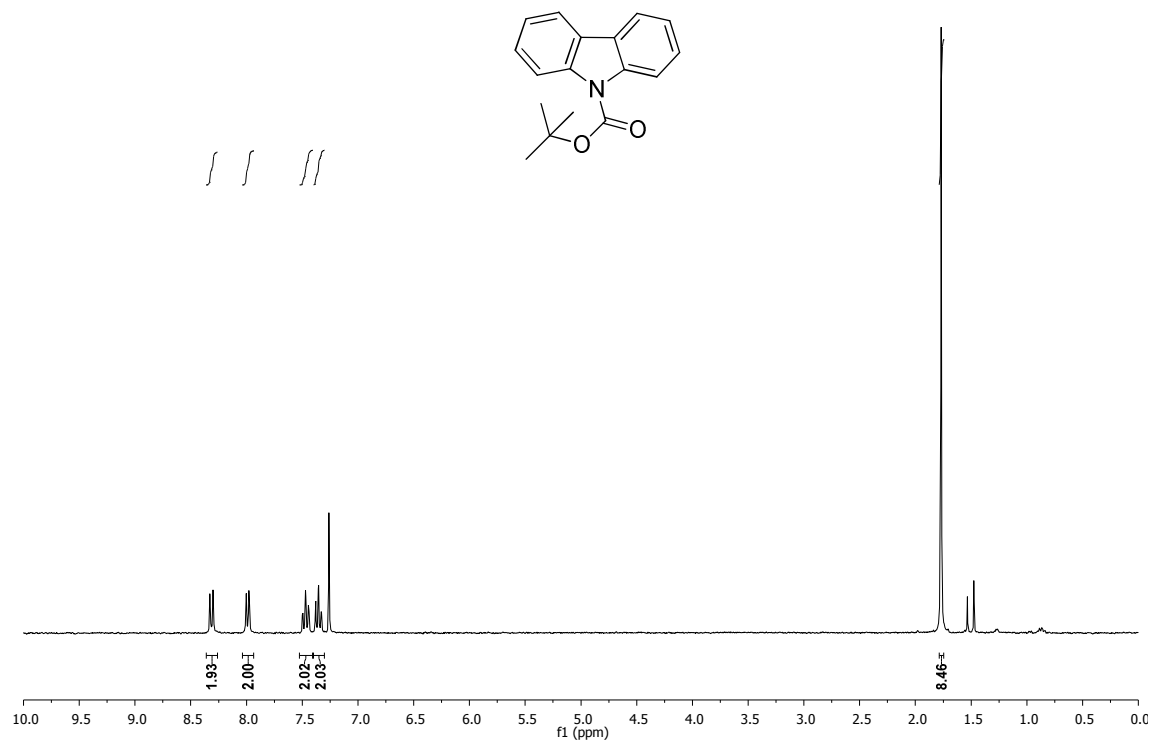

Appendix II-C:

NMR spectra chapter 4

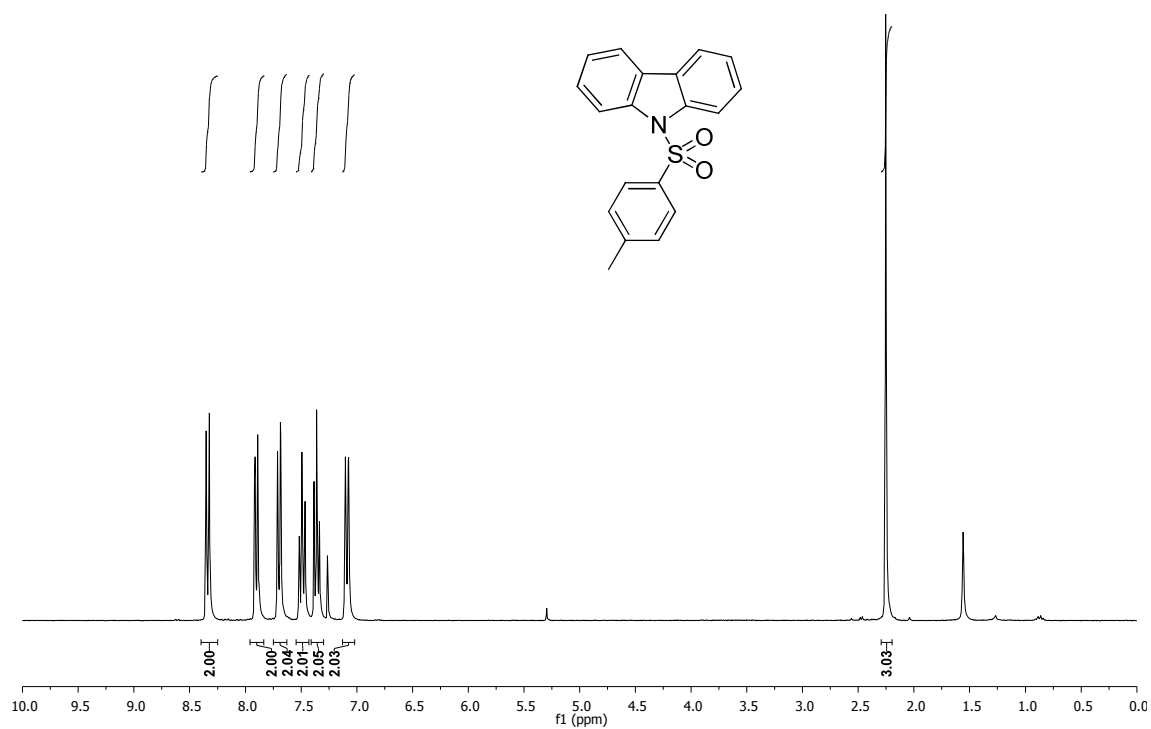
***N*-(*tert*-Butyl)-9H-carbazole-9-carboxylate (7)**

¹H NMR (300 MHz, CDCl₃)

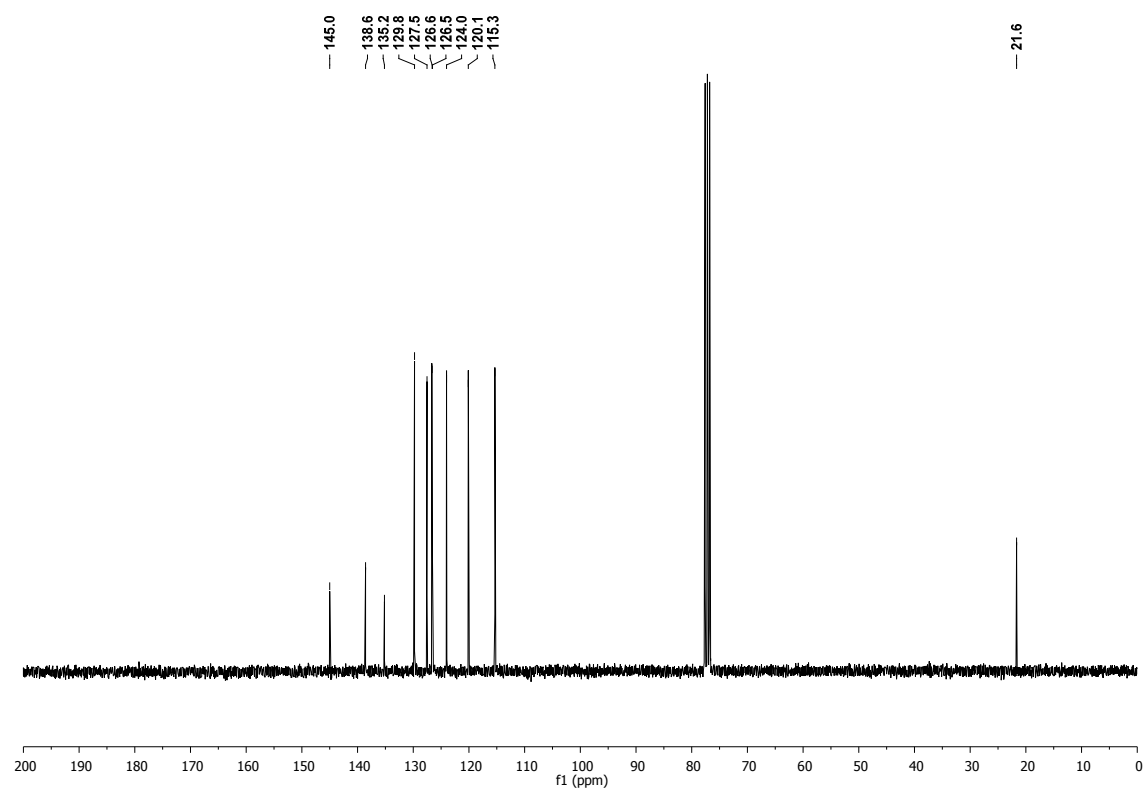


***N*-(2-*p*-Toluene)sulfonyl-9H-carbazole (5)**

¹H NMR (300 MHz, CDCl₃)

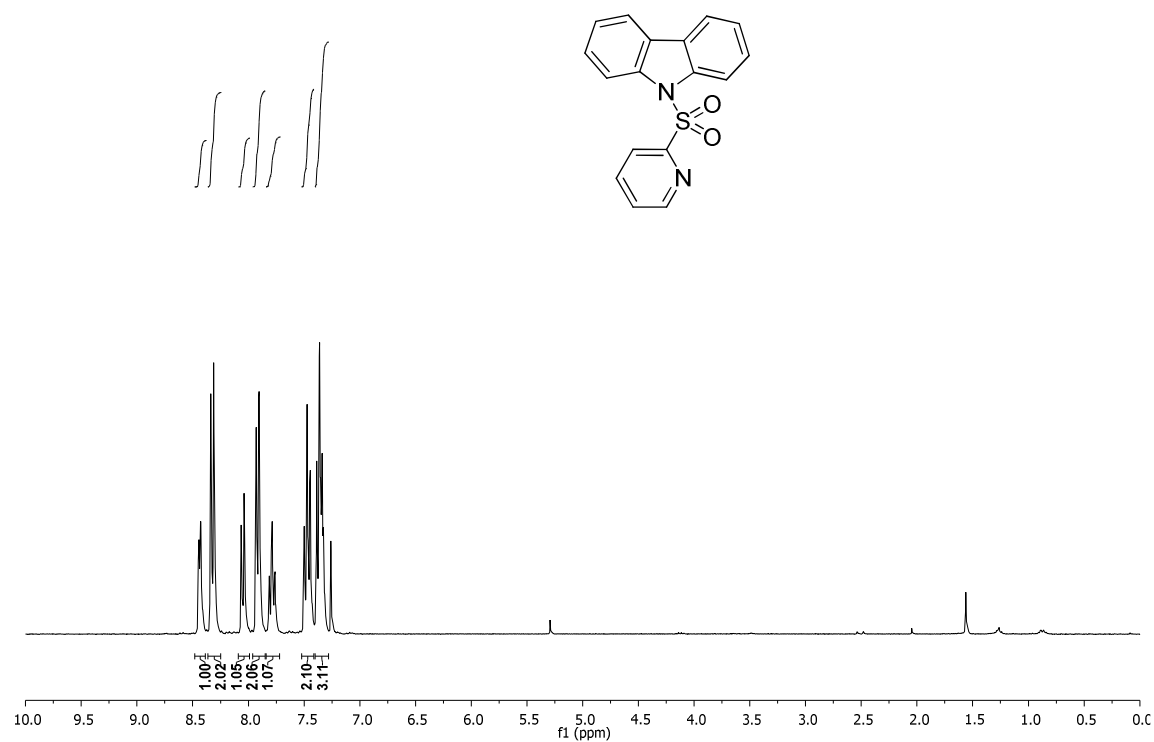


¹³C NMR (75 MHz, CDCl₃)

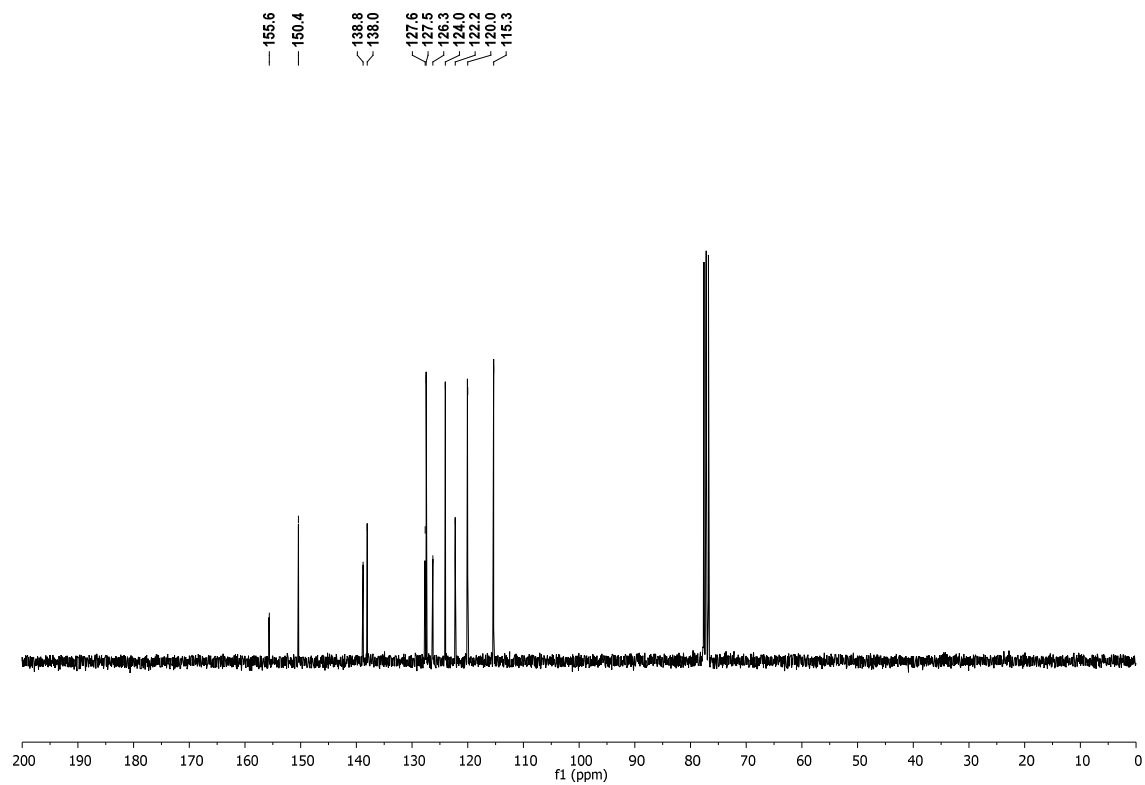


***N*-(2-pyridyl)sulfonyl-9H-carbazole (2)**

¹H NMR (300 MHz, CDCl₃)

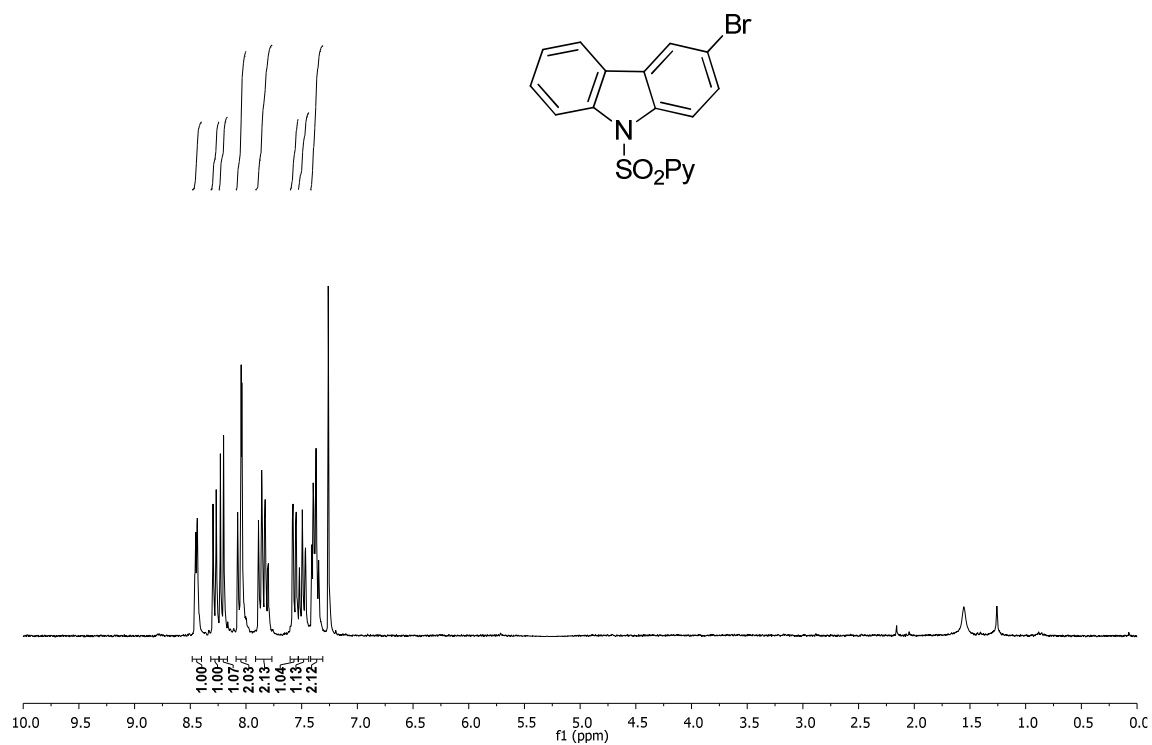


¹³C NMR (75 MHz, CDCl₃)

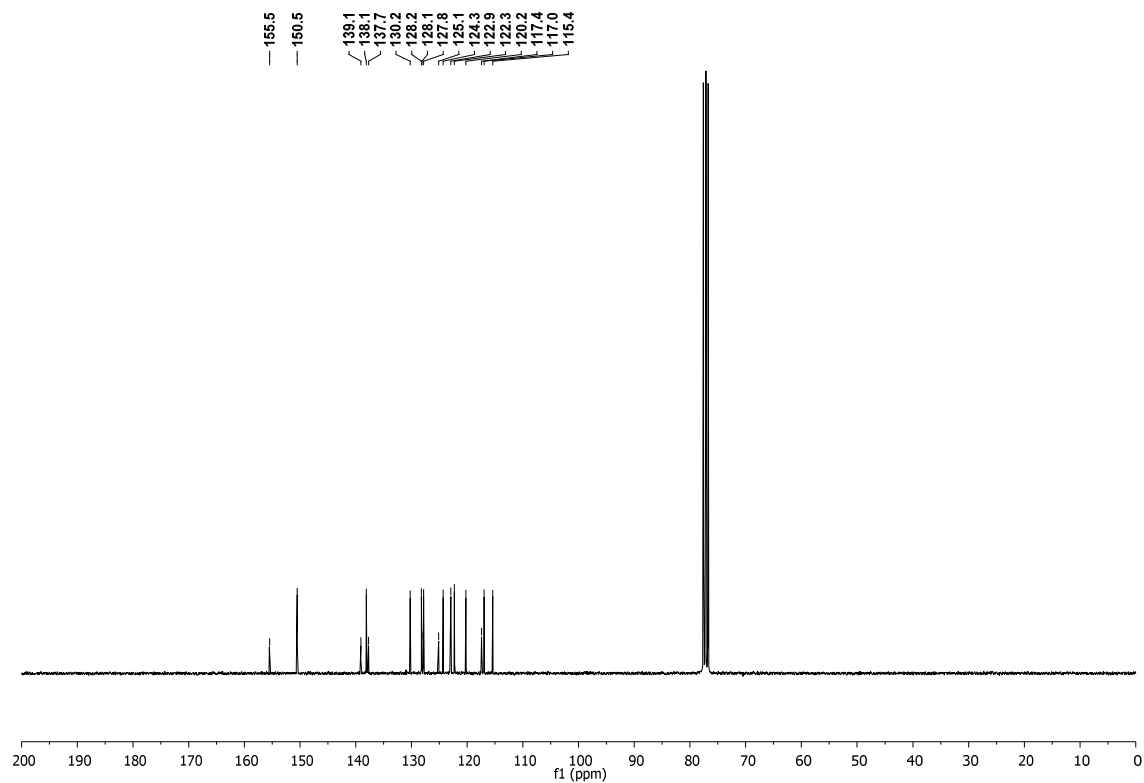


3-Bromo-N-(2-pyridyl)sulfonyl carbazole (17)

^1H NMR (300 MHz, CDCl_3)

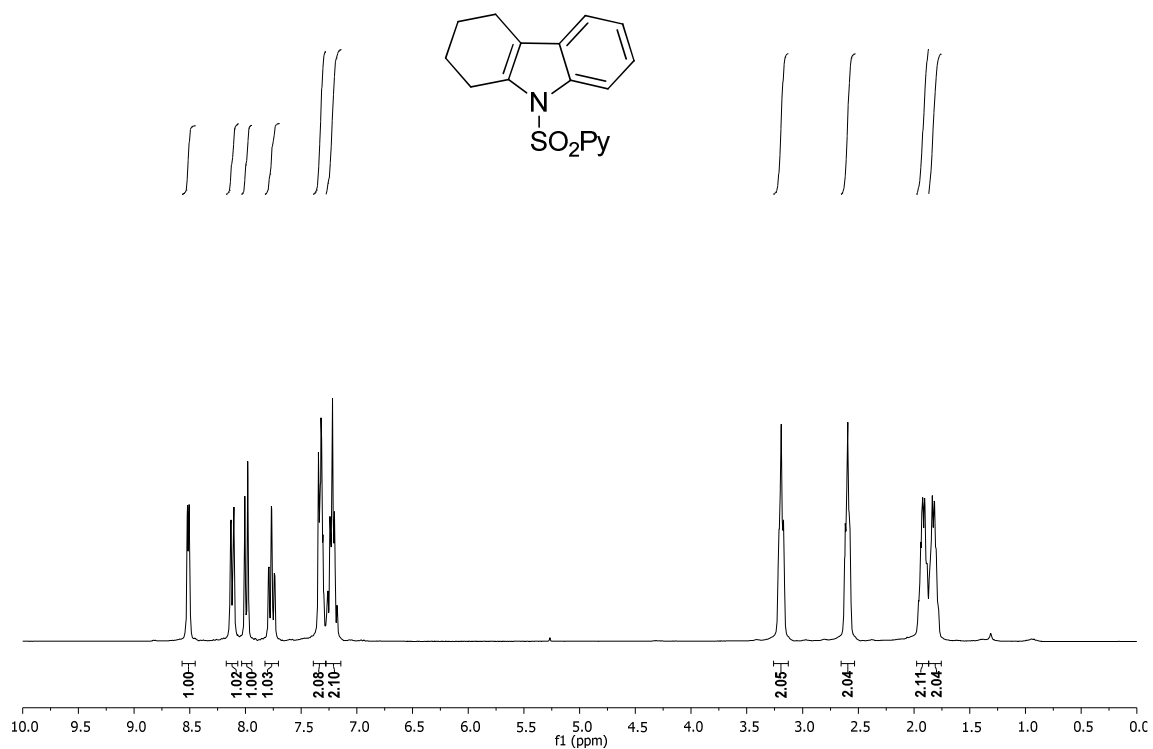


^{13}C NMR (75 MHz, CDCl_3)

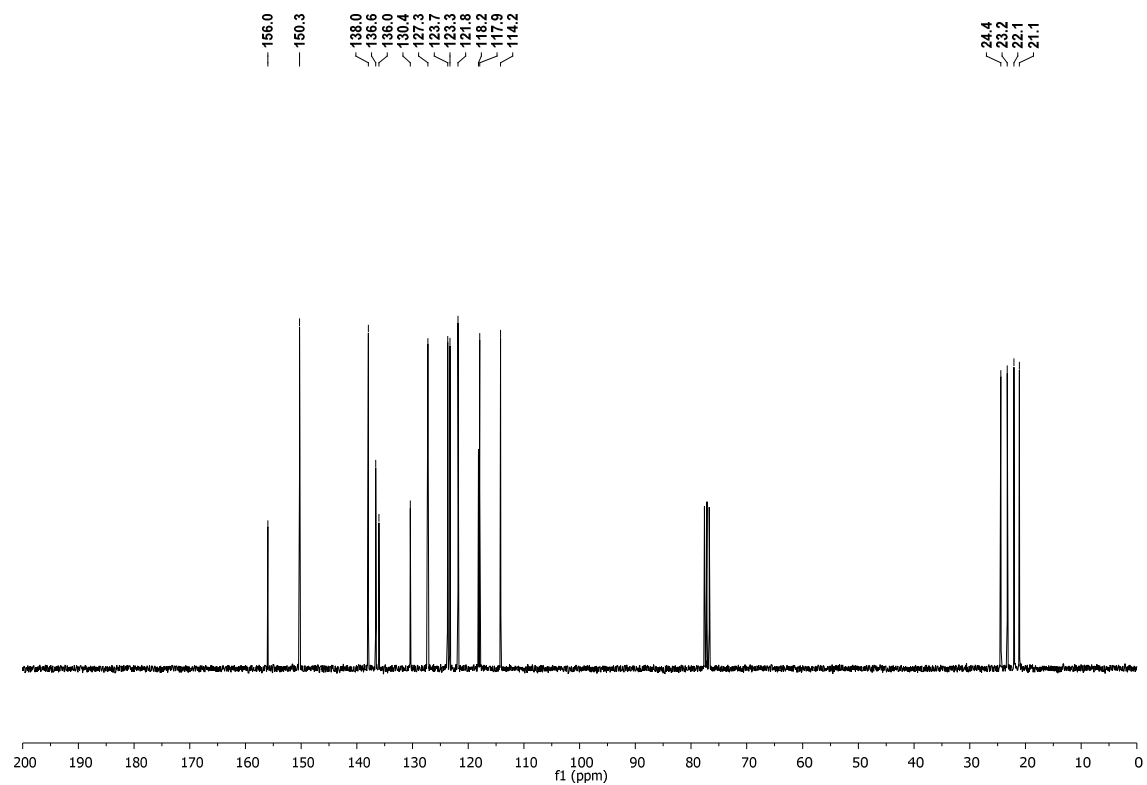


2,3,4,9-Tetrahydro-N-(2-pyridyl)sulfonyl-1H-carbazole (15)

^1H NMR (300 MHz, CDCl_3)

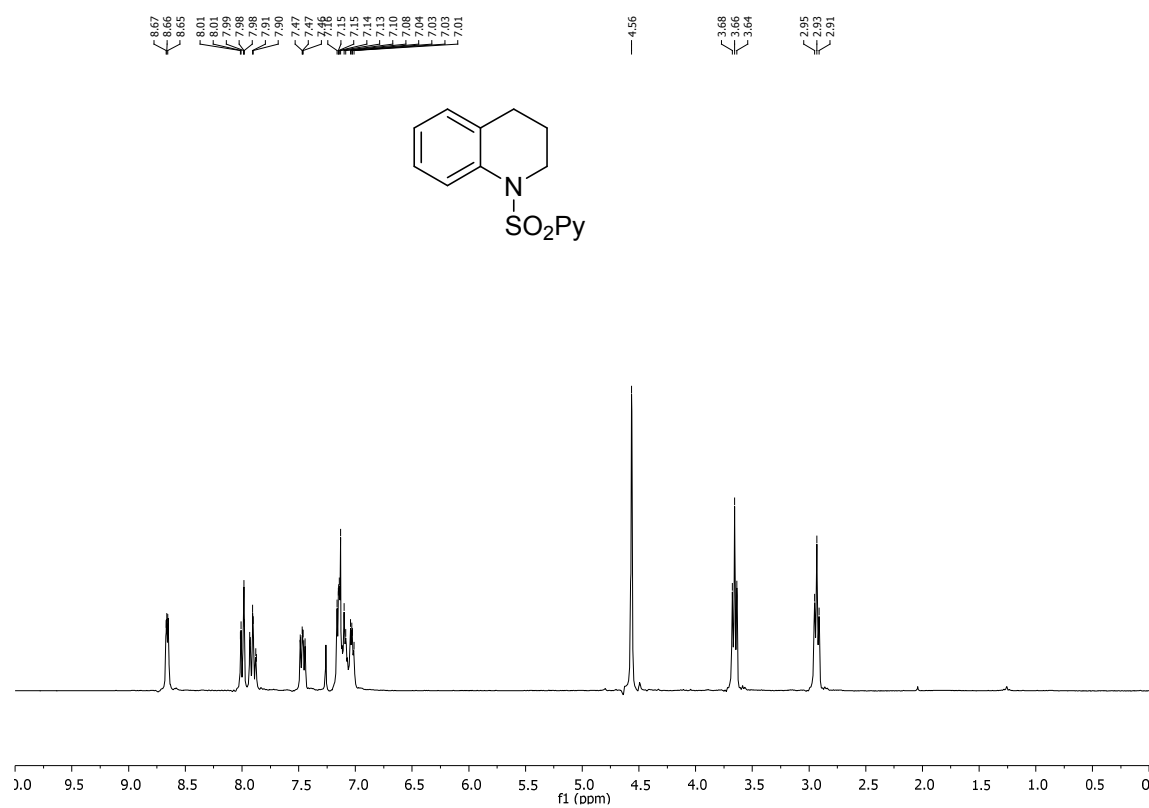


^{13}C NMR (75 MHz, CDCl_3)



***N*-(2-Pyridyl)sulfonyl-1,2,3,4-tetrahydroquinoline (31)**

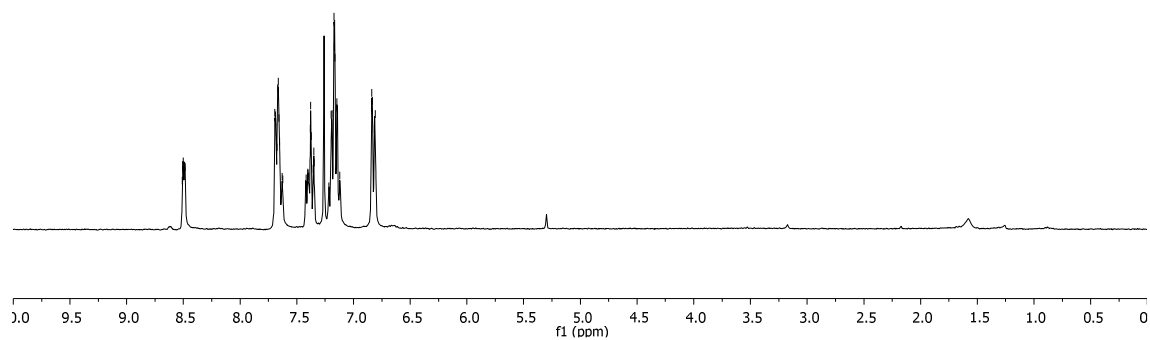
¹H NMR (300 MHz, CDCl₃)



***N*-(2-Pyridyl)sulfonyl-1,2,3,4-tetrahydroquinoline (33)**

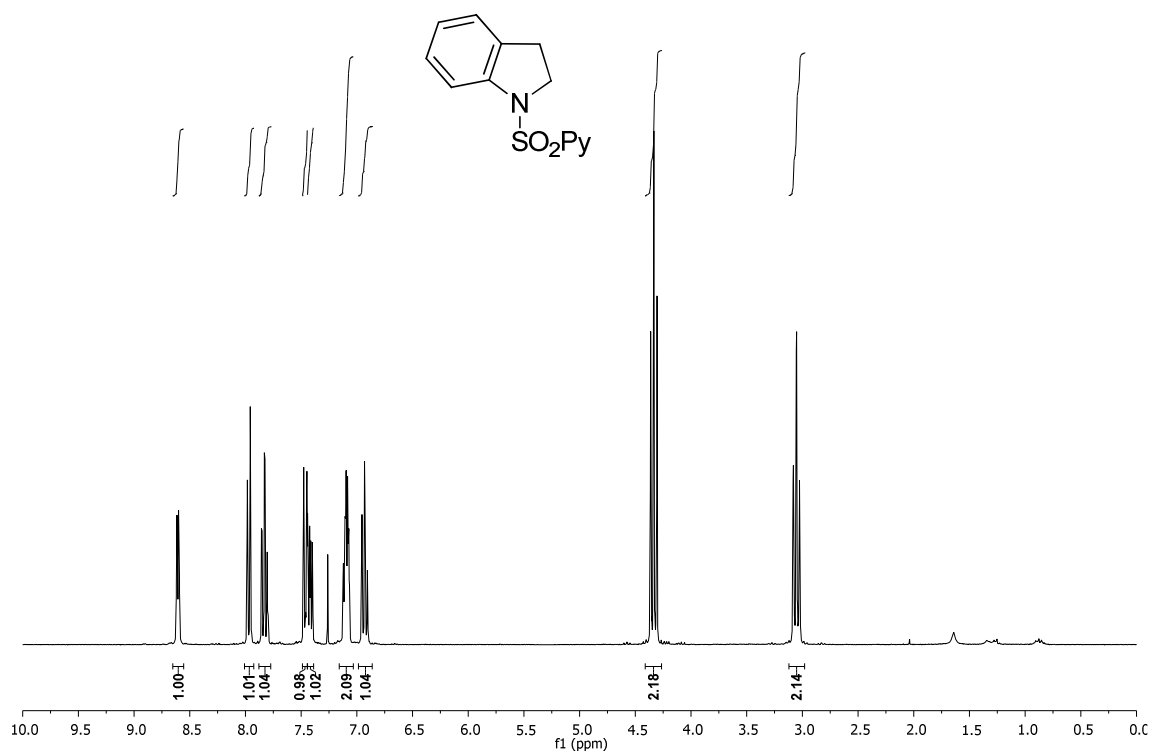
¹H NMR (300 MHz, CDCl₃)

8.51
8.51
8.50
8.49
8.48
7.69
7.67
7.56
7.51
7.17
7.17
7.16
7.14
6.84
6.82
6.81

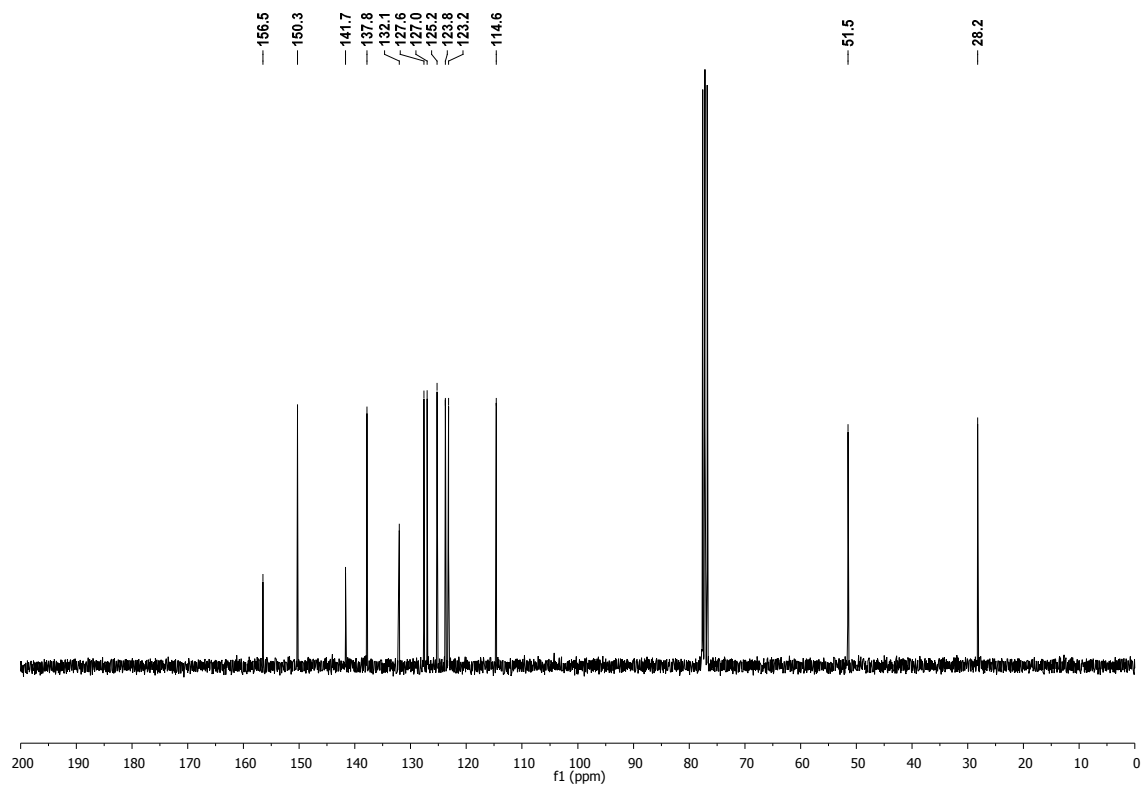


***N*-(2-Pyridyl)sulfonyl indoline (35)**

¹H NMR (300 MHz, CDCl₃)

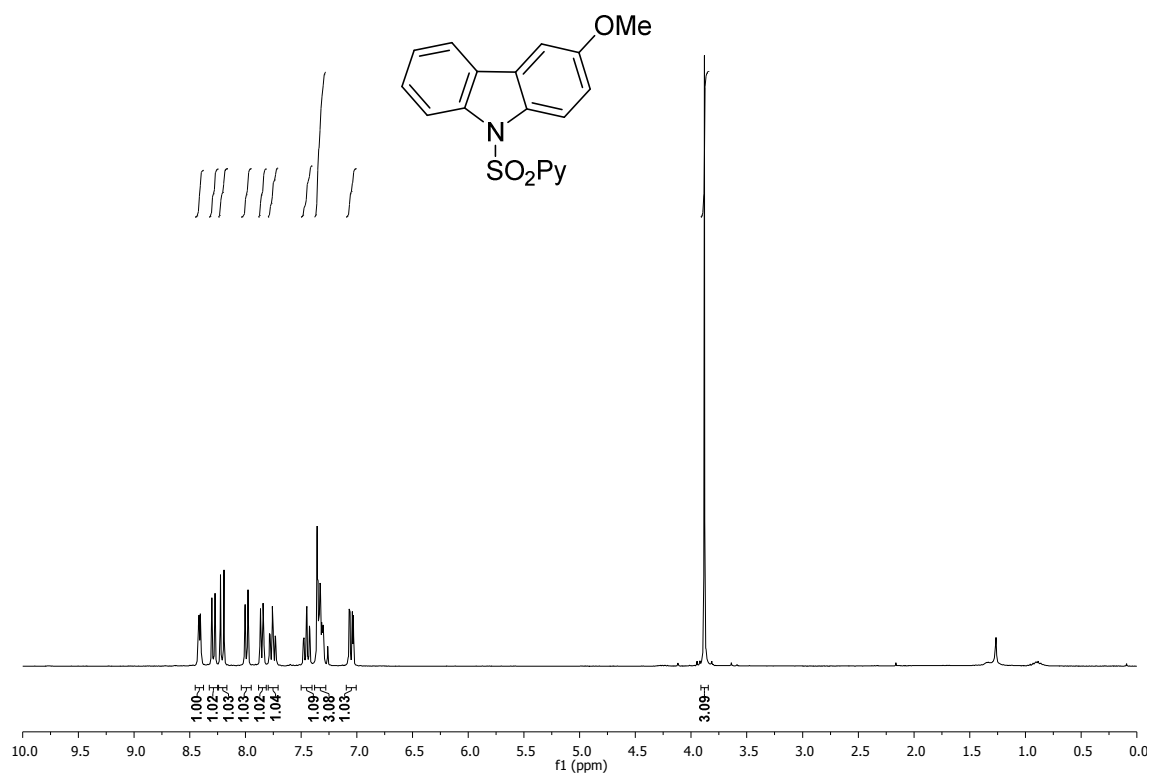


¹³C NMR (75 MHz, CDCl₃)

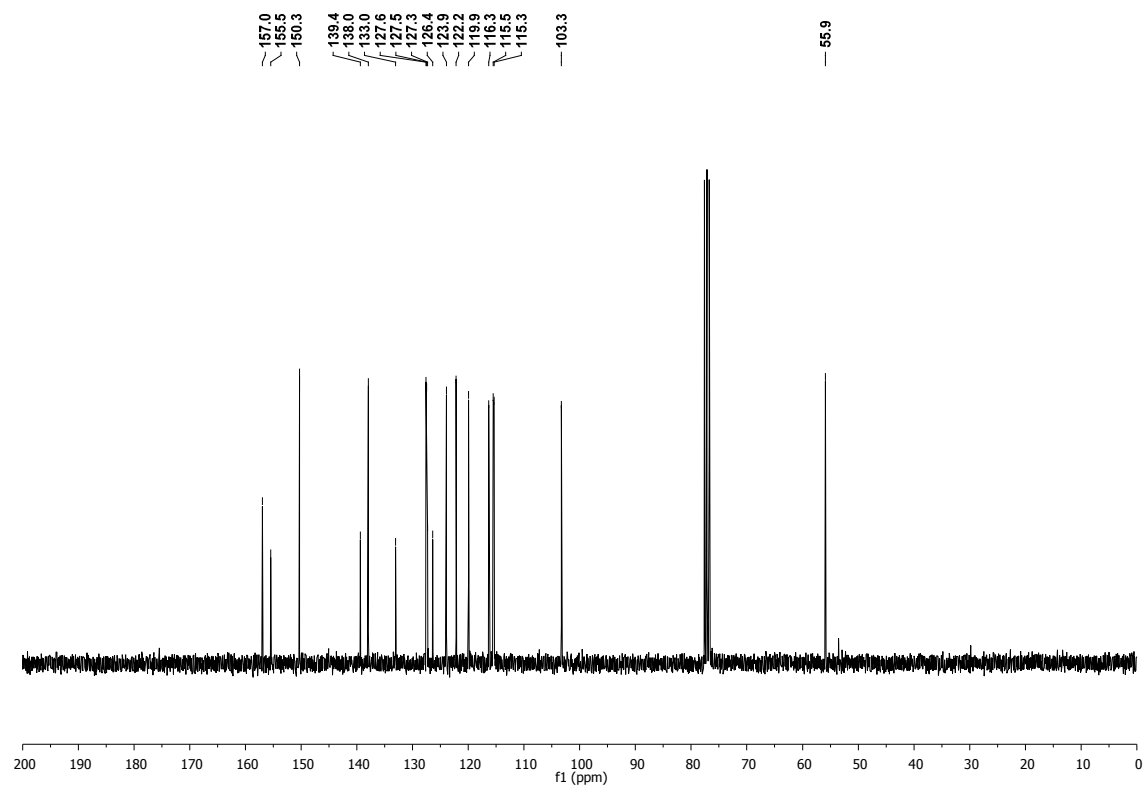


3-Methoxy-*N*-(2-pyridyl)sulfonyl-9H-carbazole (18)

¹H NMR (300 MHz, CDCl₃)

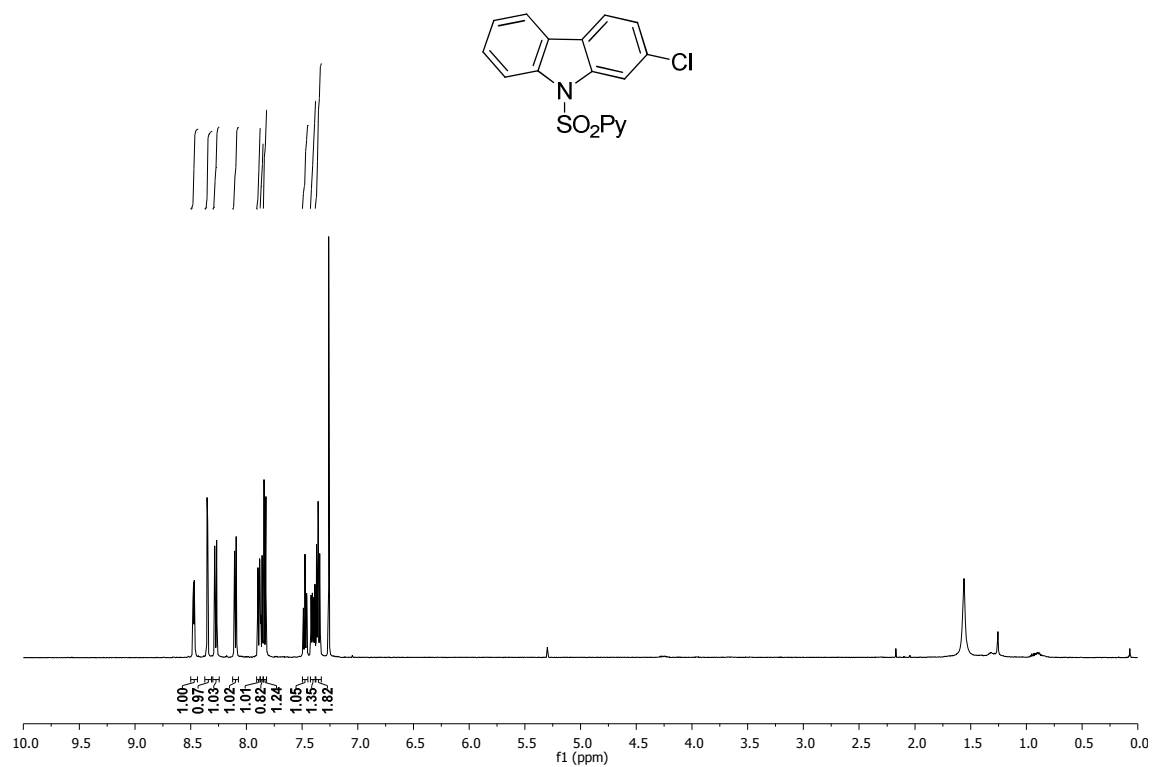


¹³C NMR (75 MHz, CDCl₃)

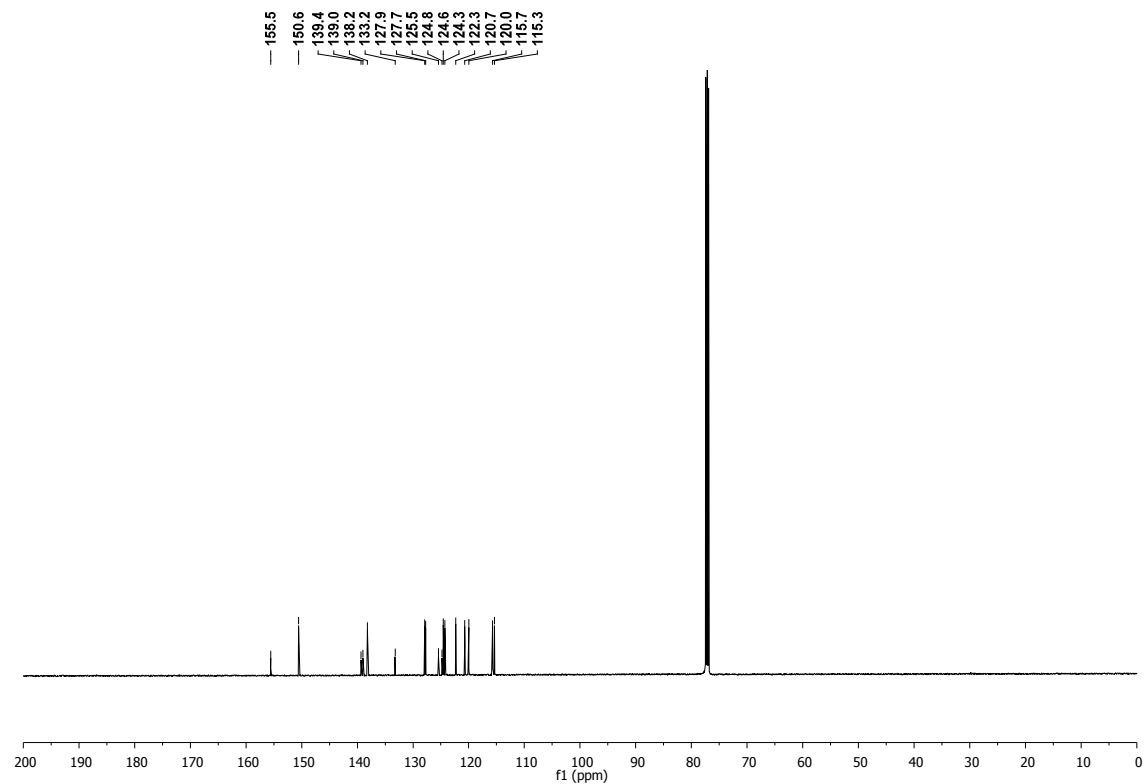


2-Chloro-N-2(pyridyl)sulfonyl-9H-carbazole (19)

^1H NMR (500 MHz, CDCl_3)

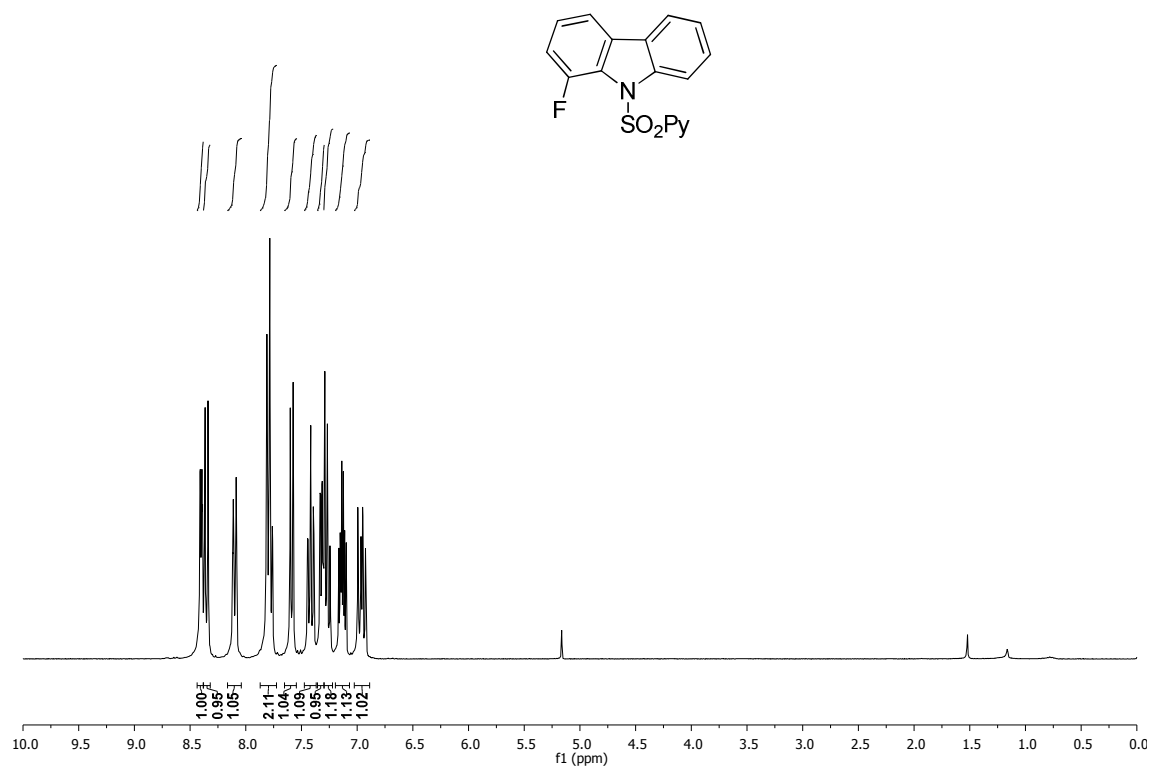


^{13}C NMR (125 MHz, CDCl_3)

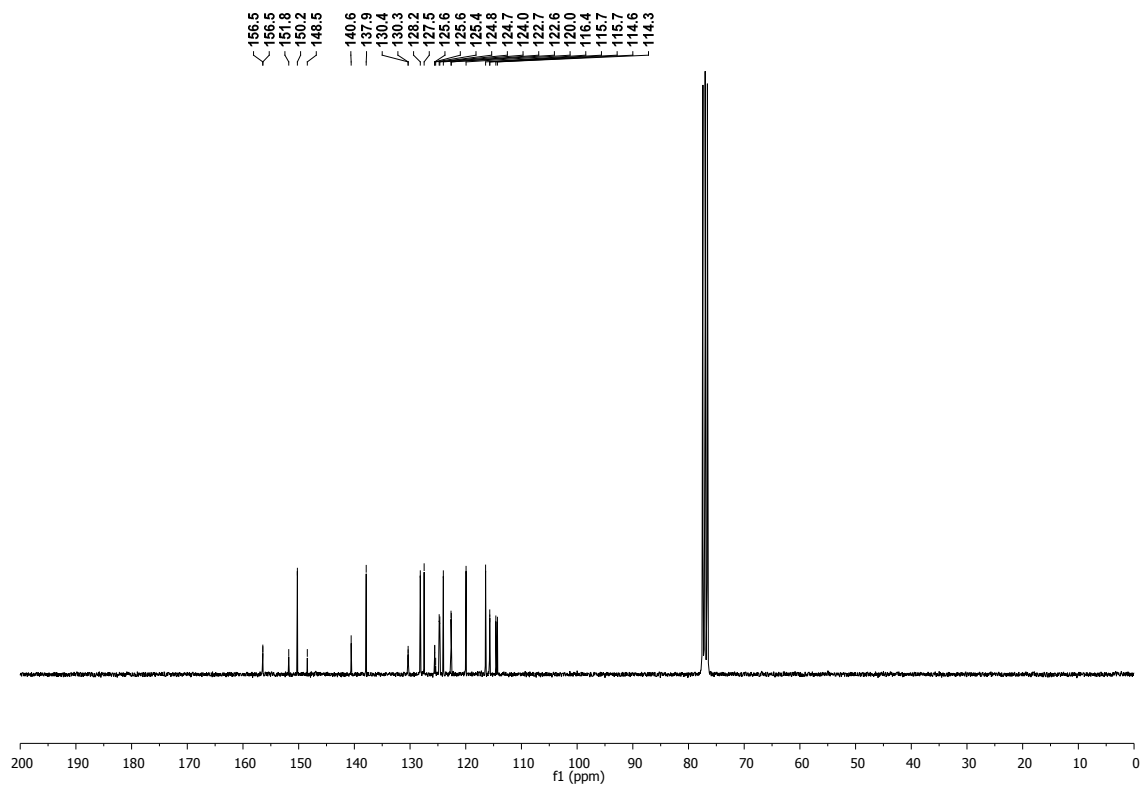


1-Fluoro-N-(2-pyridyl)sulfonyl-9H-carbazole (20)

^1H NMR (300 MHz, CDCl_3)

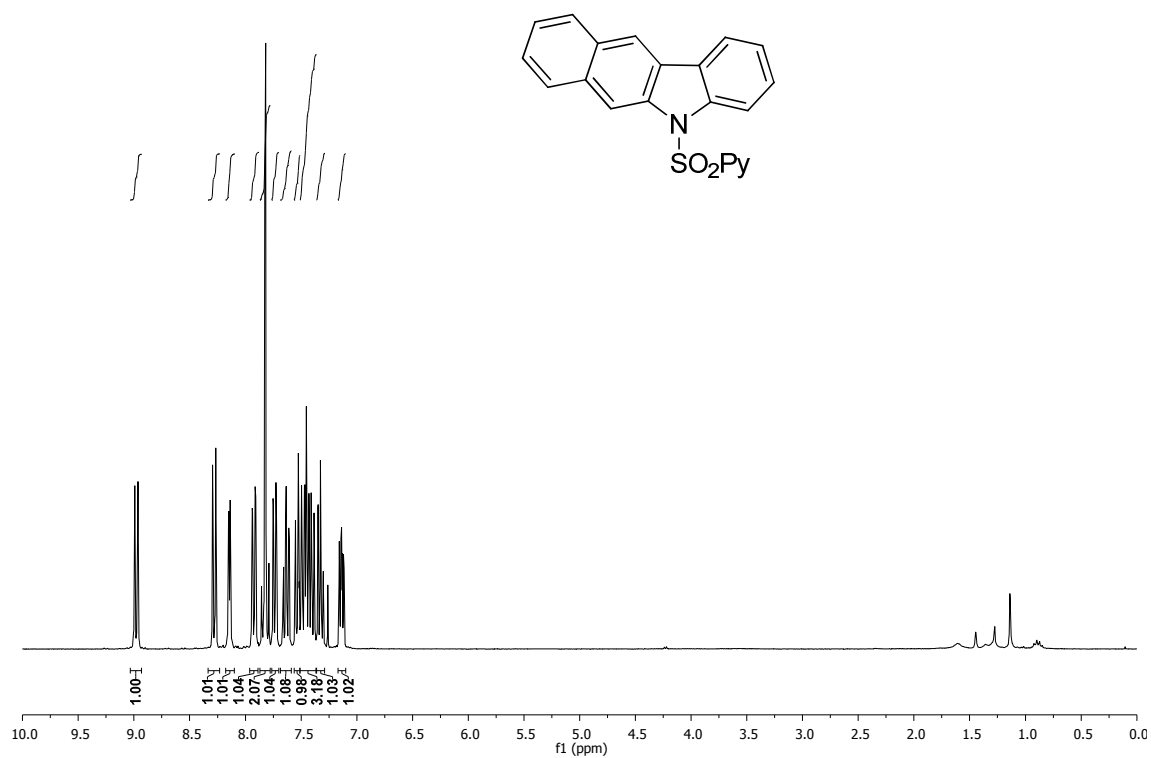


^{13}C NMR (75 MHz, CDCl_3)

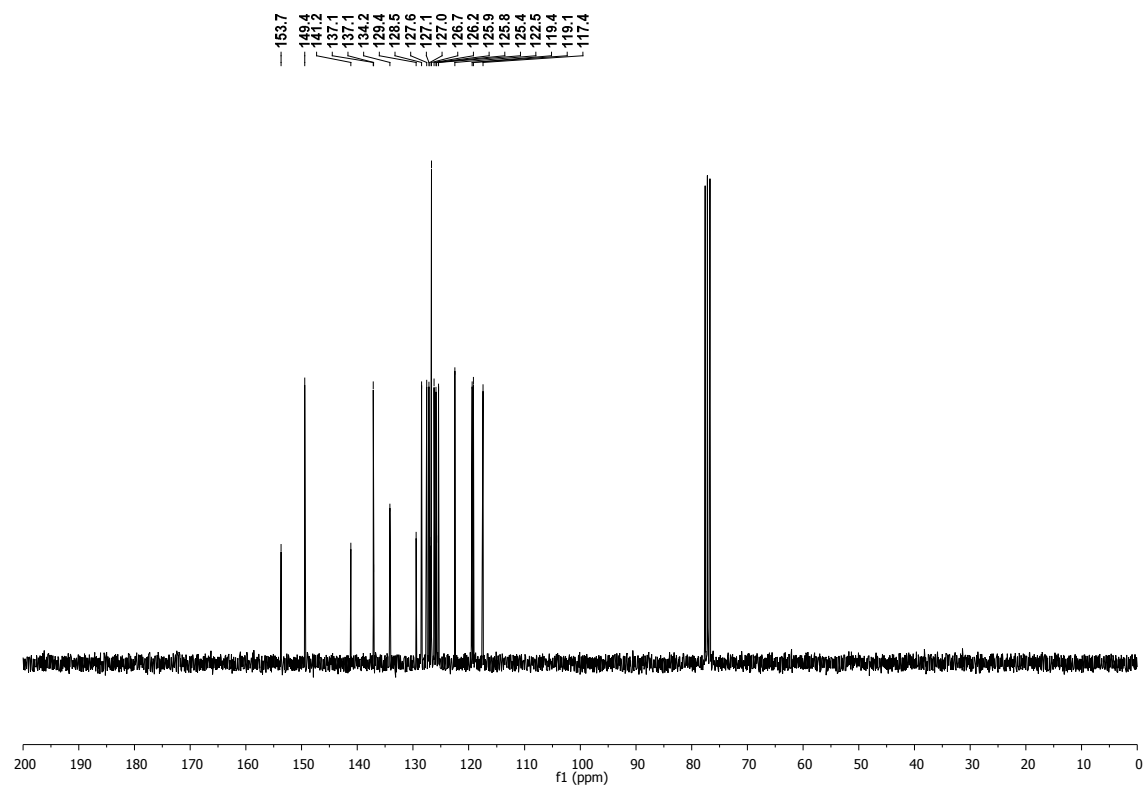


N-2(Pyridyl)sulfonyl-5H-benzo[*b*]carbazole (21)

¹H NMR (300 MHz, CDCl₃)

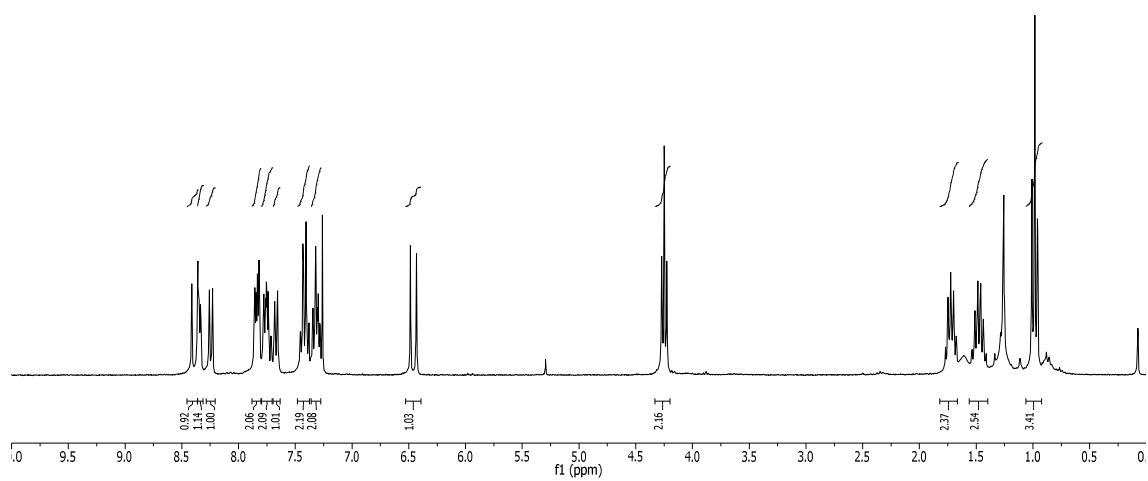
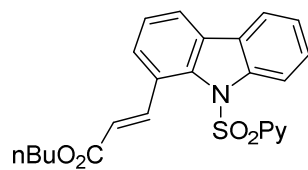


¹³C NMR (75 MHz, CDCl₃)

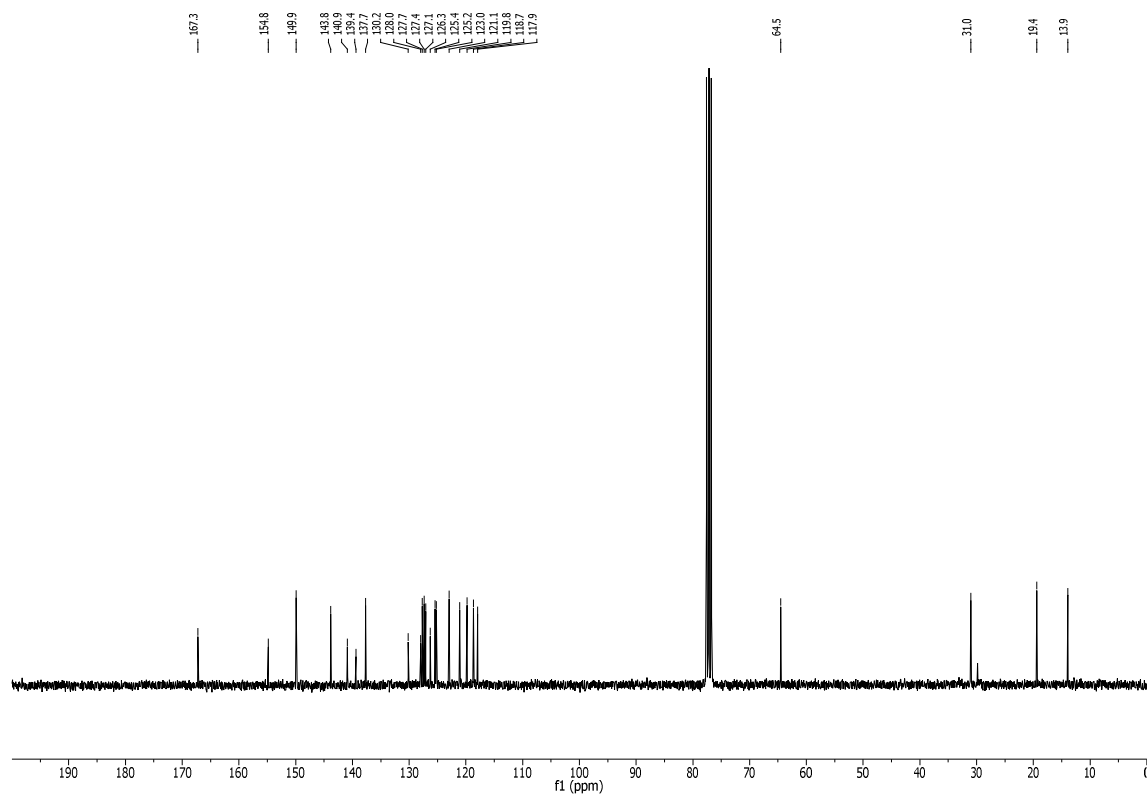


Butyl (*E*)-3-[*N*-(2-pyridyl)sulfonyl-9H-carbazol-1-yl]acrylate (**3**)

^1H NMR (300 MHz, CDCl_3)

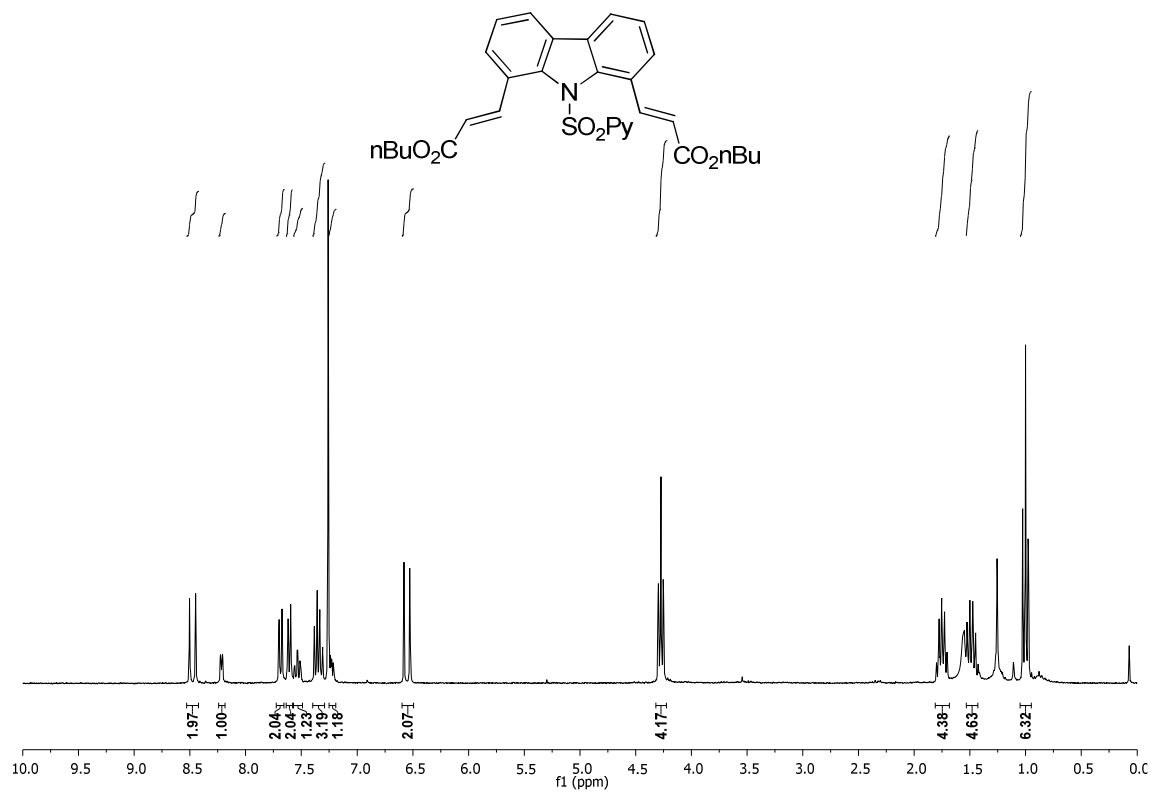


^{13}C NMR (75 MHz, CDCl_3)

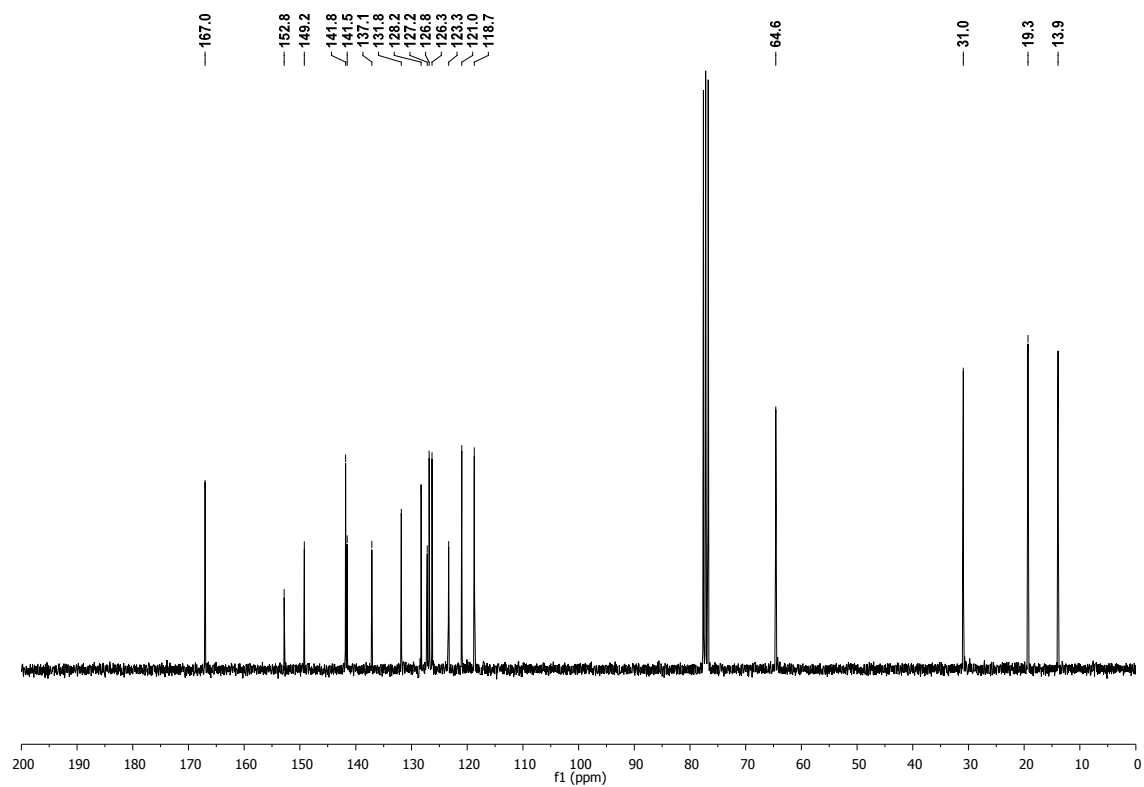


(*E,E*)-Dibutyl 3,3'-[*N*-(2-pyridyl)sulfonyl-9H-carbazole-1,8-diyl]diacrylate (4)

¹H NMR (300 MHz, CDCl₃)

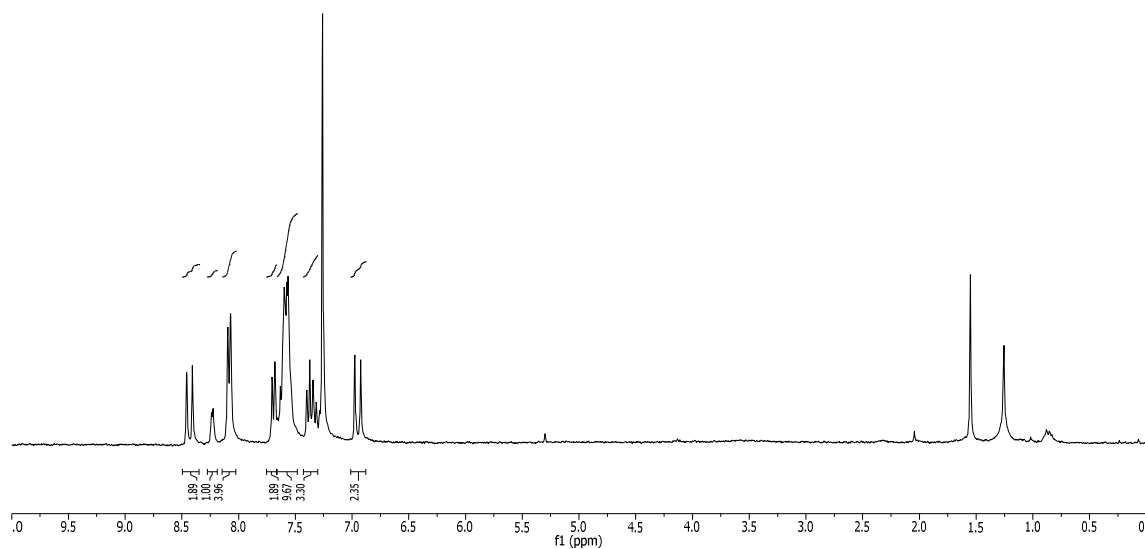
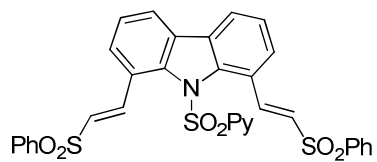


¹³C NMR (75 MHz, CDCl₃)

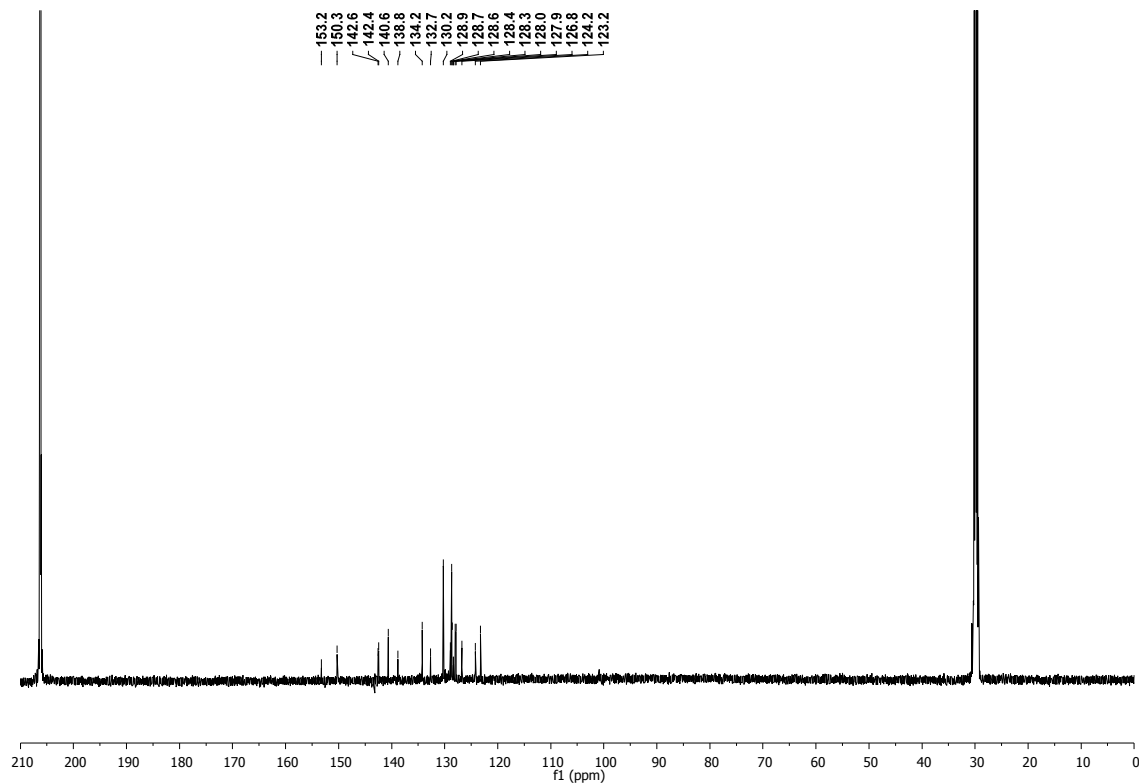


1,8-Bis[(*E*)-2-(phenylsulfonyl)vinyl]- *N*-(2-pyridyl)sulfonyl-9H-carbazole (8)

¹H NMR (300 MHz, CDCl₃)

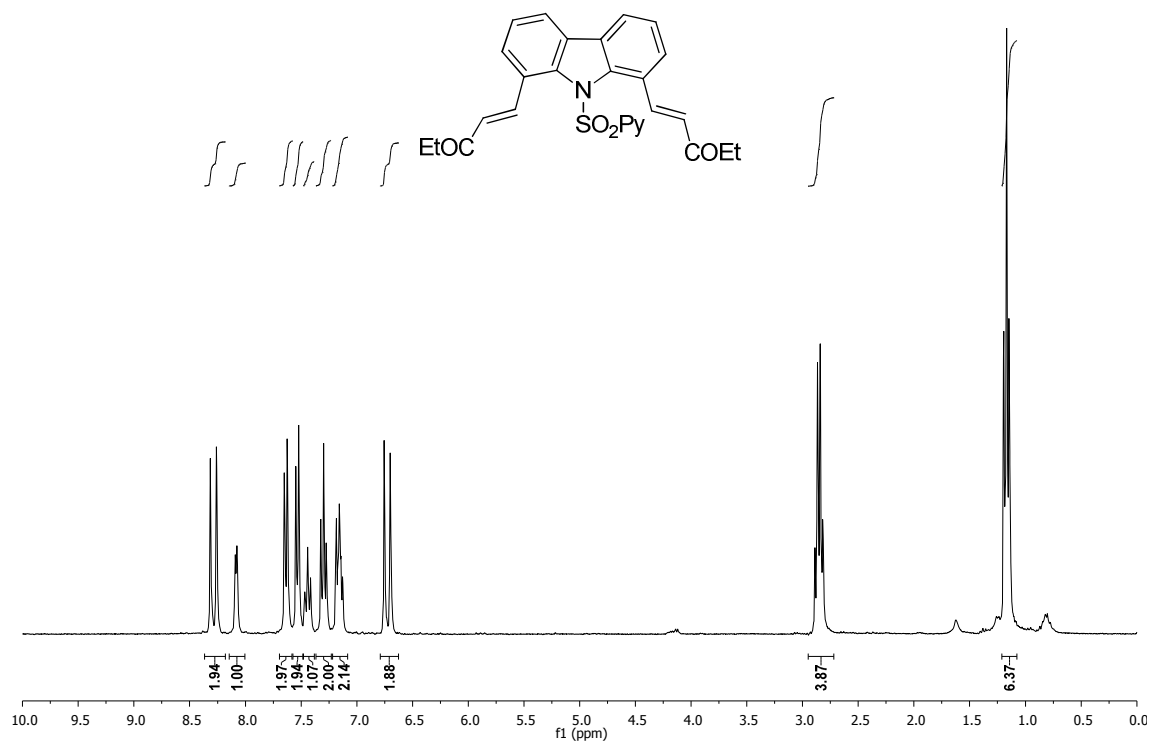


¹³C NMR (125 MHz, acetone-d₆)

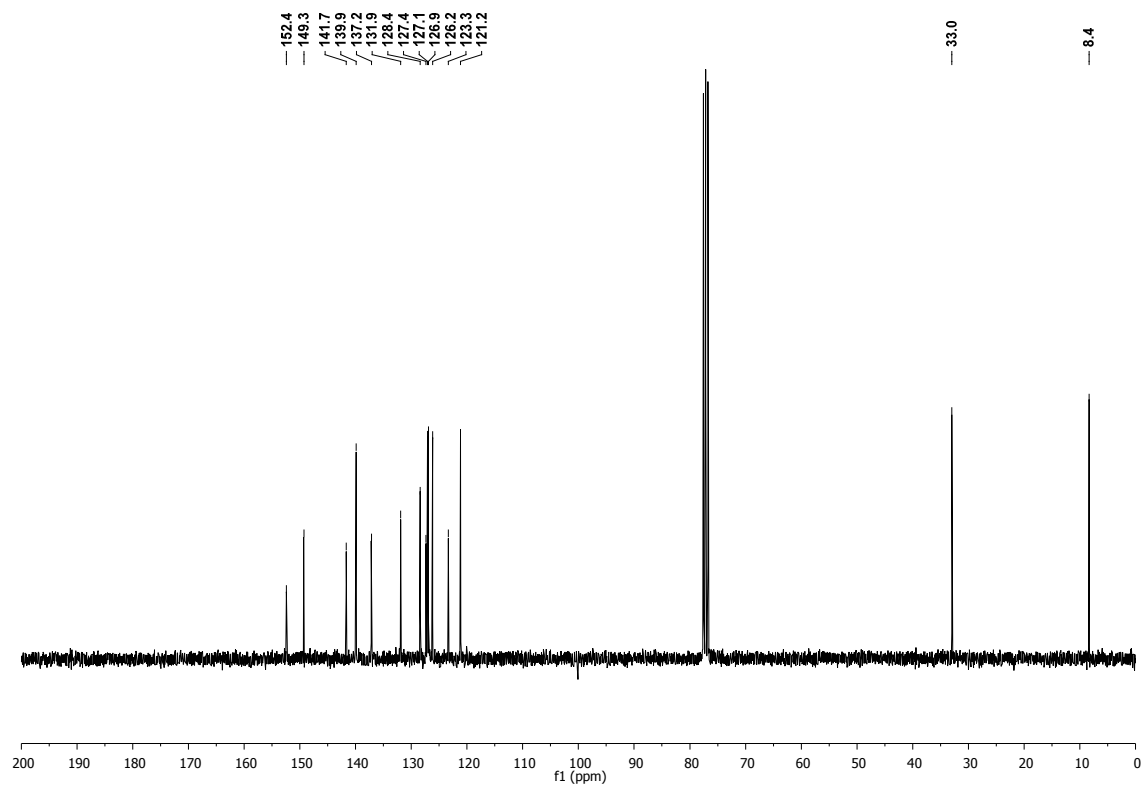


(*E,E*)-1,1'-[*N*-(2-Pyridyl)sulfonyl-9H-carbazole-1,8-diyl]bis(pent-1-en-3-one) (9)

¹H NMR (300 MHz, CDCl₃)

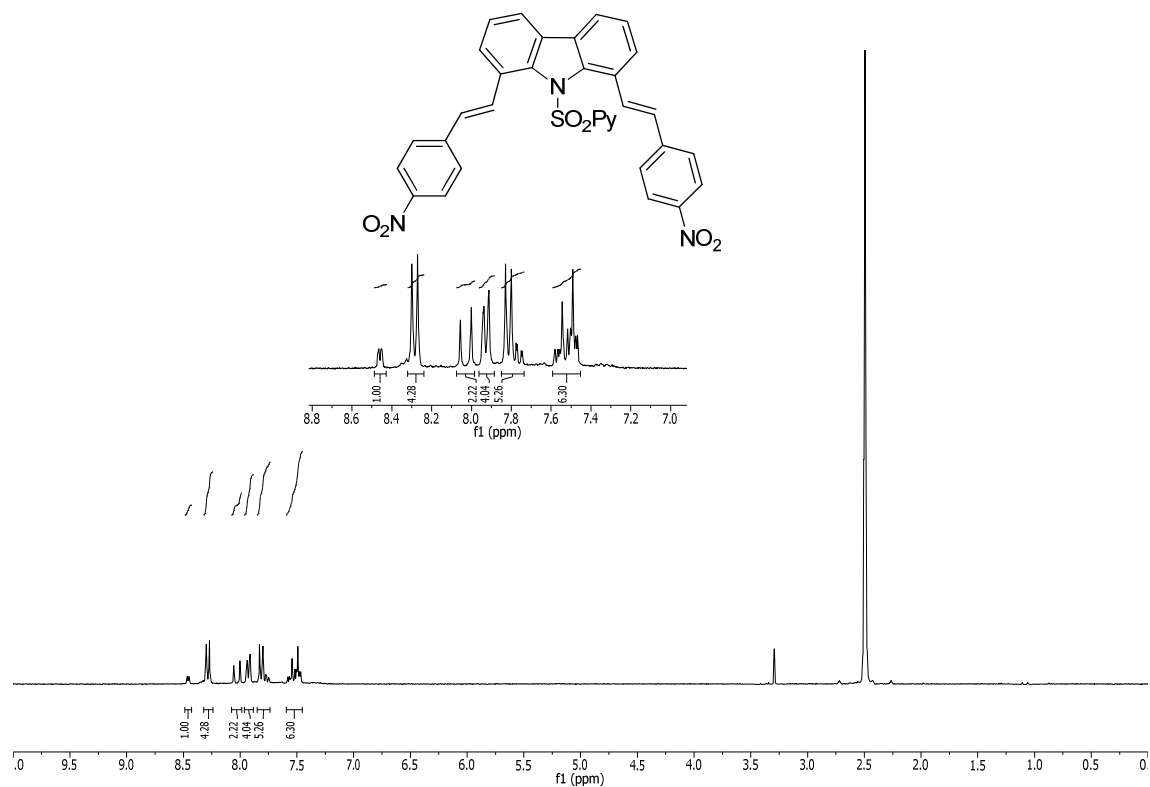


¹³C NMR (75 MHz, CDCl₃)

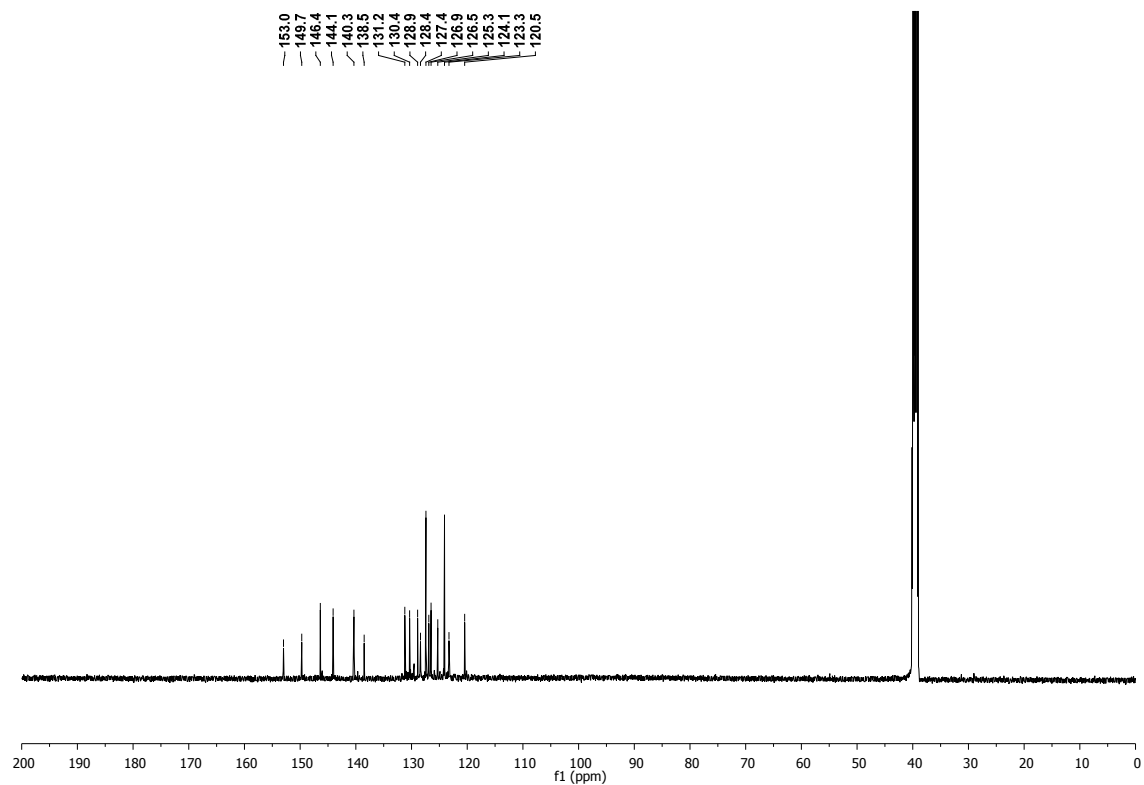


1,8-Bis[(*E*)-4-nitrostyryl]- *N*-(2-pyridyl)sulfonyl-9H-carbazole (10)

¹H NMR (300 MHz, DMSO-d₆)

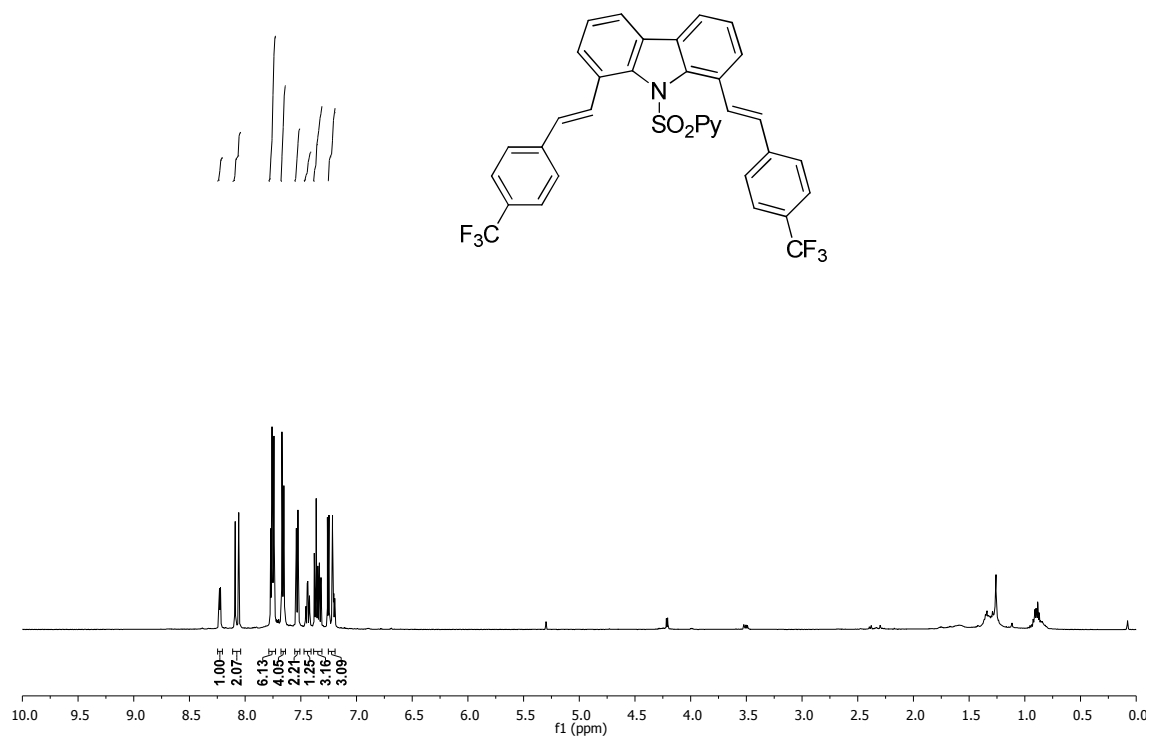


¹³C NMR (125 MHz, DMSO-d₆)

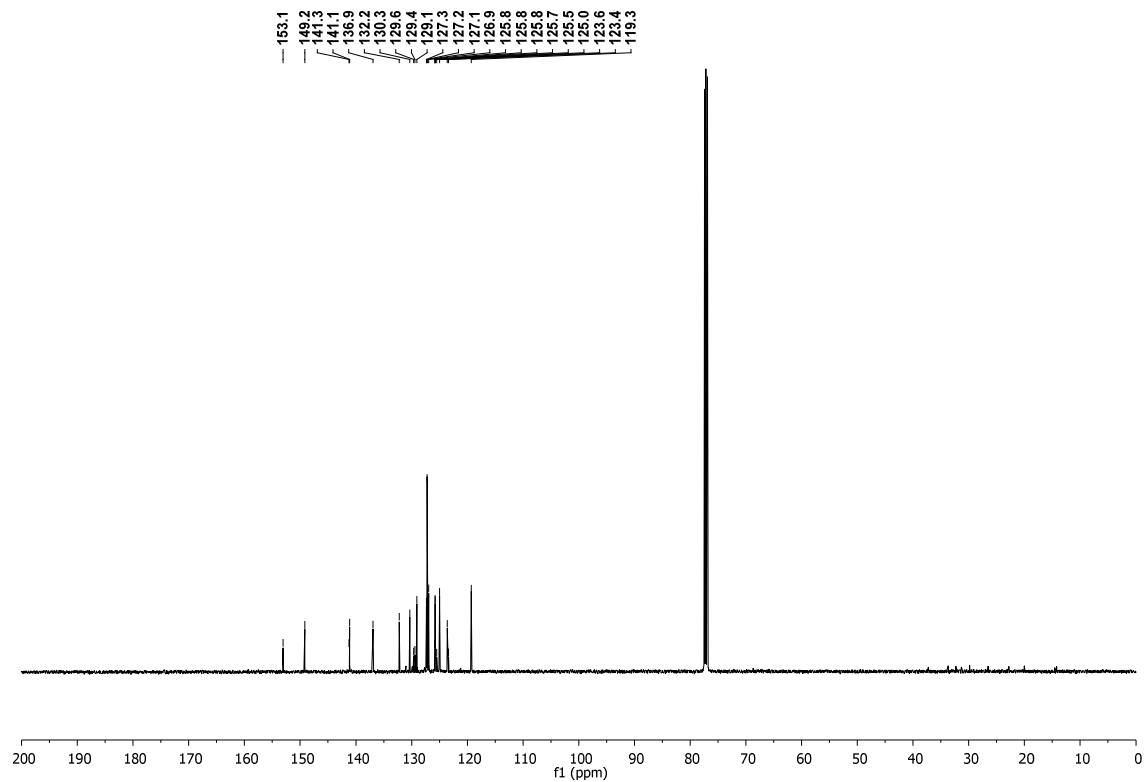


1,8-Bis[(*E*)-4-(trifluoromethyl)styryl]-*N*-(2-pyridyl)sulfonyl-9H-carbazole (11)

^1H NMR (500 MHz, CDCl_3)



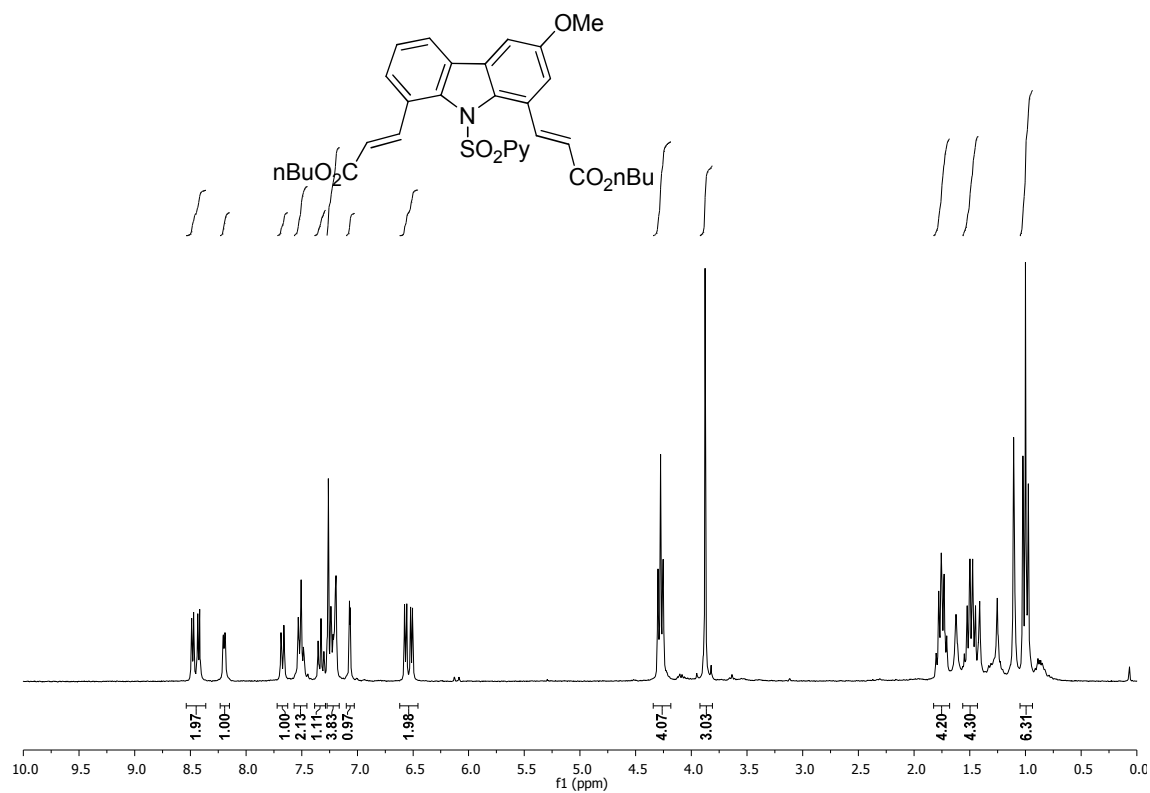
^{13}C NMR (125 MHz, CDCl_3)



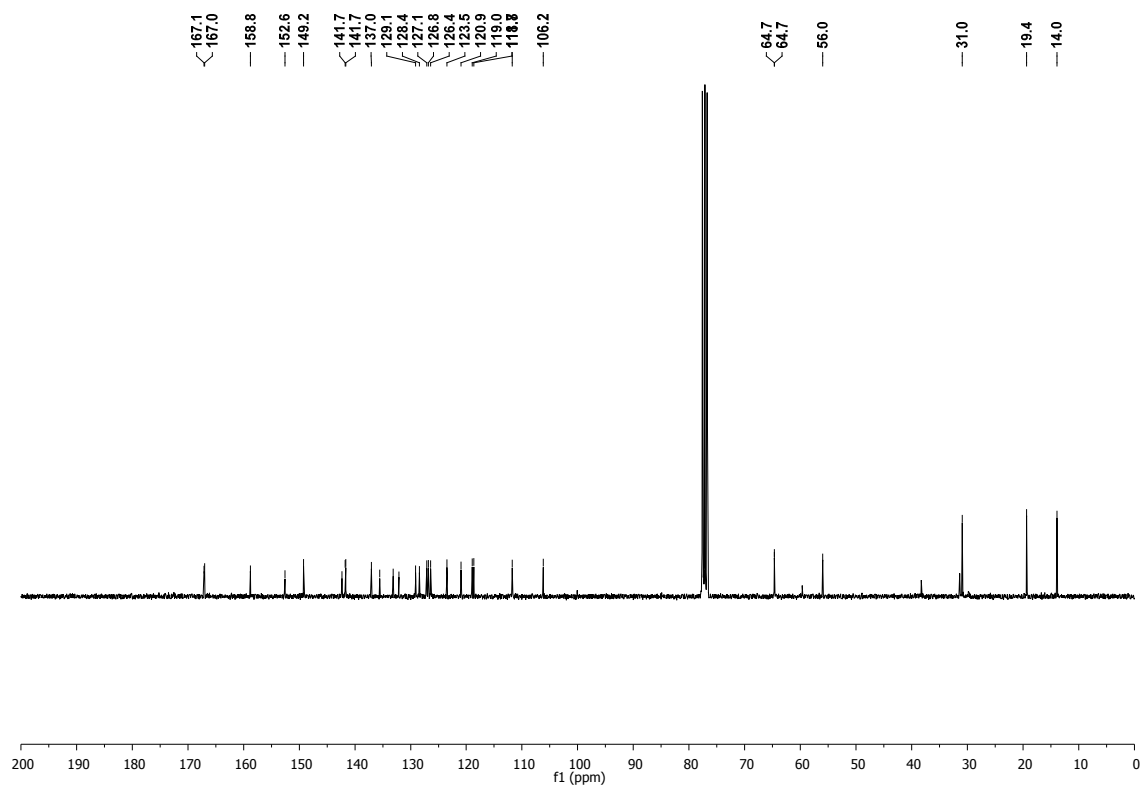
**(*E,E*)-Dibutyl
diyl]diacrylate (24)**

3,3'-[3-methoxy-*N*-(2-pyridyl)sulfonyl-9H-carbazole-1,8-

¹H NMR (300 MHz, CDCl₃)

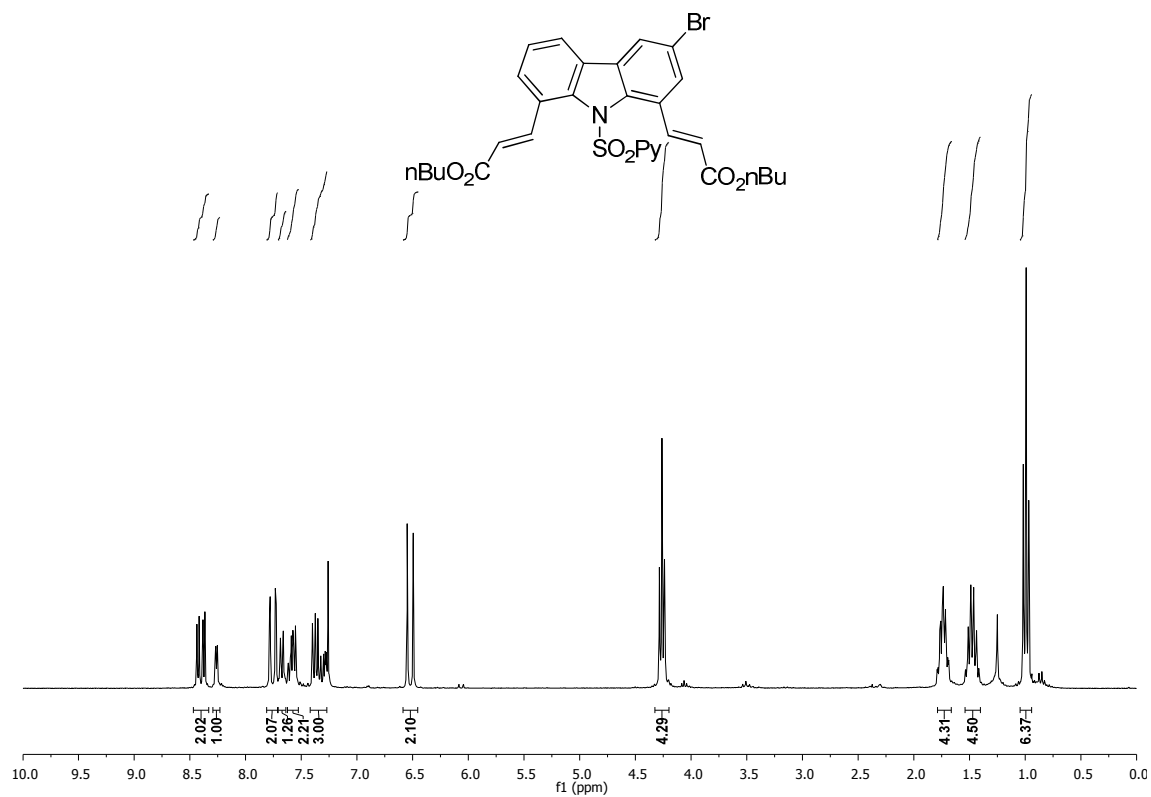


¹³C NMR (75 MHz, CDCl₃)

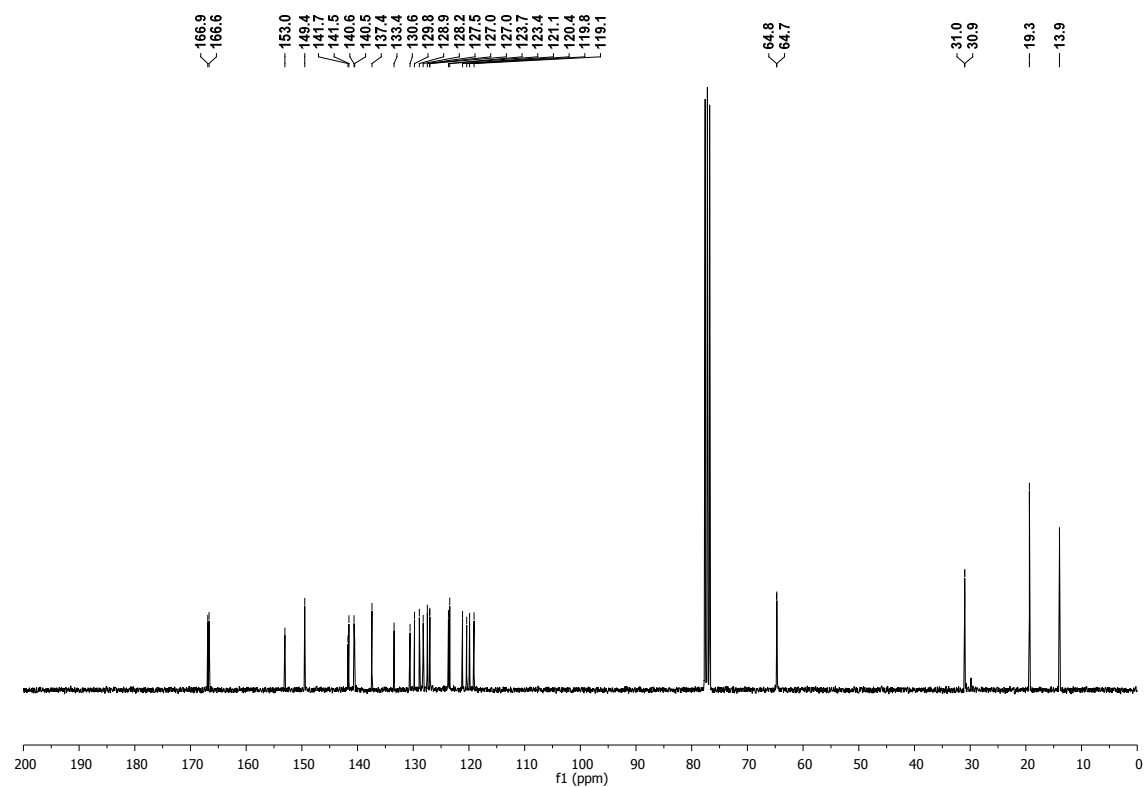


(*E,E*)-Dibutyl 3,3'-[3-bromo-*N*-(2-pyridyl)sulfonyl-9H-carbazole-1,8-diyl]diacrylate (25)

¹H NMR (300 MHz, CDCl₃)



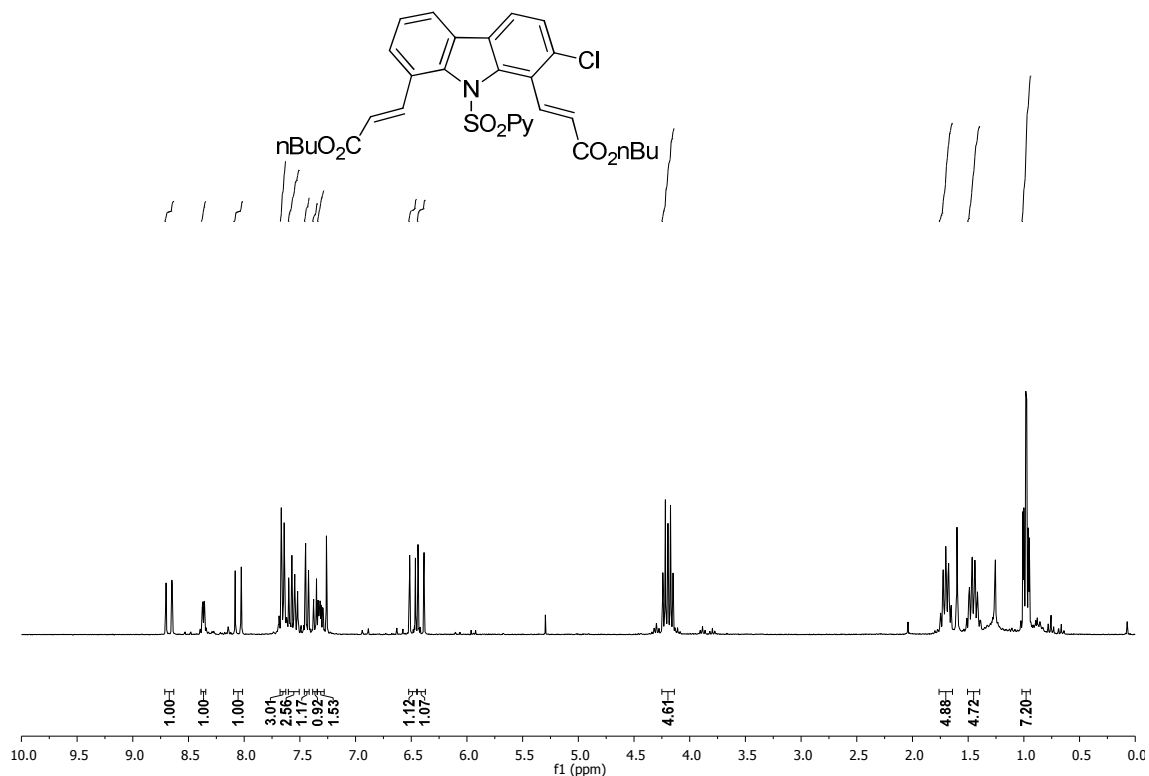
¹³C NMR (75 MHz, CDCl₃)



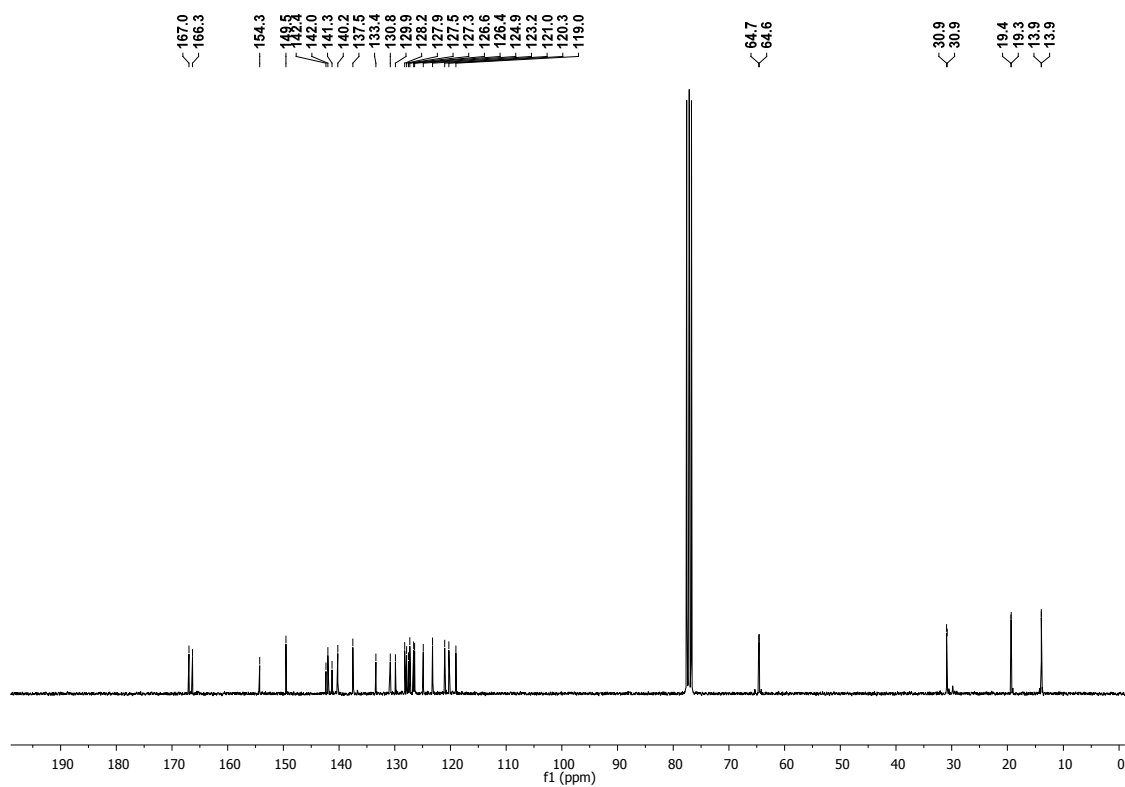
(*E,E*)-Dibutyl 3,3'-[2-chloro-*N*-(2-pyridyl)sulfonyl-9H-carbazole-1,8-diyl]diacrylate

(26)

¹H NMR (300 MHz, CDCl₃)

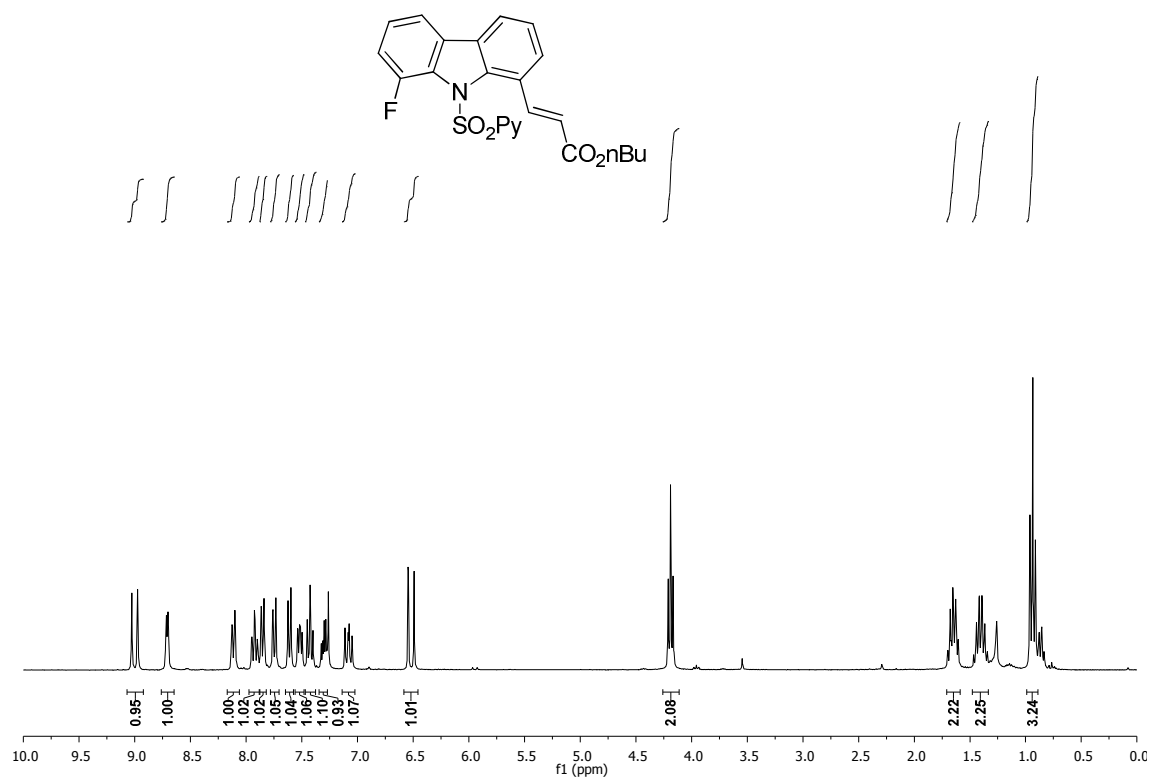


¹³C NMR (75 MHz, CDCl₃)

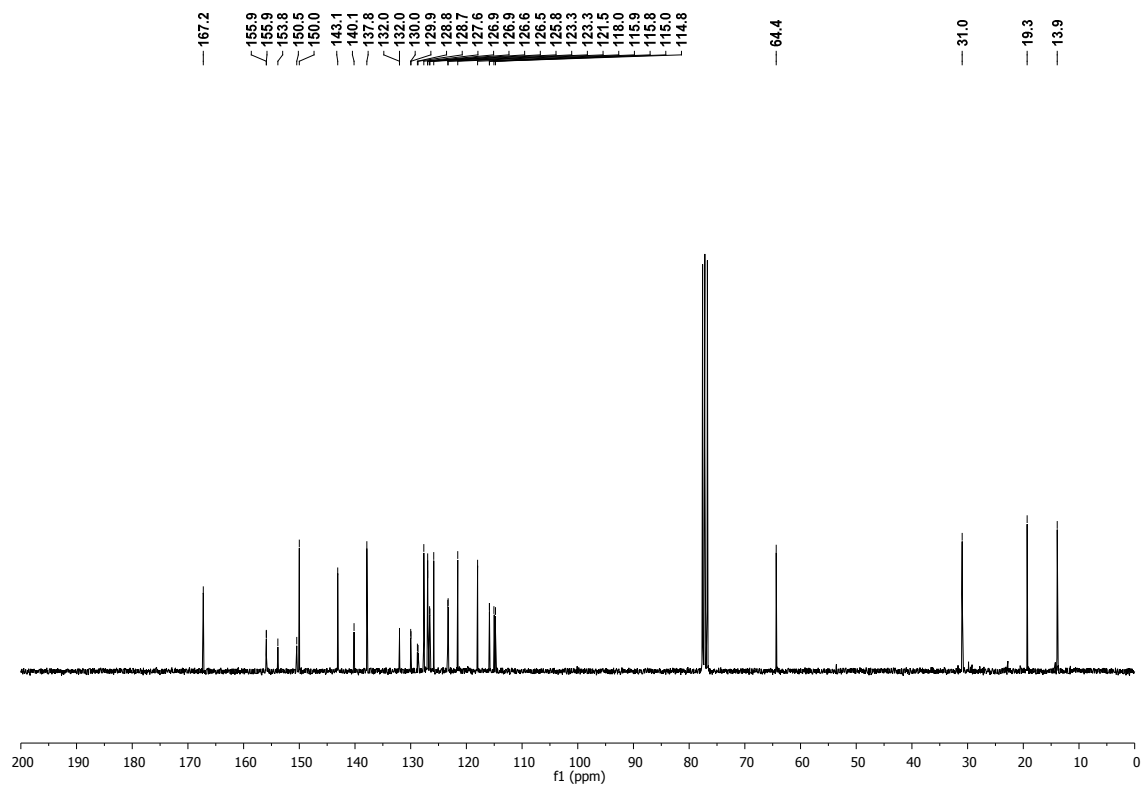


(E)-Butyl 3-[8-fluoro-N-(2-pyridyl)sulfonyl-9H-carbazol-1-yl]acrylate (27)

¹H NMR (300 MHz, CDCl₃)

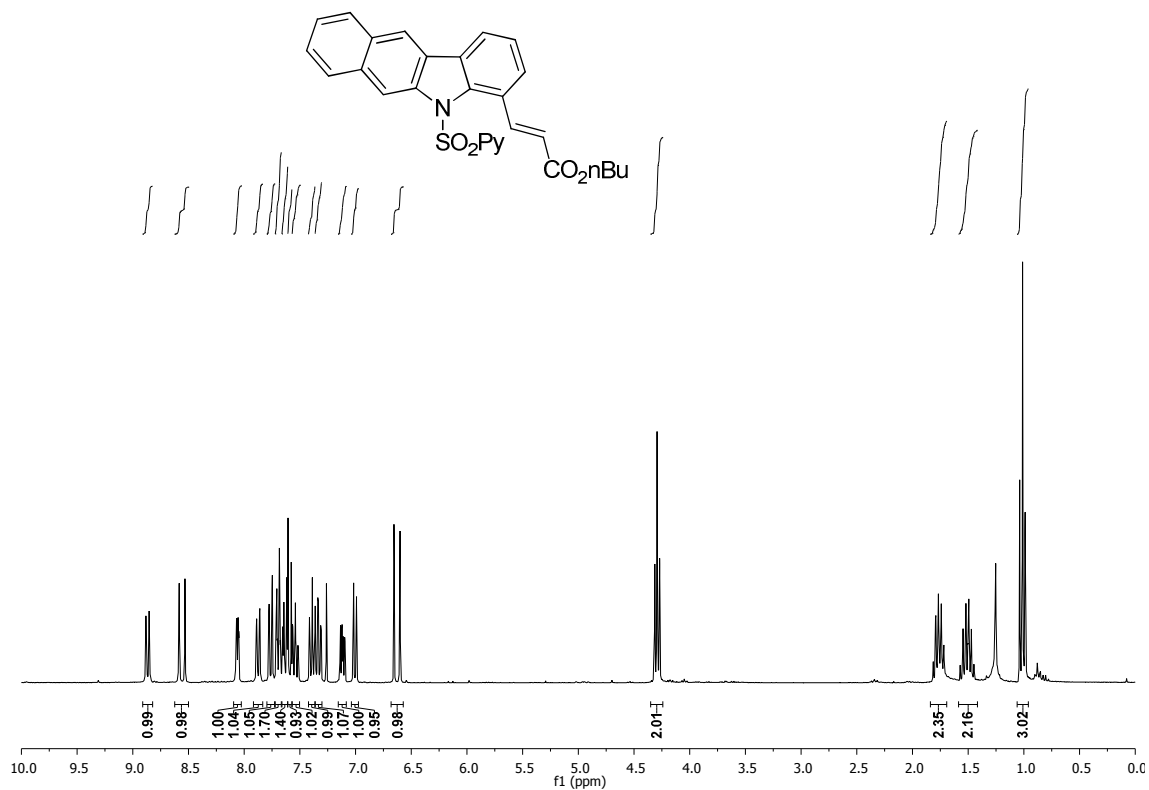


¹³C NMR (75 MHz, CDCl₃)

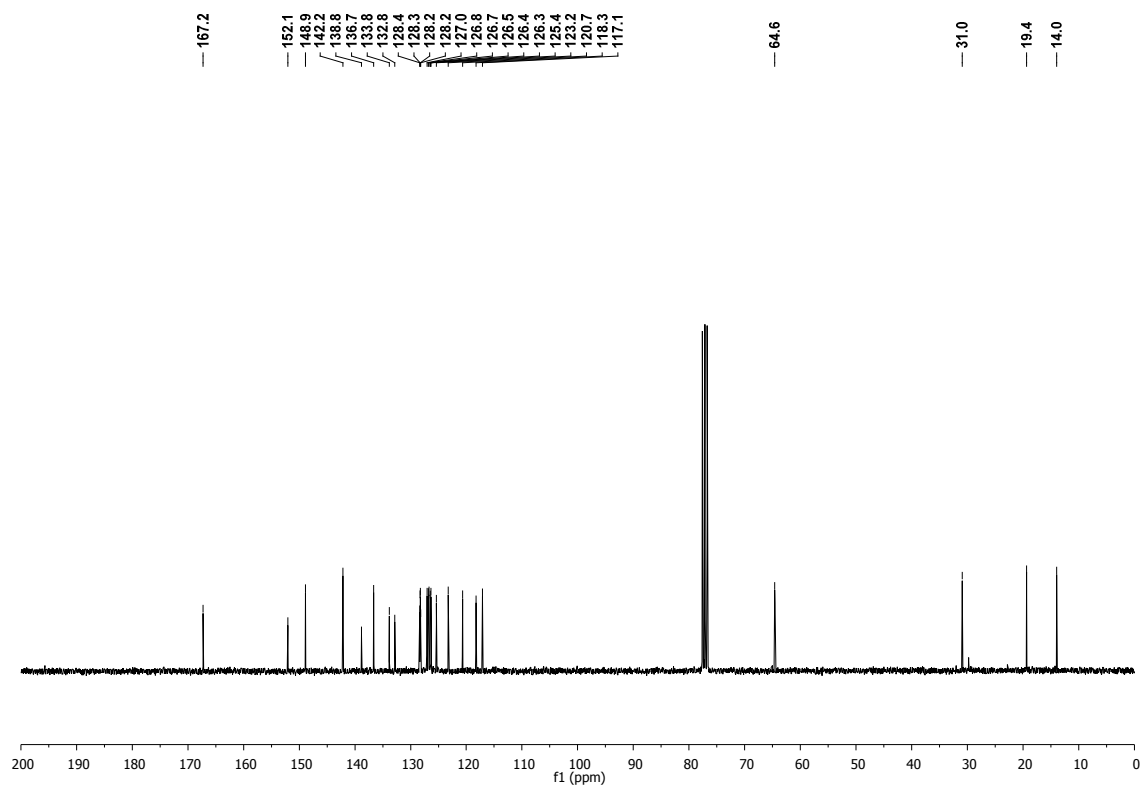


(E)-Butyl 3-{N-(2-pyridyl)sulfonyl-5H-benzo[b]carbazol-4-yl}acrylate (28)

¹H NMR (300 MHz, CDCl₃)

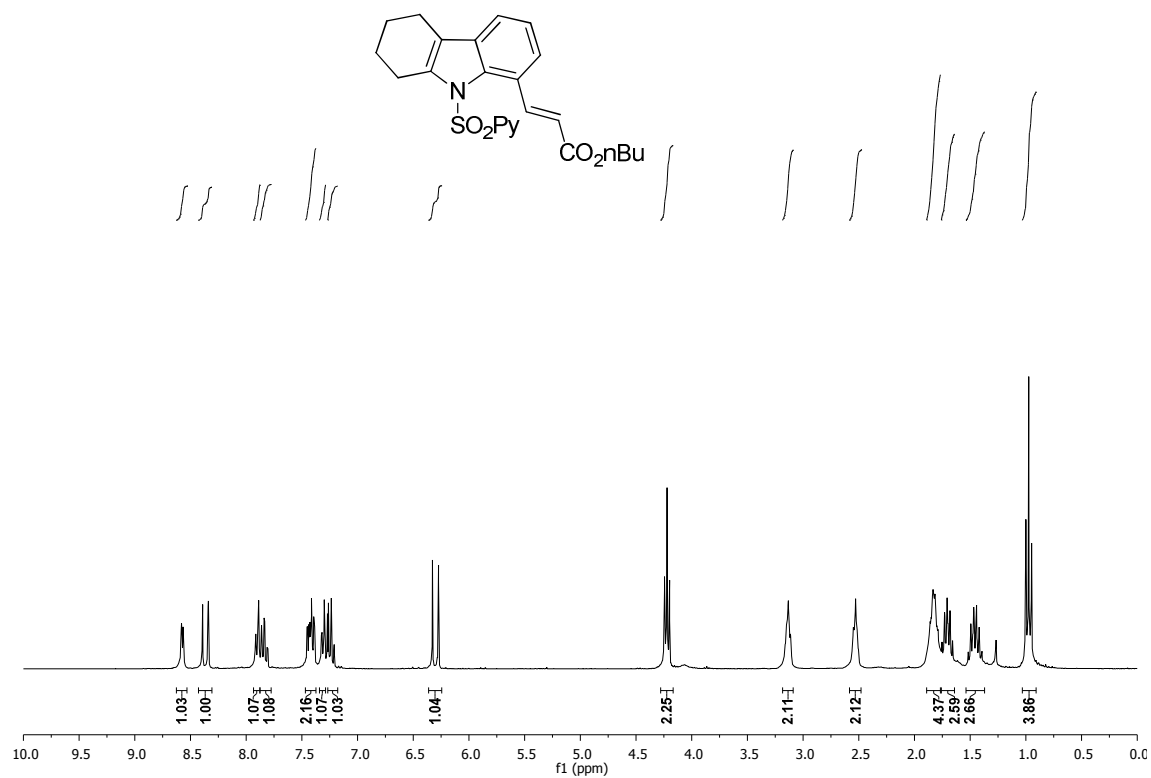


¹³C NMR (75 MHz, CDCl₃)

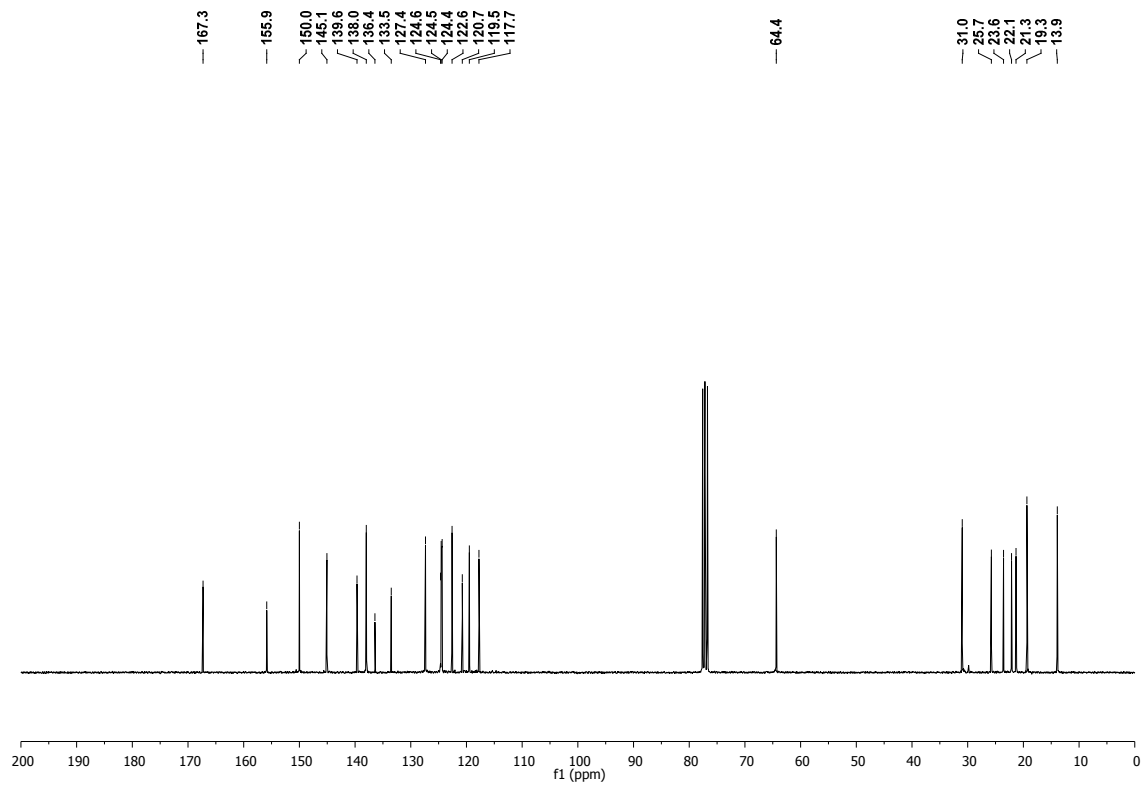


(E)-Butyl 3-N-(2-pyridyl)sulfonyl-2,3,4,9-tetrahydro-1H-carbazol-8-yl]acrylate (29)

¹H NMR (300 MHz, CDCl₃)

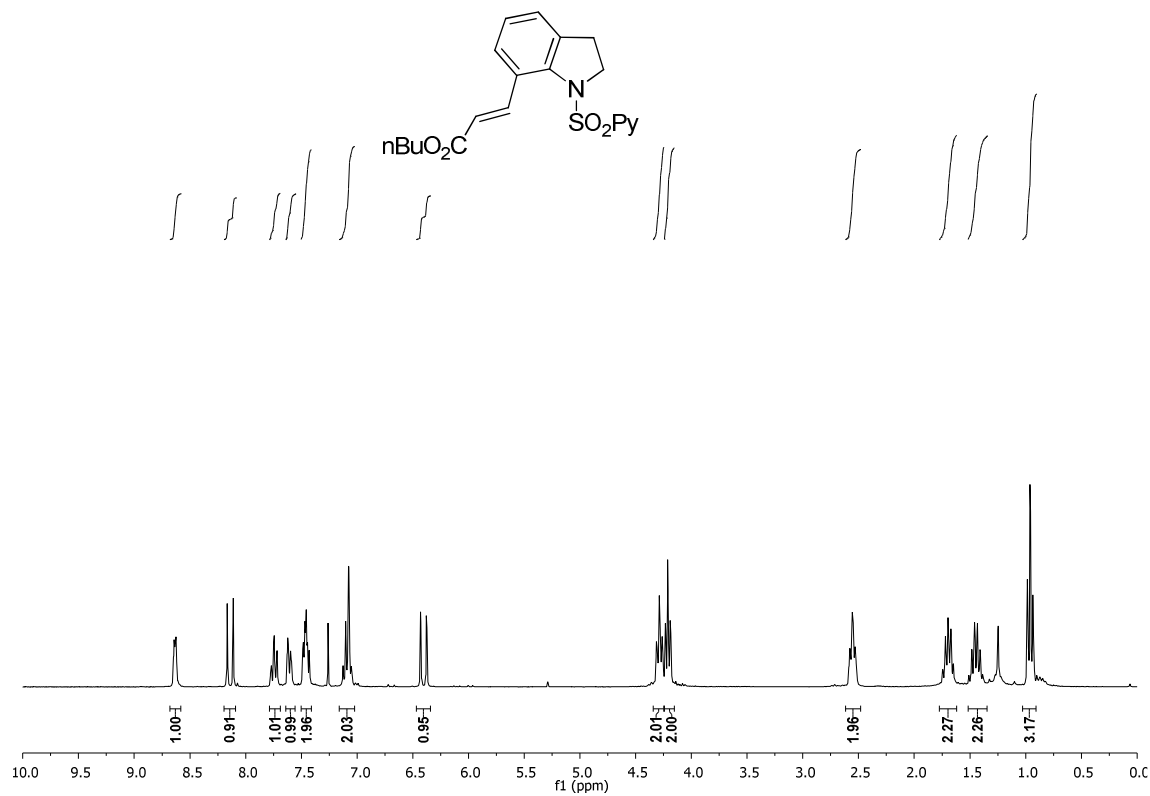


¹³C NMR (75 MHz, CDCl₃)

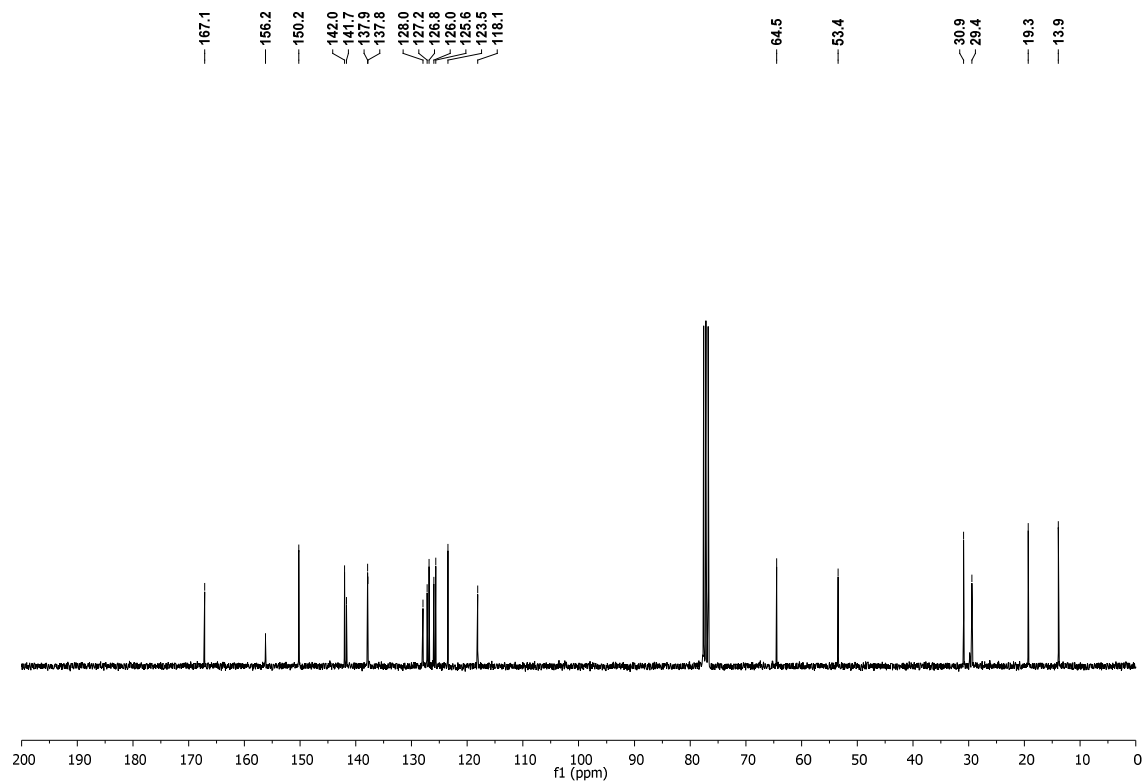


(E)-Butyl 3-[N-(2-pyridyl)sulfonyl]indolin-7-yl]acrylate (38)

¹H NMR (300 MHz, CDCl₃)

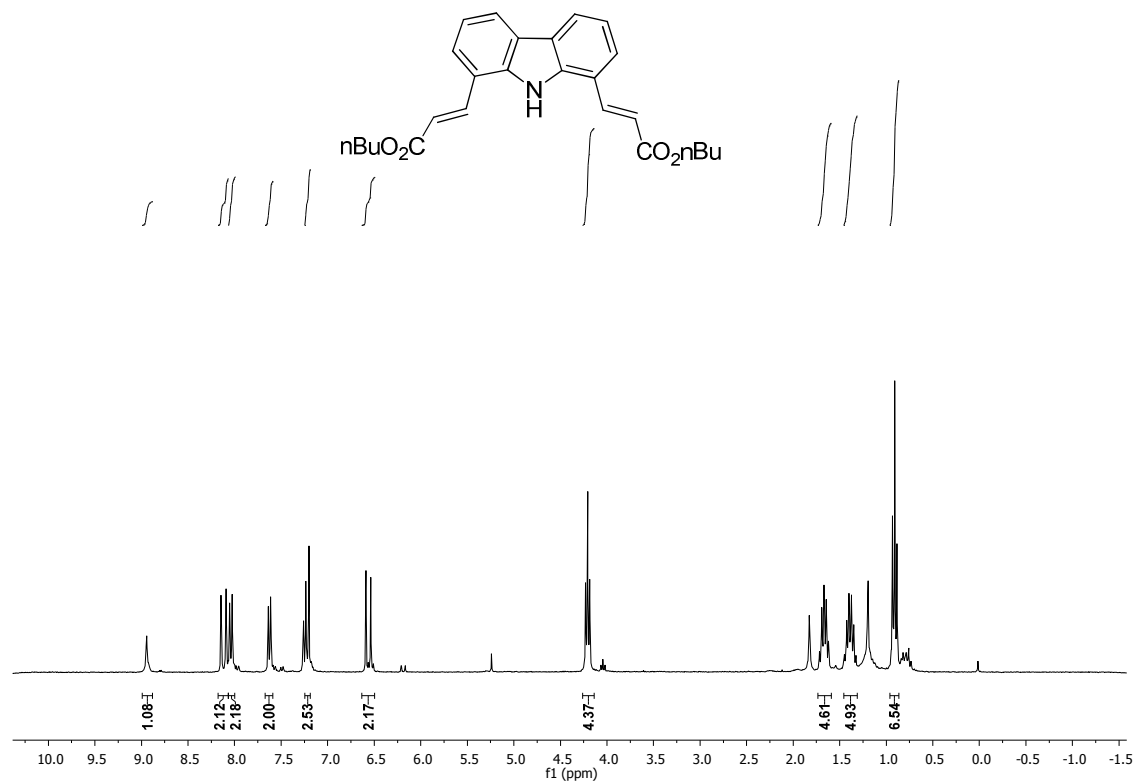


¹³C NMR (75 MHz, CDCl₃)

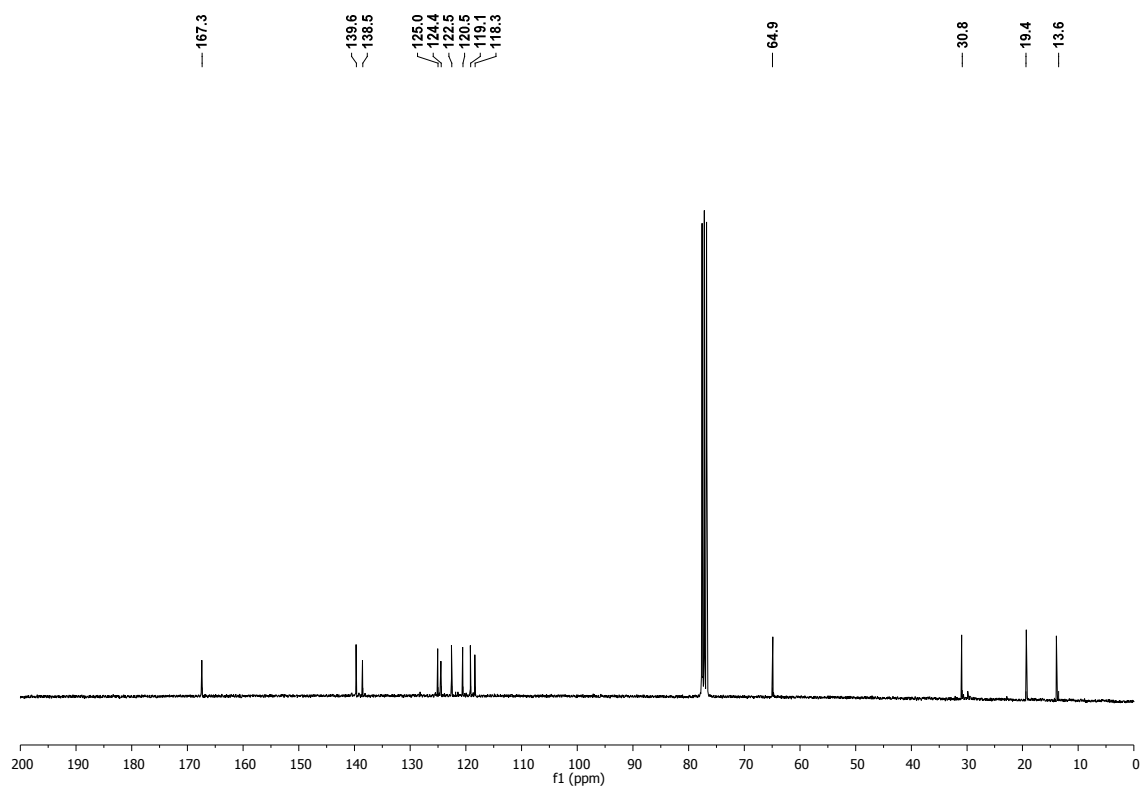


(*E,E*)-dibutyl 3,3'-(9H-carbazole-1,8-diyl)diacrylate (39)

¹H NMR (300 MHz, CDCl₃)

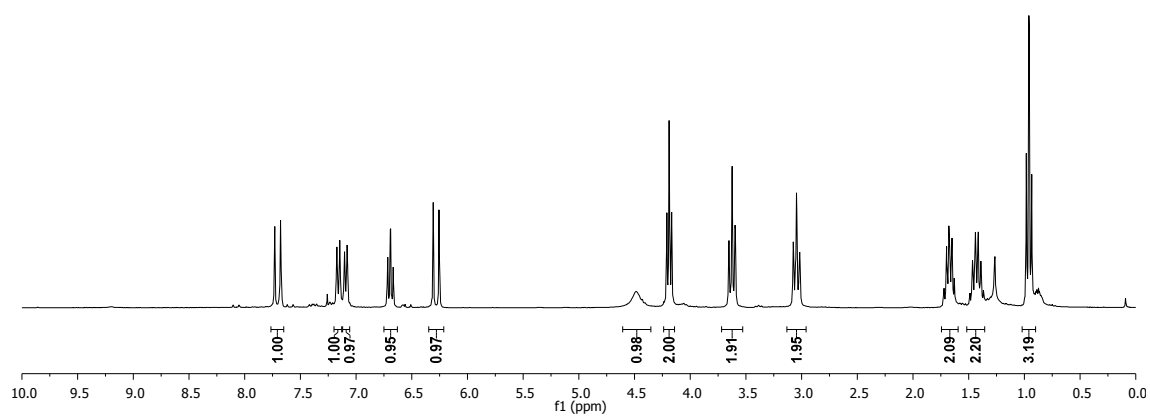
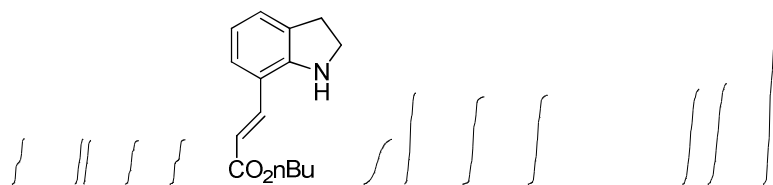


¹³C NMR (75 MHz, CDCl₃)



(E)-Butyl 3-(indolin-7-yl)acrylate (41)

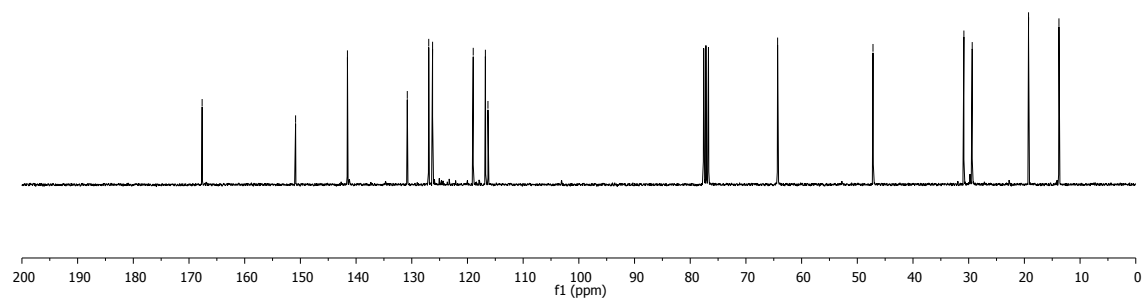
¹H NMR (300 MHz, CDCl₃)



¹³C NMR (75 MHz, CDCl₃)

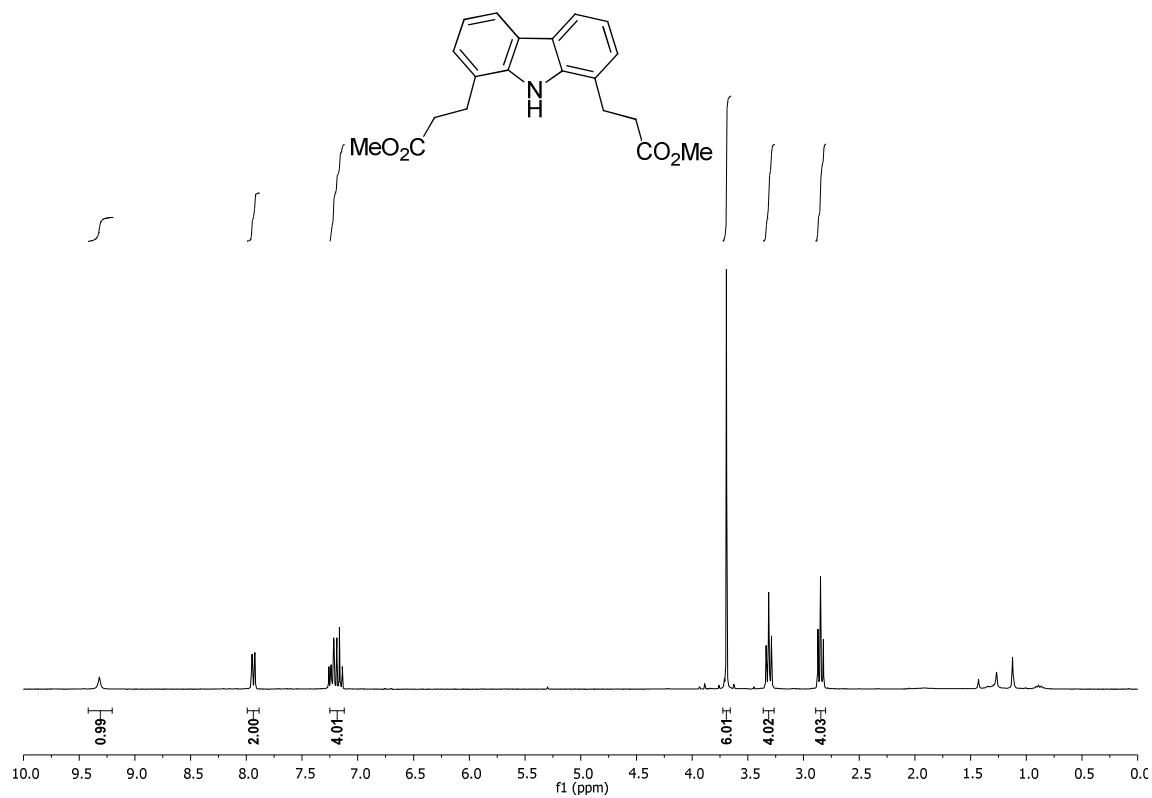
Chemical shifts (ppm) for the ¹³C NMR spectrum are listed below:

| | | | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|
| 167.6 | 150.9 | 141.6 | 130.8 | 127.0 | 126.3 | 119.0 | 116.8 | 116.3 | 64.3 | 47.2 | 30.9 | 29.4 | 18.3 | 13.8 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|

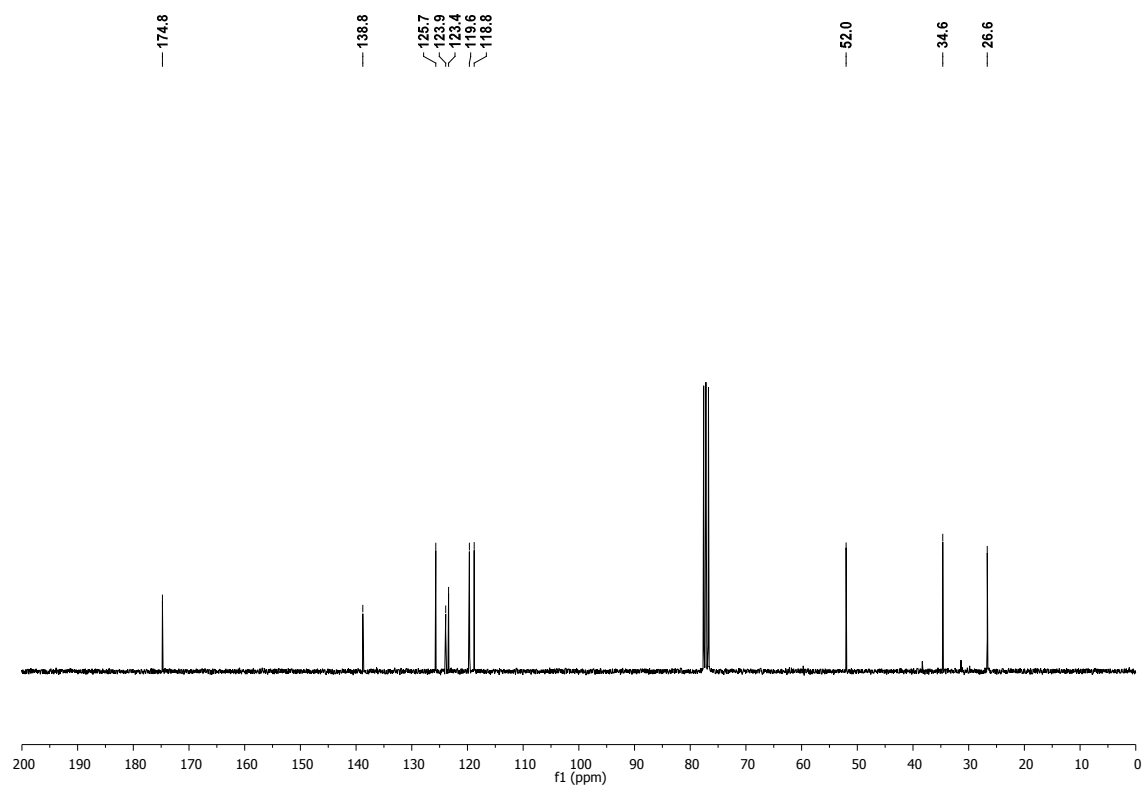


Dimethyl 3,3'-(9H-carbazole-1,8-diyl)dipropionate (40)

^1H NMR (300 MHz, CDCl_3)

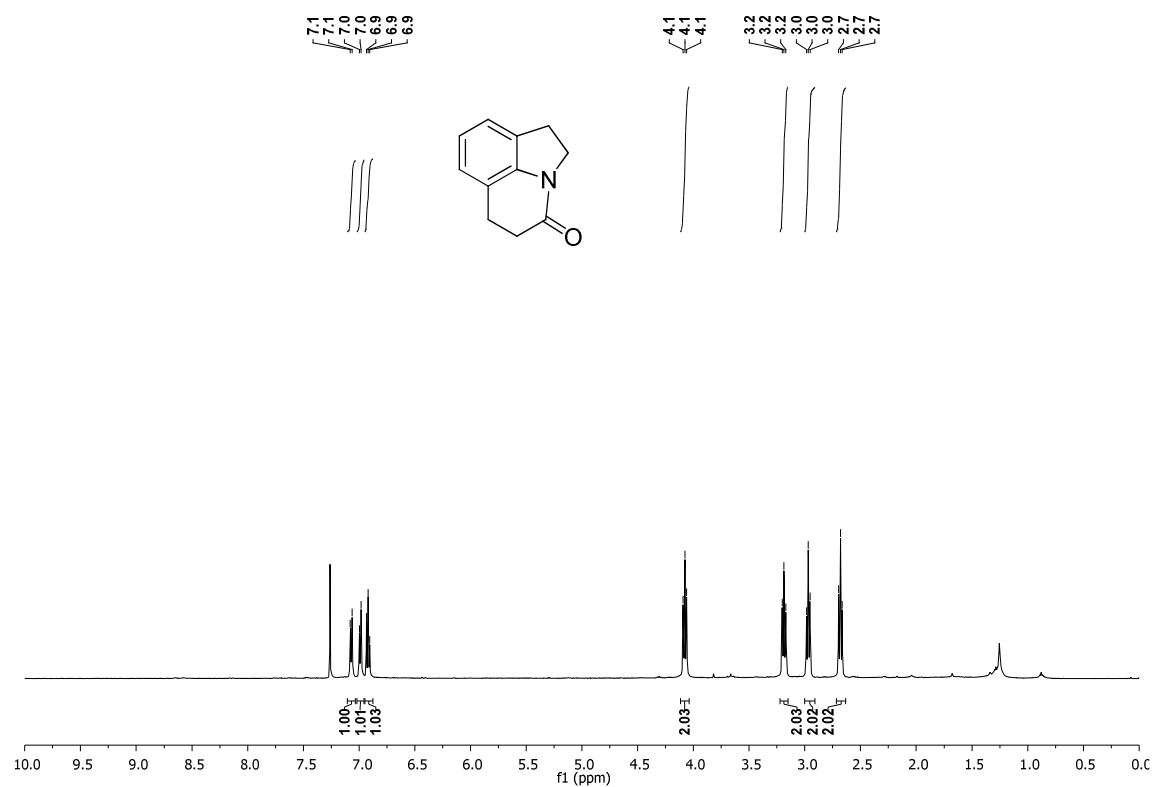


^{13}C NMR (75 MHz, CDCl_3)

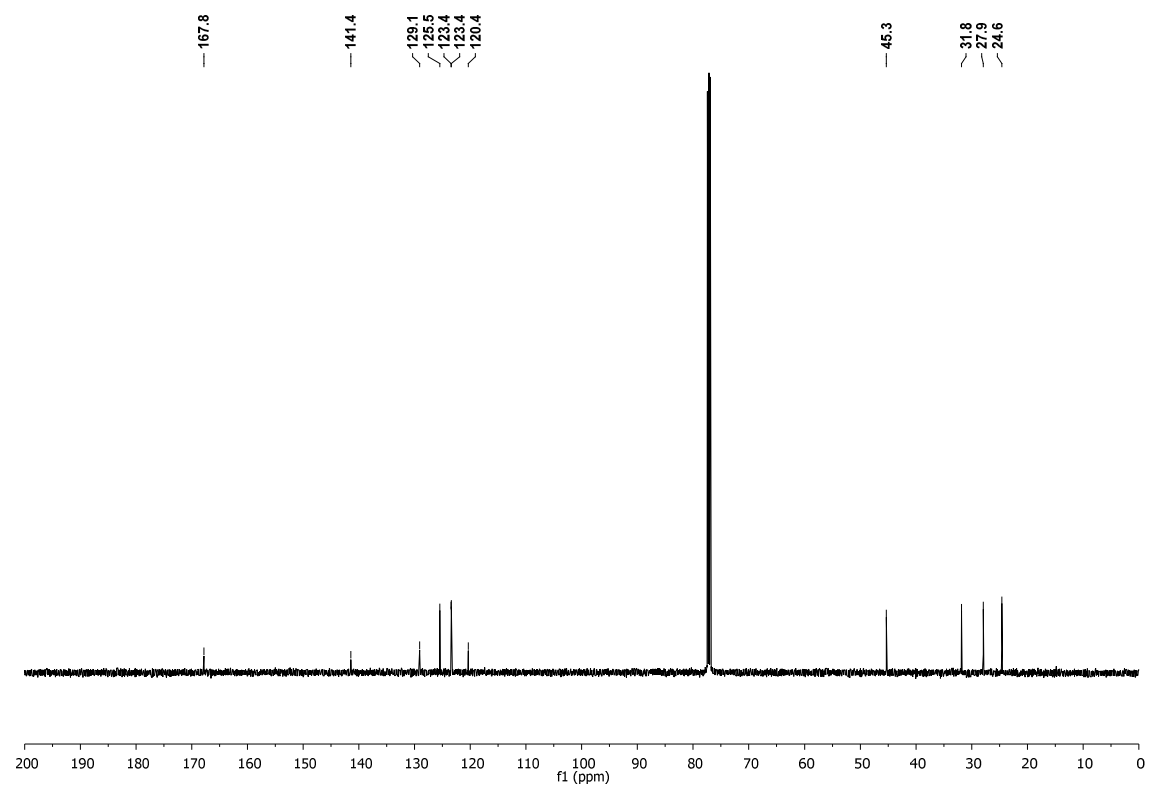


1,2,5,6-Tetrahydropyrrolo[3,2,1-ij]quinolin-4-one (42)

^1H NMR (500 MHz, CDCl_3)

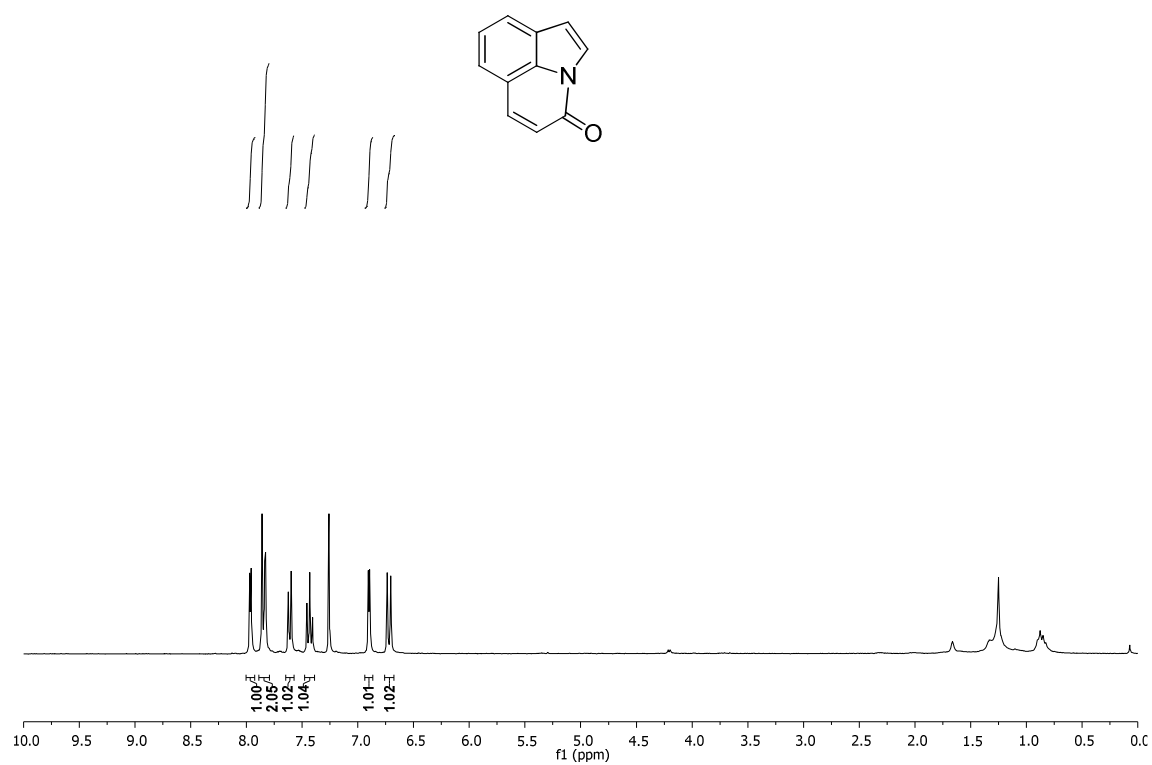


^{13}C NMR (125 MHz, CDCl_3)



Pyrrolo[3,2,1-ij]quinolin-4-one (43)

^1H NMR (300 MHz, CDCl_3)



^{13}C NMR (75 MHz, CDCl_3)

