

Supporting Information

Pd-Catalyzed Direct C-H Arylation of Thieno[3,4-c]pyrrole-4,6-dione (TPD): A Step-Economical Synthetic Alternative to Access TPD-Centred Symmetrical Small Molecules

Shan-Yun Chang, Po-Han Lin, and Ching-Yuan Liu*

Department of Chemical and Materials Engineering, National Central University,

Jhongli City, Taoyuan County, Taiwan 320, R.O.C

E-mail: cylu0312@ncu.edu.tw

NMR Spectra (^1H & ^{13}C) for compounds **1a-1c**, **3a-3u**, **4a-4d**, **5a-5b**, **6**

Figure S1. ^1H NMR Spectrum of **1a** (300 MHz, CDCl_3)

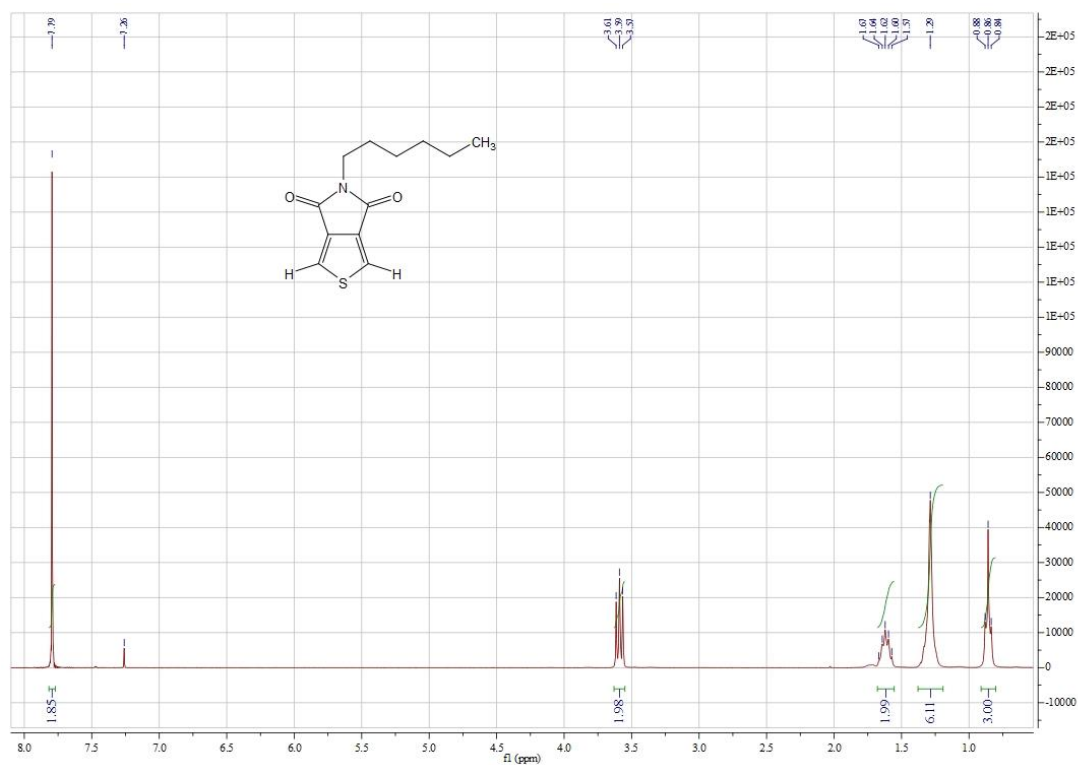


Figure S2. ^{13}C NMR Spectrum of **1a** (75 MHz, CDCl_3)

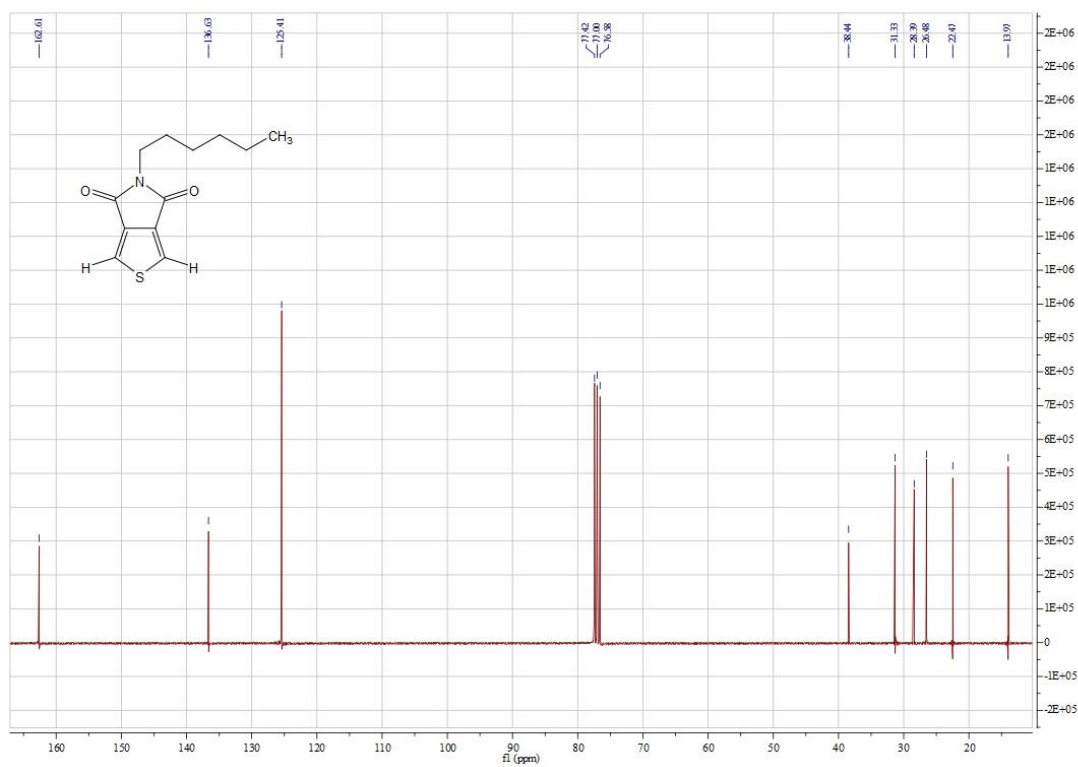


Figure S3. ^1H NMR Spectrum of **1b** (300 MHz, CDCl_3)

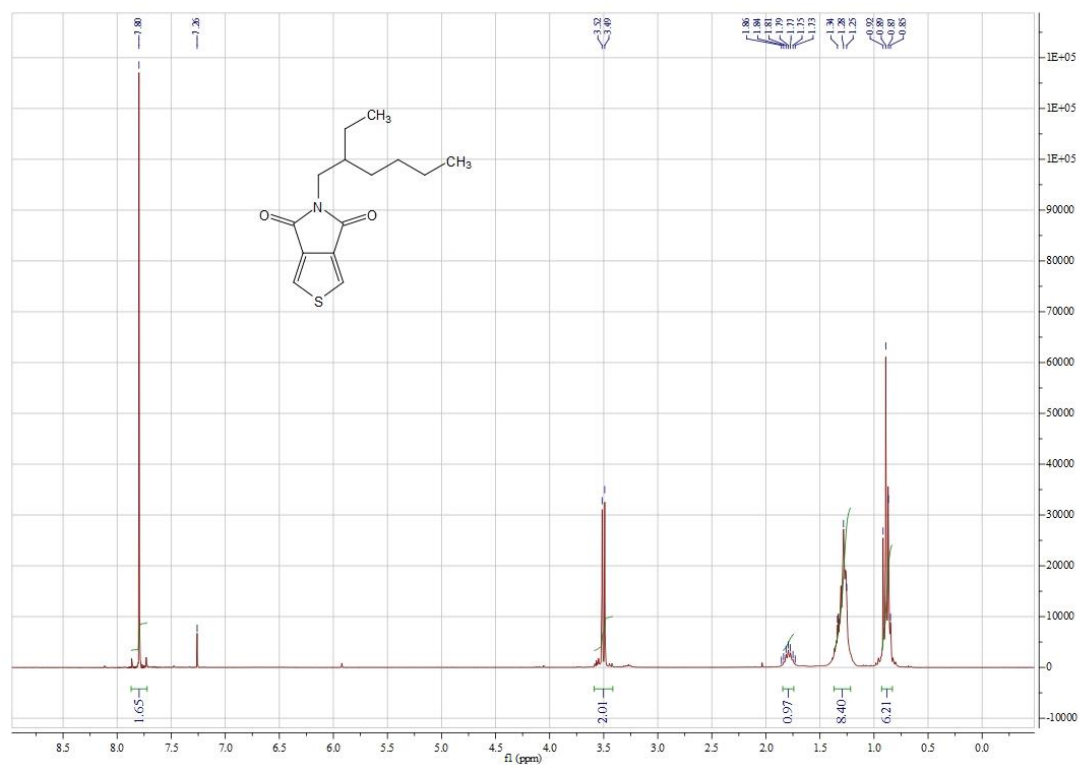


Figure S4. ^{13}C NMR Spectrum of **1b** (75 MHz, CDCl_3)

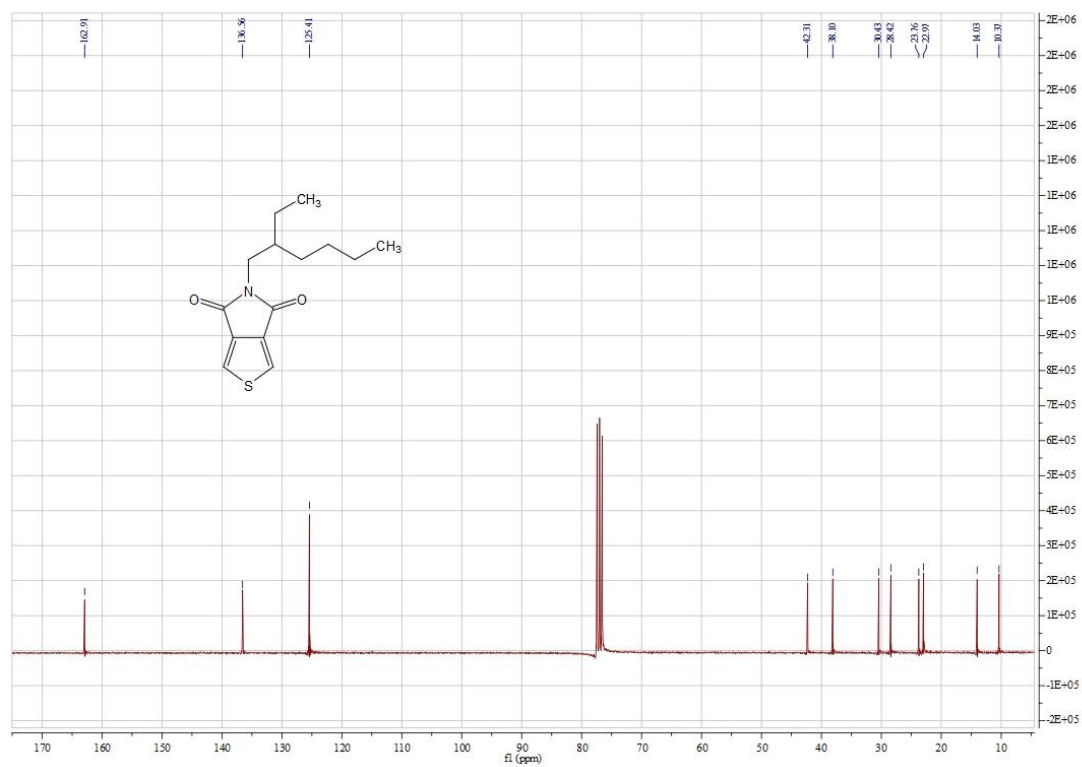


Figure S5. ^1H NMR Spectrum of **1c** (300 MHz, CDCl_3)

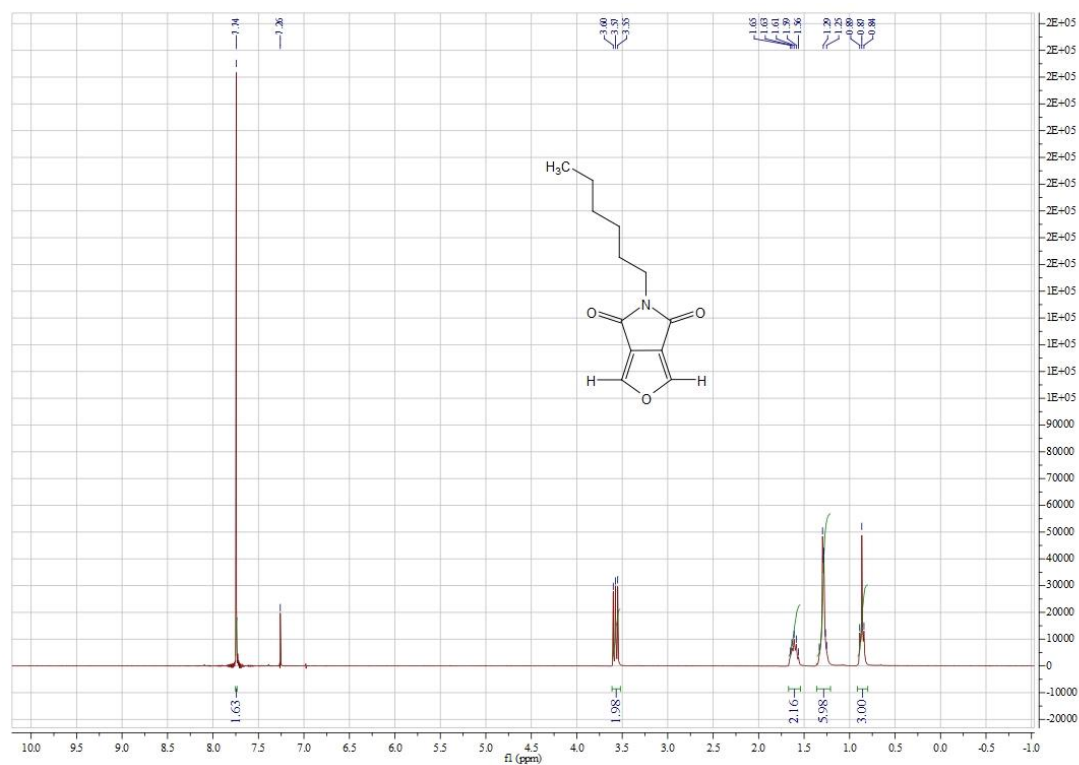


Figure S6. ^{13}C NMR Spectrum of **1c** (75 MHz, CDCl_3)

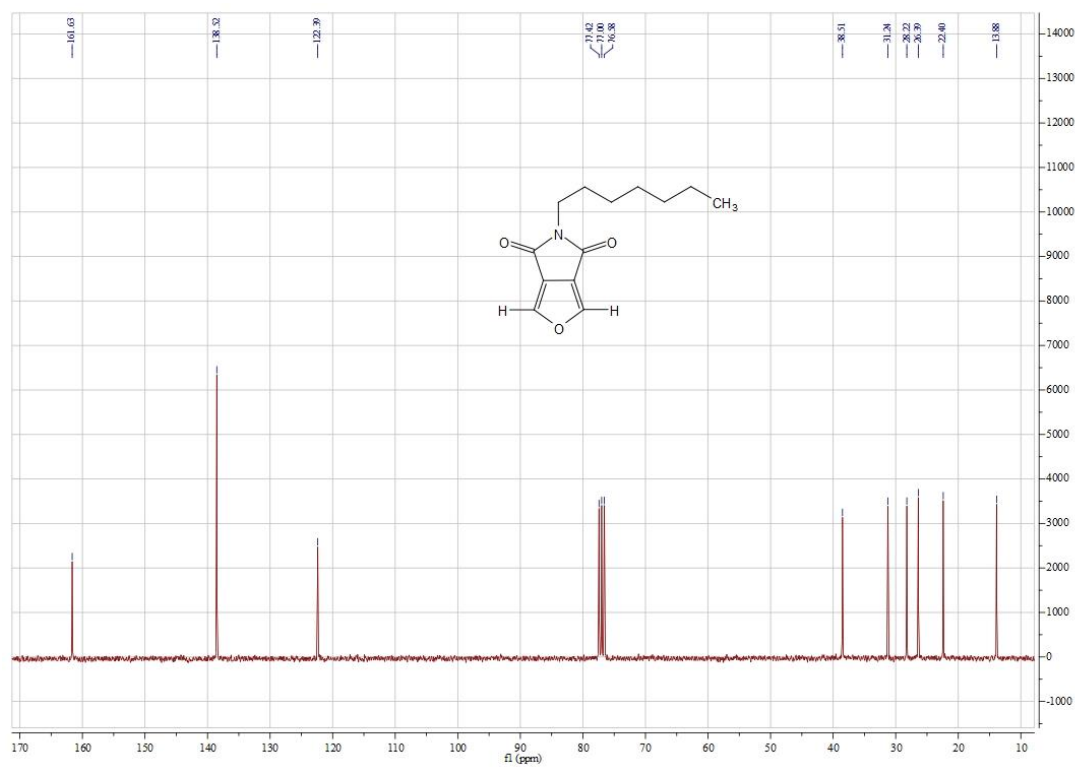


Figure S7. ^1H NMR Spectrum of **3a** (300 MHz, CDCl_3)

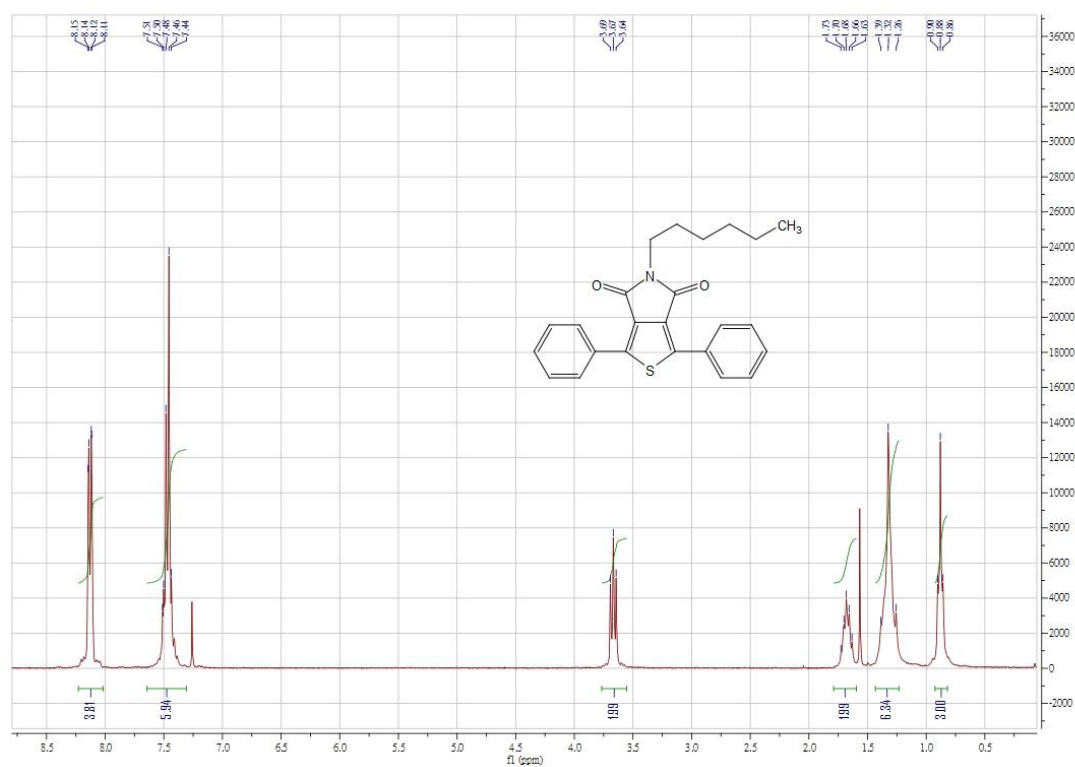


Figure S8. ^{13}C NMR Spectrum of **3a** (75 MHz, CDCl_3)

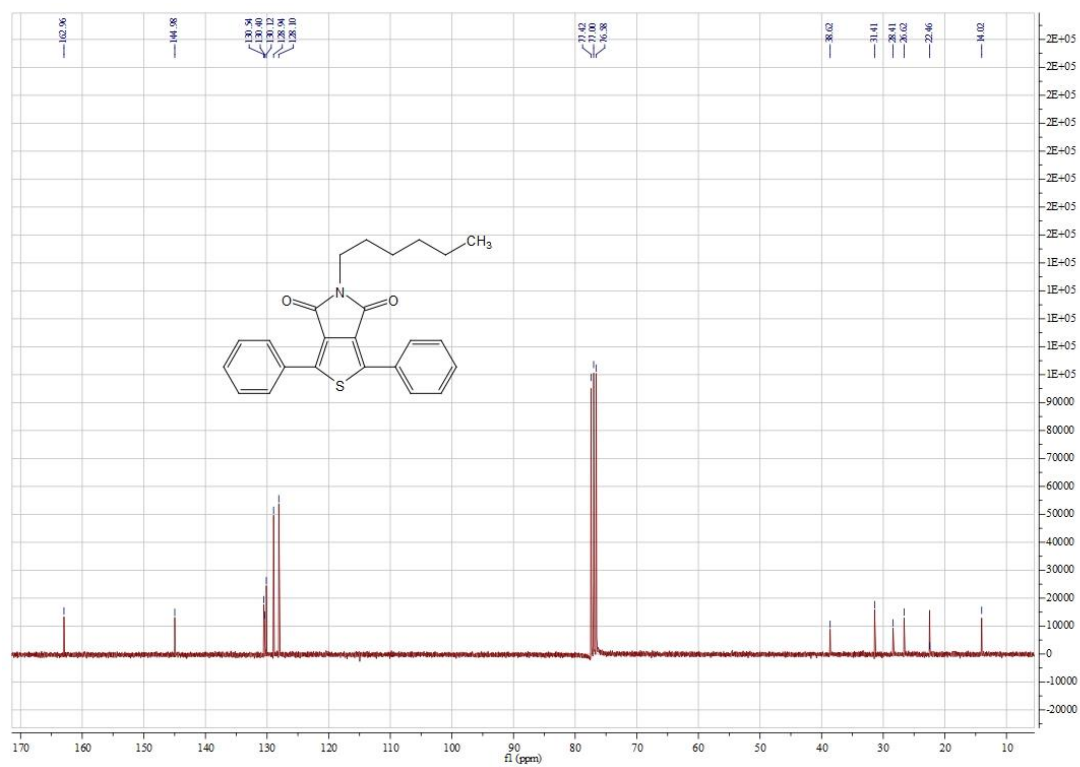


Figure S9. ^1H NMR Spectrum of **3b** (300 MHz, CDCl_3)

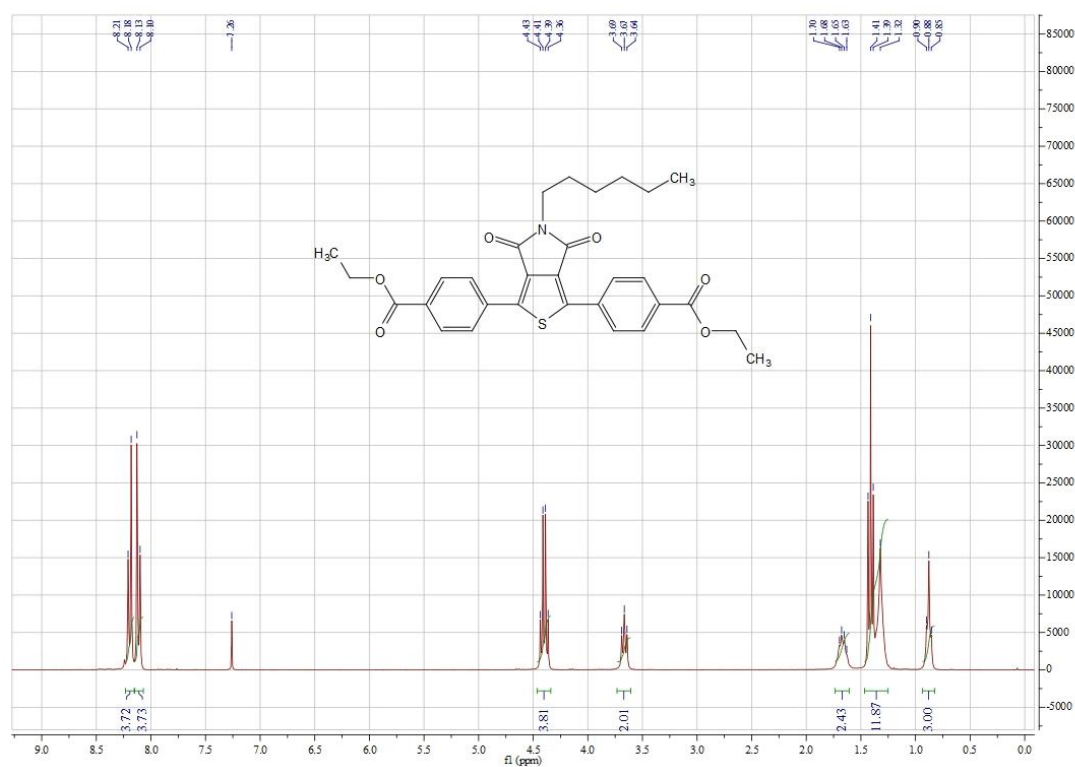


Figure S10. ^{13}C NMR Spectrum of **3b** (75 MHz, CDCl_3)

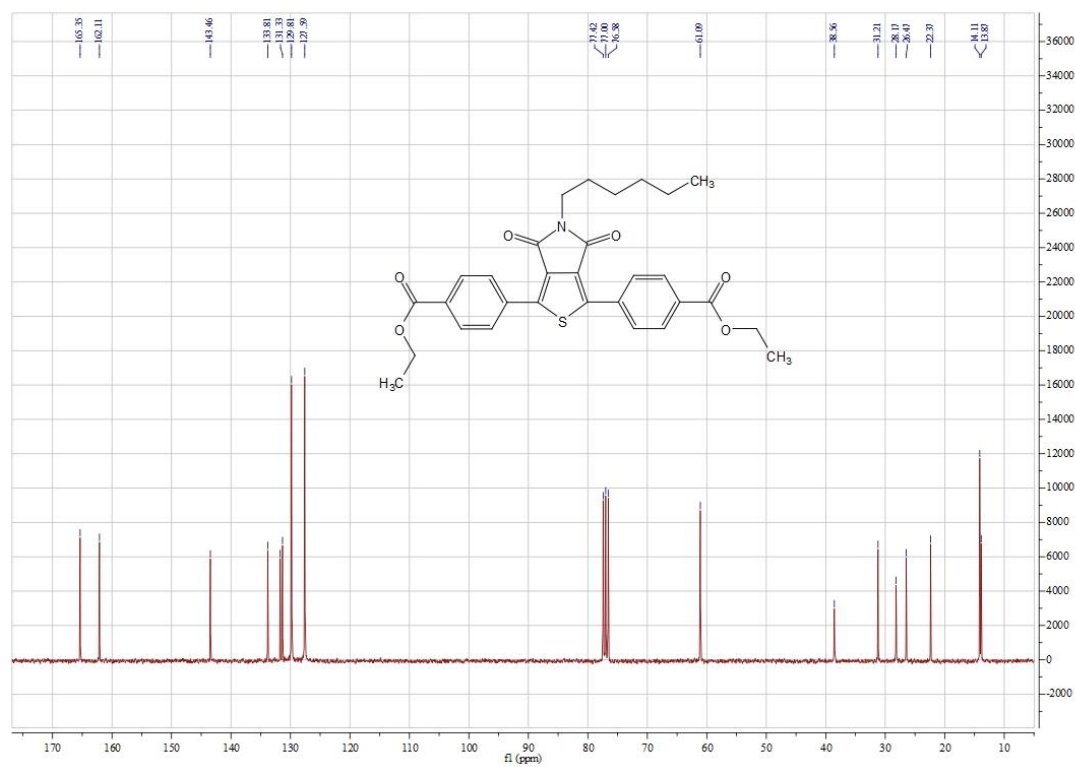


Figure S11. ^1H NMR Spectrum of **3c** (300 MHz, CDCl_3)

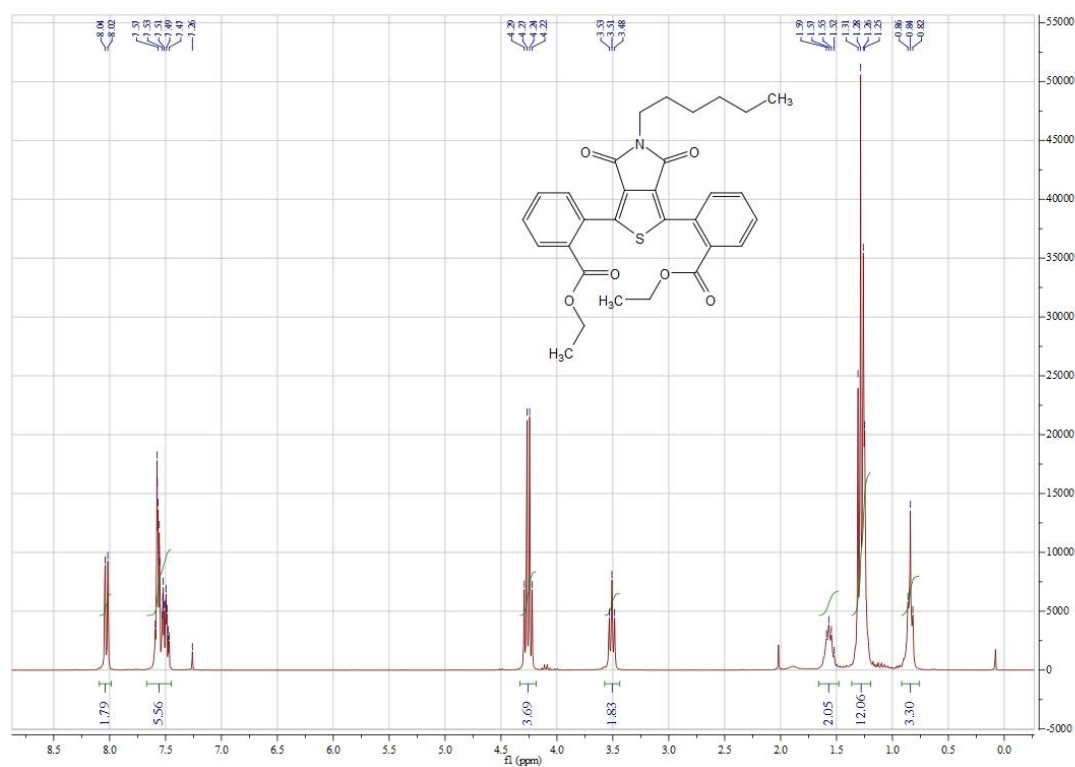


Figure S12. ^{13}C NMR Spectrum of **3c** (75 MHz, CDCl_3)

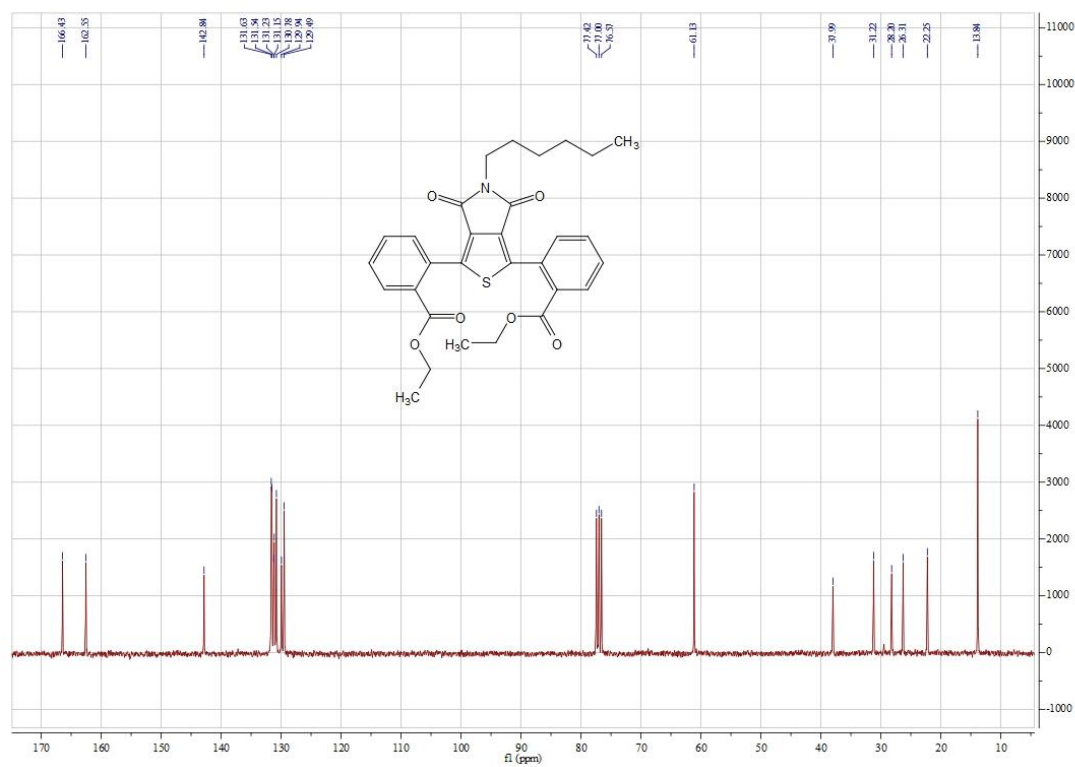


Figure S13. ^1H NMR Spectrum of **3d** (300 MHz, CDCl_3)

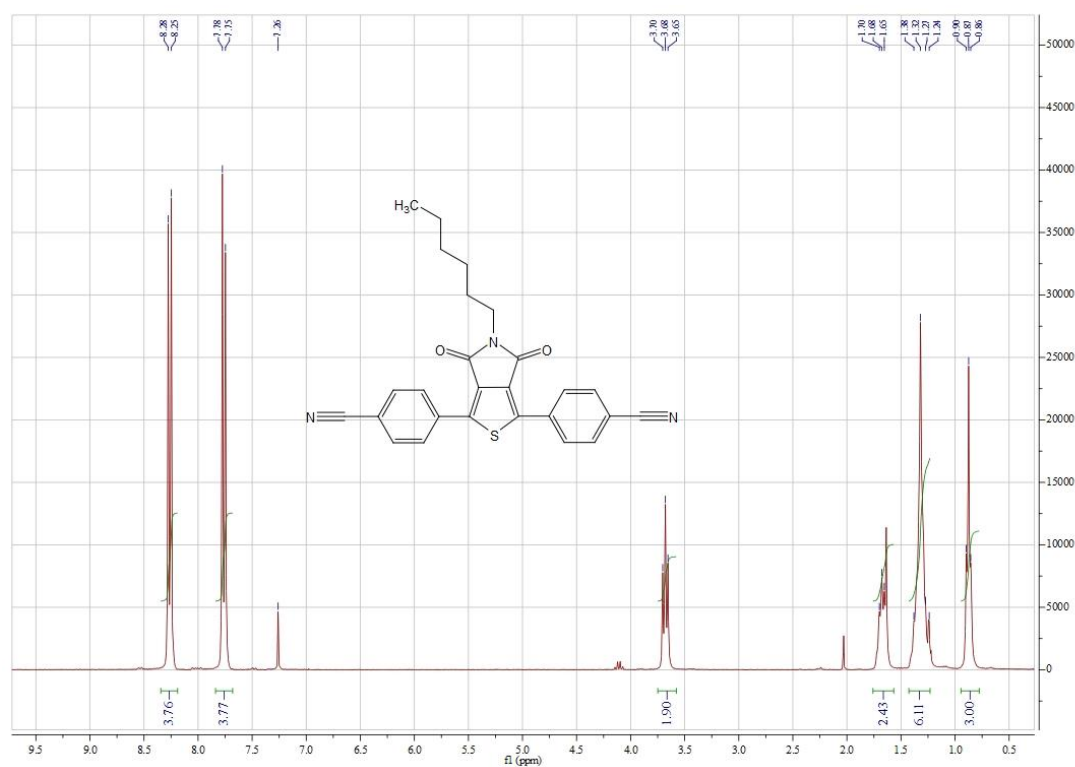


Figure S14. ^{13}C NMR Spectrum of **3d** (75 MHz, CDCl_3)

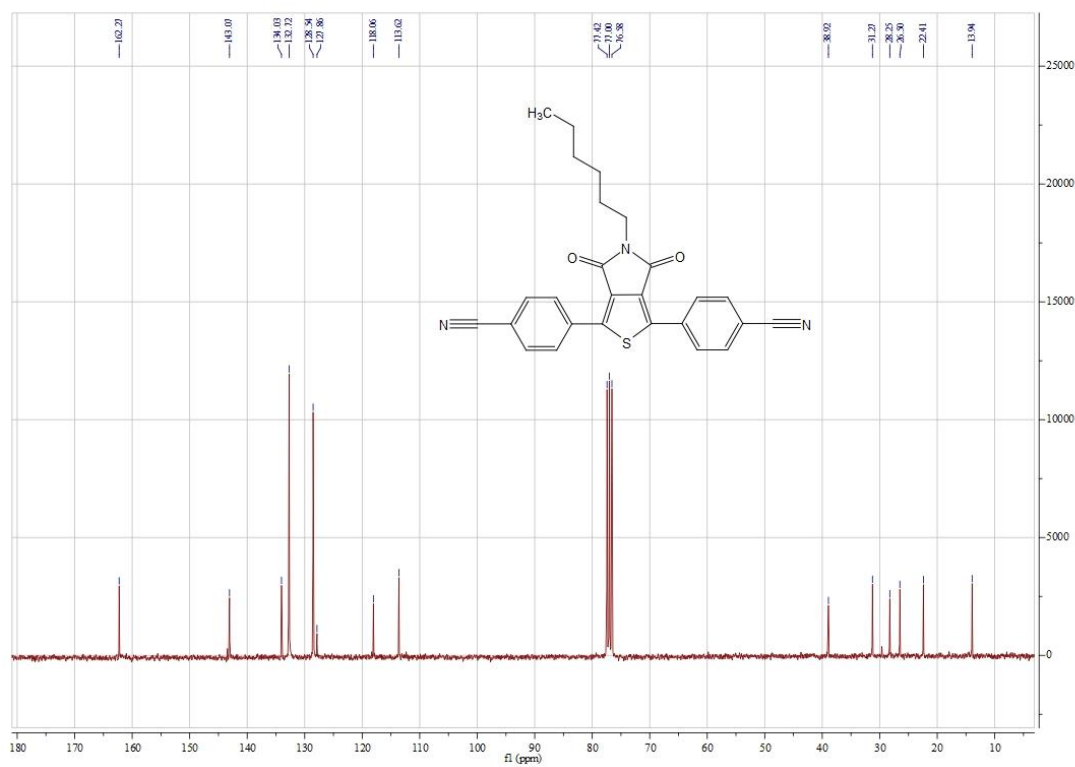


Figure S15. ^1H NMR Spectrum of **3e** (300 MHz, CDCl_3)

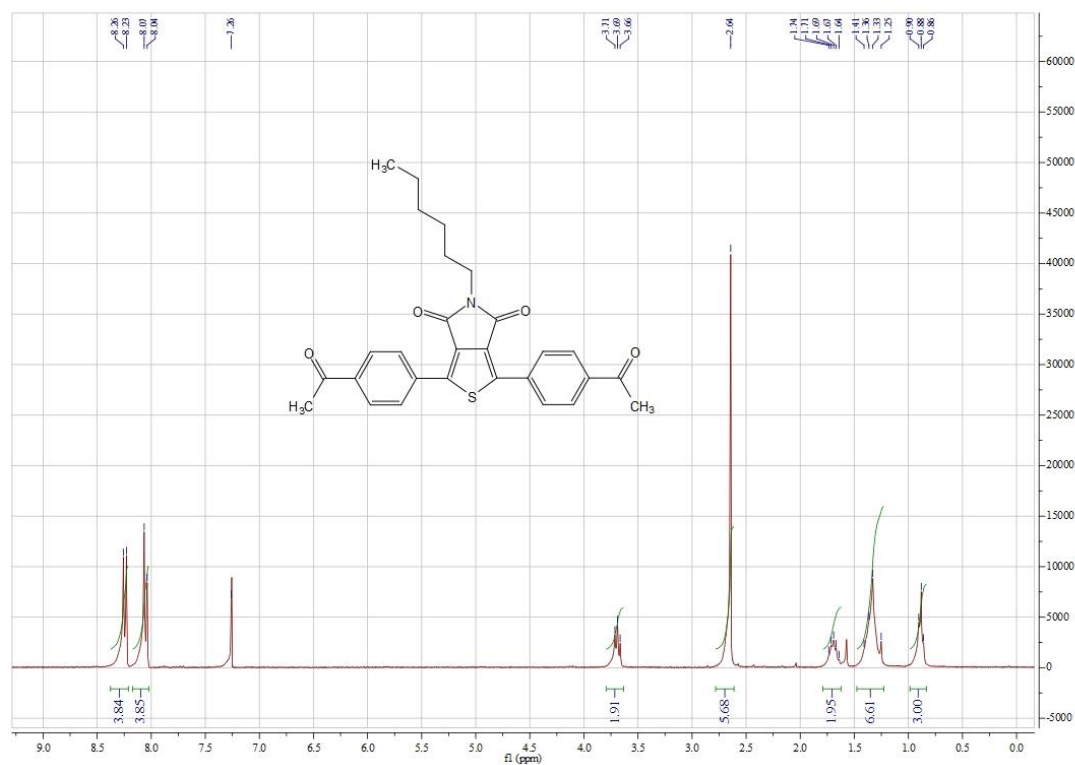


Figure S16. ^{13}C NMR Spectrum of **3e** (75 MHz, CDCl_3)

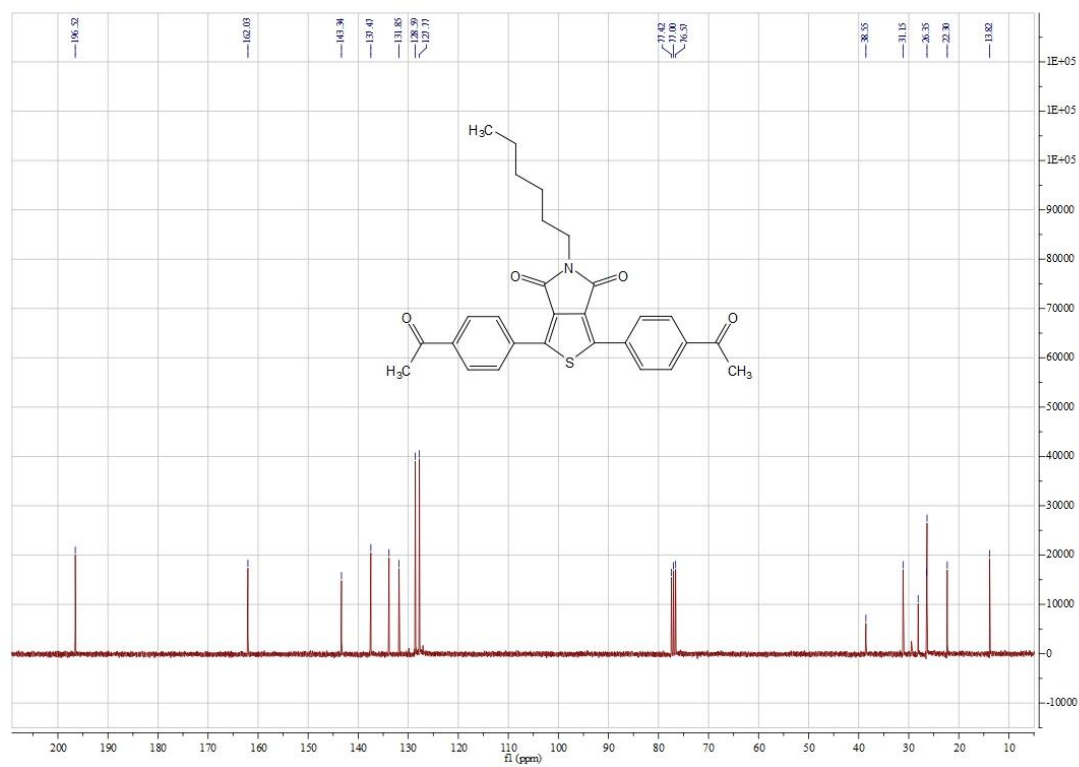


Figure S17. ^1H NMR Spectrum of **3f** (300 MHz, CDCl_3)

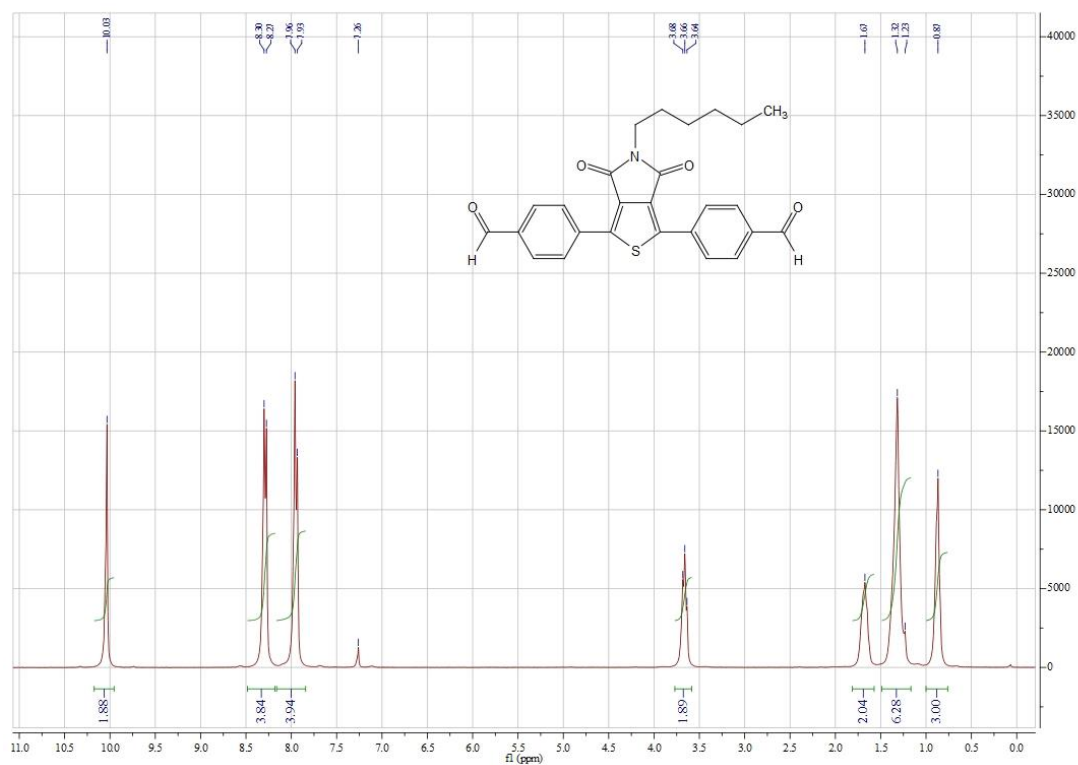


Figure S18. ^{13}C NMR Spectrum of **3f** (75 MHz, CDCl_3)

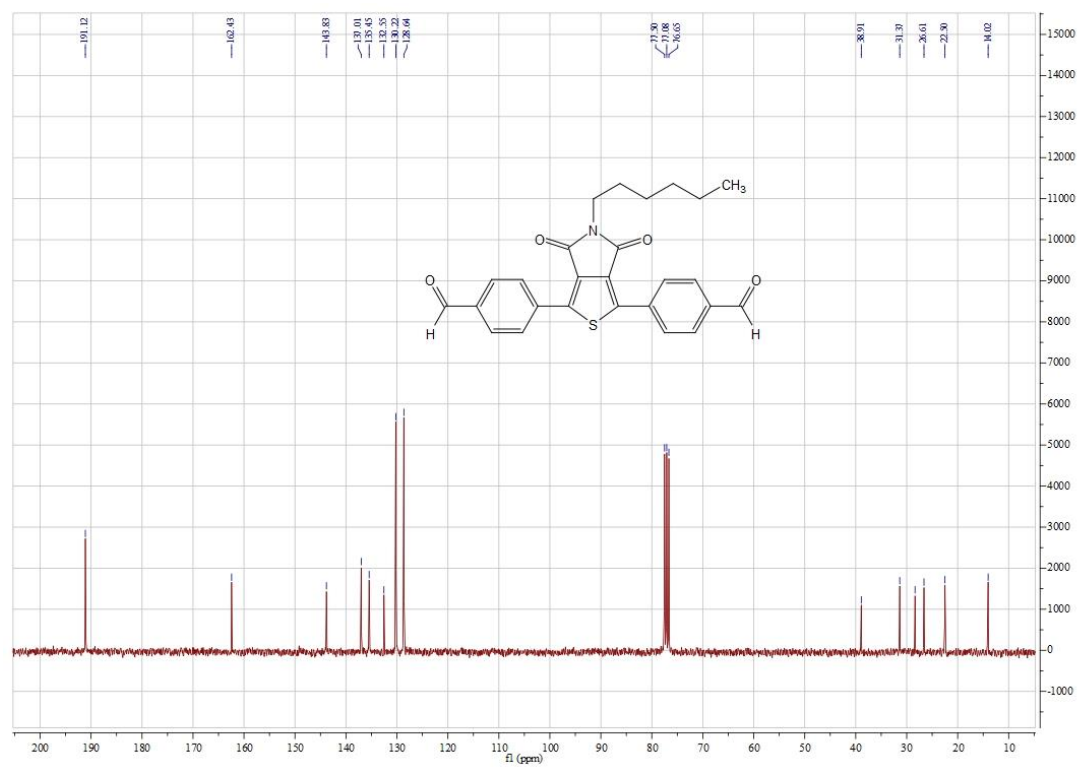


Figure S19. ^1H NMR Spectrum of **3g** (300 MHz, CDCl_3)

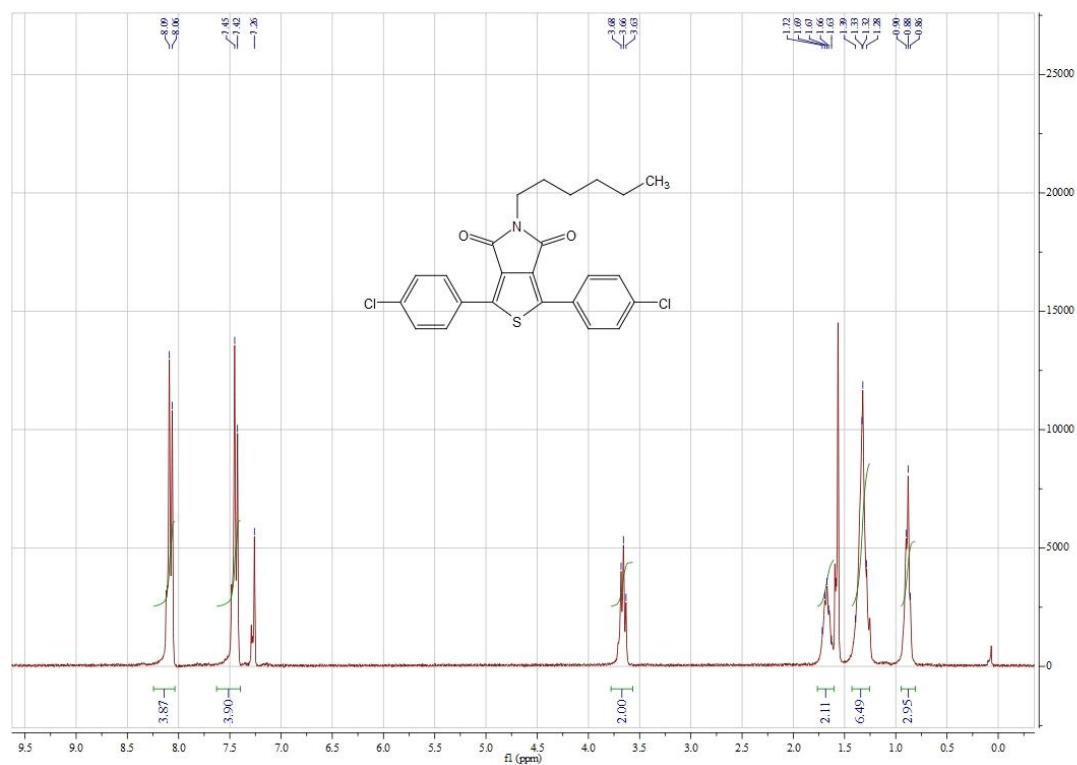


Figure S20. ^{13}C NMR Spectrum of **3g** (75 MHz, CDCl_3)

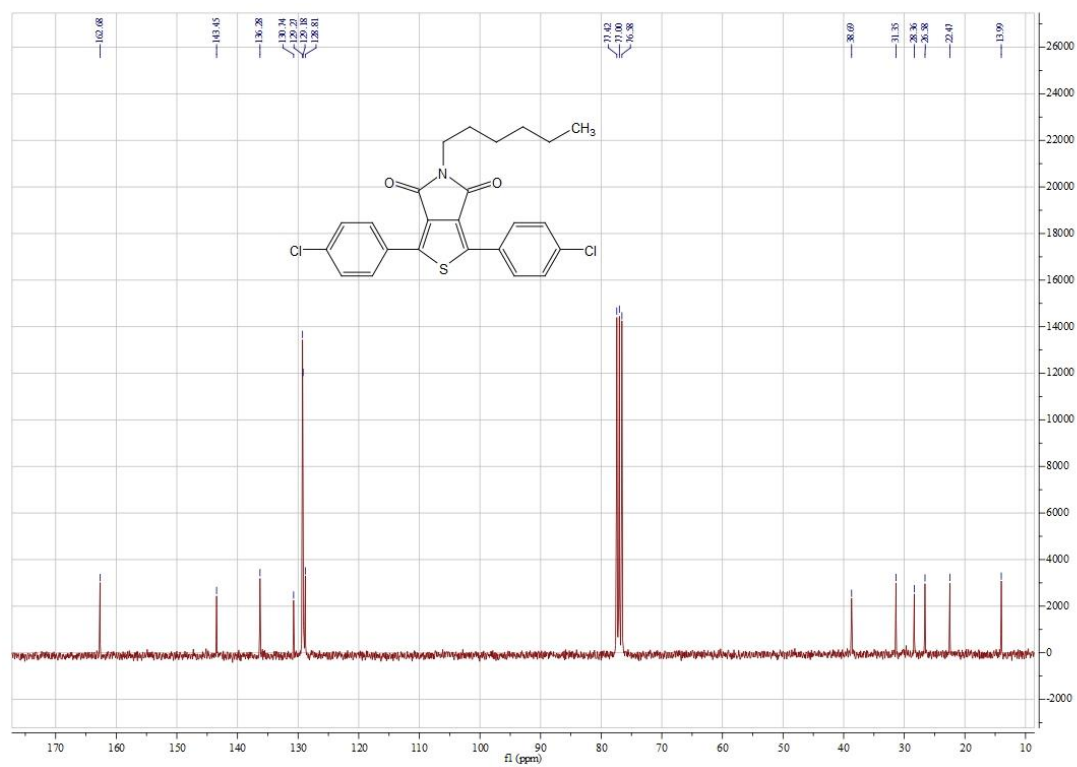


Figure S21. ^1H NMR Spectrum of **3h** (300 MHz, CDCl_3)

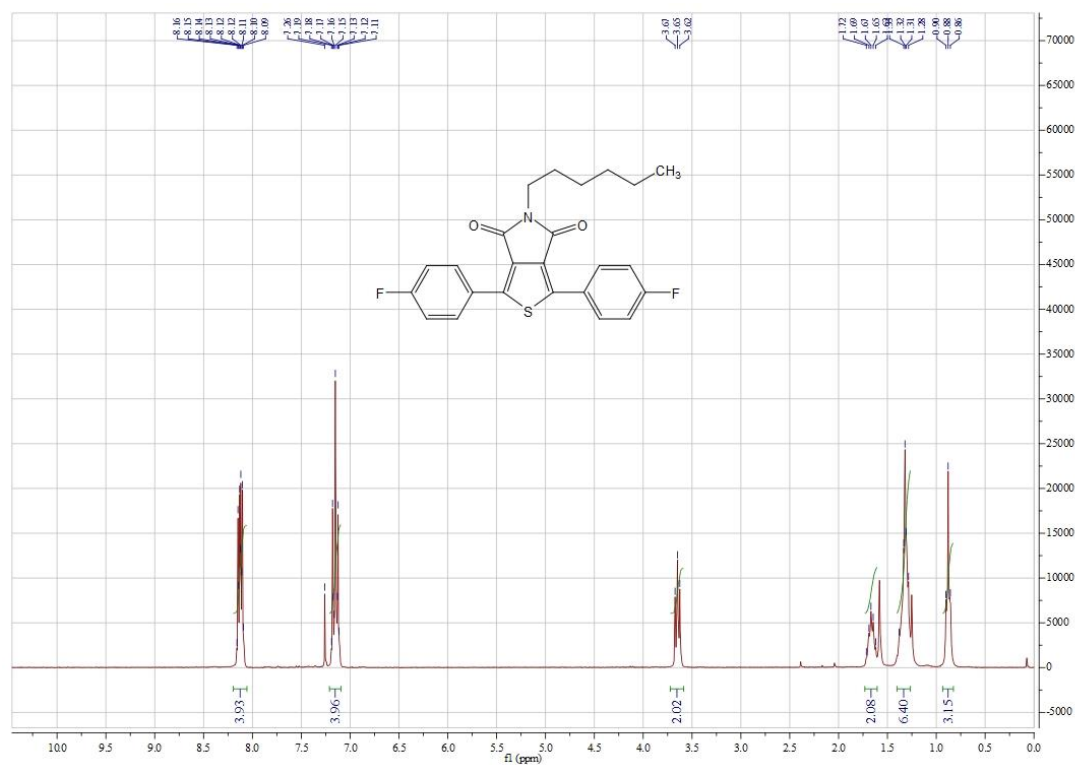


Figure S22. ^{13}C NMR Spectrum of **3h** (75 MHz, CDCl_3)

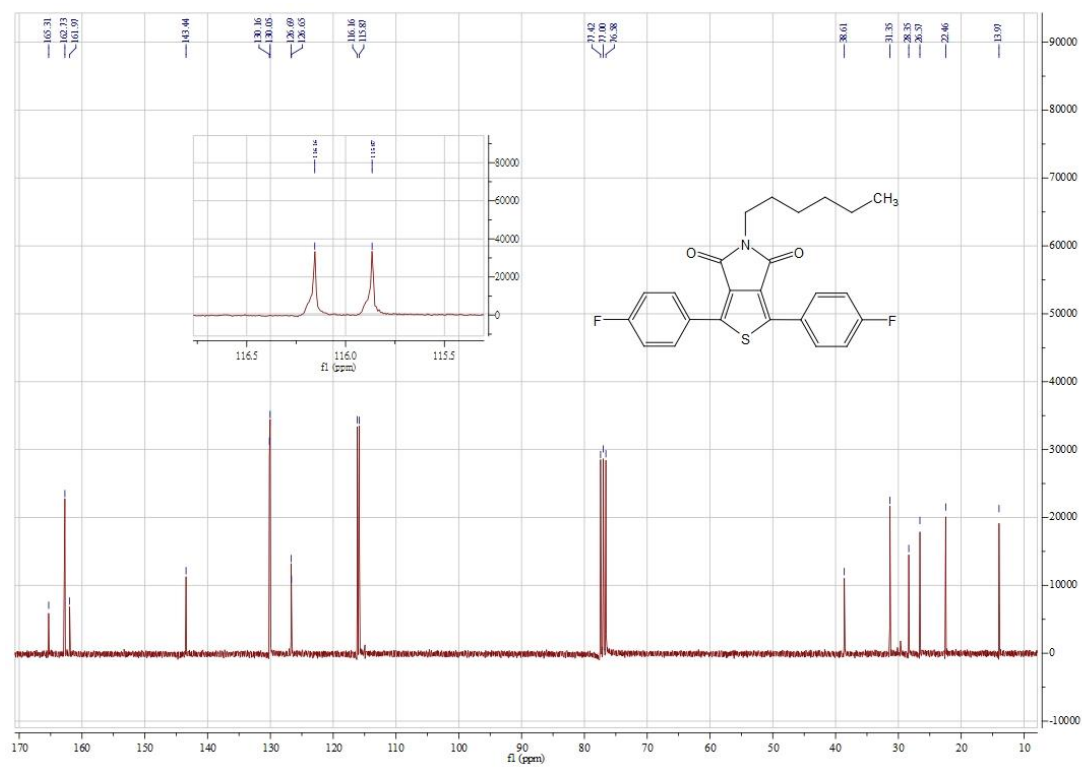


Figure S23. ^1H NMR Spectrum of **3i** (300 MHz, CDCl_3)

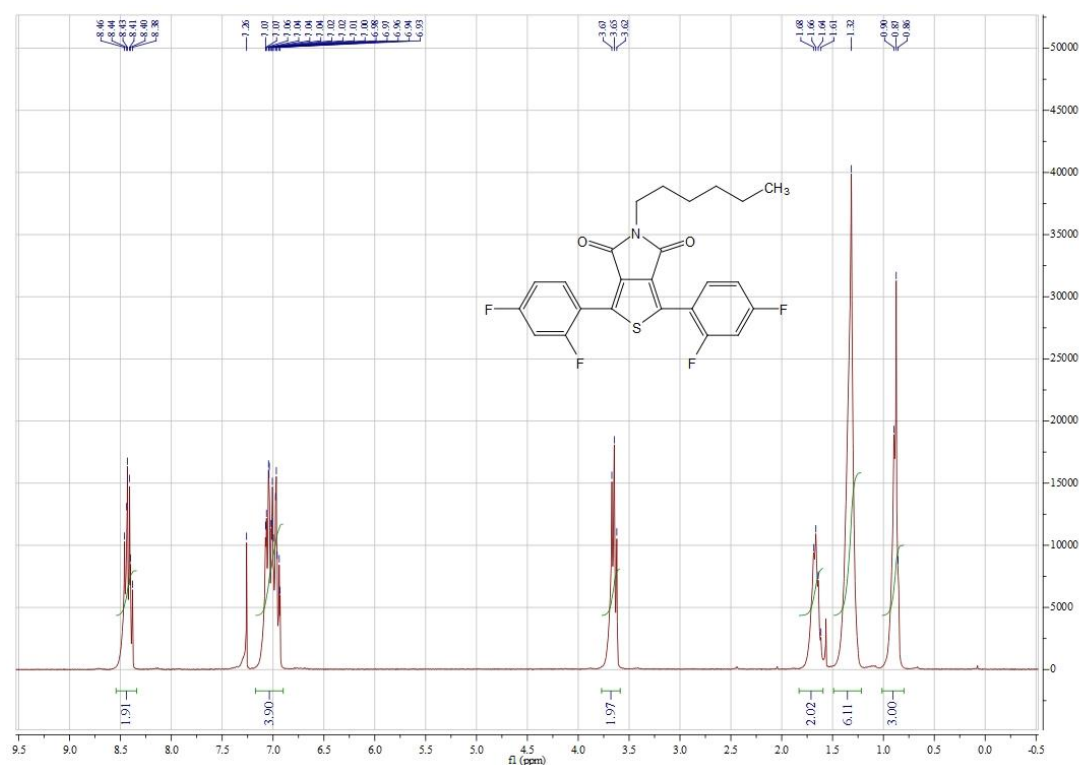


Figure S24. ^{13}C NMR Spectrum of **3i** (75 MHz, CDCl_3)

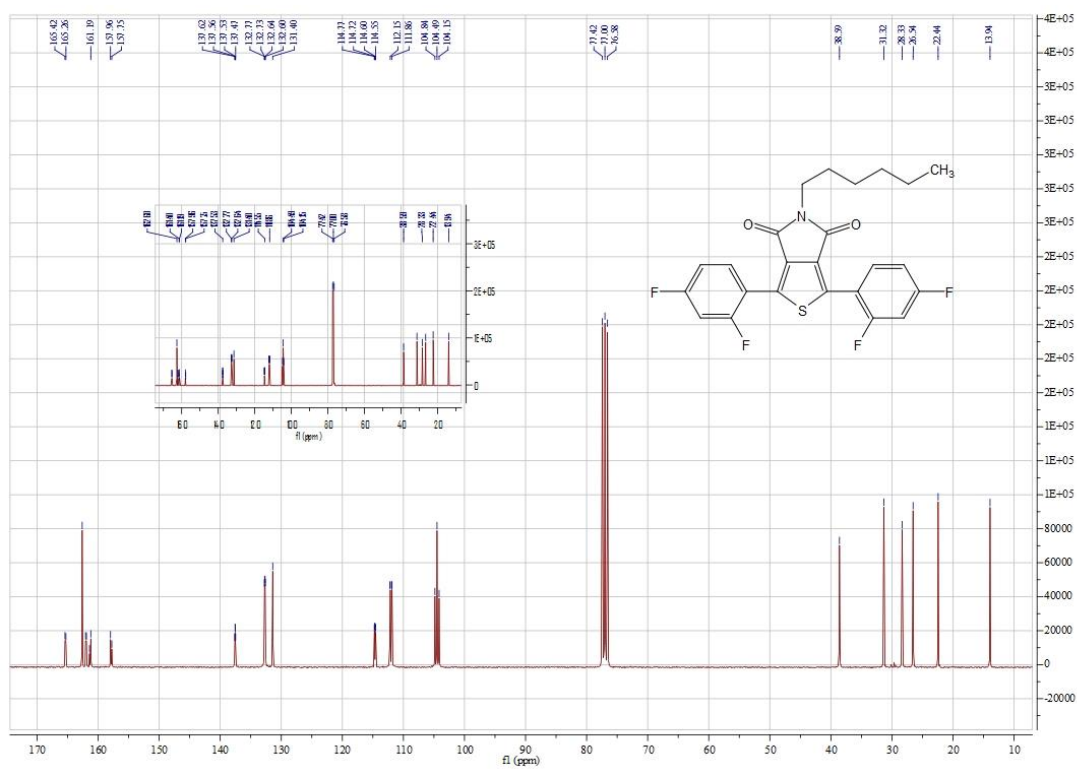


Figure S27. ^1H NMR Spectrum of **3k** (300 MHz, CDCl_3)

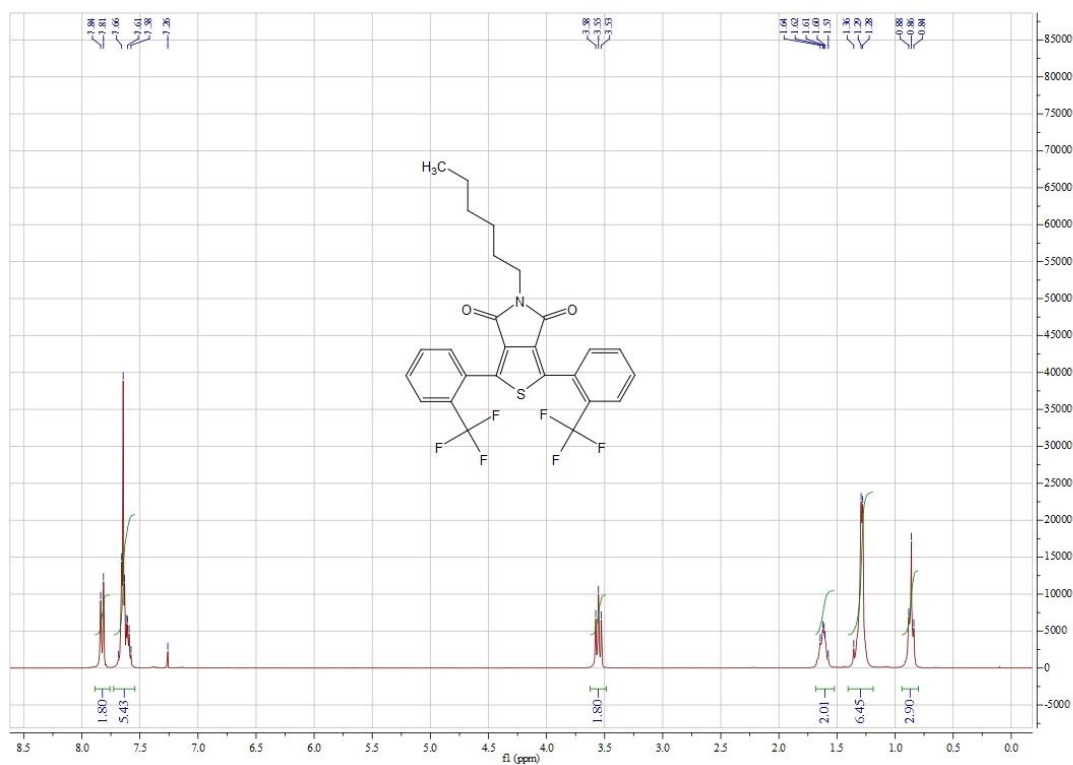


Figure S28. ^{13}C NMR Spectrum of **3k** (75 MHz, CDCl_3)

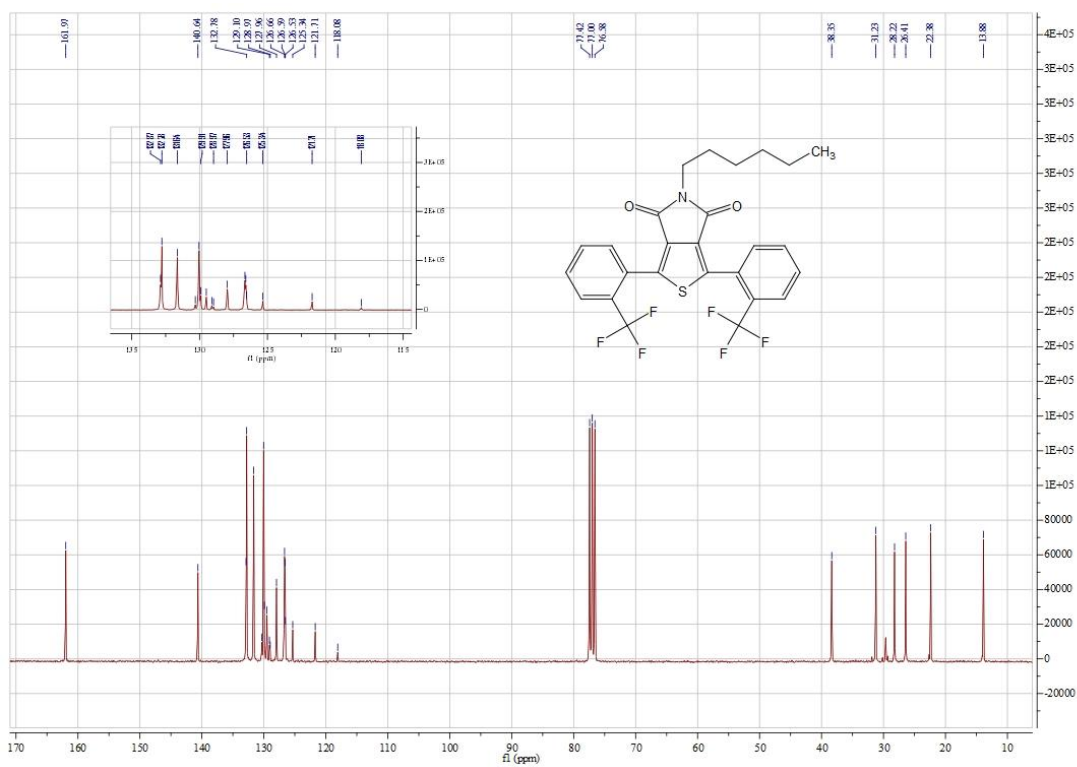


Figure S29. ^1H NMR Spectrum of **3l** (300 MHz, CDCl_3)

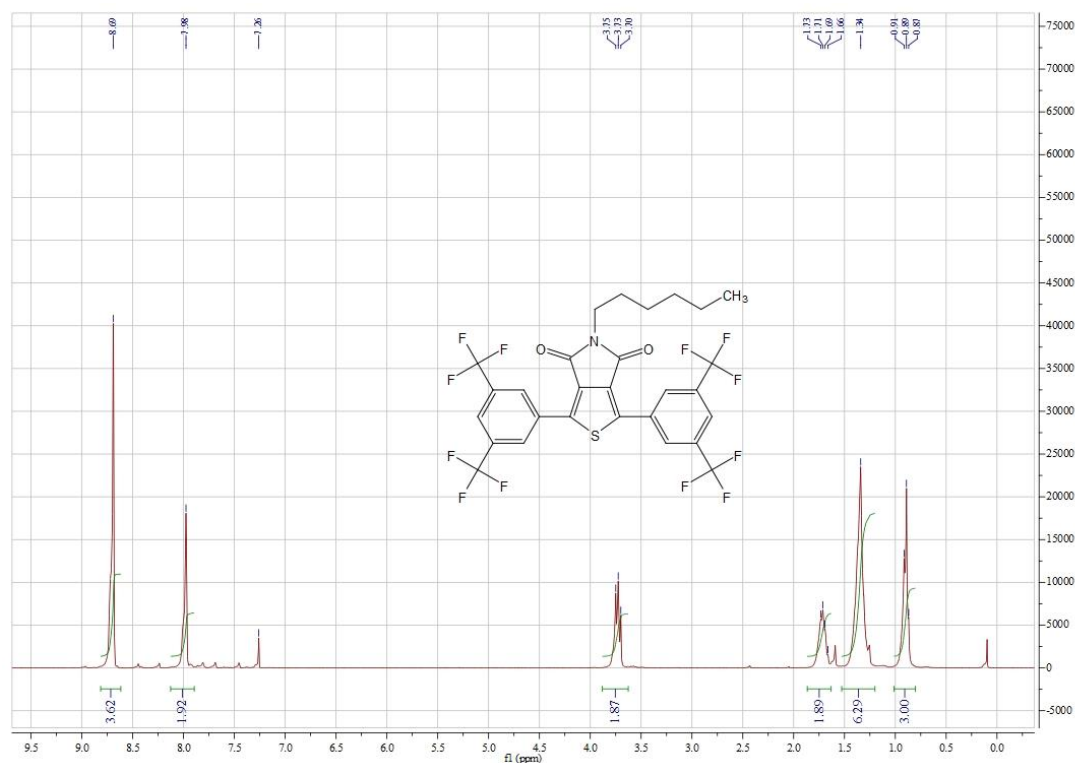


Figure S30. ^{13}C NMR Spectrum of **3l** (75 MHz, CDCl_3)

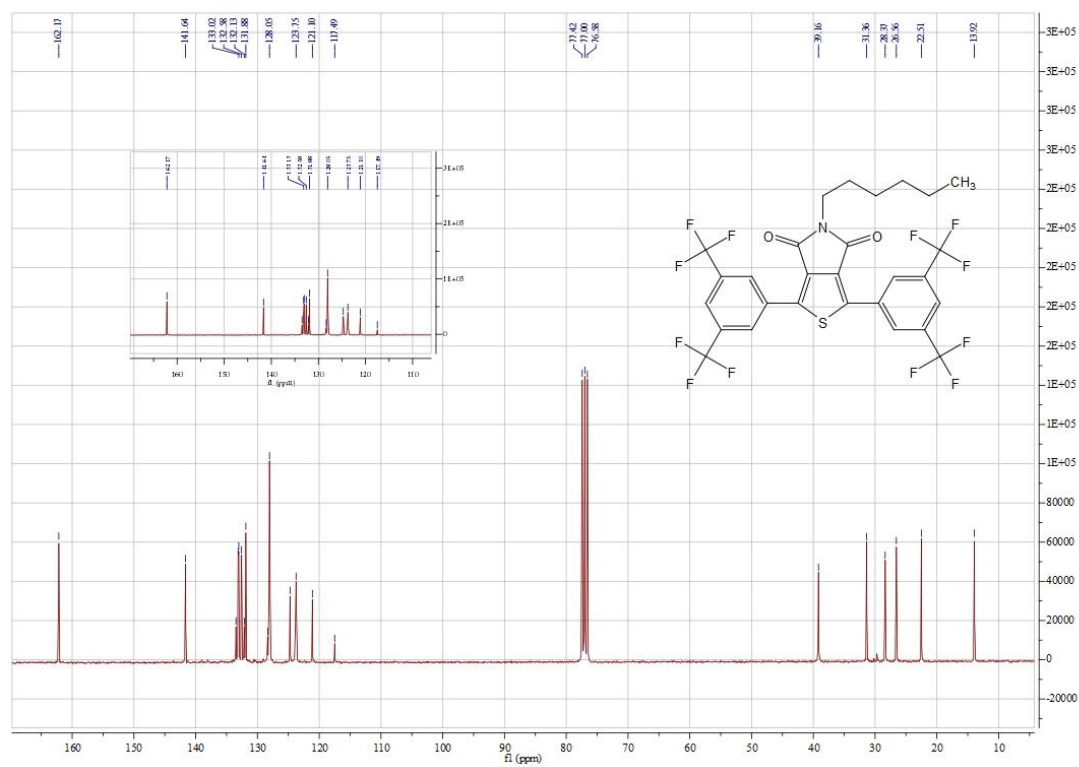


Figure S31. ^1H NMR Spectrum of **3m** (300 MHz, CDCl_3)

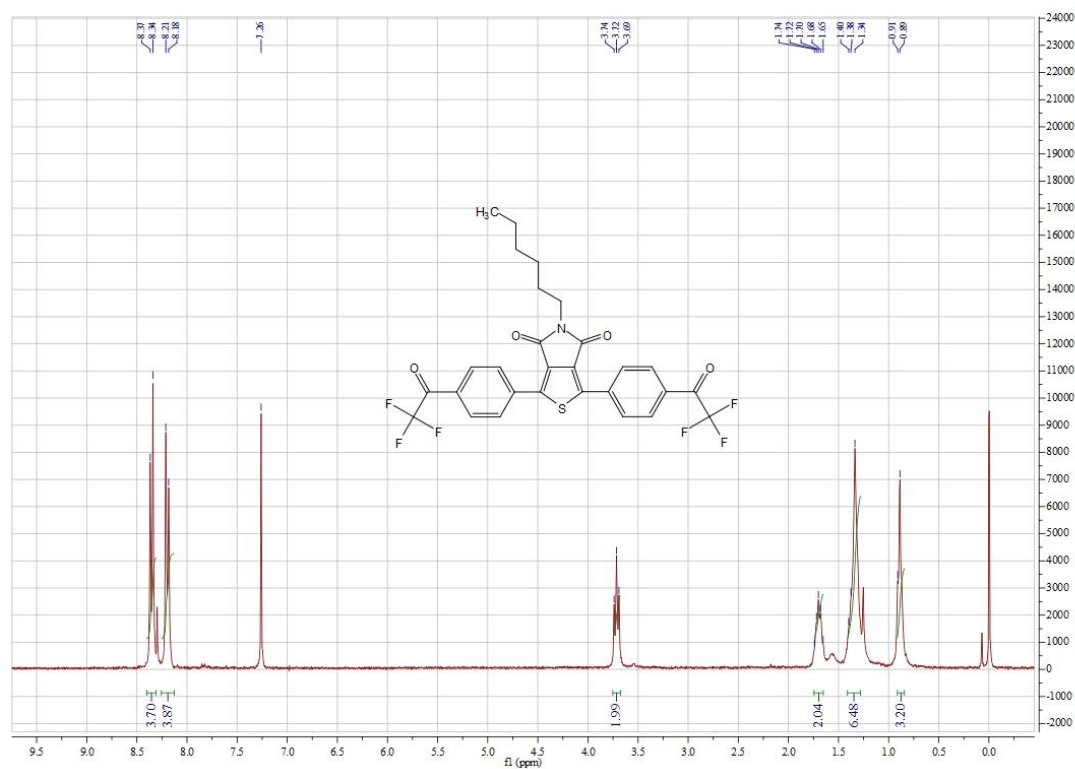


Figure S32. ^{13}C NMR Spectrum of **3m** (75 MHz, CDCl_3)

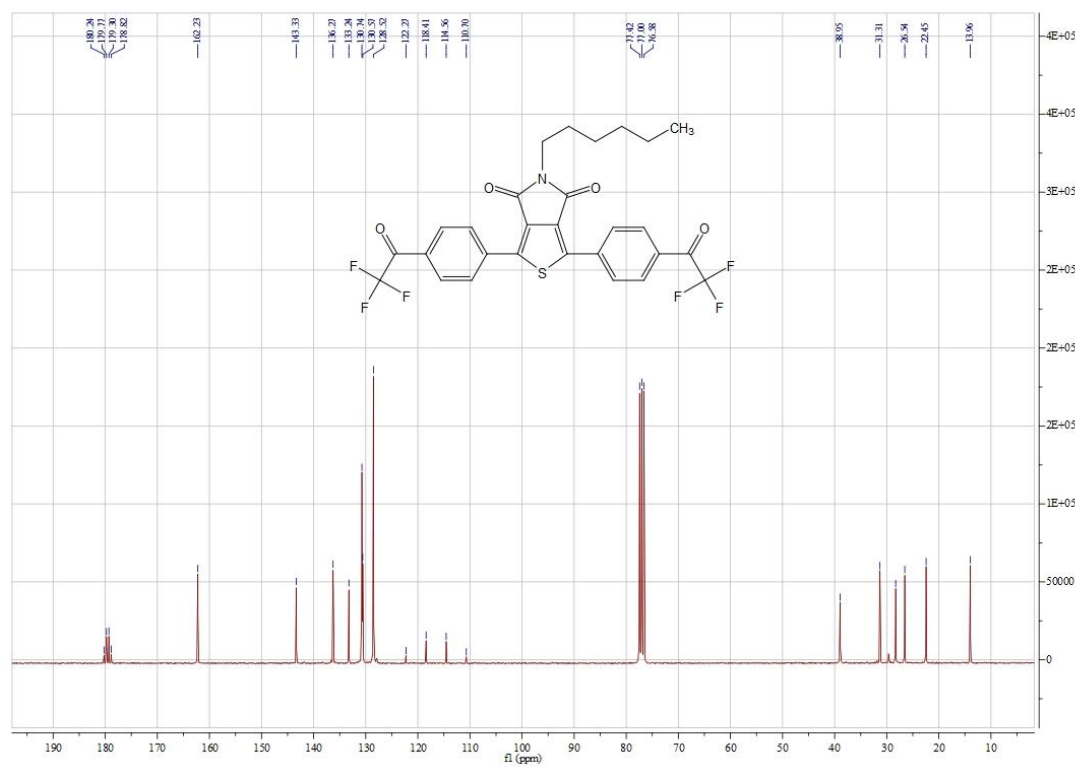


Figure S33. ^1H NMR Spectrum of **3n** (300 MHz, CDCl_3)

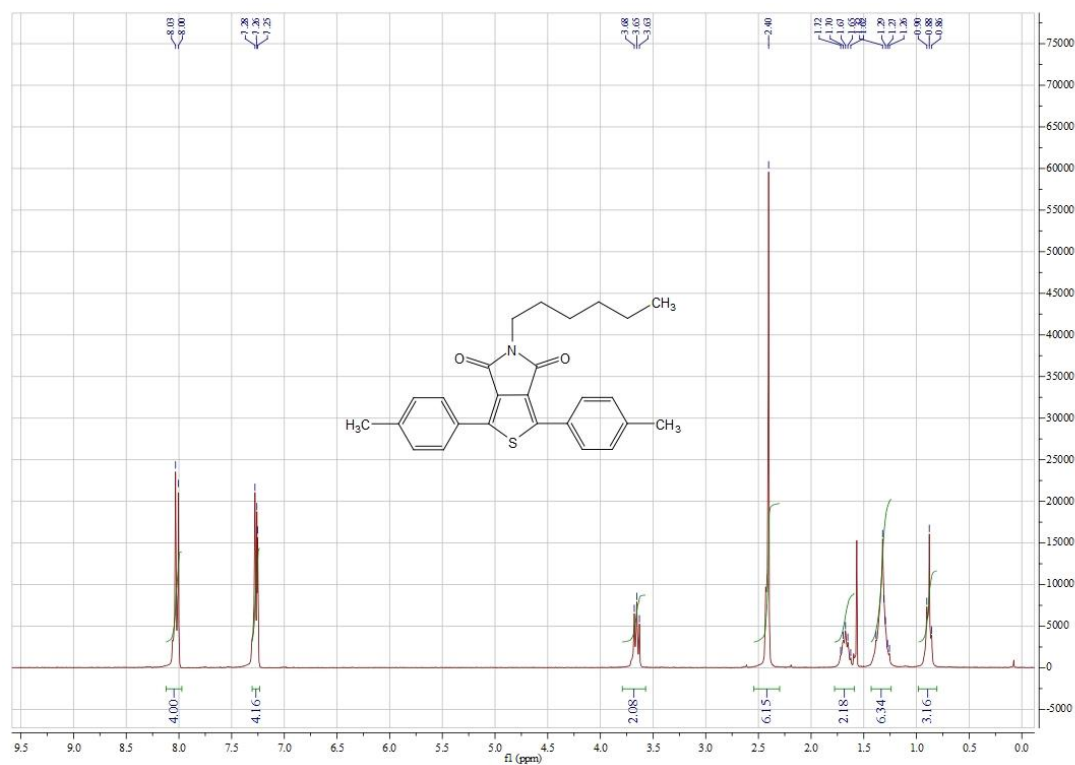


Figure S34. ^{13}C NMR Spectrum of **3n** (75 MHz, CDCl_3)

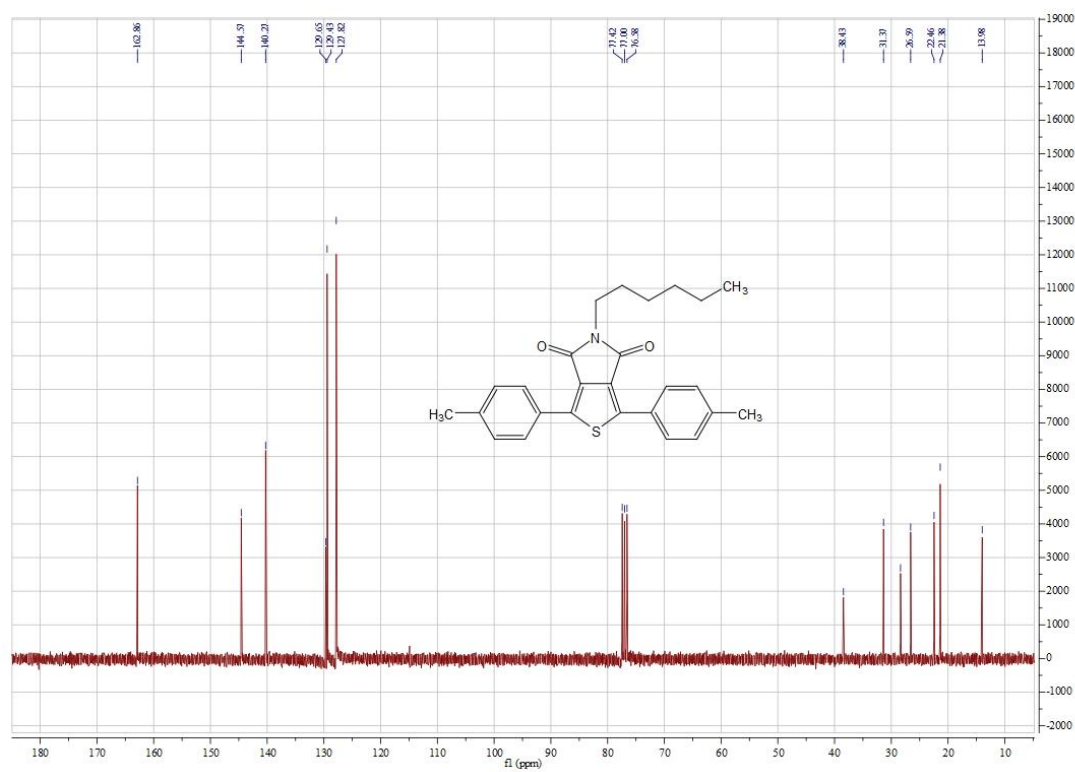


Figure S35. ^1H NMR Spectrum of **3o** (300 MHz, CDCl_3)

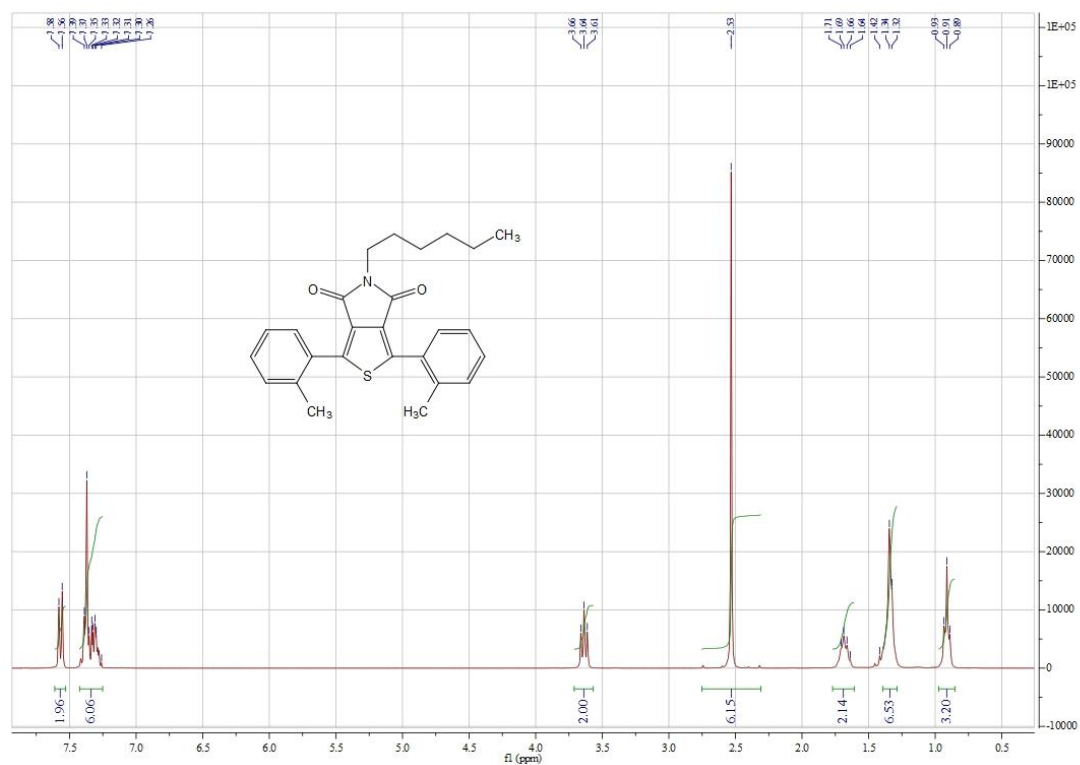


Figure S36. ^{13}C NMR Spectrum of **3o** (75 MHz, CDCl_3)

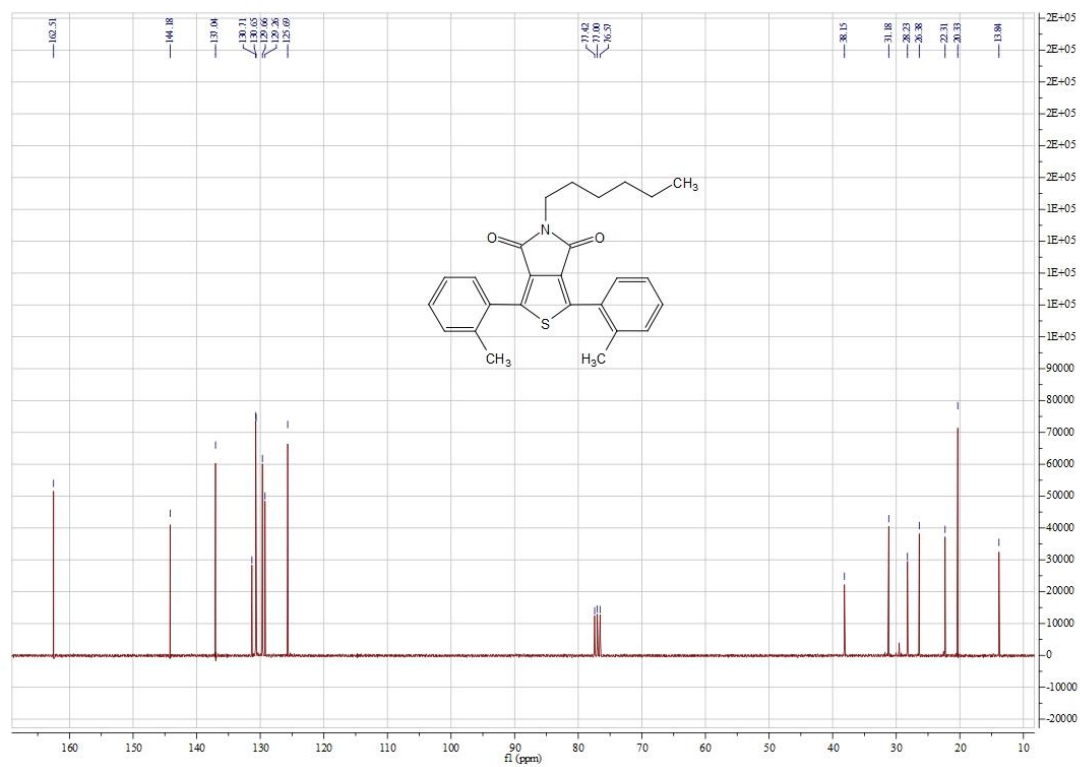


Figure S37. ^1H NMR Spectrum of **3p** (300 MHz, CDCl_3)

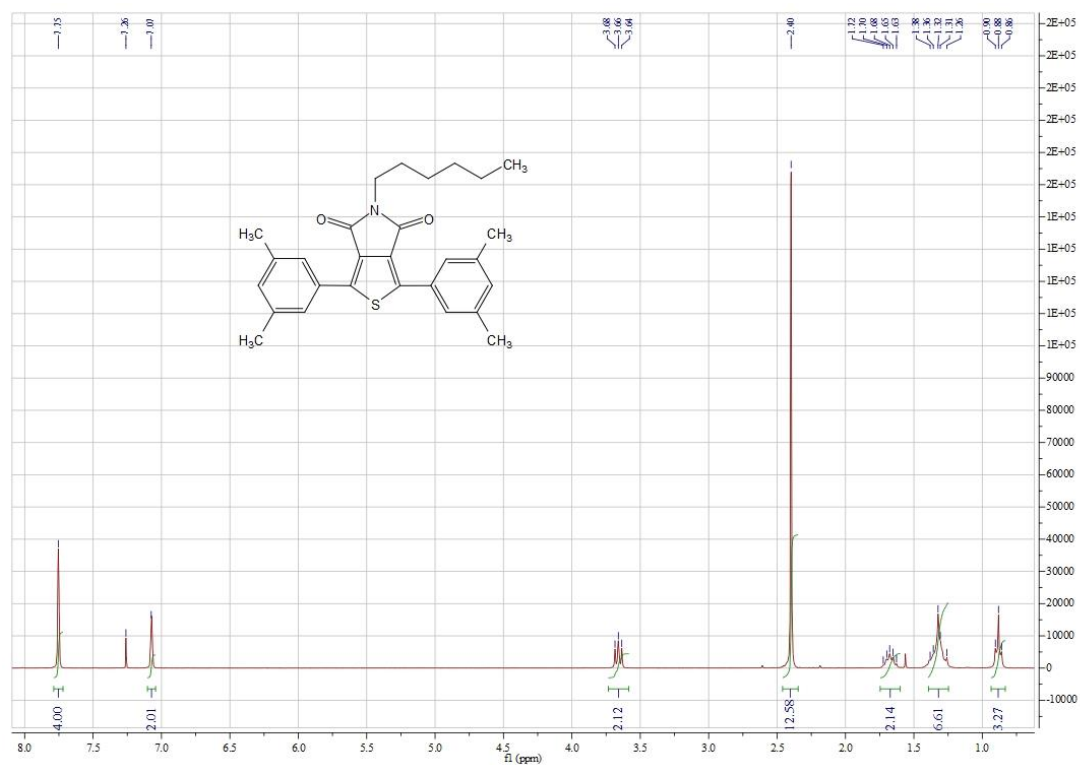


Figure S38. ^{13}C NMR Spectrum of **3p** (75 MHz, CDCl_3)

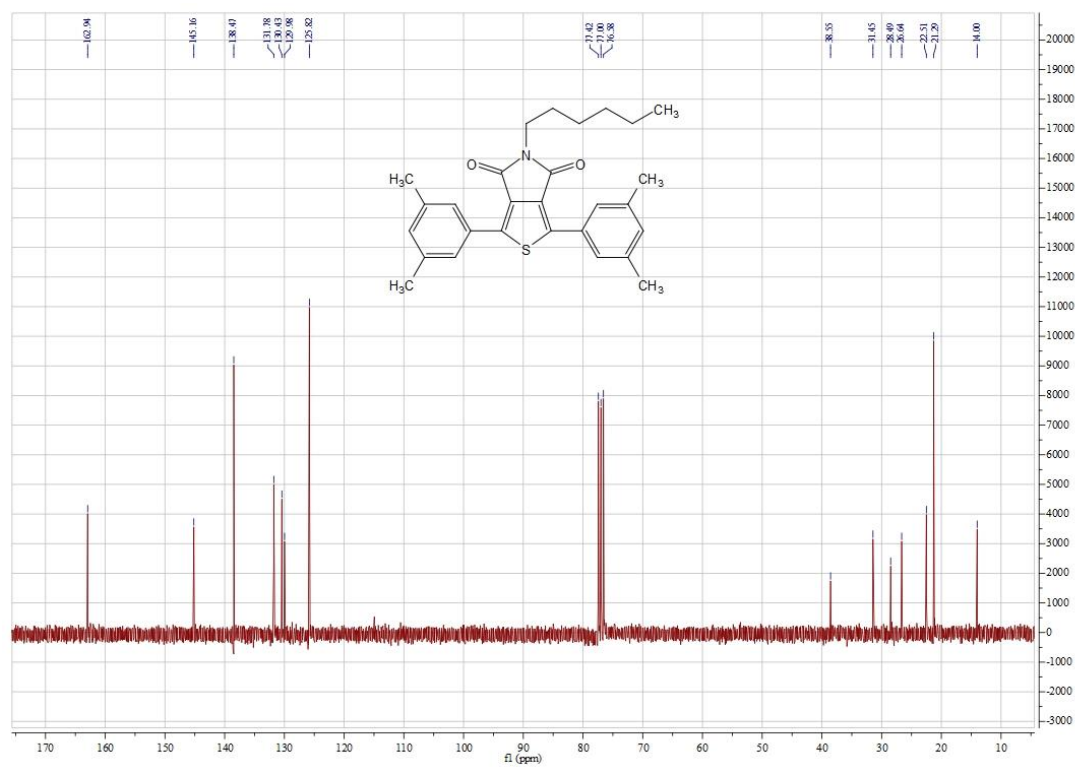


Figure S39. ^1H NMR Spectrum of **3q** (300 MHz, CD_2Cl_2)

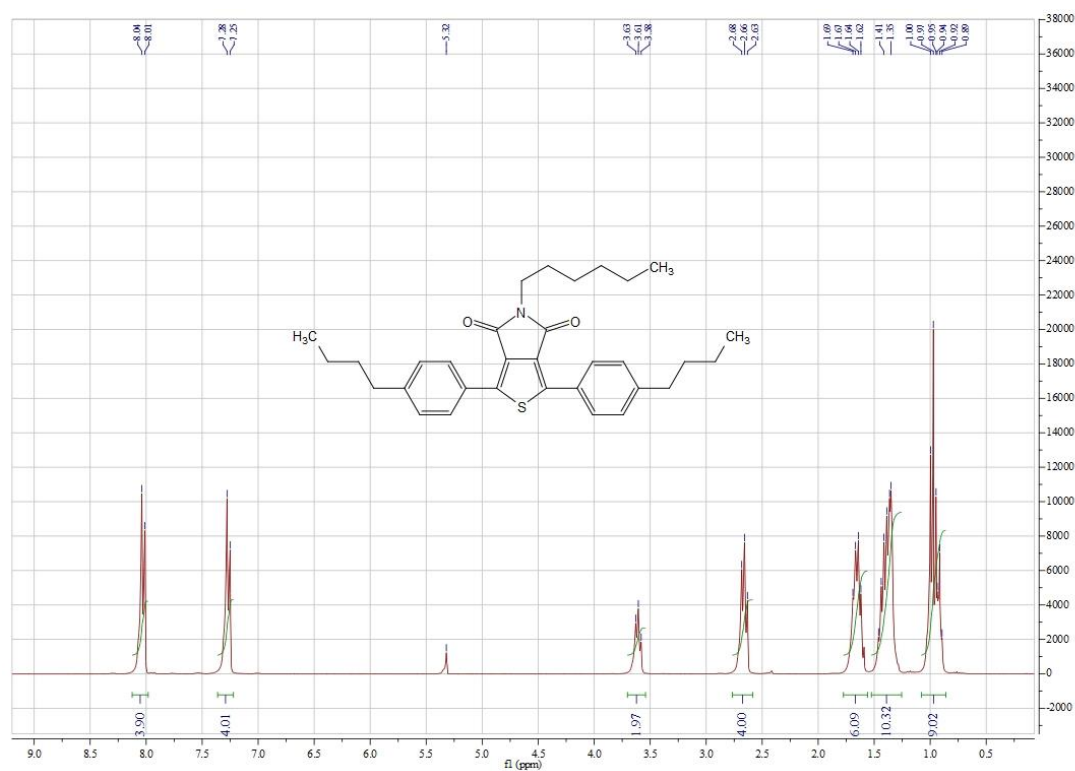


Figure S40. ^{13}C NMR Spectrum of **3q** (75 MHz, CD_2Cl_2)

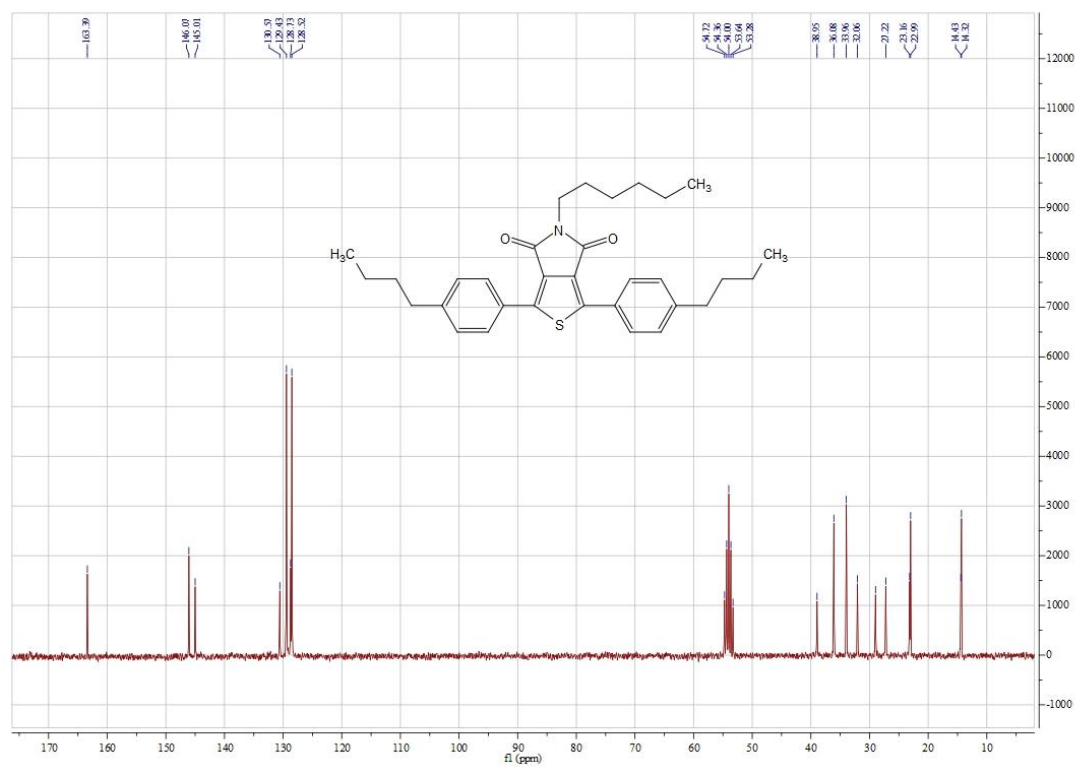


Figure S41. ^1H NMR Spectrum of **3r** (300 MHz, CDCl_3)

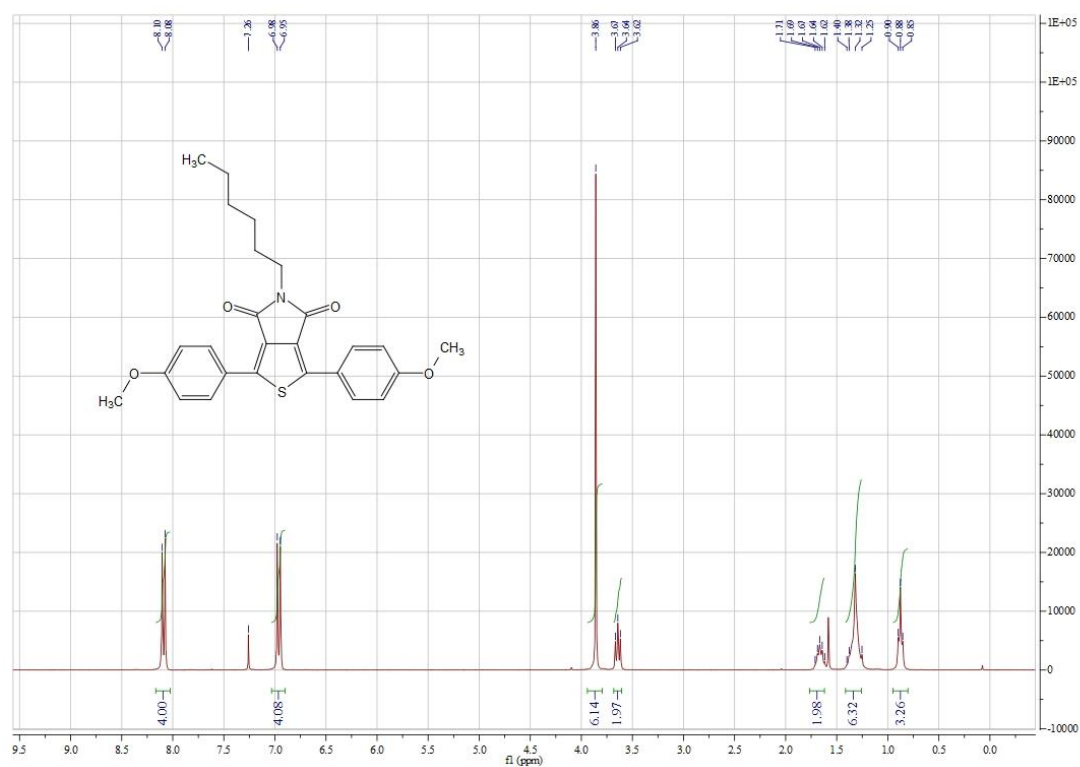


Figure S42. ^{13}C NMR Spectrum of **3r** (75 MHz, CDCl_3)

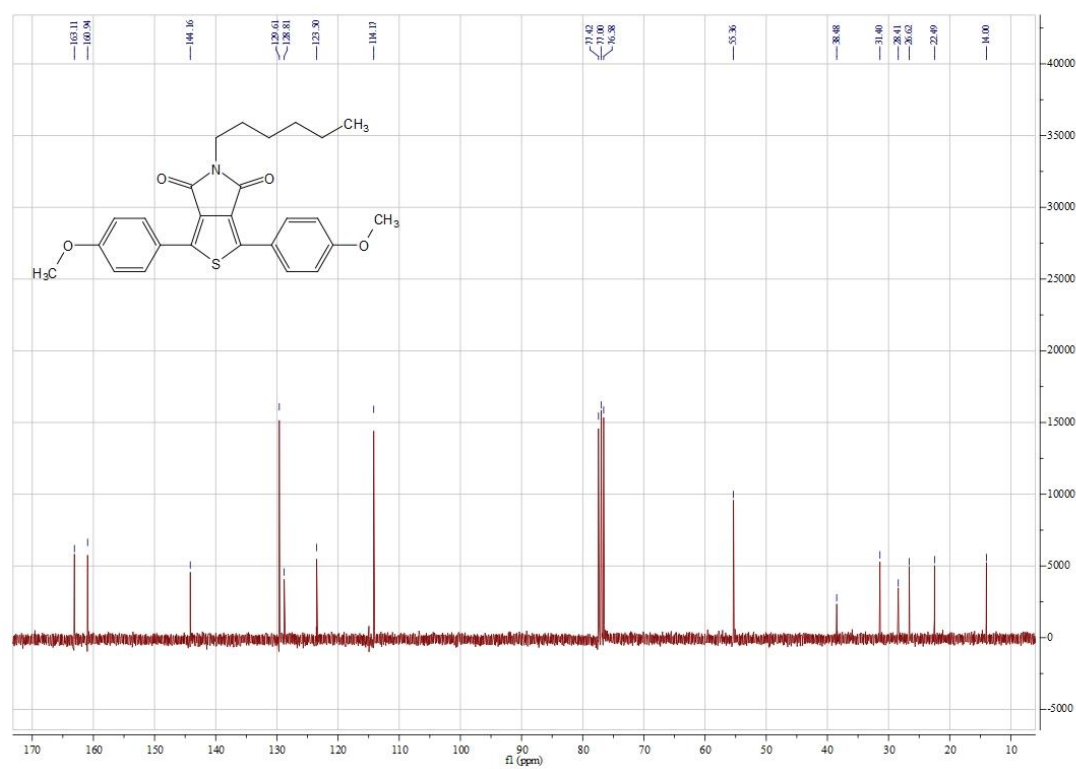


Figure S43. ^1H NMR Spectrum of **3s** (300 MHz, CDCl_3)

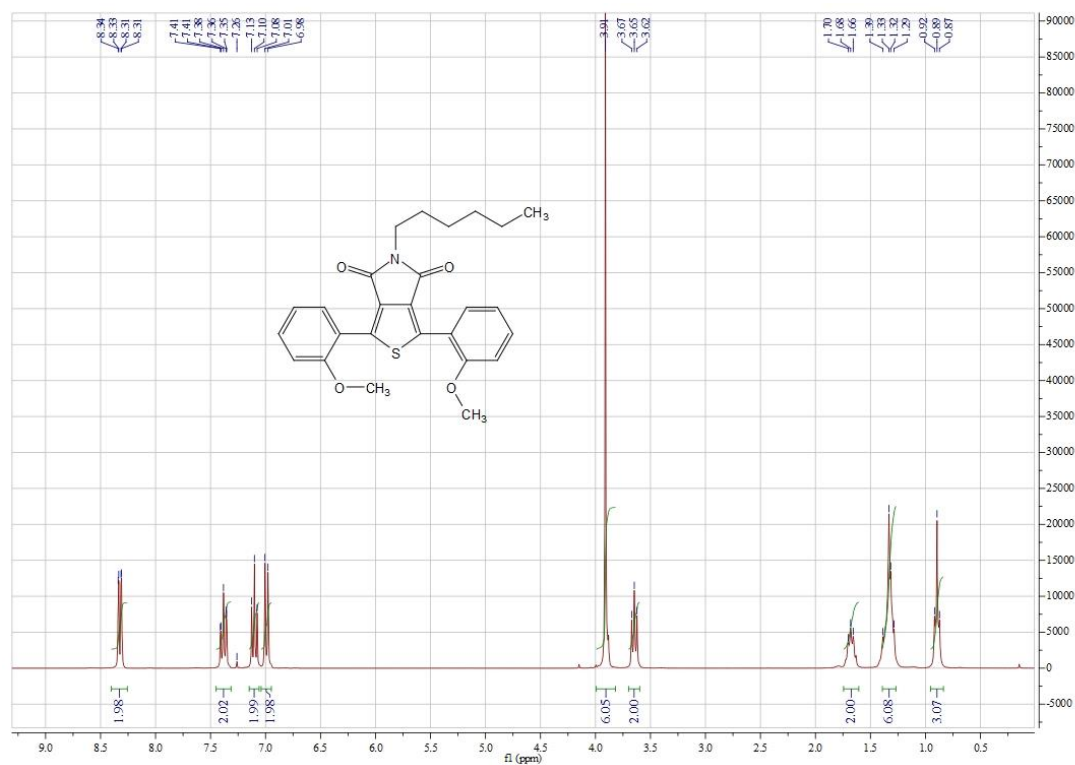


Figure S44. ^{13}C NMR Spectrum of **3s** (75 MHz, CDCl_3)

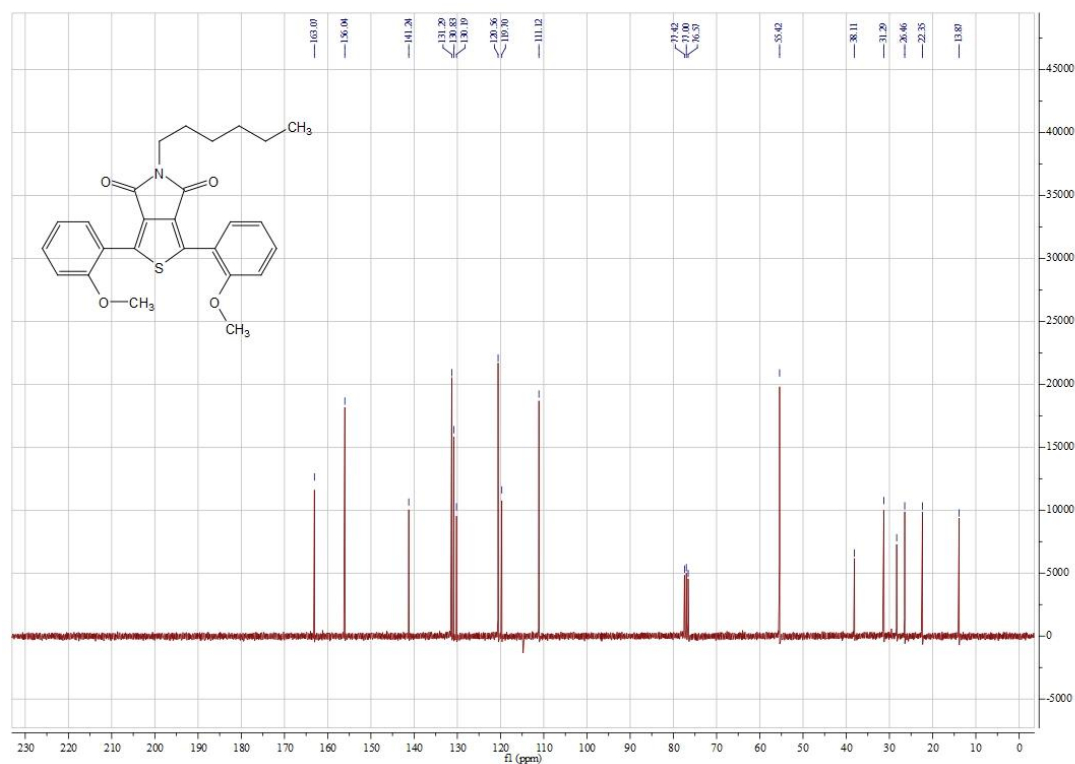


Figure S45. ^1H NMR Spectrum of **3t** (300 MHz, CDCl_3)

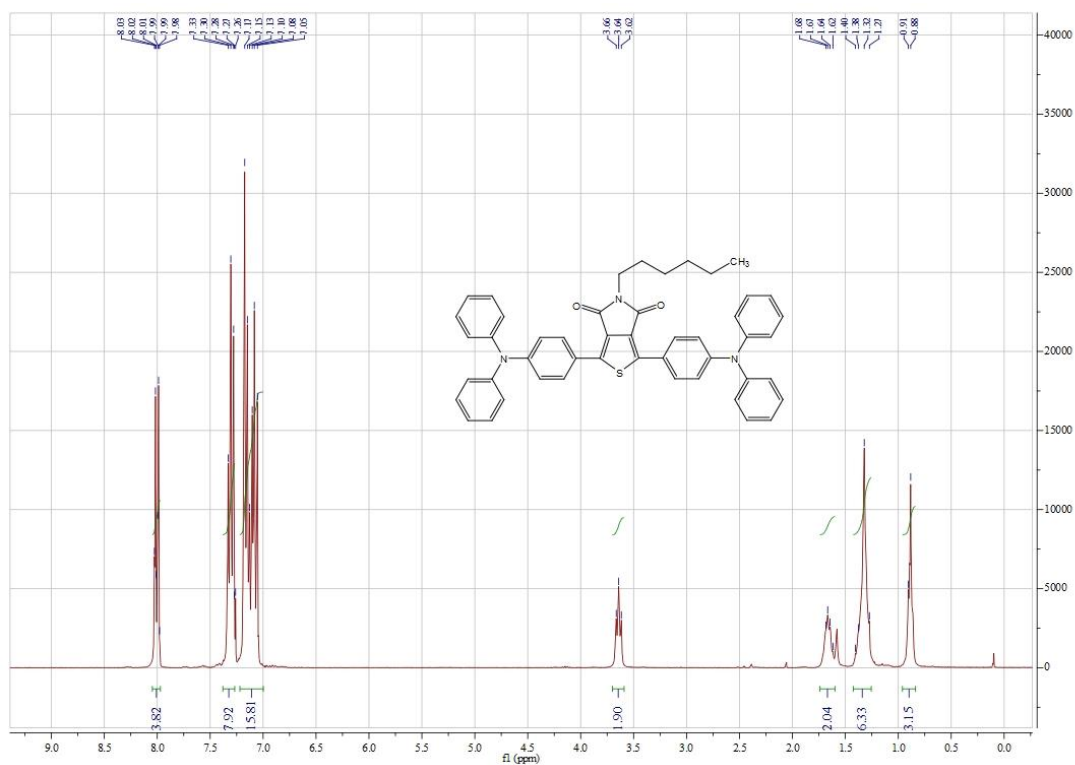


Figure S46. ^{13}C NMR Spectrum of **3t** (75 MHz, CDCl_3)

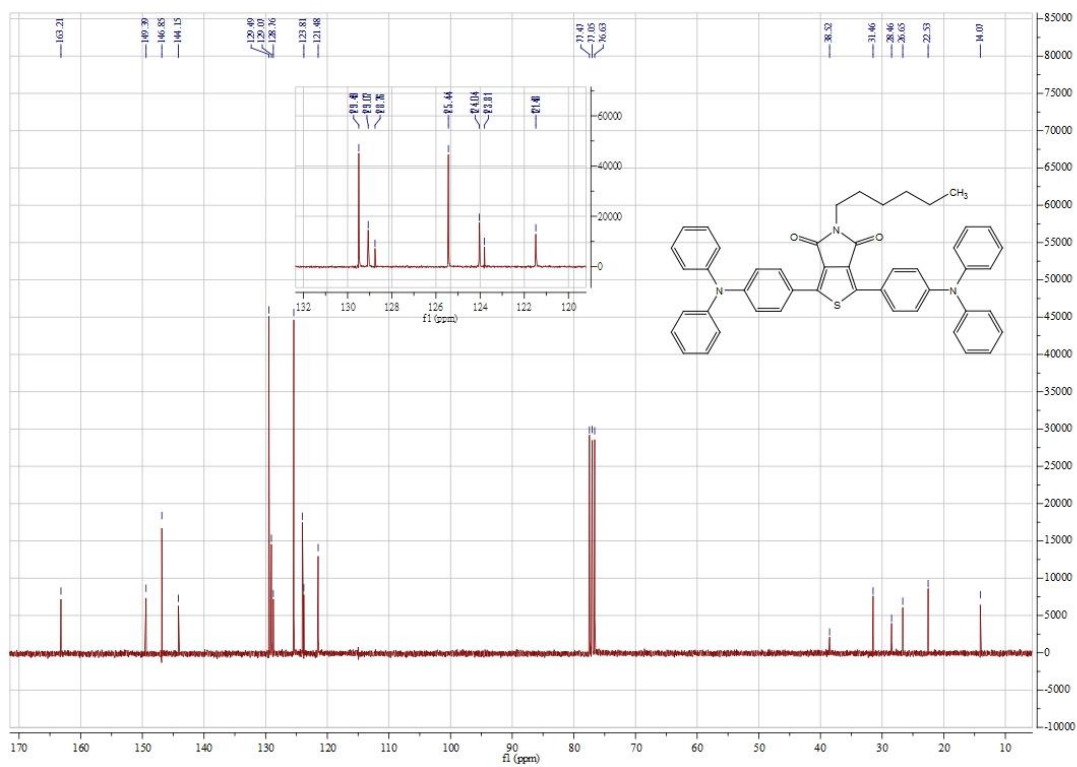


Figure S47. ^1H NMR Spectrum of **3u** (300 MHz, CDCl_3)

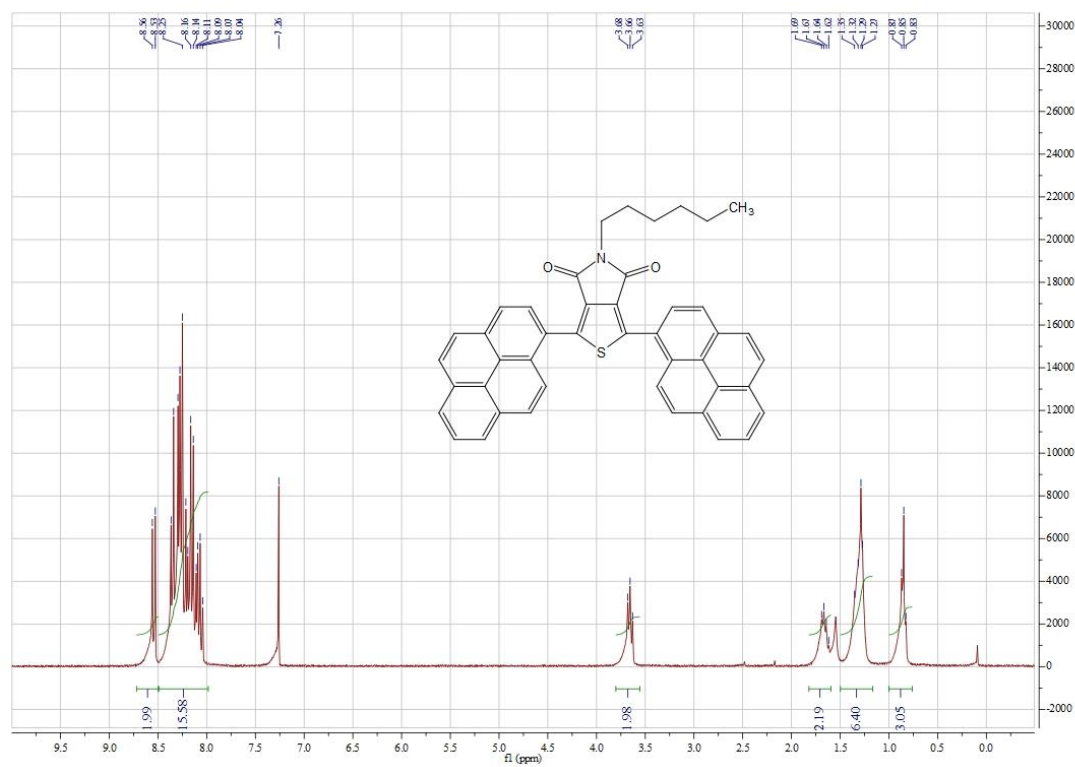


Figure S48. ^{13}C NMR Spectrum of **3u** (75 MHz, CDCl_3)

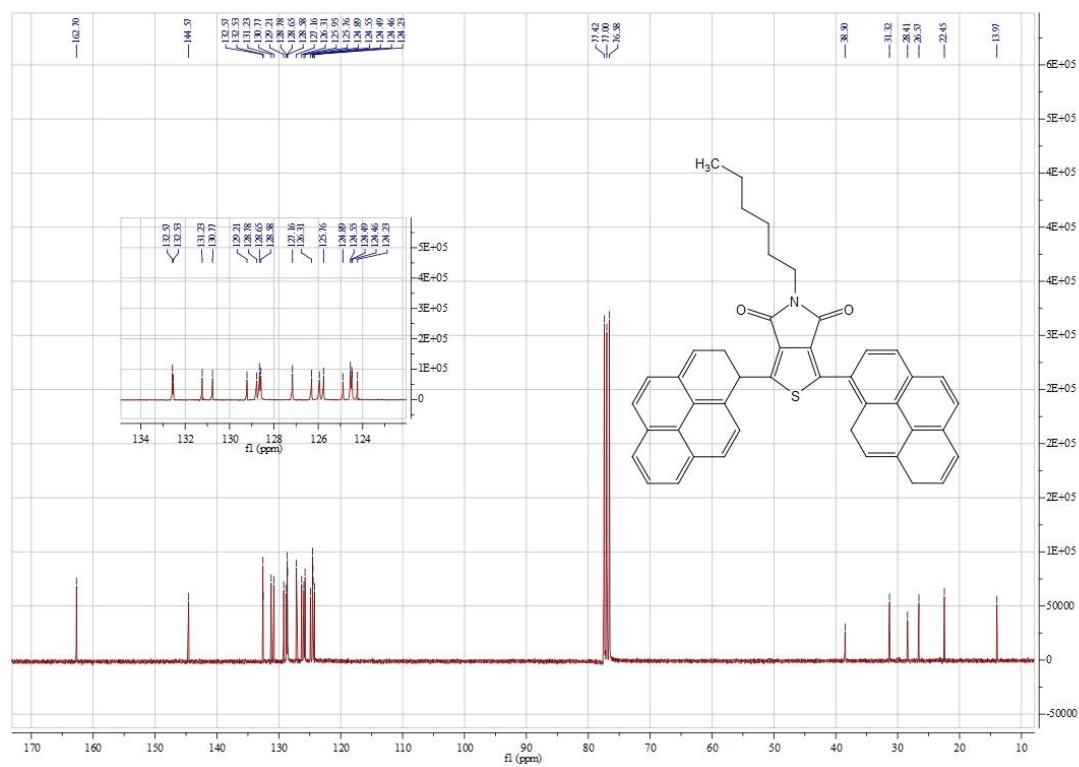


Figure S49. ^1H NMR Spectrum of **4a** (300 MHz, CDCl_3)

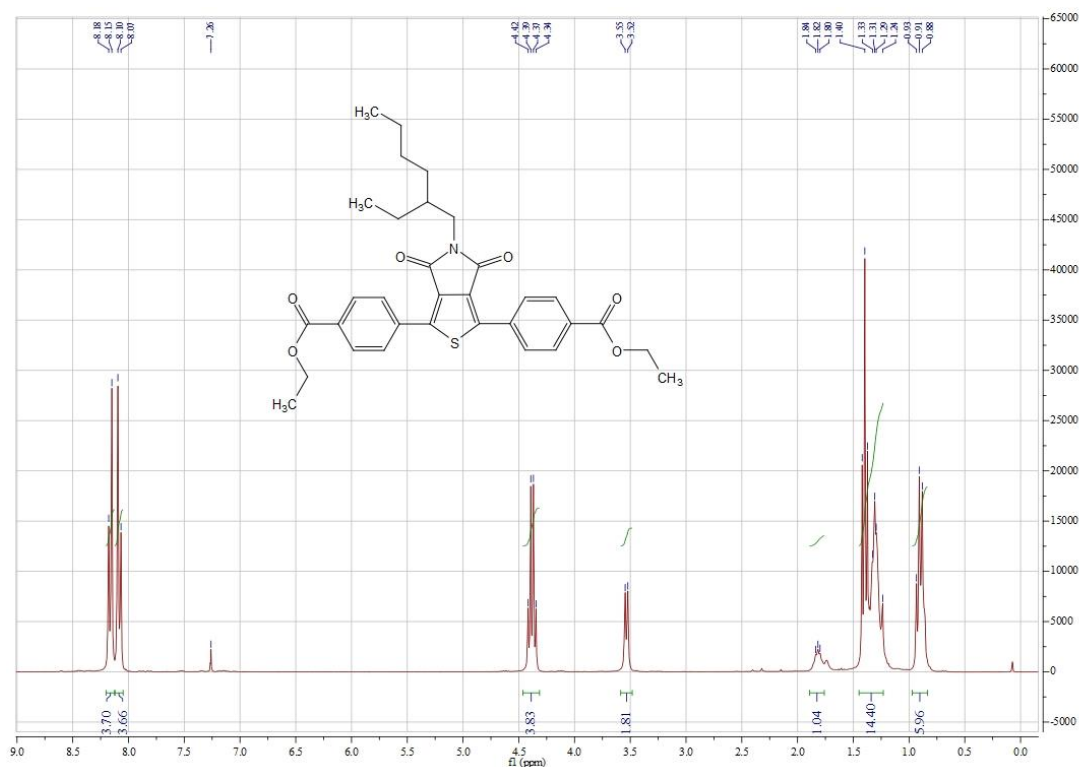


Figure S50. ^{13}C NMR Spectrum of **4a** (75 MHz, CDCl_3)

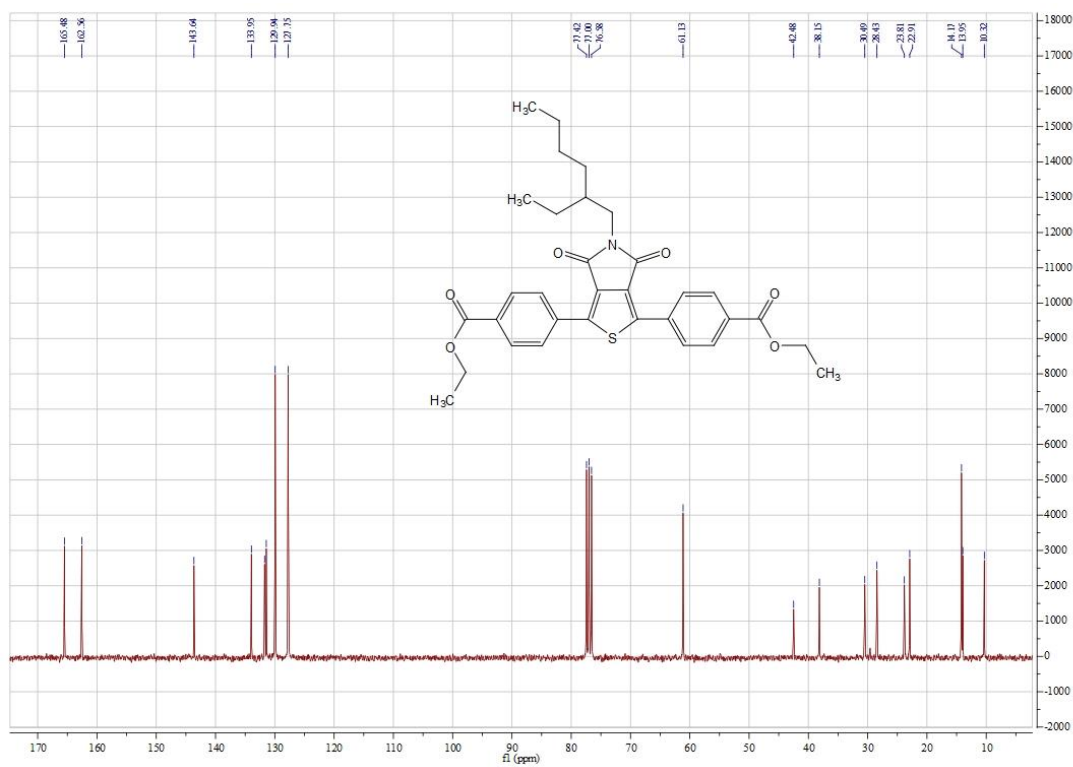


Figure S51. ^1H NMR Spectrum of **4b** (300 MHz, CDCl_3)

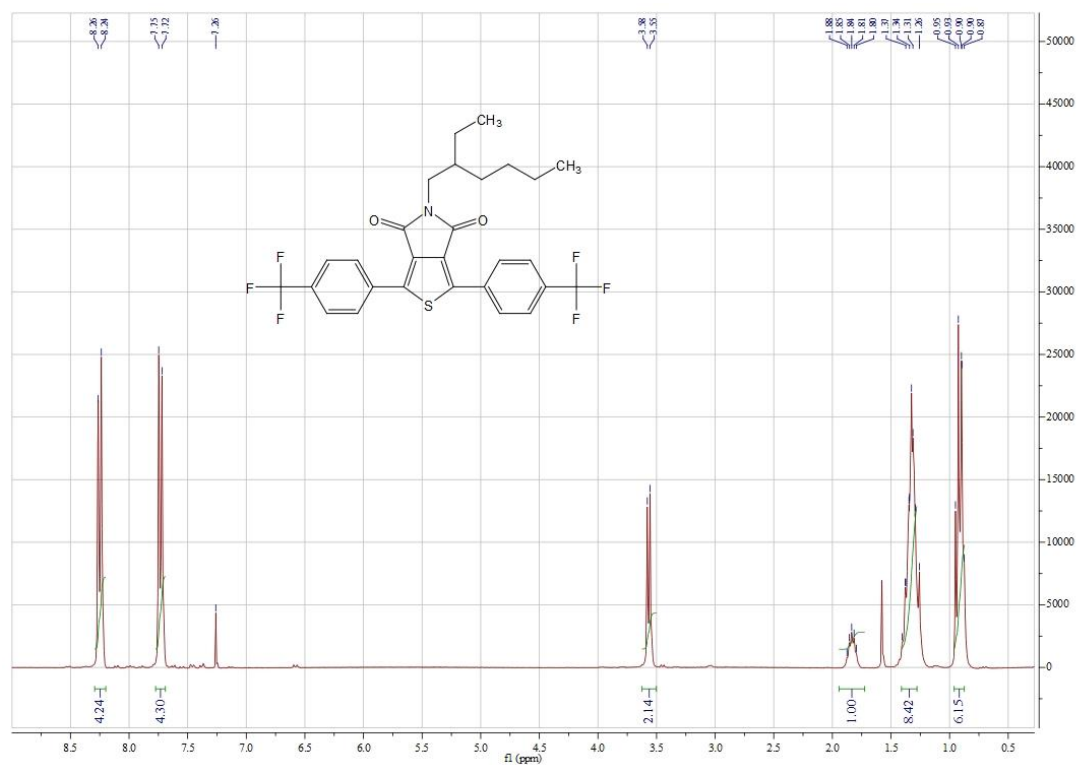


Figure S52. ^{13}C NMR Spectrum of **4b** (75 MHz, CDCl_3)

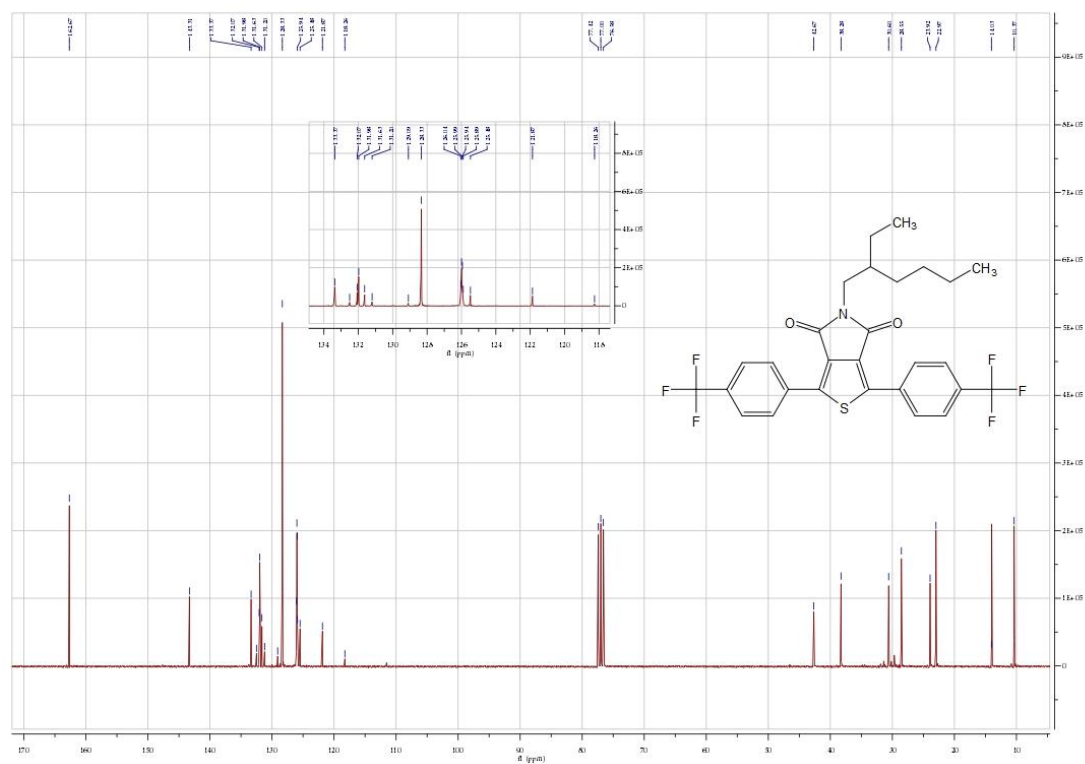


Figure S53. ^1H NMR Spectrum of **4c** (300 MHz, CD_2Cl_2)

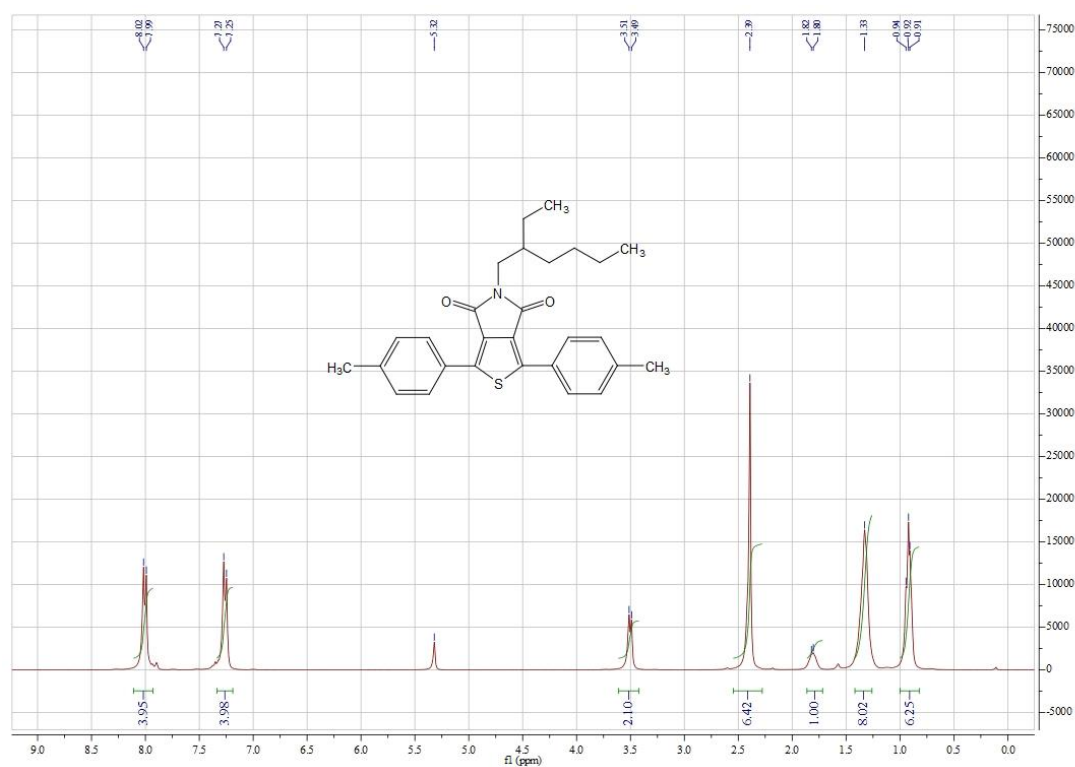


Figure S54. ^{13}C NMR Spectrum of **4c** (75 MHz, CD_2Cl_2)

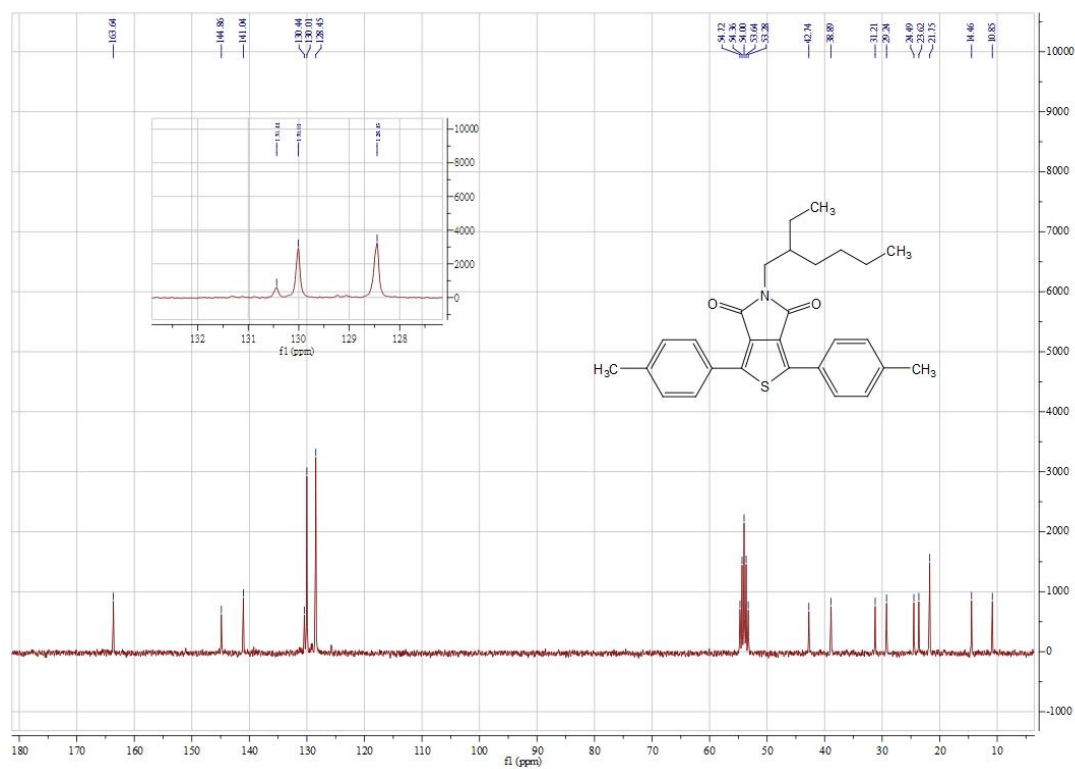


Figure S55. ^1H NMR Spectrum of **4d** (300 MHz, CDCl_3)

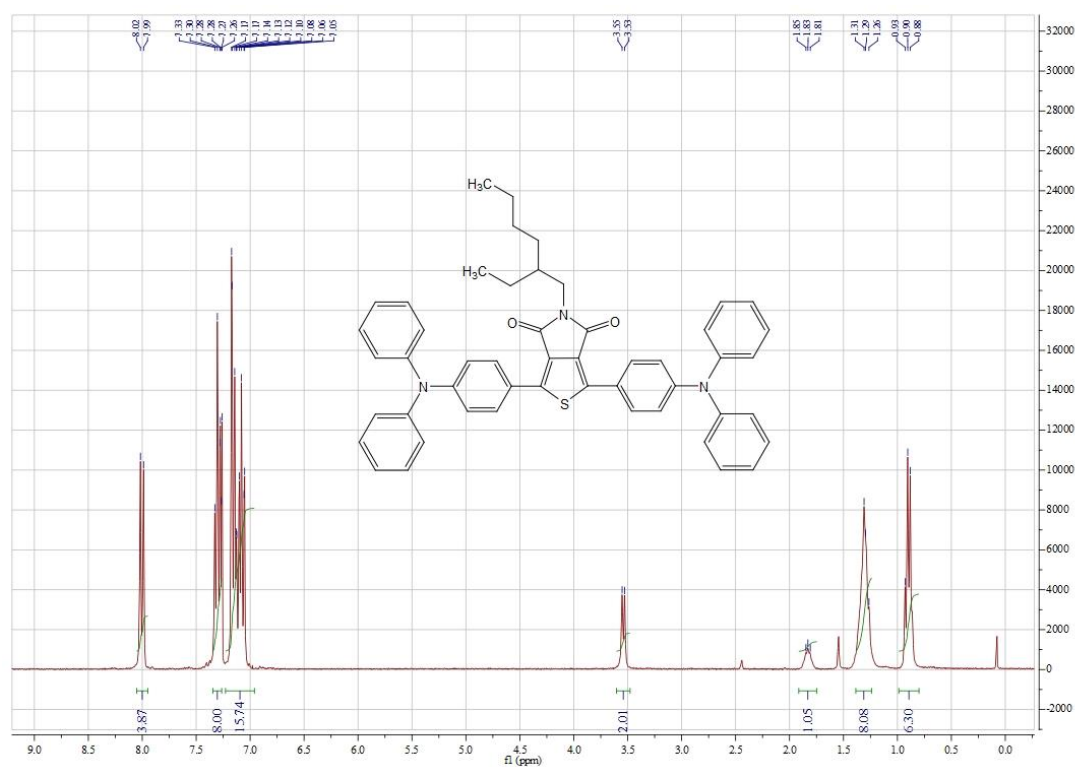


Figure S56. ^{13}C NMR Spectrum of **4d** (75 MHz, CDCl_3)

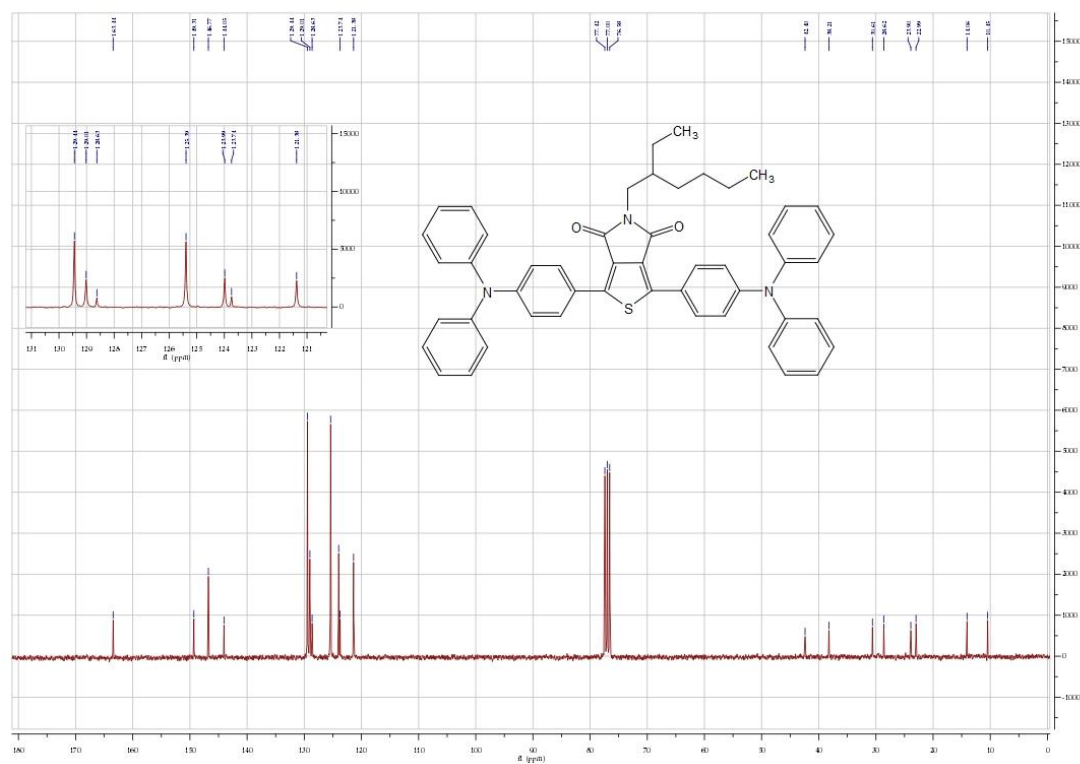


Figure S57. ^1H NMR Spectrum of **5a** (300 MHz, CDCl_3)

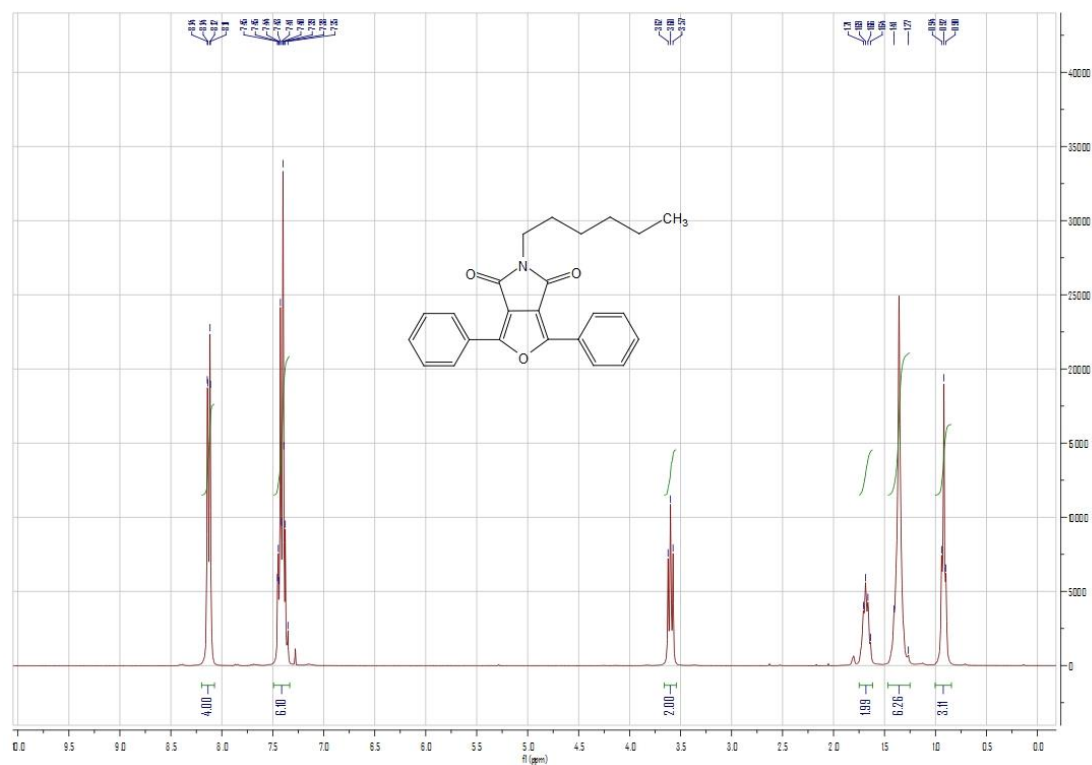


Figure S58. ^{13}C NMR Spectrum of **5a** (75 MHz, CDCl_3)

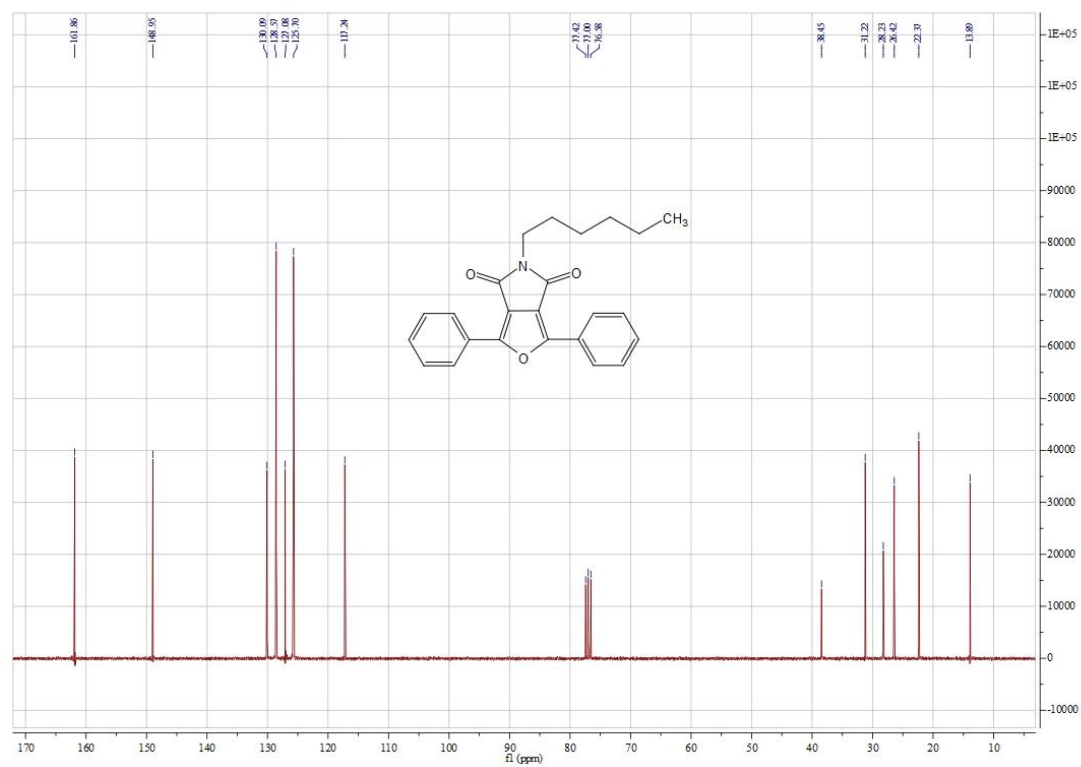


Figure S59. ^1H NMR Spectrum of **5b** (300 MHz, CDCl_3)

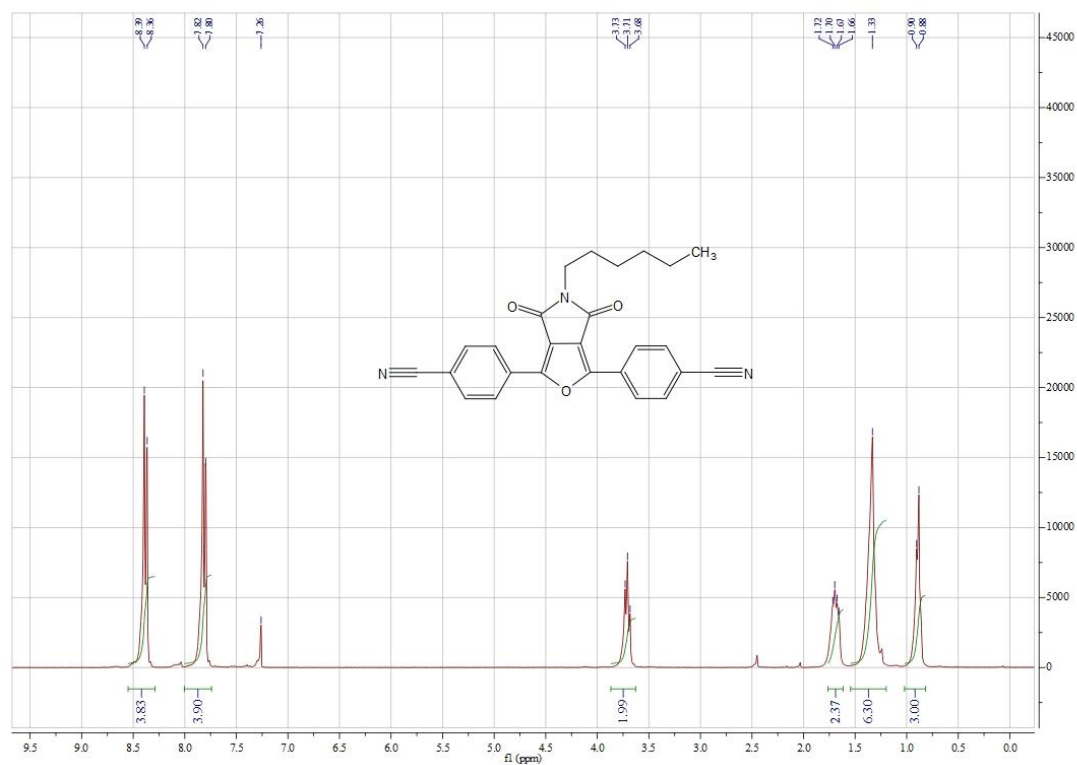


Figure S60. ^{13}C NMR Spectrum of **5b** (75 MHz, CDCl_3)

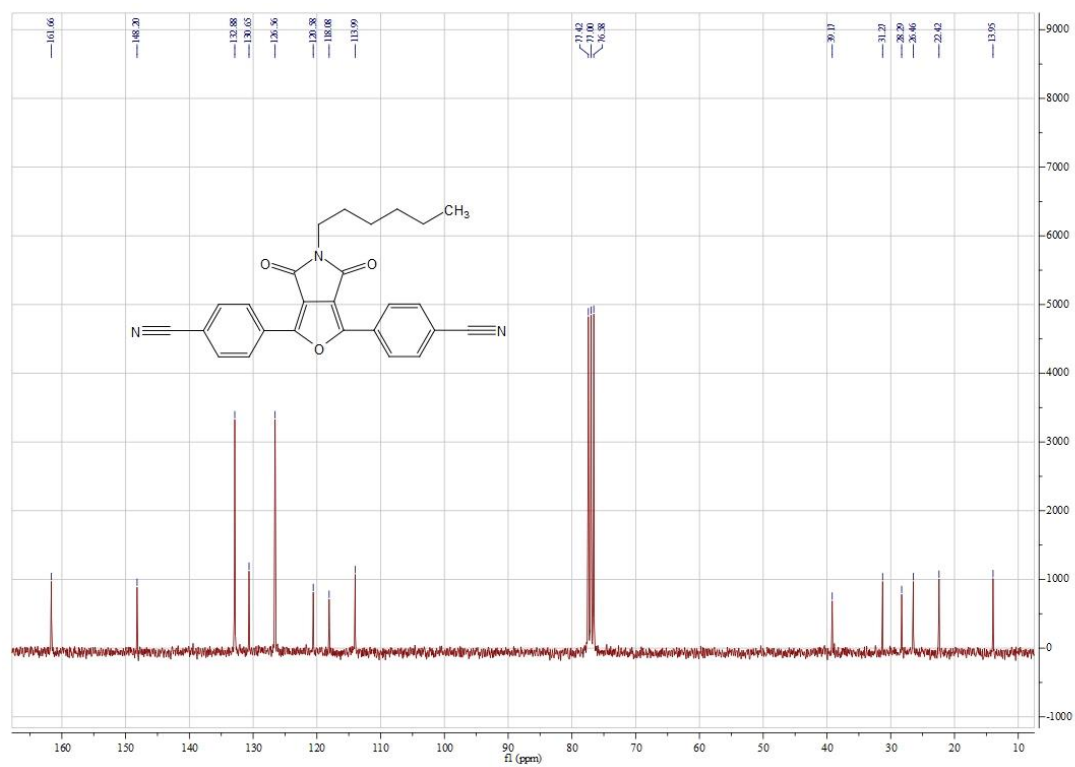


Figure S61. ^1H NMR Spectrum of **6** (300 MHz, CDCl_3)

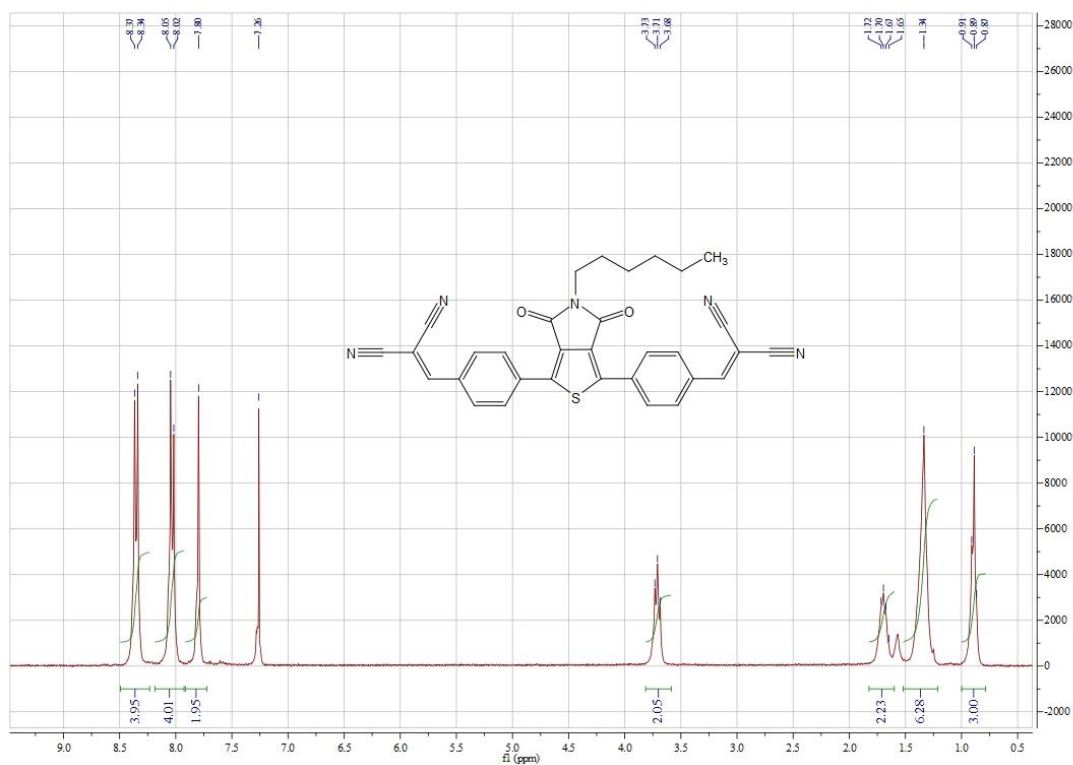


Figure S62. ^{13}C NMR Spectrum of **6** (75 MHz, CDCl_3)

