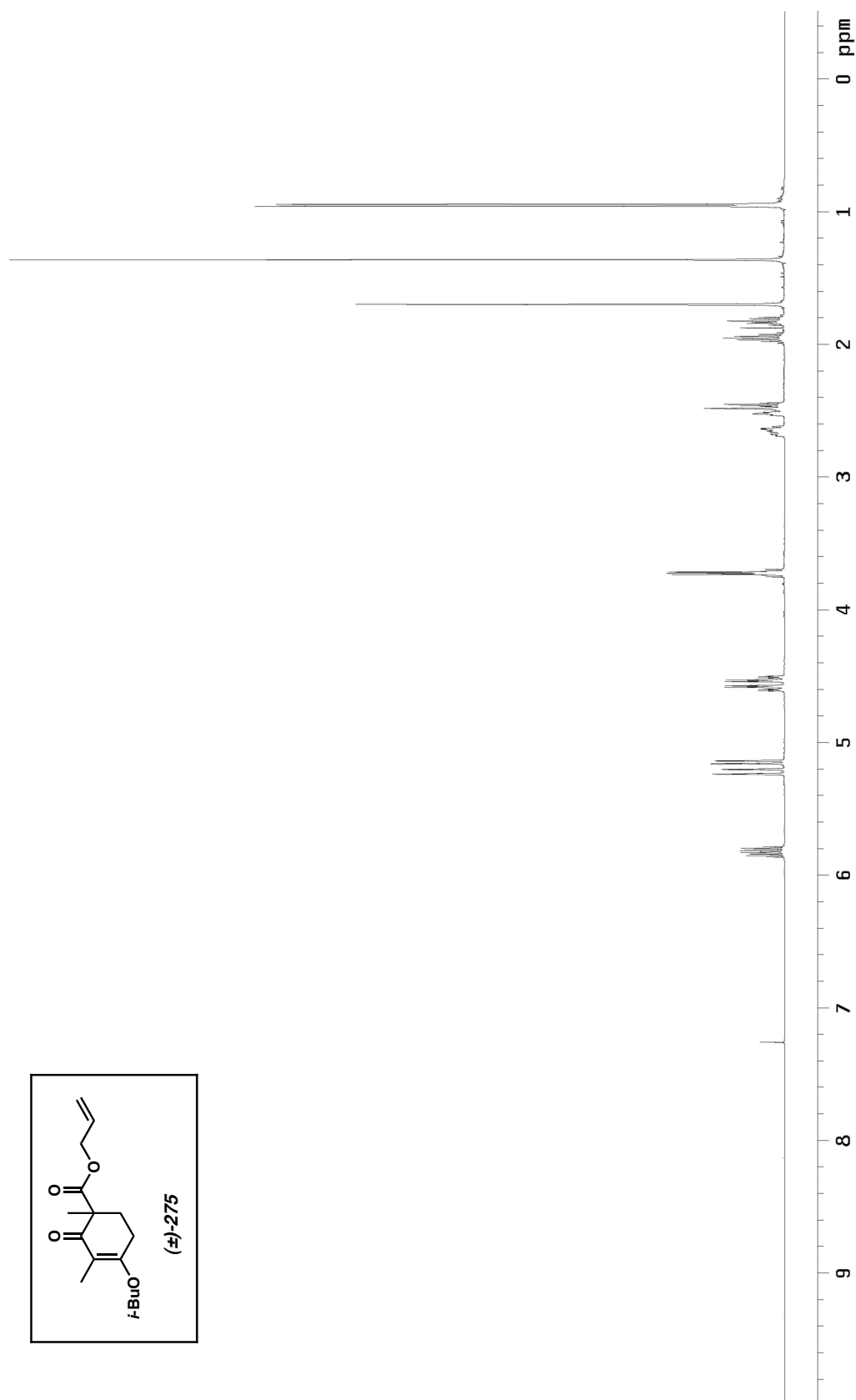


APPENDIX 4

Spectra Relevant to Chapter 4:

*Enantioselective Allylic Alkylations of Vinylogous
 β -Ketoester Derivatives: Total Synthesis of (+)-Carissone*

Figure A4.1. ¹H NMR spectrum (500 MHz, CDCl₃) of **275**.

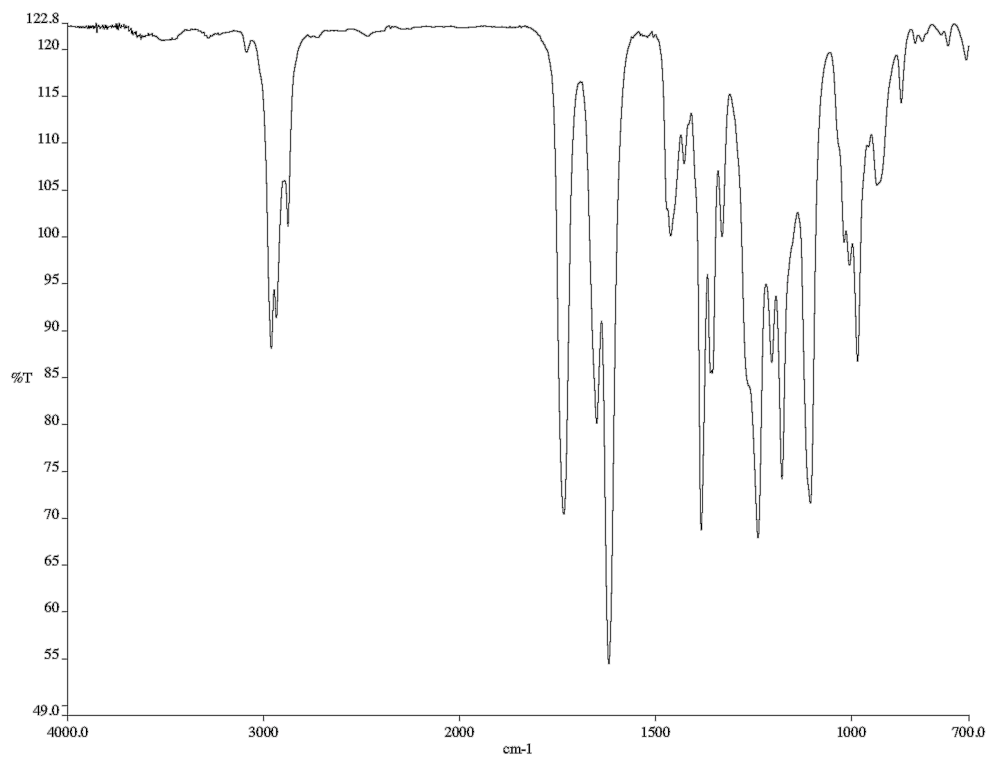


Figure A4.2. Infrared spectrum (neat film/NaCl) of **275**.

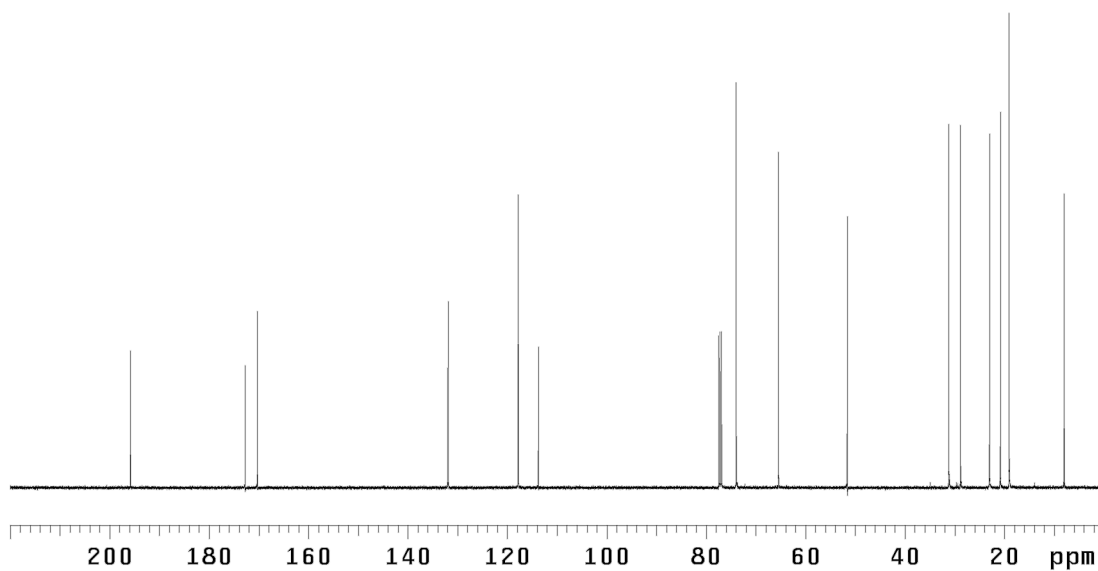
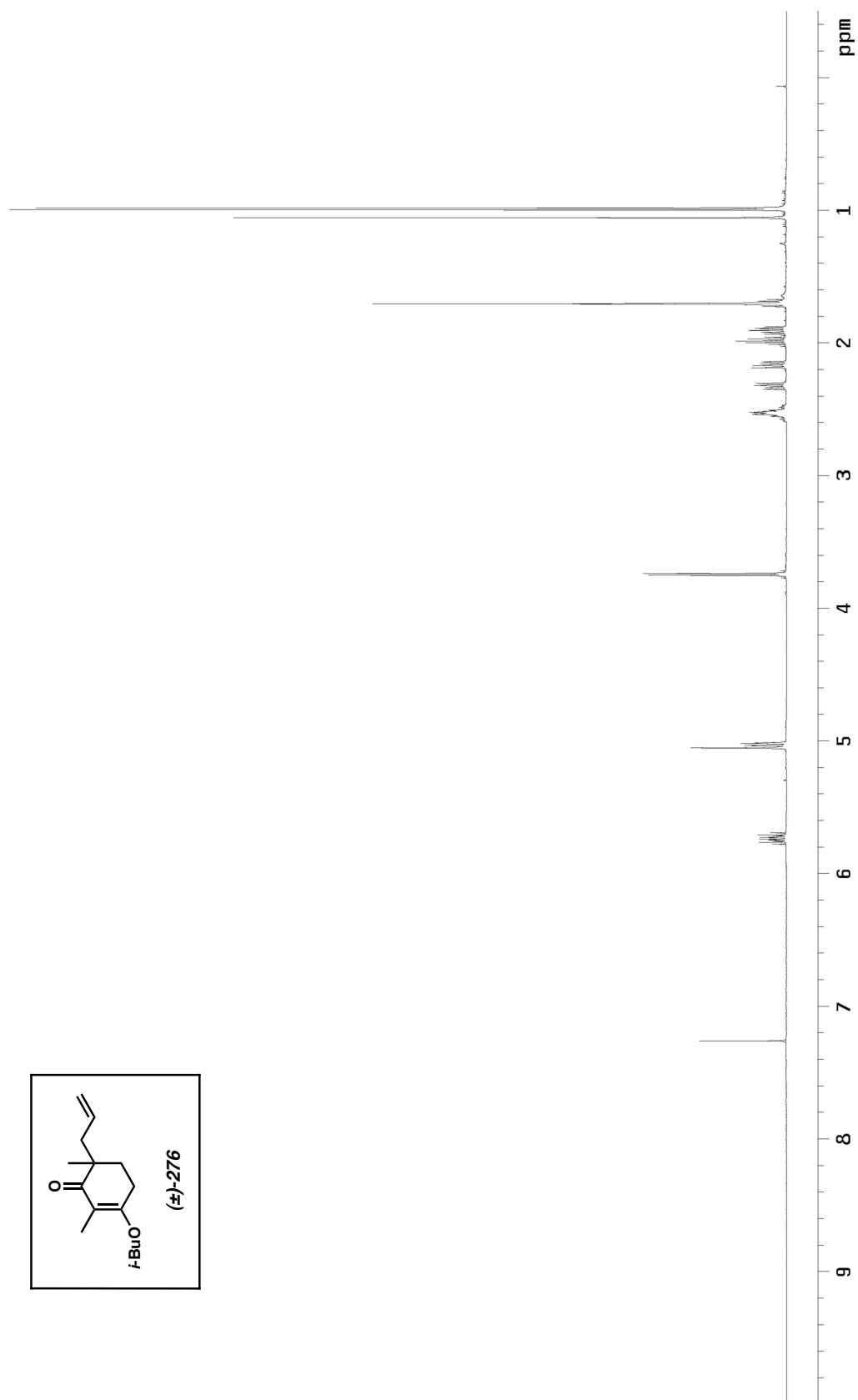


Figure A4.3. ¹³C NMR spectrum (126 MHz, CDCl₃) of **275**.

Figure A4.4. ¹H NMR spectrum (500 MHz, CDCl₃) of **276**.

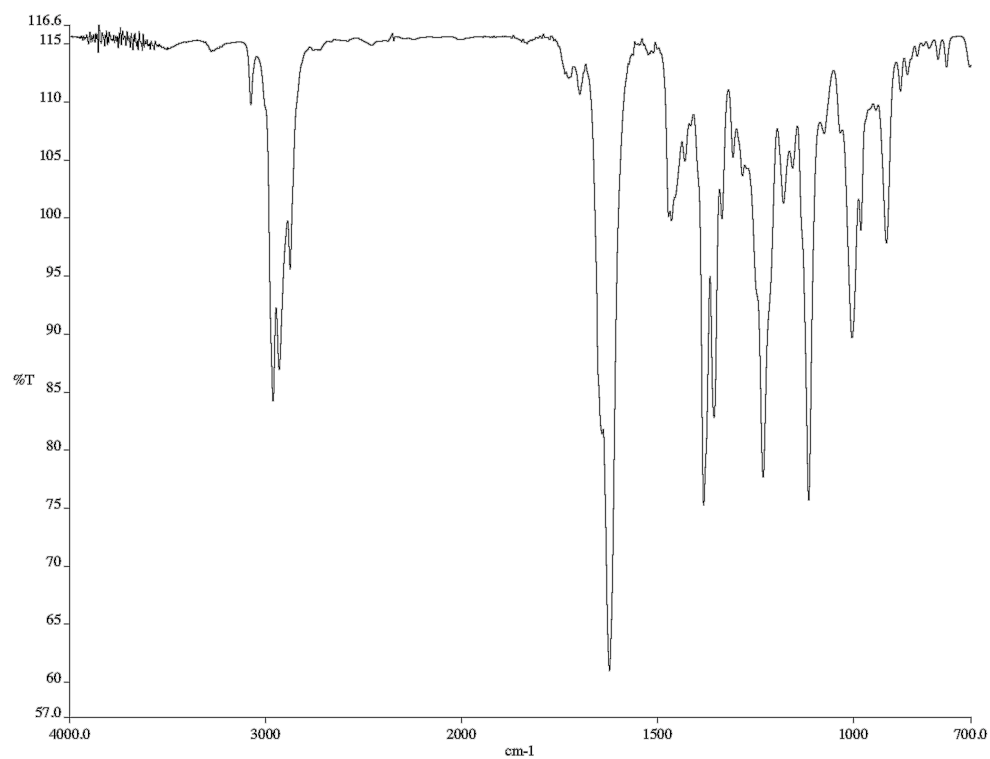


Figure A4.5. Infrared spectrum (neat film/NaCl) of **276**.

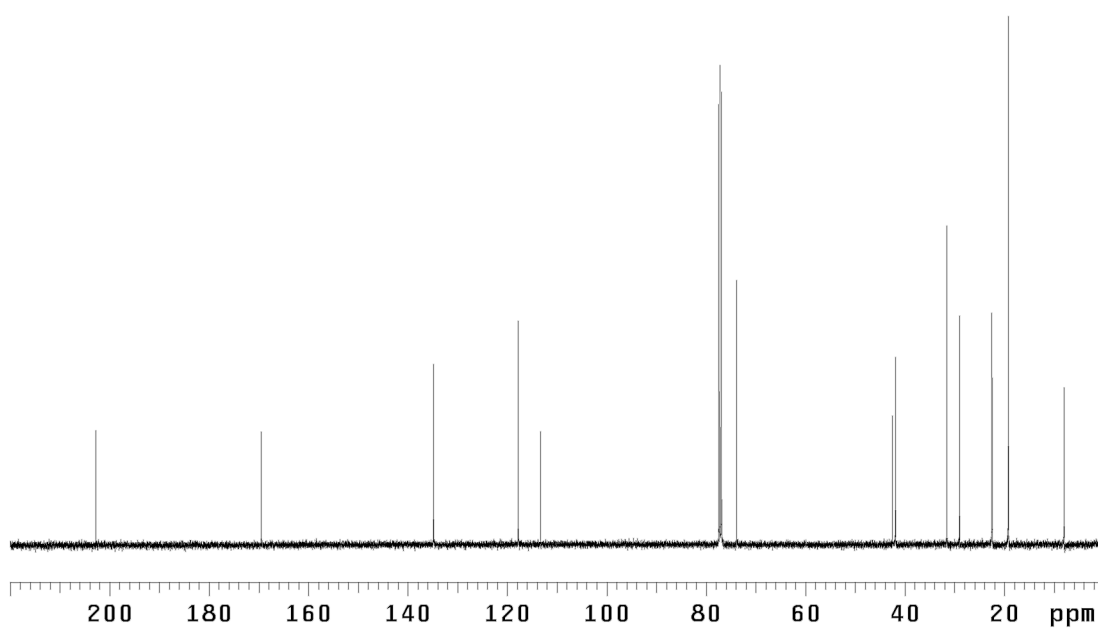
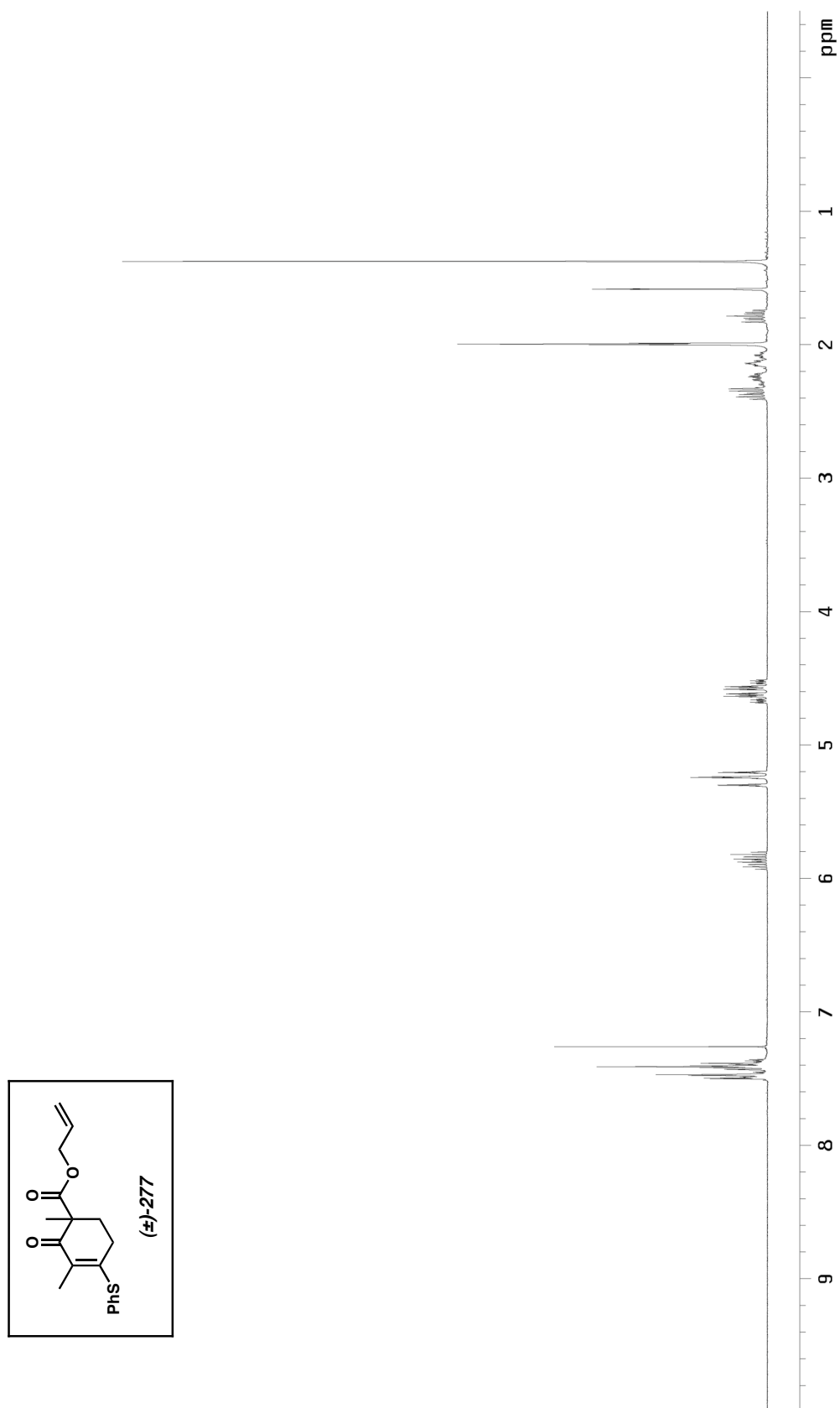


Figure A4.6. ¹³C NMR spectrum (126 MHz, CDCl₃) of **276**.

Figure A4.7. ¹H NMR spectrum (300 MHz, CDCl₃) of **277**.

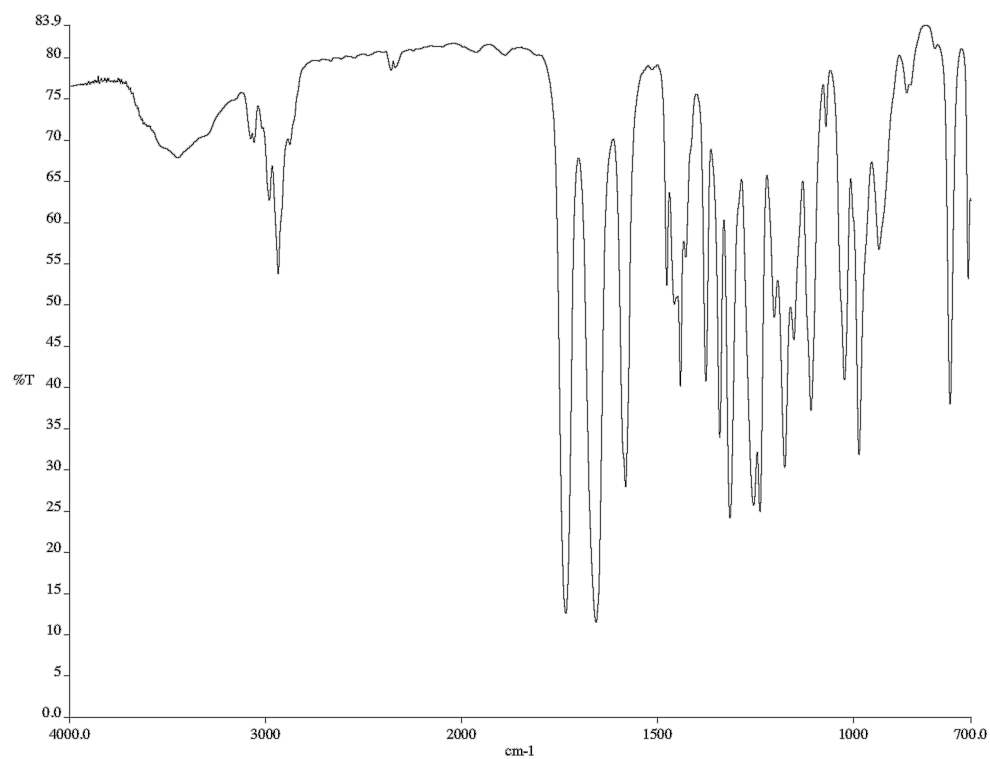


Figure A4.8. Infrared spectrum (neat film/NaCl) of **277**.

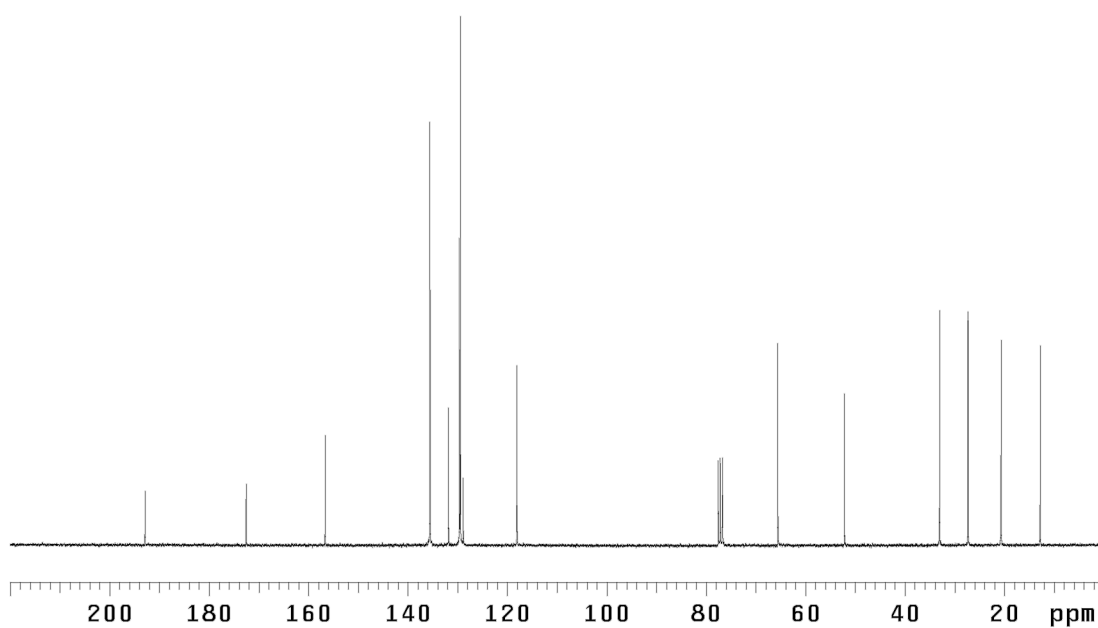
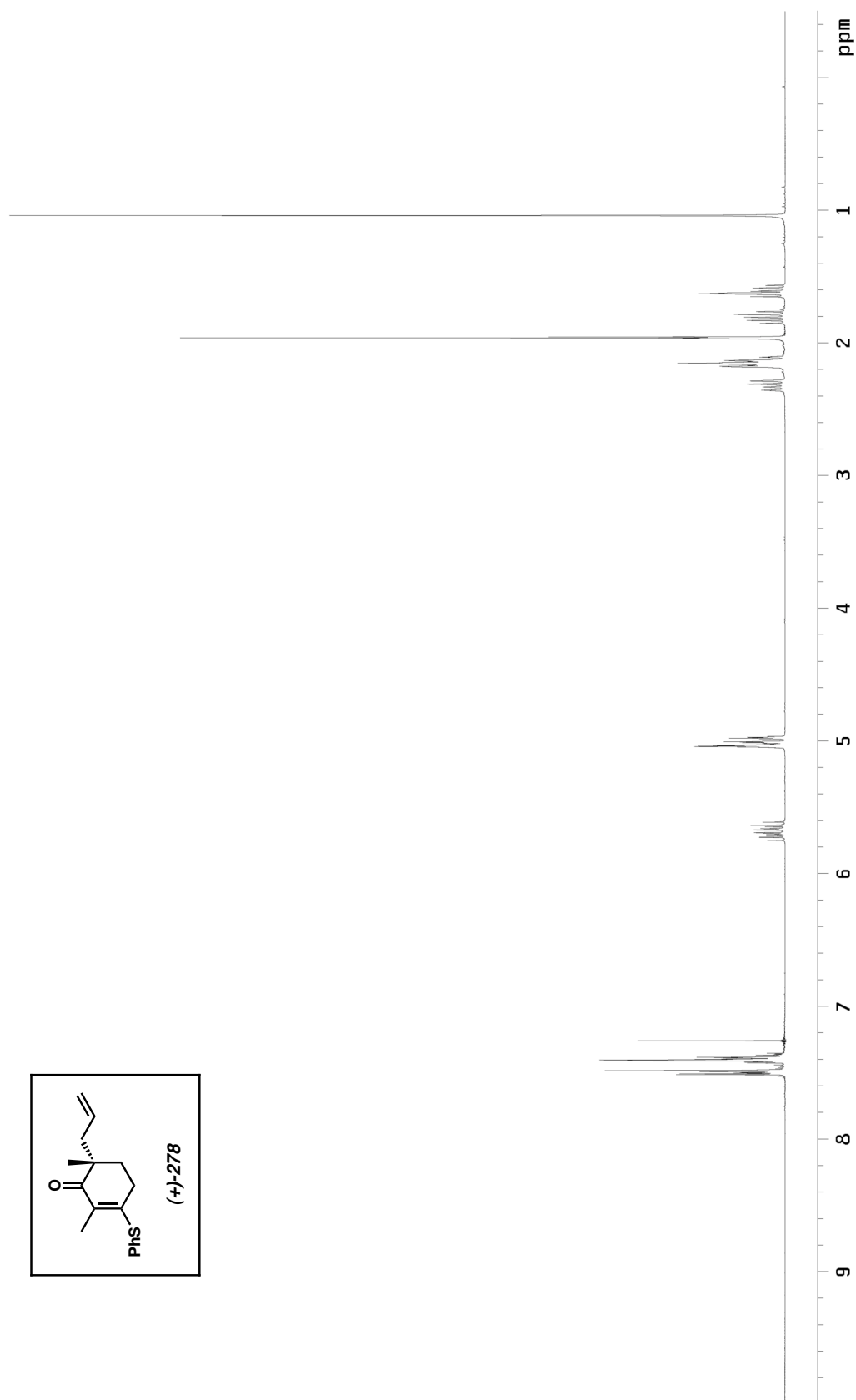


Figure A4.9. ¹³C NMR spectrum (75 MHz, CDCl₃) of **277**.

Figure A4.10. ^1H NMR spectrum (300 MHz, CDCl_3) of **278**.

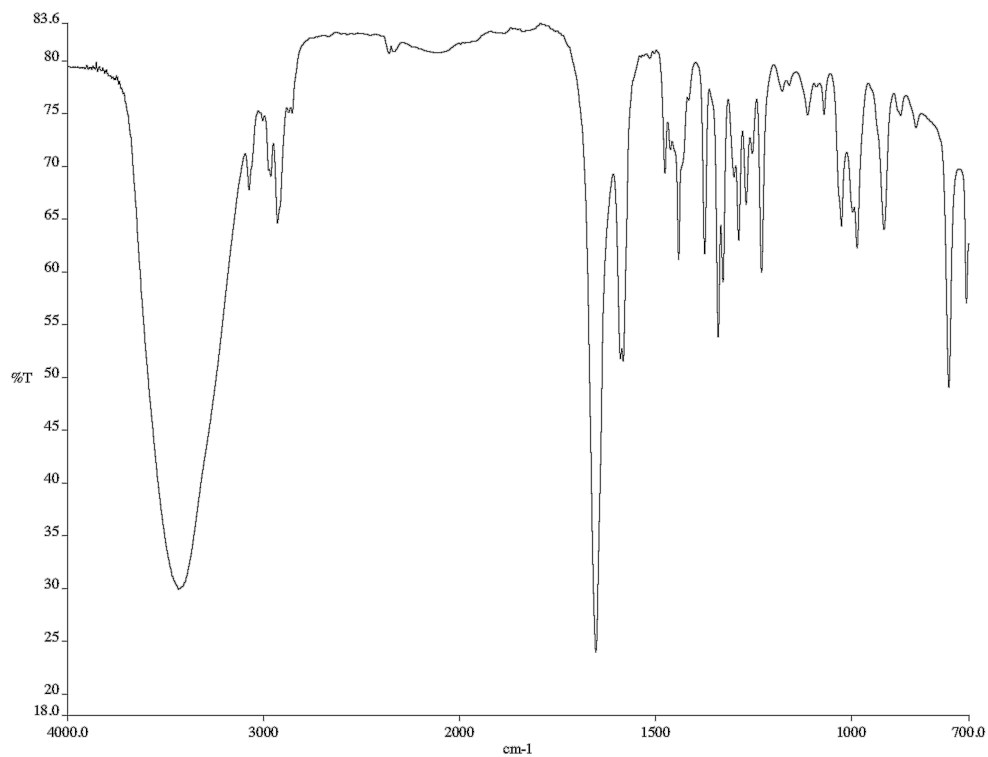


Figure A4.11. Infrared spectrum (neat film/NaCl) of **278**.

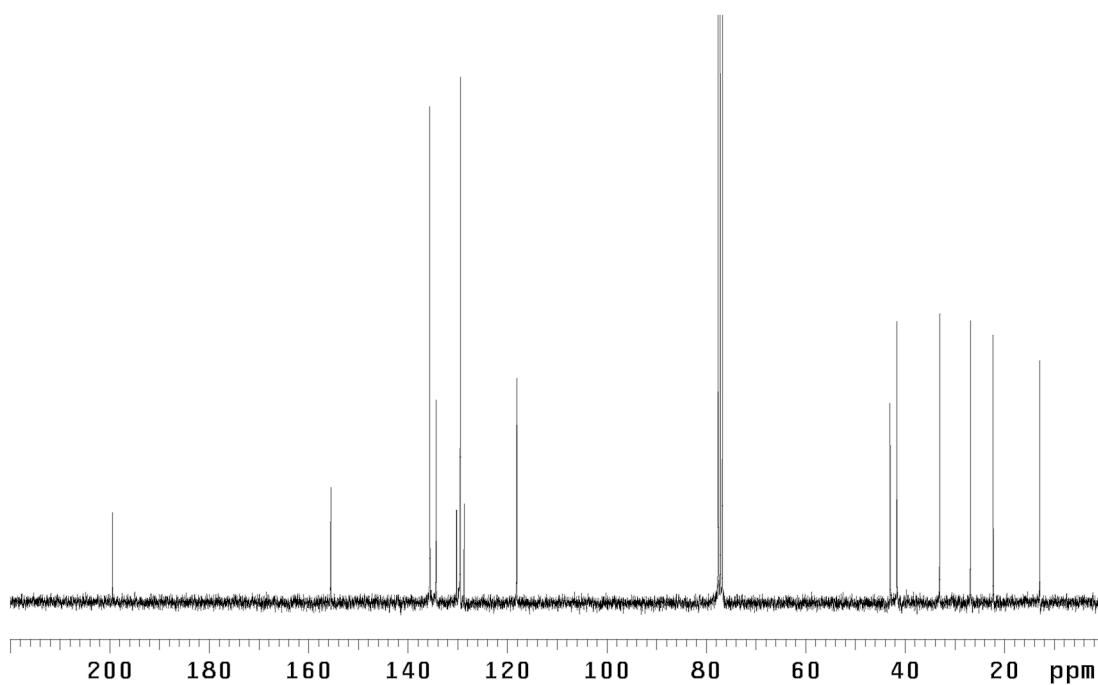
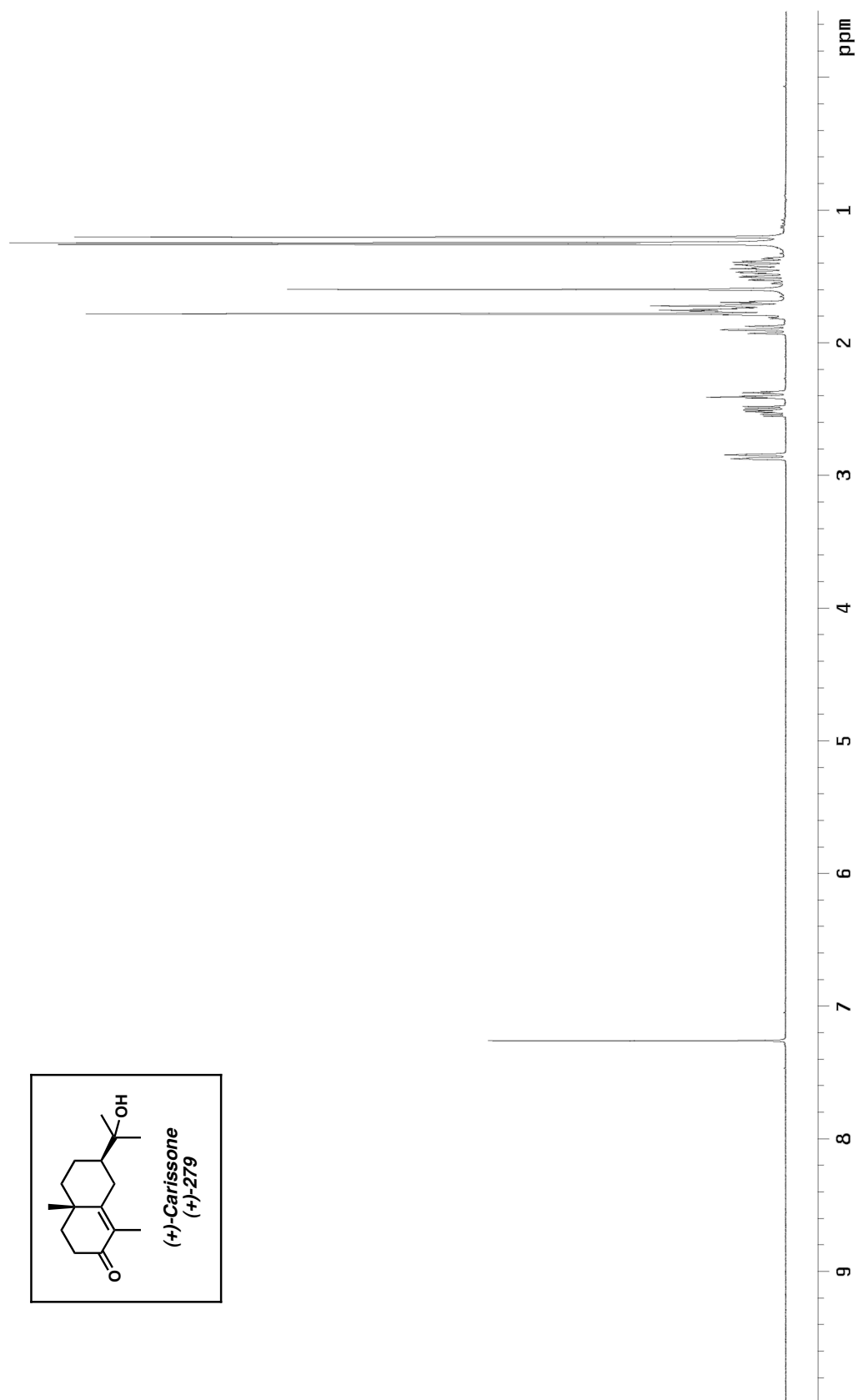


Figure A4.12. ¹³C NMR spectrum (75 MHz, CDCl₃) of **278**.

Figure A4.13. ^1H NMR spectrum (500 MHz, CDCl_3) of (+)-carissone (279).

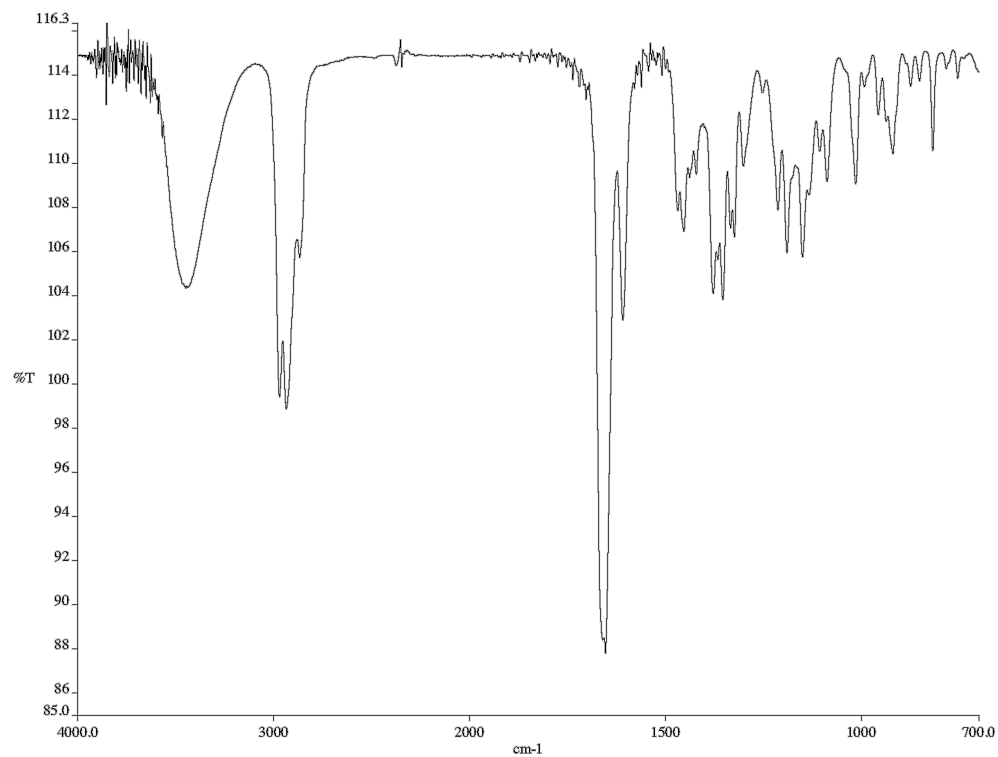


Figure A4.14. Infrared spectrum (neat film/NaCl) of (+)-carissone (**279**).

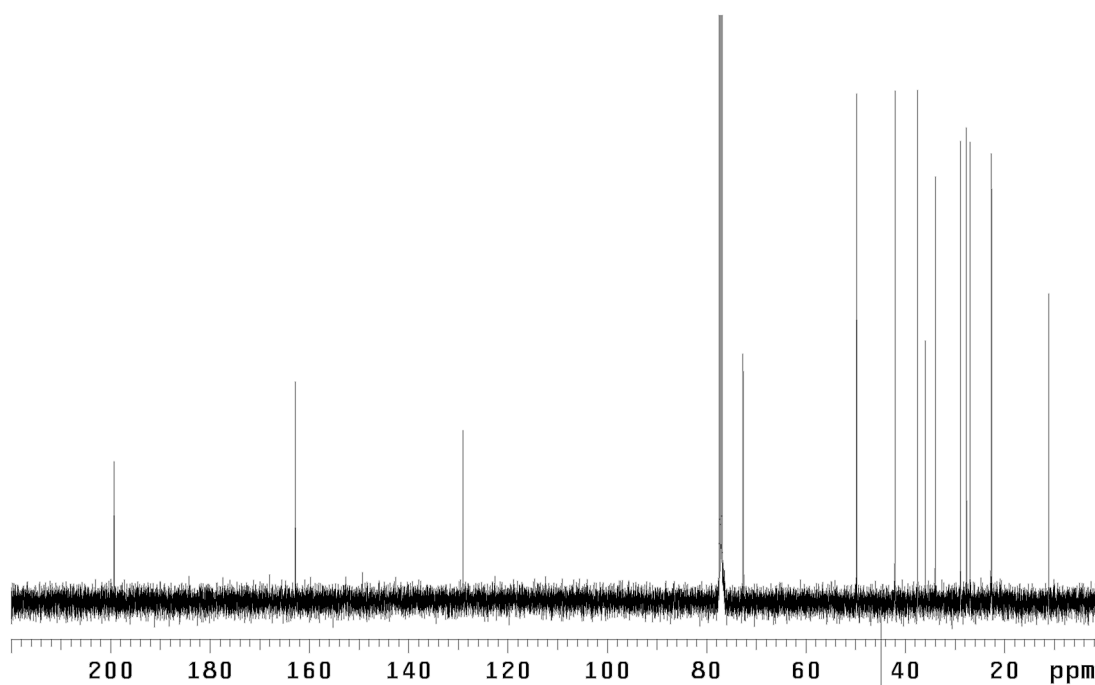
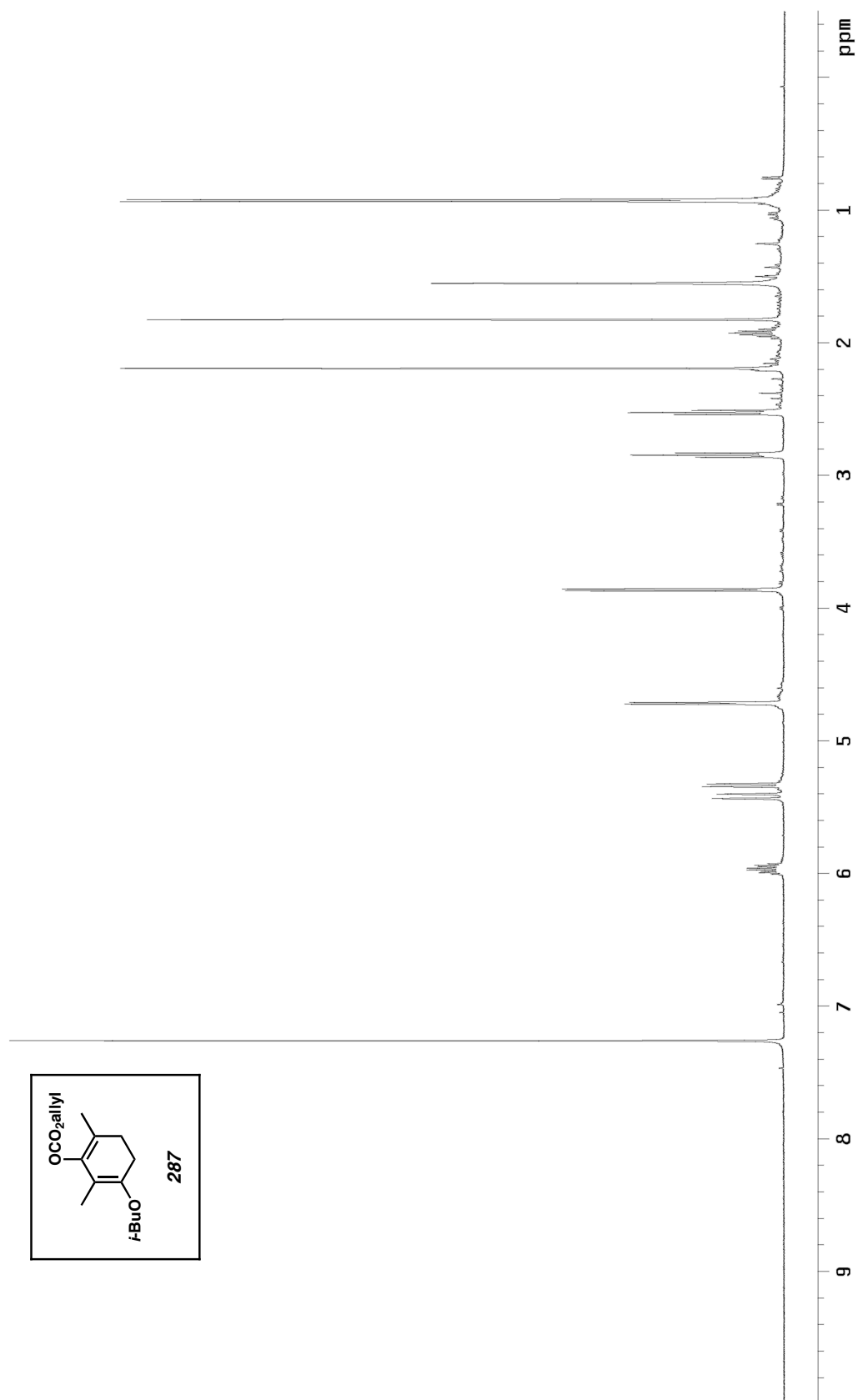
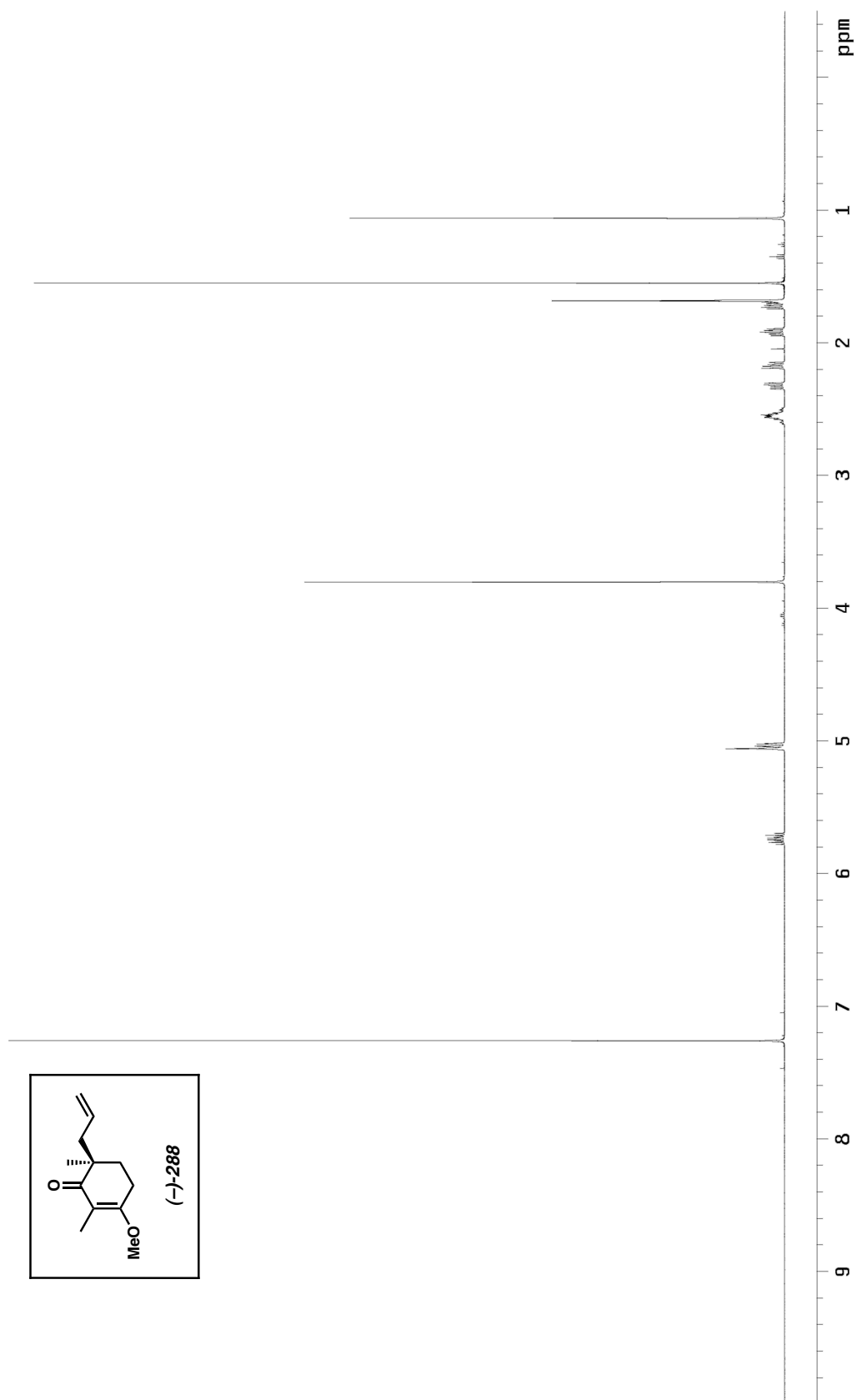


Figure A4.15. ¹³C NMR spectrum (126 MHz, CDCl₃) of (+)-carissone (**279**).

Figure A4.16. ^1H NMR spectrum (500 MHz, CDCl_3) of **287**.

Figure A4.17. ^1H NMR spectrum (500 MHz, CDCl_3) of **288**.

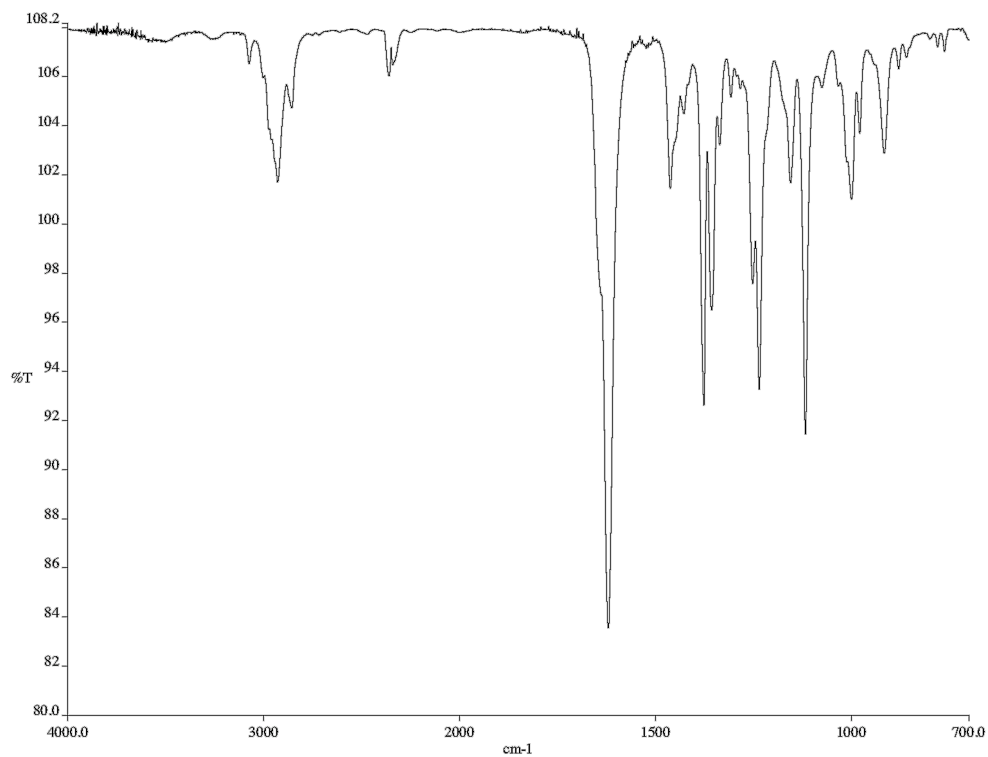


Figure A4.18. Infrared spectrum (neat film/NaCl) of **288**.

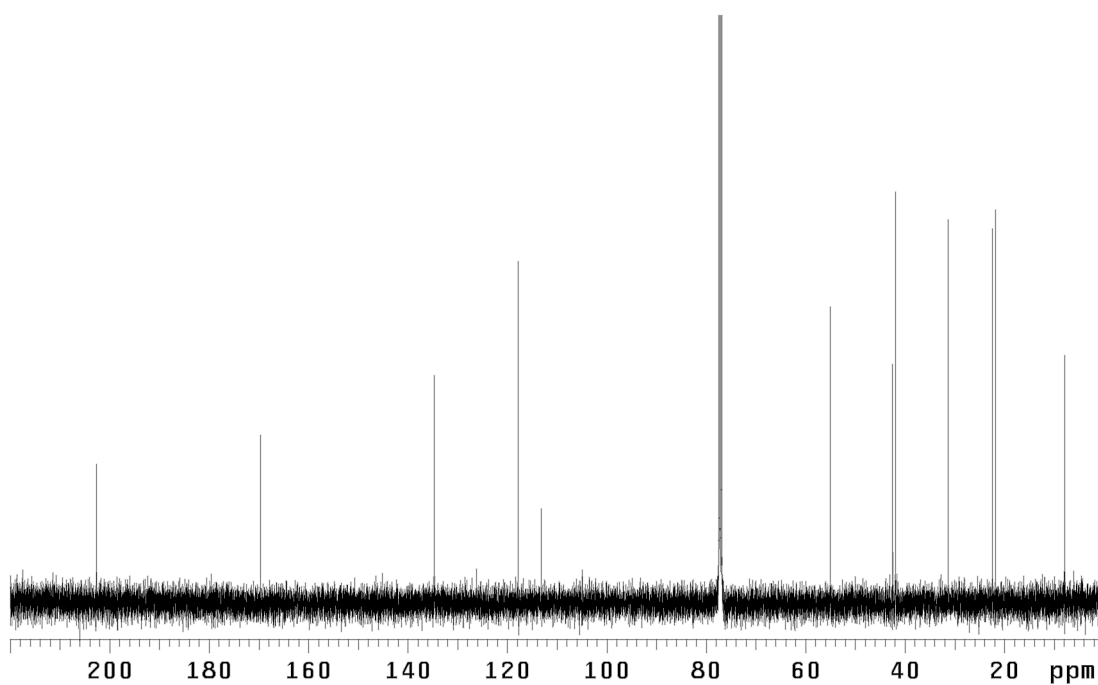
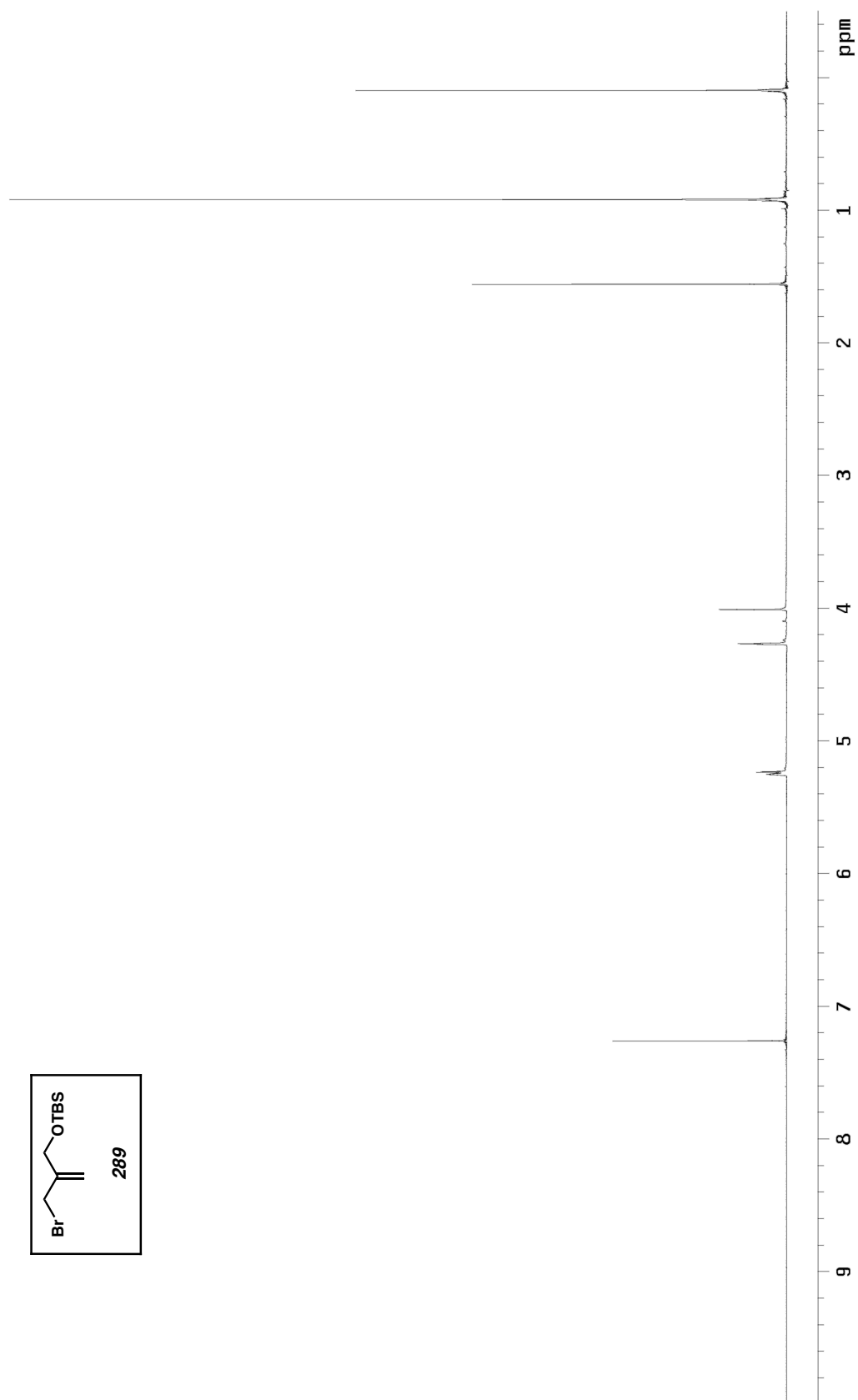
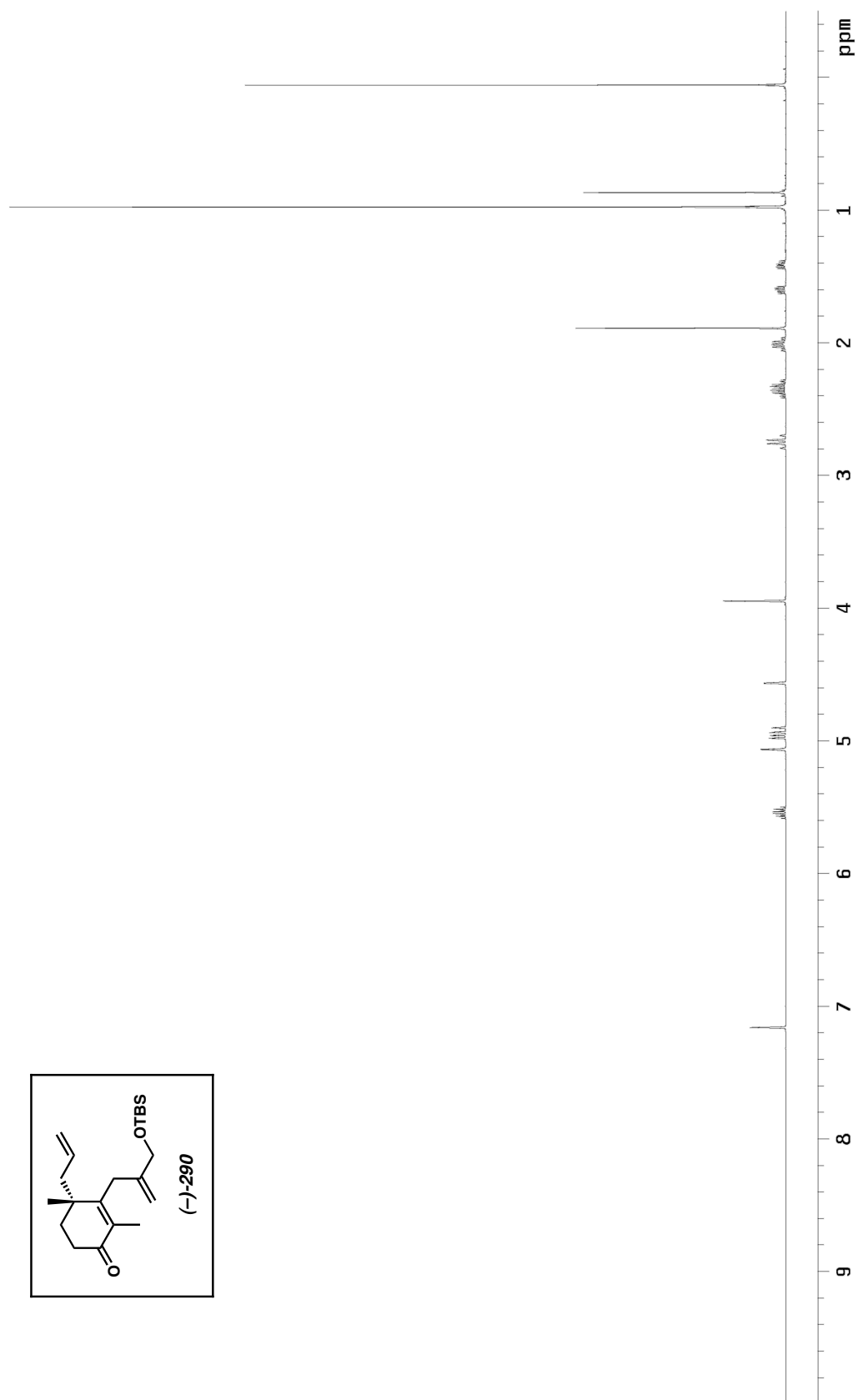


Figure A4.19. ¹³C NMR spectrum (126 MHz, CDCl₃) of **288**.

Figure A4.20. ¹H NMR spectrum (300 MHz, CDCl₃) of **289**.

Figure A4.2.1. ^1H NMR spectrum (500 MHz, C_6D_6) of **290**.

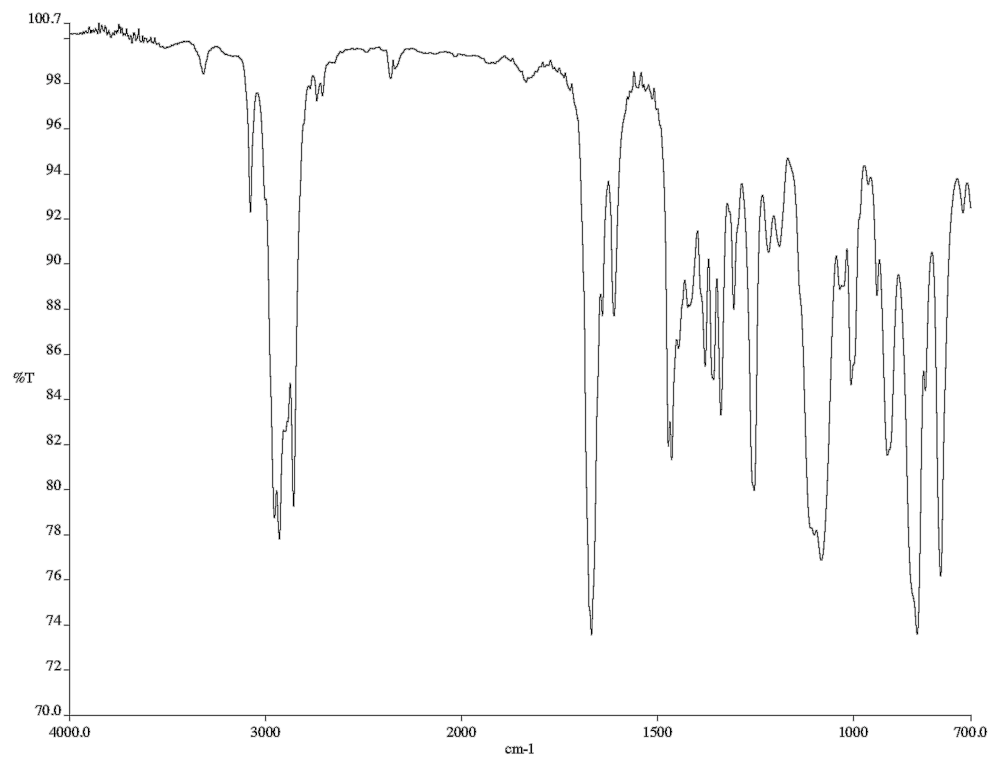


Figure A4.22. Infrared spectrum (neat film/NaCl) of **290**.

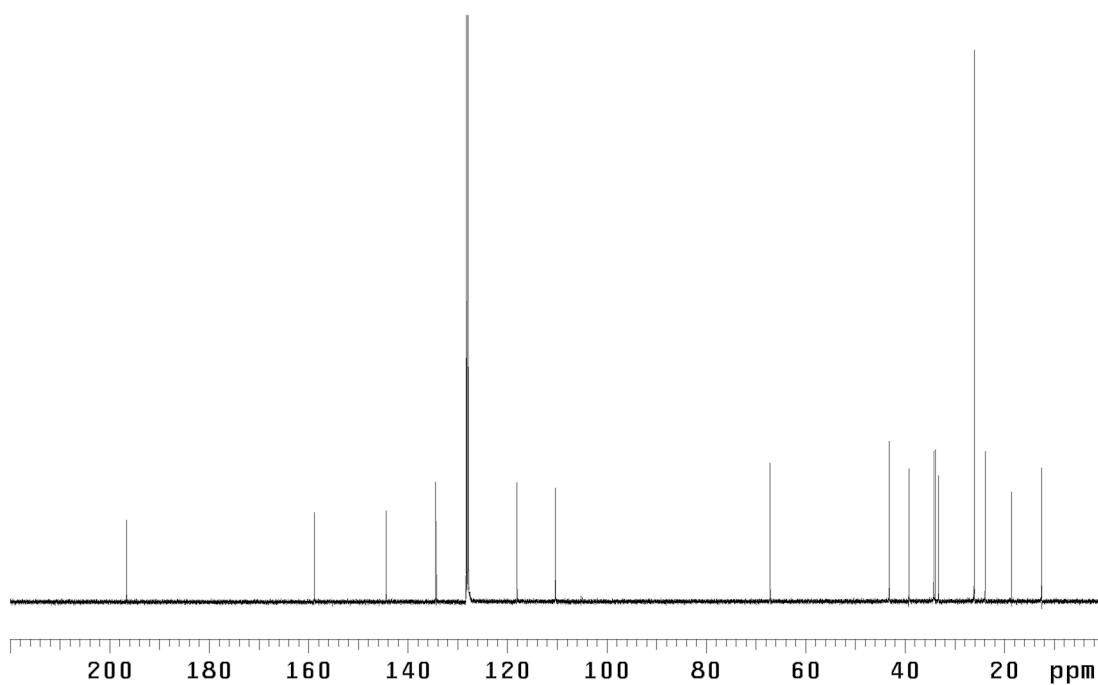
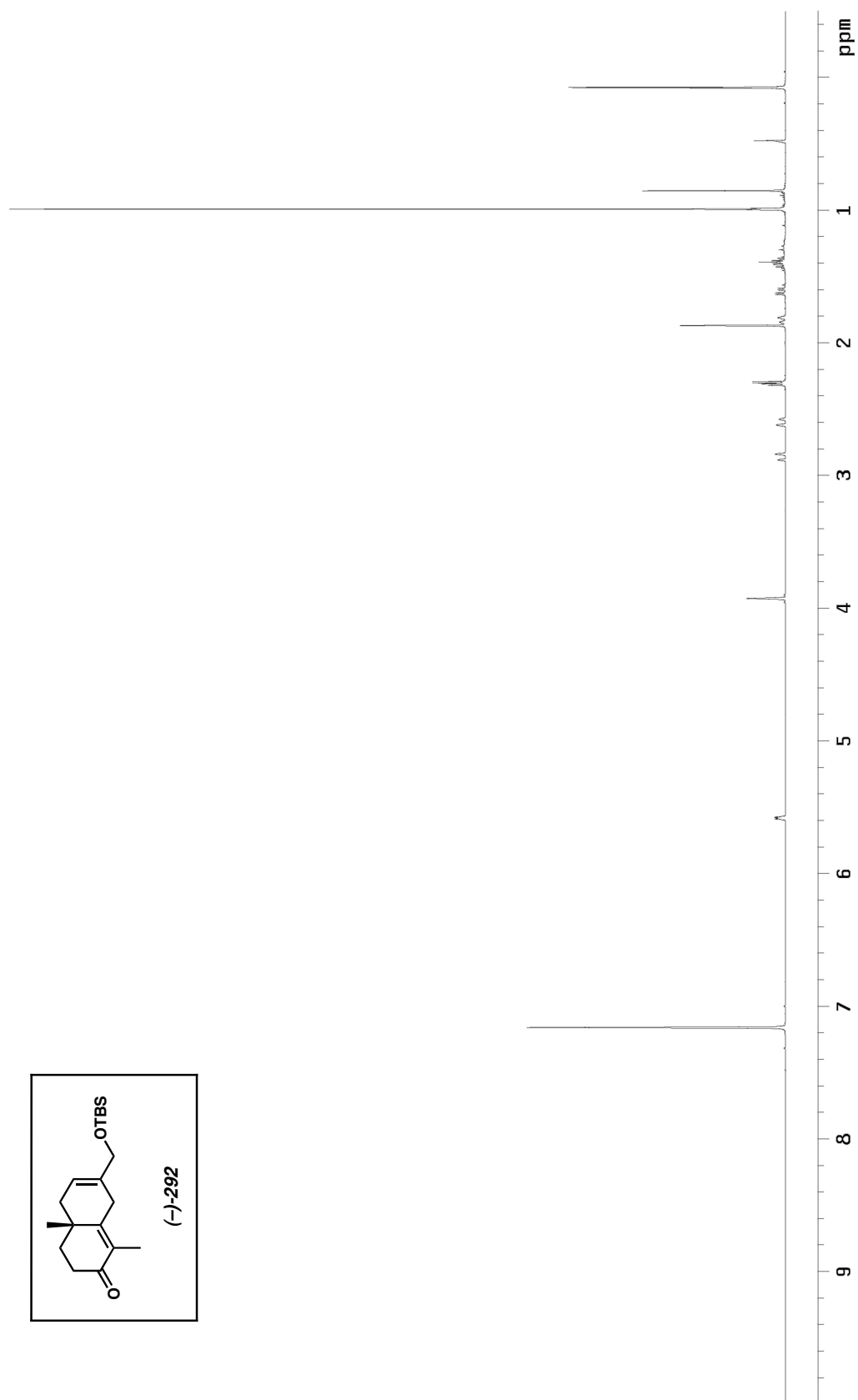


Figure A4.23. ¹³C NMR spectrum (126 MHz, C₆D₆) of **290**.

Figure A4.24. ^1H NMR spectrum (500 MHz, C_6D_6) of **292**.

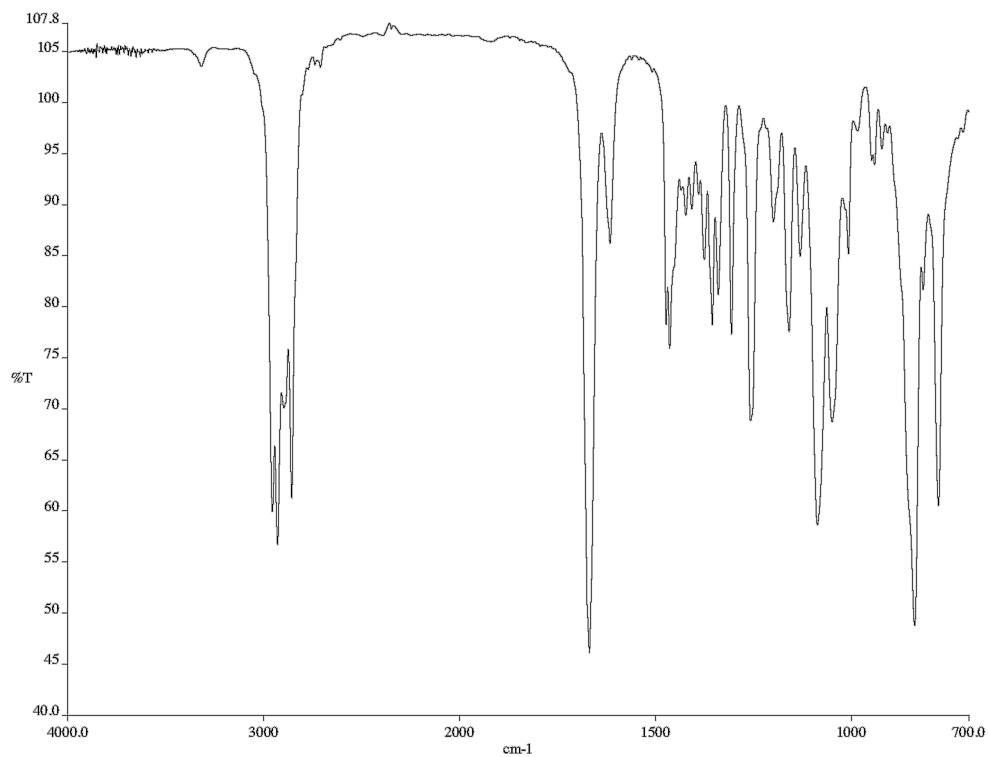


Figure A4.25. Infrared spectrum (neat film/NaCl) of **292**.

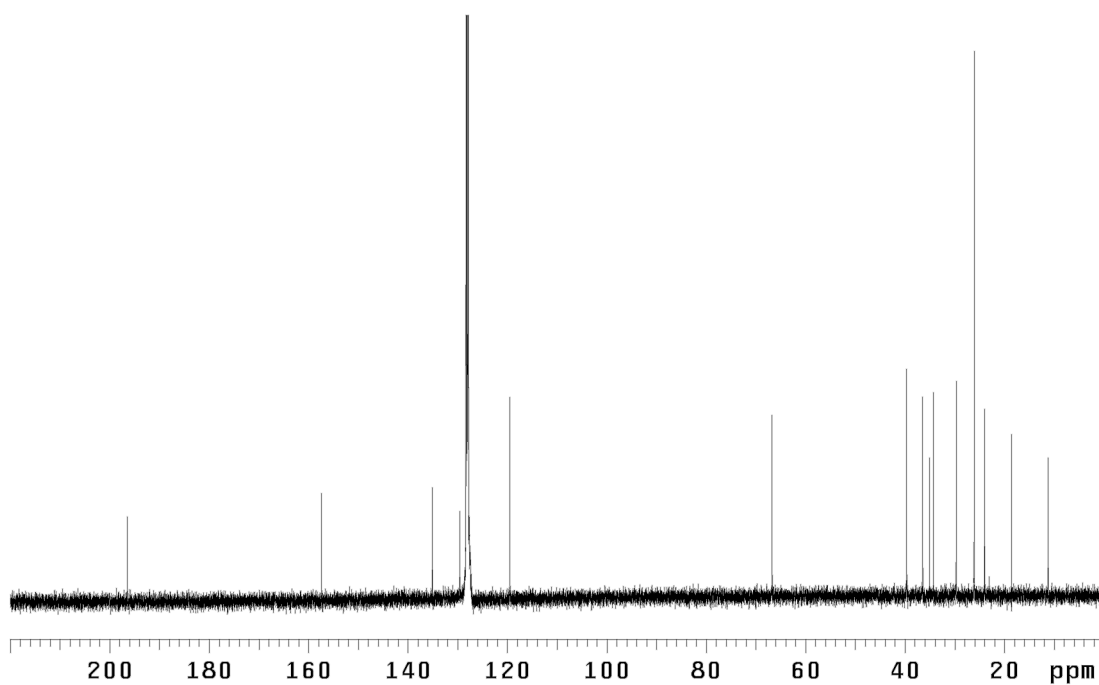
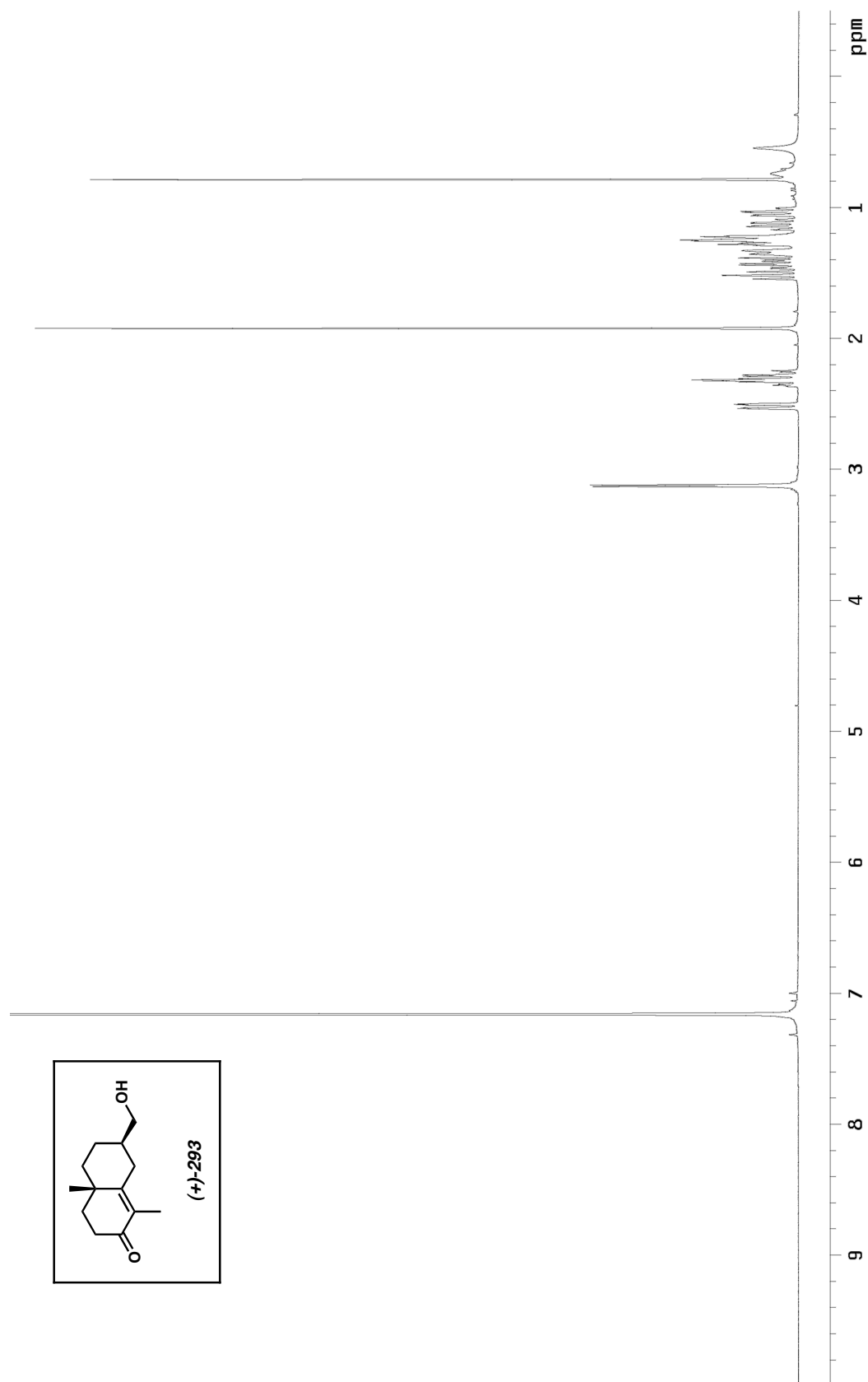


Figure A4.26. ¹³C NMR spectrum (126 MHz, C₆D₆) of **292**.

Figure A4.27. ^1H NMR spectrum (500 MHz, C_6D_6) of **293**.

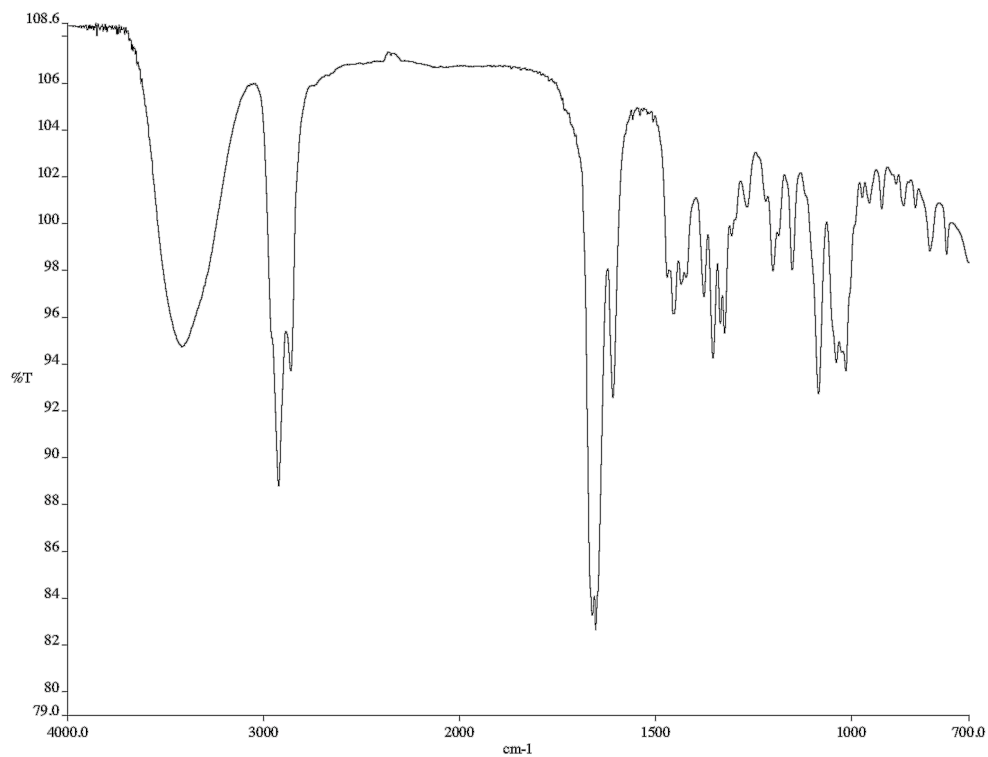


Figure A4.28. Infrared spectrum (neat film/NaCl) of **293**.

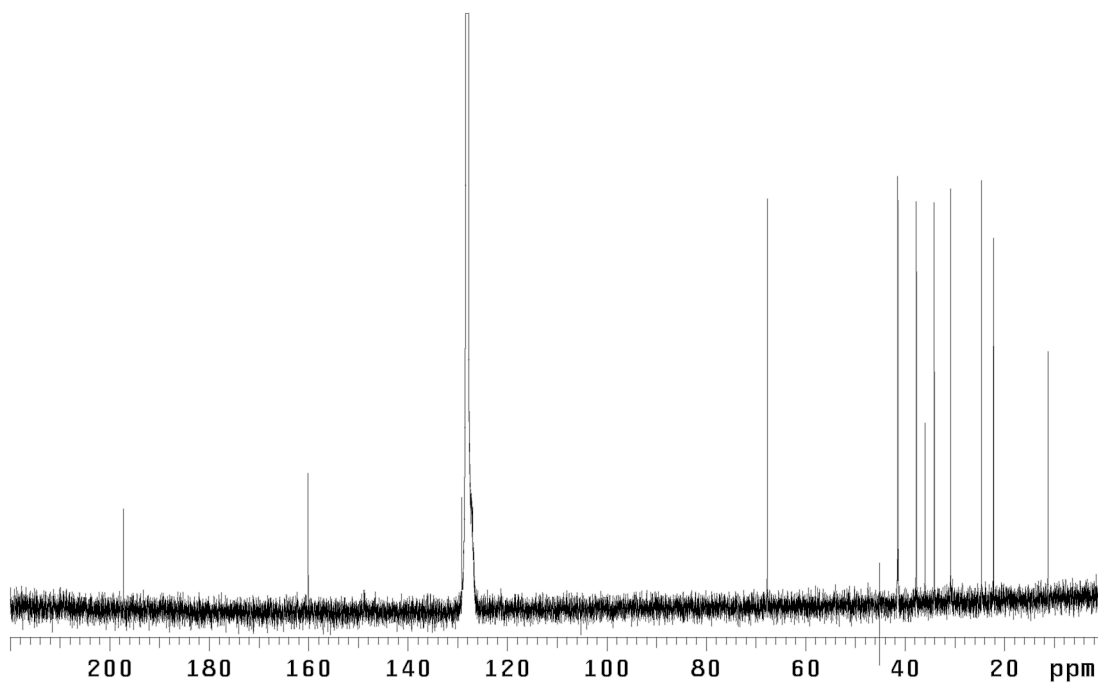
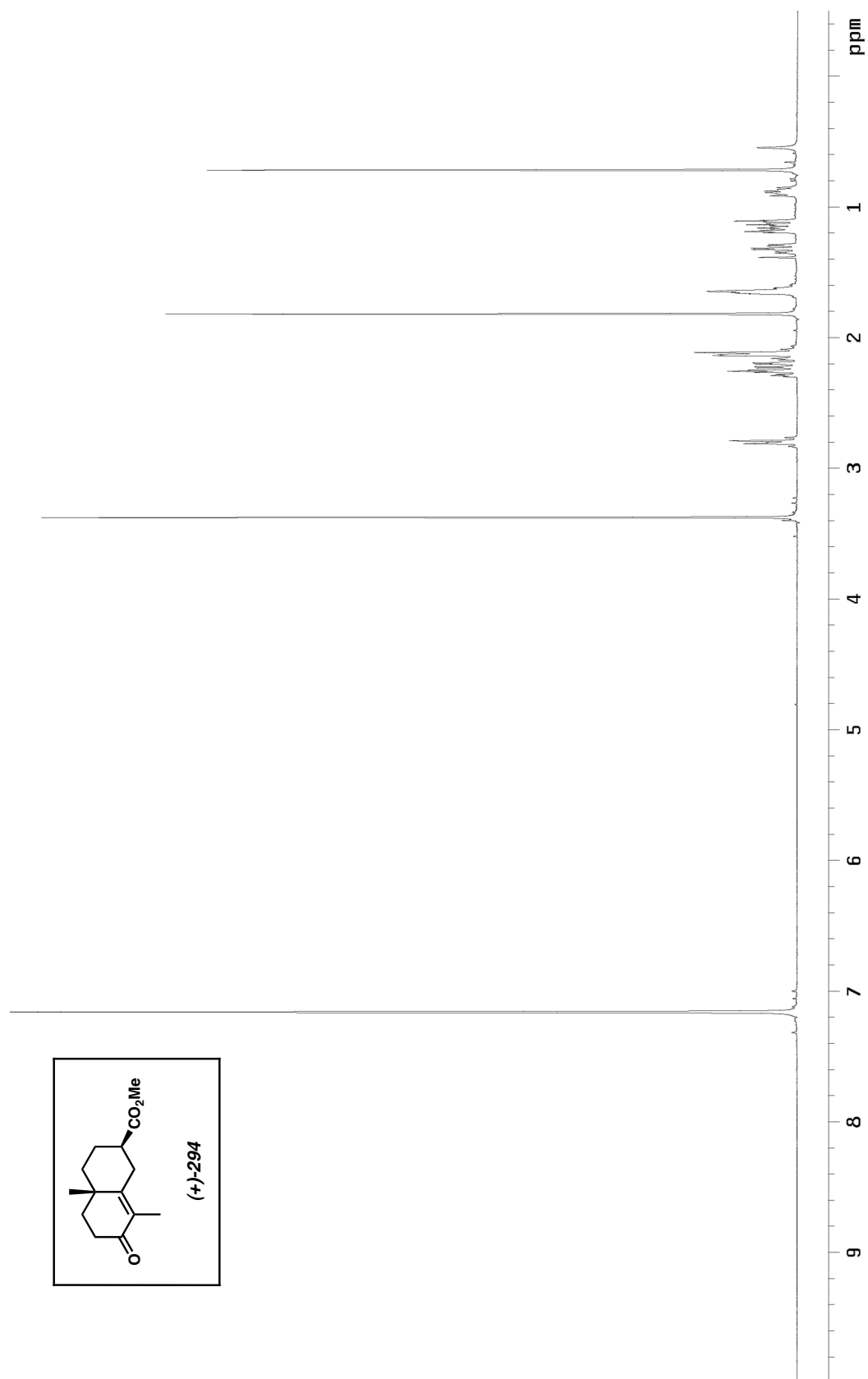


Figure A4.29. ¹³C NMR spectrum (126 MHz, C₆D₆) of **293**.

Figure A4.30. ^1H NMR spectrum (500 MHz, C_6D_6) of **294**.

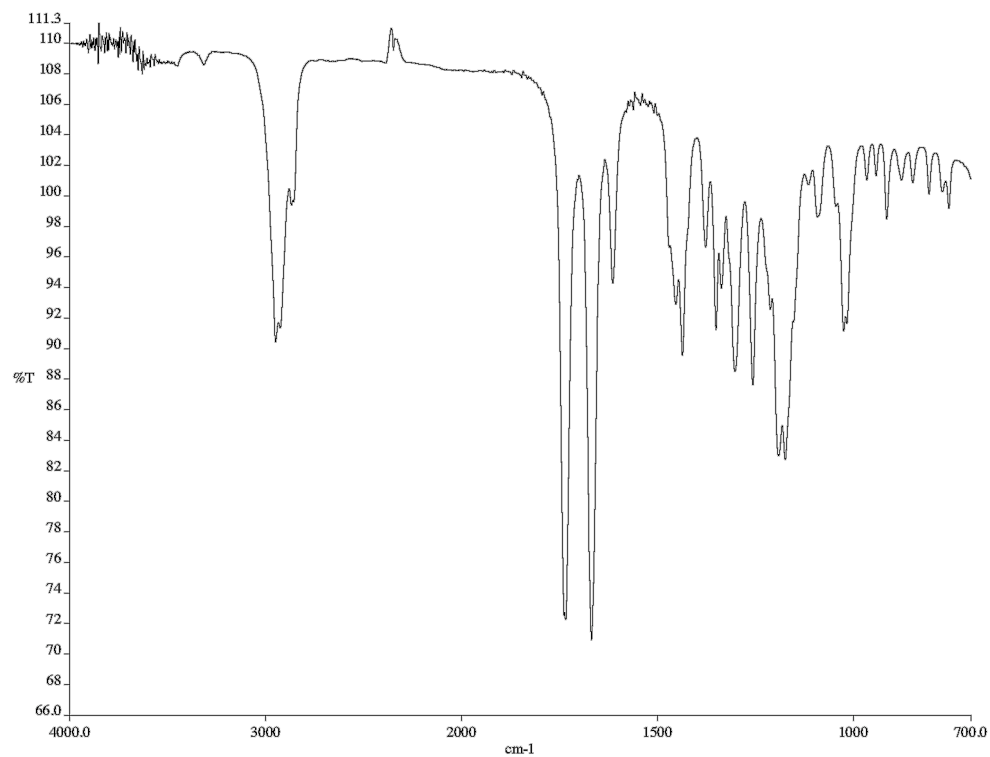


Figure A4.31. Infrared spectrum (neat film/NaCl) of **294**.

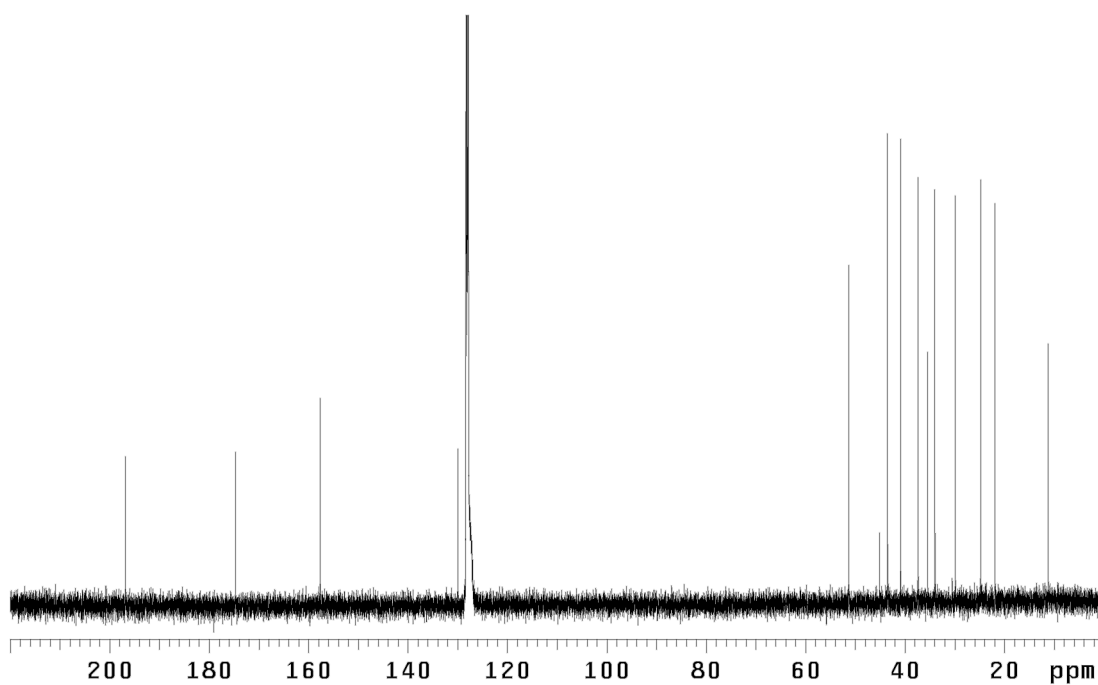
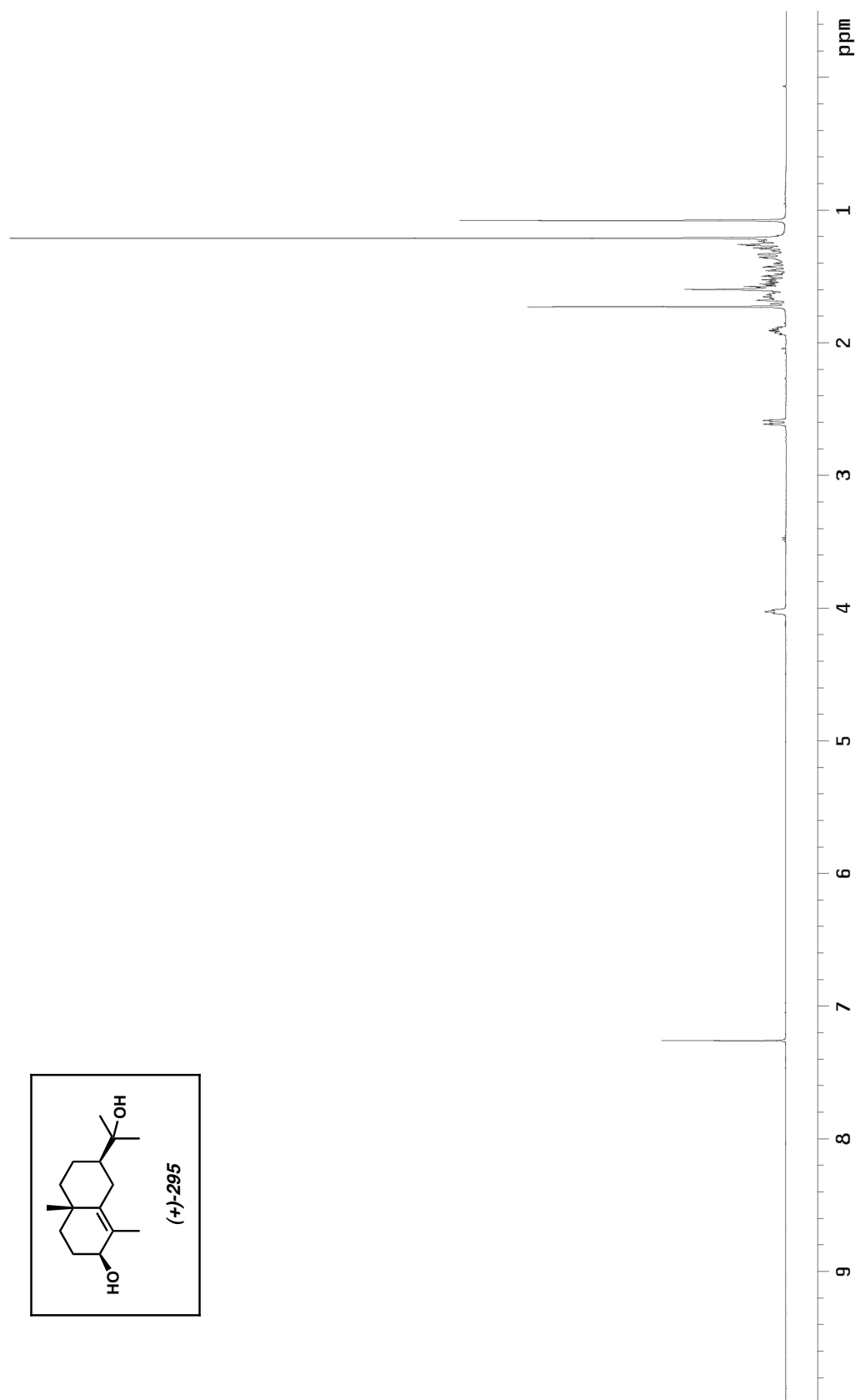


Figure A4.32. ¹³C NMR spectrum (126 MHz, C₆D₆) of **294**.

Figure A4.33. ^1H NMR spectrum (500 MHz, CDCl_3) of **295**.

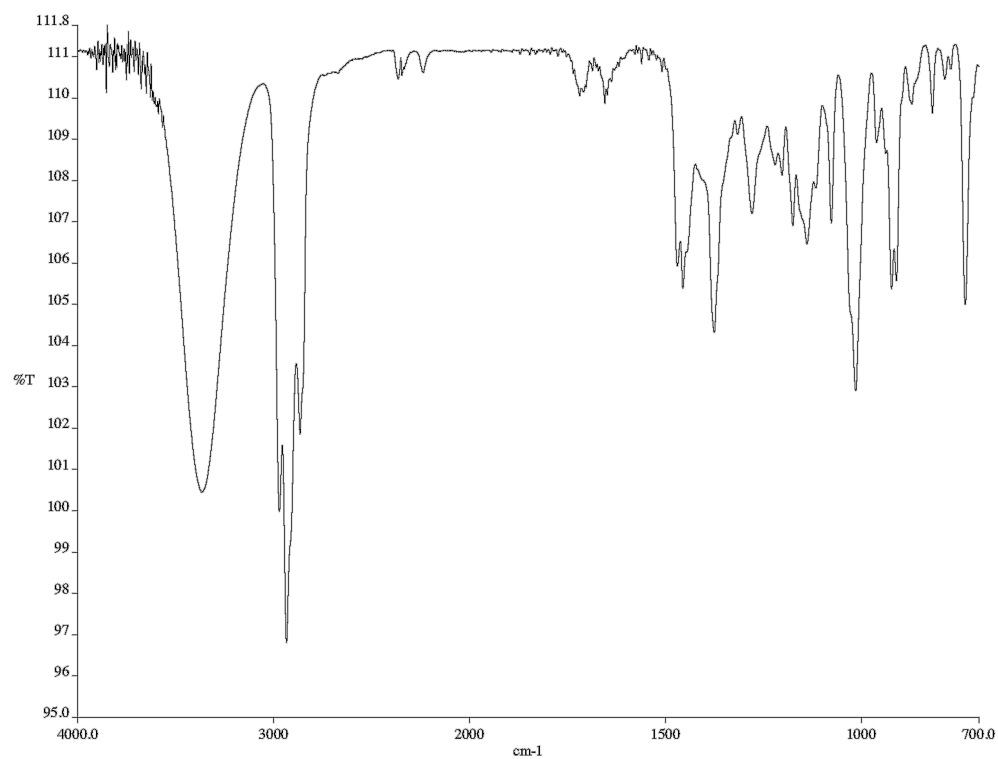


Figure A4.34. Infrared spectrum (neat film/NaCl) of **295**.

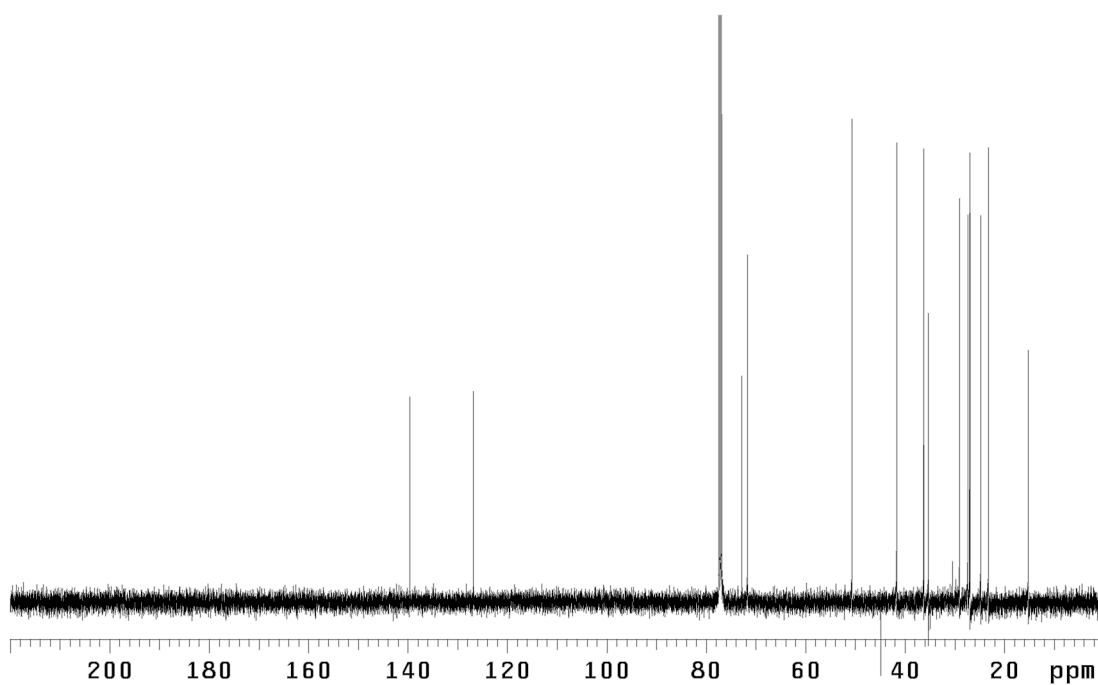


Figure A4.35. ¹³C NMR spectrum (126 MHz, CDCl₃) of **295**.

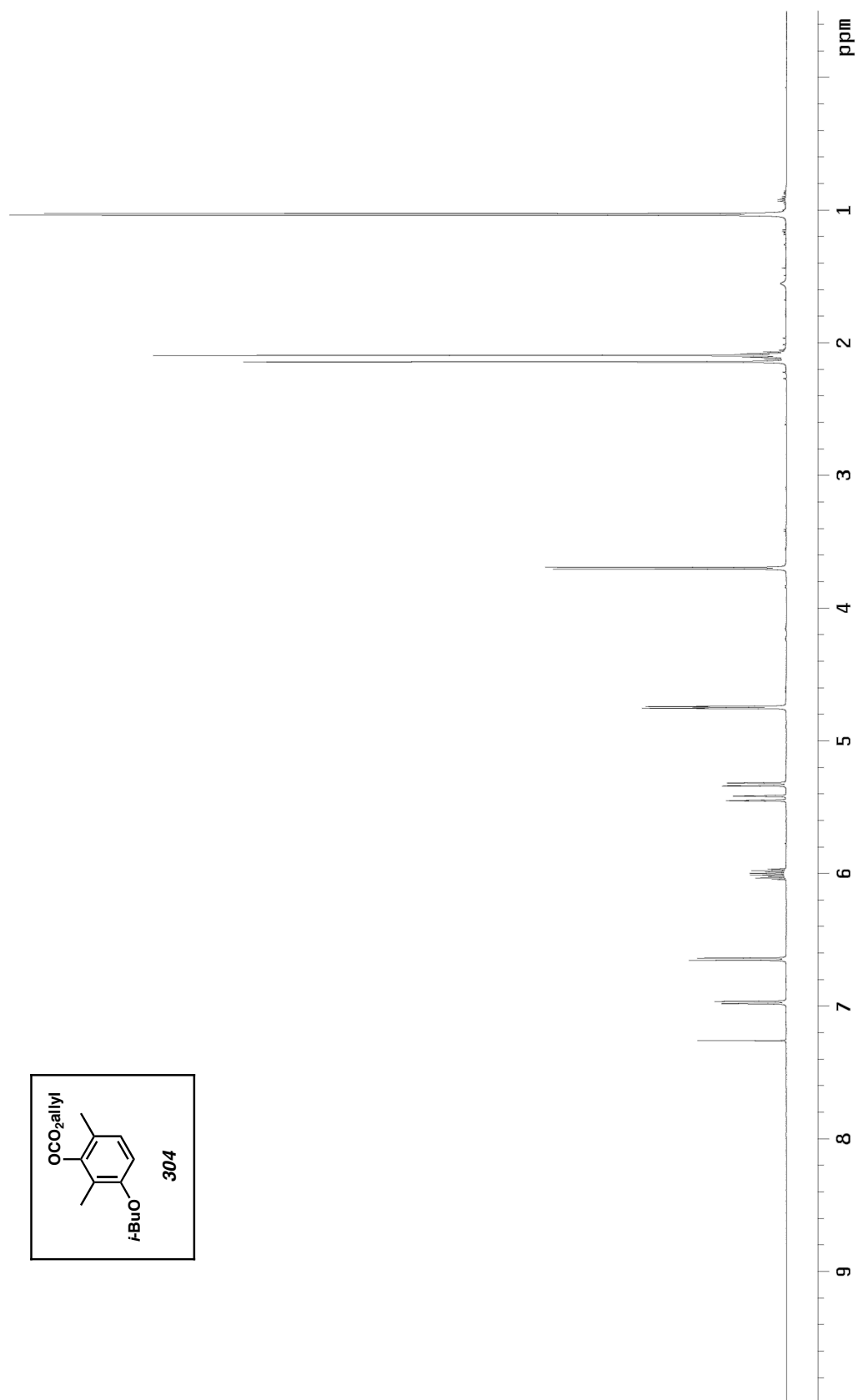


Figure A4.36. ^1H NMR spectrum (500 MHz, CDCl_3) of **304**.

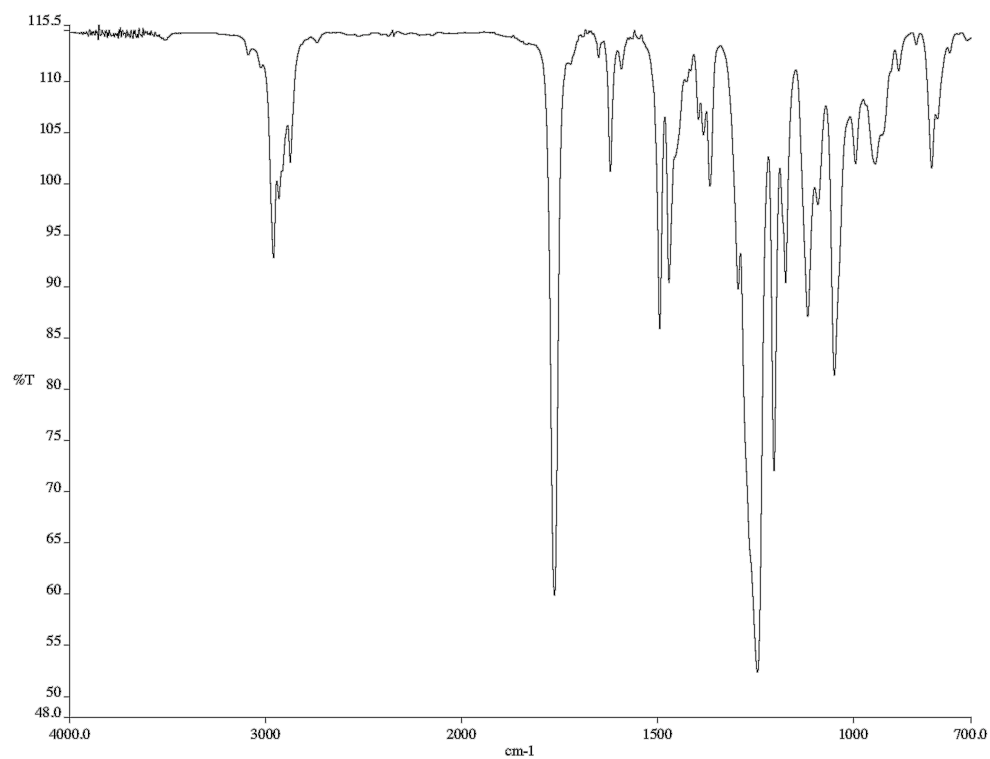


Figure A4.37. Infrared spectrum (neat film/NaCl) of **304**.

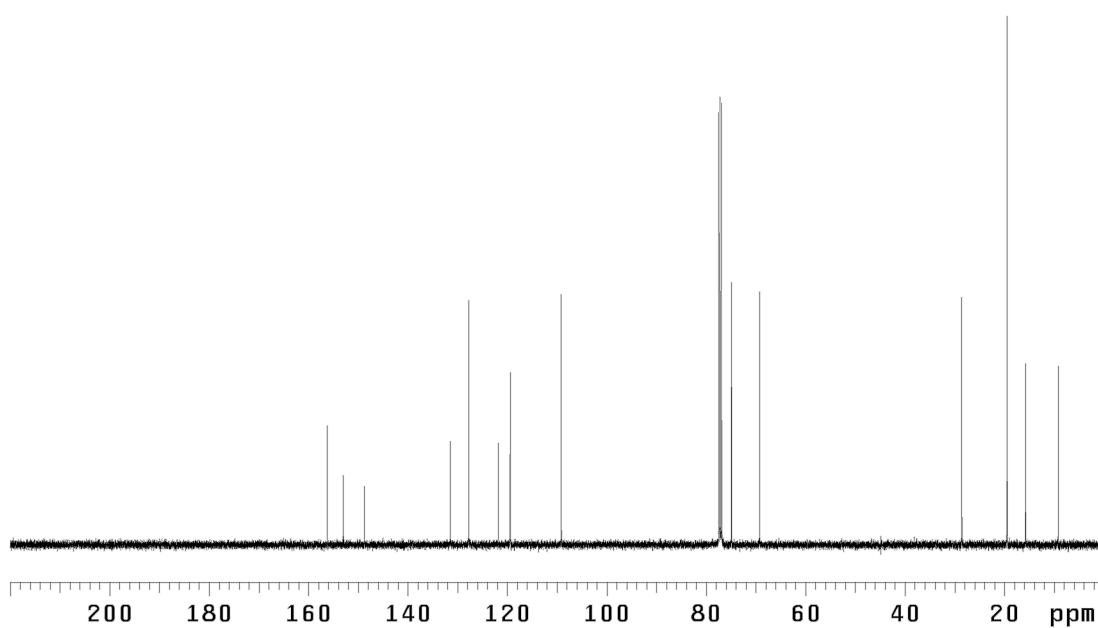
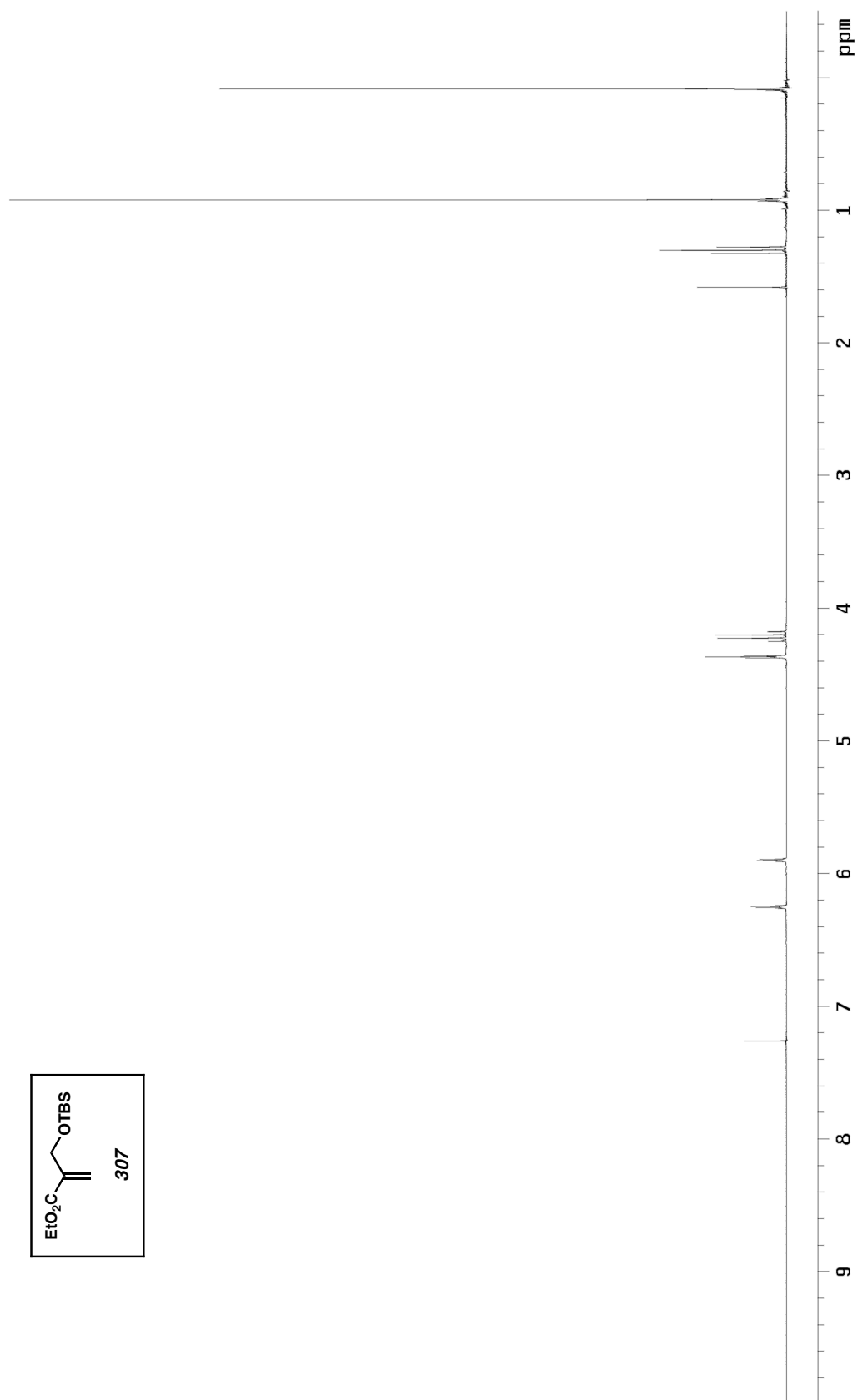
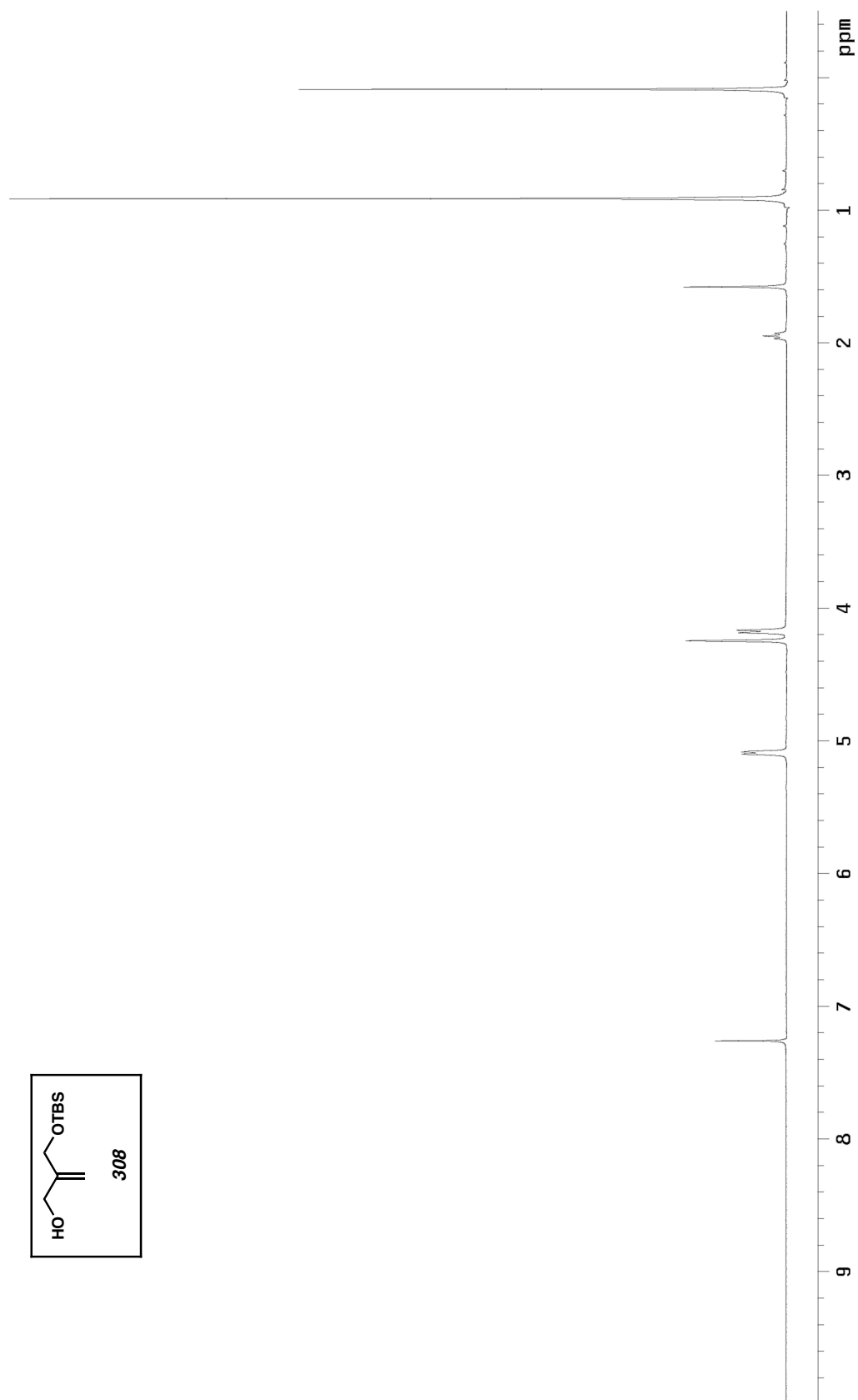


Figure A4.38. ¹³C NMR spectrum (126 MHz, CDCl₃) of **304**.

Figure A4.39. ¹H NMR spectrum (300 MHz, CDCl₃) of **307**.

Figure A4.40. ¹H NMR spectrum (300 MHz, CDCl₃) of **308**.

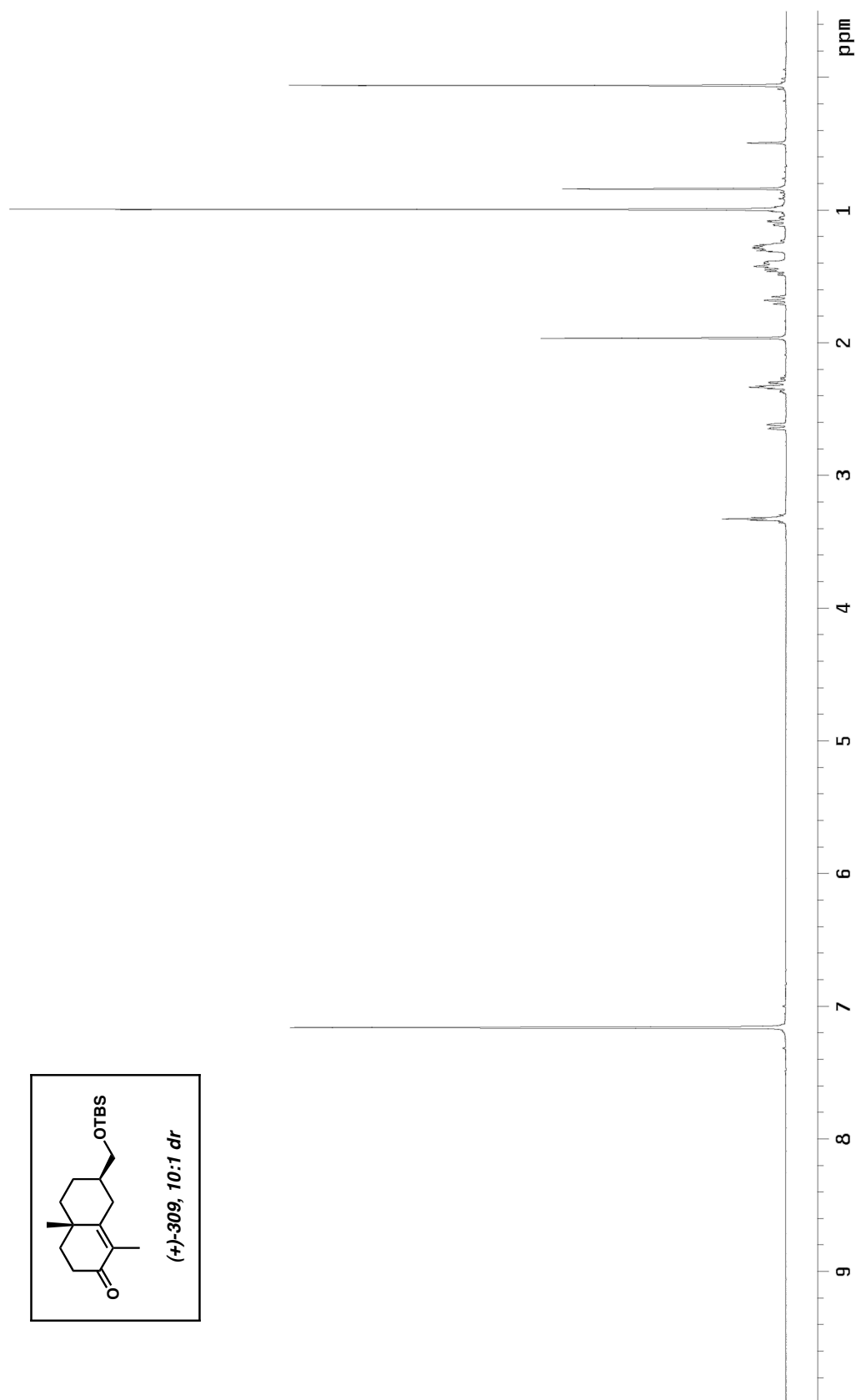


Figure A4.41. ^1H NMR spectrum (500 MHz, C_6D_6) of the major diastereomer of **309**.

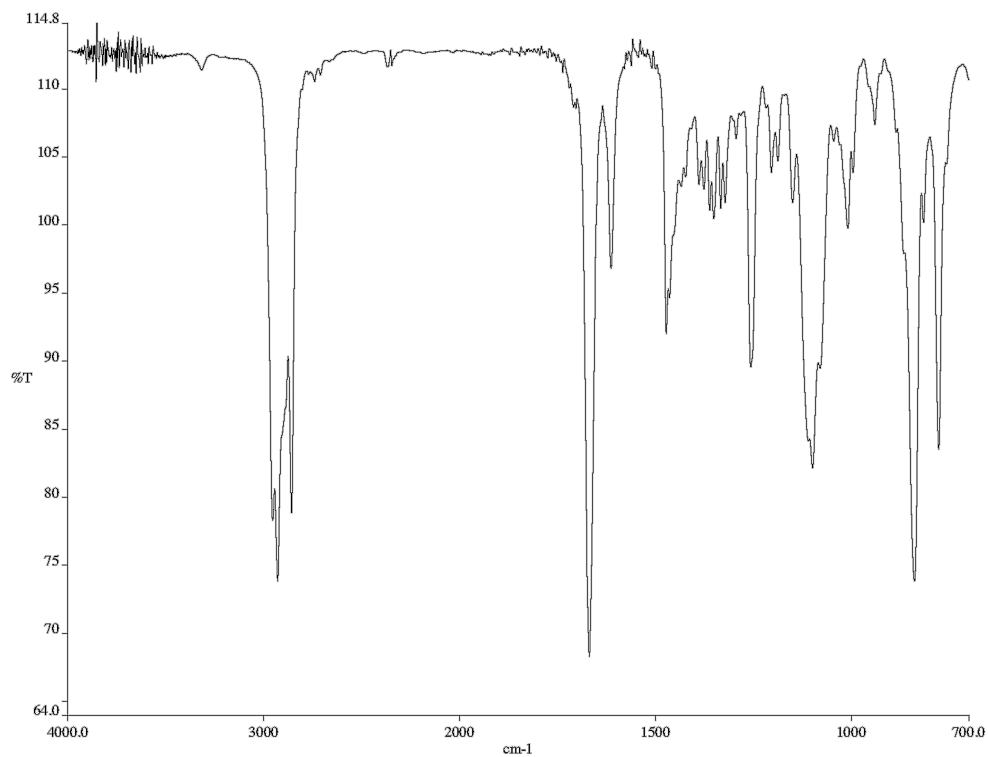


Figure A4.42. Infrared spectrum (neat film/NaCl) of the major diastereomer of **309**.

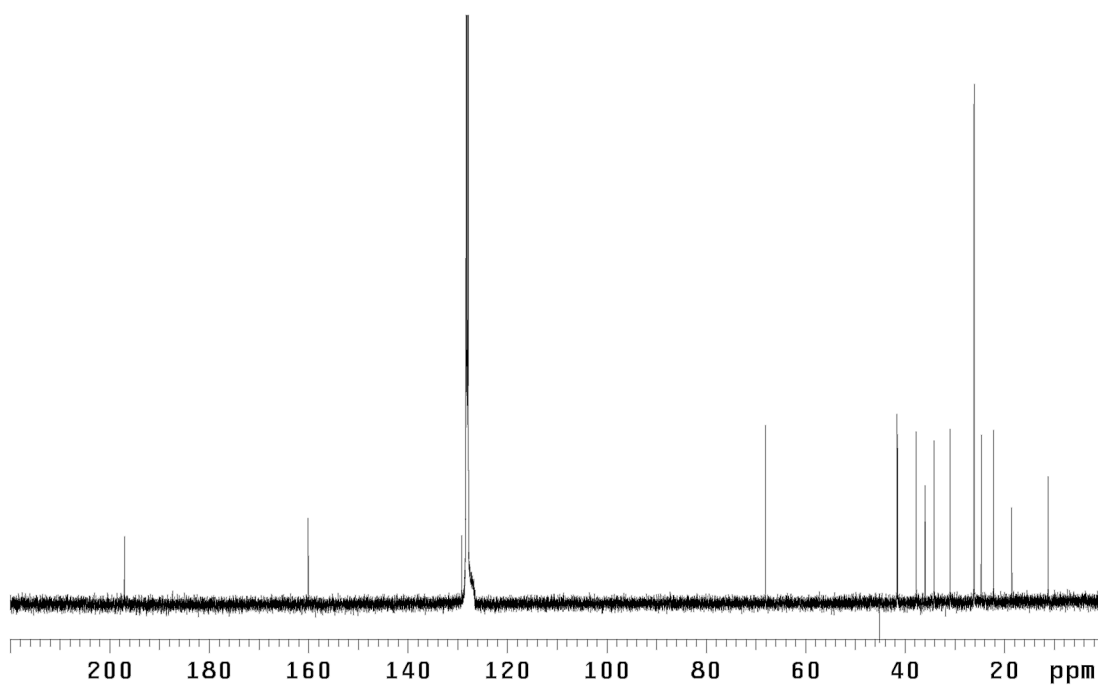


Figure A4.43. ¹³C NMR spectrum (126 MHz, C₆D₆) of the major diastereomer of **309**.