Supplementary Information
for
Effect of cyano, ethynyl and ethylenedioxy groups on the photophysical properteies of carbazole-based porphyrins

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Fig. S1 ^{1}H and ^{13}C NMR spectra of **10** in $CDCl_3$

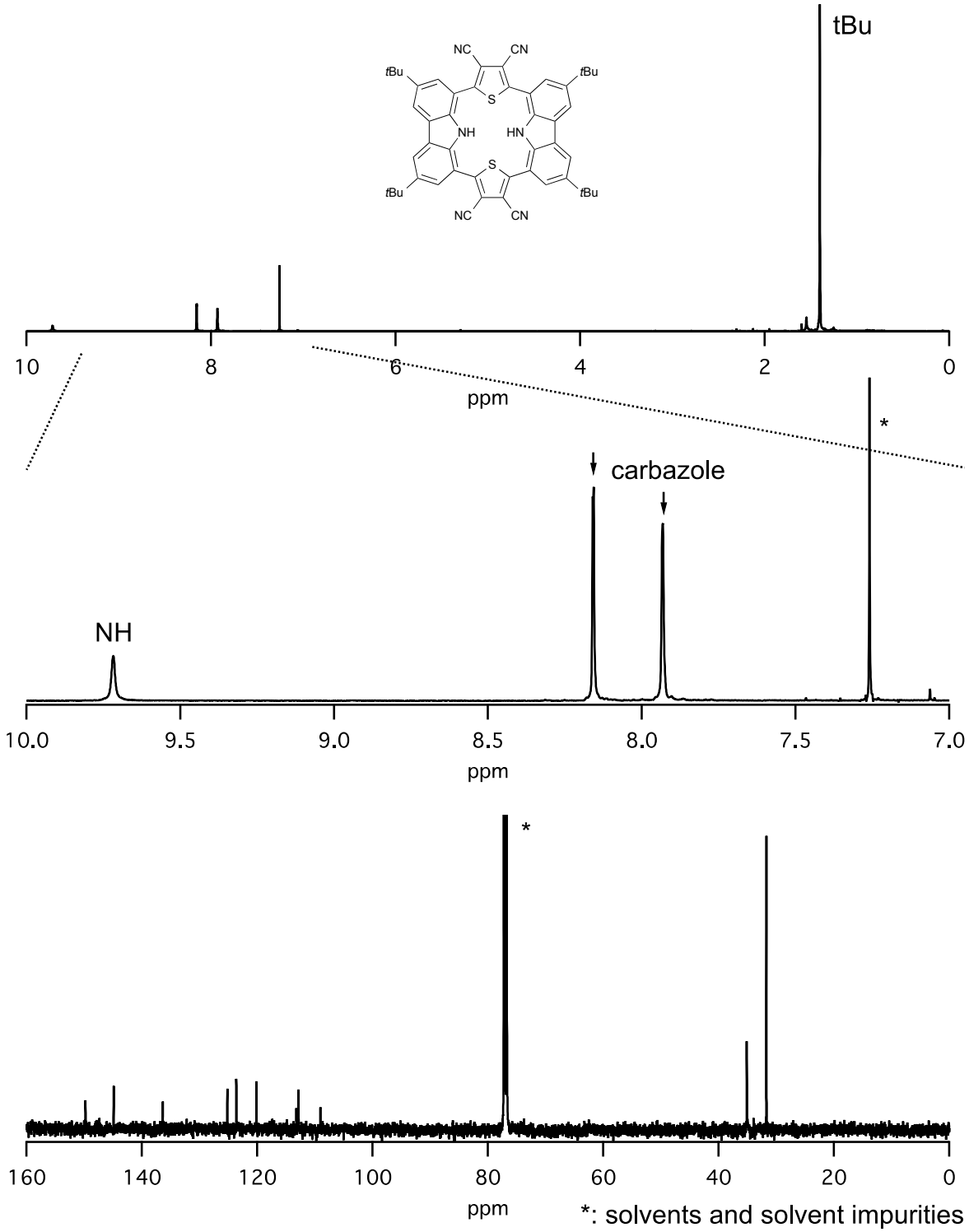

Fig. S2 ^{1}H and ^{13}C NMR spectra of **11** in $CDCl_3$

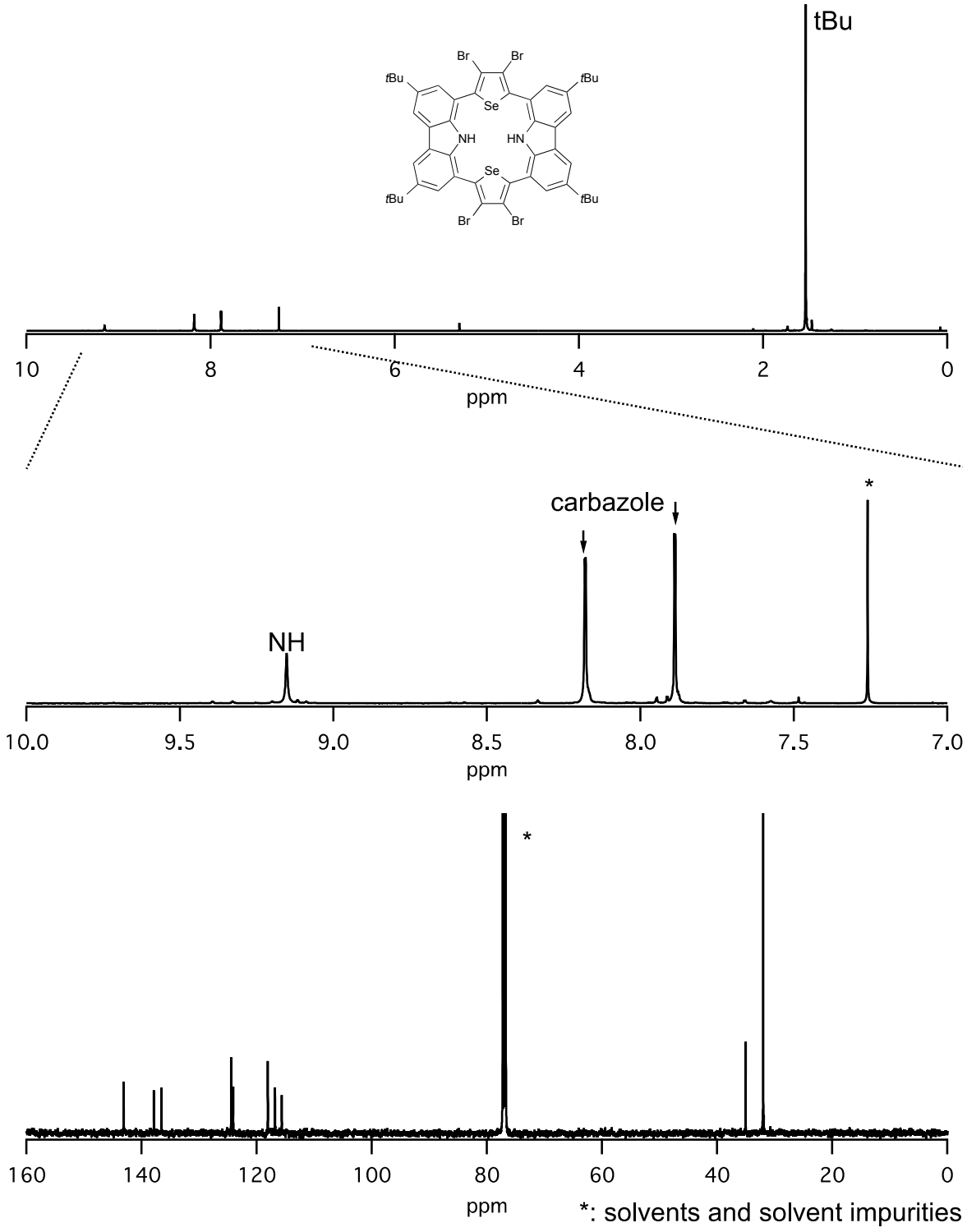

Fig. S3 ^{1}H and ^{13}C NMR spectra of **12** in $CDCl_3$

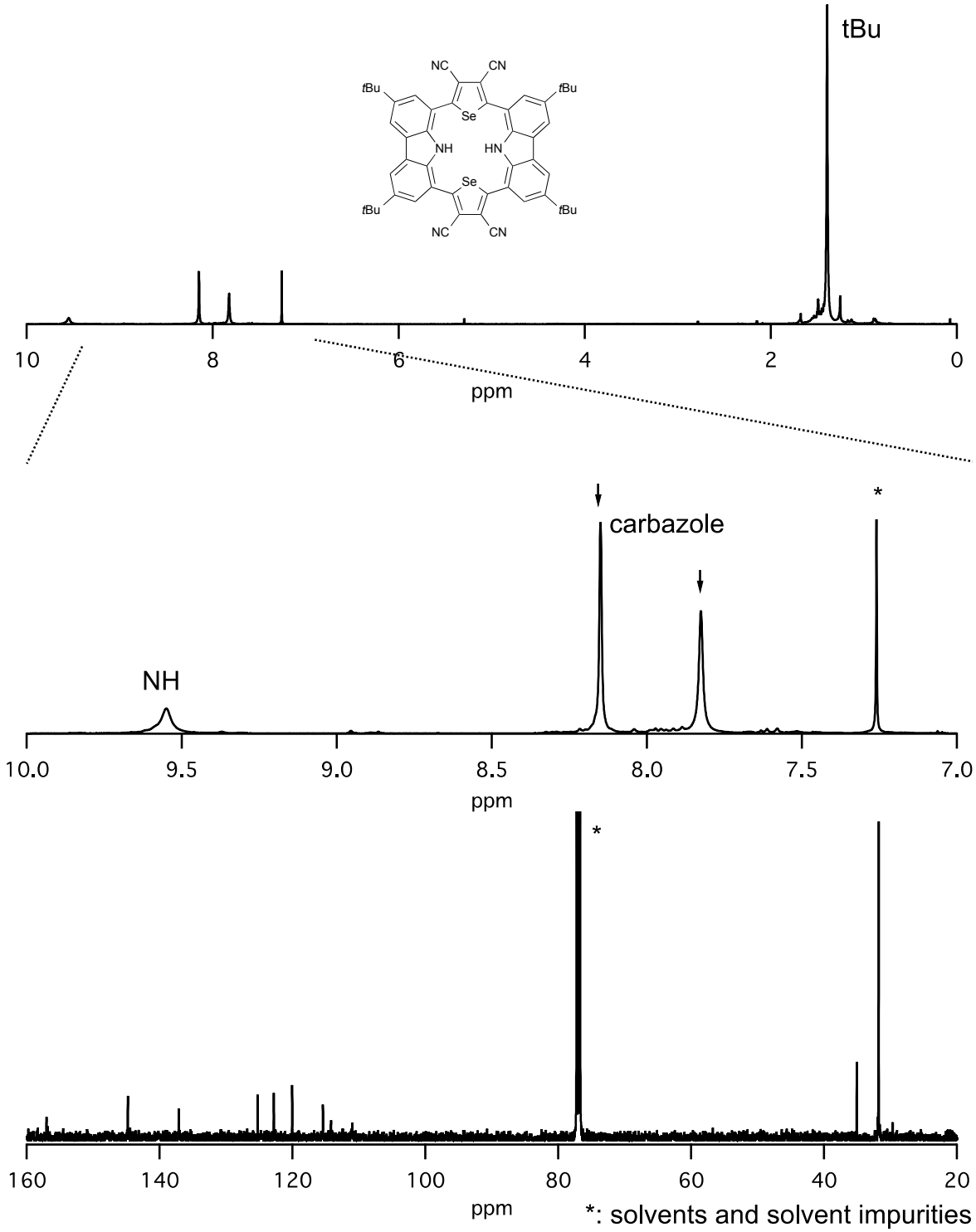

Fig. S4 ^{1}H and ^{13}C NMR spectra of **13** in $CDCl_3$

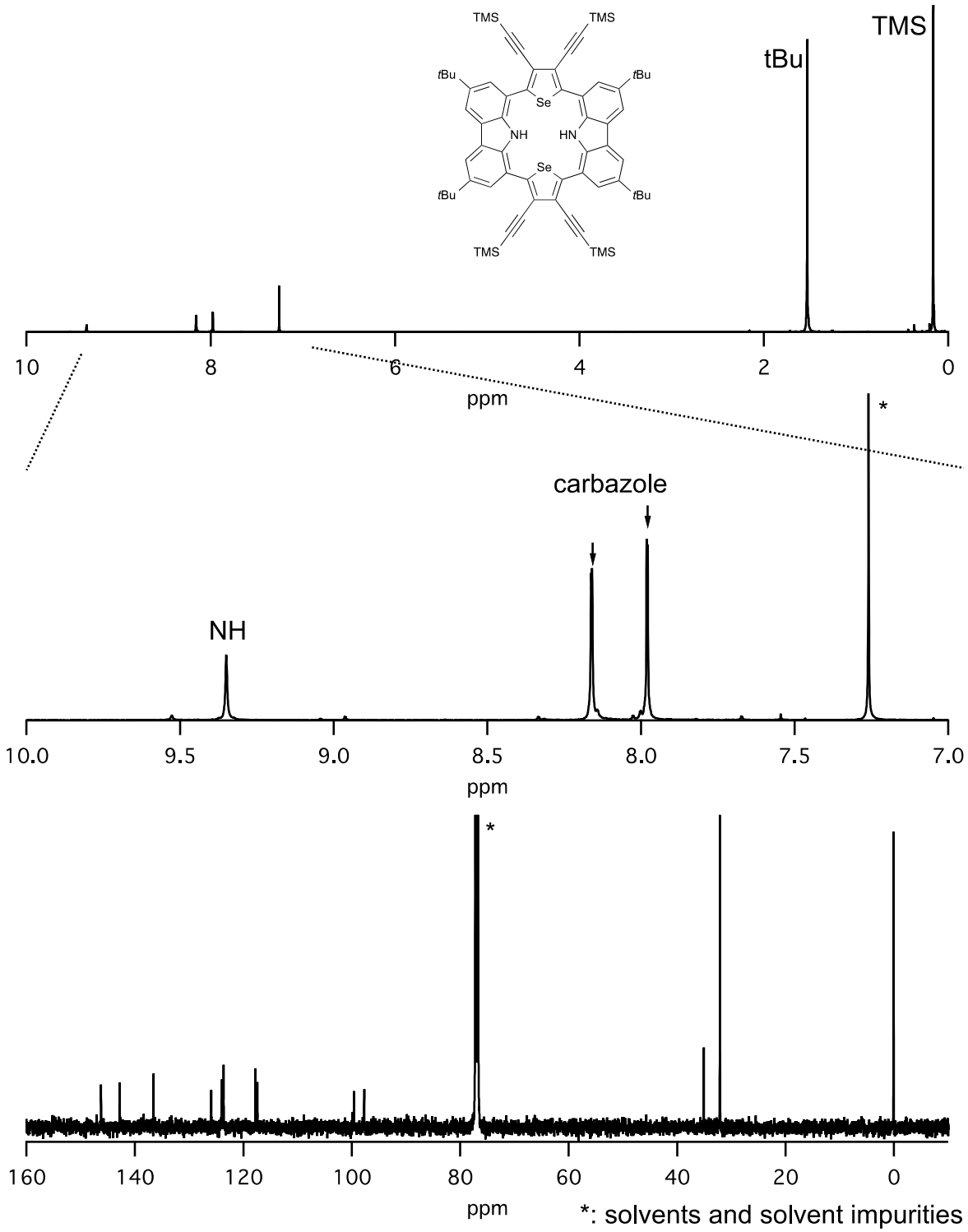

Fig. S5 ^{1}H and ^{13}C NMR spectra of **6** in $CDCl_3$

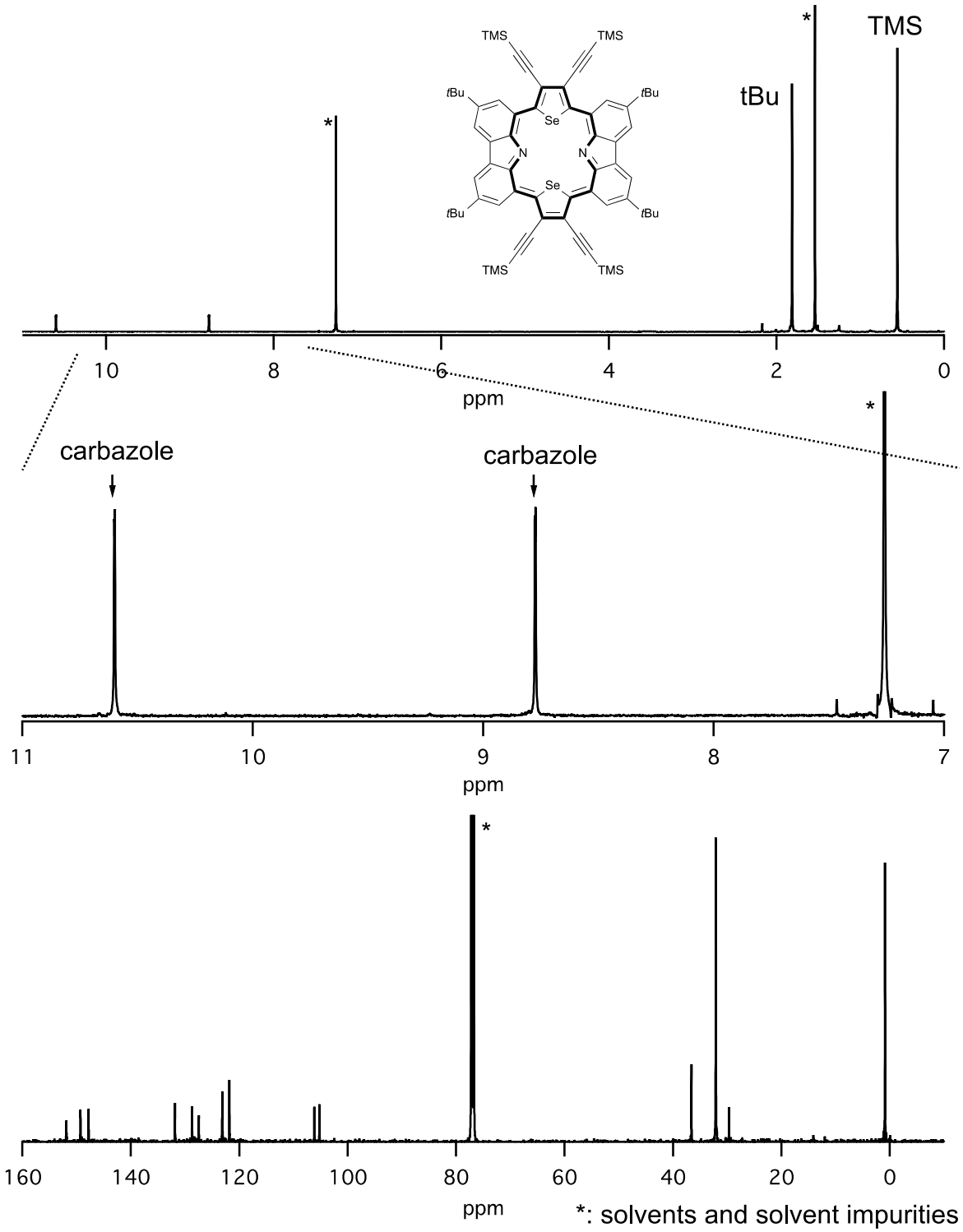

Fig. S6 ^{1}H and ^{13}C NMR spectra of **14** in $CDCl_3$

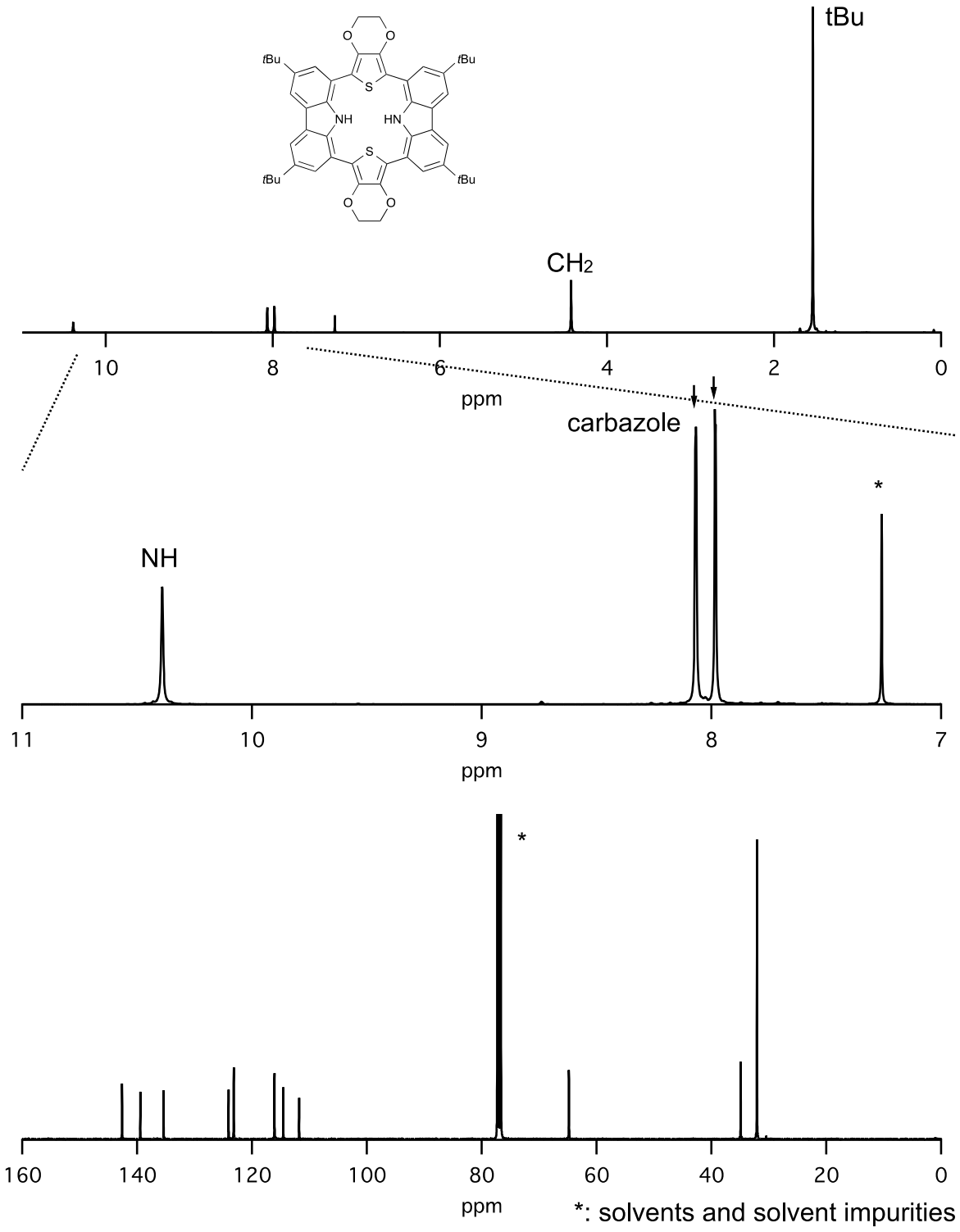

Fig. S7 ^{1}H NMR spectrum of **4** in $CDCl_3$

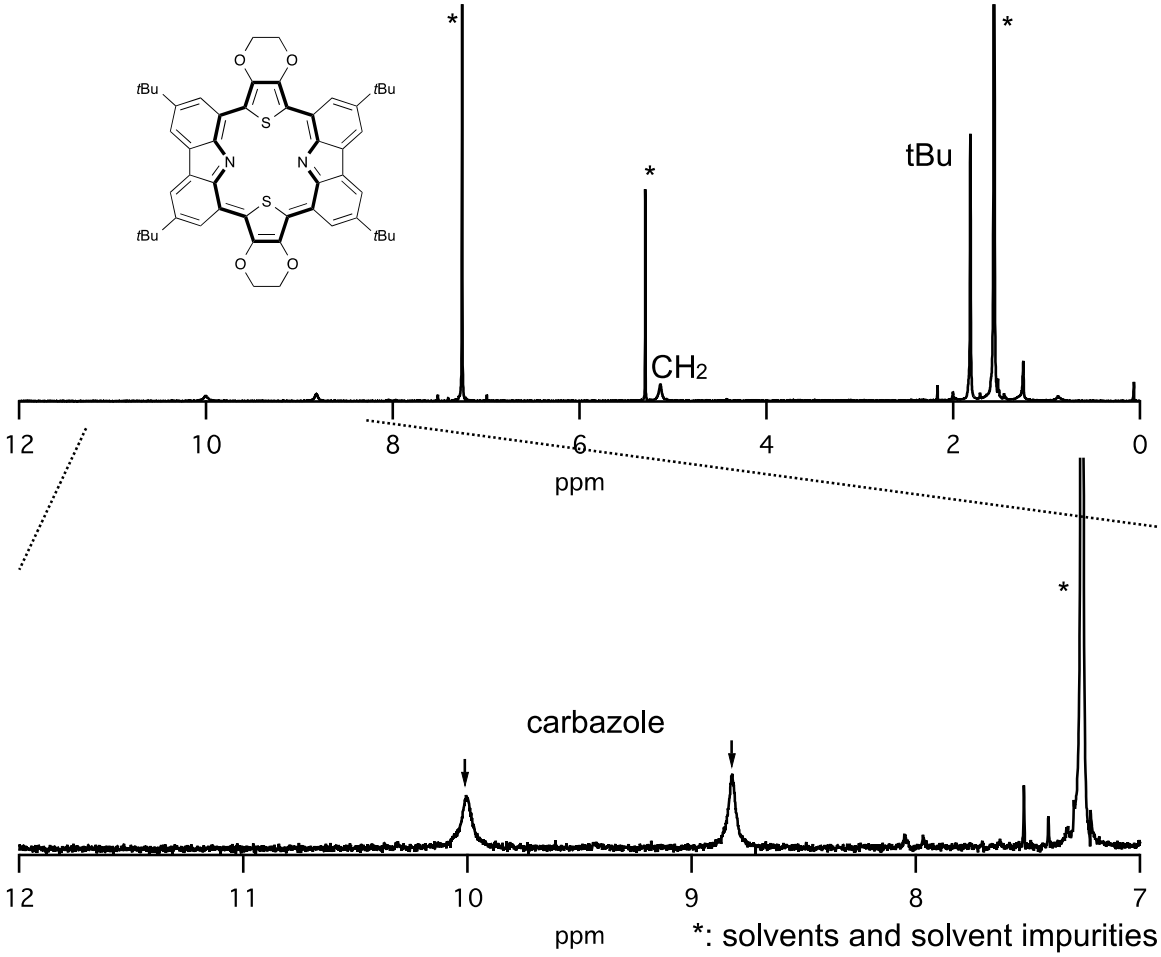

Fig. S8 ^{1}H and ^{13}C NMR spectra of **15** in $CDCl_3$

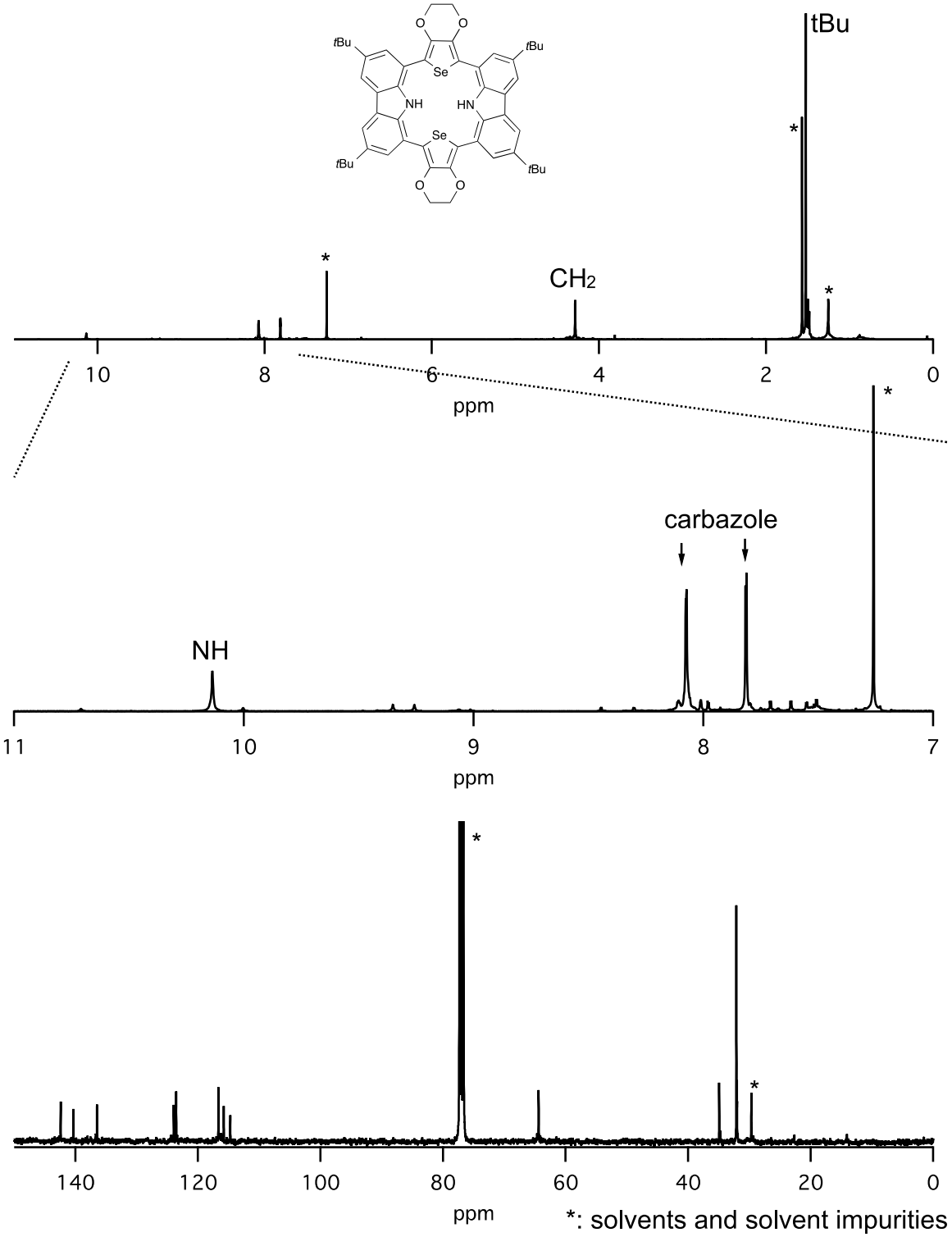

Fig. S9 ^{1}H NMR spectrum of **8** in $CDCl_3$

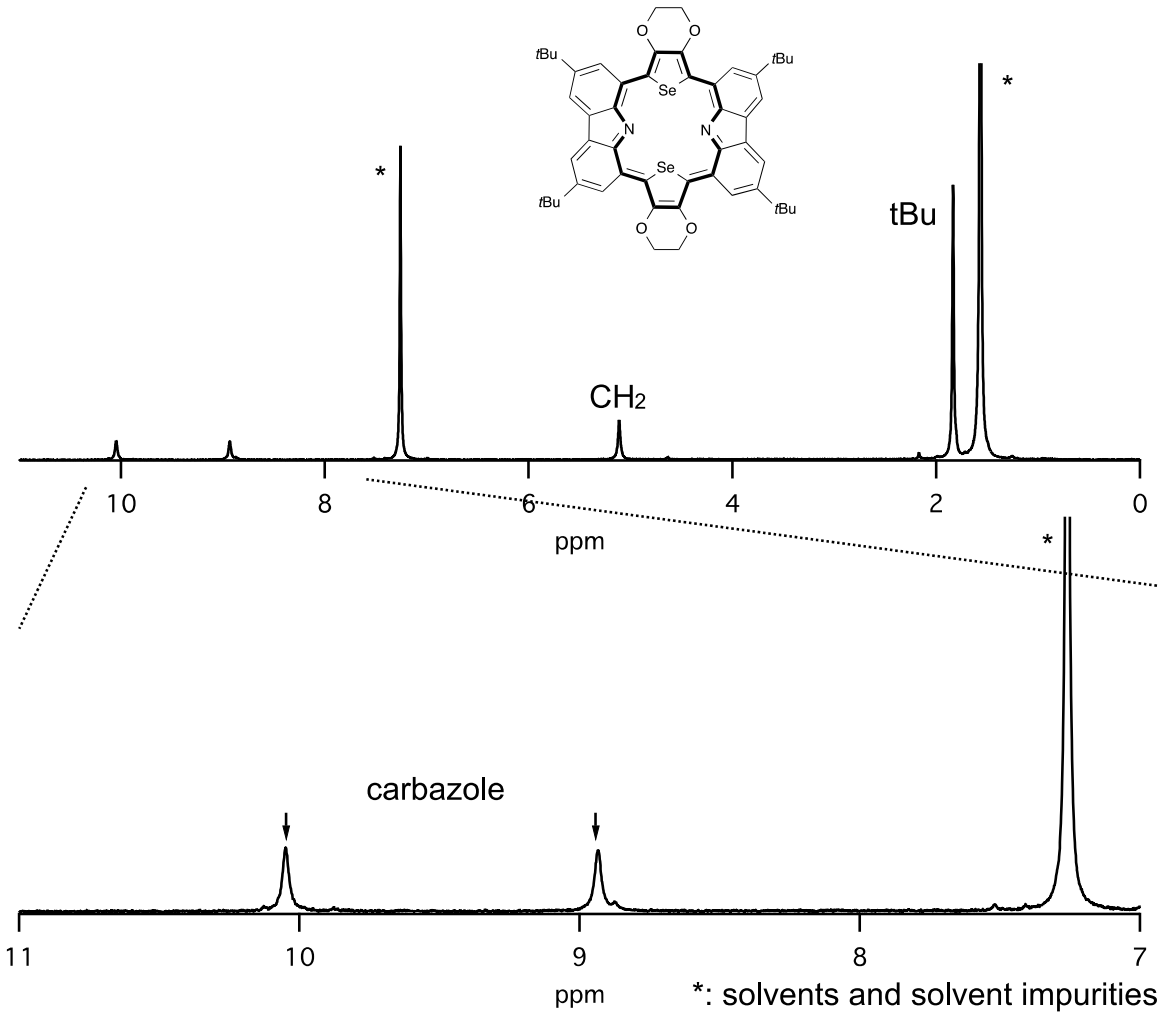

Fig. S10 Cyclic Voltammogram and Differential Pulse Voltammogram of **6**. (solvent: CH_2Cl_2, supporting electrolyte: Bu_4NPF_6 (0.10 M), counter electrode: Pt, reference electrode: Ag/Ag^+, working electrode: glassy carbon, scan rate: 0.05 V/s).

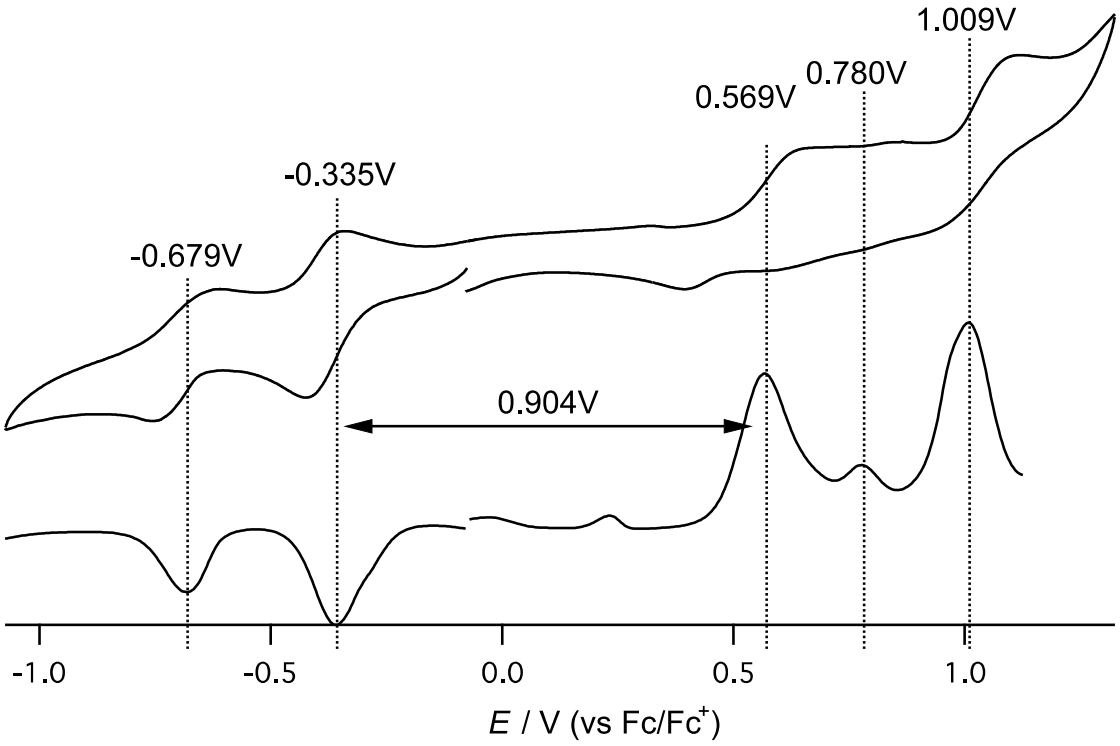

Table S1 Selected data of calculated electronic transitions in **1**

State	Transition energy (nm)	Oscillator strength	Composition of band and CI coefficiencies
1	1045.8	0.299554	H–1 → L (79%), H → L+1 (14%)
2	813.7	0.760098	H → L (85%)
3	630.1	0.000000	H–2 → L (95%)
4	609.5	0.023228	H–3 → L (93%)
5	457.0	0.000000	H–4 → L (84%)
6	418.4	0.000000	H–1 → L+2 (79%), H–5 → L (9%)
7	412.2	0.000000	H → L+2 (78%), H–4 → L (12%)
8	411.6	1.232244	H → L+1 (74%), H–1 → L (13%)
9	395.1	0.000000	H–7 → L (92%)
10	394.0	0.001567	H–8 → L (93%)

Table S2 Selected data of calculated electronic transitions in **2**

State	Transition energy (nm)	Oscillator strength	Composition of band and CI coefficiencies
1	1069.8	0.342325	H–1 → L (79%), H → L+1 (15%)
2	844.7	0.788252	H → L (85%)
3	611.3	0.000009	H–2 → L (94%)
4	592.5	0.006579	H–3 → L (93%)
5	463.5	0.000000	H–4 → L (76%), H → L+2 (18%)
6	438.8	0.000051	H–5 → L (61%), H–1 → L+2 (29%)
7	429.3	1.824787	H → L+2 (74%), H–1 → L (15%)
8	415.2	0.002586	H–1 → L+3 (62%), H–5 → L (33%)
9	414.9	0.000000	H → L+2 (71%), H–4 → L (21%)
10	406.4	2.711576	H–1 → L+1 (83%)

Table S3 Selected data of calculated electronic transitions in **3**

State	Transition energy (nm)	Oscillator strength	Composition of band and CI coefficiencies
1	1028.3	0.315875	H–1 → L (76%), H → L+1 (16%)
2	859.5	0.907297	H → L (86%)
3	718.7	0.000000	H–2 → L (96%)
4	700.4	0.009895	H–3 → L (93%)
5	485.8	0.000000	H–4 → L (83%)
6	434.2	1.683976	H→ L+1 (76%), H–1 → L (16%)
7	418.9	0.000000	H–5 → L (43%), H–1 → L+2 (38%)
8	416.4	0.000000	H → L+2 (78%), H–4 → L (14%)
9	391.5	2.817804	H–1 → L+1 (84%)
10	389.2	0.000000	H–1 → L+2 (49%), H–5 → L (45%)