

APPENDIX 1

Spectra Relevant to Chapter 2

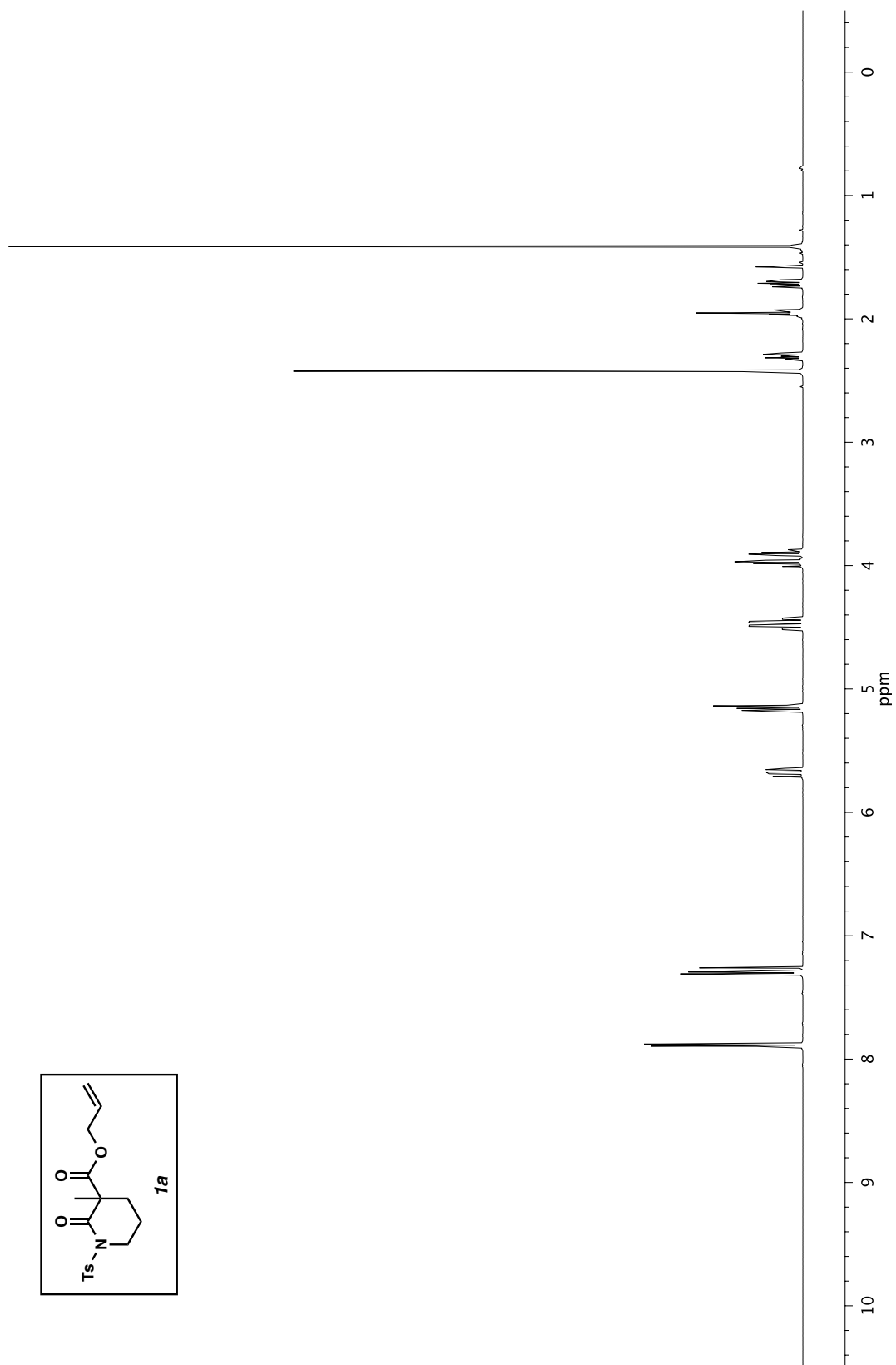


Figure A1.1 ^1H NMR (500 MHz, CDCl_3) of compound **1a**.

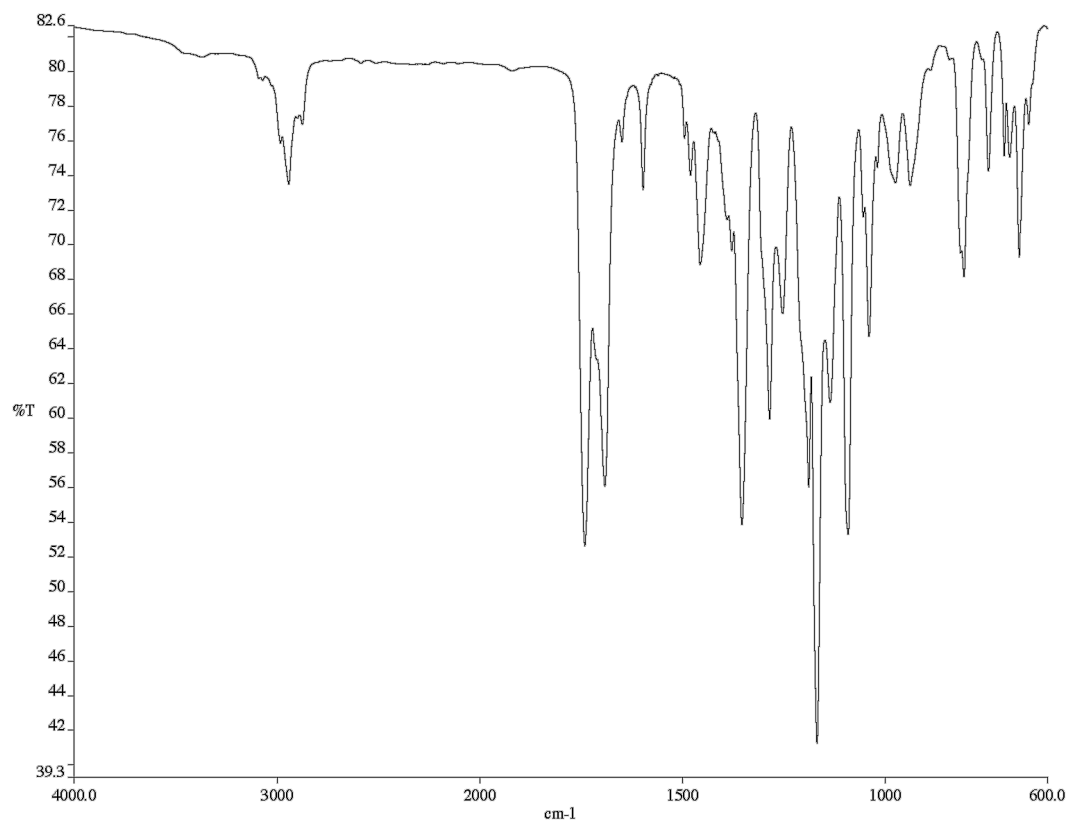


Figure A1.2 Infrared spectrum (Thin Film, NaCl) of compound **1a**.

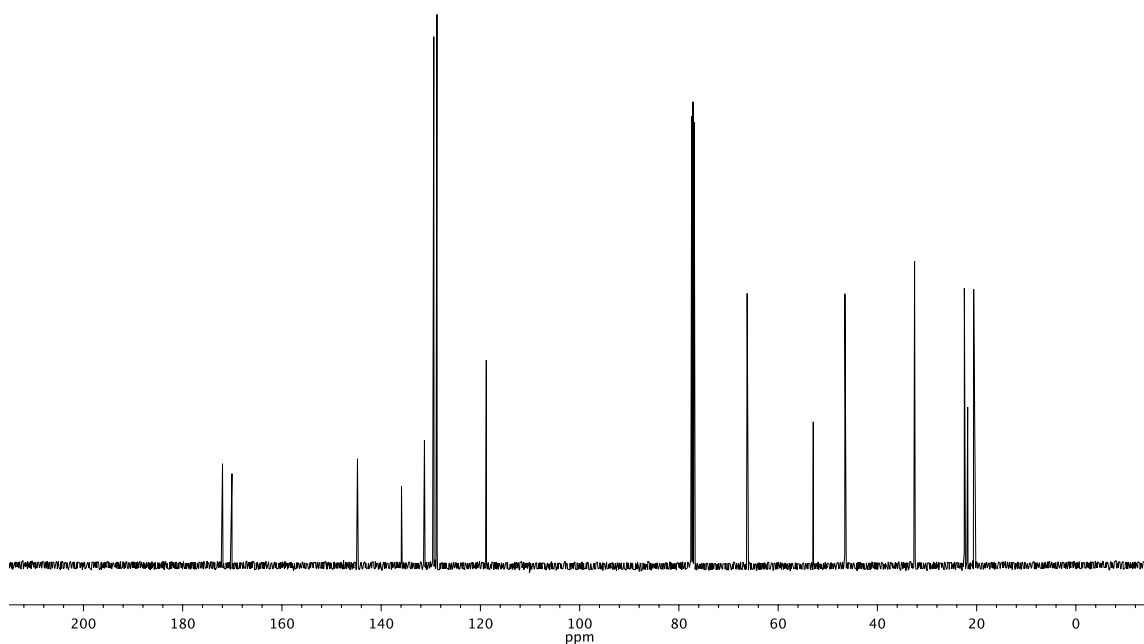


Figure A1.3 ¹³C NMR (126 MHz, CDCl₃) of compound **1a**.

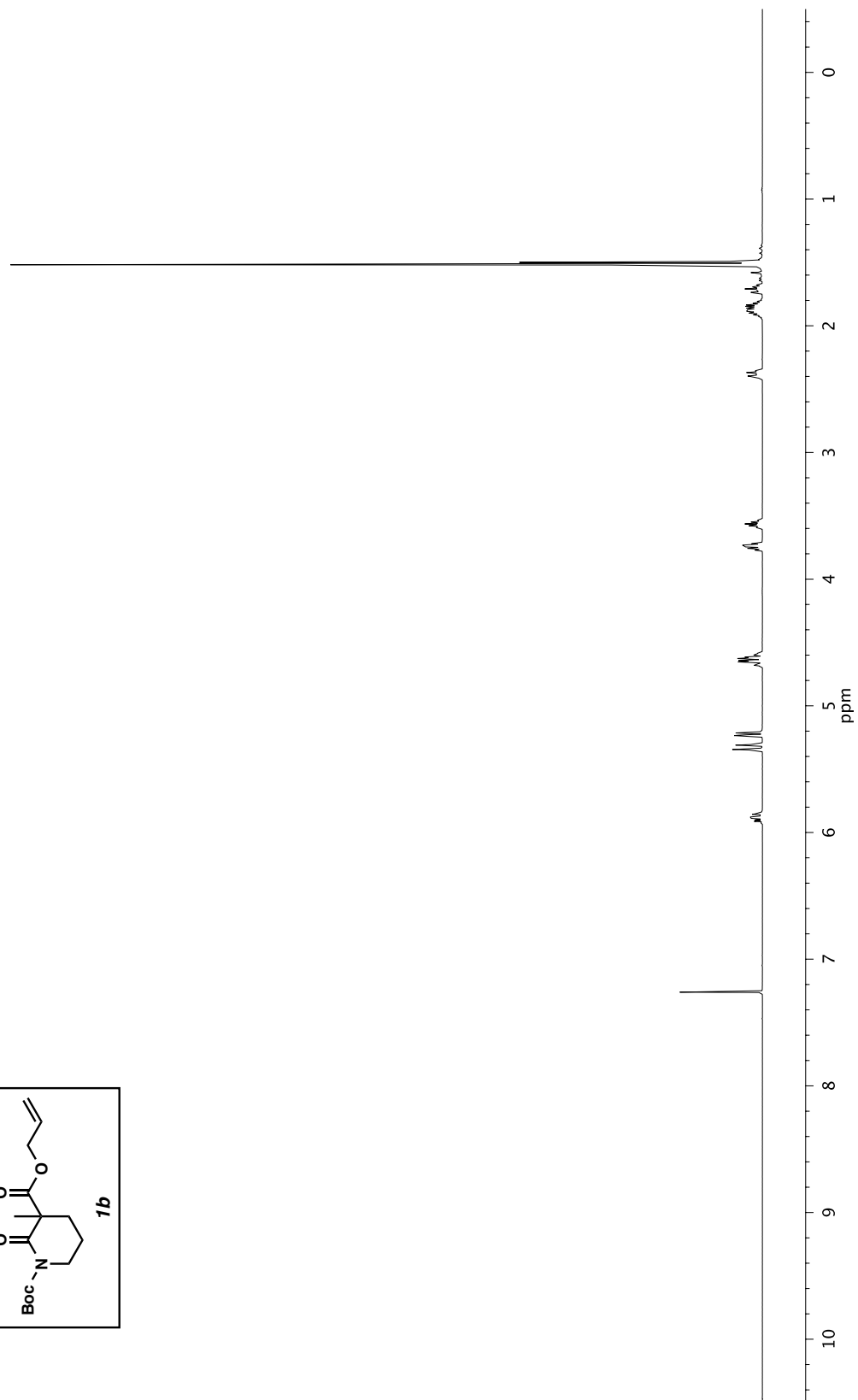
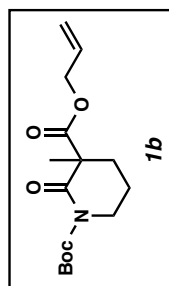


Figure A1.4 ¹H NMR (500 MHz, CDCl₃) of compound **1b**.

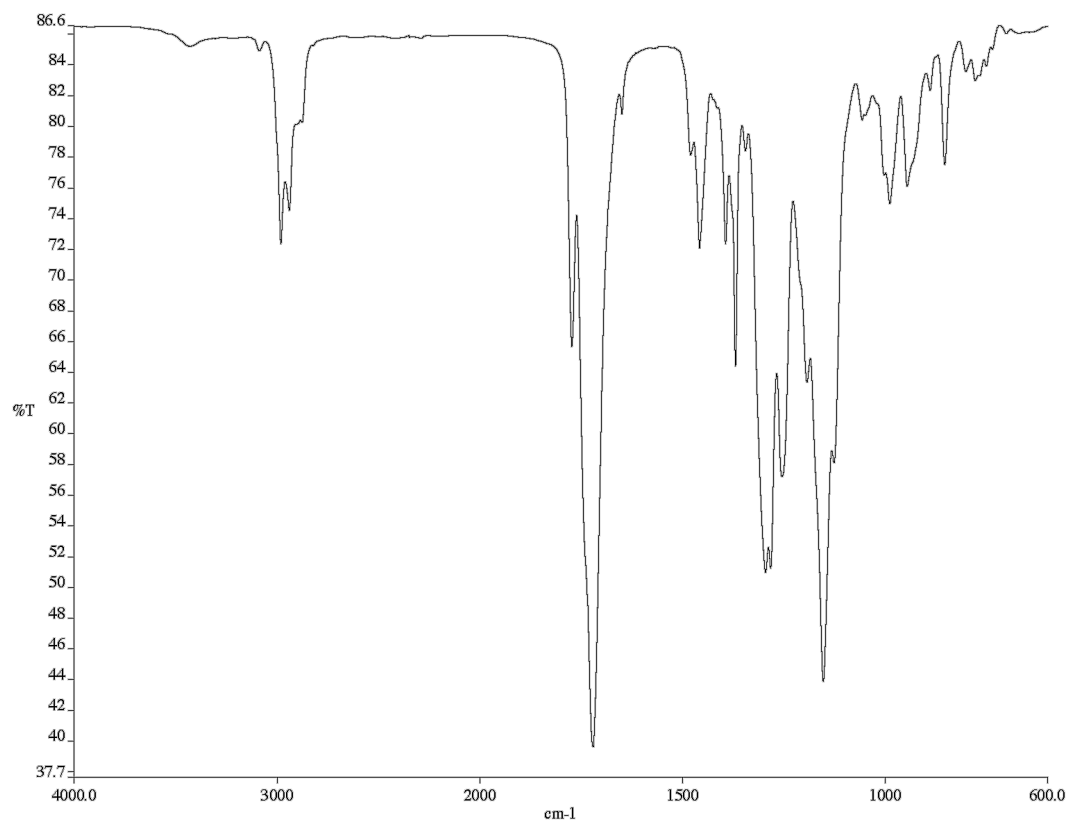


Figure A1.5 Infrared spectrum (Thin Film, NaCl) of compound **1b**.

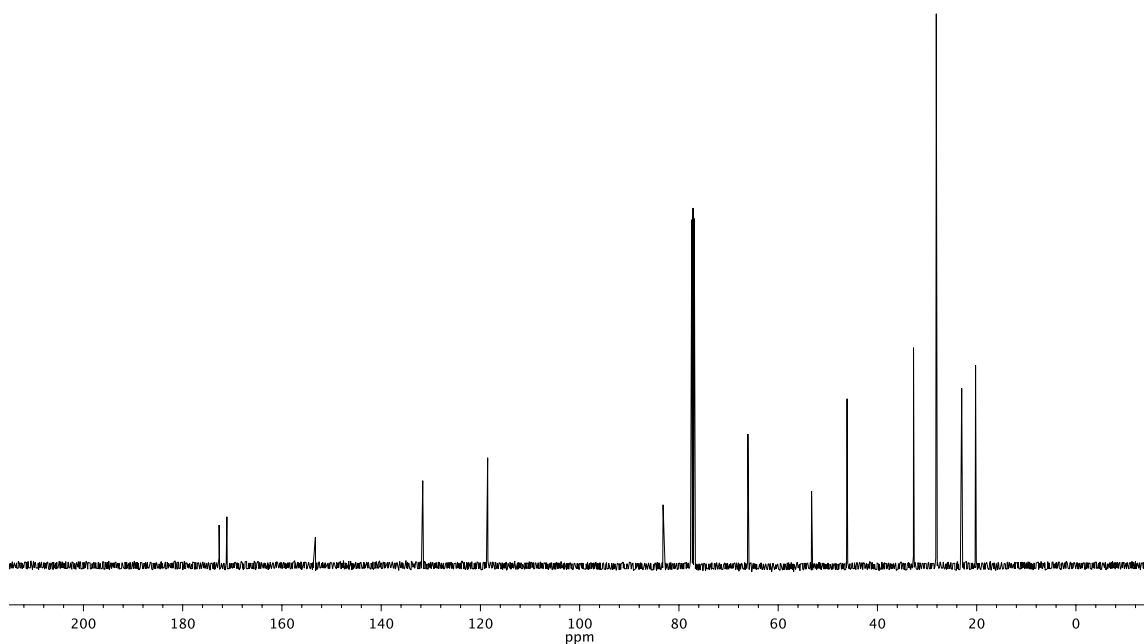


Figure A1.6 ¹³C NMR (126 MHz, CDCl₃) of compound **1b**.

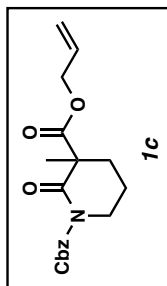
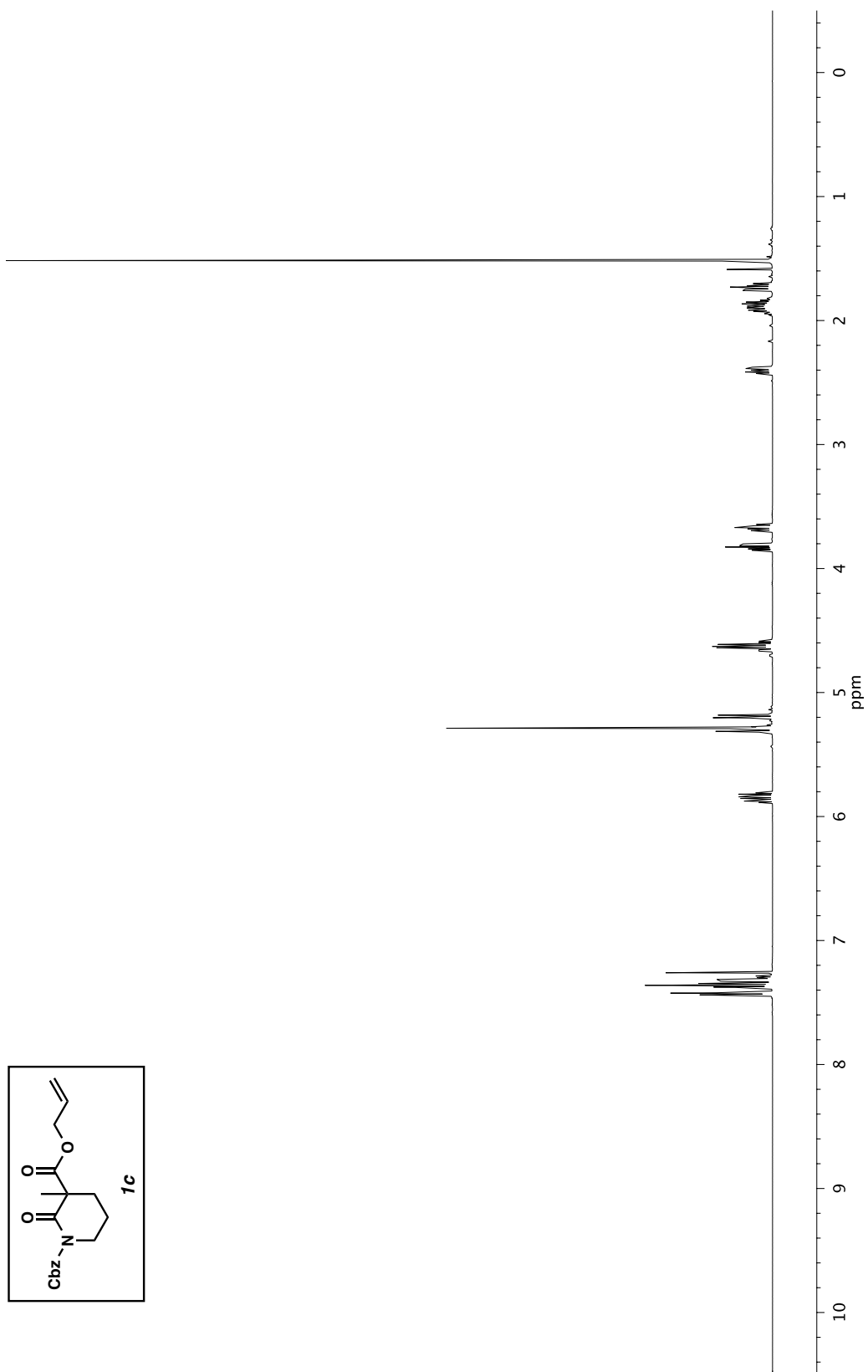


Figure A1.7 ^1H NMR (500 MHz, CDCl_3) of compound **1c**.

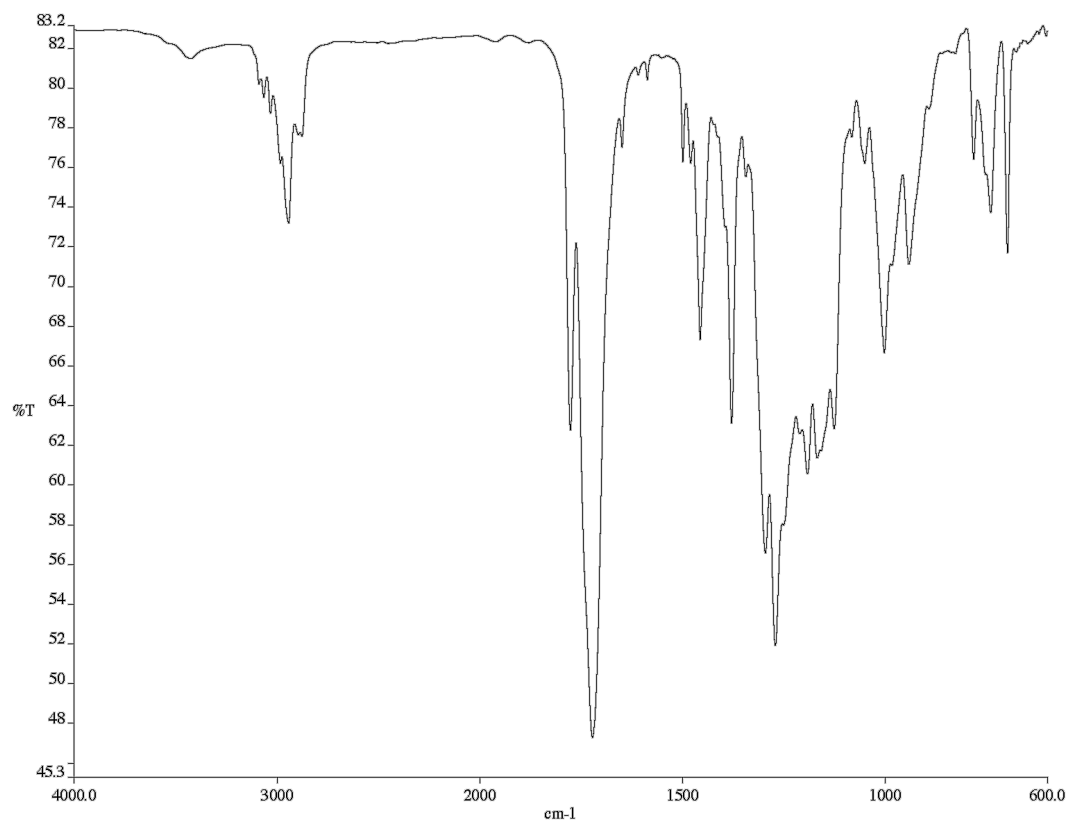


Figure A1.8 Infrared spectrum (Thin Film, NaCl) of compound 1c.

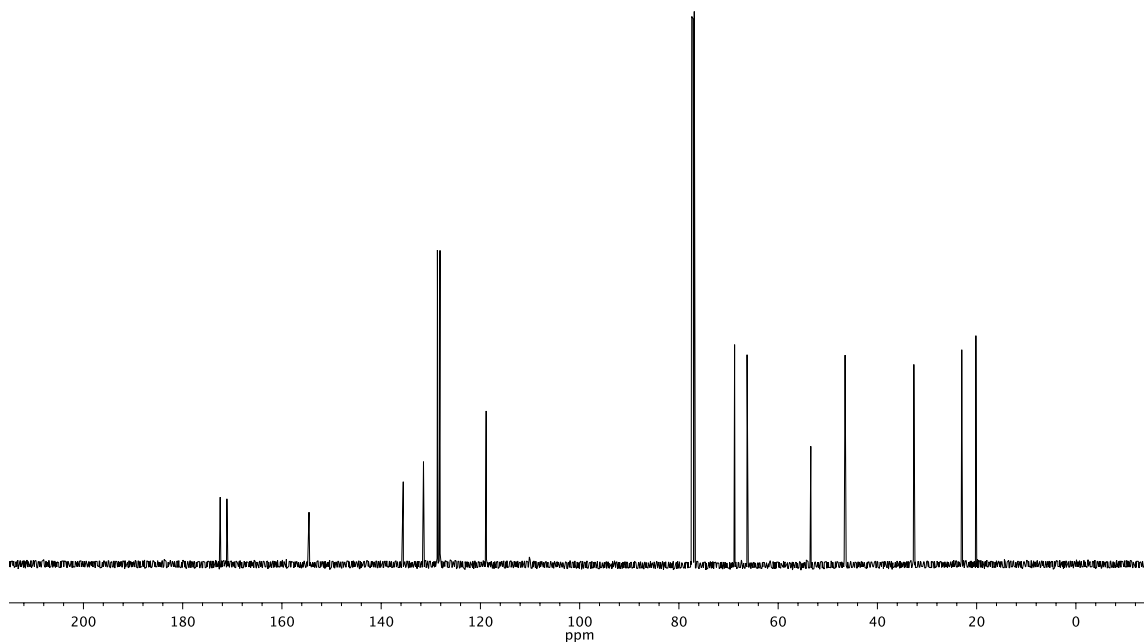


Figure A1.9 ¹³C NMR (126 MHz, CDCl₃) of compound 1c.

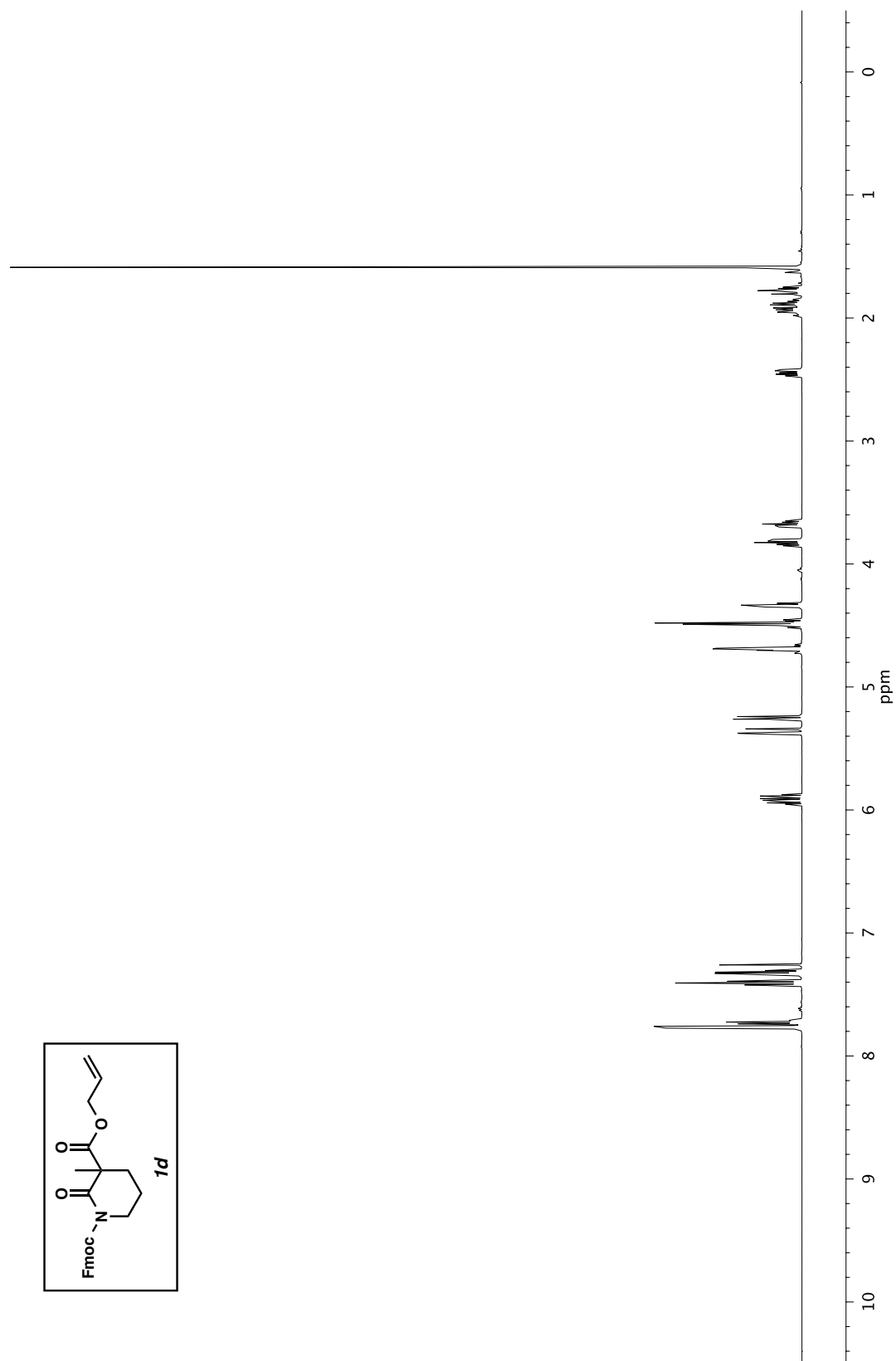


Figure A1.10 ^1H NMR (500 MHz, CDCl_3) of compound **1d**.

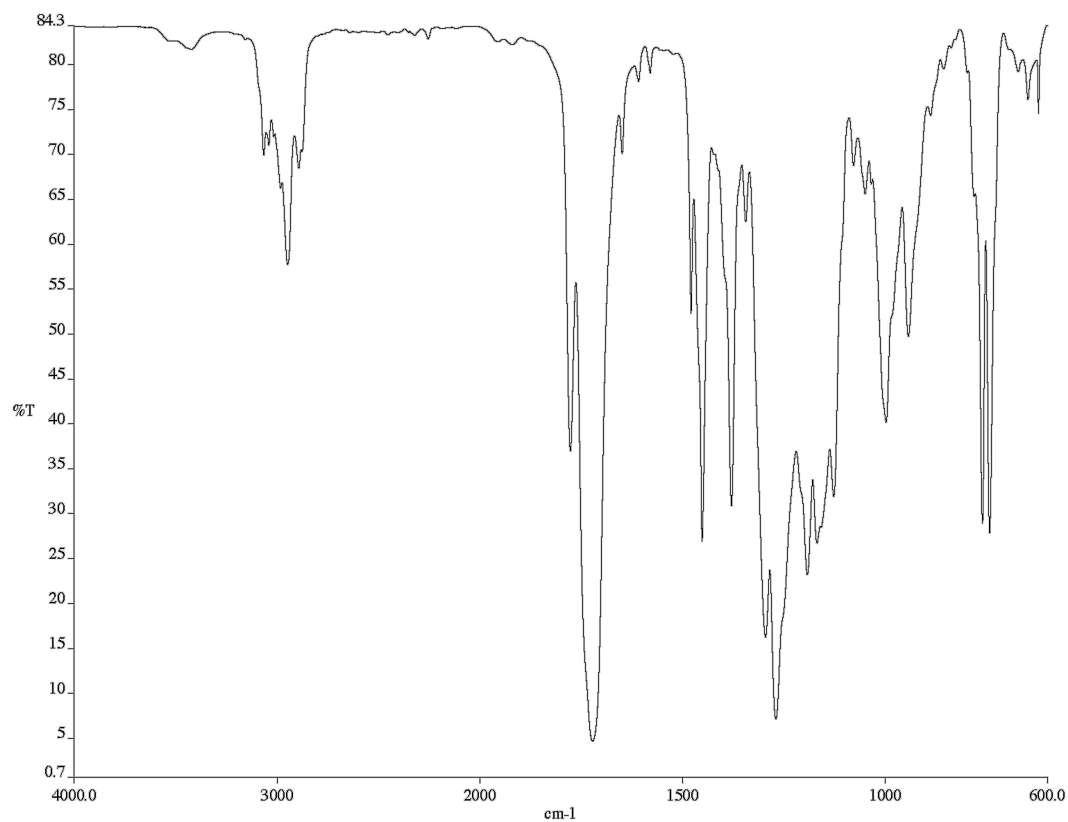


Figure A1.11 Infrared spectrum (Thin Film, NaCl) of compound **1d**.

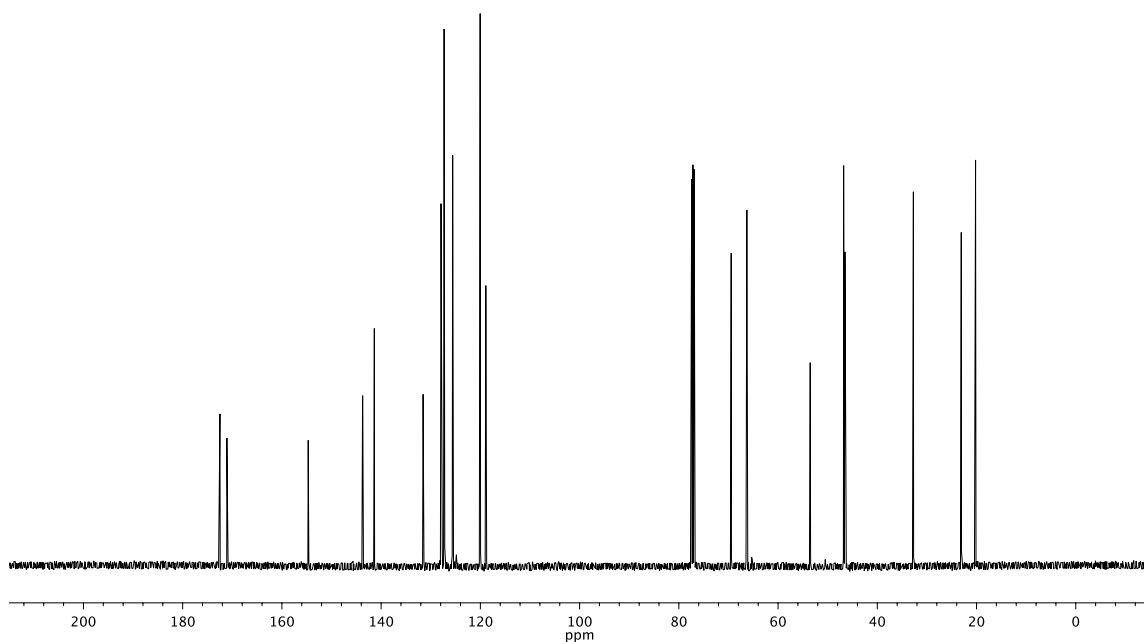
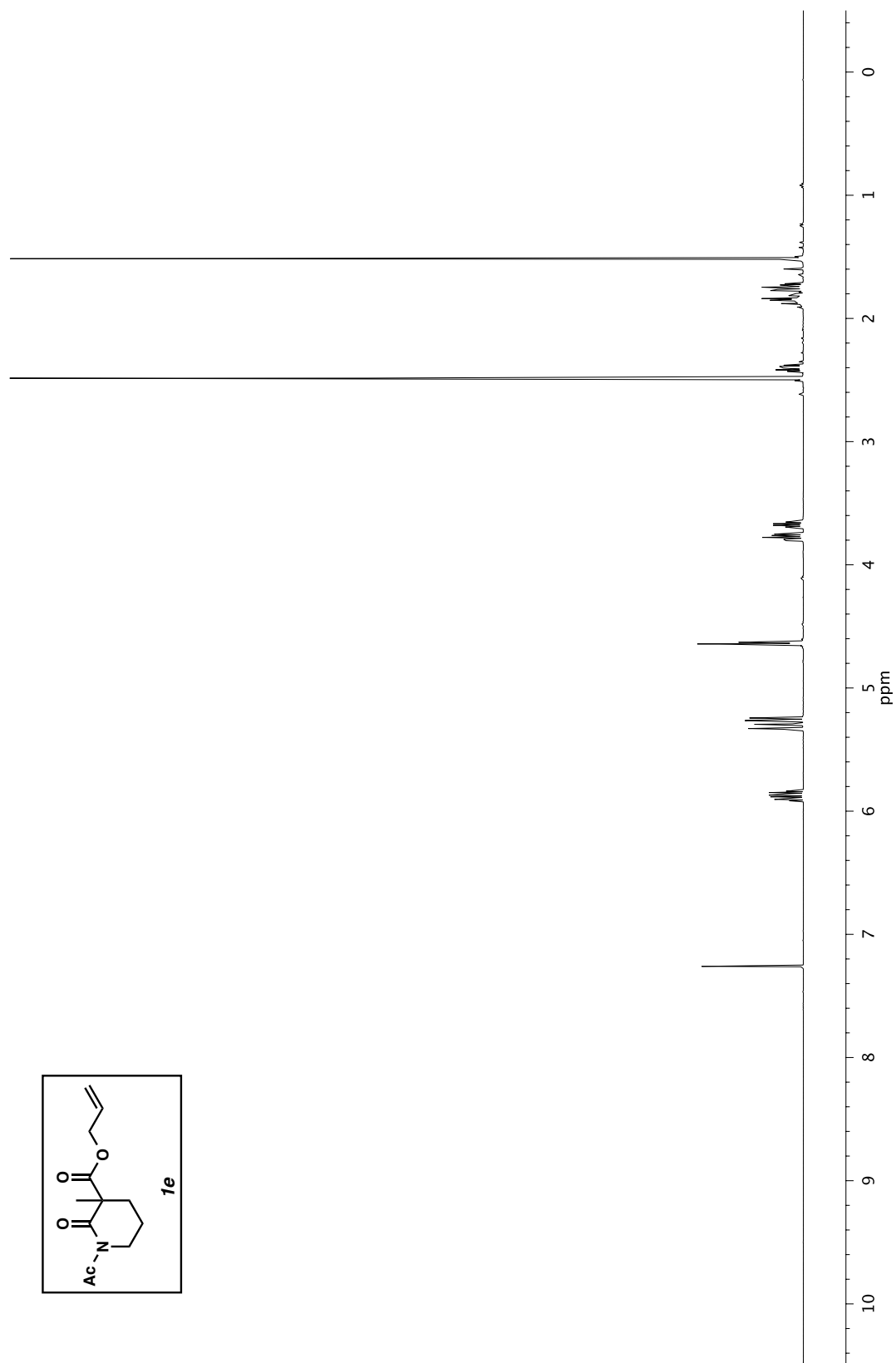


Figure A1.12 ¹³C NMR (126 MHz, CDCl₃) of compound **1d**.

Figure A1.13 ^1H NMR (500 MHz, CDCl_3) of compound **1e**.

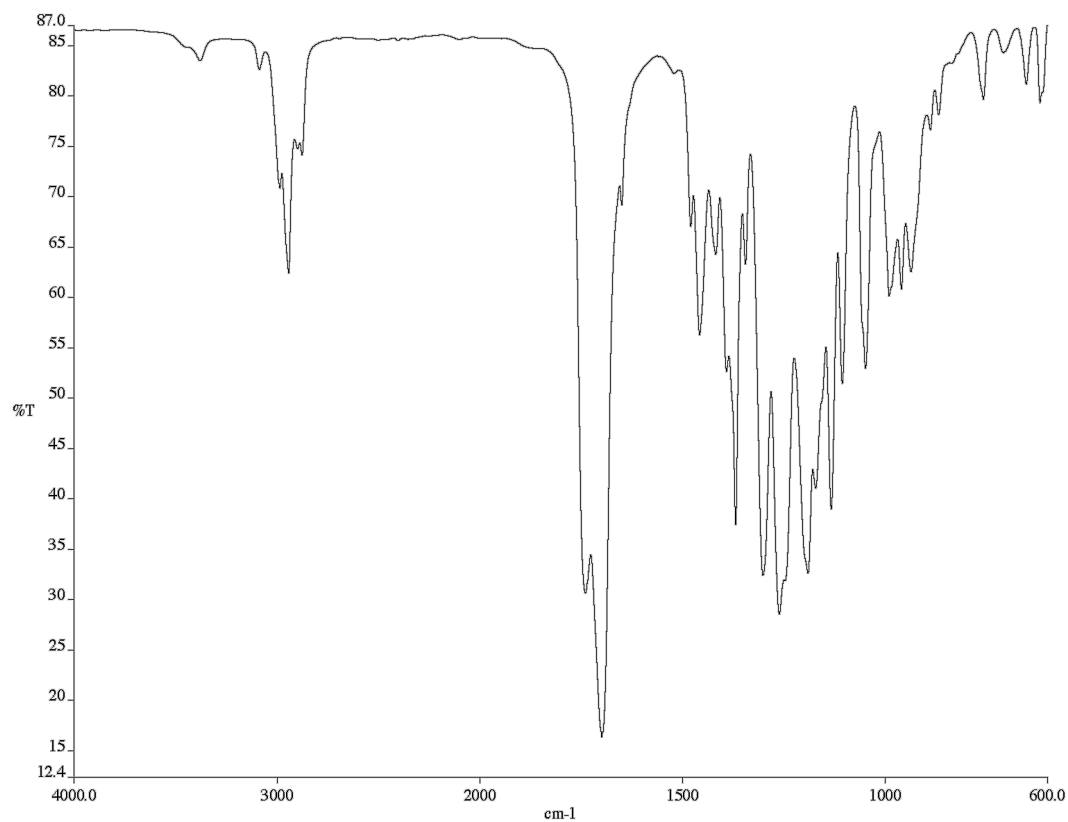


Figure A1.14 Infrared spectrum (Thin Film, NaCl) of compound **1e**.

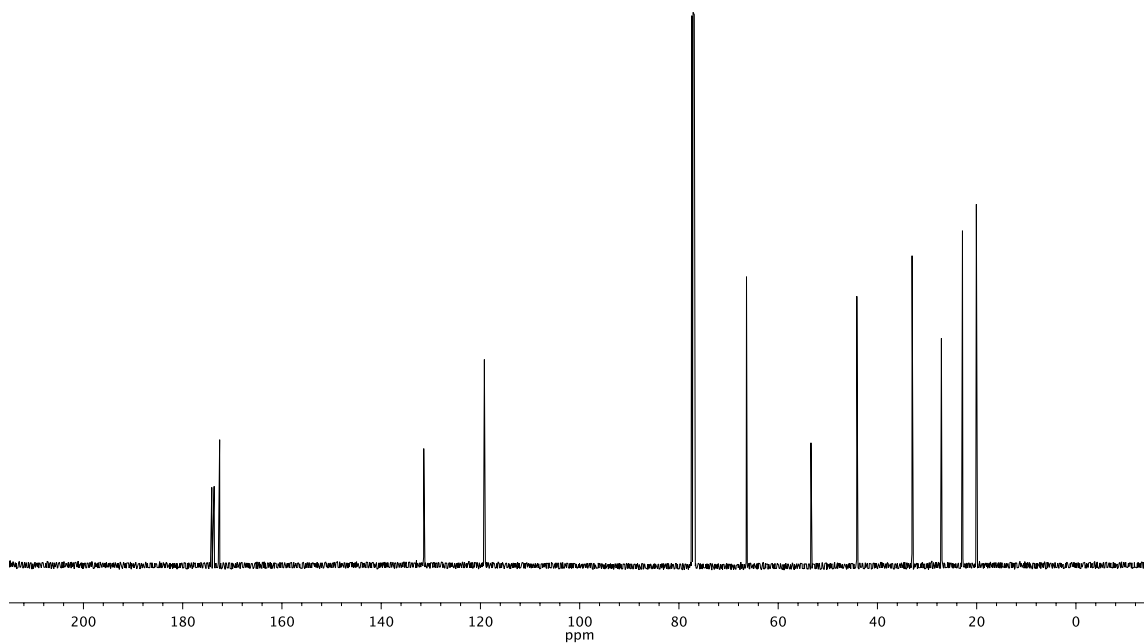
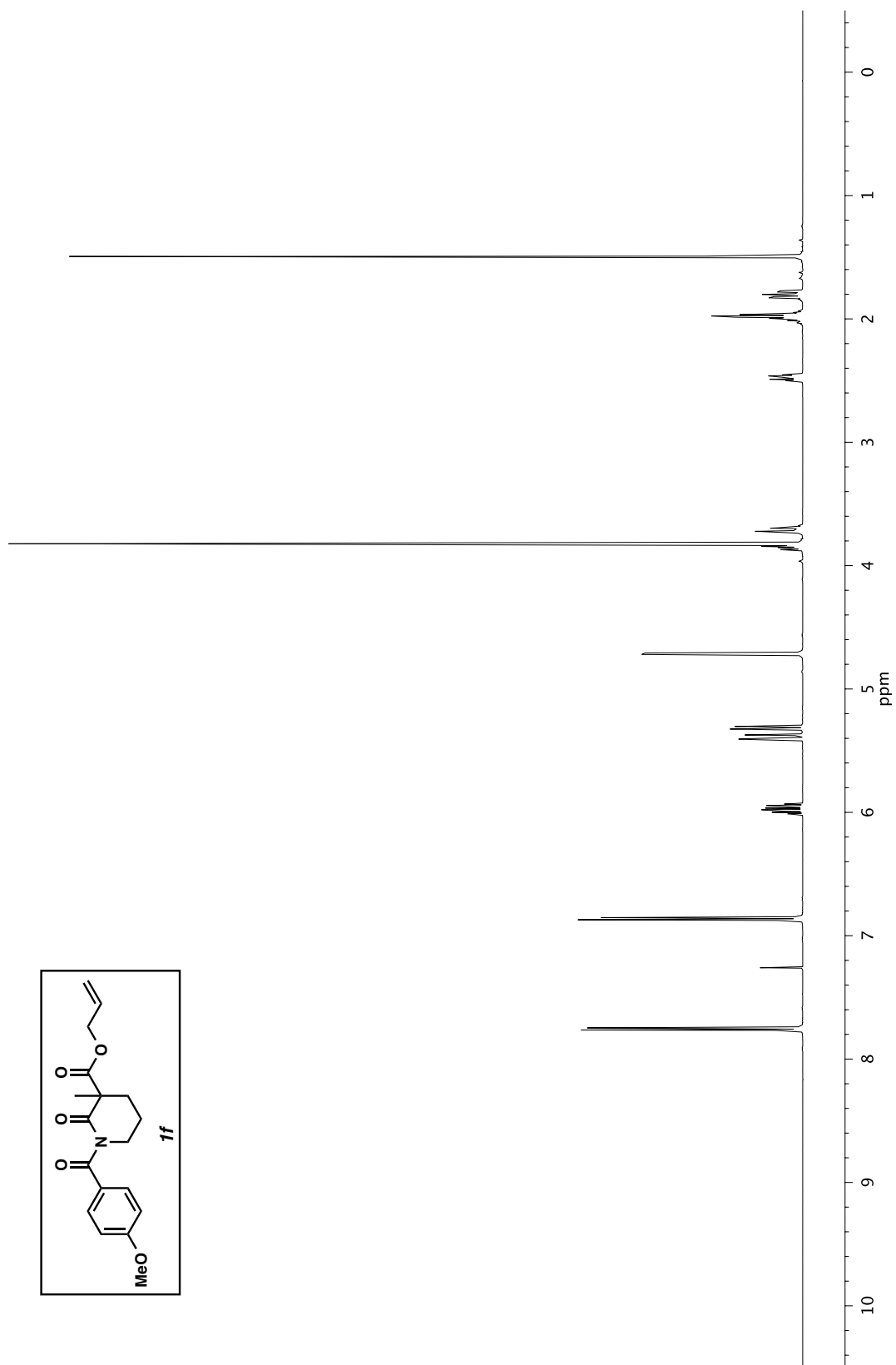


Figure A1.15 ¹³C NMR (126 MHz, CDCl₃) of compound **1e**.

Figure A1.16 ^1H NMR (500 MHz, CDCl_3) of compound **1f**.

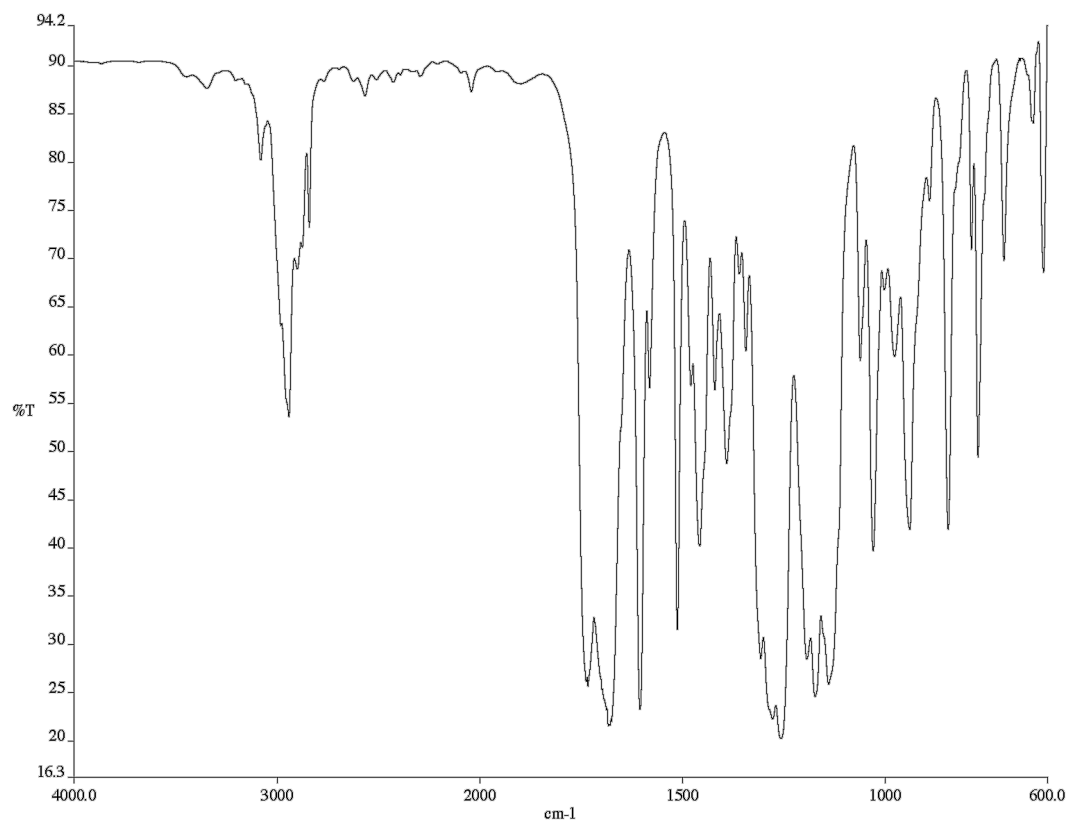


Figure A1.17 Infrared spectrum (Thin Film, NaCl) of compound **1f**.

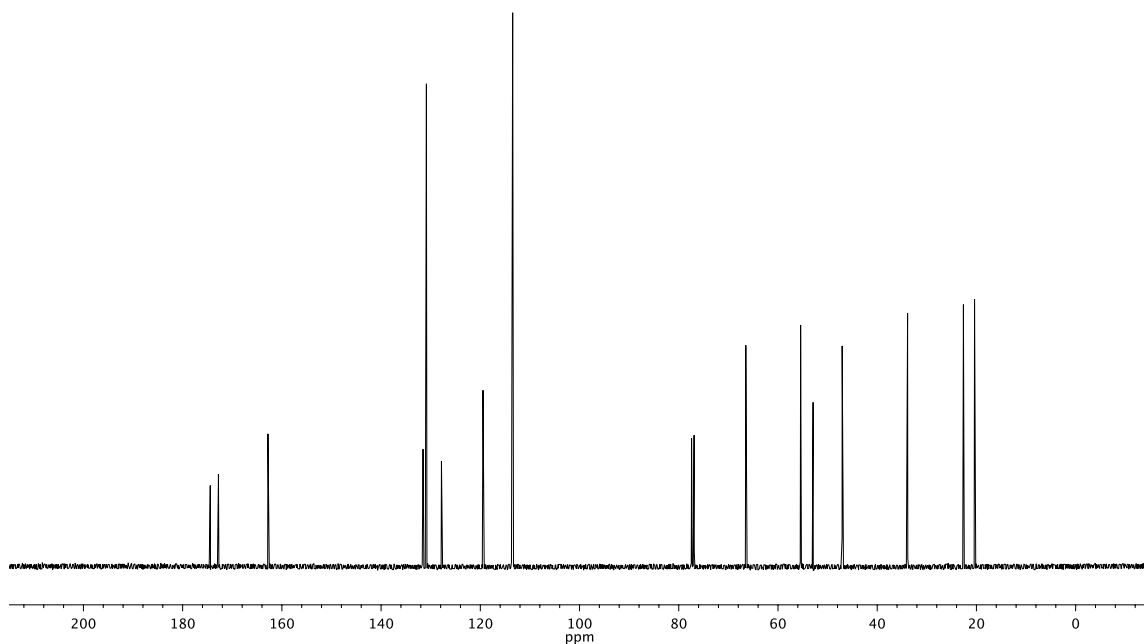


Figure A1.18 ¹³C NMR (126 MHz, CDCl₃) of compound **1f**.

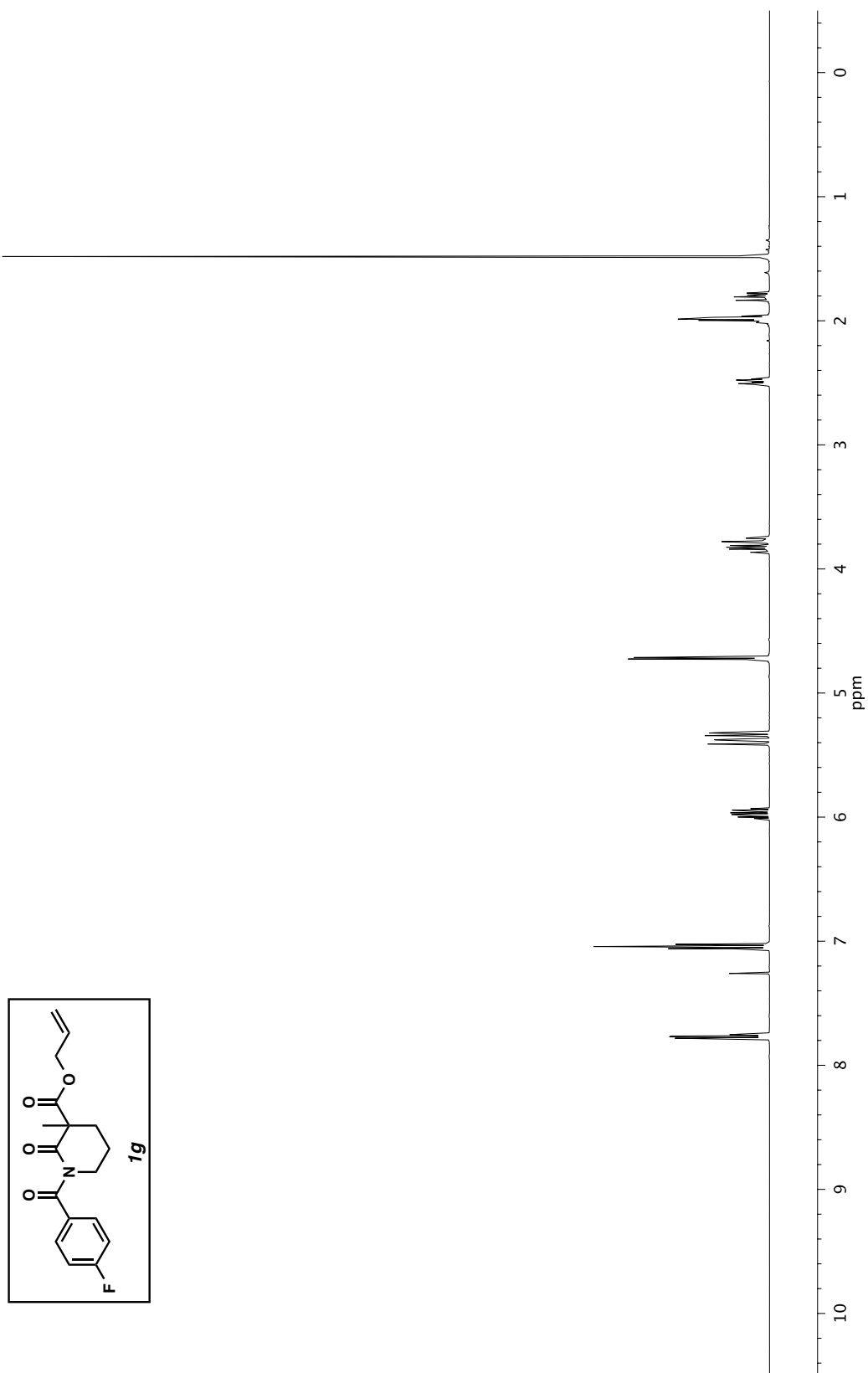


Figure A1.19 ¹H NMR (500 MHz, CDCl₃) of compound **1g**.

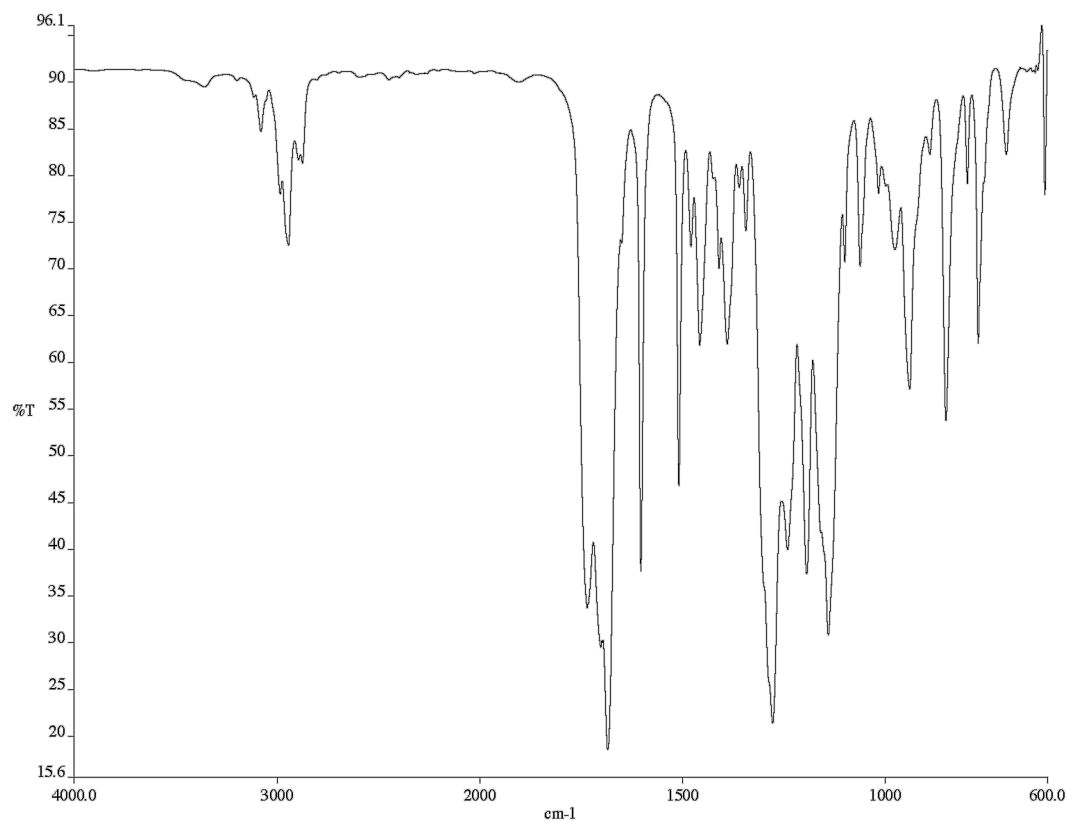


Figure A1.20 Infrared spectrum (Thin Film, NaCl) of compound **1g**.

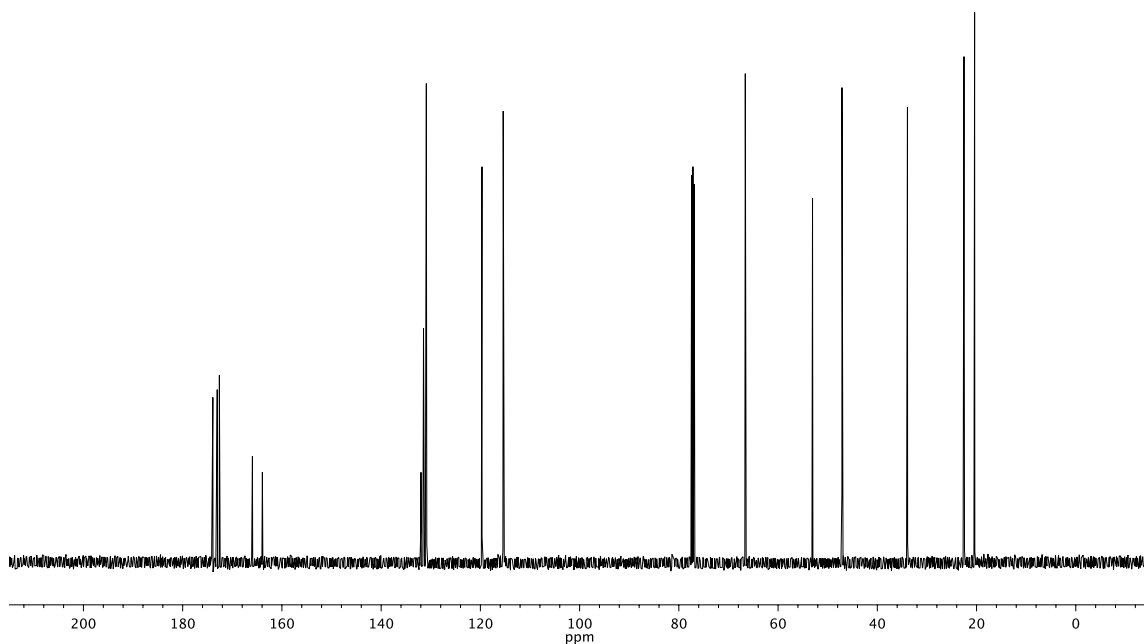


Figure A1.21 ¹³C NMR (126 MHz, CDCl₃) of compound **1g**.

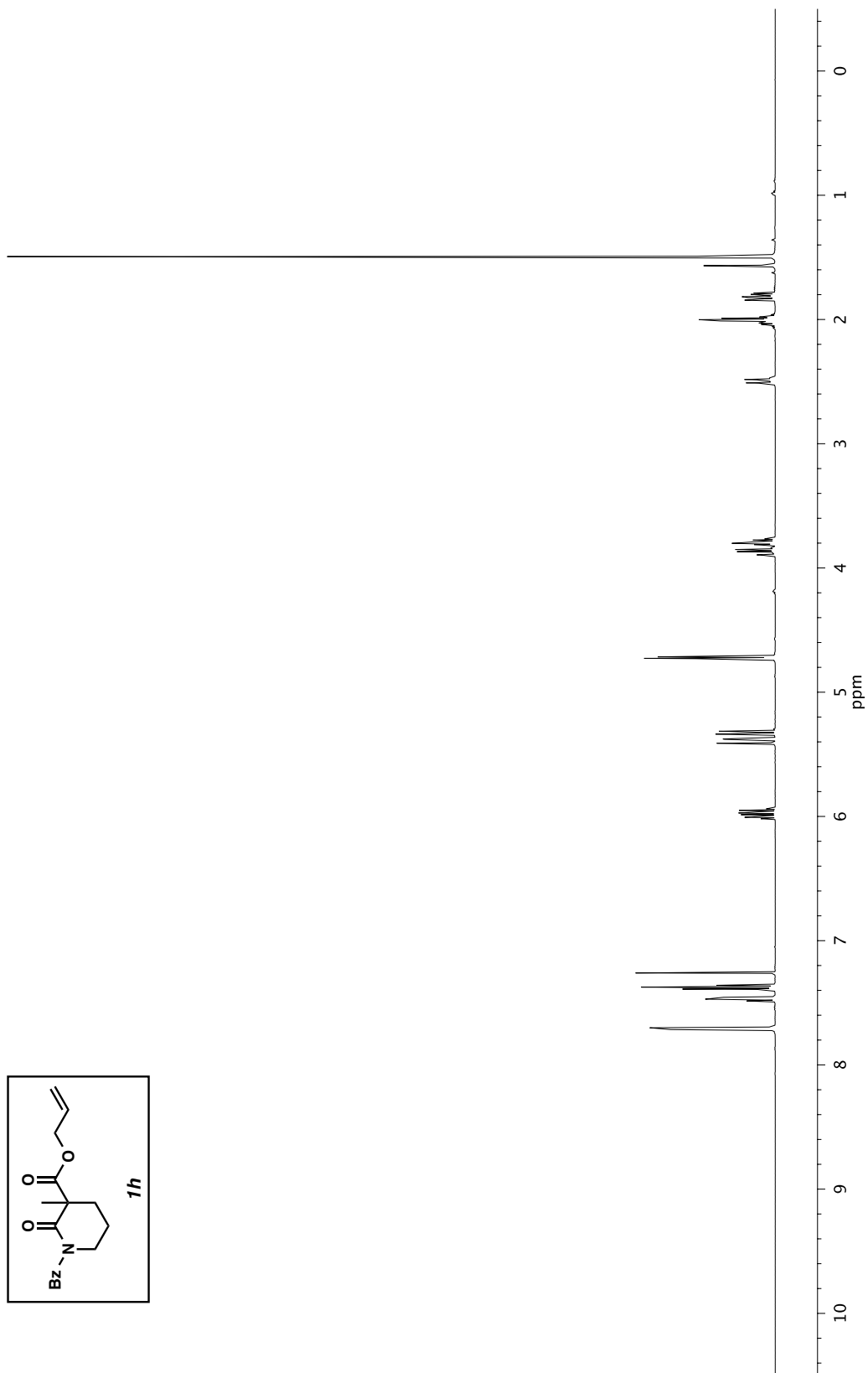


Figure A1.22 ¹H NMR (500 MHz, CDCl₃) of compound **1h**.

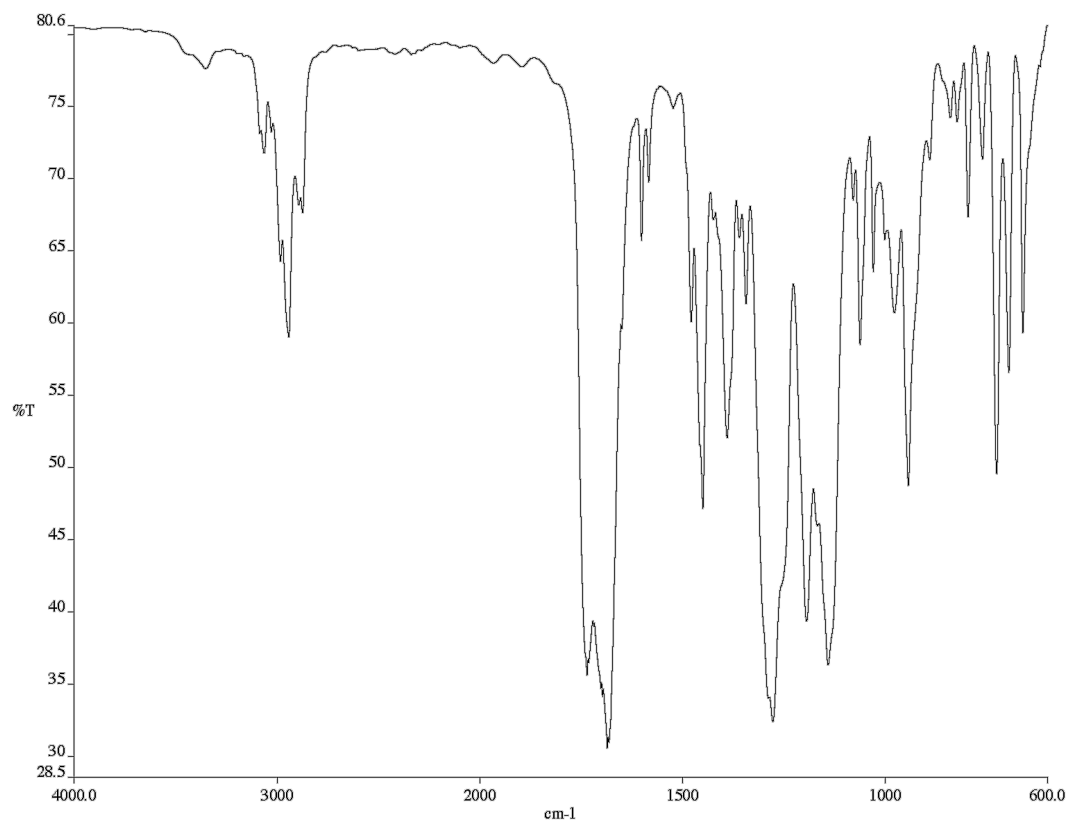


Figure A1.23 Infrared spectrum (Thin Film, NaCl) of compound **1h**.

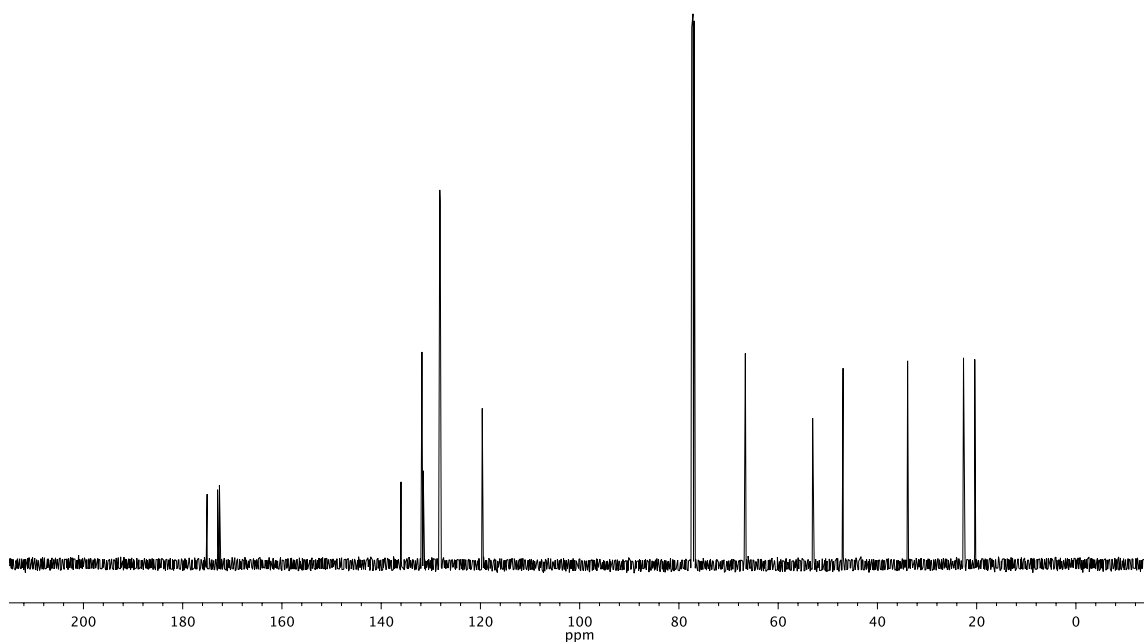


Figure A1.24 ¹³C NMR (126 MHz, CDCl₃) of compound **1h**.

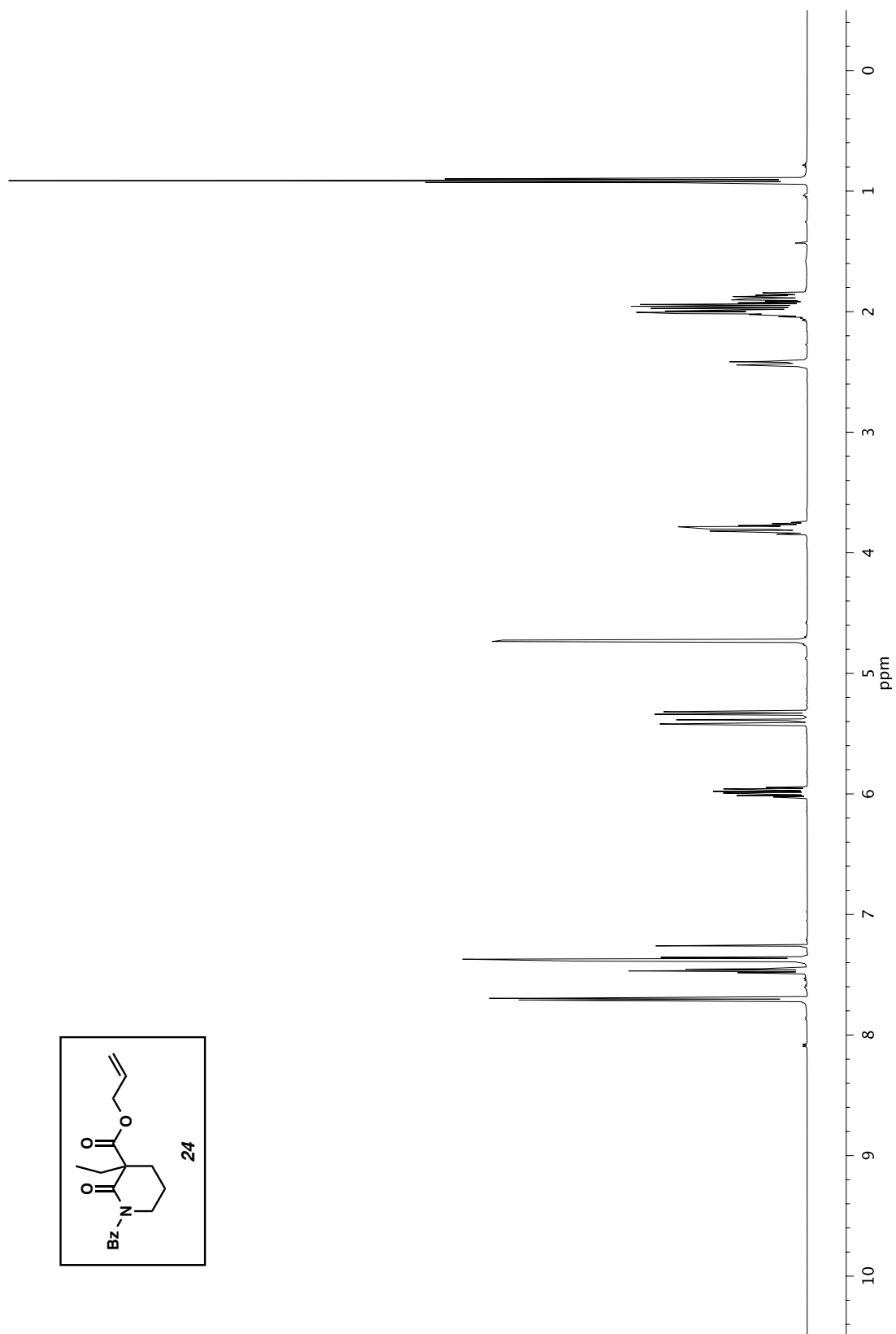


Figure A1.25 ^1H NMR (500 MHz, CDCl_3) of compound **24**.

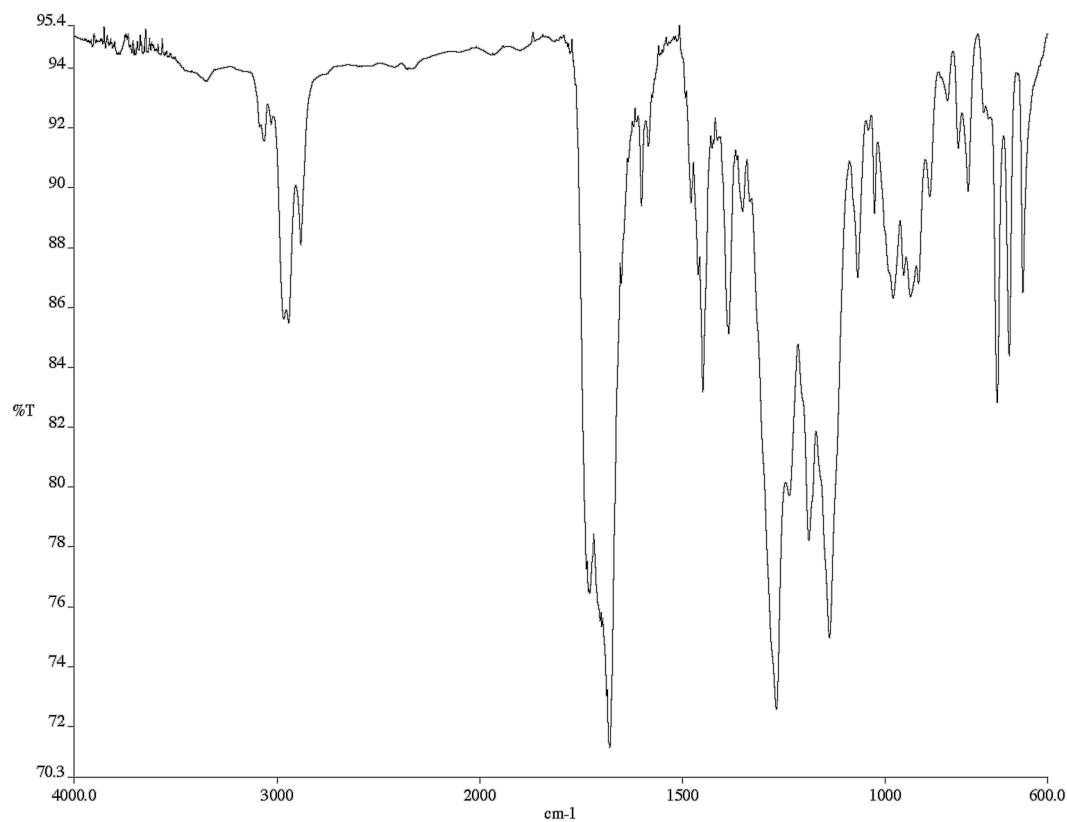


Figure A1.26 Infrared spectrum (Thin Film, NaCl) of compound **24**.

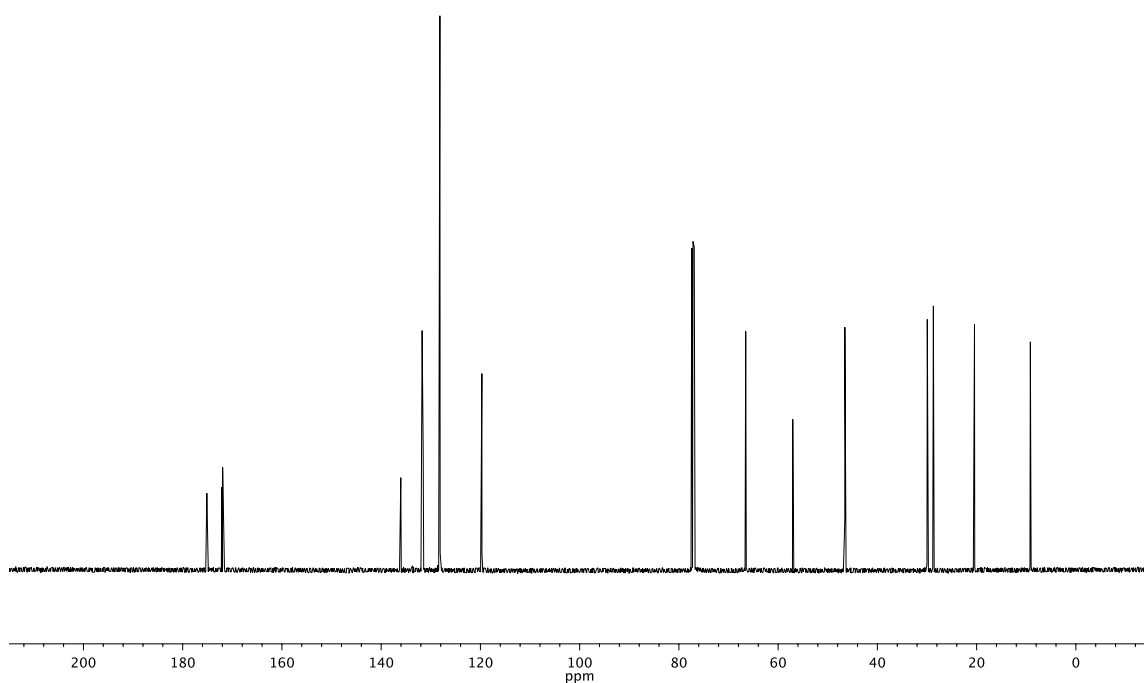


Figure A1.27 ¹³C NMR (126 MHz, CDCl₃) of compound **24**.

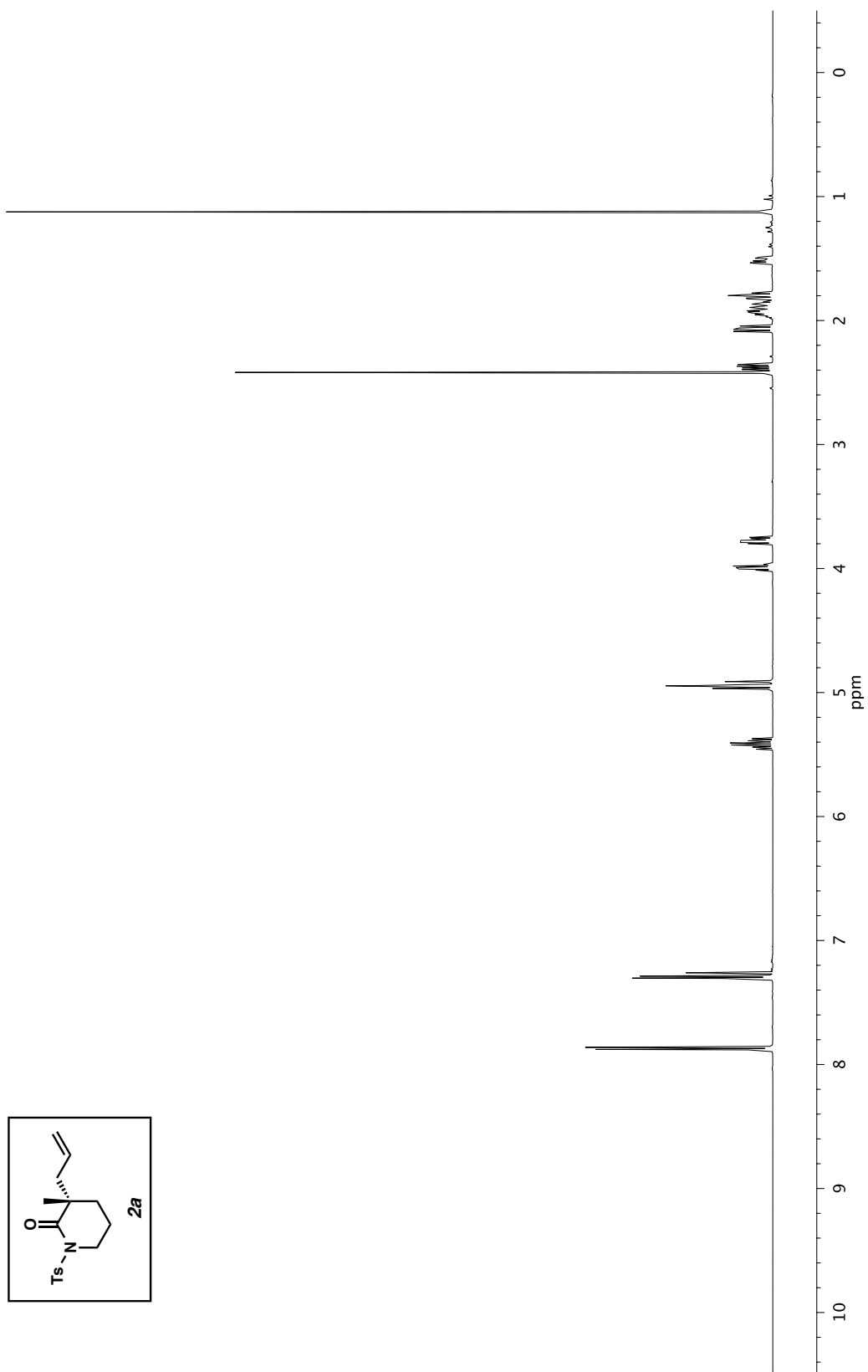


Figure A1.28 ^1H NMR (500 MHz, CDCl_3) of compound **2a**.

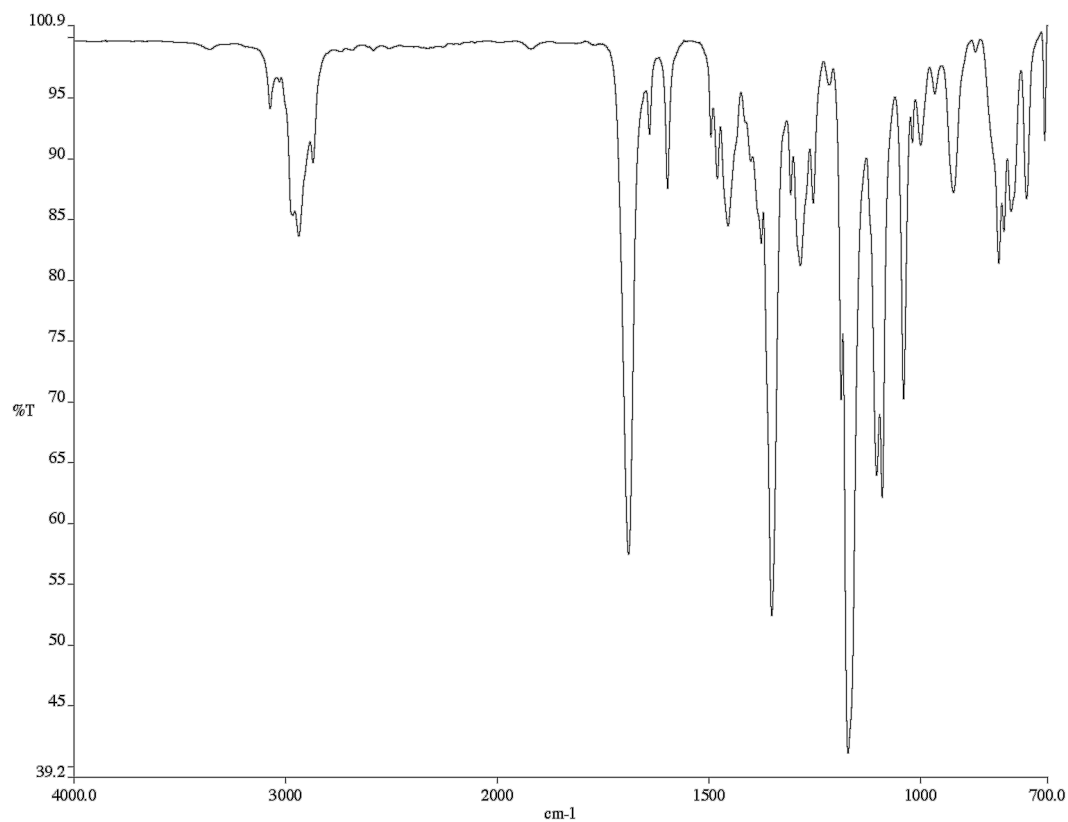


Figure A1.29 Infrared spectrum (Thin Film, NaCl) of compound **2a**.

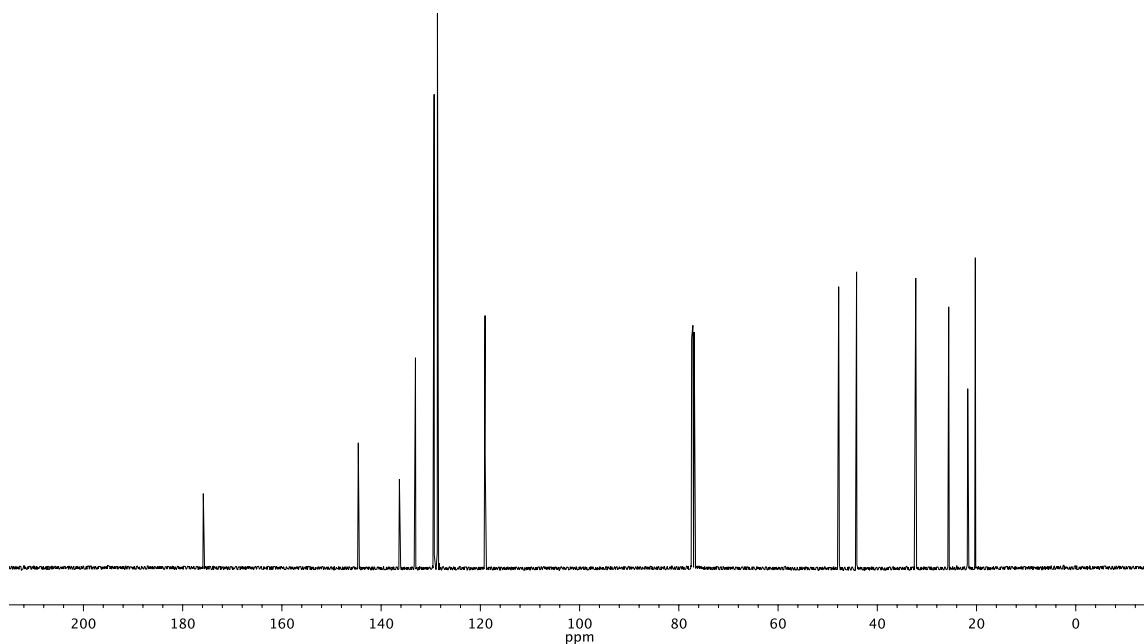


Figure A1.30 ¹³C NMR (126 MHz, CDCl₃) of compound **2a**.

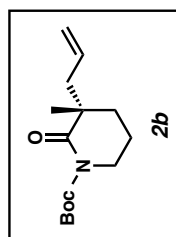
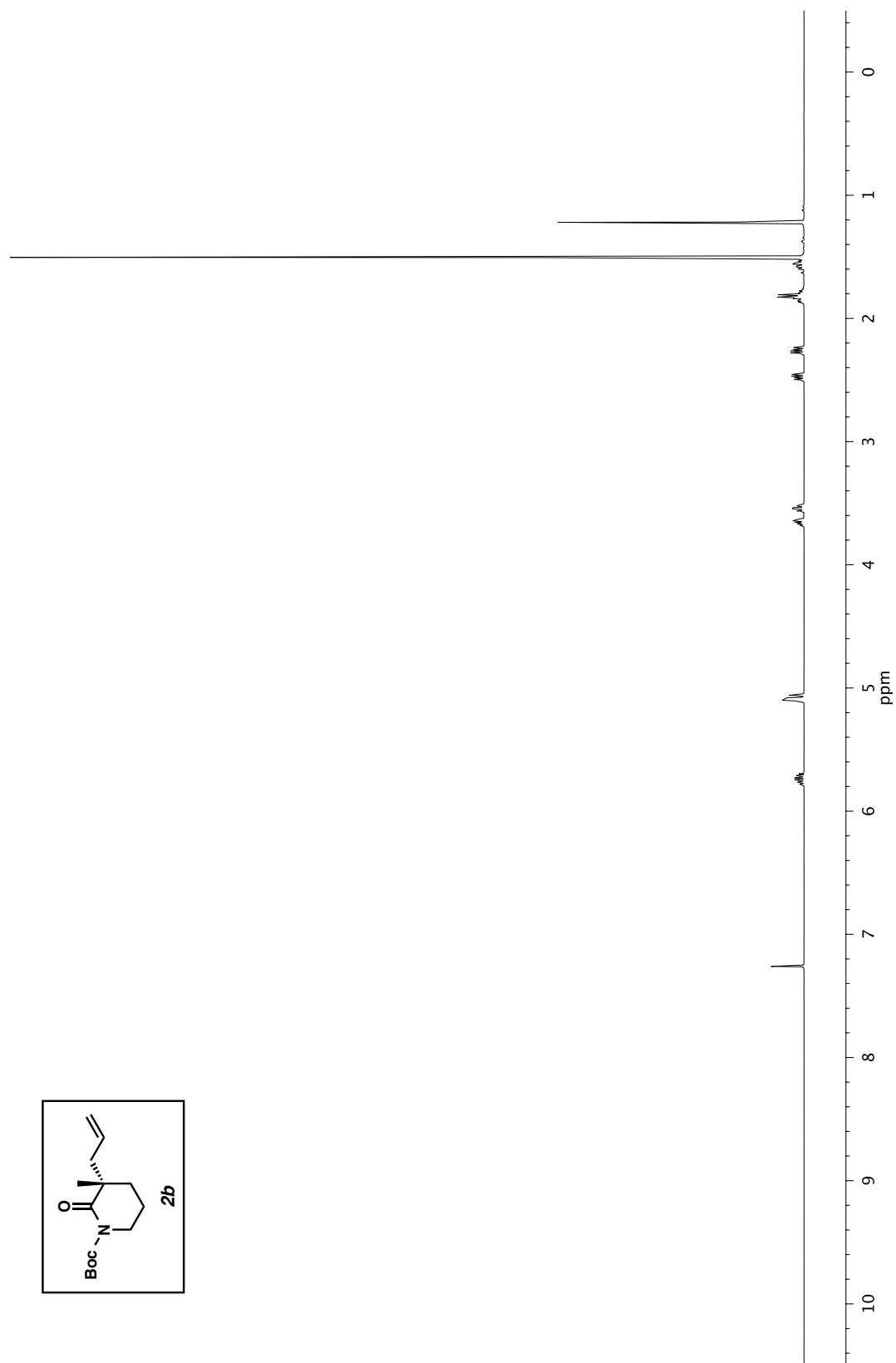


Figure A1.31 ^1H NMR (500 MHz, CDCl_3) of compound **2b**.

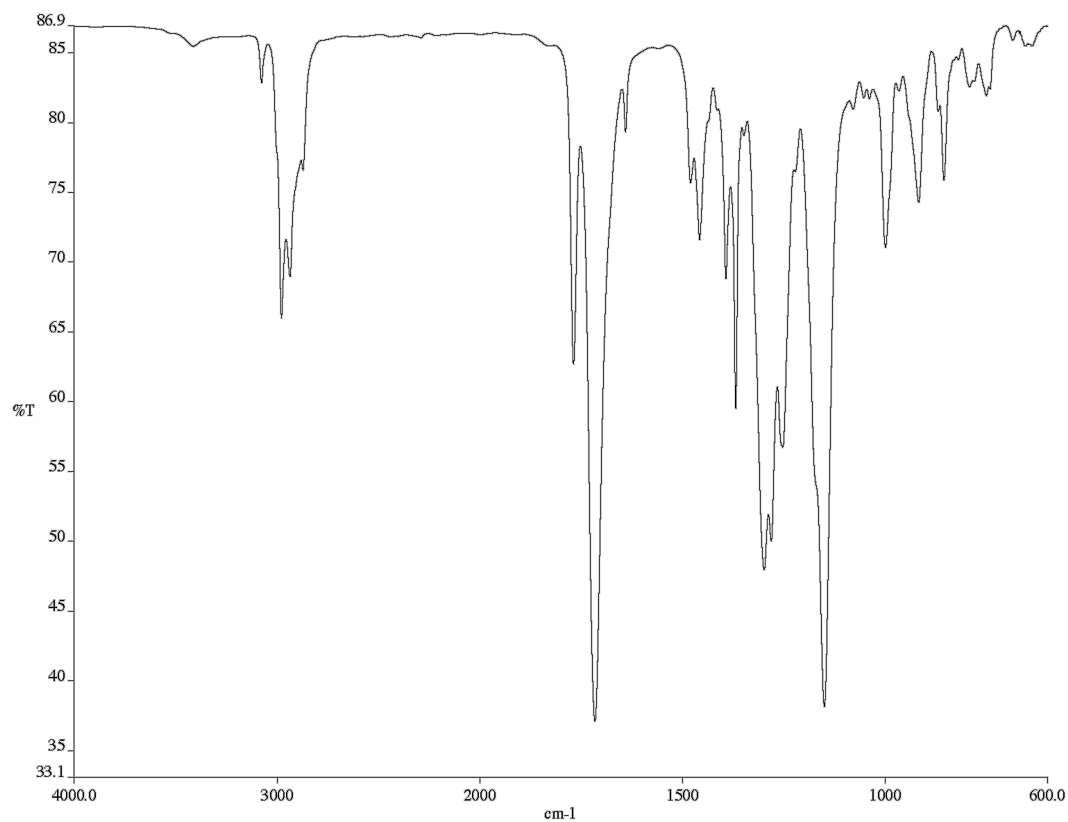


Figure A1.32 Infrared spectrum (Thin Film, NaCl) of compound **2b**.

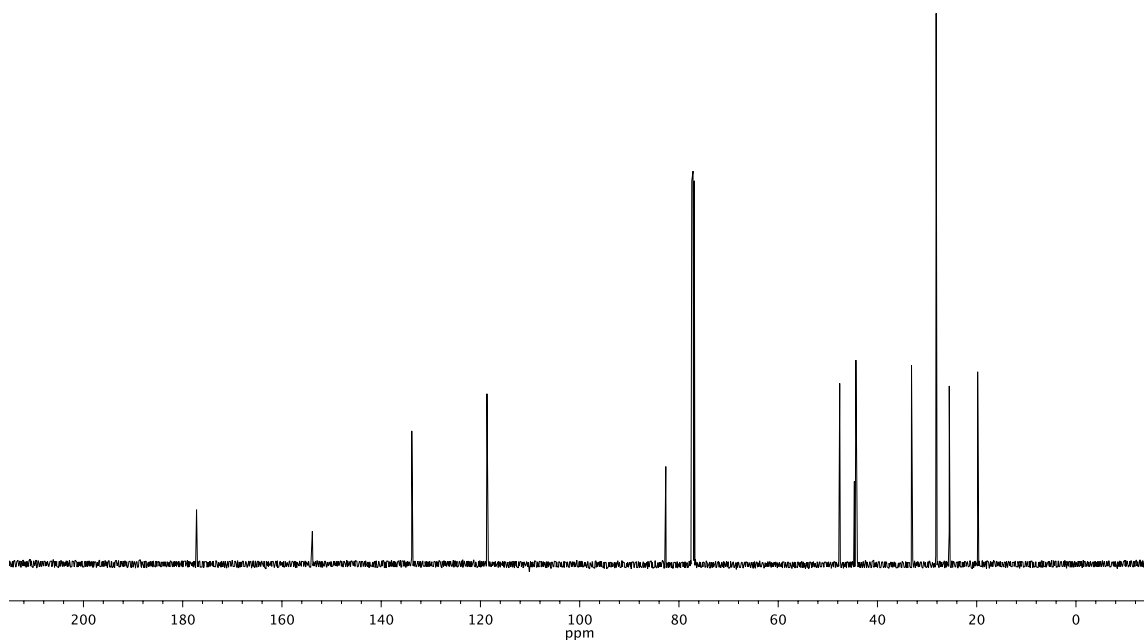


Figure A1.33 ¹³C NMR (126 MHz, CDCl₃) of compound **2b**.

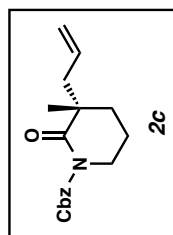
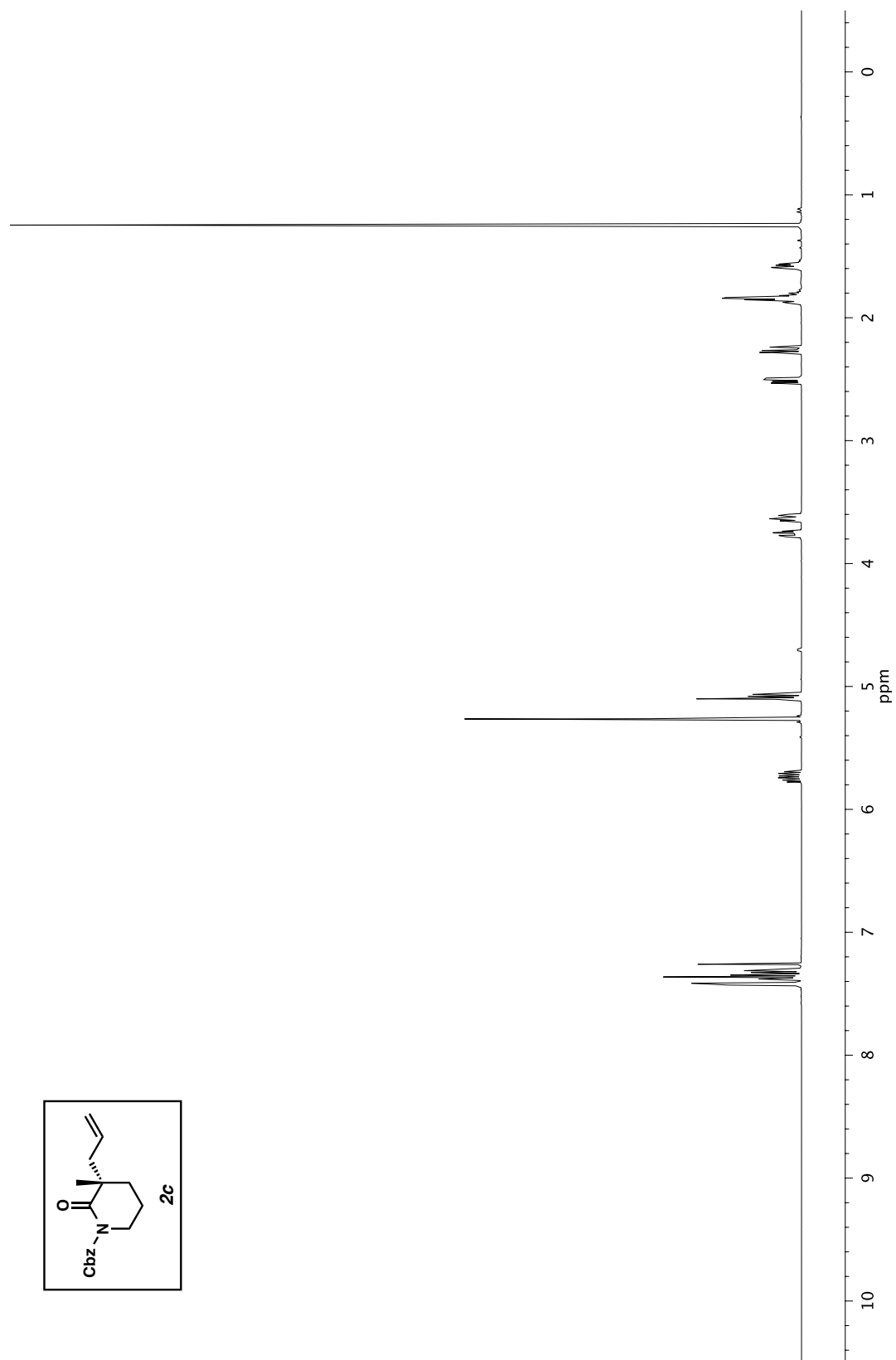


Figure A1.34 ^1H NMR (500 MHz, CDCl_3) of compound **2c**.

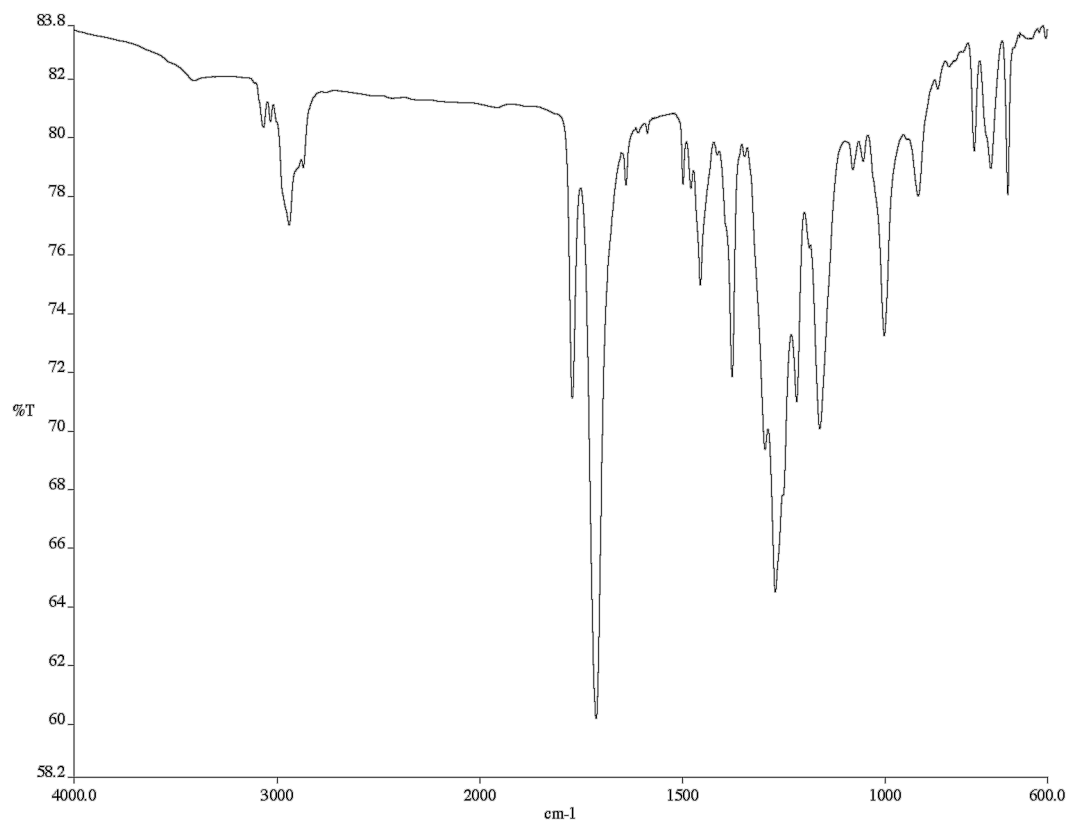


Figure A1.35 Infrared spectrum (Thin Film, NaCl) of compound **2c**.

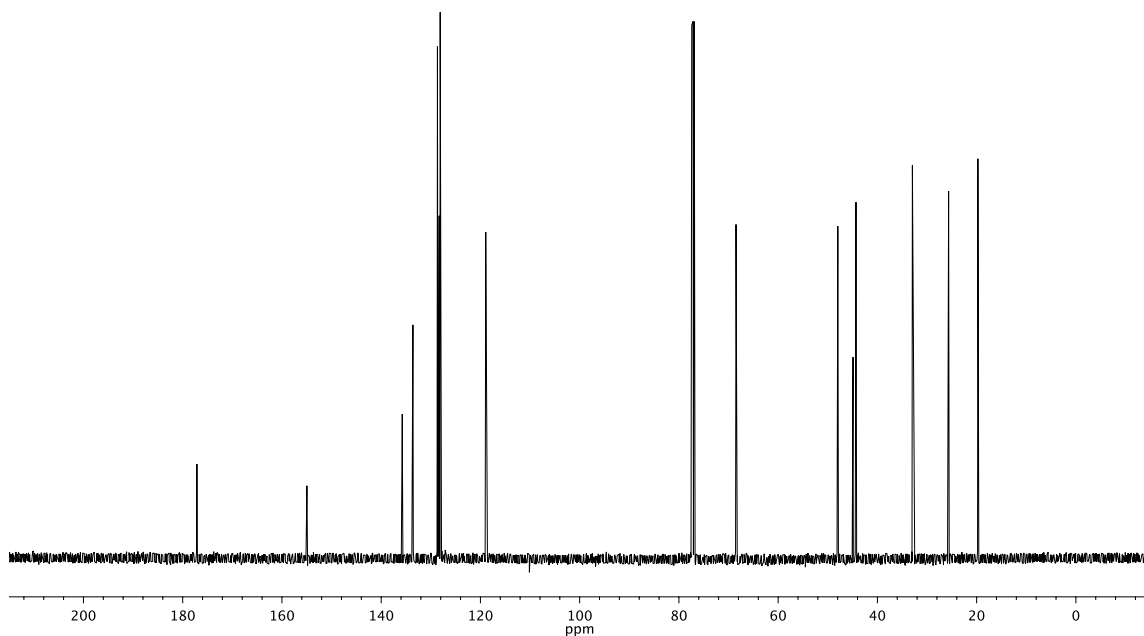


Figure A1.36 ¹³C NMR (126 MHz, CDCl₃) of compound **2c**.

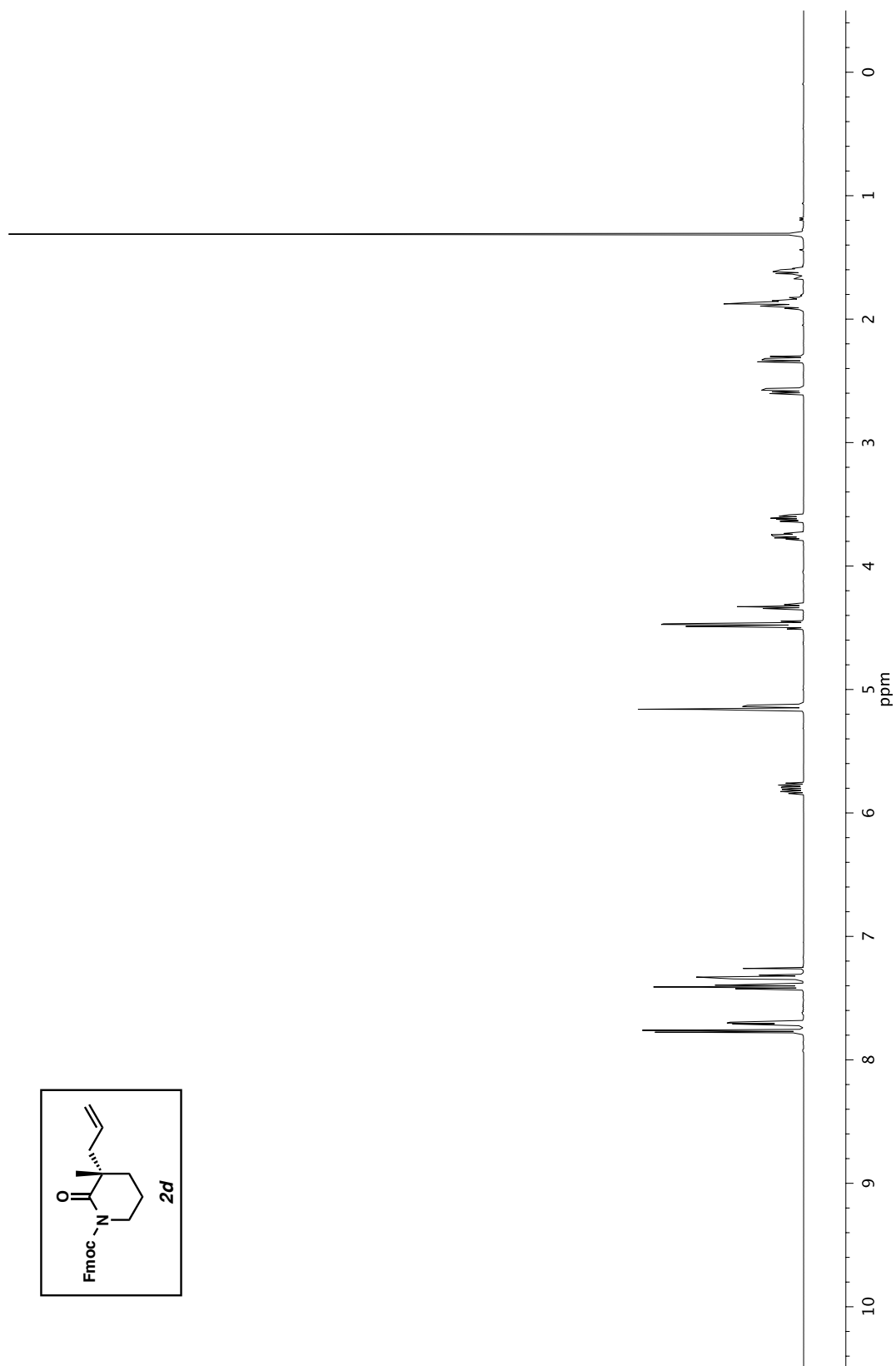


Figure A1.37 ^1H NMR (500 MHz, CDCl_3) of compound **2d**.

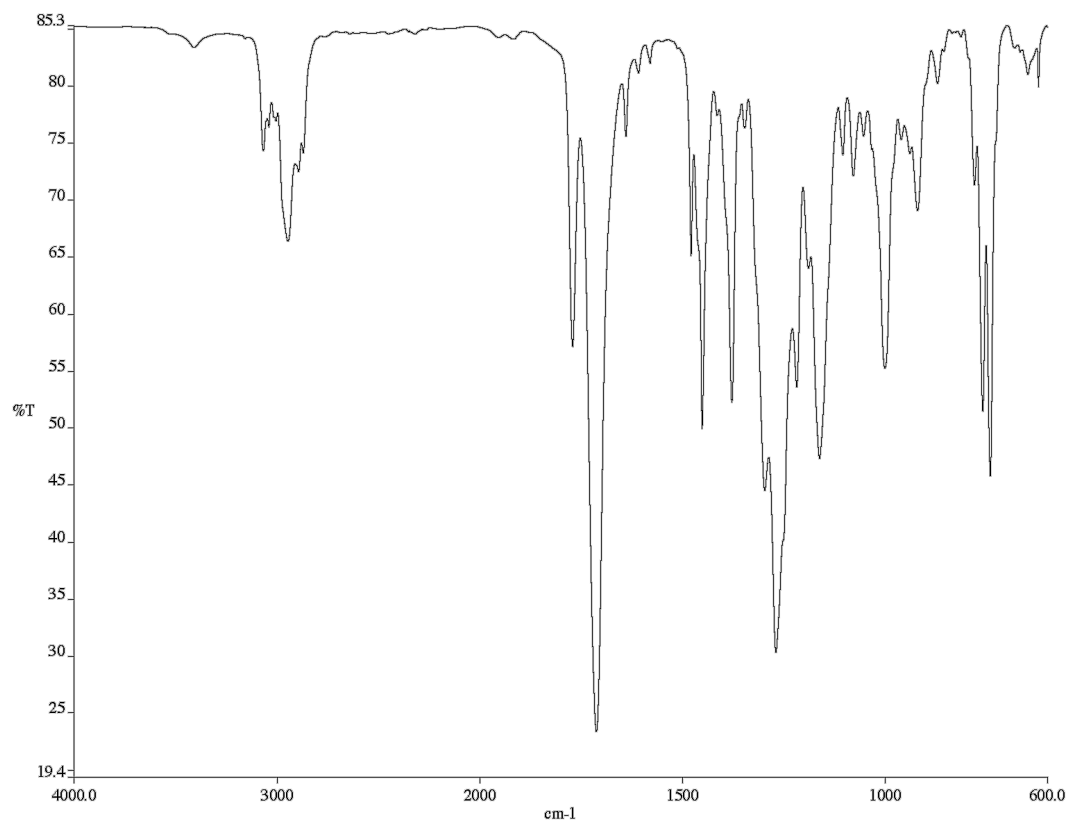


Figure A1.38 Infrared spectrum (Thin Film, NaCl) of compound **2d**.

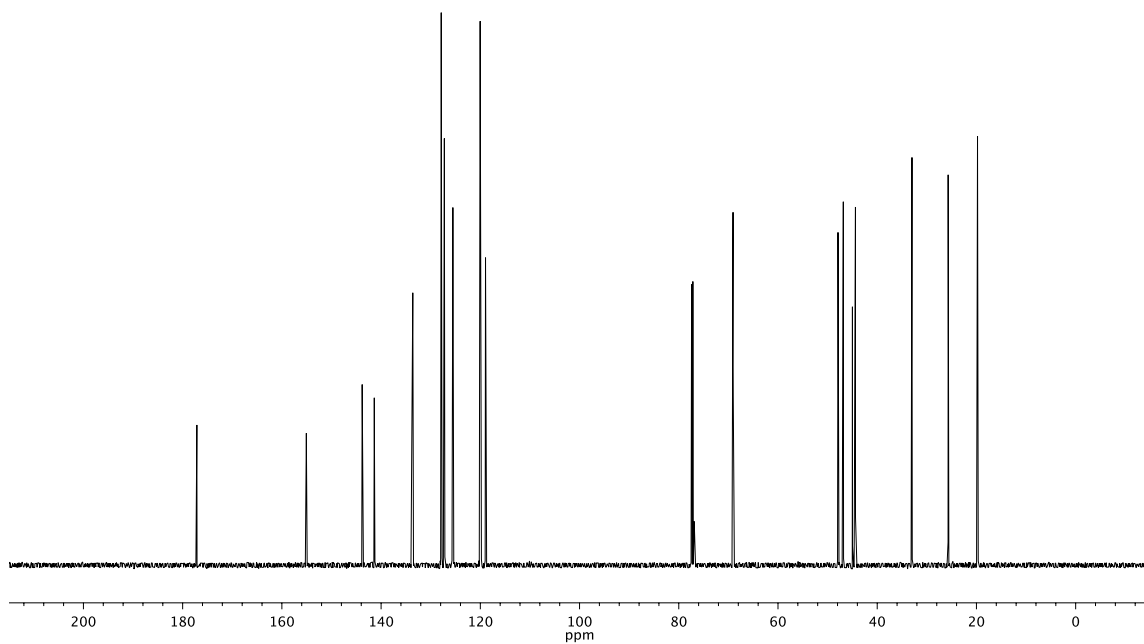


Figure A1.39 ¹³C NMR (126 MHz, CDCl₃) of compound **2d**.

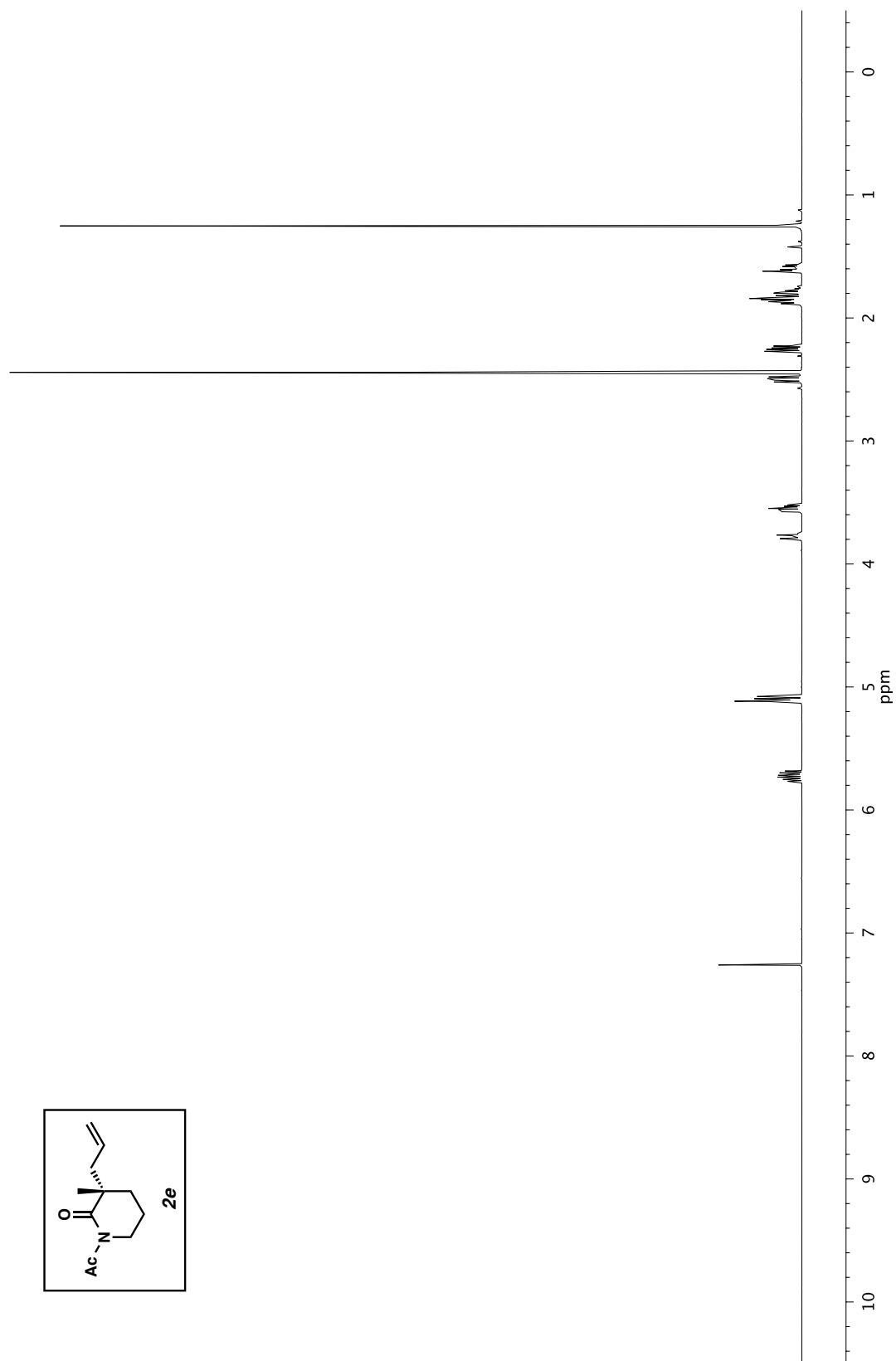


Figure A1.40 ^1H NMR (500 MHz, CDCl_3) of compound **2e**.

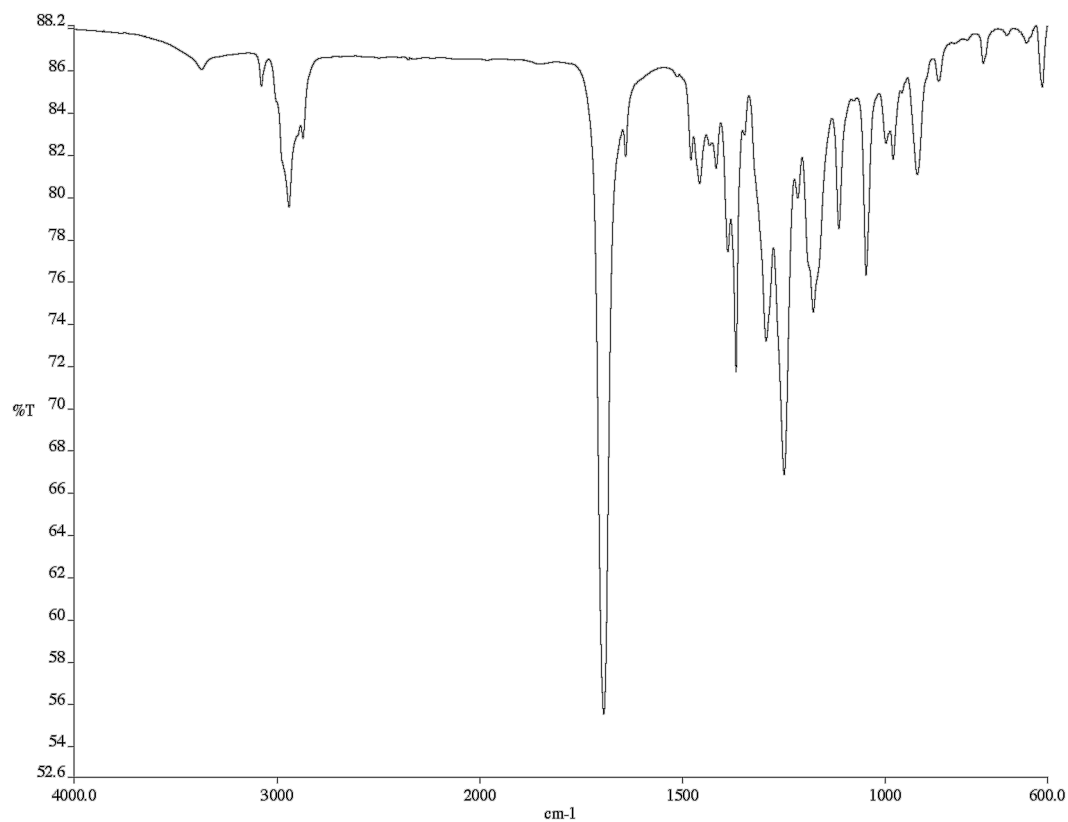


Figure A1.41 Infrared spectrum (Thin Film, NaCl) of compound **2e**.

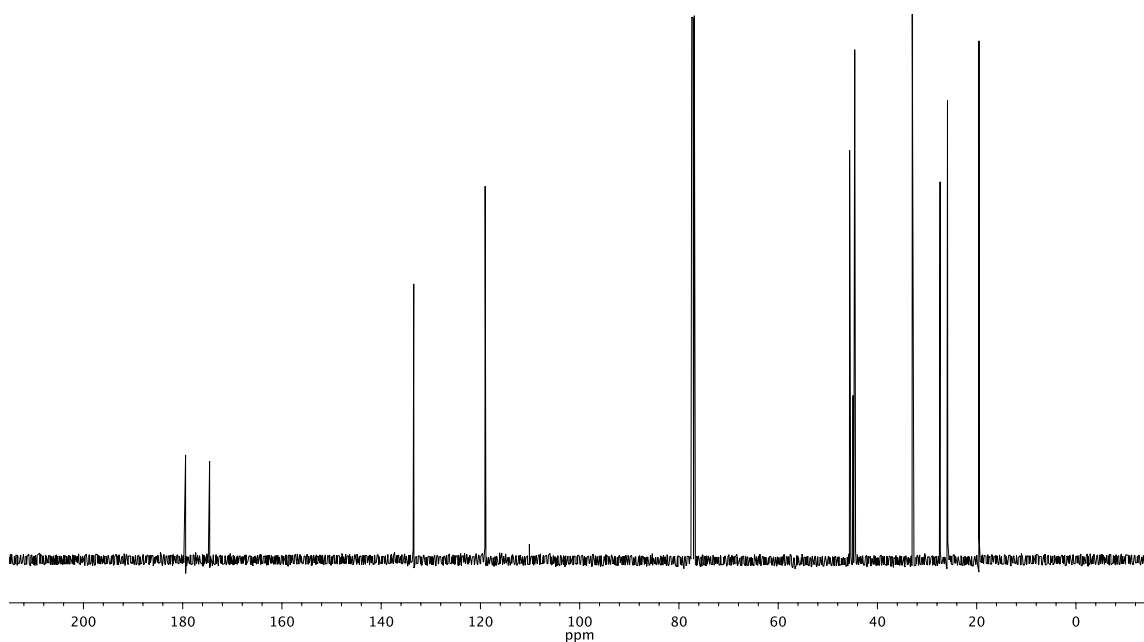
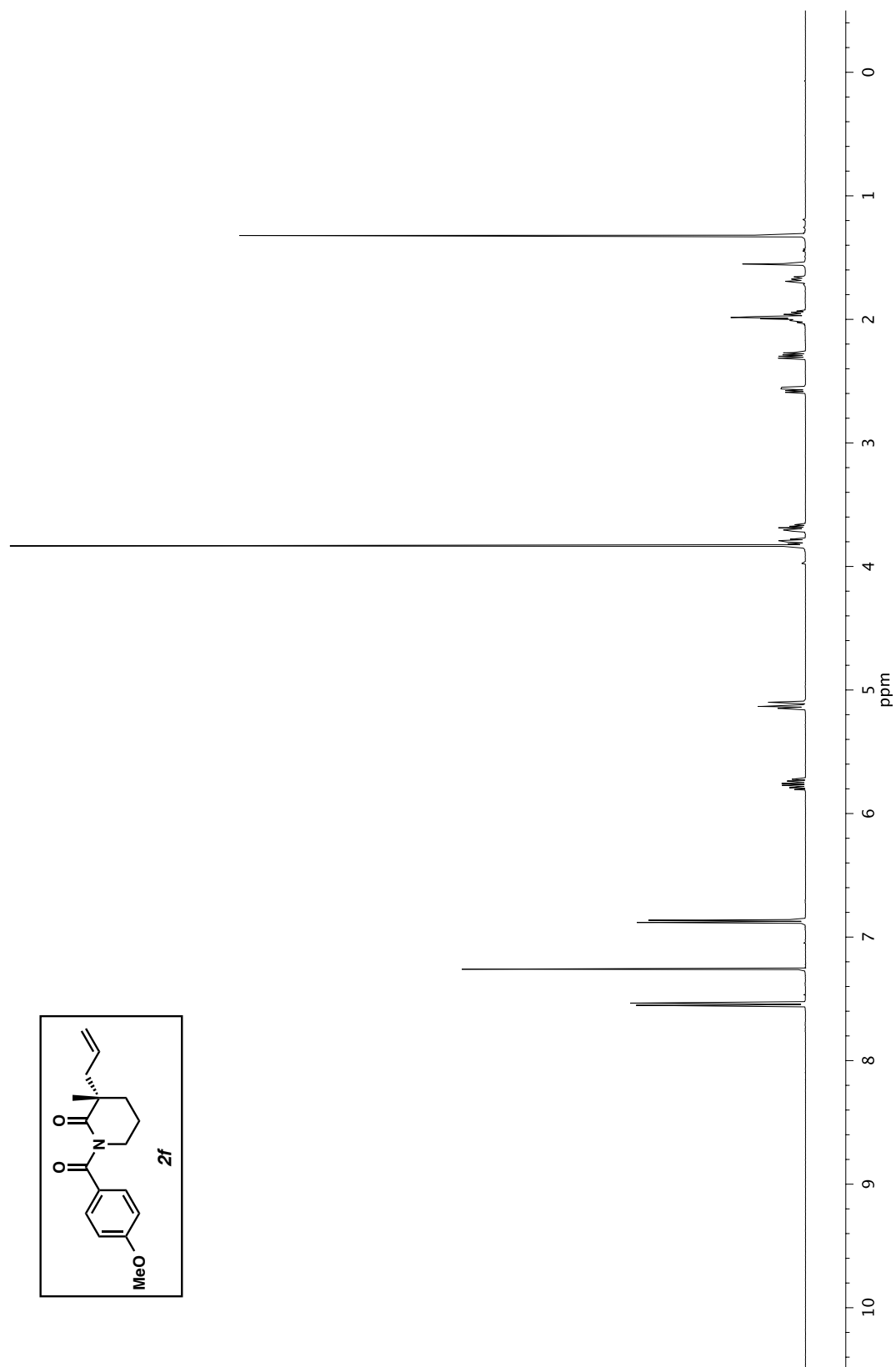


Figure A1.42 ¹³C NMR (126 MHz, CDCl₃) of compound **2e**.

Figure A1.43 ^1H NMR (500 MHz, CDCl_3) of compound **2f**.

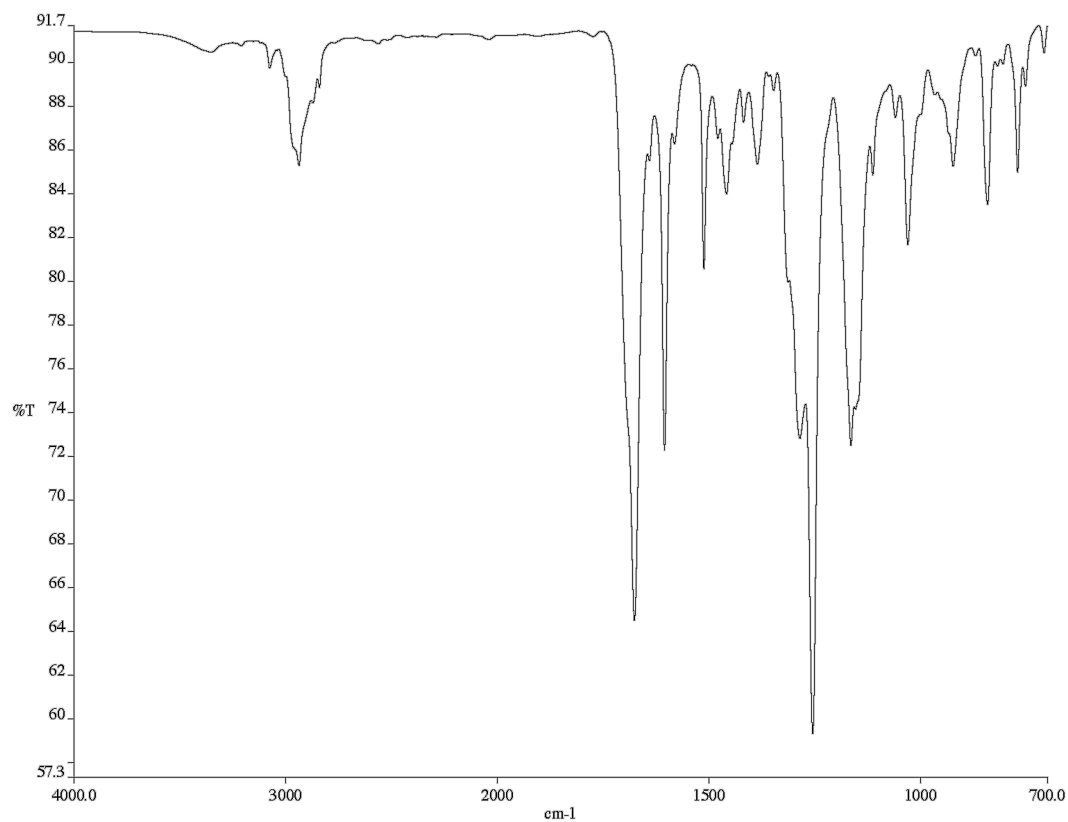


Figure A1.44 Infrared spectrum (Thin Film, NaCl) of compound **2f**.

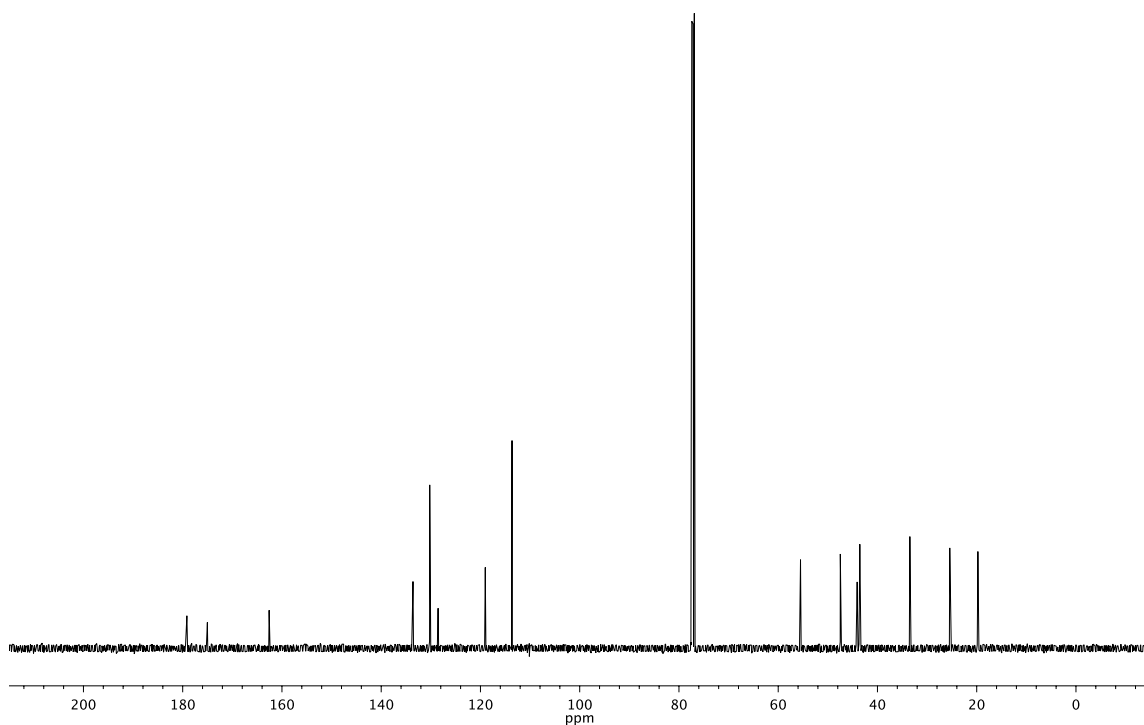
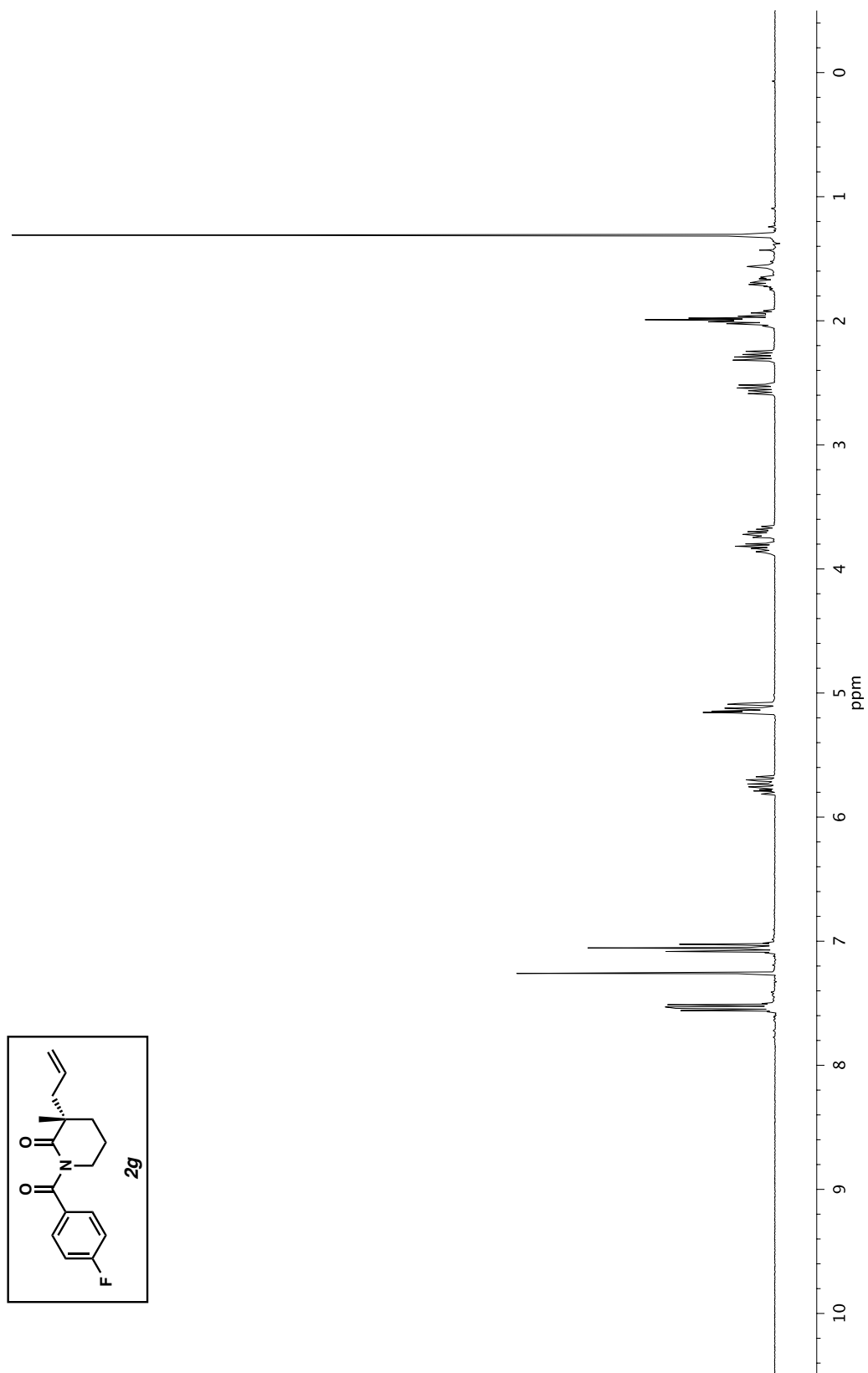


Figure A1.45 ¹³C NMR (126 MHz, CDCl₃) of compound **2f**.

Figure A1.46 ¹H NMR (500 MHz, CDCl₃) of compound **2g**.

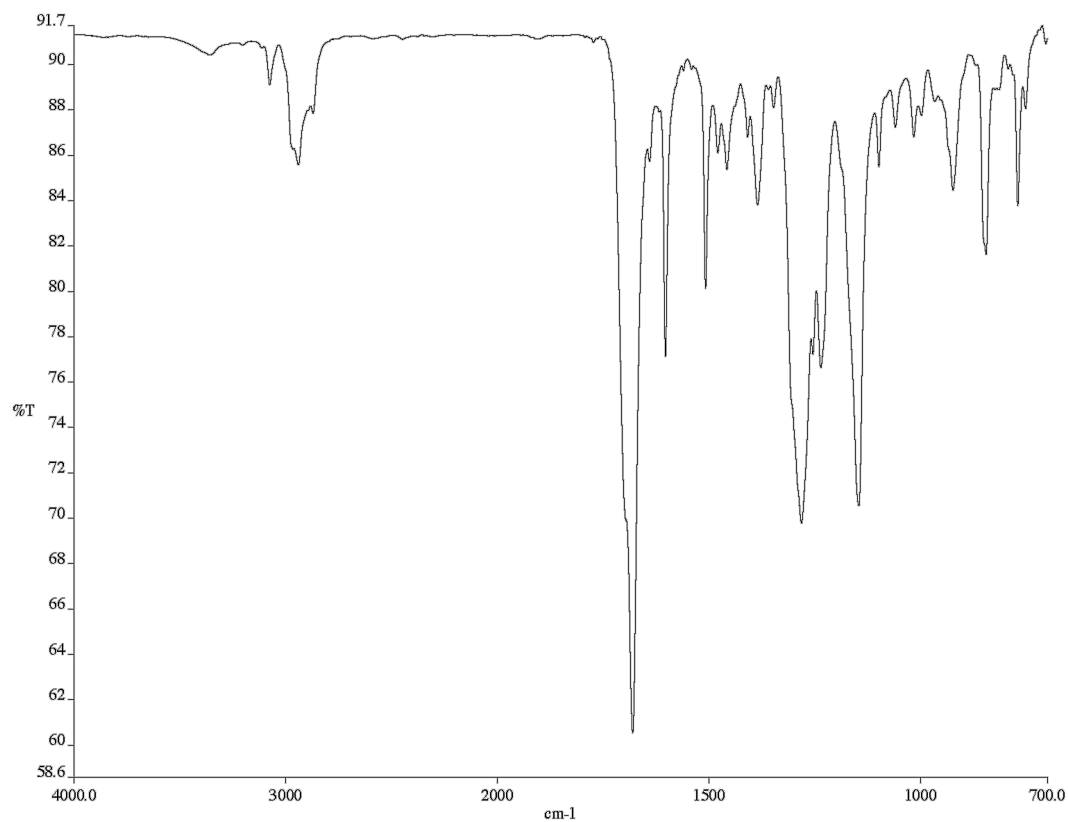


Figure A1.47 Infrared spectrum (Thin Film, NaCl) of compound **2g**.

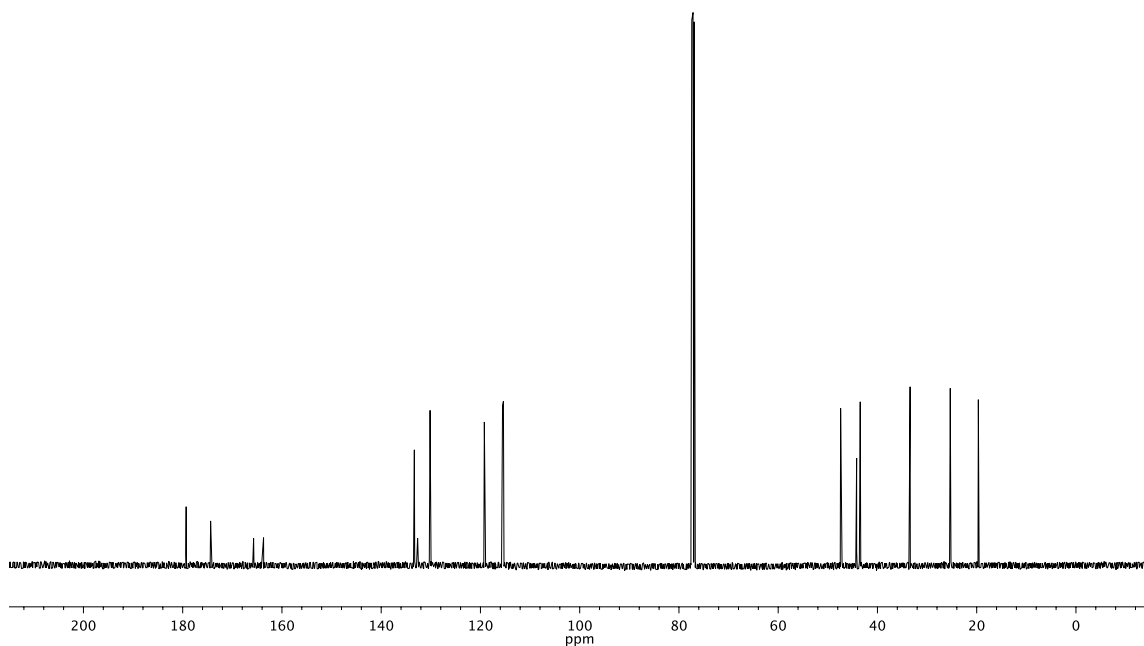


Figure A1.48 ¹³C NMR (126 MHz, CDCl₃) of compound **2g**.

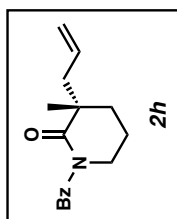
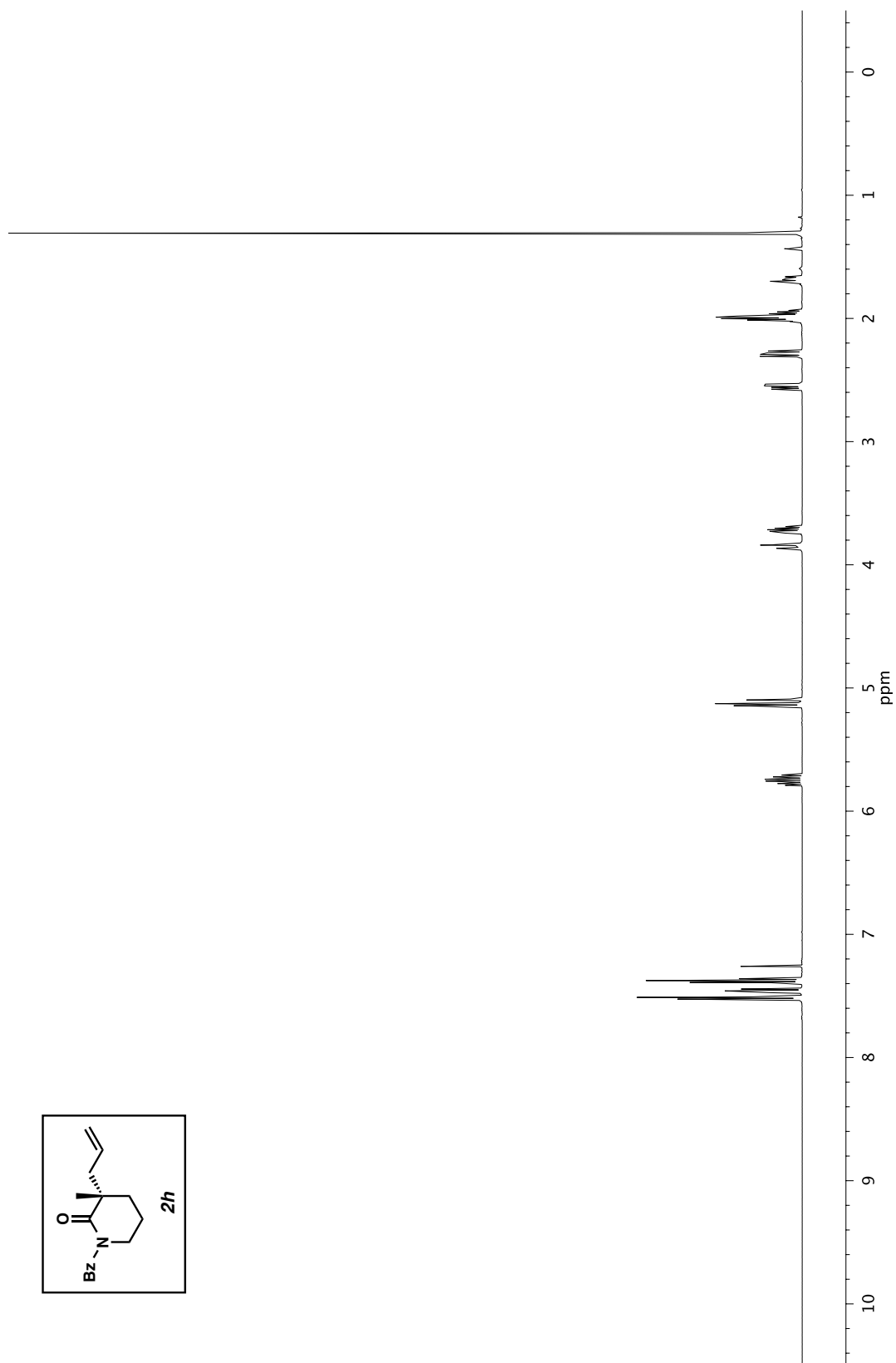


Figure A1.49 ^1H NMR (500 MHz, CDCl_3) of compound **2h**.

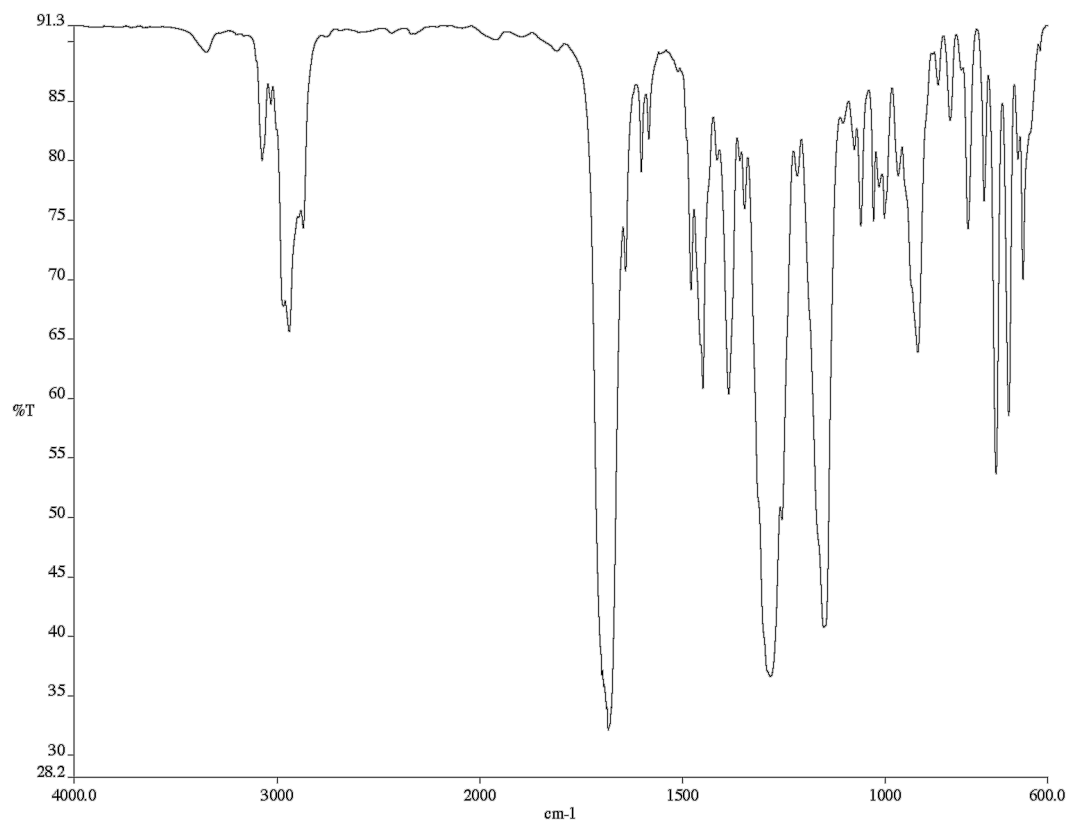


Figure A1.50 Infrared spectrum (Thin Film, NaCl) of compound **2h**.

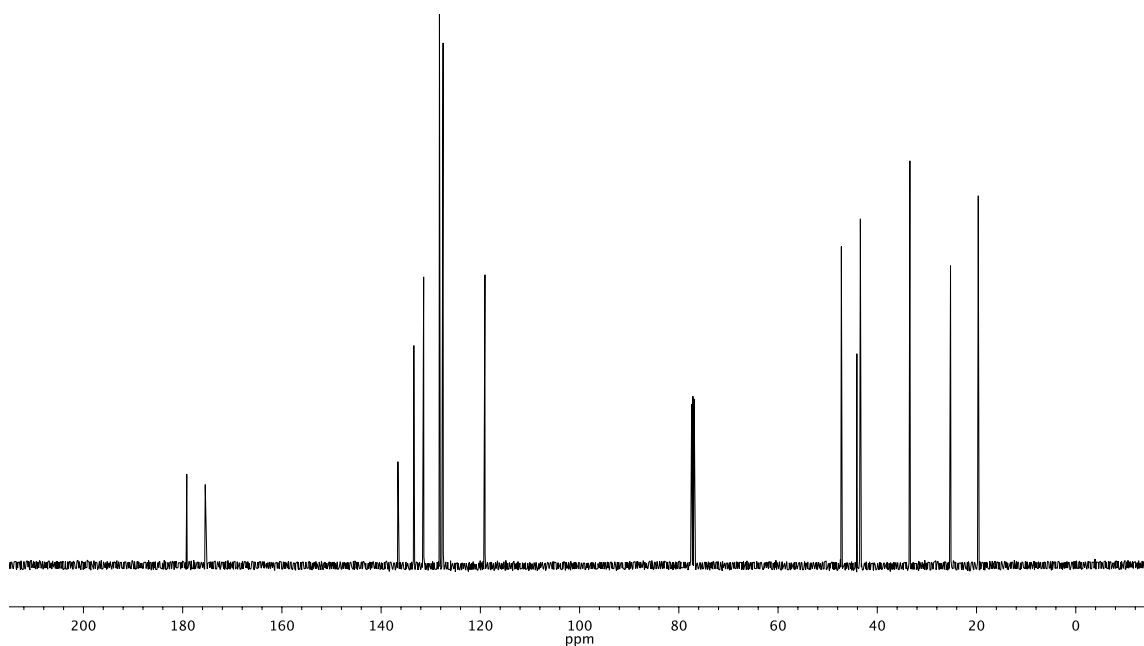


Figure A1.51 ¹³C NMR (126 MHz, CDCl₃) of compound **2h**.

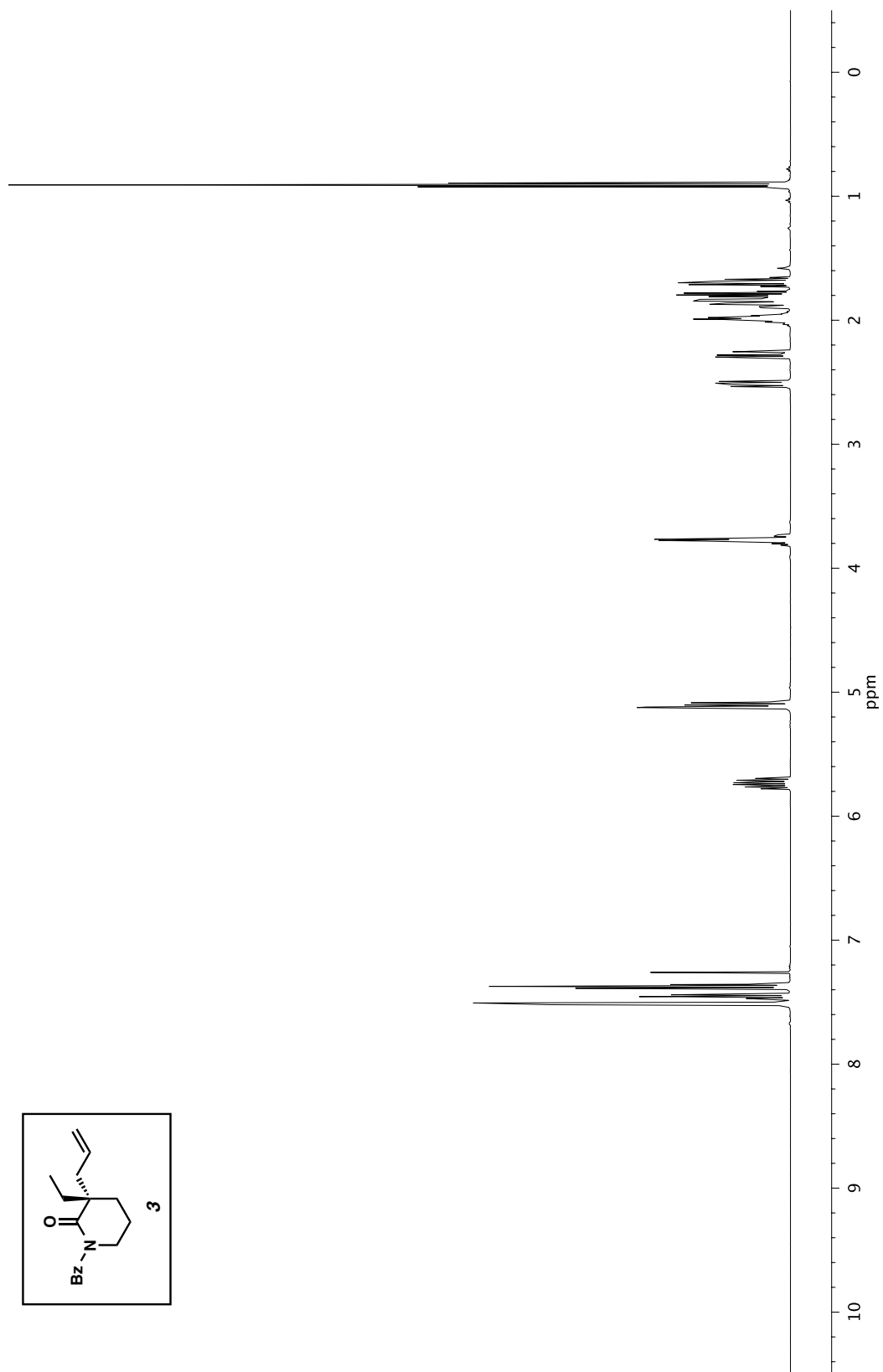


Figure A1.52 ^1H NMR (500 MHz, CDCl_3) of compound **3**.

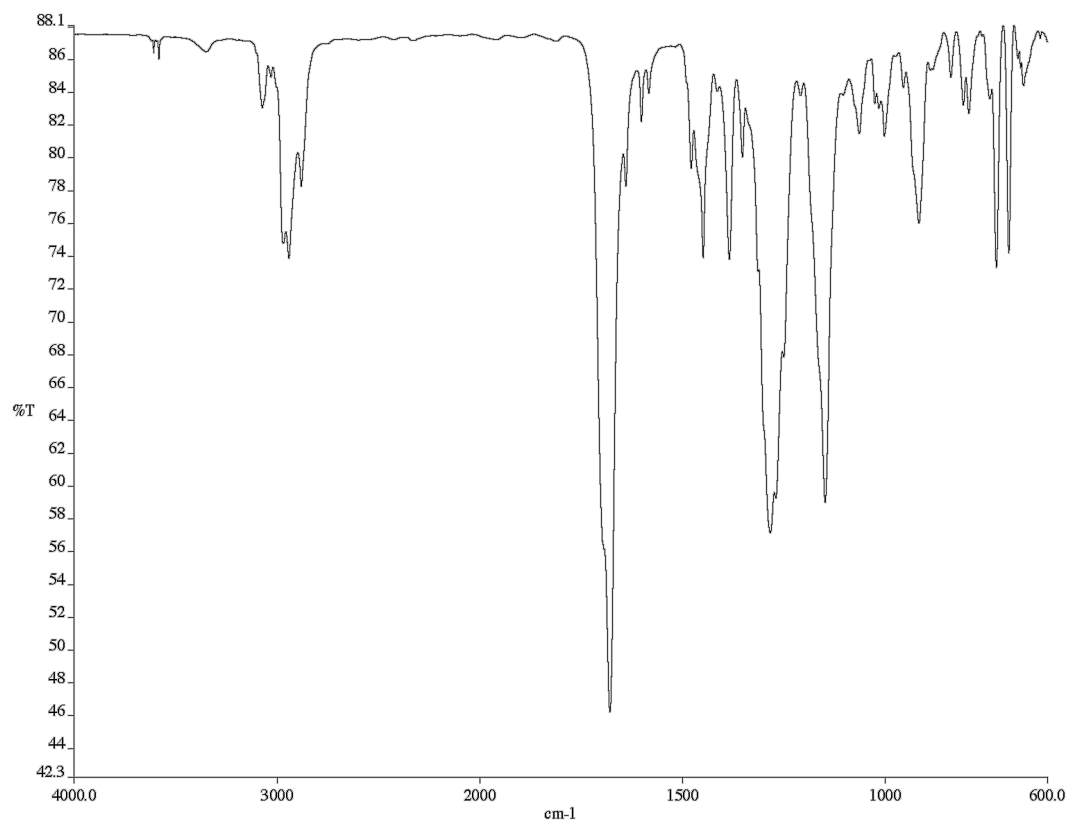


Figure A1.53 Infrared spectrum (Thin Film, NaCl) of compound 3.

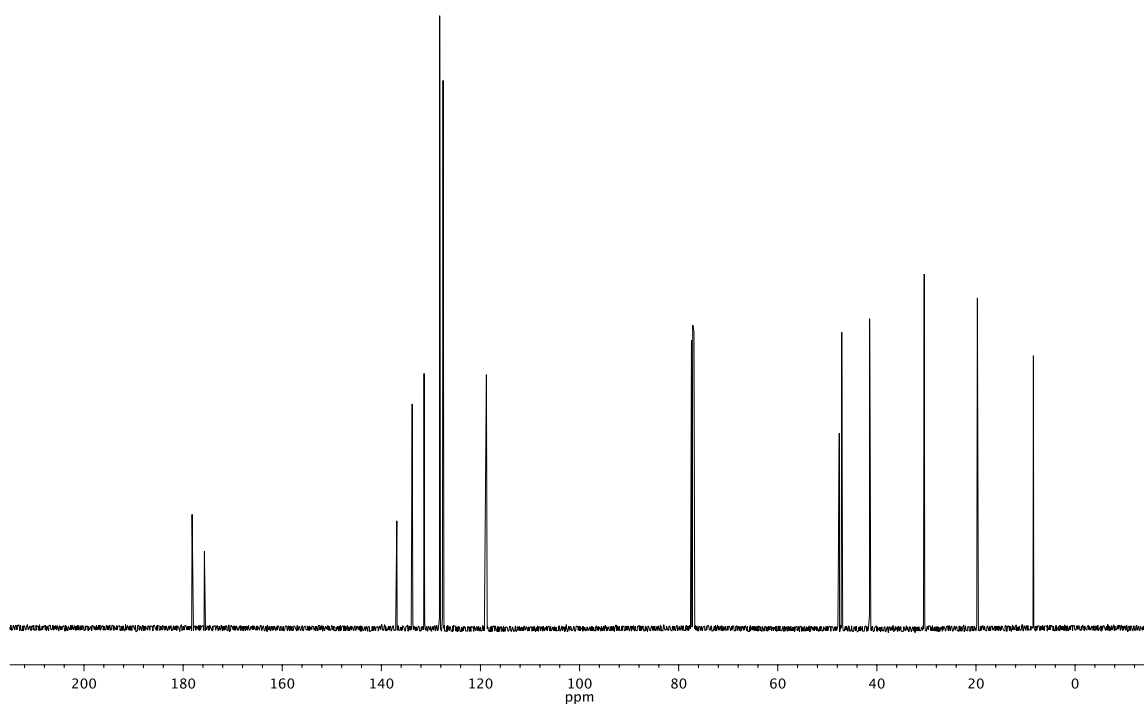


Figure A1.54 ¹³C NMR (126 MHz, CDCl₃) of compound 3.

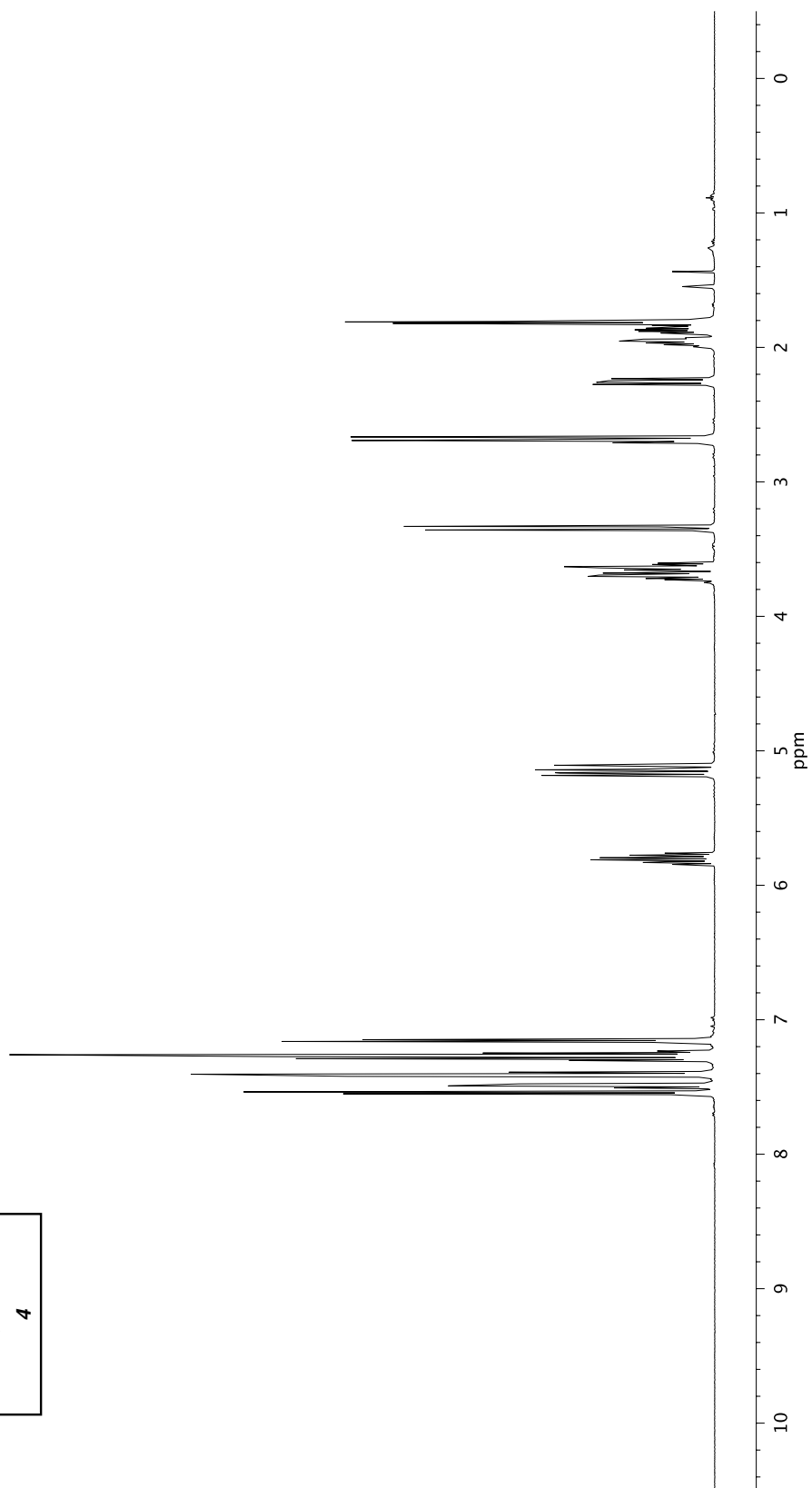
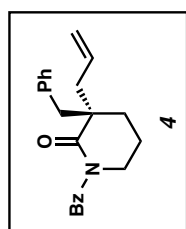


Figure A1.55 ¹H NMR (500 MHz, CDCl₃) of compound 4.

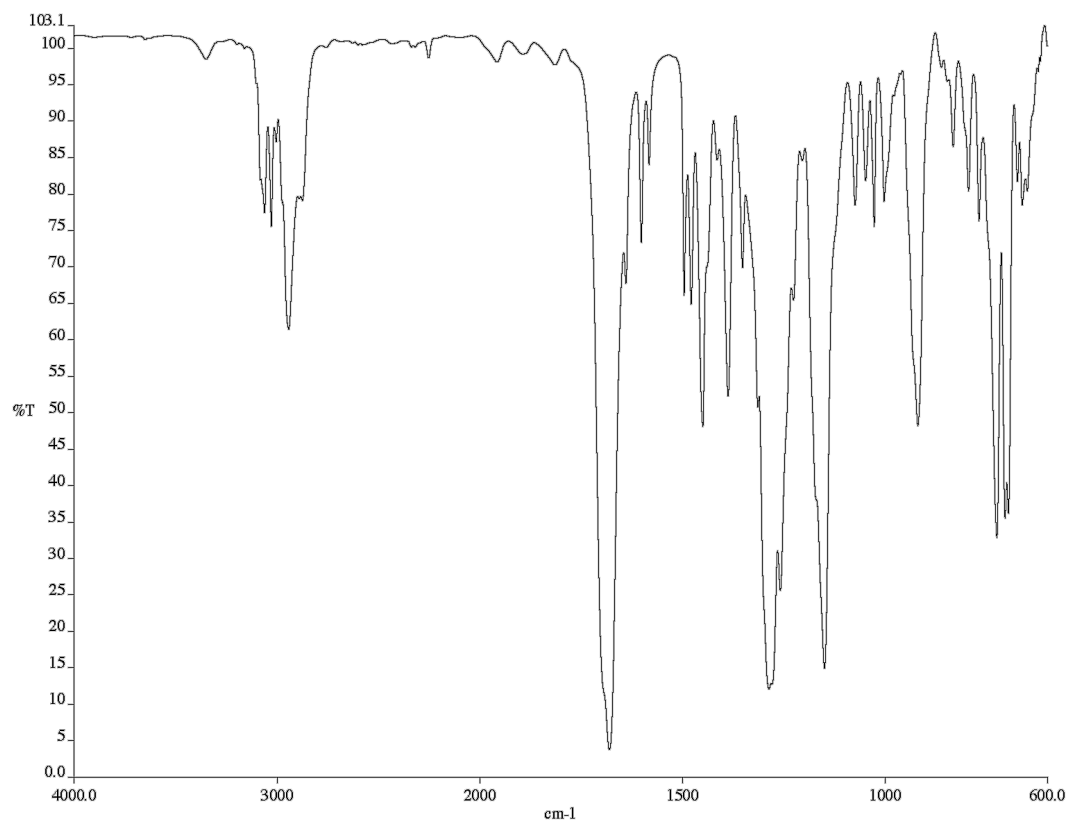


Figure A1.56 Infrared spectrum (Thin Film, NaCl) of compound 4.

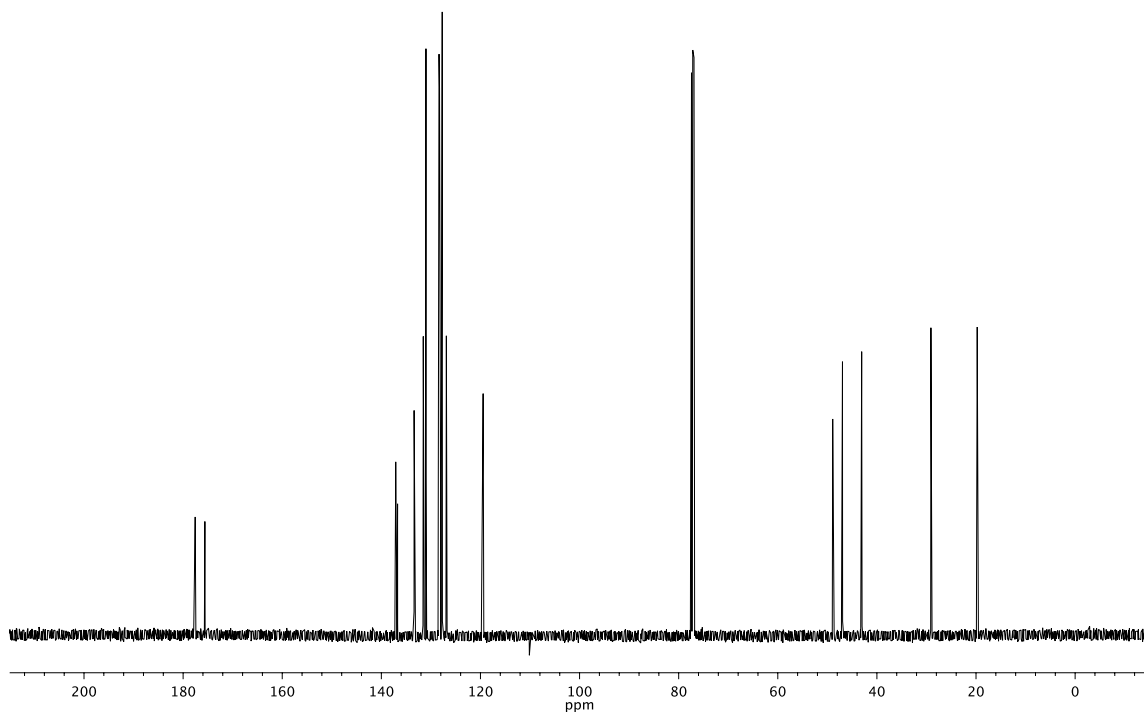


Figure A1.57 ¹³C NMR (126 MHz, CDCl₃) of compound 4.

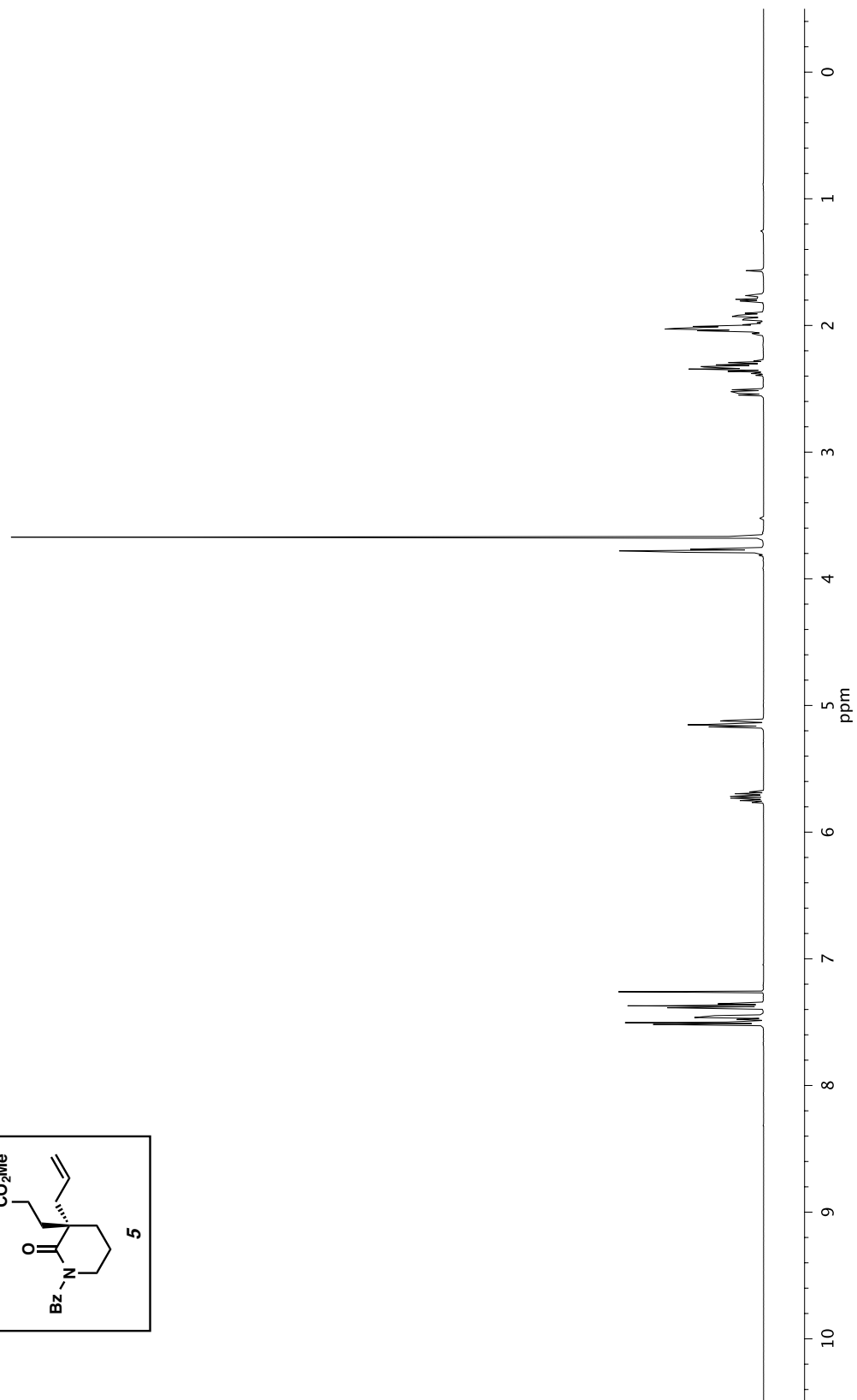
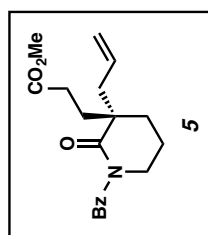


Figure A1.58 ¹H NMR (500 MHz, CDCl₃) of compound **5**.

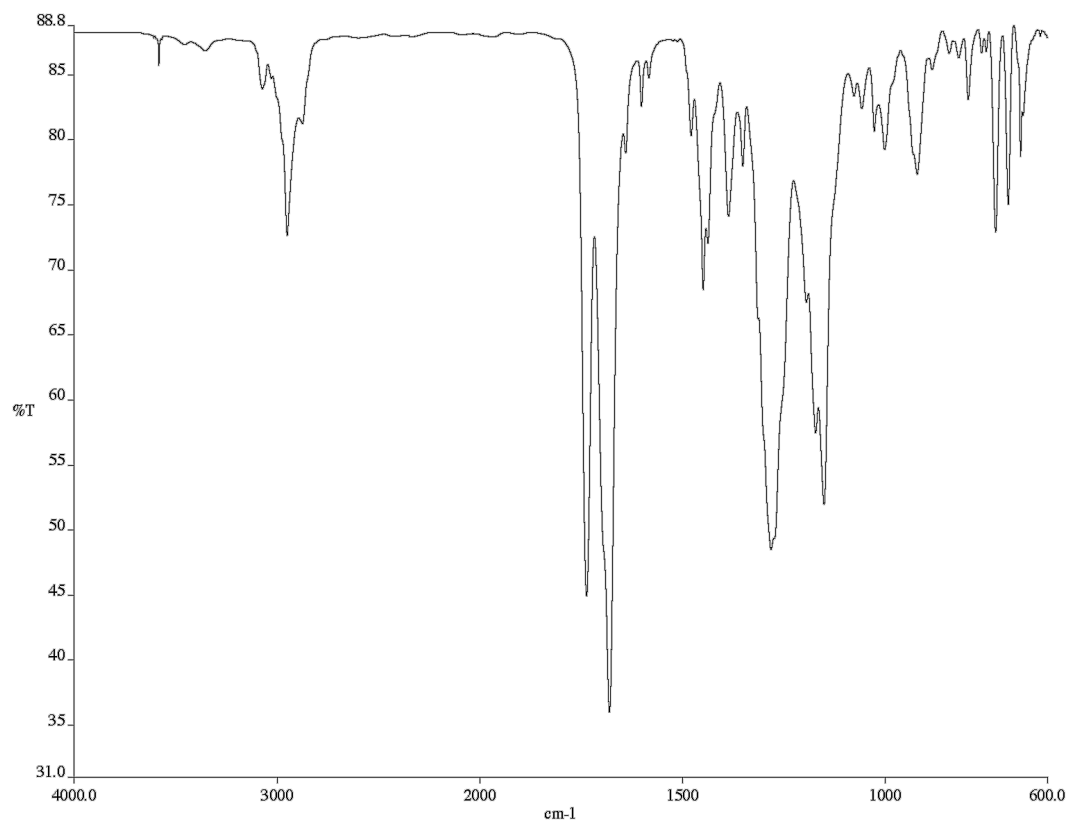


Figure A1.59 Infrared spectrum (Thin Film, NaCl) of compound **5**.

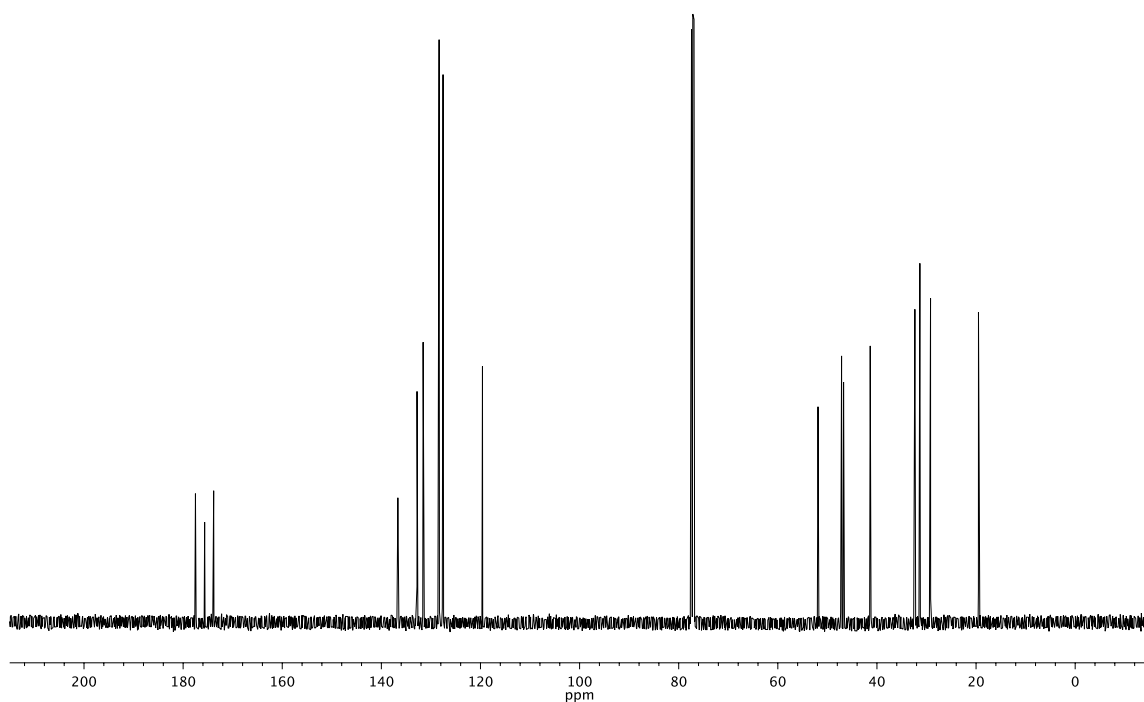


Figure A1.60 ¹³C NMR (126 MHz, CDCl₃) of compound **5**.

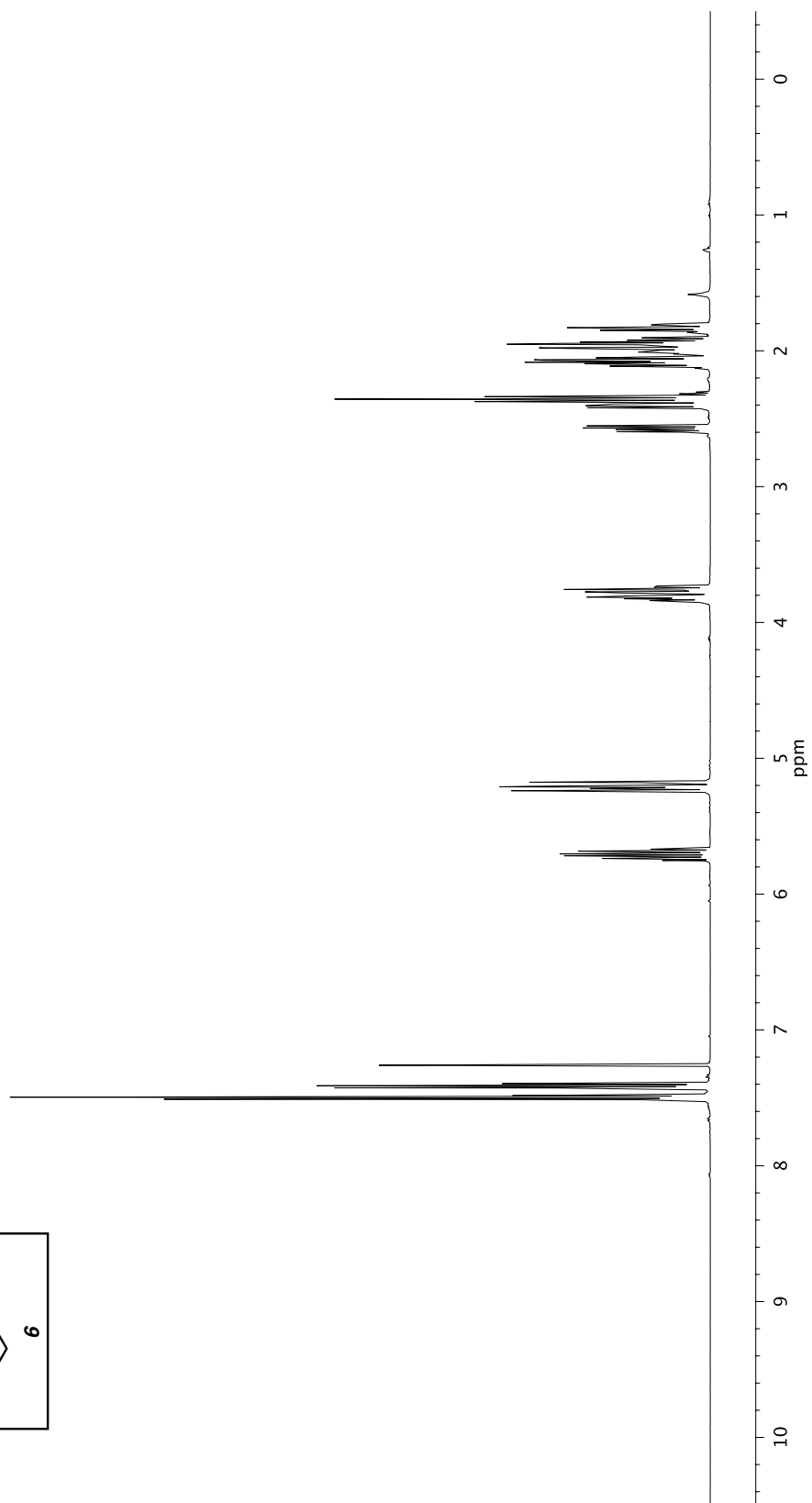
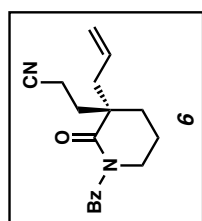


Figure A1.61 ¹H NMR (500 MHz, CDCl₃) of compound **6**.

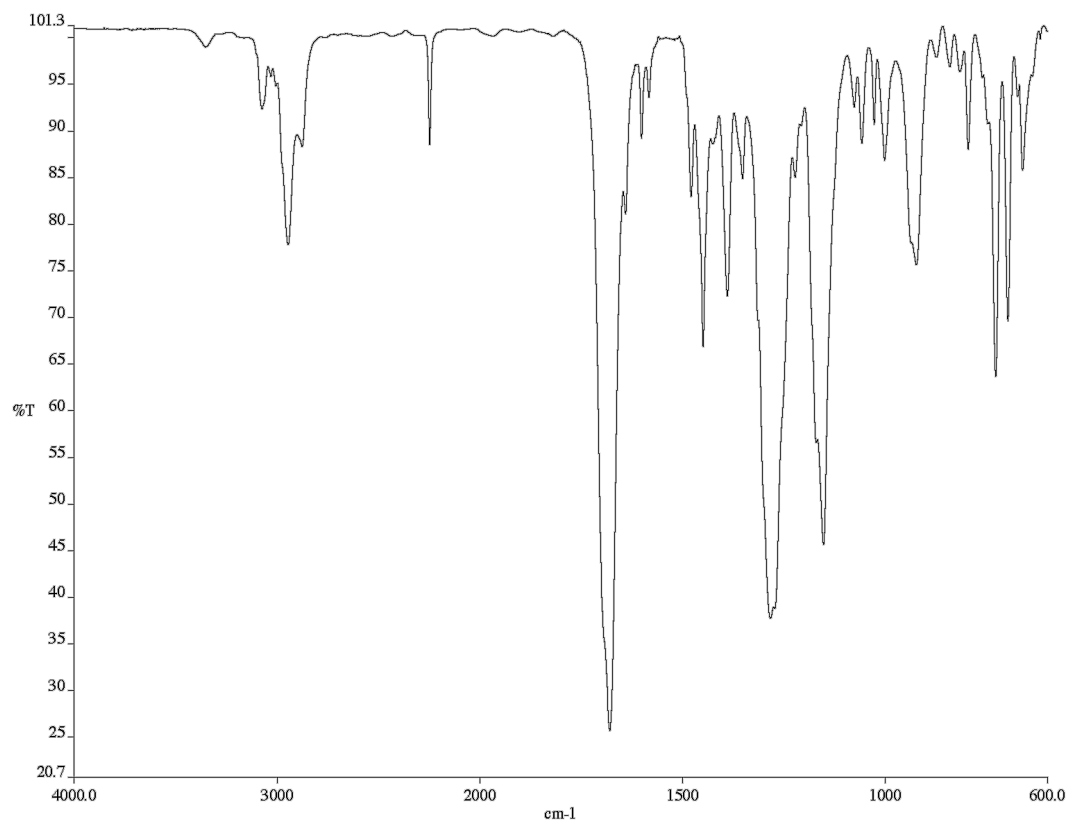


Figure A1.62 Infrared spectrum (Thin Film, NaCl) of compound 6.

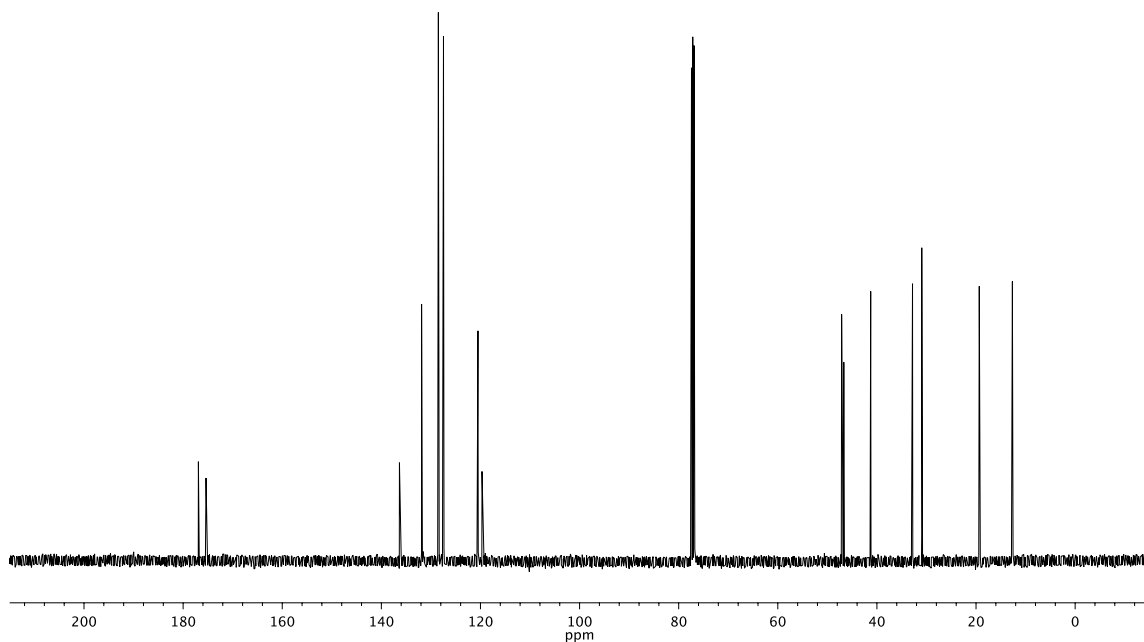


Figure A1.63 ¹³C NMR (126 MHz, CDCl₃) of compound 6.

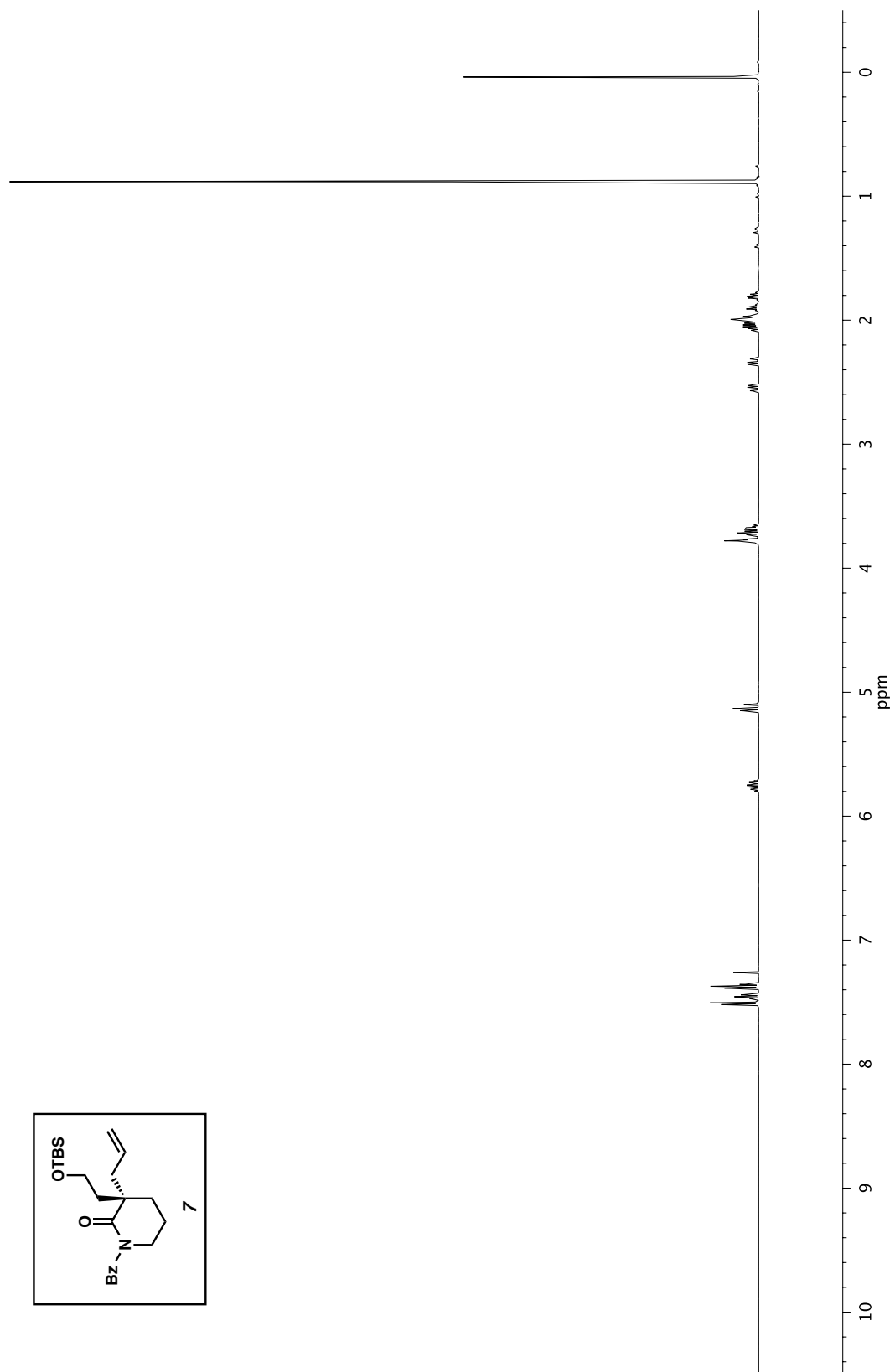


Figure A1.64 ¹H NMR (500 MHz, CDCl₃) of compound 7.

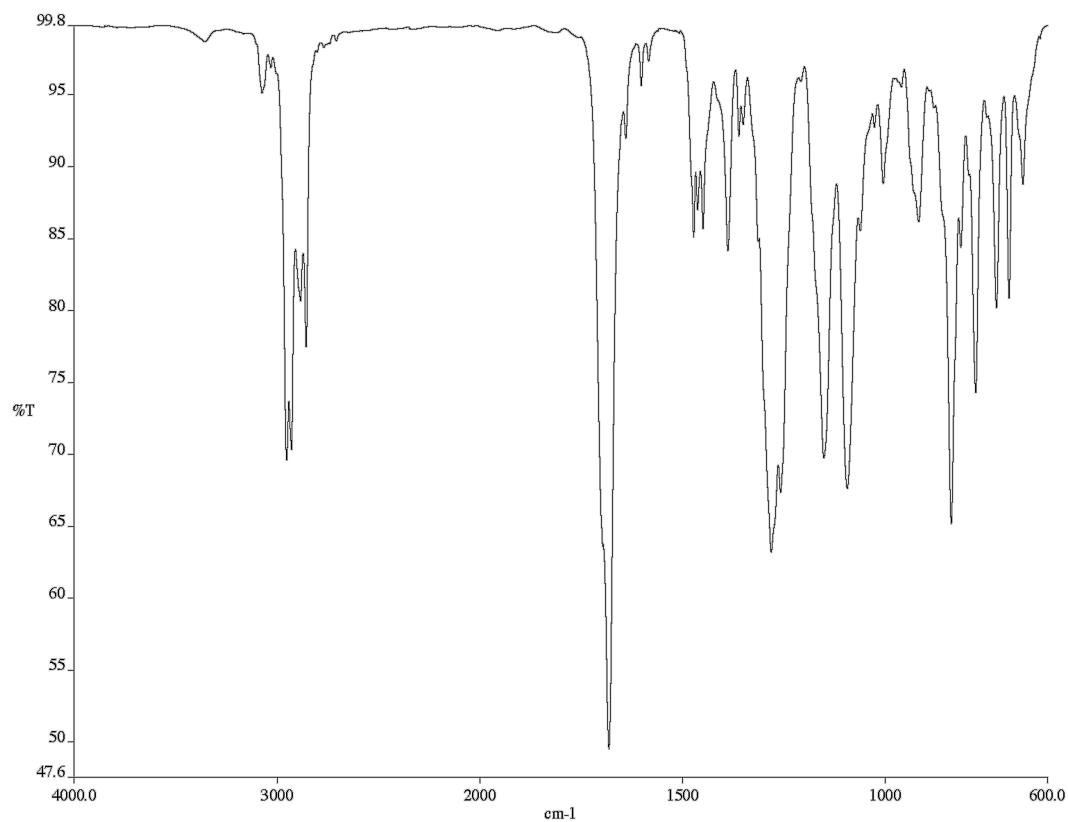


Figure A1.65 Infrared spectrum (Thin Film, NaCl) of compound 7.

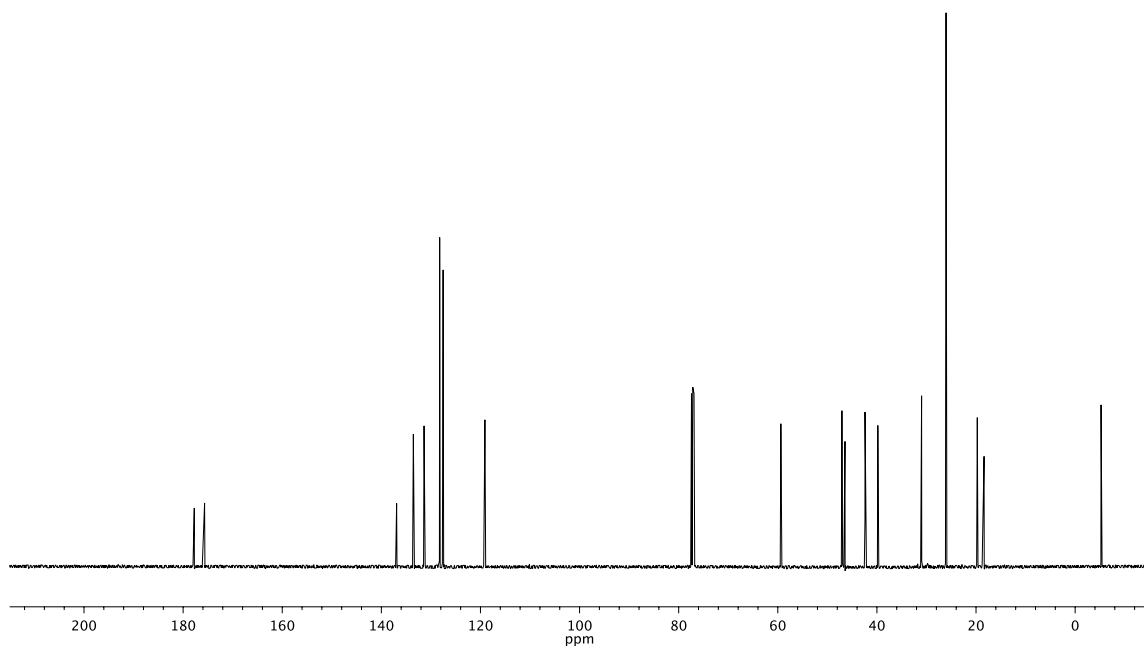


Figure A1.66 ¹³C NMR (126 MHz, CDCl₃) of compound 7.

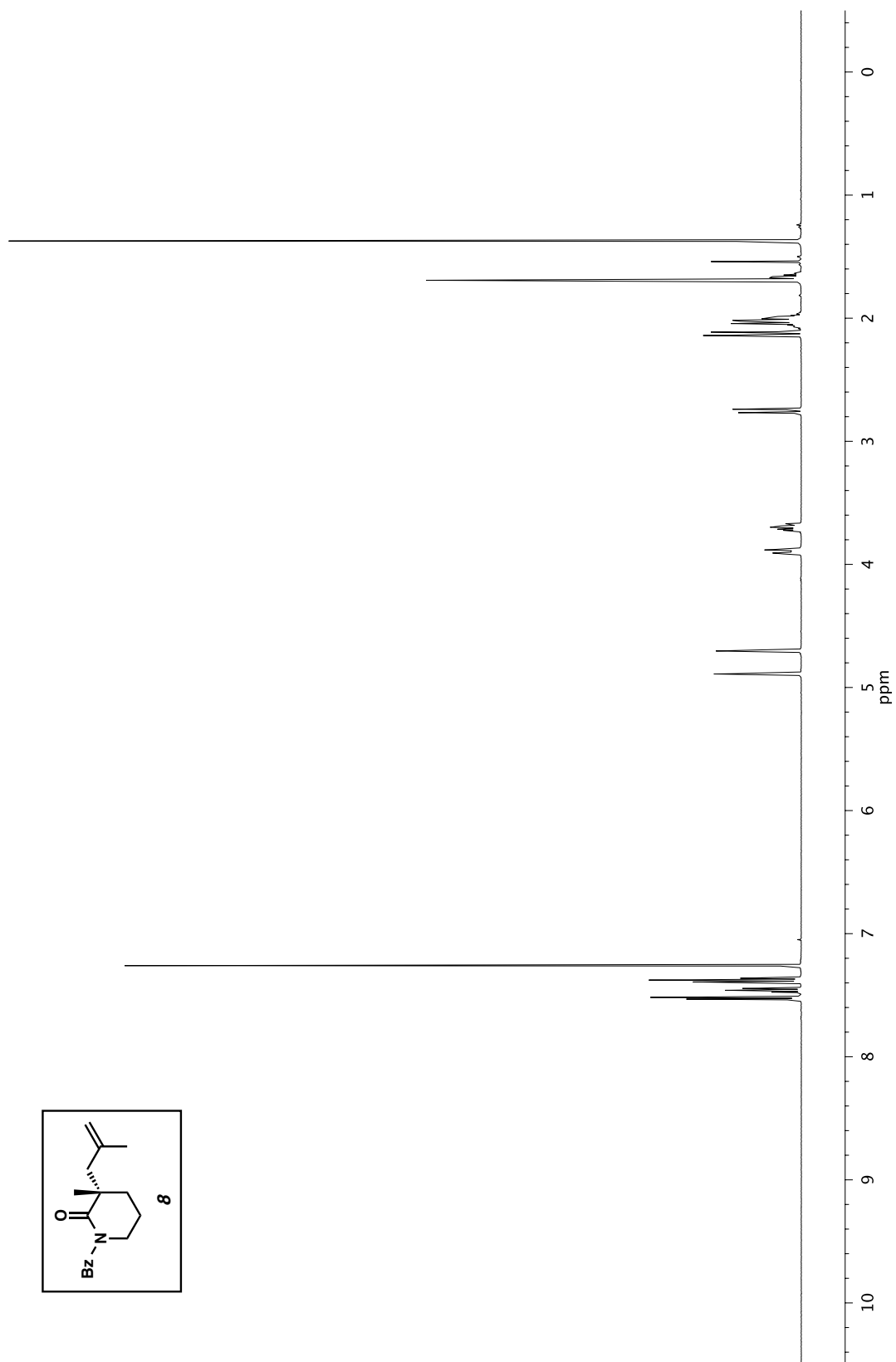


Figure A1.67 ^1H NMR (500 MHz, CDCl_3) of compound **8**.

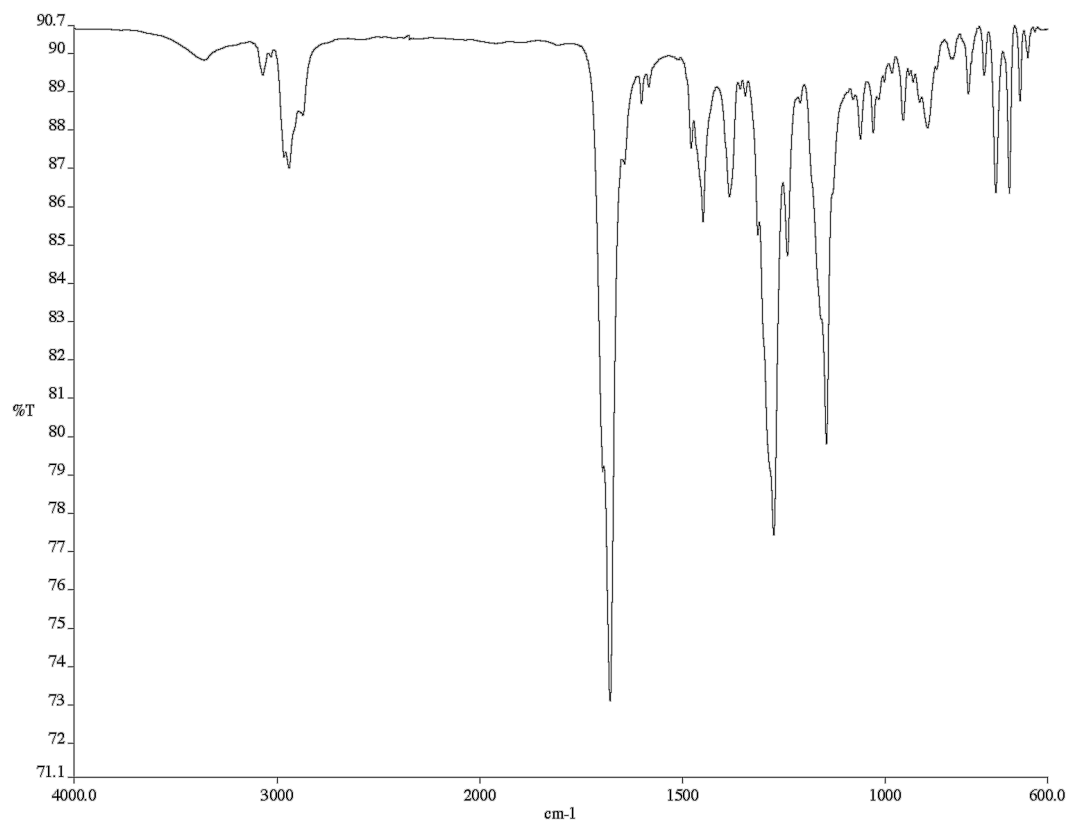


Figure A1.68 Infrared spectrum (Thin Film, NaCl) of compound **8**.

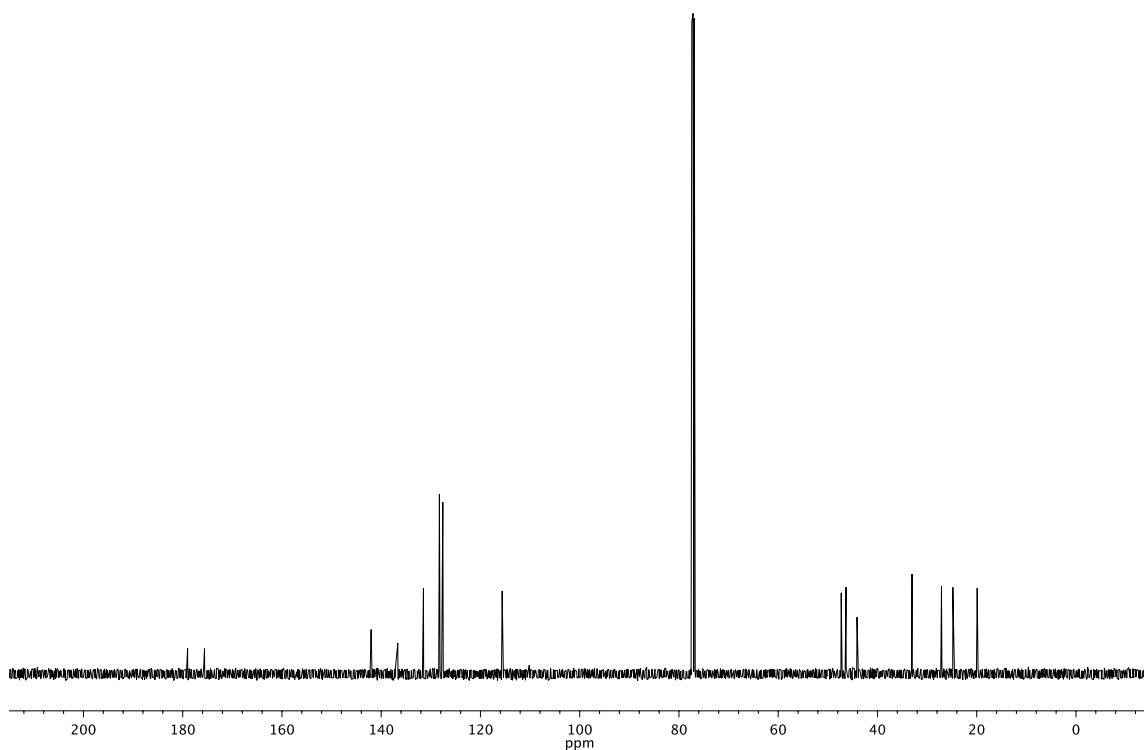


Figure A1.69 ¹³C NMR (126 MHz, CDCl₃) of compound **8**.

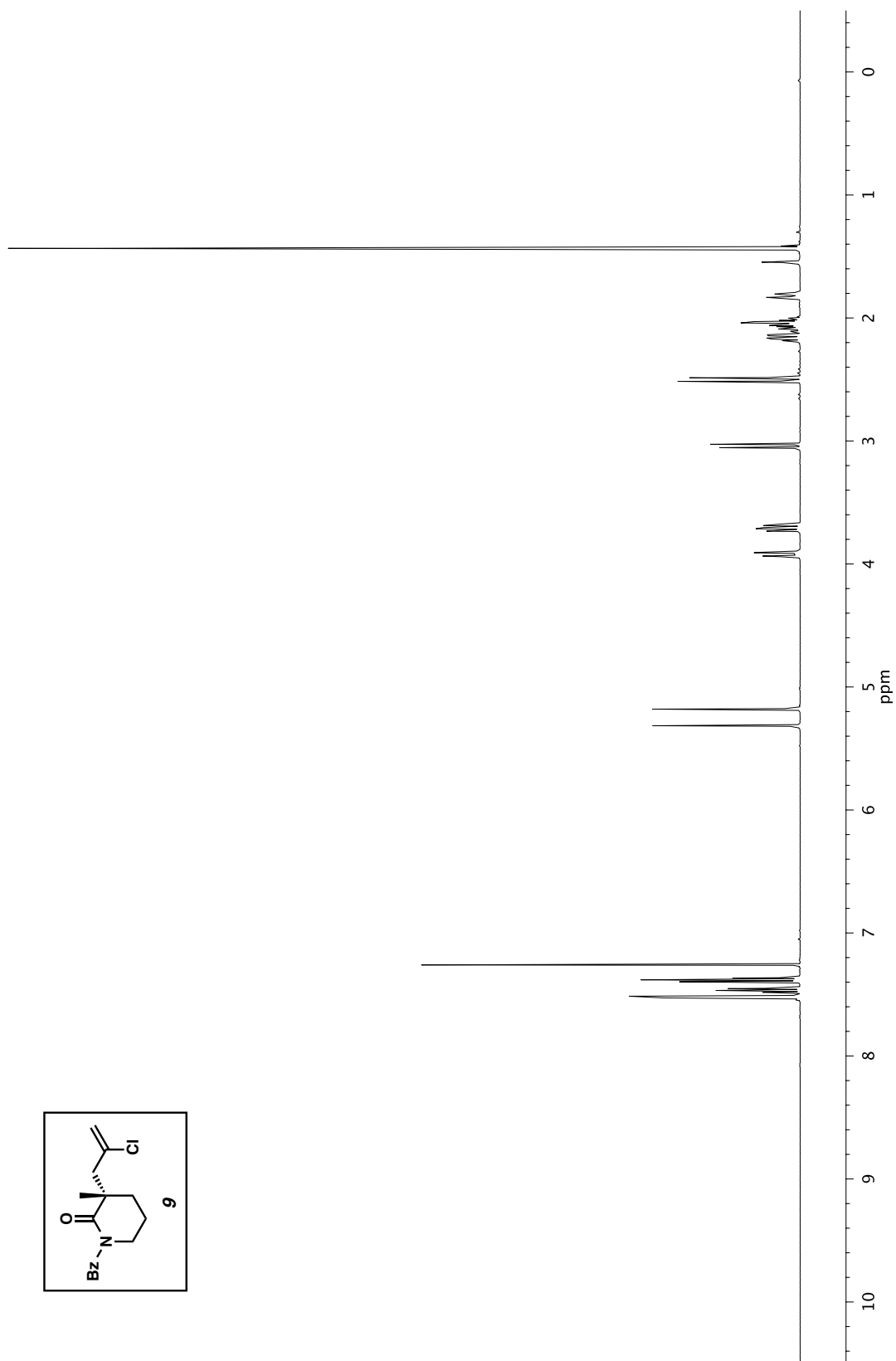


Figure A1.70 ^1H NMR (500 MHz, CDCl_3) of compound **9**.

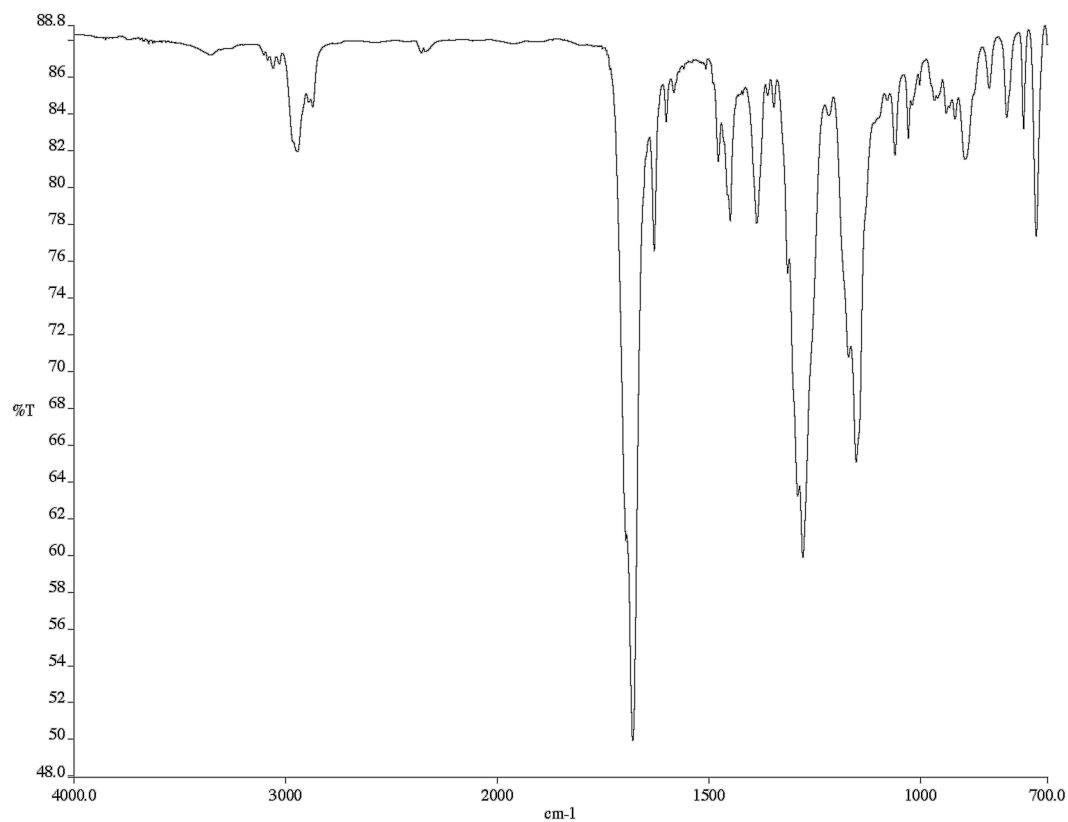


Figure A1.71 Infrared spectrum (Thin Film, NaCl) of compound **9**.

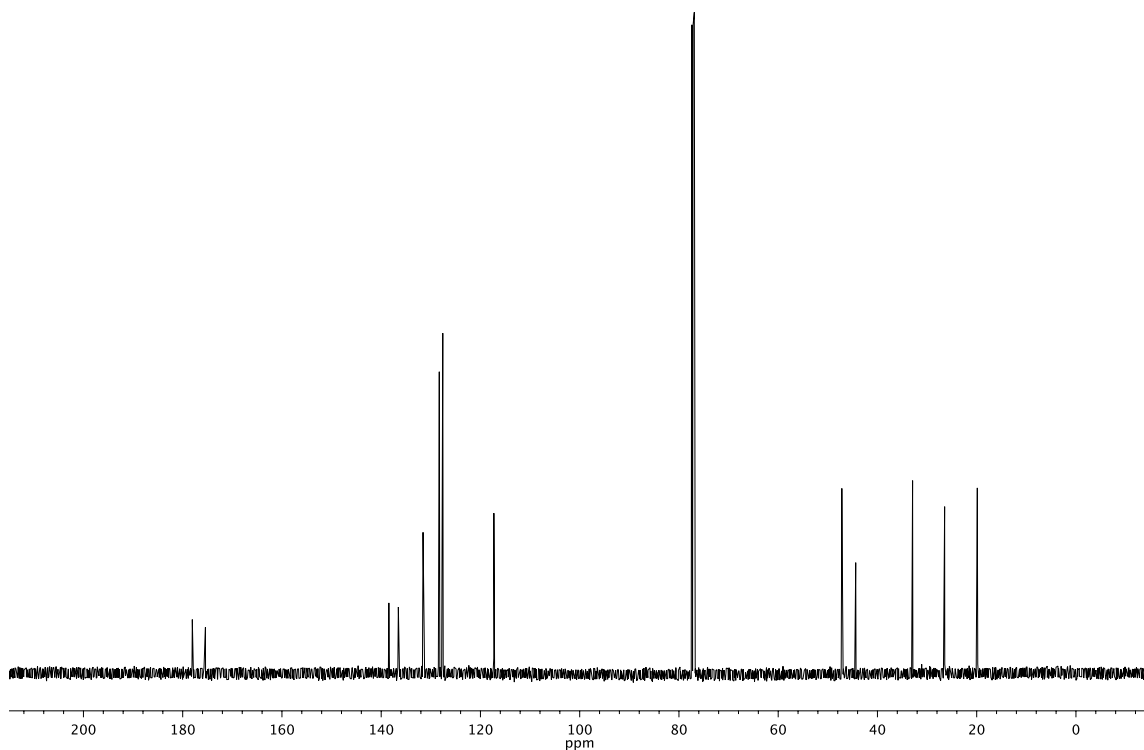


Figure A1.72 ¹³C NMR (126 MHz, CDCl₃) of compound **9**.

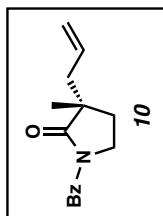
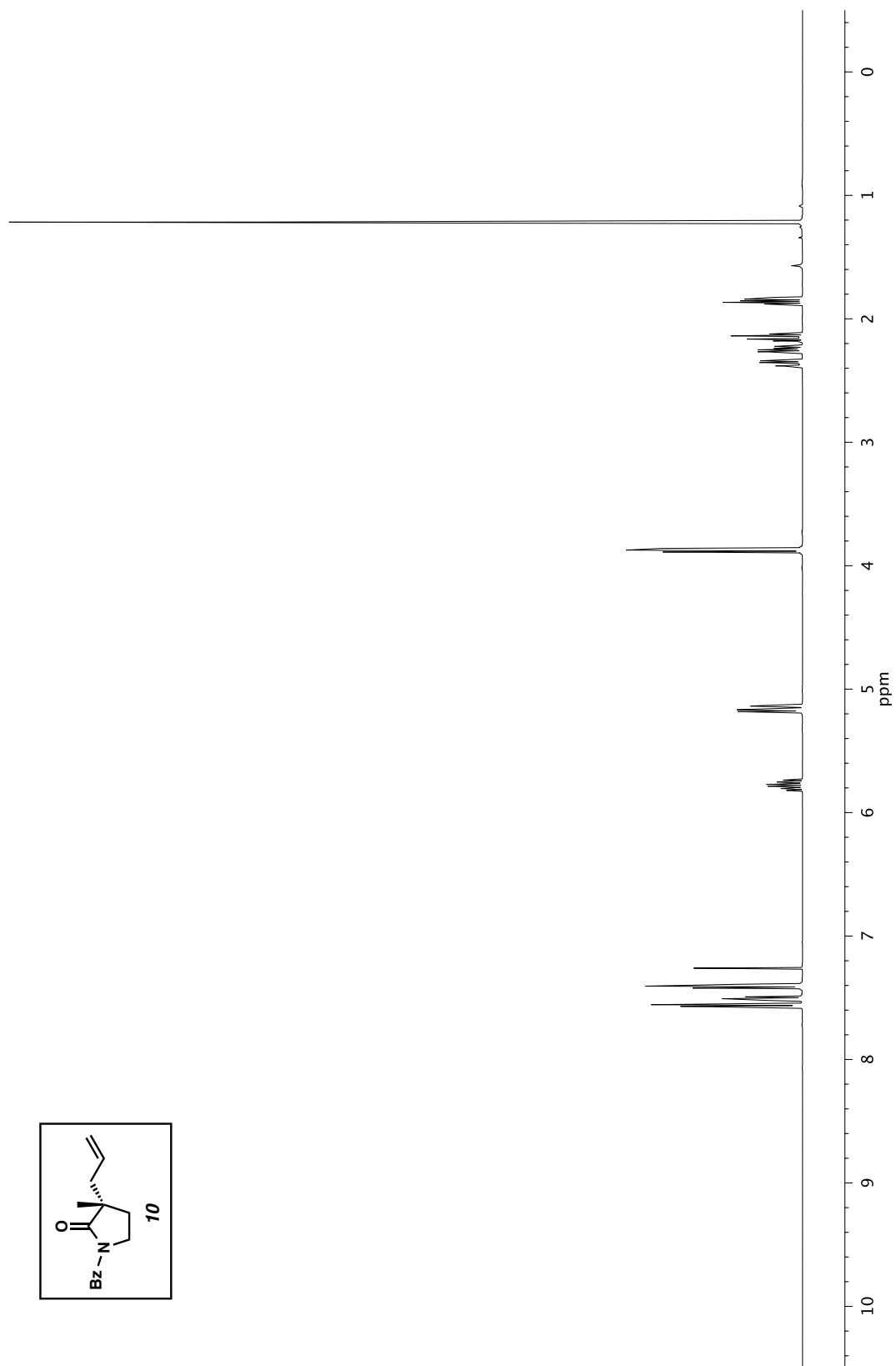


Figure A1.73 ^1H NMR (500 MHz, CDCl_3) of compound **10**.

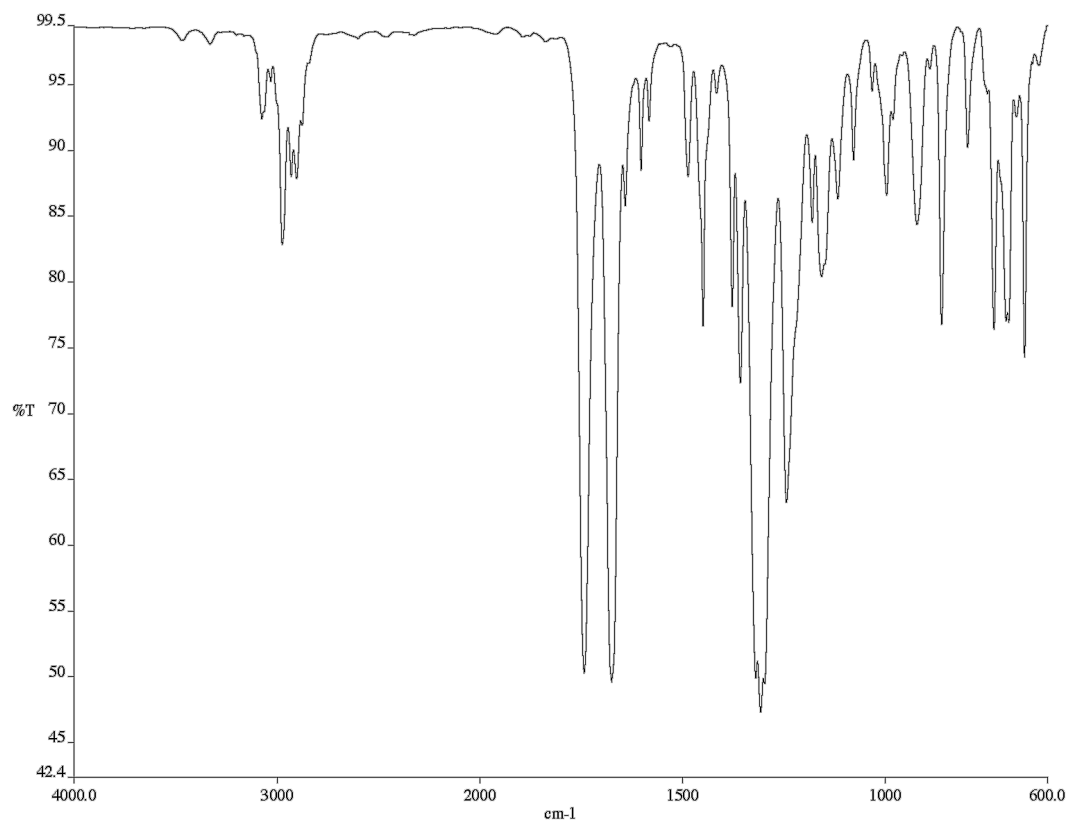


Figure A1.74 Infrared spectrum (Thin Film, NaCl) of compound **10**.

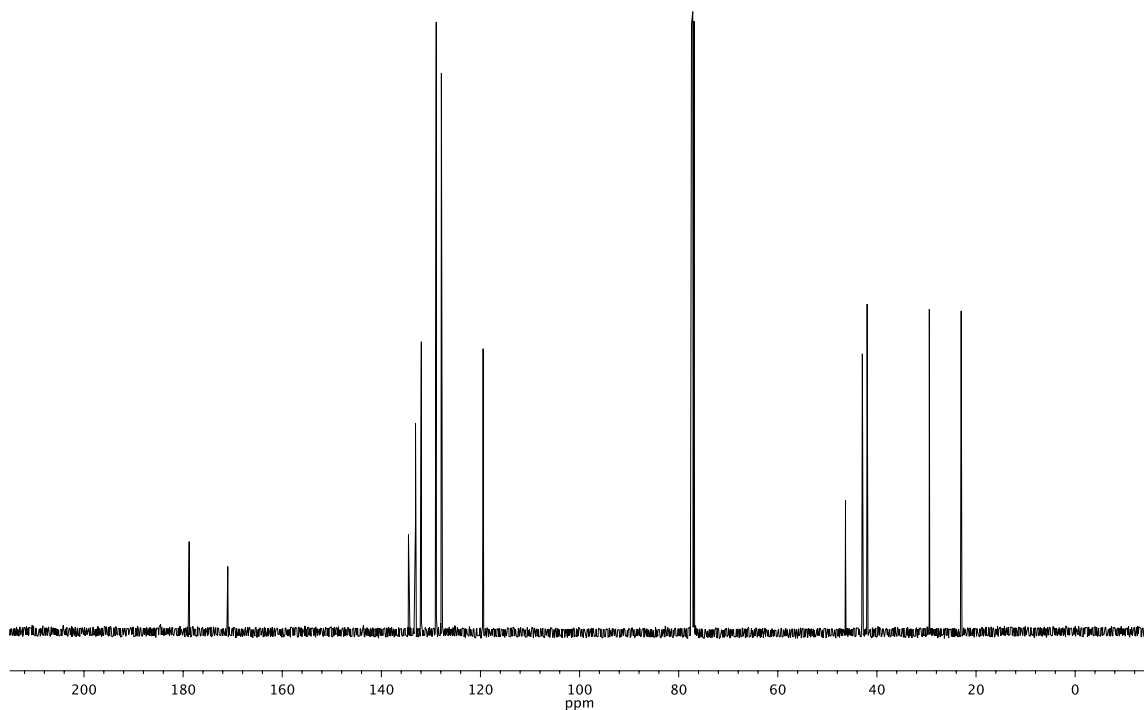


Figure A1.75 ¹³C NMR (126 MHz, CDCl₃) of compound **10**.

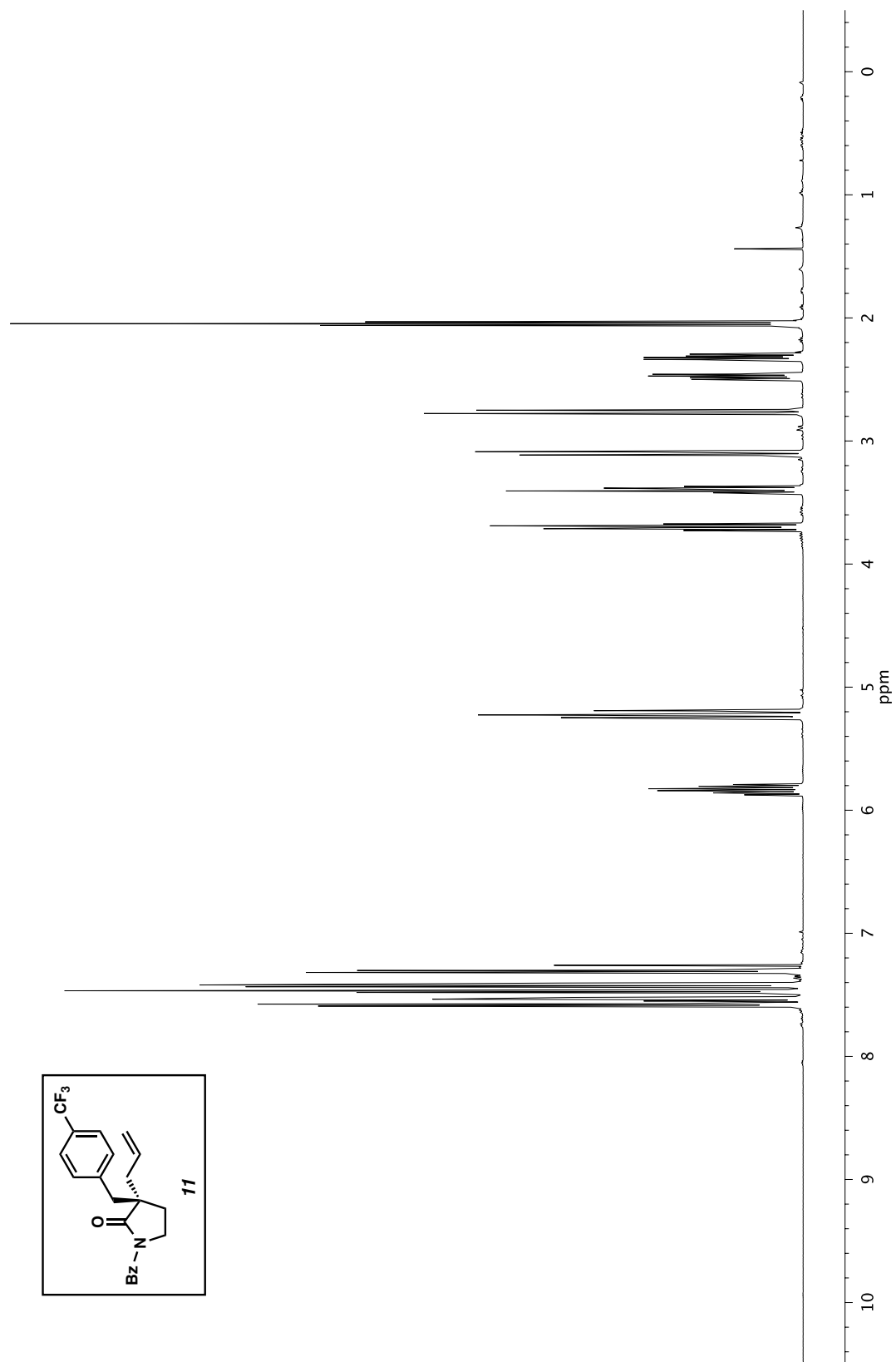


Figure A1.76 ^1H NMR (500 MHz, CDCl_3) of compound **11**.

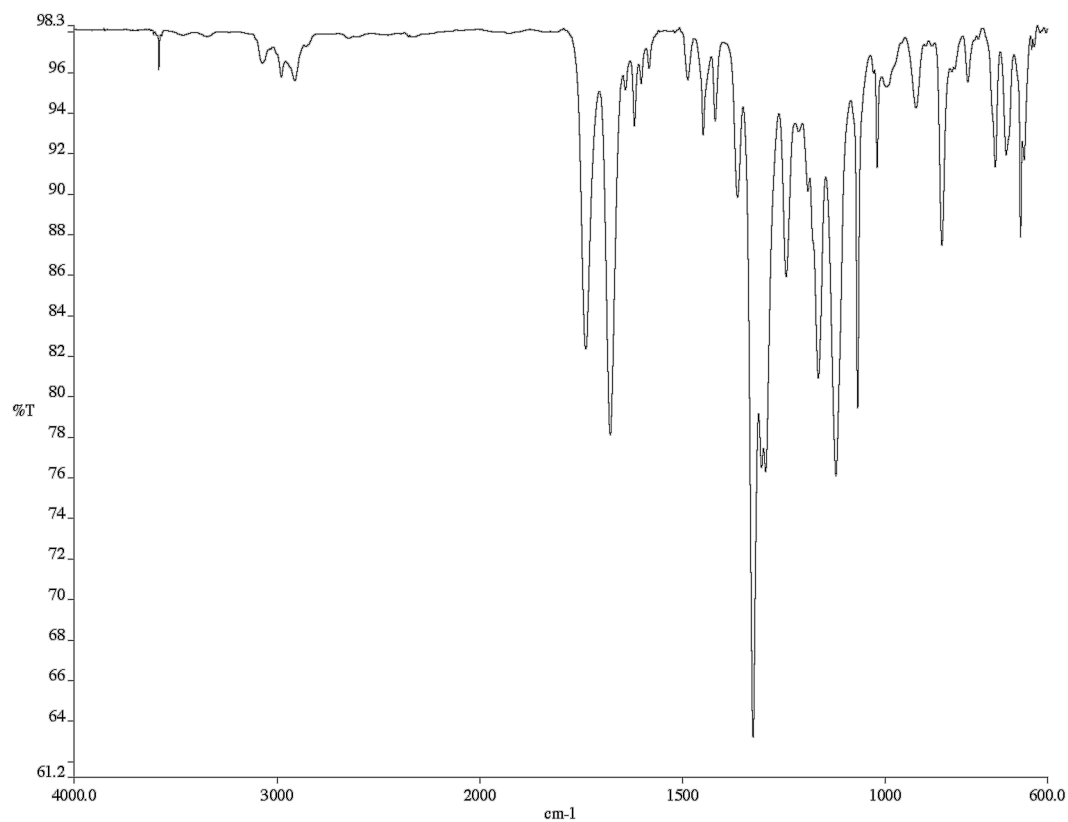


Figure A1.77 Infrared spectrum (Thin Film, NaCl) of compound **11**.

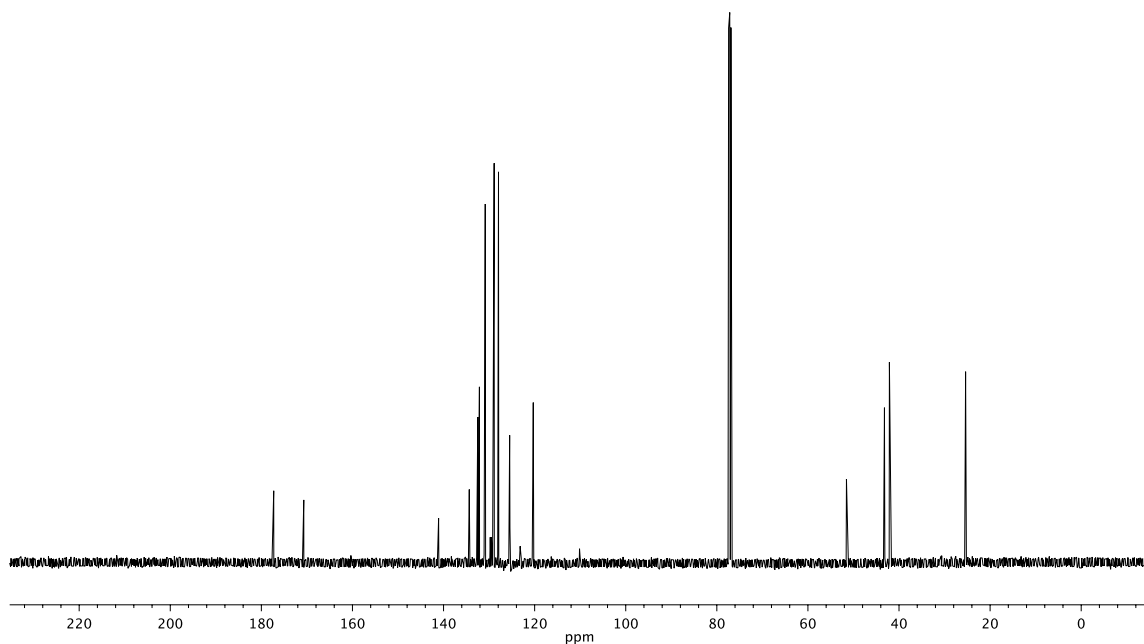


Figure A1.78 ¹³C NMR (126 MHz, CDCl₃) of compound **11**.

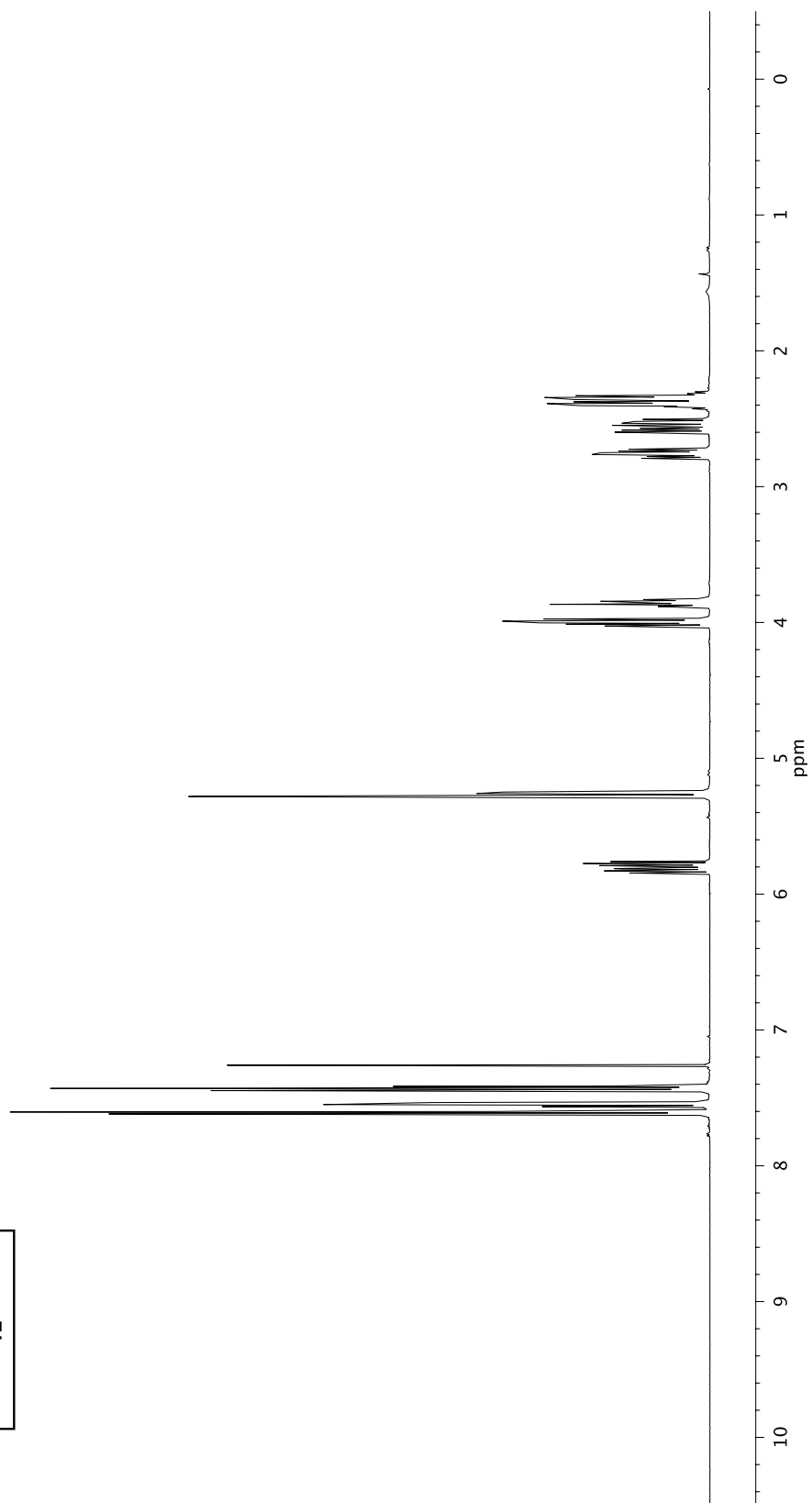
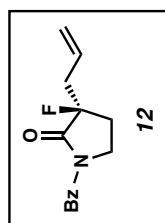


Figure A1.79 ¹H NMR (500 MHz, CDCl₃) of compound **12**.

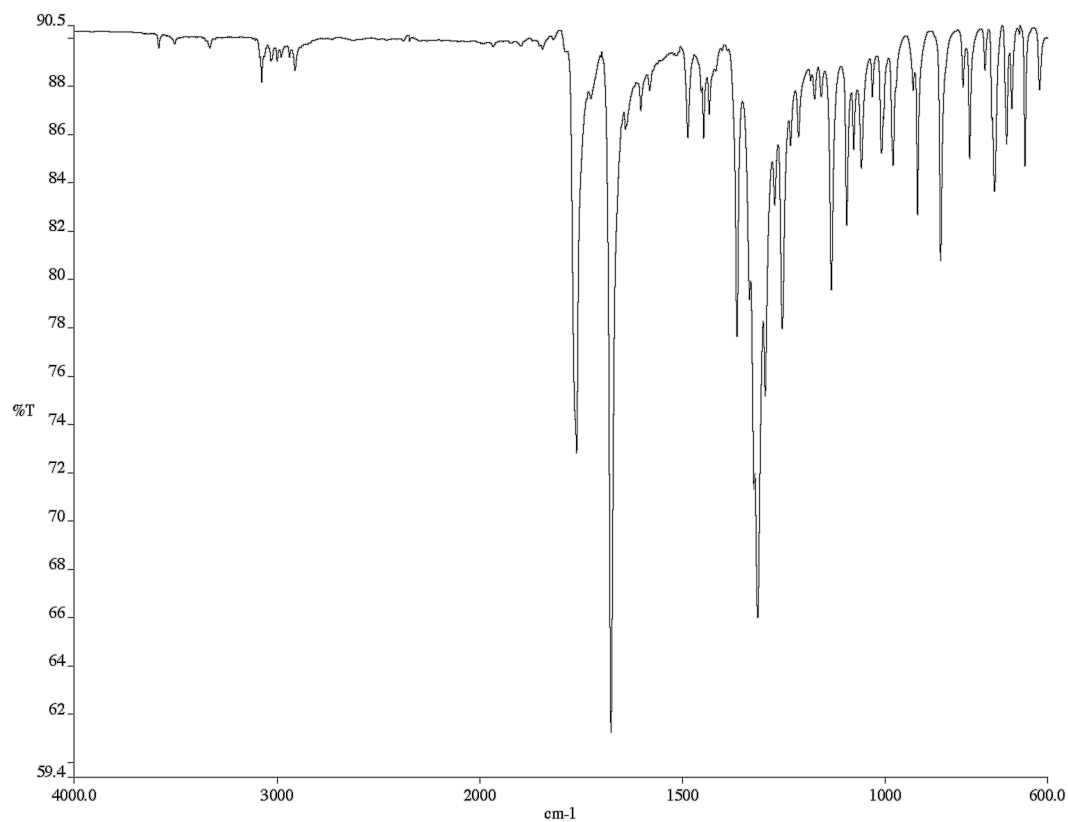


Figure A1.80 Infrared spectrum (Thin Film, NaCl) of compound **12**.

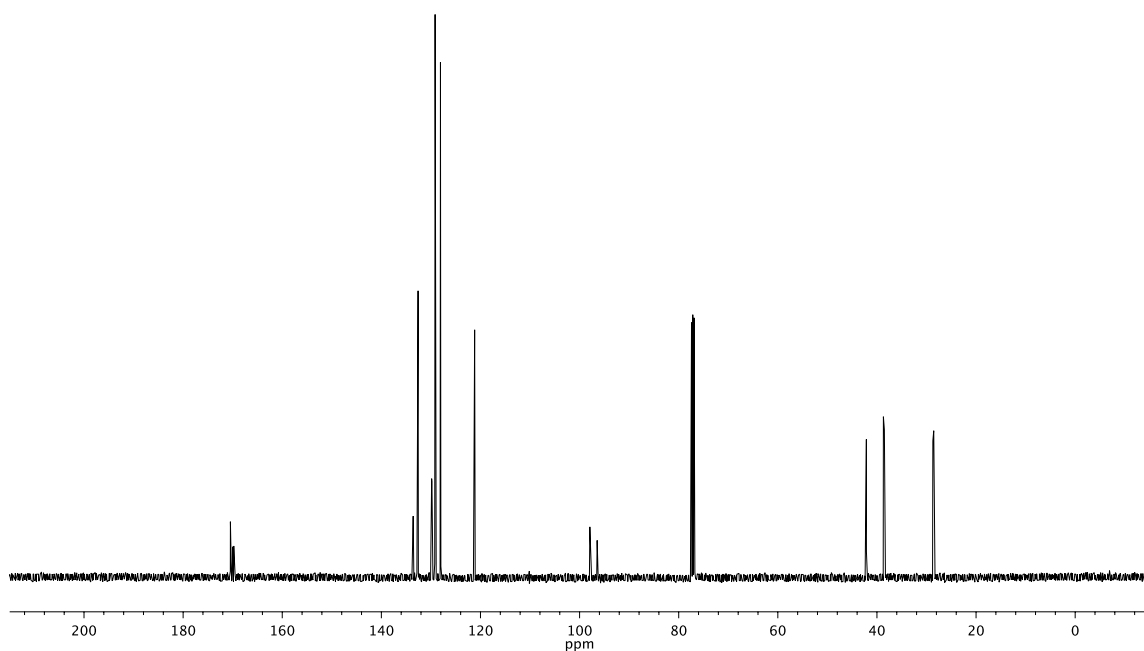


Figure A1.81 ¹³C NMR (126 MHz, CDCl₃) of compound **12**.

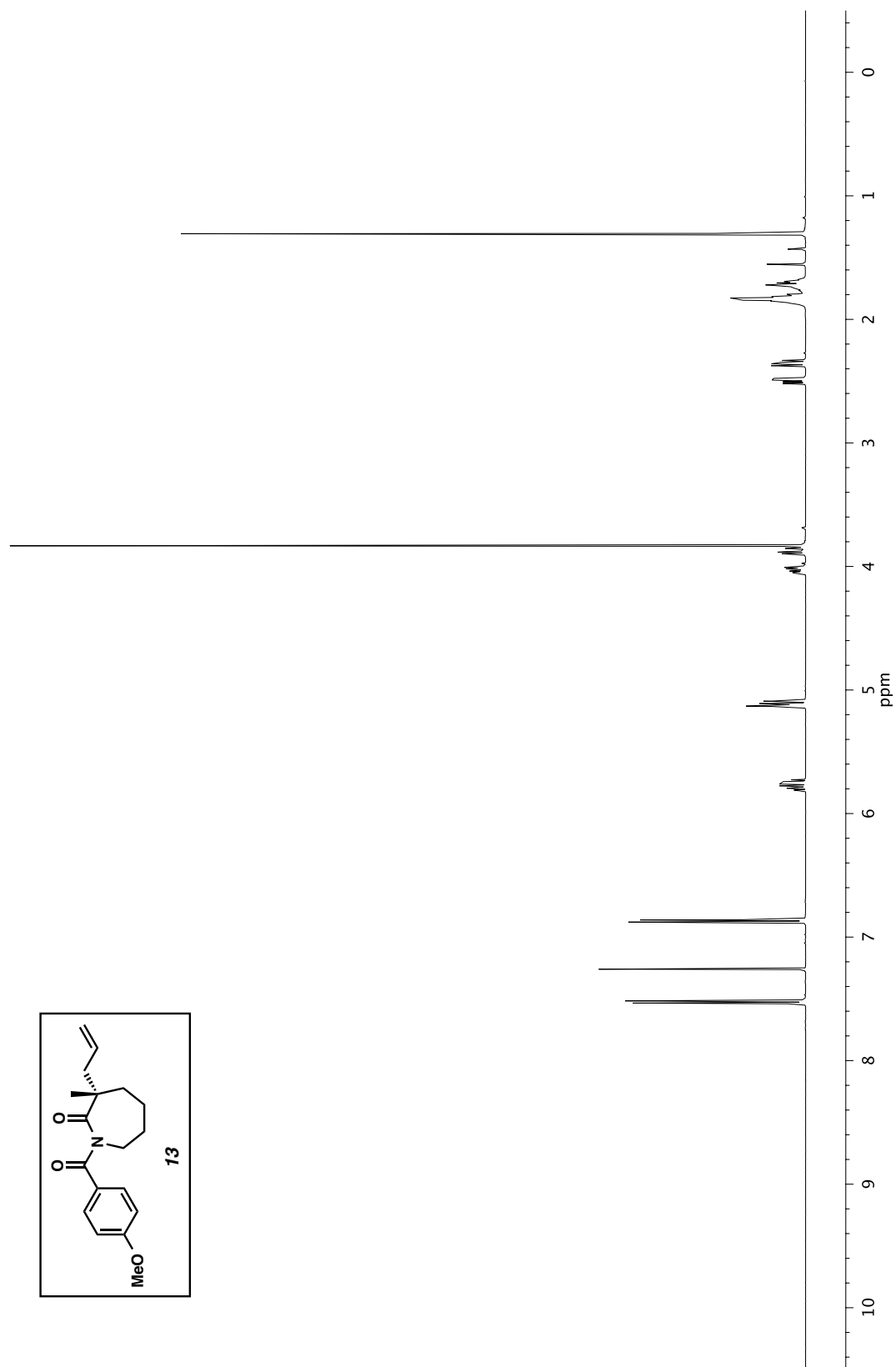


Figure A1.82 ^1H NMR (500 MHz, CDCl_3) of compound **13**.

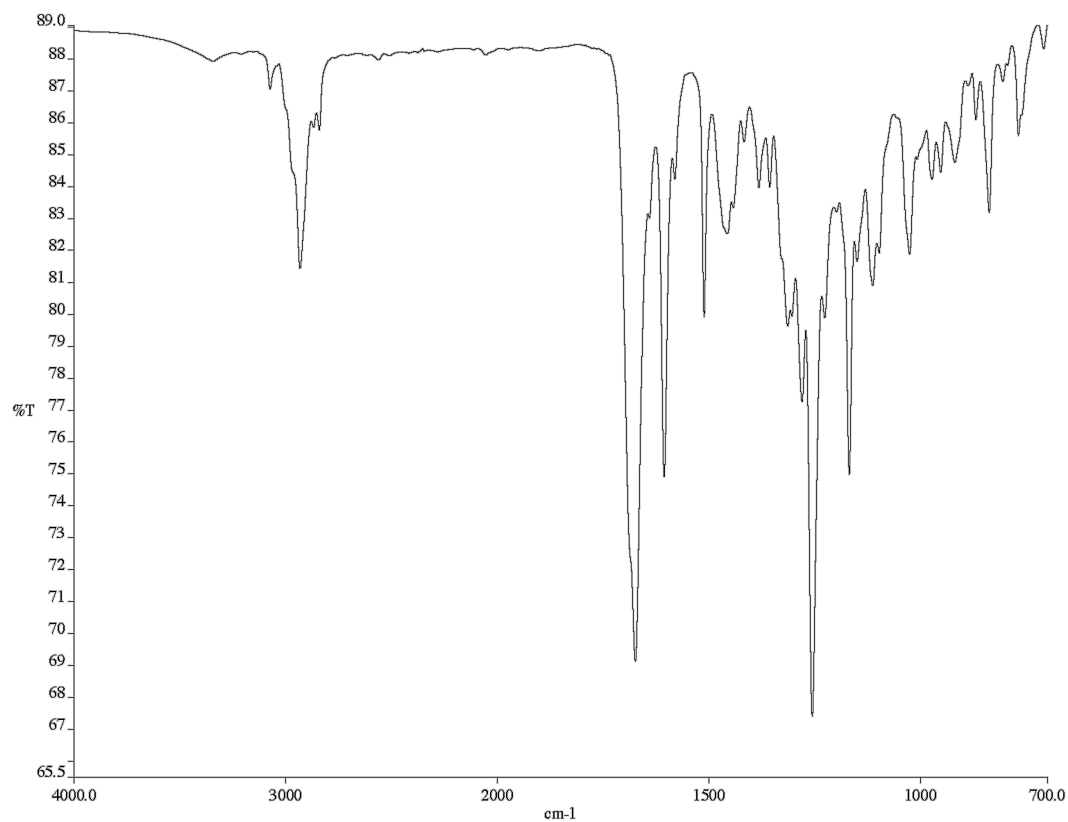


Figure A1.83 Infrared spectrum (Thin Film, NaCl) of compound **13**.

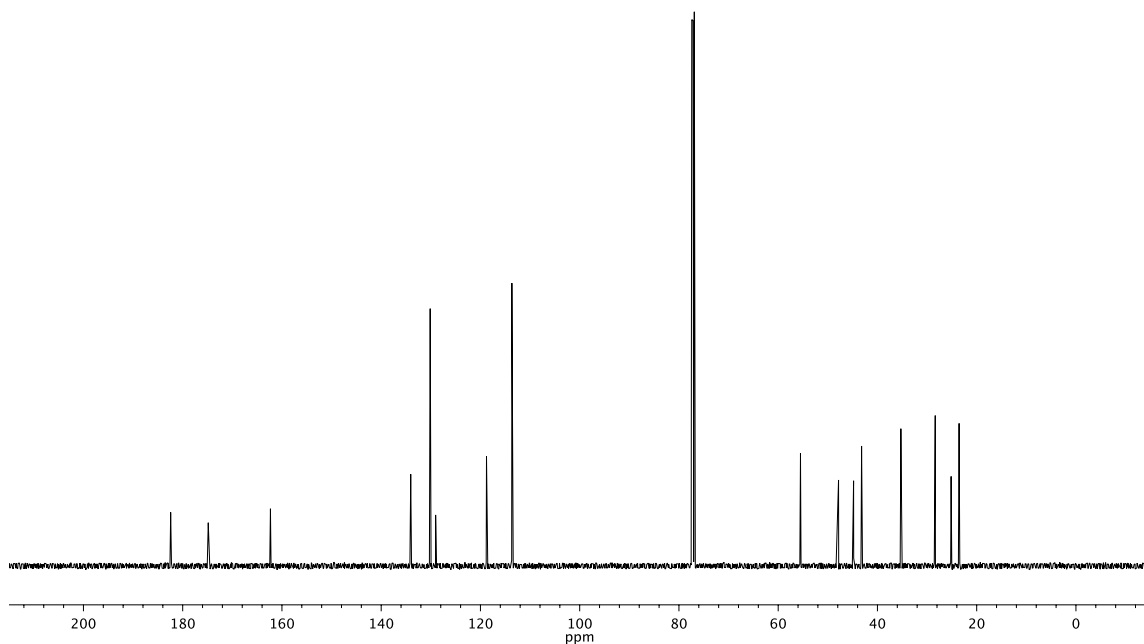


Figure A1.84 ¹³C NMR (126 MHz, CDCl₃) of compound **13**.

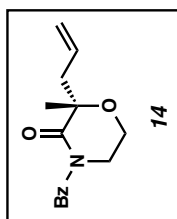
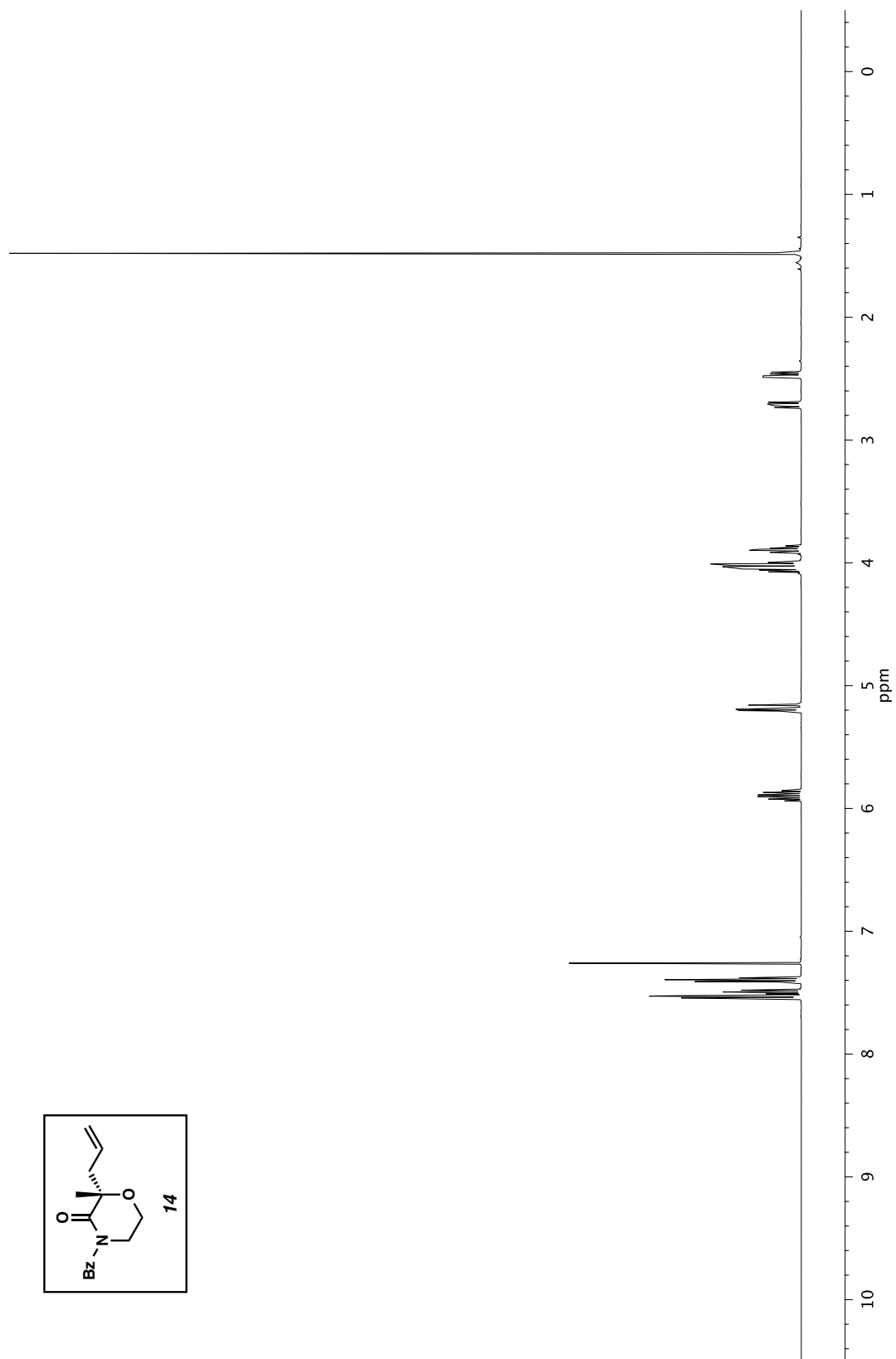


Figure A1.85 ^1H NMR (500 MHz, CDCl_3) of compound **14**.

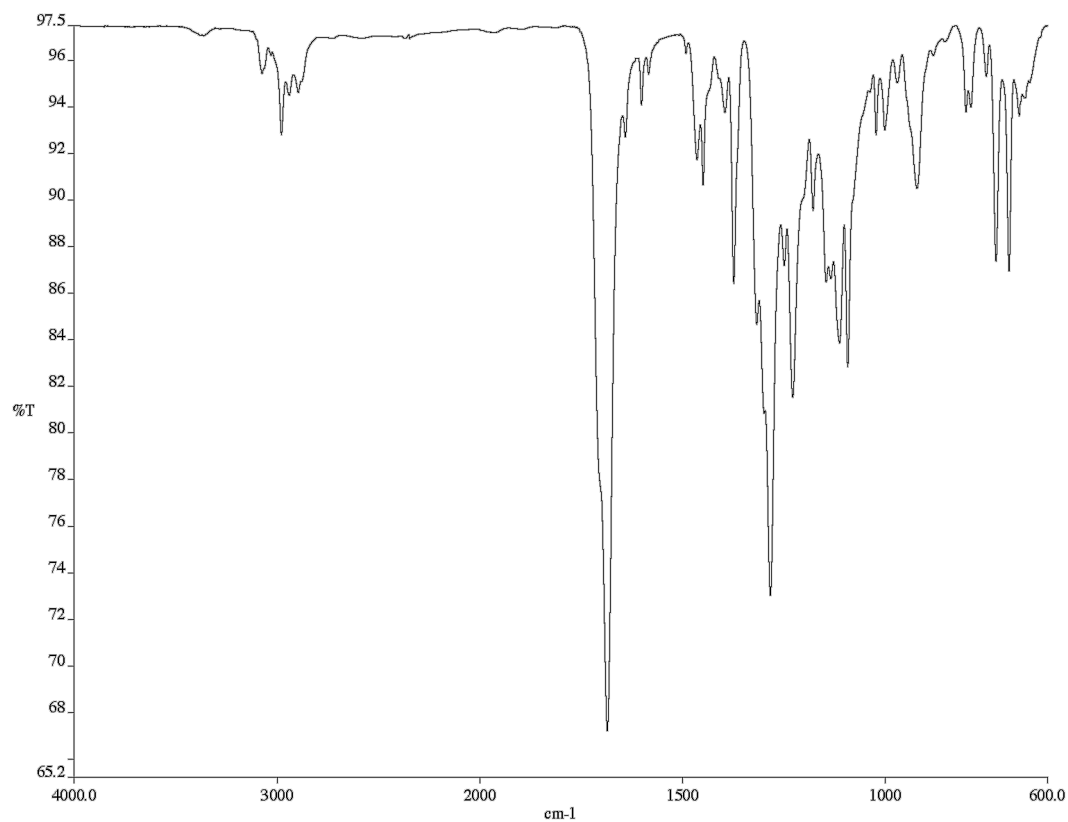


Figure A1.86 Infrared spectrum (Thin Film, NaCl) of compound **14**.

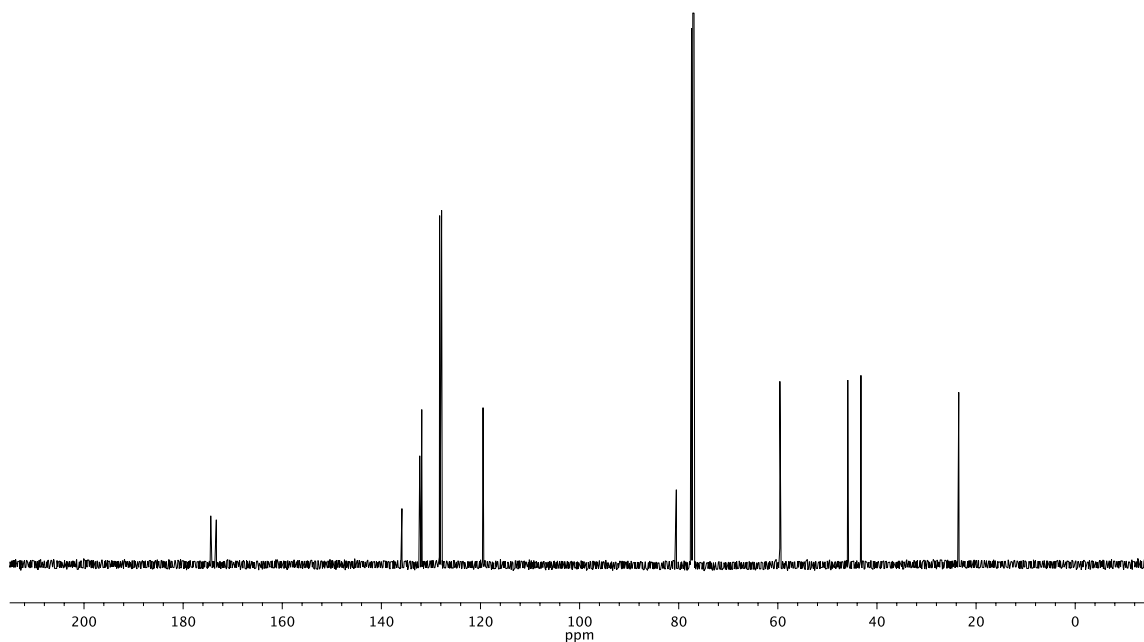


Figure A1.87 ¹³C NMR (126 MHz, CDCl₃) of compound **14**.

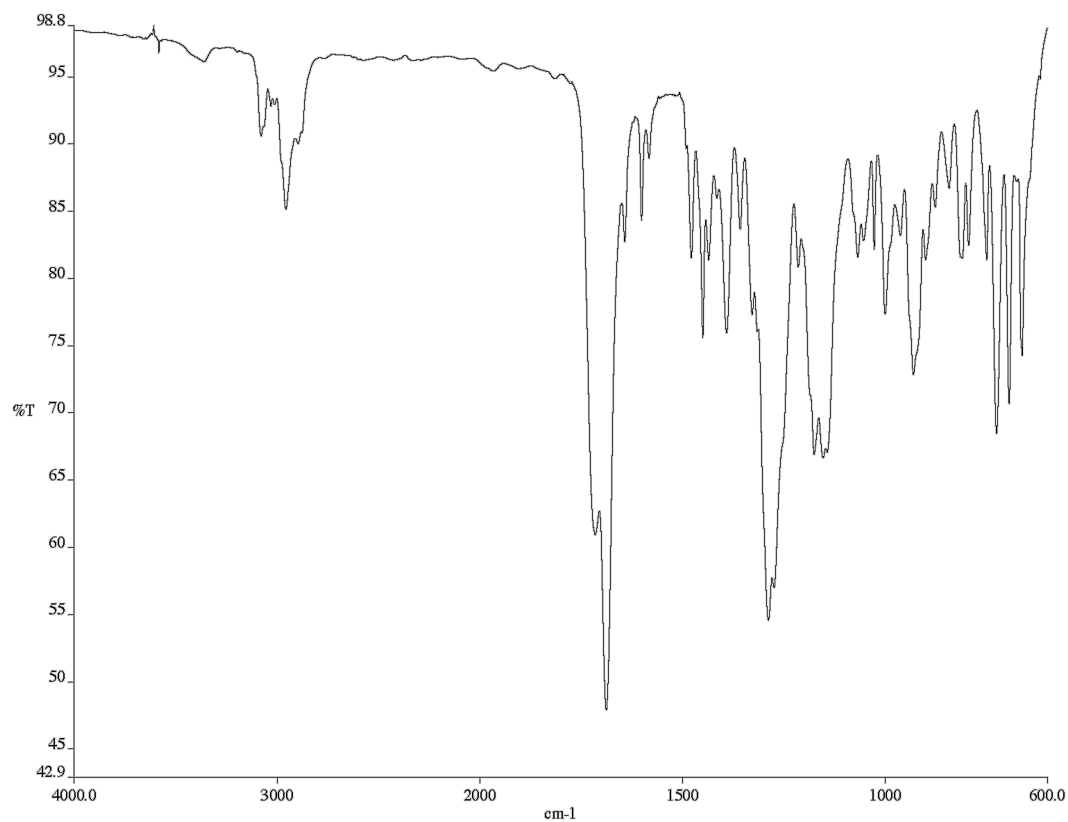


Figure A1.89 Infrared spectrum (Thin Film, NaCl) of compound **15**.

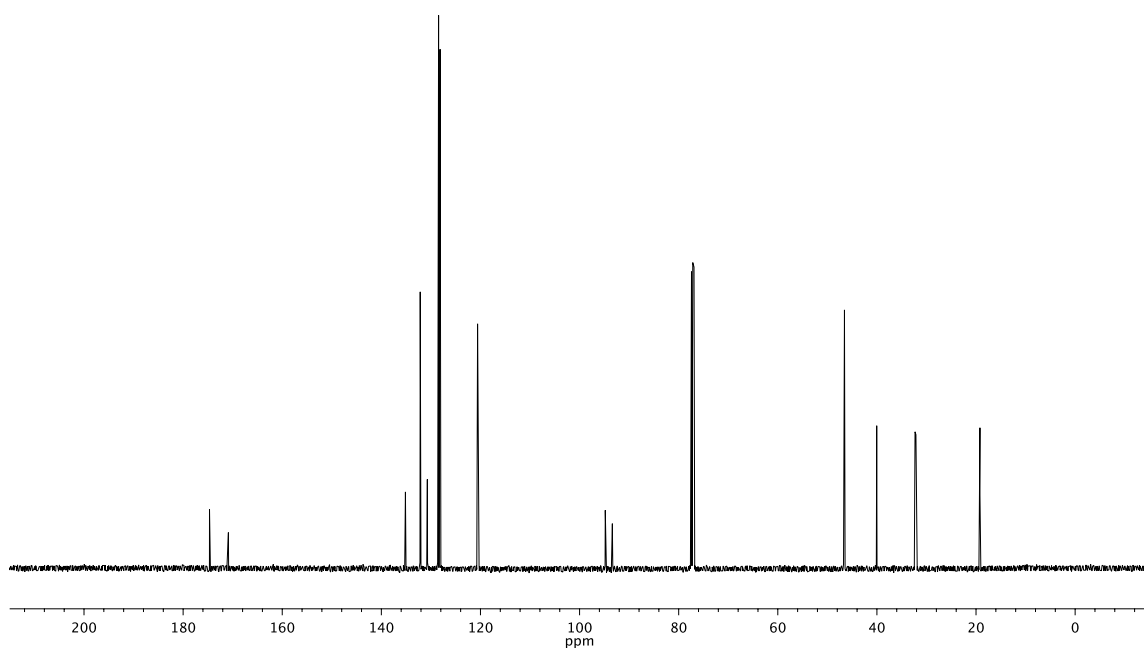


Figure A1.90 ¹³C NMR (126 MHz, CDCl₃) of compound **15**.

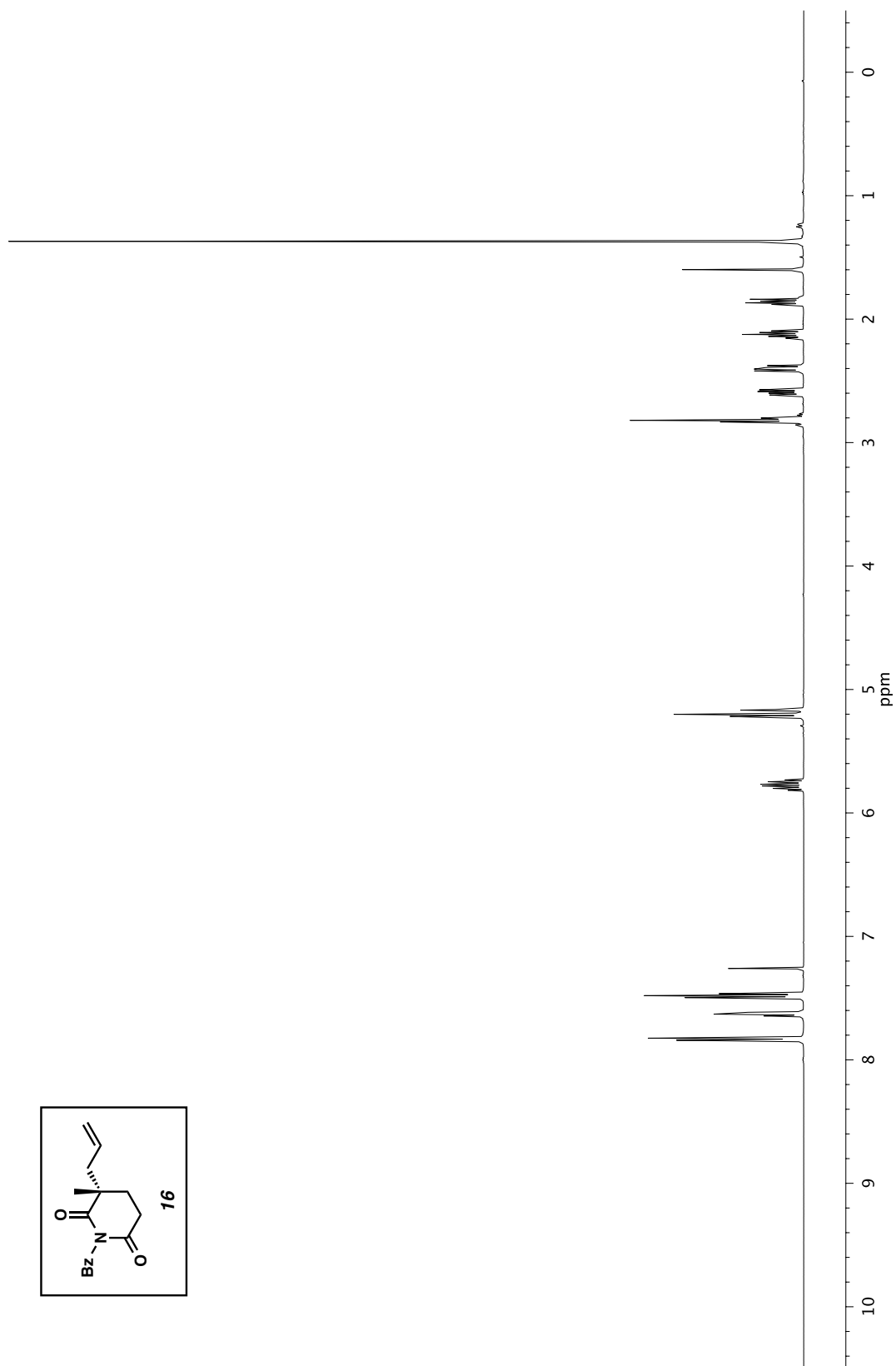
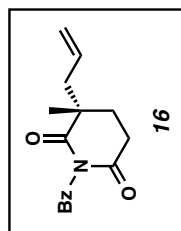


Figure A1.91 ^1H NMR (500 MHz, CDCl_3) of compound **16**.

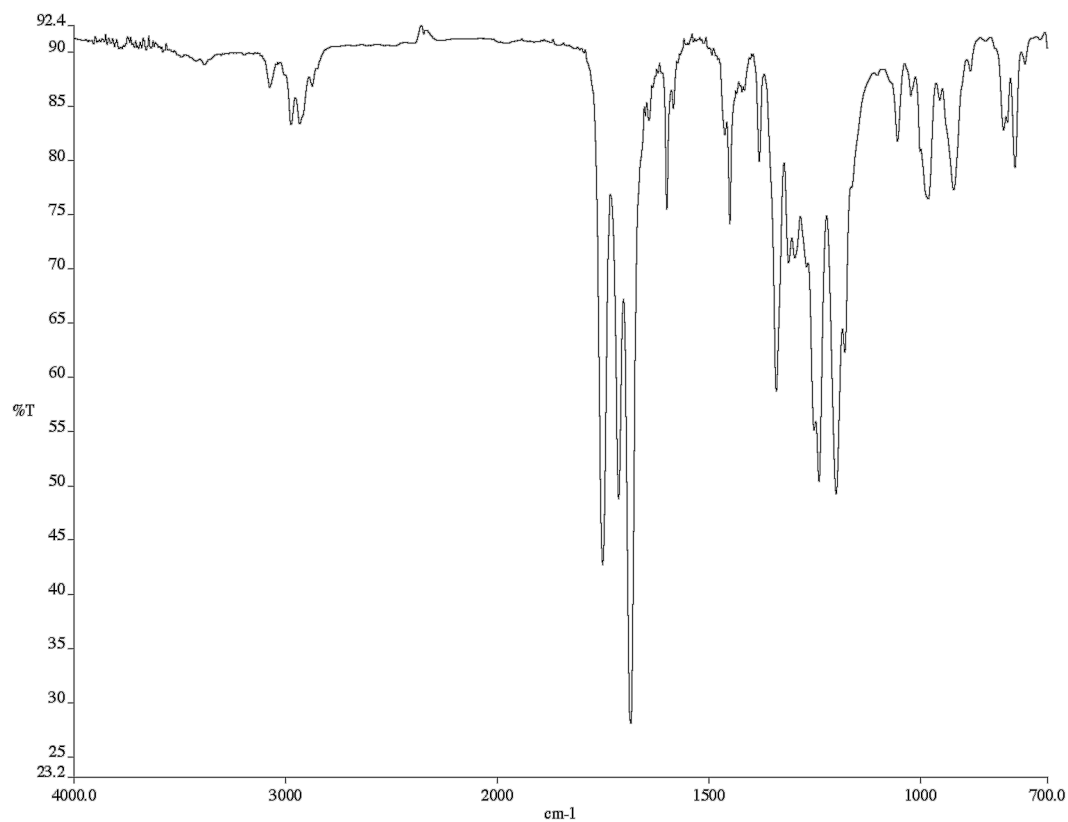


Figure A1.92 Infrared spectrum (Thin Film, NaCl) of compound **16**.

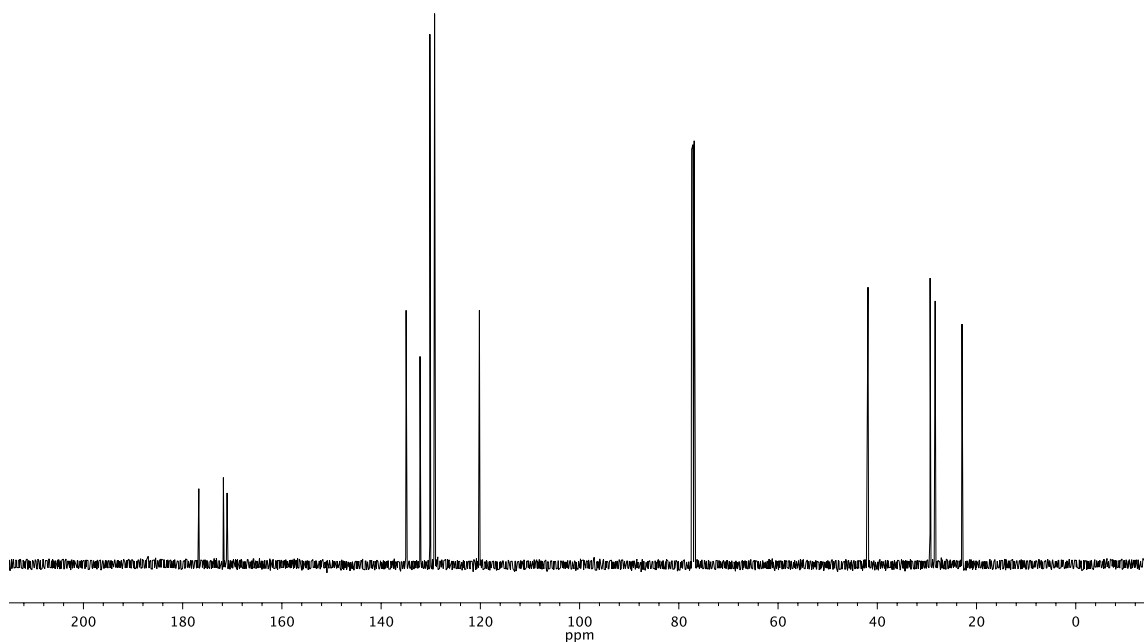


Figure A1.93 ¹³C NMR (126 MHz, CDCl₃) of compound **16**.

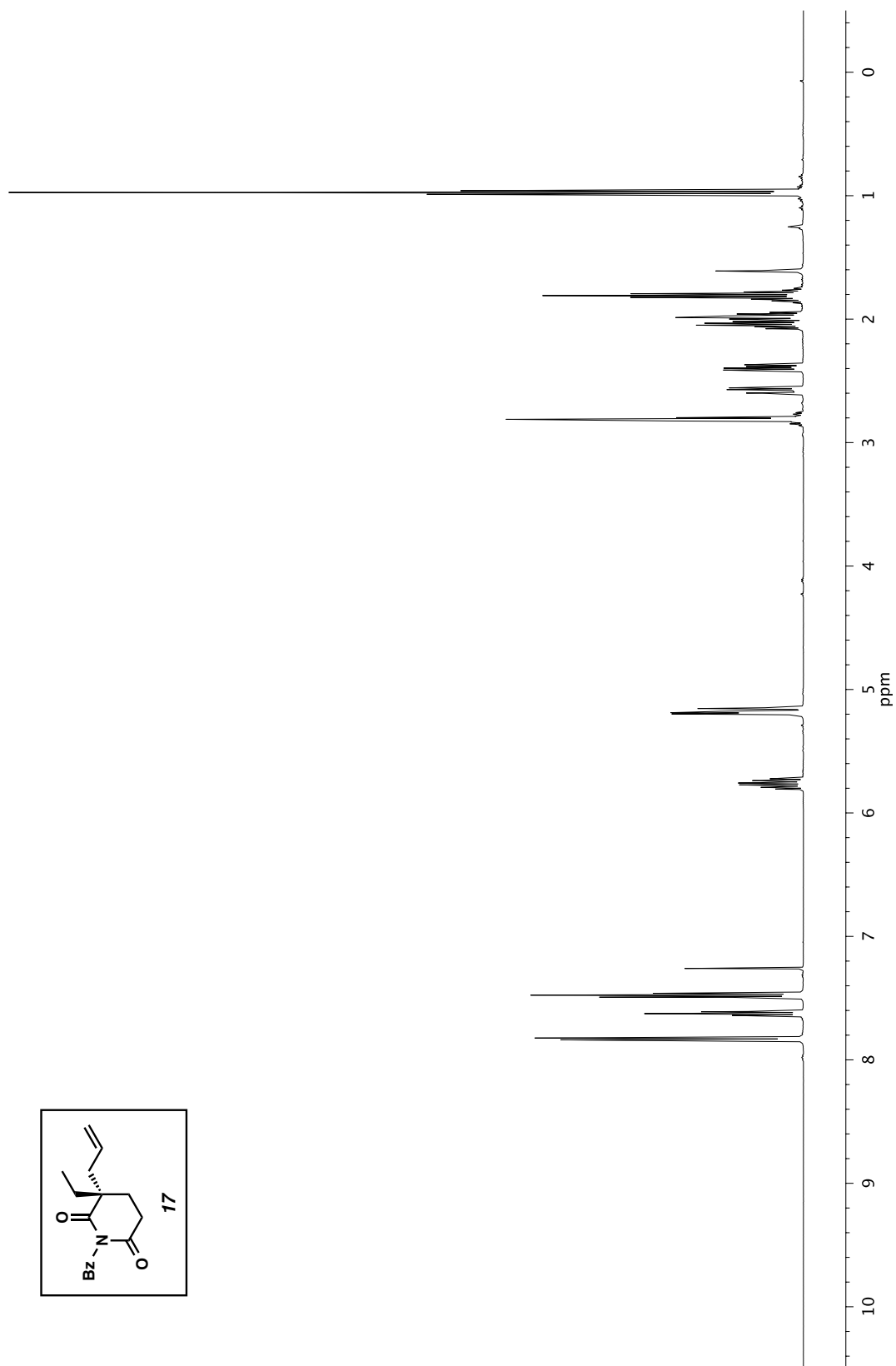


Figure A1.94 ^1H NMR (500 MHz, CDCl_3) of compound **17**.

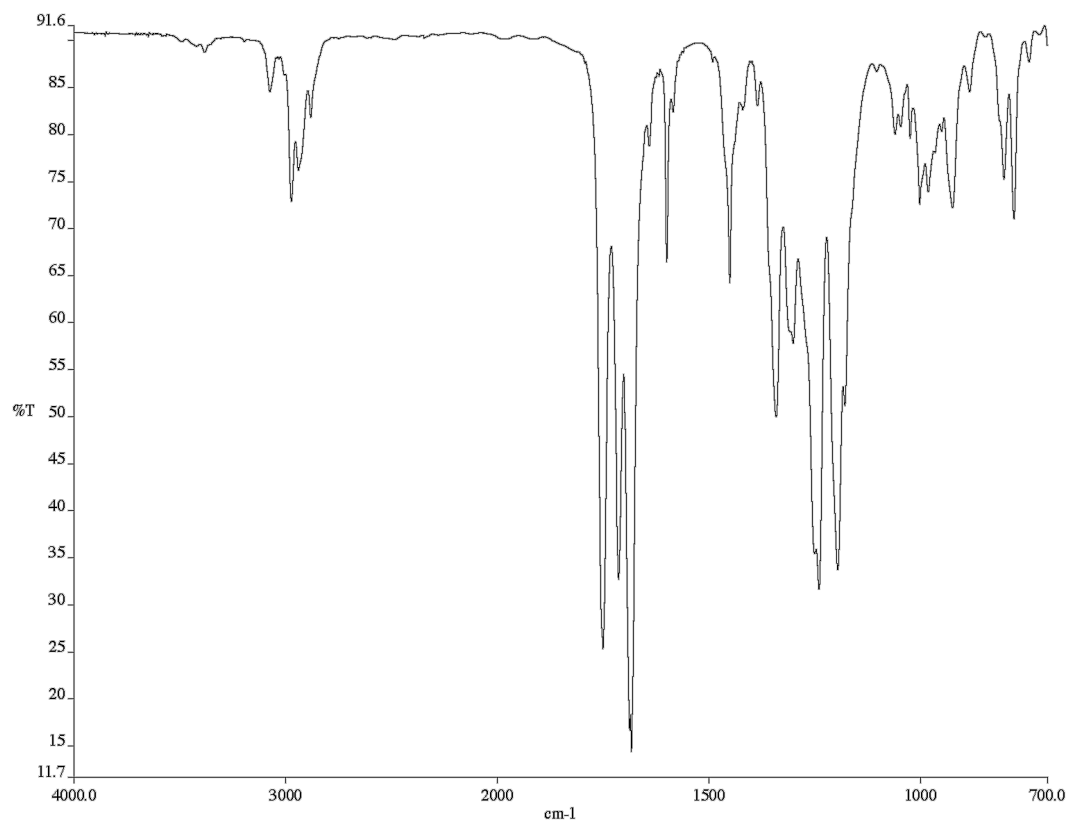


Figure A1.95 Infrared spectrum (Thin Film, NaCl) of compound 17.

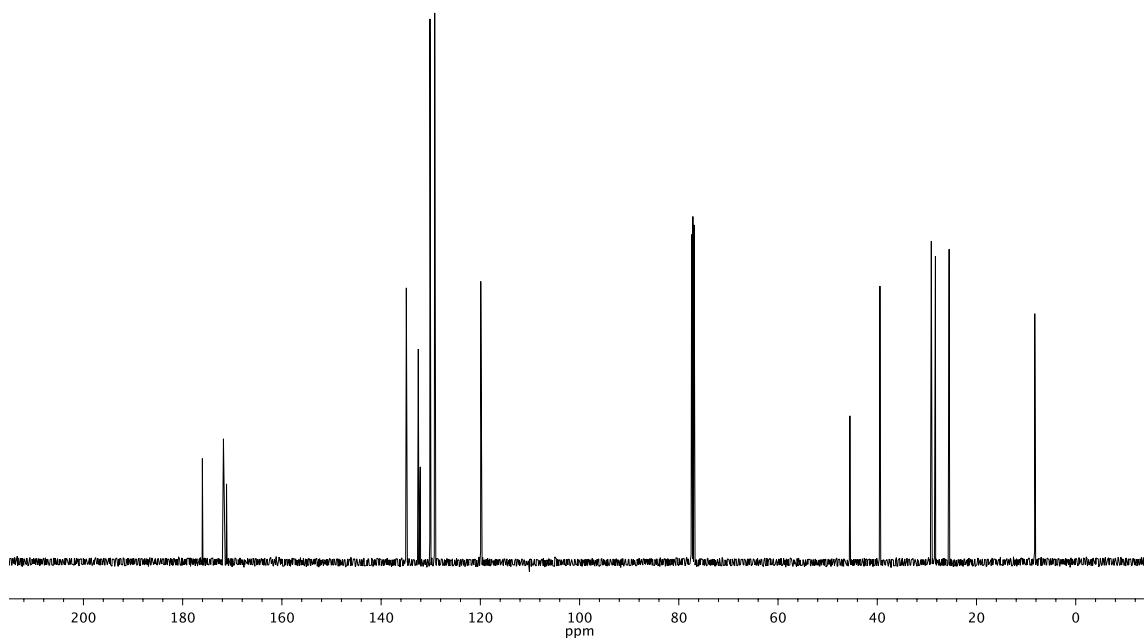


Figure A1.96 ¹³C NMR (126 MHz, CDCl₃) of compound 17.

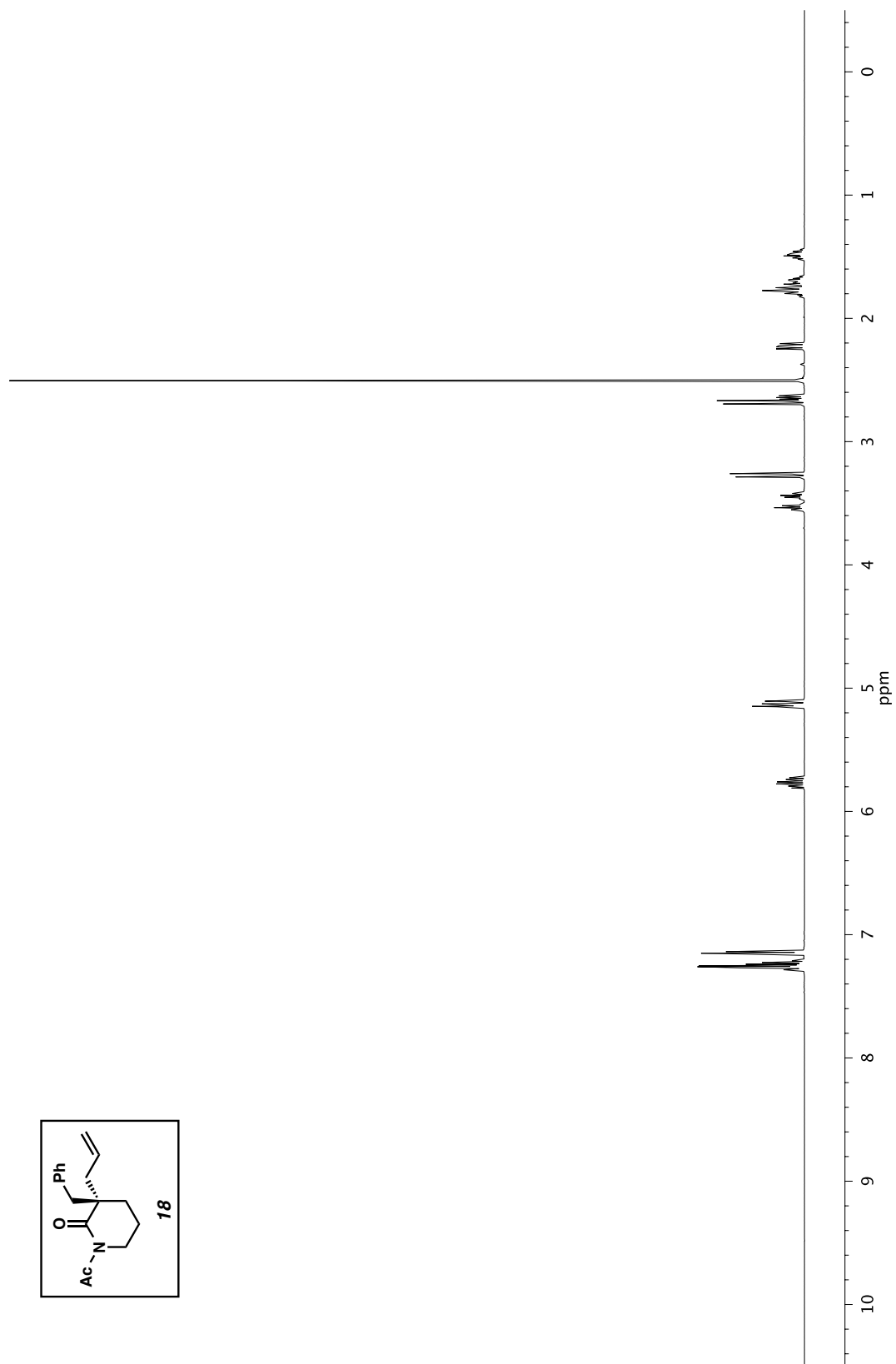


Figure A1.97 ¹H NMR (500 MHz, CDCl₃) of compound **18**.

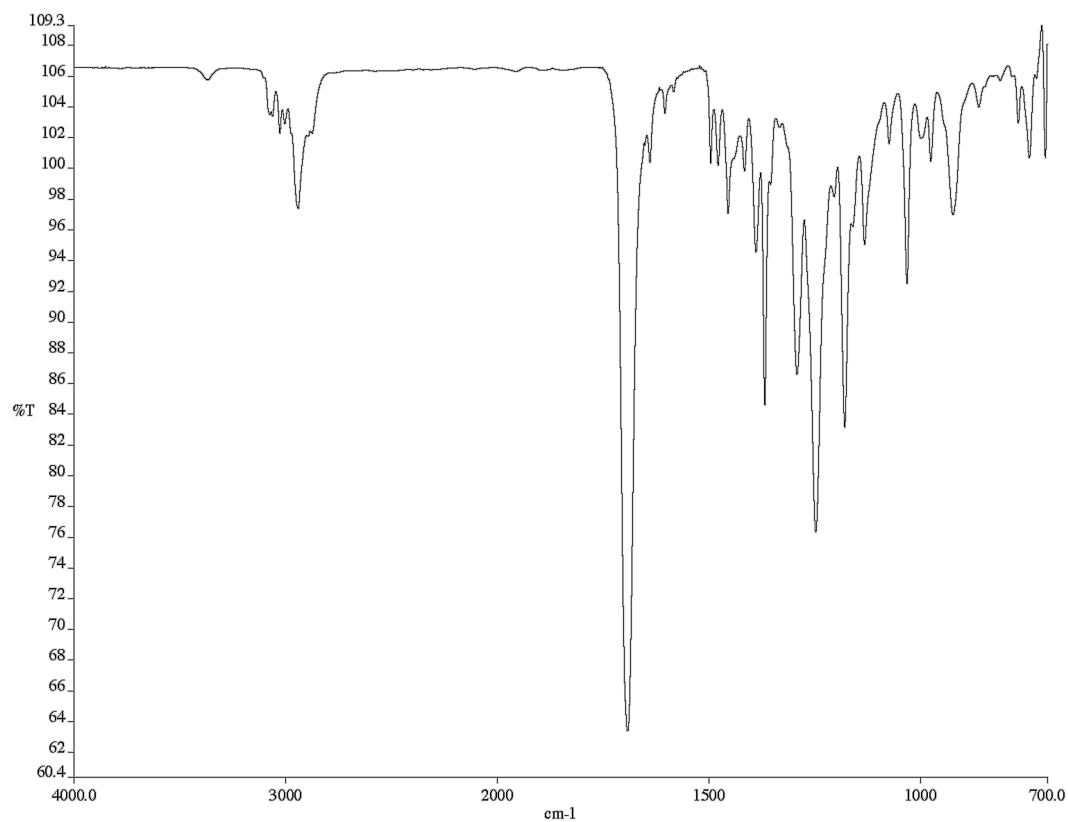


Figure A1.98 Infrared spectrum (Thin Film, NaCl) of compound **18**.

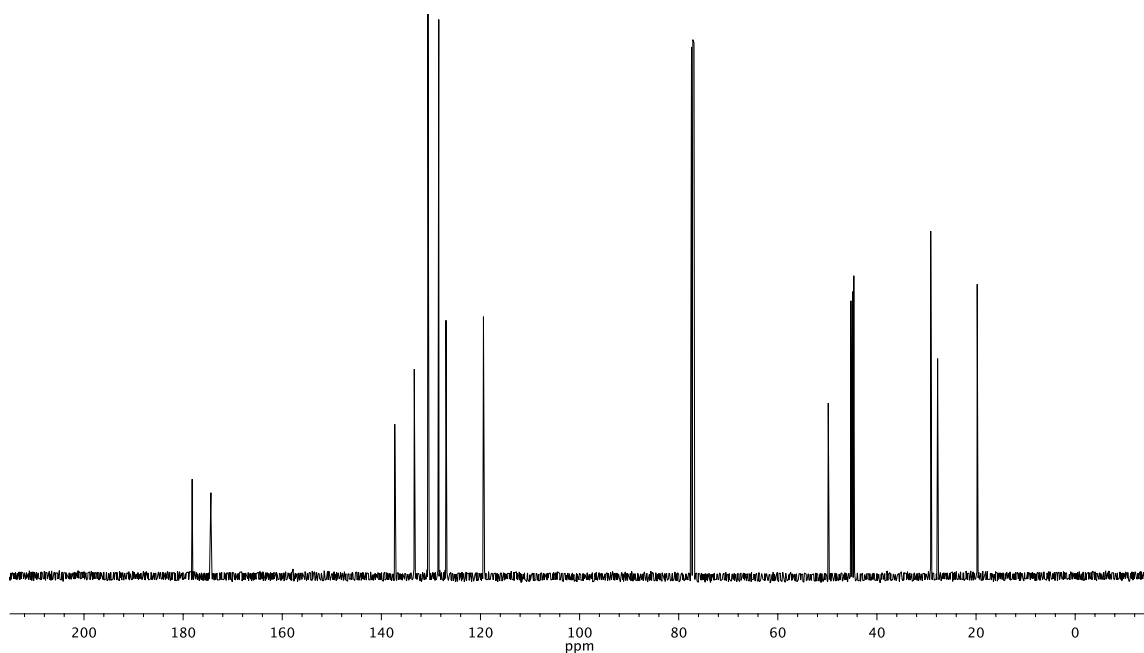


Figure A1.99 ¹³C NMR (126 MHz, CDCl₃) of compound **18**.

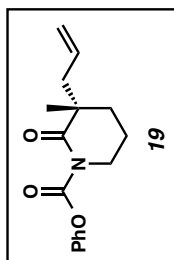
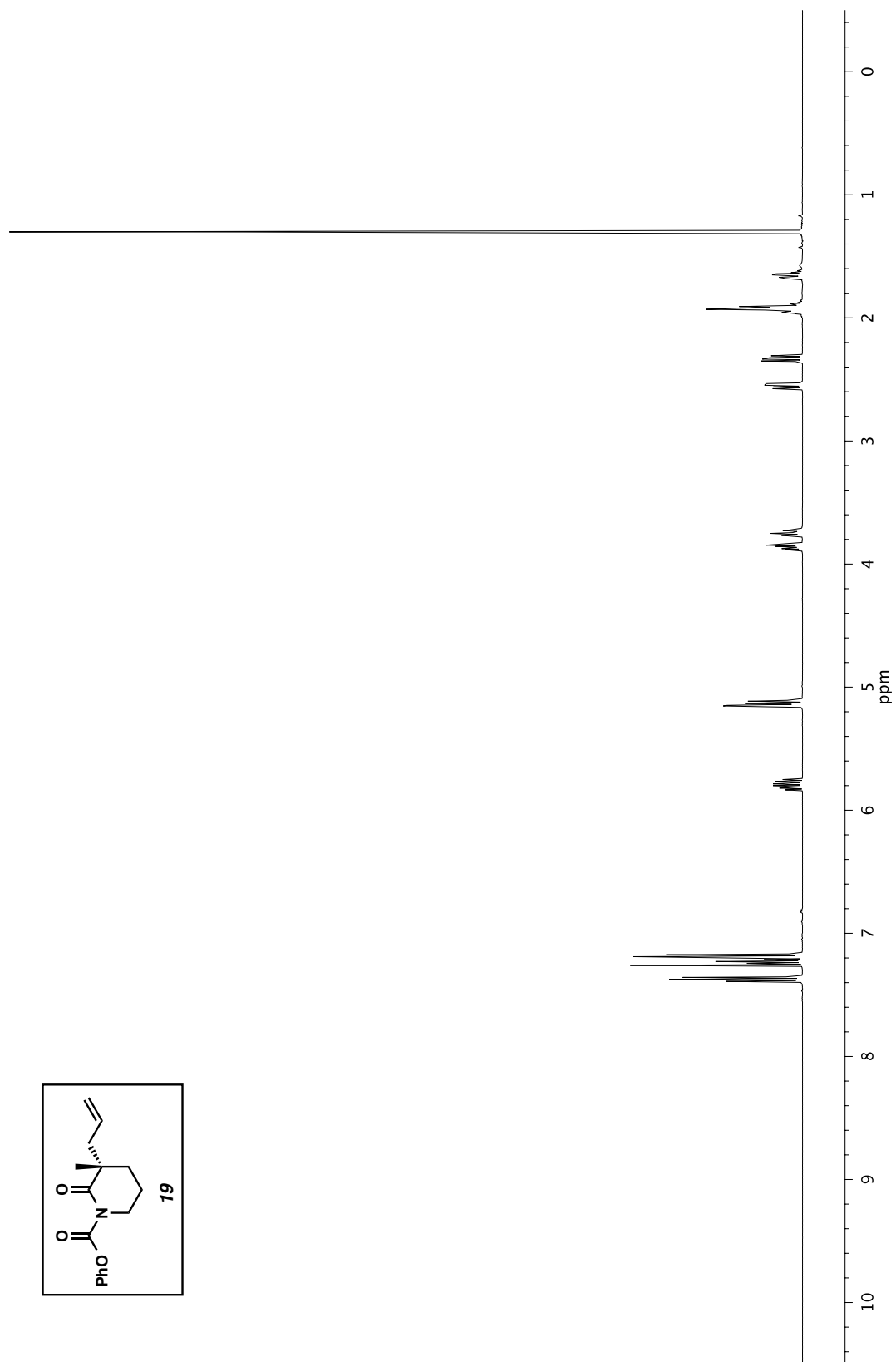


Figure A1.100 ^1H NMR (500 MHz, CDCl_3) of compound **19**.

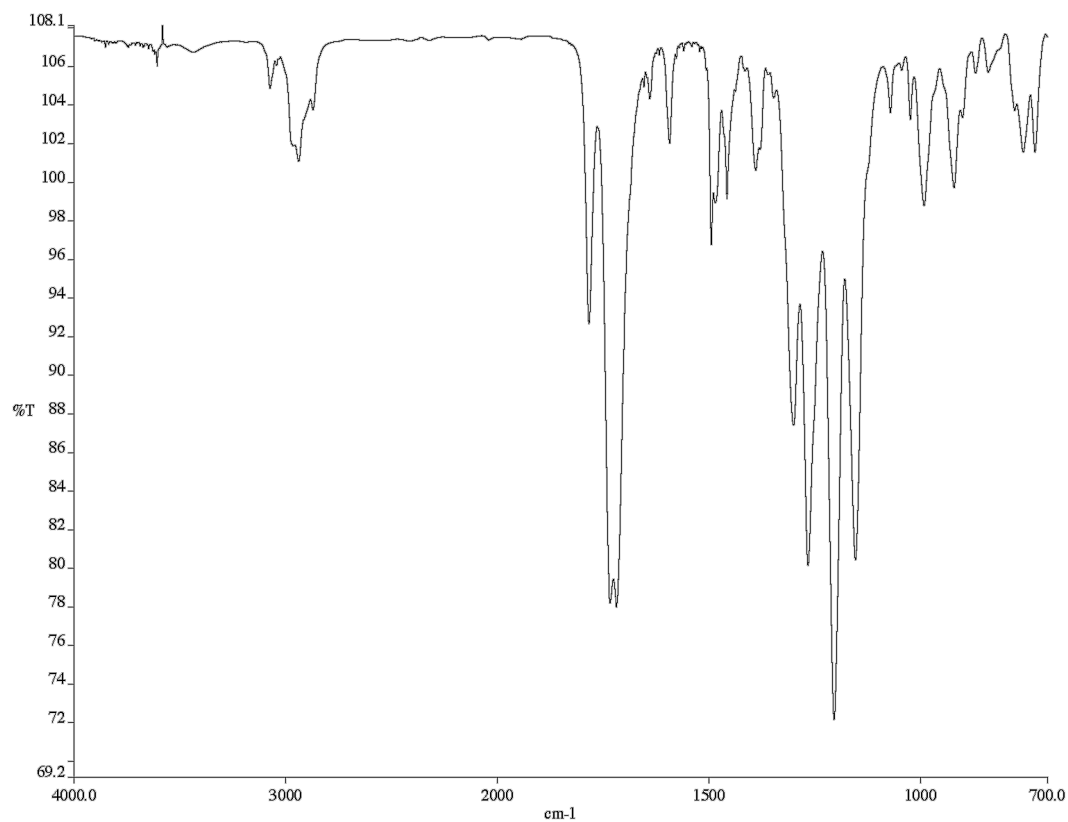


Figure A1.101 Infrared spectrum (Thin Film, NaCl) of compound **19**.

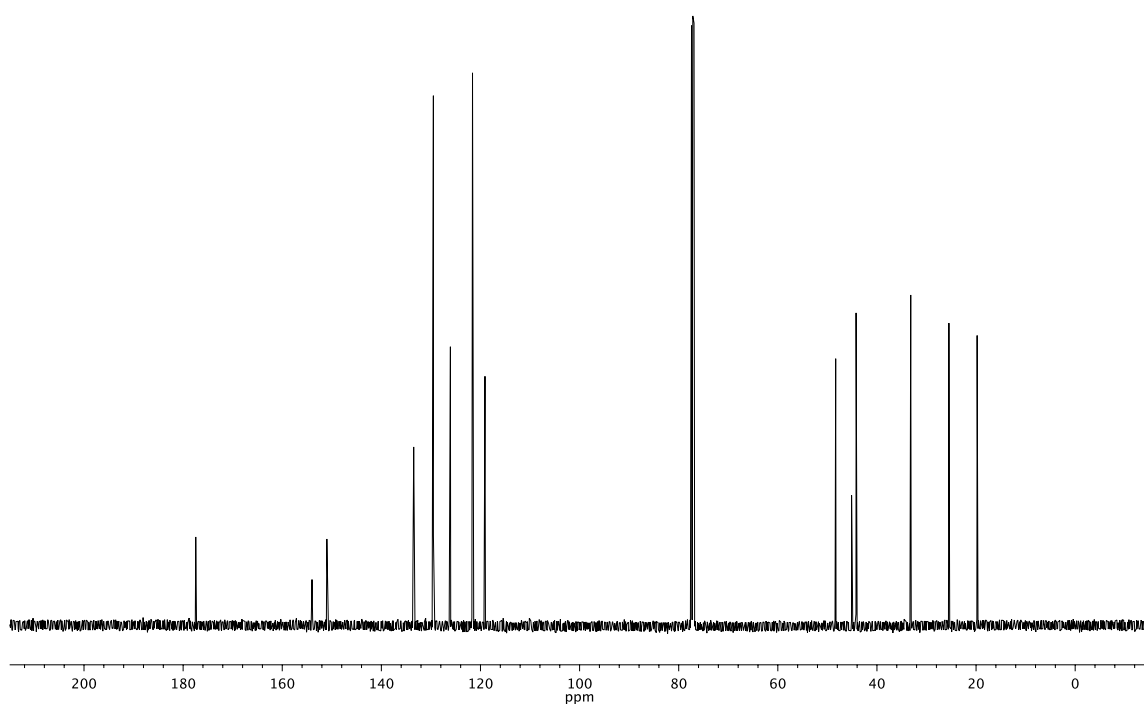


Figure A1.102 ¹³C NMR (126 MHz, CDCl₃) of compound **19**.

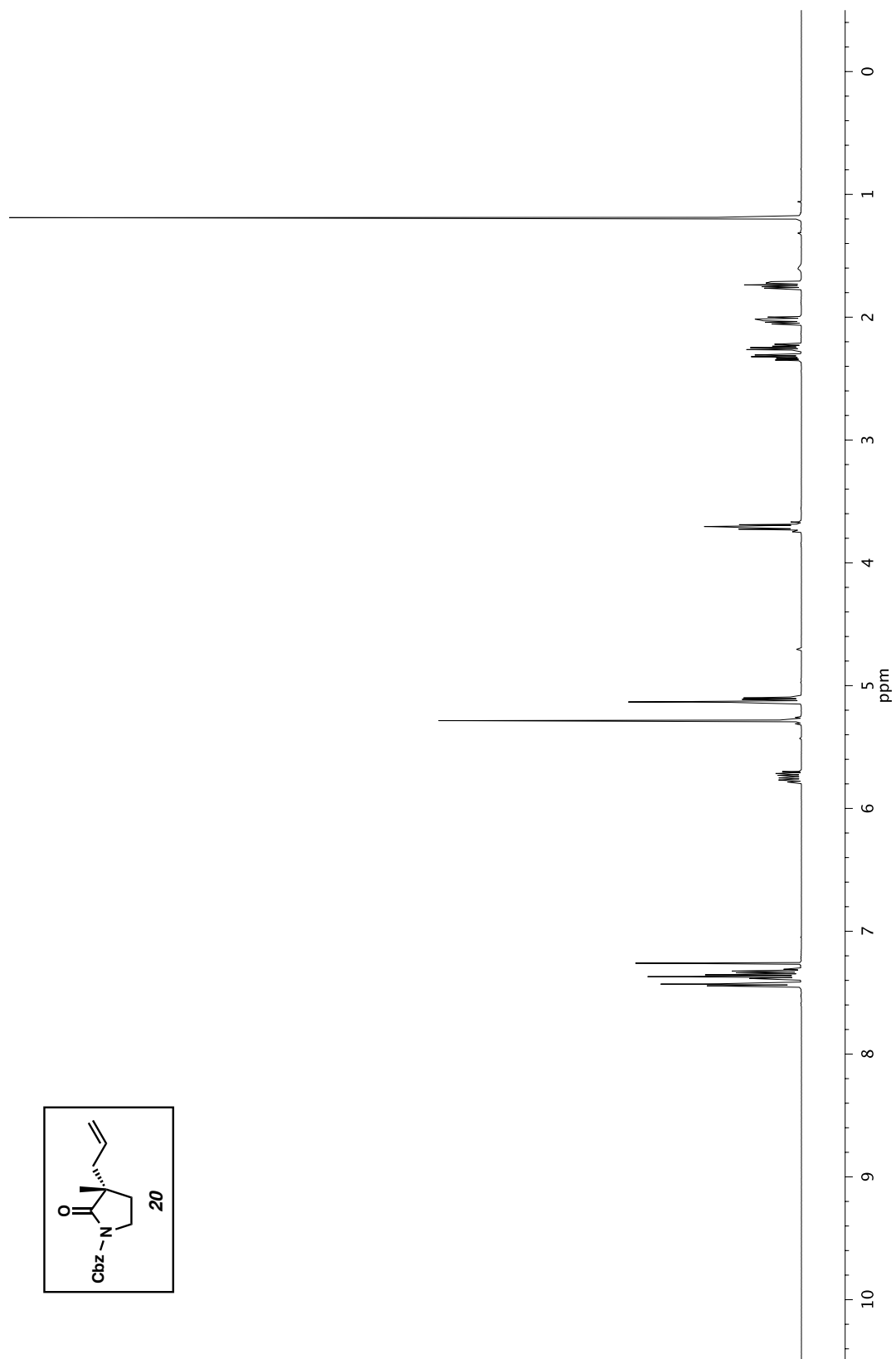


Figure A1.103 ^1H NMR (500 MHz, CDCl_3) of compound **20**.

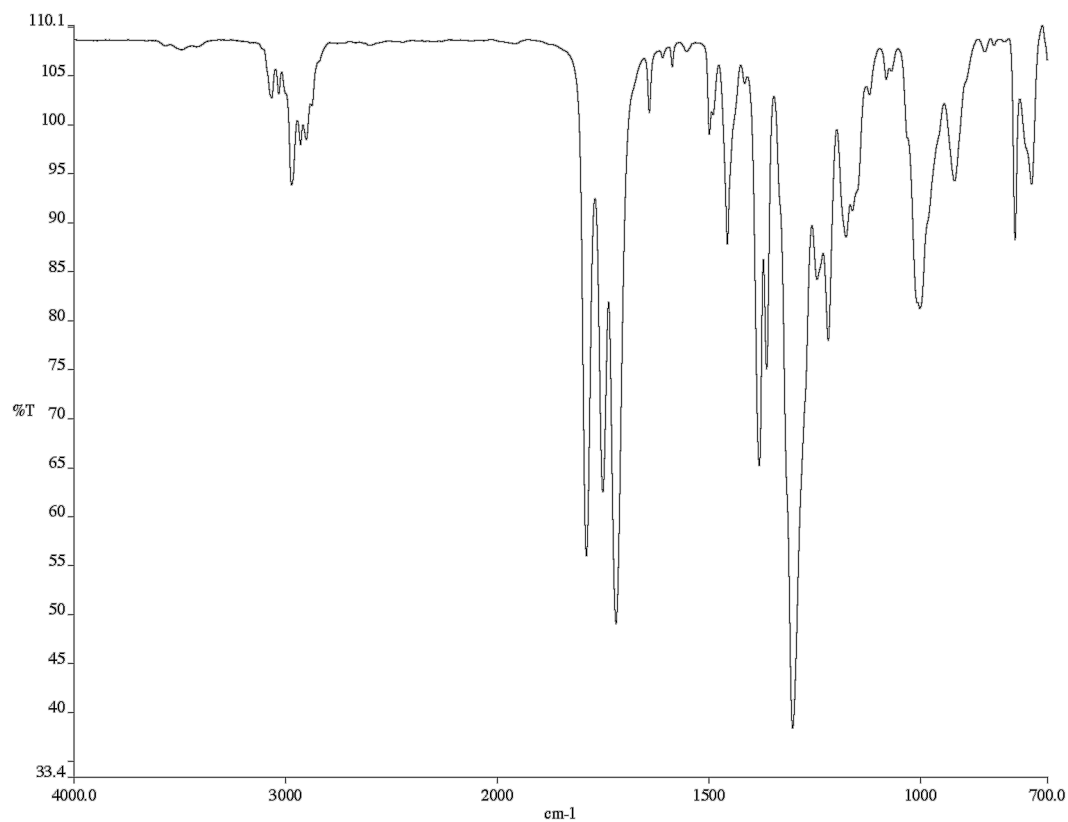


Figure A1.104 Infrared spectrum (Thin Film, NaCl) of compound **20**.

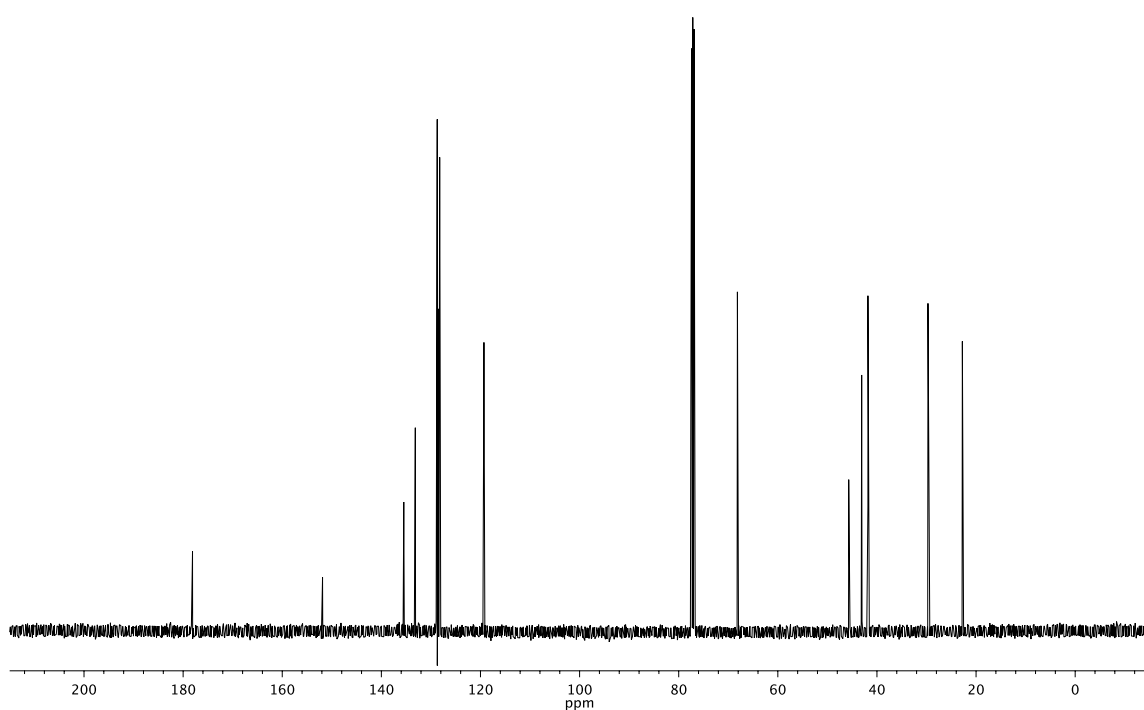


Figure A1.105 ¹³C NMR (126 MHz, CDCl₃) of compound **20**.

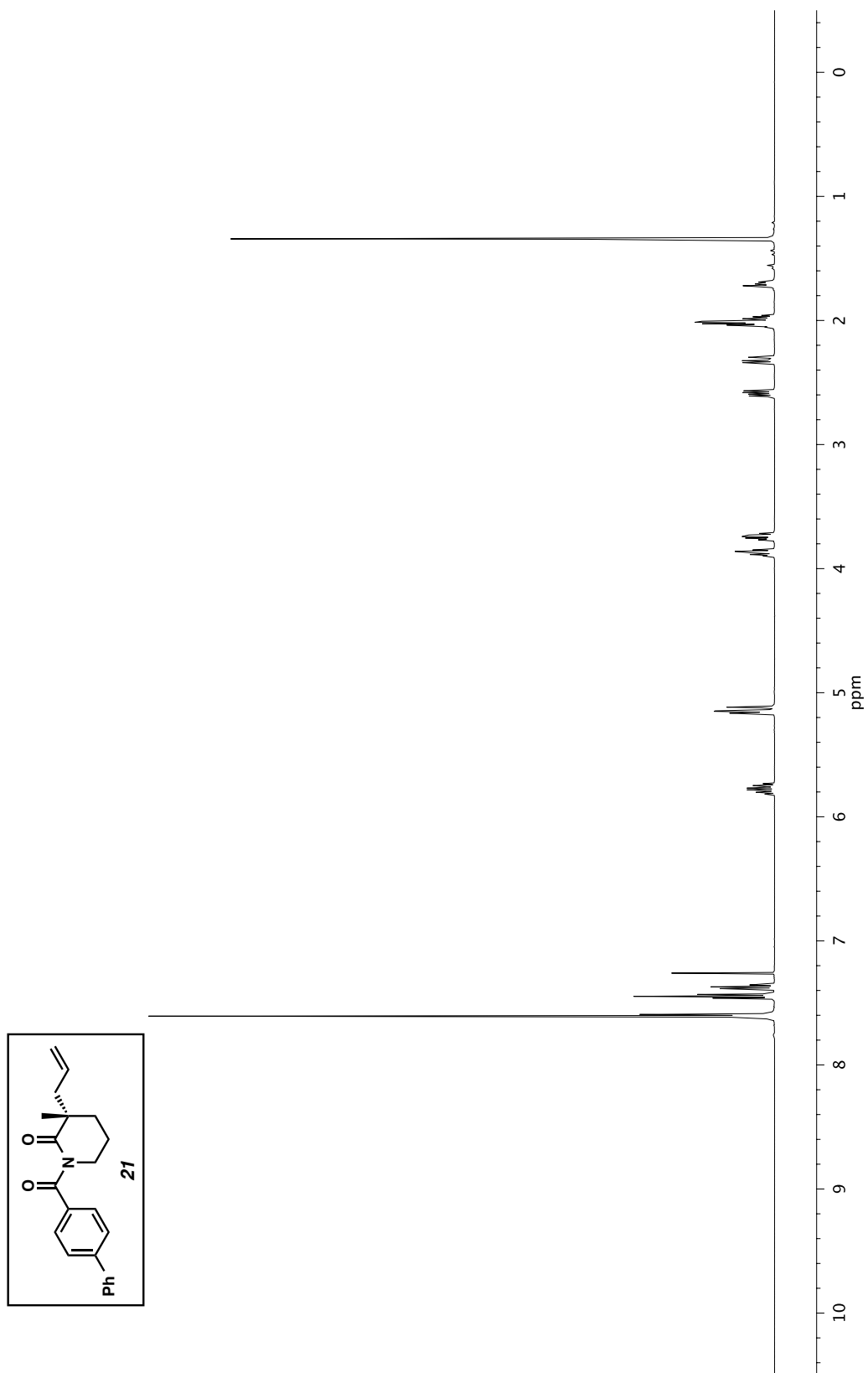


Figure A1.106 ^1H NMR (500 MHz, CDCl_3) of compound **21**.

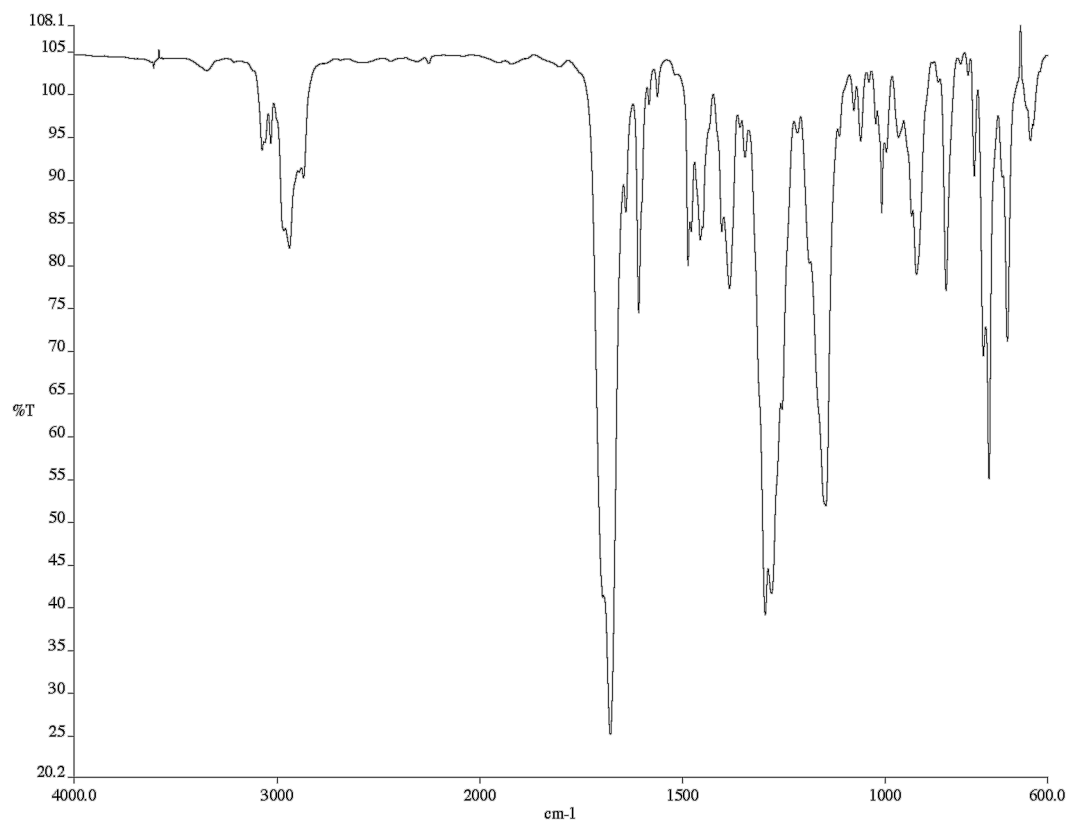


Figure A1.107 Infrared spectrum (Thin Film, NaCl) of compound **21**.

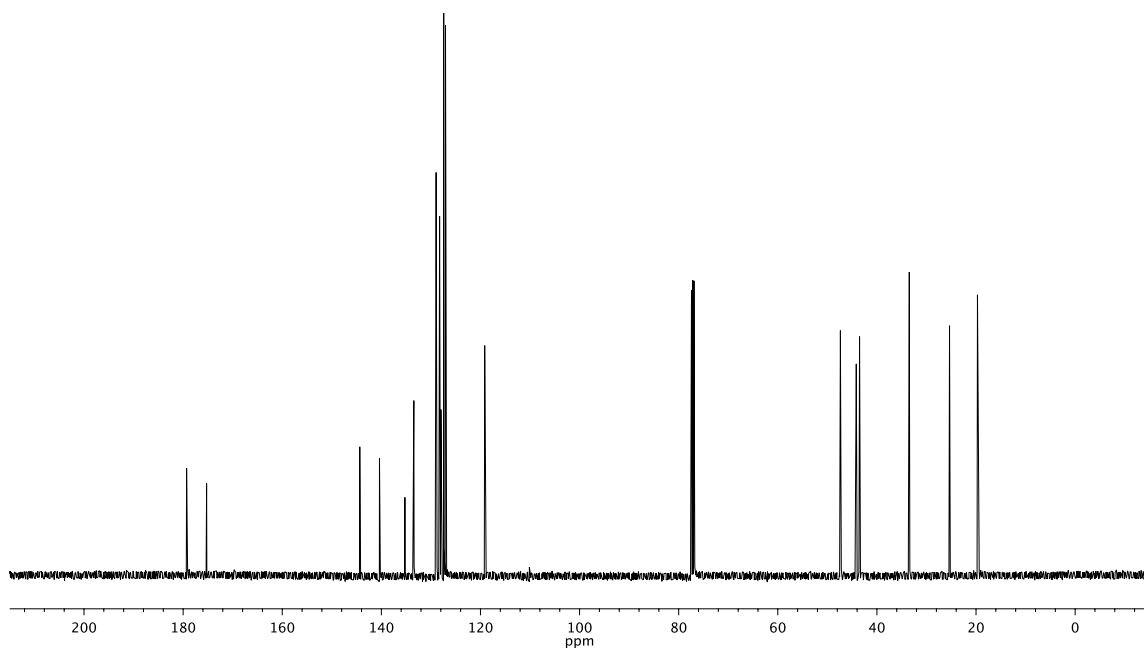


Figure A1.108 ¹³C NMR (126 MHz, CDCl₃) of compound **21**.

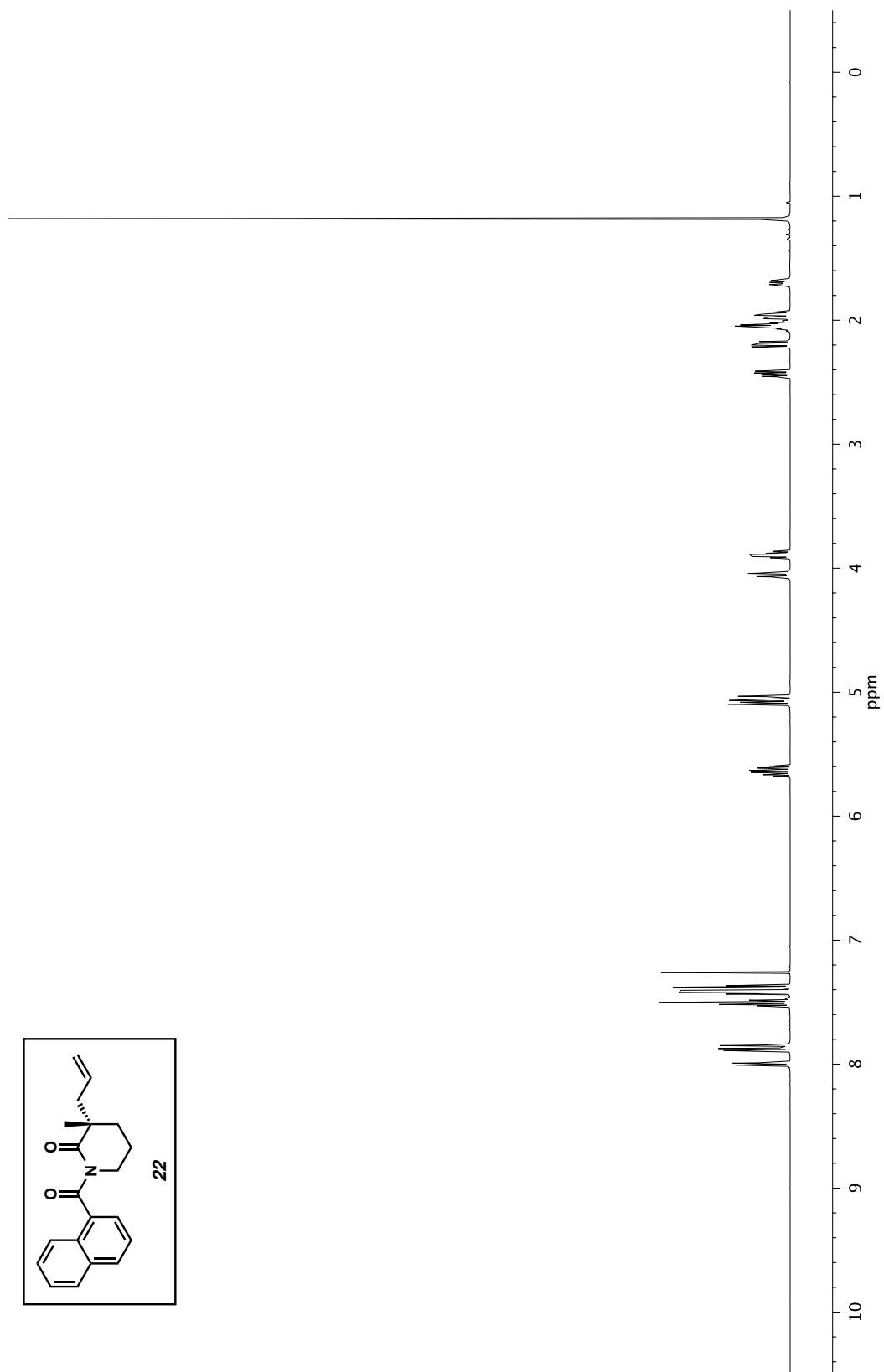


Figure A1.109 ^1H NMR (500 MHz, CDCl_3) of compound **22**.

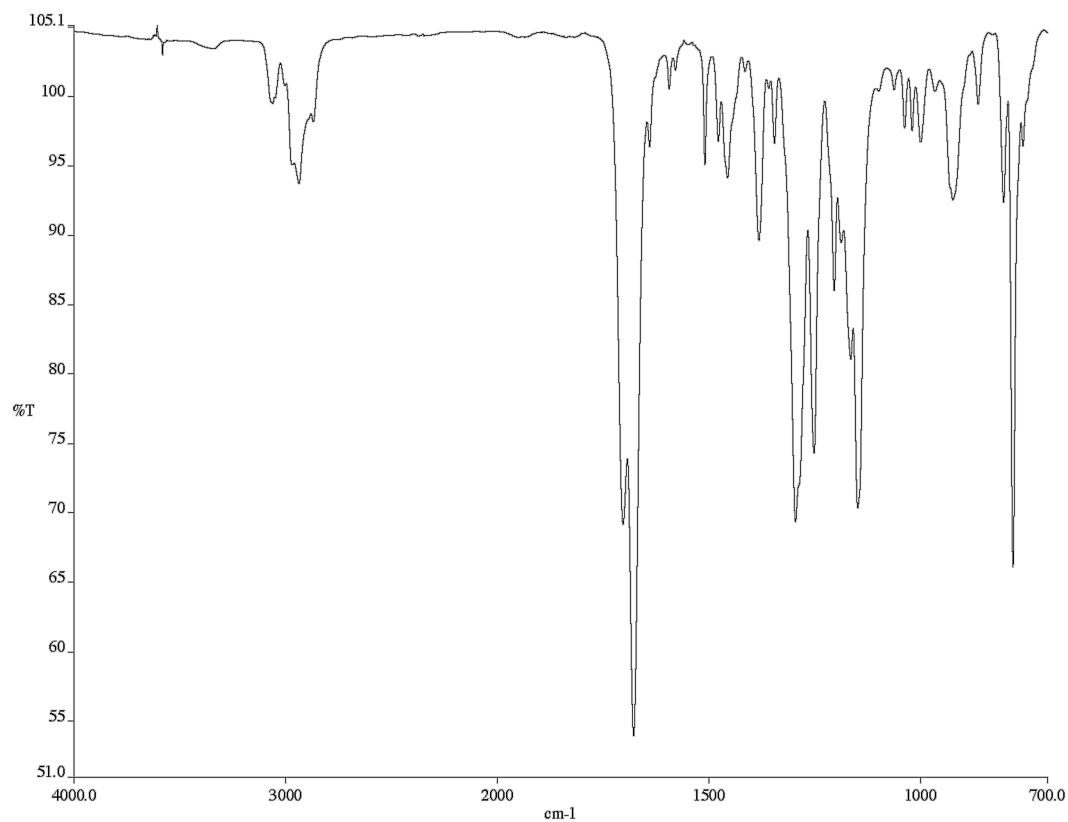


Figure A1.110 Infrared spectrum (Thin Film, NaCl) of compound **22**.

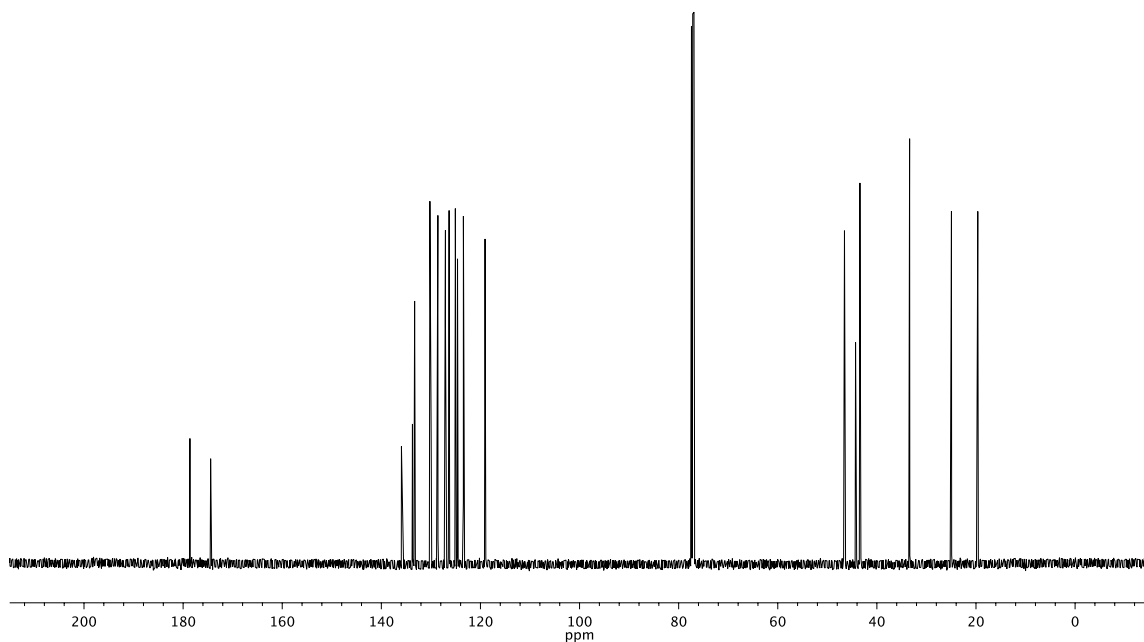


Figure A1.111 ¹³C NMR (126 MHz, CDCl₃) of compound **22**.

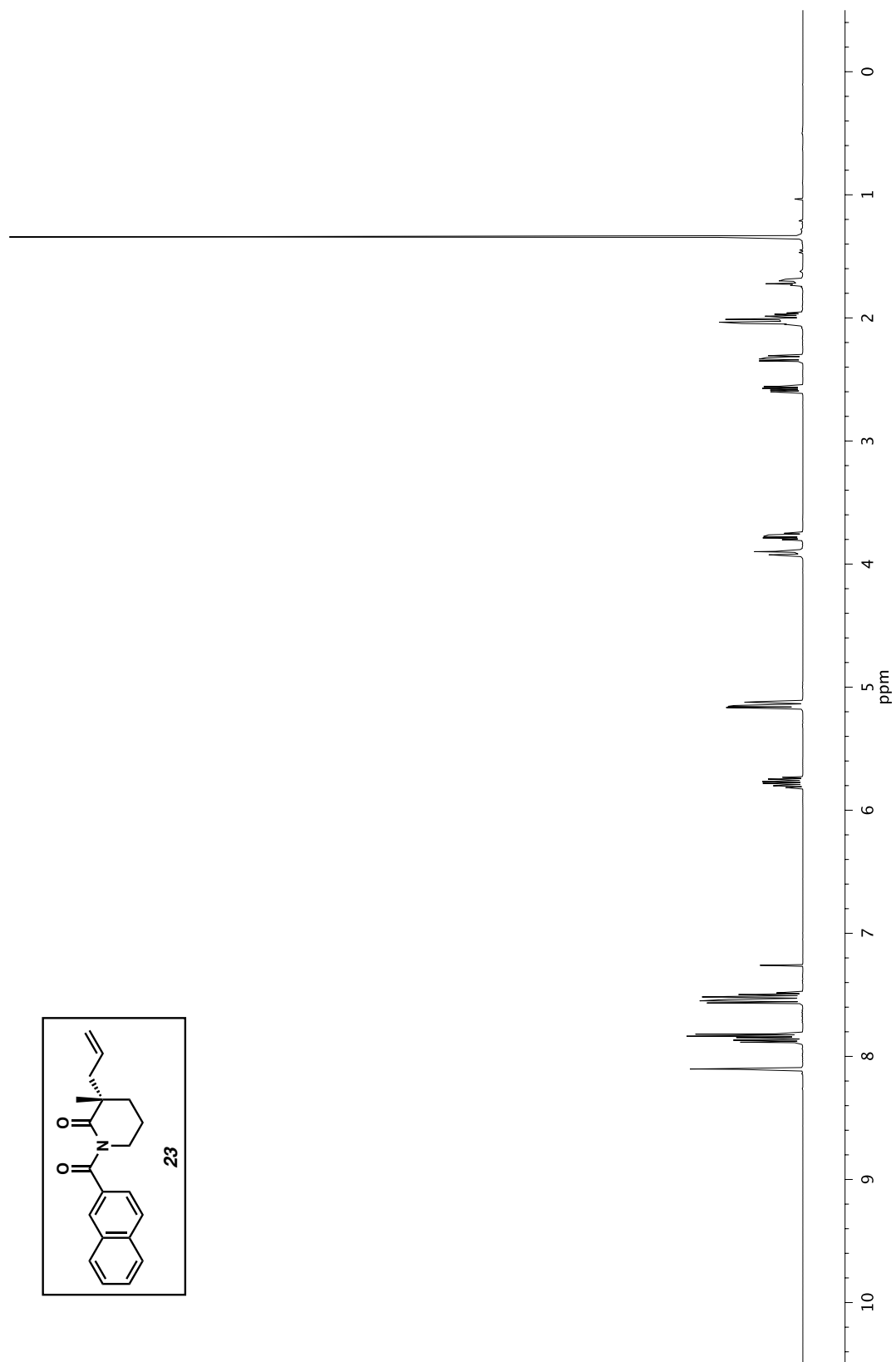


Figure A1.112 ^1H NMR (500 MHz, CDCl_3) of compound **23**.

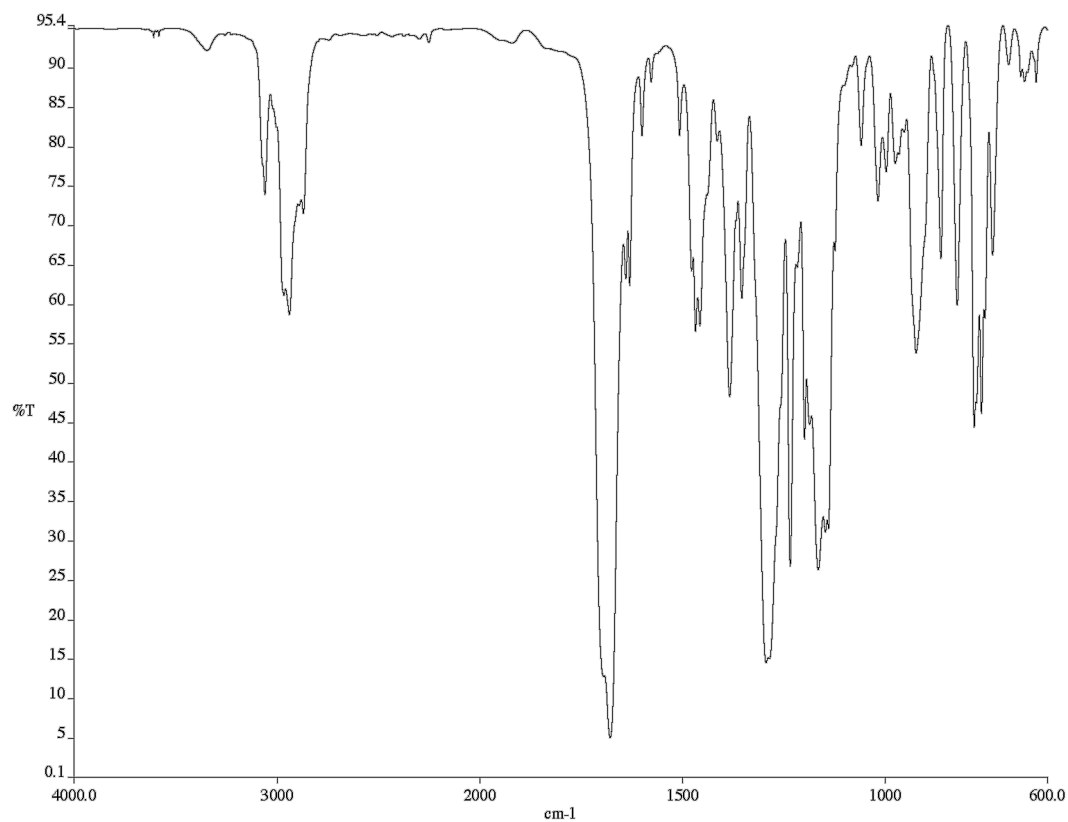


Figure A1.113 Infrared spectrum (Thin Film, NaCl) of compound **23**.

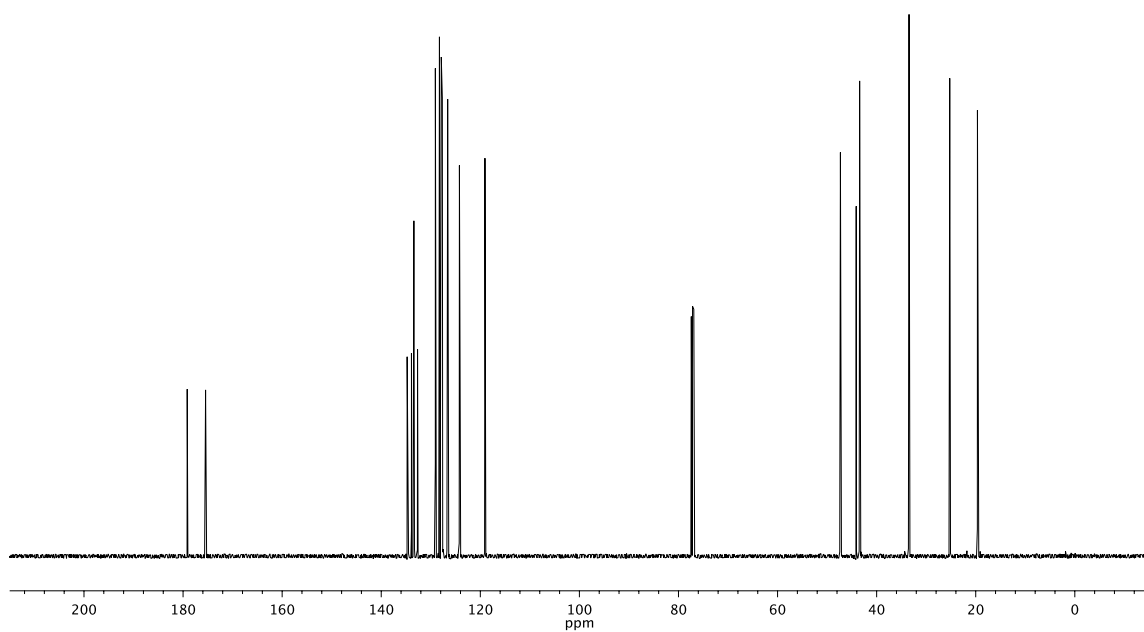


Figure A1.114 ¹³C NMR (126 MHz, CDCl₃) of compound **23**.

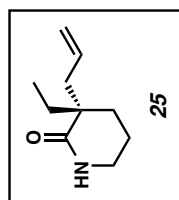
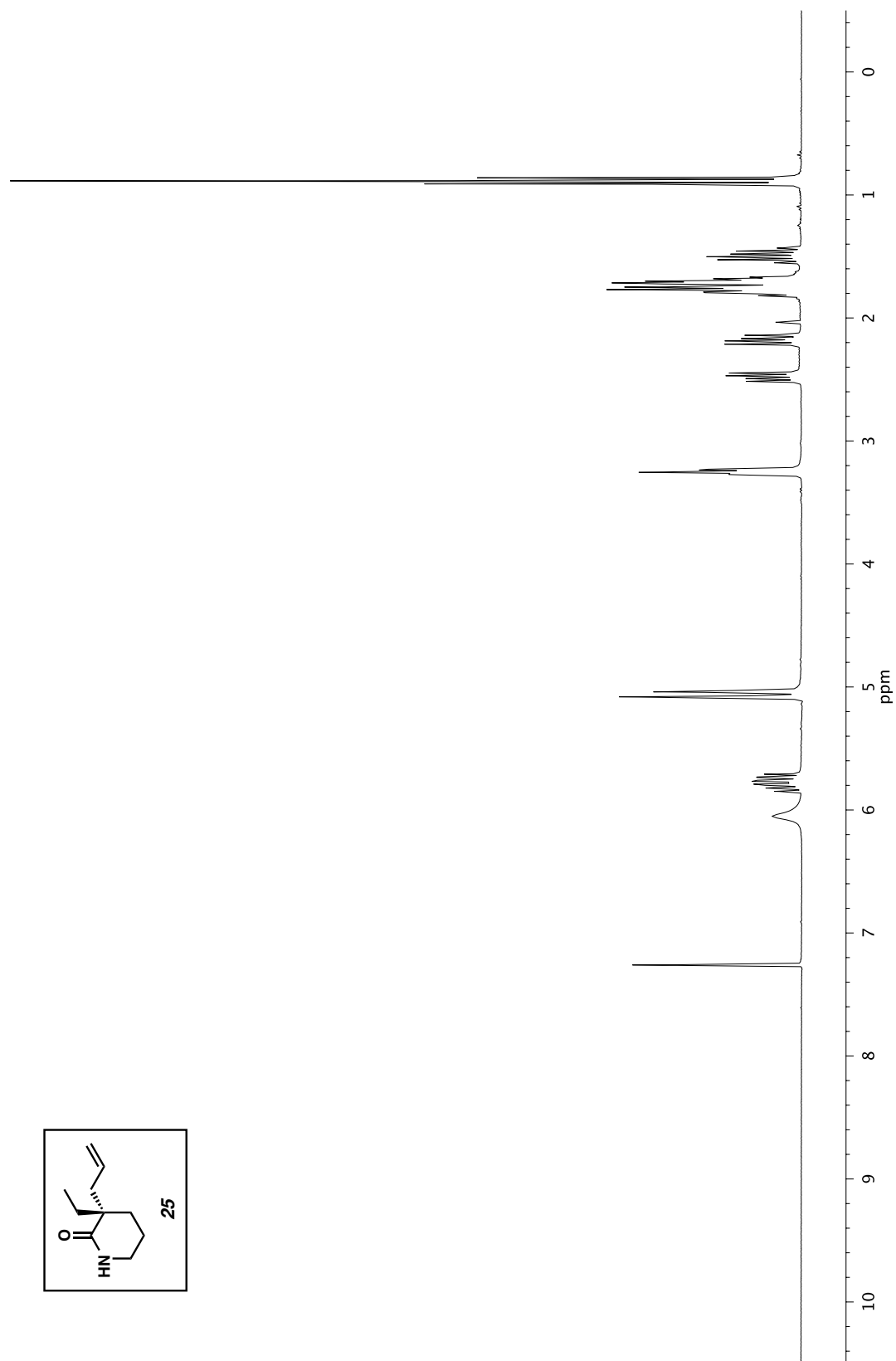


Figure A1.115 ^1H NMR (300 MHz, CDCl_3) of compound **25**.

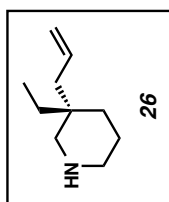
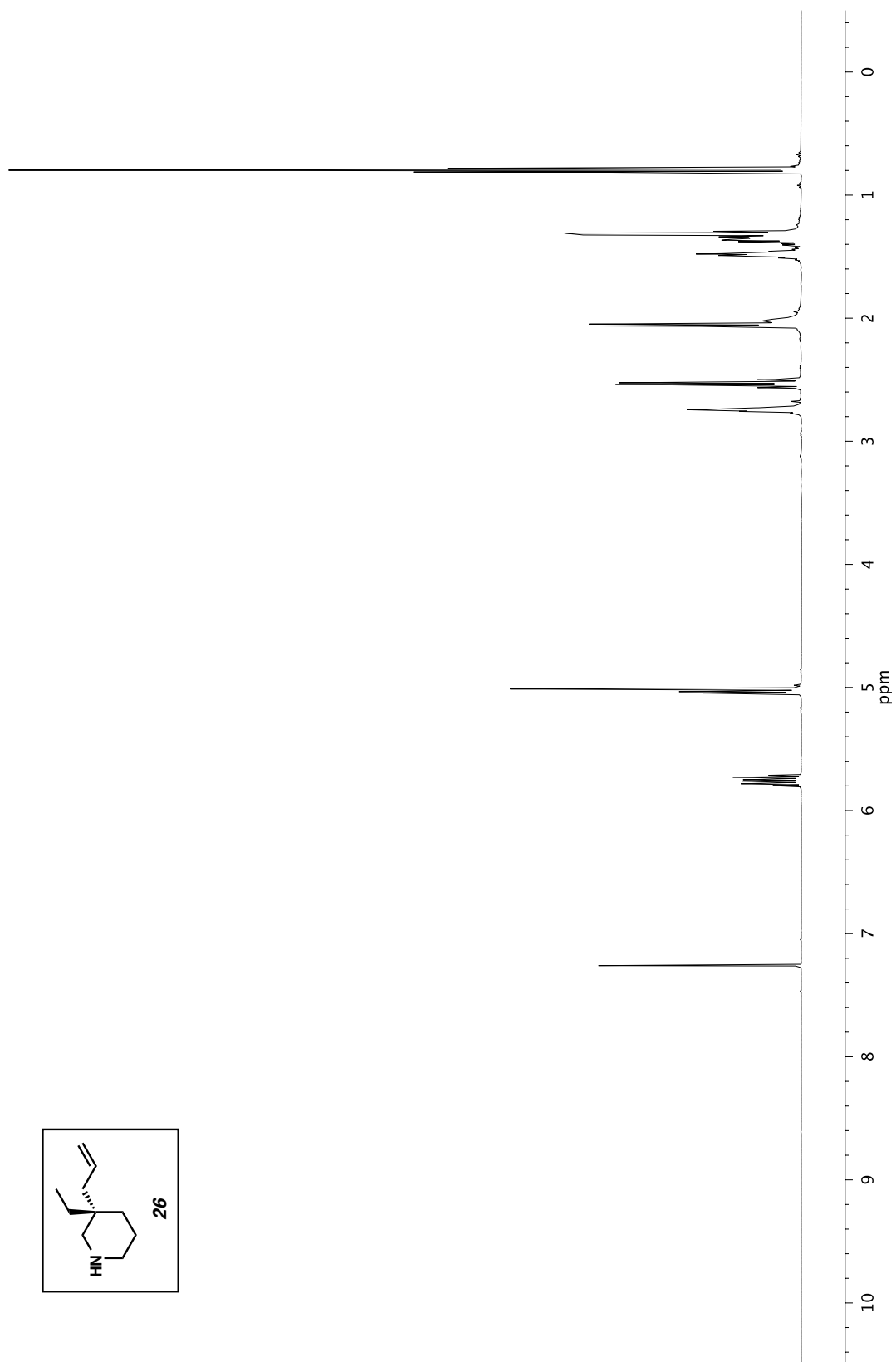


Figure A1.116 ^1H NMR (500 MHz, CDCl_3) of compound **26**.

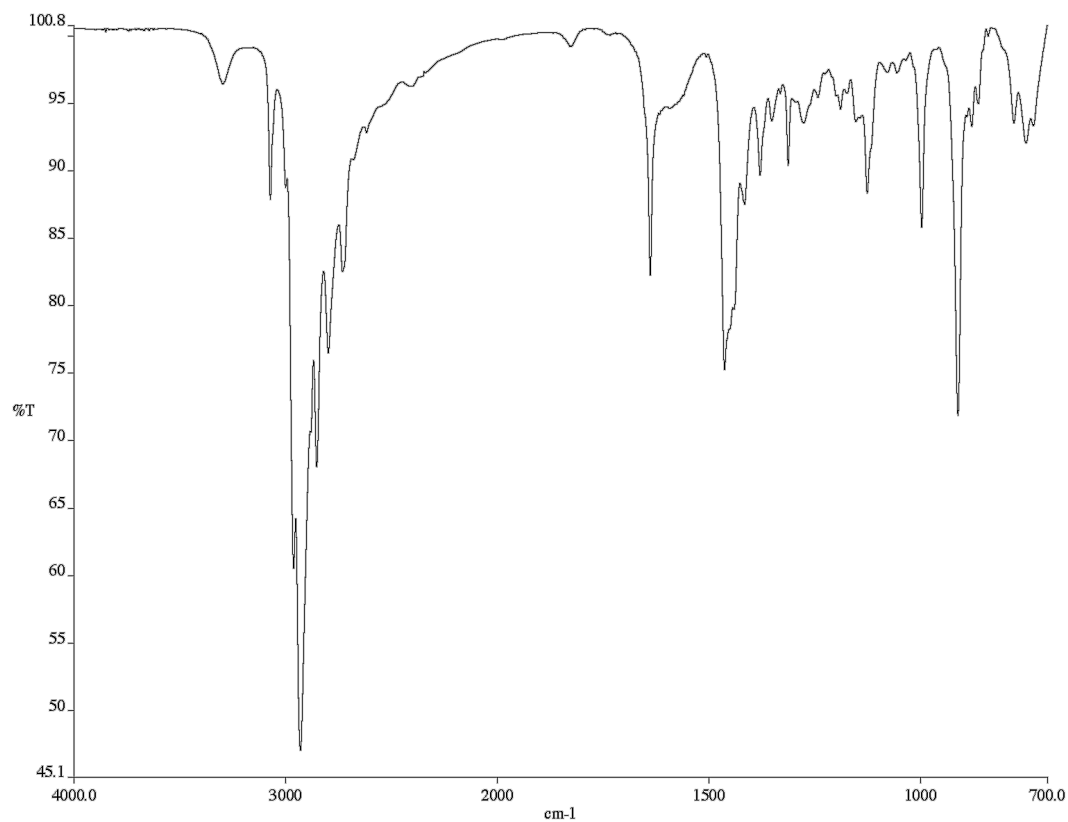


Figure A1.117 Infrared spectrum (Thin Film, NaCl) of compound **26**.

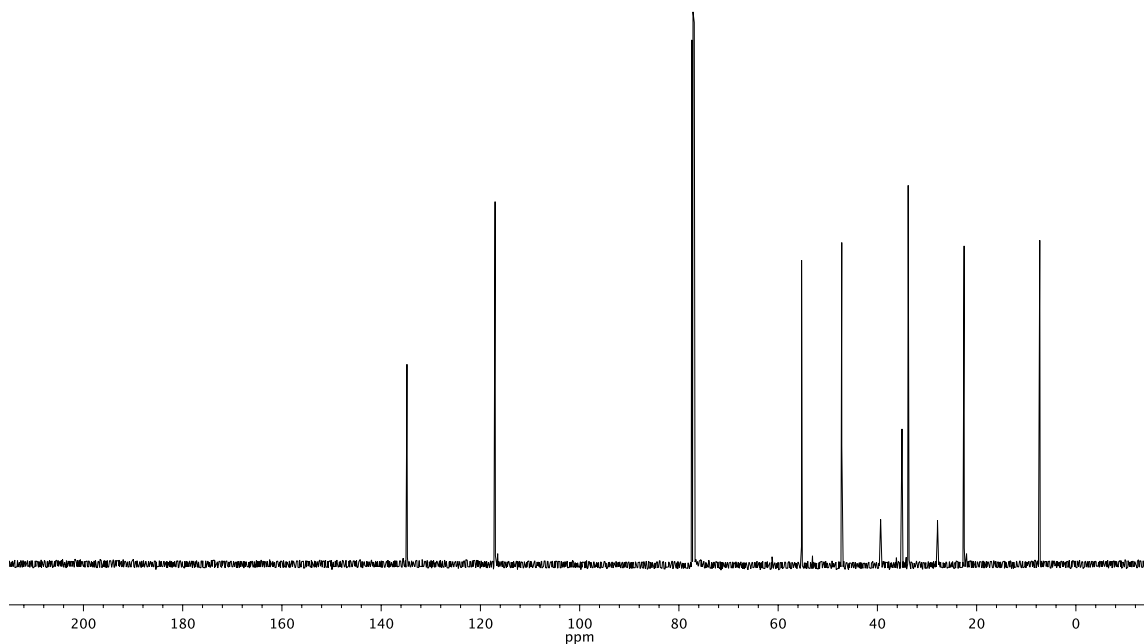


Figure A1.118 ¹³C NMR (126 MHz, CDCl₃) of compound **26**.

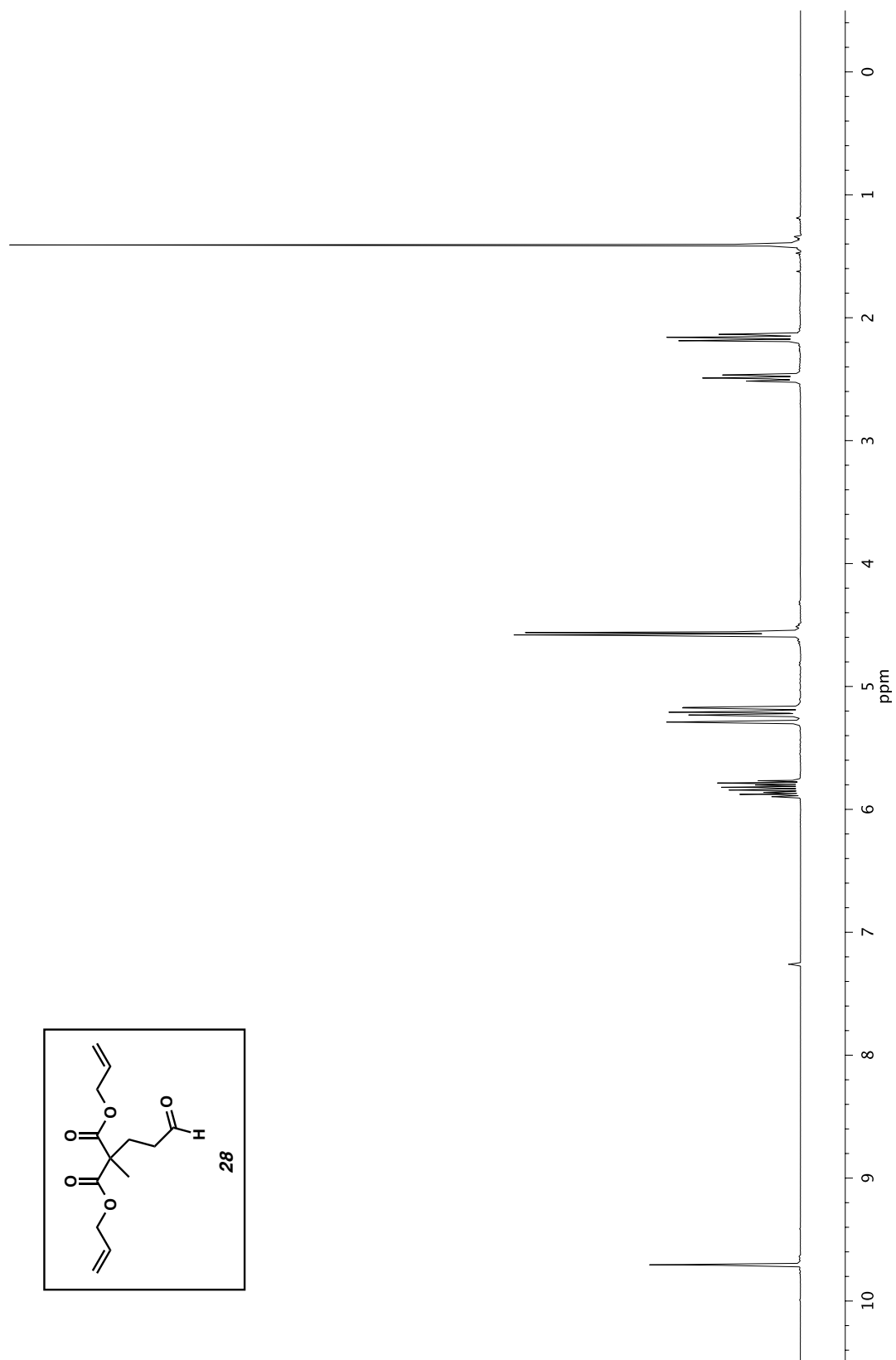


Figure A1.119 ^1H NMR (300 MHz, CDCl_3) of compound **28**.

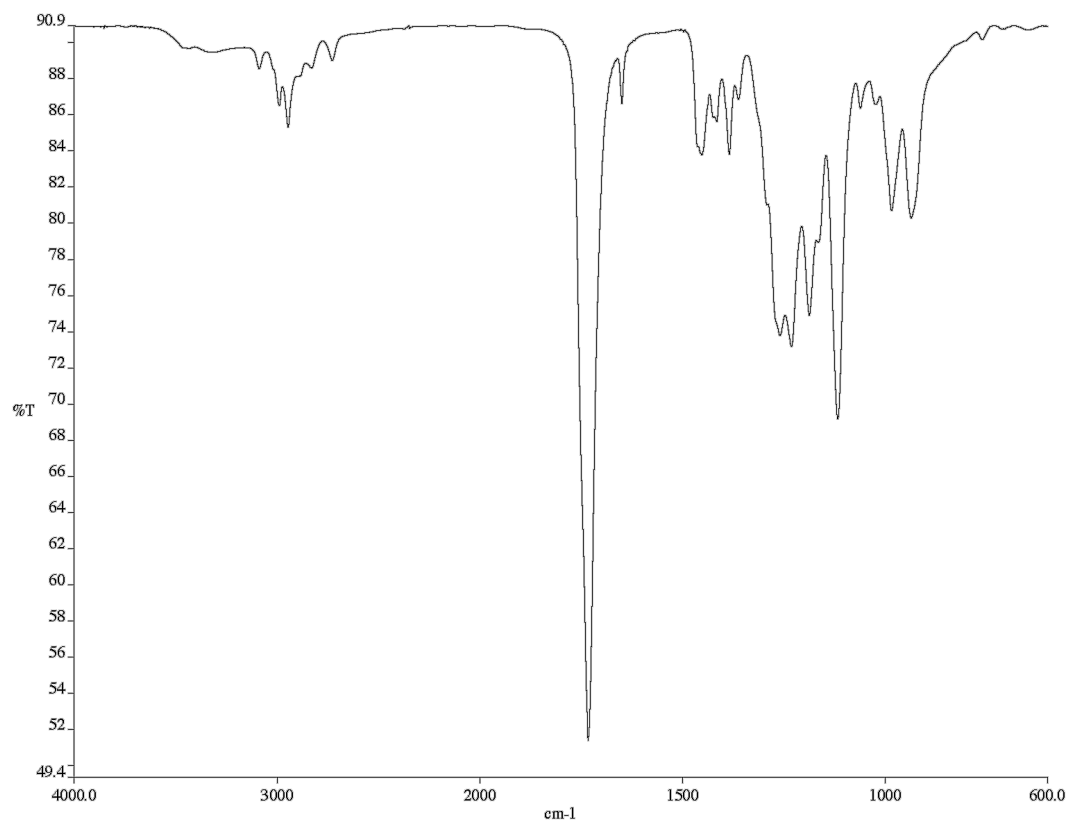


Figure A1.120 Infrared spectrum (Thin Film, NaCl) of compound **28**.

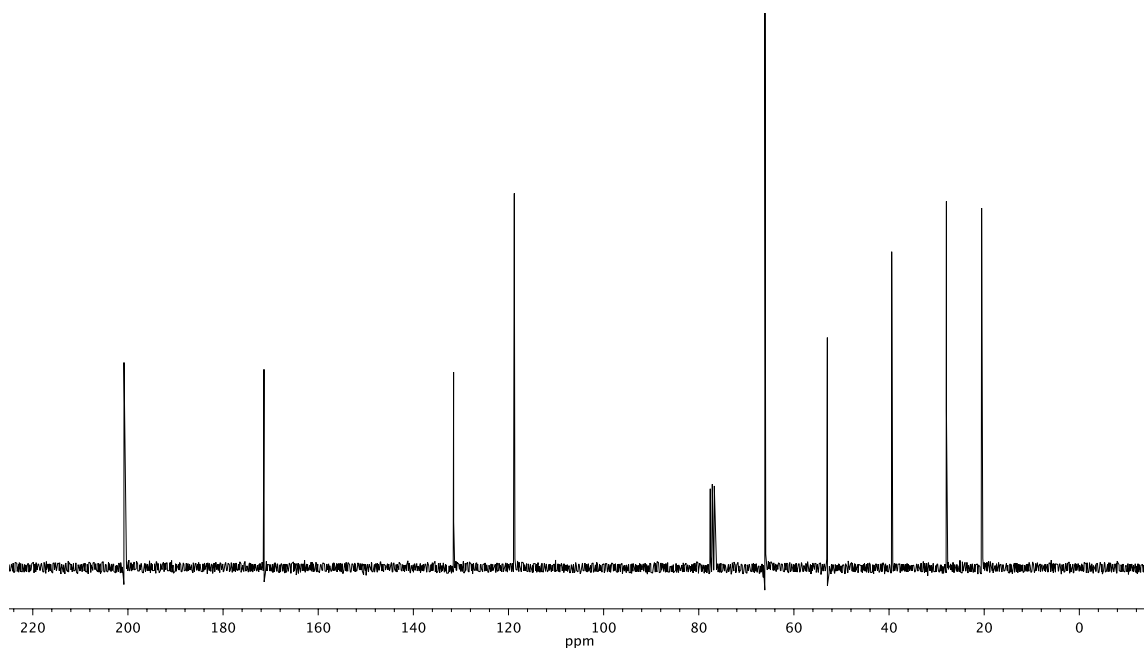


Figure A1.121 ¹³C NMR (75 MHz, CDCl₃) of compound **28**.

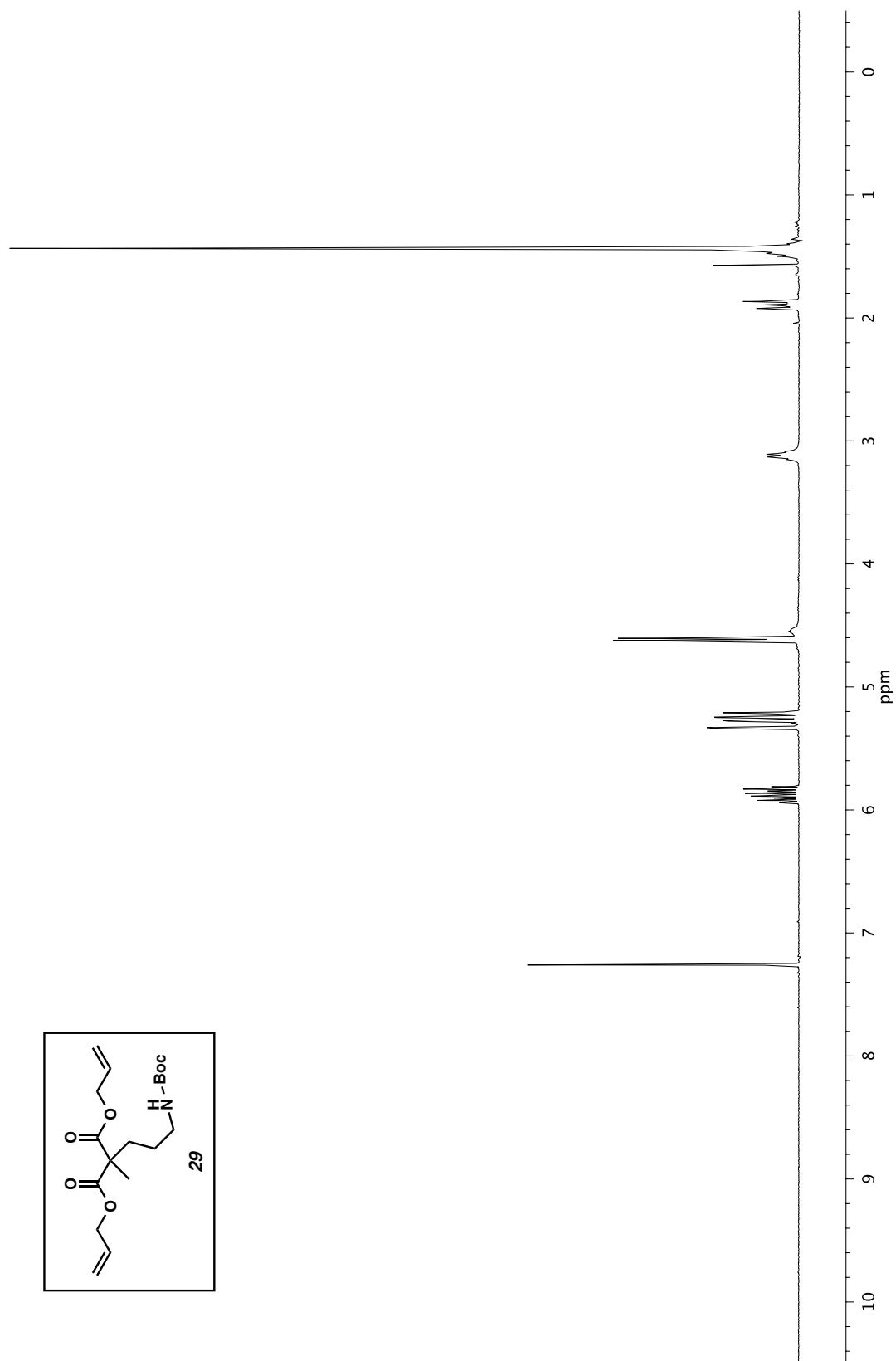


Figure A1.122 ^1H NMR (300 MHz, CDCl_3) of compound **29**.

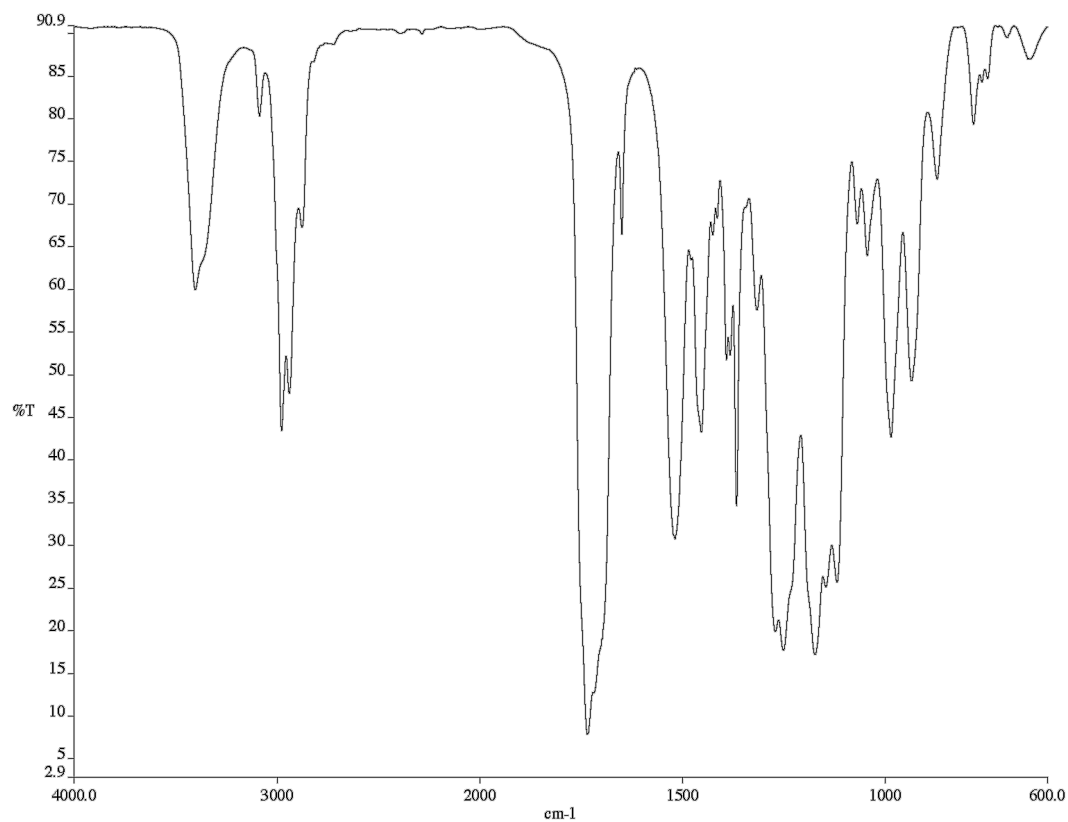


Figure A1.123 Infrared spectrum (Thin Film, NaCl) of compound **29**.

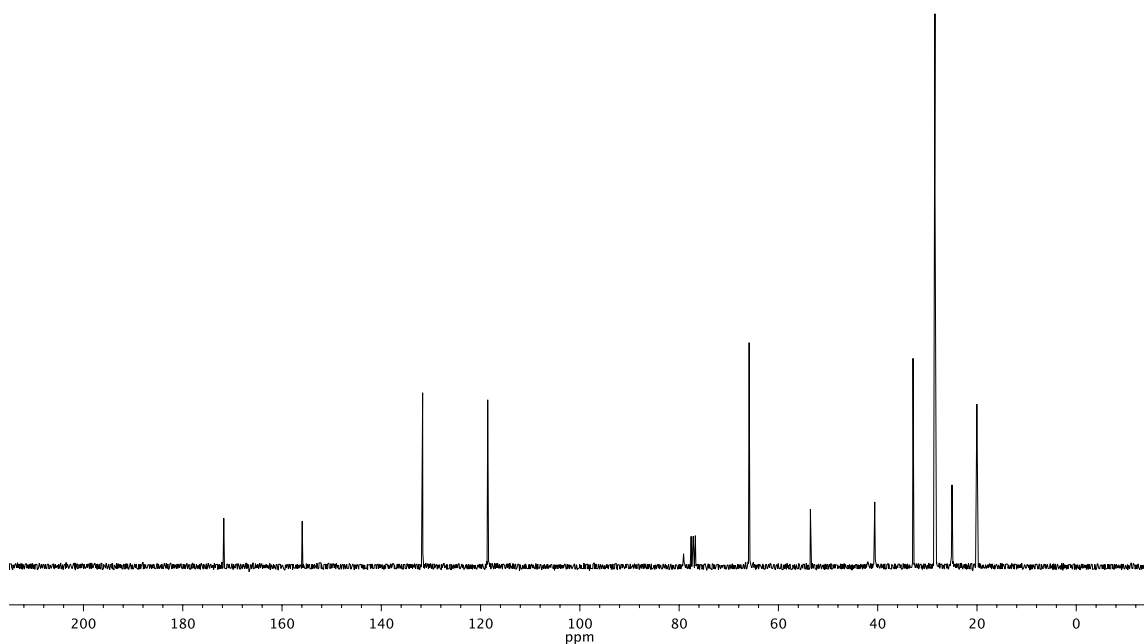


Figure A1.124 ¹³C NMR (75 MHz, CDCl₃) of compound **29**.

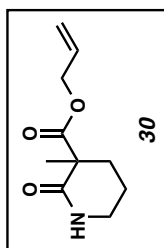
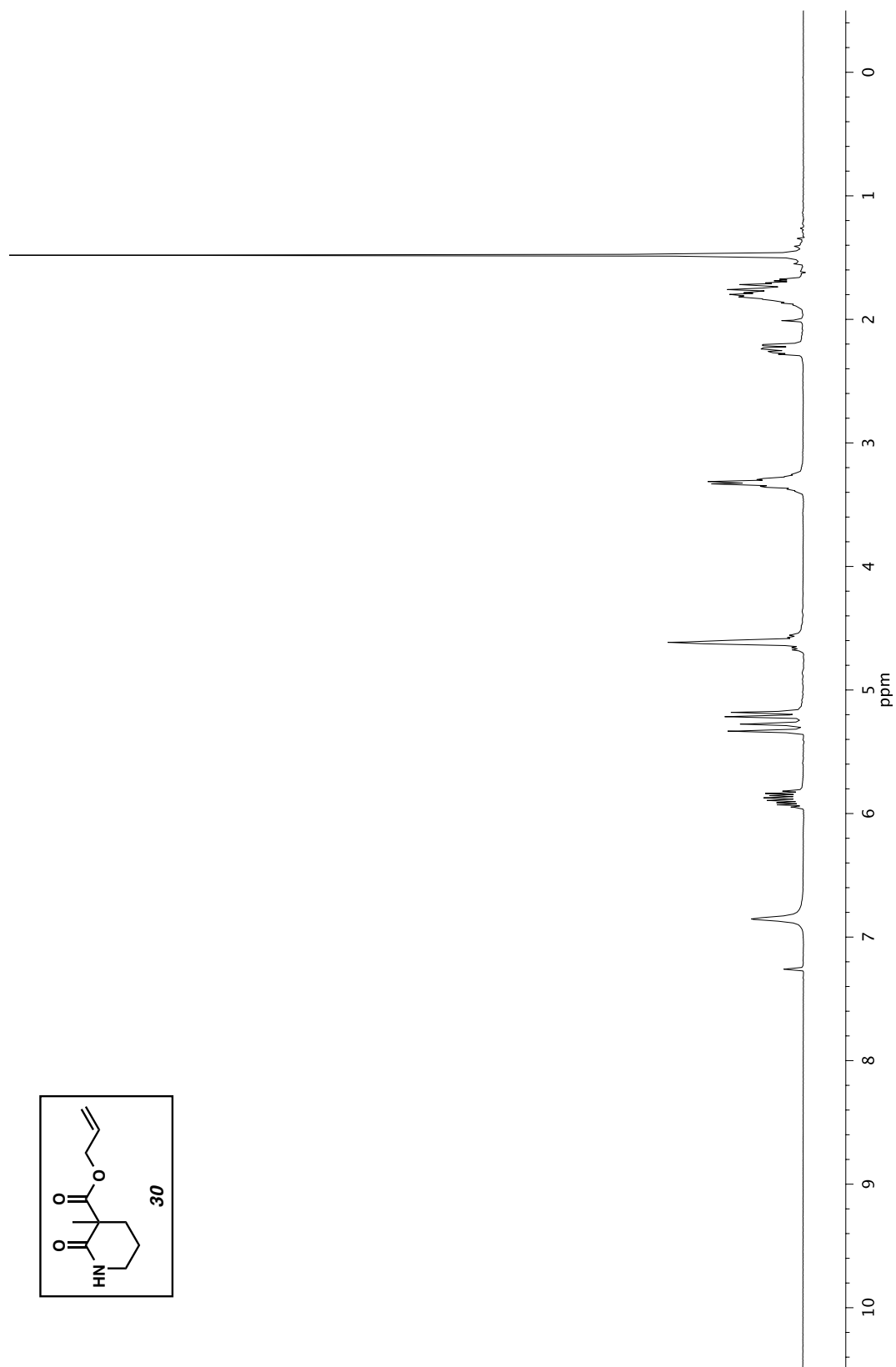


Figure A1.125 ^1H NMR (300 MHz, CDCl_3) of compound **30**.

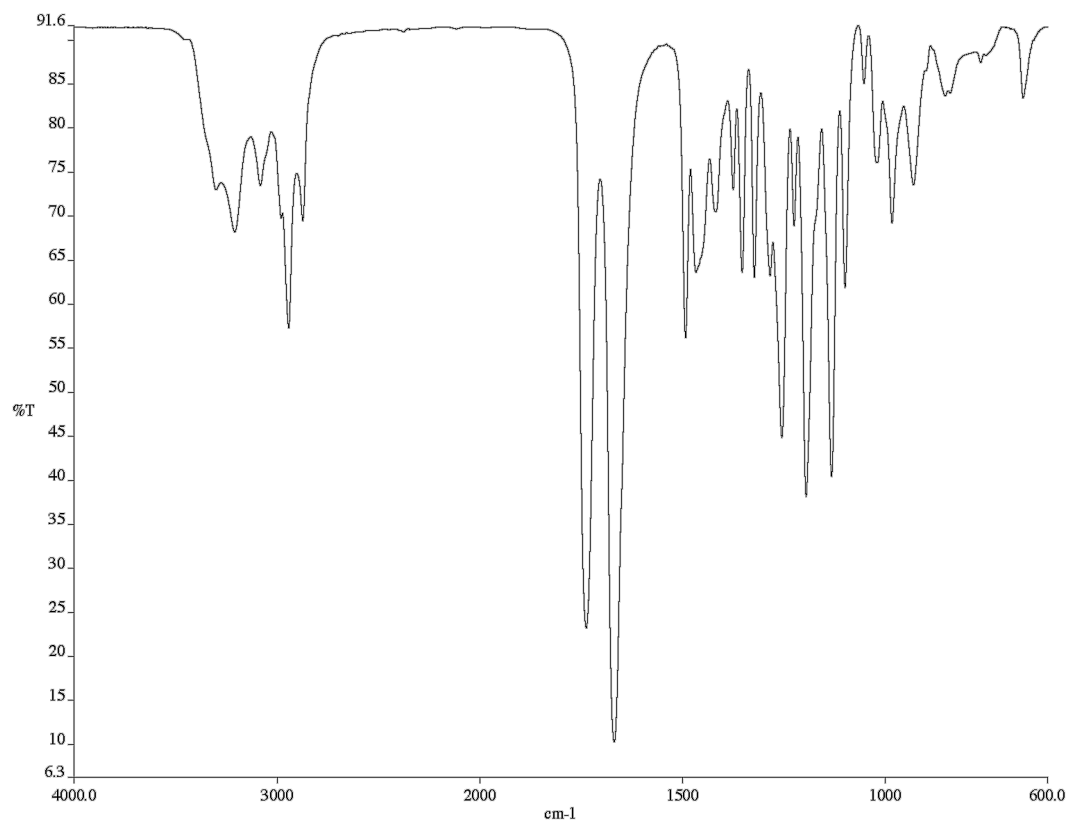


Figure A1.126 Infrared spectrum (Thin Film, NaCl) of compound **30**.

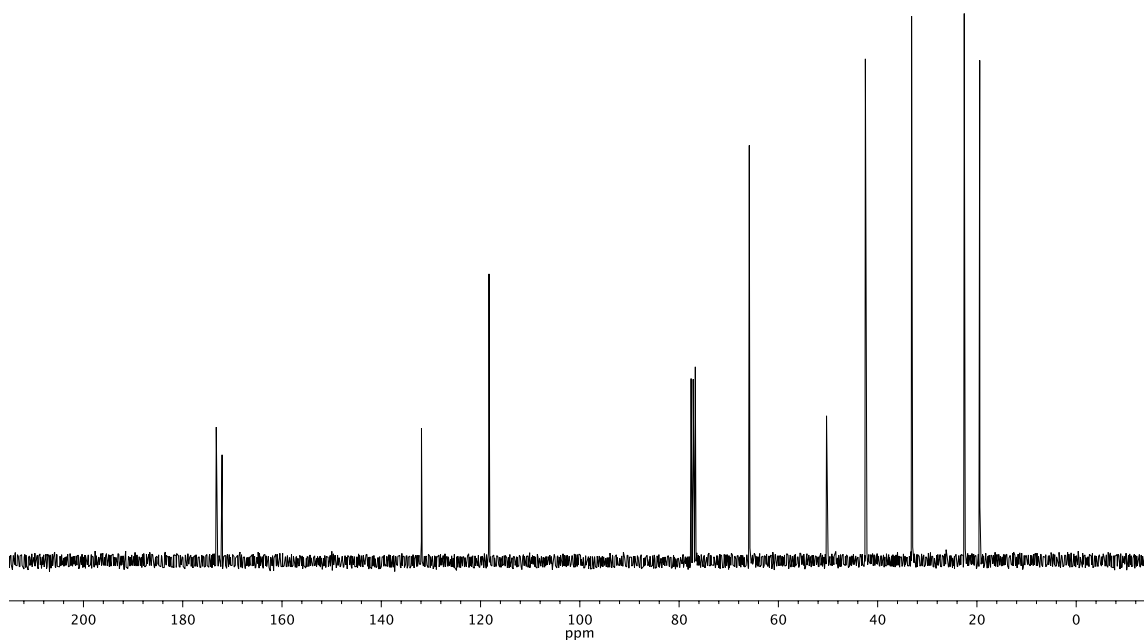


Figure A1.127 ¹³C NMR (75 MHz, CDCl₃) of compound **30**.