Electronic Supplementary Information for

Dithieno-naphthalimide based copolymers for air-stable field effect transistors: synthesis, characterization and device performance

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Table of contents

1. Differential pulse voltammograms.

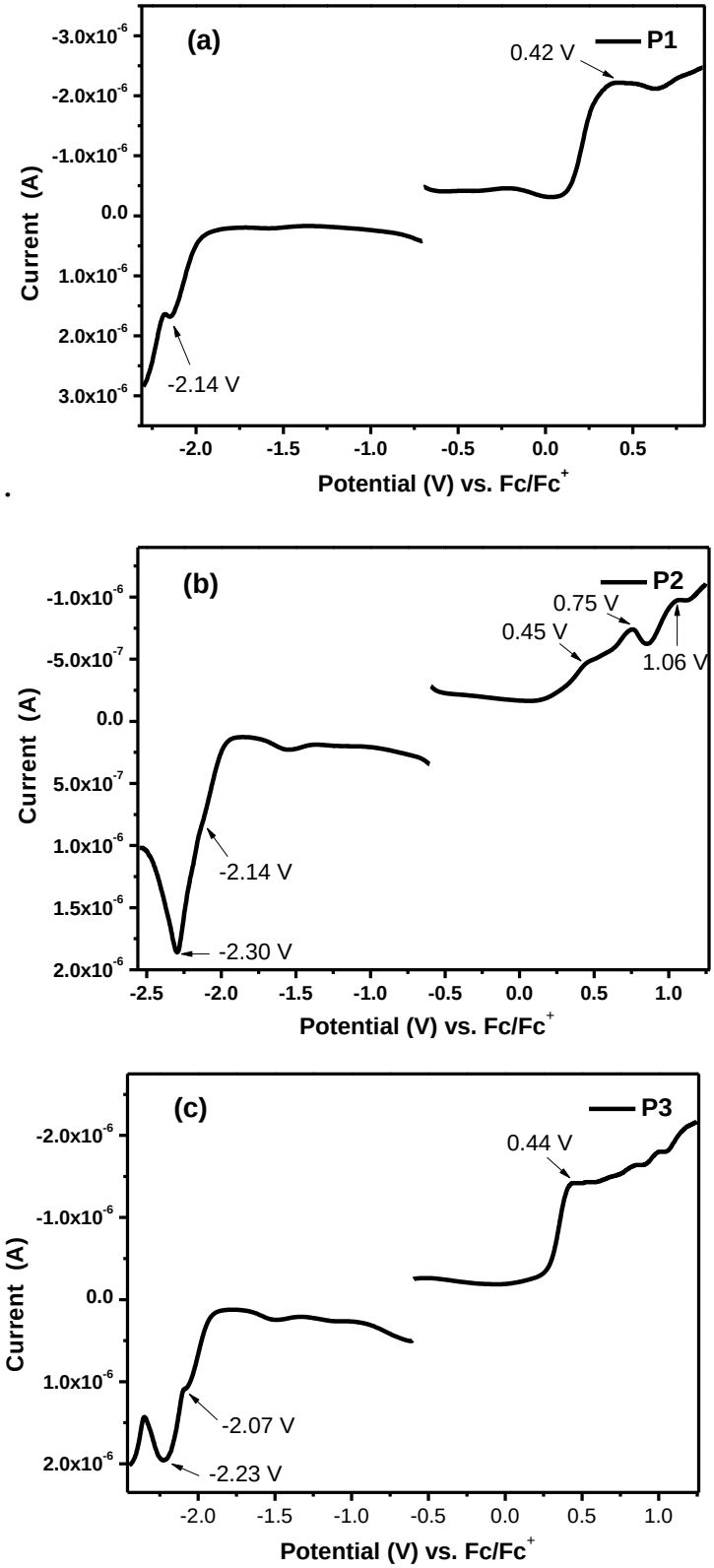


Fig. S1 Differential pulse voltammograms of copolymers **P1** (a), **P2** (b) and **P3** (c) in chlorobenzene with 0.1 M Bu_4NPF_6 as the supporting electrolyte, AgCl/Ag as reference electrode, Au as working electrode, Pt wire as counter electrode, and a scan rate at 50 mV s^{-1}. The potential was externally calibrated against the ferrocene/ferrocenium couple.

2. Thermogravimetric analysis (TGA) curves

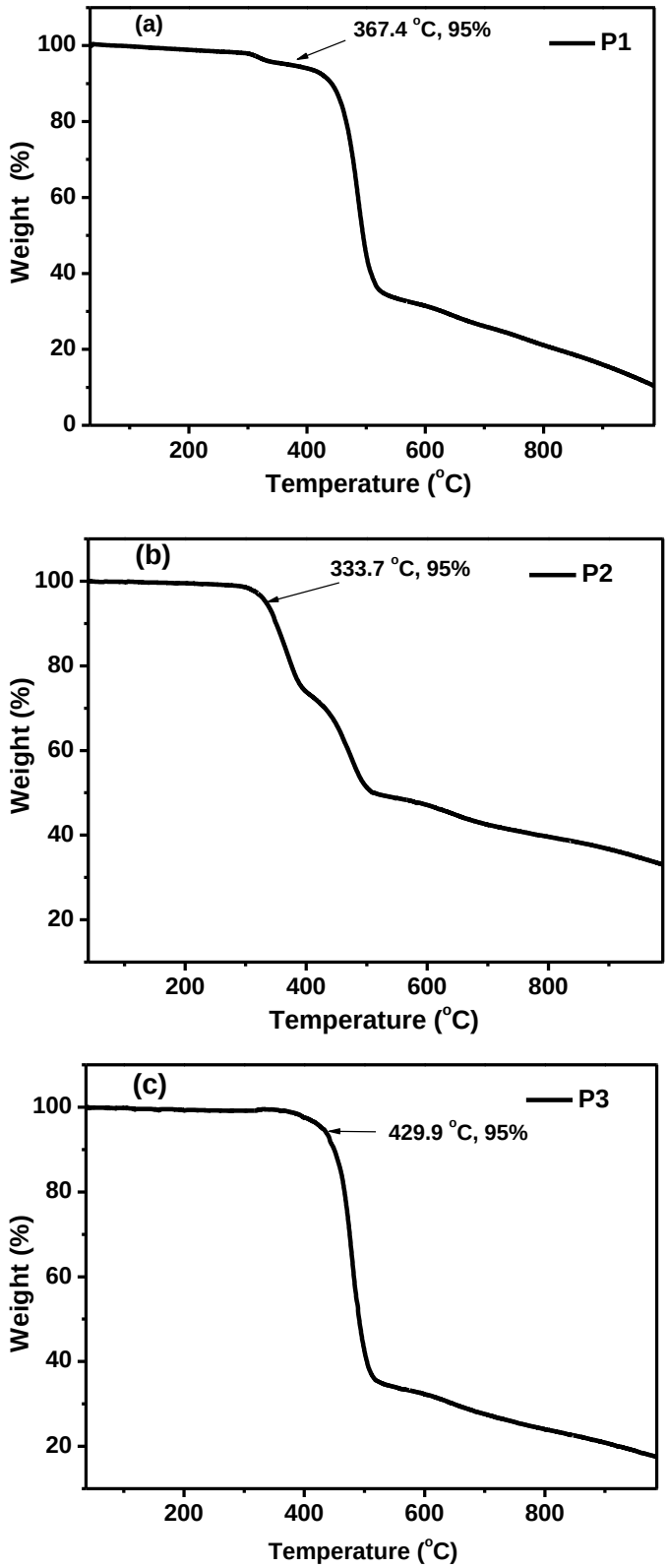


Fig. S2 Thermogravimetric analysis curves of copolymer **P1** (a), **P2** (b) and **P3** (c) in N_2 at a heating rate of 10 $^{o}C\ min^{-1}$.

3. Differential scanning calorimetry (DSC) curves

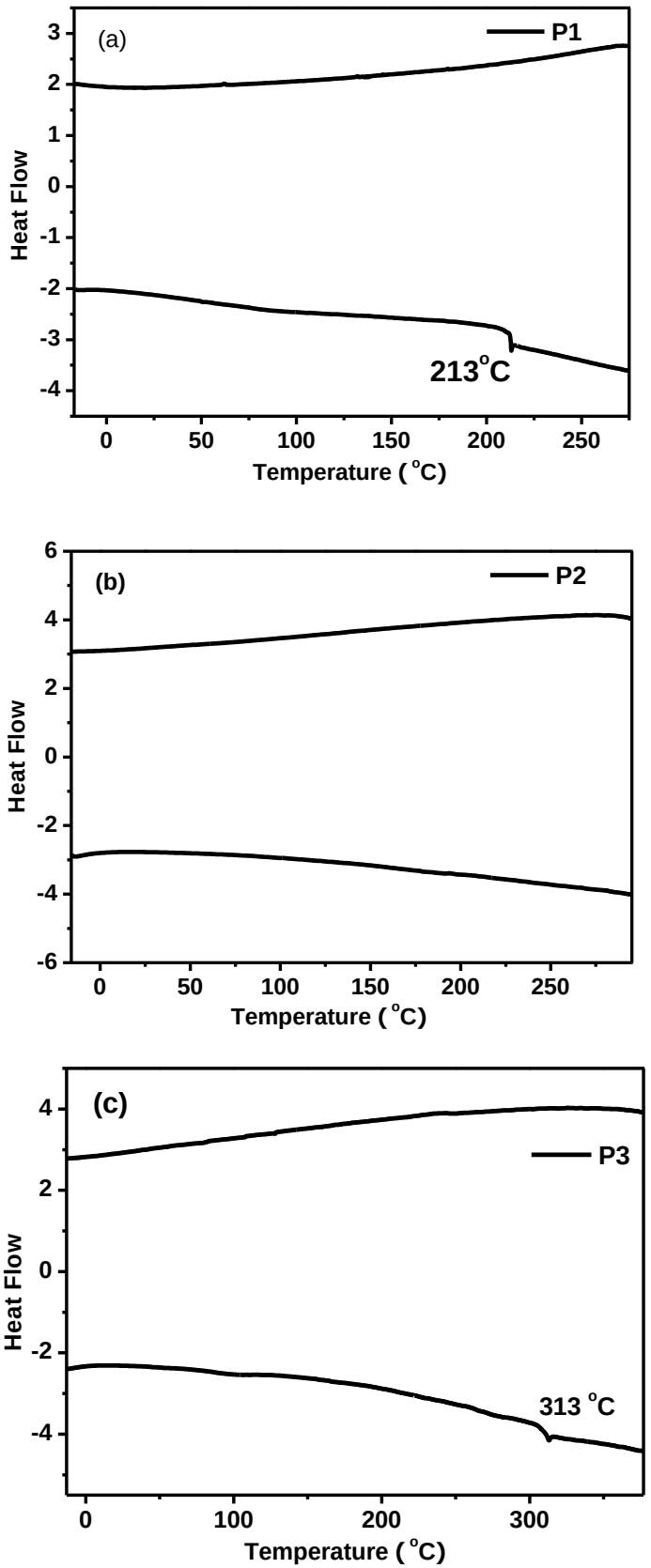


Fig. S3 Differential scanning calorimetry curves of copolymer **P1** (a), **P2** (b) and **P3** (c) in N_2 at a heating rate of 10 ^{o}C min^{-1}

4. Two-dimensional (2D) X-ray diffraction

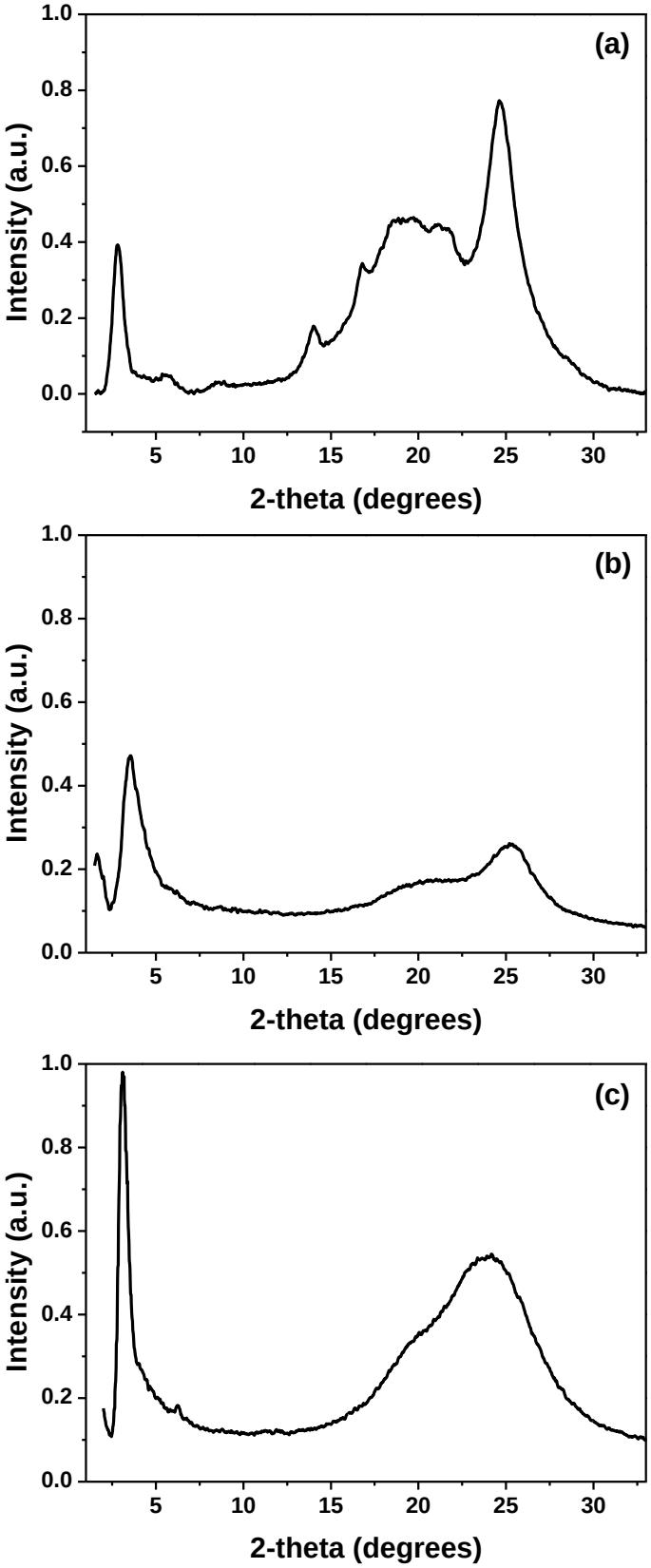


Fig. S4 2D XRD patterns of the thin films of **P1** (a), **P2** (b) and **P3** (c) with the incident X-ray parallel to the thin film.

5. Device stability for copolymer P1

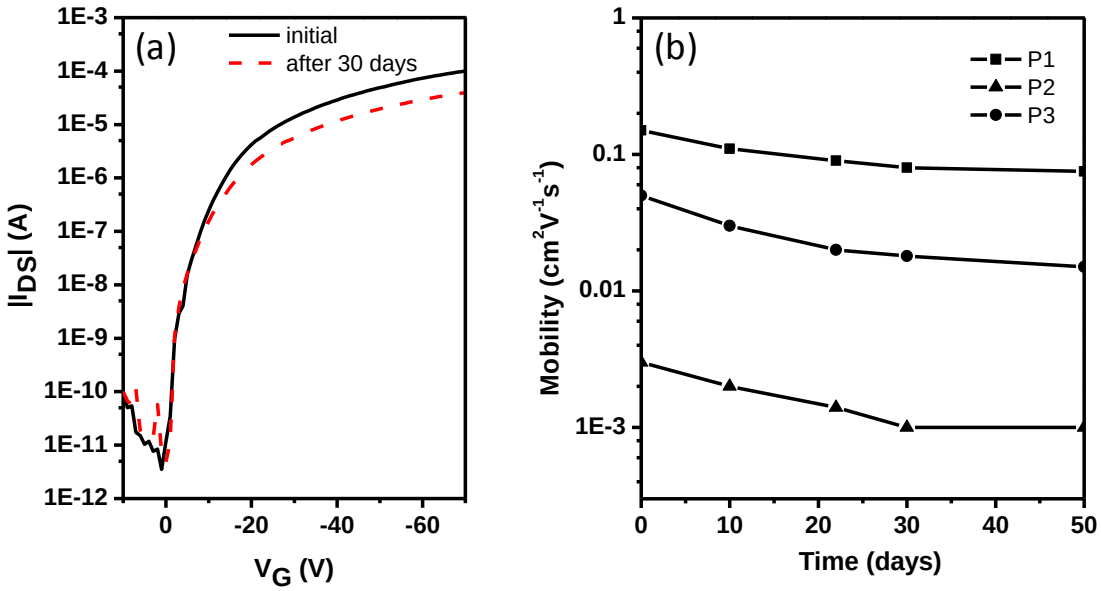


Fig. S5 (a) Transfer plot for a fresh **P1**-based device and after one month storage in air. (b) charge carrier mobility for **P1**-**P3** based polymers versus the storage time. The plots showed average values.

6. NMR spectra and HRMS (EI) spectrum

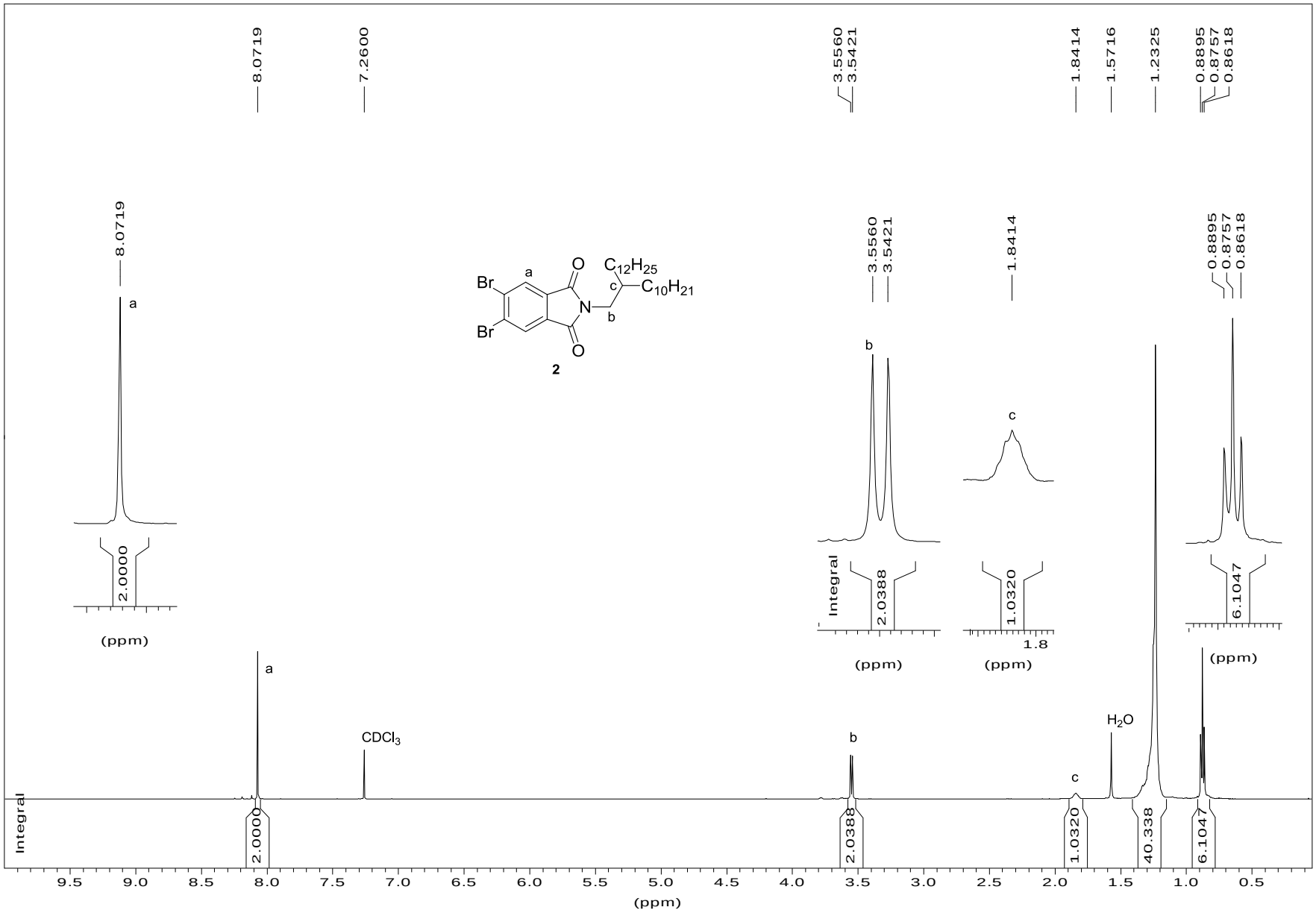


Fig. S6 ^{1}H NMR (500 MHz) spectrum of compound **2** in $CDCl_3$.

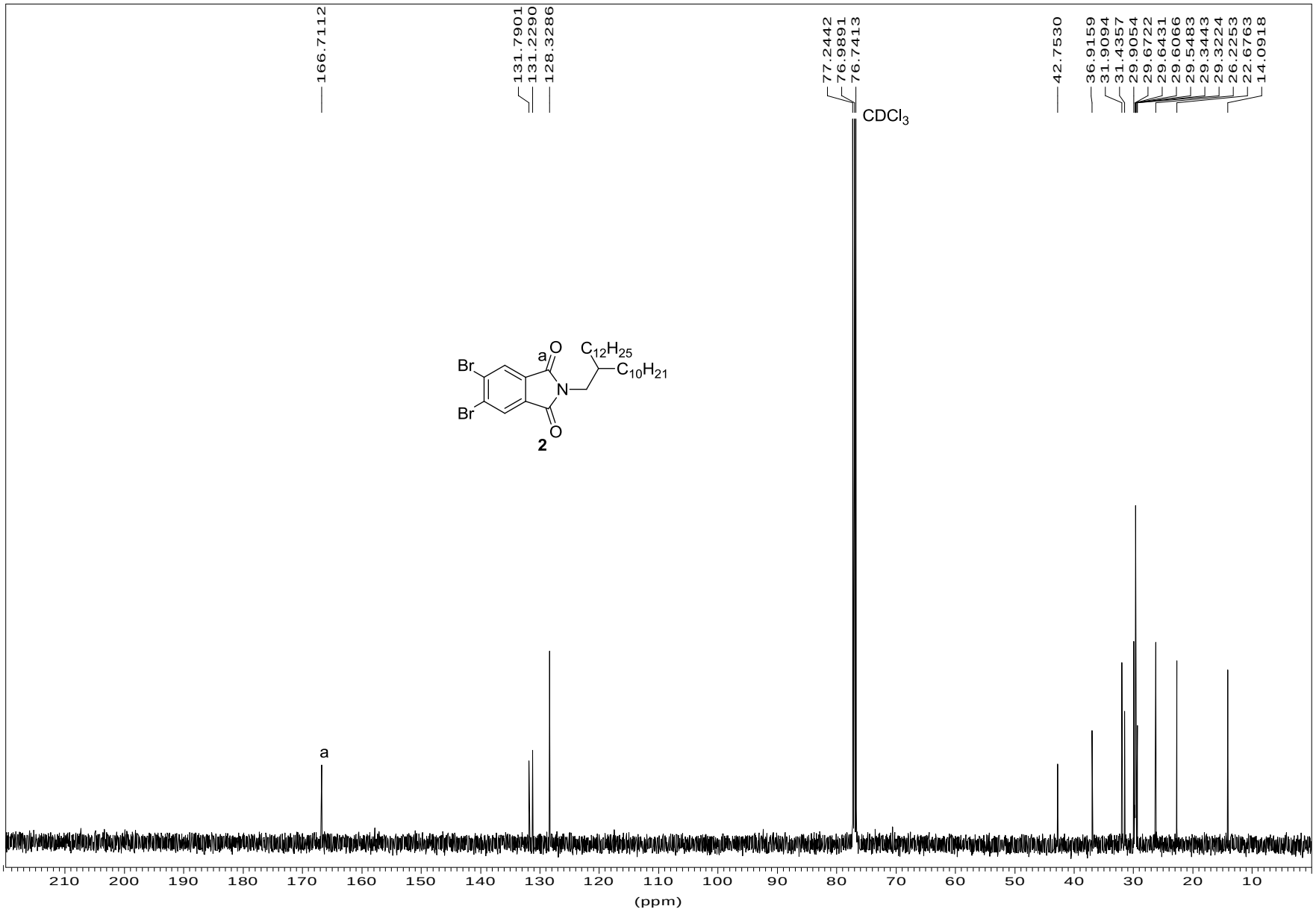


Fig. S7 ^{13}C NMR (125 MHz) spectrum of compound **2** in $CDCl_3$.

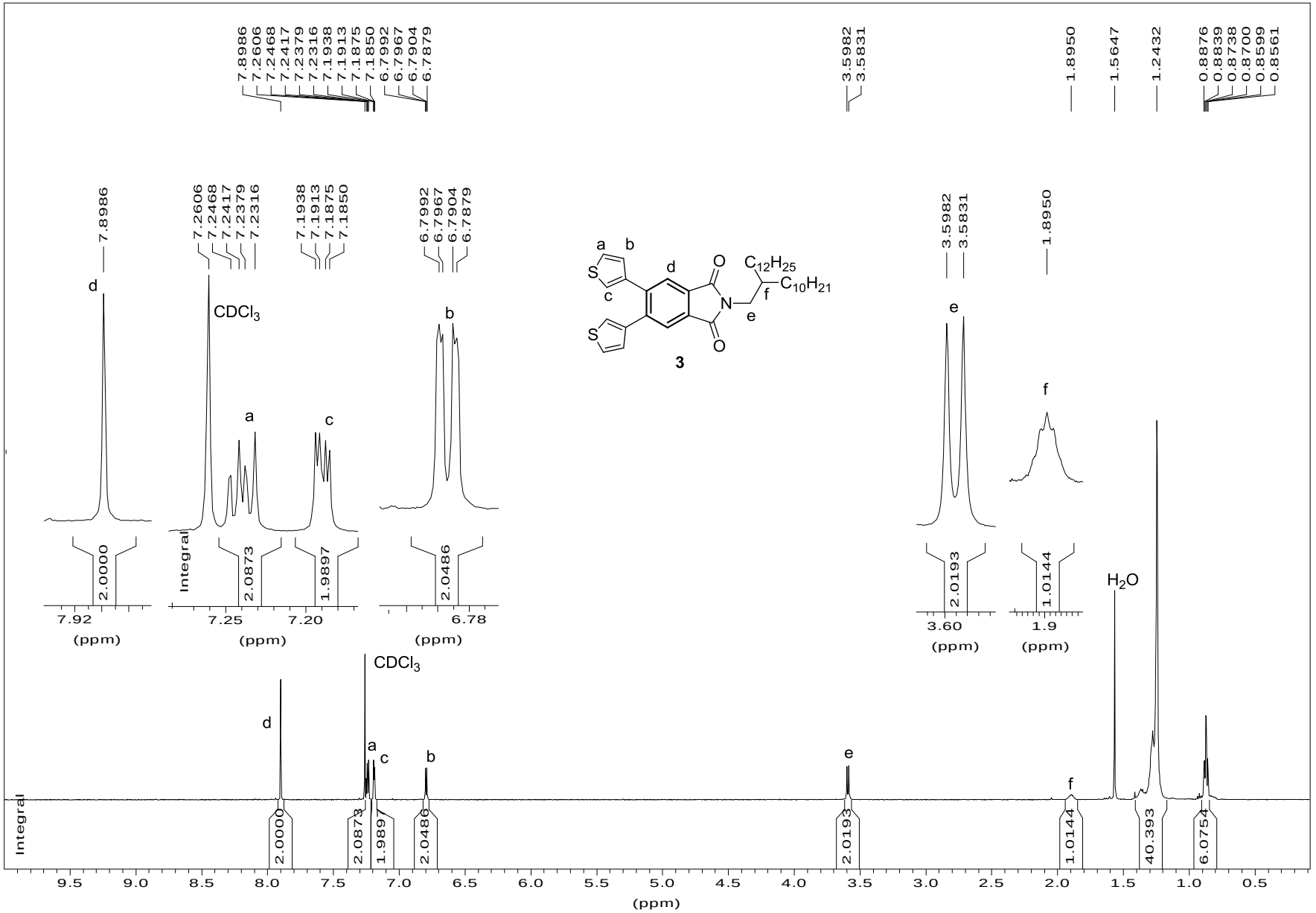


Fig. S8 ^{1}H NMR (500 MHz) spectrum of compound **3** in $CDCl_3$.

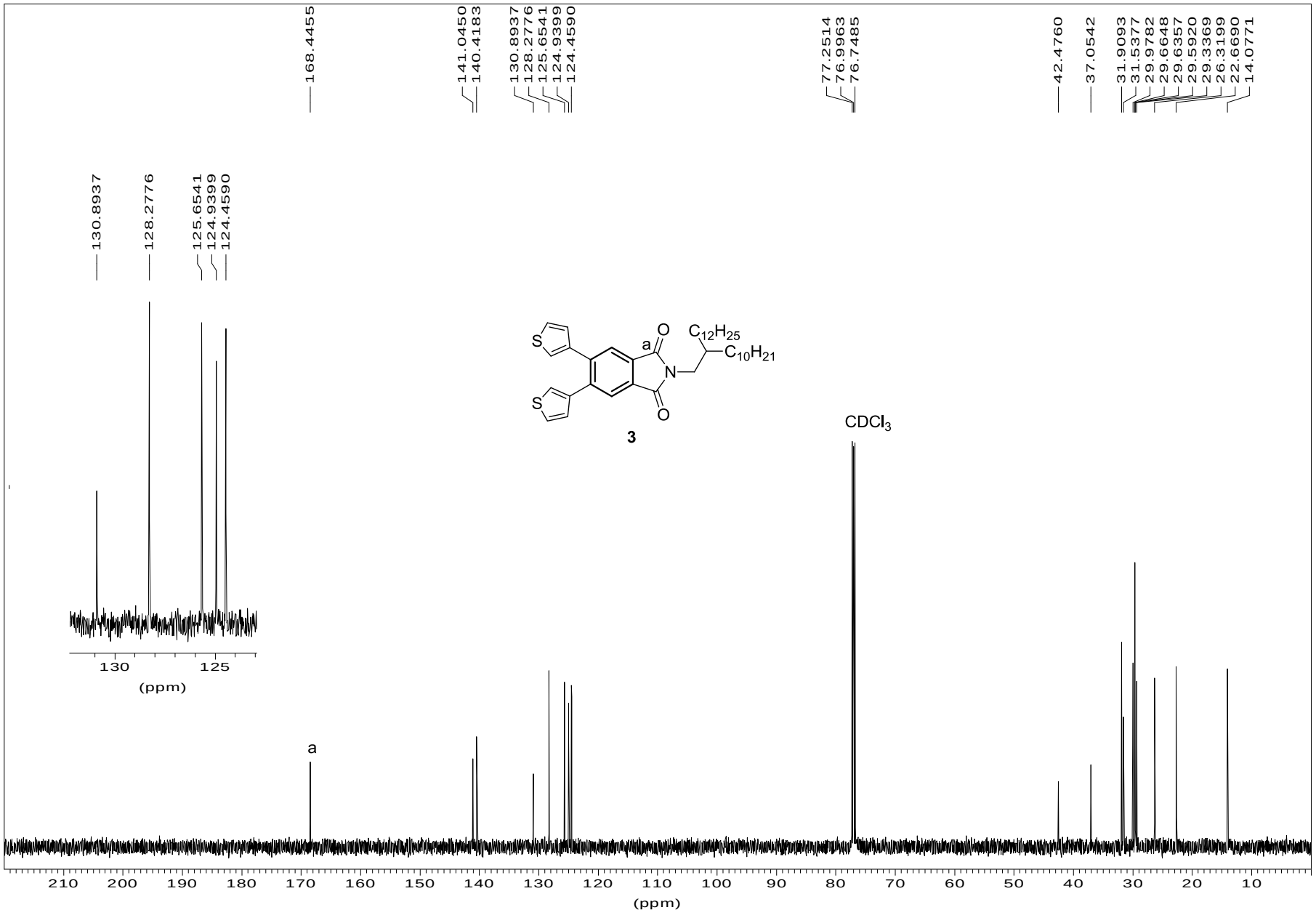


Fig. S9 ^{13}C NMR (125 MHz) spectrum of compound **3** in $CDCl_3$.

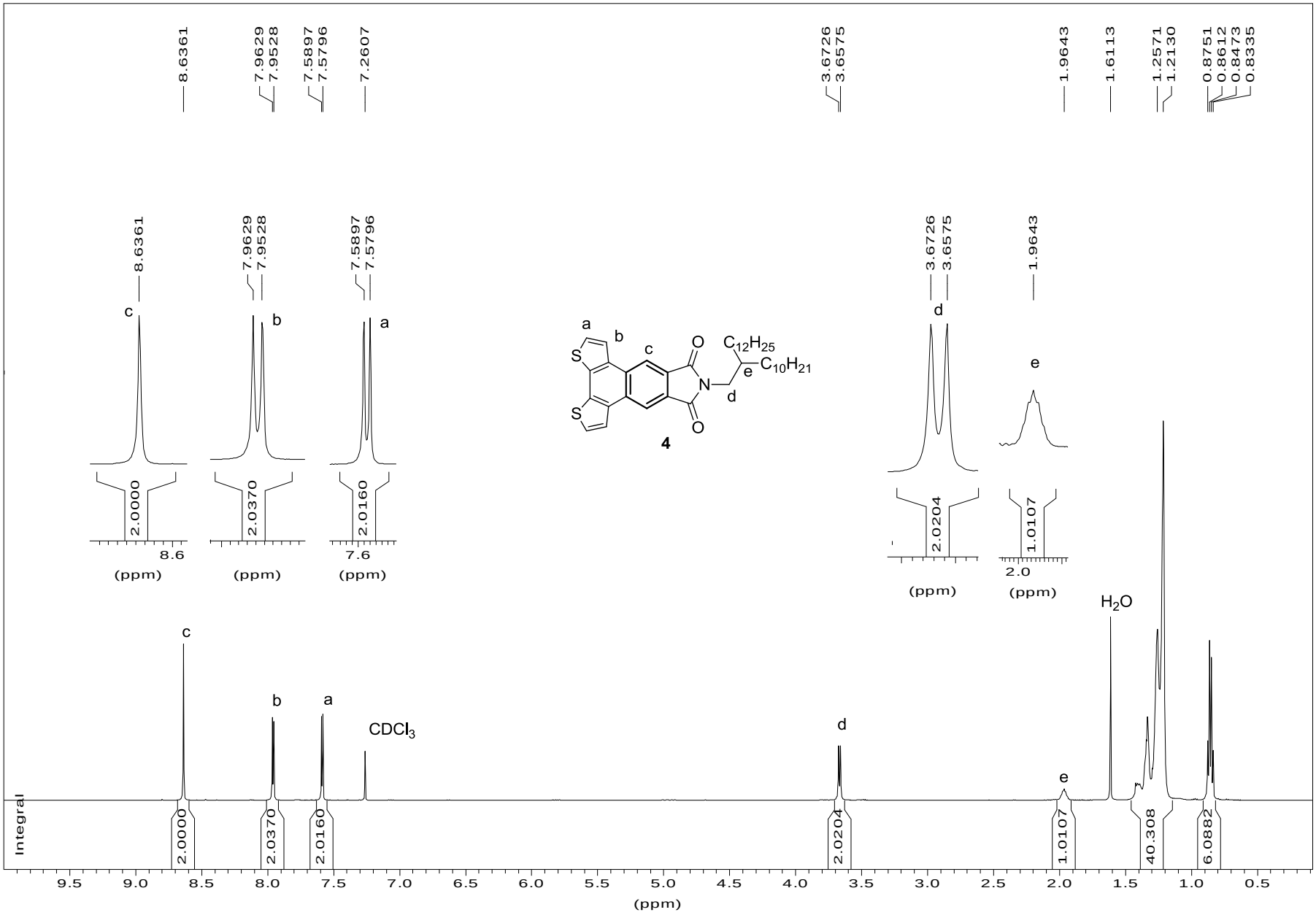


Fig. S10 ^{1}H NMR (500 MHz) spectrum of compound **4** in $CDCl_3$.

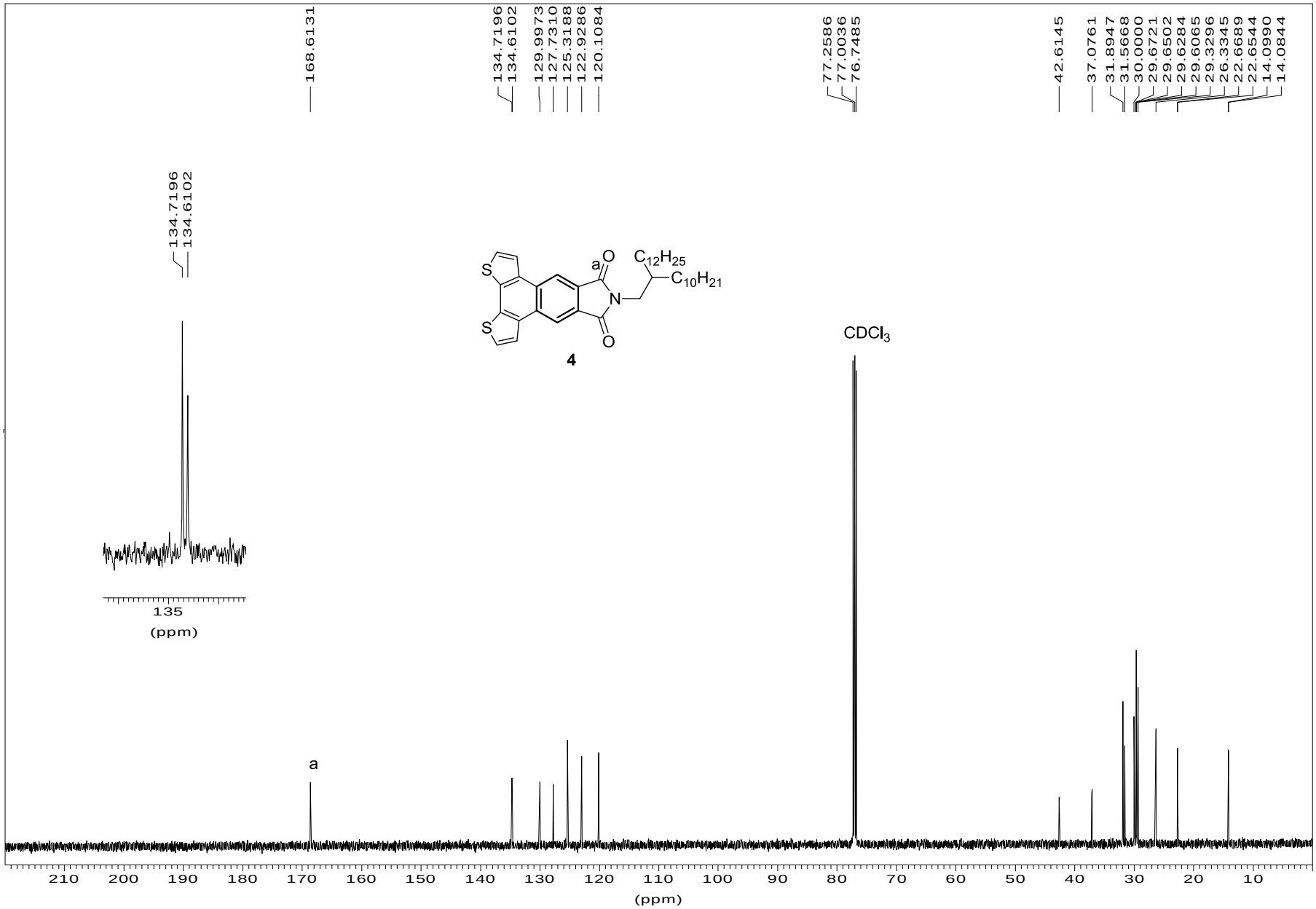


Fig. S11 ^{13}C NMR (125 MHz) spectrum of compound **4** in $CDCl_3$.

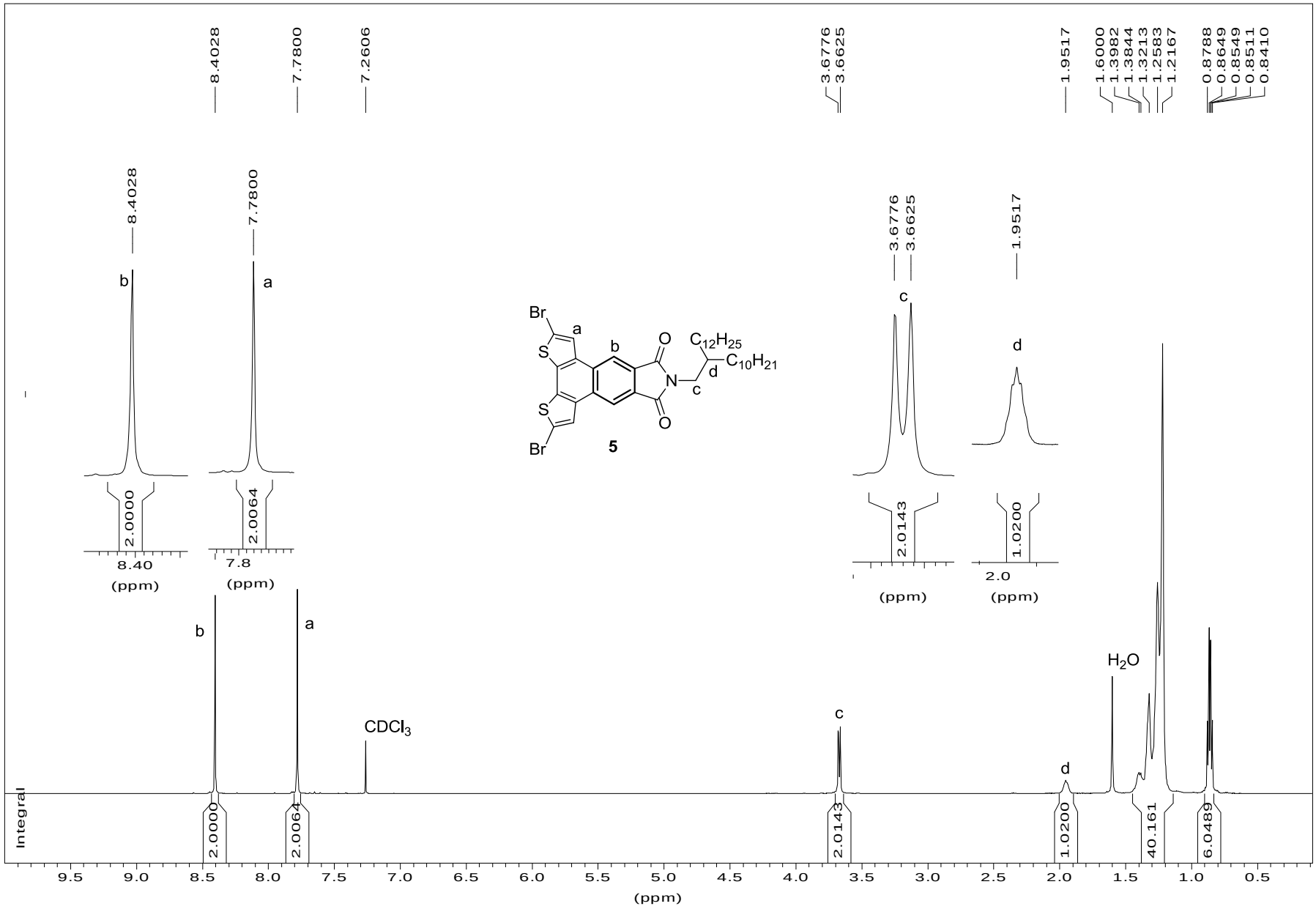


Fig. S12 ^{1}H NMR (500 MHz) spectrum of compound **5** in $CDCl_3$.

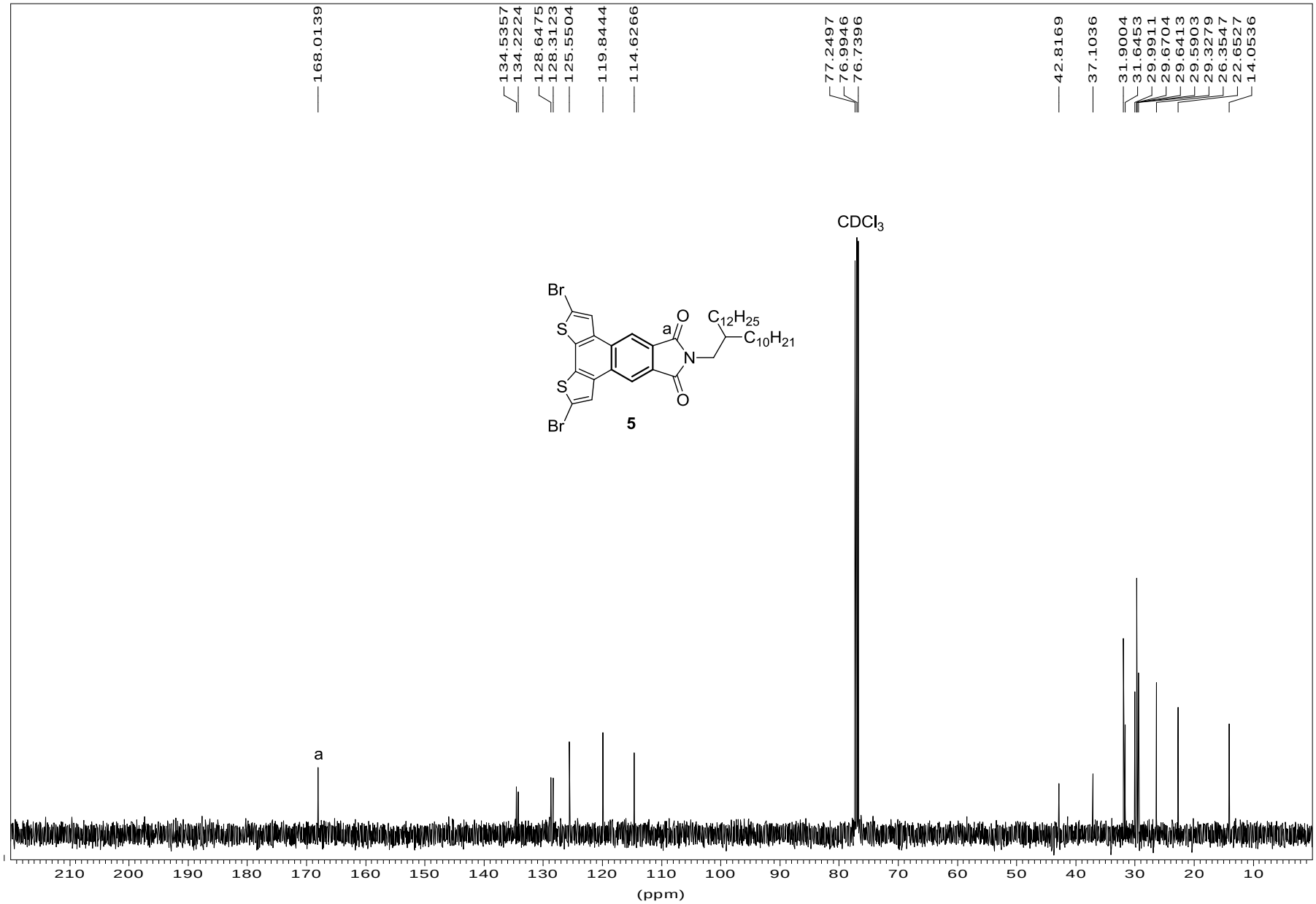


Fig. S13 ^{13}C NMR (125 MHz) spectrum of compound **5** in $CDCl_3$.

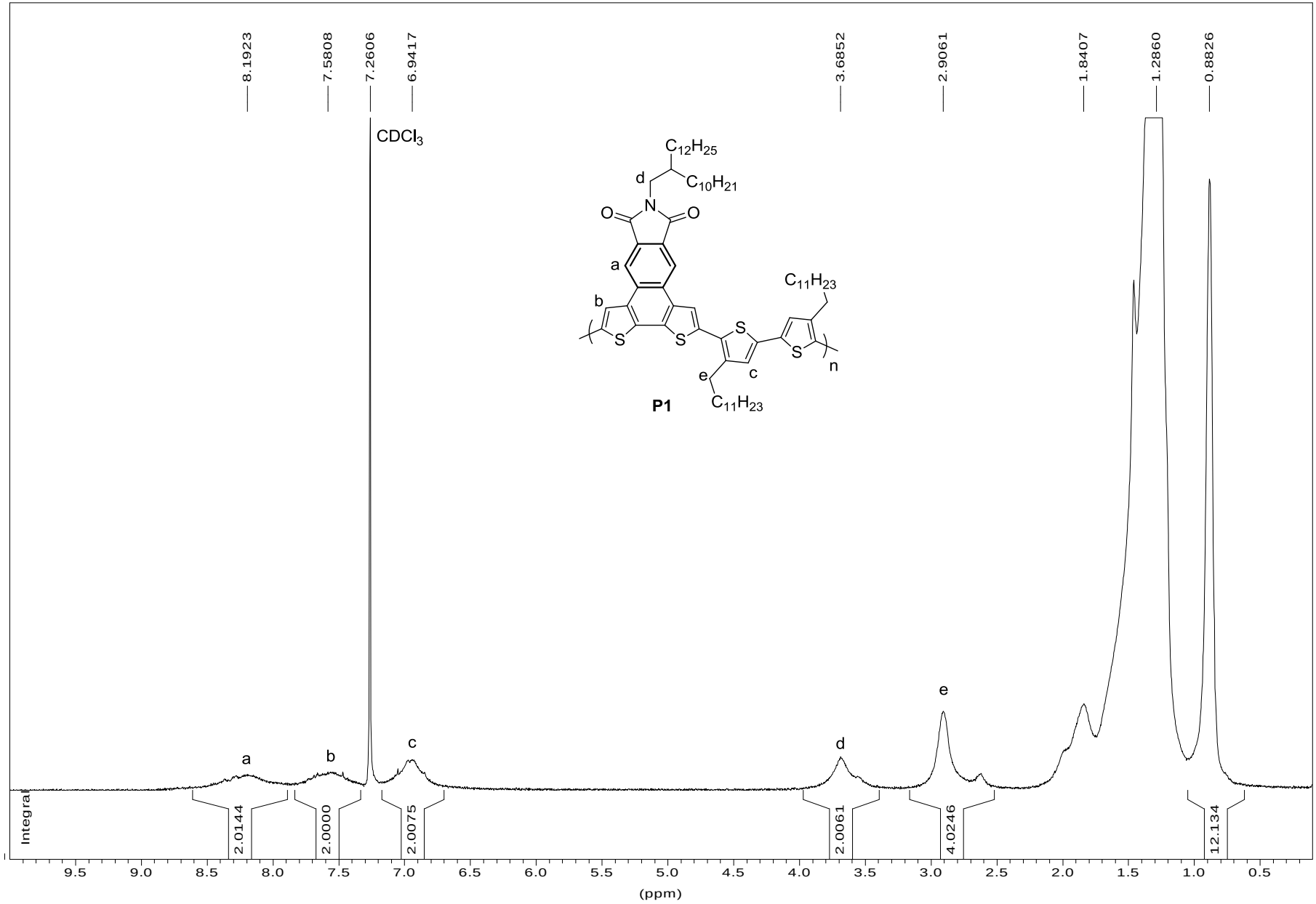


Fig. S14 ^{1}H NMR (500 MHz) spectrum of compound **P1** in $CDCl_3$.

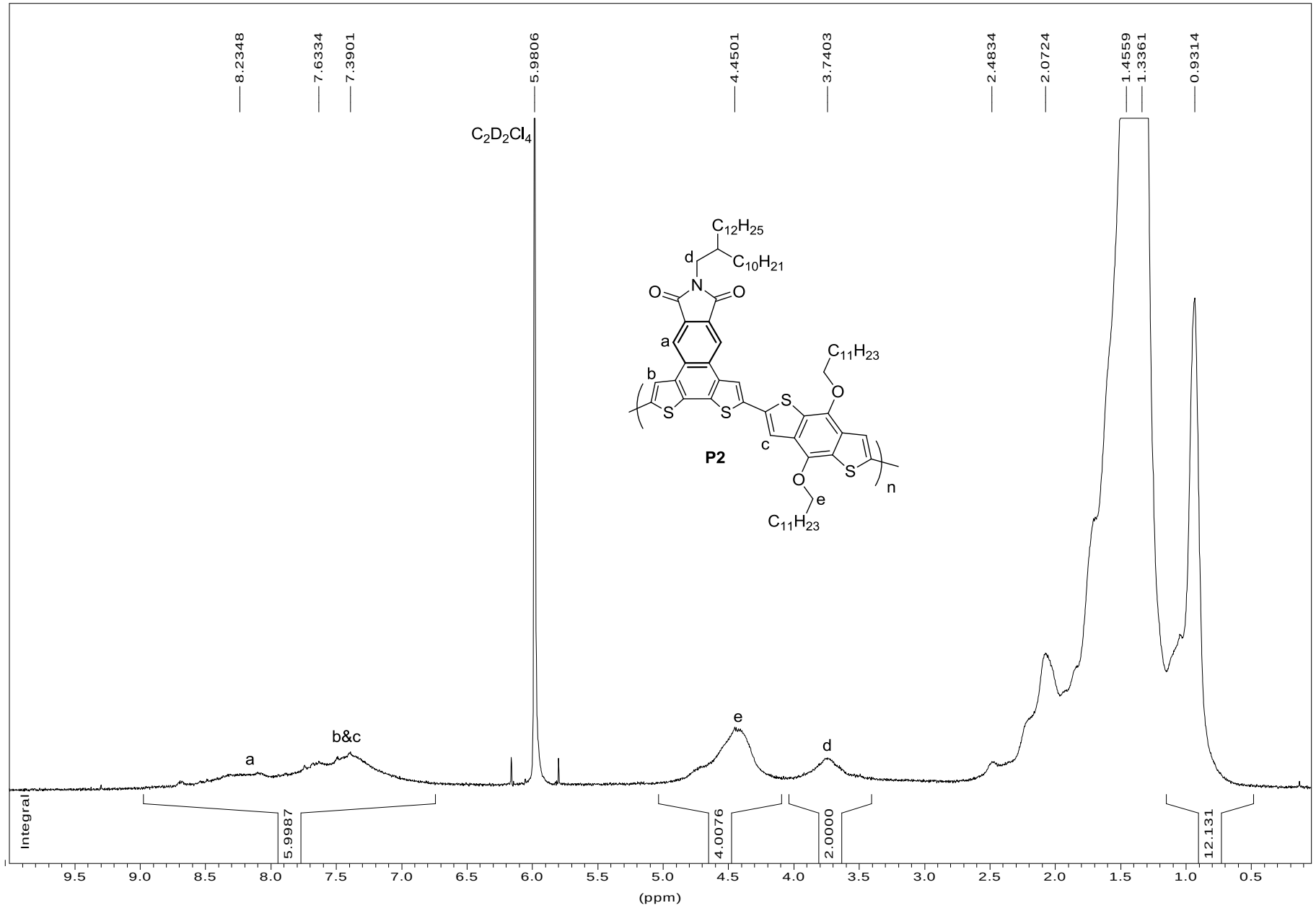


Fig. S15 ^{1}H NMR (500 MHz) spectrum of compound **P2** in $C_2D_2Cl_4$.

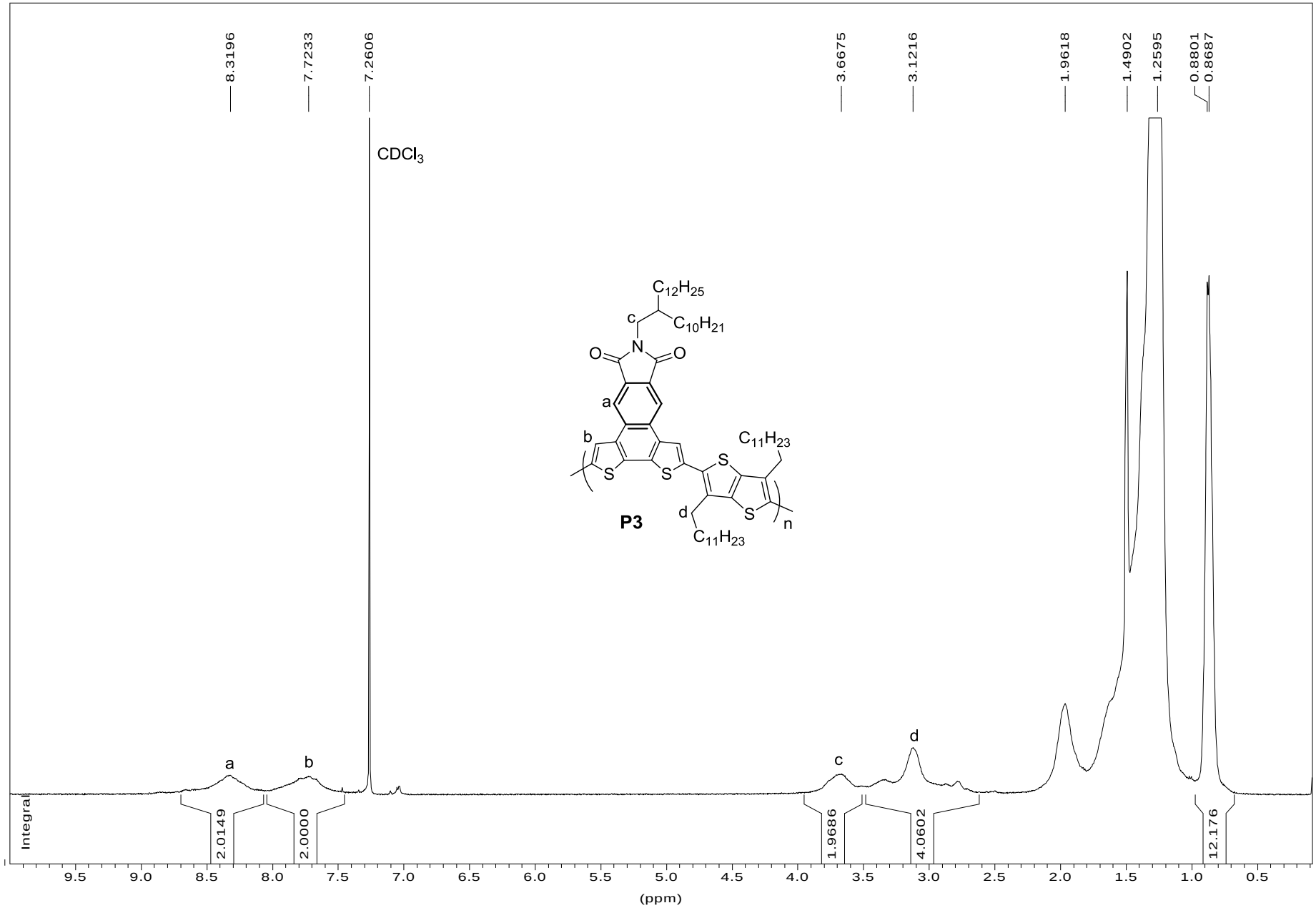
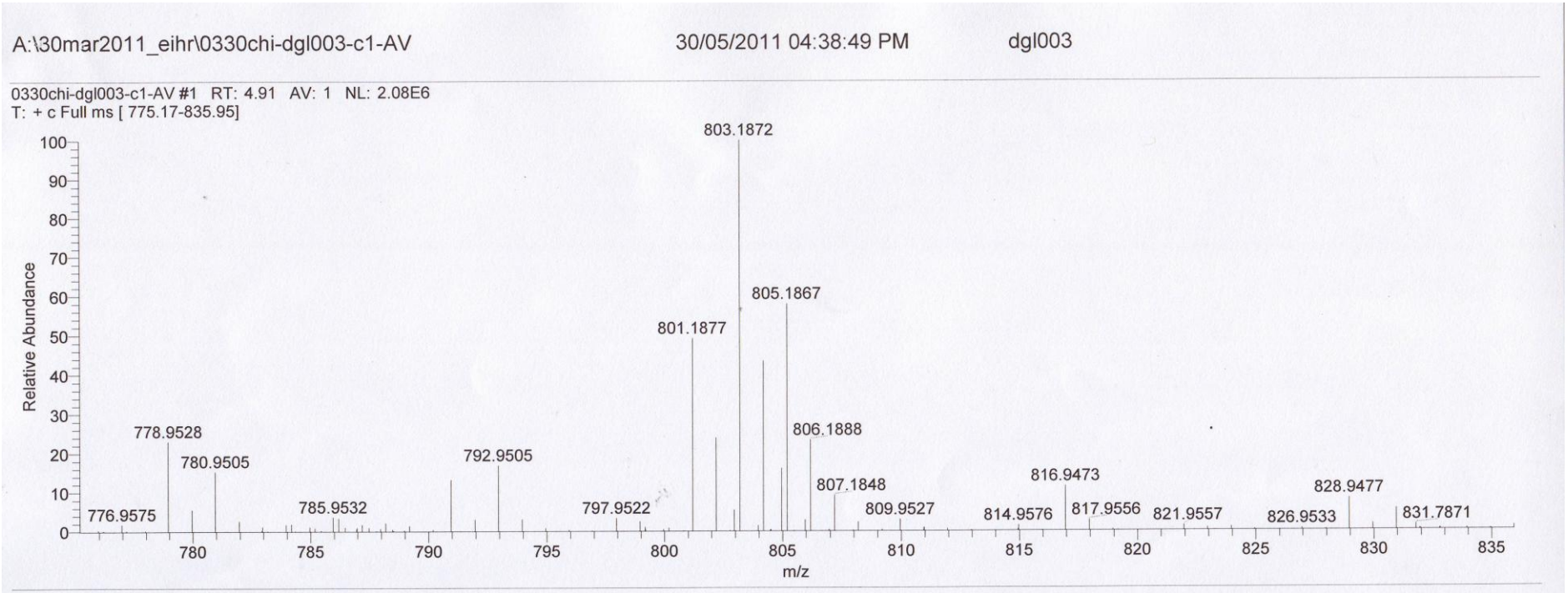


Fig. S16 ^{1}H NMR (500 MHz) spectrum of compound **P3** in $CDCl_3$.



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T: + c Full ms [775.17-835.95]
m/z= 800.29-805.66

m/z	Intensity	Relative	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
801.1877	1022388.0	49.08	801.1884	-0.93	14.0	$C_{40}H_{53}O_2N_1{}^{79}Br_2{}^{32}S_2$
803.1872	2083064.0	100.00	803.1864	1.05	14.0	$C_{40}H_{53}O_2N_1{}^{79}Br_1{}^{81}Br_1{}^{32}S_2$
805.1867	1205068.0	57.85	805.1844	2.88	14.0	$C_{40}H_{53}O_2N_1{}^{81}Br_2{}^{32}S_2$

Fig. S17 HREI-MS spectrum of compound **5**.