

## SUPPLEMENTARY MATERIAL FOR:

**The Synthesis and Biological Evaluation of Some C-9 and C-10 Substituted Derivatives of the RNA Polymerase I Transcription Inhibitor CX-5461**

*Madushani Amarasiri,<sup>A</sup> Yen Vo,<sup>A</sup> Michael G. Gardiner,<sup>A</sup> Perlita Poh,<sup>B</sup> Priscilla Soo,<sup>B</sup> Megan Pavy,<sup>B</sup> Nadine Hein,<sup>B</sup> Rita Ferreira,<sup>B</sup> Katherine M. Hannan,<sup>B</sup> Ross D. Hannan<sup>B-F,H</sup> and Martin G. Banwell<sup>A,G,H</sup>*

<sup>A</sup>Research School of Chemistry, Institute of Advanced Studies,  
The Australian National University, Canberra, ACT 2601, Australia

<sup>B</sup>ACRF Department of Cancer Biology and Therapeutics,  
John Curtin School of Medical Research,

The Australian National University, Canberra ACT 2601, Australia

<sup>C</sup>Department of Biochemistry and Molecular Biology, University of Melbourne, Parkville,  
Victoria 3010, Australia.

<sup>D</sup>Peter MacCallum Cancer Centre, 305 Grattan St, Melbourne, Victoria 3000, Australia.

<sup>E</sup>Department of Biochemistry and Molecular Biology, Monash University, Clayton,  
Victoria, 3800, Australia.

<sup>F</sup>School of Biomedical Sciences, University of Queensland,  
Brisbane, Queensland, 4072, Australia.

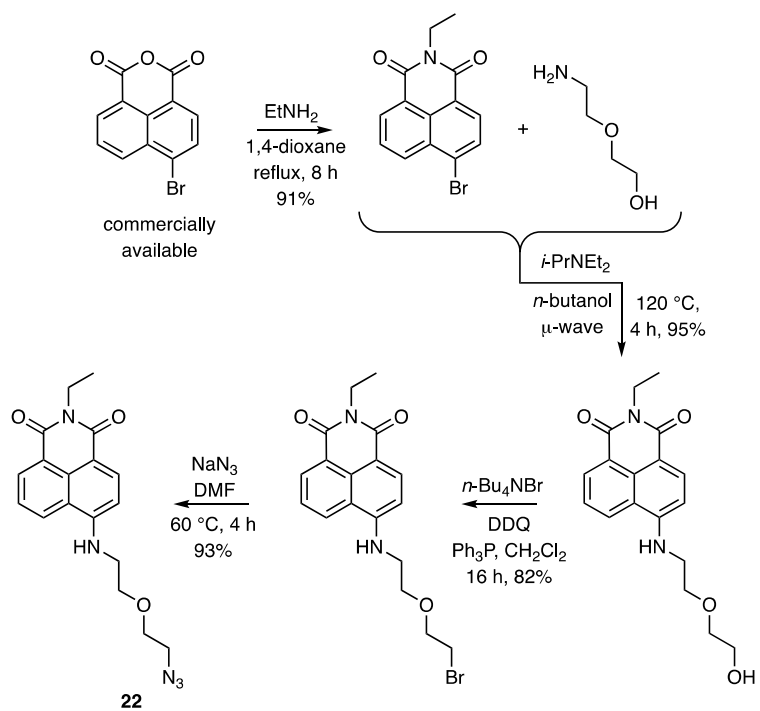
<sup>G</sup>Institute for Advanced and Applied Chemical Synthesis,  
Jinan University, Guangzhou 510632, China

<sup>H</sup>Corresponding authors.

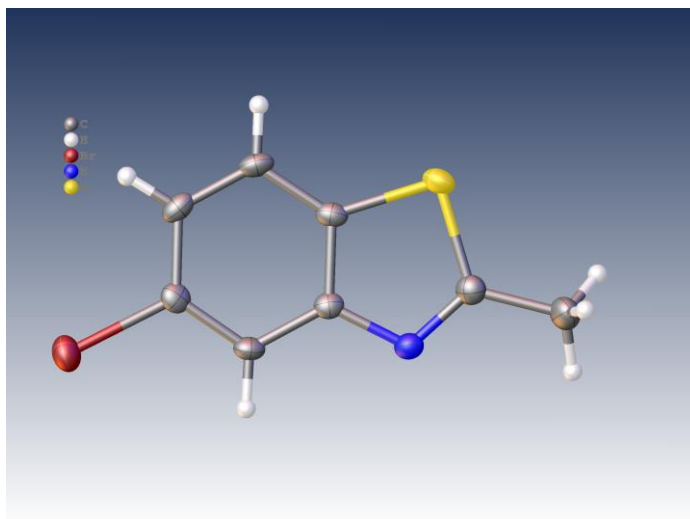
Email: [Ross.Hannan@anu.edu.au](mailto:Ross.Hannan@anu.edu.au) and [Martin.Banwell@anu.edu.au](mailto:Martin.Banwell@anu.edu.au)

**CONTENTS**

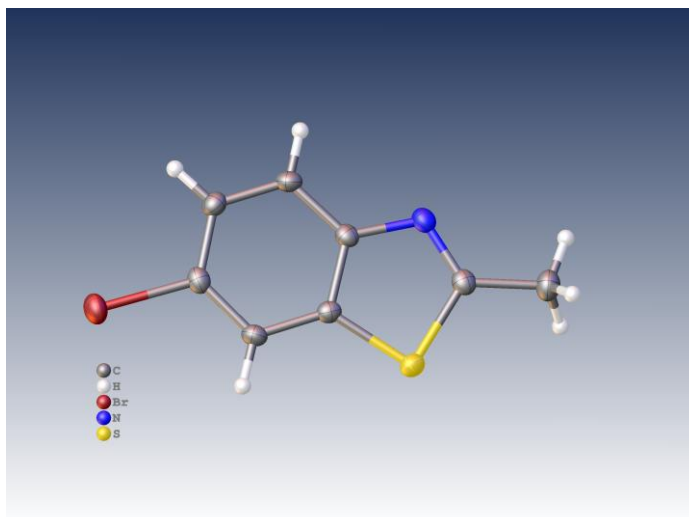
	<b>Page</b>
Reaction Sequence Used in the Synthesis of the Azide <b>22</b> .	S2
Anisotropic Displacement Ellipsoid Plots for Compounds <b>4</b> and <b>13</b> .	S3
<sup>1</sup> H and <sup>13</sup> C NMR Spectra for Compounds <b>2, 3, 4, 5, 6, 8, 10, 12-26</b> and those of the three precursors to azide <b>22</b> .	S5



**Scheme SM1:** Reaction Sequence Used in the Synthesis of Azide **22**  
(see Experimental Section for details)

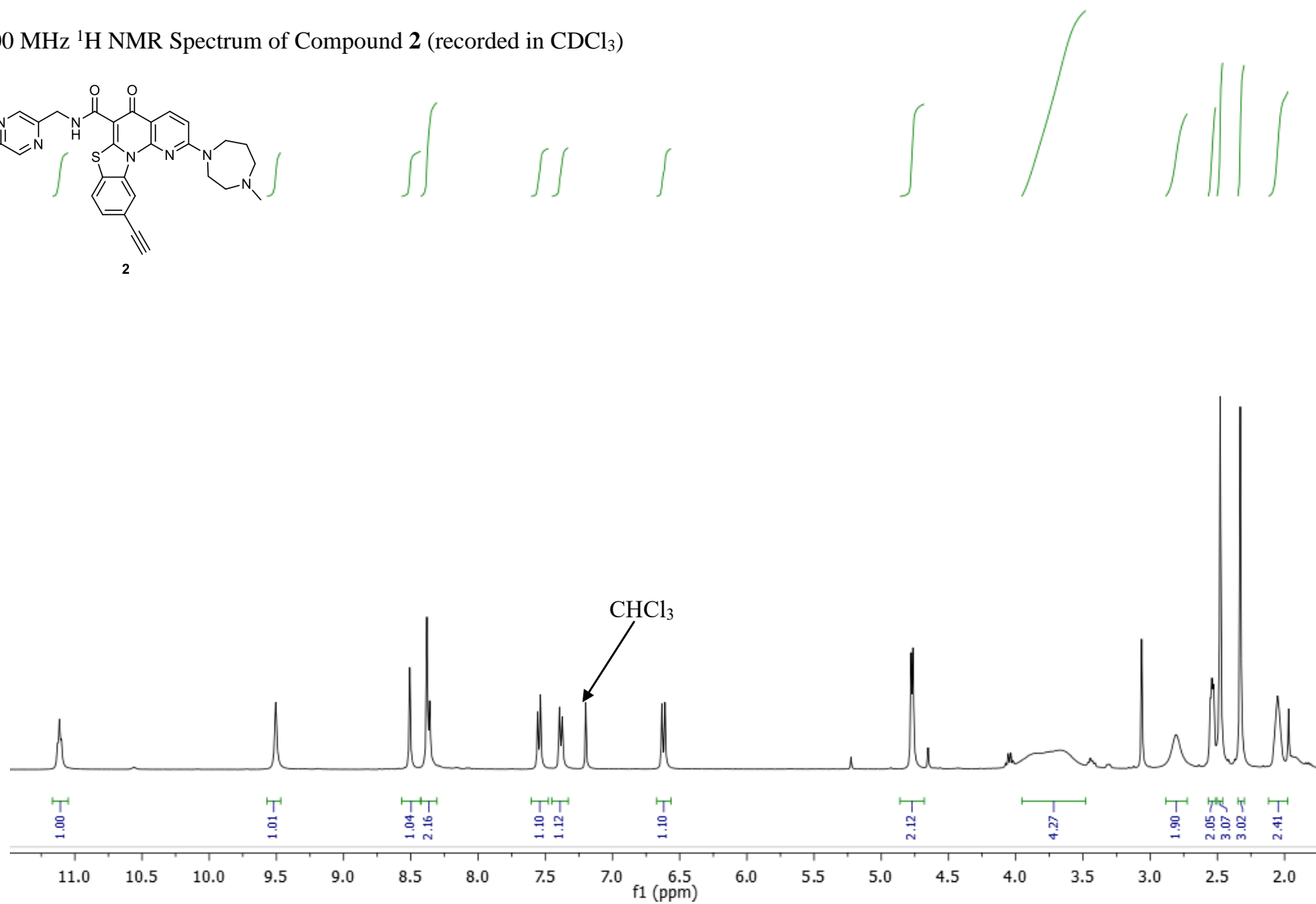
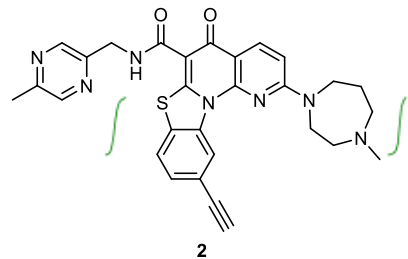


**Figure SM1:** Structure of compound **4** (CCDC 2058495) with labeling of selected atoms. Anisotropic displacement ellipsoids show 50% probability levels. Hydrogen atoms are drawn as circles with small radii. Disorder has been omitted for clarity.



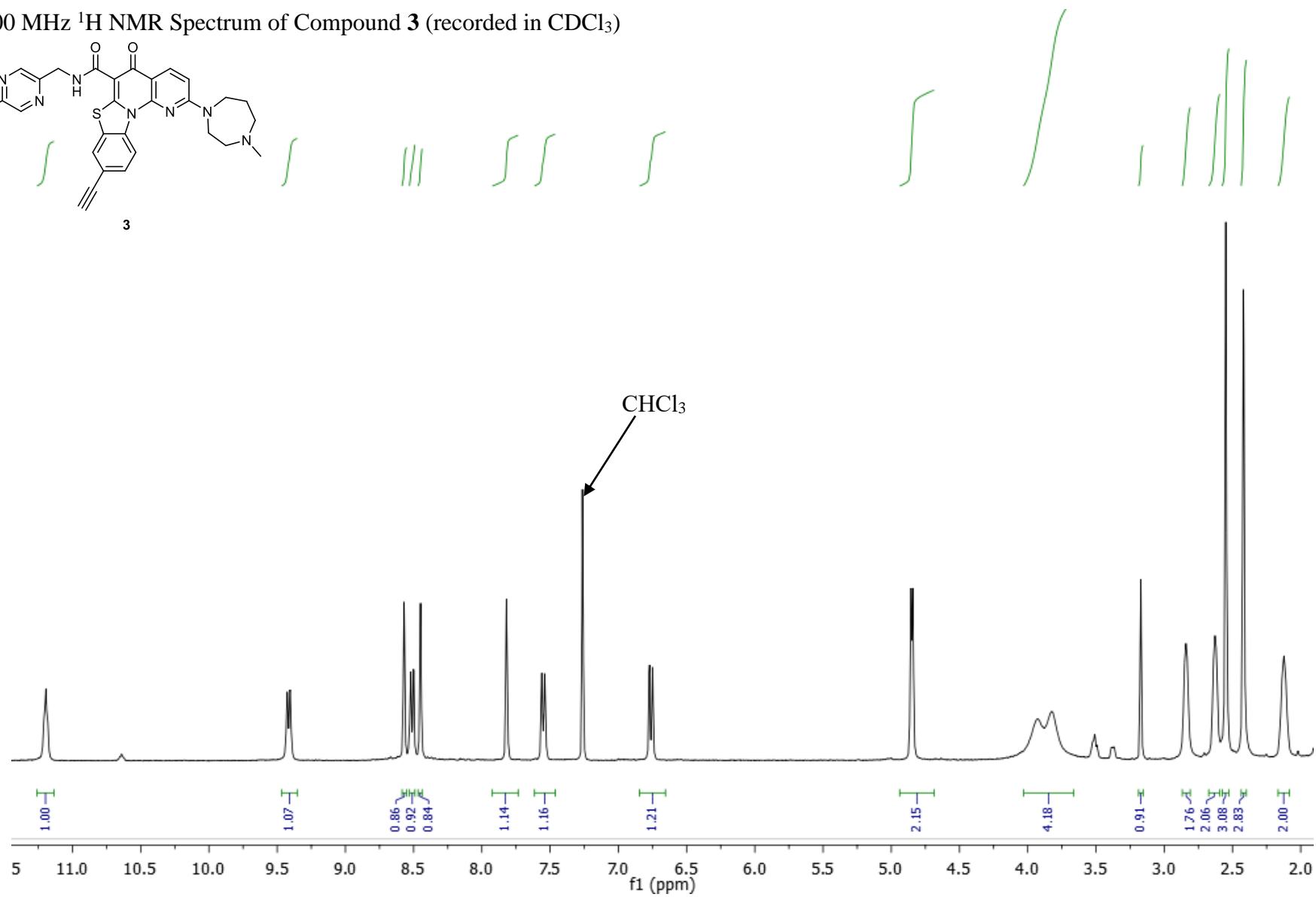
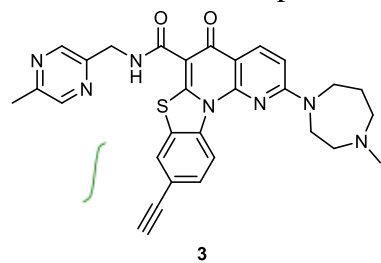
**Figure SM2:** Structure of compound **13** (CCDC 2058496) with labeling of selected atoms. Anisotropic displacement ellipsoids show 50% probability levels. Hydrogen atoms are drawn as circles with small radii. Disorder has been omitted for clarity.

400 MHz  $^1\text{H}$  NMR Spectrum of Compound **2** (recorded in  $\text{CDCl}_3$ )

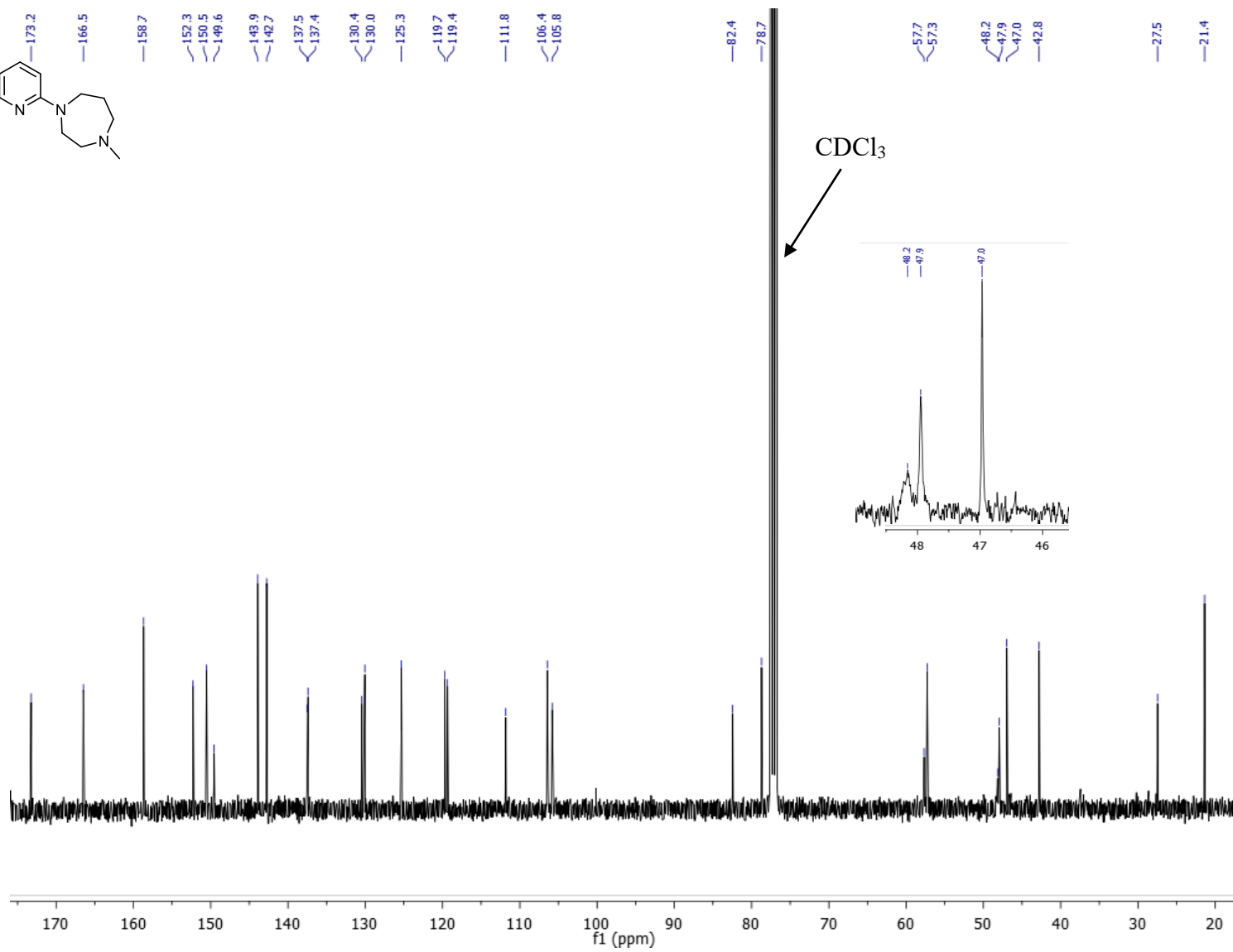
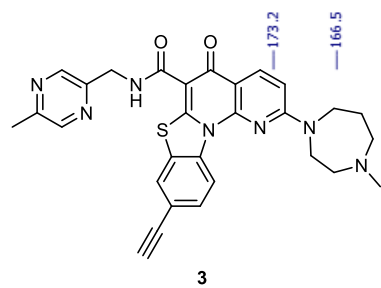




400 MHz  $^1\text{H}$  NMR Spectrum of Compound **3** (recorded in  $\text{CDCl}_3$ )

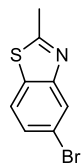


101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **3** (recorded in  $\text{CDCl}_3$ )

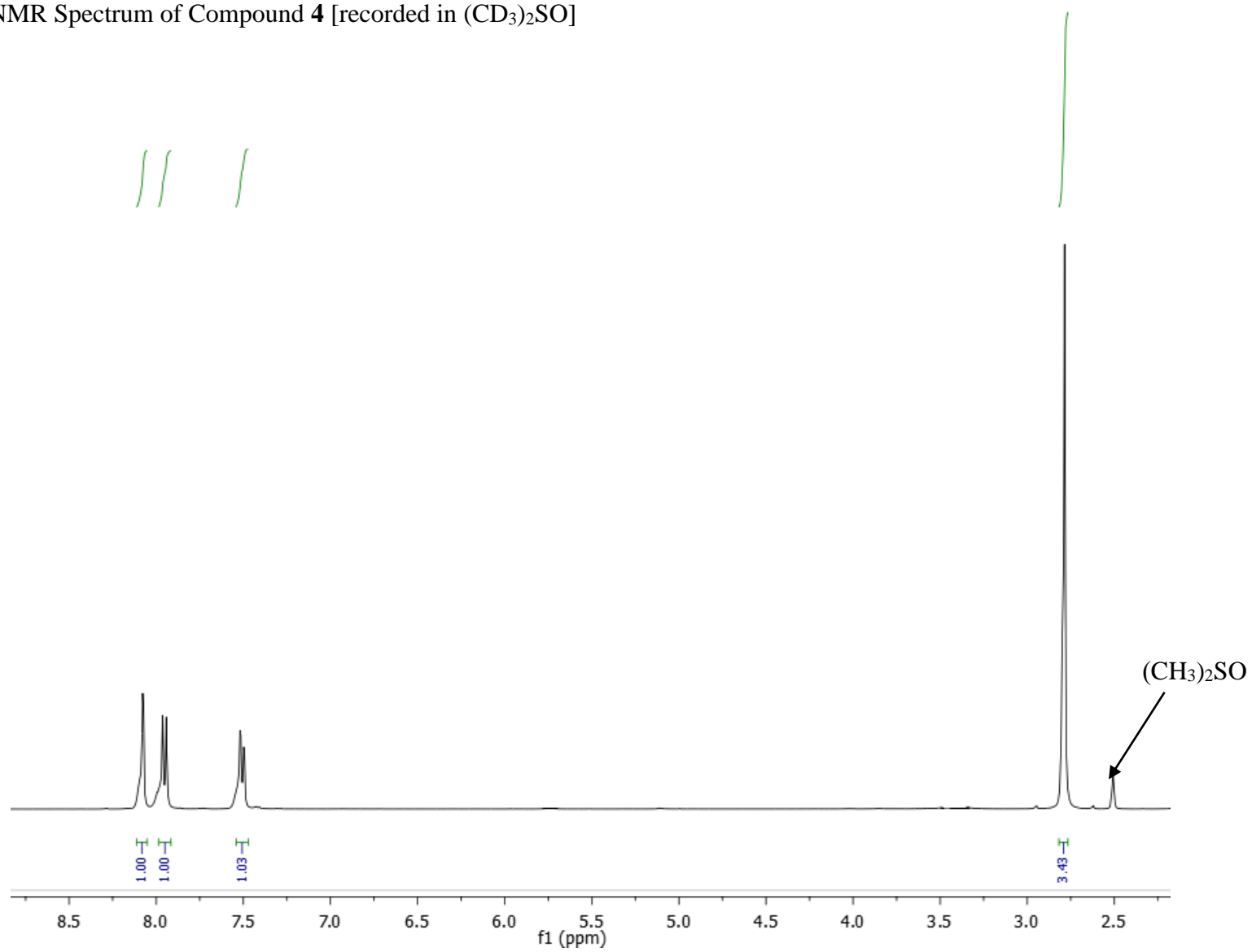




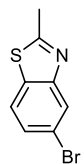
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **4** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]



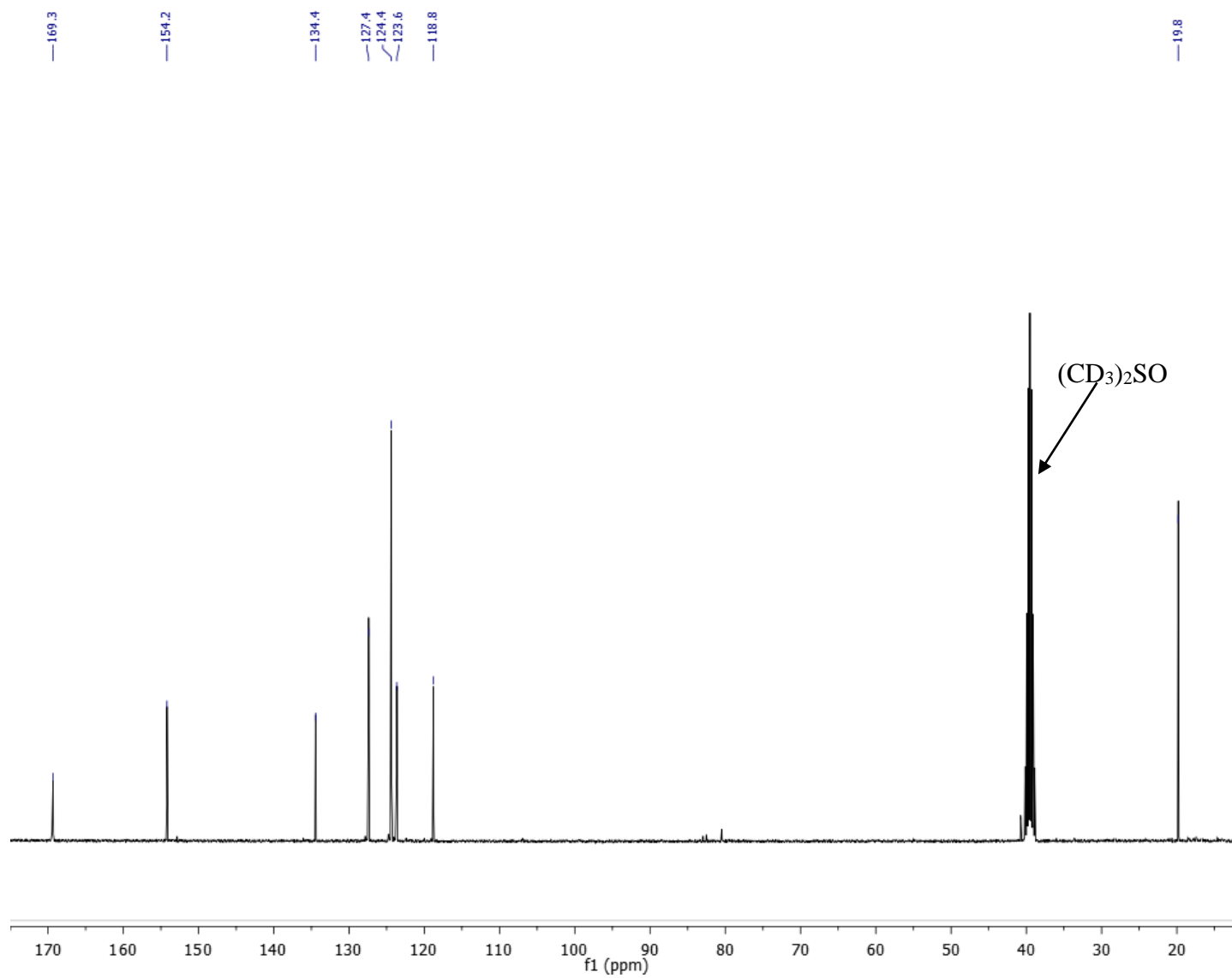
**4**



101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **4** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]

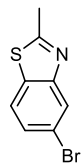


**4**

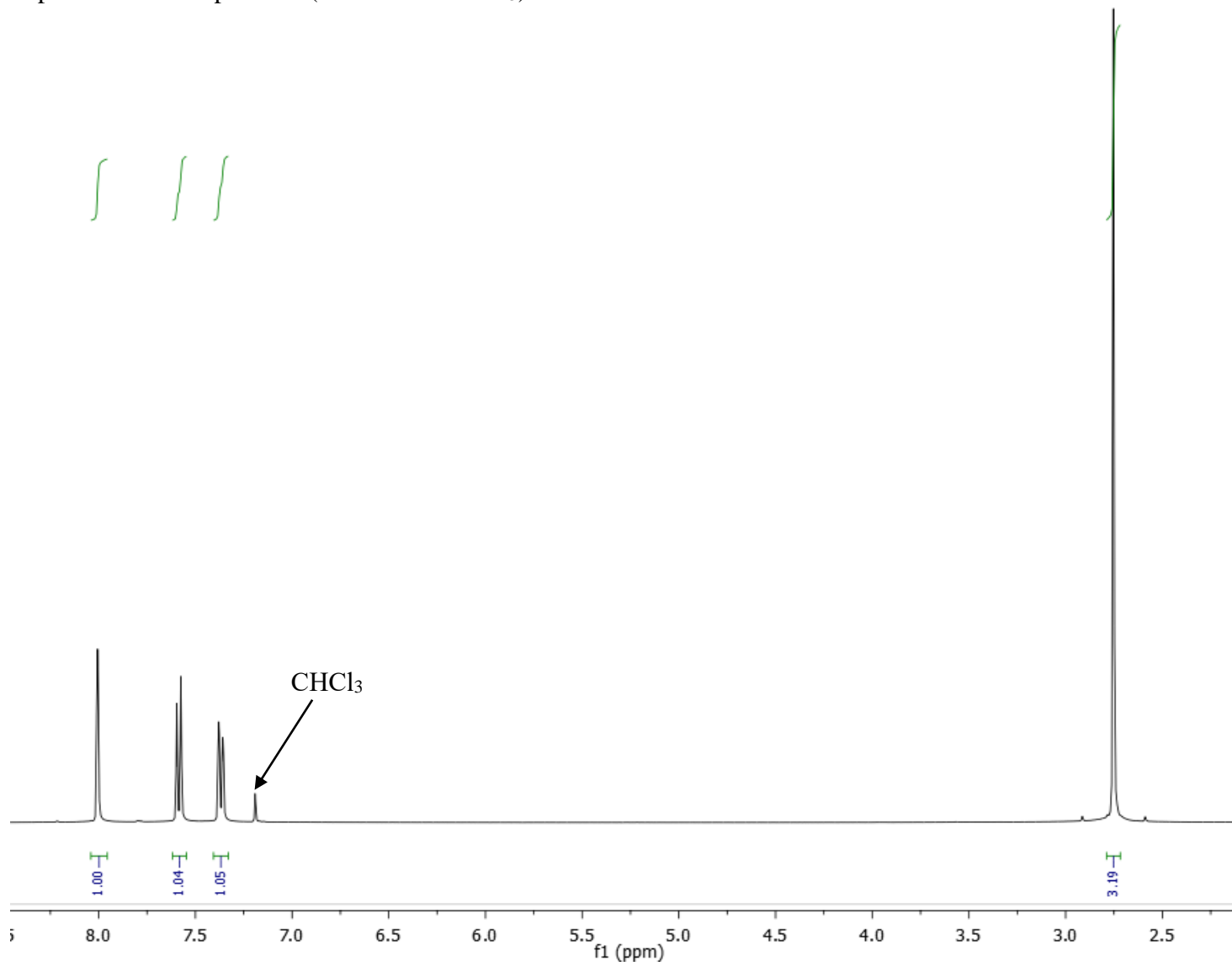


S10

400 MHz  $^1\text{H}$  NMR Spectrum of Compound **4** (recorded in  $\text{CDCl}_3$ )

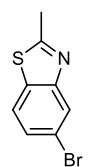


**4**

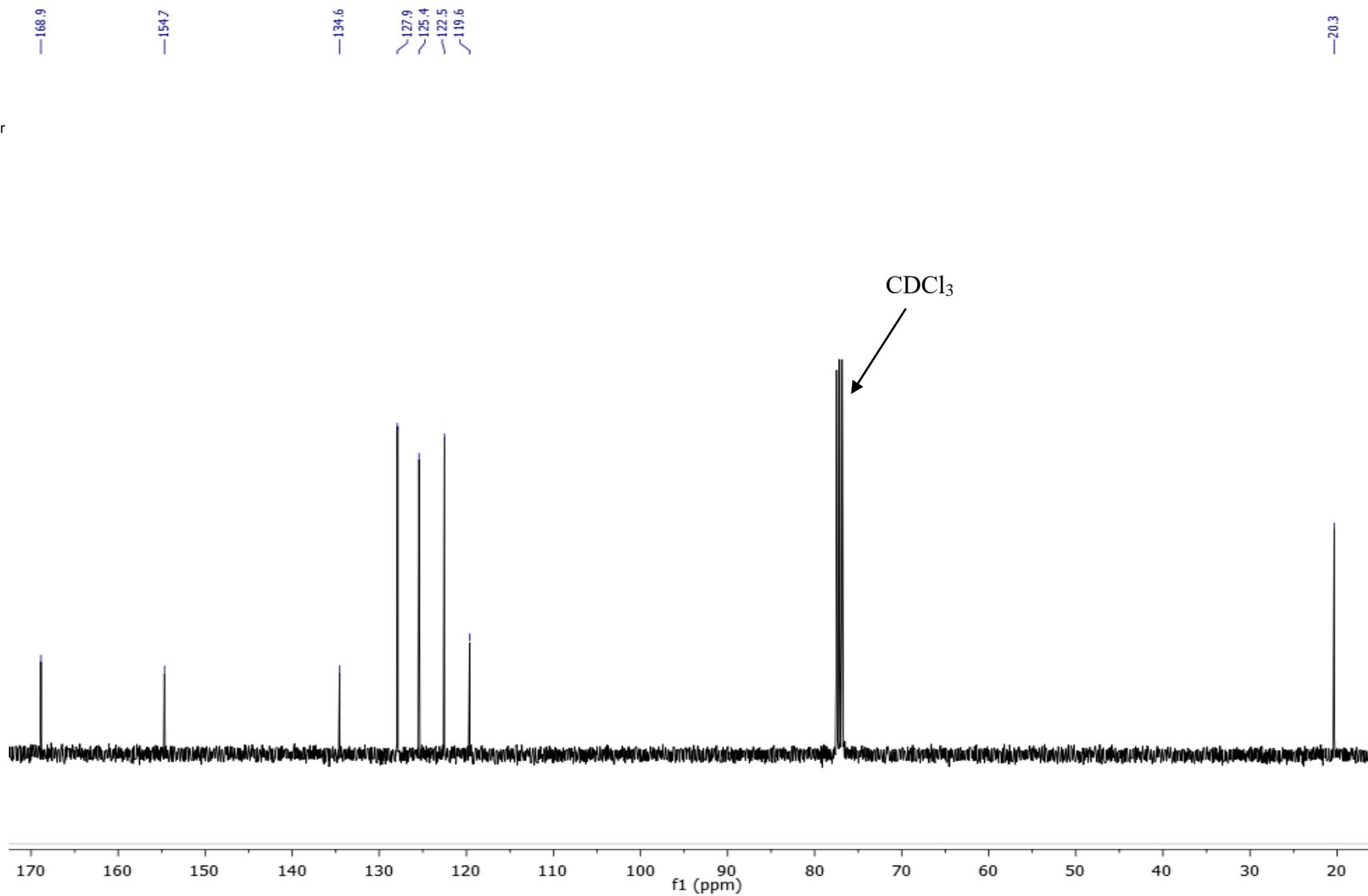


S11

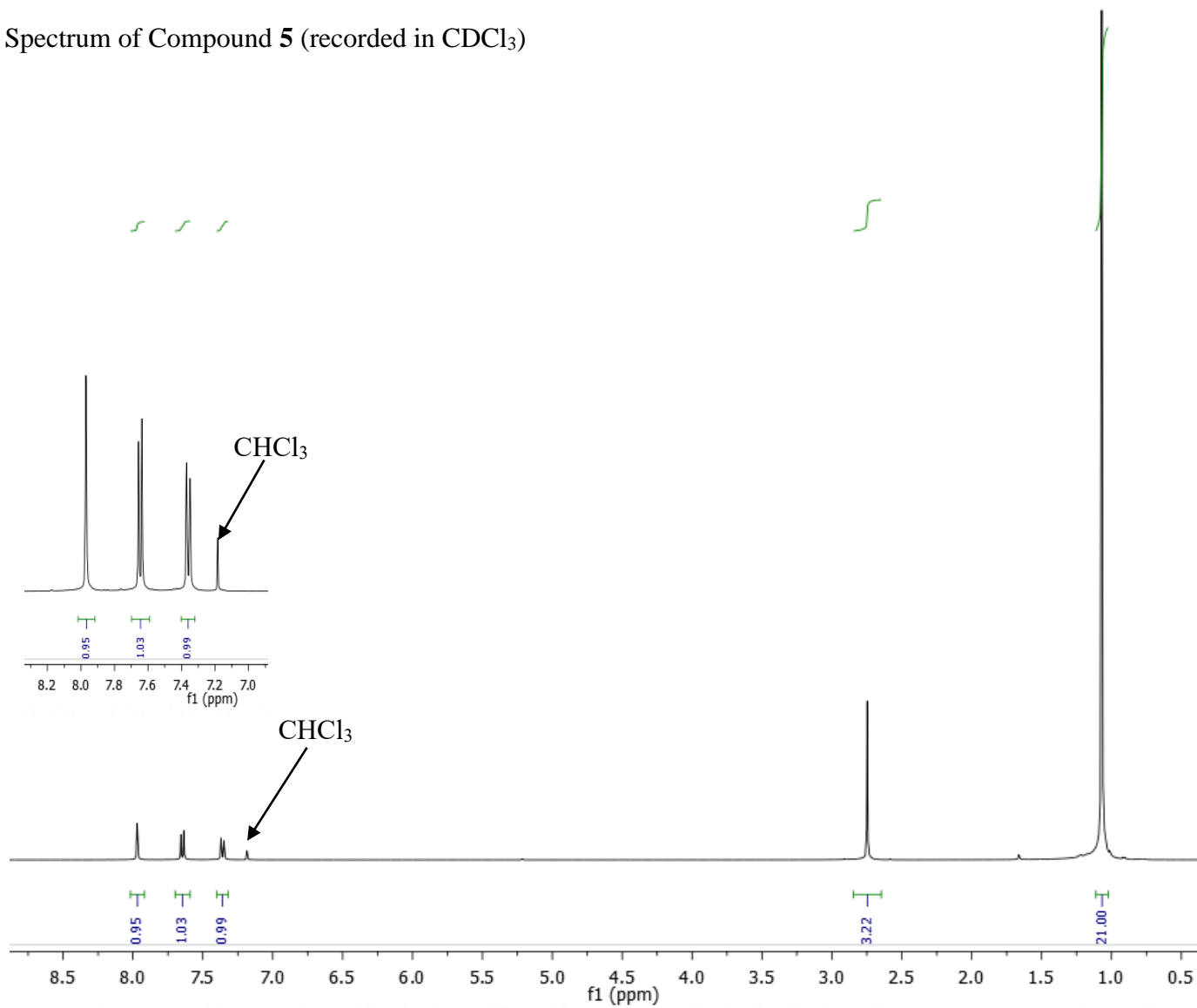
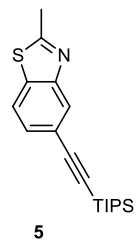
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **4** (recorded in  $\text{CDCl}_3$ )



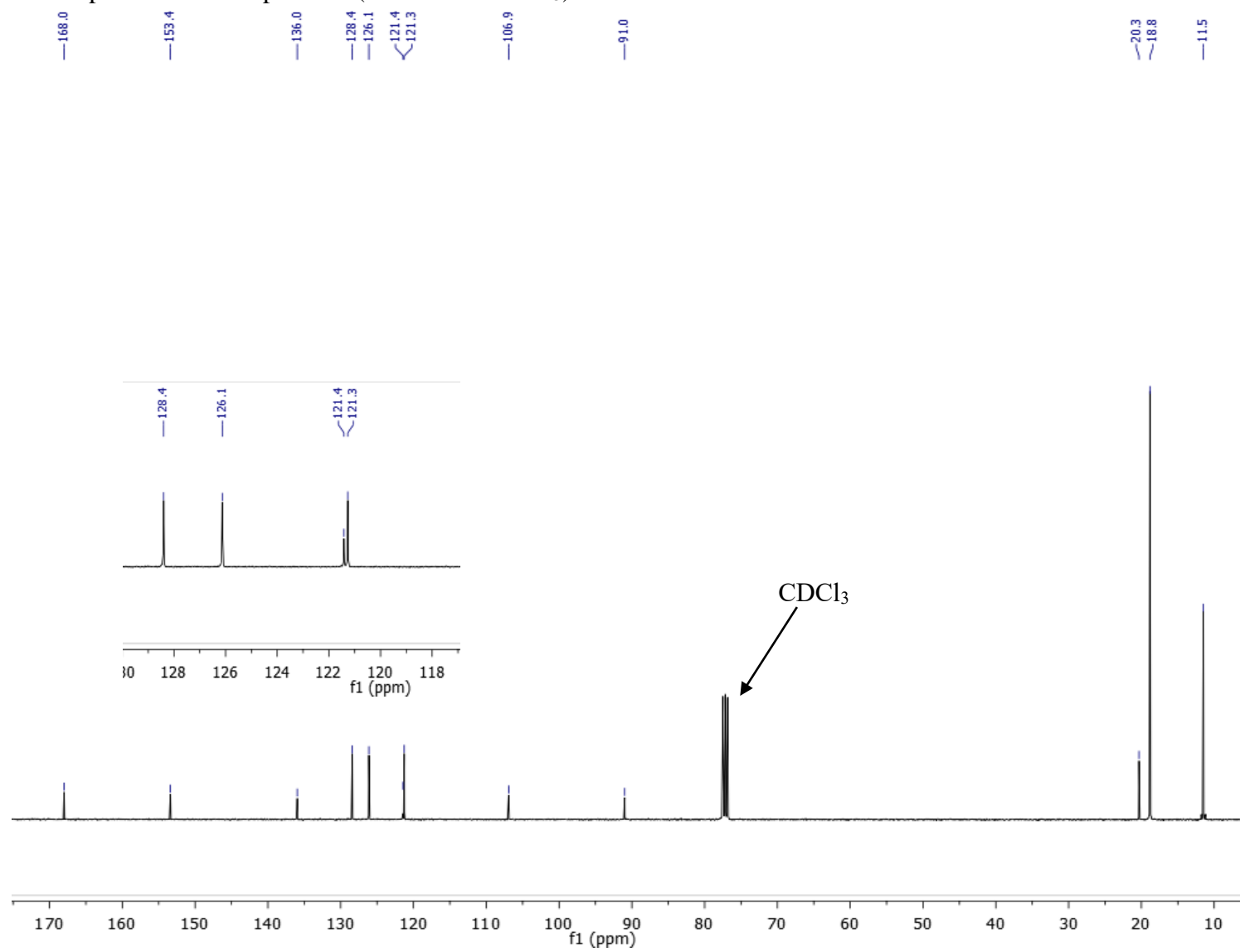
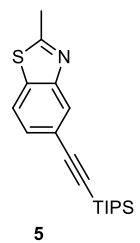
**4**



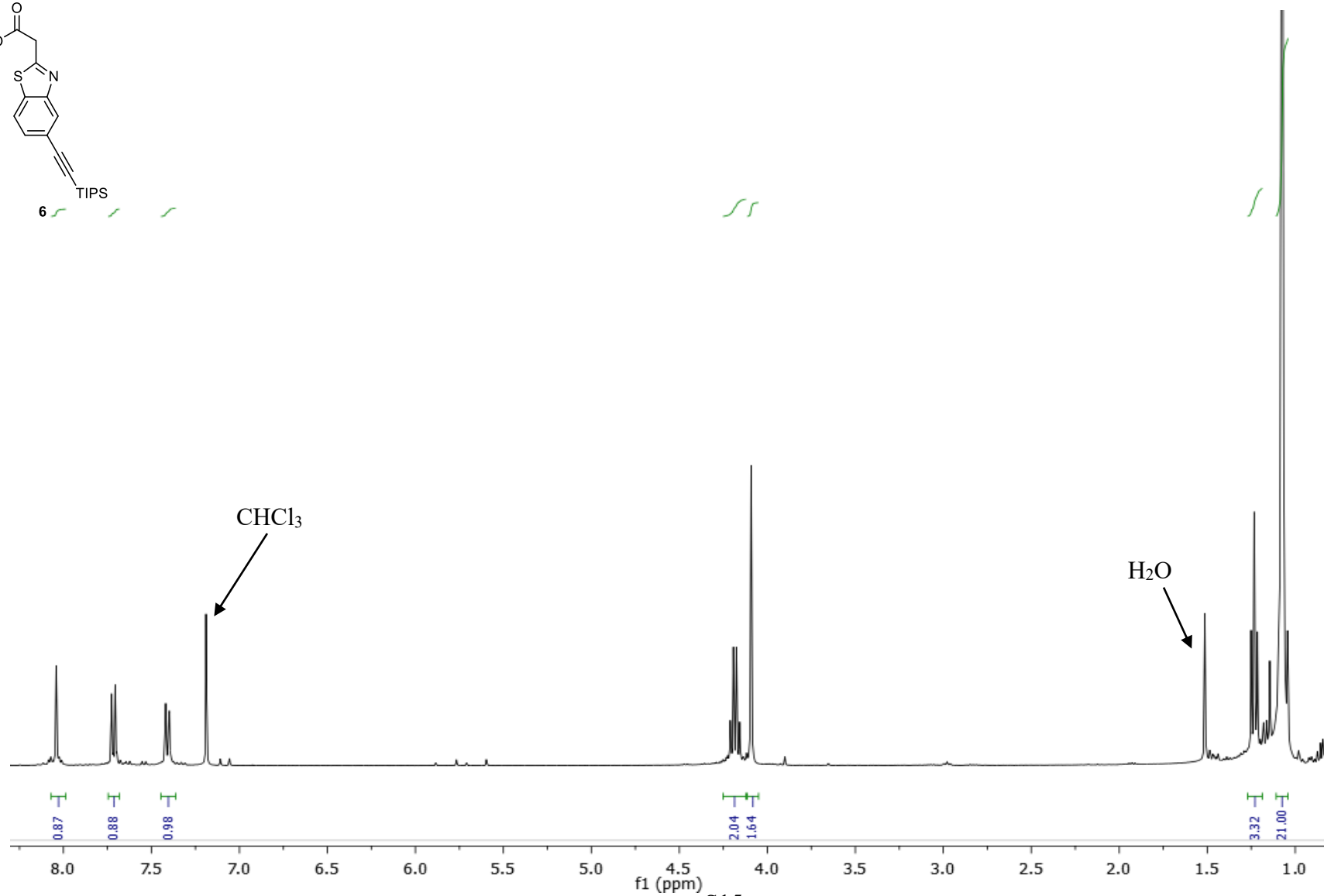
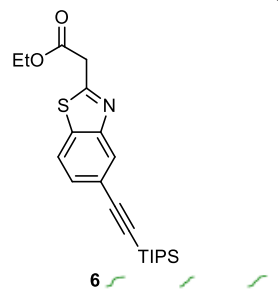
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **5** (recorded in  $\text{CDCl}_3$ )



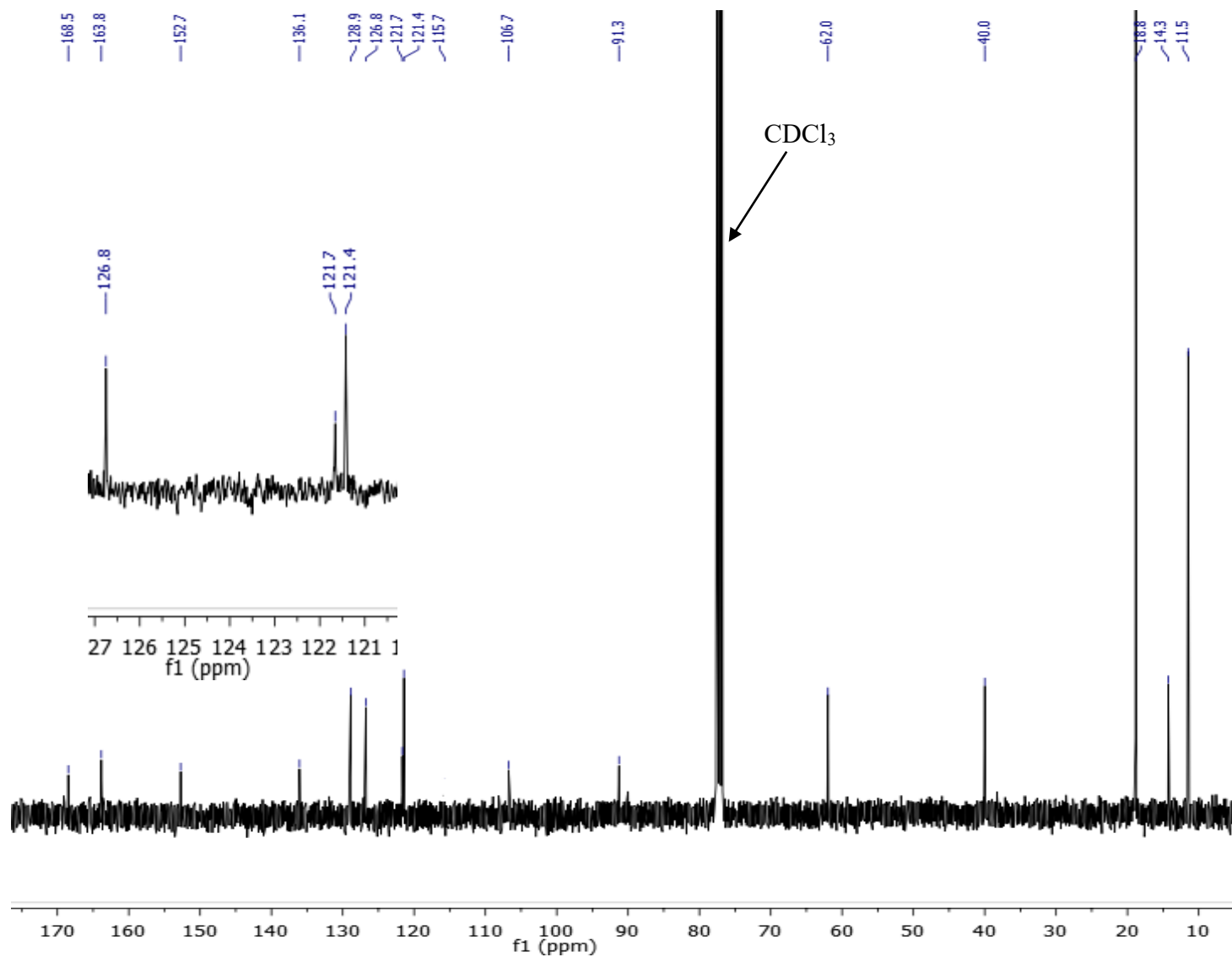
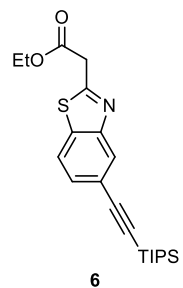
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **5** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **6** (recorded in  $\text{CDCl}_3$ )

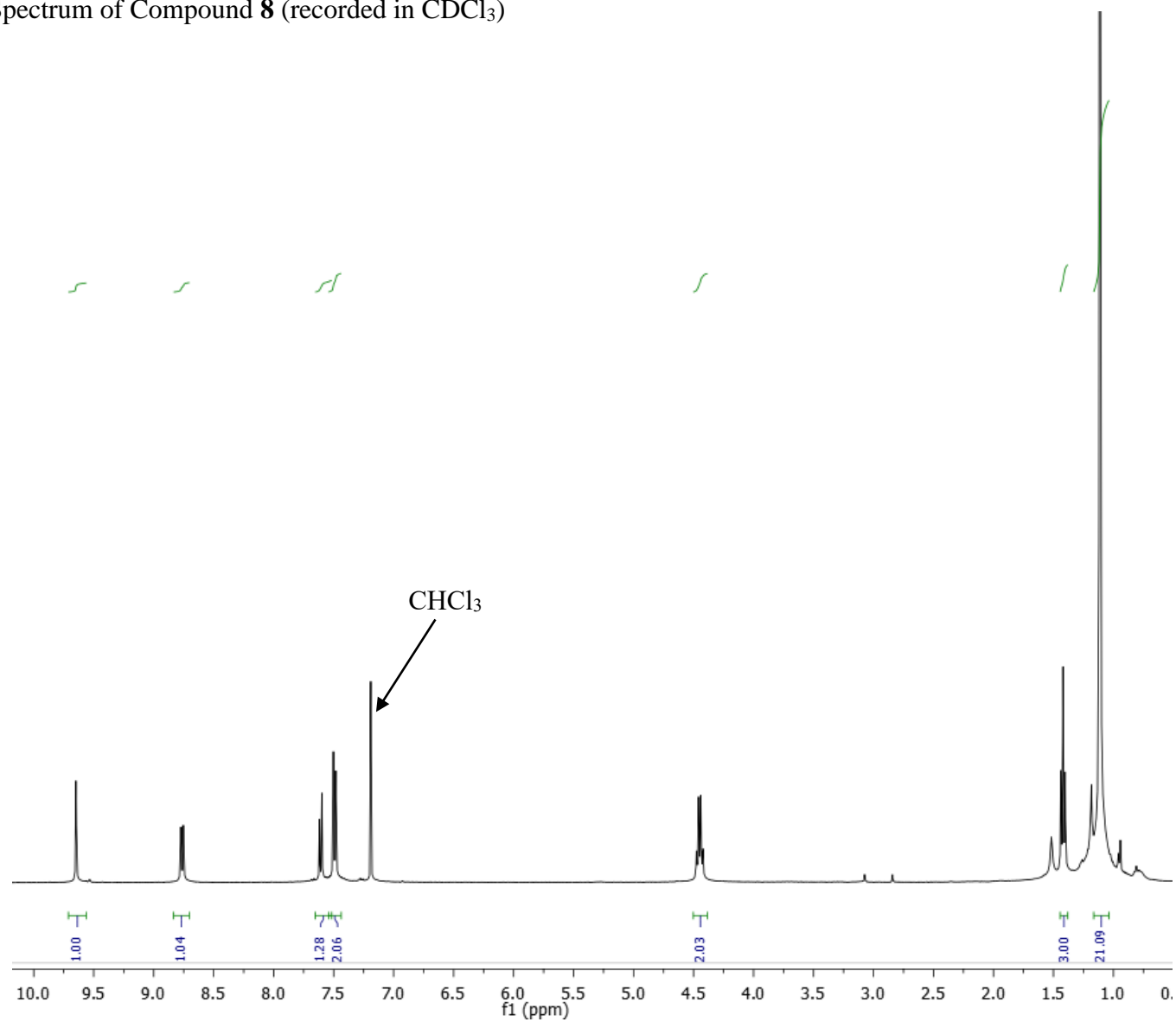
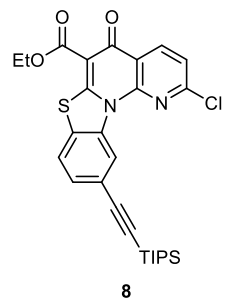


101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **6** (recorded in  $\text{CDCl}_3$ )

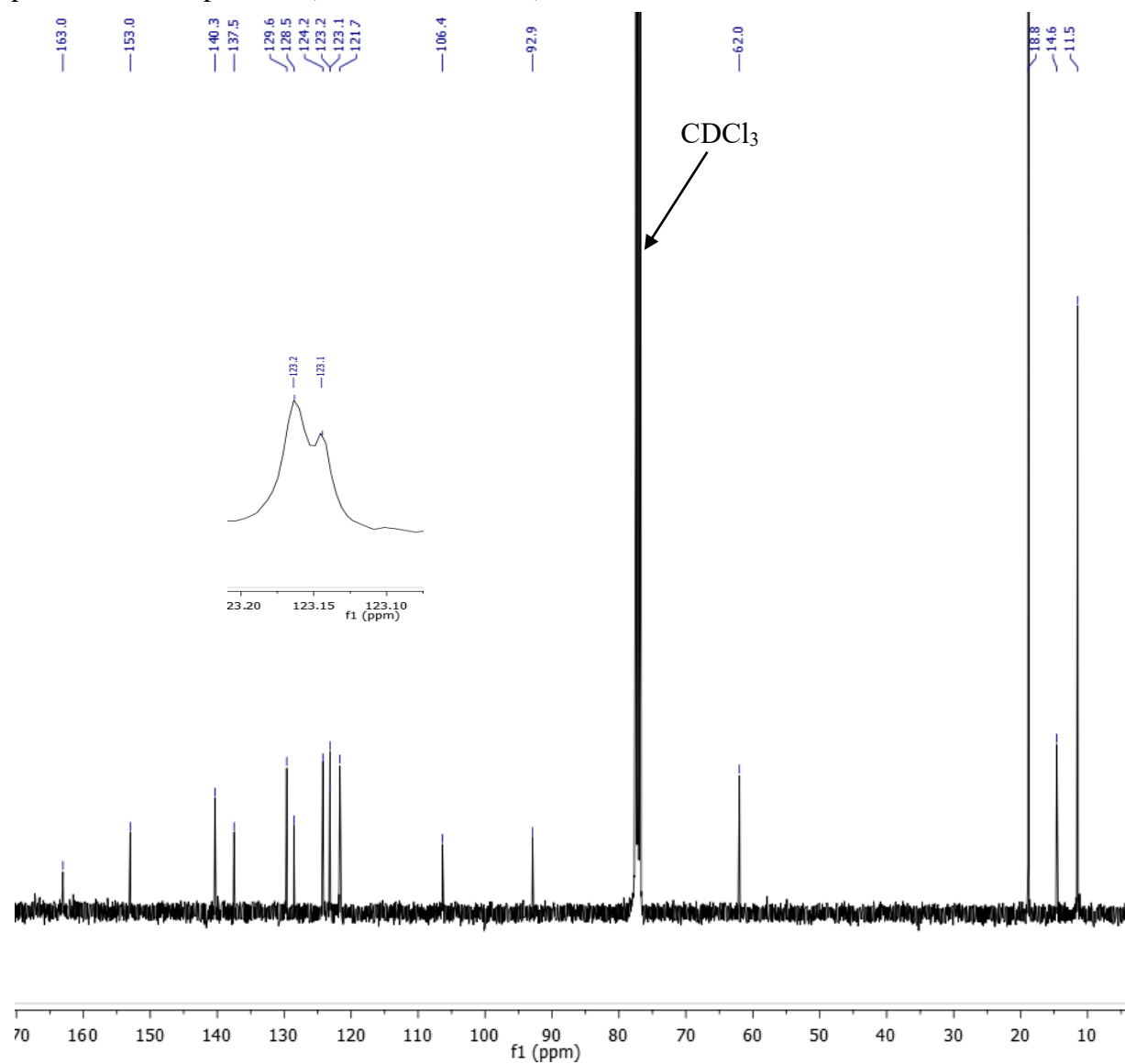
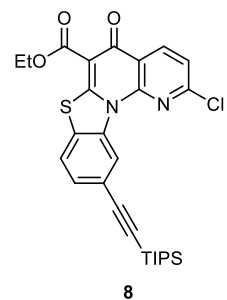




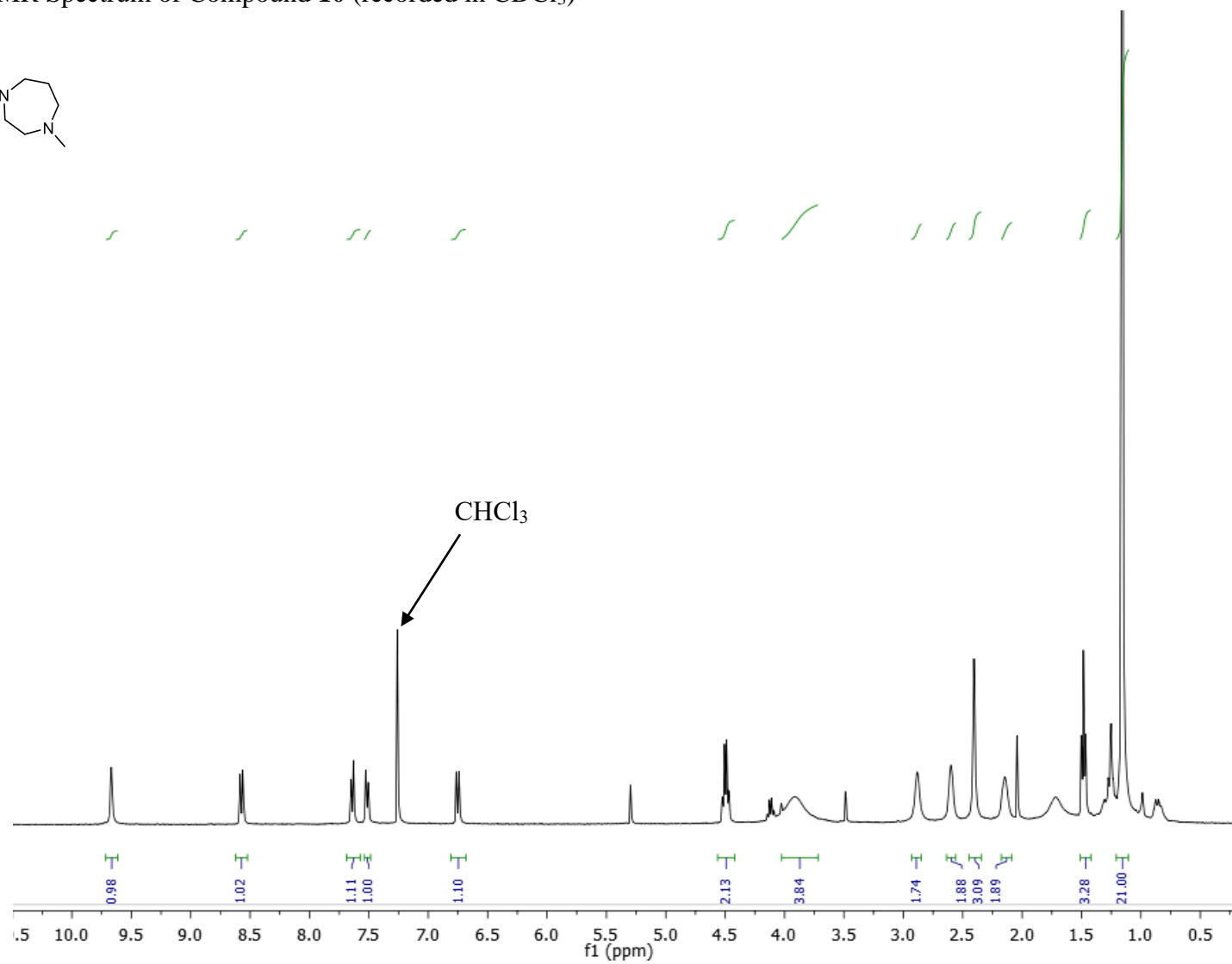
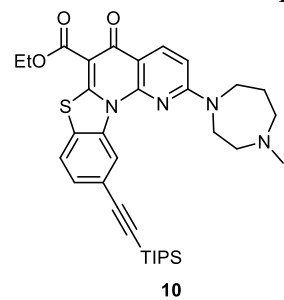
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **8** (recorded in  $\text{CDCl}_3$ )



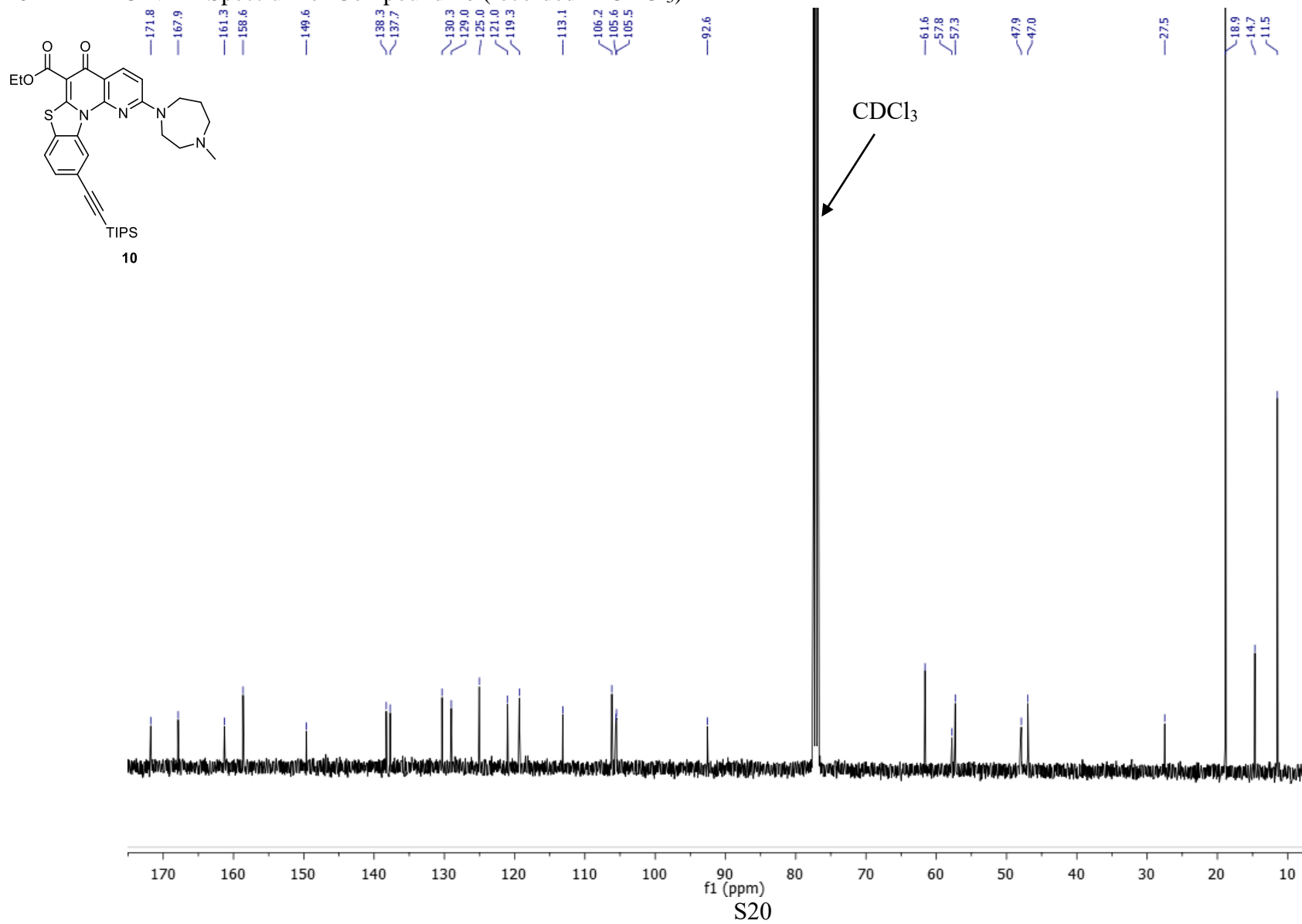
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **8** (recorded in  $\text{CDCl}_3$ )



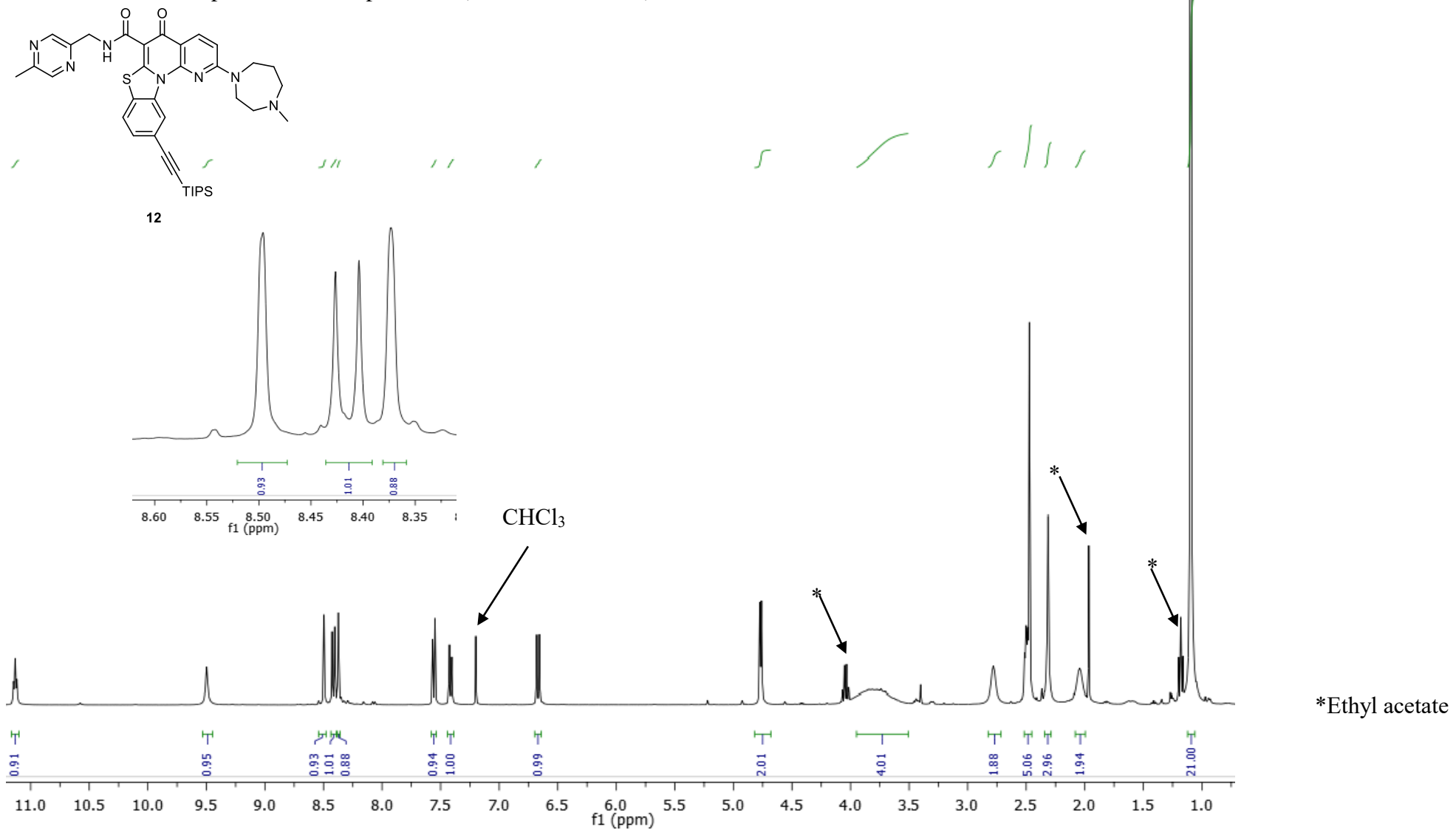
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **10** (recorded in  $\text{CDCl}_3$ )



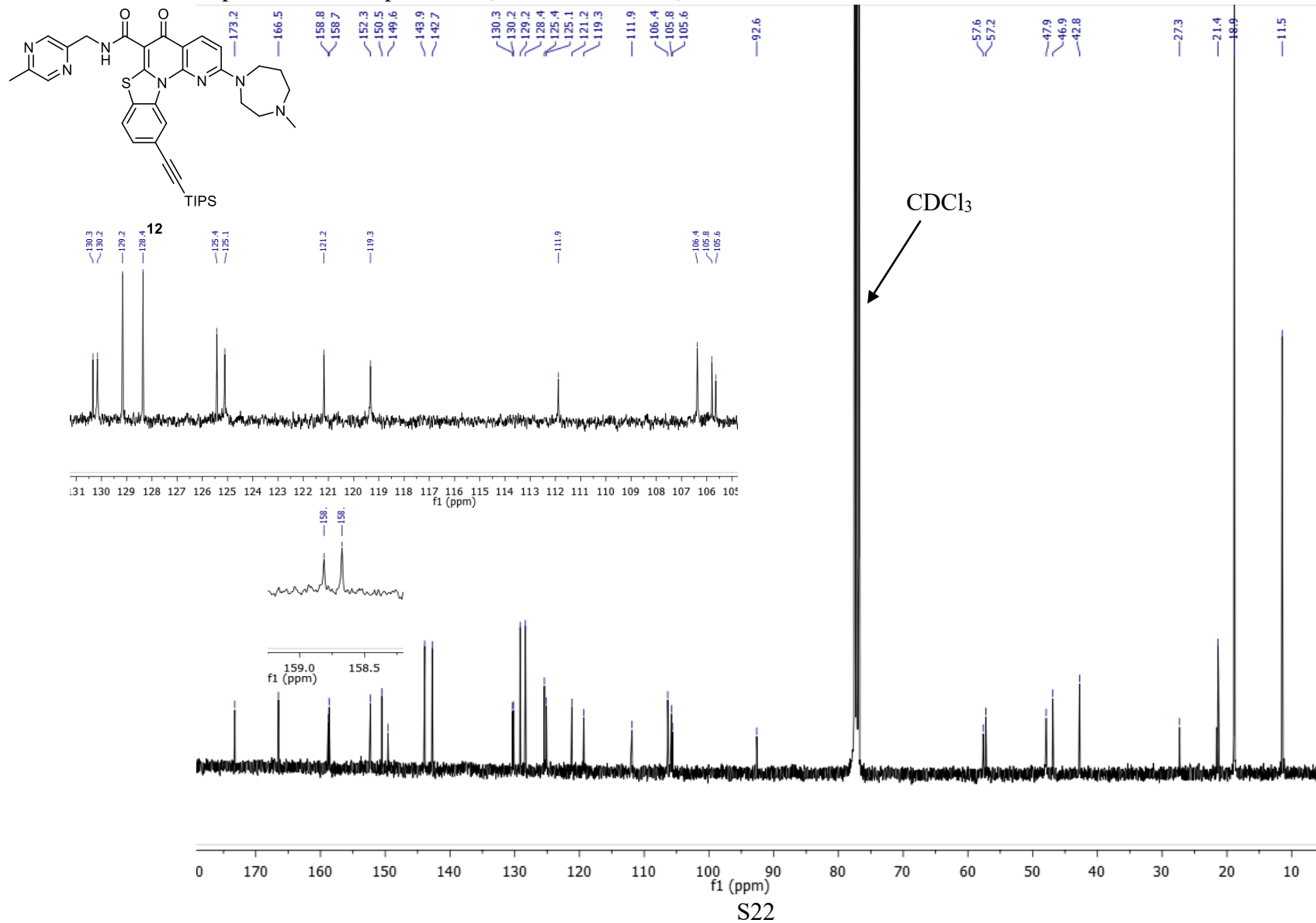
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **10** (recorded in  $\text{CDCl}_3$ )



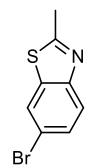
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **12** (recorded in  $\text{CDCl}_3$ )



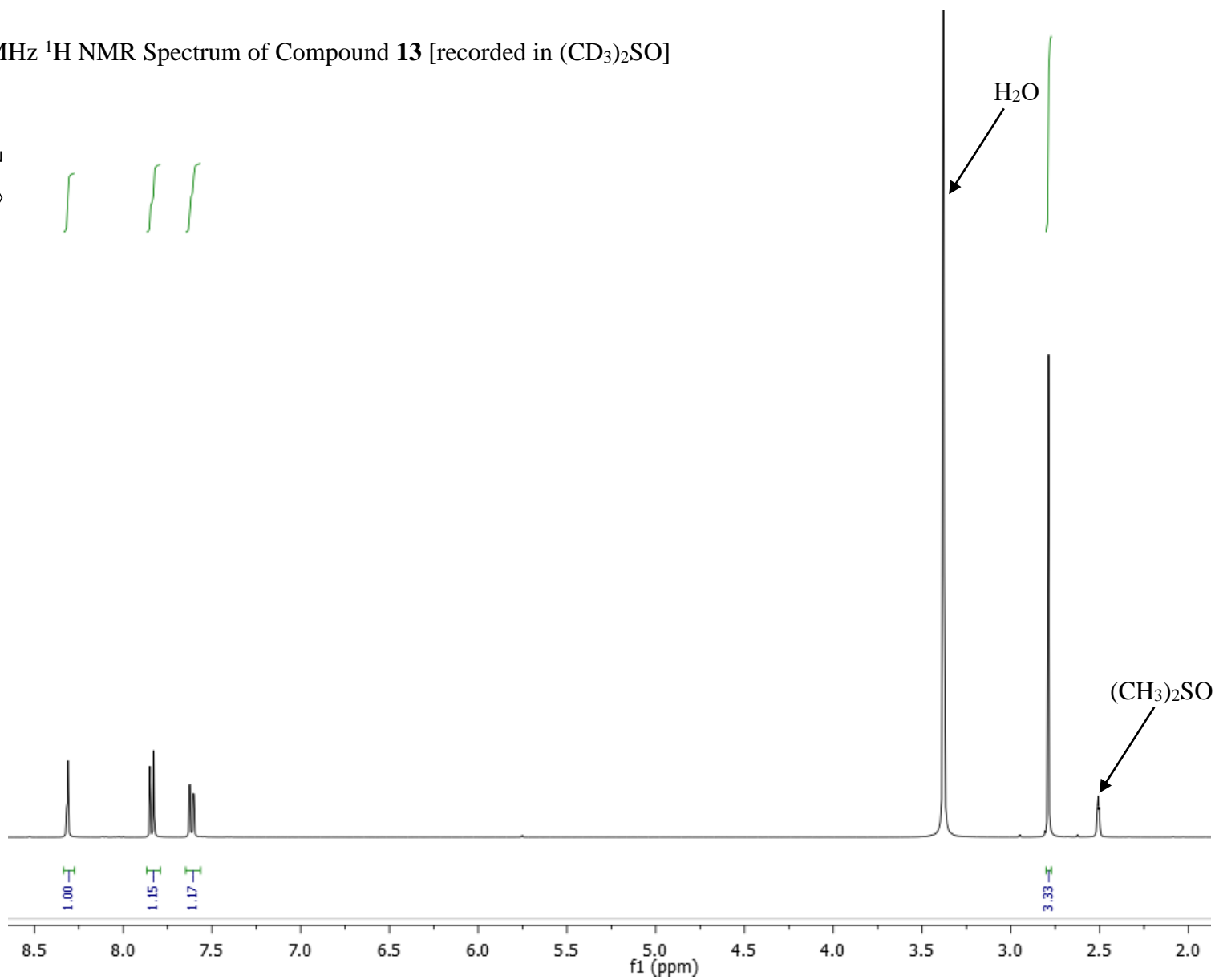
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **12** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **13** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]

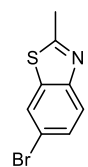


**13**

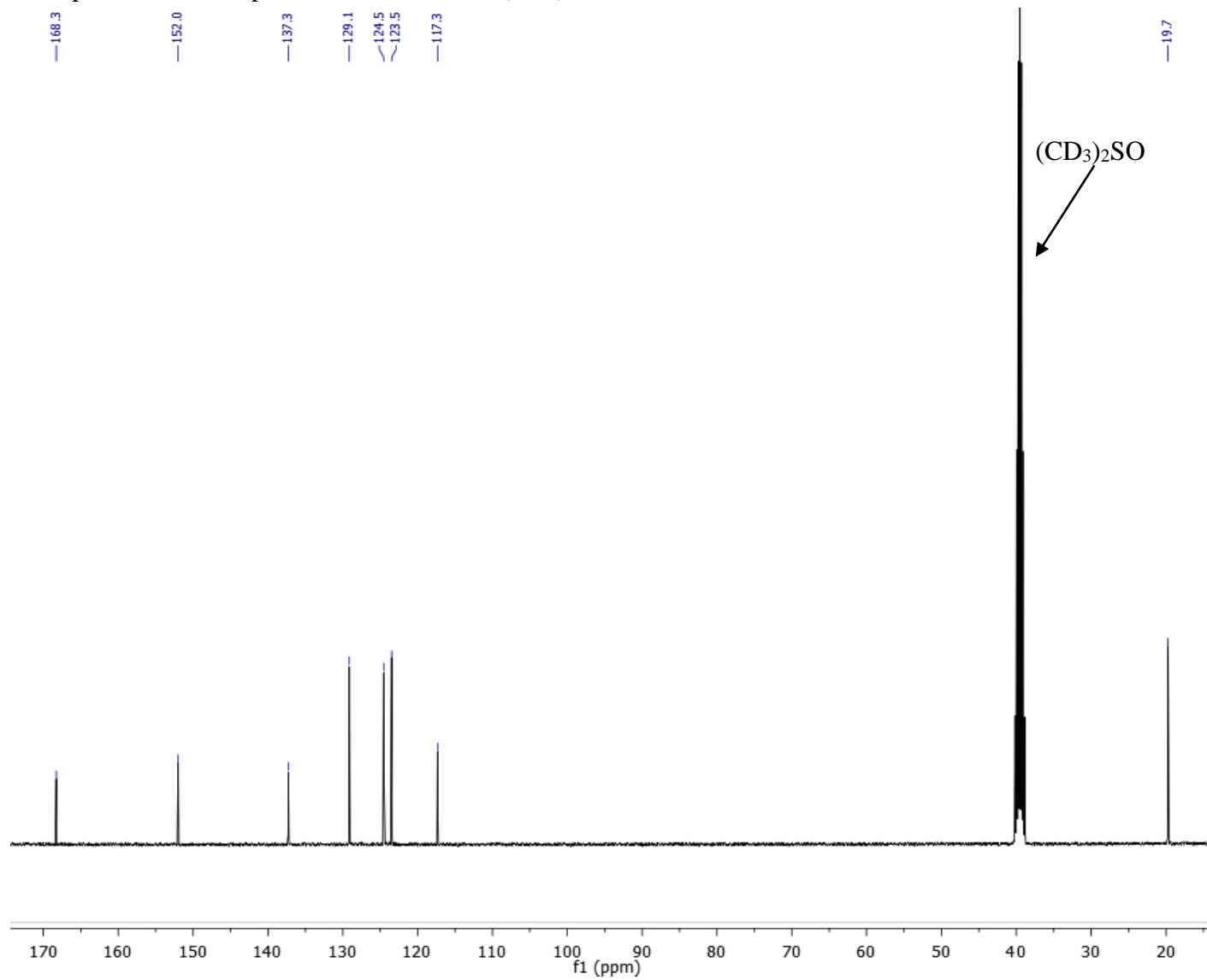


S23

101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **13** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]

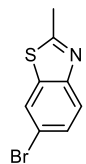


**13**

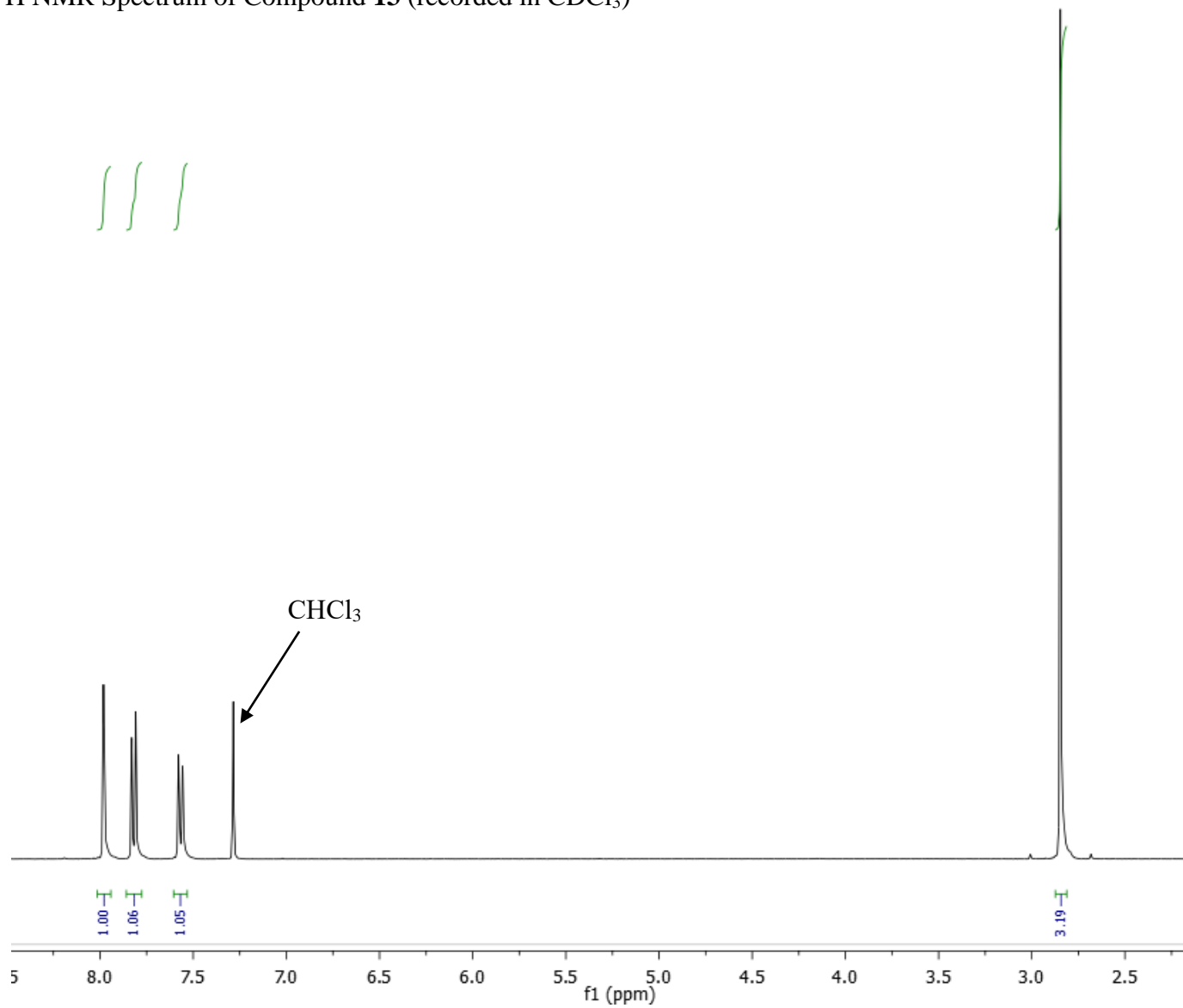




400 MHz  $^1\text{H}$  NMR Spectrum of Compound **13** (recorded in  $\text{CDCl}_3$ )

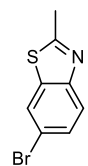


**13**

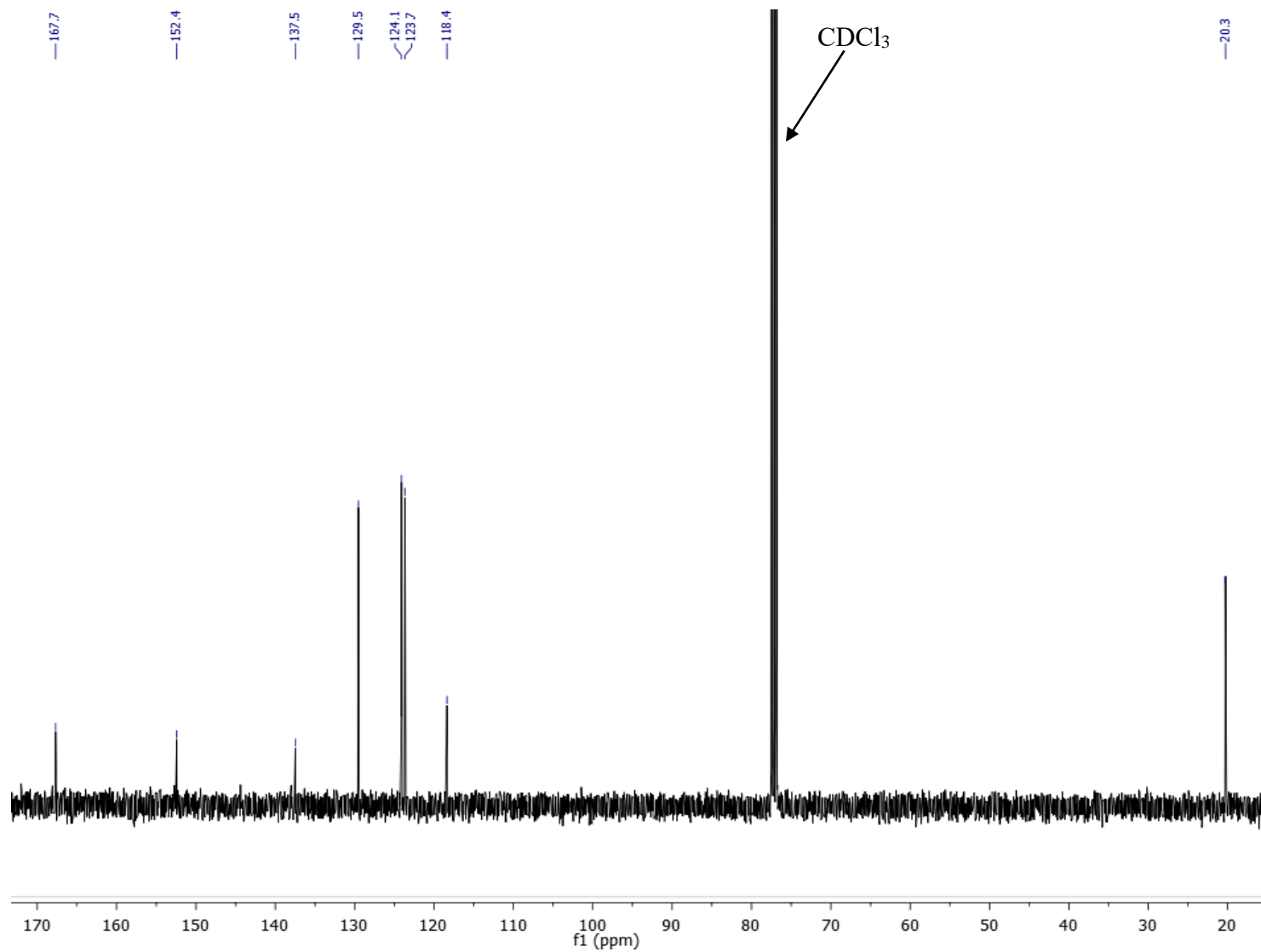


S25

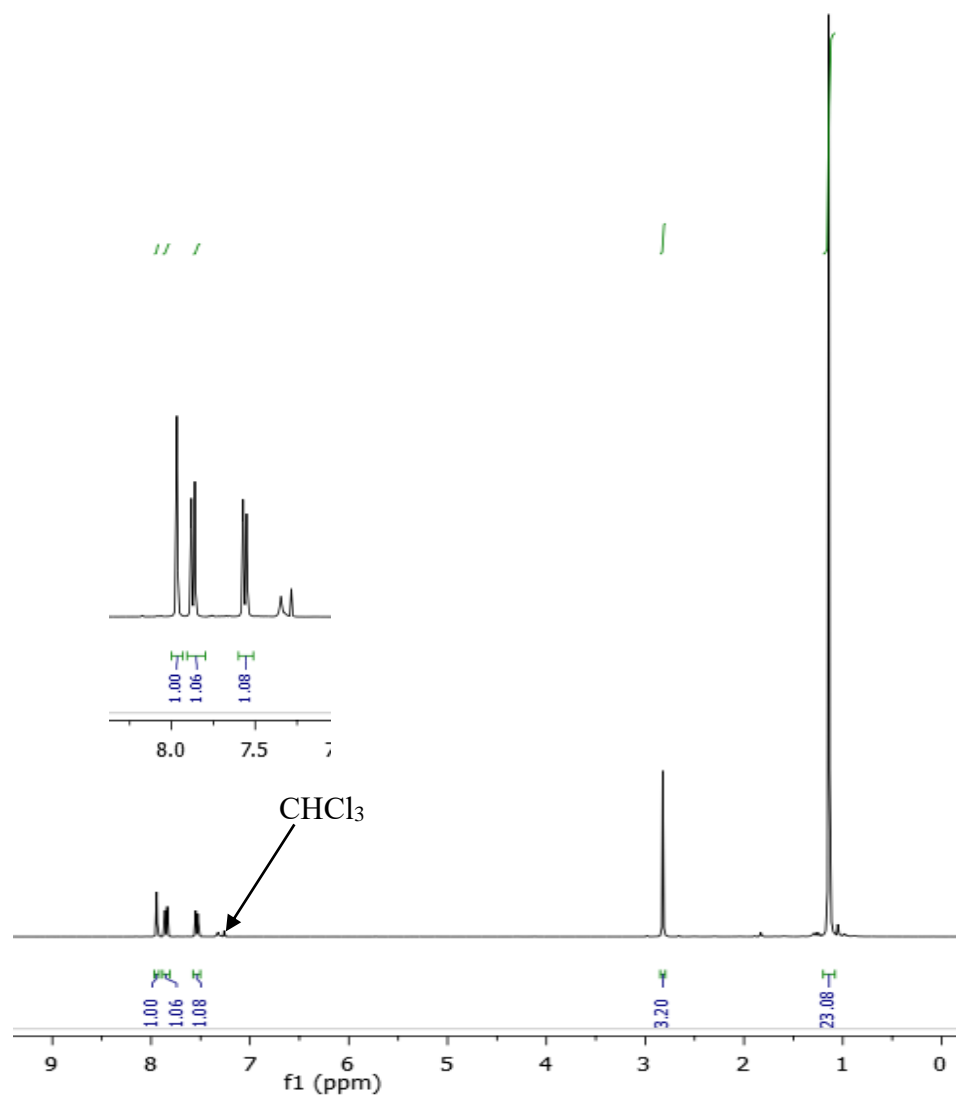
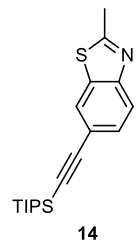
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **13** (recorded in  $\text{CDCl}_3$ )



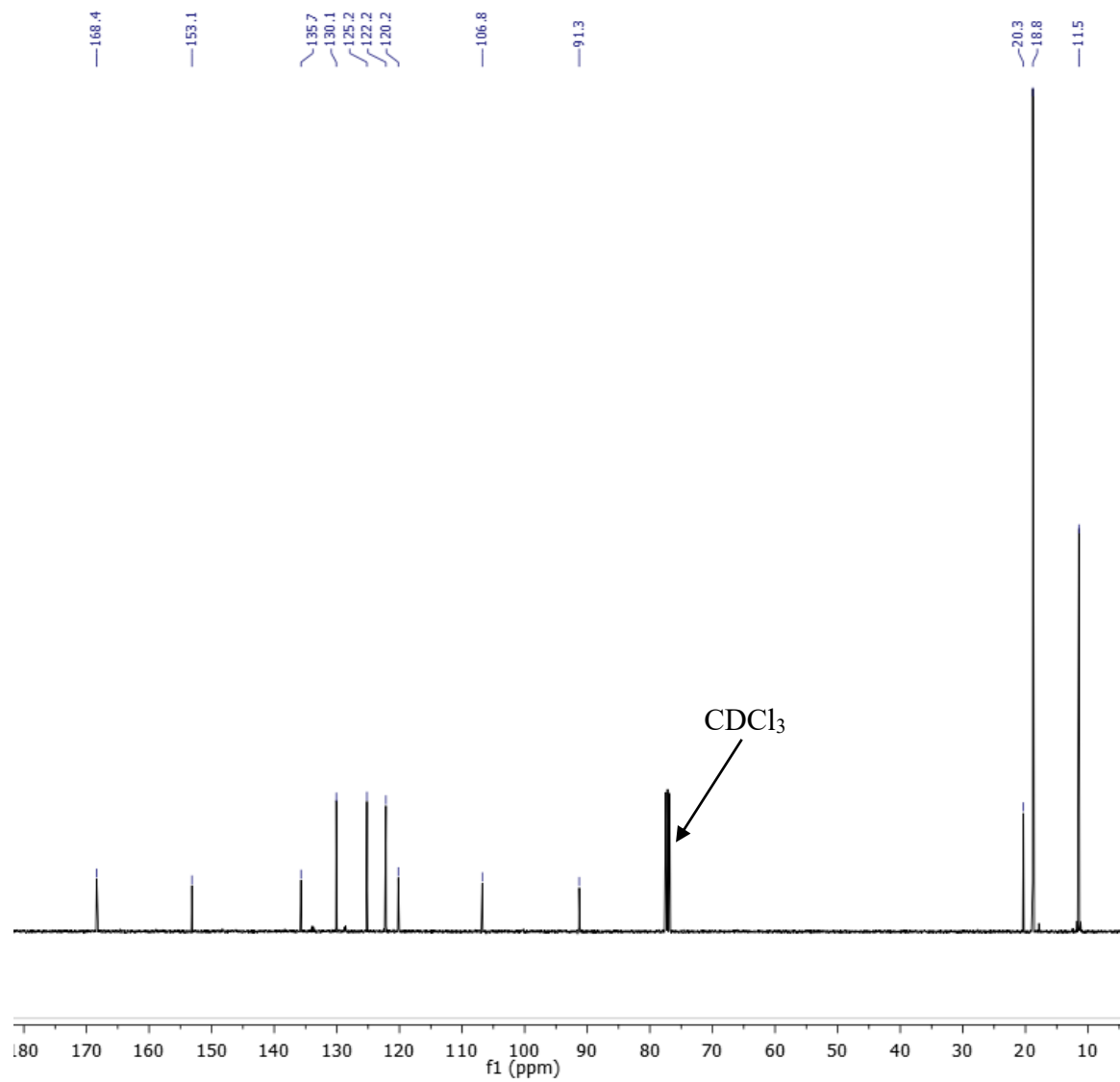
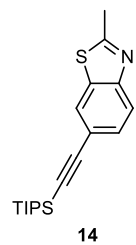
**13**



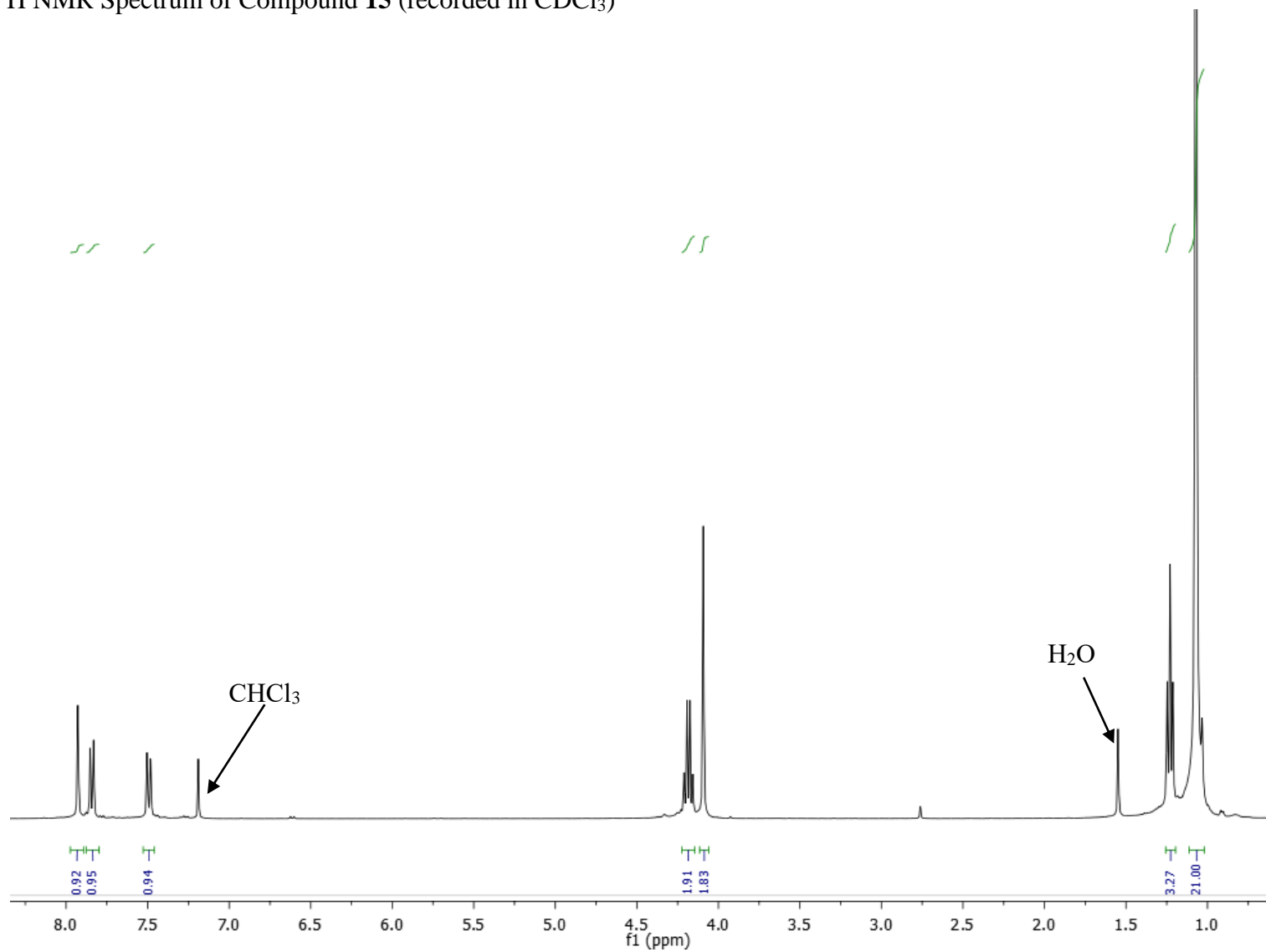
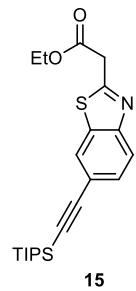
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **14** (recorded in  $\text{CDCl}_3$ )



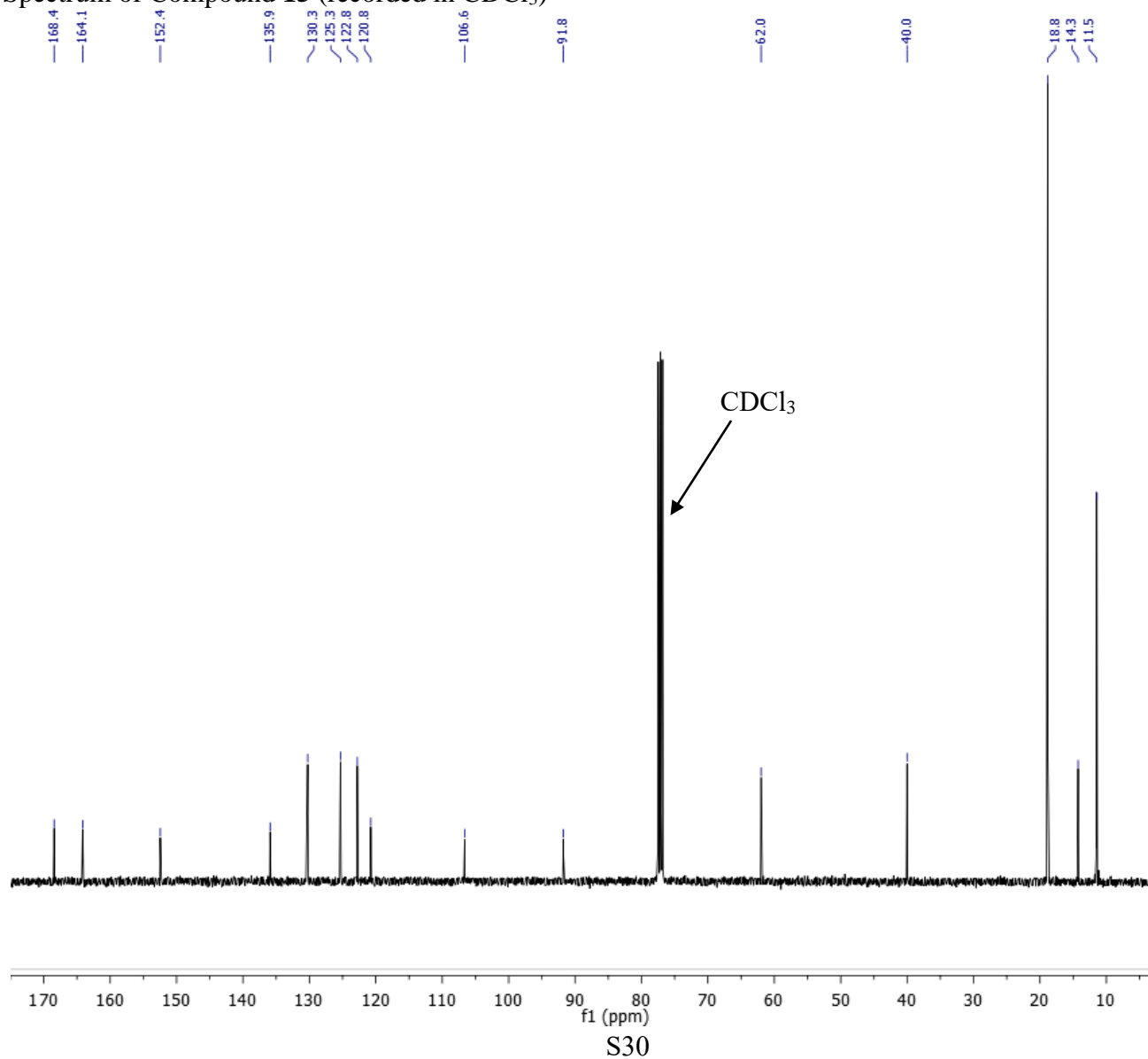
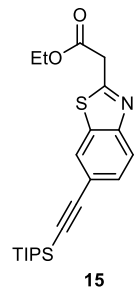
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **14** (recorded in  $\text{CDCl}_3$ )



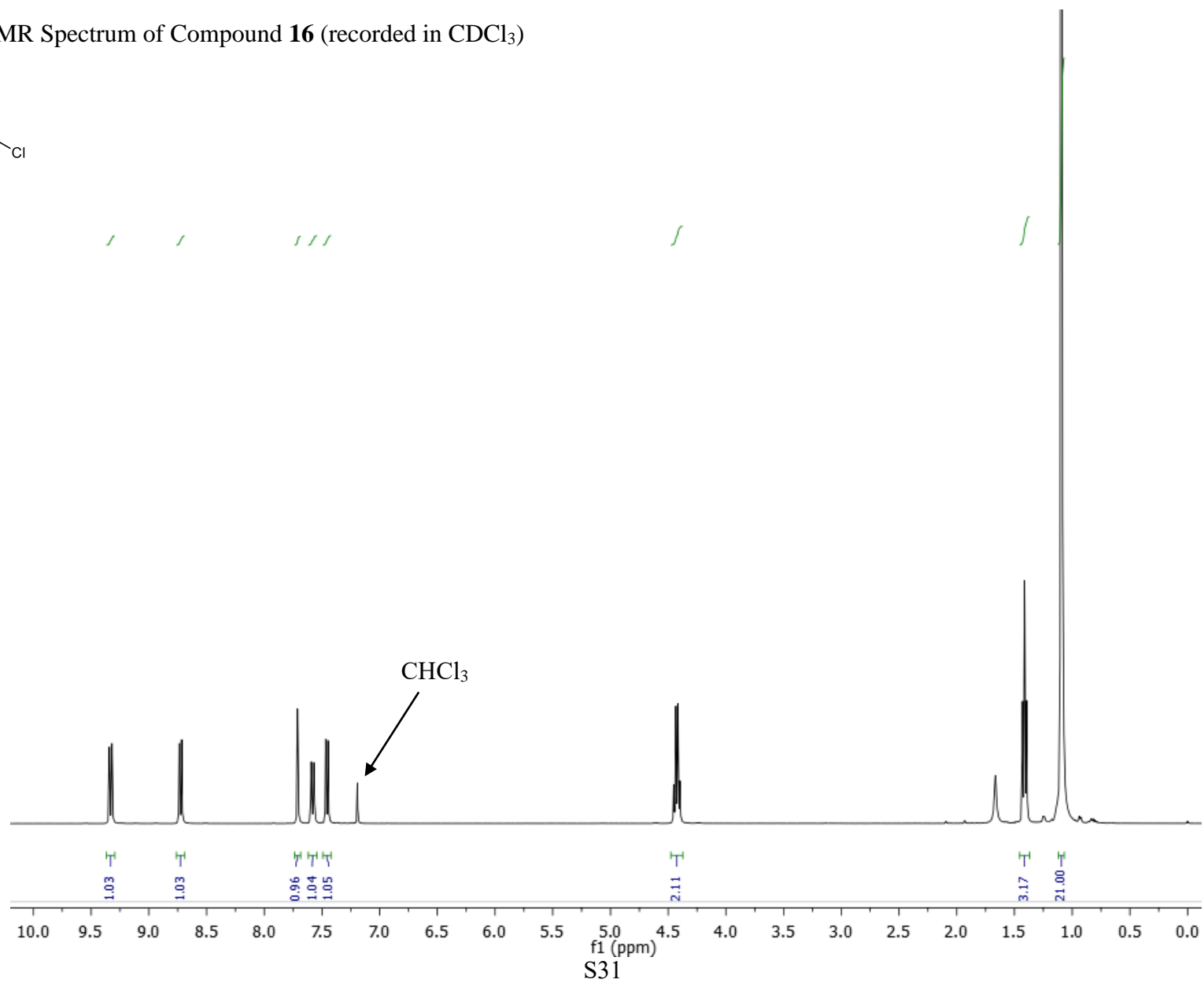
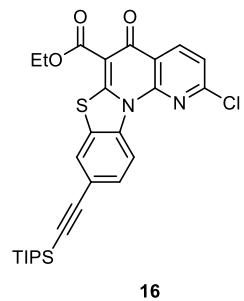
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **15** (recorded in  $\text{CDCl}_3$ )



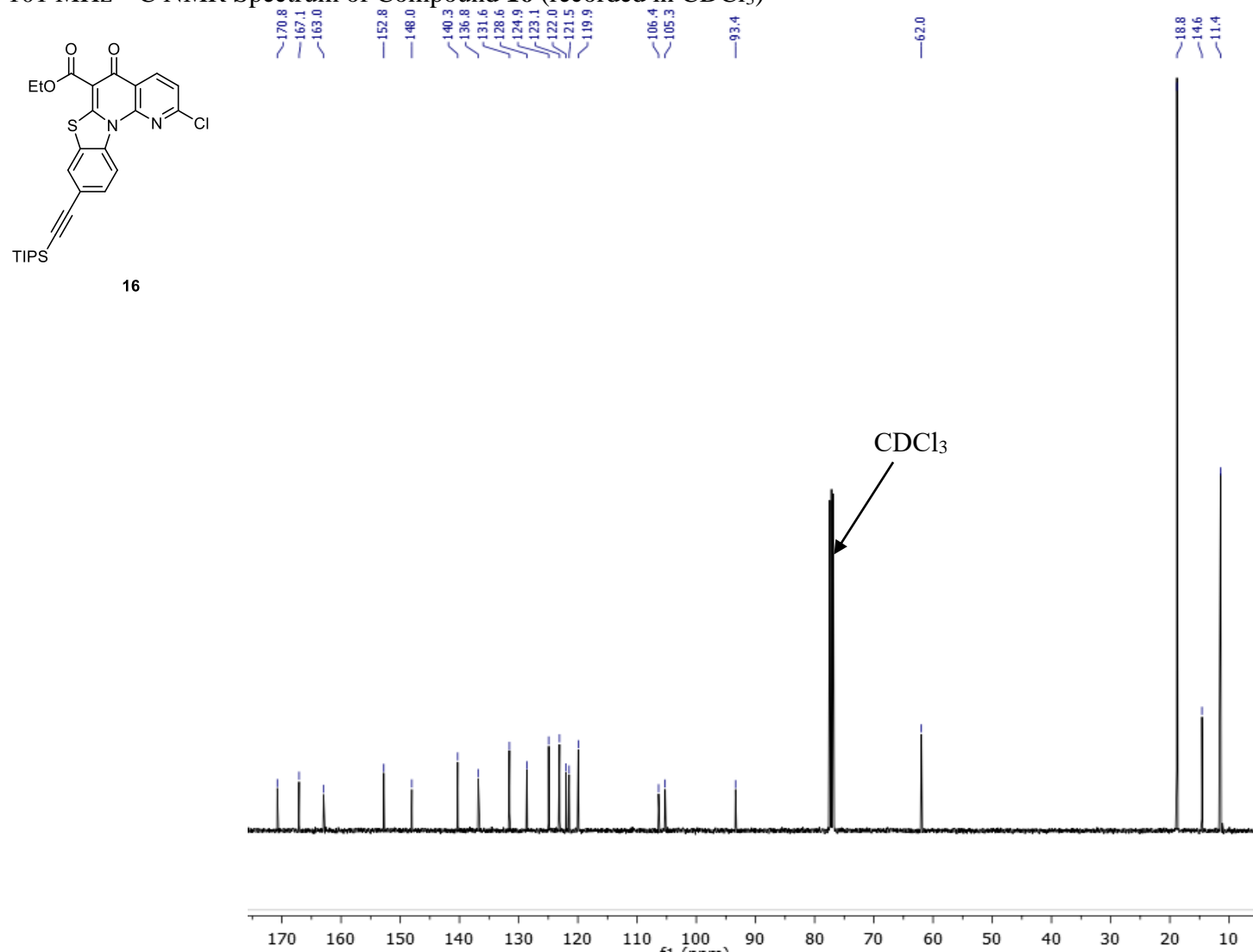
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **15** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **16** (recorded in  $\text{CDCl}_3$ )

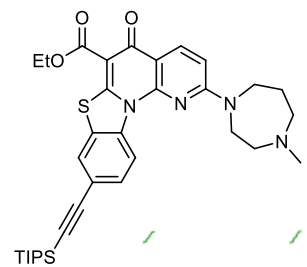


101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **16** (recorded in  $\text{CDCl}_3$ )

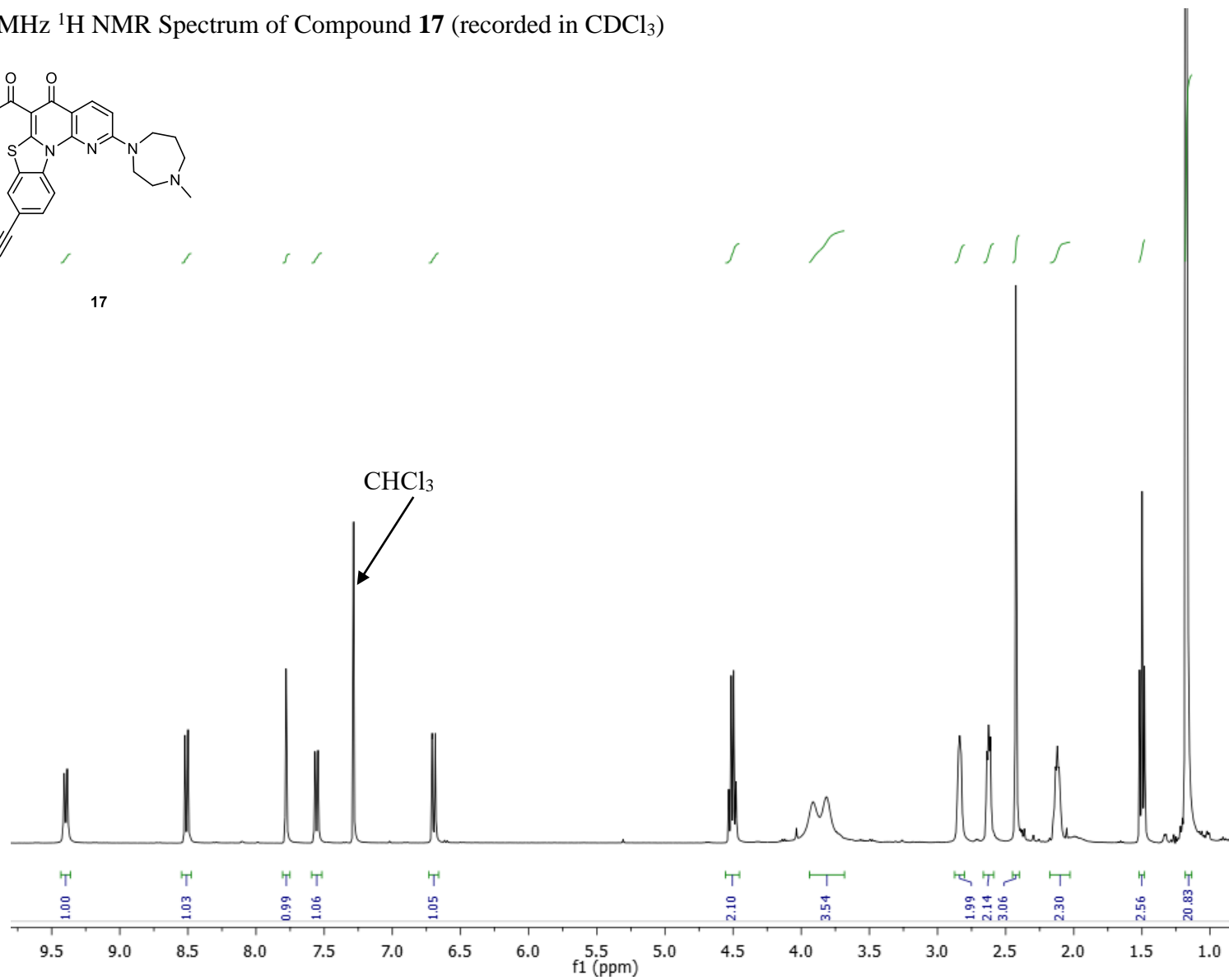




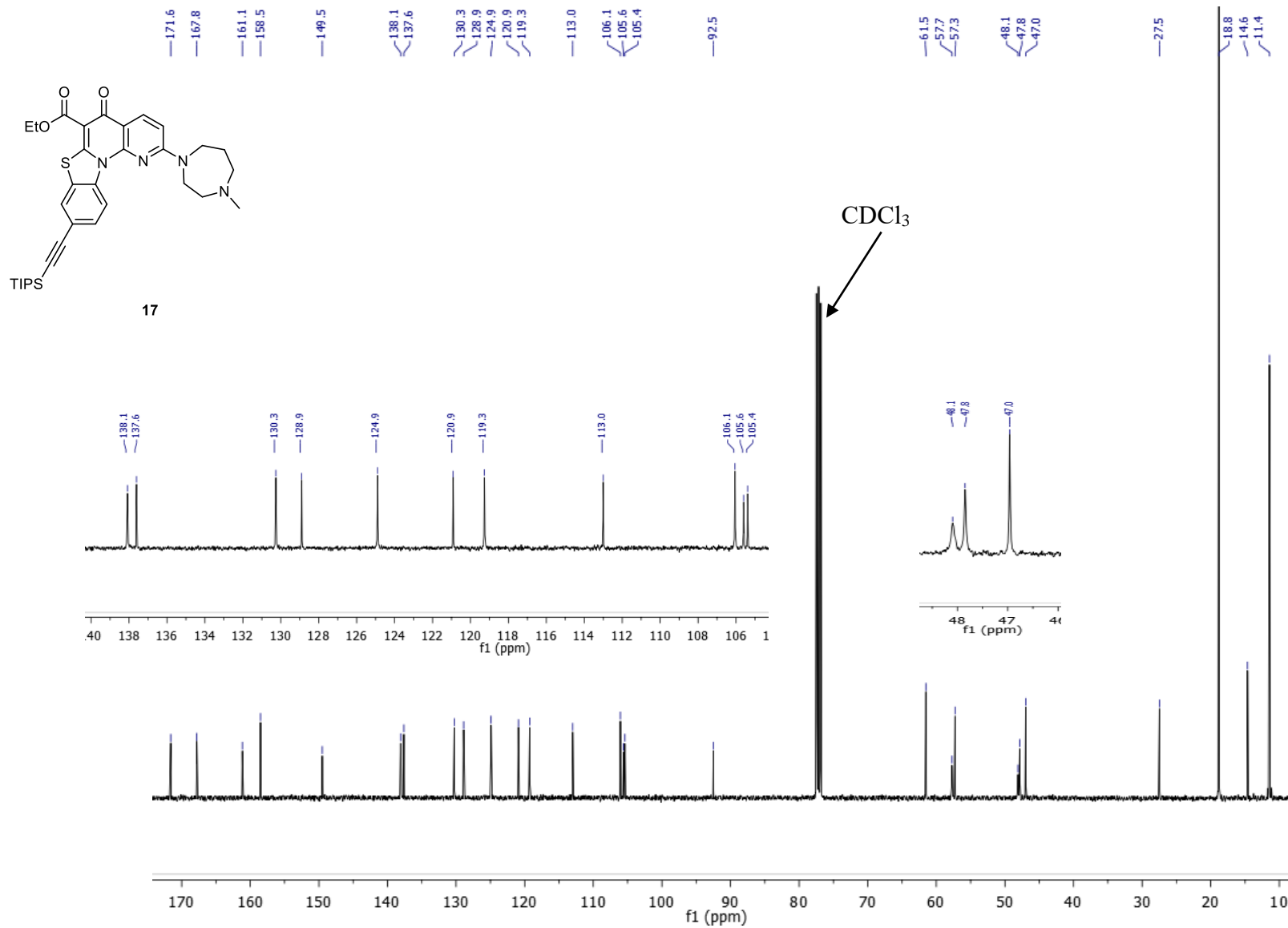
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **17** (recorded in  $\text{CDCl}_3$ )



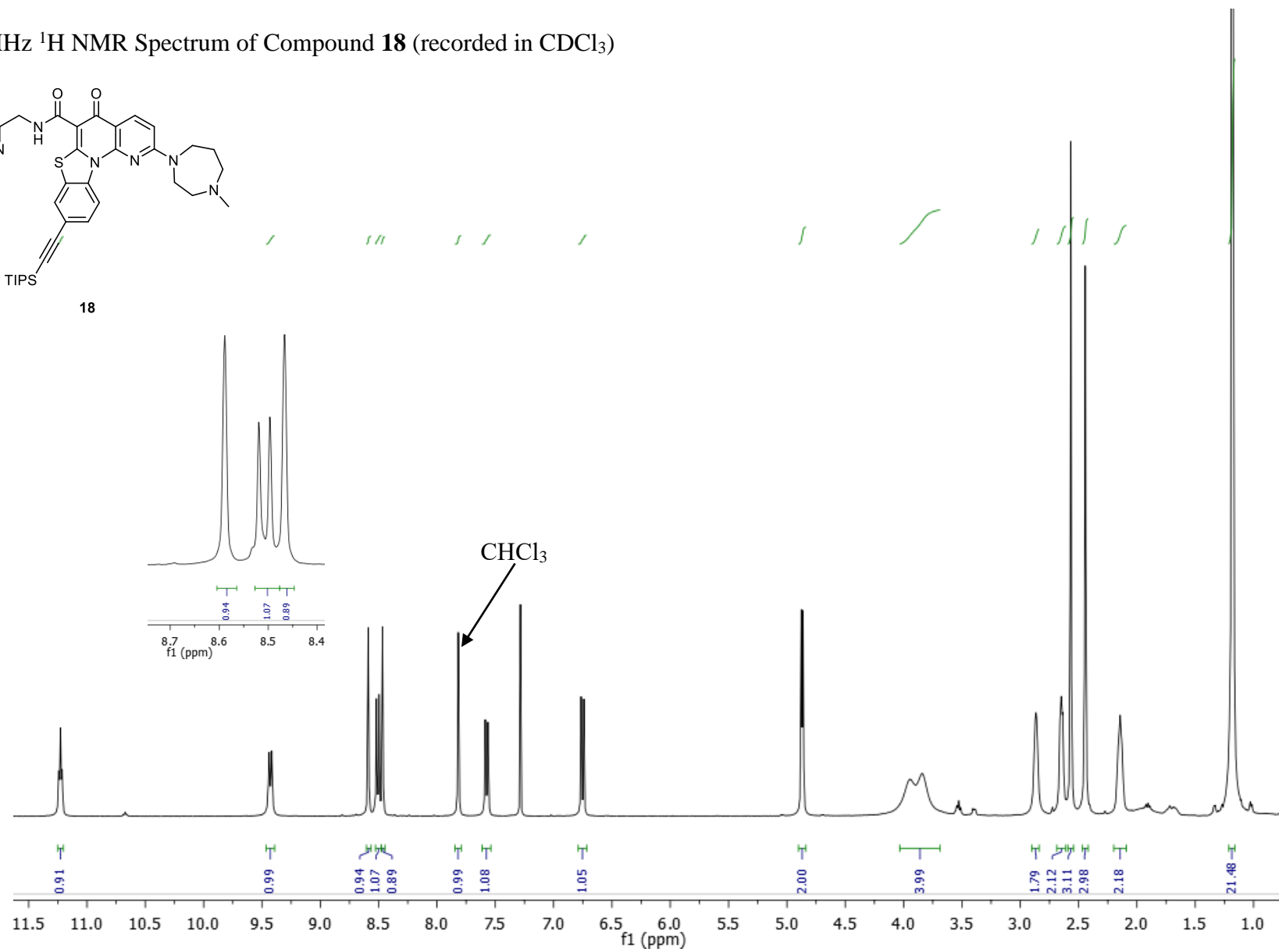
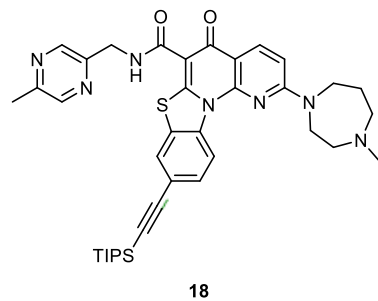
**17**



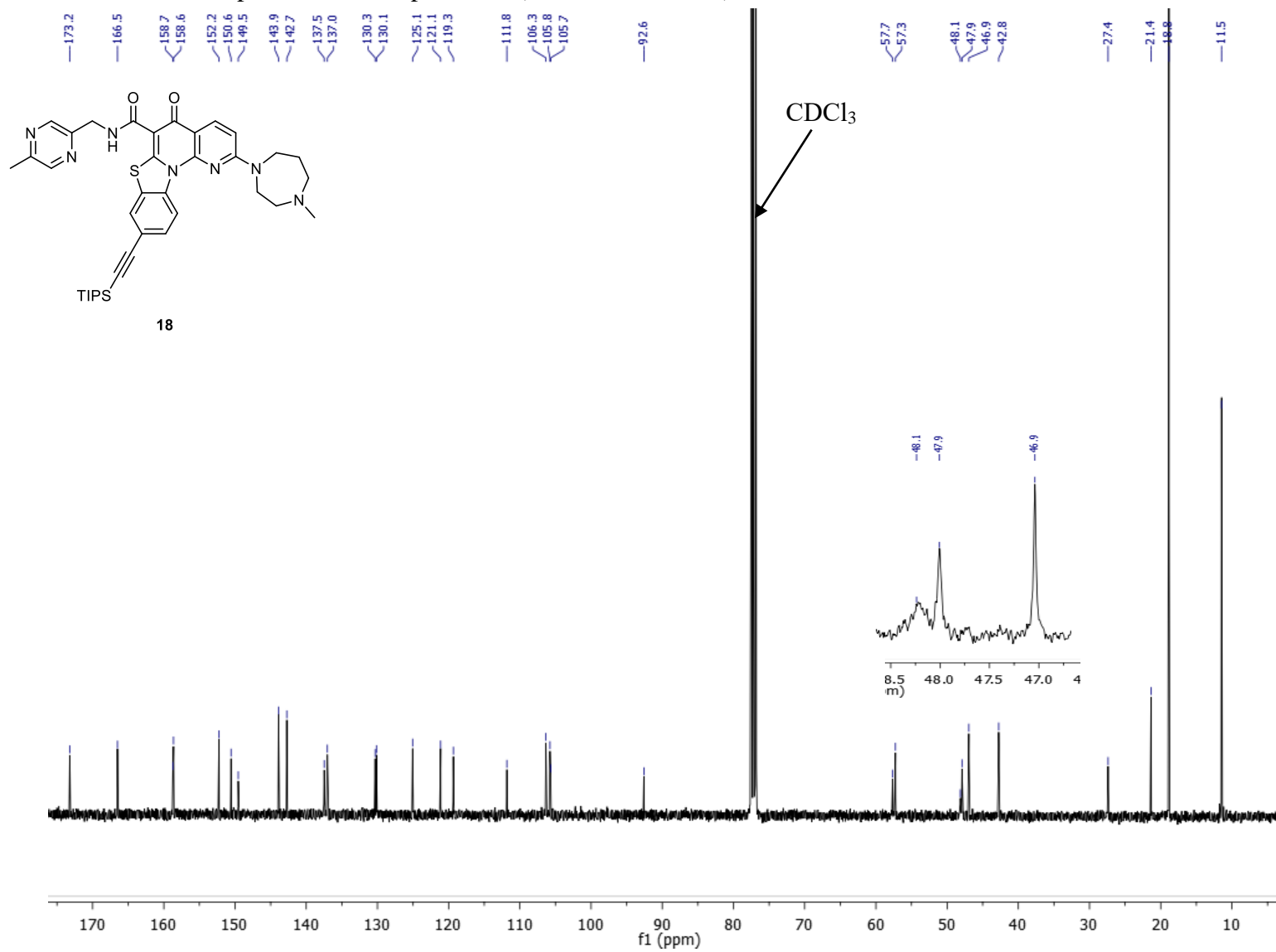
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **17** (recorded in  $\text{CDCl}_3$ )



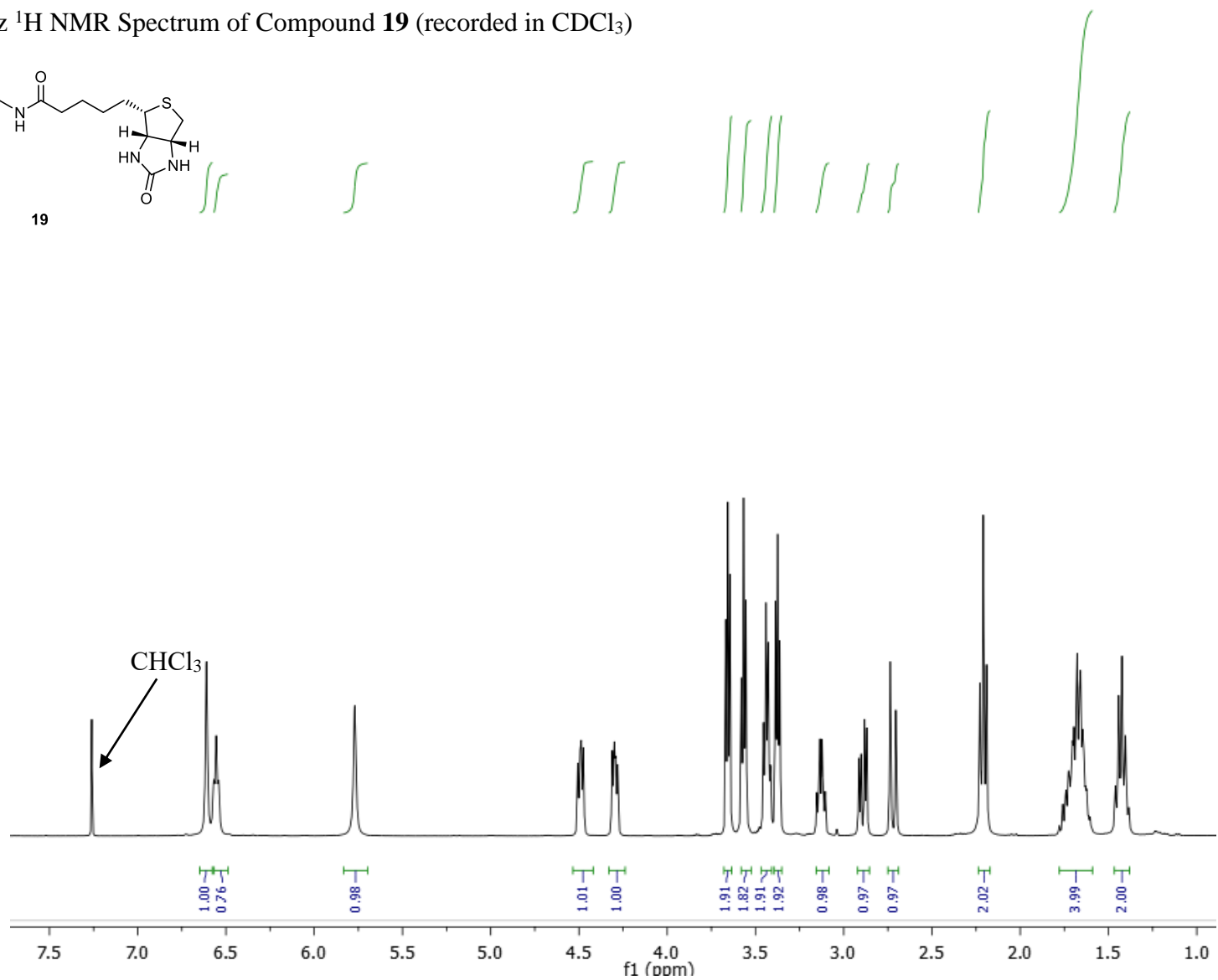
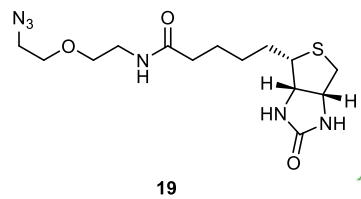
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **18** (recorded in  $\text{CDCl}_3$ )



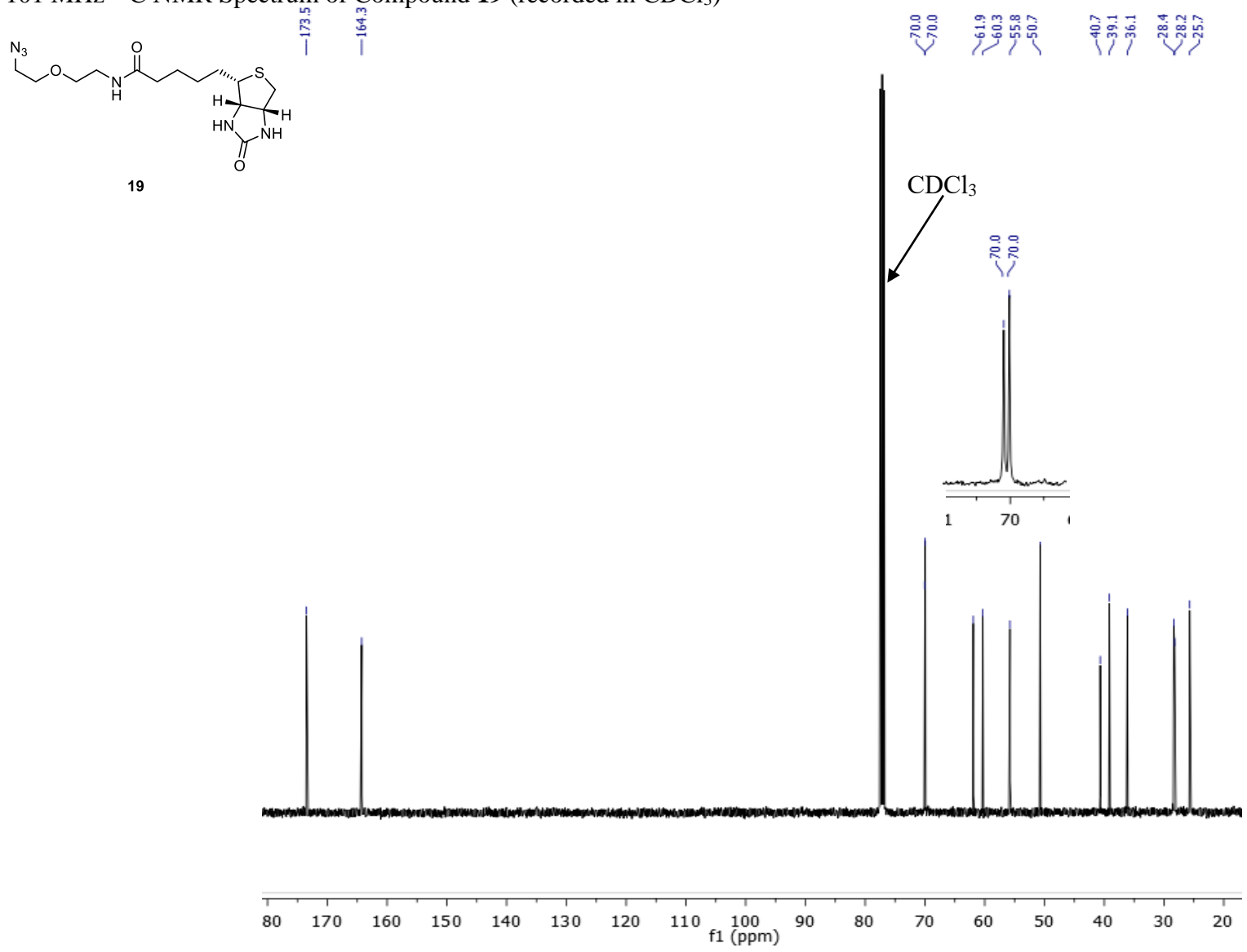
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **18** (recorded in  $\text{CDCl}_3$ )



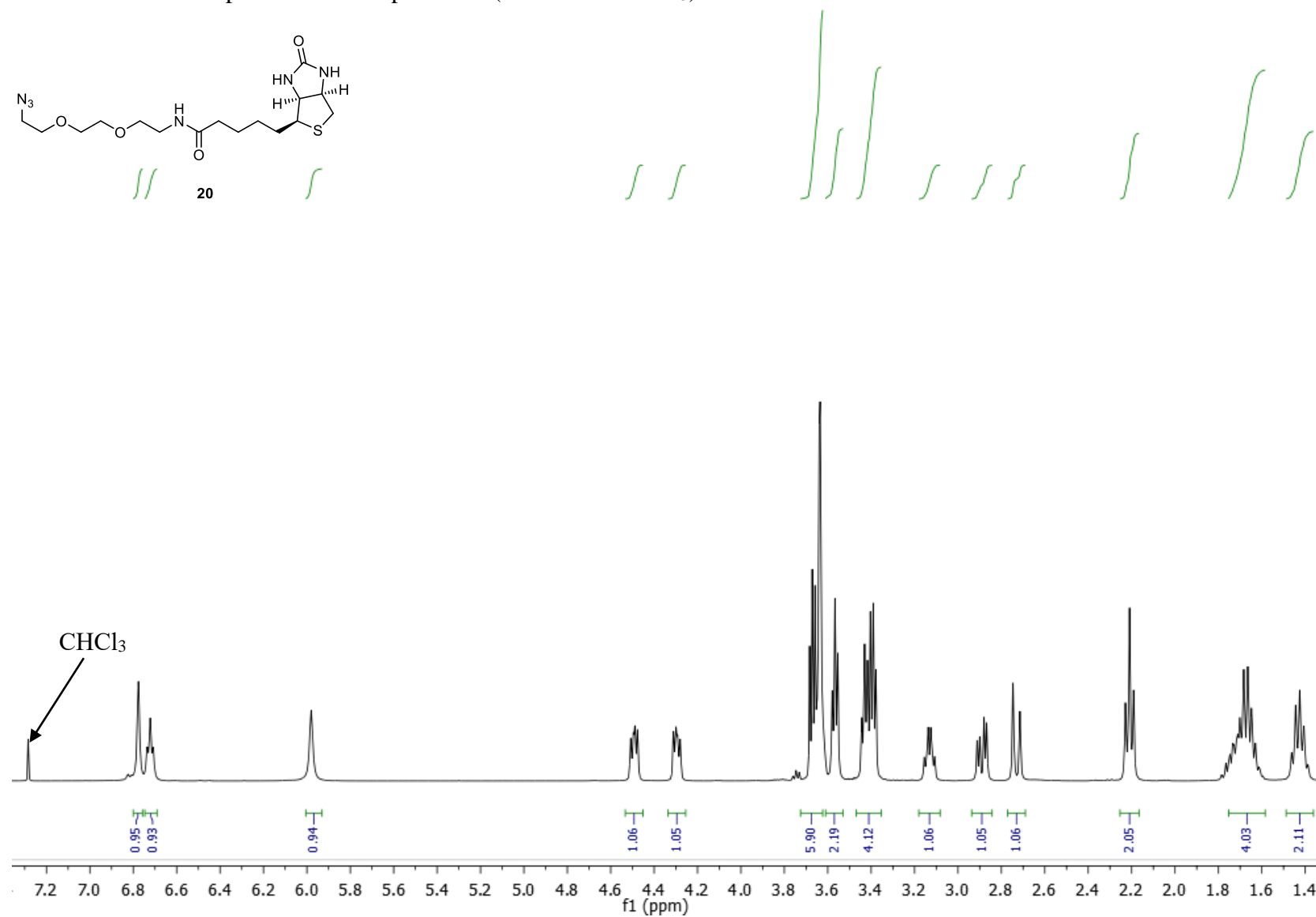
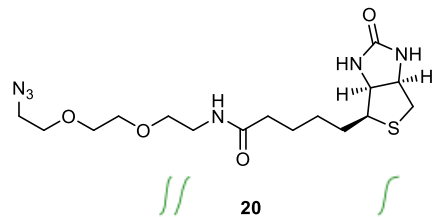
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **19** (recorded in  $\text{CDCl}_3$ )



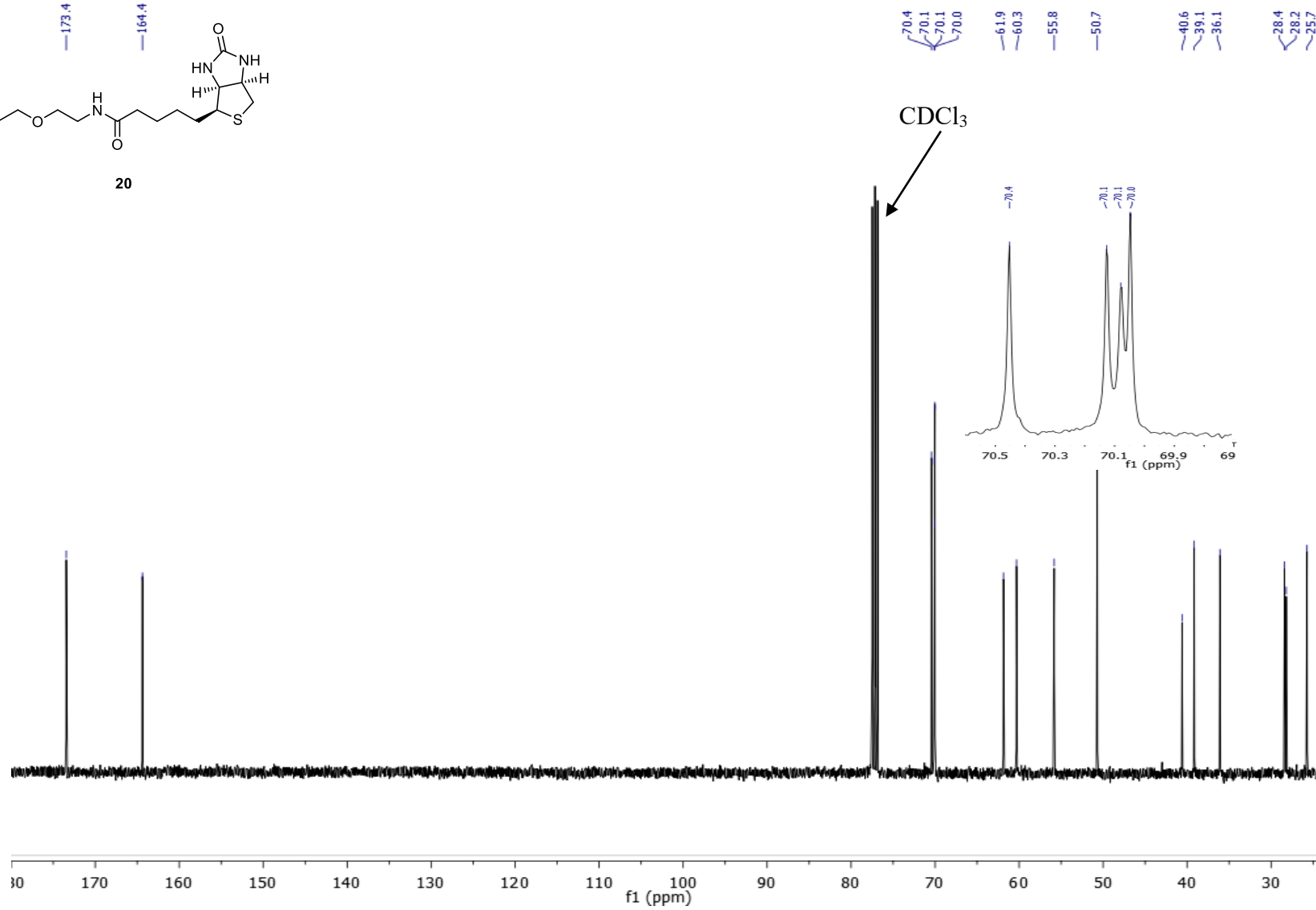
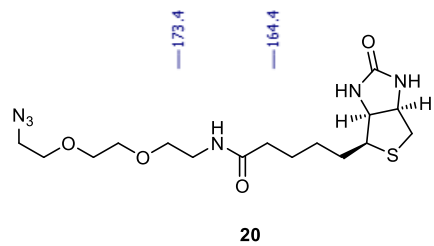
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **19** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **20** (recorded in  $\text{CDCl}_3$ )

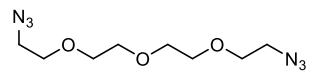


101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **20** (recorded in  $\text{CDCl}_3$ )

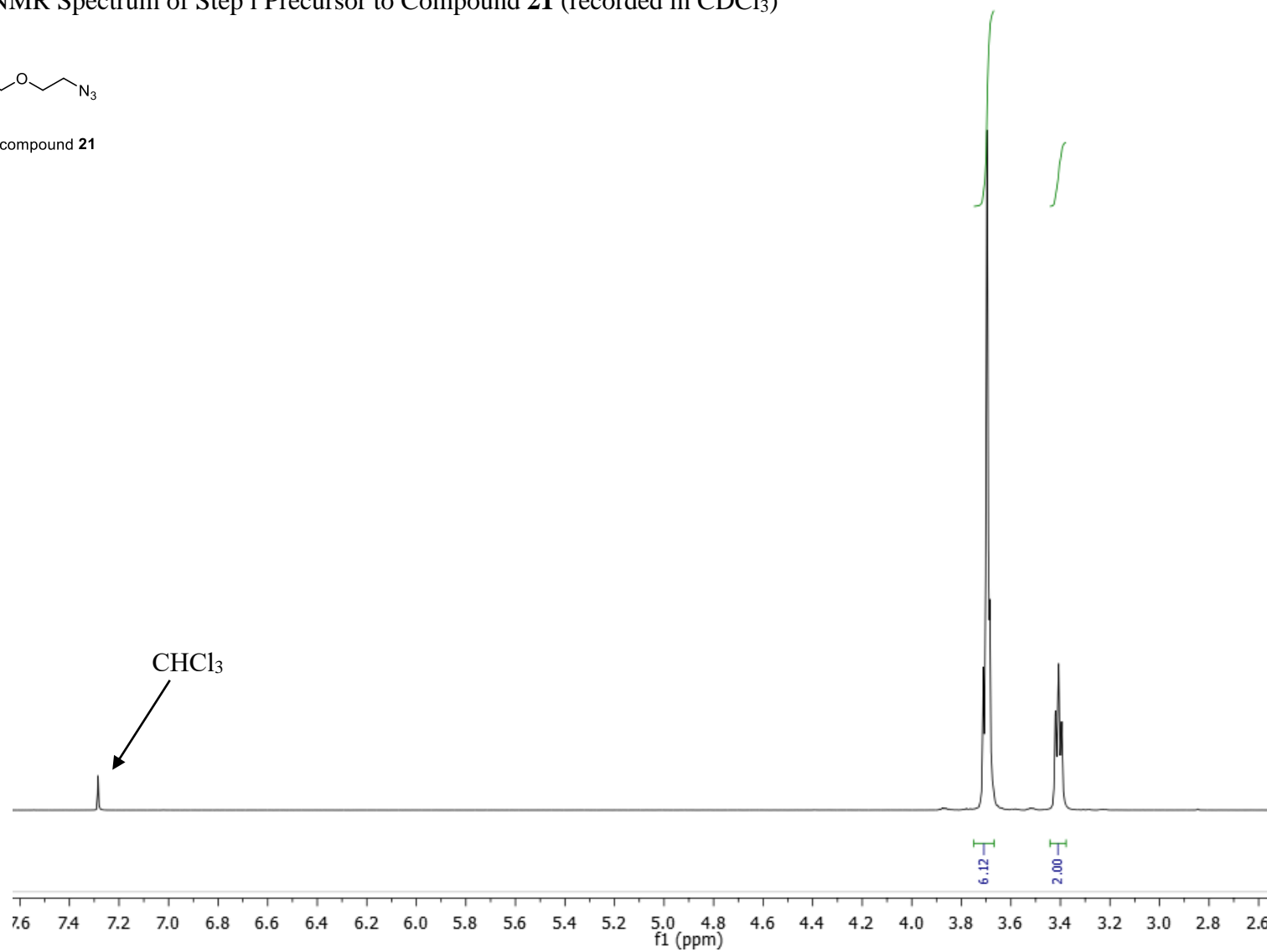




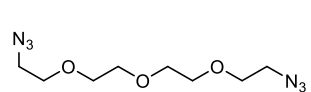
400 MHz  $^1\text{H}$  NMR Spectrum of Step i Precursor to Compound **21** (recorded in  $\text{CDCl}_3$ )



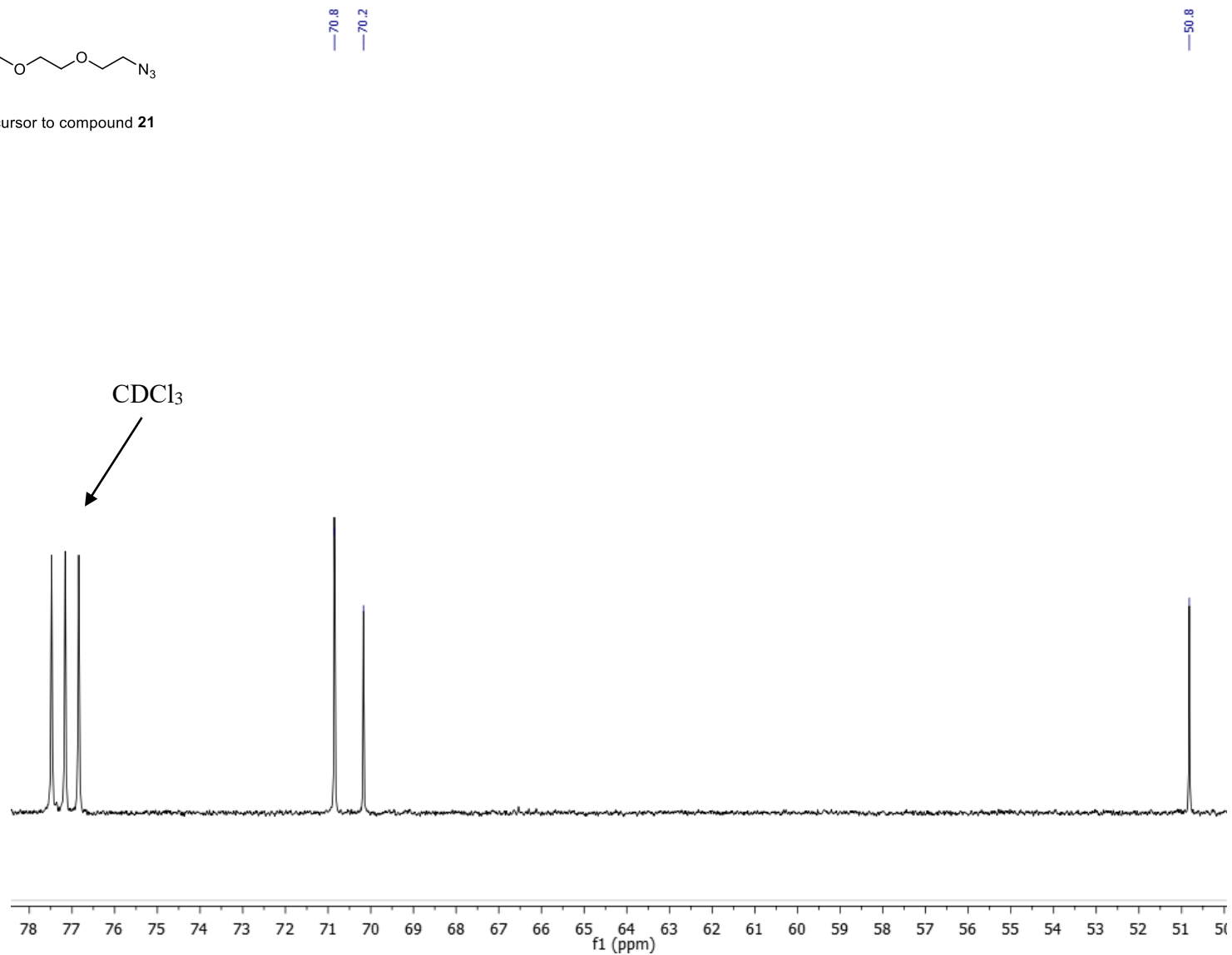
Step i precursor to compound **21**



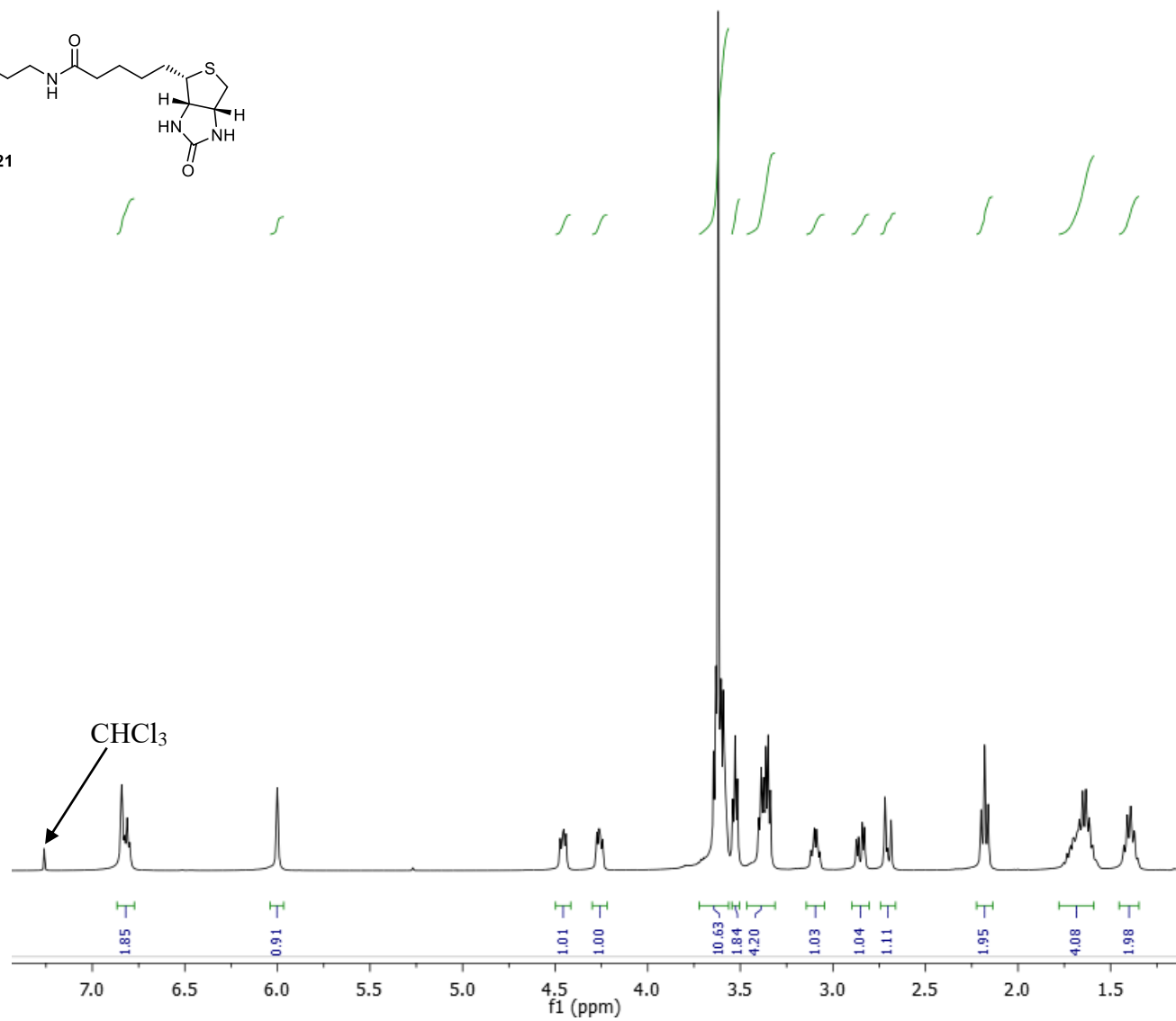
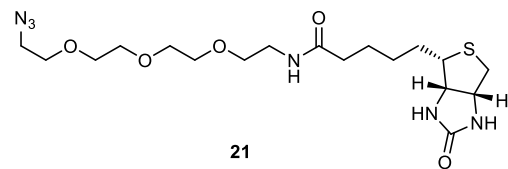
101 MHz  $^{13}\text{C}$  NMR Spectrum of Step i Precursor to Compound **21** (recorded in  $\text{CDCl}_3$ )



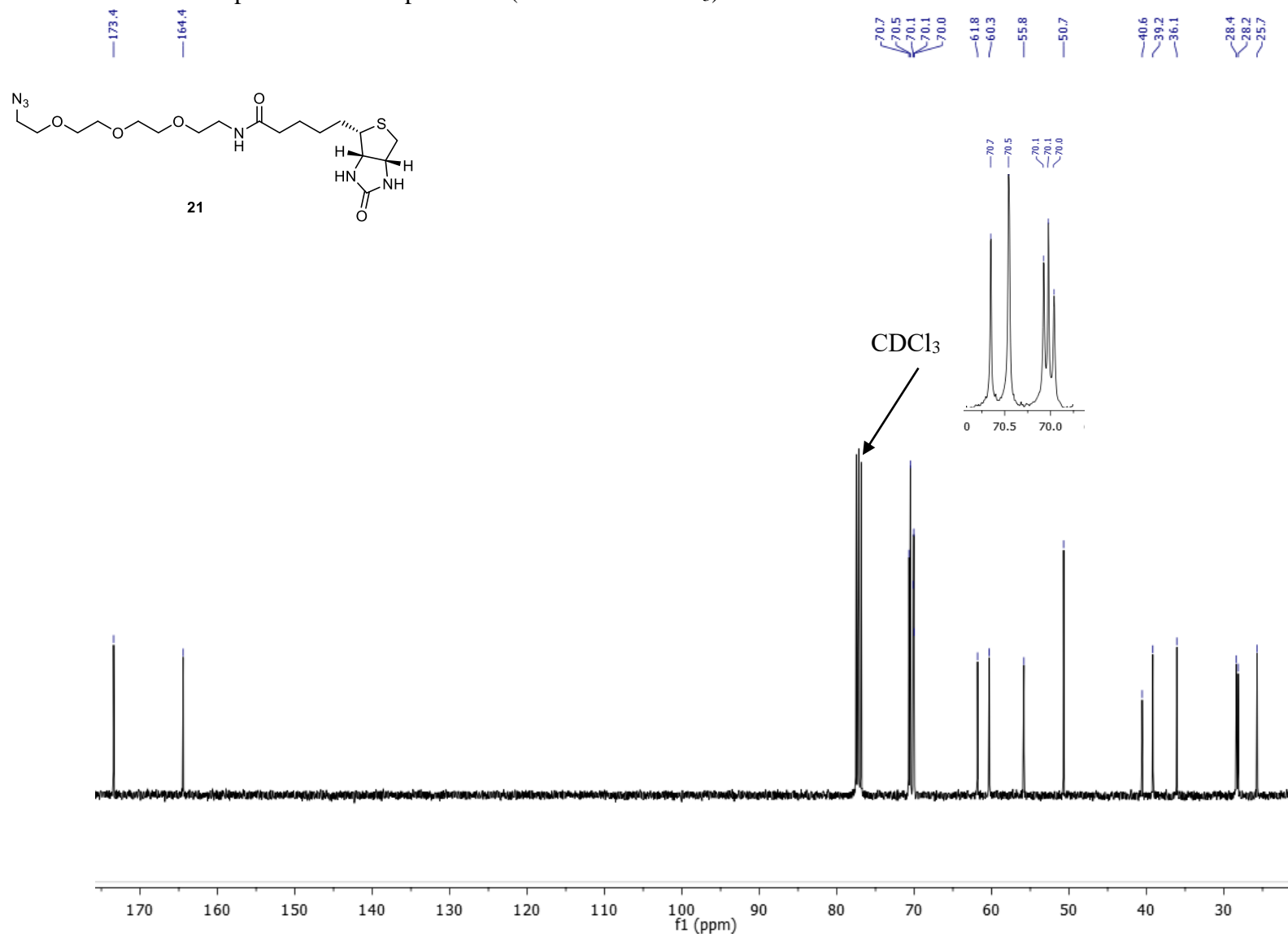
Step i precursor to compound **21**



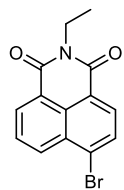
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **21** (recorded in  $\text{CDCl}_3$ )



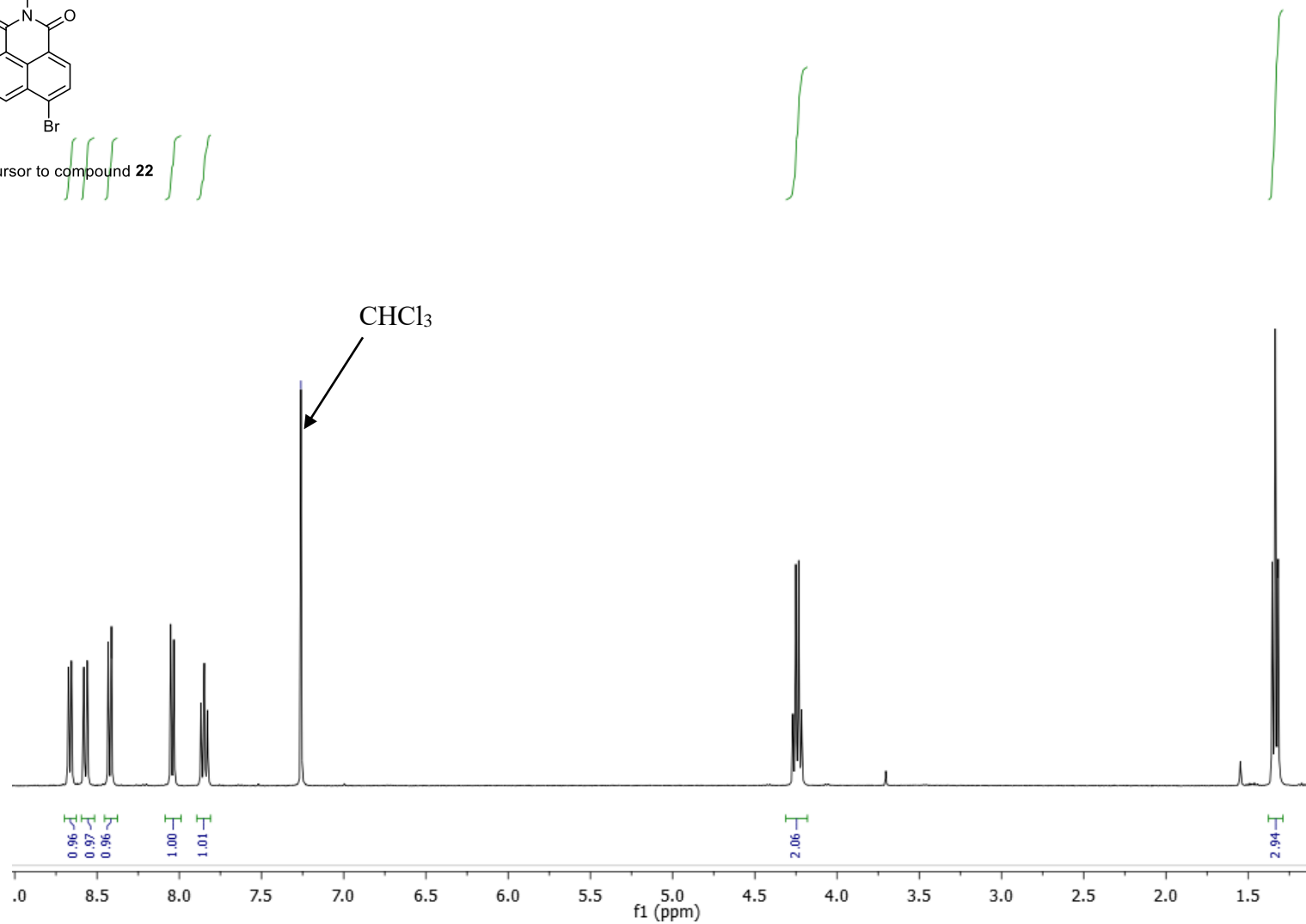
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **21** (recorded in  $\text{CDCl}_3$ )



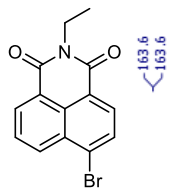
400 MHz  $^1\text{H}$  NMR Spectrum of Step i Precursor to Compound **22** (recorded in  $\text{CDCl}_3$ )



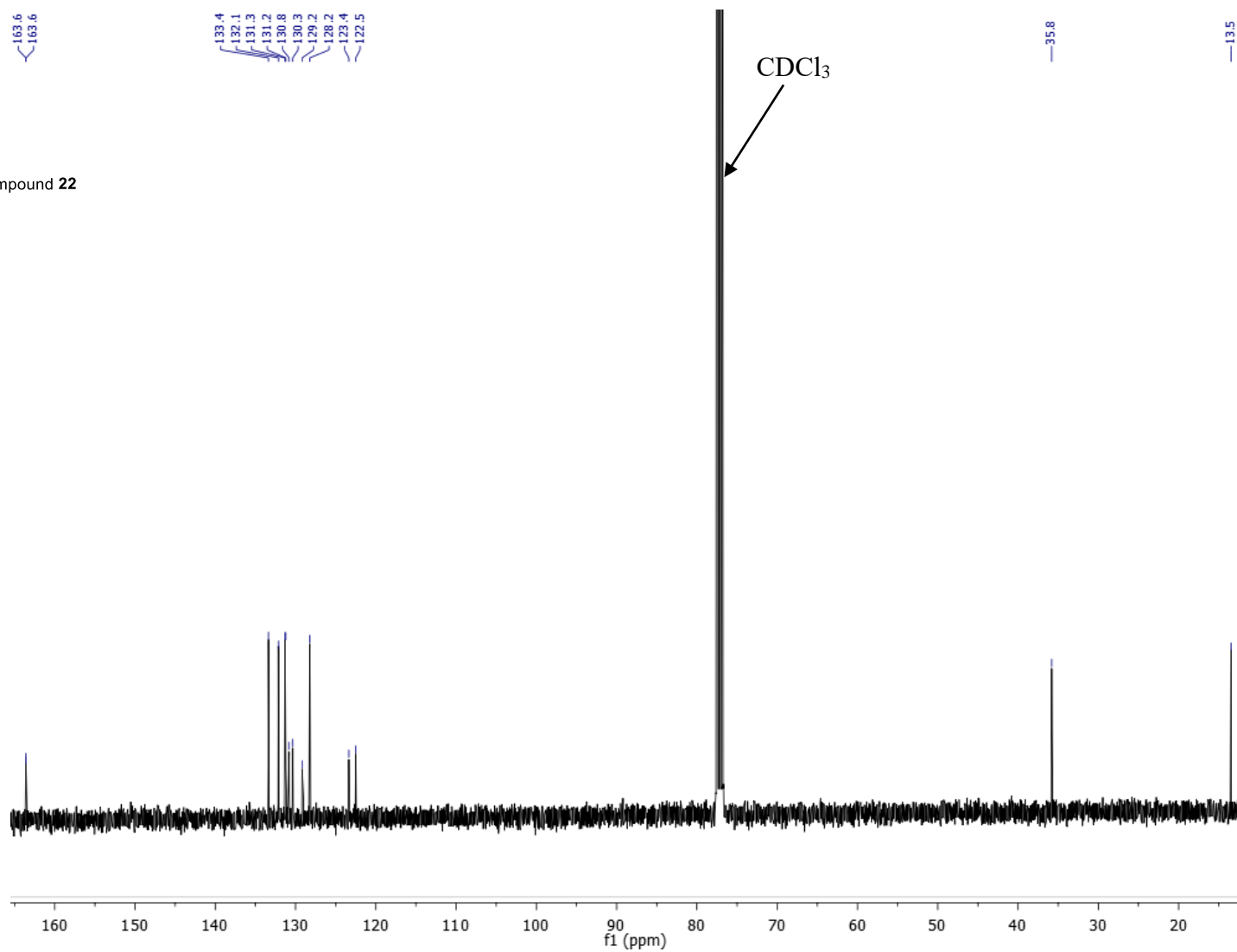
Step i precursor to compound **22**



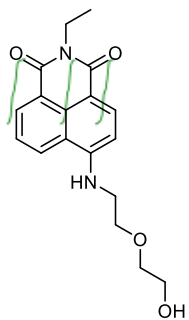
101 MHz  $^{13}\text{C}$  NMR Spectrum of Step i Precursor to Compound **22** (recorded in  $\text{CDCl}_3$ )



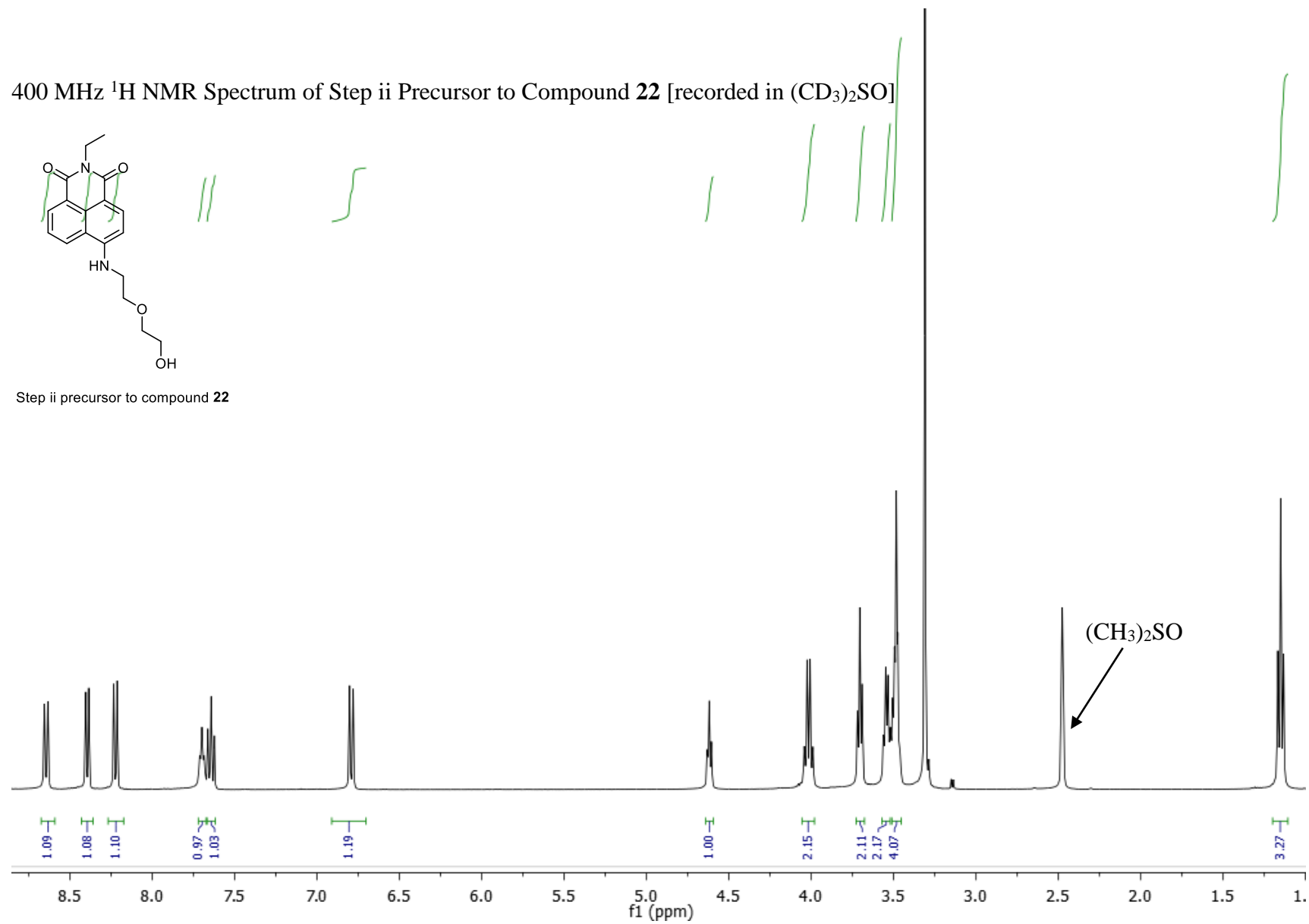
Step i precursor to compound **22**



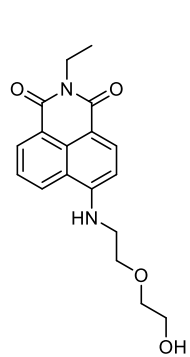
400 MHz  $^1\text{H}$  NMR Spectrum of Step ii Precursor to Compound **22** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]



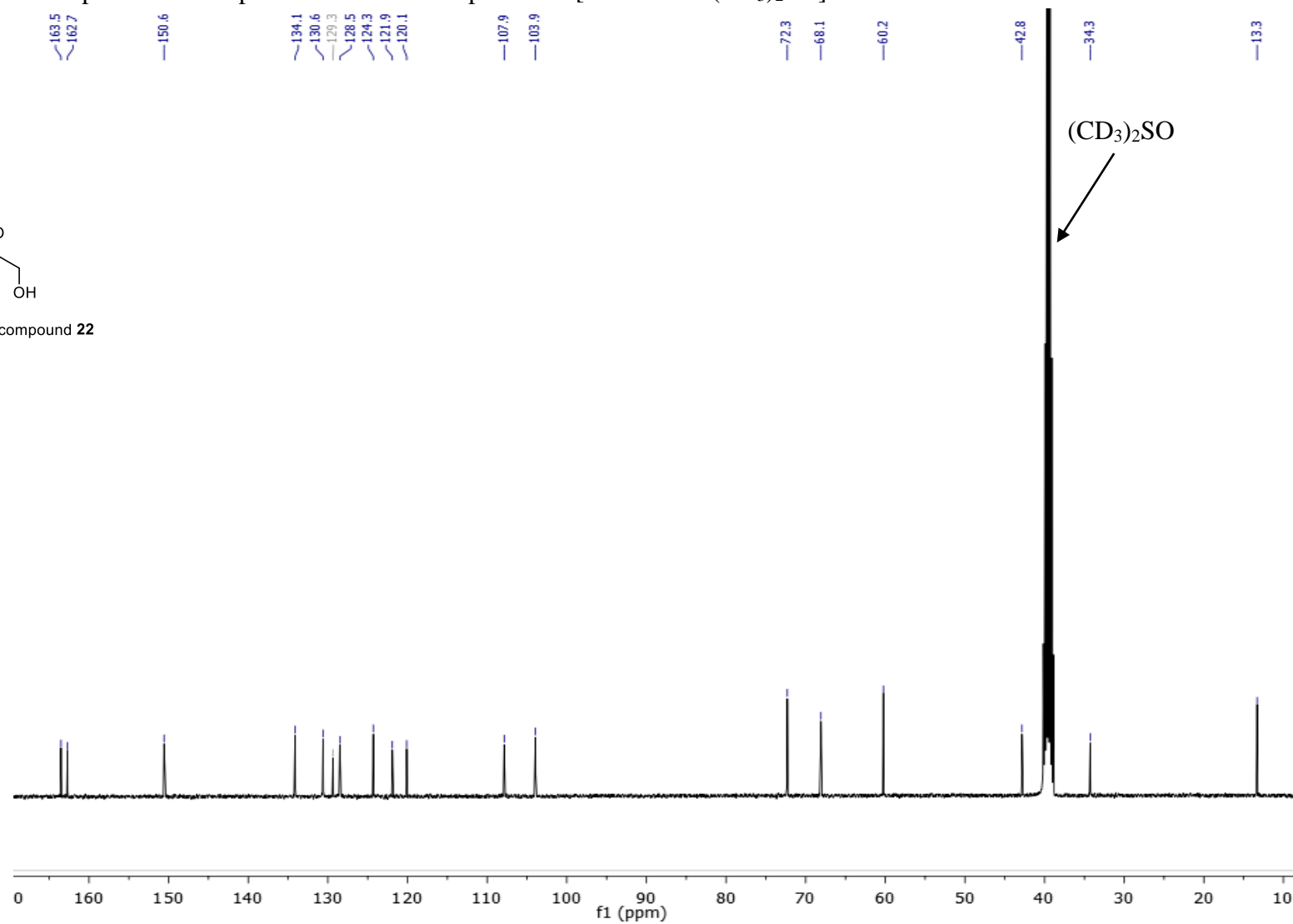
Step ii precursor to compound **22**



101 MHz  $^{13}\text{C}$  NMR Spectrum of Step ii Precursor to Compound **22** [recorded in  $(\text{CD}_3)_2\text{SO}$ ]

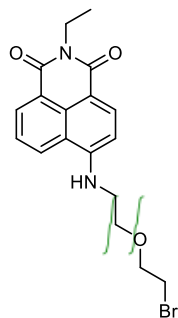


Step ii precursor to compound **22**

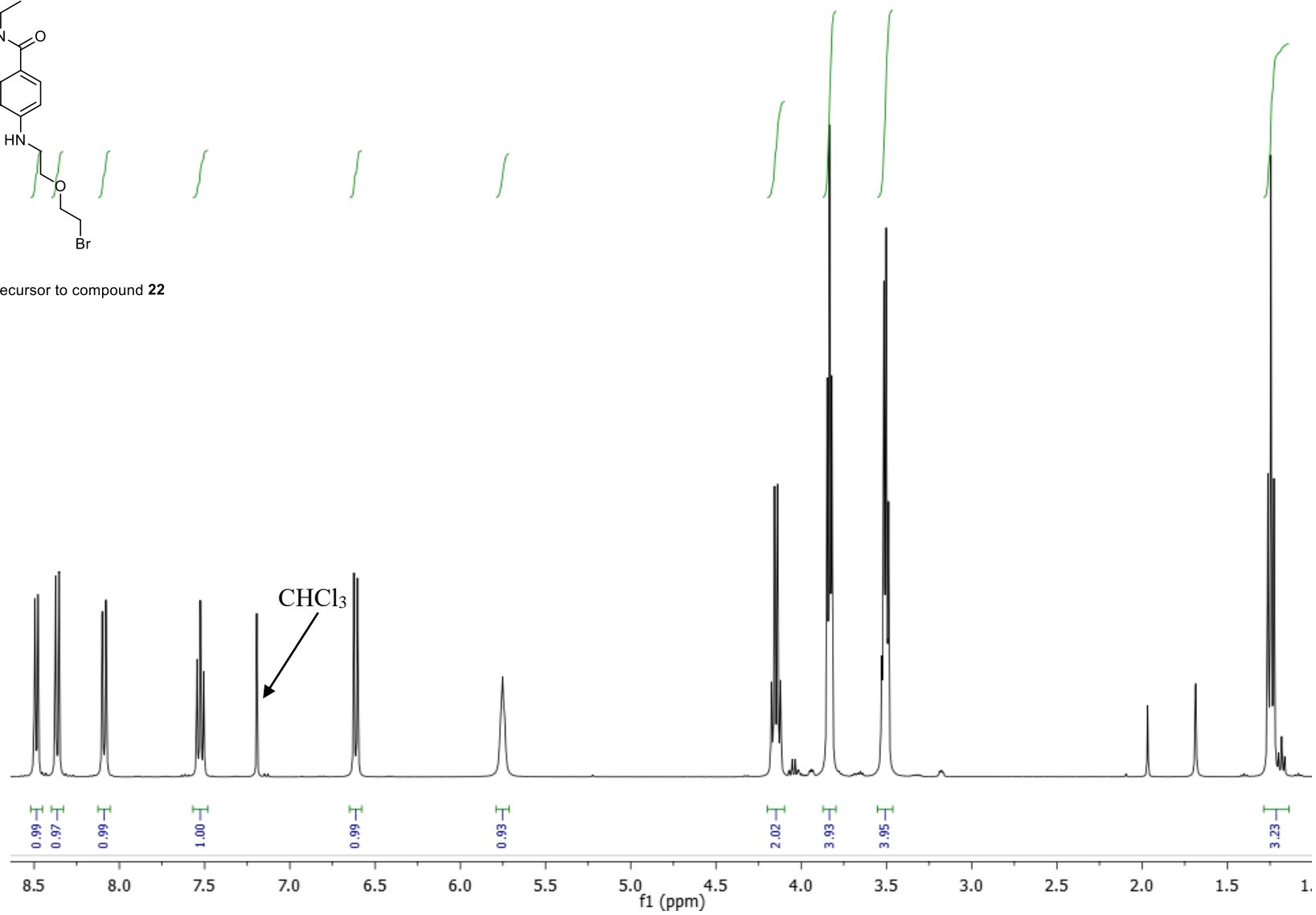




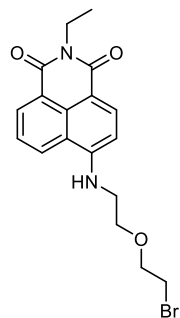
400 MHz  $^1\text{H}$  NMR Spectrum of Step iii Precursor to Compound **22** (recorded in  $\text{CDCl}_3$ )



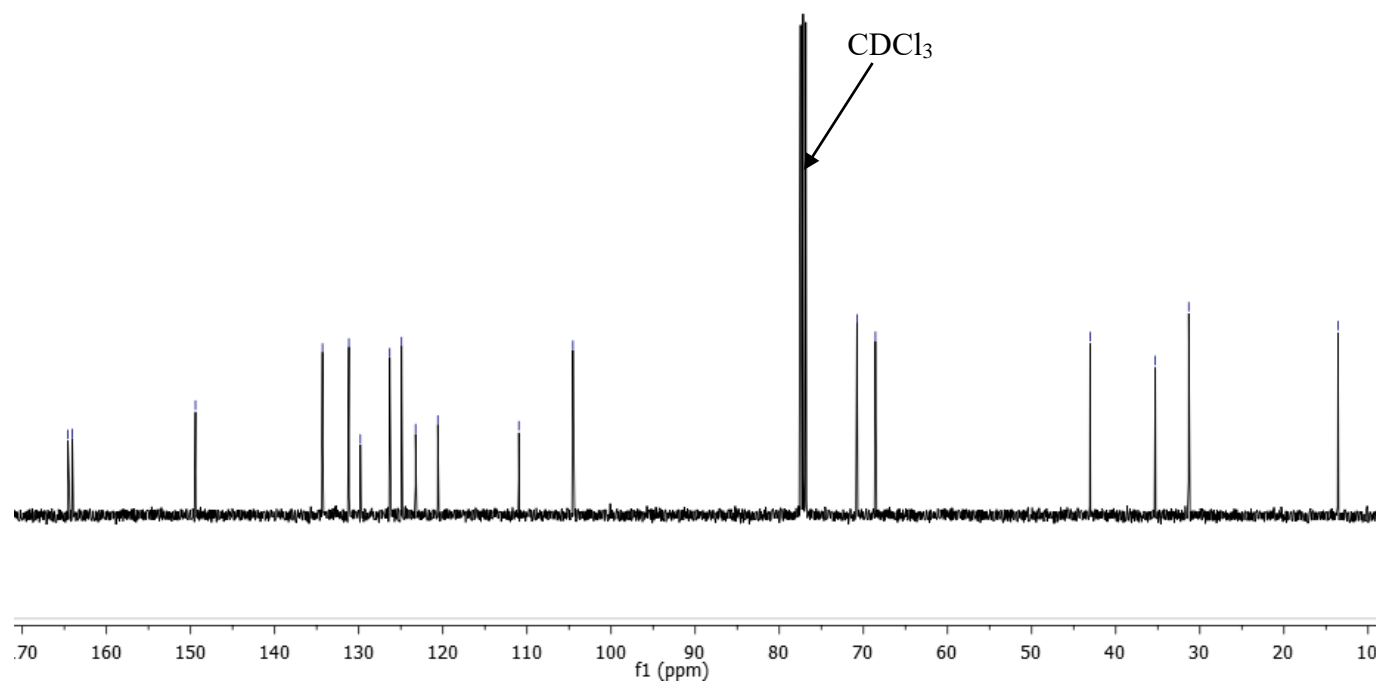
Step iii precursor to compound **22**



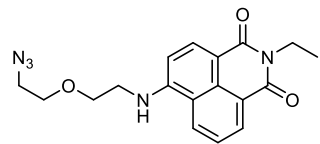
101 MHz  $^{13}\text{C}$  NMR Spectrum of Step iii Precursor to Compound **22** (recorded in  $\text{CDCl}_3$ )



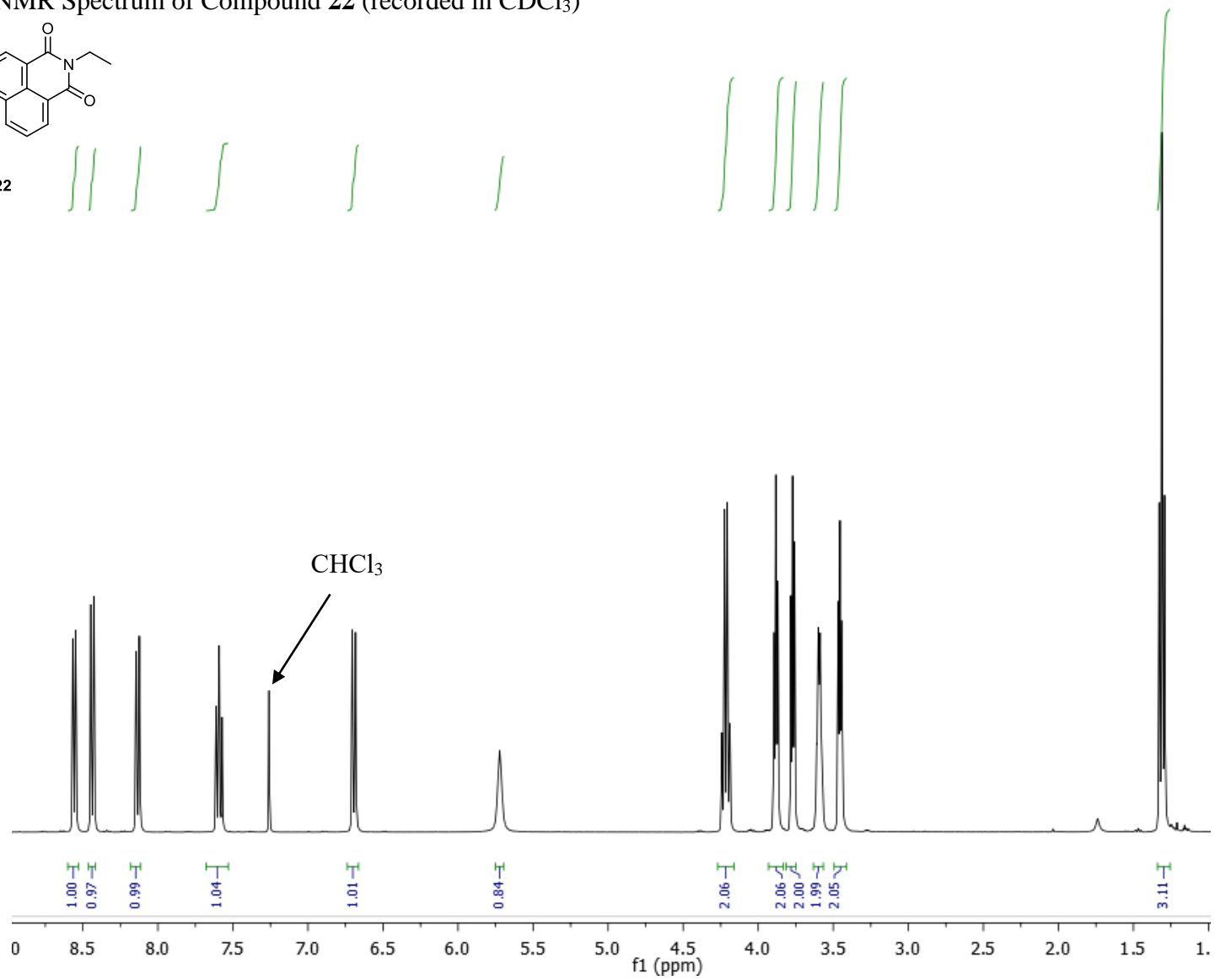
Step iii precursor to compound **22**



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **22** (recorded in  $\text{CDCl}_3$ )

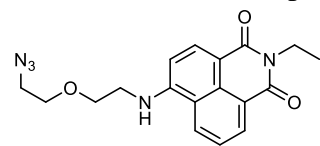


**22**

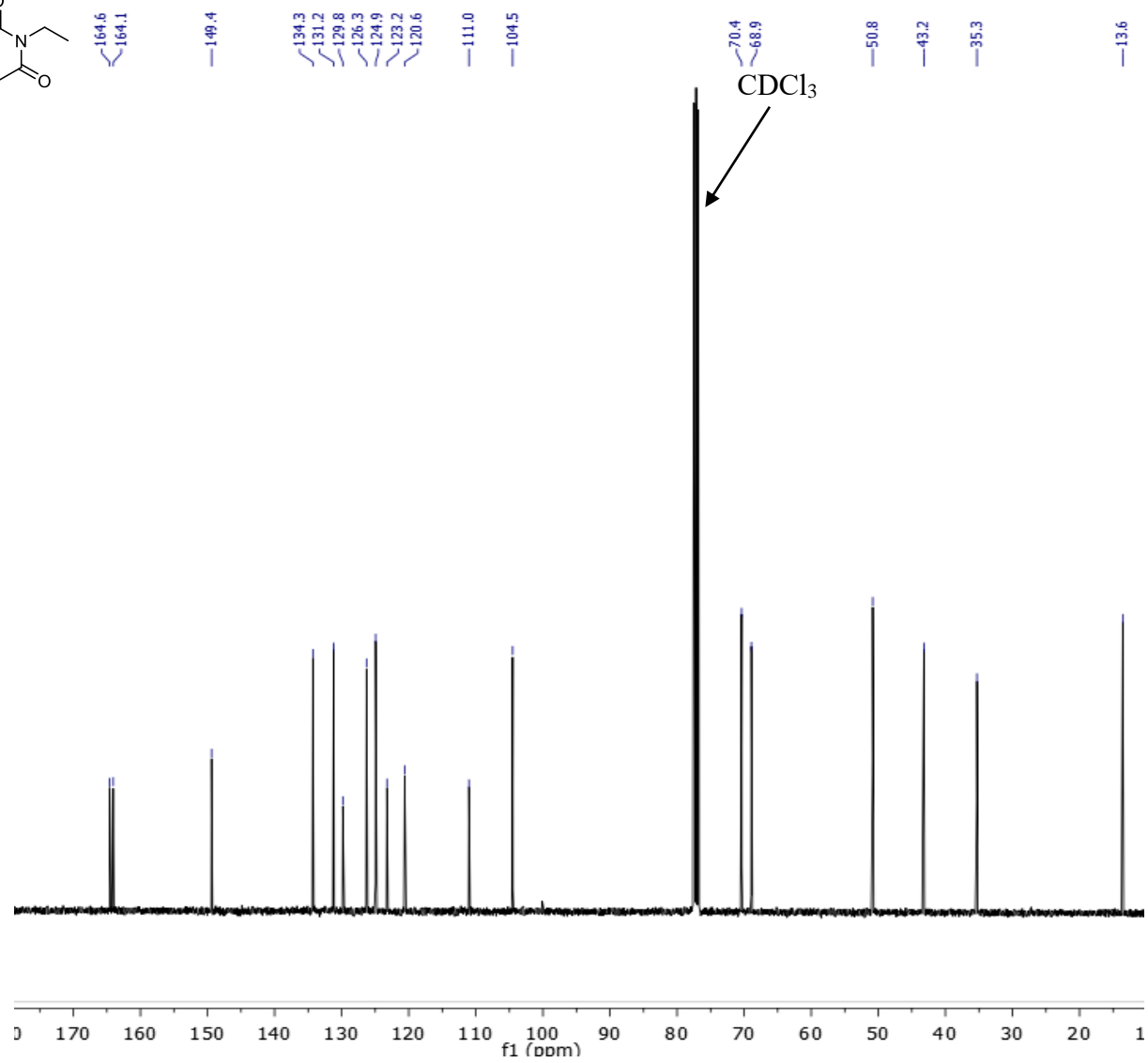


S51

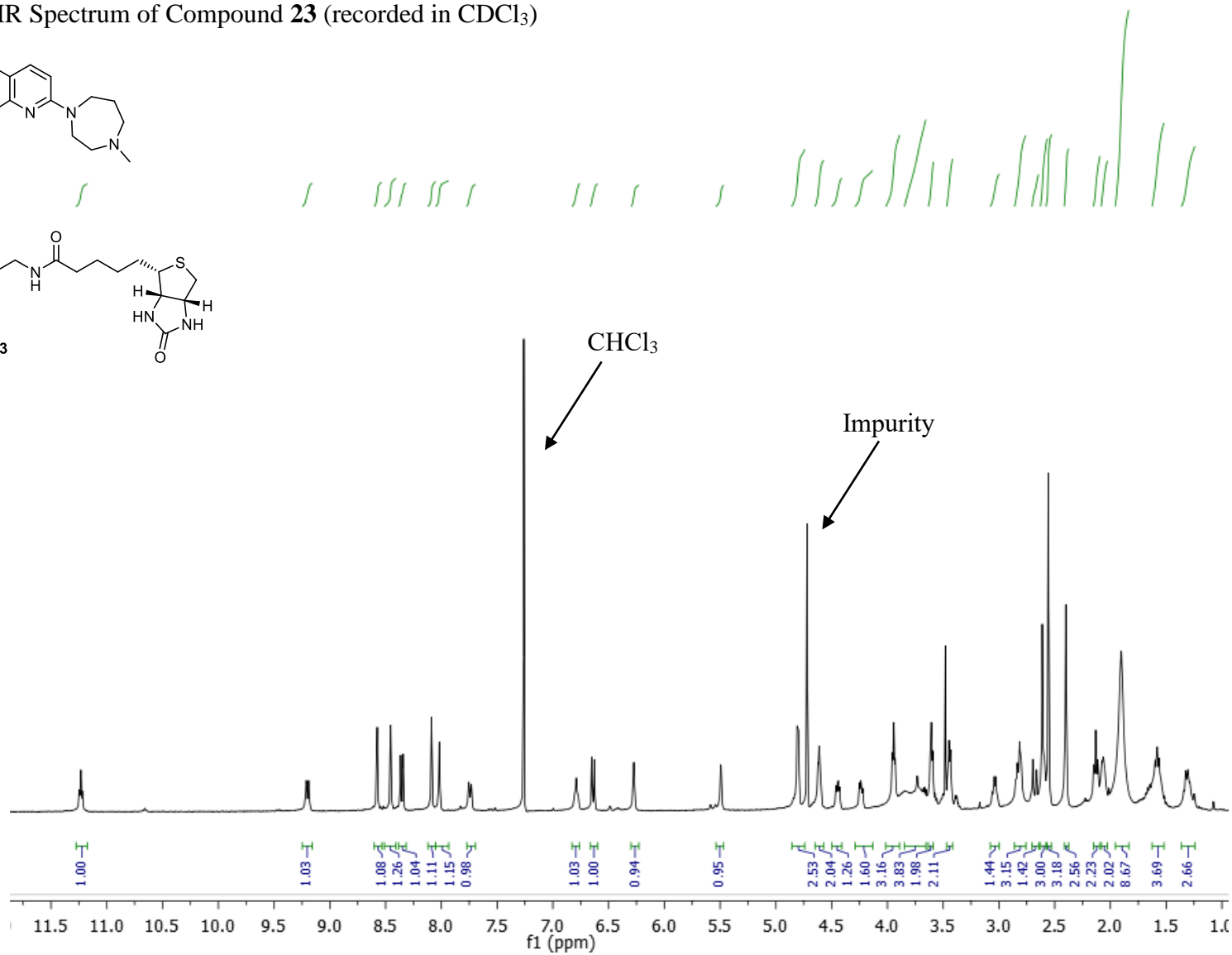
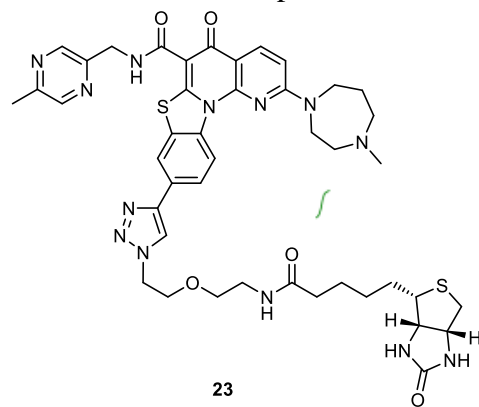
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **22** (recorded in  $\text{CDCl}_3$ )



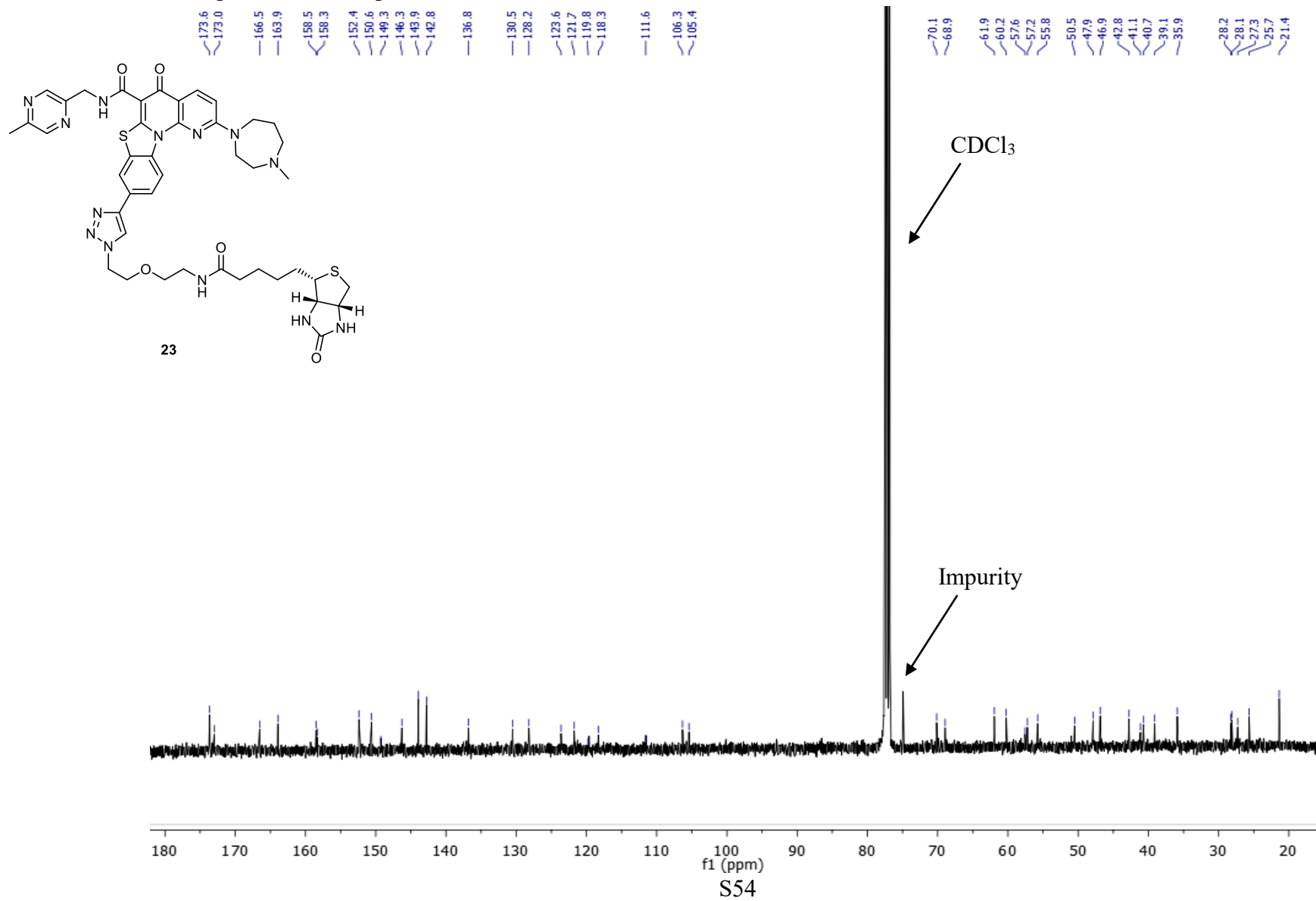
**22**



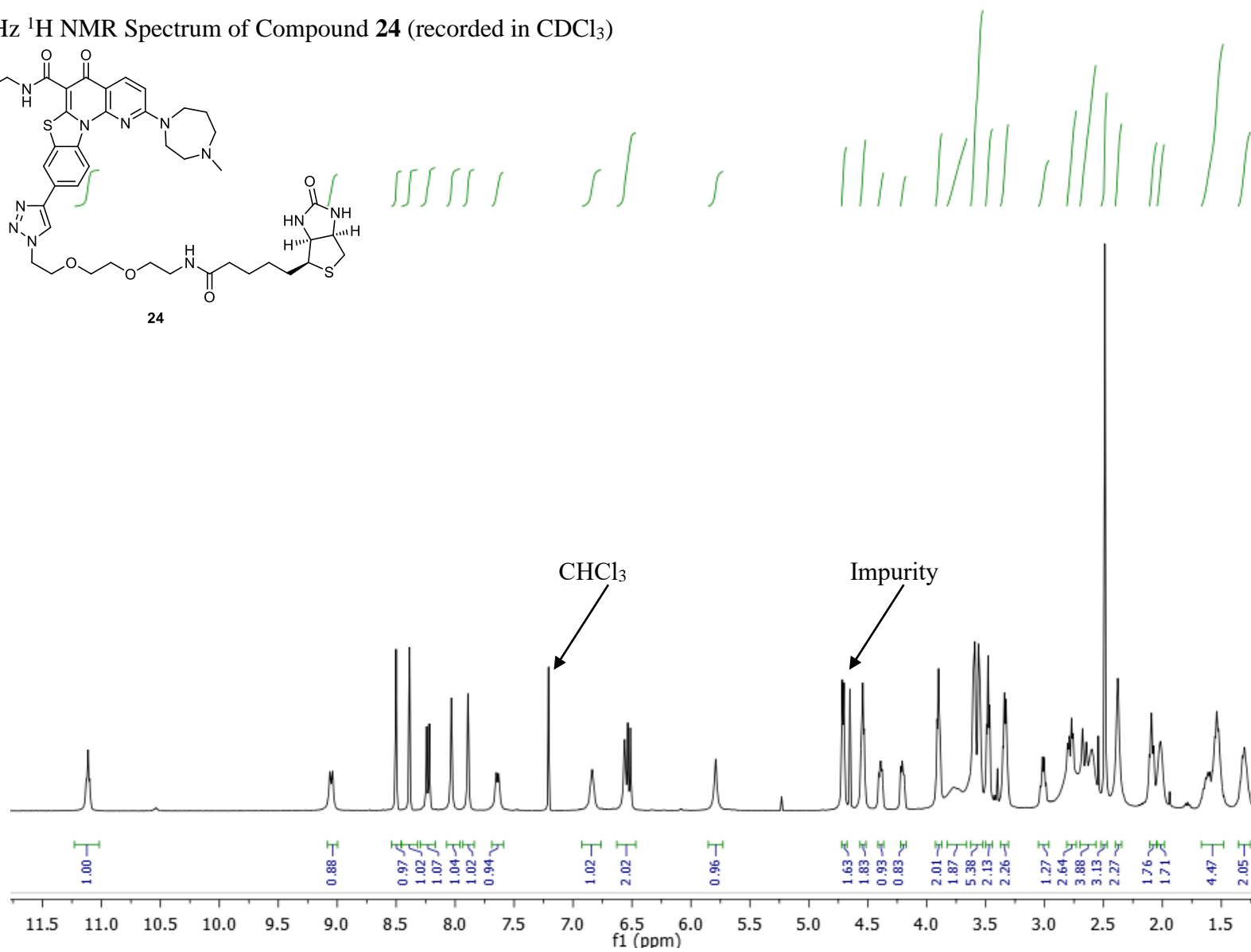
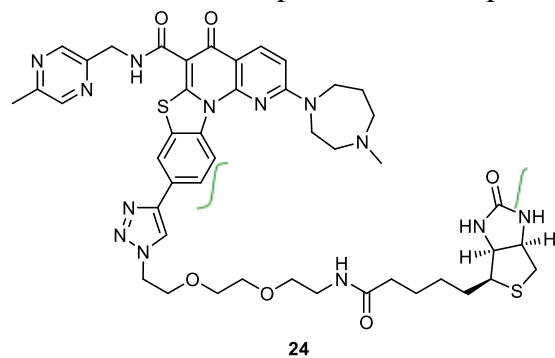
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **23** (recorded in  $\text{CDCl}_3$ )



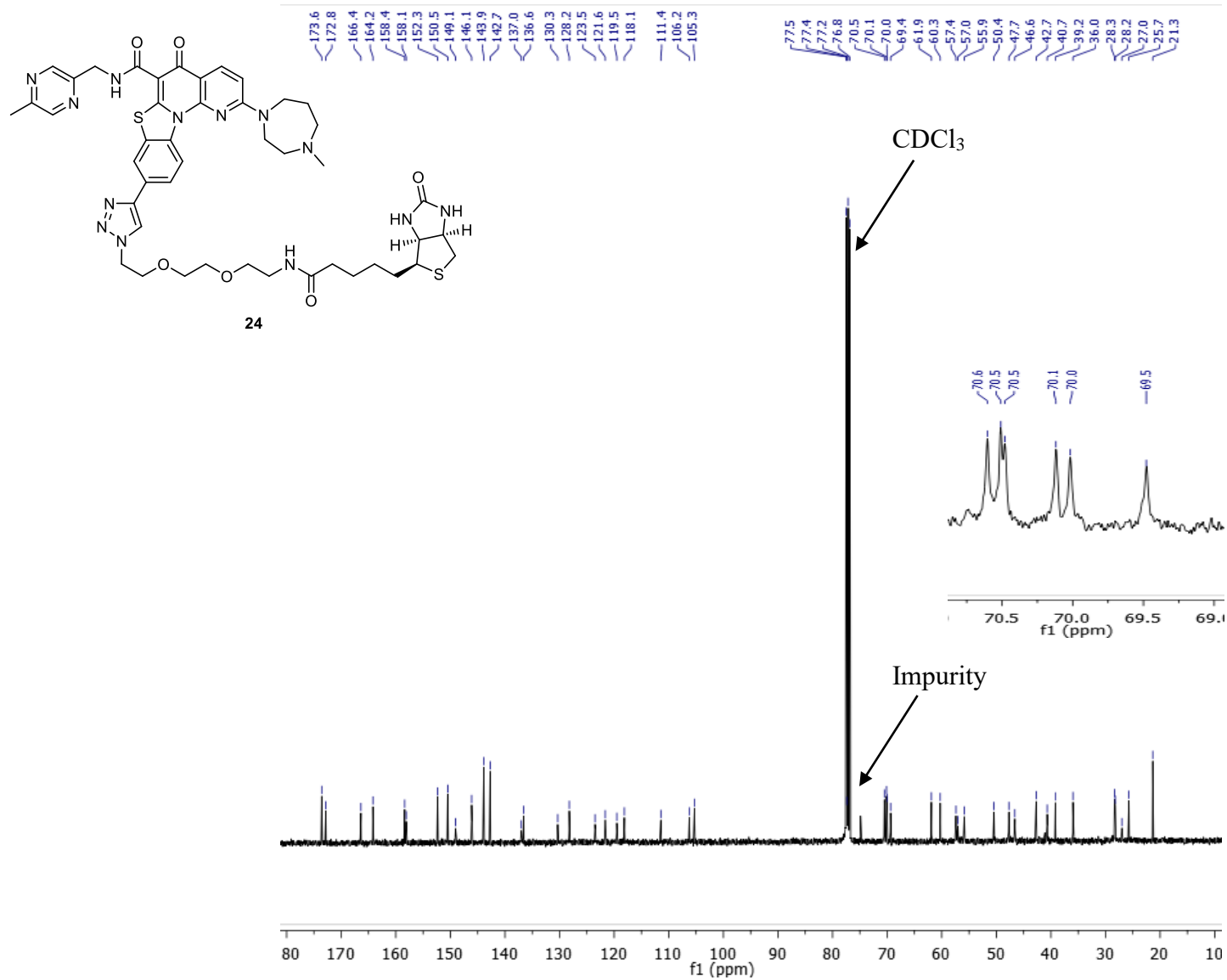
101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **23** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **24** (recorded in  $\text{CDCl}_3$ )

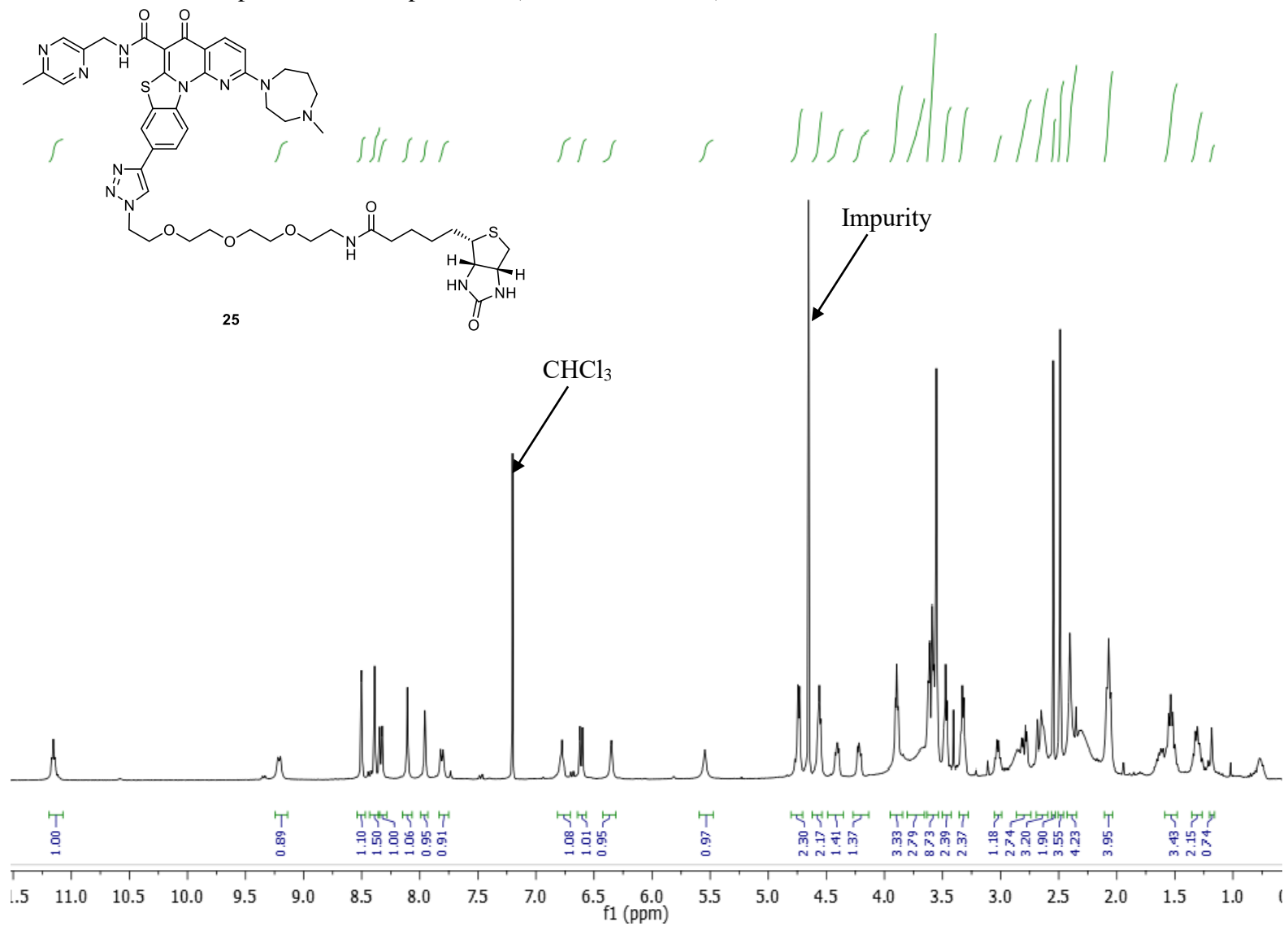


101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **24** (recorded in  $\text{CDCl}_3$ )

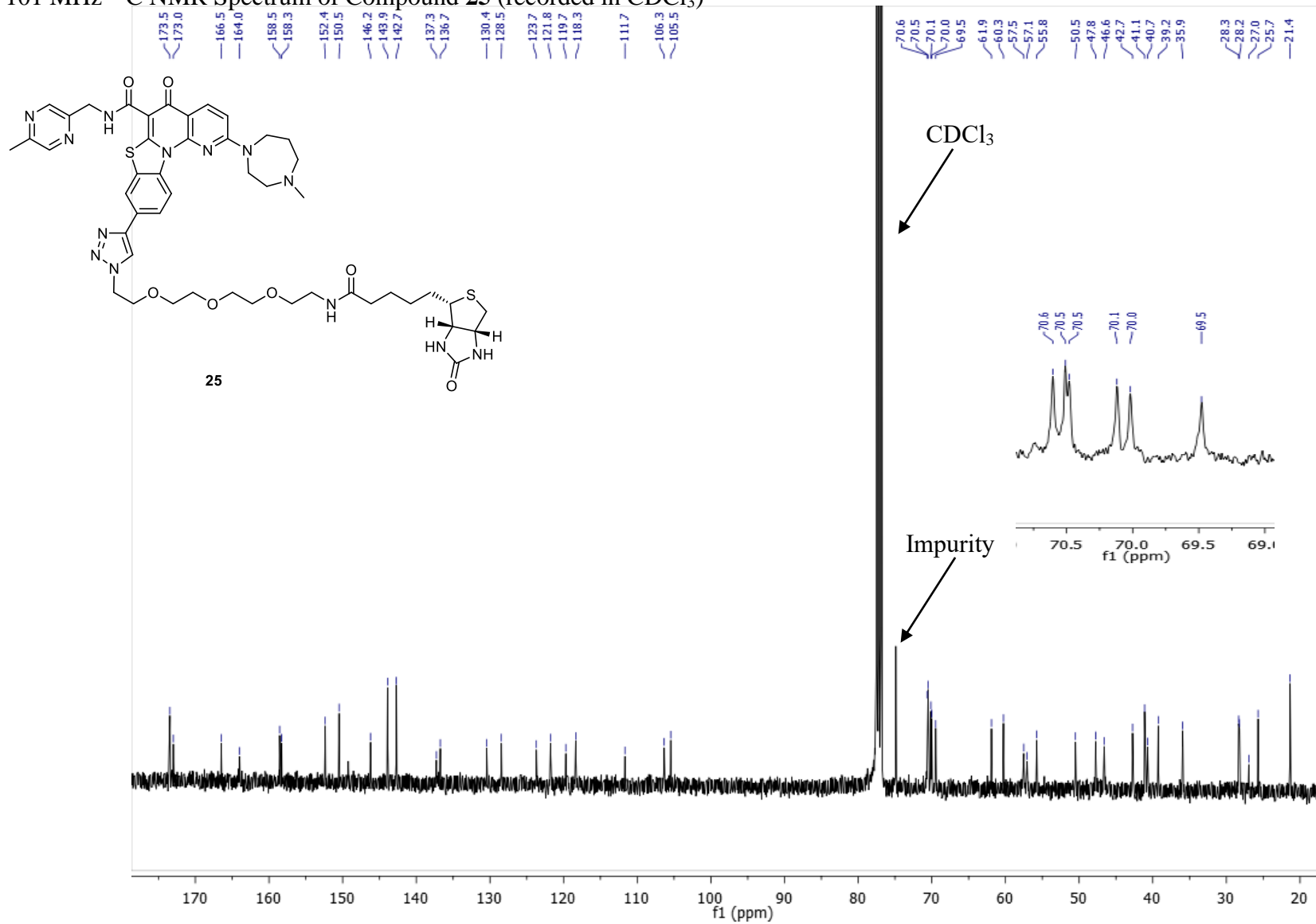




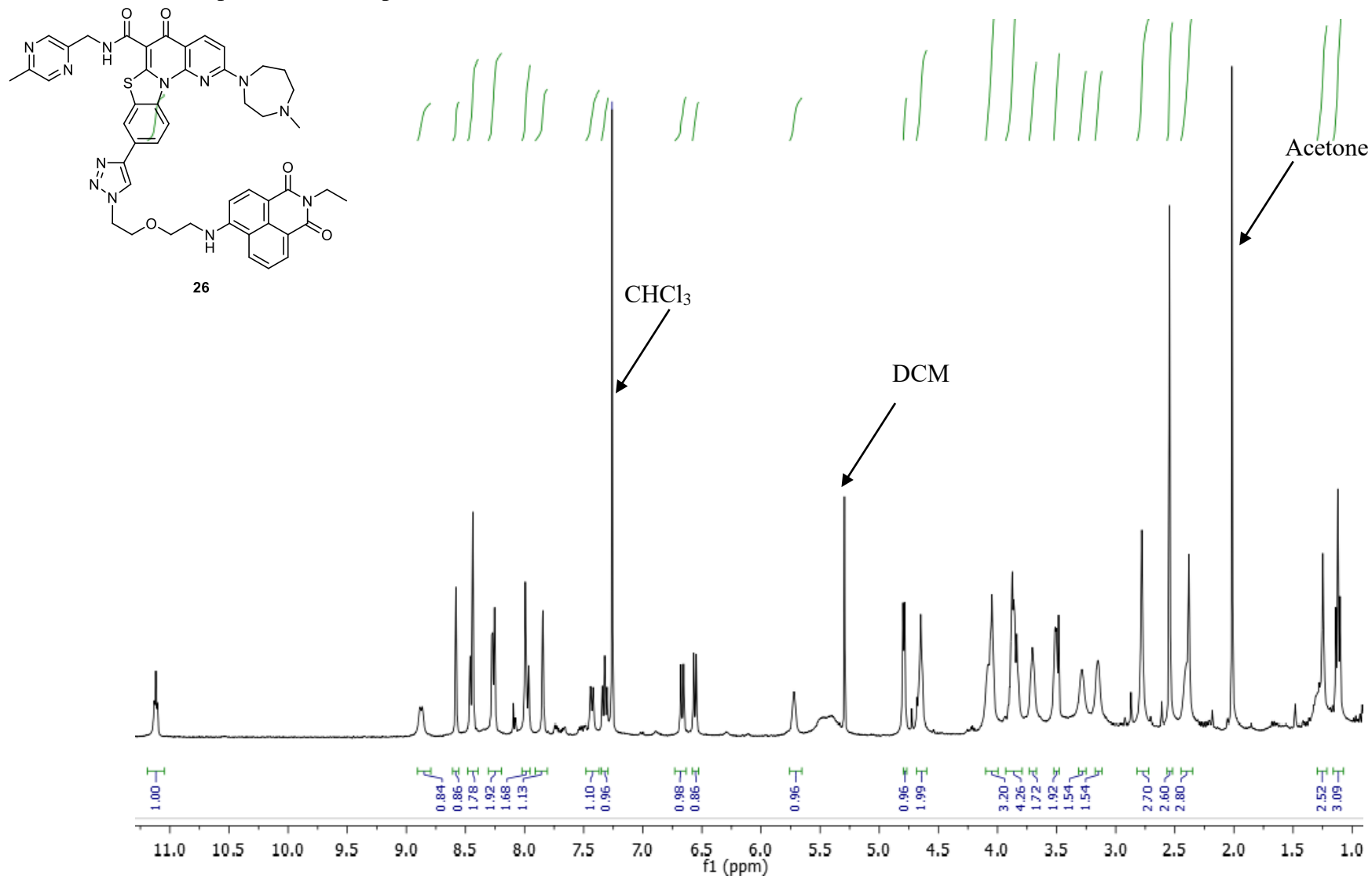
400 MHz  $^1\text{H}$  NMR Spectrum of Compound **25** (recorded in  $\text{CDCl}_3$ )



101 MHz  $^{13}\text{C}$  NMR Spectrum of Compound **25** (recorded in  $\text{CDCl}_3$ )



400 MHz  $^1\text{H}$  NMR Spectrum of Compound **26** (recorded in  $\text{CDCl}_3$ )



150 MHz <sup>13</sup>C NMR Spectrum of Compound **26** (recorded in CDCl<sub>3</sub>)

