

**Supporting Information For:**

# **Copper-Catalyzed Boroacylation of Allenes to Access Tetrasubstituted Vinylboronates**

Bing-Xue Shen<sup>†,‡</sup>, Xiang-Ting Min<sup>†,‡</sup>, Yan-Cheng Hu<sup>†,\*</sup>, Lei-Lei Qian<sup>†,‡</sup>, Sa-Na Yang<sup>†,‡</sup>, Boshun Wan<sup>†</sup> and Qing-An Chen<sup>†</sup>

<sup>†</sup>Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, China

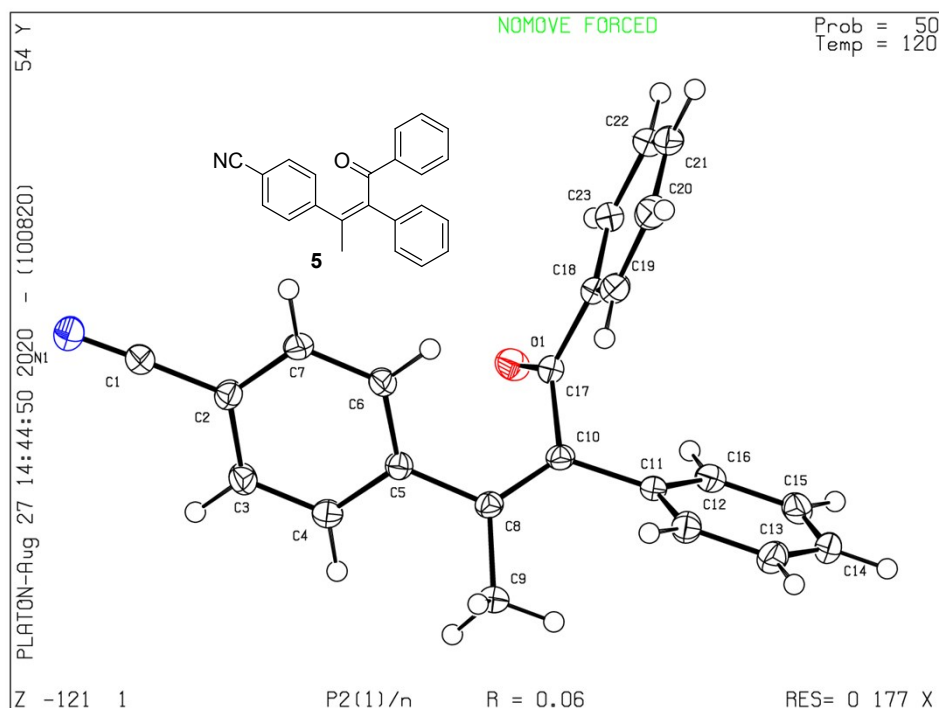
<sup>‡</sup>University of Chinese Academy of Sciences, Beijing 100049, China

E-mail: ychu@dicp.ac.cn

## **Table of Contents**

<b>1. X-ray crystallographic data of 5.....</b>	<b>S2</b>
<b>2. NMR spectra of products.....</b>	<b>S4</b>

## 1. X-ray crystallographic data of 5.



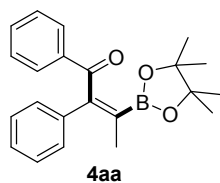
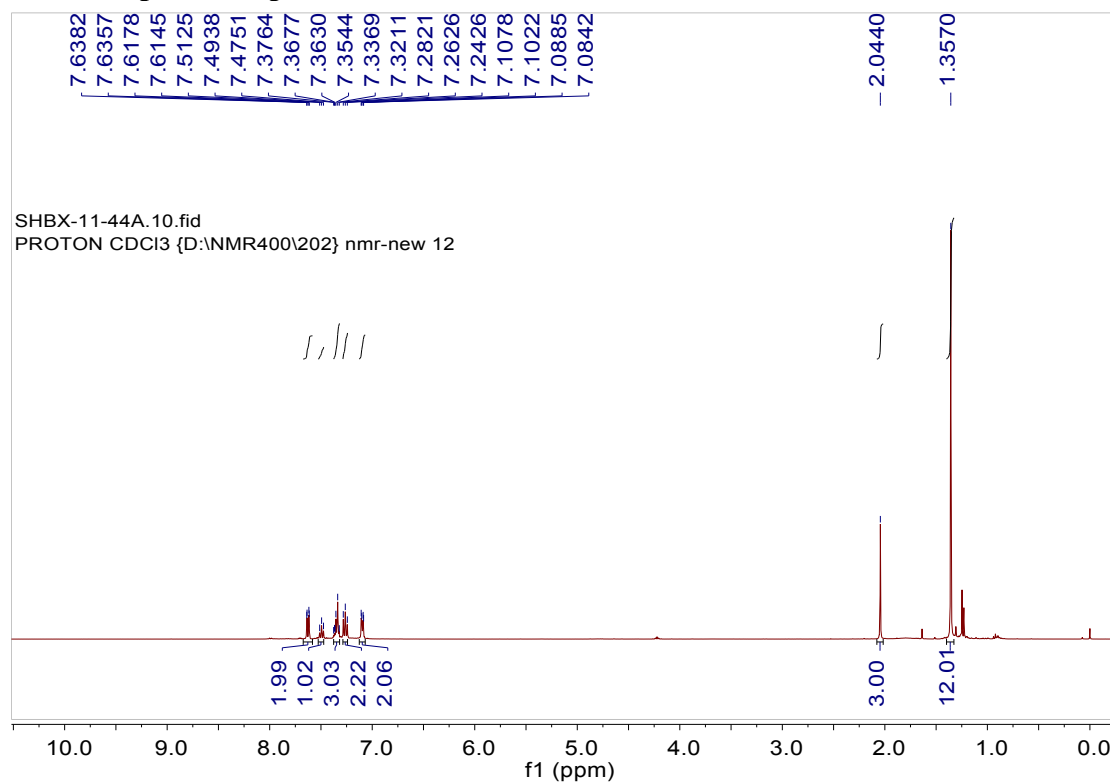
### Thermal ellipsoid was 30%

Table 1. Crystal data and structure refinement for **5**. (CCDC 2025787)

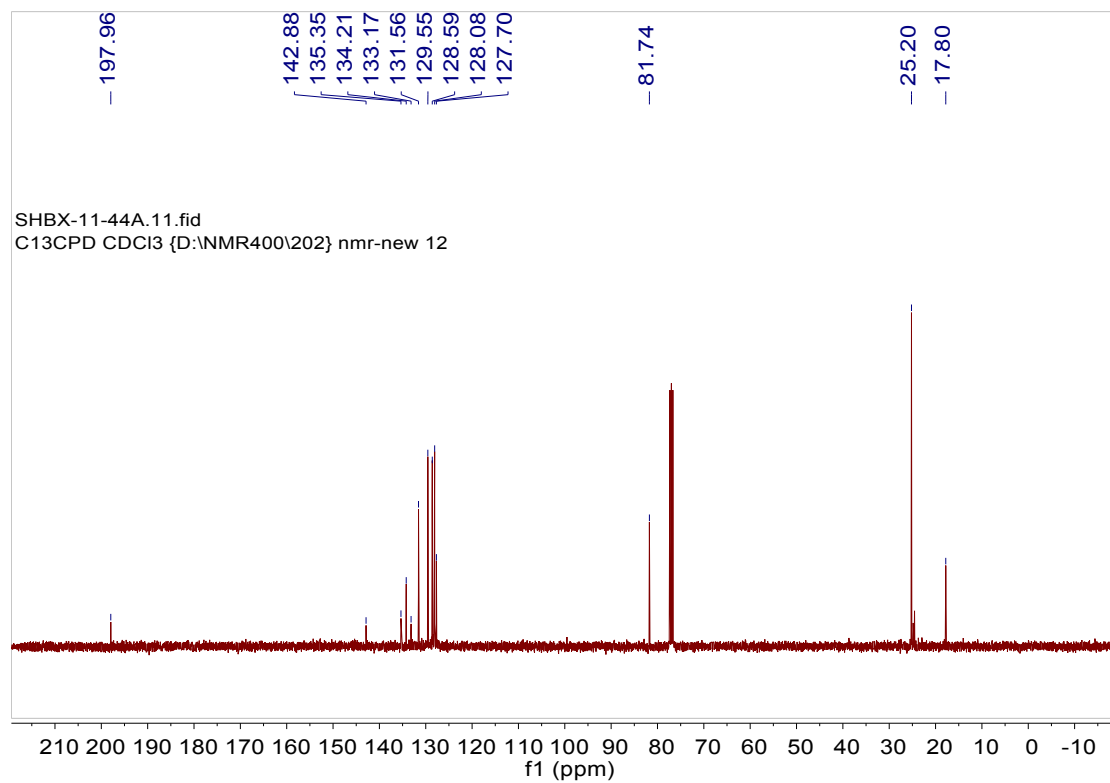
Identification code	<b>5</b>
Empirical formula	$C_{23}H_{17}NO$
Formula weight	323.38
Temperature/K	120.0
Crystal system	monoclinic
Space group	$P2_1/n$
$a/\text{\AA}$	8.8725(4)
$b/\text{\AA}$	11.6847(5)
$c/\text{\AA}$	16.8773(8)
$\alpha/^\circ$	90.00
$\beta/^\circ$	102.266(2)
$\gamma/^\circ$	90.00
Volume/ $\text{\AA}^3$	1709.77(13)
Z	4
$\rho_{\text{calc}}/\text{cm}^3$	1.256
$\mu/\text{mm}^{-1}$	0.077
F(000)	680.0
Crystal size/ $\text{mm}^3$	0.16 × 0.14 × 0.12
Radiation	MoK $\alpha$ ( $\lambda = 0.71073$ )

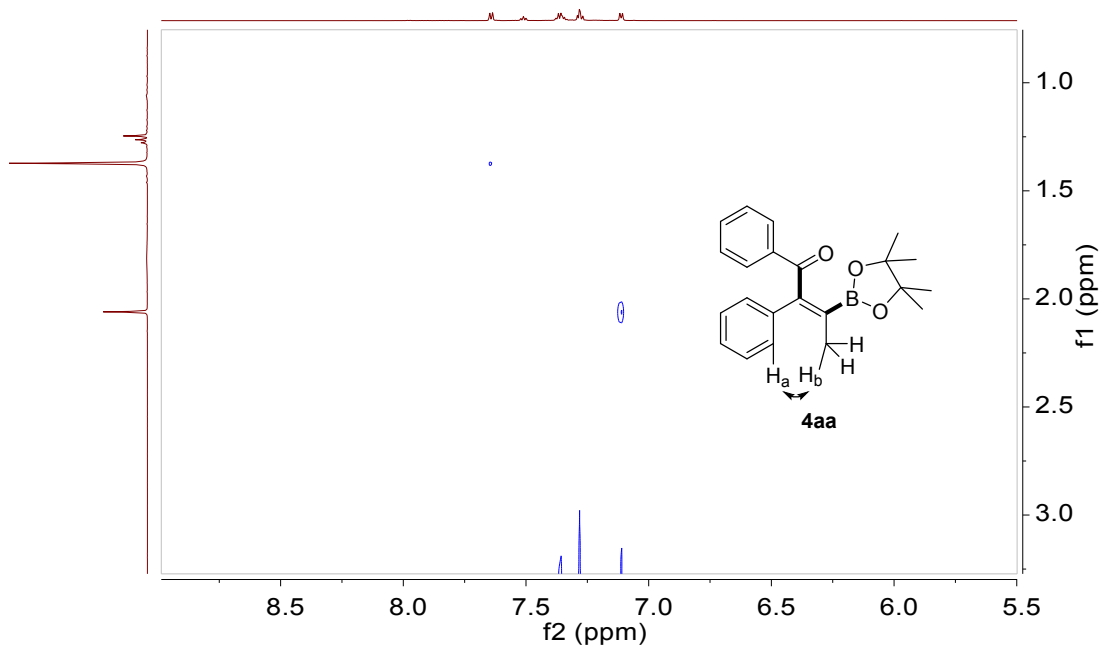
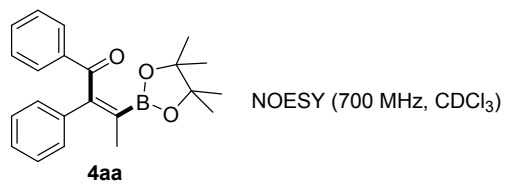
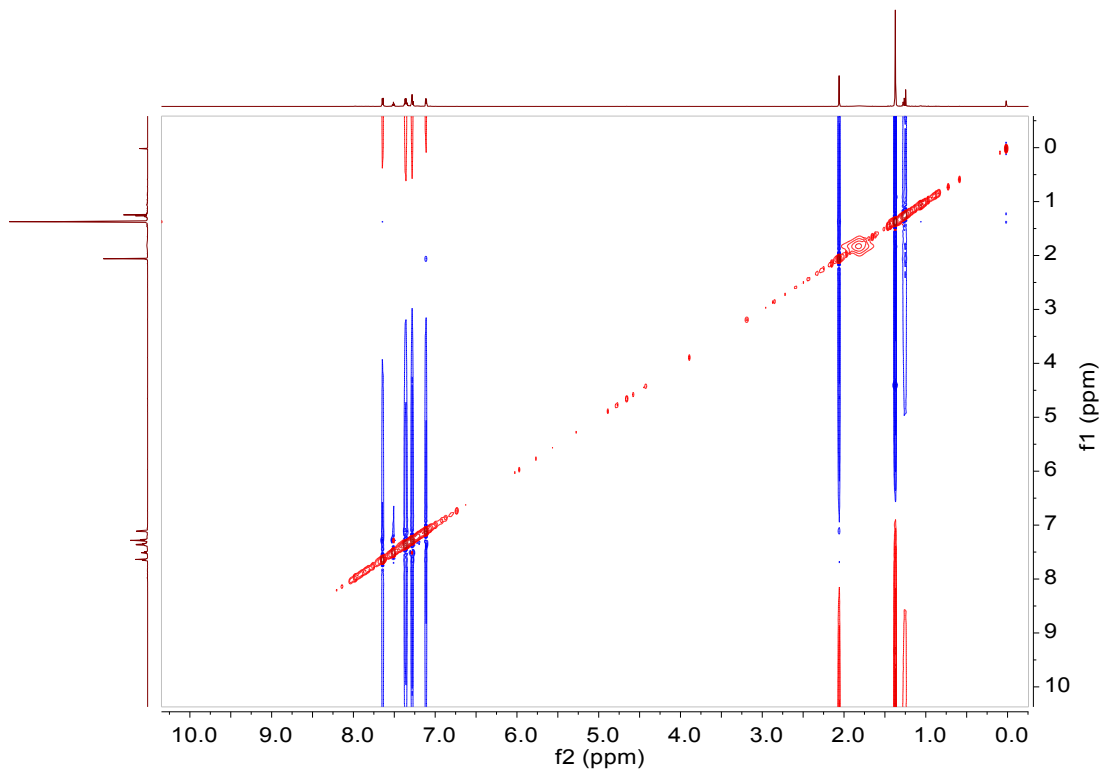
2 $\Theta$  range for data collection/ $^{\circ}$  4.28 to 54.98  
Index ranges -11  $\leq$  h  $\leq$  11, -14  $\leq$  k  $\leq$  15, -21  $\leq$  l  $\leq$  21  
Reflections collected 13178  
Independent reflections 3915 [R<sub>int</sub> = 0.0304, R<sub>sigma</sub> = 0.0341]  
Data/restraints/parameters 3915/0/227  
Goodness-of-fit on F<sup>2</sup> 1.266  
Final R indexes [I  $\geq$  2 $\sigma$  (I)] R<sub>1</sub> = 0.0607, wR<sub>2</sub> = 0.1587  
Final R indexes [all data] R<sub>1</sub> = 0.0679, wR<sub>2</sub> = 0.1658  
Largest diff. peak/hole / e  $\text{\AA}^{-3}$  0.61/-0.72

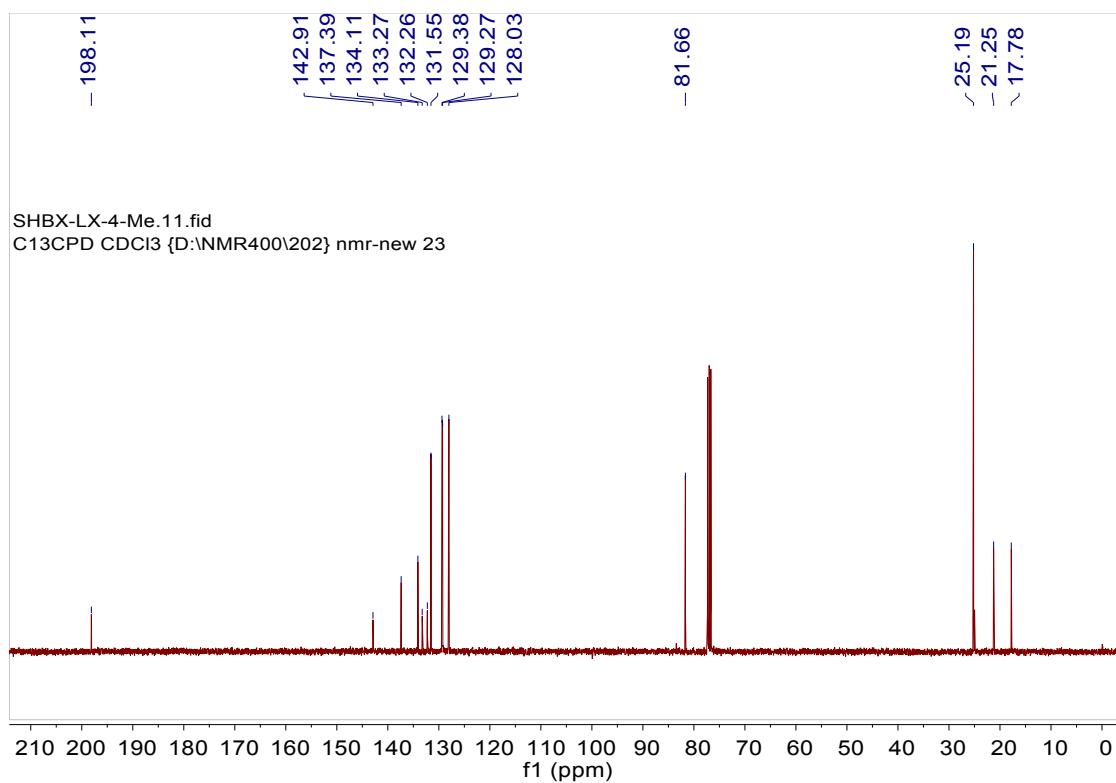
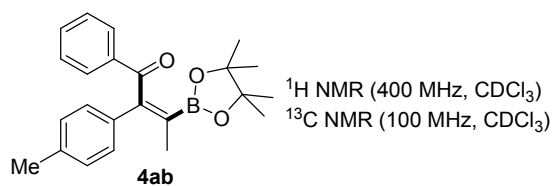
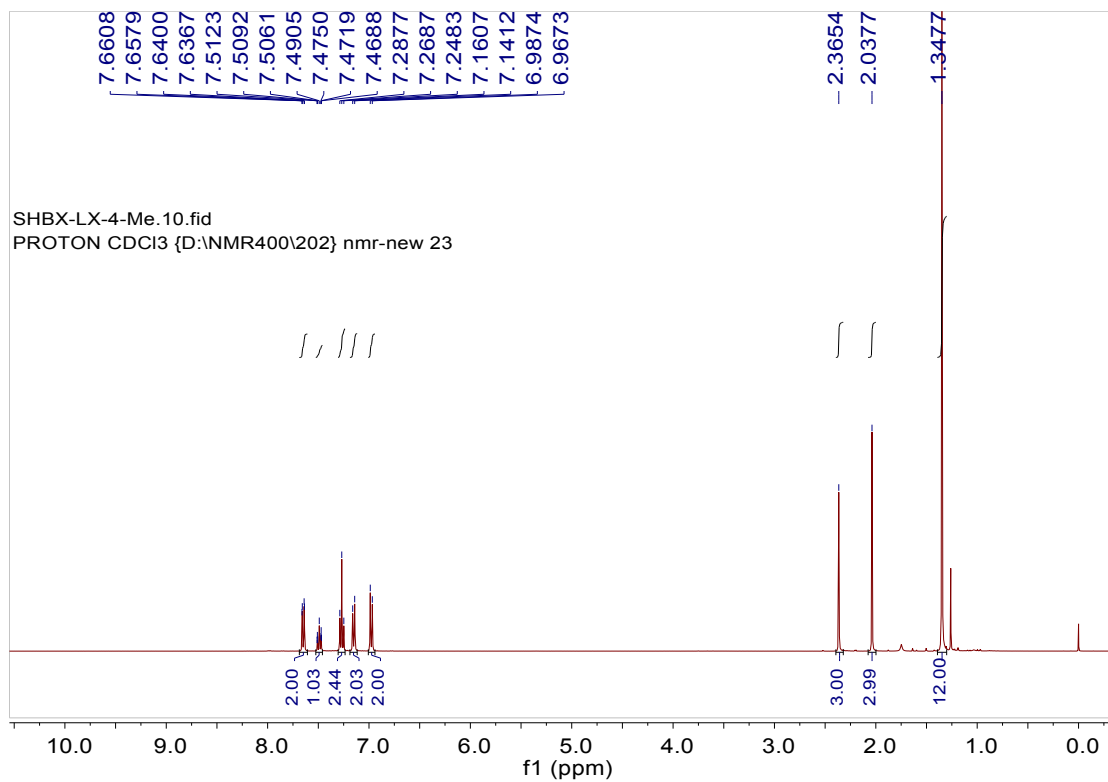
## 2. NMR spectra of products.

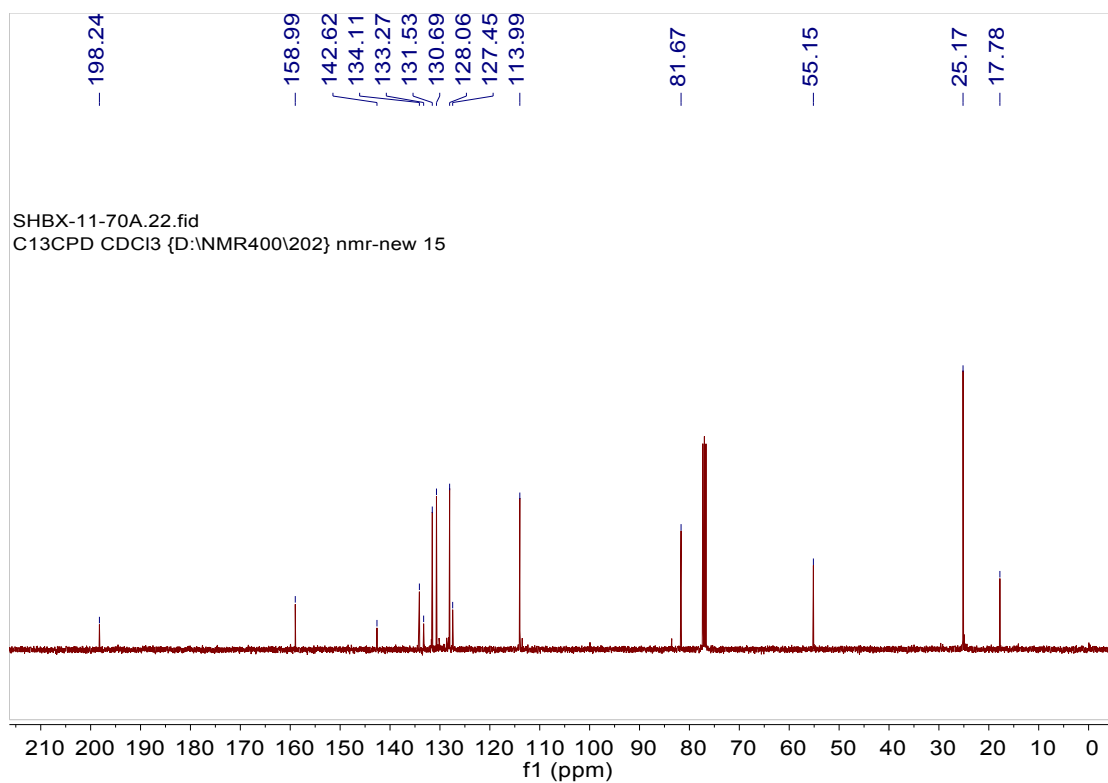
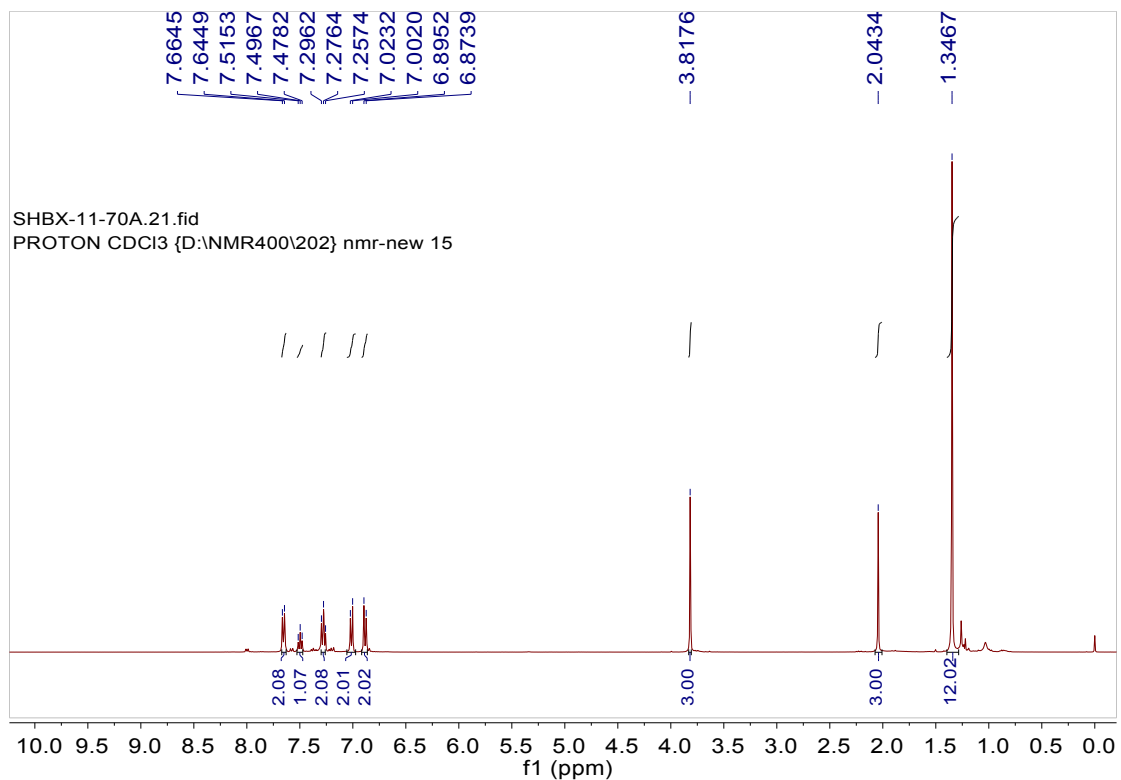


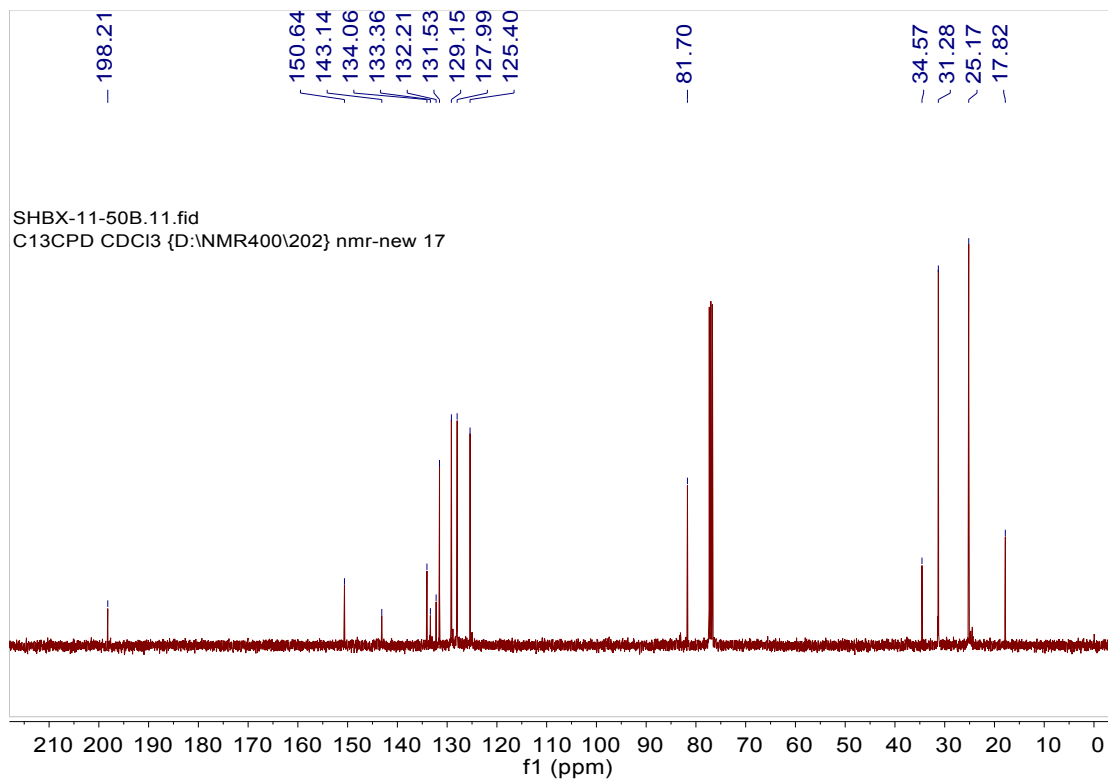
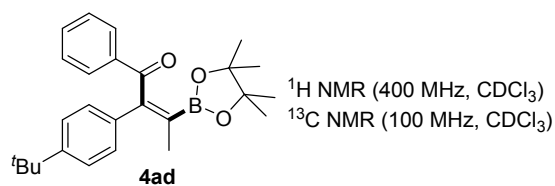
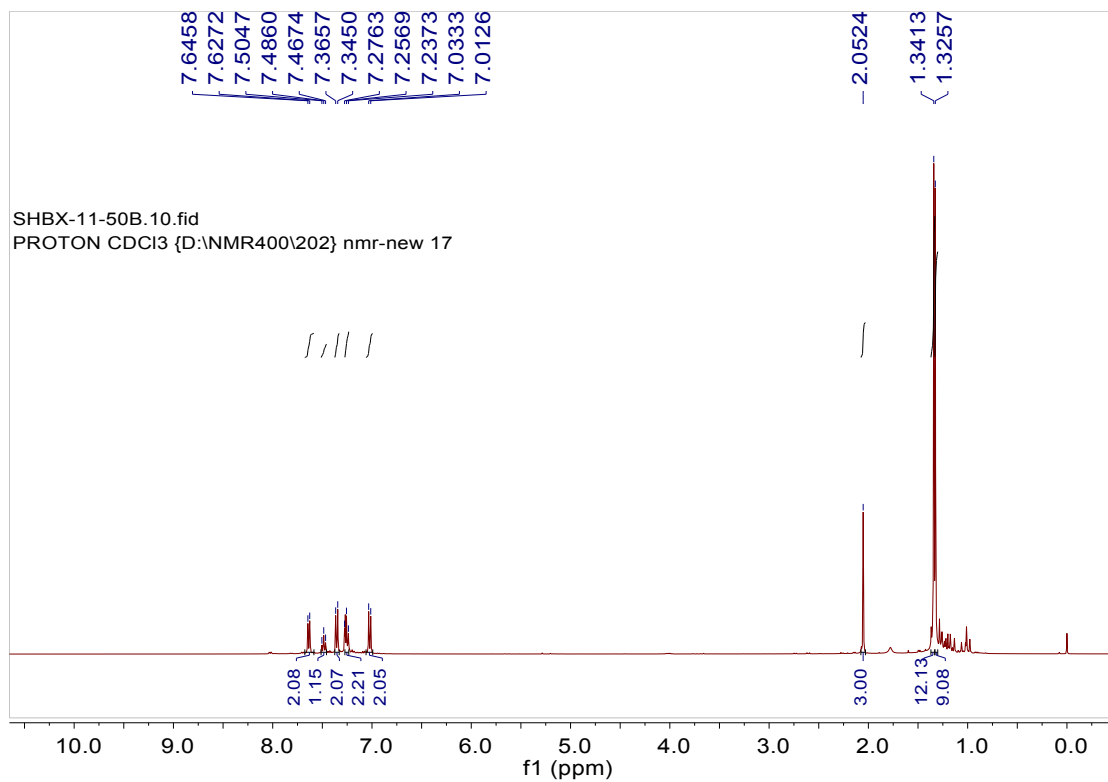
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



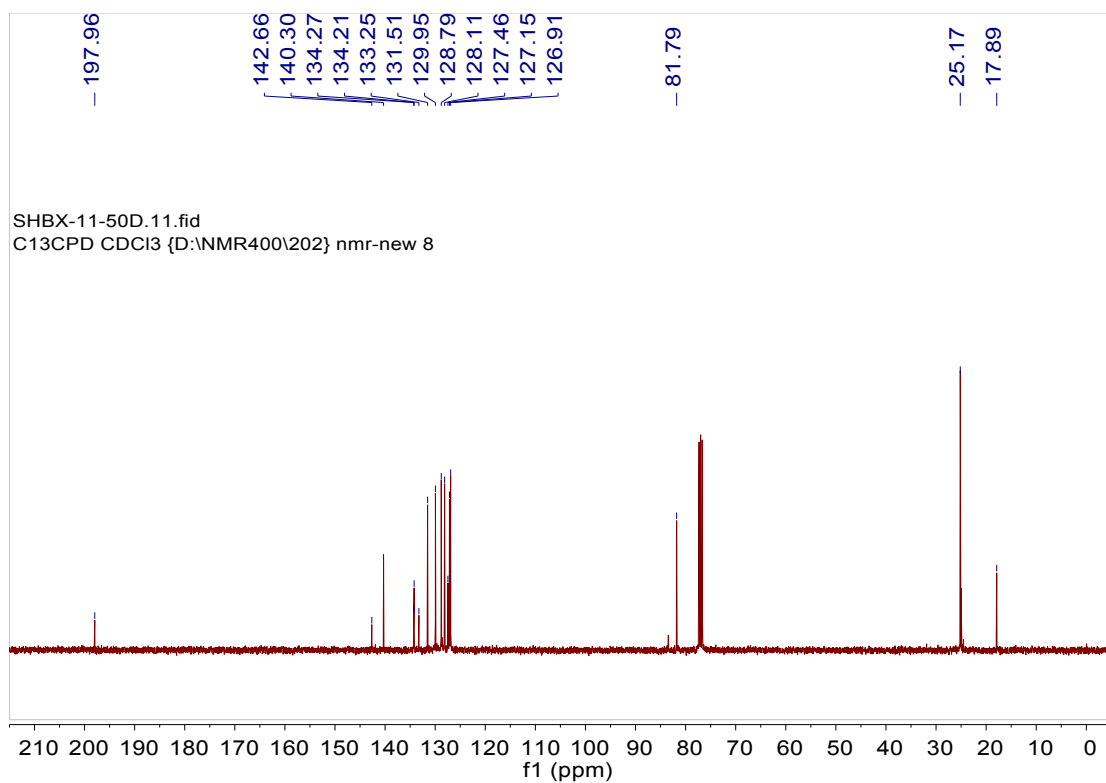
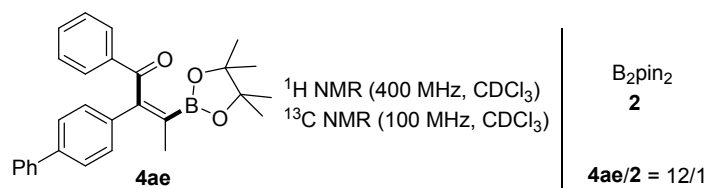
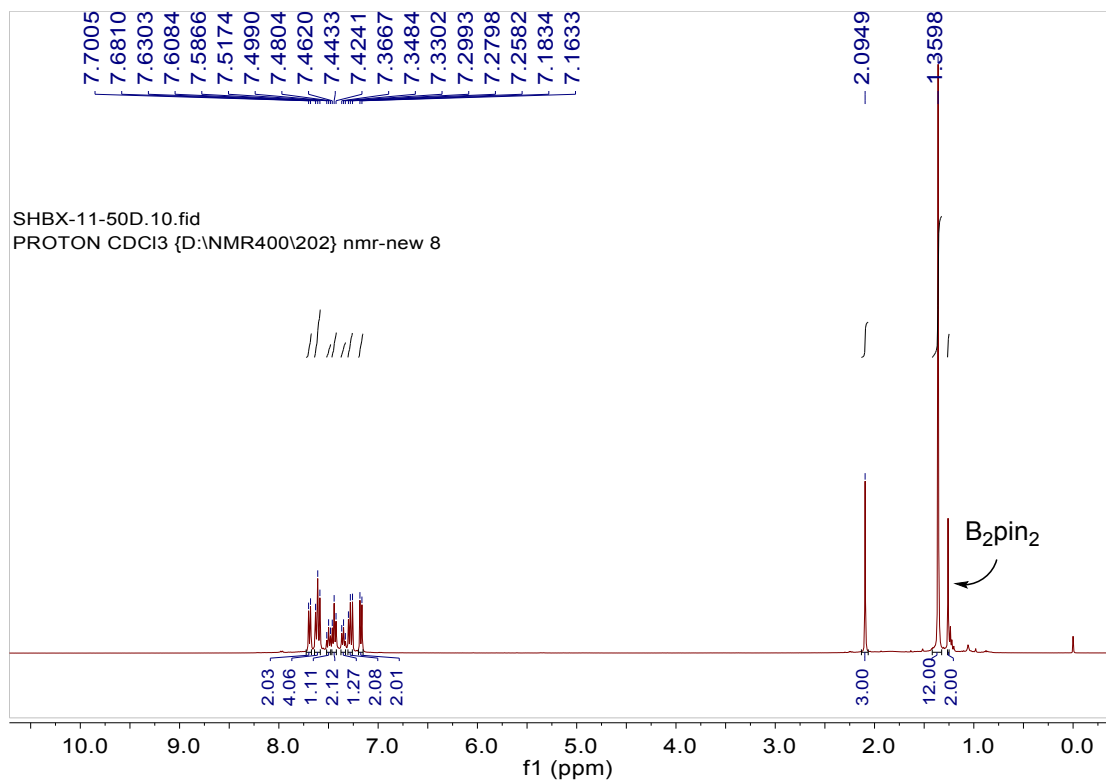


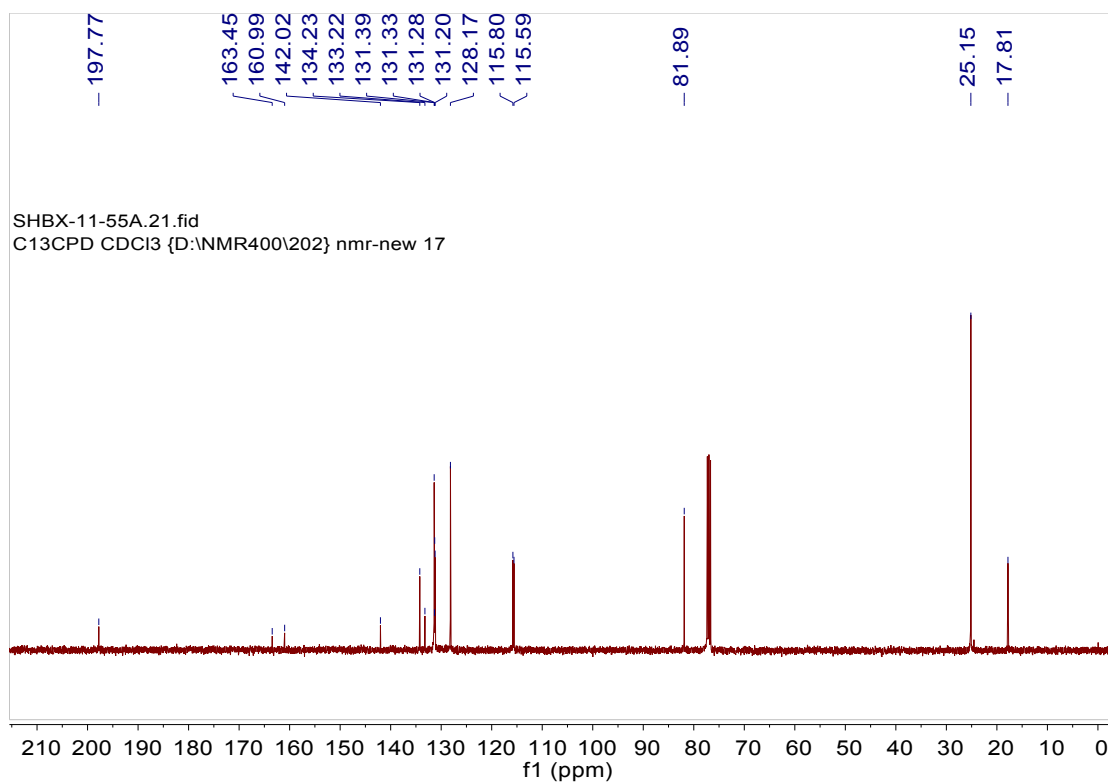
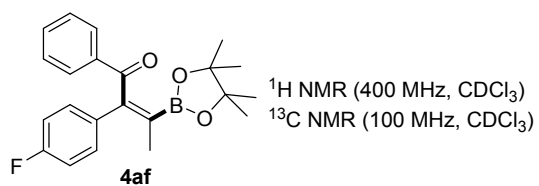
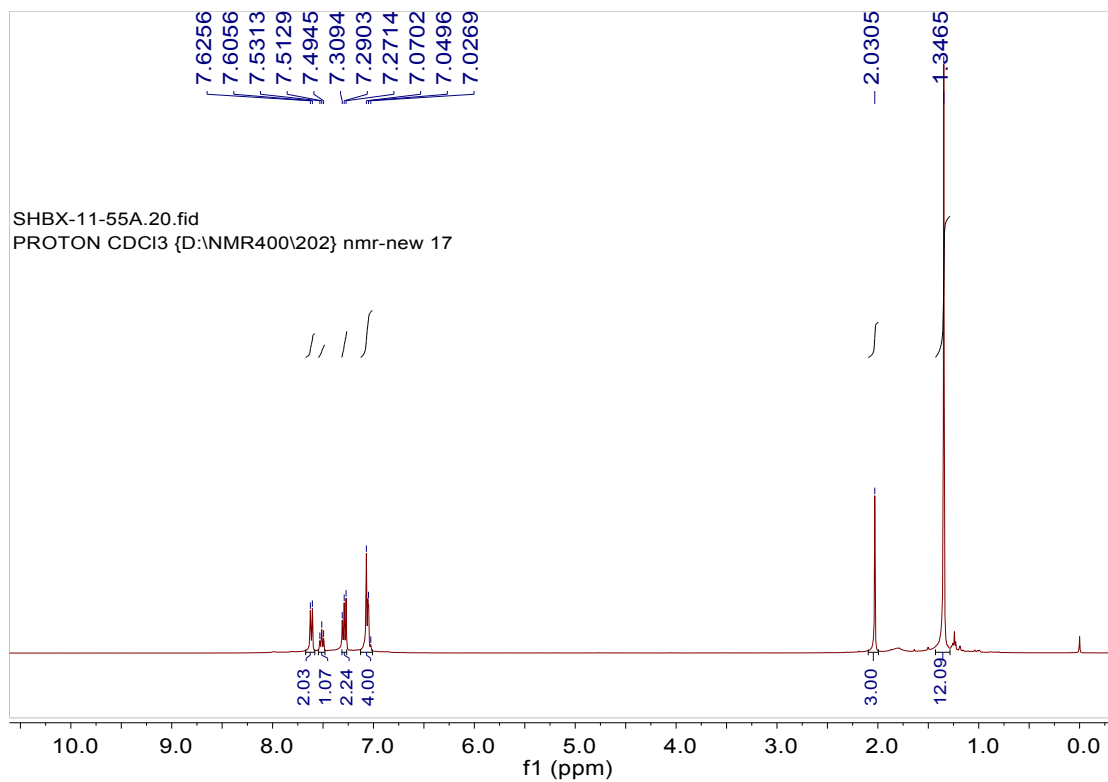


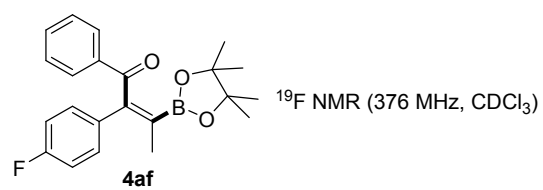
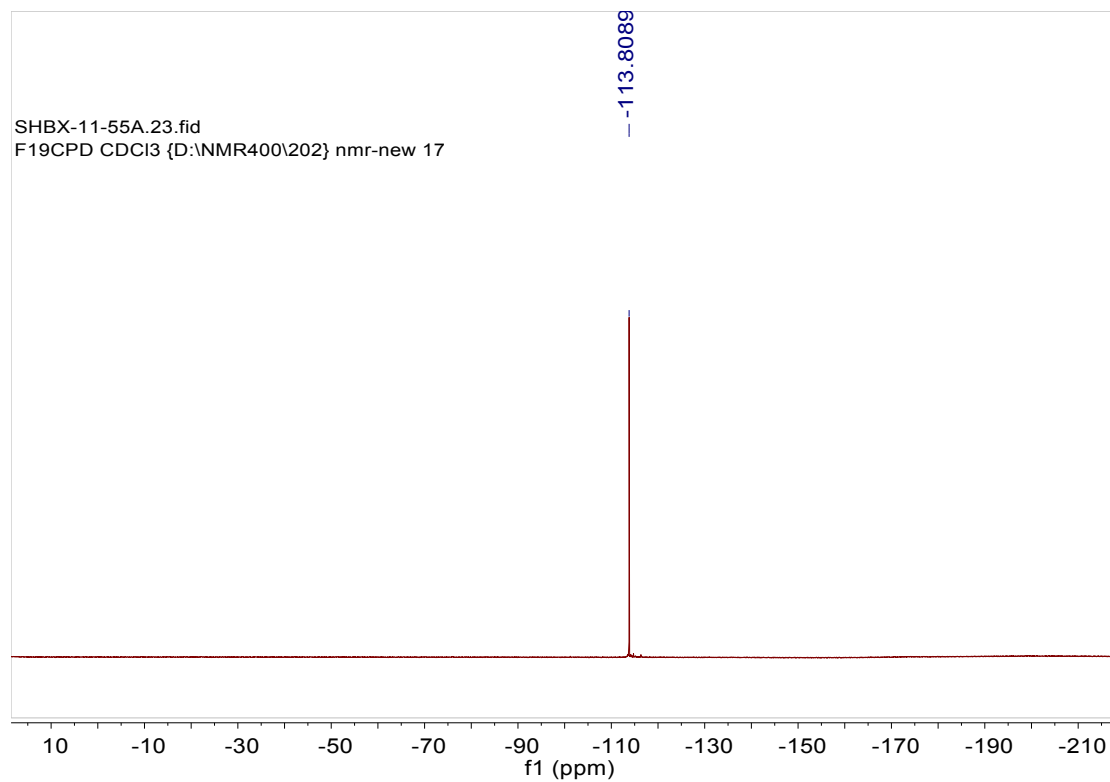


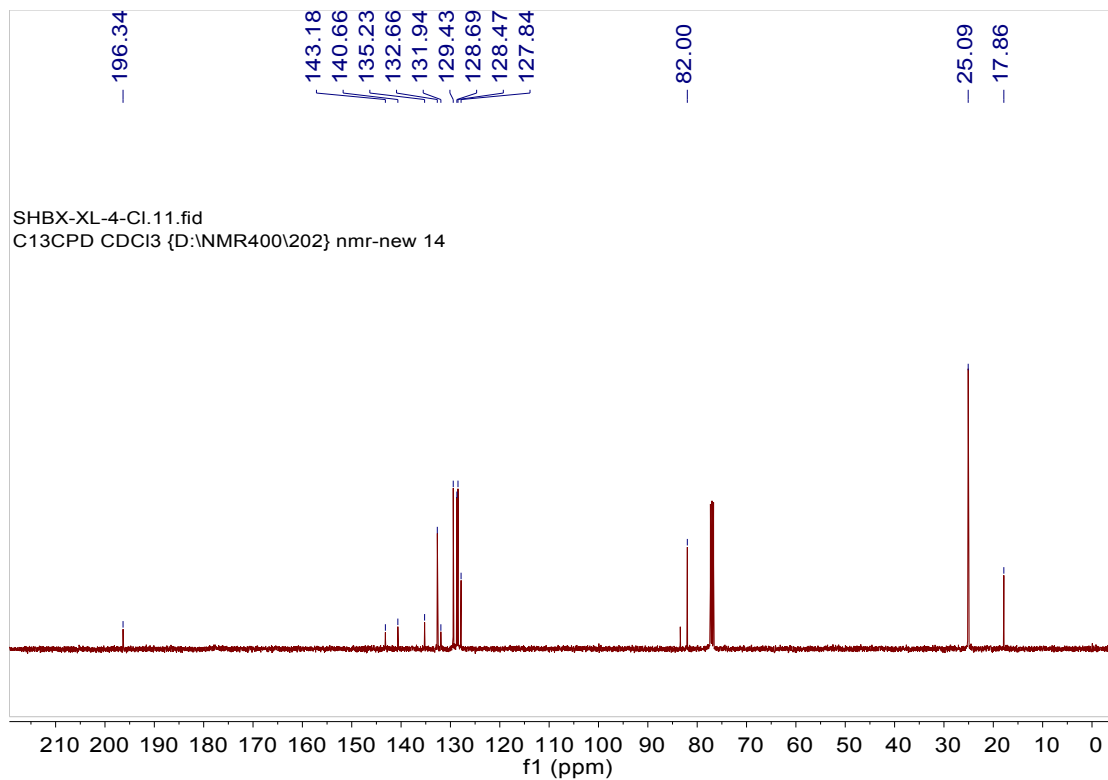
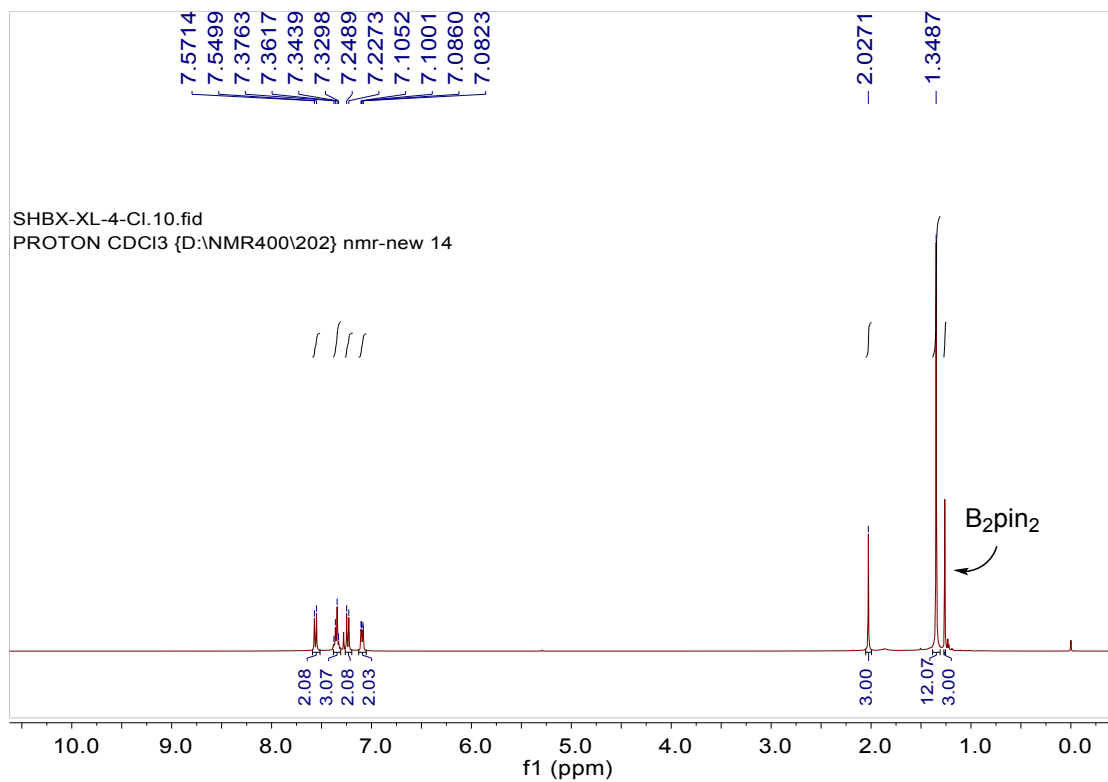


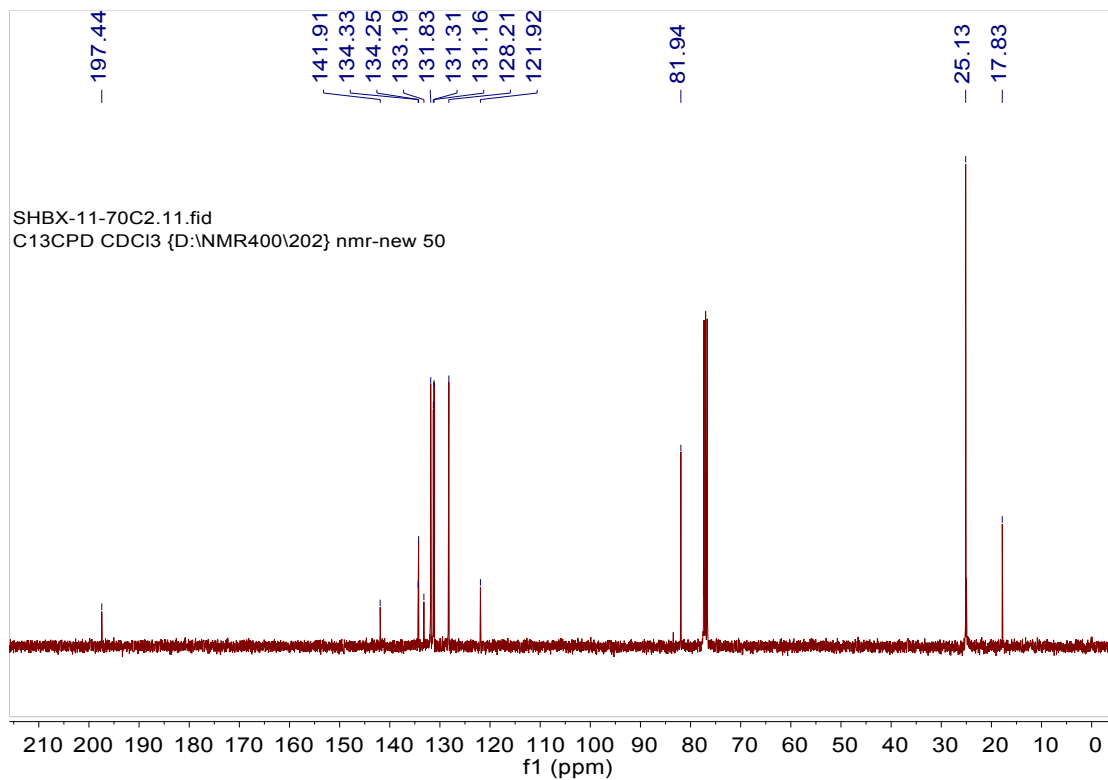
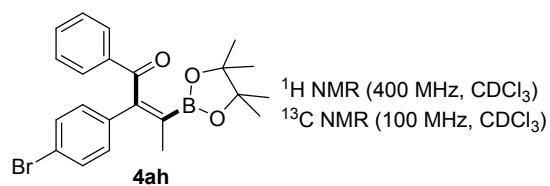
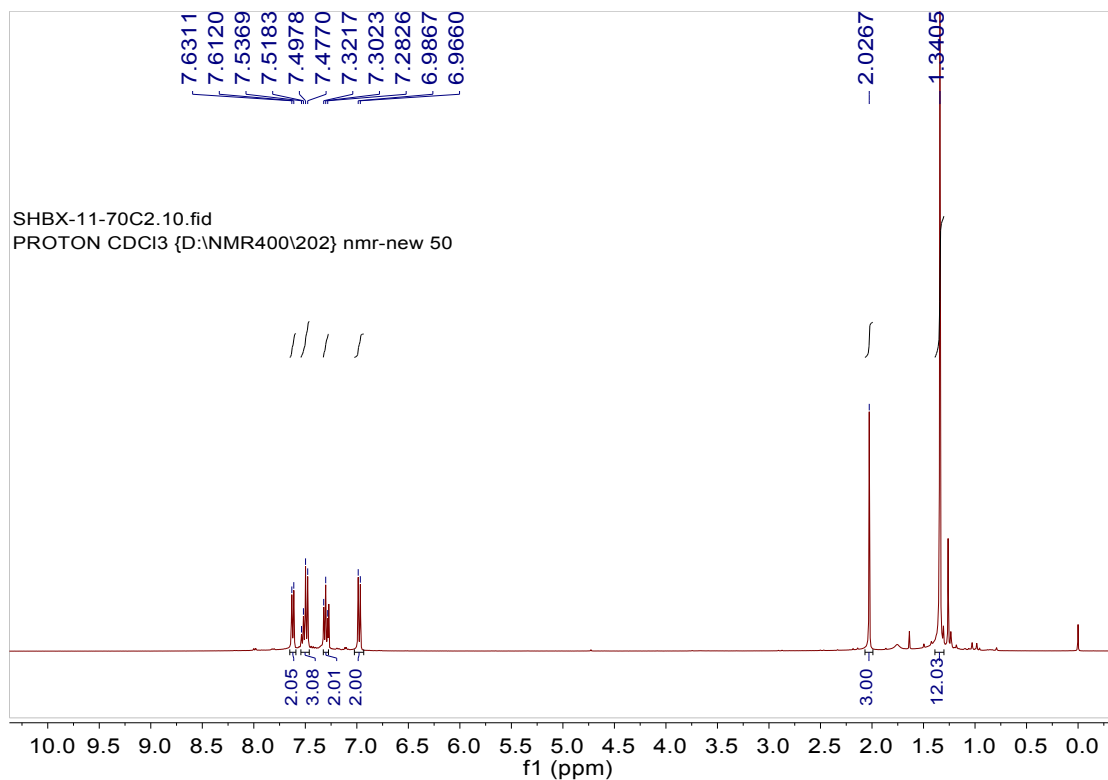


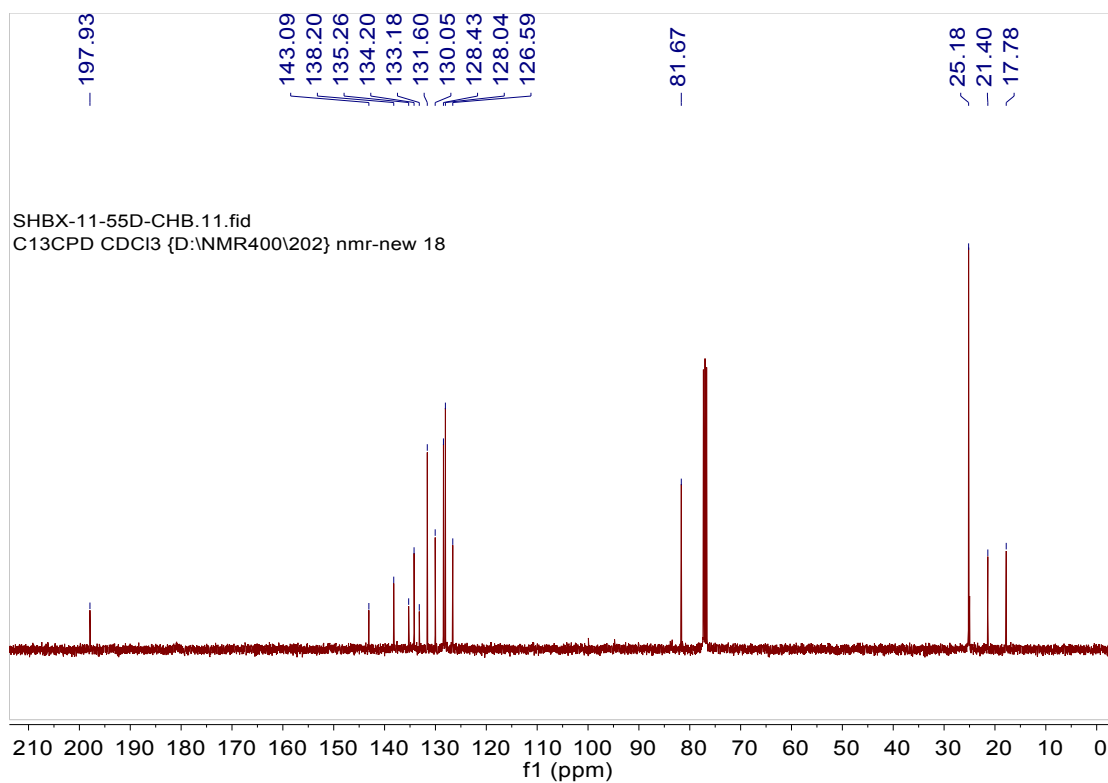
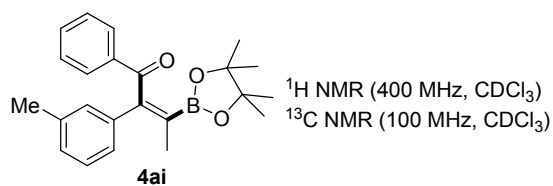
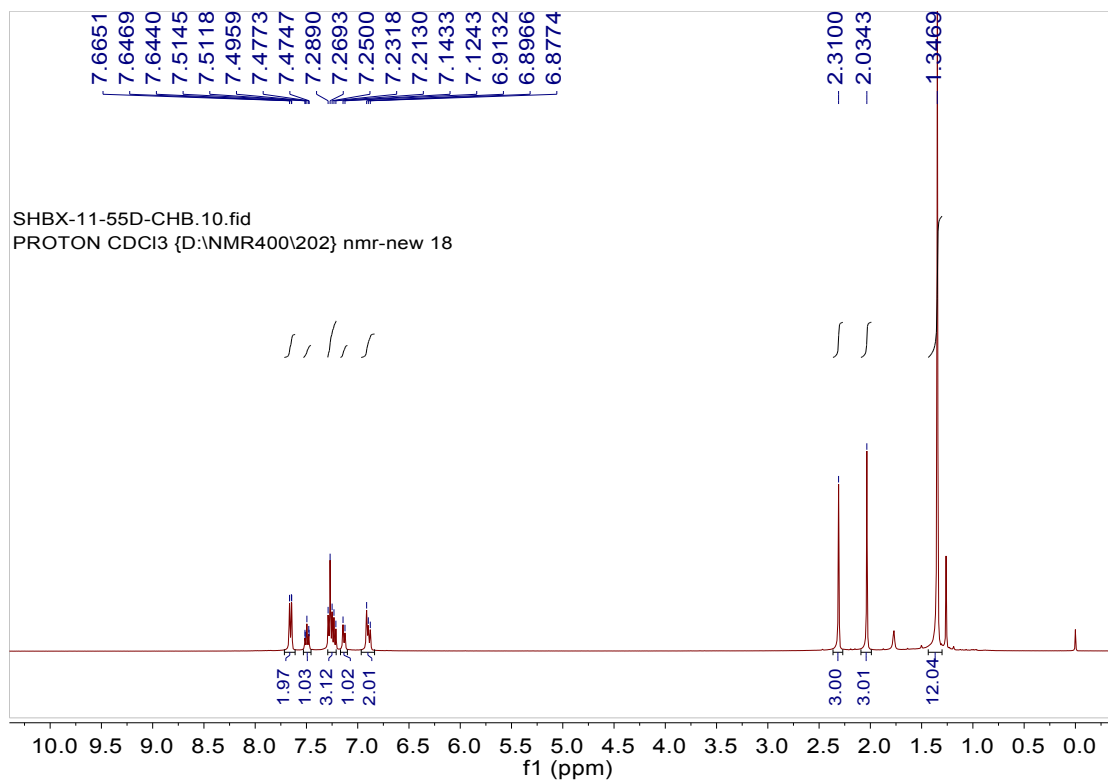


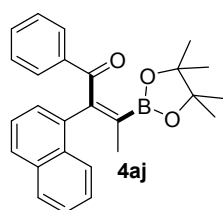
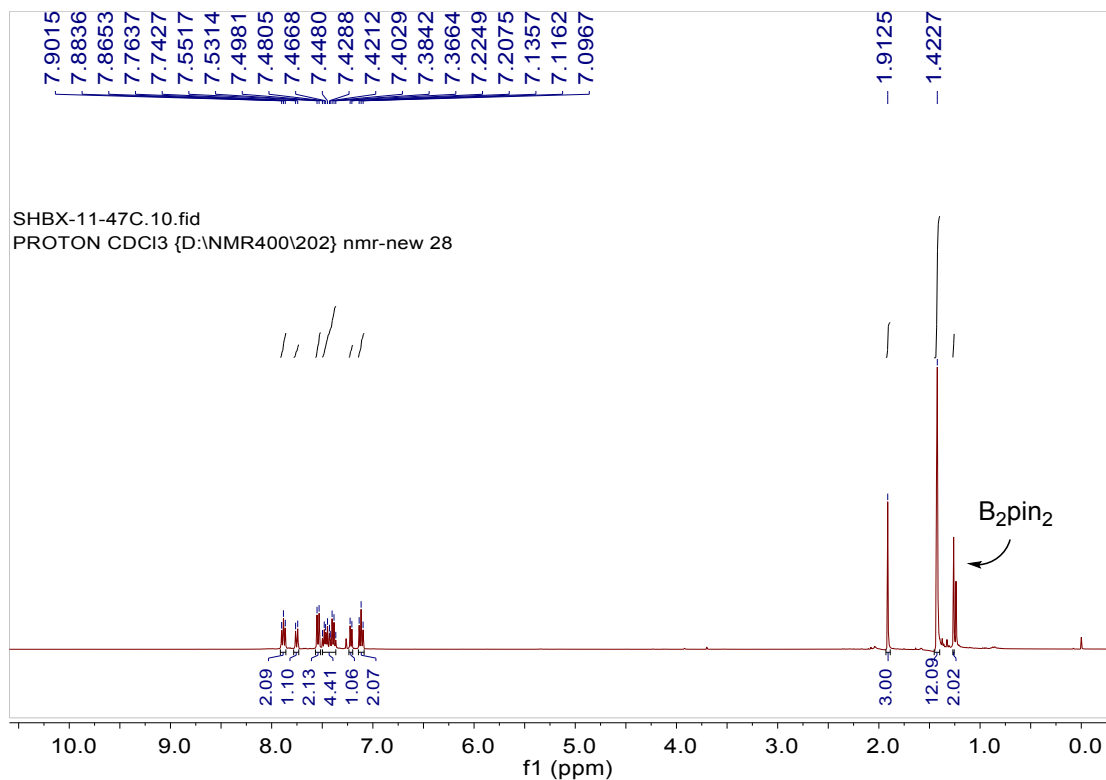








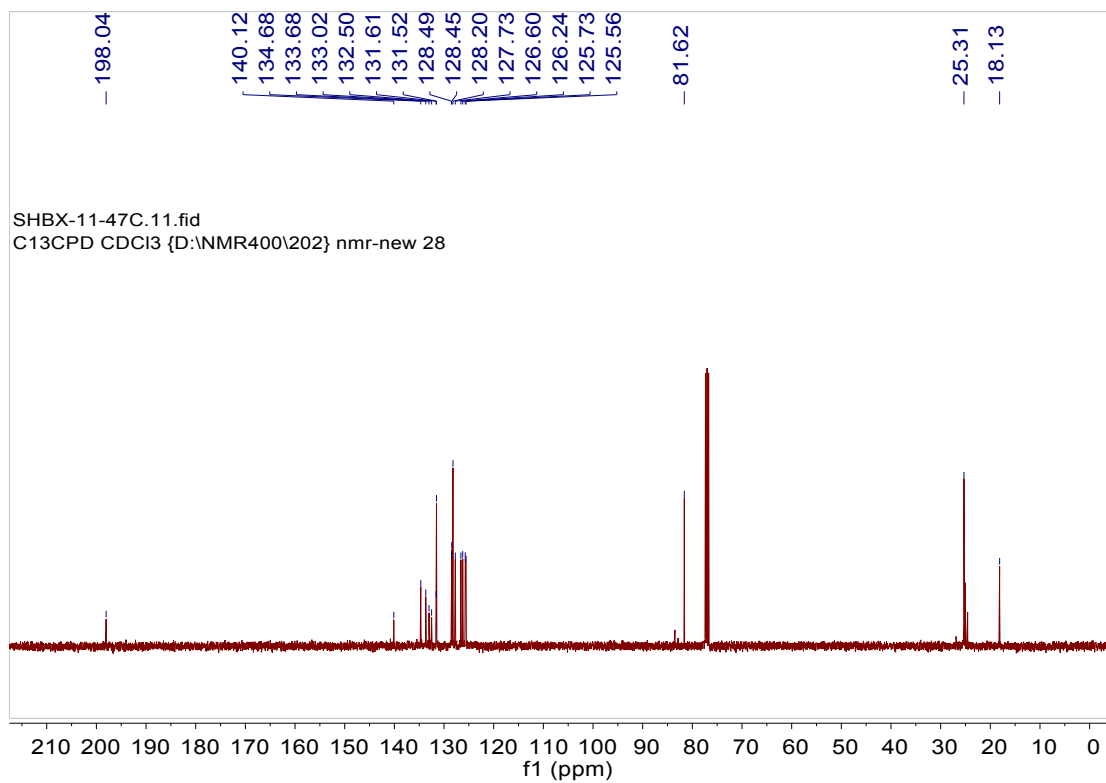


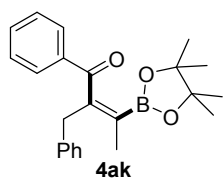
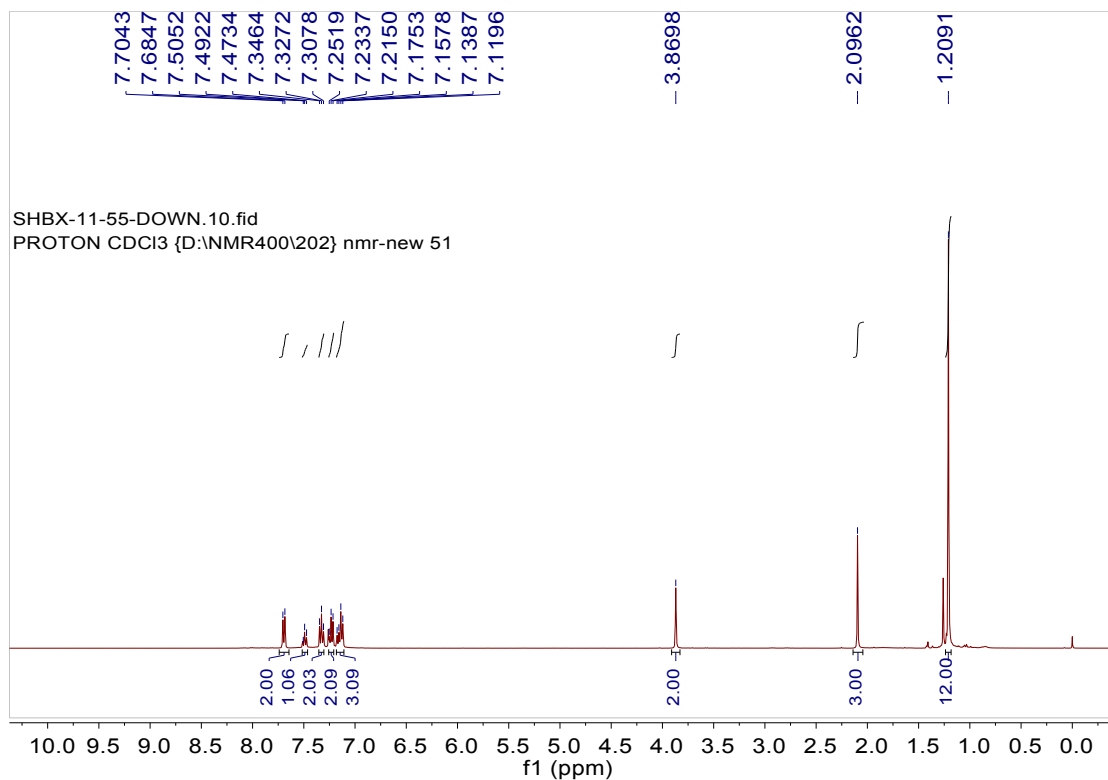


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

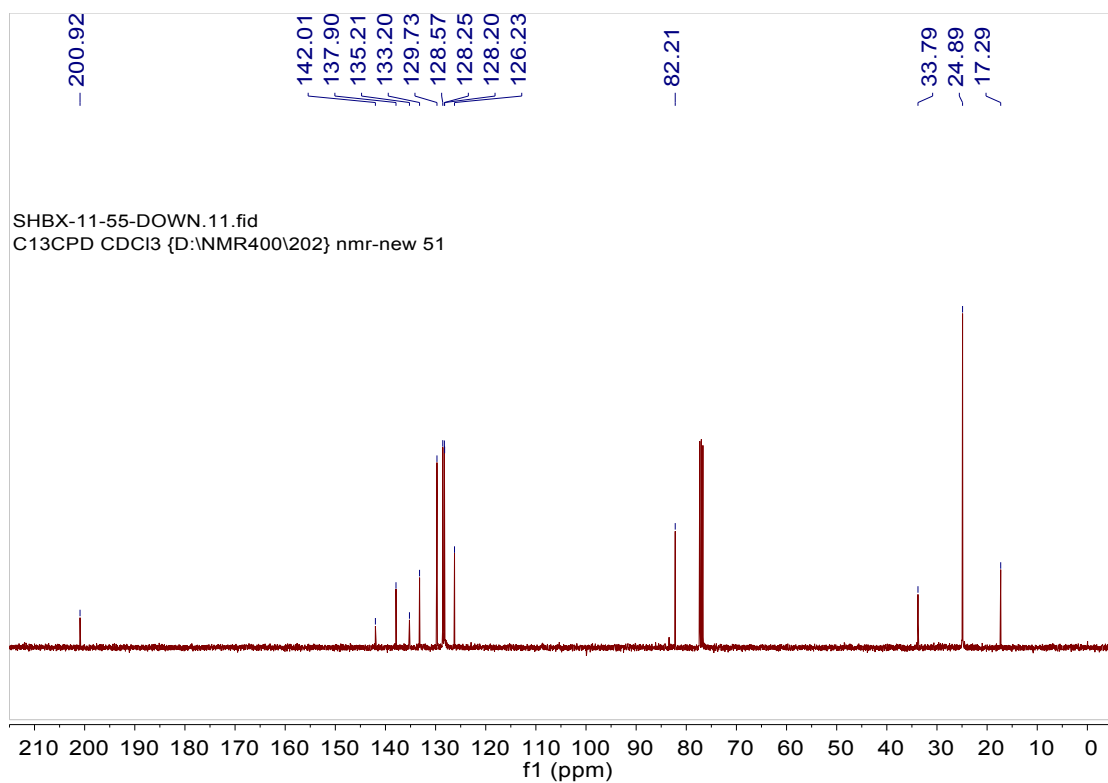
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**4aj/2 = 12/1**

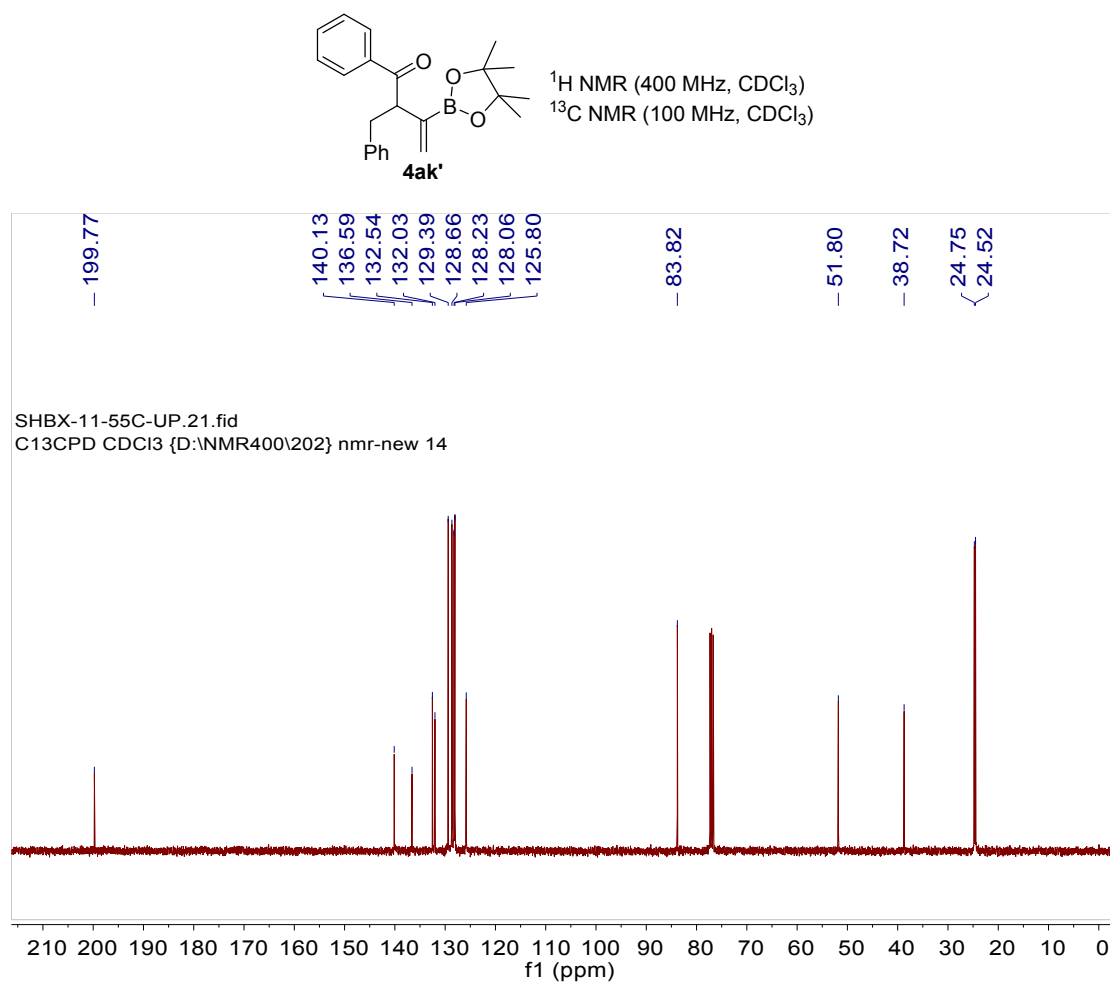
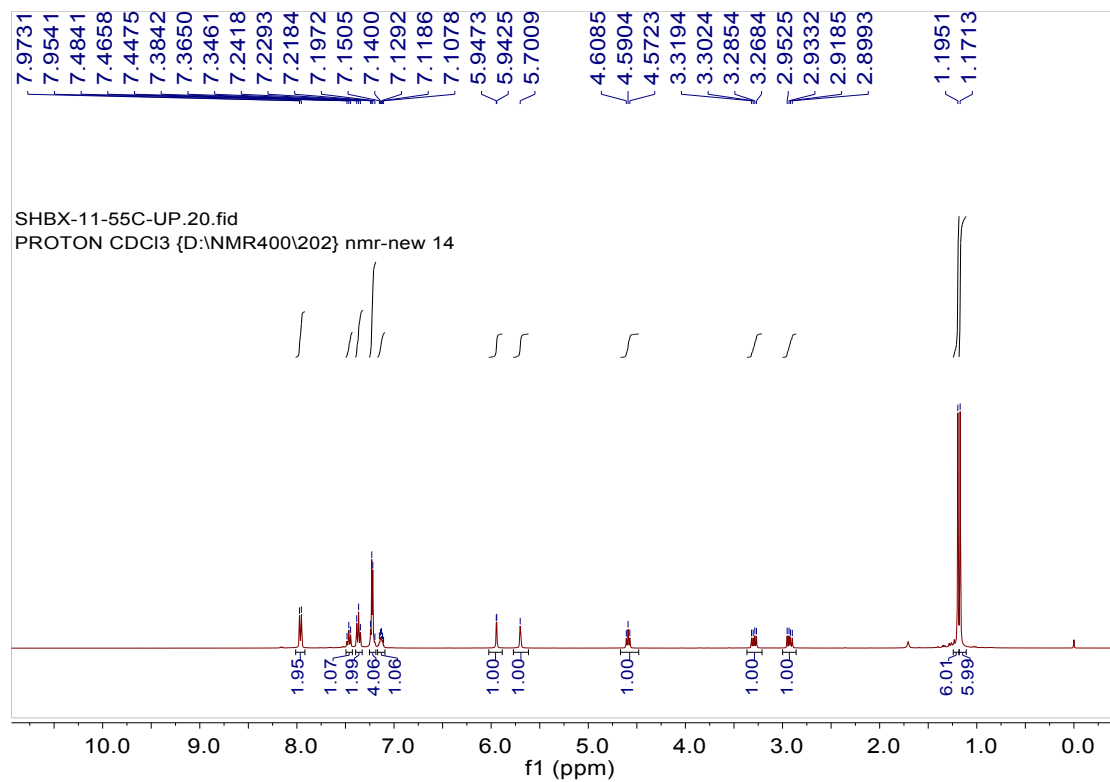


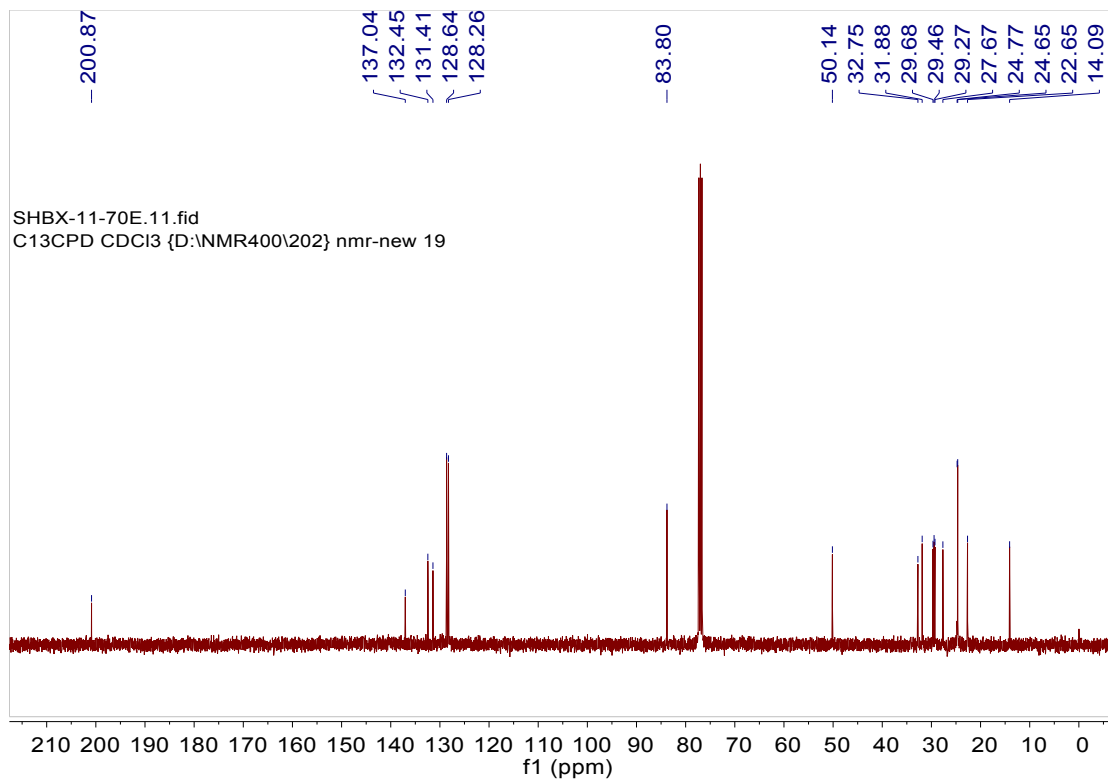
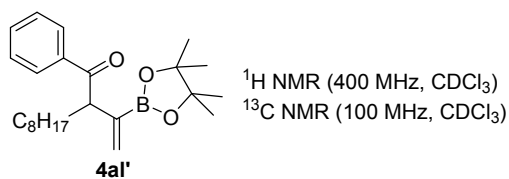
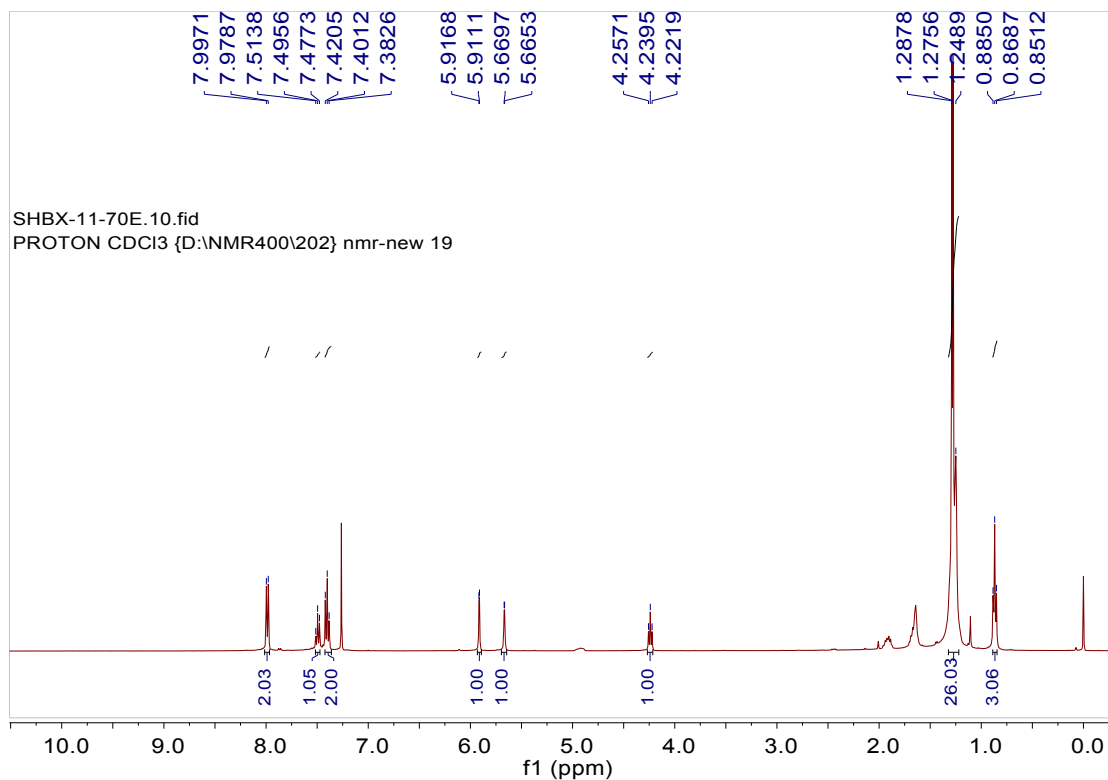


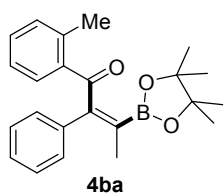
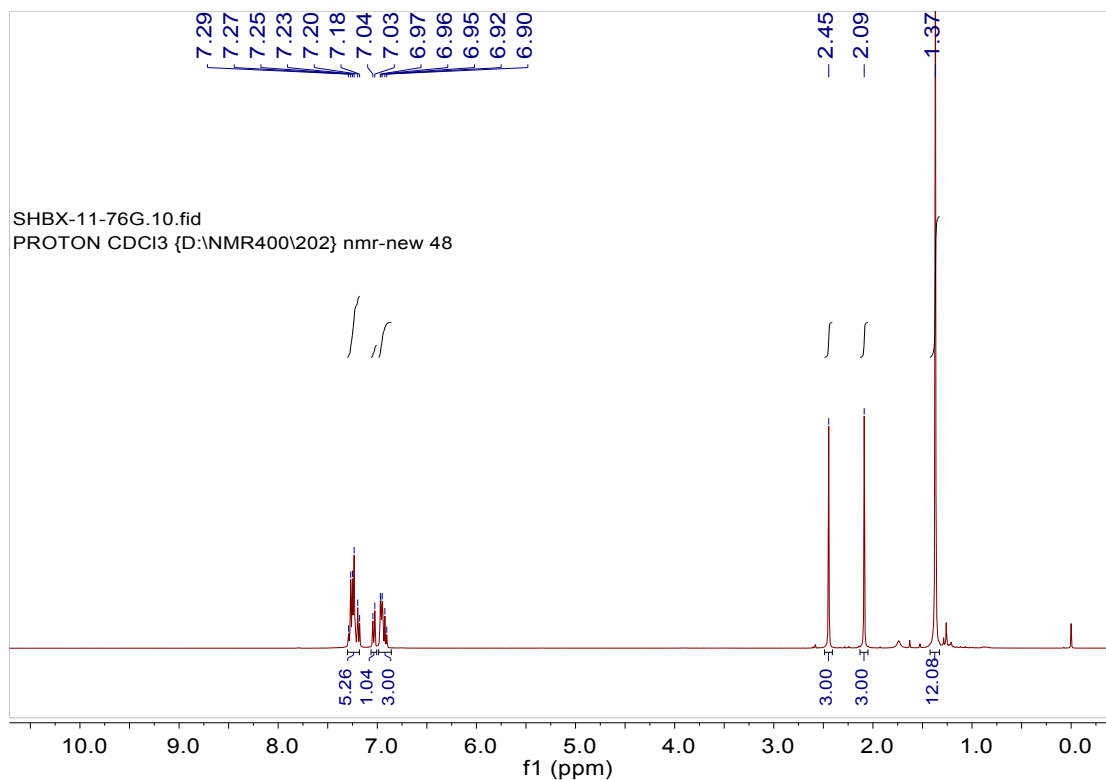
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<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



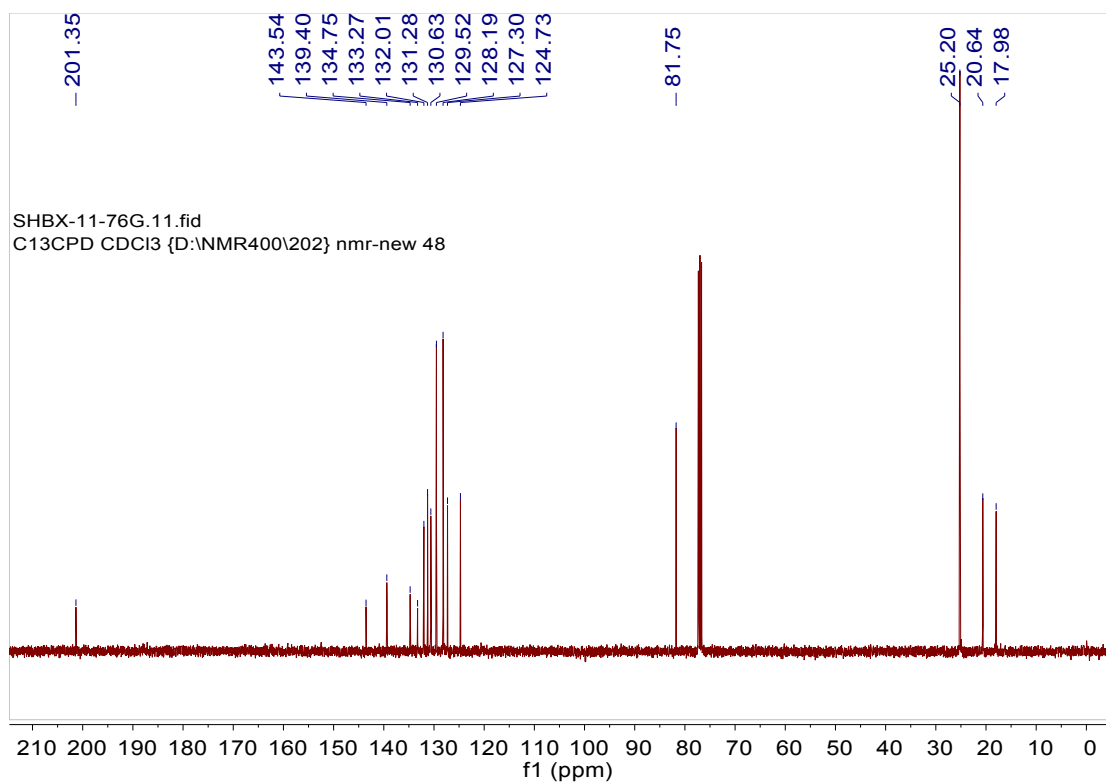


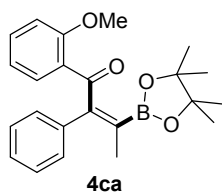
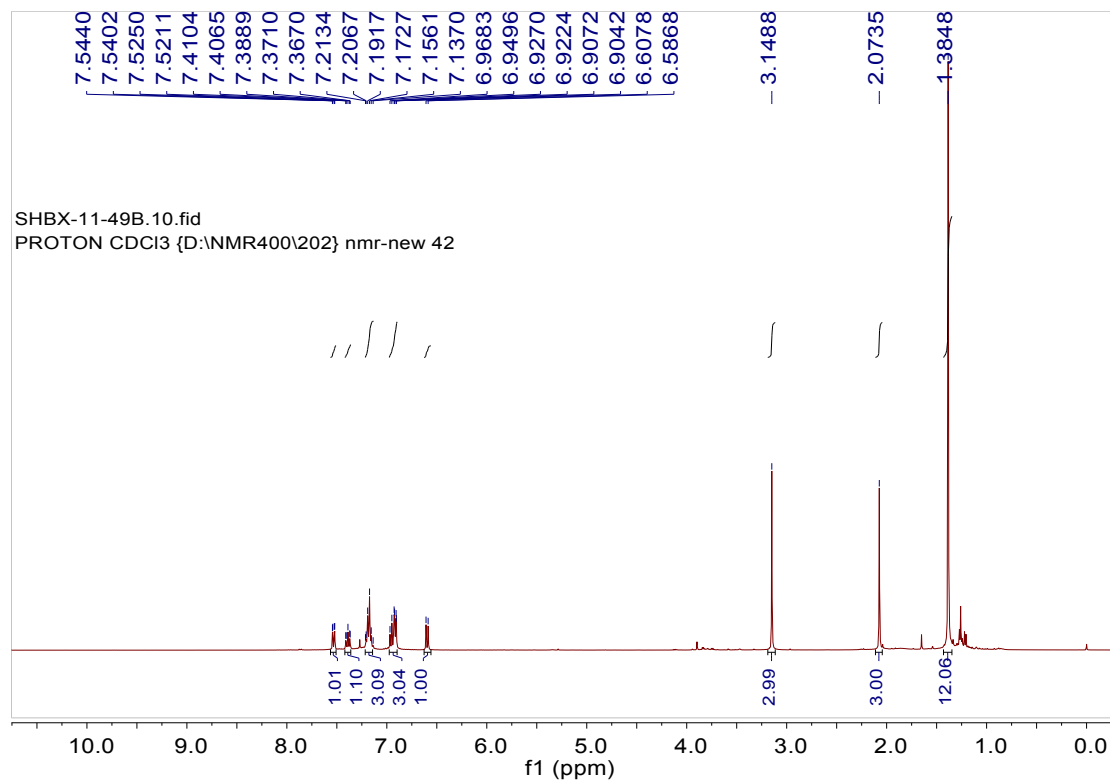




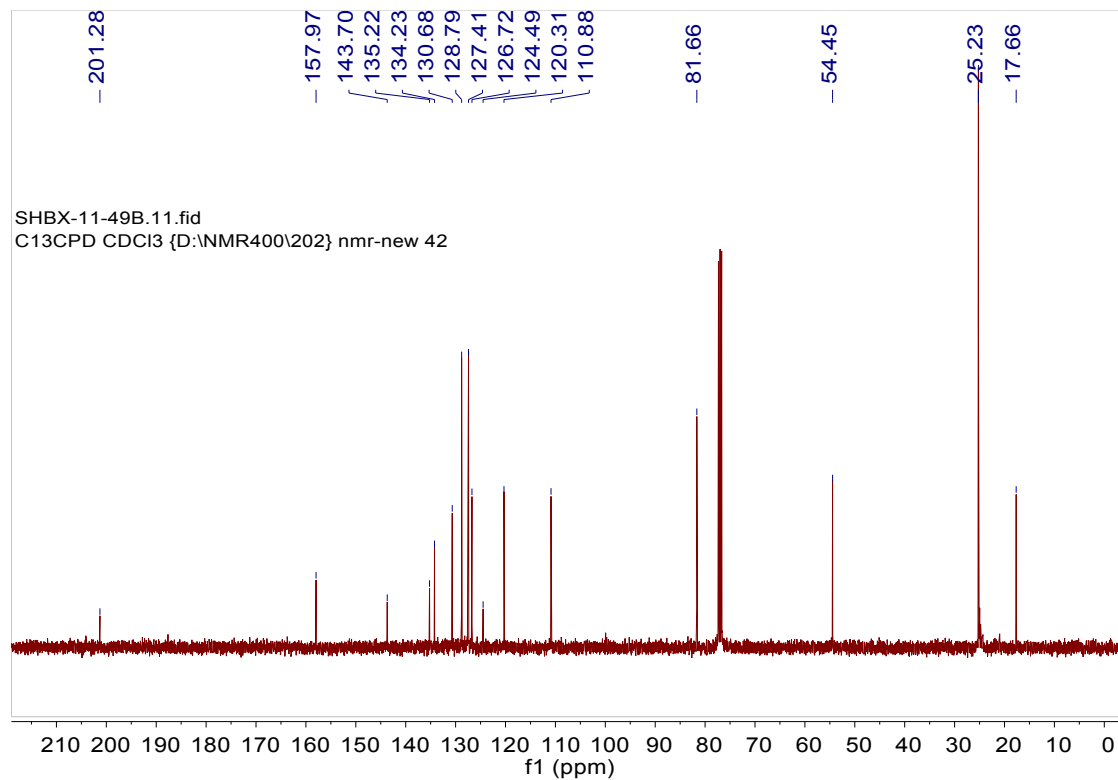


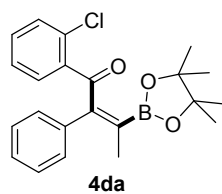
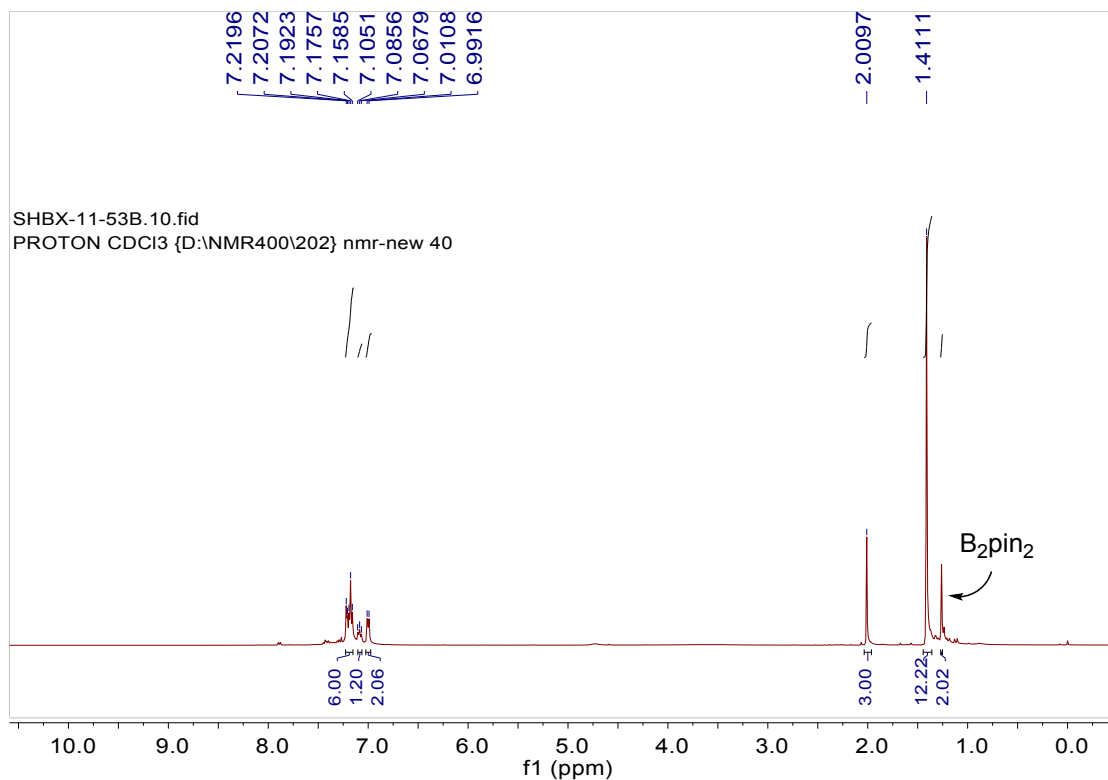
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<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)





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<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

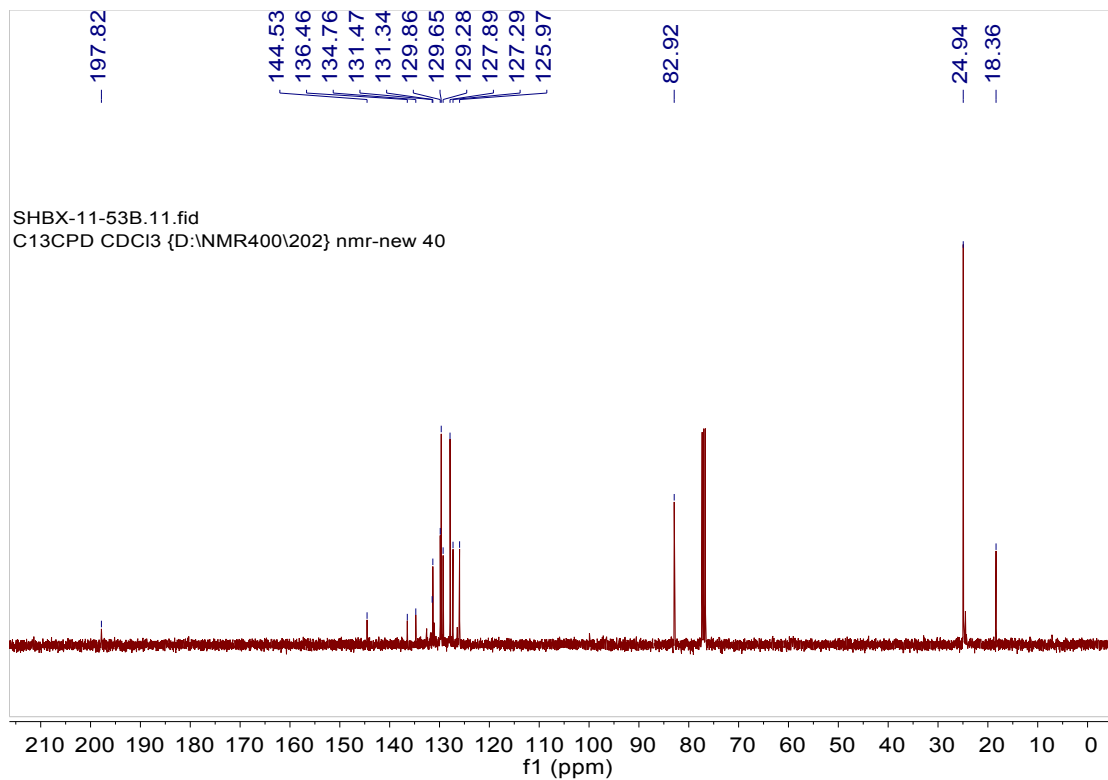


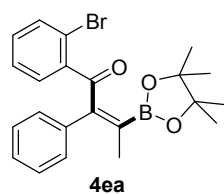
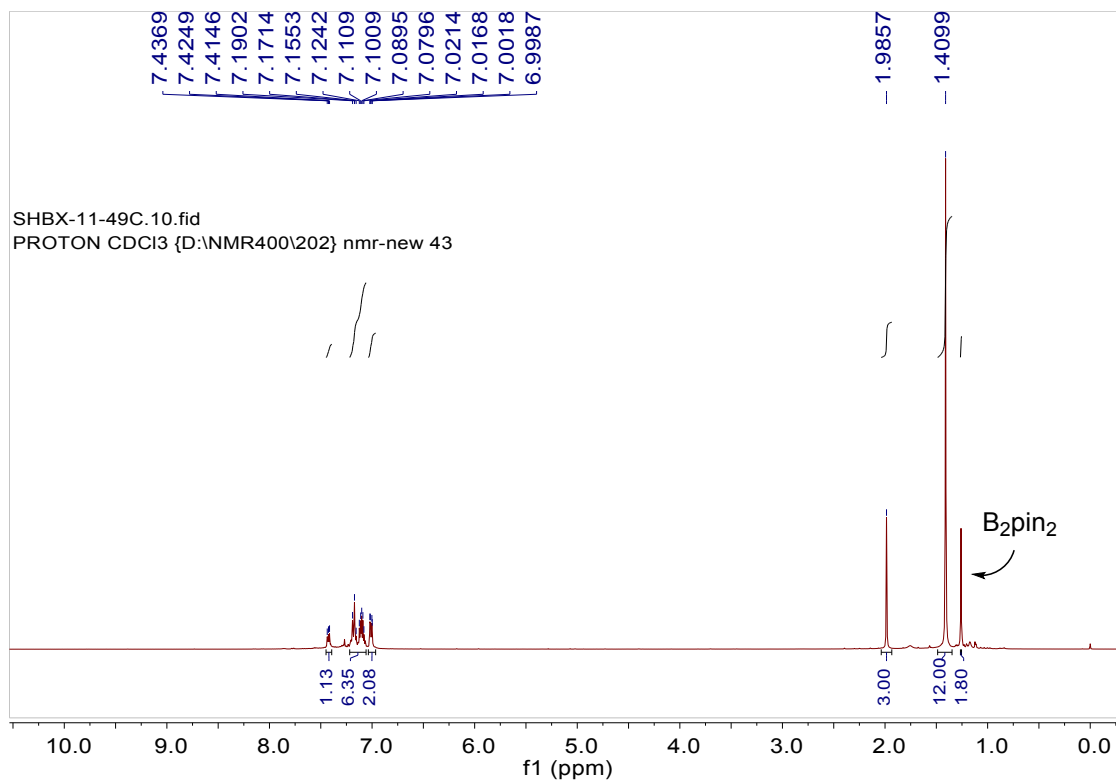


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

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**2**

**4da/2 = 12/1**

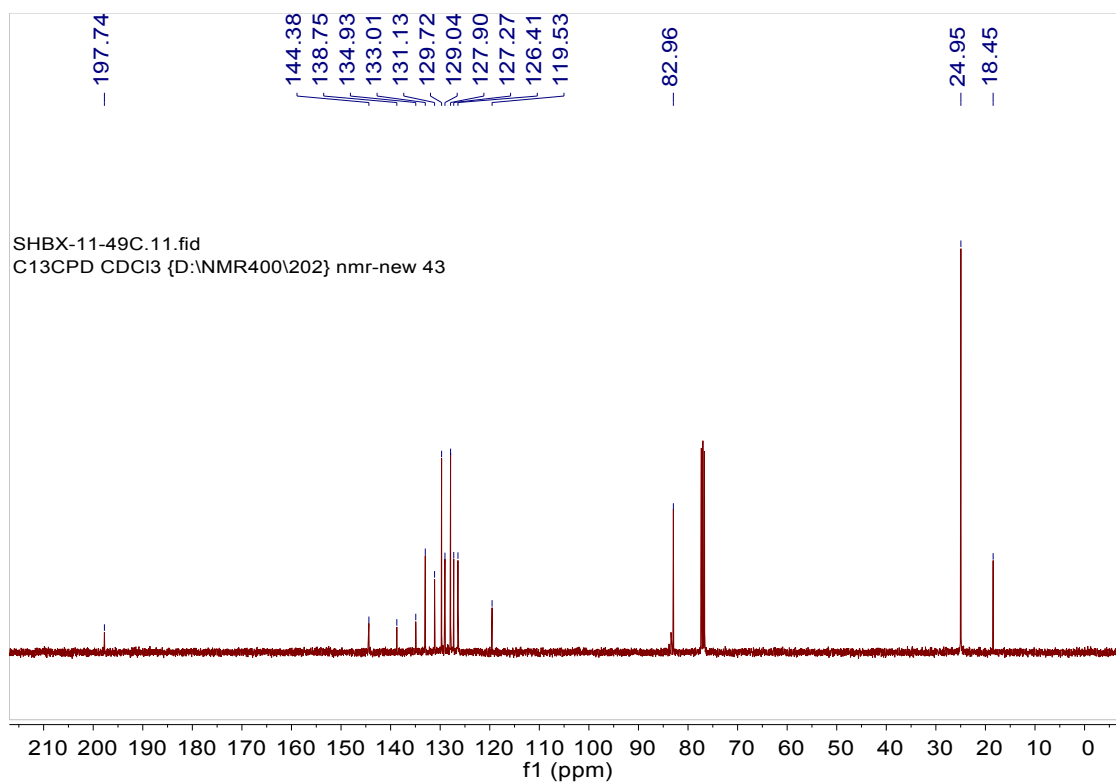


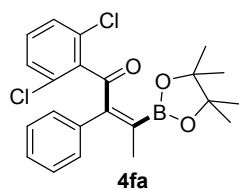
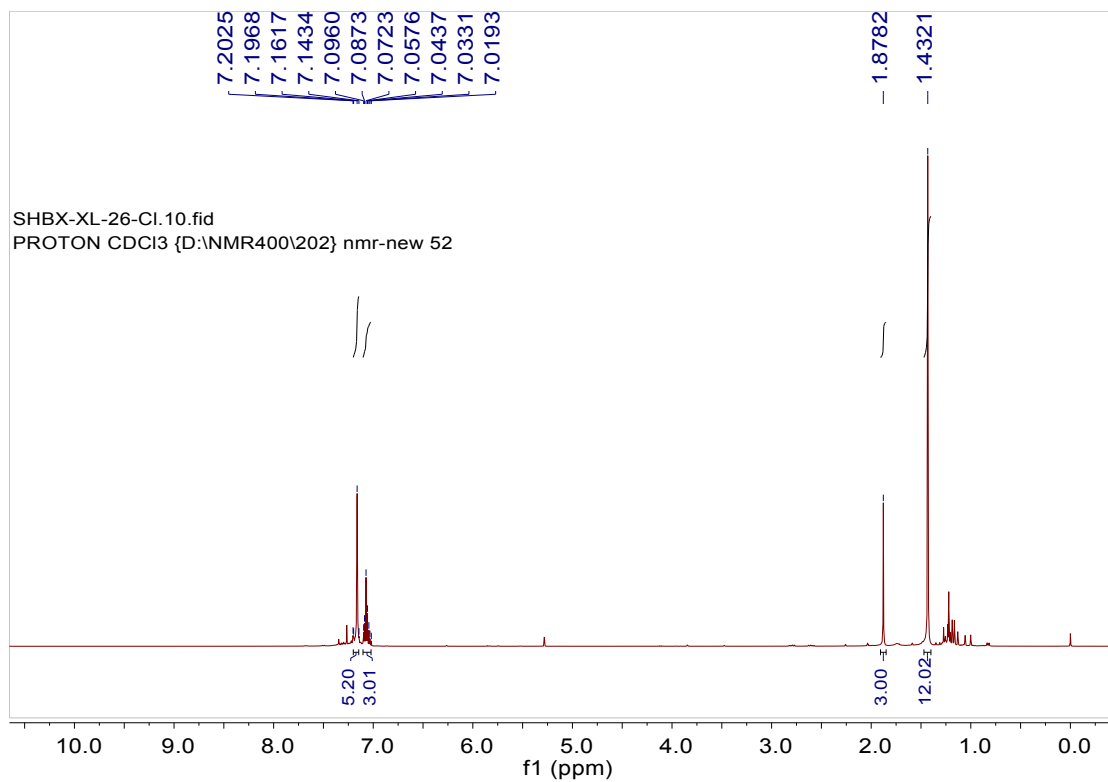


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

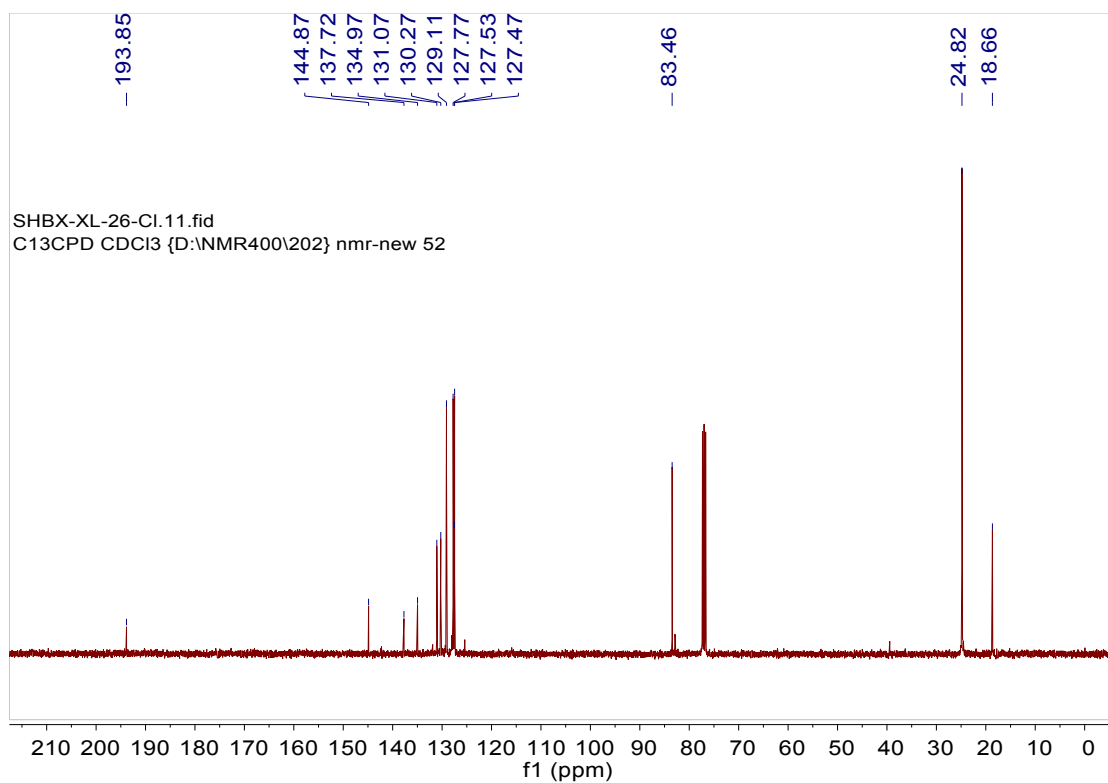
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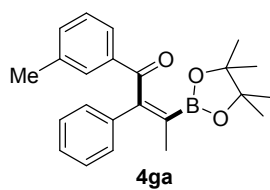
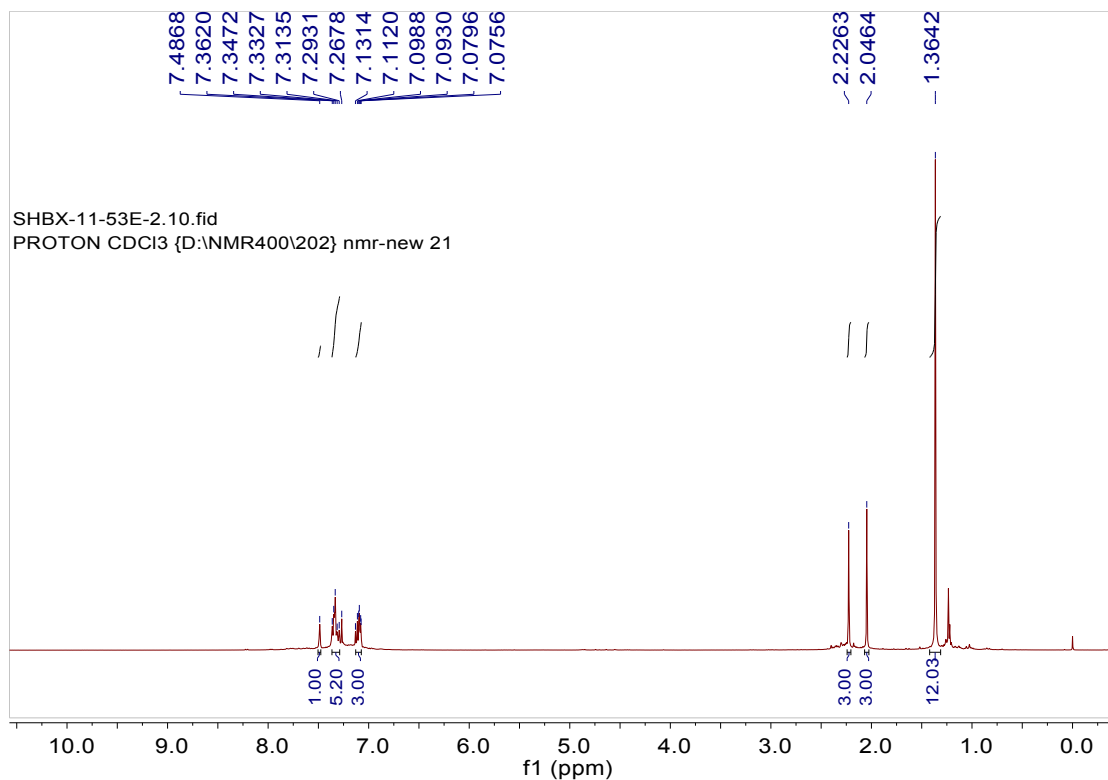
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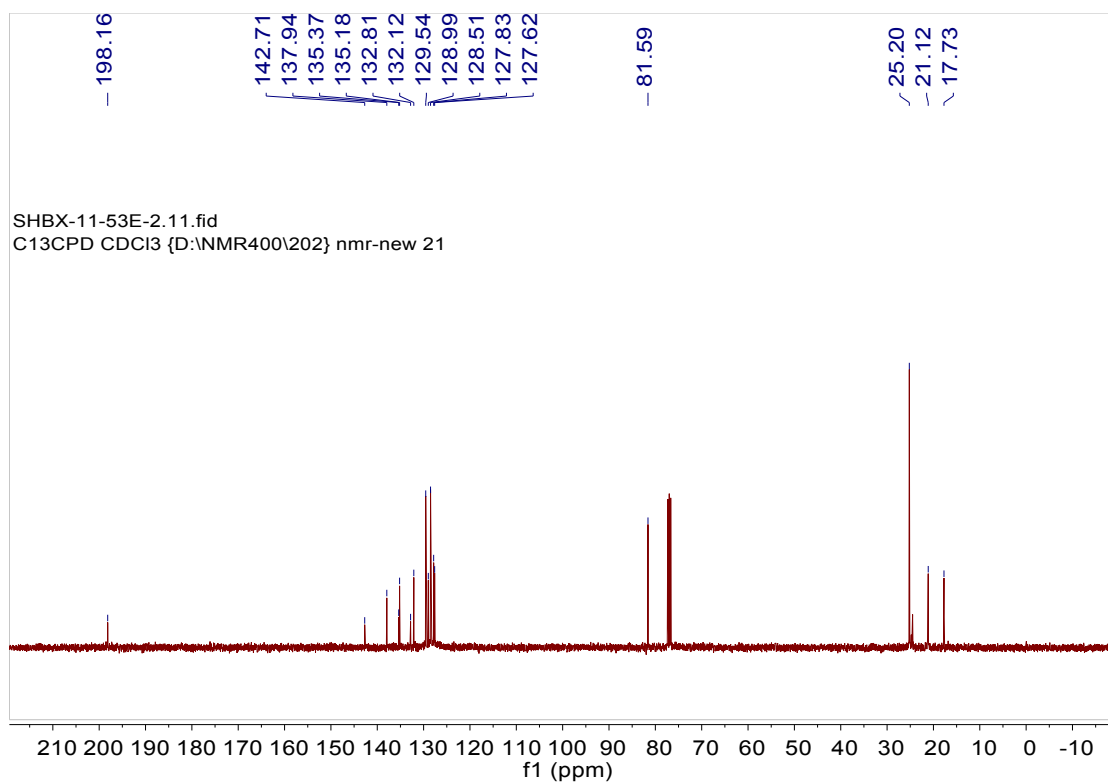


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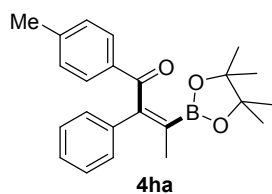
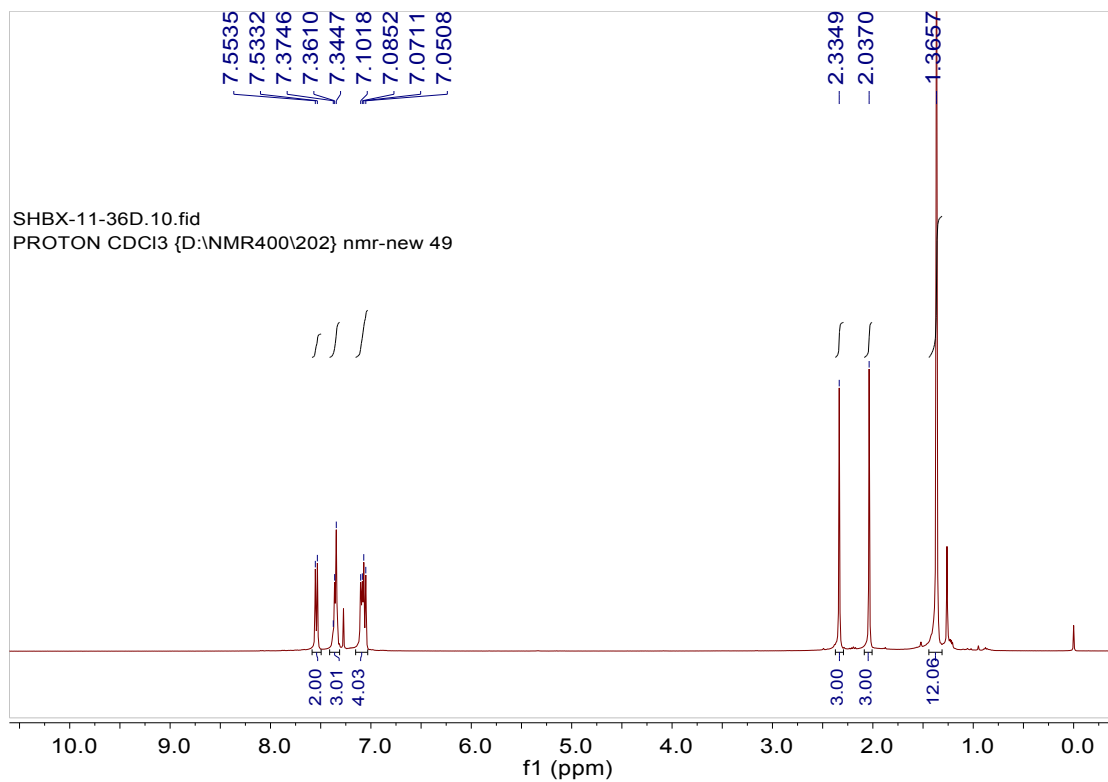




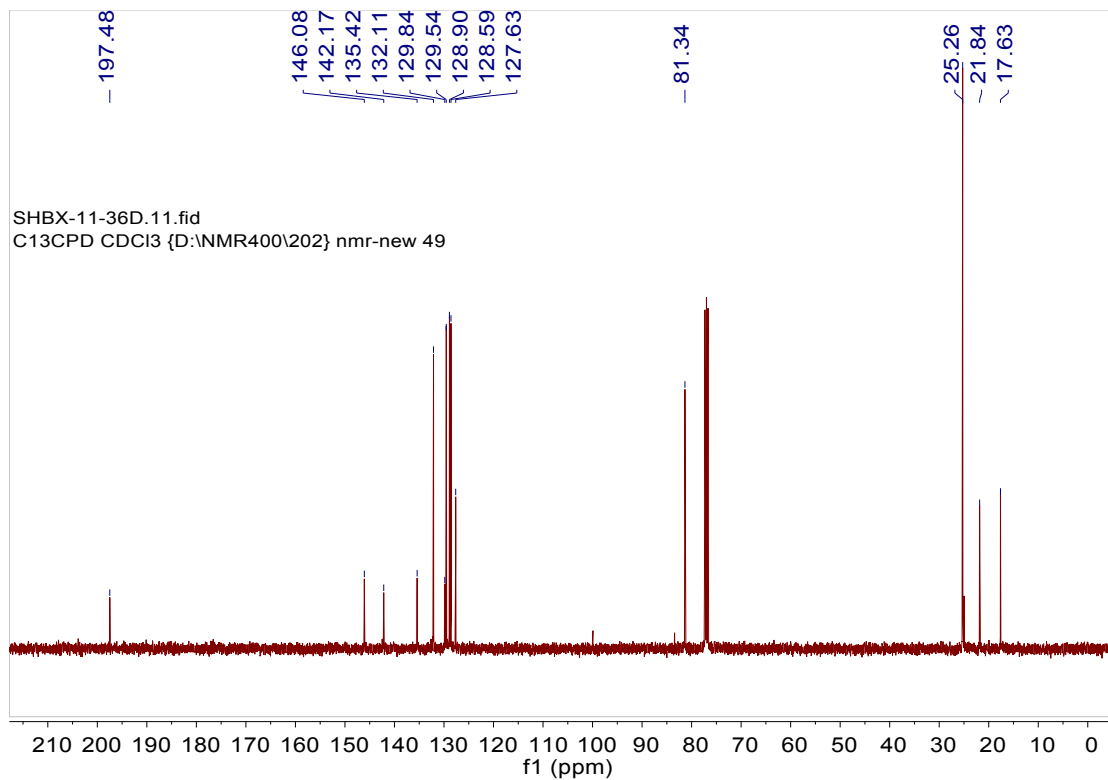
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

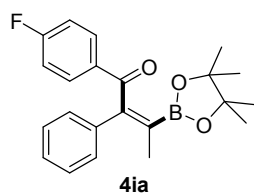
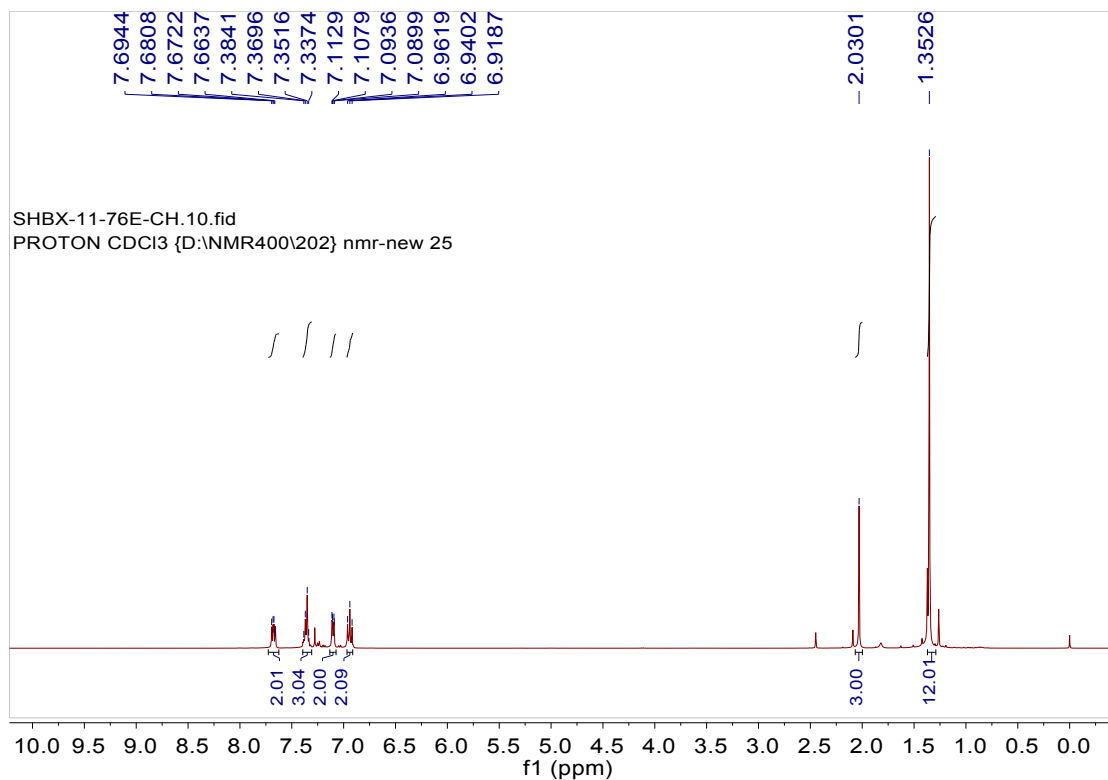




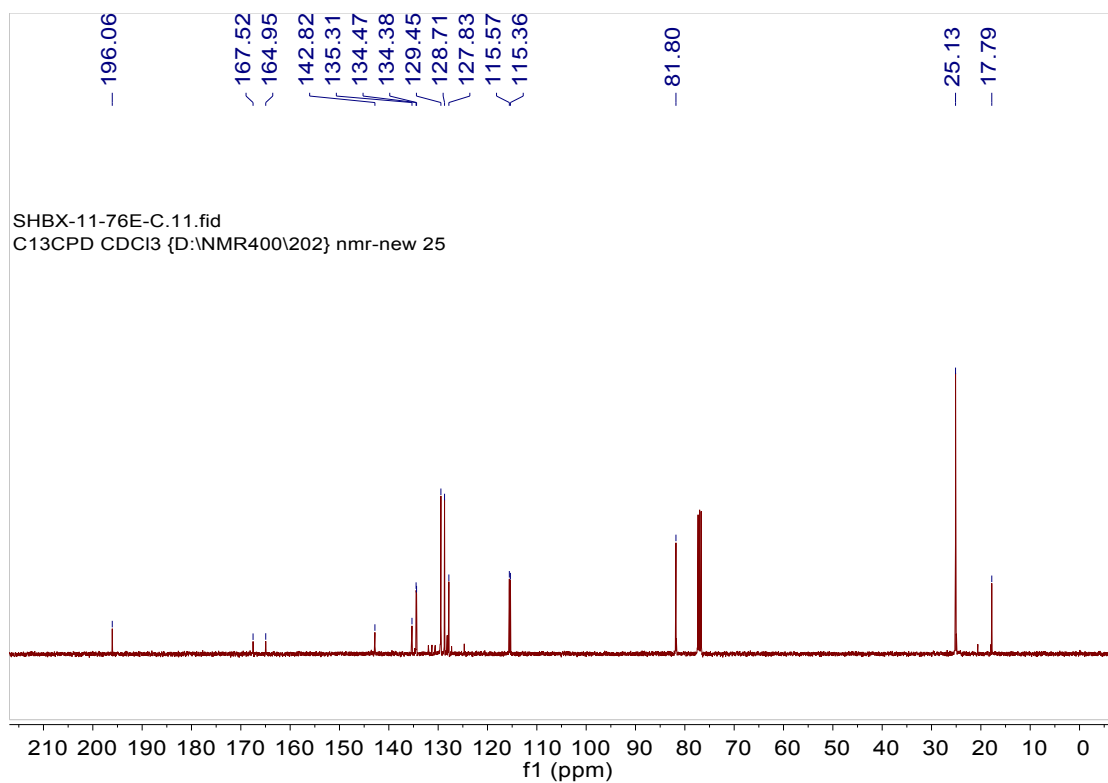


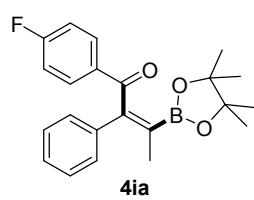
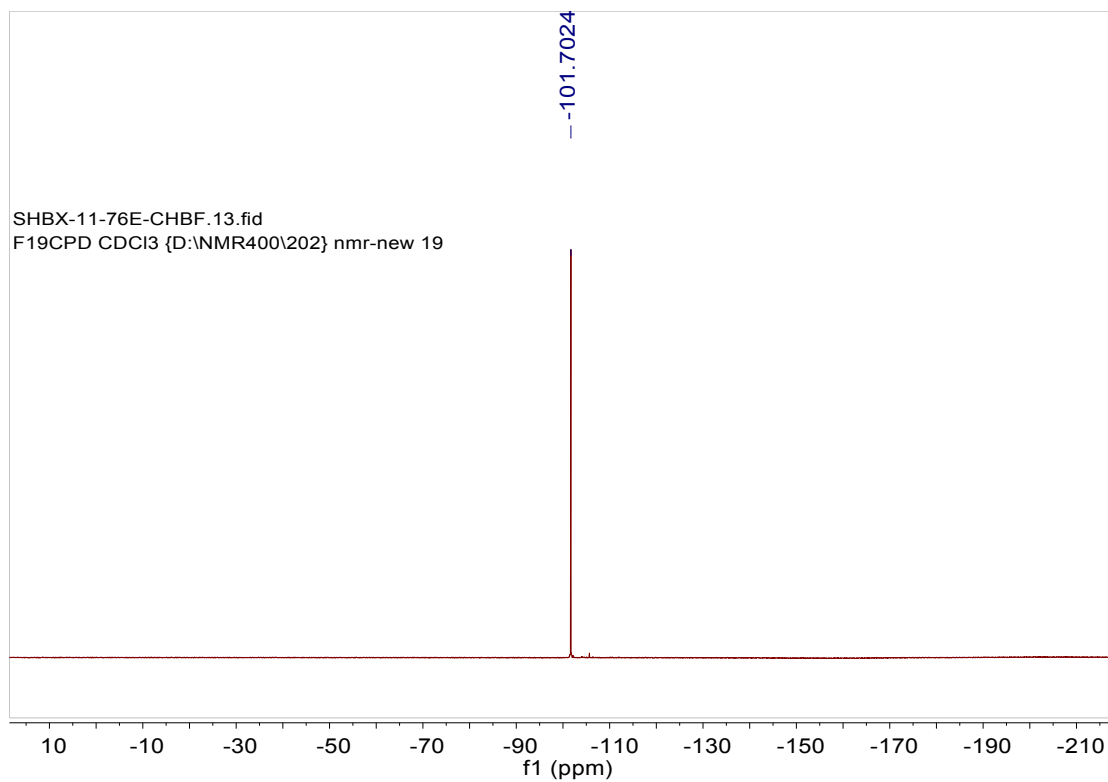
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



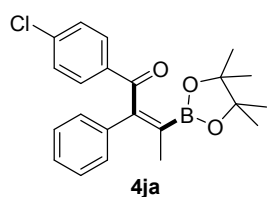
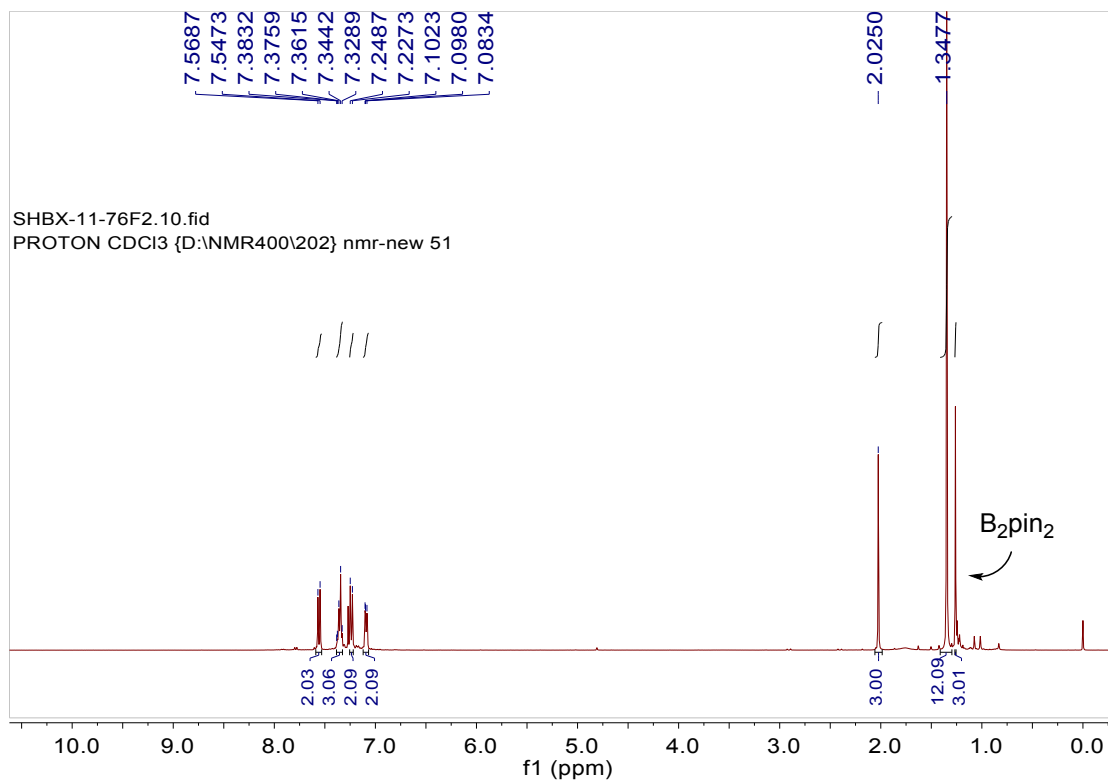


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)





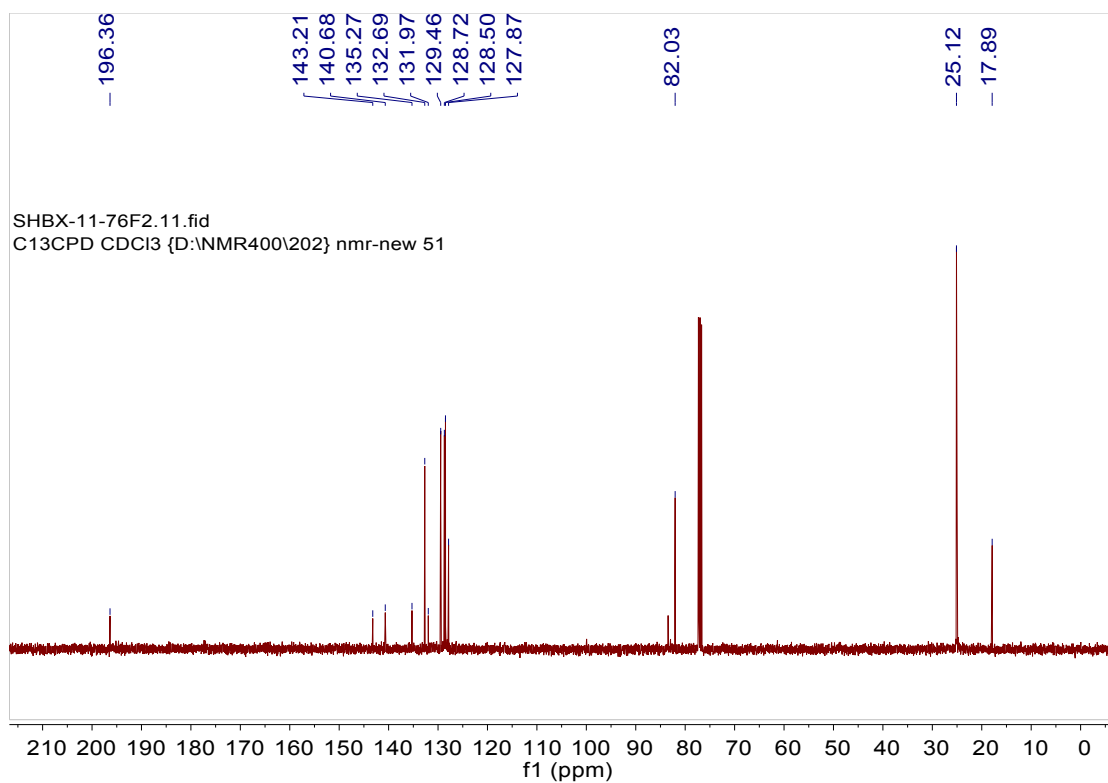
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

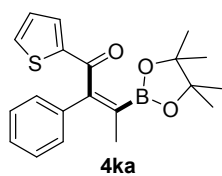
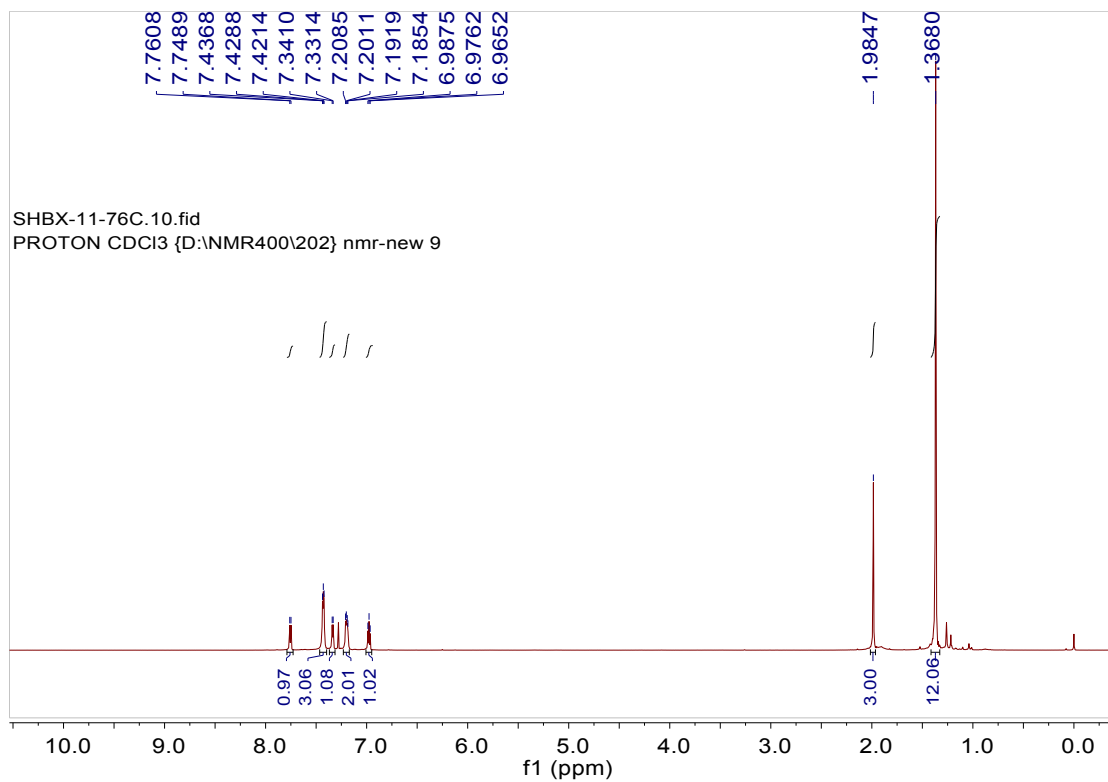


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

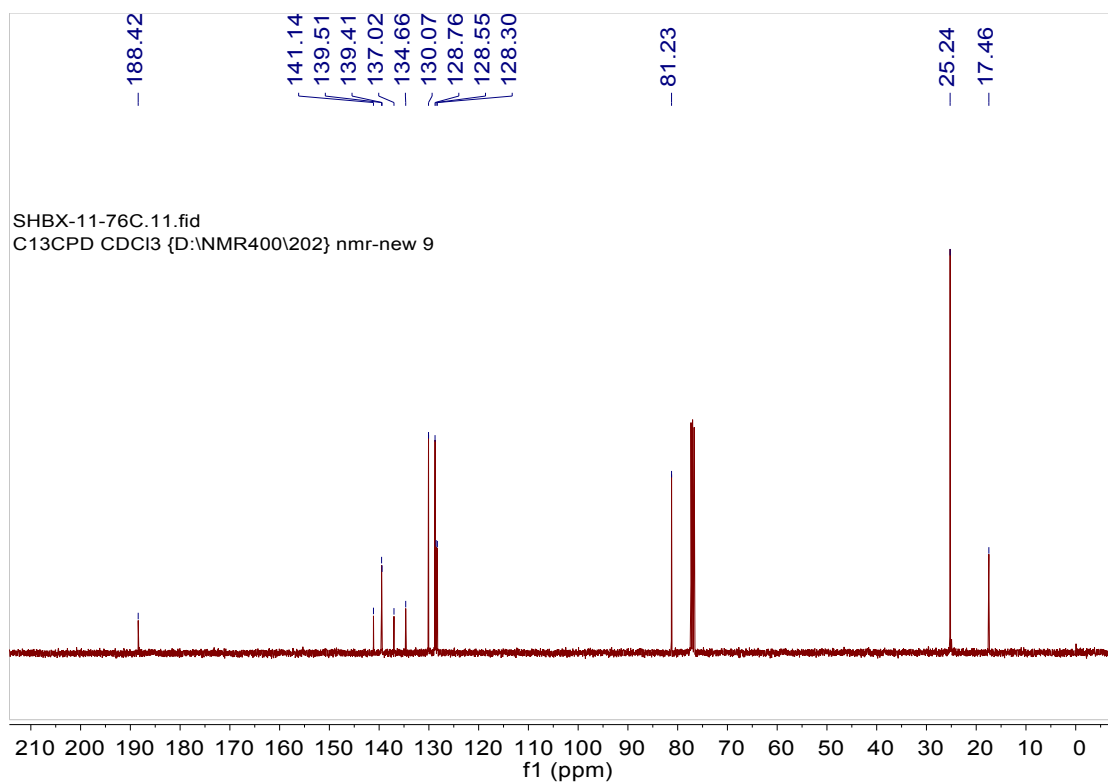
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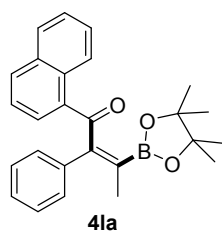
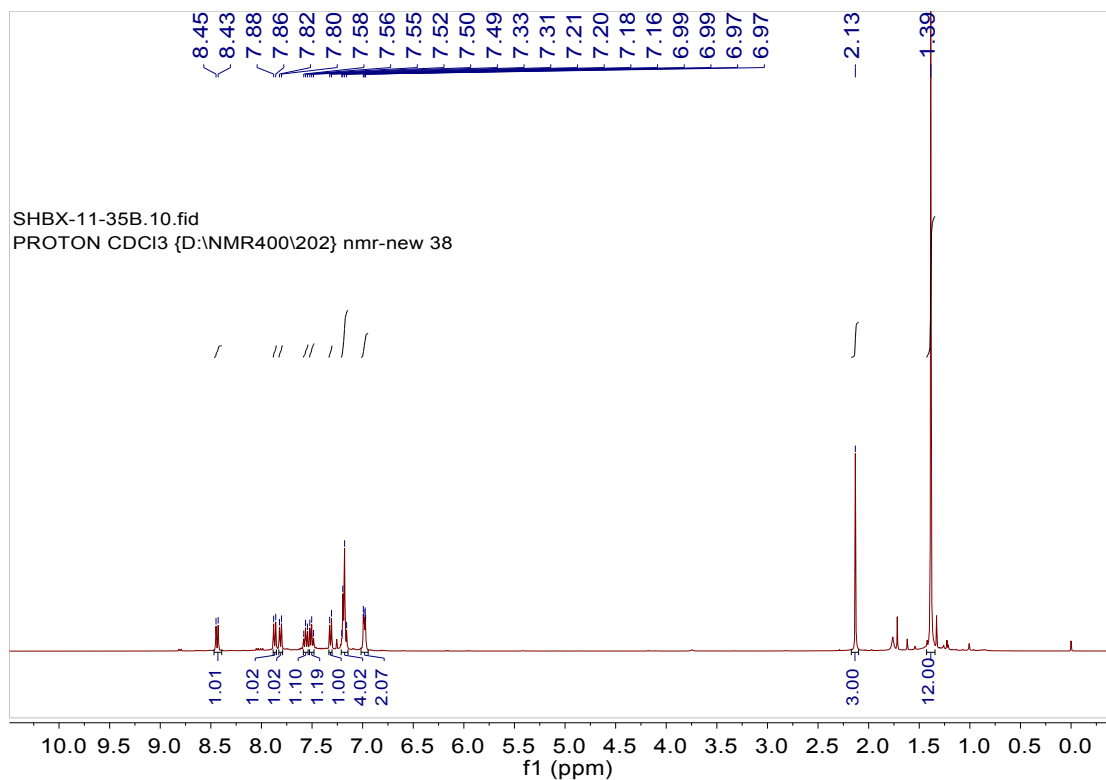
**4ja/2 = 8/1**



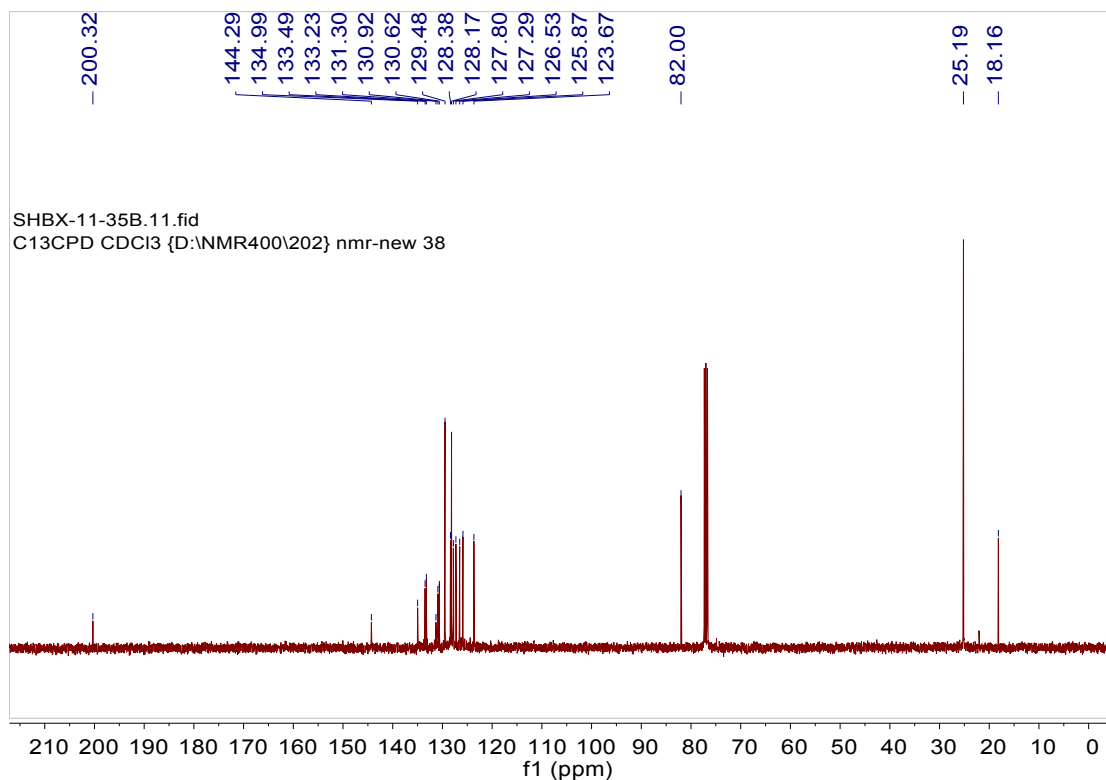


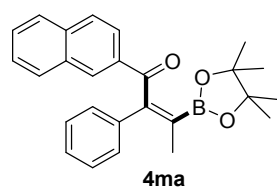
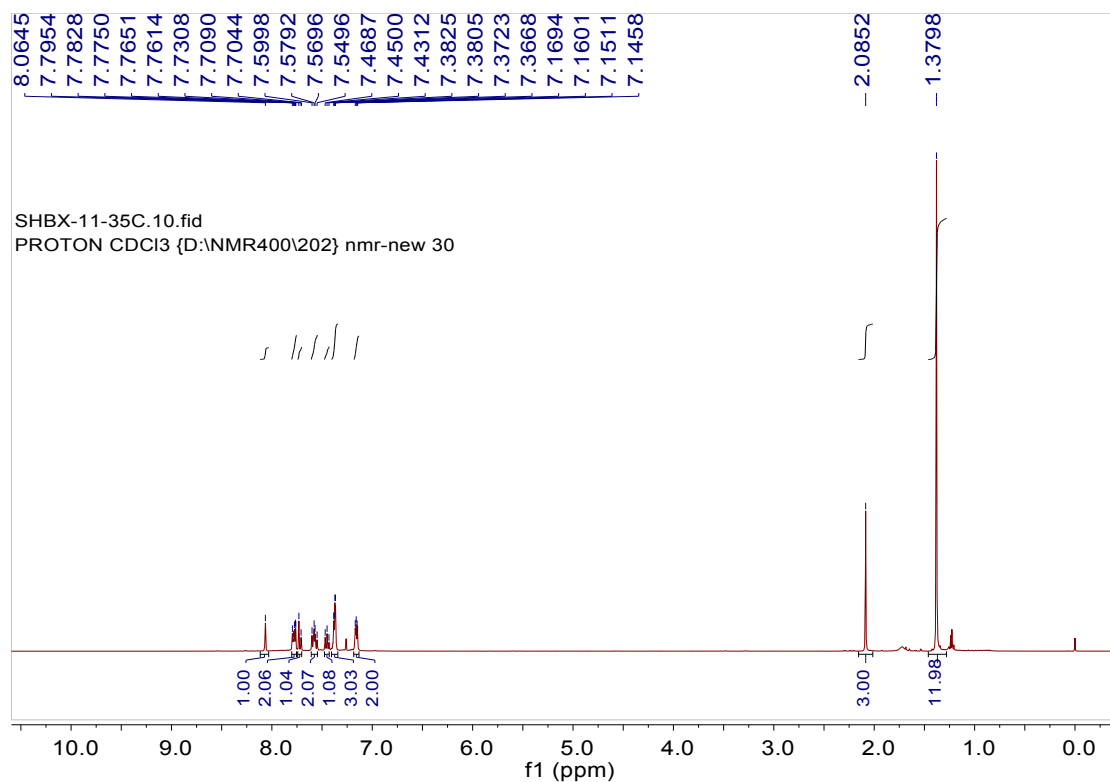
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



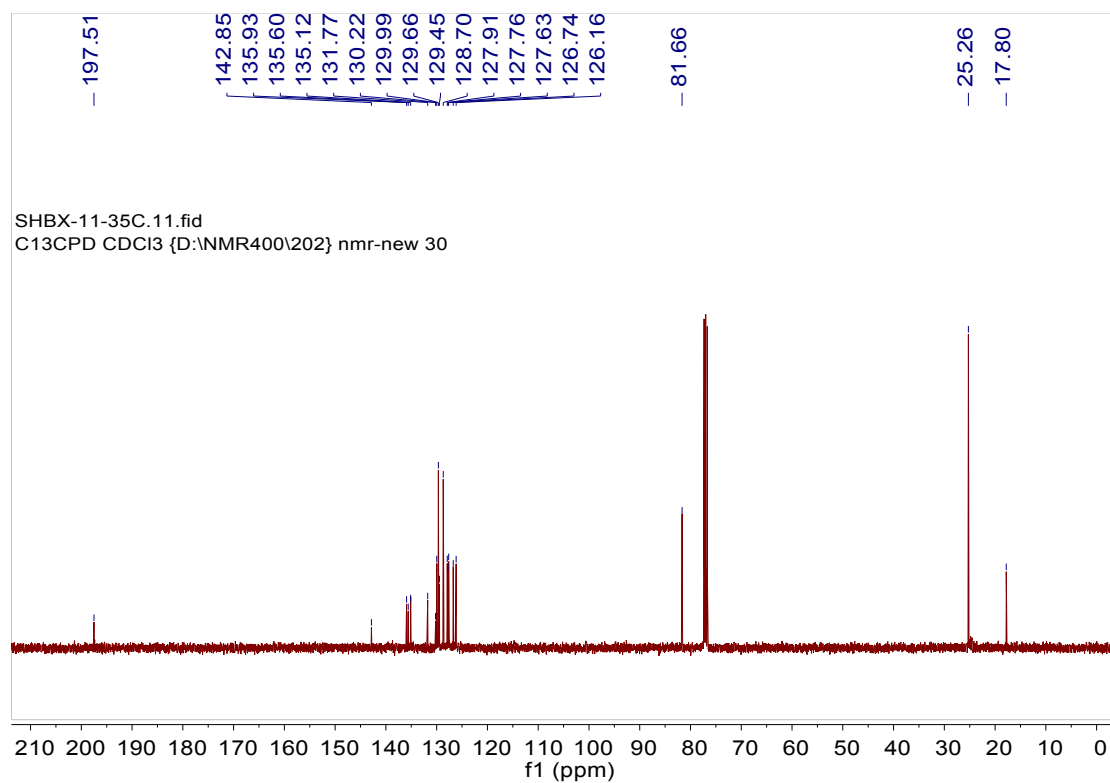


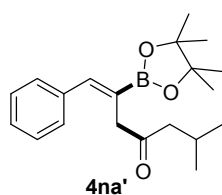
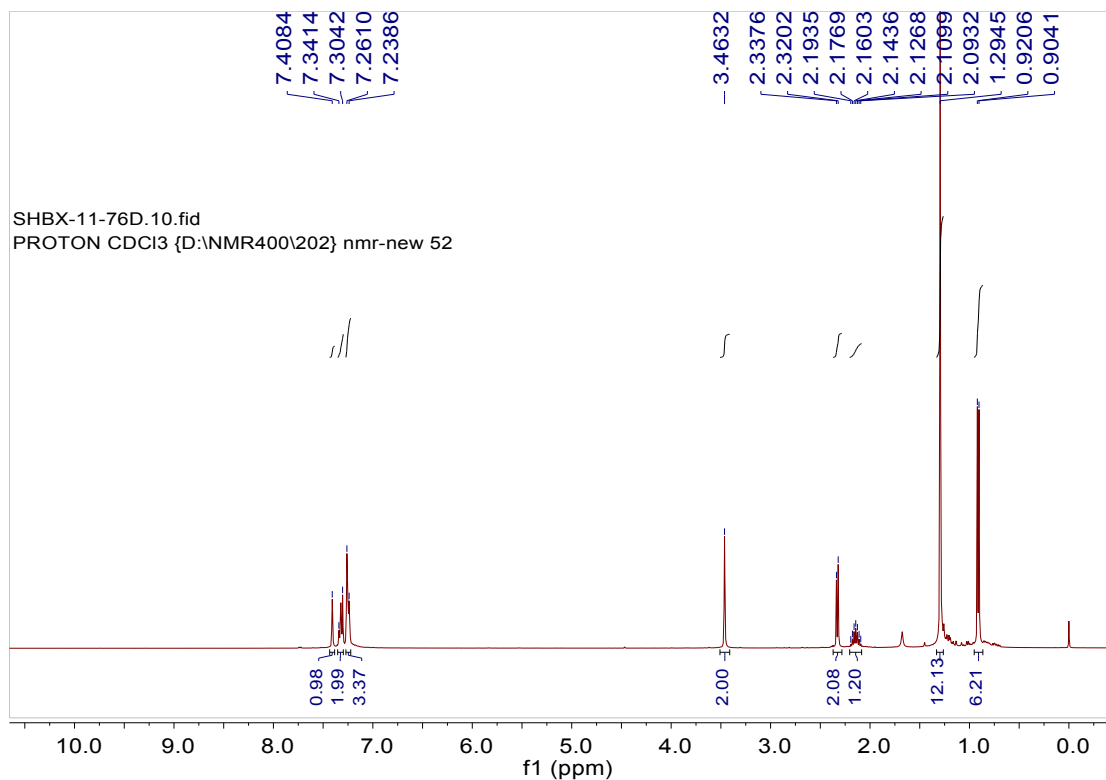
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



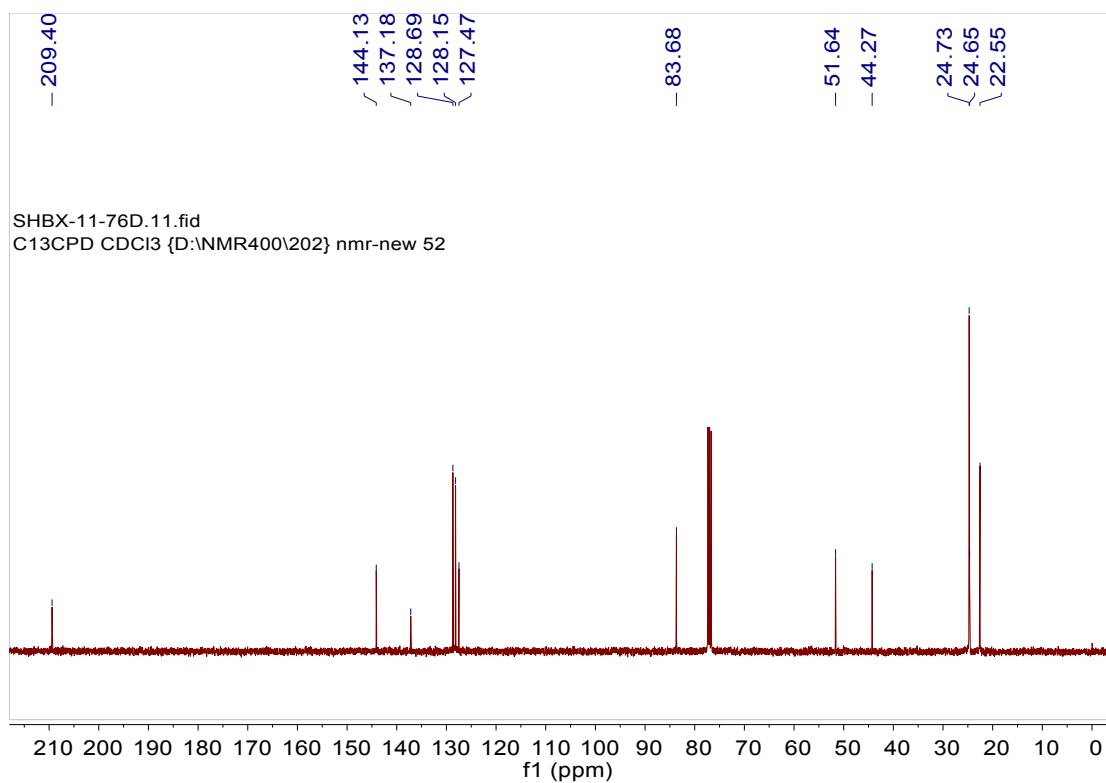


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

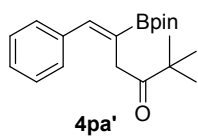
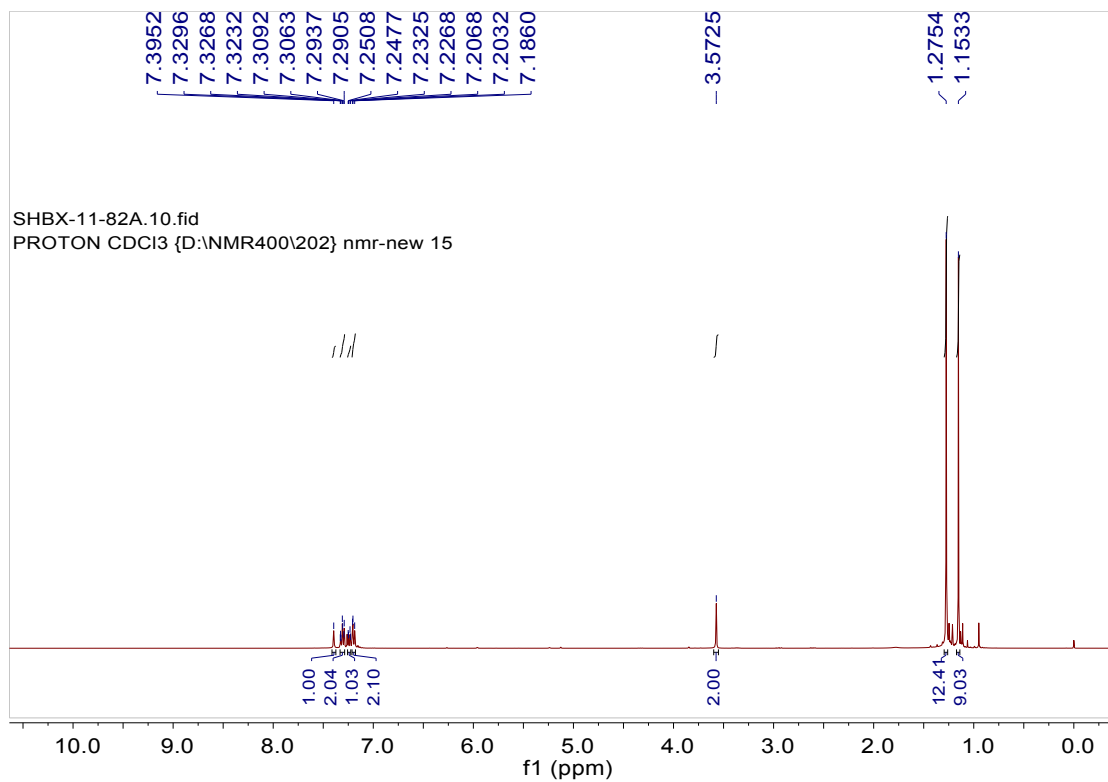




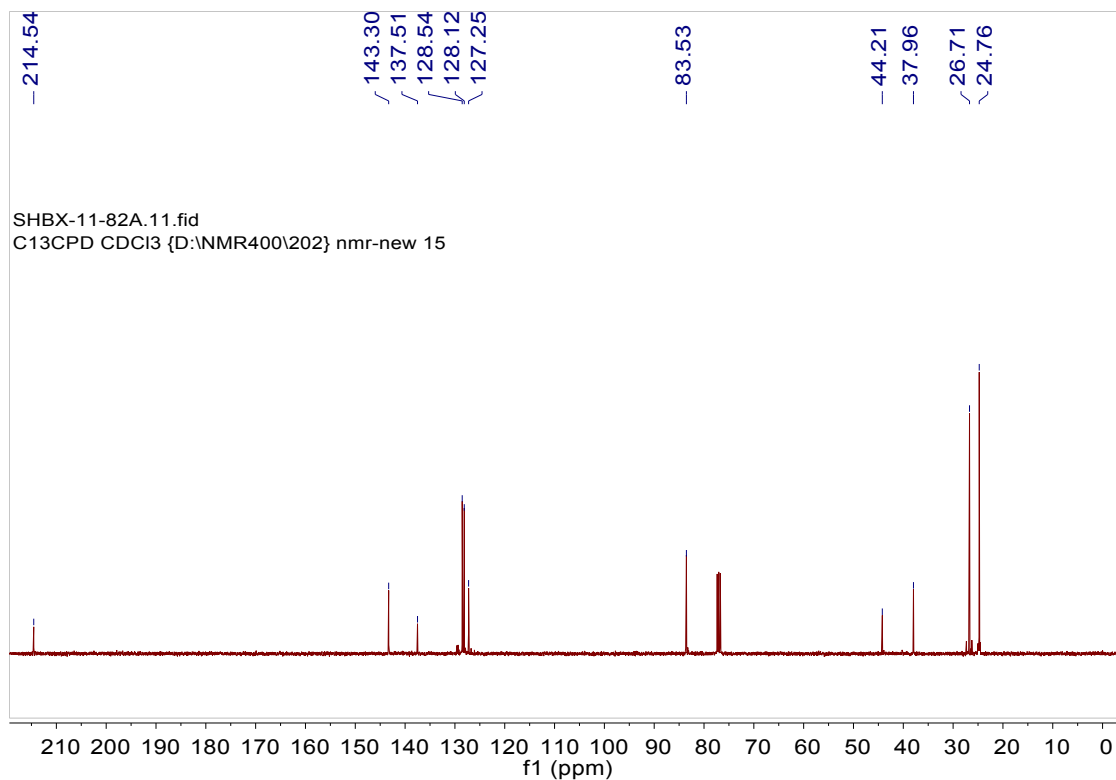
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<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

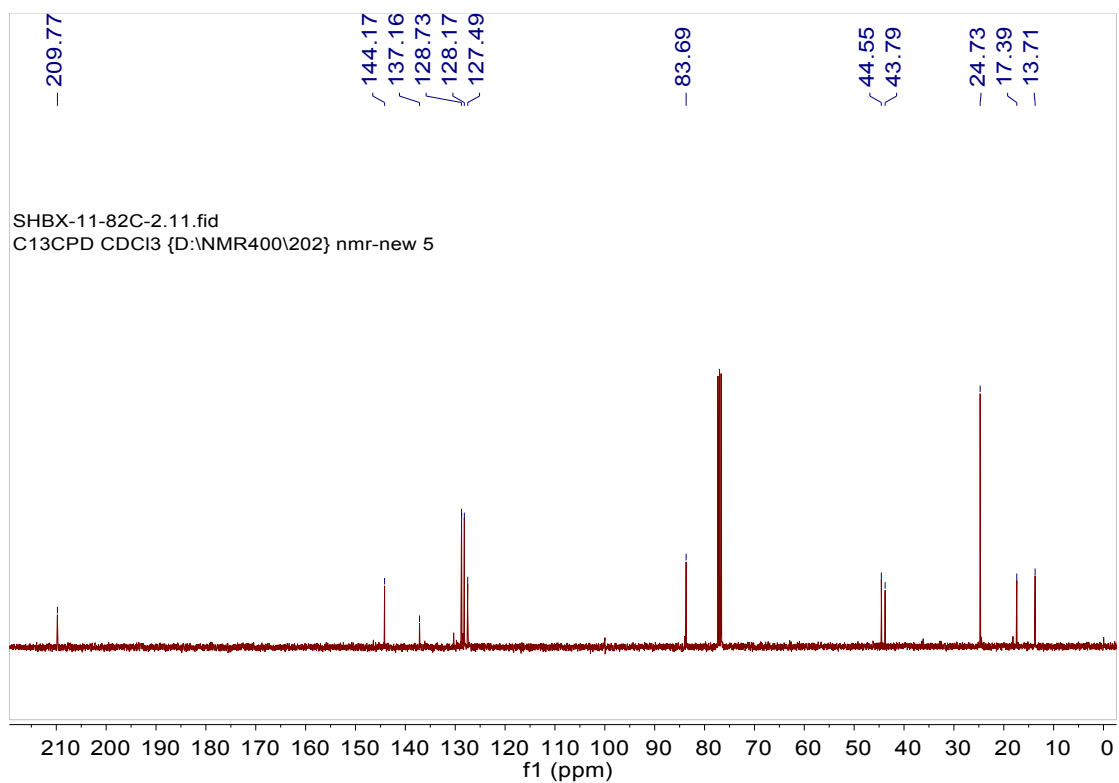
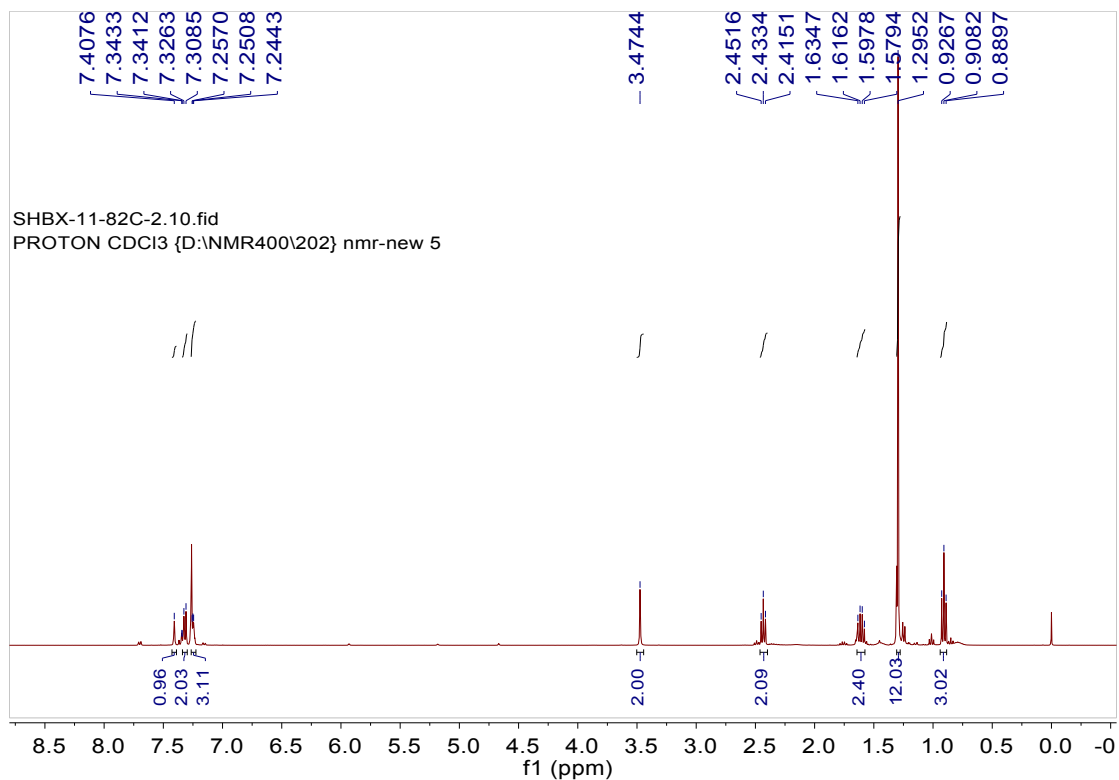


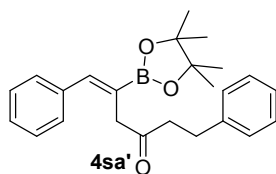
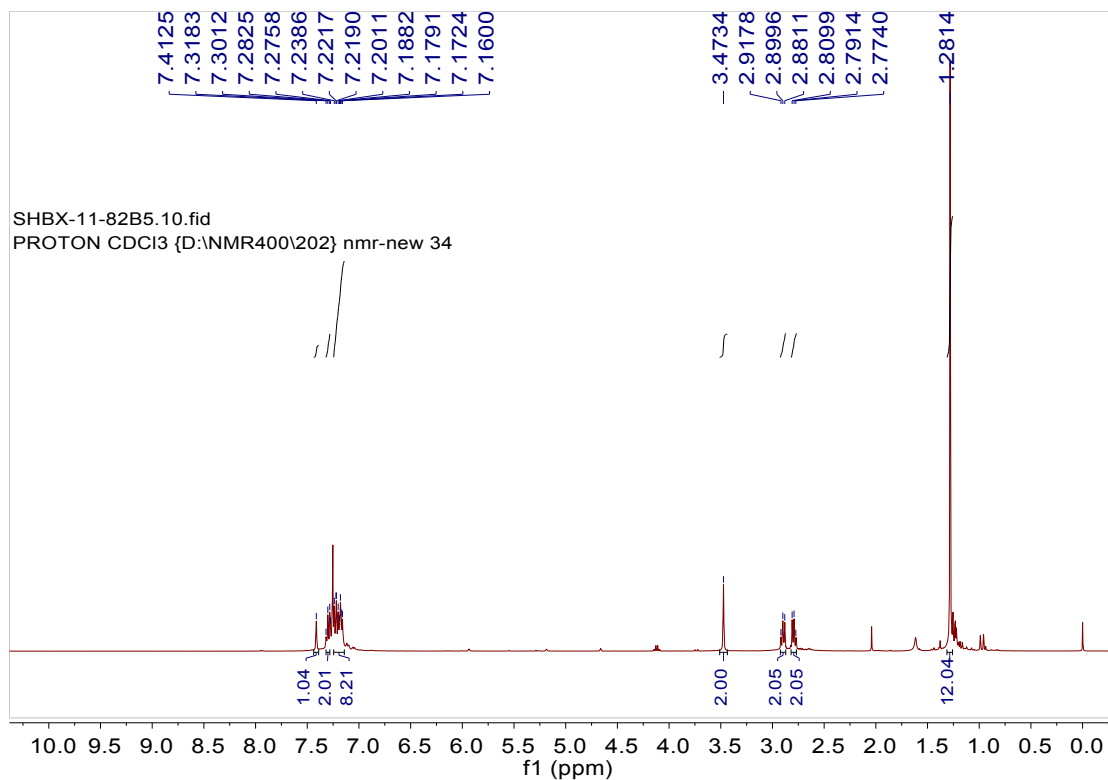




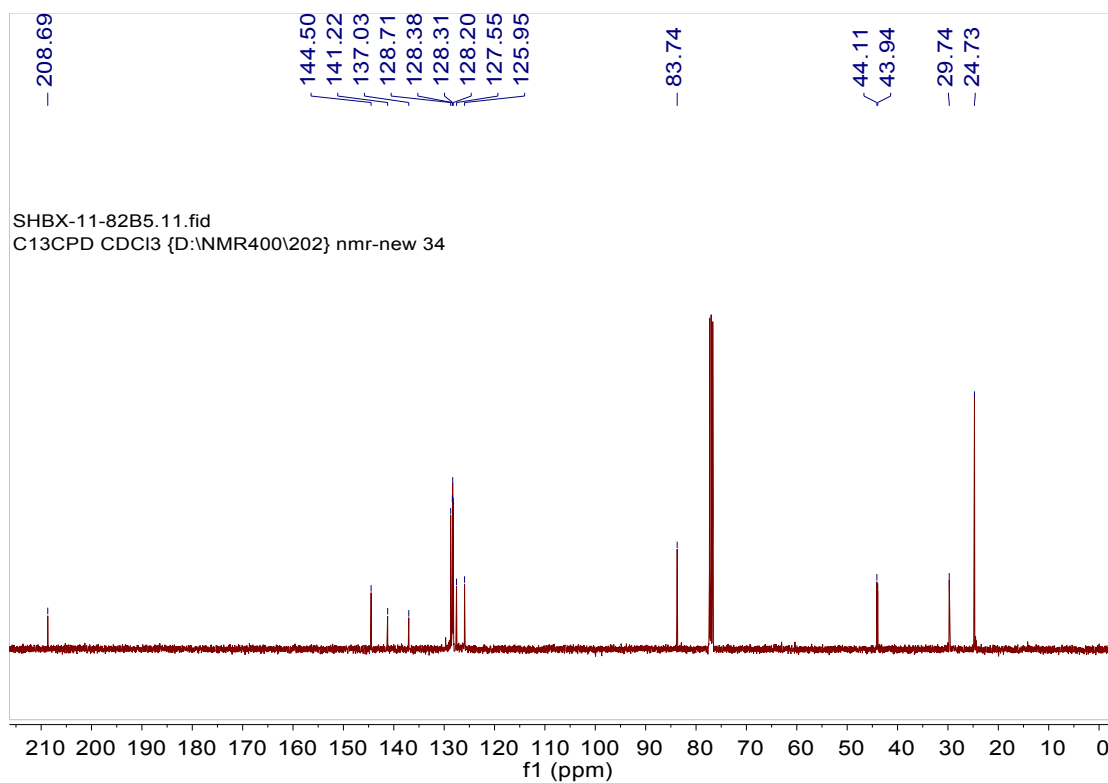
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

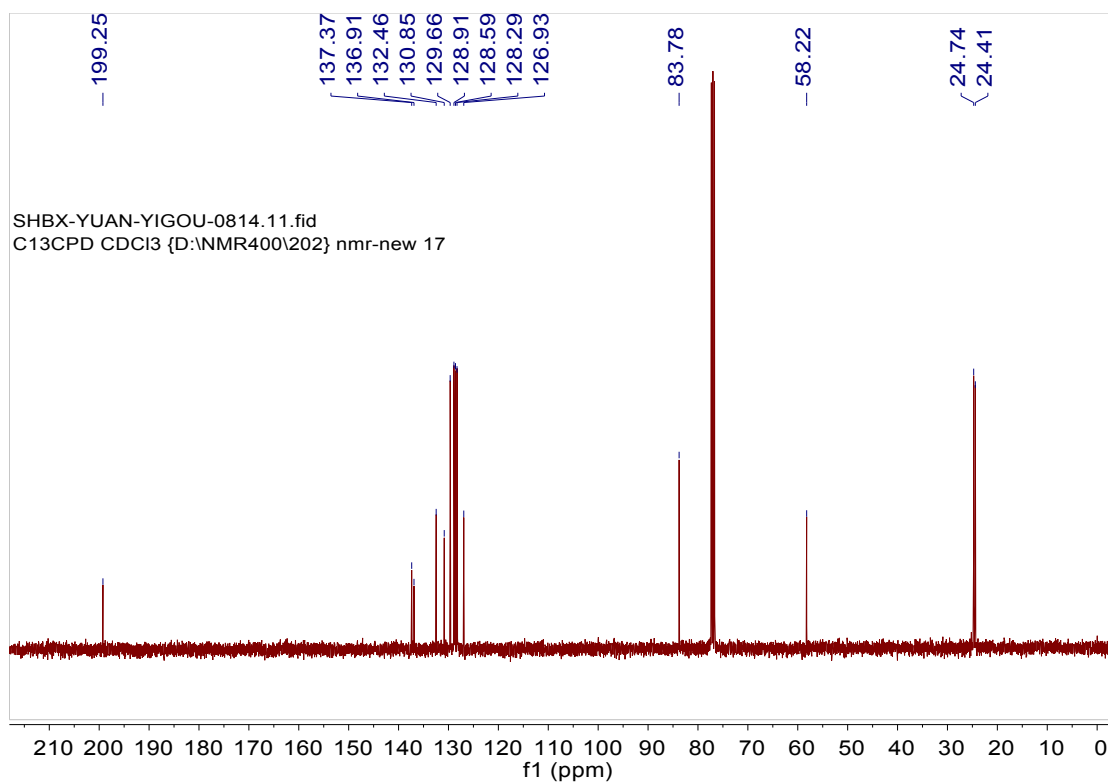
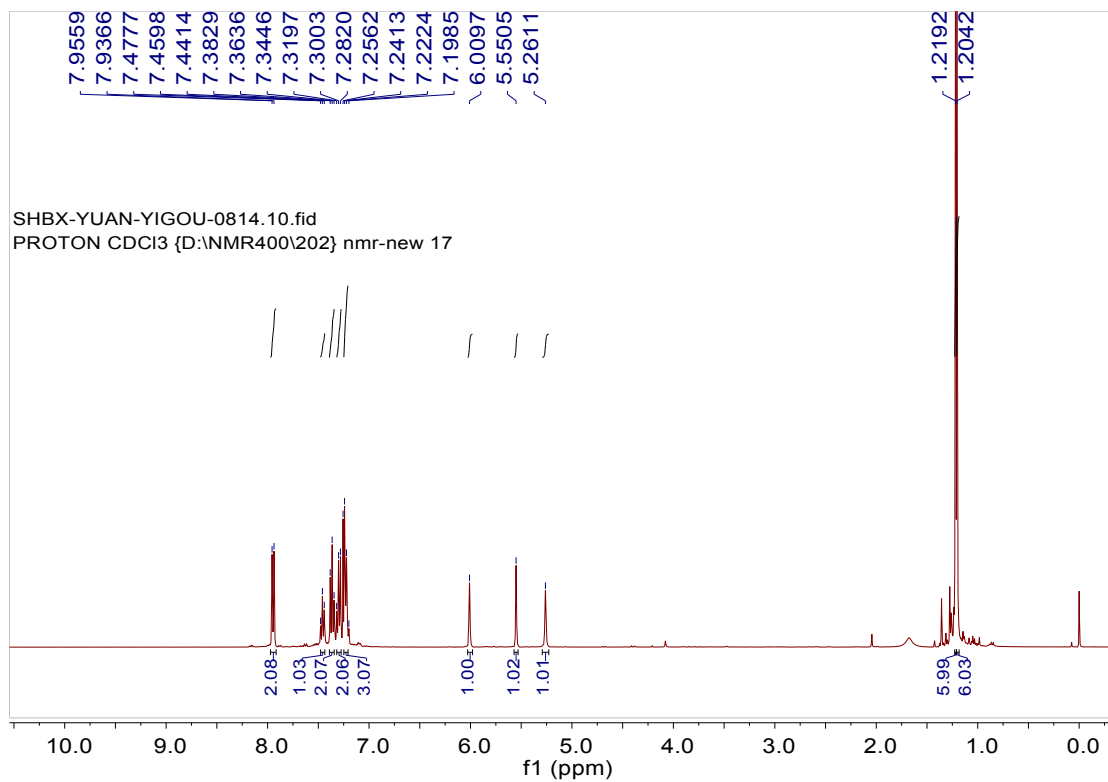


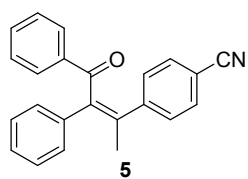
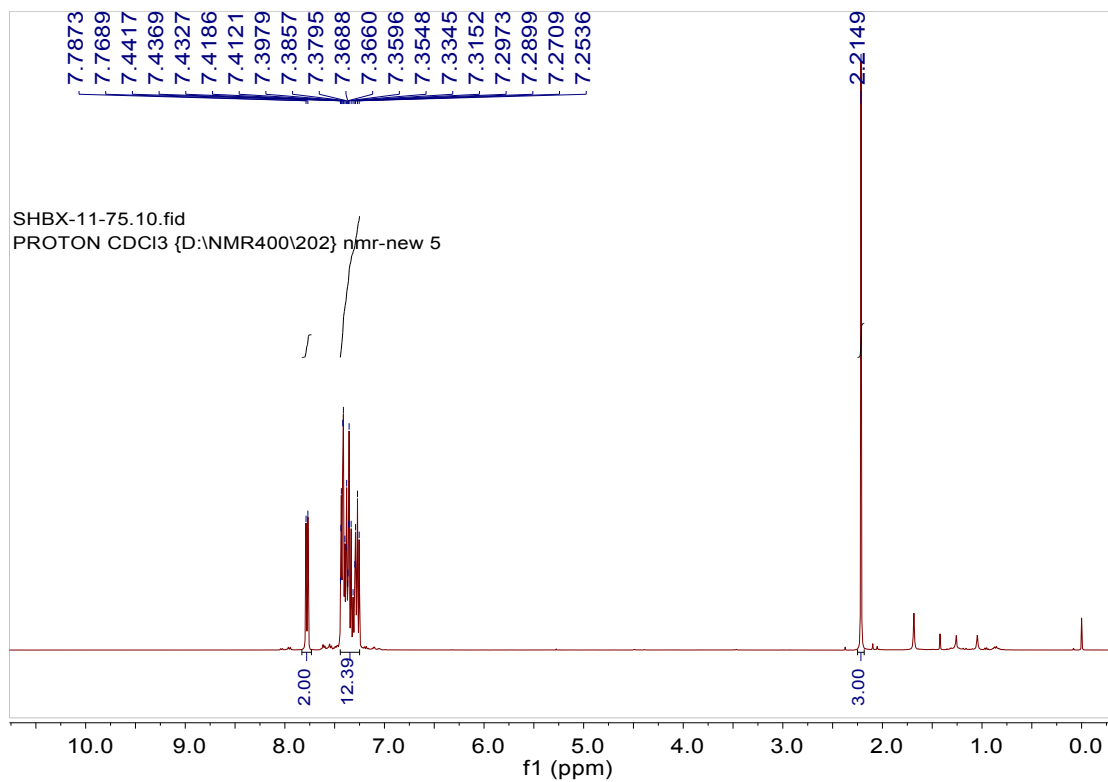




<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)







<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

