

**Chemoselective Lactam Formation in the Addition of Benzenesulfonyl Bromide
to N-Allyl Acrylamides and N-Allyl 3,3-Dimethylacrylamides**

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Supporting Information

^1H NMR and ^1H - ^1H NOESY spectra were recorded in CDCl_3 or C_6D_6 at 400 MHz with δ measured relative to CHCl_3 (7.27 ppm) or C_6H_6 (7.16 ppm) respectively. ^{13}C NMR spectra were recorded at 100 MHz with δ relative to the central ^{13}C peak of CDCl_3 (77.23 ppm).

Figure 1. ^1H NMR spectrum of *trans*-9a in C_6D_6 (3 - 1).

Figure 2. ^1H NMR spectrum of *trans*-9a in C_6D_6 (3 - 2).

Figure 3. ^1H NMR spectrum of *trans*-9a in C_6D_6 (3 - 3).

Figure 4. ^1H - ^1H NOESY spectrum of *trans*-9a in C_6D_6 .

Figure 5. ^{13}C NMR spectrum of *trans*-9a in CDCl_3 .

Figure 6. ^1H NMR spectrum of *cis*-9a in C_6D_6 (3 - 1).

Figure 7. ^1H NMR spectrum of *cis*-9a in C_6D_6 (3 - 2).

Figure 8. ^1H NMR spectrum of *cis*-9a in C_6D_6 (3 - 3).

Figure 9. ^1H - ^1H NOESY spectrum of *cis*-9a in C_6D_6 .

Figure 10. ^{13}C NMR spectrum of *cis*-9a in CDCl_3 .

Figure 11. ^1H NMR spectrum of 9b ($\text{c/t} = 1 : 5$) in C_6D_6 .

Figure 12. ^1H - ^1H NOESY spectrum of 9b ($\text{c/t} = 1 : 5$) in C_6D_6 .

Figure 13. ^{13}C NMR spectrum of 9b ($\text{c/t} = 1 : 5$) in CDCl_3 .

Figure 14. ^1H NMR spectrum of *trans*-9c in CDCl_3 .

Figure 15. ^1H - ^1H NOESY spectrum of *trans*-9c in CDCl_3 .

Figure 16. ^{13}C NMR spectrum of *trans*-9c in CDCl_3 .

Figure 17. ^1H NMR spectrum of *cis*-9c in C_6D_6 .

Figure 18. ^1H - ^1H NOESY spectrum of *cis*-9c in C_6D_6 .

Figure 19. ^{13}C NMR spectrum of *cis*-**9c** in CDCl_3 .

Figure 20. ^1H NMR spectrum of *trans*-**9d** in C_6D_6 .

Figure 21. ^1H - ^1H NOESY spectrum of *trans*-**9d** in C_6D_6 .

Figure 22. ^{13}C NMR spectrum of *trans*-**9d** in CDCl_3 .

Figure 23. ^1H NMR spectrum of *cis*-**9d** in C_6D_6 .

Figure 24. ^1H - ^1H NOESY spectrum of *cis*-**9d** in C_6D_6 .

Figure 25. ^{13}C NMR spectrum of *cis*-**9d** in CDCl_3 .

Figure 26. ^1H NMR spectrum of *trans*-**9e** in CDCl_3 .

Figure 27. ^1H - ^1H NOESY spectrum of *trans*-**9e** in CDCl_3 .

Figure 28. ^{13}C NMR spectrum of *trans*-**9e** in CDCl_3 .

Figure 29. ^1H NMR spectrum of **10c** (2 rotamers) in CDCl_3 .

Figure 30. ^{13}C NMR spectrum of **10c** (2 rotamers) in CDCl_3 .

Figure 31. ^1H NMR spectrum of **10d** (2 rotamers) in CDCl_3 .

Figure 32. ^{13}C NMR spectrum of **10d** (2 rotamers) in CDCl_3 .

Figure 33. ^1H NMR spectrum of **10e** in CDCl_3 .

Figure 34. ^{13}C NMR spectrum of **10e** in CDCl_3 .

Figure 35. ^1H NMR spectrum of **10f** in CDCl_3 .

Figure 36. ^{13}C NMR spectrum of **10f** in CDCl_3 .

Figure 37. ^1H NMR spectrum of **12a** and **13a** (2 : 1) in CDCl_3 .

Figure 38. ^1H - ^1H NOESY spectrum of **12a** and **13a** (2 : 1) in CDCl_3 .

Figure 39. ^{13}C NMR spectrum of **12a** and **13a** (2 : 1) in CDCl_3 .

Figure 40. ^1H NMR spectrum of **12b** in CDCl_3 .

Figure 41. ^{13}C NMR spectrum of **12b** in CDCl_3 .

Figure 42. ^1H NMR spectrum of **12c** in C_6D_6 .

Figure 43. ^{13}C NMR spectrum of **12c** in C_6D_6 .

Figure 44. ^1H NMR spectrum of **12d** and **13d** (2.5 : 1) in C_6D_6 .

Figure 45. ^1H - ^1H NOESY spectrum of **12d** and **13d** (2.5 : 1) in C_6D_6 .

Figure 46. ^{13}C NMR spectrum of **12d** and **13d** (2.5 : 1) in CDCl_3 .

Figure 47. ^1H NMR spectrum of **13c** in C_6D_6 .

Figure 48. ^1H - ^1H NOESY spectrum of **13c** in C_6D_6 .

Figure 49. ^{13}C NMR spectrum of **13c** in CDCl_3 .

Figure 50. ^1H NMR spectrum of **14** ($\text{c/t} = 2 : 1$ or $1 : 2$) in CDCl_3 .

Figure 51. ^{13}C NMR spectrum of **14** ($\text{c/t} = 2 : 1$ or $1 : 2$) in CDCl_3 .

Figure 52. ^1H NMR spectrum of **15** in CDCl_3 .

Figure 53. ^{13}C NMR spectrum of **15** in CDCl_3 .

Figure 54. ^1H NMR spectrum of **19** ($\text{c/t} = 2 : 1$ or $1 : 2$) in CDCl_3 .

Figure 55. ^{13}C NMR spectrum of **19** ($\text{c/t} = 2 : 1$ or $1 : 2$) in CDCl_3 .

Figure 56. ^1H NMR spectrum of **21** in CDCl_3 .

Figure 57. ^{13}C NMR spectrum of **21** in CDCl_3 .

Figure 58. ^1H NMR spectrum of *trans*-**23** in CDCl_3 .

Figure 59. ^1H - ^1H NOESY spectrum of *trans*-**23** in CDCl_3 .

Figure 60. ^{13}C NMR spectrum of *trans*-**23** in CDCl_3 .

Figure 61. ^1H NMR spectrum of *cis*-**23** in CDCl_3 .

Figure 62. ^1H - ^1H NOESY spectrum of *cis*-**23** in CDCl_3 .

Figure 63. ^{13}C NMR spectrum of *cis*-**23** in CDCl_3 .

Figure 64. ^1H NMR spectrum of **24** ($\text{c/t} = 2 : 1$ or $1 : 2$) in CDCl_3 .

Figure 65. ^1H NMR spectrum of *trans*-**25** in C_6D_6 .

Figure 66. ^1H - ^1H NOESY spectrum of *trans*-**25** in C_6D_6 .

Figure 67. ^{13}C NMR spectrum of *trans*-**25** in CDCl_3 .

Figure 68. ^1H NMR spectrum of **26** in CDCl_3 .

Figure 69. ^{13}C NMR spectrum of **26** in CDCl_3 .

Figure 70. ^1H NMR spectrum of **27** in CDCl_3 .

Figure 71. ^1H - ^1H NOESY spectrum of **27** in CDCl_3 .

Figure 72. ^{13}C NMR spectrum of **27** in CDCl_3 .

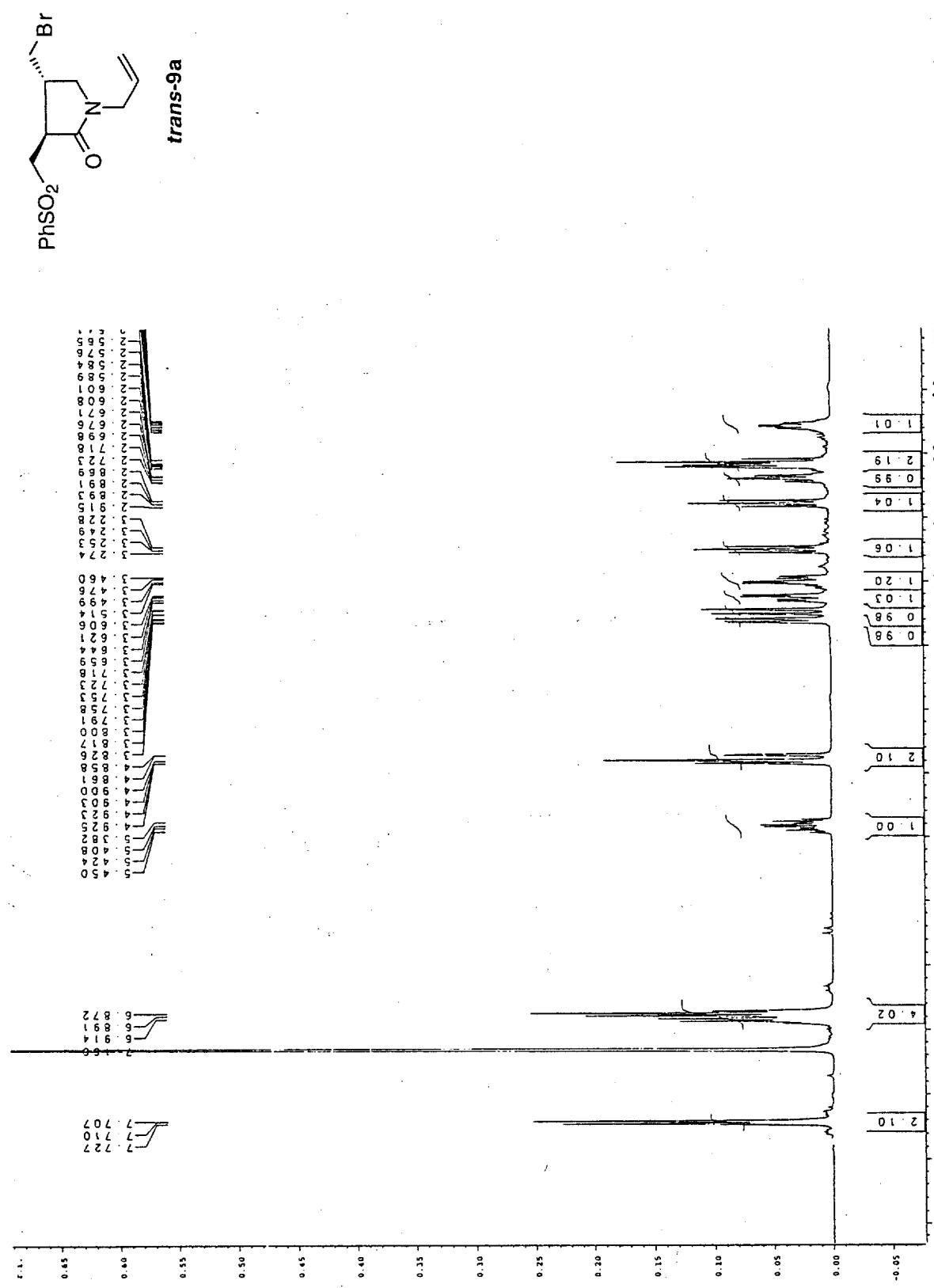


Figure 1. ^1H NMR spectrum of *trans*-9a in C_6D_6 (3 - 1).

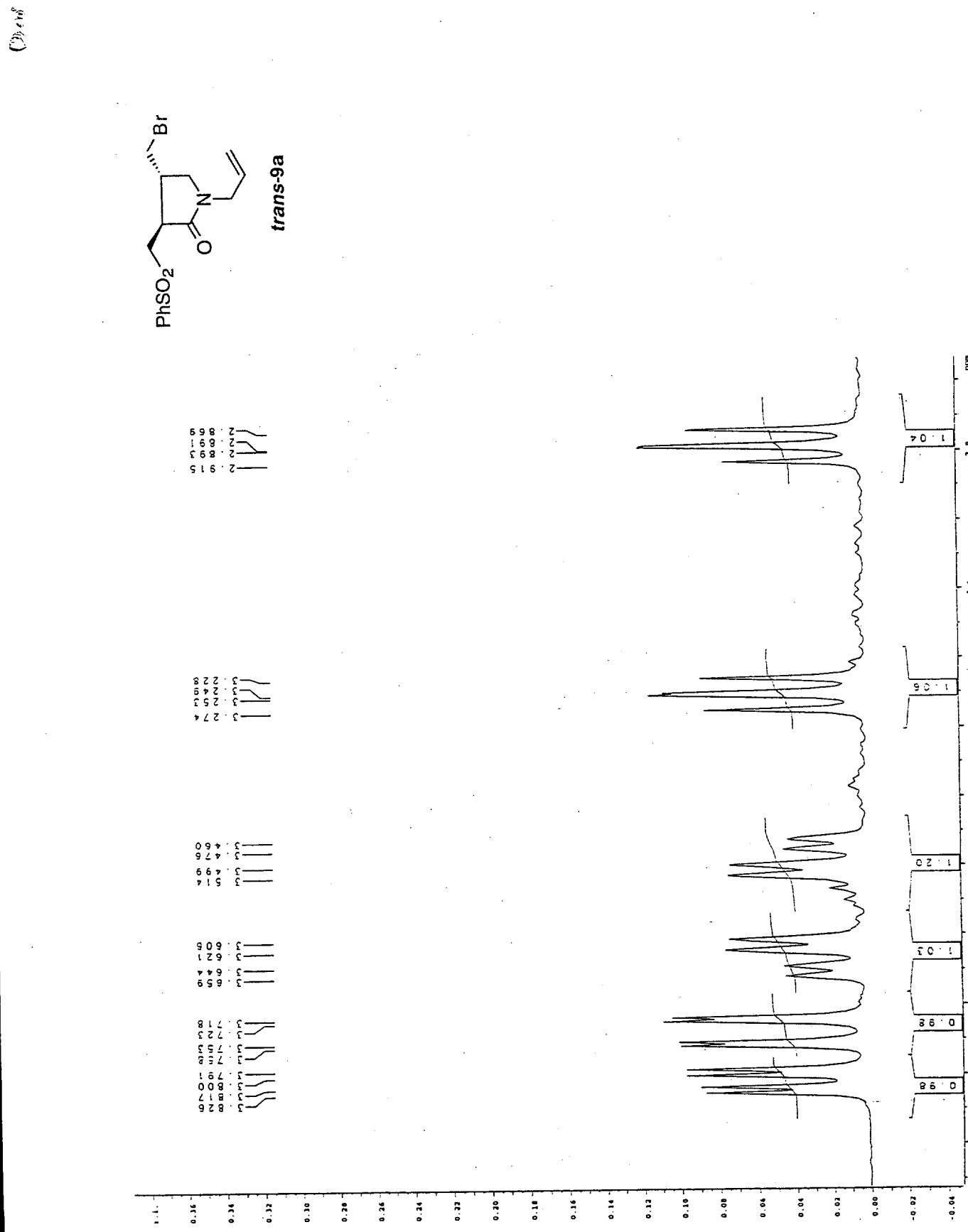


Figure 2. ¹H NMR spectrum of *trans*-9a in C₆D₆ (3 - 2).

(J)ppm

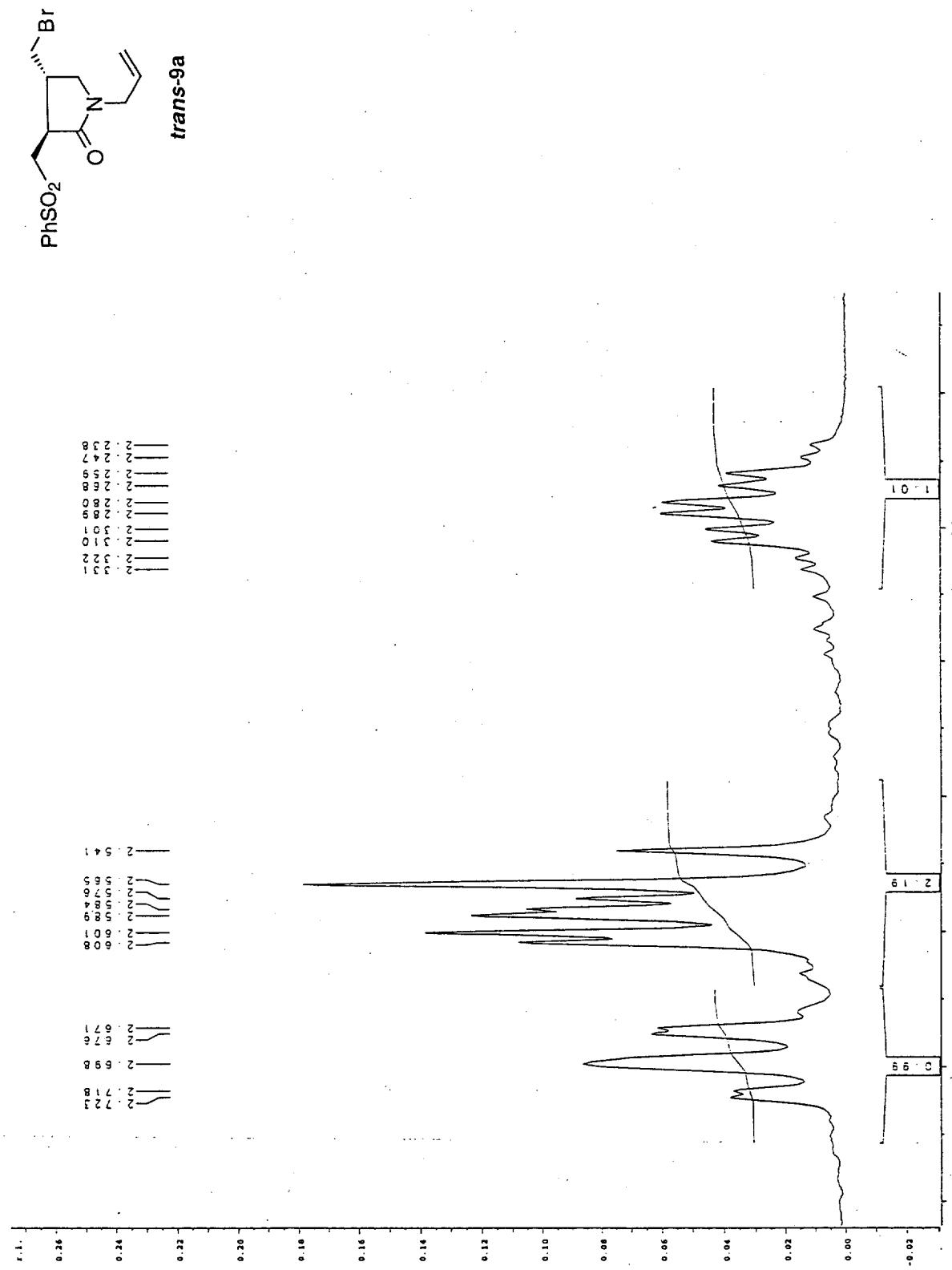


Figure 3. ^1H NMR spectrum of *trans*-9a in C_6D_6 (3 - 3).

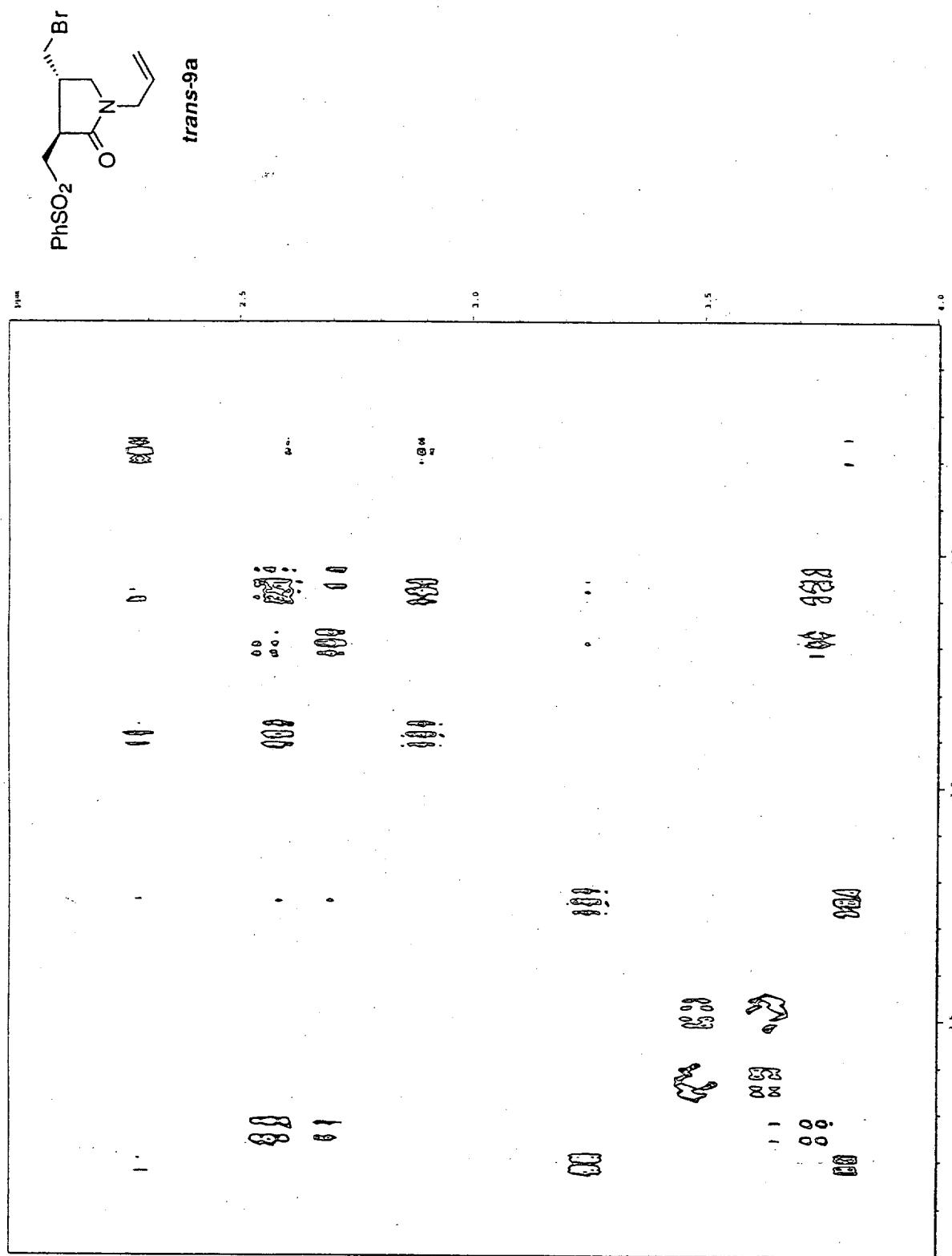


Figure 4. ^1H - ^1H NOESY spectrum of *trans*-9a in C_6D_6 .

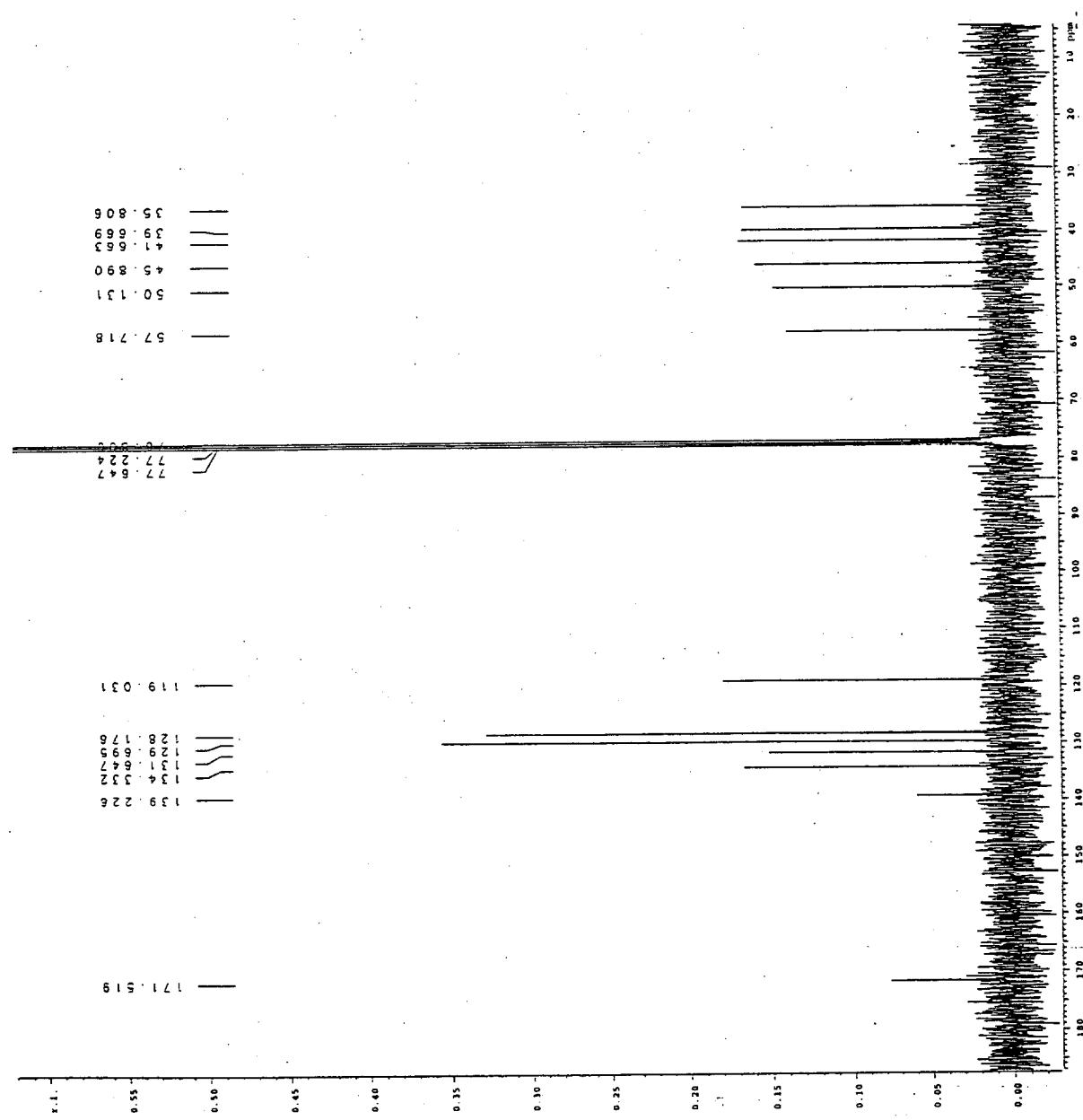
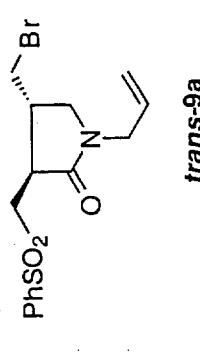


Figure 5. ^{13}C NMR spectrum of *trans*-9a in CDCl_3 .



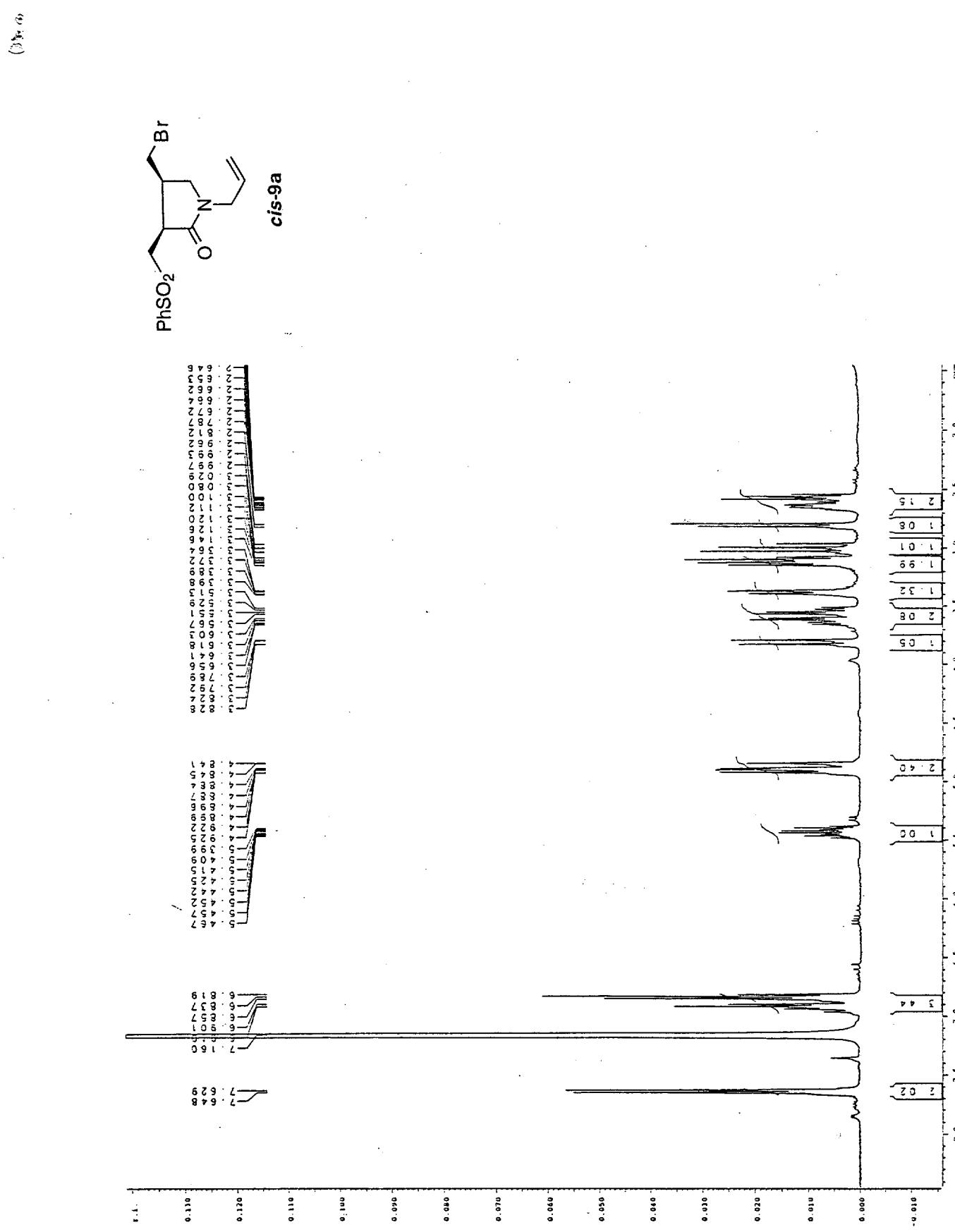
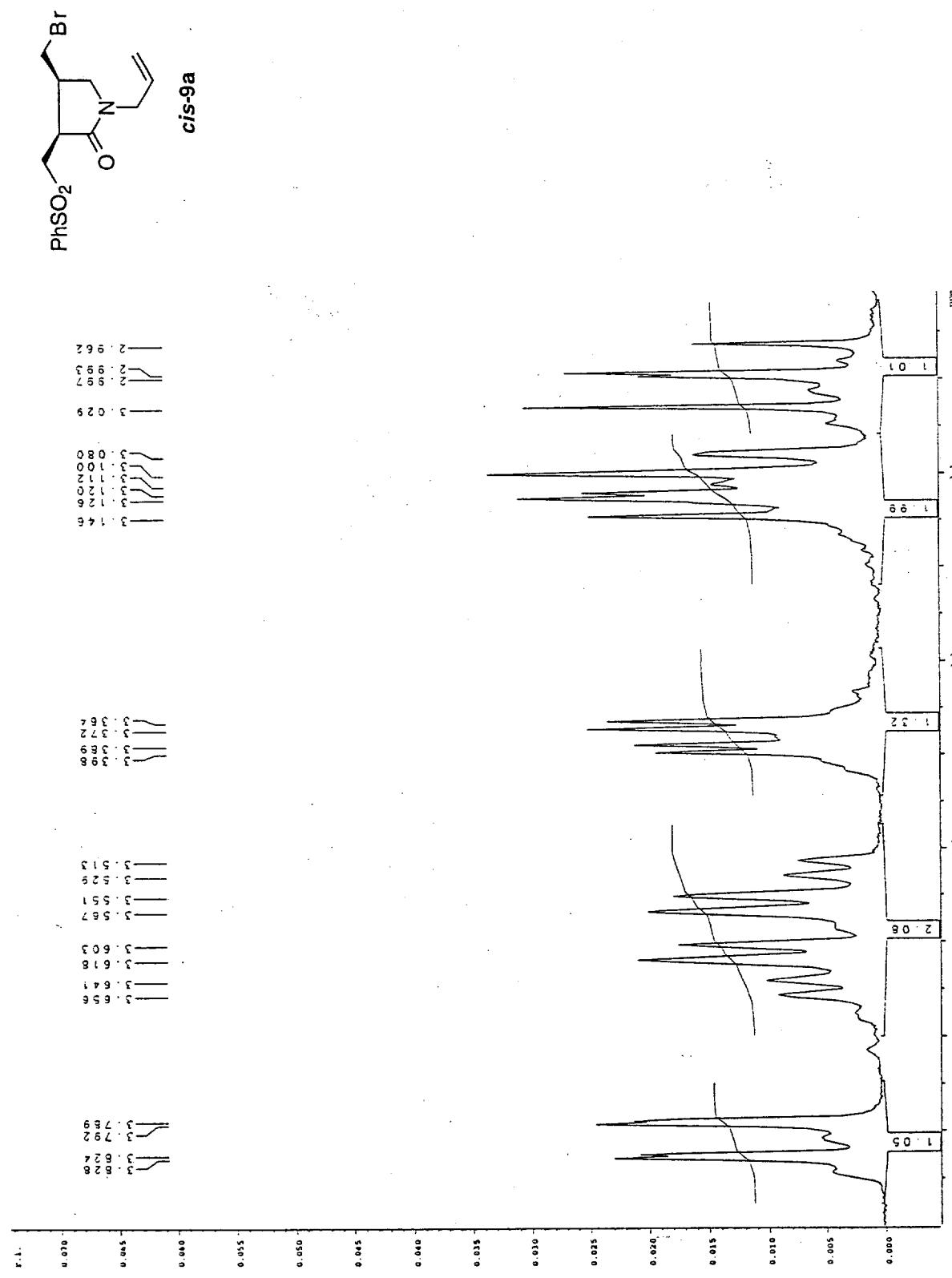


Figure 6. ^1H NMR spectrum of *cis*-9a in C_6D_6 (3 - 1).

(3)r, 4r

Figure 7. ^1H NMR spectrum of *cis*-9a in C_6D_6 (3 - 2).

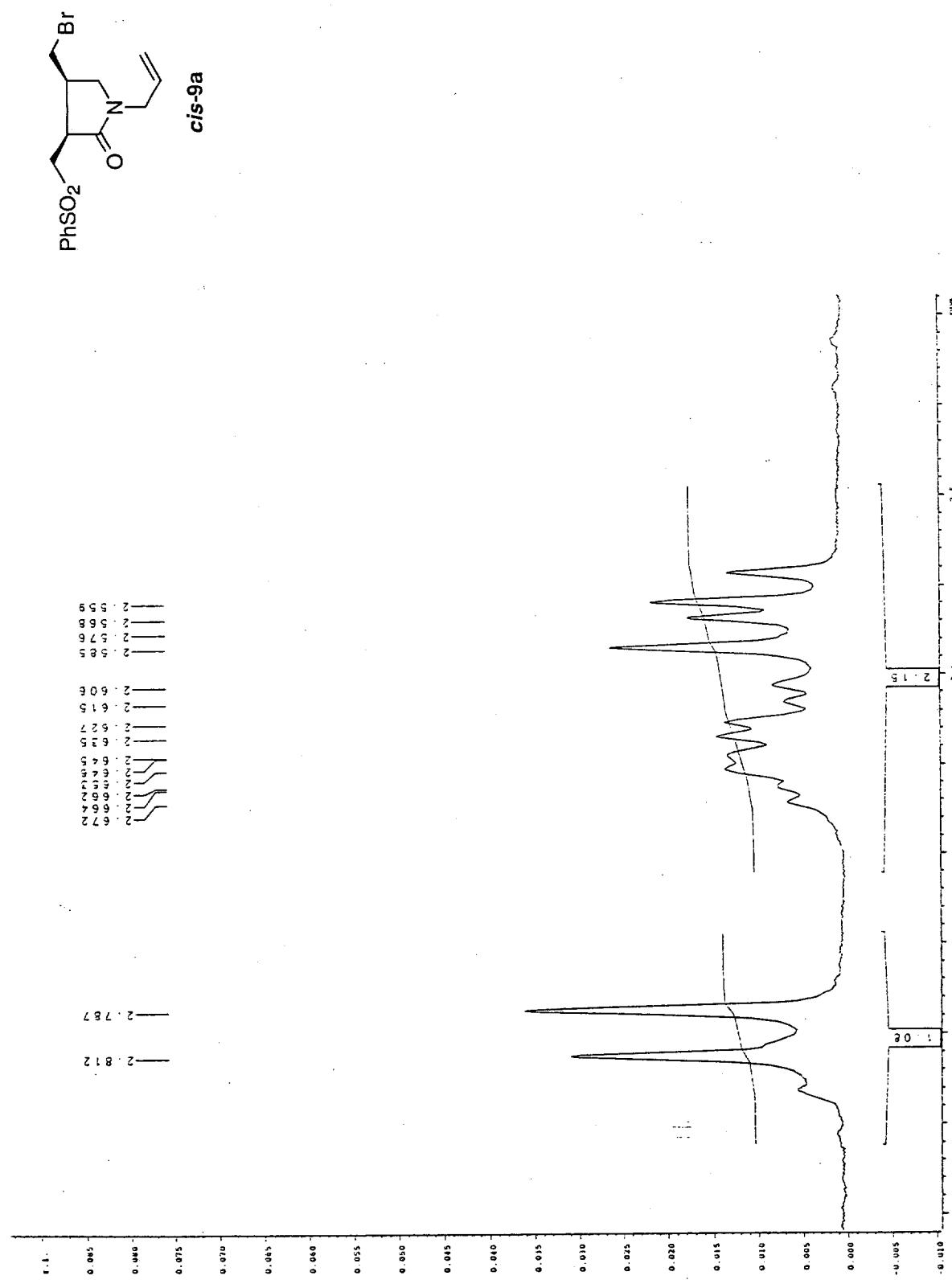


Figure 8. ^1H NMR spectrum of *cis*-9a in C₆D₆ (3 - 3).

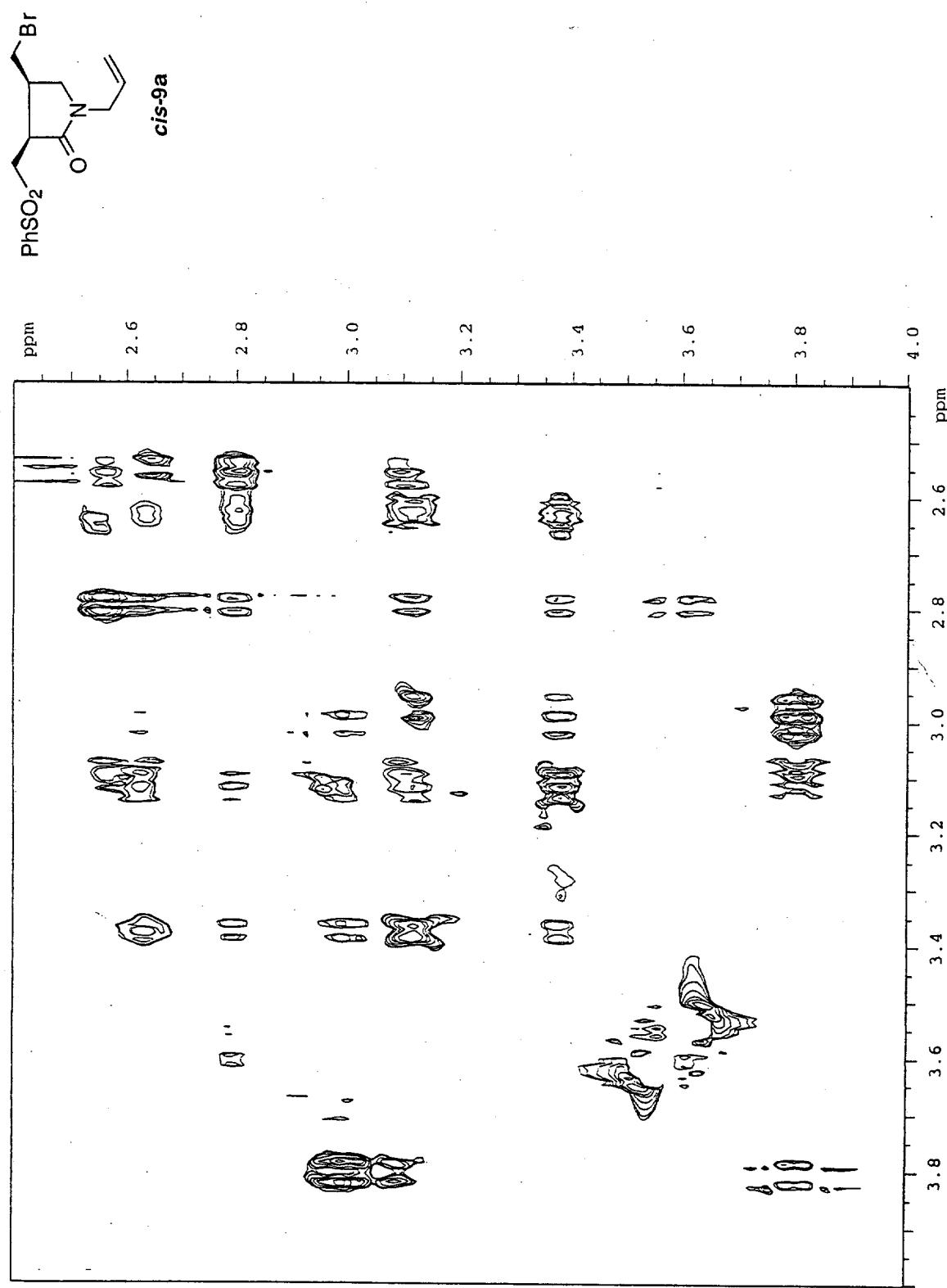


Figure 9. ^1H - ^1H NOESY spectrum of *cis*-9a in C_6D_6 .

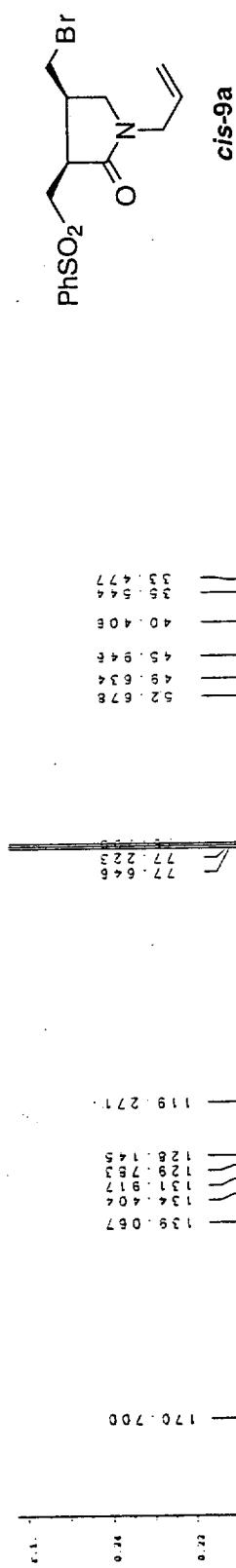


Figure 10. ^{13}C NMR spectrum of *cis*-9a in CDCl_3 .

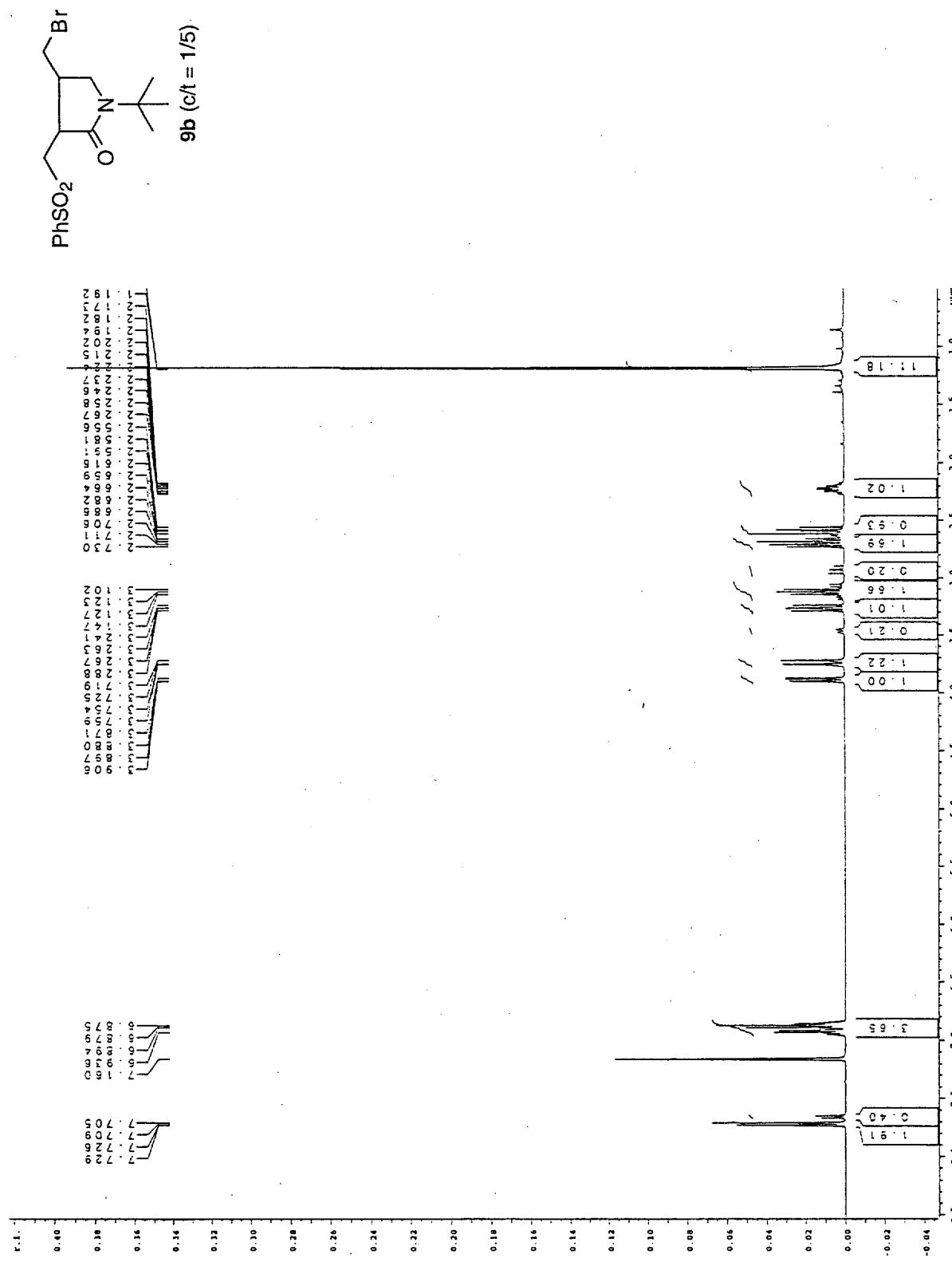


Figure 11. ^1H NMR spectrum of **9b** ($c/t = 1 : 5$) in C_6D_6 .

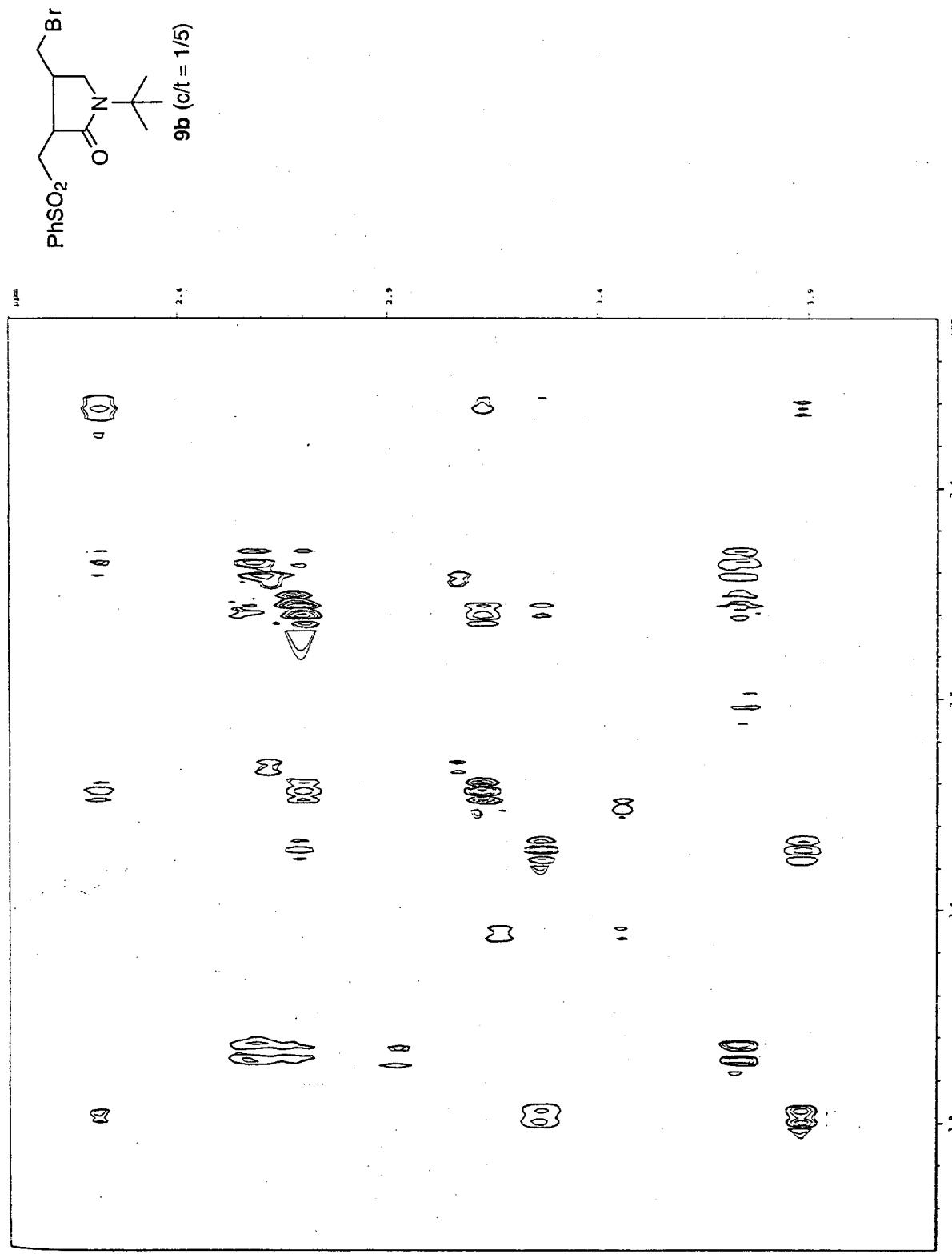


Figure 12. ^1H - ^1H NOESY spectrum of **9b** ($c/t = 1 : 5$) in C_6D_6 .

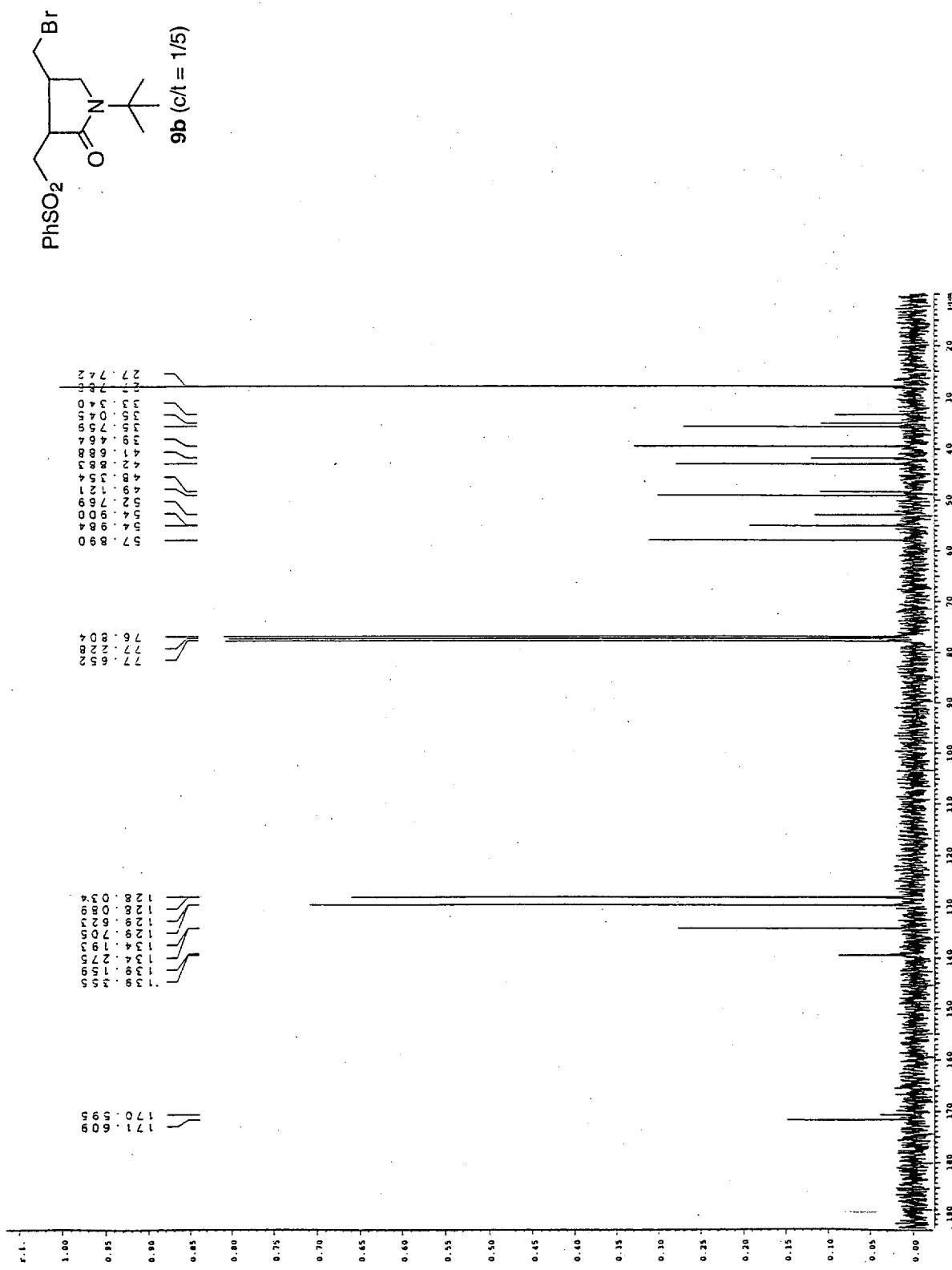


Figure 13. ^{13}C NMR spectrum of **9b** ($c/t = 1 : 5$) in CDCl_3 .

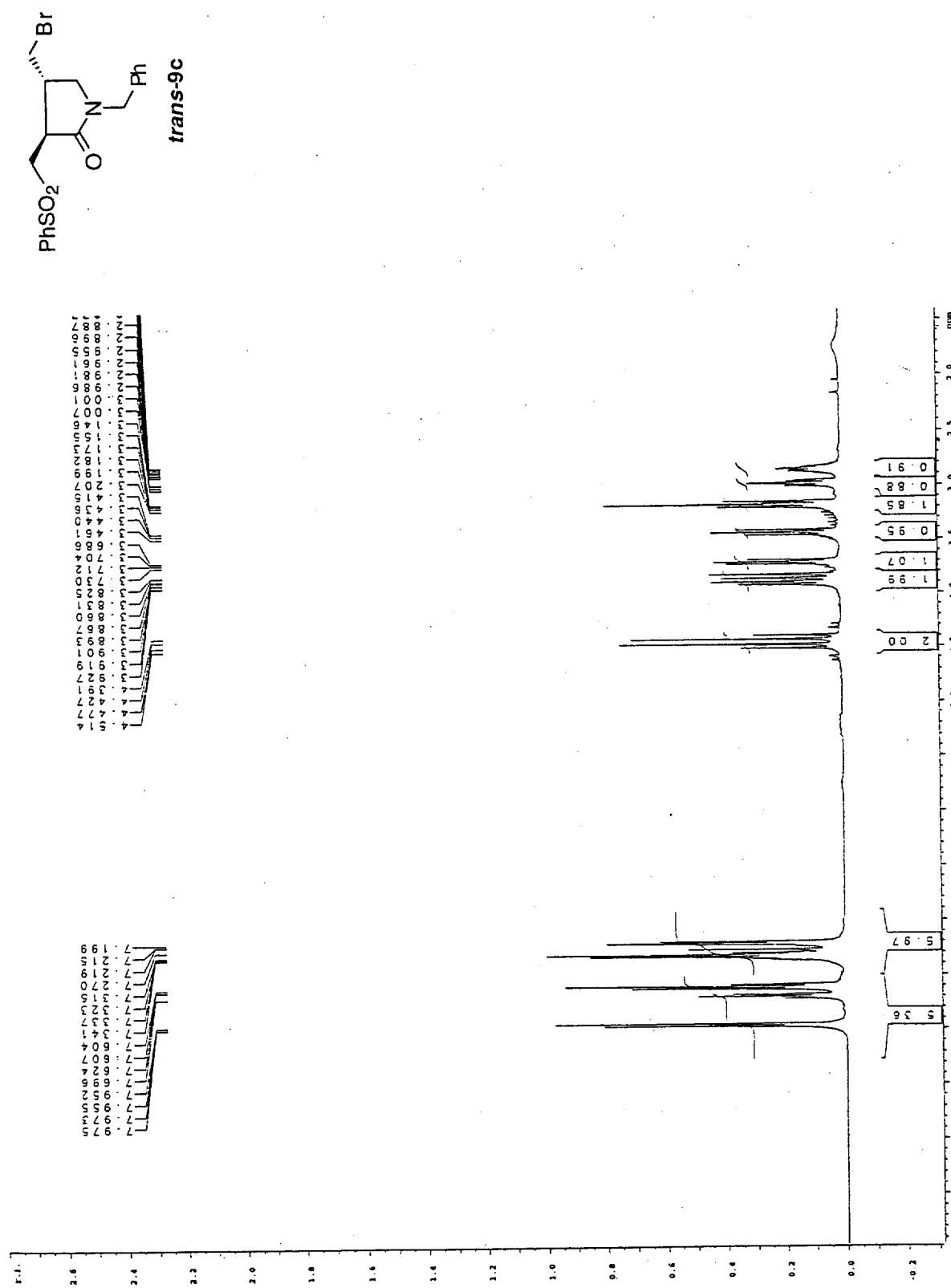


Figure 14. ^1H NMR spectrum of *trans*-9c in CDCl_3 .

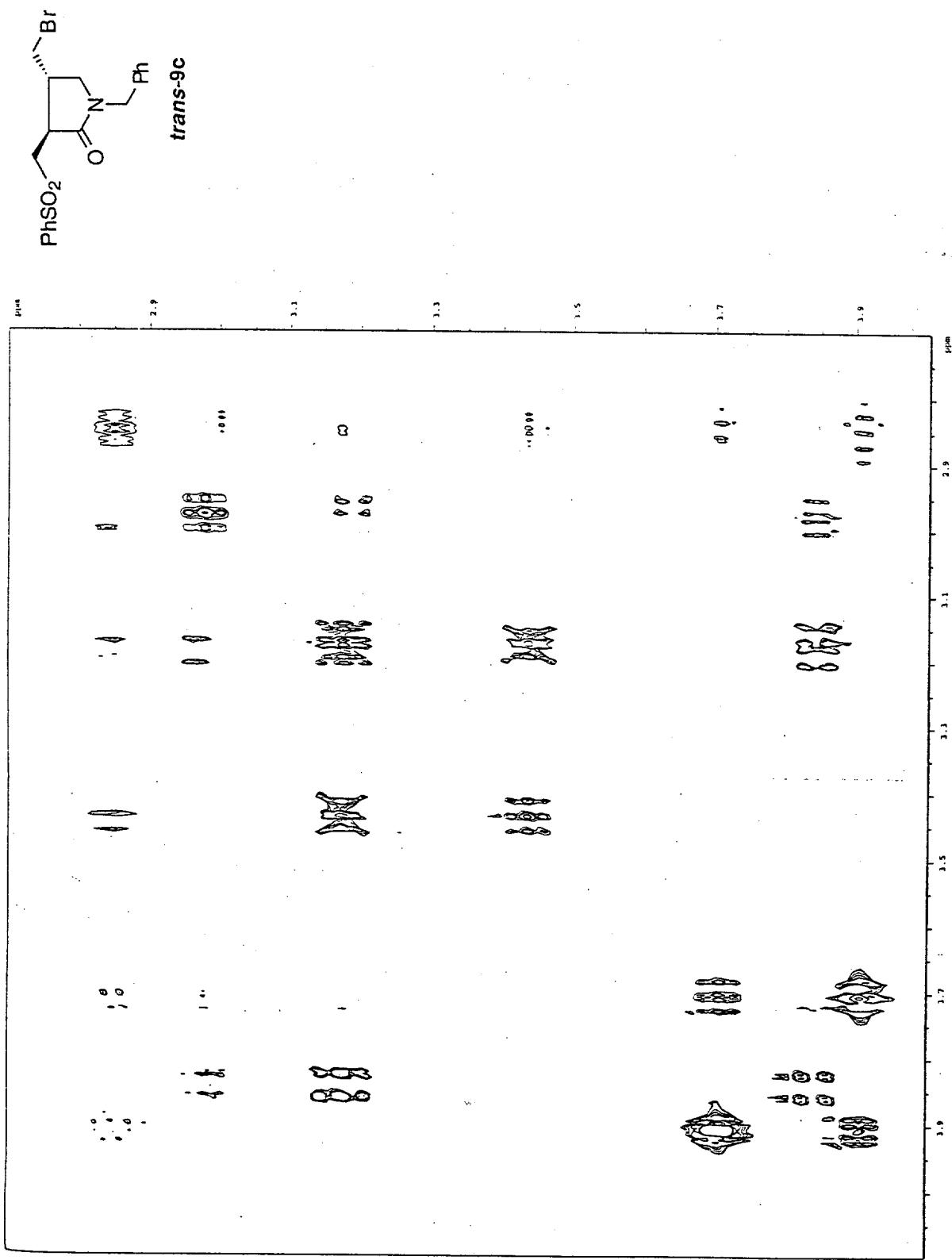


Figure 15. ¹H - ¹H NOESY spectrum of *trans*-9c in CDCl₃.

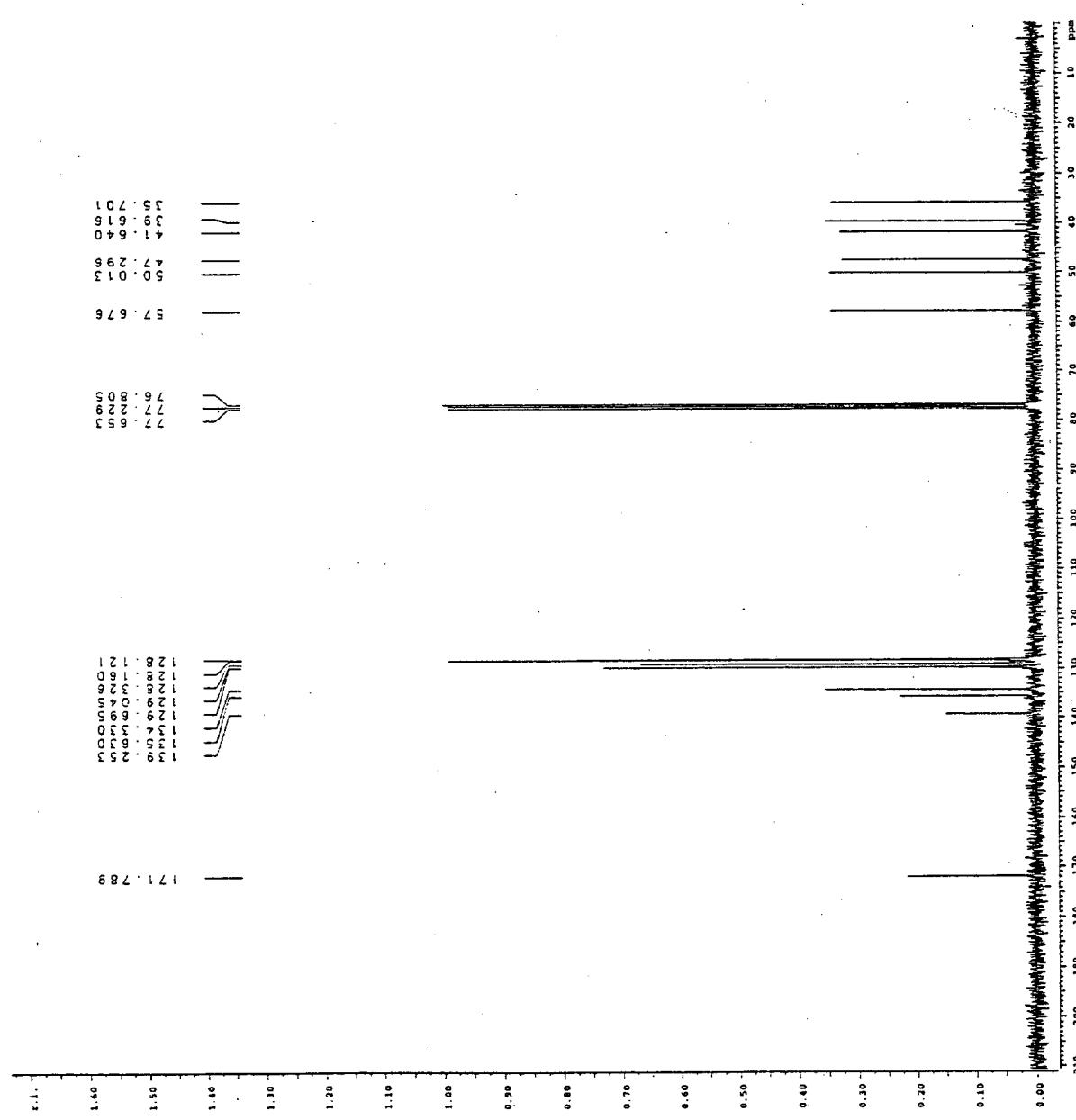


Figure 16. ^{13}C NMR spectrum of *trans*-9c in CDCl_3 .

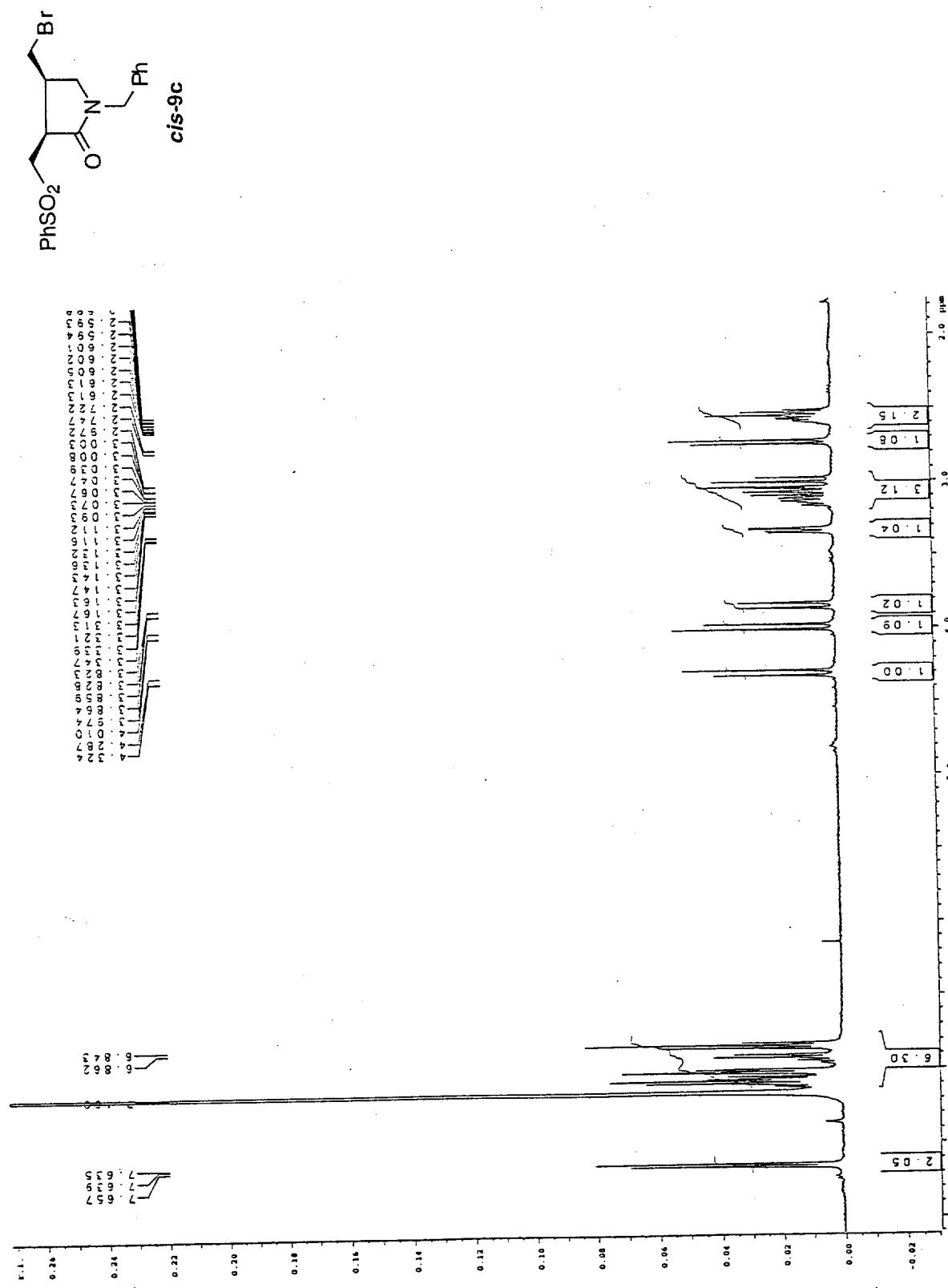


Figure 17. ^1H NMR spectrum of *cis*-9c in C_6D_6 .

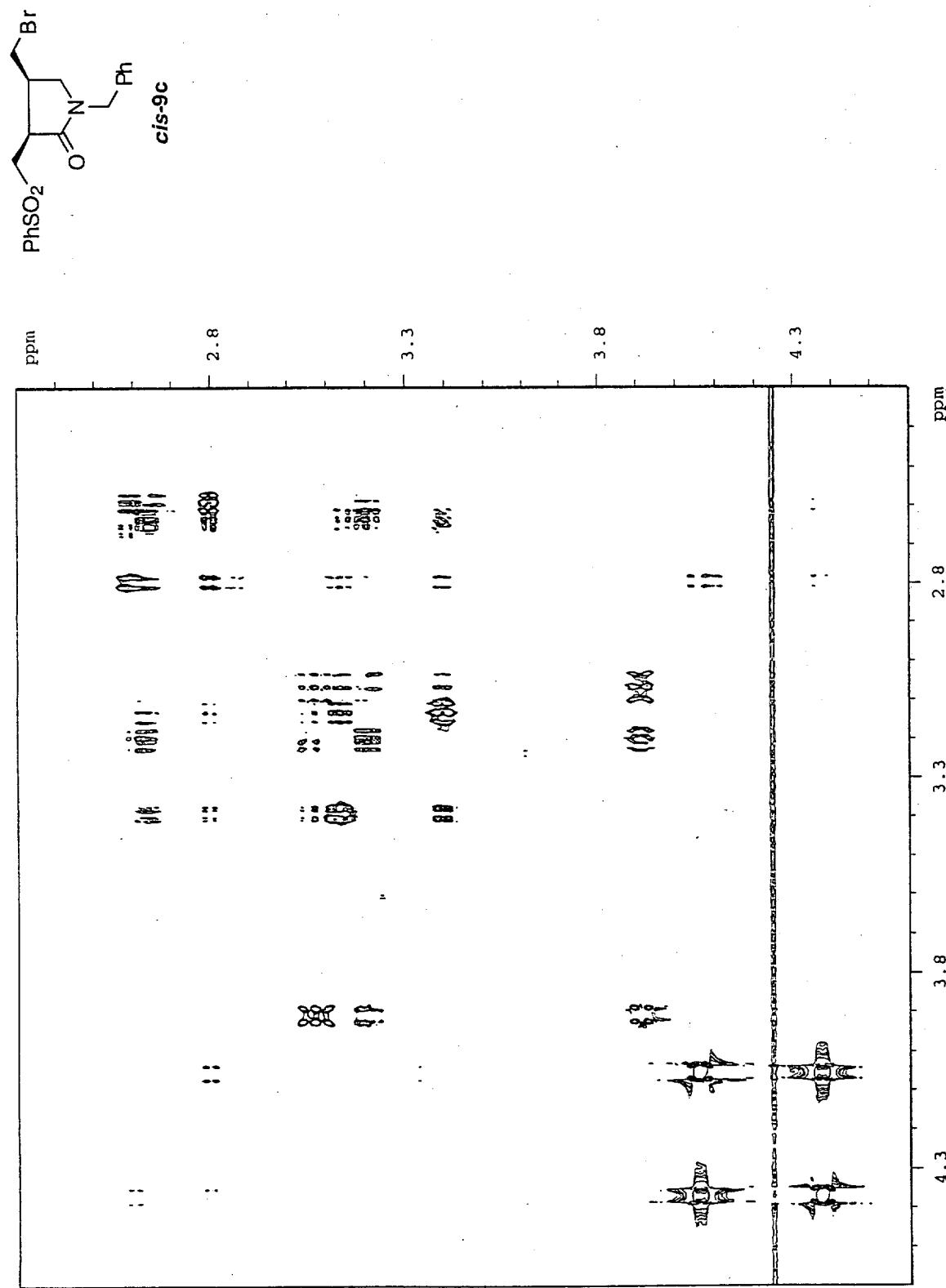


Figure 18. ^1H - ^1H NOESY spectrum of *cis*-9c in C_6D_6 .

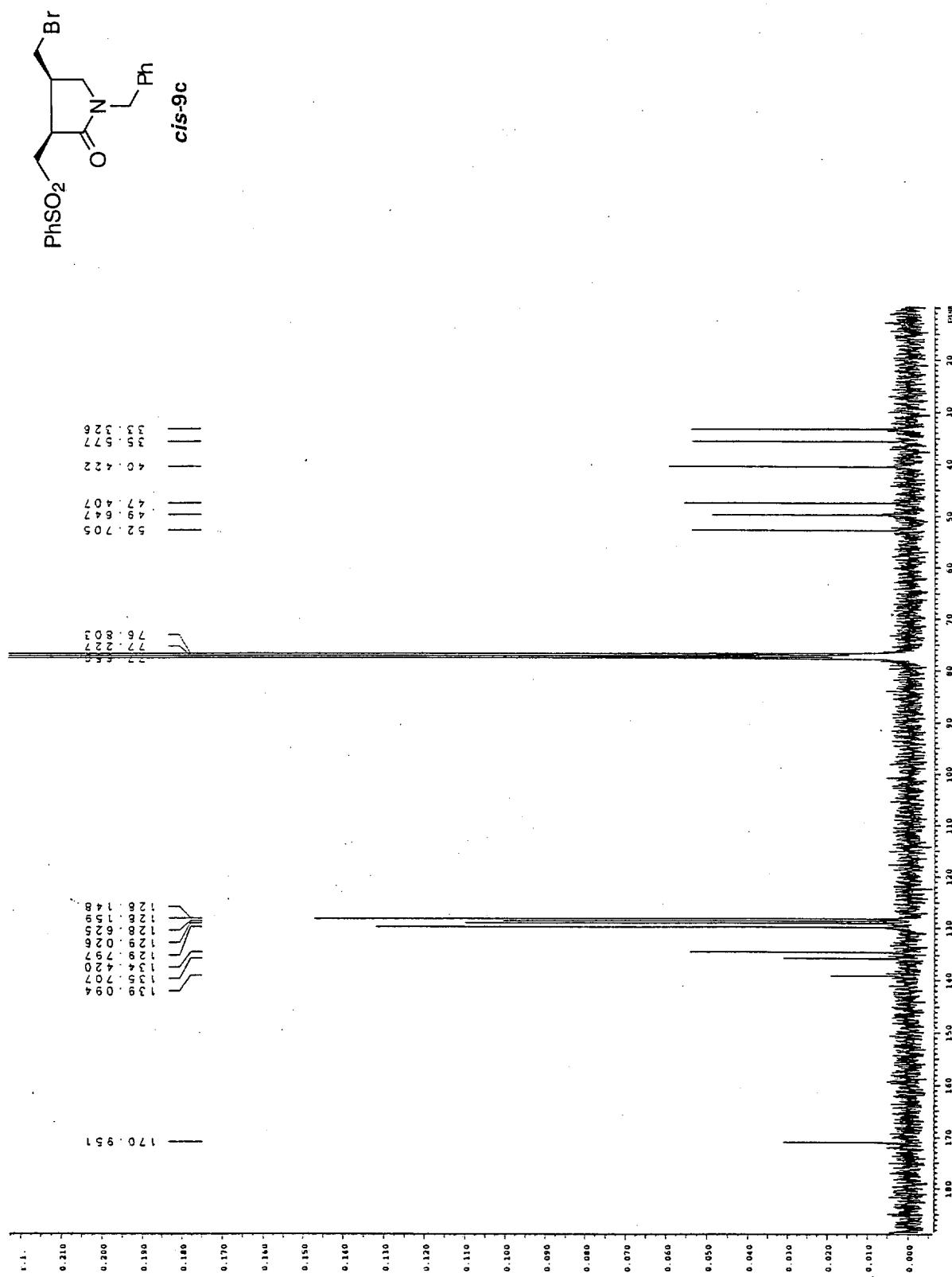


Figure 19. ^{13}C NMR spectrum of *cis*-9c in CDCl_3 .

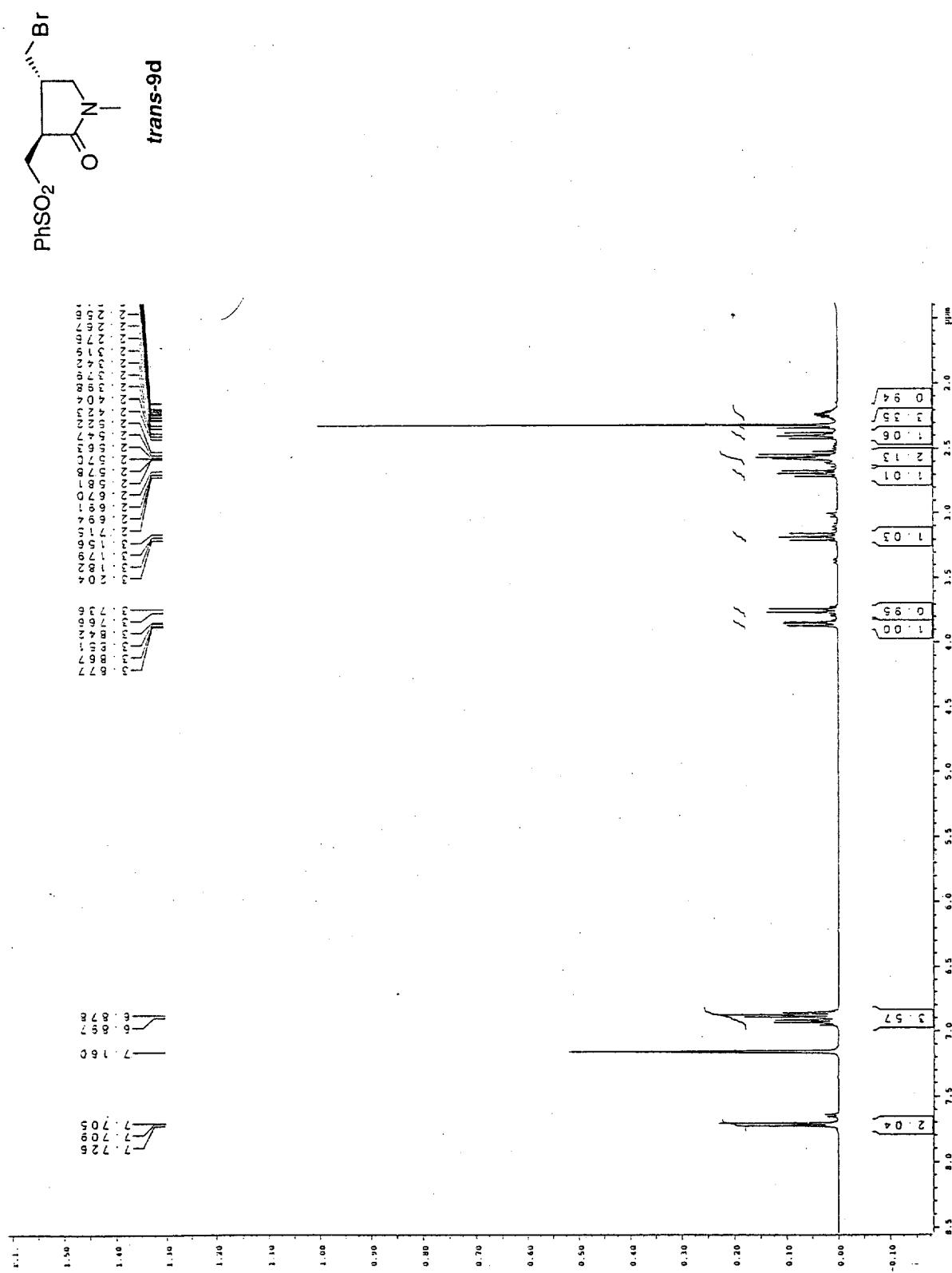


Figure 20. ^1H NMR spectrum of *trans*-9d in C_6D_6 .

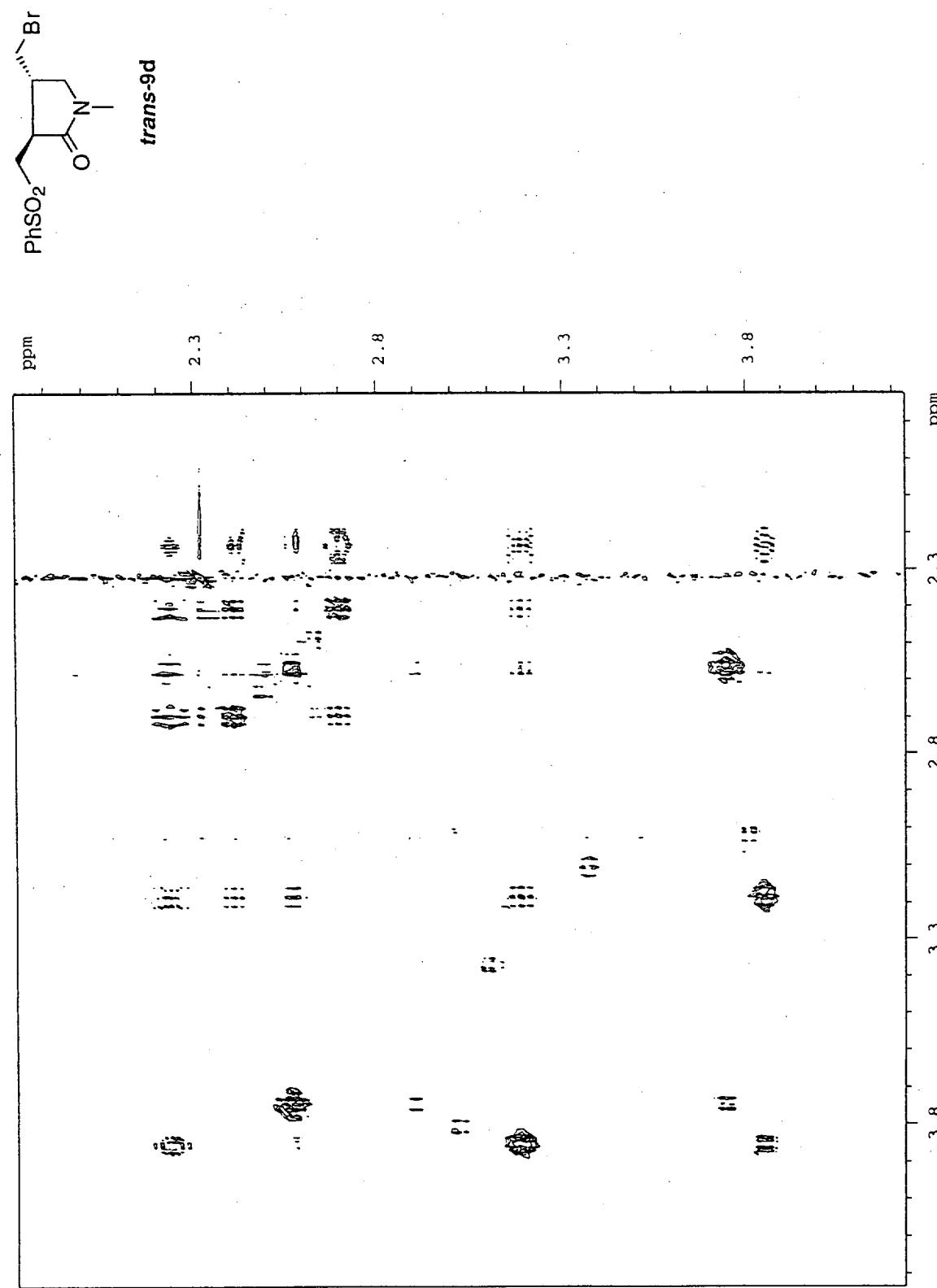


Figure 21. ^1H - ^1H NOESY spectrum of *trans*-9d in C_6D_6 .

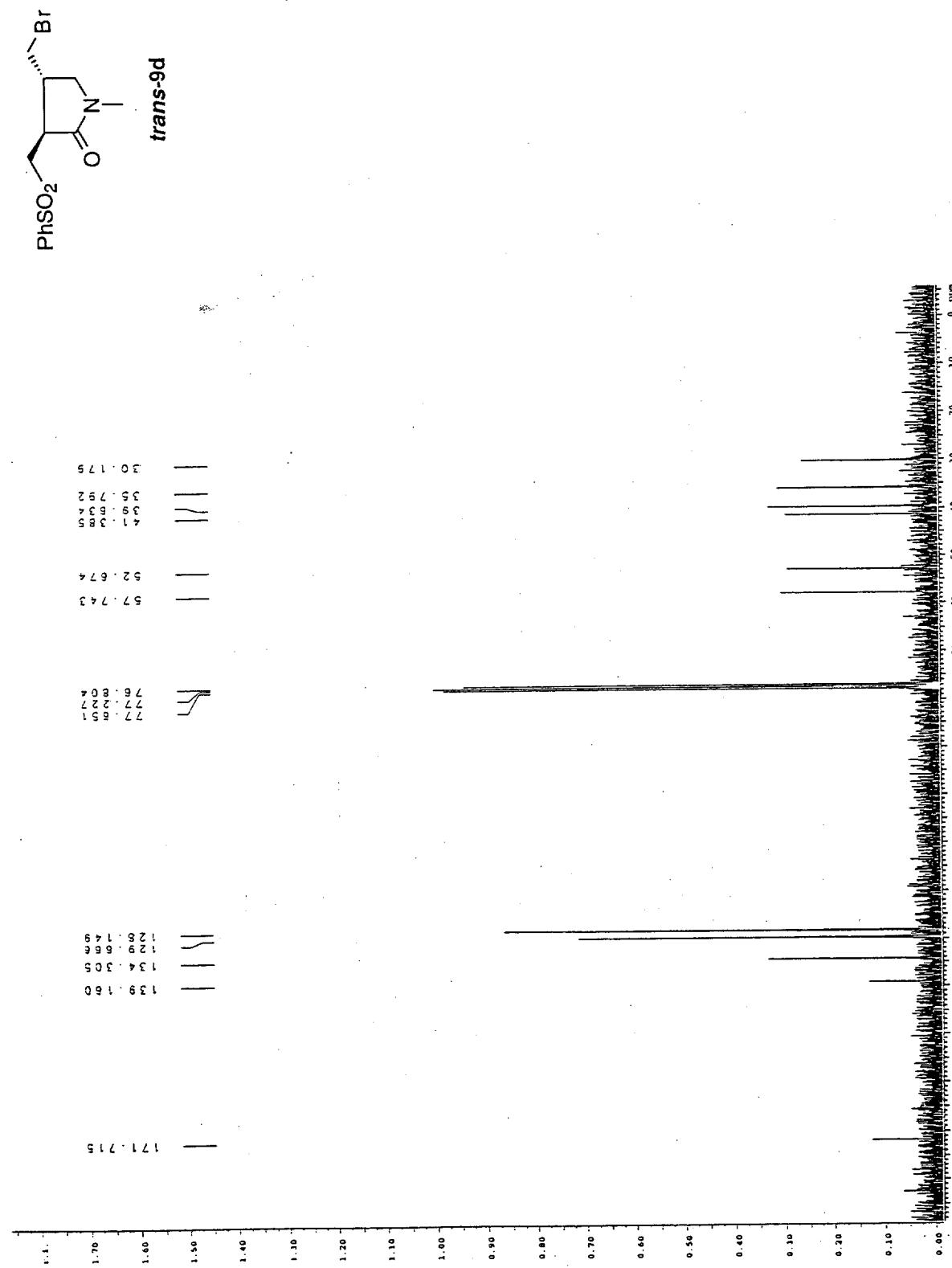


Figure 22. ^{13}C NMR spectrum of *trans*-9d in CDCl_3 .

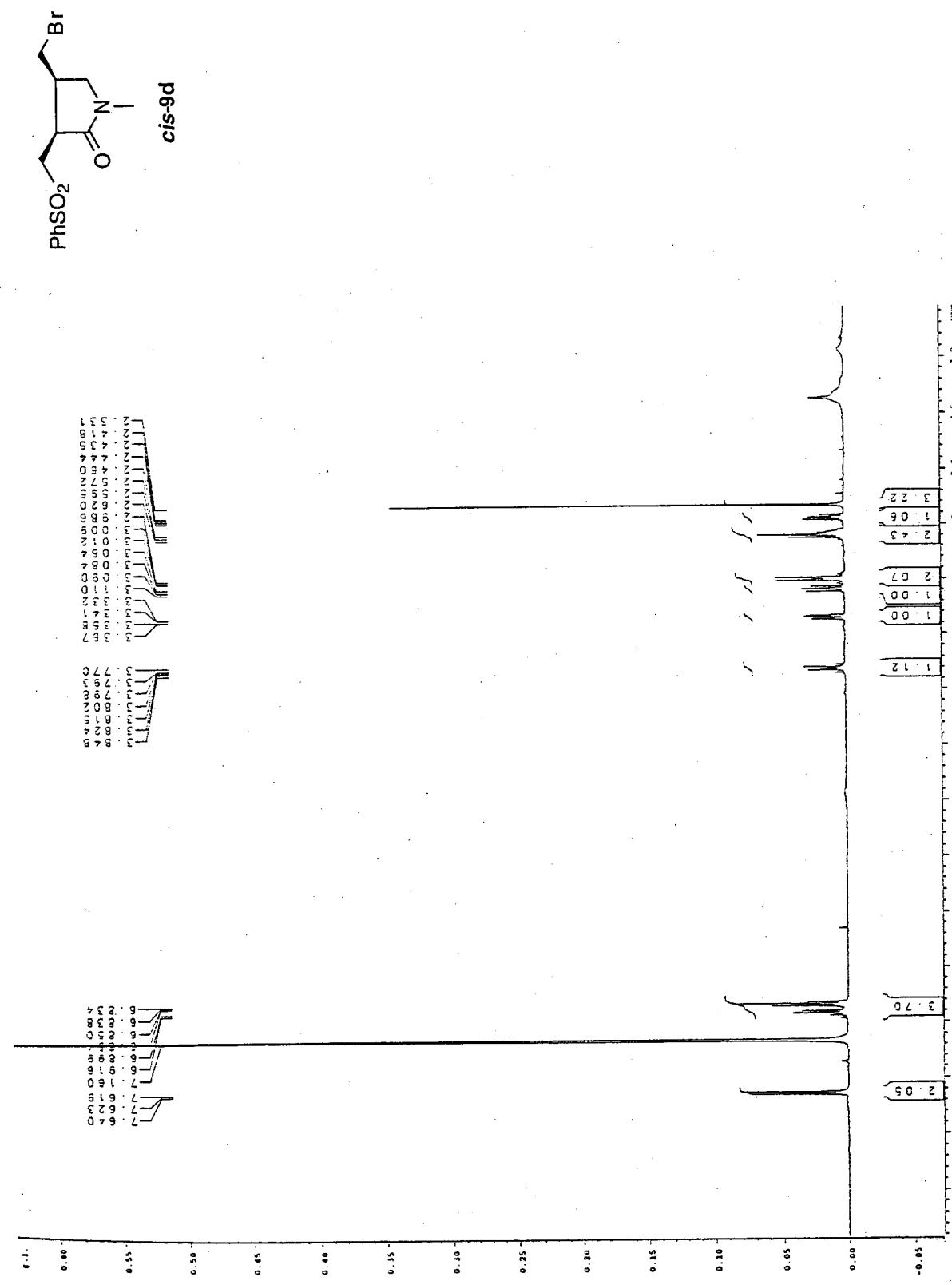
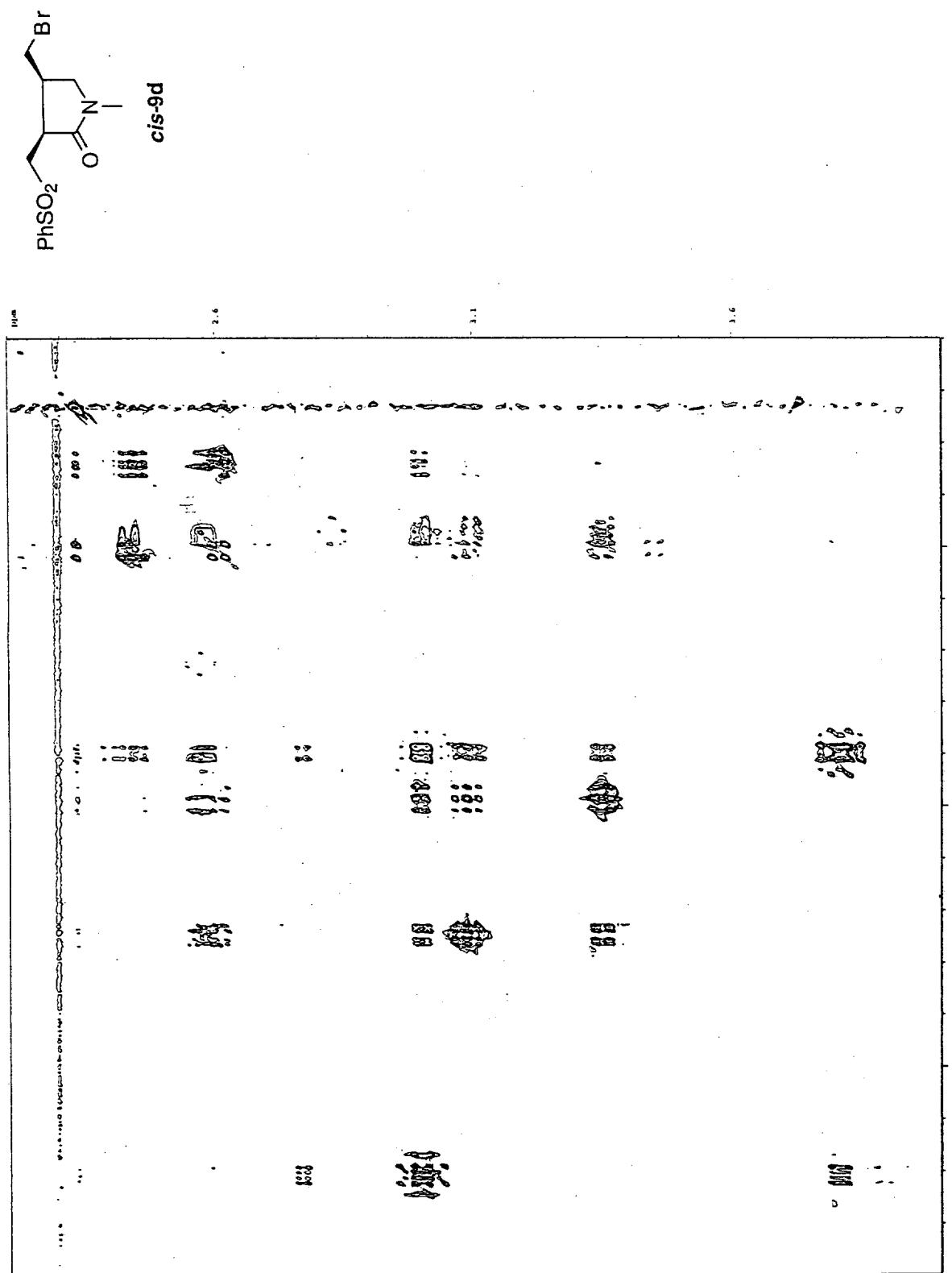


Figure 23. ^1H NMR spectrum of *cis*-9d in C_6D_6 .

Figure 24. ^1H - ^1H NOESY spectrum of *cis*-9d in C_6D_6 .

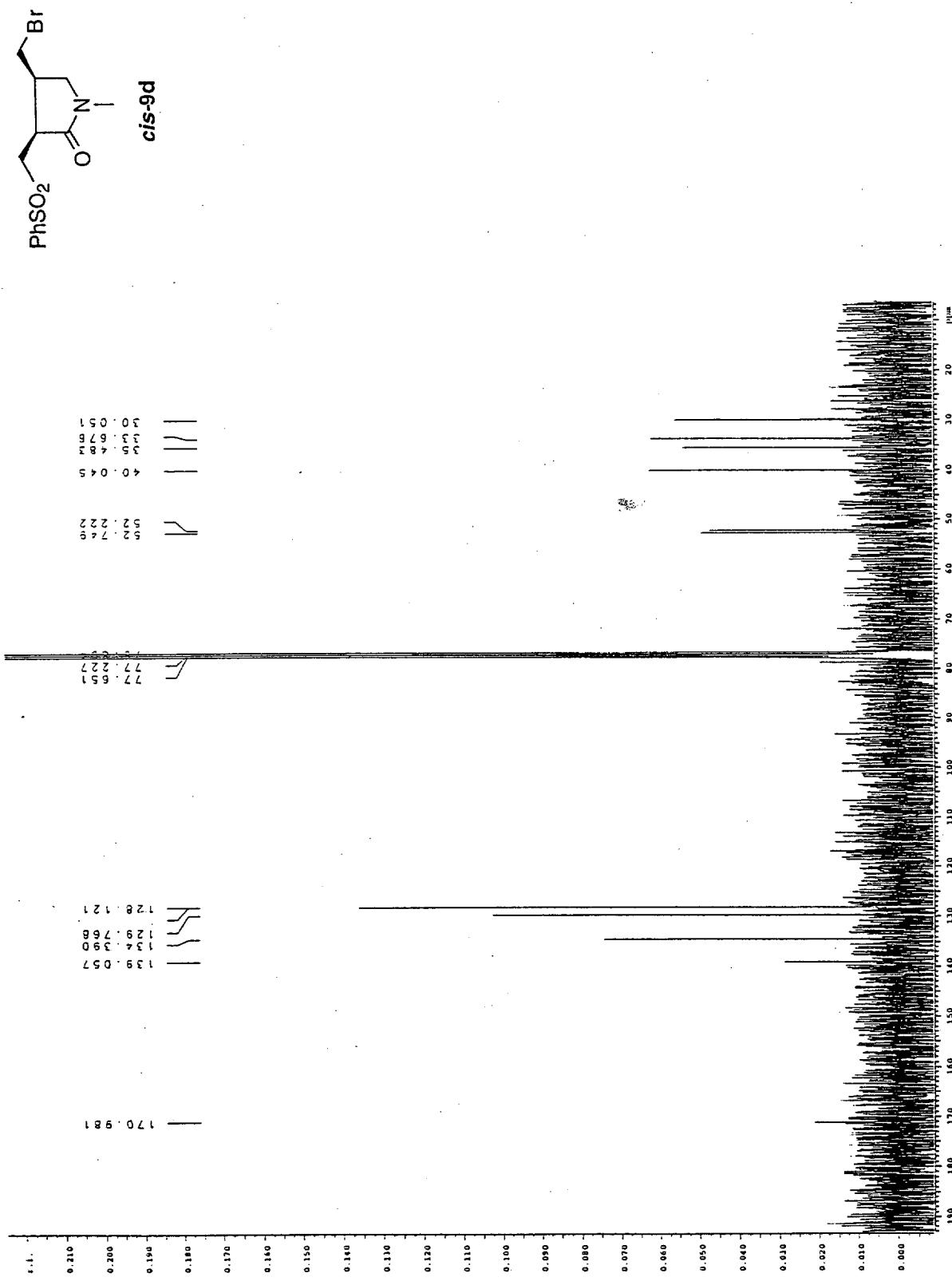
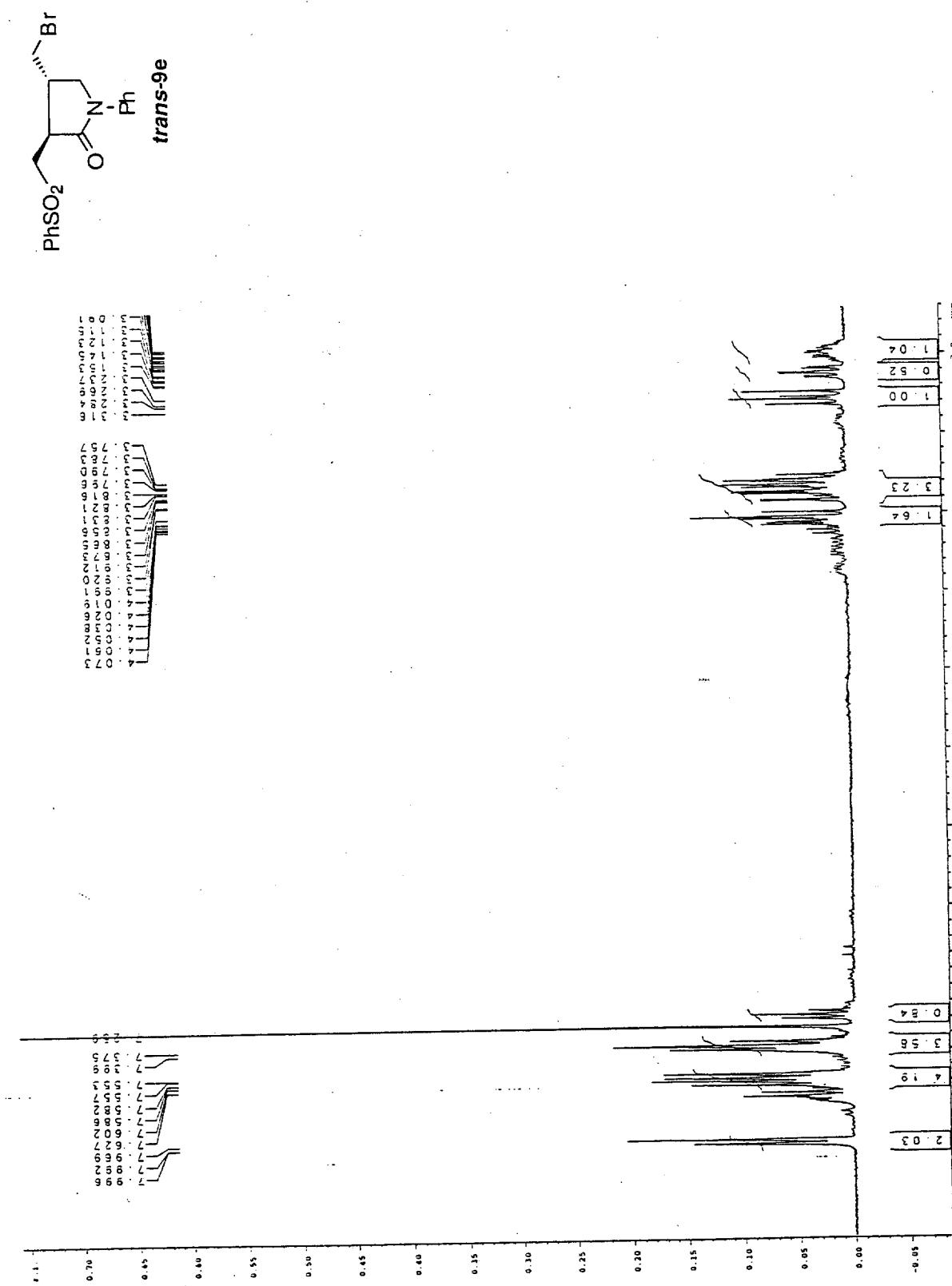


Figure 25. ^{13}C NMR spectrum of *cis*-9d in CDCl_3 .



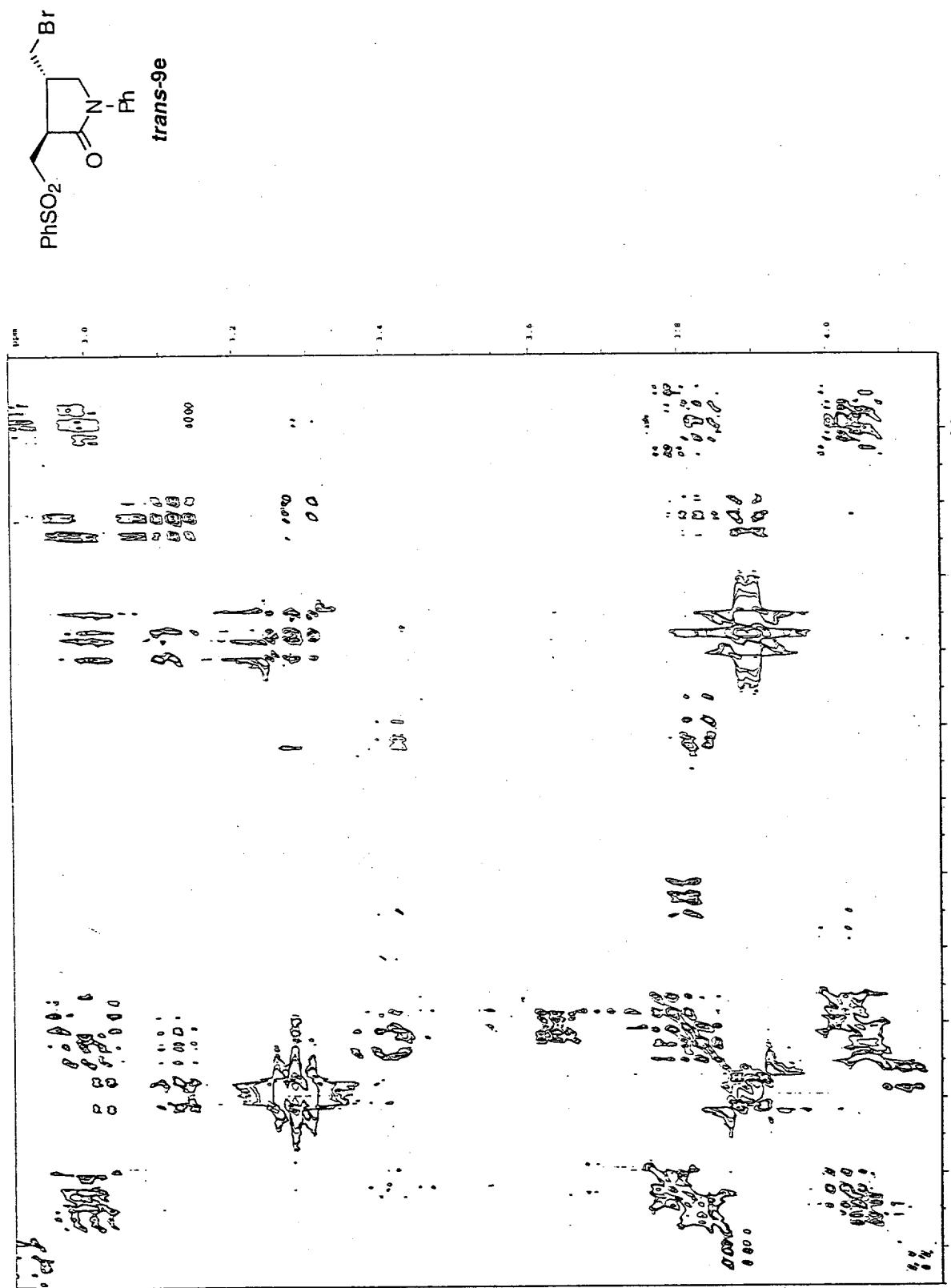


Figure 27. ^1H - ^1H NOESY spectrum of *trans*-9e in CDCl_3 .

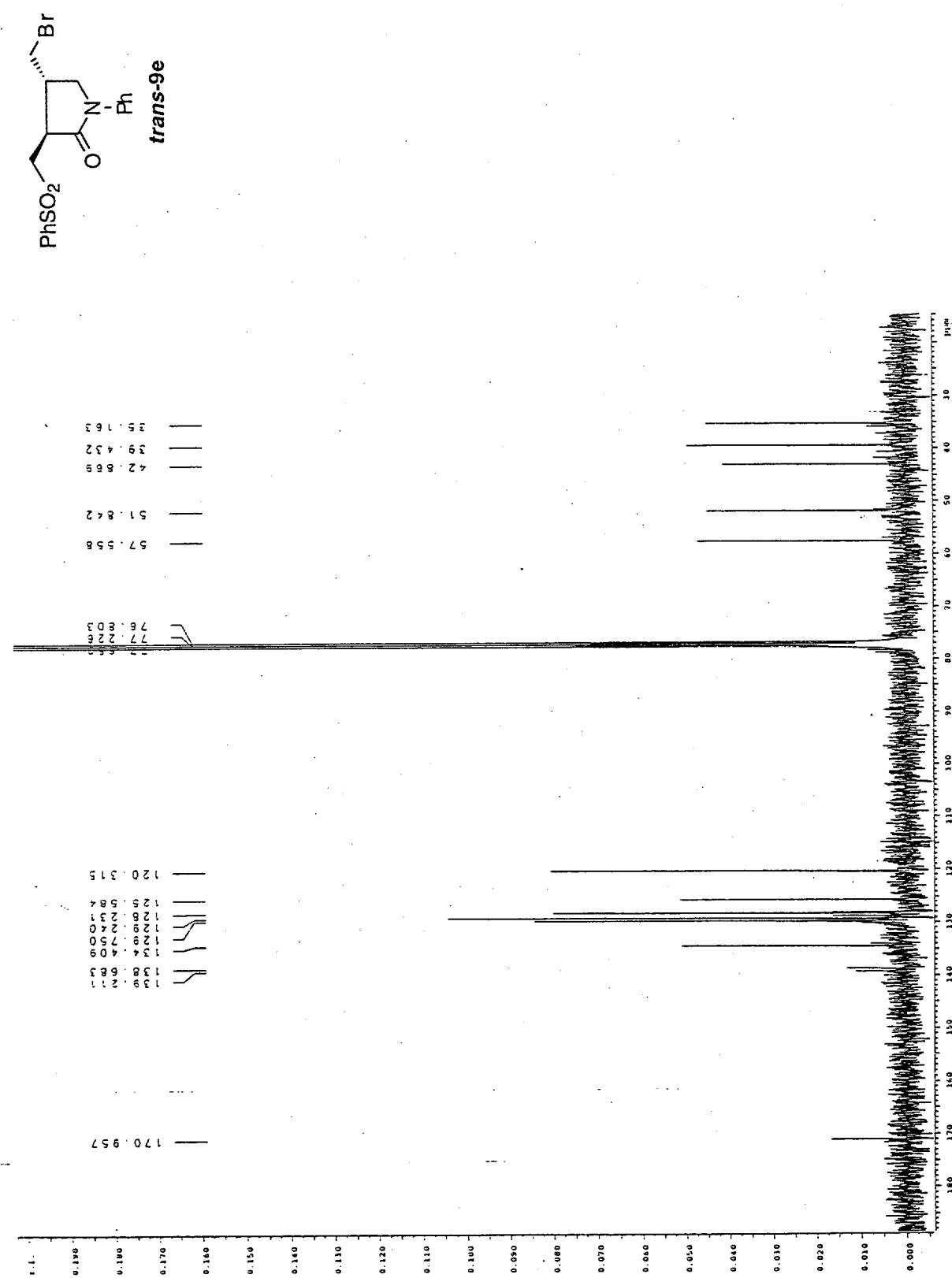


Figure 28. ^{13}C NMR spectrum of *trans*-9e in CDCl_3 .

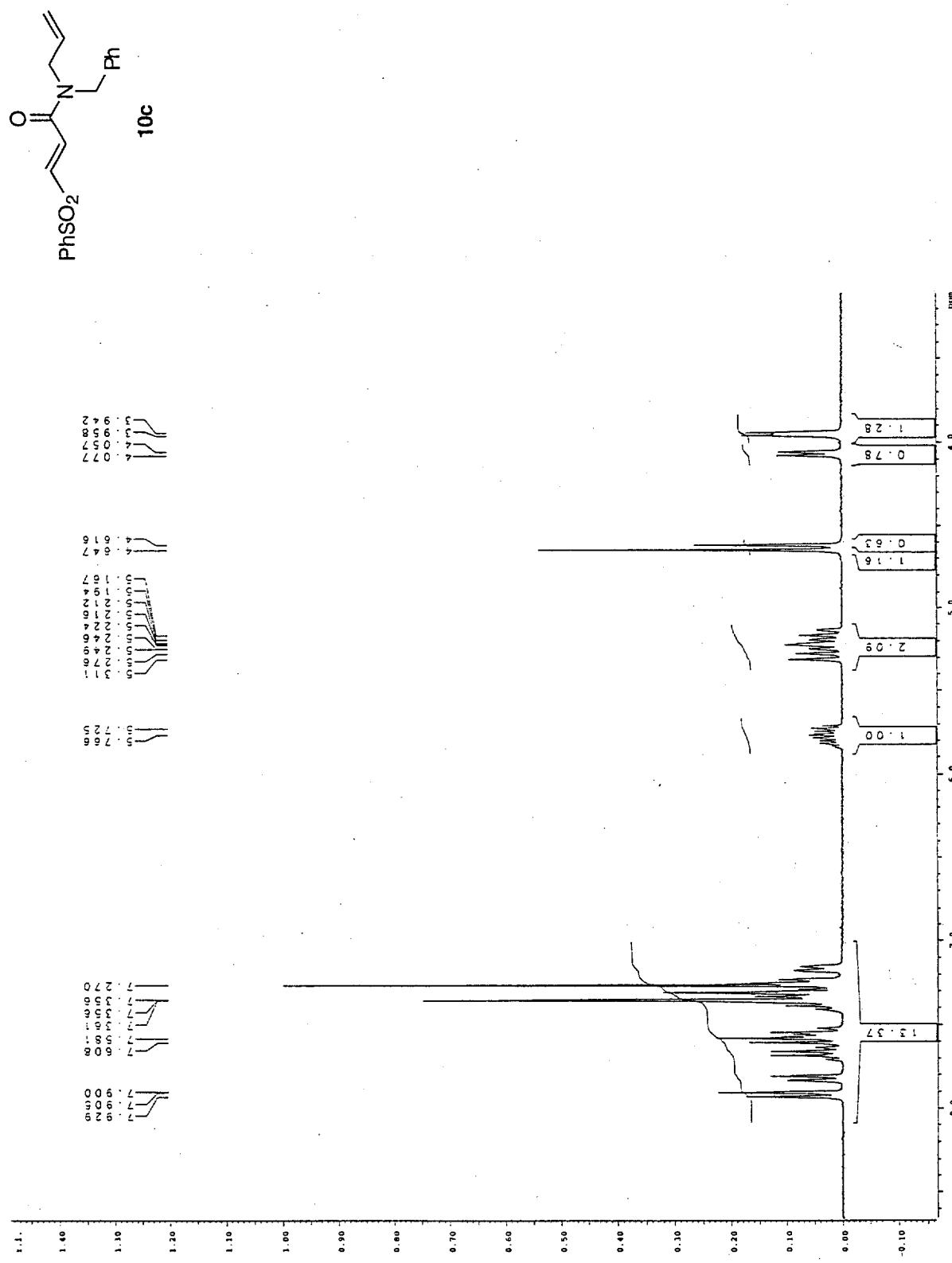


Figure 29. ^1H NMR spectrum of **10c** (2 rotamers) in CDCl_3 .

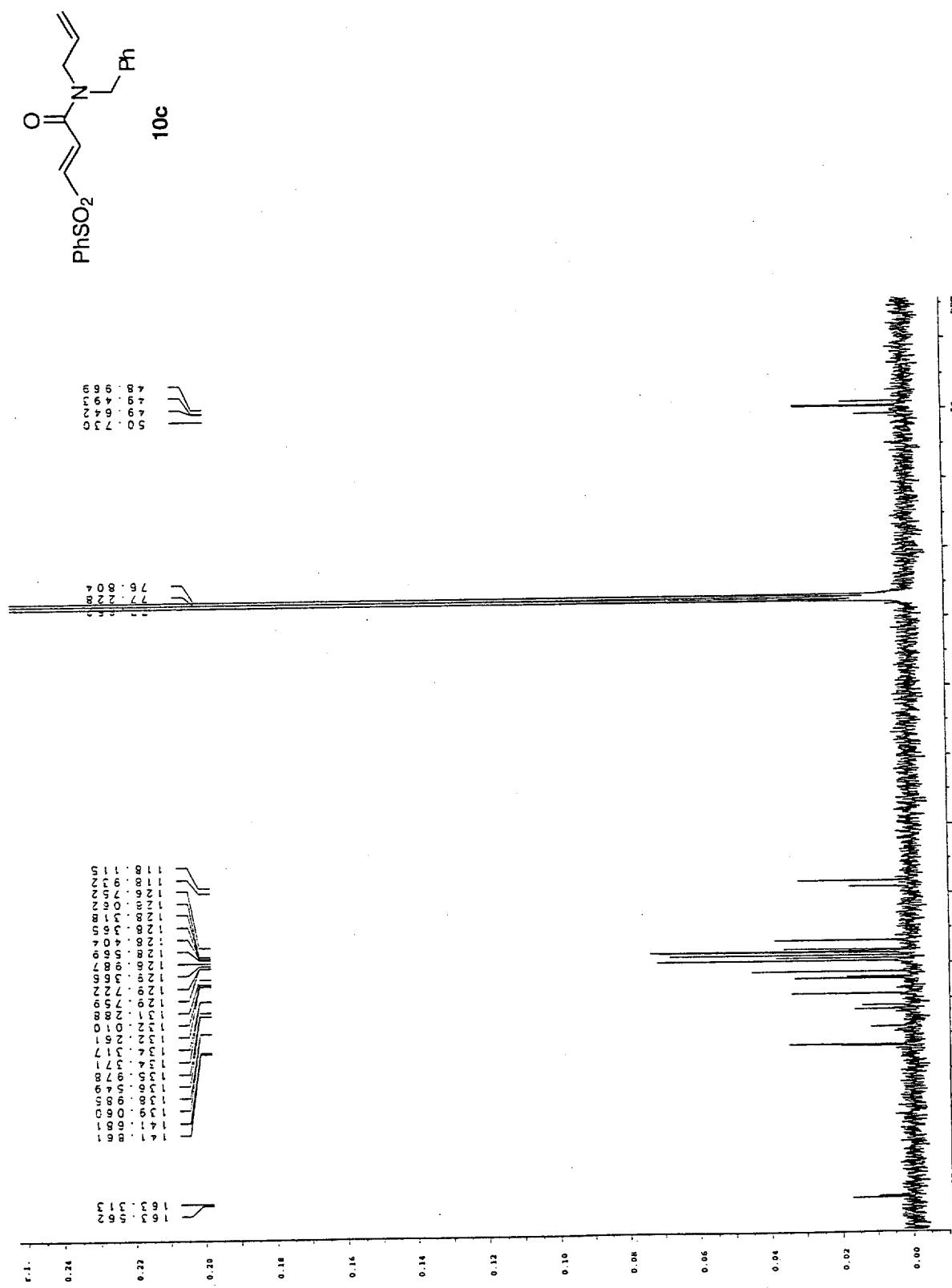


Figure 30. ^{13}C NMR spectrum of **10c** (2 rotamers) in CDCl_3 .

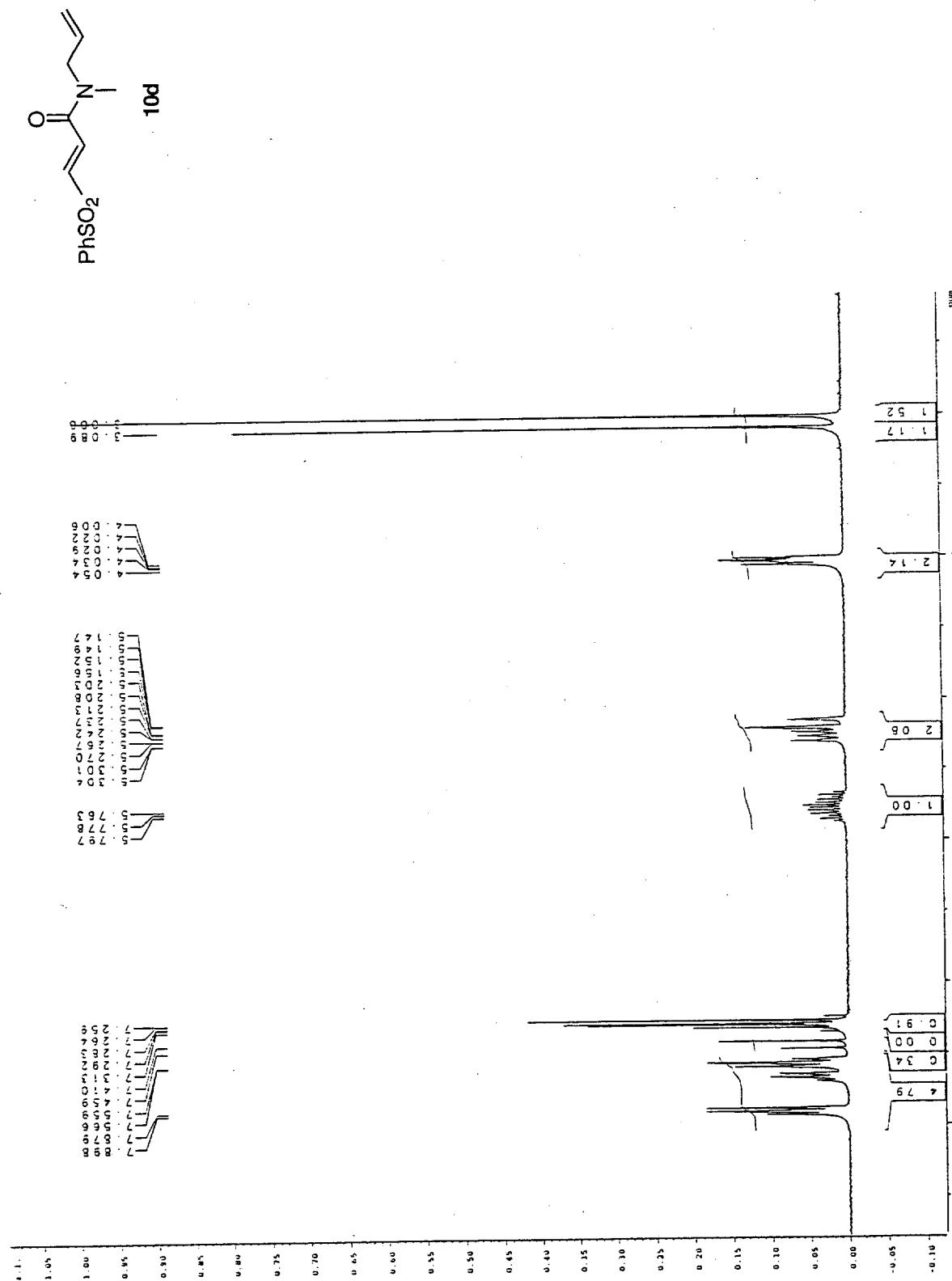


Figure 31. ^1H NMR spectrum of **10d** (2 rotamers) in CDCl_3 .

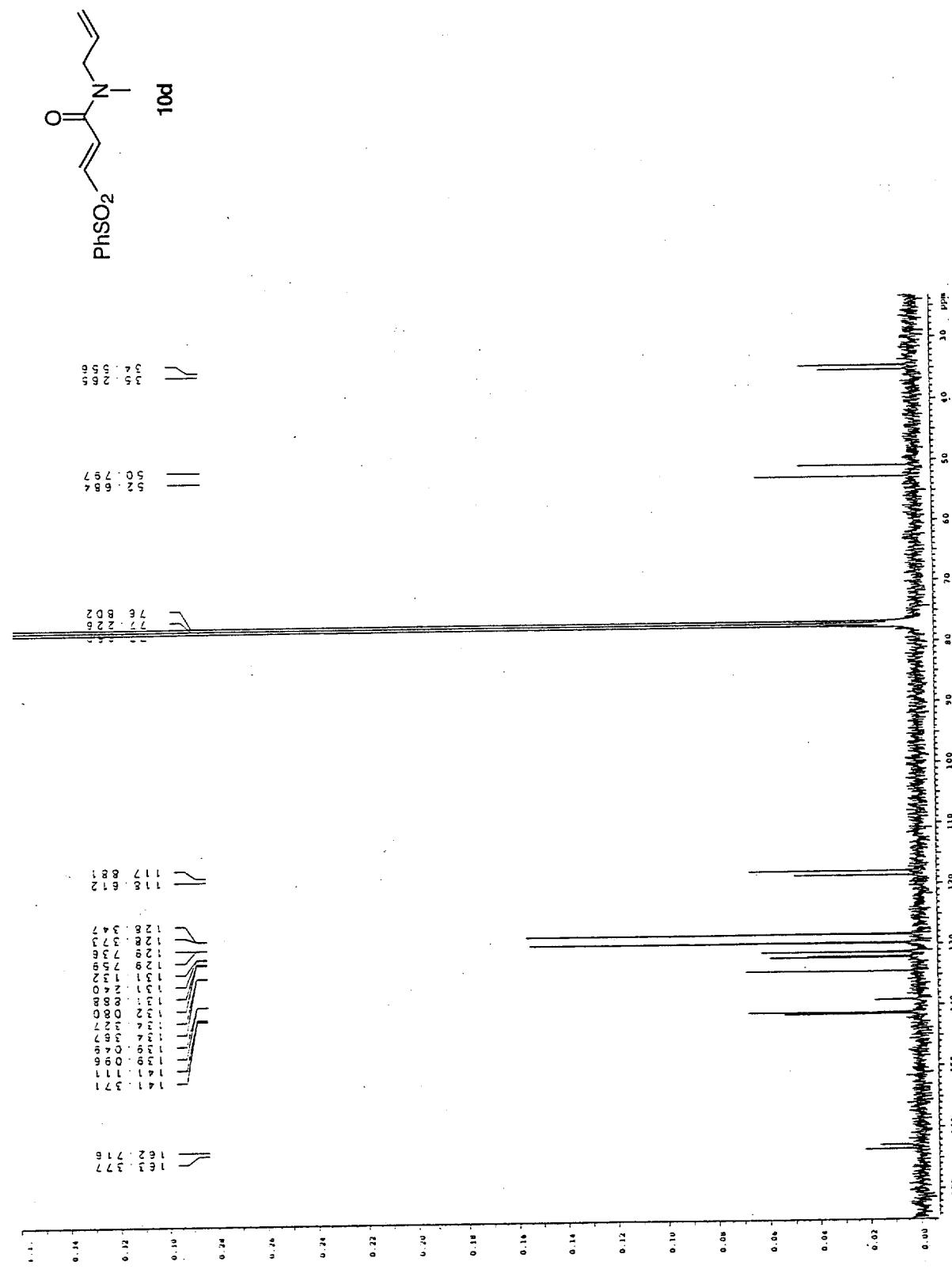


Figure 32. ^{13}C NMR spectrum of 10d (2 rotamers) in CDCl_3 .

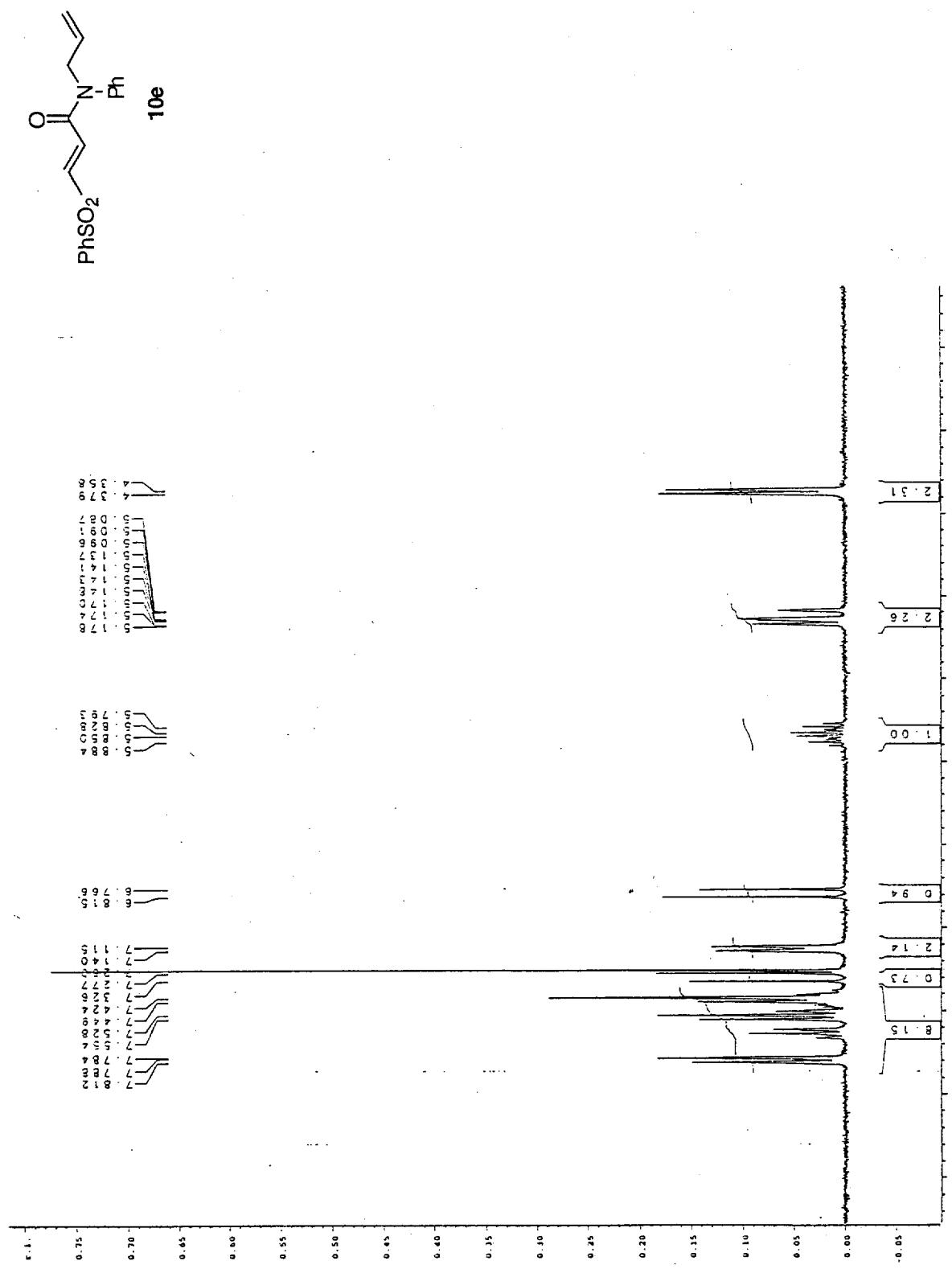


Figure 33. ¹H NMR spectrum of **10e** in CDCl_3 .

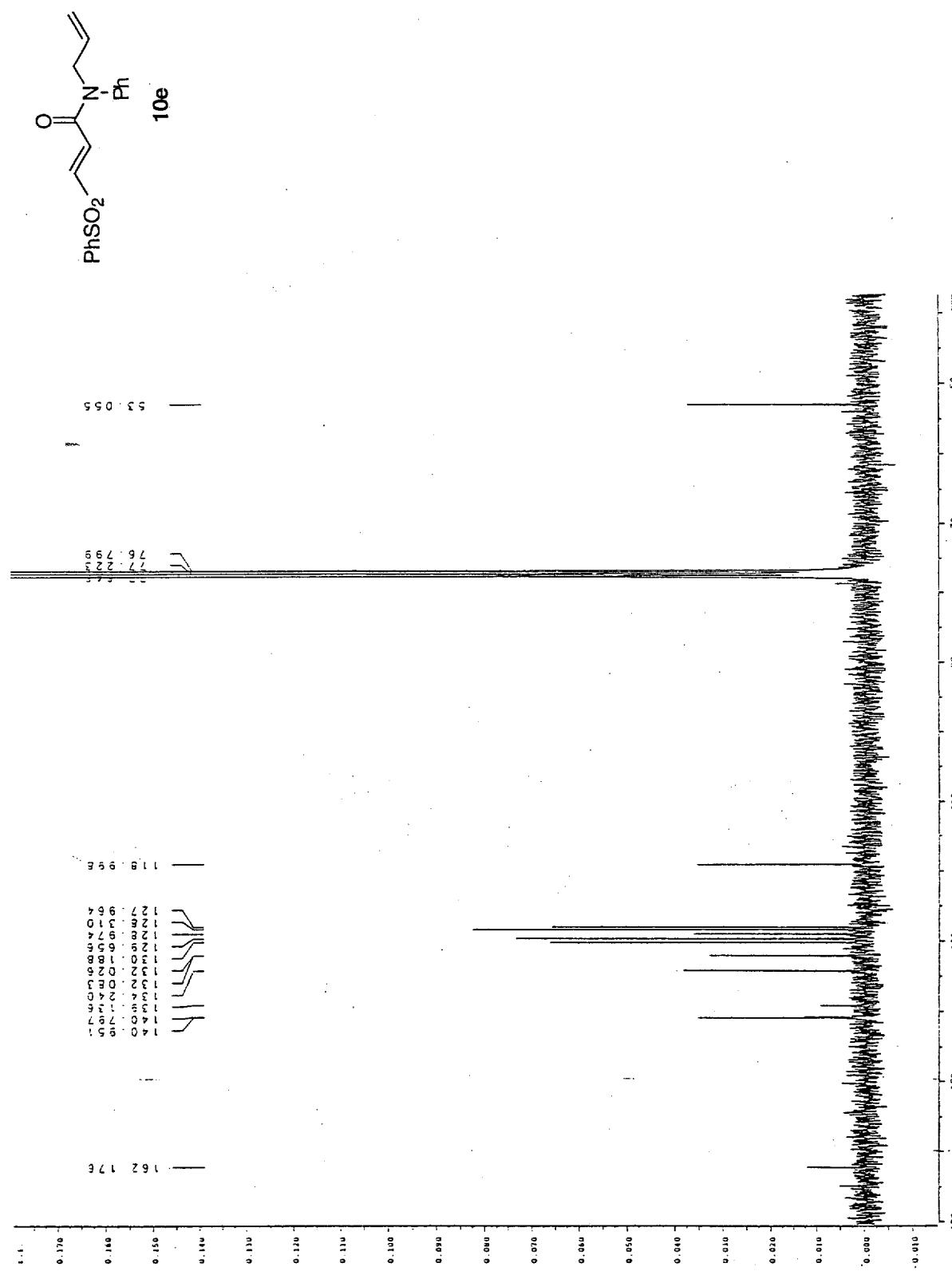


Figure 34. ^{13}C NMR spectrum of 10e in CDCl_3 .

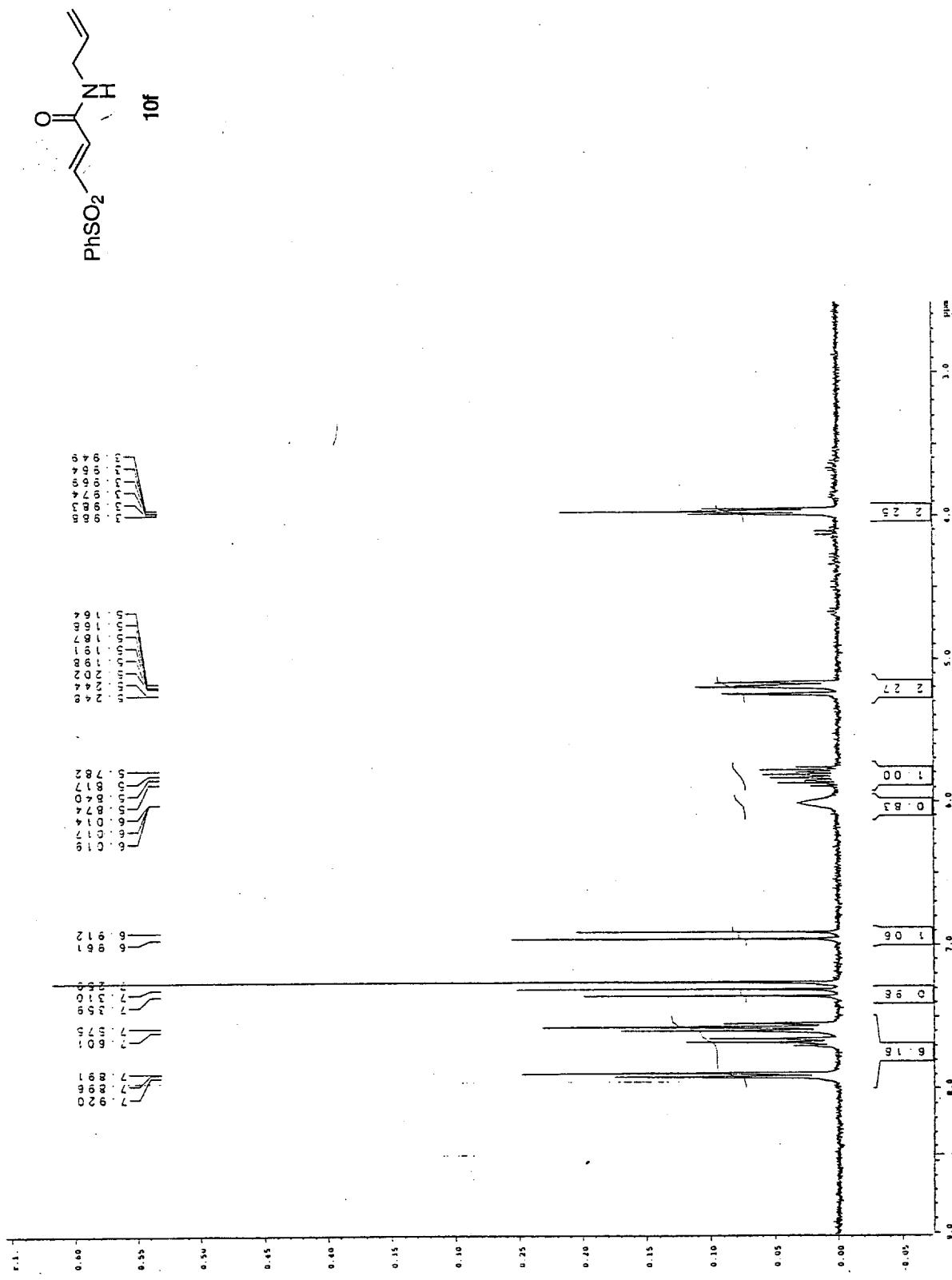


Figure 35. ^1H NMR spectrum of 10f in CDCl_3 .

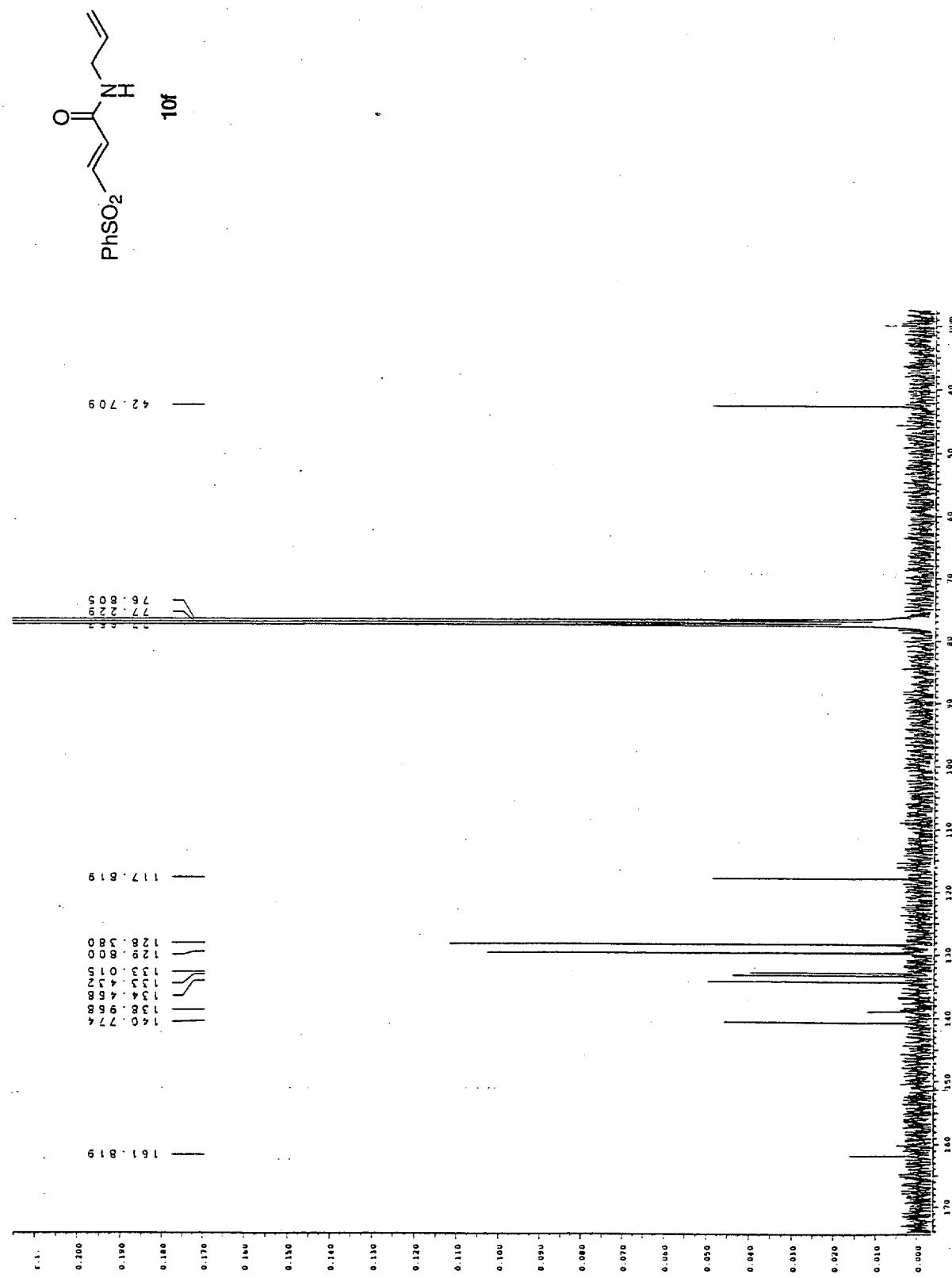


Figure 36. ^{13}C NMR spectrum of **10f** in CDCl_3 .

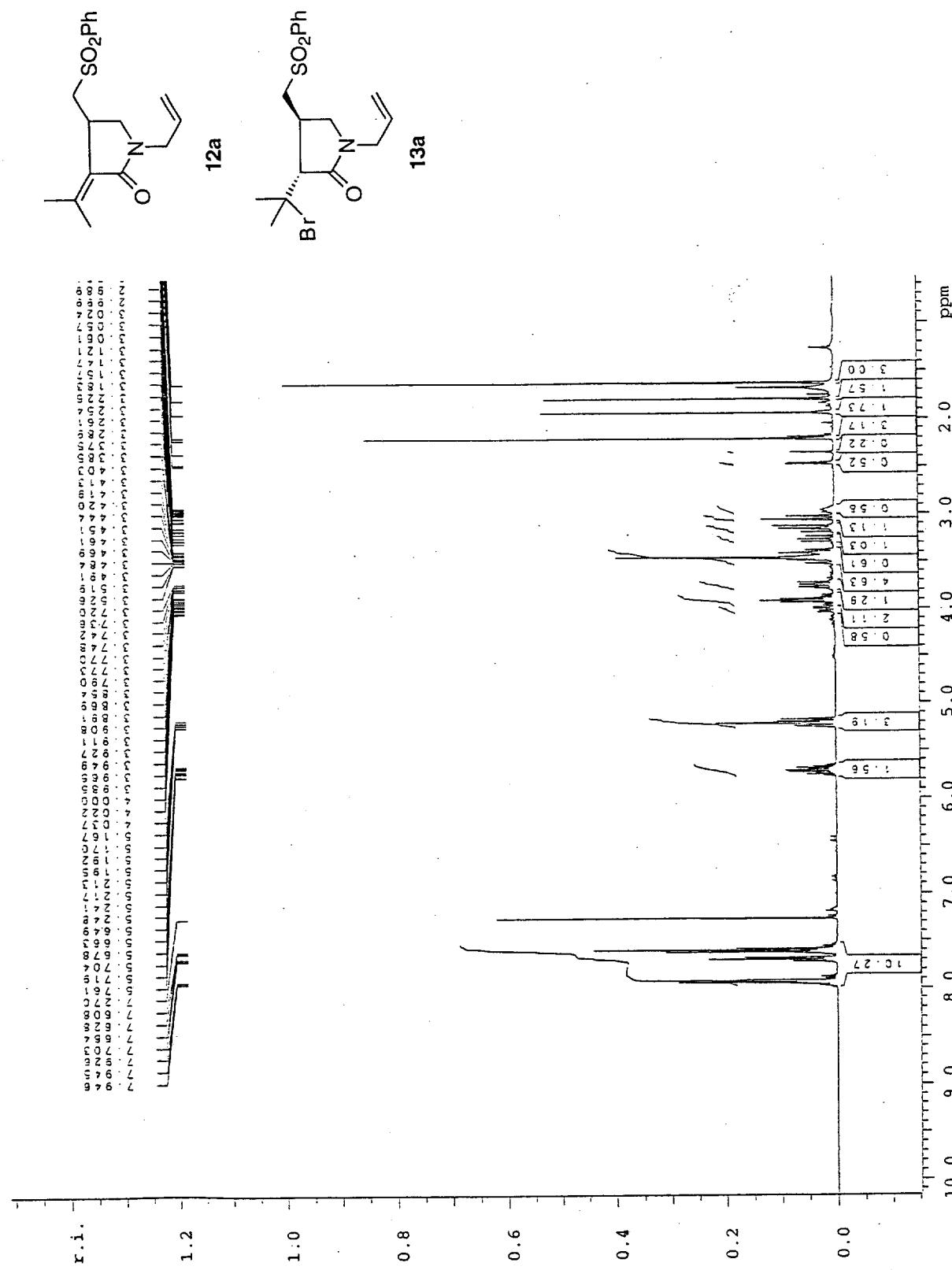


Figure 37. ^1H NMR spectrum of **12a** and **13a** (2 : 1) in CDCl₃.