

Supporting Information
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Supporting information

Tris(pentafluorophenyl)borane-Catalysed Stereoselective C-Glycosylation of Glycals: A Facile Synthesis of Allyl and Alkynyl glycosides

Anand Gaurav,^{a,b} Zanjila Azeem,^{a,b} and Pintu Kumar Mandal^{a,b,*}

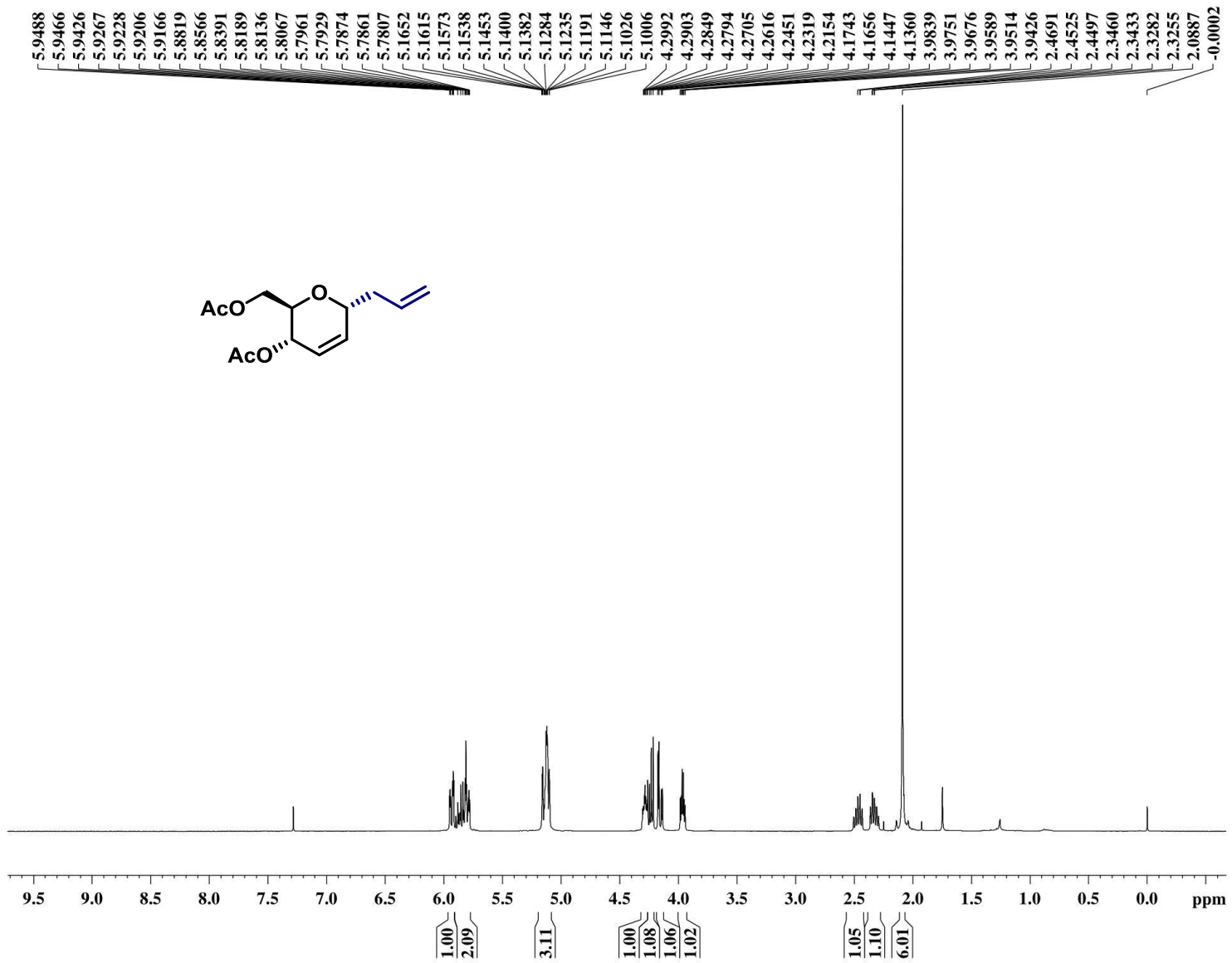
^aMedicinal and Process Chemistry Division, CSIR-Central Drug Research Institute, BS-10/1, Sector 10, Jankipuram Extension, Sitapur Road, P.O. Box 173, Lucknow, 226 031, India.

^bAcademy of Scientific and Innovative Research (AcSIR), Ghaziabad- 201002, India

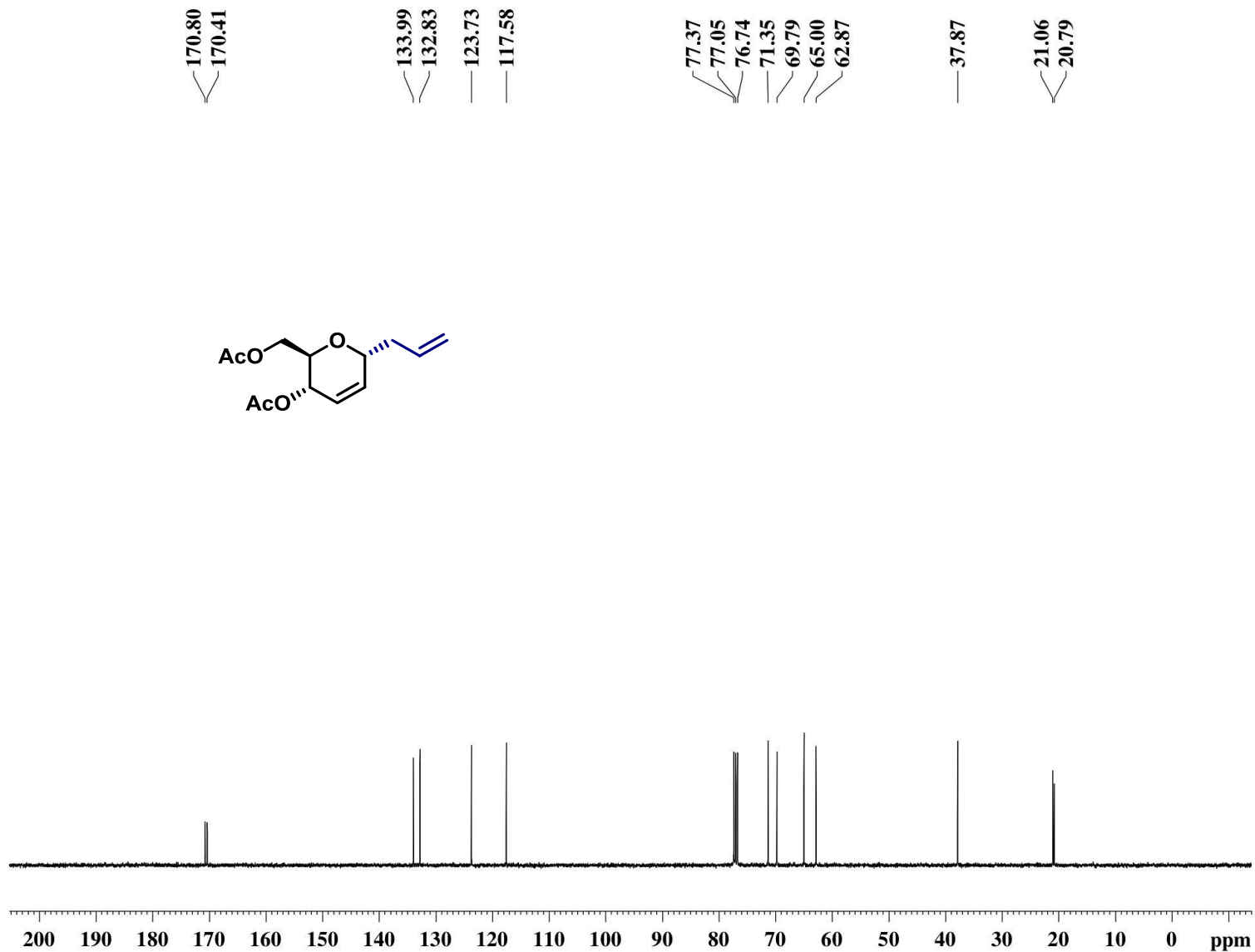
*Corresponding author; Email: pintuchem06@gmail.com / pk.mandal@cdri.res.in

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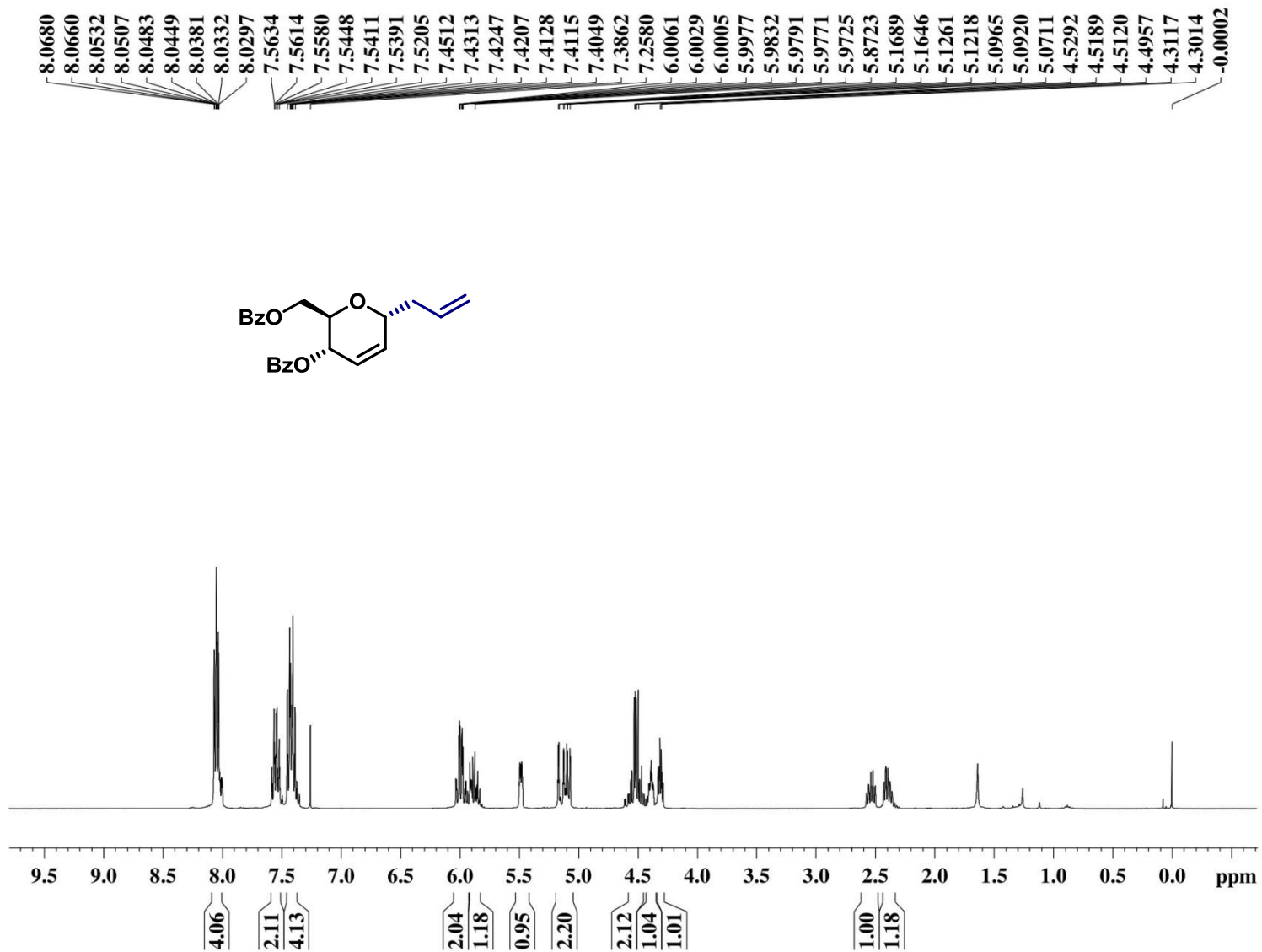
^1H , ^{13}C , DEPT 135, ^{19}F NMR spectra and 2D HSQC/NOESY NMR spectra of **3a-3l** & **5a-5g**.....**S3-S56**



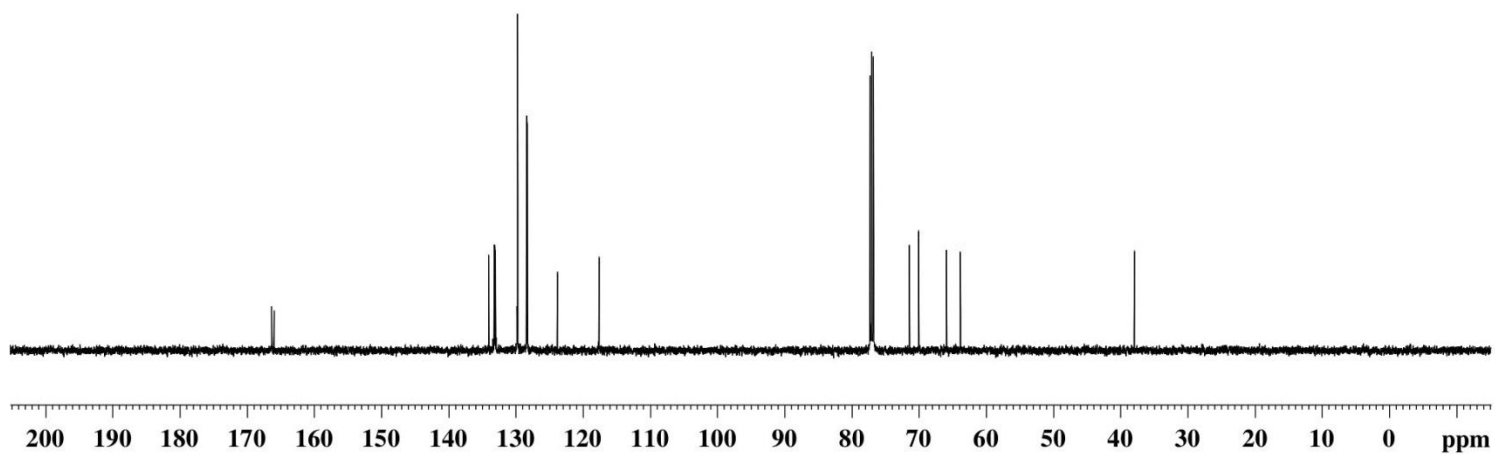
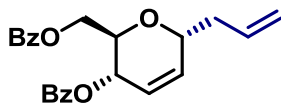
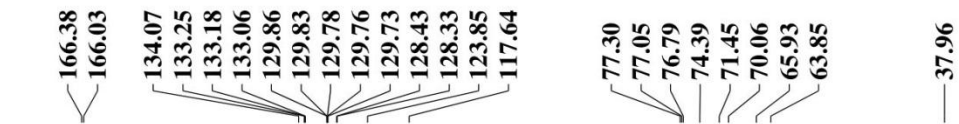
¹H NMR spectrum of **3a** (400 MHz, CDCl₃)



$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3a** (100 MHz, CDCl_3)

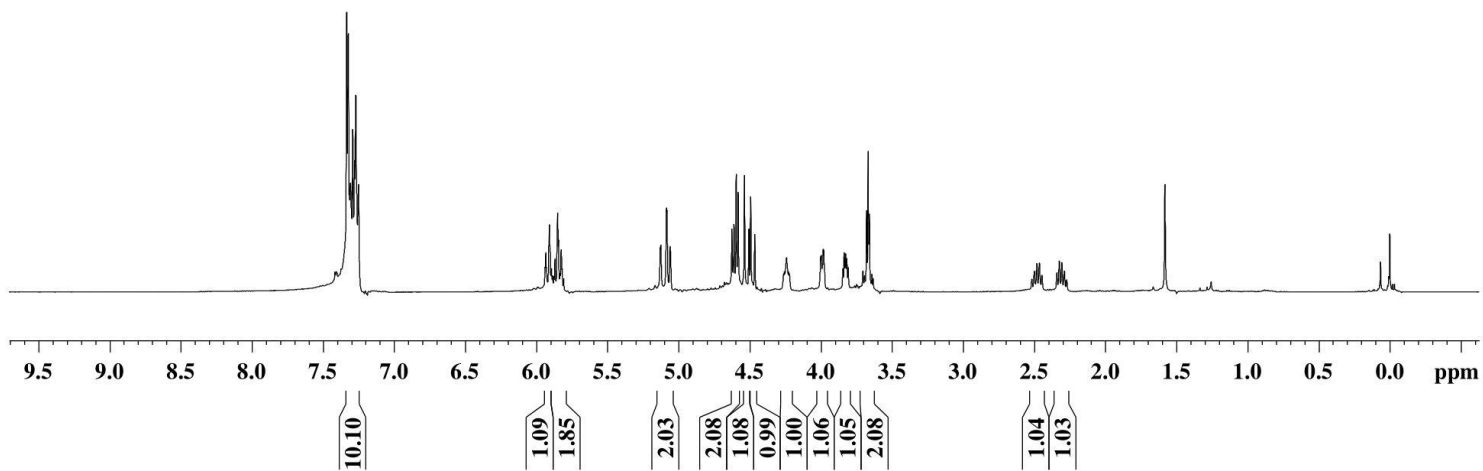
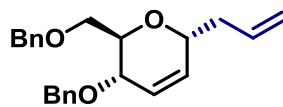


¹H NMR spectrum of **3b** (400 MHz, CDCl₃)

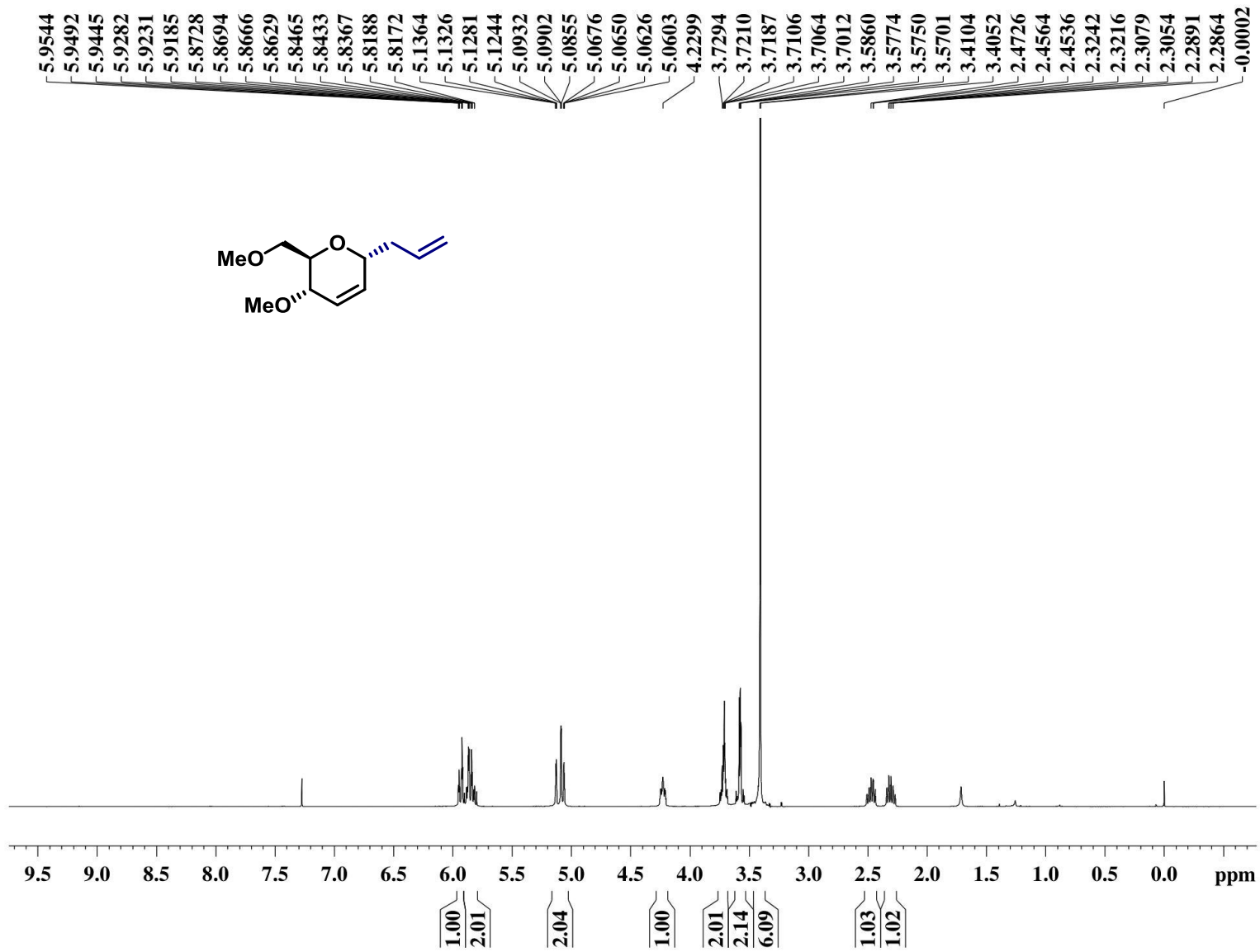


$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3b** (100 MHz, CDCl_3)

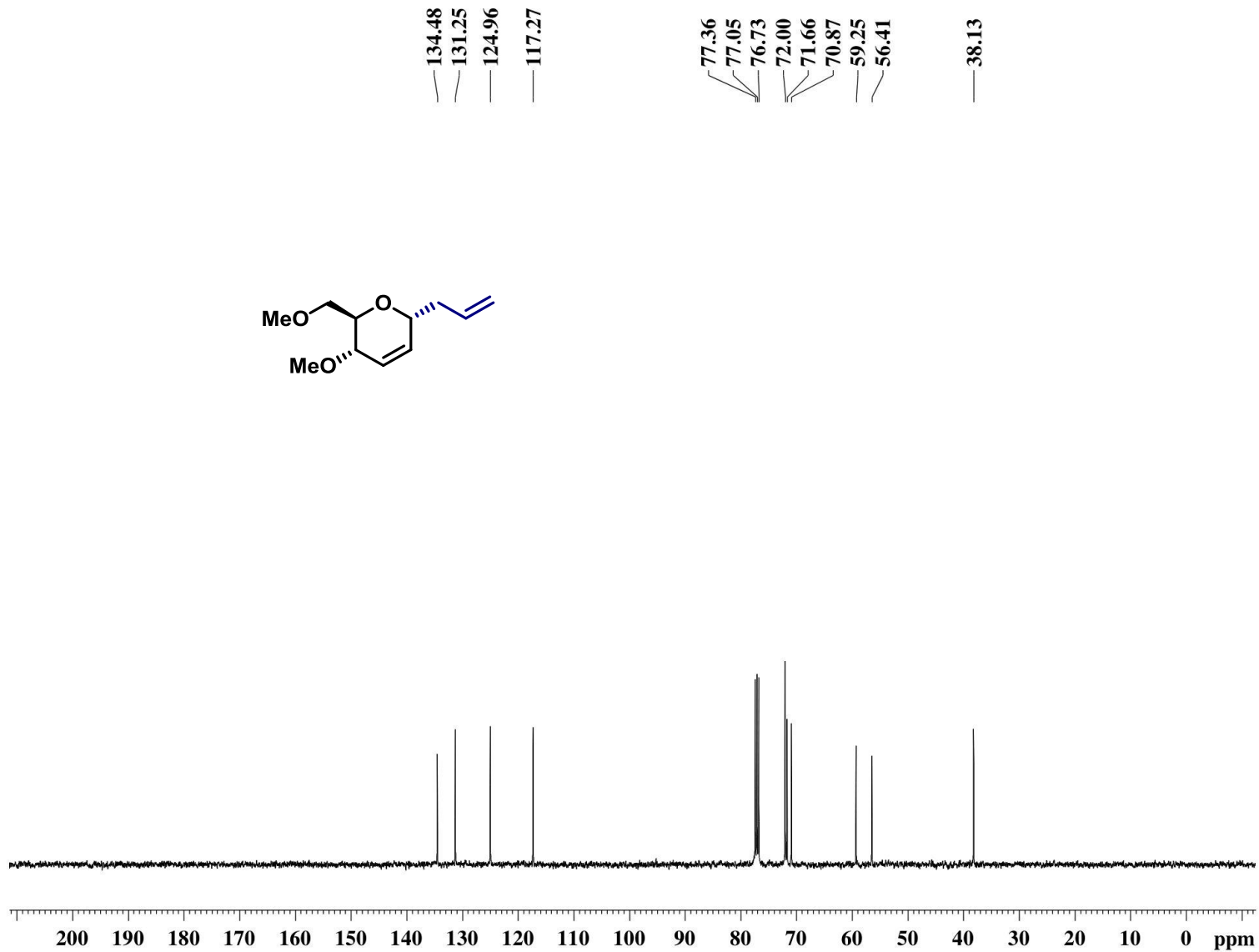
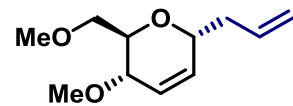
7.3341
7.3249
7.3226
7.3074
7.2923
7.2778
7.2704
7.2497
5.9391
5.9341
5.9293
5.9126
5.9081
5.9031
5.8947
5.8692
5.8508
5.8444
5.8249
5.8184
5.1291
5.1253
5.0860
5.0832
5.0605
4.6259
4.6109
4.5955
4.5820
4.5369
4.5064
4.4939
4.4650
4.2416
4.0010
3.9968
3.9886
3.9834
3.9791
3.8453
3.8358
3.8259
3.8183
3.8076
3.7047
3.6786
3.6673
3.6590
2.4812
2.4646
2.3242
2.3058
2.2890
-0.0002



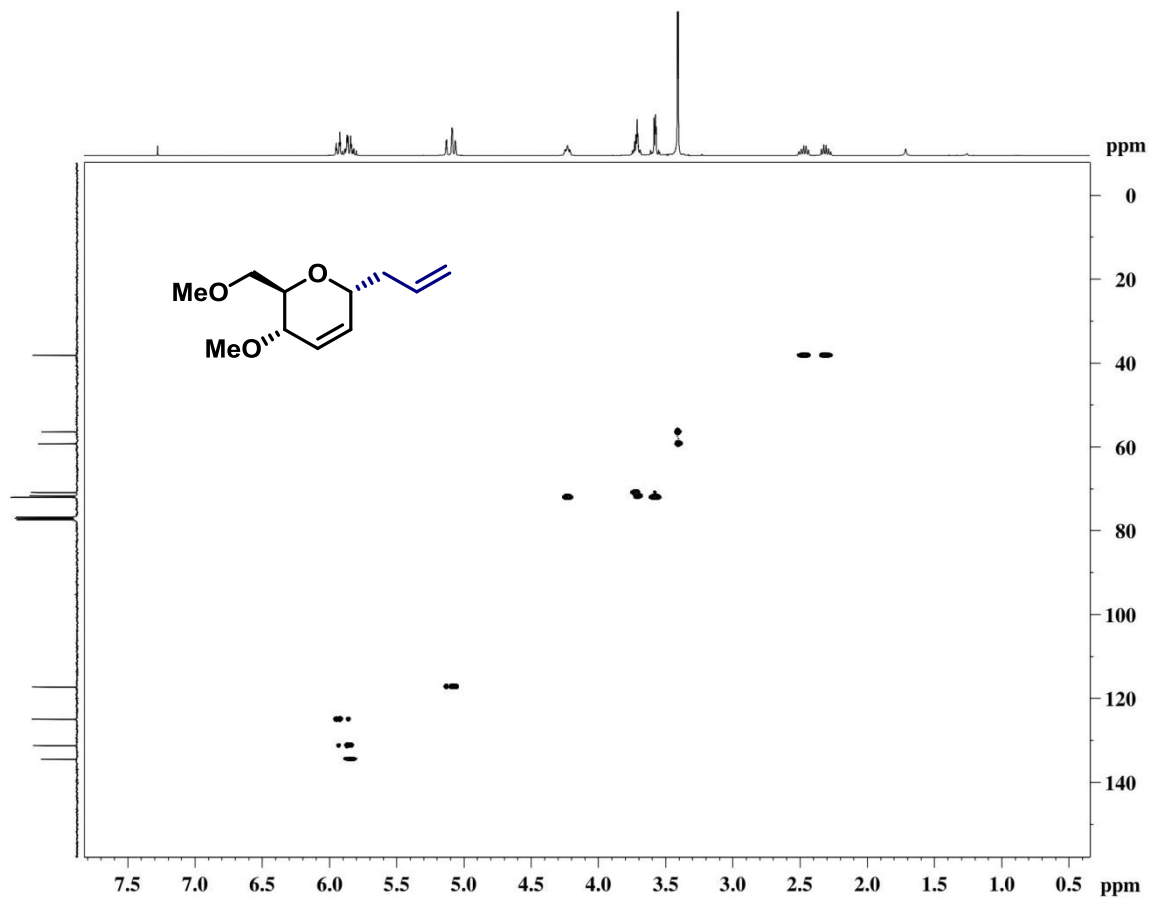
¹H NMR spectrum of **3c** (400 MHz, CDCl₃)



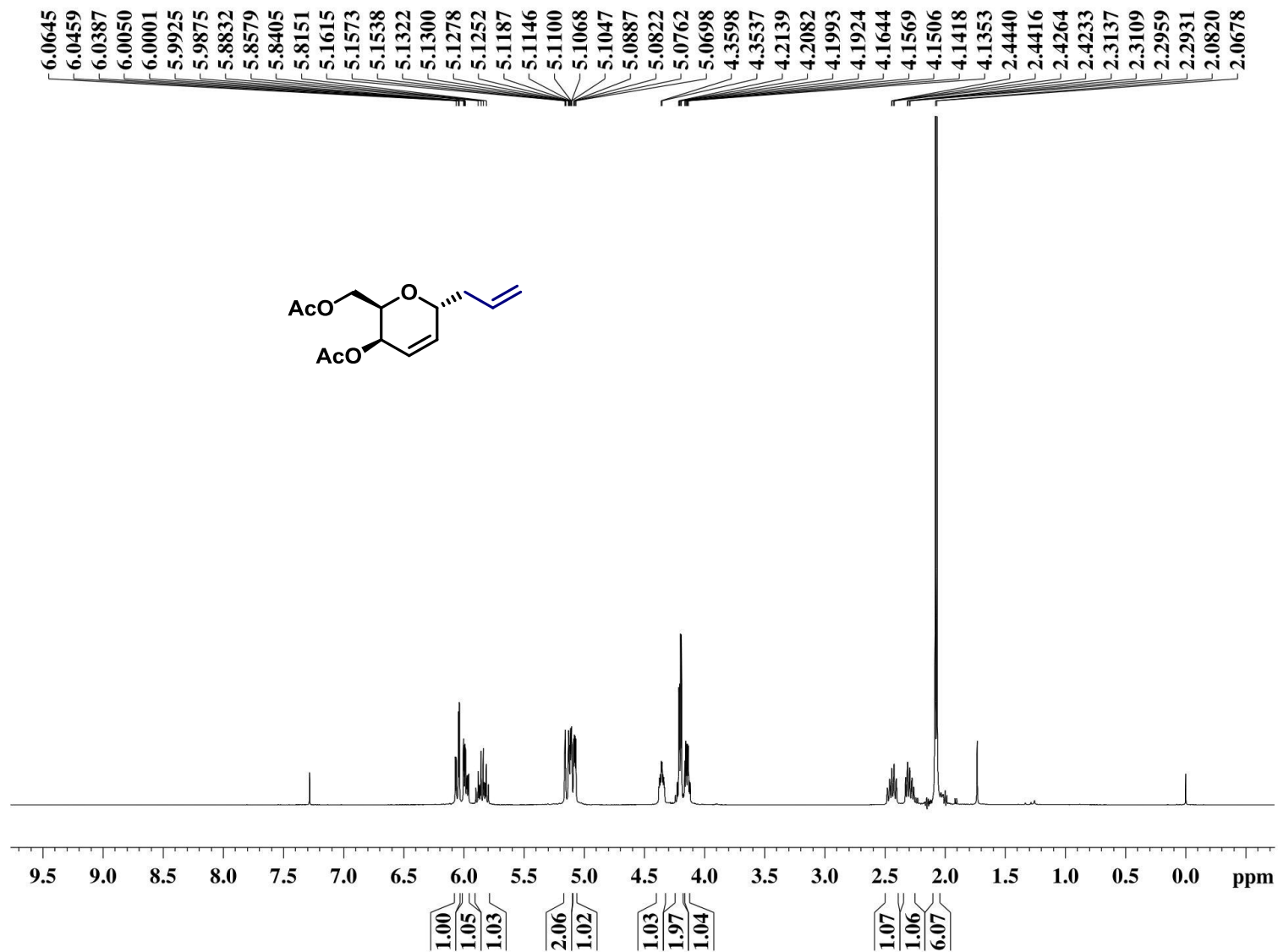
¹H NMR spectrum of **3d** (400 MHz, CDCl₃)



$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3d** (100 MHz, CDCl_3)

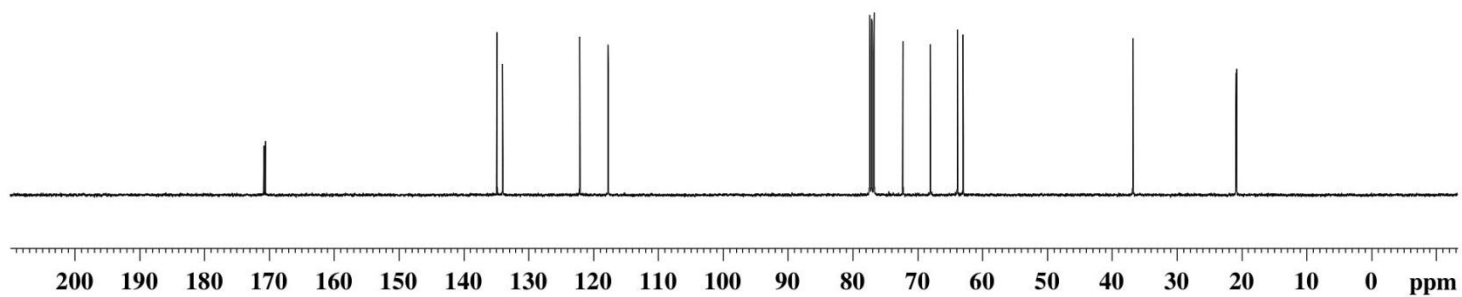
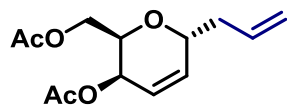


2D-HSQC spectrum of **3d** (400 MHz, CDCl₃)



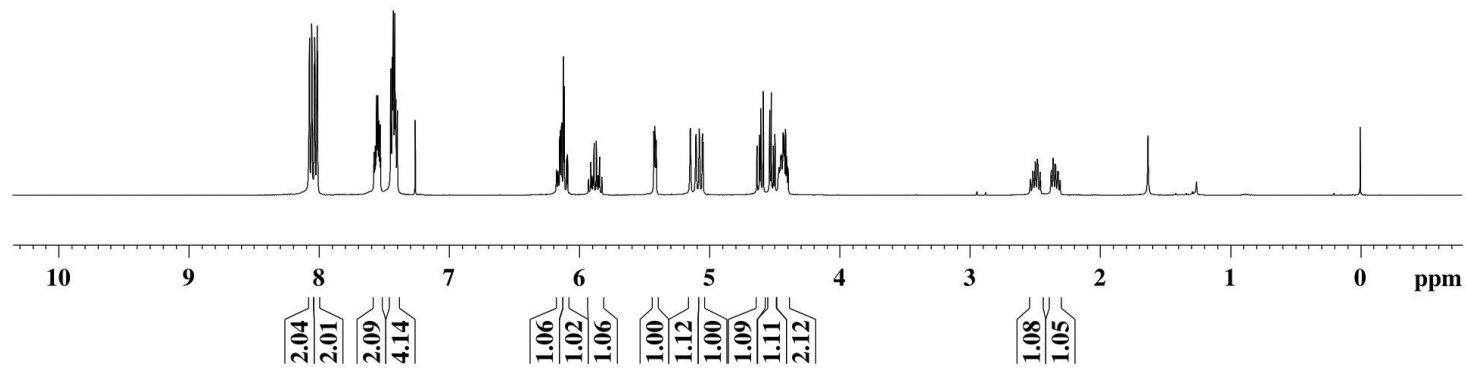
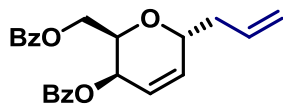
¹H NMR spectrum of **3e** (400 MHz, CDCl₃)

170.73
170.52
134.80
133.91
122.03
117.65
77.37
77.05
76.73
74.44
72.27
68.03
63.86
62.98
36.79
20.89
20.80

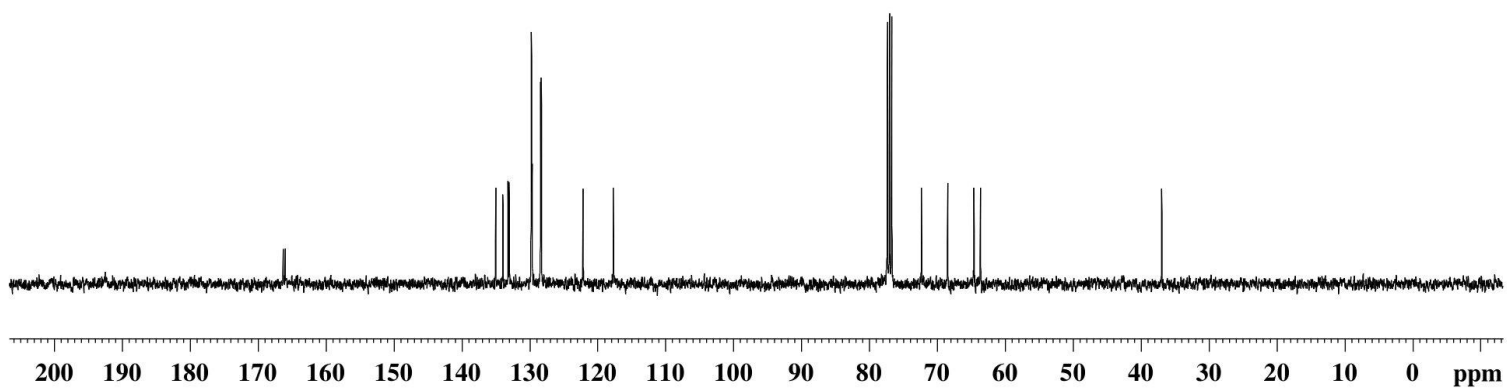
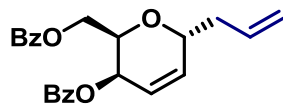


$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3e** (100 MHz, CDCl_3)

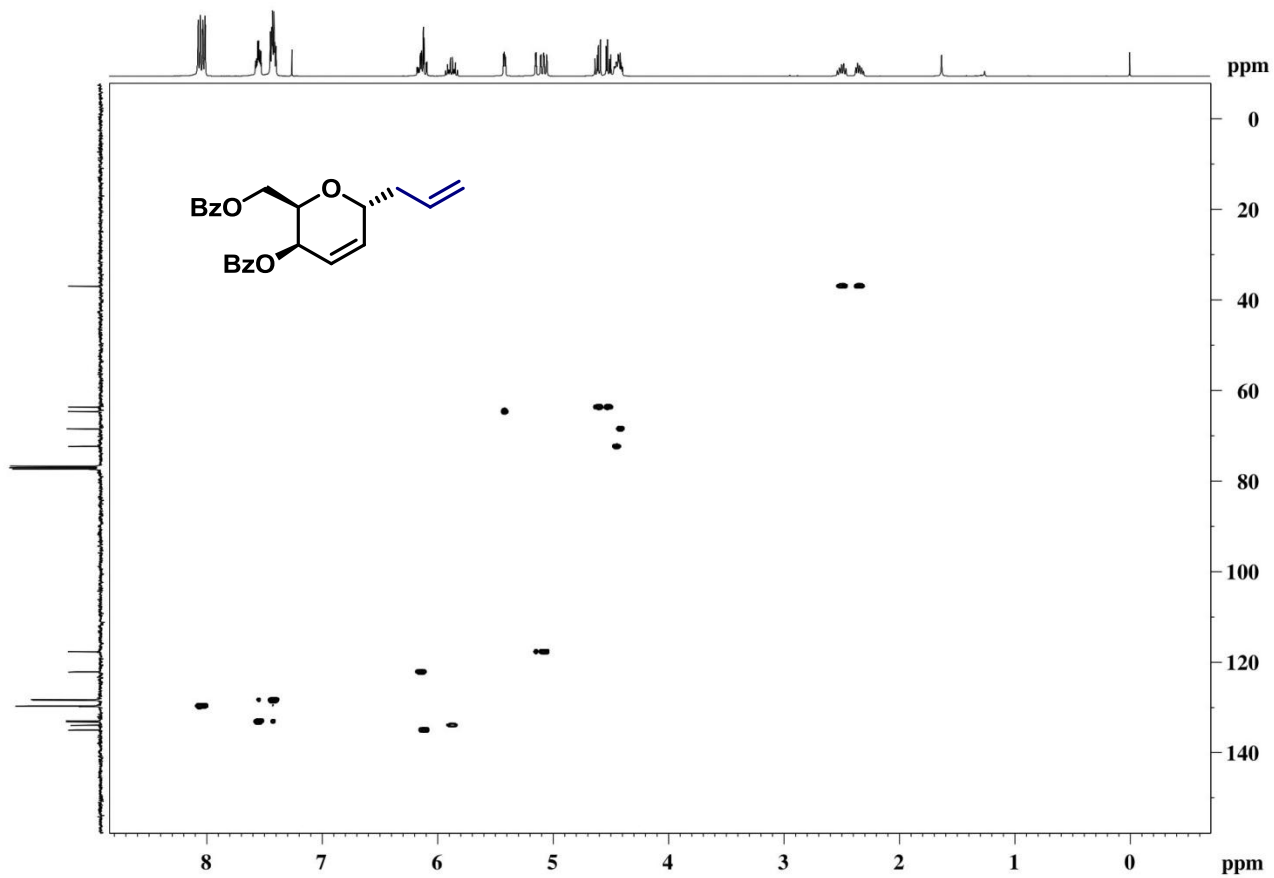
8.0743
8.0731
8.0712
8.0534
8.0500
8.0329
8.0317
8.0298
8.0121
8.0086
7.5557
7.5511
7.5463
7.5371
7.5278
7.4461
7.4422
7.4348
7.4264
7.4150
7.4121
7.4078
7.3964
7.2585
6.1490
6.1444
6.1370
6.1330
6.1206
6.1141
5.4263
5.4194
5.4153
5.1475
5.1432
5.1048
5.1005
5.0779
5.0525
4.6139
4.6045
4.5852
4.5358
4.5241
4.4953
4.4327
4.4258
4.4138
-0.0002



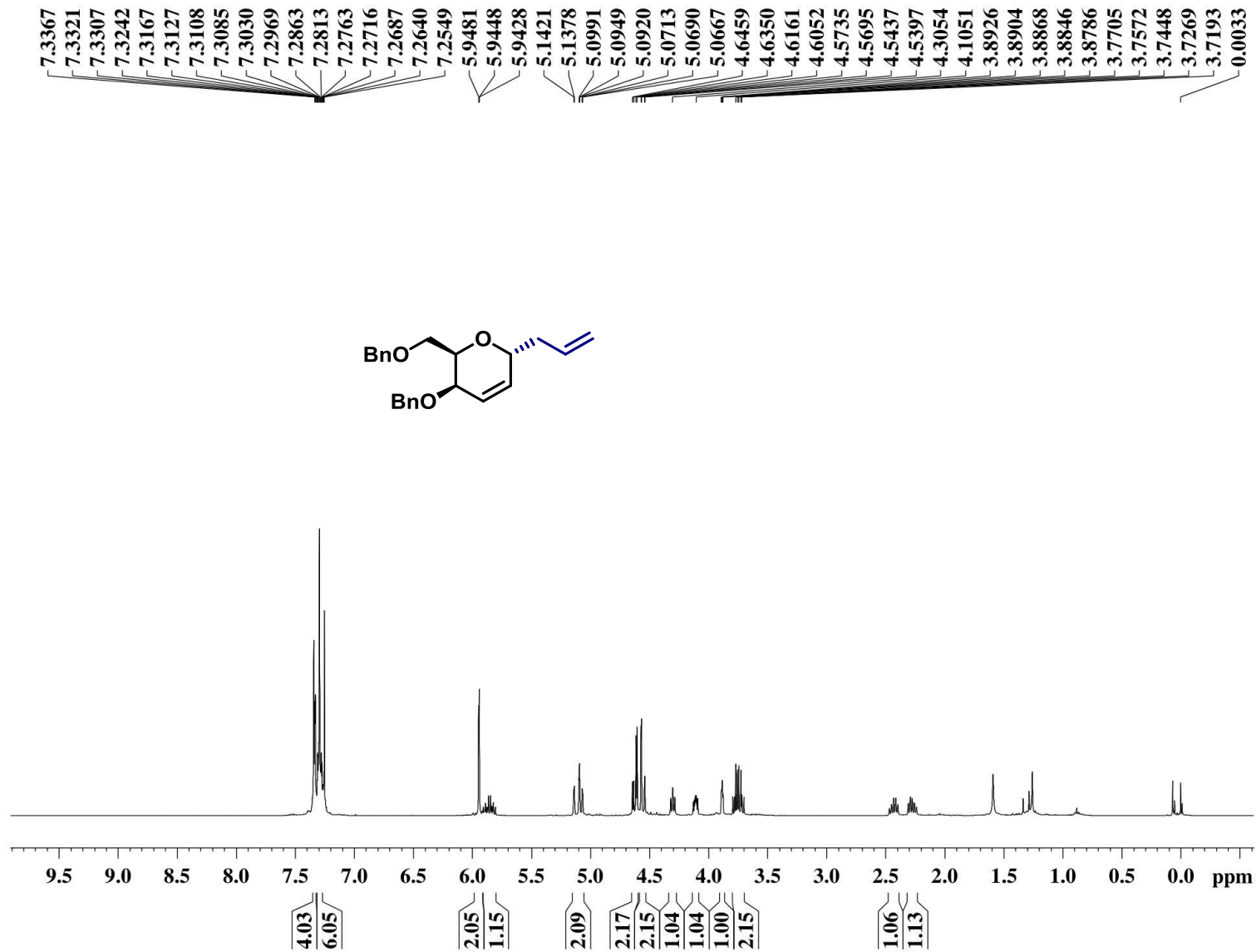
¹H NMR spectrum of **3f** (400 MHz, CDCl₃)



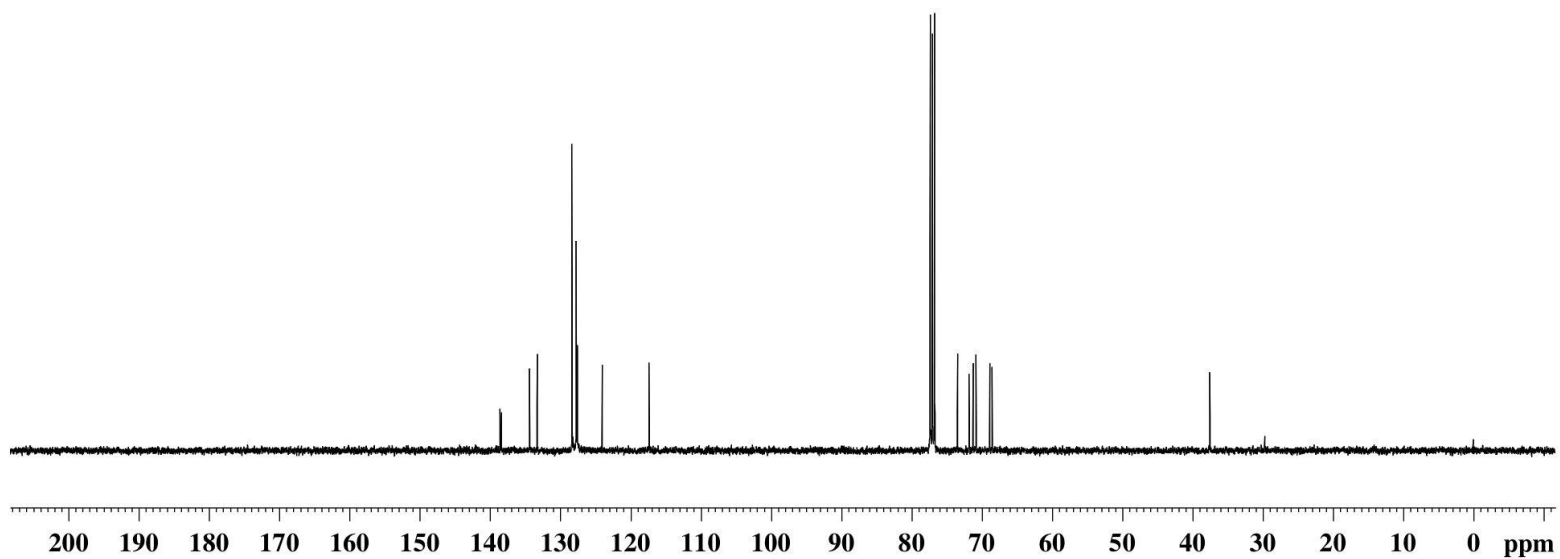
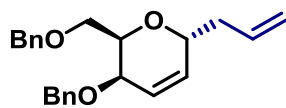
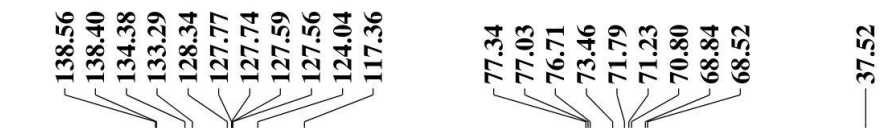
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3f** (100 MHz, CDCl_3)



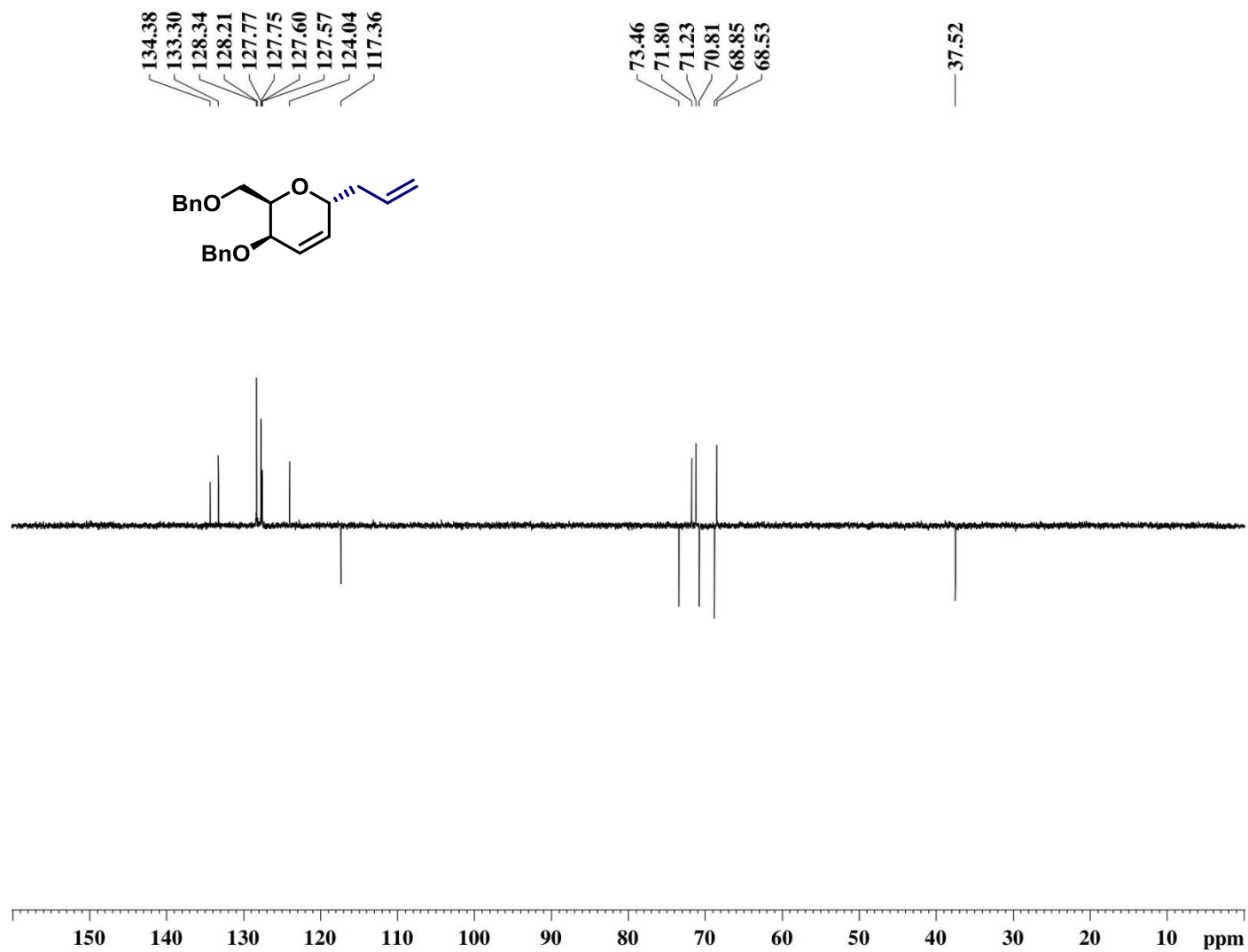
2D-HSQC spectrum of **3f** (400 MHz, CDCl_3)



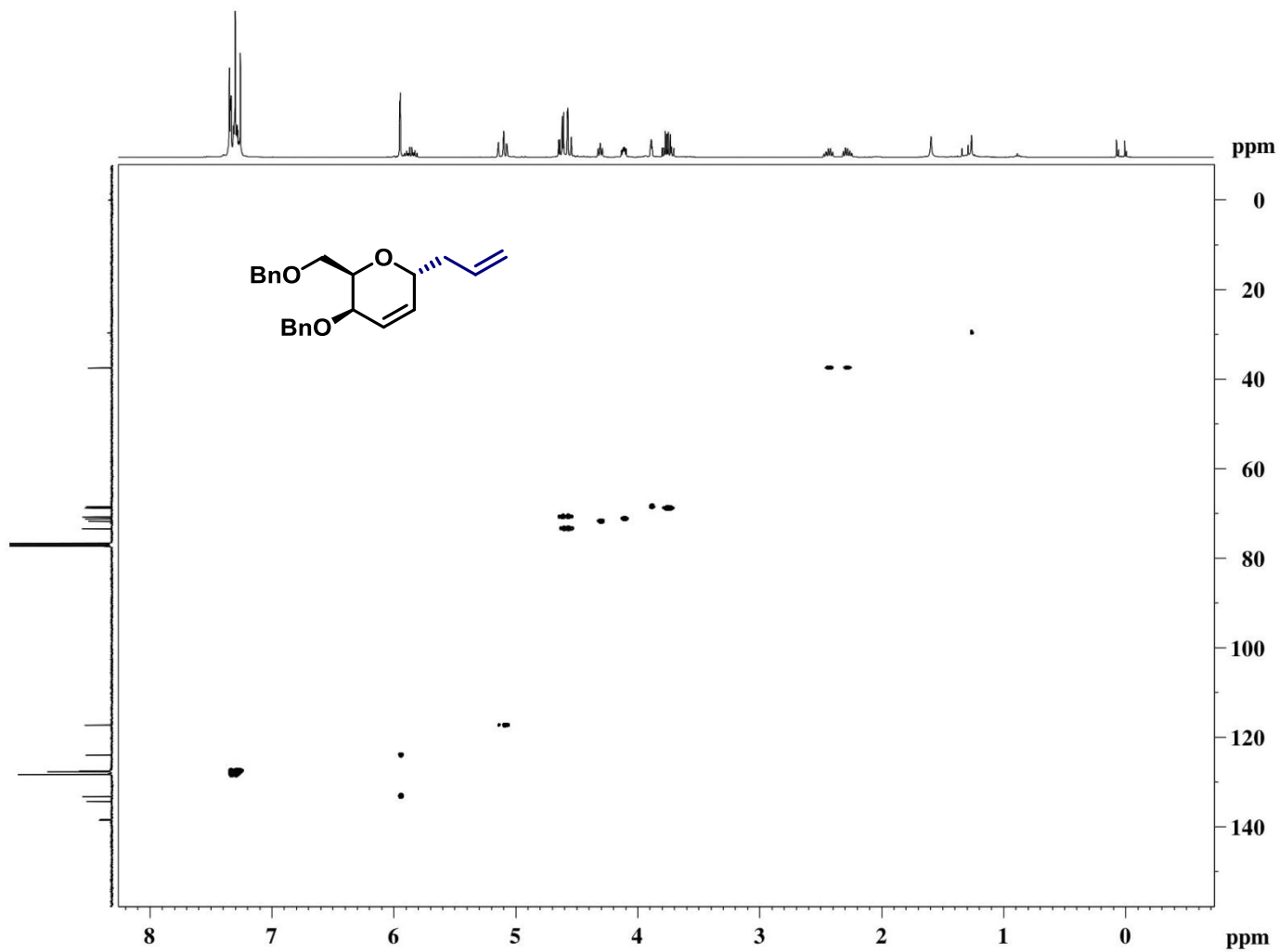
¹H NMR spectrum of **3g** (400 MHz, CDCl₃)



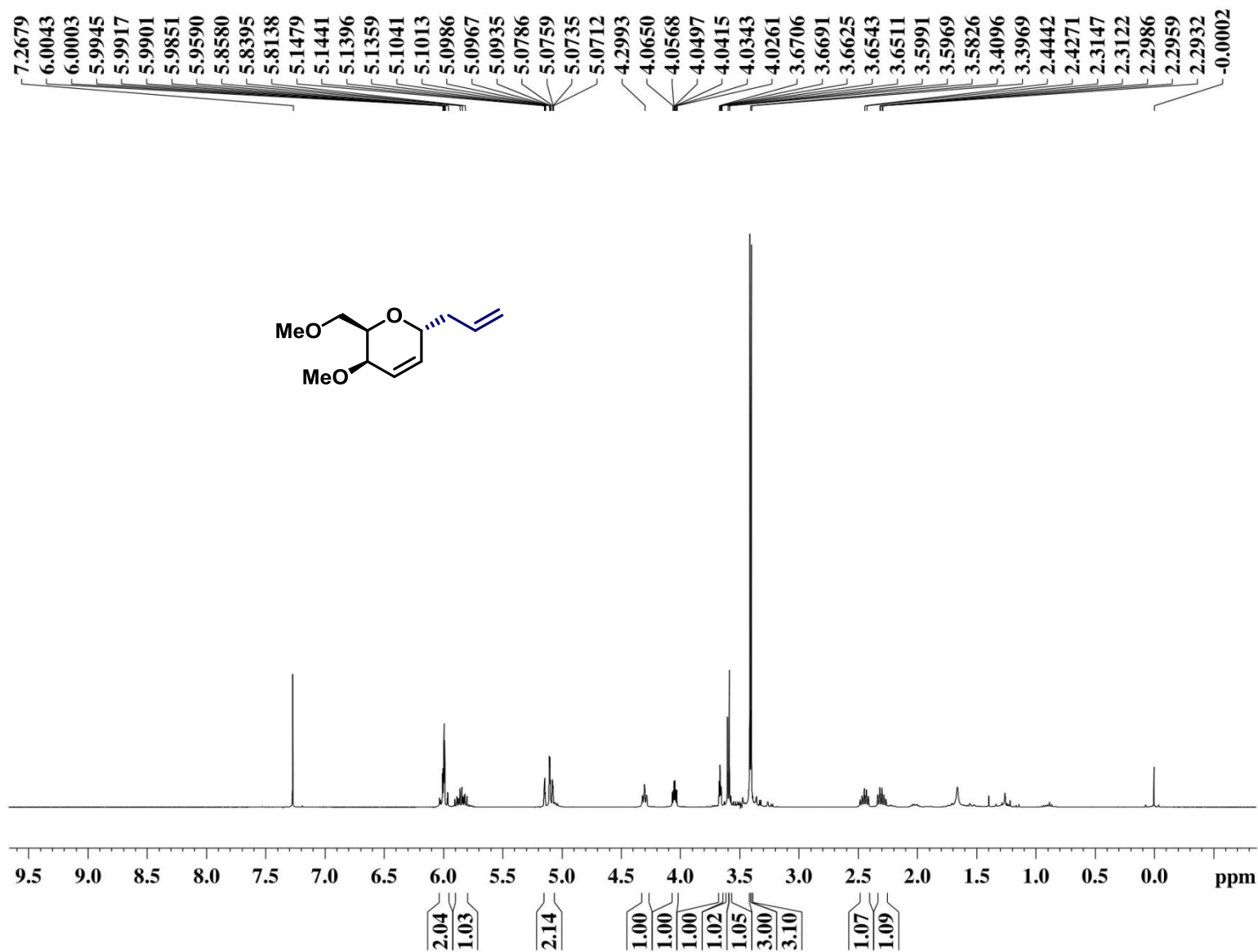
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3g** (100 MHz, CDCl_3)



¹³C Dept-135 spectrum of **3g** (100 MHz, CDCl₃)

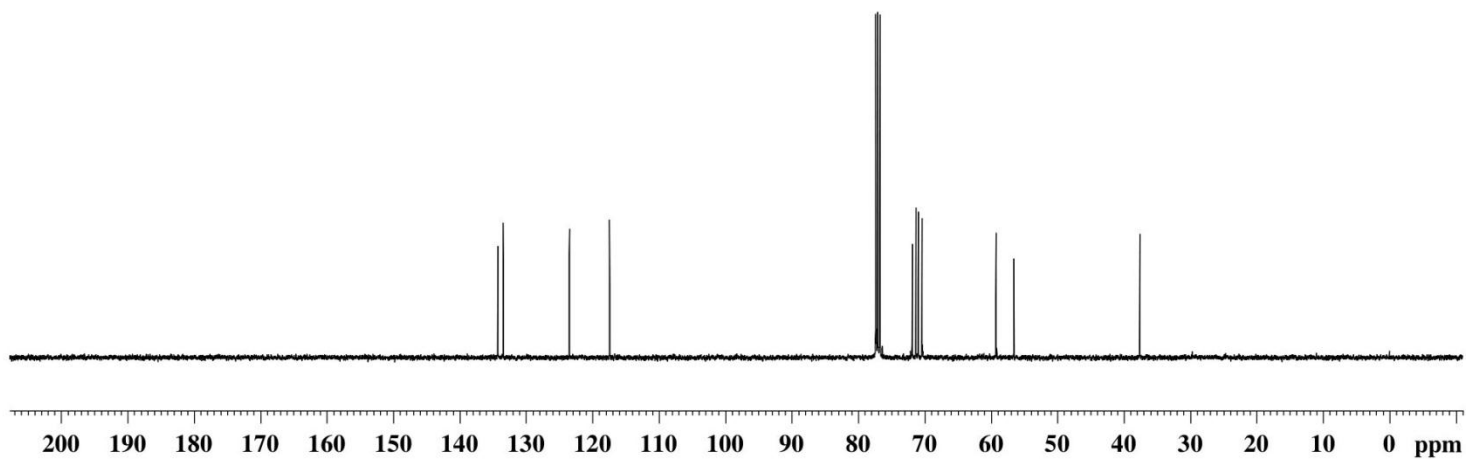
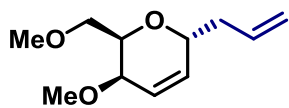


2D-HSQC spectrum of **3g** (400 MHz, CDCl₃)

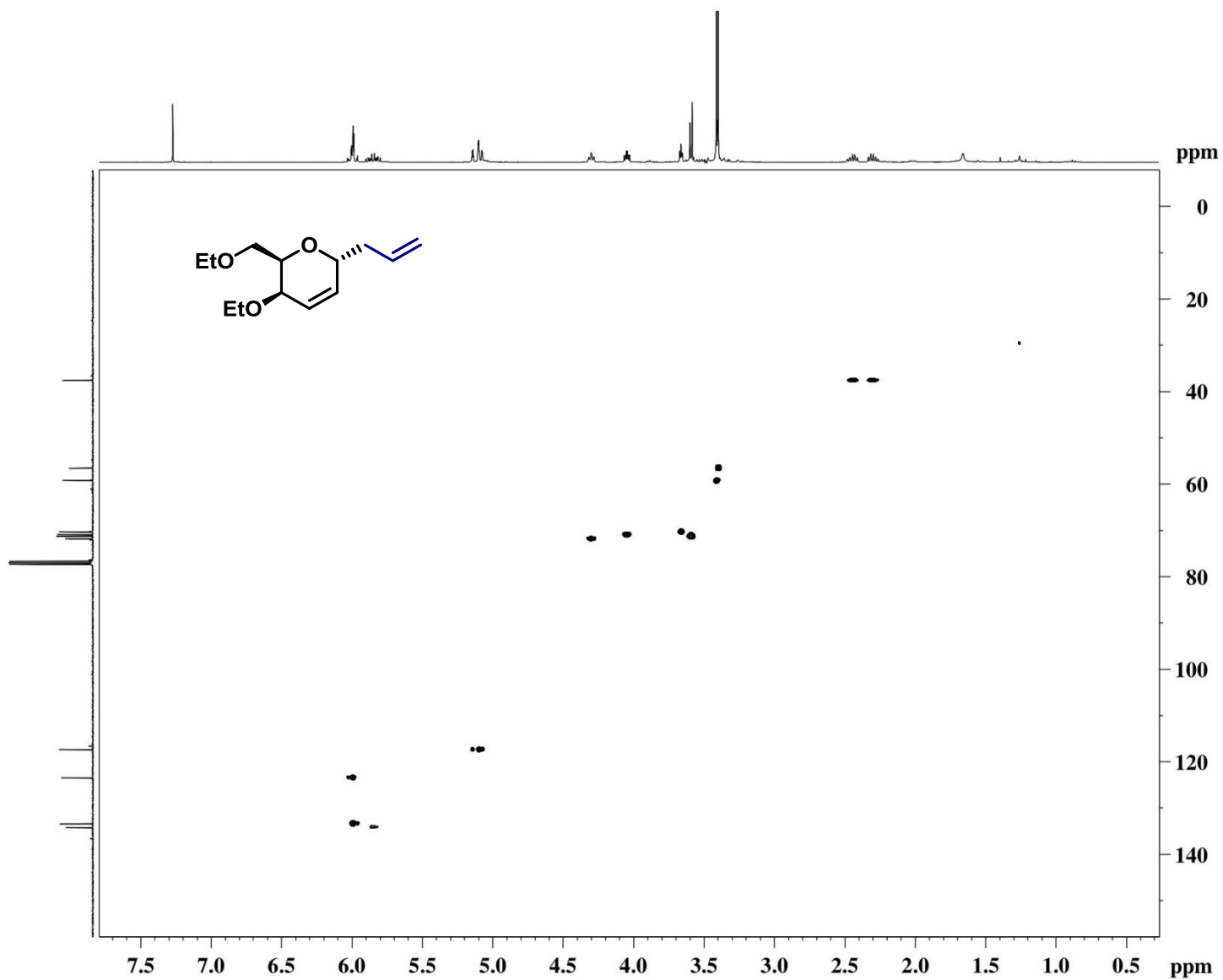


¹H NMR spectrum of **3h** (400 MHz, CDCl₃)

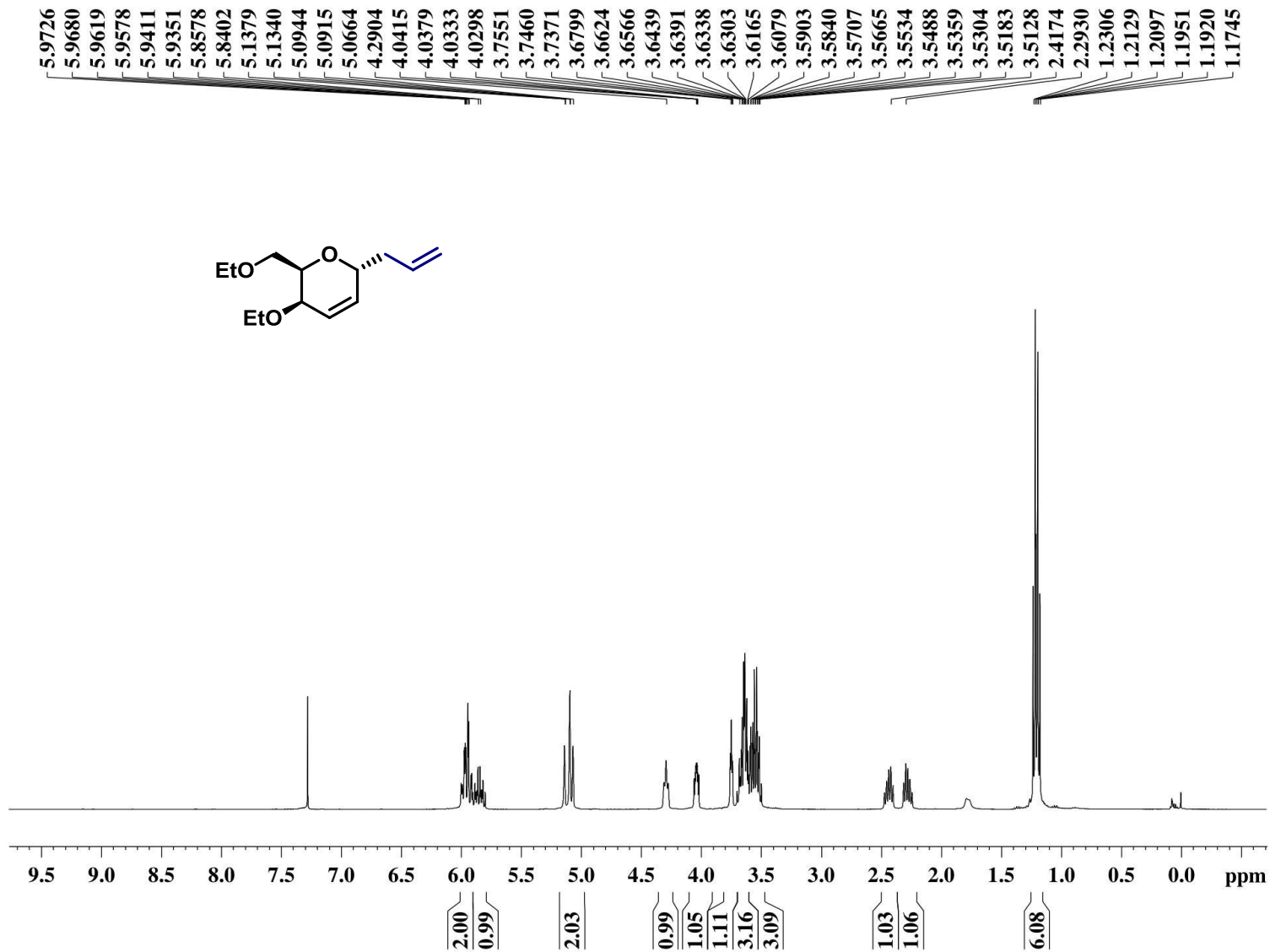
134.24
133.44
123.49
117.41
77.34
77.03
76.71
71.83
71.29
70.94
70.37
59.24
56.54
37.59



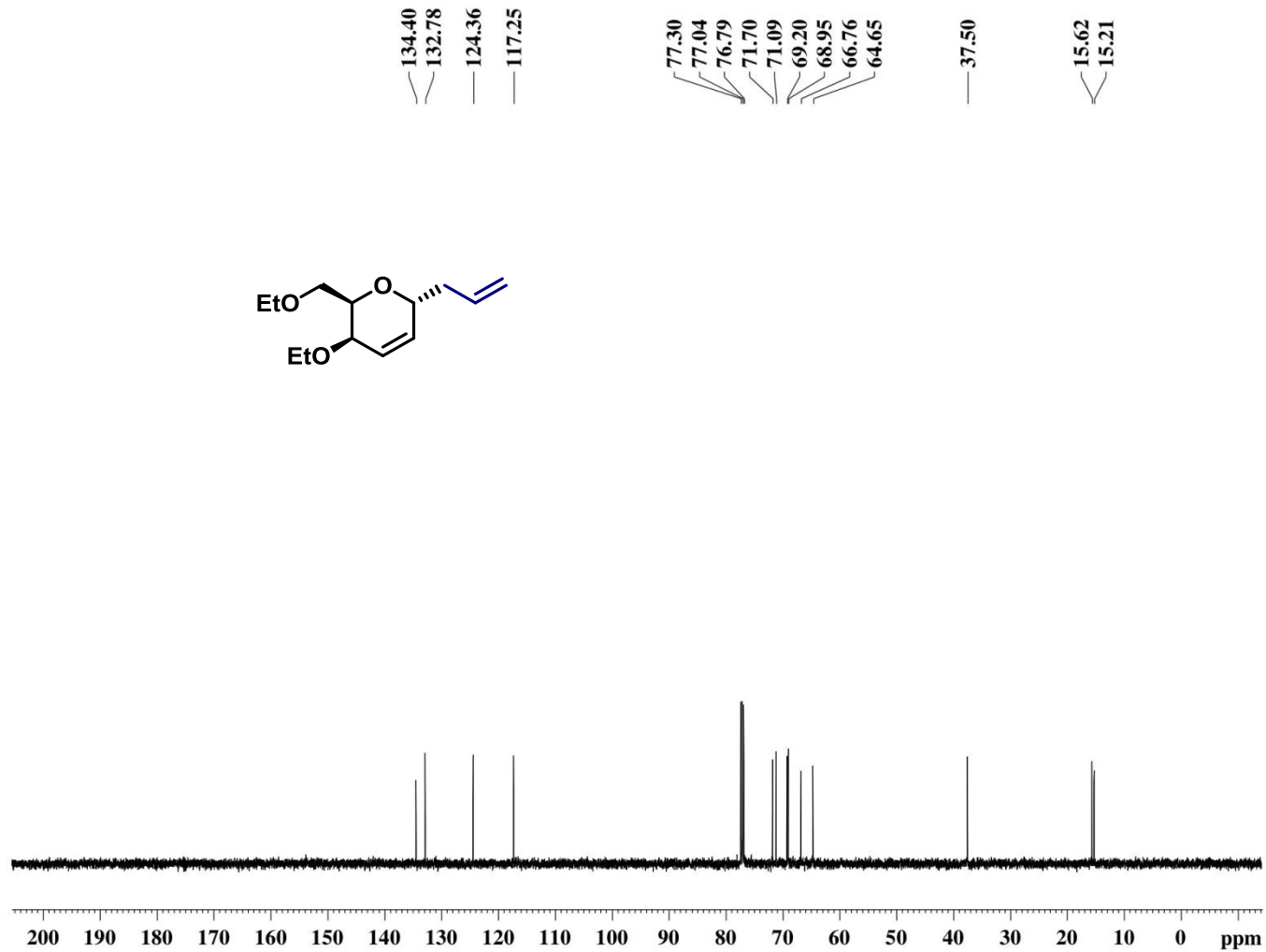
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3h** (100 MHz, CDCl_3)



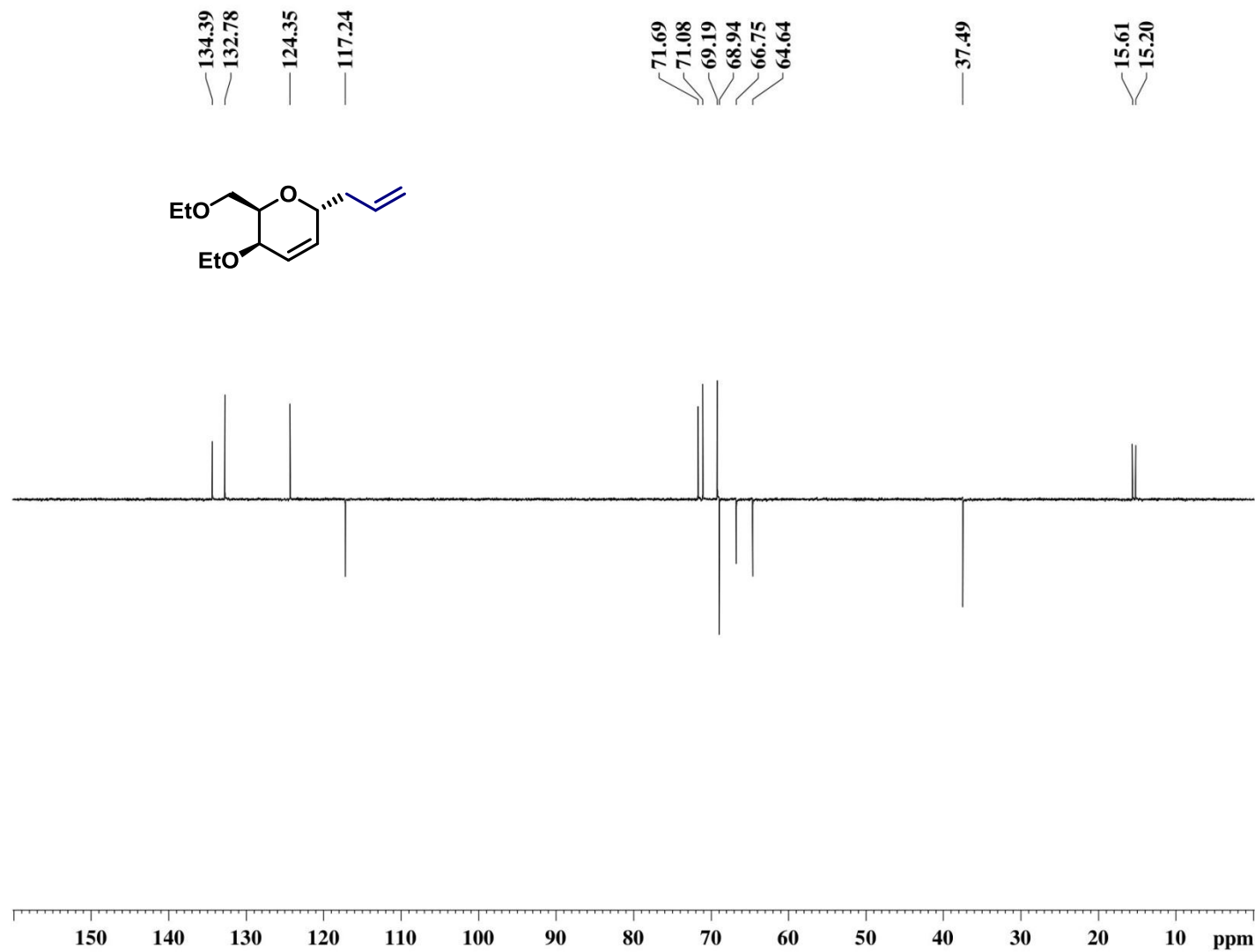
2D-HSQC spectrum of **3h** (400 MHz, CDCl₃)



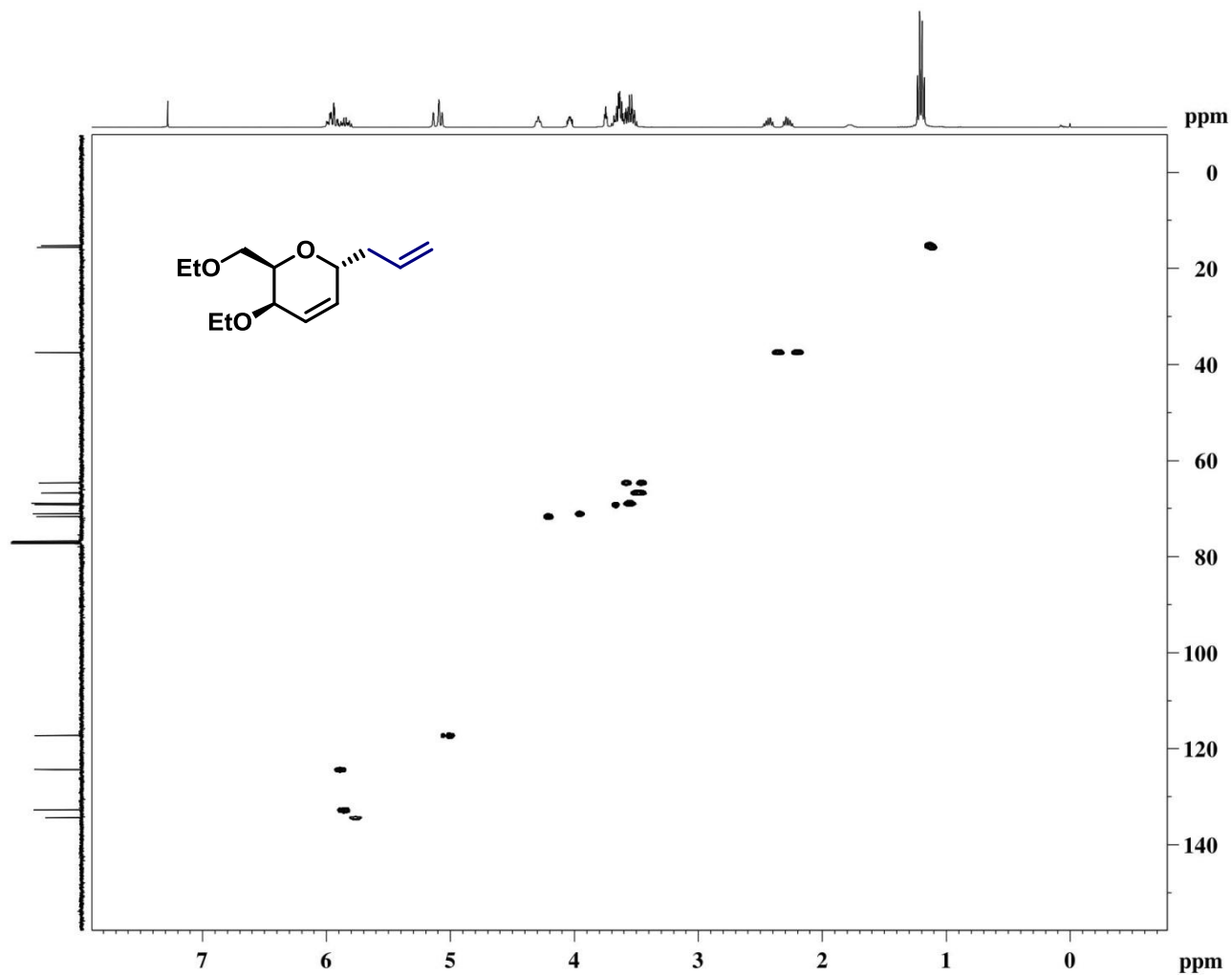
¹H NMR spectrum of **3i** (400 MHz, CDCl₃)



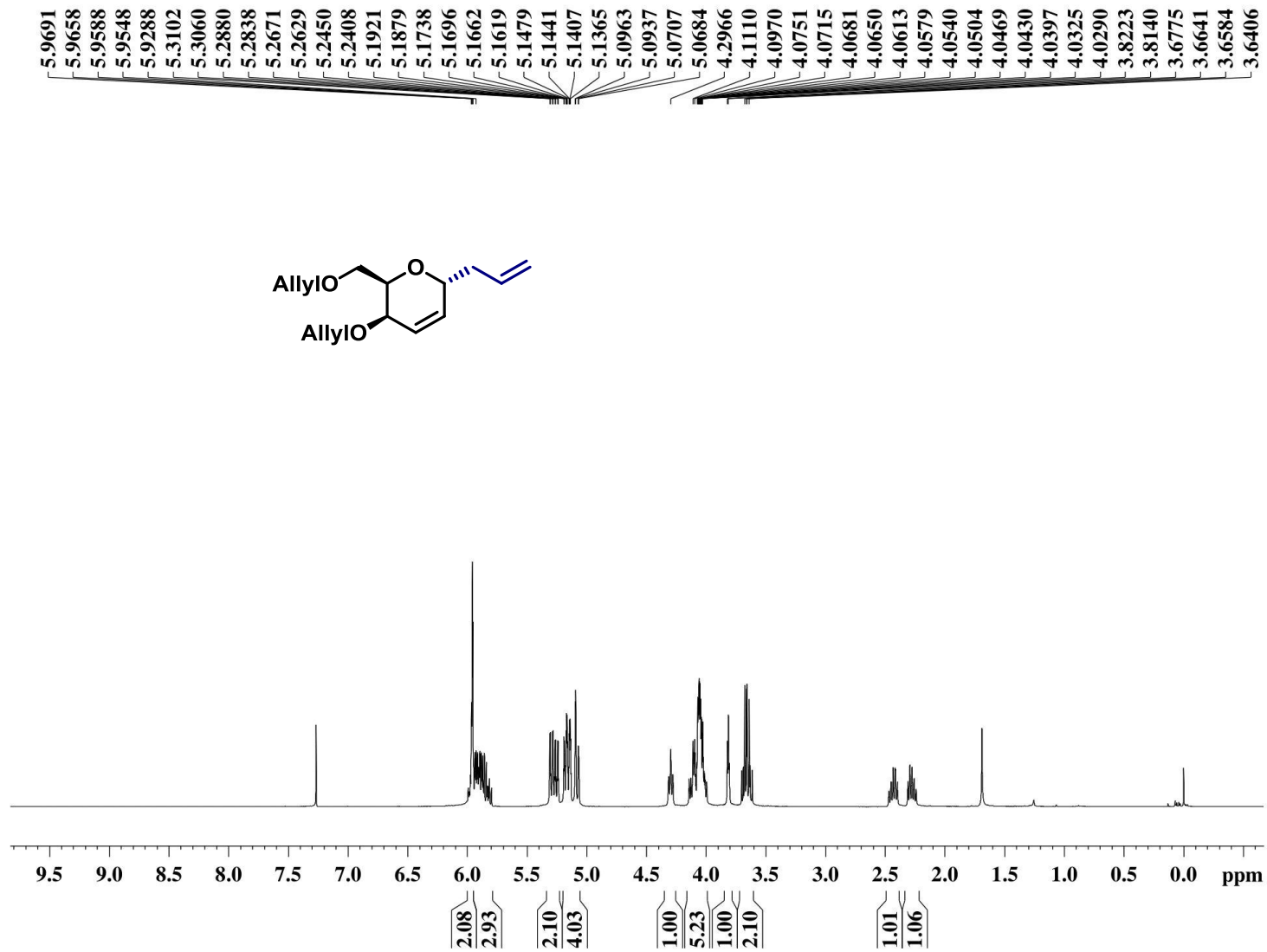
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3i** (100 MHz, CDCl_3)



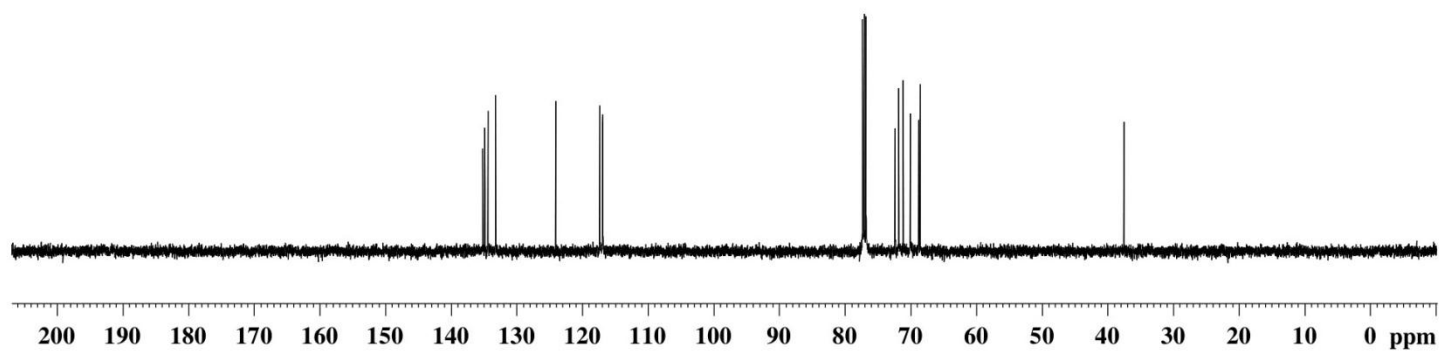
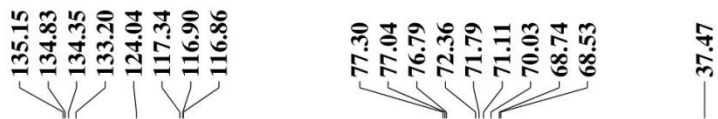
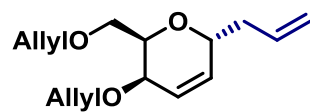
¹³C Dept-135 spectrum of **3i** (100 MHz, CDCl₃)



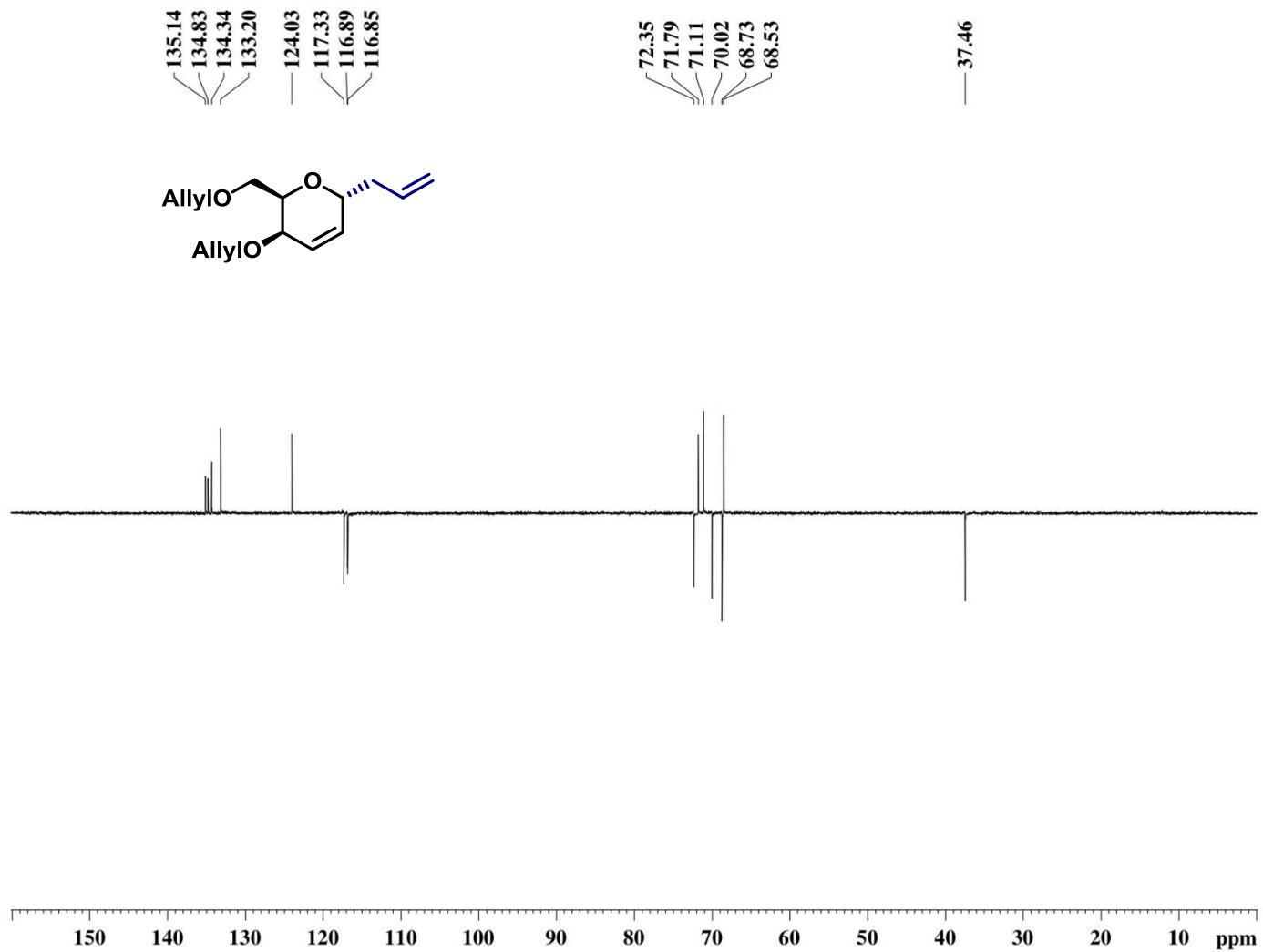
2D-HSQC spectrum of **3i** (400 MHz, CDCl₃)



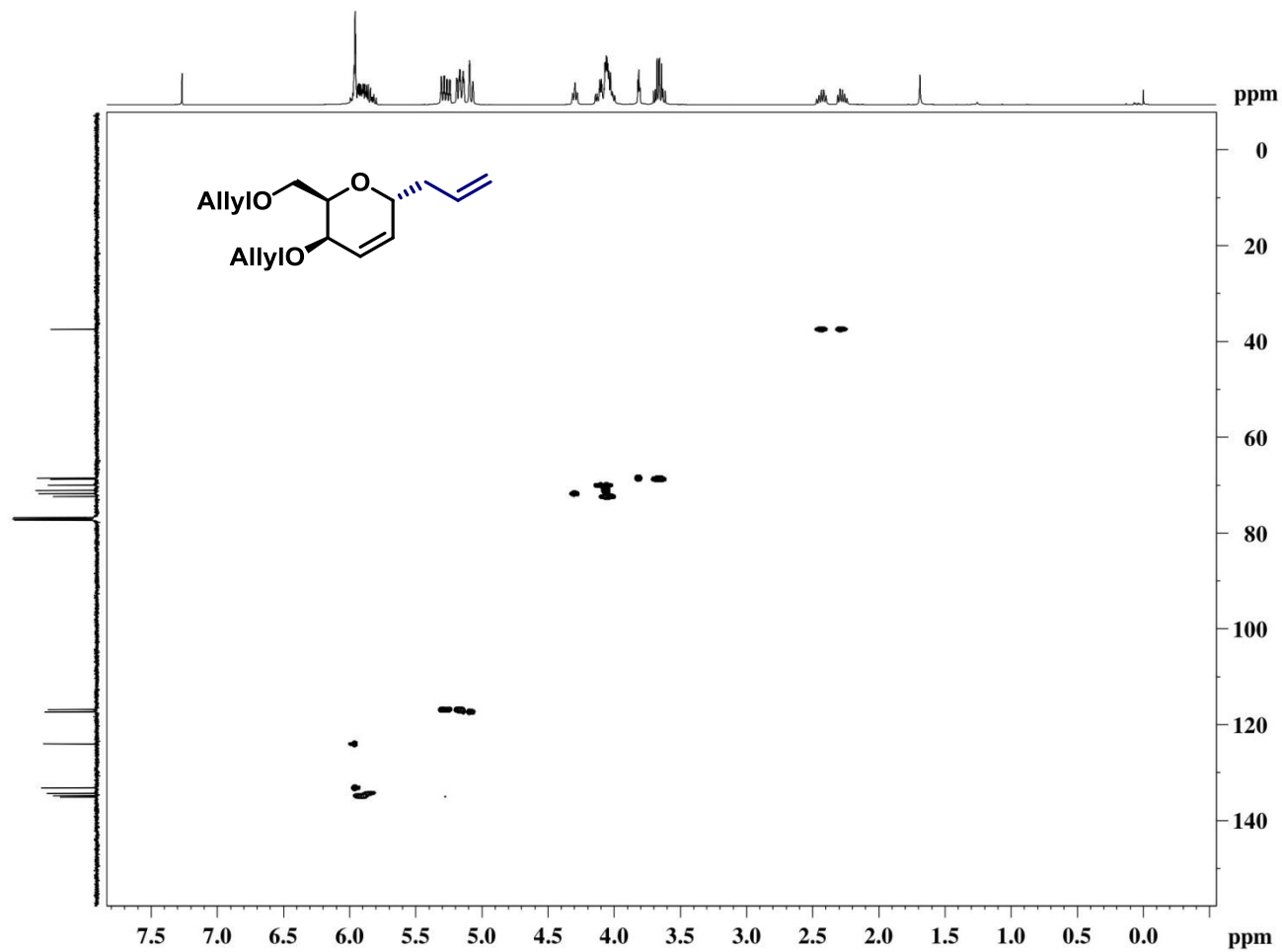
^1H NMR spectrum of **3j** (400 MHz, CDCl_3)



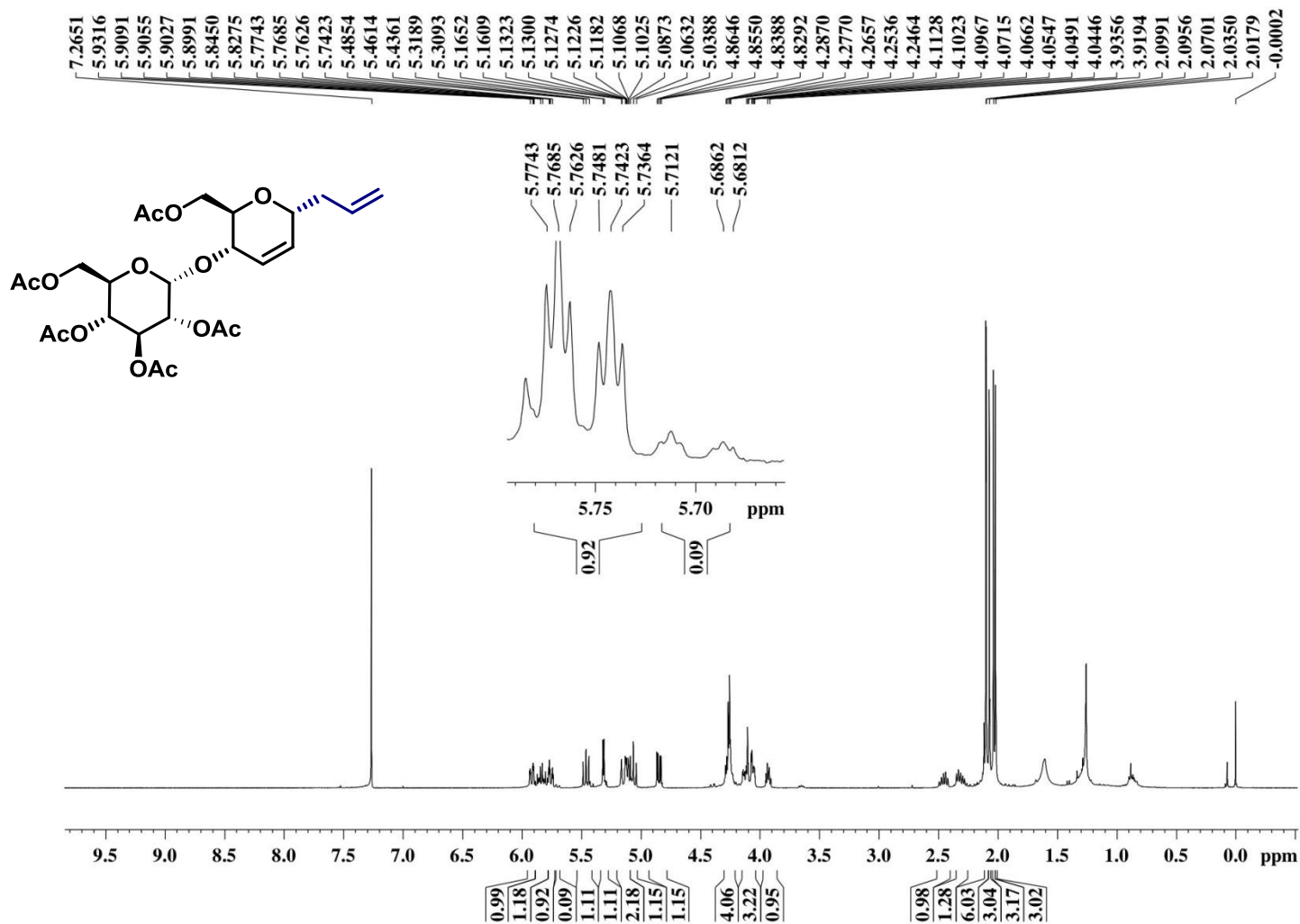
¹³C{¹H} NMR spectrum of **3j** (100 MHz, CDCl₃)



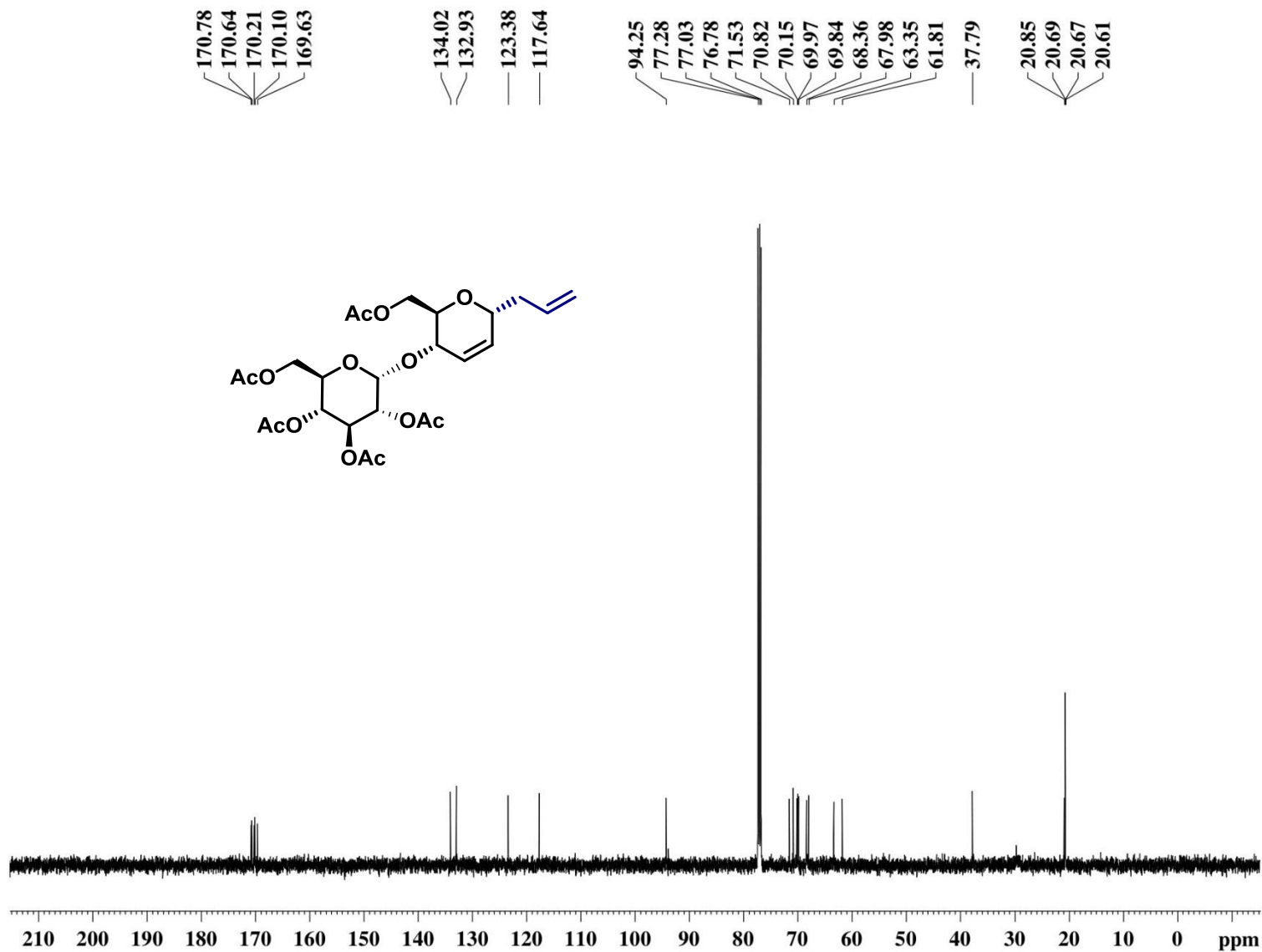
¹³C Dept-135 spectrum of **3j** (100 MHz, CDCl₃)



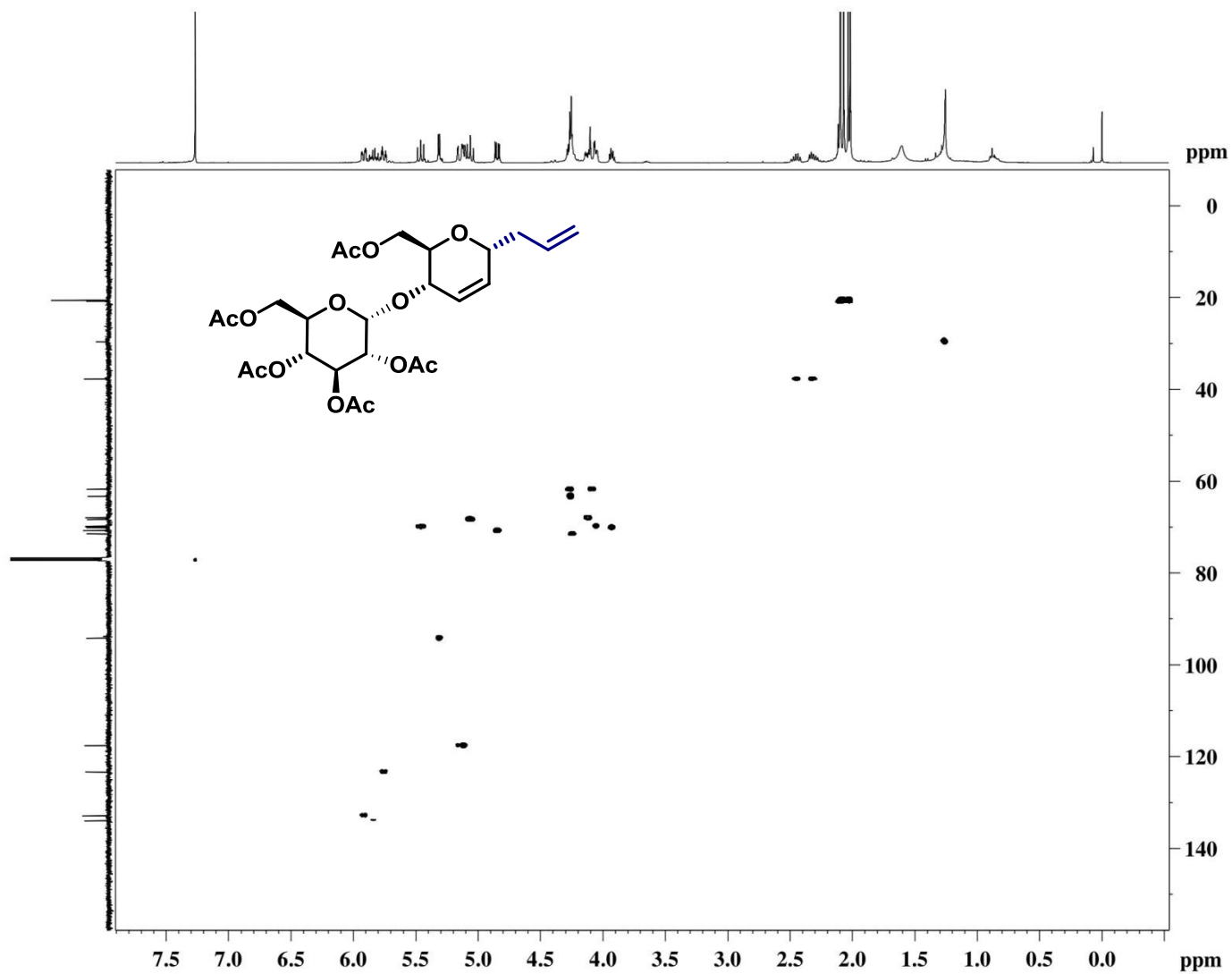
2D-HSQC spectrum of **3j** (400 MHz, CDCl₃)



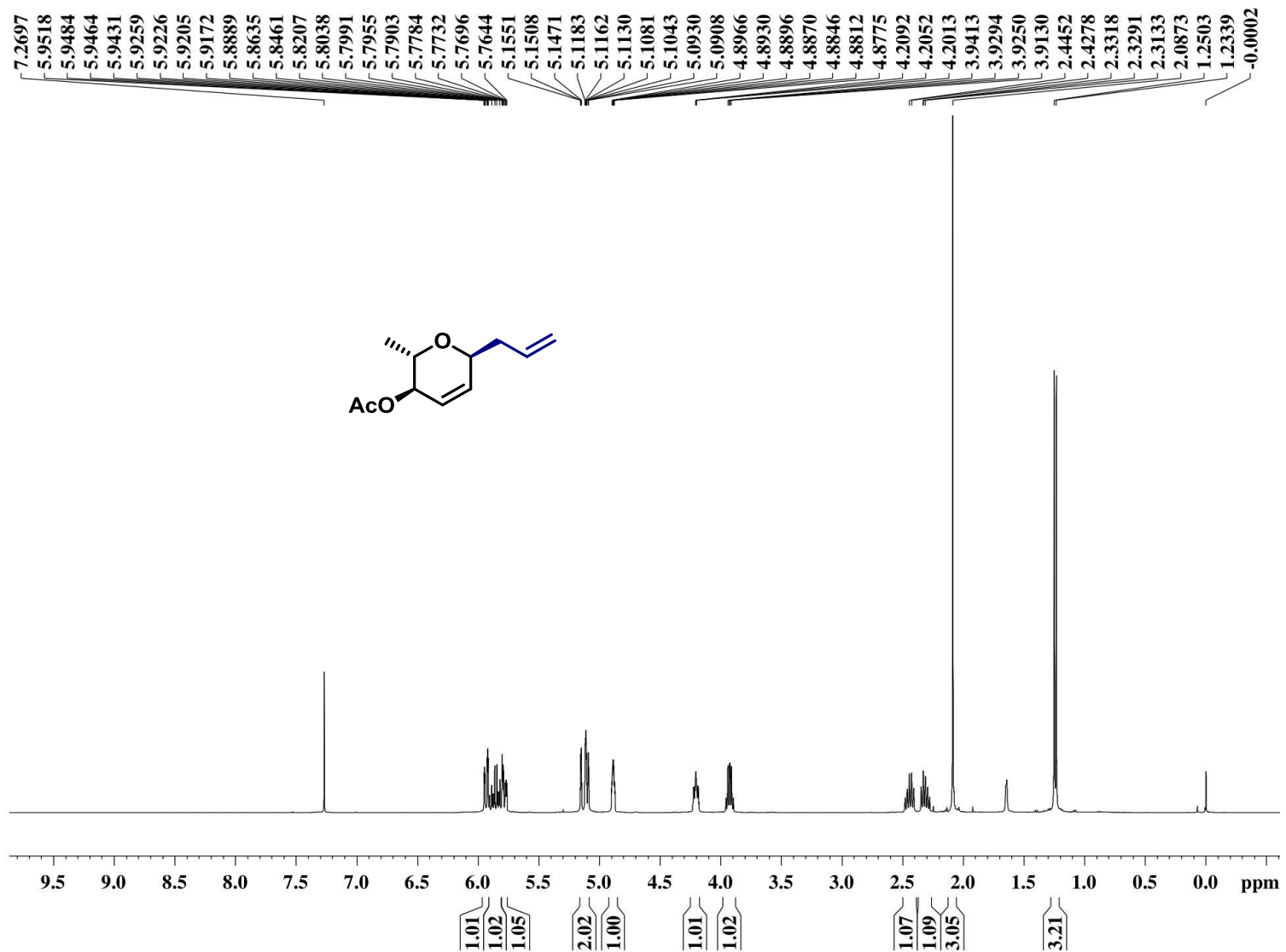
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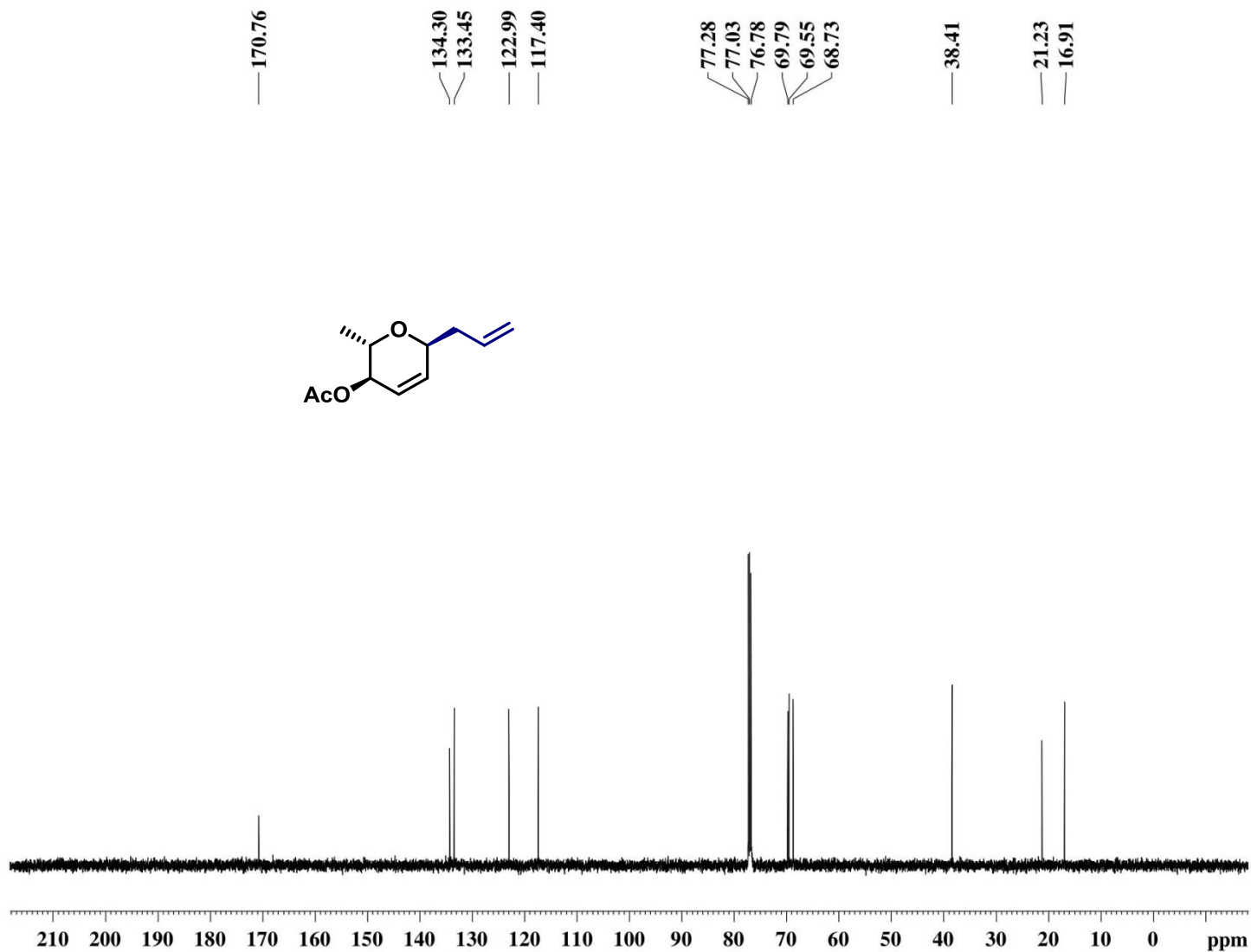
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3k** (100 MHz, CDCl_3)



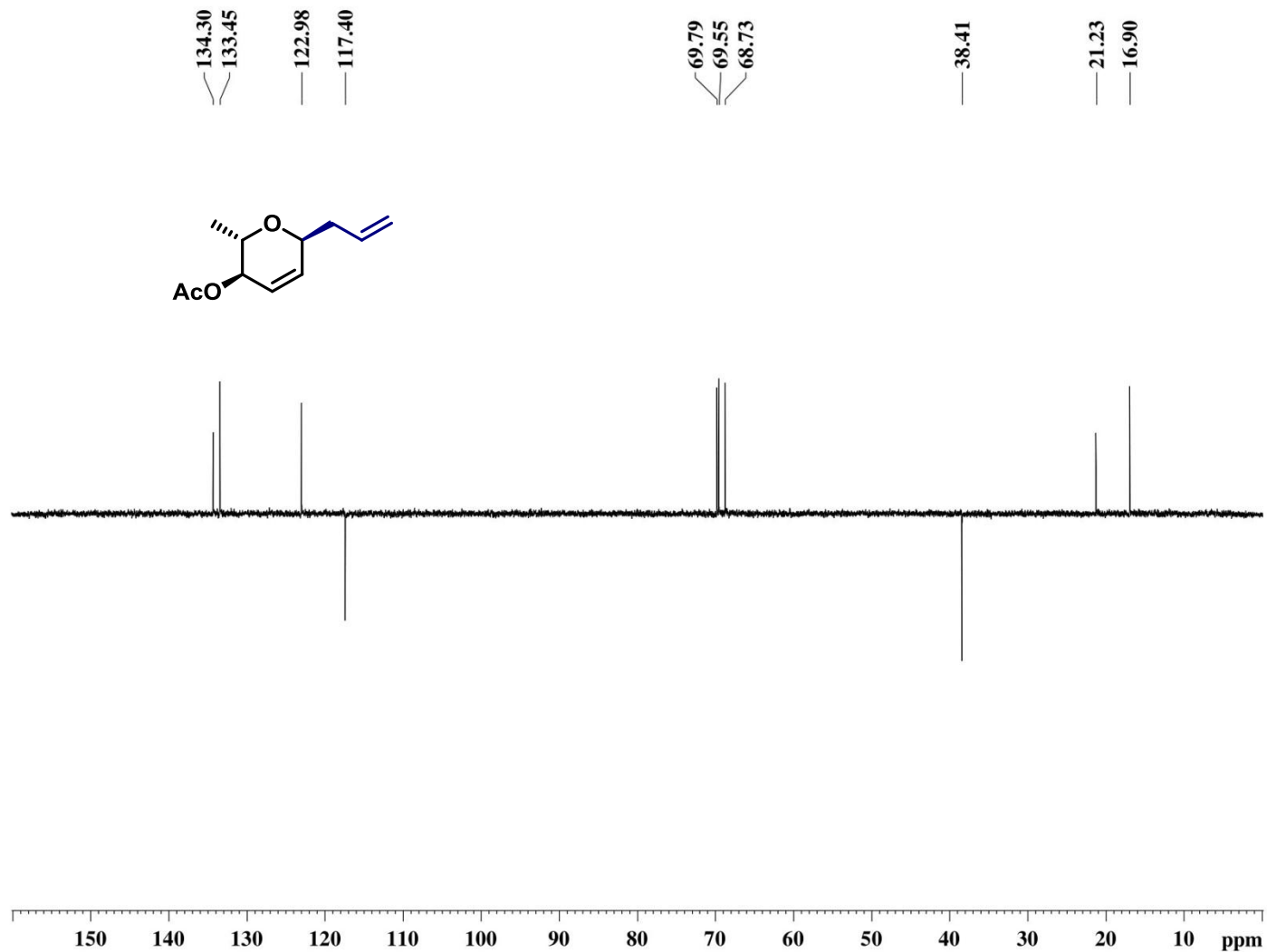
2D-HSQC spectrum of **3k** (400 MHz, CDCl₃)



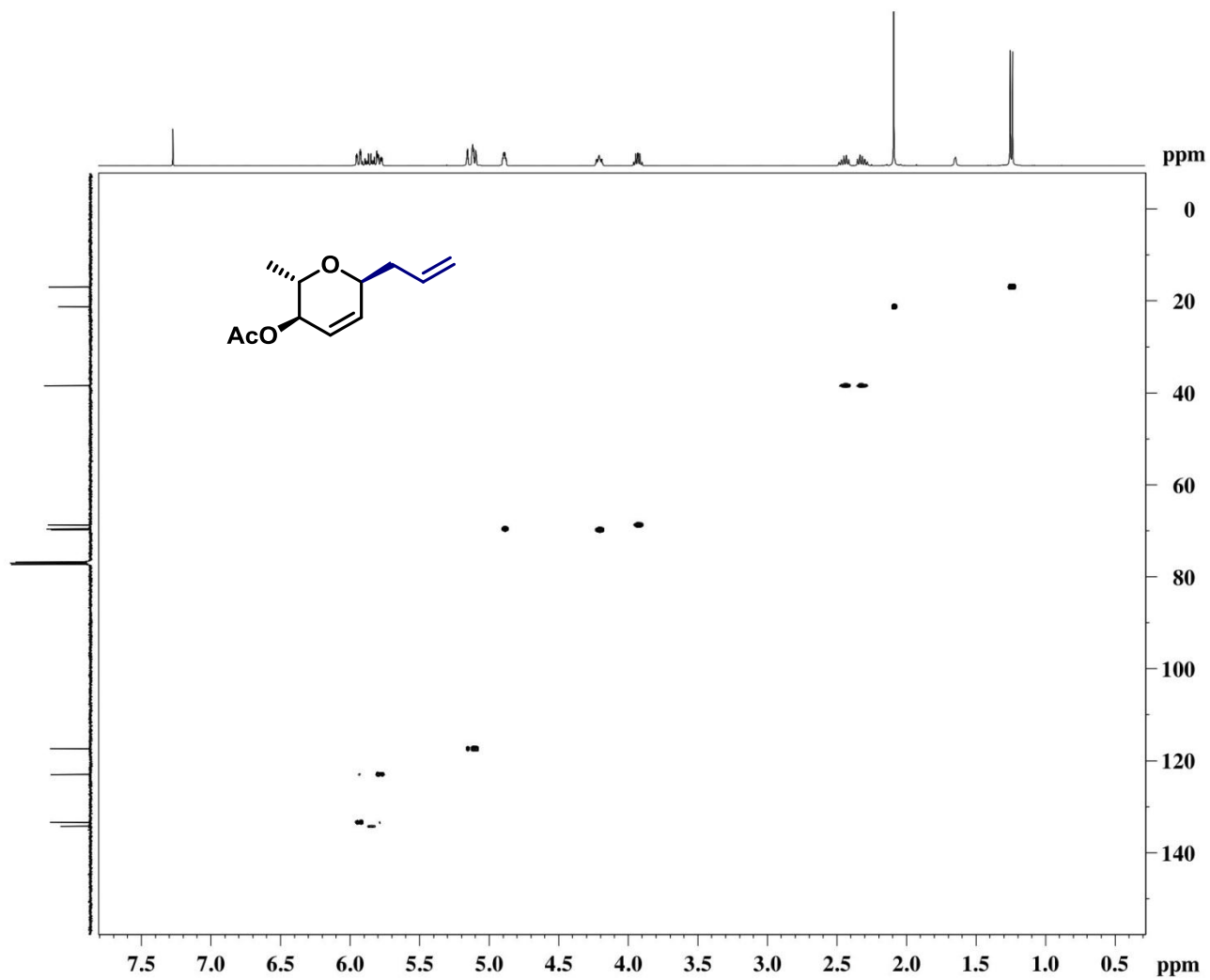
¹H NMR spectrum of **3I** (400 MHz, CDCl₃)



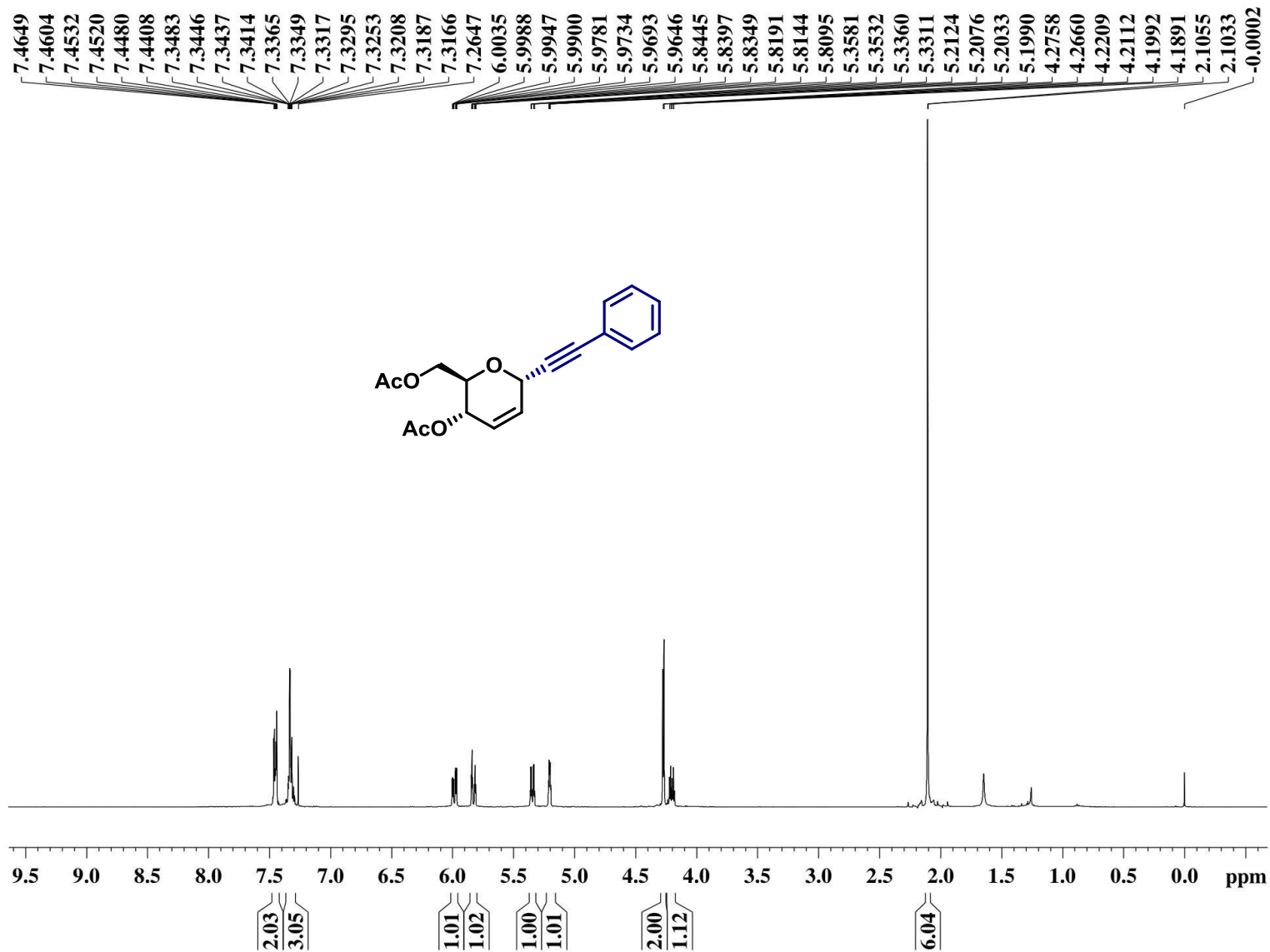
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **3I** (100 MHz, CDCl_3)



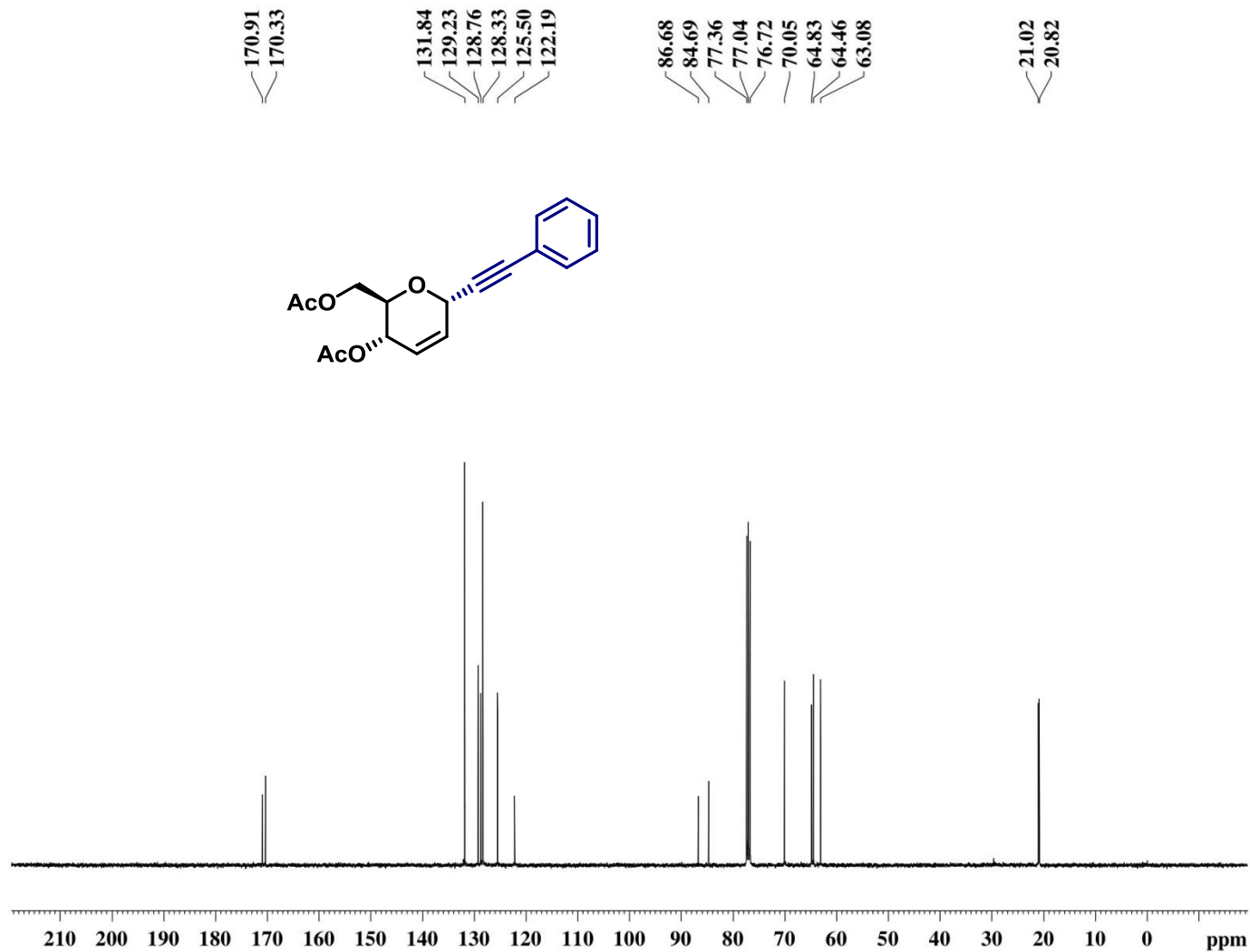
¹³C Dept-135 spectrum of **3I** (100 MHz, CDCl₃)



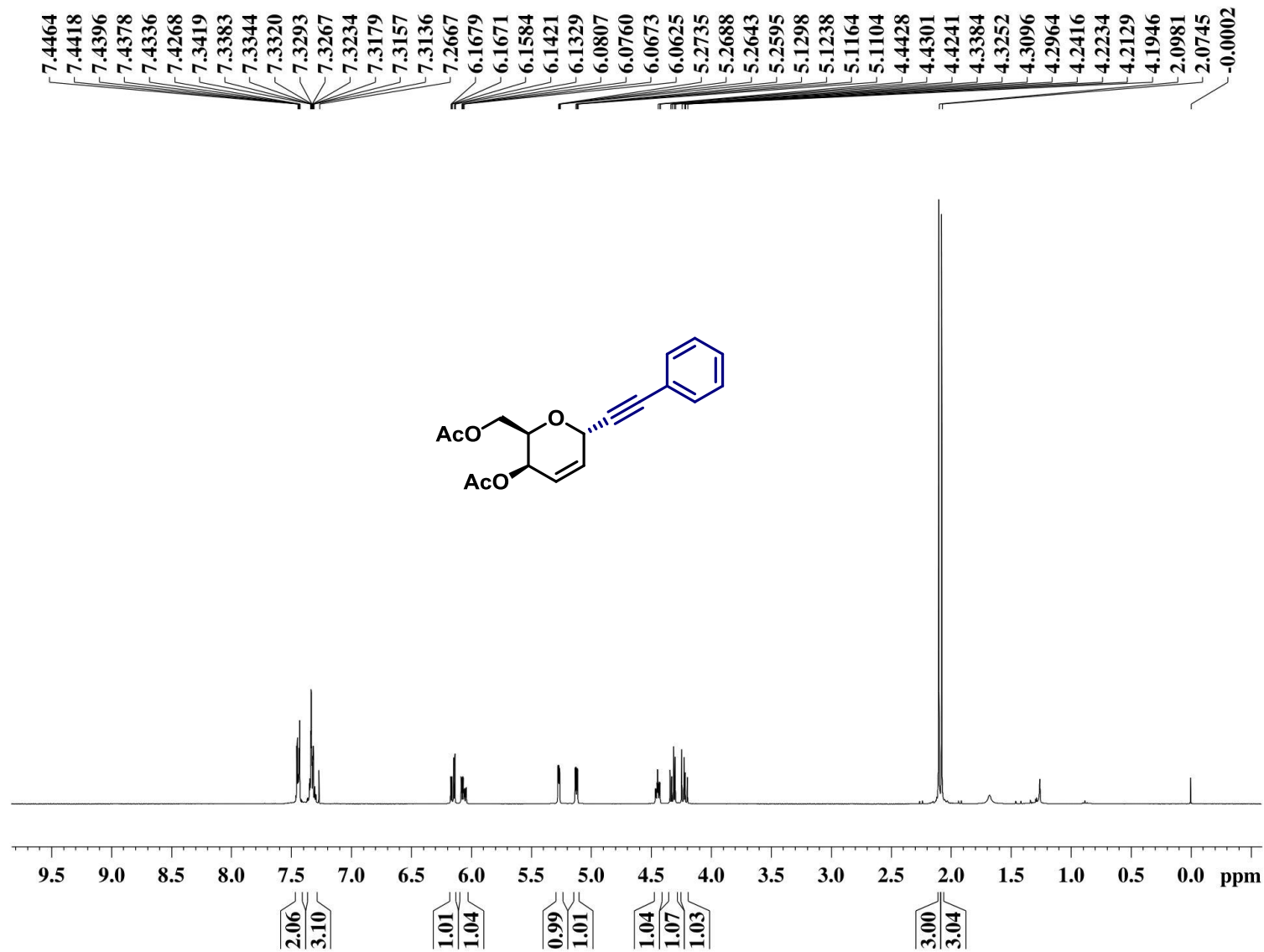
2D-HSQC spectrum of **3I** (400 MHz, CDCl_3)



¹H NMR spectrum of **5a** (400 MHz, CDCl₃)



$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5a** (100 MHz, CDCl_3)



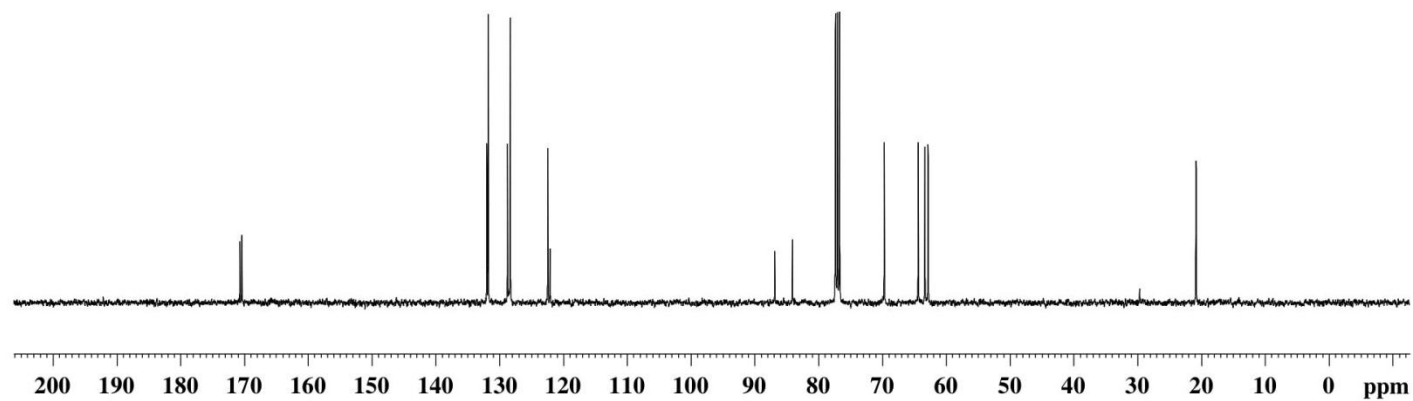
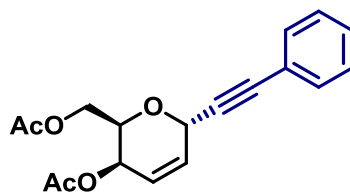
¹H NMR spectrum of **5b** (400 MHz, CDCl₃)

170.74
170.44

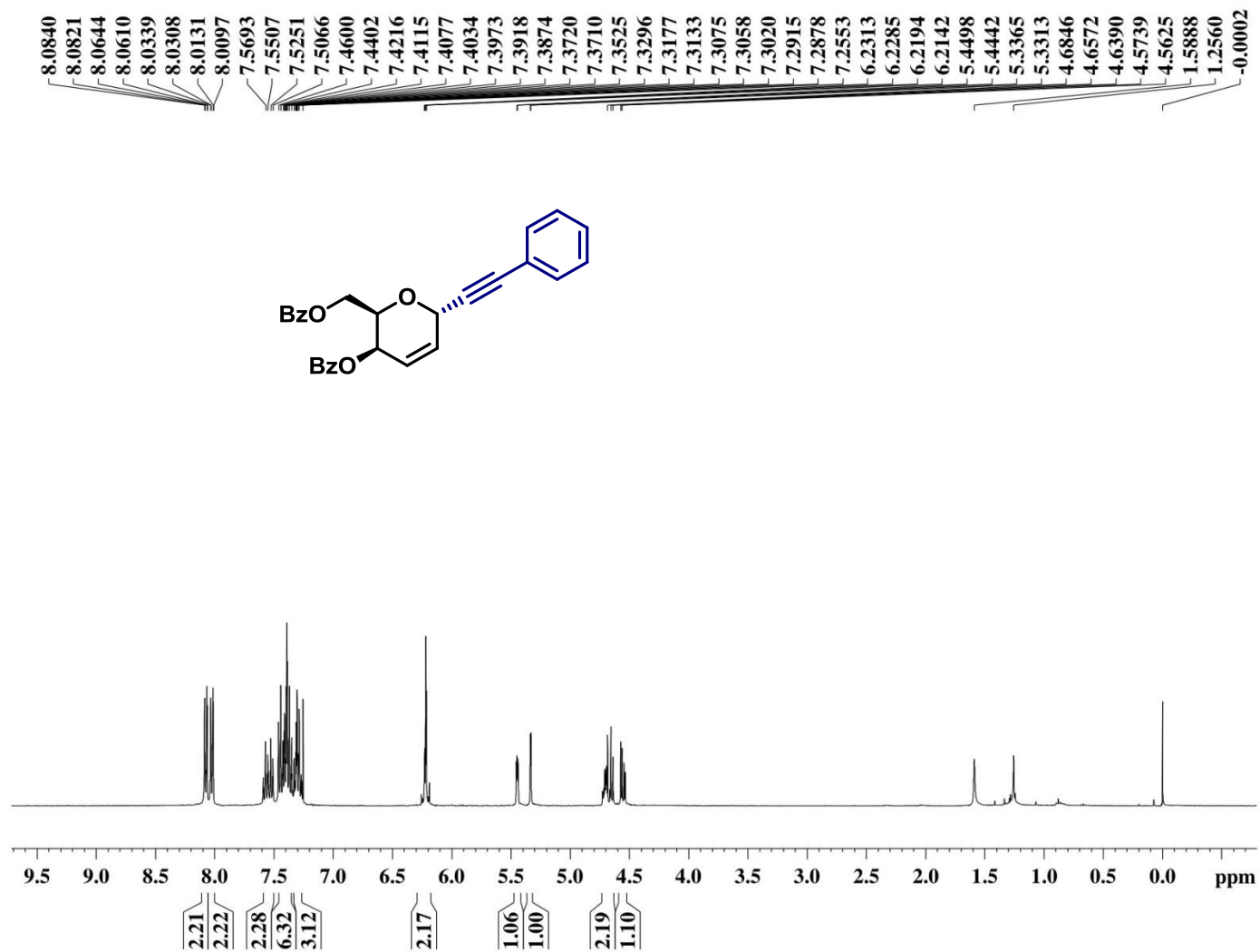
132.02
131.82
128.79
128.35
122.47
122.11

86.89
84.12
77.37
77.05
76.73
69.72
64.40
63.35
62.85

20.87
20.81

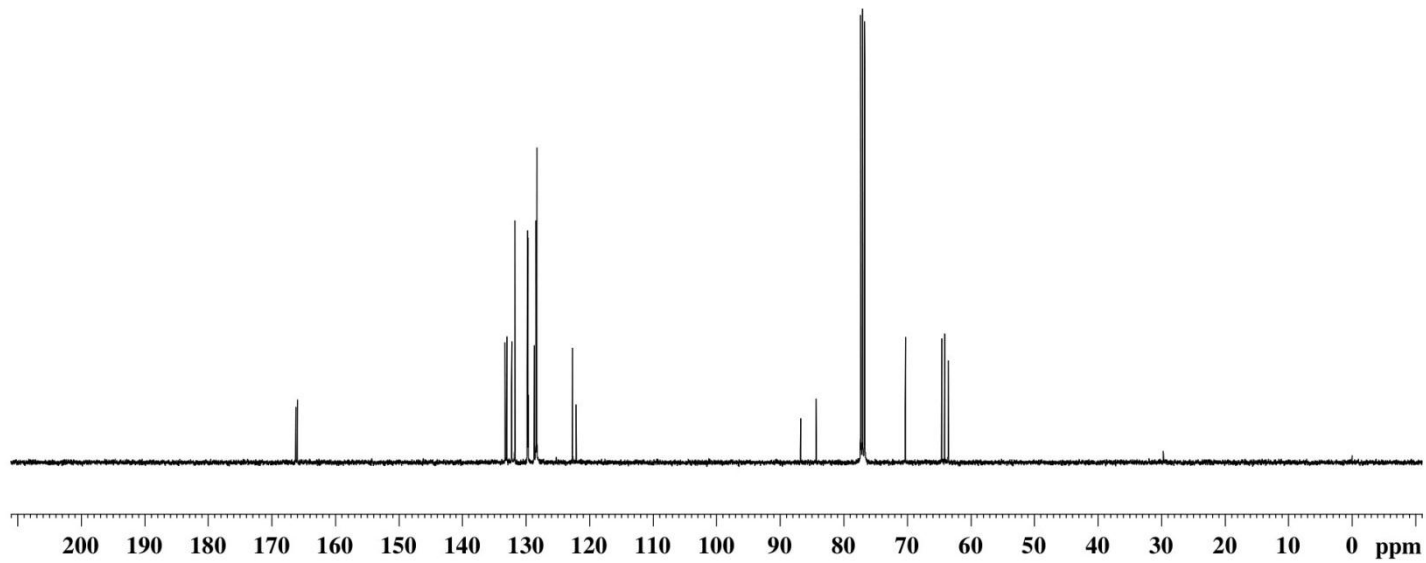
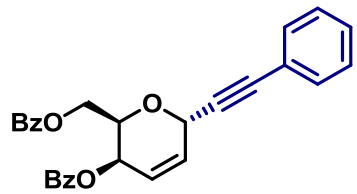


$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5b** (100 MHz, CDCl_3)

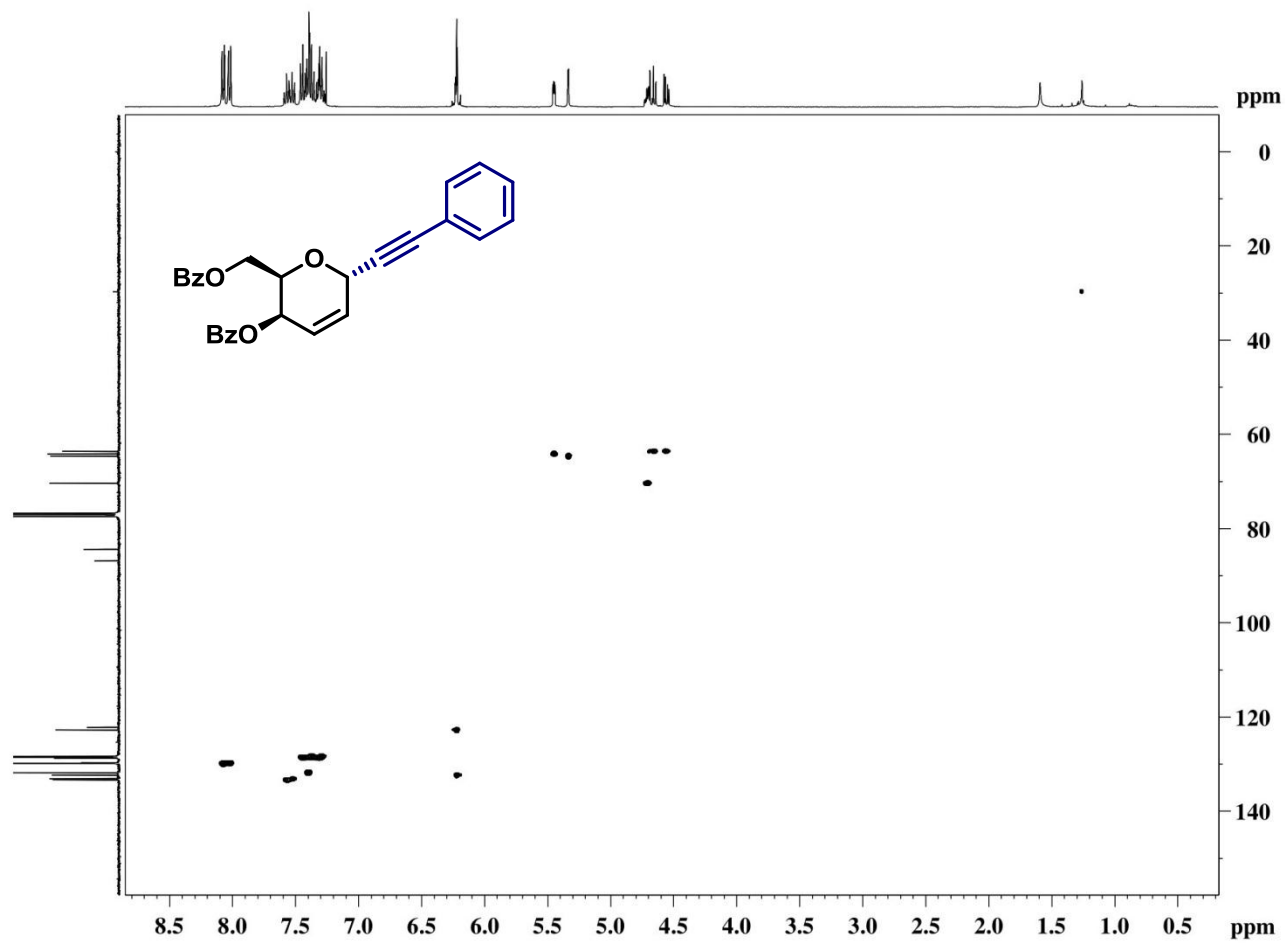


¹H NMR spectrum of **5c** (400 MHz, CDCl₃)

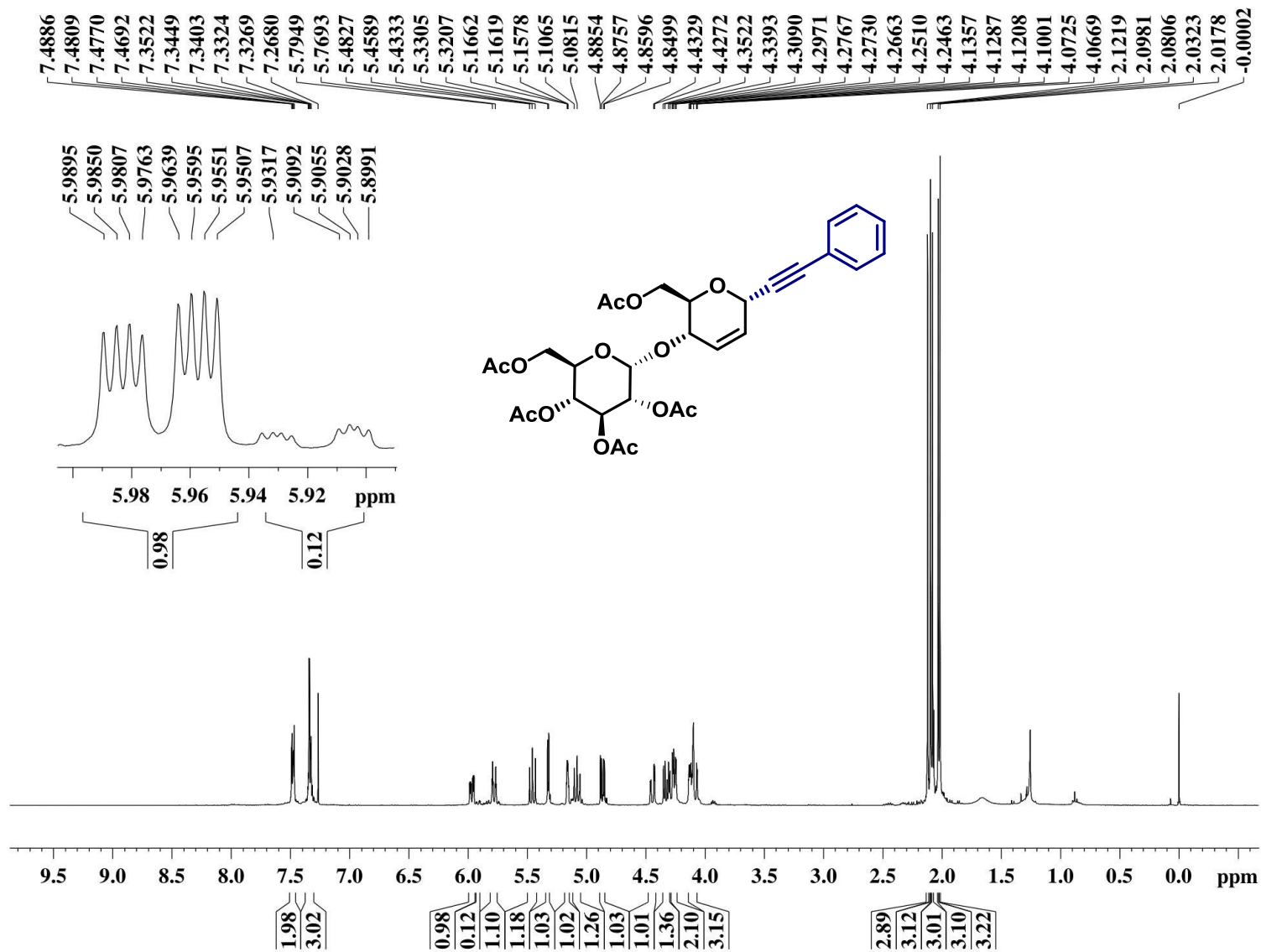
166.26
 166.02
 133.31
 133.05
 132.29
 131.78
 129.82
 129.74
 129.67
 128.72
 128.48
 128.34
 128.32
 122.70
 122.14
 86.80
 84.35
 77.35
 77.03
 76.72
 70.31
 64.58
 64.13
 63.55



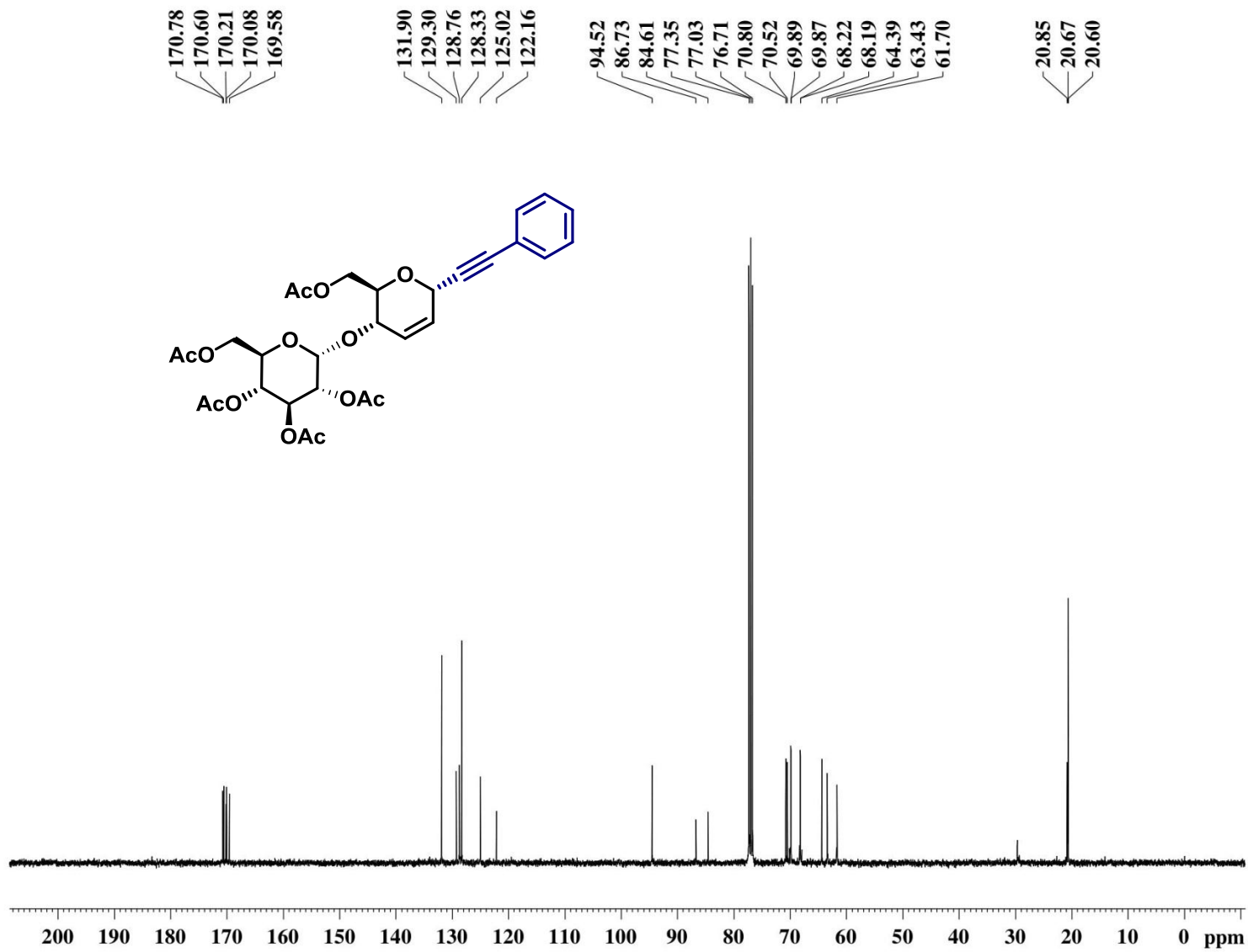
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5c** (100 MHz, CDCl_3)



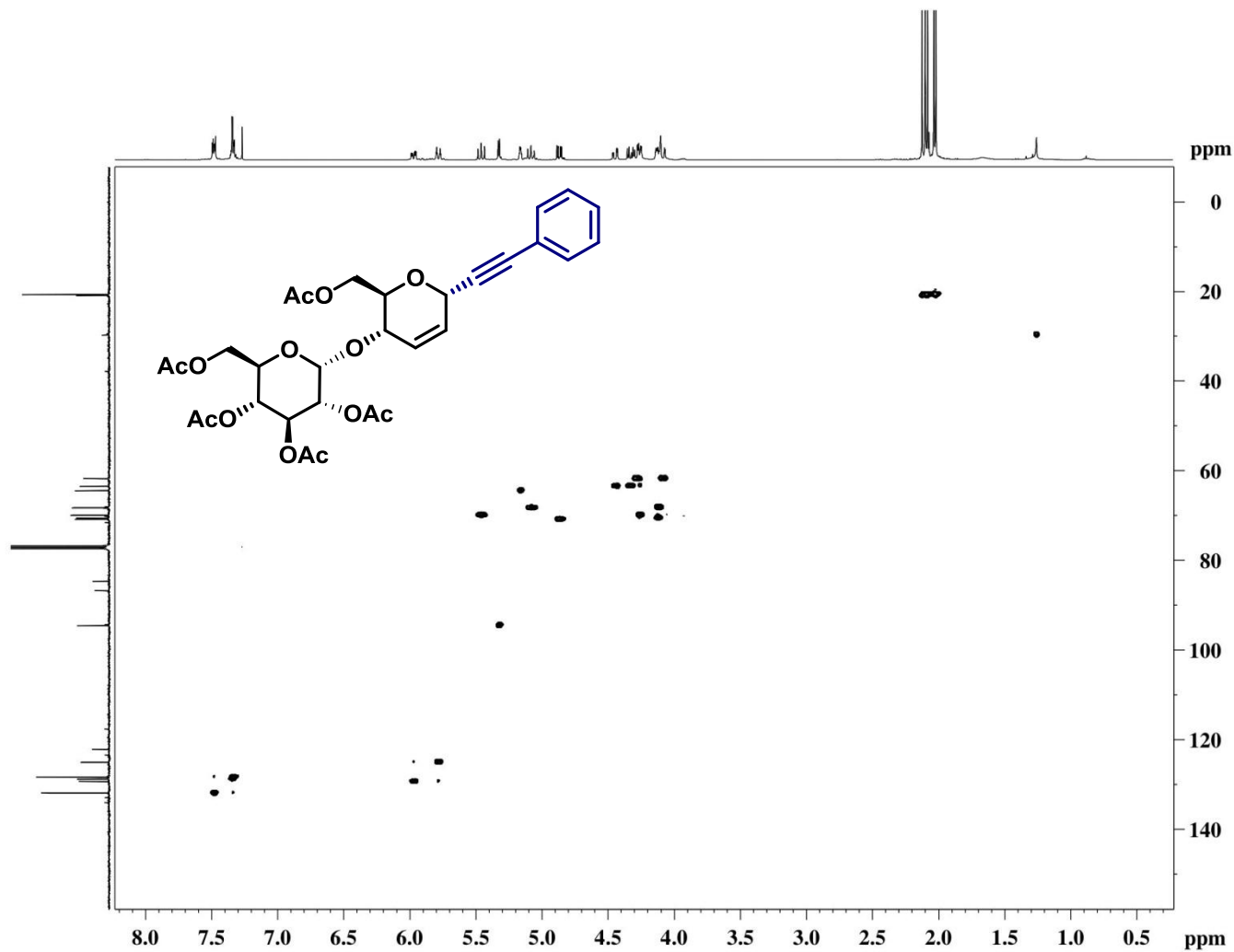
2D-HSQC spectrum of **5c** (400 MHz, CDCl₃)



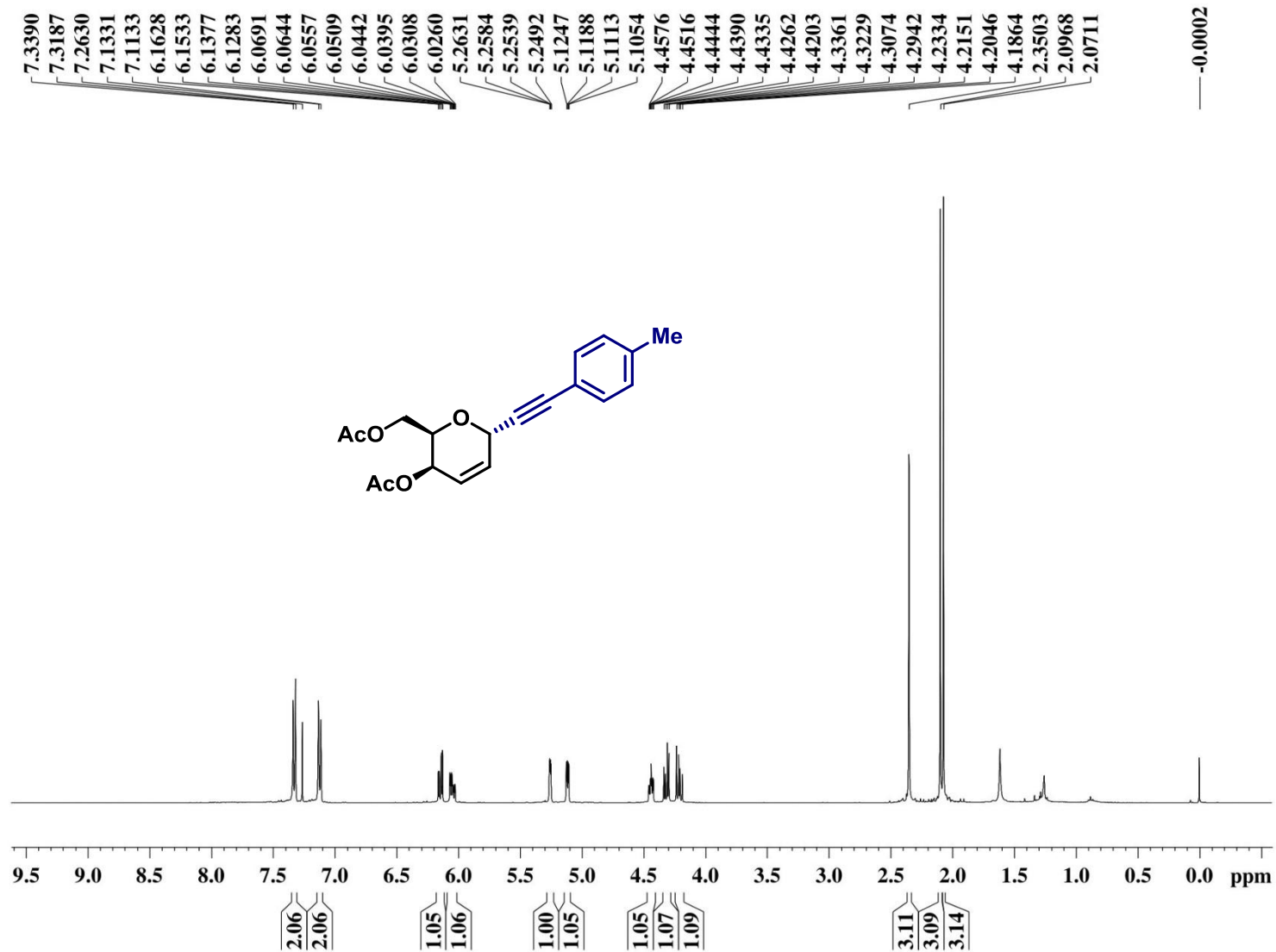
¹H NMR spectrum of **5d** (400 MHz, CDCl₃)



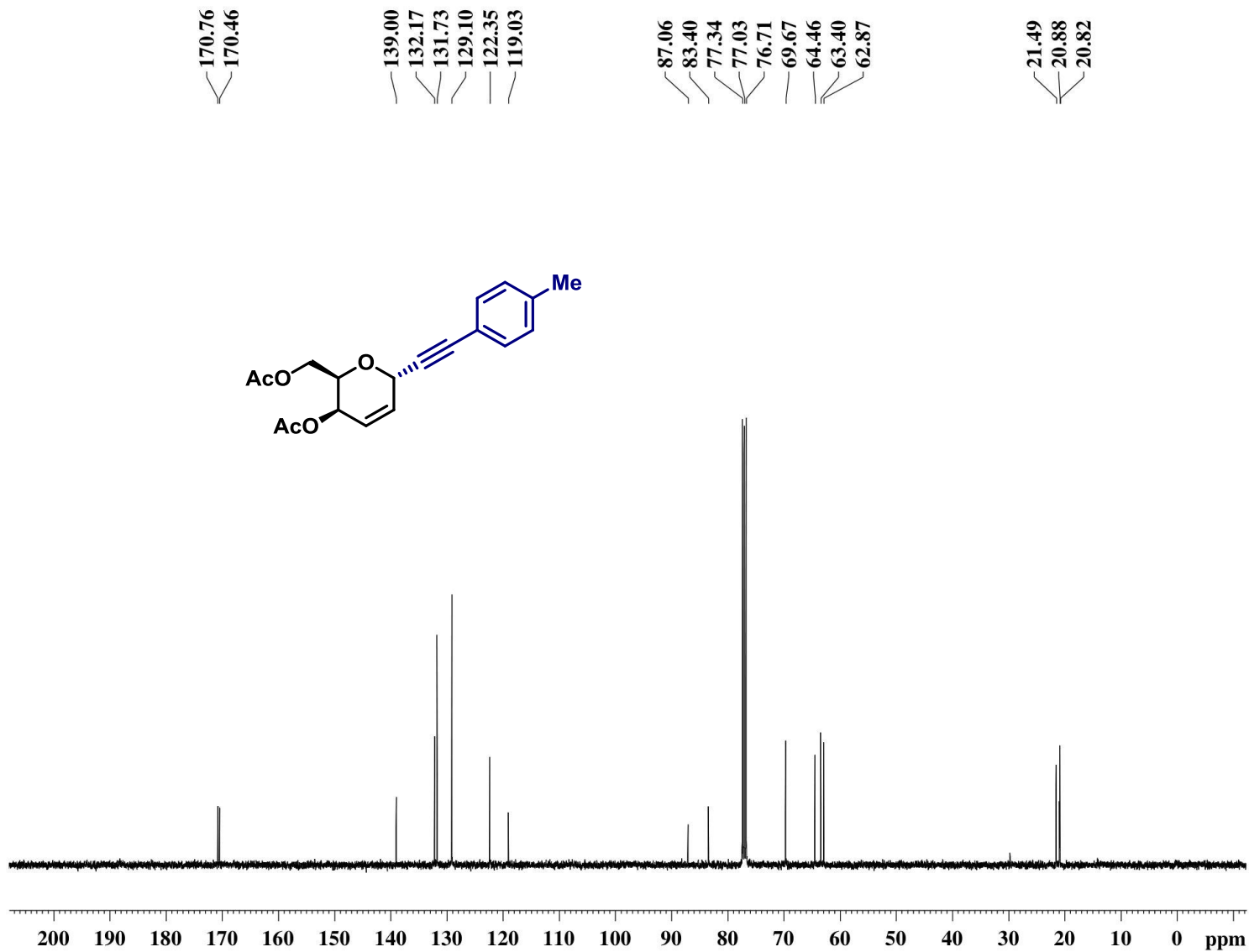
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5d** (100 MHz, CDCl_3)



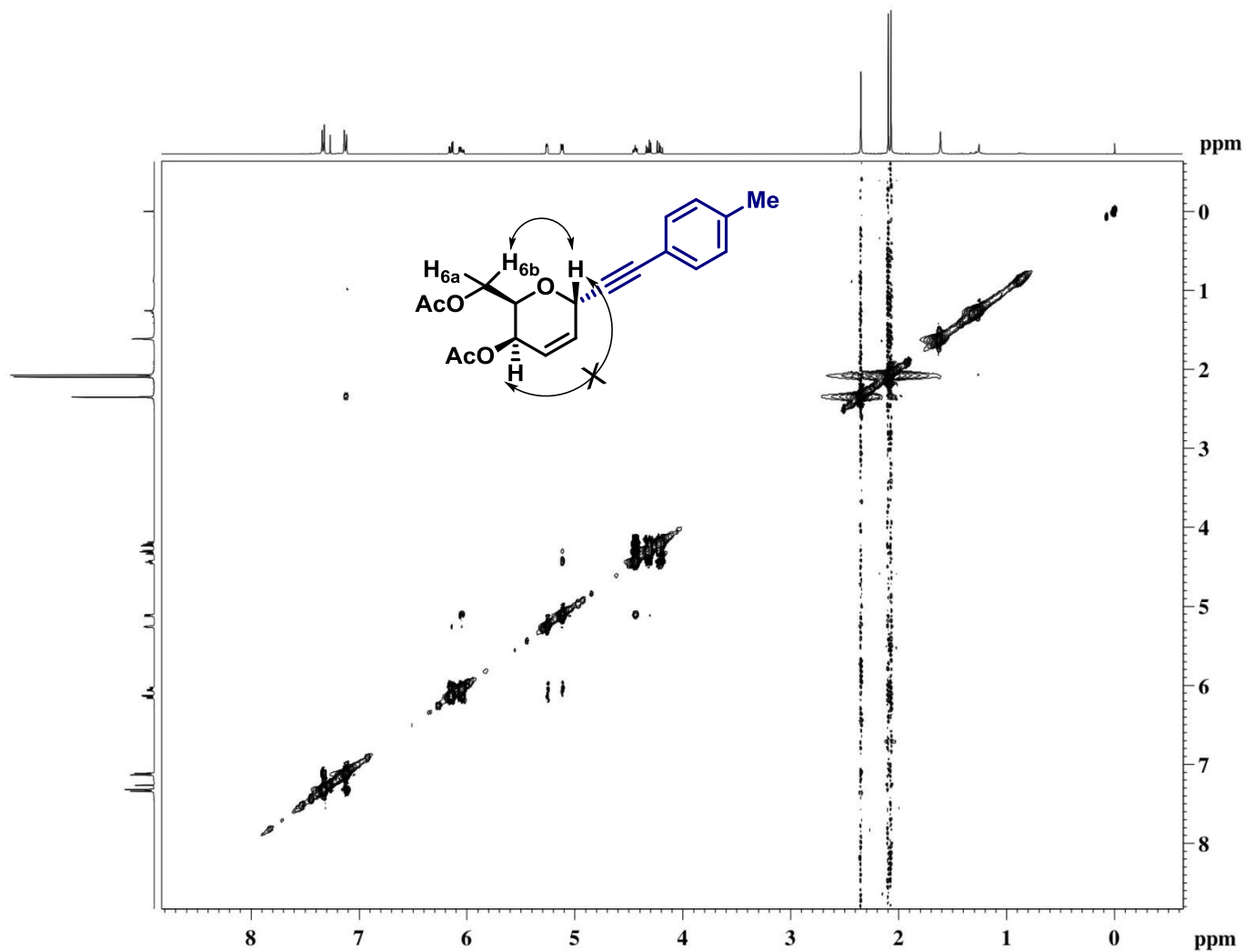
2D-HSQC spectrum of **5d** (400 MHz, CDCl₃)



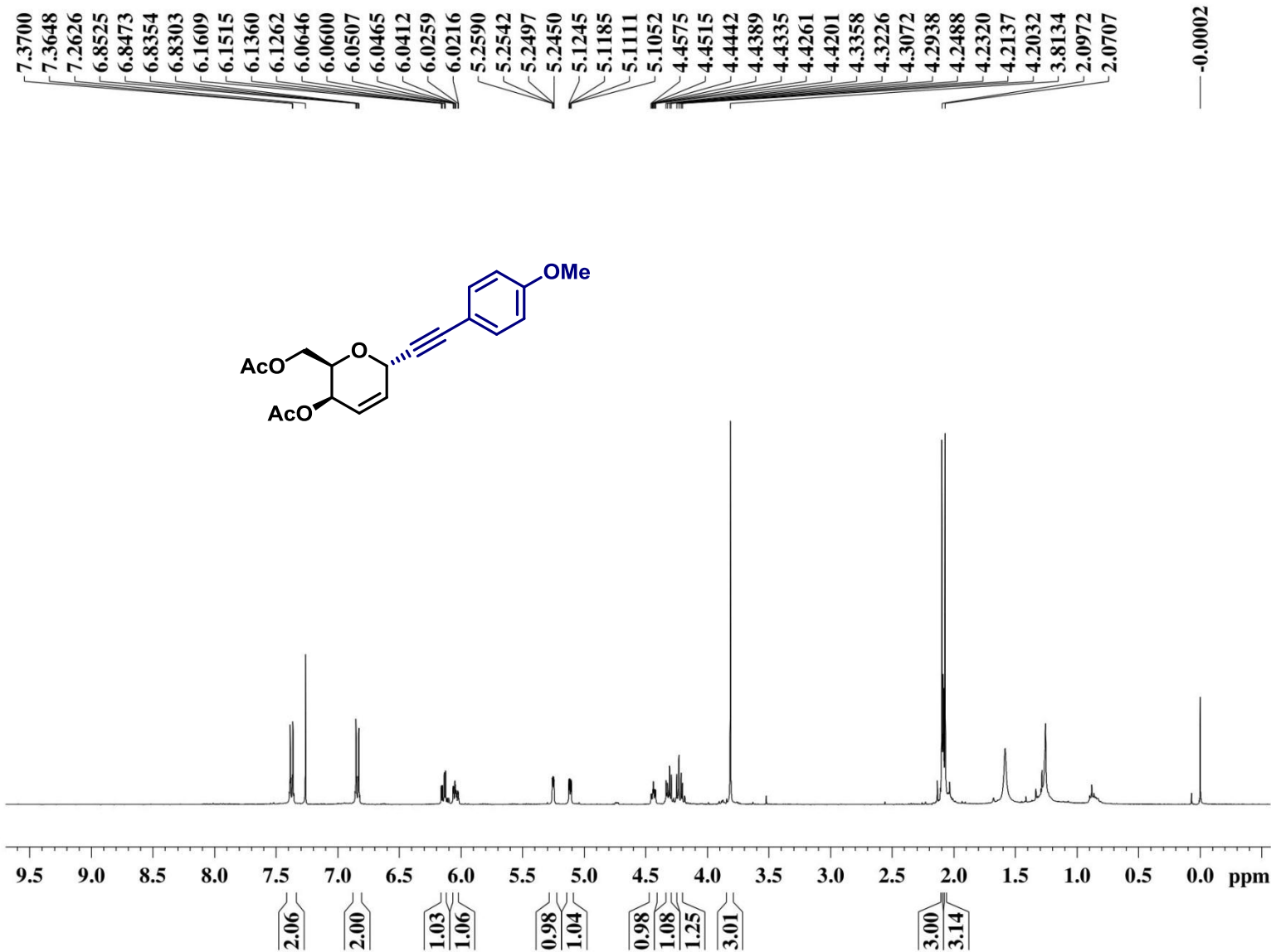
¹H NMR spectrum of **5e** (400 MHz, CDCl₃)



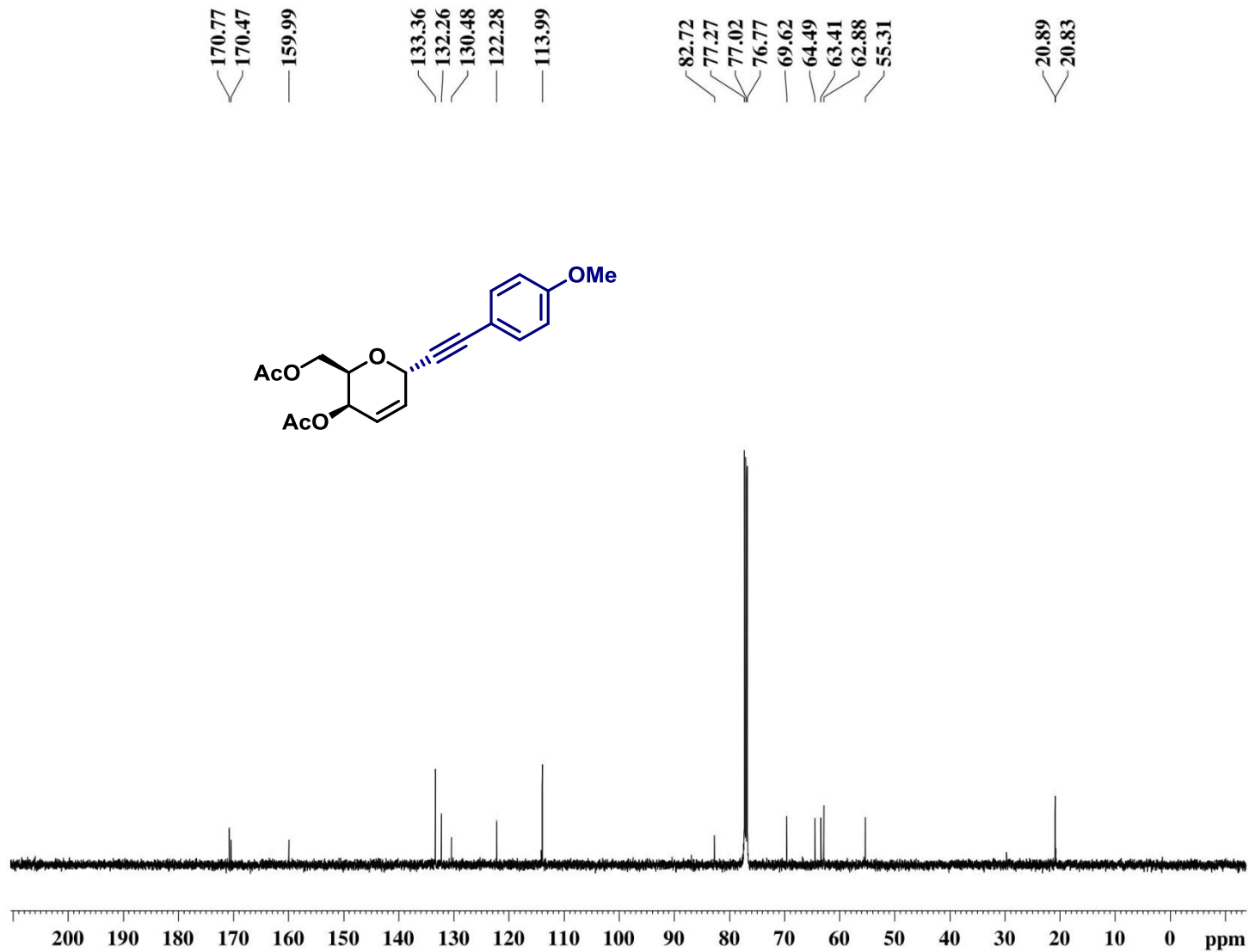
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5e** (100 MHz, CDCl_3)



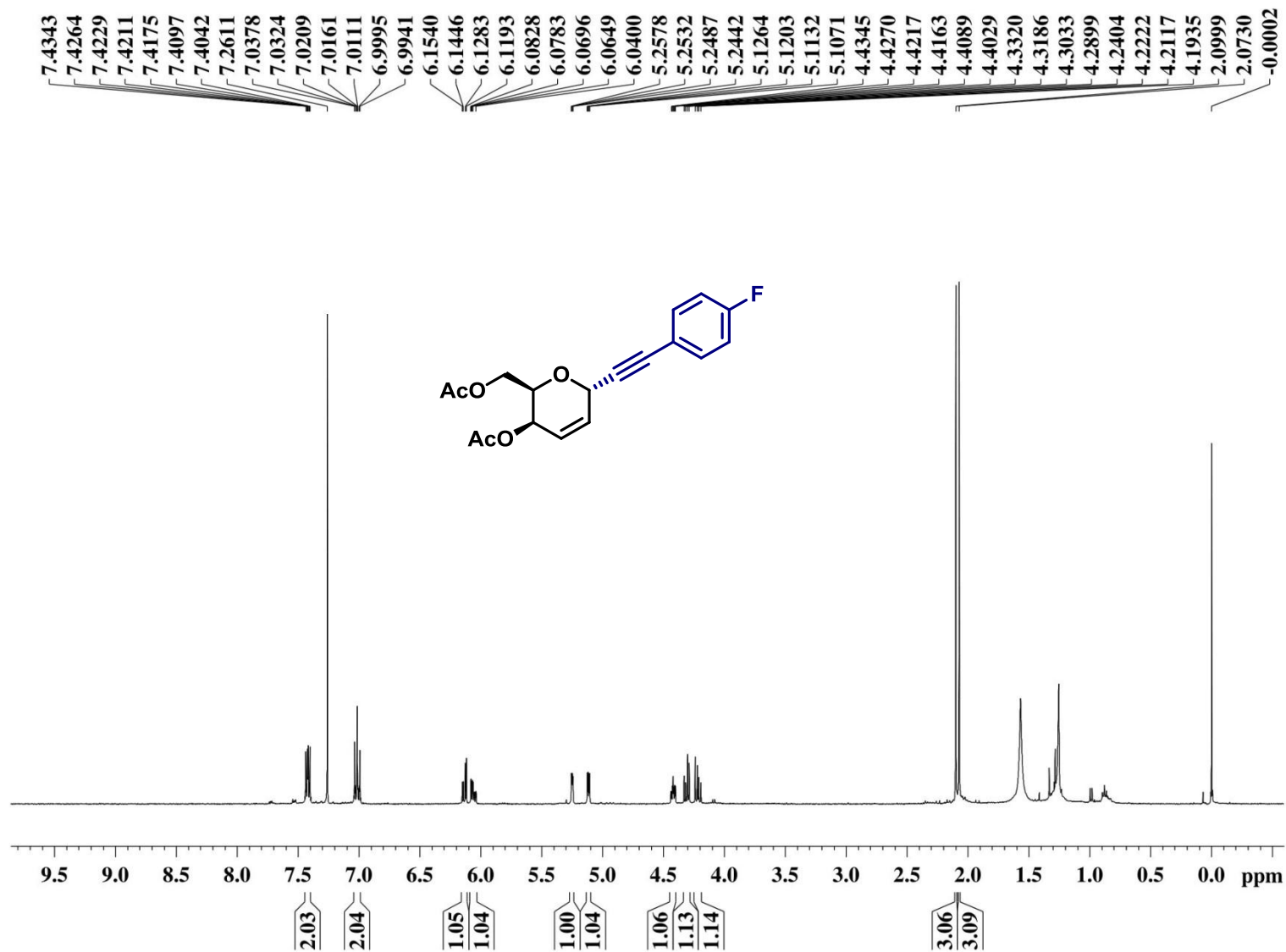
2D-NOESY NMR spectrum of **5e** (400 MHz, CDCl₃)



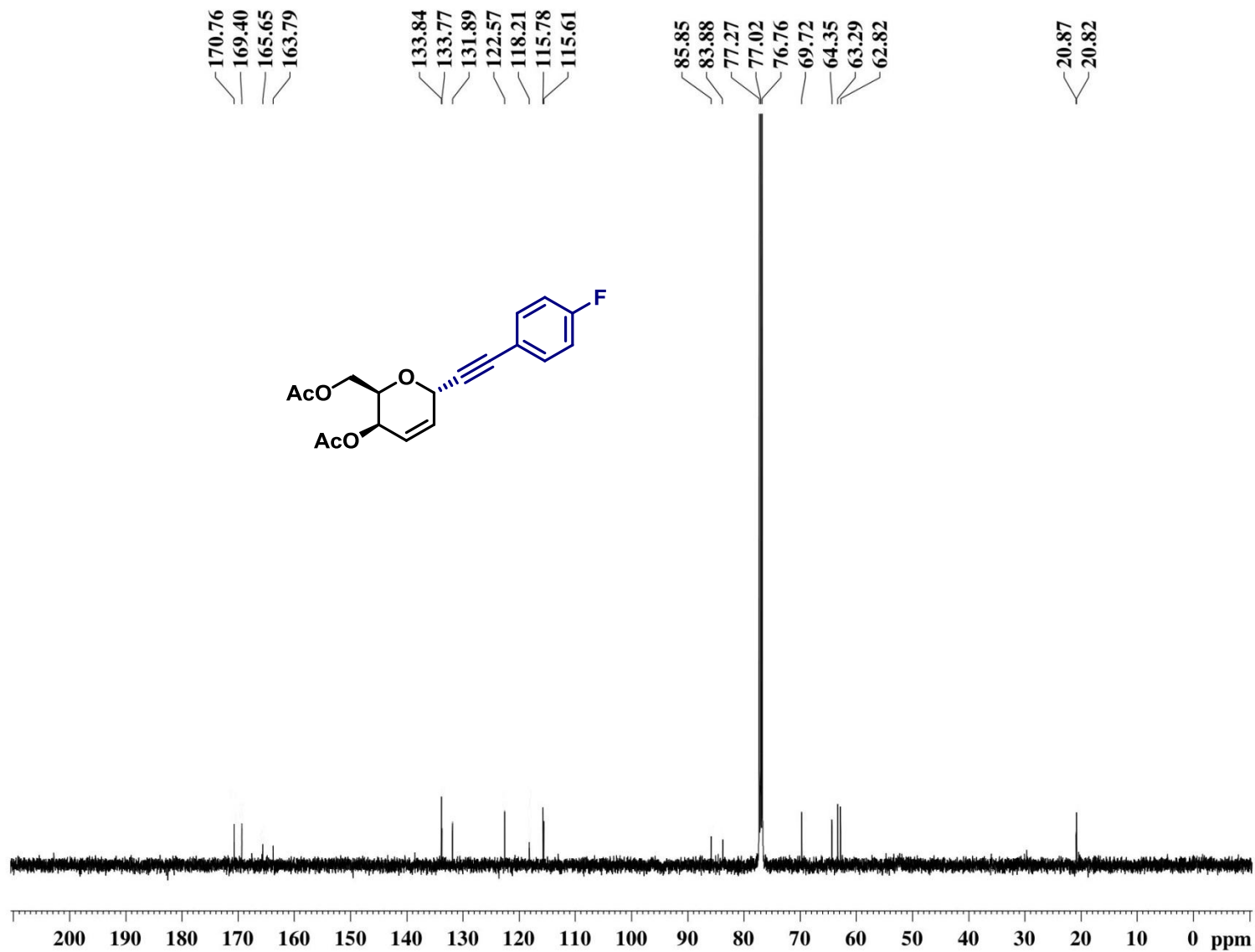
¹H NMR spectrum of **5f** (400 MHz, CDCl₃)



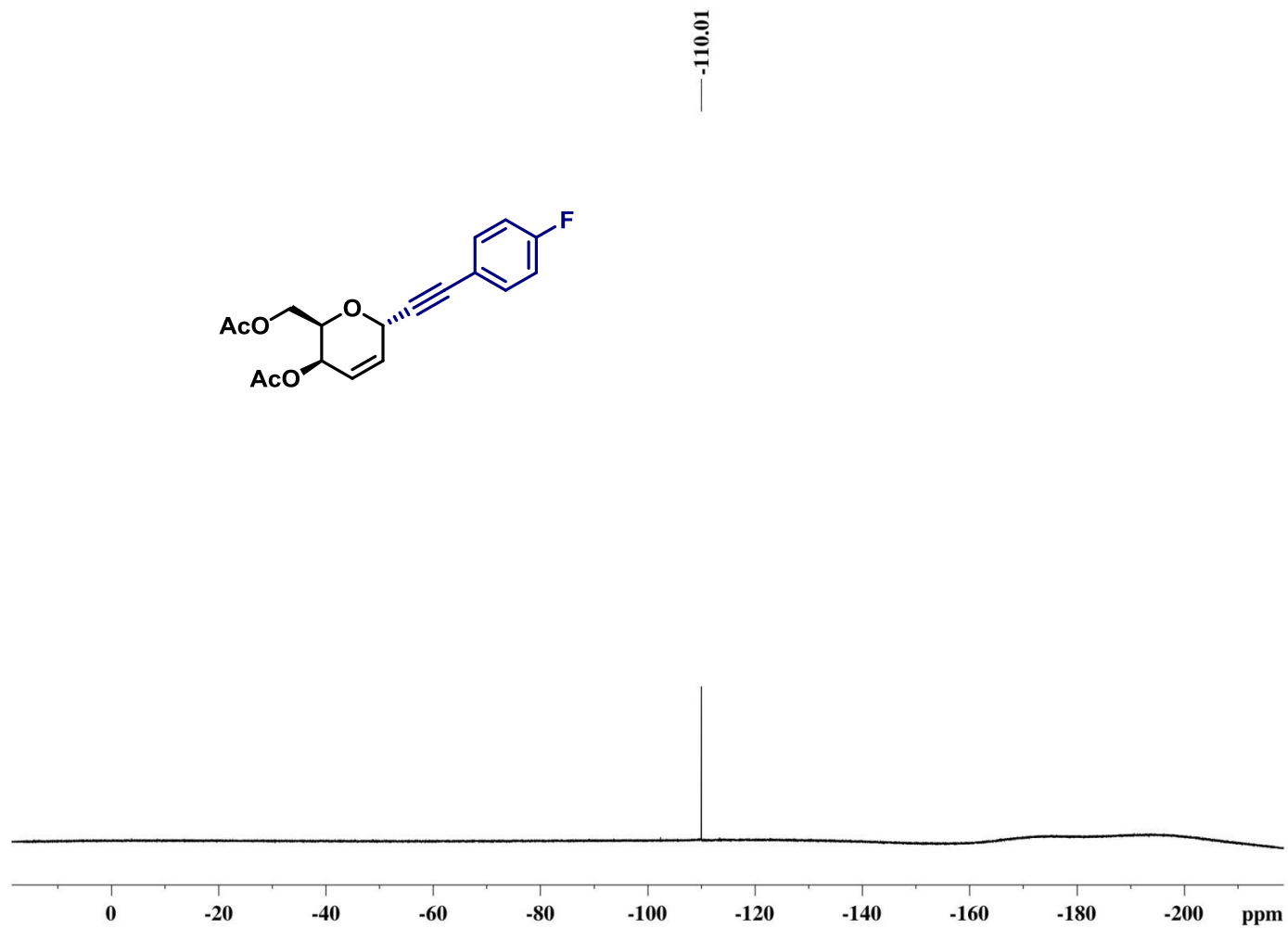
$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5f** (100 MHz, CDCl_3)



¹H NMR spectrum of **5g** (400 MHz, CDCl₃)



$^{13}\text{C}\{^1\text{H}\}$ NMR spectrum of **5g** (100 MHz, CDCl_3)



^{19}F NMR of **5g** (376 MHz, CDCl_3)