

Divergent reactivity of divinylsilanes toward sulfonamides in different oxidative systems

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Electronic supplementary information

Copies of ^1H and ^{13}C NMR spectra of all compounds

S1-S73

Copies of ¹H and ¹³C NMR spectra of all compounds

Figure S1. ¹H NMR spectrum of compound **4**

(2-chloro-1-iodoethyl)diphenyl(vinyl)silane, 4

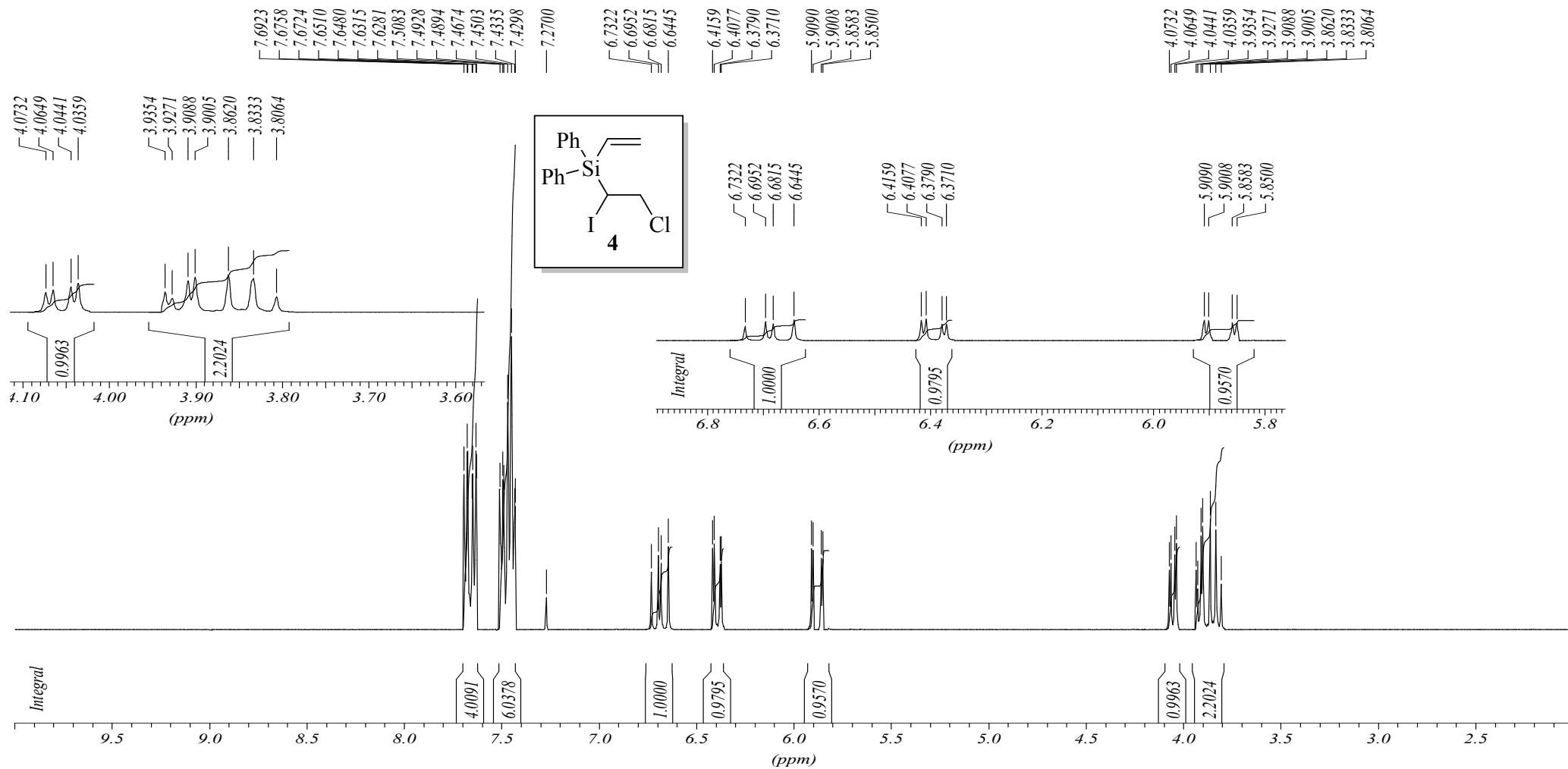


Figure S2. ^{13}C NMR spectrum of compound **4**

(2-Chloro-1-iodoethyl)diphenyl(vinyl)silane, 4

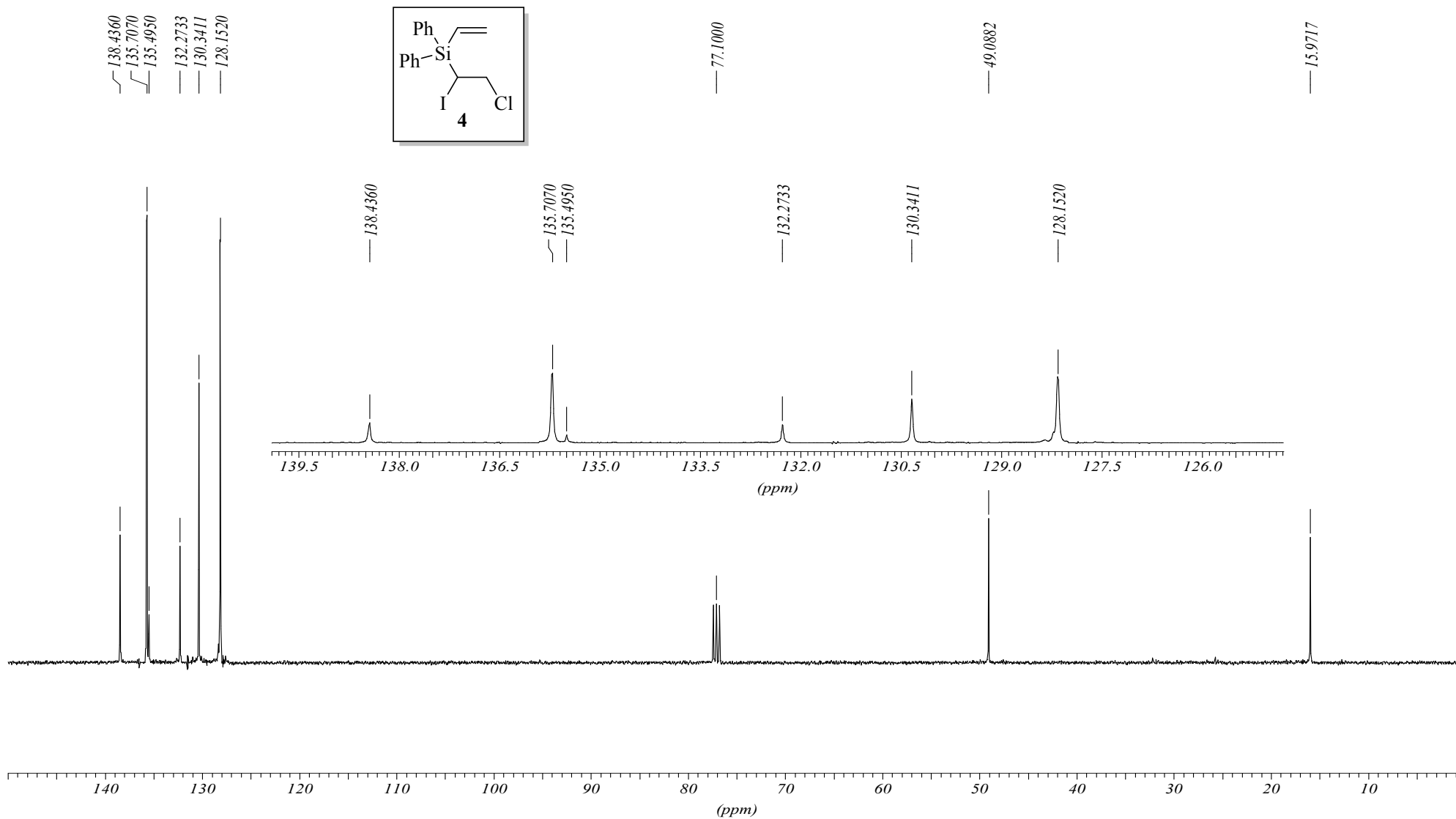


Figure S3. ¹H NMR spectrum of compound **5**

Bis(1-chloro-2-iodoethyl)diphenylsilane, 5 (R = Ph).

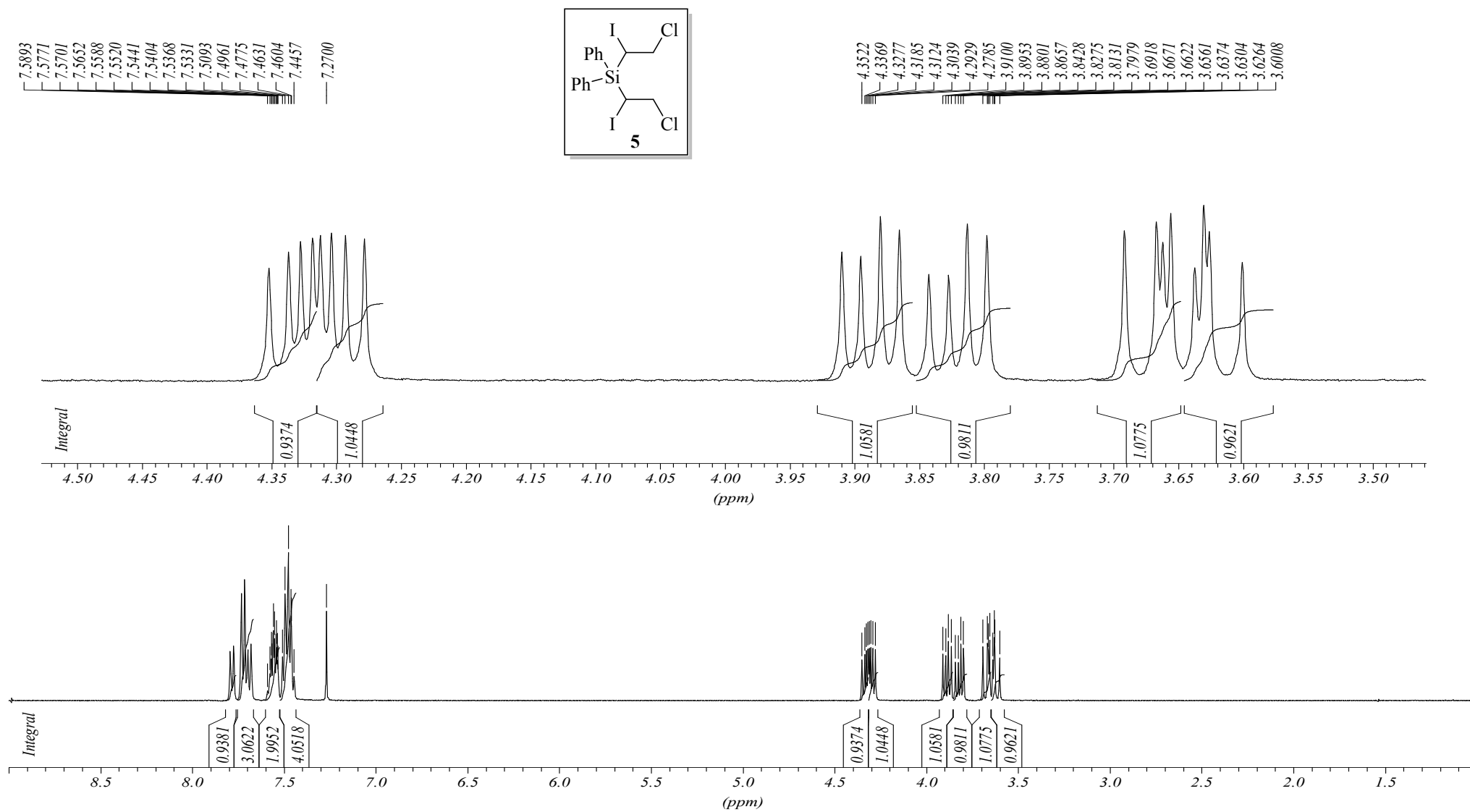


Figure S4. ^{13}C NMR spectrum of compound **5**

Bis(1-chloro-2-iodoethyl)diphenylsilane, 5 (R = Ph).

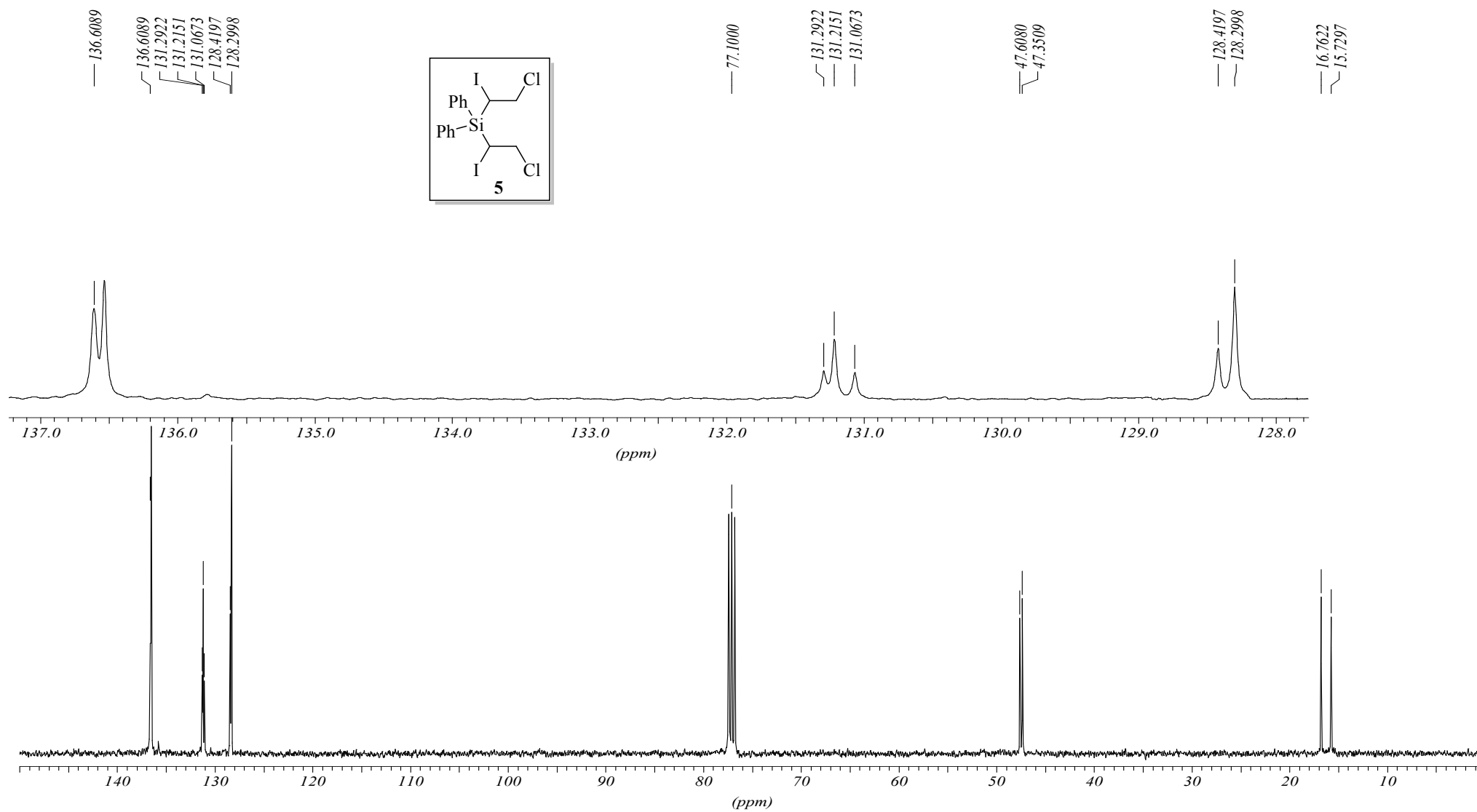


Figure S5. ¹H NMR spectrum of compound **6**

2-(Diphenyl(vinyl)silyl)-1-((4-nitrophenyl)sulfonyl)aziridine, **6**

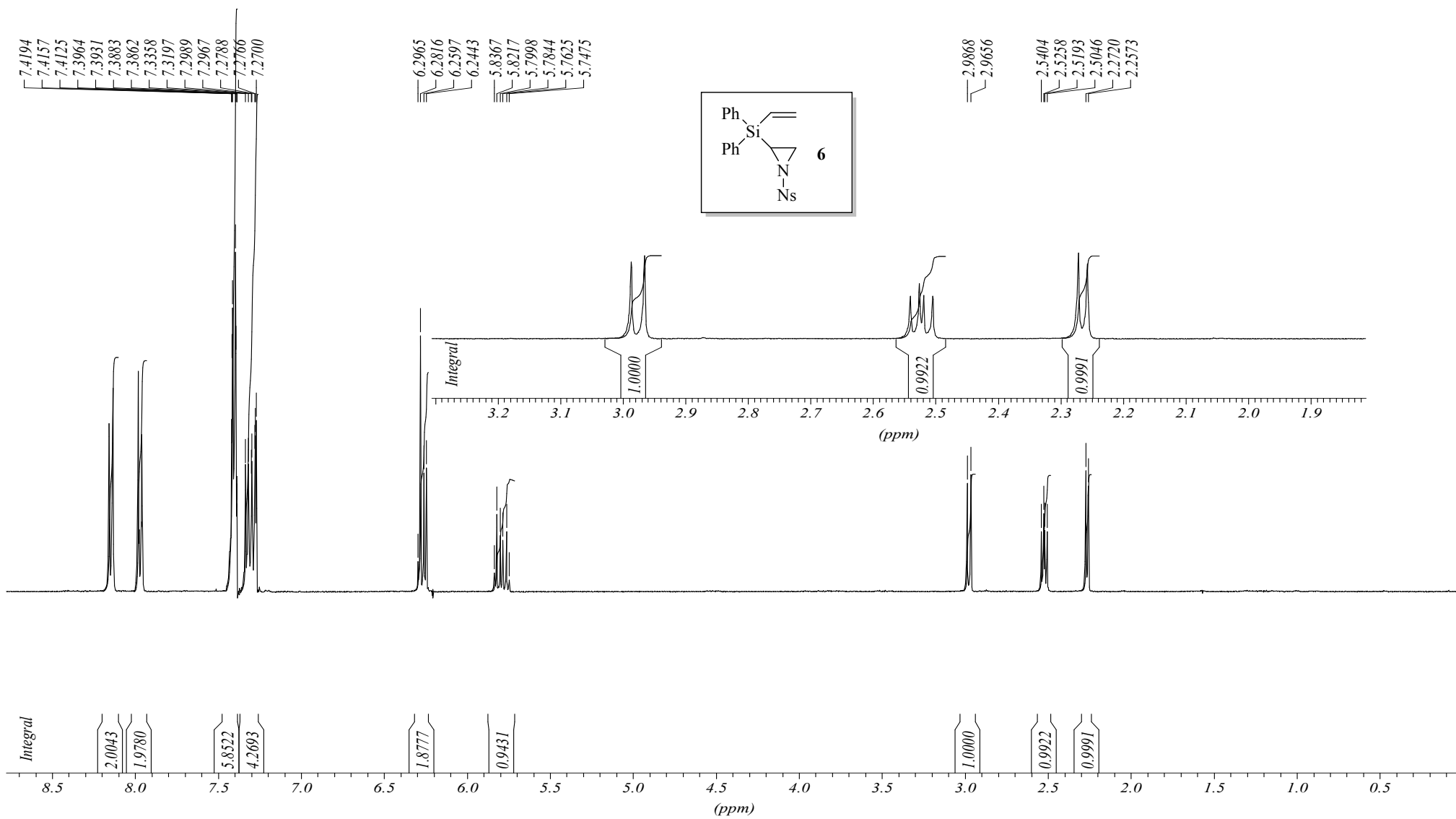


Figure S6. ¹³C NMR spectrum of compound **6**

2-(Diphenyl(vinyl)silyl)-1-((4-nitrophenyl)sulfonyl)aziridine, 6

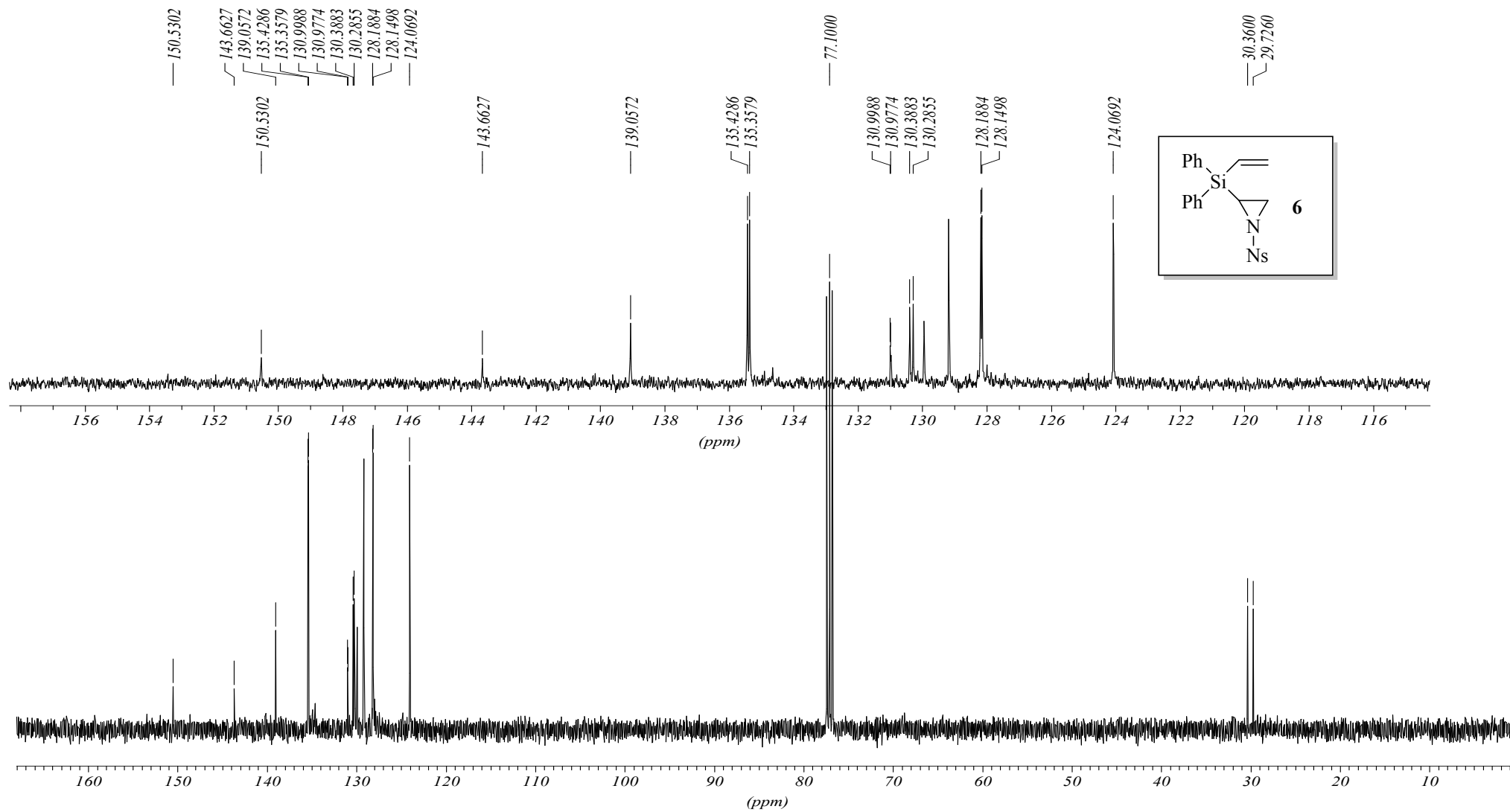


Figure S7. ¹³C (J-mod) NMR spectrum of compound **6**

2-(Diphenyl(vinyl)silyl)-1-((4-nitrophenyl)sulfonyl)aziridine, 6

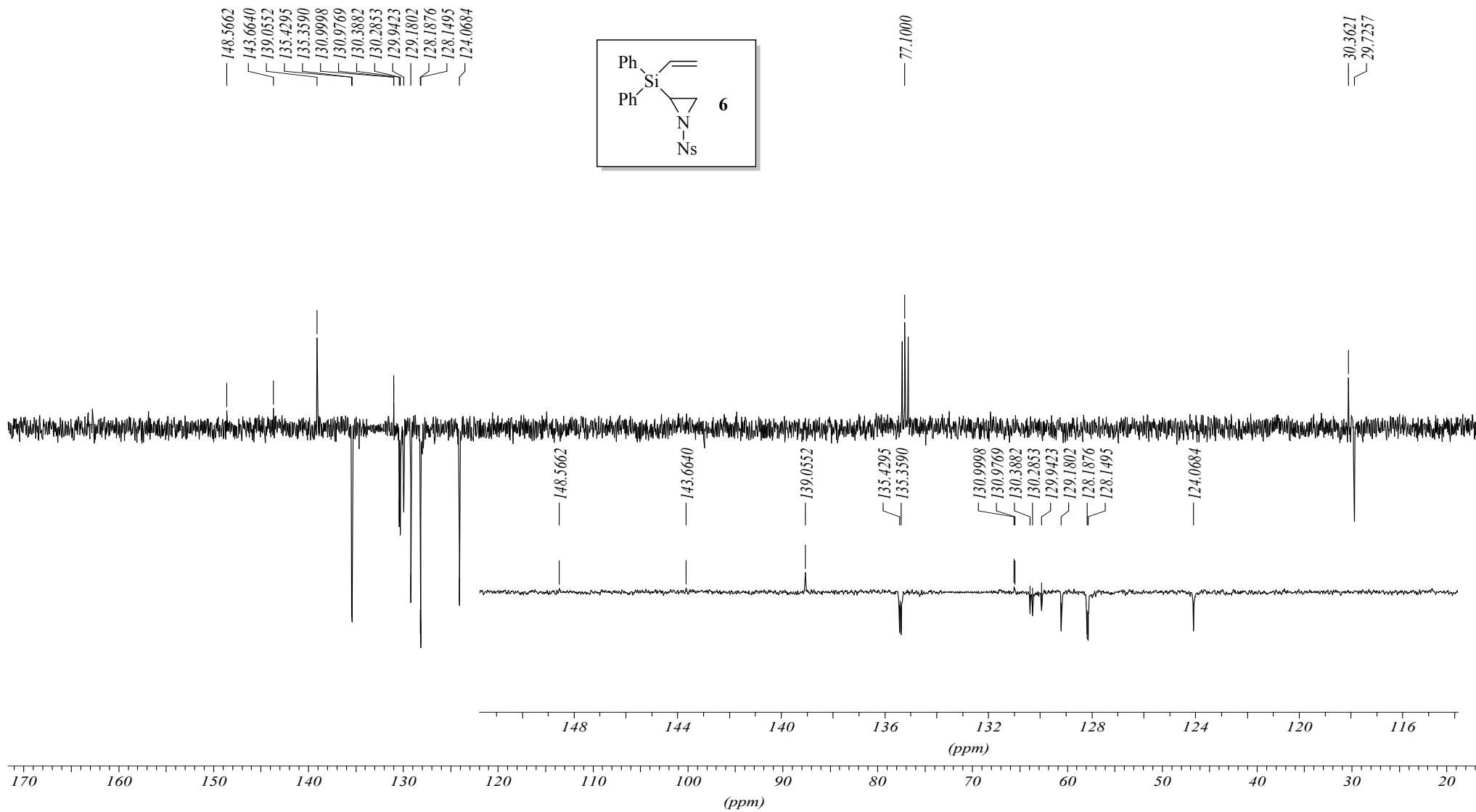


Figure S8. ¹H NMR spectrum of compound 7

Bis(1-((4-nitrophenyl)sulfonyl)aziridin-2-yl)diphenylsilane, 7

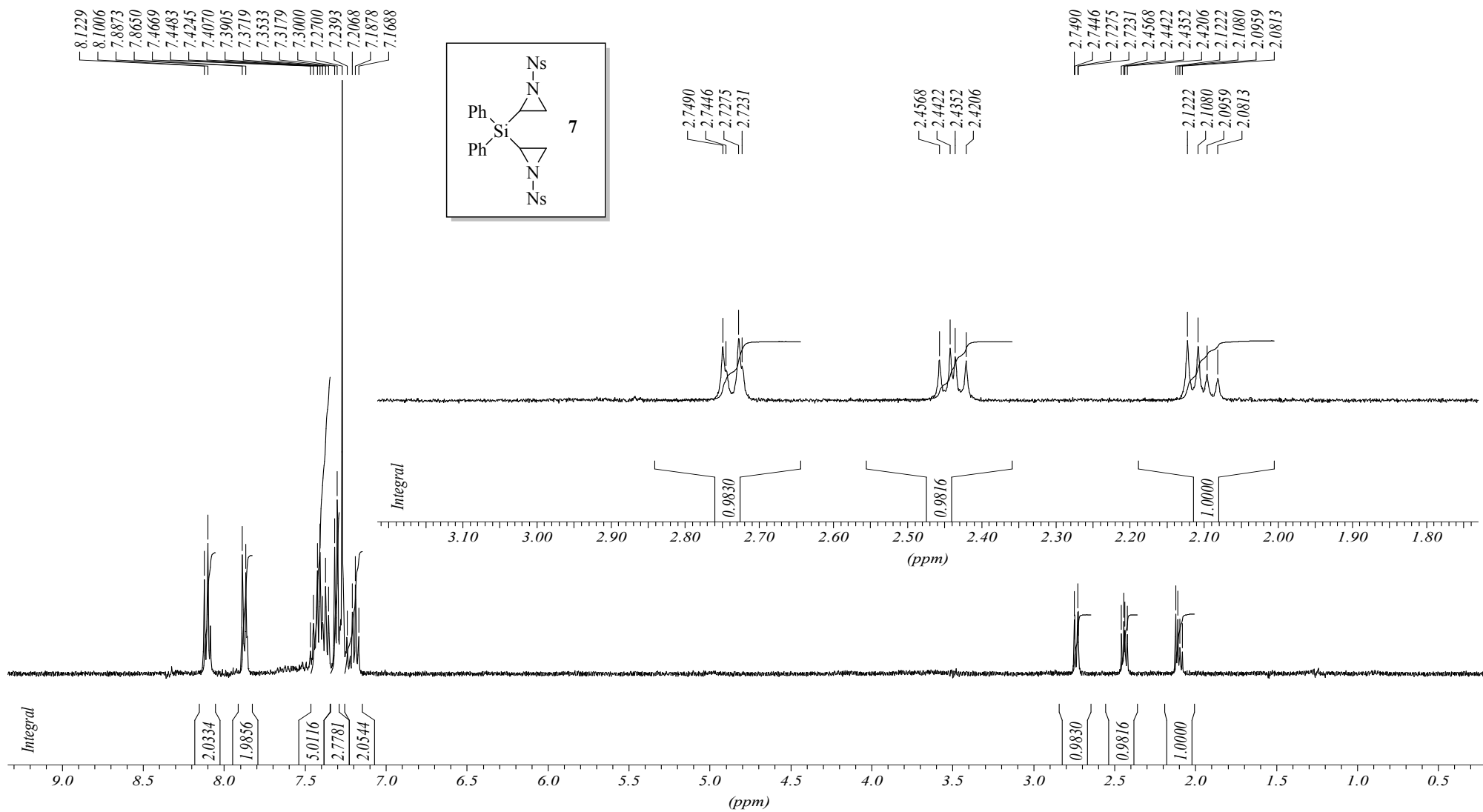


Figure S9. ¹H NMR spectrum of compound **9**

(1,2-Dibromoethyl)dimethyl(vinyl)silane, **9** (R = Me).

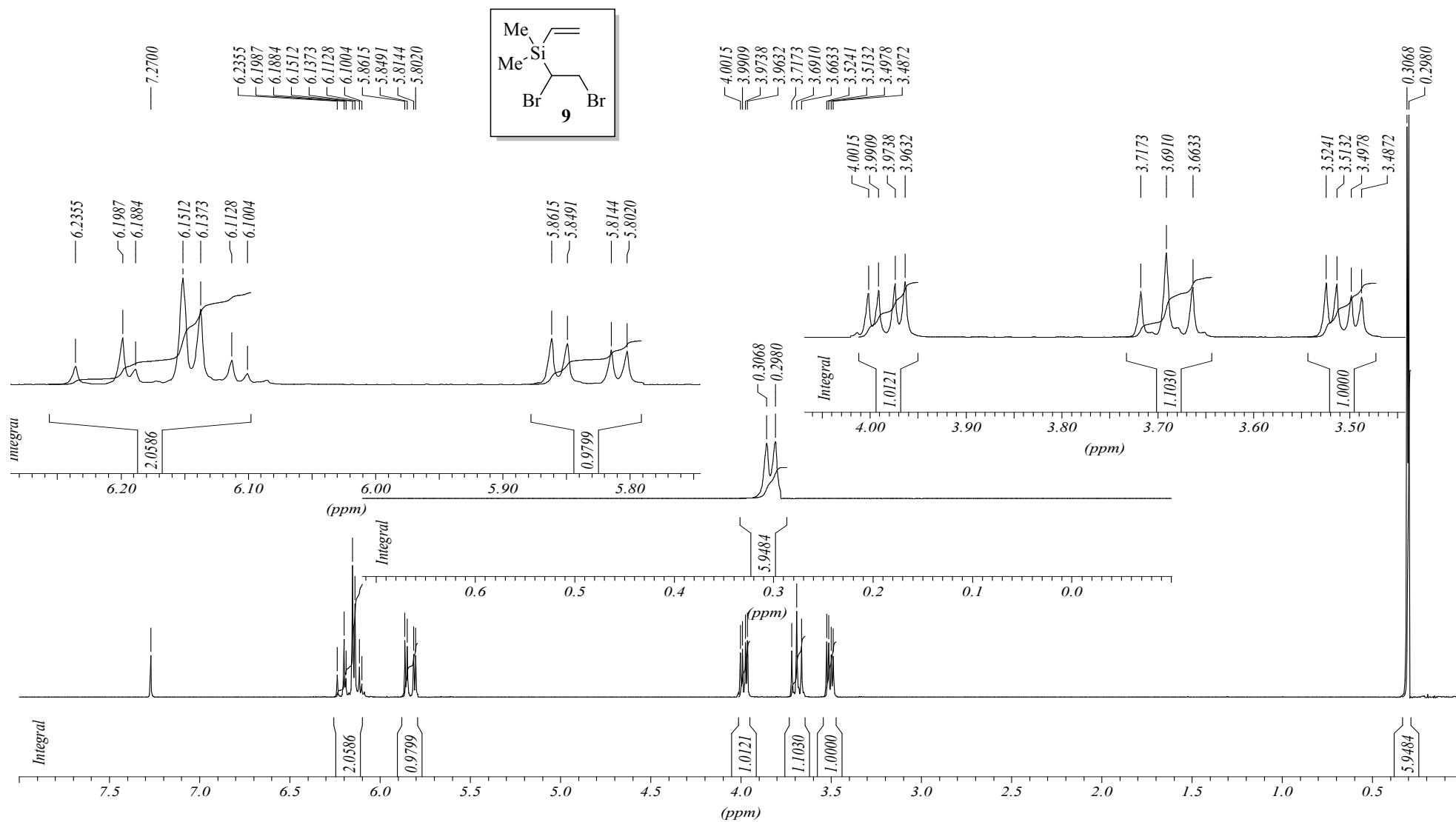


Figure S10. ^{13}C NMR spectrum of compound **9**.

(1,2-Dibromoethyl)dimethyl(vinyl)silane, **9** (R = Me).

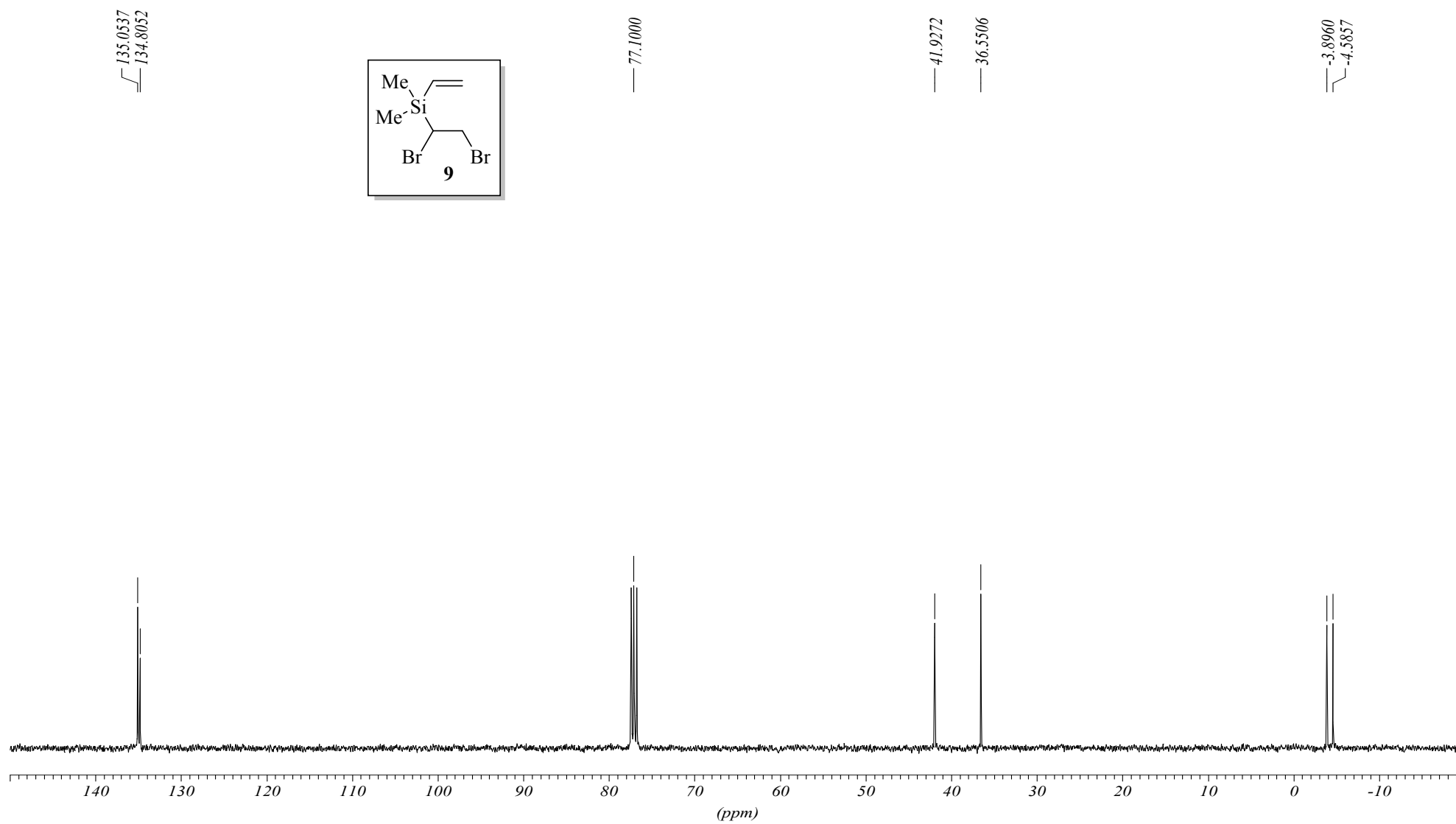


Figure S11. ¹H NMR spectrum of compound **9**

(1,2-dibromoethyl)diphenyl(vinyl)silane, **9** (R = Ph)

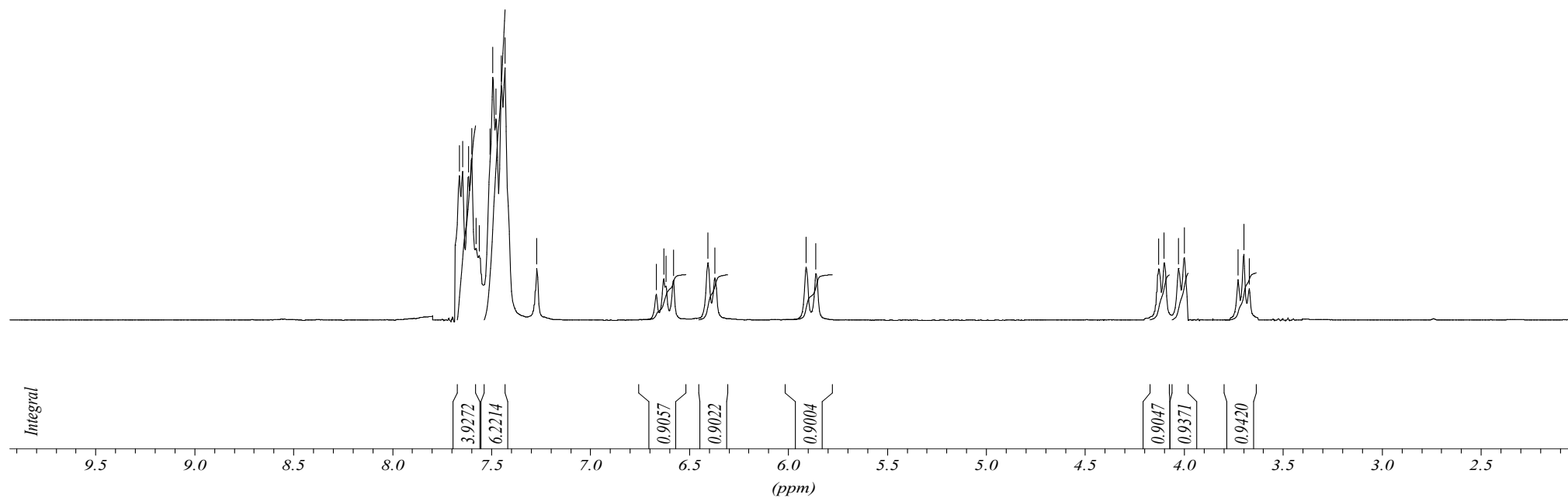
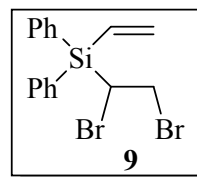


Figure S12. ^{13}C NMR spectrum of compound **9**
(1,2-dibromoethyl)diphenyl(vinyl)silane, **9** (R = Ph)

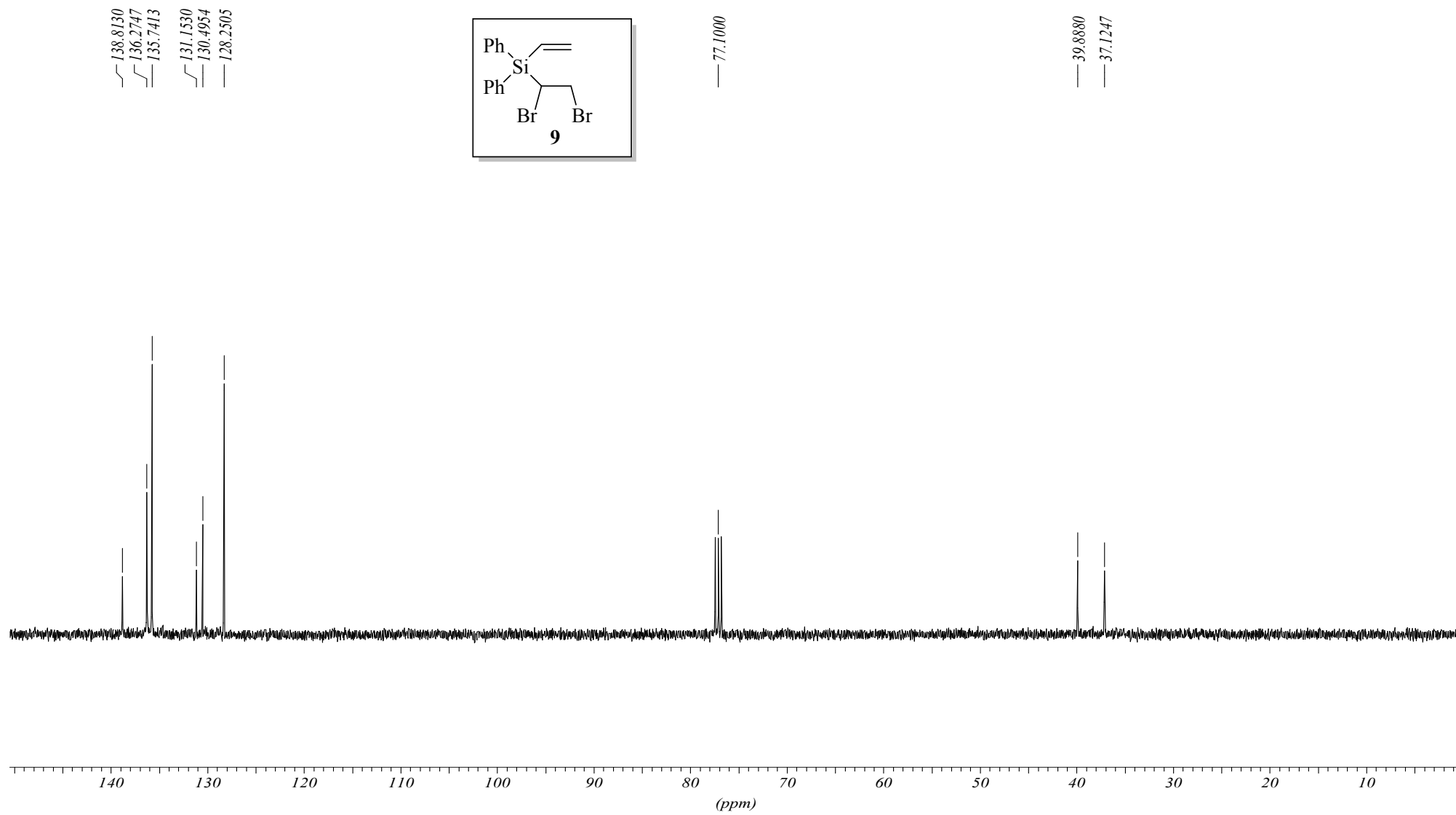


Figure S13. ¹H NMR spectrum of compound **10**

(1,2-dibromoethyl)diphenyl(vinyl)silane, 10

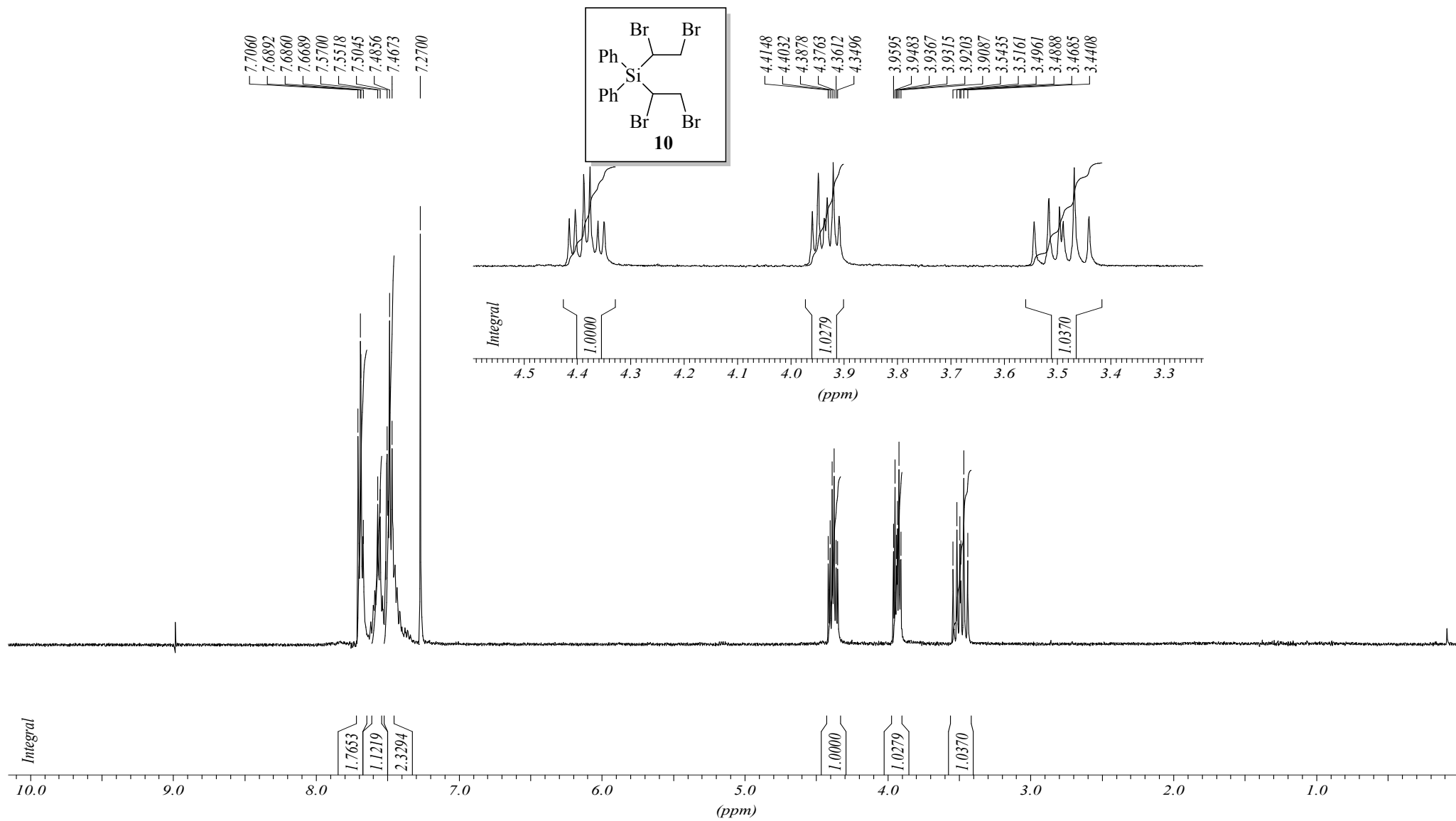


Figure S14. ^{13}C NMR spectrum of compound **10**

(1,2-dibromoethyl)diphenyl(vinyl)silane, 10

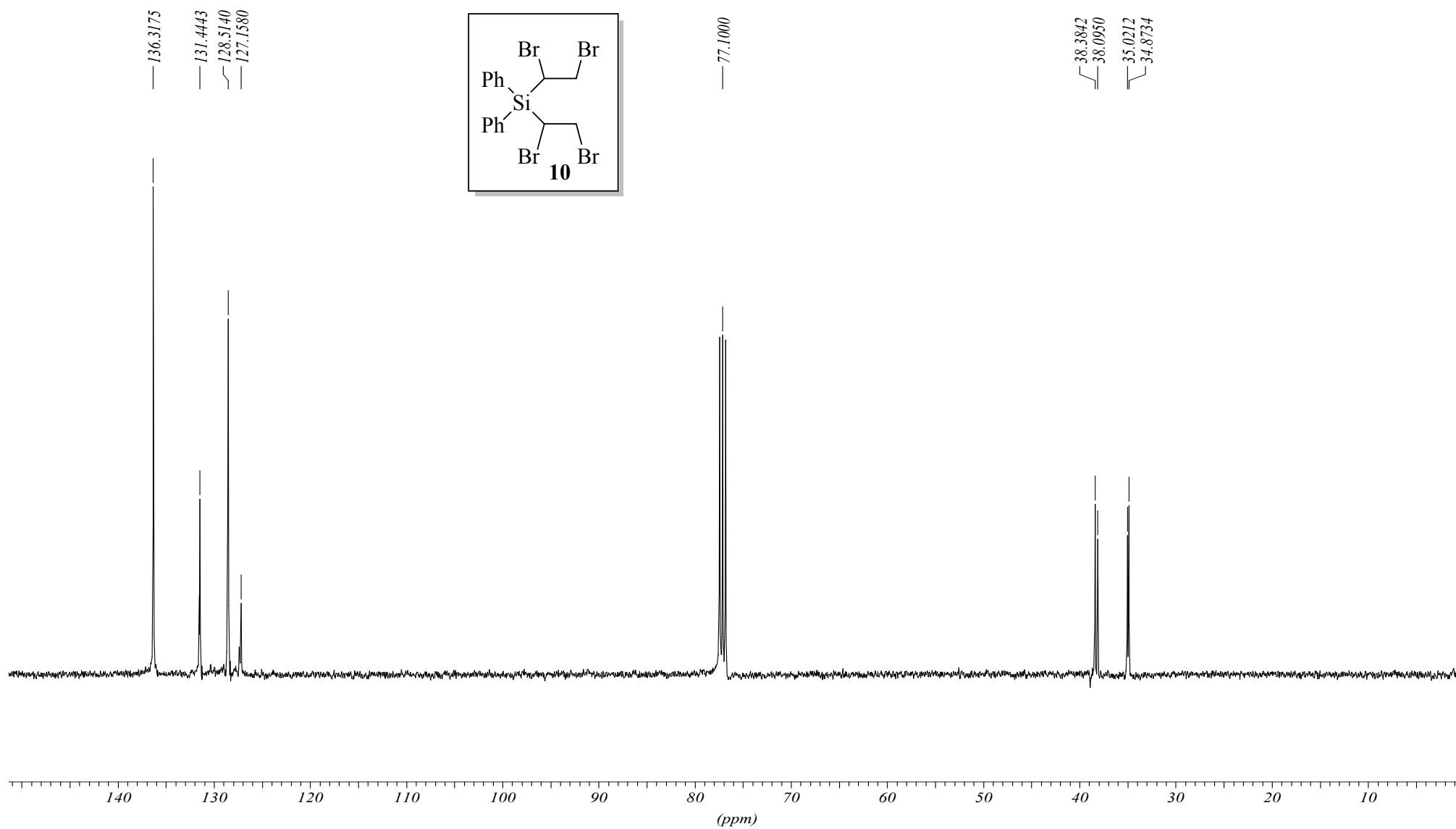


Figure S15. ¹H NMR spectrum of compound **11a**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)trifluoromethanesulfonamide, **11a** (R = Ph).

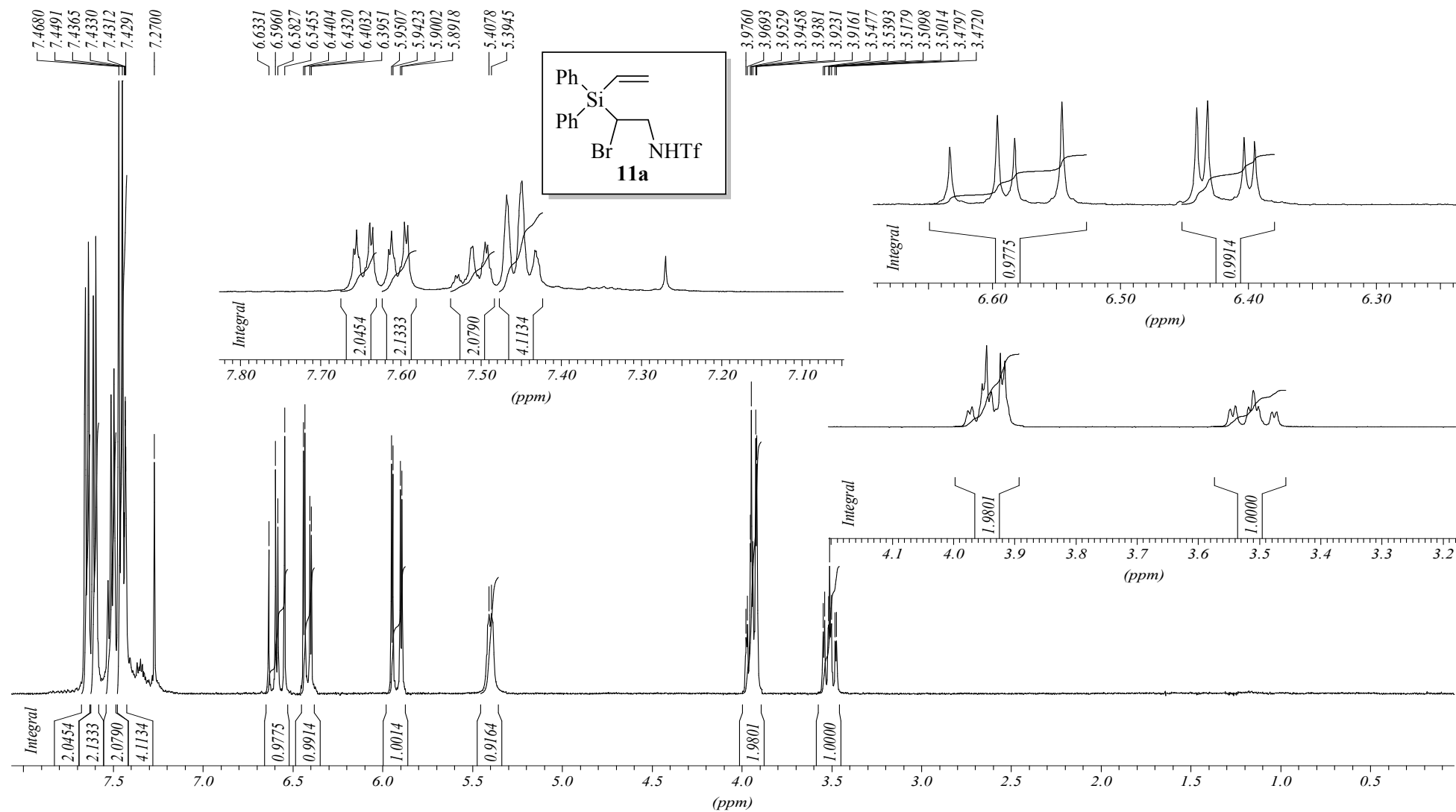


Figure S16. ^{13}C NMR spectrum of compound **11a**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)trifluoromethanesulfonamide, **11a** (R = Ph).

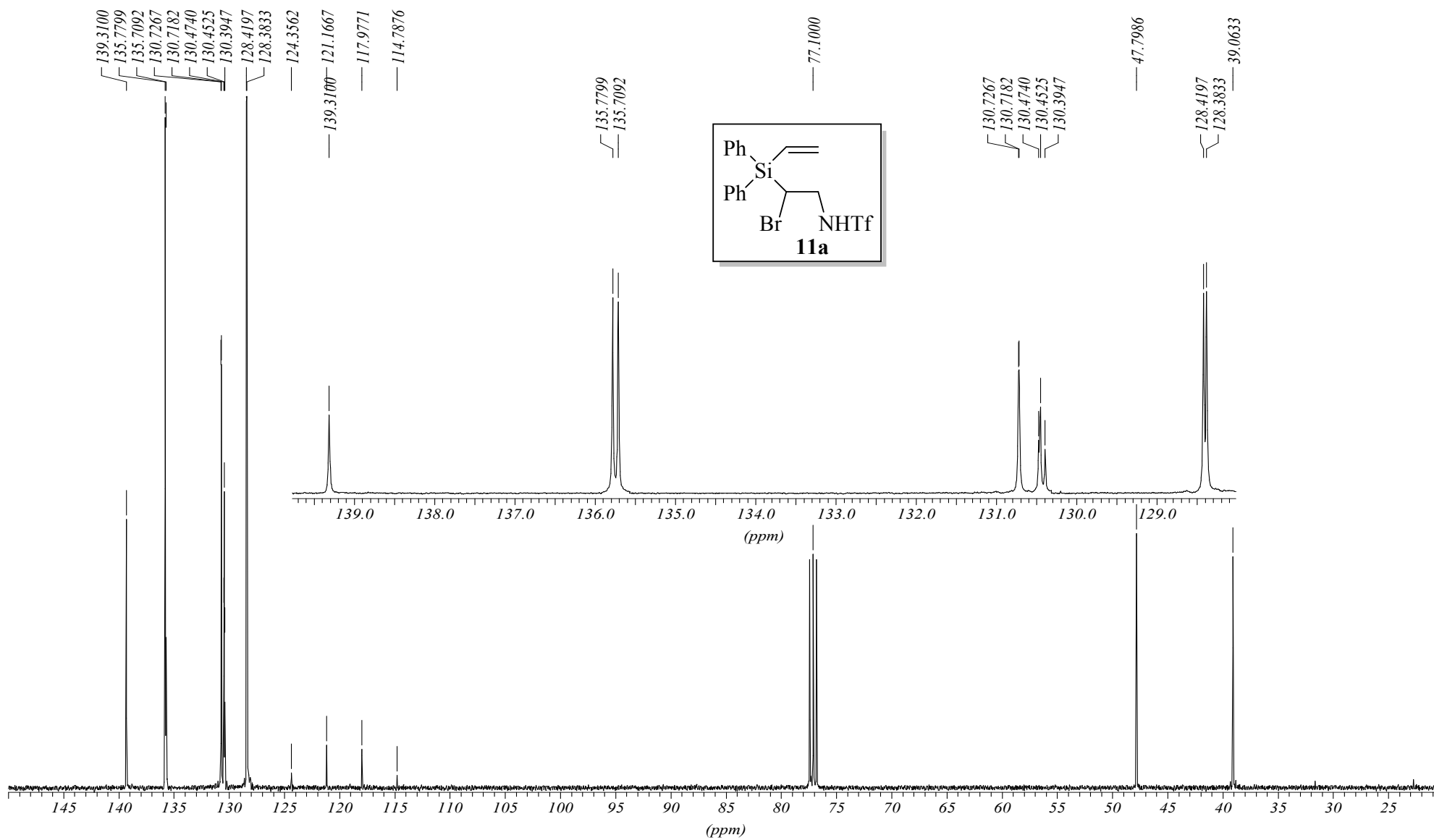


Figure S17. ¹H NMR spectrum of compound **11a**

N-(2-bromo-2-(dimethyl(vinyl)silyl)ethyl)trifluoromethanesulfonamide, **11a** (R = Me).

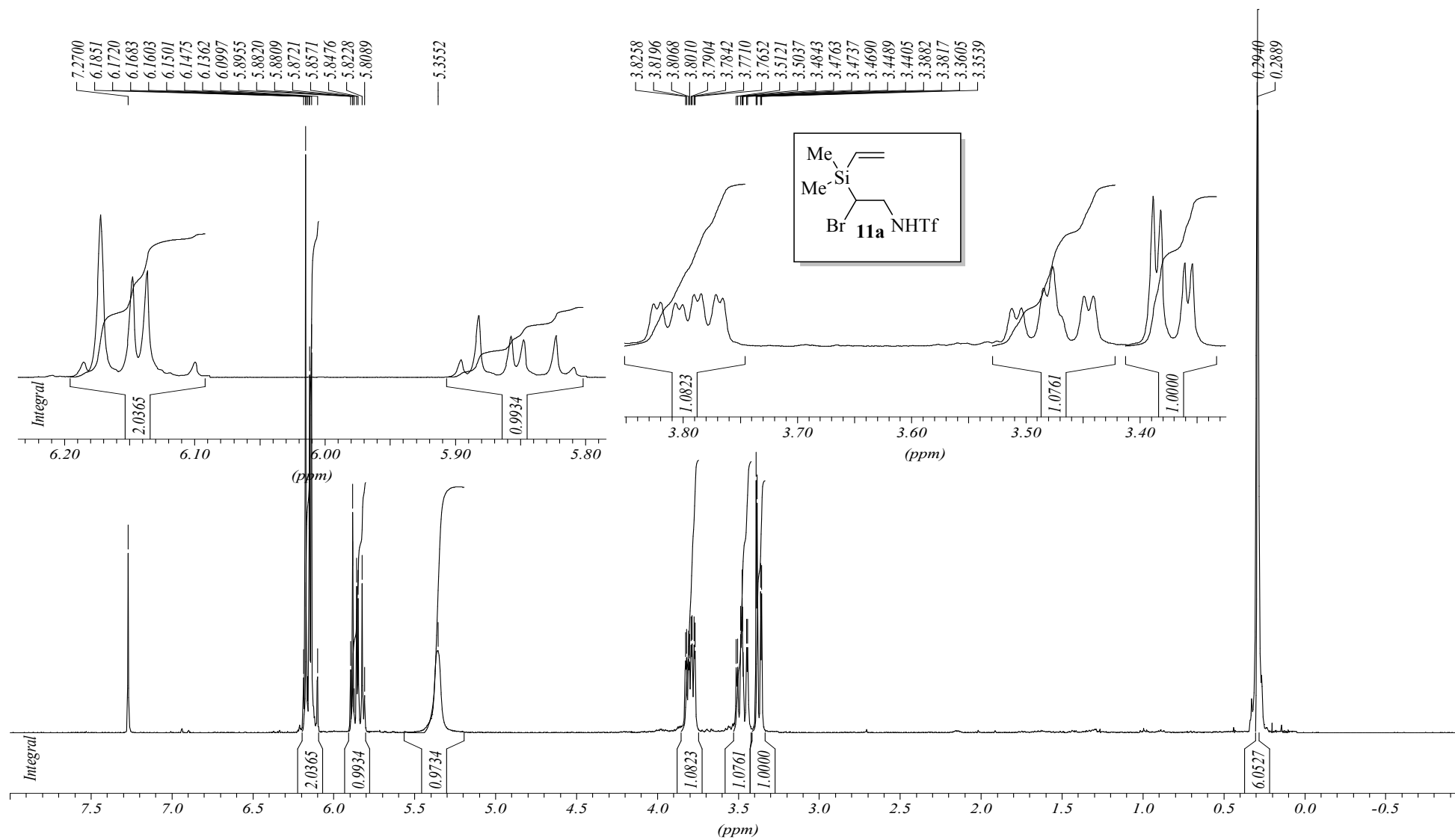


Figure S18. ^{13}C NMR spectrum of compound **11a**

N-(2-bromo-2-(dimethyl(vinyl)silyl)ethyl)trifluoromethanesulfonamide, **11a** (R = Me).

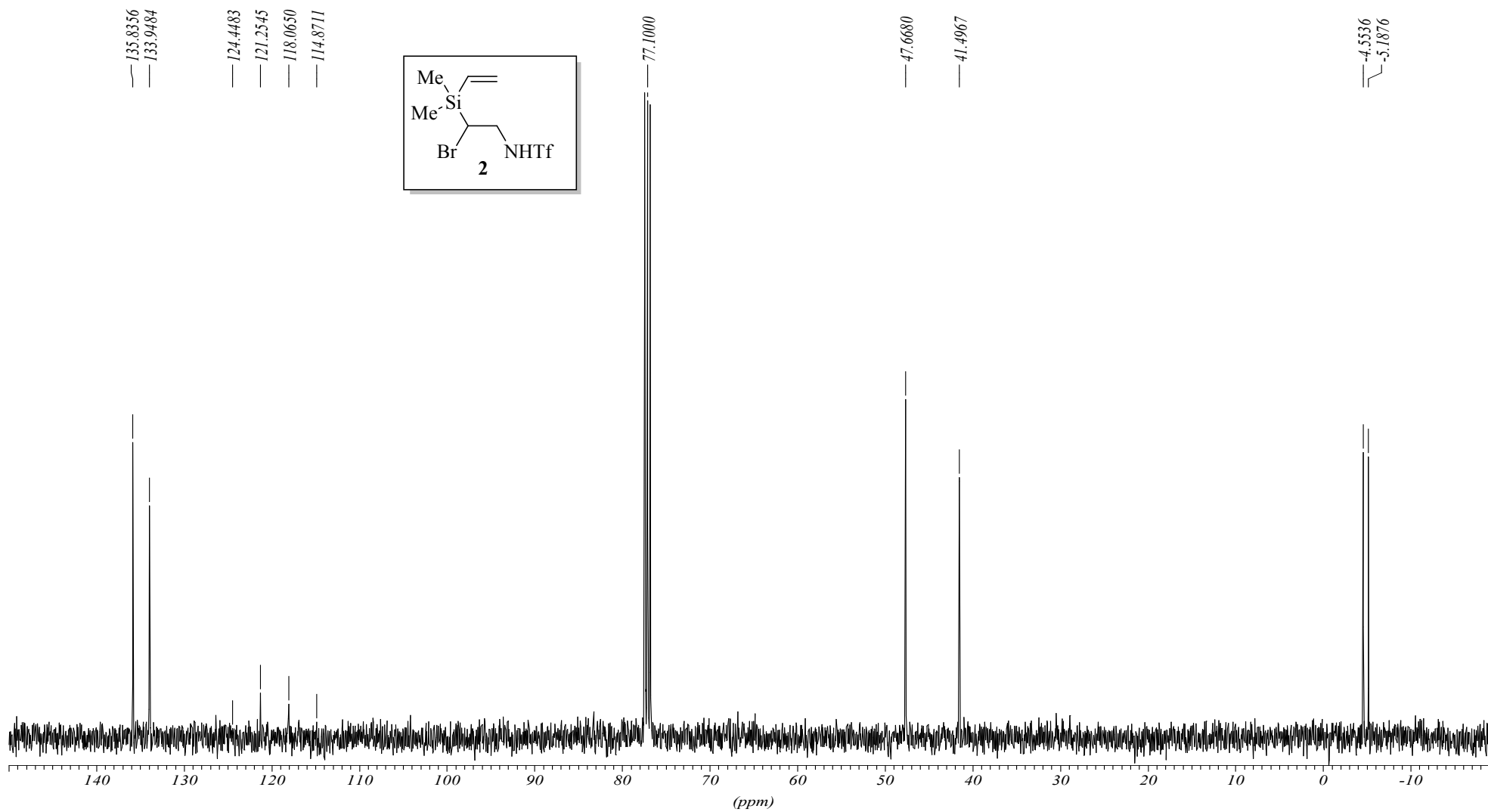


Figure S19. ¹H NMR spectrum of compound **11c**

N-(2-Bromo-2-(dimethyl(vinyl)silyl)ethyl)-4-methylbenzenesulfonamide, **11c** (R = Me).

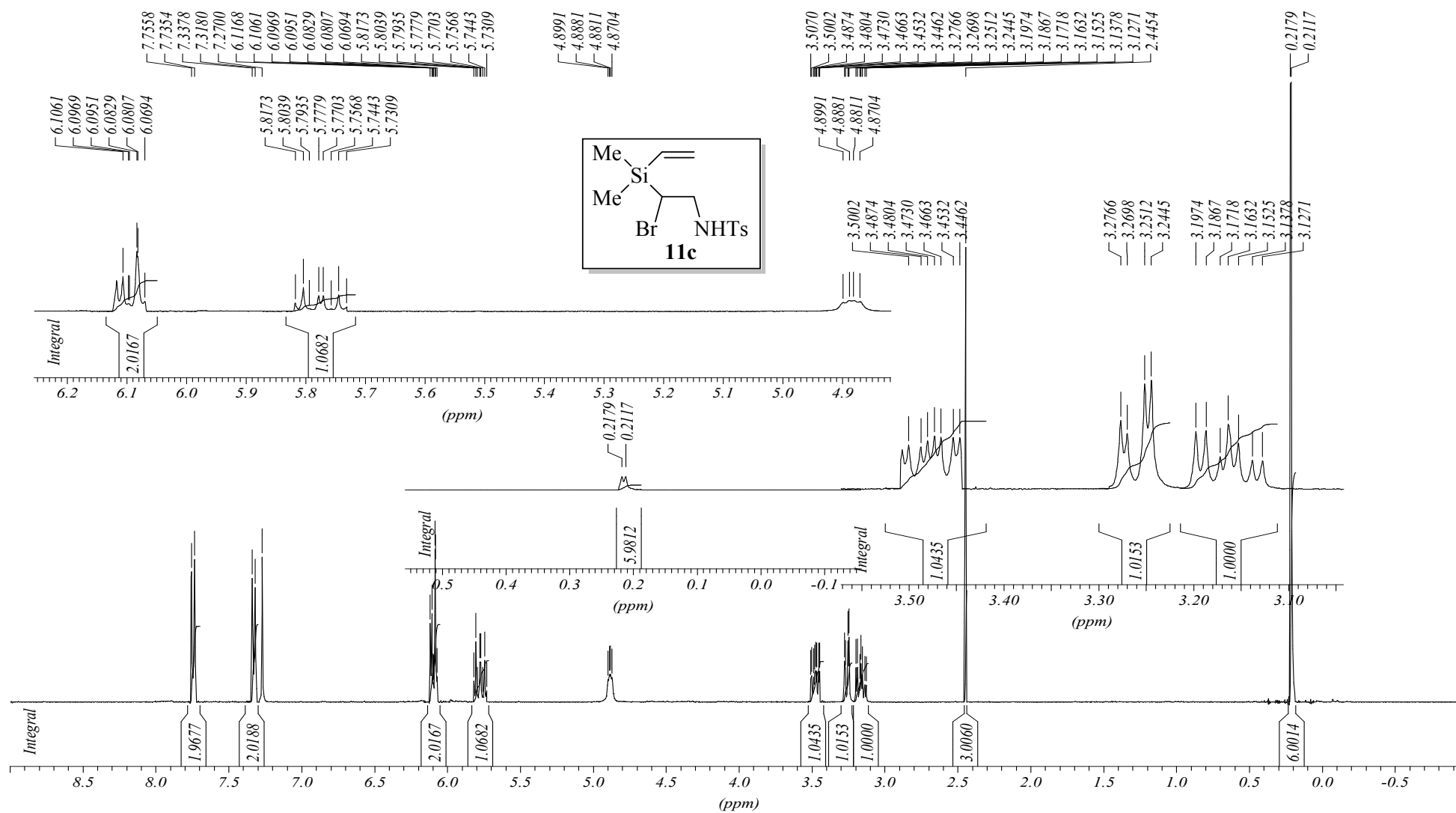


Figure S20. ^{13}C NMR spectrum of compound **11c**

N-(2-Bromo-2-(dimethyl(vinyl)silyl)ethyl)-4-methylbenzenesulfonamide, **11c** (R = Me).

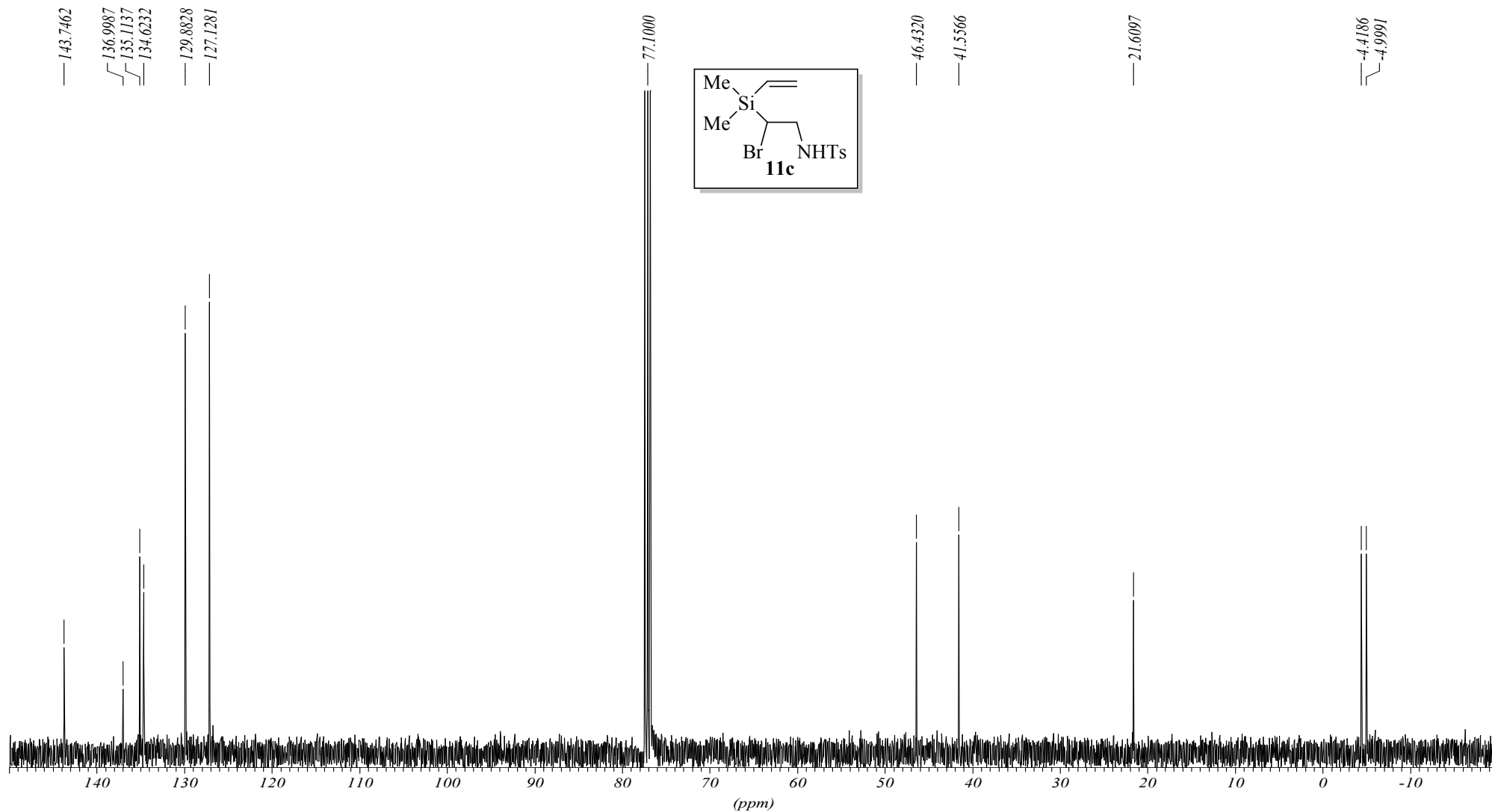


Figure S21. ¹H NMR spectrum of compound **11d**

N-(2-Bromo-2-(dimethyl(vinyl)silyl)ethyl)-4-nitrobenzenesulfonamide, **11d** (R = Me).

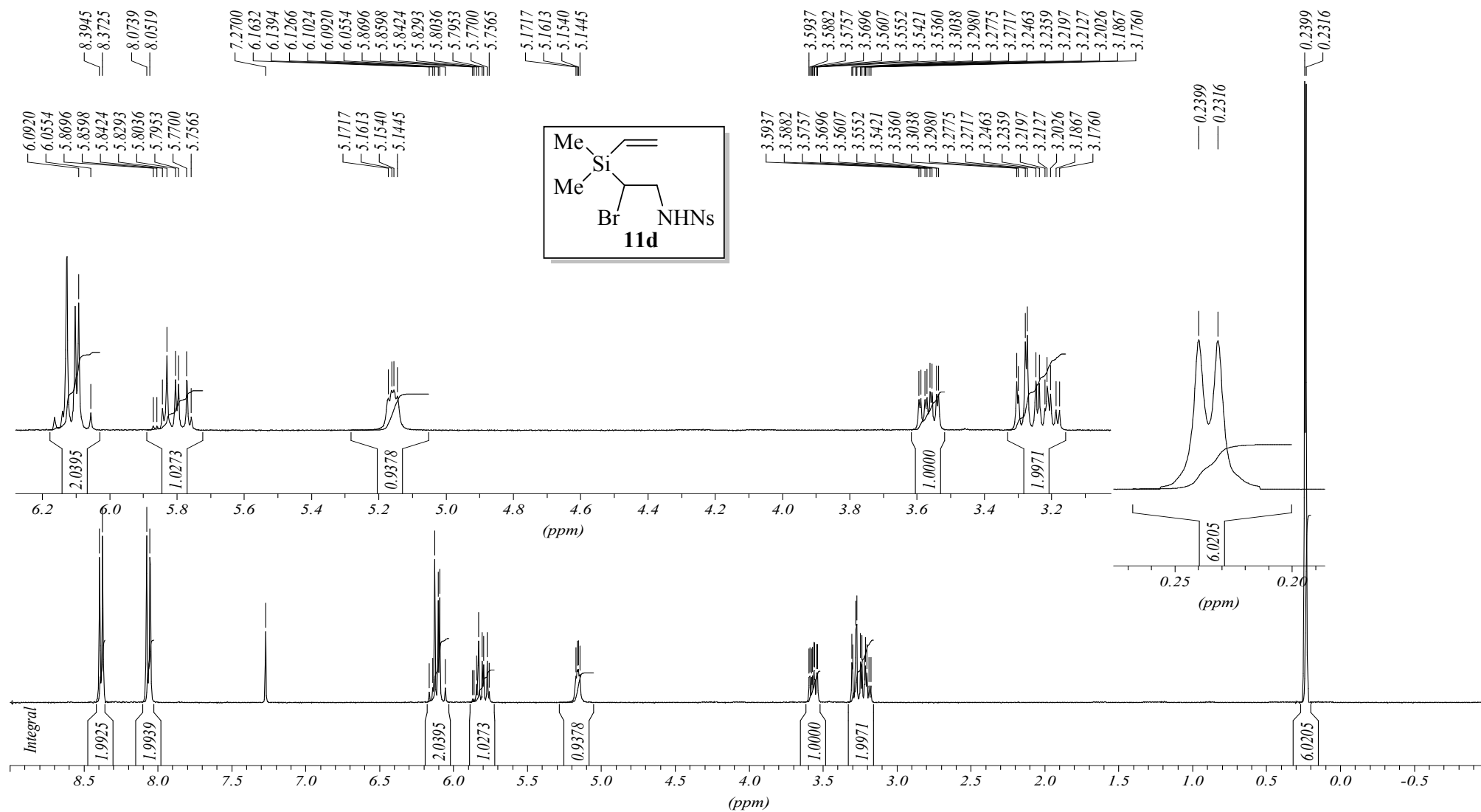


Figure S22. ^{13}C NMR spectrum of compound **11d**

N-(2-Bromo-2-(dimethyl(vinyl)silyl)ethyl)-4-nitrobenzenesulfonamide, **11d** (R = Me).

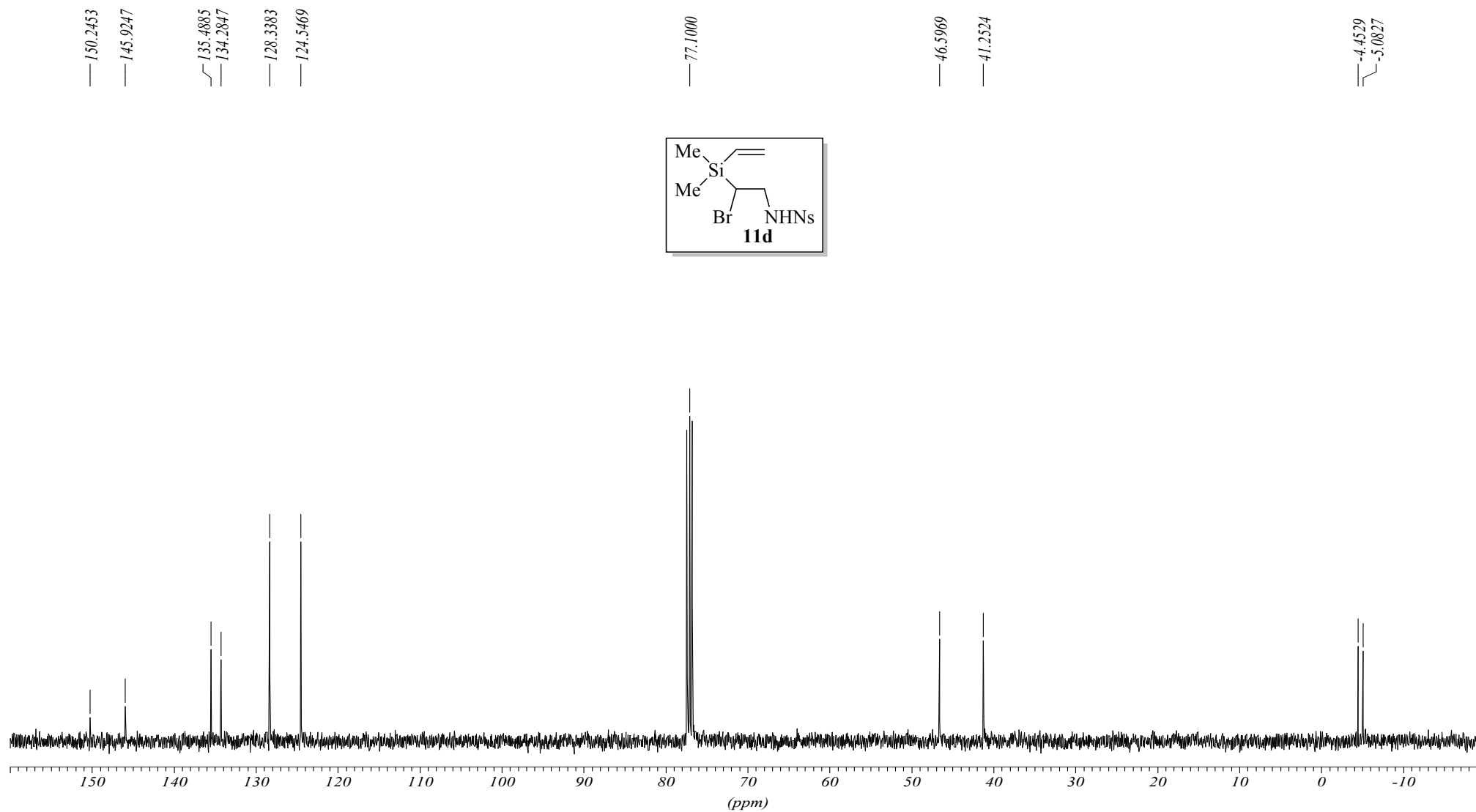


Figure S23. ¹H NMR spectrum of compound **12a**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **12a** (R = Ph).

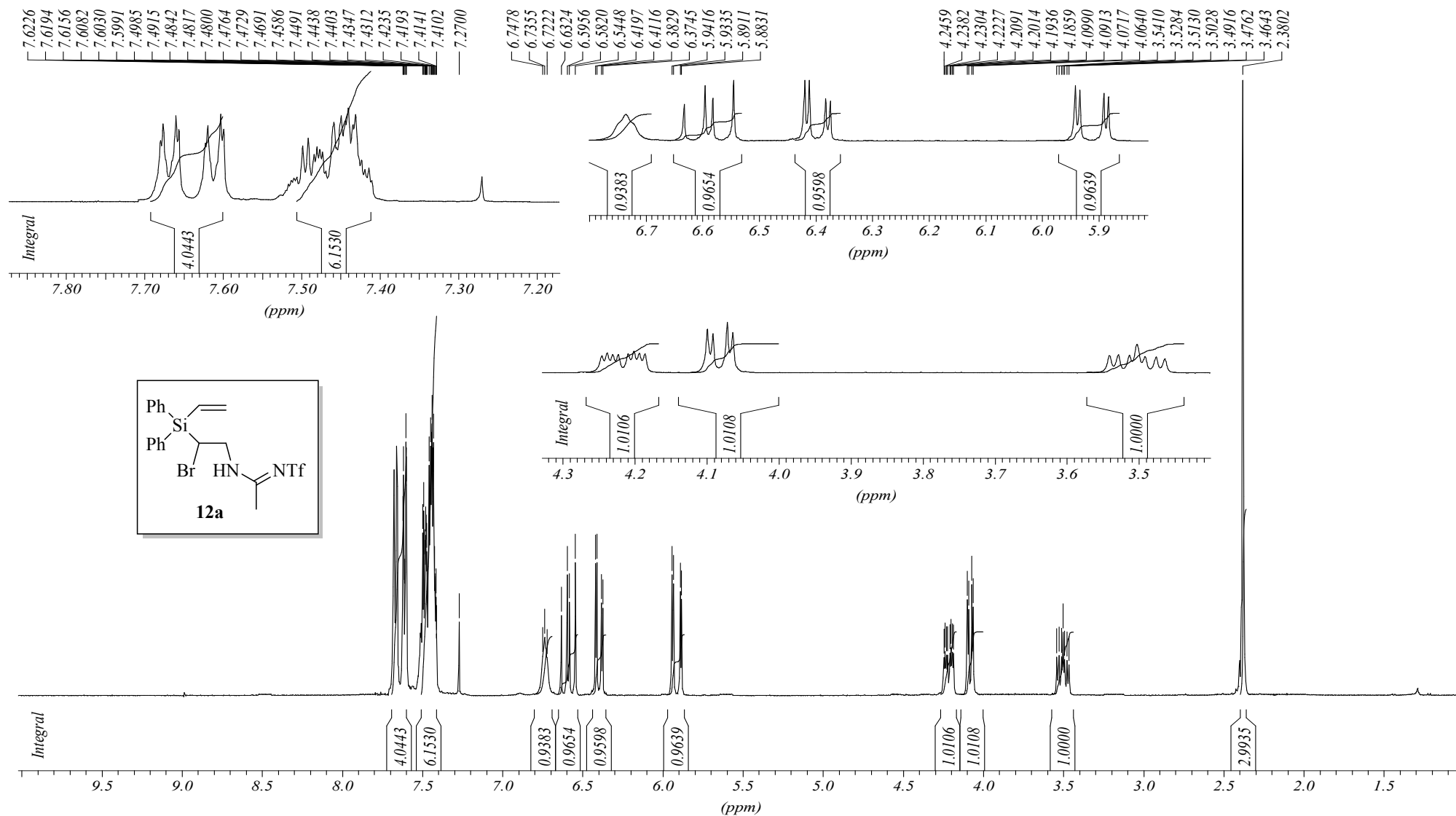


Figure S24. ^{13}C NMR spectrum of compound **12a**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **12a**

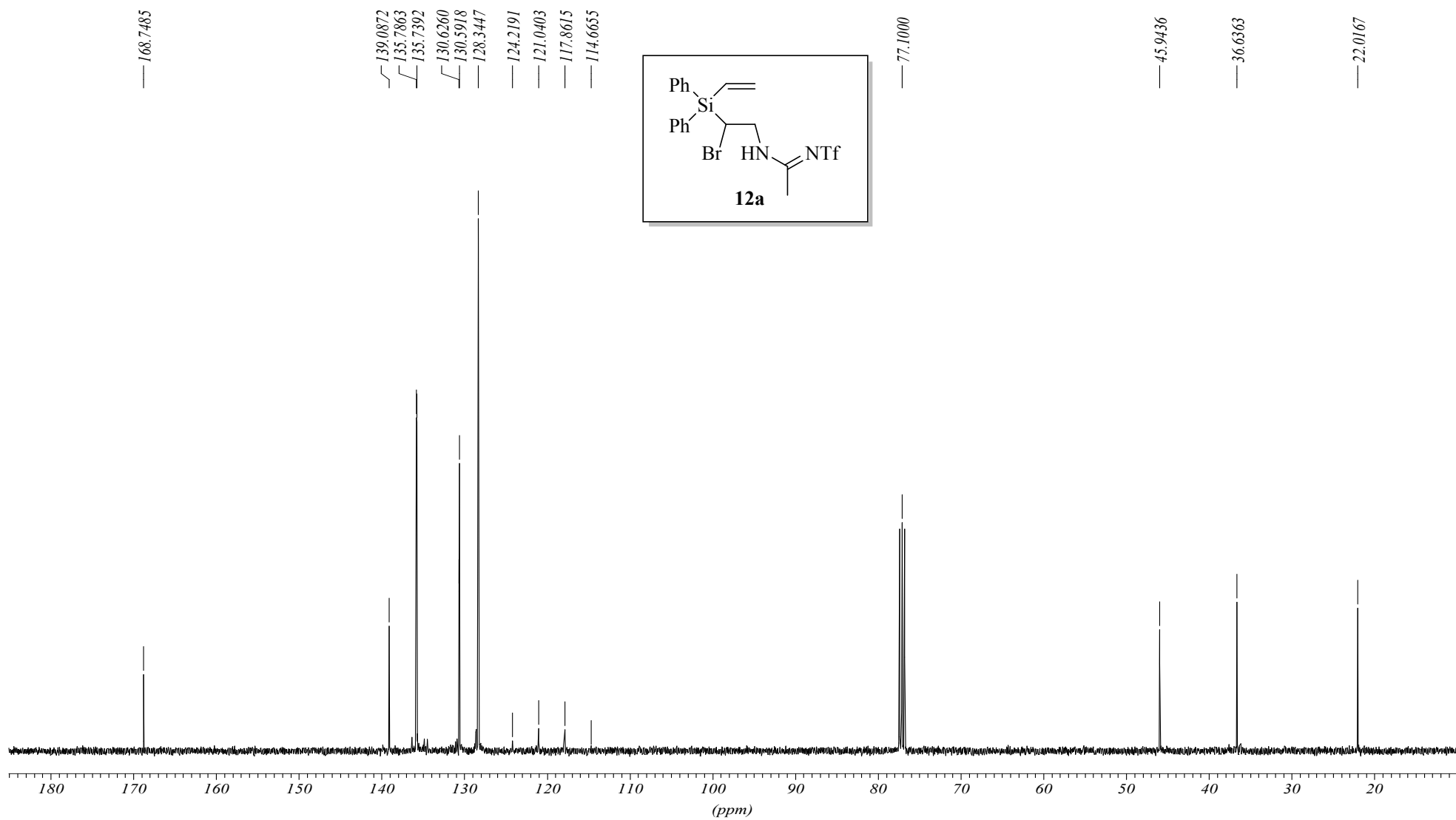


Figure S25. ¹H NMR spectrum of compound **12a**

N-(2-bromo-2-(dimethyl(vinyl)silyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **12a** (R = Me).

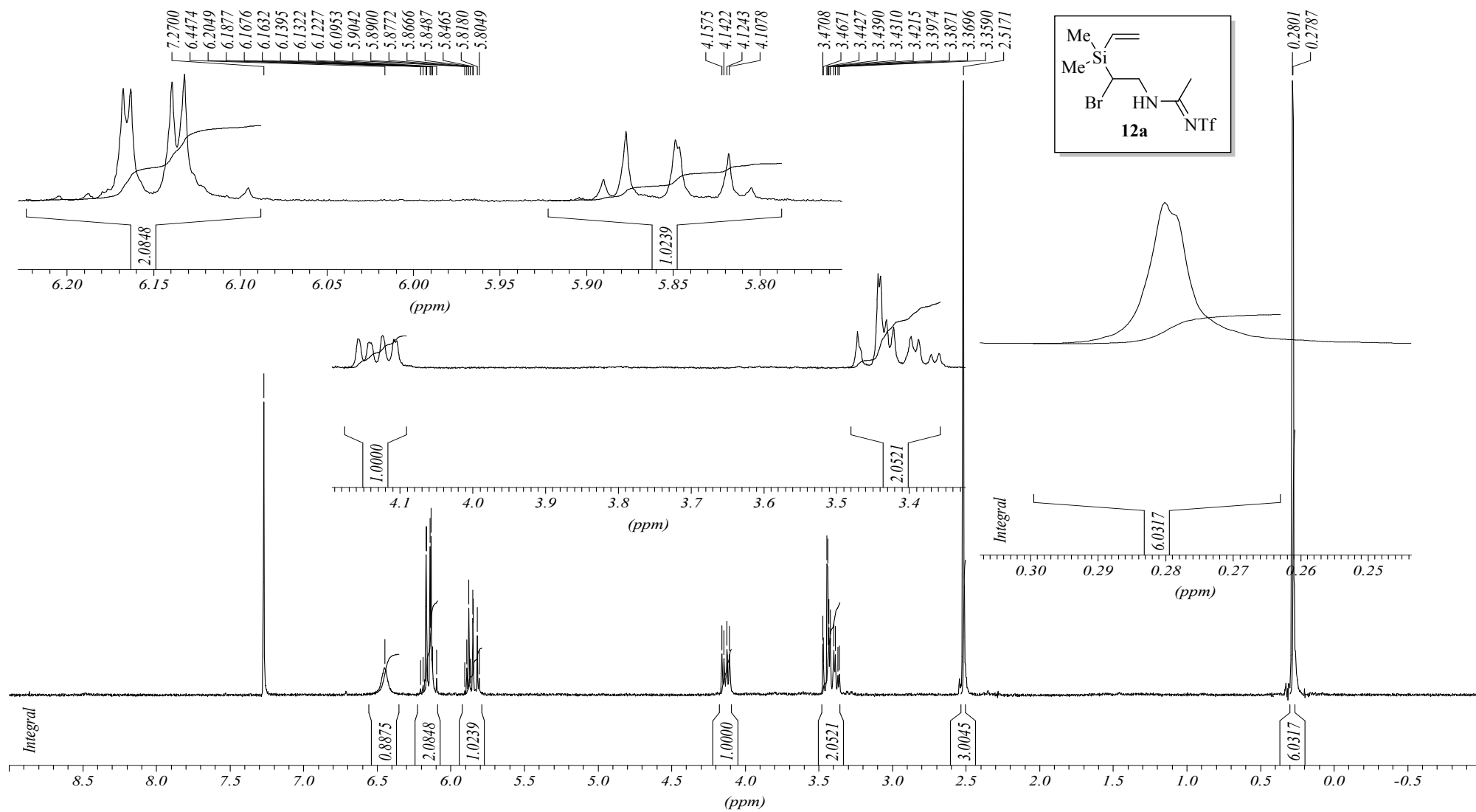


Figure S26. ^{13}C NMR spectrum of compound **12a**

N-(2-bromo-2-(dimethyl(vinyl)silyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **12a** (R = Me).

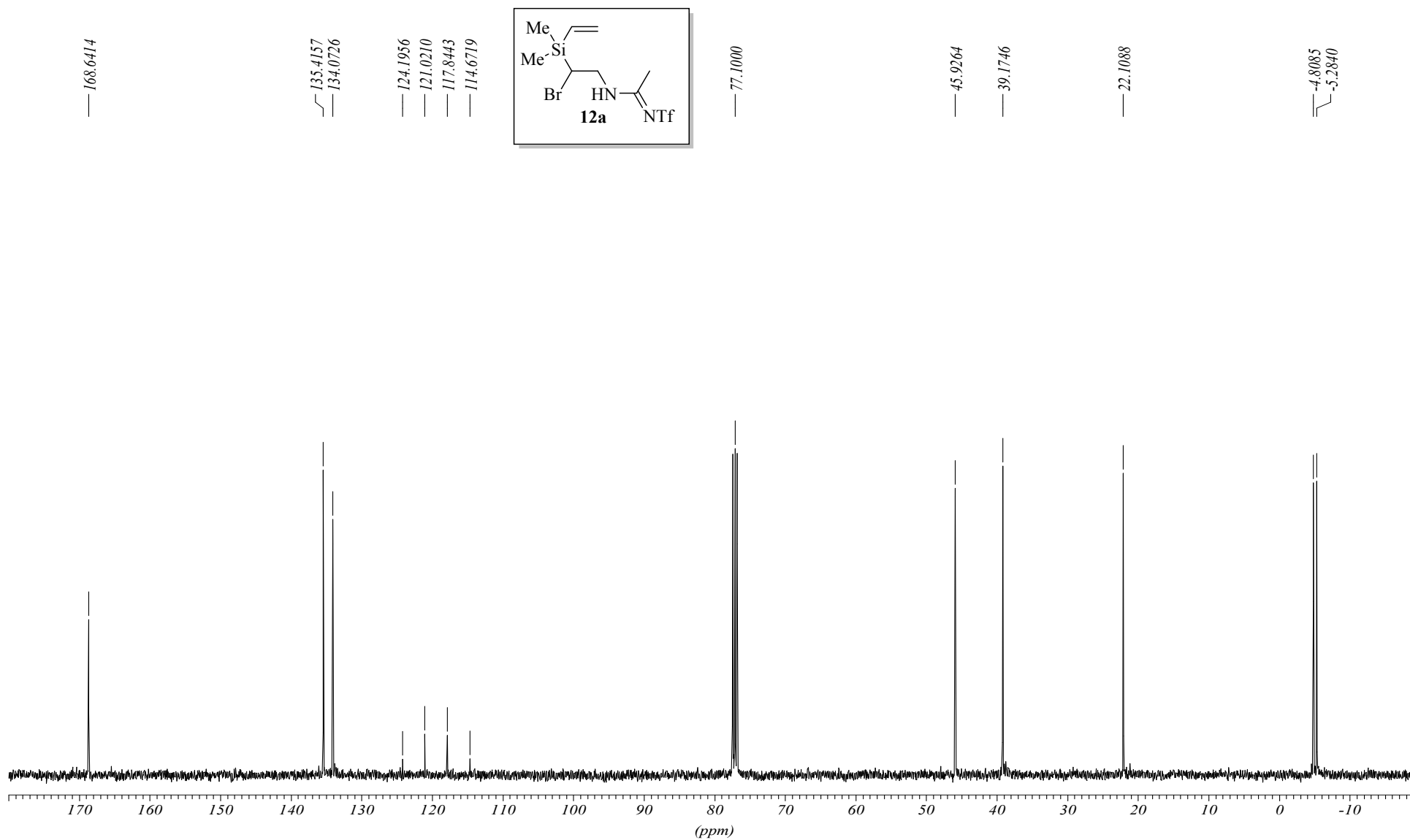


Figure S27. ¹H NMR spectrum of compound **13a**

N-(2-bromo-2-((1,2-dibromoethyl)diphenylsilyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **13a** (R = Ph).

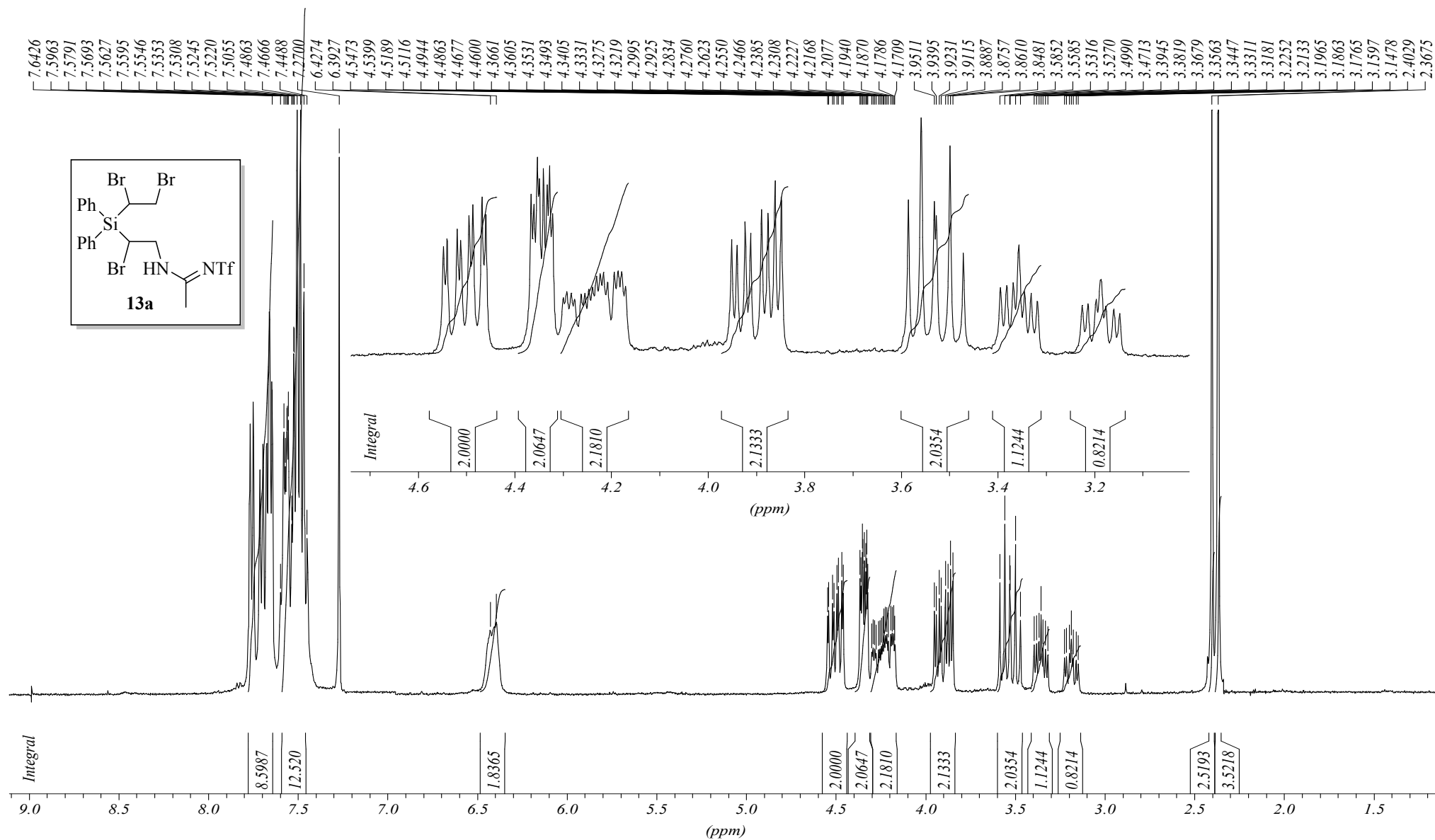


Figure S28. ^{13}C (*J*-mod) NMR spectrum of compound **13a**

N-(2-bromo-2-((1,2-dibromoethyl)diphenylsilyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **13a** (R = Ph).

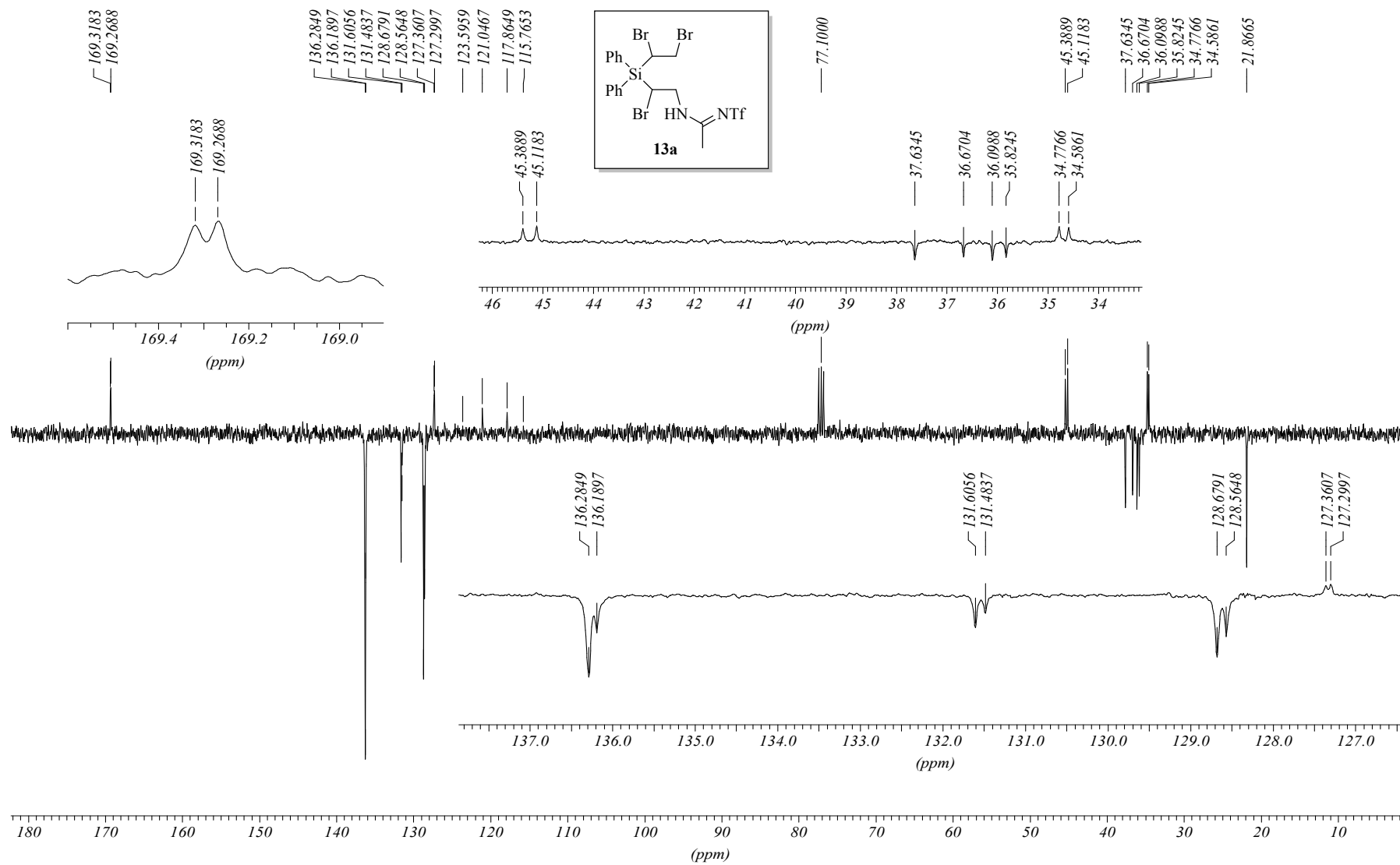


Figure S29. ¹H NMR spectrum of compound **13a**

N-(2-bromo-2-((1,2-dibromoethyl)dimethylsilyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **13a** (R = Me).

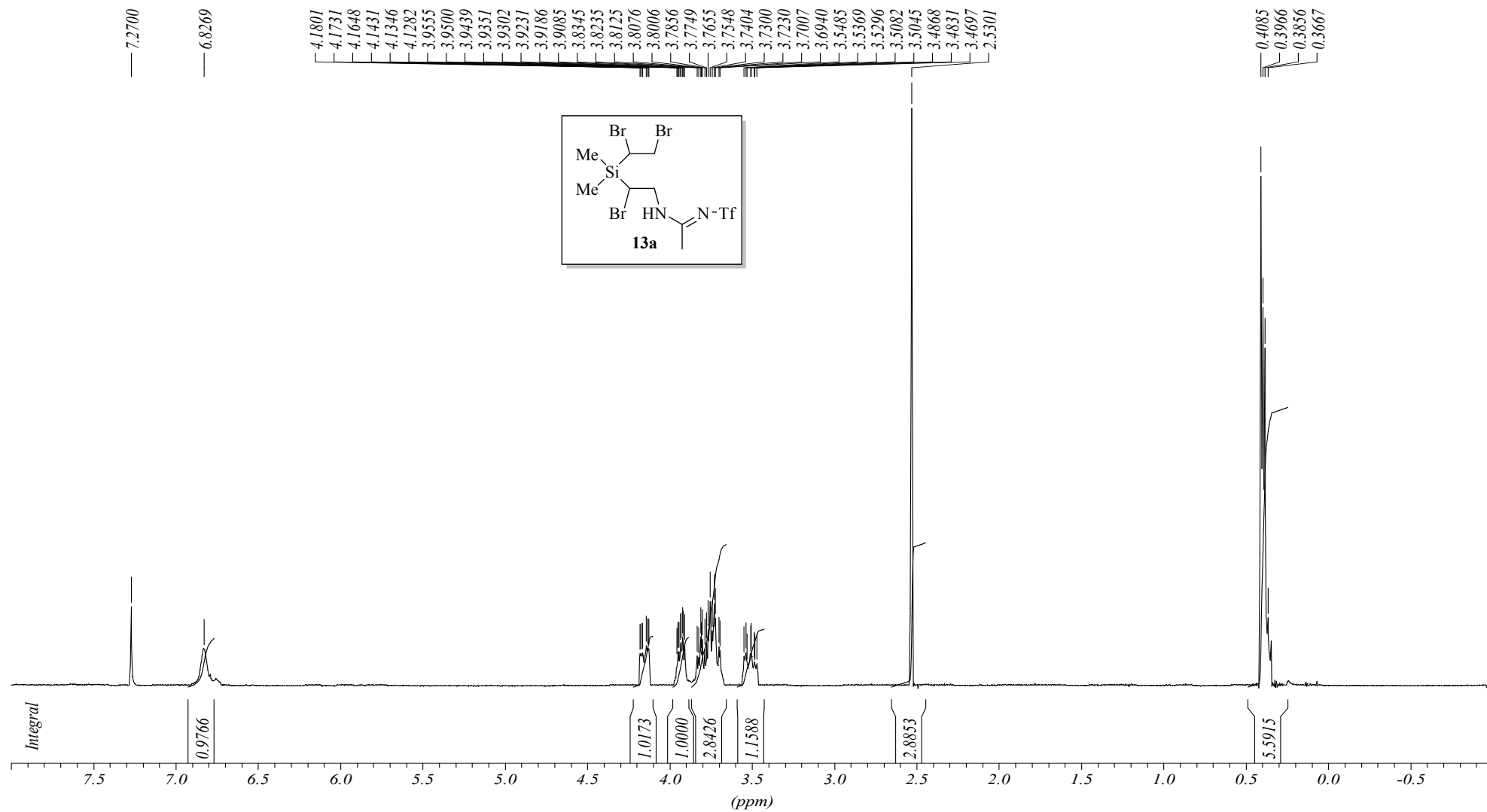


Figure S30. ^{13}C NMR spectrum of compound **13a**

N-(2-bromo-2-((1,2-dibromoethyl)dimethylsilyl)ethyl)-*N'*-((trifluoromethyl)sulfonyl)acetimidamide, **13a** (R = Me).

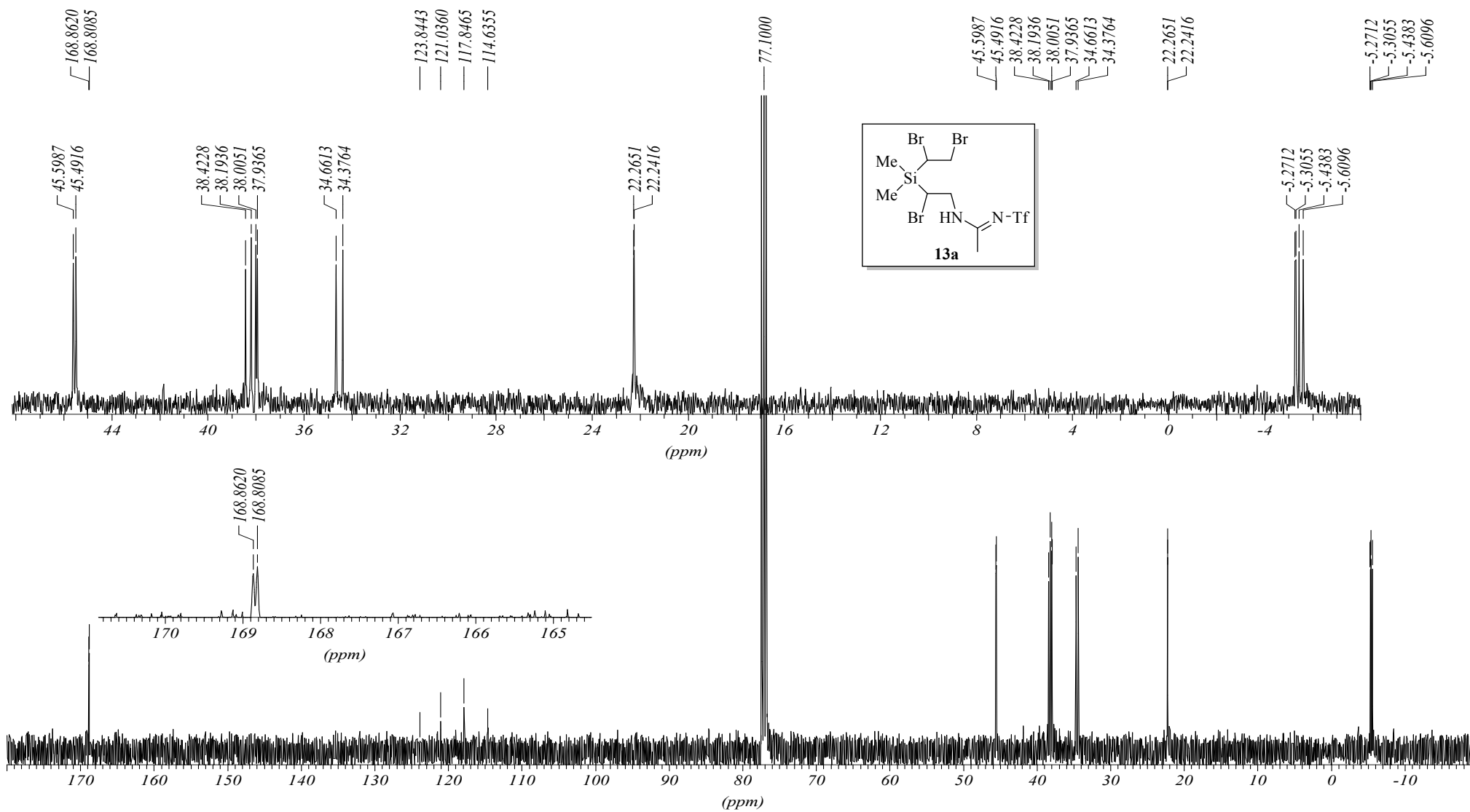


Figure S31. ¹H NMR spectrum of compound **13d**

N-(2-bromo-2-((1,2-dibromoethyl)diphenylsilyl)ethyl)-*N'*-(4-nitrophenylsulfonyl)-acetamidine, **13d** (R = Ph).

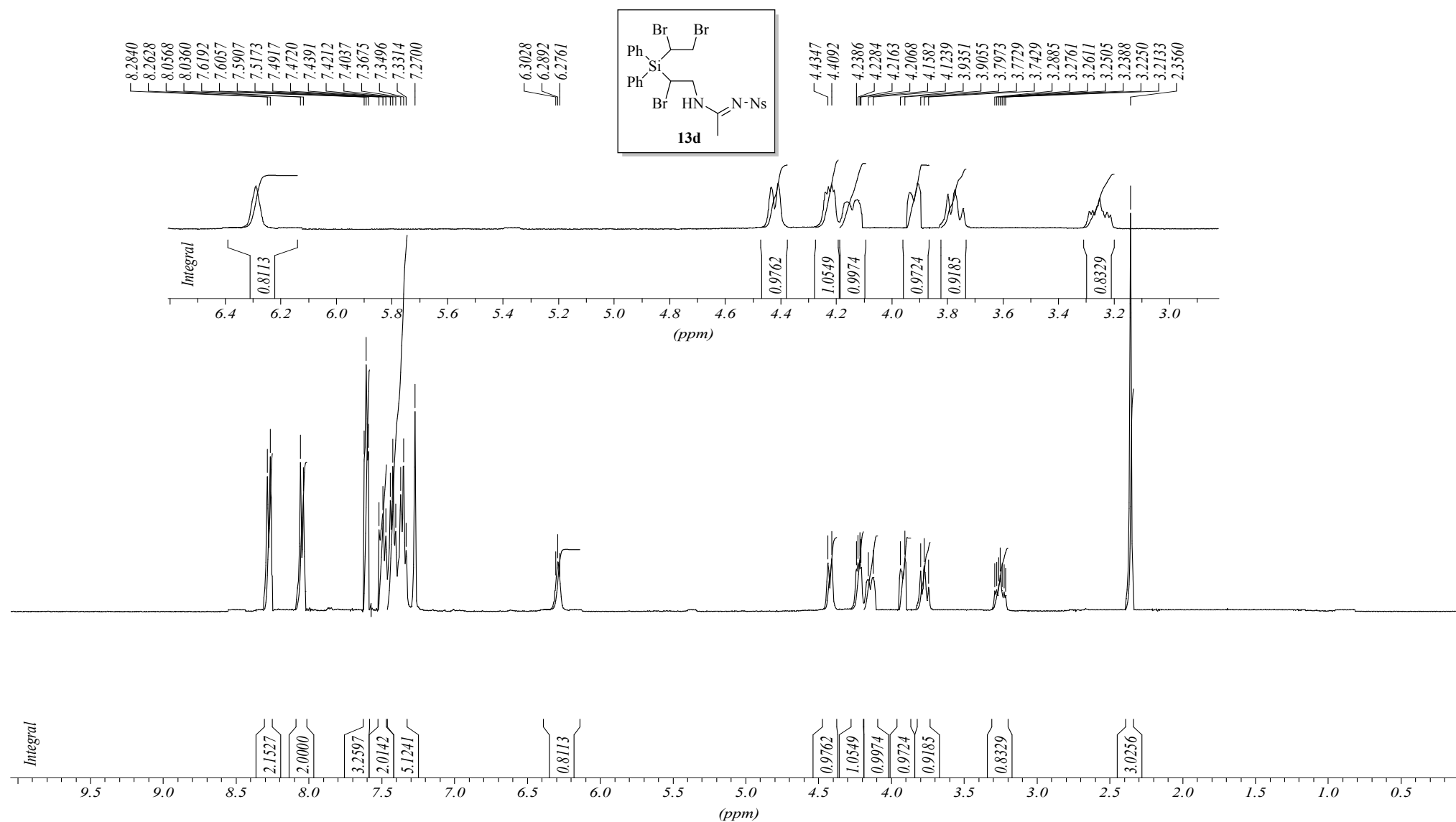


Figure S32. ^{13}C NMR spectrum of compound **13d**

N-(2-bromo-2-((1,2-dibromoethyl)diphenylsilyl)ethyl)-*N'*-(4-nitrophenylsulfonyl)-acetamidine, **13d** (R = Ph).

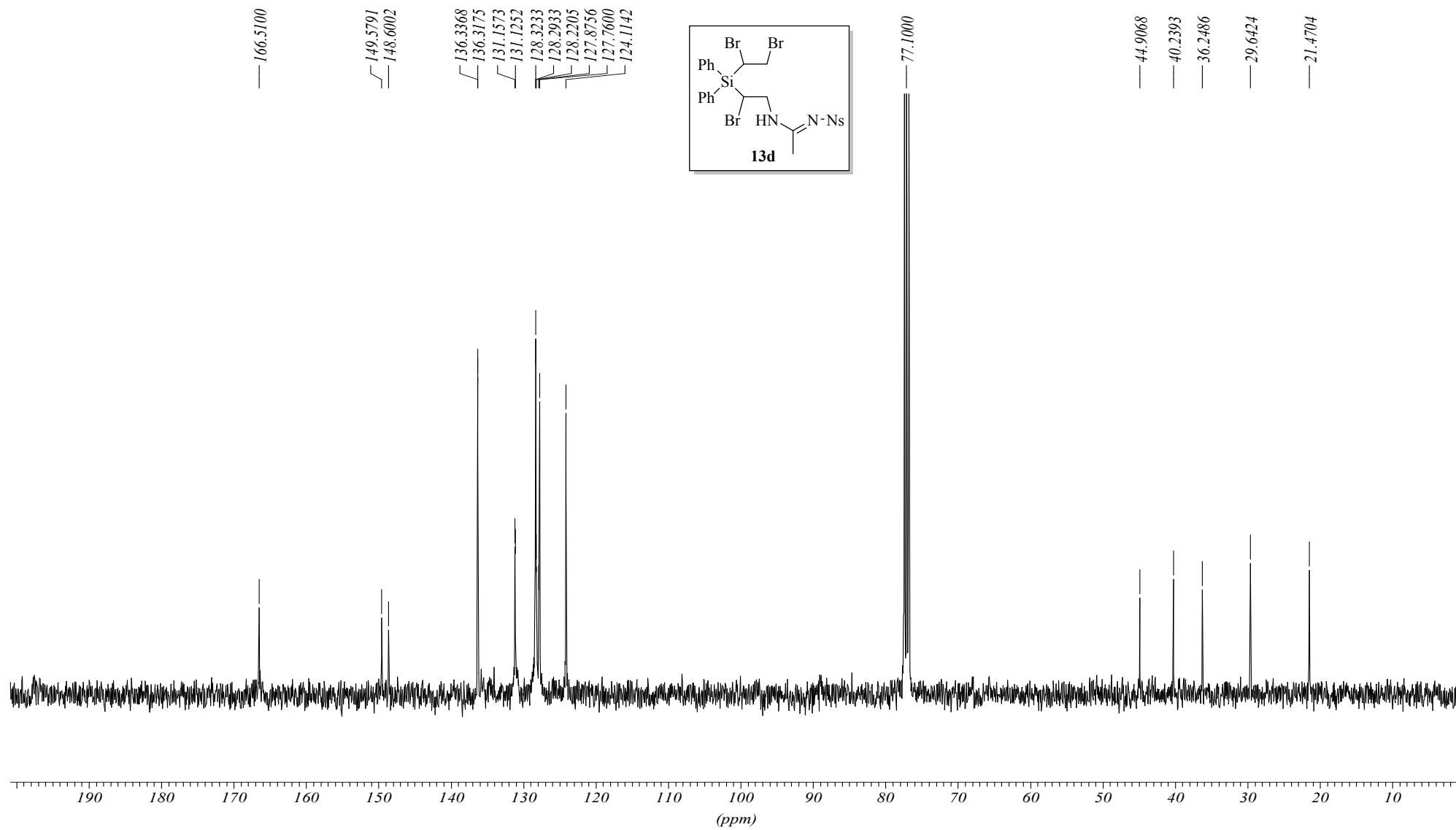


Figure S33. ¹H NMR spectrum of compound **14**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)acetamide, **14**.

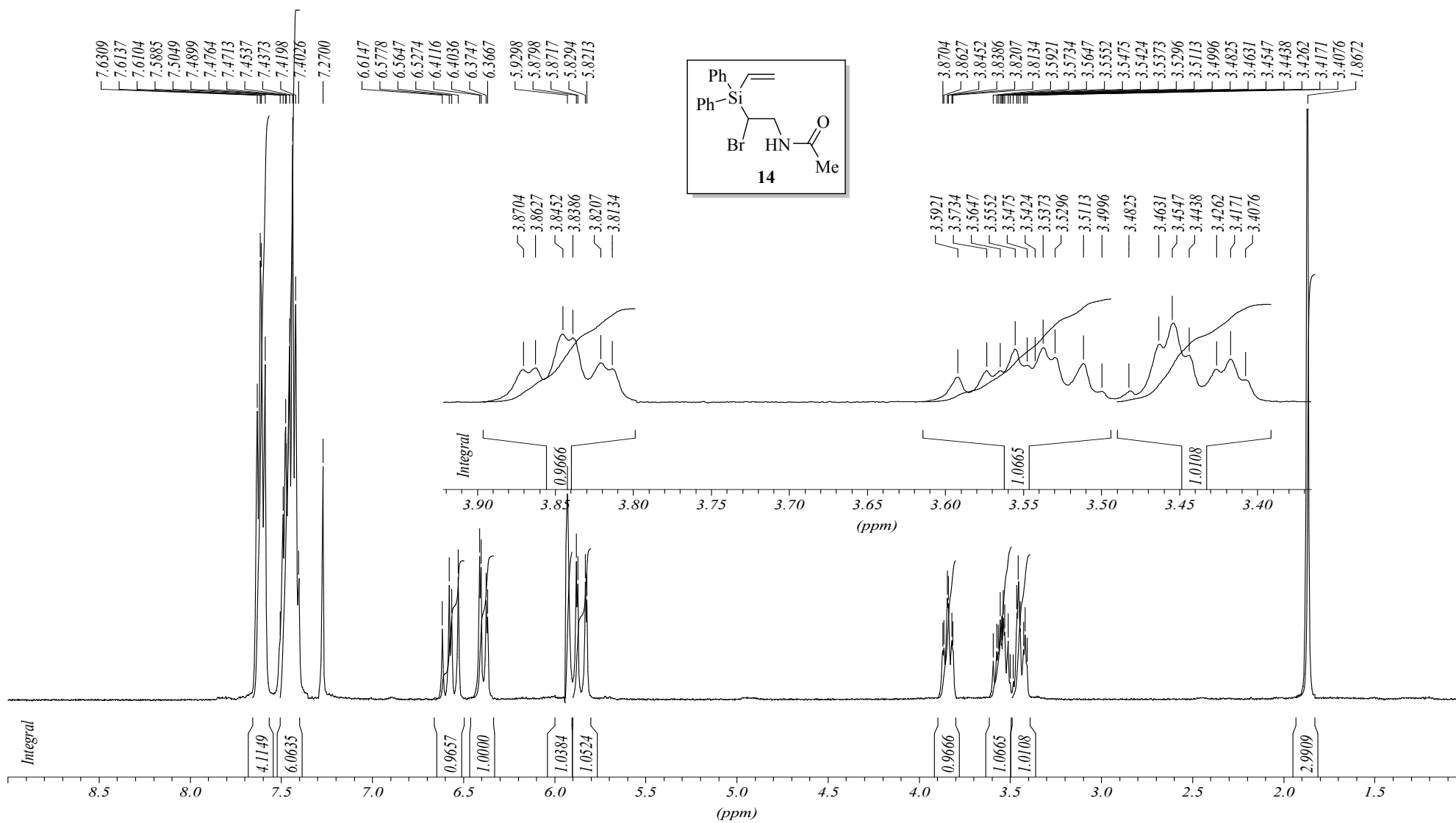


Figure S34. ^{13}C NMR spectrum of compound **14**

N-(2-bromo-2-(diphenyl(vinyl)silyl)ethyl)acetamide, **14**.

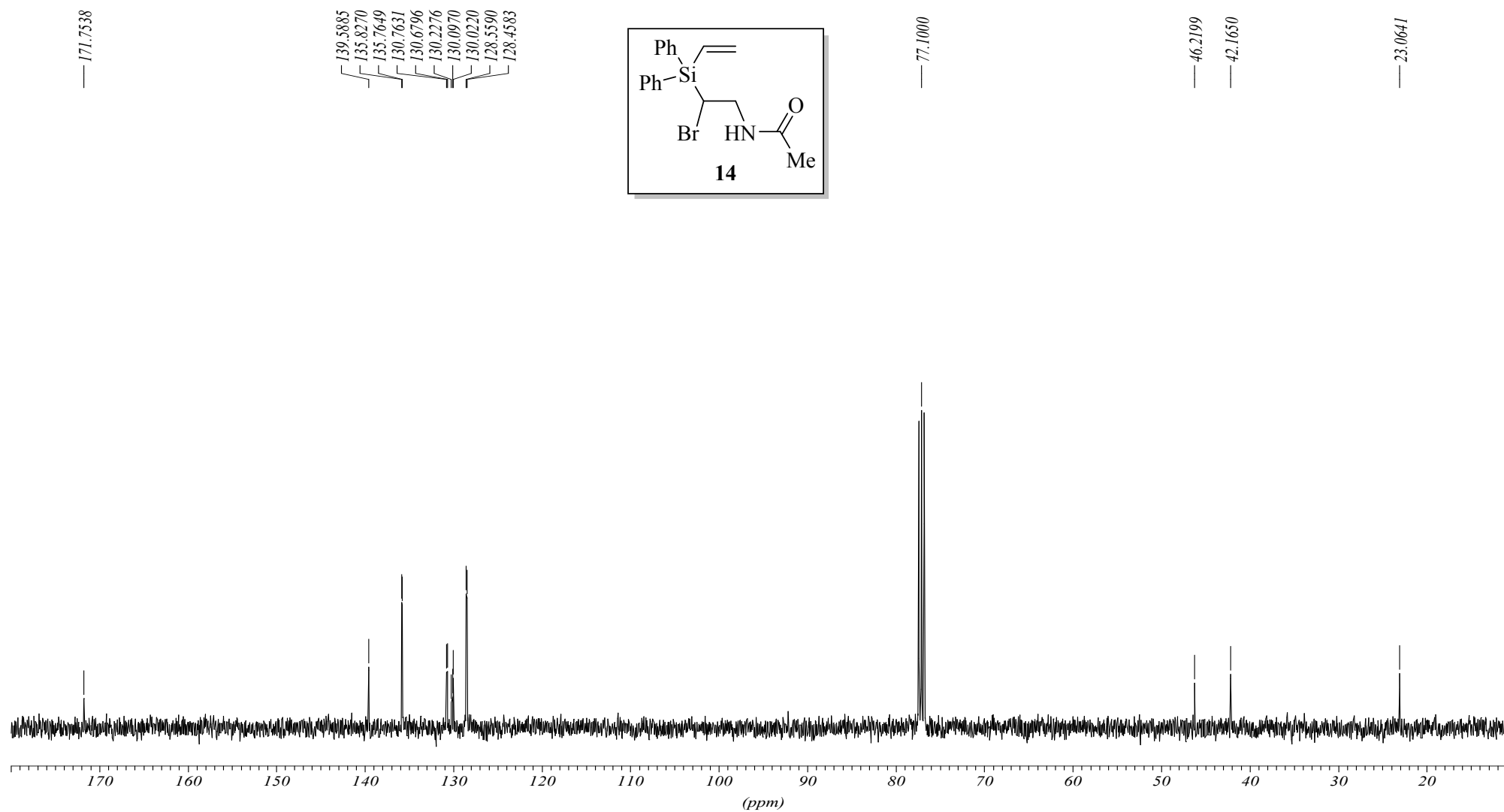


Figure S35. ¹H NMR spectrum of compound **15**

(1-Bromo-2-(4-bromobutoxy)ethyl)diphenyl(vinyl)silane, **15** (R = Ph).

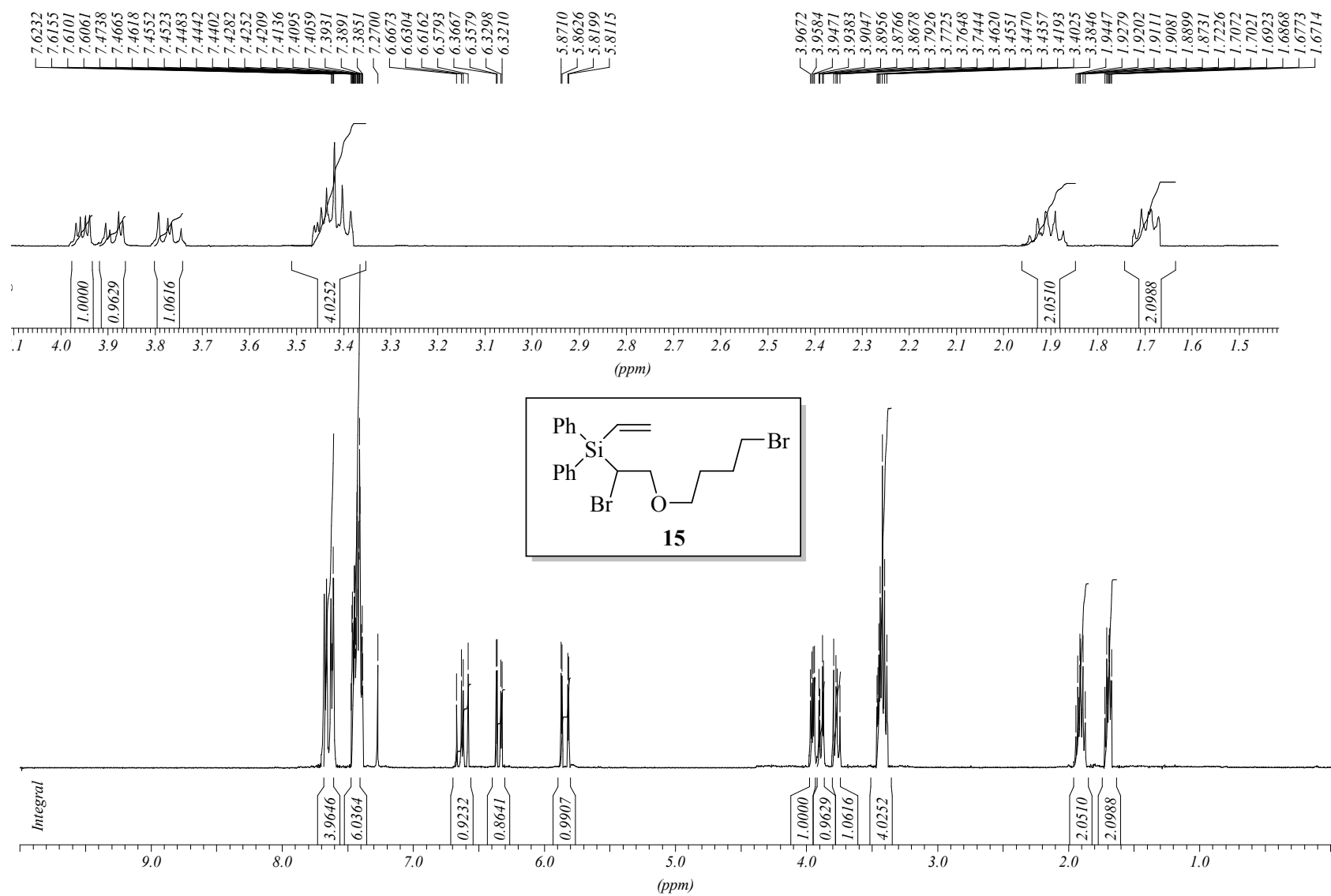


Figure S36. ^{13}C (J -mod) NMR spectrum of compound **15**

(1-Bromo-2-(4-bromobutoxy)ethyl)diphenyl(vinyl)silane, **15** (R = Ph).

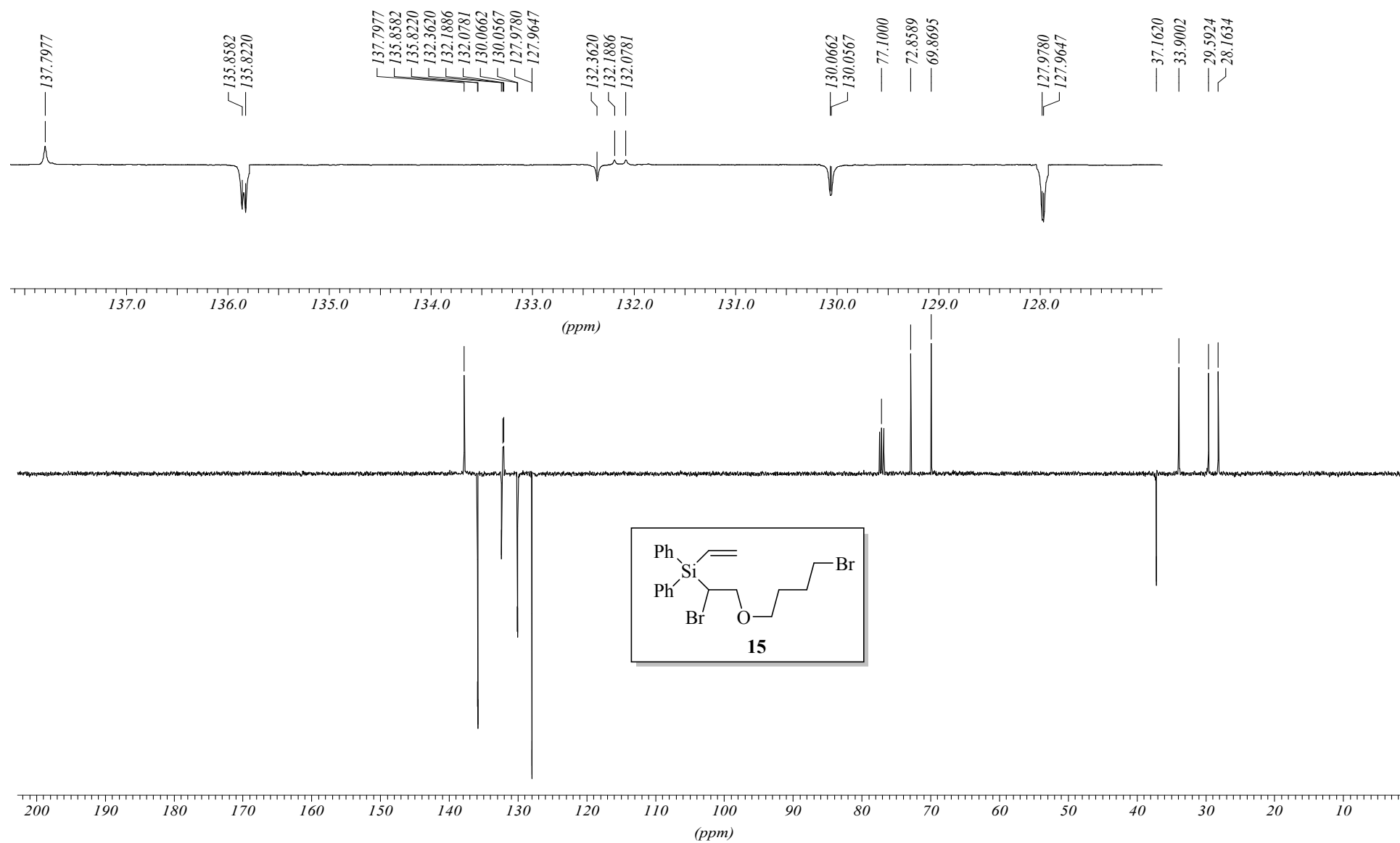


Figure S37. ¹H NMR spectrum of compound **15**

(1-Bromo-2-(4-bromobutoxy)ethyl)dimethyl(vinyl)silane, **15** (R = Me).

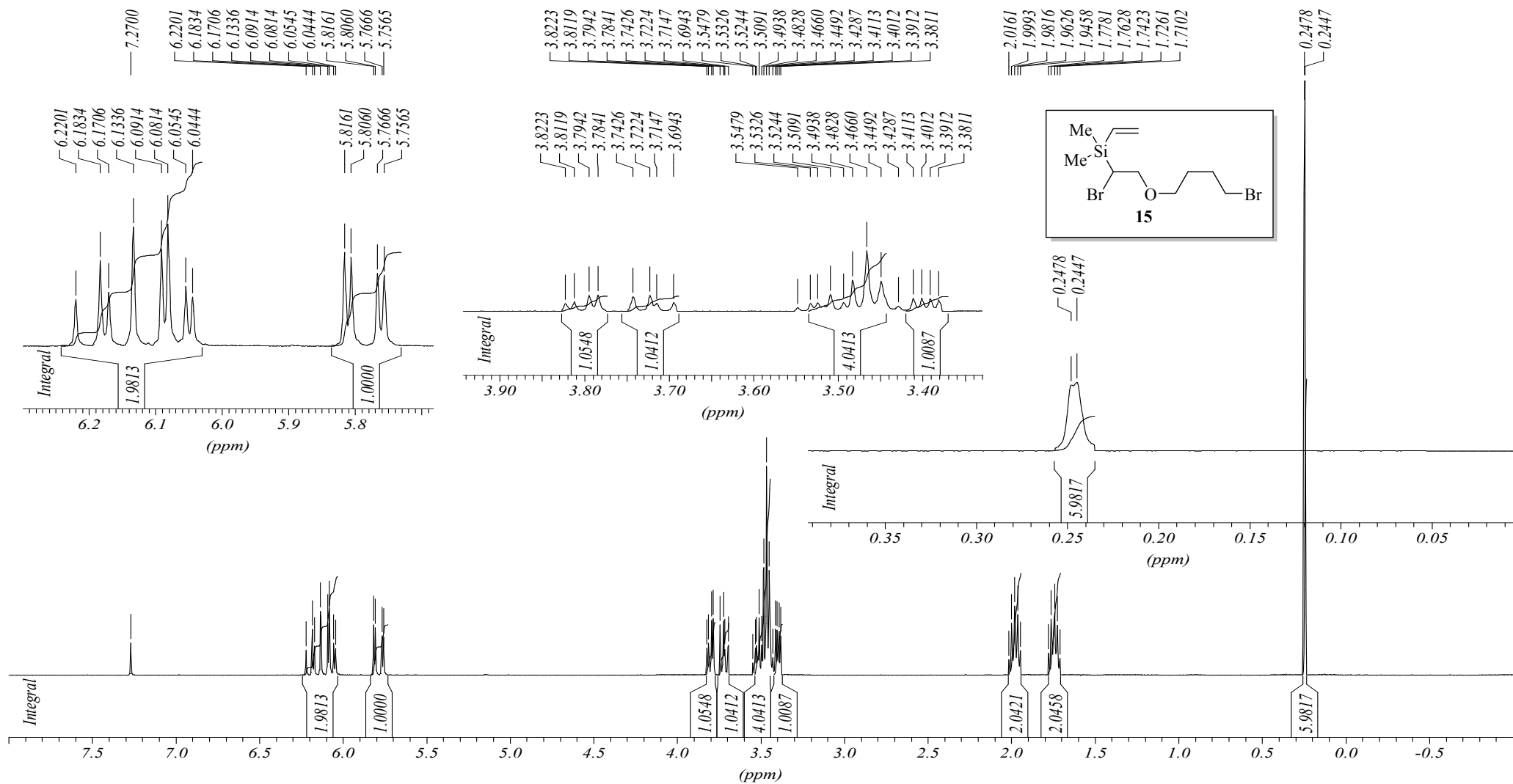


Figure S38. ^{13}C NMR spectrum of compound **15**

(1-Bromo-2-(4-bromobutoxy)ethyl)dimethyl(vinyl)silane, **15** (R = Me).

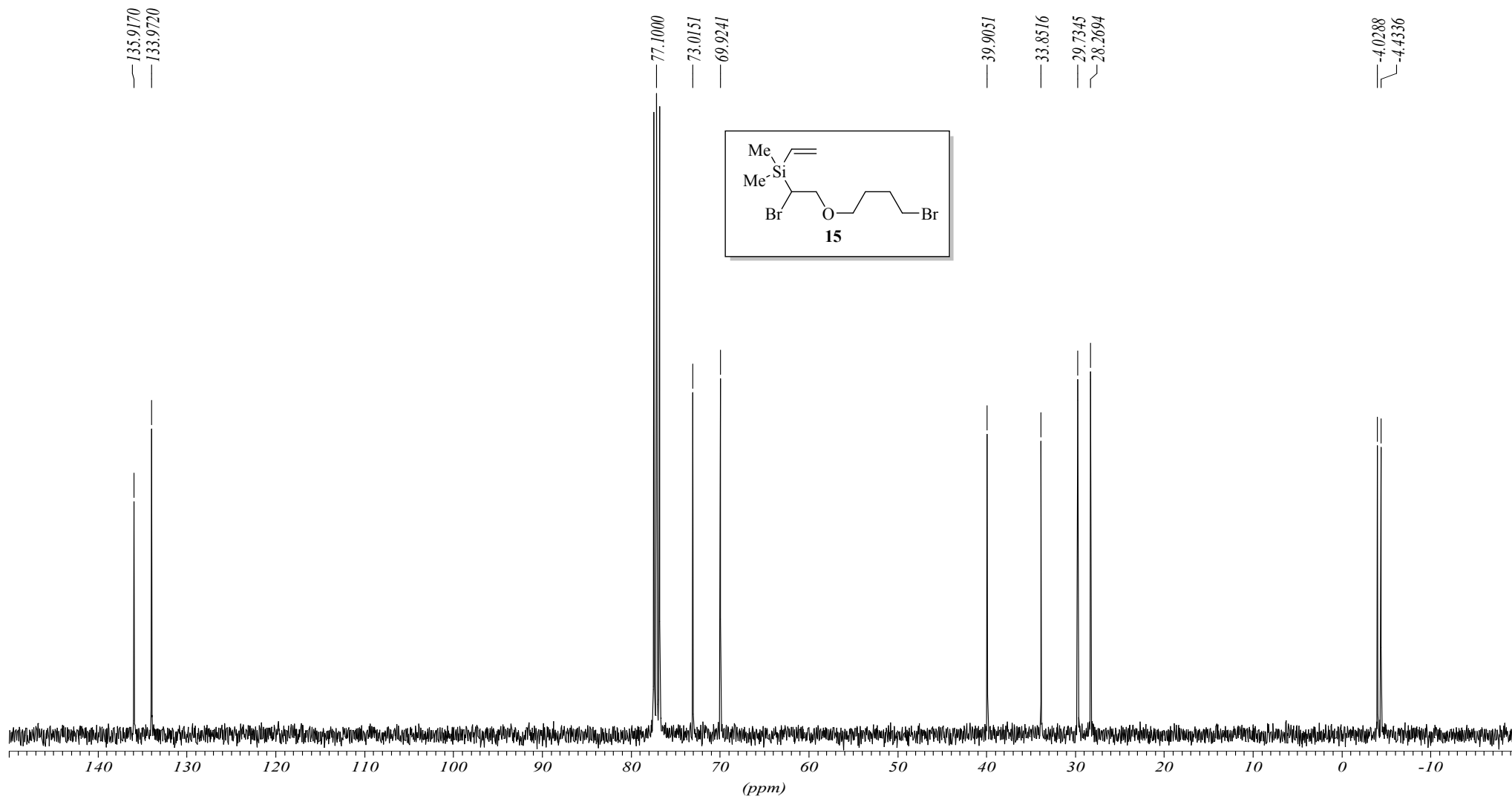


Figure S39. ^1H NMR spectrum of compound **16a**

N-(4-(2-bromo-2-(diphenyl(vinyl)silyl)ethoxy)butyl)trifluoromethanesulfonamide, **16a** (R = Ph).

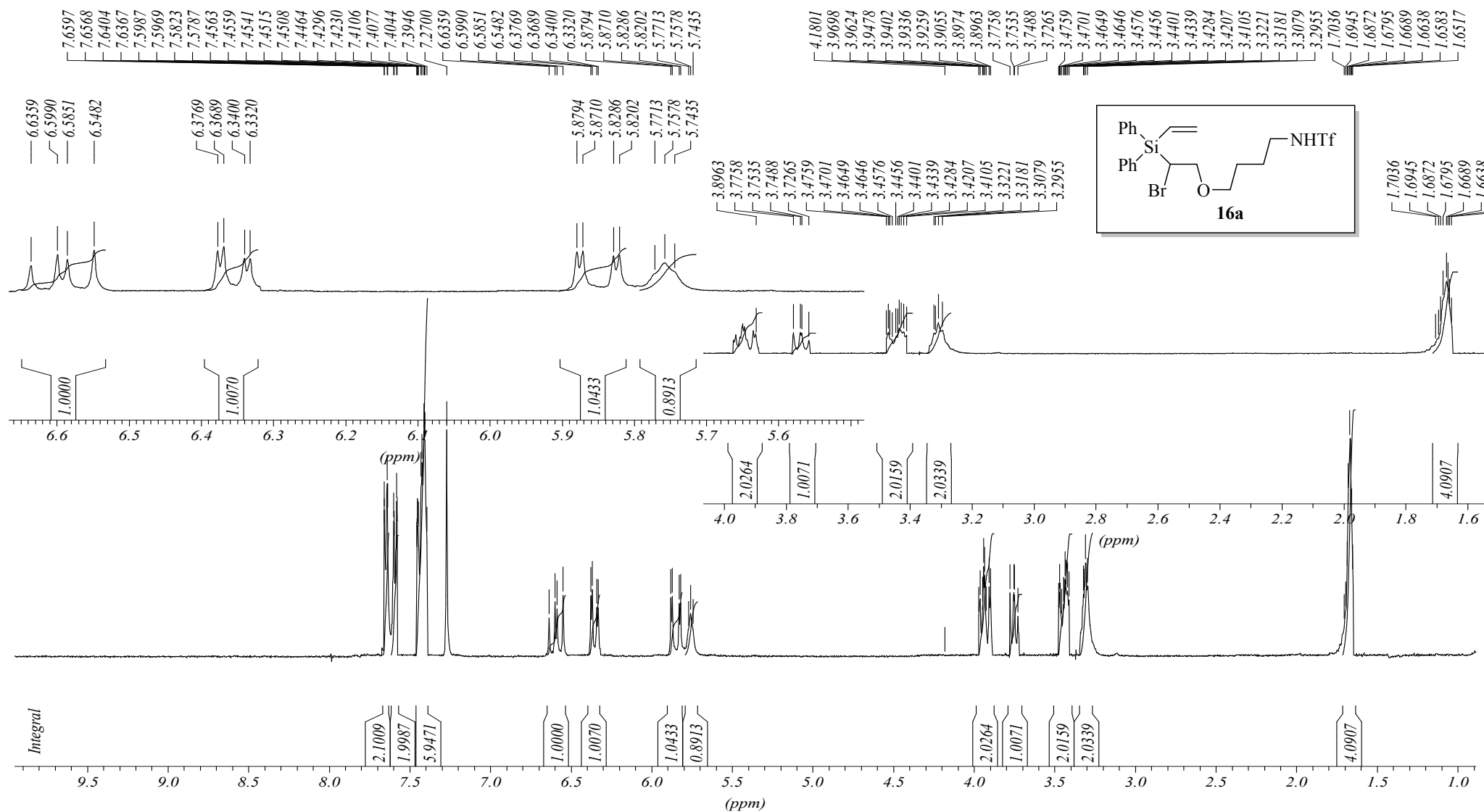


Figure S40. ¹³C (*J*-mod) NMR spectrum of compound **16a**

N-(4-(2-bromo-2-(diphenyl(vinyl)silyl)ethoxy)butyl)trifluoromethanesulfonamide, **16a** (R = Ph).

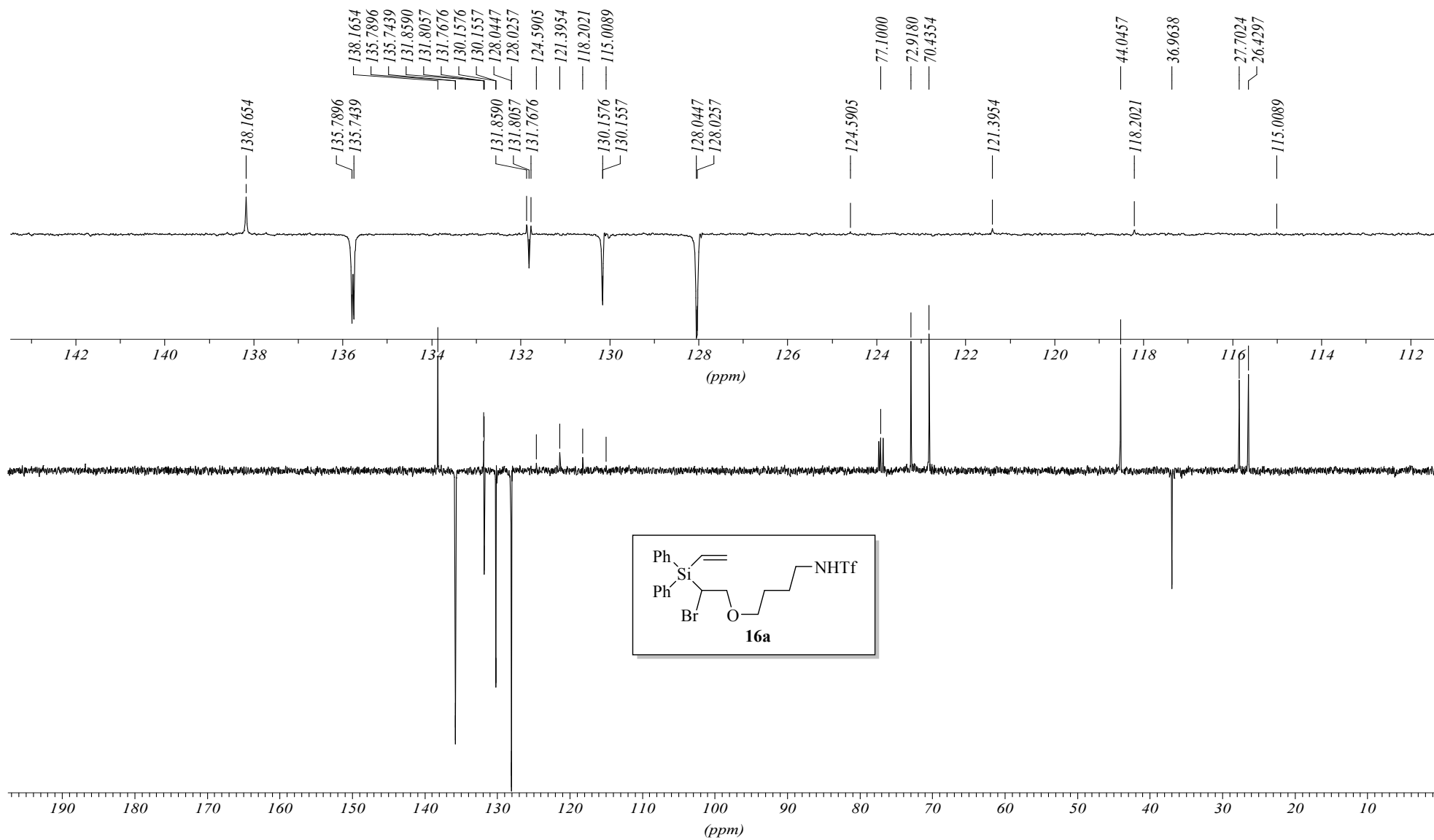


Figure S41. ¹H NMR spectrum of compound **16d**

N-(4-(2-bromo-2-(diphenyl(vinyl)silyl)ethoxy)butyl)-4-nitrobenzenesulfonamide, **16d** (R = Ph).

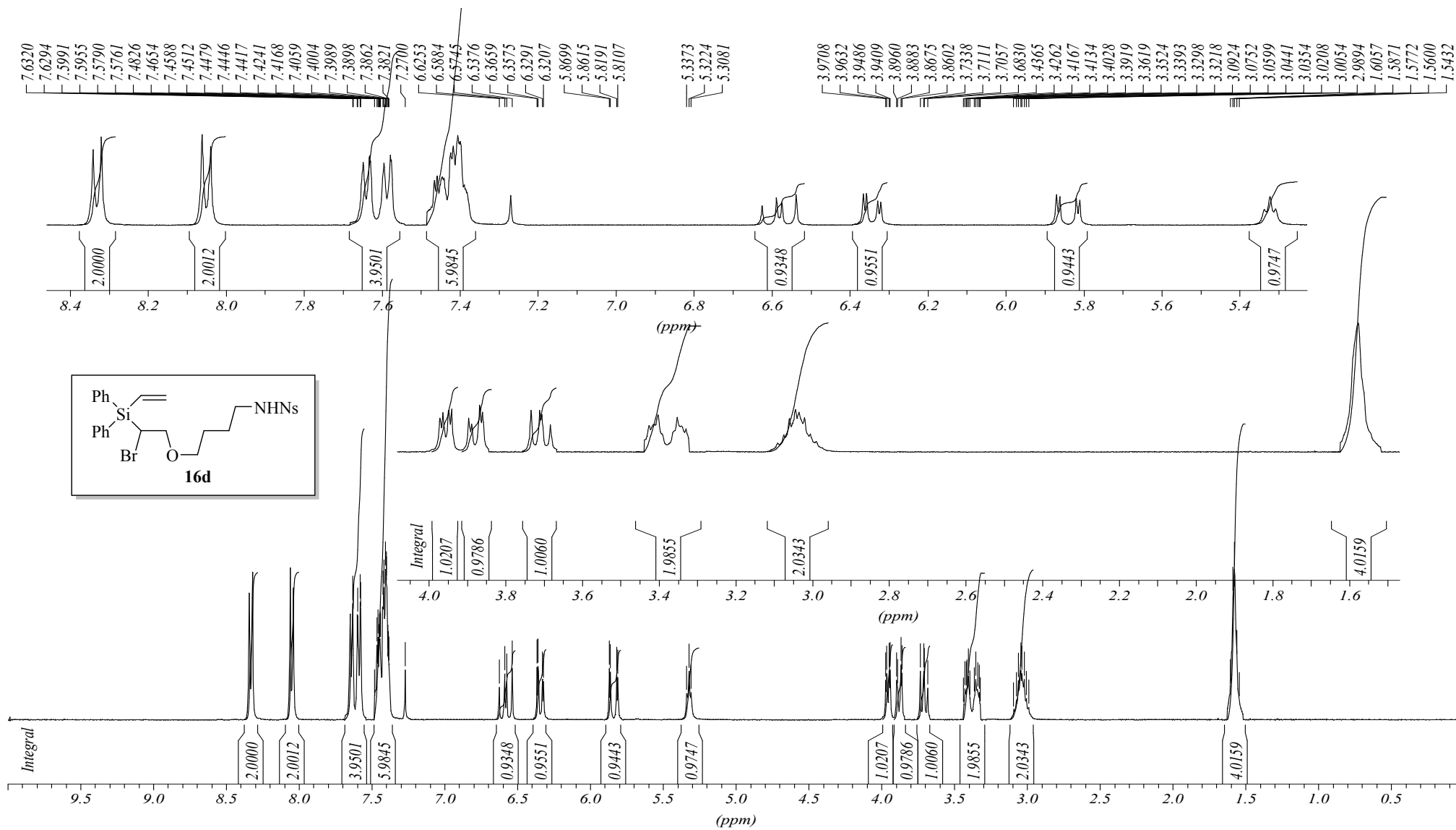


Figure S42. ¹³C NMR spectrum of compound **16d**

N-(4-(2-bromo-2-(diphenyl(vinyl)silyl)ethoxy)butyl)-4-nitrobenzenesulfonamide, **16d** (R = Ph).

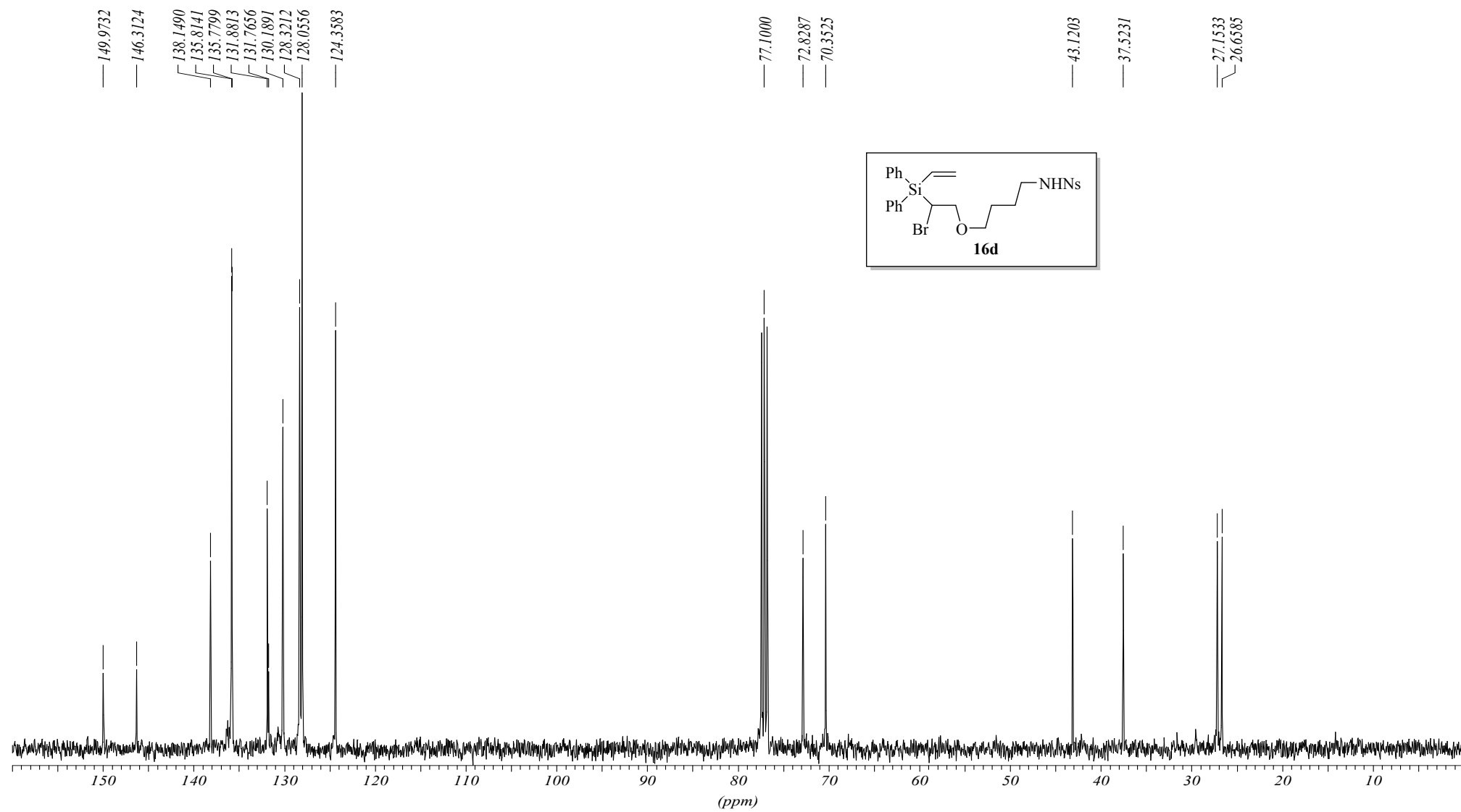


Figure S43. ^{13}C (J-mod) NMR spectrum of compound **16d**

N-(4-(2-bromo-2-(diphenyl(vinyl)silyl)ethoxy)butyl)-4-nitrobenzenesulfonamide, **16d** (R = Ph).

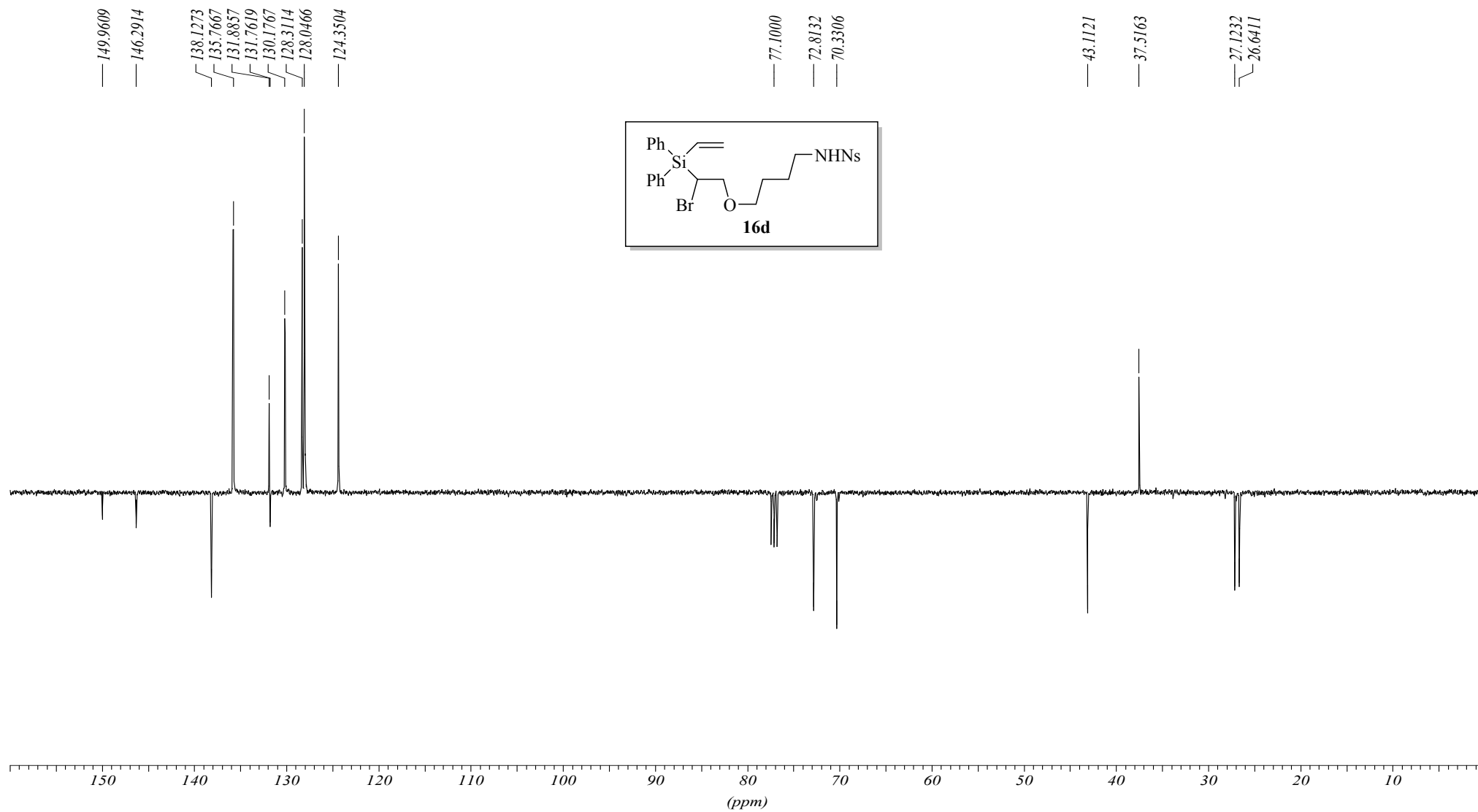


Figure S44. ¹H NMR spectrum of compound **16a**

N-(4-(2-bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)trifluoromethanesulfonamide, **16a** (R = Me).

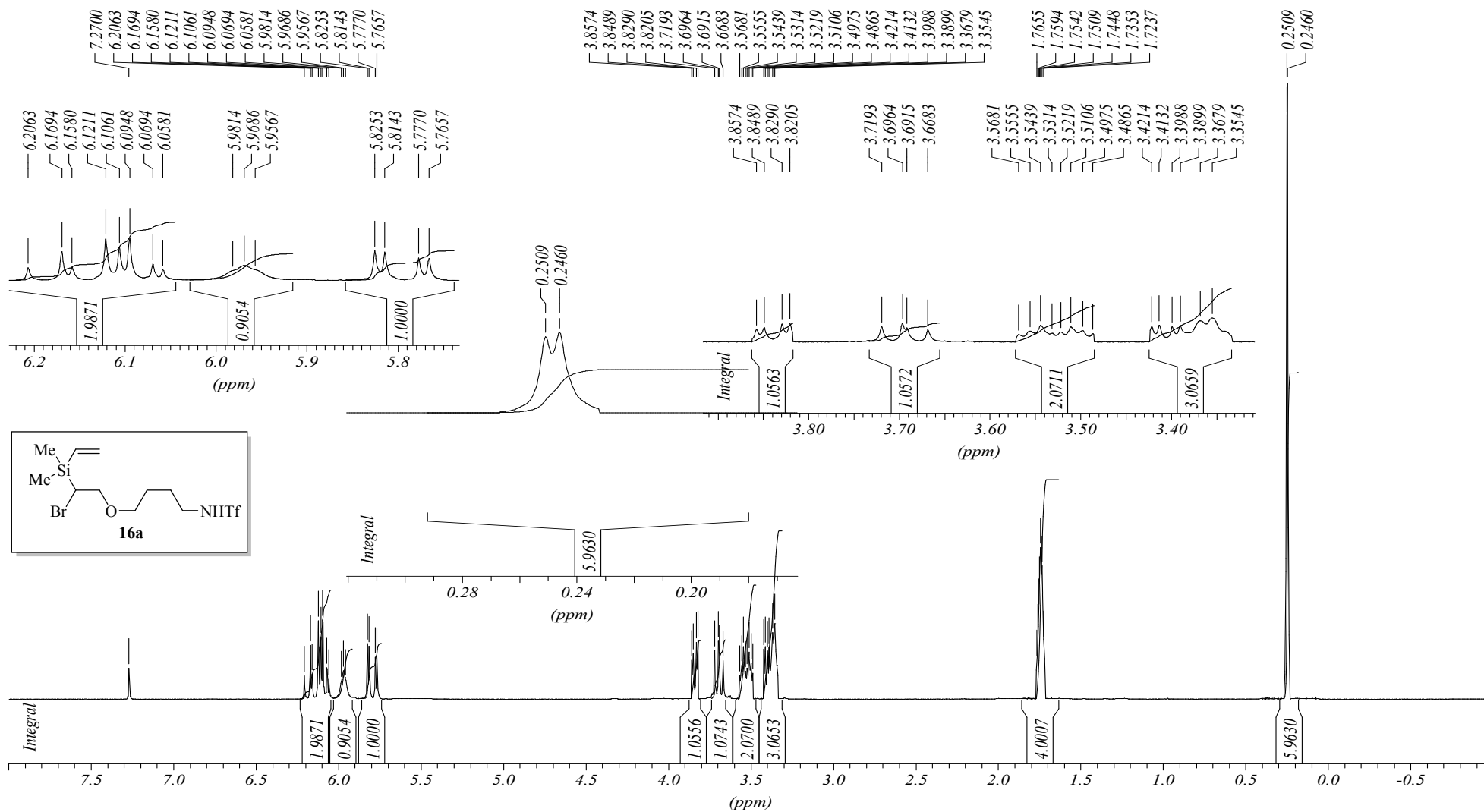


Figure S45. ¹³C NMR spectrum of compound **16a**

N-(4-(2-bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl) trifluoromethanesulfonamide, **16a** (R = Me).

135.3386
134.2162

124.5426
121.3466
118.1528
114.9632

77.1000
72.8758
70.3118

44.0650
39.7616

27.6267
26.4079

-4.3544
-4.8192

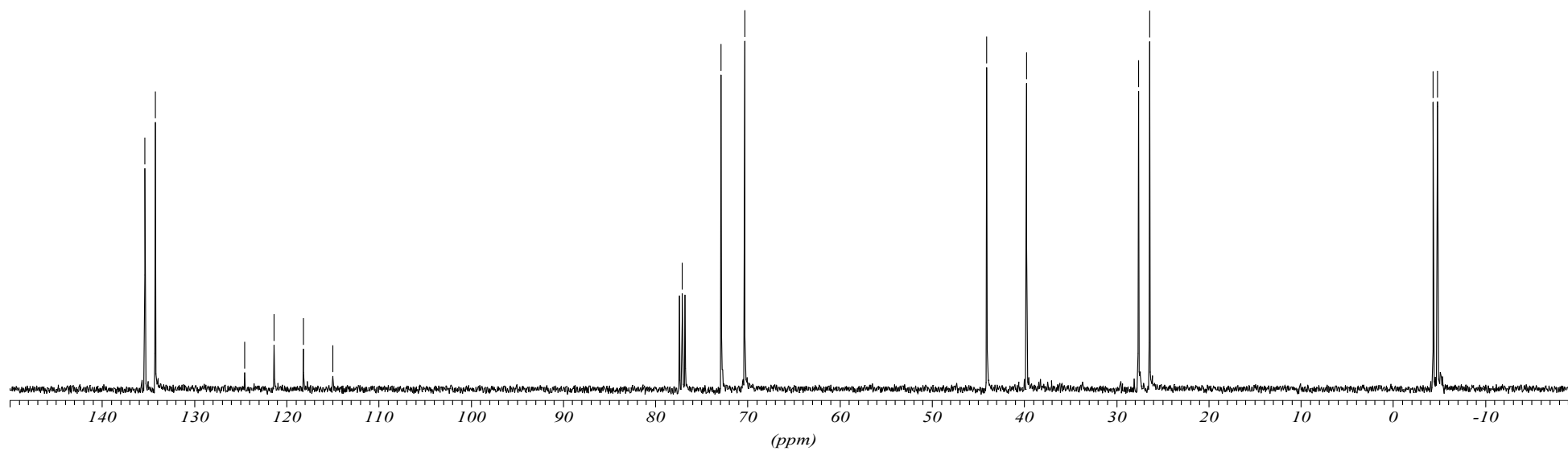
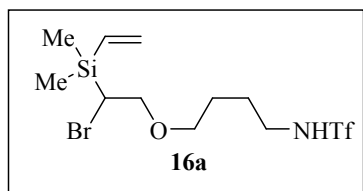


Figure S46. ¹H NMR spectrum of compound **16b**

N-(4-(2-Bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)methanesulfonamide, **16b** (R = Me).

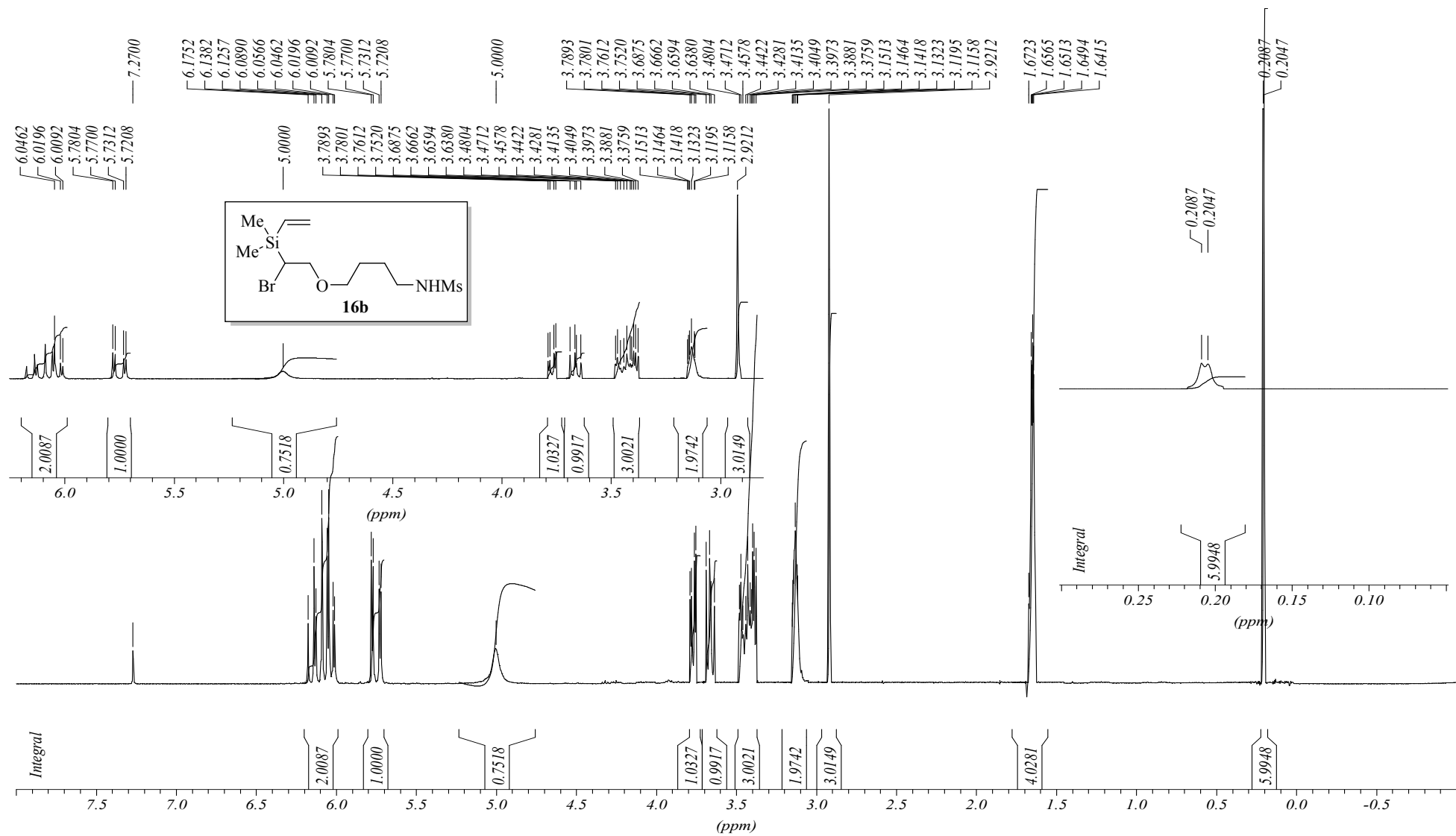


Figure S47. ^{13}C NMR spectrum of compound **16b**

N-(4-(2-Bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)methanesulfonamide, **16b** (R = Me).

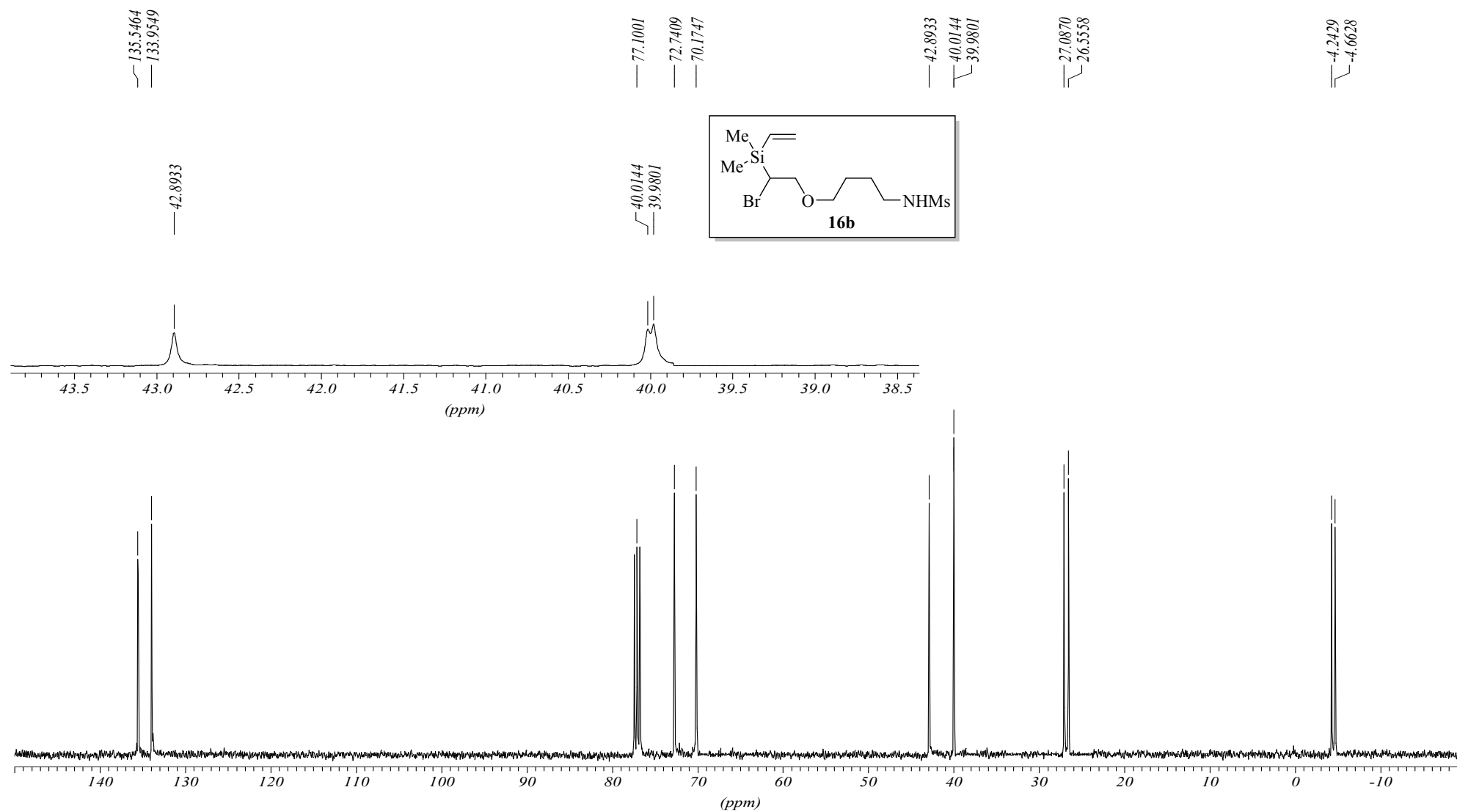


Figure S48. ¹H NMR spectrum of compound **16c**

N-(4-(2-bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)-4-methylbenzenesulfonamide, **16c** (R = Me).

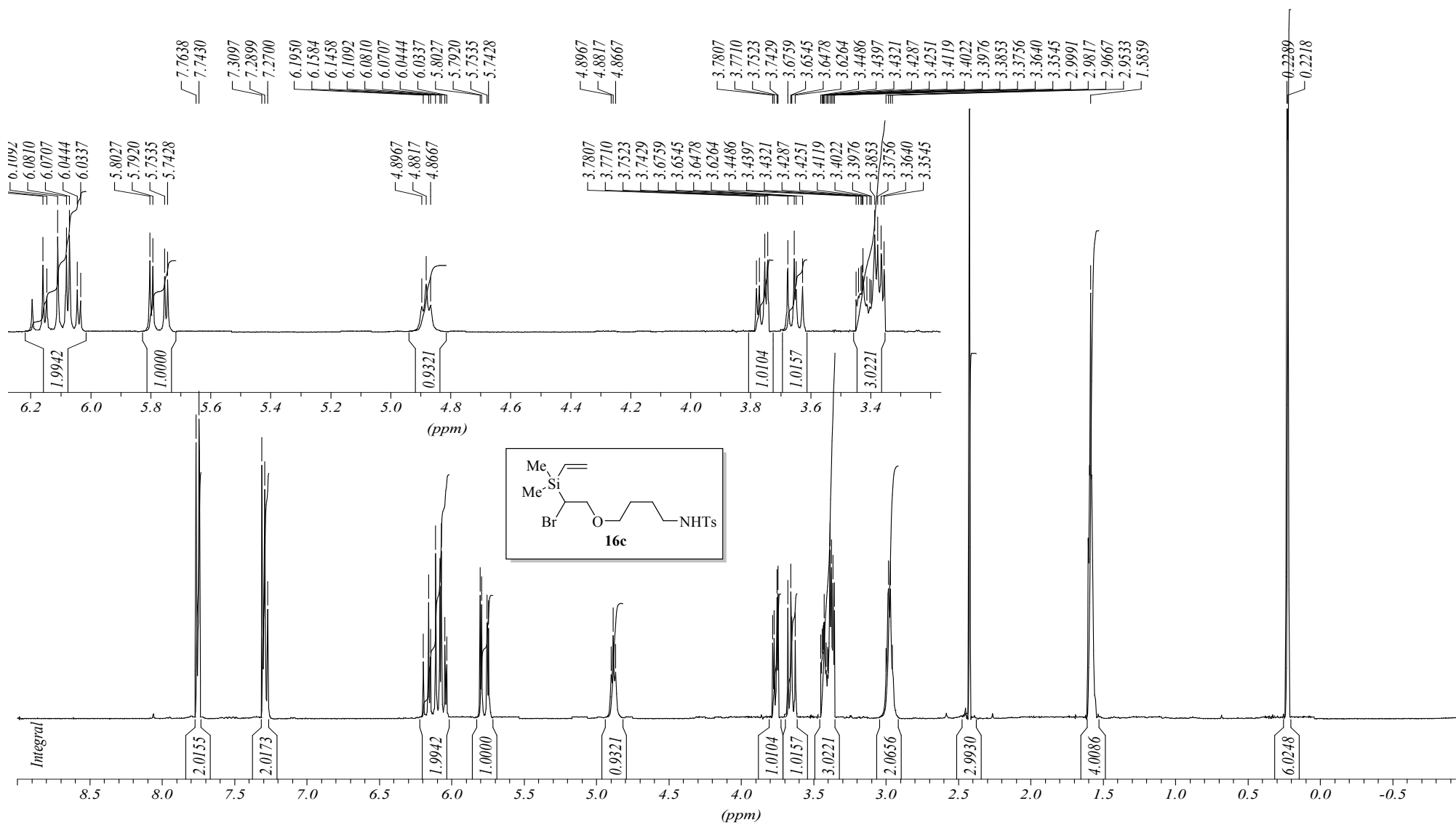


Figure S49. ^{13}C NMR spectrum of compound **16c**

N-(4-(2-bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)-4-methylbenzenesulfonamide, **16c** (R = Me).

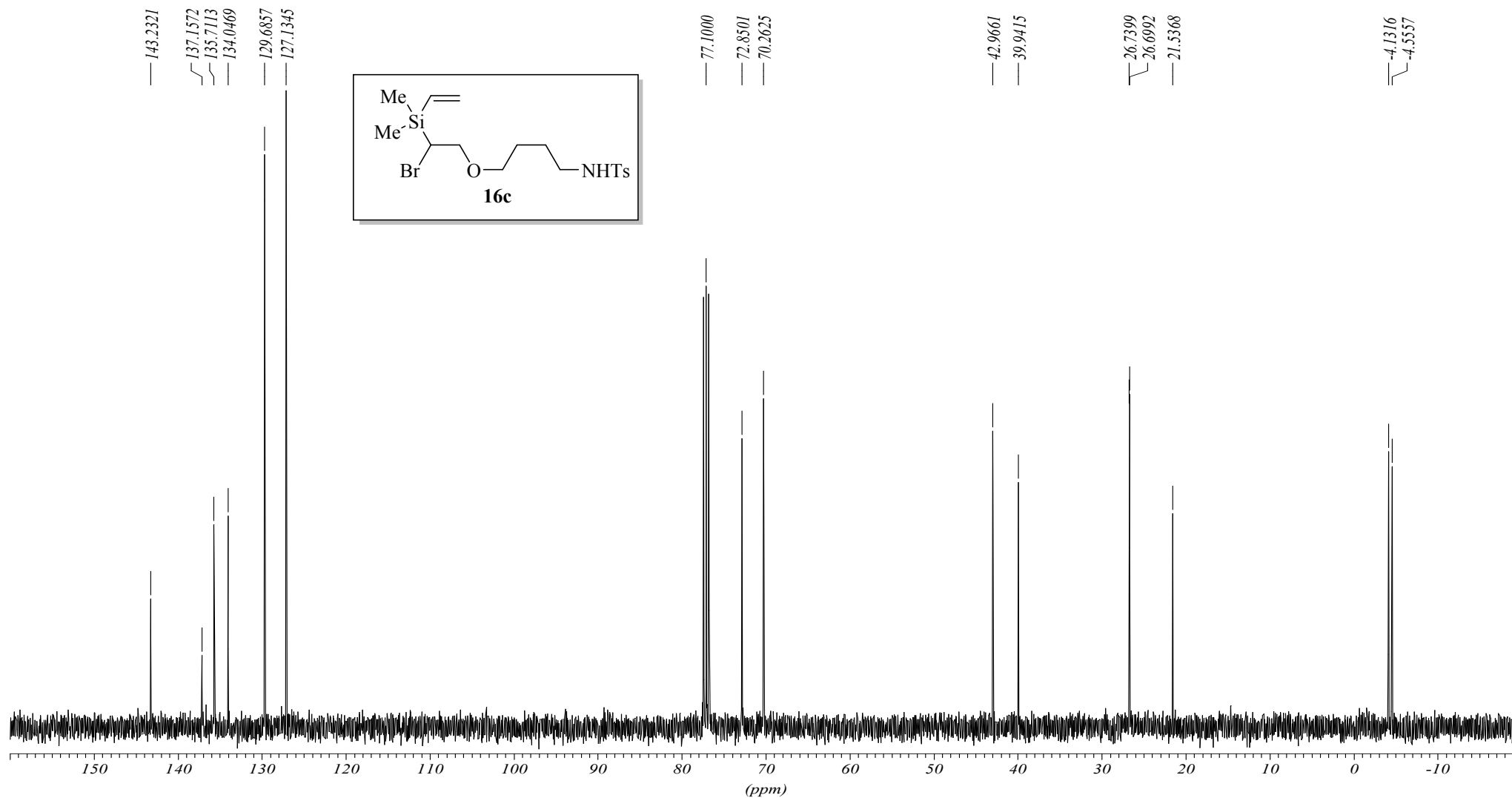


Figure S50. ¹H NMR spectrum of compound **16d**

N-(4-(2-Bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)-4-nitrobenzenesulfonamide, **16d** (R = Me).

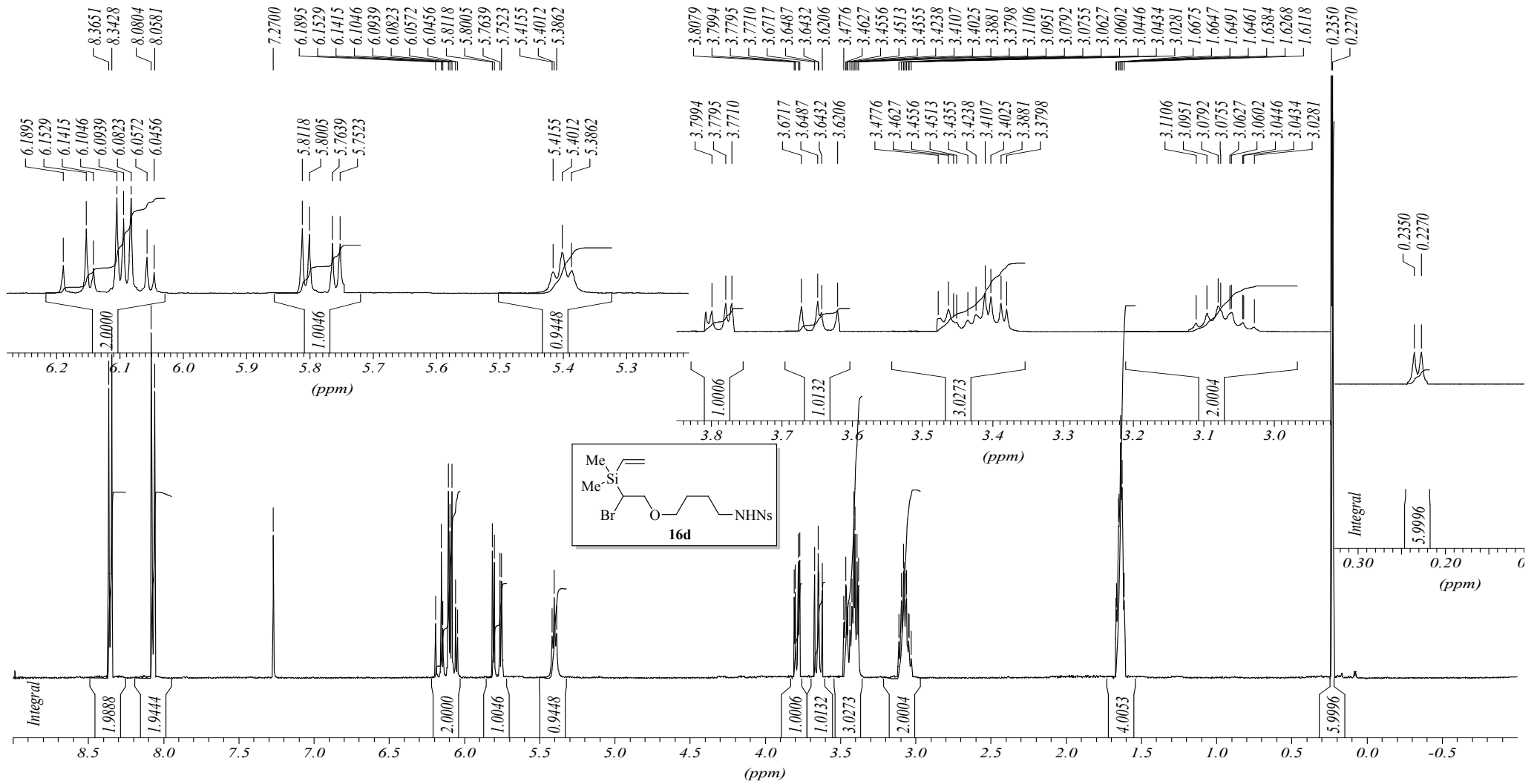


Figure S51. ^{13}C NMR spectrum of compound **16d**

N-(4-(2-Bromo-2-(dimethyl(vinyl)silyl)ethoxy)butyl)-4-nitrobenzenesulfonamide, **16d** (R = Me).

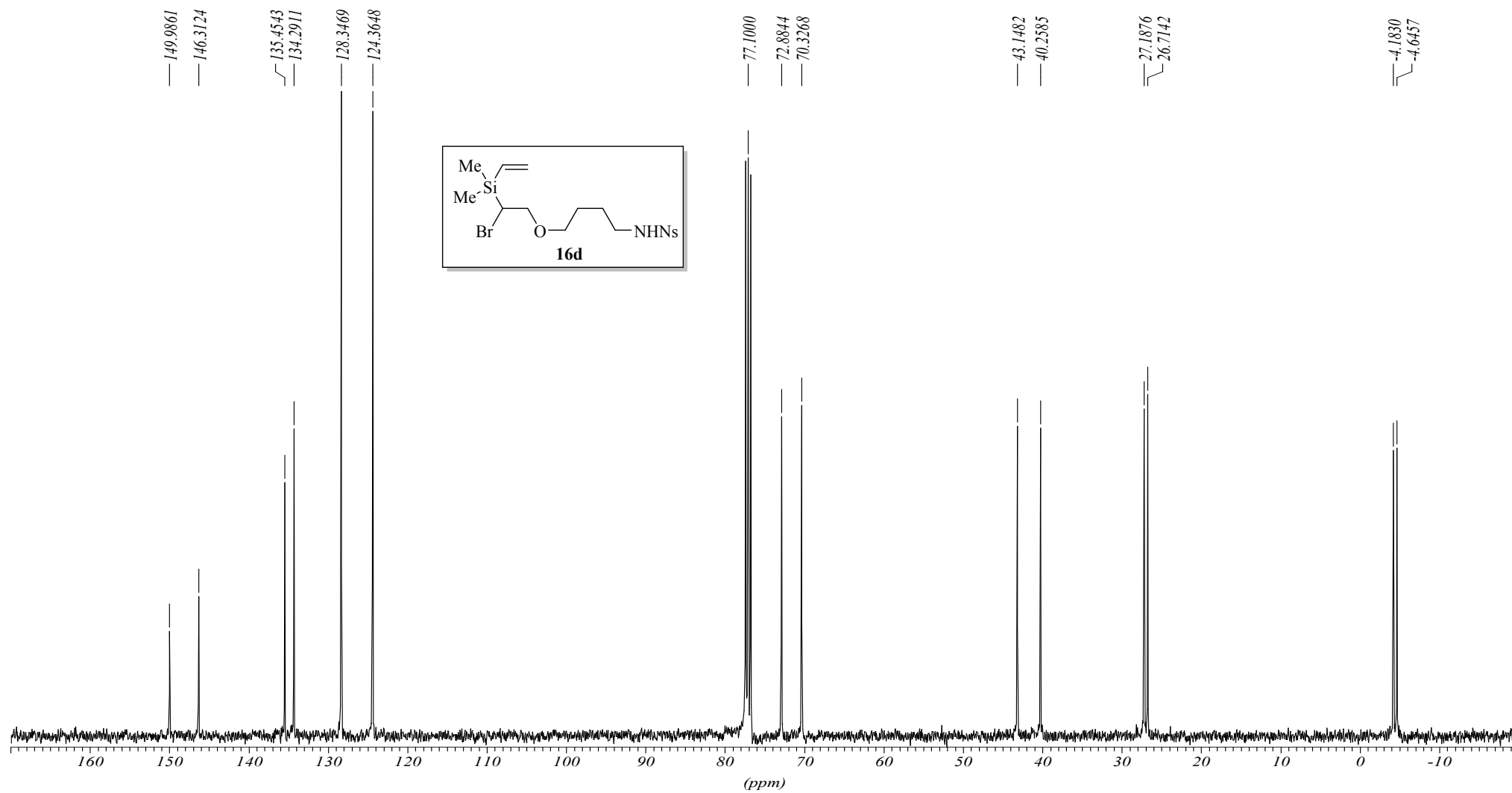


Figure S52. ¹H NMR spectrum of compound **18**

5-(Dimethyl(vinyl)silyl)-2-methyl-1-((trifluoromethyl)sulfonyl)-4,5-dihydro-1H-imidazole, **18** (R = Me).

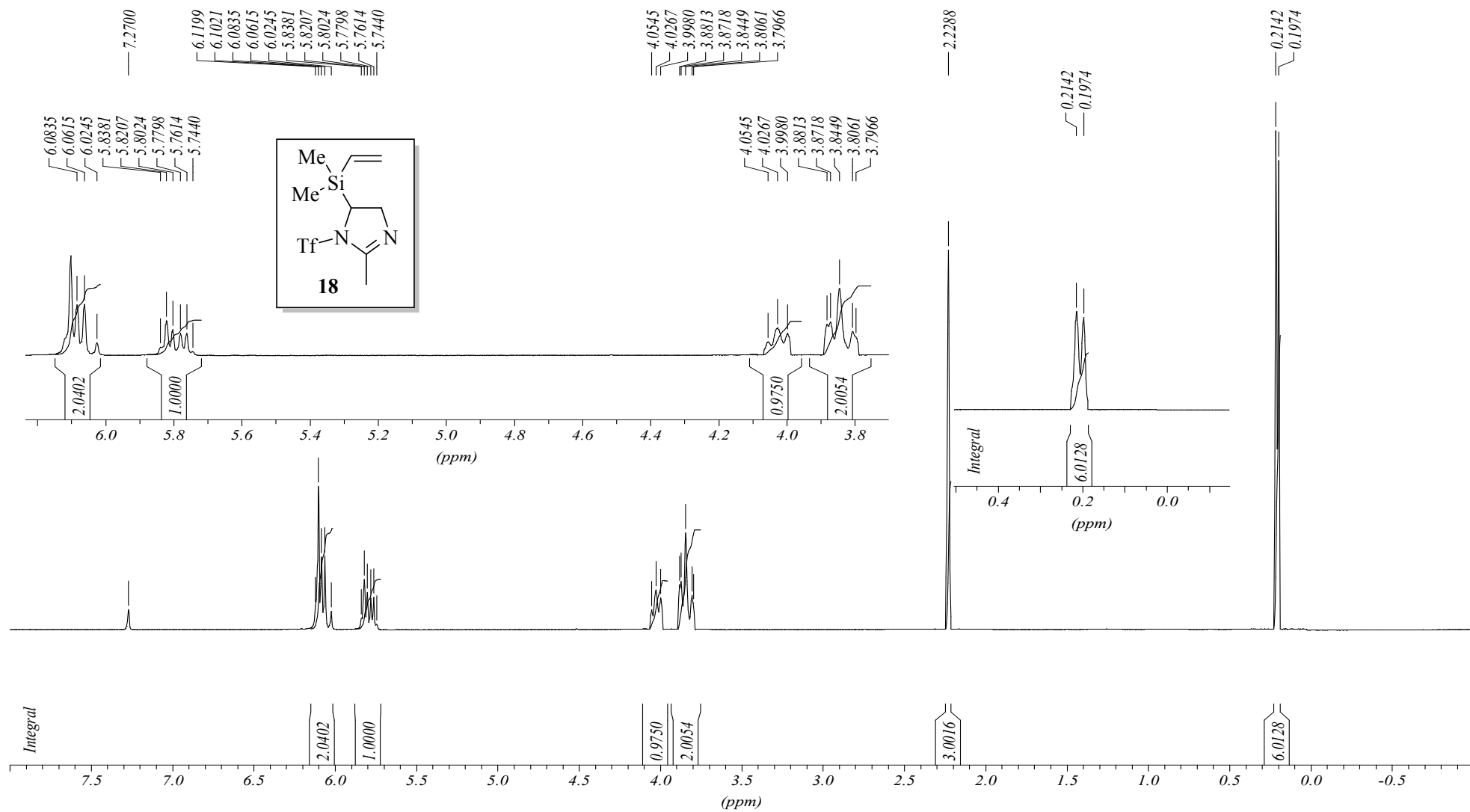


Figure S53. ^{13}C NMR spectrum of compound **18**

5-(Dimethyl(vinyl)silyl)-2-methyl-1-((trifluoromethyl)sulfonyl)-4,5-dihydro-1H-imidazole, **18** (R = Me).

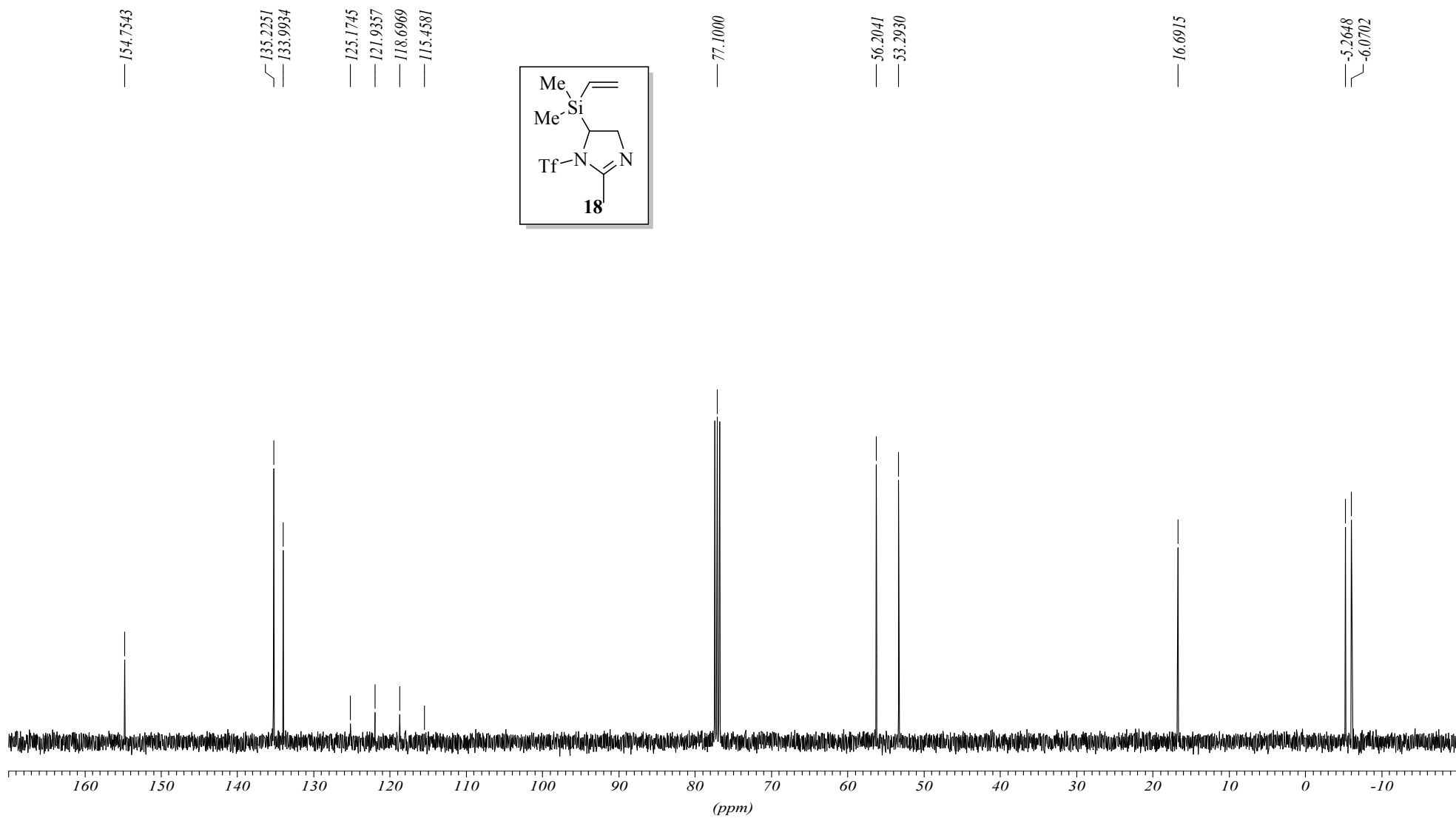


Figure S54. ¹H NMR spectrum of compound **18**

5-(Diphenyl(vinyl)silyl)-2-methyl-1-(trifluoromethylsulfonyl)-4,5-dihydro-1H-imidazole, 18 (R = Ph).

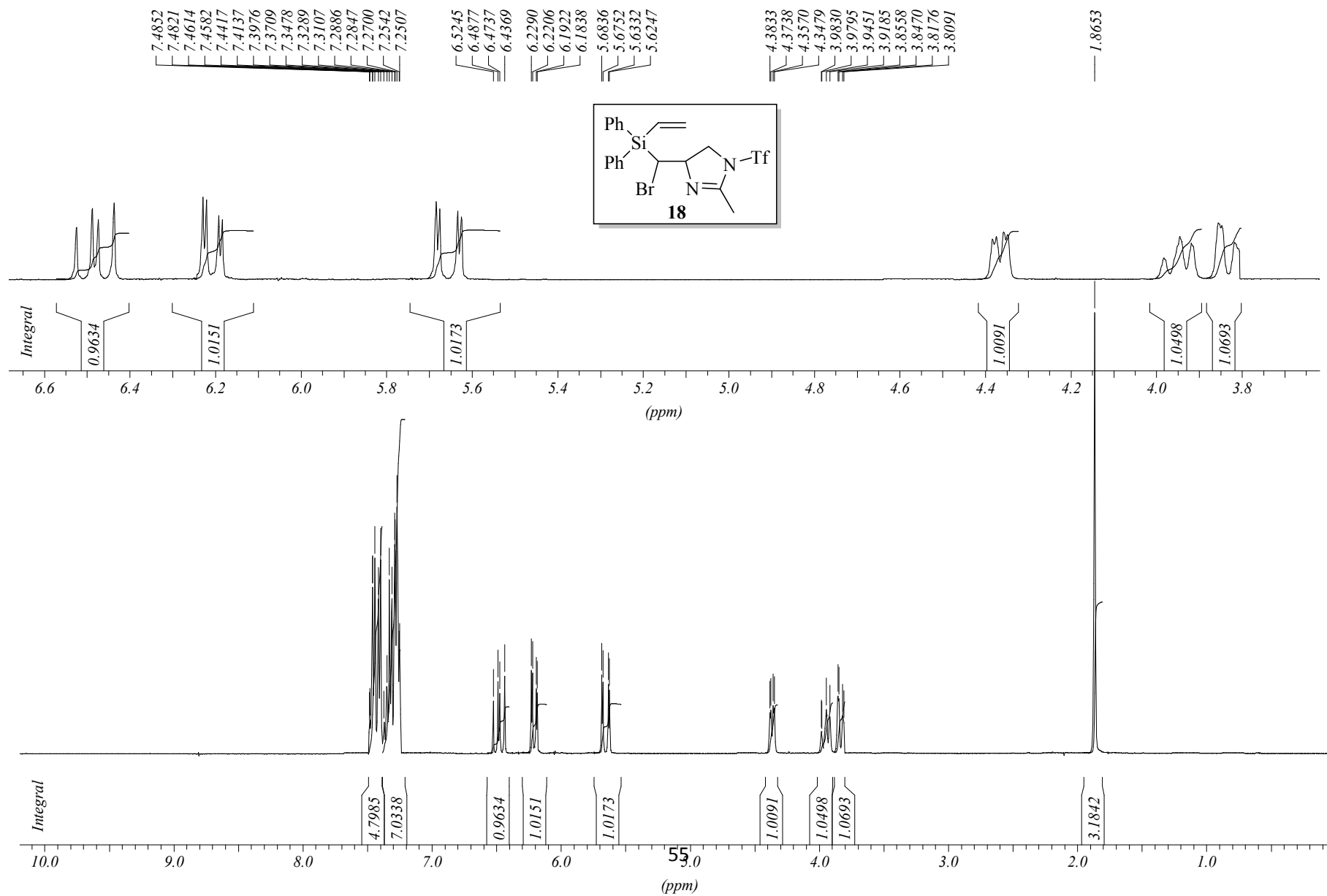


Figure S55. ^{13}C NMR spectrum of compound **18**

5-(Diphenyl(vinyl)silyl)-2-methyl-1-(trifluoromethylsulfonyl)-4,5-dihydro-1H-imidazole, 18 (R = Ph).

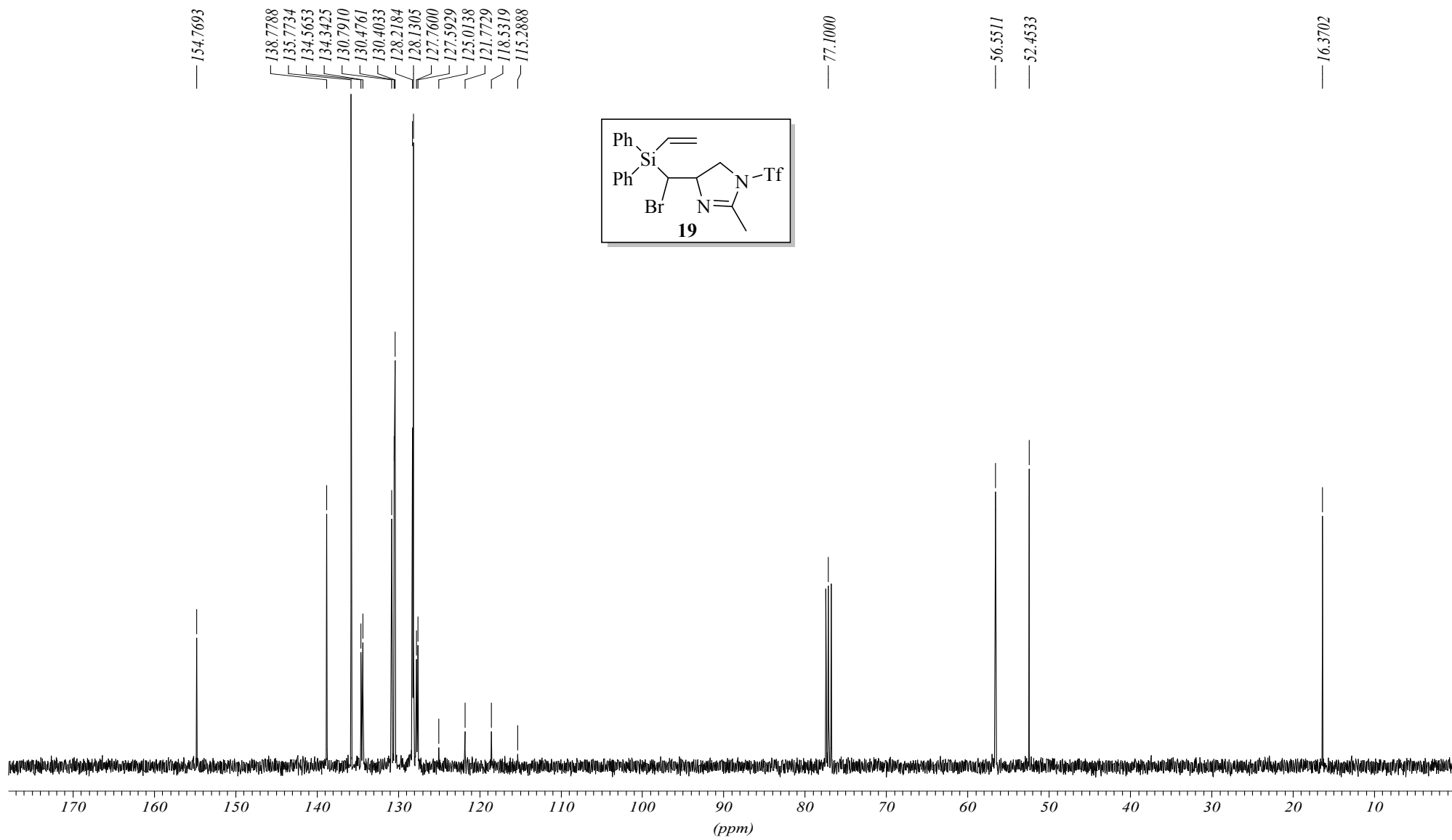


Figure S56. ^{13}C (J -mod) NMR spectrum of compound **18**

5-(Diphenyl(vinyl)silyl)-2-methyl-1-(trifluoromethylsulfonyl)-4,5-dihydro-1H-imidazole, **18** (R = Ph).

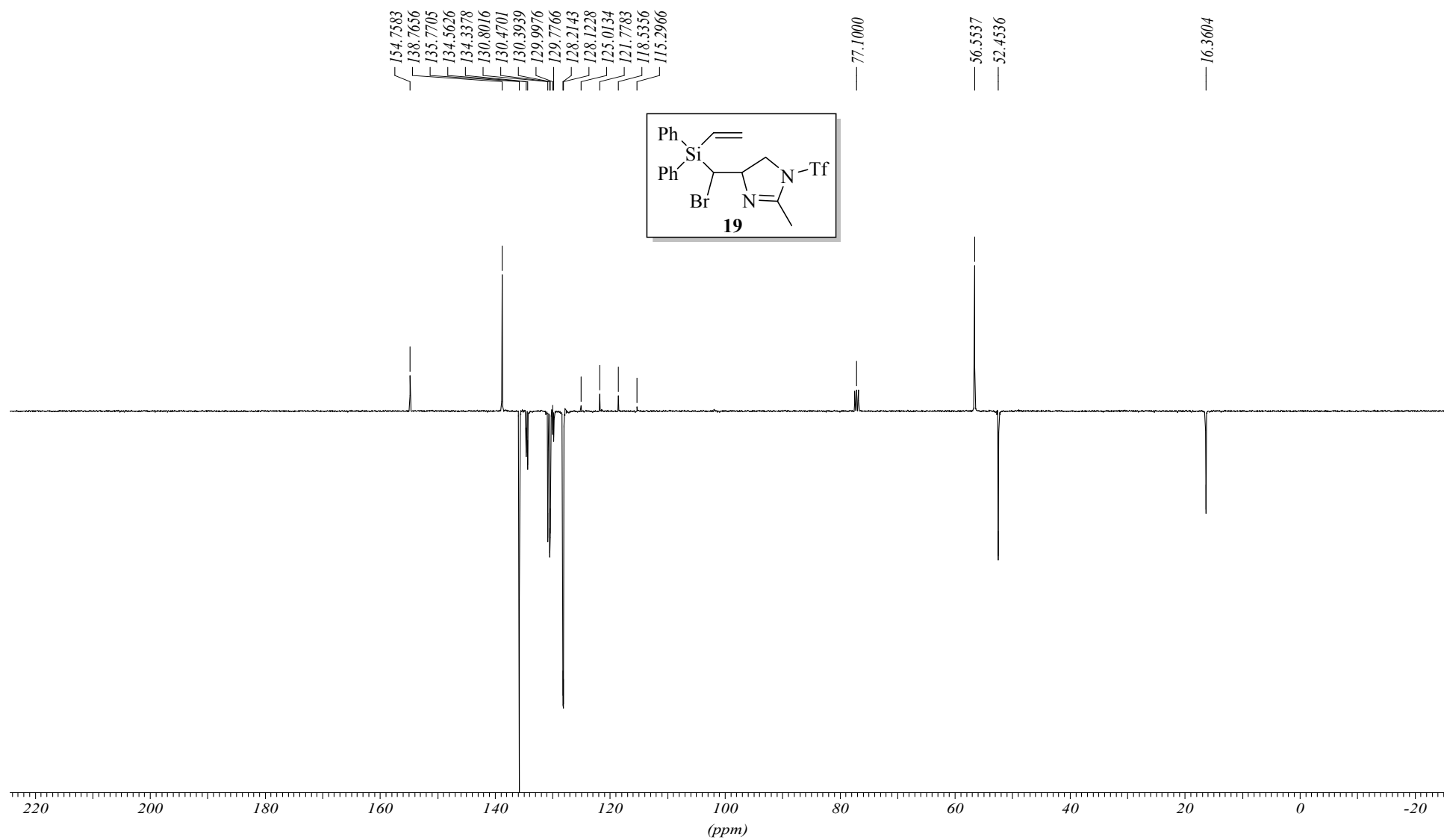


Figure S57. ¹H NMR spectrum of compound **19**

2,2,4,4,6,6,8,8-octaphenyl-*1,3,5,7,2,4,6,8*-tetraoxatetrasilocane, **19**

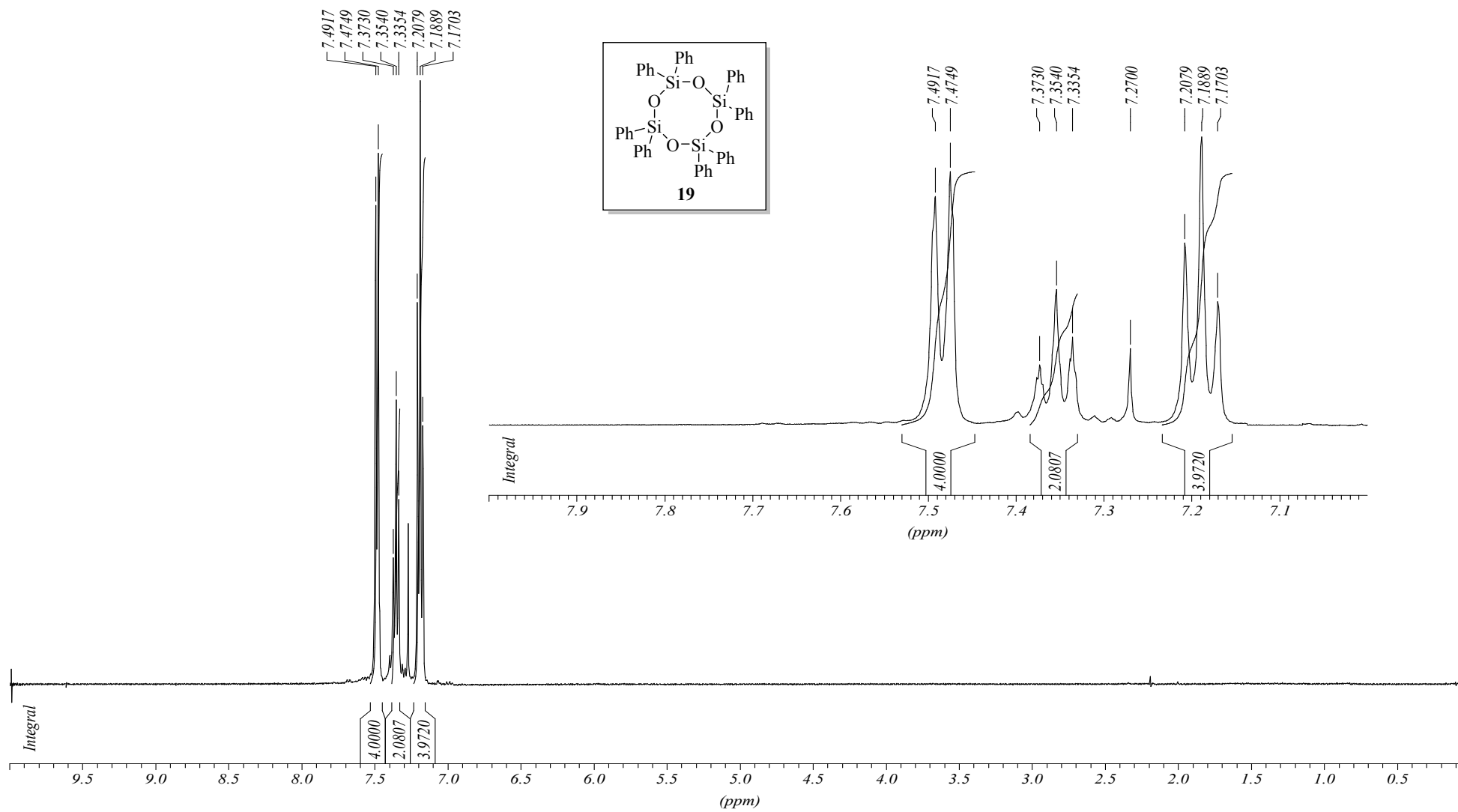


Figure S58. ^{13}C NMR spectrum of compound **19**

2,2,4,4,6,6,8,8-octaphenyl-1,3,5,7,2,4,6,8-tetraoxatetrasilocane, **19**

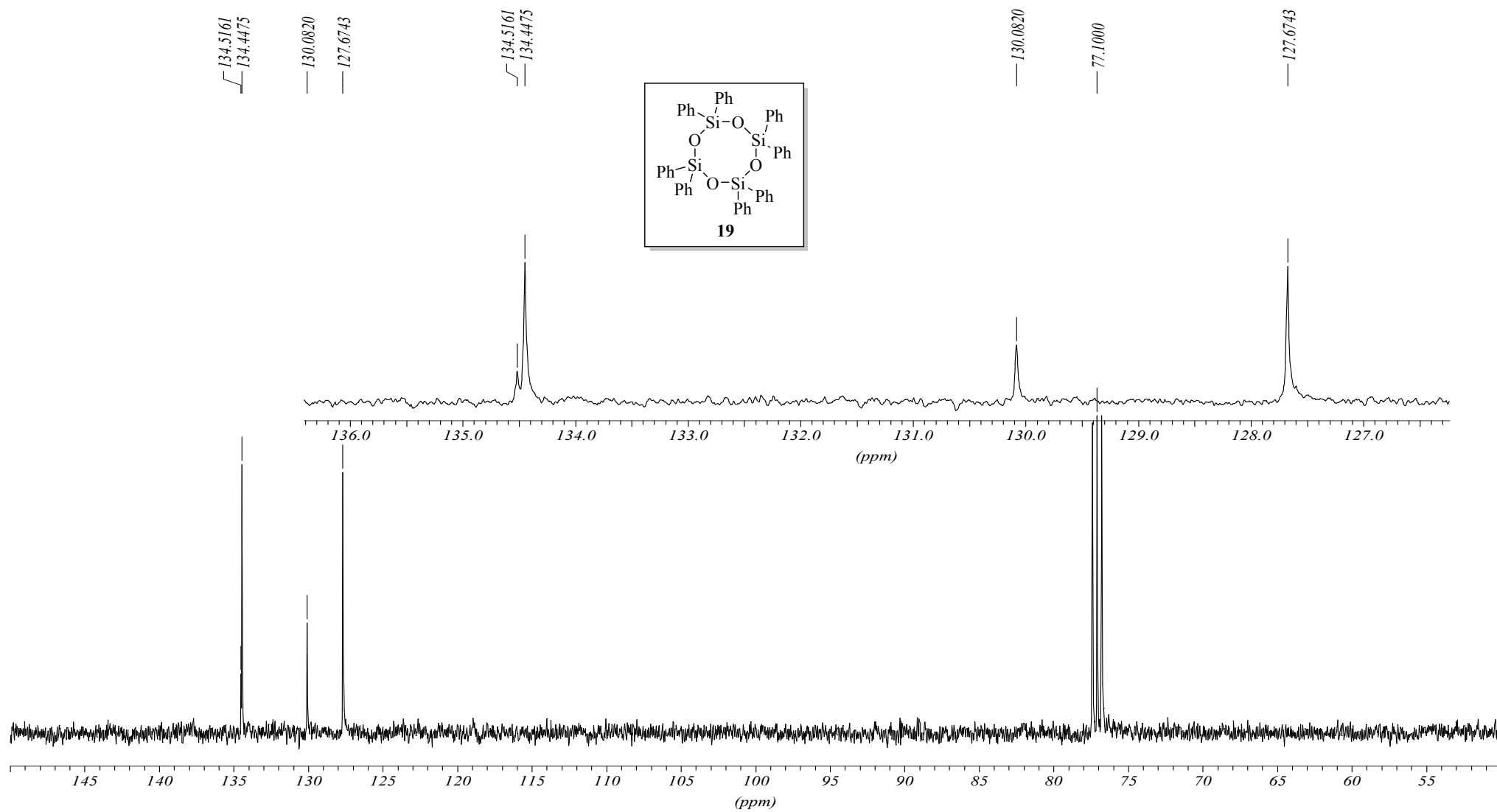


Figure S59. ¹H NMR spectrum of compound **20a**

2-Methyl-5,5-diphenyl-1-((trifluoromethyl)sulfonyl)-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20a (R = Ph).

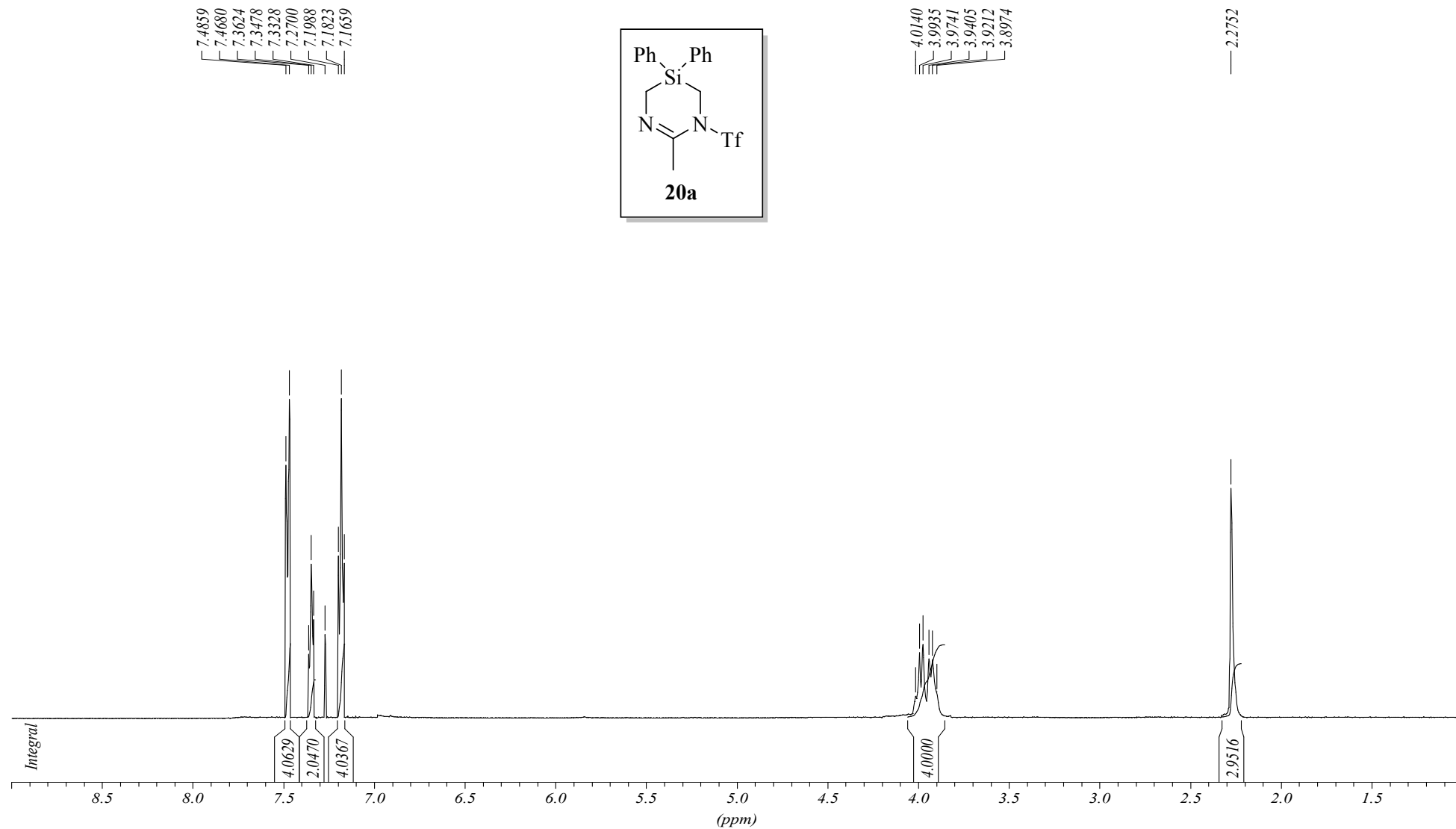


Figure S60. ^{13}C NMR spectrum of compound **20a**

2-Methyl-5,5-diphenyl-1-((trifluoromethyl)sulfonyl)-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20a (R = Ph).

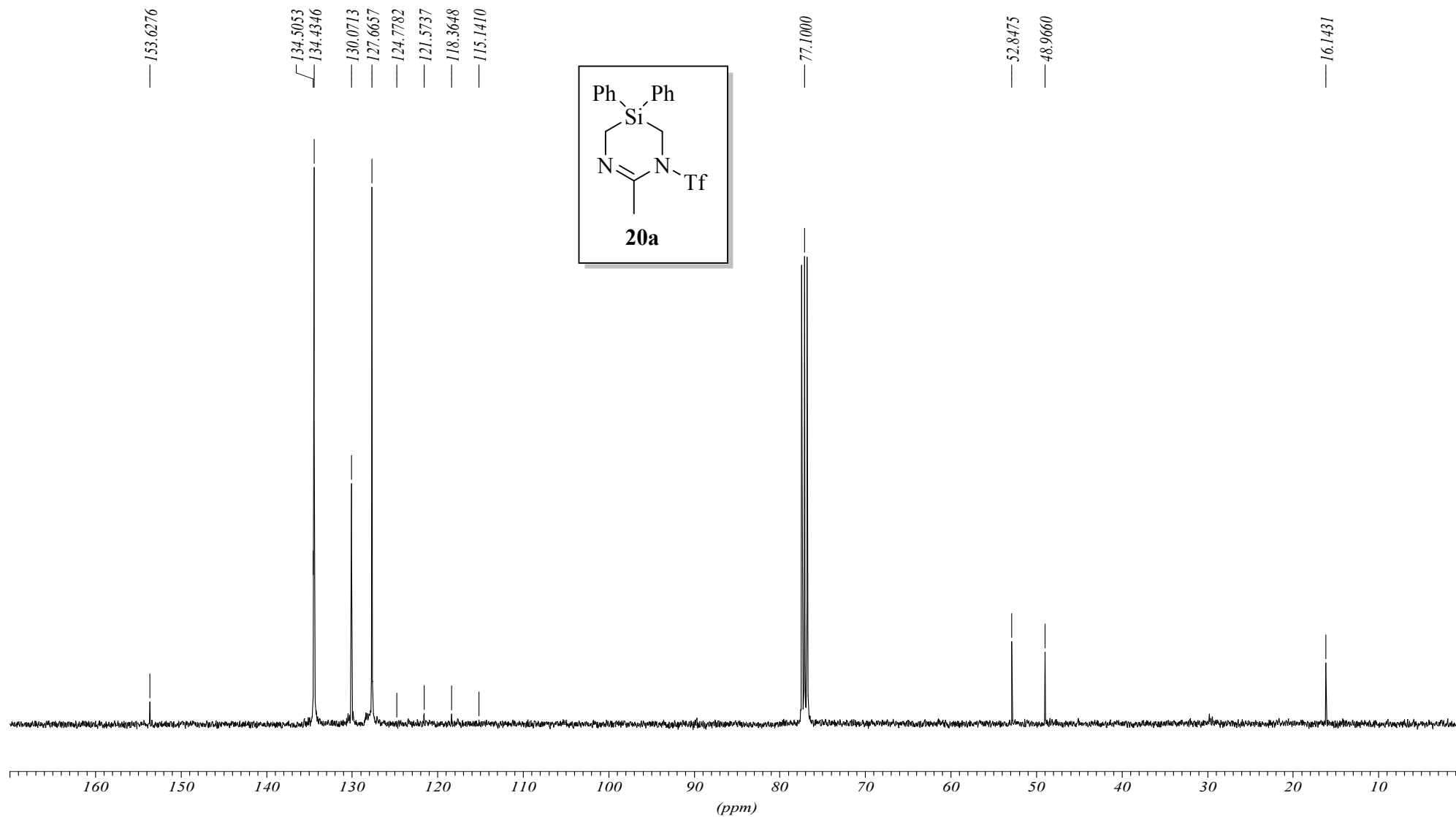


Figure S61. ¹H NMR spectrum of compound **20d**

2-Methyl-1-((4-nitrophenyl)sulfonyl)-5,5-diphenyl-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20d (R = Ph).

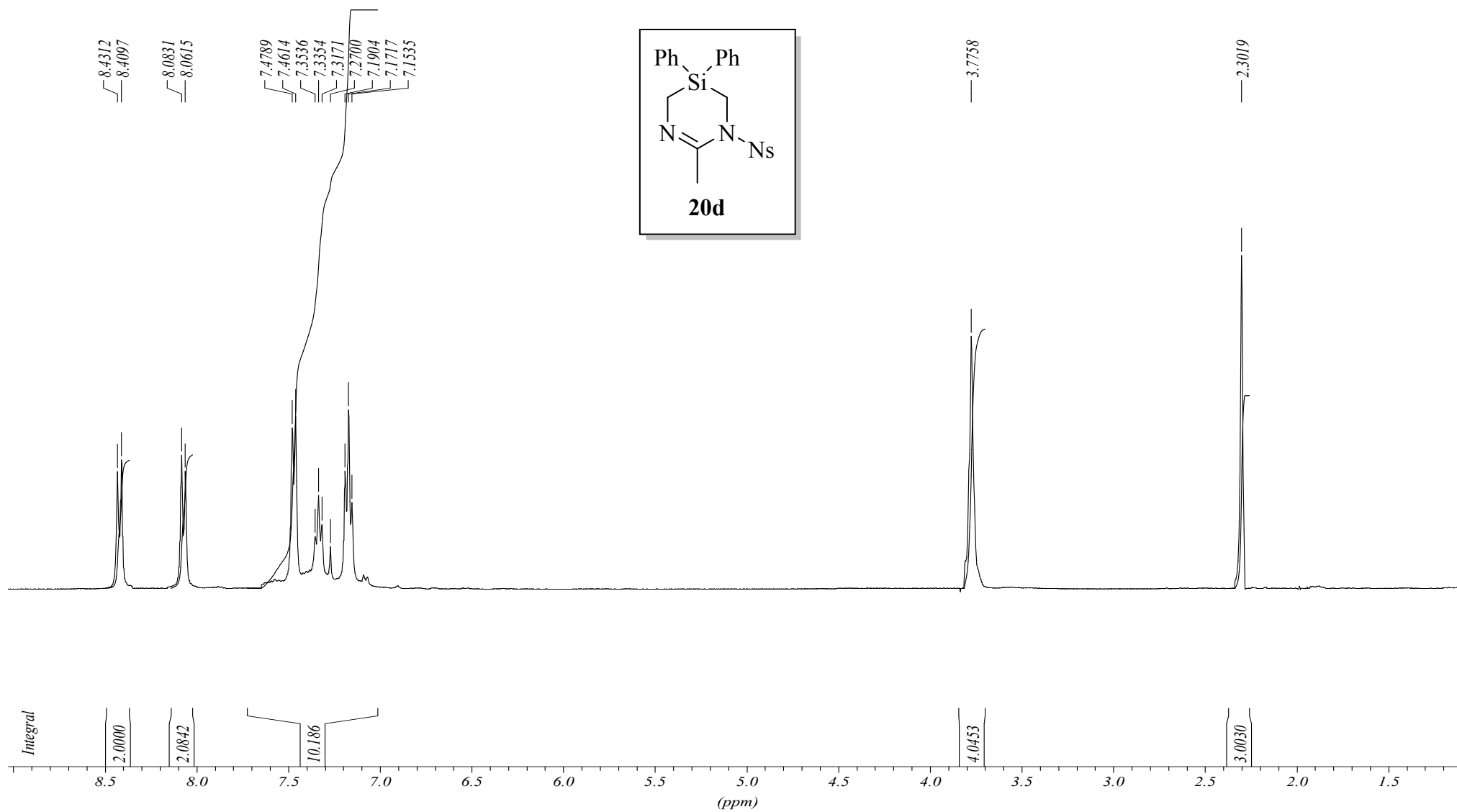


Figure S62. ^{13}C NMR spectrum of compound **20d**

2-Methyl-1-((4-nitrophenyl)sulfonyl)-5,5-diphenyl-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20d (R = Ph).

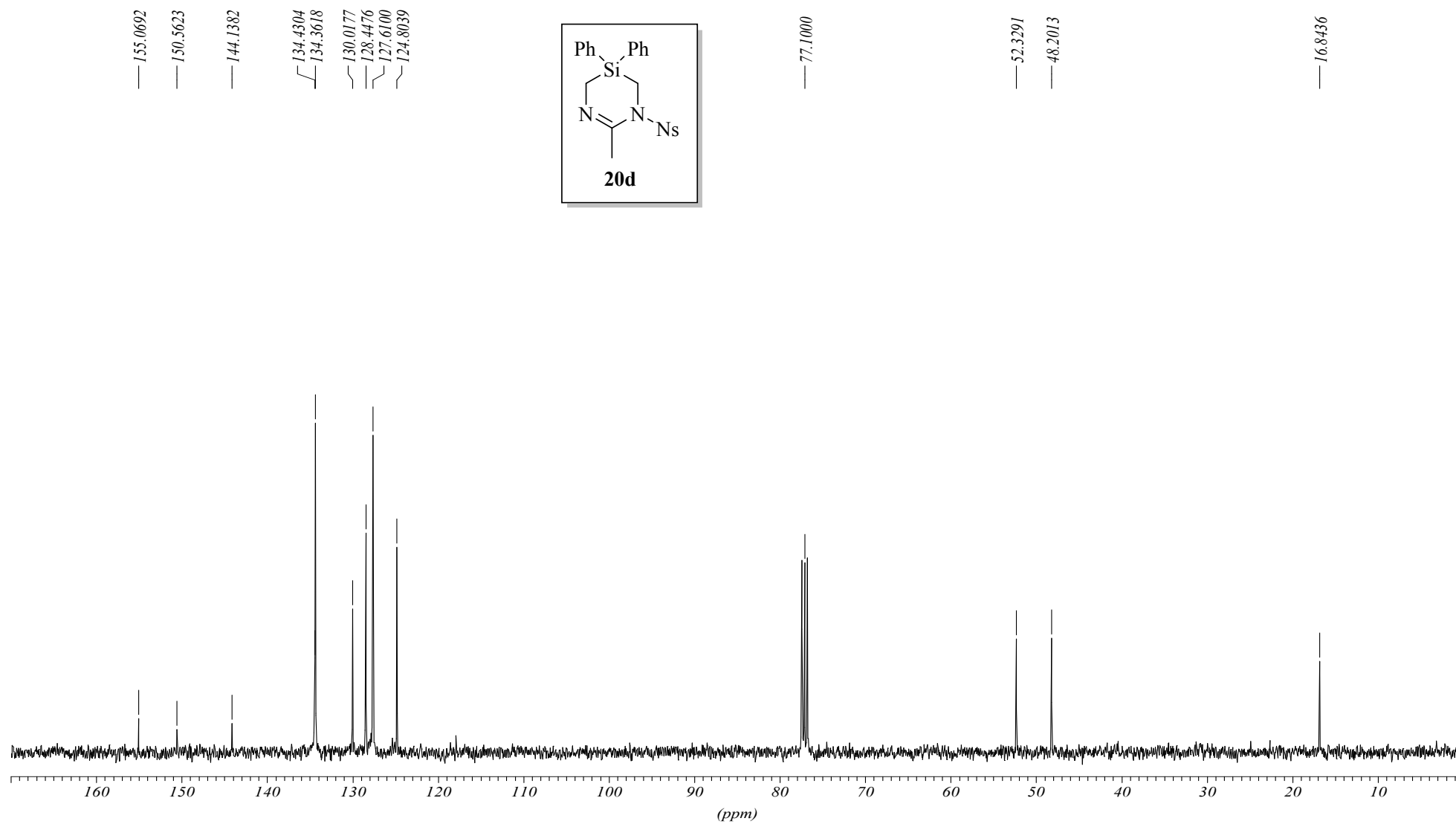


Figure S63. $\{^{13}\text{C}-^1\text{H}\}$ NMR spectrum of compound **20d**

2-Methyl-1-((4-nitrophenyl)sulfonyl)-5,5-diphenyl-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20d

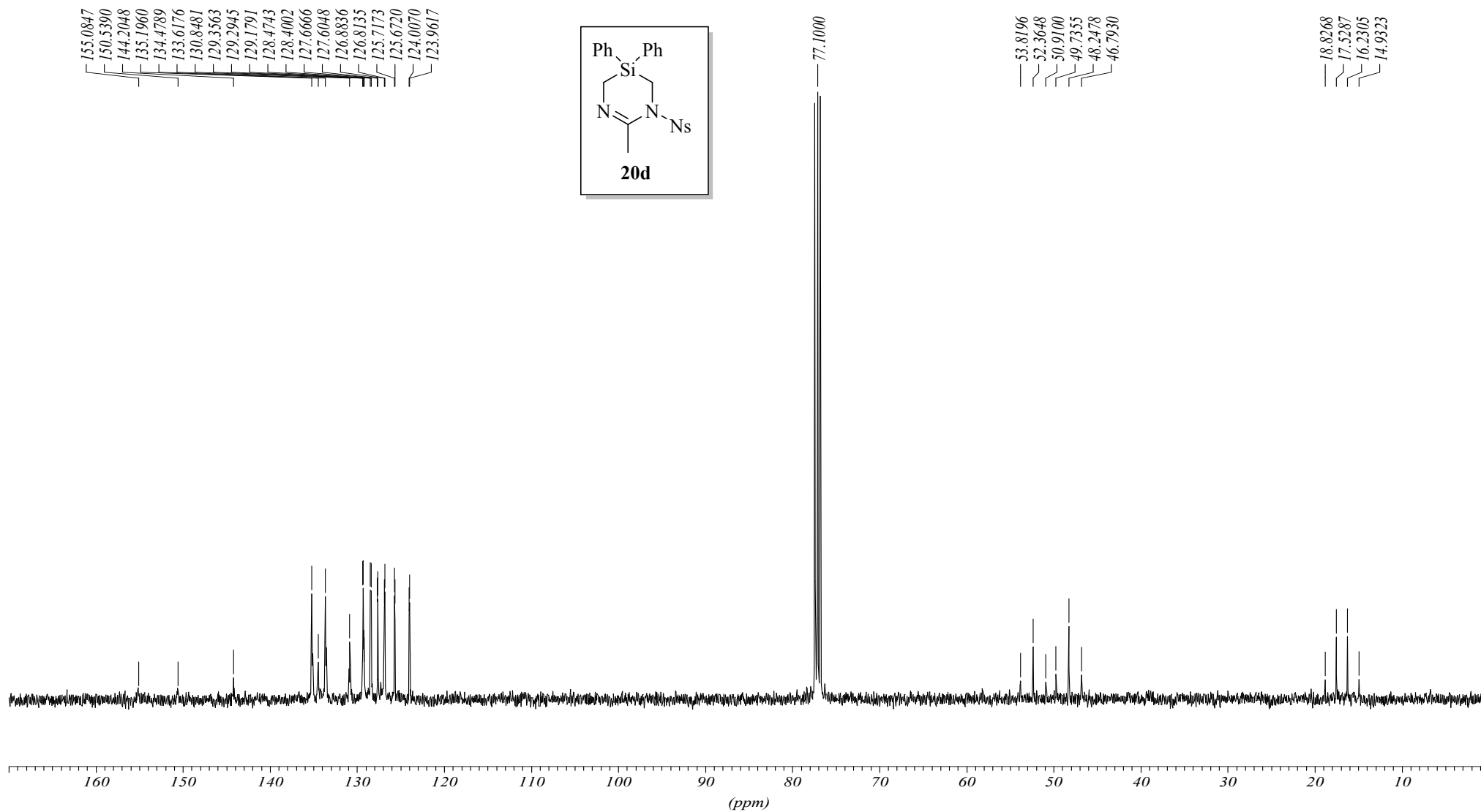


Figure S64. ^{13}C (J -mod)NMR spectrum of compound **20d**

2-Methyl-1-((4-nitrophenyl)sulfonyl)-5,5-diphenyl-1,4,5,6-tetrahydro-1,3,5-diazasiline, **20d** (R = Ph).

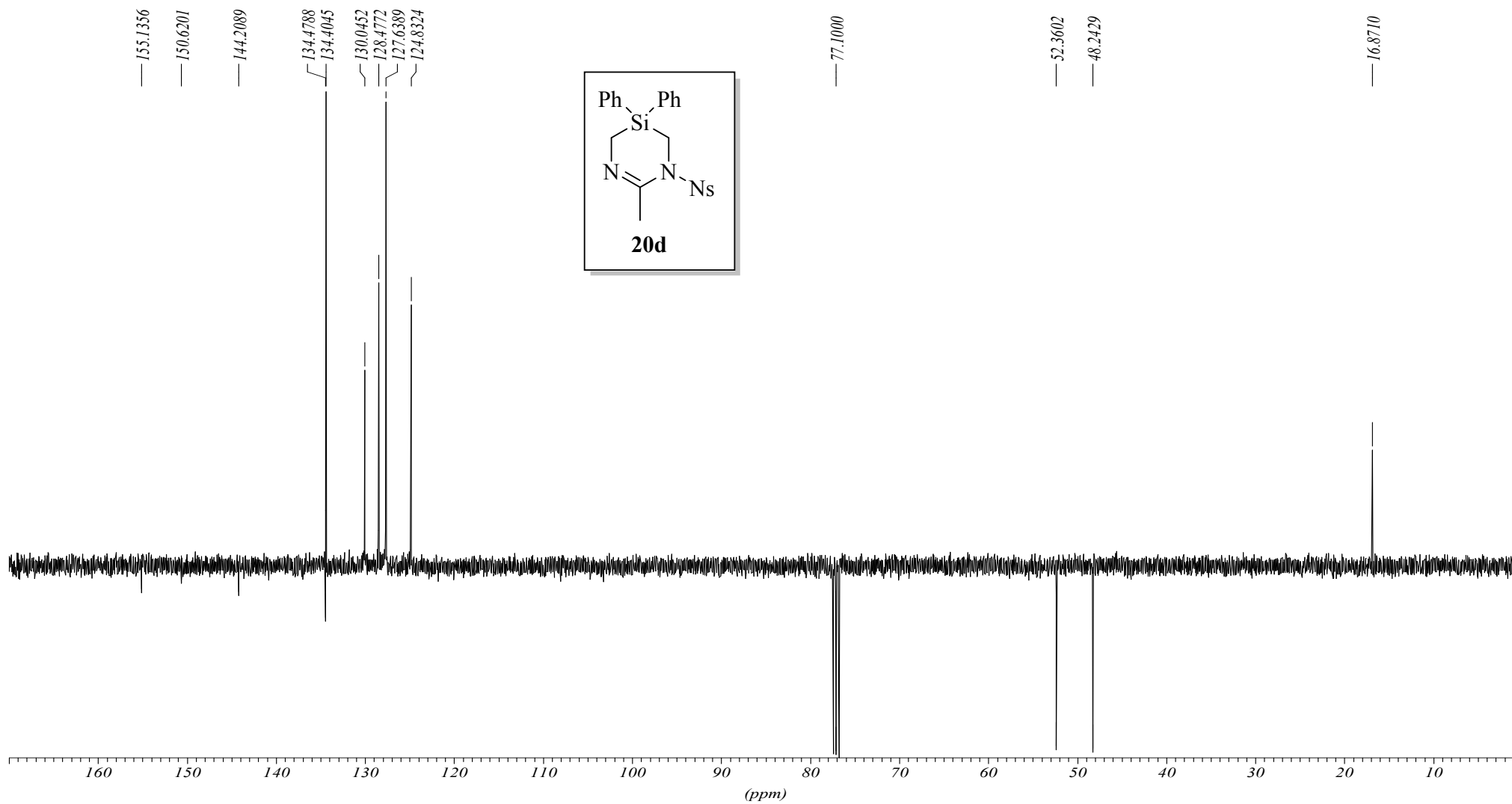


Figure S65. ¹H NMR spectrum of compound **20a**

2,5,5-trimethyl-1-((trifluoromethyl)sulfonyl)-1,4,5,6-tetrahydro-1,3,5-diazasiline, **20a** (R = Me).

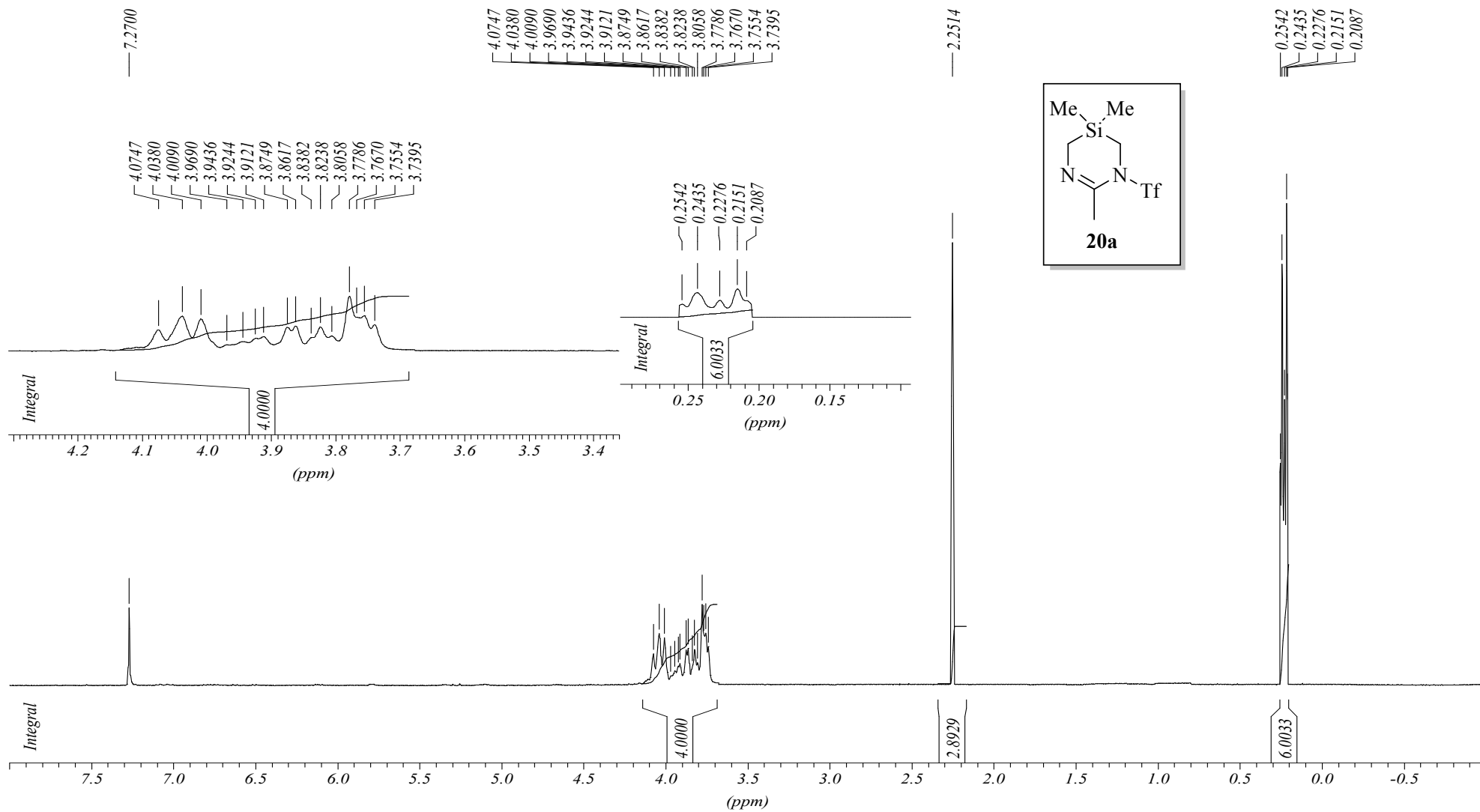


Figure S66. ^{13}C NMR spectrum of compound **20a**

2,5,5-Trimethyl-1-((trifluoromethyl)sulfonyl)-1,4,5,6-tetrahydro-1,3,5-diazasiline, 20a (R = Me).

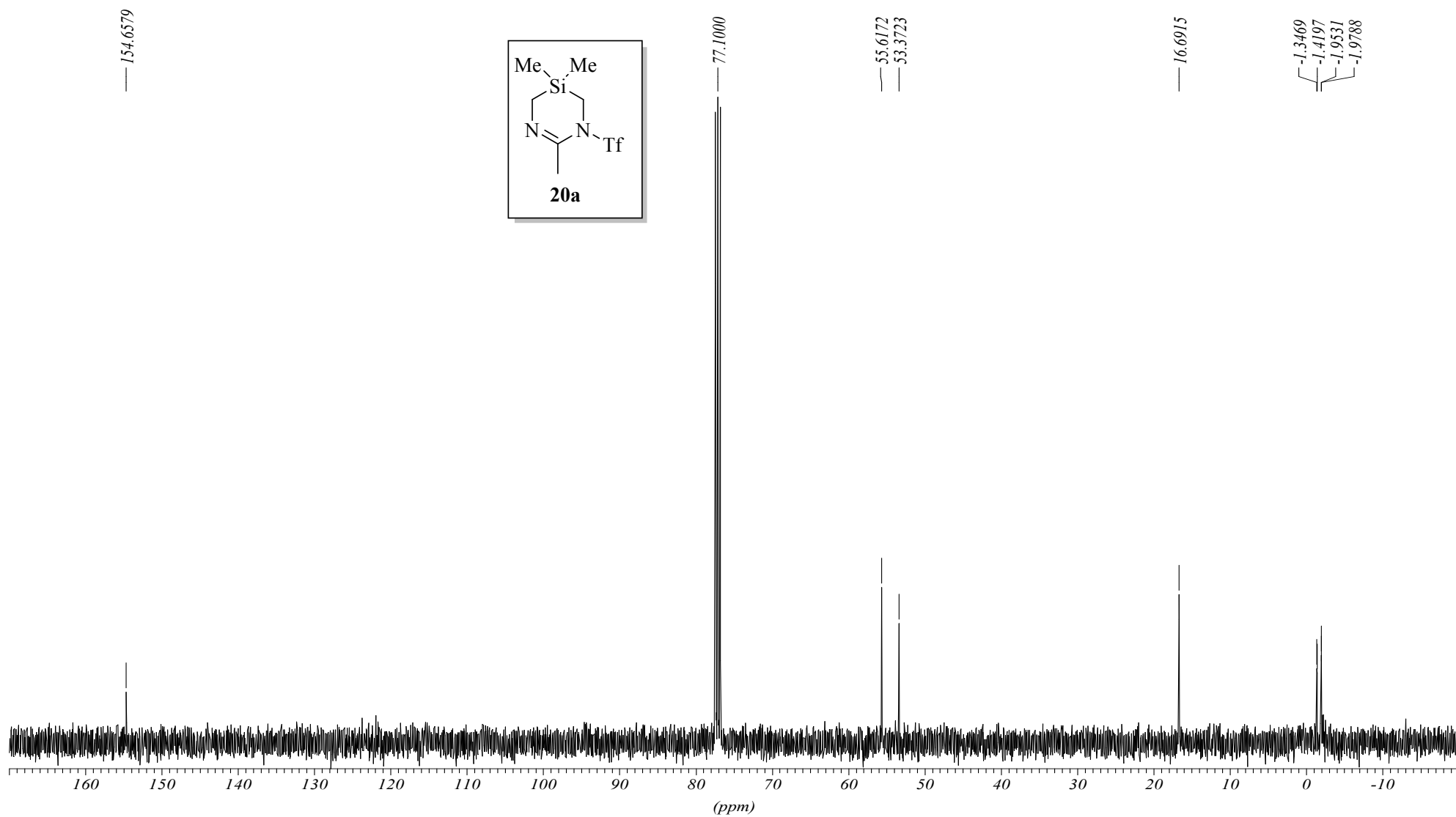


Figure S67. ¹H NMR spectrum of compound **21a**

3-(Diphenyl(vinyl)silyl)-4-((trifluoromethyl)sulfonyl)-1,4-oxazocane, 21a (R = Ph).

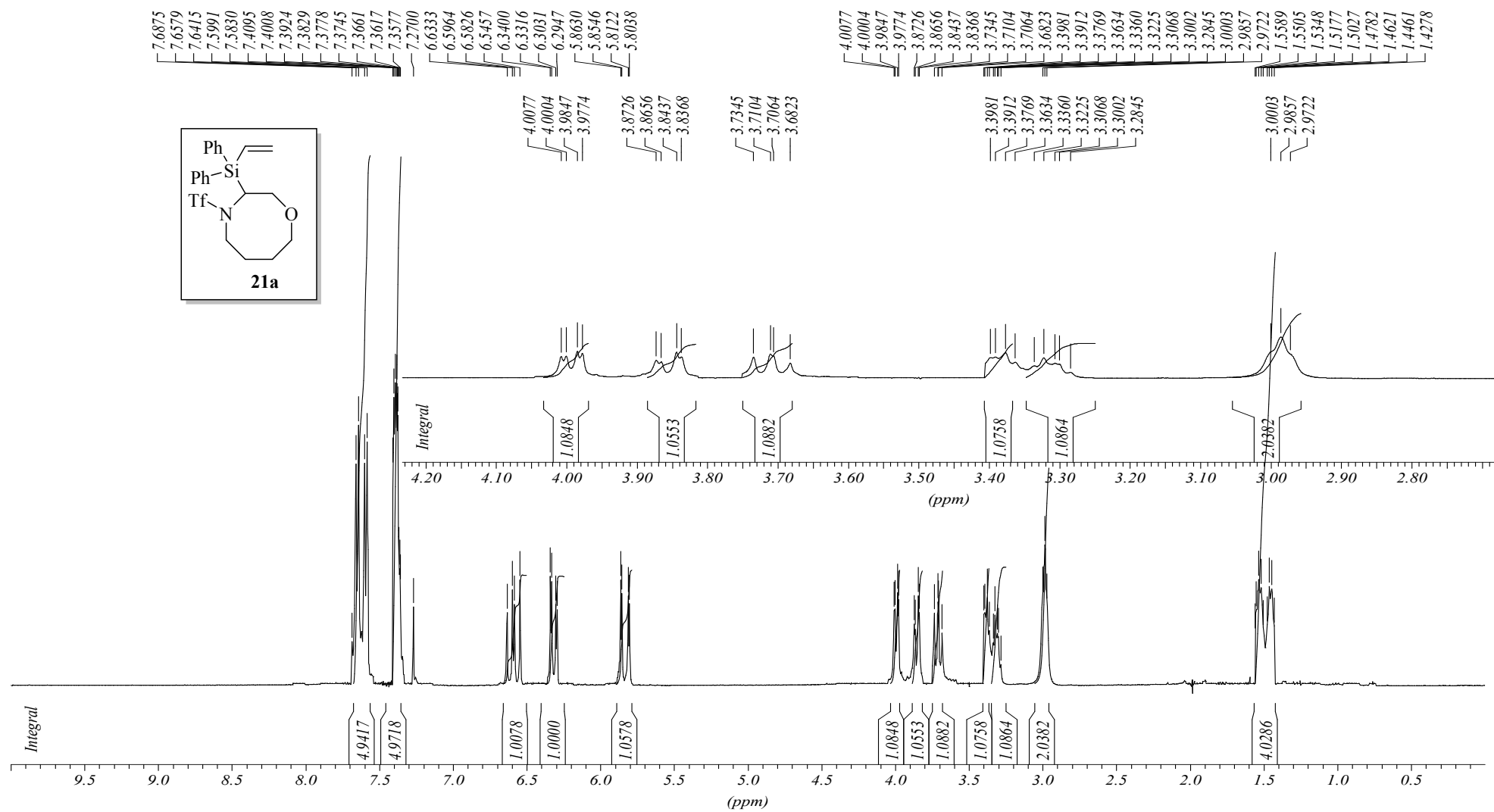


Figure S68. ^{13}C NMR spectrum of compound **21a**.

3-(Diphenyl(vinyl)silyl)-4-((trifluoromethyl)sulfonyl)-1,4-oxazocane, 21a (R = Ph).

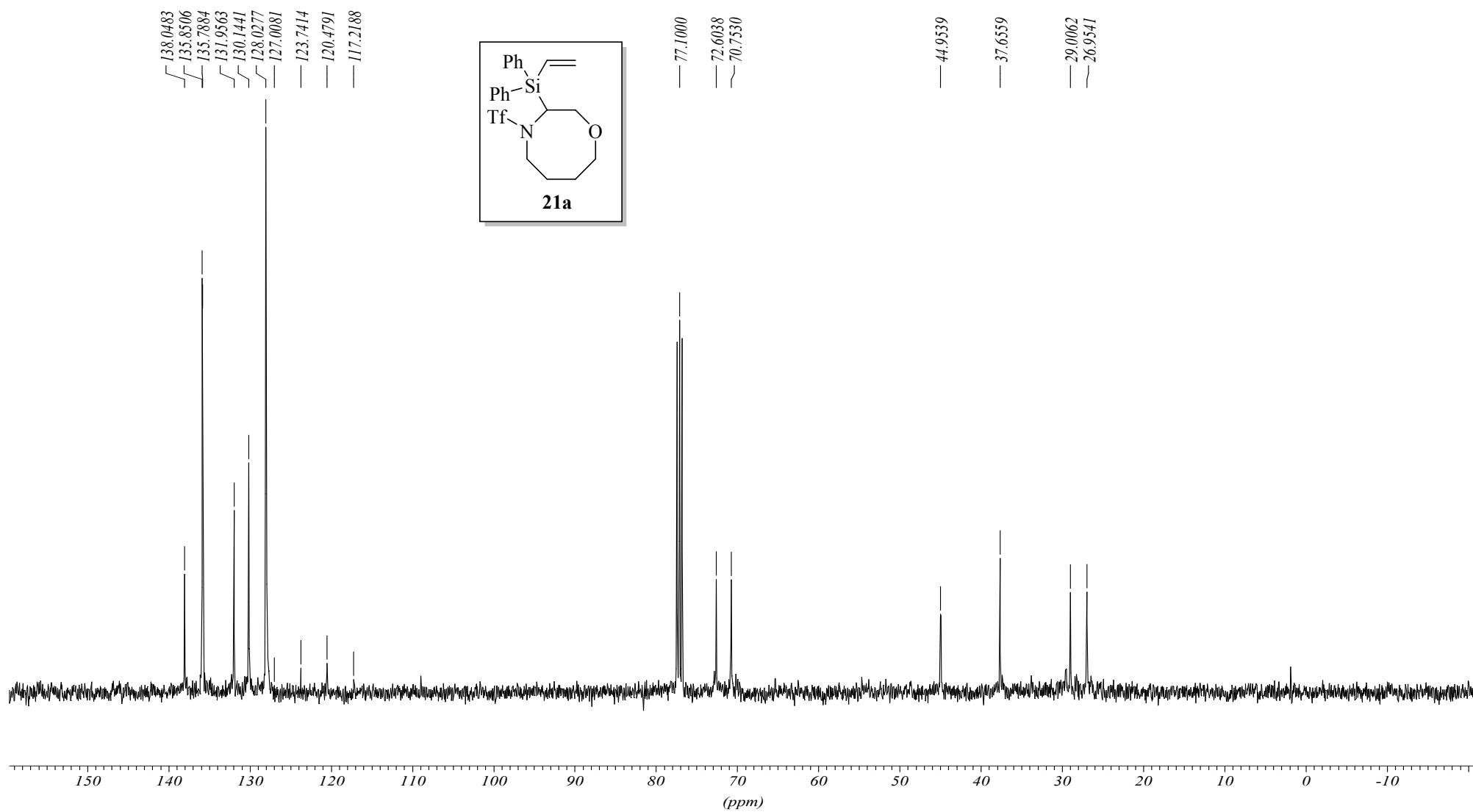


Figure S69. ¹H NMR spectrum of compound **21d**

3-(Diphenyl(vinyl)silyl)-4-((4-nitrophenyl)sulfonyl)-1,4-oxazocane, **21d** (R = Ph).

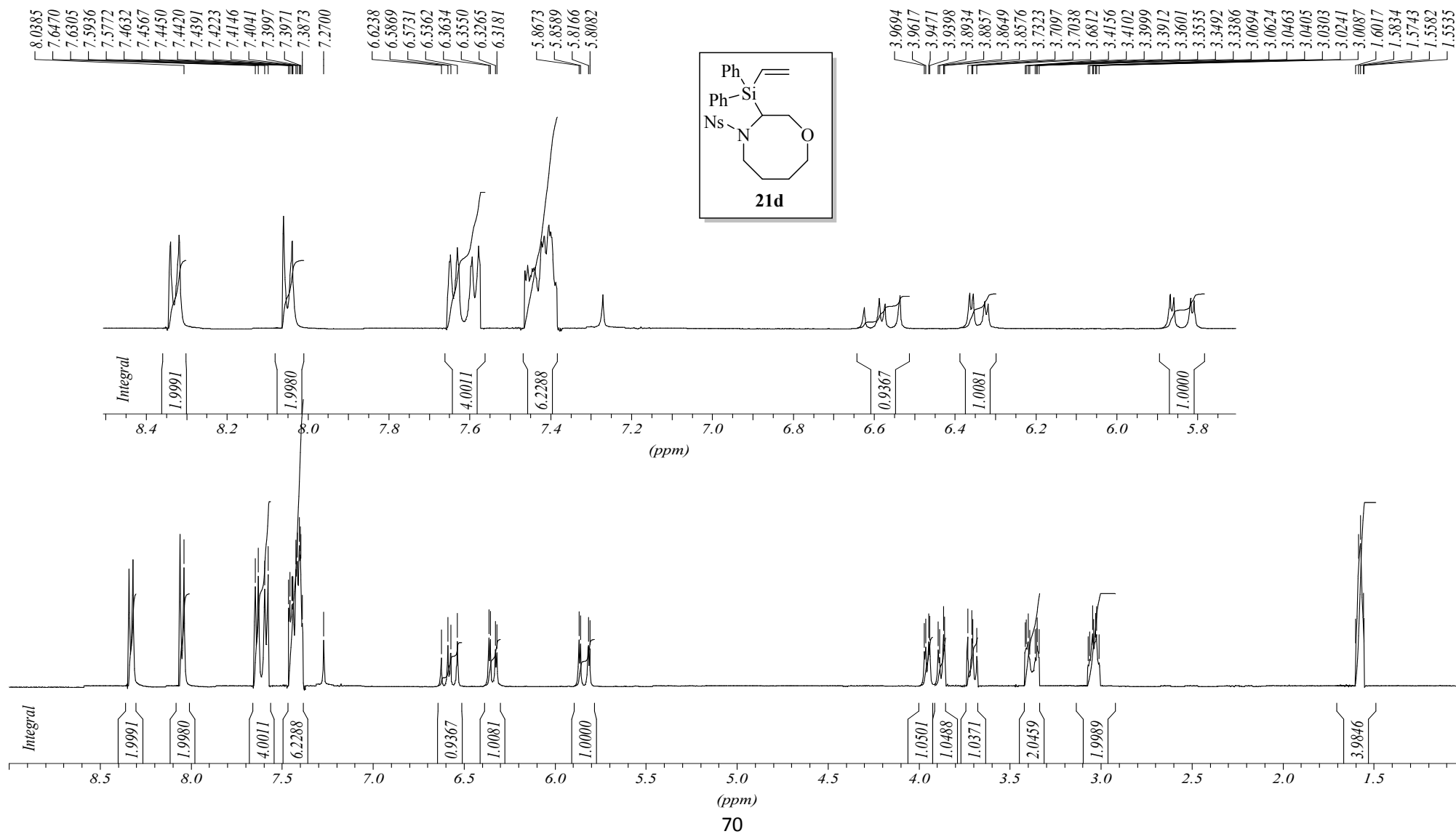


Figure S70. ^{13}C NMR spectrum of compound **21d**

3-(Diphenyl(vinyl)silyl)-4-((4-nitrophenyl)sulfonyl)-1,4-oxazocane, 21d (R = Ph).

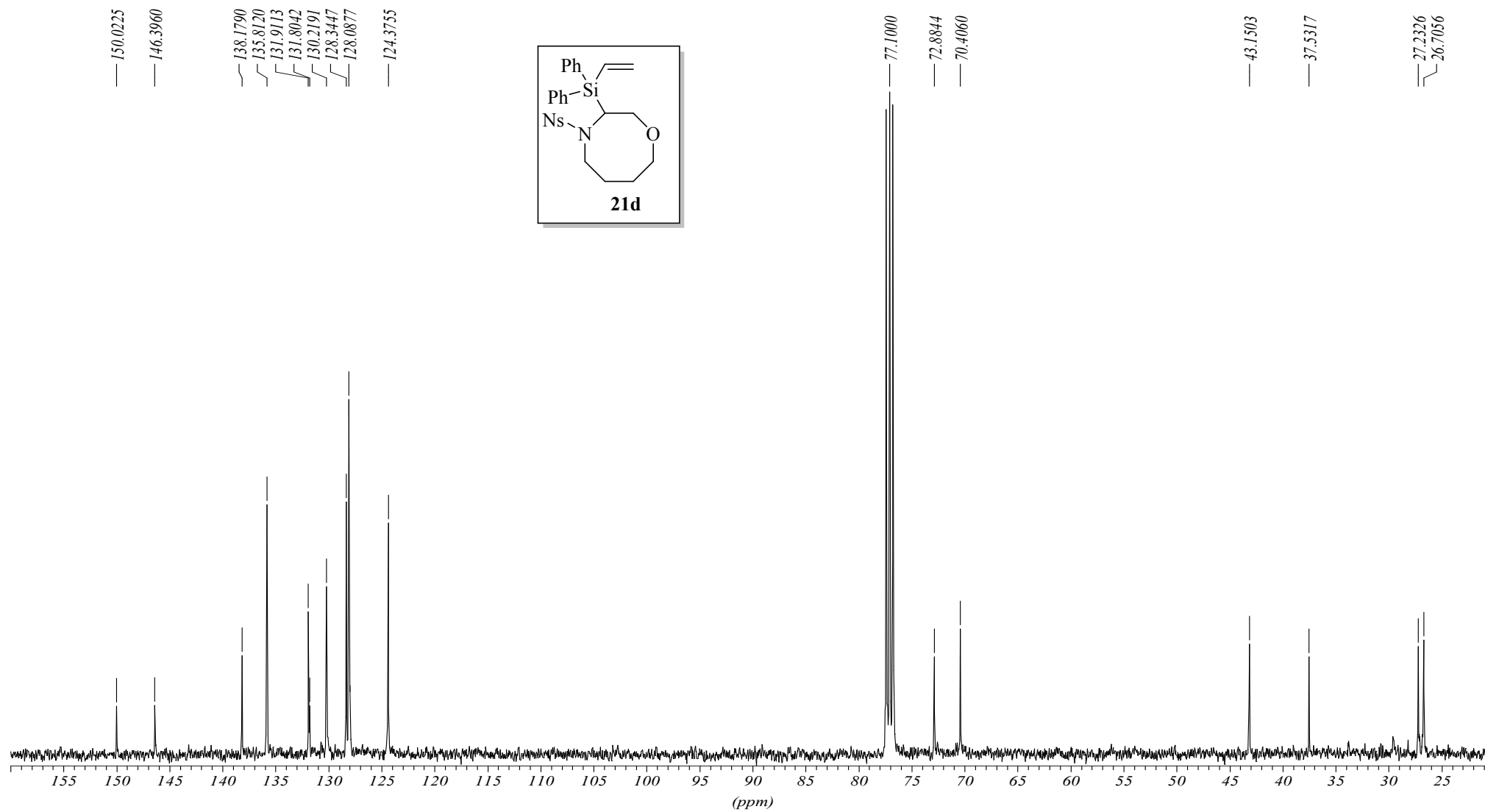


Figure S71. ¹H NMR spectrum of compound **21a**

3-(Dimethyl(vinyl)silyl)-4-((trifluoromethyl)sulfonyl)-1,4-oxazocane, **21a** (R = Me).

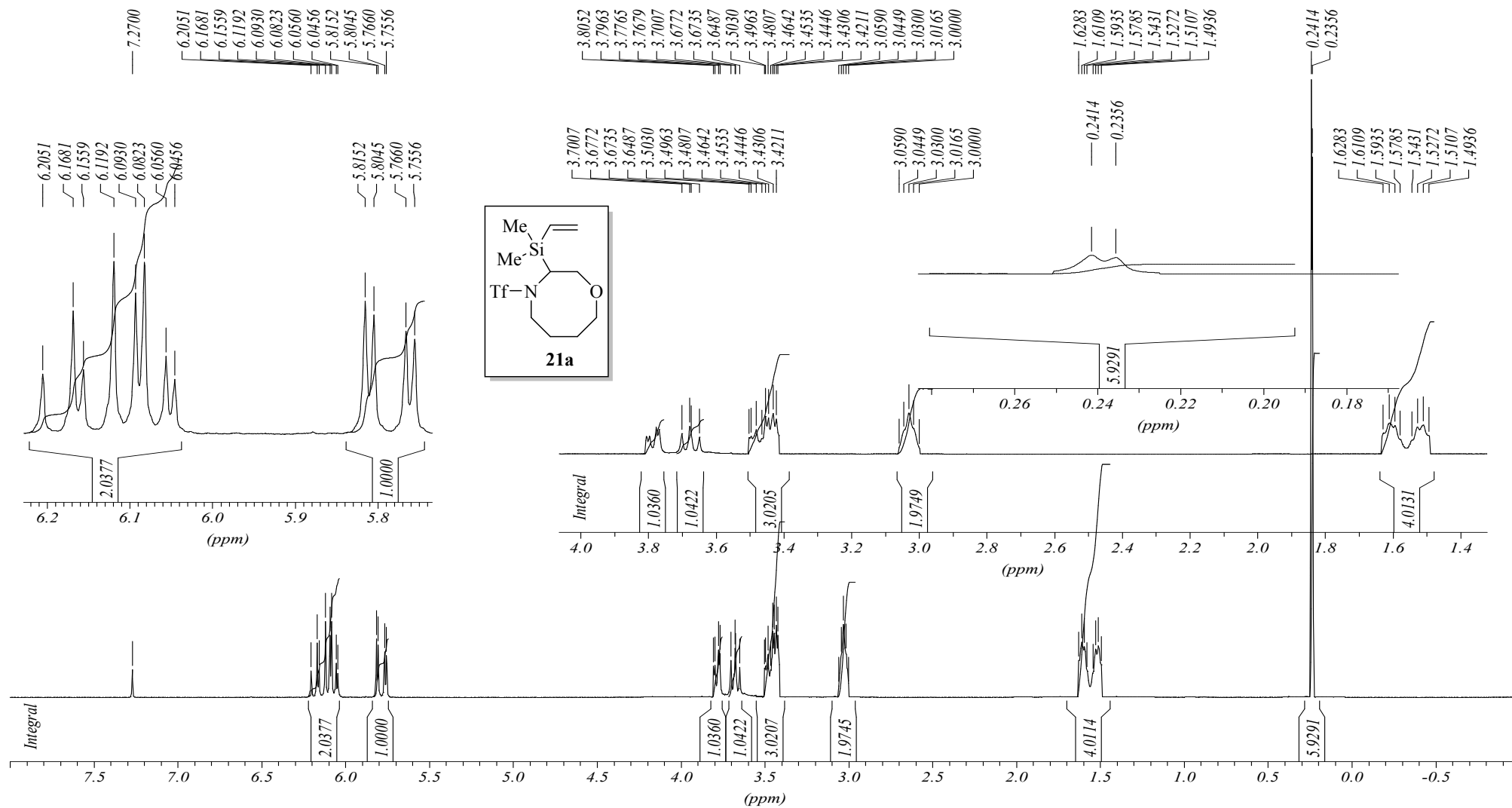


Figure S72. ^{13}C NMR spectrum of compound **21a**

3-(Dimethyl(vinyl)silyl)-4-((trifluoromethyl)sulfonyl)-1,4-oxazocane, **21a** (R = Me).

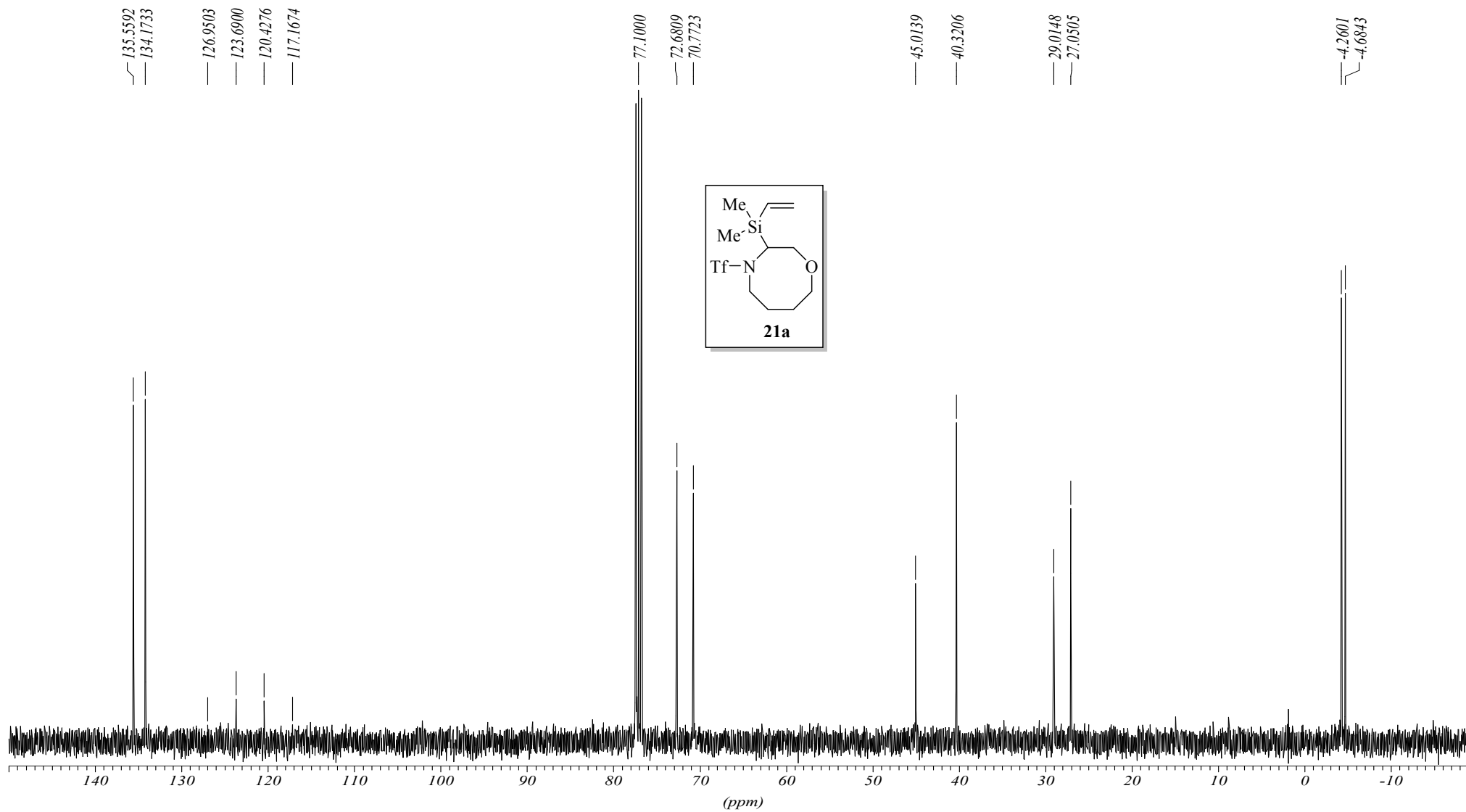


Figure S73. ^1H NMR monitoring of the reaction mixture (**13d** + K_2CO_3 , $\text{R}^1 = \text{Ph}$): 20, 40 and 60 min after the start of the reaction.

