

APPENDIX 11

Spectra Relevant to Chapter 5:

*Synthesis of Non-natural Cyanthiwigin–Gagunin Hybrids through
Late-Stage Diversification of the the Cyanthiwigin Natural Product Core*

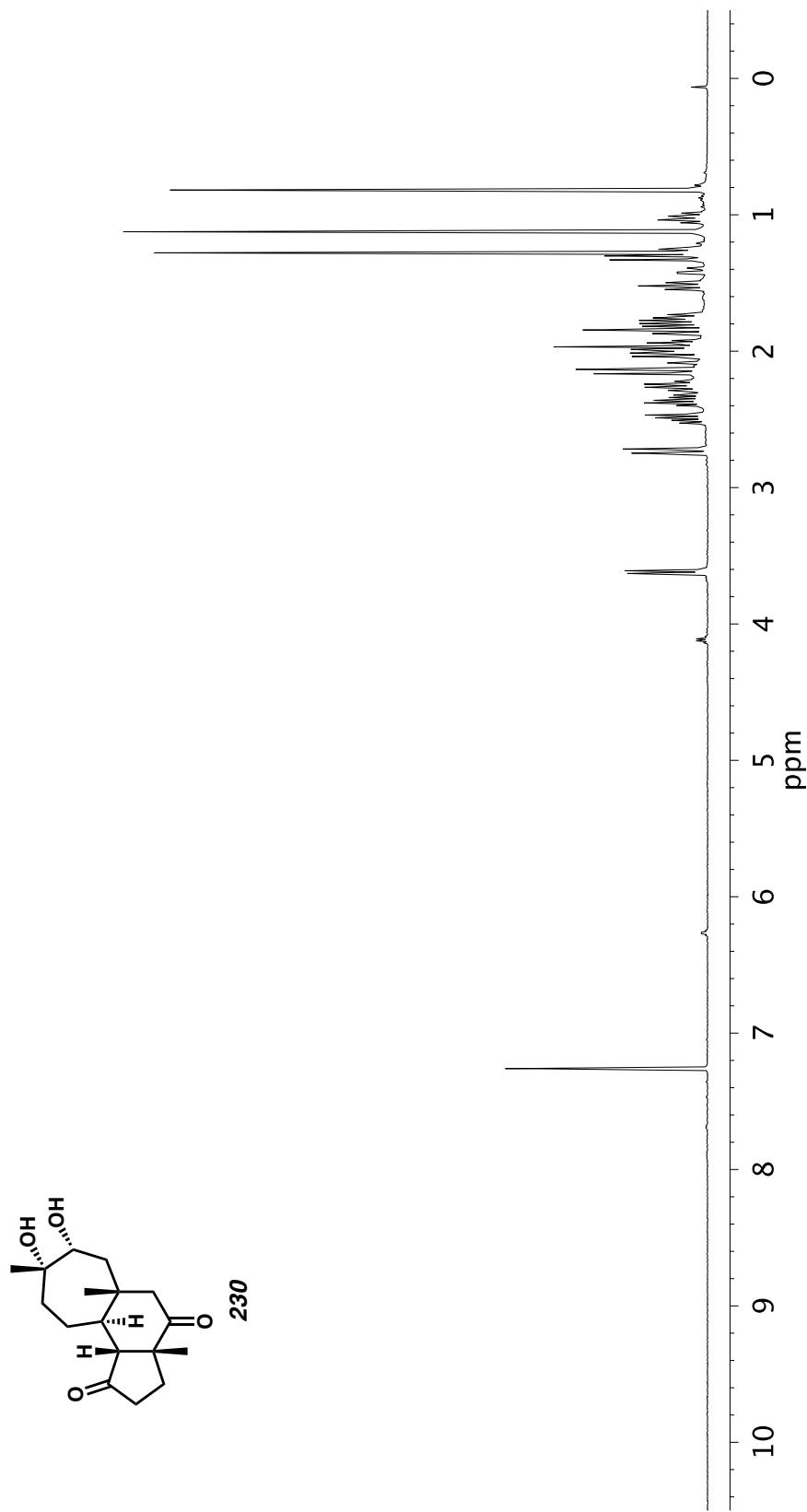


Figure A11.1. ^1H NMR (500 MHz, CDCl_3) of compound 230.

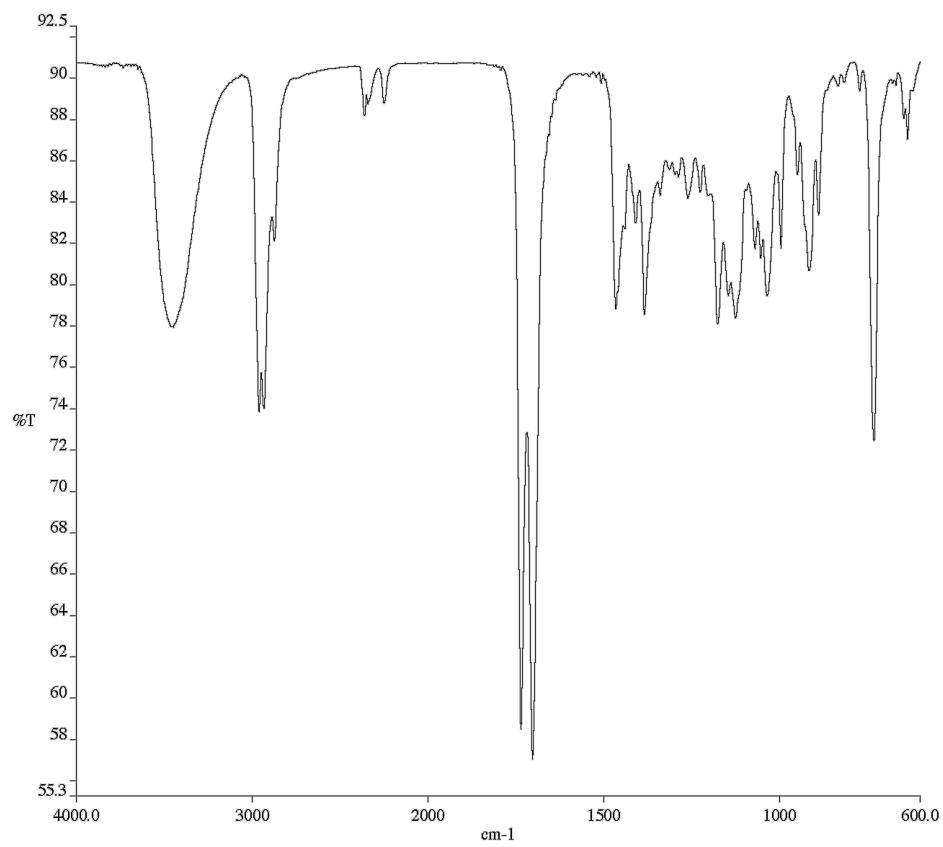


Figure A11.2. Infrared spectrum (Thin Film, KBr) of compound **230**.

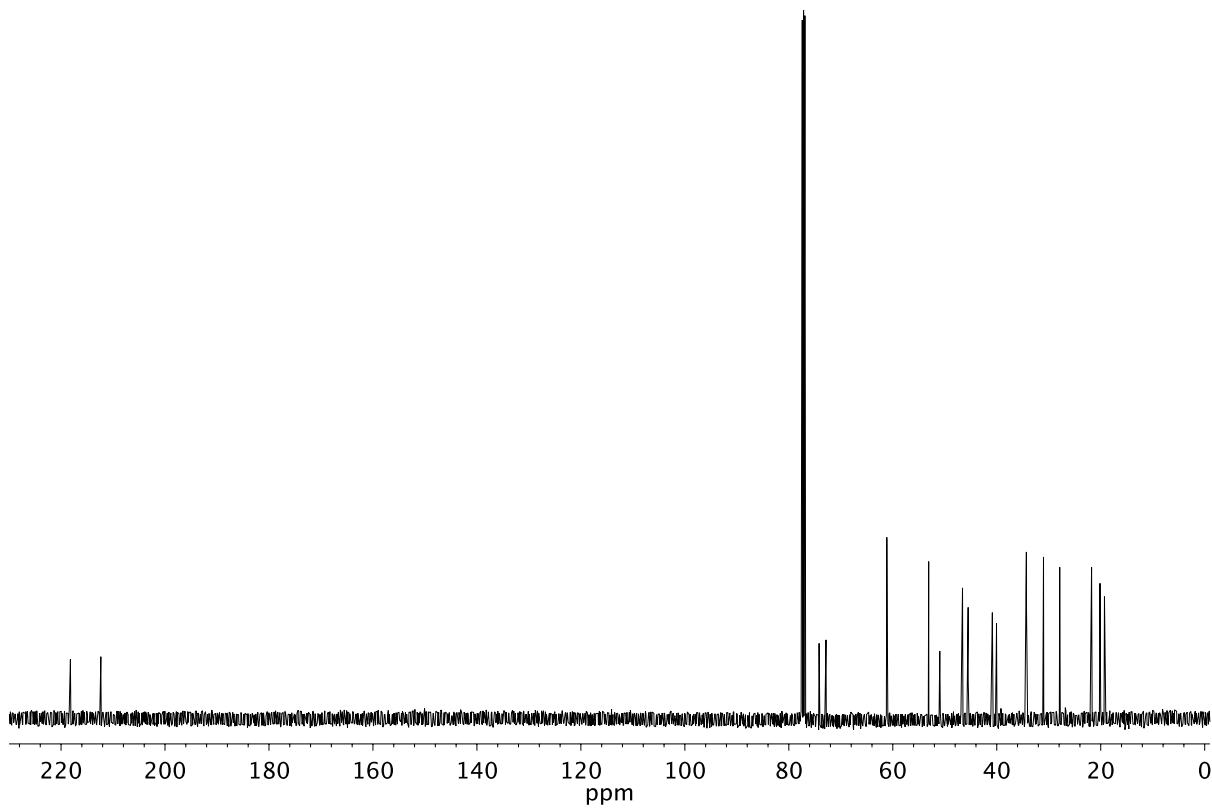
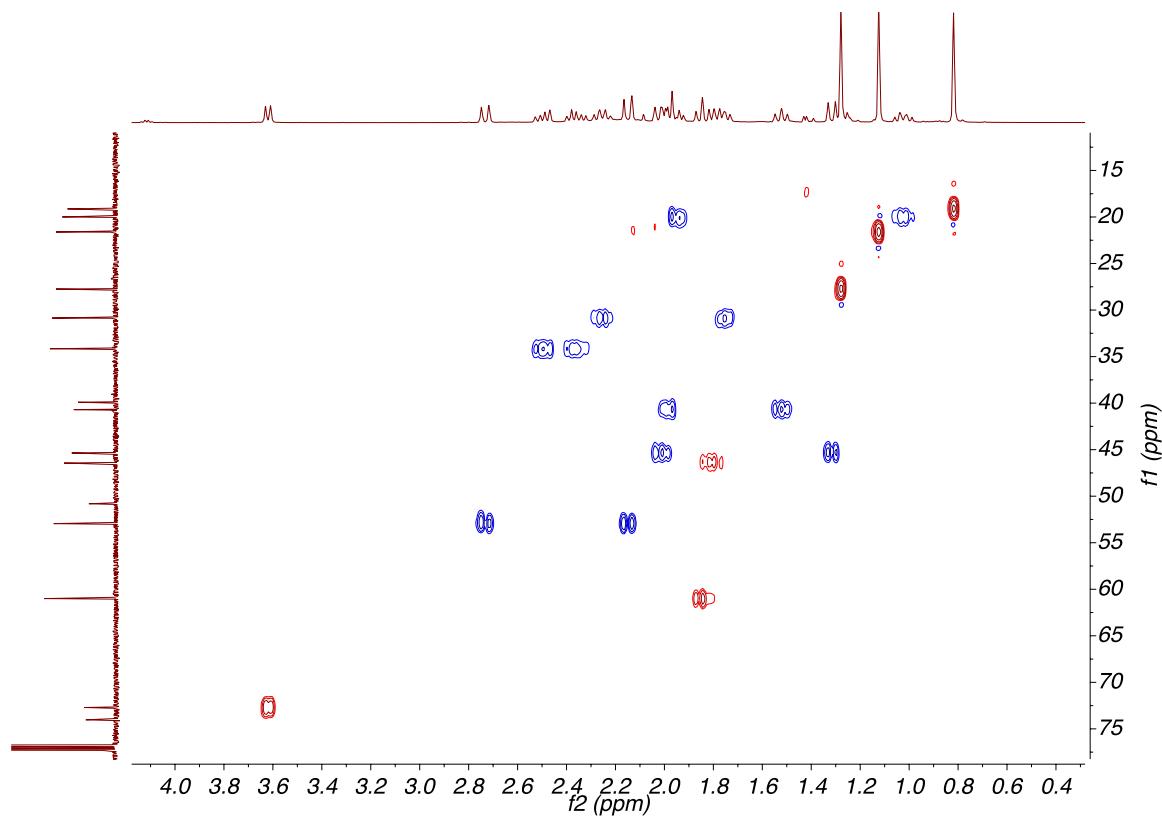
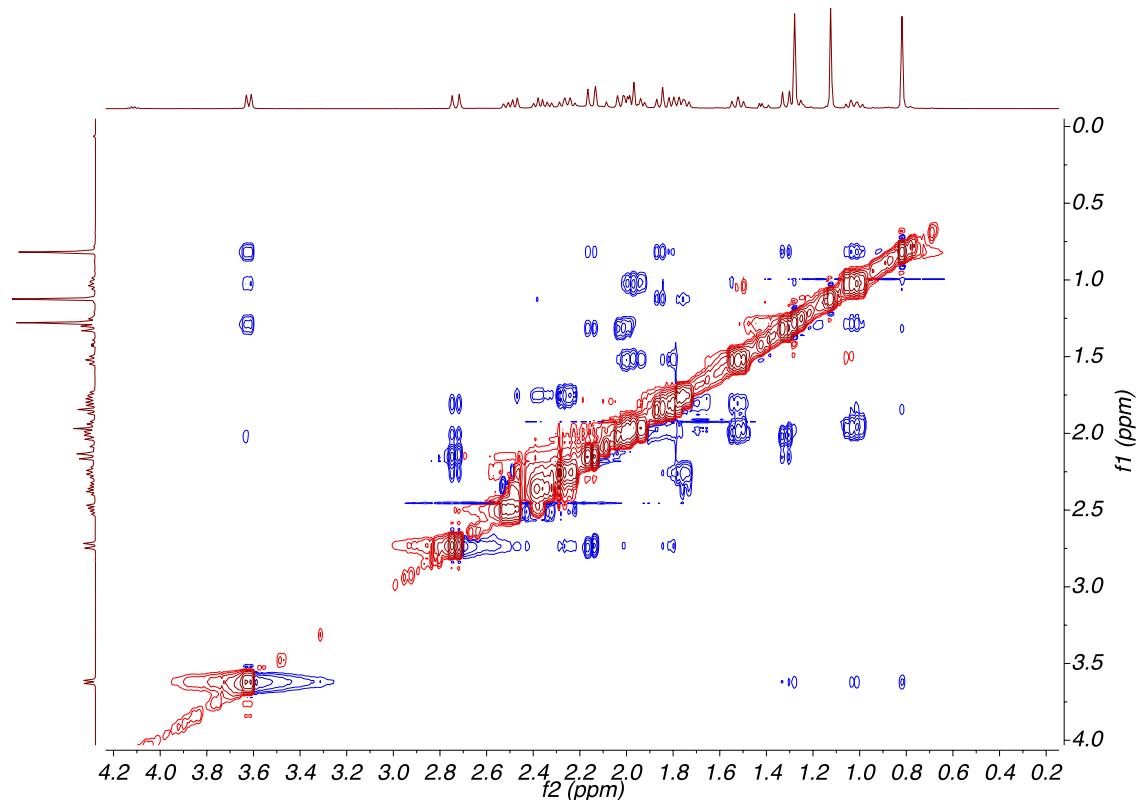


Figure A11.3. ¹³C NMR (126 MHz, CDCl₃) of compound **230**.

Figure A11.4. HSQC (500, 126 MHz, CDCl_3) of compound **230**.Figure A11.5. NOESY (500 MHz, CDCl_3) of compound **230**.

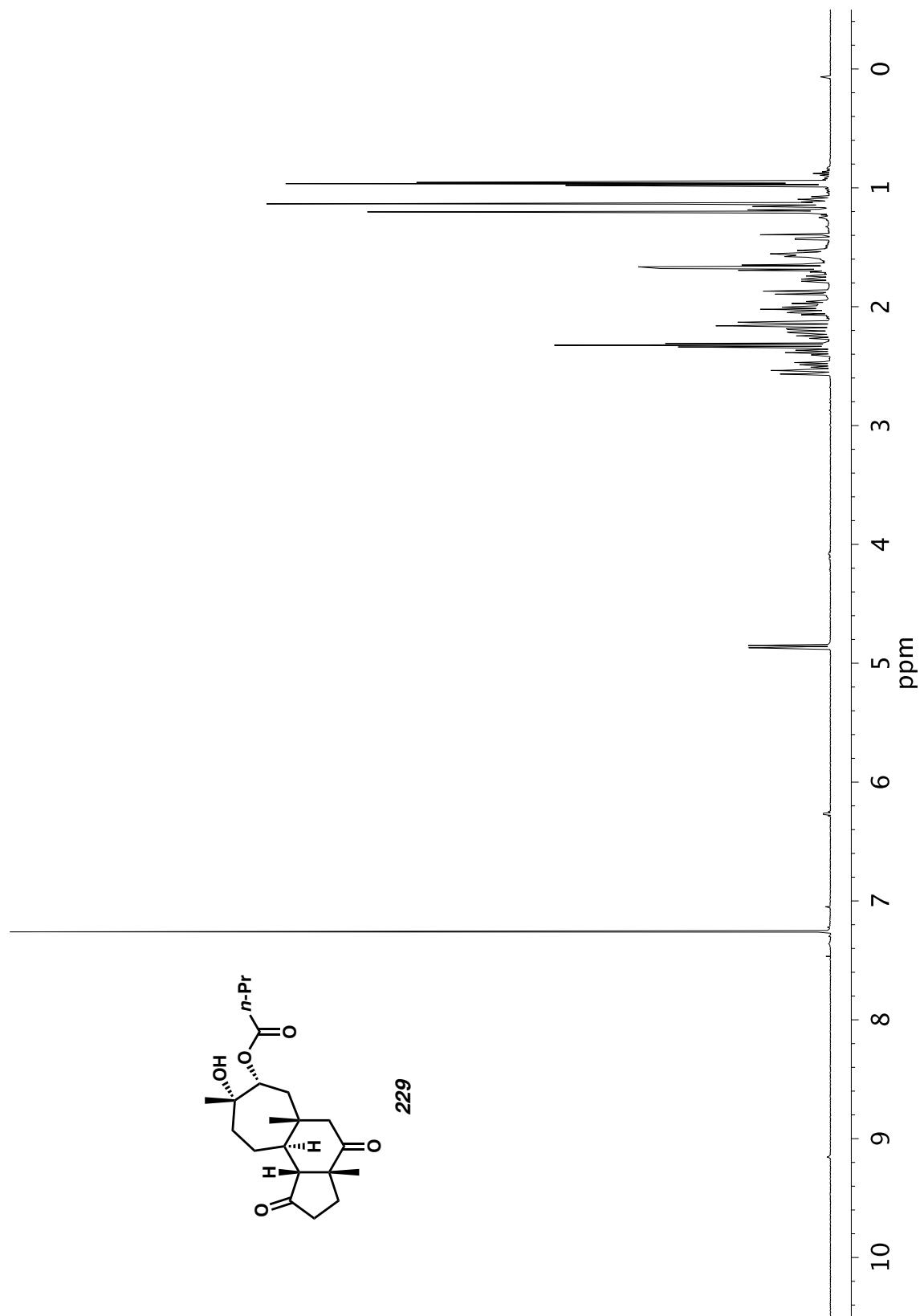


Figure A11.6. ^1H NMR (500 MHz, CDCl_3) of compound 229.

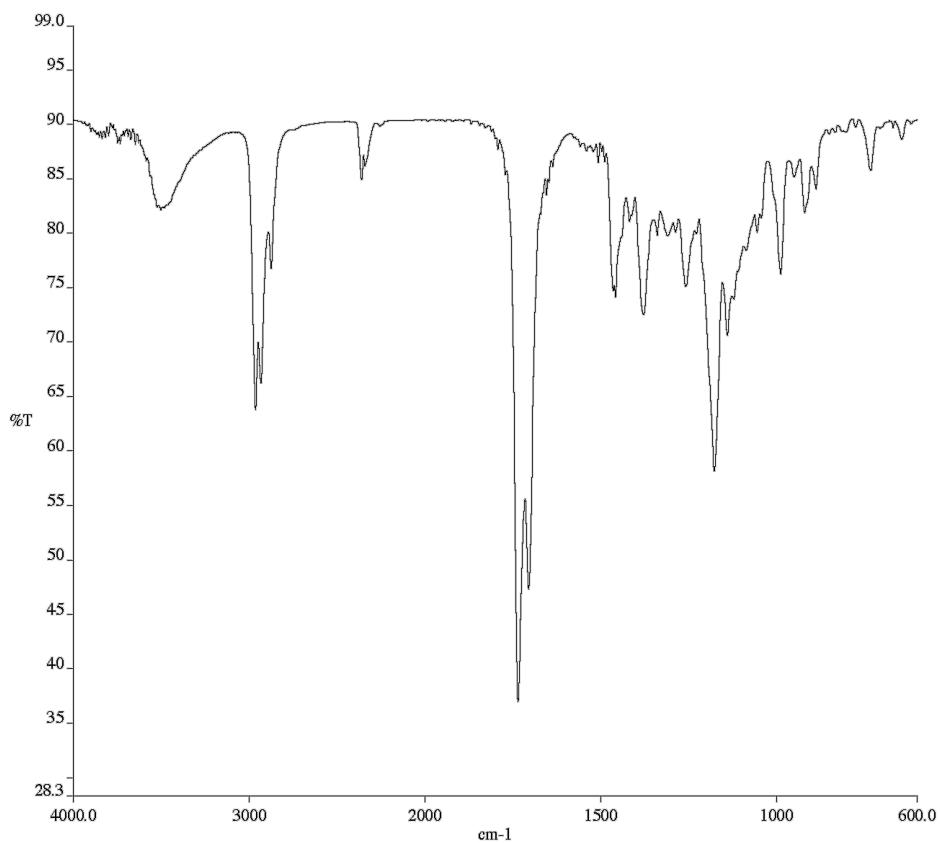
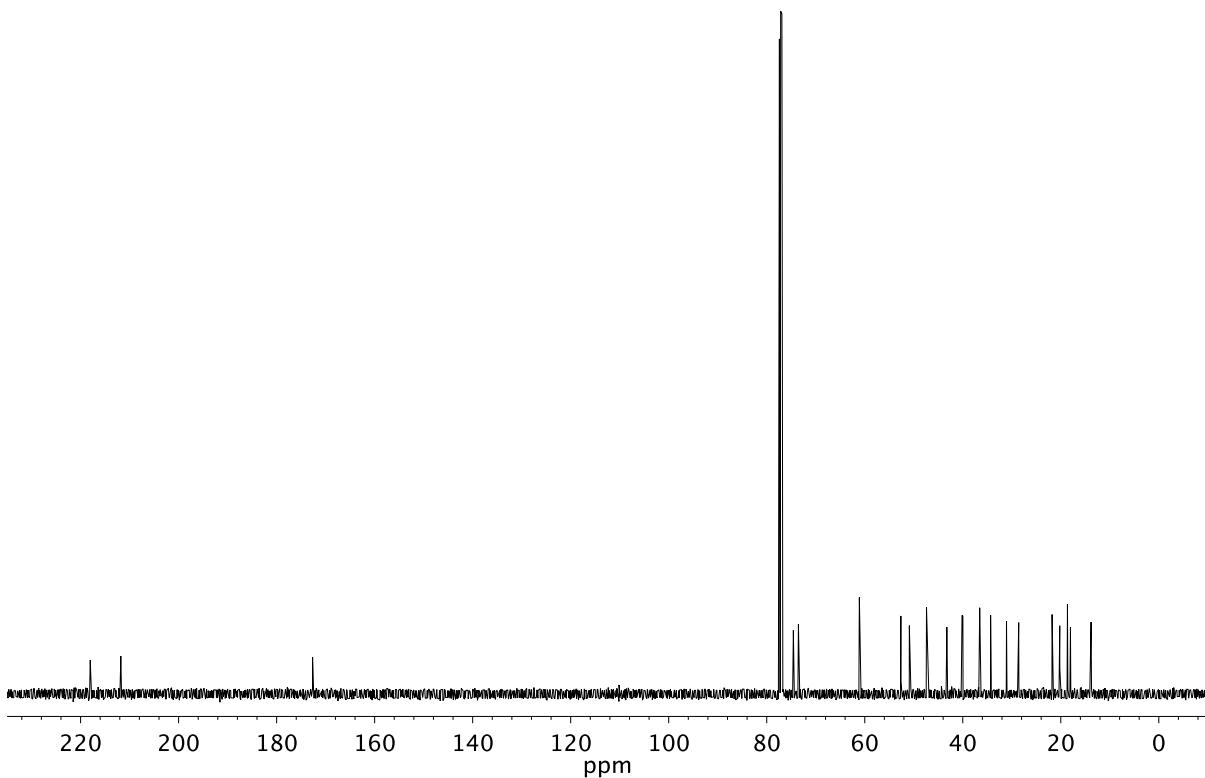
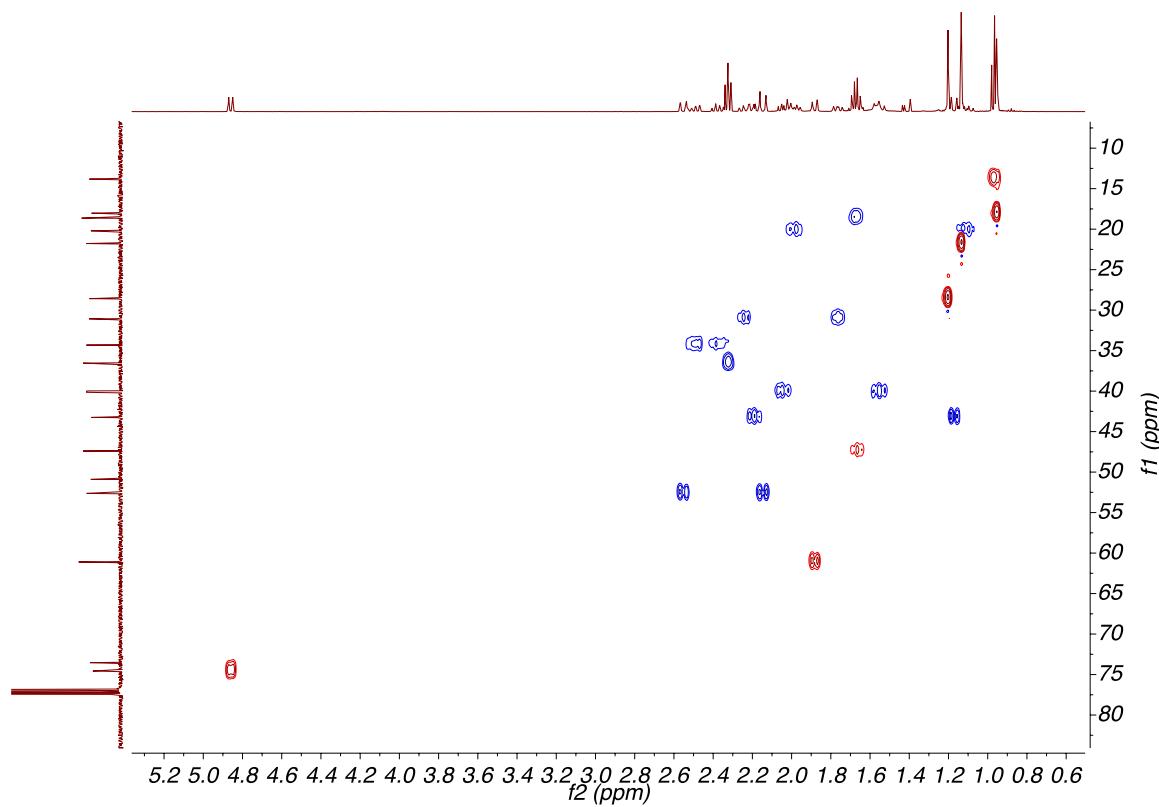
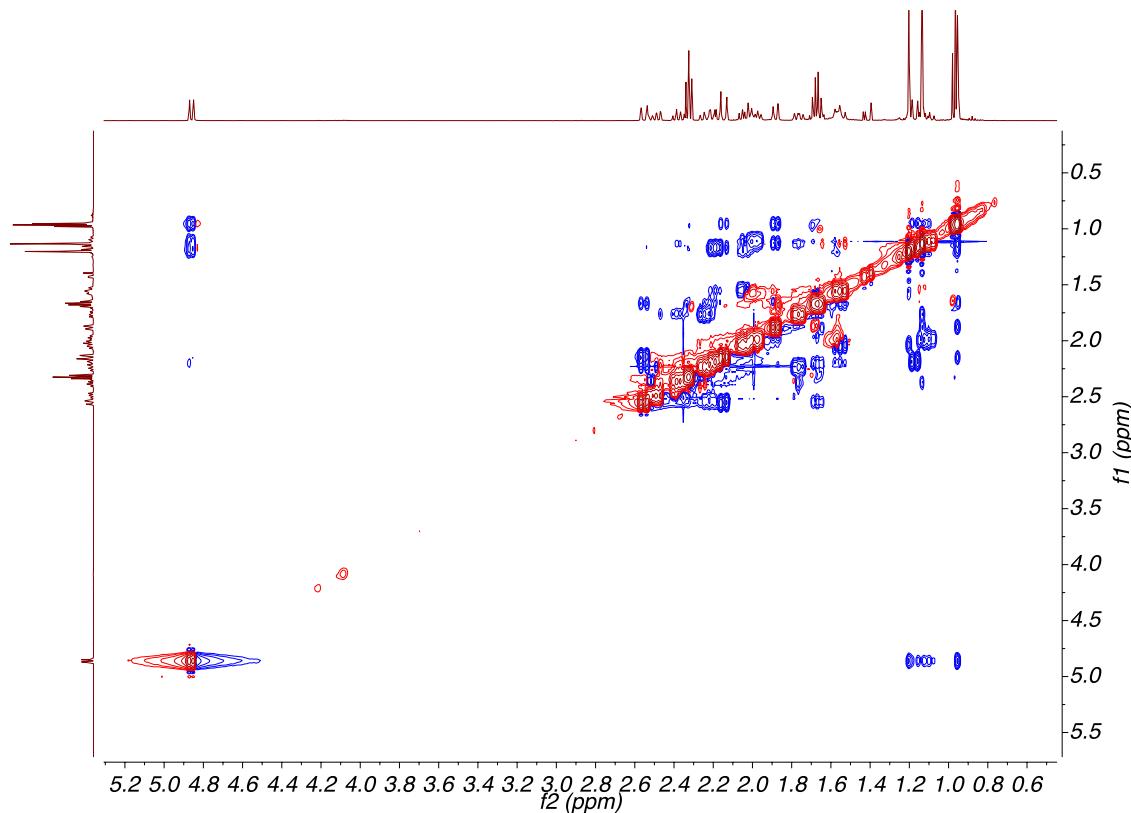


Figure 11.7. Infrared Spectrum (Thin Film, KBr) of compound 229.



Figure A11.9. HSQC (500, 126 MHz, CDCl_3) of compound 229.Figure A11.10. NOESY (500 MHz, CDCl_3) of compound 229.

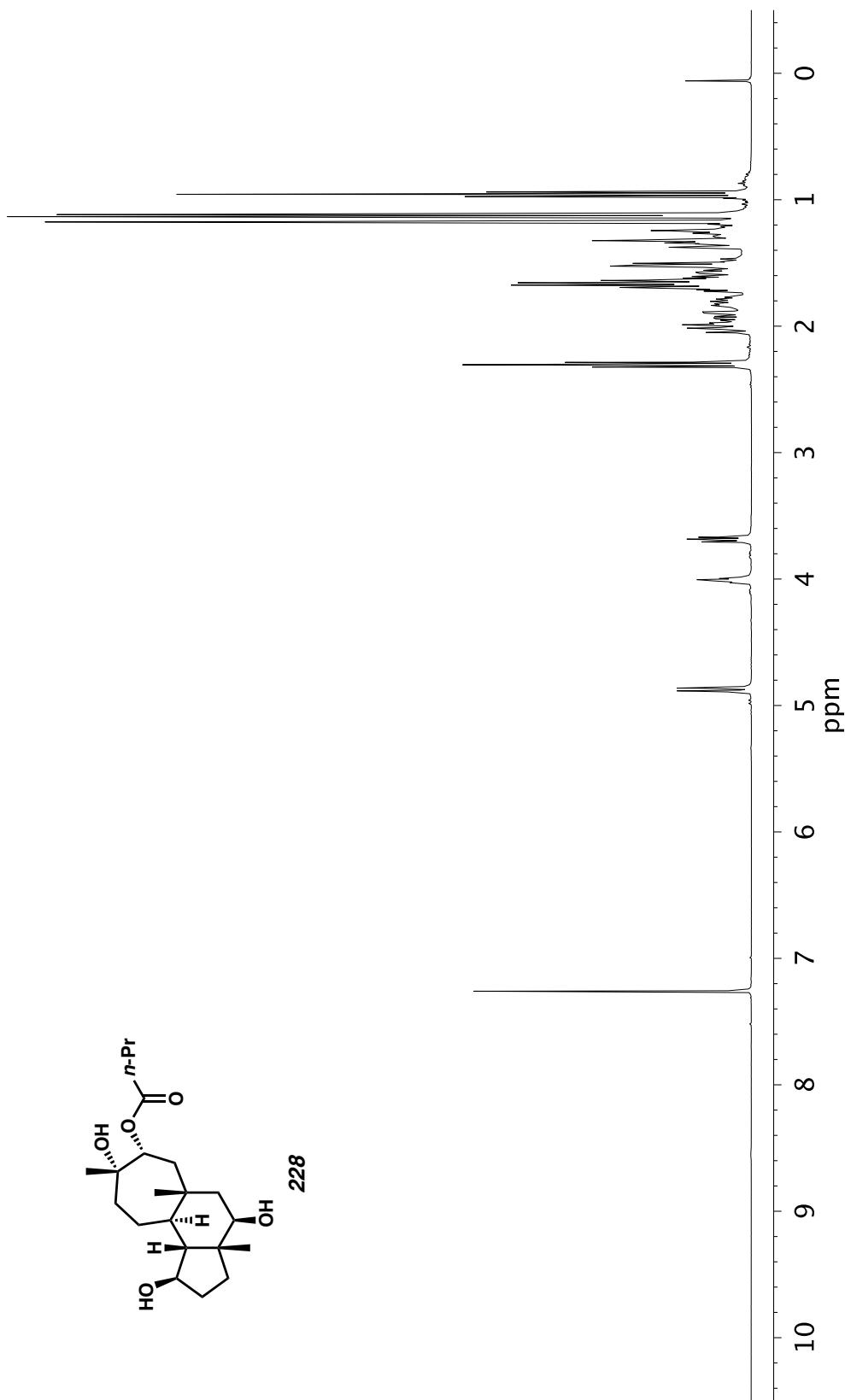


Figure A11.11. ^1H NMR (400 MHz, CDCl_3) of compound 228.

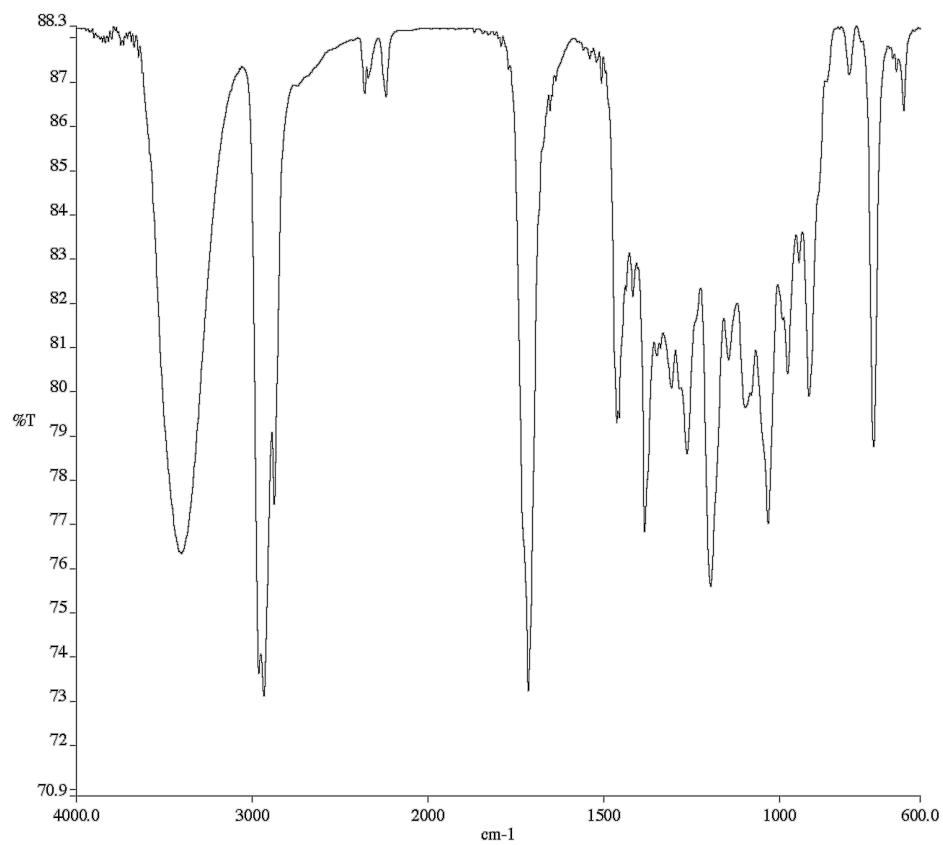


Figure A11.12. Infrared Spectrum (Thin Film, KBr) of compound 228.

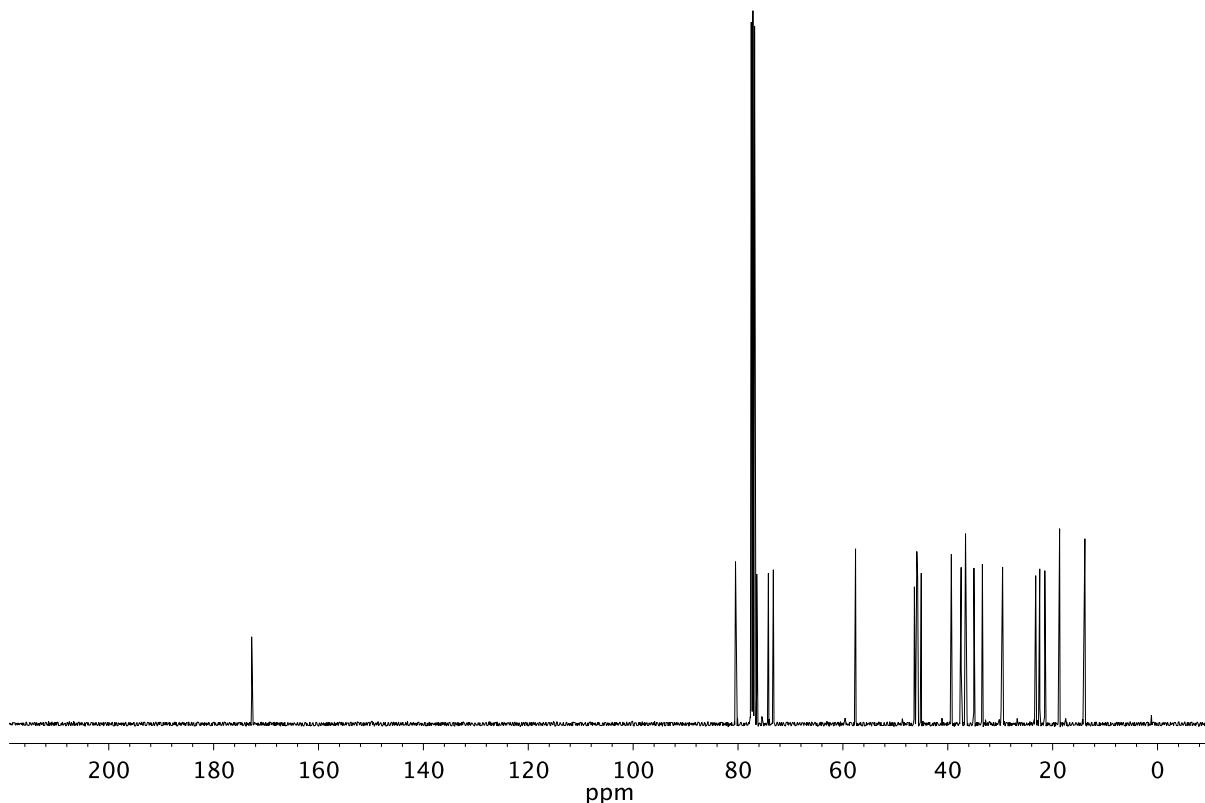


Figure A11.13. ^{13}C NMR (101 MHz, CDCl_3) of compound 228.

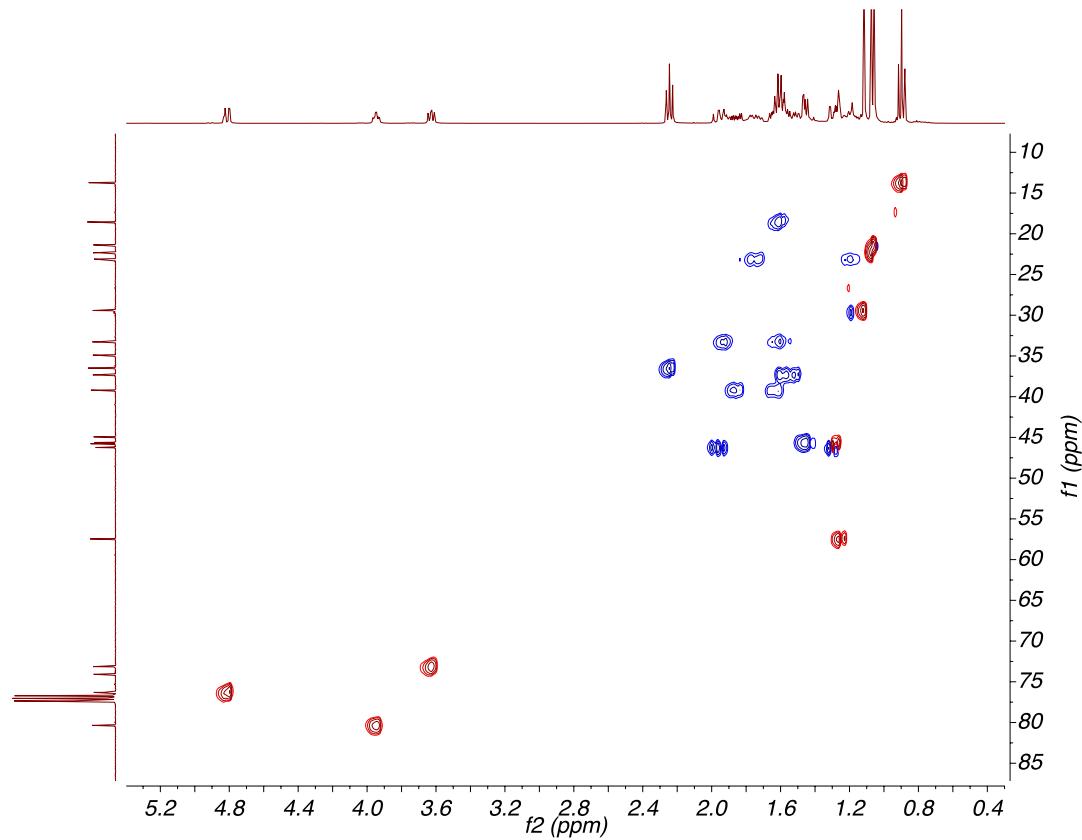


Figure A11.14. HSQC (400, 101 MHz, CDCl_3) of compound 228.

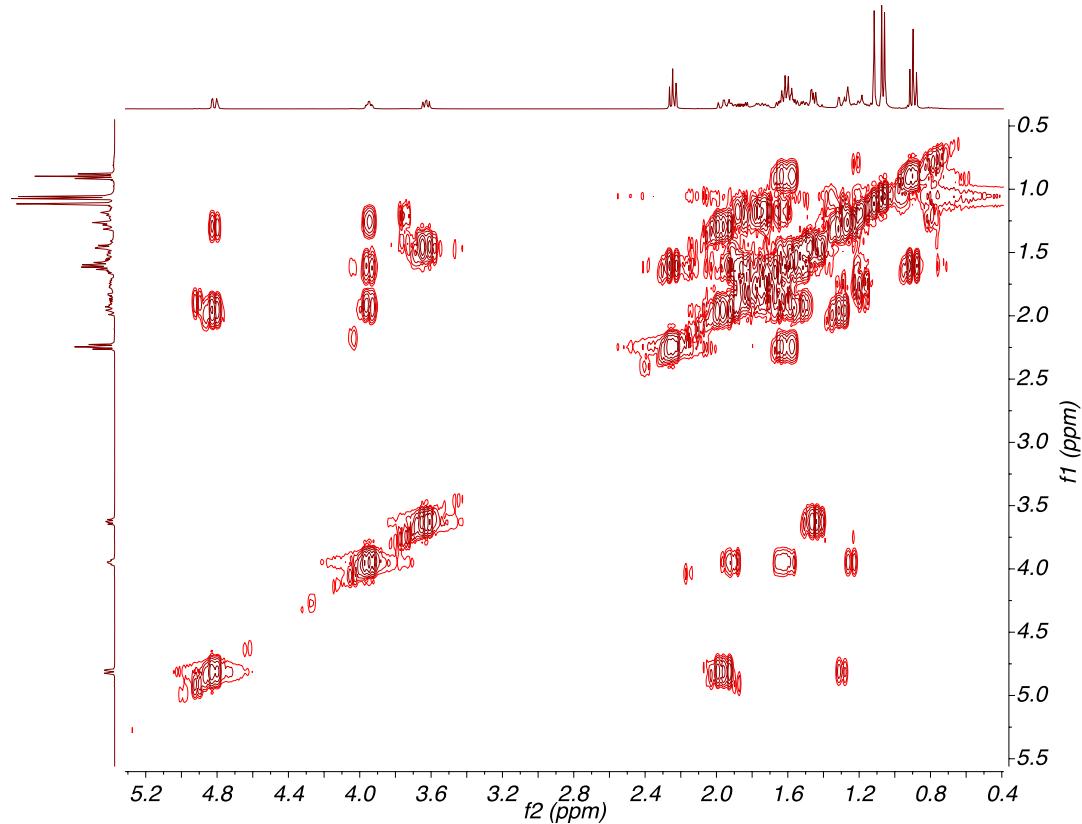


Figure A11.15. COSY (400 MHz, CDCl_3) of compound 228.

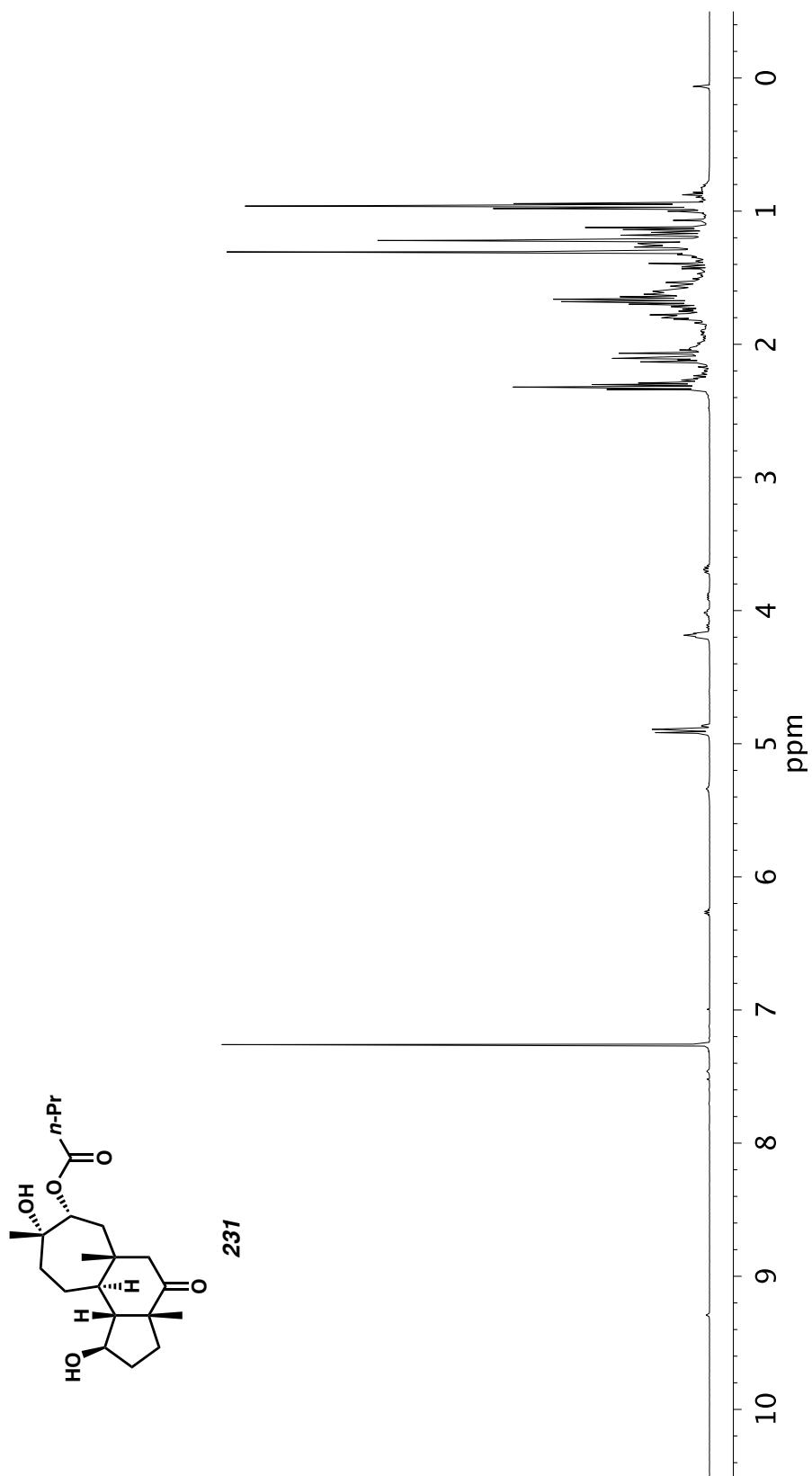


Figure A11.16. ^1H NMR (400 MHz, CDCl_3) of compound 231.

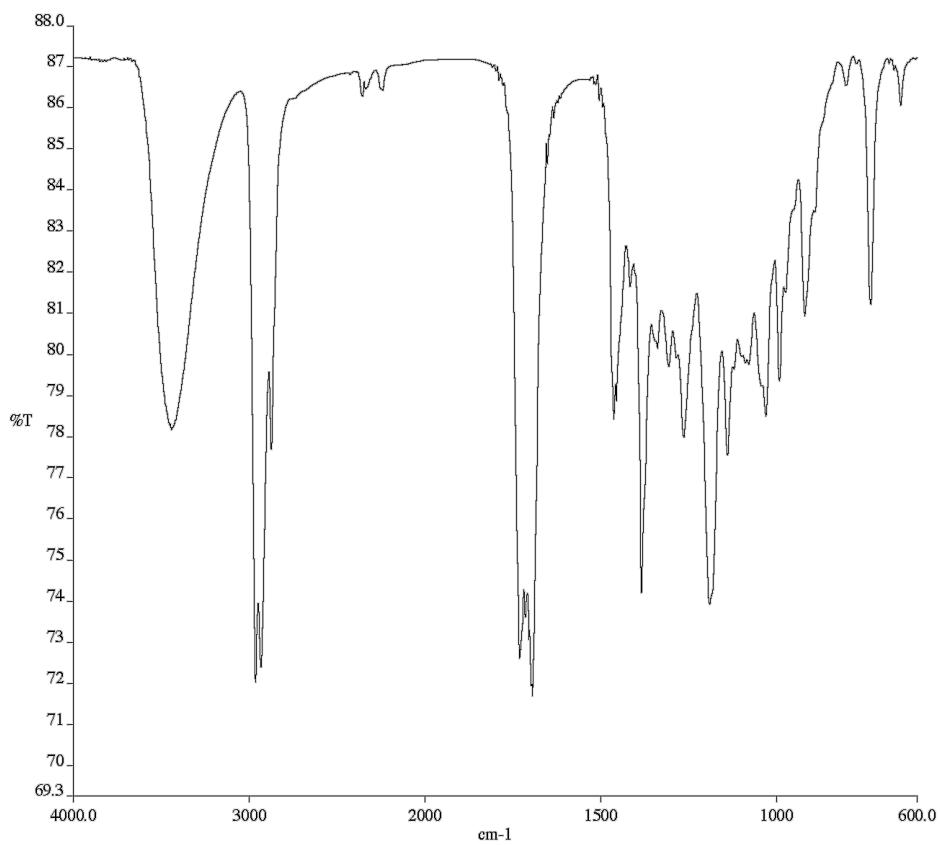


Figure A11.17. Infrared Spectrum (Thin Film, KBr) of compound **231**.

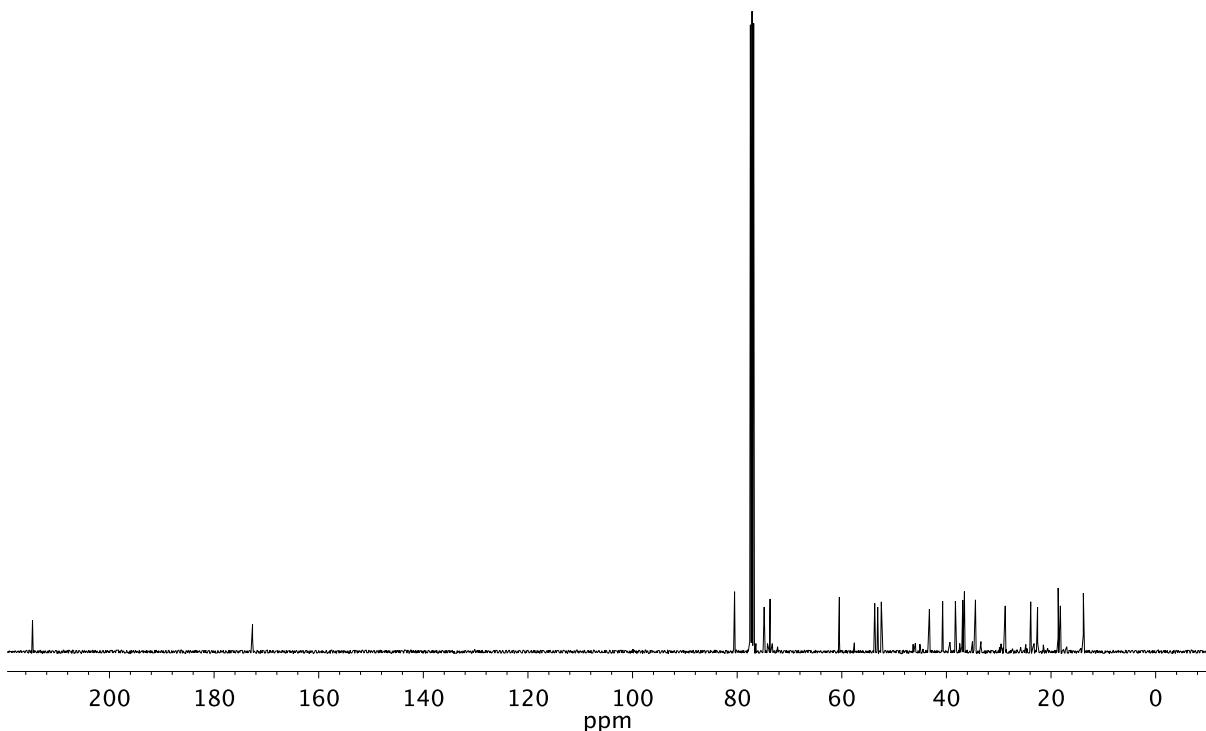
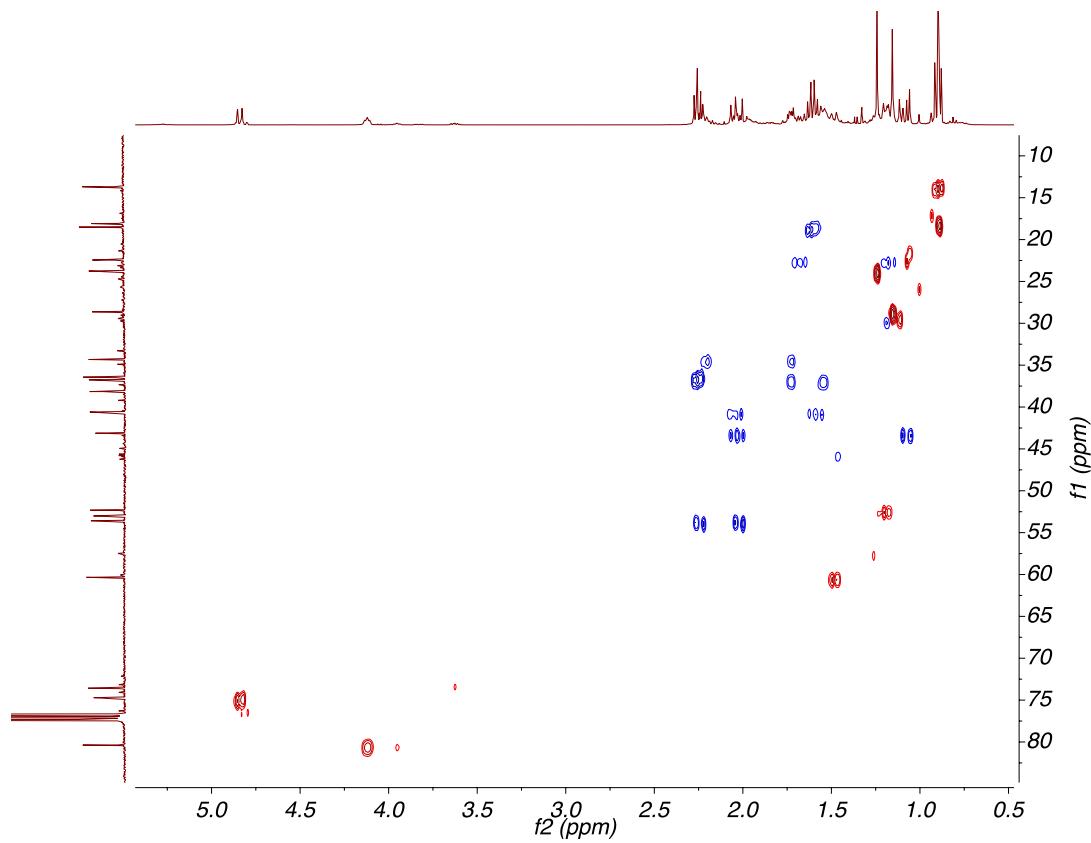
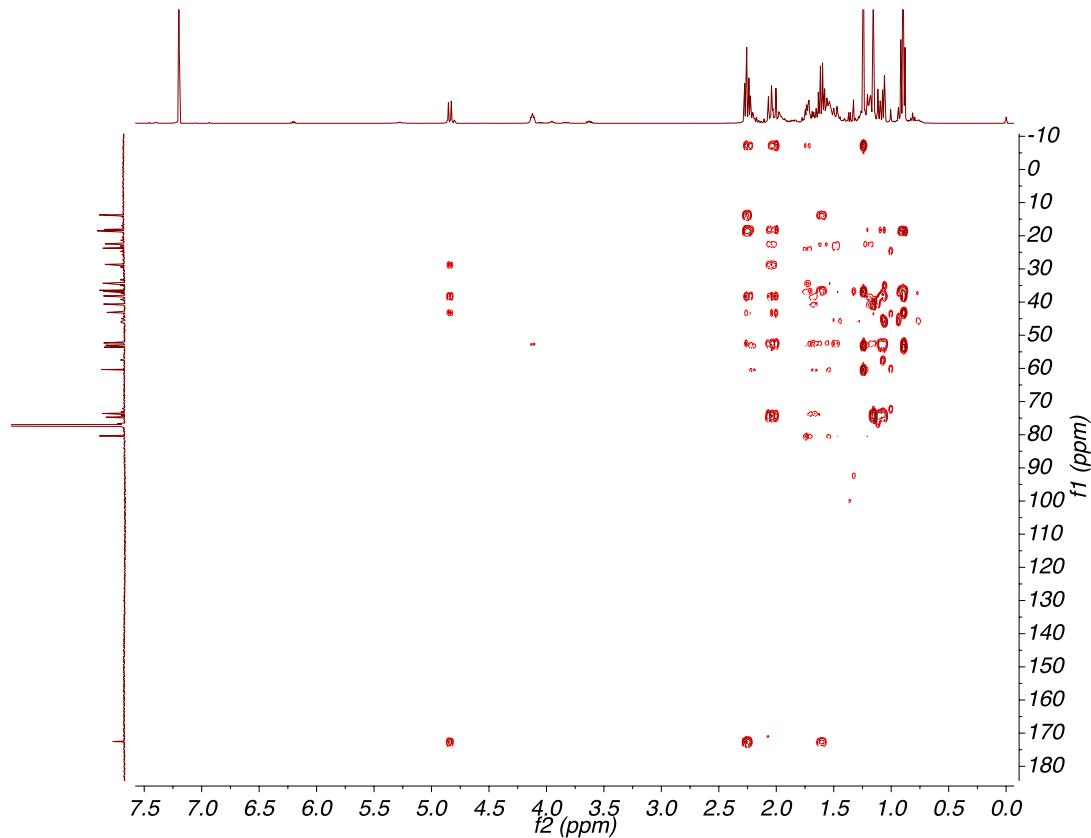


Figure A11.18. ^{13}C NMR (101 MHz, CDCl_3) of compound **231**.

Figure A11.19. HSQC (400, 101 MHz, CDCl_3) of compound 231.Figure A11.20. HMBC (400, 101 MHz, CDCl_3) of compound 231.

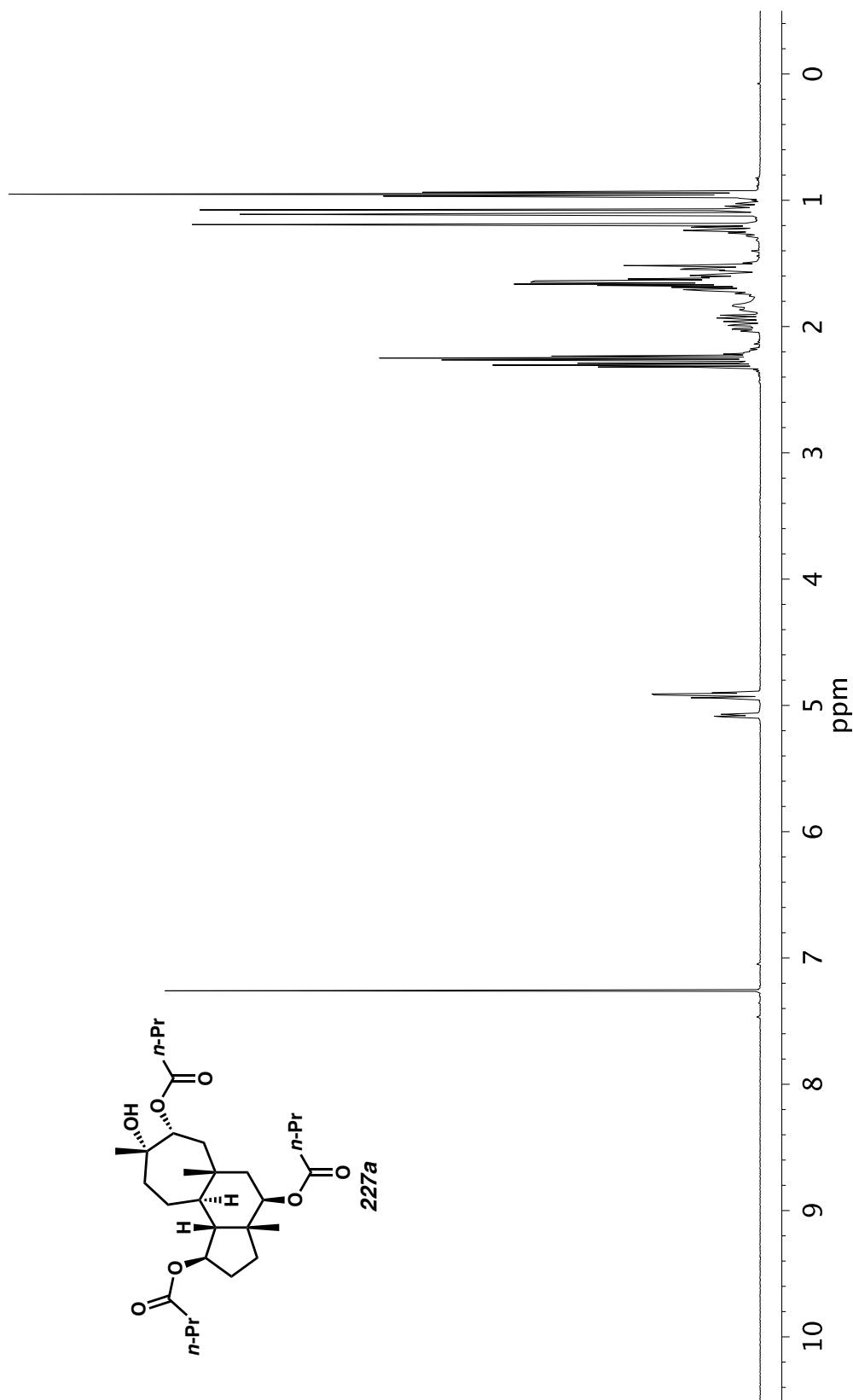


Figure A11.21. ^1H NMR (500 MHz, CDCl_3) of compound 227a.

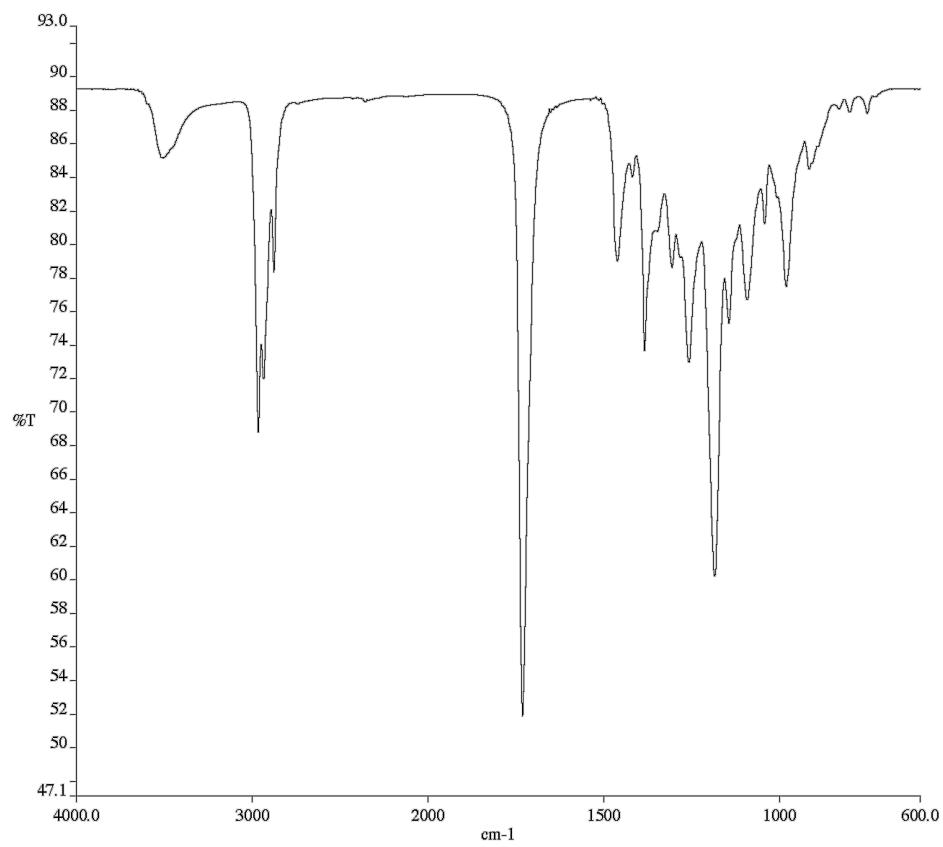


Figure A11.22. Infrared Spectrum (Thin Film, KBr) of compound **227a**.

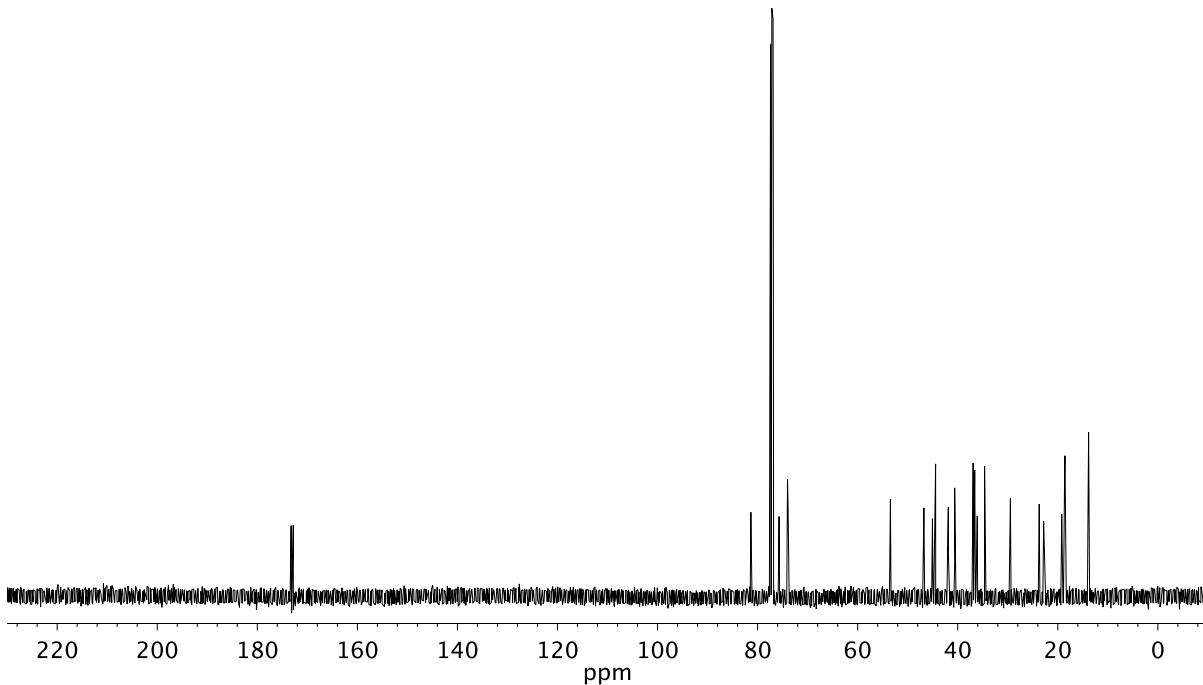


Figure A11.23. ^{13}C NMR (126 MHz, CDCl_3) of compound **227a**.

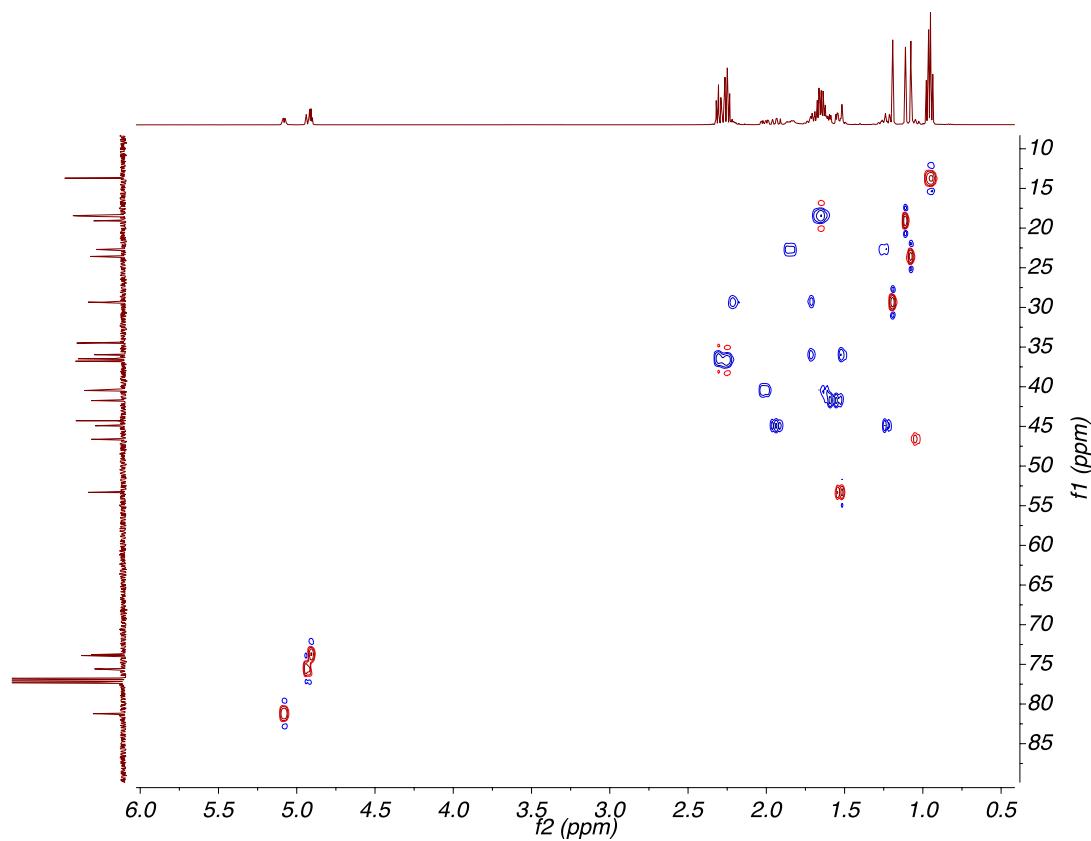


Figure A11.24. HSQC (500, 126 MHz, CDCl_3) of compound 227a.

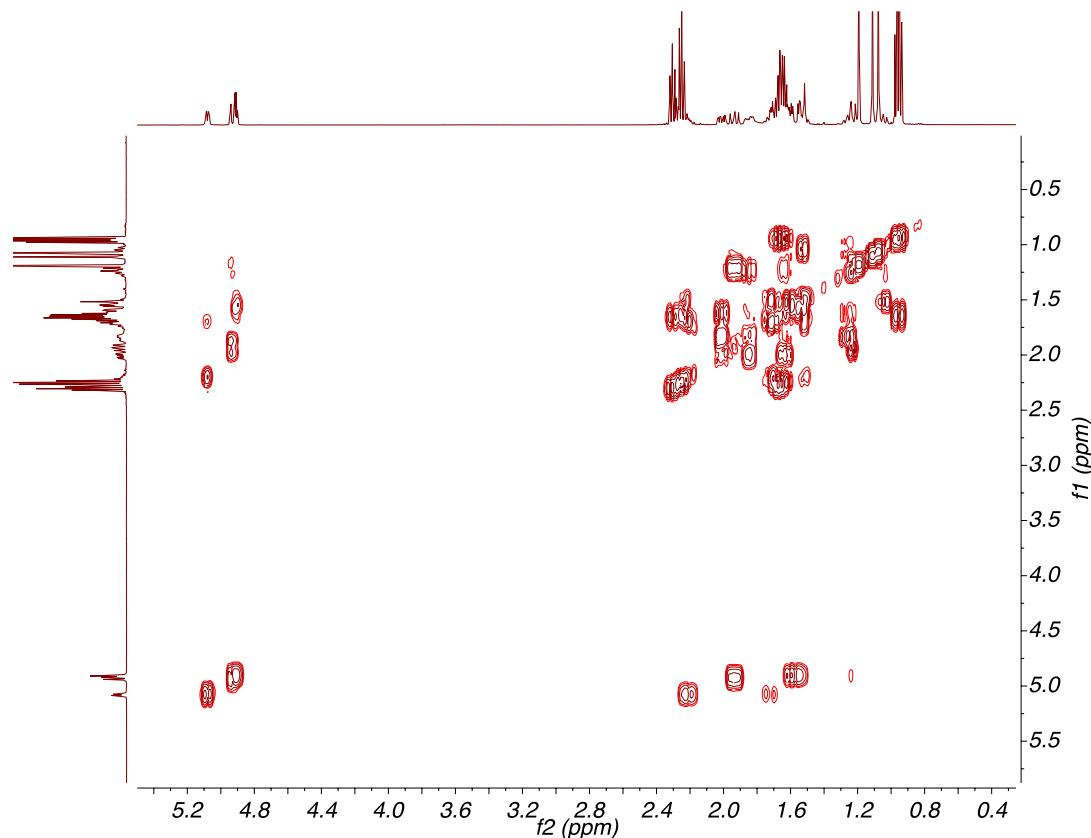


Figure A11.25. COSY (500 MHz, CDCl_3) of compound 227a.

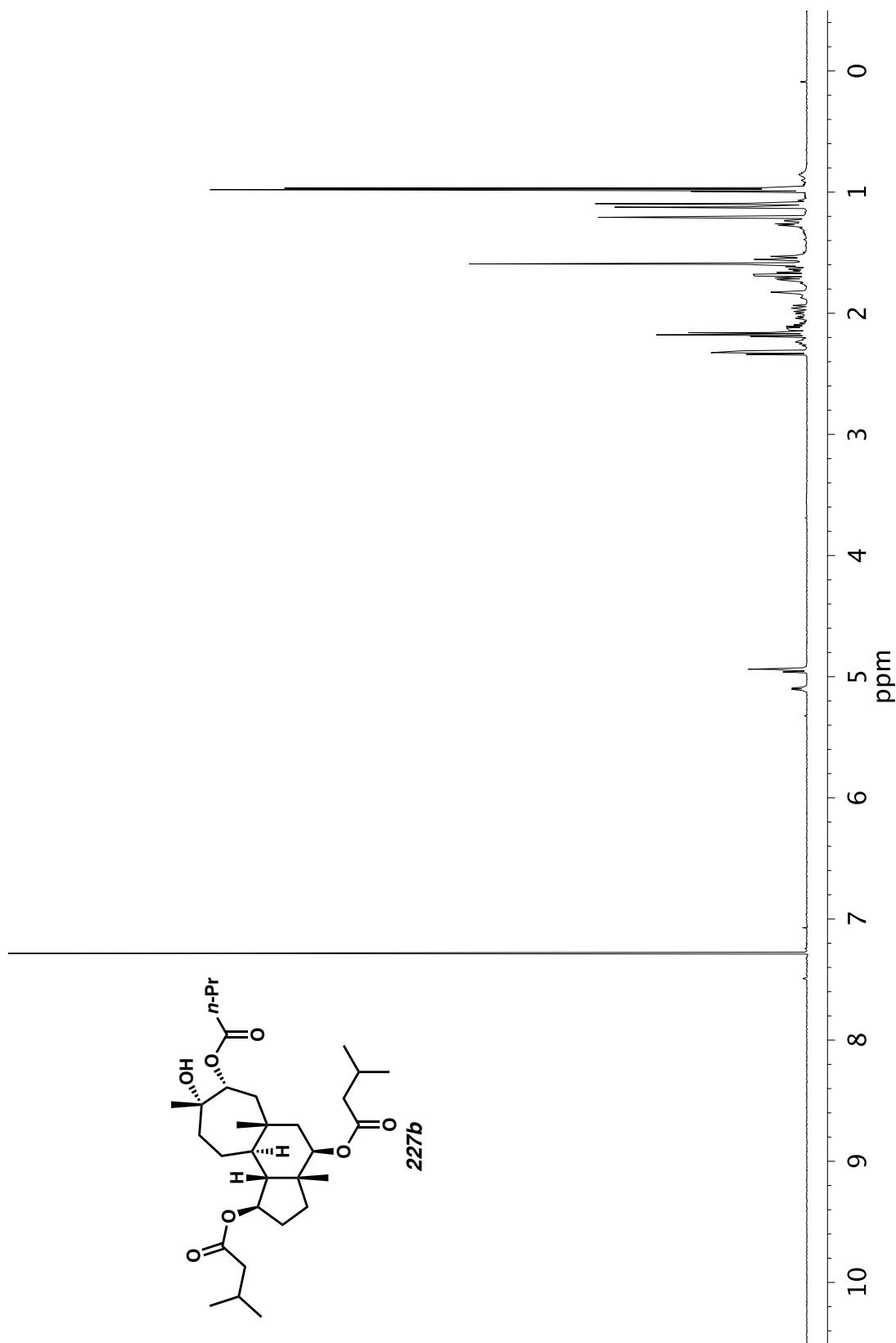


Figure A11.26. ^1H NMR (500 MHz, CDCl_3) of compound **227b**.

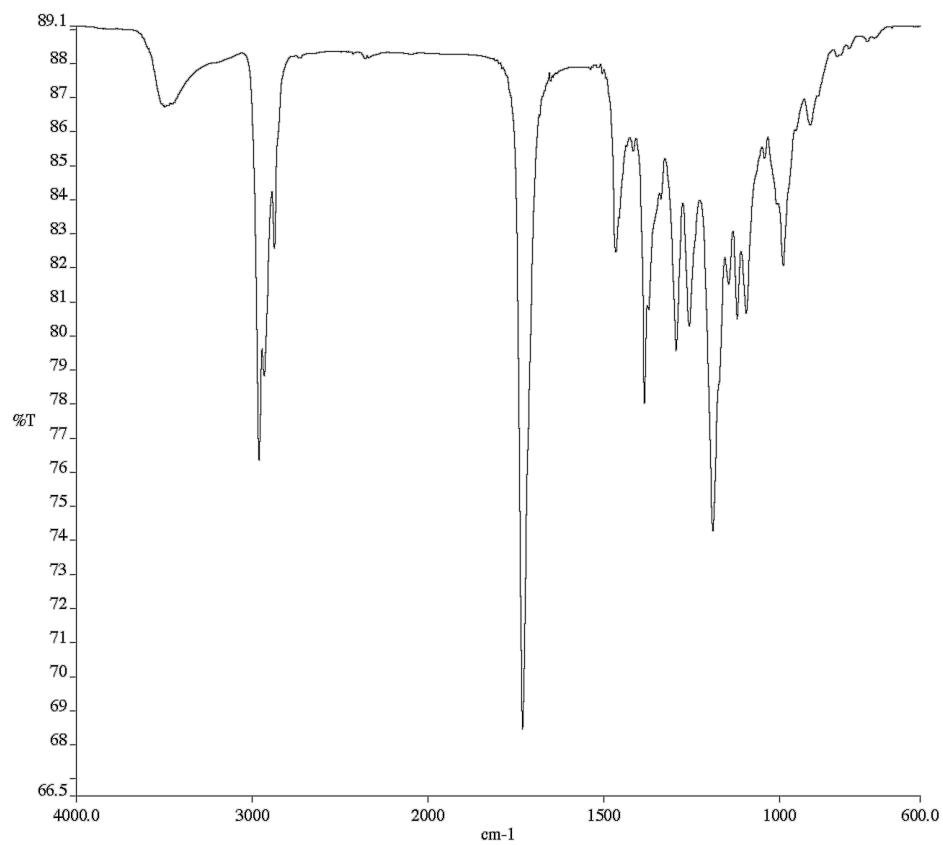


Figure A11.27. Infrared Spectrum (Thin Film, KBr) of compound **227b**.

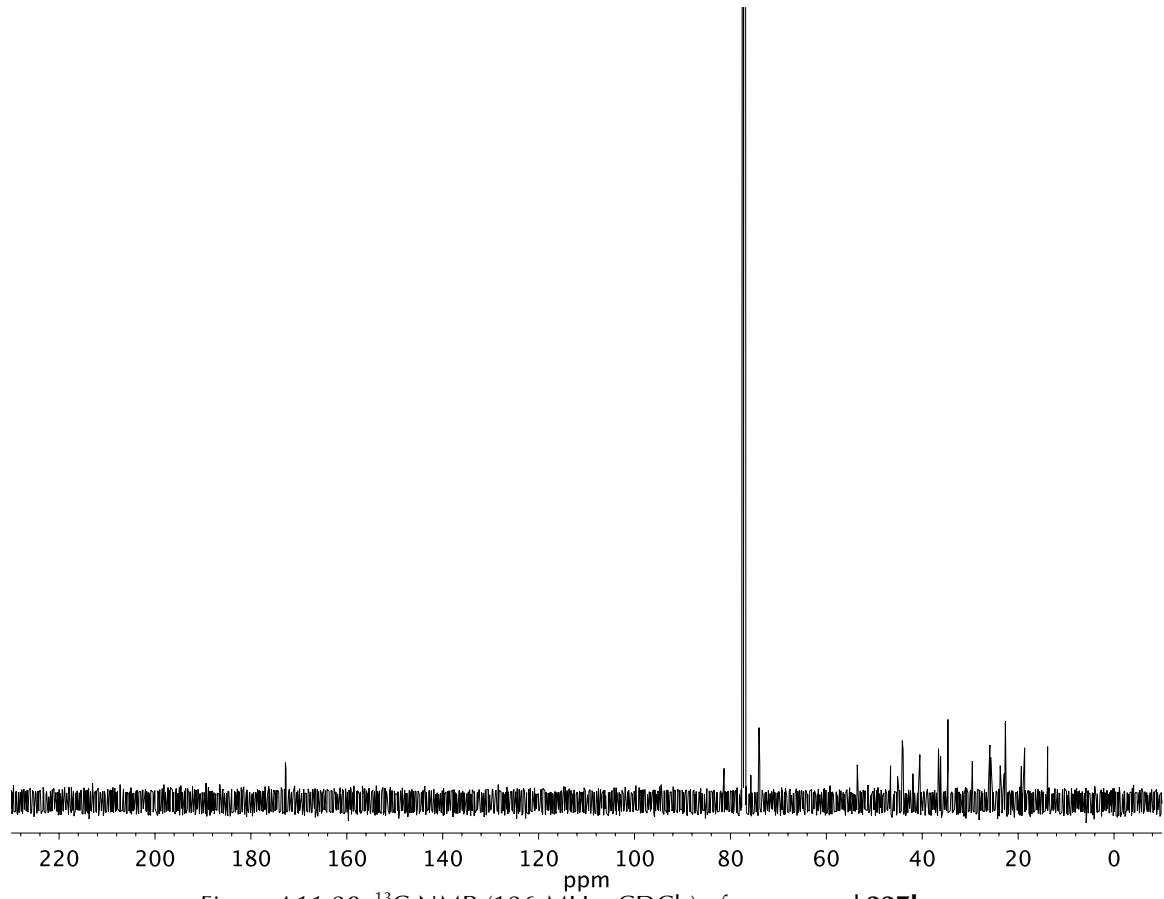
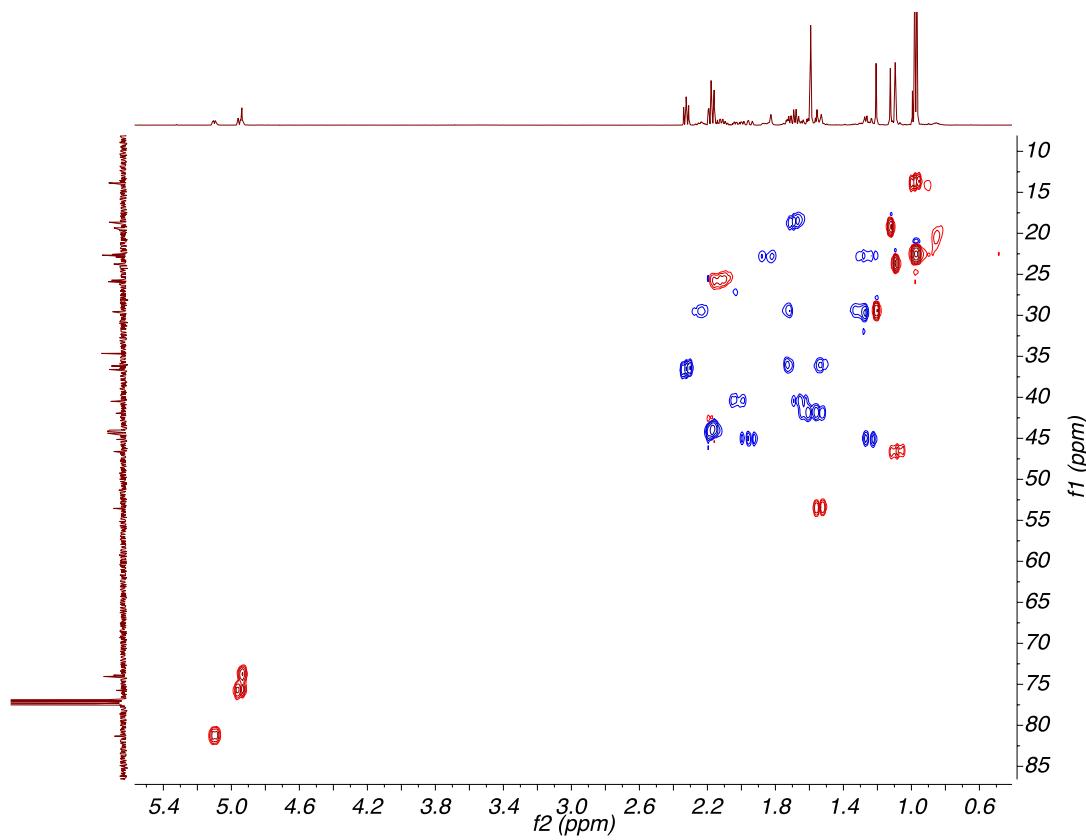
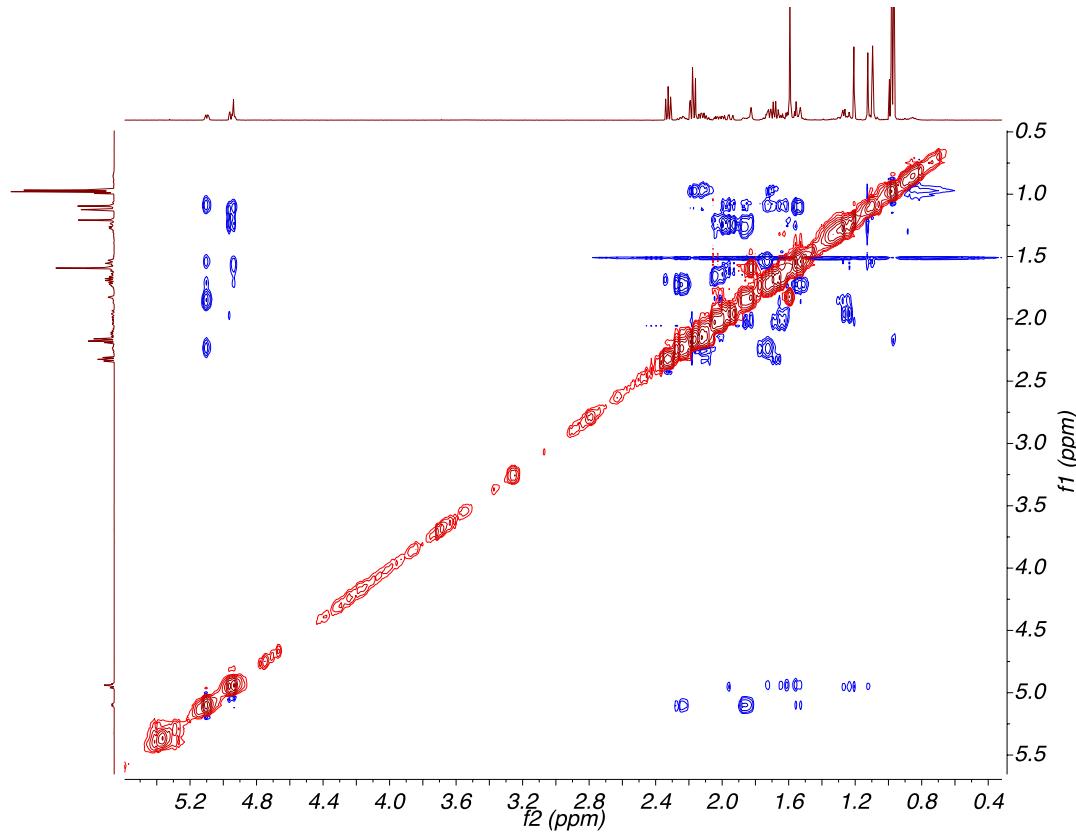


Figure A11.28. ^{13}C NMR (126 MHz, CDCl_3) of compound **227b**.

Figure A11.29. HSQC (400, 126 MHz, CDCl_3) of compound **227b**.Figure A11.30. NOESY (400 MHz, CDCl_3) of compound **227b**.

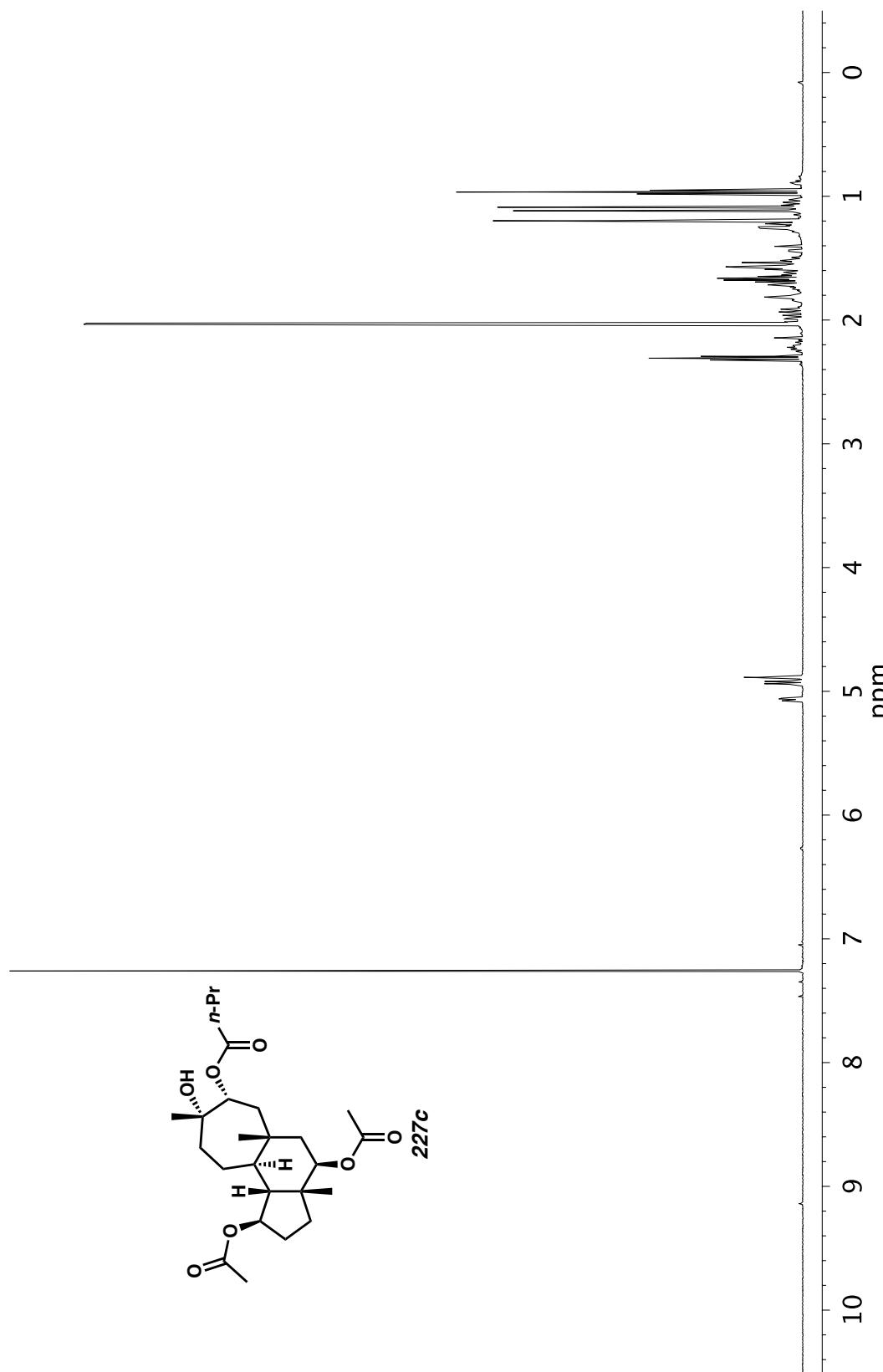


Figure A11.31. ^1H NMR (500 MHz, CDCl_3) of compound 227c.

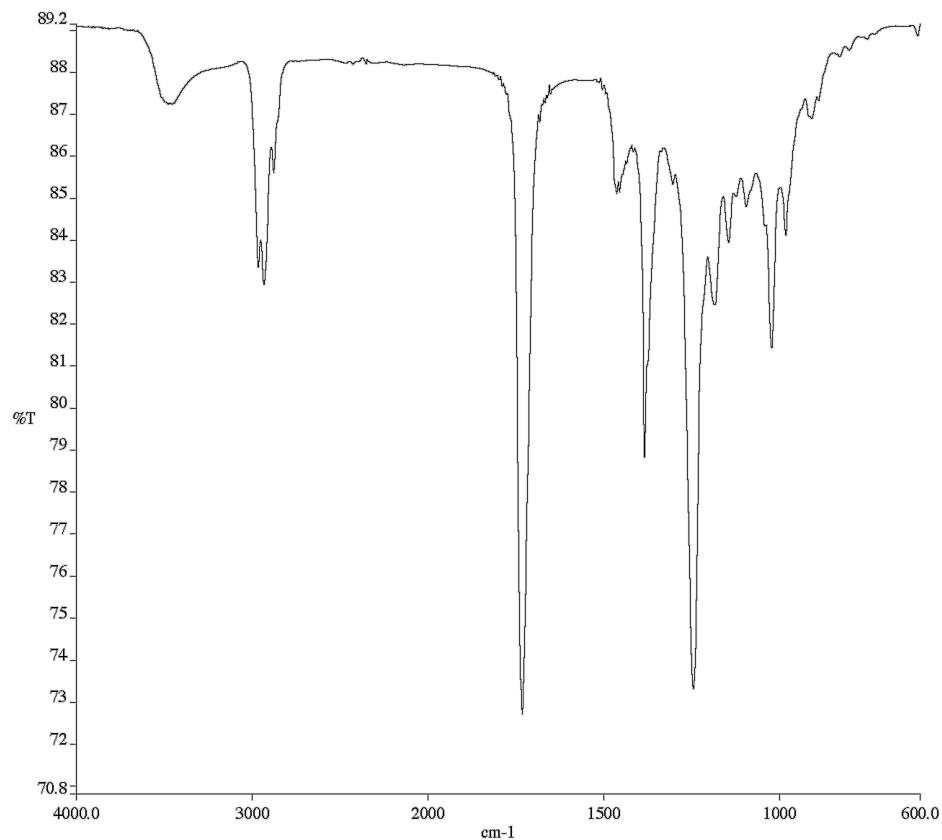


Figure A11.32. Infrared Spectrum (Thin Film, KBr) of compound **227c**.

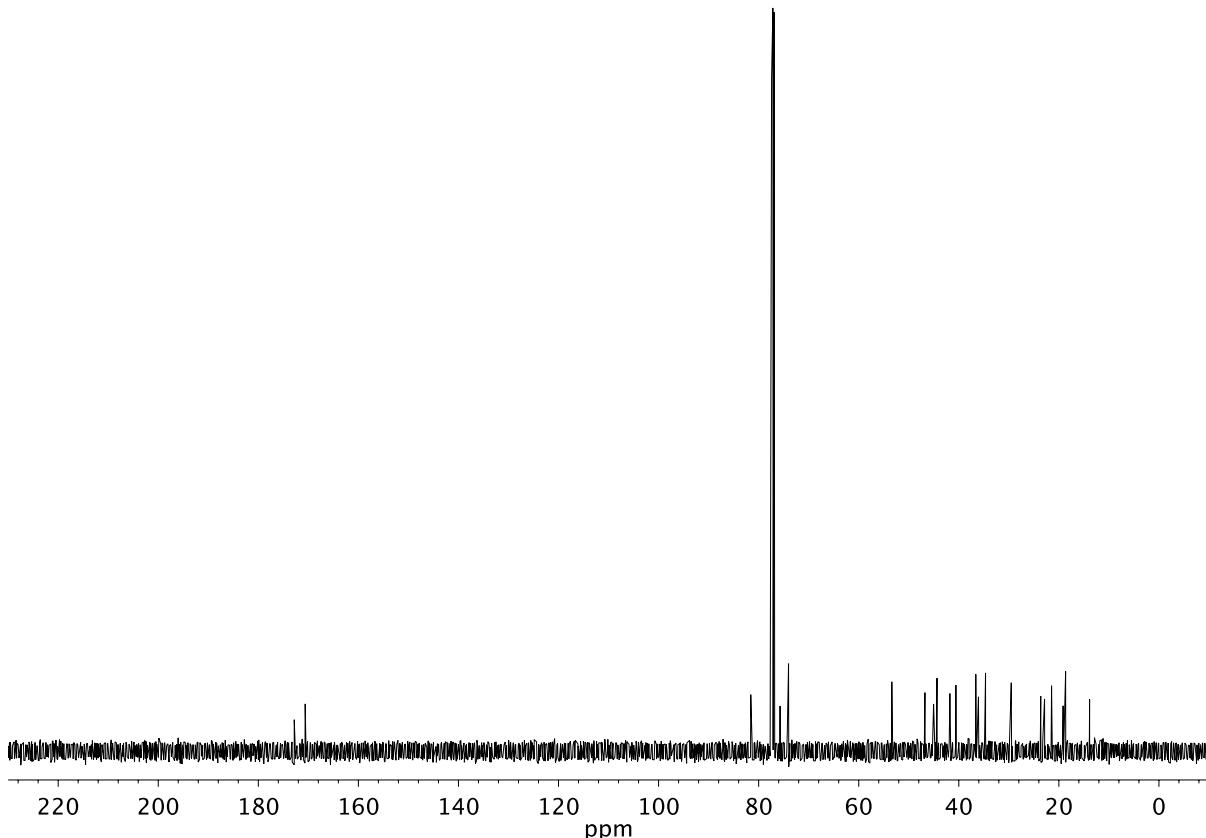
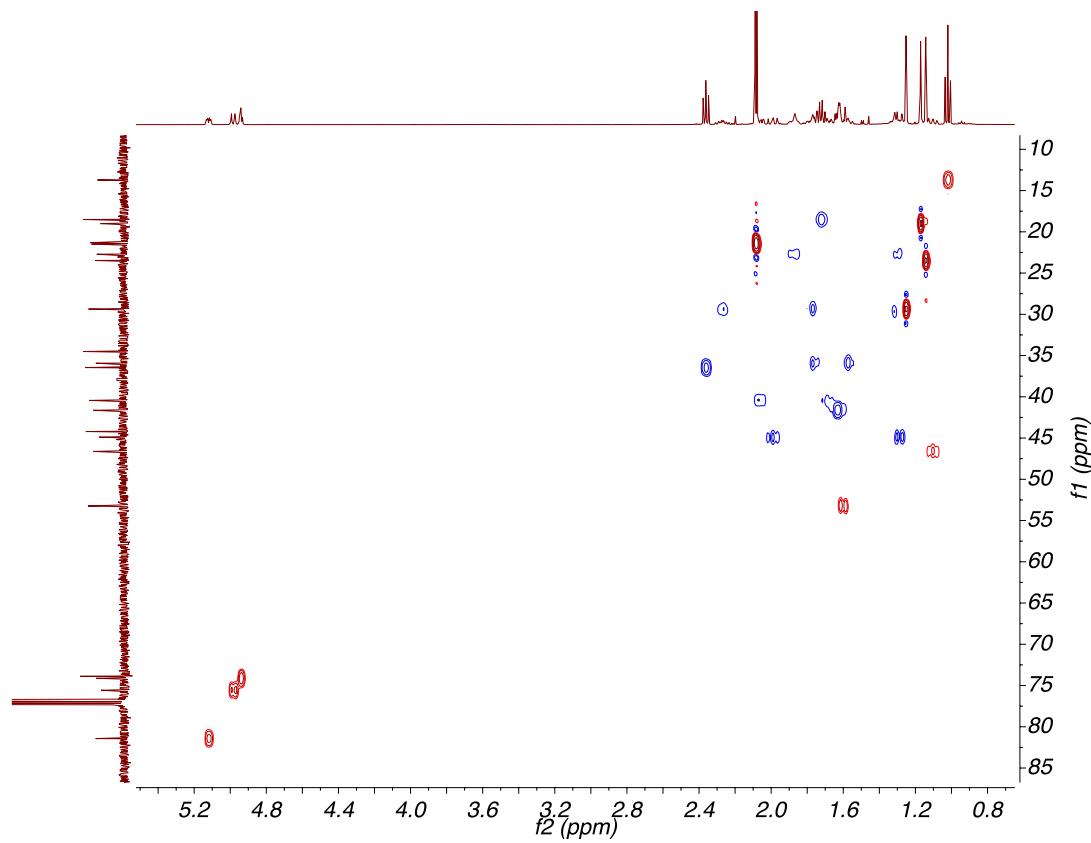
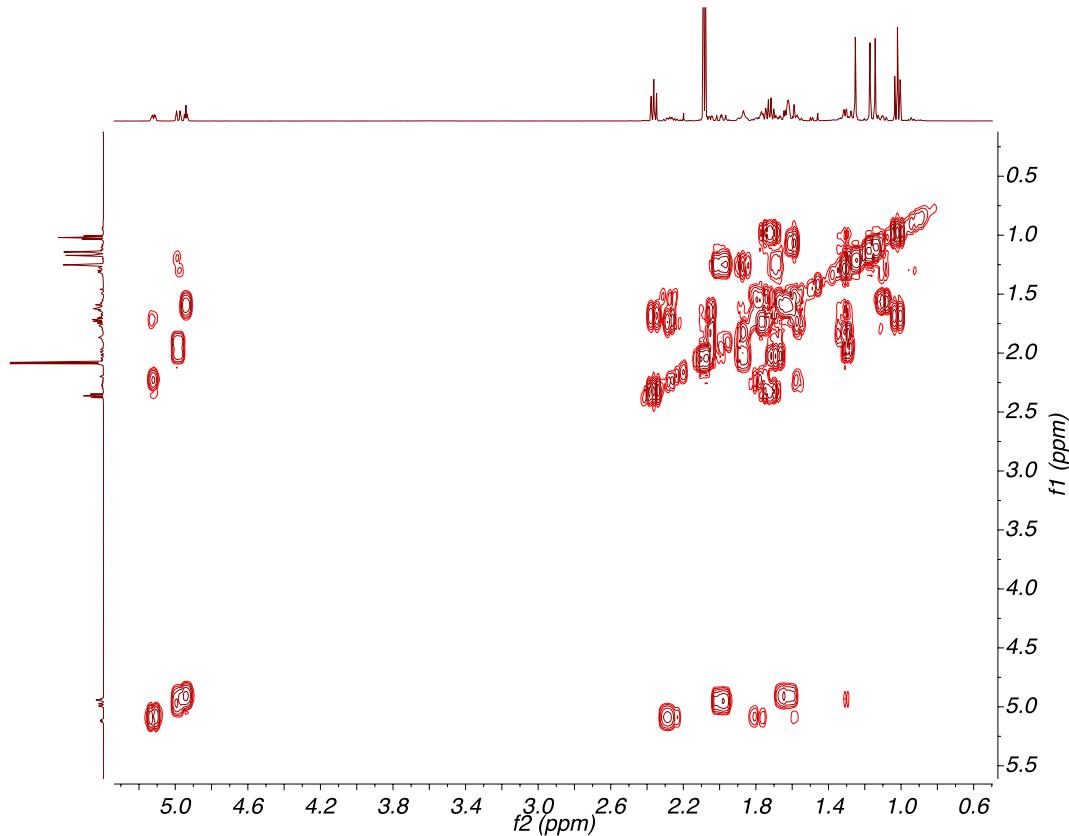


Figure A11.33. ¹³C NMR (126 MHz, CDCl₃) of compound **227c**.

Figure A11.34. HSQC (500, 126 MHz, CDCl_3) of compound **227c**.Figure A11.35. COSY (500 MHz, CDCl_3) of compound **227c**.

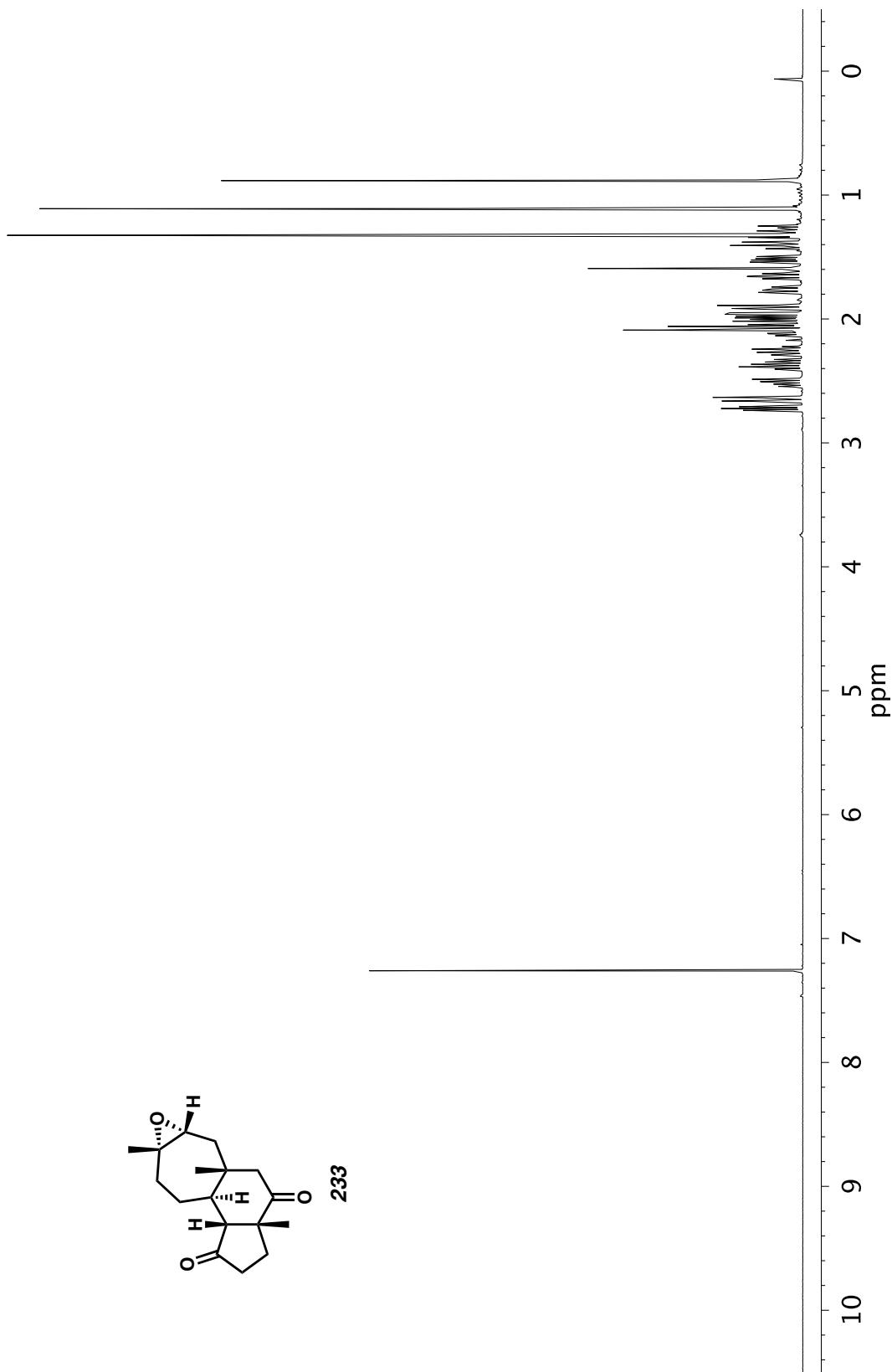


Figure A11.36. ^1H NMR (500 MHz, CDCl_3) of compound 233.

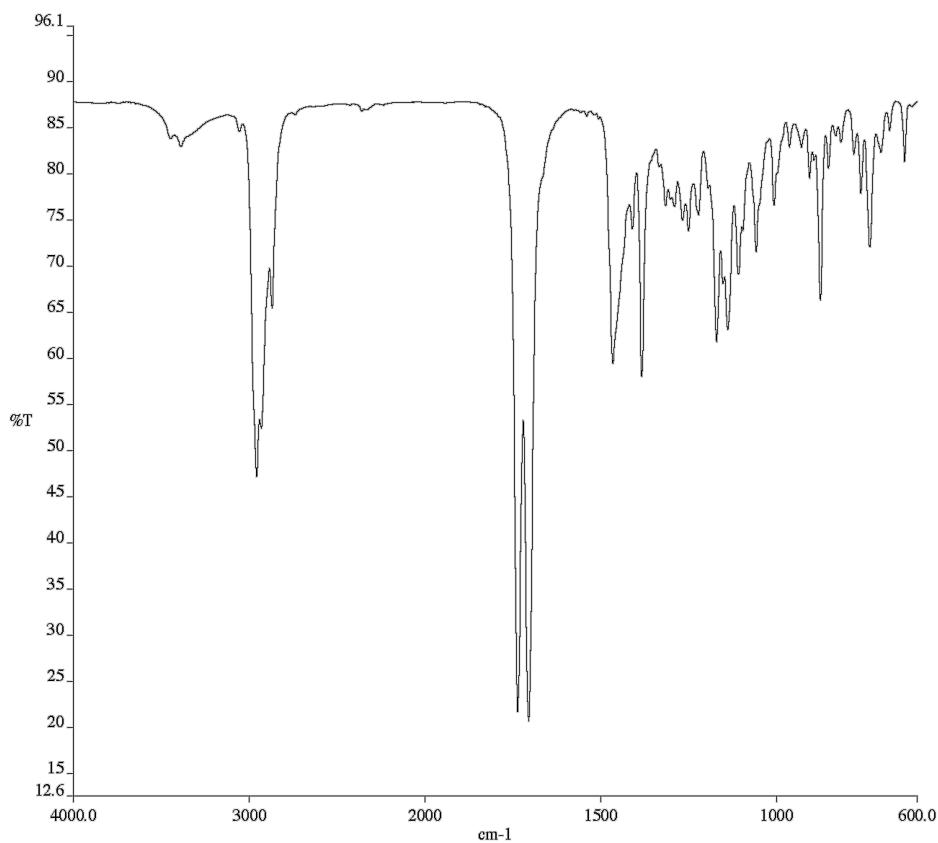


Figure A11.37. Infrared Spectrum (Thin Film, KBr) of compound 233.

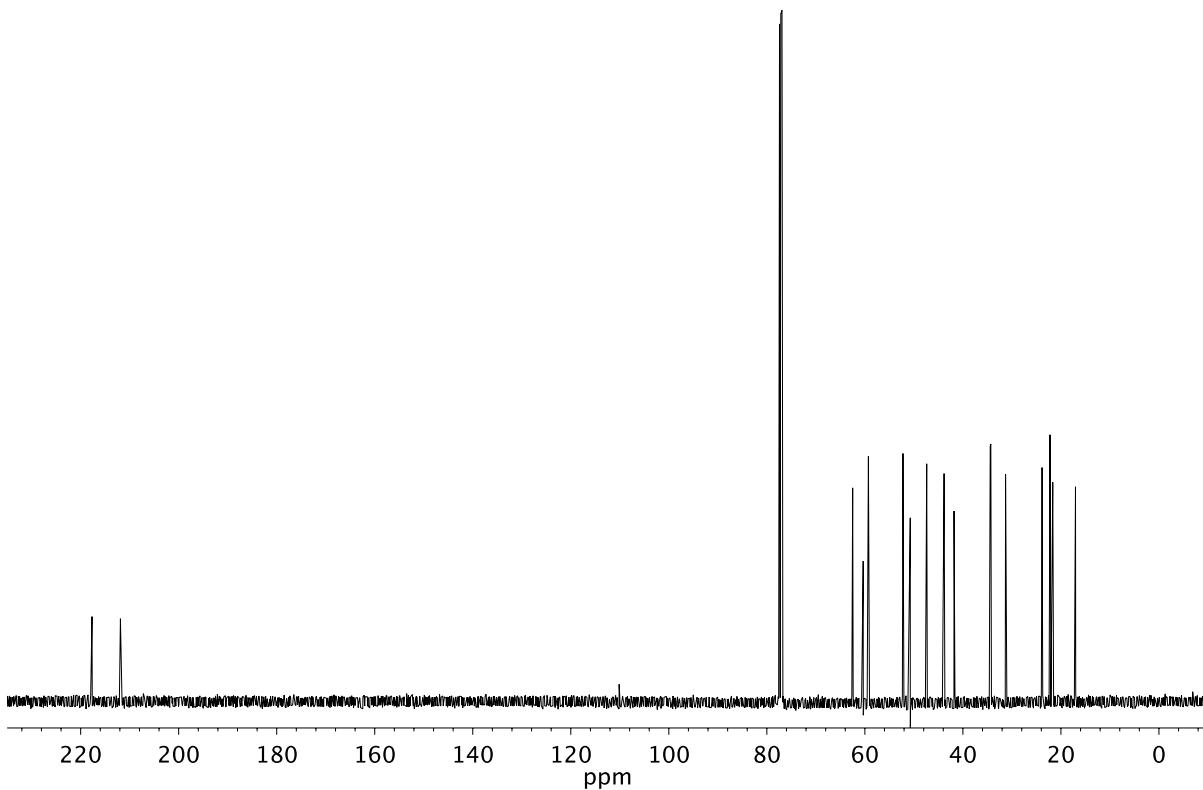
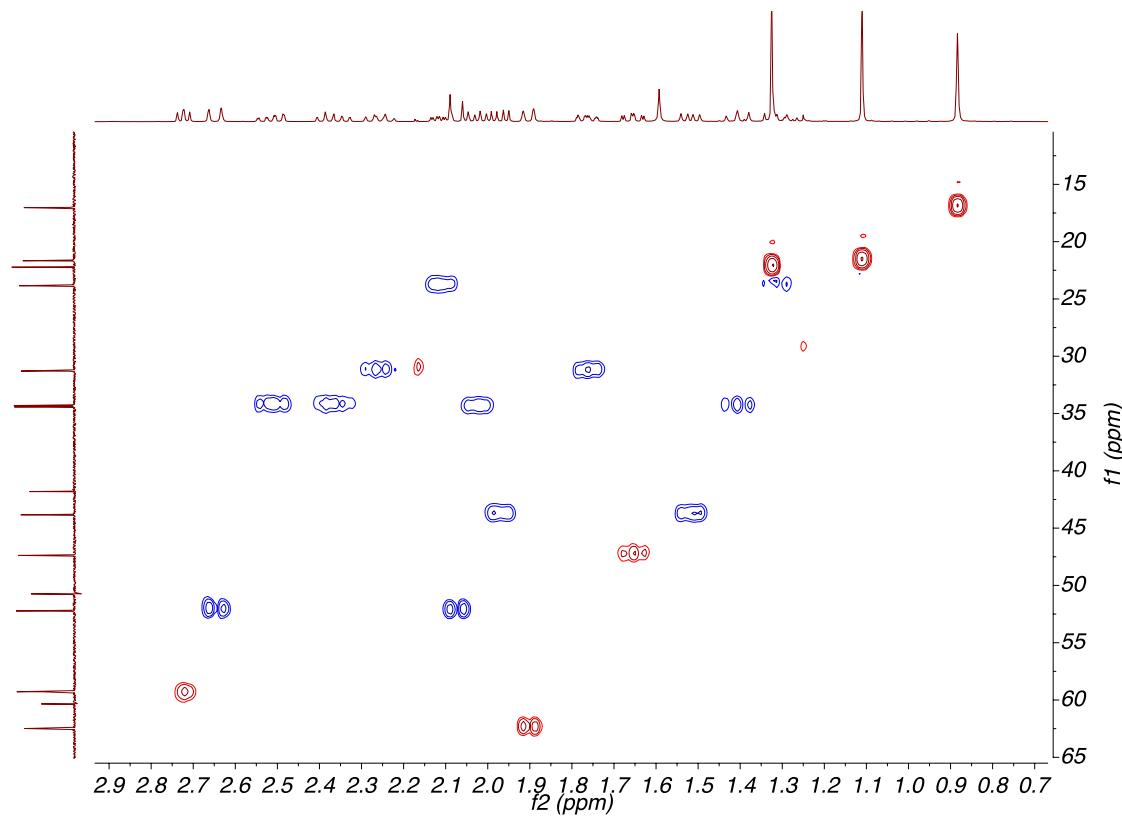
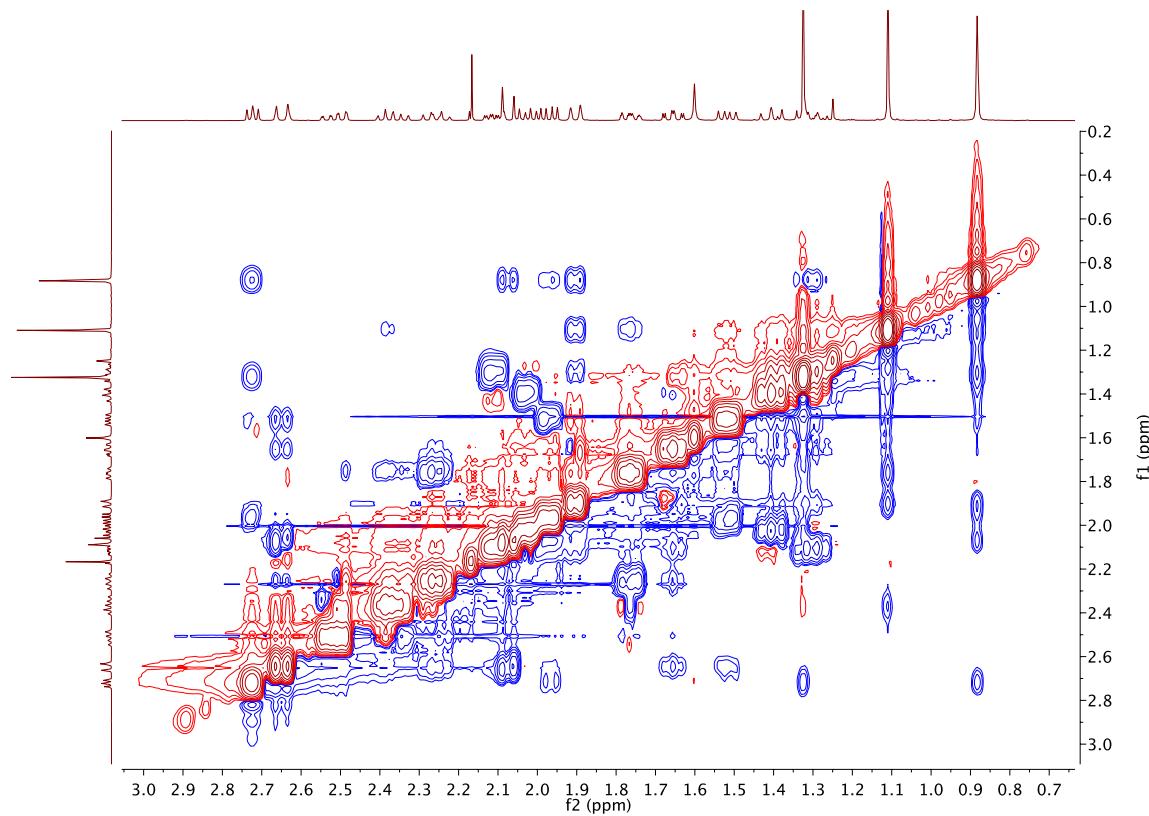


Figure A11.38. ^{13}C NMR (126 MHz, CDCl_3) of compound 233.

Figure A11.39. HSQC (500, 126 MHz, CDCl_3) of compound 233.Figure A11.40. NOESY (500 MHz, CDCl_3) of compound 233.

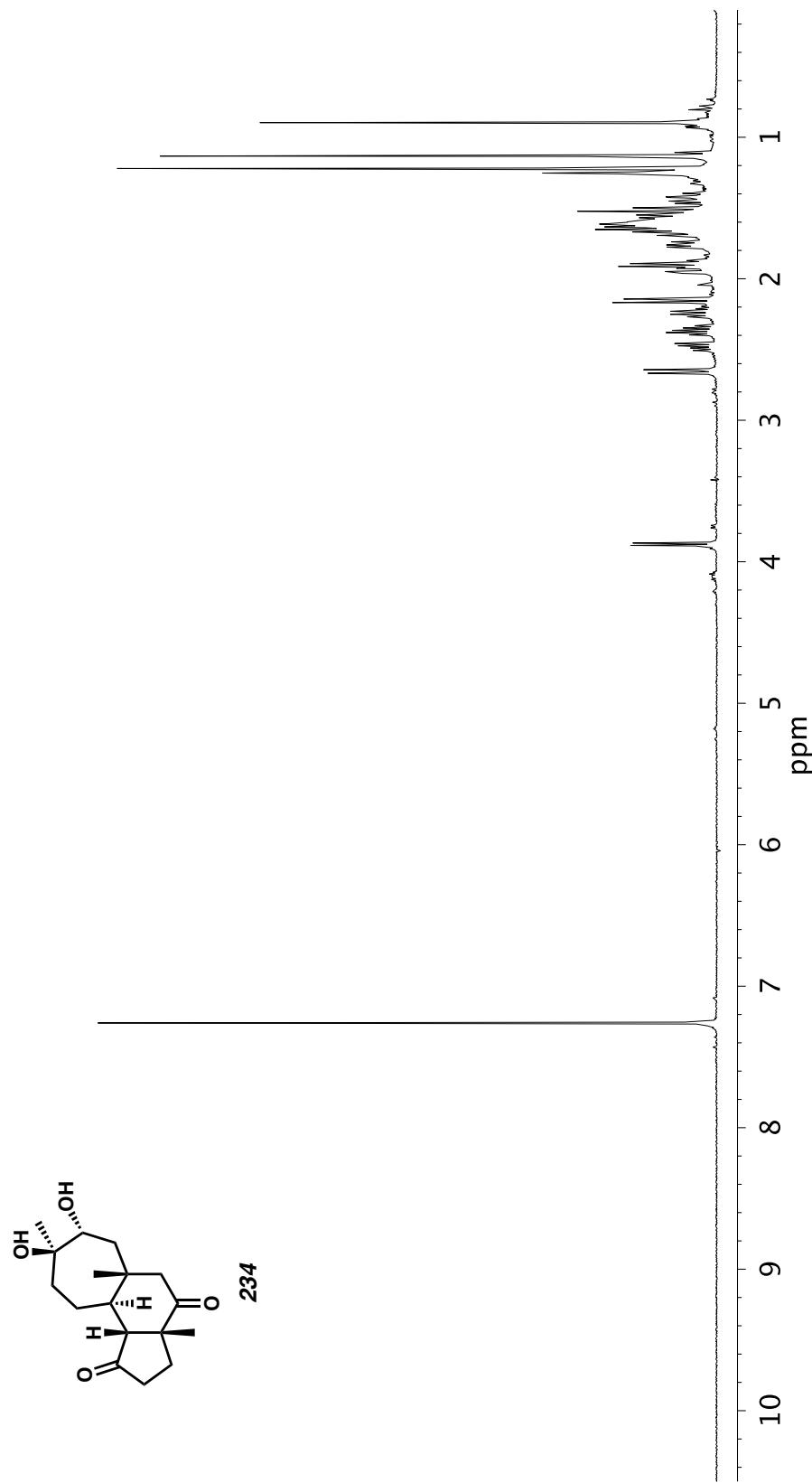


Figure A11.41. ^1H NMR (600 MHz, CDCl_3) of compound 234.

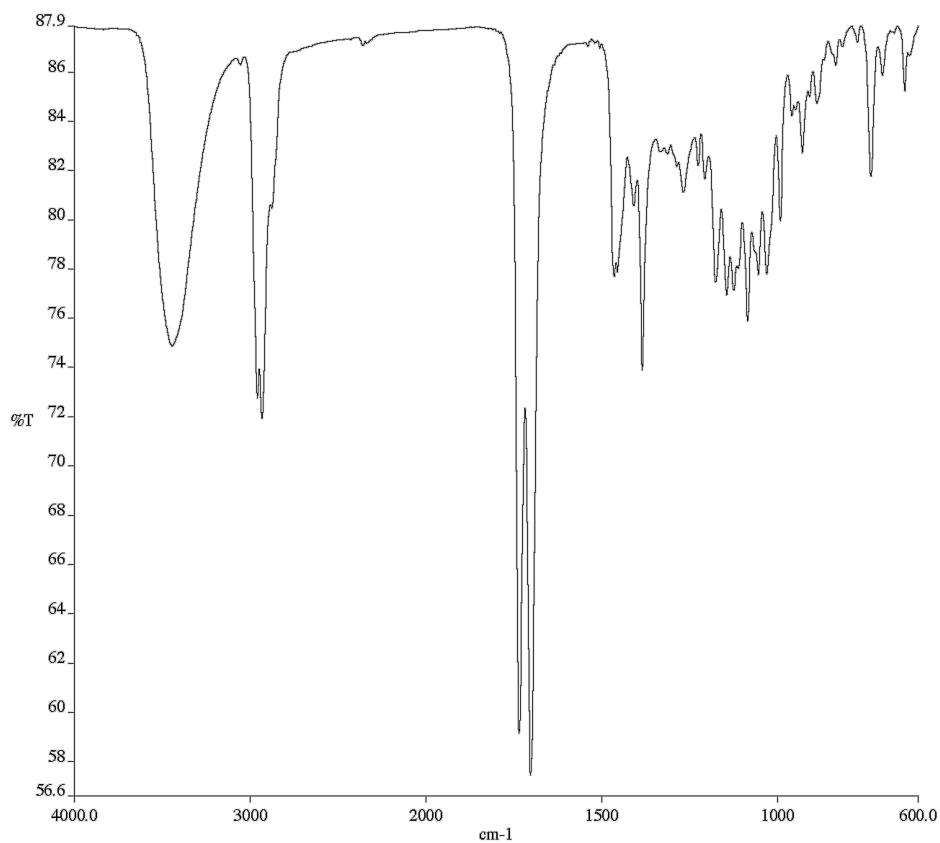


Figure A11.42. Infrared Spectrum (Thin Film, KBr) of compound 234.

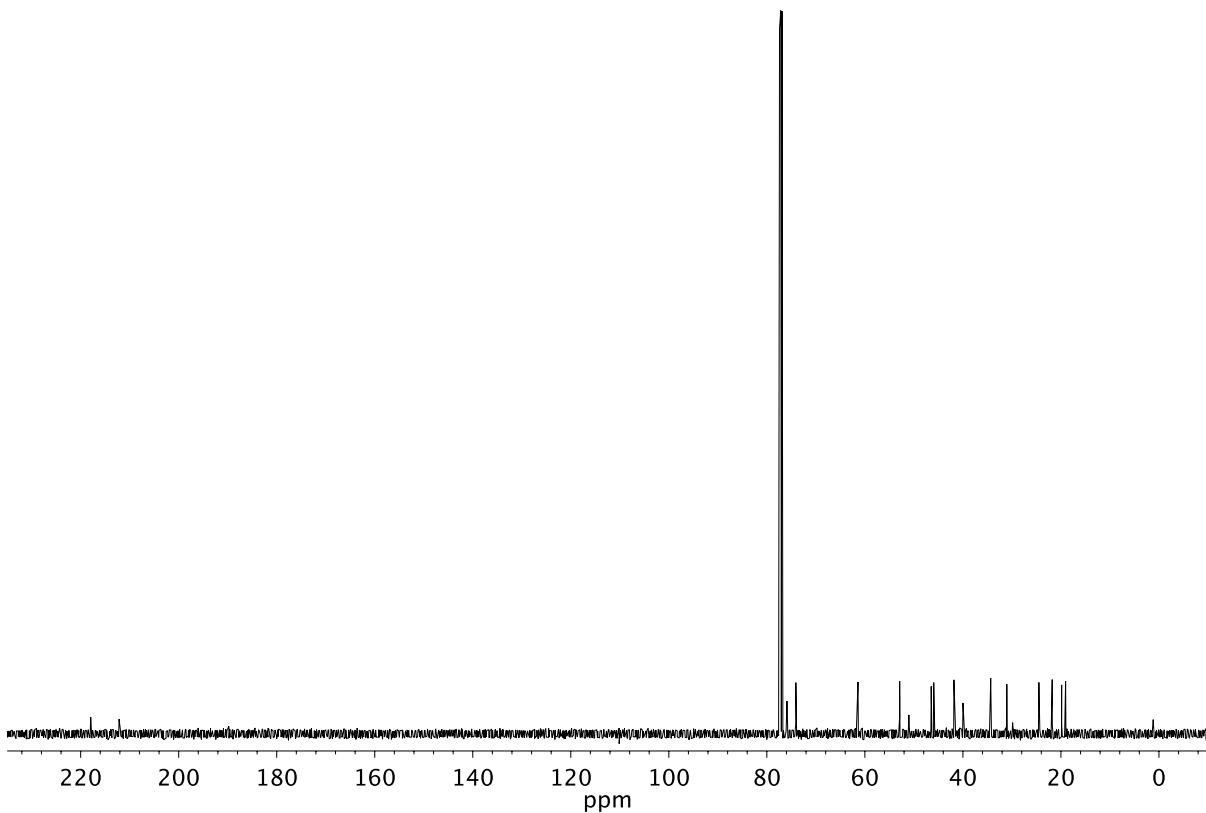
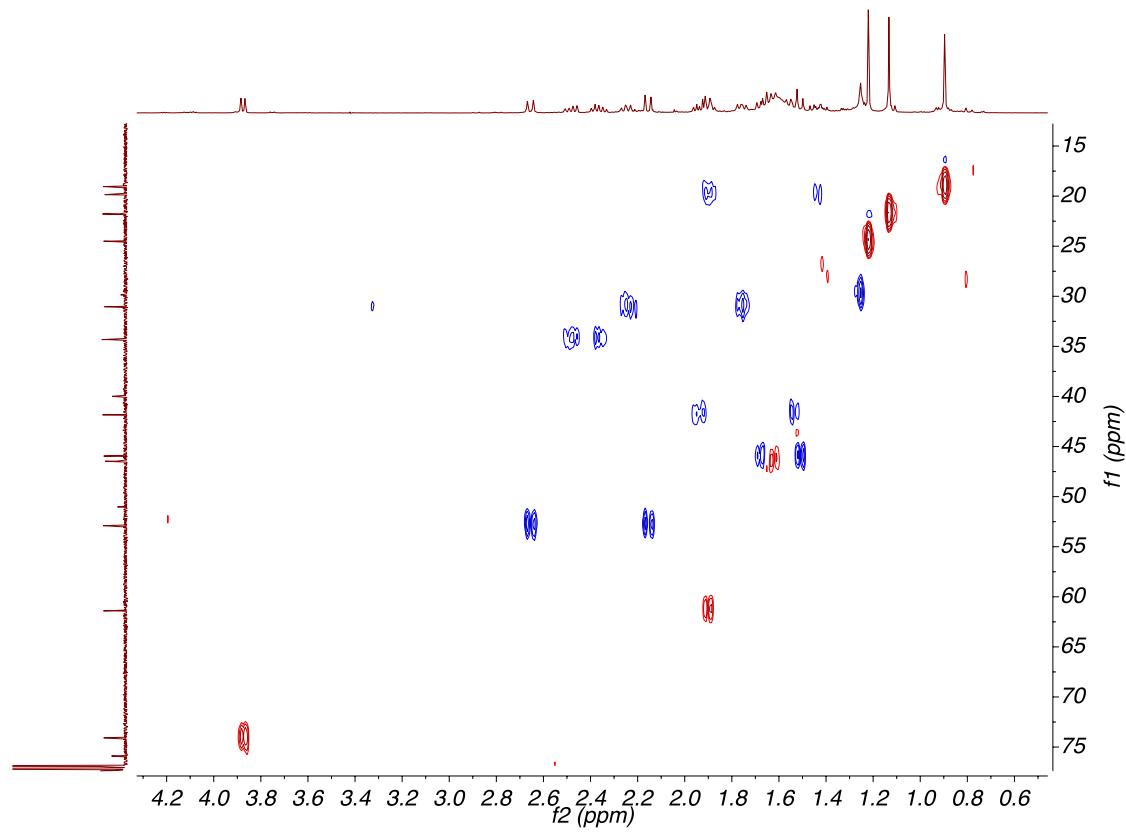
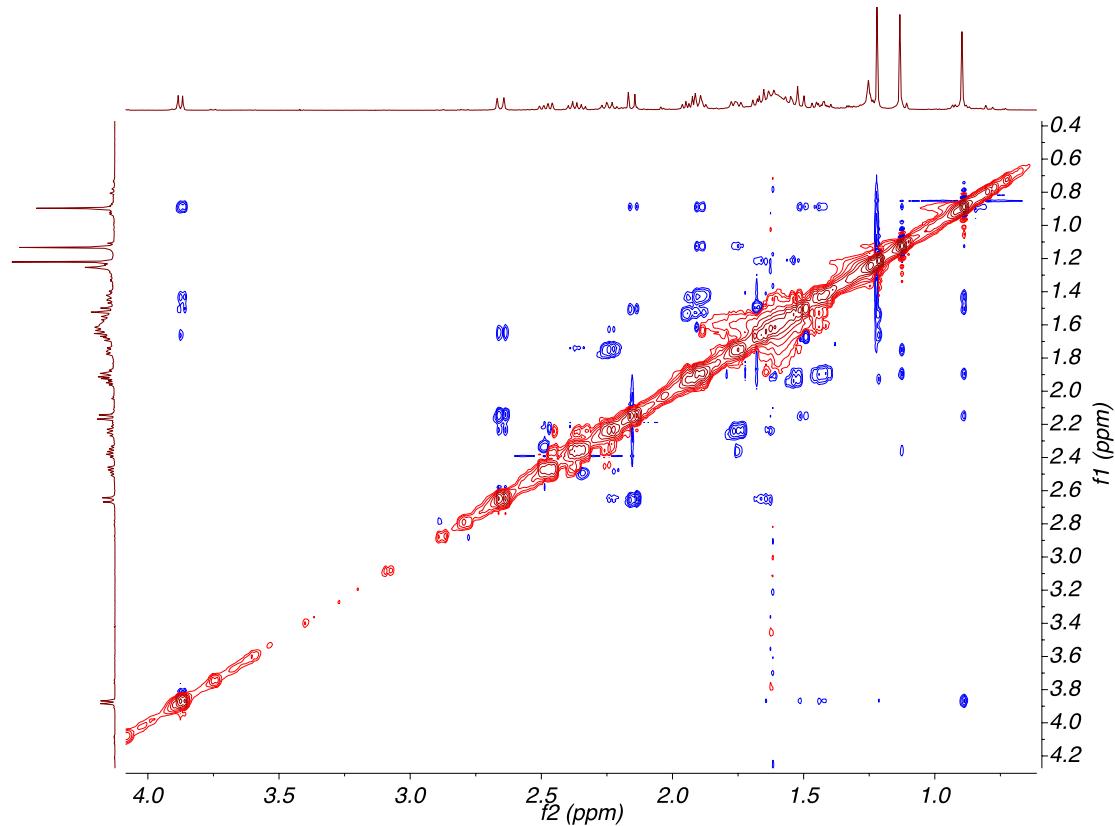


Figure A11.43. ^{13}C NMR (126 MHz, CDCl_3) of compound 234.

Figure A11.44. HSQC (600, 126 MHz, CDCl_3) of compound 234.Figure A11.45. NOESY (600 MHz, CDCl_3) of compound 234.

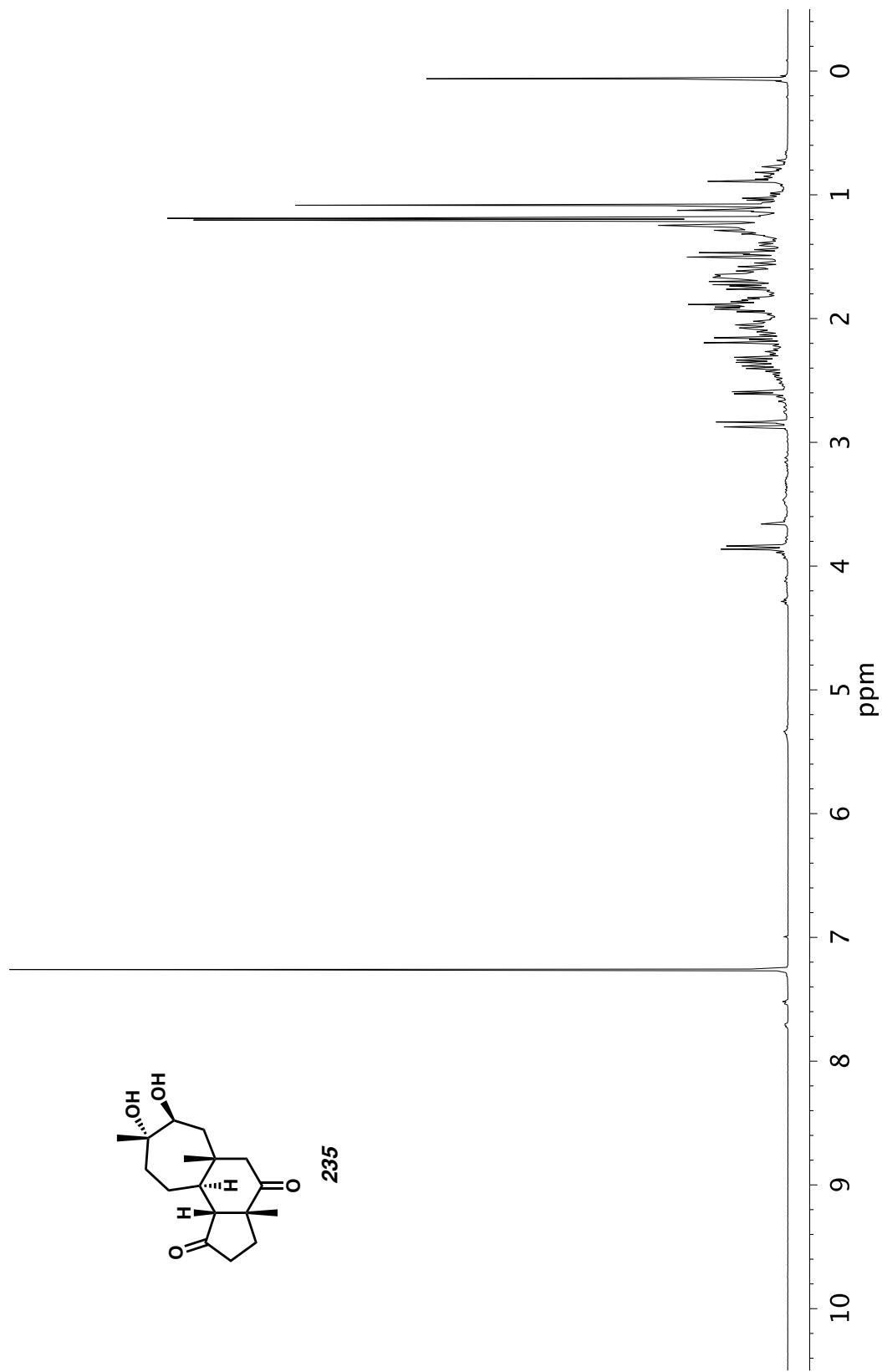


Figure A11.46. ^1H NMR (400 MHz, CDCl_3) of compound 235.

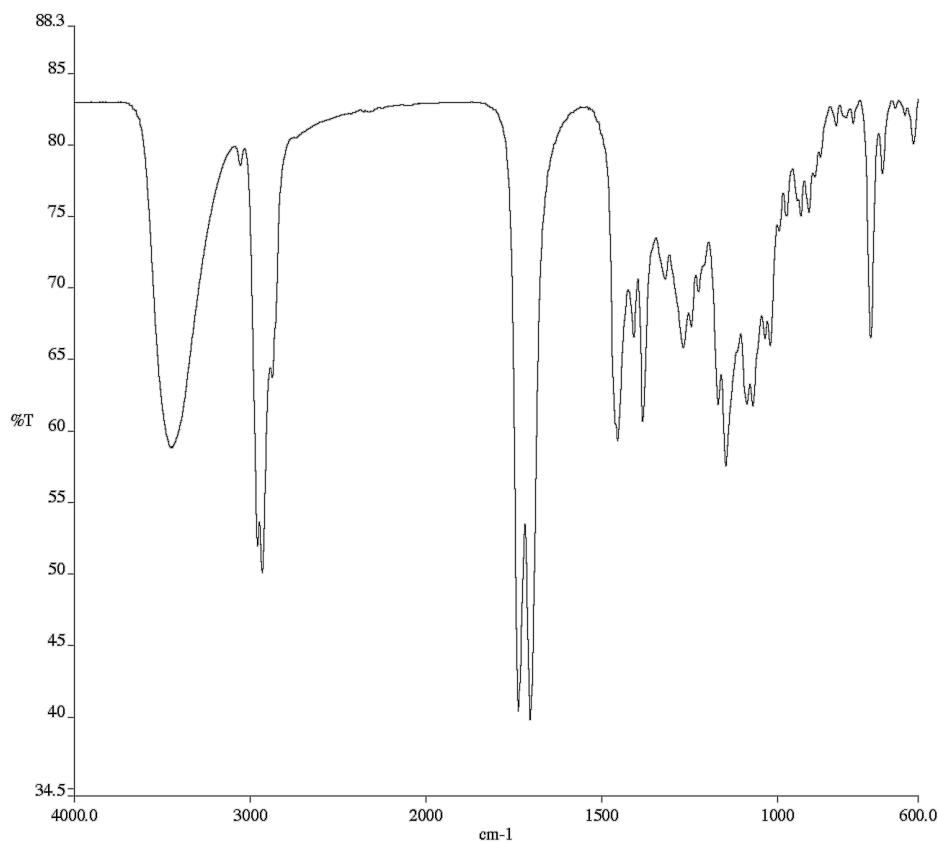


Figure A11.47. Infrared Spectrum (Thin Film, KBr) of compound 235.

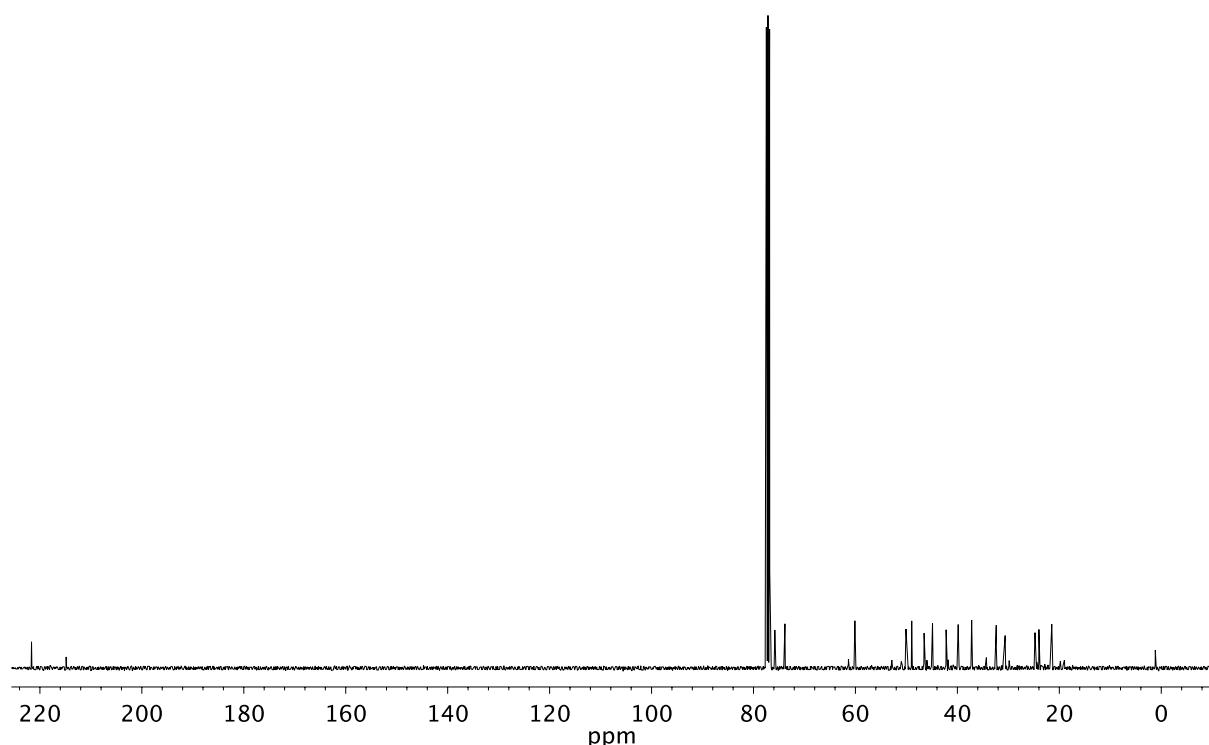


Figure A11.48. ^{13}C NMR (101 MHz, CDCl_3) of compound 235.

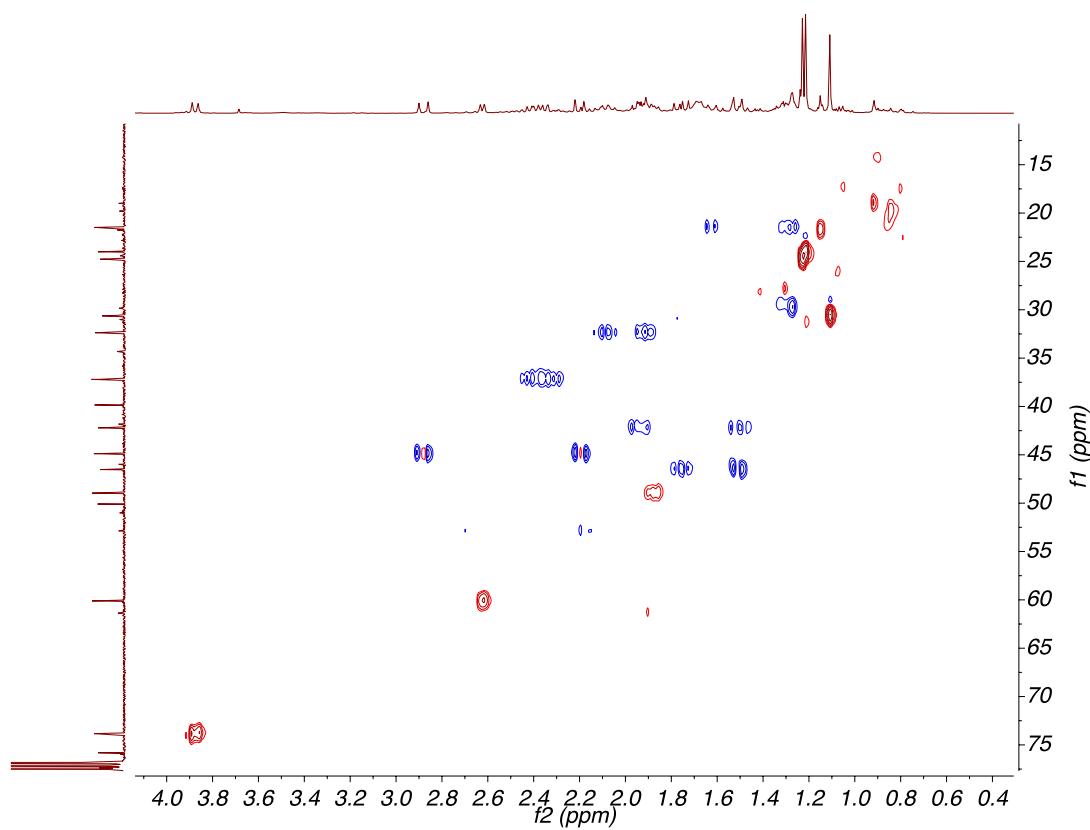


Figure A11.49. HSQC (400, 101 MHz, CDCl_3) of compound 235.

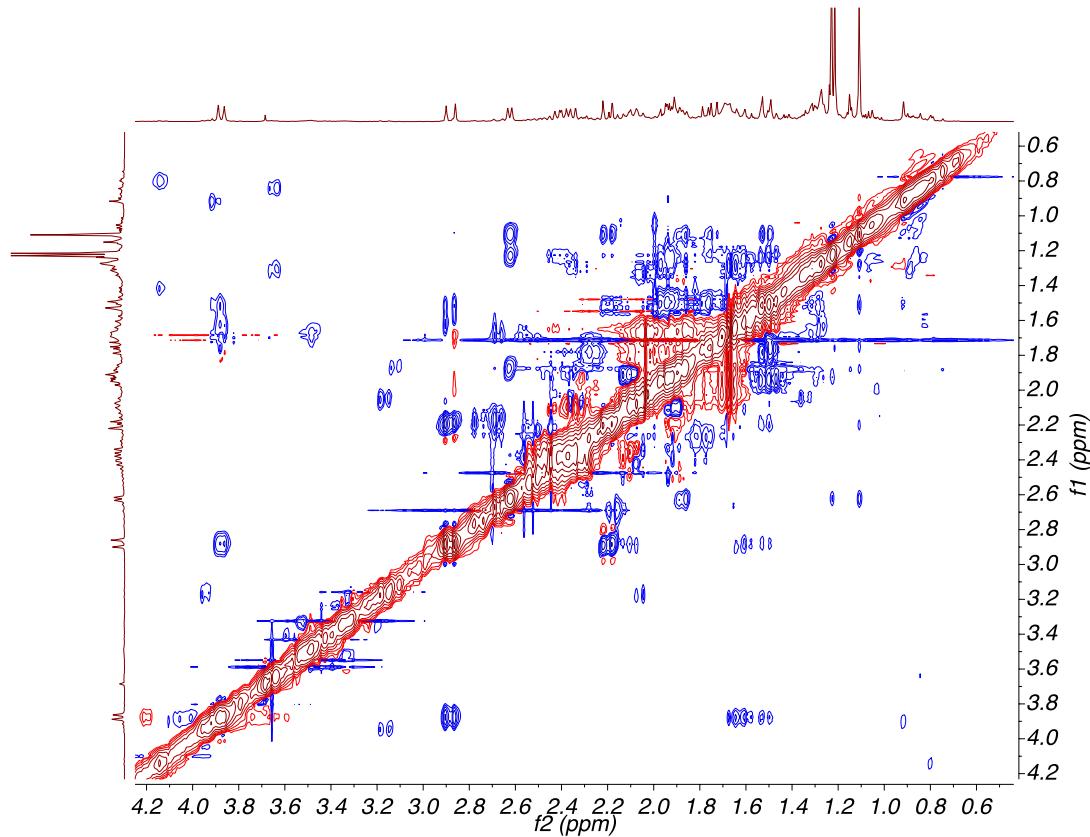


Figure A11.50. NOESY (400 MHz, CDCl_3) of compound 235.

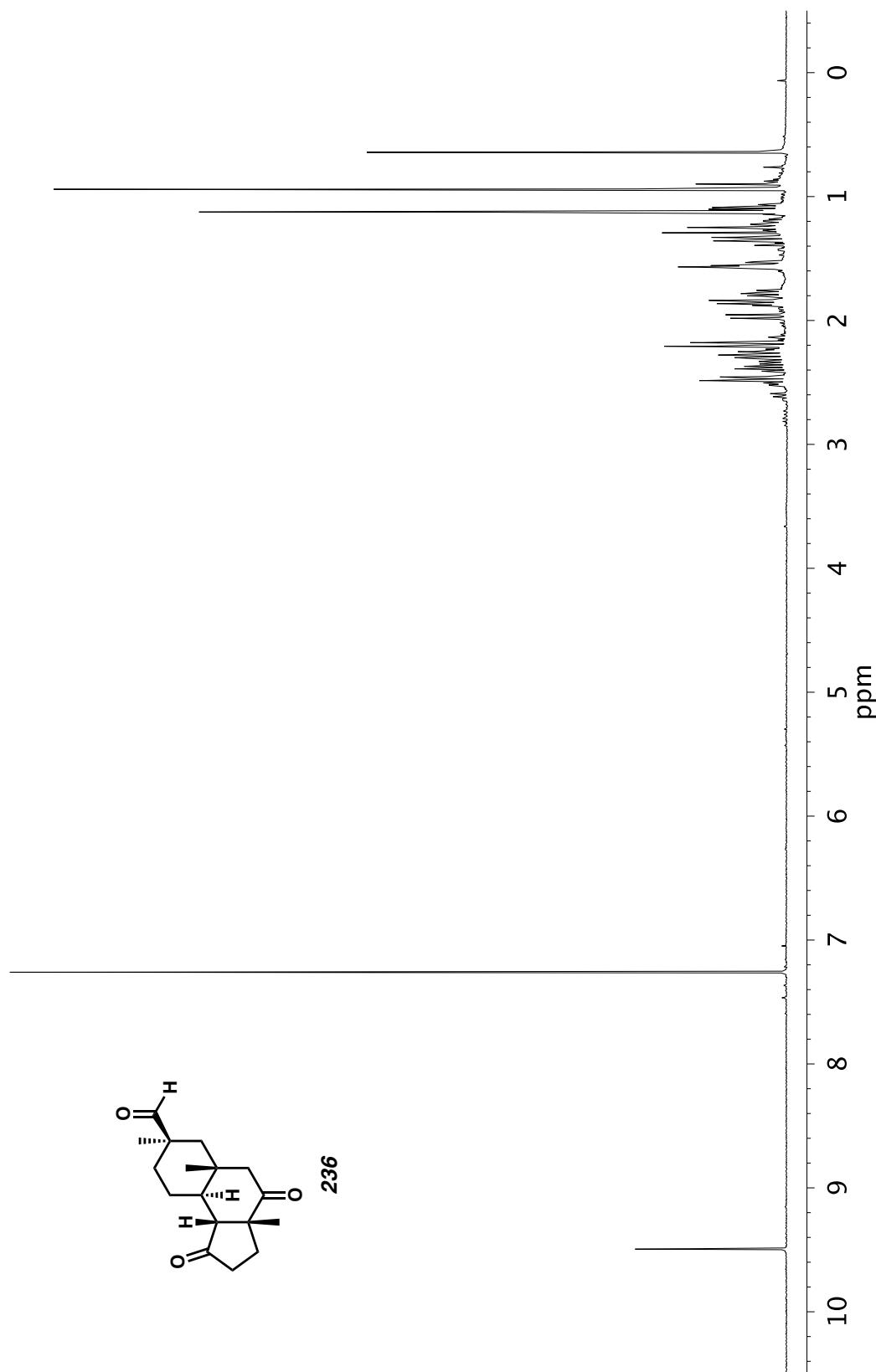


Figure A11.51. ^1H NMR (500 MHz, CDCl_3) of compound 236.

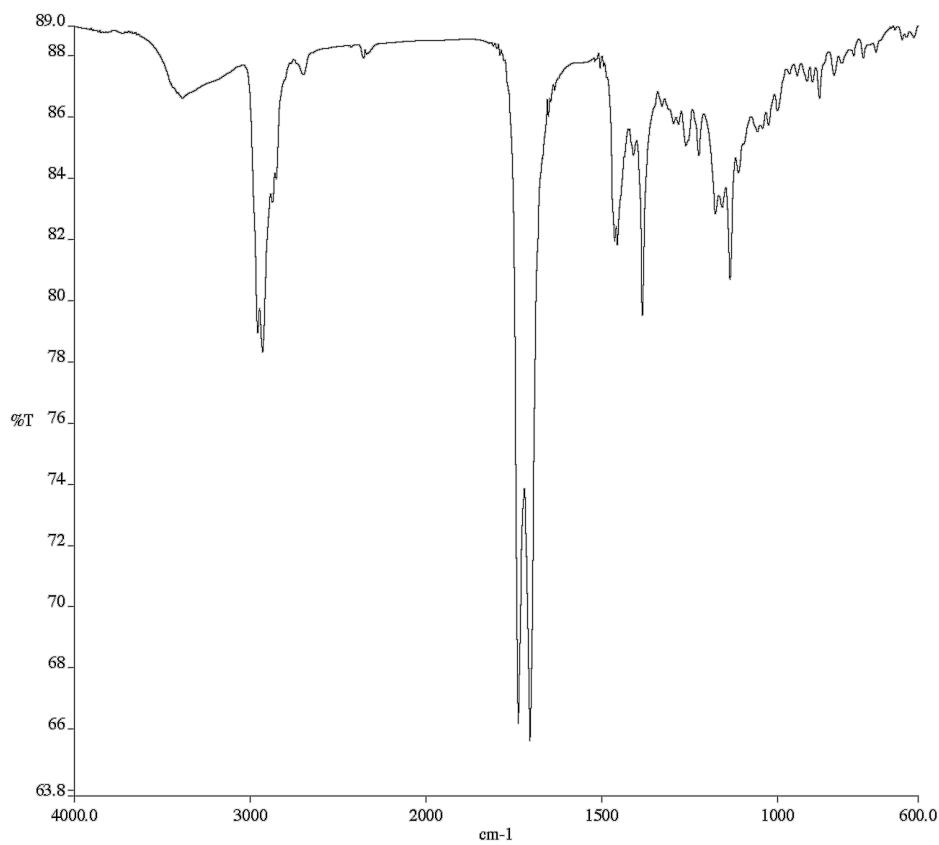


Figure A11.52. Infrared Spectrum (Thin Film, KBr) of compound 236.

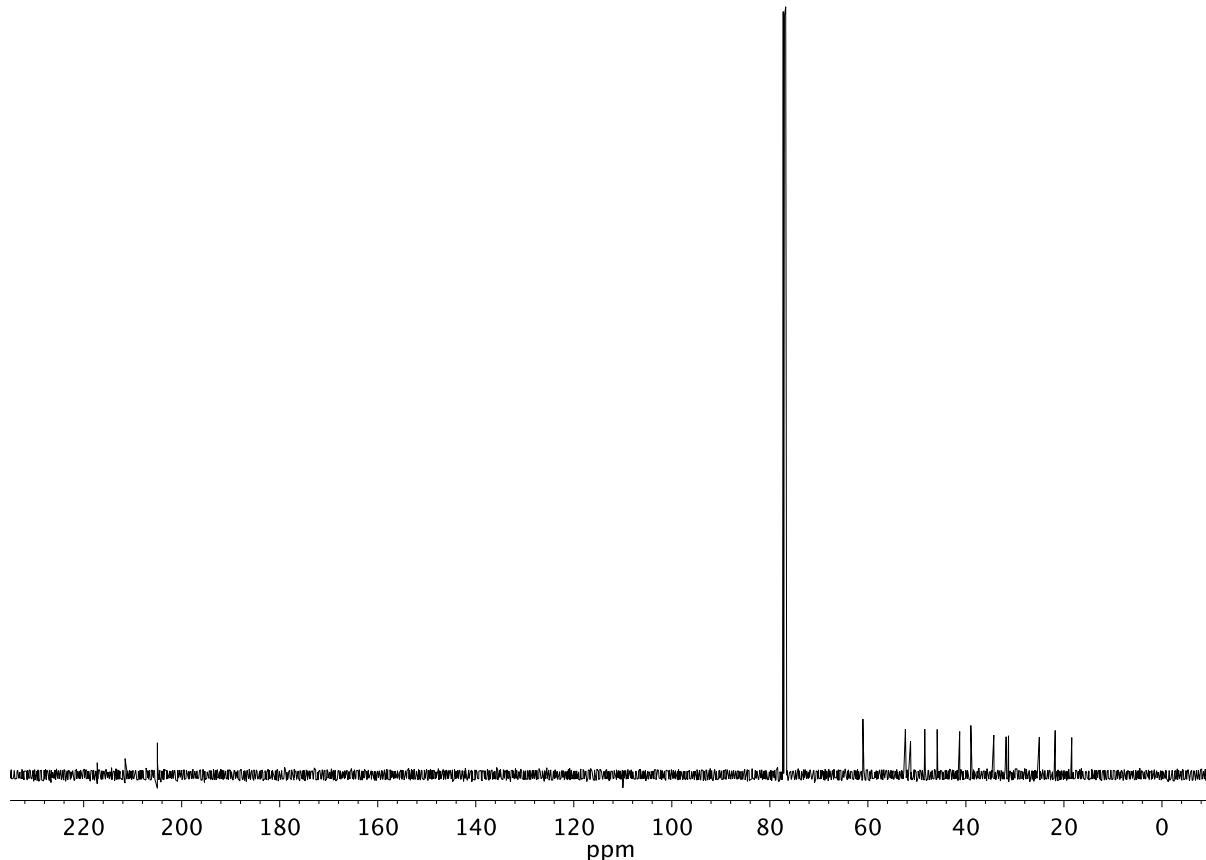


Figure A11.53. ^{13}C NMR (126 MHz, CDCl_3) of compound 236.

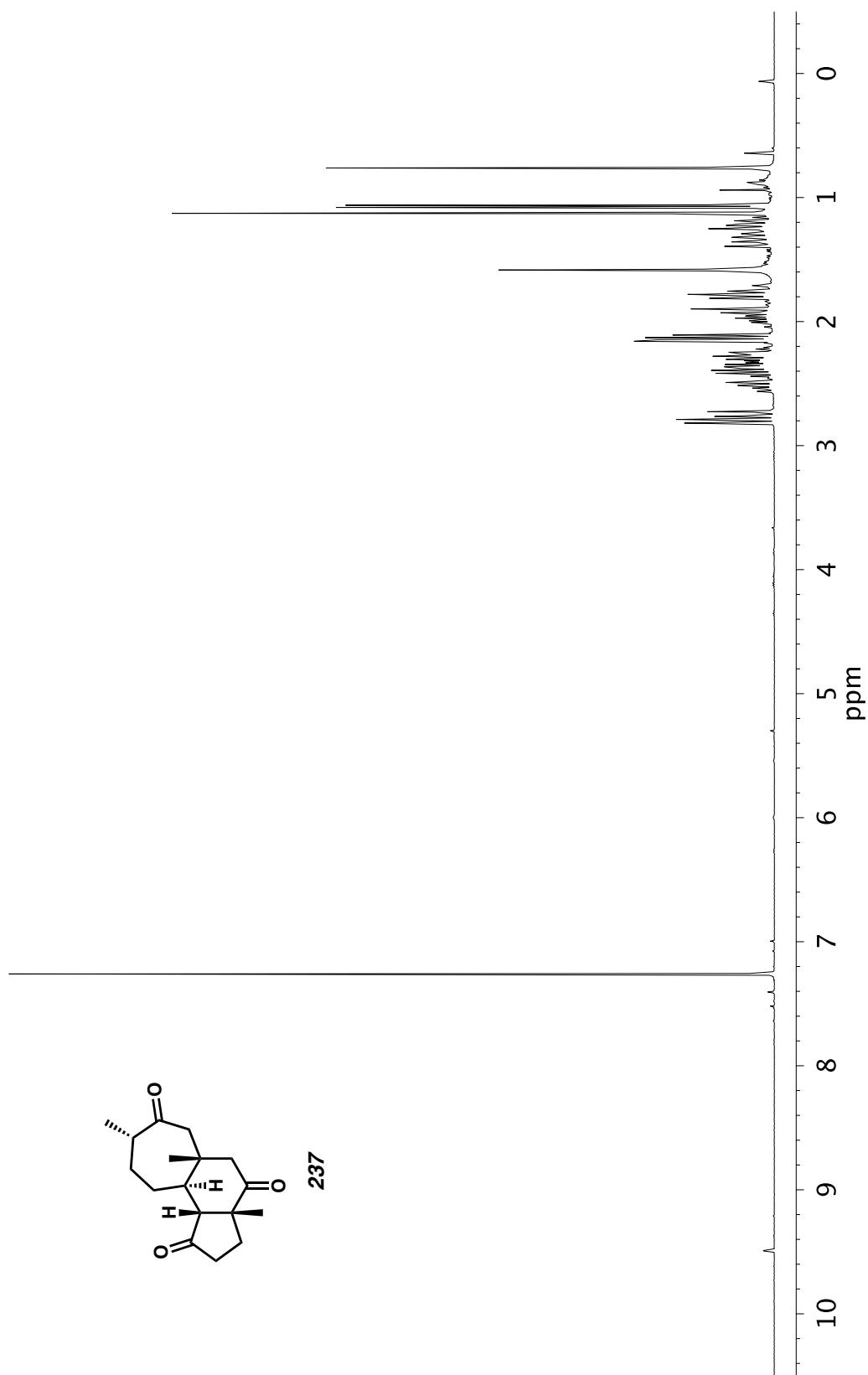


Figure A11.54. ^1H NMR (400 MHz, CDCl_3) of compound 237.

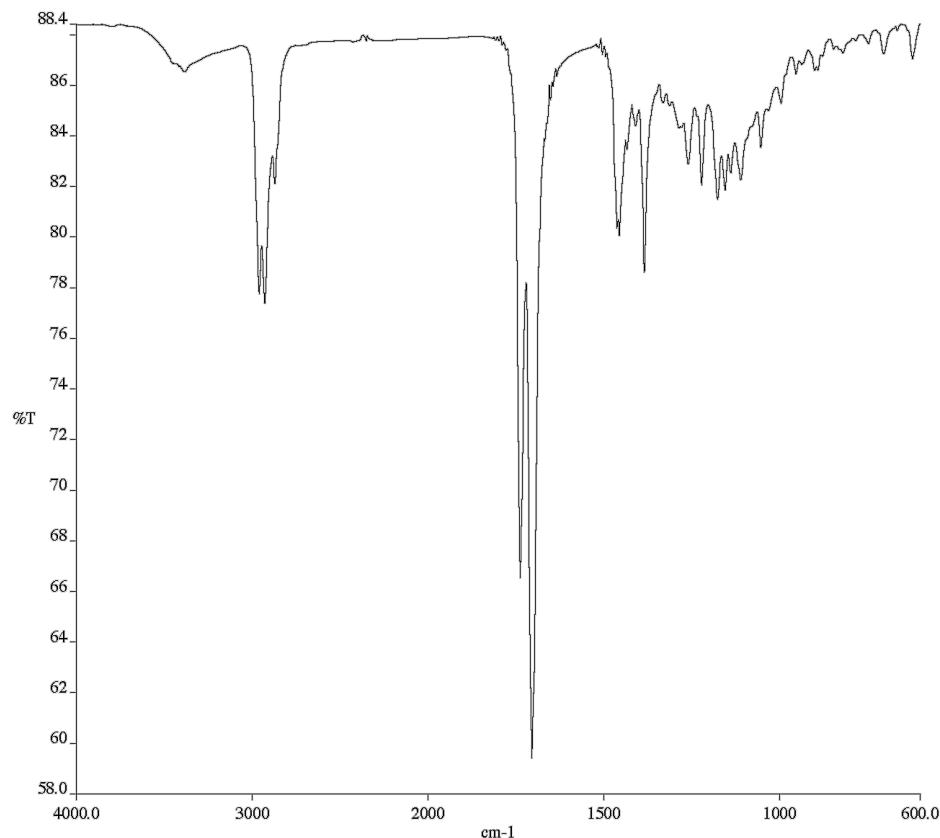


Figure A11.55. Infrared Spectrum (Thin Film, KBr) of compound 237.

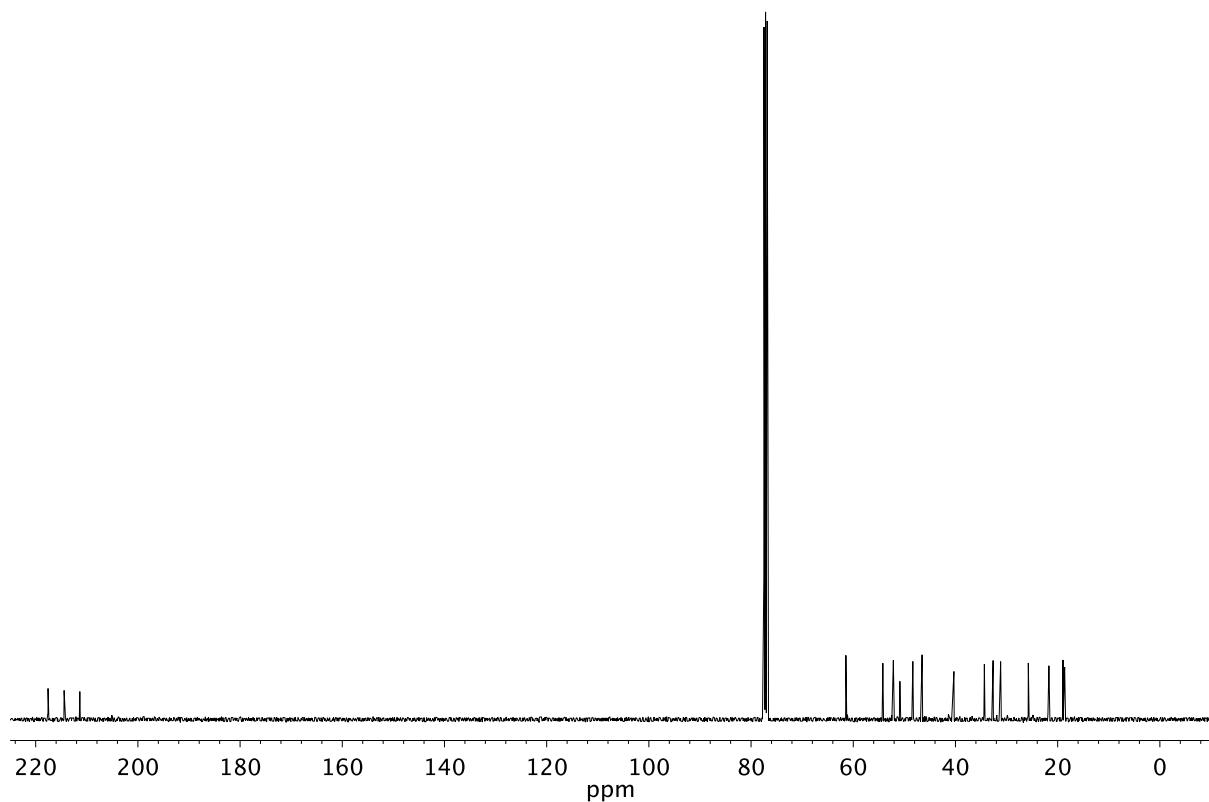
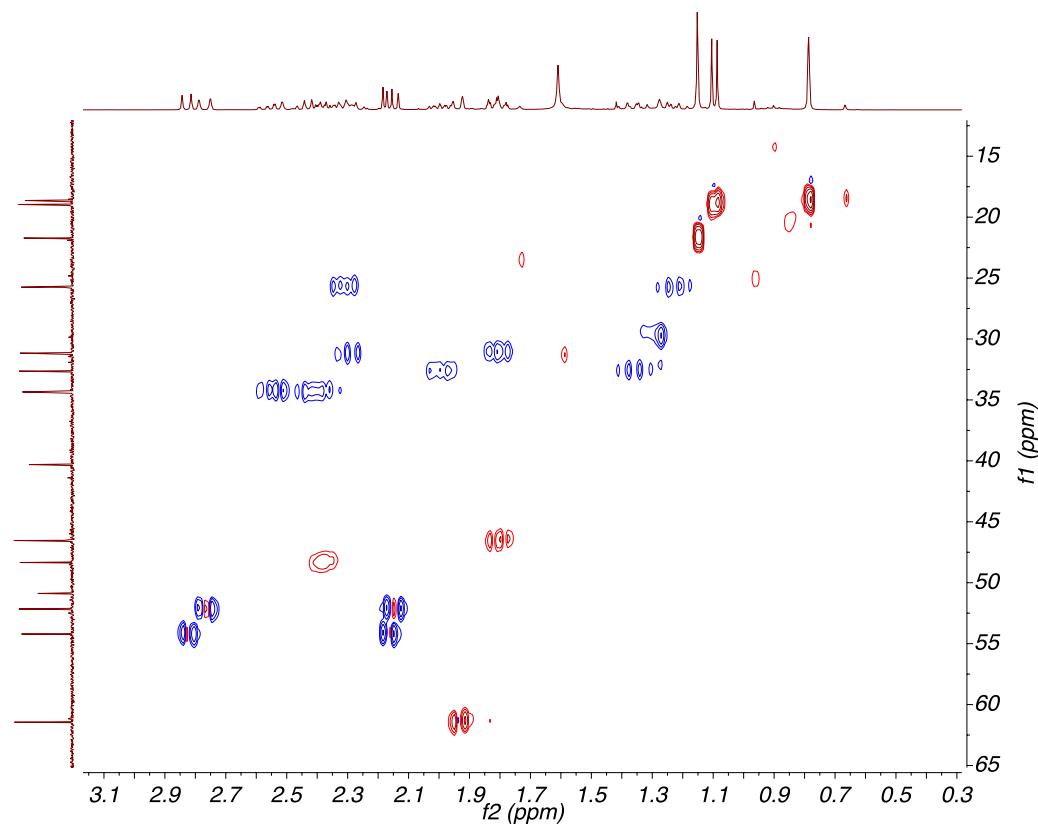
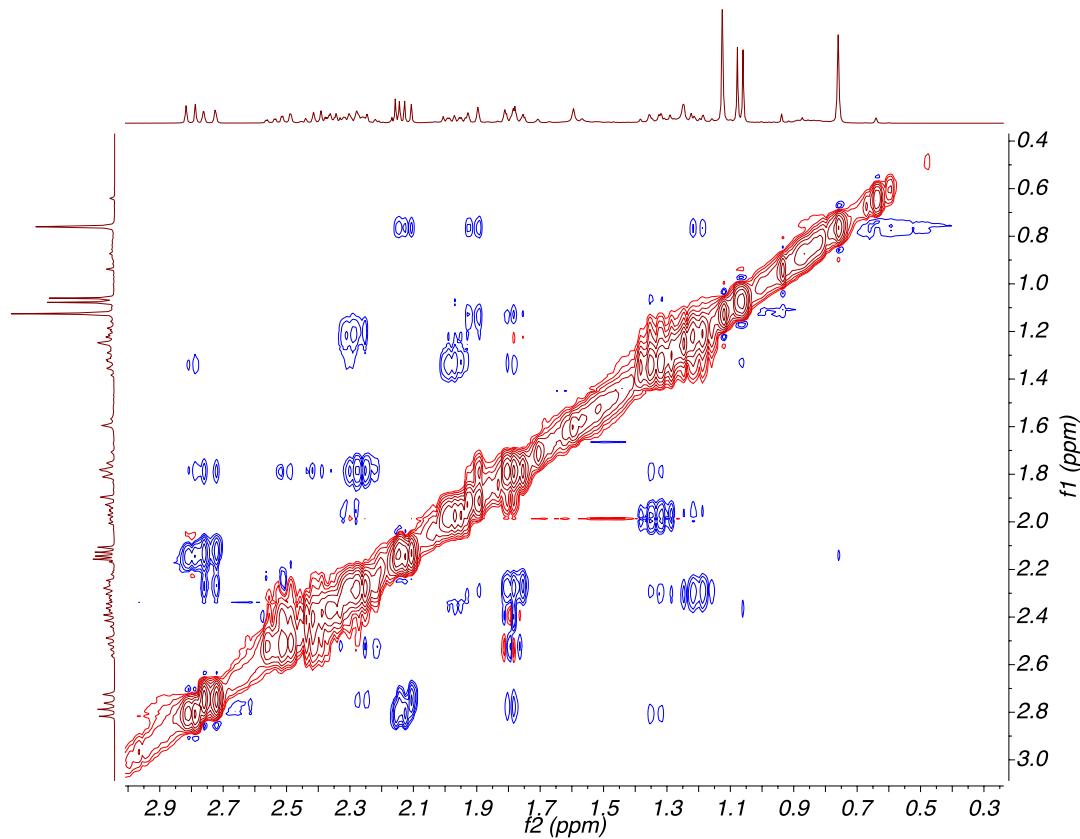


Figure A11.56. ^{13}C NMR (101 MHz, CDCl_3) of compound 237.

Figure A11.57. HSQC (400, 101 MHz, CDCl_3) of compound 237.Figure A11.58. NOESY (400 MHz, CDCl_3) of compound 237.

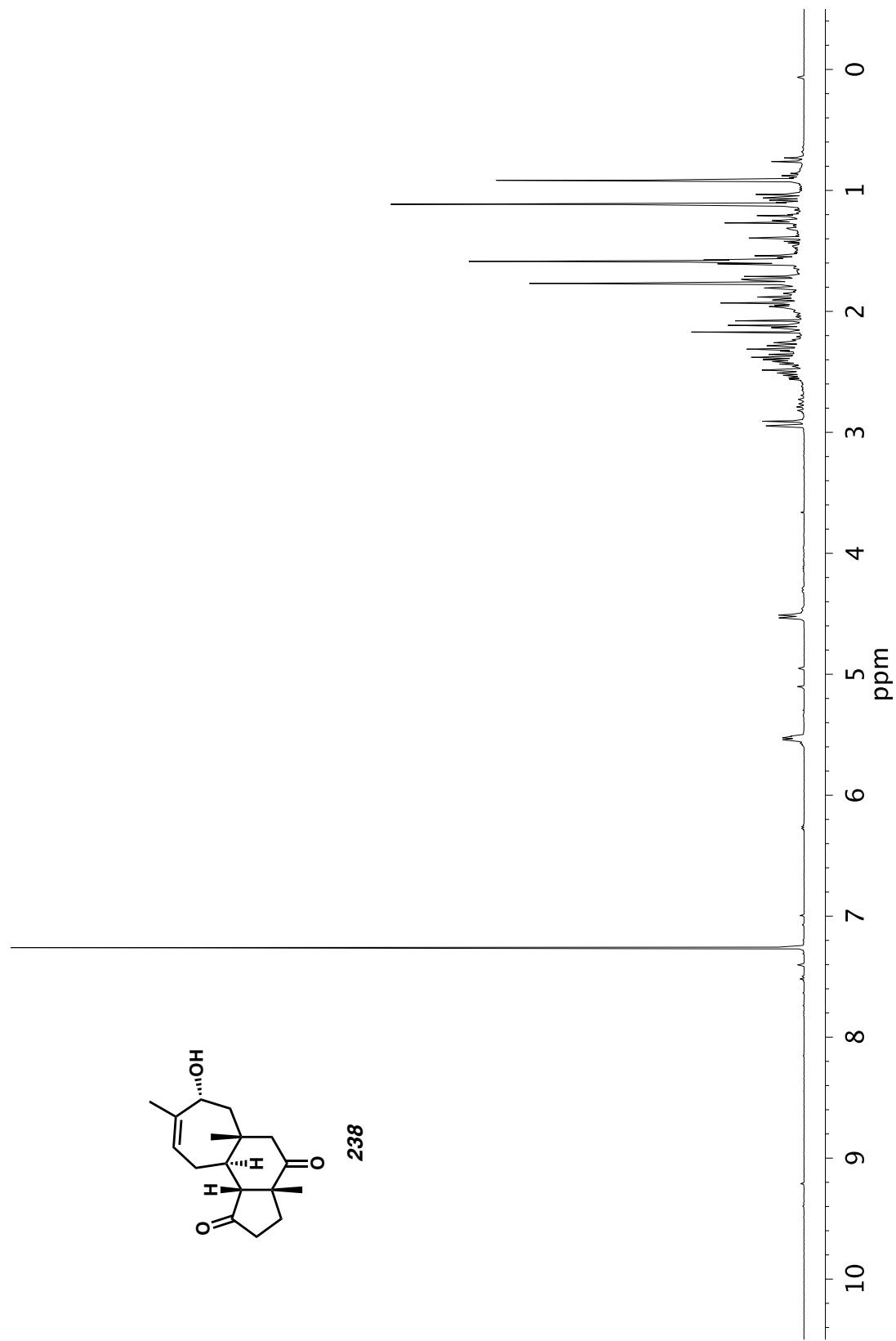


Figure A11.59. ^1H NMR (400 MHz, CDCl_3) of compound 238.

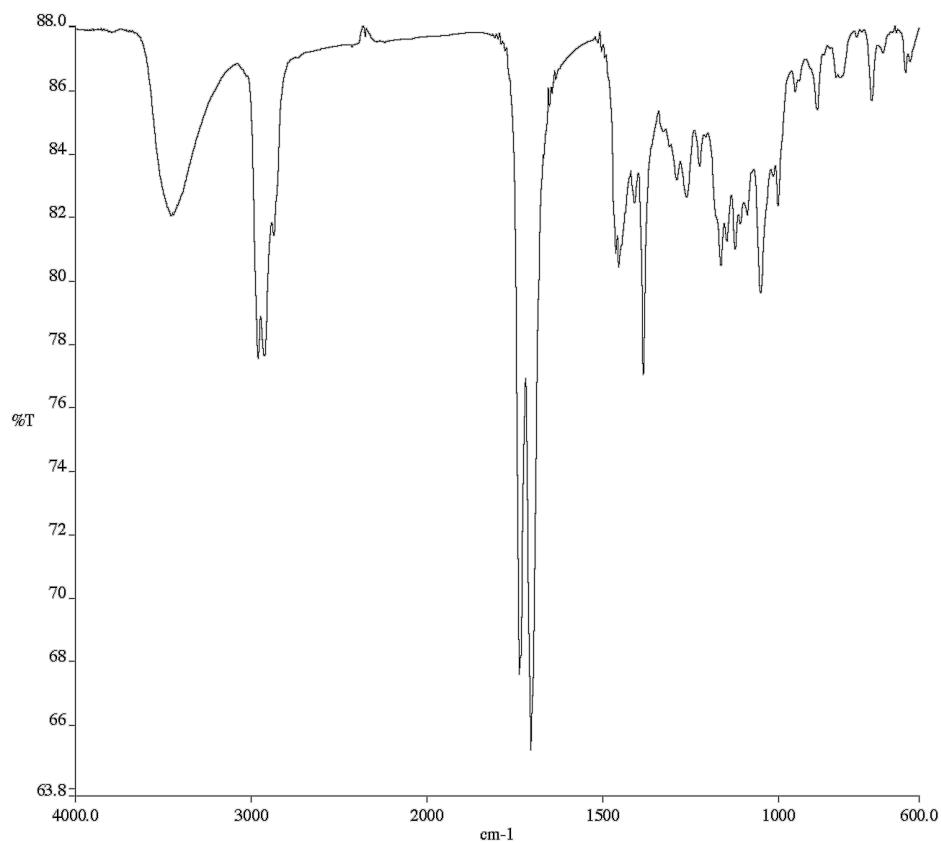


Figure A11.60. Infrared Spectrum (Thin Film, KBr) of compound 238.

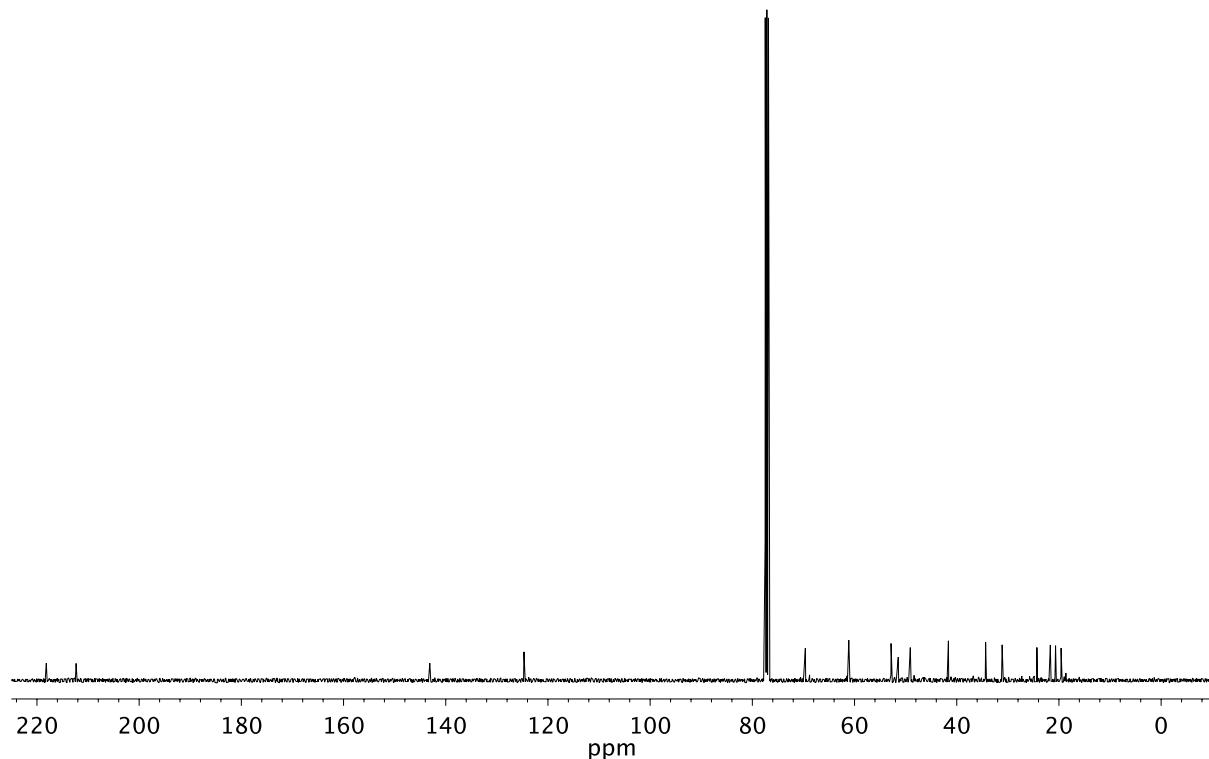
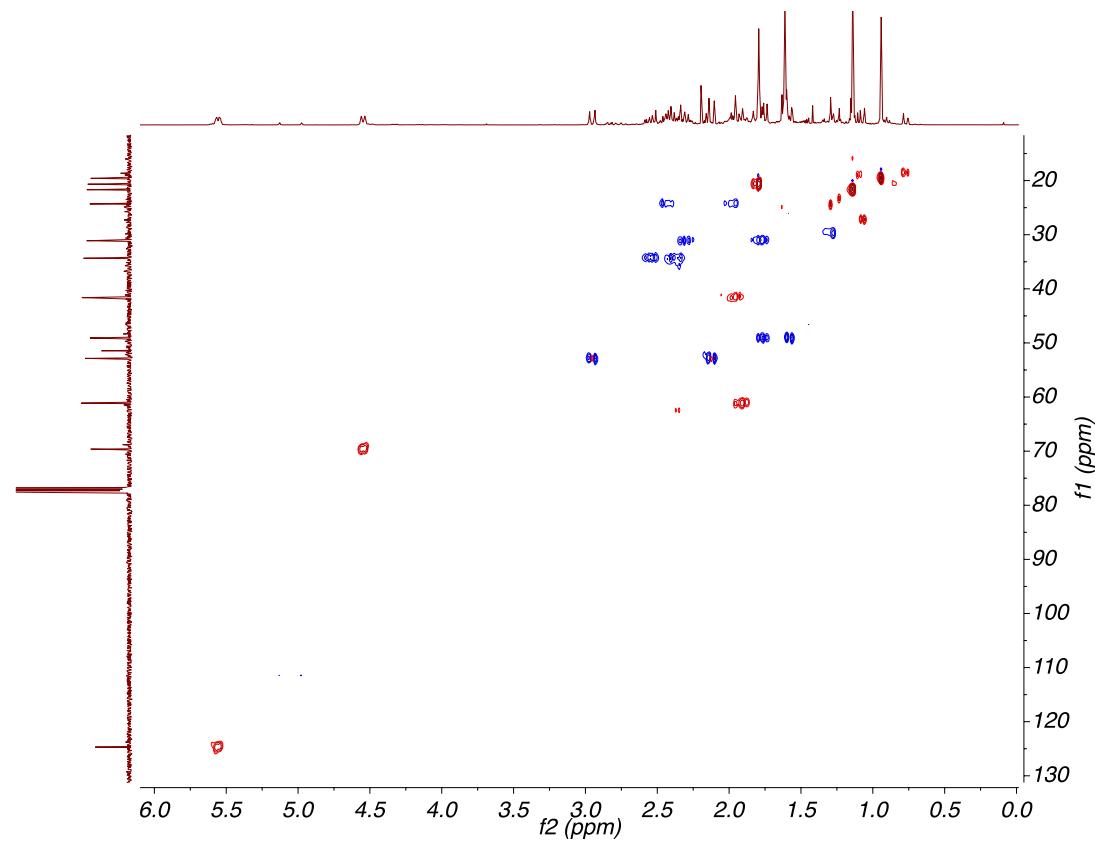
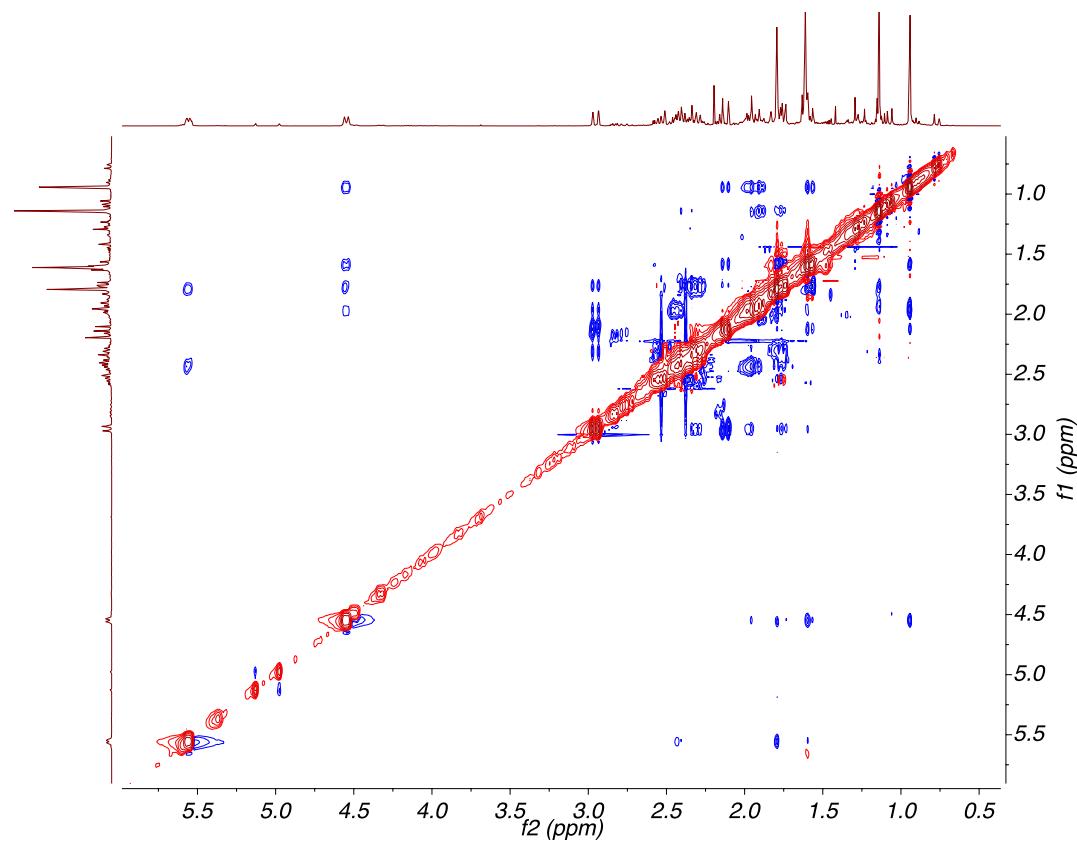


Figure A11.61. ^{13}C NMR (101 MHz, CDCl_3) of compound 238.

Figure A11.62. HSQC (400, 101 MHz, CDCl_3) of compound 238.Figure A11.63. NOESY (400 MHz, CDCl_3) of compound 238.

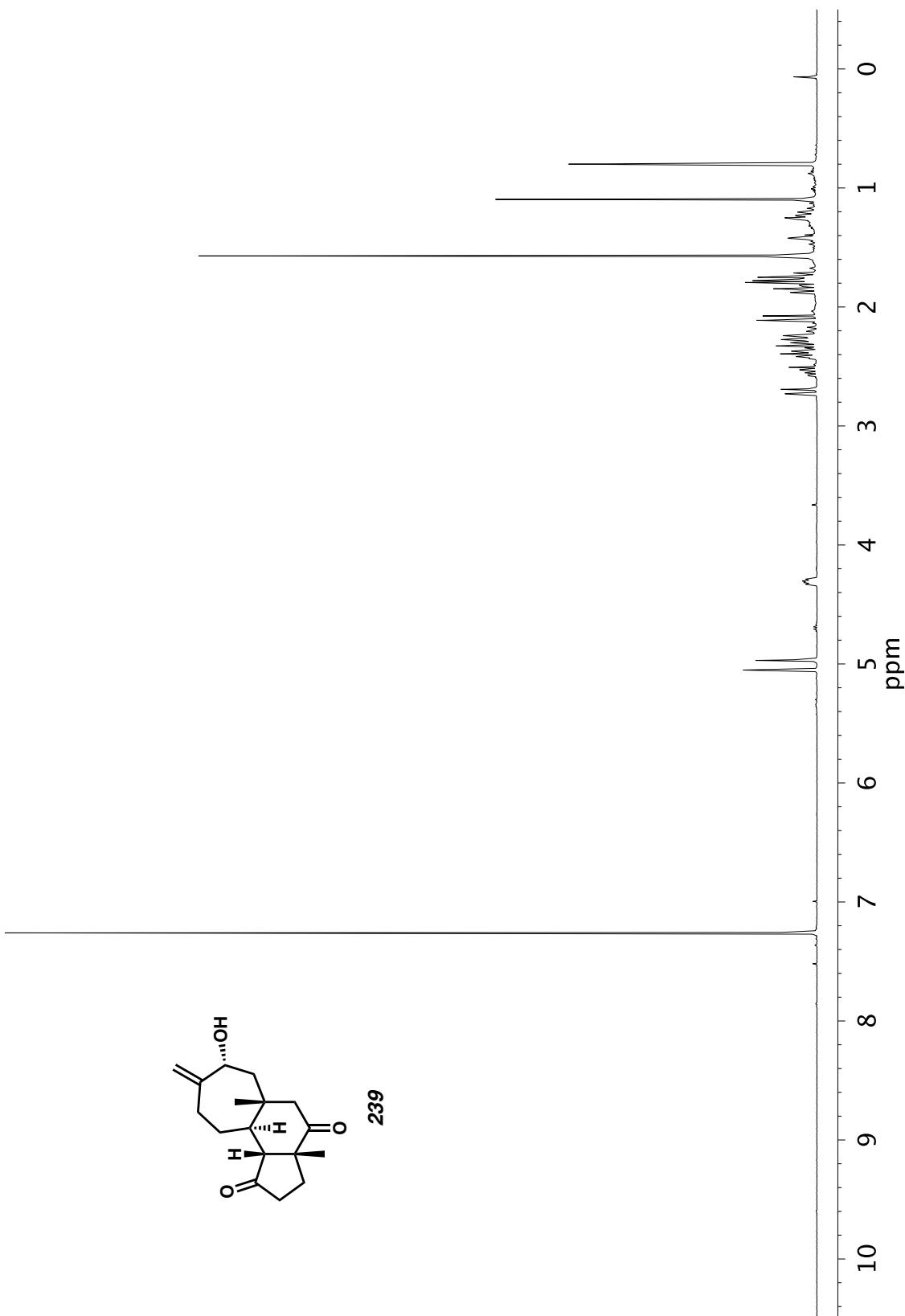


Figure A11.64. ^1H NMR (400 MHz, CDCl_3) of compound 239.

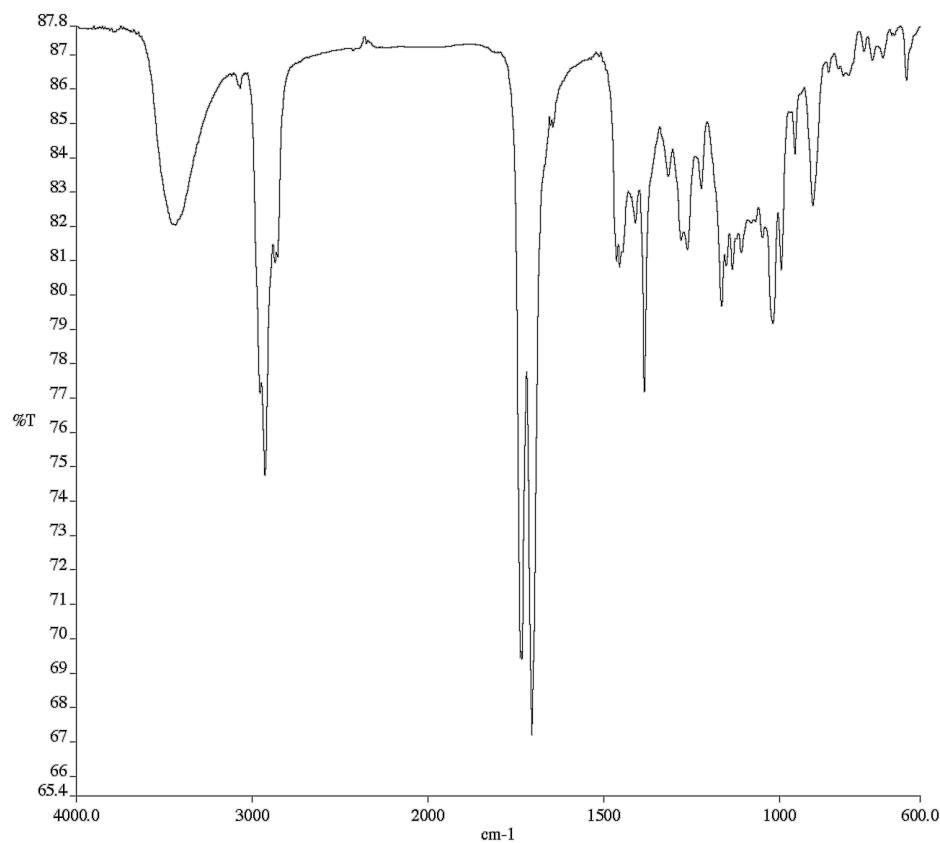


Figure A11.65. Infrared Spectrum (Thin Film, KBr) of compound 239.

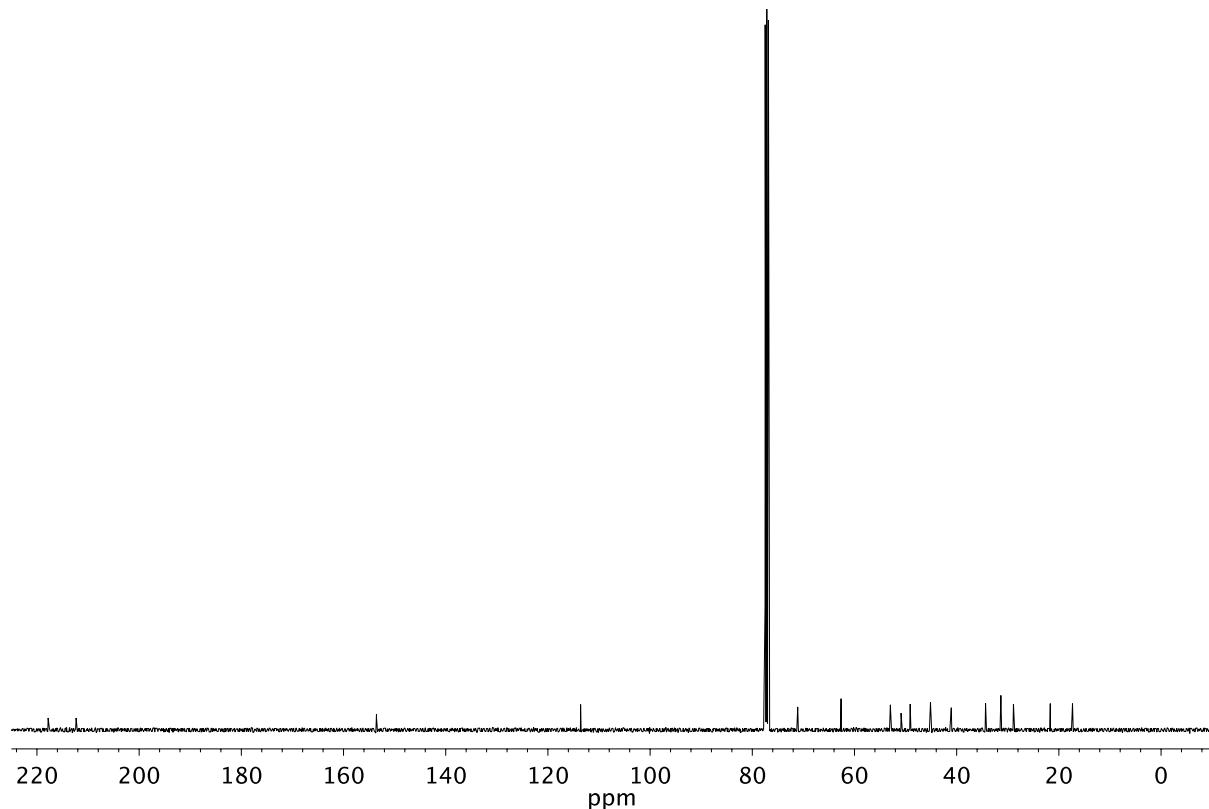
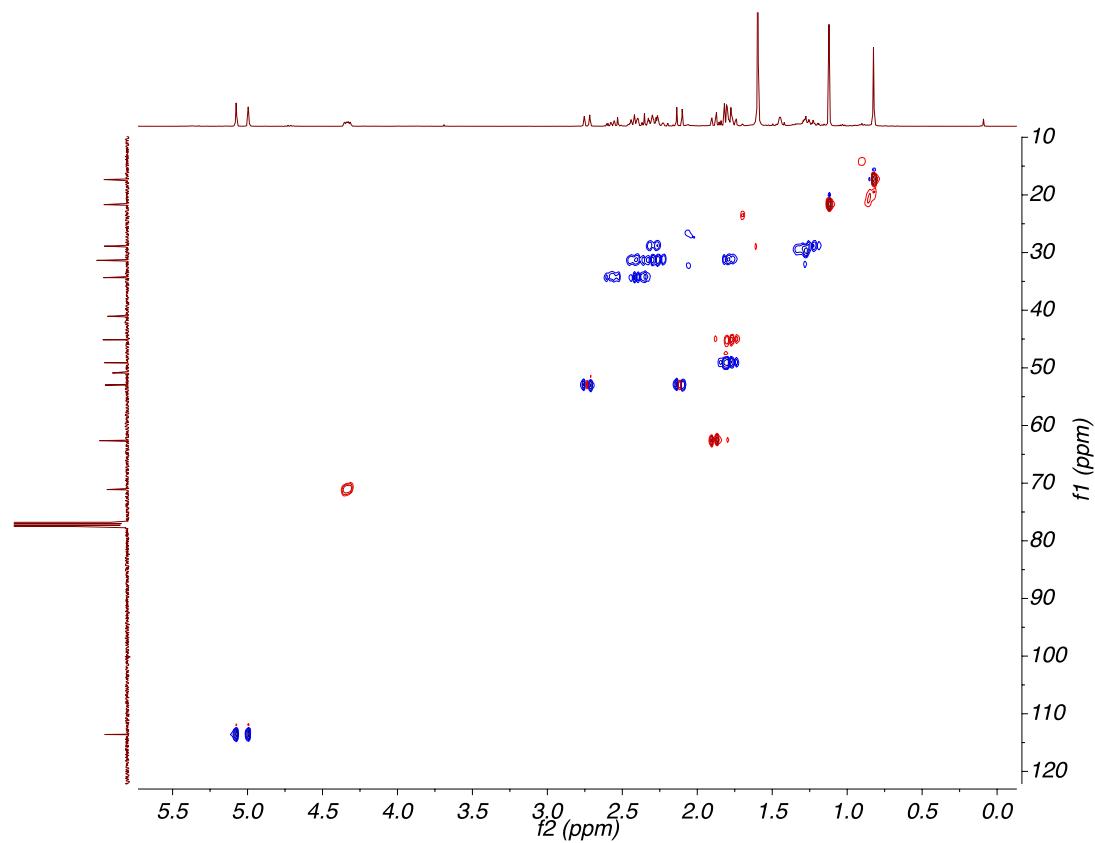
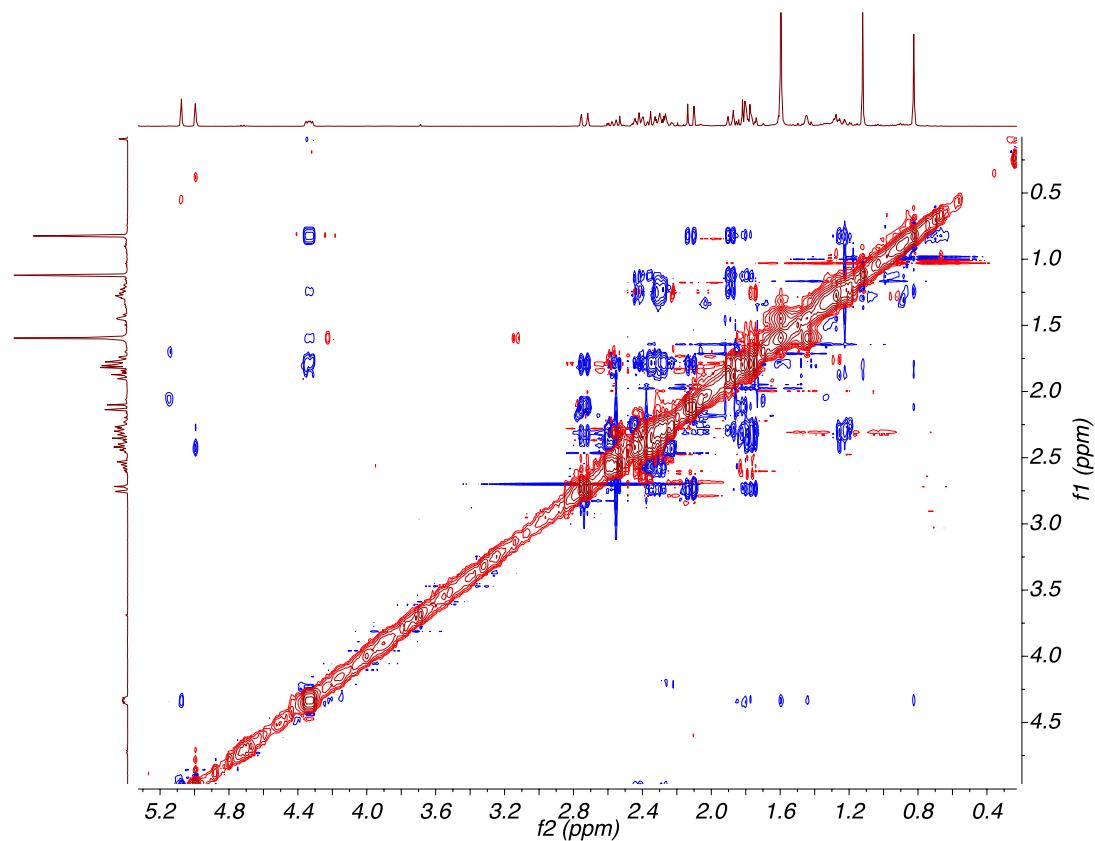


Figure A11.66. ^{13}C NMR (101 MHz, CDCl_3) of compound 239.

Figure A11.67. HSQC (400, 101 MHz, CDCl_3) of compound 239.Figure A11.68. NOESY (400 MHz, CDCl_3) of compound 239.

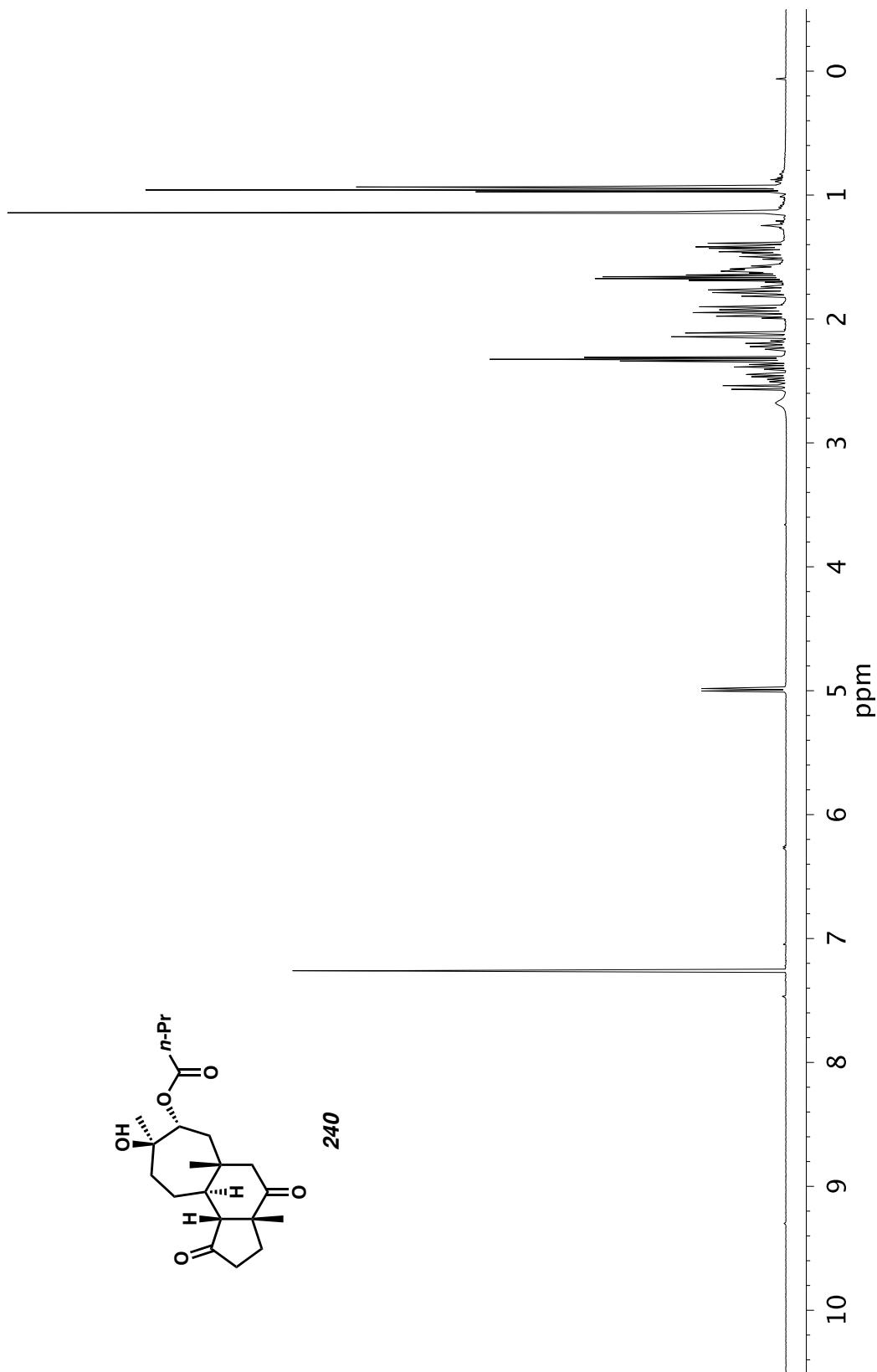


Figure A11.69. ^1H NMR (500 MHz, CDCl_3) of compound 240.

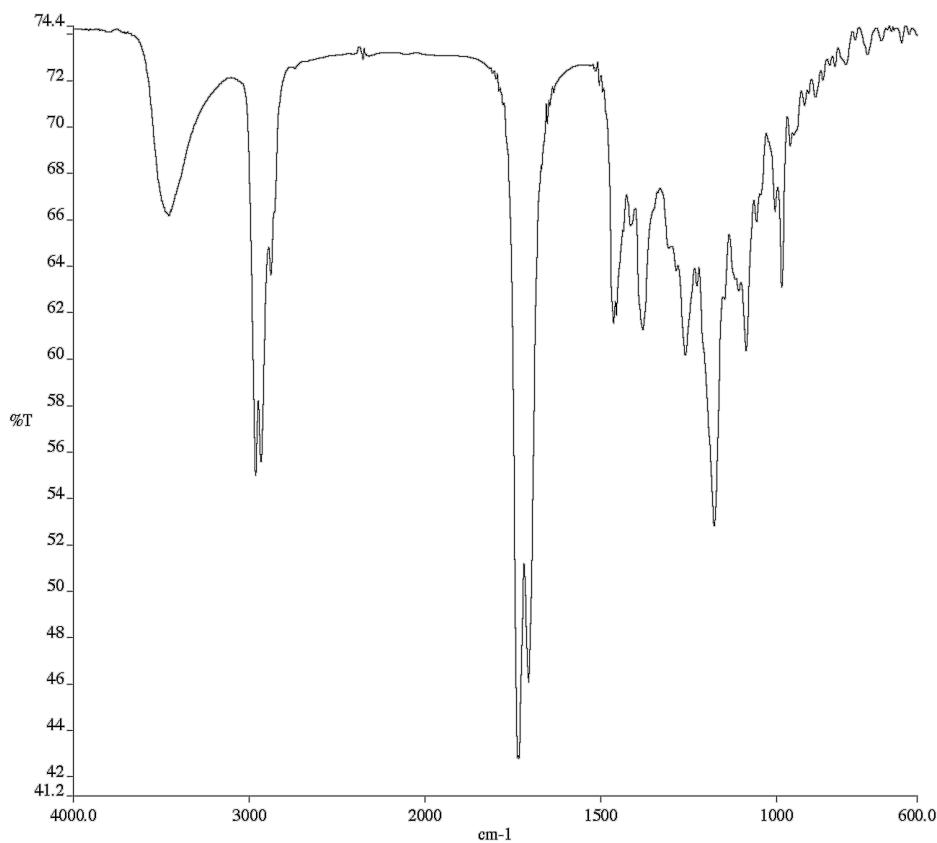


Figure A11.70. Infrared Spectrum (Thin Film, KBr) of compound **240**.

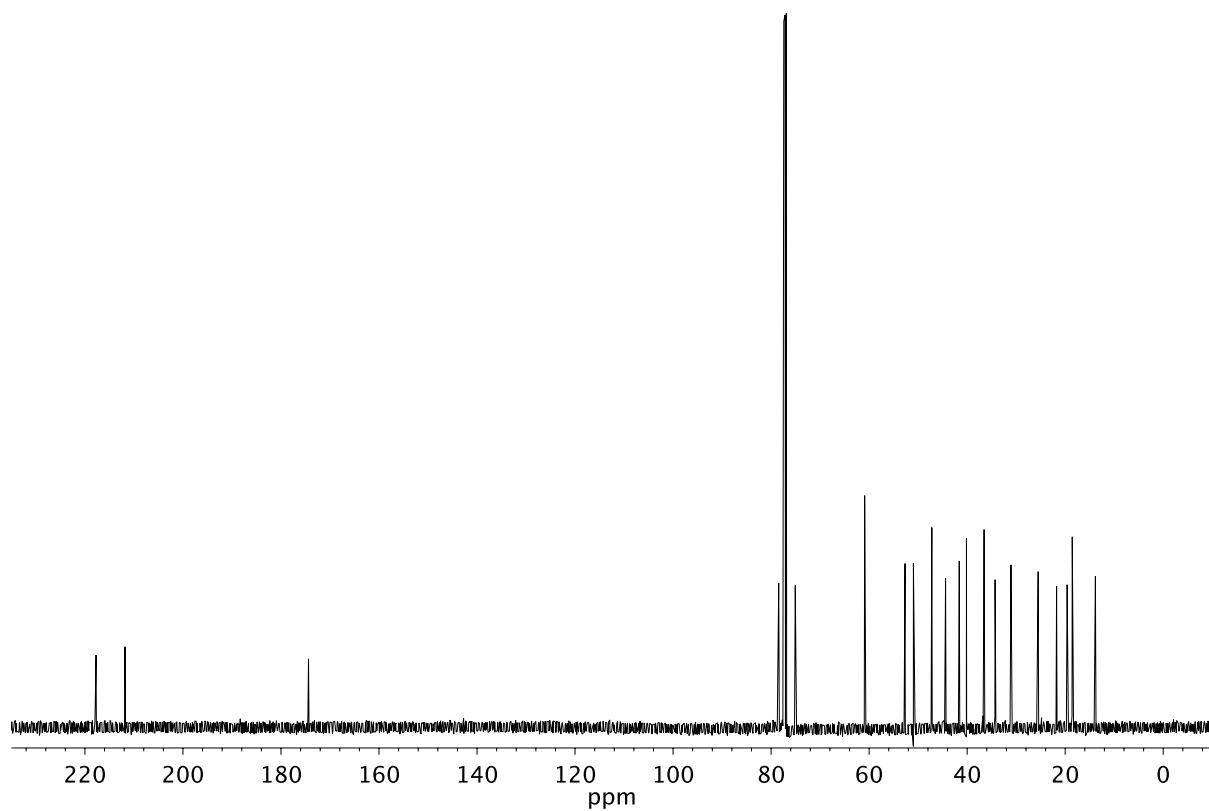
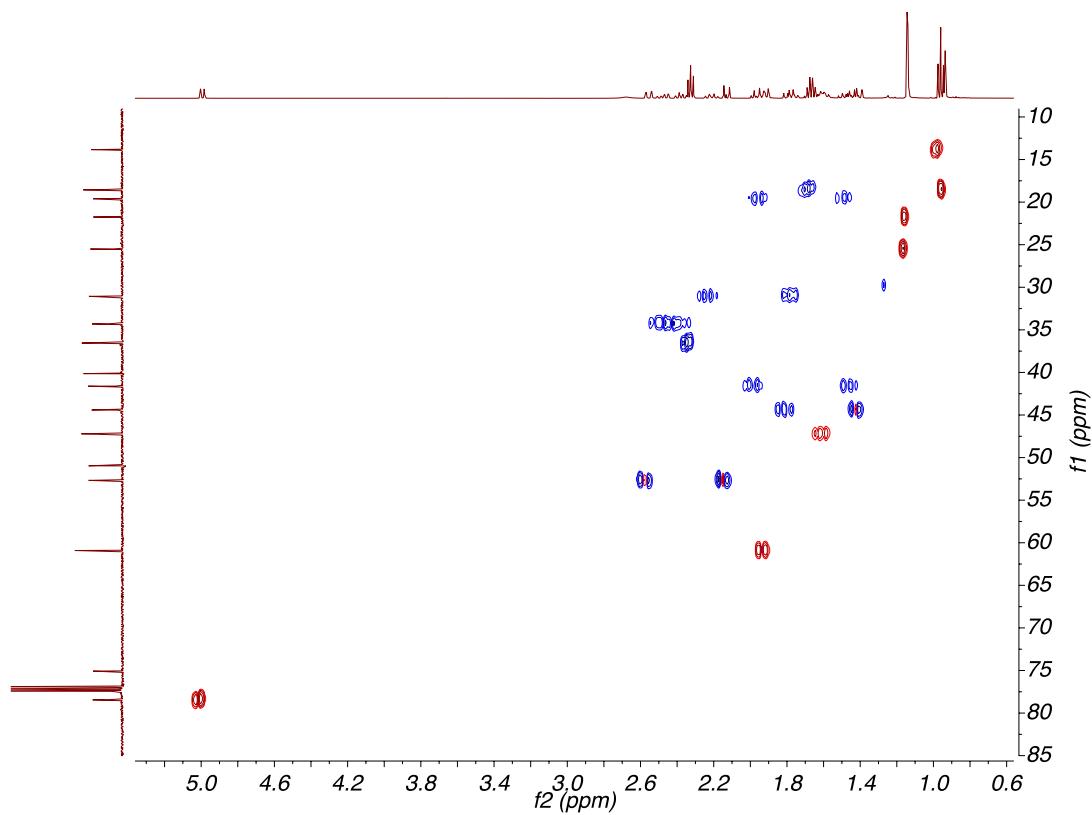
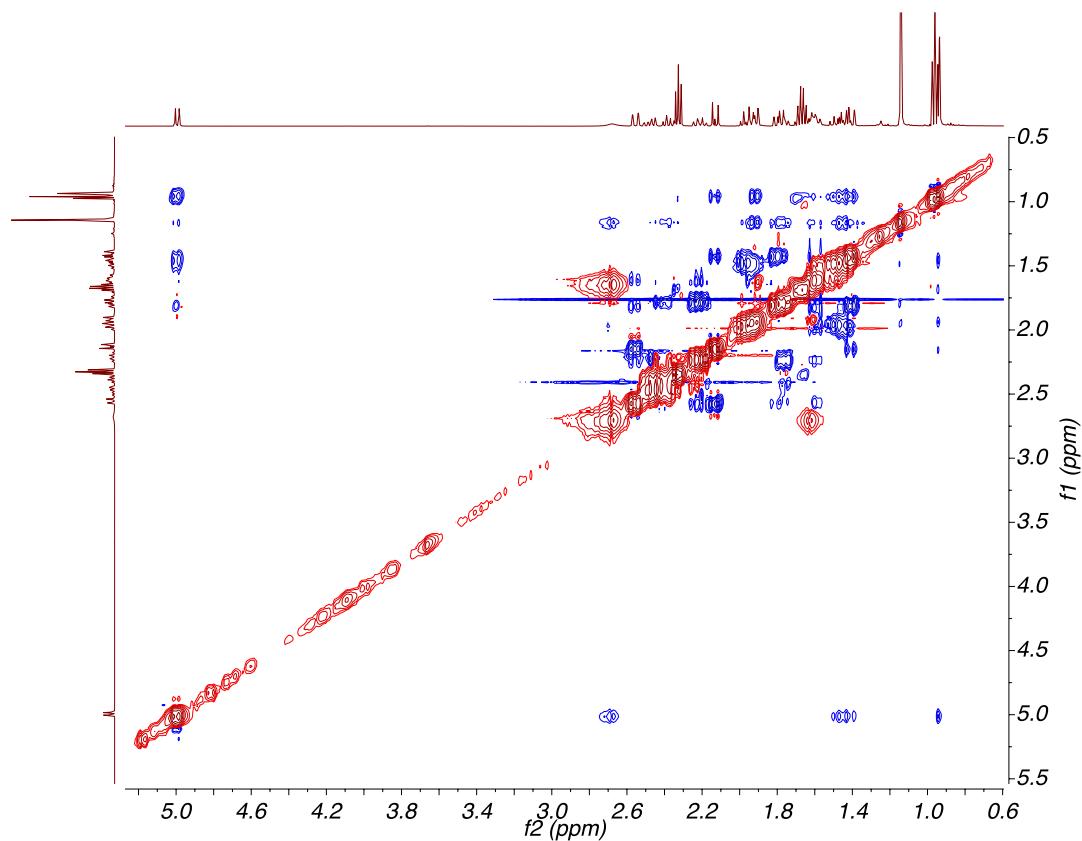


Figure A11.71. ^{13}C NMR (126 MHz, CDCl_3) of compound **240**.

Figure A11.72. HSQC (400, 101 MHz, CDCl_3) of compound 240.Figure A11.73. NOESY (400 MHz, CDCl_3) of compound 240.