

Supporting information

**Functionalised carbazole as cathode for high voltage non-aqueous
organic redox flow battery**

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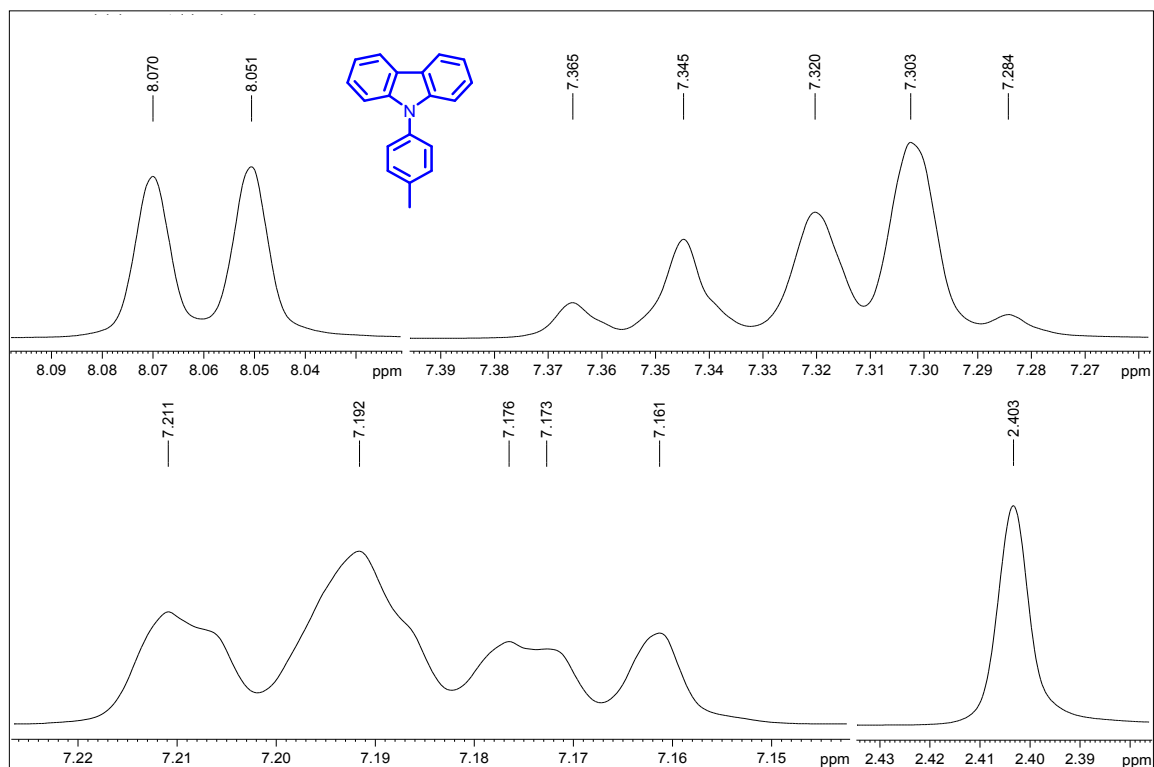
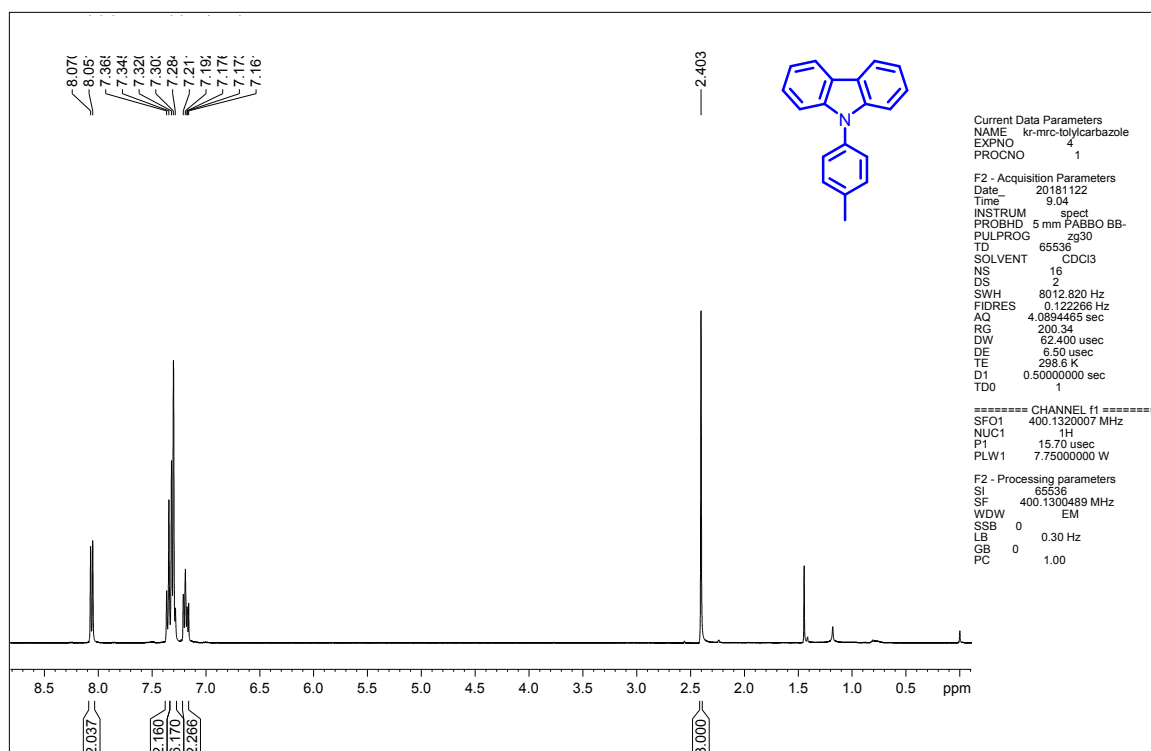


Fig. S1 (a) and (b) ^1H NMR spectrum of (2) in CDCl_3 (400 MHz)

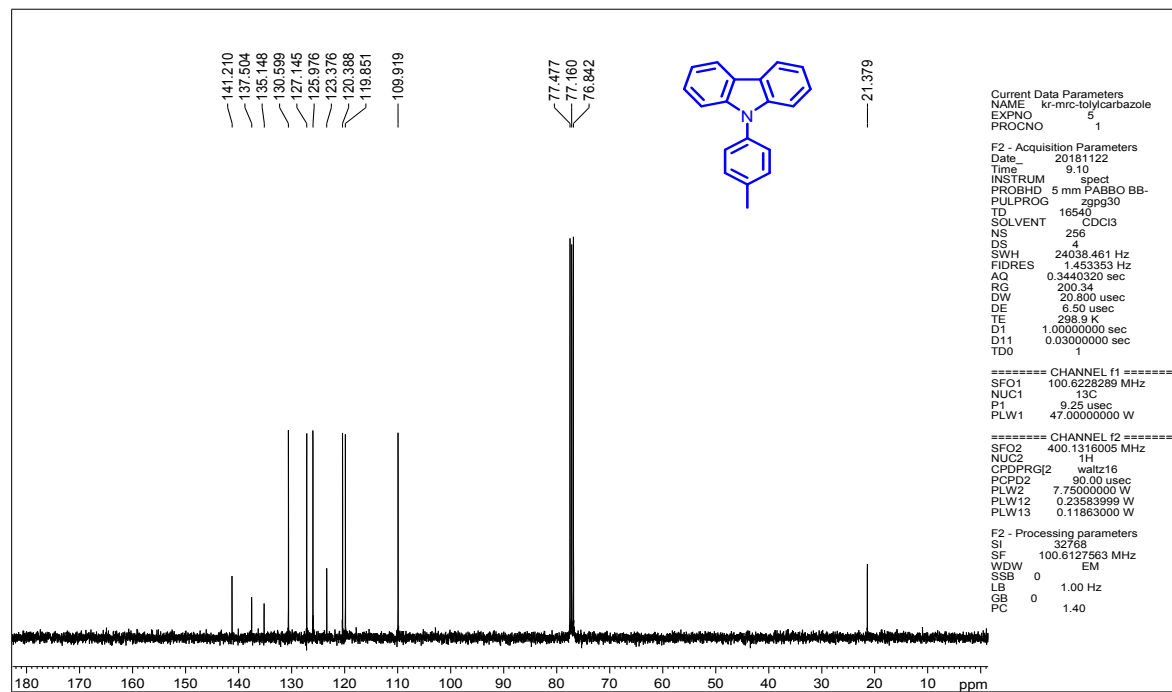


Fig. S2 ^{13}C spectrum of (2) in CDCl_3 (100 MHz)

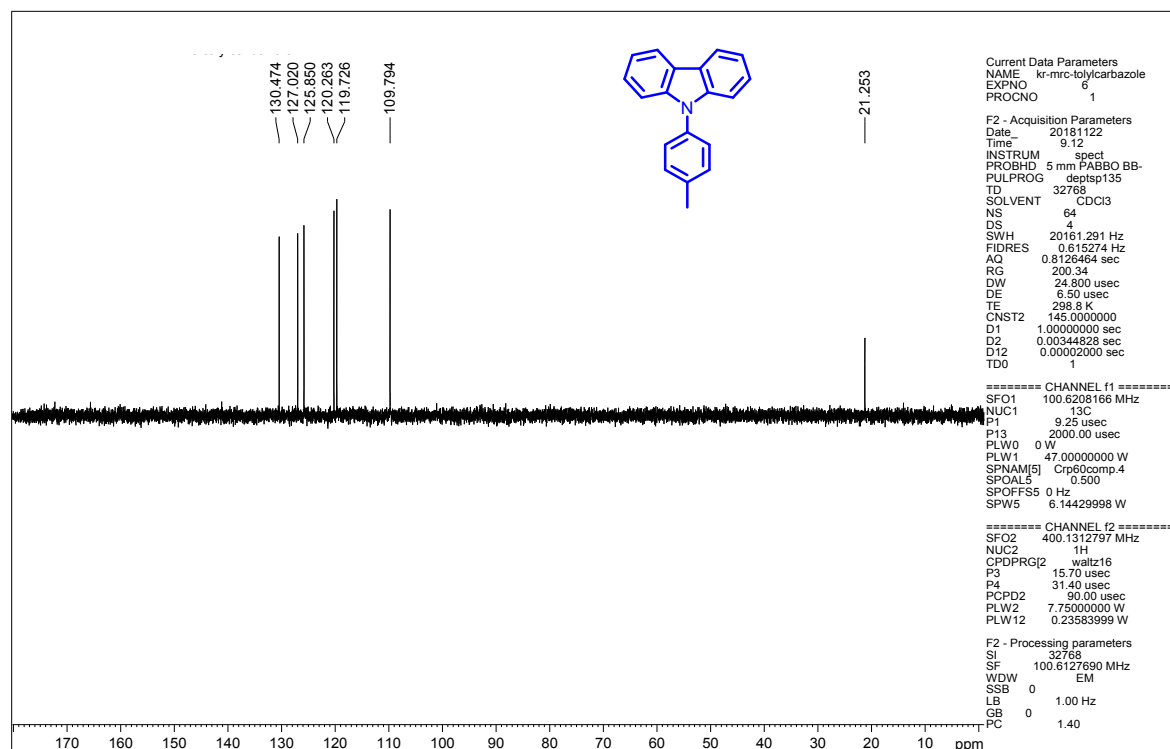
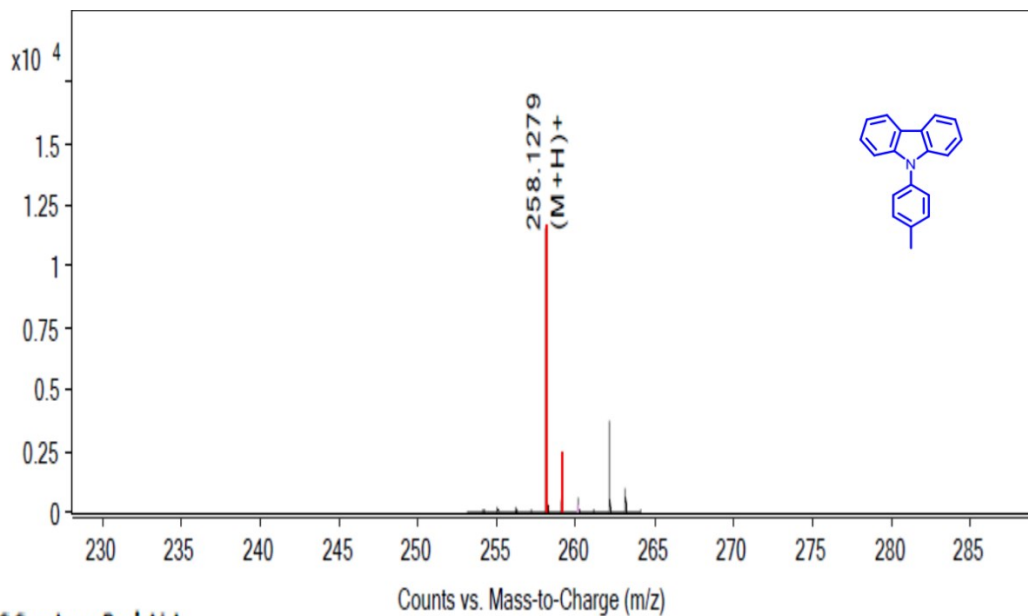


Fig. S3 DEPT of (2) in CDCl₃ (100 MHz)



MS Spectrum Peak List

m/z	Calc m/z	Diff(ppm)	z	Abund	Ion
258.1279	258.1277	-0.61	1	11610.2	(M+H)+
258.1279				11608.09	
259.1306	259.131	1.39	1	2245.81	(M+H)+

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Fig. S4 HRMS of (2)

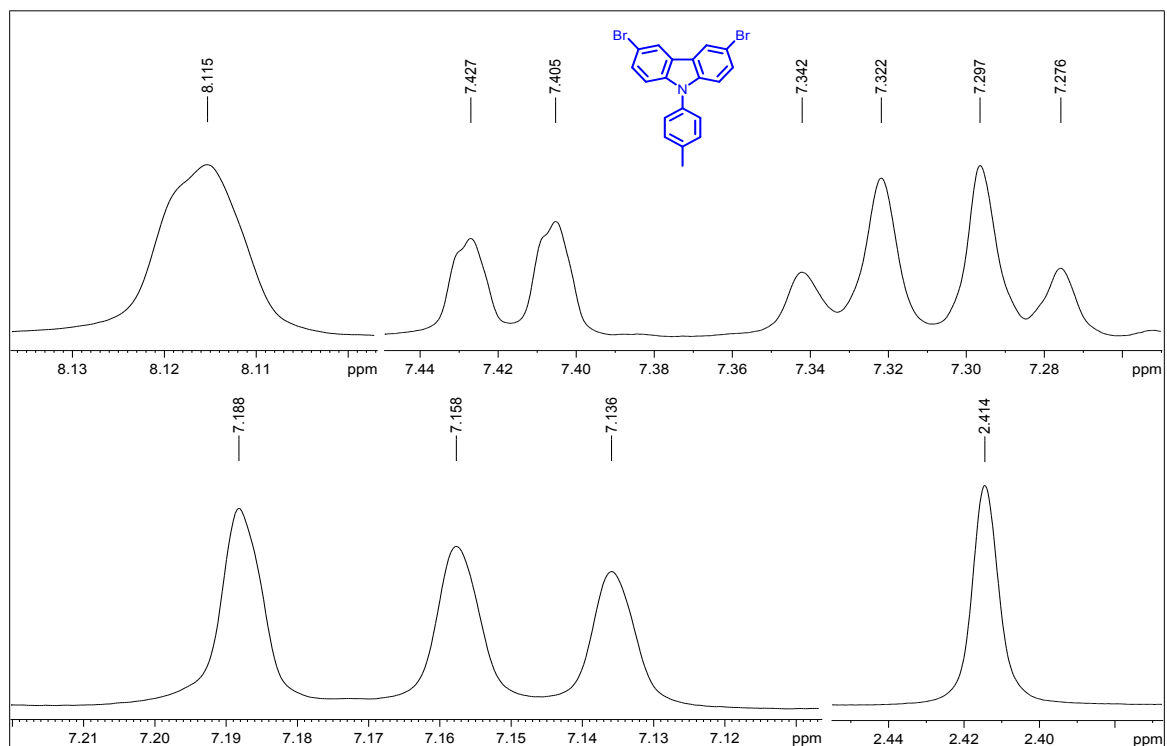
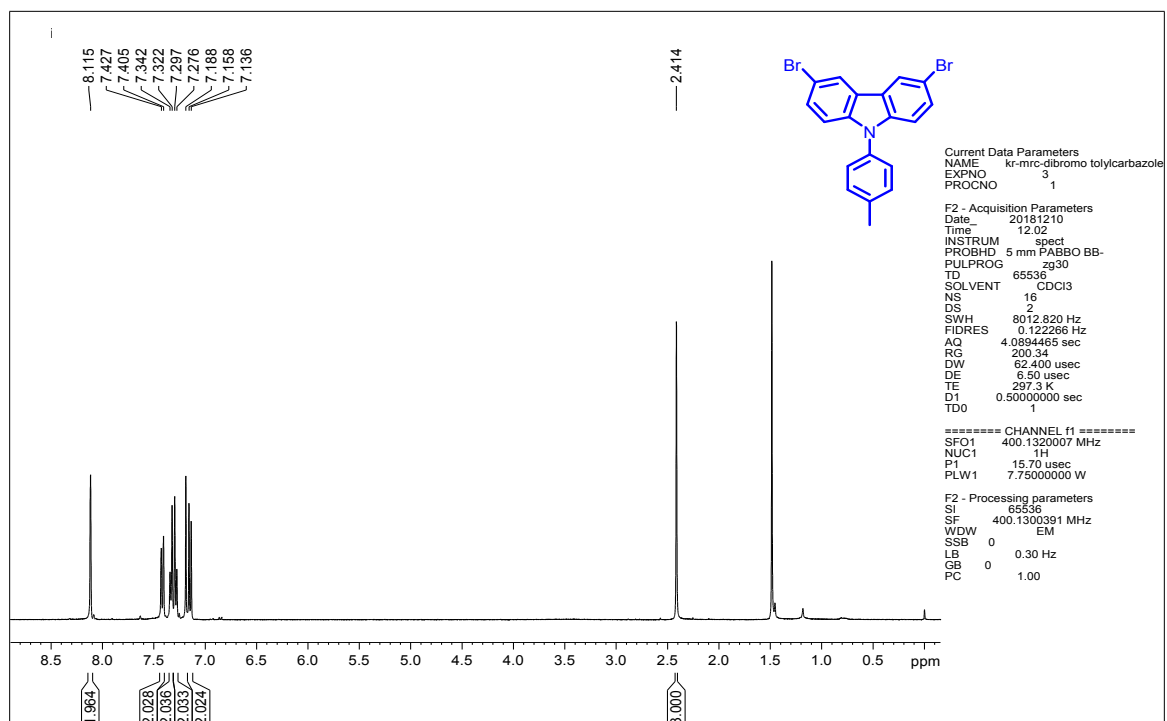


Fig. S5 (a) and (b) ^1H NMR spectrum of (3) in CDCl_3 (400 MHz)

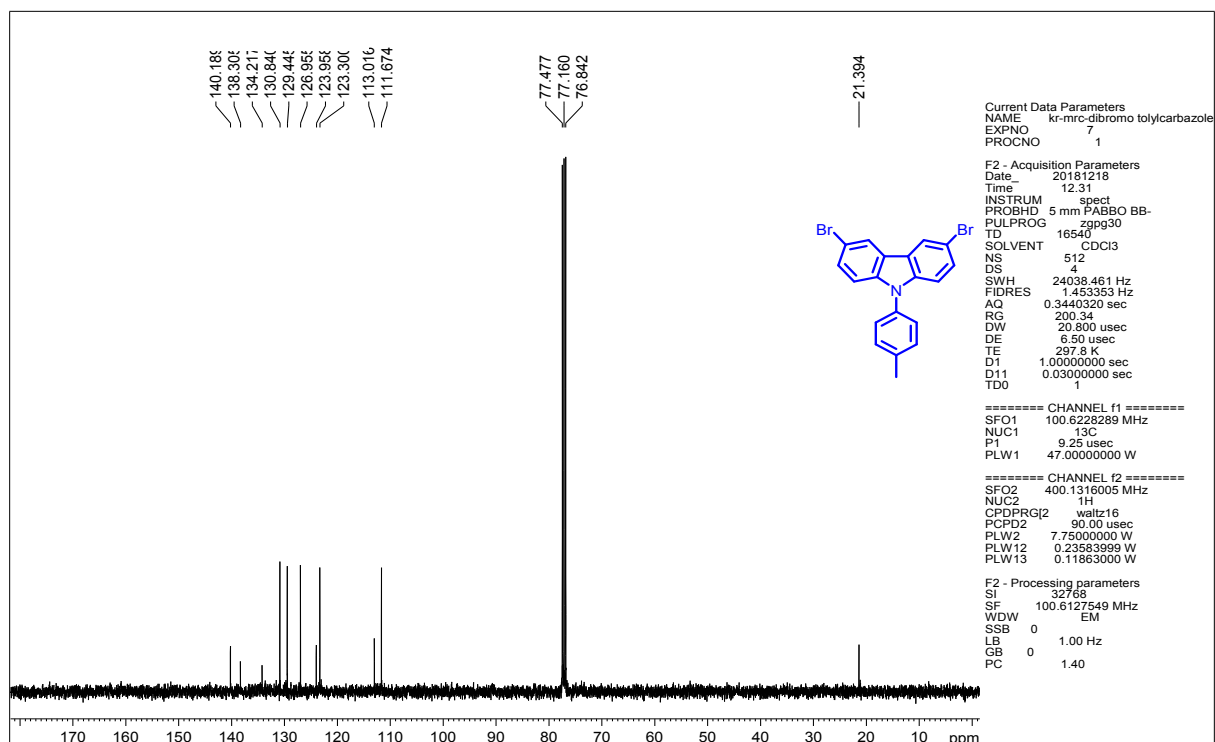


Fig. S6 ^{13}C spectrum of (3) in CDCl_3 (100 MHz)

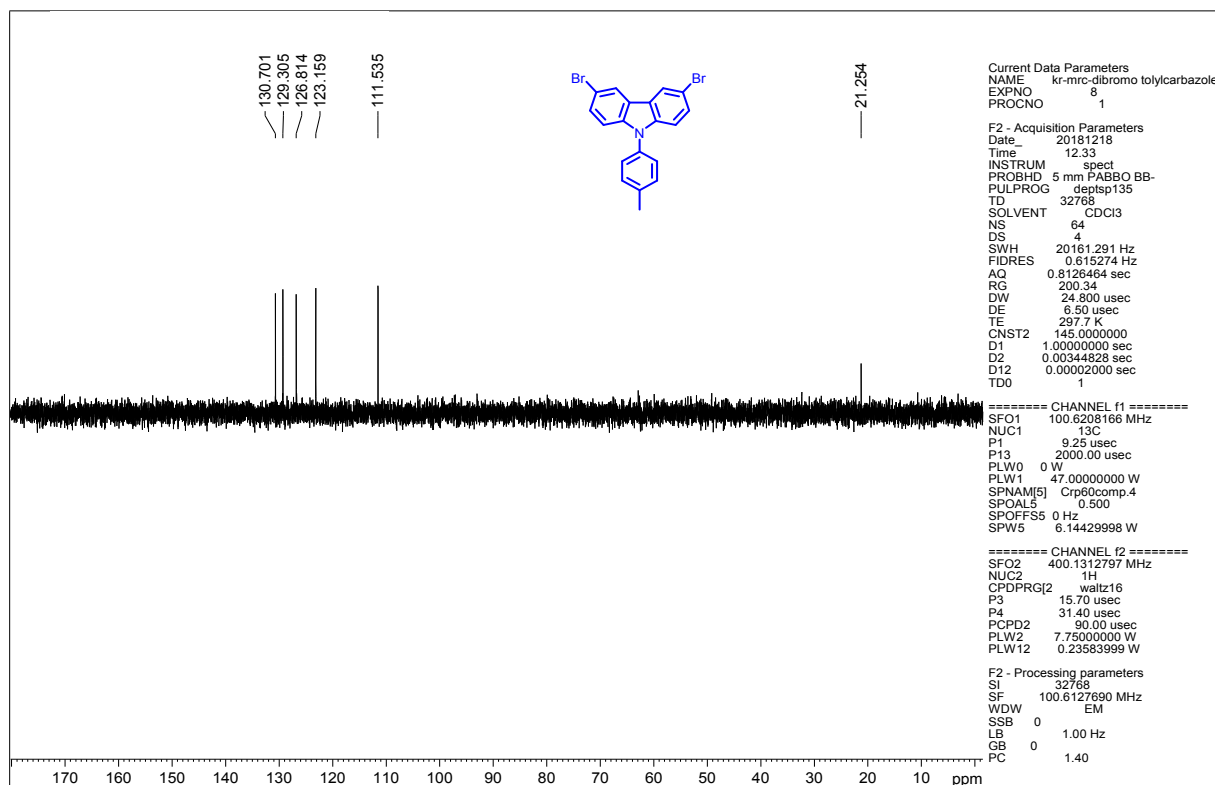


Fig. S7 DEPT of (3) in CDCl_3 (100 MHz)

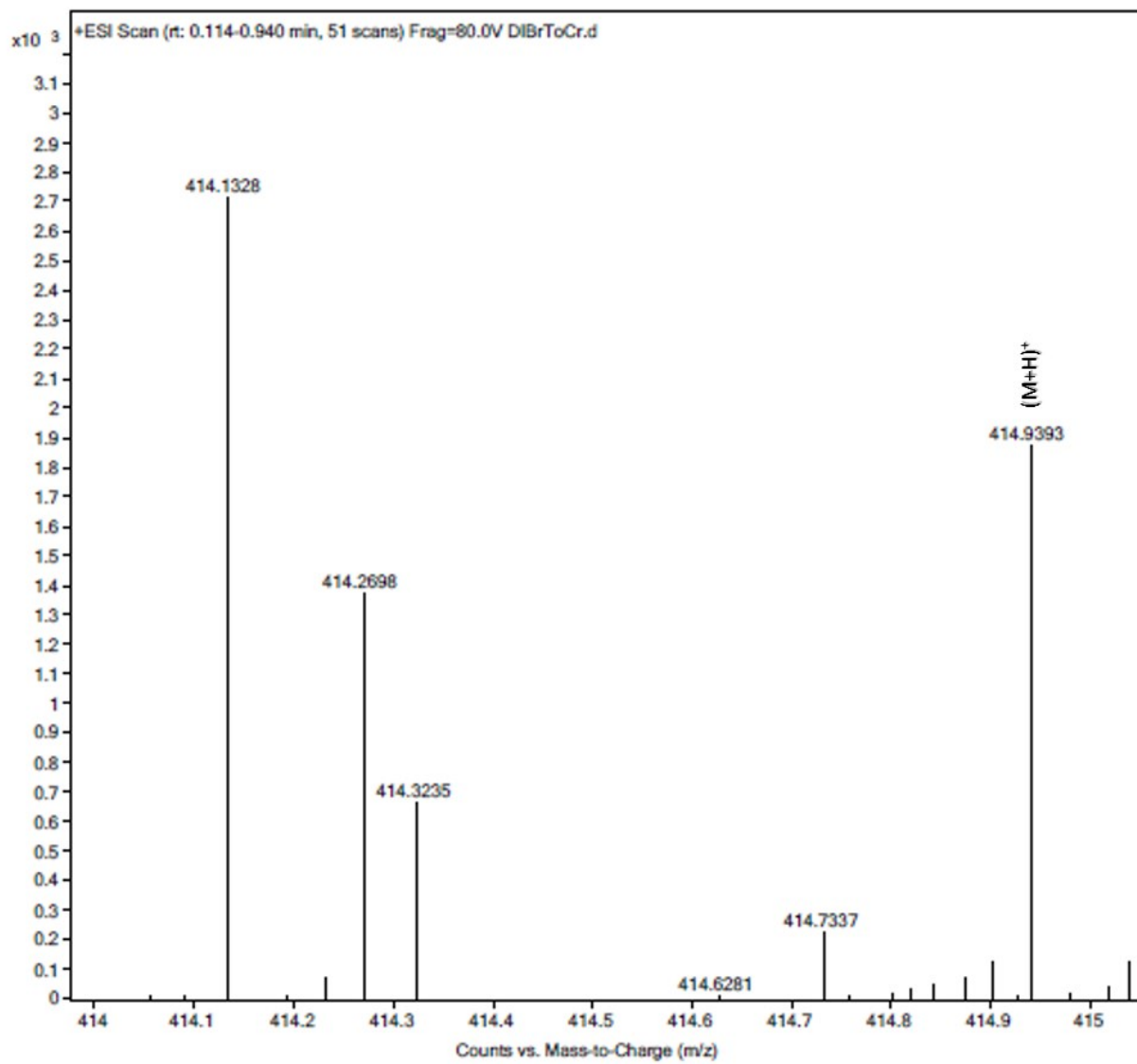


Fig. S8 HRMS of (3)

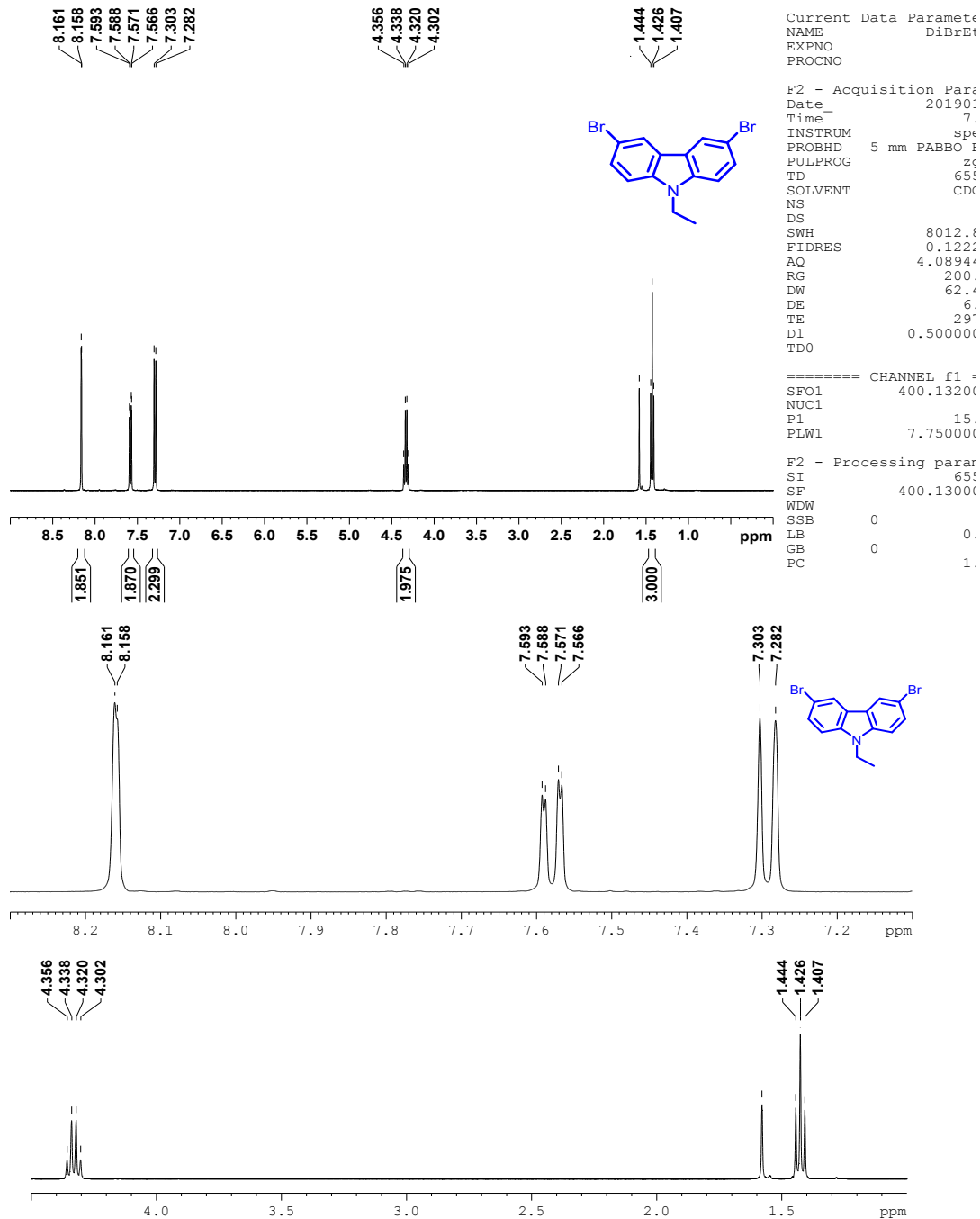
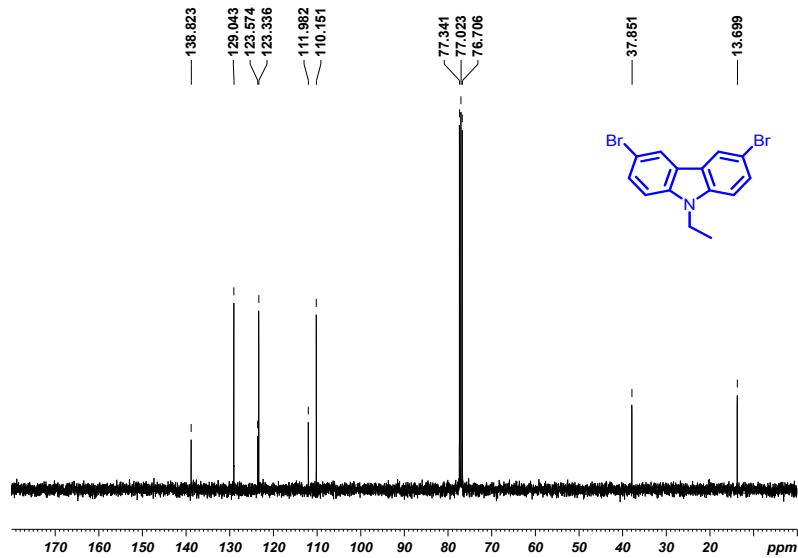


Fig. S9 (a) and (b) ^1H NMR spectrum of (4) CDCl_3 (400 MHz)



Current Data Parameters
 NAME DiBrEtCr
 EXPNO 2
 PROCNO 1

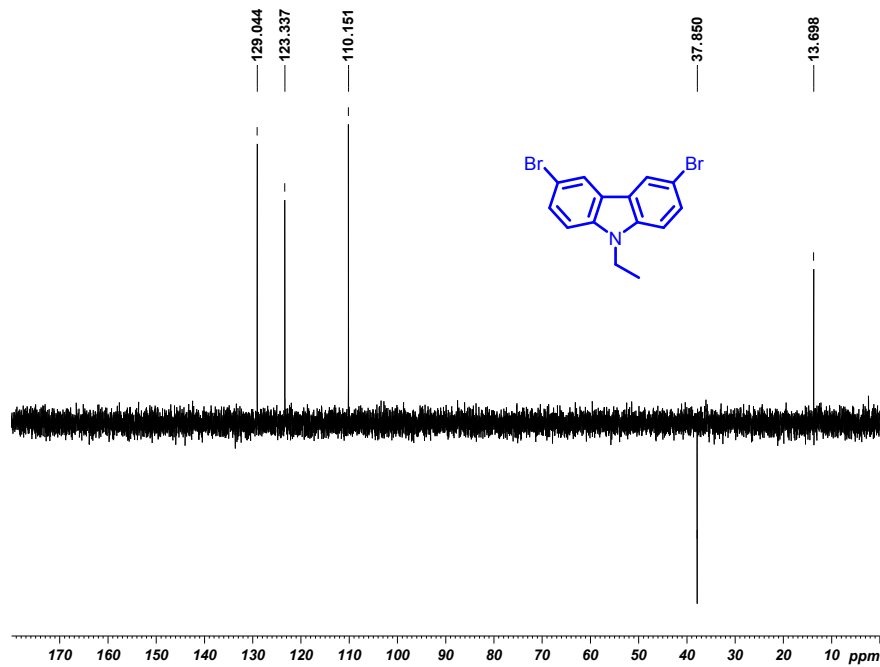
F2 - Acquisition Parameters
 Date_ 20190116
 Time 7.18
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 16540
 SOLVENT CDCl3
 NS 256
 DS 4
 SWH 24038.461 Hz
 FIDRES 1.453353 Hz
 AQ 0.3440320 sec
 RG 200.34
 DW 20.800 usec
 DE 6.50 usec
 TE 298.2 K
 D1 1.00000000 sec
 D11 0.03000000 sec
 TDO 1

===== CHANNEL f1 =====
 SFO1 100.6228289 MHz
 NUC1 13C
 P1 9.25 usec
 PLW1 47.00000000 W

===== CHANNEL f2 =====
 SFO2 400.1316005 MHz
 NUC2 1H
 CPDPRG2 waltz16
 PCPD2 90.00 usec
 PLW2 7.75000000 W
 PLW12 0.23583999 W
 PLW13 0.11863000 W

F2 - Processing parameters
 SI 32768
 SF 100.6127690 MHz
 WDW EM
 SSB 0

Fig. S10 ¹³C NMR spectrum of (4) in CDCl₃ (100 MHz)



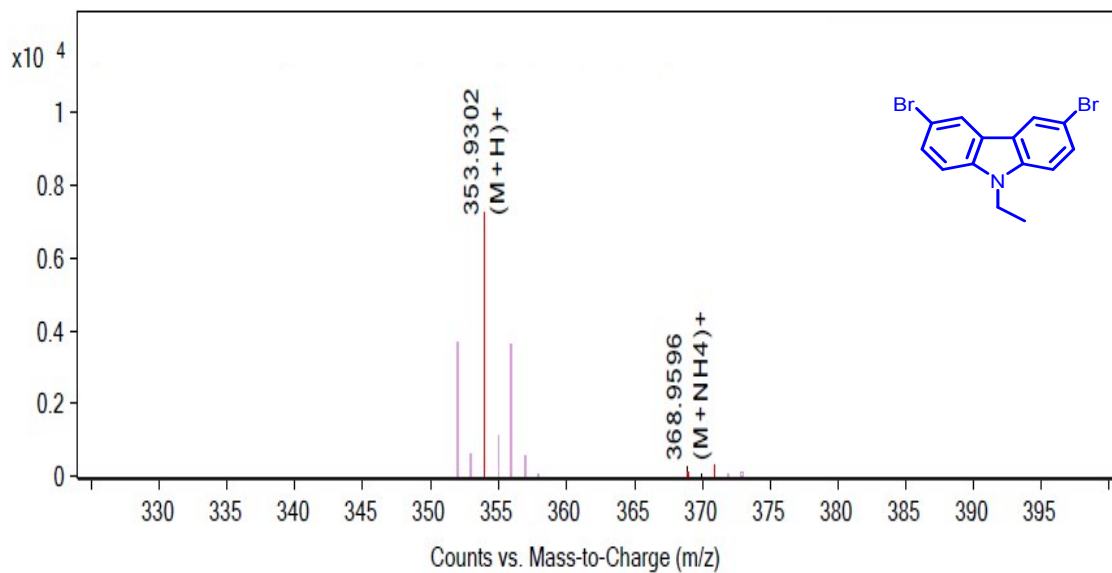
Current Data Parameters
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 EXPNO 3
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20190116
 Time 7.20
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG deptsp135
 TD 32768
 SOLVENT CDCl3
 NS 64
 DS 4
 SWH 20161.291 Hz
 FIDRES 0.615274 Hz
 AQ 0.8126464 sec
 RG 200.34
 DW 24.800 usec
 DE 6.50 usec
 TE 298.1 K
 CNST2 145.0000000
 D1 1.00000000 sec
 D2 0.00344828 sec
 D12 0.00002000 sec
 TDO 1

===== CHANNEL f1 =====
 SFO1 100.6208166 MHz
 NUC1 13C
 P1 9.25 usec
 P13 2000.00 usec
 PLW0 0 W
 PLW1 47.00000000 W
 SPNAM[5] Crp60comp.4
 SPOAL5 0.500
 SPOFFS5 0 Hz
 SPW5 6.14429998 W

===== CHANNEL f2 =====
 SFO2 400.1312797 MHz
 NUC2 1H
 CPDPRG2 waltz16
 P3 15.70 usec
 P4 31.40 usec
 PCPD2 90.00 usec
 PLW2 7.75000000 W
 PLW12 0.23583999 W

Fig. S11 DEPT of (4) in CDCl₃ (100 MHz)



MS Spectrum Peak List

m/z	z	Abund	Ion
353.9302	1	7250.48	(M+H) ⁺
368.9596	1	246.42	(M+NH ₄) ⁺
369.9629	1	91.86	(M+NH ₄) ⁺
370.9572	1	100.03	(M+NH ₄) ⁺

Fig. S12 HRMS of (4)

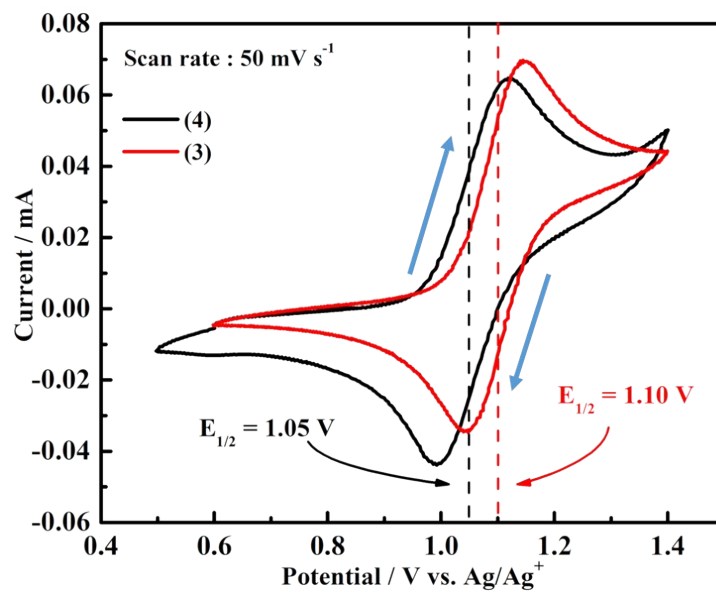


Fig. S13 compares E_{1/2} values for the CV of (4) and (3) in 4 : 1 Solvent mixture of ACN : DCM containing 0.1 M TBAPF₆ as supporting electrolyte.