

Benzodithiophene-Thiadiazoloquinoxaline as an Acceptor for Ambipolar Copolymers with Deep LUMO Level and Distinct Linkage Pattern

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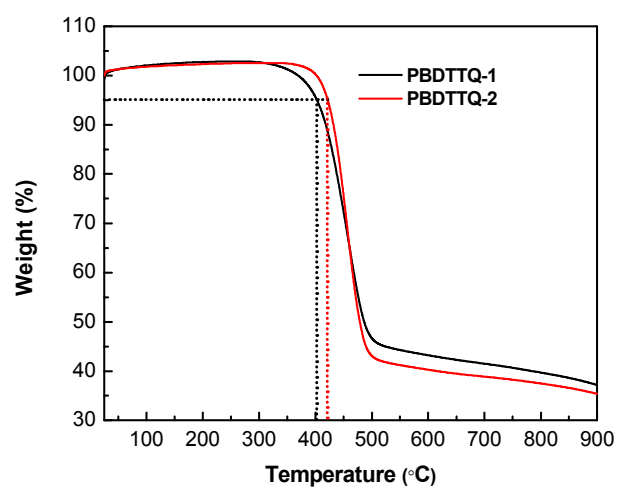


Figure S1. TGA curves for **PBDTTQ-1** and **PBDTTQ-2** measured under a nitrogen atmosphere at a heating rate of 10 °C/min.

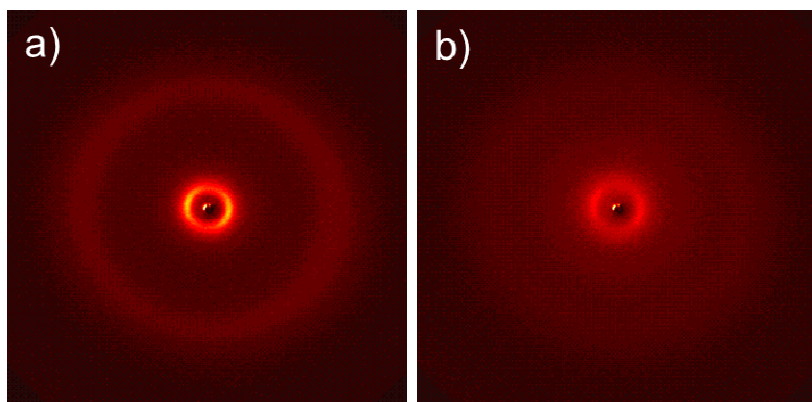


Figure S2. 2DWAXS of a) PBDTTQ-1 and b) PBDTTQ-2. The fiber sample was mounted vertical towards the 2D detector.

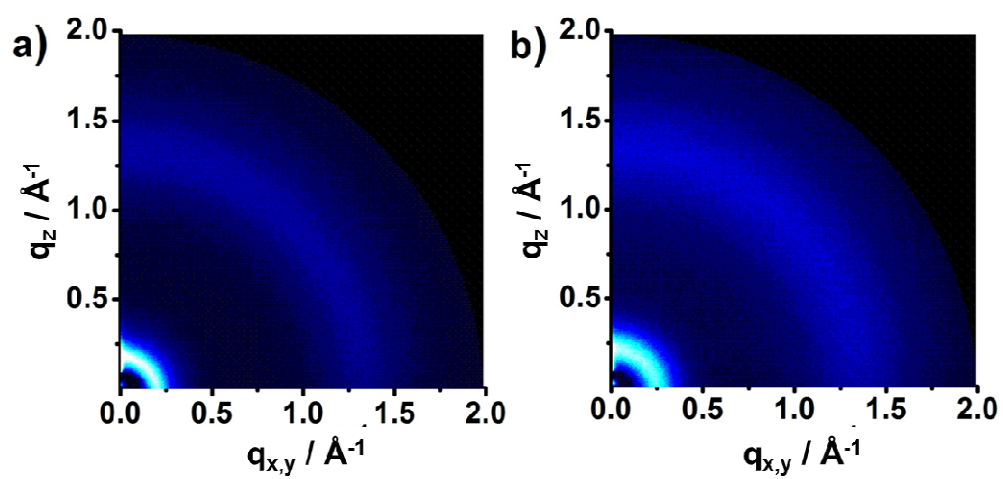


Figure S3. GIWAXS of a) PBDTTQ-1 and b) PBDTTQ-2.

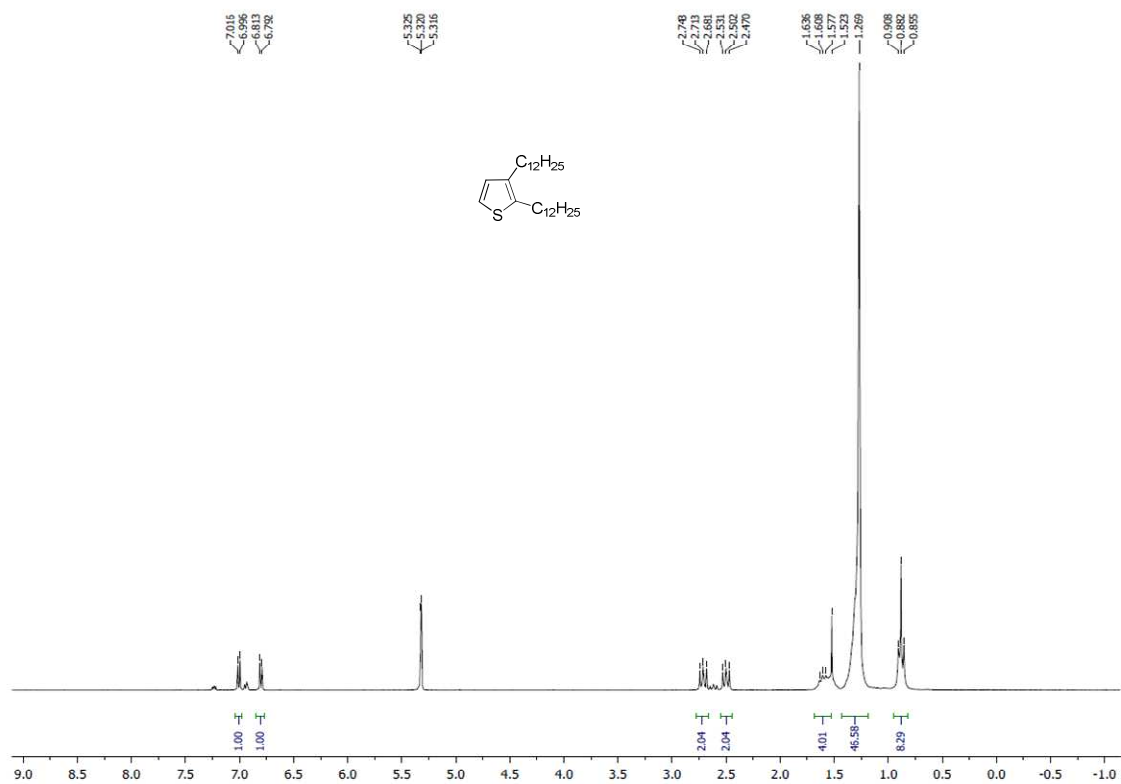


Figure S4. ¹H NMR spectrum of compound **2**.

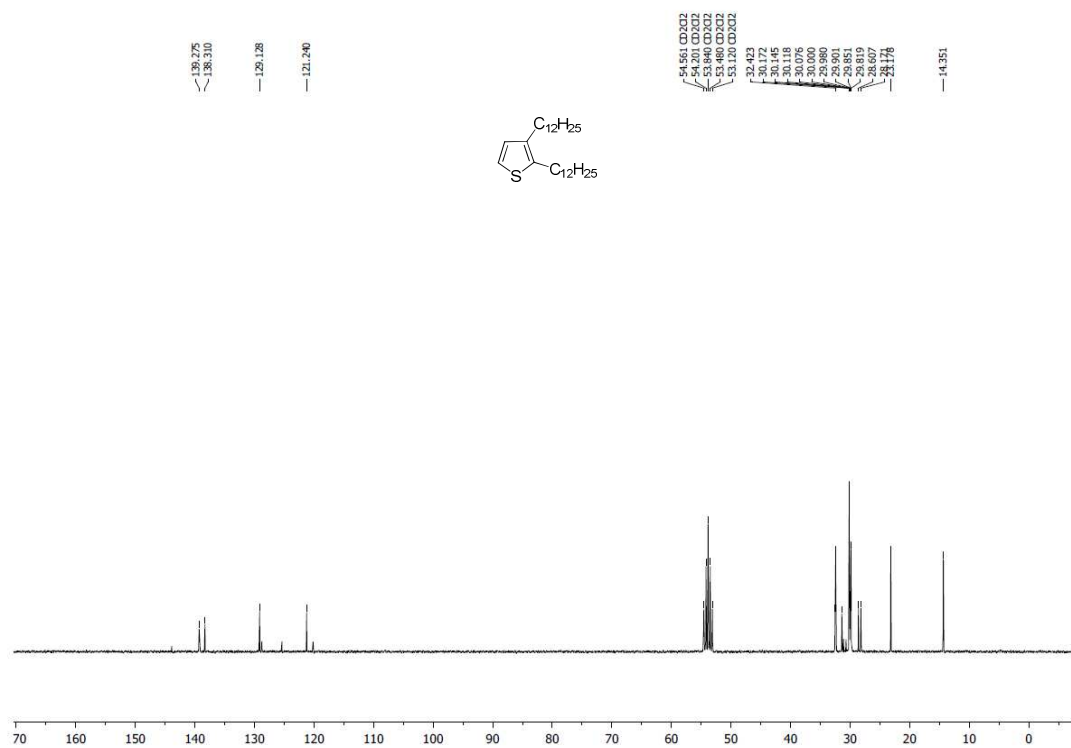
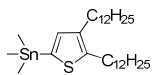


Figure S5. ¹³C NMR spectrum of compound **2**.



Chemical structure of poly(2,5-diethylthiophene): *C1=CC(=C(C1)S)CC*

¹³C NMR spectrum (CDCl₃) showing peaks for the polymer. The x-axis represents chemical shift in ppm, ranging from 70 to -10.

Peak list (ppm):

- 145.262
- 139.770
- 137.717
- 132.734
- 54.561 CDCl₃
- 54.200 CDCl₃
- 53.840 CDCl₃
- 53.480 CDCl₃
- 53.120 CDCl₃
- 32.573
- 32.419
- 32.156
- 31.893
- 30.165
- 30.143
- 30.108
- 30.080
- 29.844
- 29.804
- 29.846
- 29.794
- 29.754
- 14.351
- 8.269

- S6 -

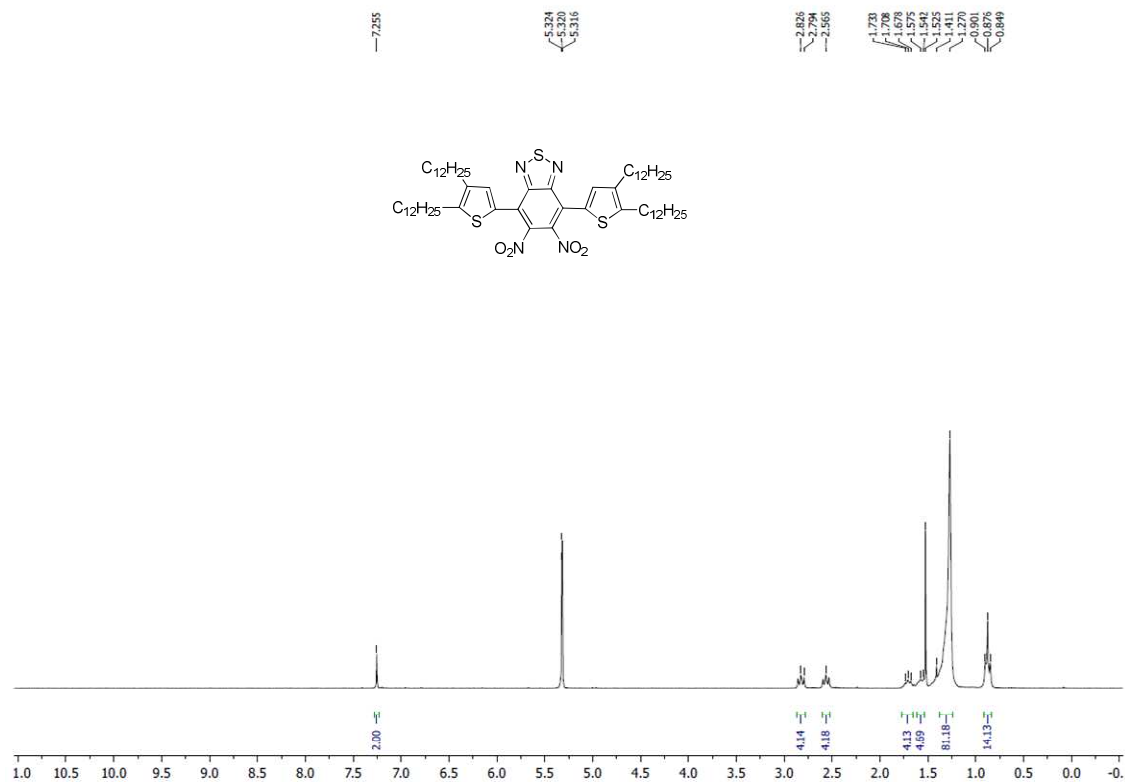


Figure S8. ¹H NMR spectrum of compound 5.

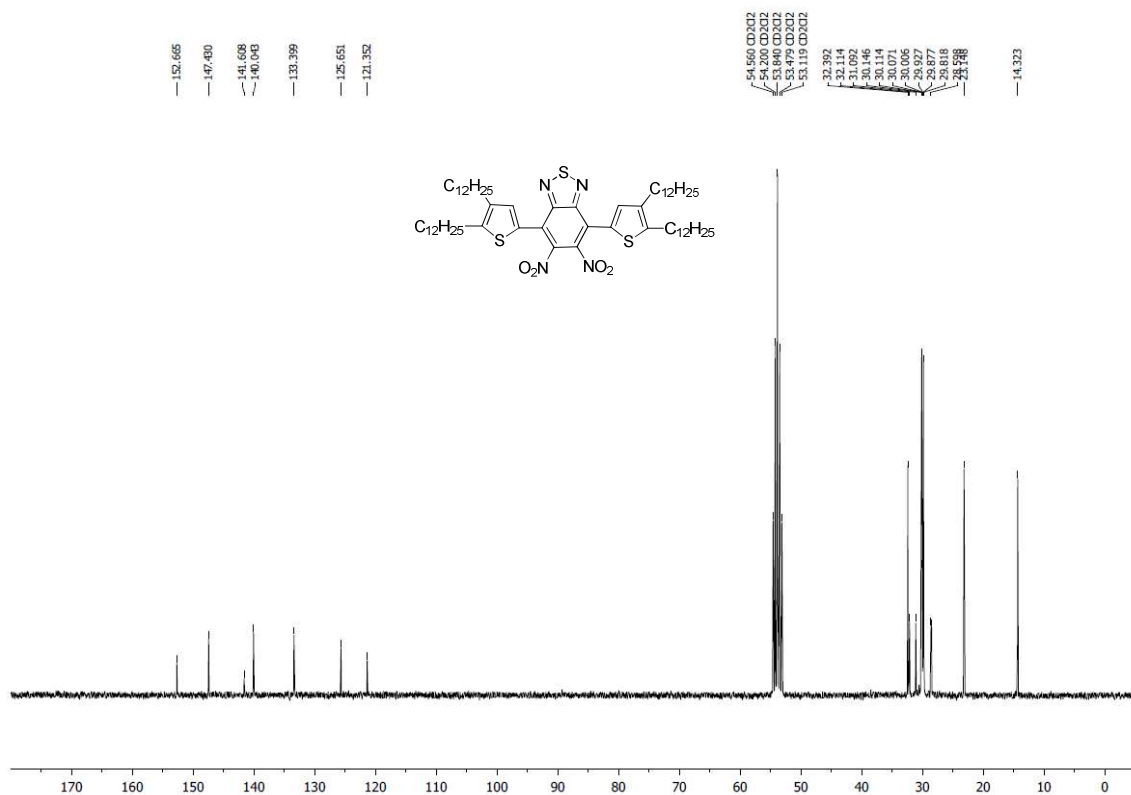


Figure S9. ¹³C NMR spectrum of compound 5.

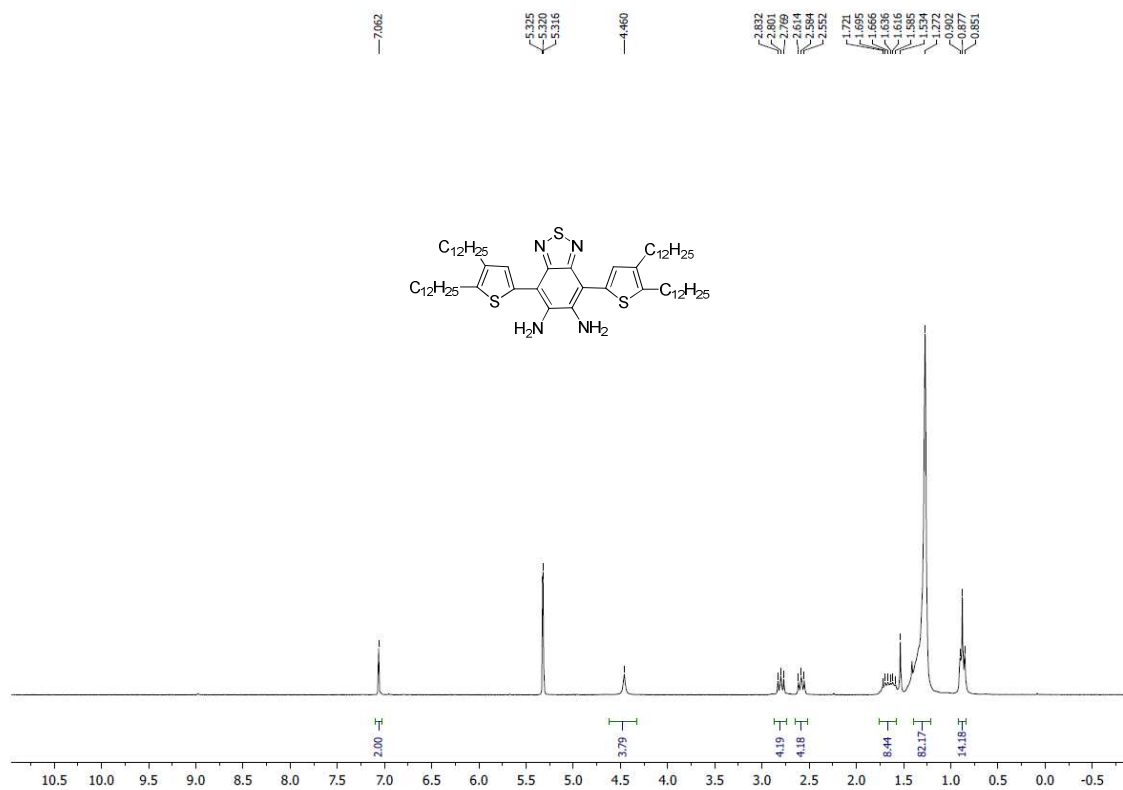


Figure S10. ¹H NMR spectrum of compound 6.

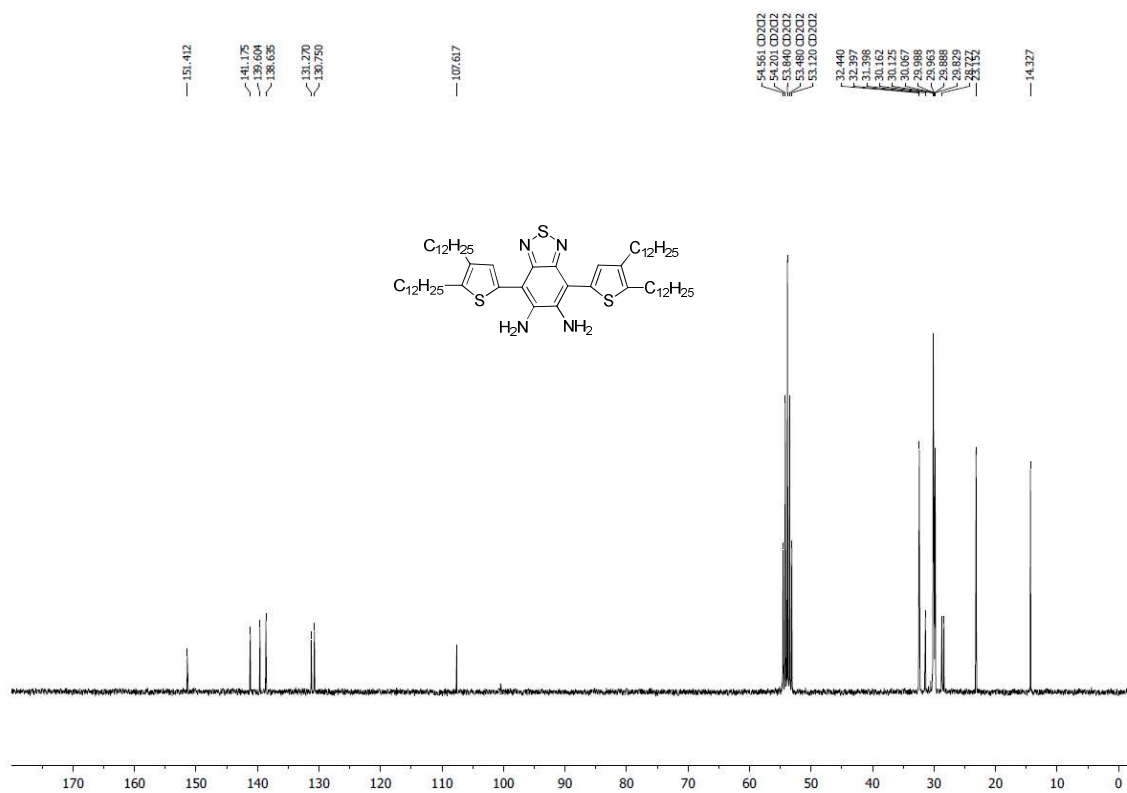
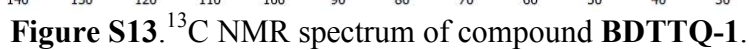
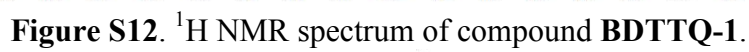


Figure S11. ¹³C NMR spectrum of compound 6.



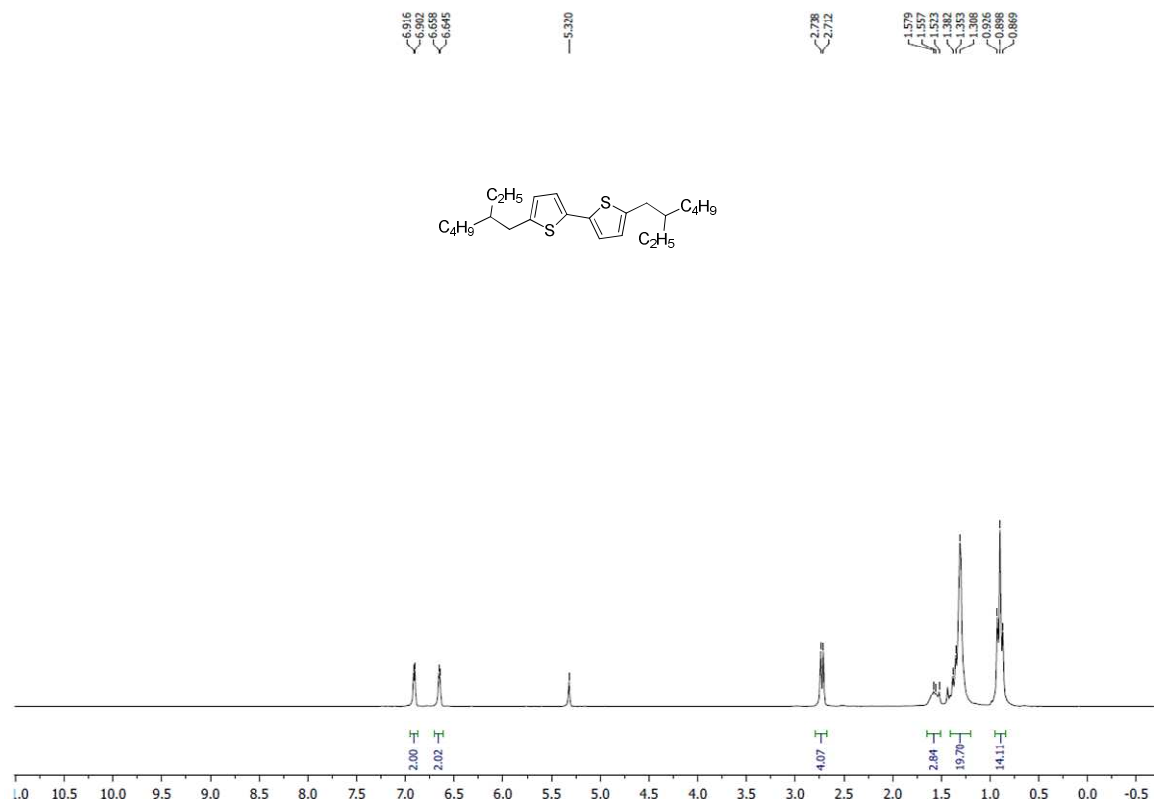


Figure S14. ¹H NMR spectrum of compound **9**.

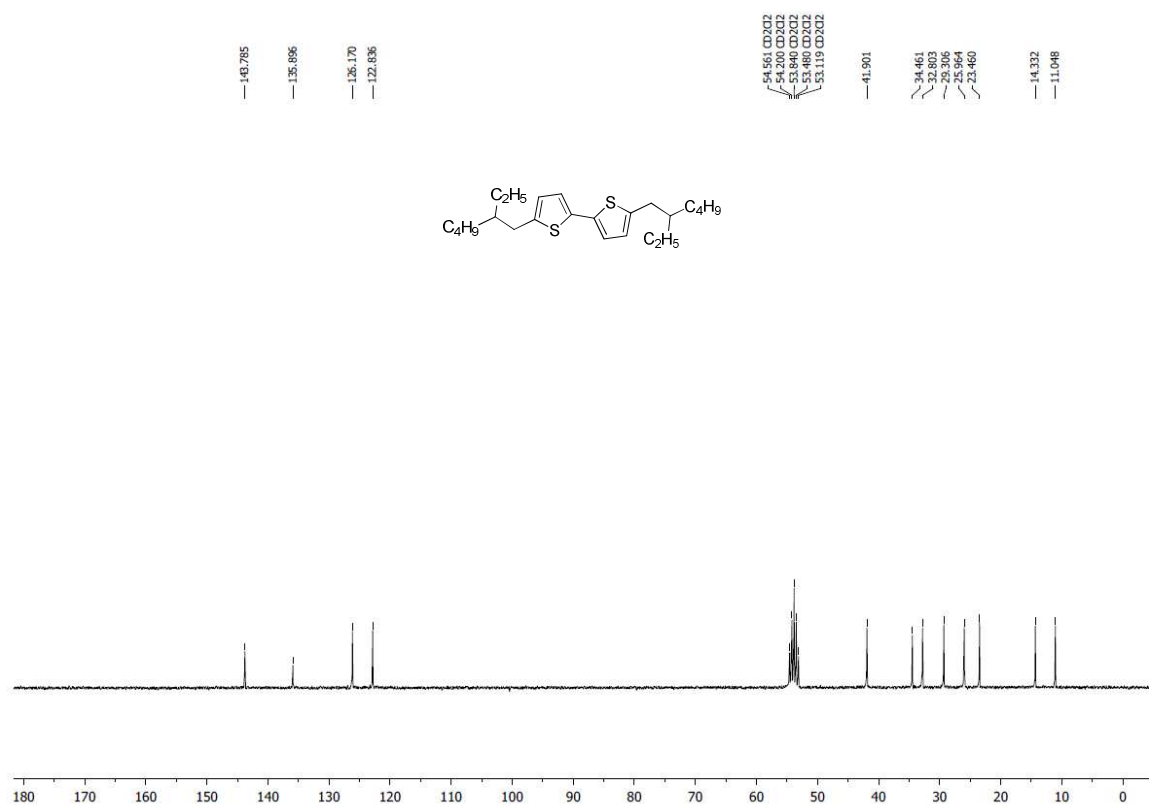


Figure S15. ¹³C NMR spectrum of compound **9**.

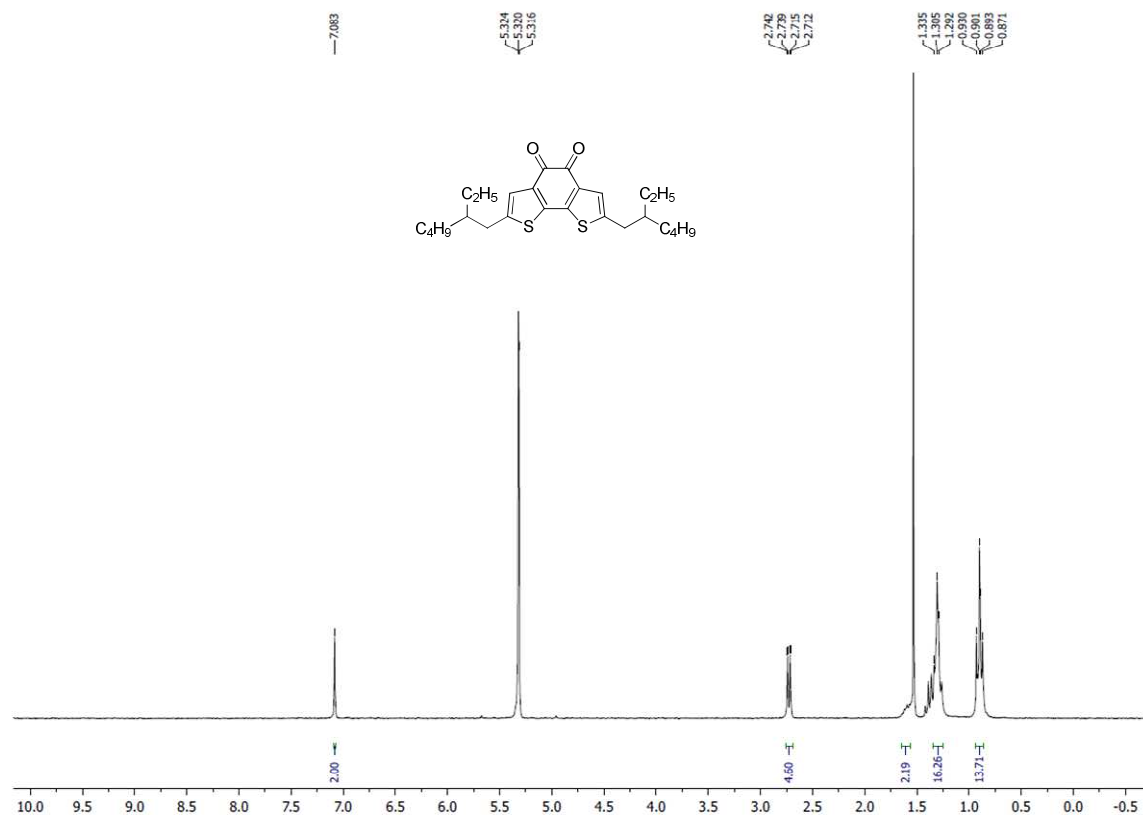
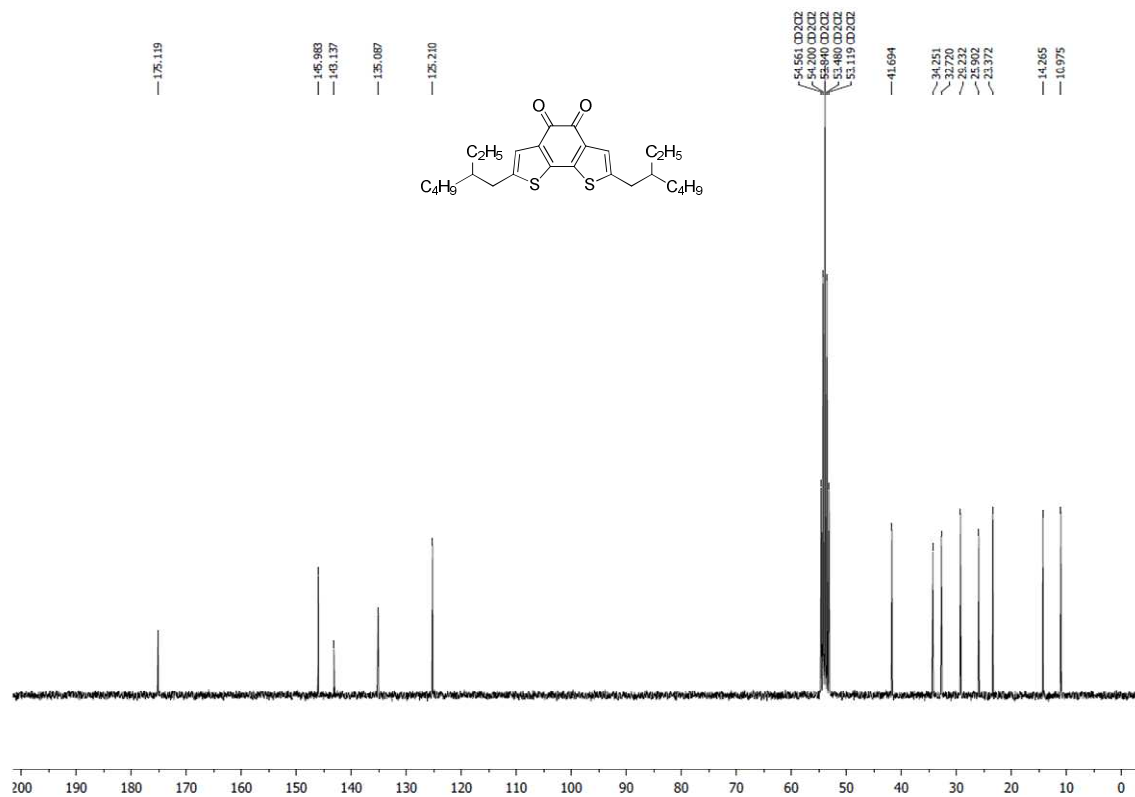


Figure S16. ¹H NMR spectrum of compound 10.



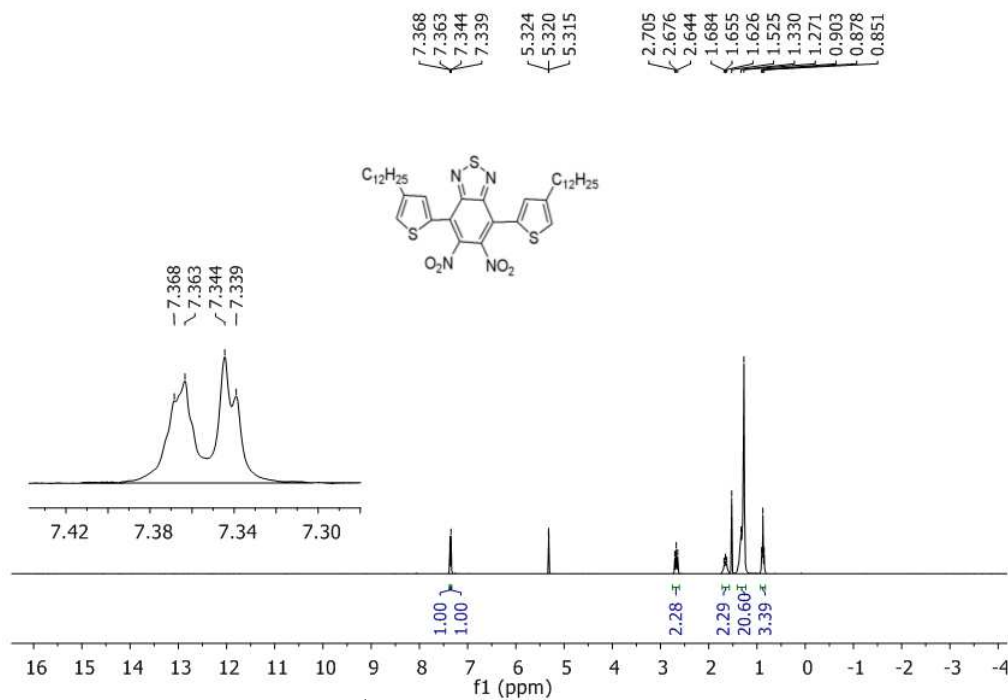


Figure S18. ¹H-NMR spectrum of compound 12

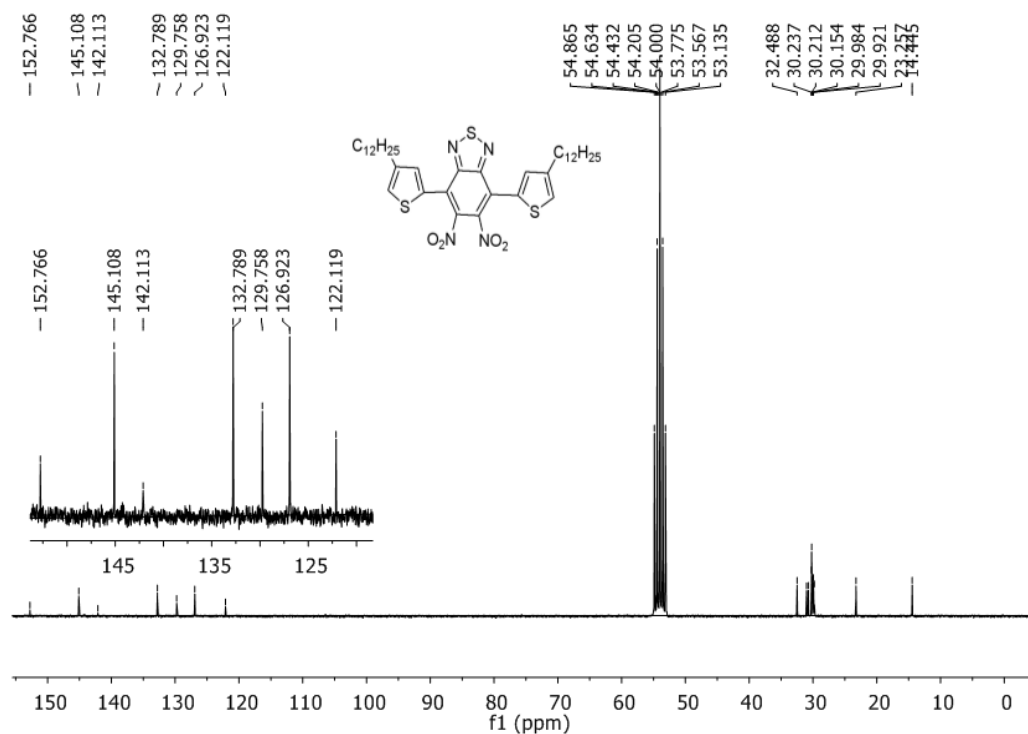


Figure S19. ¹³C NMR spectrum of compound 12

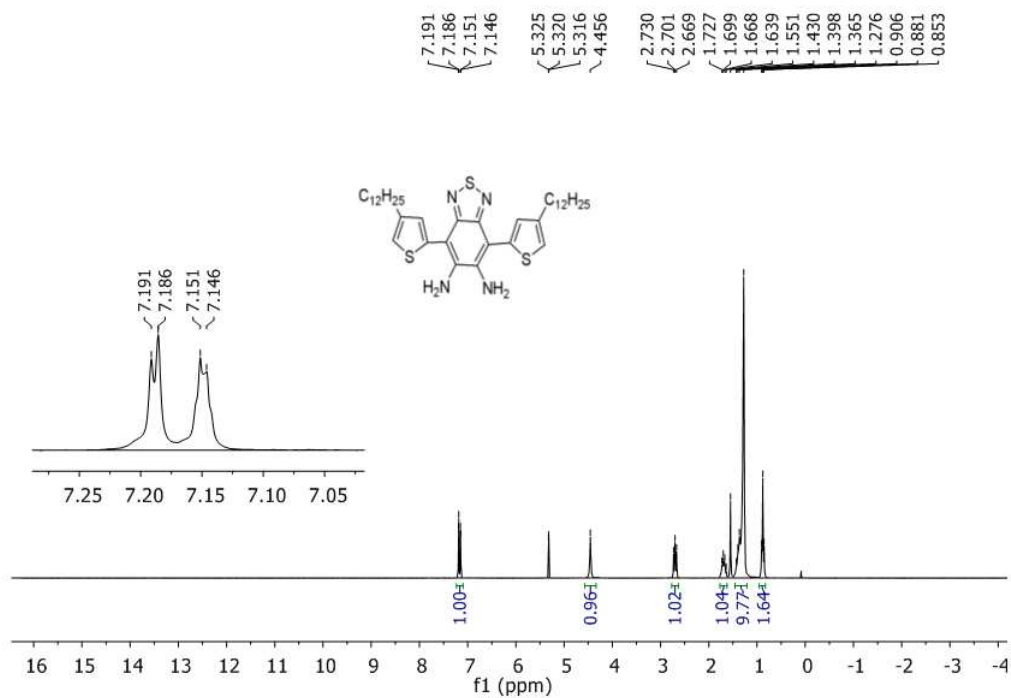


Figure S20. ¹H NMR spectrum of compound 13

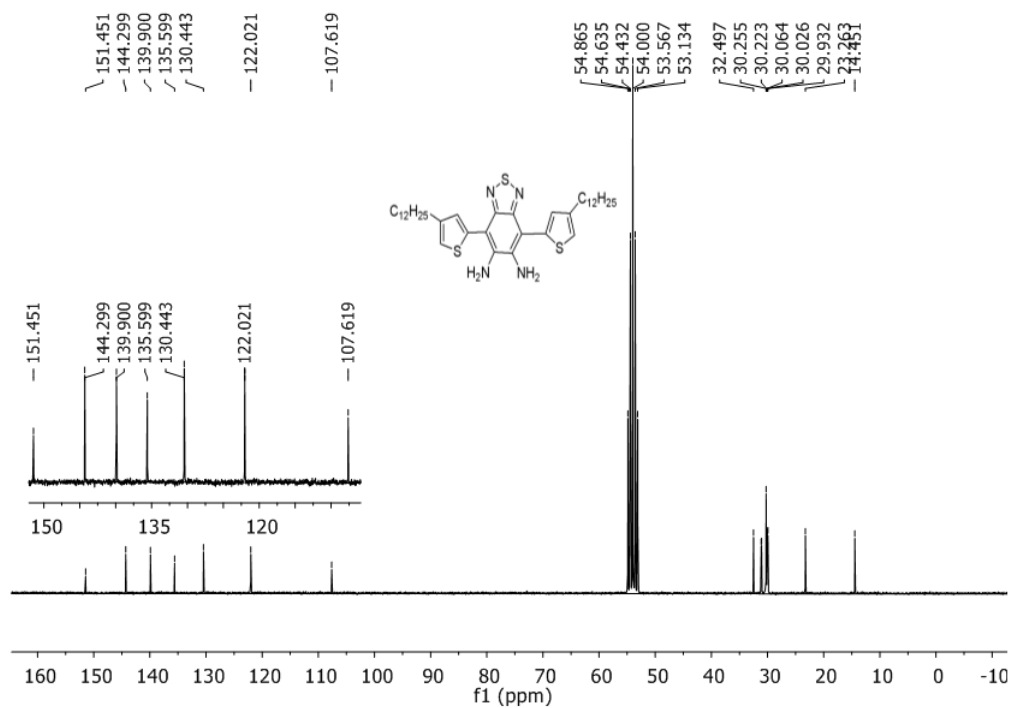


Figure S21. ¹³C NMR spectrum of compound 13

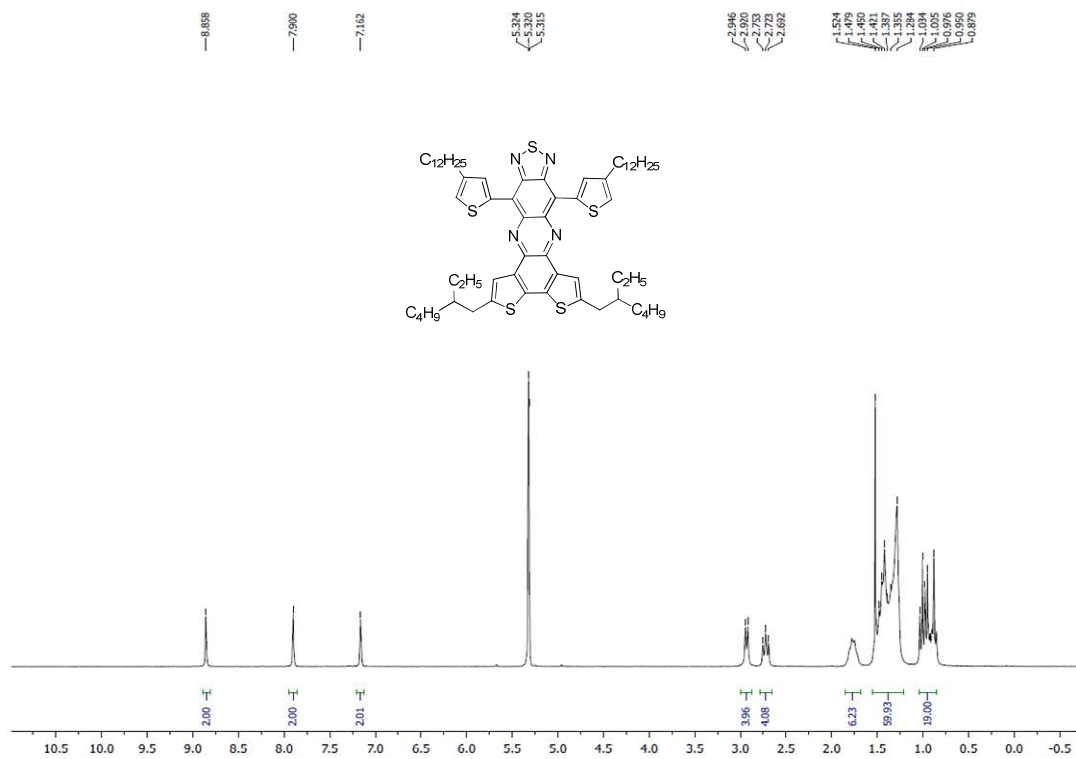


Figure S22. ¹H NMR spectrum of compound 14.

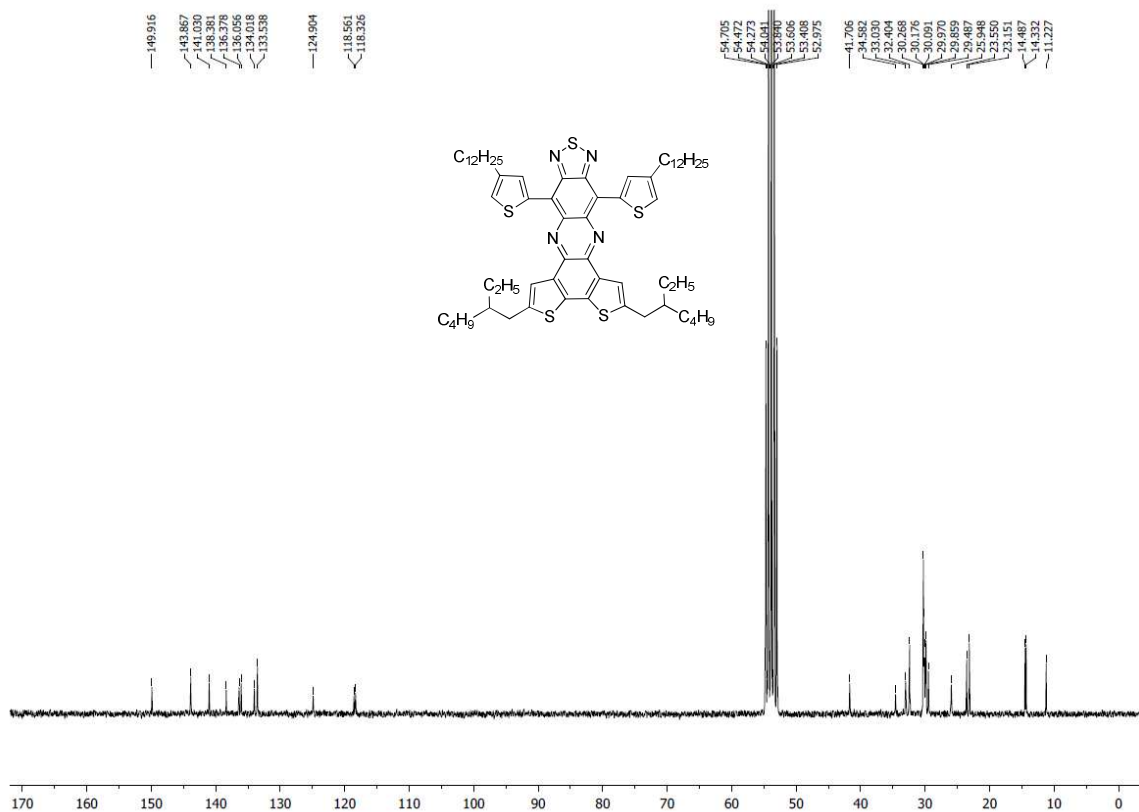


Figure S23. ¹³C NMR spectrum of compound 14

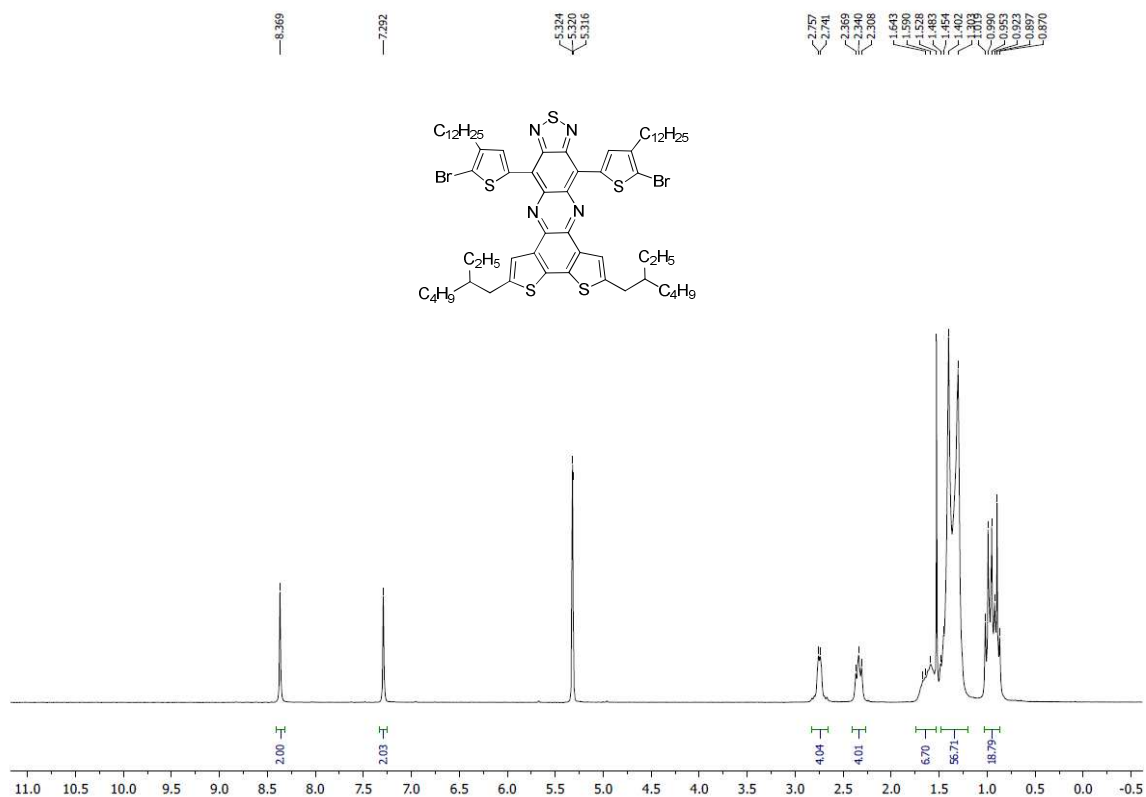


Figure S24. ^1H NMR spectrum of compound BDTTQ-2.

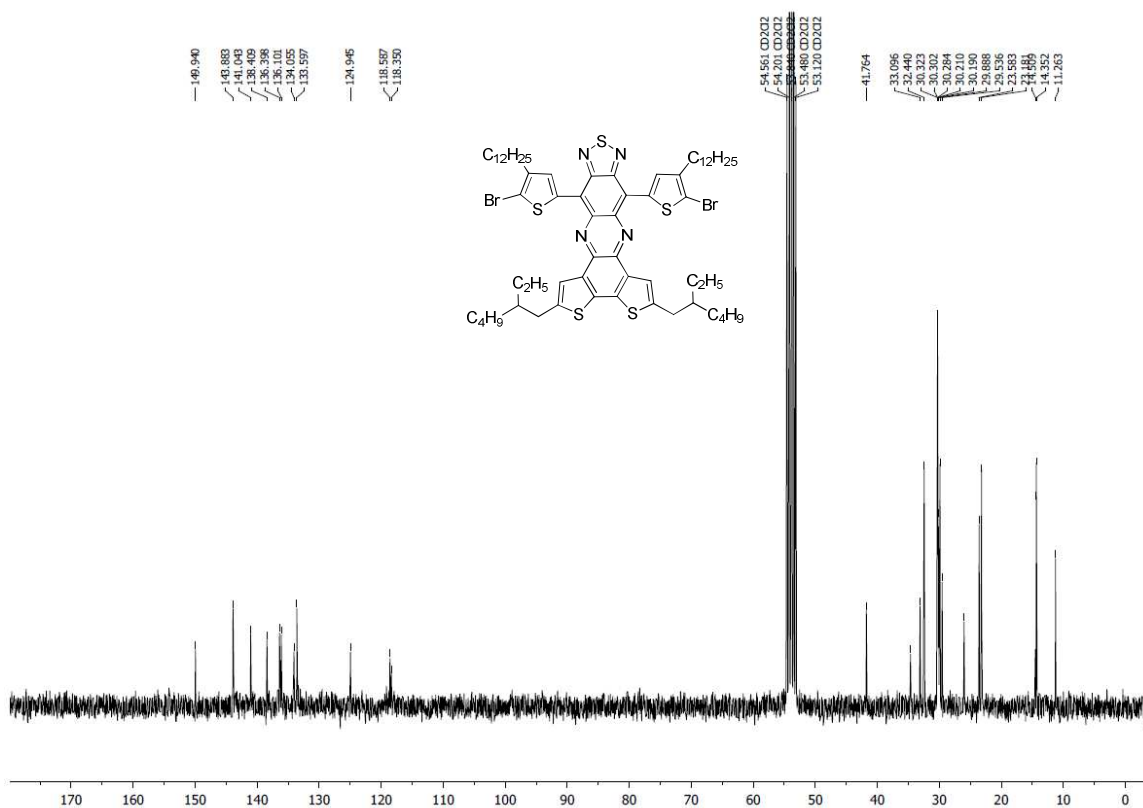
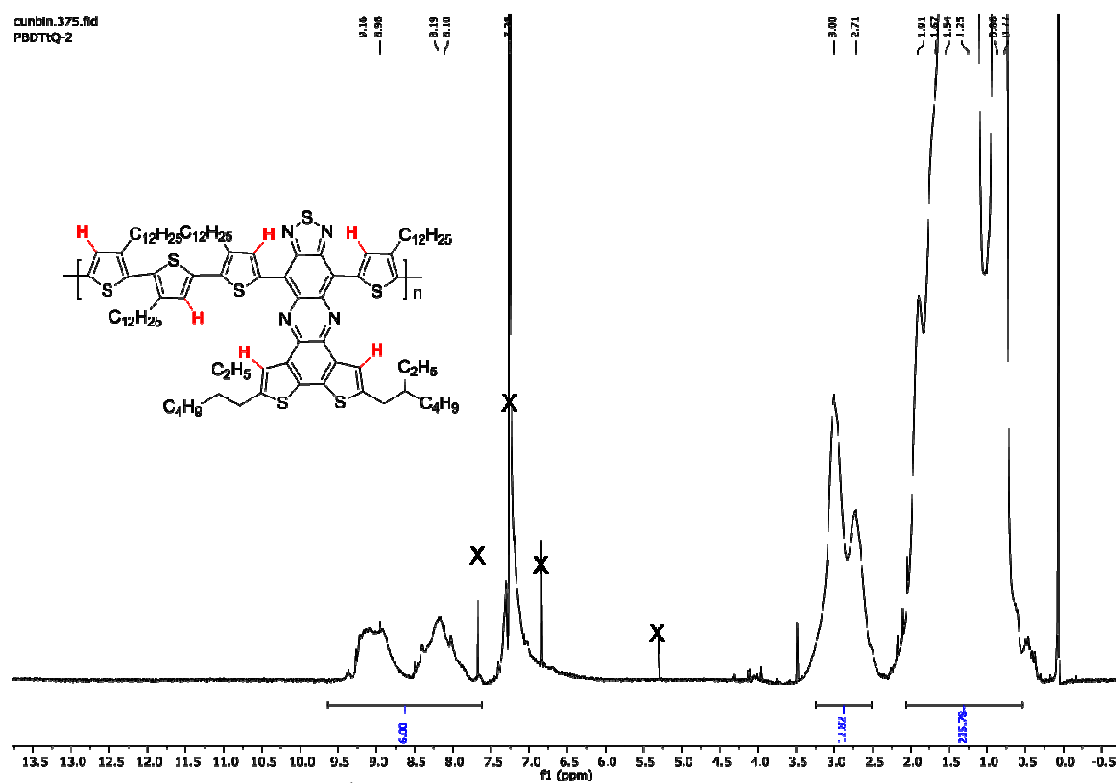
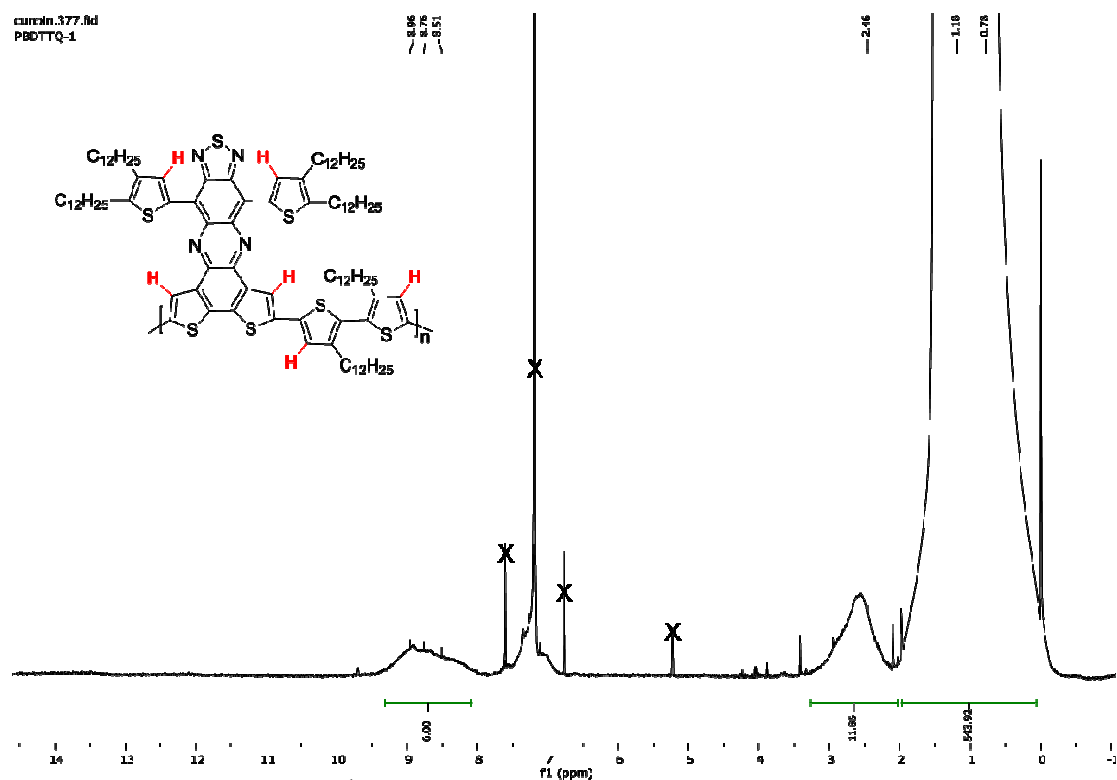


Figure S25. ^{13}C NMR spectrum of compound BDTTQ-2.



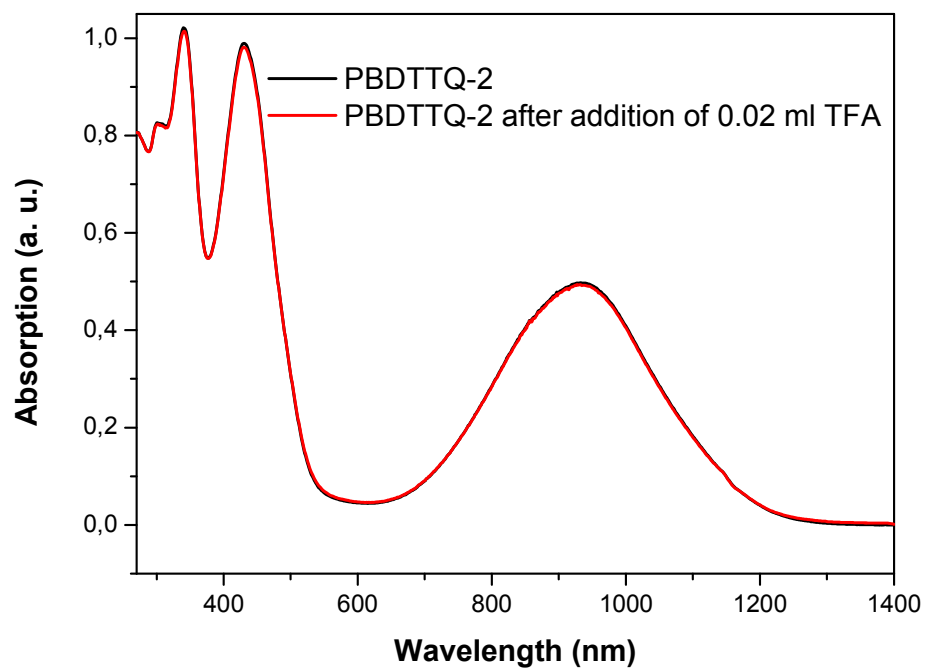


Figure S28. UV-Visible absorption spectra of **PBDTTQ-2** in chloroform solution ($c=2\times 10^{-5}$ M) with and without TFA.