

*Supporting information for*

**Green and efficient construction of chromeno[3,4-*c*]pyrrole core *via*  
Barton-Zard reaction from 3-nitro-2*H*-chromenes and  
ethyl isocyanoacetate**

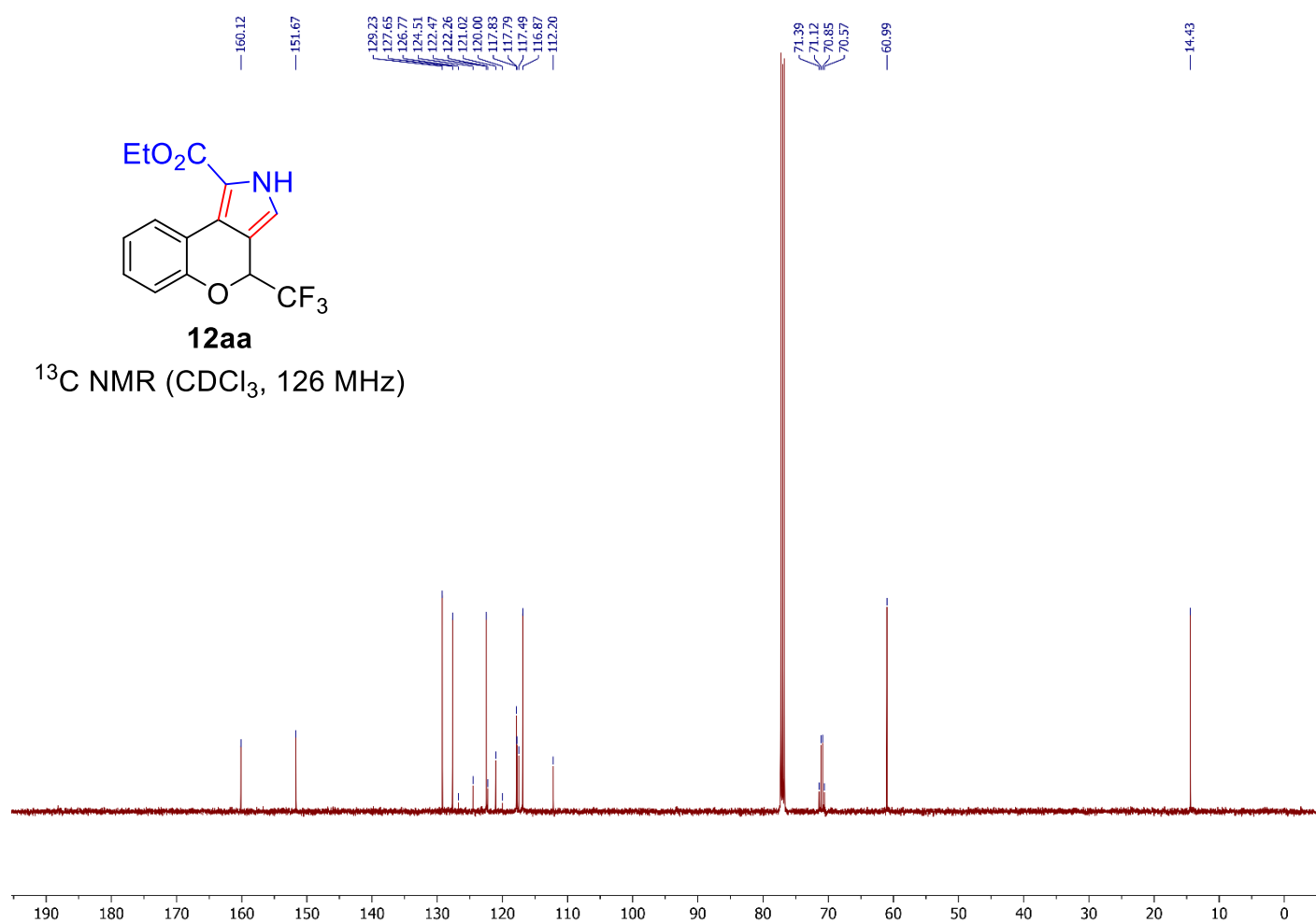
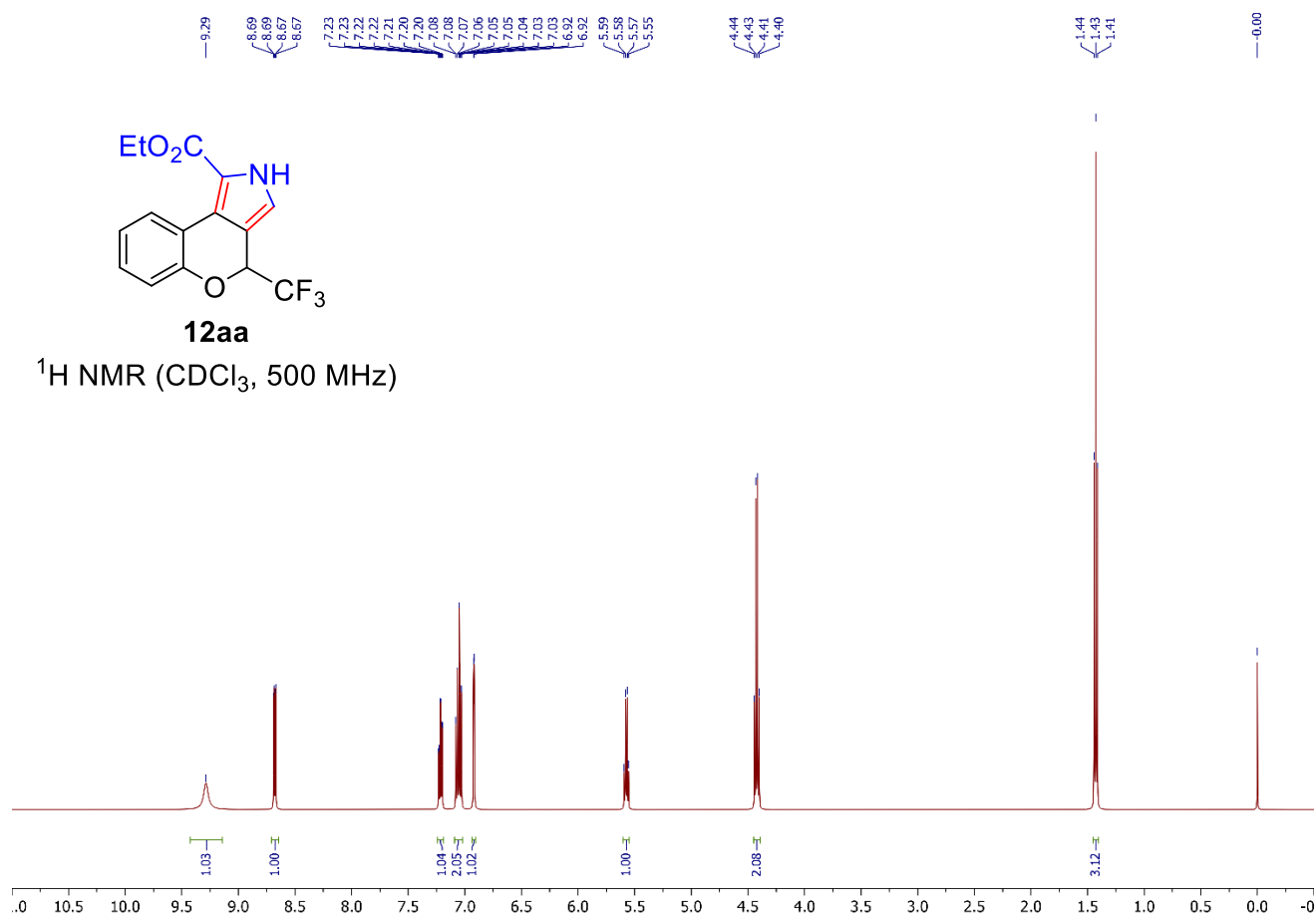
Ivan A. Kochnev, Alexey Y. Barkov, Nikolay S. Zimnitskiy, Vladislav Y. Korotaev\* and  
Vyacheslav Y. Sosnovskikh\*

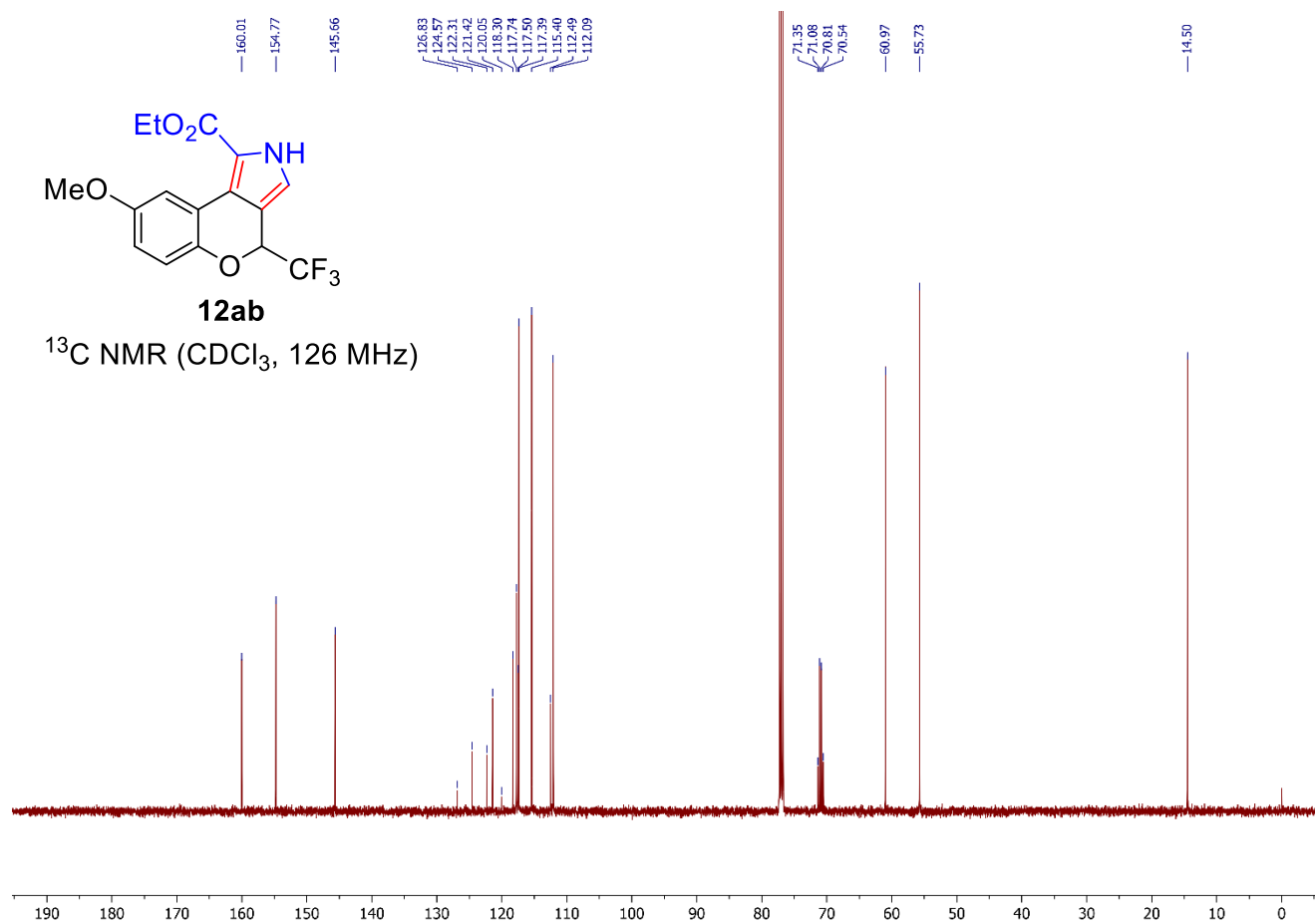
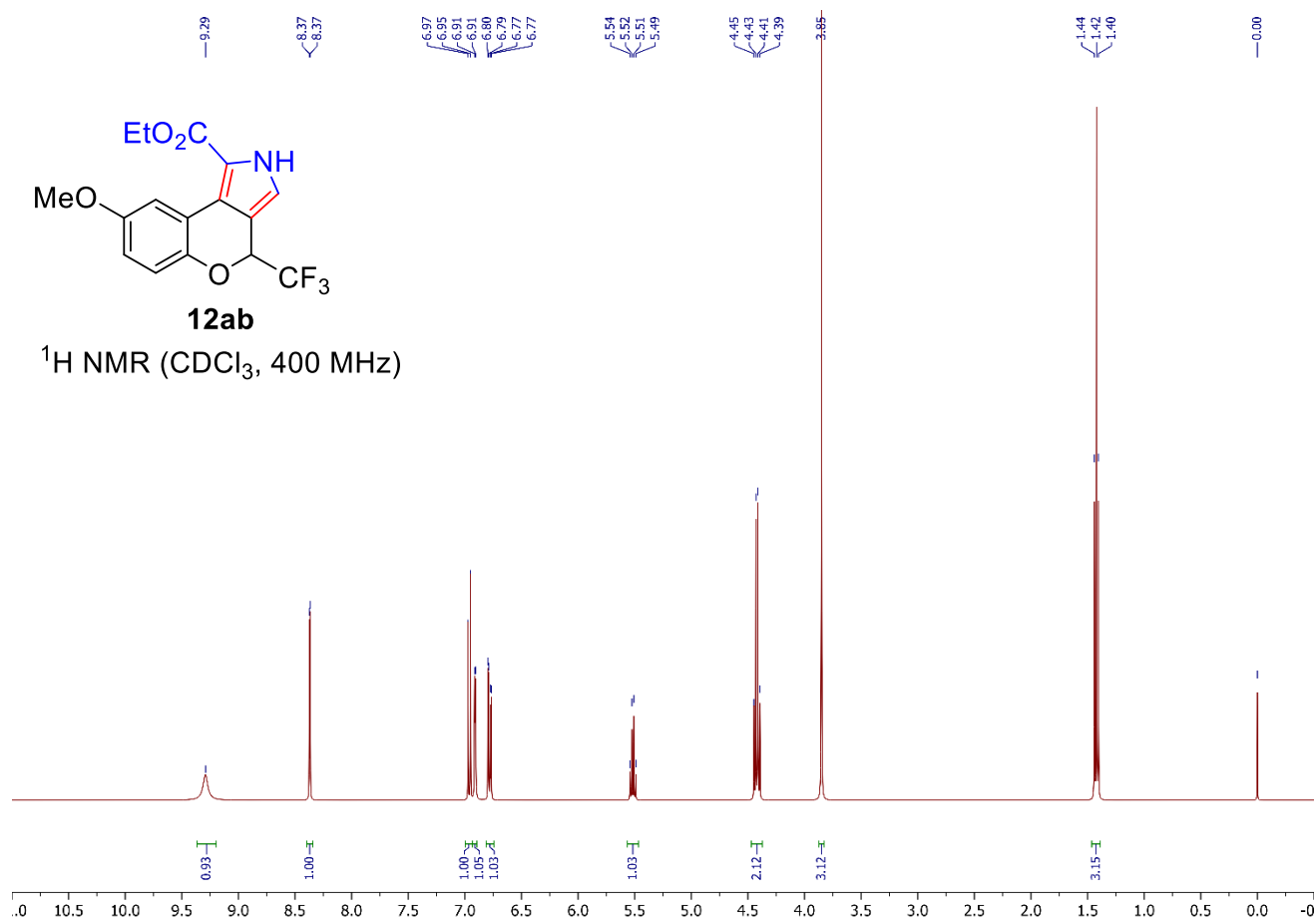
Institute of Natural Sciences and Mathematics, Ural Federal University, 51 Lenina Ave.,  
620000 Ekaterinburg, Russian Federation

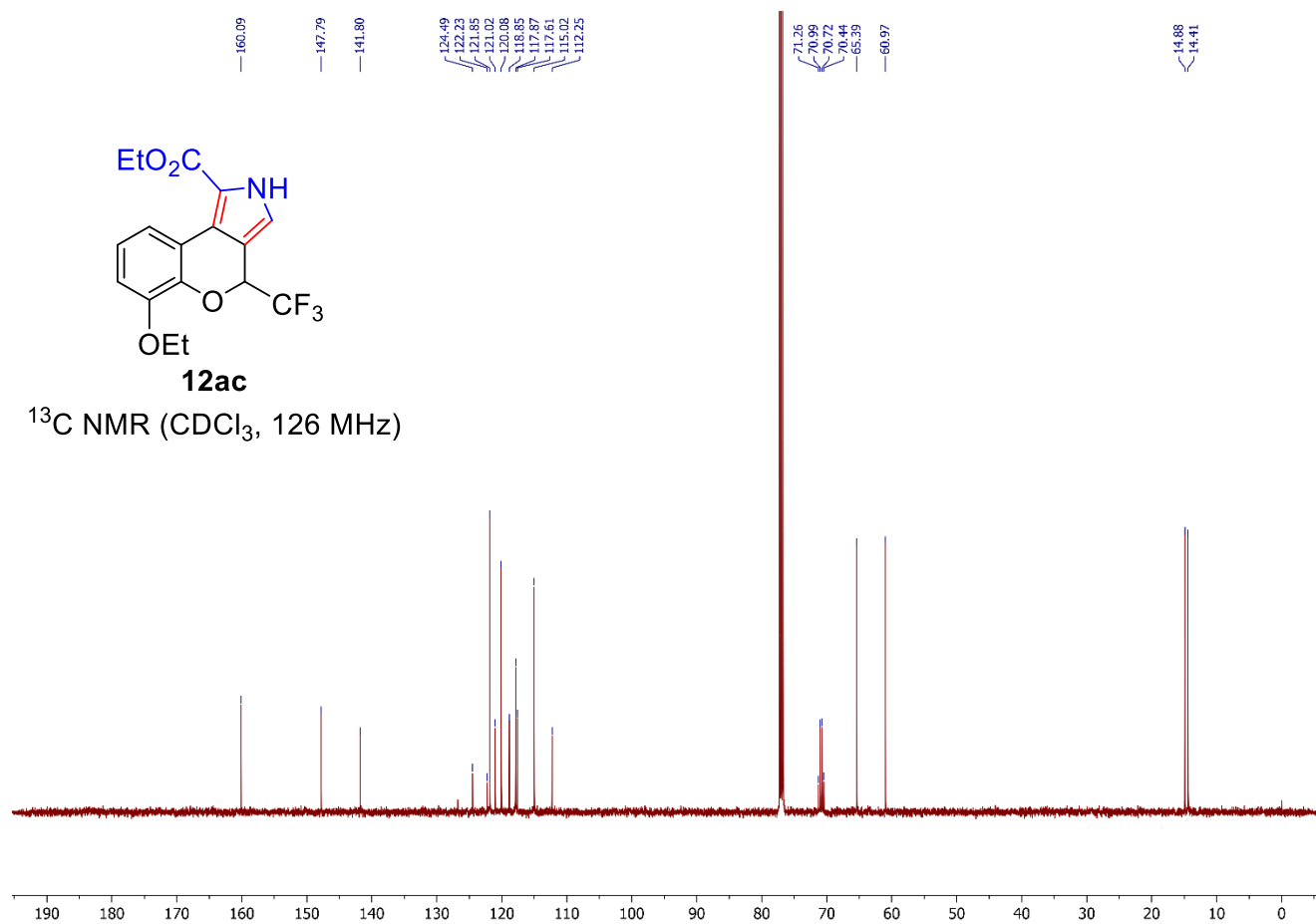
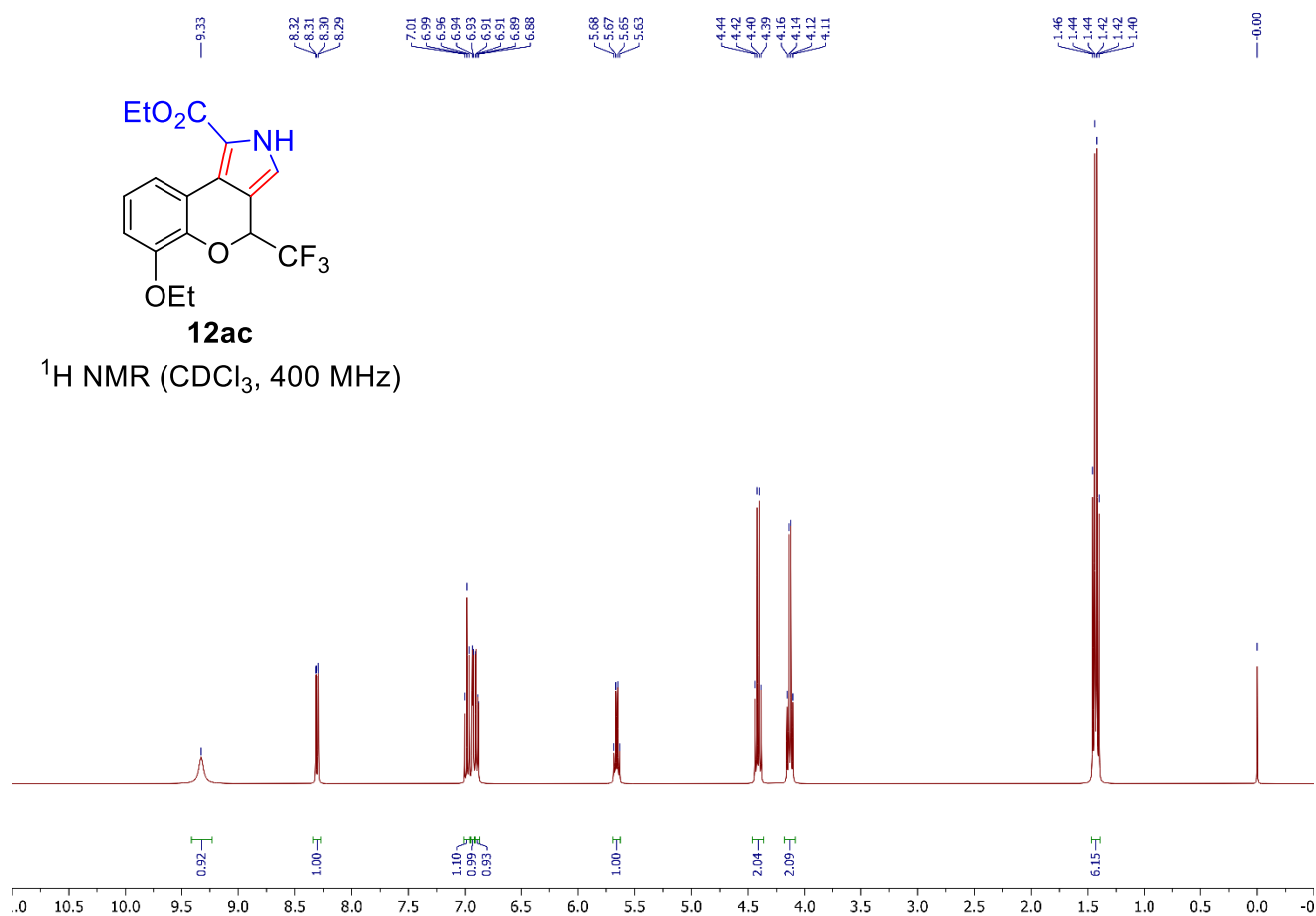
E-mail: [korotev.vladislav@urfu.ru](mailto:korotev.vladislav@urfu.ru), [vy.sosnovskikh@urfu.ru](mailto:vy.sosnovskikh@urfu.ru)

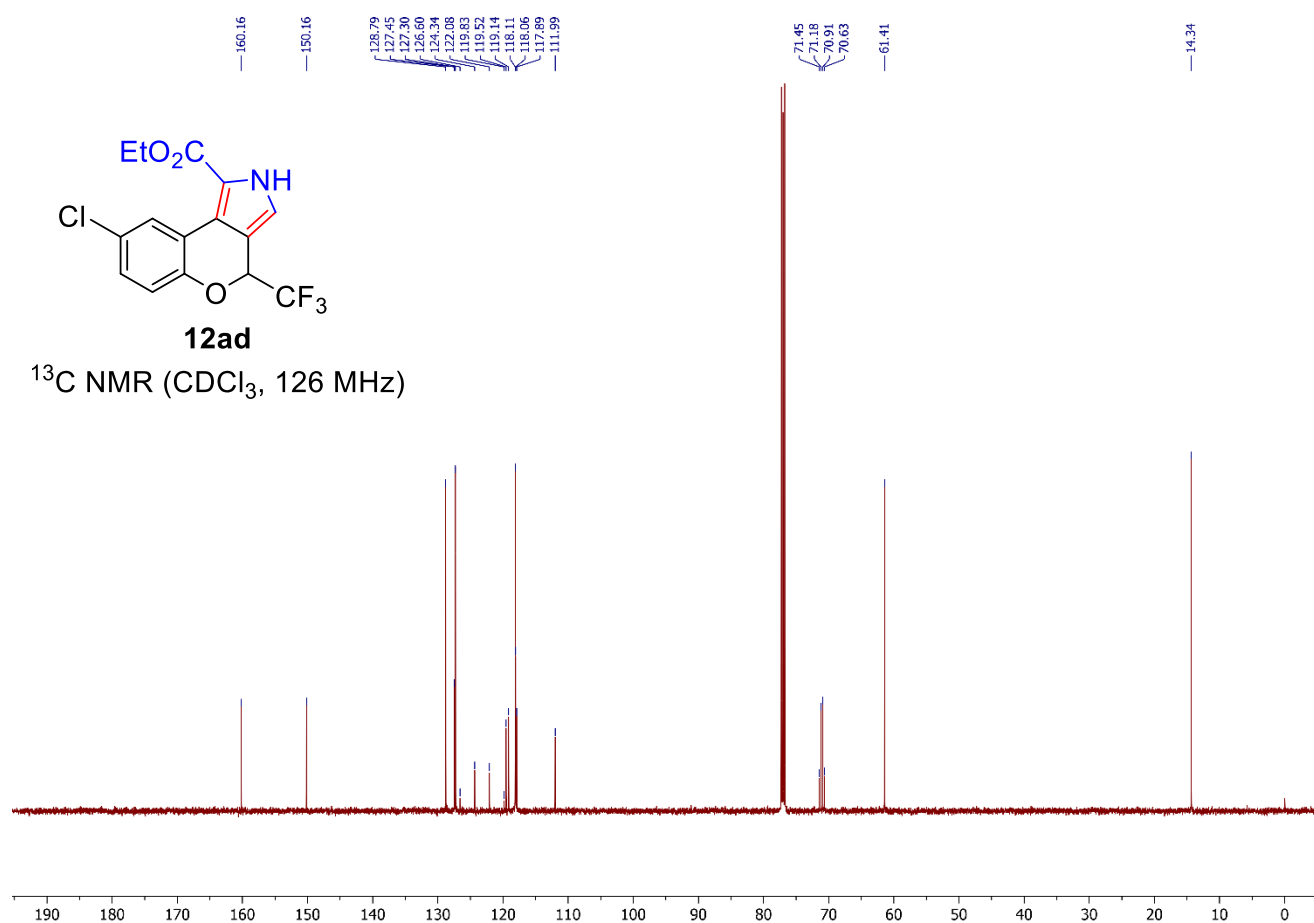
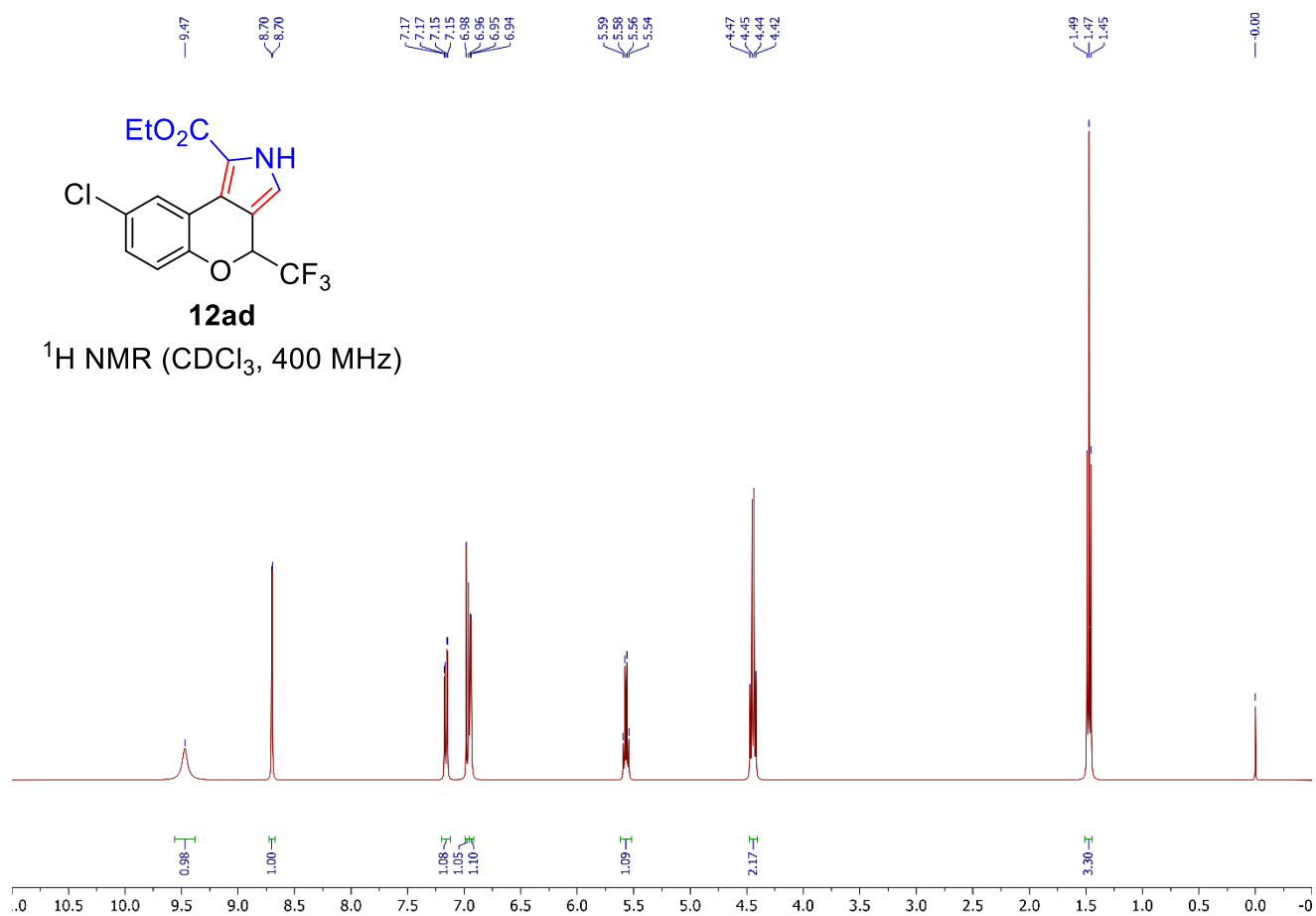
**Table of Contents**

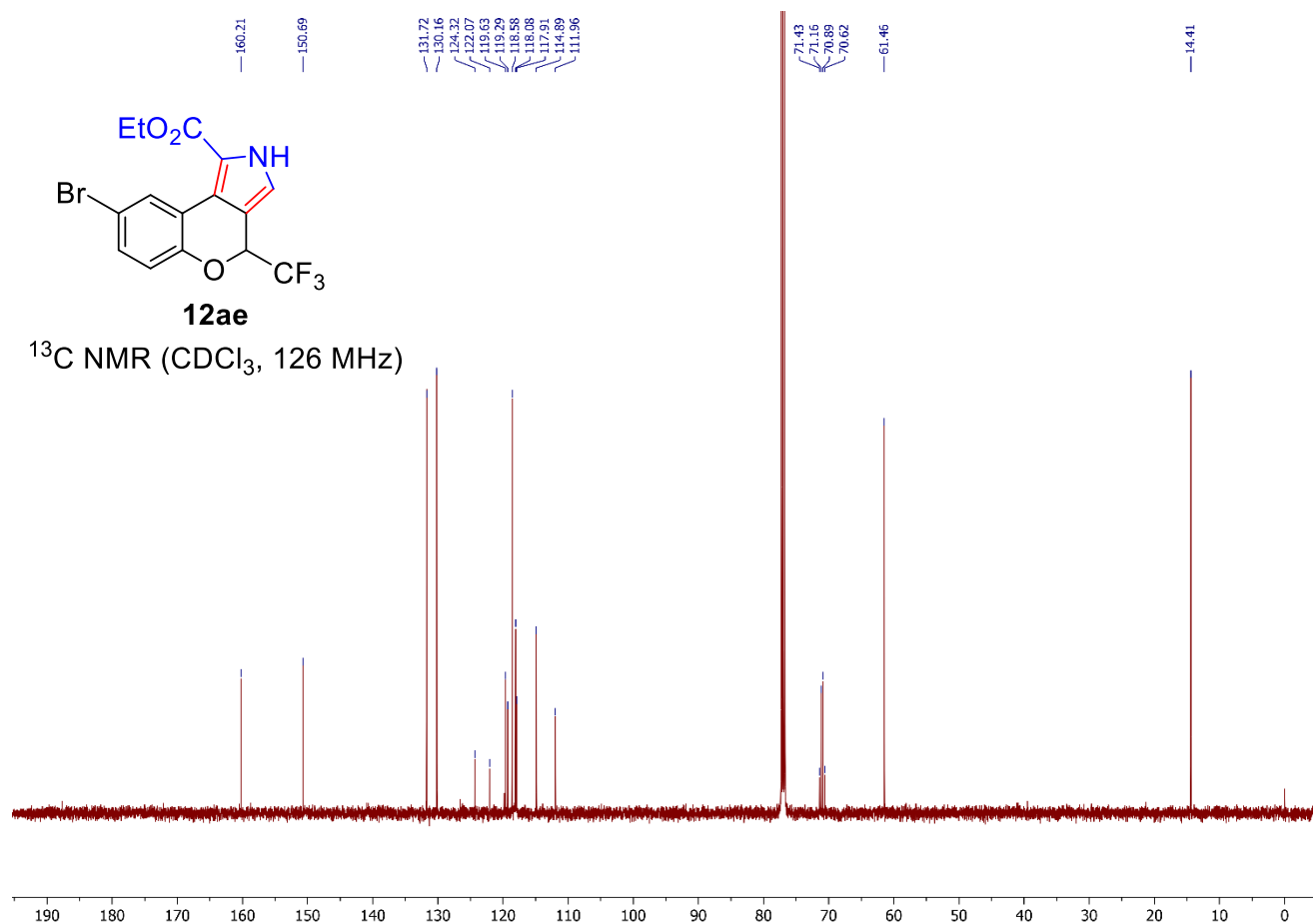
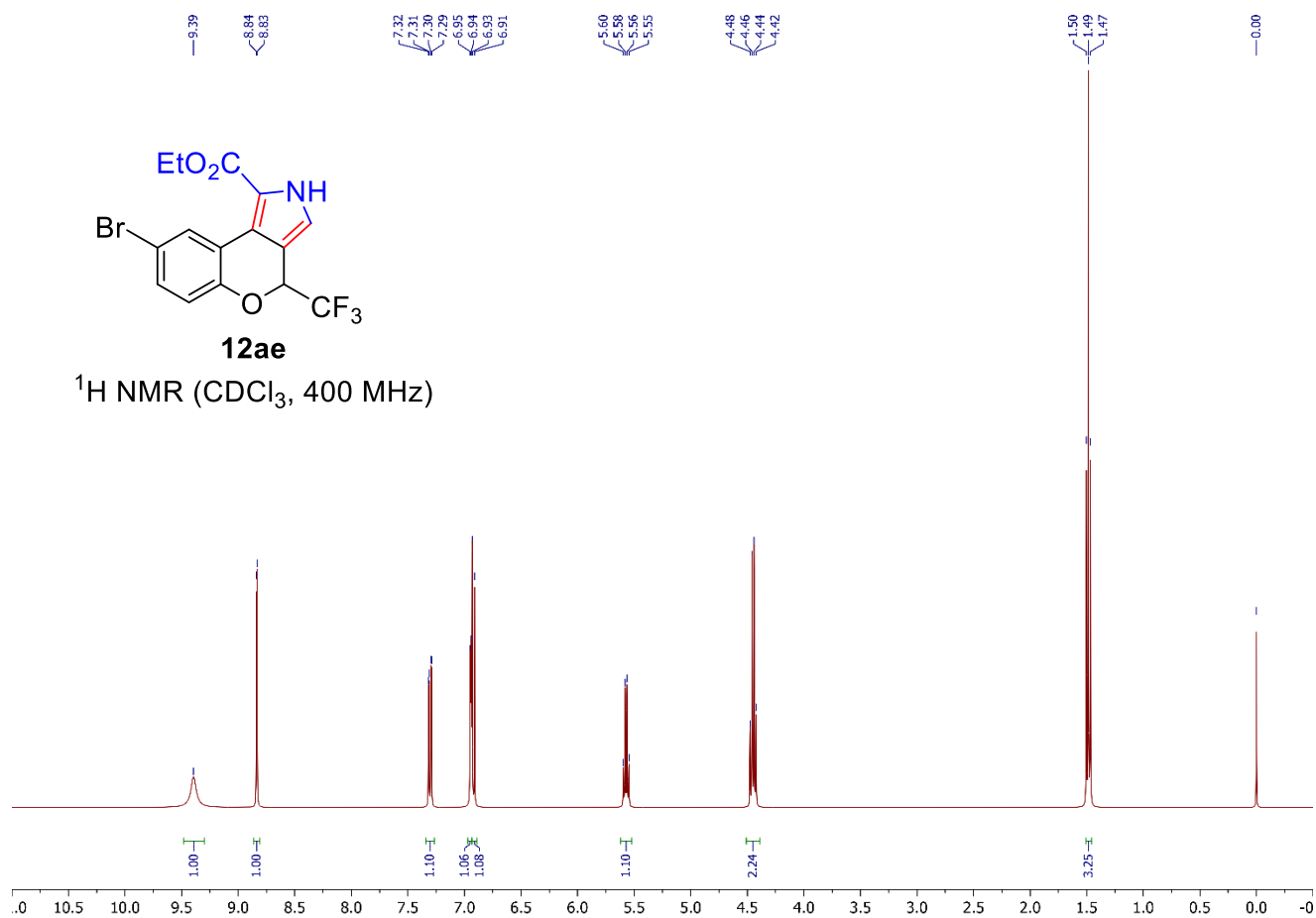
1. Copies of $^1\text{H}$ and $^{13}\text{C}$ NMR spectra of synthesized compounds	S2–S32
--	--------

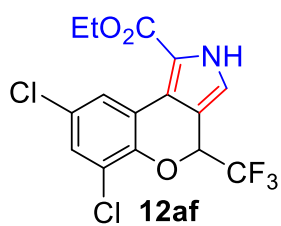




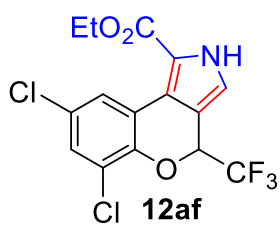
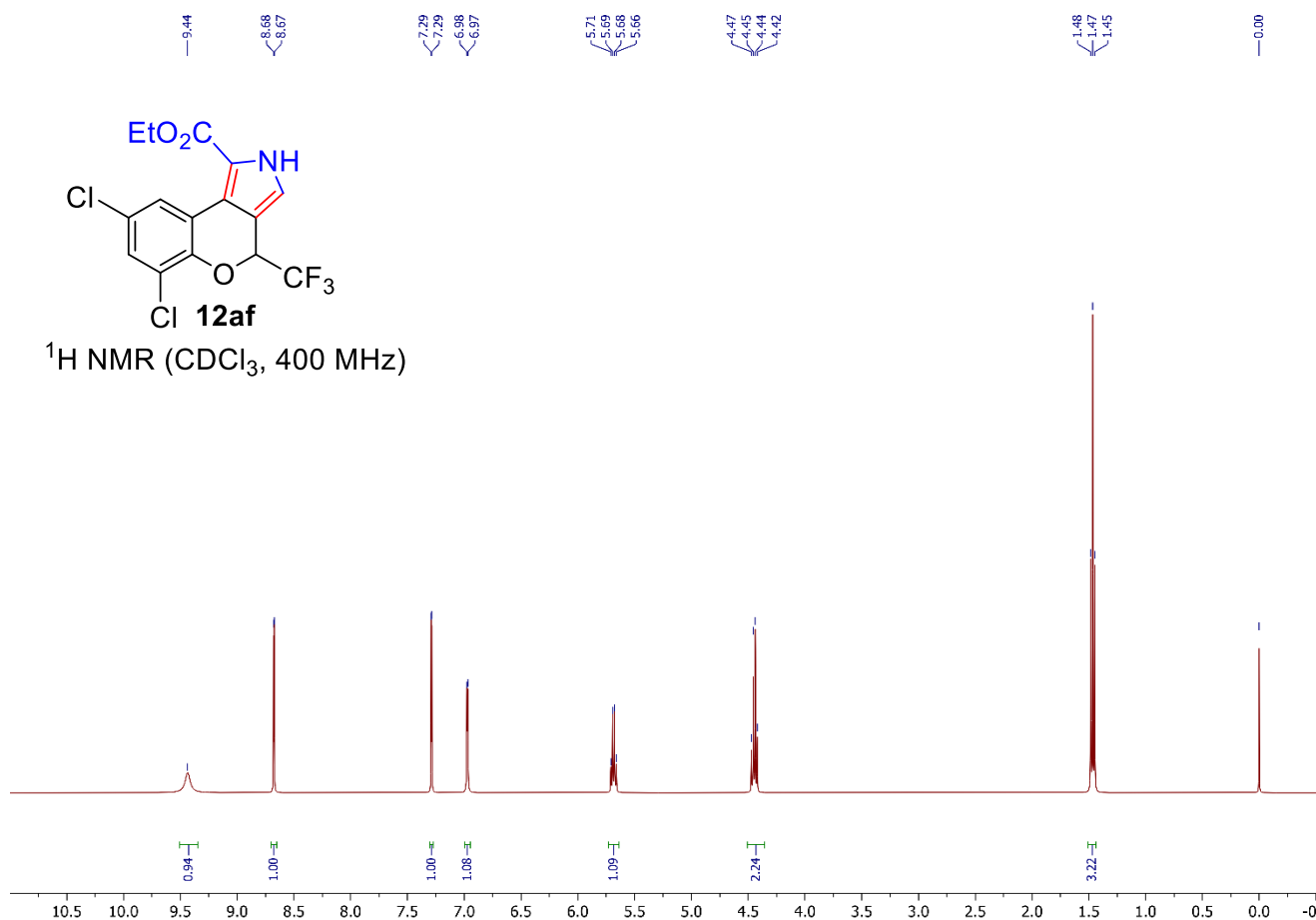




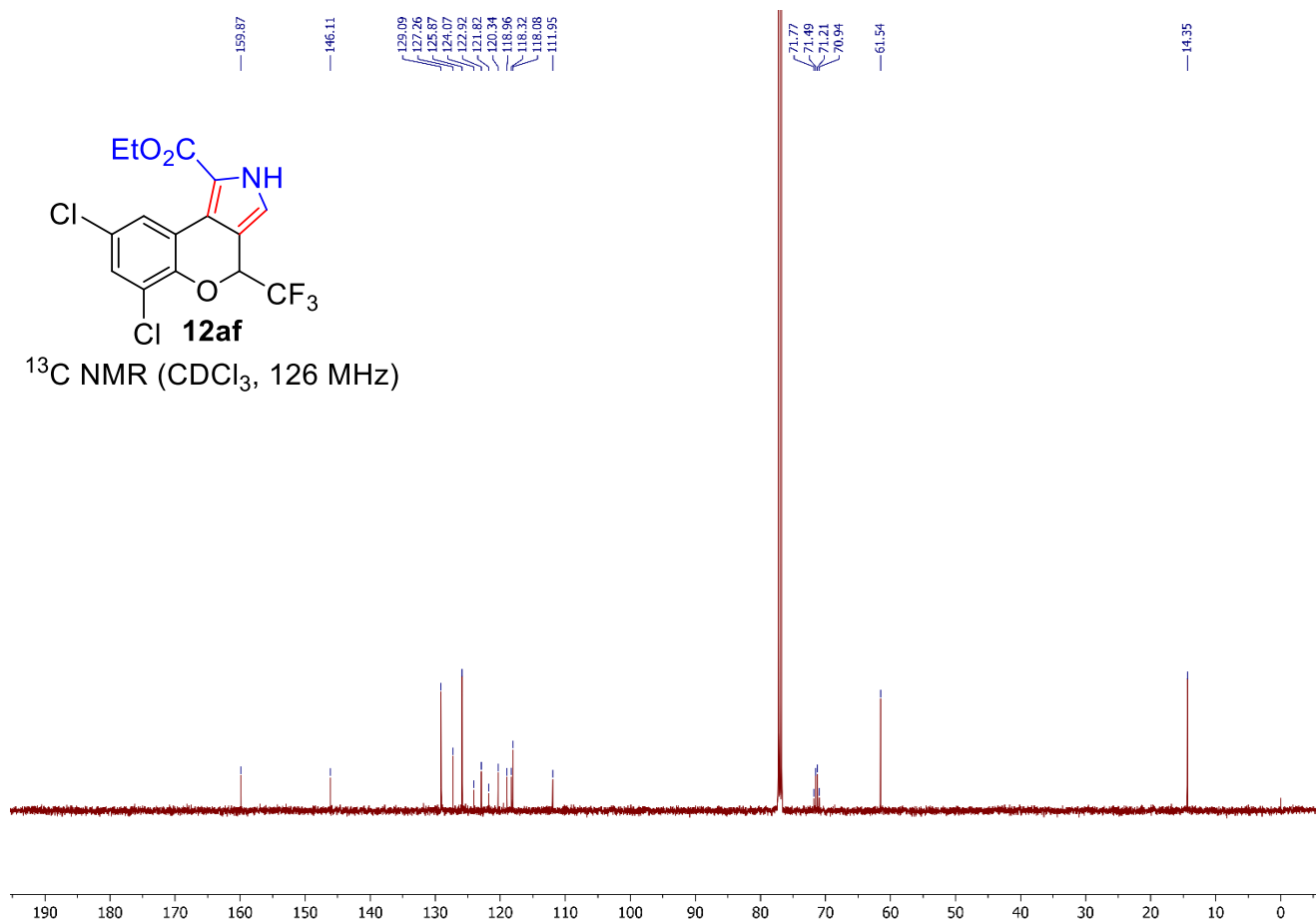


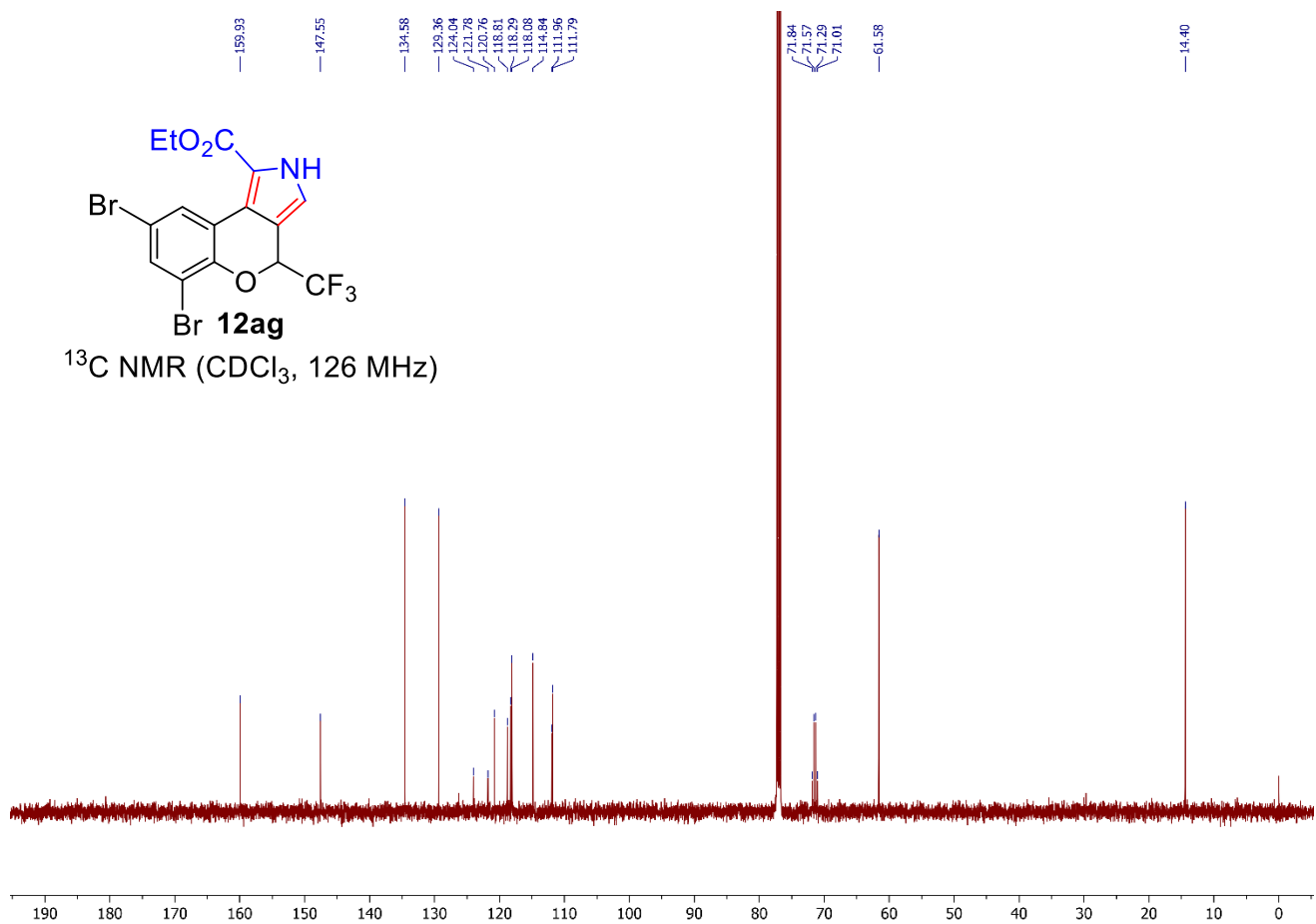
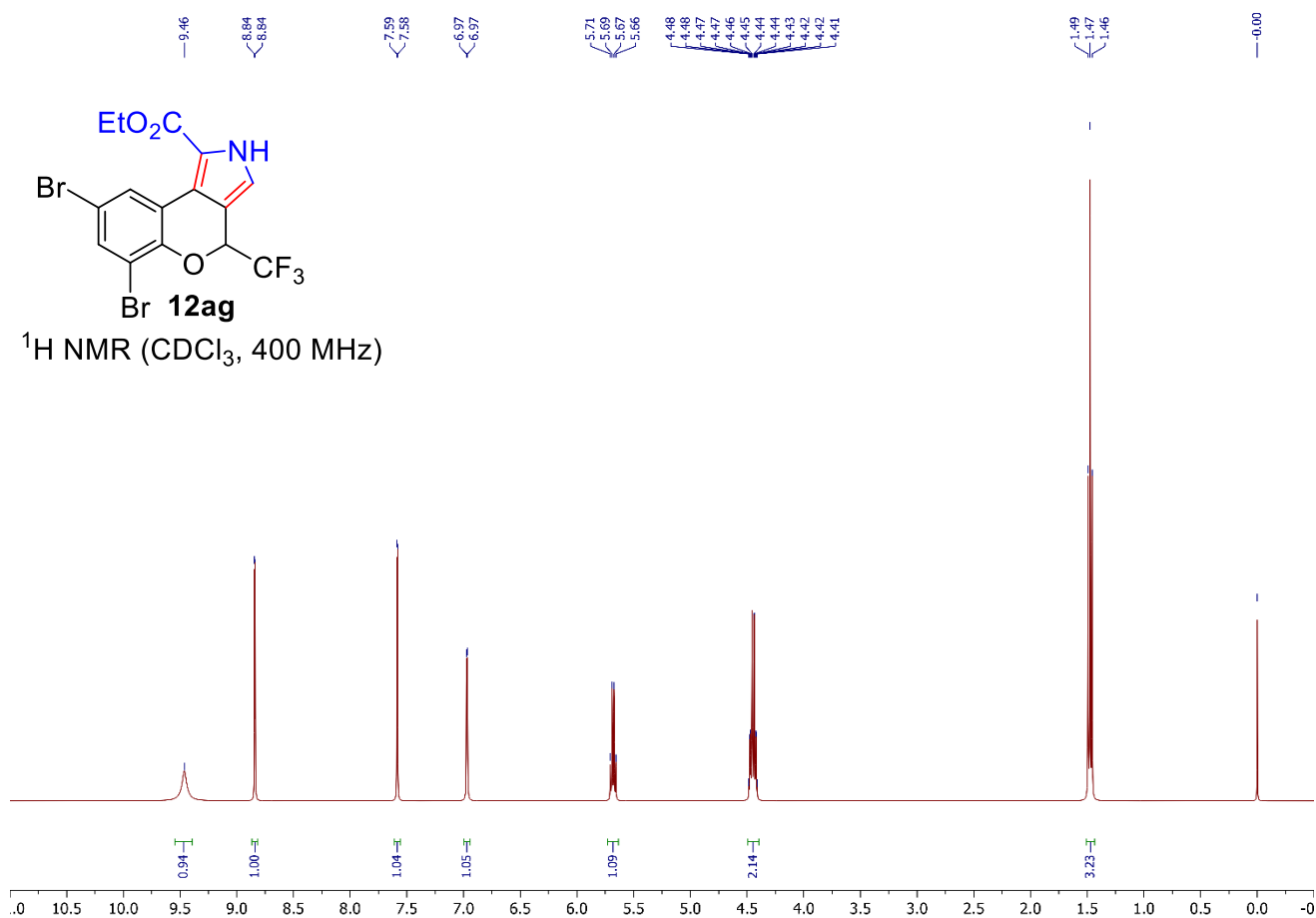


$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)

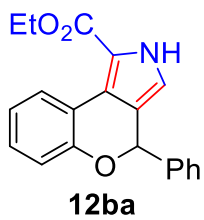


$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

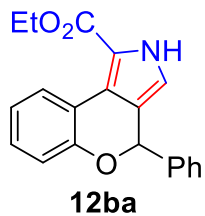
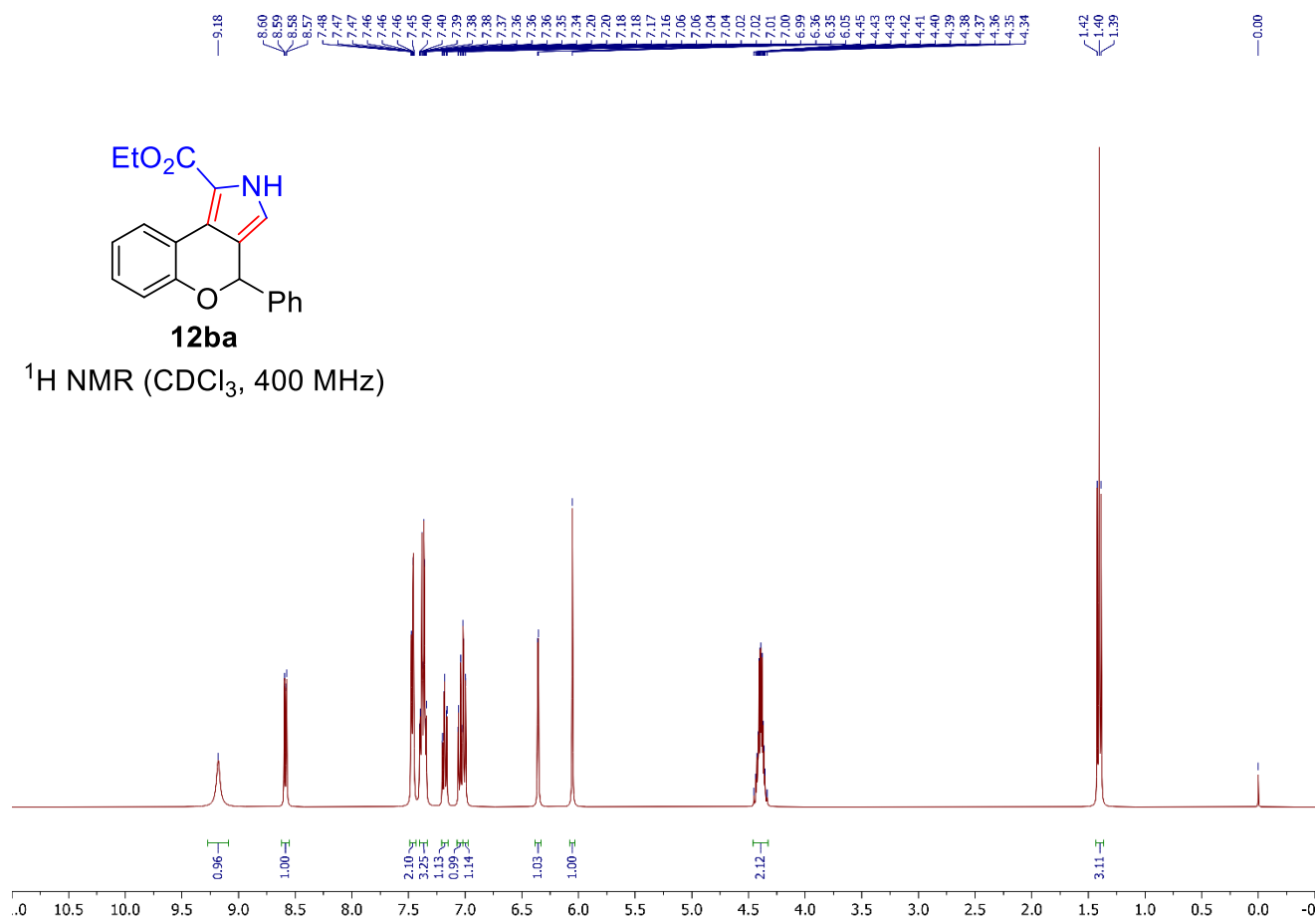




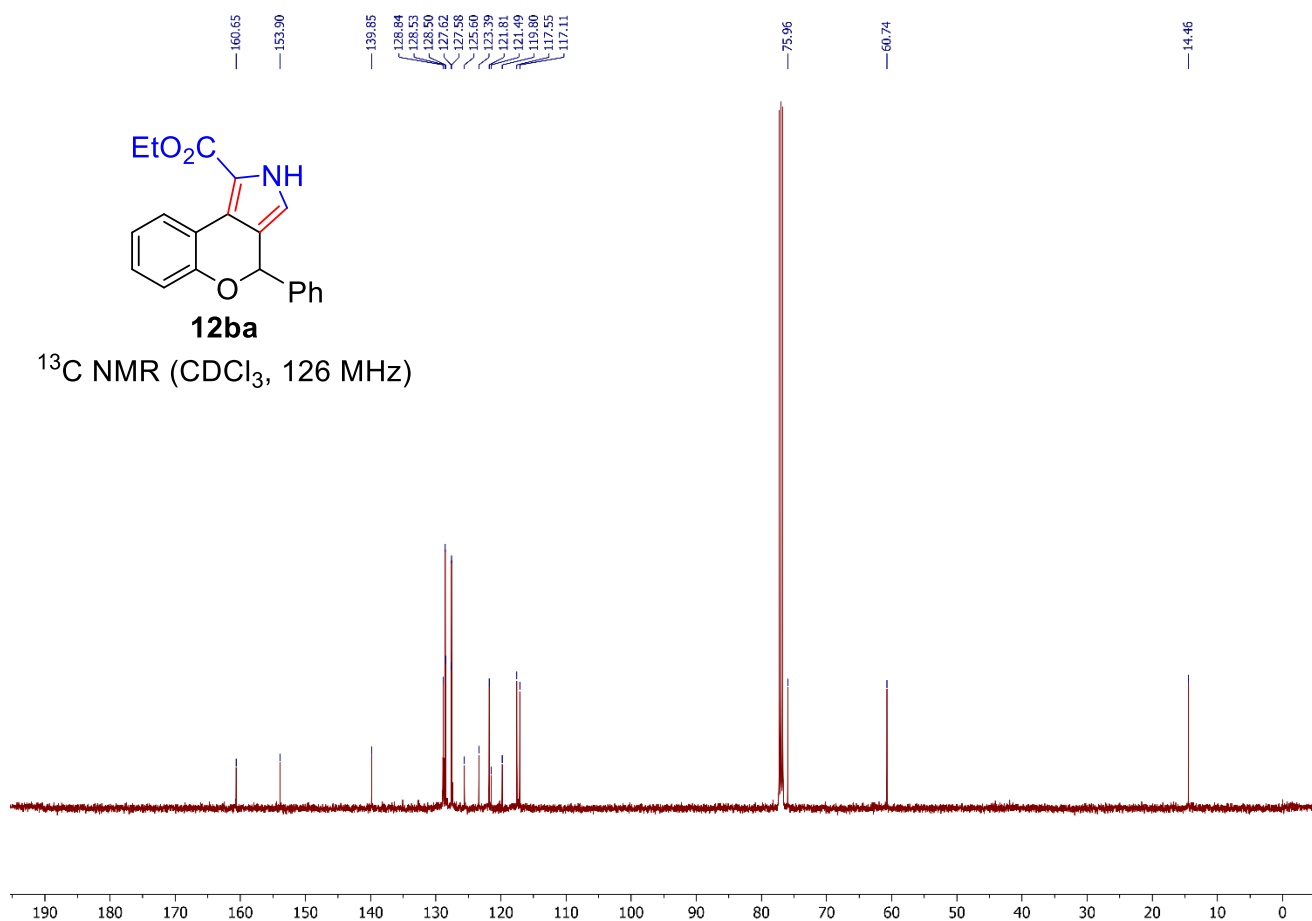


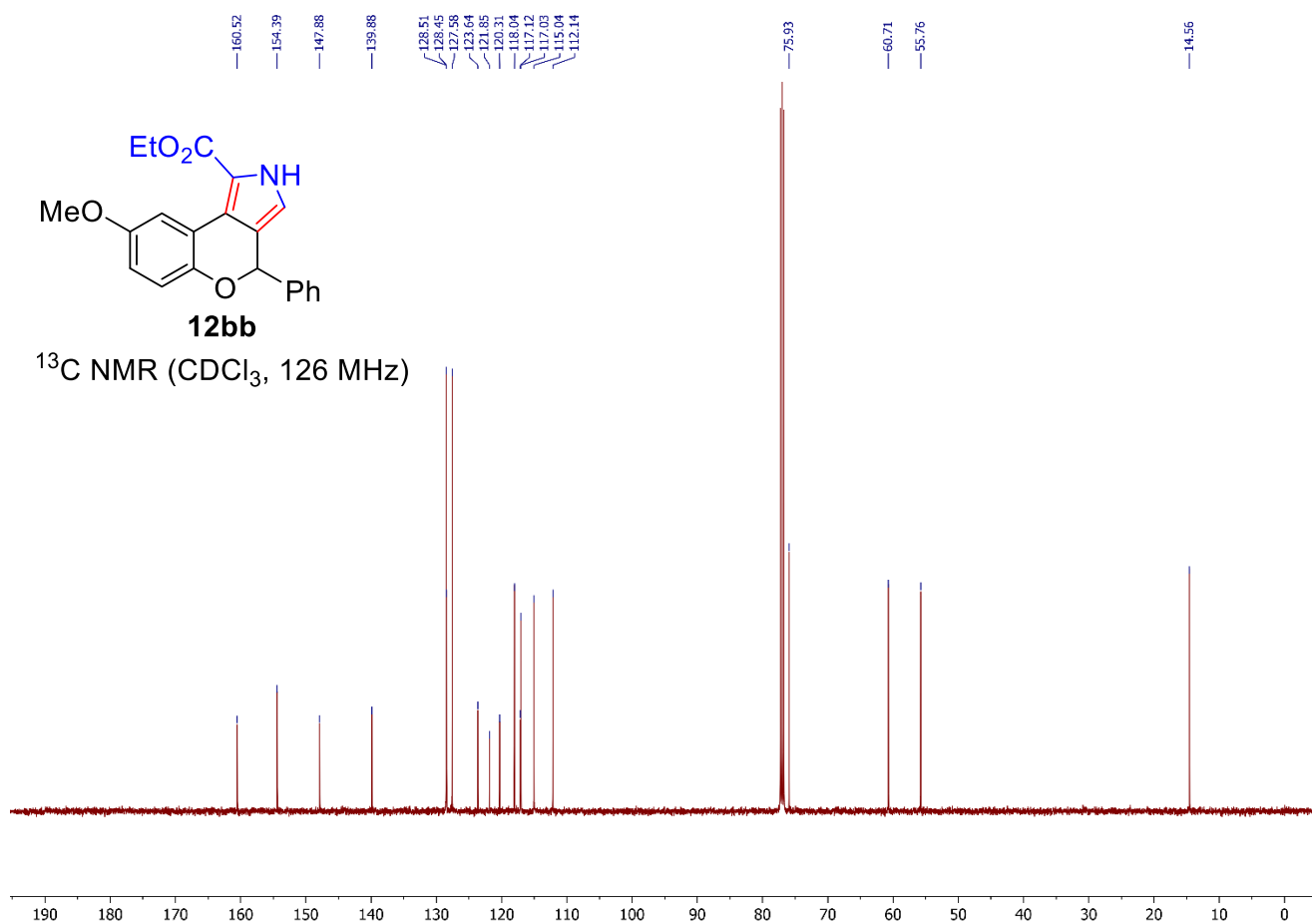
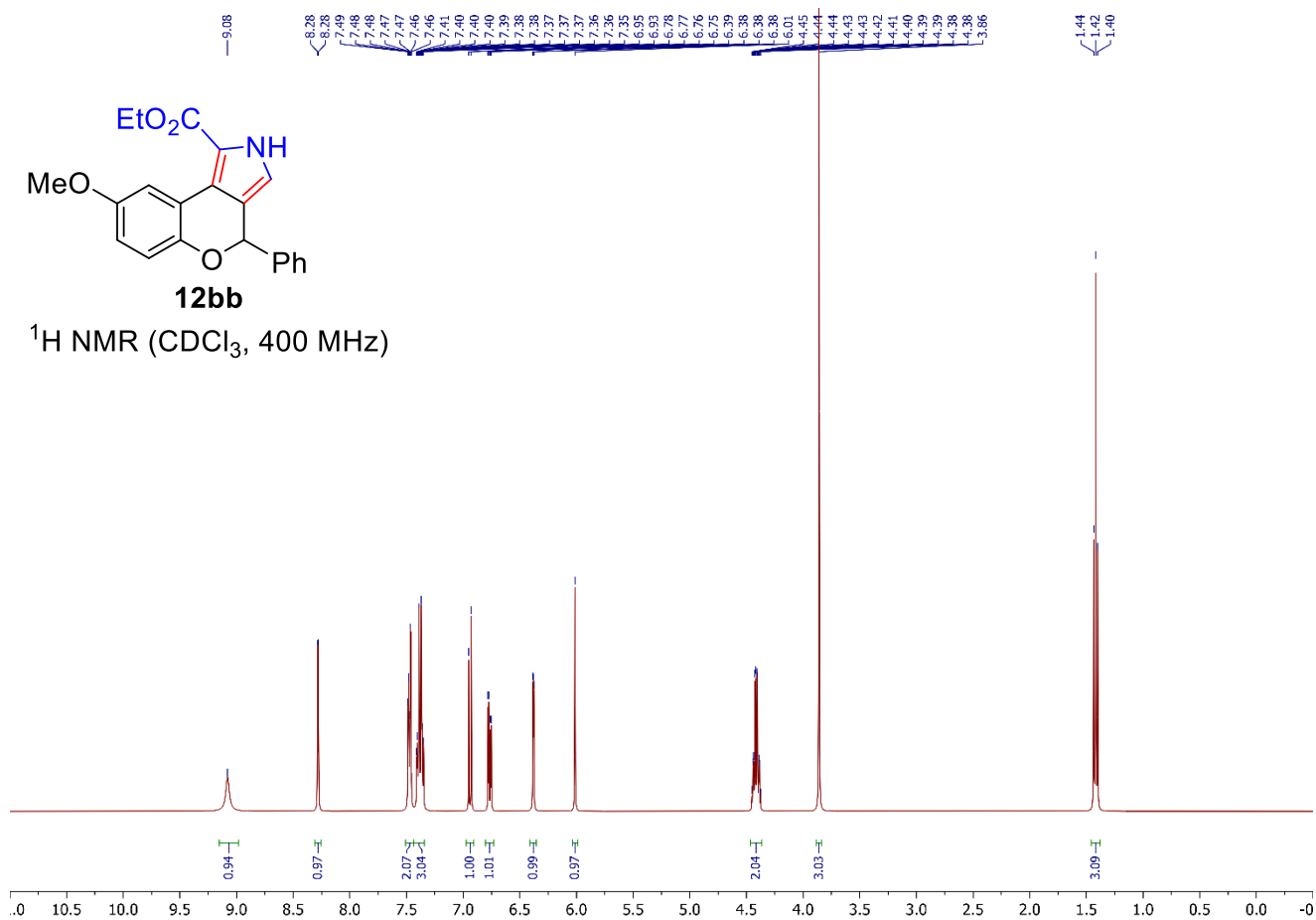


$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)



$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)







**12bc**

<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)

Chemical structure of **12bc** is shown above the spectrum. The structure is a benzofuran derivative with an ethyl ester group (EtO<sub>2</sub>C) and a phenyl group (Ph) attached to the furan ring, and an ethoxy group (OEt) attached to the benzene ring.

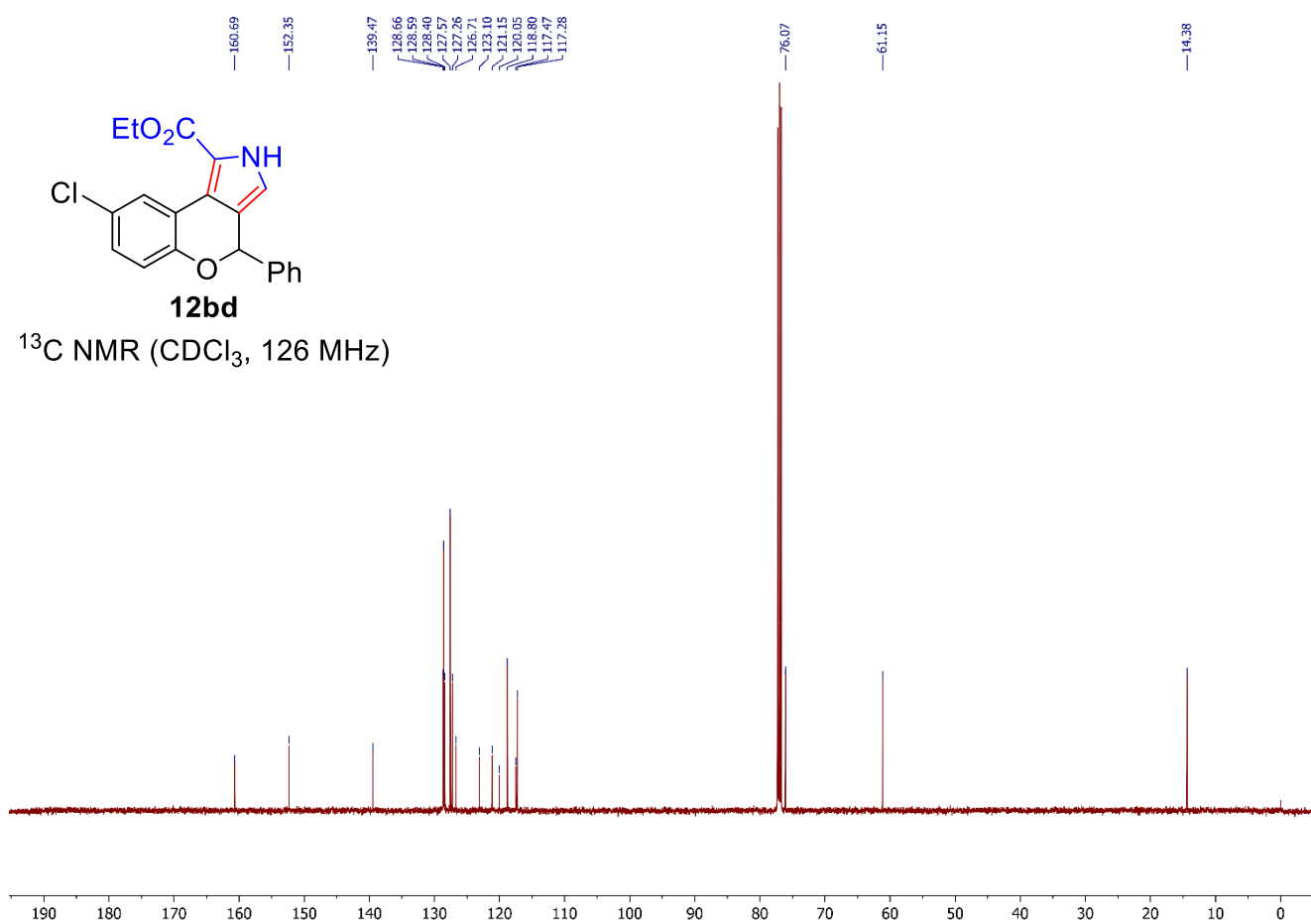
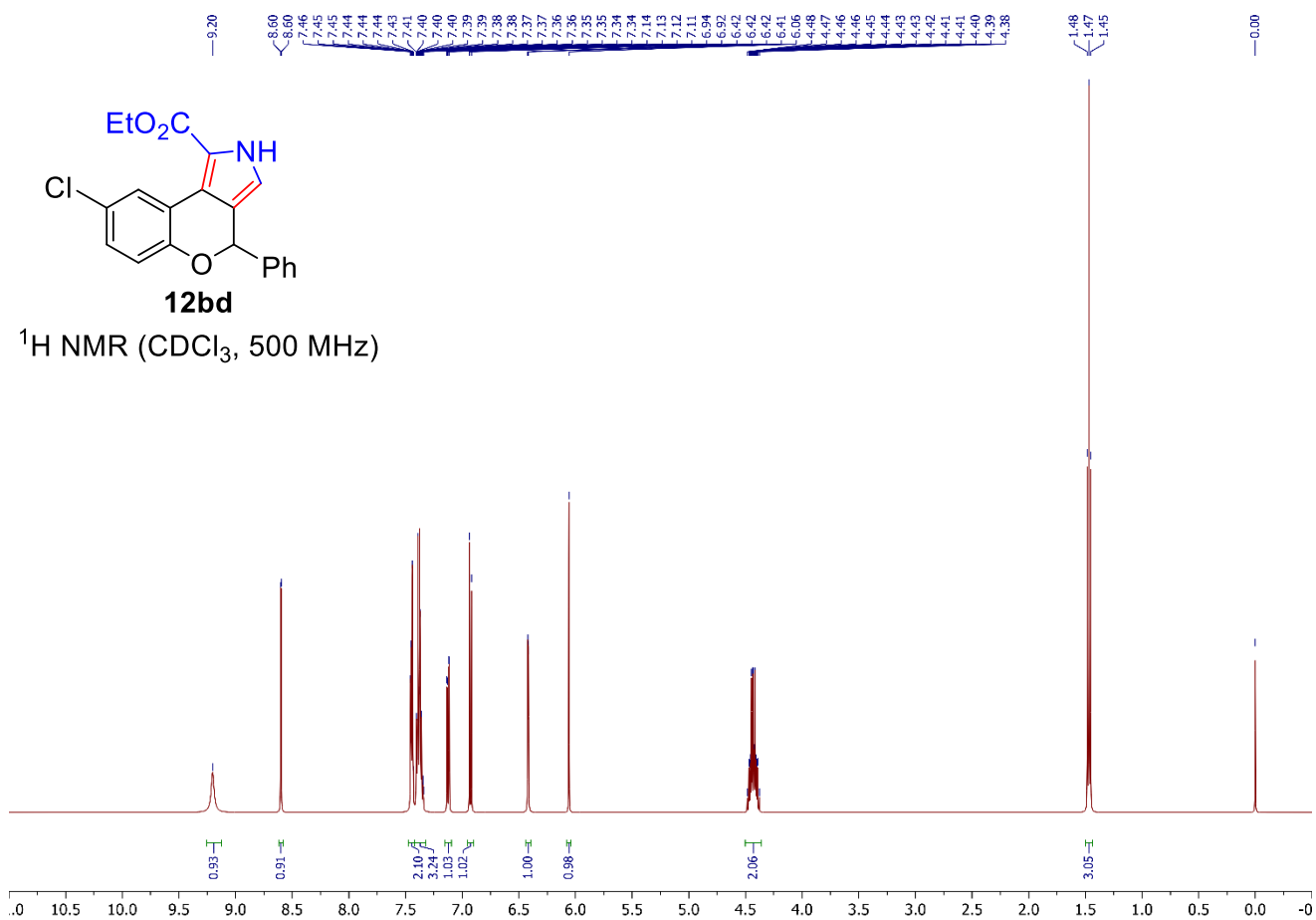


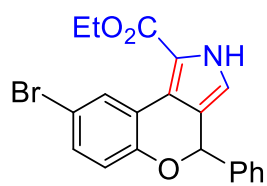
**12bc**

$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

Chemical structure of **12bc** is shown above the spectrum. The structure is a benzodioxane derivative with an ethyl ester group ( $\text{EtO}_2\text{C}$ ) and a phenyl group ( $\text{Ph}$ ) attached to the dioxane ring, and an ethoxy group ( $\text{OEt}$ ) attached to the benzene ring.

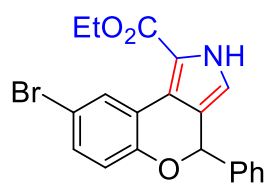
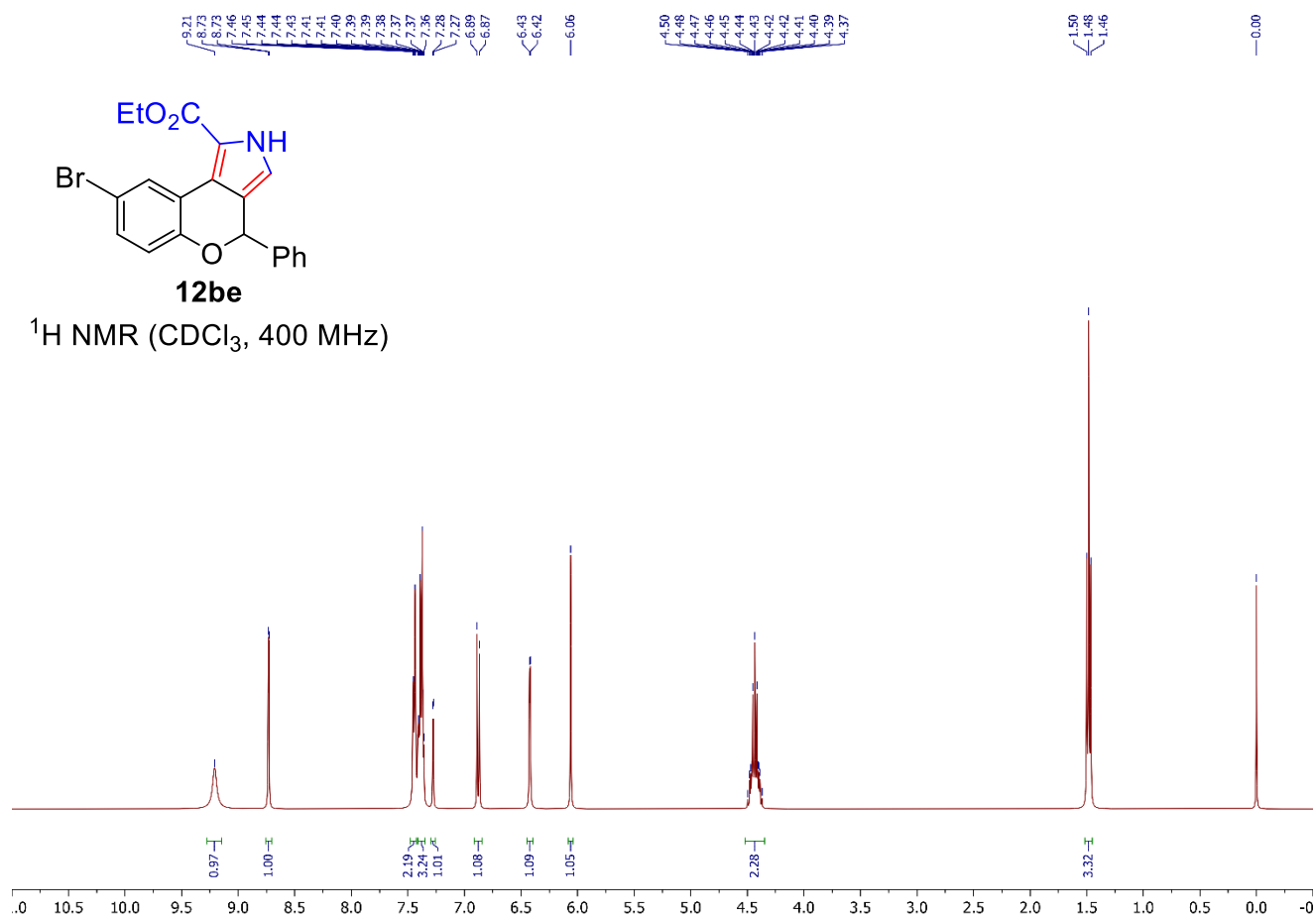
Peak list (ppm): 160.60, 146.33, 143.67, 139.96, 128.28, 128.12, 127.31, 123.01, 121.37, 121.10, 120.91, 120.18, 117.15, 117.03, 114.47, 75.41, 65.14, 60.68, 14.90, 14.43.





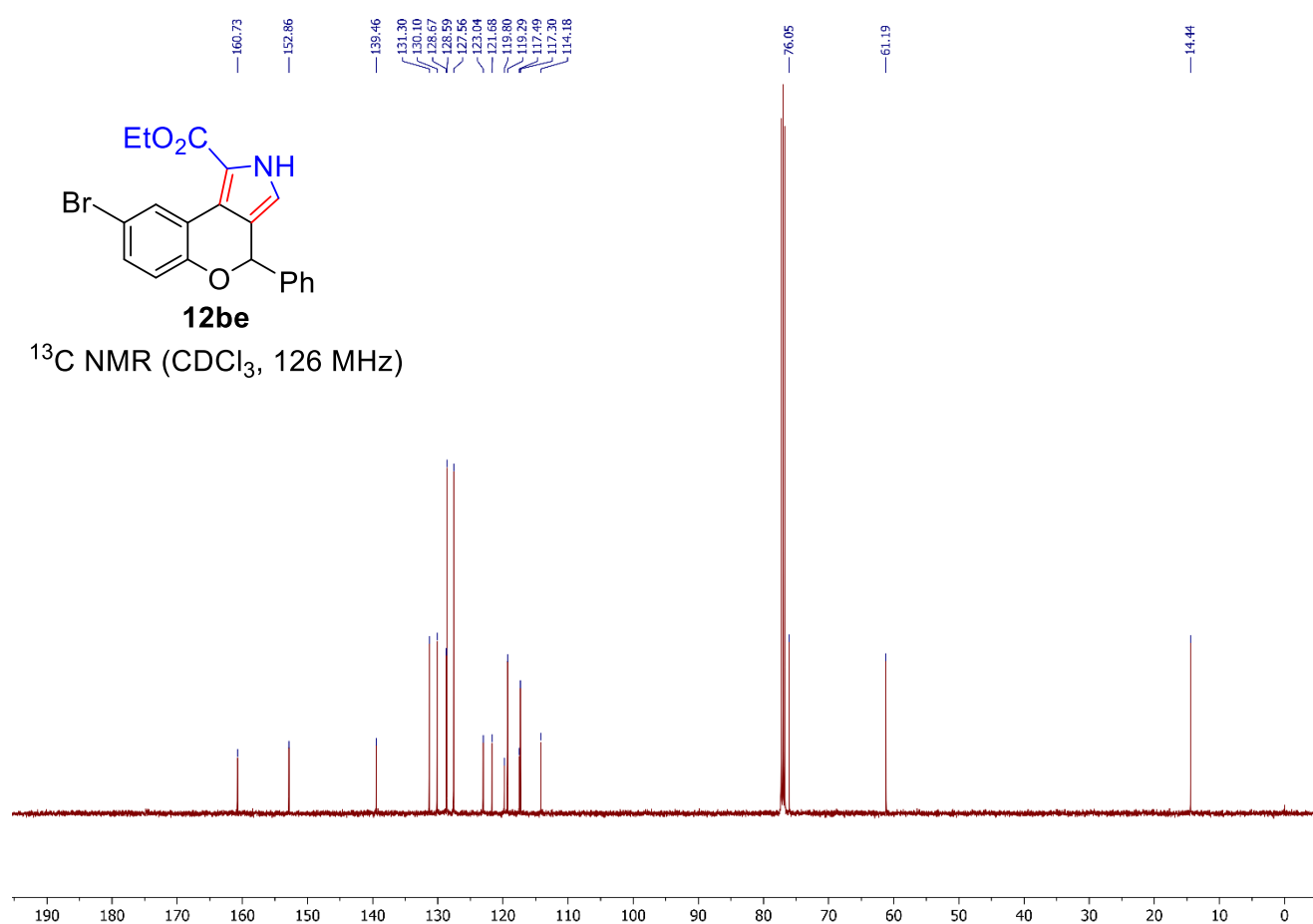
**12be**

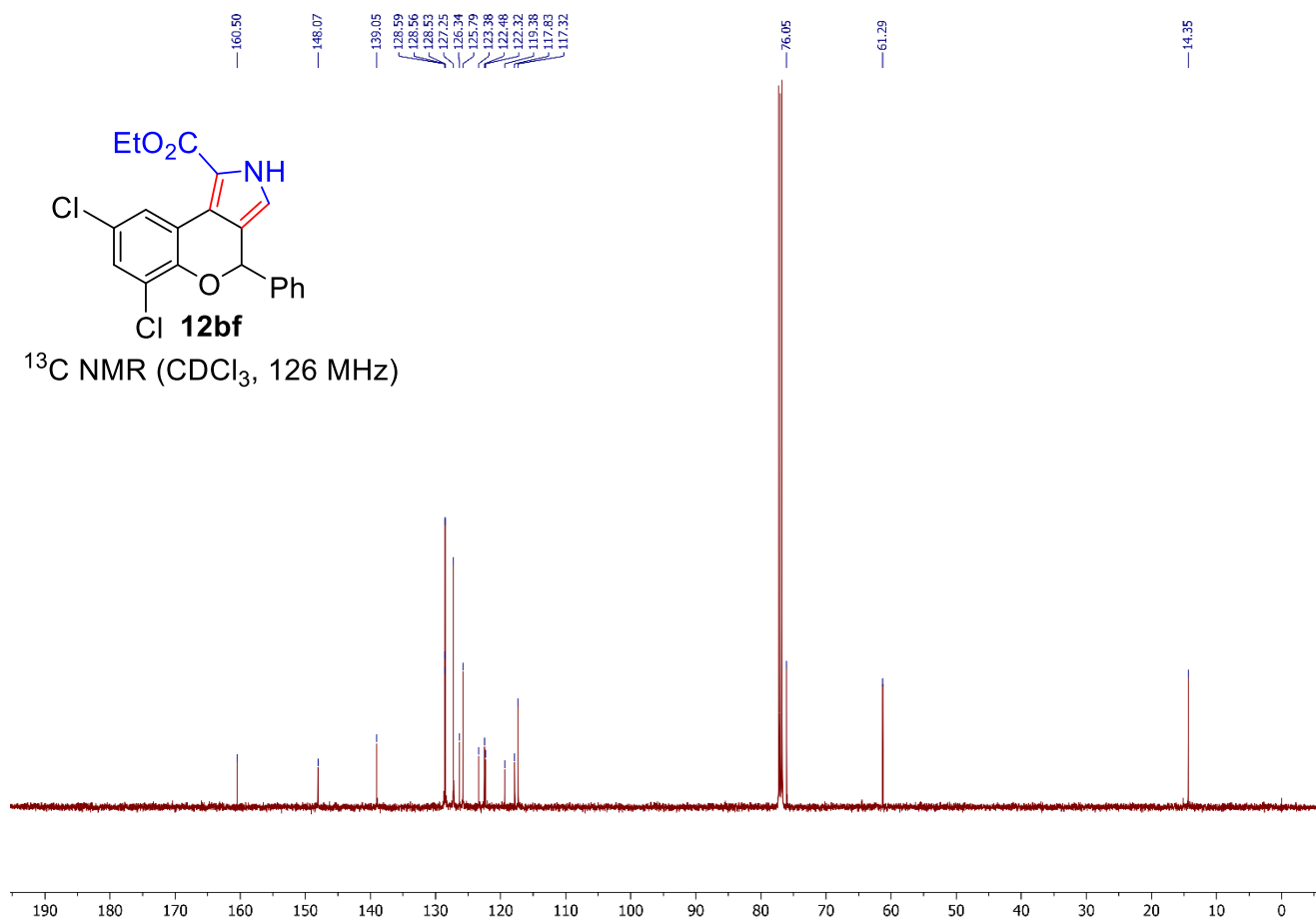
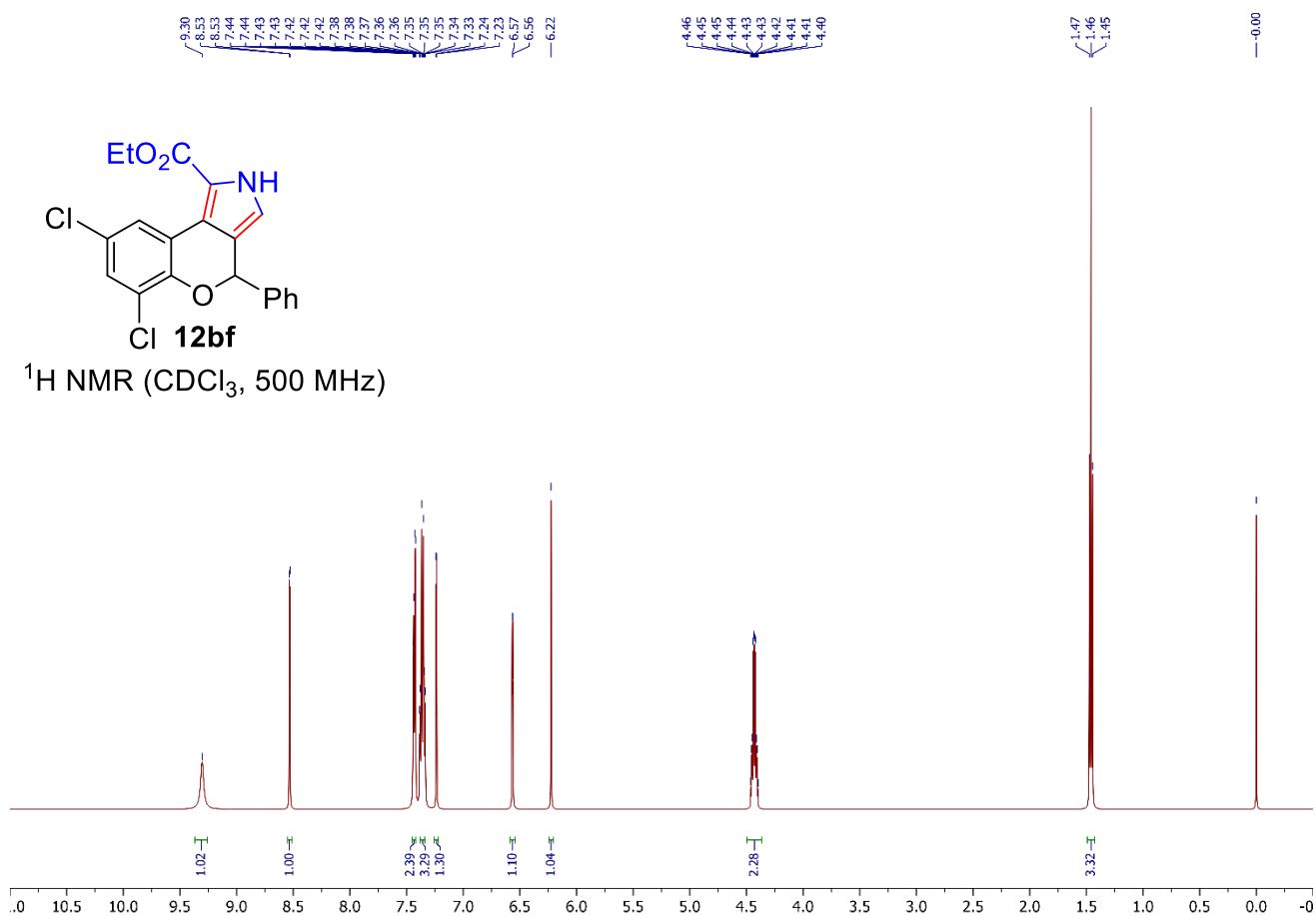
$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)

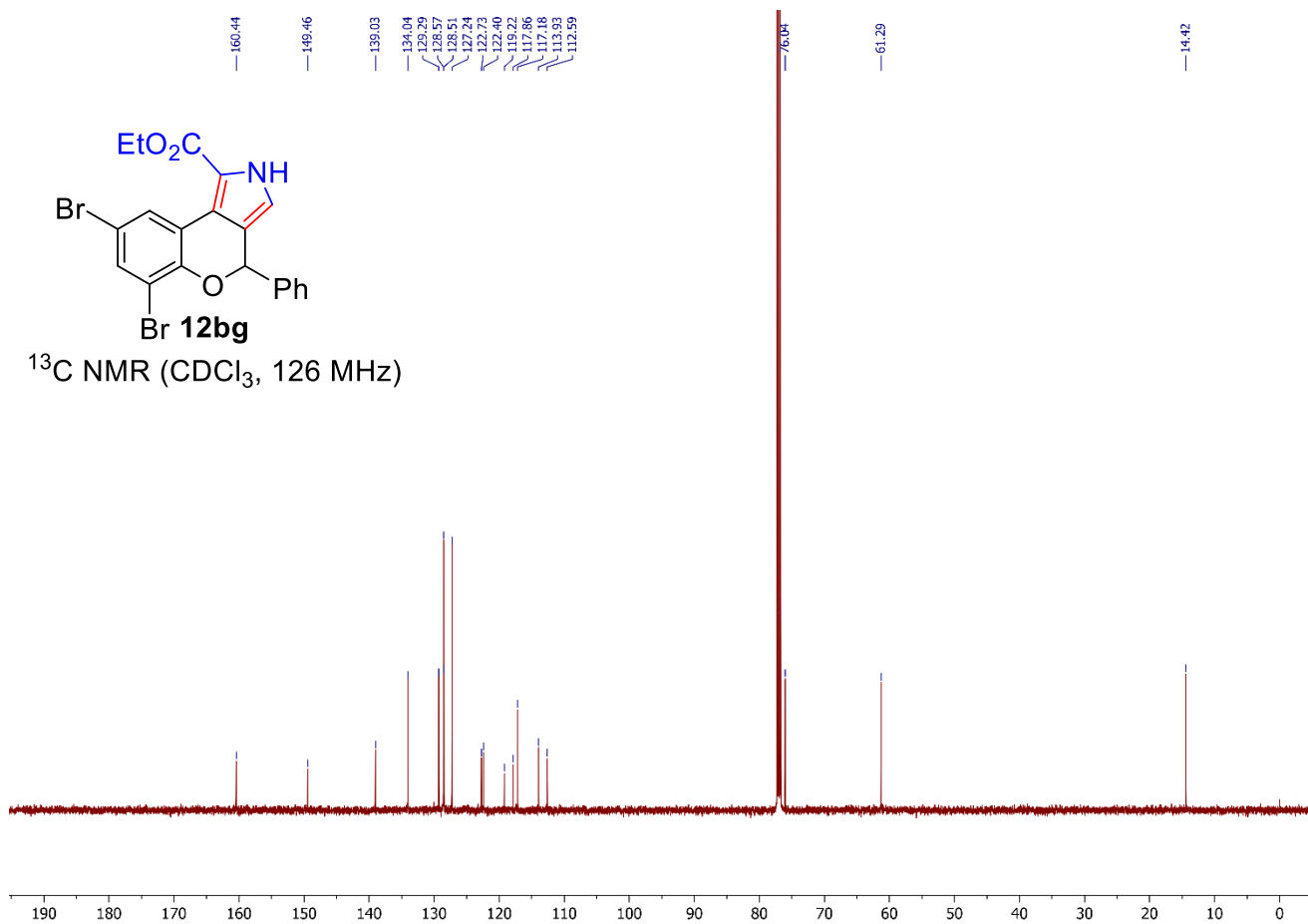
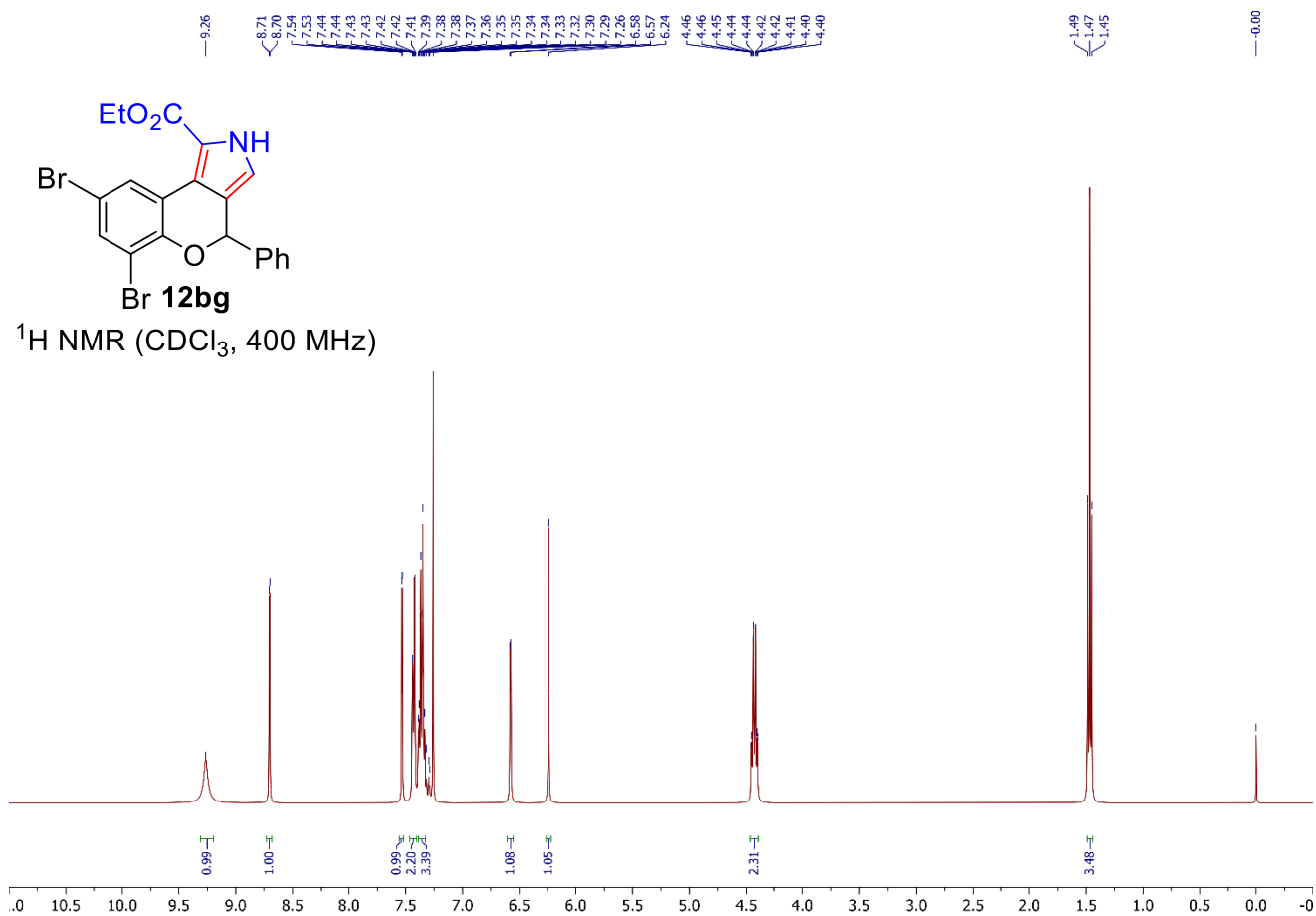


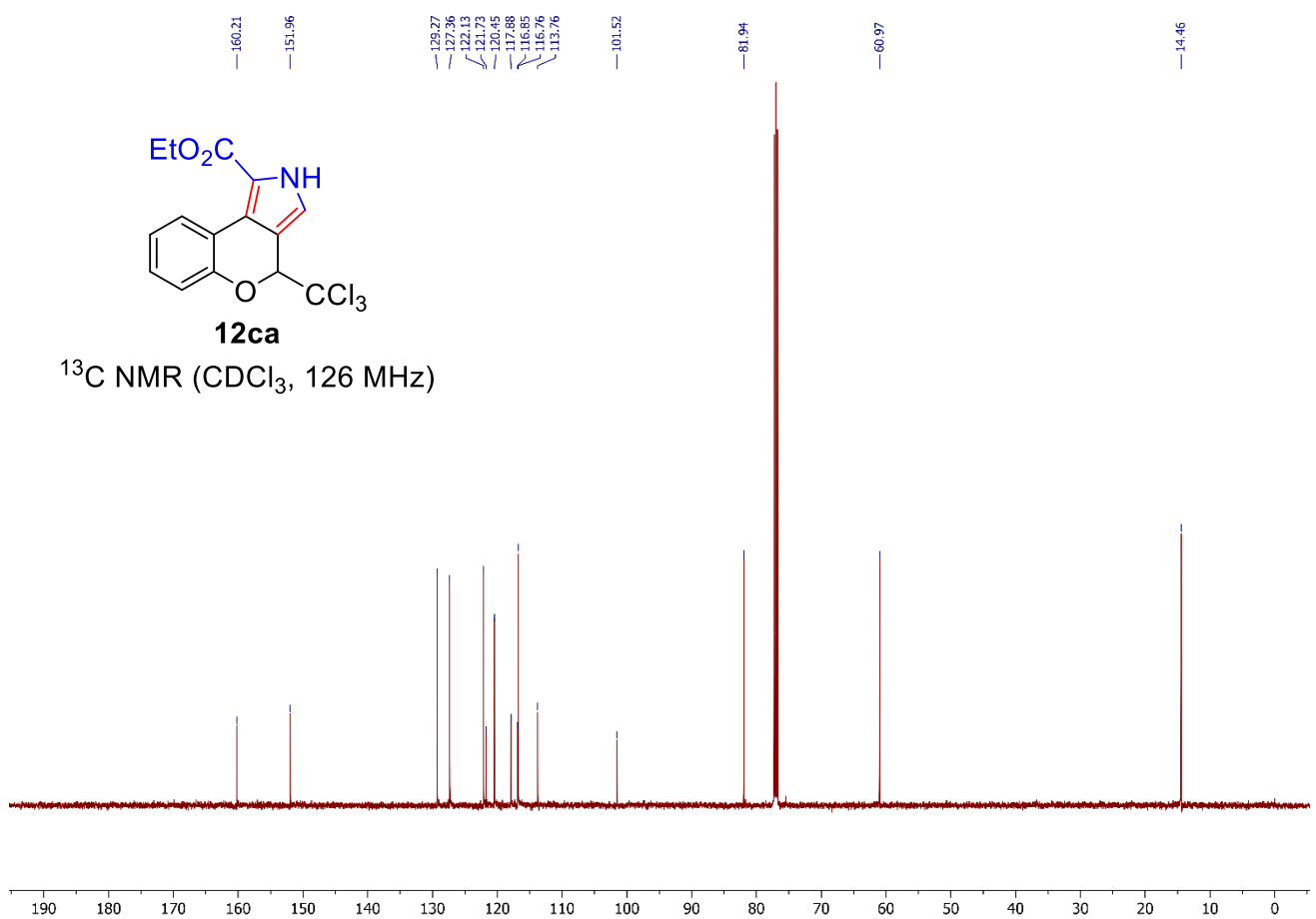
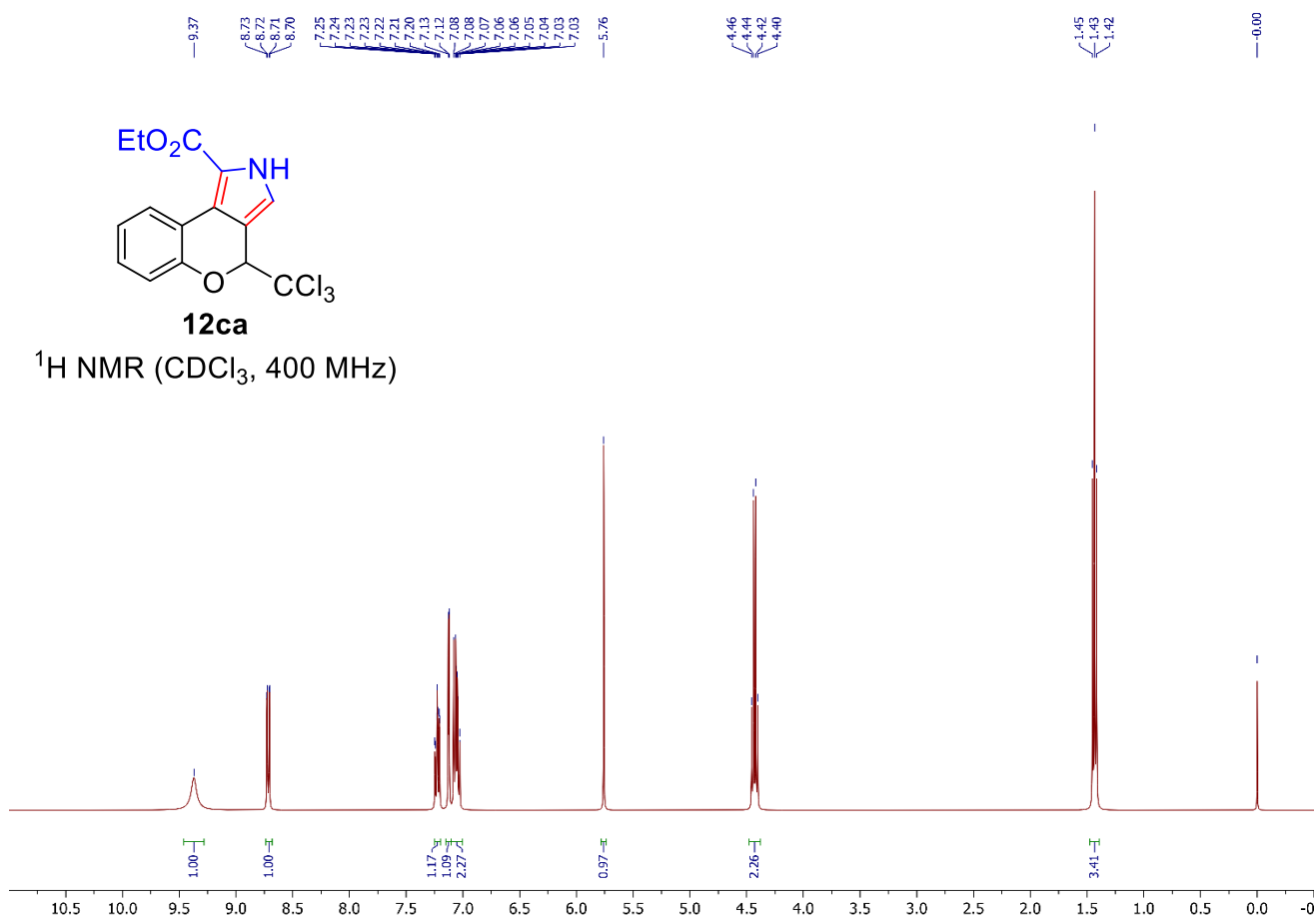
**12be**

$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

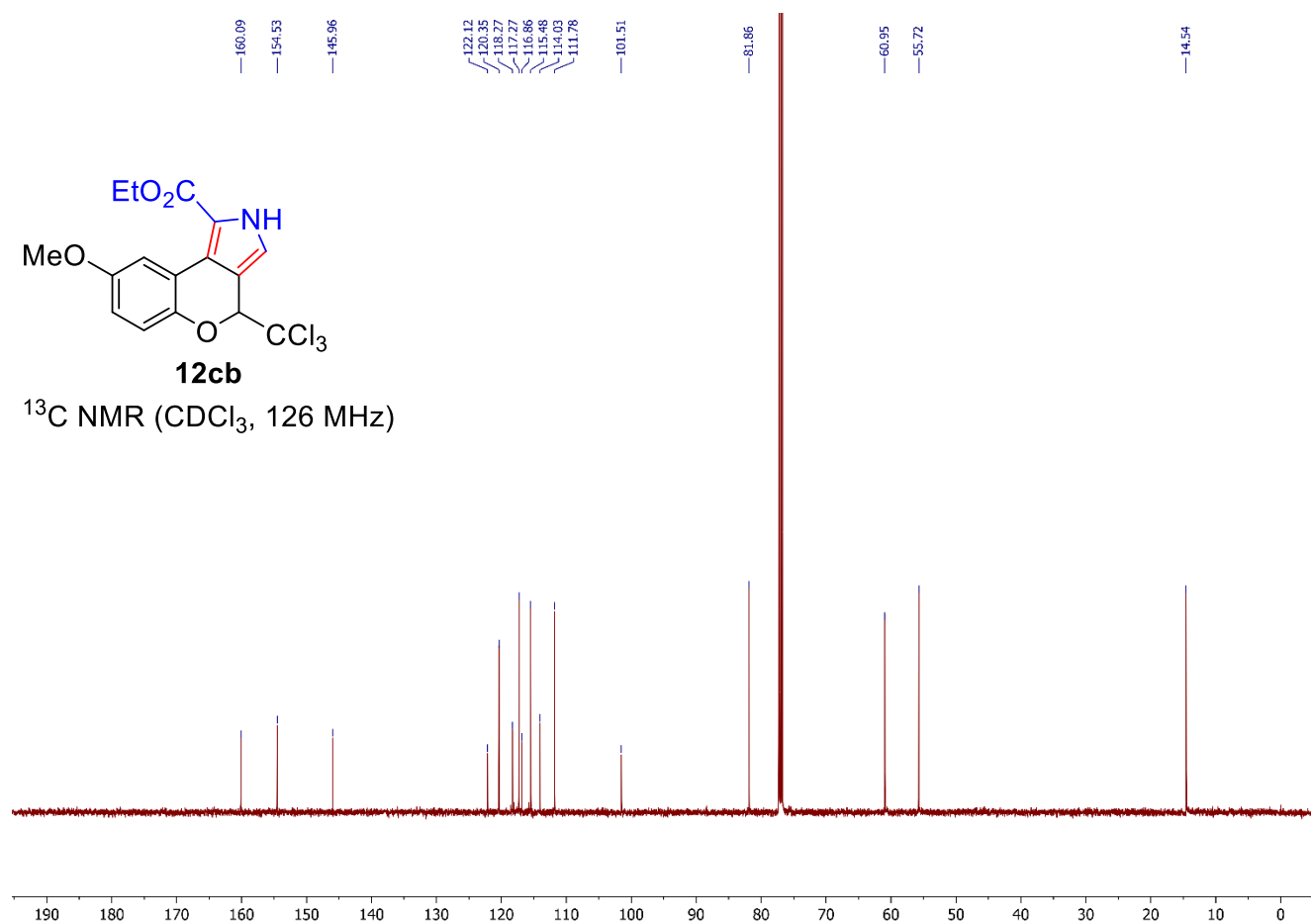
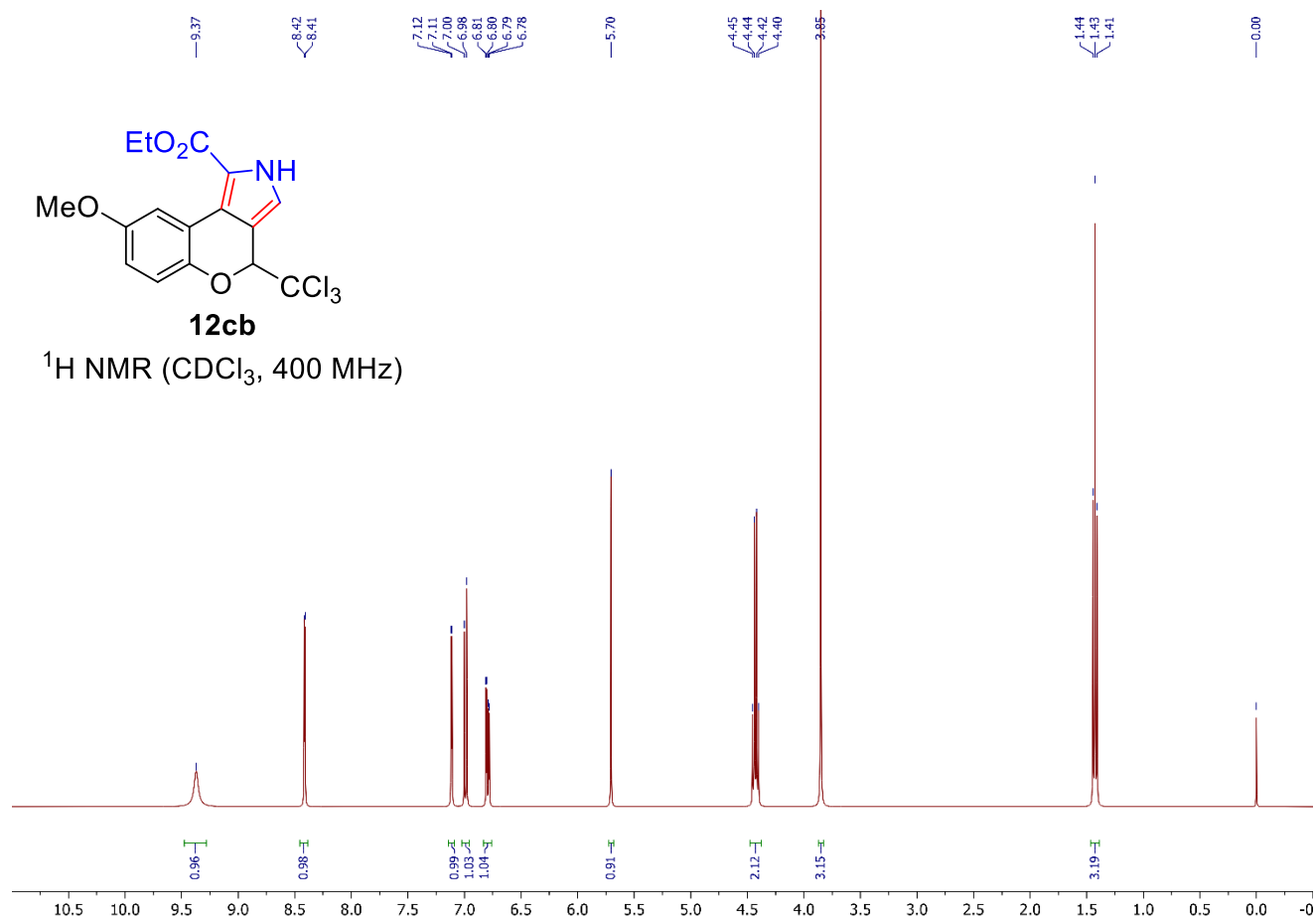


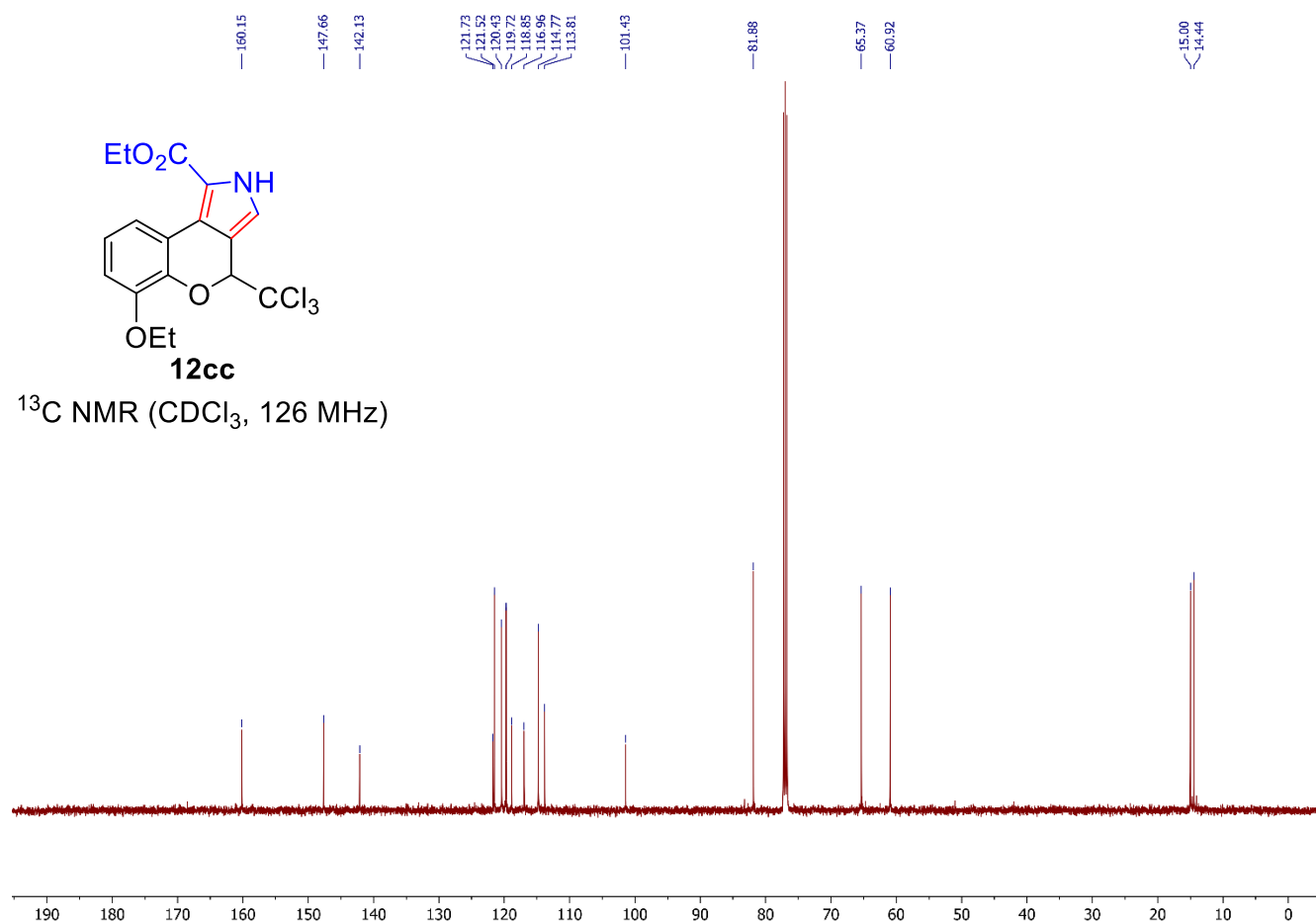
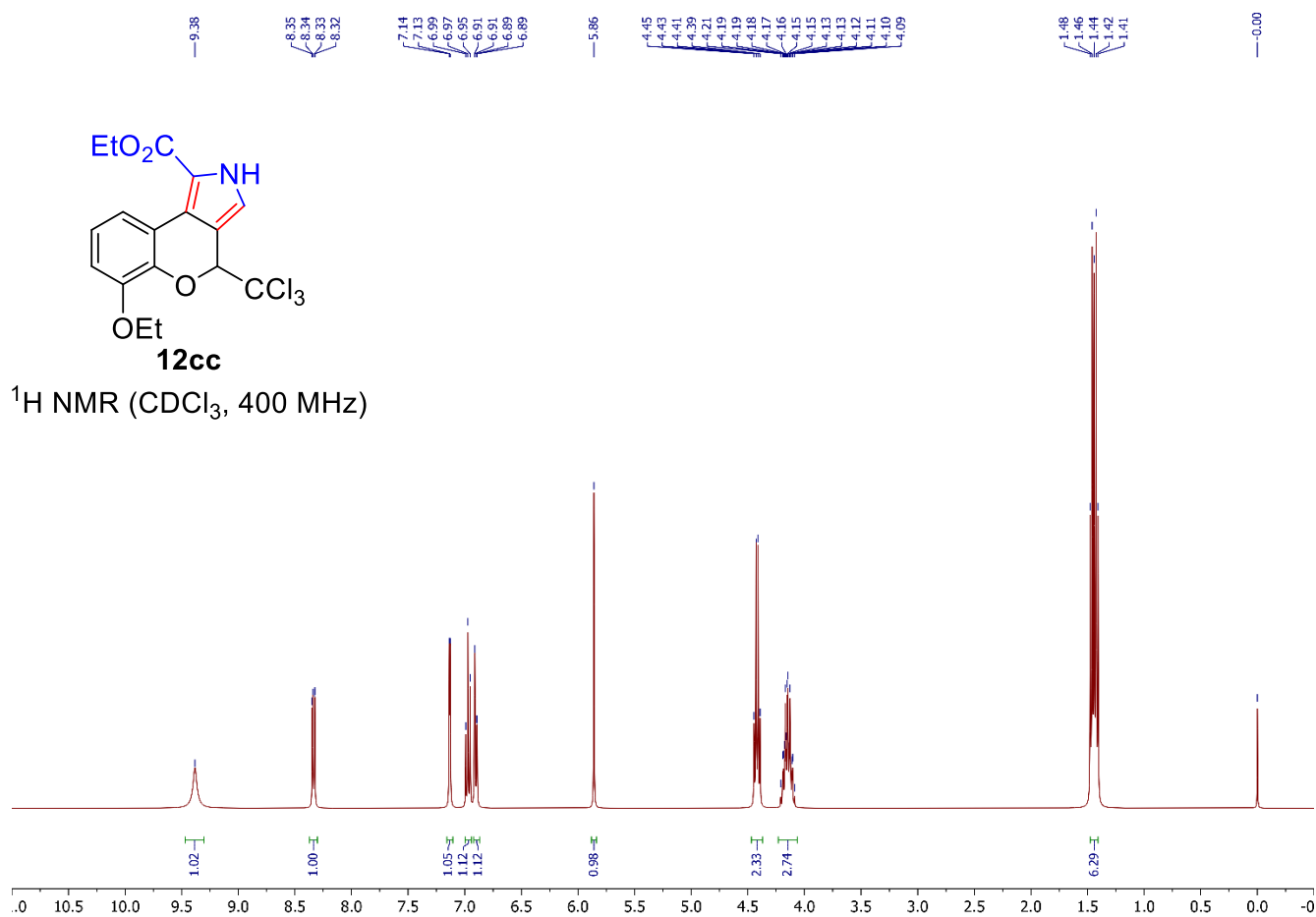


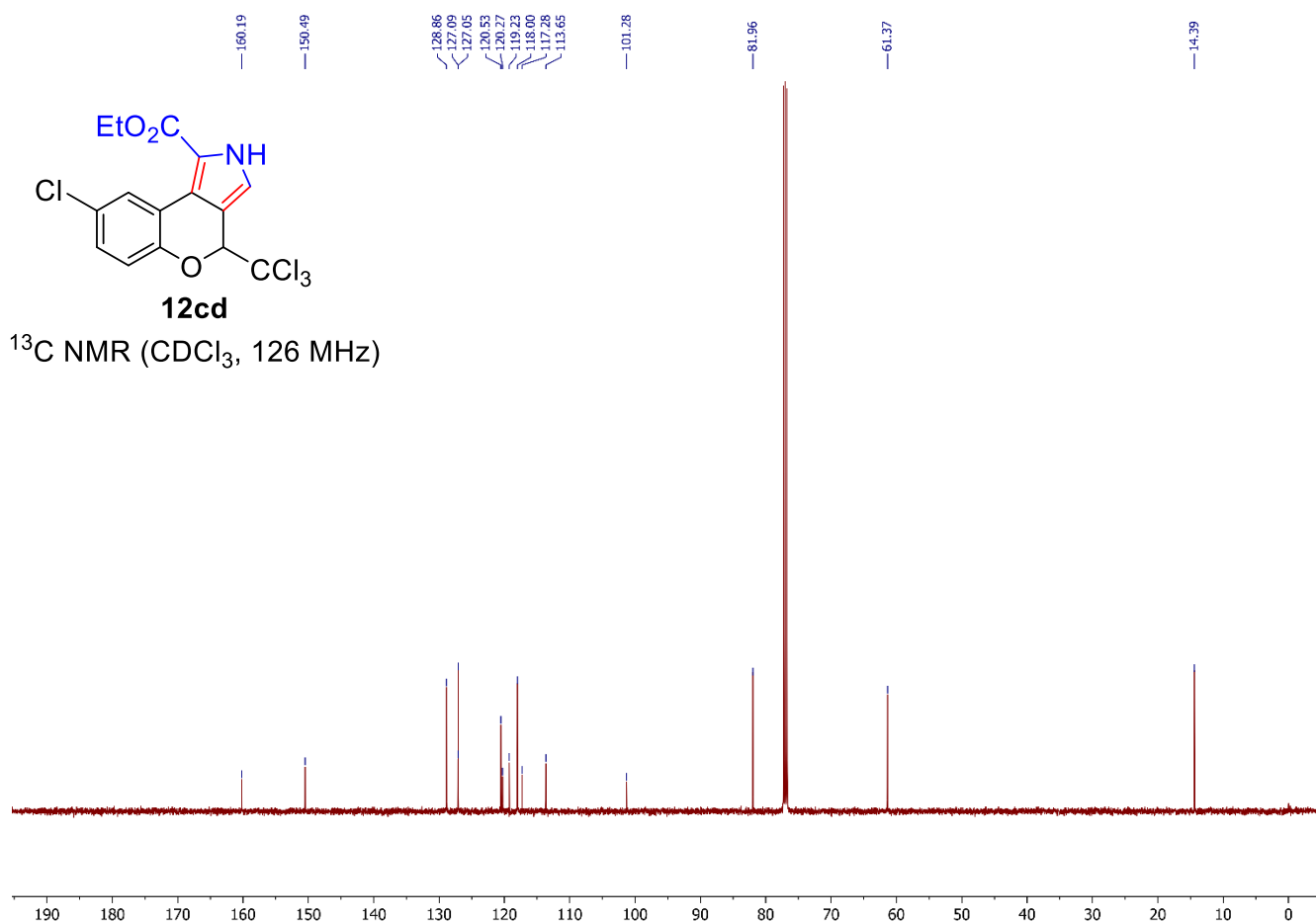
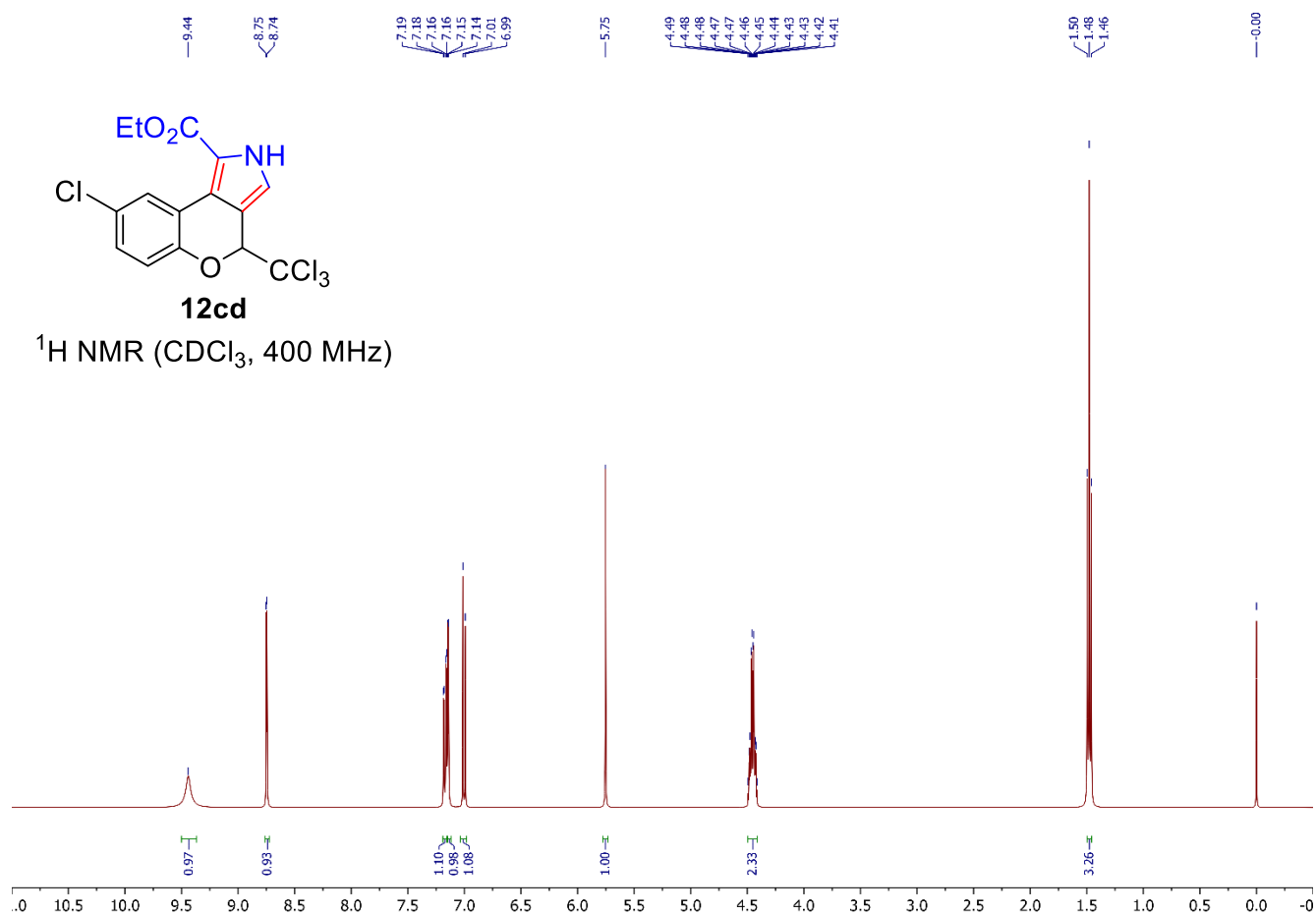


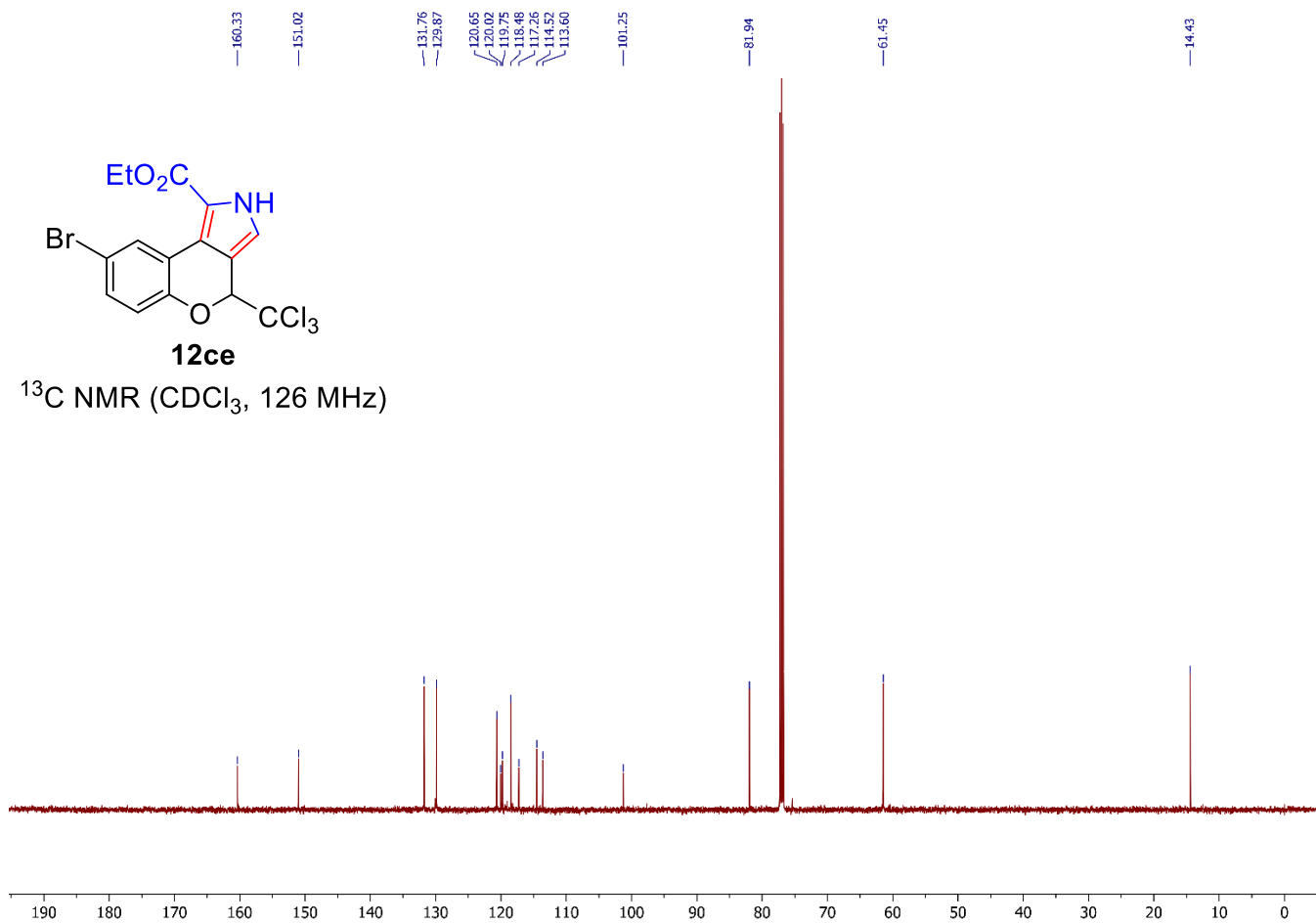
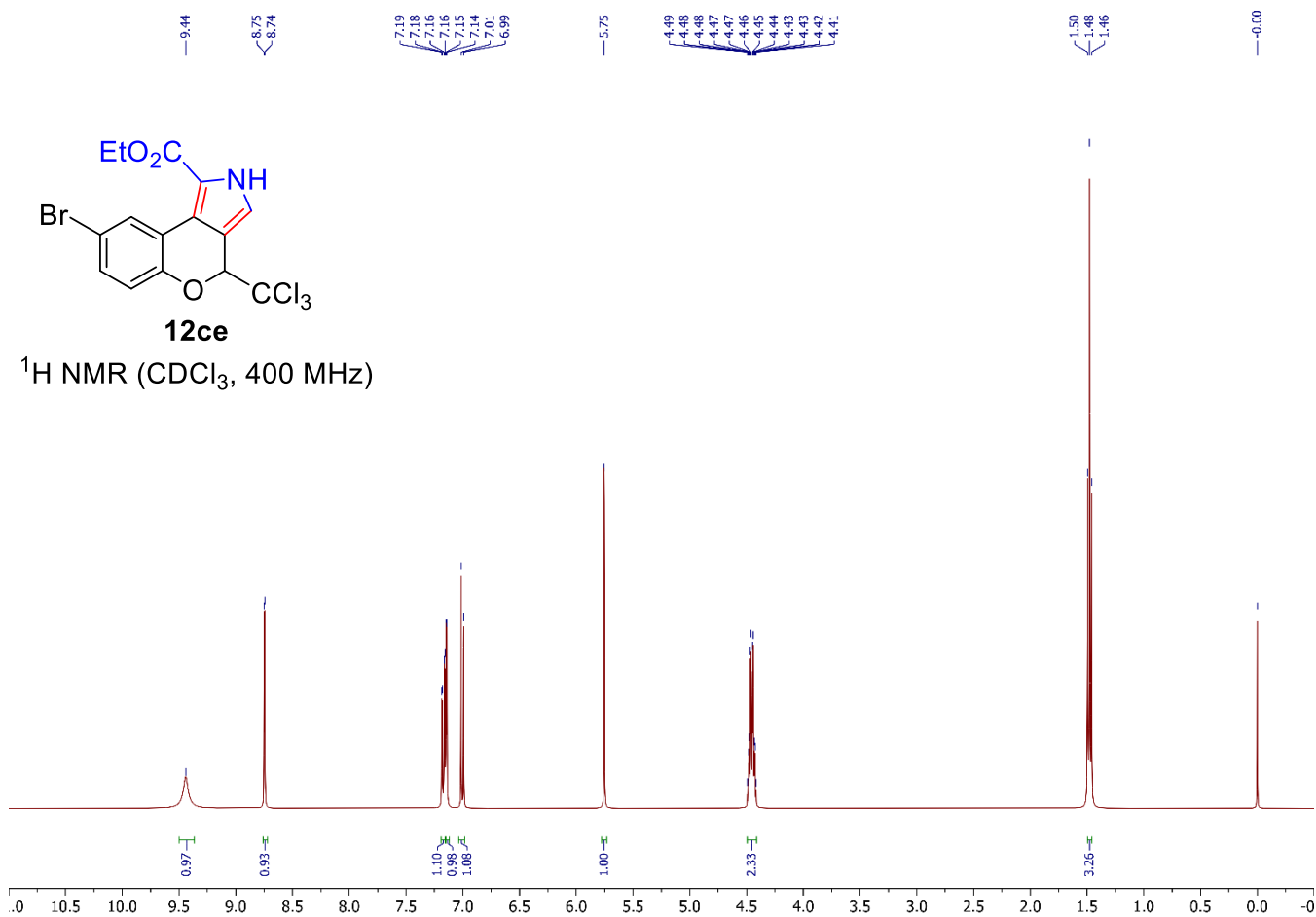


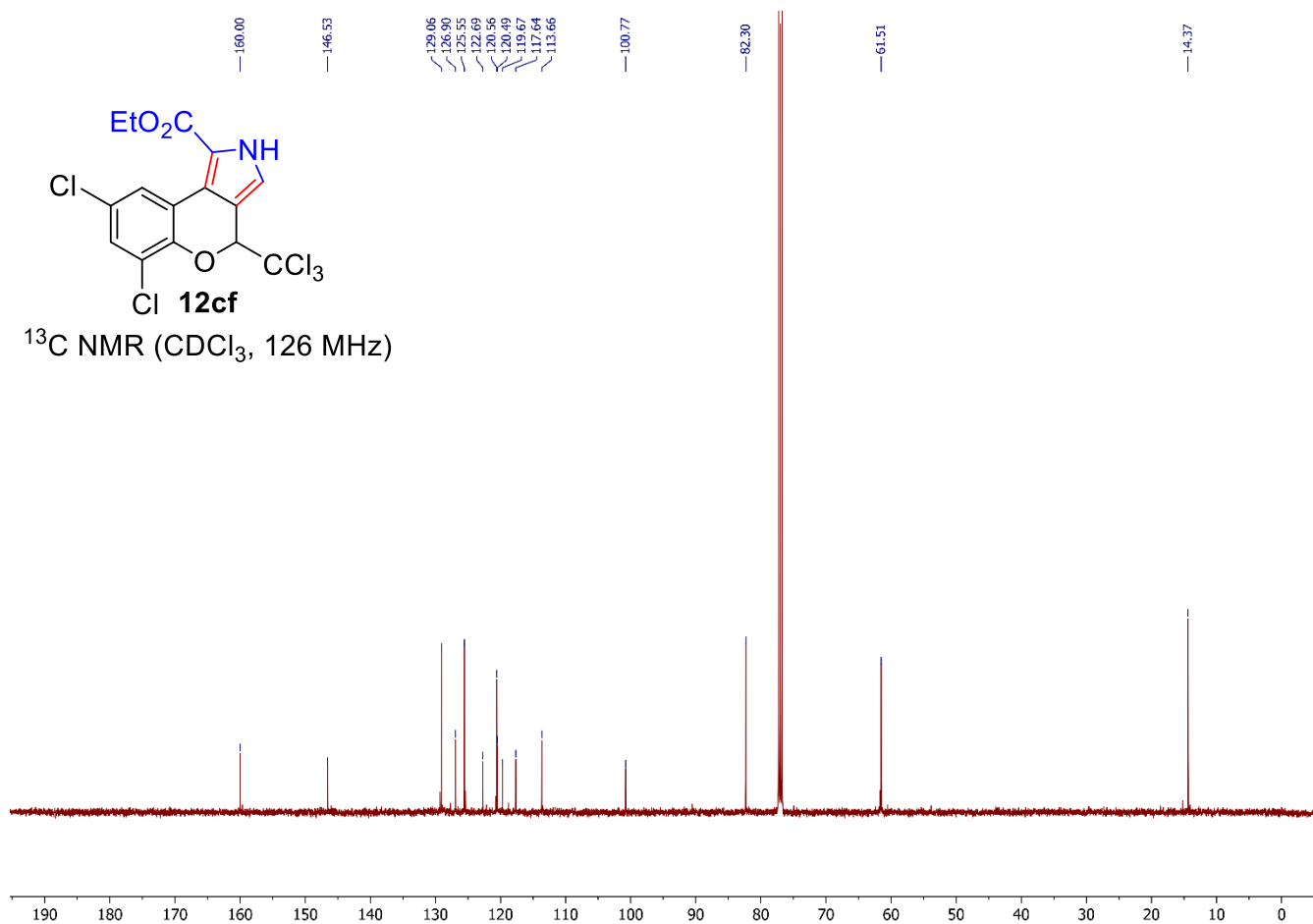
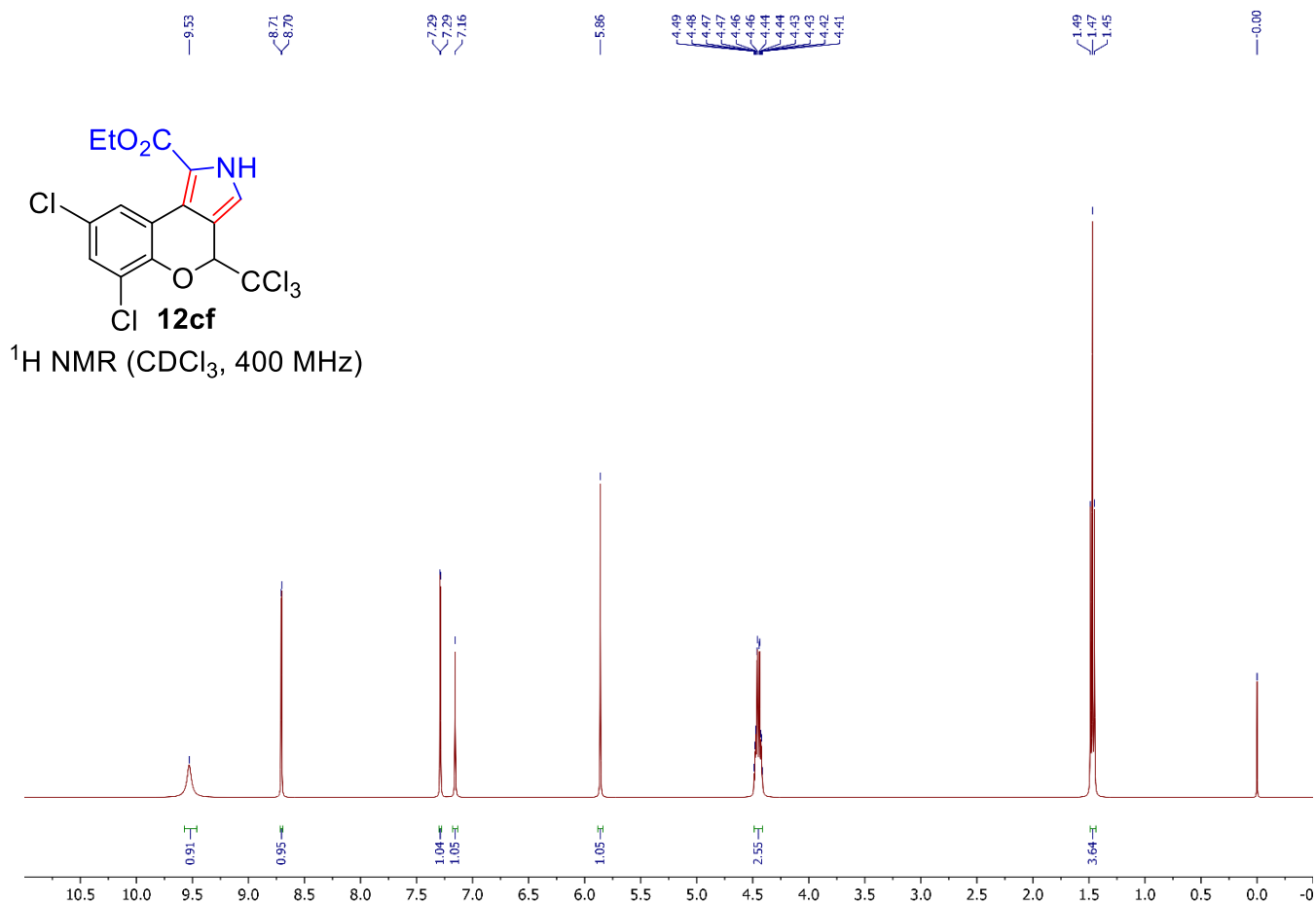


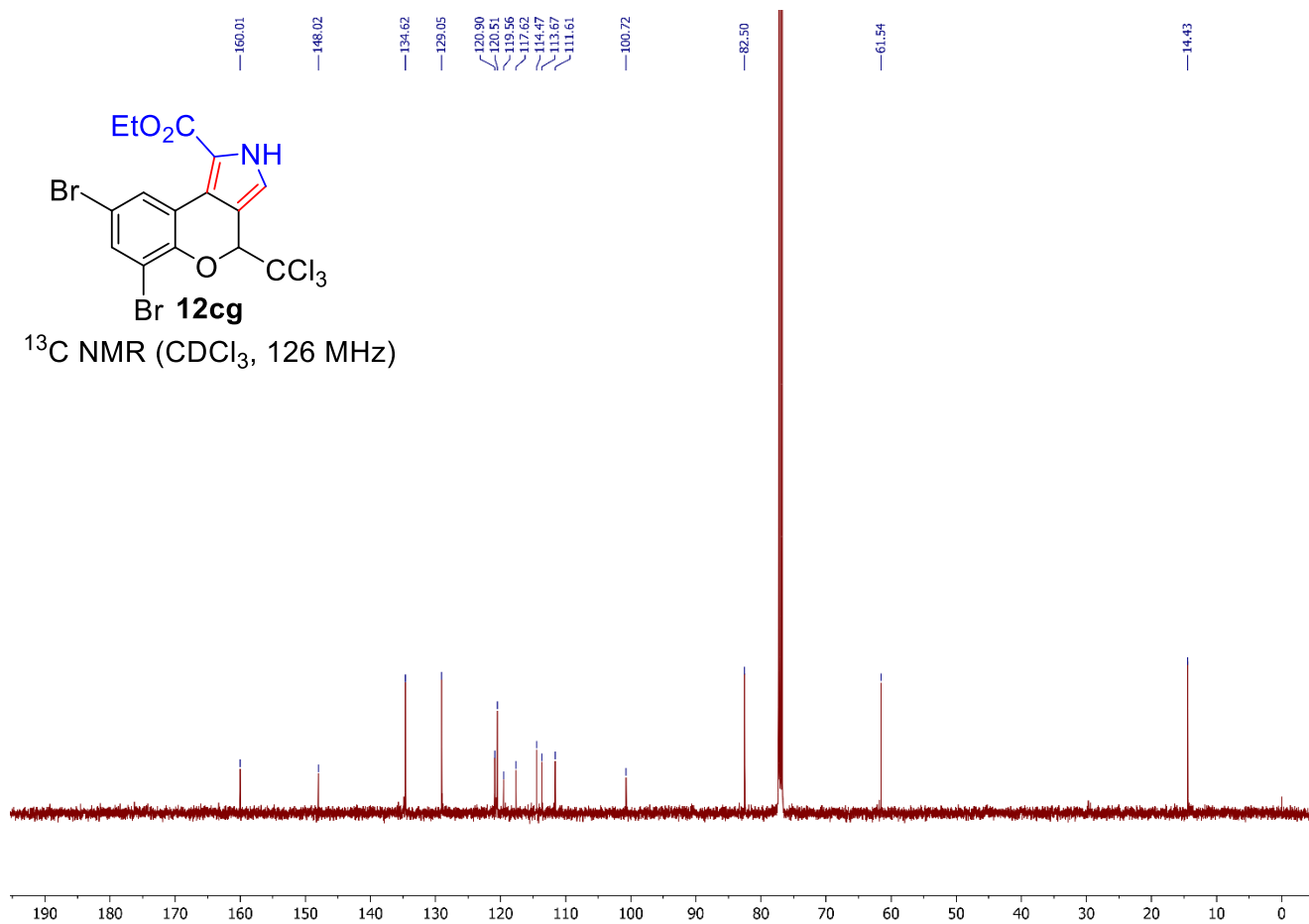
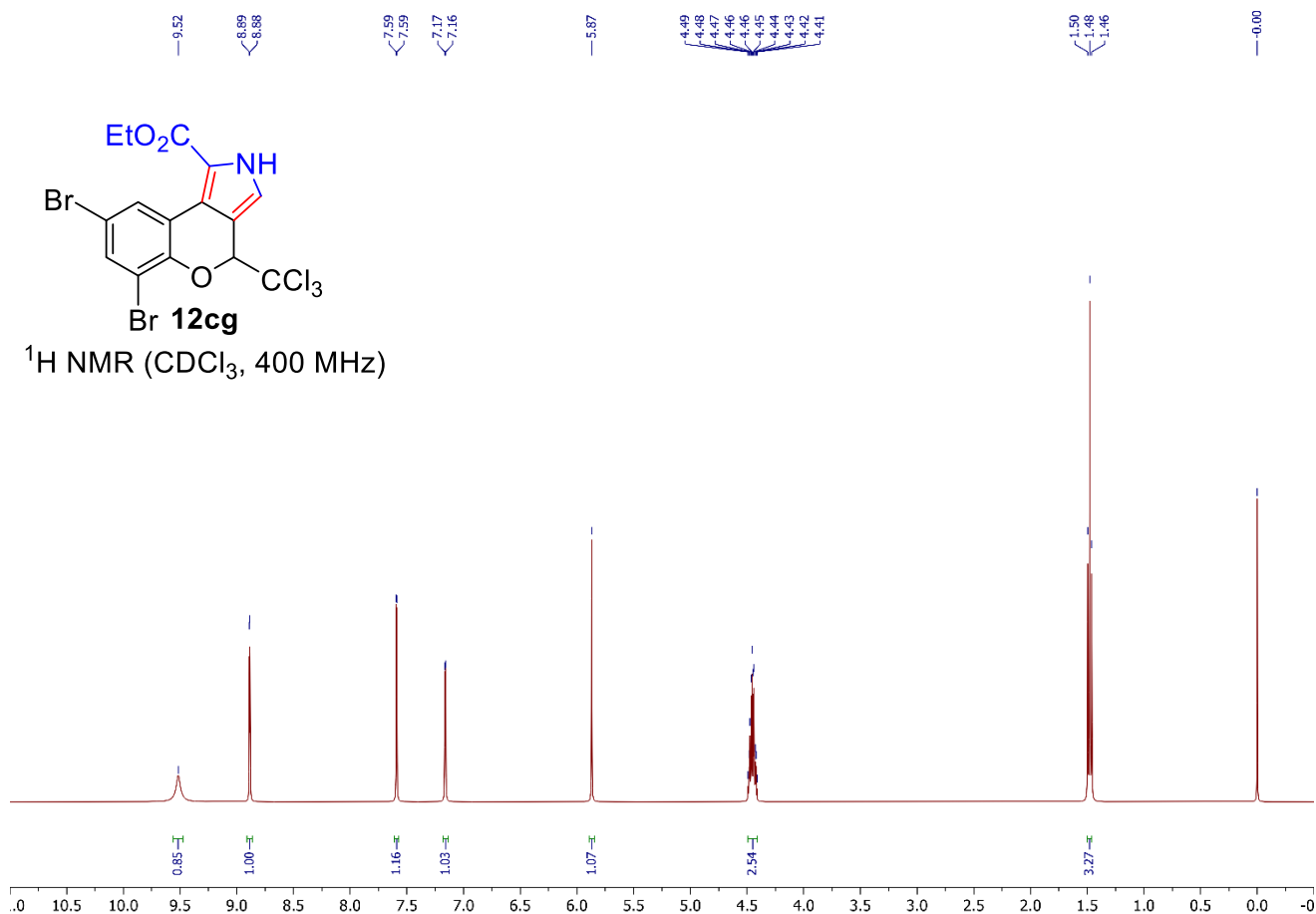


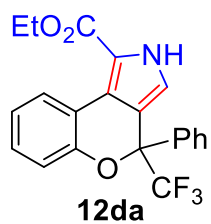




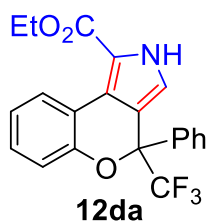
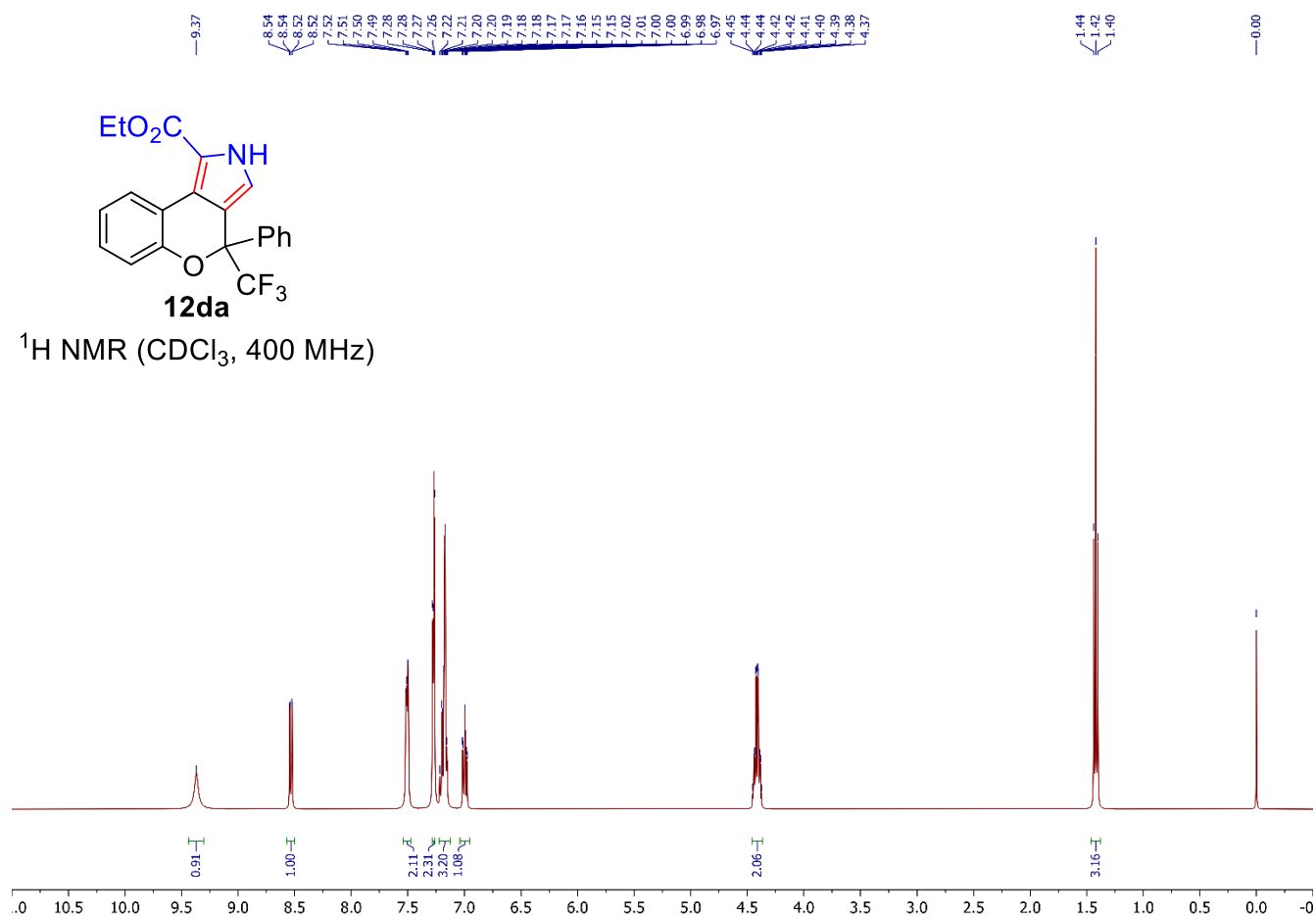




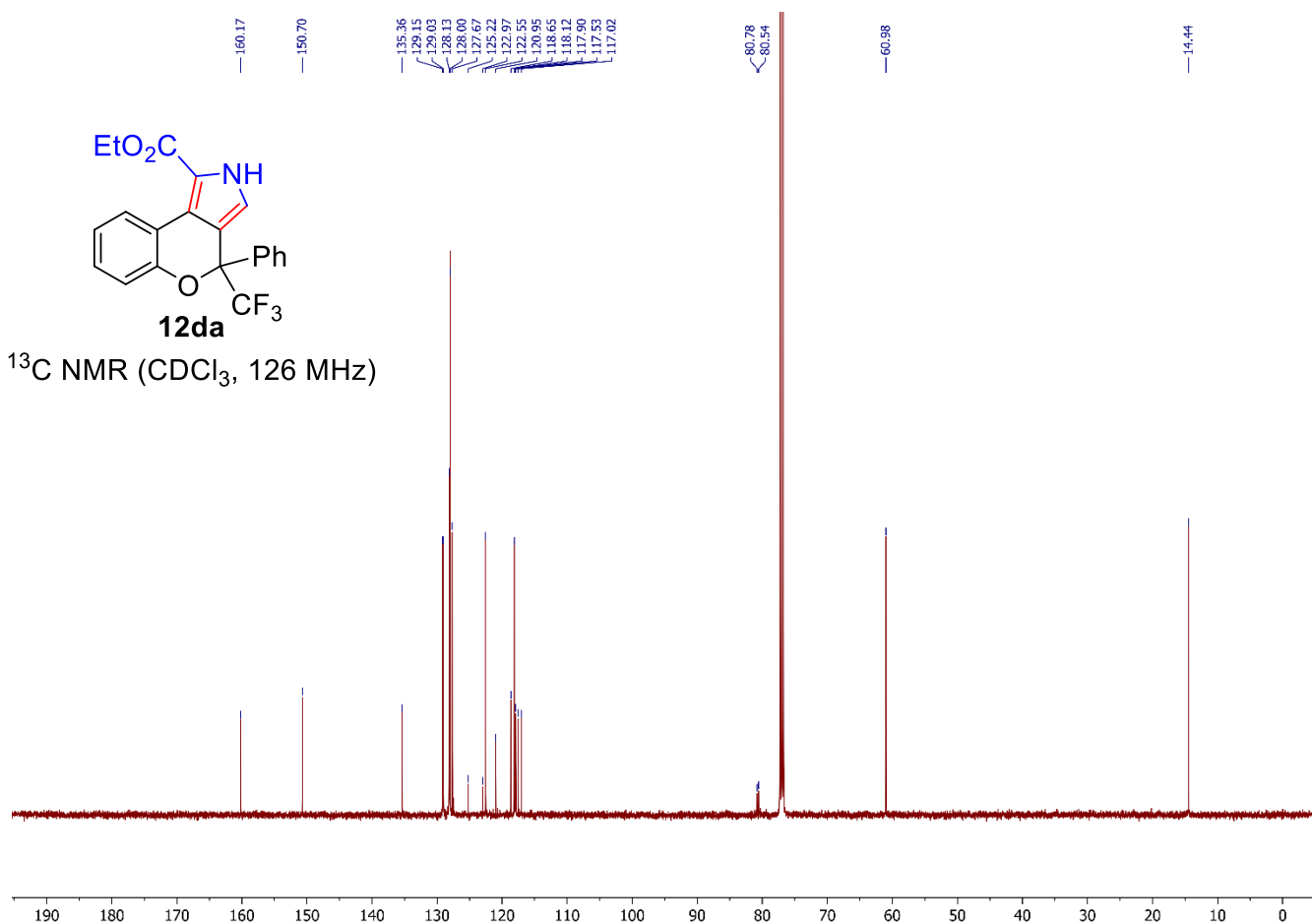


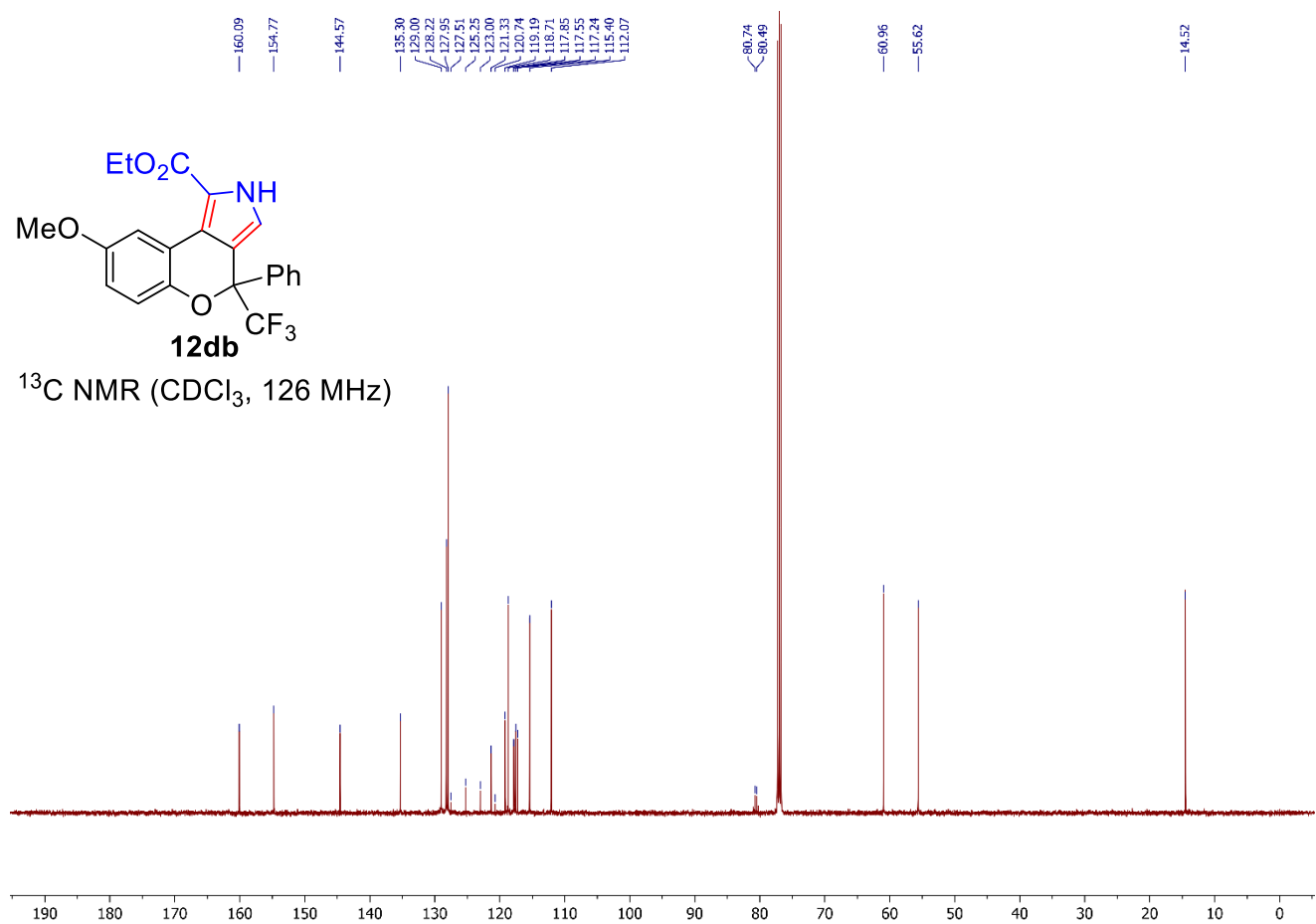
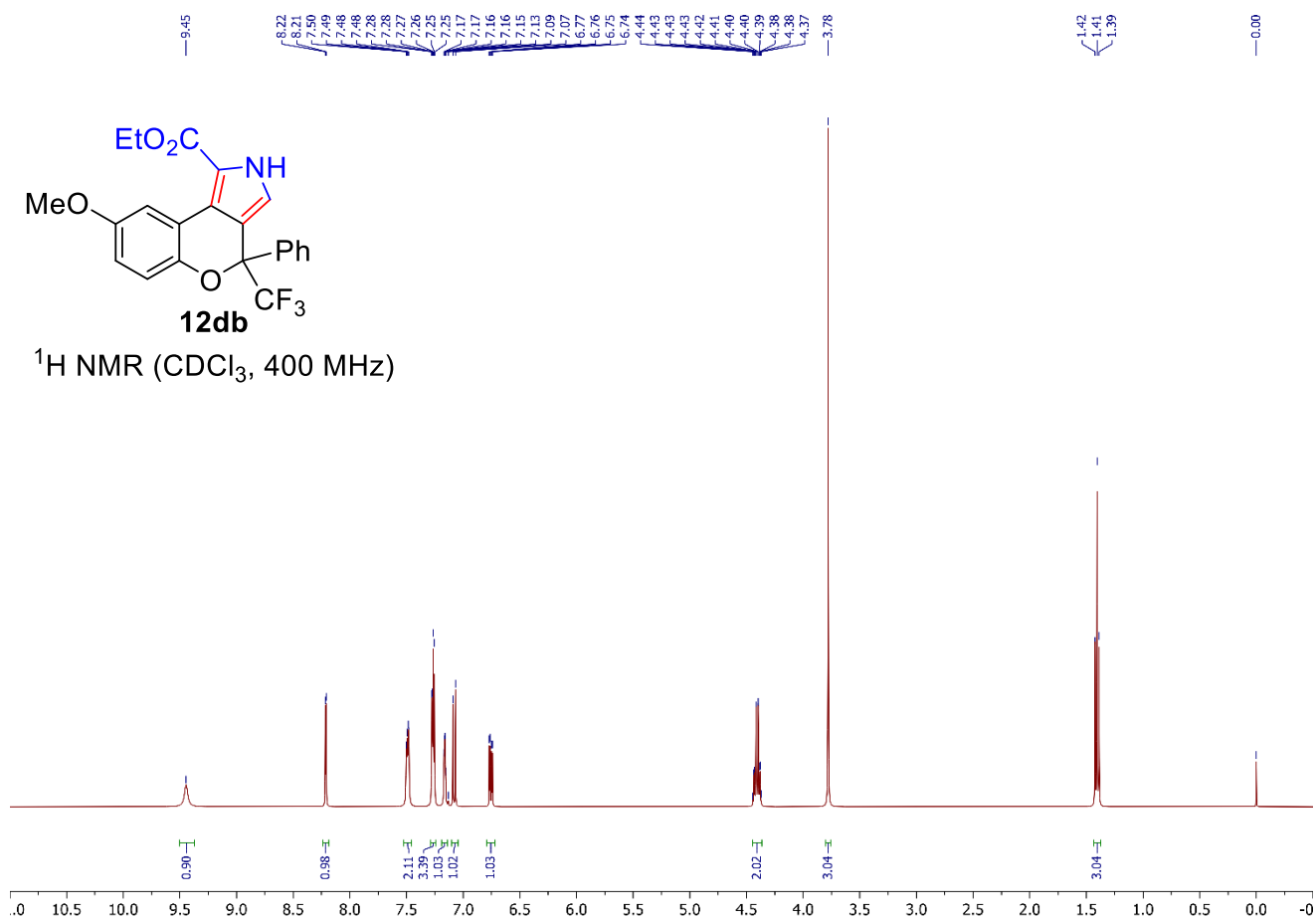


$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)

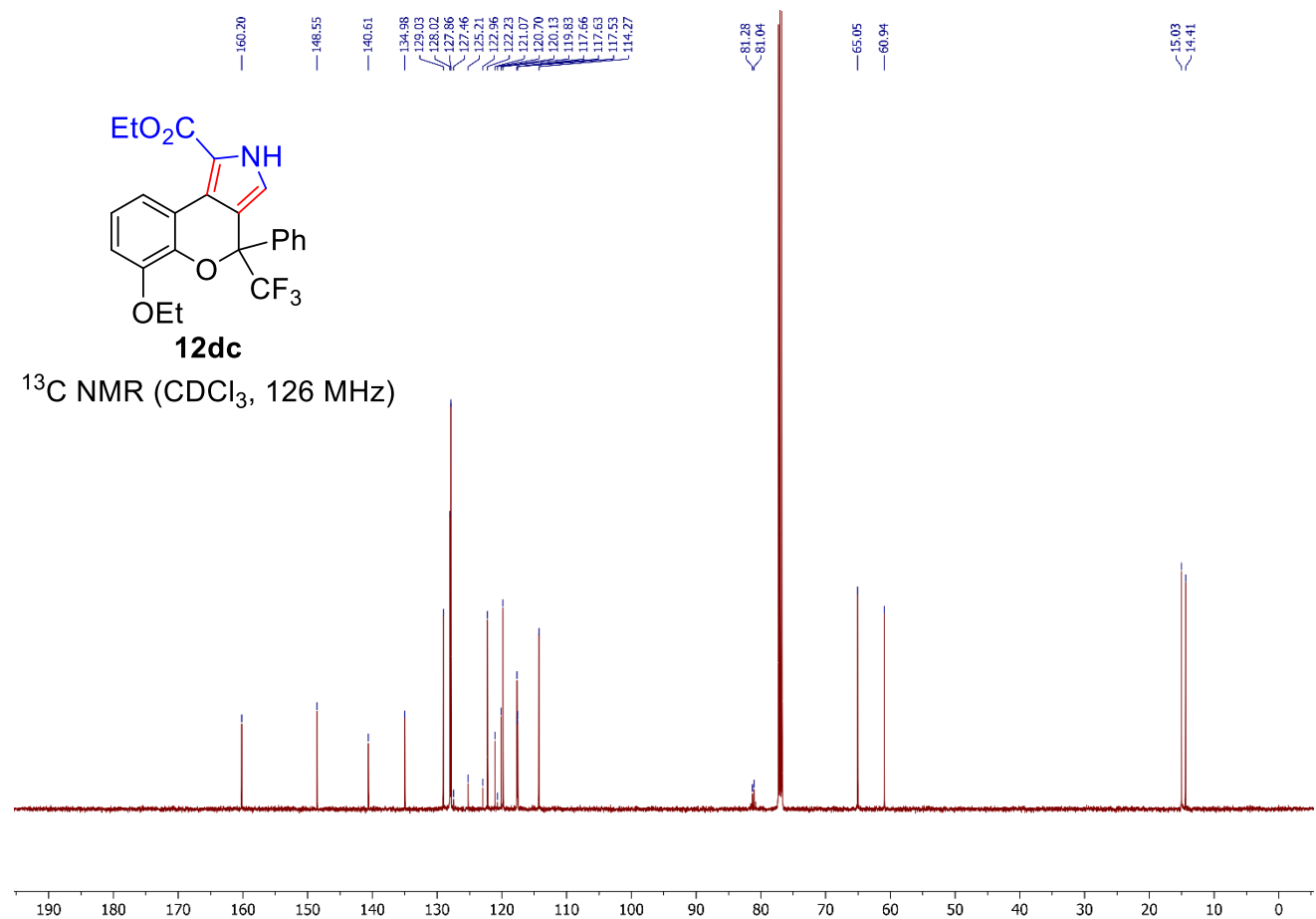
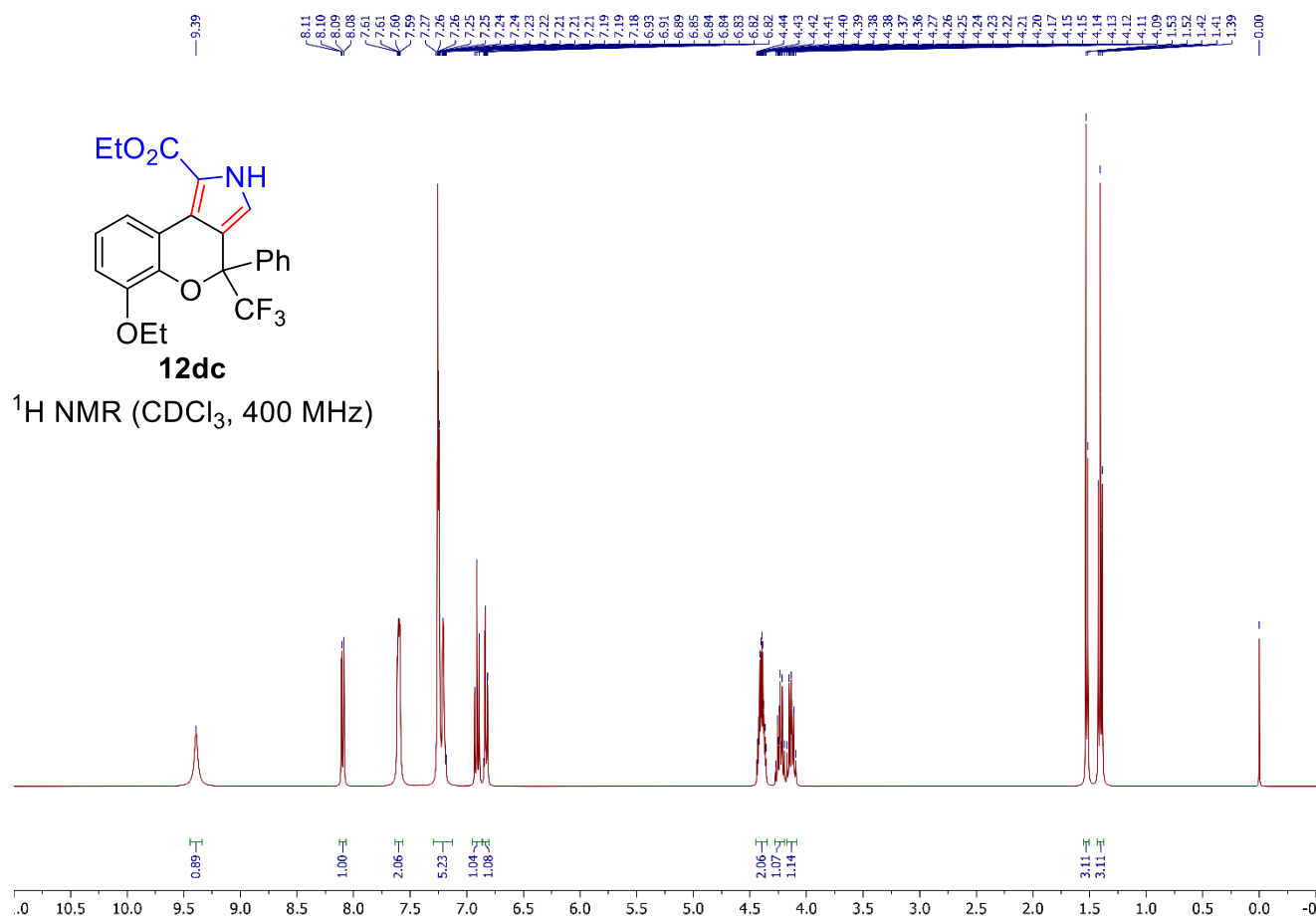


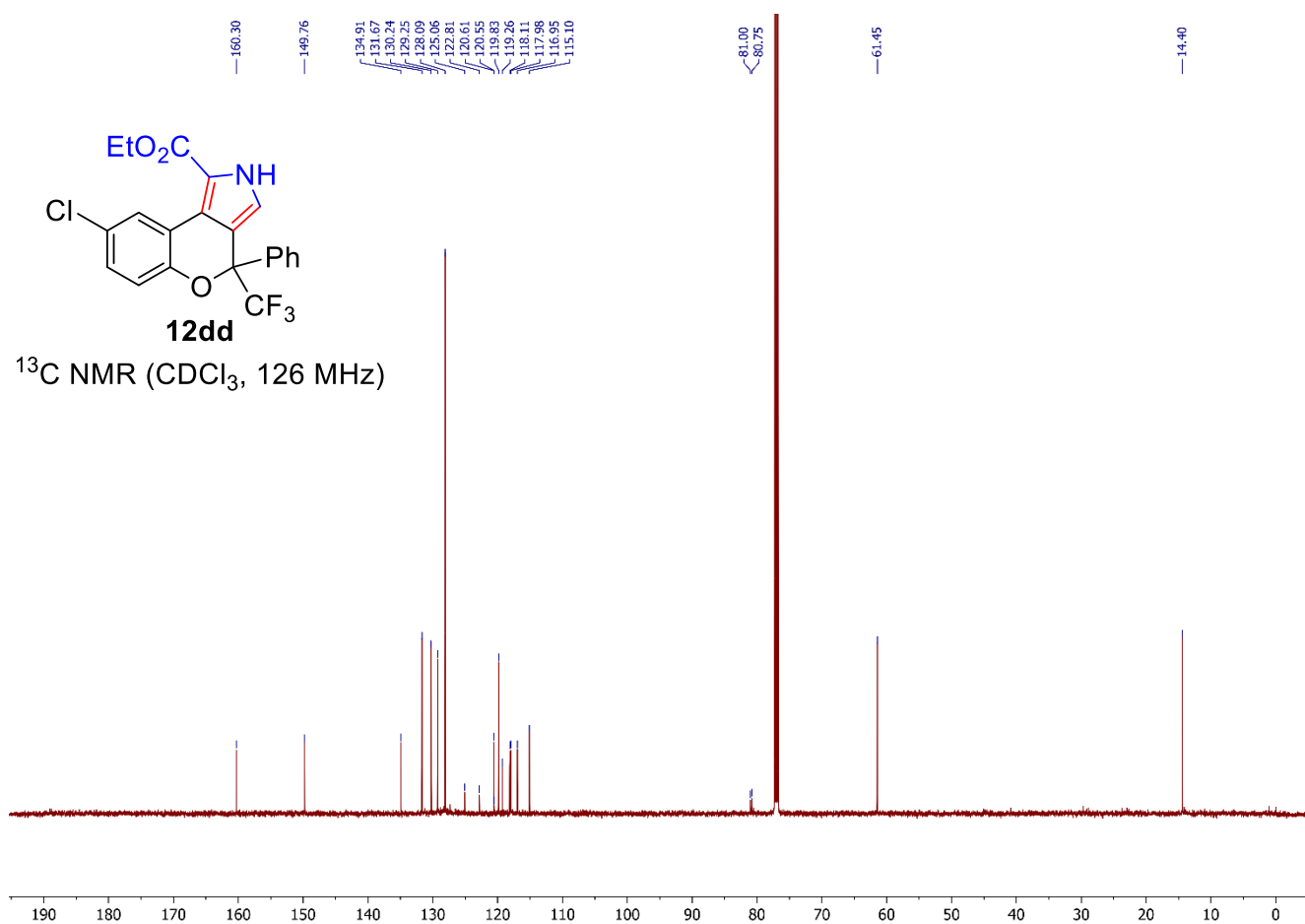
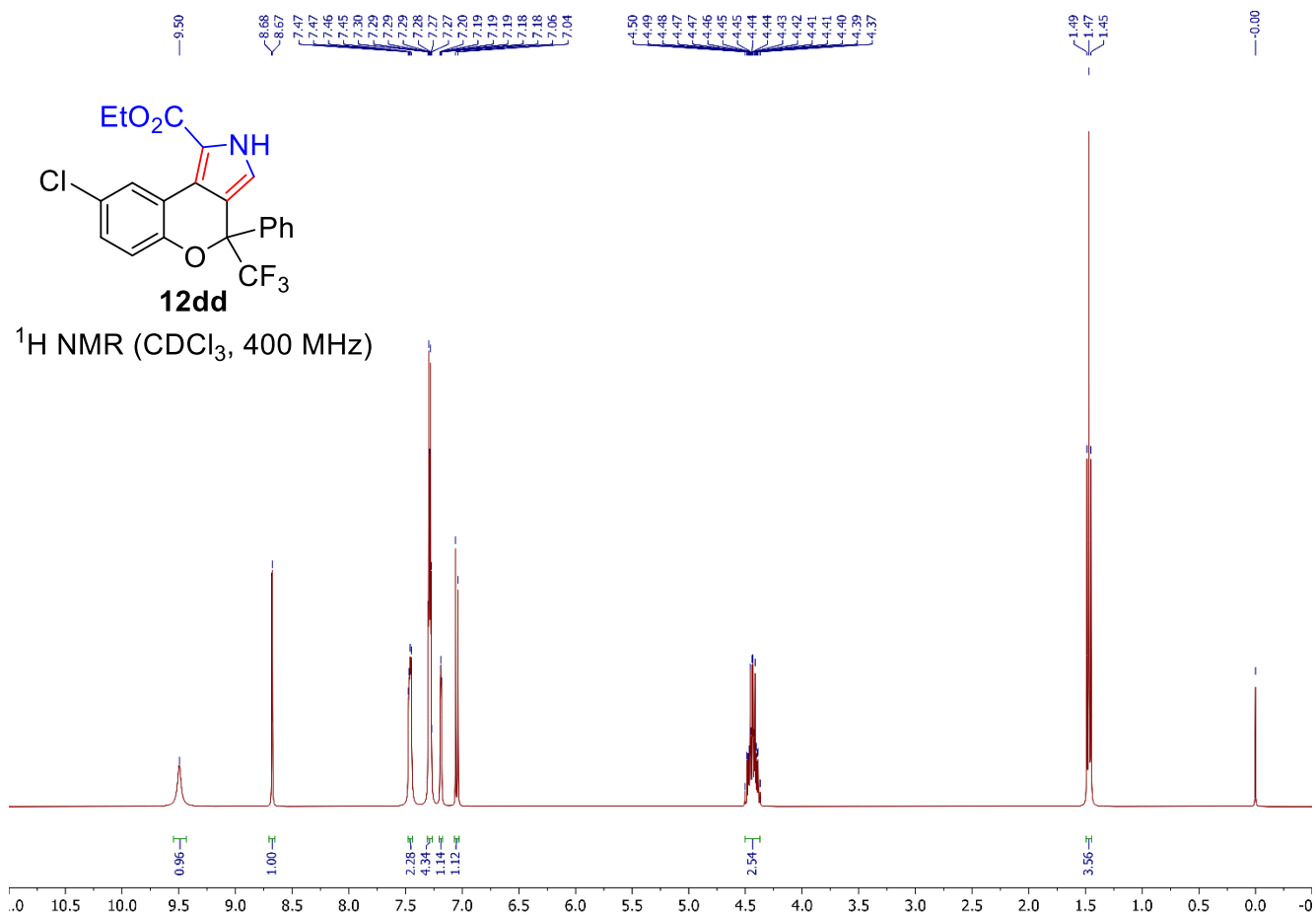
$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

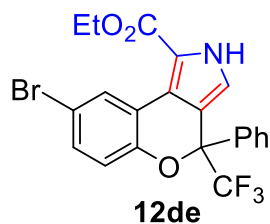




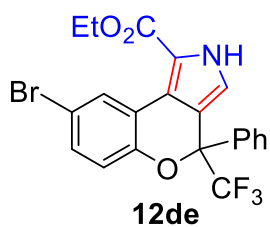
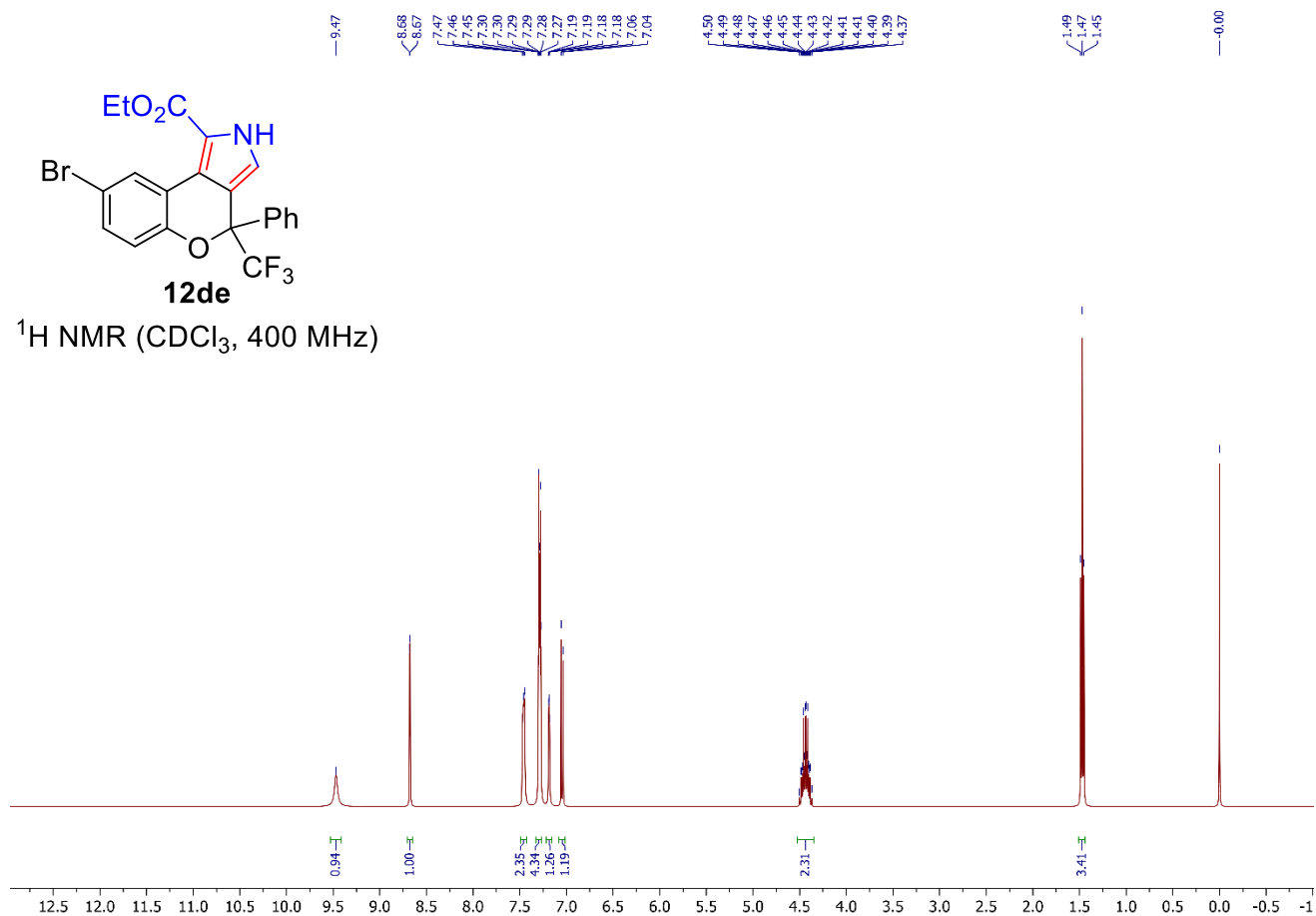




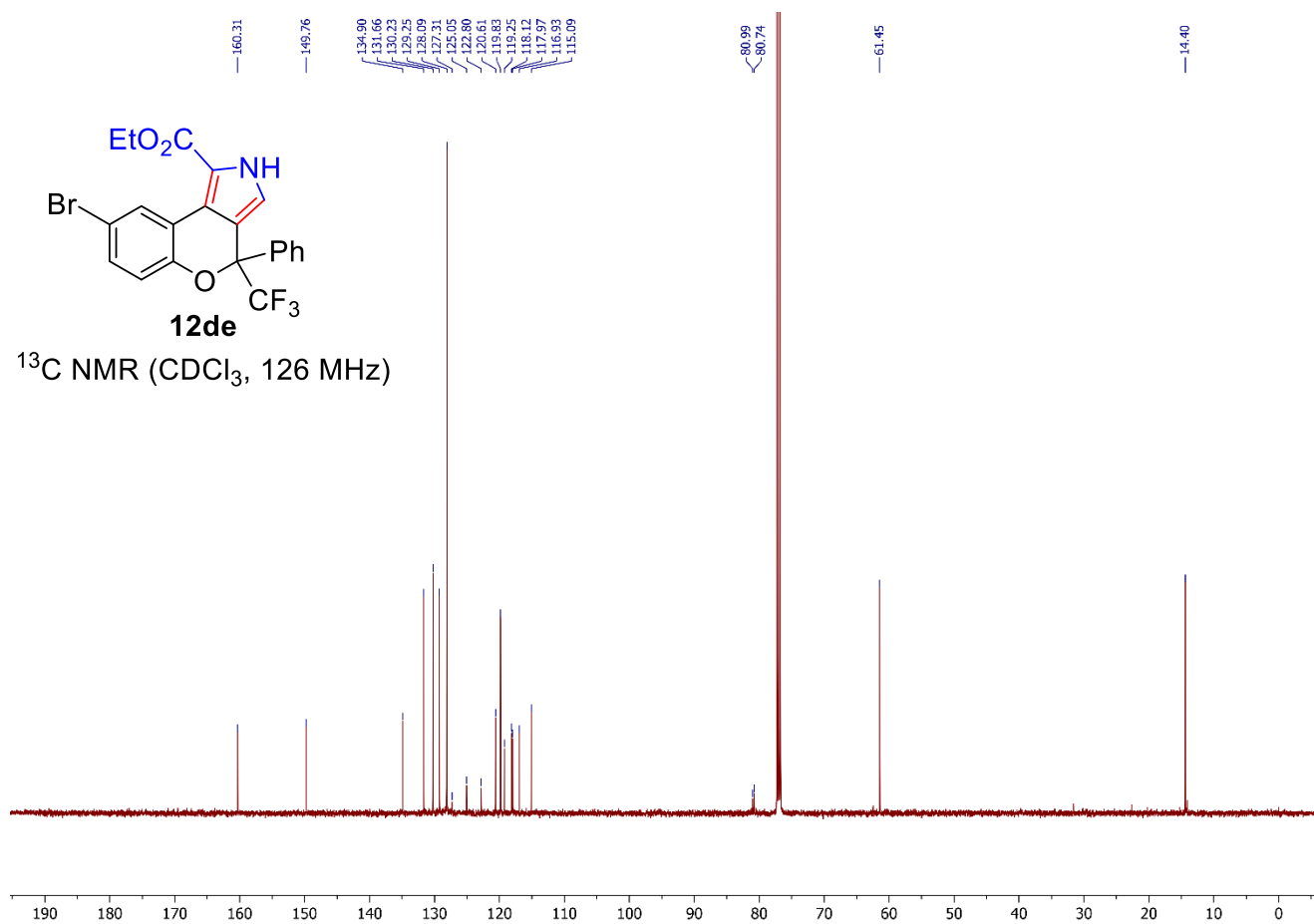


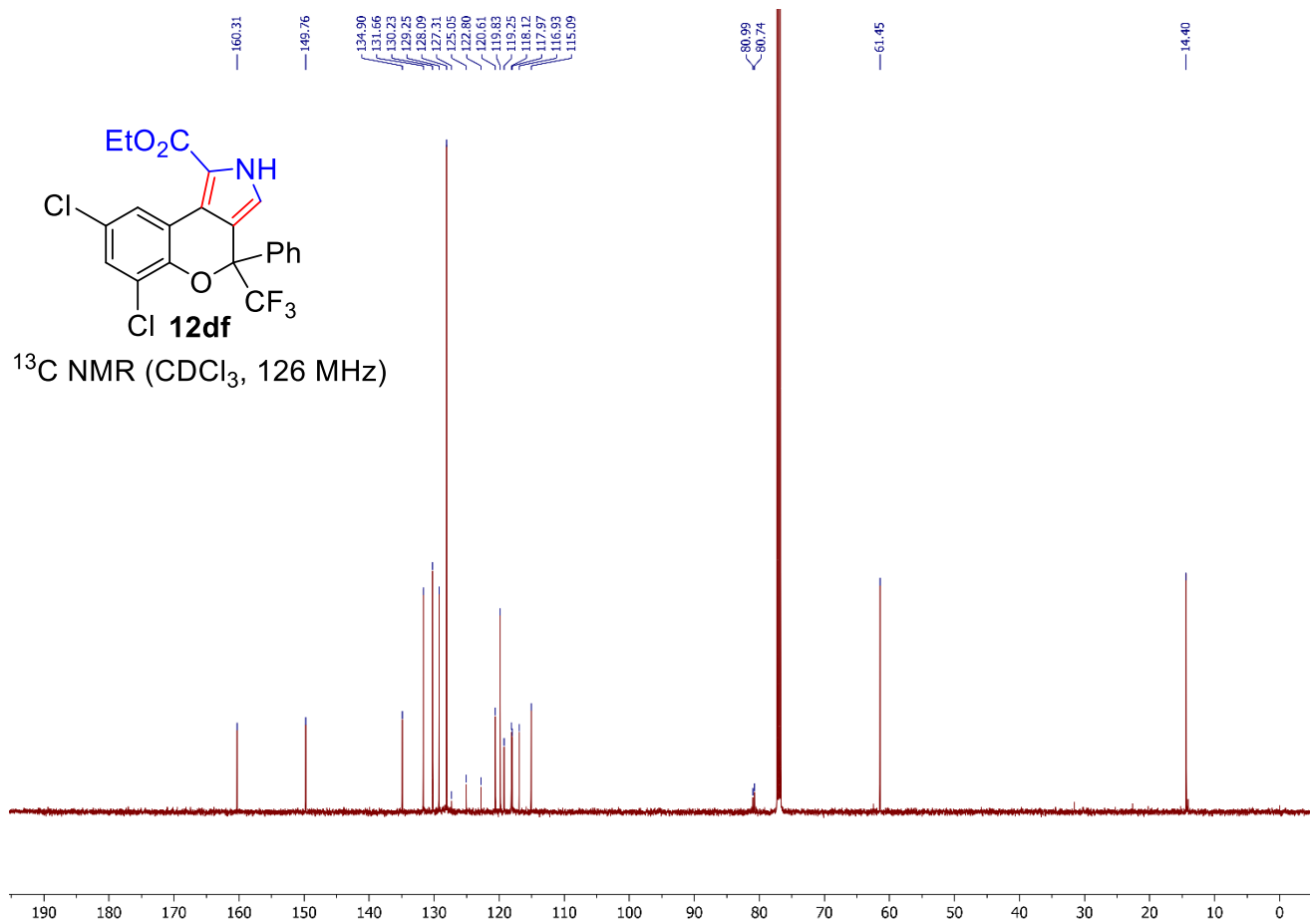
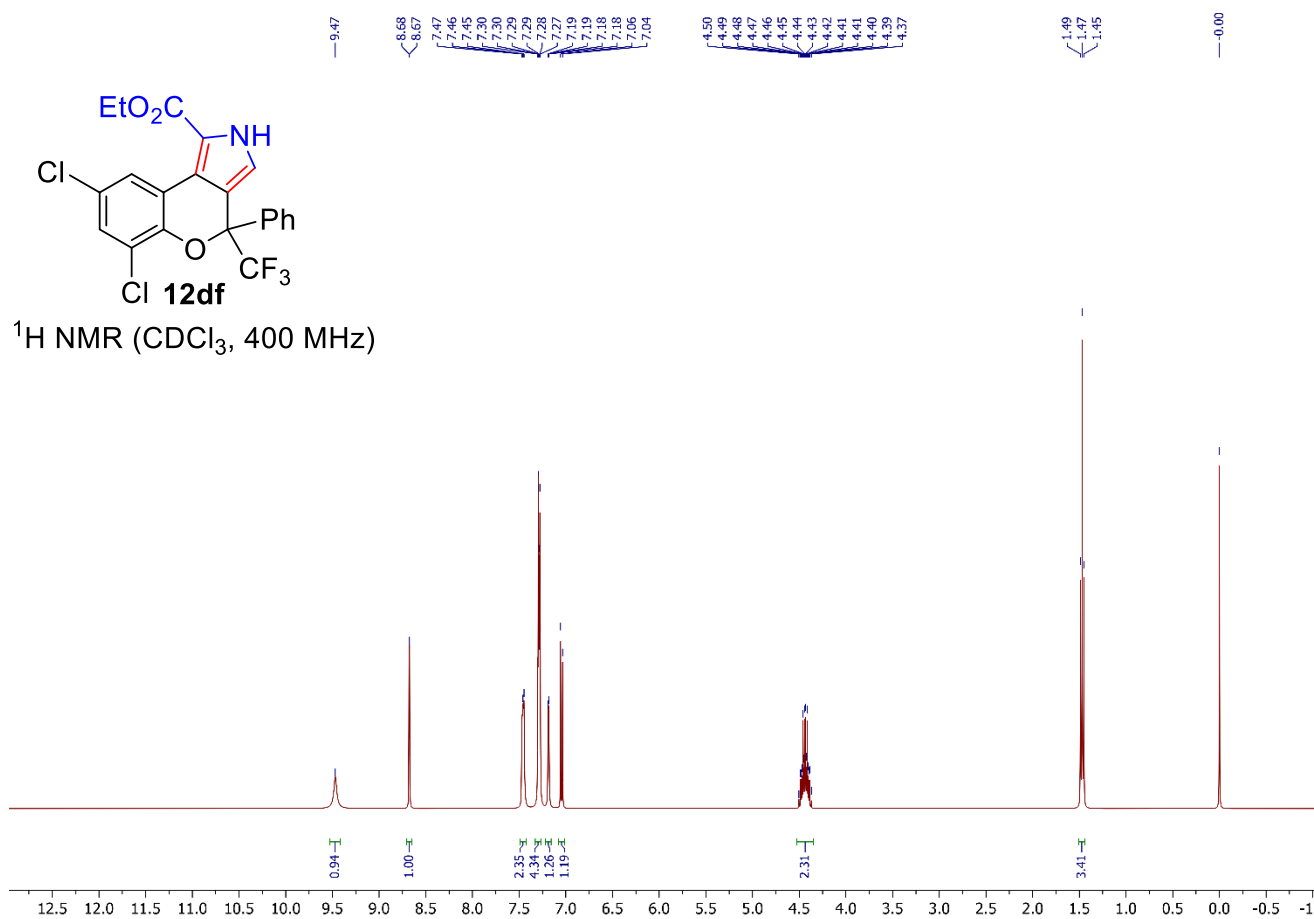


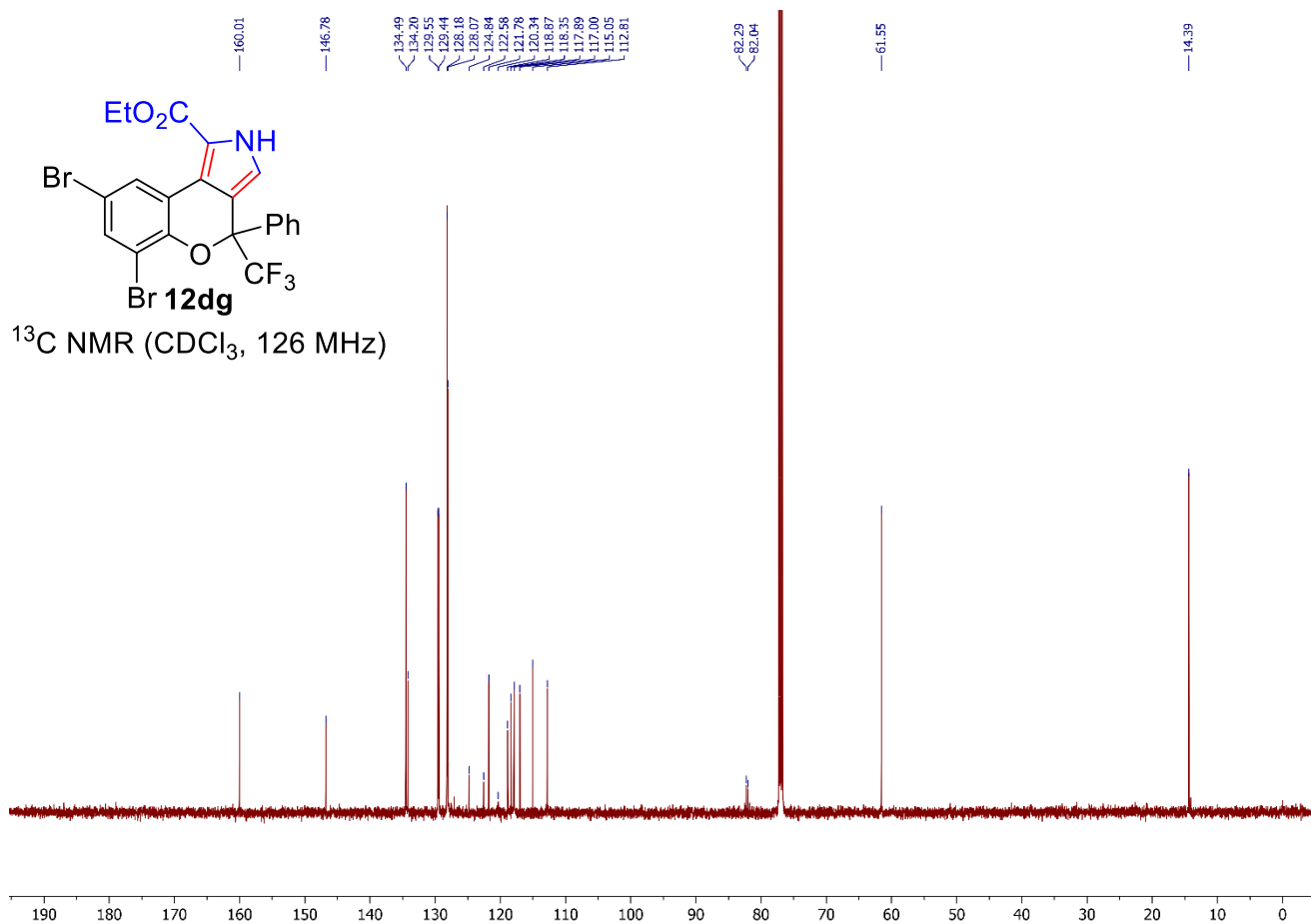
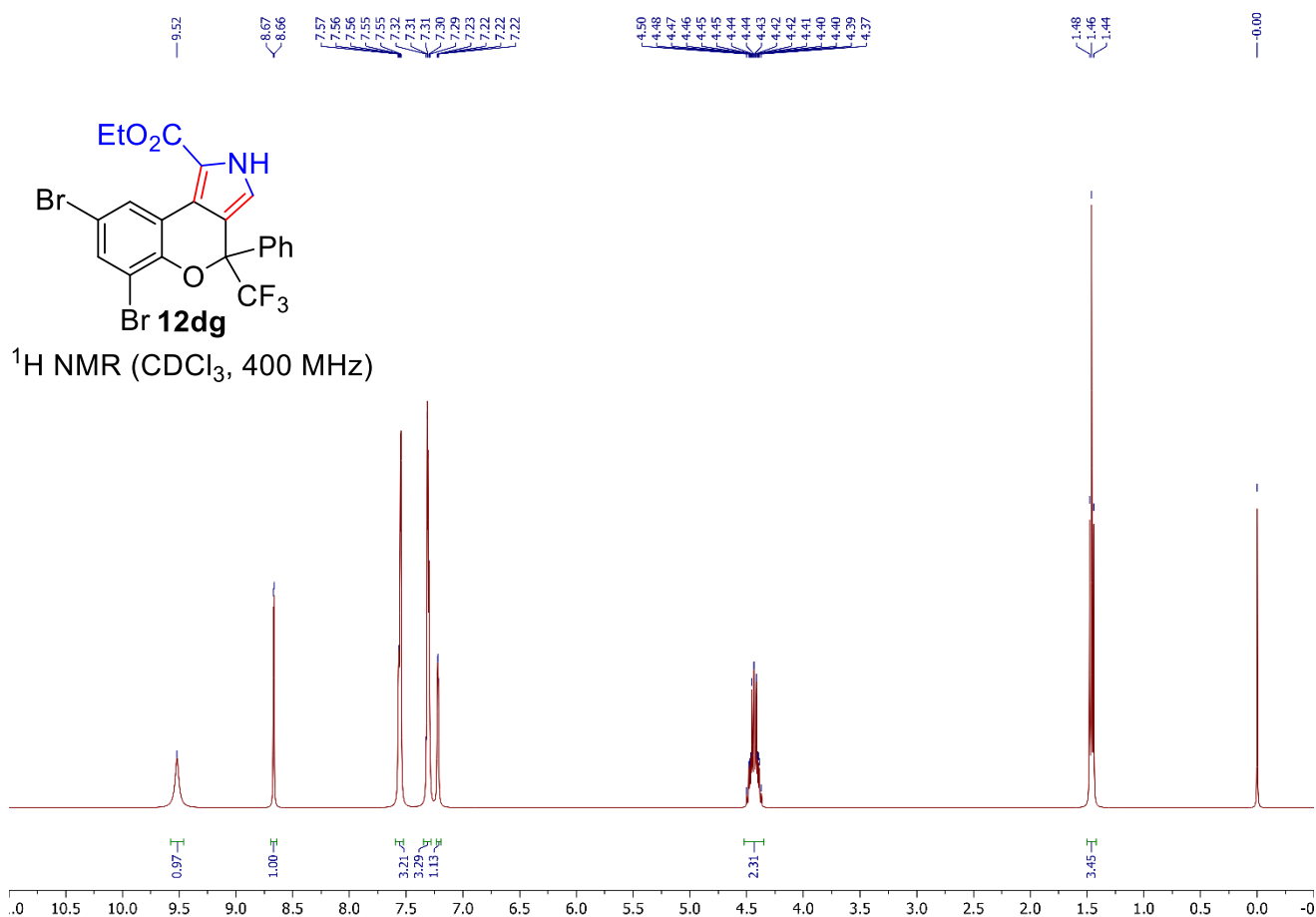
$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)

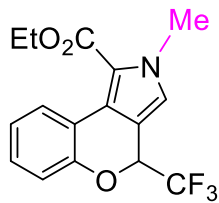


$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

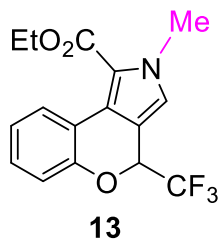
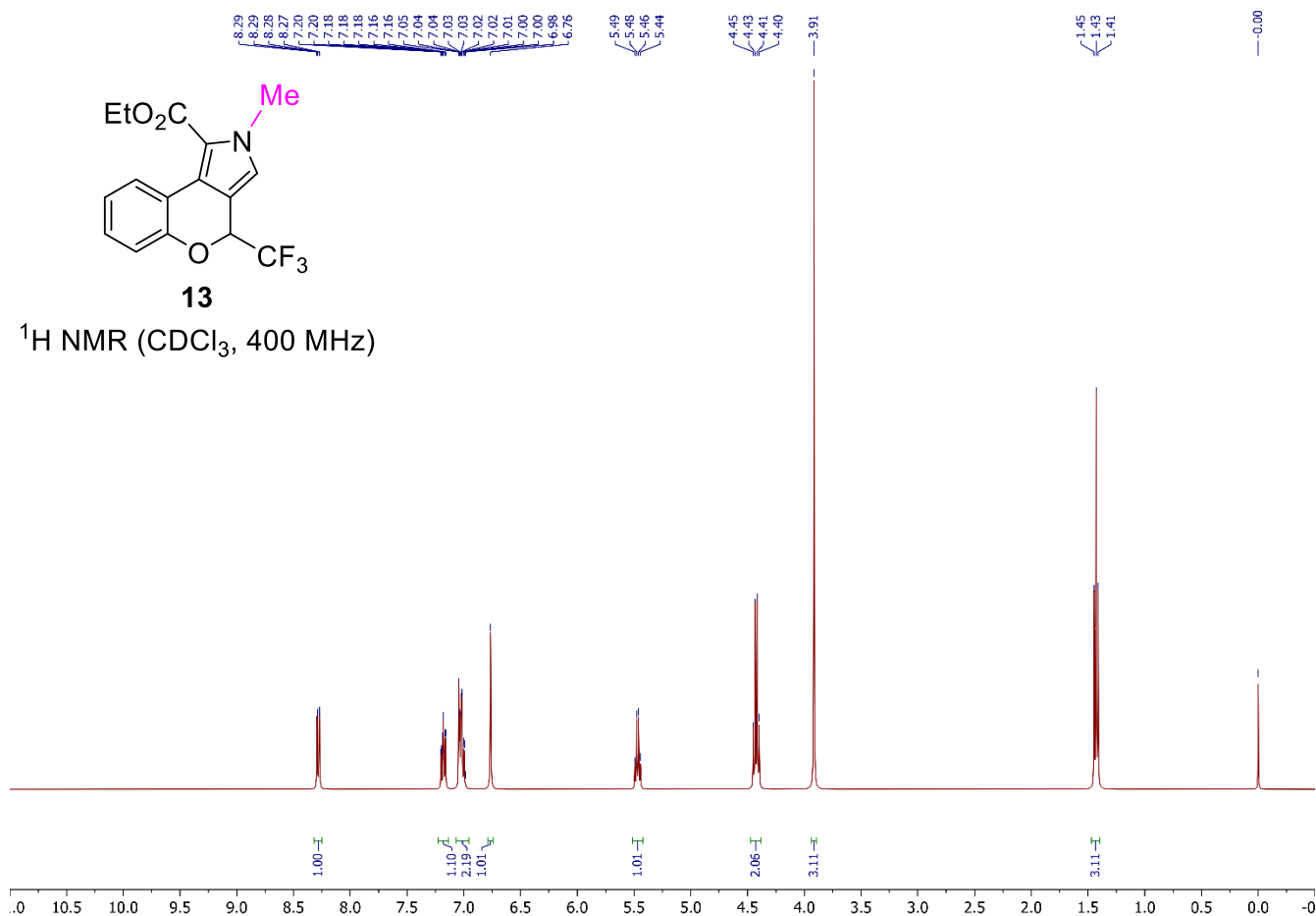




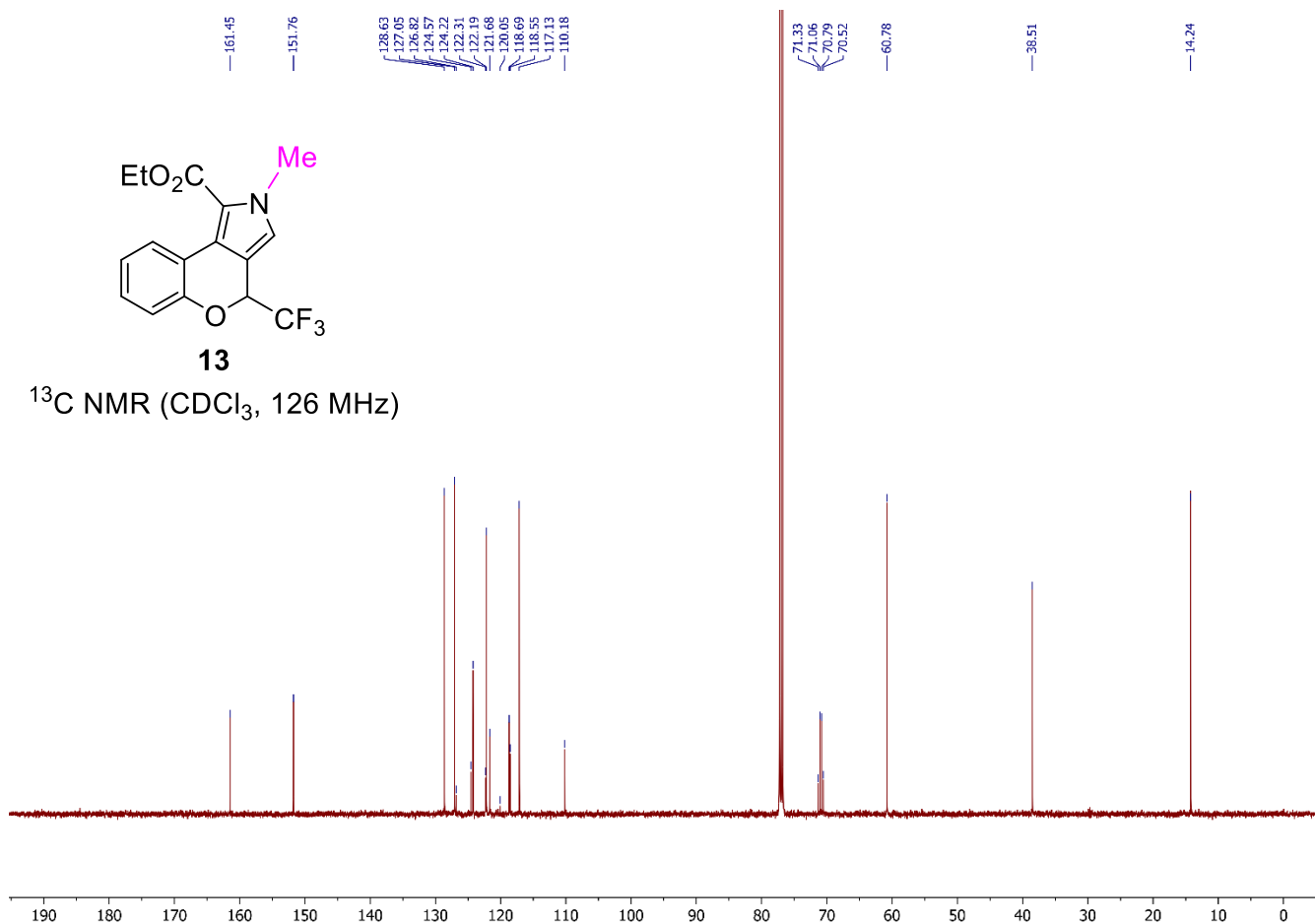


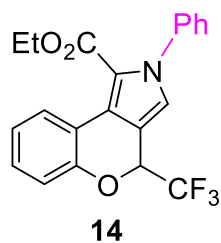
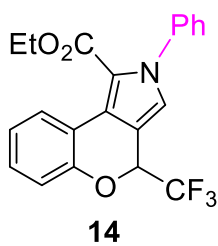


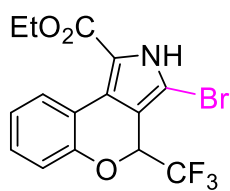
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz)



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 126 MHz)

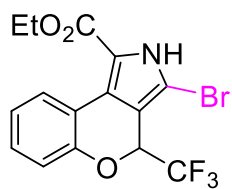
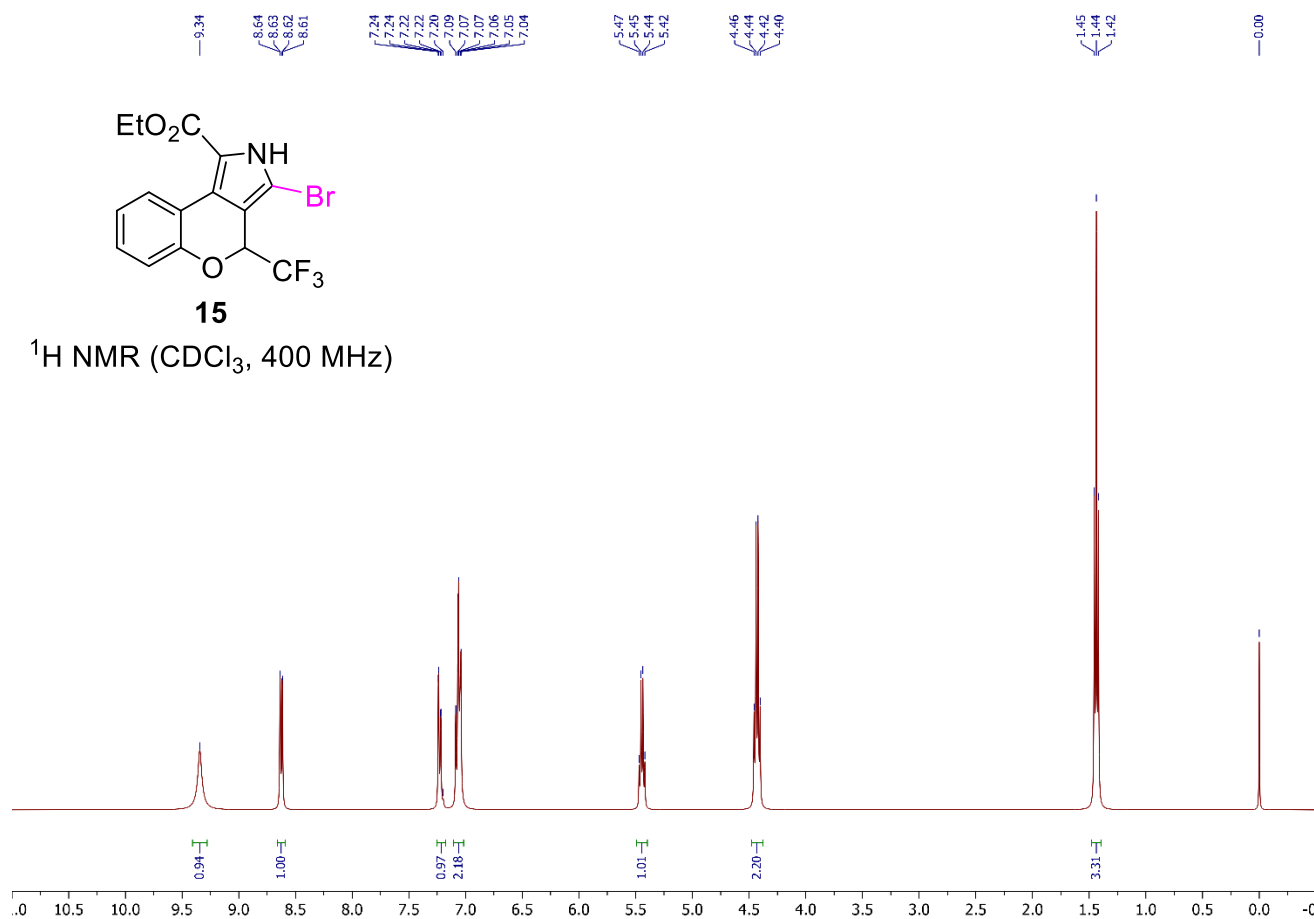






**15**

$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400 MHz)



**15**

$^{13}\text{C}$  NMR ( $\text{CDCl}_3$ , 126 MHz)

