

## ***APPENDIX 1***

*Spectra Relevant to Chapter 2*

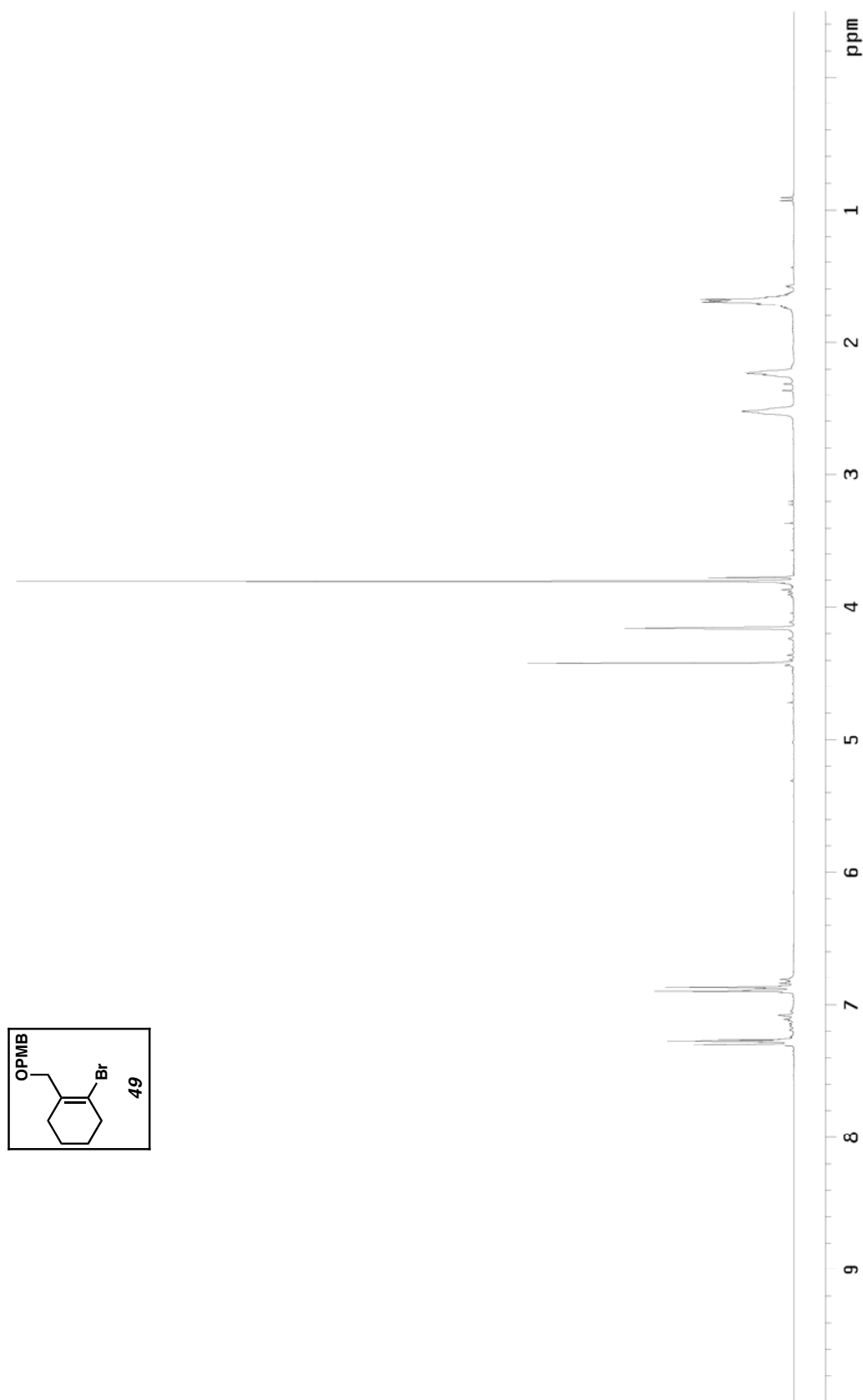


Figure A1.1.1 <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>) of bromide 49.

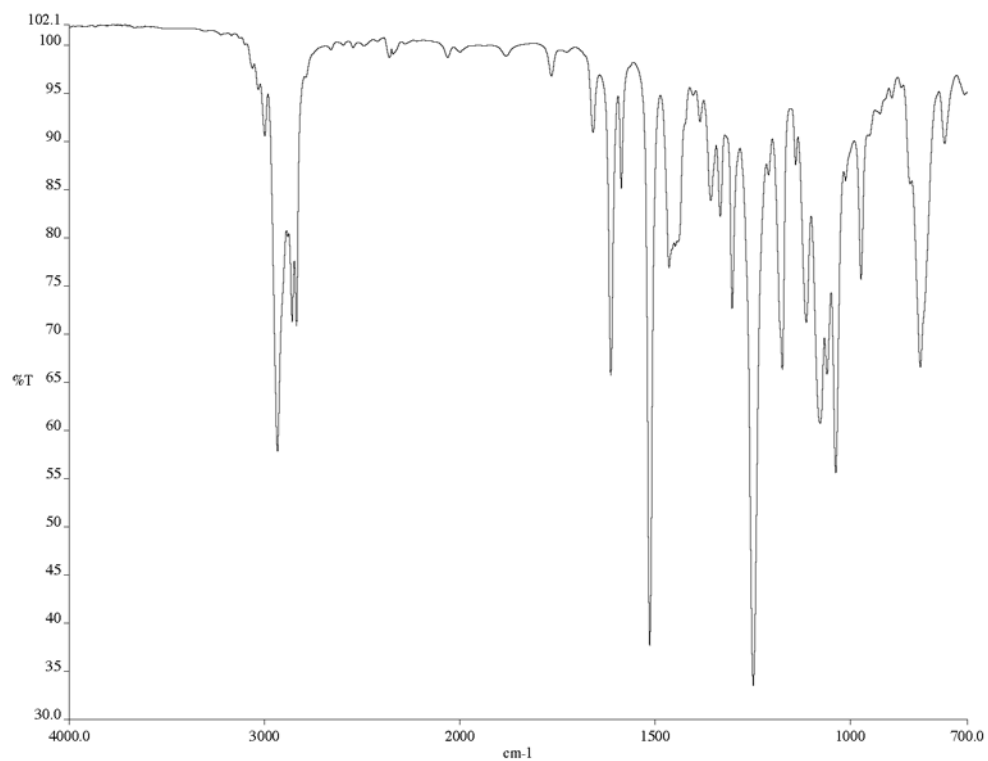


Figure A1.1.2 Infrared spectrum (thin film/NaCl) of bromide **49**.

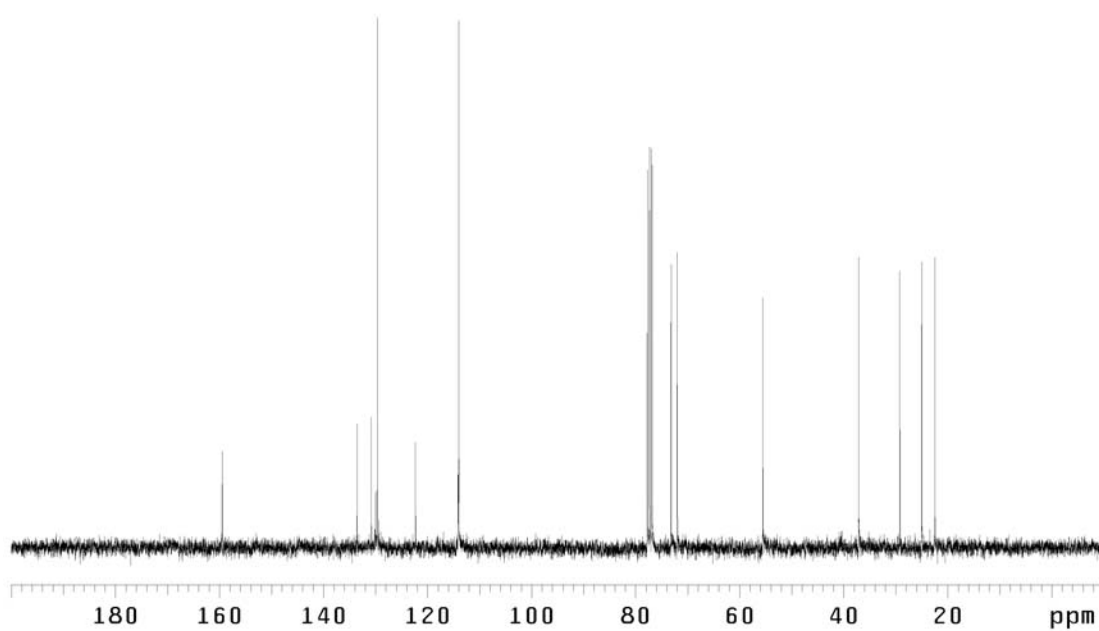


Figure A1.1.3 <sup>13</sup>C NMR (75 MHz, CDCl<sub>3</sub>) of bromide **49**.

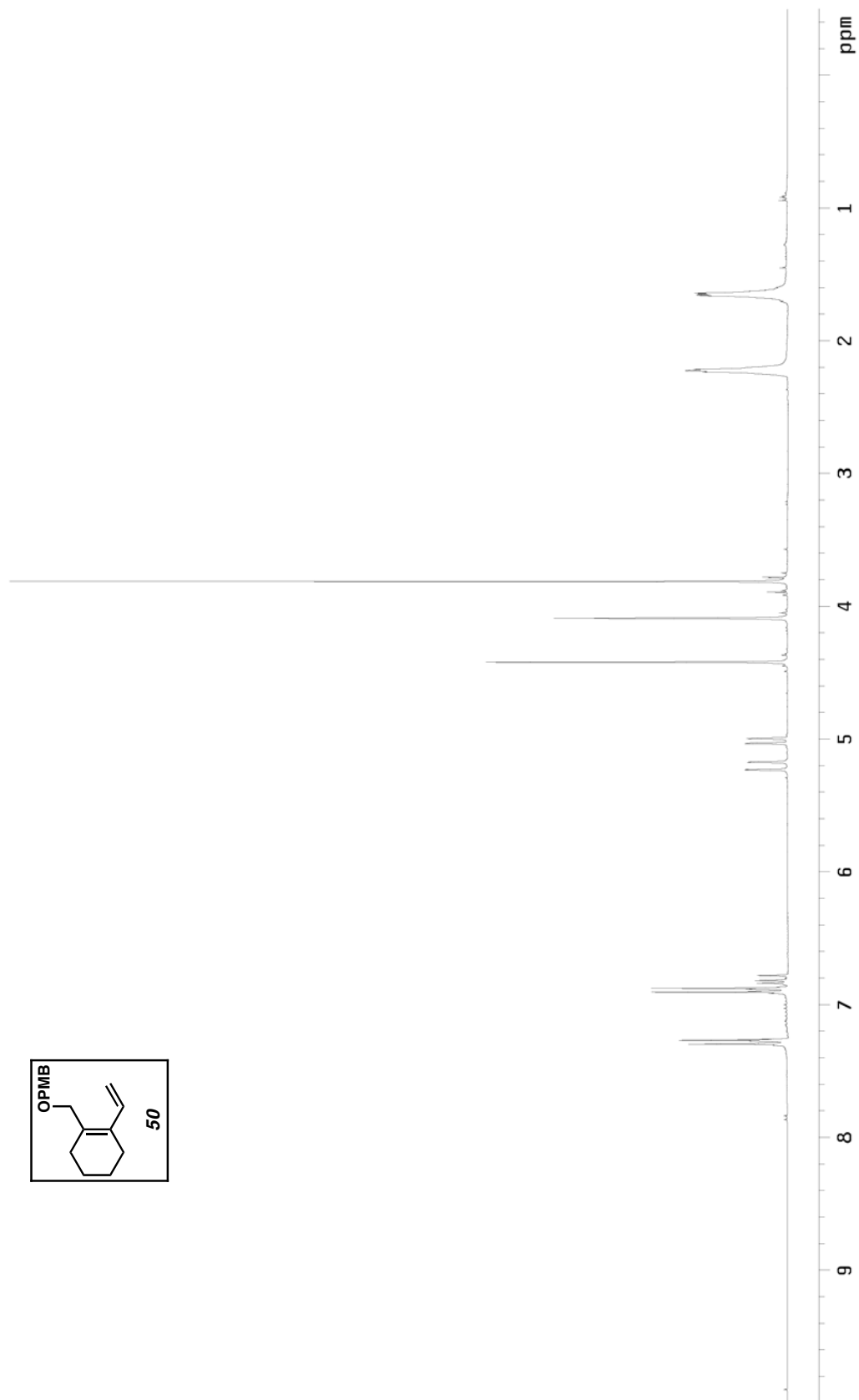


Figure A1.2.1 <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>) of diene 50.

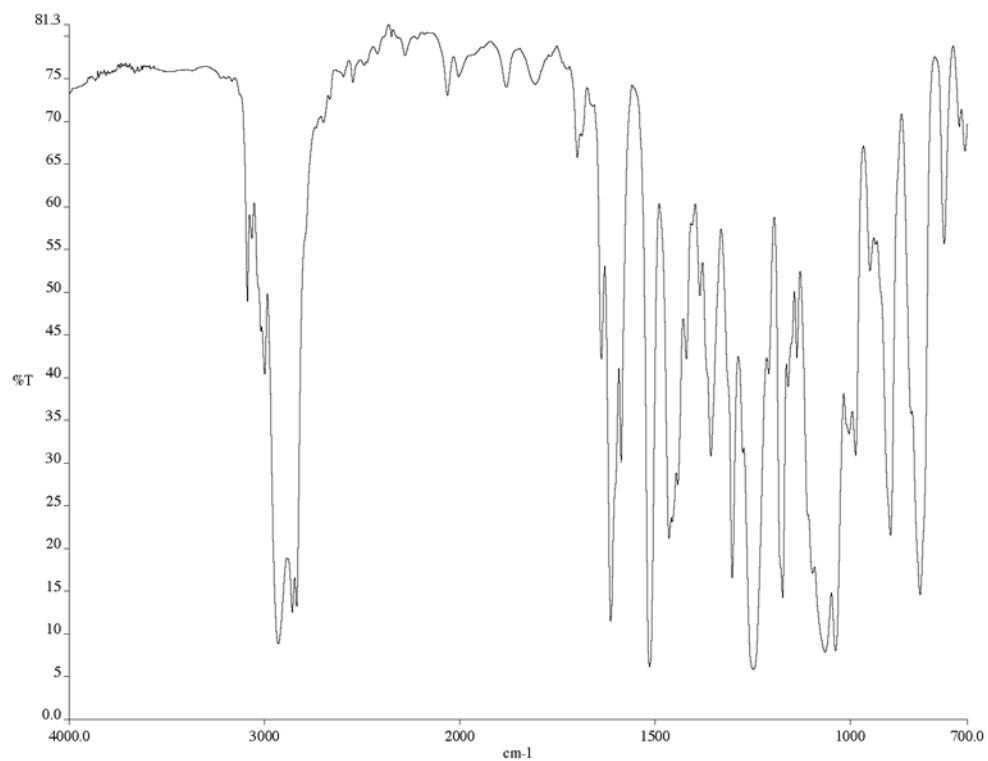


Figure A1.2.2 Infrared spectrum (thin film/NaCl) of diene **50**.

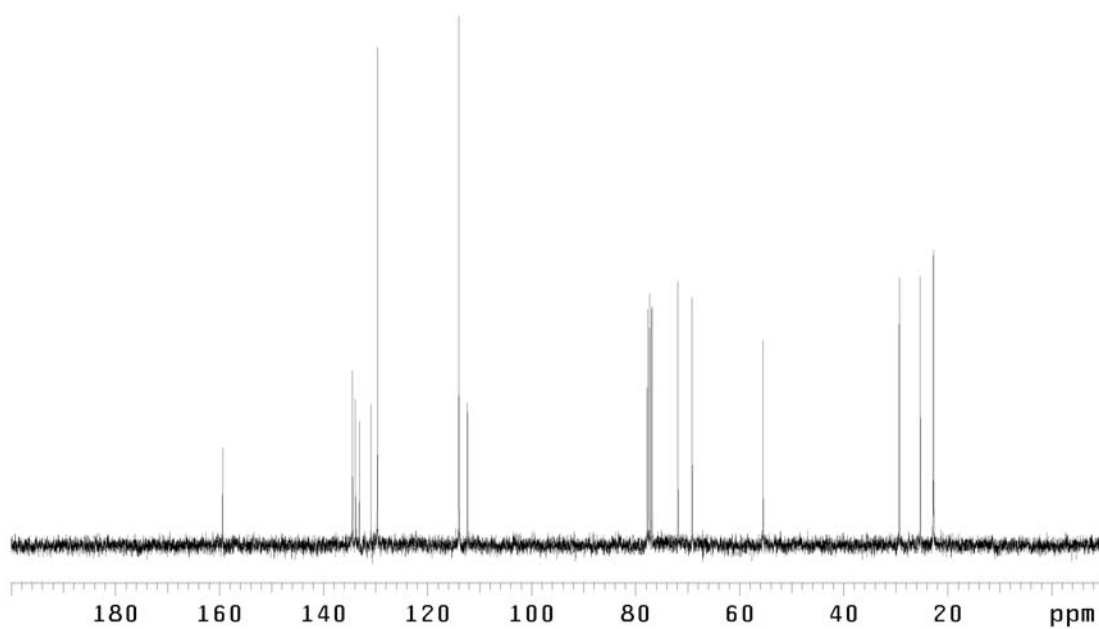


Figure A1.2.3 <sup>13</sup>C NMR (75 MHz, CDCl<sub>3</sub>) of diene **50**.

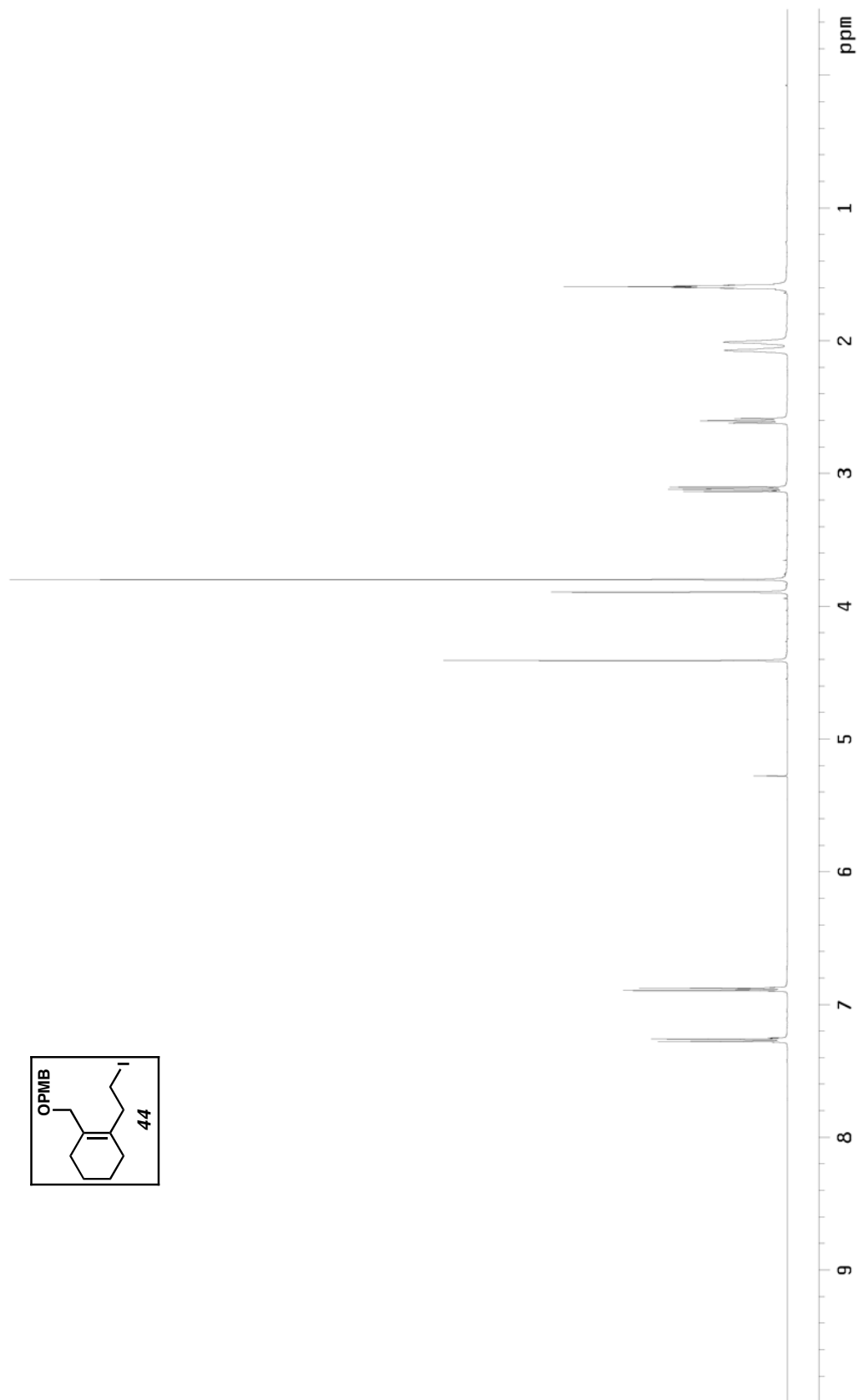


Figure A1.3.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of iodide 44.

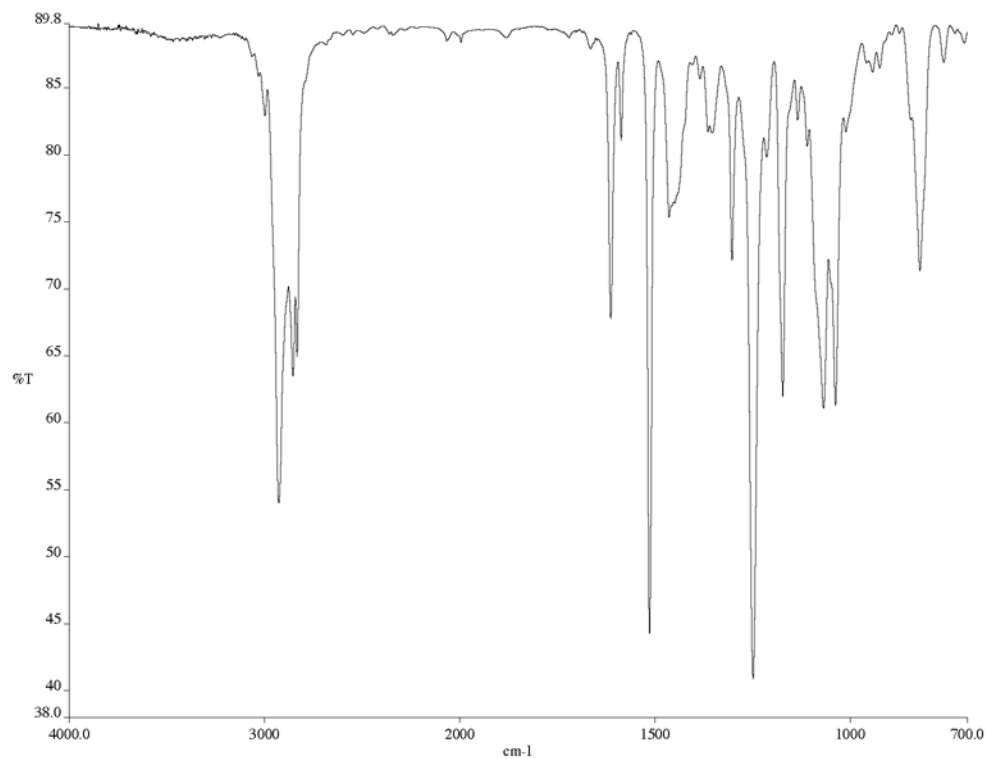


Figure A1.3.2 Infrared spectrum (thin film/NaCl) of iodide **44**.

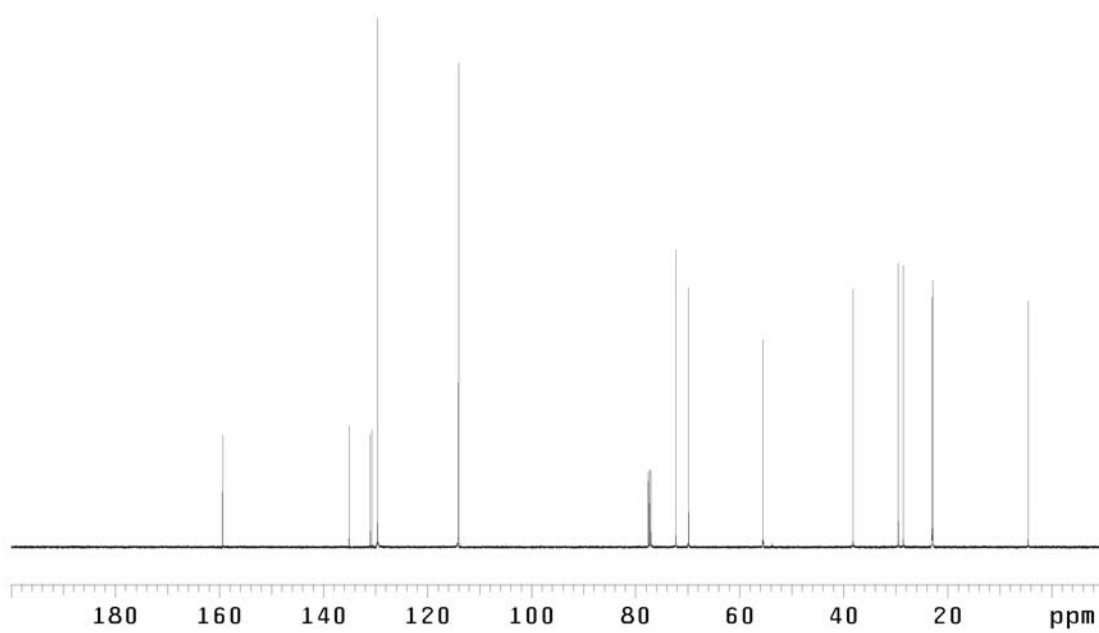


Figure A1.3.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of iodide **44**.

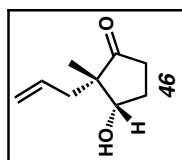
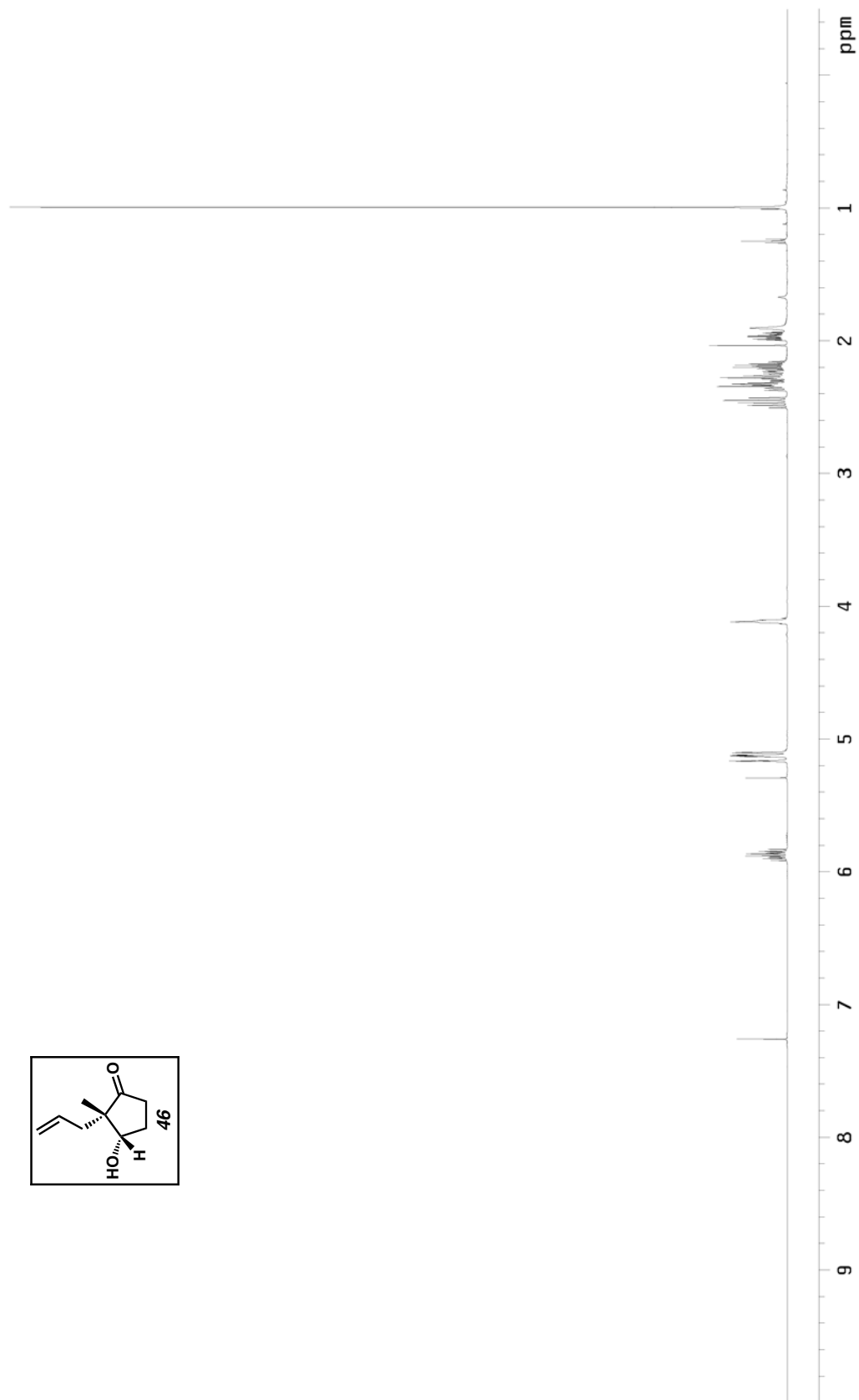


Figure A1.4.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of alcohol 46.



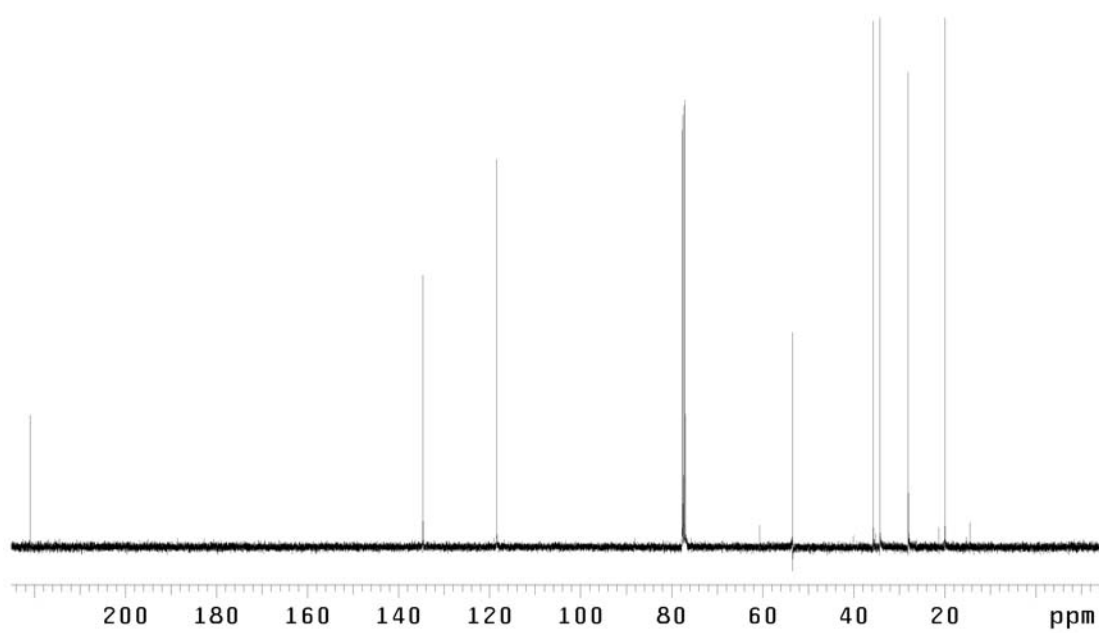


Figure A1.4.2  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ) of alcohol **46**.

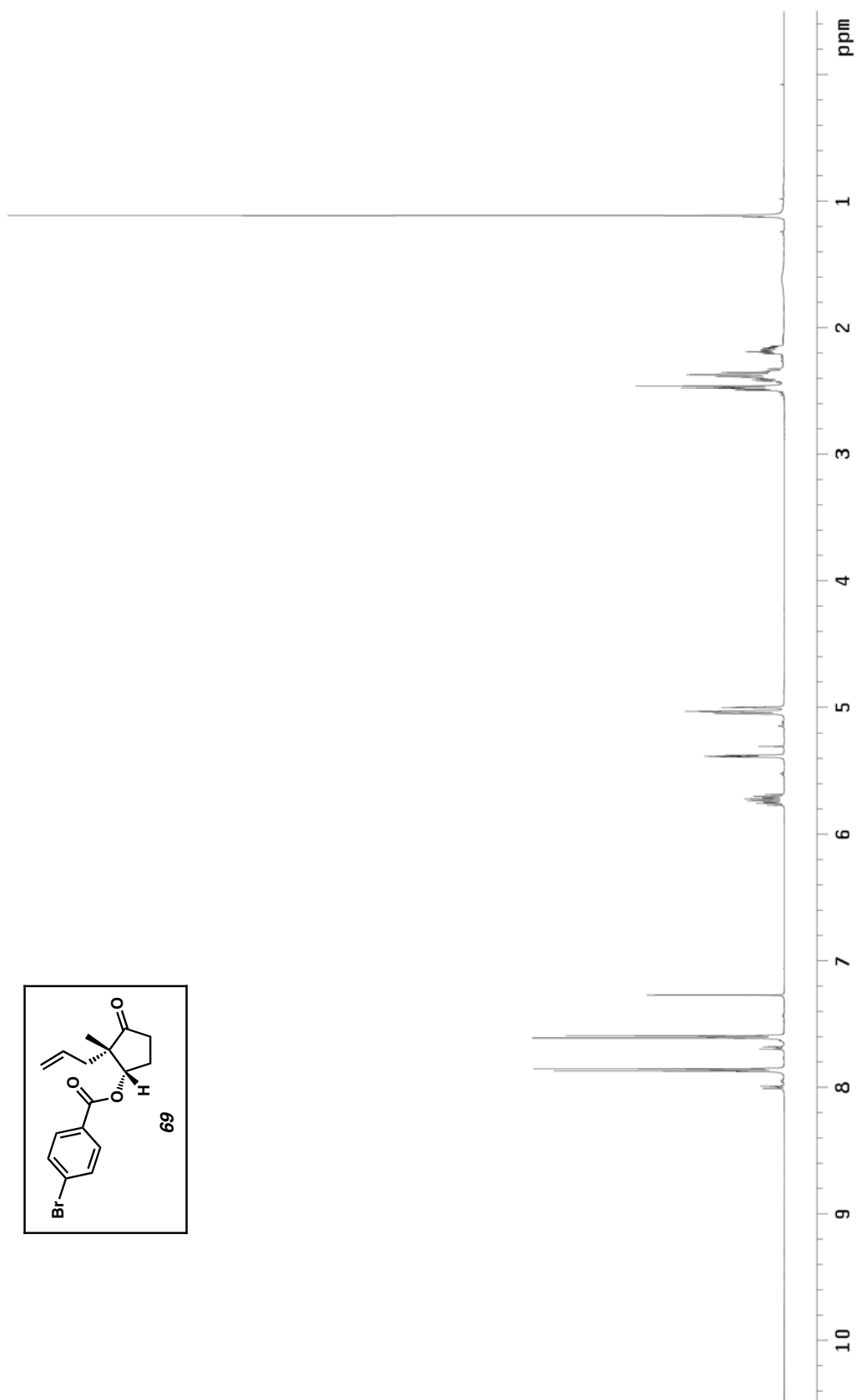
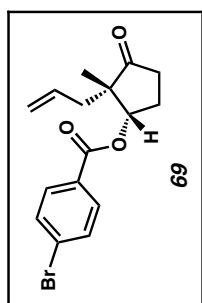


Figure A1.5.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **69**.

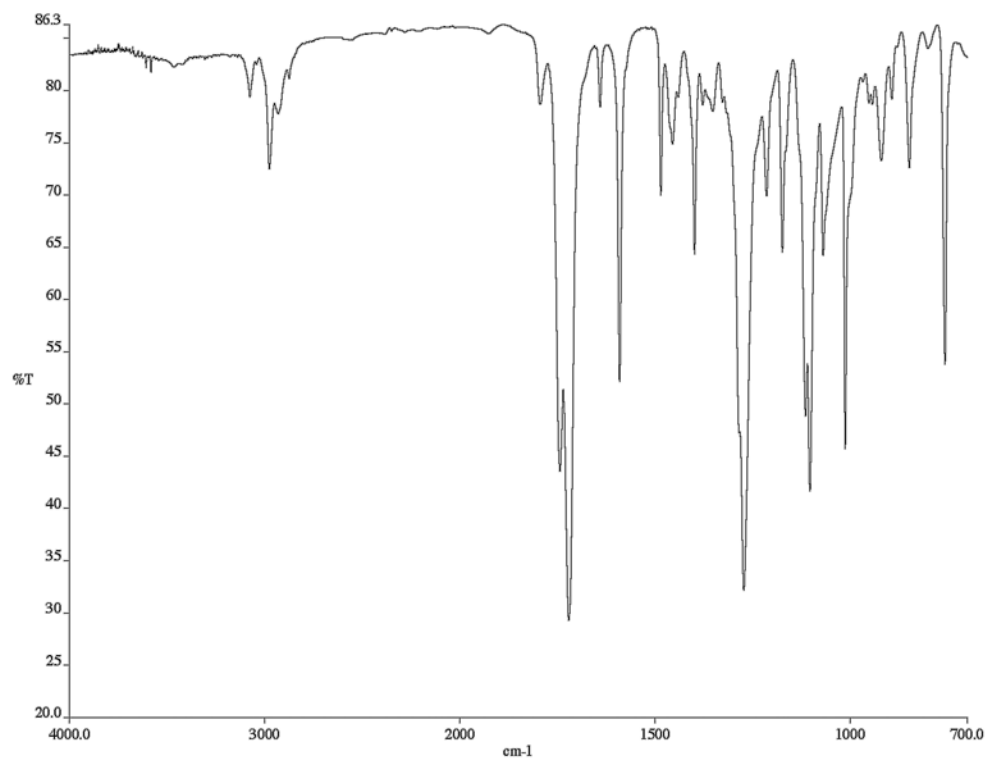


Figure A1.5.2 Infrared spectrum (thin film/NaCl) of compound **69**.

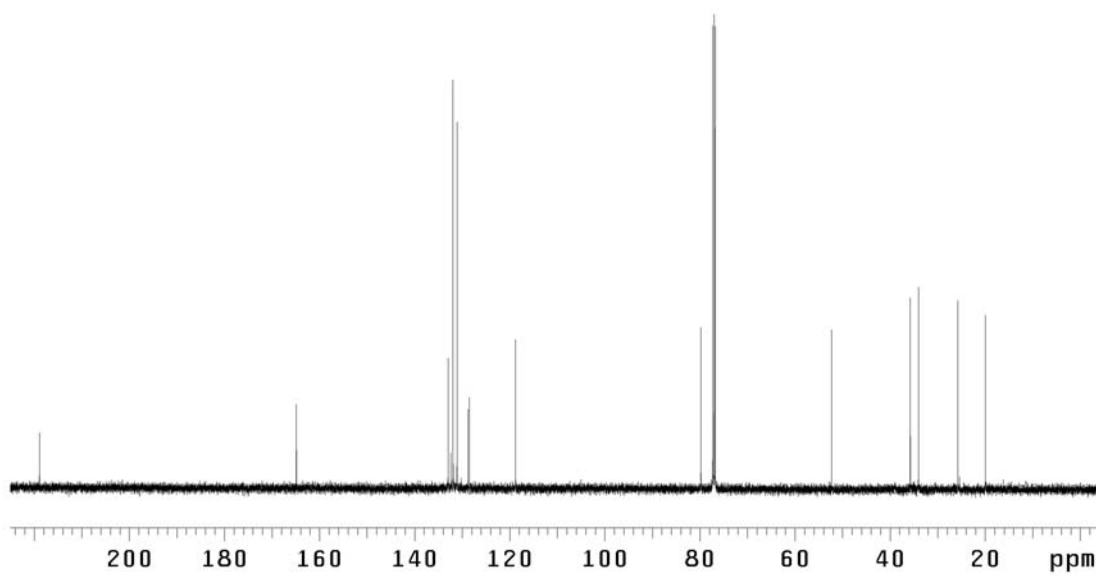


Figure A1.5.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **69**.

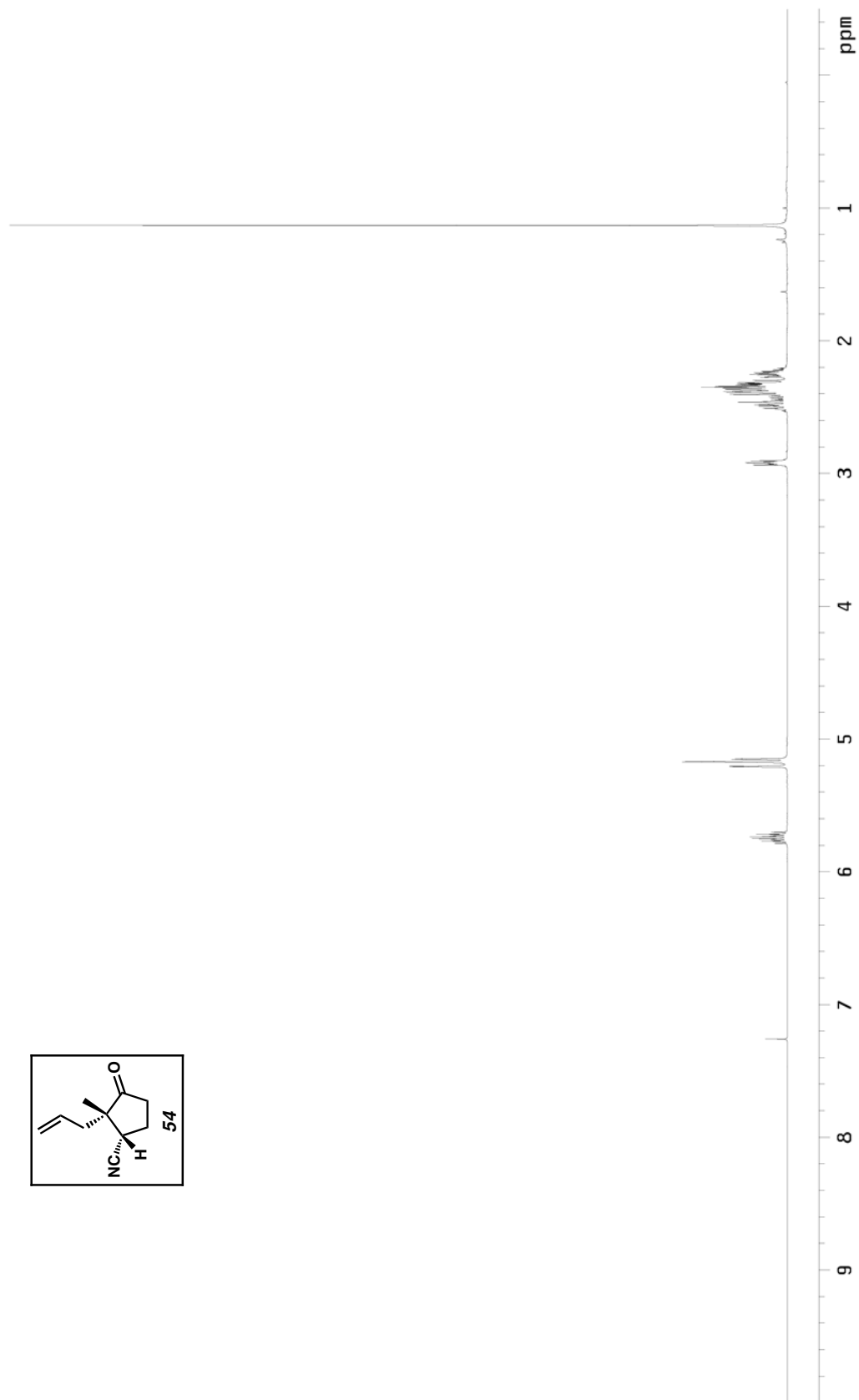


Figure A1.6.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of nitrile **54**.

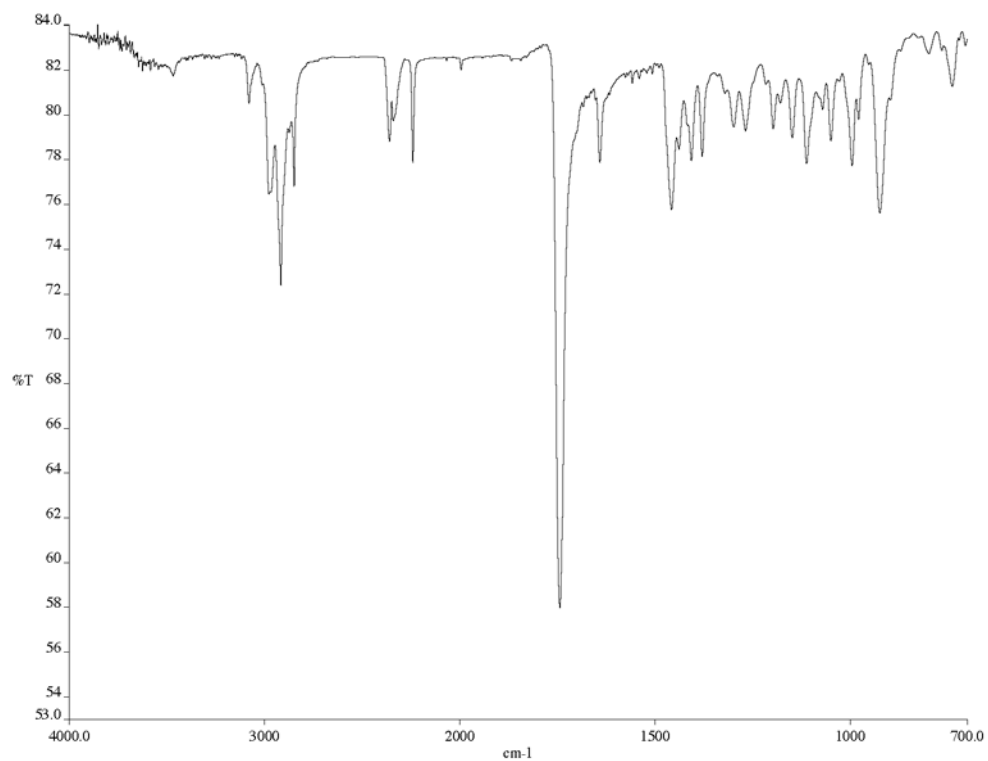


Figure A1.6.2 Infrared spectrum (thin film/NaCl) of nitrile **54**.

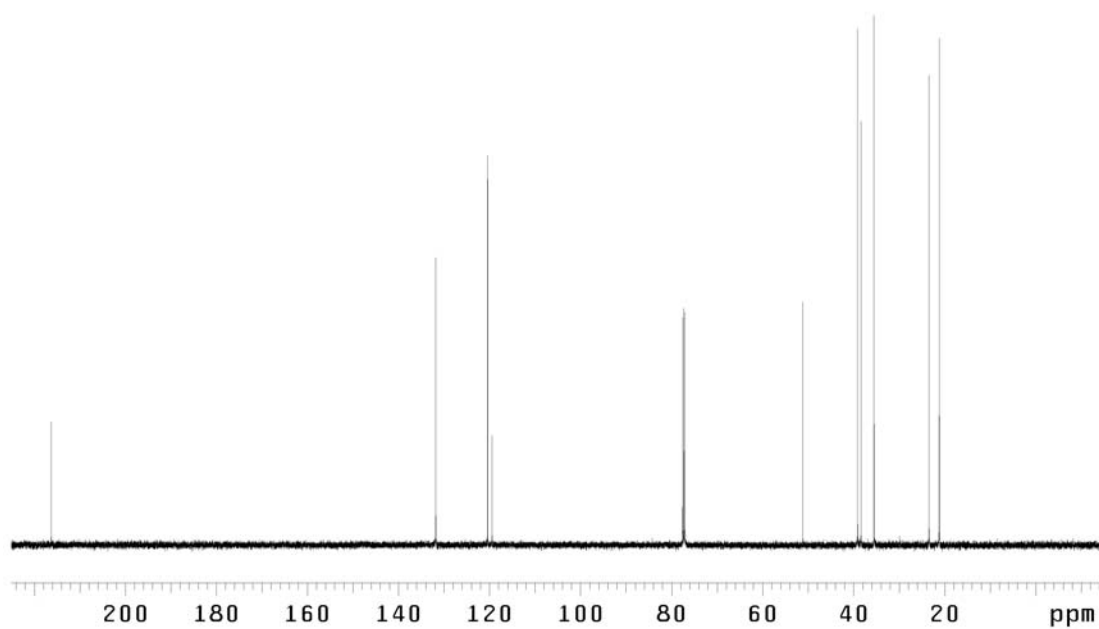


Figure A1.6.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of nitrile **54**.

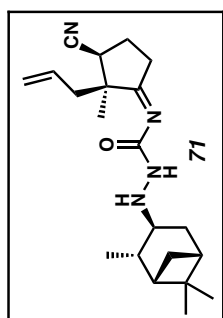
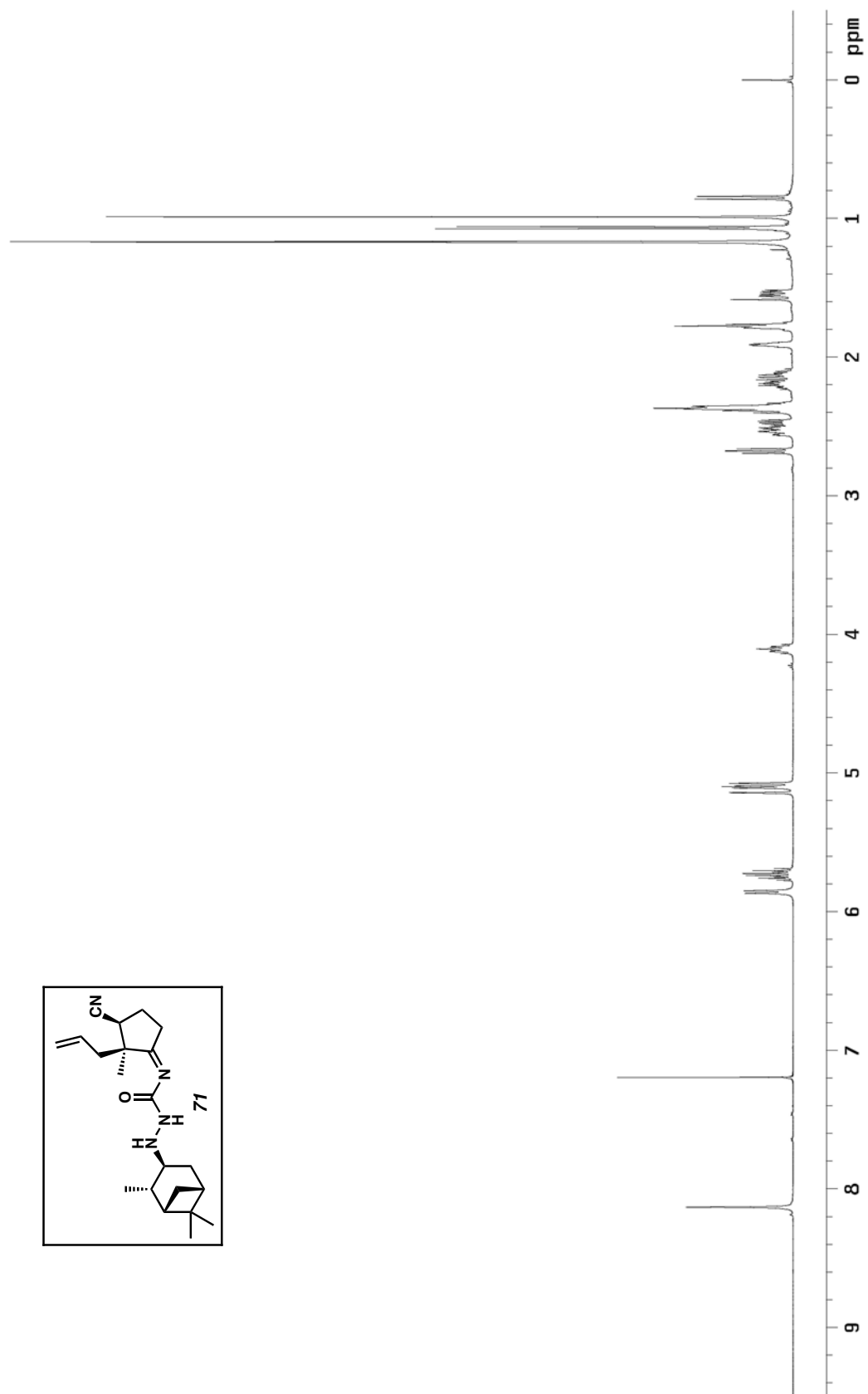


Figure A1.7.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound 71.

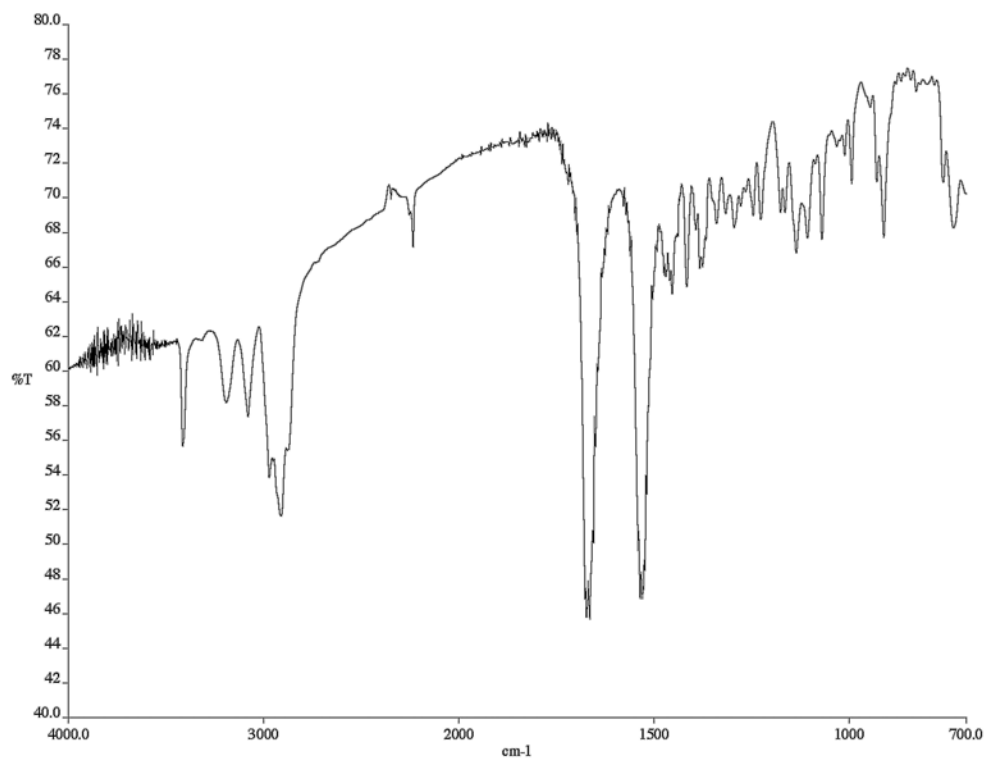


Figure A1.7.2 Infrared spectrum (thin film/NaCl) of compound **71**.

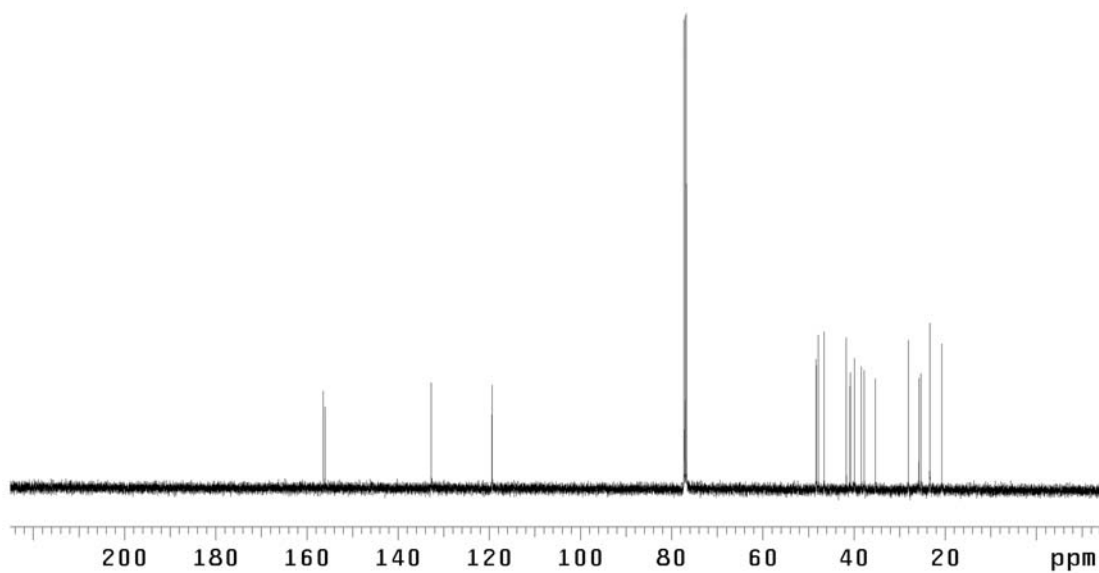


Figure A1.7.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **71**.

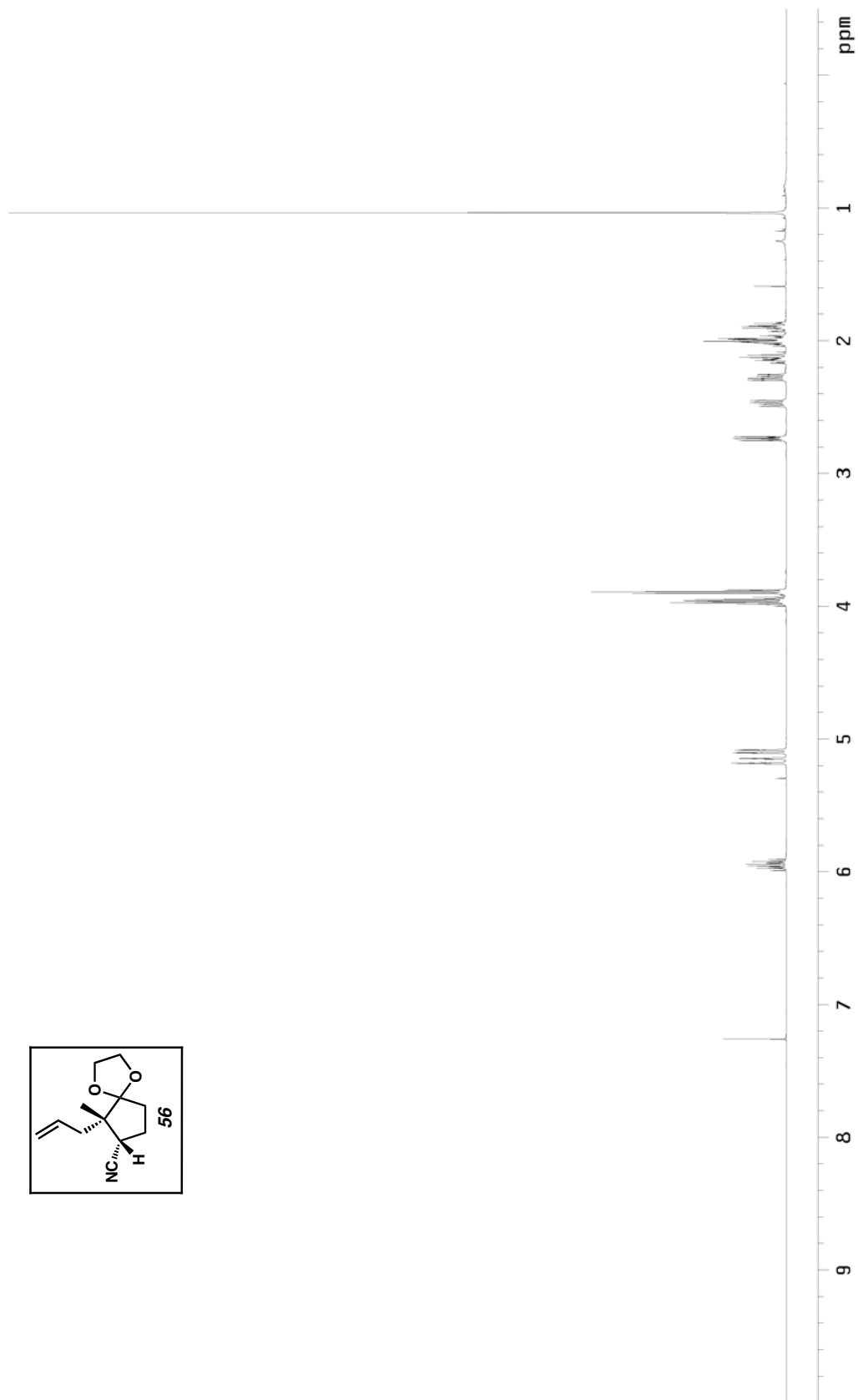
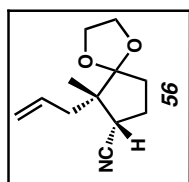


Figure A1.8.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of ketal **56**.



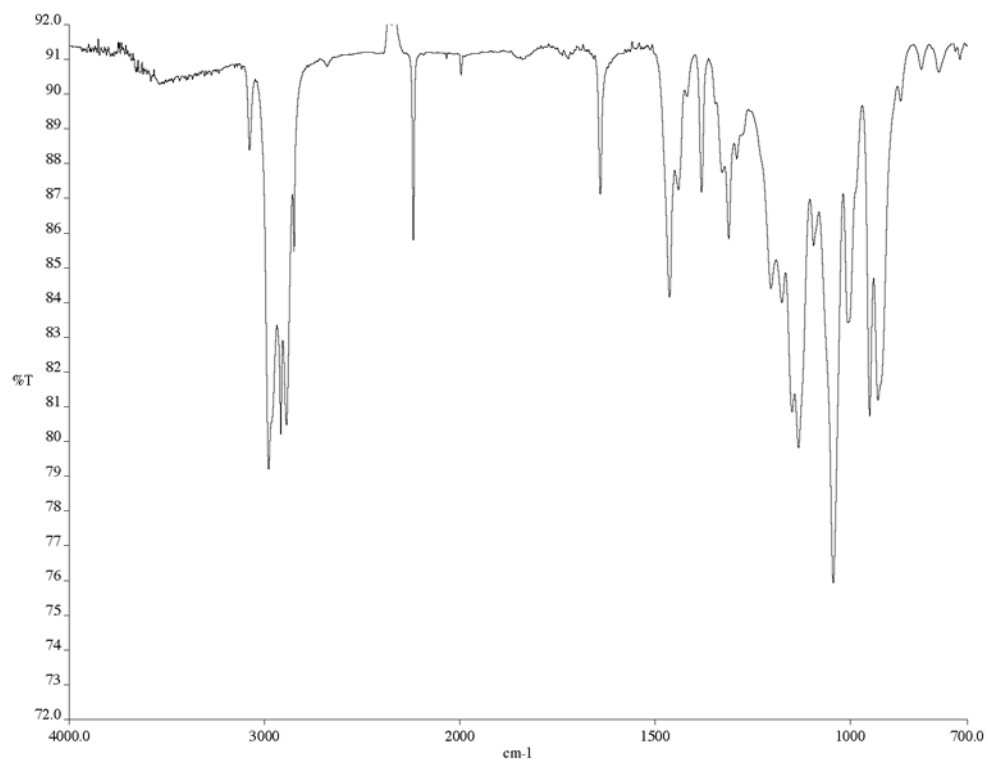


Figure A1.8.2 Infrared spectrum (thin film/NaCl) of ketal **56**.

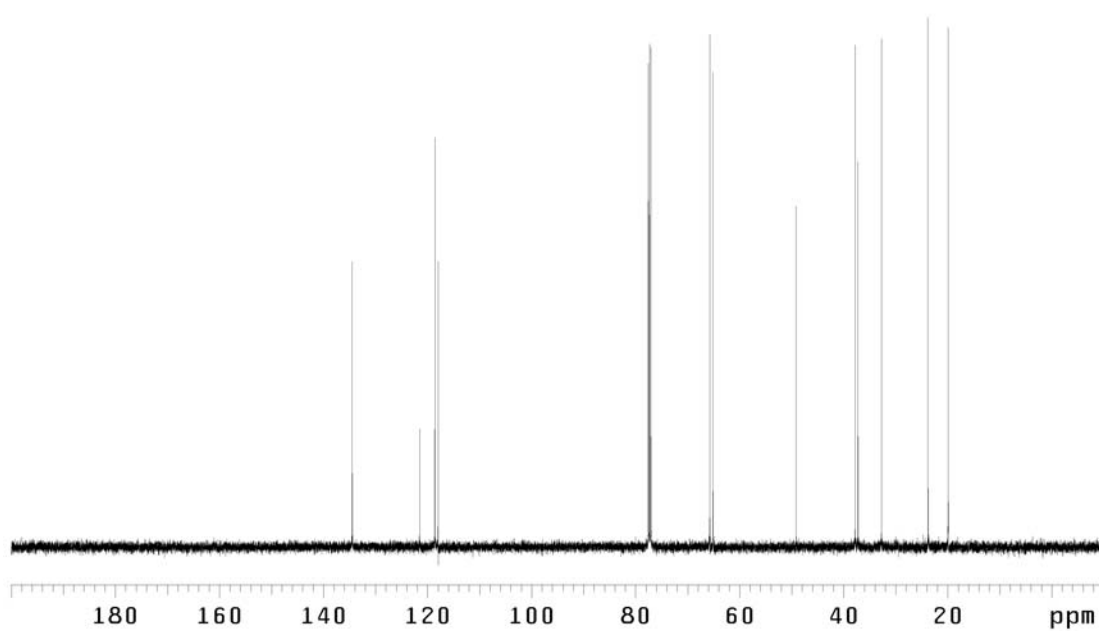


Figure A1.8.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of ketal **56**.

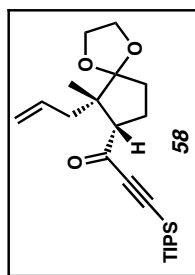
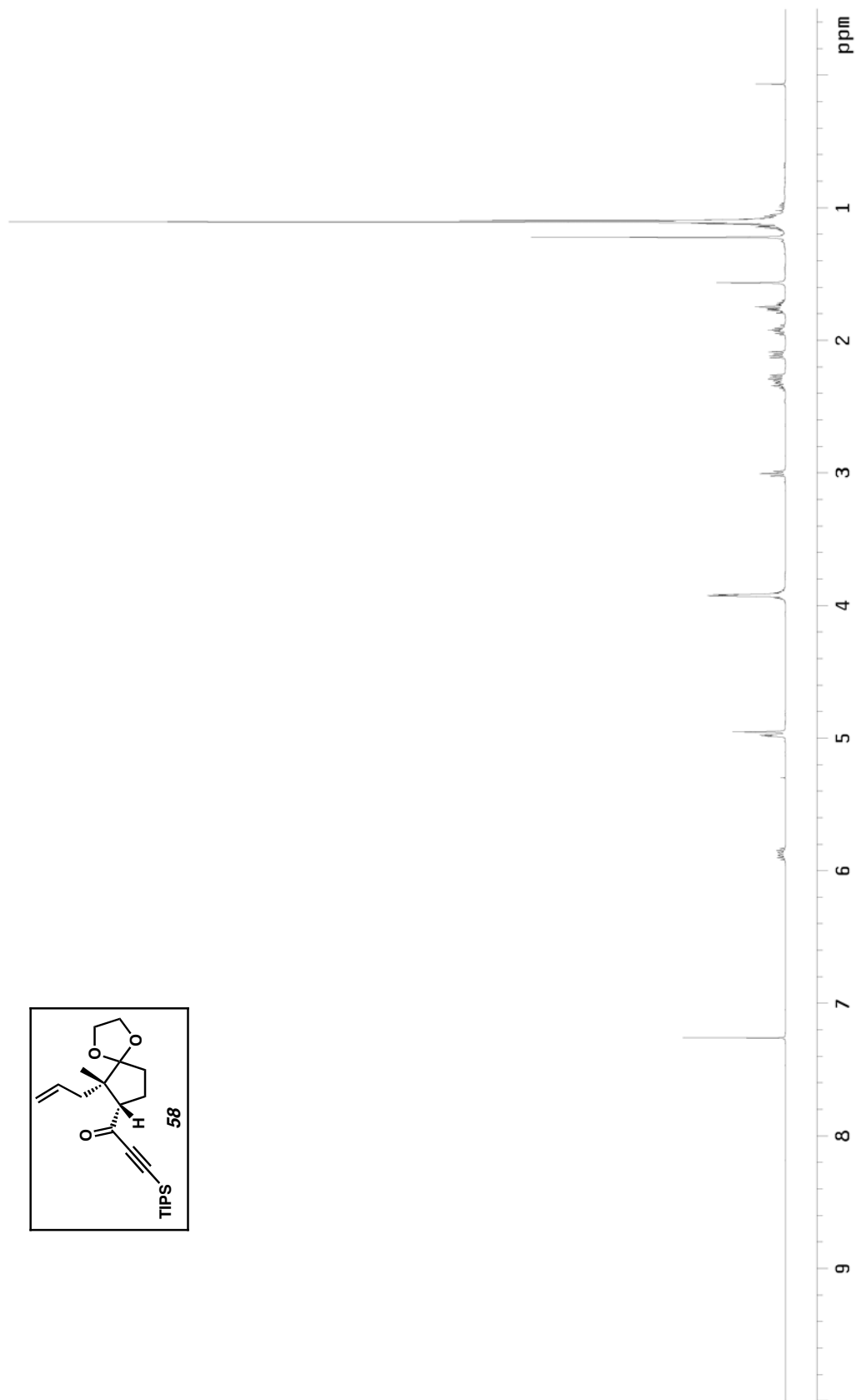


Figure A1.9.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of ynone **58**.

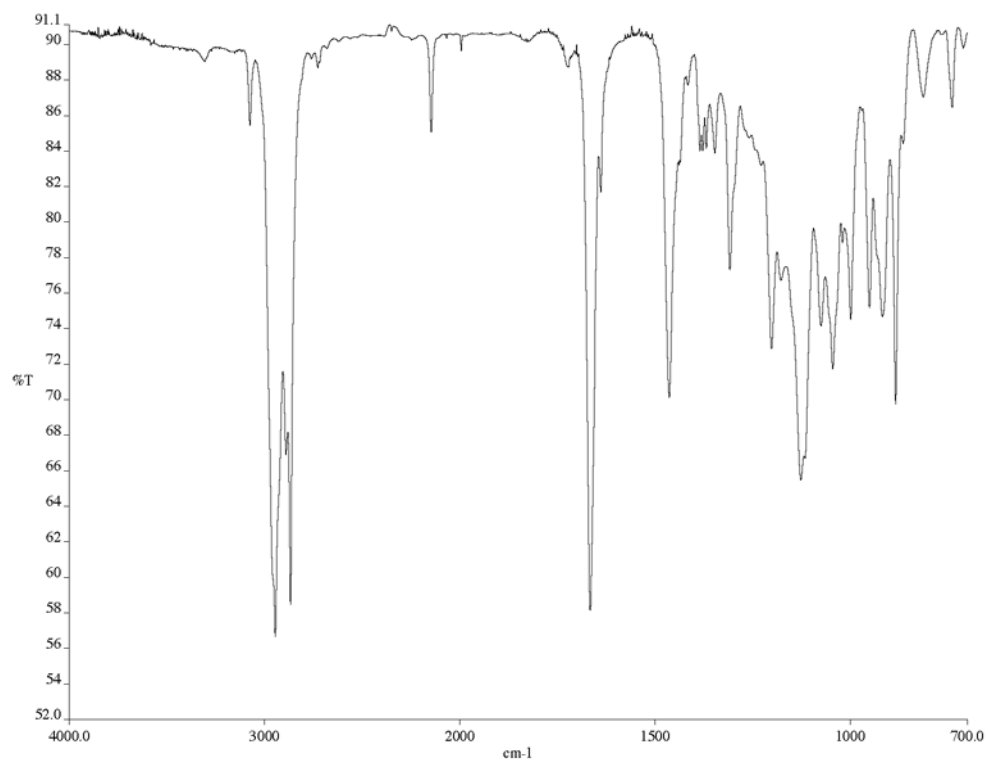


Figure A1.9.2 Infrared spectrum (thin film/NaCl) of ynone **58**.

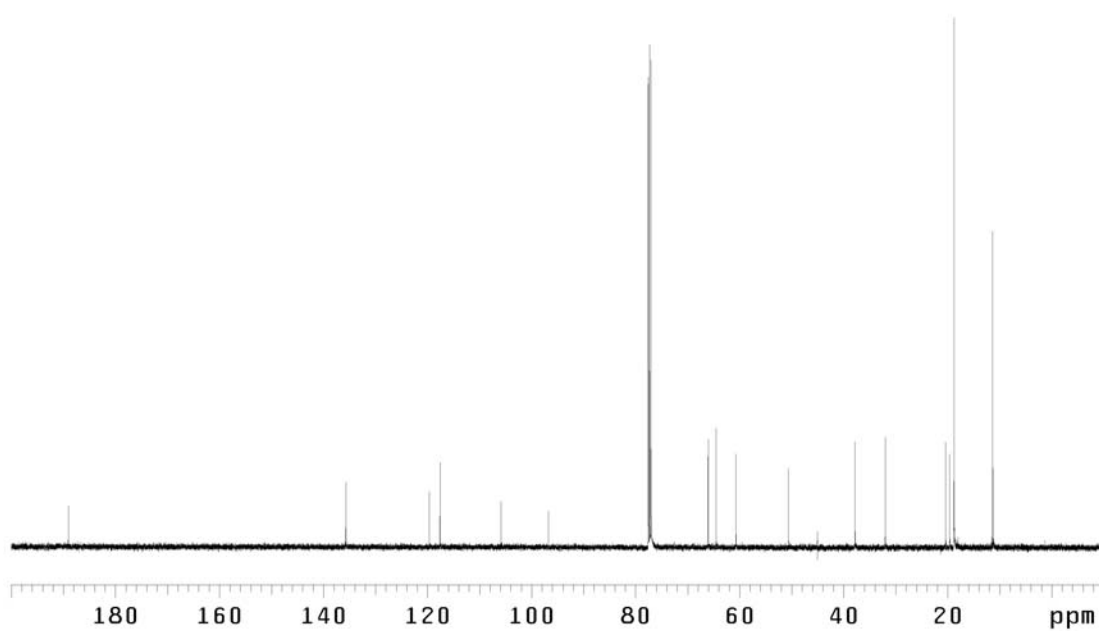


Figure A1.9.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of ynone **58**.

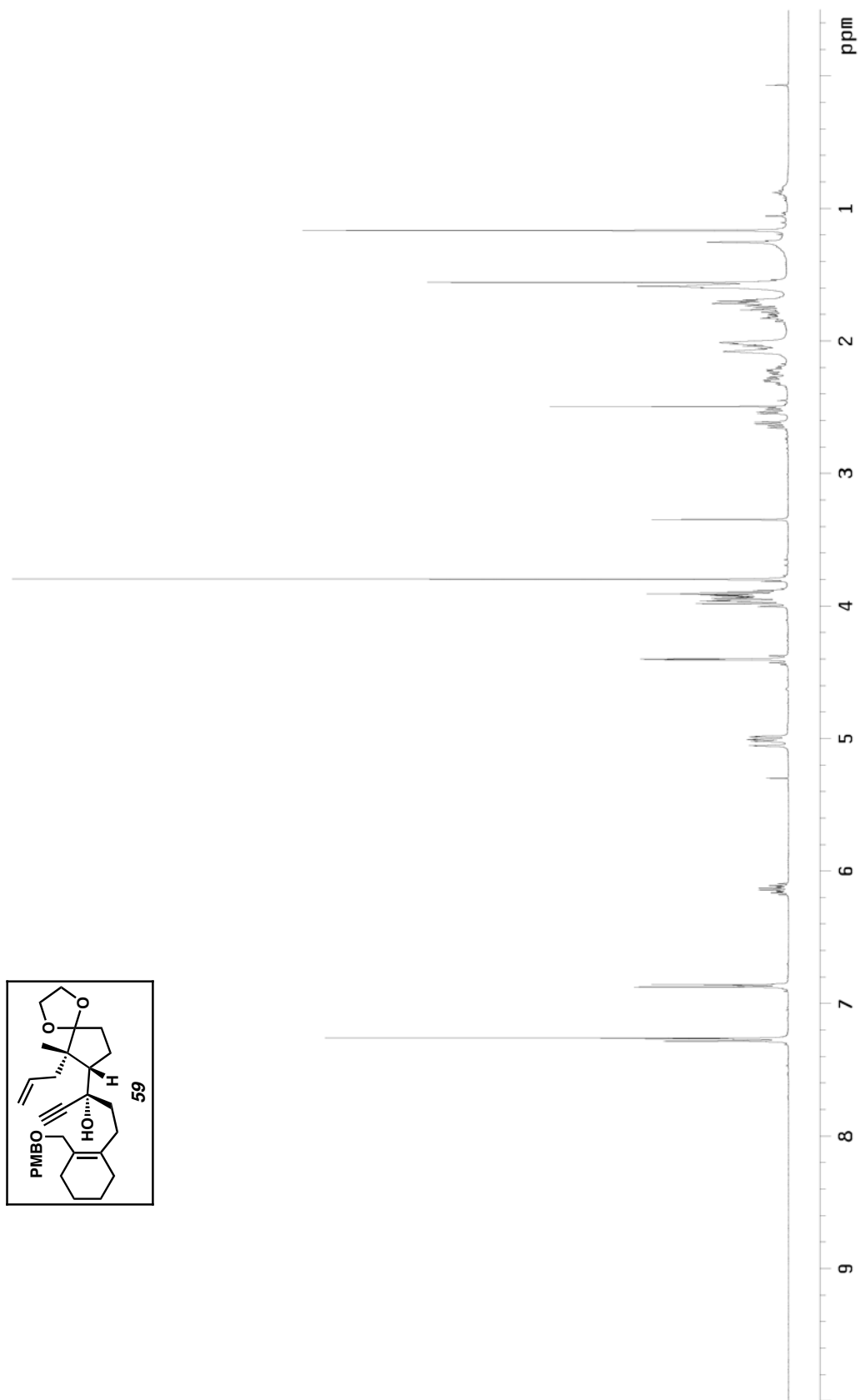
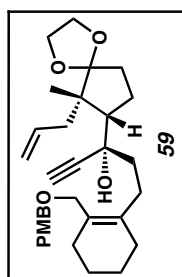


Figure A1.10.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **59**.

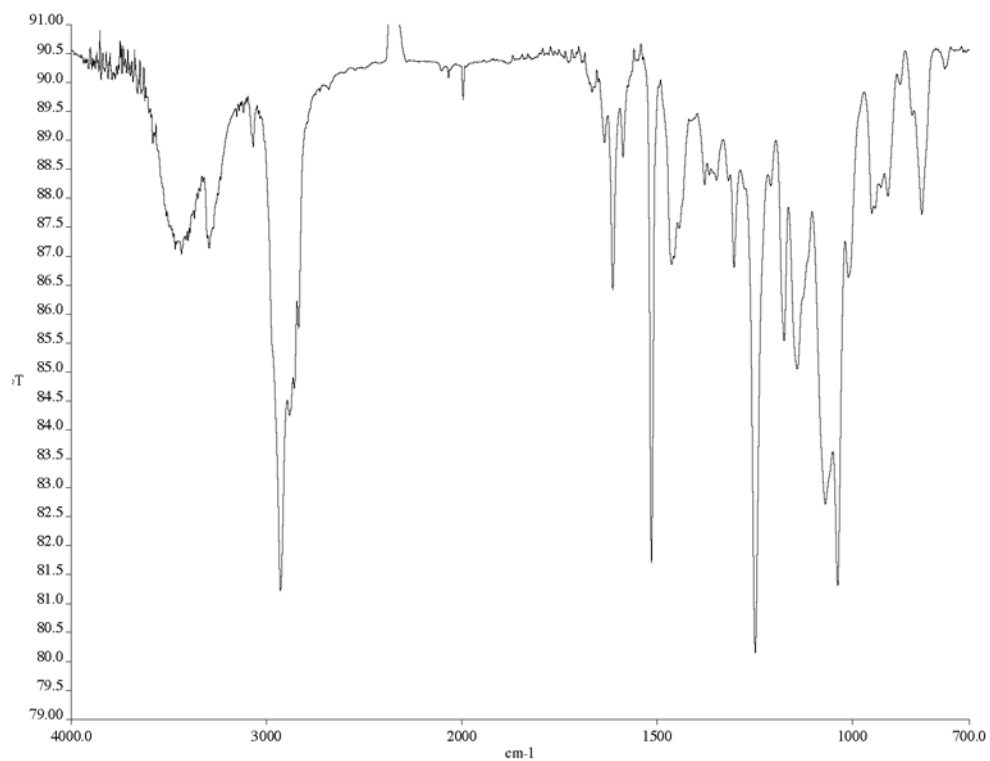


Figure A1.10.2 Infrared spectrum (thin film/NaCl) of compound **59**.

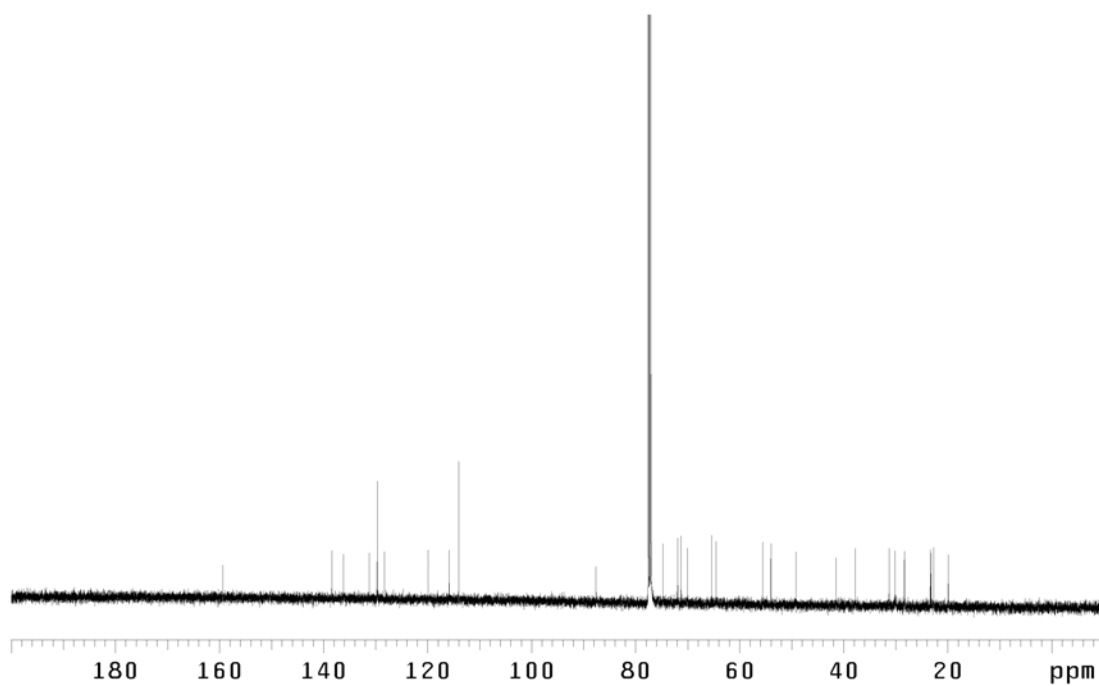


Figure A1.10.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **59**.

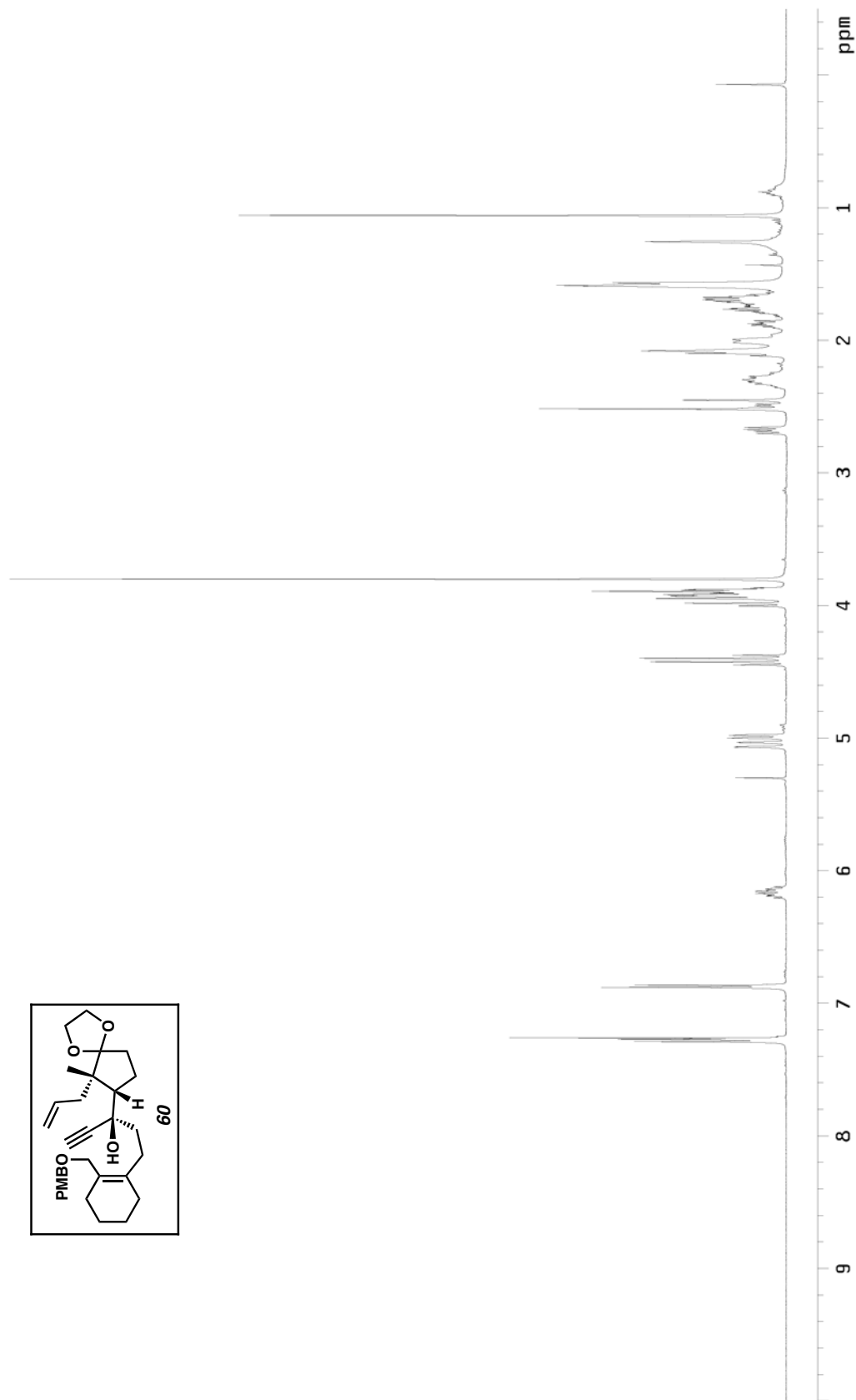


Figure A1.11.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **60**.

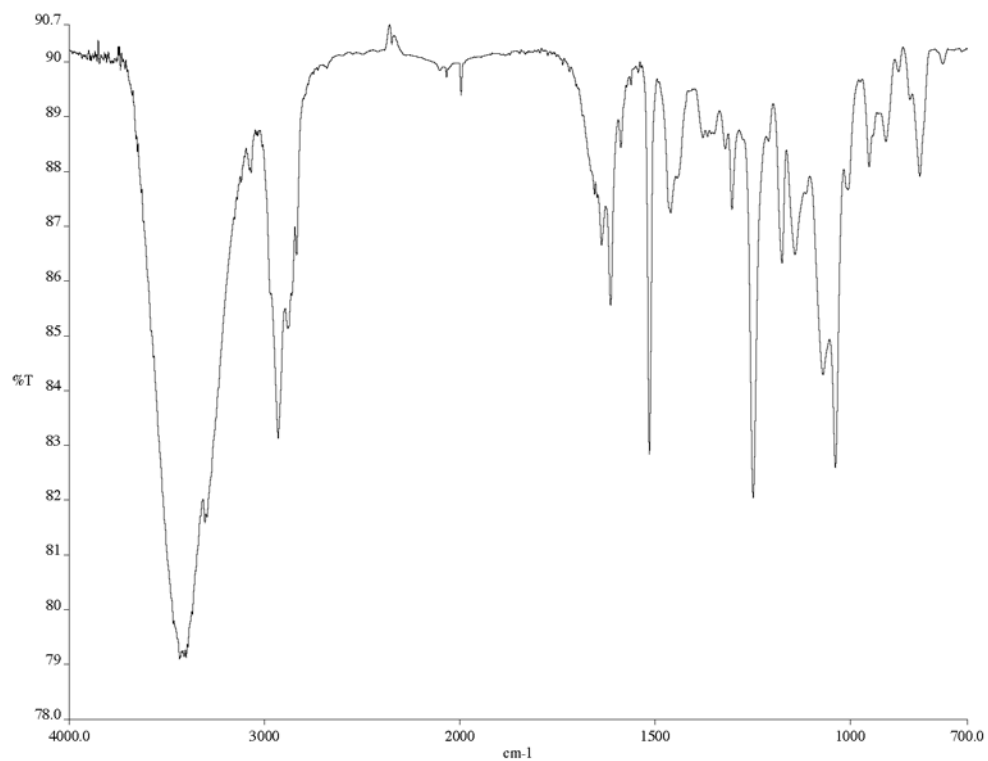


Figure A1.11.2 Infrared spectrum (thin film/NaCl) of compound **60**.

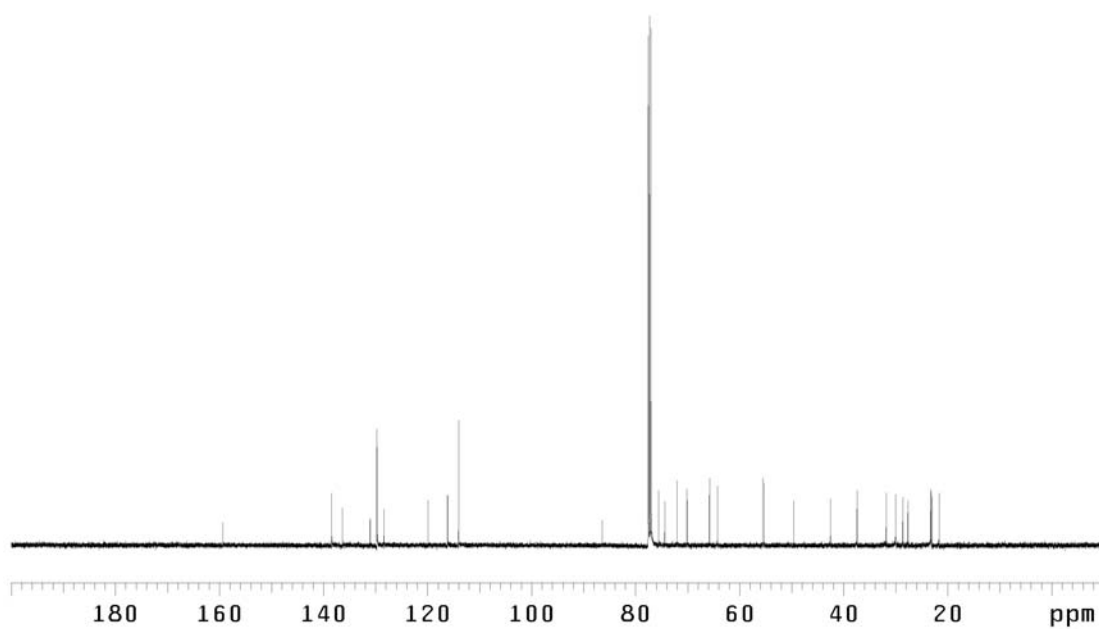


Figure A1.11.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **60**.

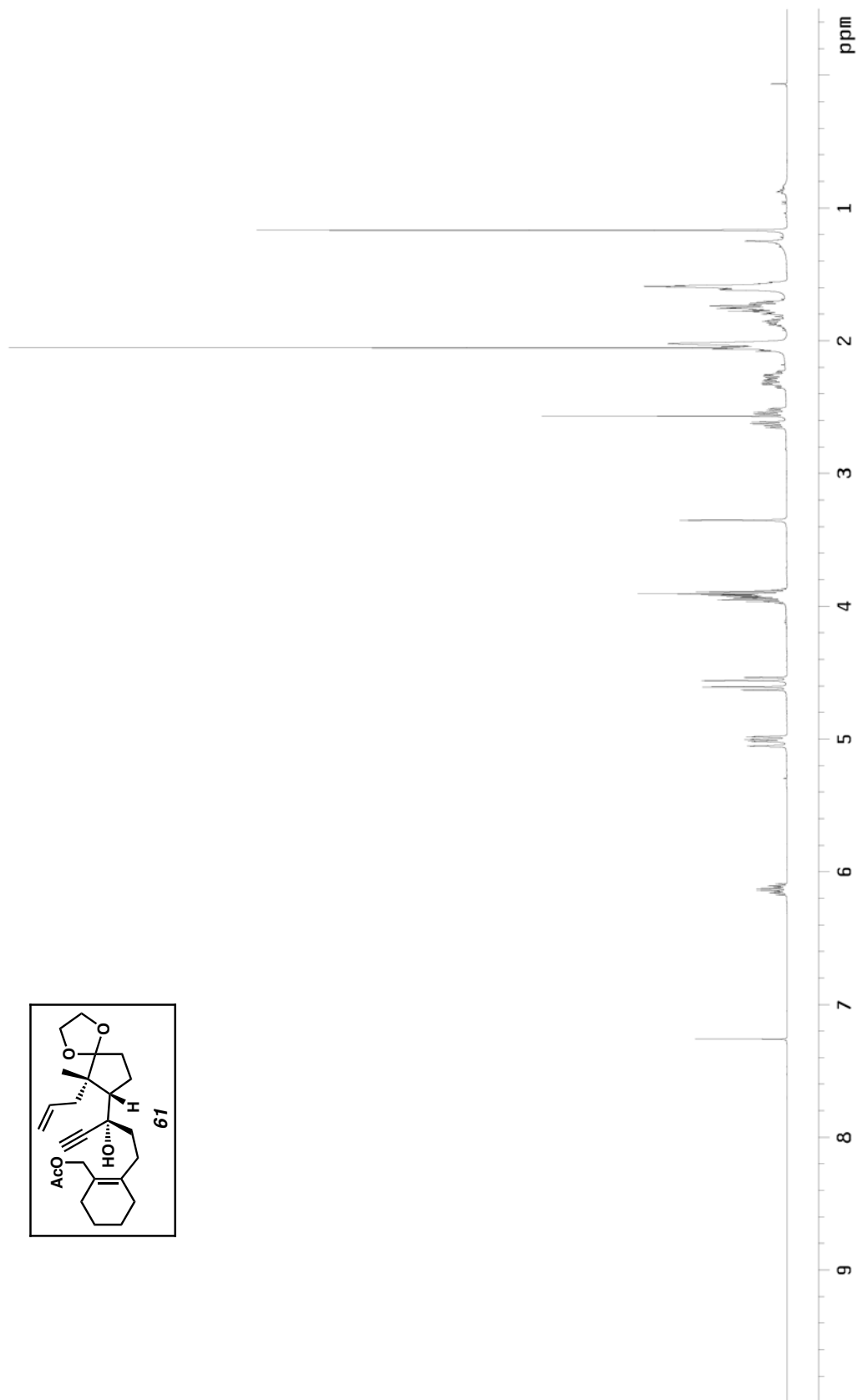


Figure A1.12.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **61**.



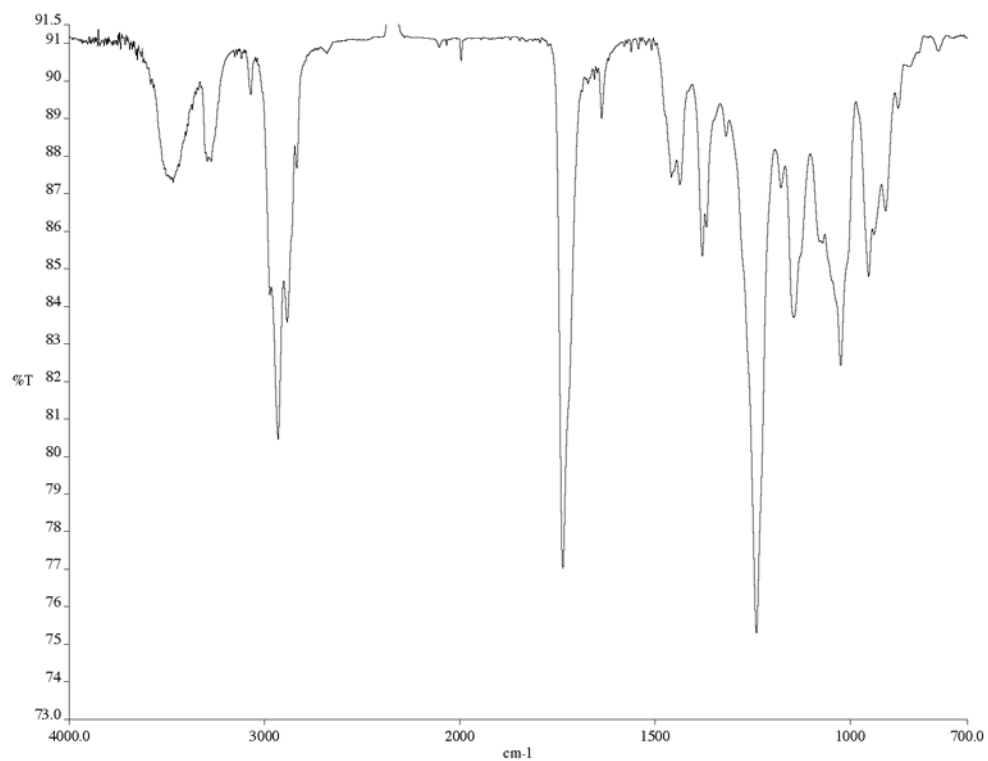


Figure A1.12.2 Infrared spectrum (thin film/NaCl) of compound **61**.

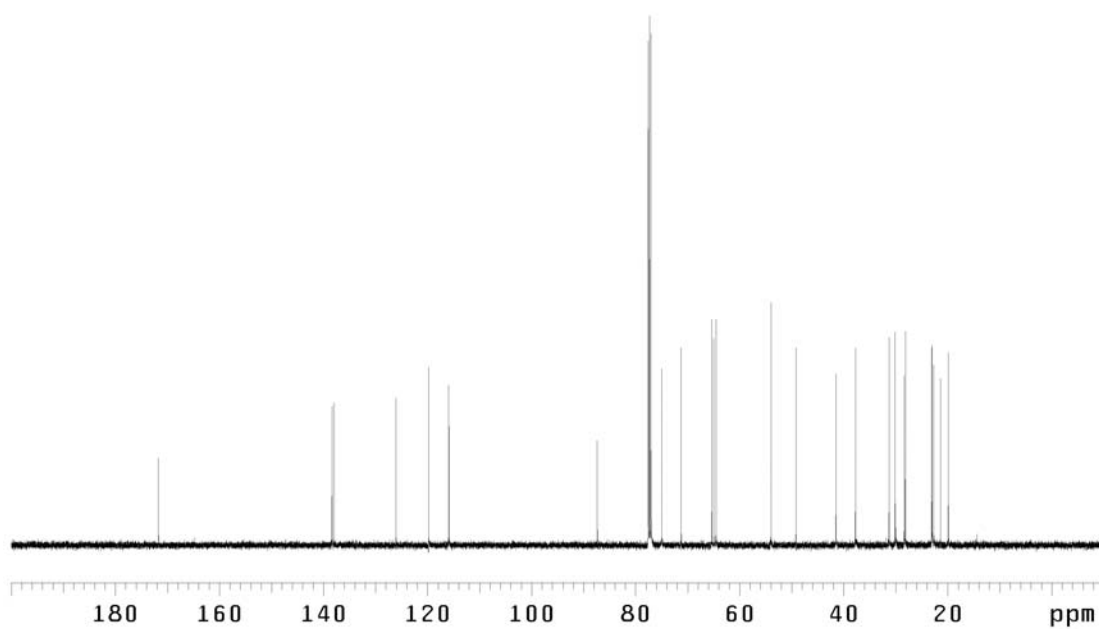


Figure A1.12.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **61**.

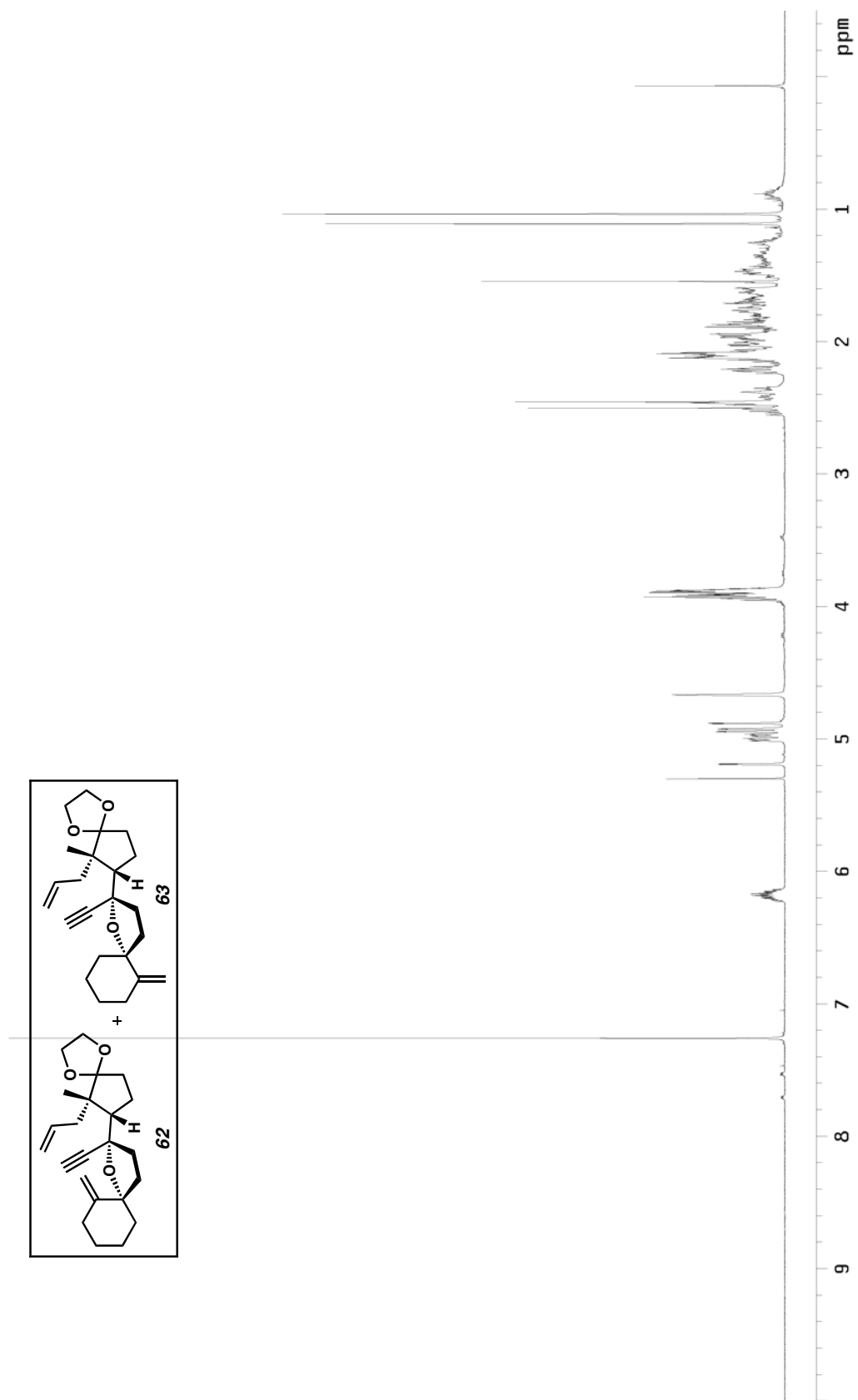


Figure A1.13.1  $^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ ) of compounds **62** and **63**.

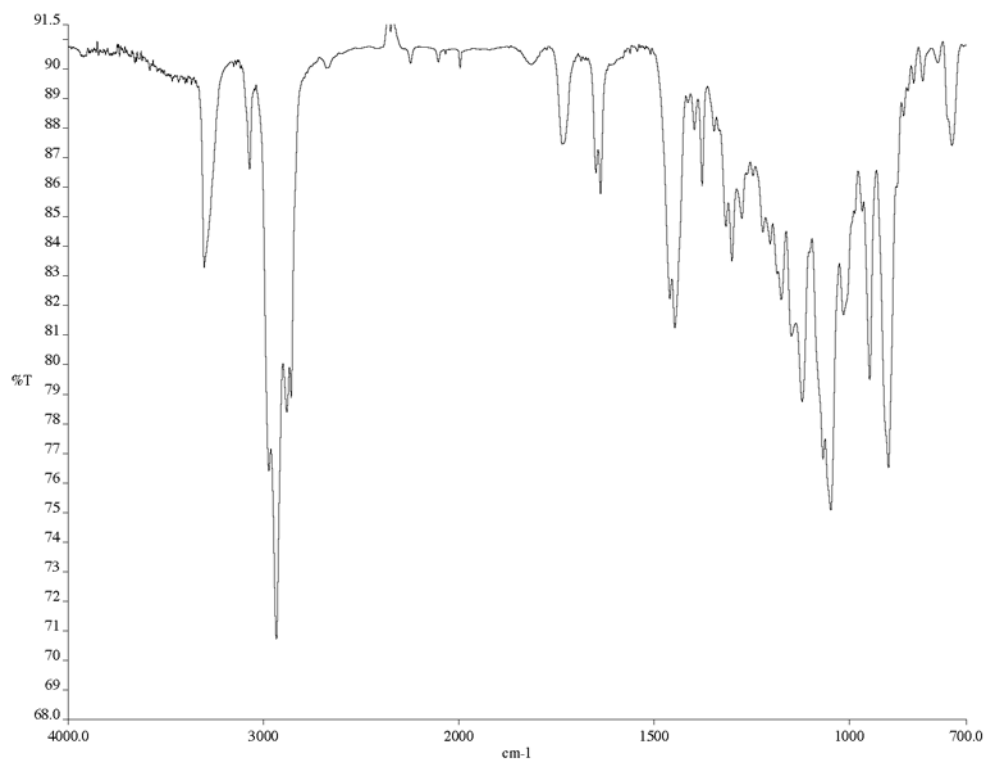


Figure A1.13.2 Infrared spectrum (thin film/NaCl) of compounds **62** and **63**.

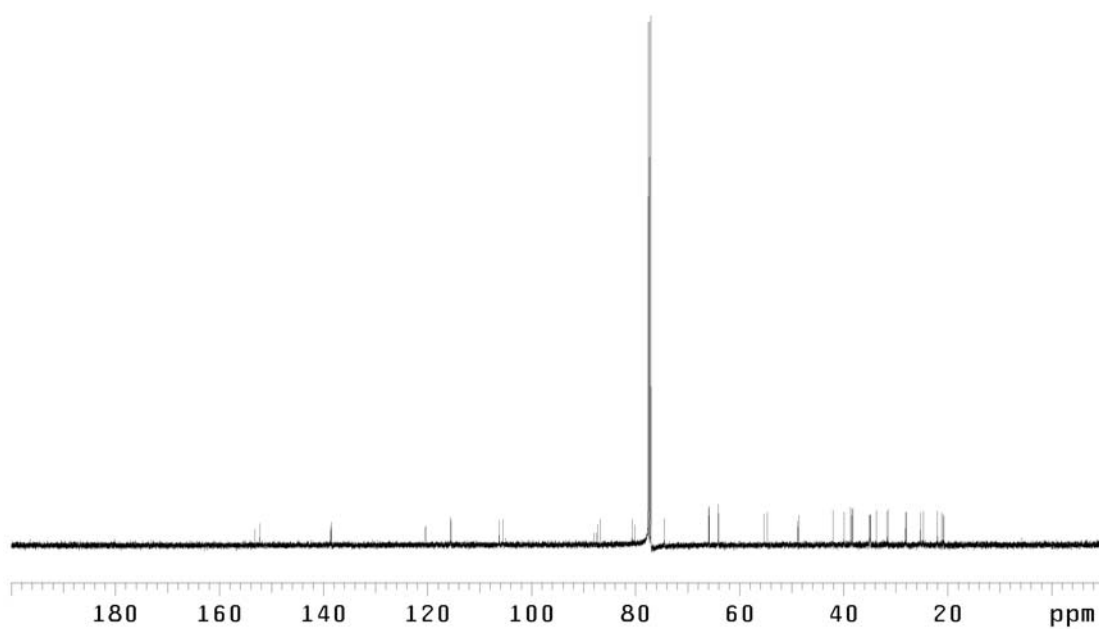


Figure A1.13.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compounds **62** and **63**.

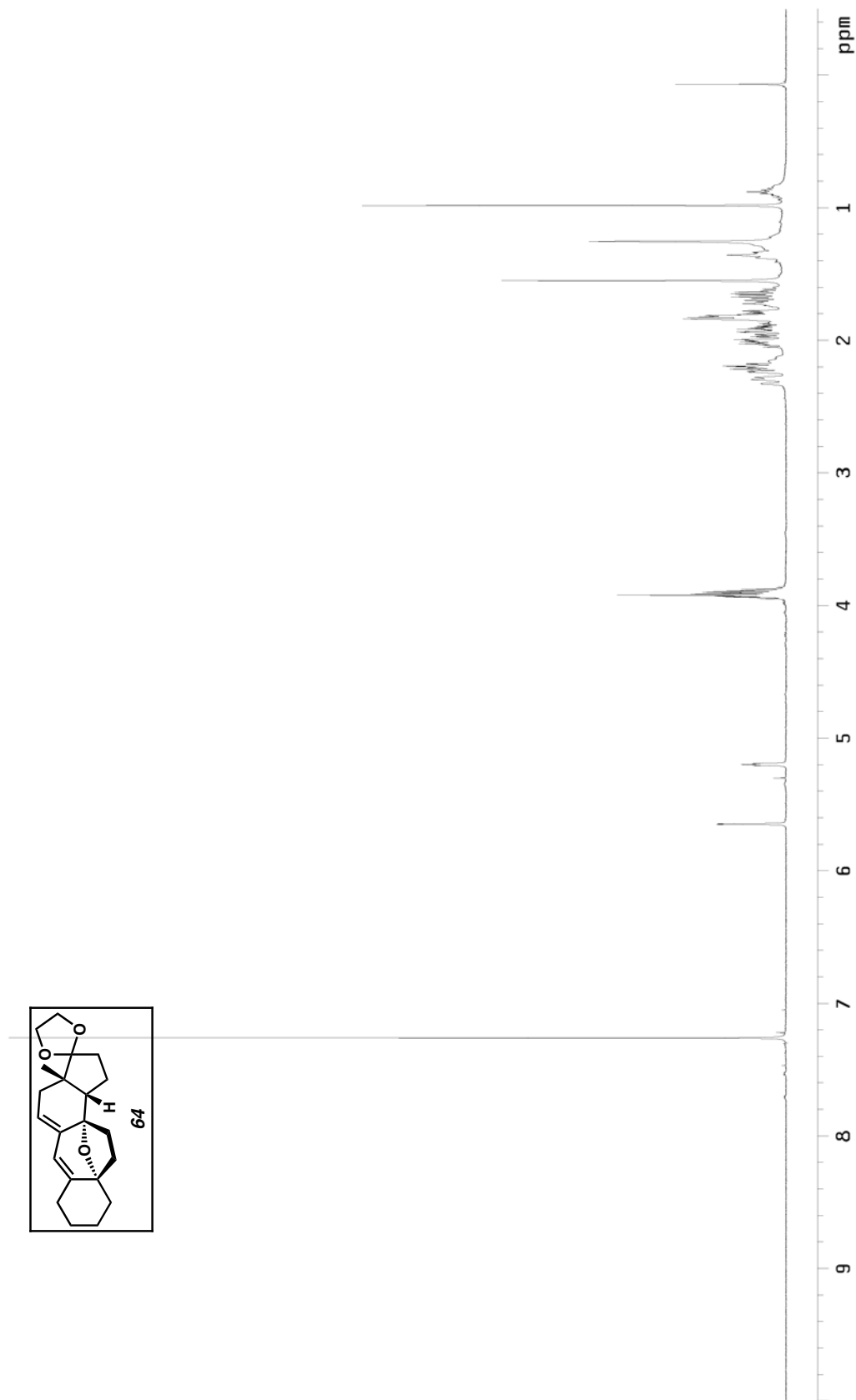


Figure A1.14.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **64**.

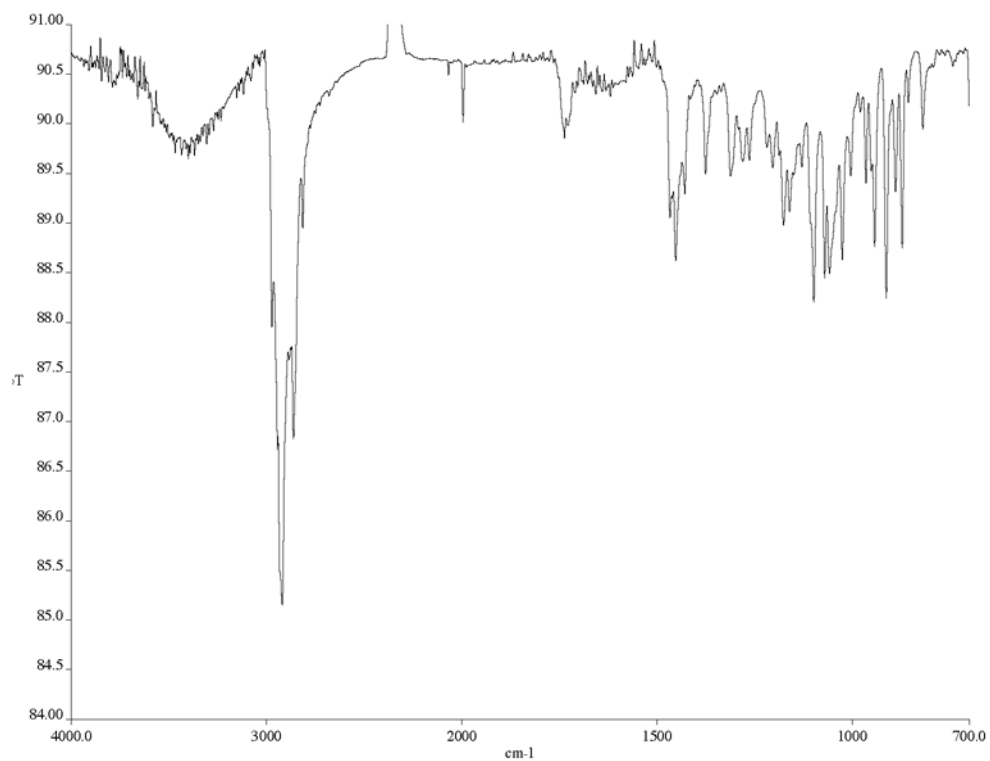


Figure A1.14.2 Infrared spectrum (thin film/NaCl) of compound **64**.

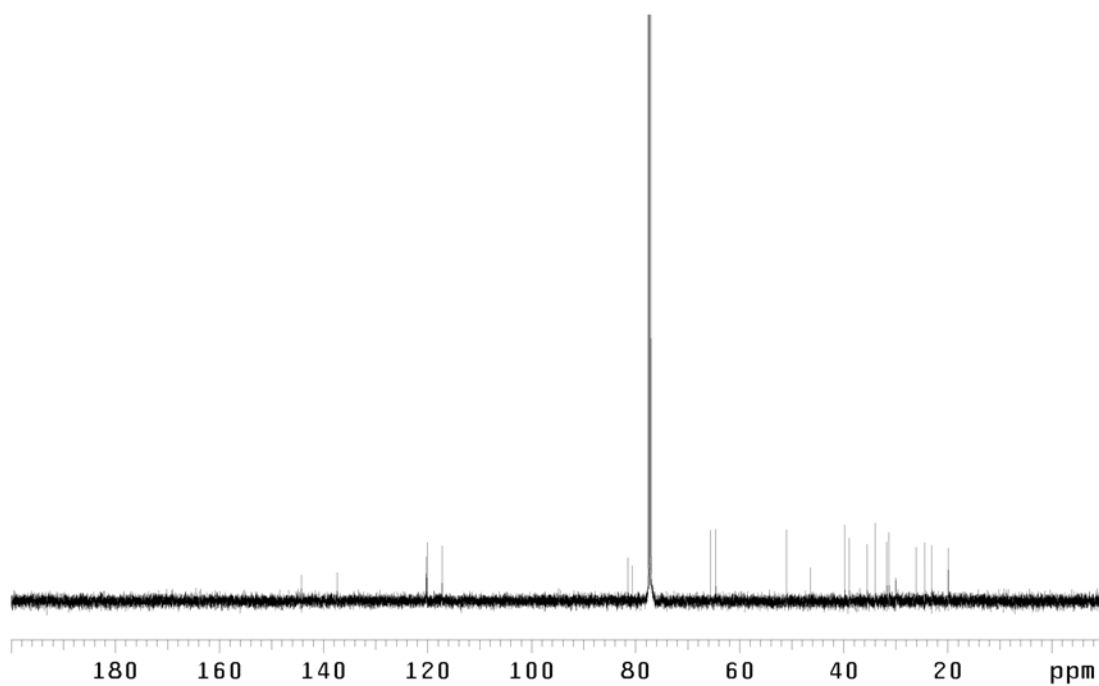


Figure A1.14.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **64**.

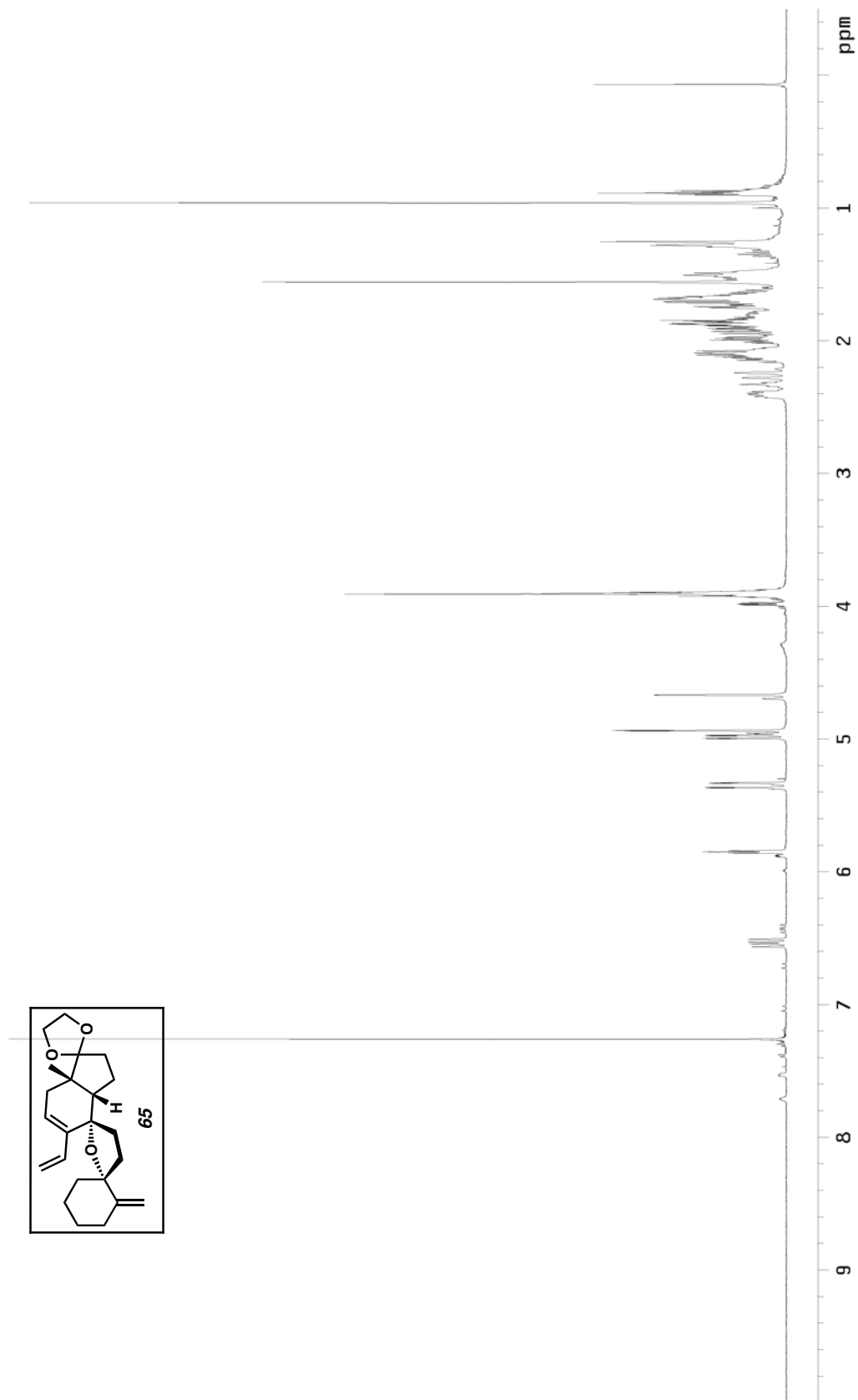


Figure A1.15.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **65**.

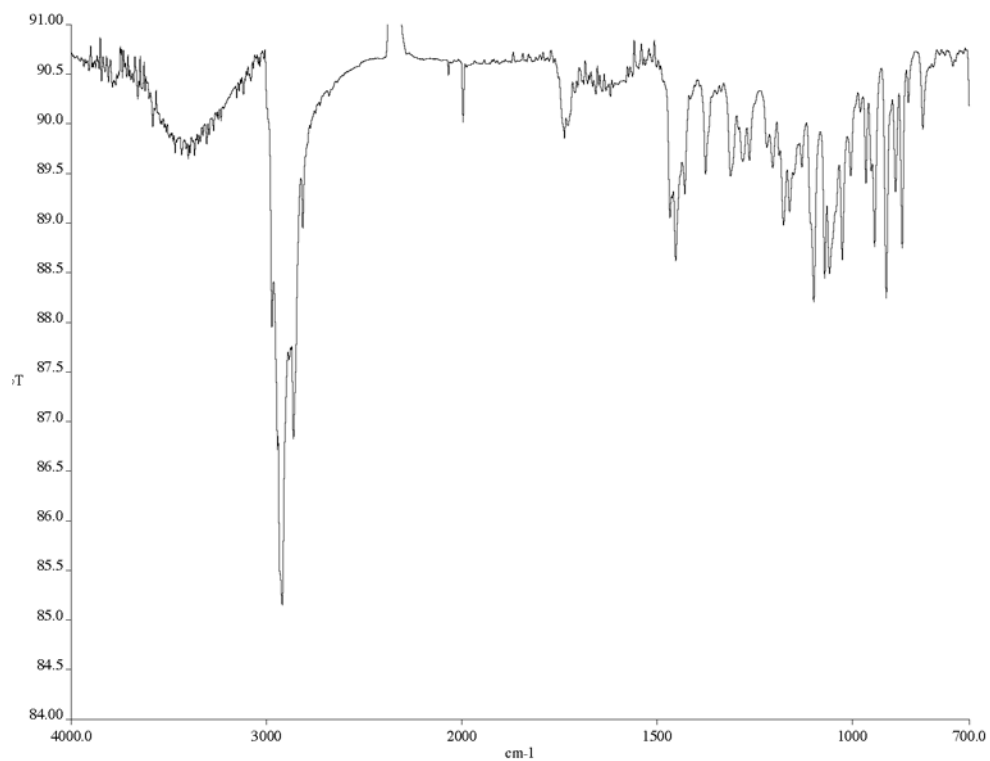


Figure A1.15.2 Infrared spectrum (thin film/NaCl) of compound **65**.

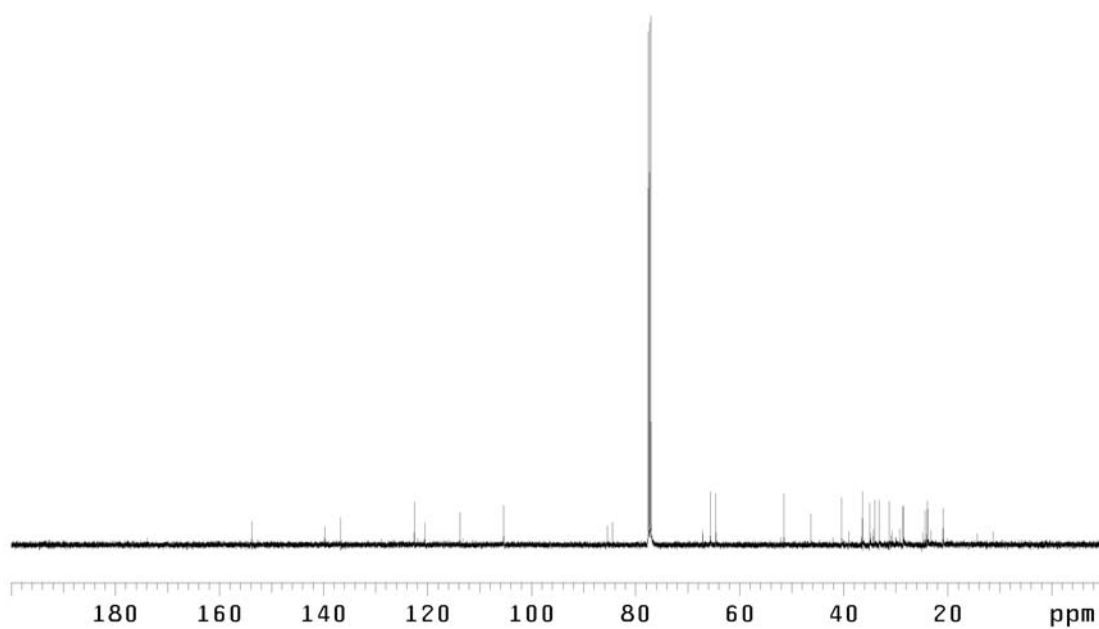


Figure A1.15.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **65**.

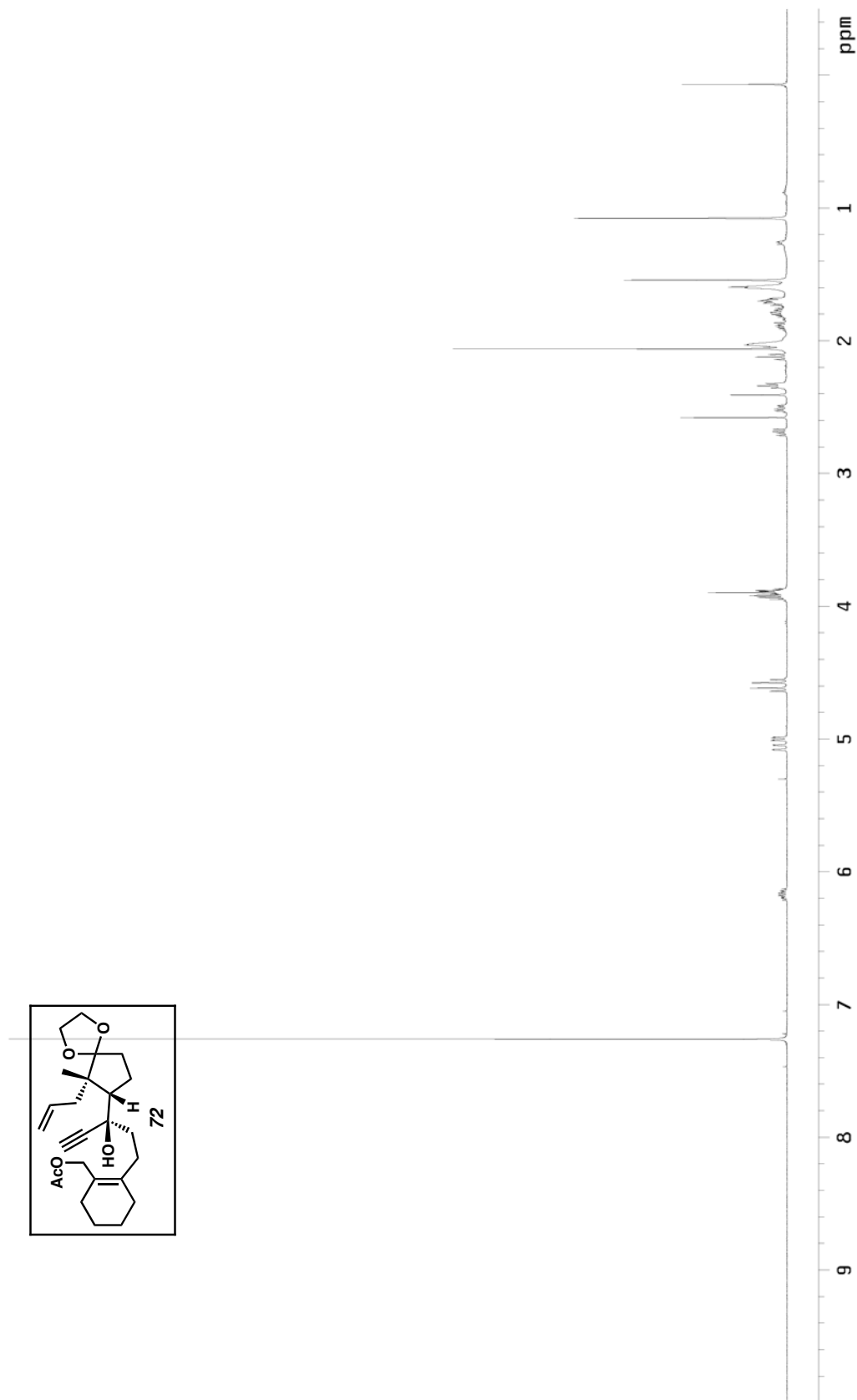


Figure A1.16.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound 72.



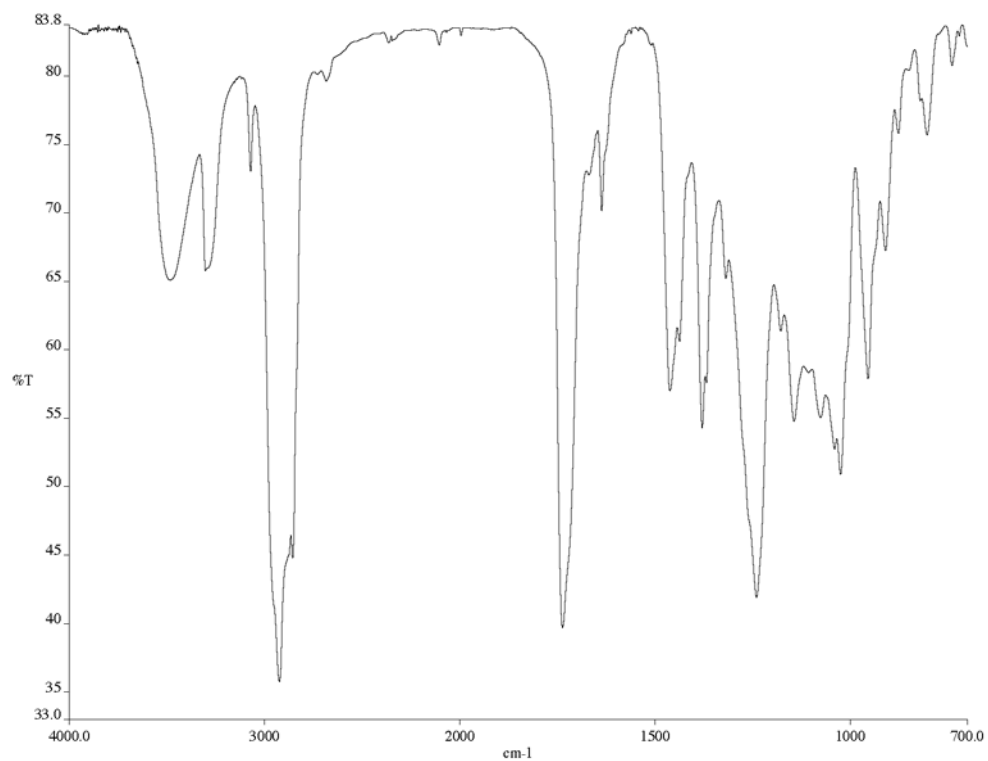


Figure A1.16.2 Infrared spectrum (thin film/NaCl) of compound **72**.

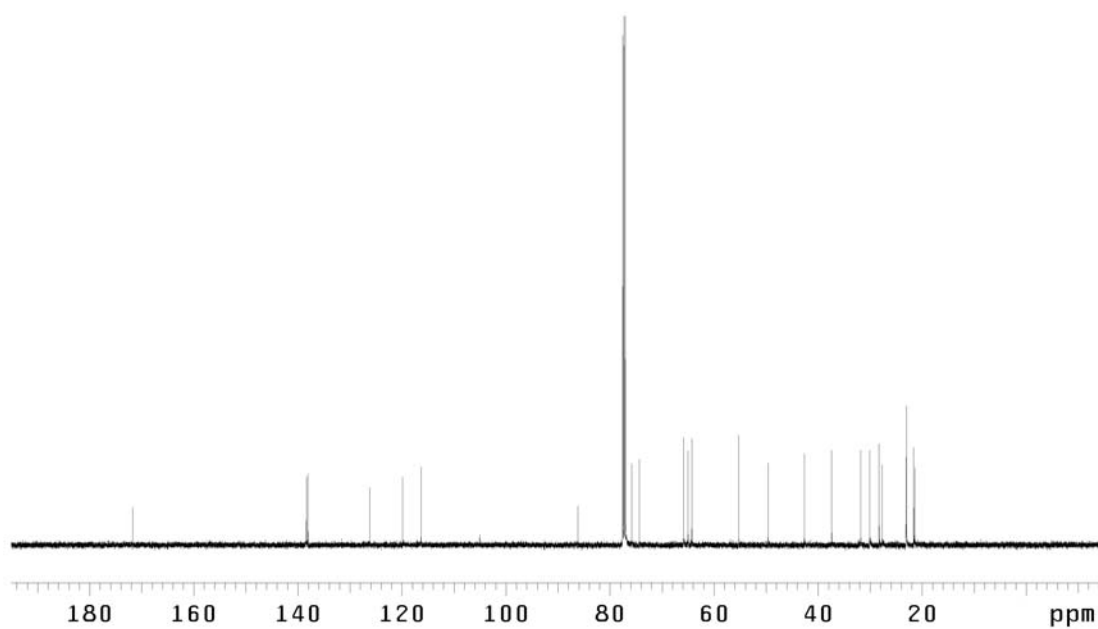


Figure A1.16.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **72**.

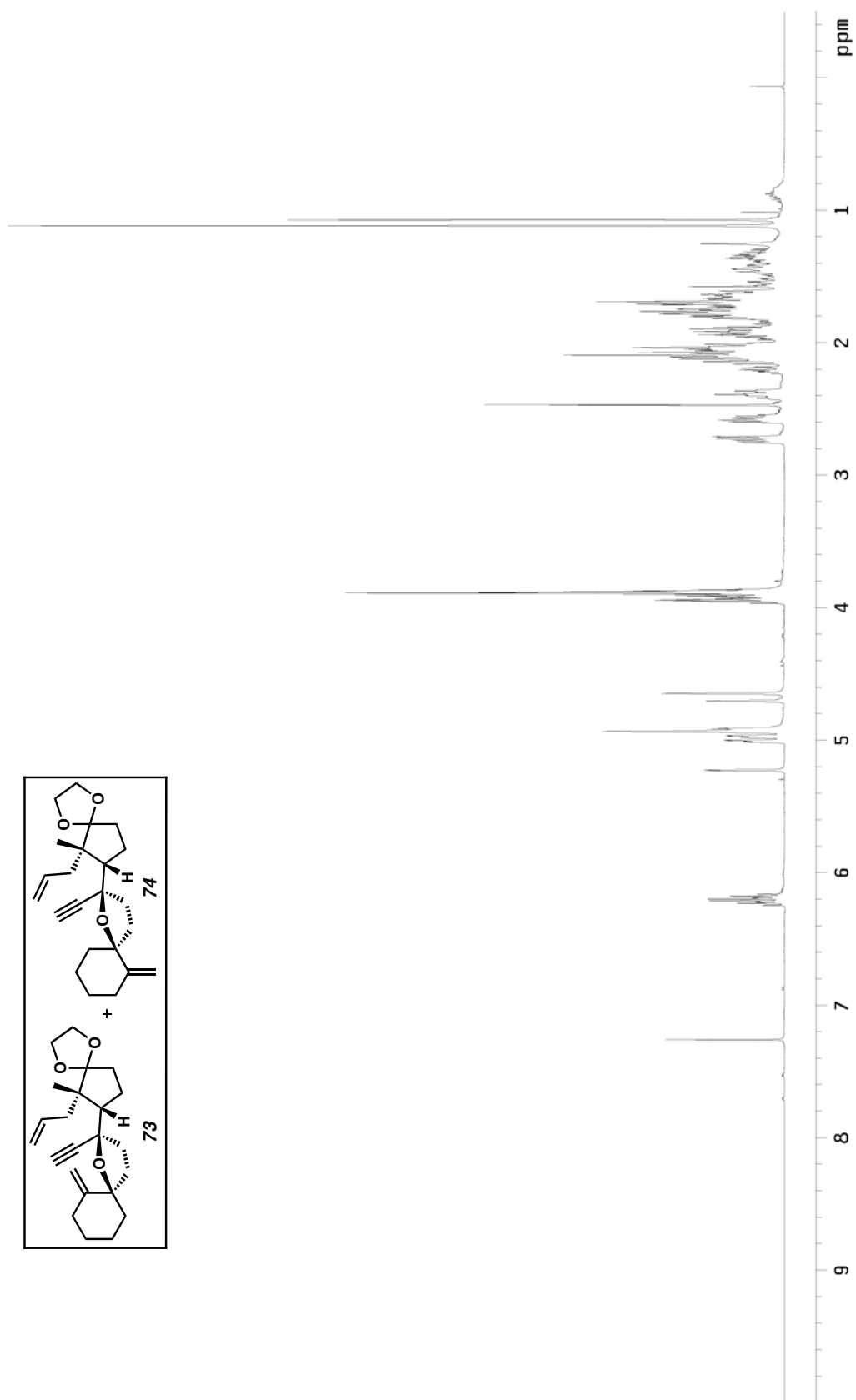


Figure A1.17.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compounds **73** and **74**.

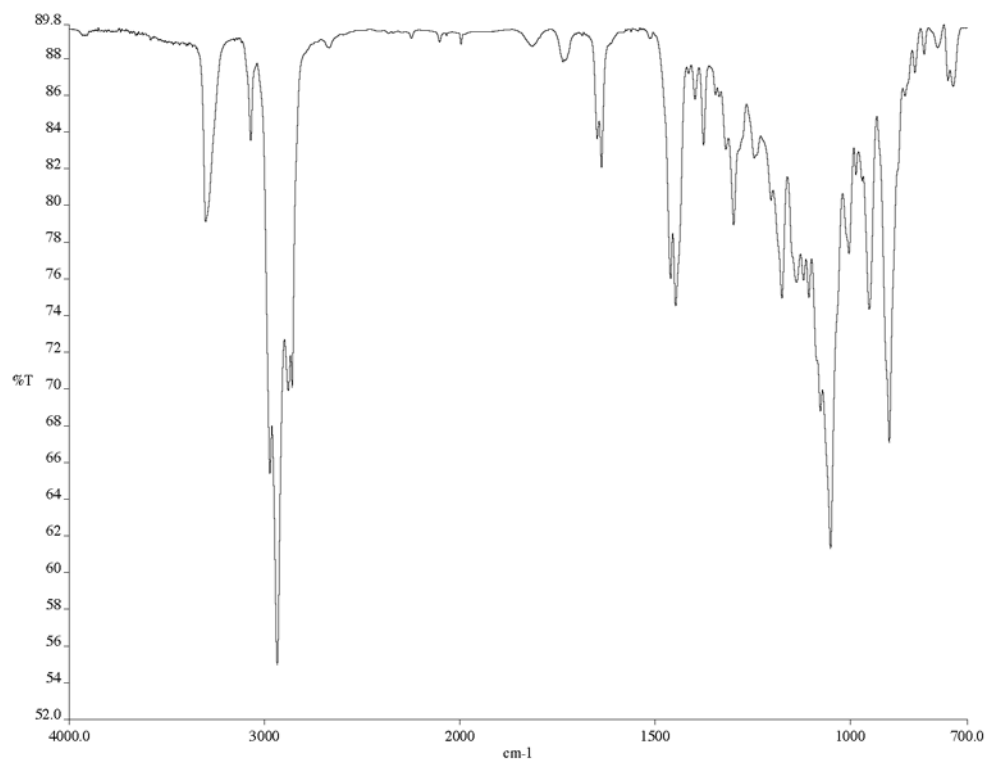


Figure A1.17.2 Infrared spectrum (thin film/NaCl) of compounds **73** and **74**.

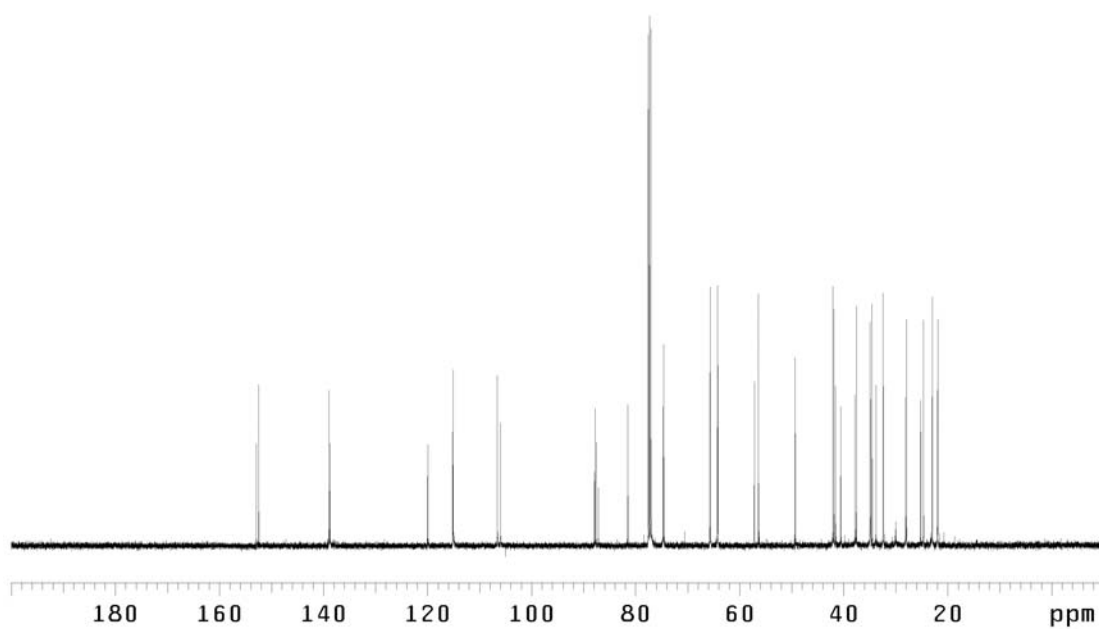


Figure A1.17.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compounds **73** and **74**.

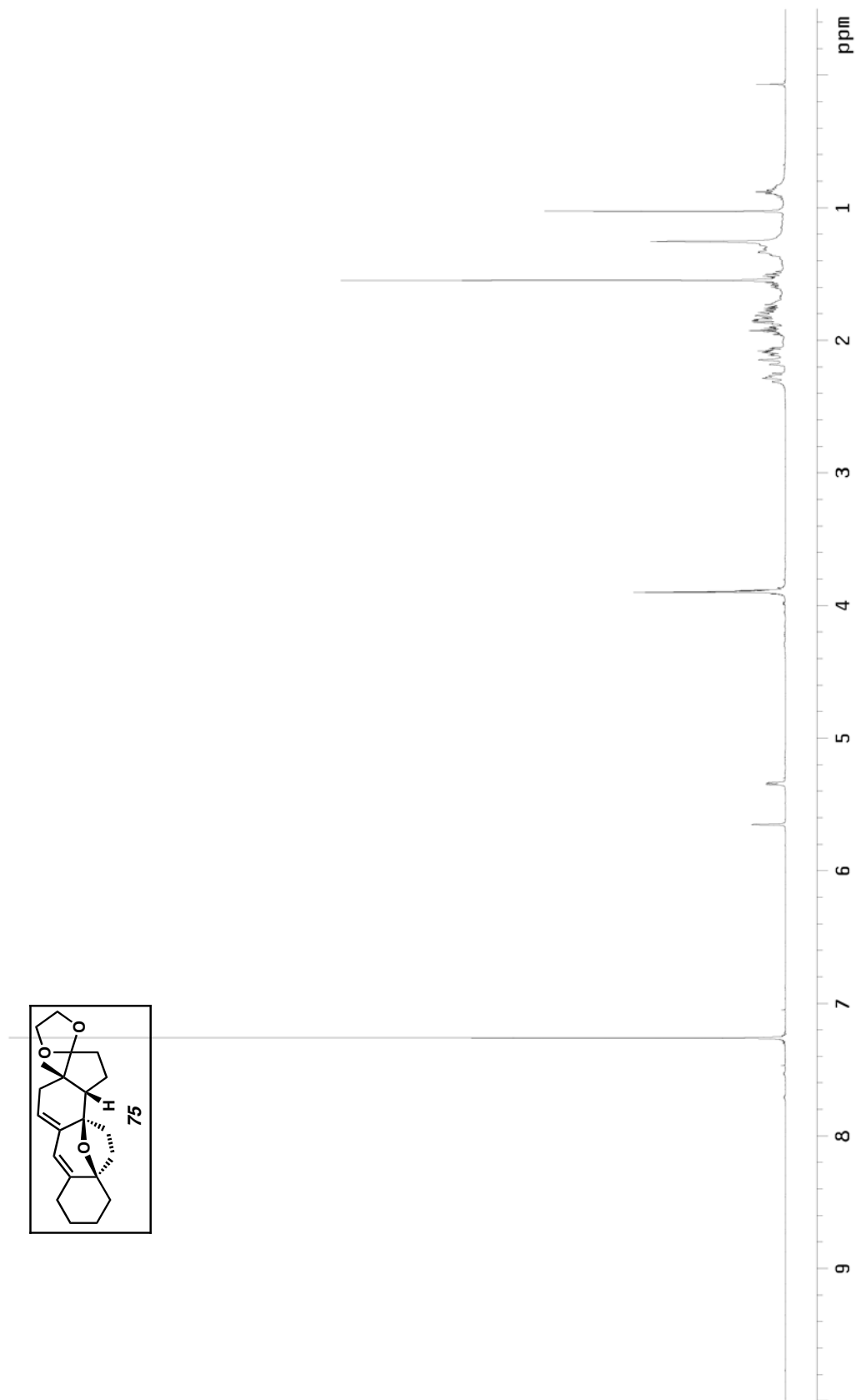


Figure A1.18.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound 75.

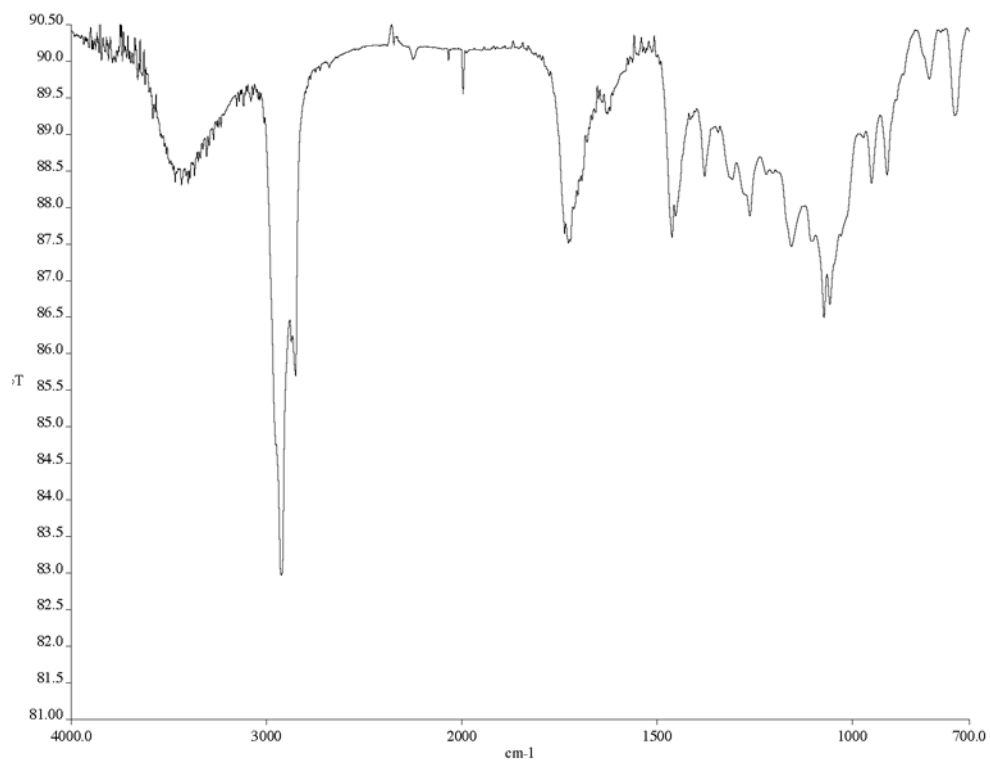


Figure A1.18.2 Infrared spectrum (thin film/NaCl) of compound **75**.

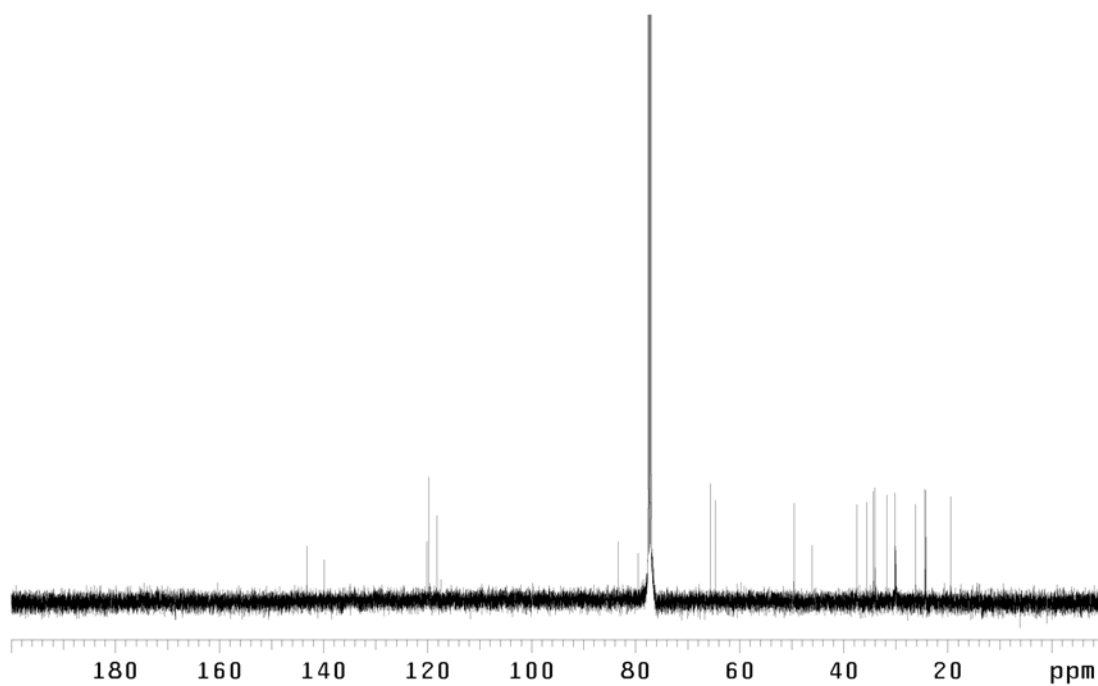


Figure A1.18.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **75**.

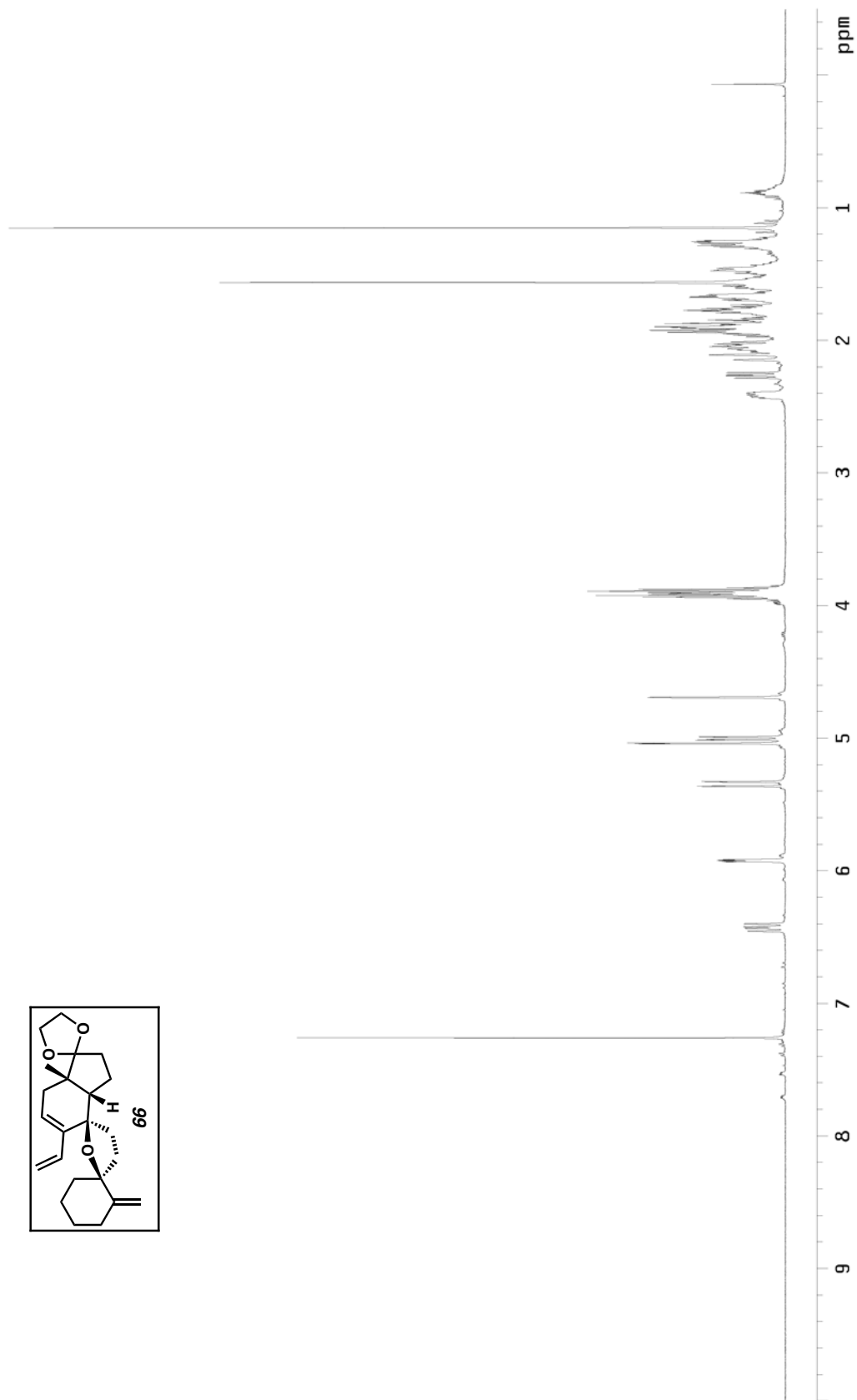


Figure A1.19.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **66**.

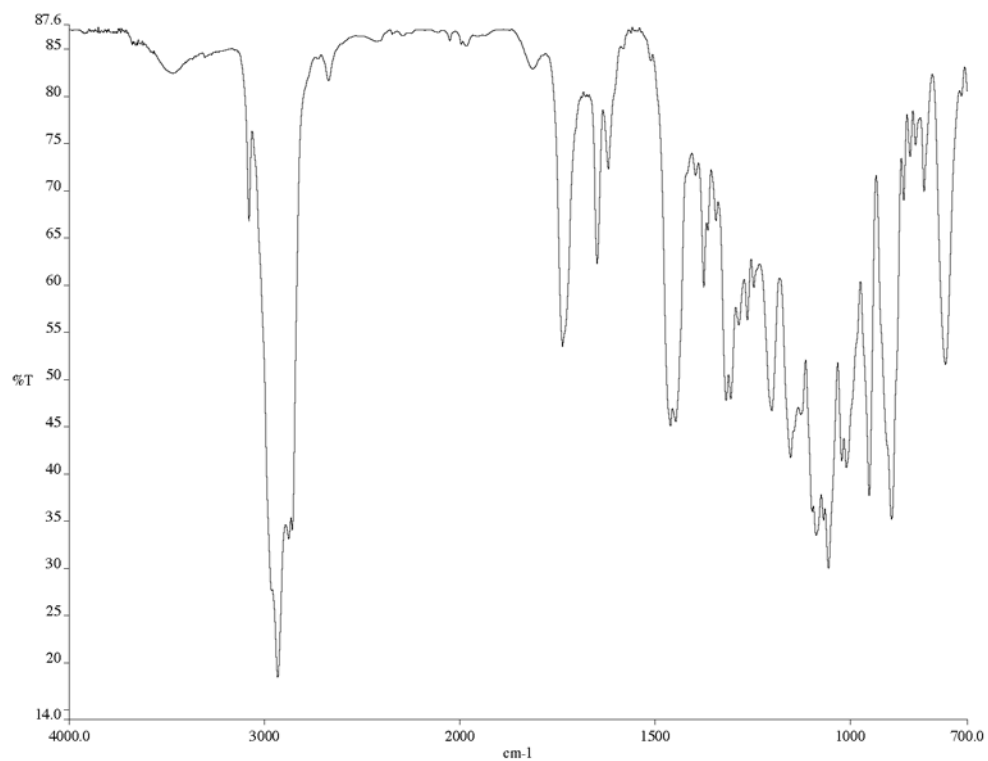


Figure A1.19.2 Infrared spectrum (thin film/NaCl) of compound **66**.

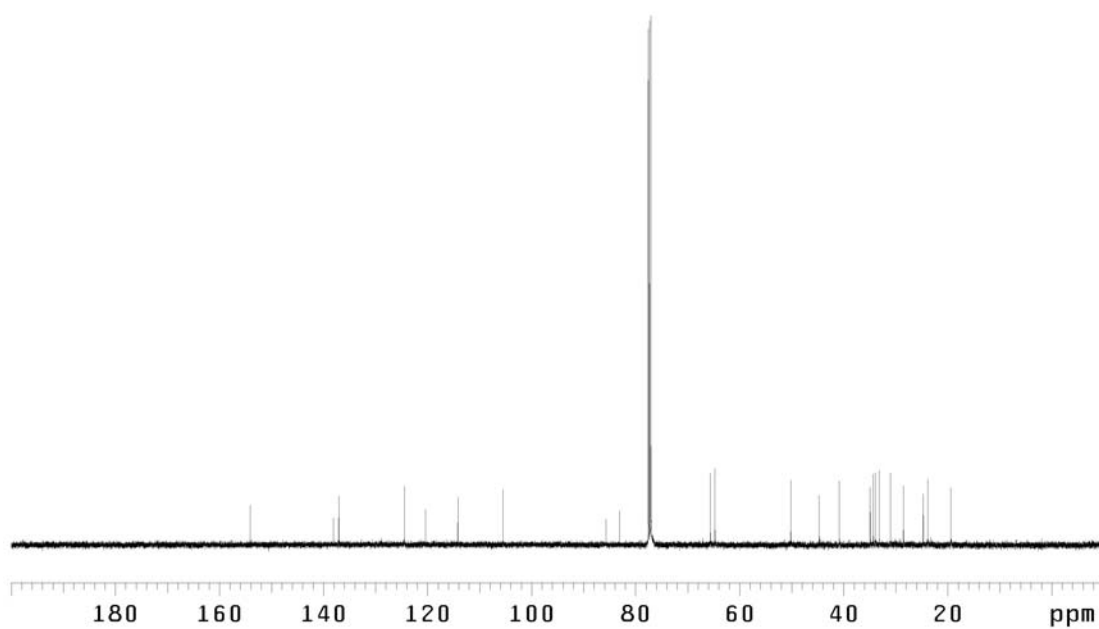


Figure A1.19.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **66**.

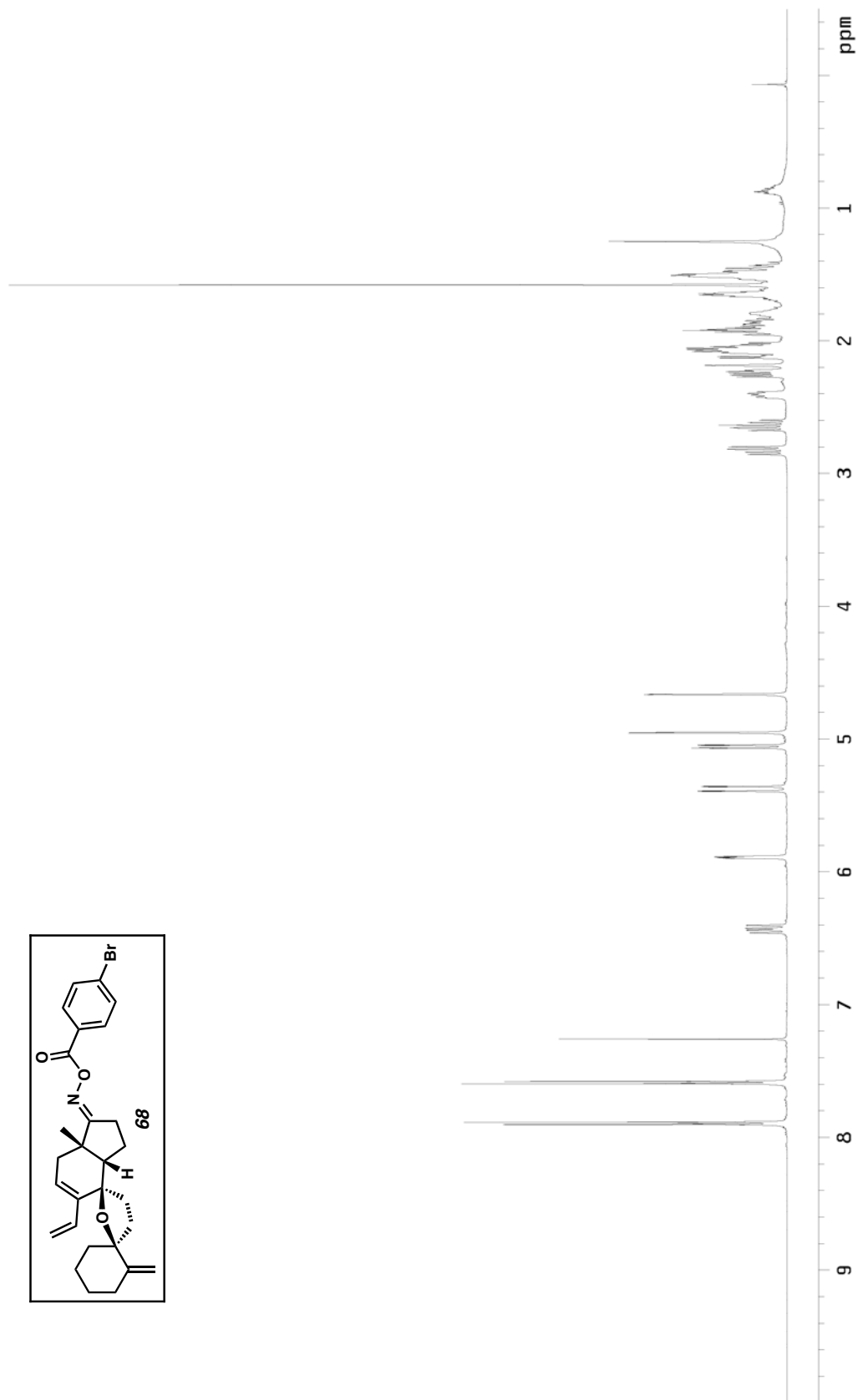


Figure A1.20.1 <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of compound **68**.



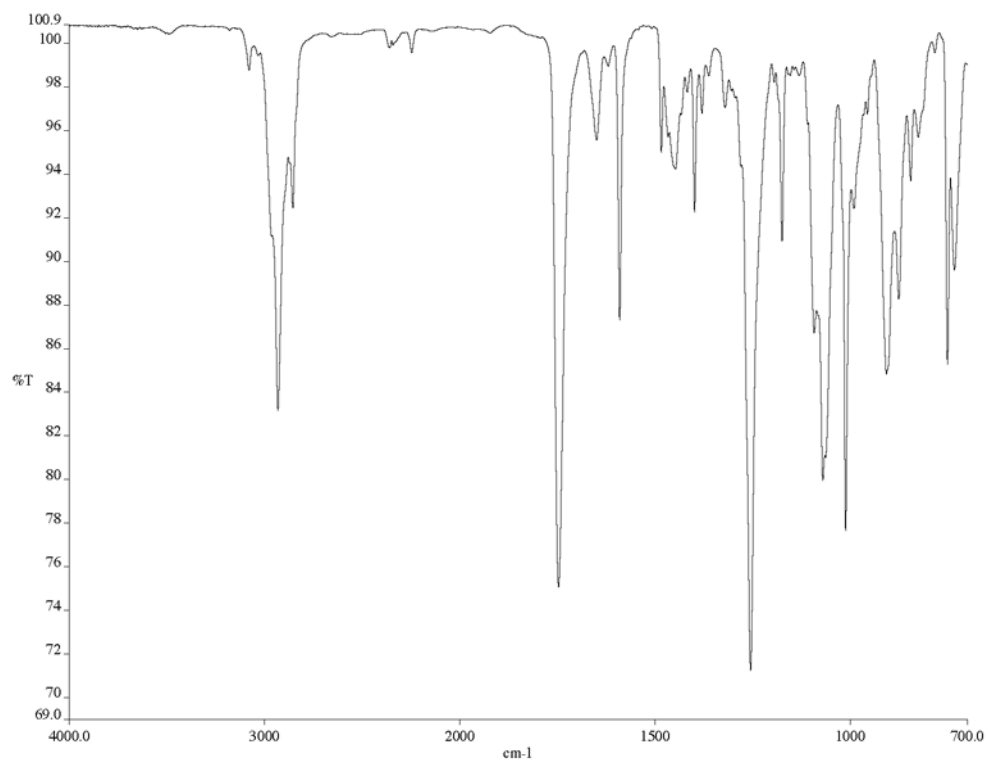


Figure A1.20.2 Infrared spectrum (thin film/NaCl) of compound **68**.

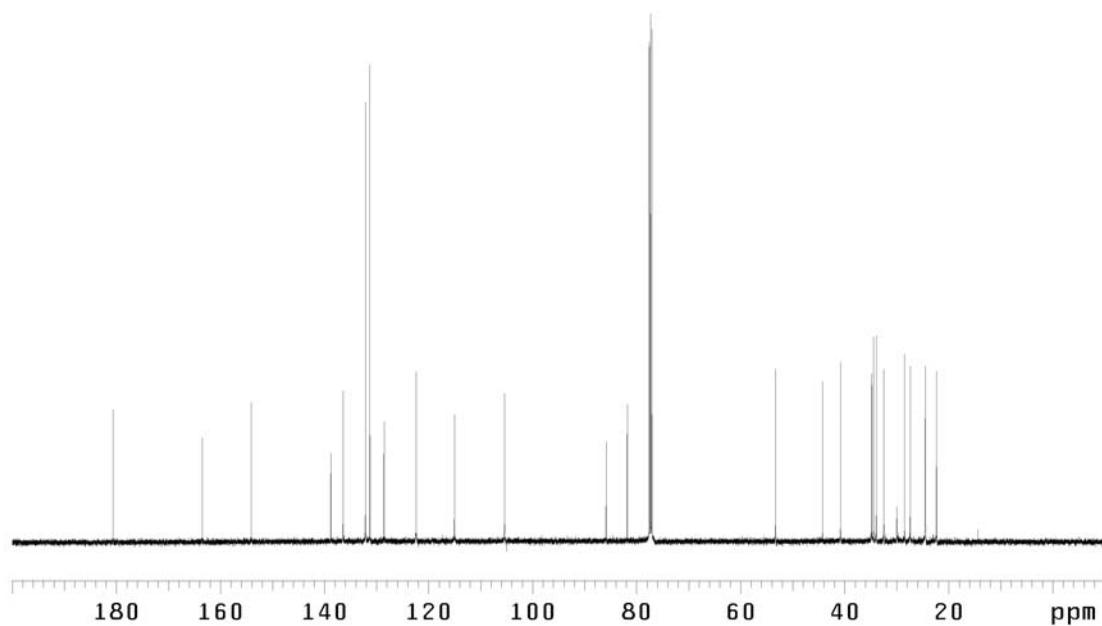


Figure A1.20.3 <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) of compound **68**.