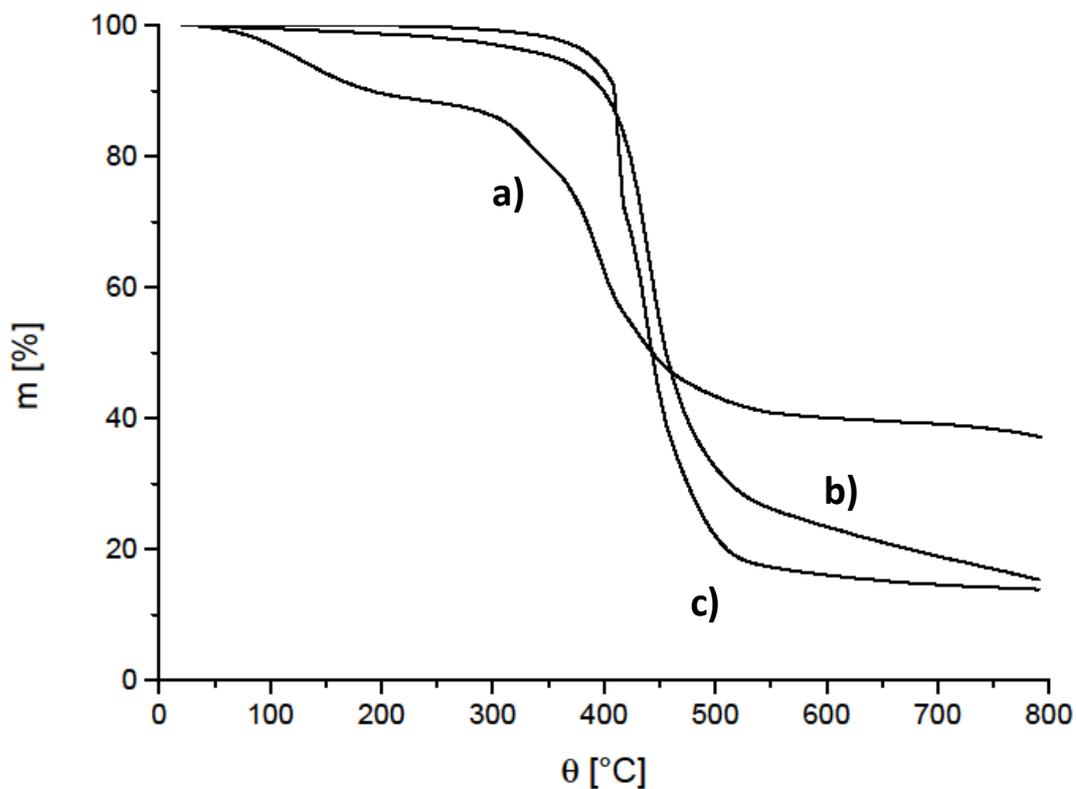


# Supporting Information

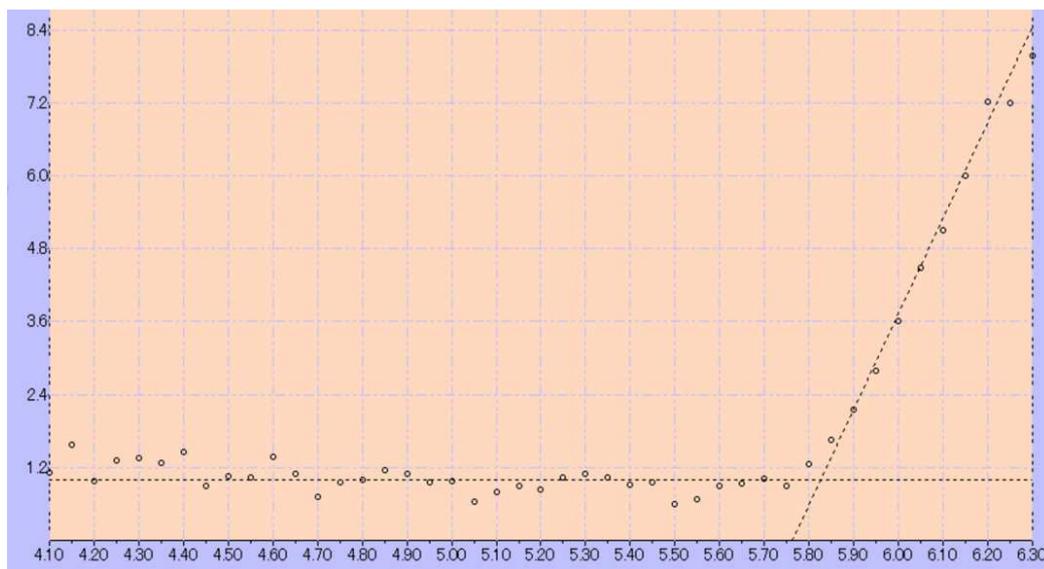
## Toward n-type analogues to poly(3-alkylthiophene)s: Impact of side-chain variation on bulk-morphology and electron transport characteristics of head-to-tail regioregular poly(4-alkylthiazole)s

*Jakob Jäger, Nadine Tchamba Yimga, Marta Urdanpilleta, Elizabeth von Hauff\*, and Frank Pammer\**

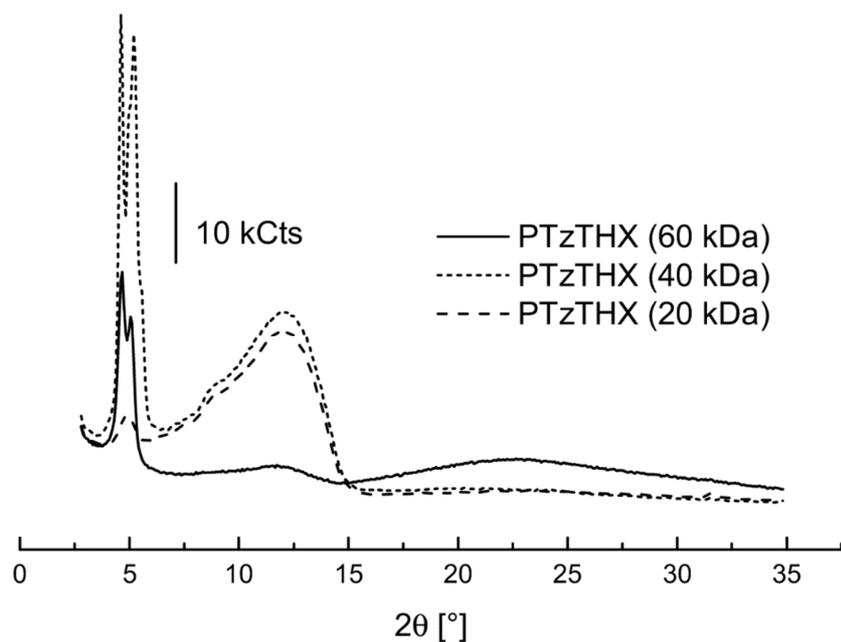
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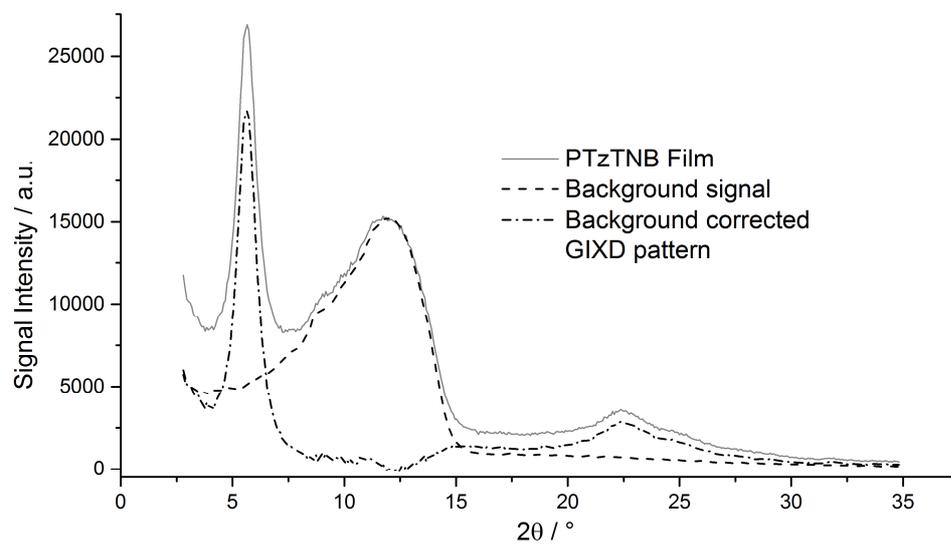
**Figure S1.** Thermogravimetric analyses a) **PTzTIB**, b) **PTzTNB**, and c) **PTzTHX**. Scan rate 15 °C/min.



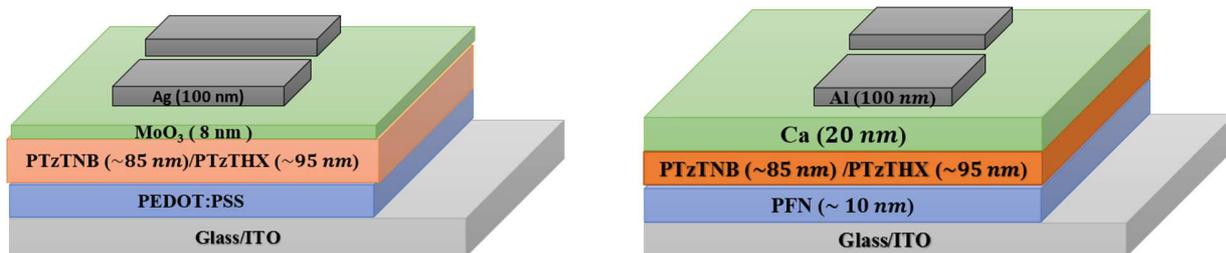
**Figure S2.** UV-PES ion current-curve for **PTzTHX**. Vertical axis: arbitrary unit. Horizontal axis: eV.



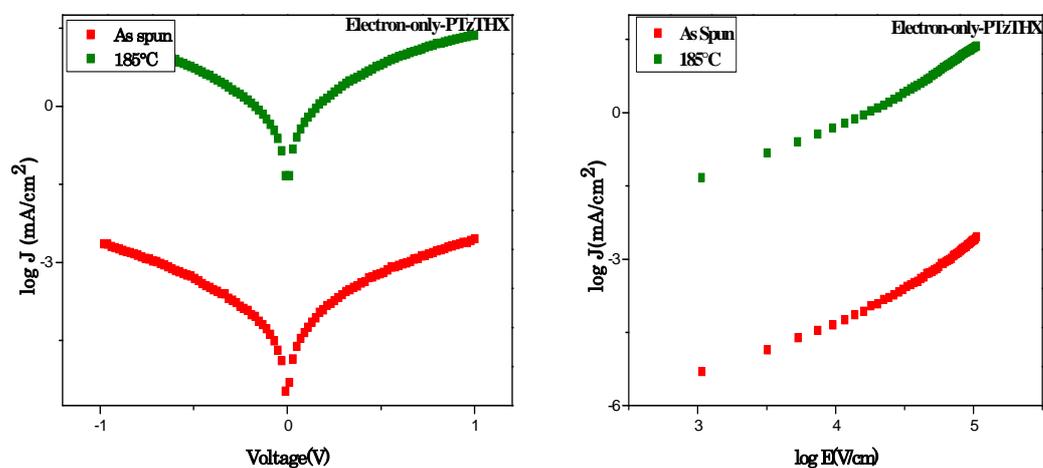
**Figure S3a.** Comparison of GIXD-refractograms of different batches of **PTzTHX**. The broad peak between  $5$  and  $15^\circ$  stems from the glass substrate. See also Figure S3b.



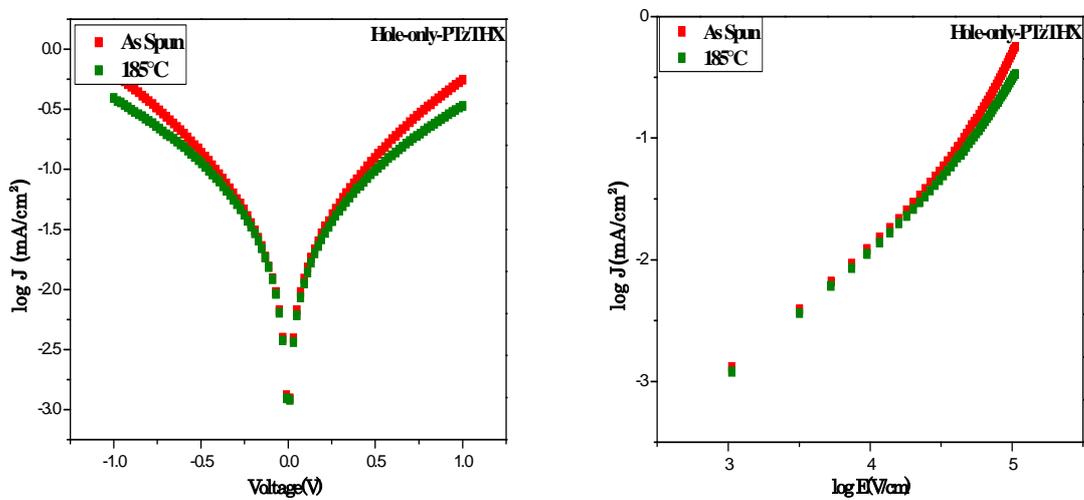
**Figure S3b.** Background corrected GIXD pattern of **PTzTNB**.



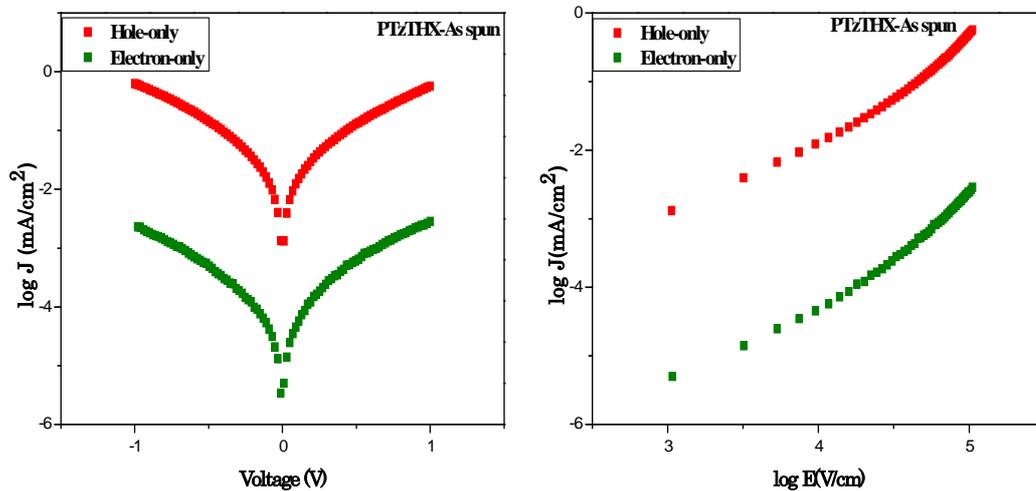
**Figure S4:** Architecture of the electron-only and hole-only based devices on PTzTNB/PTzTHX.



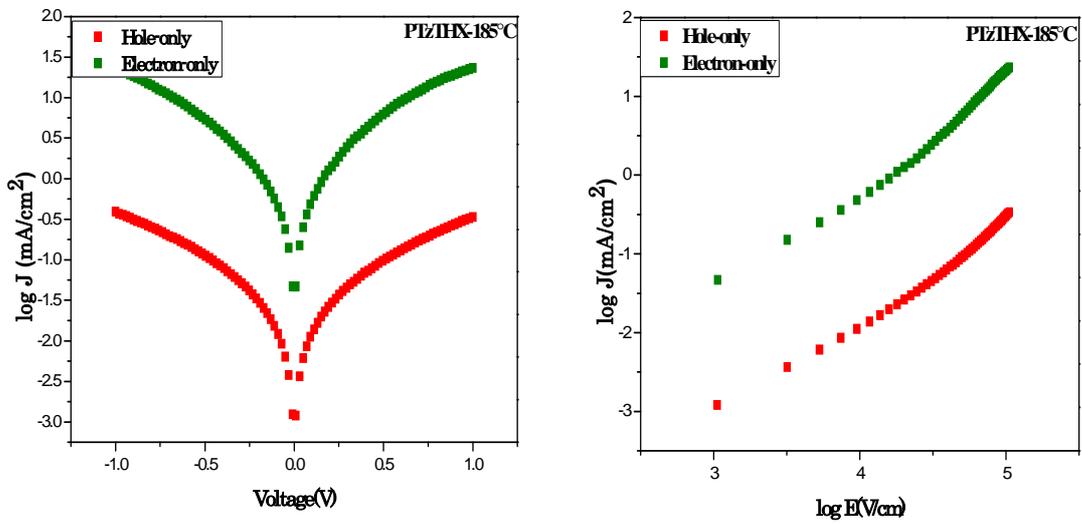
**Figure S5:** Semi-logarithmic plots of J-V (left) and log (J)-log(V) (right) curves of the electron-only devices based on PTzTHX, with the film measured as-spun, and annealed at 185°C for 10 minutes



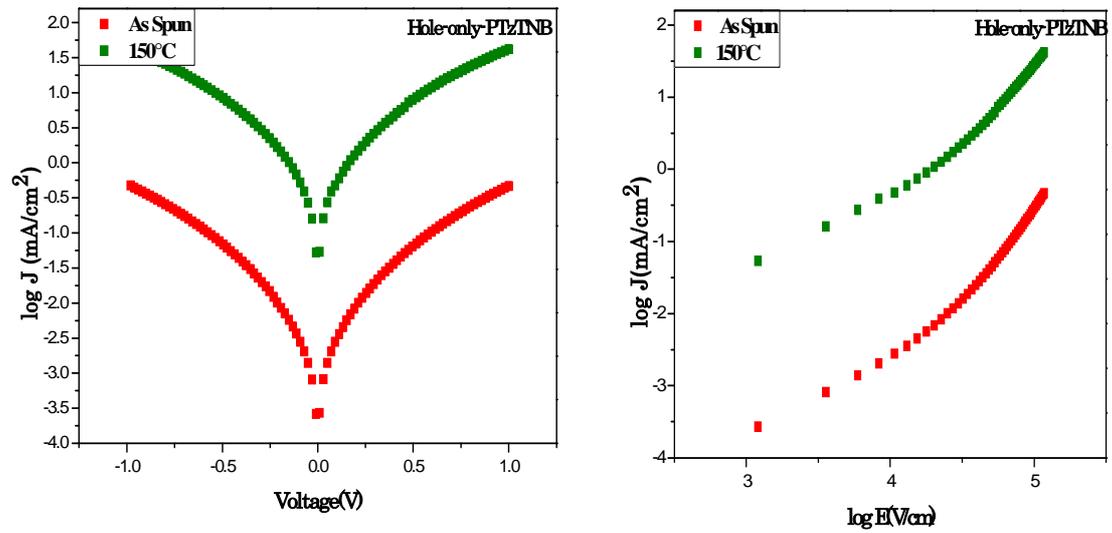
**Figure S6:** Semi-logarithmic plots of J-V (left) and log (J)-log(V) (right) curves of the hole-only devices based on **PTzTHX**, with the film measured as-spun, and annealed at 185°C for 10 minutes.



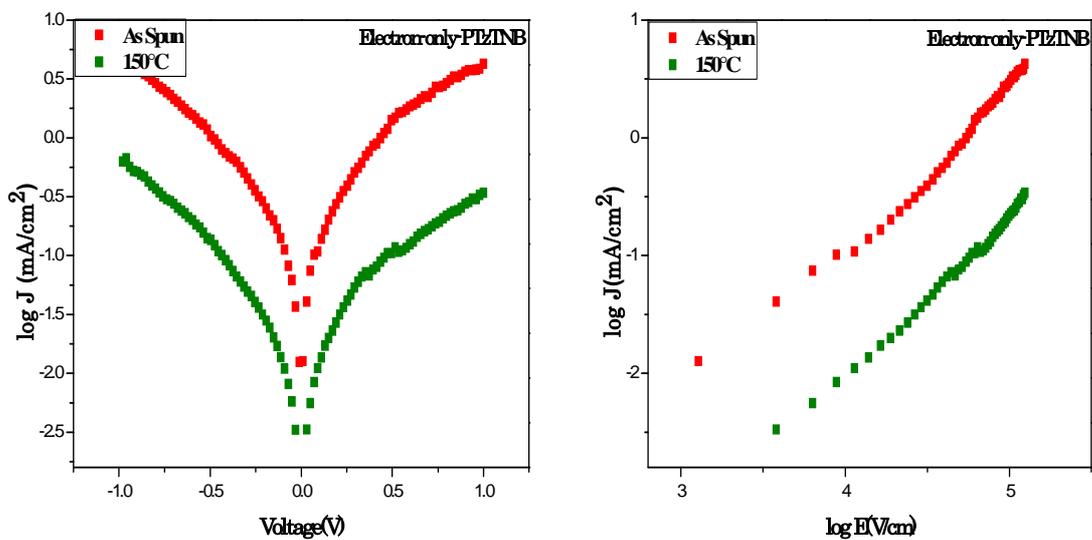
**Figure S7:** Semi-logarithmic plots of J-V (left) and log (J)-log (V) (right) curves of the electron-only and hole-only devices based on **PTzTHX**, measured as-spun.



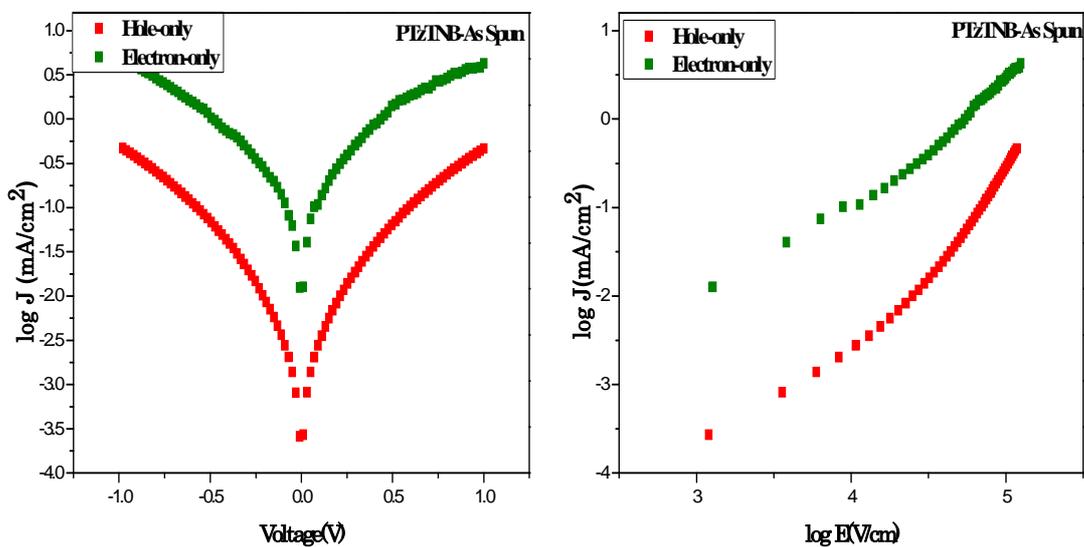
**Figure S8:** Semi-logarithmic plots of J-V (left) and  $\log(J)$ - $\log(V)$  (right) curves of the electron-only and hole-only devices based on **PTzTHX**, with film annealed at 185°C for 10 minutes.



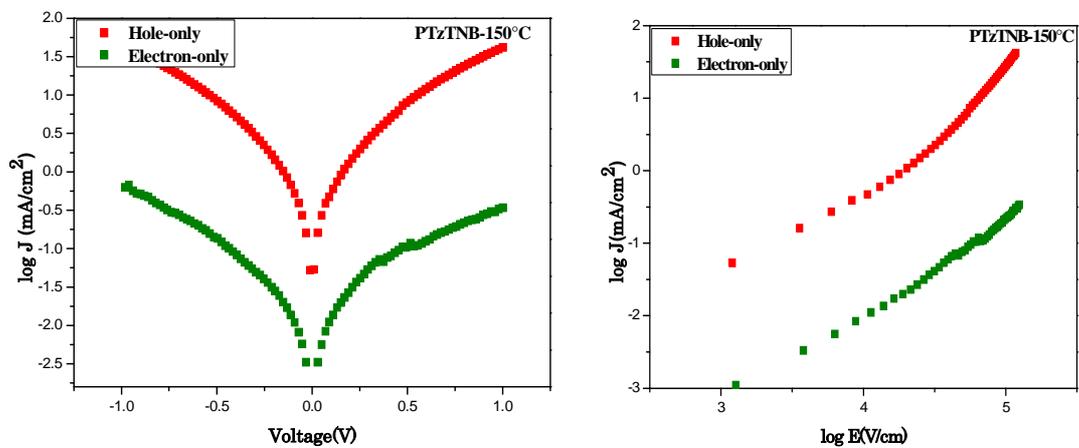
**Figure S9:** Semi-logarithmic plots of J-V (left) and  $\log(J)$ - $\log(V)$  (right) curves of the hole-only devices based on **PTzTNB**, with the film measured as-spun, and annealed at 150°C for 30 minutes.



**Figure S10:** Semi-logarithmic plots of J-V (left) and  $\log(J)$ - $\log(V)$  (right) curves of the electron-only devices based on **PTzTNB**, with the film measured as-spun, and annealed at 150°C for 30 minutes

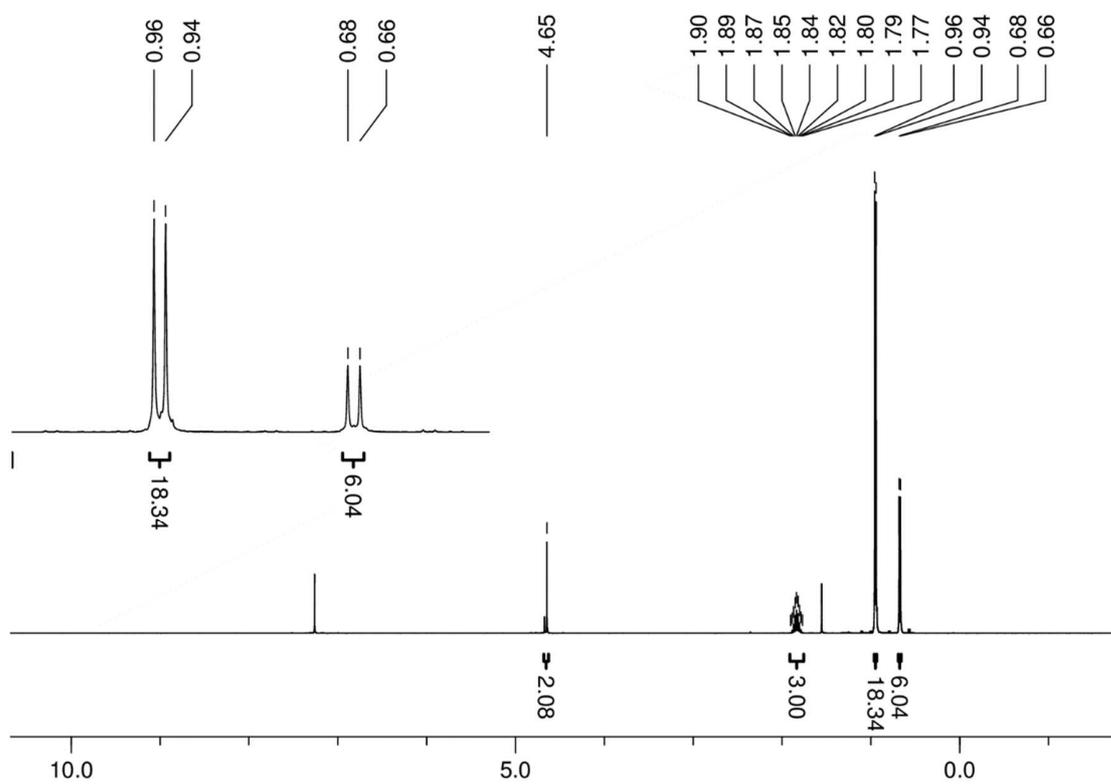


**Figure S11:** Semi-logarithmic plots of J-V (left) and  $\log(J)$ - $\log(V)$  (right) curves of the electron-only and hole-only based devices on **PTzTNB**, measured as-spun

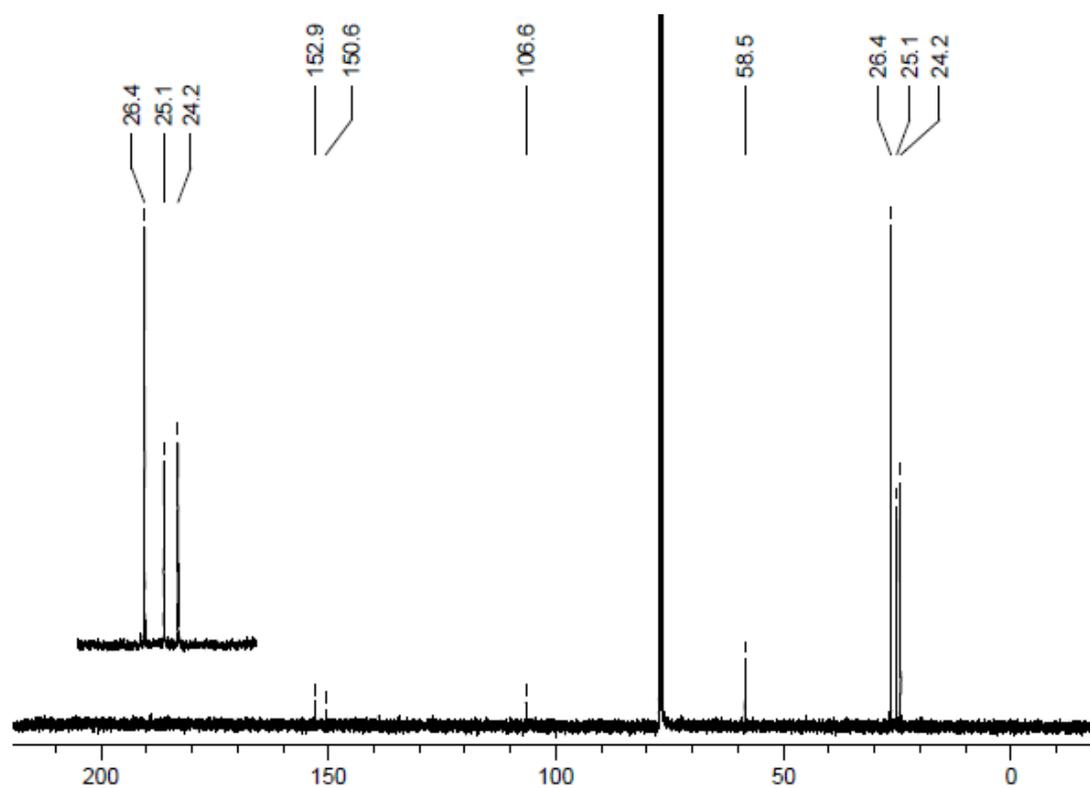


**Figure S12:** Semi-logarithmic plots of J-V (left) and  $\log(J)$ - $\log(V)$  (right) curves of the electron-only and hole-only based devices on **PTzTNB**, with film annealed at 150°C for 30 minutes.

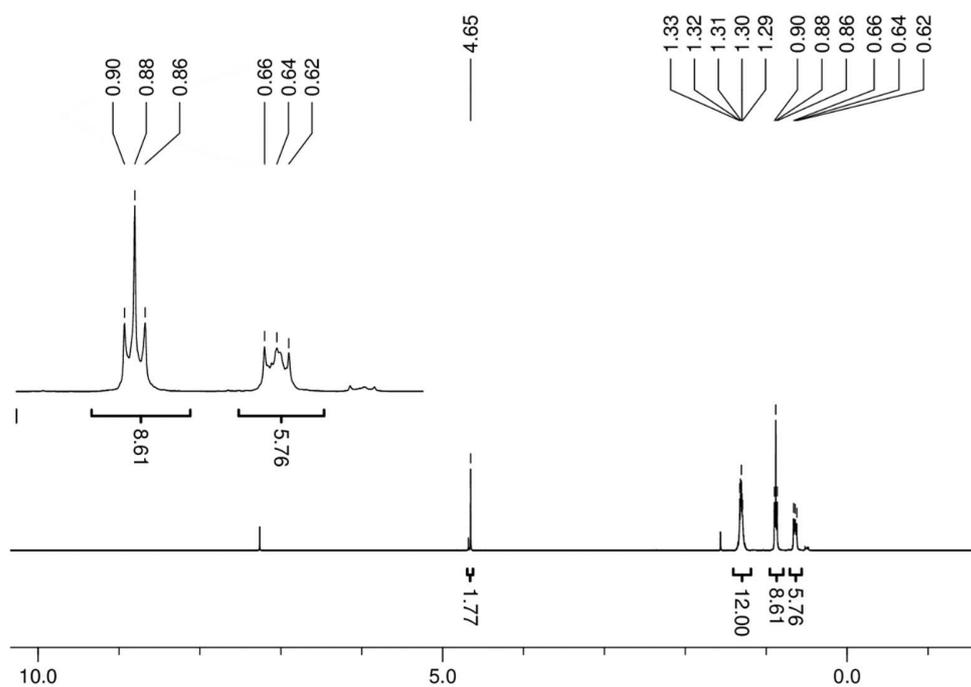
### Supplementary Analytical Data



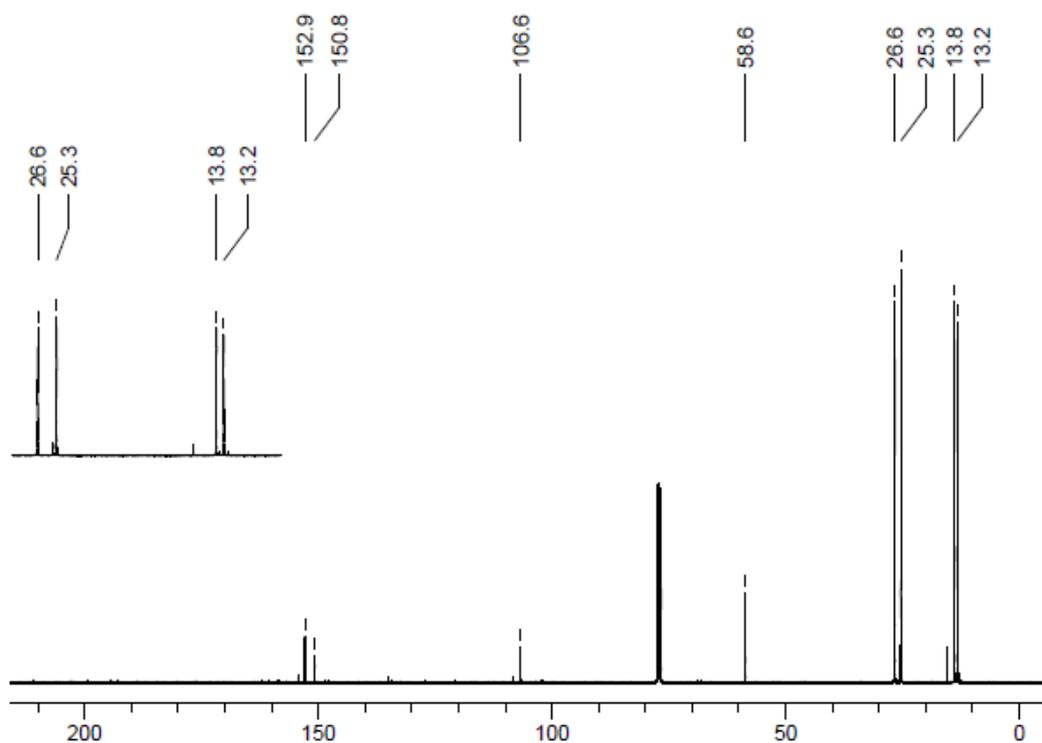
**Figure S13.**  $^1\text{H}$  NMR-spectrum of 5-bromo-2-chloro-4-(triisobutylsilyloxymethyl)-thiazole (**2a**). For  $^1\text{H}$  NMR data of *rr*-PTzs recorded under similar conditions see: F. Pammer, J. Jäger, B. Rudolf, Y. Sun, *Macromolecules*, **2014**, *47*, 5904-5912.



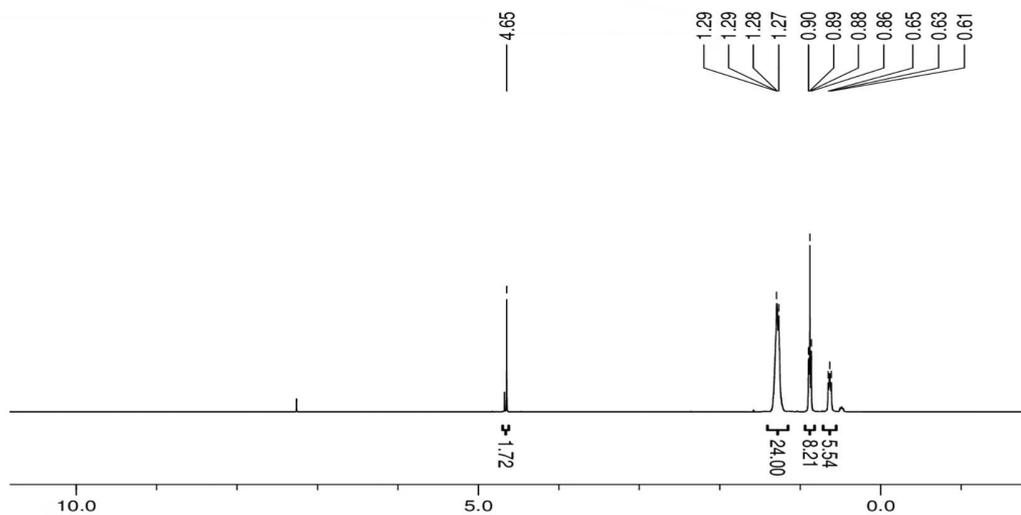
**Figure S14.**  $^{13}\text{C}$  NMR-spectrum of 5-bromo-2-chloro-(triisobutylsilyloxymethyl)-thiazole (**2a**).



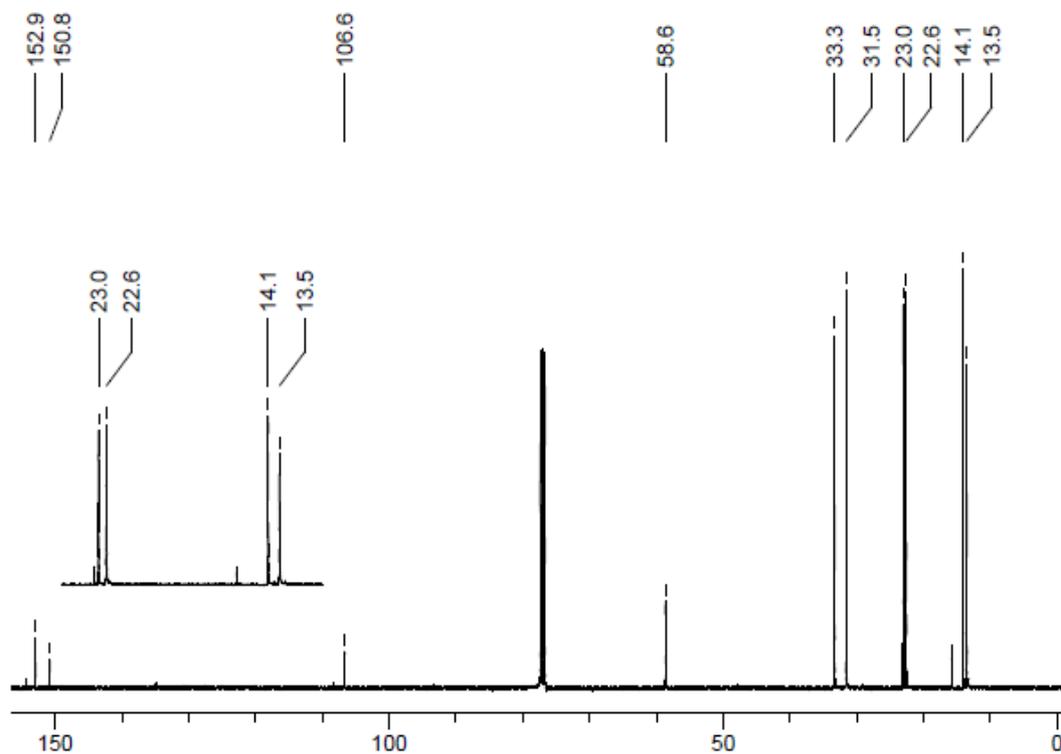
**Figure S15.**  $^1\text{H}$  NMR-spectrum of 5-bromo-2-chloro-4-(tri(*n*-butyl)silyloxymethyl)-thiazole (**2b**).



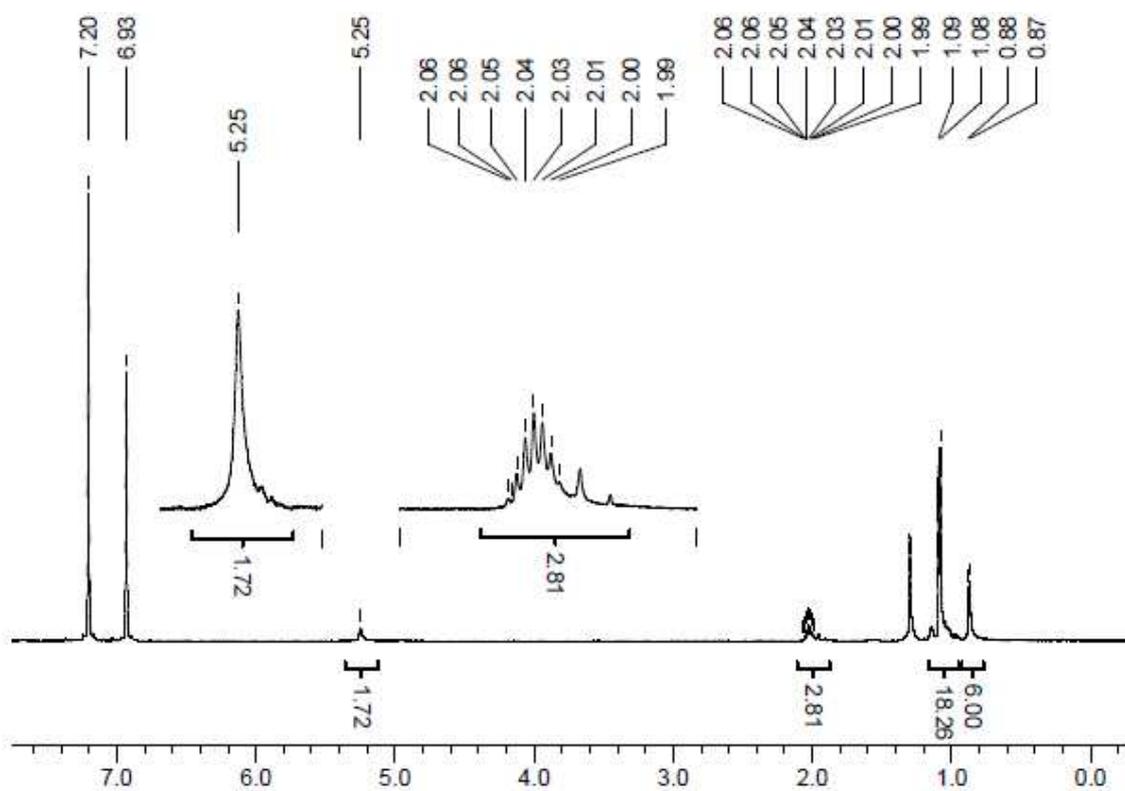
**Figure S16.**  $^{13}\text{C}$  NMR-spectrum of 5-bromo-2-chloro-(tri(*n*-butyl)silyloxymethyl)-thiazole (**2b**).



**Figure S17.**  $^1\text{H}$  NMR-spectrum of 5-bromo-2-chloro-4-(tri(*n*-hexyl)silyloxymethyl)-thiazole (**2c**).



**Figure S18.**  $^{13}\text{C}$  NMR-spectrum of 5-bromo-2-chloro-(tri(*n*-hexyl)silyloxymethyl)-thiazole (**2c**).



**Figure S19.**  $^1\text{H}$  NMR-spectrum of **PTzTIB** in 1,2-dichlorobenzene- $\text{d}_4$  at 100 °C.

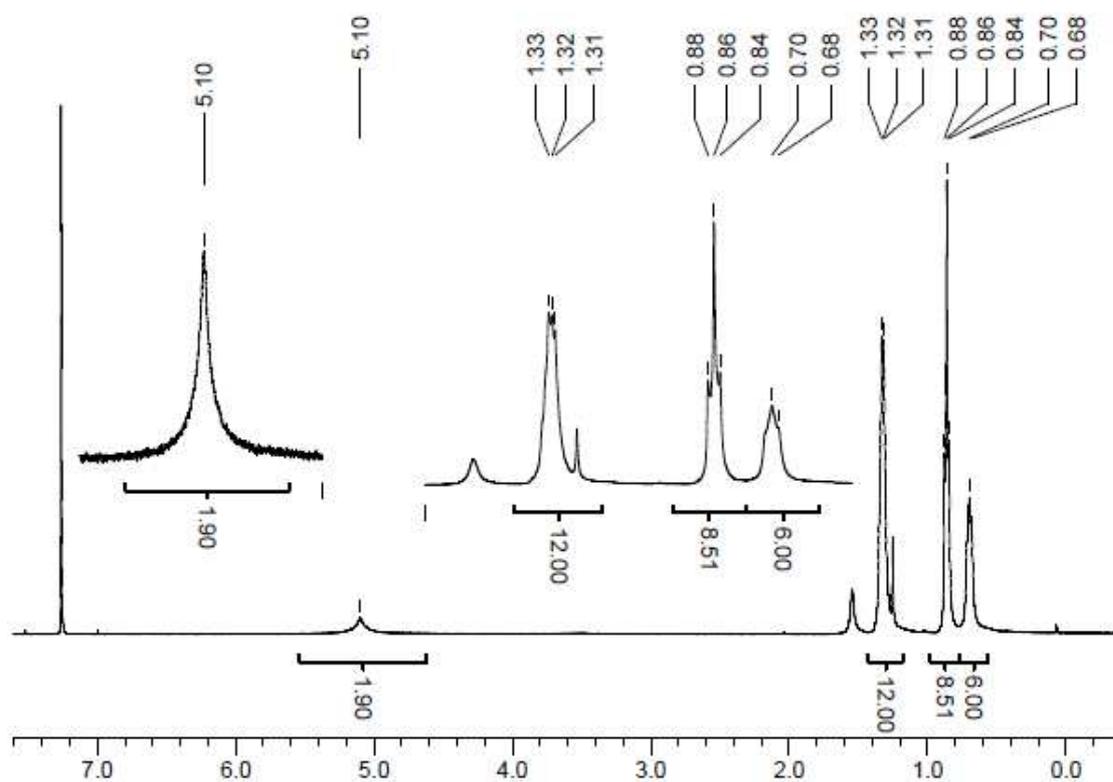


Figure S20..  $^1\text{H}$  NMR-spectrum of PTzTNB in  $\text{CDCl}_3$  at  $20^\circ\text{C}$ .

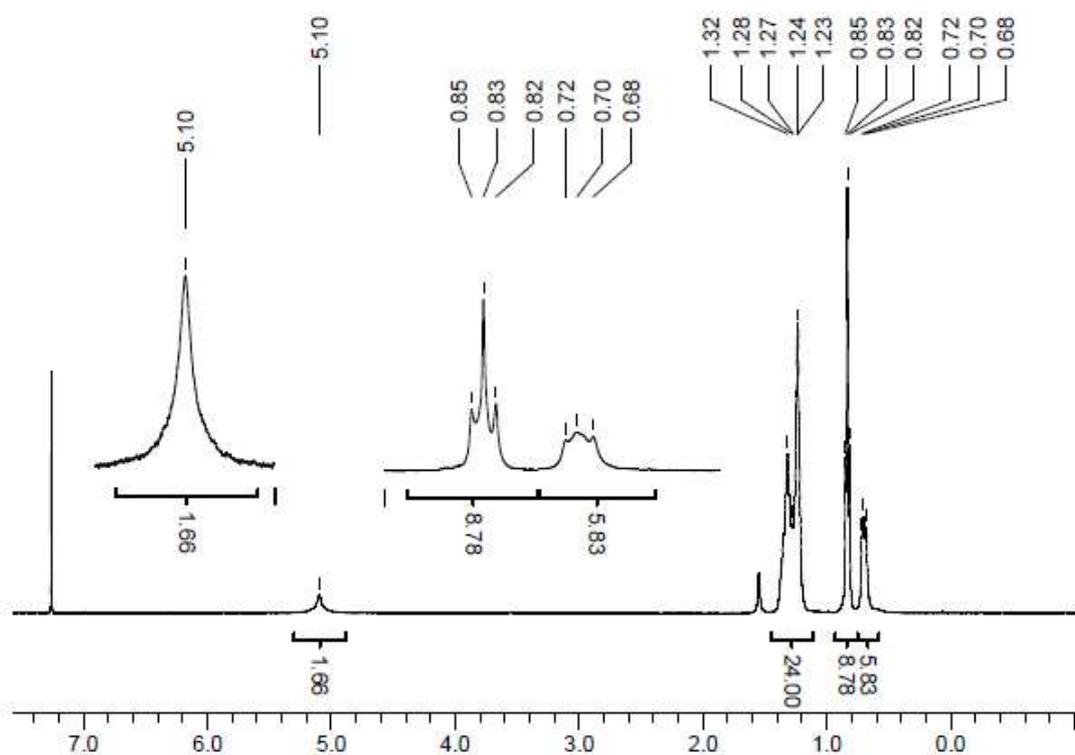
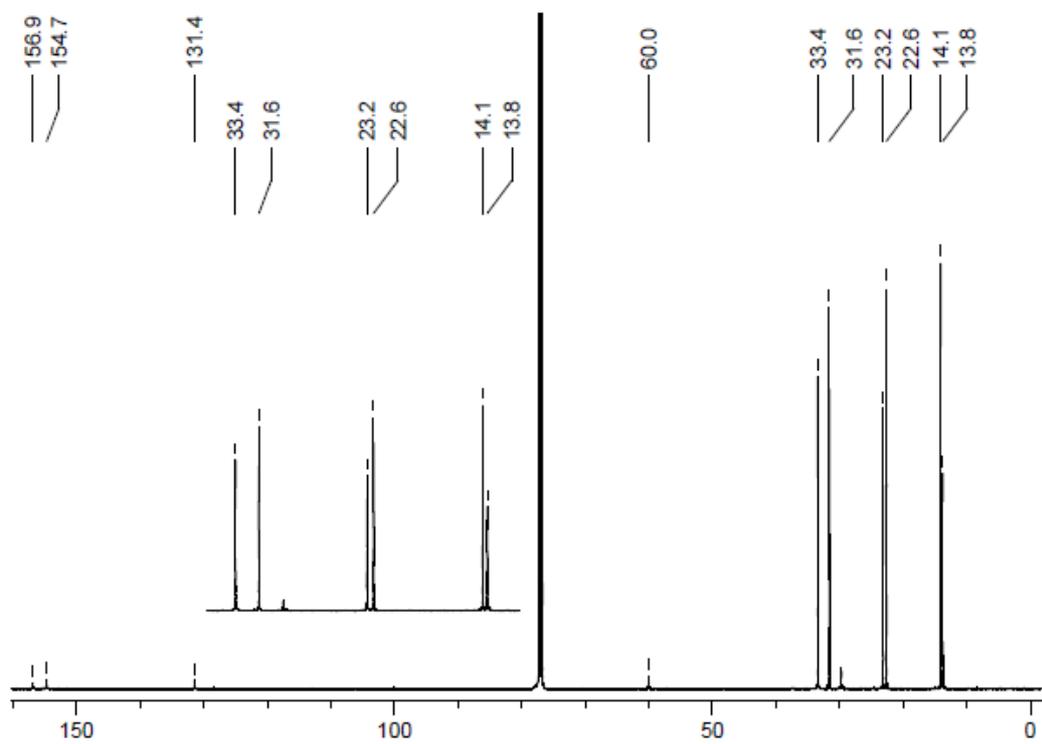


Figure S21.  $^1\text{H}$  NMR-spectrum of PTzTHX in  $\text{CDCl}_3$  at  $20^\circ\text{C}$ .



**Figure S22.**  $^{13}\text{C}$  NMR-spectrum of PTzTHX in  $\text{CDCl}_3$ .