

# Supporting Information

## Stereocontrolled Construction of 1-Vinylindanes via Intramolecular Cyclization of o-Cinnamyl Chalcones

Nein-Chen Hsueh,<sup>a</sup> Kai-Shang Lai<sup>a</sup> and Meng-Yang Chang<sup>\*a,b</sup>

<sup>a</sup>*Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung 807, Taiwan* <sup>b</sup>*Department of Medical Research, Kaohsiung Medical University Hospital, Kaohsiung 807, Taiwan*

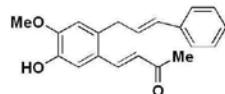
\*Corresponding authors: [mychang@kmu.edu.tw](mailto:mychang@kmu.edu.tw)

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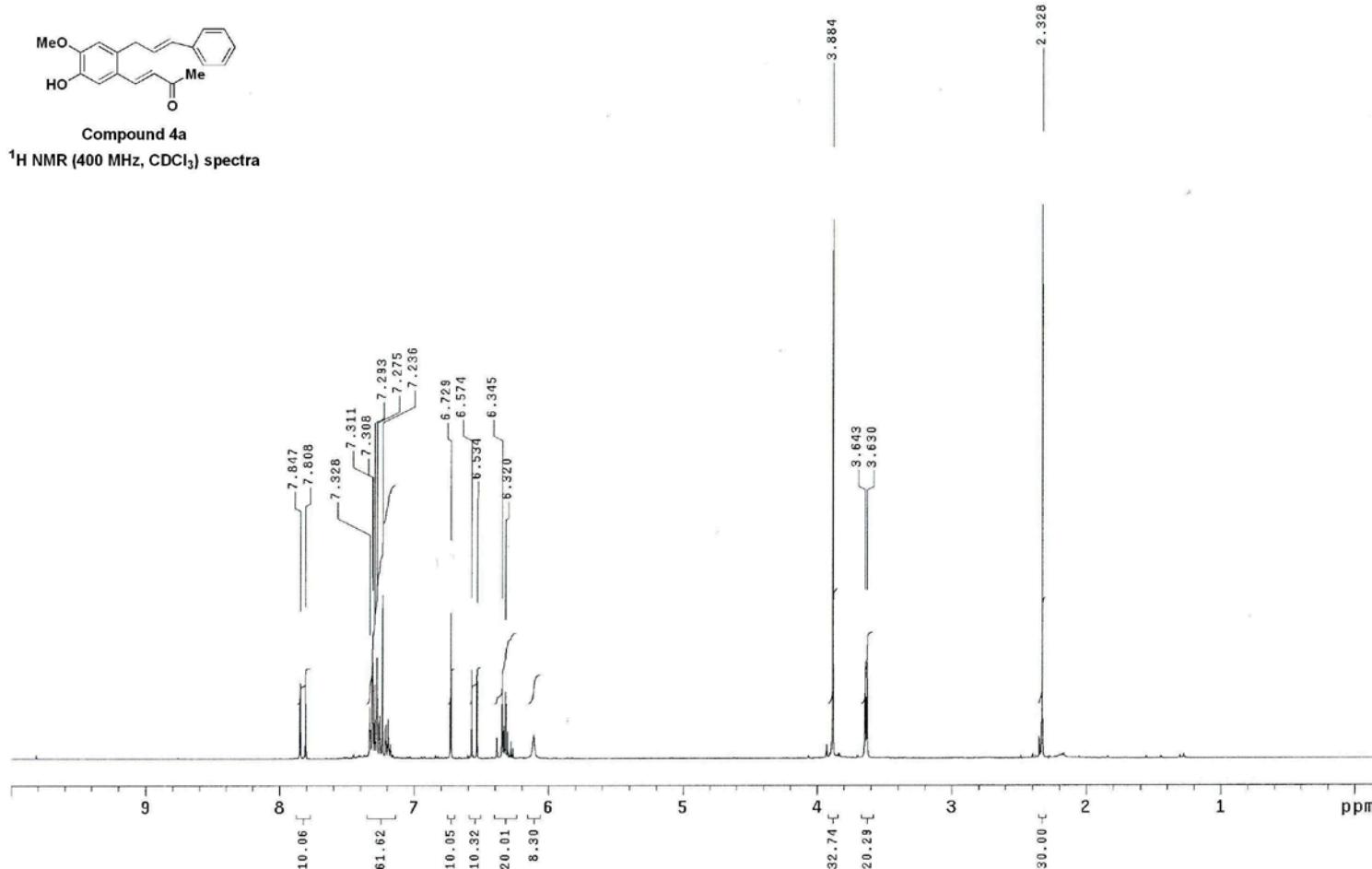
# Compound 4a ( $^1\text{H}$ -NMR spectral data)

KS1060822  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Aug 24 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



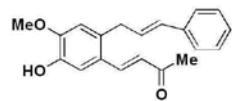
Compound 4a

$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



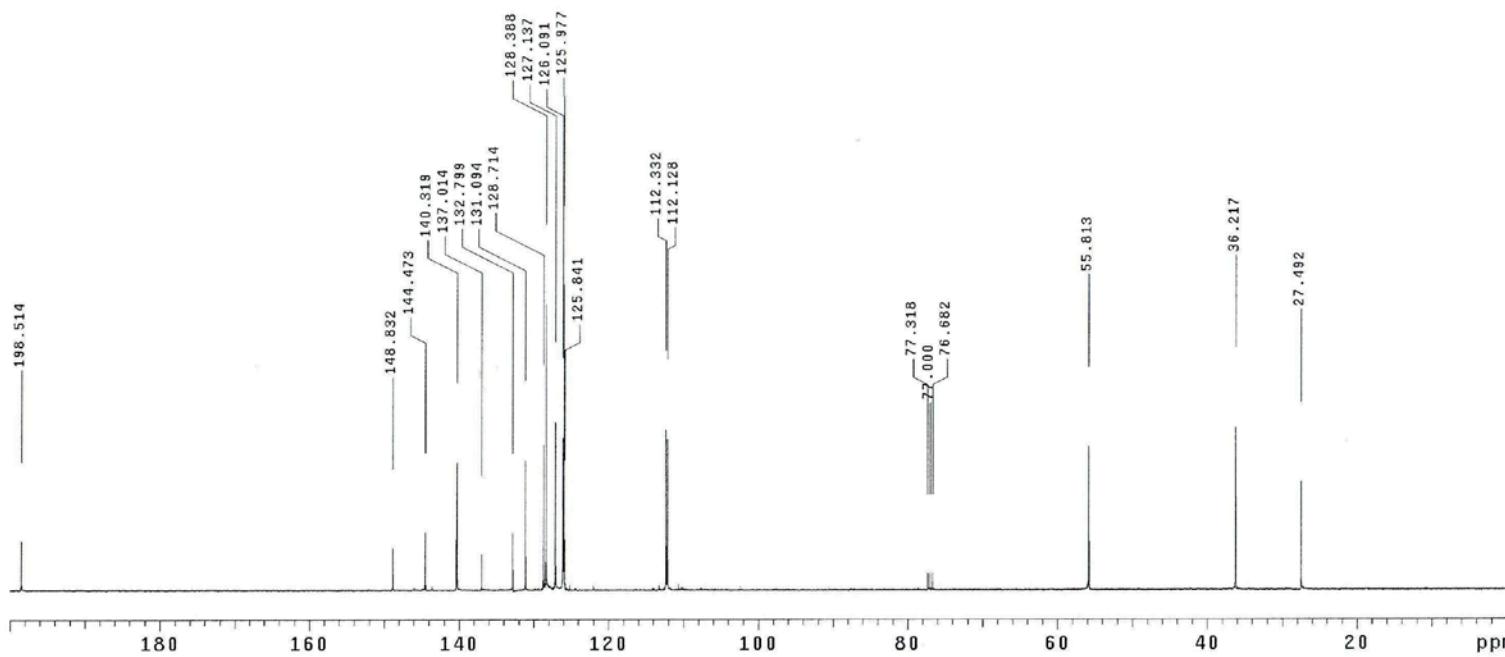
# Compound 4a ( $^{13}\text{C}$ -NMR spectral data)

KS1060822  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Aug 24 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 1312 repetitions



Compound 4a

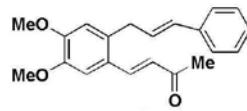
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



# Compound 4b ( $^1\text{H}$ -NMR spectral data)

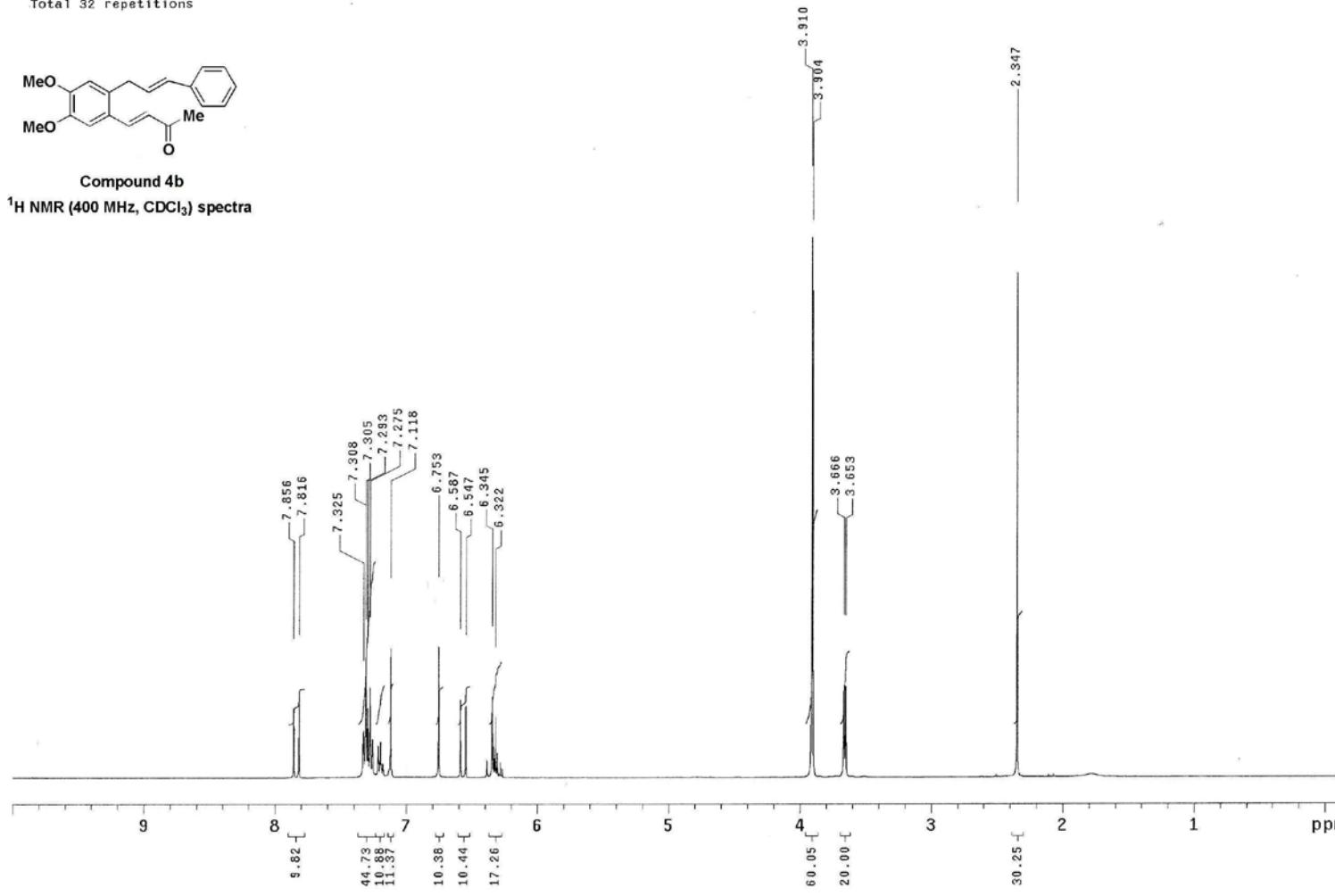
NC1060904

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 4 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4b

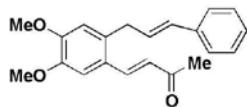
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 4b ( $^{13}\text{C}$ -NMR spectral data)

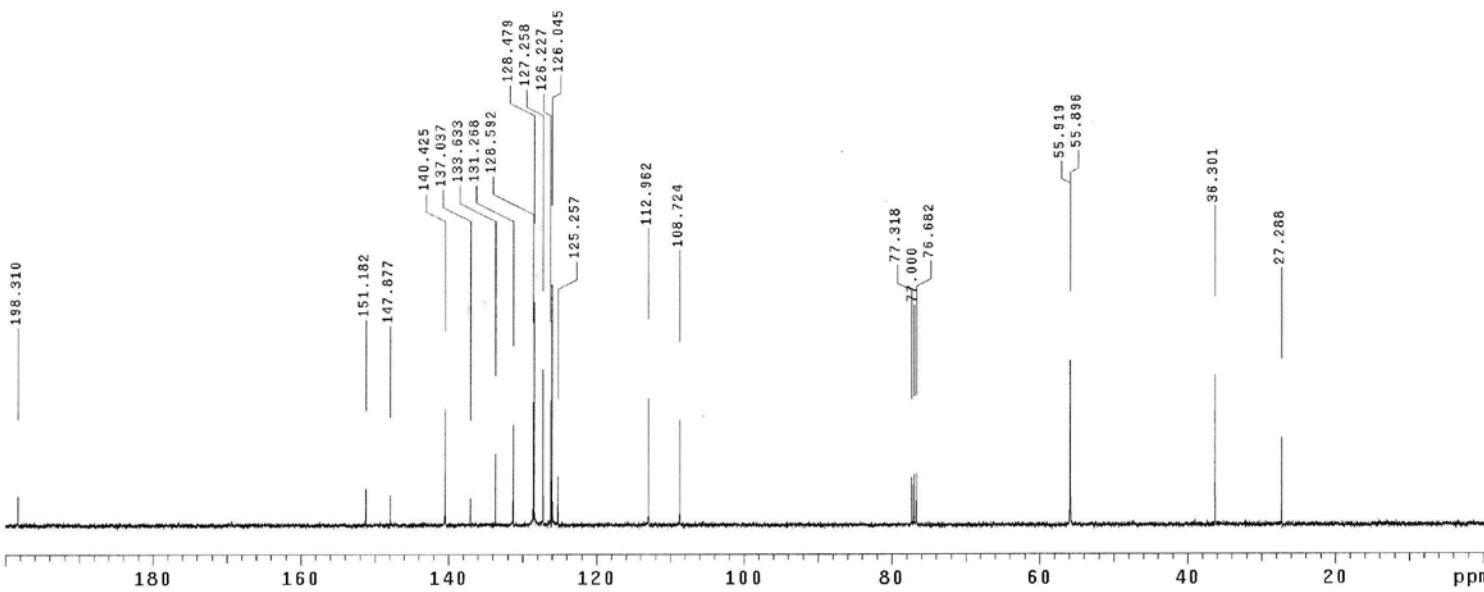
NC1060904

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 4 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 544 repetitions



Compound 4b

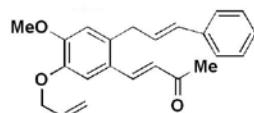
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



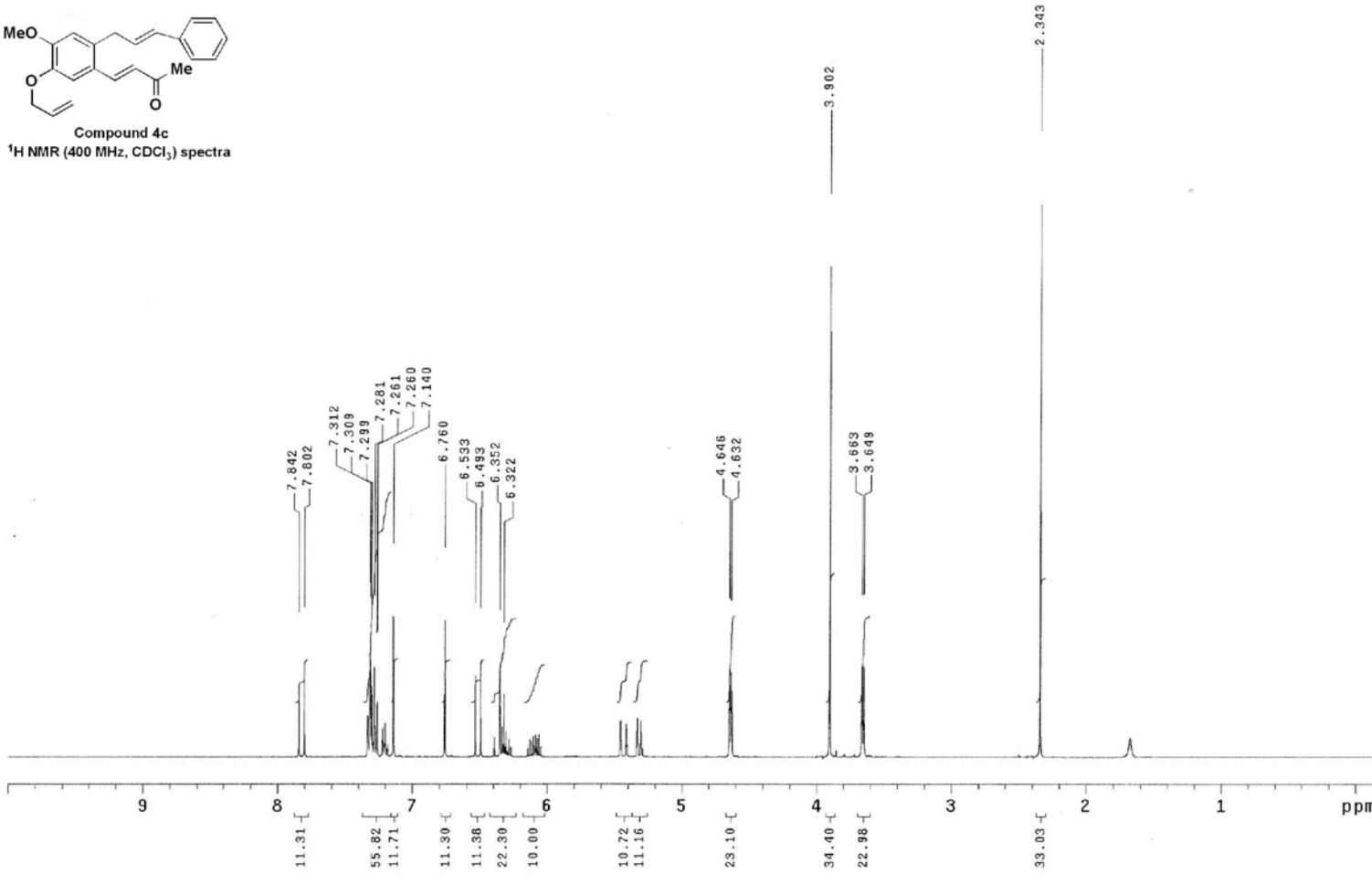
# Compound 4c ( $^1\text{H}$ -NMR spectral data)

KSA01

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 22 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



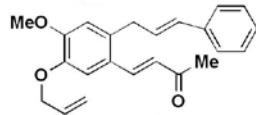
Compound 4c  
 $^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



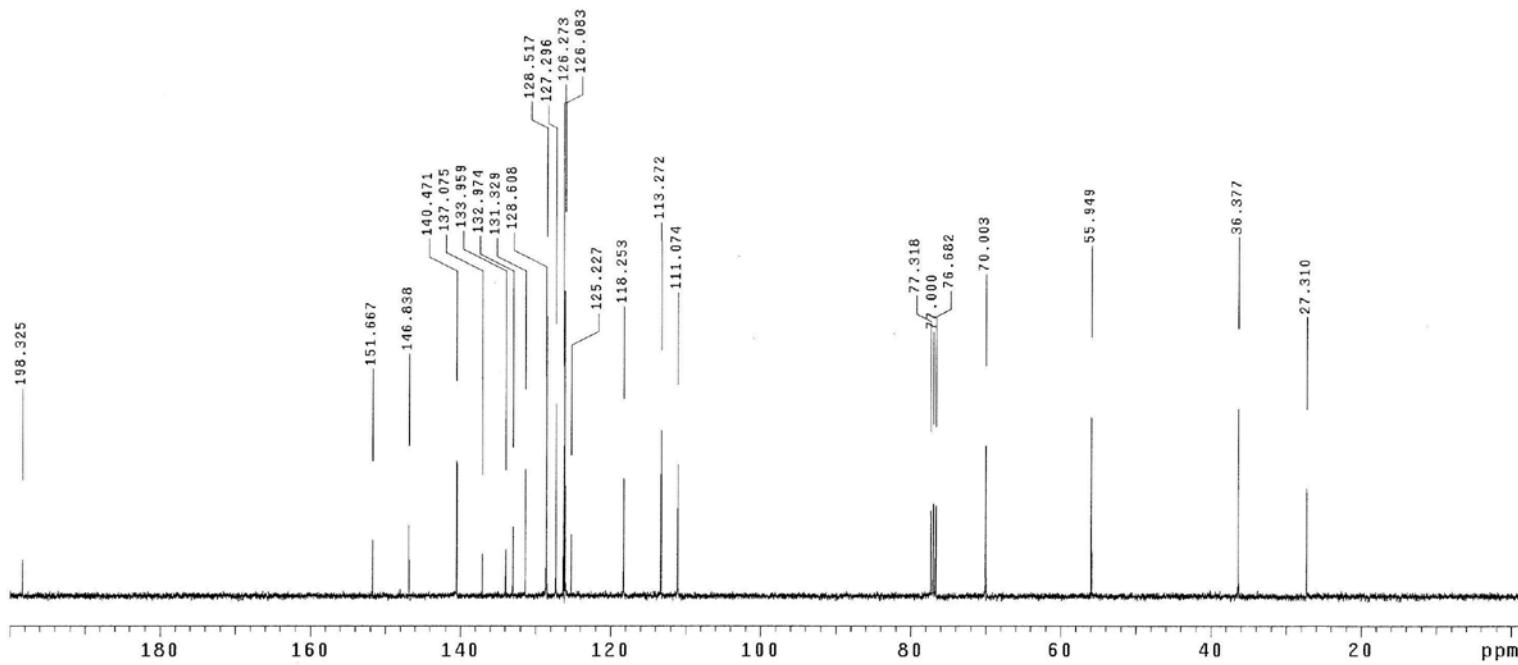
## Compound 4c ( $^{13}\text{C}$ -NMR spectral data)

KSA01

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Sep 22 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1056 repetitions



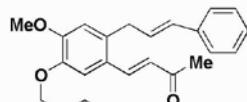
Compound 4c  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4d ( $^1\text{H}$ -NMR spectral data)

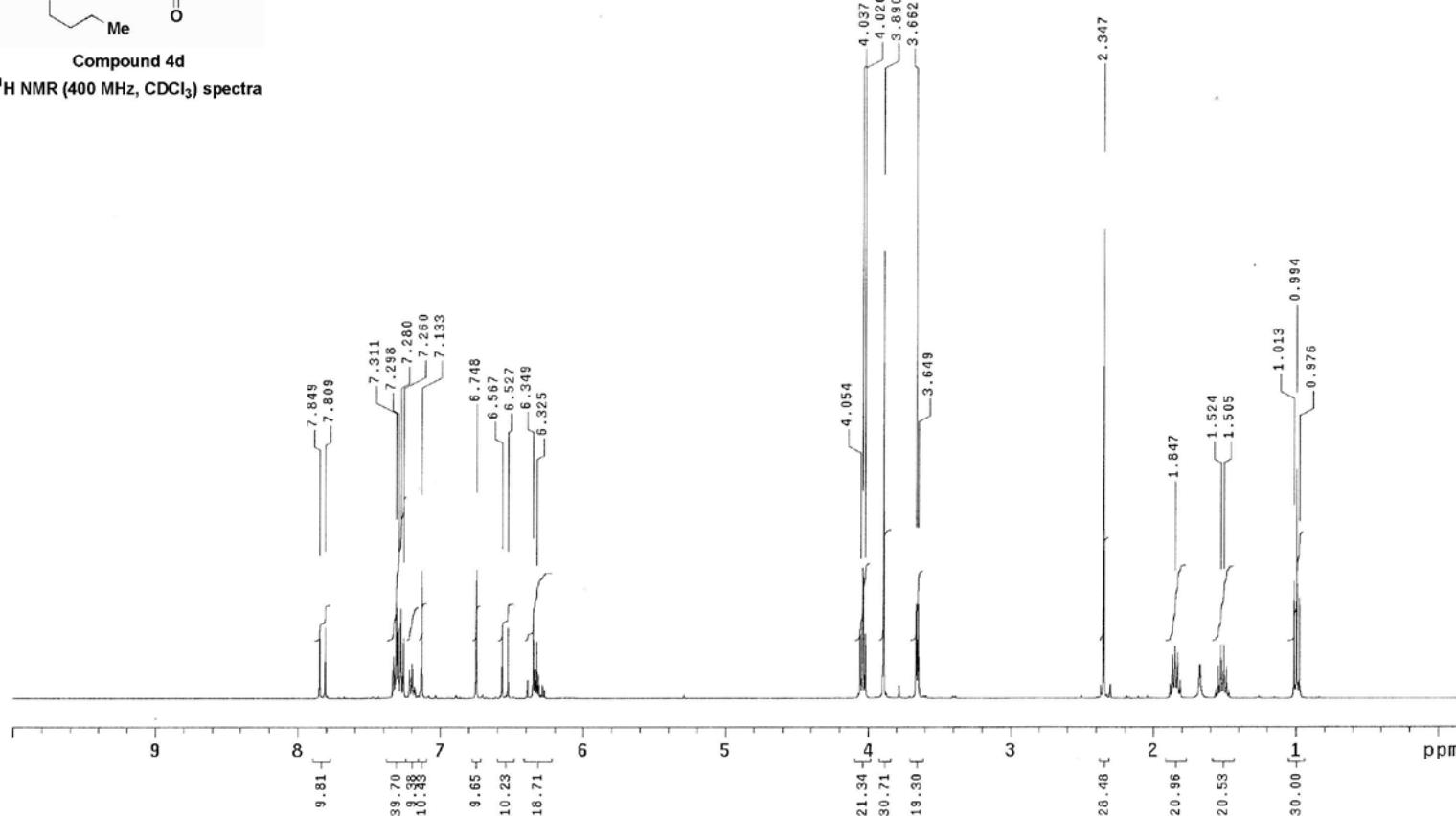
KSA03

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 28 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4d

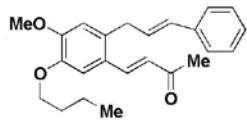
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 4d ( $^{13}\text{C}$ -NMR spectral data)

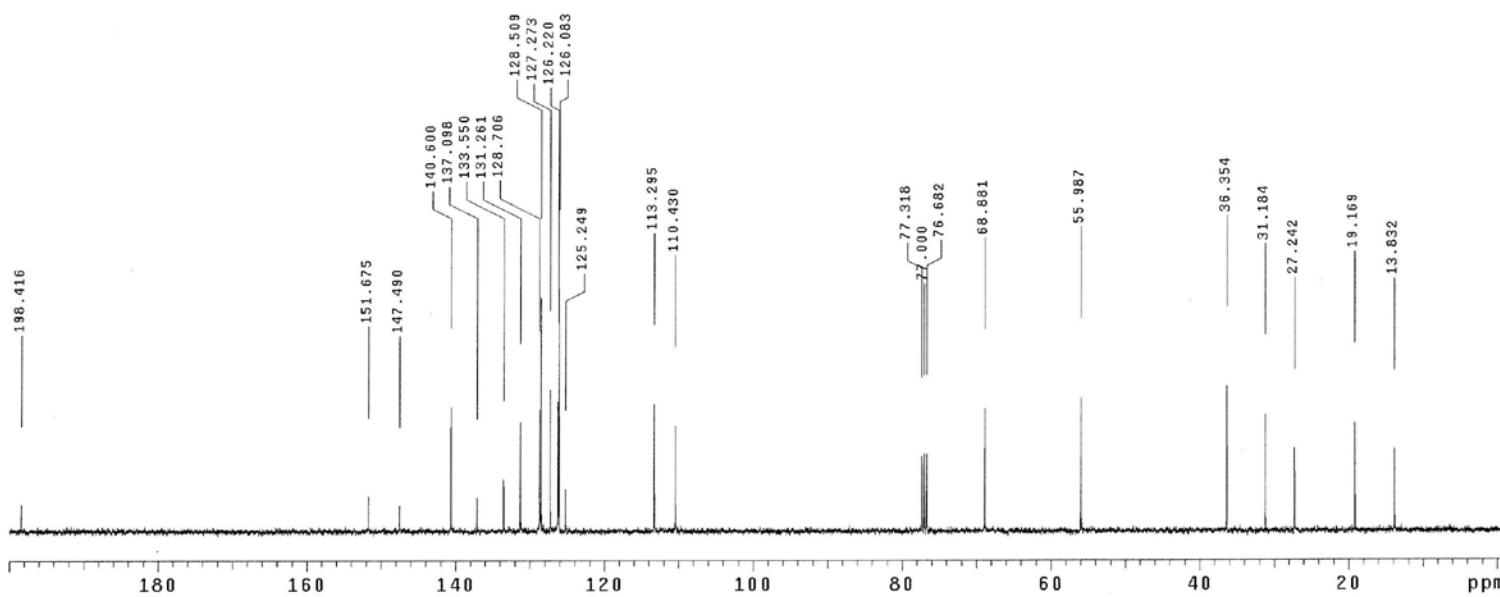
KSA03

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 28 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1040 repetitions



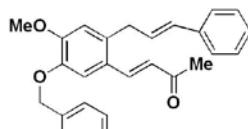
Compound 4d

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

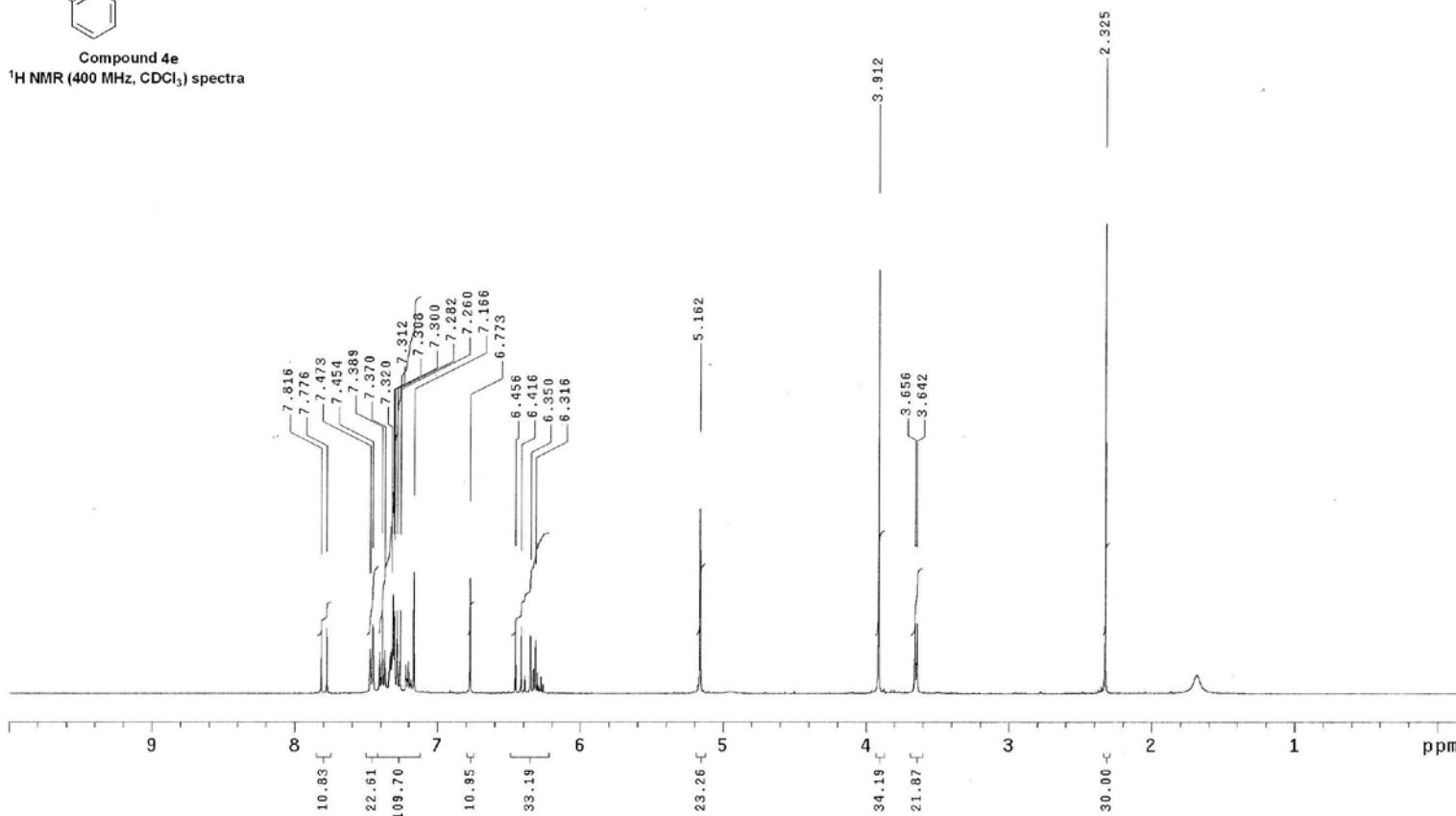


# Compound 4e (<sup>1</sup>H-NMR spectral data)

KSA02  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 22 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



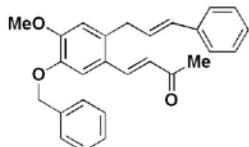
Compound 4e  
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



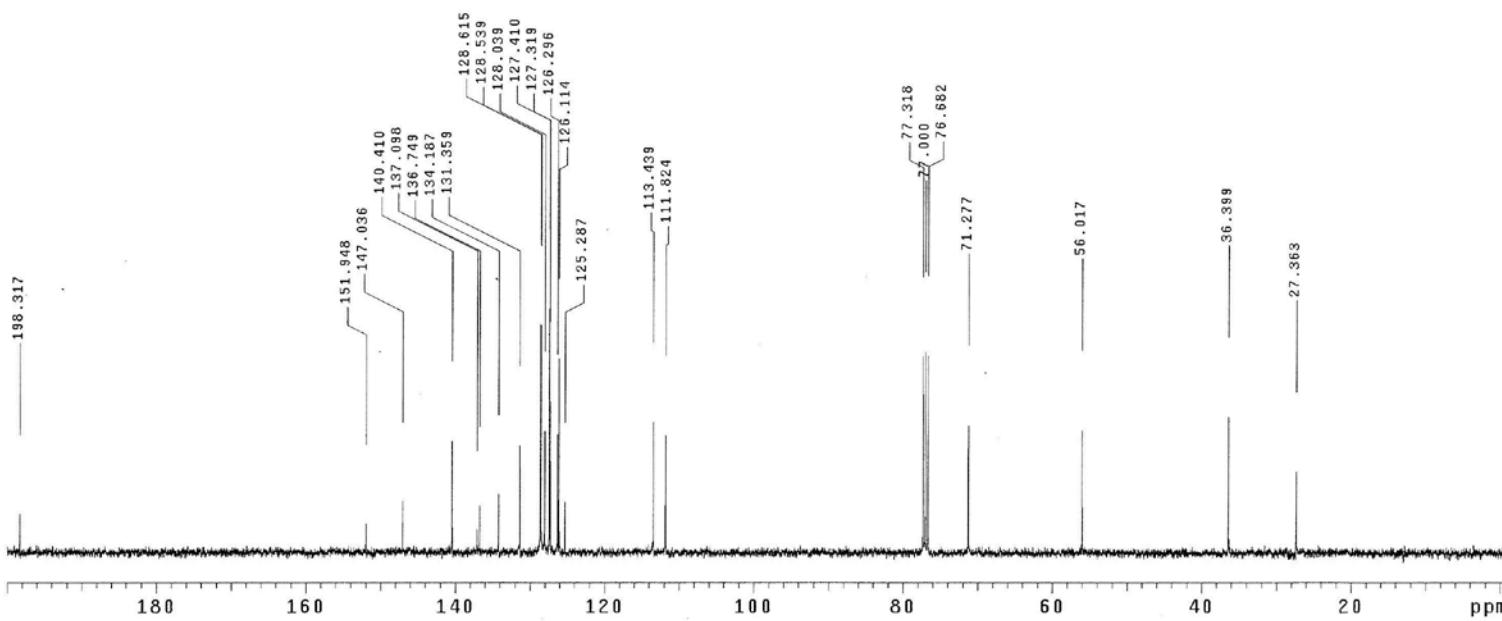
## Compound 4e ( $^{13}\text{C}$ -NMR spectral data)

KSA02

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Sep 22 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2608 repetitions



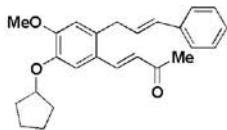
Compound 4e  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4f (<sup>1</sup>H-NMR spectral data)

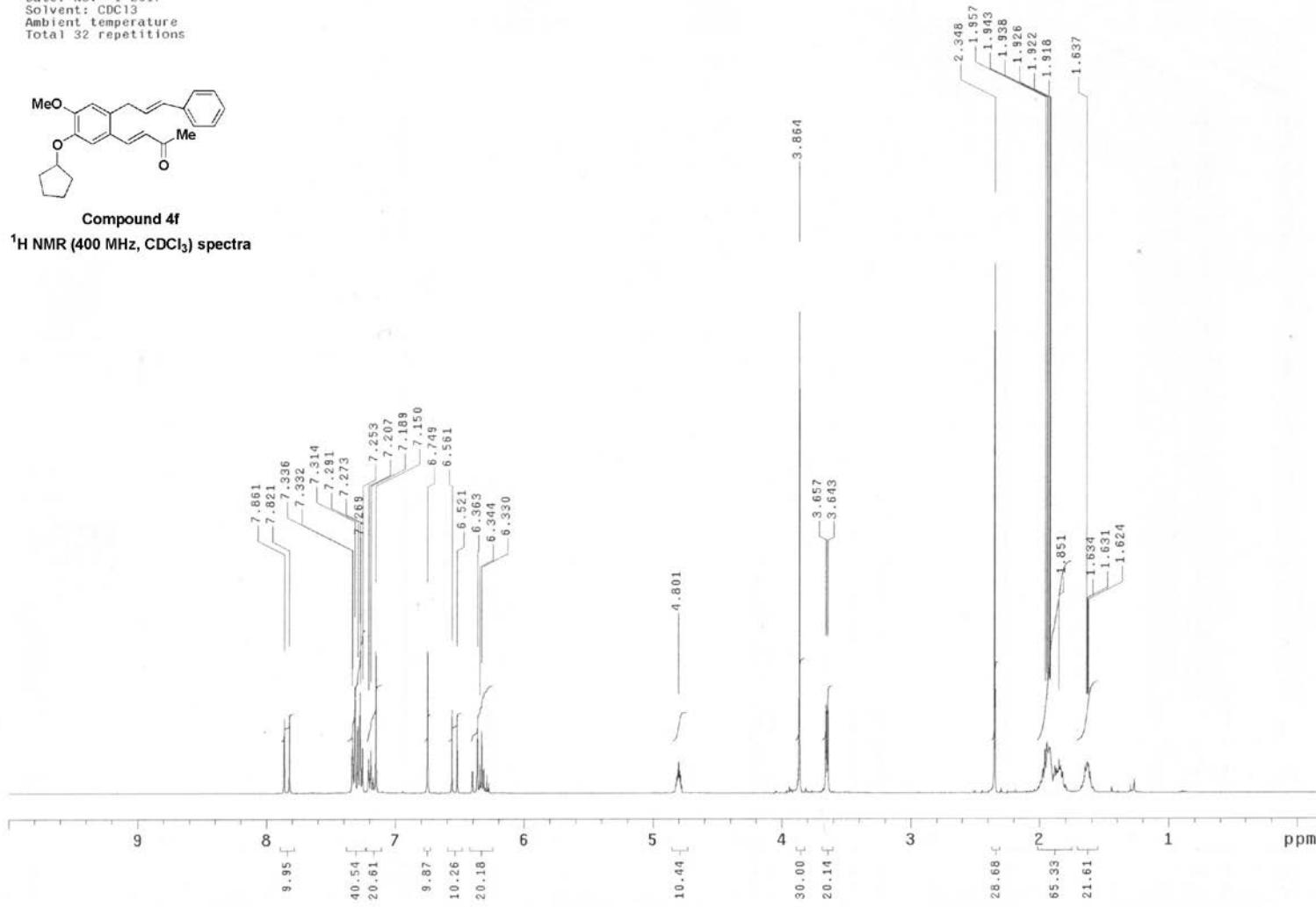
KS1061031

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 1 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



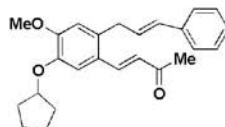
Compound 4f

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



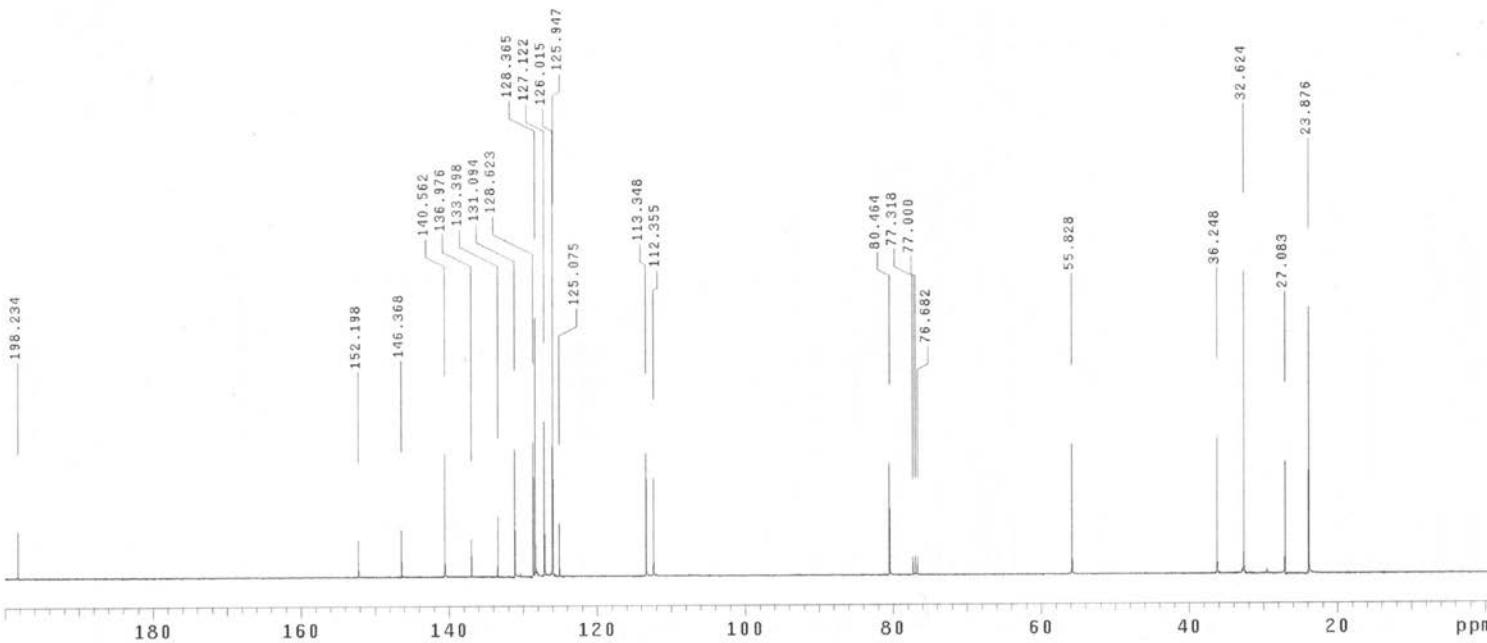
## Compound 4f ( $^{13}\text{C}$ -NMR spectral data)

KS1061031  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 1 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32000 repetitions



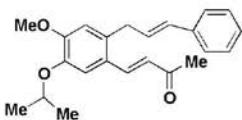
Compound 4f

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

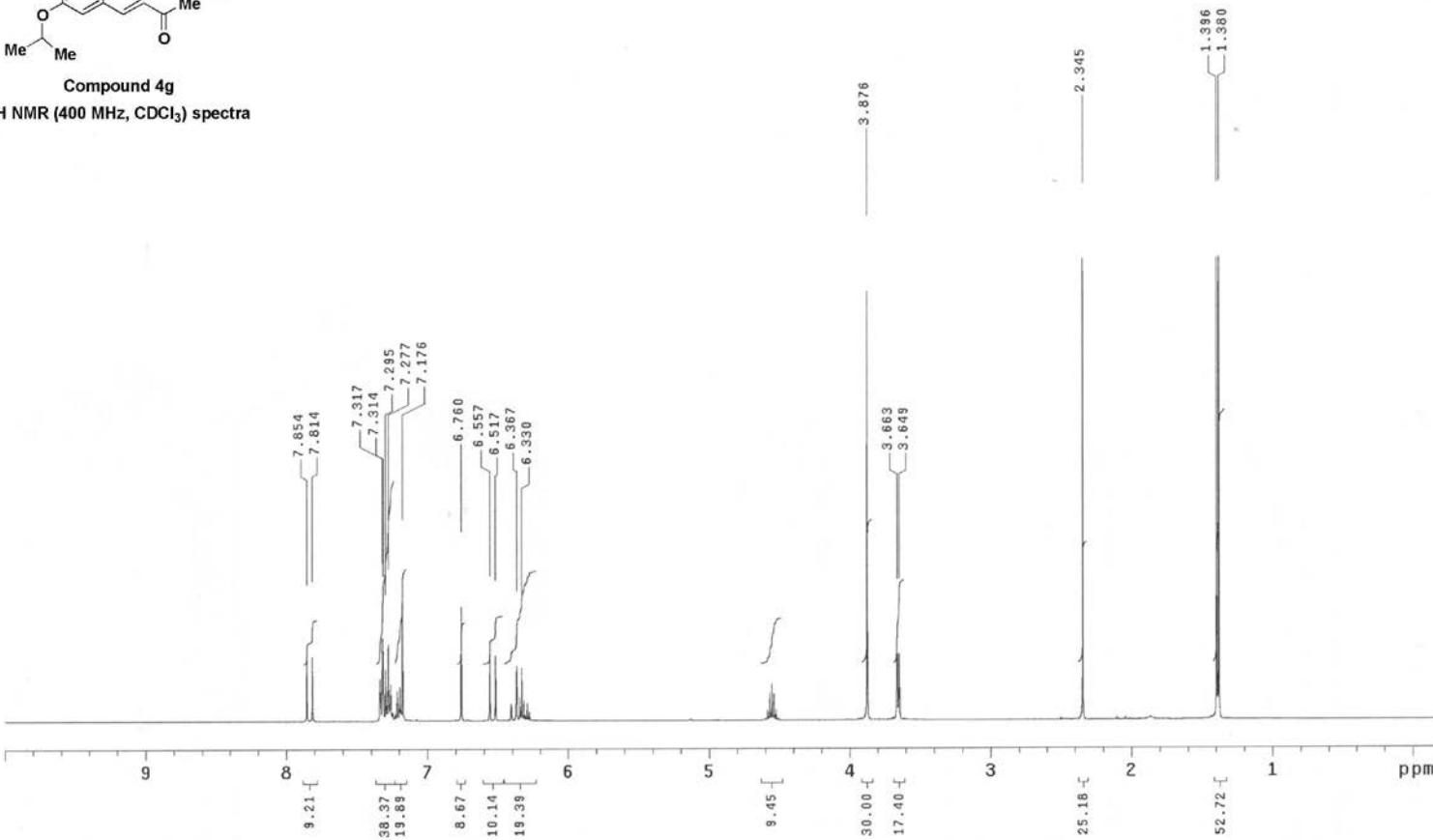


# Compound 4g ( $^1\text{H}$ -NMR spectral data)

NC1070103  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 4 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



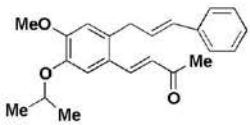
Compound 4g  
 $^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



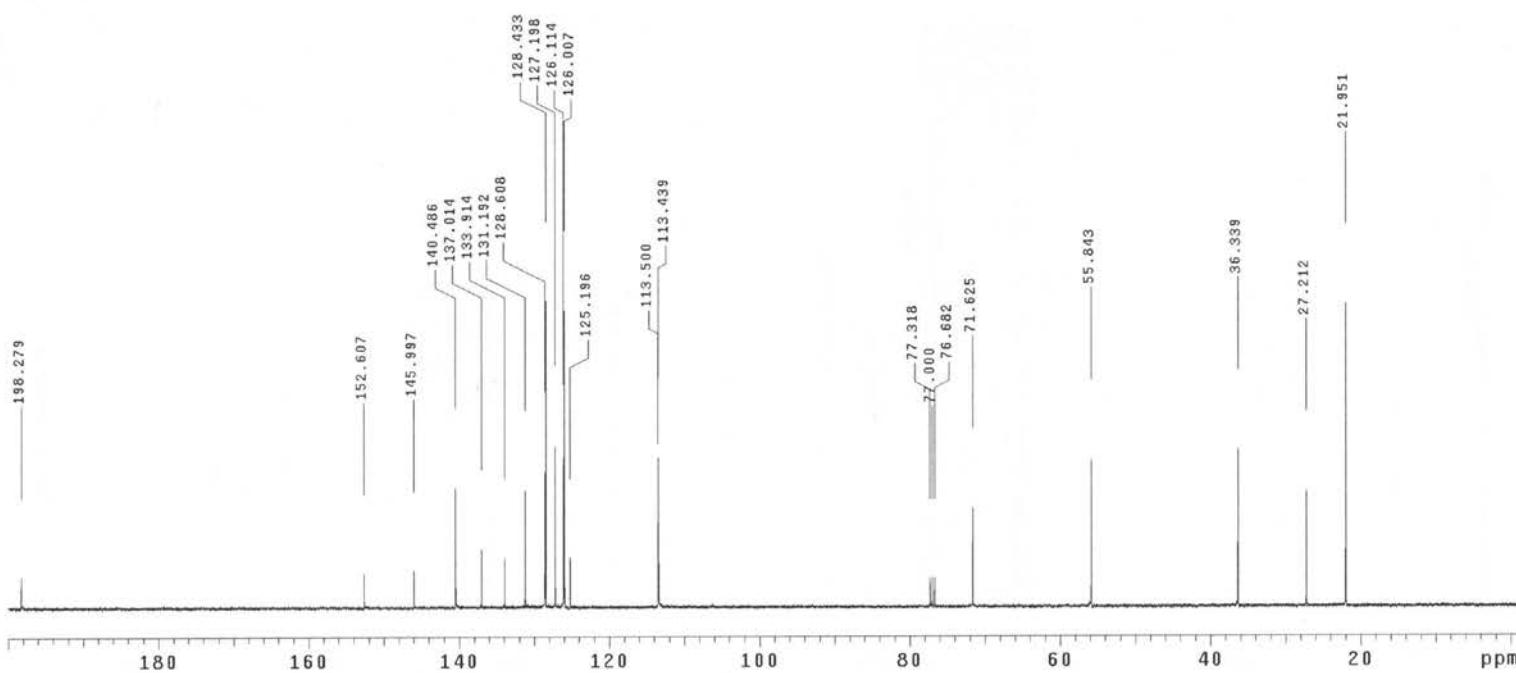
# Compound 4g ( $^{13}\text{C}$ -NMR spectral data)

NC1070103

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 4 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 512 repetitions

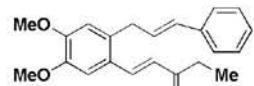


$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

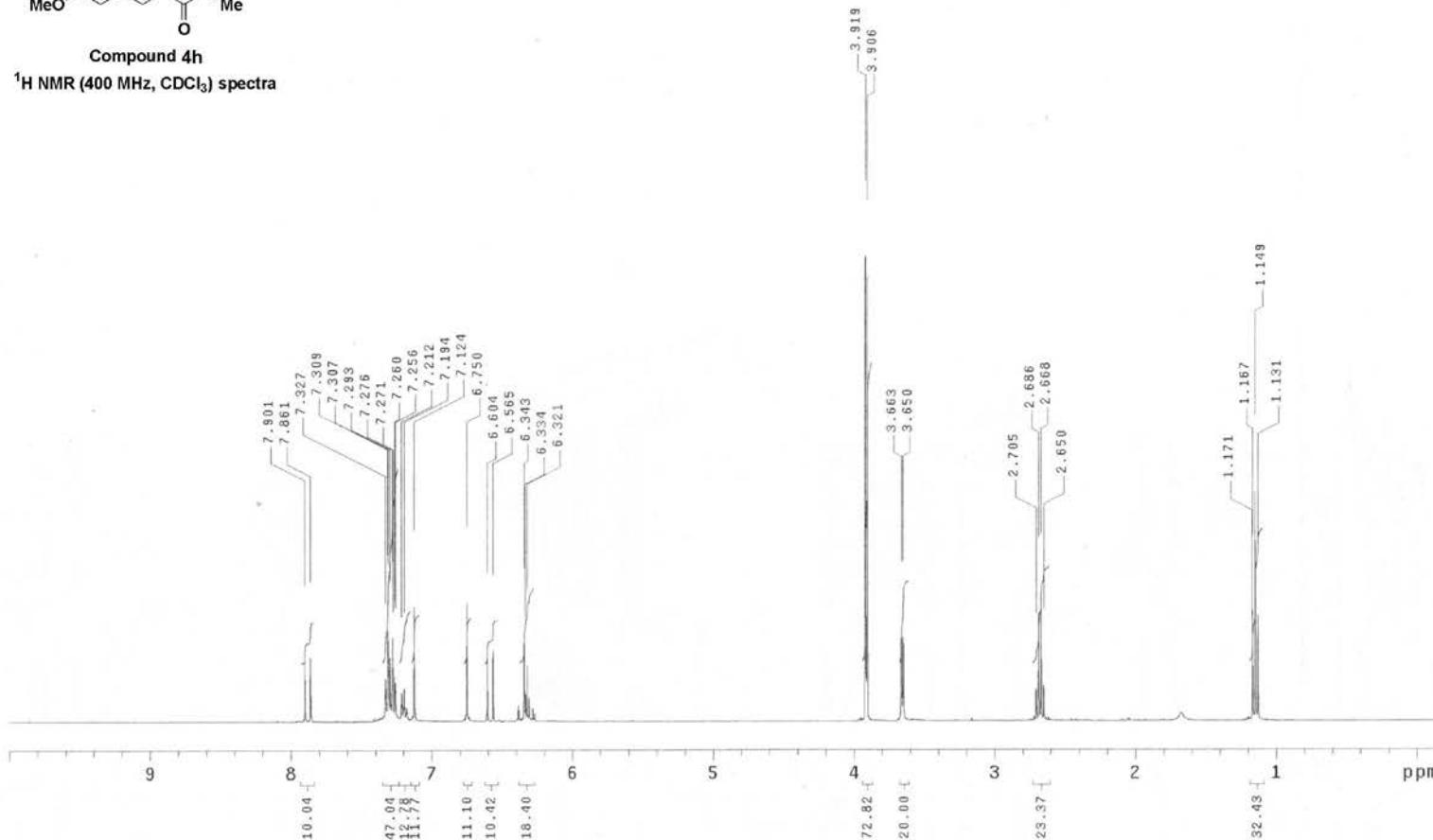


## Compound 4h ( $^1\text{H-NMR}$ spectral data)

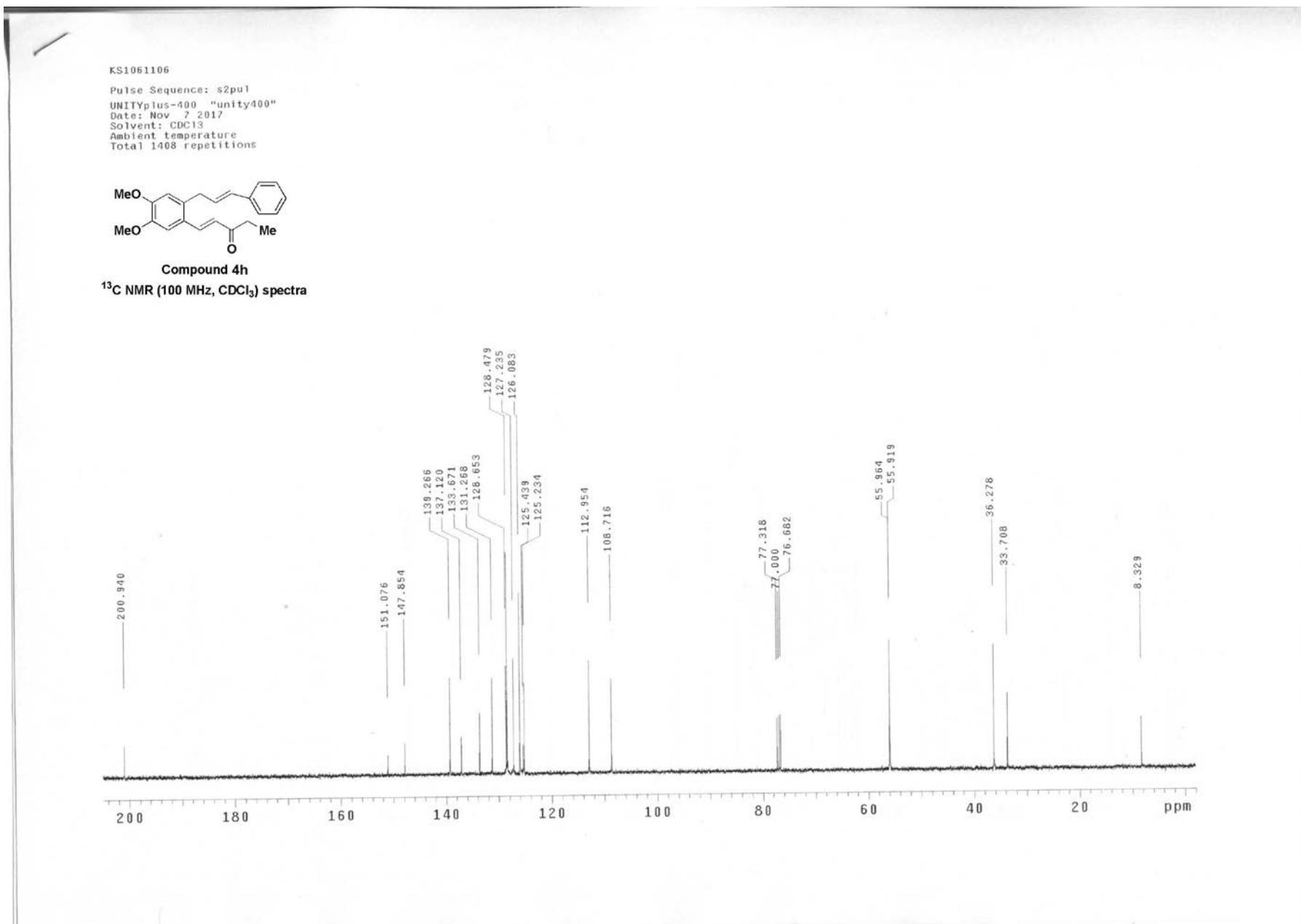
KS1061106  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 7 2017  
Solvent: CDC13  
Ambient temperature  
Total 32 repetitions



### Compound 4h

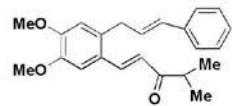


## Compound 4h ( $^{13}\text{C}$ -NMR spectral data)



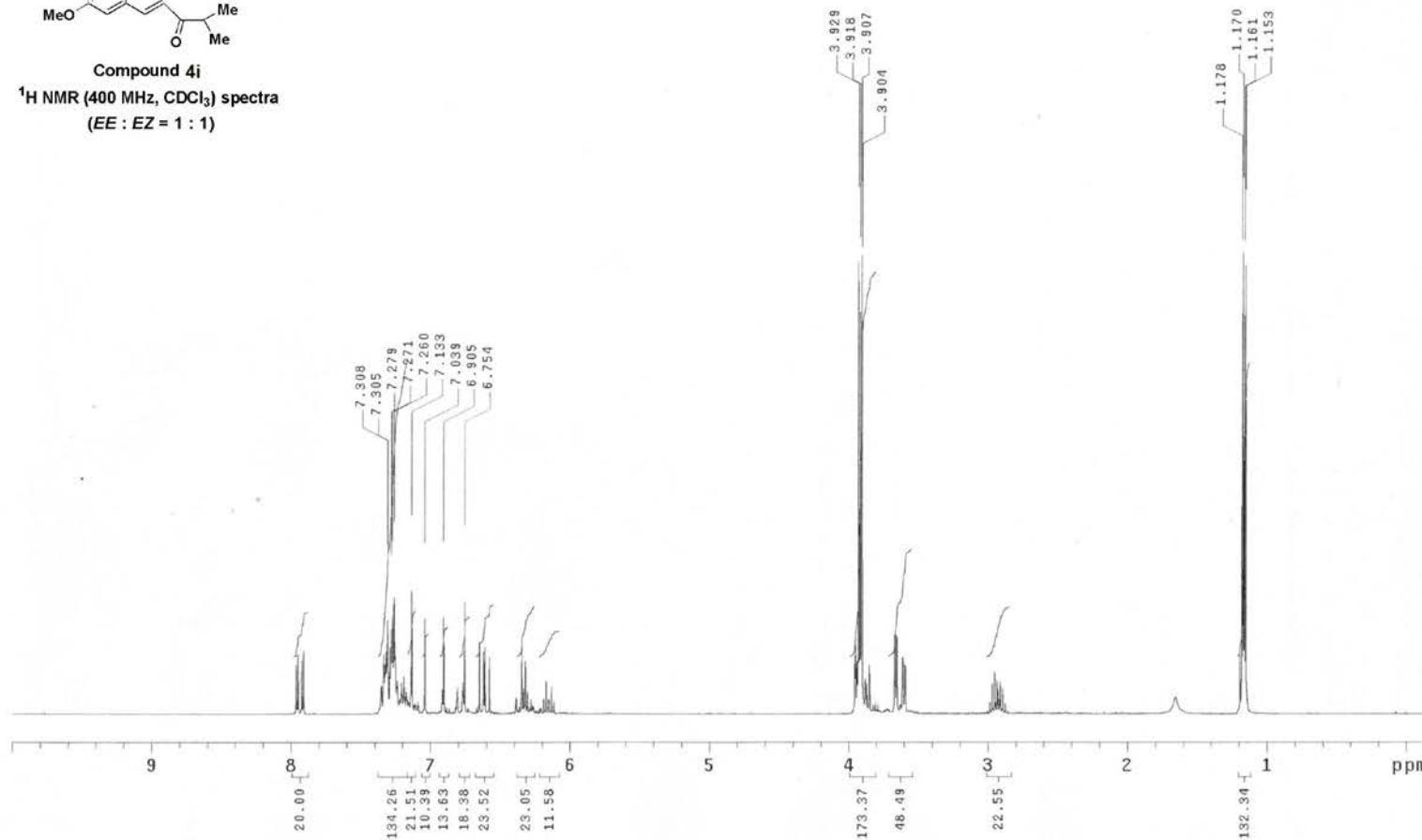
# Compound 4i (<sup>1</sup>H-NMR spectral data)

KS1061113  
Pulse Sequence: s2pul  
UNITYplus-400, "unity400"  
Date: Nov 14 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions

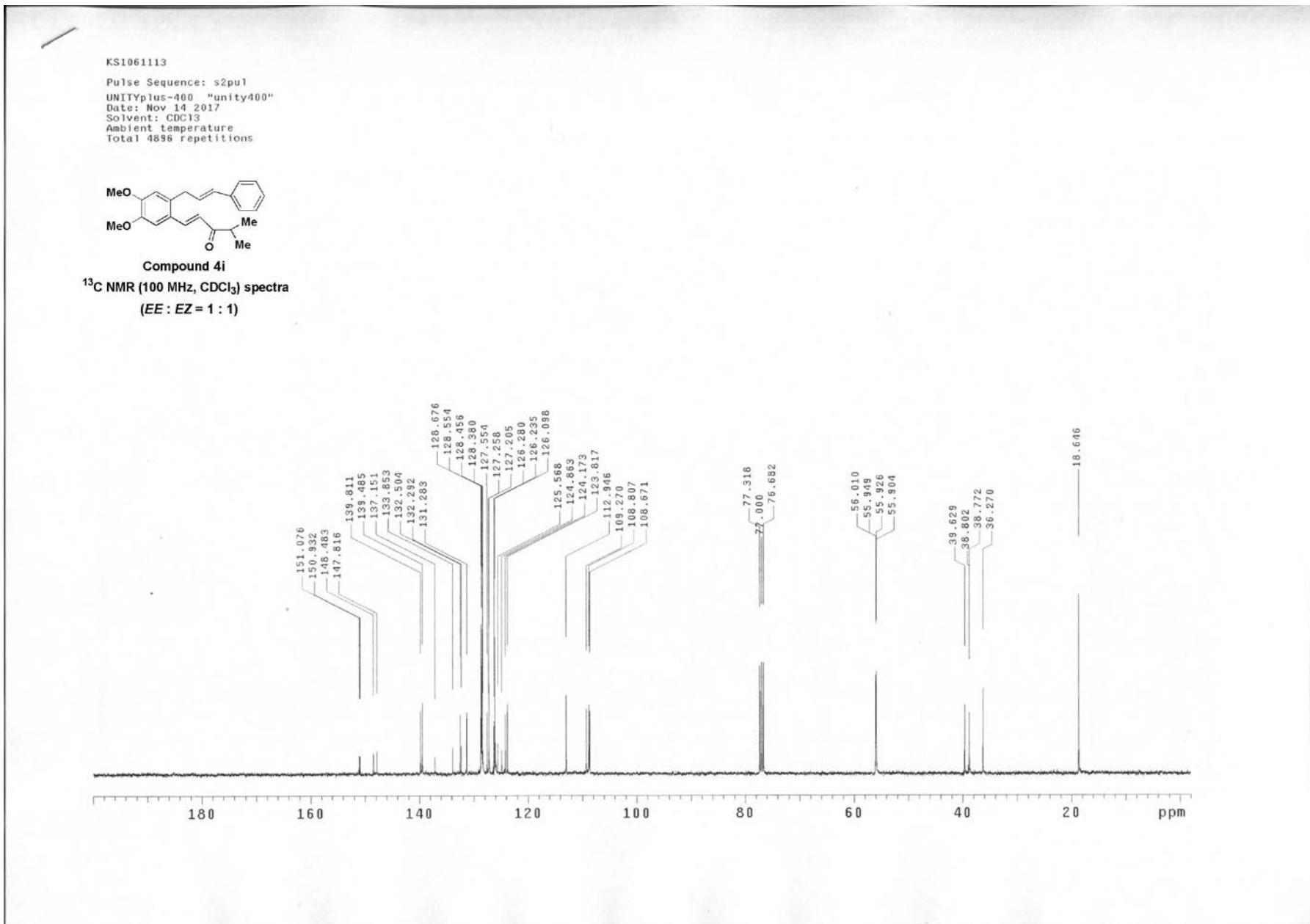


Compound 4i

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra  
(EE : EZ = 1 : 1)



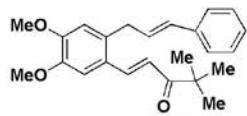
# Compound 4i (<sup>13</sup>C-NMR spectral data)



# Compound 4j (<sup>1</sup>H-NMR spectral data)

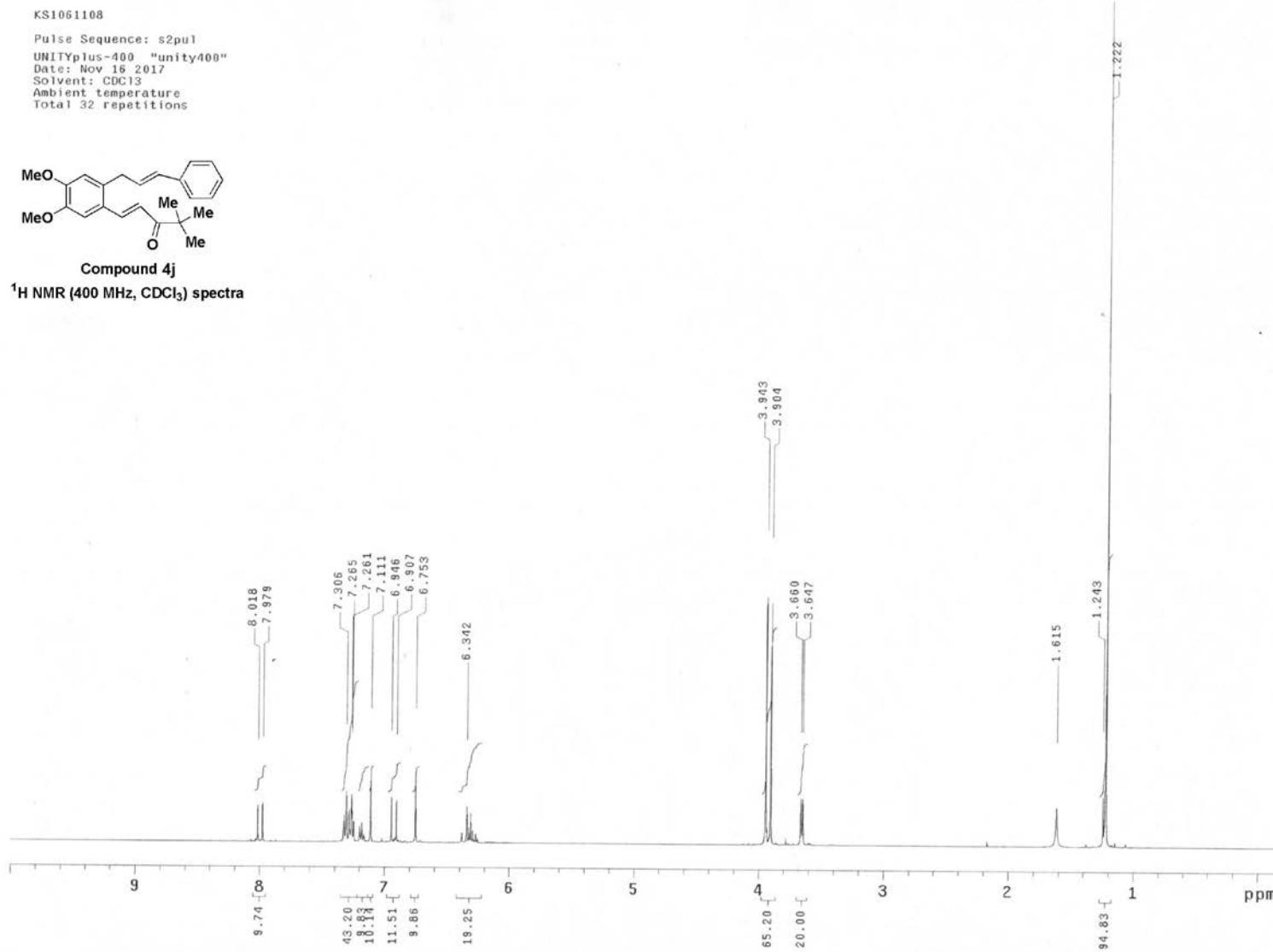
KS1061108

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 16 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



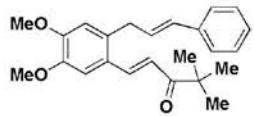
Compound 4j

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



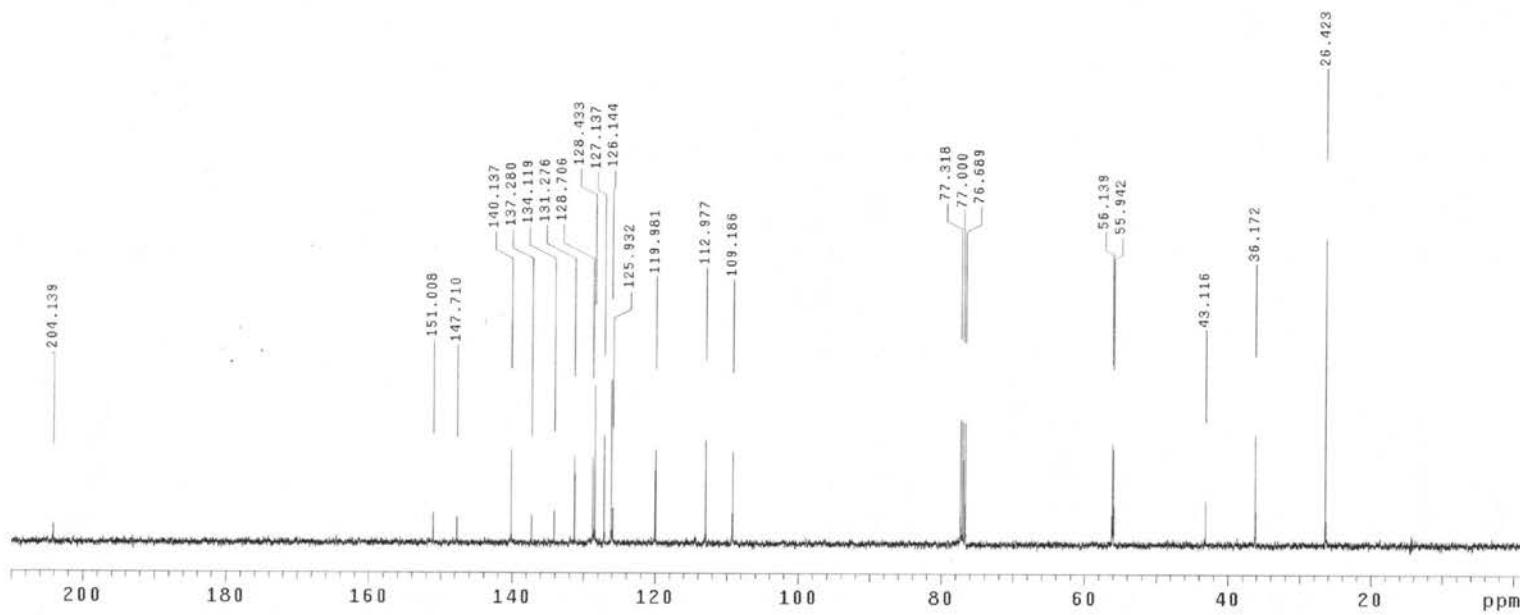
# Compound 4j (<sup>13</sup>C-NMR spectral data)

KS1061108  
Pulse Sequence: spul  
UNITYplus-400 "unity400"  
Date: Nov 18 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1824 repetitions



Compound 4j

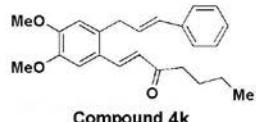
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



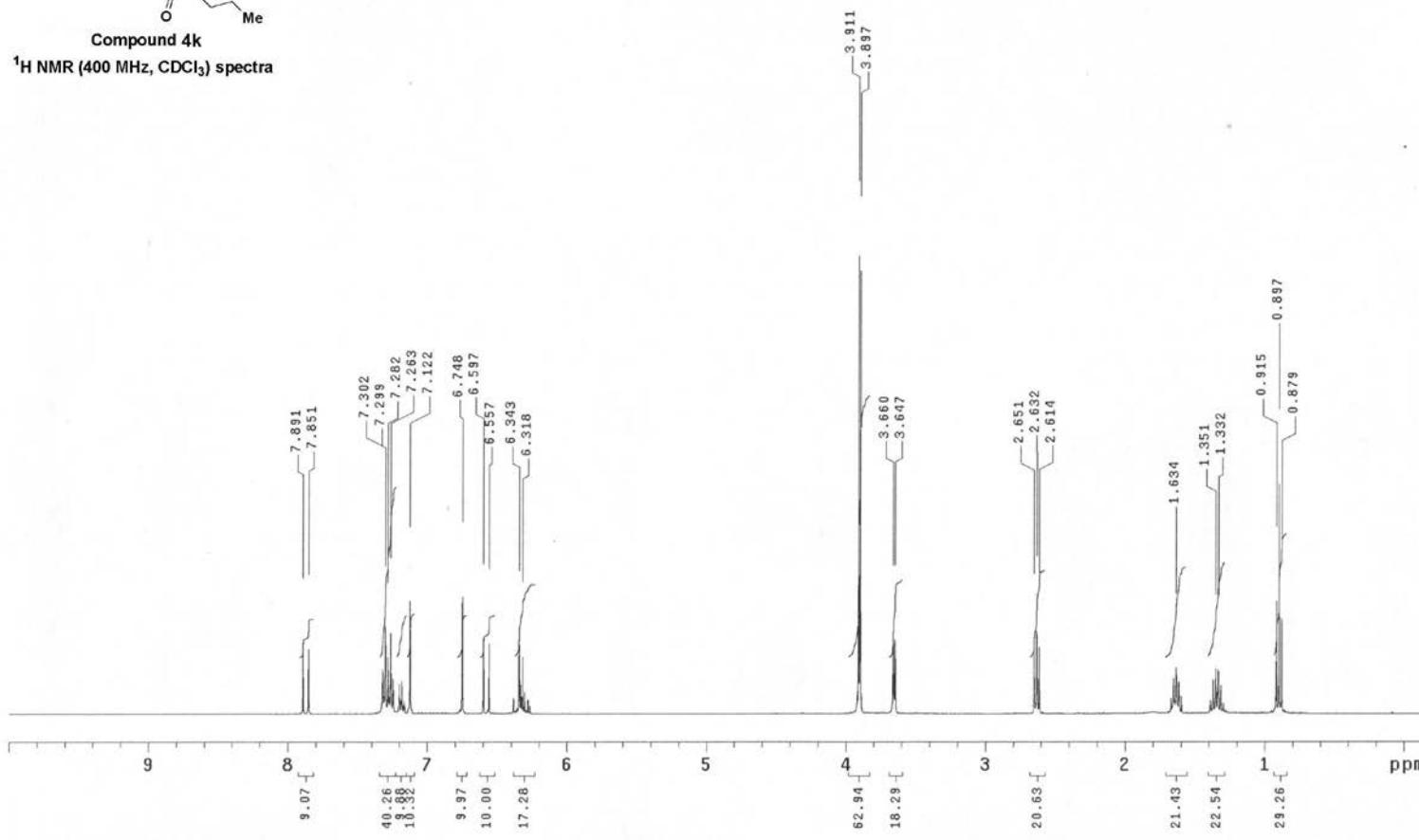
# Compound 4k ( $^1\text{H}$ -NMR spectral data)

KS1061129

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 1 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



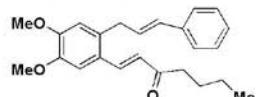
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



## Compound 4k ( $^{13}\text{C}$ -NMR spectral data)

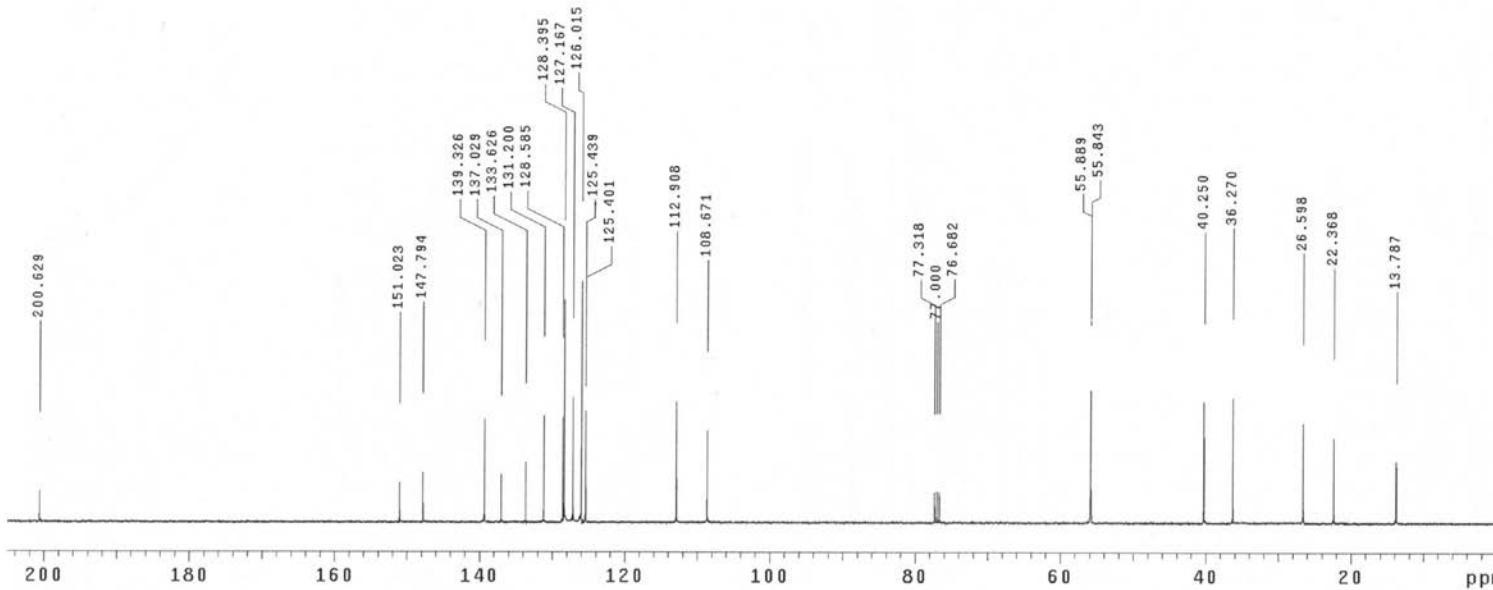
KS1051129

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 1 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1120 repetitions



Compound 4k

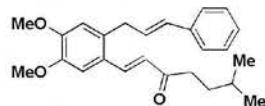
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4l (<sup>1</sup>H-NMR spectral data)

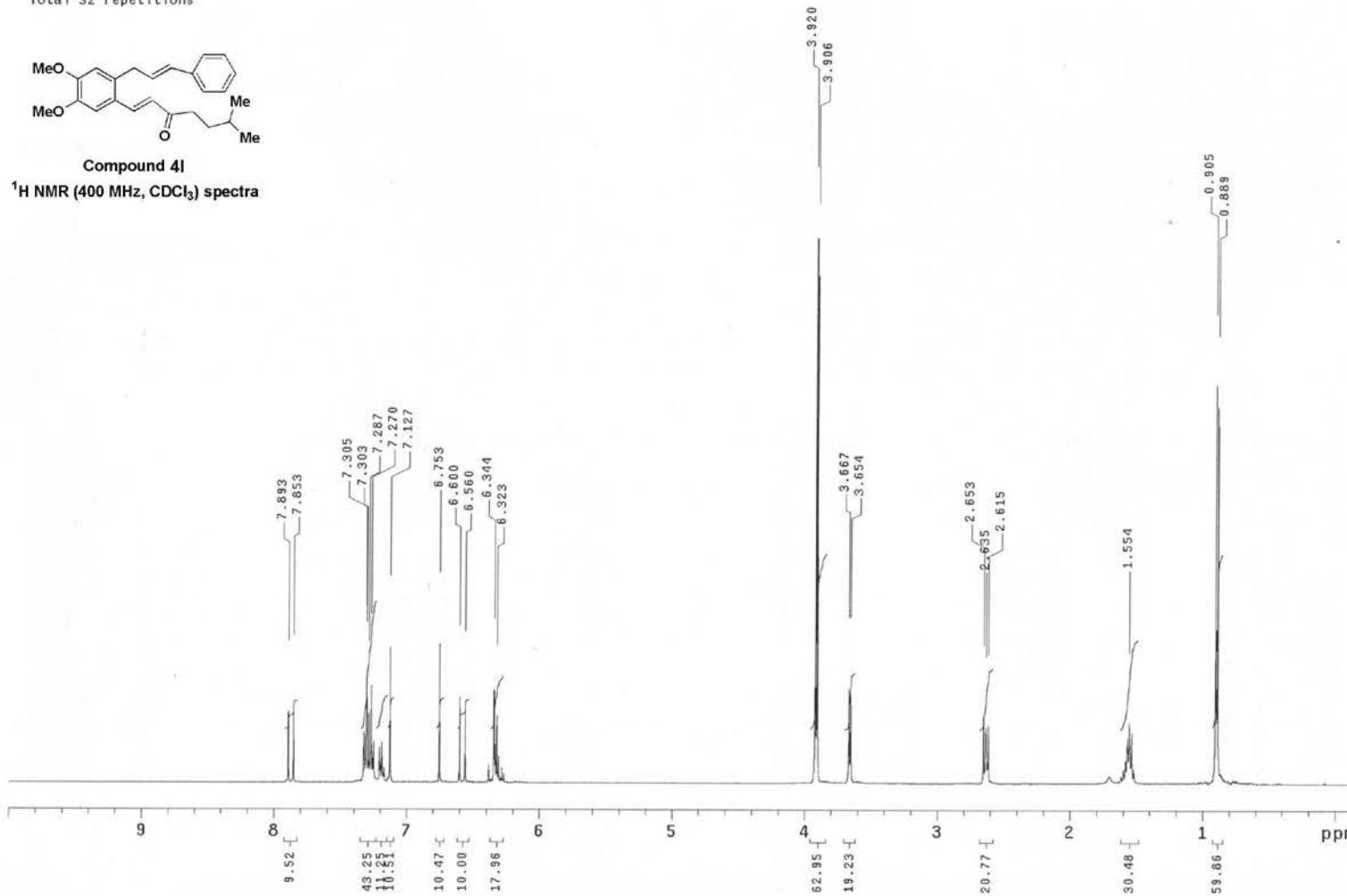
KS1061130

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 1 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4l

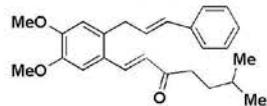
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 4I ( $^{13}\text{C}$ -NMR spectral data)

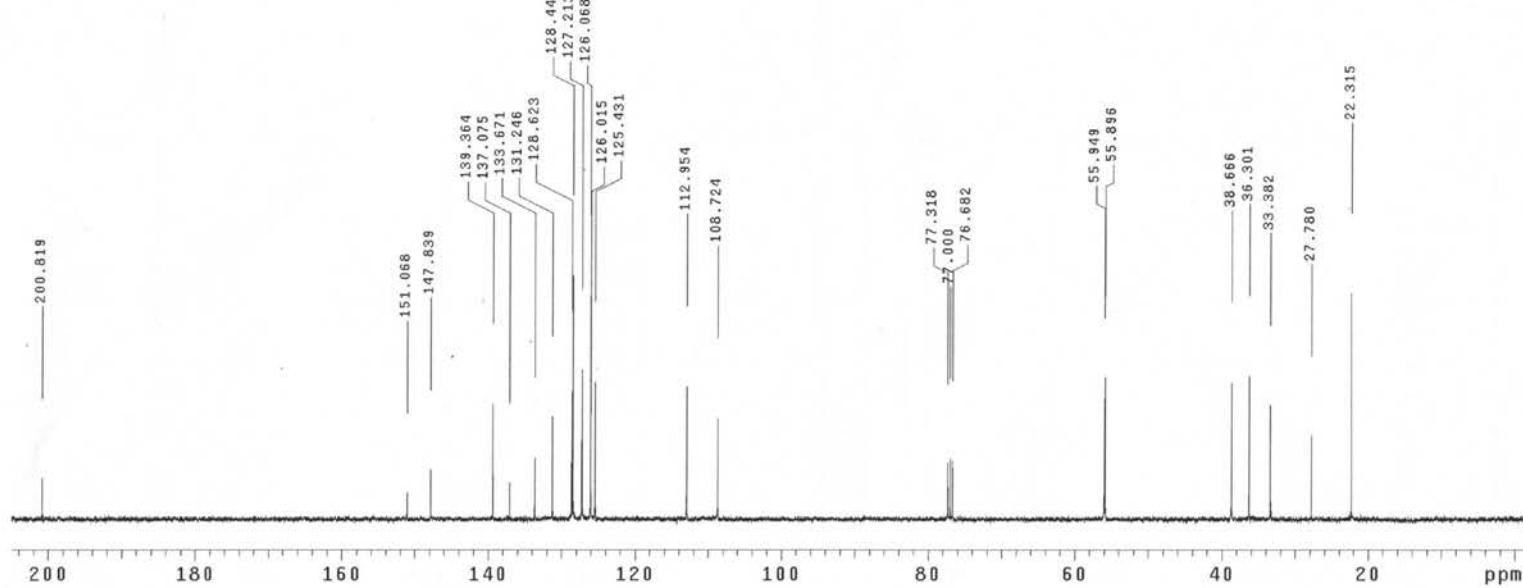
KS1061130

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 1 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 672 repetitions



Compound 4I

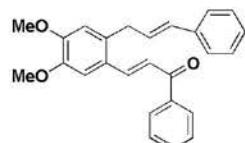
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



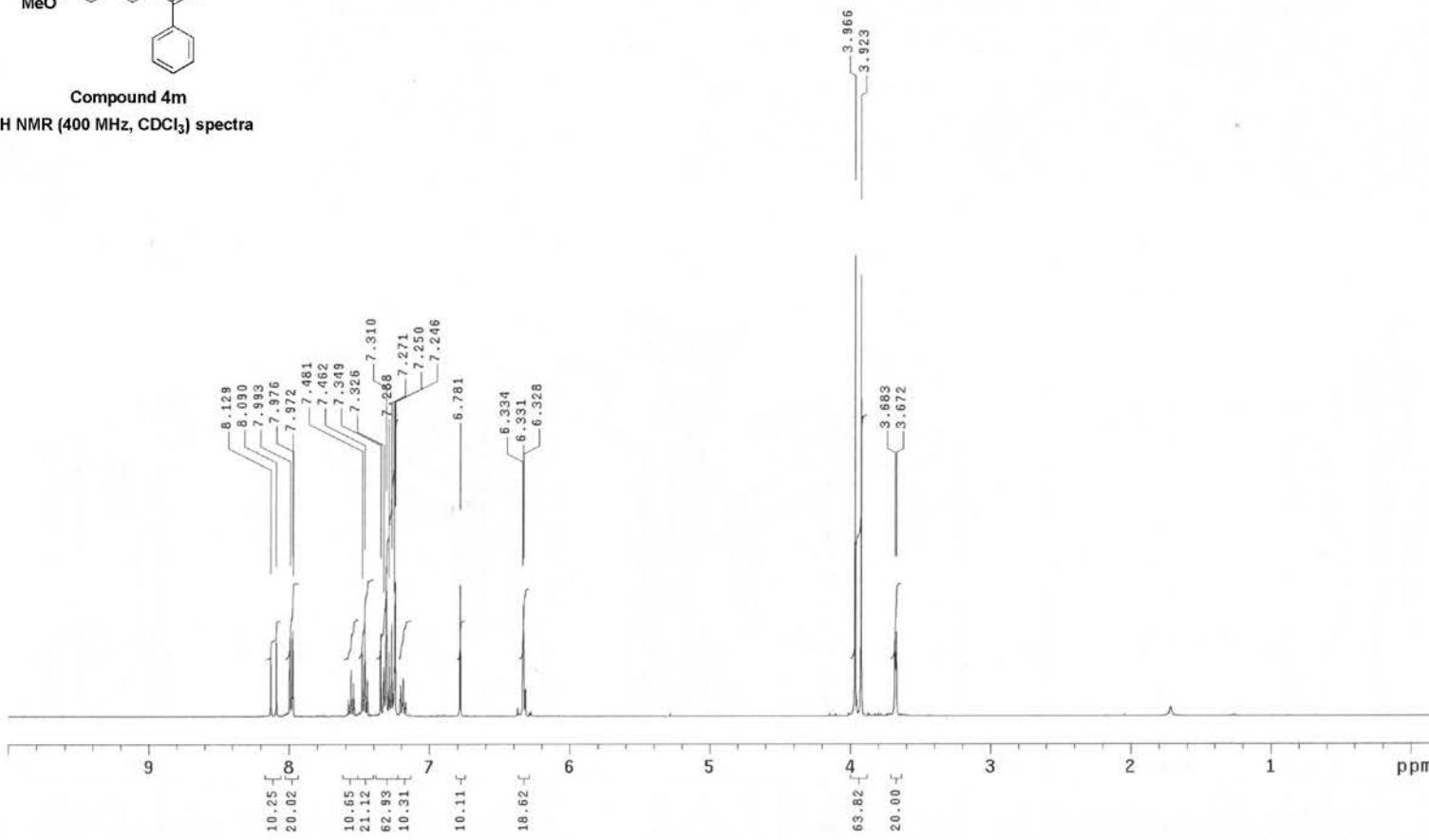
## Compound 4m ( $^1\text{H-NMR}$ spectral data)

KS1061210

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 11 2017  
Solvent: CDC13  
Ambient temperature  
Total 32 repetitions

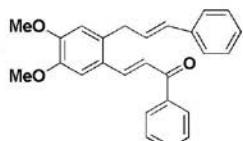


### Compound 4m



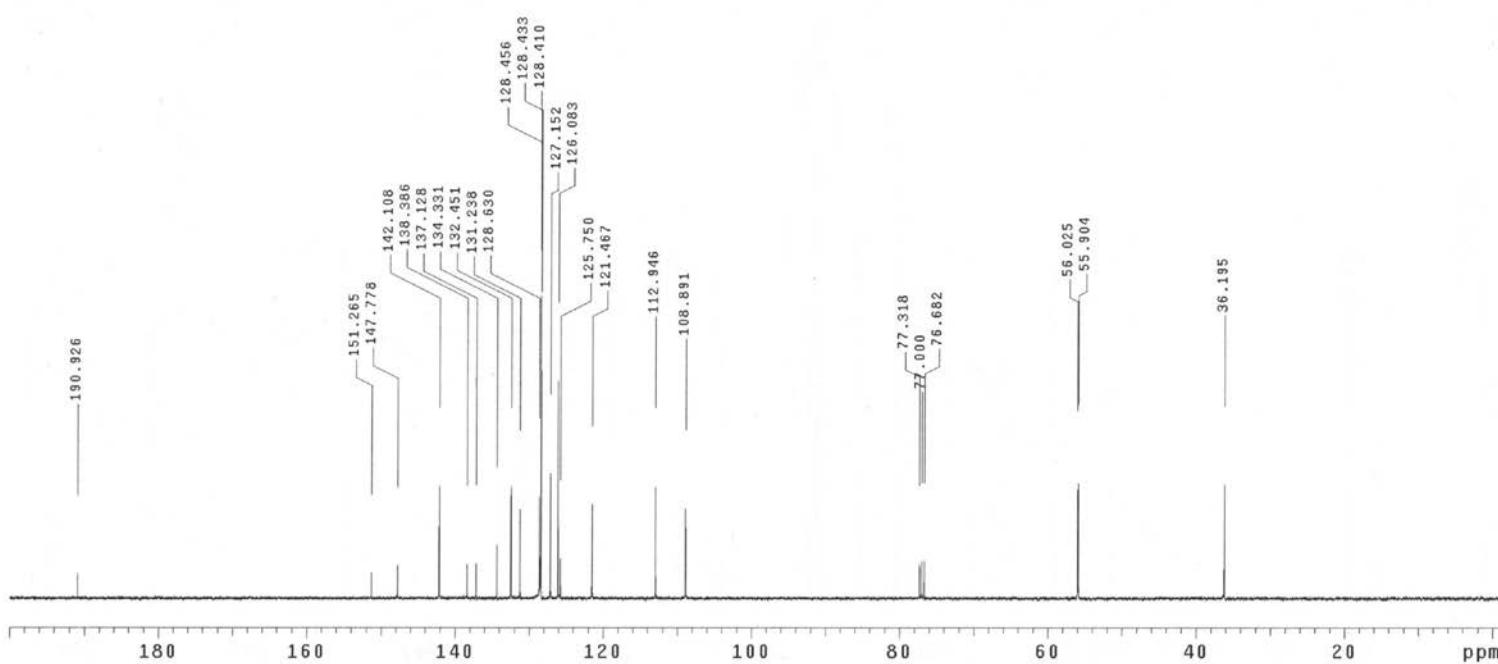
# Compound 4m ( $^{13}\text{C}$ -NMR spectral data)

KS1061210  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 11 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 640 repetitions



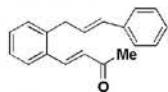
Compound 4m

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



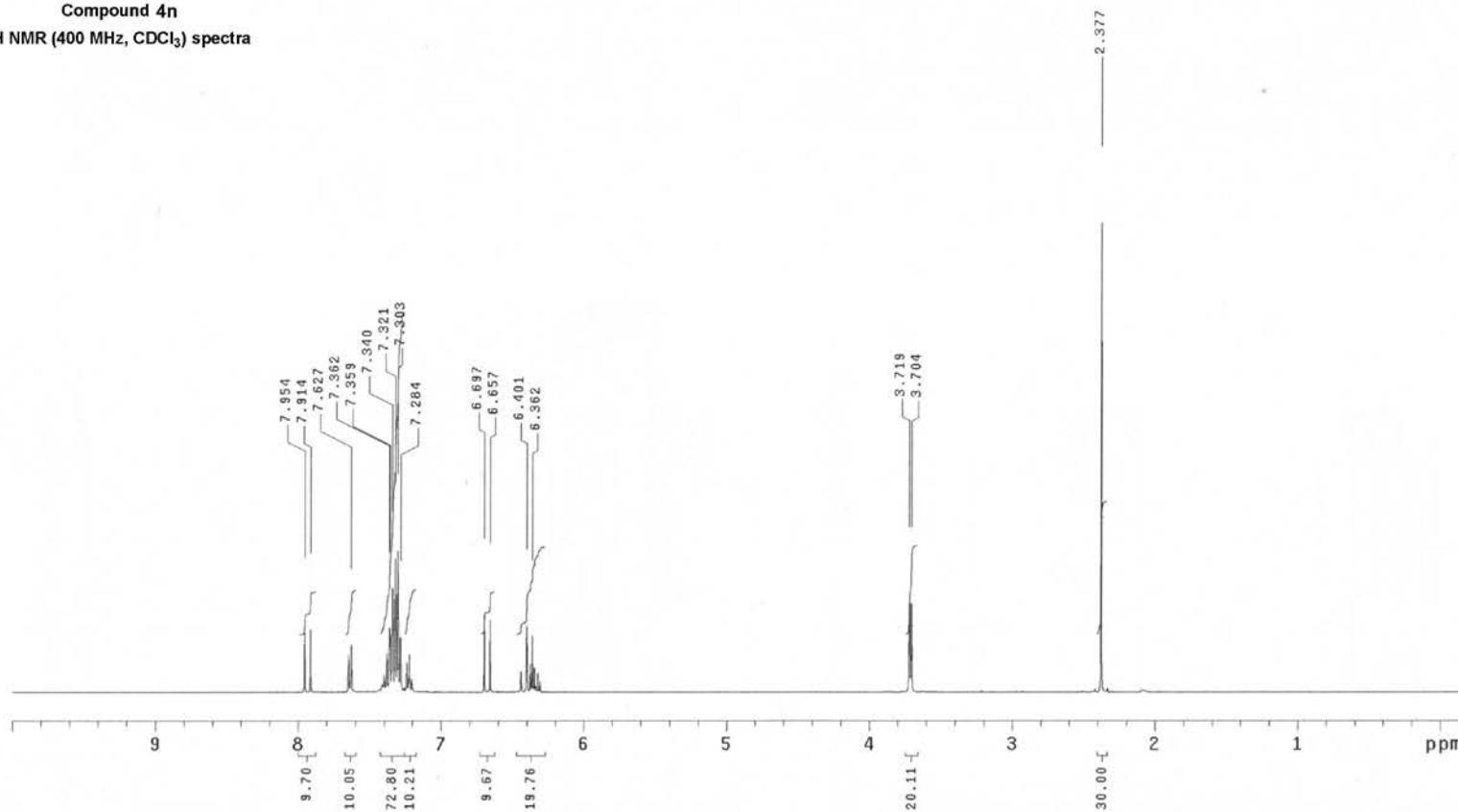
## Compound 4n ( $^1\text{H}$ -NMR spectral data)

KS1061214  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 15 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4n

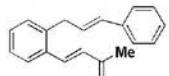
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 4n ( $^{13}\text{C}$ -NMR spectral data)

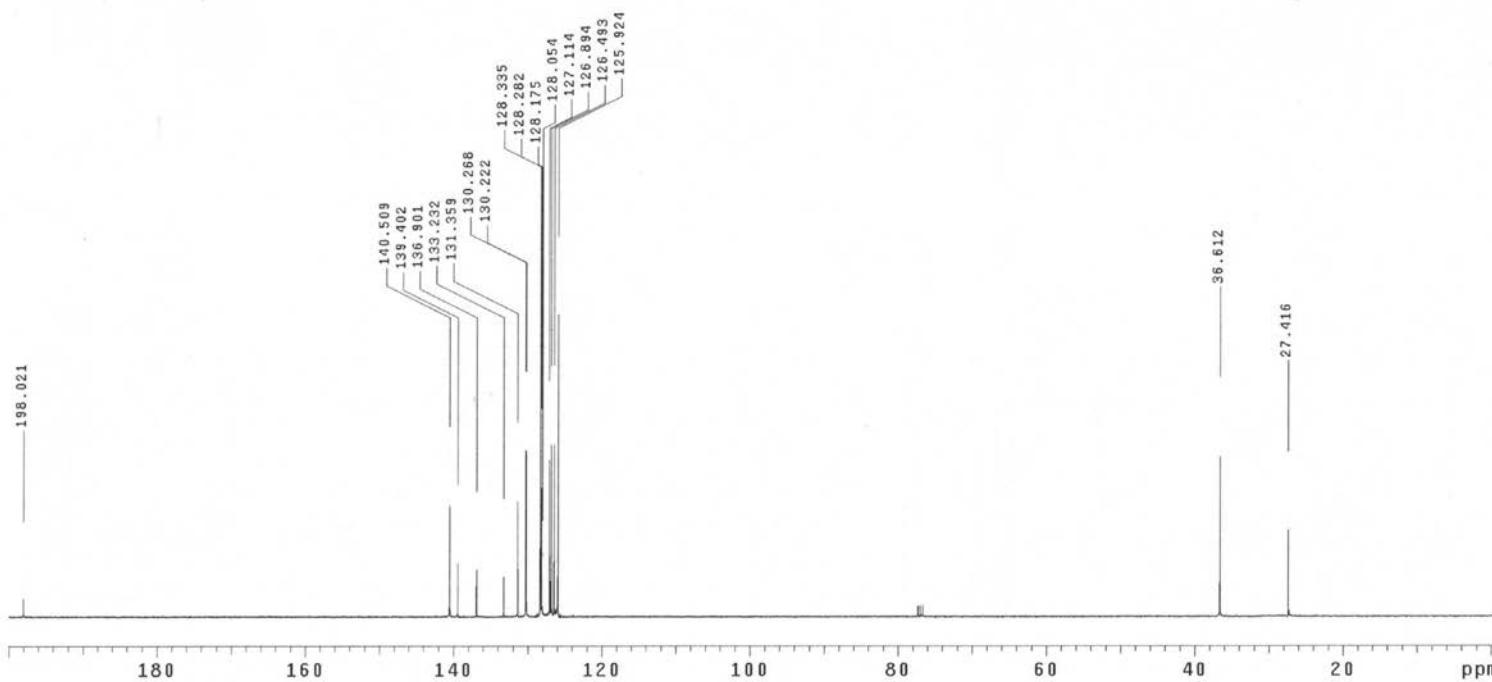
KS1061214

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 15 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 432 repetitions



Compound 4n

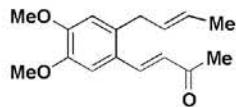
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4o (<sup>1</sup>H-NMR spectral data)

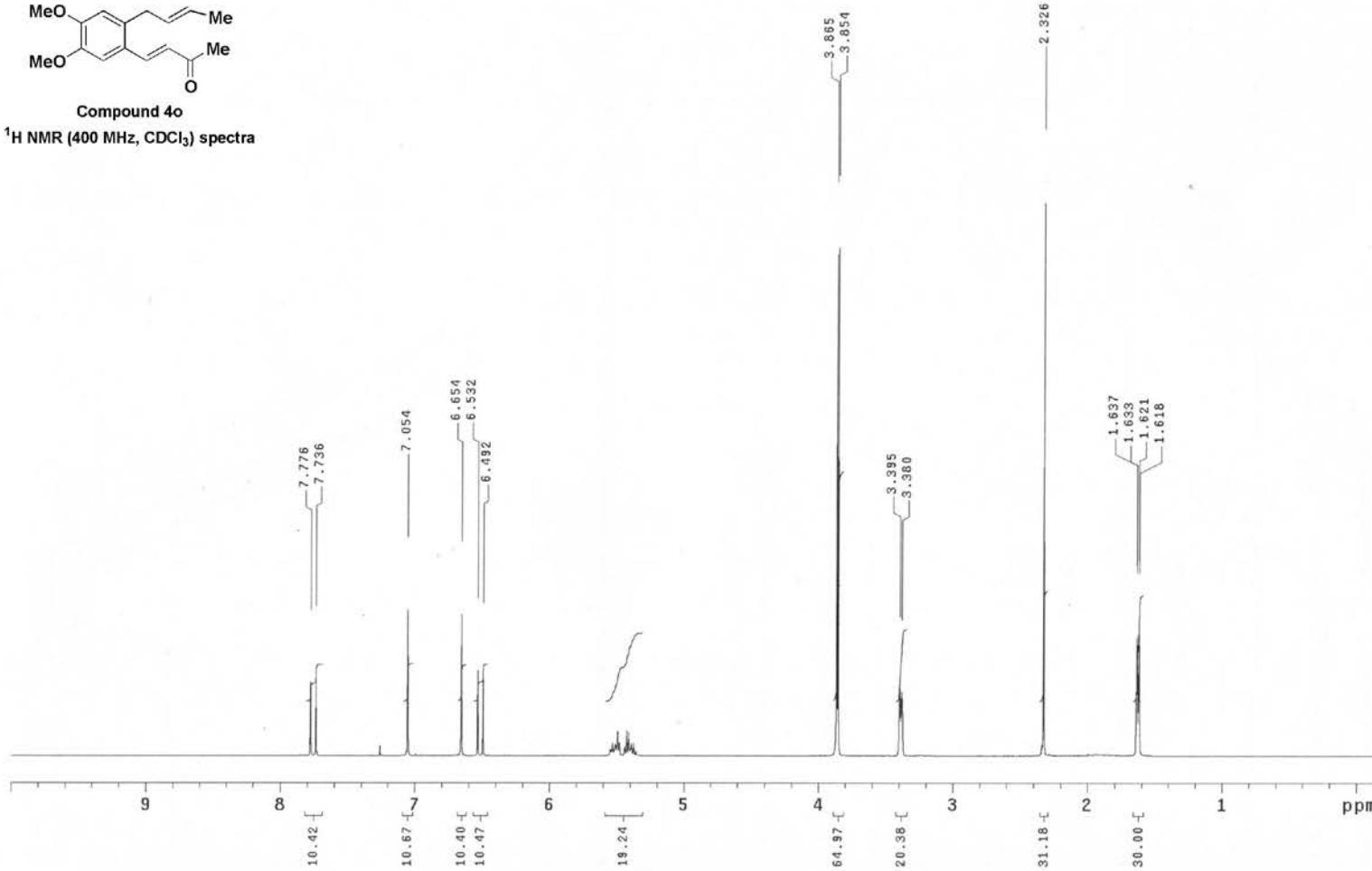
KS1061207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 8 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4o

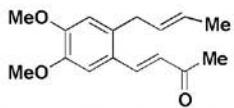
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 4o ( $^{13}\text{C}$ -NMR spectral data)

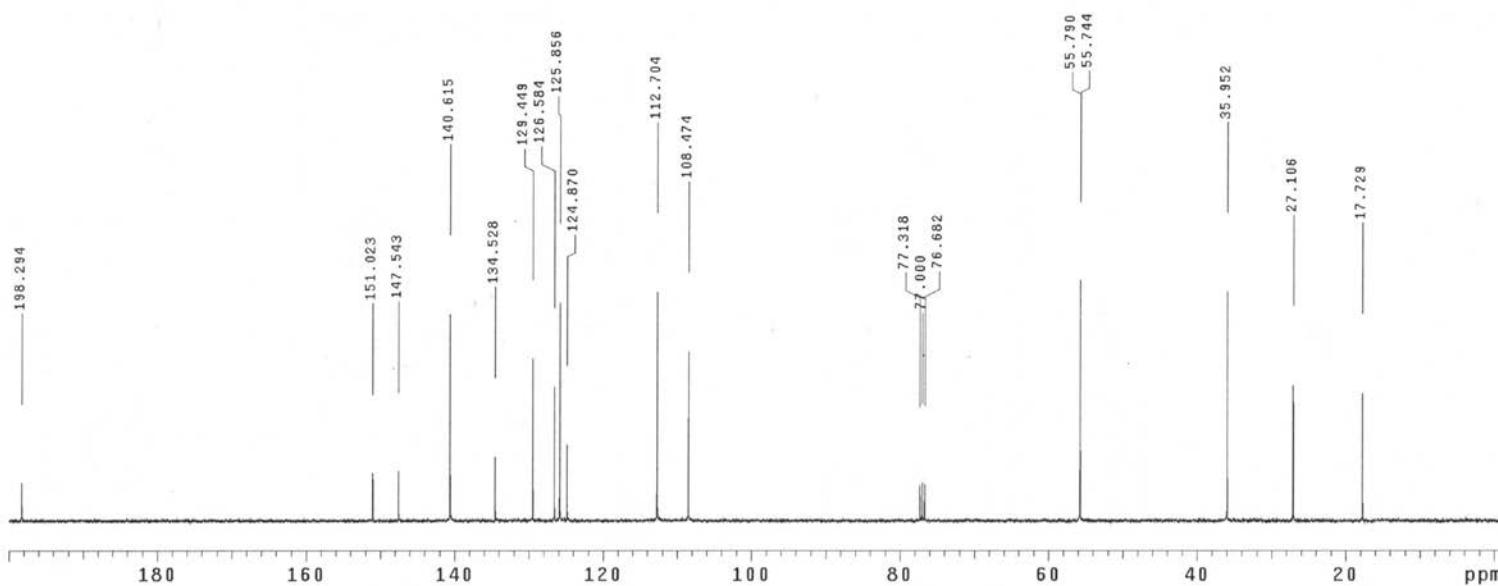
KS1061207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Dec 8 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 480 repetitions



Compound 4o

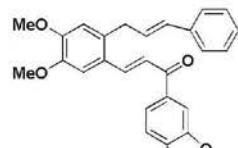
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4p ( $^1\text{H}$ -NMR spectral data)

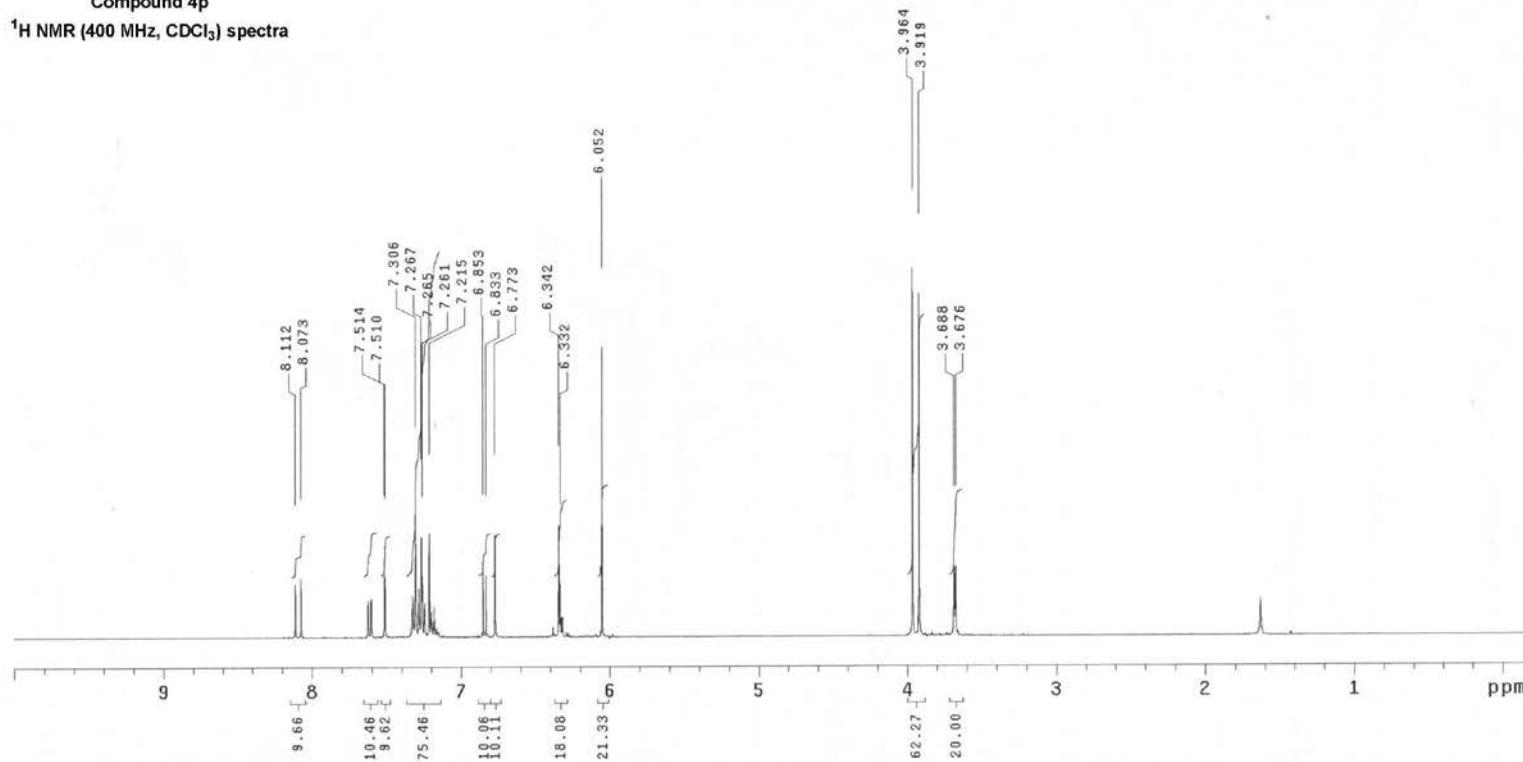
KS1070115

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 16 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



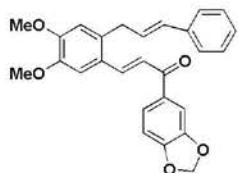
Compound 4p

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



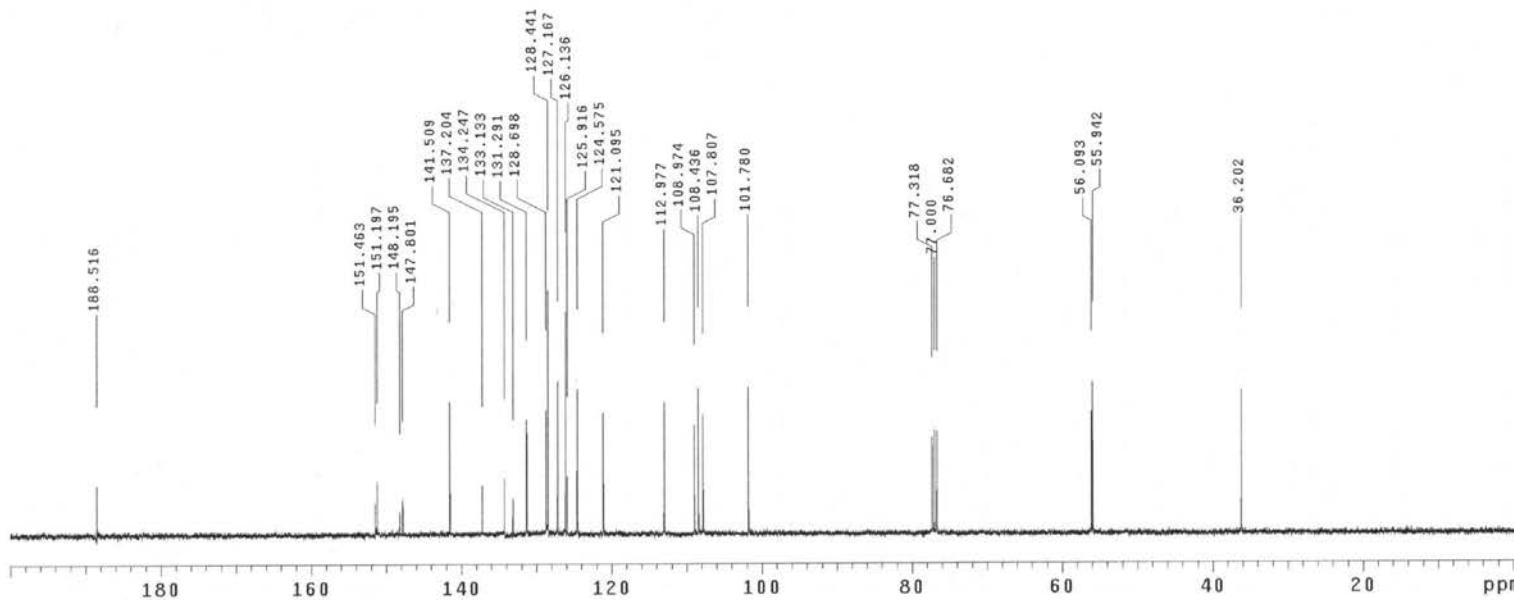
# Compound 4p ( $^{13}\text{C}$ -NMR spectral data)

KS1070115  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 16 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2448 repetitions



Compound 4p

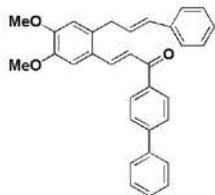
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 4q (<sup>1</sup>H-NMR spectral data)

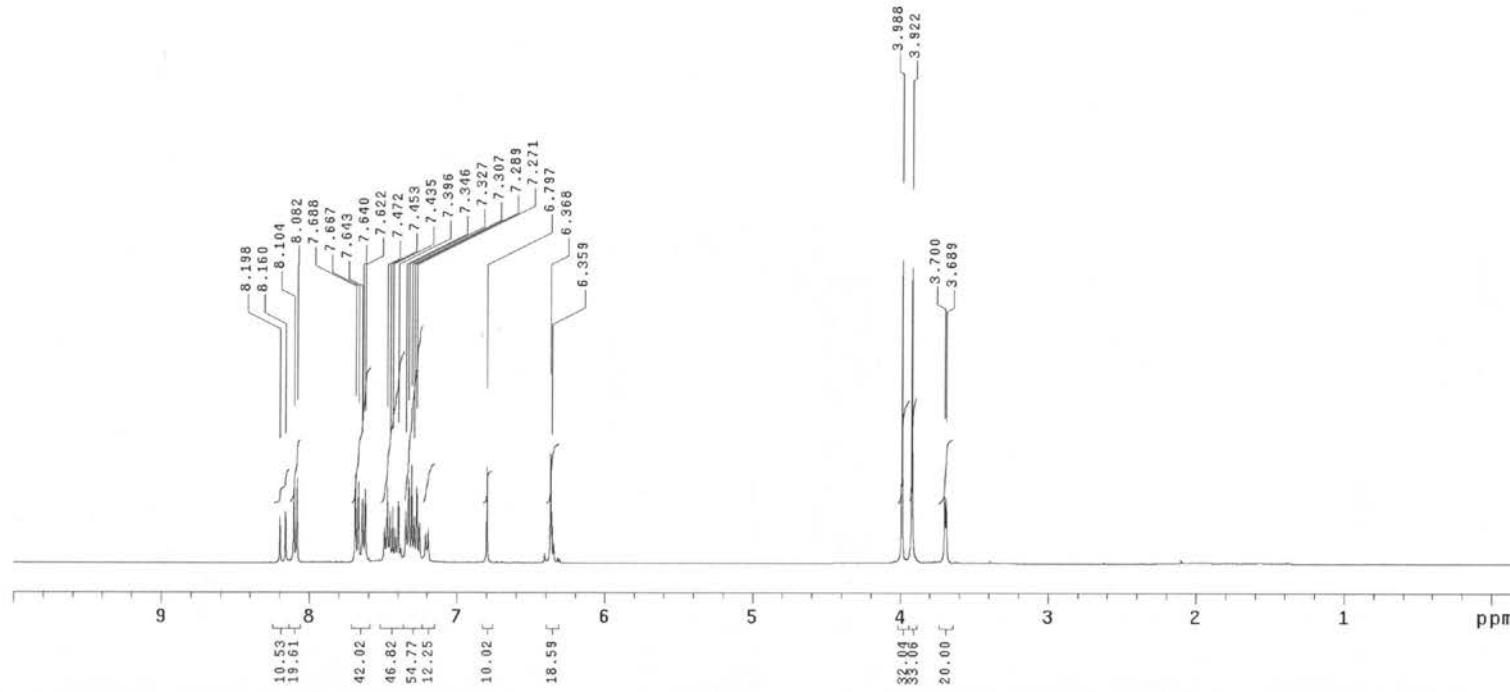
KS1070116

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 16 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4q

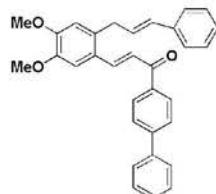
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 4q ( $^{13}\text{C}$ -NMR spectral data)

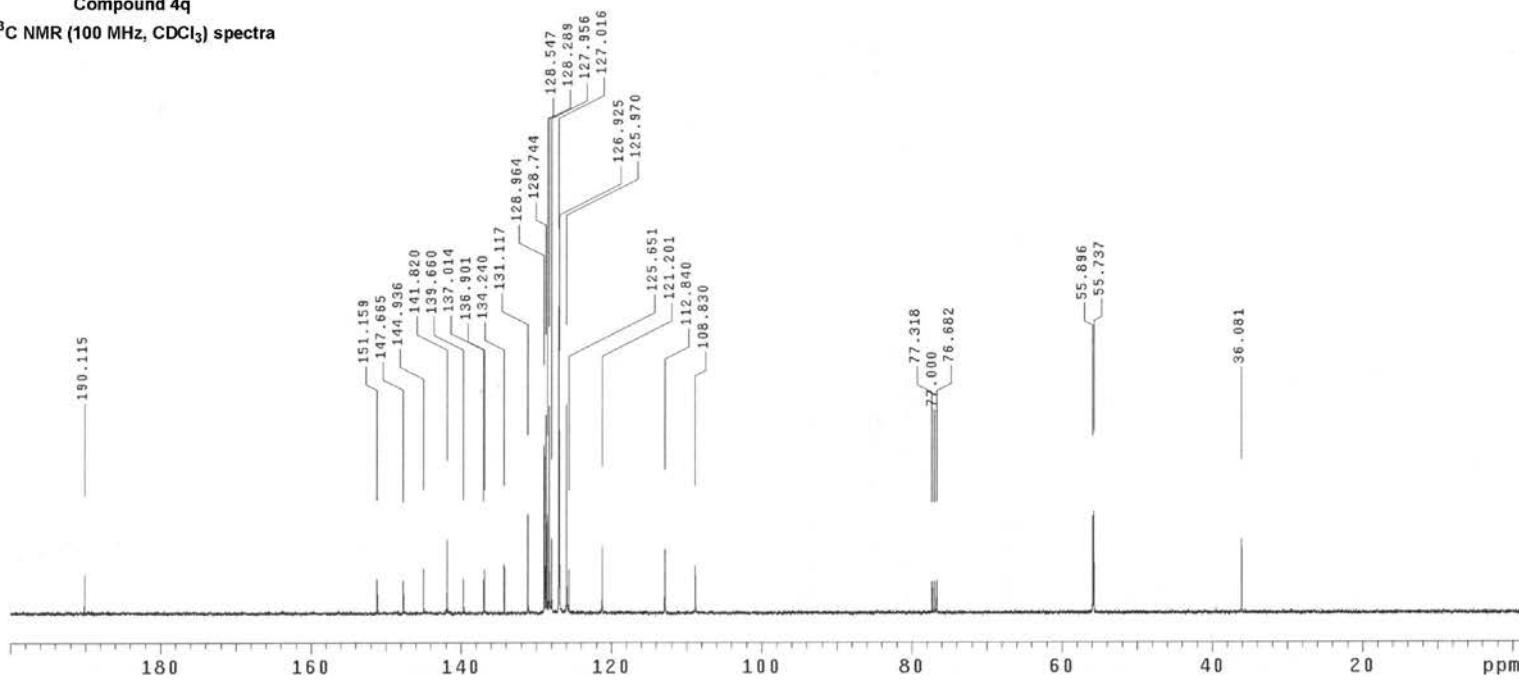
KS1070116

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 16 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 80 repetitions



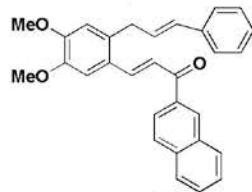
Compound 4q

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



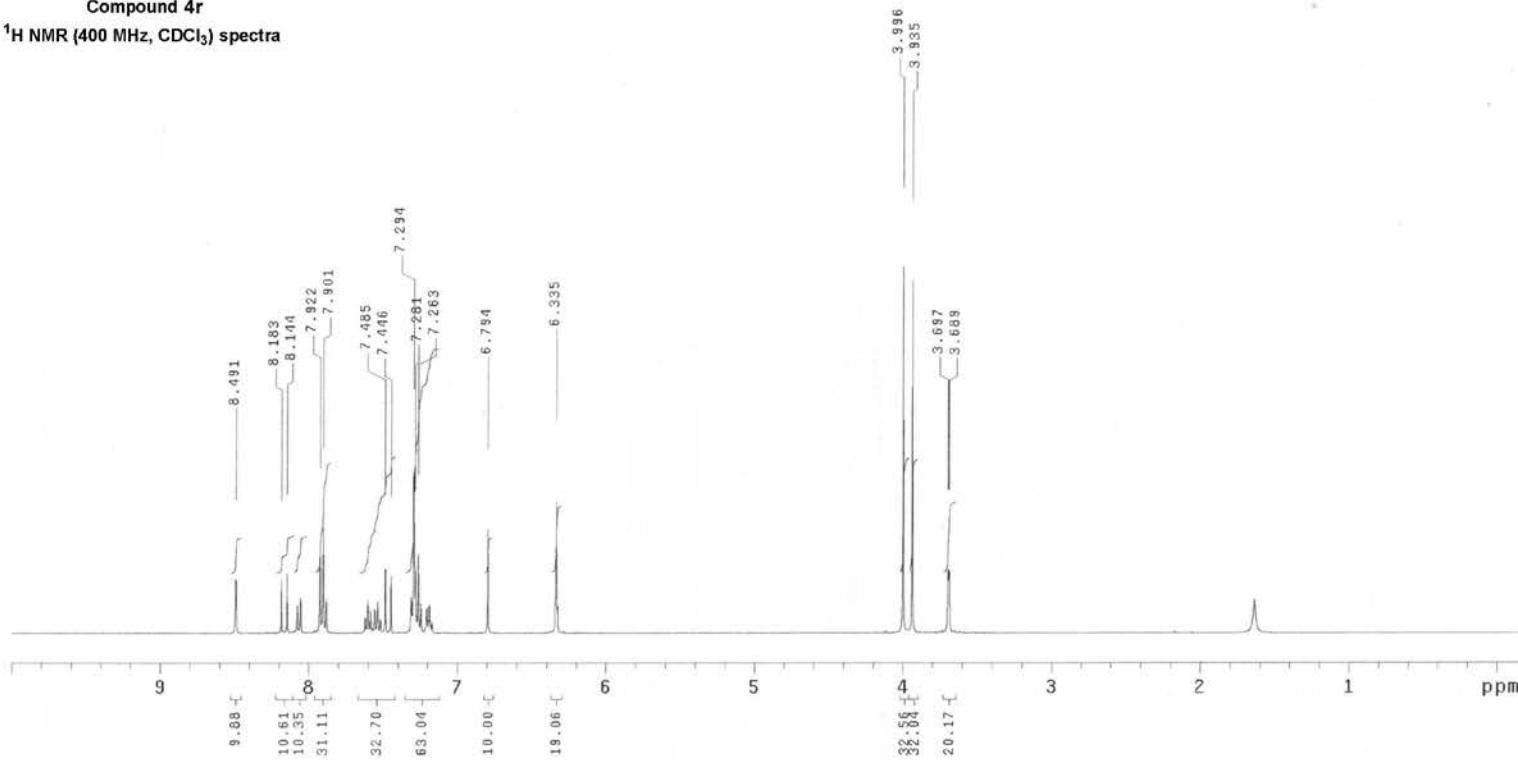
## Compound 4r ( $^1\text{H}$ -NMR spectral data)

KSA08  
Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Oct 6 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4r

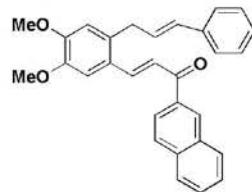
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



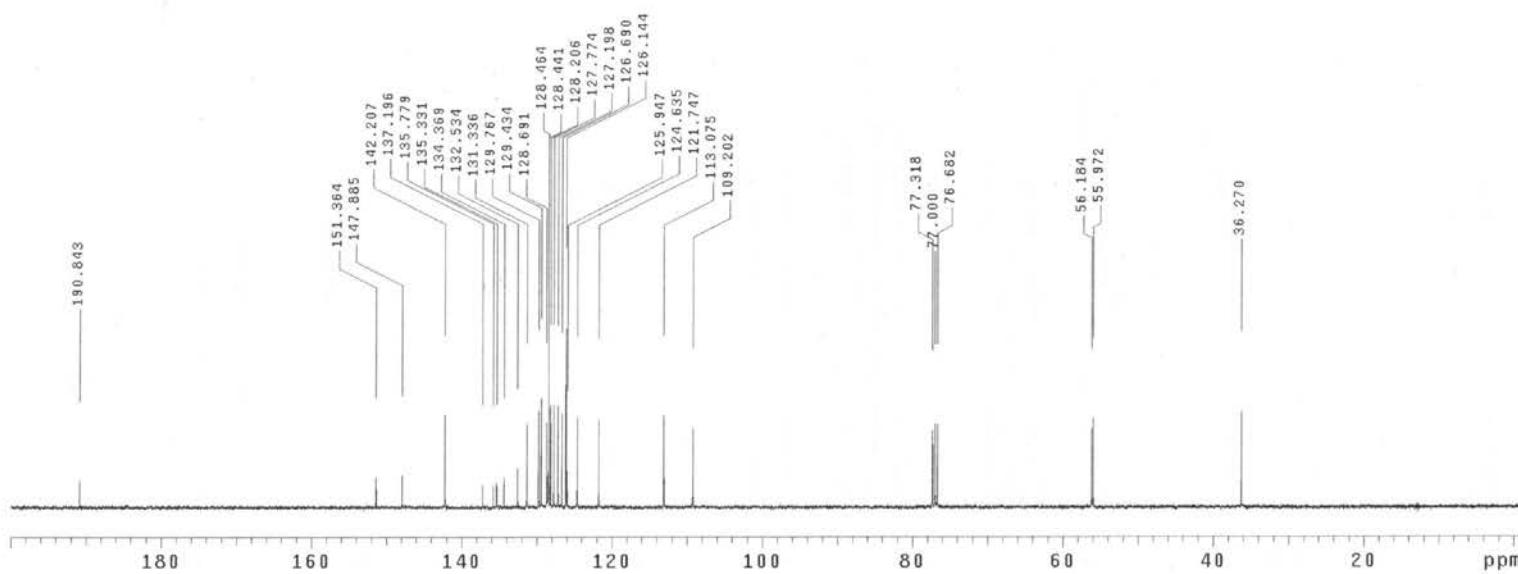
# Compound 4r (<sup>13</sup>C-NMR spectral data)

KSA08

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Oct 6 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2176 repetitions



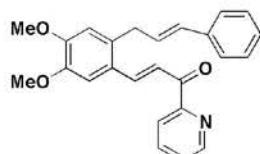
Compound 4r  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 4s ( $^1\text{H}$ -NMR spectral data)

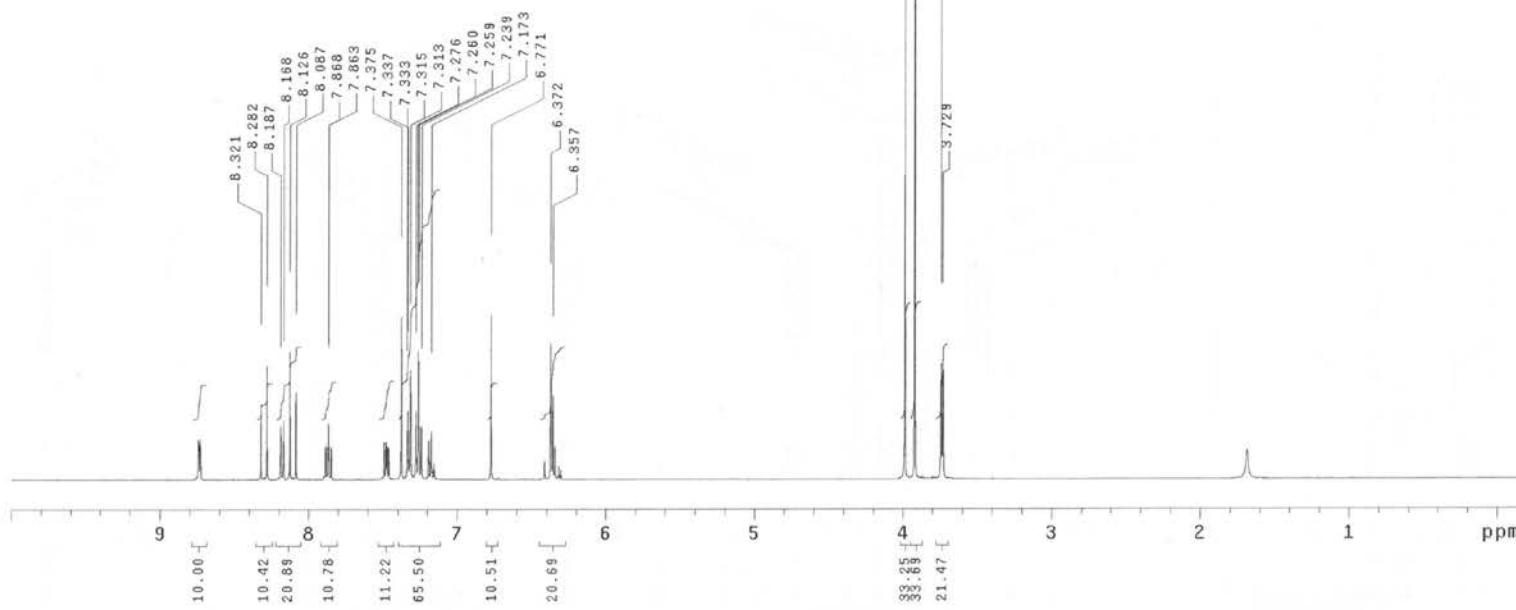
KSA09-1

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Oct 6 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



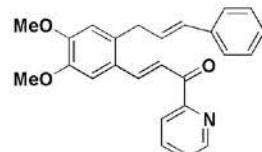
Compound 4s

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



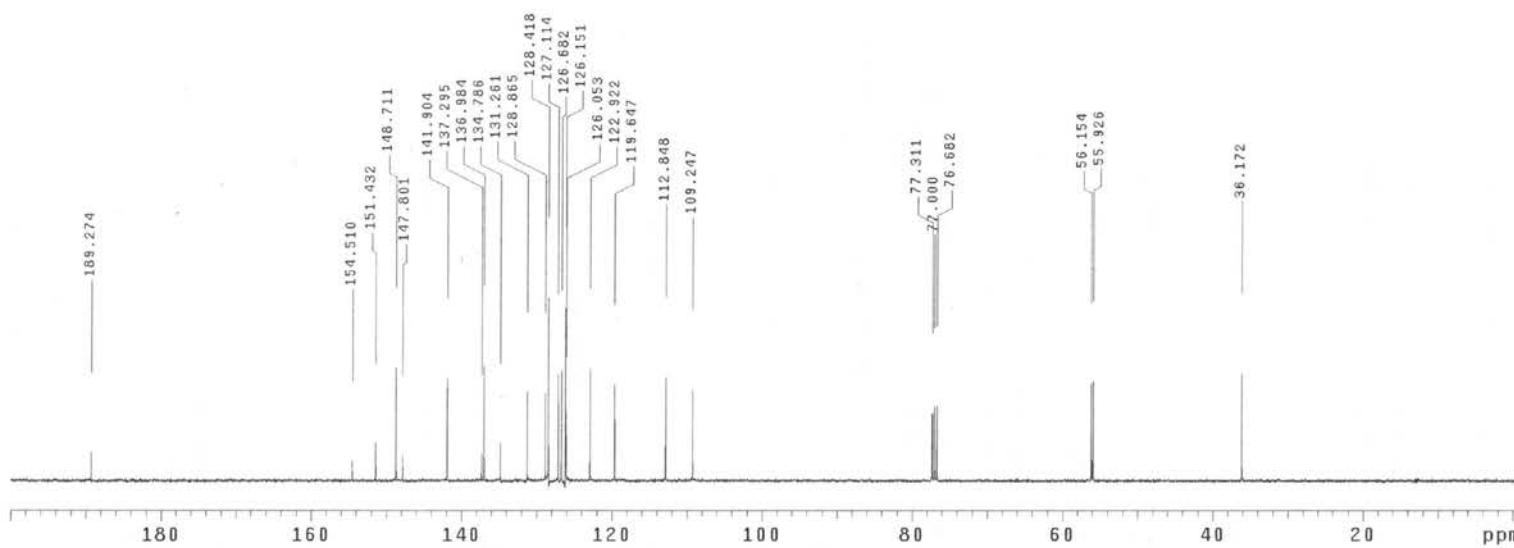
## Compound 4s ( $^{13}\text{C}$ -NMR spectral data)

KSA09-1  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Oct 6 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 3056 repetitions



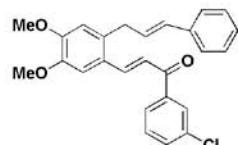
Compound 4s

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



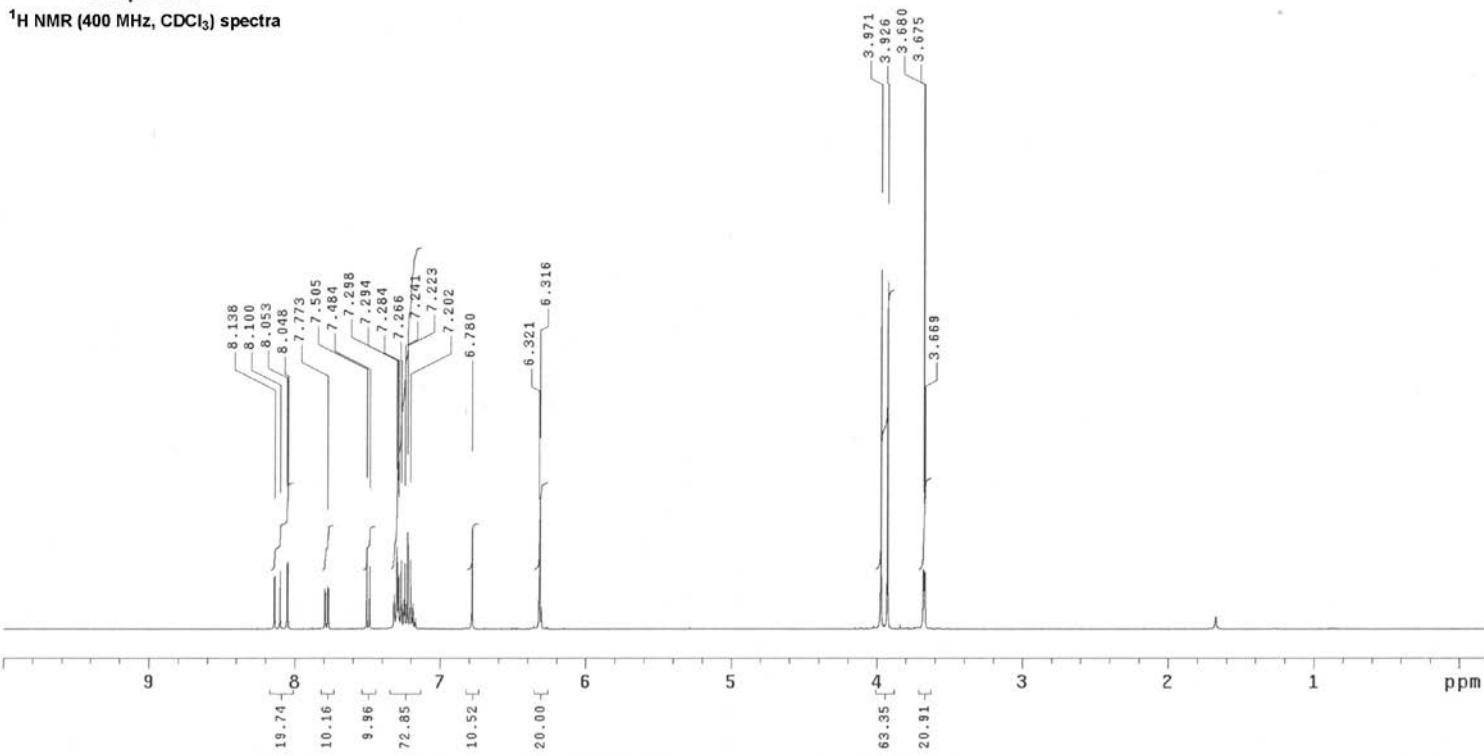
## Compound 4t ( $^1\text{H}$ -NMR spectral data)

KS1070118  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 19 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



Compound 4t

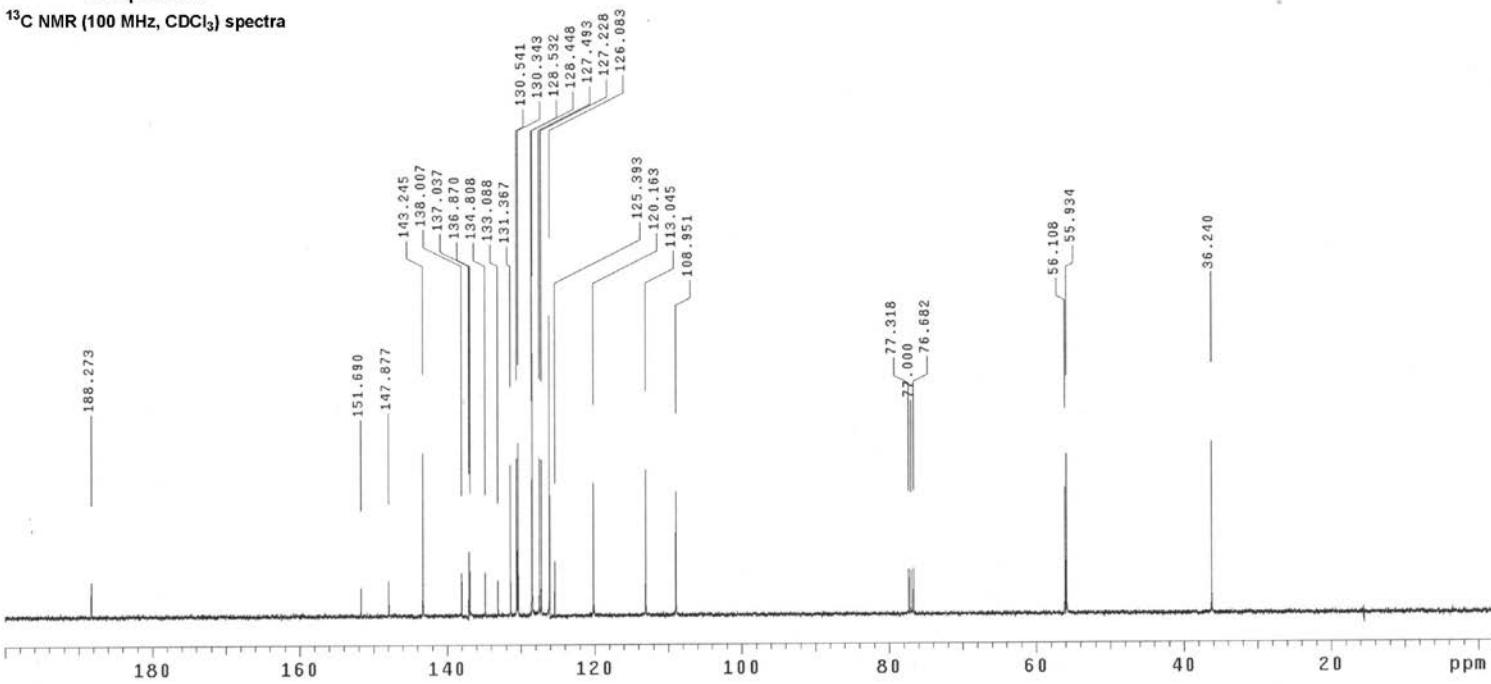
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



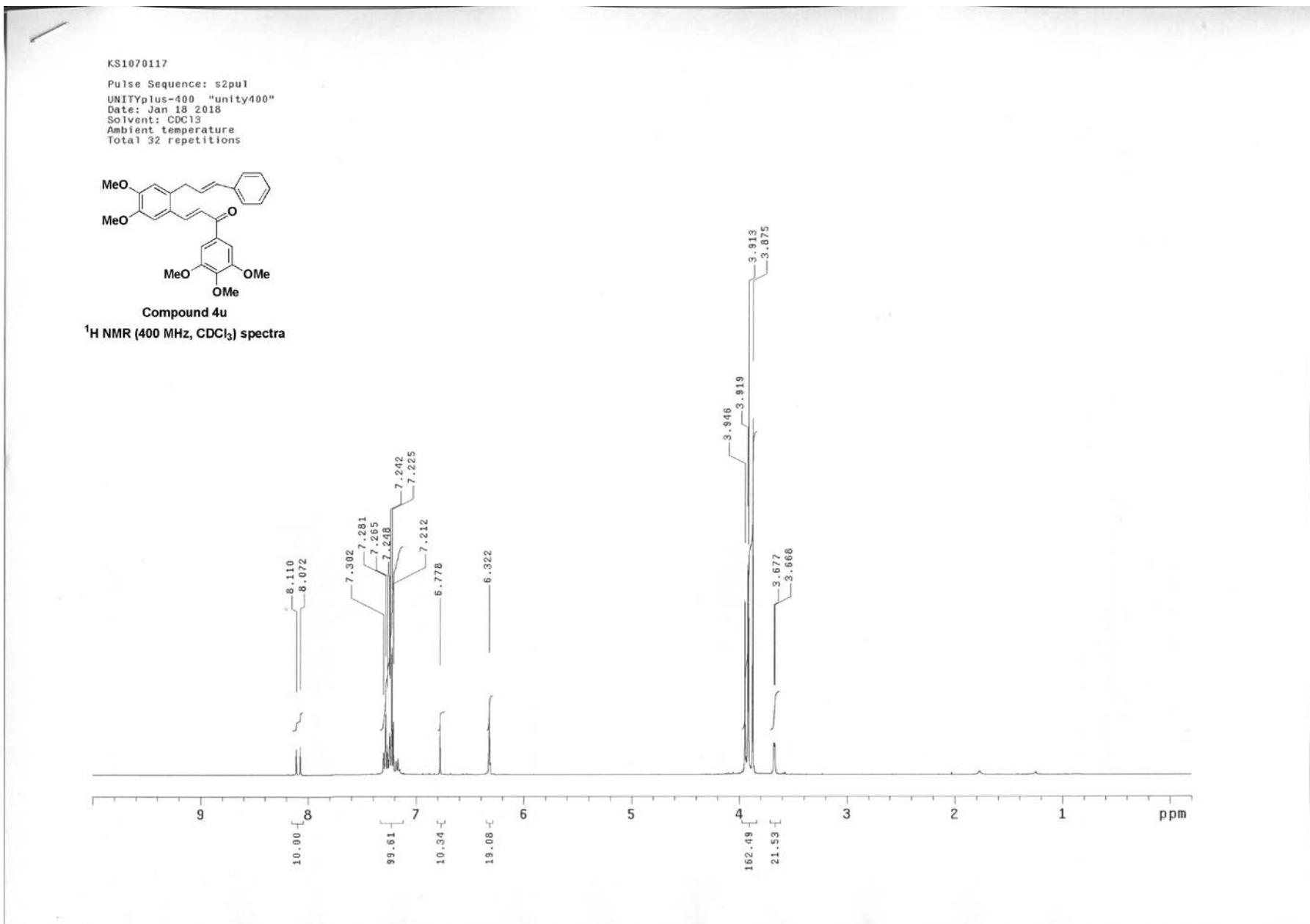
## Compound 4t (<sup>13</sup>C-NMR spectral data)

KS1070118  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 19 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 816 repetitions

O=C(c1ccc(Cl)cc1)c2cc(O)c3ccccc3cc2O  
**Compound 4t**  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



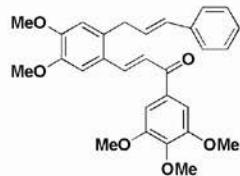
# Compound 4u (<sup>1</sup>H-NMR spectral data)



## Compound 4u ( $^{13}\text{C}$ -NMR spectral data)

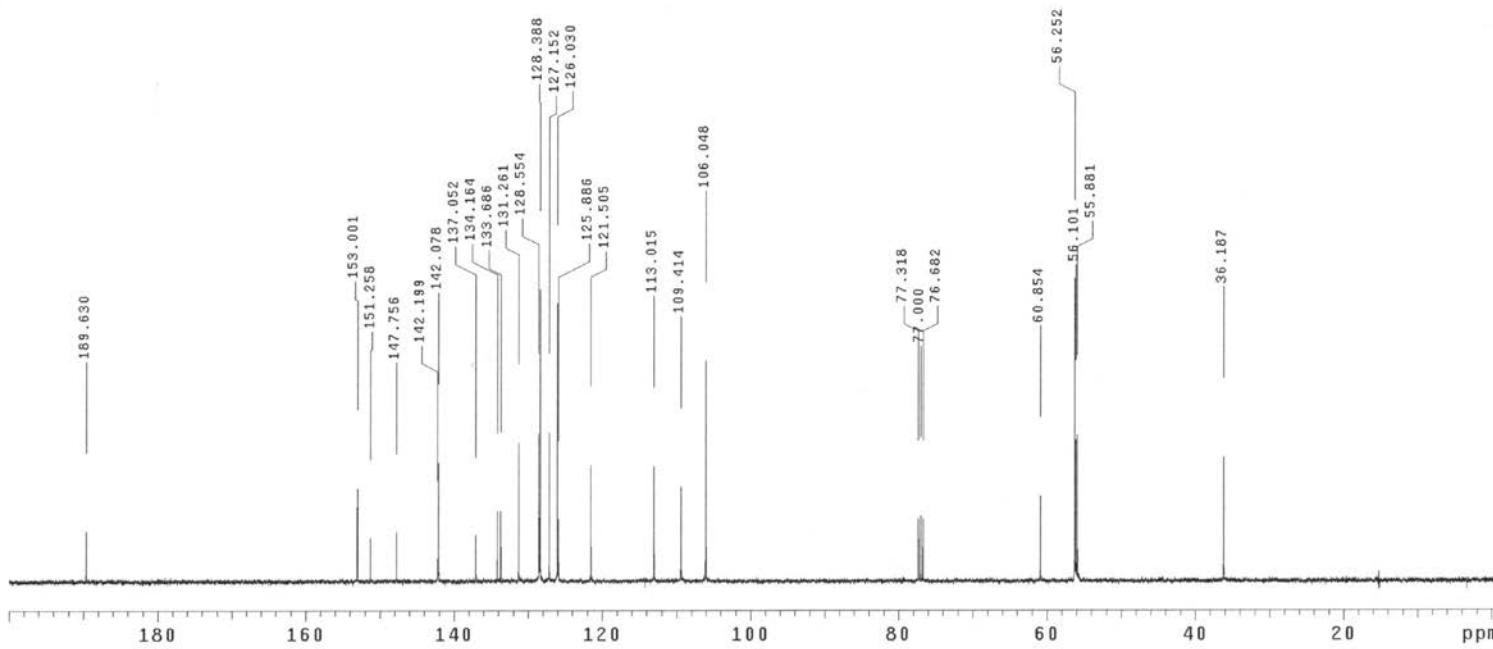
KS1070117

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 18 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 64000 repetitions



Compound 4u

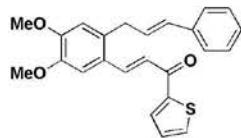
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 4v ( $^1\text{H}$ -NMR spectral data)

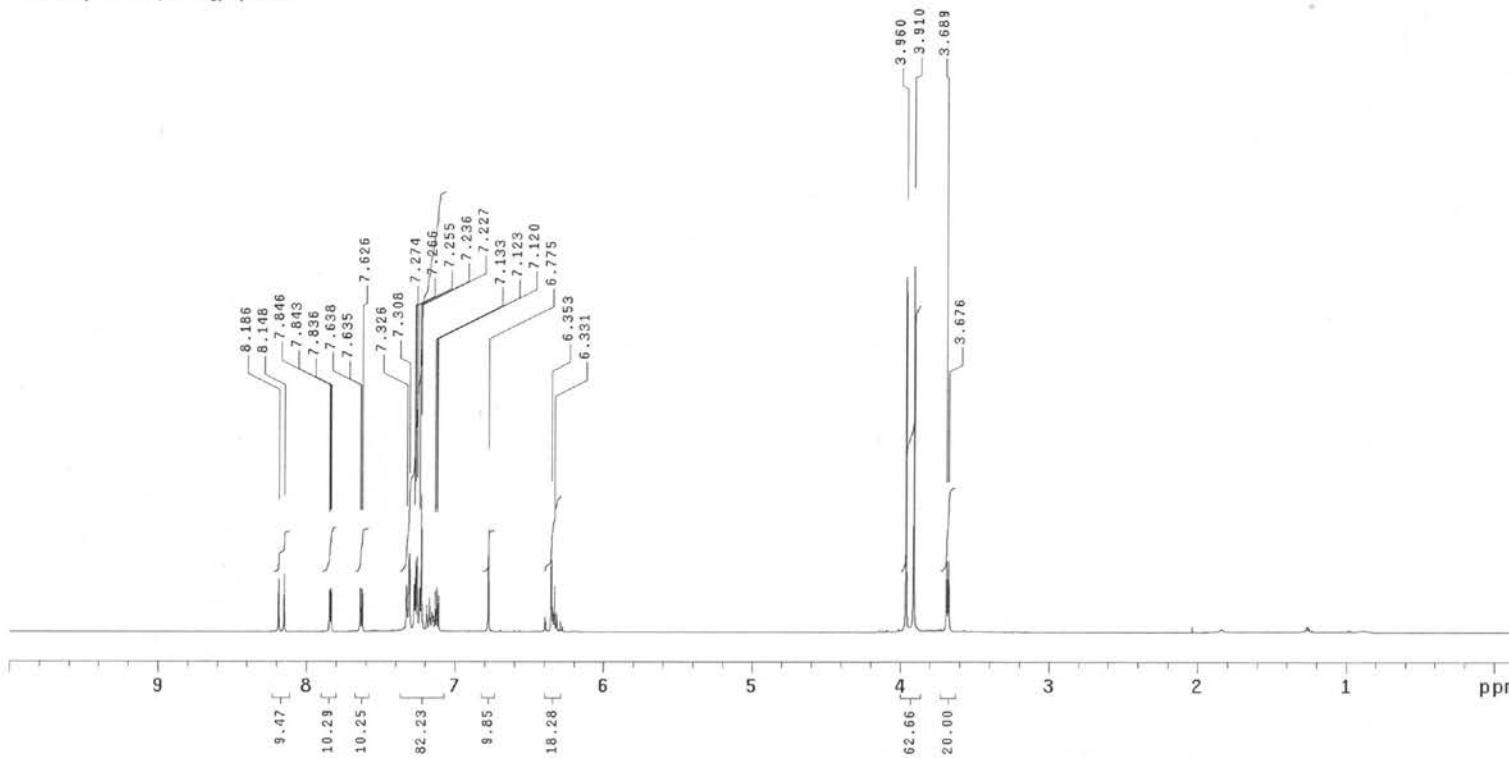
KS1070207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb. 8 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4v

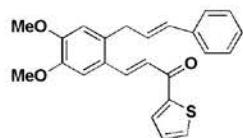
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 4v ( $^{13}\text{C}$ -NMR spectral data)

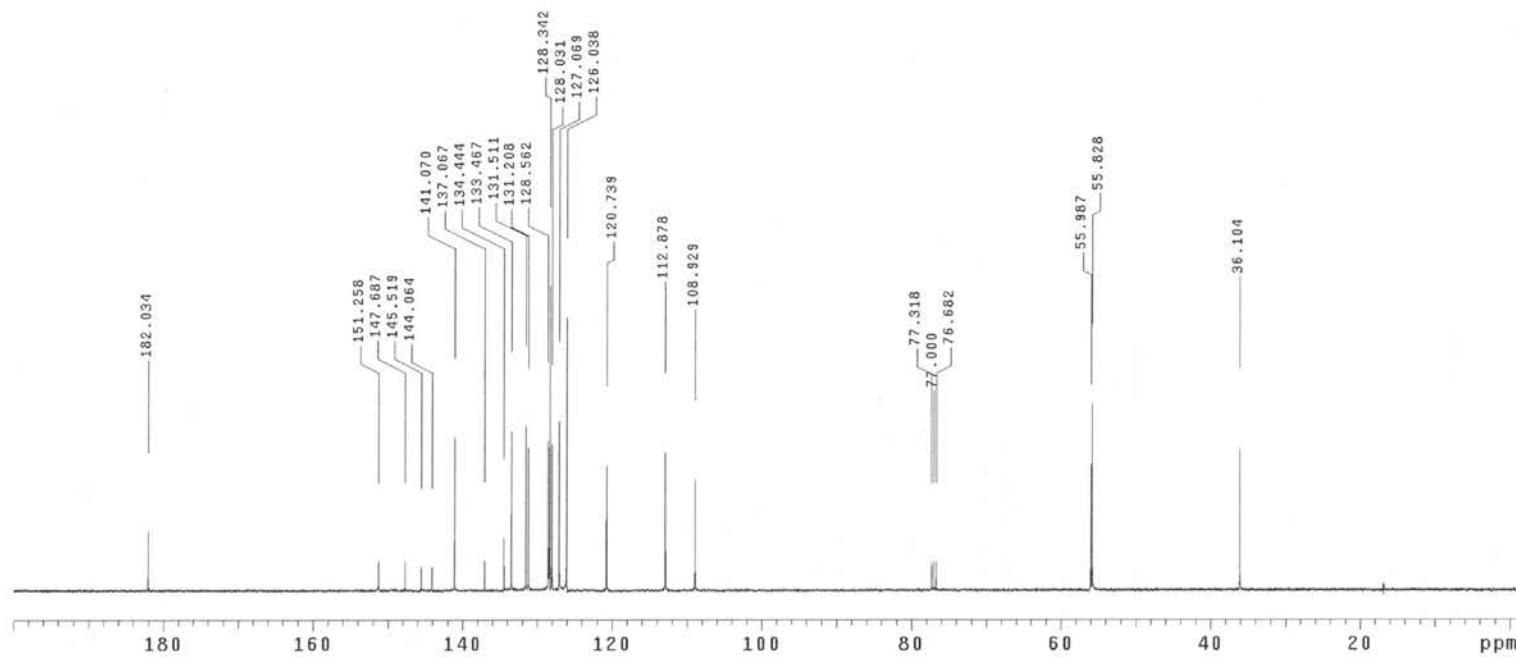
KS1070207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 8 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1024 repetitions



Compound 4v

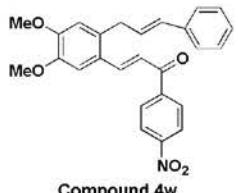
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 4w ( $^1\text{H}$ -NMR spectral data)

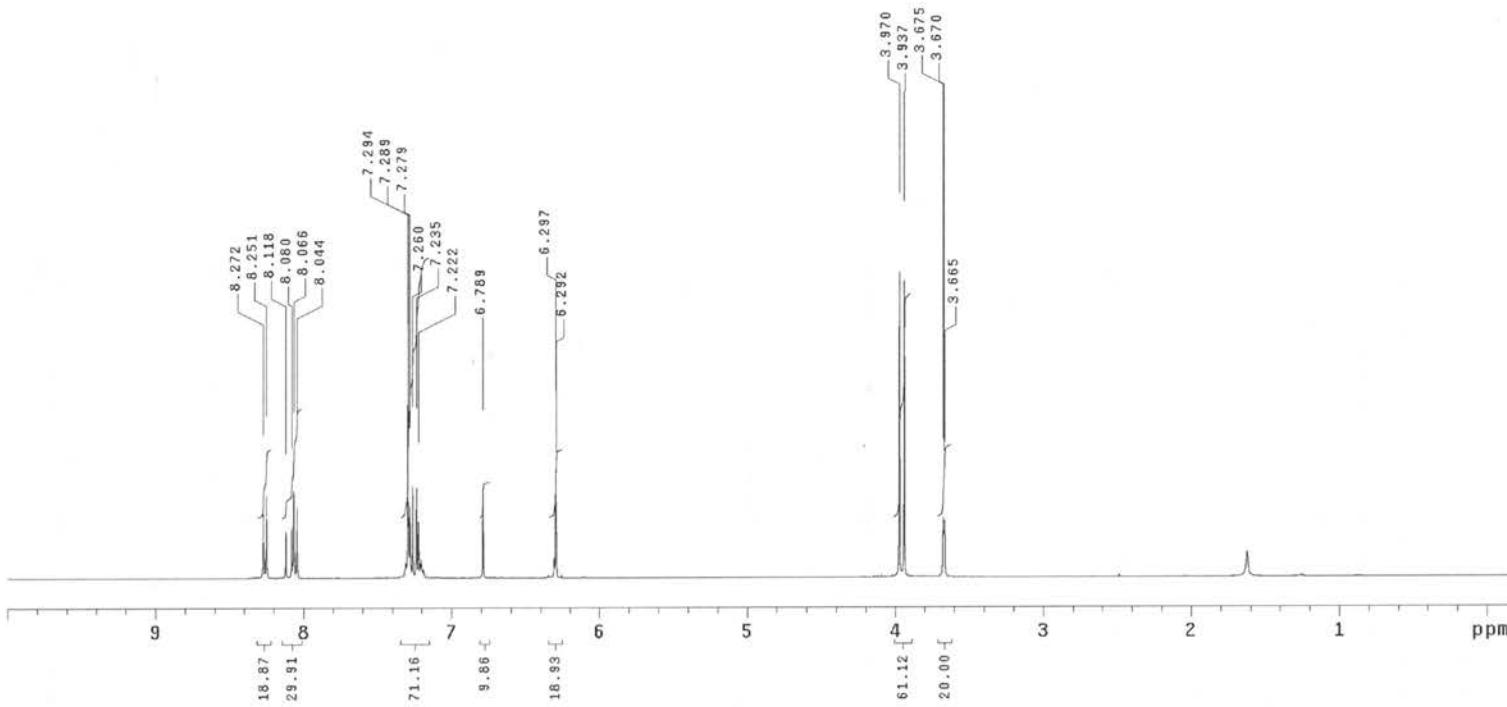
KS1070124

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 25 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



Compound 4w

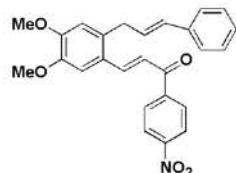
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



## Compound 4w ( $^{13}\text{C}$ -NMR spectral data)

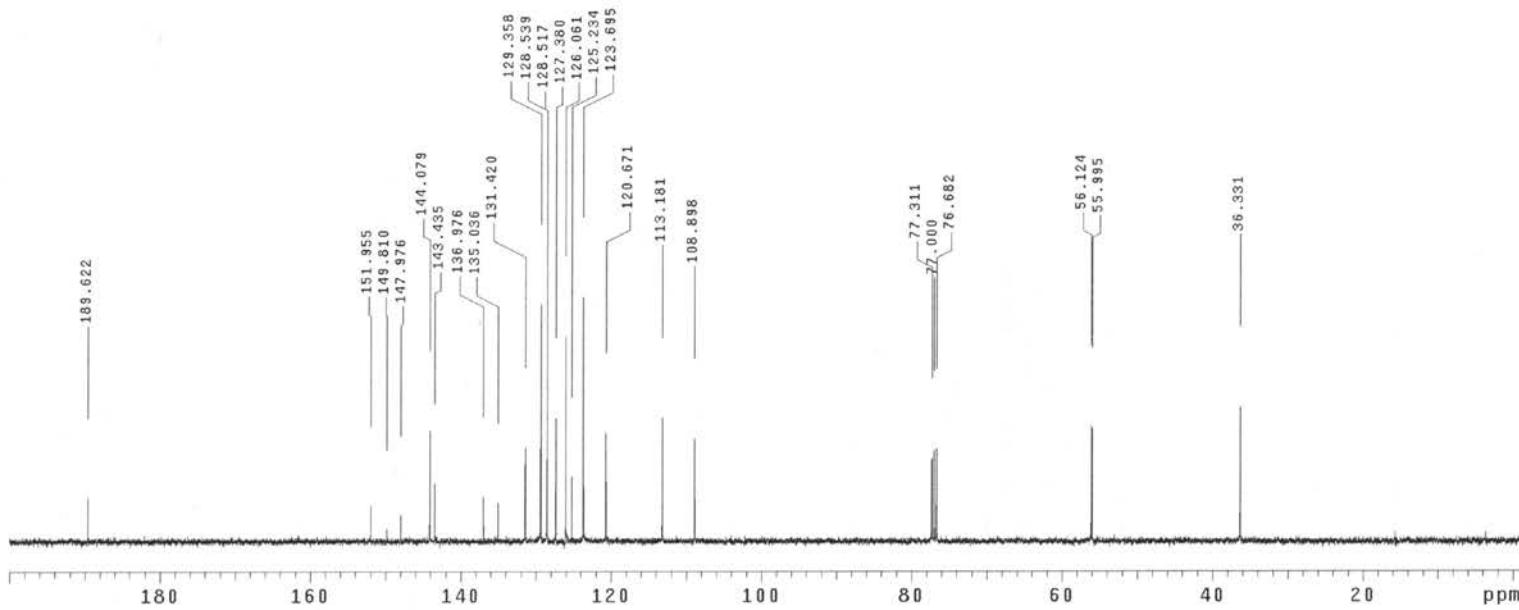
KS1070124

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 25 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 1472 repetitions



Compound 4w

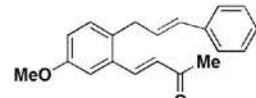
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



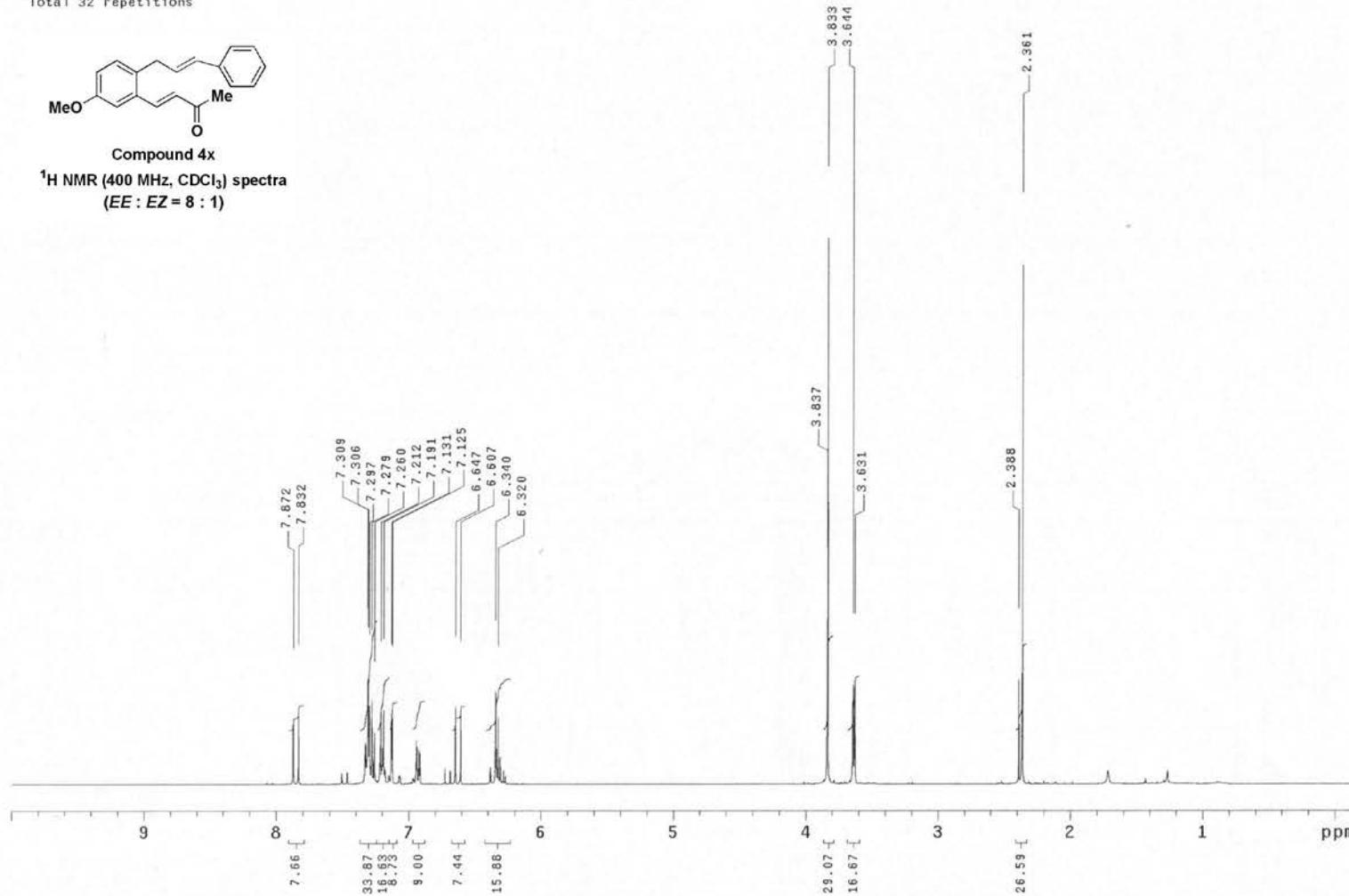
# Compound 4x ( $^1\text{H}$ -NMR spectral data)

KS1070307

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 7 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions

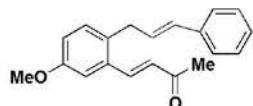


Compound 4x  
 $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra  
(*EE* : *EZ* = 8 : 1)

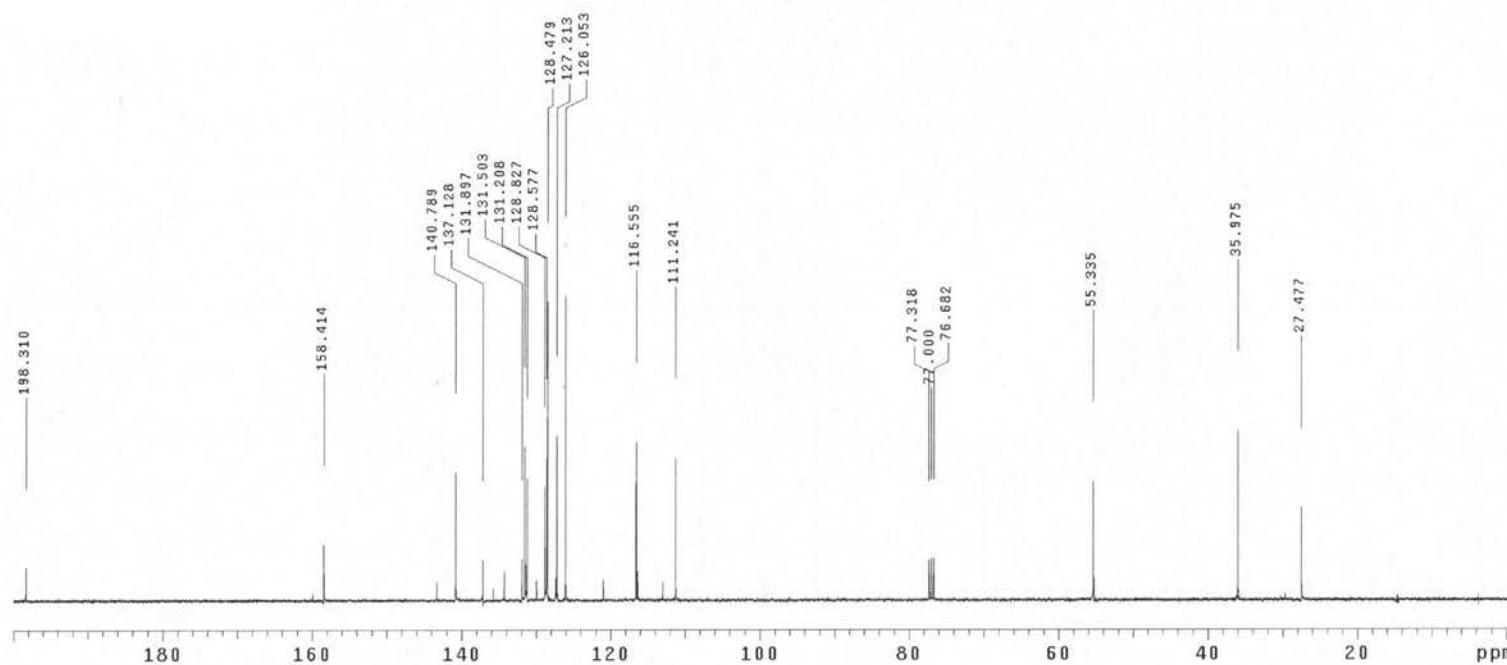


# Compound 4x ( $^{13}\text{C}$ -NMR spectral data)

KS1070307  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 7 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2016 repetitions



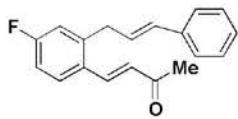
Compound 4x  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra  
(EE : EZ = 8 : 1)



# Compound 4y ( $^1\text{H}$ -NMR spectral data)

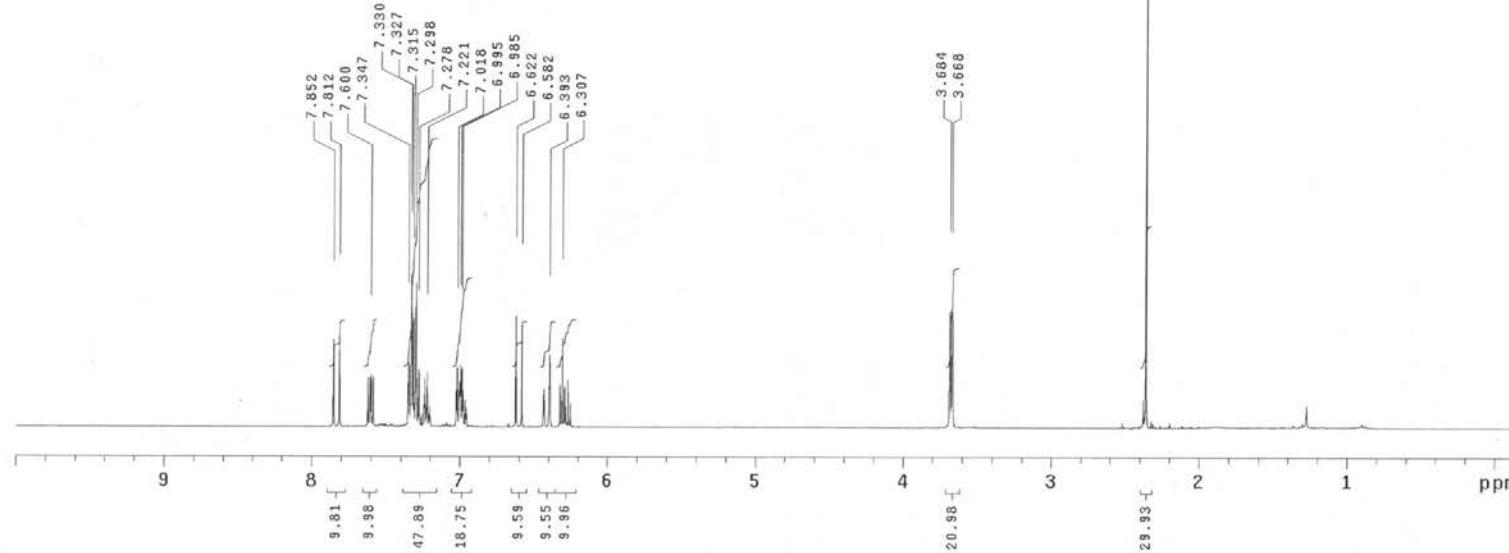
KS1070403

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Apr 3 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



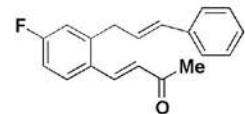
Compound 4y

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

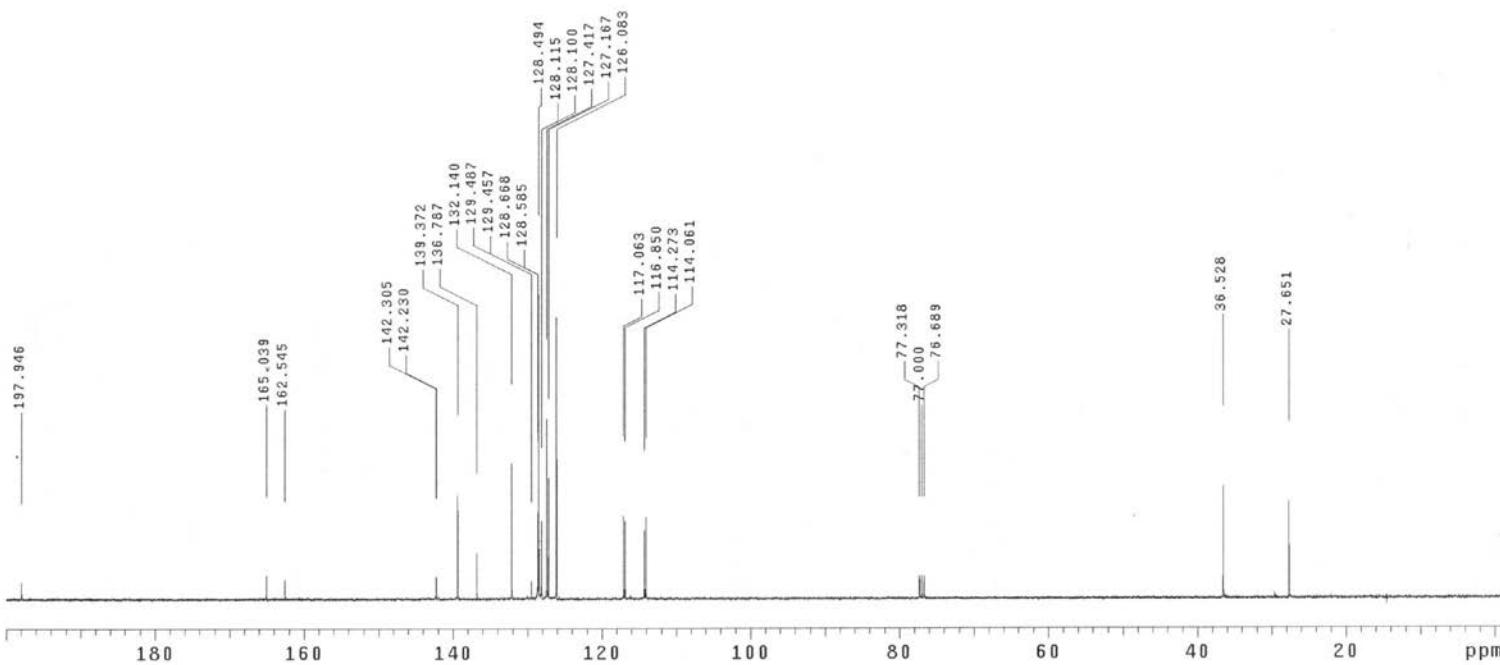


## Compound 4y ( $^{13}\text{C}$ -NMR spectral data)

KS1070403  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Apr 3 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 336 repetitions

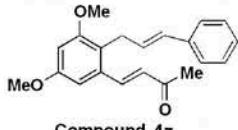


Compound 4y  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



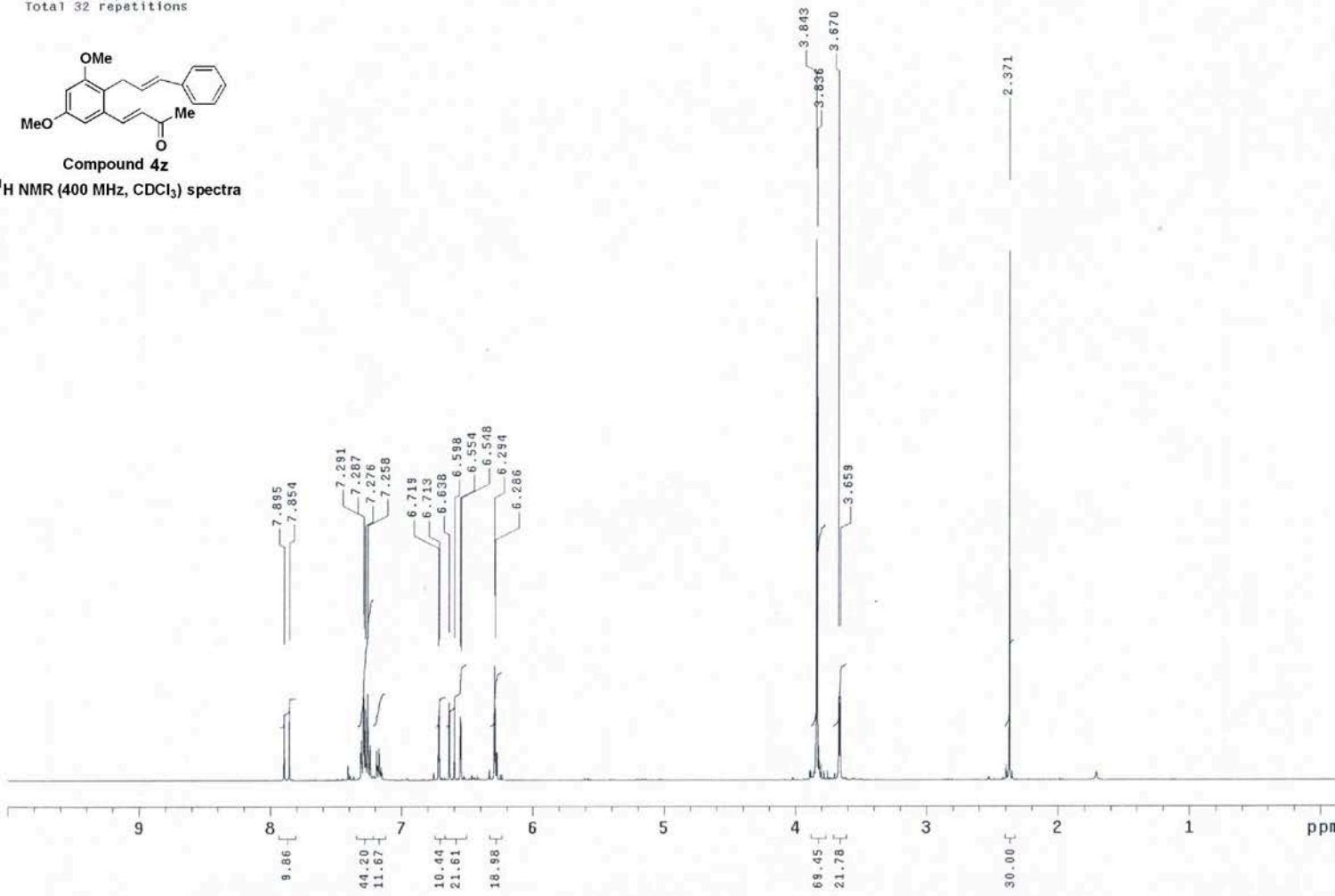
## Compound 4z ( $^1\text{H}$ -NMR spectral data)

KS1070313  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 14 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4z

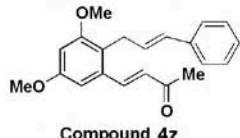
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 4z (<sup>13</sup>C-NMR spectral data)

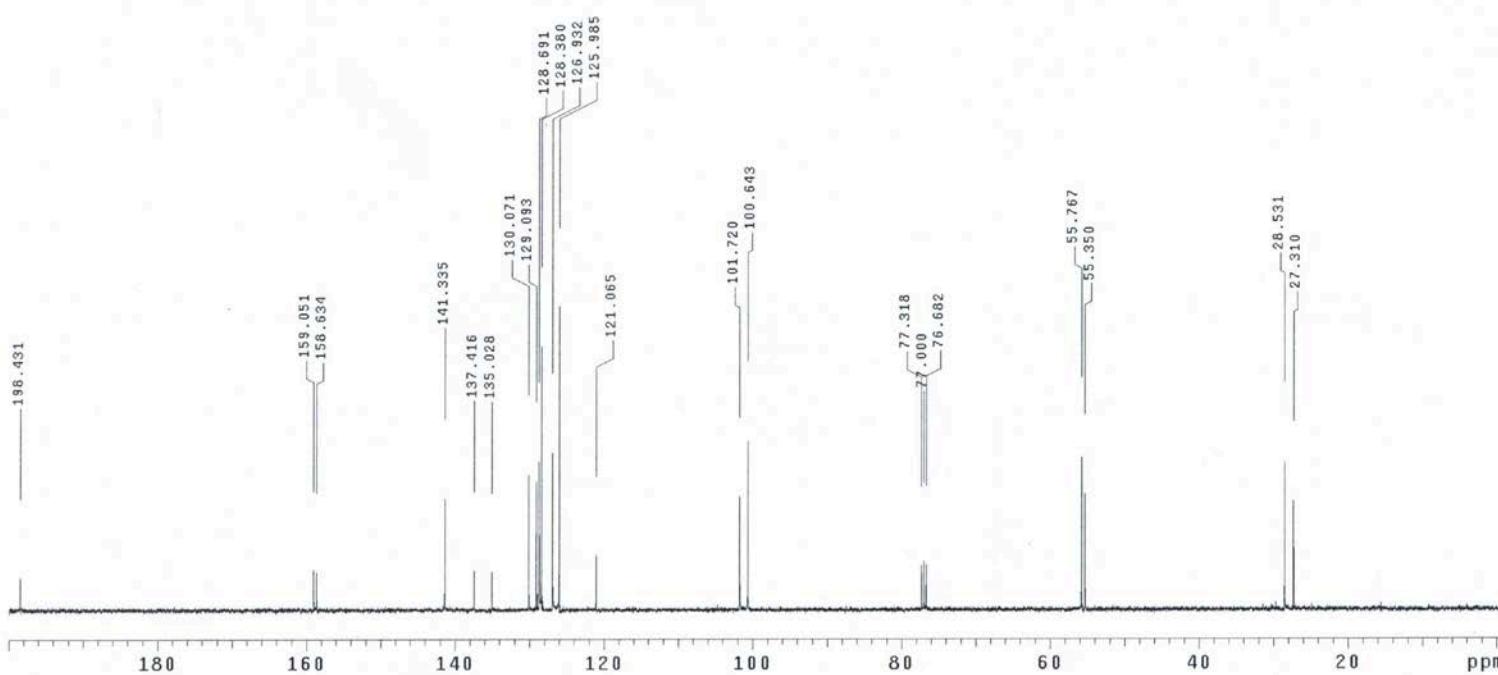
KS1070313

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 14 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 720 repetitions



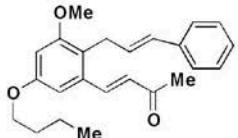
Compound 4z

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

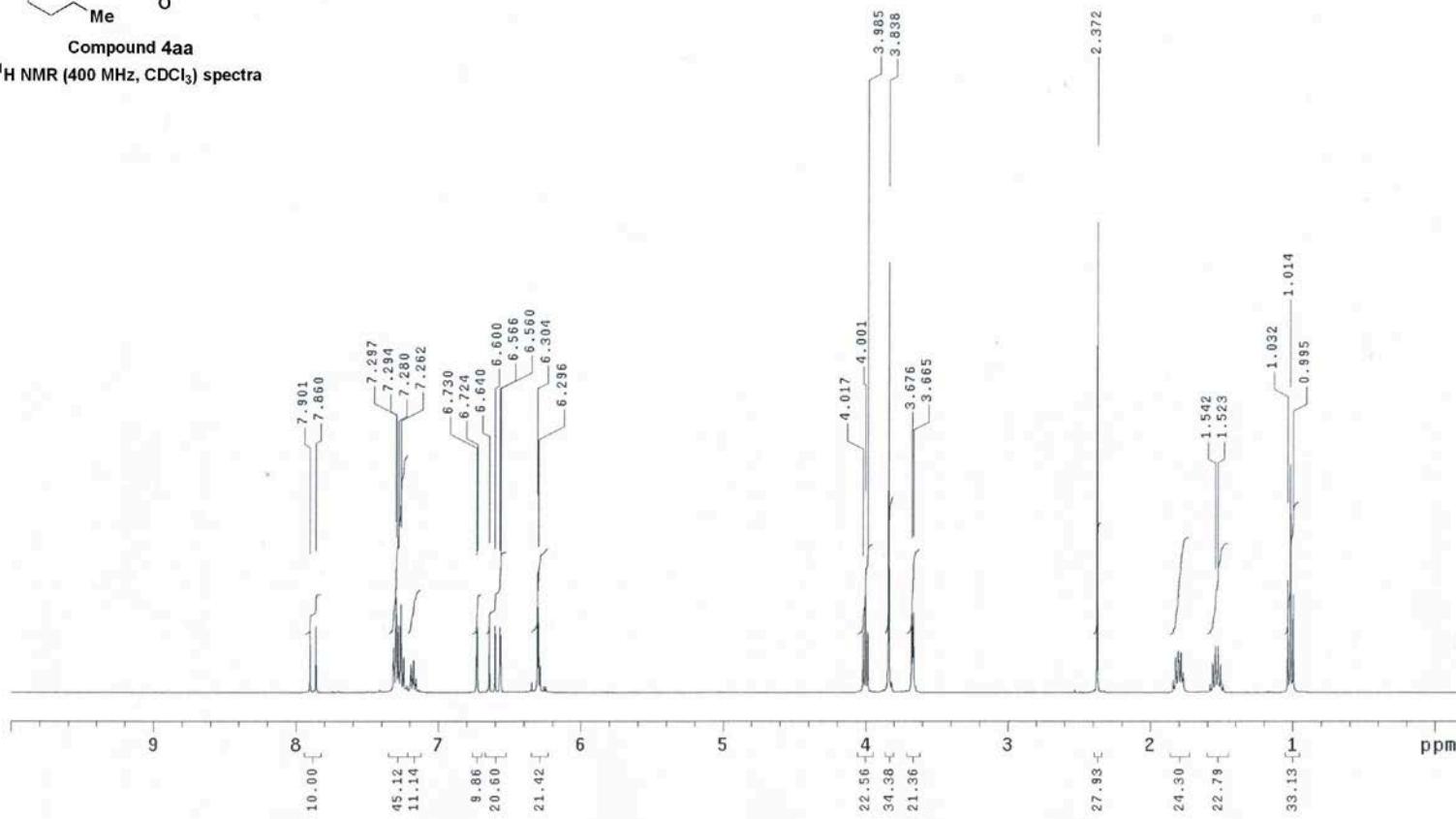


## Compound 4aa ( $^1\text{H-NMR}$ spectral data)

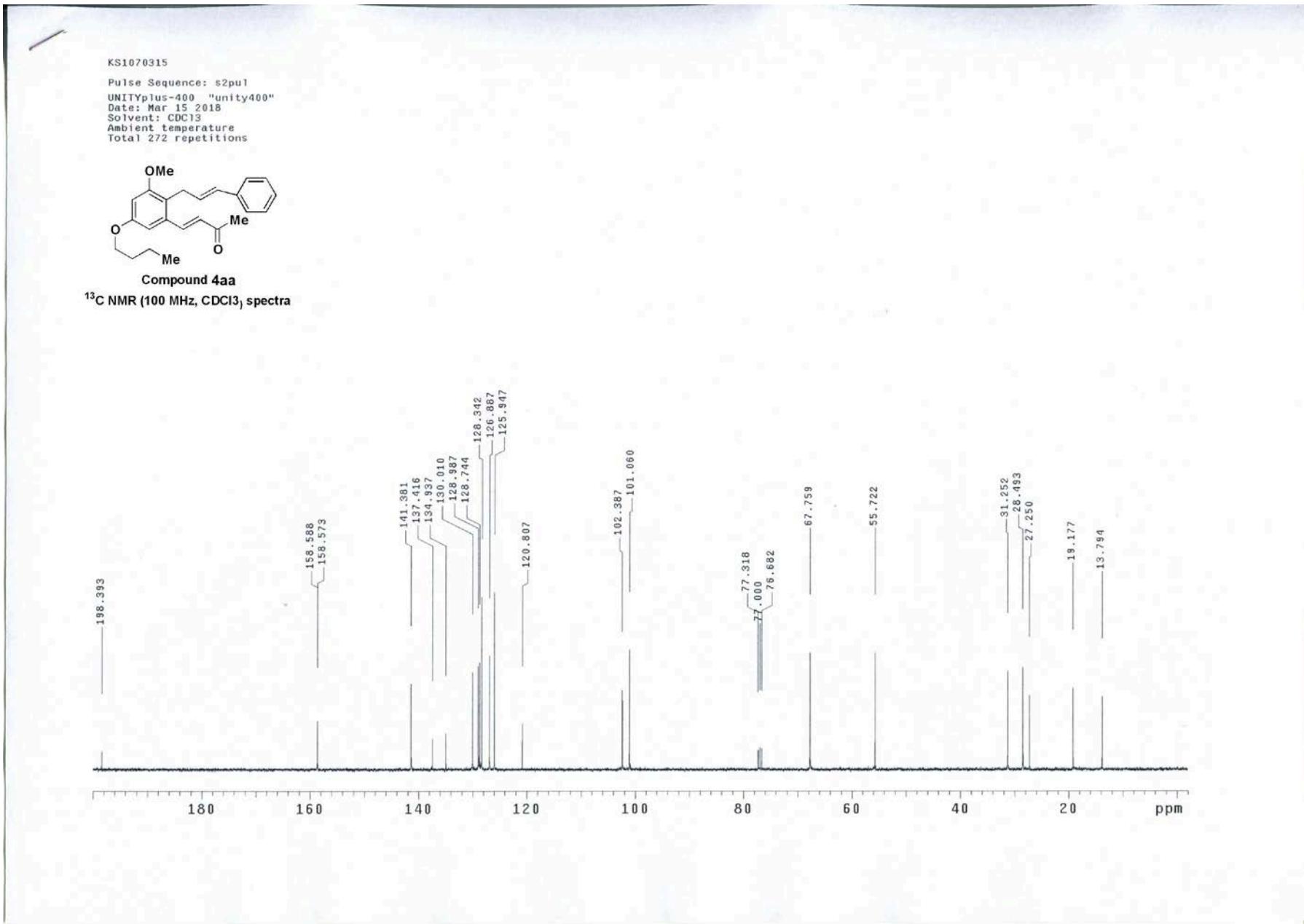
KS1070315  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 15 2018  
Solvent: CDC13  
Ambient temperature  
Total 32 repetitions



### Compound 4aa



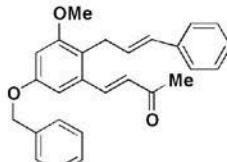
# Compound 4aa ( $^{13}\text{C}$ -NMR spectral data)



## Compound 4ab ( $^1\text{H}$ -NMR spectral data)

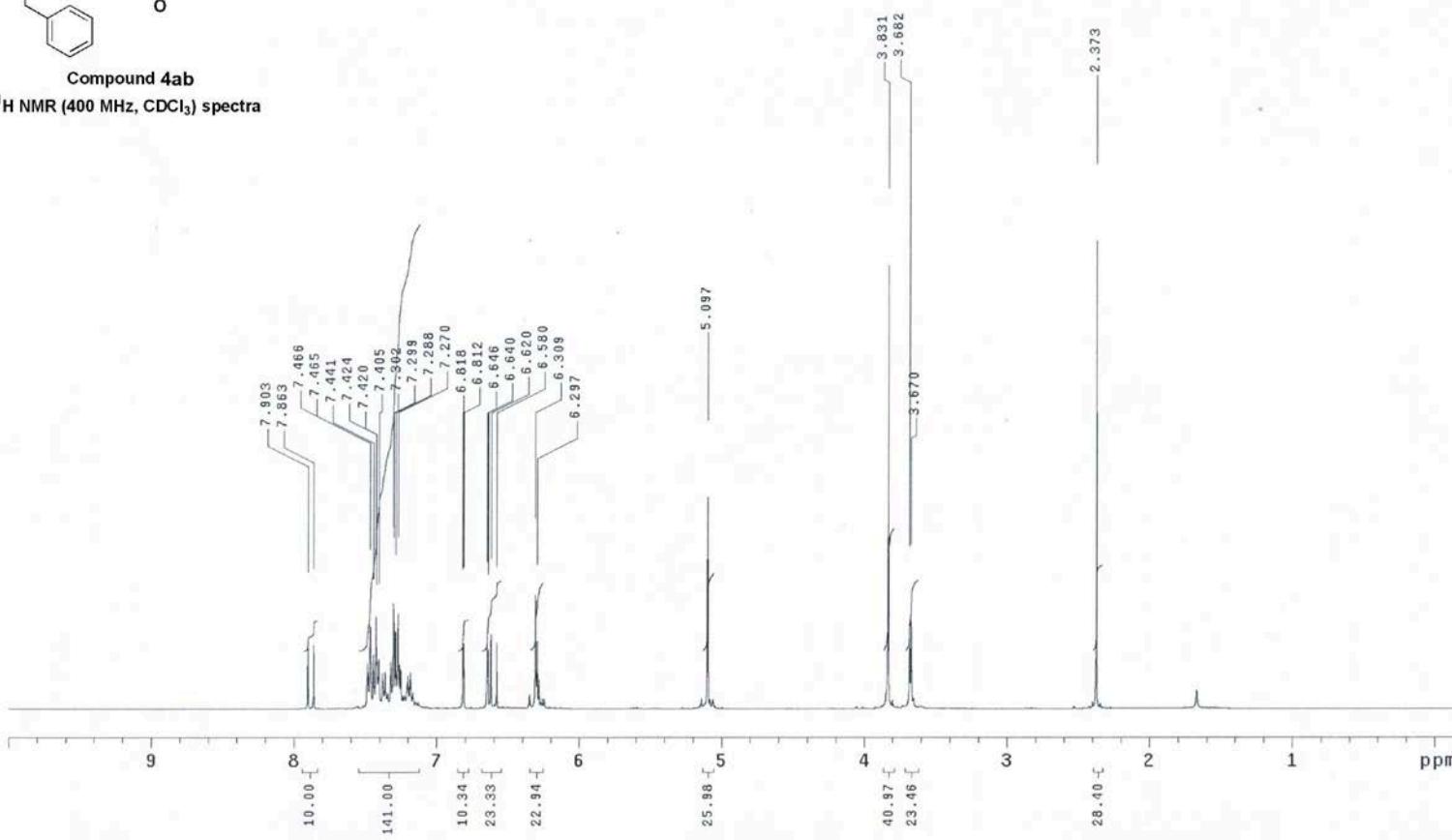
KS1070314

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 14 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 4ab

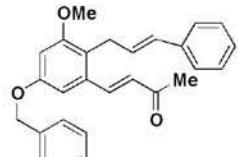
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 4ab ( $^{13}\text{C}$ -NMR spectral data)

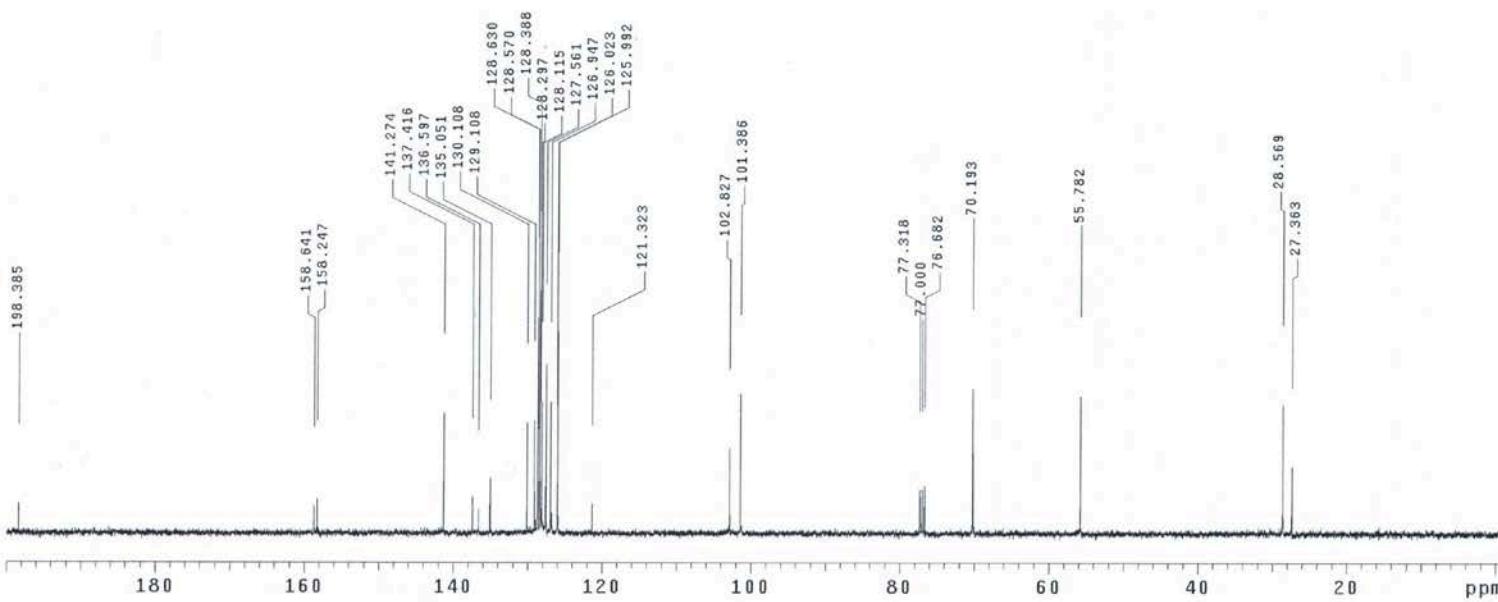
KS1070314

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Mar 14 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 576 repetitions



Compound 4ab

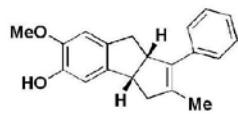
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



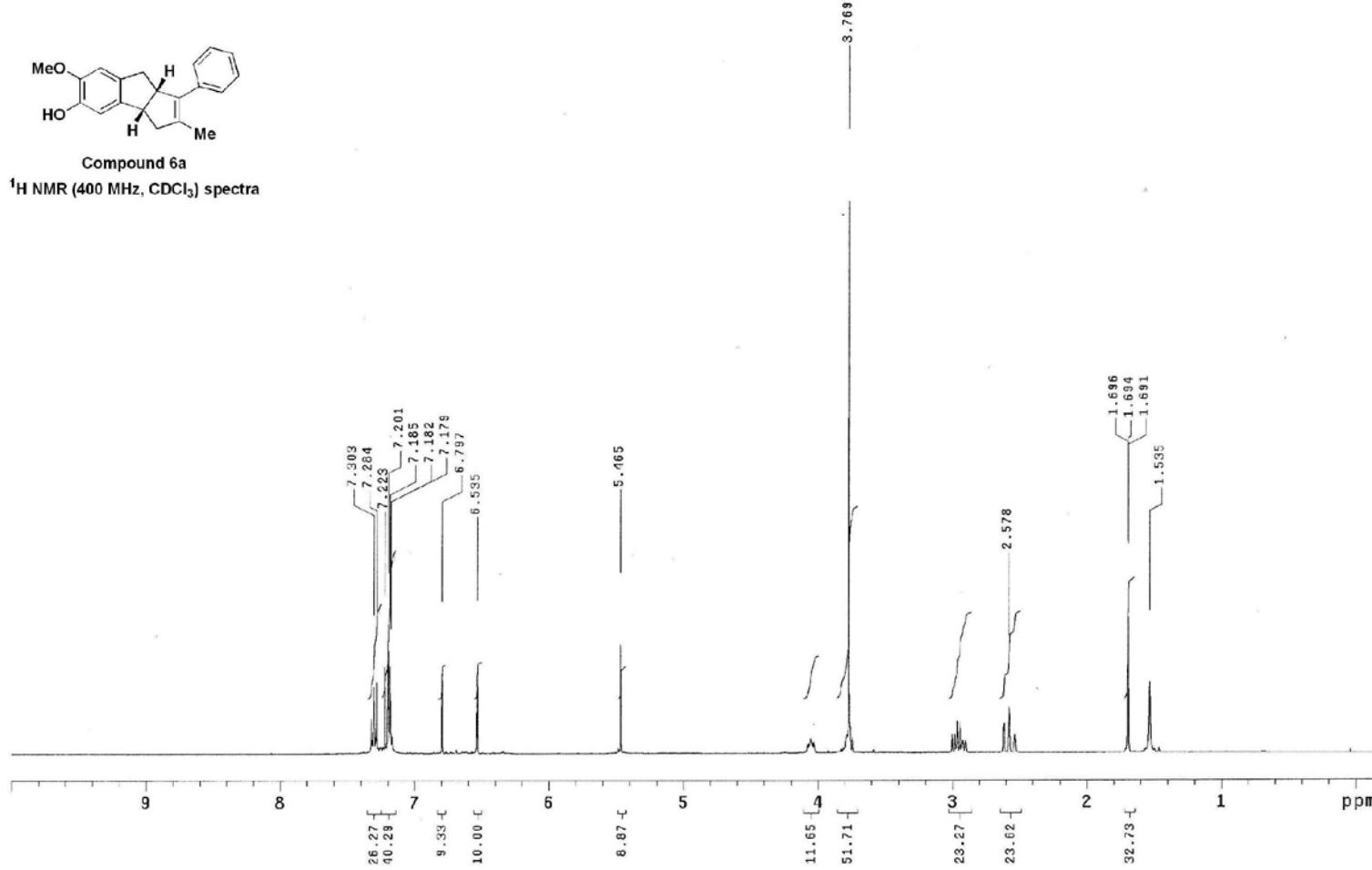
# Compound 6a ( $^1\text{H}$ -NMR spectral data)

NC1060824

Pulse Sequence:  $\text{c}2\text{pul}$   
UNITYplus-400 "unity400"  
Date: Aug 28 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 64 repetitions

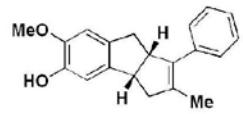


Compound 6a  
 $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra

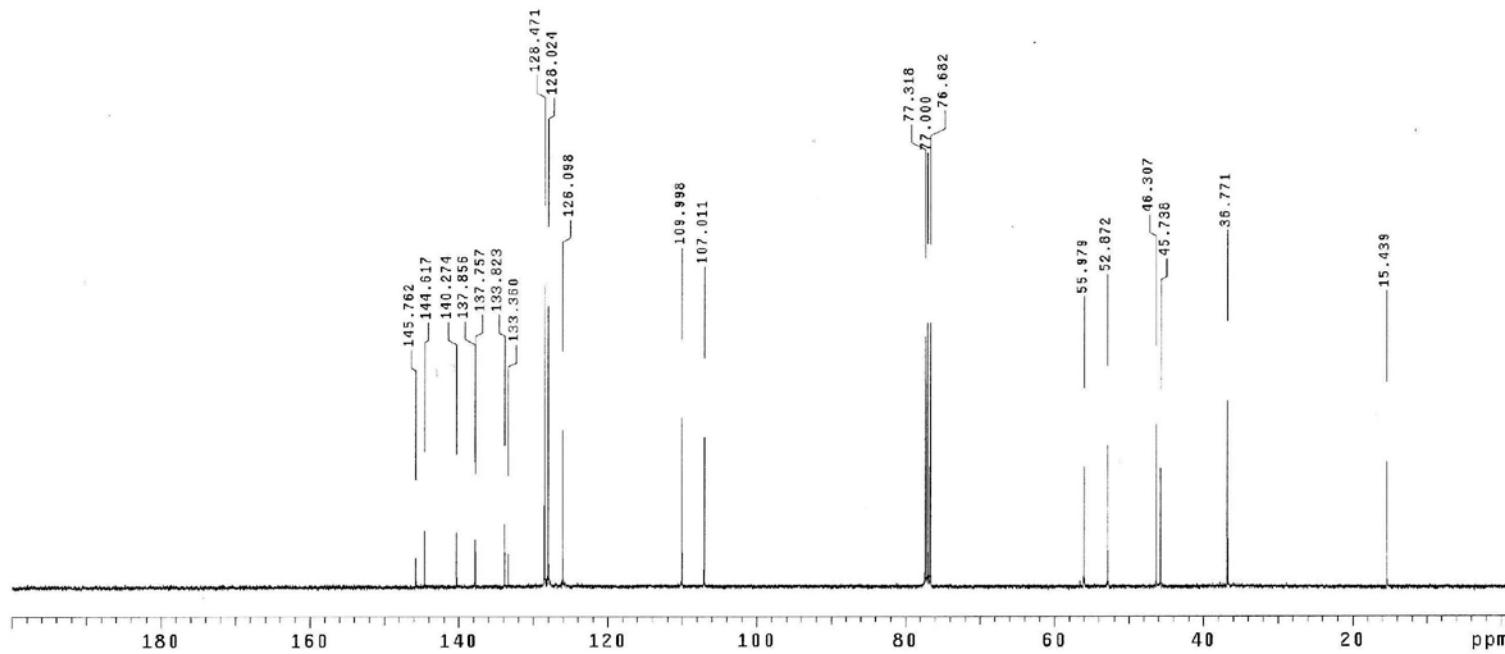


# Compound 6a ( $^{13}\text{C}$ -NMR spectral data)

NC1060824  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Aug 28 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 20480 repetitions



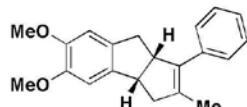
Compound 6a  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 6b ( $^1\text{H}$ -NMR spectral data)

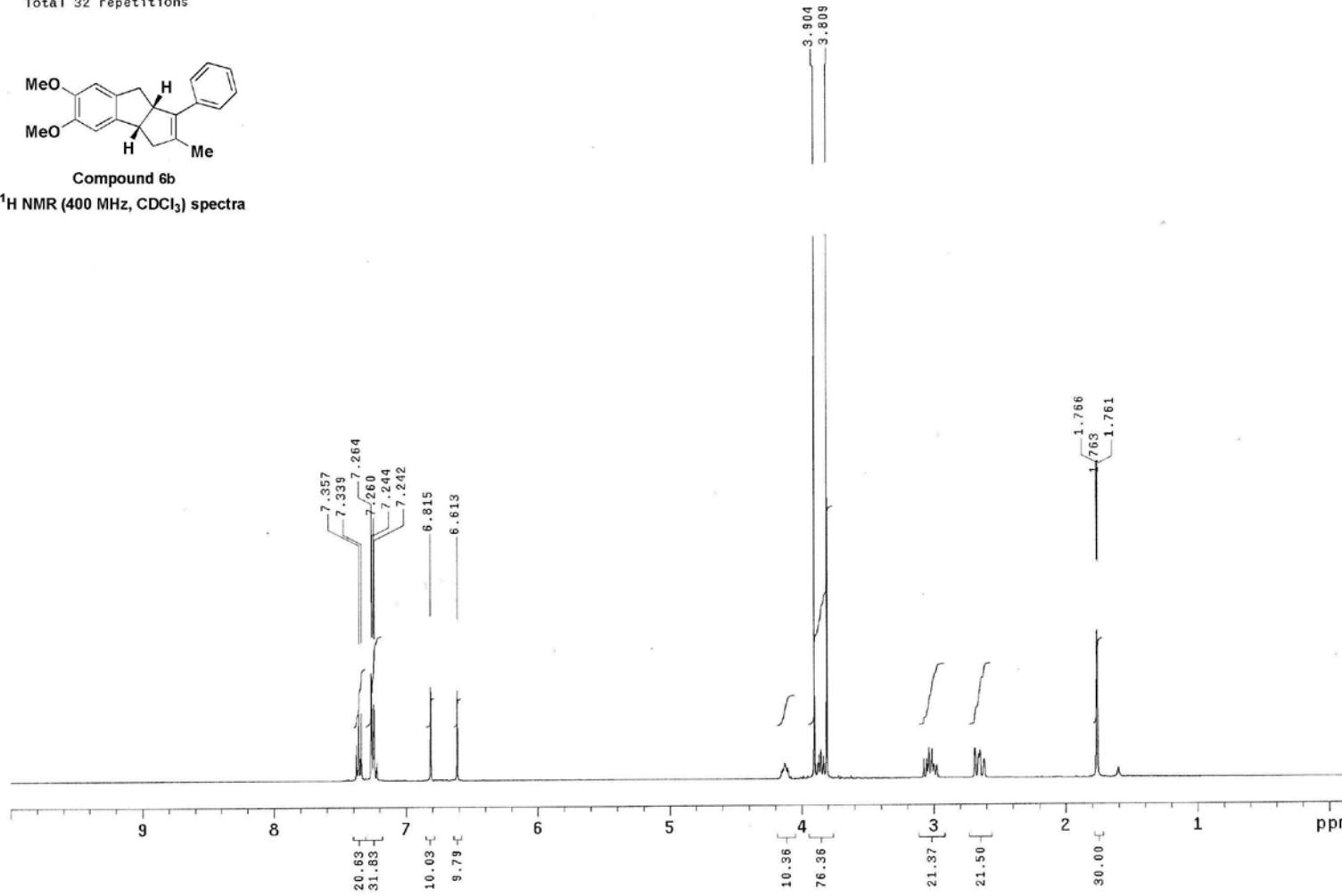
NC1060906

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 7 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 6b

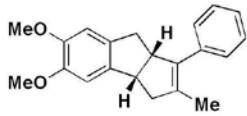
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 6b ( $^{13}\text{C}$ -NMR spectral data)

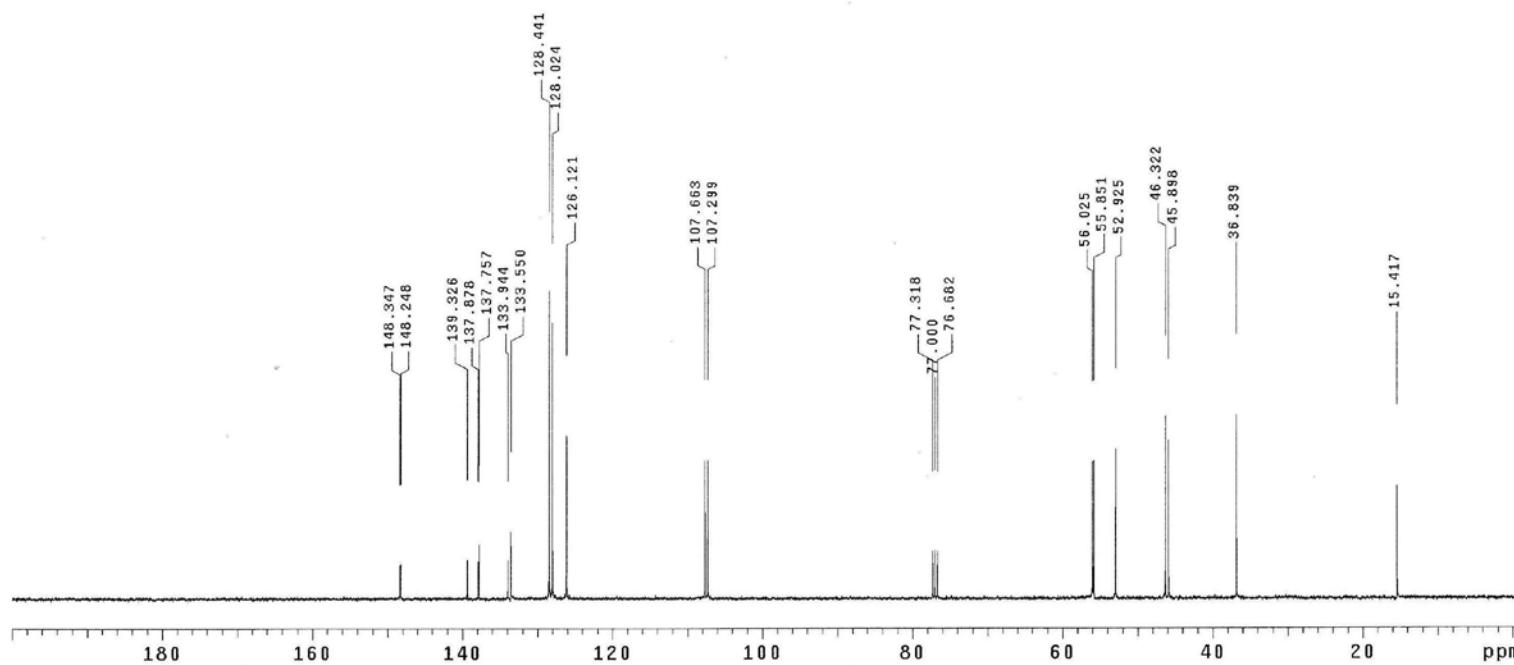
NC1060906

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 7 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1024 repetitions



Compound 6b

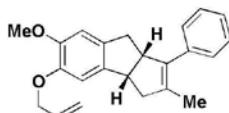
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 6c ( $^1\text{H}$ -NMR spectral data)

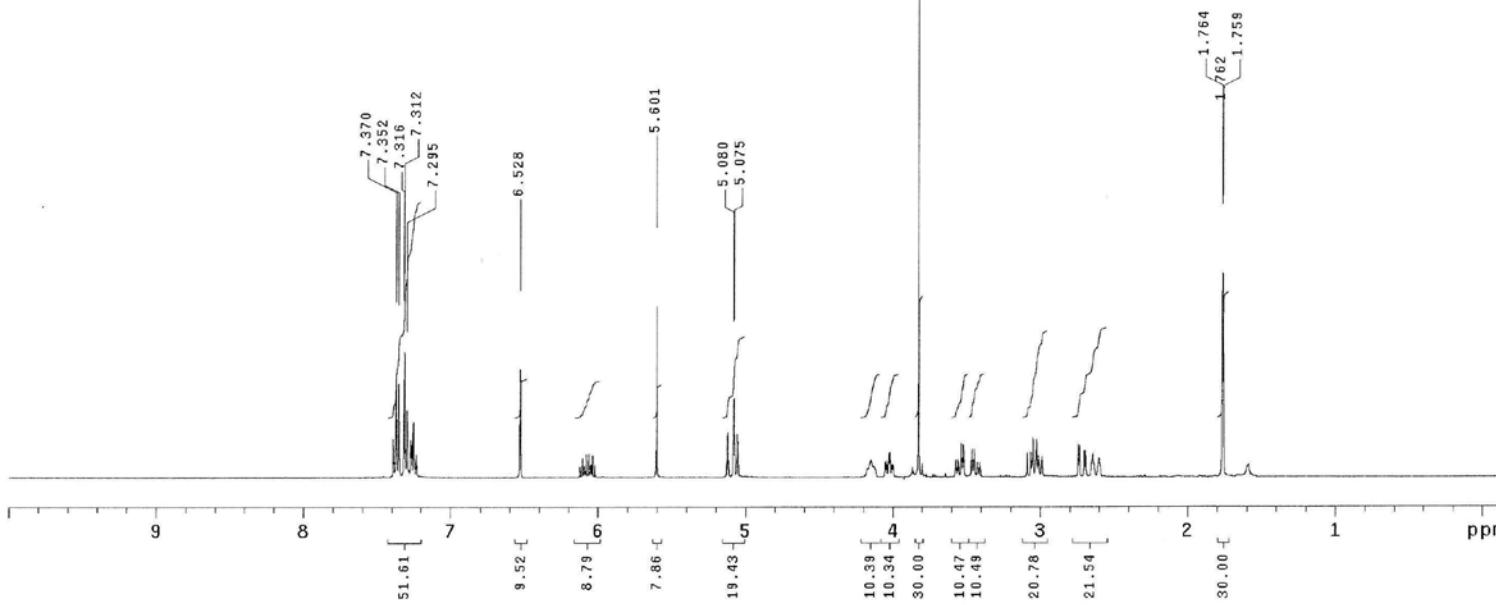
NC1060928

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 29 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 64 repetitions



Compound 6c

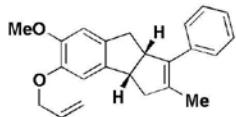
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 6c ( $^{13}\text{C}$ -NMR spectral data)

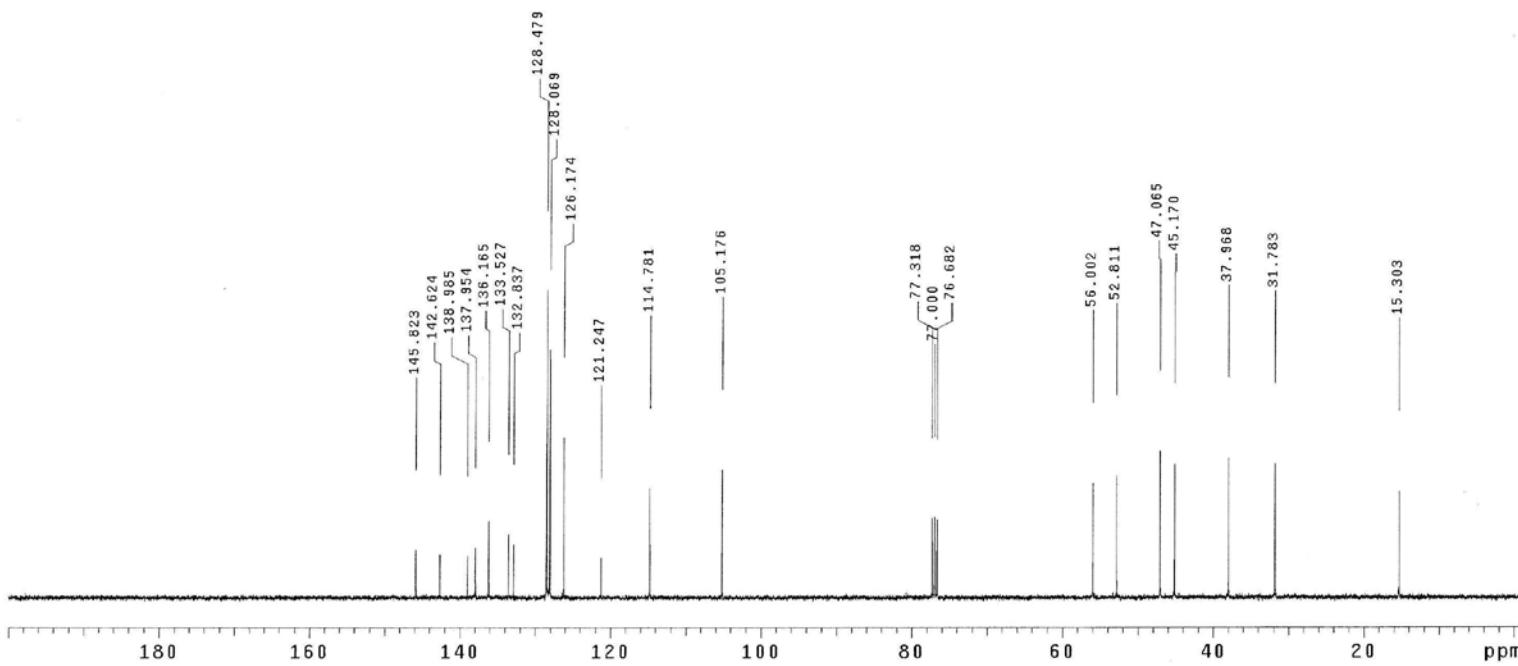
NC1060928

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Sep 29 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 736 repetitions



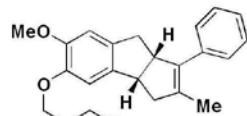
Compound 6c

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

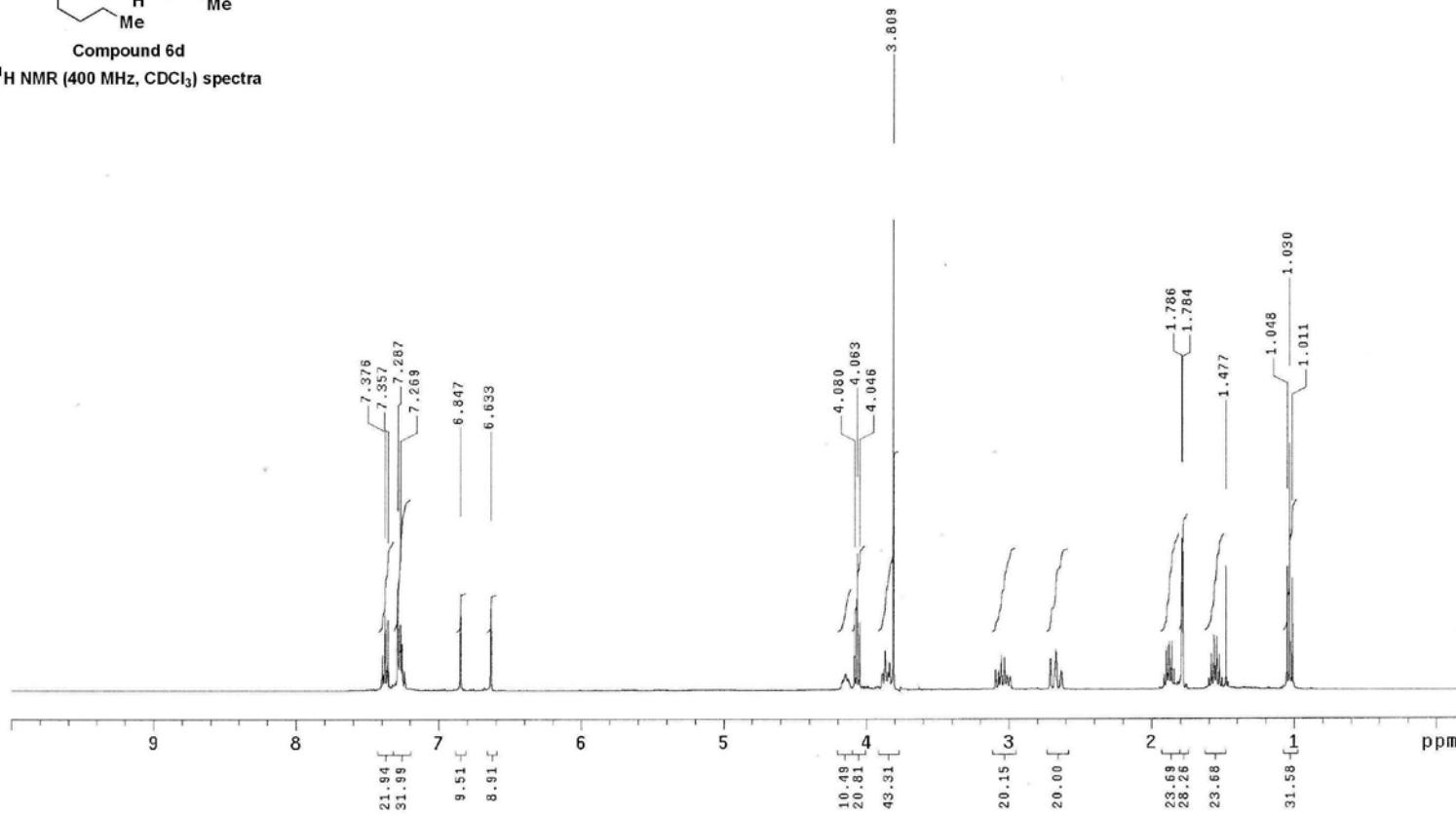


## Compound 6d ( $^1\text{H-NMR}$ spectral data)

NC1061002  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Oct 2 2017  
Solvent: CDCl3  
Ambient temperature  
Total 32 repetitions

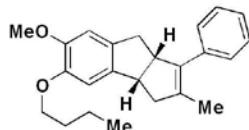


### Compound 6d

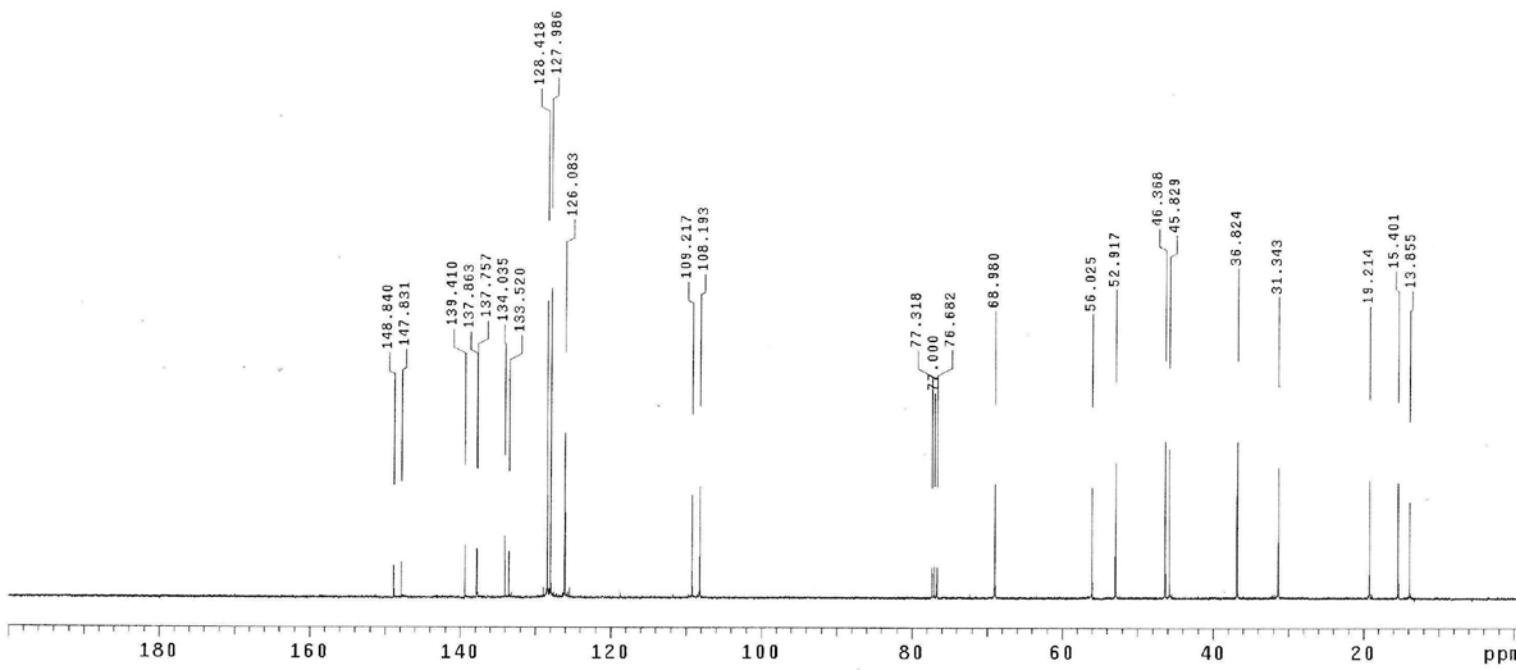


## Compound 6d ( $^{13}\text{C}$ -NMR spectral data)

NC1061002  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Oct 2 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 864 repetitions



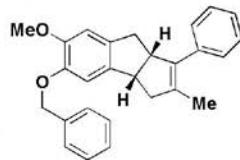
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



# Compound 6e ( $^1\text{H}$ -NMR spectral data)

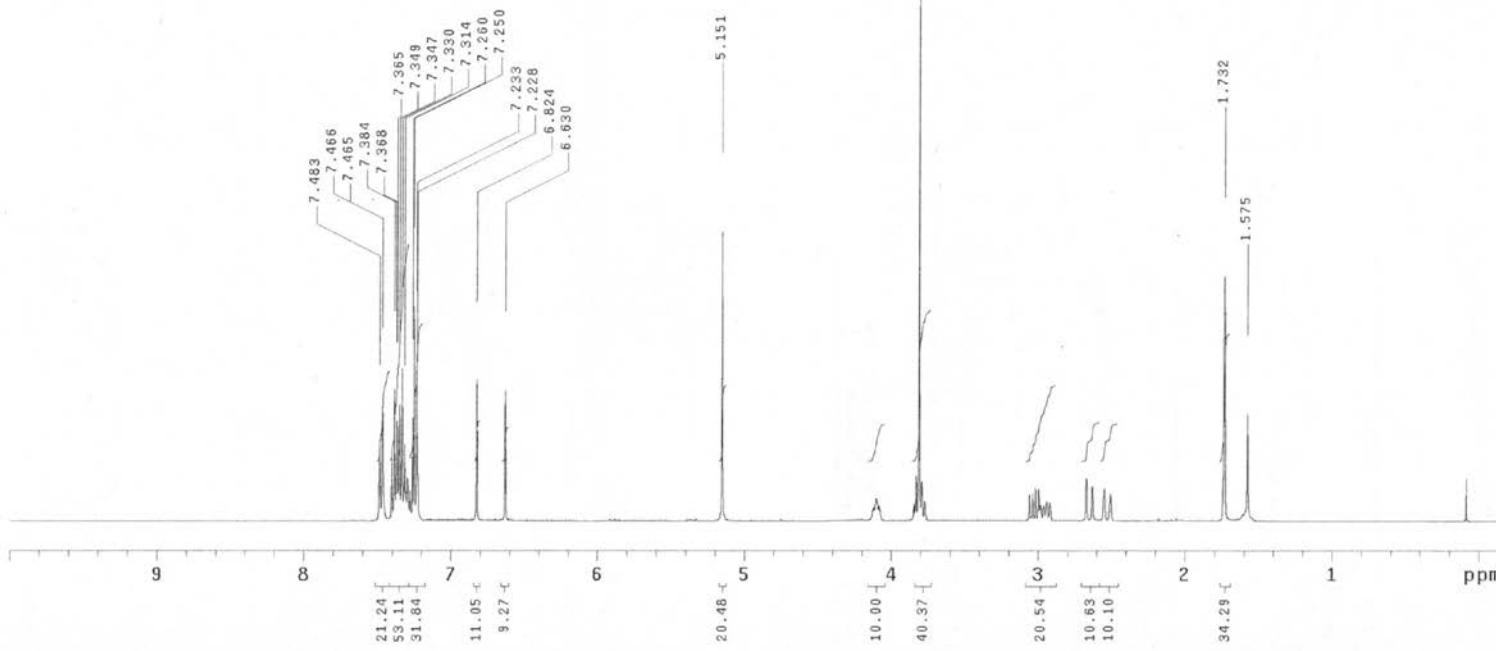
NC1061127

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 28 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



Compound 6e

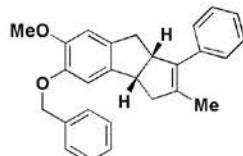
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



## Compound 6e ( $^{13}\text{C}$ -NMR spectral data)

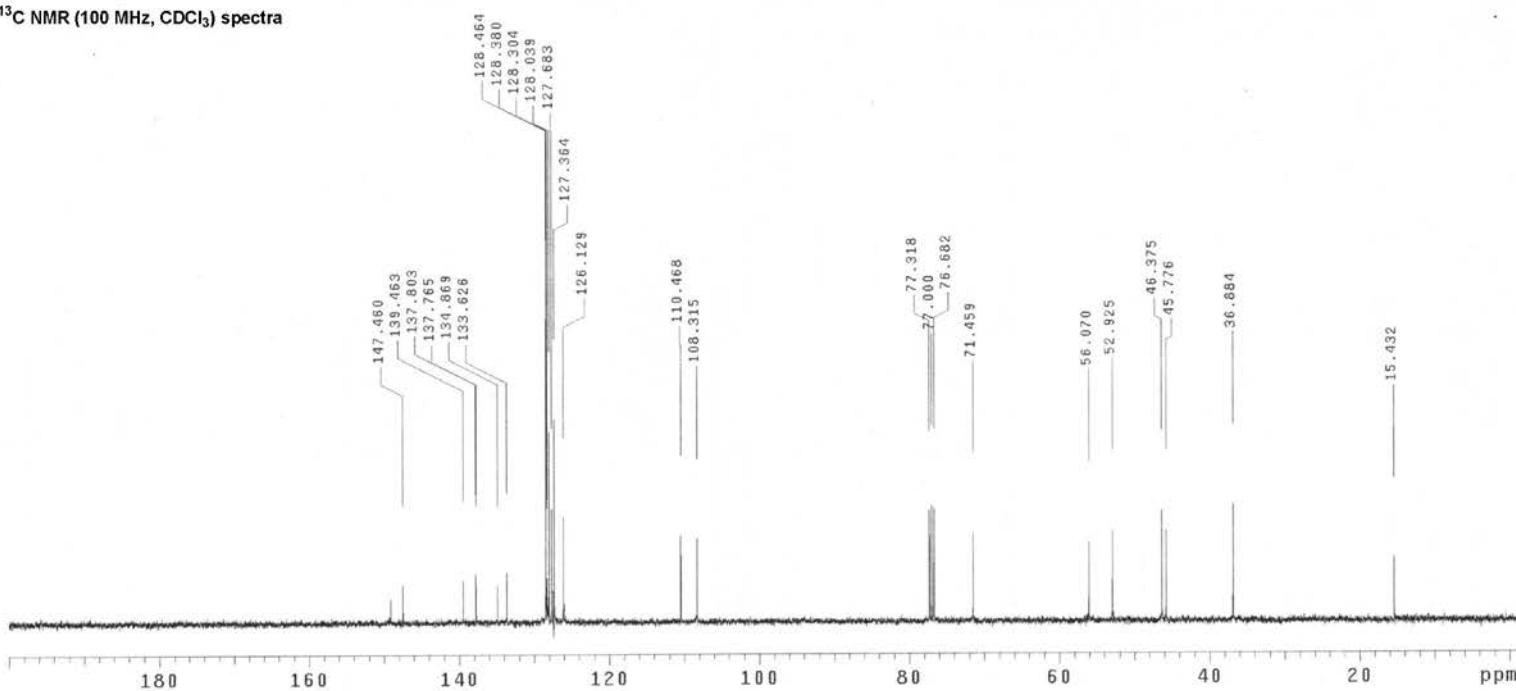
NC1061127

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 28 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2096 repetitions



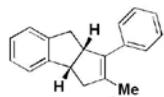
Compound 6e

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

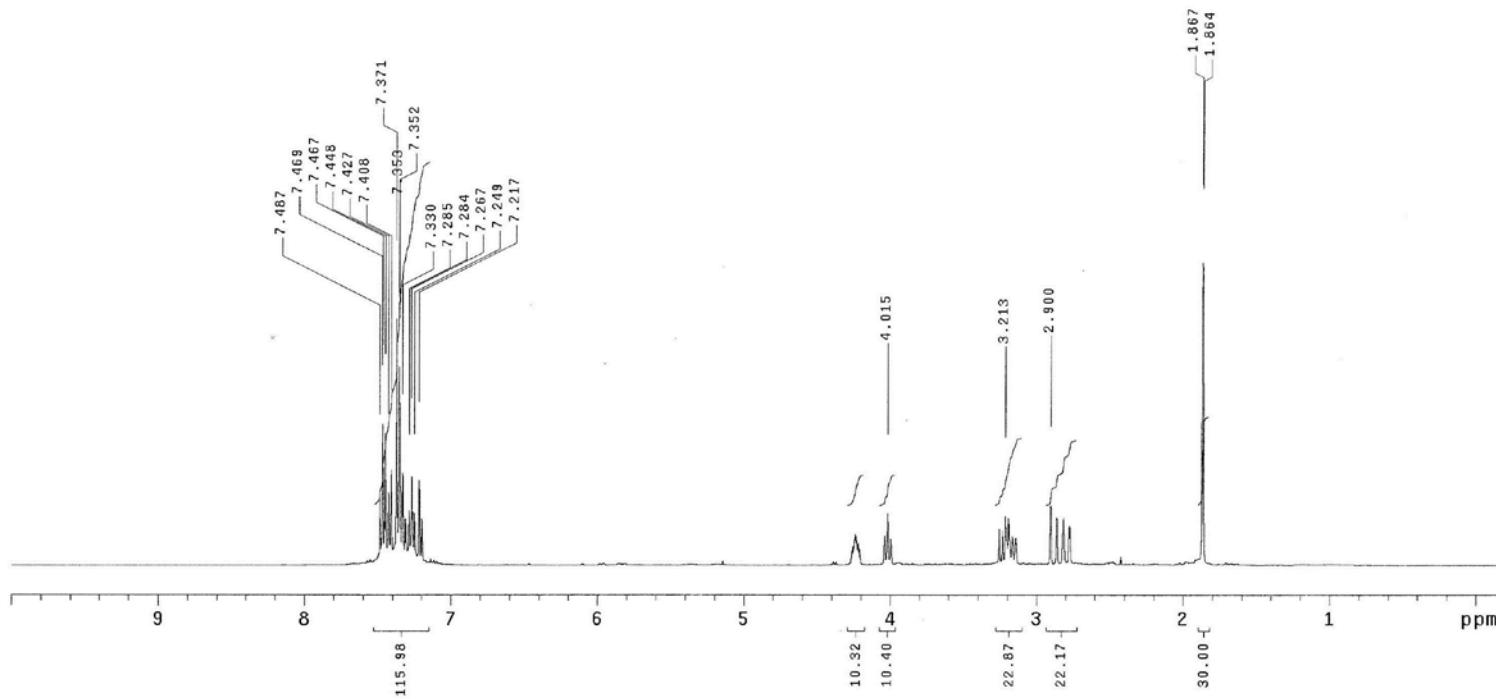


# Compound 6n ( $^1\text{H}$ -NMR spectral data)

NC1060926  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 26 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



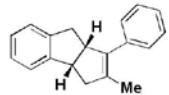
Compound 6n  
 $^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



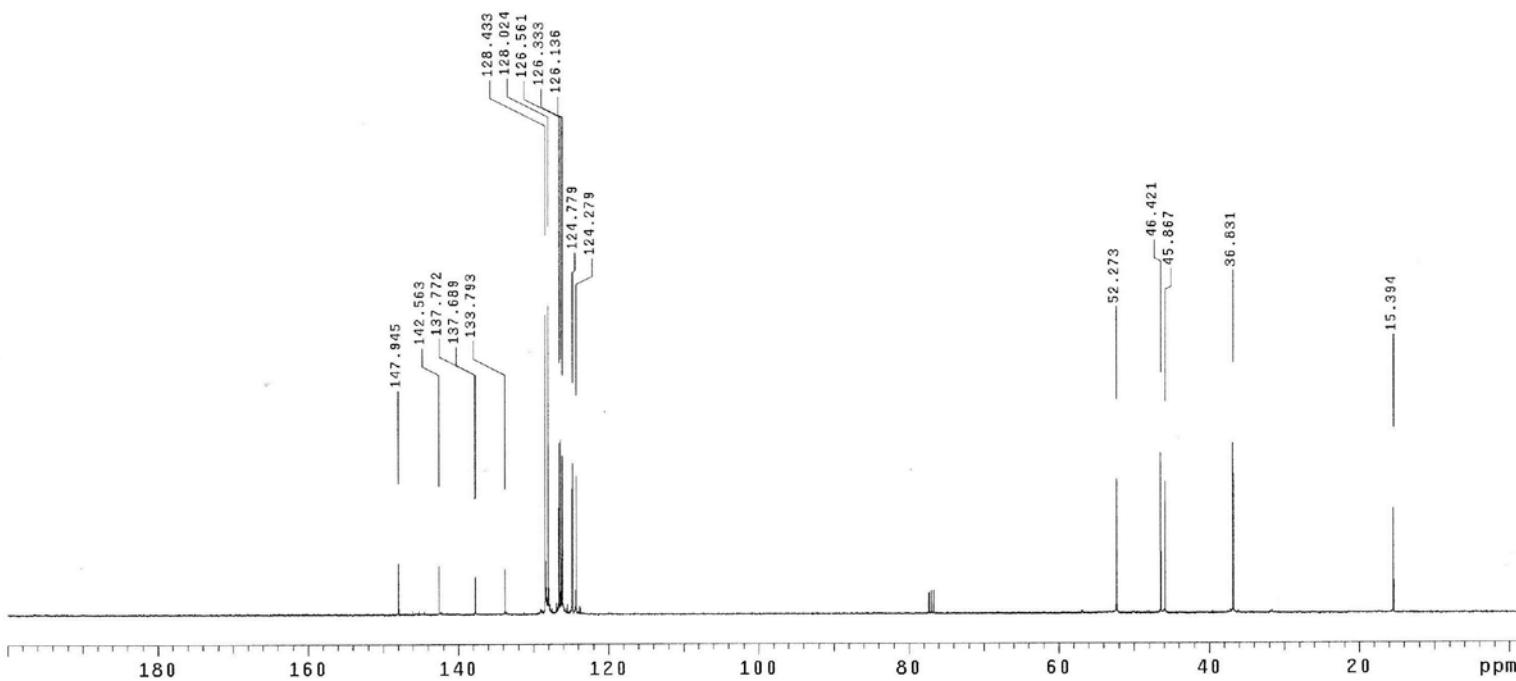
## Compound 6n ( $^{13}\text{C}$ -NMR spectral data)

NC1060926

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Sep 26 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 432 repetitions

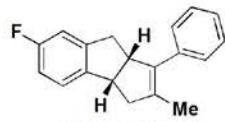


Compound 6n  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

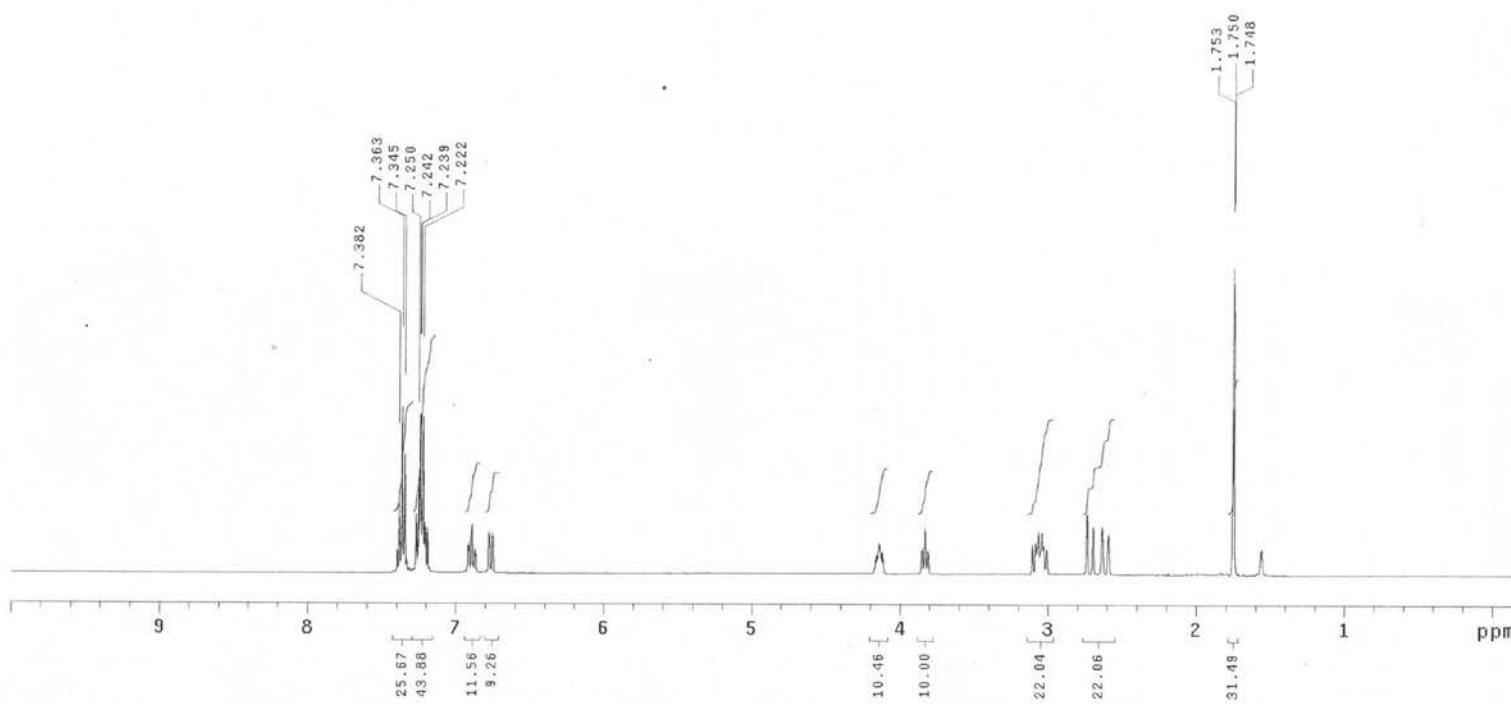


# Compound 6y ( $^1\text{H}$ -NMR spectral data)

NC1061122  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 23 2017  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 64 repetitions

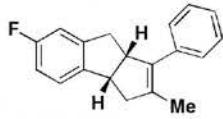


$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



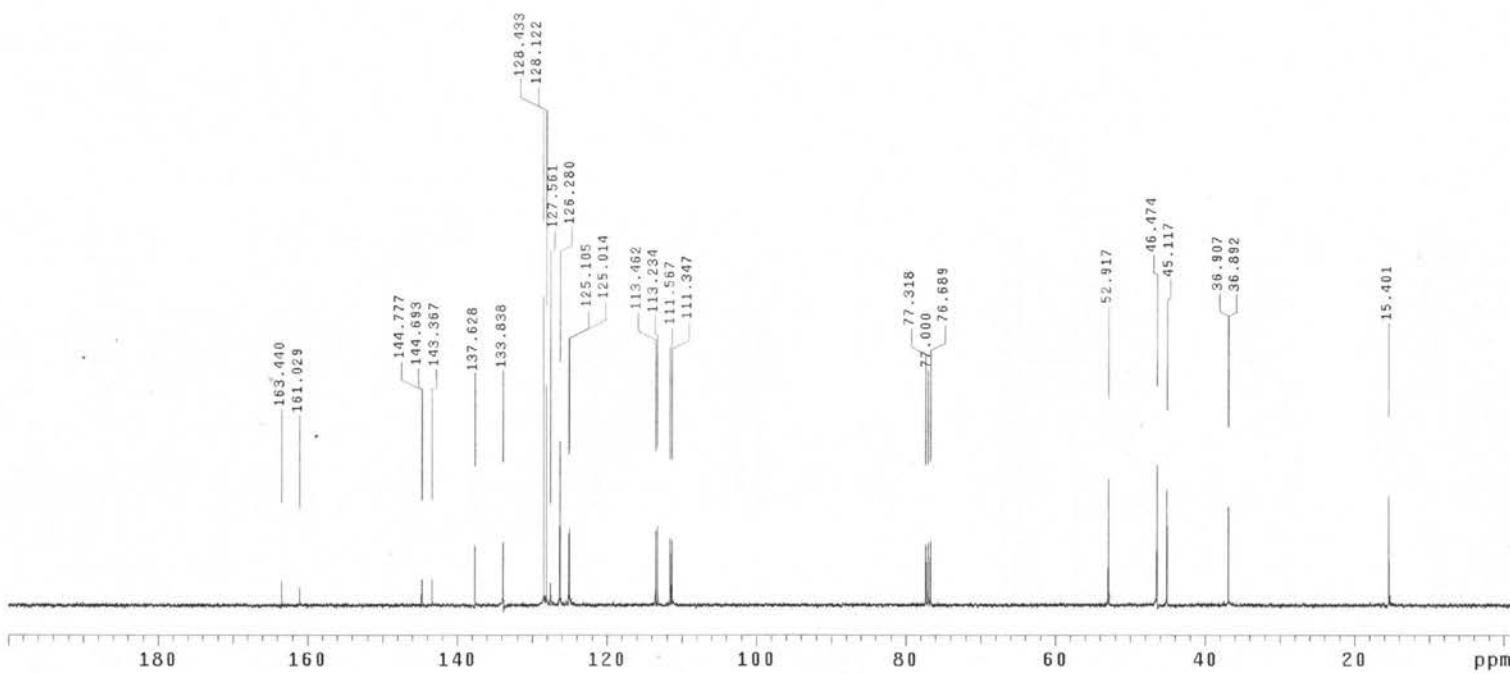
## Compound 6y ( $^{13}\text{C}$ -NMR spectral data)

NC1061122  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Nov 23 2017  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 2080 repetitions



Compound 6y

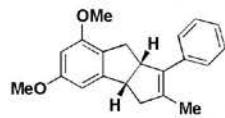
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



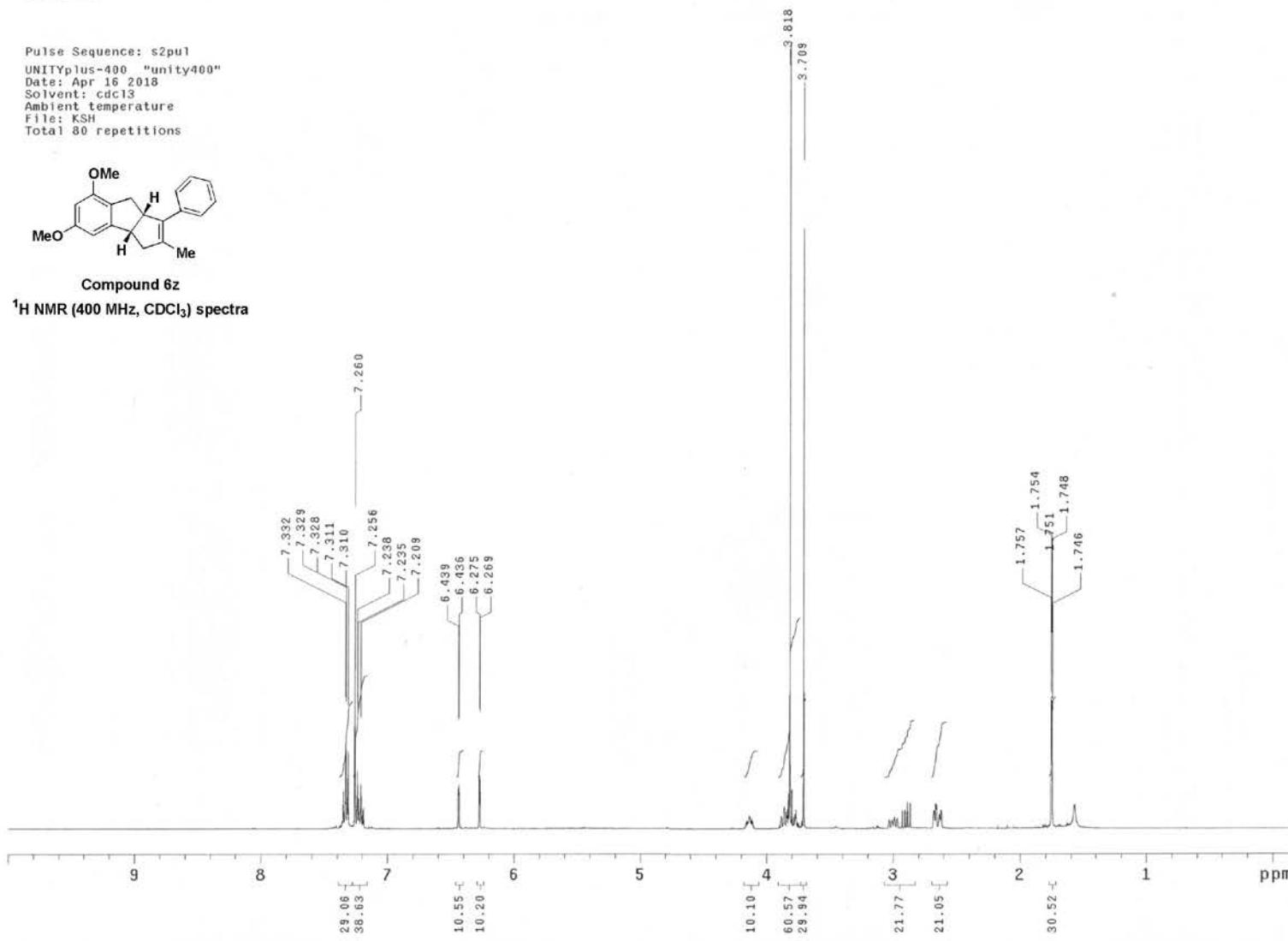
## Compound 6z ( $^1\text{H-NMR}$ spectral data)

KS1070413

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Apr 16 2018  
Solvent: cdc13  
Ambient temperature  
File: KSH  
Total 80 repetitions



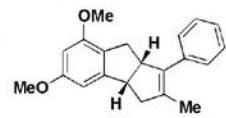
**Compound 6z**  
 **$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra**



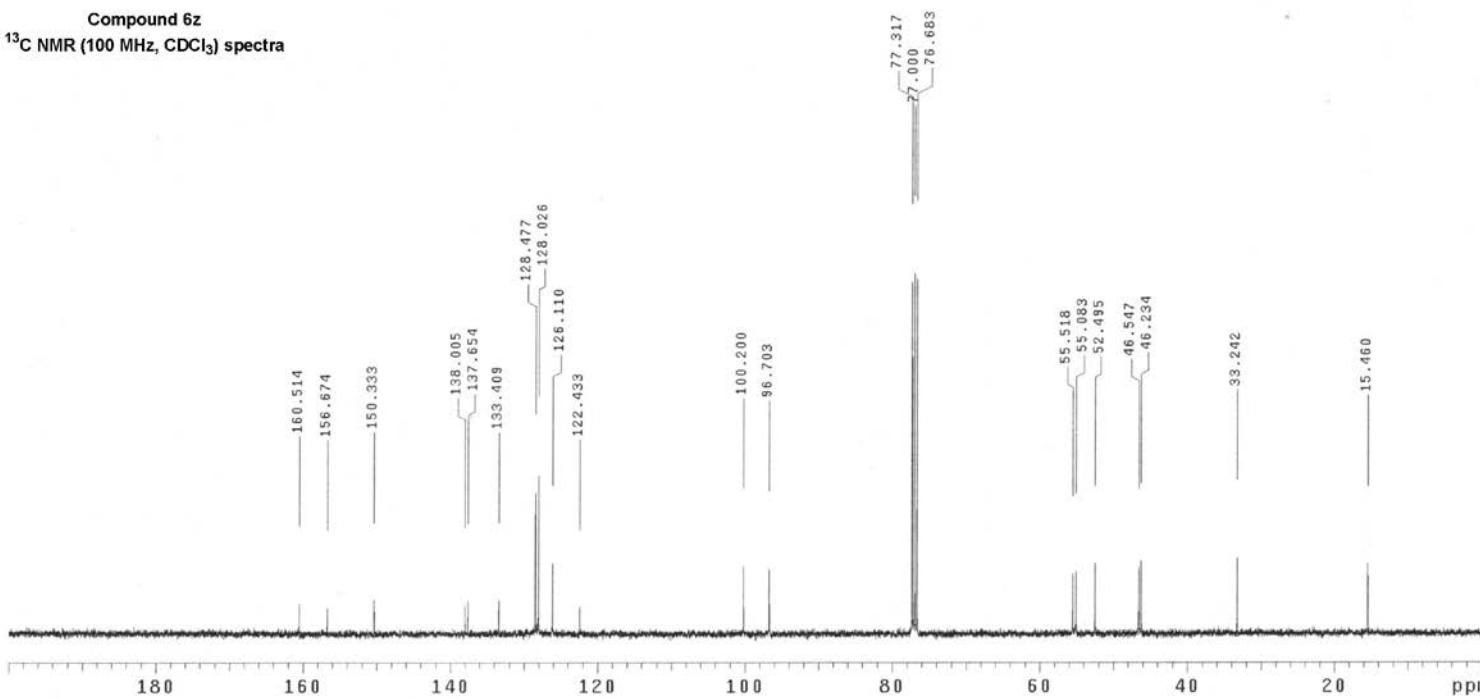
## Compound 6z (<sup>13</sup>C-NMR spectral data)

KS1070413

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Apr 16 2018  
Solvent: *cdcl*<sub>3</sub>  
Ambient temperature  
File: KSC  
Total 624 repetitions



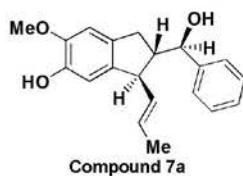
Compound 6z  
<sup>13</sup>C NMR (100 MHz, *CDCl*<sub>3</sub>) spectra



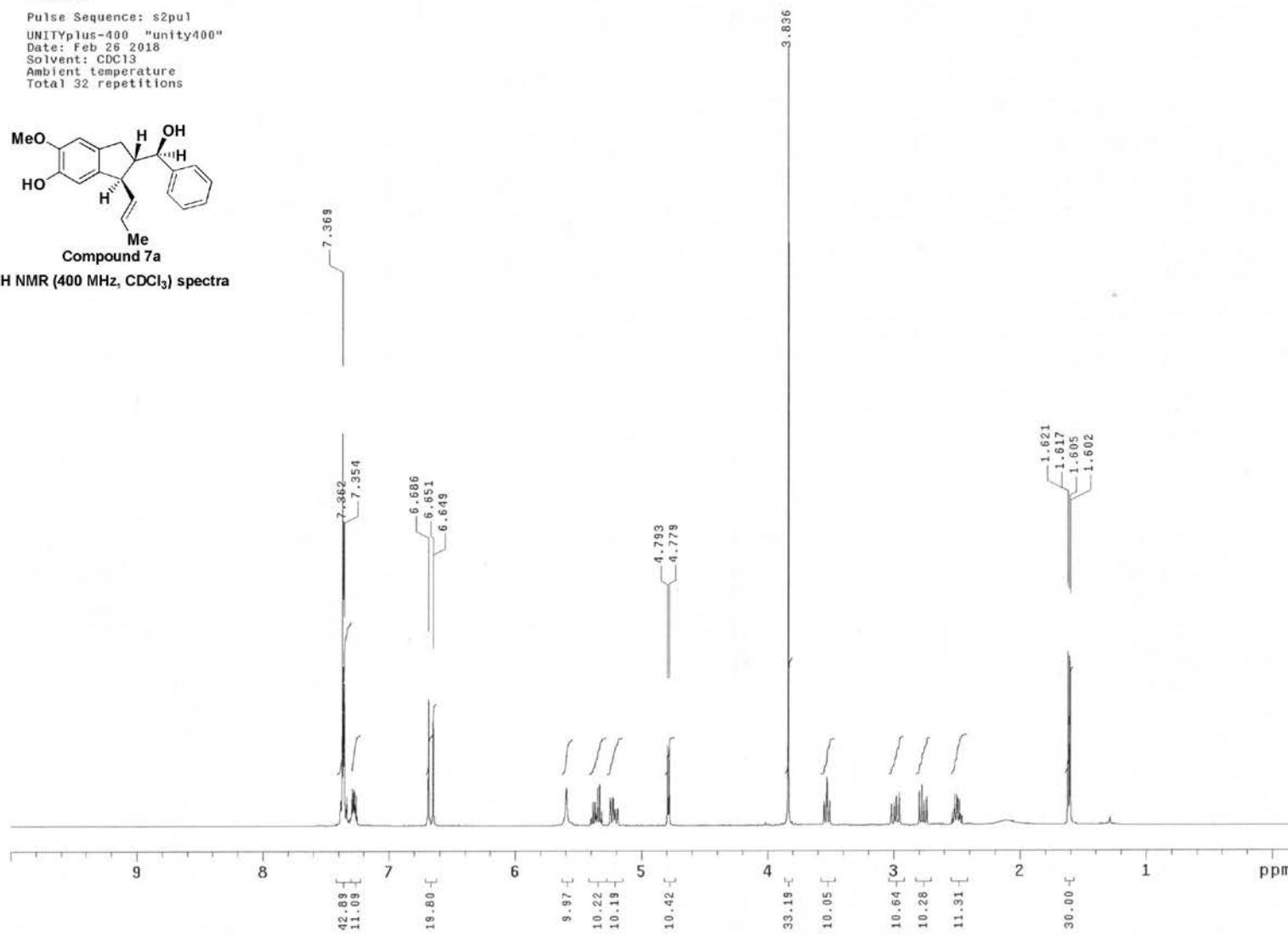
## Compound 7a ( $^1\text{H}$ -NMR spectral data)

NCNB0223

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 28 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions



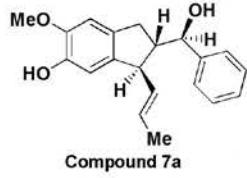
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



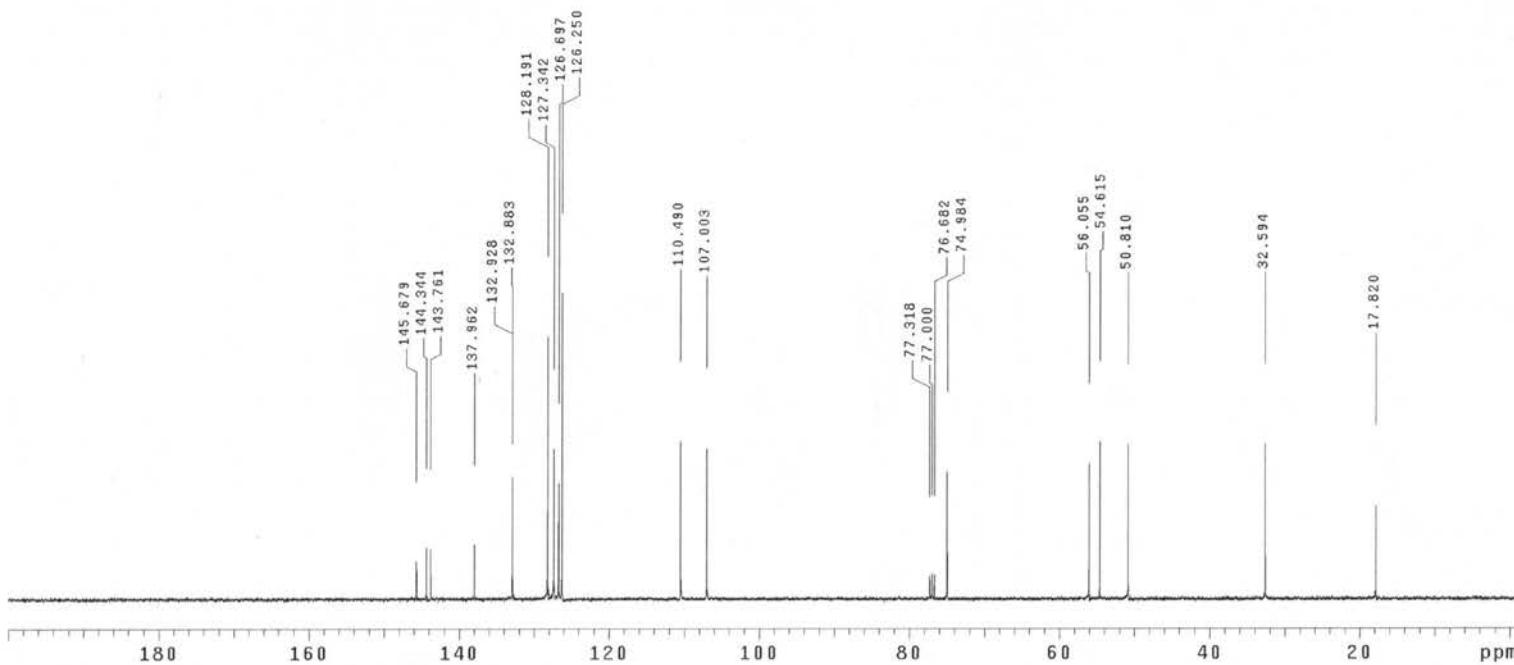
## Compound 7a ( $^{13}\text{C}$ -NMR spectral data)

NCNB0223

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 26 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 320 repetitions

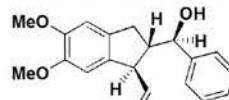


$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

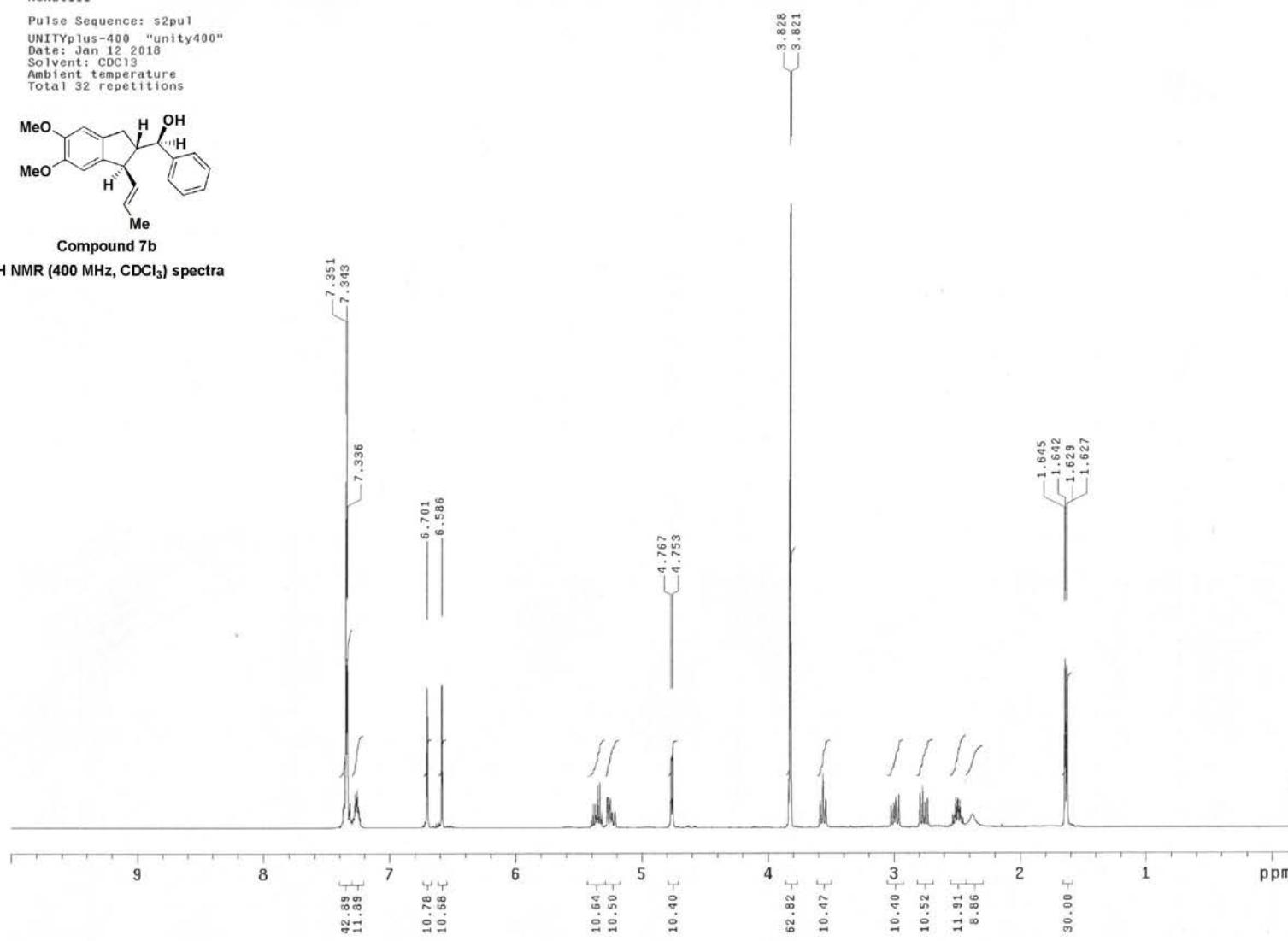


## Compound 7b ( $^1\text{H-NMR}$ spectral data)

NCNB0111  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 12 2018  
Solvent: CDCl3  
Ambient temperature  
Total 32 repetitions

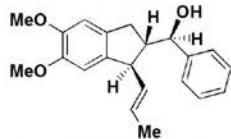


**Compound 7b**



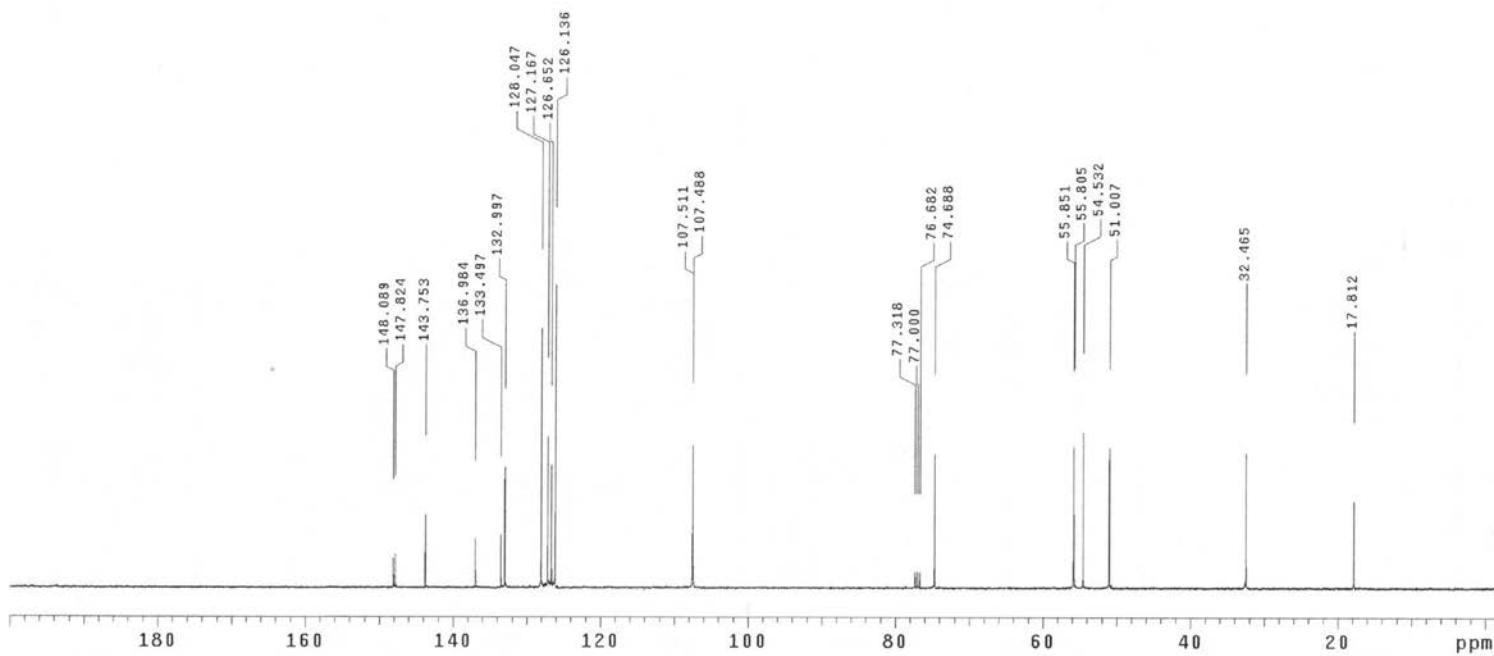
## Compound 7b ( $^{13}\text{C}$ -NMR spectral data)

NCNB0111  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 12 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 352 repetitions



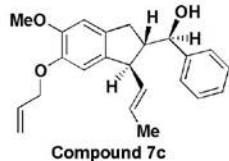
Compound 7b

$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra

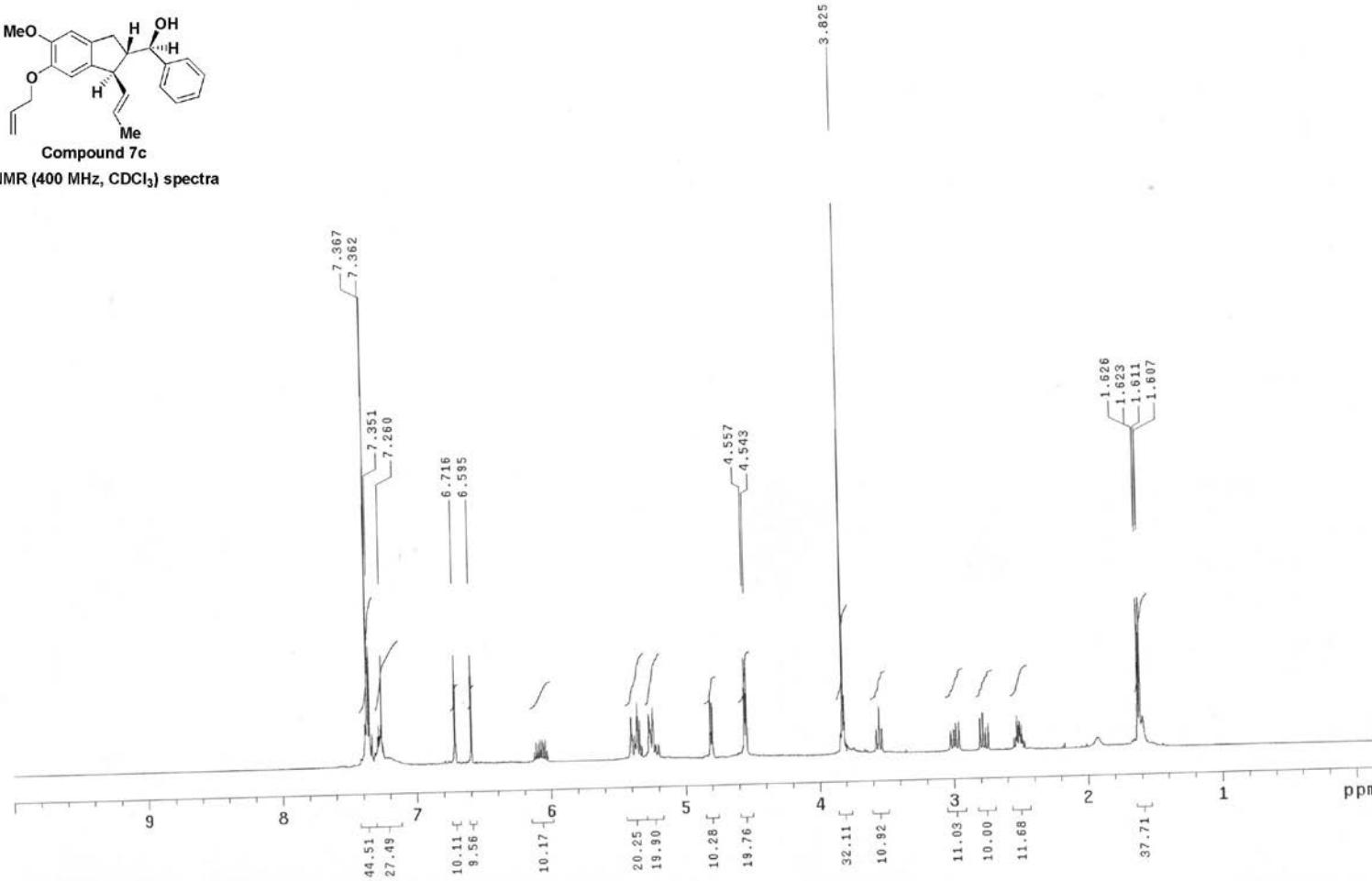


## Compound 7c ( $^1\text{H-NMR}$ spectral data)

NCNB0131  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 5 2018  
Solvent: CDCl3  
Ambient temperature  
Total 32 repetitions



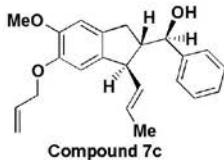
**<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra**



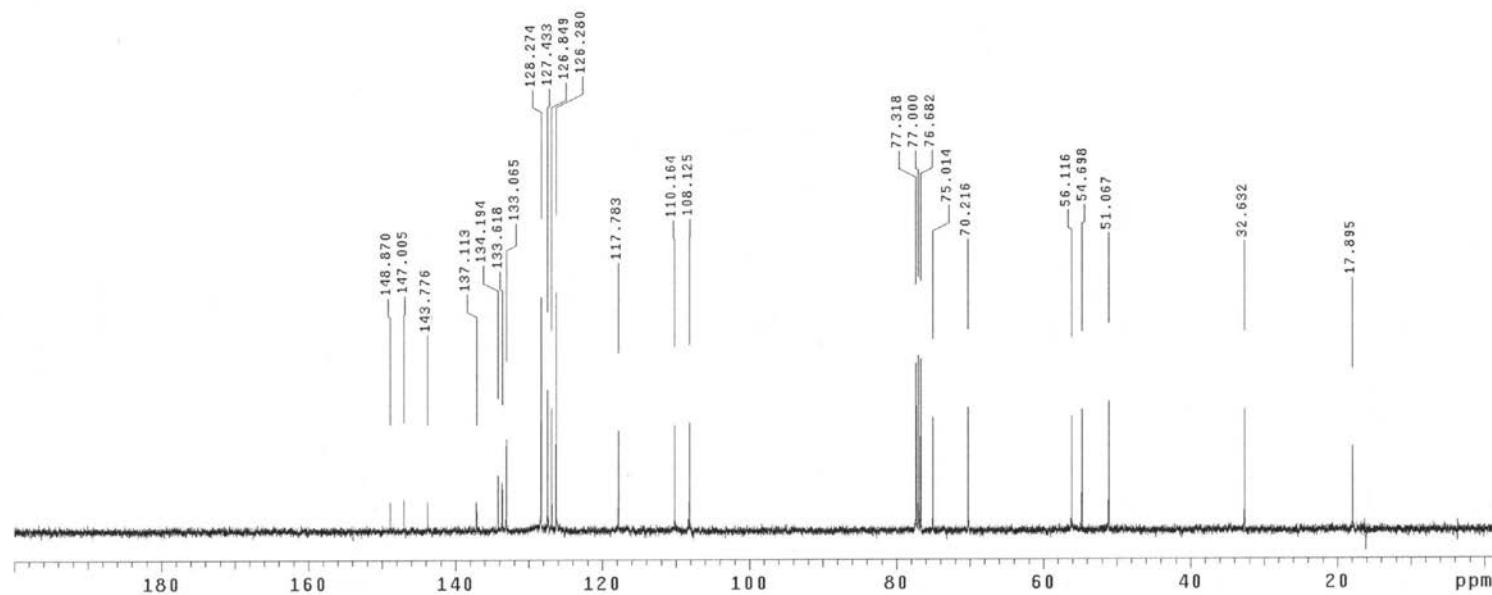
## Compound 7c ( $^{13}\text{C}$ -NMR spectral data)

NCNB0131

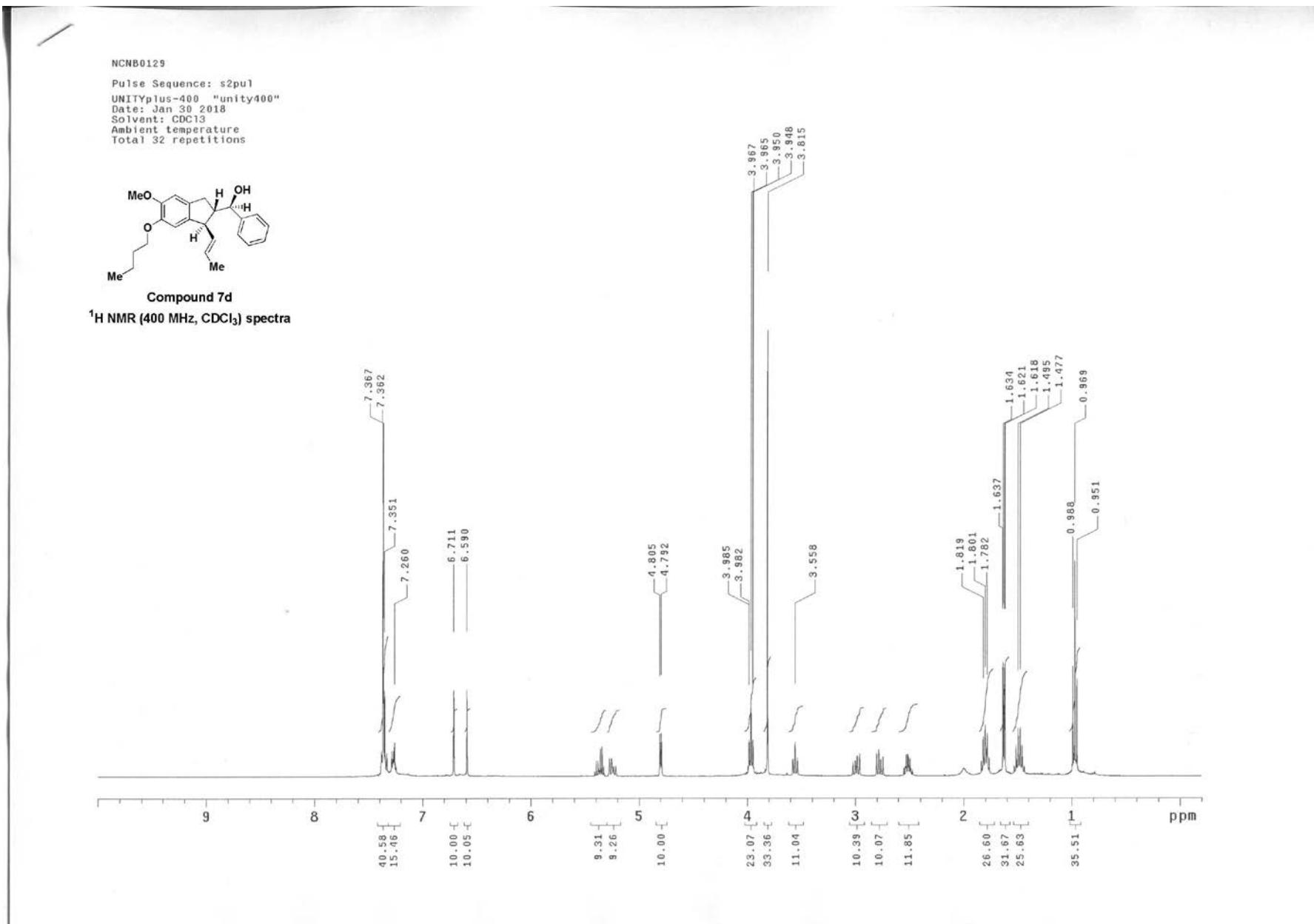
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 5 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 3280 repetitions



$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra

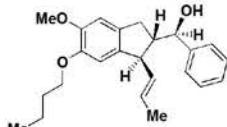


# Compound 7d ( $^1\text{H}$ -NMR spectral data)

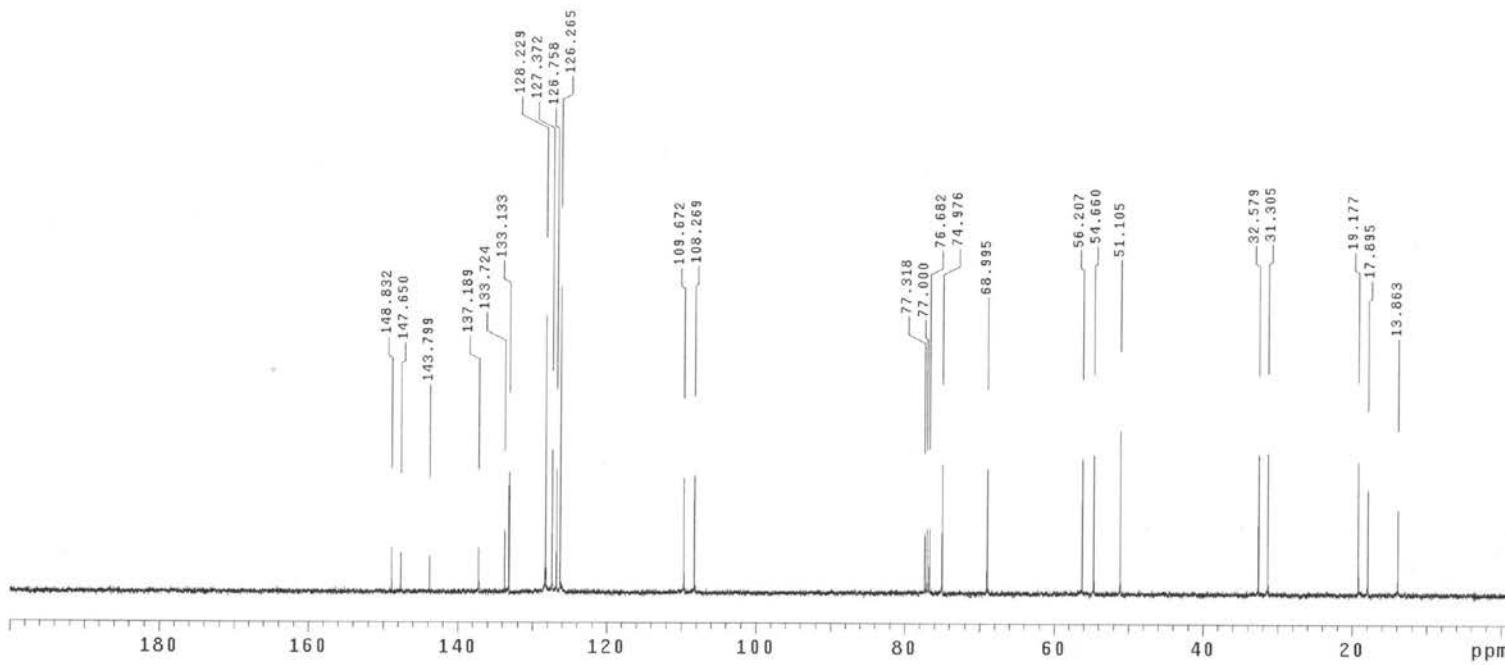


# Compound 7d ( $^{13}\text{C}$ -NMR spectral data)

NCNB0129  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 30 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 1168 repetitions



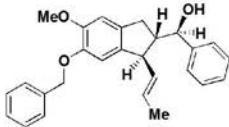
Compound 7d  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



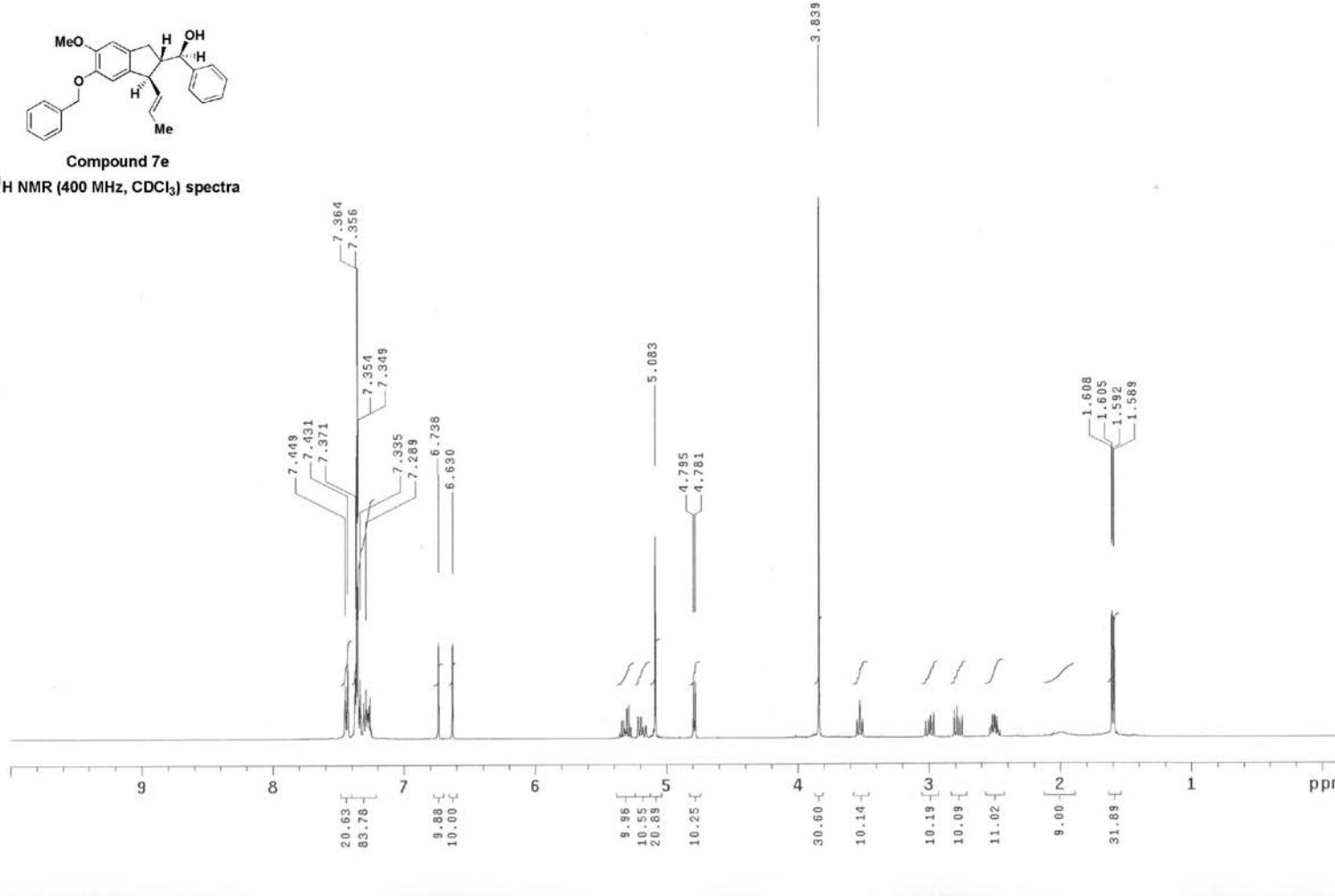
## Compound 7e ( $^1\text{H-NMR}$ spectral data)

NCNB0130

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 30 2018  
Solvent: CDC13  
Ambient temperature  
Total 32 repetitions

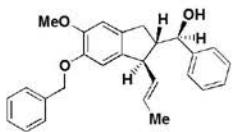


### Compound 7e



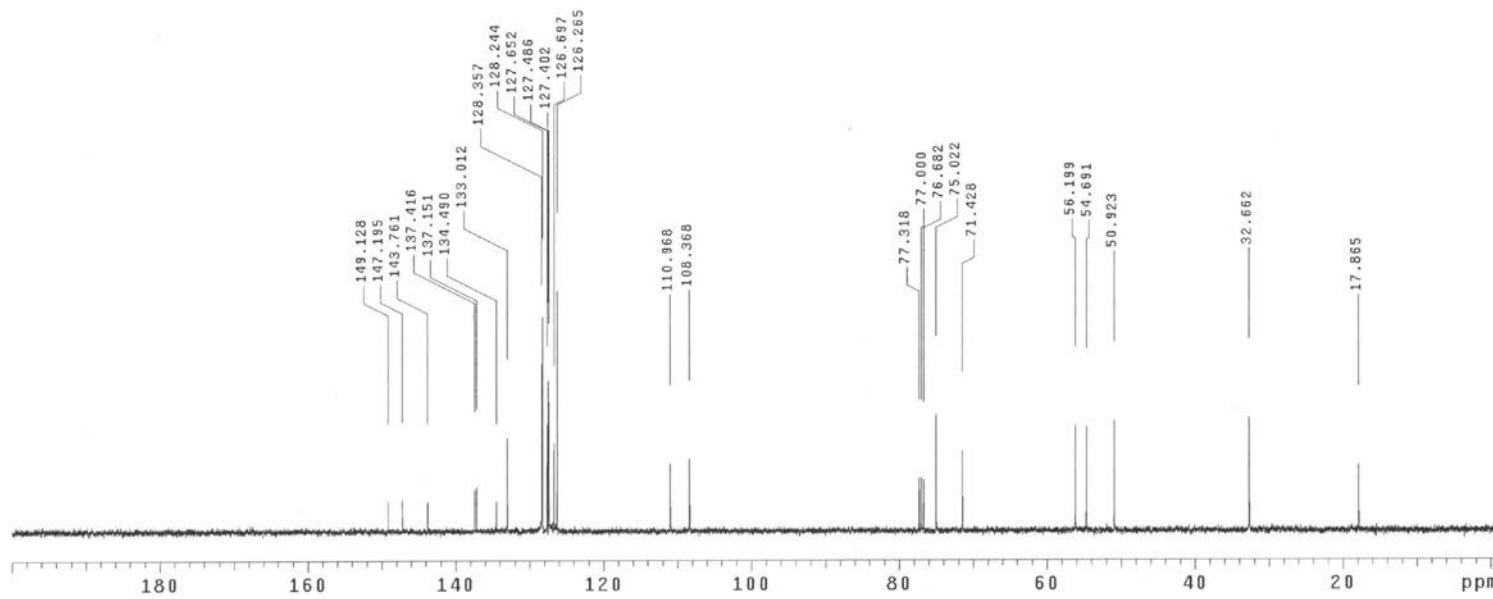
## Compound 7e ( $^{13}\text{C}$ -NMR spectral data)

NCNB0130  
Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Jan 30 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 432 repetitions



Compound 7e

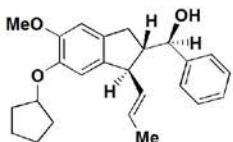
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 7f (<sup>1</sup>H-NMR spectral data)

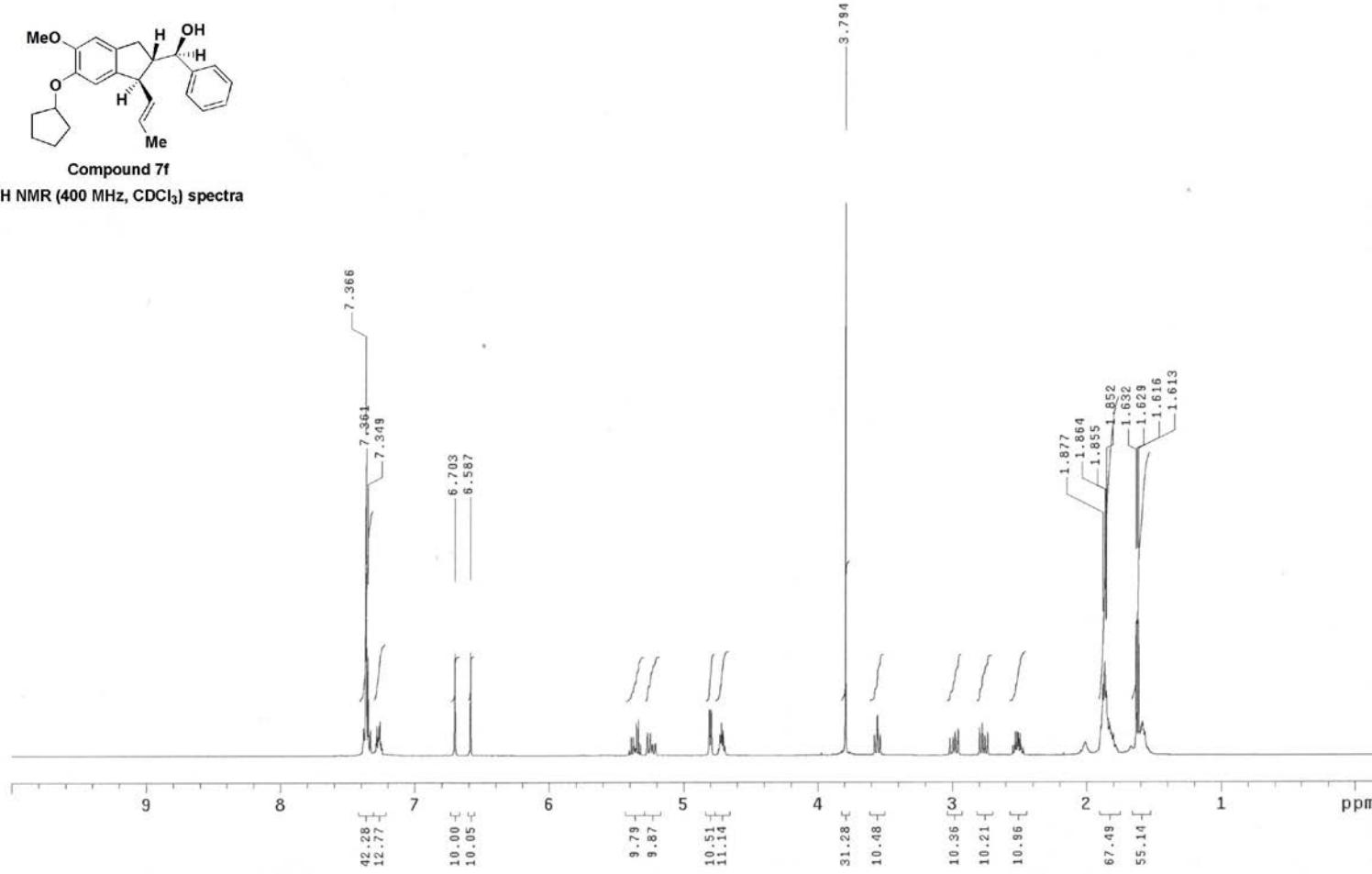
NCNB0116

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 18 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 7f

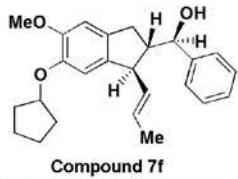
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



## Compound 7f ( $^{13}\text{C}$ -NMR spectral data)

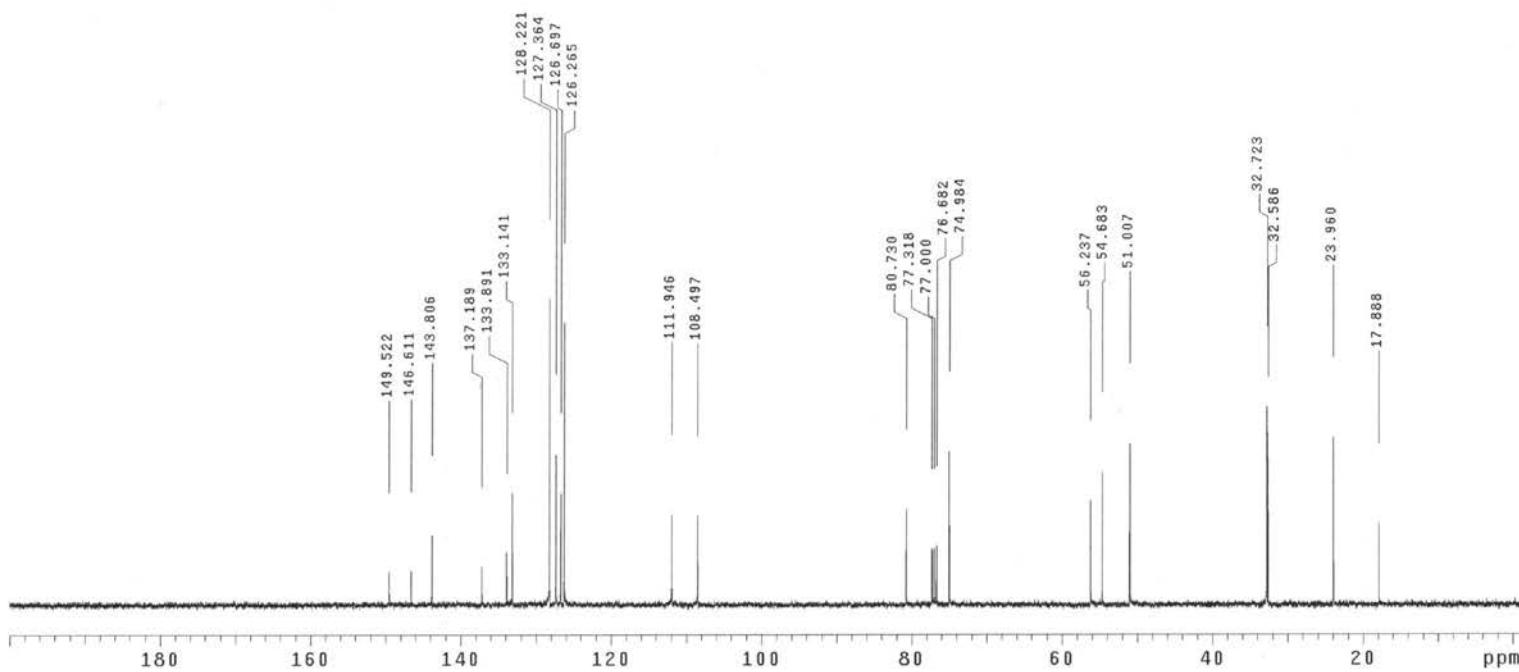
NCNB0116

Pulse Sequence: *s2pul*  
UNITYplus-400 "unity400"  
Date: Jan 18 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 640 repetitions



Compound 7f

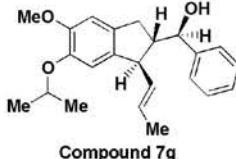
$^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



# Compound 7g (<sup>1</sup>H-NMR spectral data)

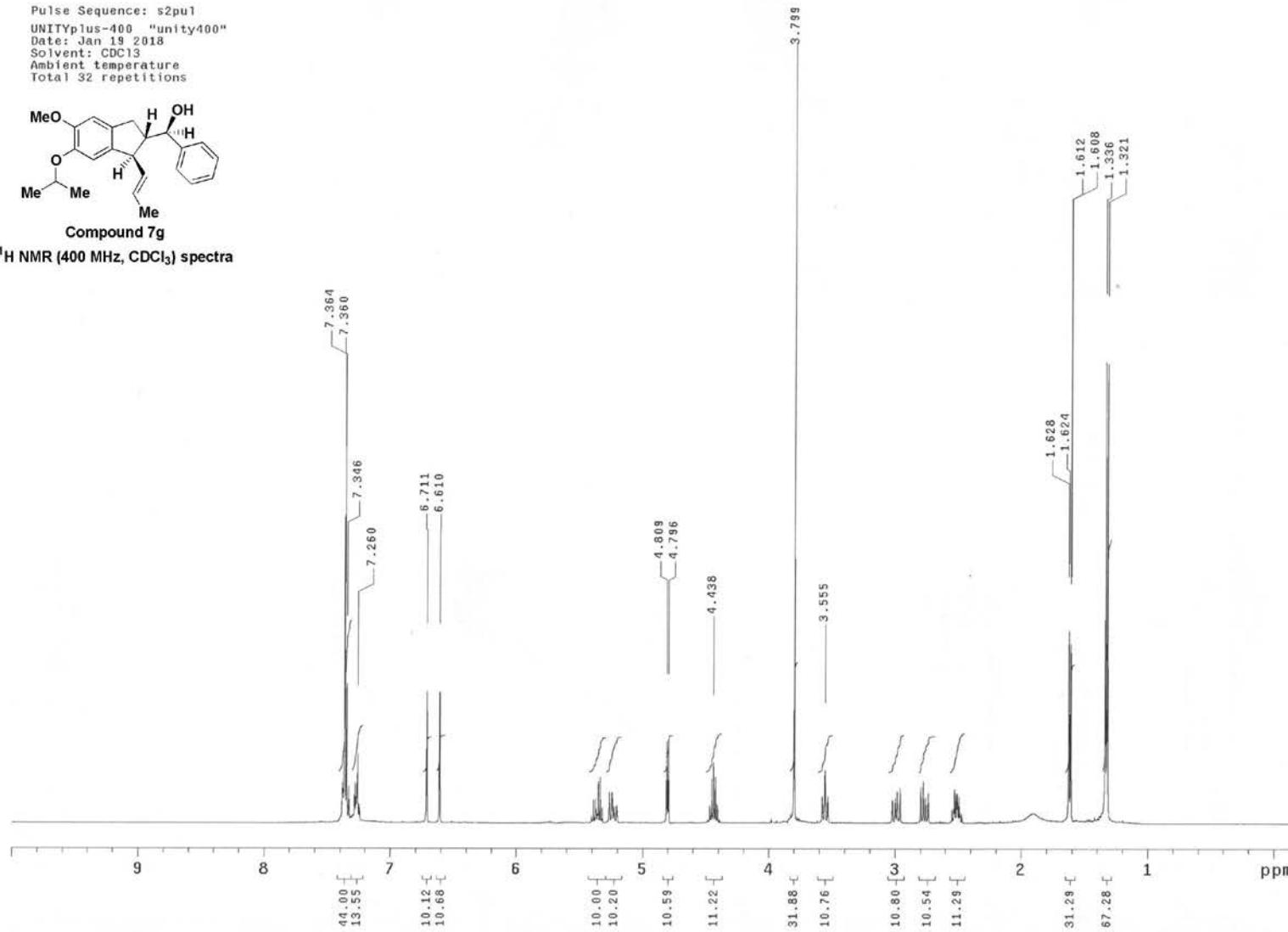
NCNB0118

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 19 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 7g

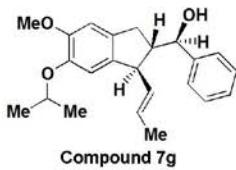
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



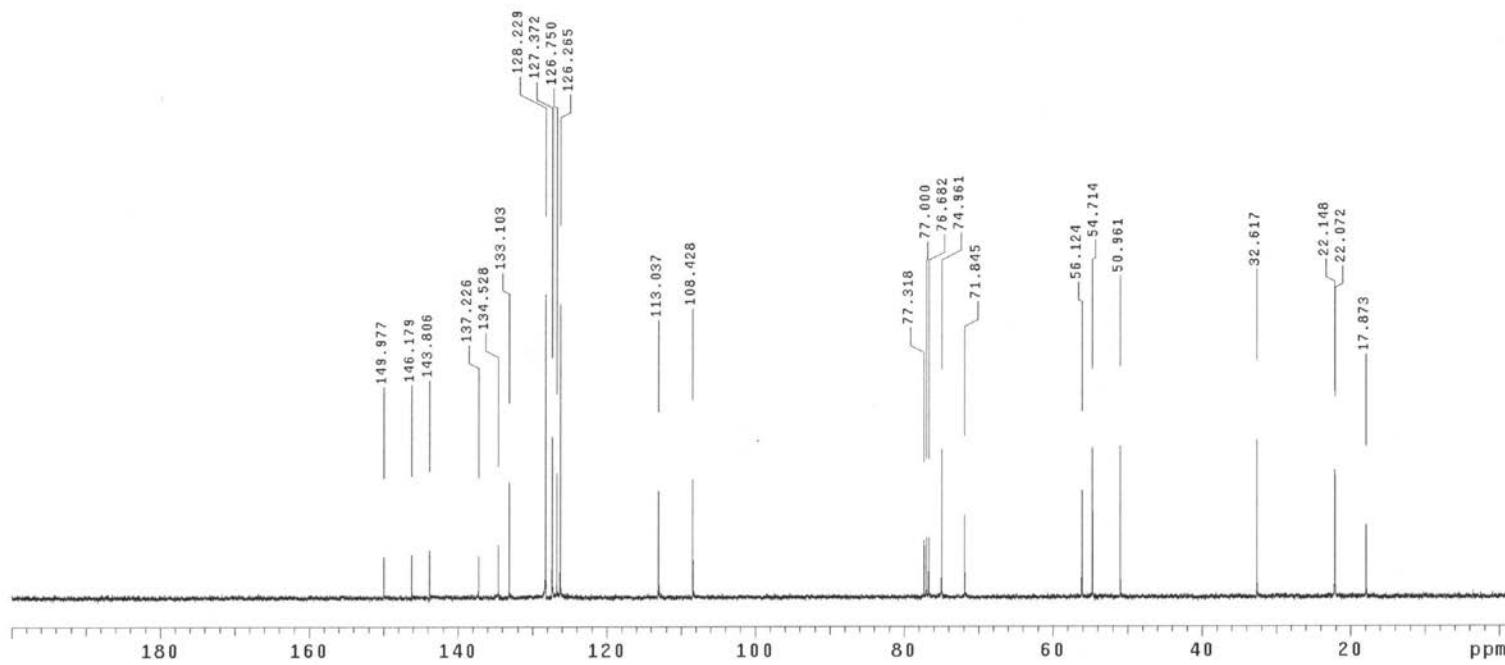
## Compound 7g ( $^{13}\text{C}$ -NMR spectral data)

NCNB0118

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 19 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1184 repetitions



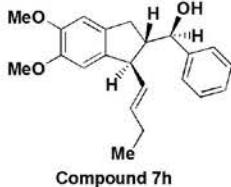
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



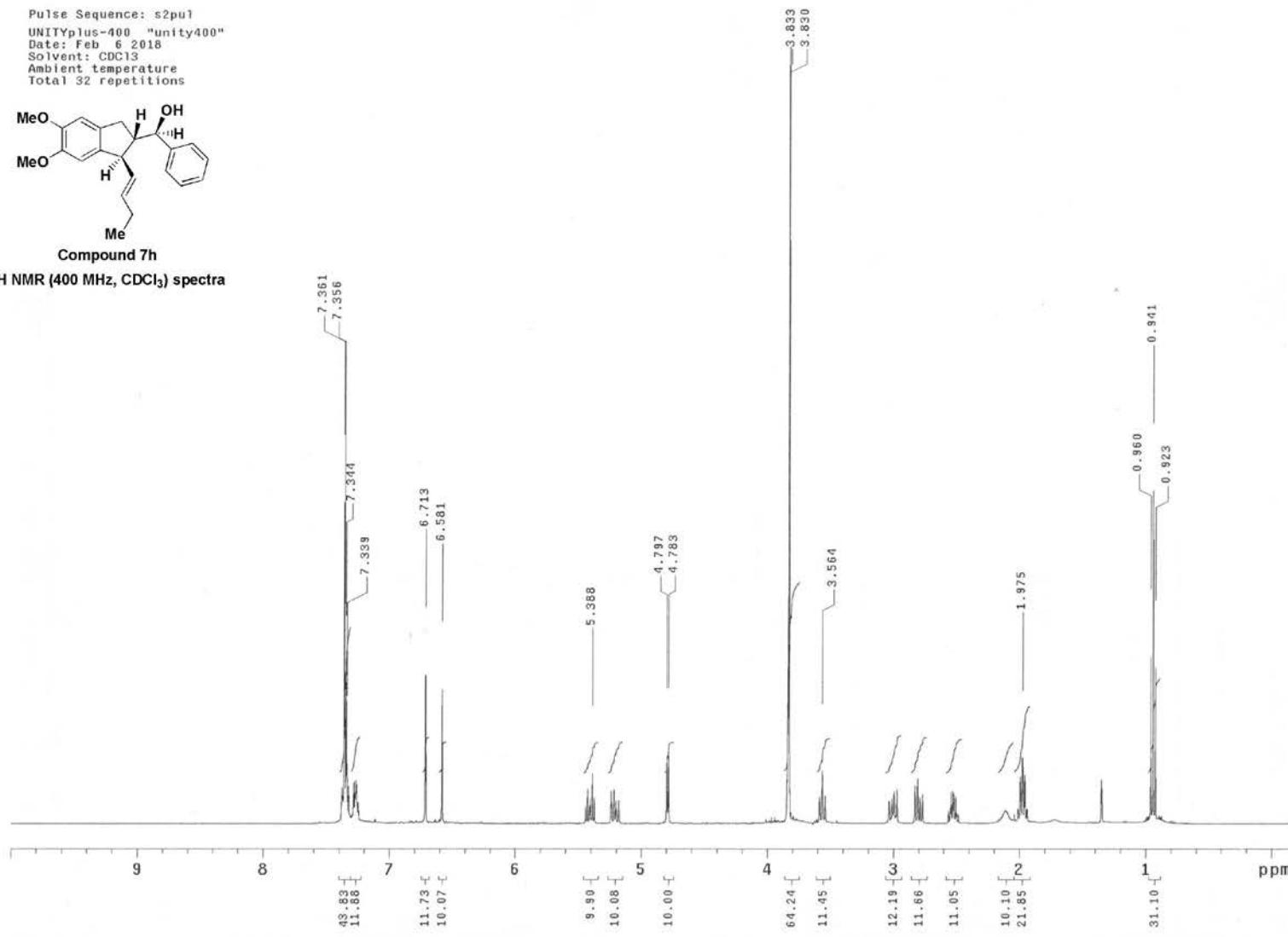
## Compound 7h ( $^1\text{H}$ -NMR spectral data)

NCNB0205

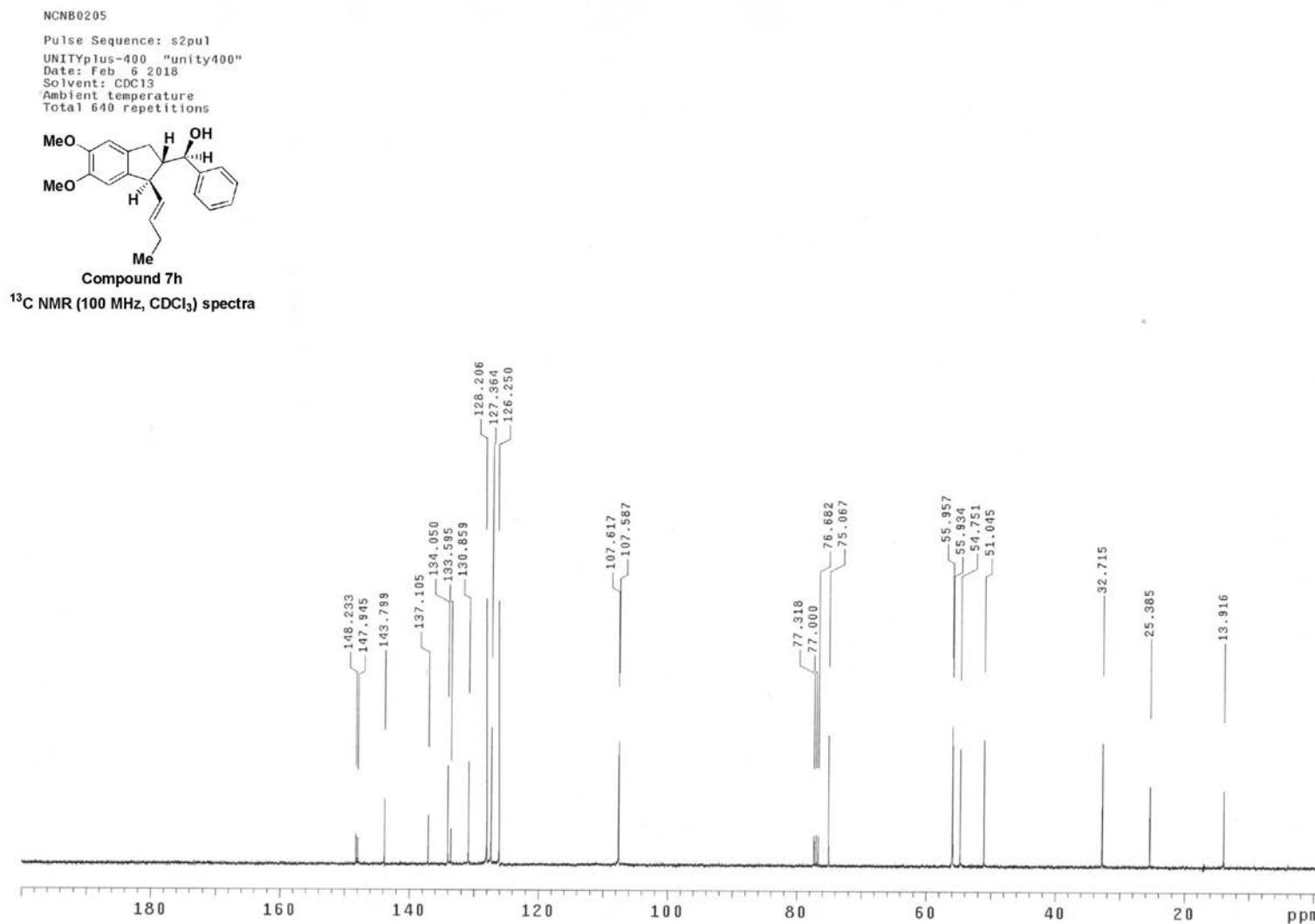
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 6 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



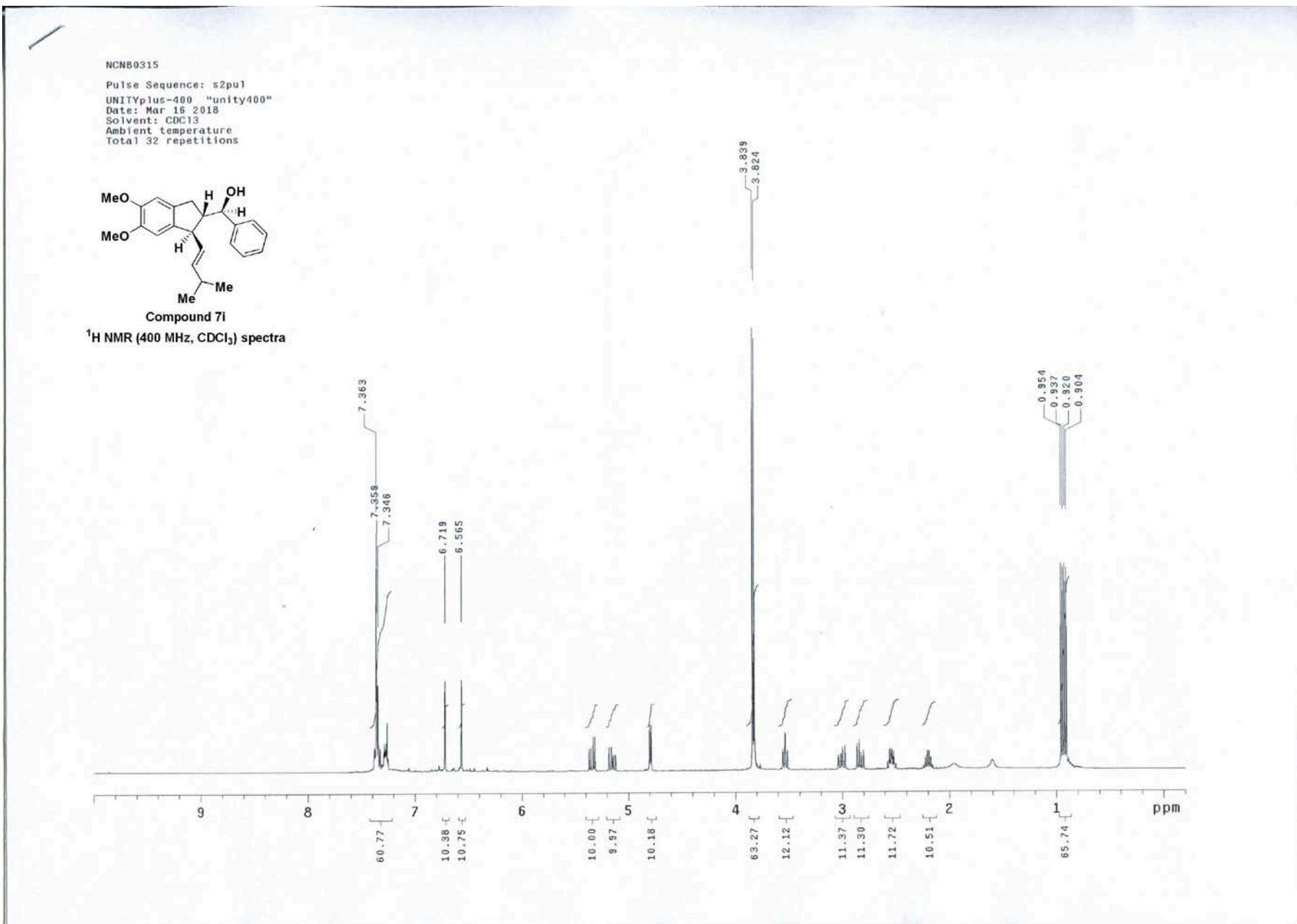
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



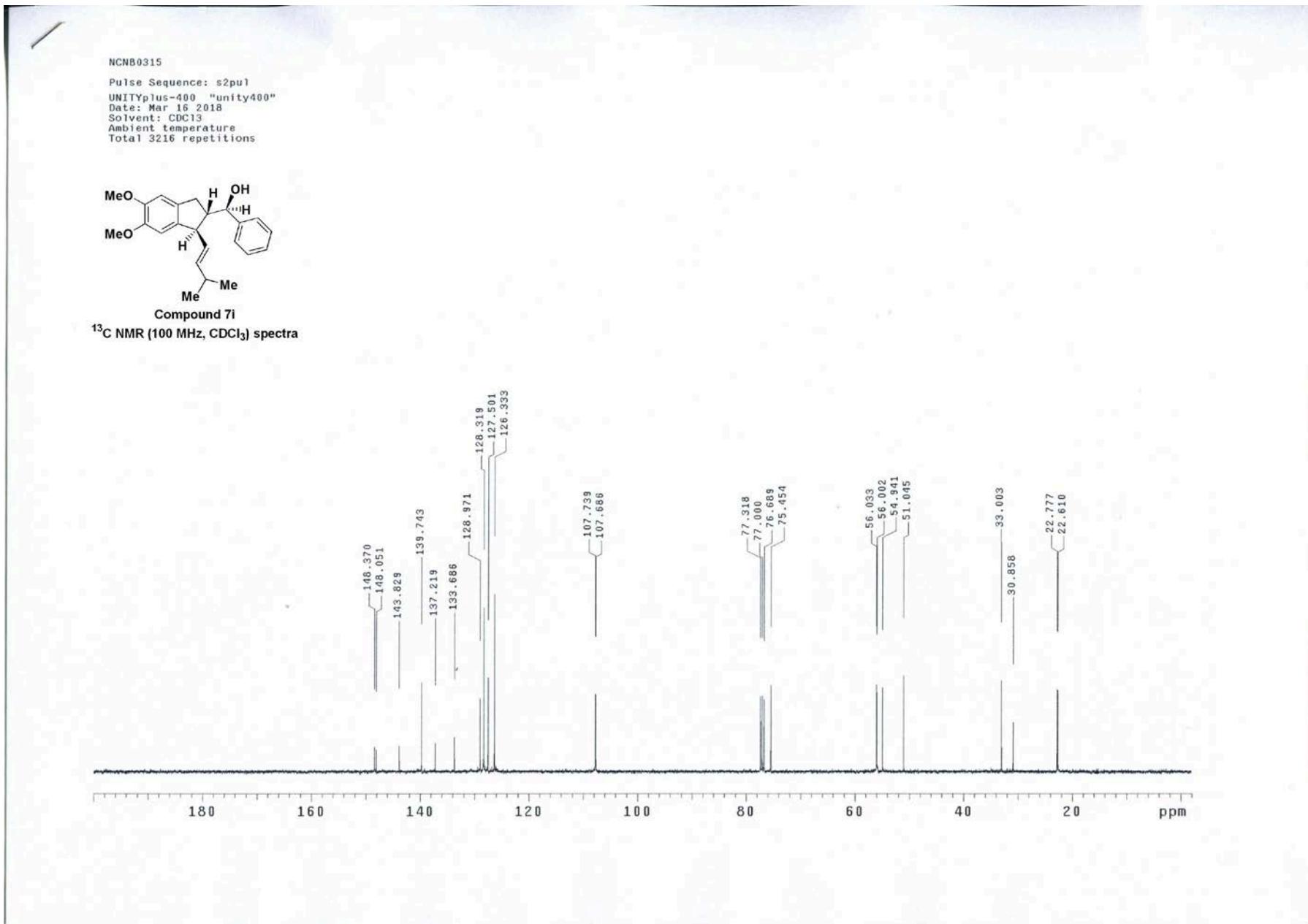
## Compound 7h ( $^{13}\text{C}$ -NMR spectral data)



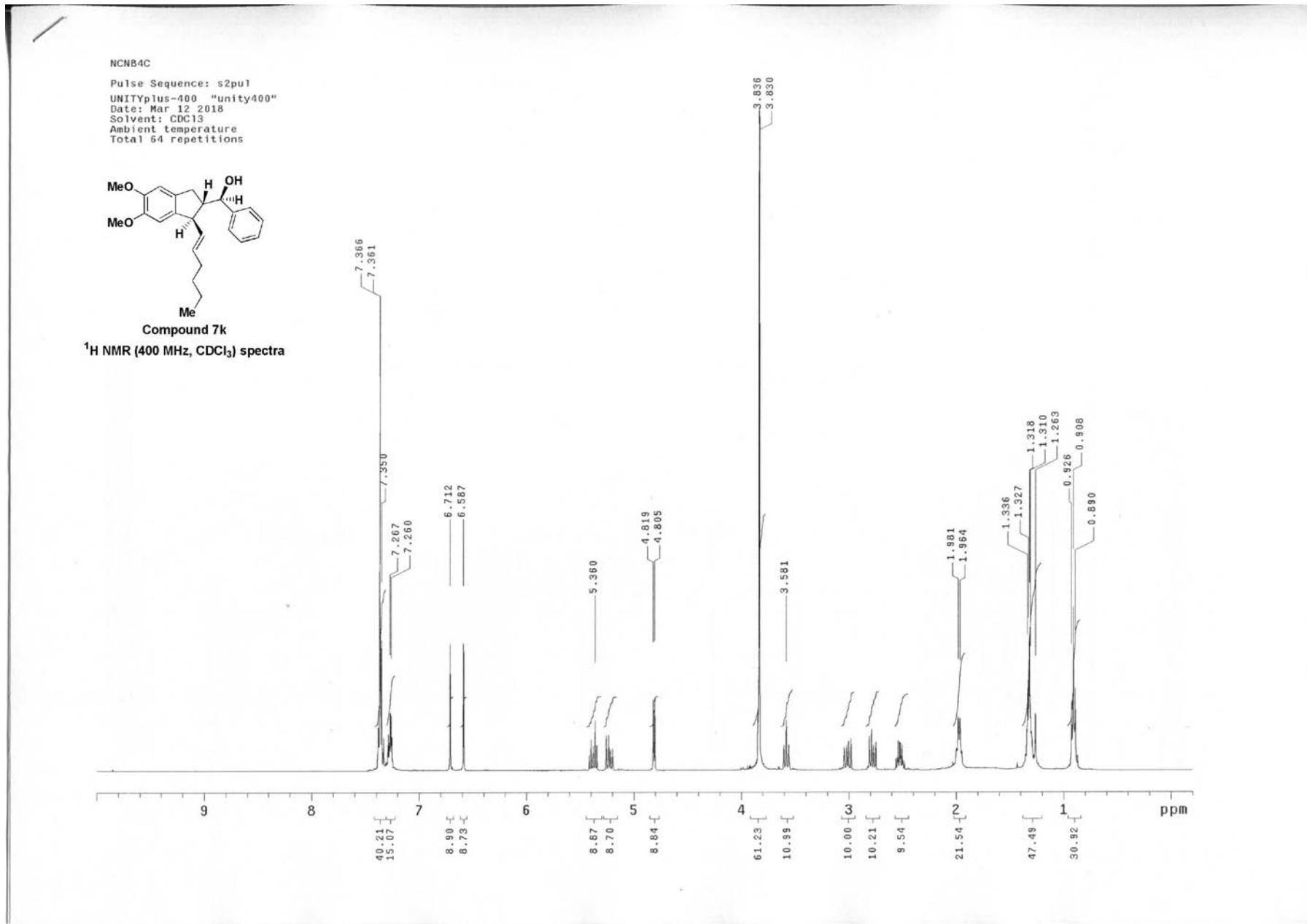
## Compound 7i (<sup>1</sup>H-NMR spectral data)



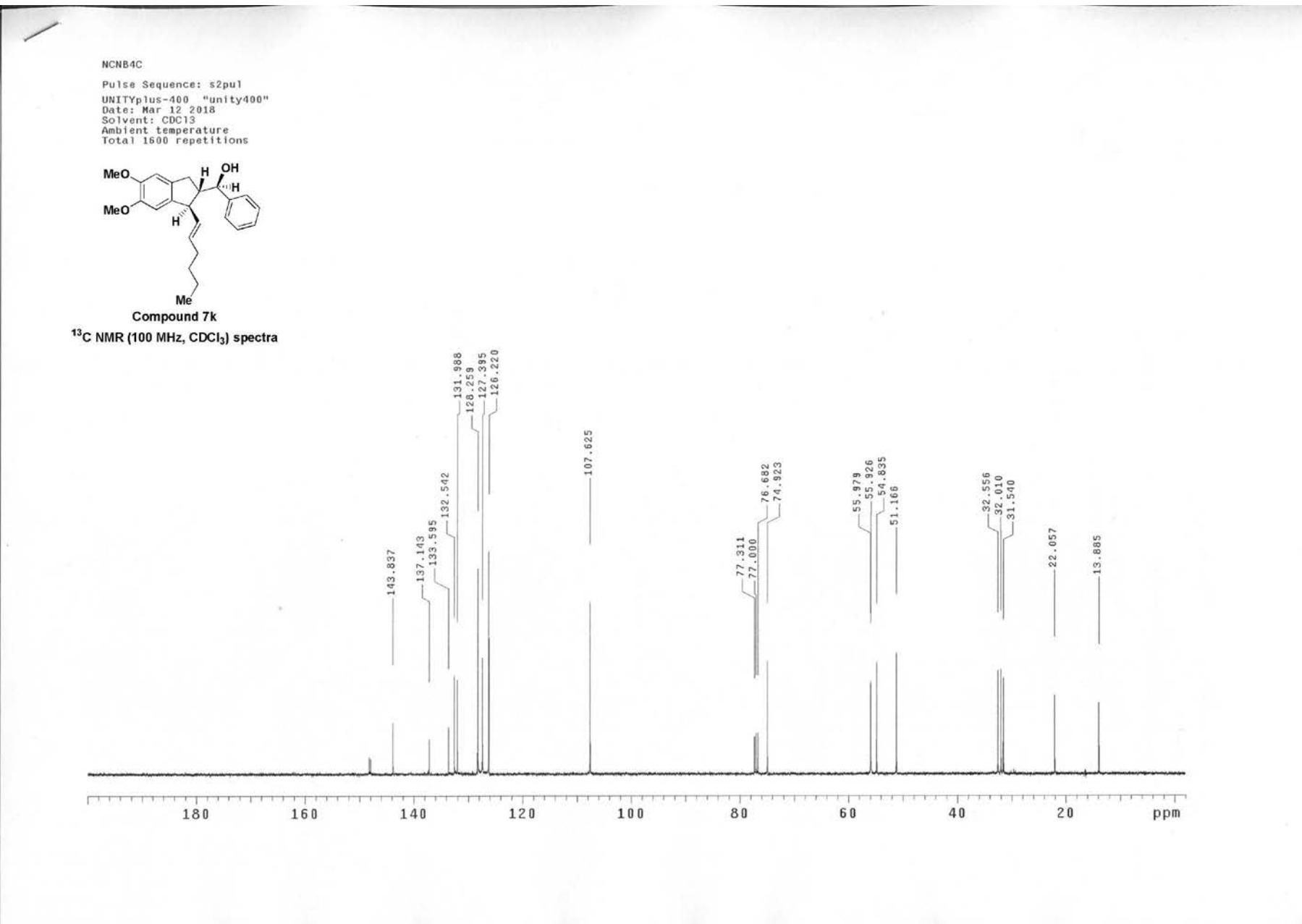
## Compound 7i (<sup>13</sup>C-NMR spectral data)



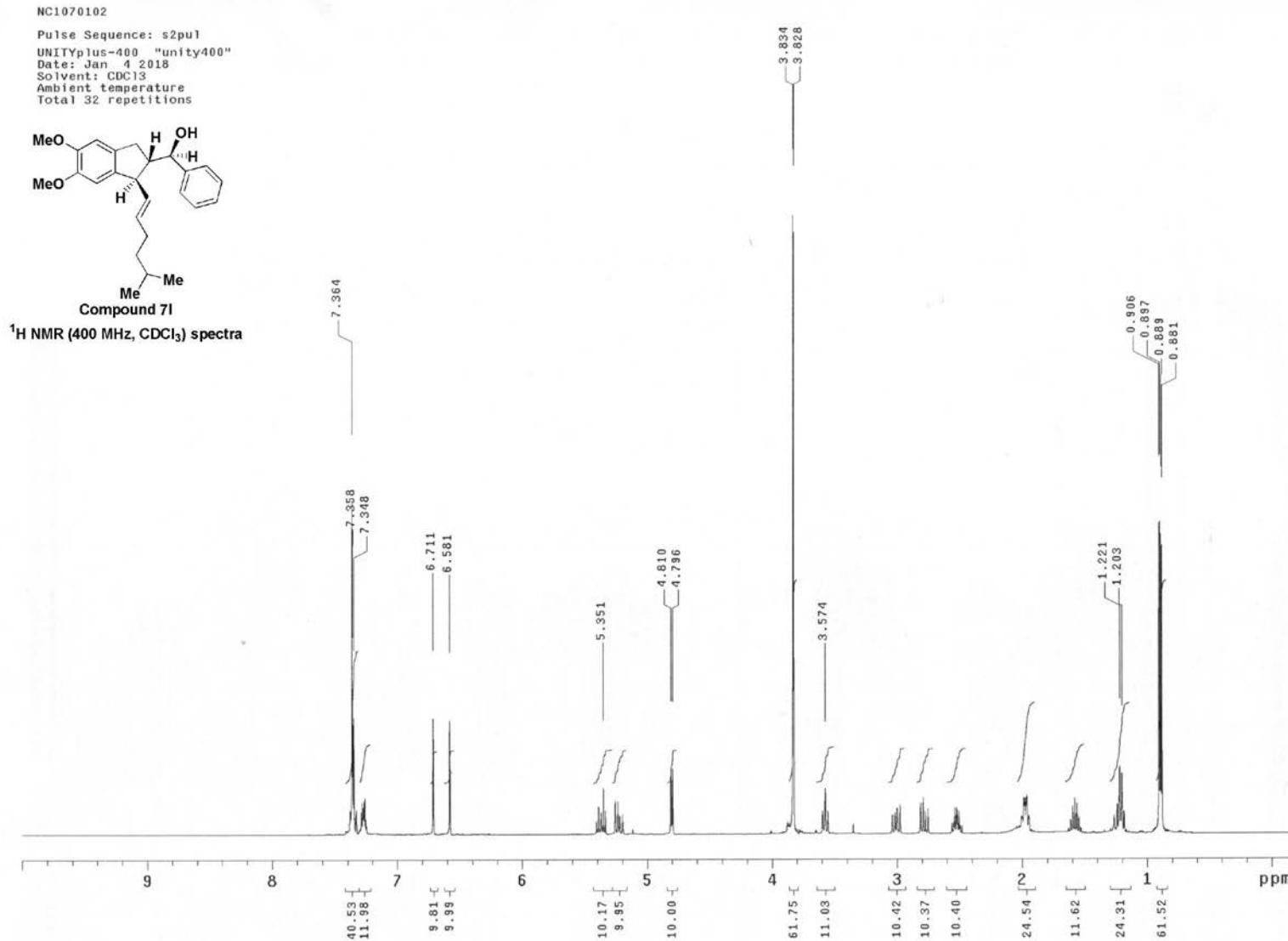
# Compound 7k (<sup>1</sup>H-NMR spectral data)



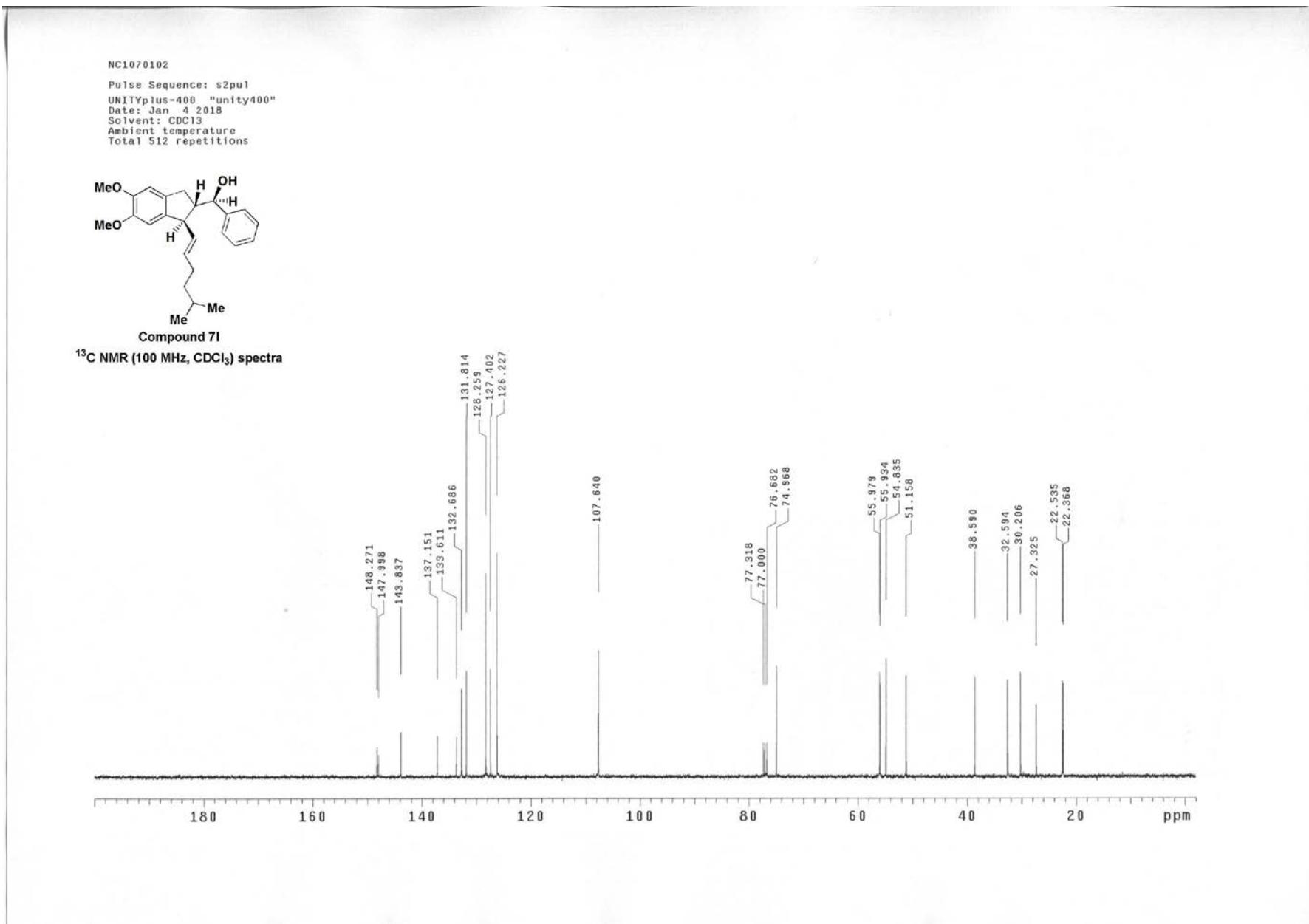
## Compound 7k ( $^{13}\text{C}$ -NMR spectral data)



# Compound 7I ( $^1\text{H}$ -NMR spectral data)

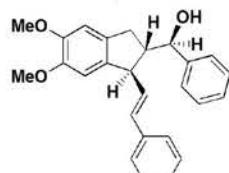


# Compound 7I ( $^{13}\text{C}$ -NMR spectral data)

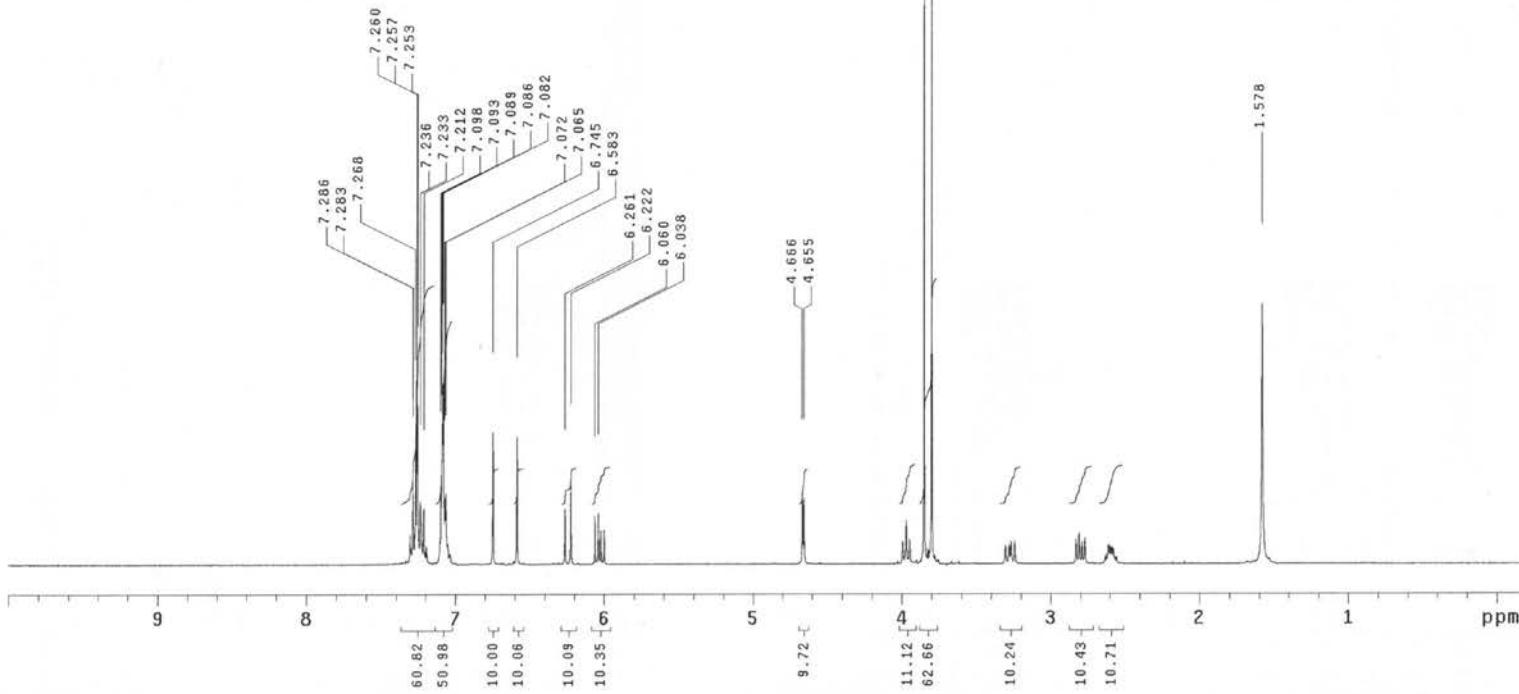


## Compound 7m ( $^1\text{H}$ -NMR spectral data)

NCPPhNB  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 4 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 54 repetitions

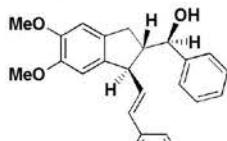


Compound 7m  
 $^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



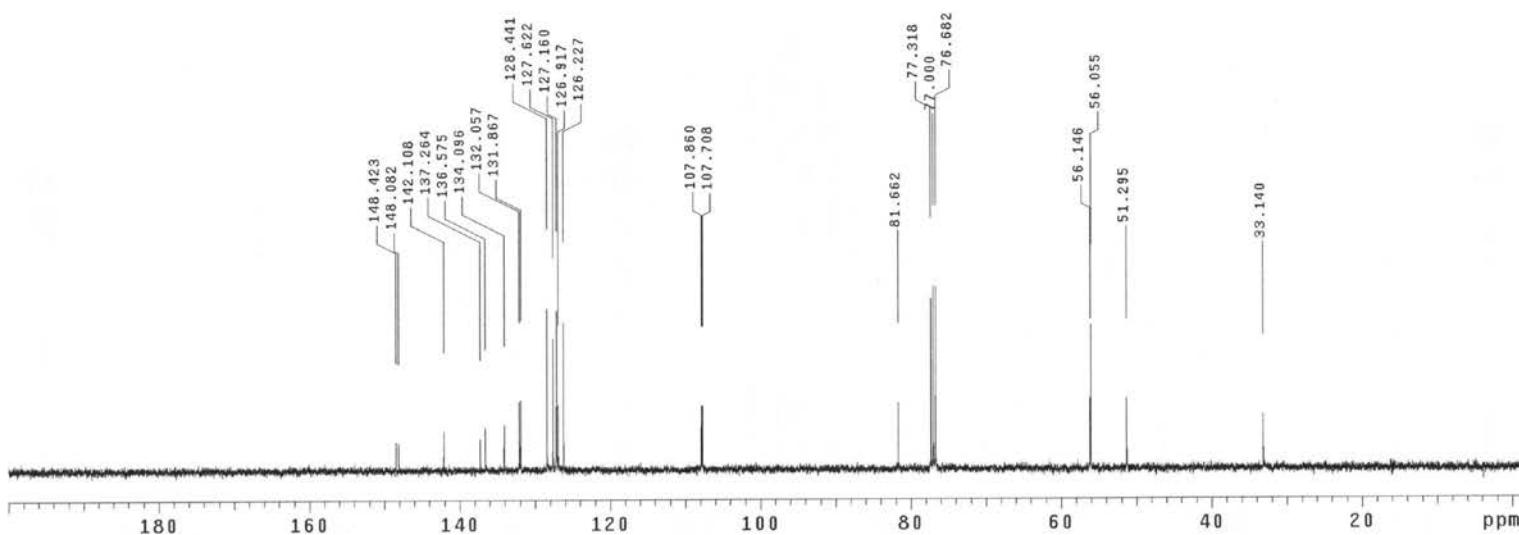
## Compound 7m ( $^{13}\text{C}$ -NMR spectral data)

NCPPhNB  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 4 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 5200 repetitions



Compound 7m

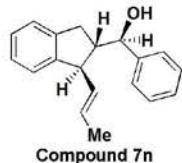
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



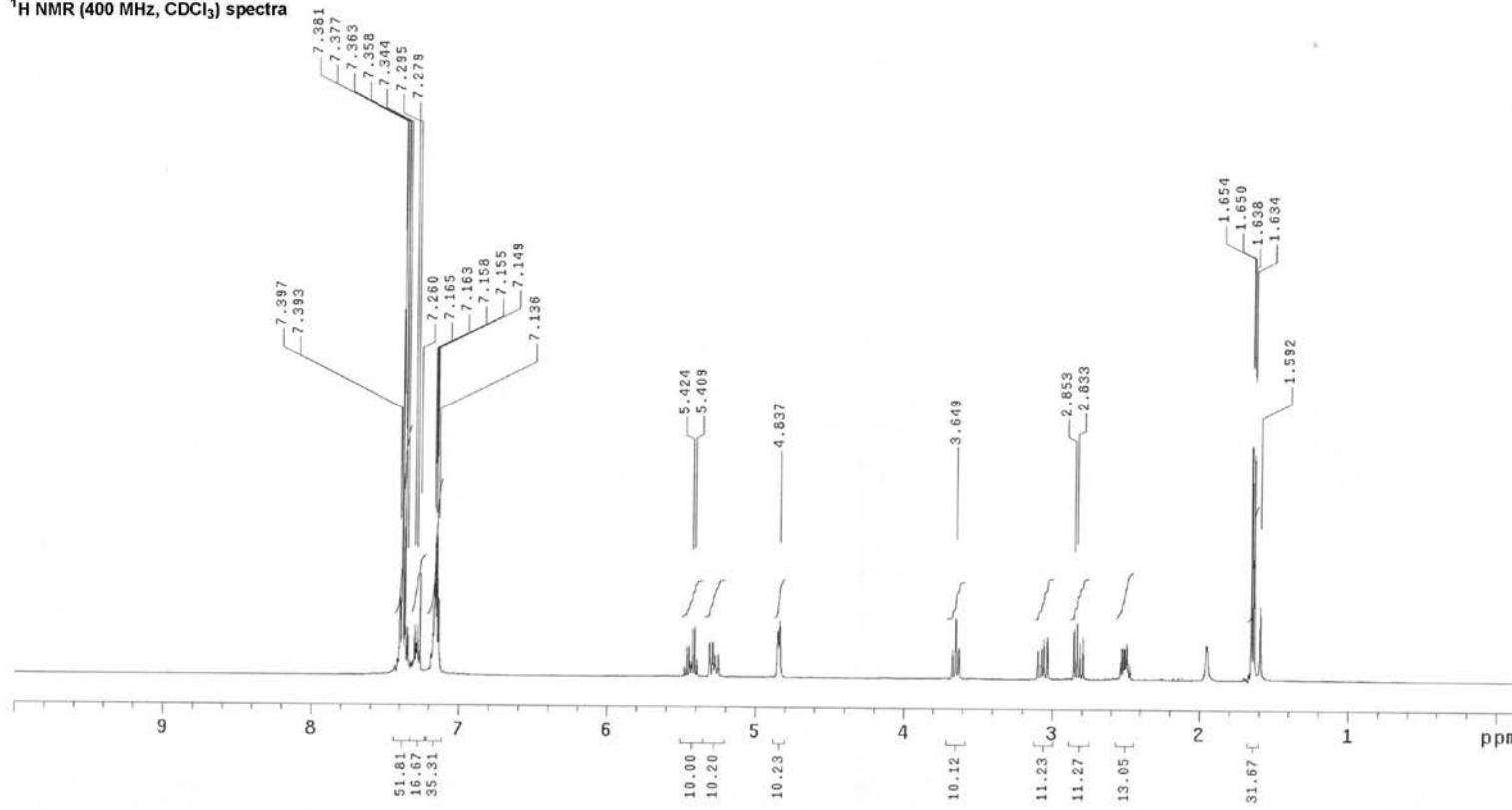
# Compound 7n ( $^1\text{H}$ -NMR spectral data)

NCNB0206

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 6 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 32 repetitions

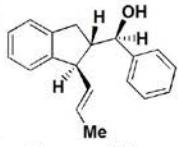


$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ) spectra



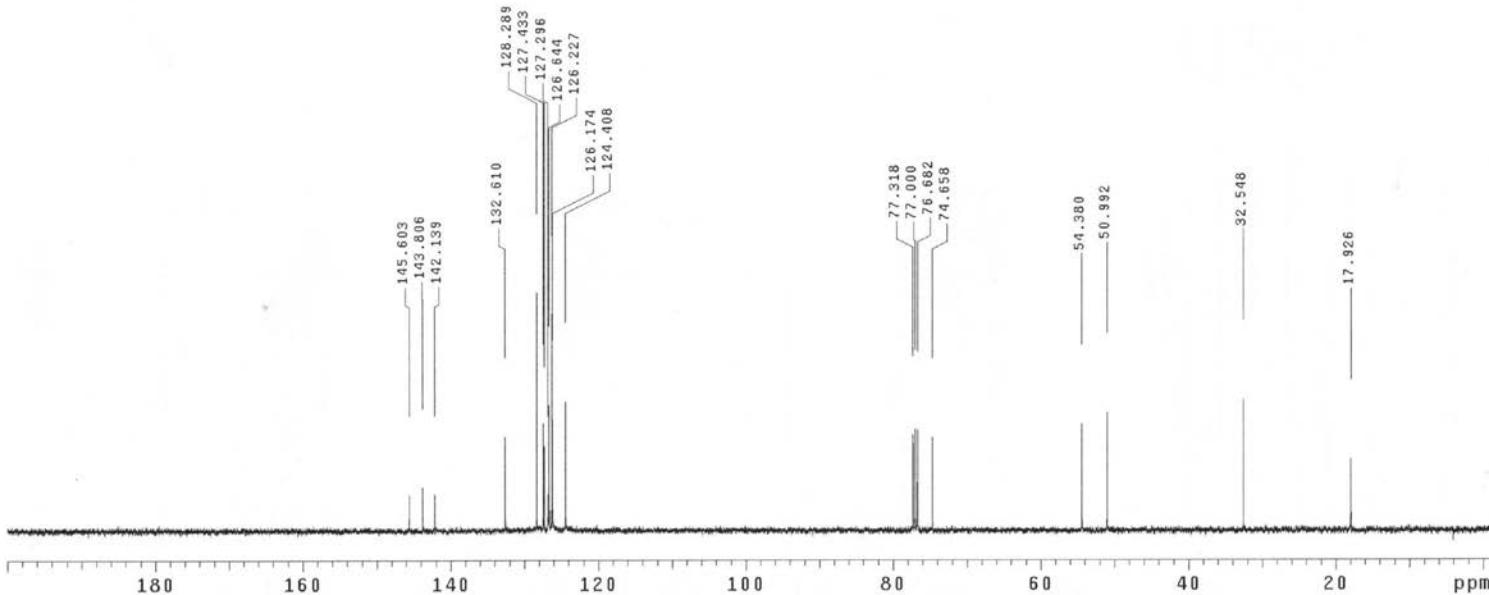
# Compound 7n ( $^{13}\text{C}$ -NMR spectral data)

NCNB0206  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 6 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1024 repetitions



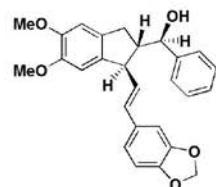
Compound 7n

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



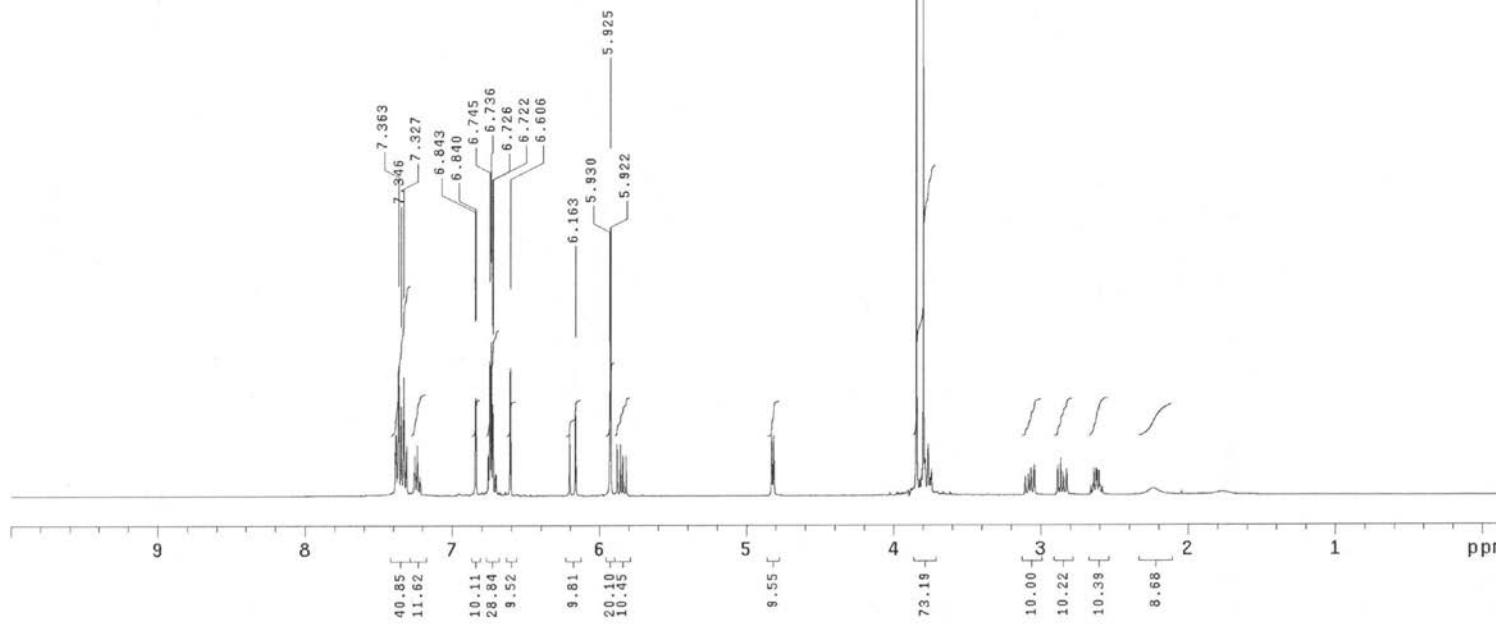
# Compound 7p (<sup>1</sup>H-NMR spectral data)

KS1070120  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 22 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 7p

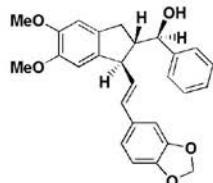
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



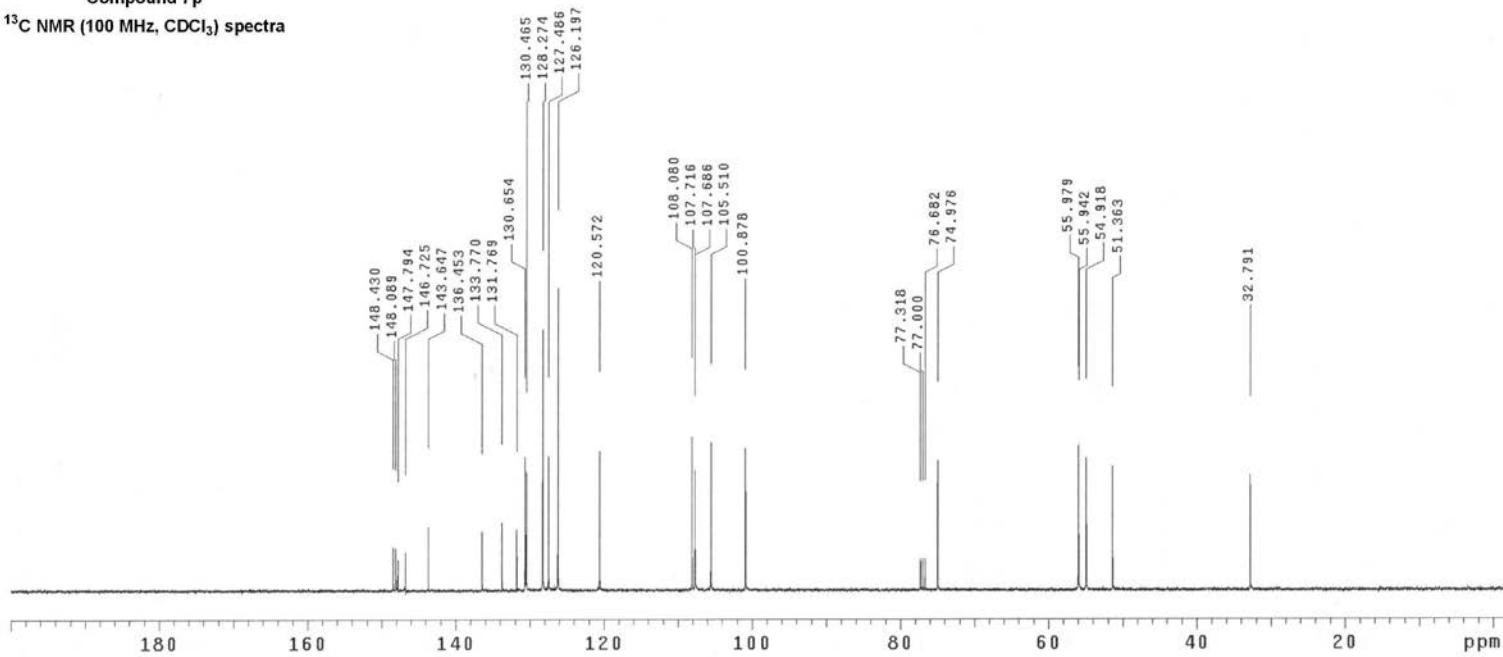
# Compound 7p (<sup>13</sup>C-NMR spectral data)

KS1070120

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 22, 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 576 repetitions



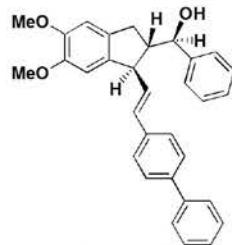
Compound 7p  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



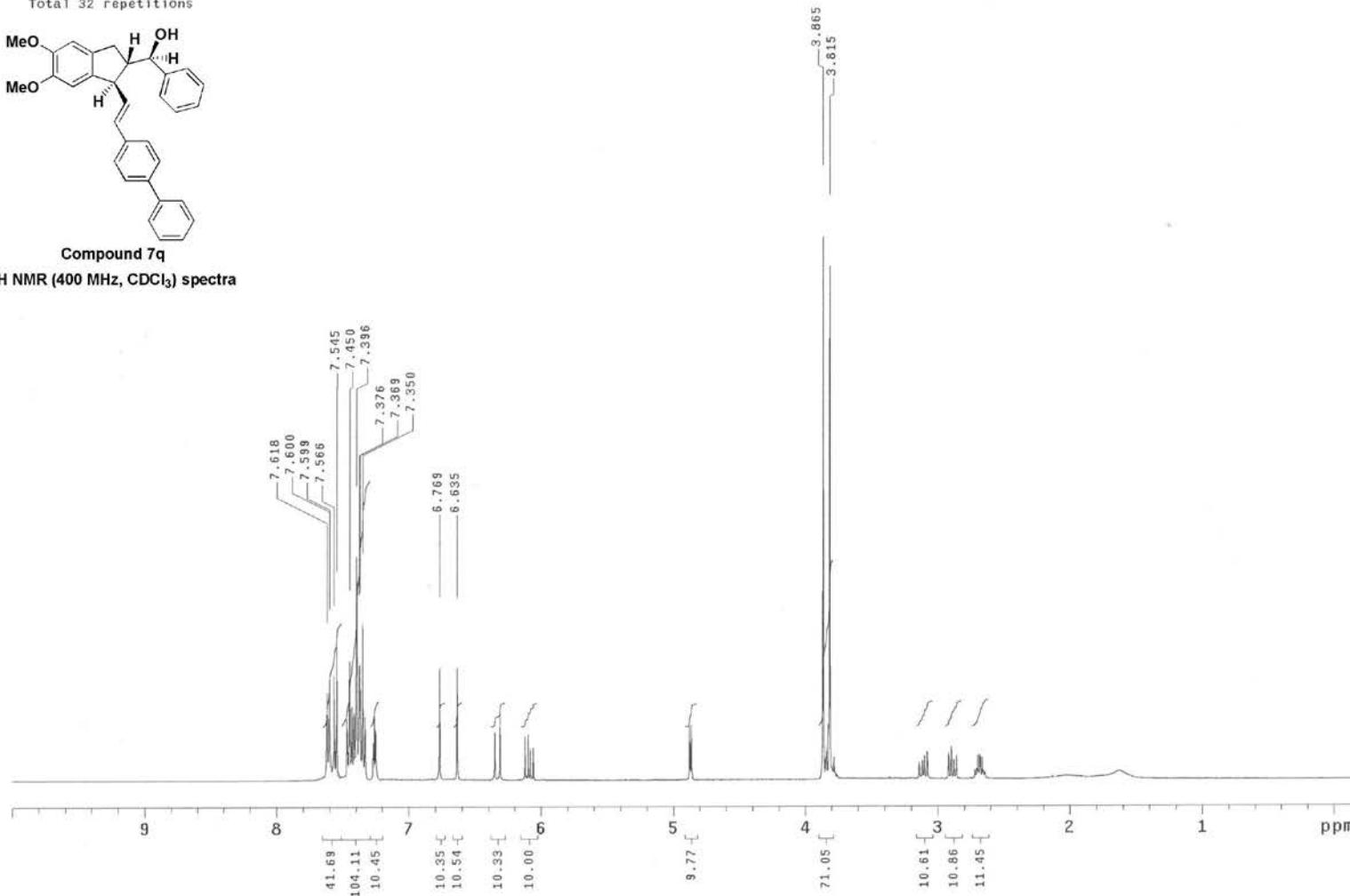
## Compound 7q (<sup>1</sup>H-NMR spectral data)

NCNB0126

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Jan 29 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



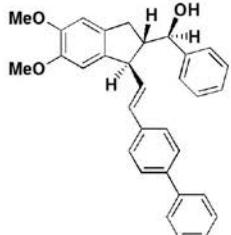
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 7q ( $^{13}\text{C}$ -NMR spectral data)

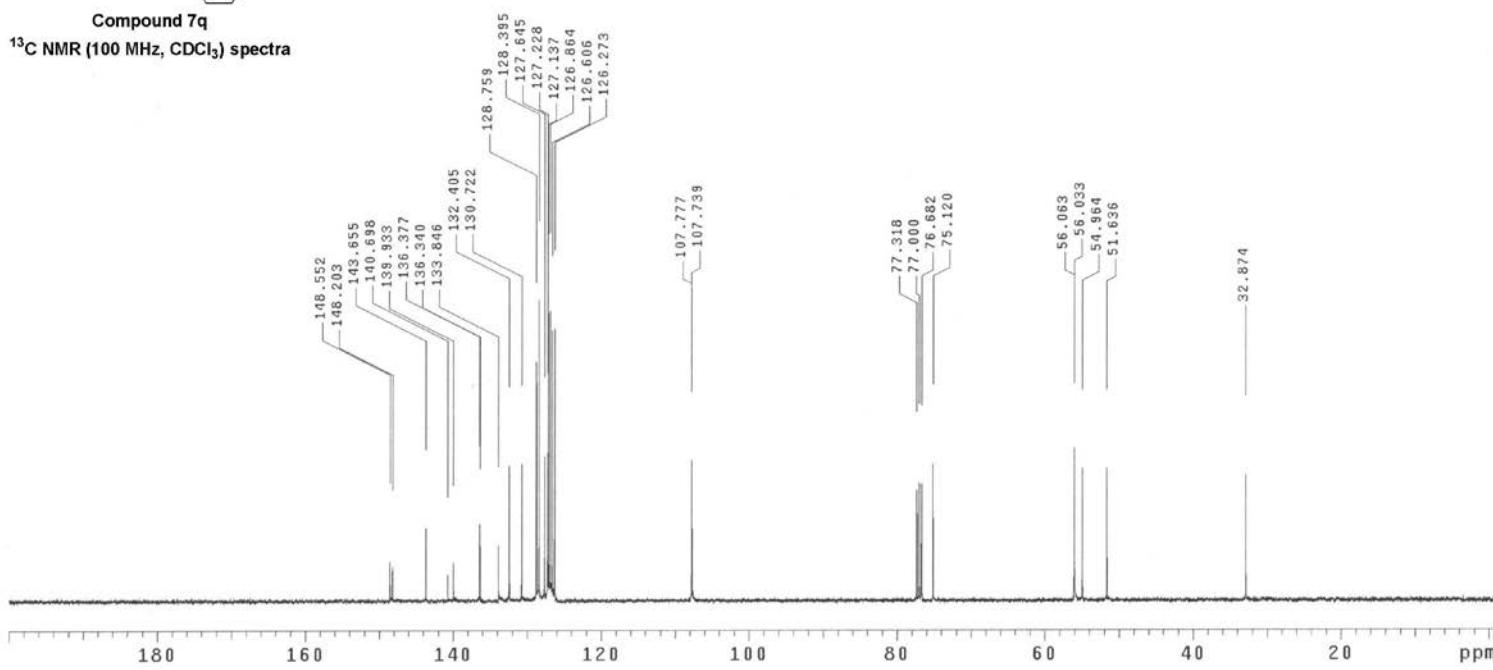
NCNB0126

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 29 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 5584 repetitions



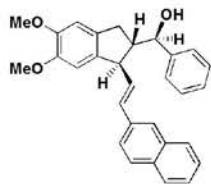
Compound 7q

$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra

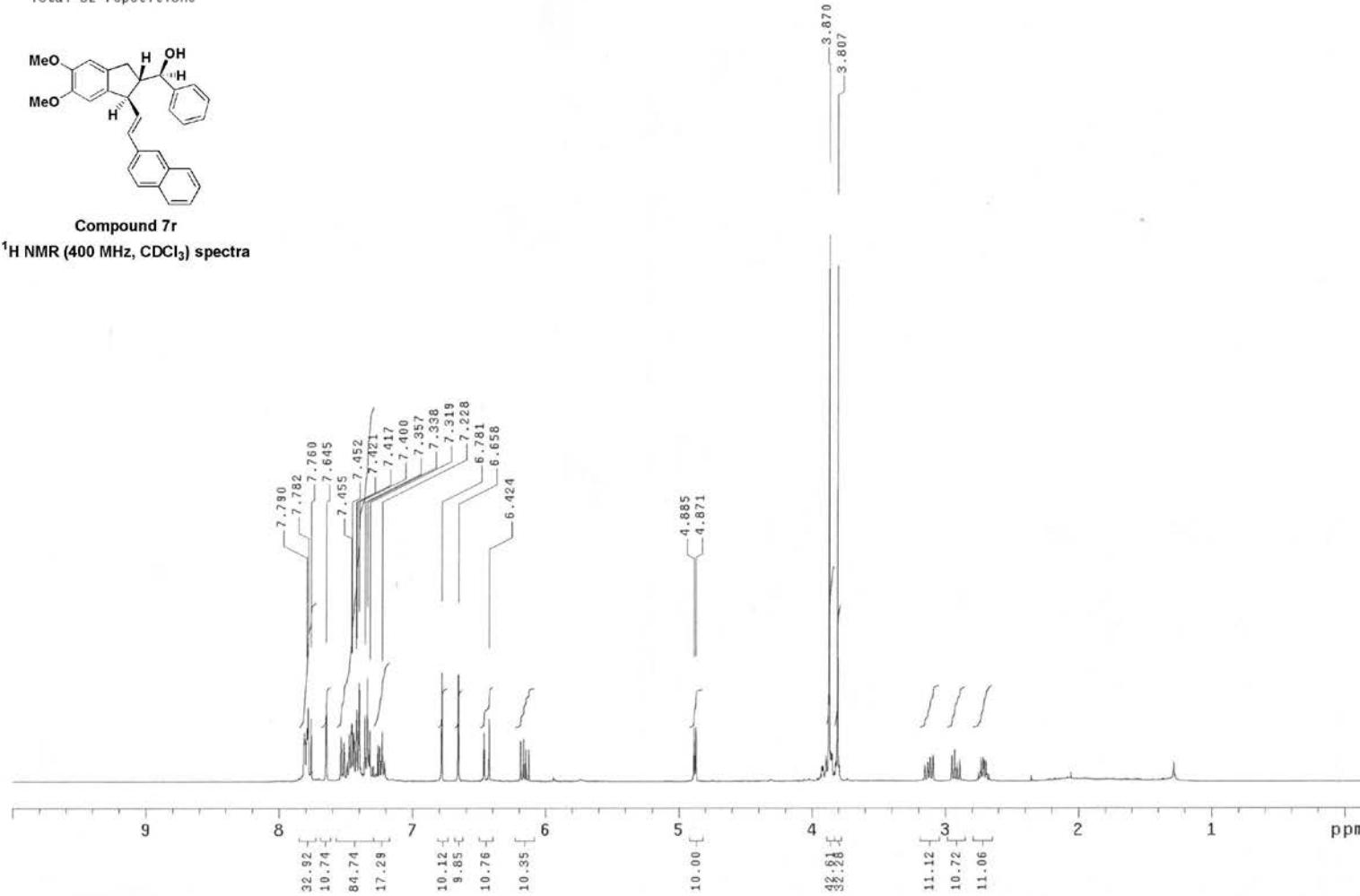


# Compound 7r ( $^1\text{H}$ -NMR spectral data)

KS1070122  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 5 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



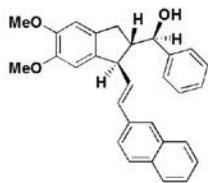
Compound 7r  
 $^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



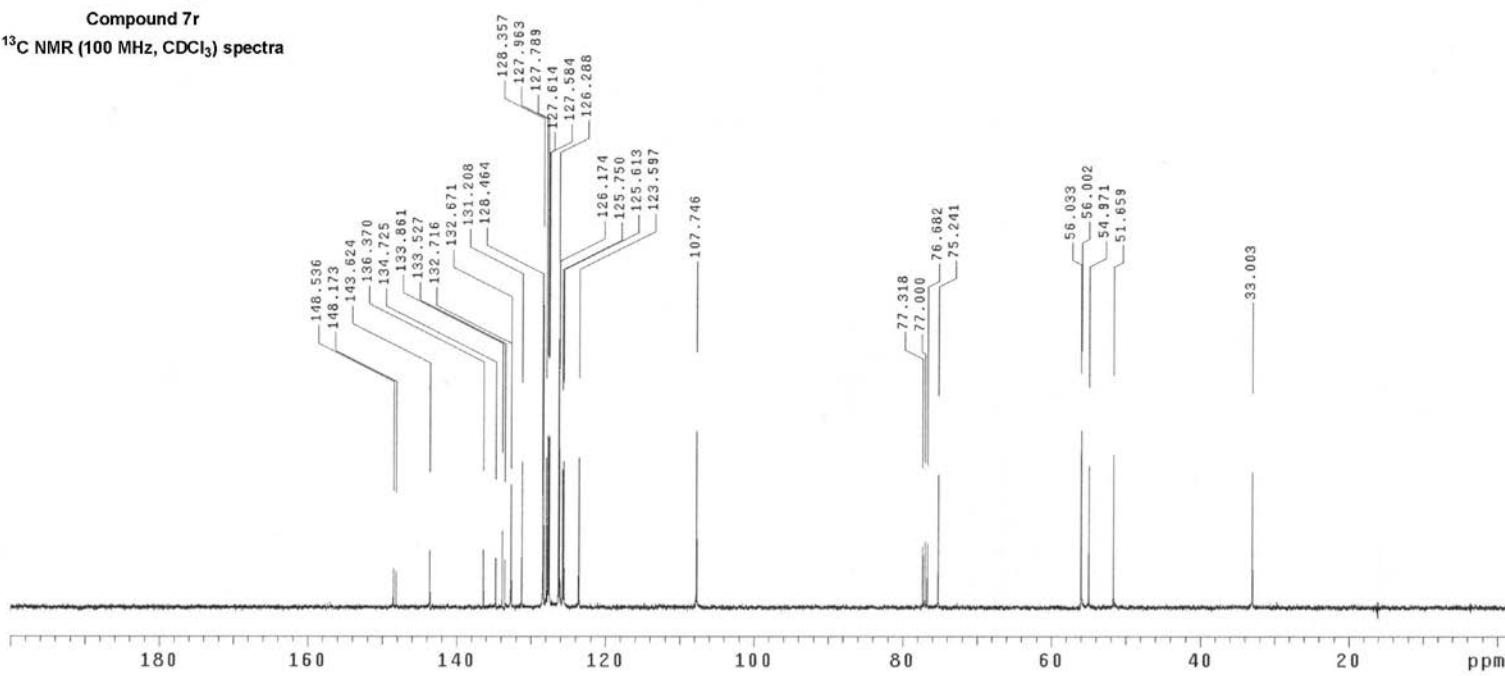
# Compound 7r (<sup>13</sup>C-NMR spectral data)

KS1070122

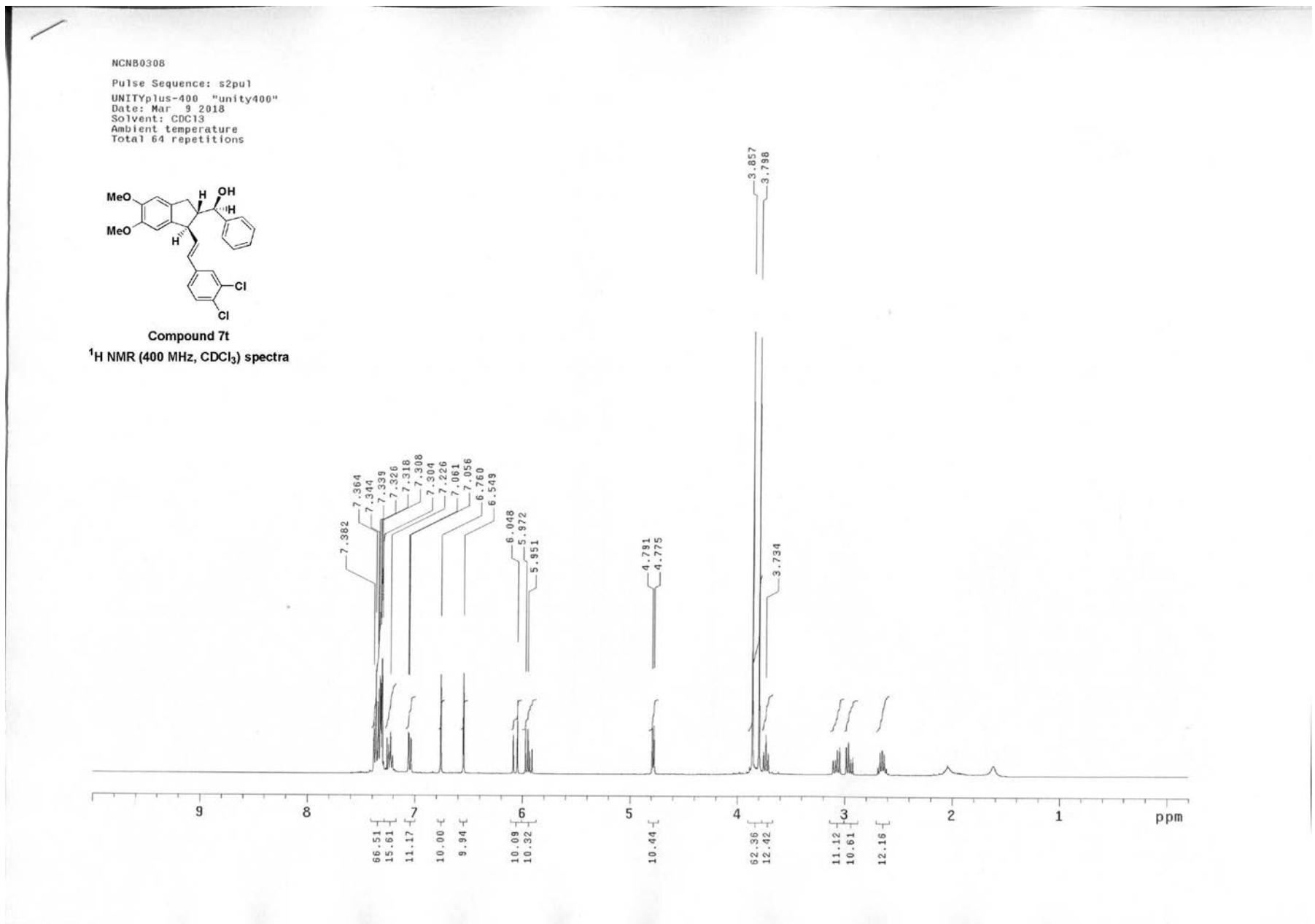
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 5 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1328 repetitions



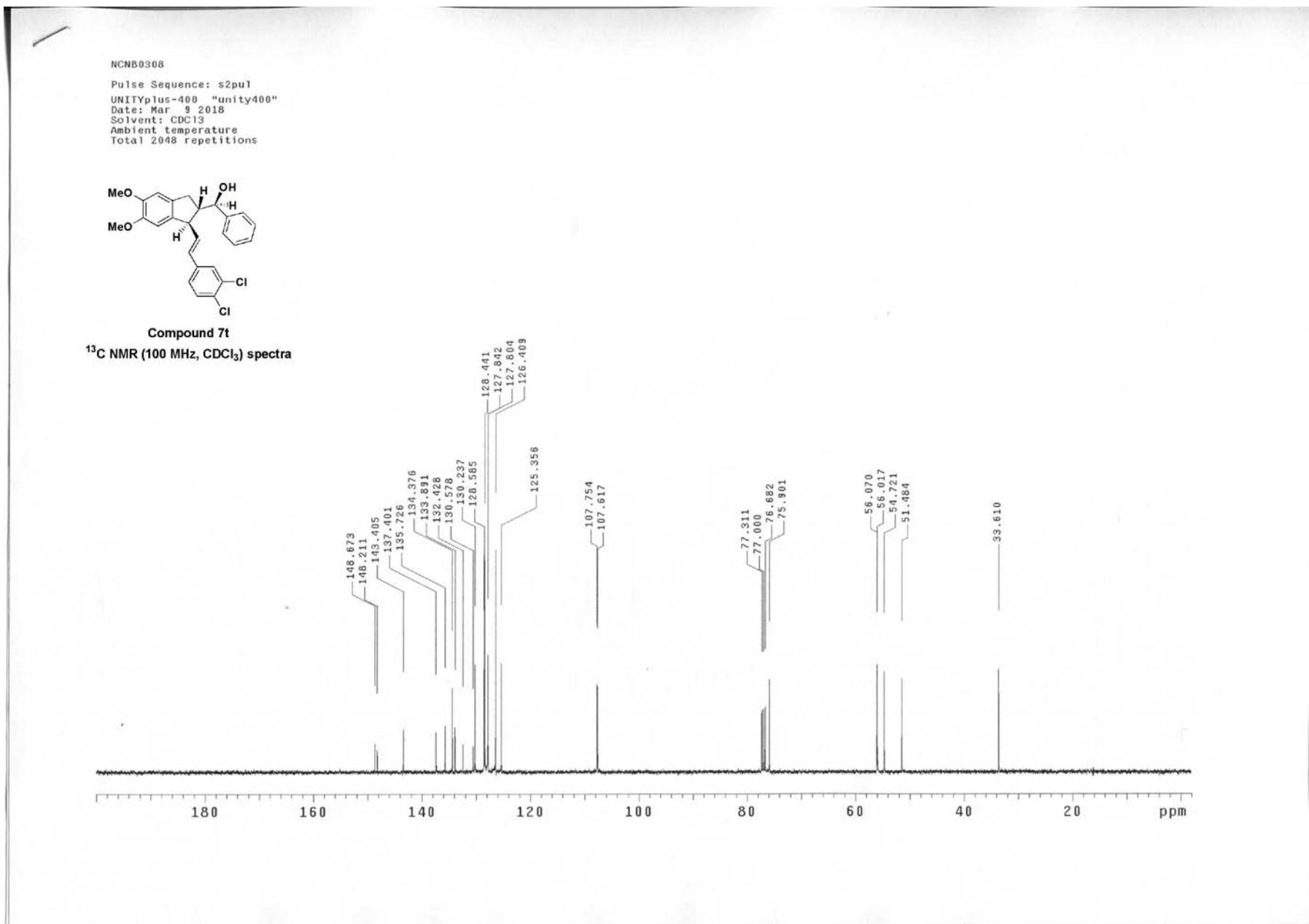
Compound 7r  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 7t ( $^1\text{H}$ -NMR spectral data)

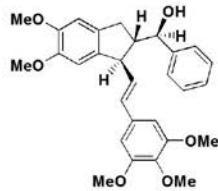


# Compound 7t (<sup>13</sup>C-NMR spectral data)

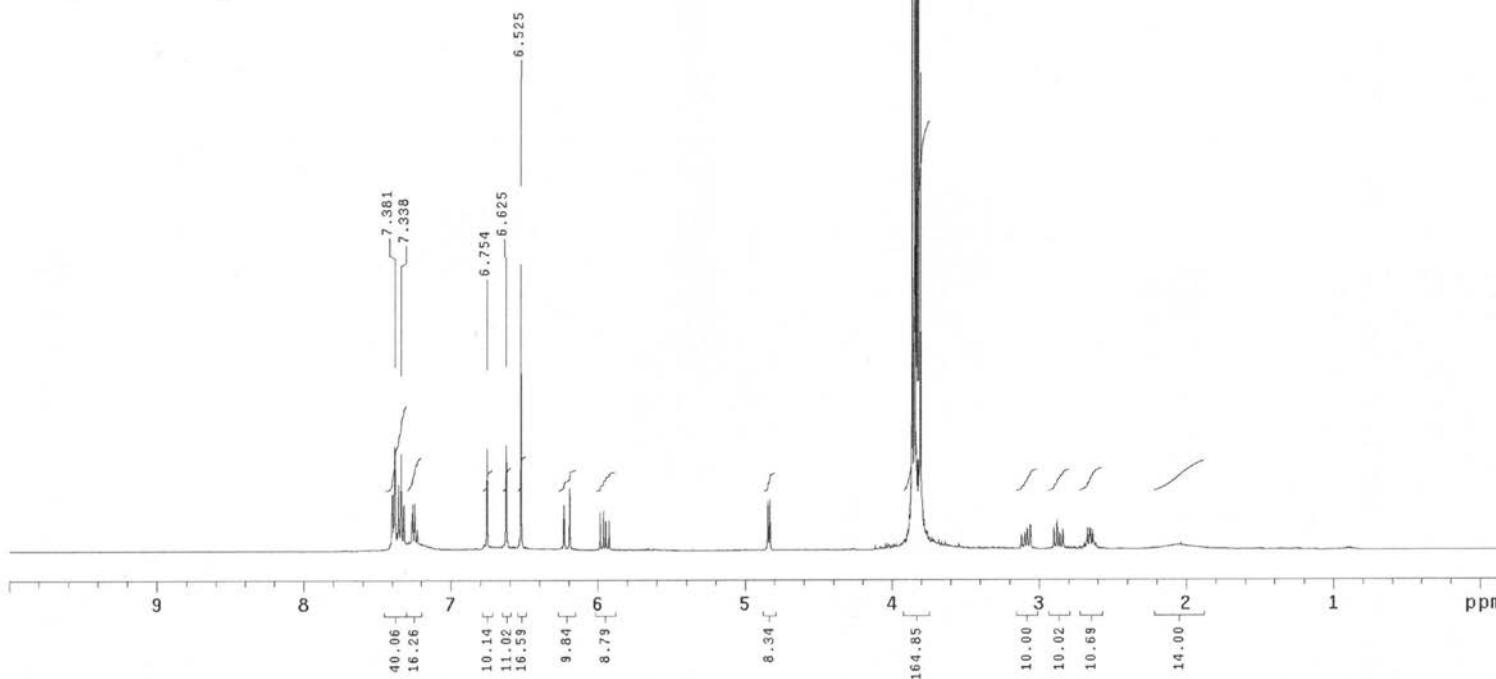


# Compound 7u (<sup>1</sup>H-NMR spectral data)

NCNB30Me  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 25 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions

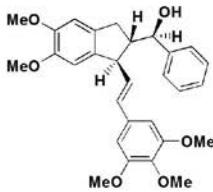


Compound 7u  
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) spectra

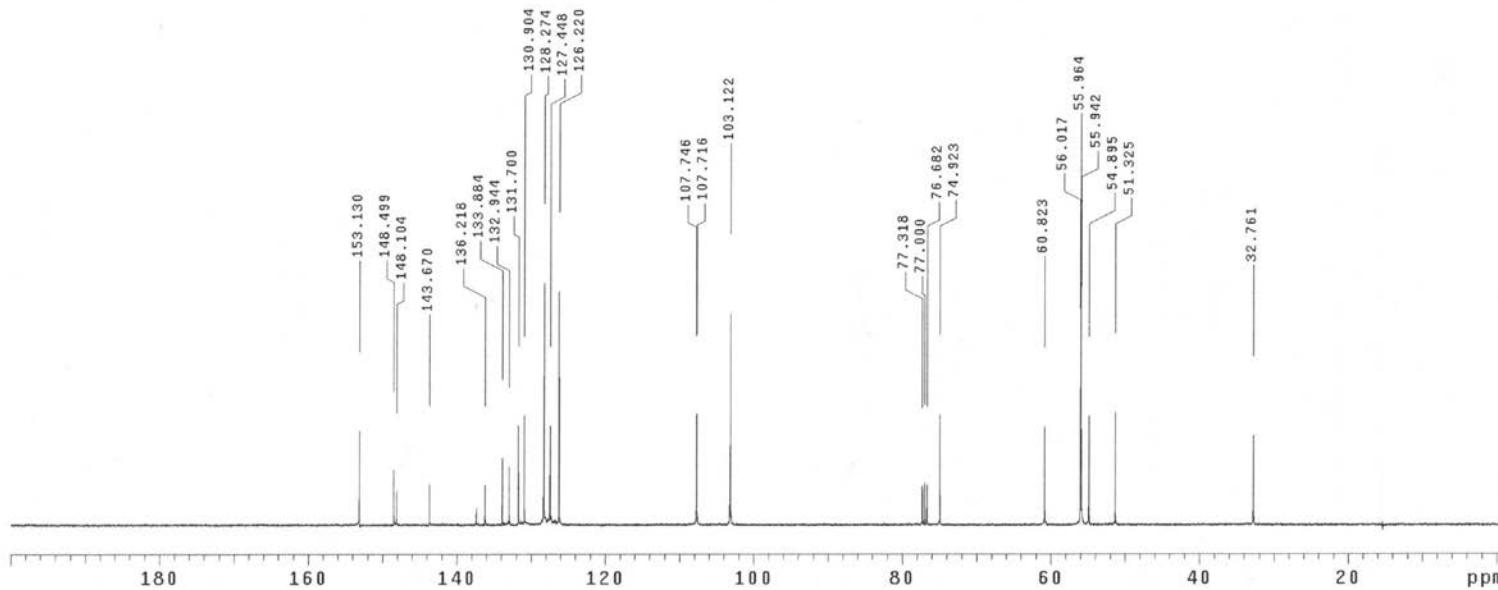


# Compound 7u ( $^{13}\text{C}$ -NMR spectral data)

NCNB30Me  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Jan 25 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 3040 repetitions



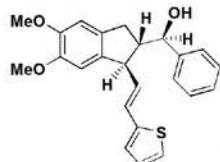
Compound 7u  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 7v ( $^1\text{H}$ -NMR spectral data)

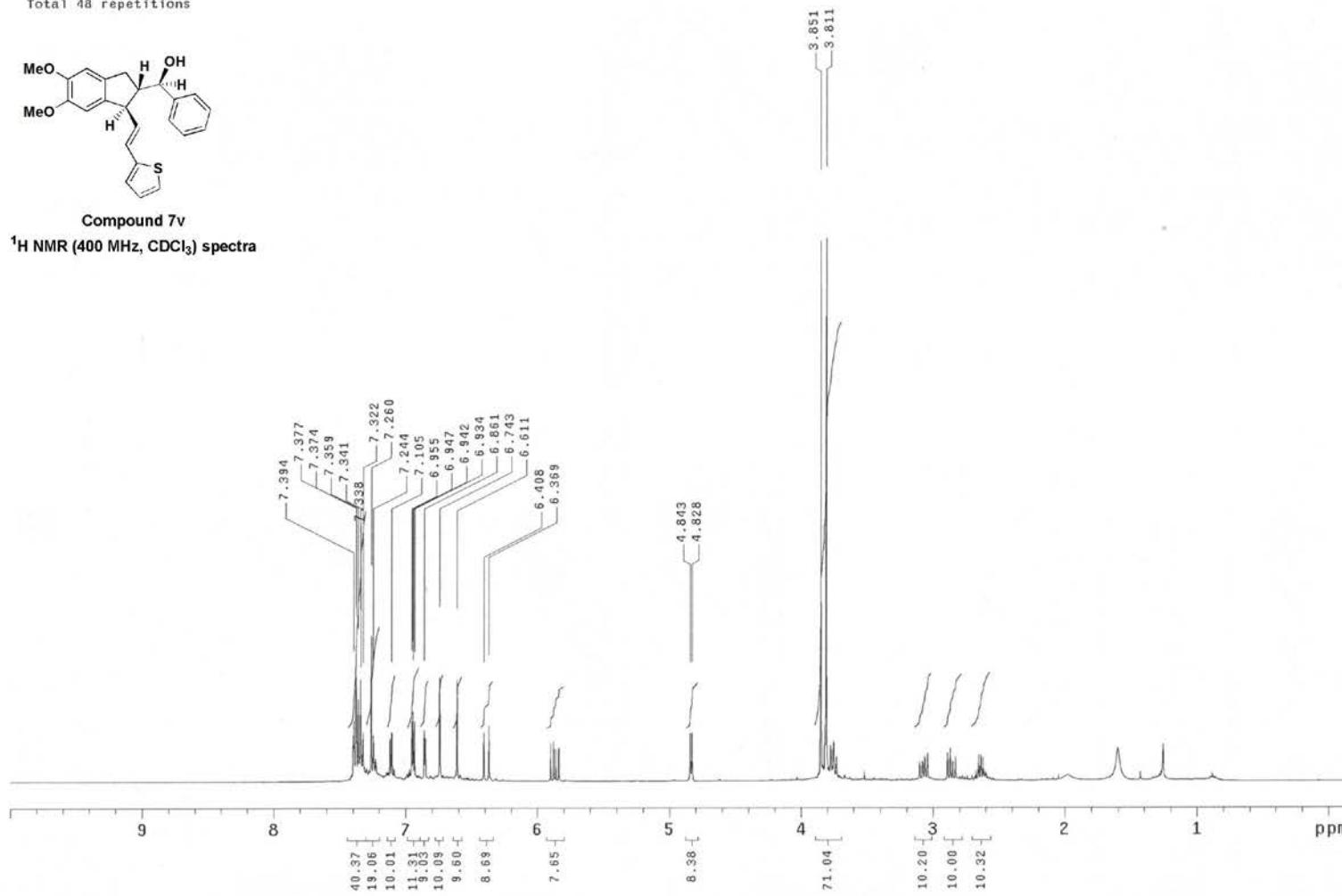
NCNB0226

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 26 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 48 repetitions



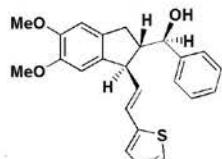
Compound 7v

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



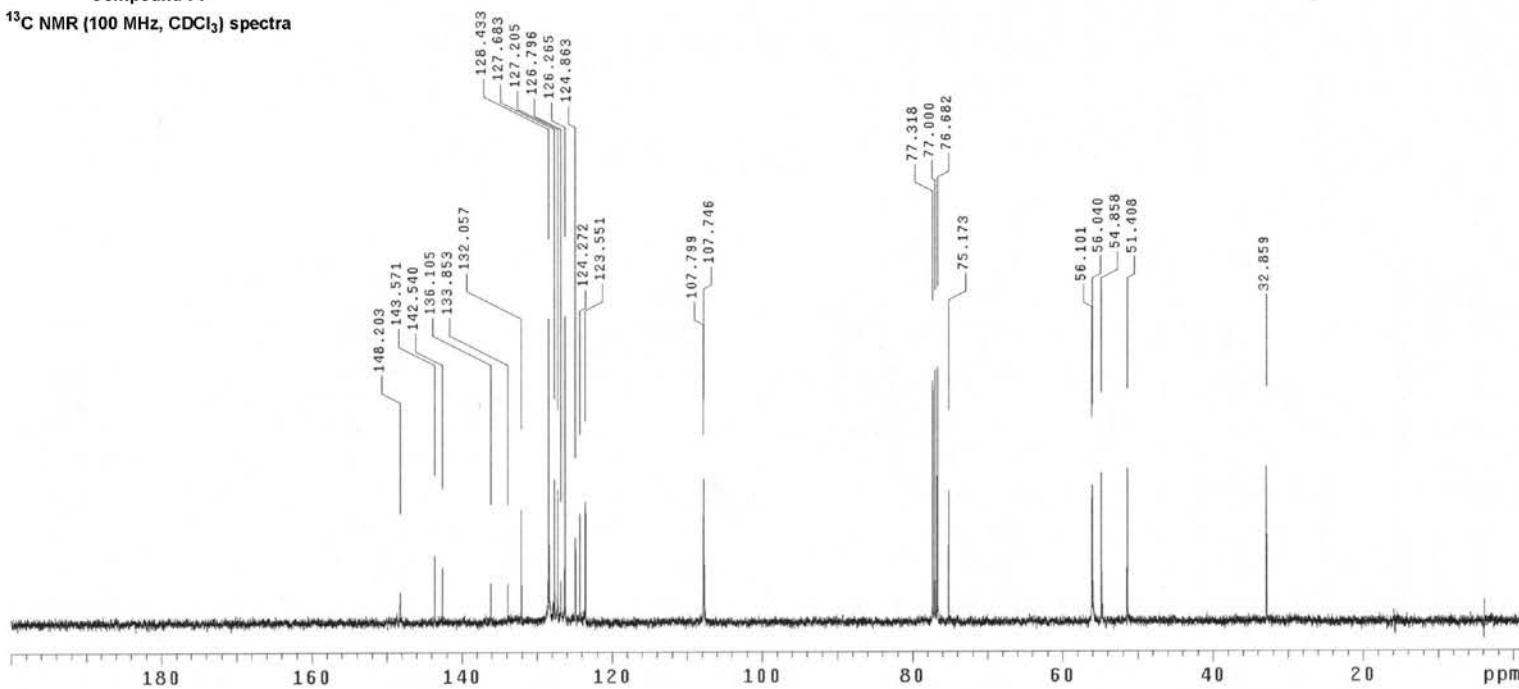
# Compound 7v ( $^{13}\text{C}$ -NMR spectral data)

NCNB0226  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 26 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 6720 repetitions



Compound 7v

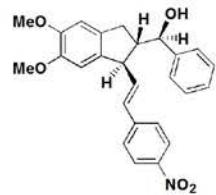
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



## Compound 7w ( $^1\text{H}$ -NMR spectral data)

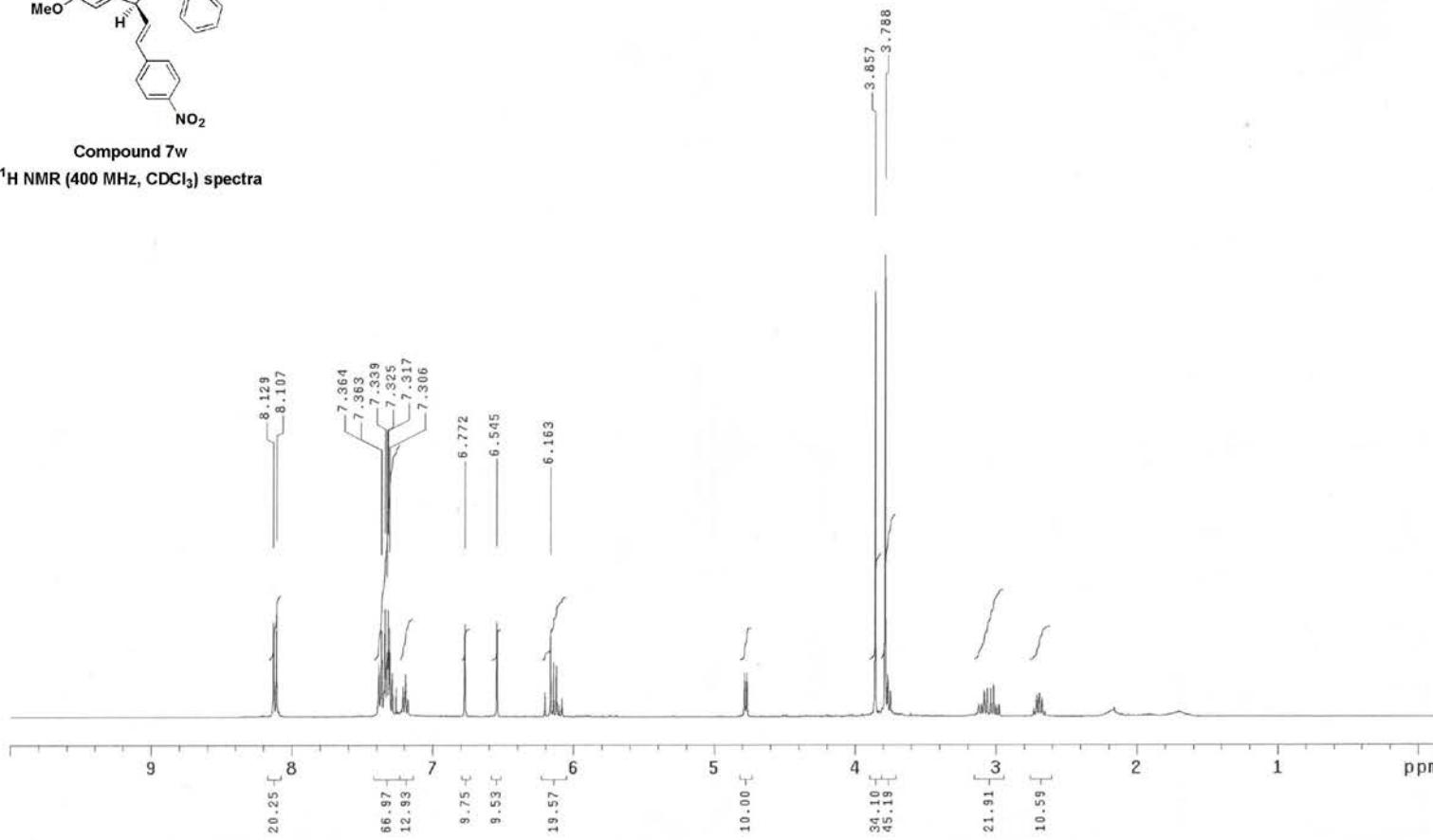
NCNB0207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 8 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 7w

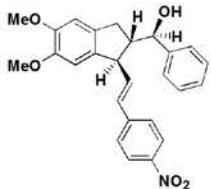
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



# Compound 7w ( $^{13}\text{C}$ -NMR spectral data)

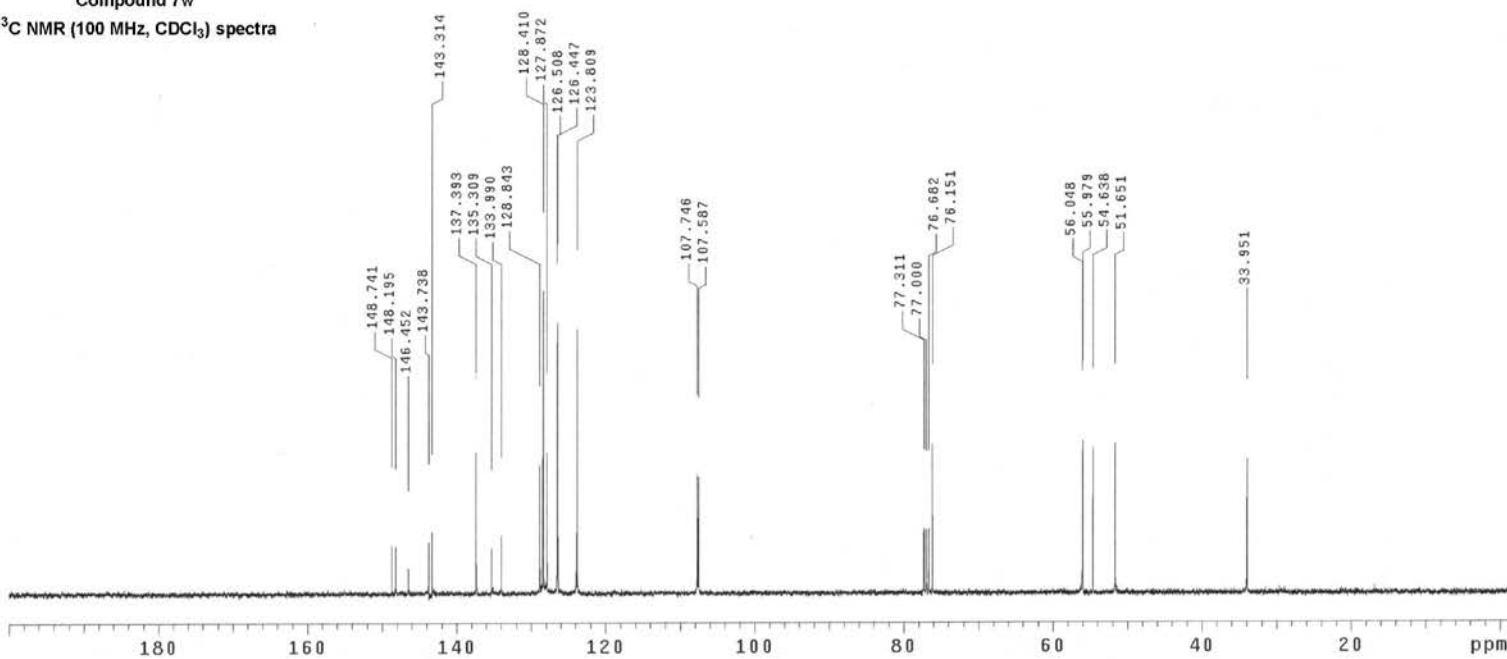
NCNB0207

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Feb 8 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 880 repetitions

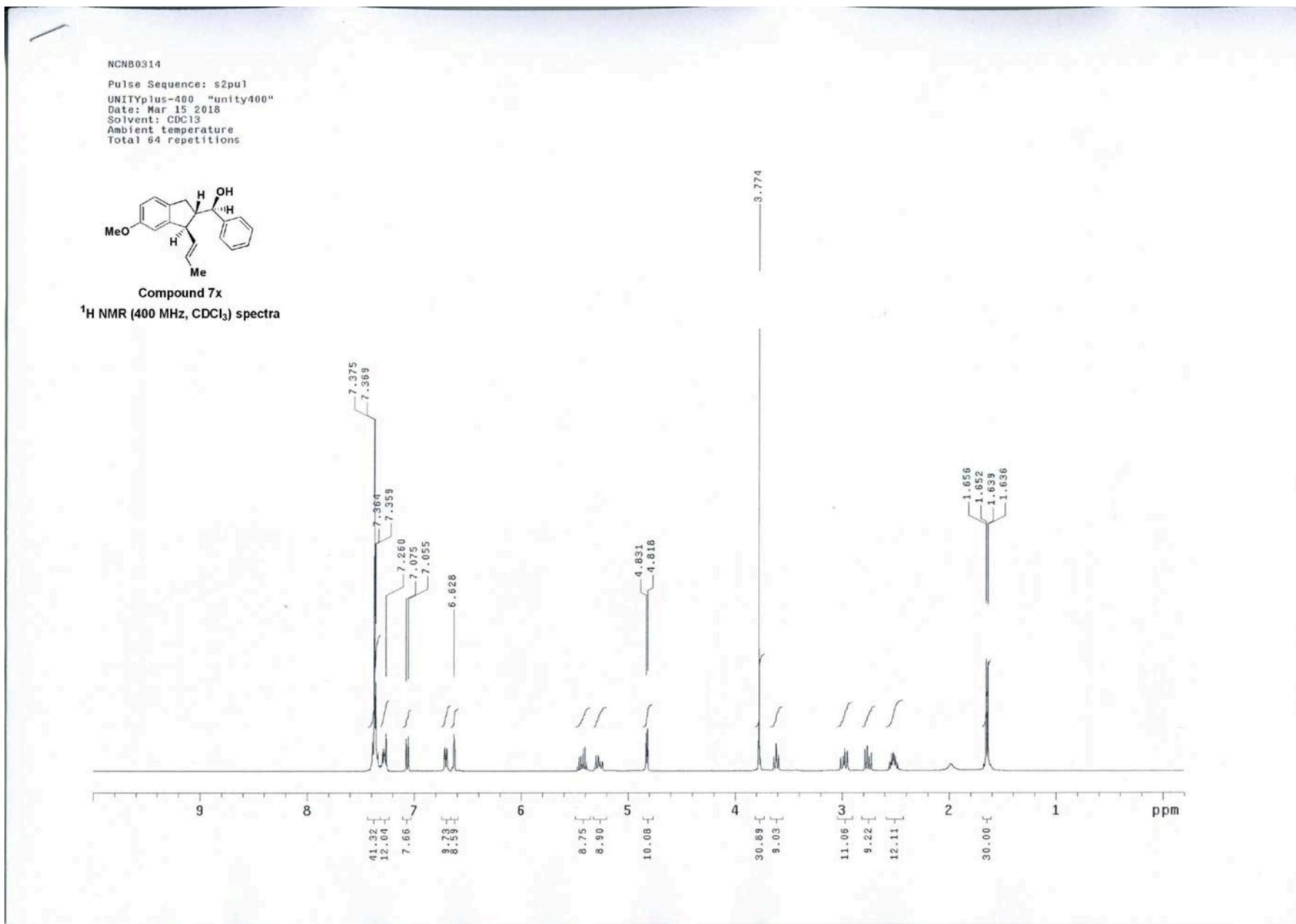


Compound 7w

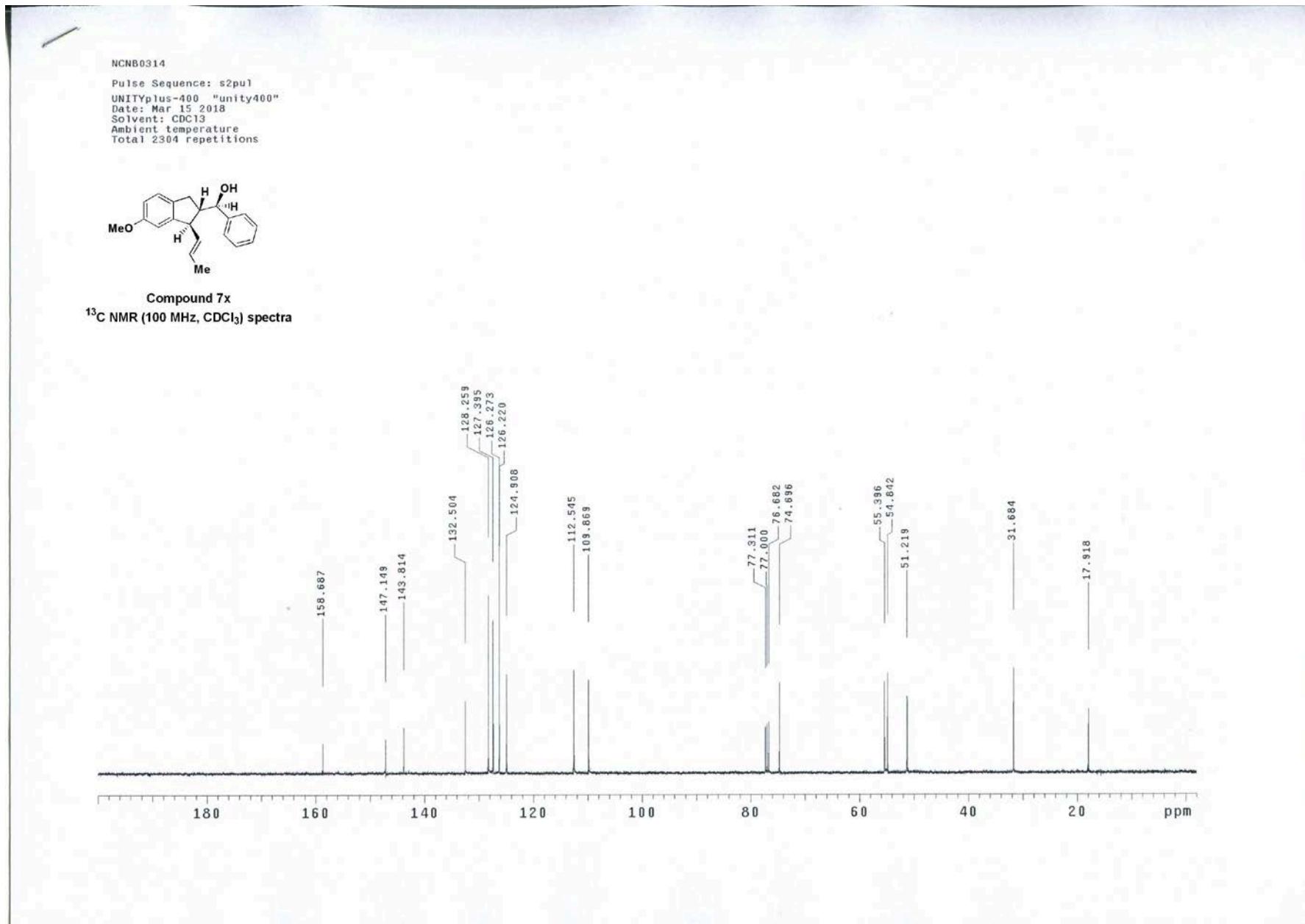
$^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



# Compound 7x ( $^1\text{H}$ -NMR spectral data)

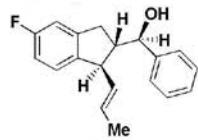


# Compound 7x ( $^{13}\text{C}$ -NMR spectral data)

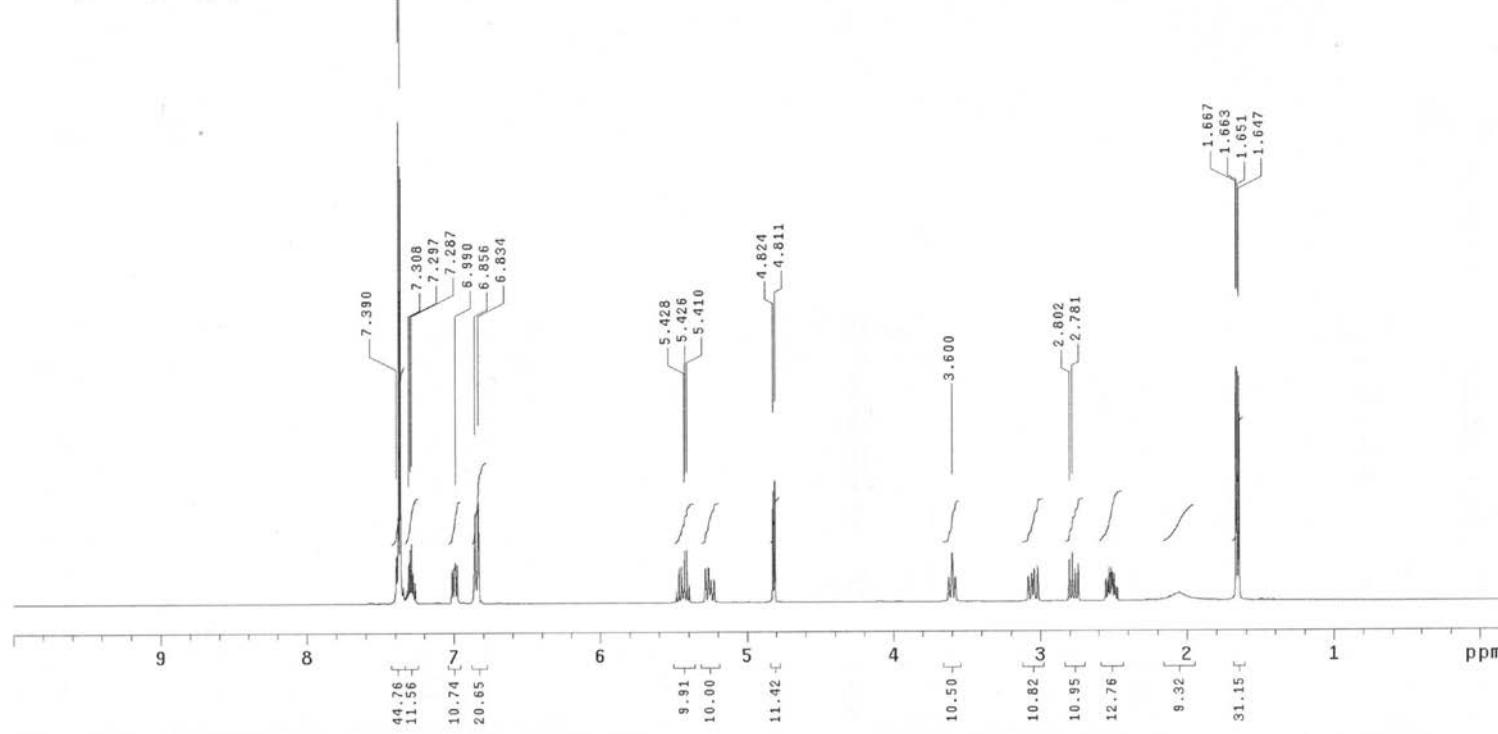


## Compound 7y ( $^1\text{H-NMR}$ spectral data)

KS1070410  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Apr 12 2018  
Solvent: CDC13  
Ambient temperature  
Total 32 repetitions



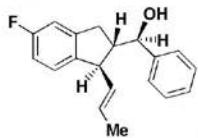
### Compound 7y



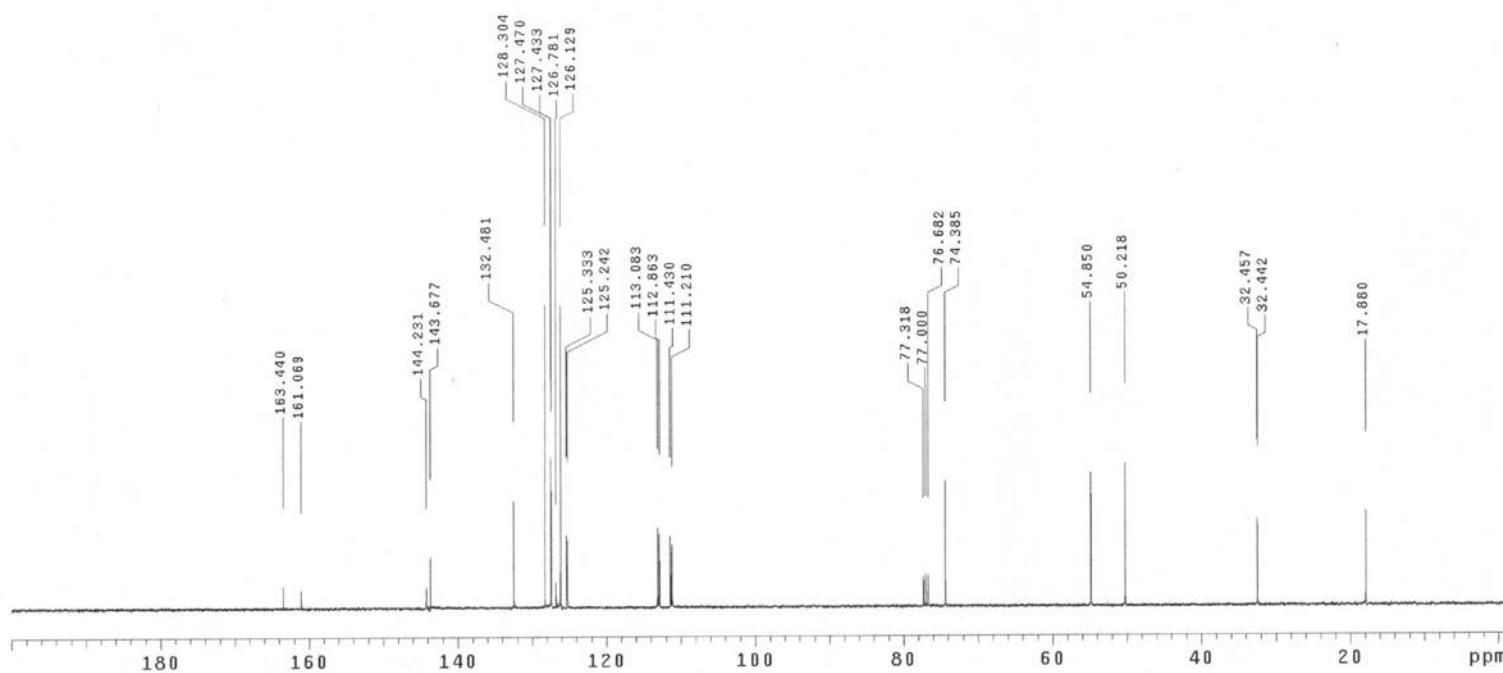
# Compound 7y ( $^{13}\text{C}$ -NMR spectral data)

KS1070410

Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Apr 12 2018  
Solvent:  $\text{CDCl}_3$   
Ambient temperature  
Total 528 repetitions



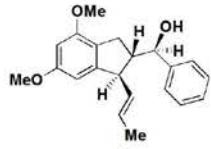
Compound 7y  
 $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ) spectra



# Compound 7z (<sup>1</sup>H-NMR spectral data)

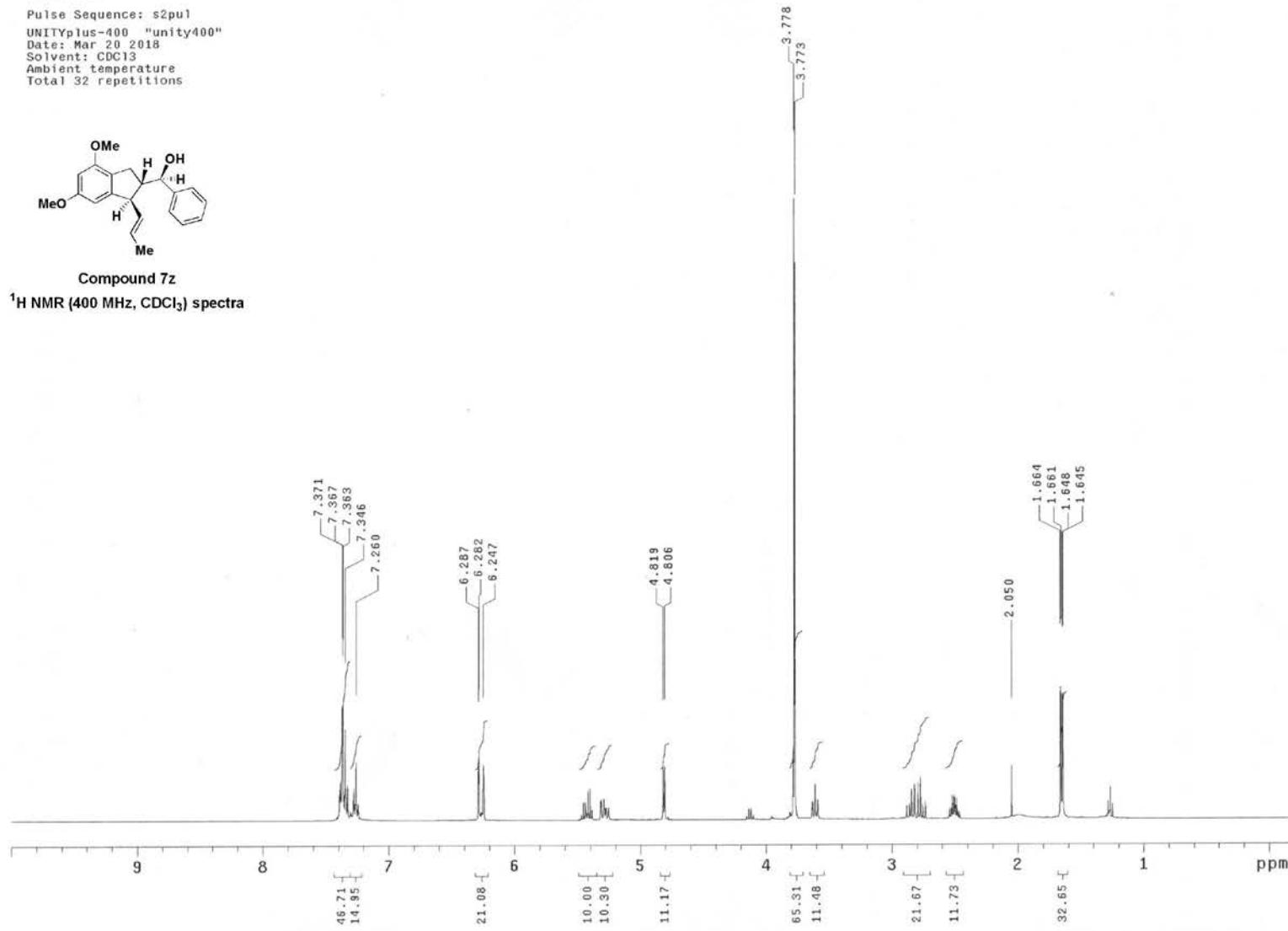
KS1070320

Pulse Sequence: s2pu1  
UNITYplus-400 "unity400"  
Date: Mar 20 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



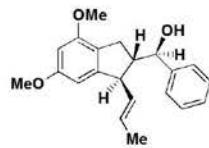
Compound 7z

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

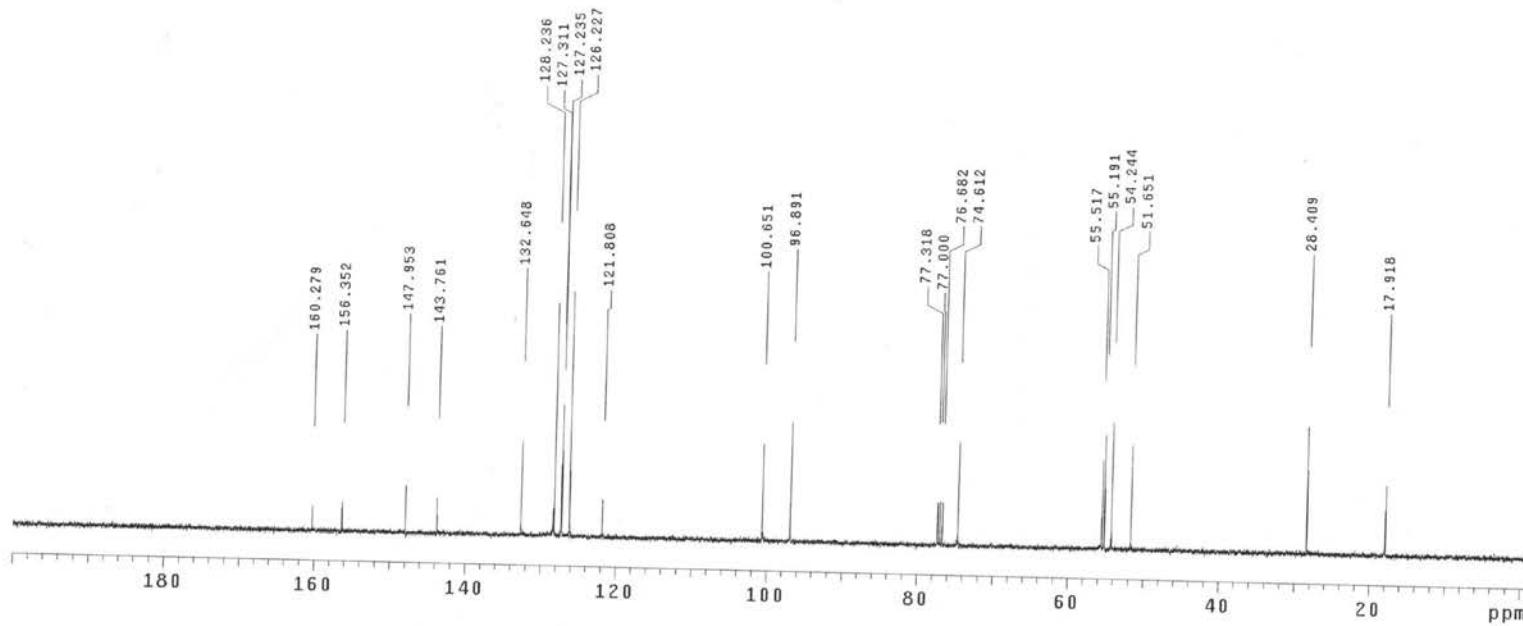


## Compound 7z (<sup>13</sup>C-NMR spectral data)

KS1070320  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 20 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 672 repetitions

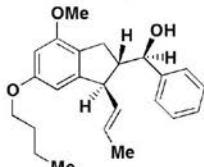


Compound 7z  
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) spectra



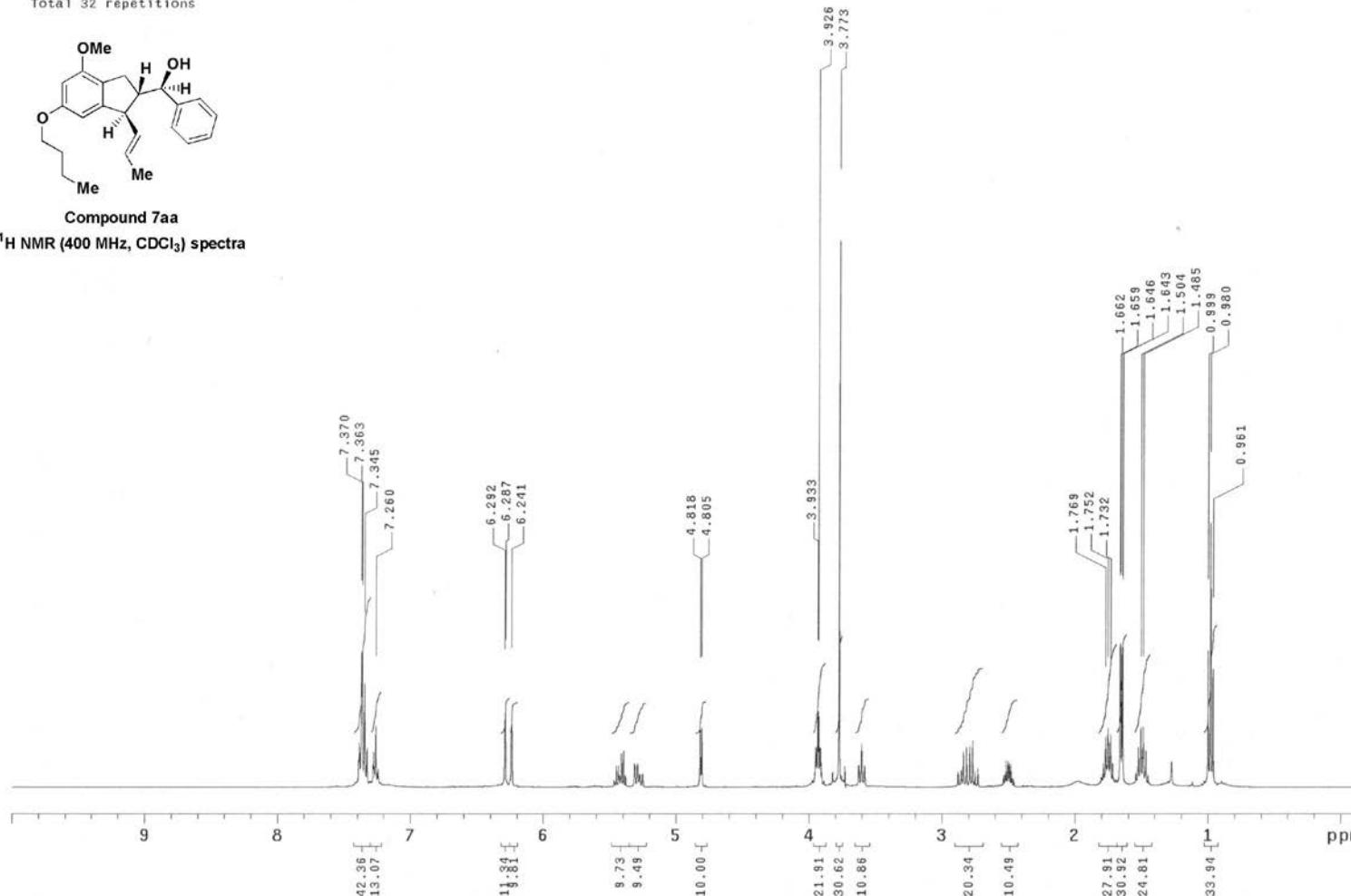
## Compound 7aa ( $^1\text{H}$ -NMR spectral data)

KS1070319  
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 19 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 32 repetitions



Compound 7aa

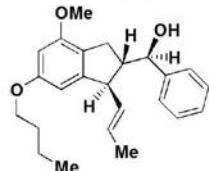
$^1\text{H}$  NMR (400 MHz, CDCl<sub>3</sub>) spectra



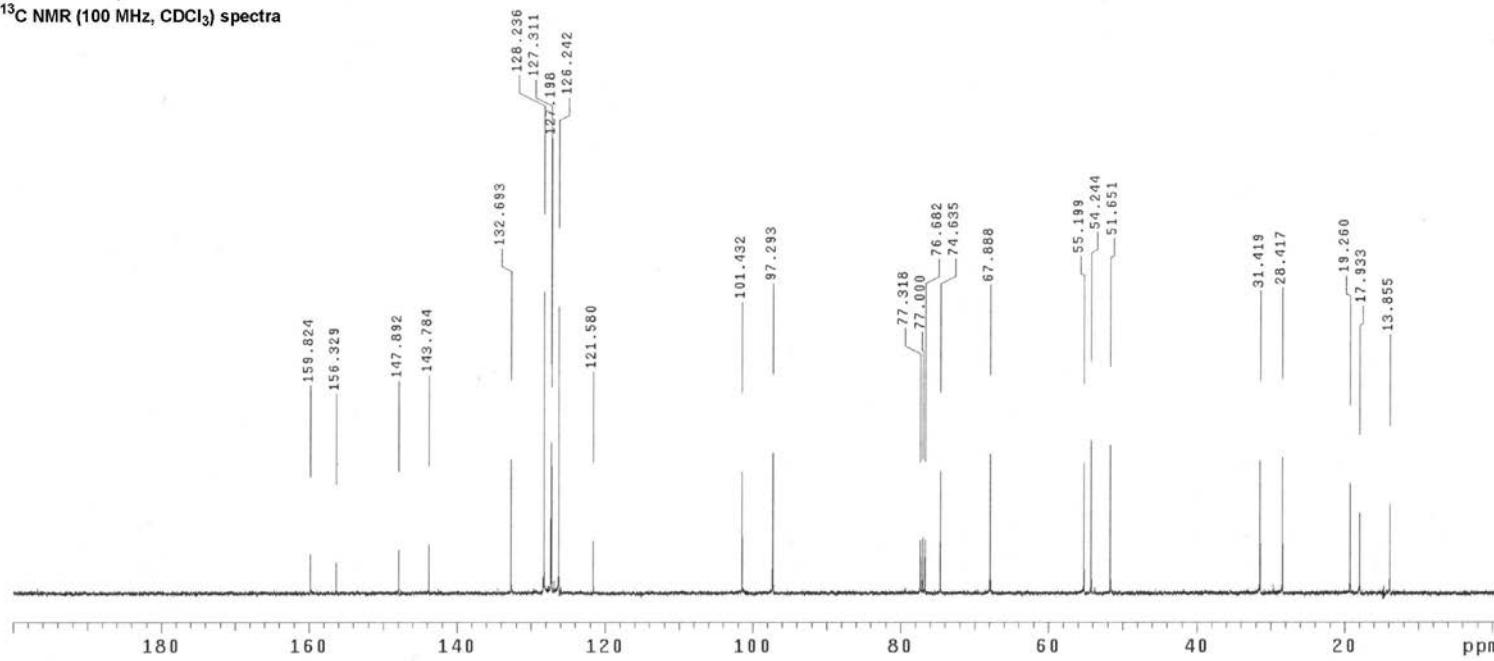
# Compound 7aa ( $^{13}\text{C}$ -NMR spectral data)

KS1070319

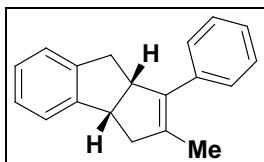
Pulse Sequence: s2pul  
UNITYplus-400 "unity400"  
Date: Mar 19 2018  
Solvent: CDCl<sub>3</sub>  
Ambient temperature  
Total 1200 repetitions



Compound 7aa  
 $^{13}\text{C}$  NMR (100 MHz, CDCl<sub>3</sub>) spectra



## X-ray crystal data of 6n



Empirical formula	C19 H18		
Formula weight	246.33		
Temperature	100(2) K		
Wavelength	0.71073 Å		
Crystal system	Orthorhombic		
Space group	P b c a		
Unit cell dimensions	$a = 11.1361(7)$ Å	$\alpha = 90^\circ.$	
	$b = 7.7797(4)$ Å	$\beta = 90^\circ.$	
	$c = 30.9551(19)$ Å	$\gamma = 90^\circ.$	
Volume	$2681.8(3)$ Å <sup>3</sup>		
Z	8		
Density (calculated)	1.220 Mg/m <sup>3</sup>		
Absorption coefficient	0.069 mm <sup>-1</sup>		
F(000)	1056		
Crystal size	0.20 x 0.15 x 0.06 mm <sup>3</sup>		
Theta range for data collection	1.316 to 26.379°.		
Index ranges	-13<=h<=13, -5<=k<=9, -38<=l<=38		
Reflections collected	14887		
Independent reflections	2735 [R(int) = 0.0345]		
Completeness to theta = 25.242°	99.9 %		
Absorption correction	Semi-empirical from equivalents		
Max. and min. transmission	0.9485 and 0.9008		
Refinement method	Full-matrix least-squares on F <sup>2</sup>		
Data / restraints / parameters	2735 / 0 / 173		
Goodness-of-fit on F <sup>2</sup>	1.077		
Final R indices [I>2sigma(I)]	R1 = 0.0411, wR2 = 0.0947		
R indices (all data)	R1 = 0.0522, wR2 = 0.1114		
Extinction coefficient	n/a		
Largest diff. peak and hole	0.206 and -0.203 e.Å <sup>-3</sup>		

# checkCIF/PLATON report

Structure factors have been supplied for datablock(s) 171013LT

THIS REPORT IS FOR GUIDANCE ONLY. IF USED AS PART OF A REVIEW PROCEDURE FOR PUBLICATION, IT SHOULD NOT REPLACE THE EXPERTISE OF AN EXPERIENCED CRYSTALLOGRAPHIC REFEREE.

No syntax errors found.    [CIF dictionary](#)    [Interpreting this report](#)

## Datablock: 171013LT

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Bond precision:	C-C = 0.0021 Å	Wavelength=0.71073	
Cell:	a=11.1361 (7) alpha=90	b=7.7797 (4) beta=90	c=30.9551 (19) gamma=90
Temperature:	100 K		
	Calculated	Reported	
Volume	2681.8 (3)	2681.8 (3)	
Space group	P b c a	P b c a	
Hall group	-P 2ac 2ab	-P 2ac 2ab	
Moiety formula	C19 H18	?	
Sum formula	C19 H18	C19 H18	
Mr	246.33	246.33	
Dx, g cm <sup>-3</sup>	1.220	1.220	
Z	8	8	
Mu (mm <sup>-1</sup> )	0.069	0.069	
F000	1056.0	1056.0	
F000'	1056.37		
h, k, lmax	13, 9, 38	13, 9, 38	
Nref	2737	2735	
Tmin, Tmax	0.988, 0.996	0.901, 0.948	
Tmin'	0.986		

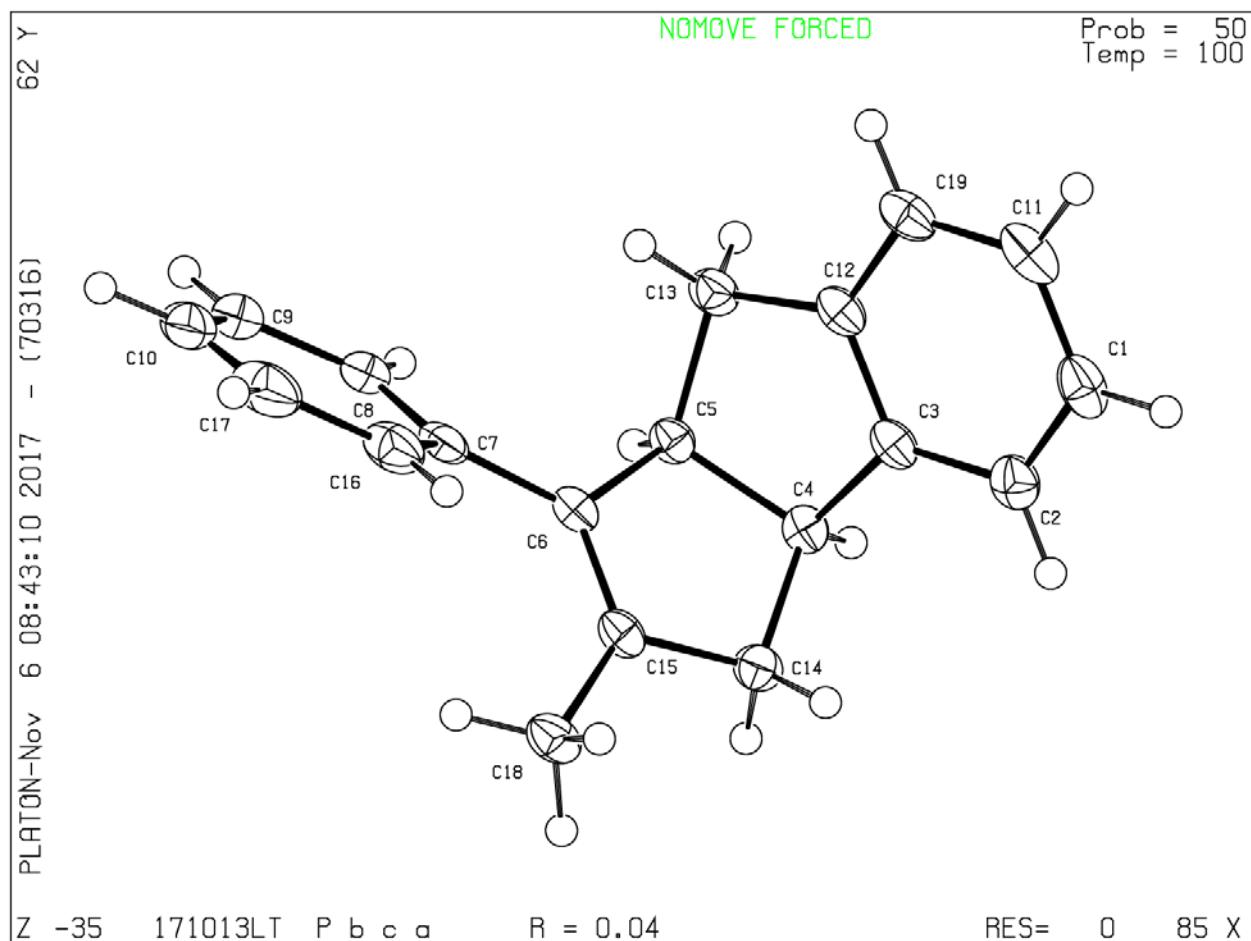
Correction method= # Reported T Limits: Tmin=0.901 Tmax=0.948  
AbsCorr = MULTI-SCAN

Data completeness= 0.999	Theta (max) = 26.379
R(reflections)= 0.0411 ( 2275)	wR2 (reflections)= 0.1114 ( 2735)
S = 1.077	Npar= 173

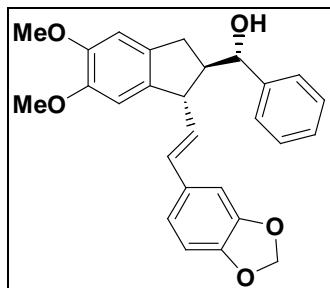
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The following ALERTS were generated. Each ALERT has the format  
test-name\_ALERT\_alert-type\_alert-level.  
Click on the hyperlinks for more details of the test.

**The thermal ellipsoid was drawn at the 50% probability level**



## X-ray crystal data of 7p



Empirical formula	C31 H34 O6	
Formula weight	502.58	
Temperature	100(2) K	
Wavelength	0.71073 Å	
Crystal system	Monoclinic	
Space group	P 21/c	
Unit cell dimensions	a = 11.796(3) Å	α= 90°.
	b = 17.150(5) Å	β= 110.944(7)°.
	c = 13.523(4) Å	γ= 90°.
Volume	2554.9(12) Å <sup>3</sup>	
Z	4	
Density (calculated)	1.307 Mg/m <sup>3</sup>	
Absorption coefficient	0.090 mm <sup>-1</sup>	
F(000)	1072	
Crystal size	0.23 x 0.22 x 0.18 mm <sup>3</sup>	
Theta range for data collection	1.849 to 26.565°.	
Index ranges	-11<=h<=14, -21<=k<=21, -16<=l<=16	
Reflections collected	40644	
Independent reflections	5269 [R(int) = 0.0886]	
Completeness to theta = 25.242°	99.9 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.9485 and 0.7968	
Refinement method	Full-matrix least-squares on F <sup>2</sup>	
Data / restraints / parameters	5269 / 0 / 339	
Goodness-of-fit on F <sup>2</sup>	1.126	
Final R indices [I>2sigma(I)]	R1 = 0.0642, wR2 = 0.1510	
R indices (all data)	R1 = 0.0956, wR2 = 0.1677	
Extinction coefficient	n/a	
Largest diff. peak and hole	0.378 and -0.375 e.Å <sup>-3</sup>	

# checkCIF/PLATON report

Structure factors have been supplied for datablock(s) mo\_180217LT\_0m

THIS REPORT IS FOR GUIDANCE ONLY. IF USED AS PART OF A REVIEW PROCEDURE FOR PUBLICATION, IT SHOULD NOT REPLACE THE EXPERTISE OF AN EXPERIENCED CRYSTALLOGRAPHIC REFEREE.

No syntax errors found.    [CIF dictionary](#)    [Interpreting this report](#)

## Datablock: mo\_180217LT\_0m

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Bond precision:	C-C = 0.0040 Å	Wavelength=0.71073	
Cell:	a=11.796 (3) alpha=90	b=17.150 (5) beta=110.944 (7)	c=13.523 (4) gamma=90
Temperature:	100 K		

	Calculated	Reported
Volume	2555.0 (13)	2554.9 (12)
Space group	P 21/c	P 21/c
Hall group	-P 2ybc	-P 2ybc
Moiety formula	C <sub>27</sub> H <sub>26</sub> O <sub>5</sub> , C <sub>4</sub> H <sub>8</sub> O	?
Sum formula	C <sub>31</sub> H <sub>34</sub> O <sub>6</sub>	C <sub>31</sub> H <sub>34</sub> O <sub>6</sub>
Mr	502.58	502.58
D <sub>x</sub> , g cm <sup>-3</sup>	1.307	1.307
Z	4	4
μ (mm <sup>-1</sup> )	0.090	0.090
F <sub>000</sub>	1072.0	1072.0
F <sub>000'</sub>	1072.54	
h,k,lmax	14,21,17	14,21,16
Nref	5336	5269
Tmin, Tmax	0.980, 0.984	0.797, 0.948
Tmin'	0.980	

Correction method= # Reported T Limits: Tmin=0.797 Tmax=0.948  
AbsCorr = MULTI-SCAN

Data completeness= 0.987	Theta(max) = 26.565
R(reflections) = 0.0642 ( 3781)	wR2(reflections) = 0.1677 ( 5269)
S = 1.126	Npar= 339

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