Electronic Supporting Information

Effect of *N*-alkyl chain length on photophysical properties of indene-1,3-dionemethylene-1,4-dihydropyridine derivatives

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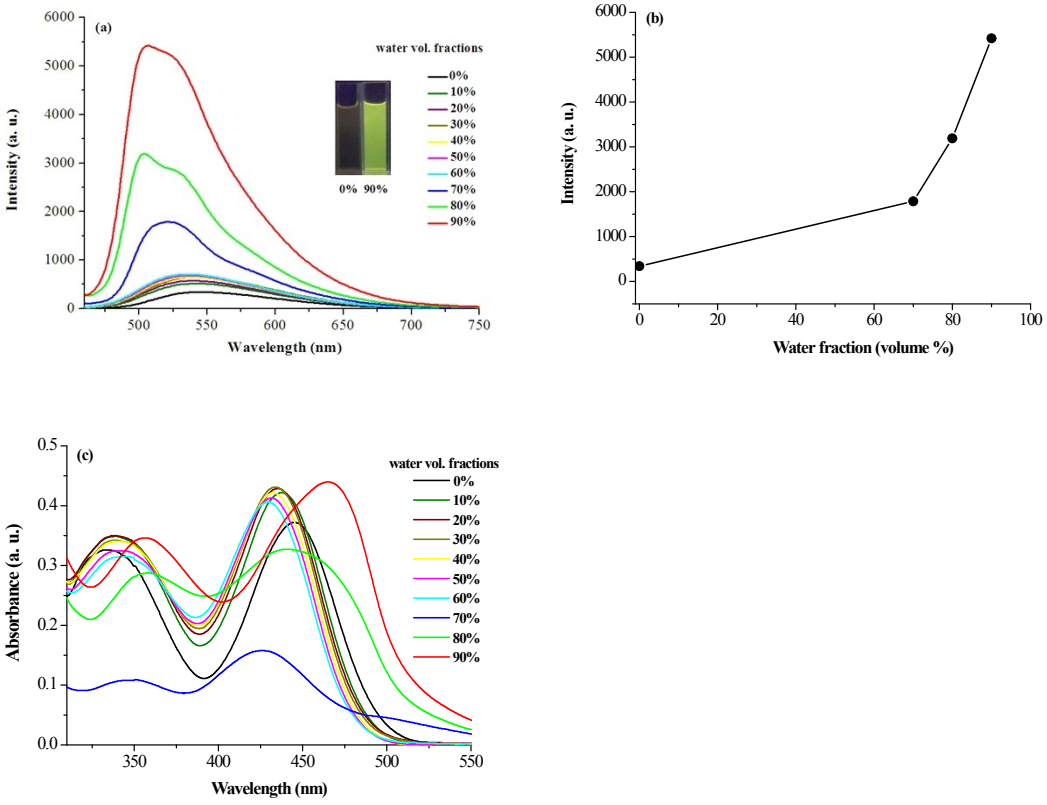

Fig. S1 (a) Fluorescence spectra of **4b** at 10 μM in THF/water mixtures with different f_w values (λ_{ex} = 440 nm). Insets: fluorescence images with water contents of 0% and 90% under a 365 nm UV lamp. (b) The effect of f_w values (f_w = 0, 70%, 80%, and 90%) on the maximum emission intensity of **4b** in THF/water mixtures at a concentration of 10 μM. (c) Absorption spectra of **4b** at 10 μM in THF/water mixtures with f_w values.

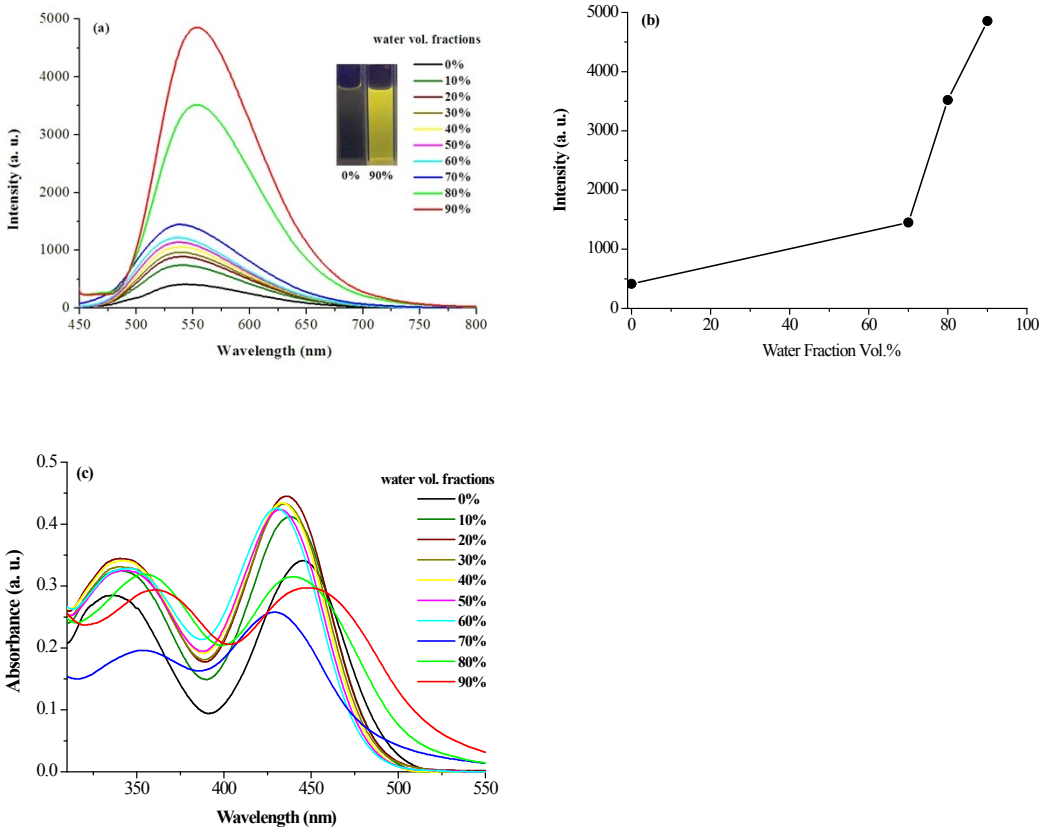

Fig. S2 (a) Fluorescence spectra of **4c** at 10 μM in THF/water mixtures with different f_w values (λ_{ex} = 430 nm). Insets: fluorescence images with water contents of 0% and 90% under a 365 nm UV lamp. (b) The effect of f_w values (f_w = 0, 70%, 80%, and 90%) on the maximum emission intensity of **4c** in THF/water mixtures at a concentration of 10 μM. (c) Absorption spectra of **4c** at 10 μM in THF/water mixtures with f_w values.

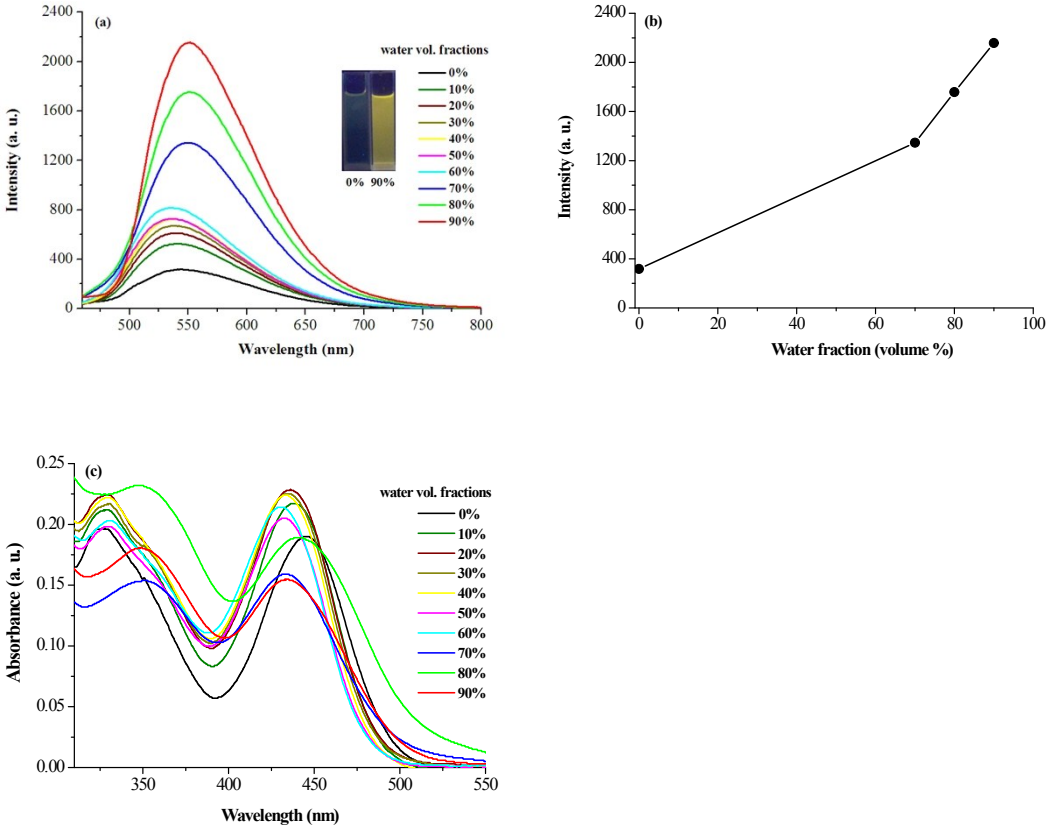

Fig. S3 (a) Fluorescence spectra of **4d** at 10 μM in THF/water mixtures with different f_w values (λ_{ex} = 440 nm). Insets: fluorescence images with water contents of 0% and 90% under a 365 nm UV lamp. (b) The effect of f_w values (f_w = 0, 70%, 80%, and 90%) on the maximum emission intensity of **4d** in THF/water mixtures at a concentration of 10 μM. (c) Absorption spectra of **4d** at 10 μM in THF/water mixtures with f_w values.

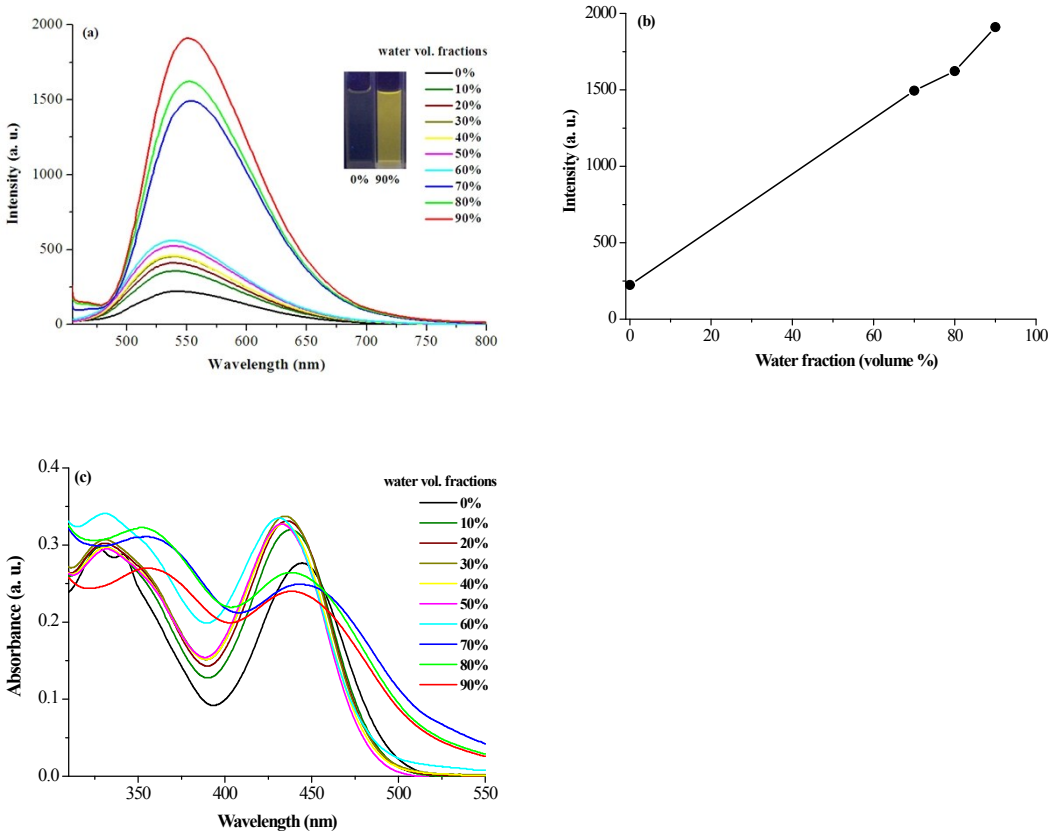

Fig. S4 (a) Fluorescence spectra of **4e** at 10 μM in THF/water mixtures with different f_w values (λ_{ex} = 435 nm). Insets: fluorescence images with water contents of 0% and 90% under a 365 nm UV lamp. (b) The effect of f_w values (f_w = 0, 70%, 80%, and 90%) on the maximum emission intensity of **4e** in THF/water mixtures at a concentration of 10 μM. (c) Absorption spectra of **4e** at 10 μM in THF/water mixtures with f_w values.

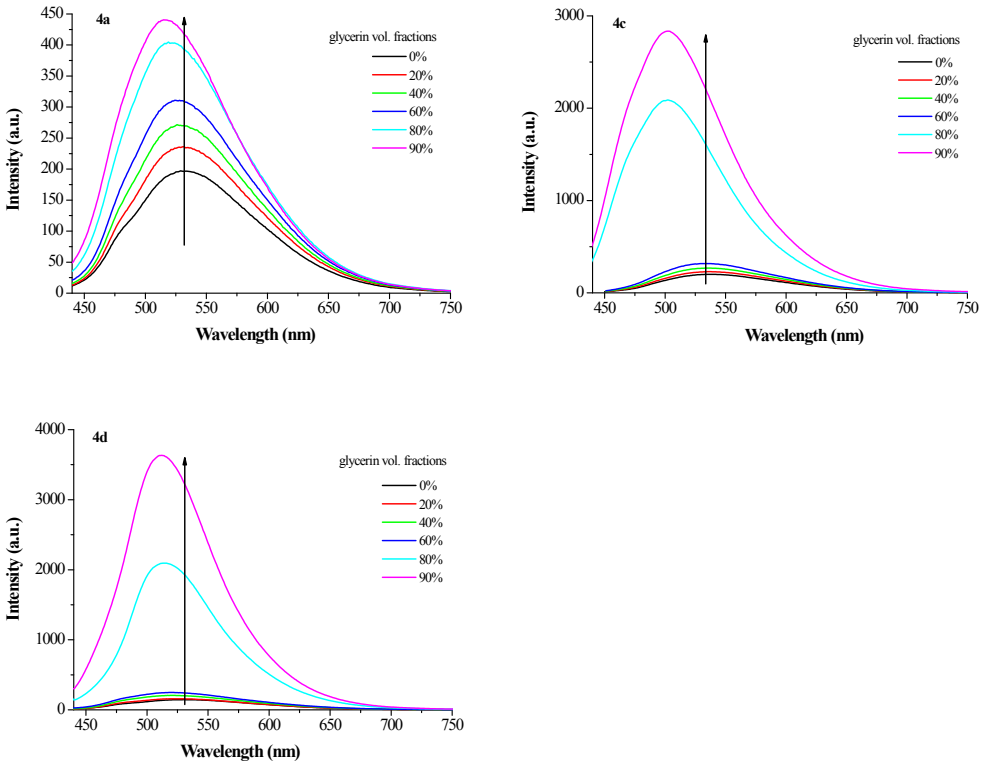

Fig. S5 Fluorescence spectra of **4a** (λ_{ex} = 420 nm), **4c** (λ_{ex} = 440 nm), and **4d** (λ_{ex} = 420 nm) in methanol/glycerol mixtures (10 μM, containing 0.5 vol % THF) with different glycerol volume fractions.

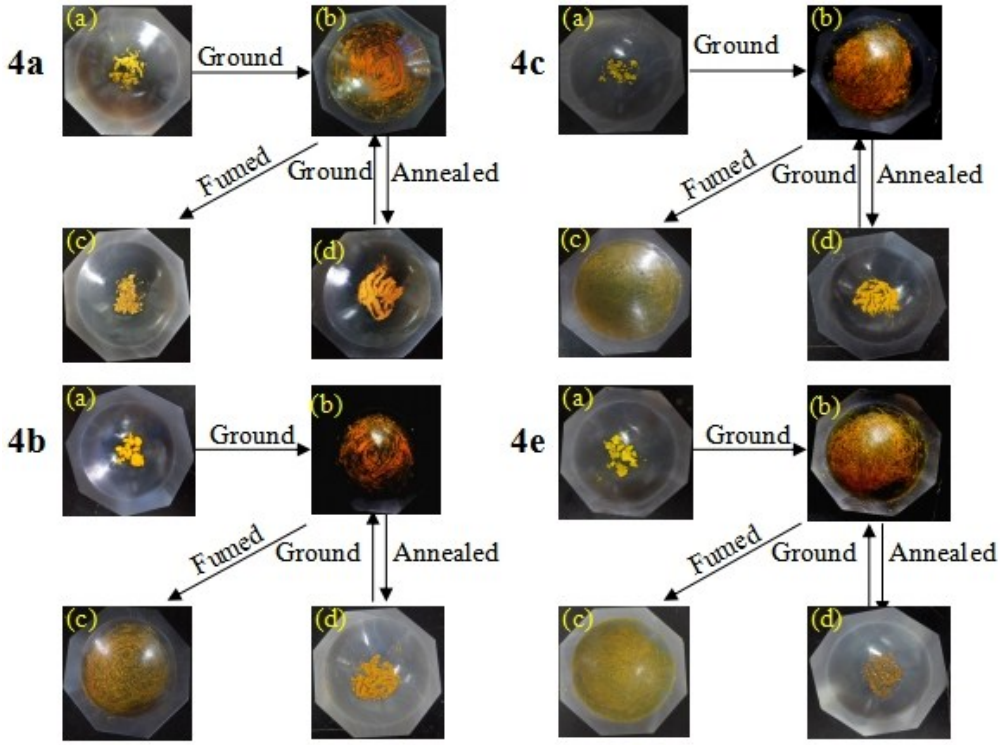

Fig. S6 Images of **4a**–**4c** and **4e** solid samples taken under natural light. (a) as-synthesized samples; (b) ground samples; (c) fumed samples using EA vapor; (d) annealed samples.

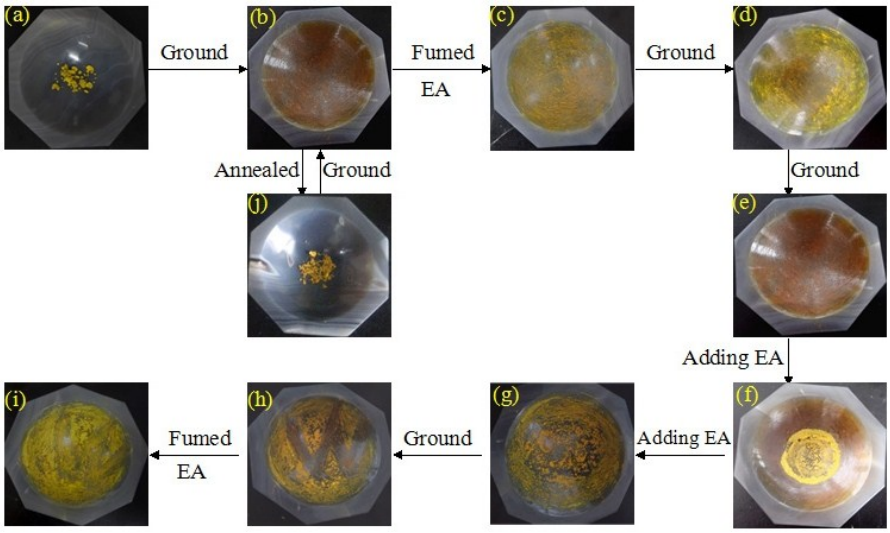

Fig. S7 Images of solid samples of **4d** taken under natural light: (a) as-synthesized samples; (b) ground samples; (c) fumed samples; (d) the central part of fumed samples was ground; (e) all fumed samples were ground; (f) several drops of EA were dropped onto the ground samples; (g) all ground samples were soaked with EA; (h) and (i) **4d** is used to write "W" with a metal spatula and then fumed using EA; (j) annealed samples.

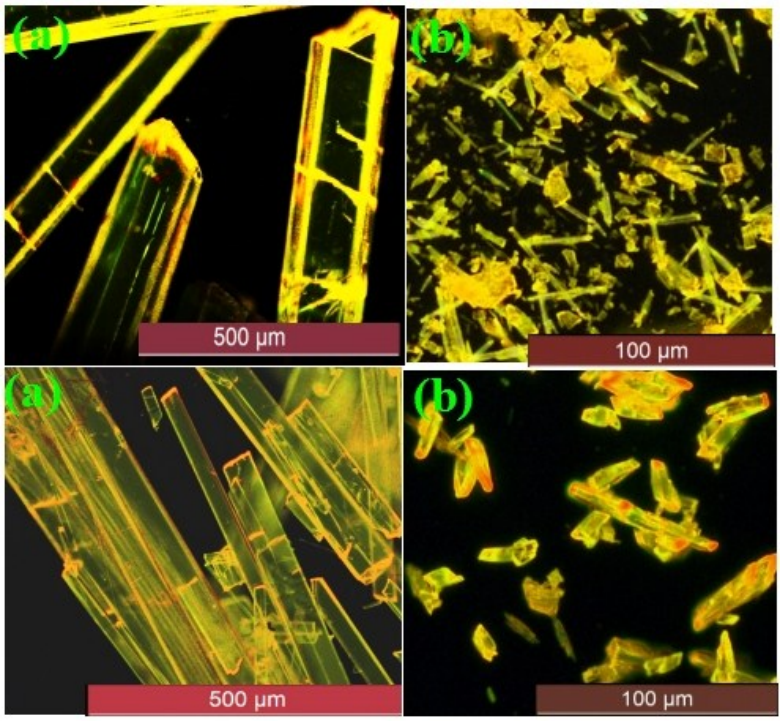

Fig. S8 The fluorescence microscope images of **4a** (top) and **4b** (bottom): (a) single crystals; (b) as-synthesized samples.

Table S1 Selected torsion angles [deg] for 3b and 3c

3b		3c	
C(12)-N(1)-C(17)-C(18)	87.75(12)	C(12)-N(1)-C(17)-C(18)	88.7(2)
C(13)-N(1)-C(17)-C(18)	-89.57(12)	C(13)-N(1)- C(17)-C(18)	-90.1(2)

Table S2 Selected torsion angles [deg] for 4a and 4b

4a		4b	
C(12)-N(1)-C(33)-C(34)	-101.2(4)	C(12)-N(1)-C(33)-C(34)	101.3(4)
C(13)-N(1)-C(33)-C(34)	82.6(4)	C(23)-N(1)-C(33)-C(34)	-92.3(4)
N(1)-C(13)-C(24)-C(25)	-143.8(3)	C(22)-C(23)-C(24)-C(25)	-26.2(5)
C(14)-C(13)-C(24)-C(25)	38.4(4)	N(1)-C(23)-C(24)-C(25)	155.8(3)
C(24)-C(25)-C(26)-C(31)	6.0(5)	C(24)-C(25)-C(26)-C(27)	-179.9(4)
C(24)-C(25)-C(26)-C(27)	-174.9(3)	C(24)-C(25)-C(26)-C(31)	-5.2(6)
C(11)-C(12)-C(15)-C(16)	28.8(4)	C(11)-C(12)-C(13)-C(14)	-28.6(5)
N(1)-C(12)-C(15)-C(16)	-152.0(3)	N(1)-C(12)-C(13)-C(14)	154.8(3)
C(15)-C(16)-C(17)-C(22)	4.0(5)	C(13)-C(14)-C(15)-C(16)	176.3(3)
C(15)-C(16)-C(17)-C(18)	-177.2(3)	C(13)-C(14)-C(15)-C(20)	-5.7(6)

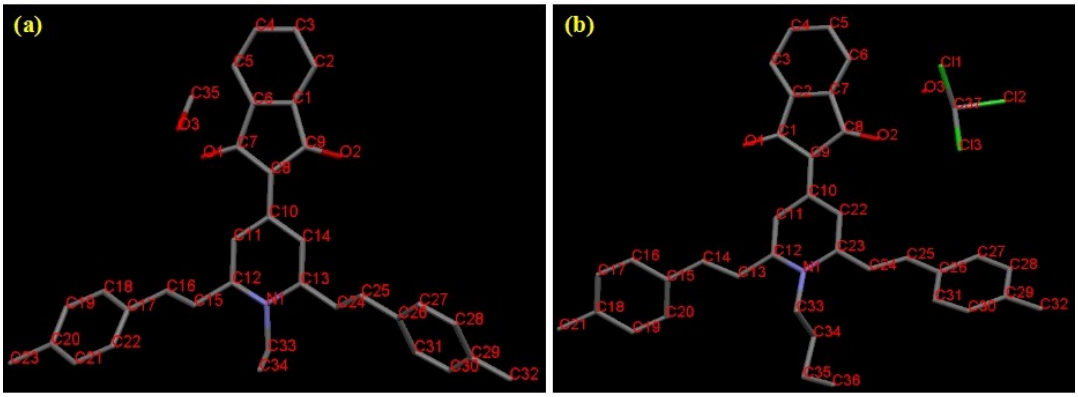

Fig. S9 Single-crystal structure of **4a** (a) with a CH_3OH molecule and **4b** (b) containing a $CHCl_3$ molecule and a water molecule. Hydrogen atoms are omitted for clarity.

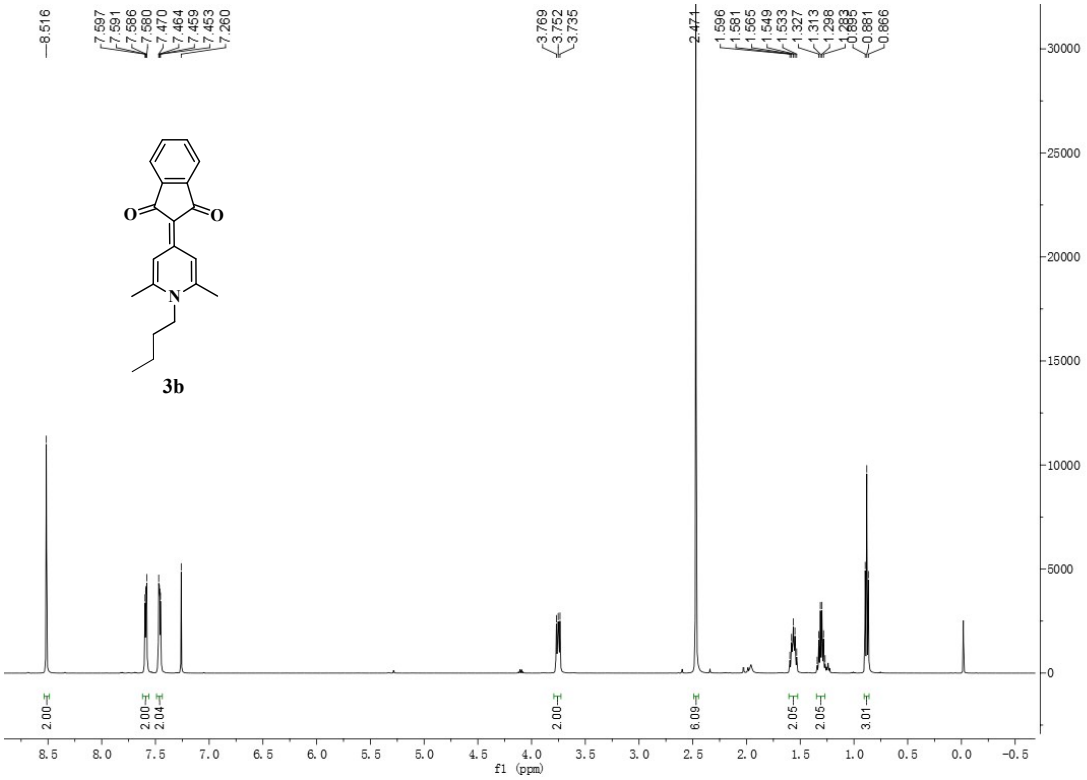

Fig. S10 ^{1}H NMR of **3b** ($CDCl_3$, 500 MHz).

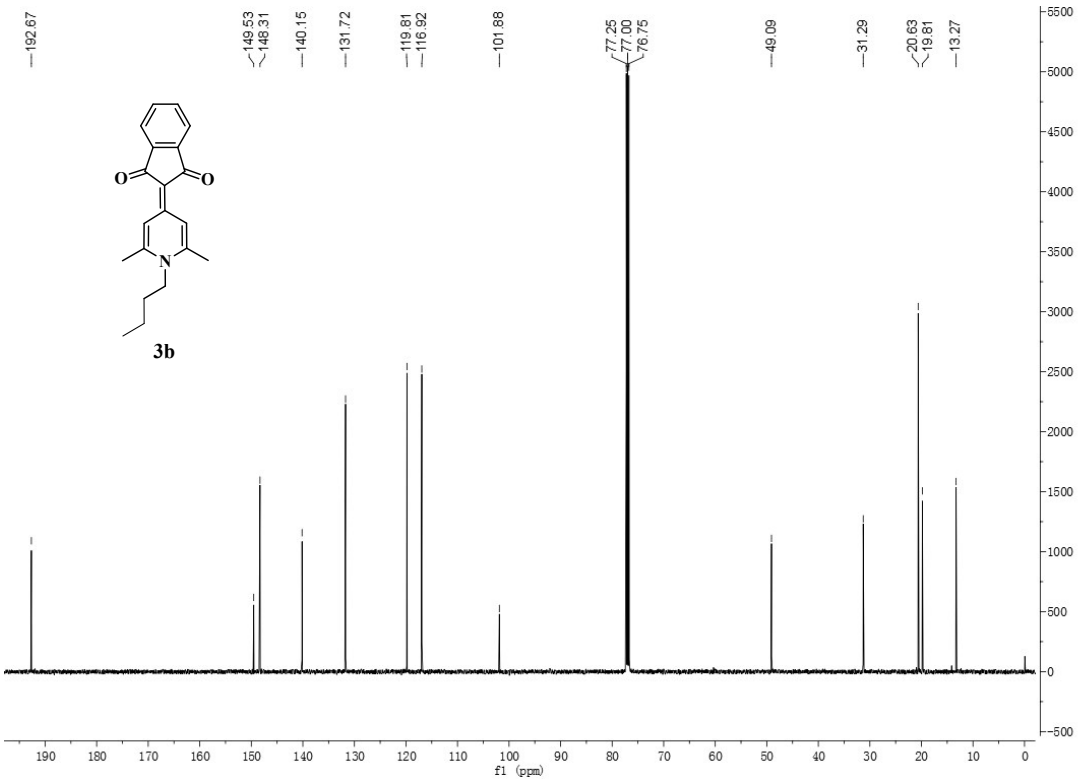

Fig. S11 ^{13}C NMR of **3b** ($CDCl_3$, 125 MHz).

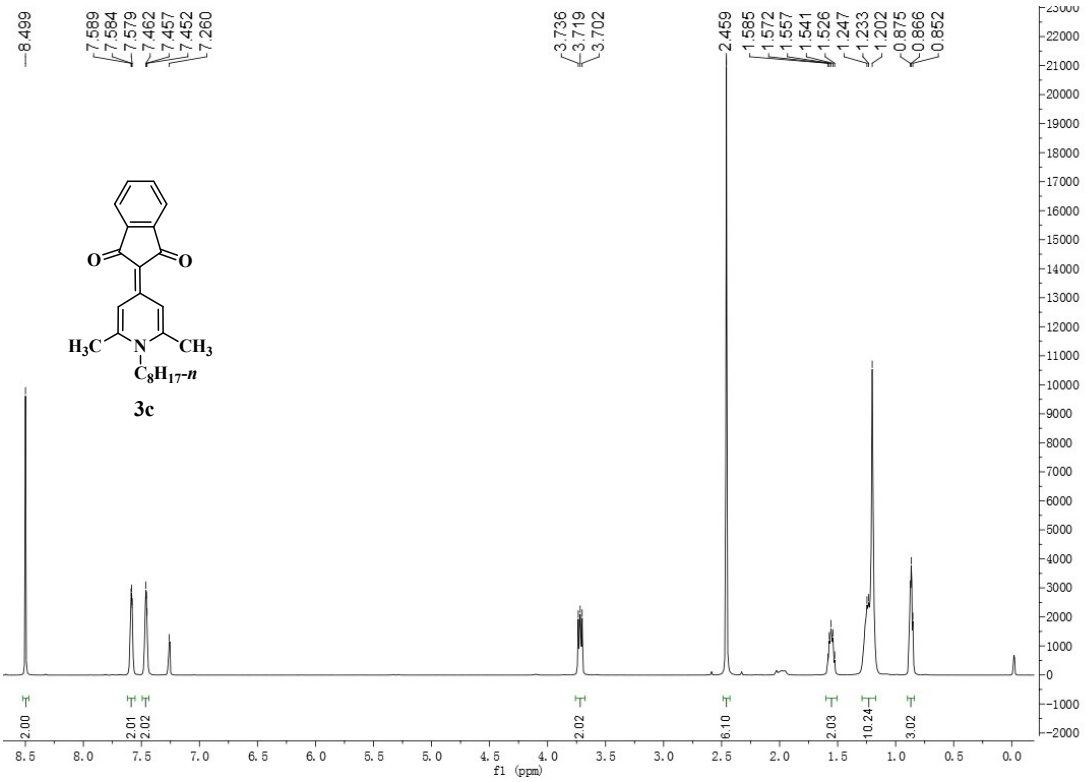

Fig. S12 ^{1}H NMR of **3c** ($CDCl_3$, 500 MHz).

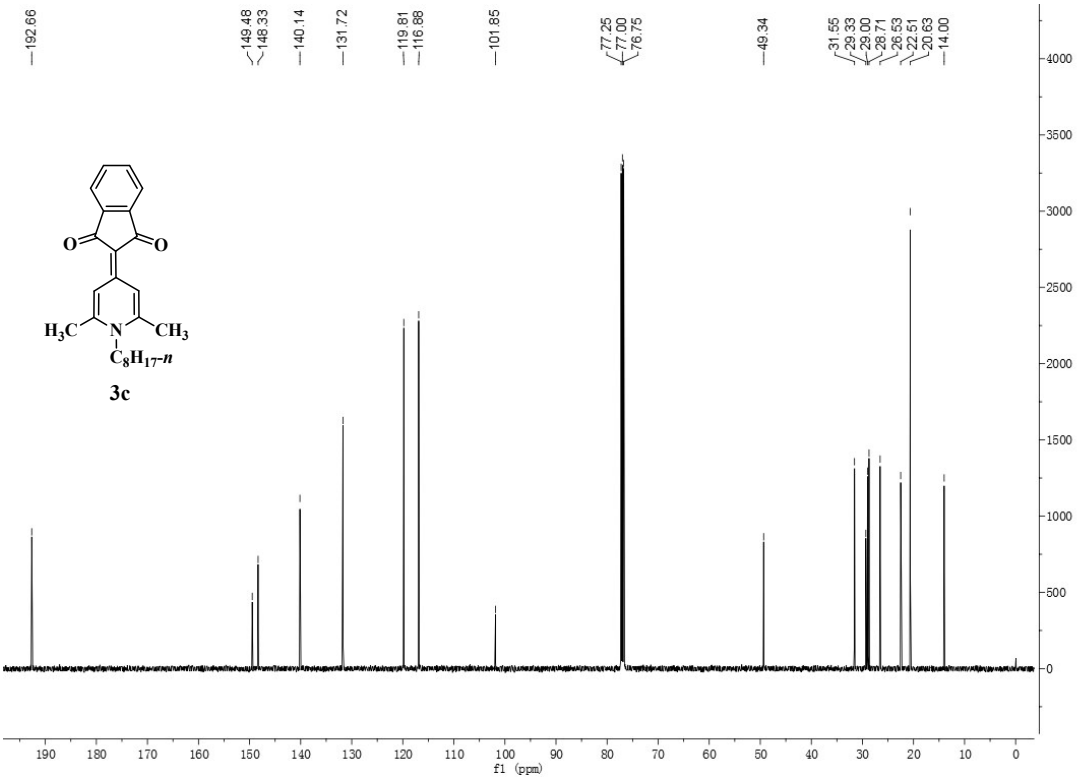

Fig. S13 ^{13}C NMR of **3c** ($CDCl_3$, 125 MHz).

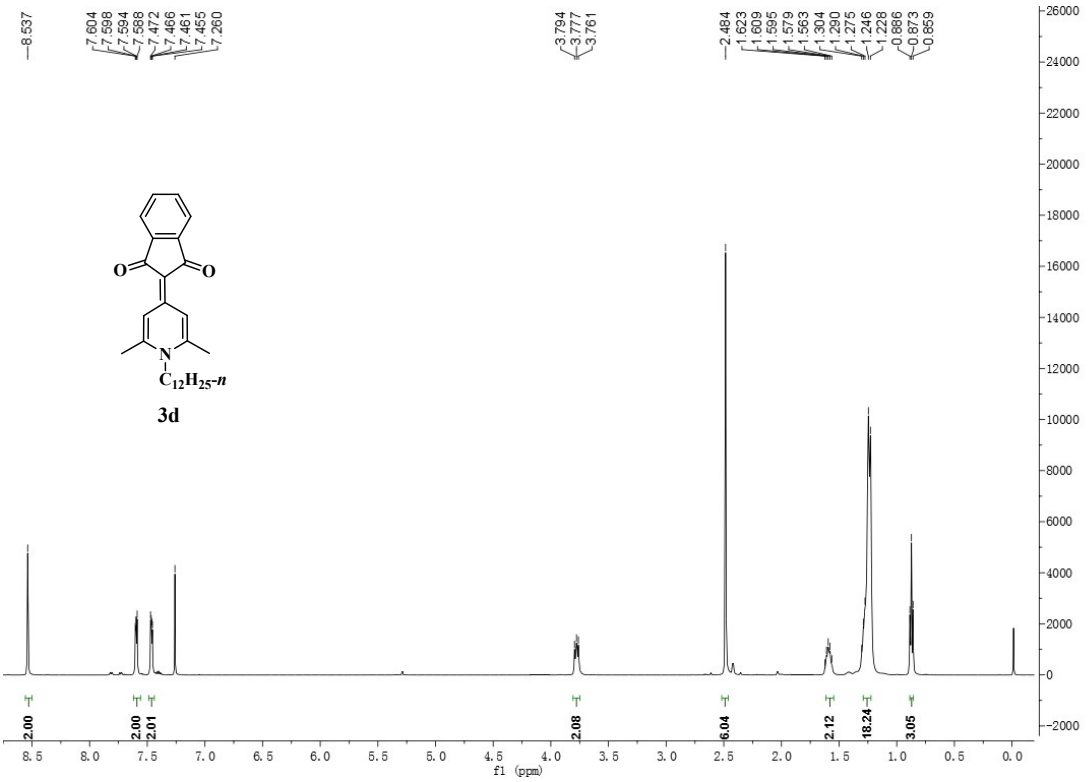

Fig. S14 ^{1}H NMR of **3d** ($CDCl_3$, 500 MHz).

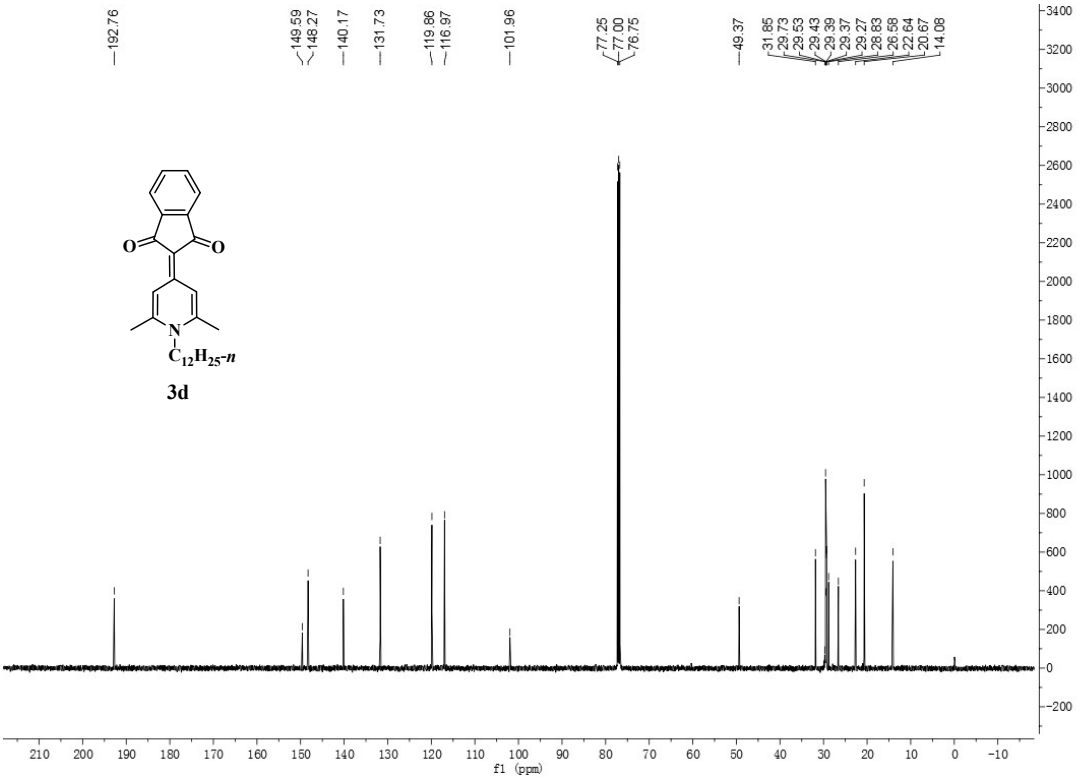

Fig. S15 ^{13}C NMR of **3d** ($CDCl_3$, 125 MHz).

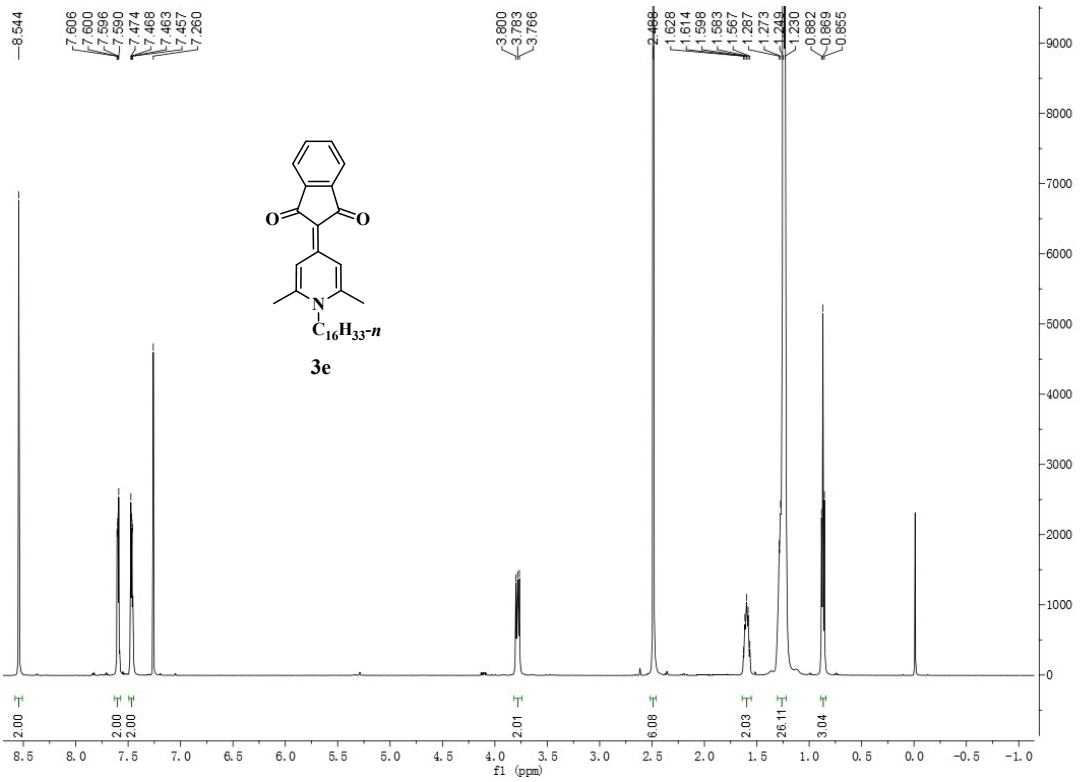

Fig. S16 ^{1}H NMR of **3e** ($CDCl_3$, 500 MHz).

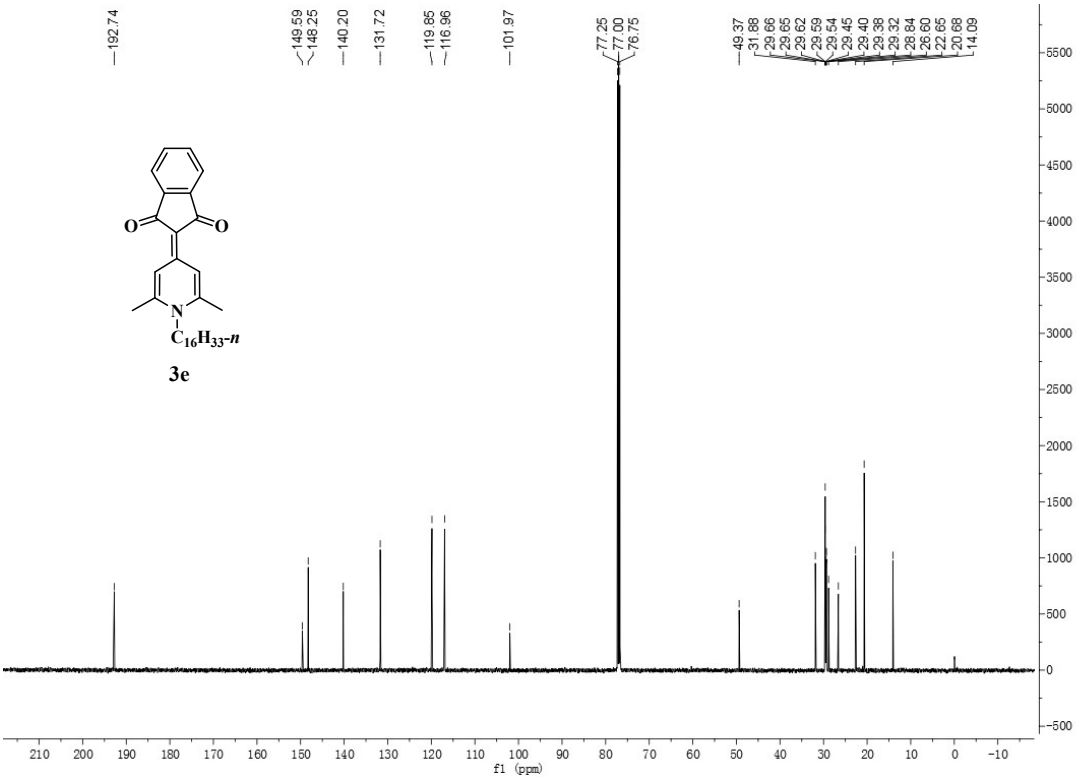

Fig. S17 ^{13}C NMR of **3e** ($CDCl_3$, 125 MHz).

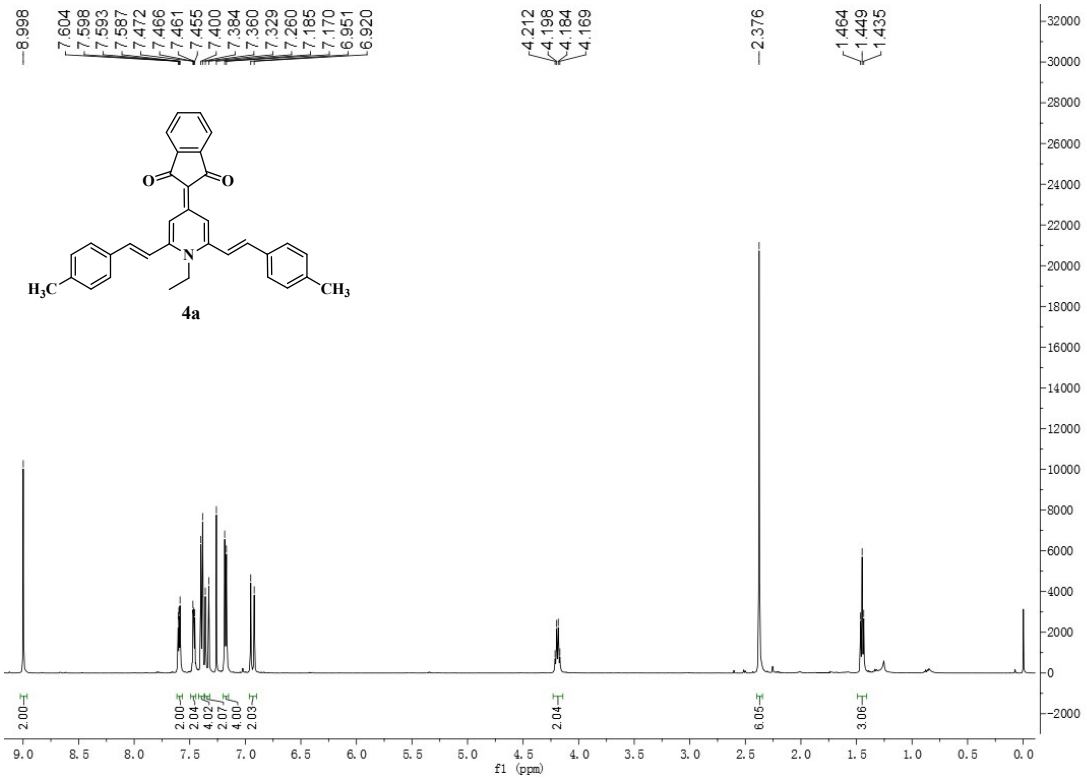

Fig. S18 ^{1}H NMR of **4a** ($CDCl_3$, 500 MHz).

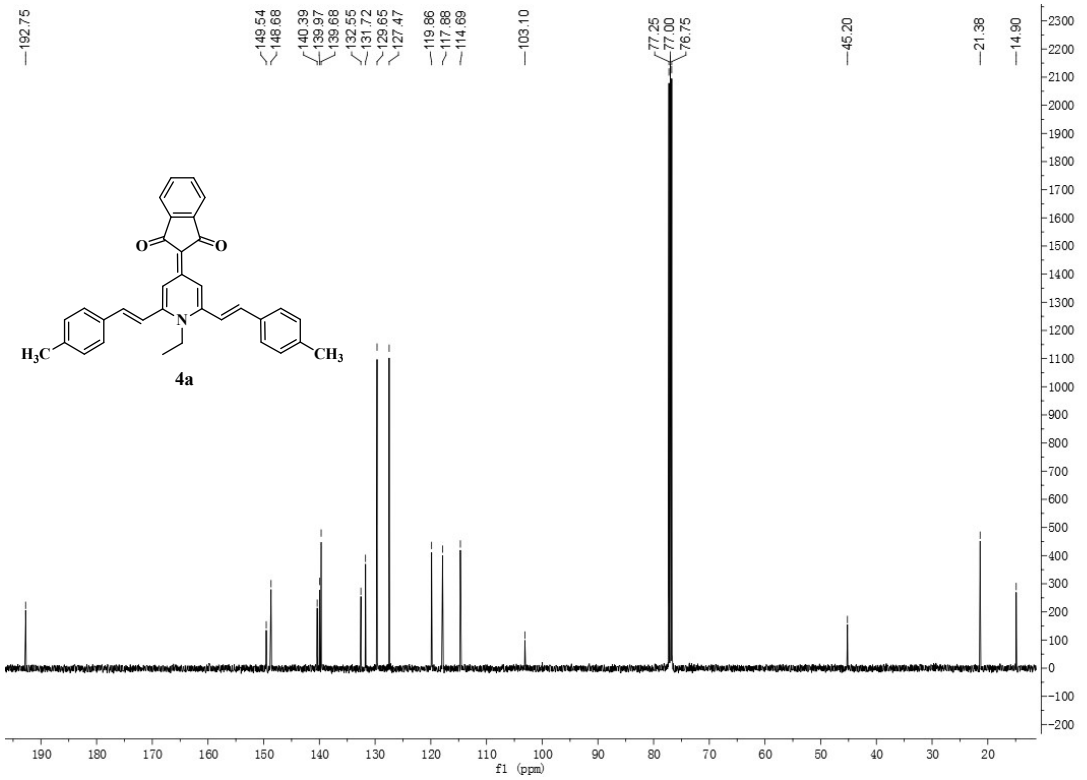

Fig. S19 ^{13}C NMR of **4a** ($CDCl_3$, 125 MHz).

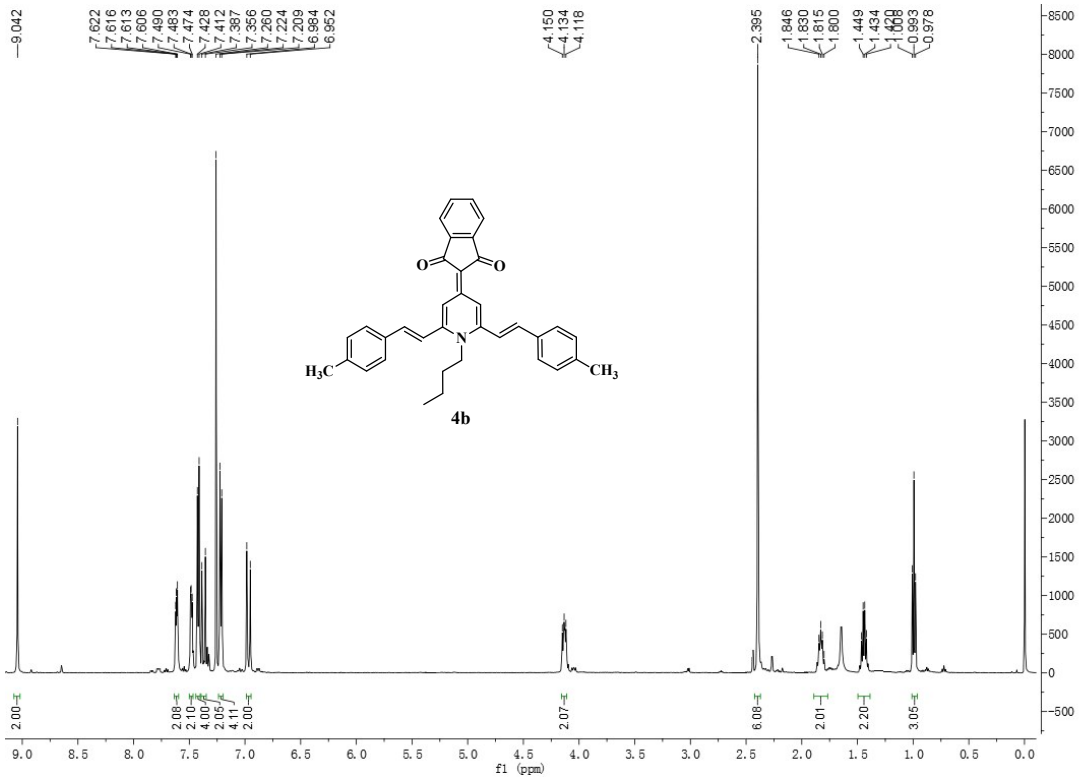

Fig. S20 ^{1}H NMR of **4b** ($CDCl_3$, 500 MHz).

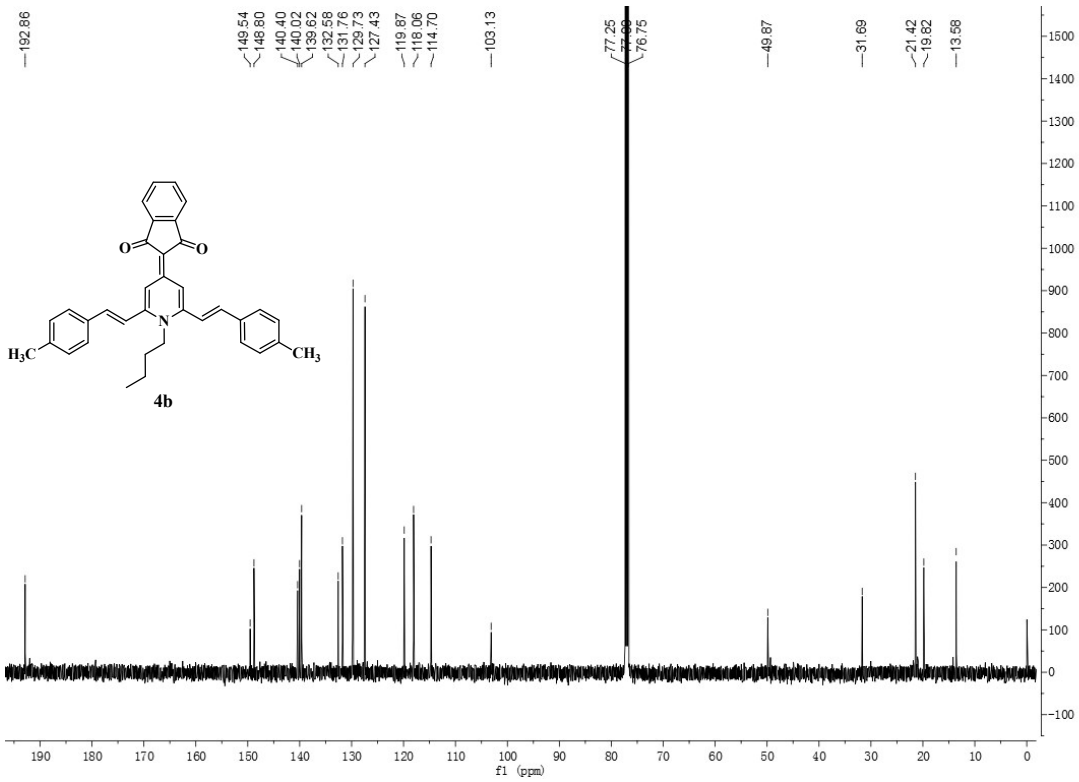

Fig. S21 ^{13}C NMR of **4b** ($CDCl_3$, 125 MHz).

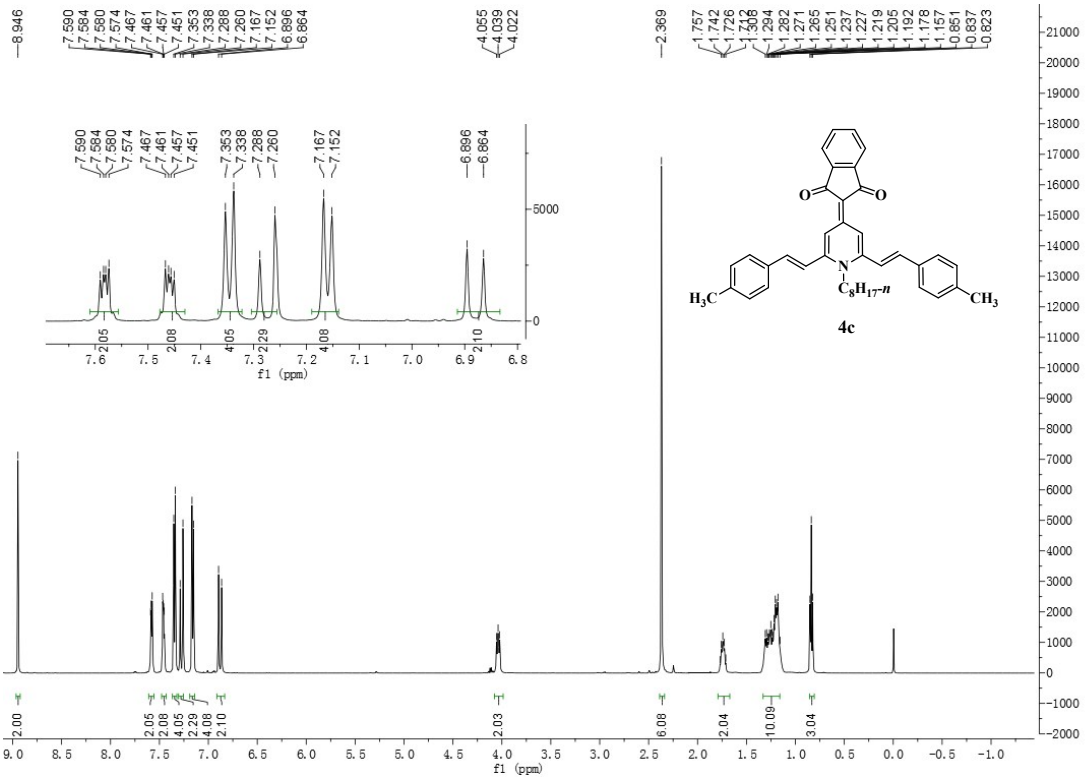

Fig. S22 ^{1}H NMR of **4c** ($CDCl_3$, 500 MHz).

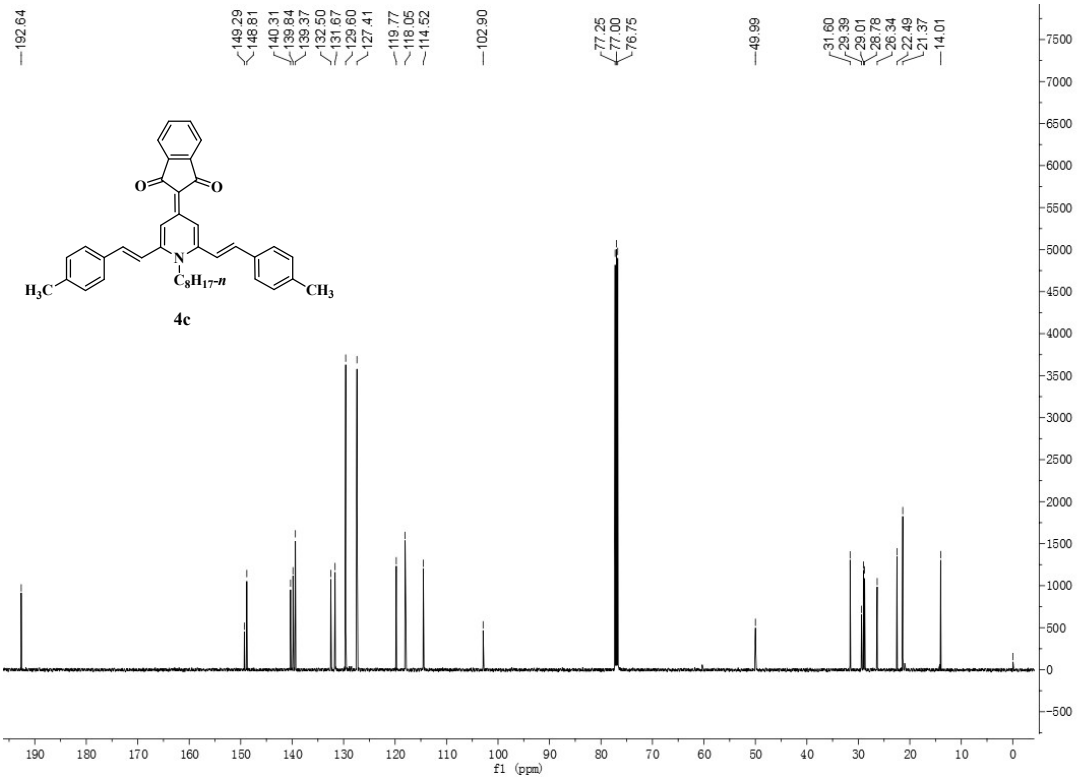

Fig. S23 ^{13}C NMR of **4c** ($CDCl_3$, 125 MHz).

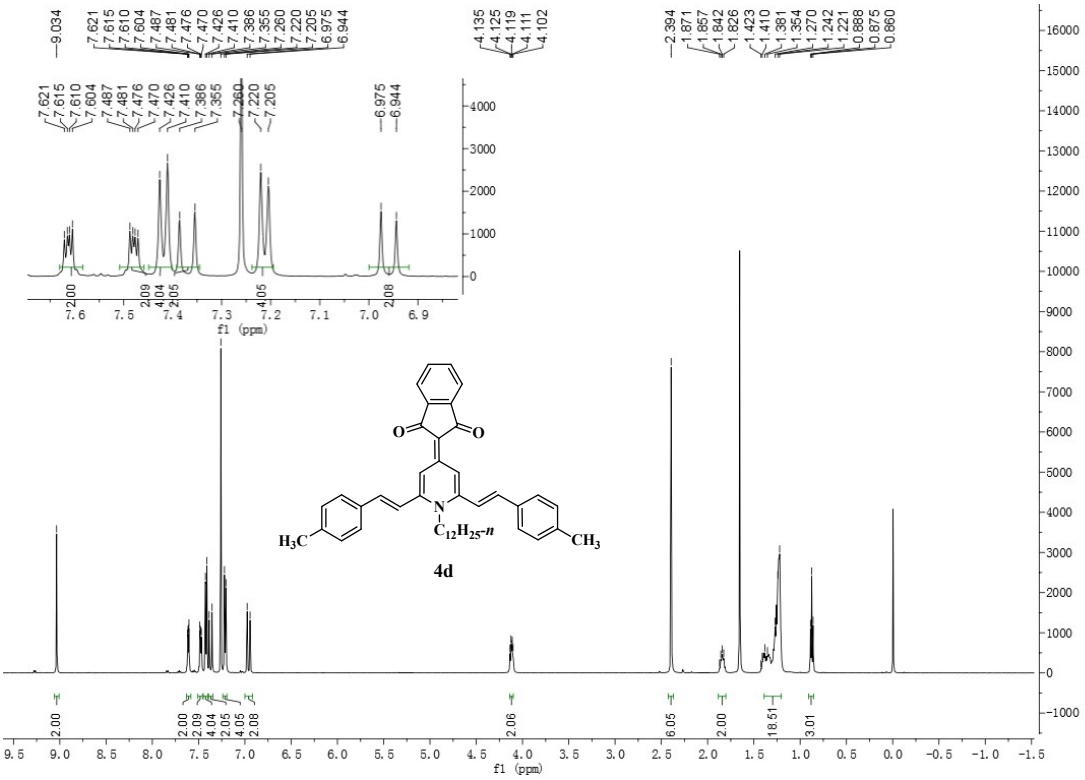

Fig. S24 ^{1}H NMR of **4d** ($CDCl_3$, 500 MHz).

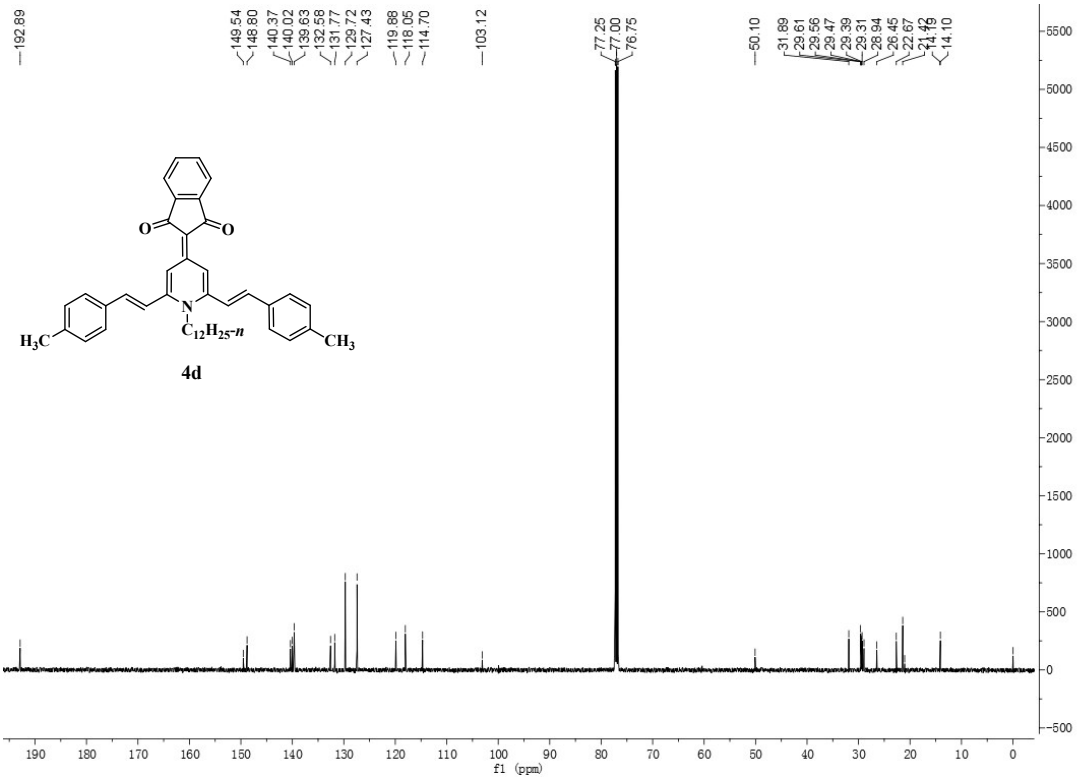

Fig. S25 ^{13}C NMR of **4d** ($CDCl_3$, 125 MHz).

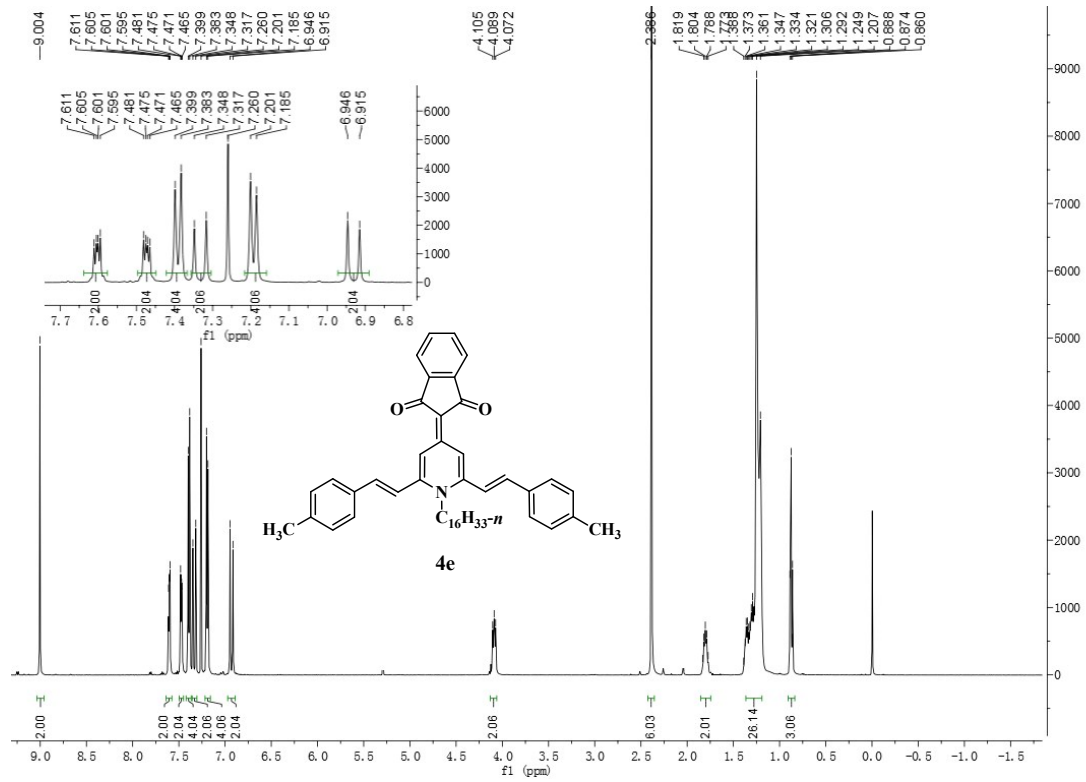

Fig. S26 ^{1}H NMR of **4e** ($CDCl_3$, 500 MHz).

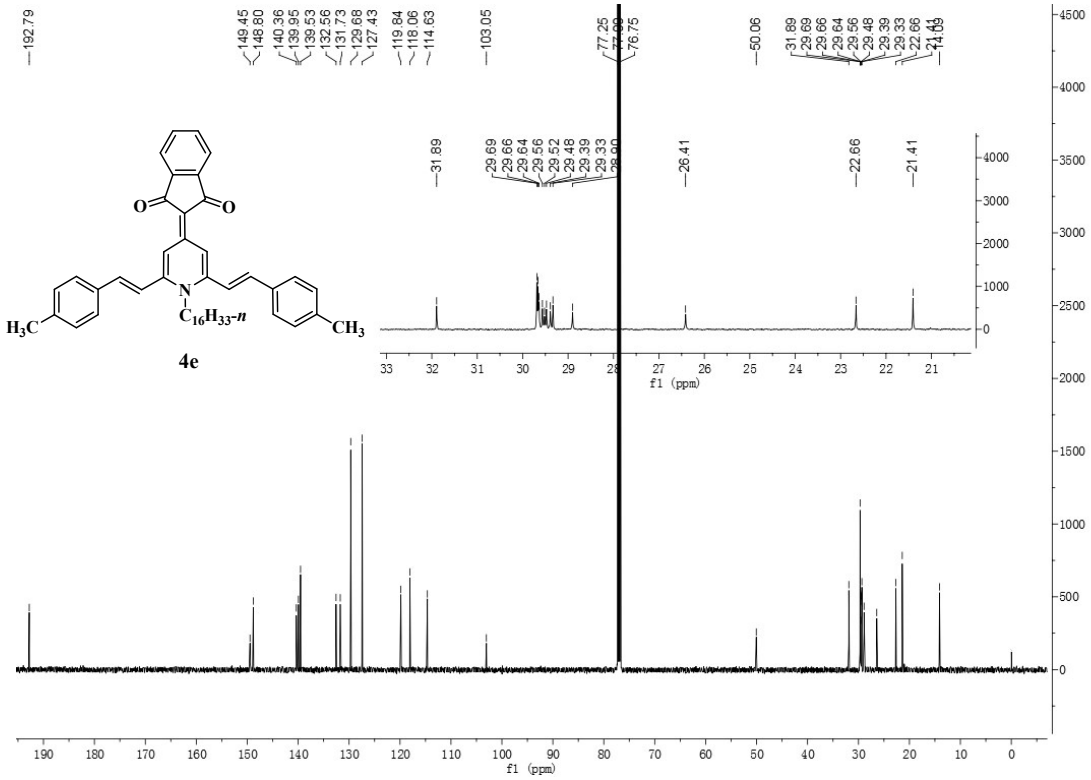

Fig. S27 ^{13}C NMR of **4e** ($CDCl_3$, 125 MHz).