APPENDIX 7

Spectra Relevant to Chapter 4:

The Cyanthiwigin Natural Product Core as a Complex Molecular Scaffold for Comparative Late-Stage C–H Functionalization Studies

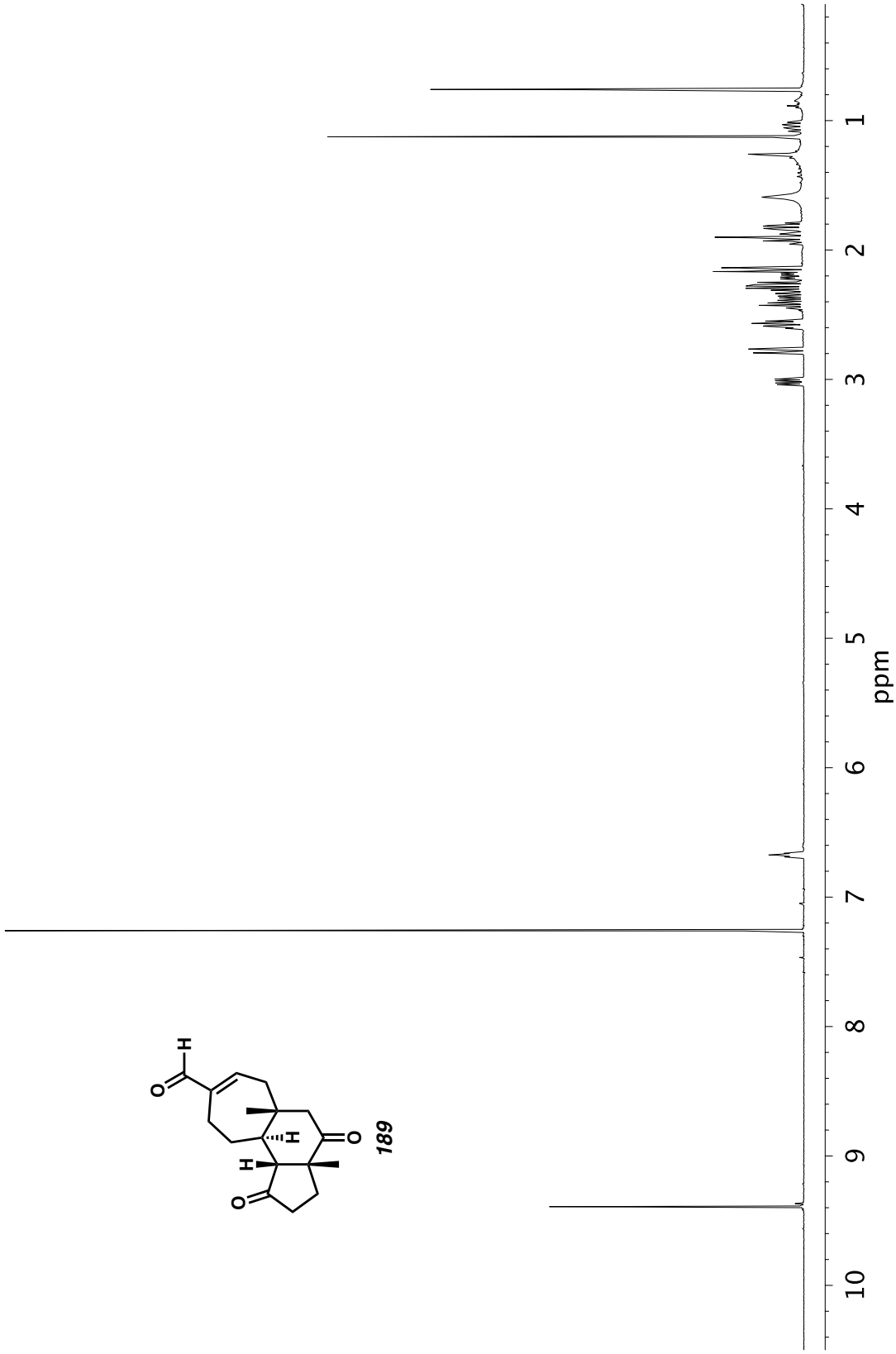

Figure A7.1. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **189**.

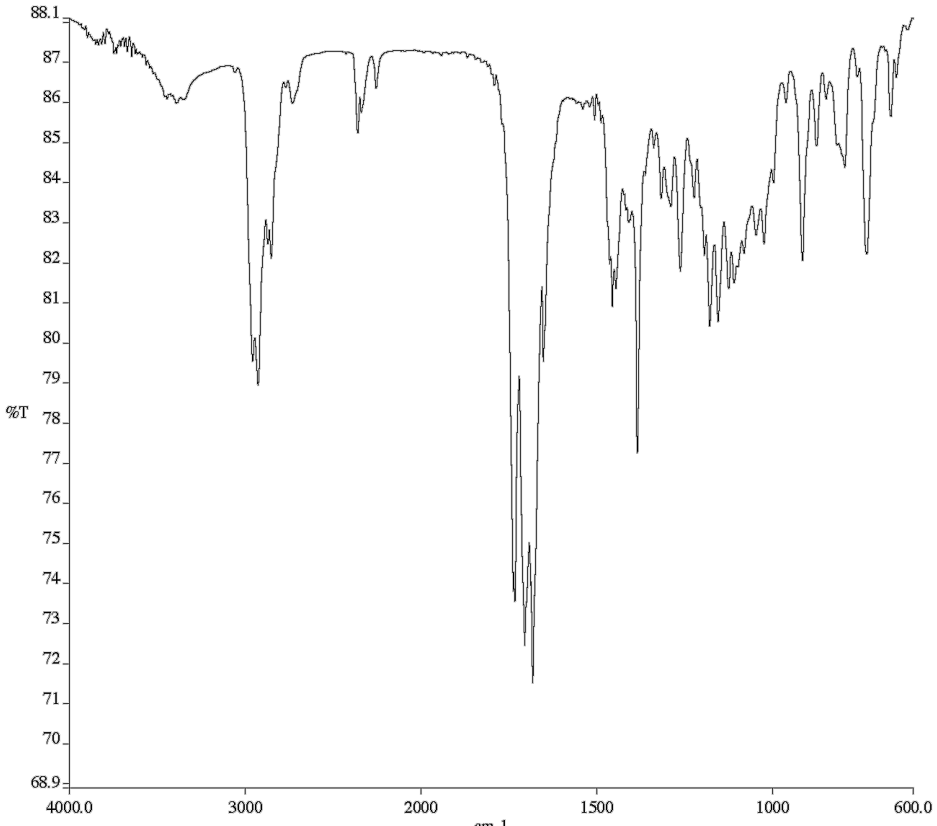

Figure A7.2. Infrared spectrum (Thin Film, KBr) of compound **189**.

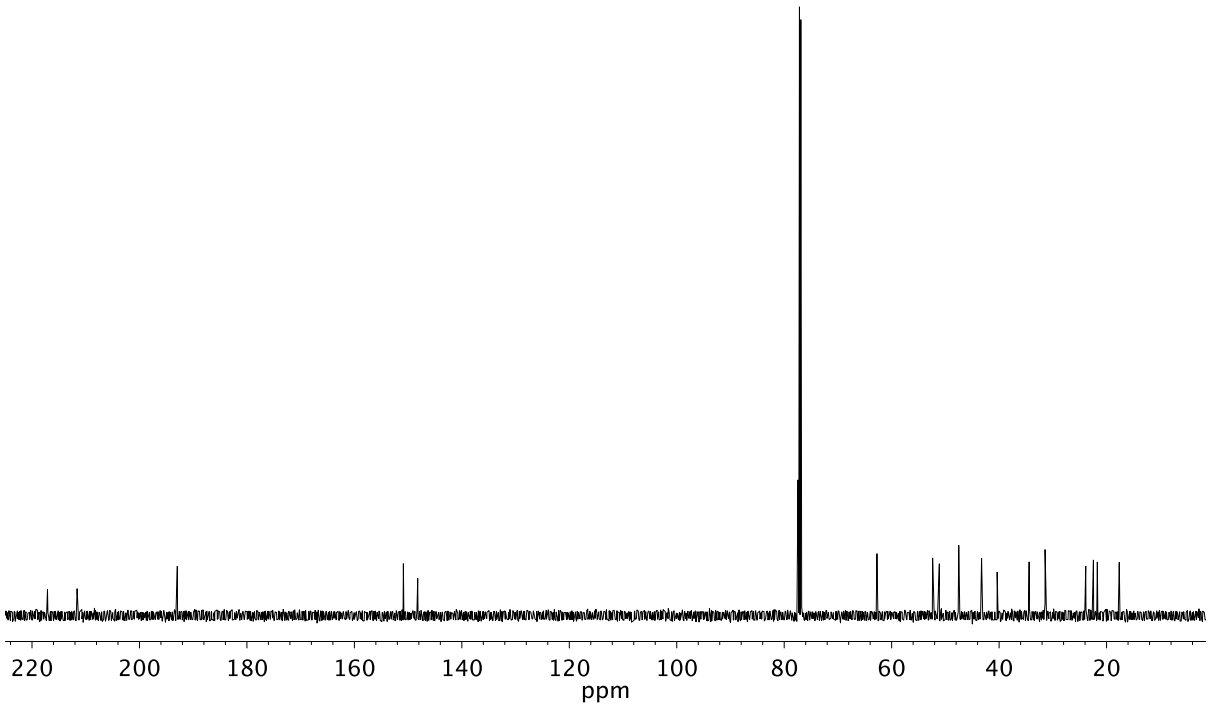

Figure A7.3. ^{13}C NMR (126 MHz, $CDCl_3$) of compound **189**.

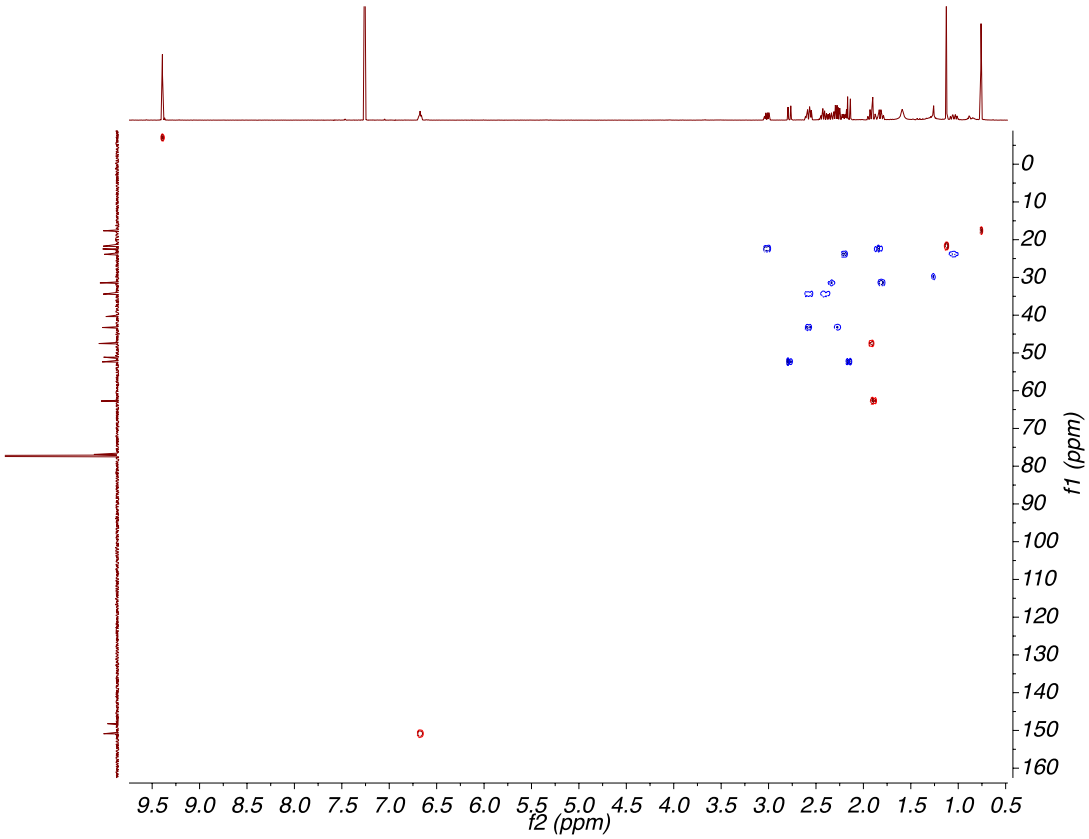

Figure A7.4. HSQC (500, 126 MHz, $CDCl_3$) of compound **189**.

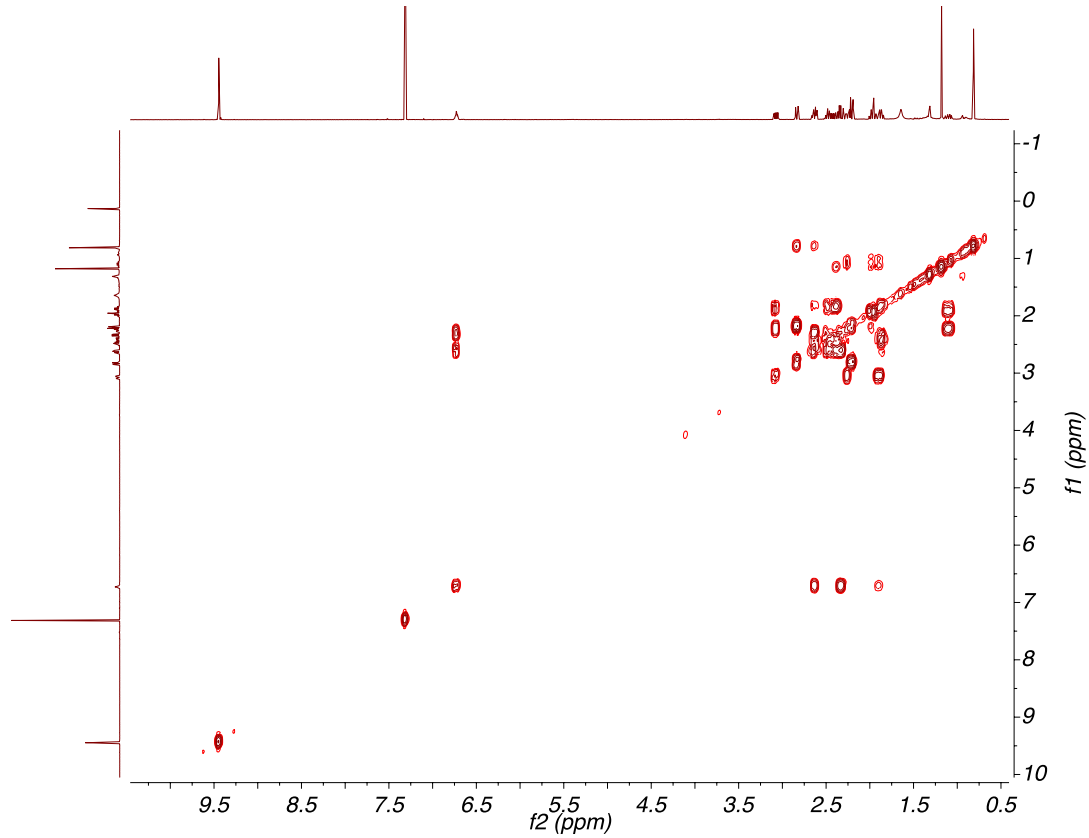

Figure A7.5. COSY (500 MHz, $CDCl_3$) of compound **189**.

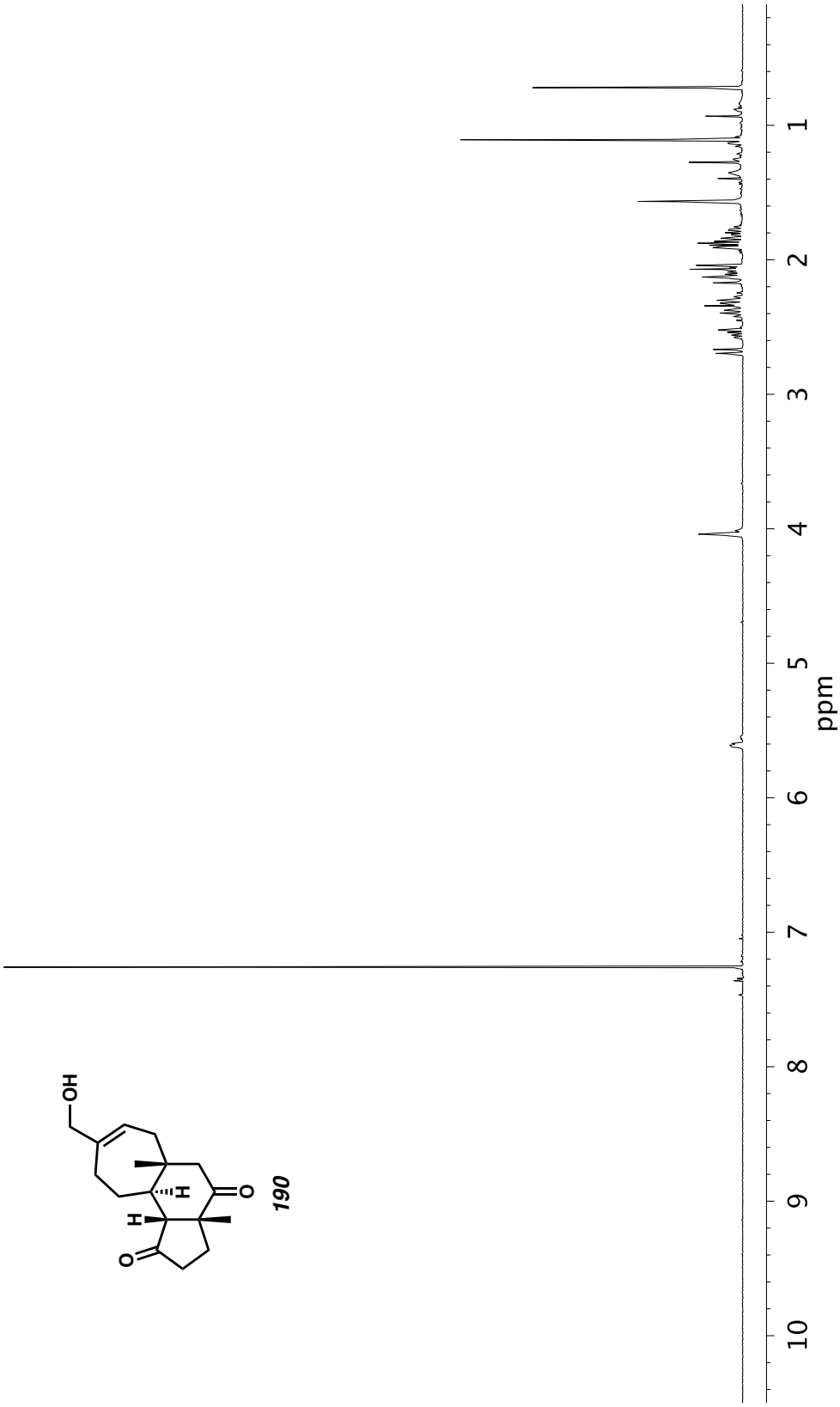

Figure A7.6. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **190**.

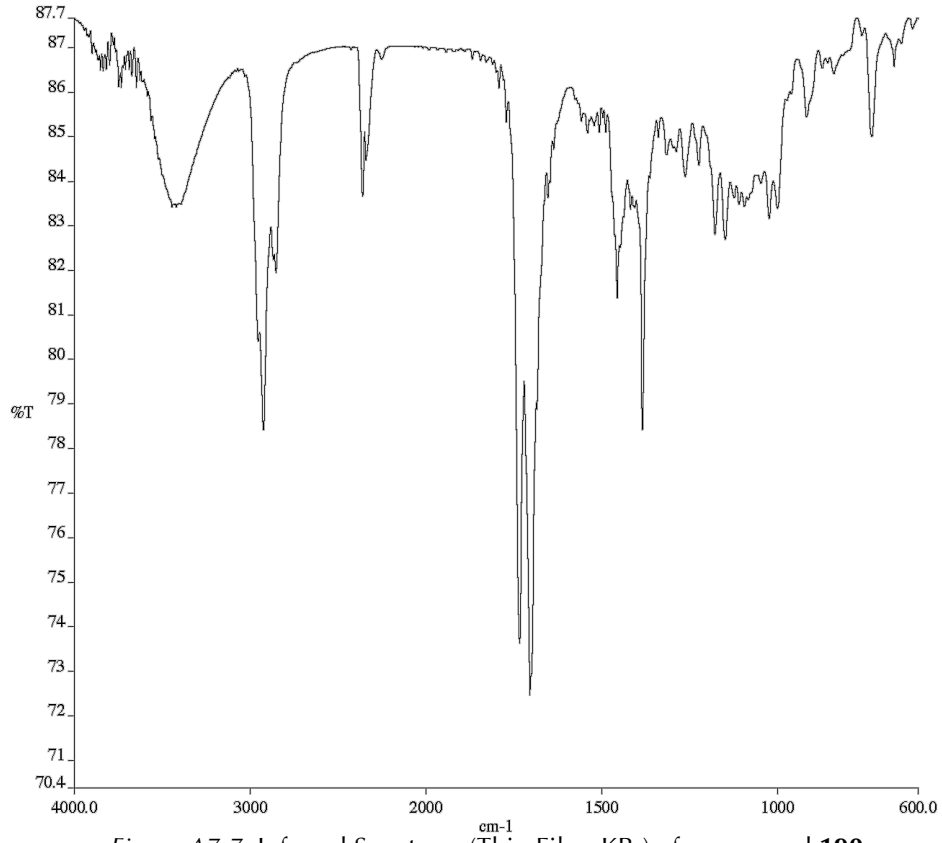

Figure A7.7. Infrared Spectrum (Thin Film, KBr) of compound **190**.

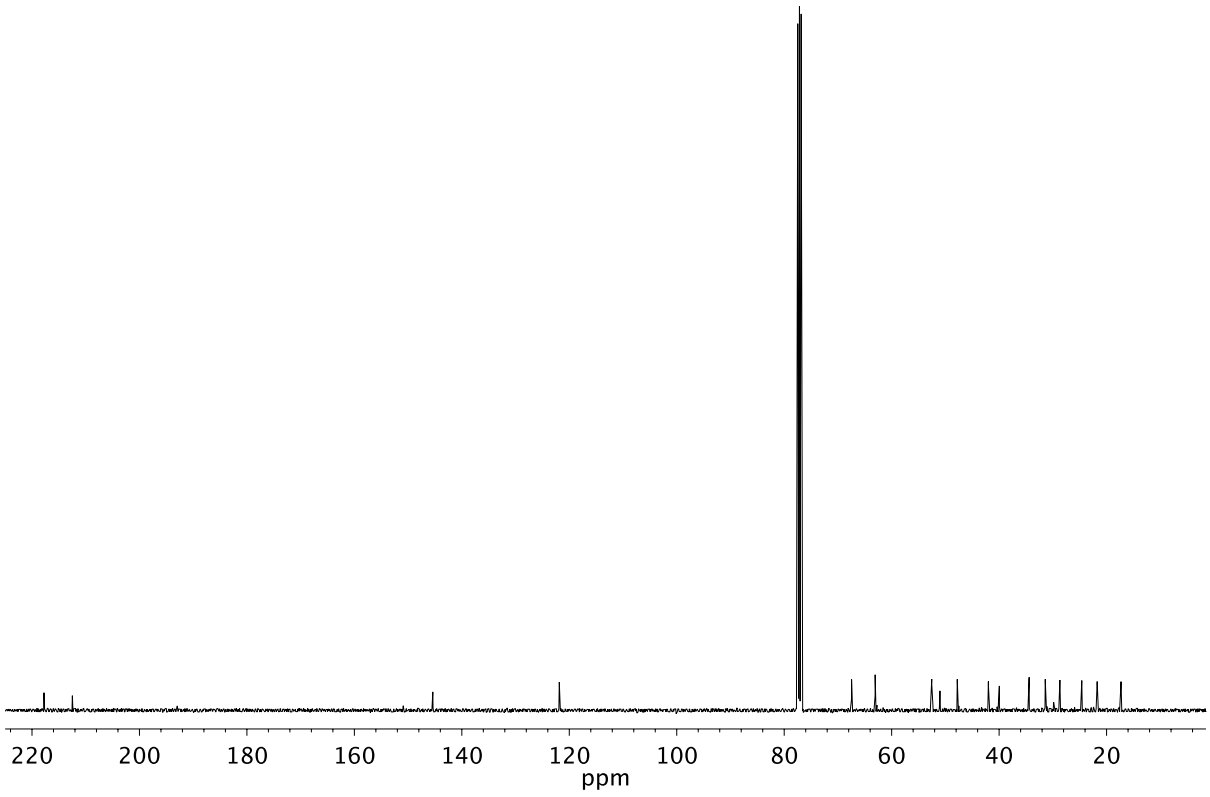

Figure A7.8. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **190**.

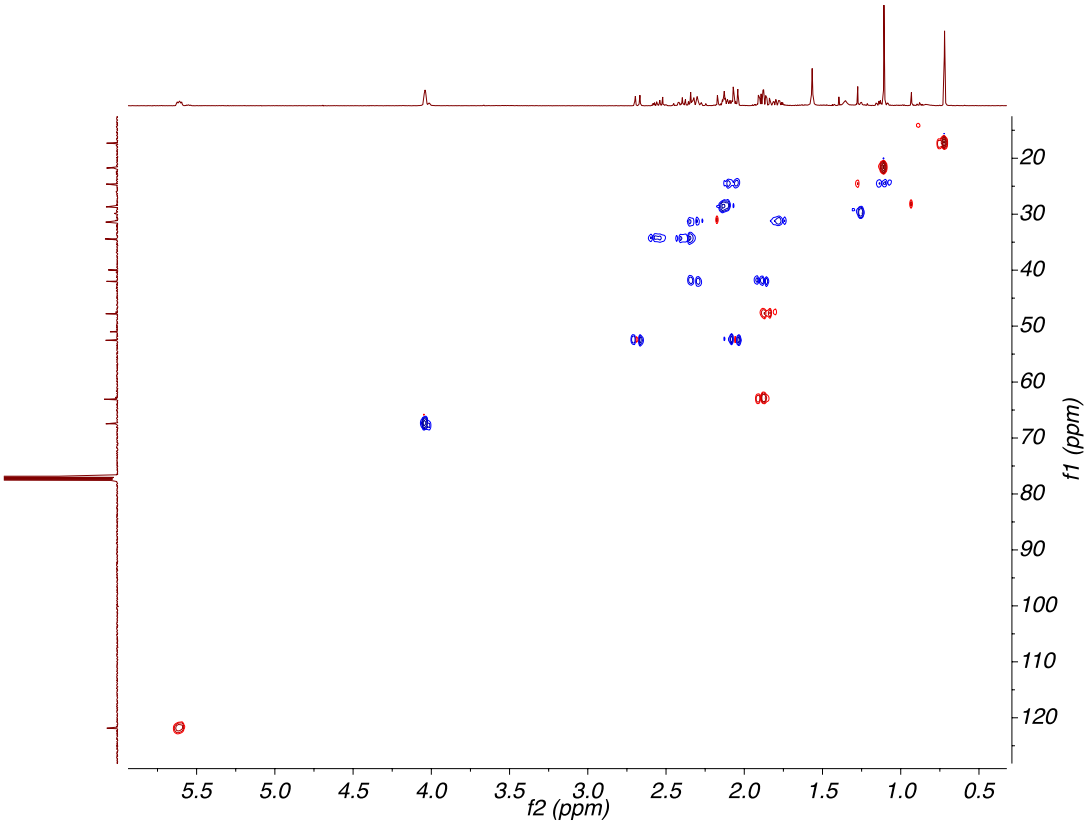

Figure A7.9. HSQC (400, 101 MHz, $CDCl_3$) of compound **190**.

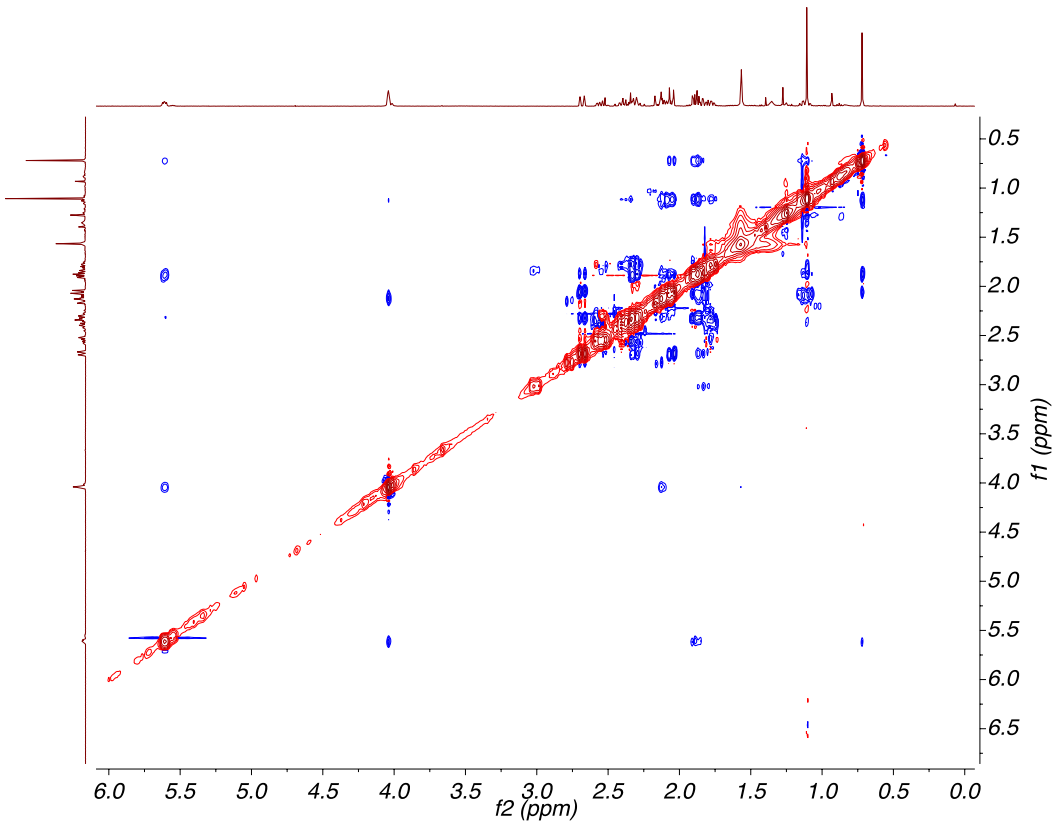

Figure A7.10. NOESY (400 MHz, $CDCl_3$) of compound **190**.

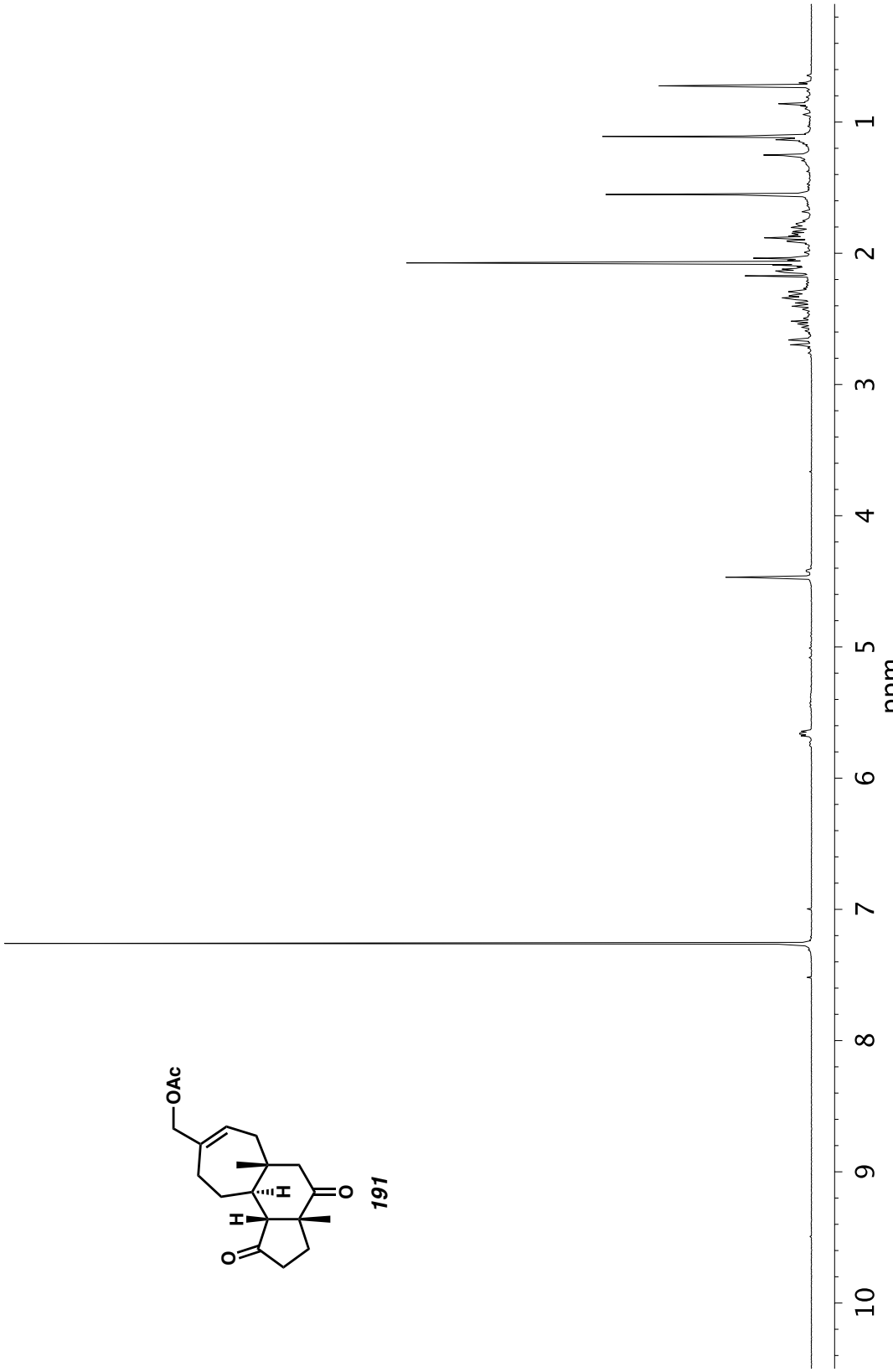

Figure A7.11. ^{1}H NMR (400 MHz, $CDCl_3$) of compound **191**.

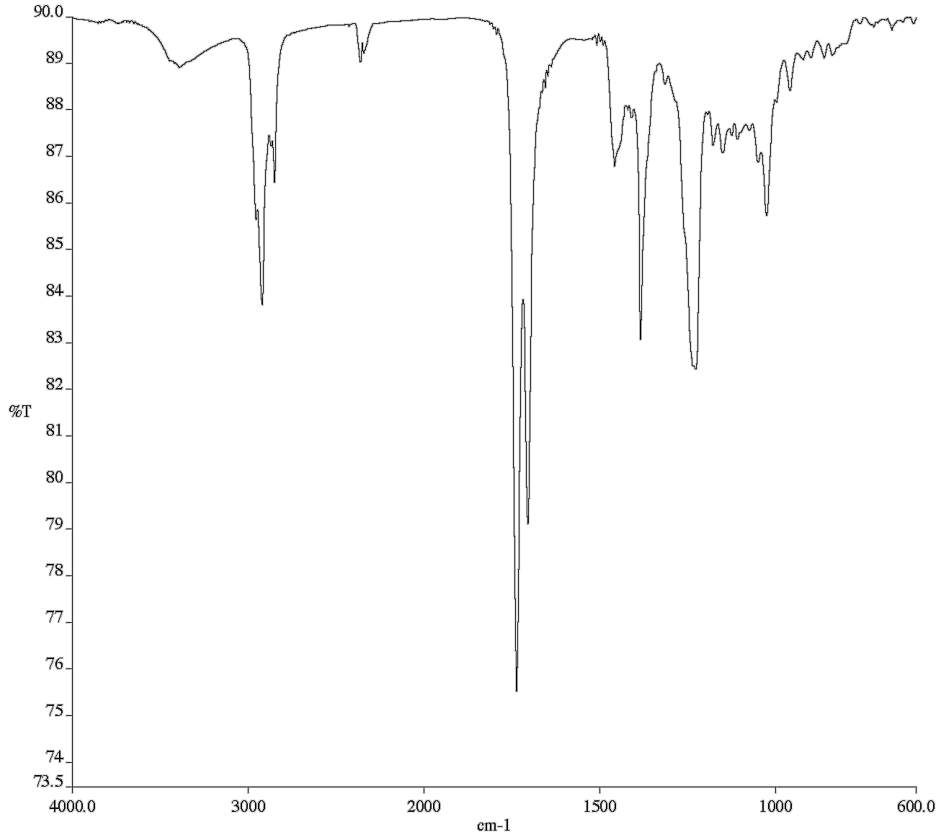

Figure A7.12. Infrared Spectrum (Thin Film, KBr) of compound **191**.

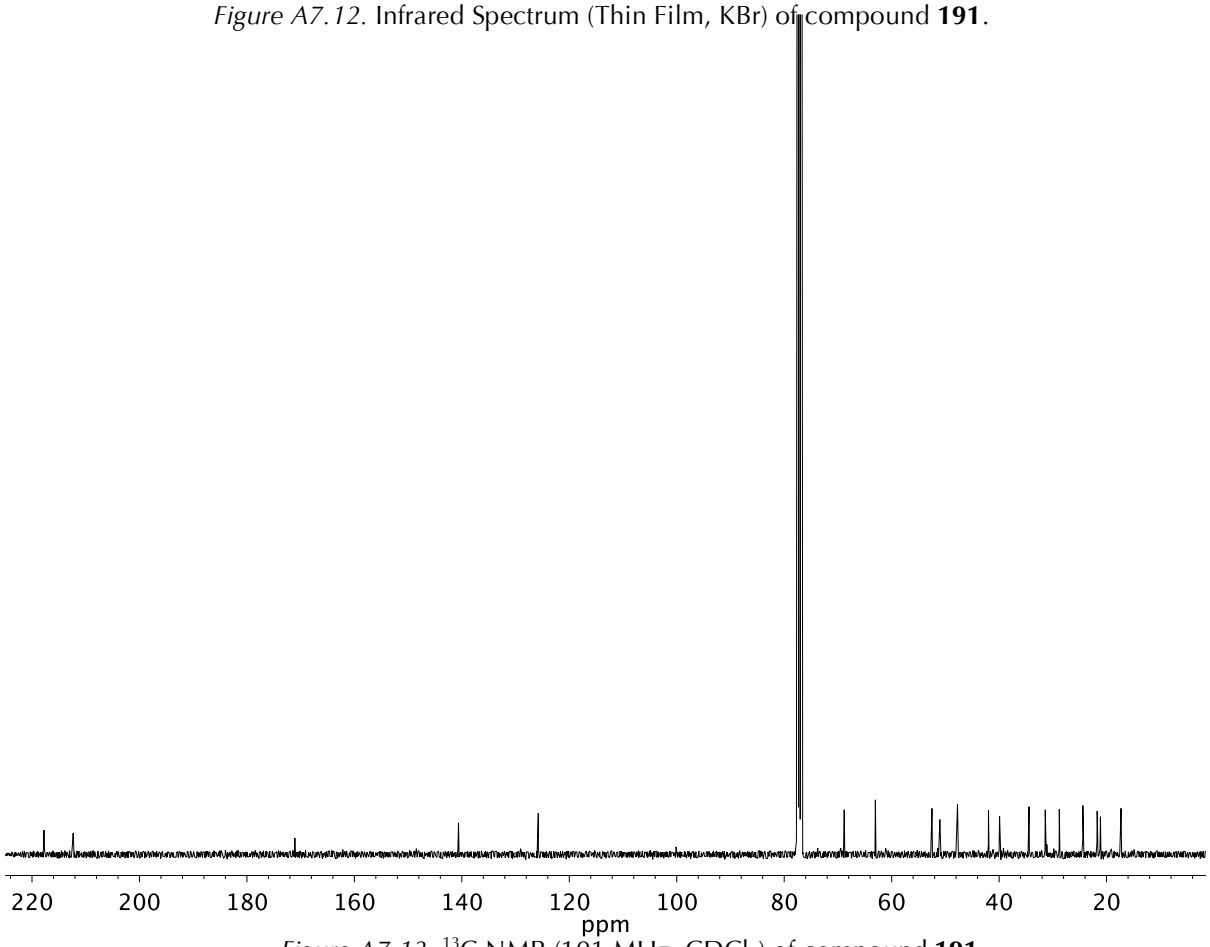

Figure A7.13. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **191**.

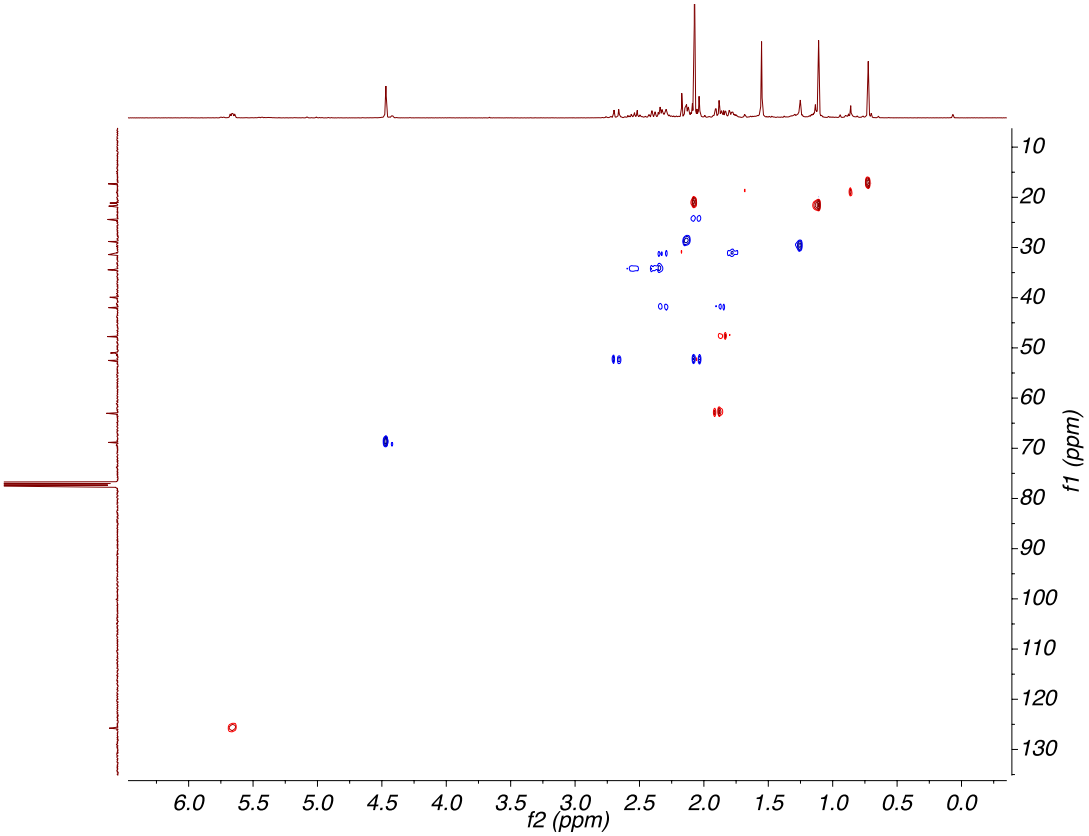

Figure A7.14. HSQC (400, 101 MHz, $CDCl_3$) of compound **191**.

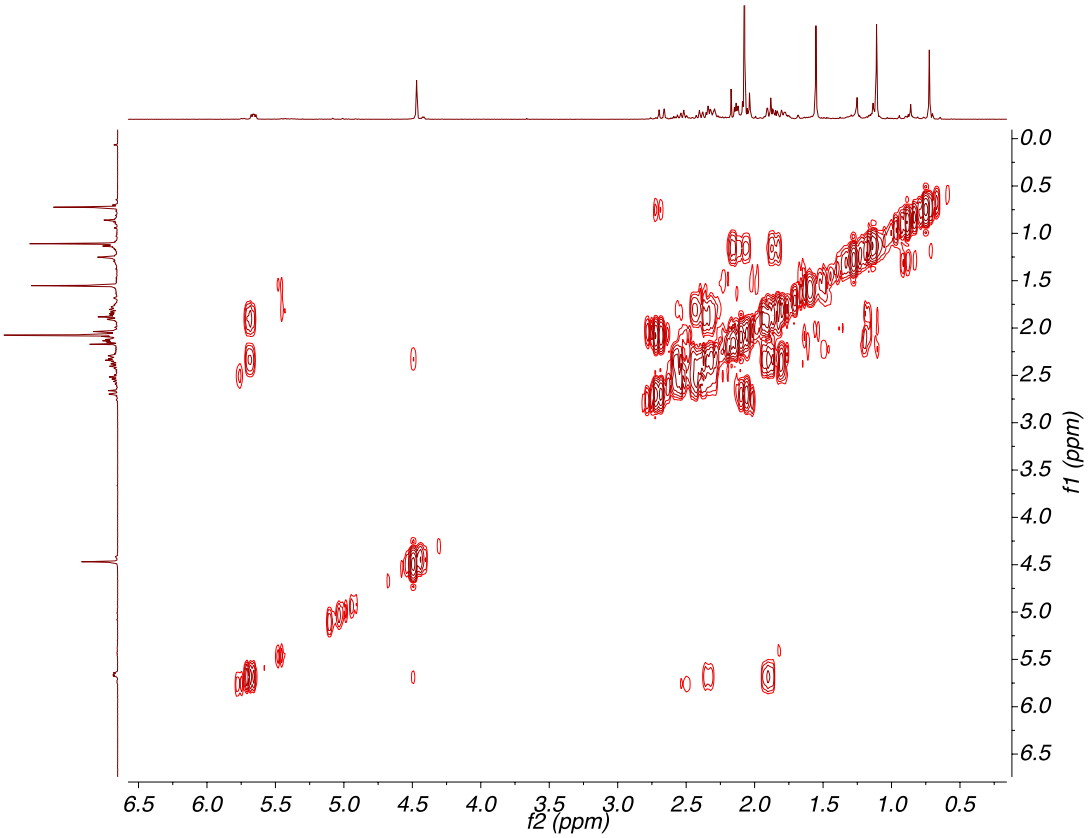

Figure A7.15. COSY (400 MHz, $CDCl_3$) of compound **191**.

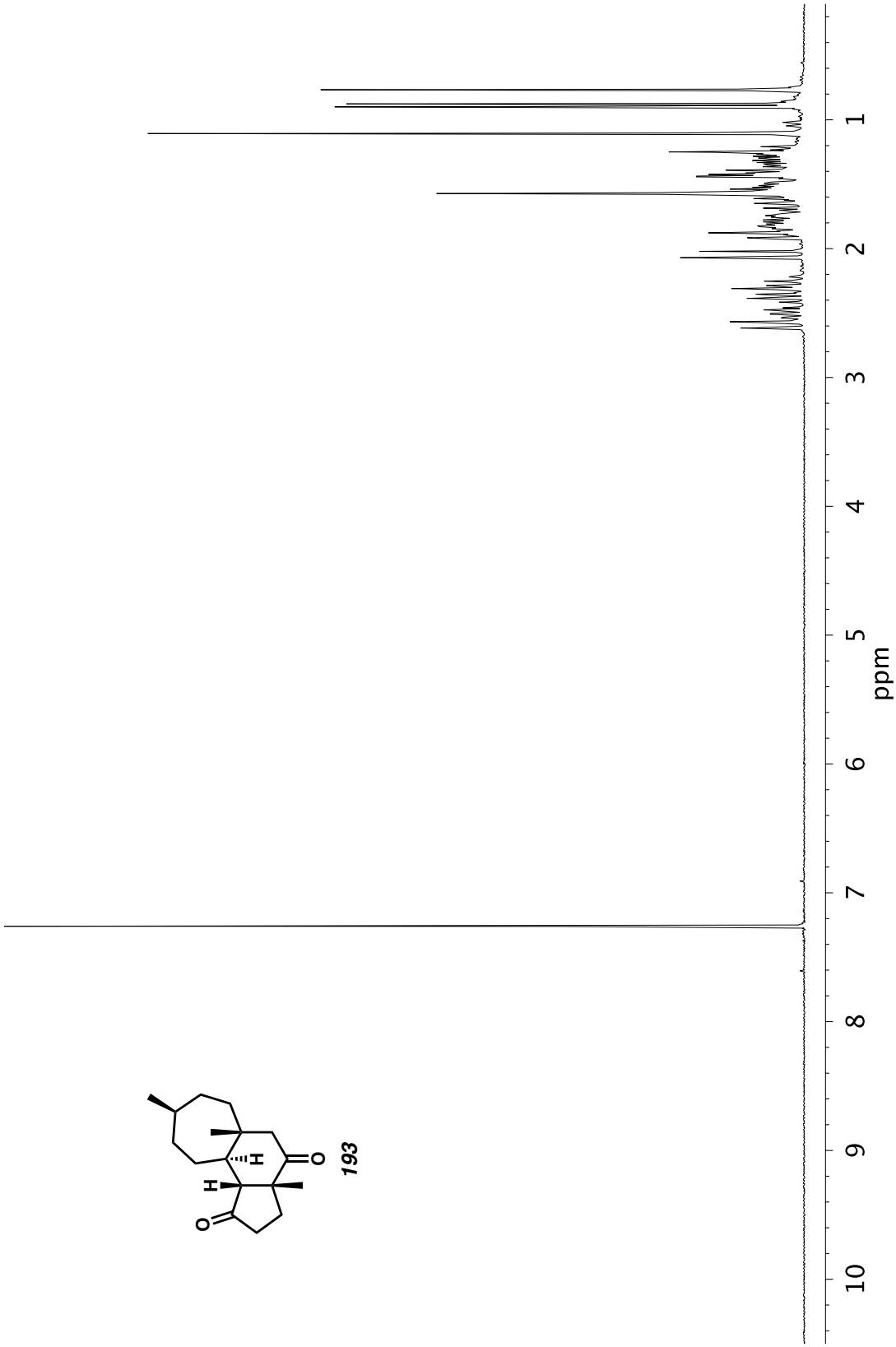

Figure A7.16. ^{1}H NMR (300 MHz, $CDCl_3$) of compound **193**.

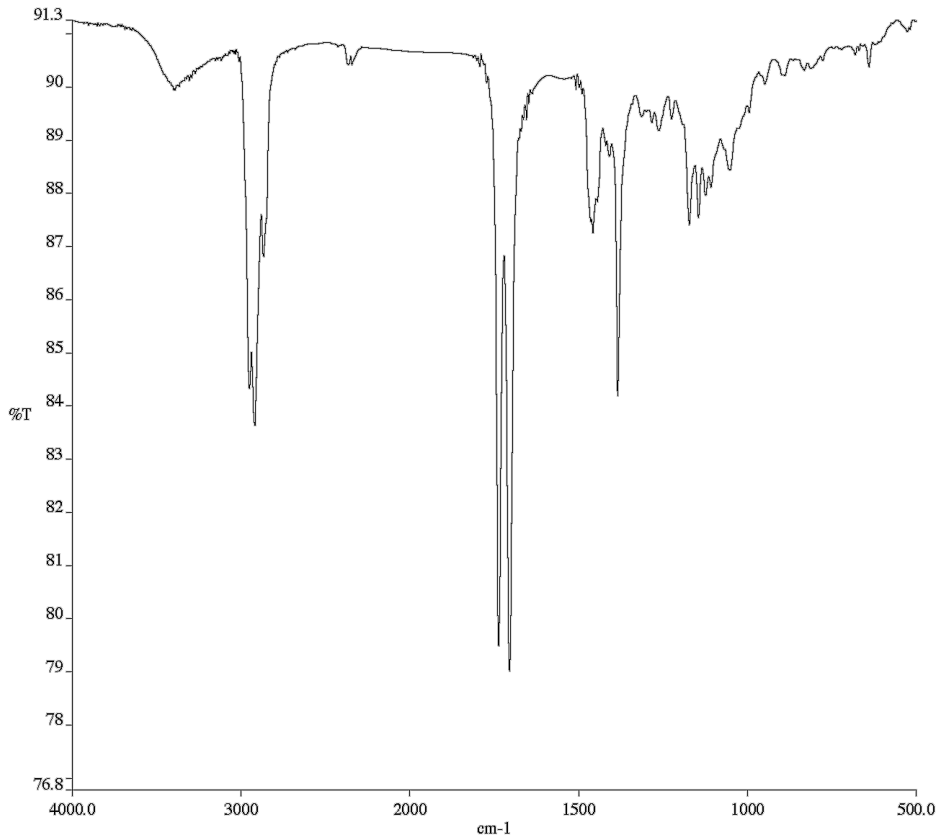

Figure A7.17. Infrared Spectrum (Thin Film, KBr) of compound **193**.

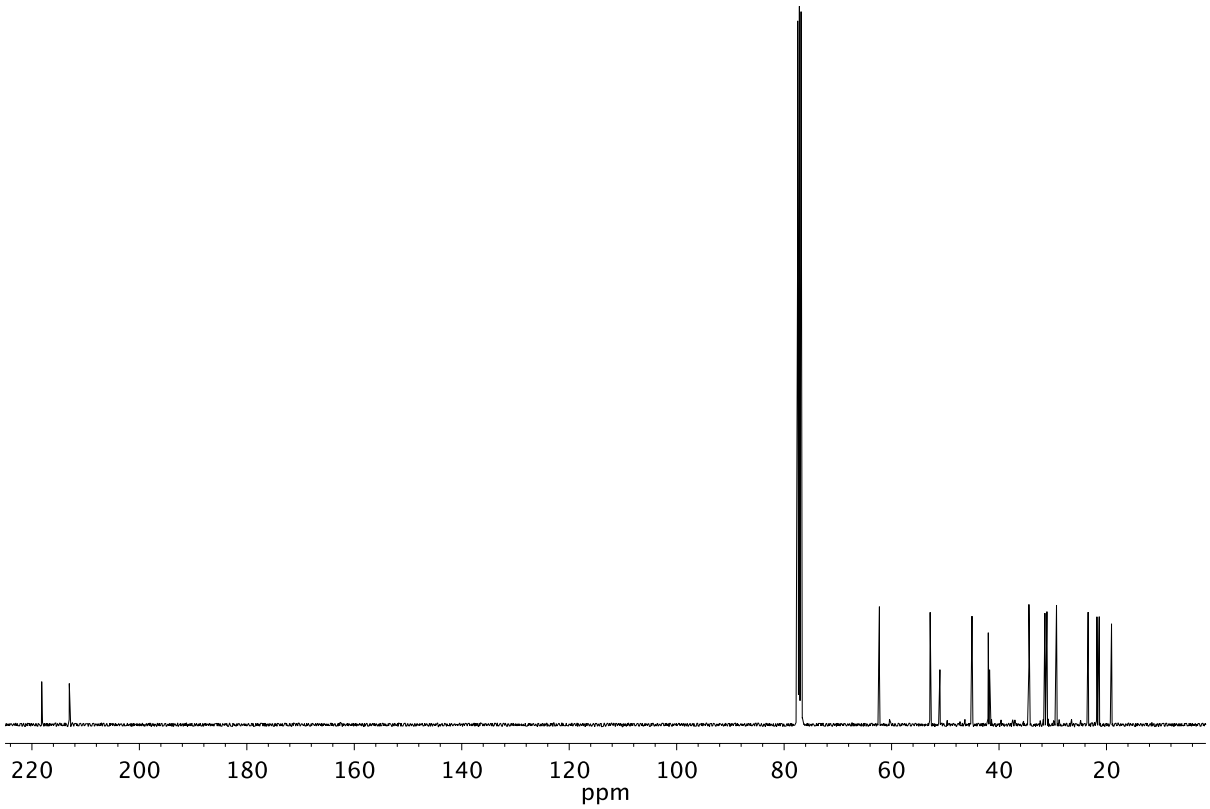

Figure A7.18. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **193**.

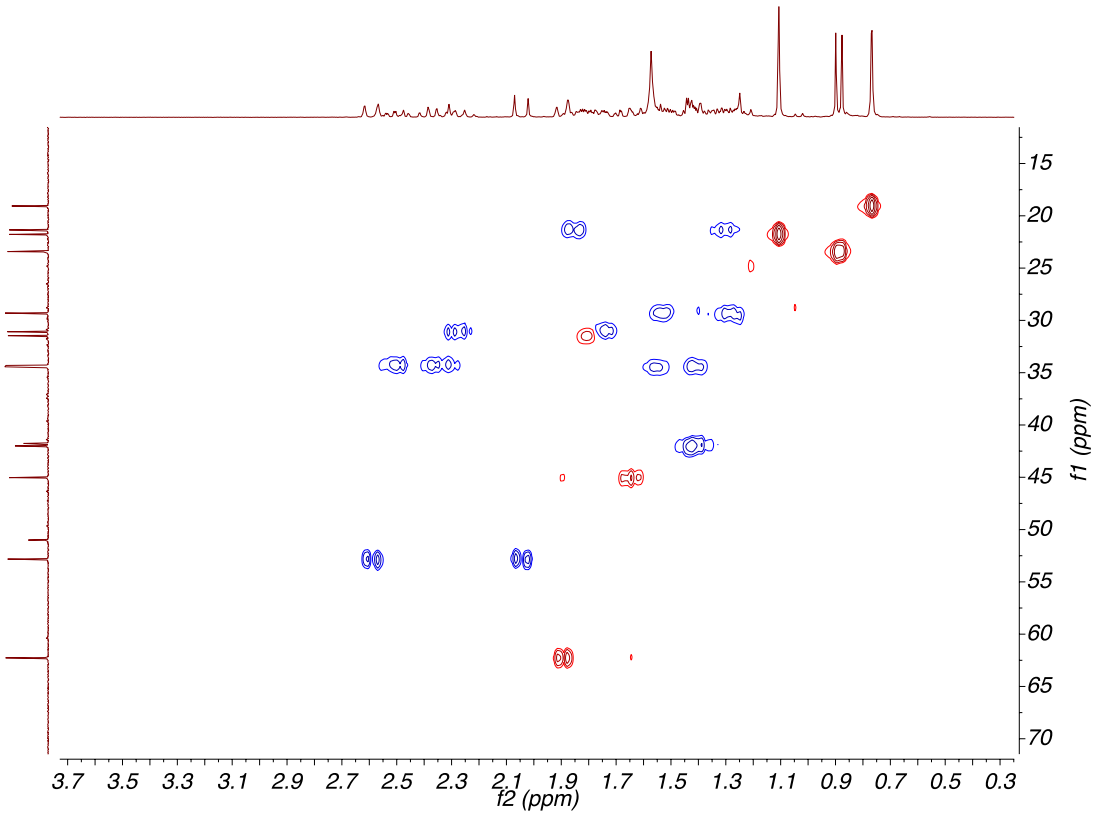

Figure A7.19. HSQC (400, 101 MHz, $CDCl_3$) of compound **193**.

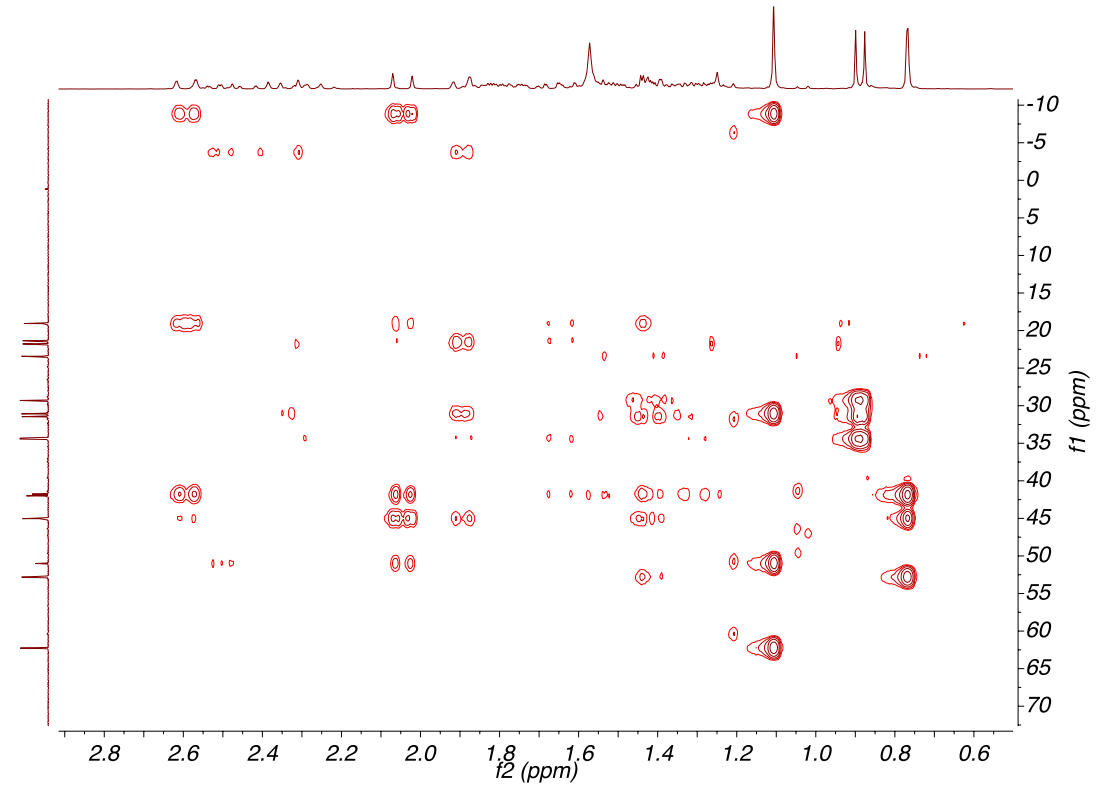

Figure A7.20. HMBC (400, 101 MHz, $CDCl_3$) of compound **193**.

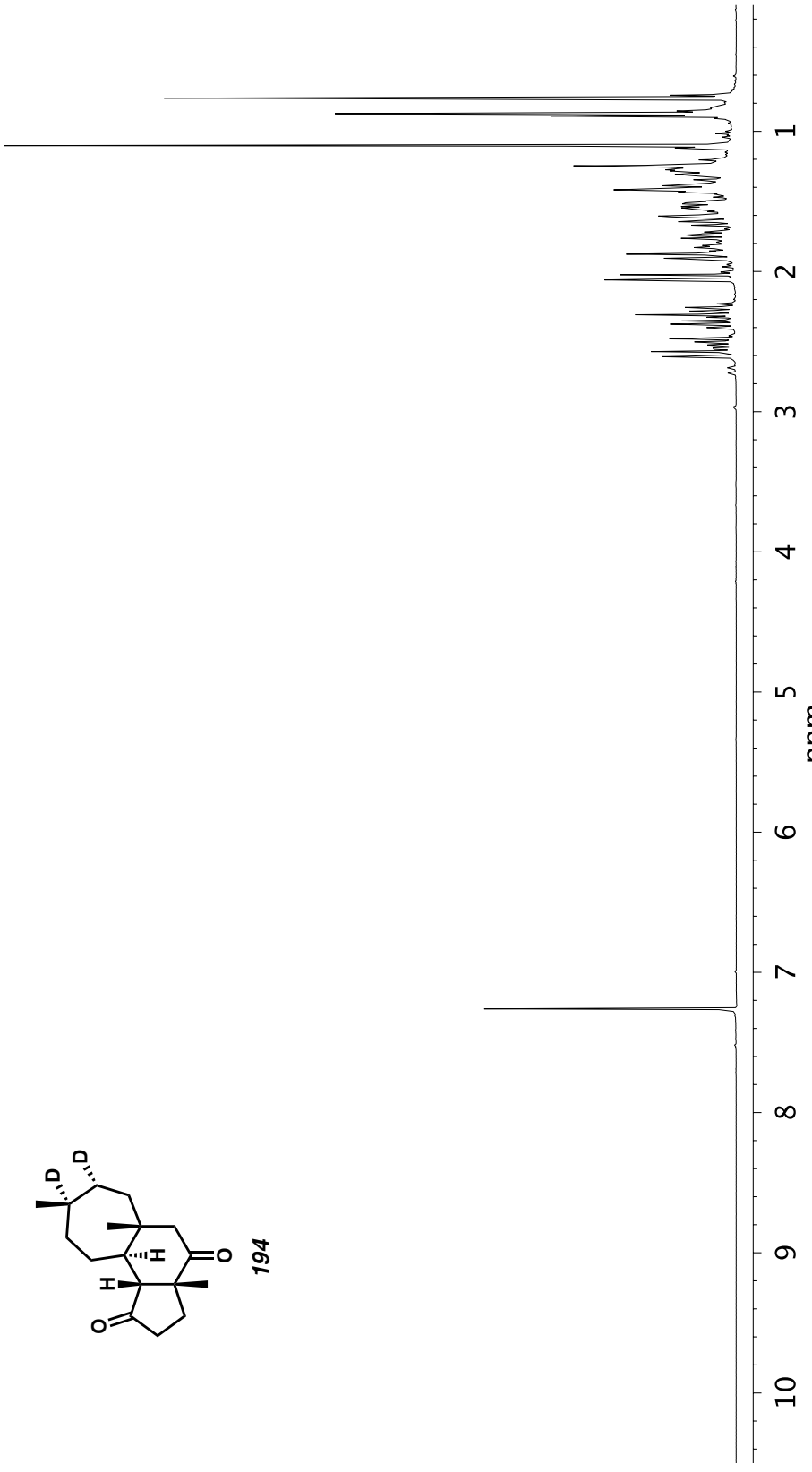

Figure A7.21. ^{1}H NMR (400 MHz, $CDCl_3$) of compound **194**.

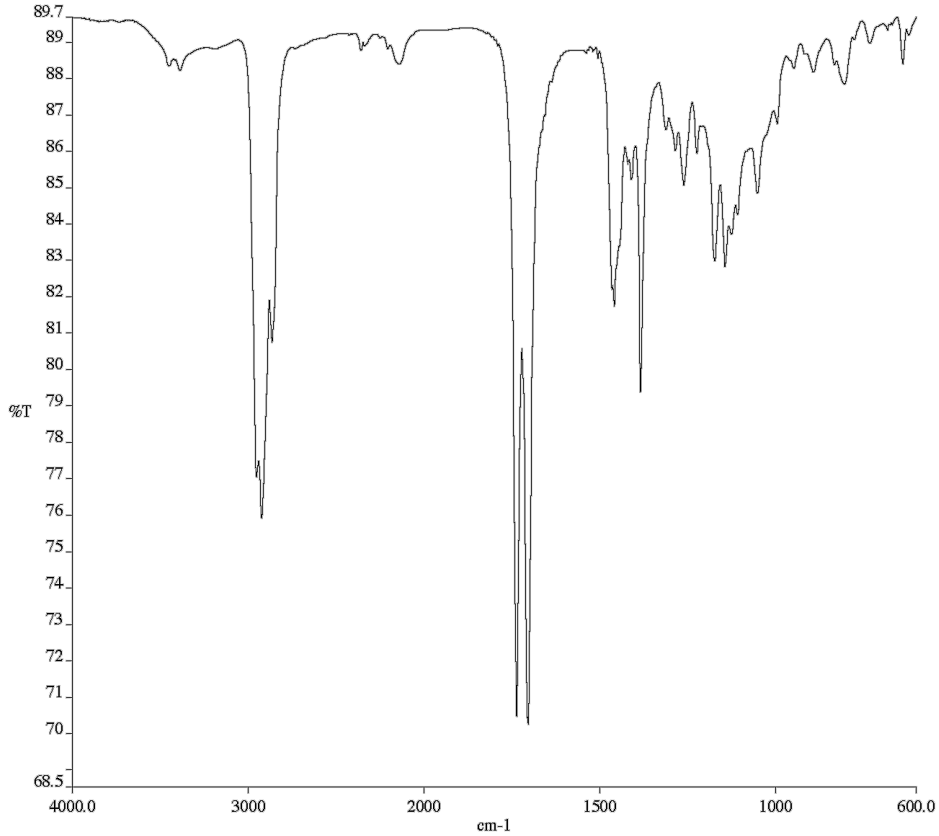

Figure A7.22. Infrared Spectrum (Thin Film, KBr) of compound **194**.

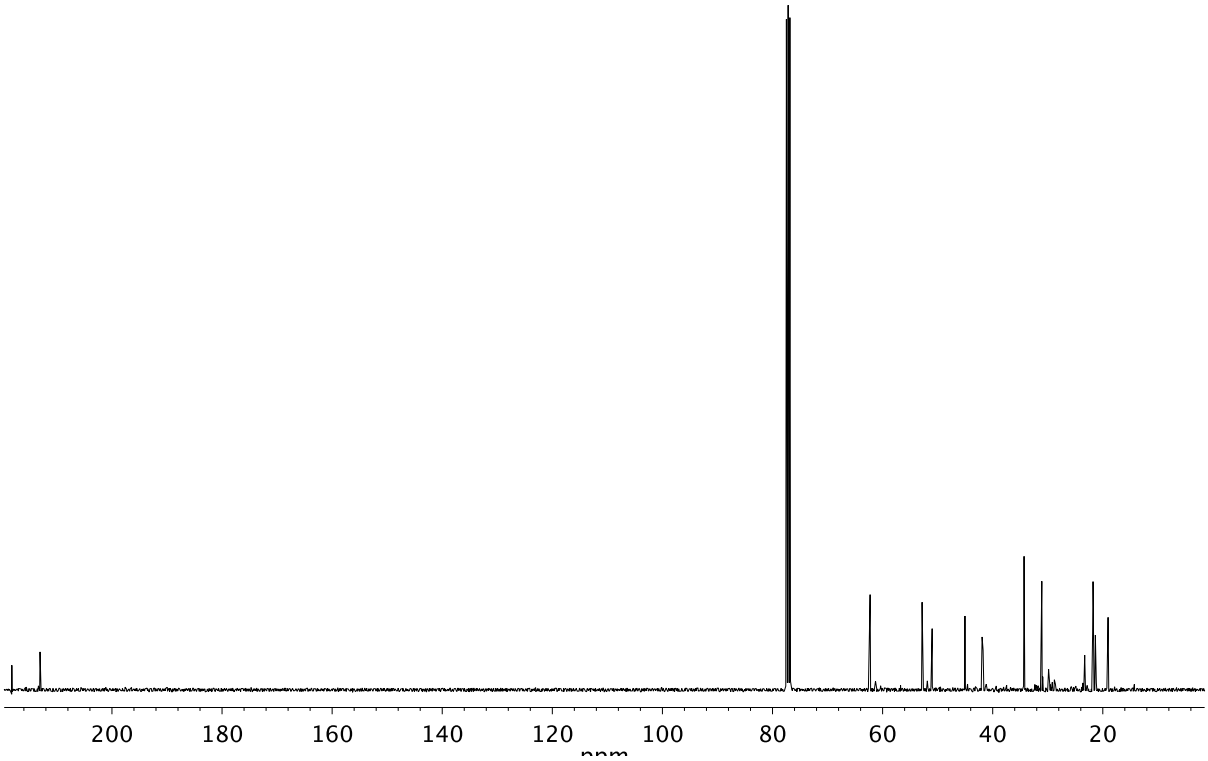

Figure A7.23. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **194**.

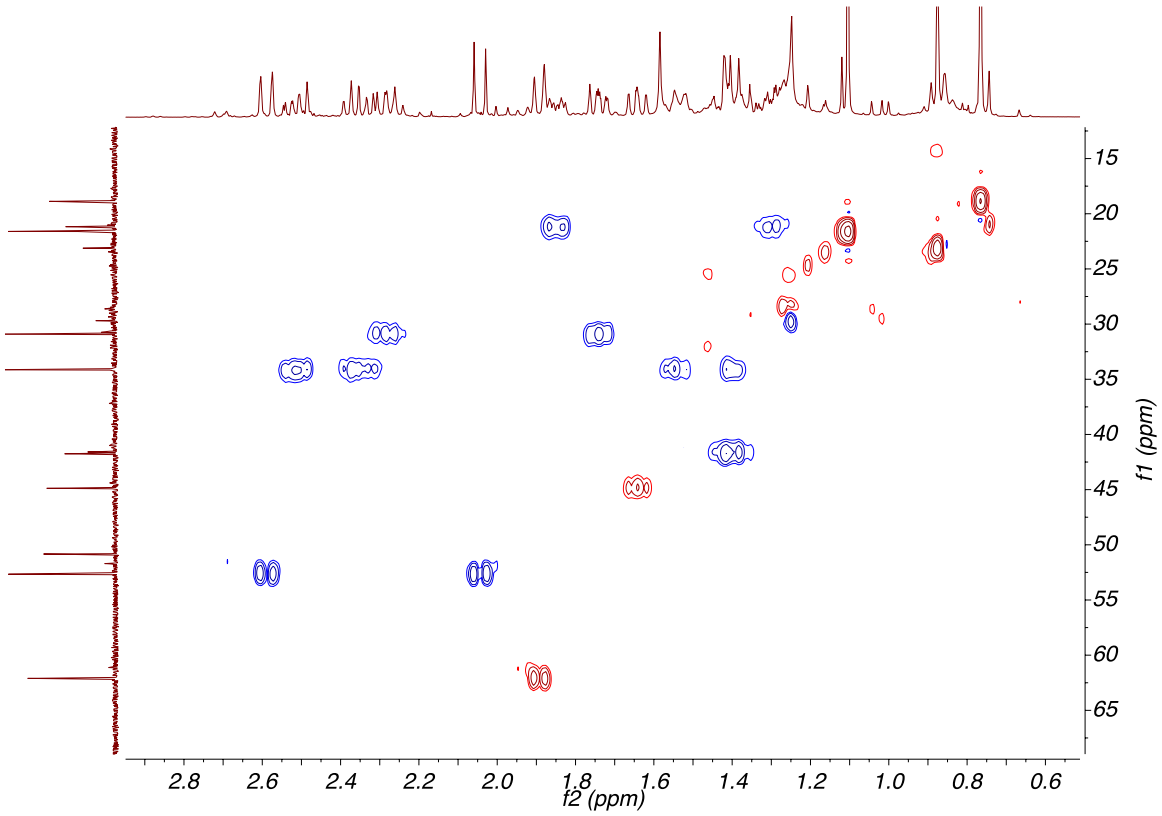

Figure A7.24. HSQC (500, 126 MHz, $CDCl_3$) of compound **194**.

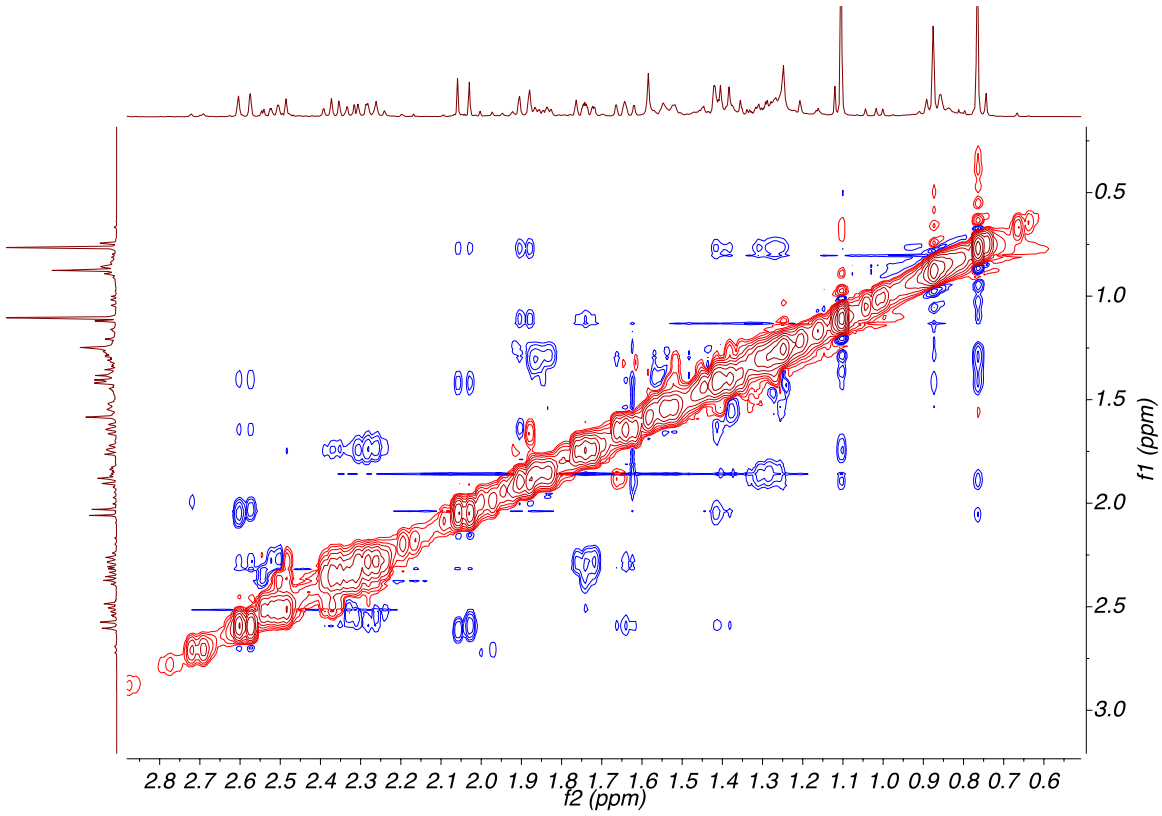

Figure A7.25. NOESY (500 MHz, $CDCl_3$) of compound **194**.

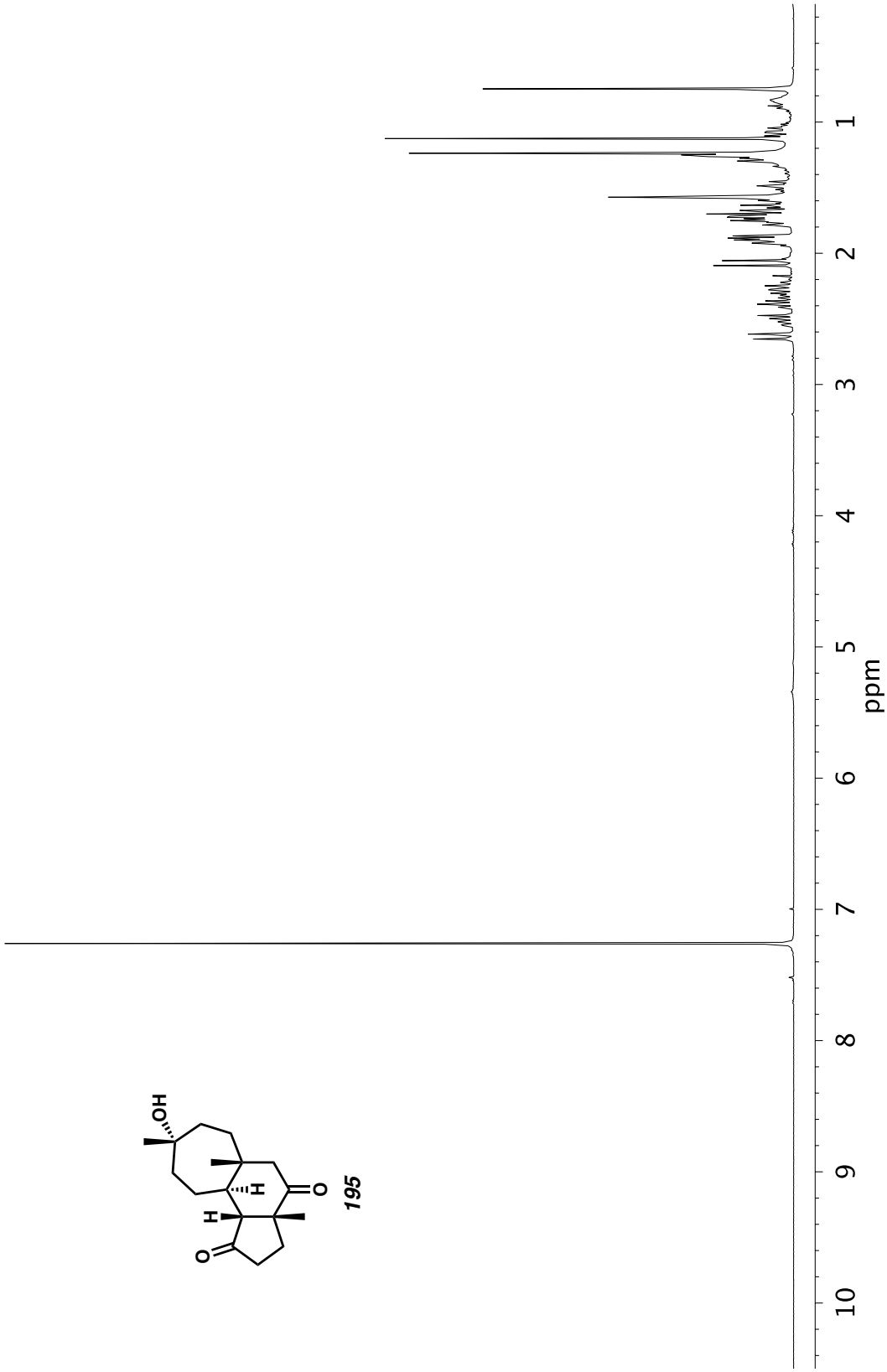

Figure A7.26. ^{1}H NMR (400 MHz, $CDCl_3$) of compound **195**.

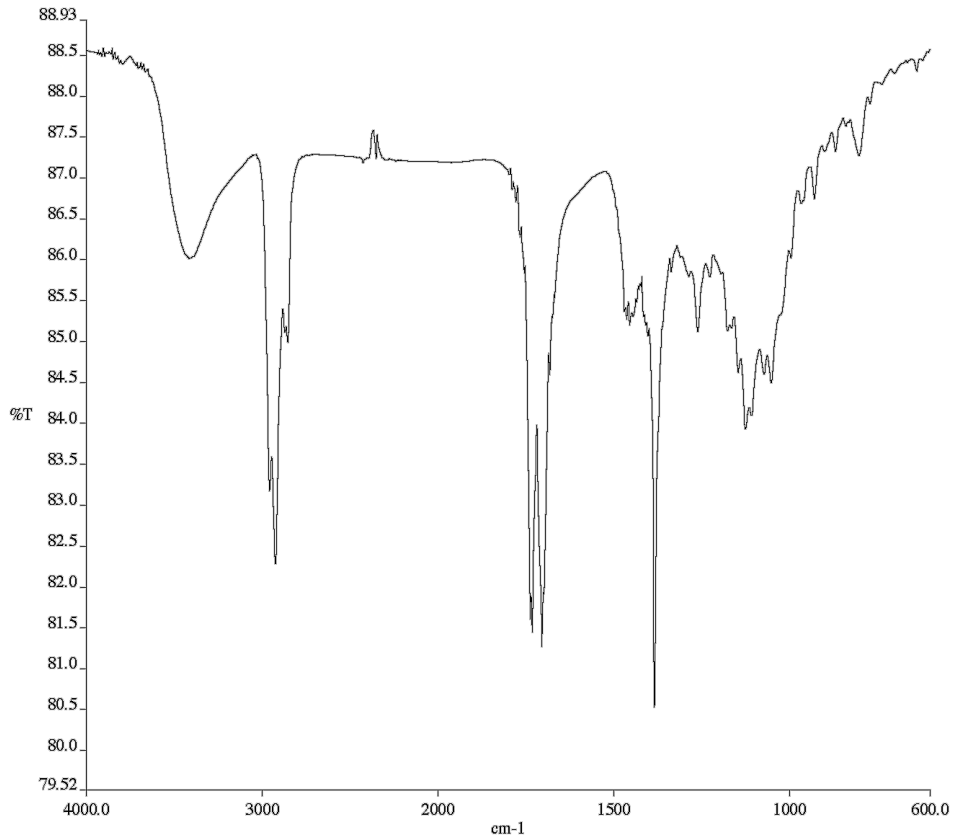

Figure A7.27. Infrared Spectrum (Thin Film, KBr) of compound **195**.

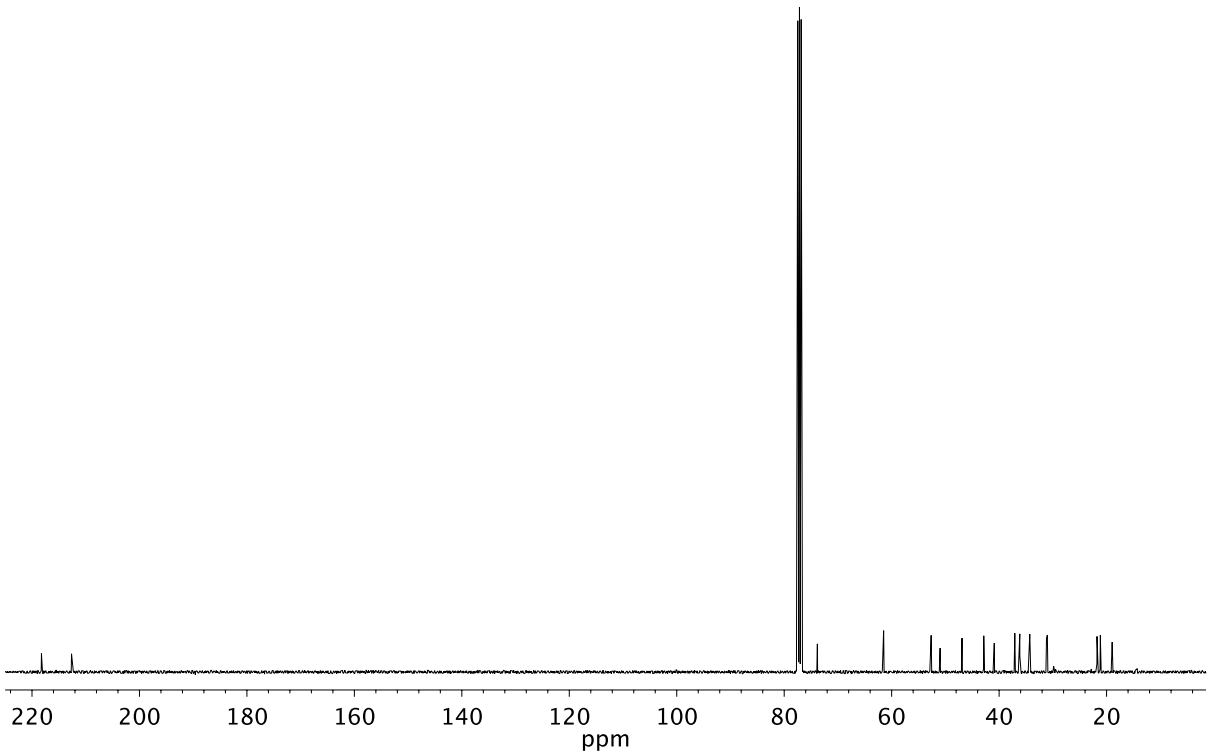

Figure A7.28. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **195**.

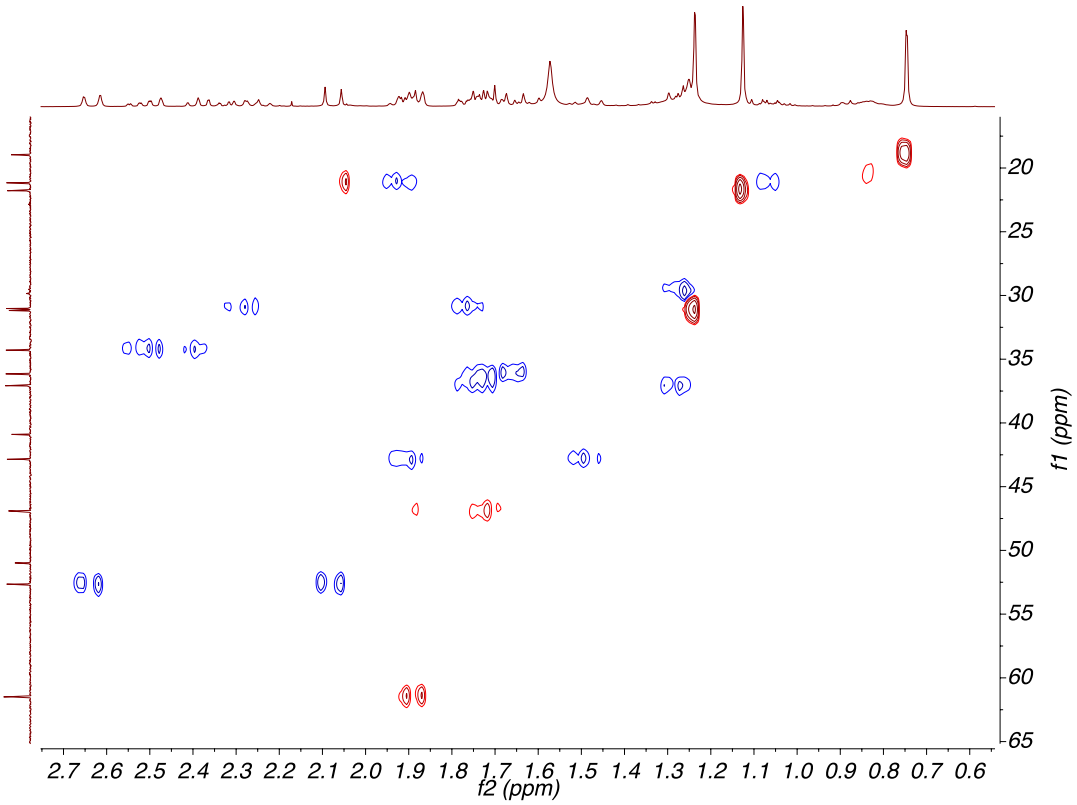

Figure A7.29. HSQC (400, 101 MHz, $CDCl_3$) of compound **195**.

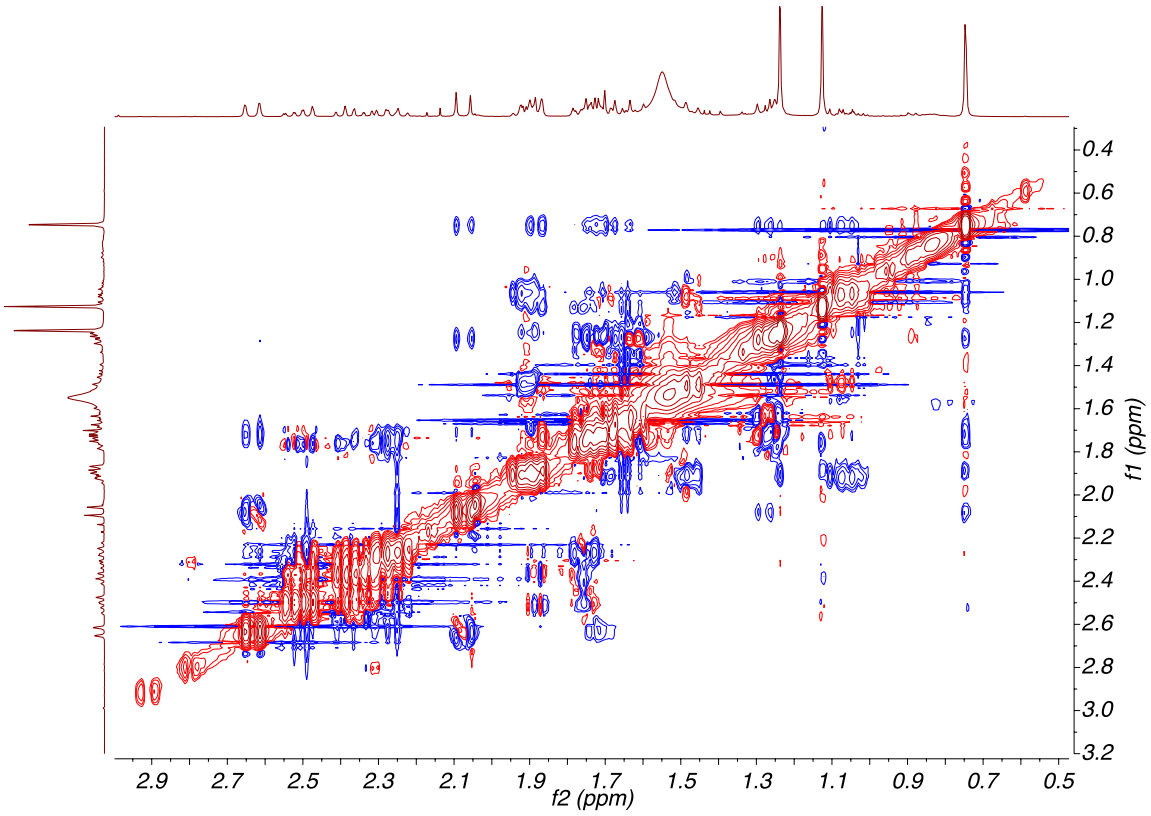

Figure A7.30. NOESY (400 MHz, $CDCl_3$) of compound **195**.

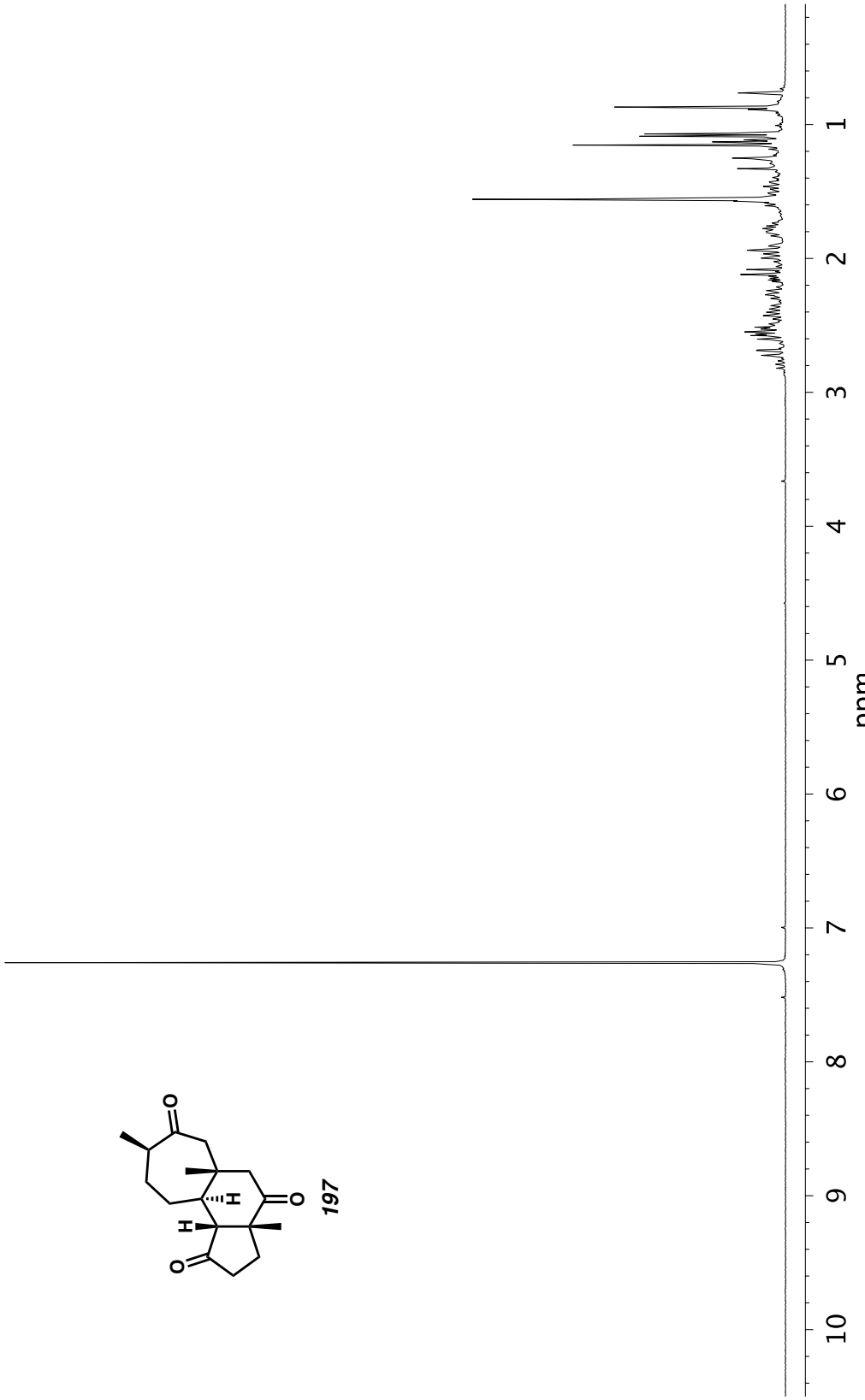

Figure A7.31. ^{1}H NMR (400 MHz, $CDCl_3$) of compound **197**.

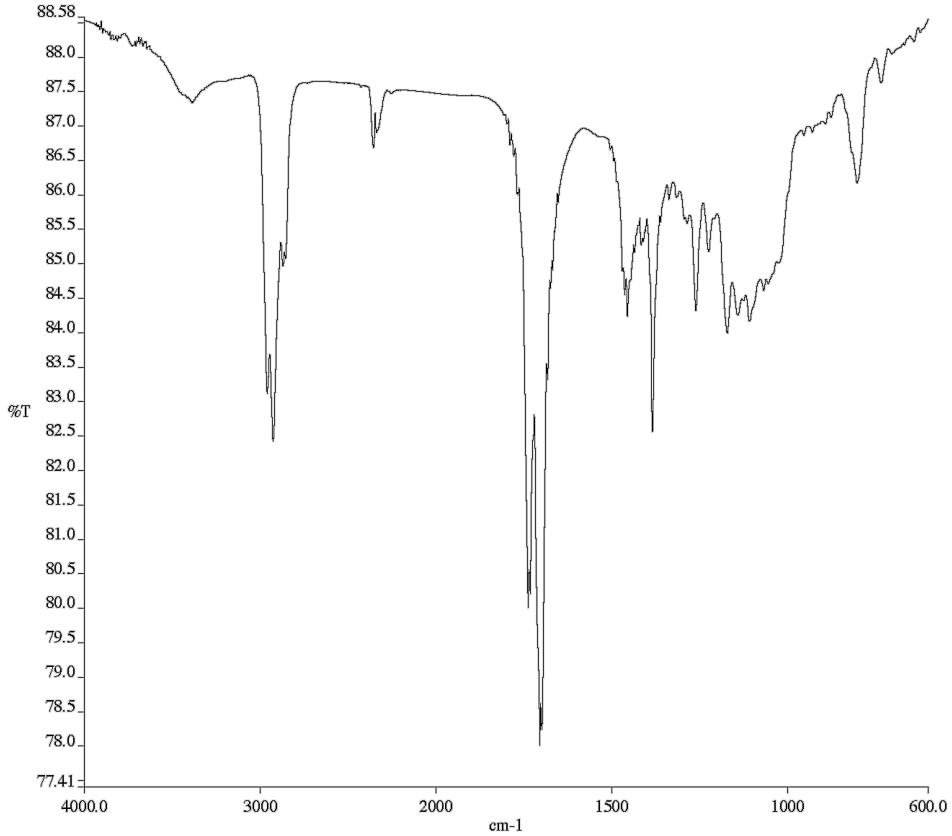

Figure A7.32. Infrared Spectrum (Thin Film, KBr) of compound **197**.

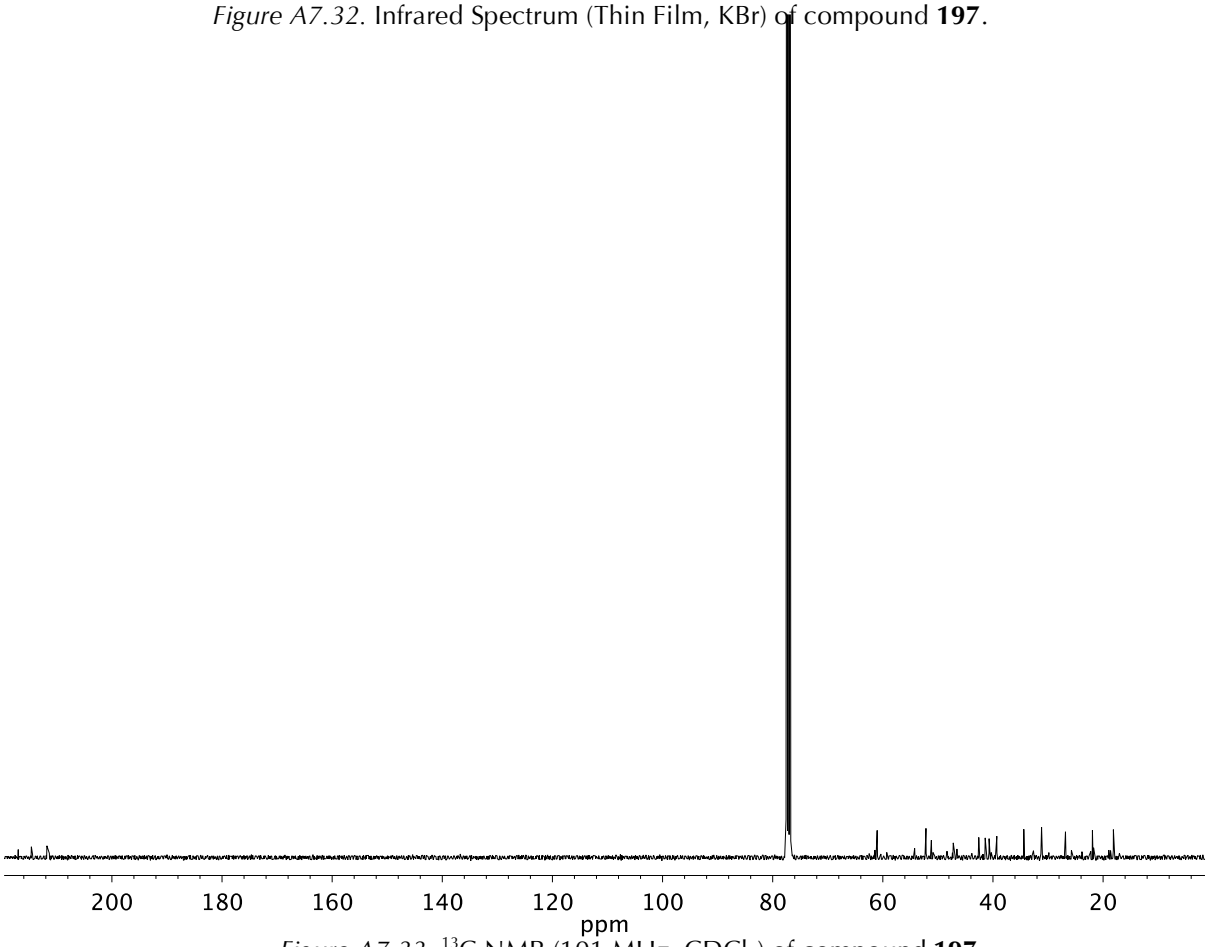

Figure A7.33. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **197**.

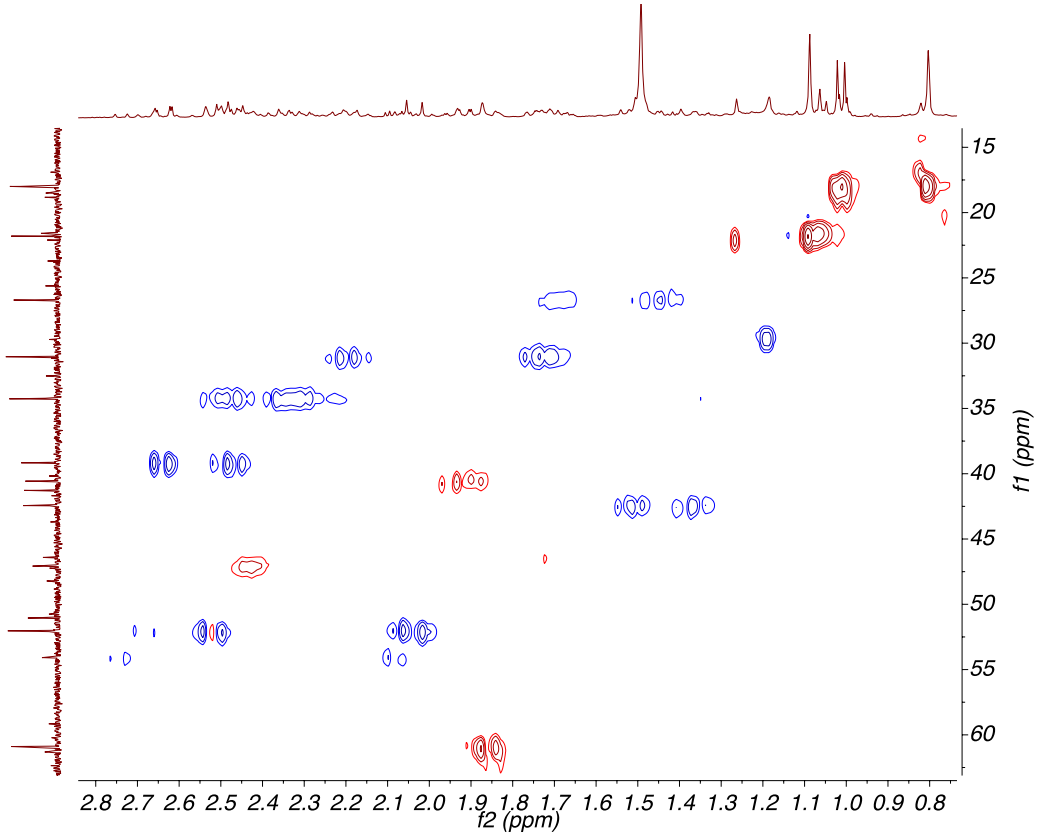

Figure A7.34. HSQC (400, 101 MHz, $CDCl_3$) of compound **197**.

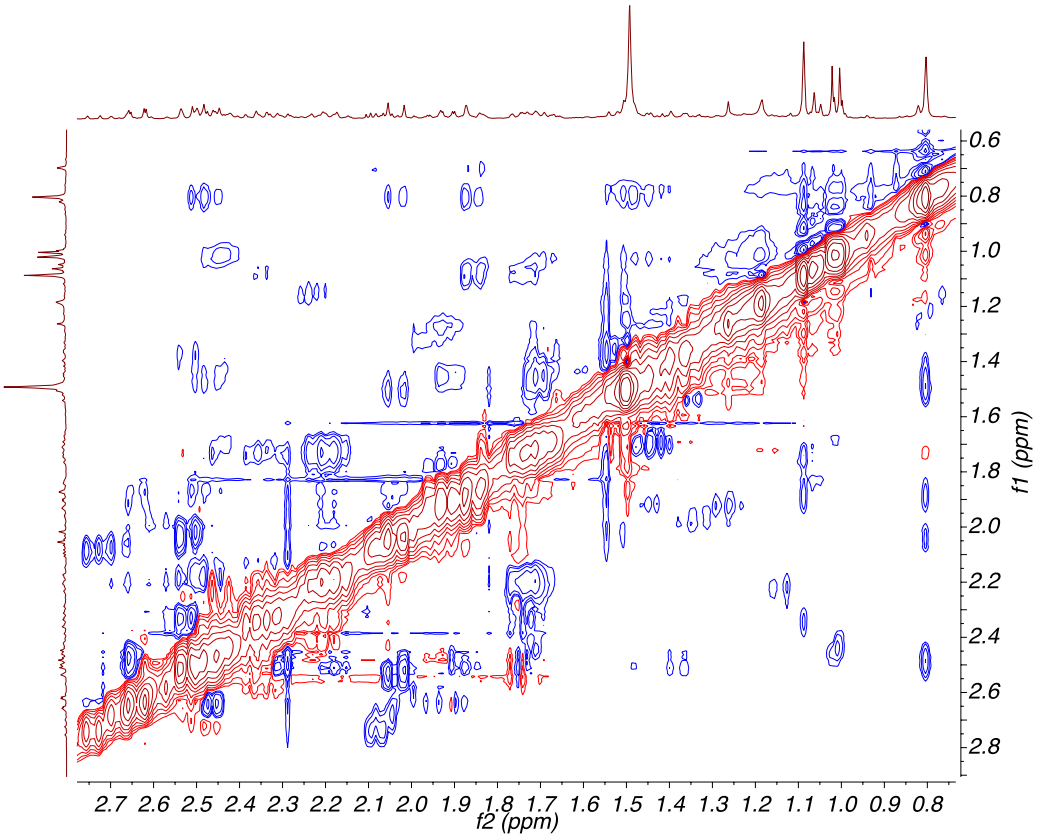

Figure A7.35. NOESY (400 MHz, $CDCl_3$) of compound **197**.

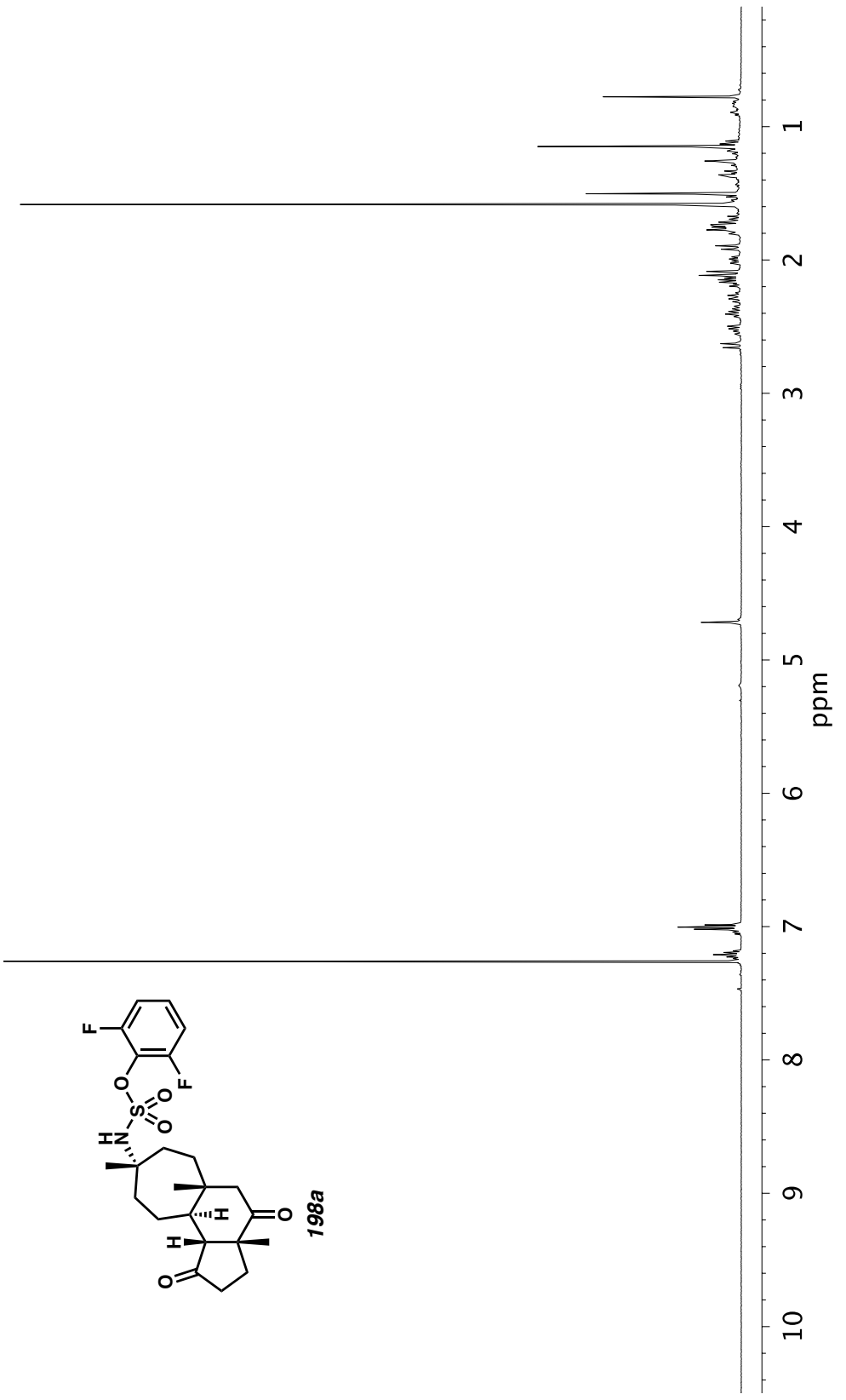

Figure A7.36. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **198a**.

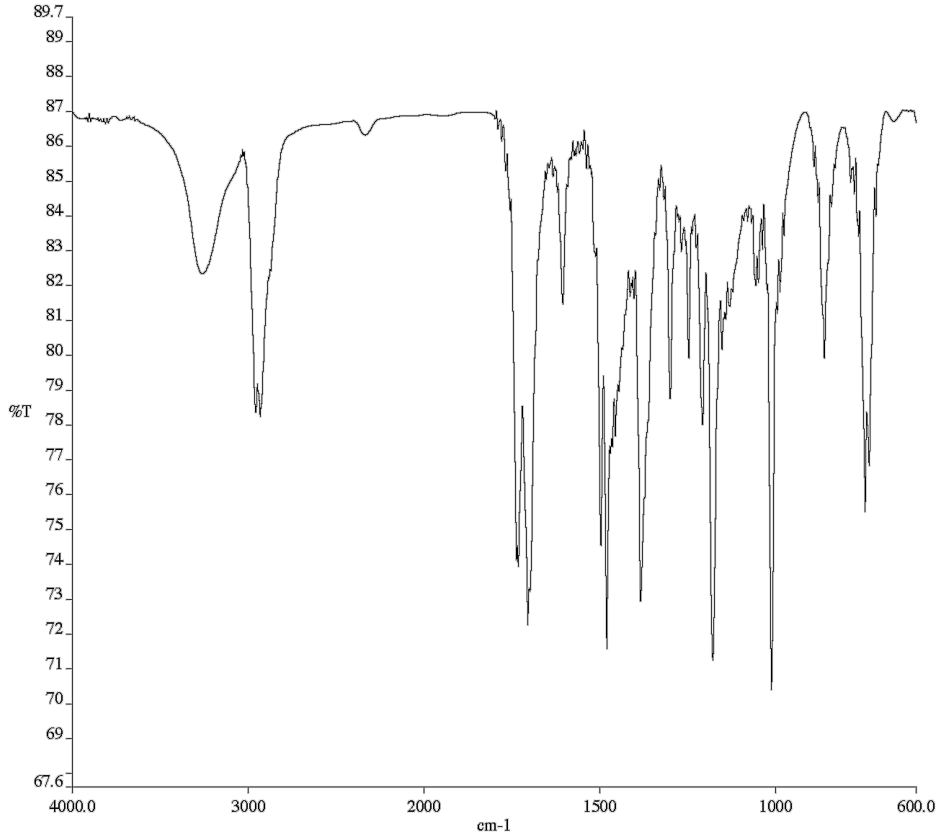

Figure A7.37. Infrared Spectrum (Thin Film, KBr) of compound **198a**.

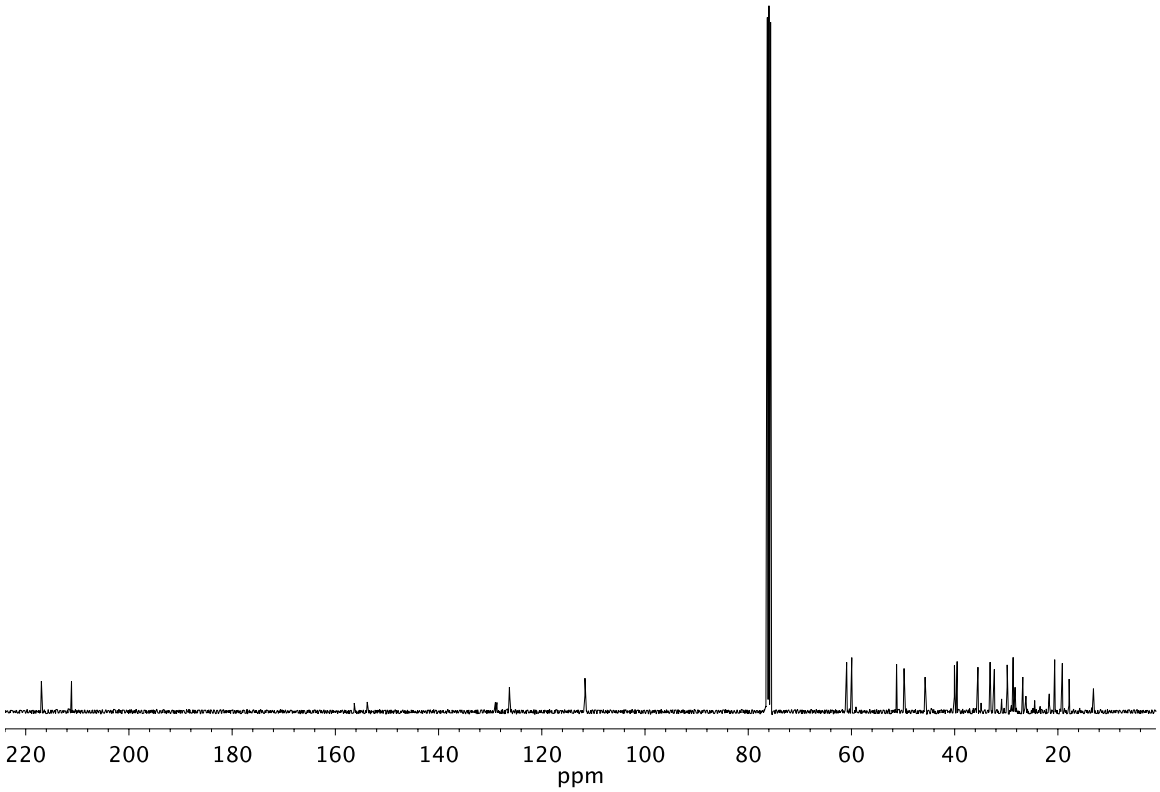

Figure A7.38. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **198a**.

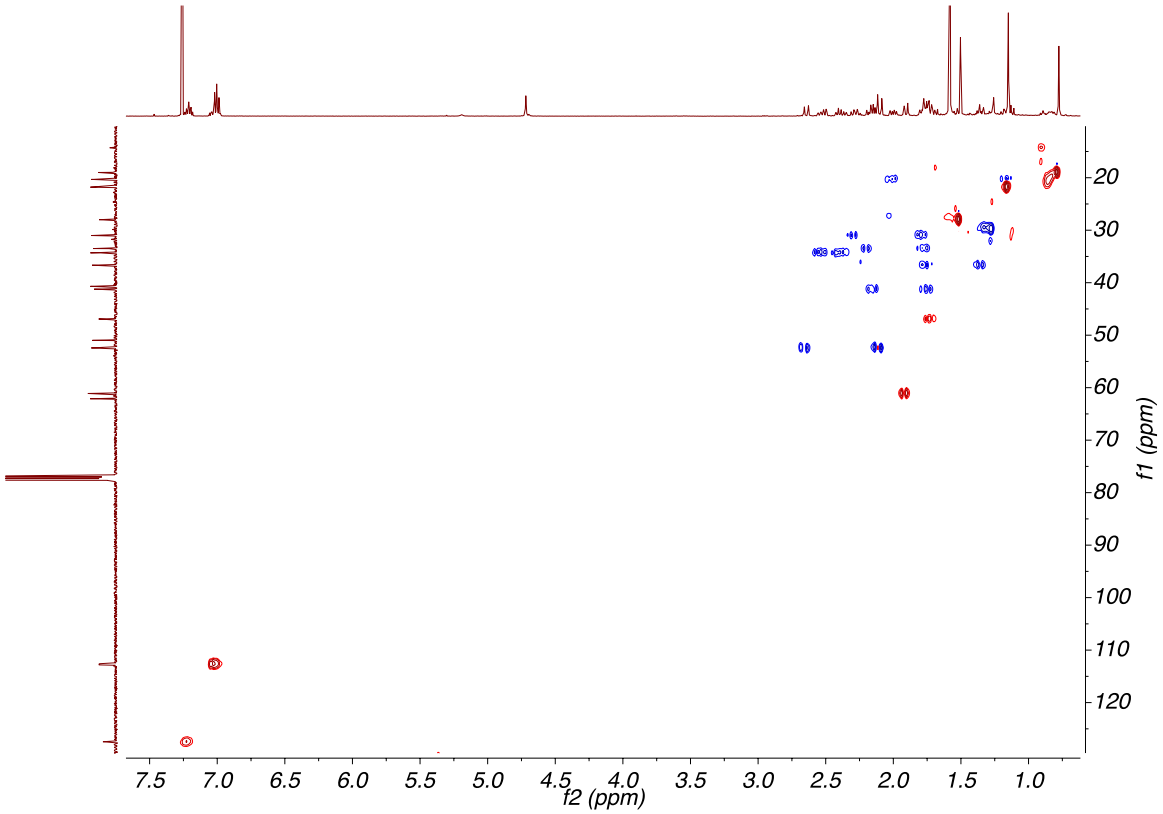

Figure A7.39. HSQC (400, 101 MHz, $CDCl_3$) of compound **198a**.

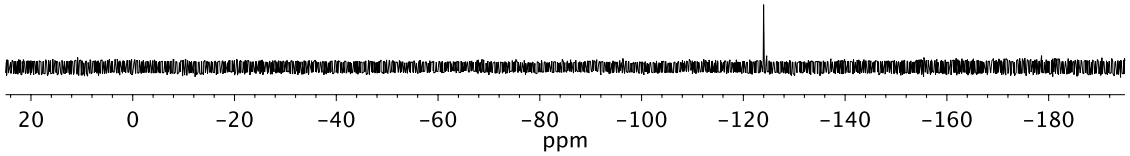

Figure A7.40. ^{19}F NMR (300 MHz, $CDCl_3$) of compound **198a**.

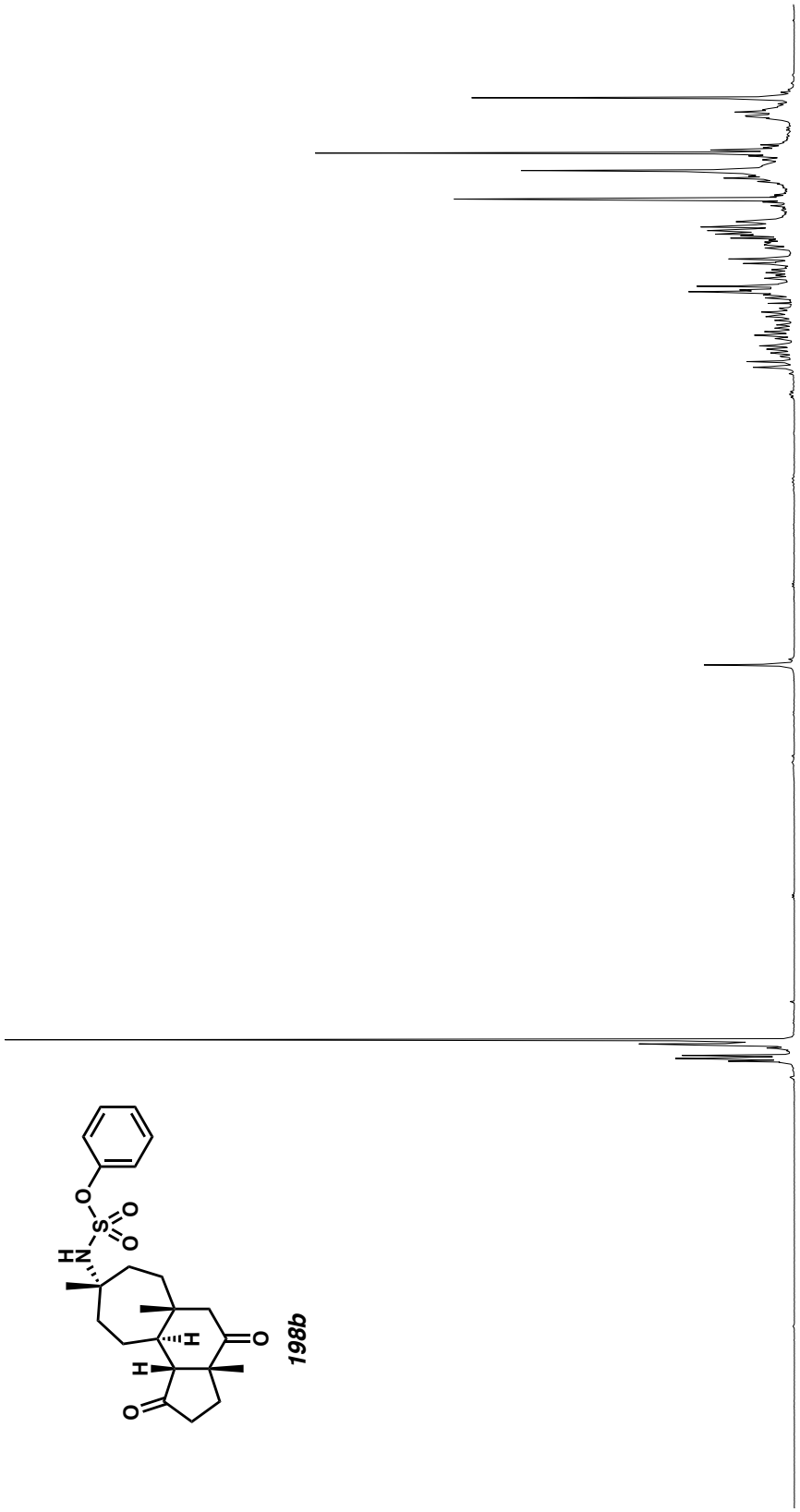

Figure A7.41. ^{1}H NMR (400 MHz, $CDCl_3$) of compound **198b**.

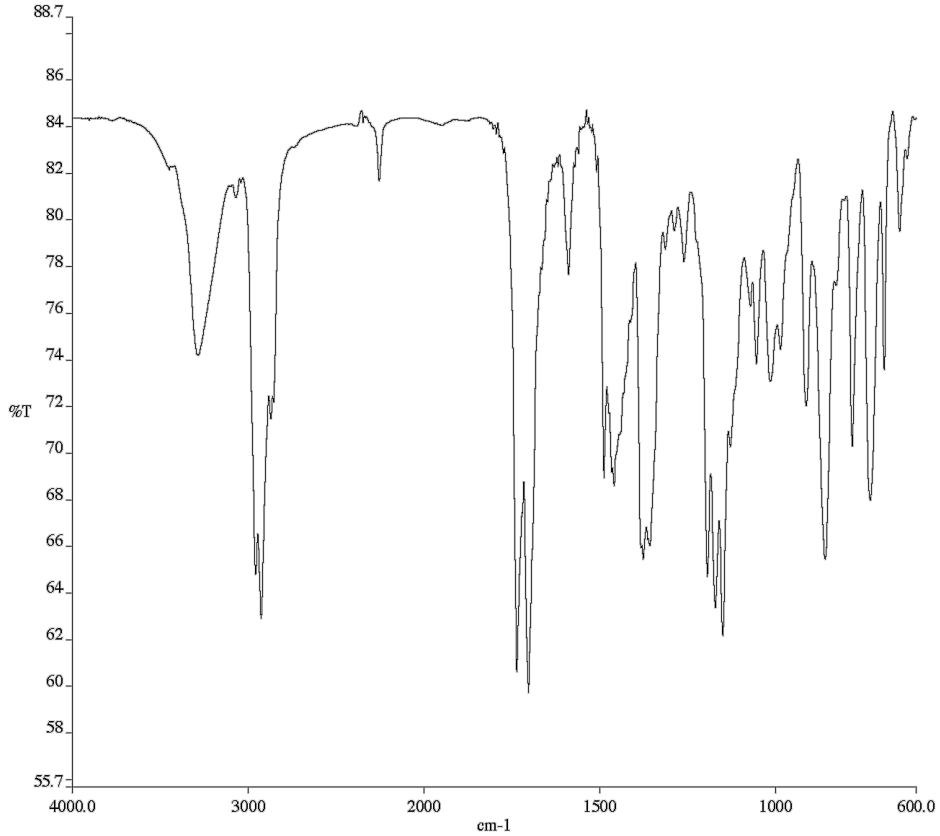

Figure A7.42. Infrared Spectrum (Thin Film, KBr) of compound **198b**.

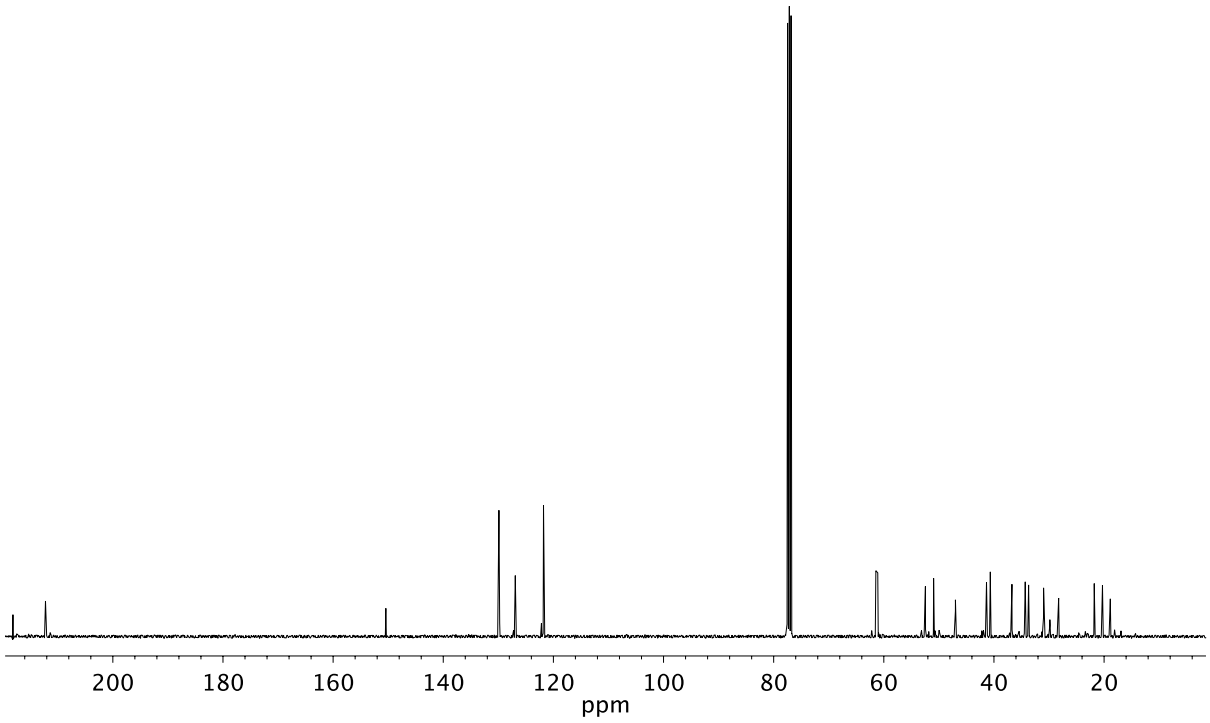

Figure A7.43. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **198b**.

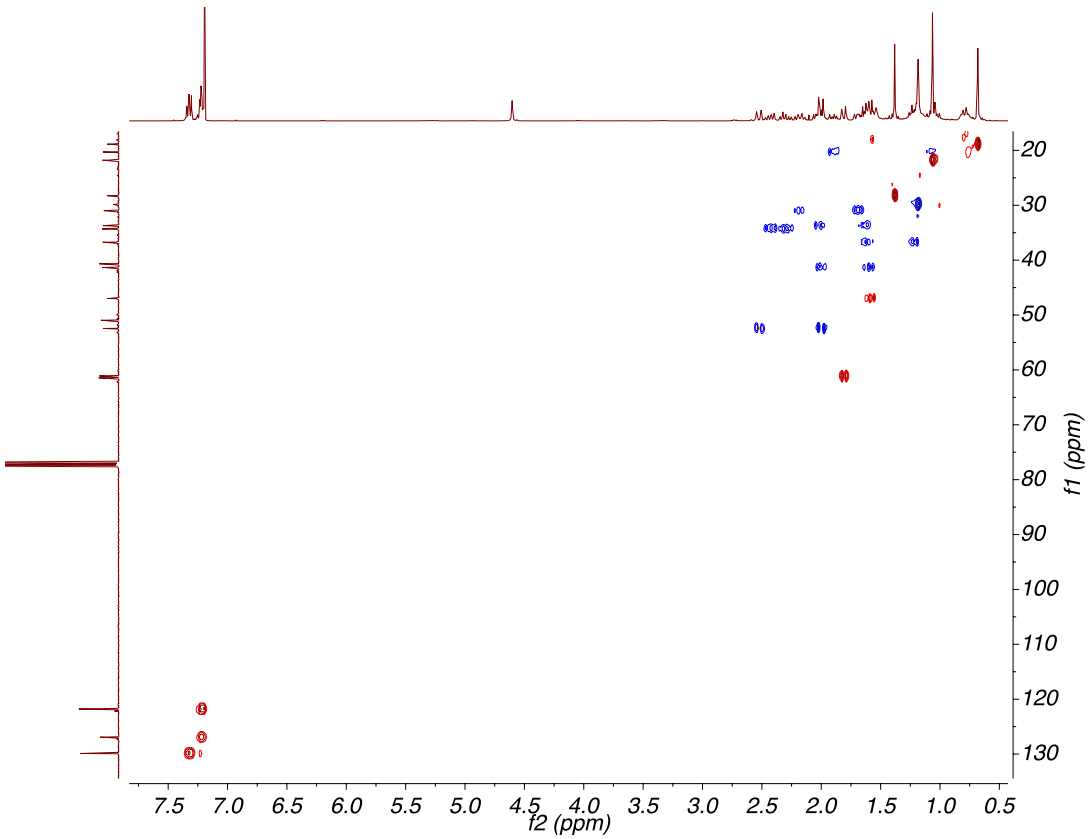

Figure A7.44. HSQC (400, 101 MHz, $CDCl_3$) of compound **198b**.

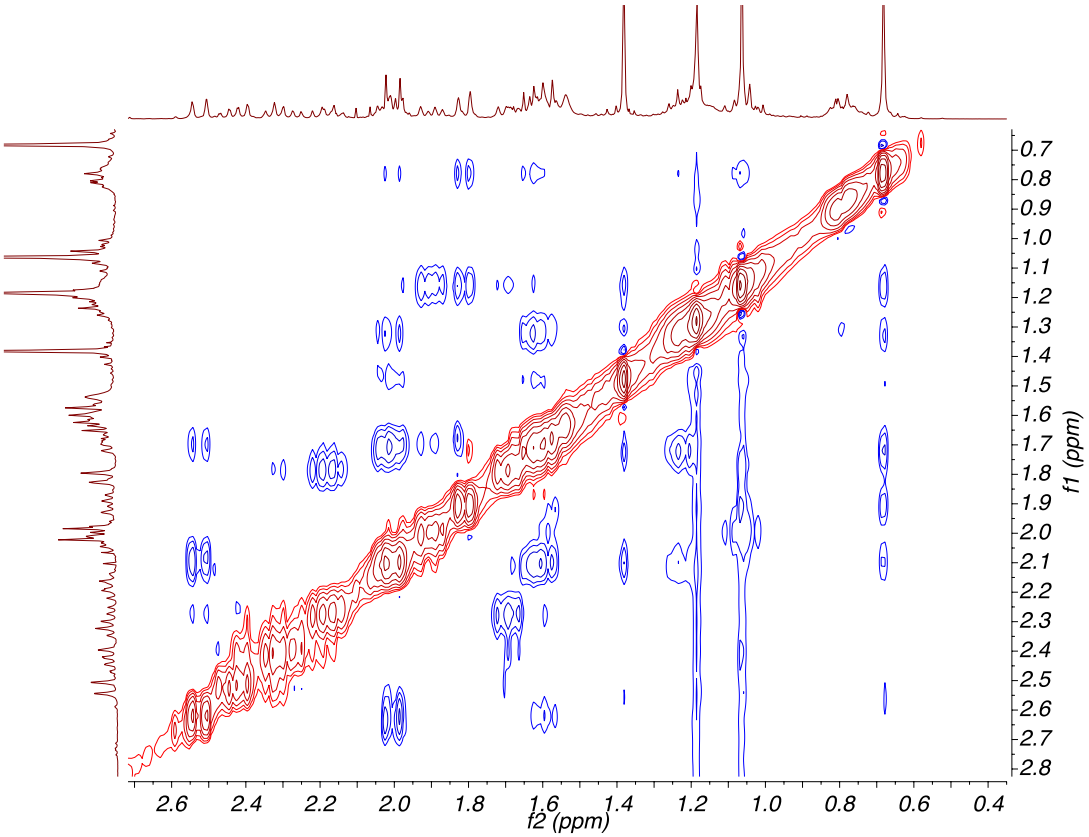

Figure A7.45. NOESY (400 MHz, $CDCl_3$) of compound **198b**.

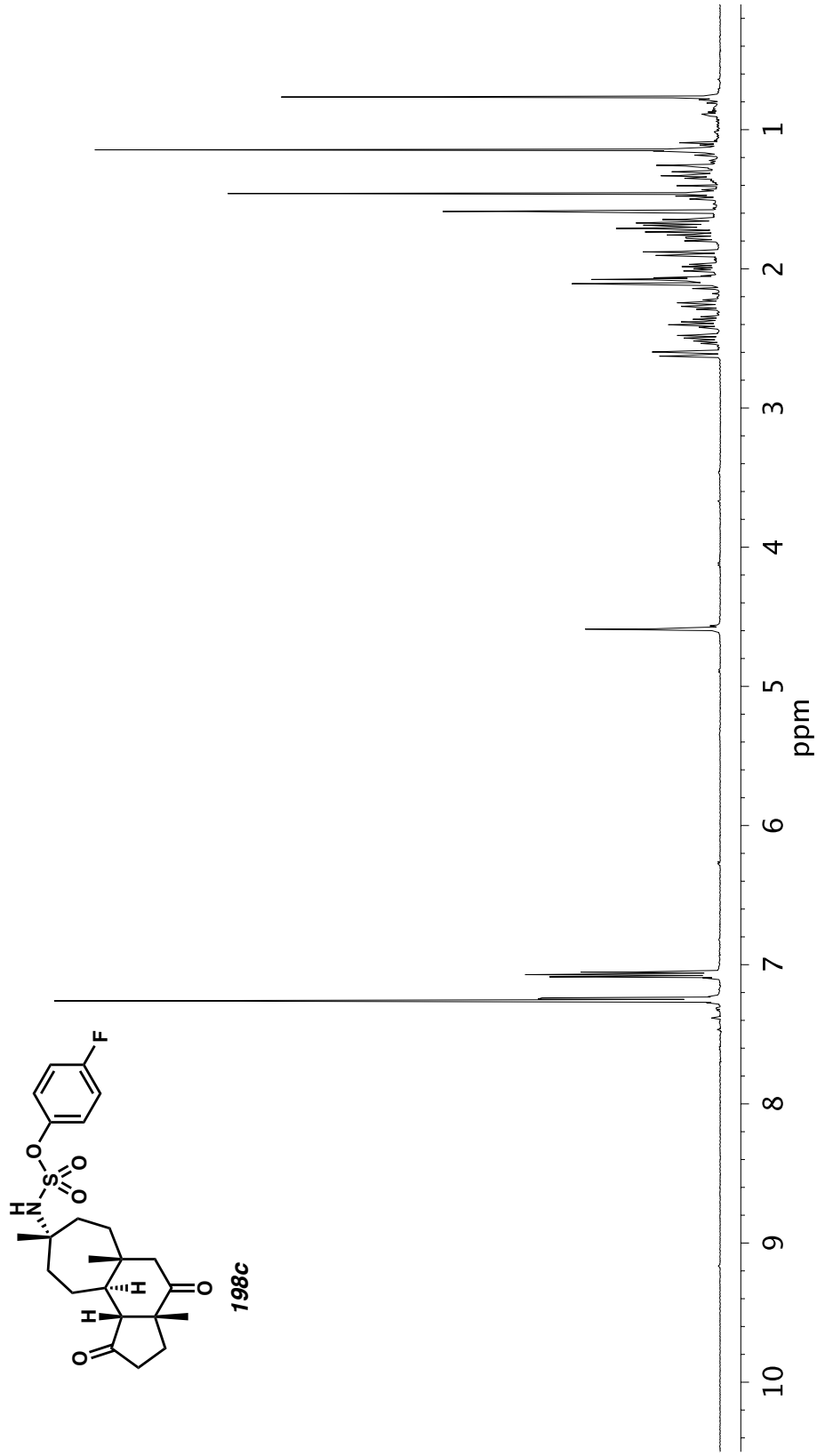

Figure A7.46. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **198c**.

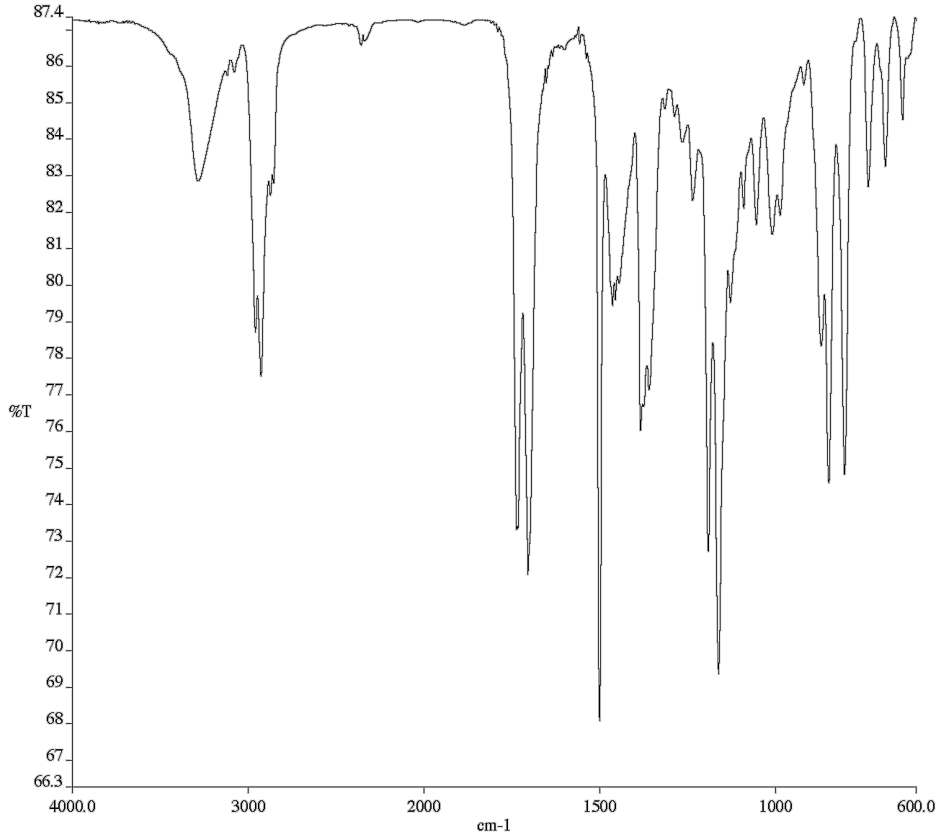

Figure A7.47. Infrared Spectrum (Thin Film, KBr) of compound **198c**.

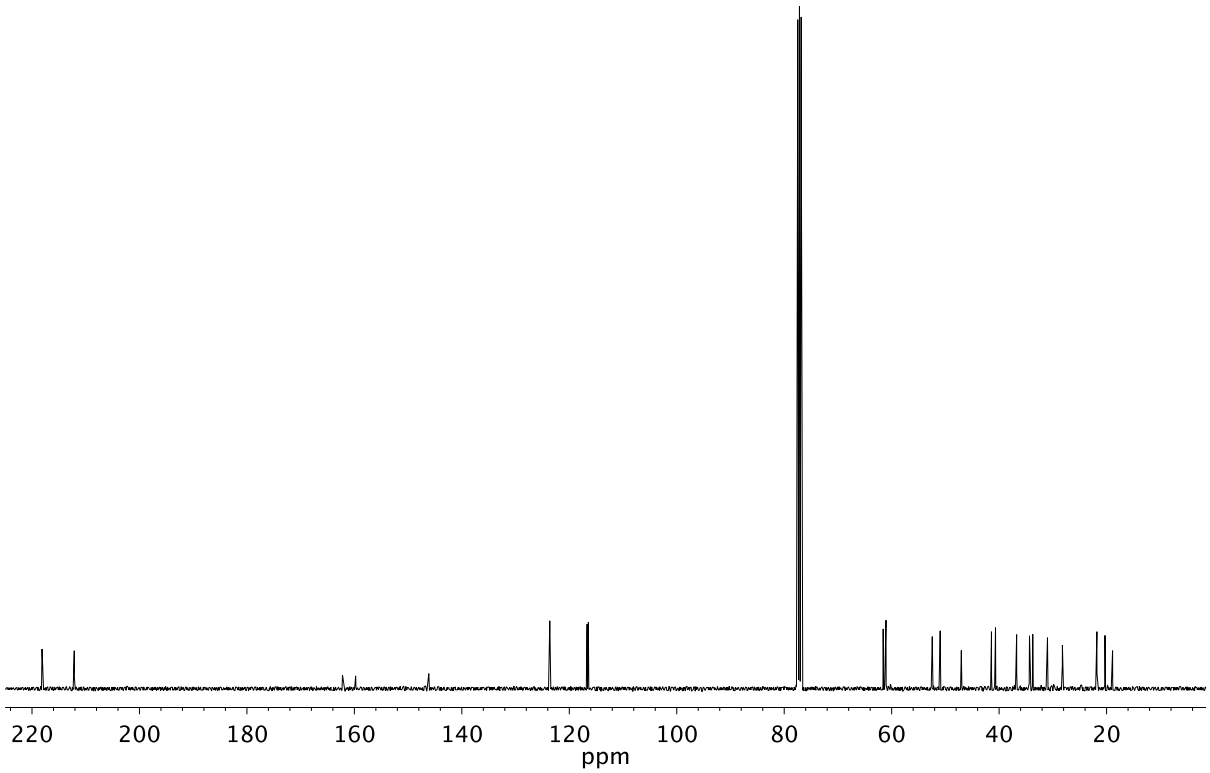

Figure A7.48. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **198c.**

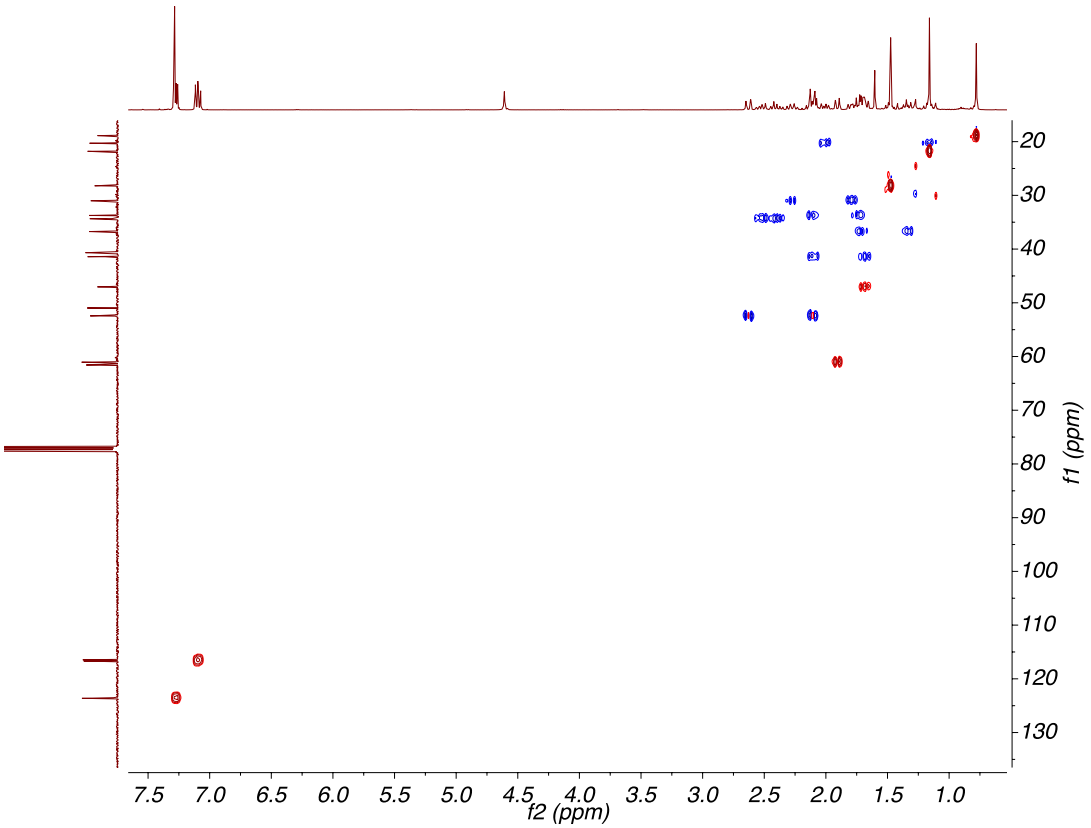

Figure A7.49. HSQC (400, 101 MHz, $CDCl_3$) of compound **198c**.

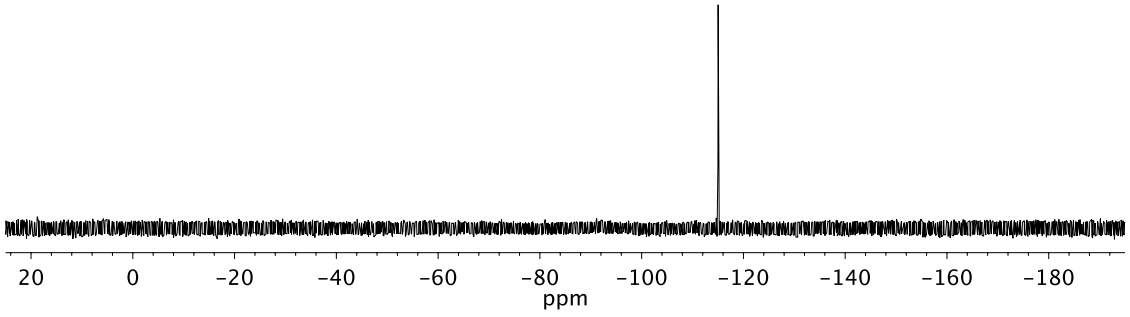

Figure A7.50. ^{19}F NMR (300 MHz, $CDCl_3$) of compound **198c**.

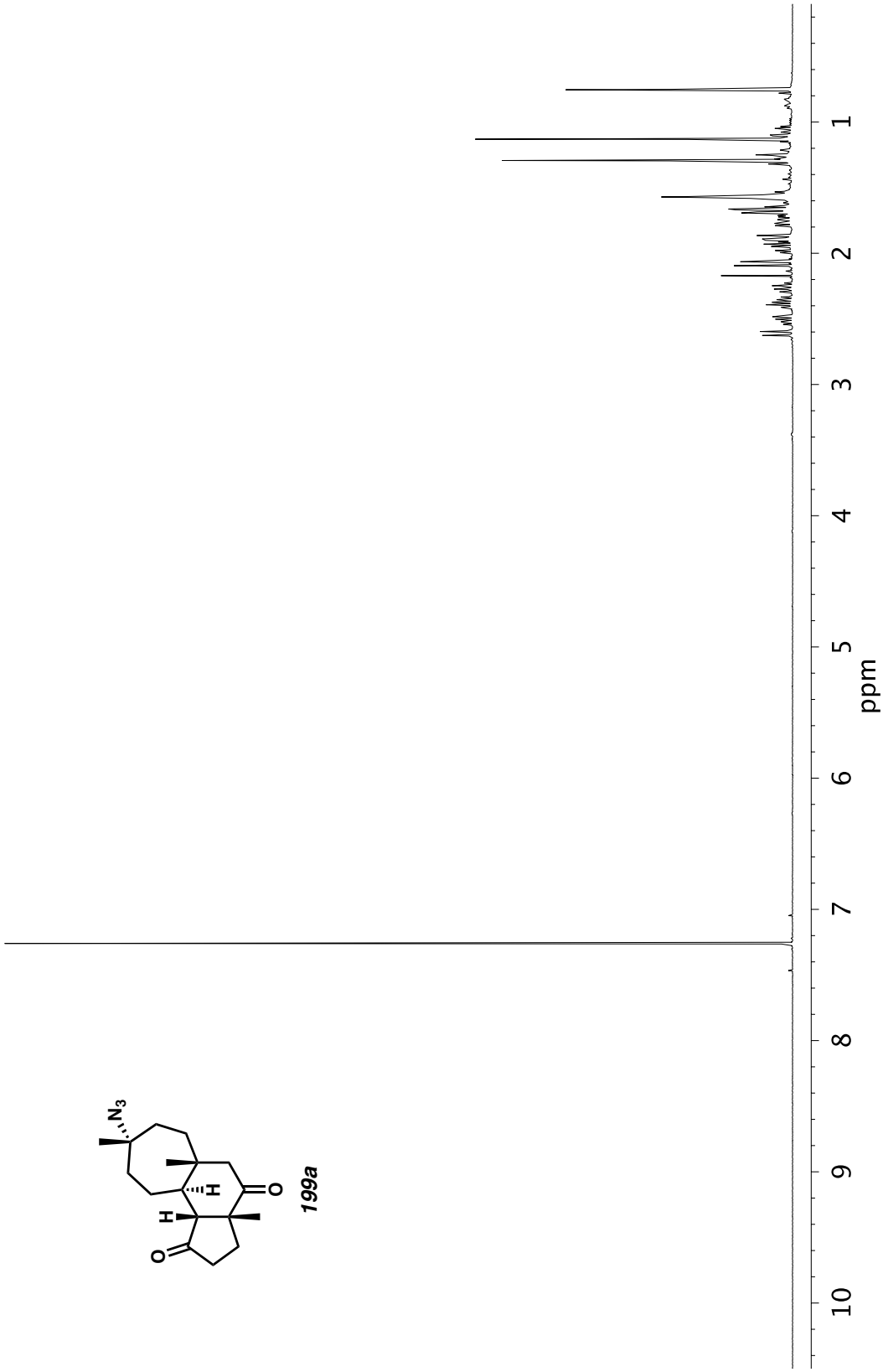

Figure A7.51. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **199a**.

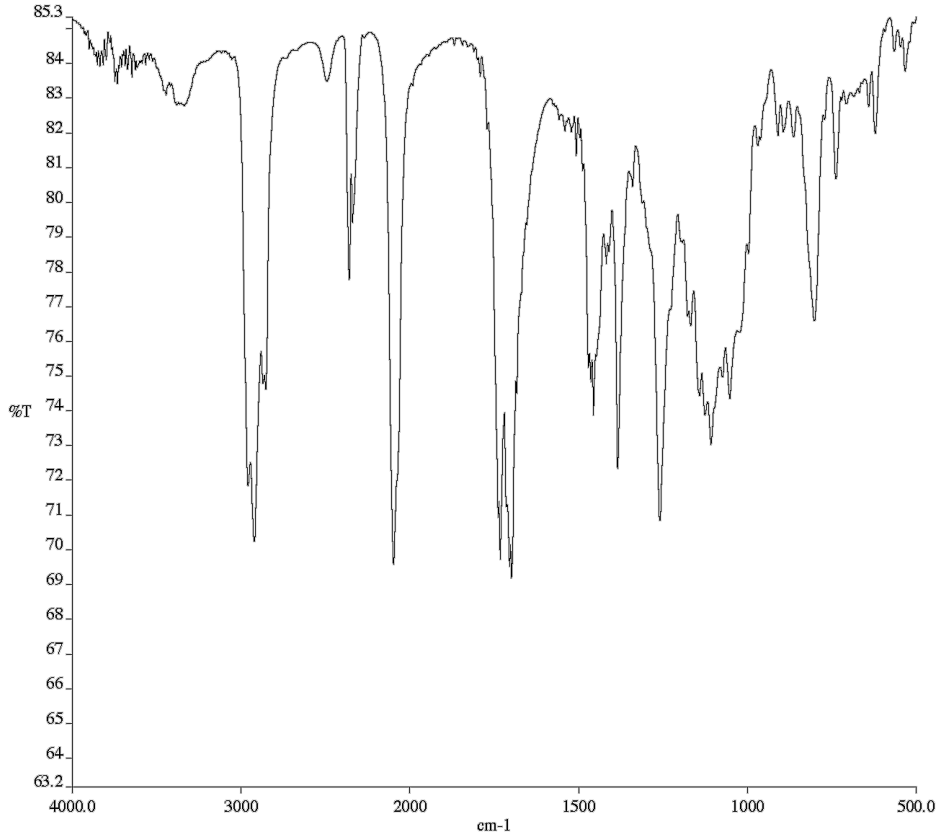

Figure A7.52. Infrared Spectrum (Thin Film, KBr) of compound **199a.**

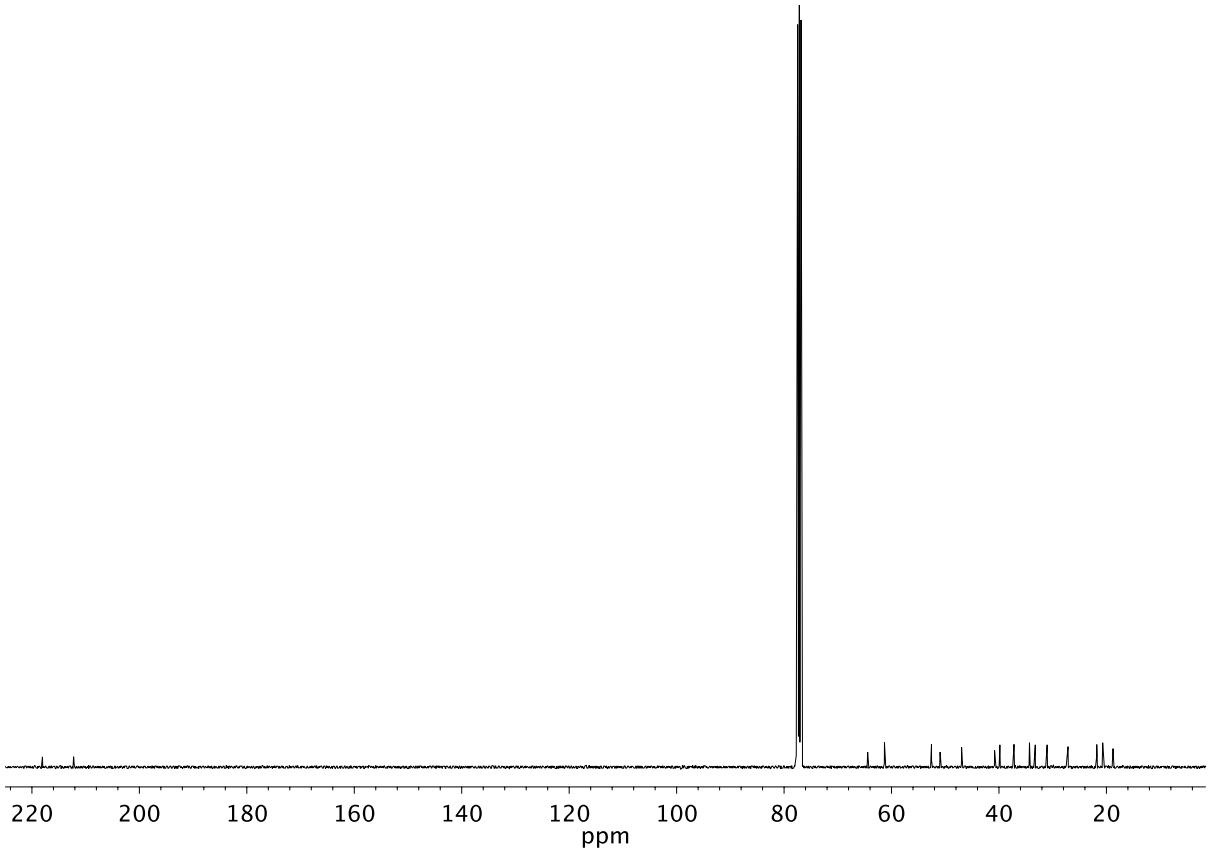

Figure A7.53. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **199a.**

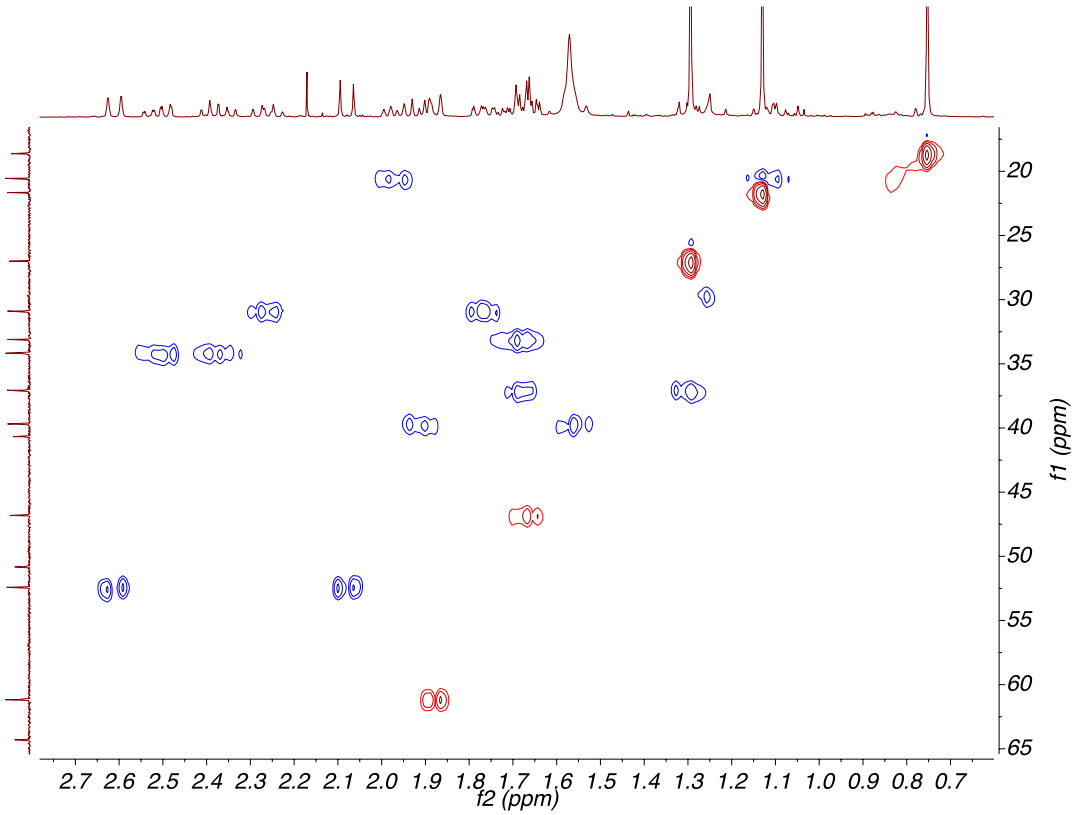

Figure A7.54. HSQC (400, 101 MHz, $CDCl_3$) of compound **199a**.

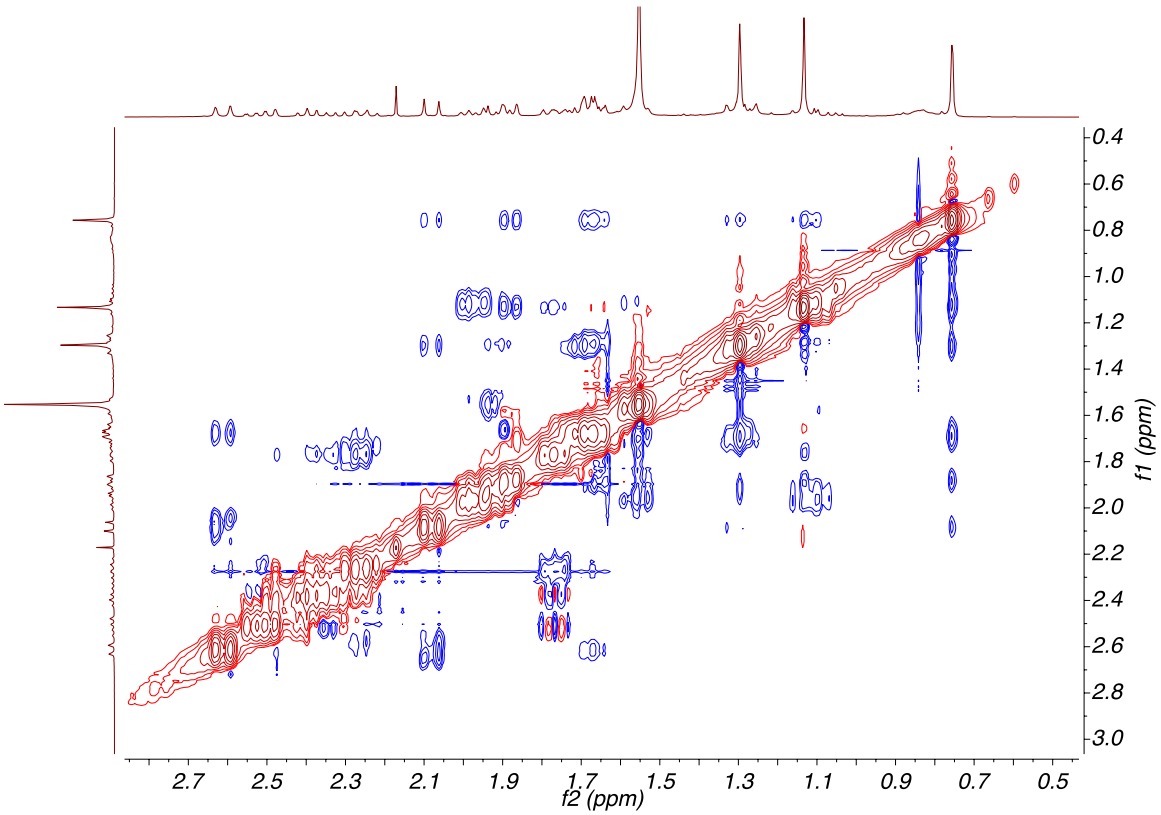

Figure A7.55. NOESY (400 MHz, $CDCl_3$) of compound **199a**.

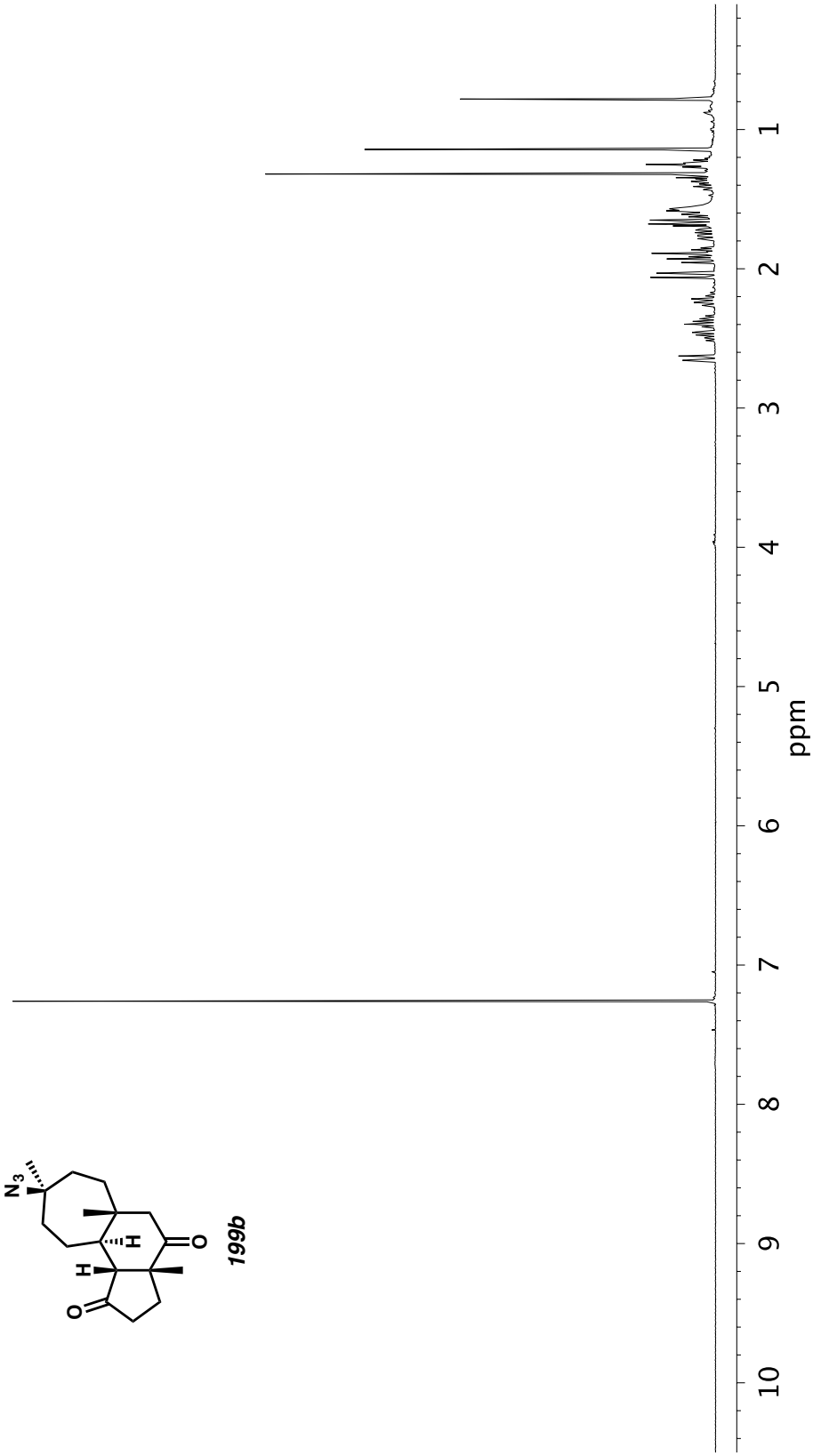

Figure A7.56. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **199b**.

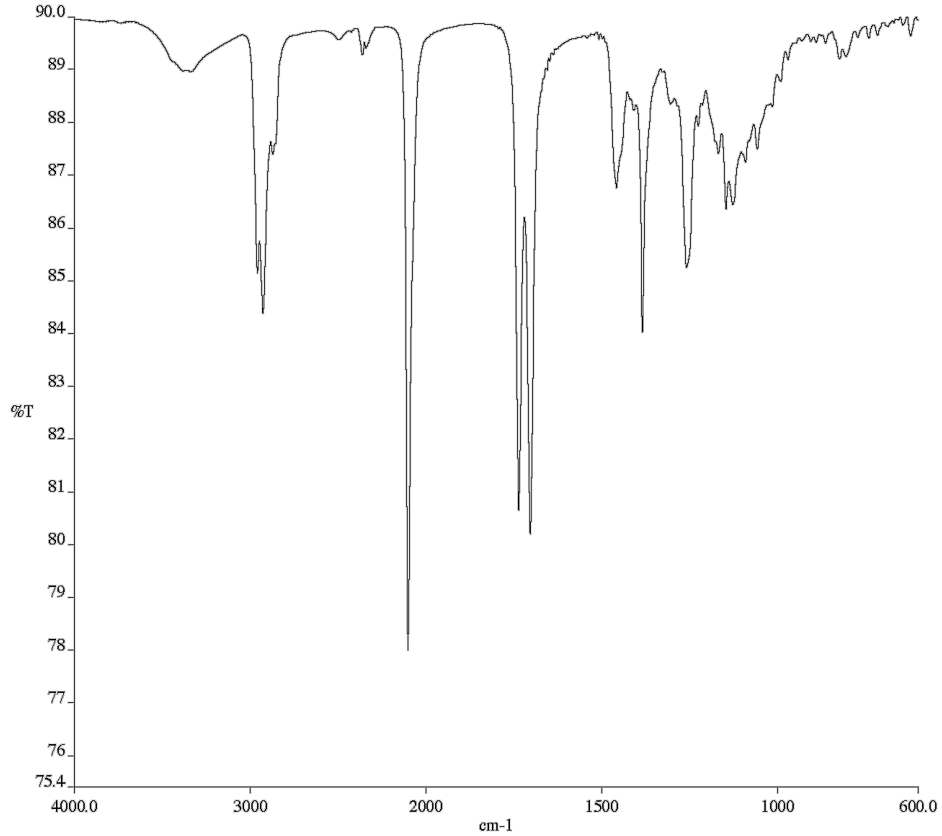

Figure A7.57. Infrared Spectrum (Thin Film, KBr) of compound **199b.**

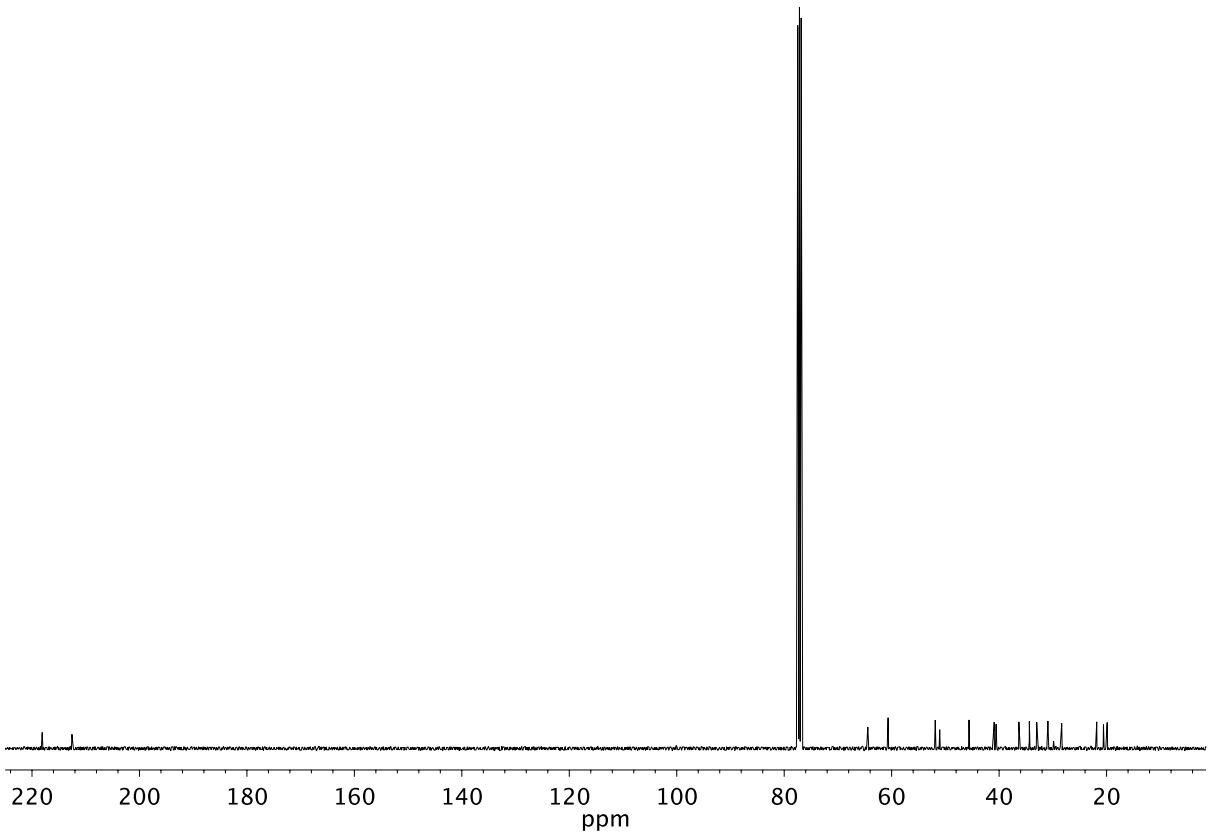

Figure A7.58. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **199b.**

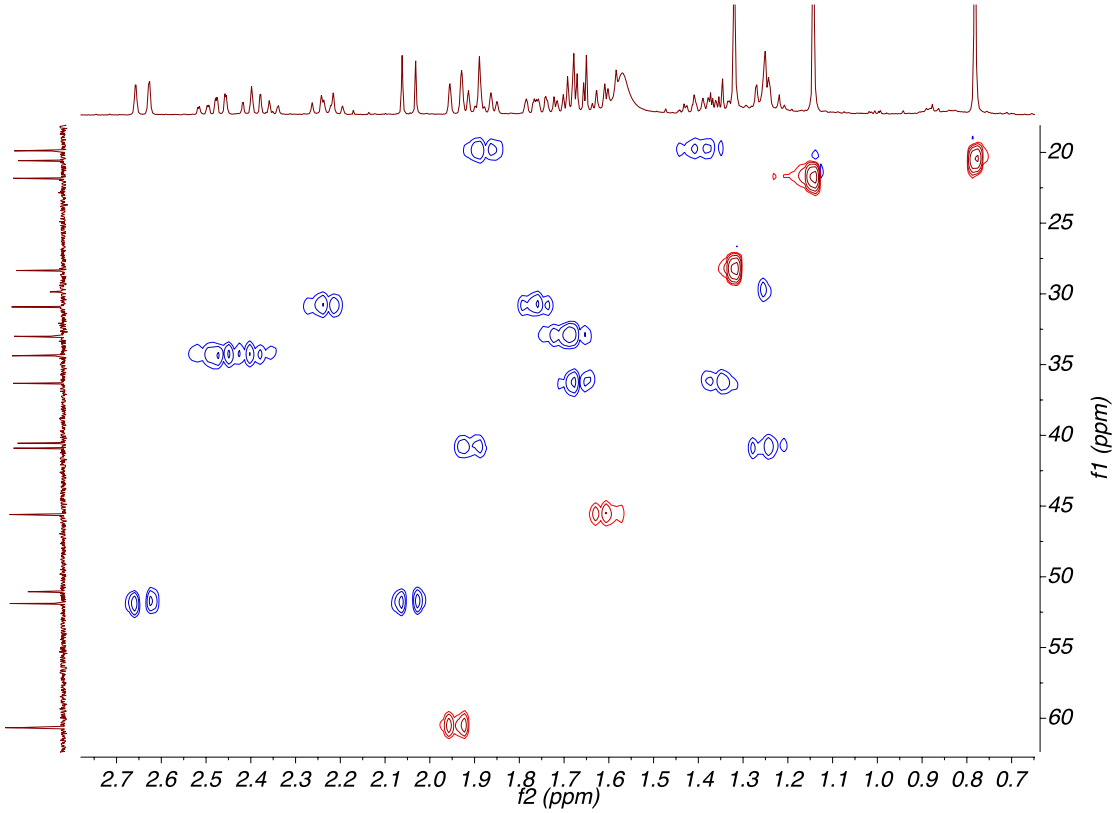

Figure A7.59. HSQC (400, 101 MHz, $CDCl_3$) of compound **199b.**

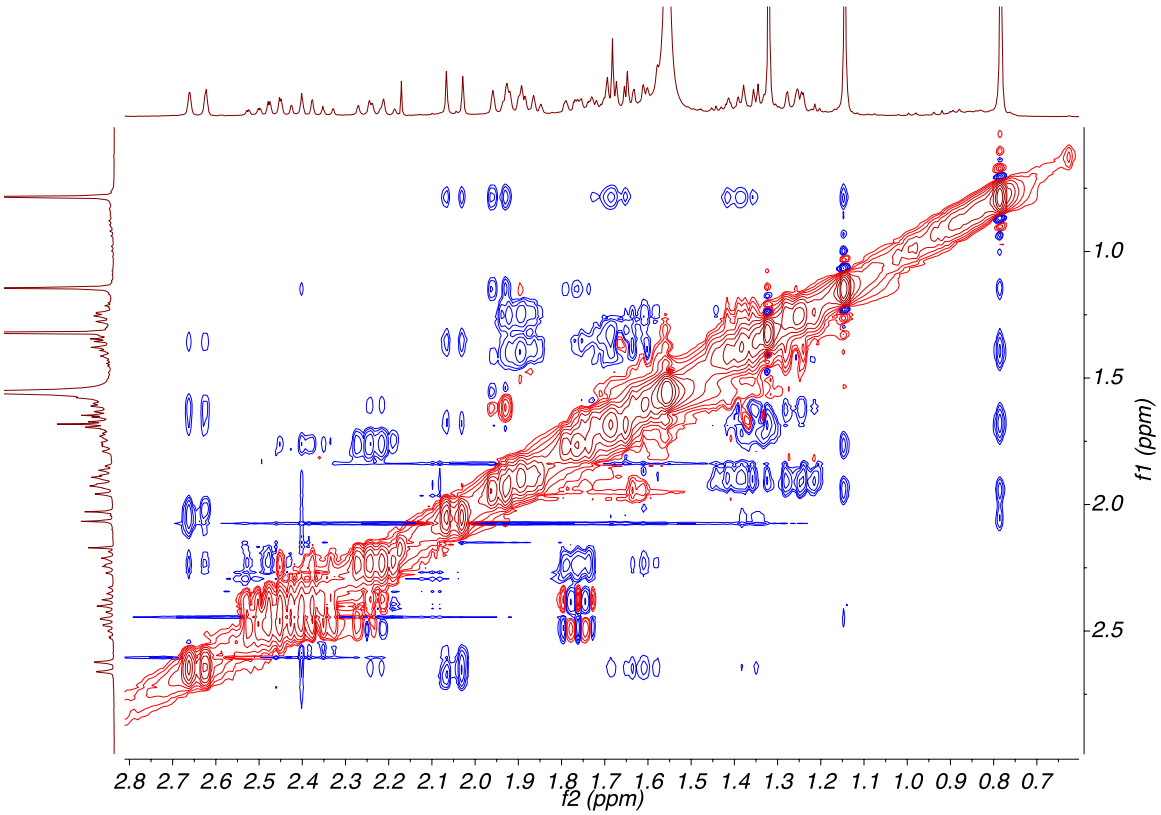

Figure A7.60. NOESY (400 MHz, $CDCl_3$) of compound **199b.**

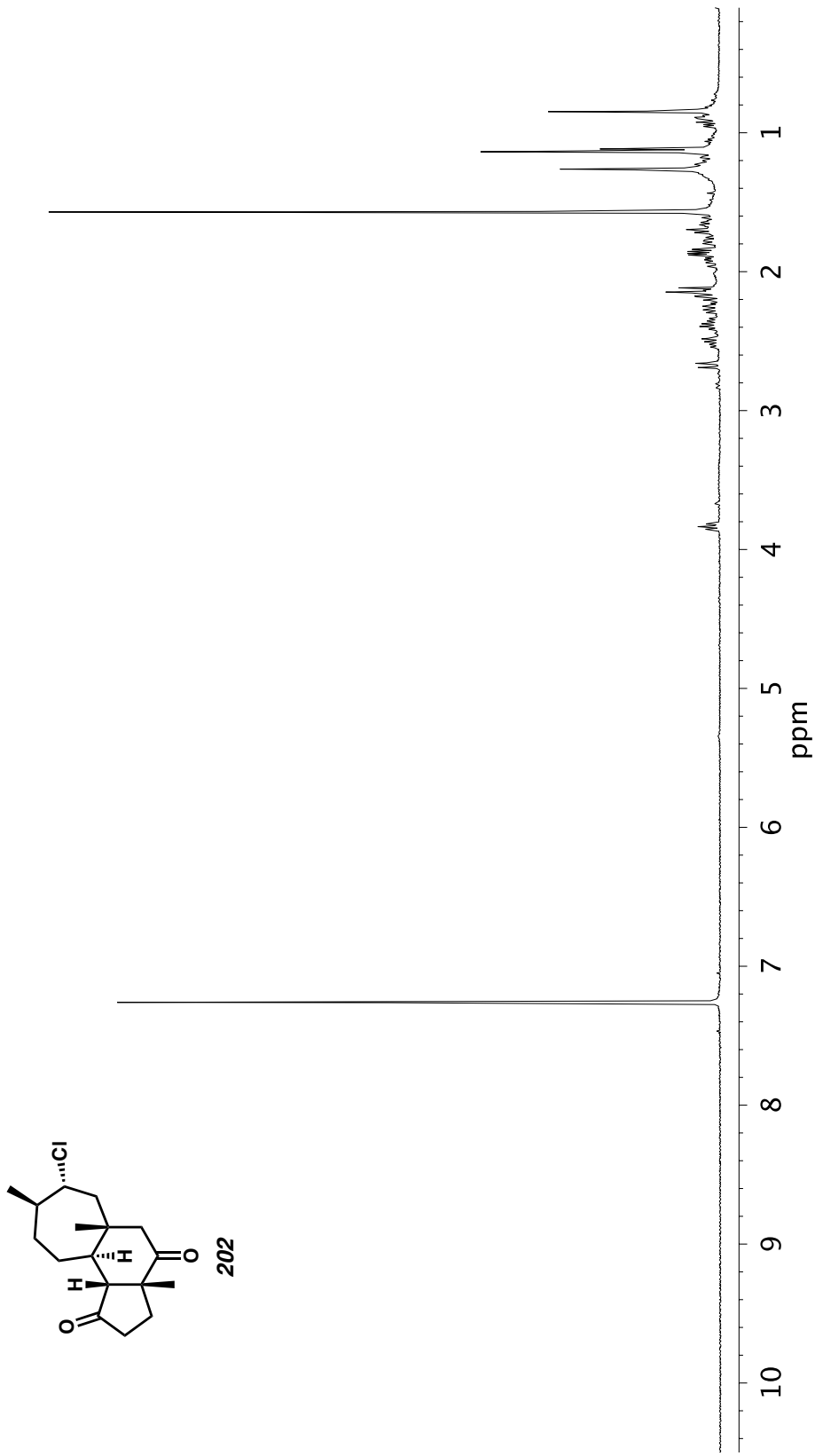

Figure A7.61. ^{1}H NMR (500 MHz, $CDCl_3$) of compound **202**.

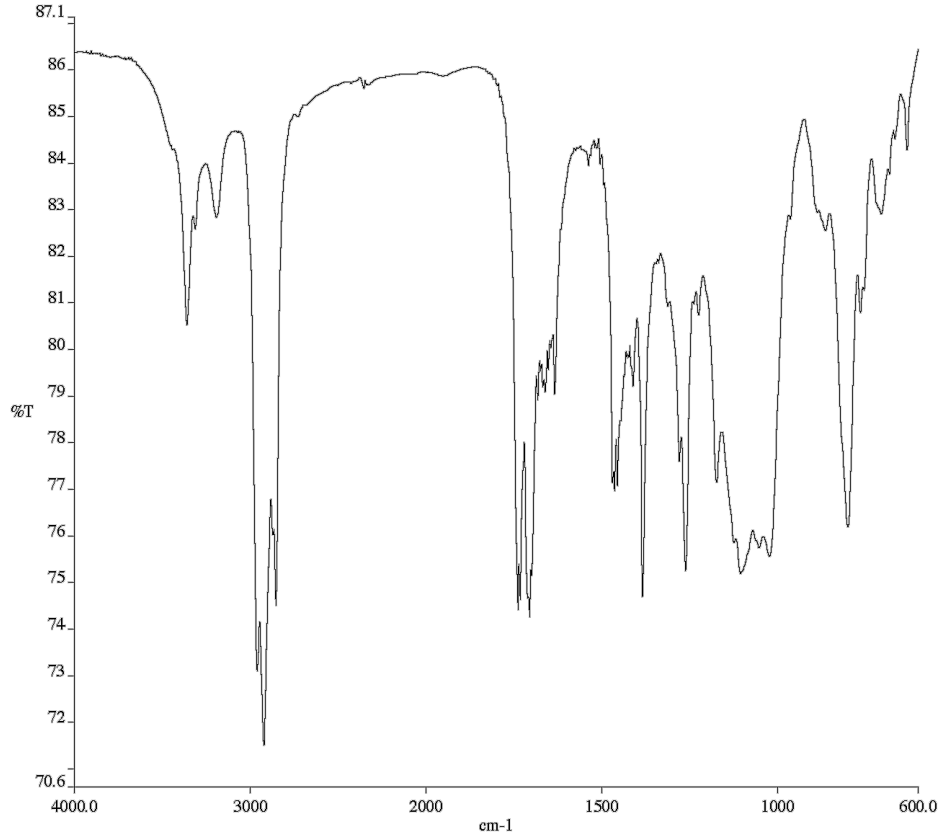

Figure A7.62. Infrared Spectrum (Thin Film, KBr) of compound **202.**

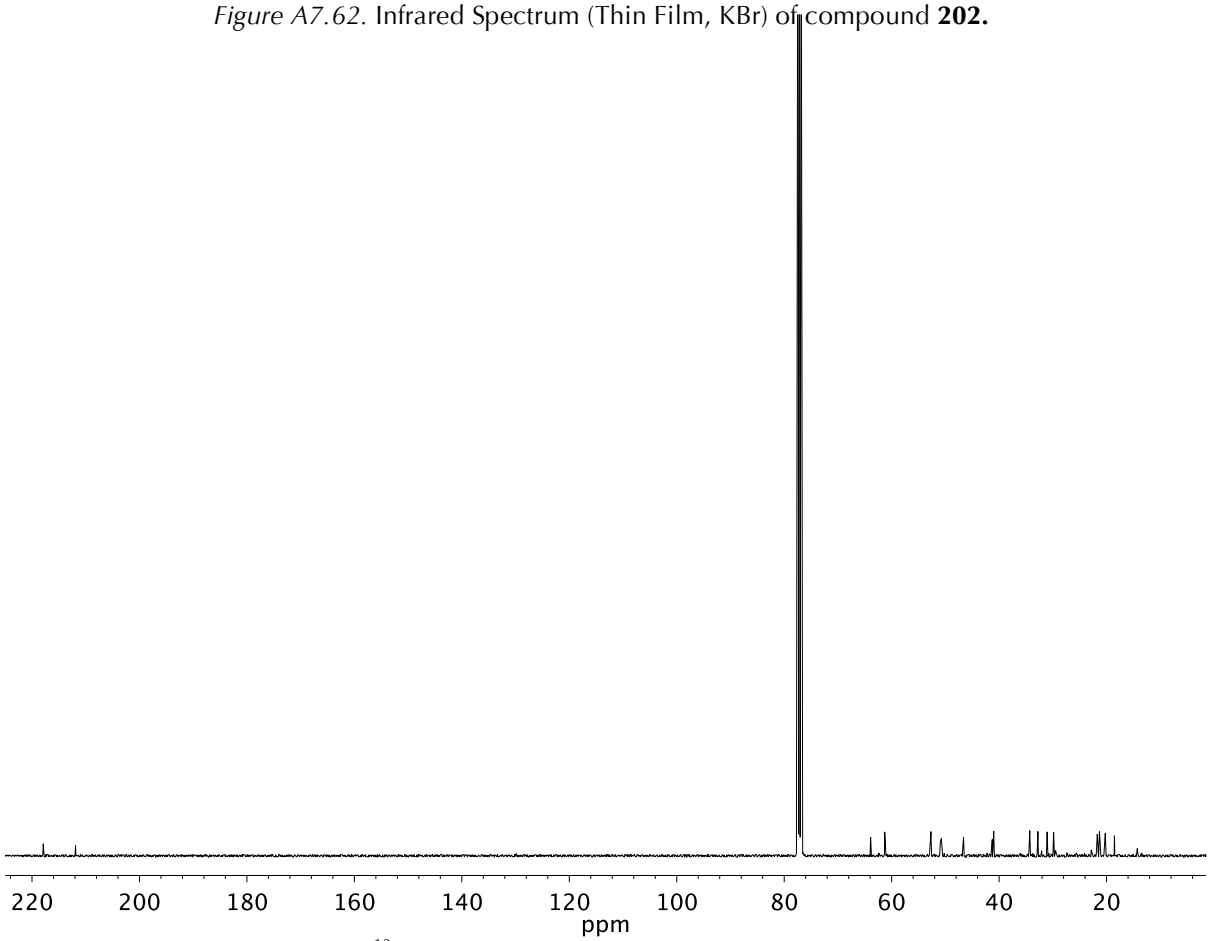

Figure A7.63. ^{13}C NMR (101 MHz, $CDCl_3$) of compound **202.**

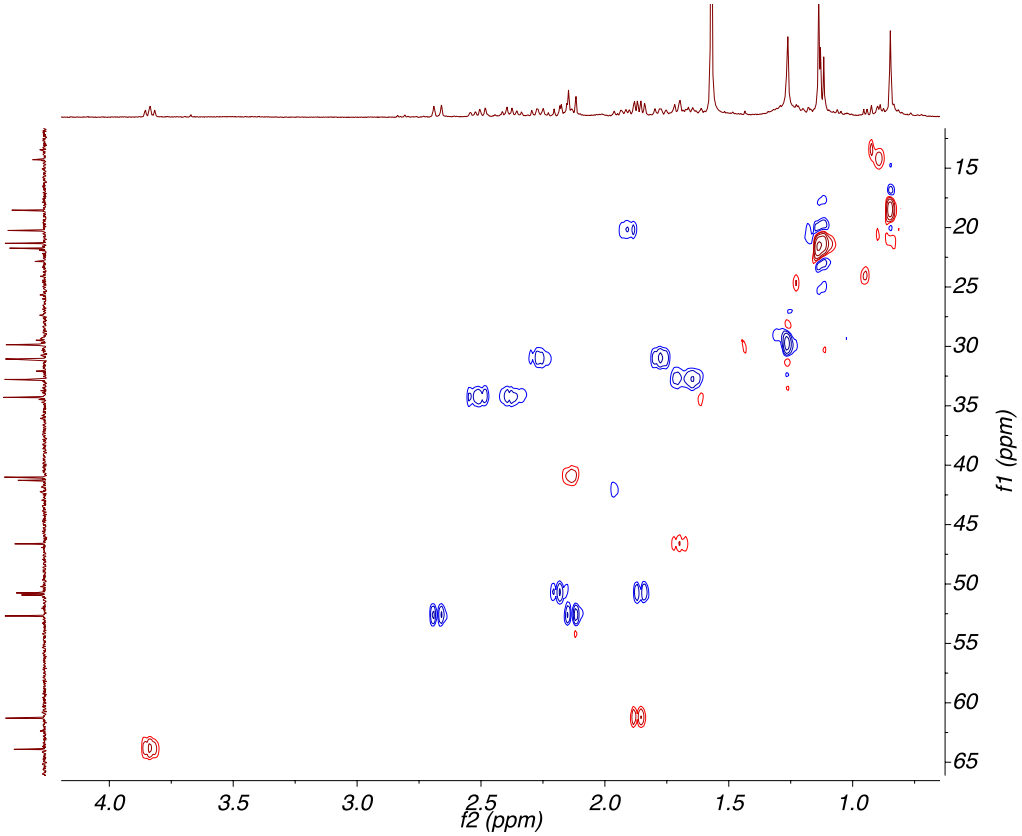

Figure A7.64. HSQC (500, 101 MHz, $CDCl_3$) of compound **202.**

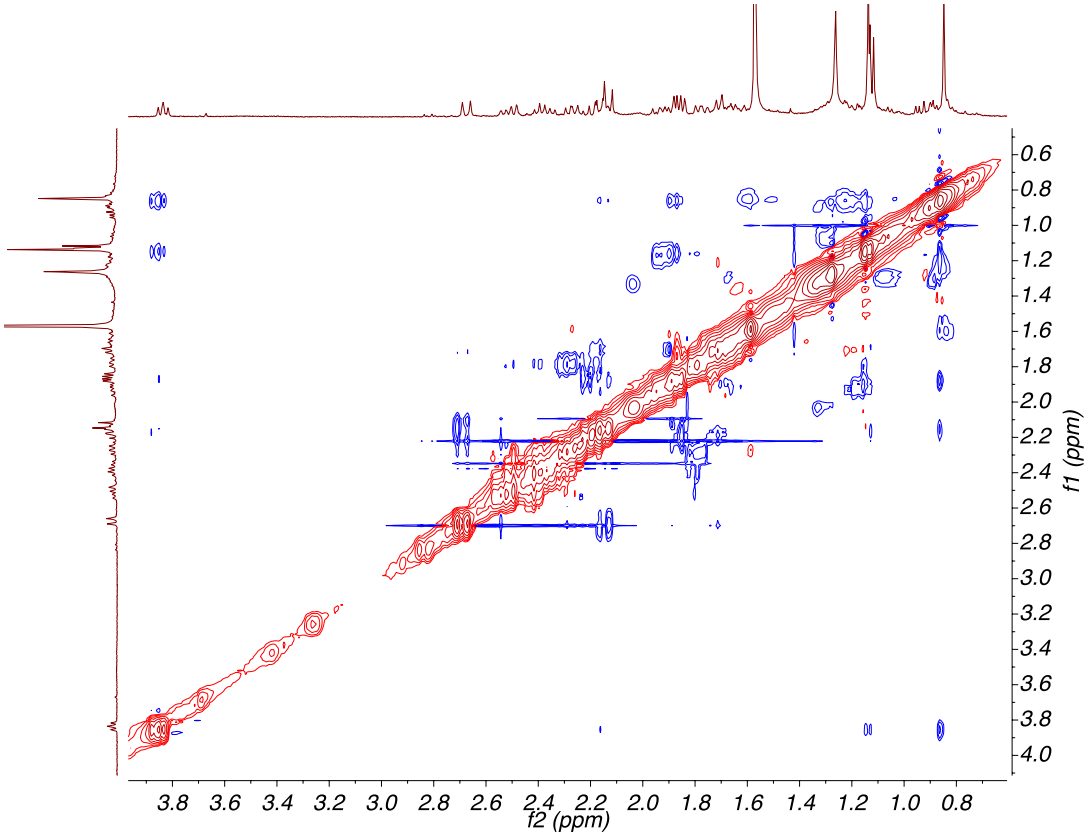

Figure A7.65. NOESY (400 MHz, $CDCl_3$) of compound **202.**