



UNIVERSITAT<sup>DE</sup>  
BARCELONA

## Aminocyclitol and iminosugar derivatives related to Gauche disease

Ester Monlleó Mas

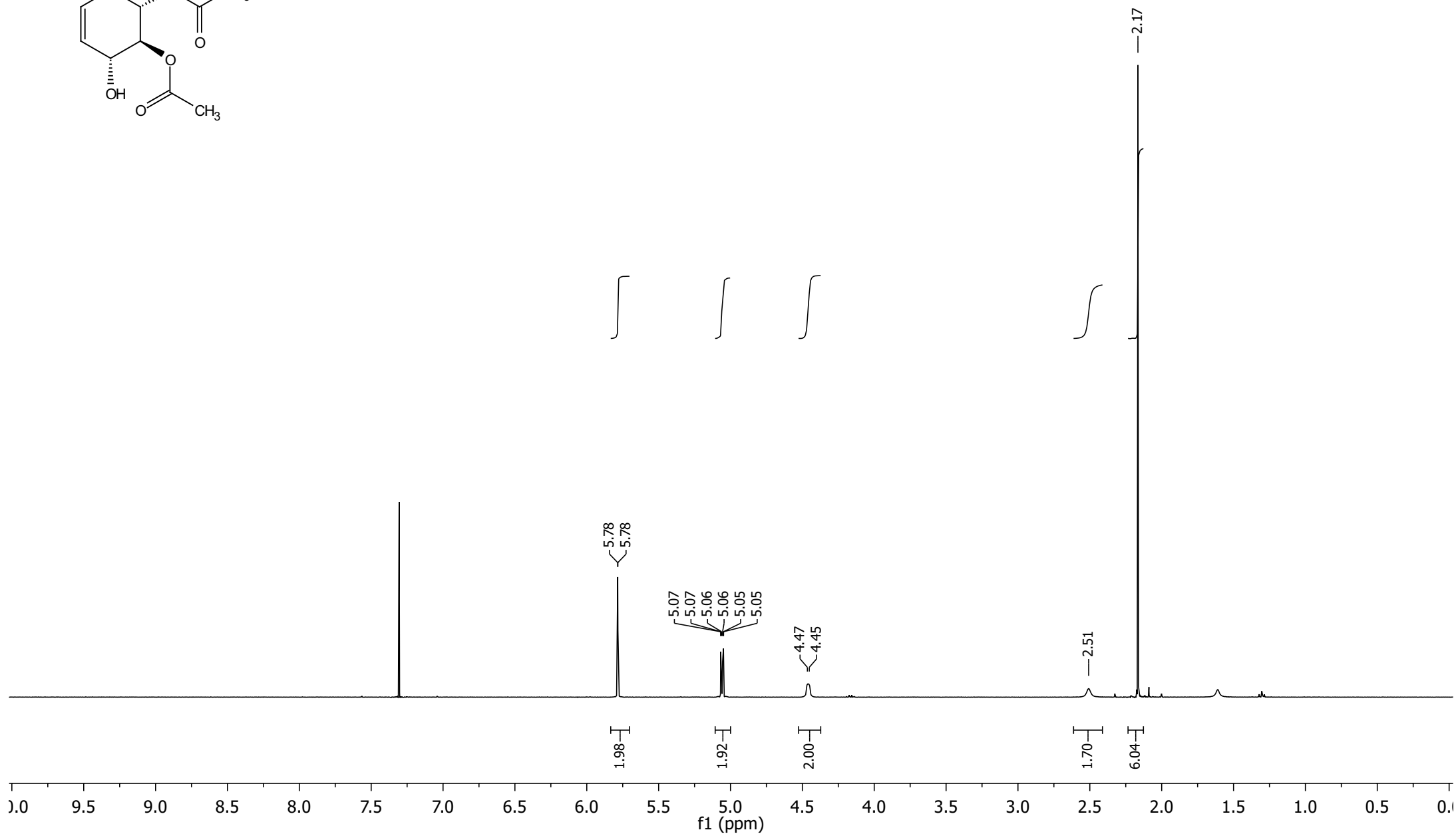
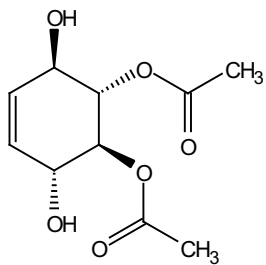


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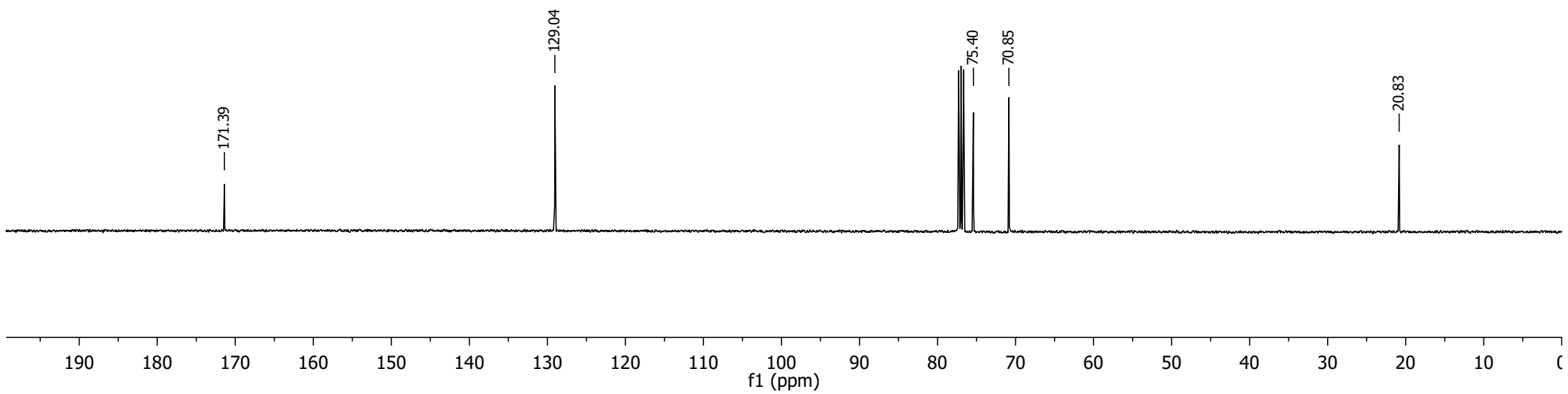
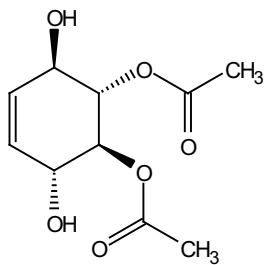
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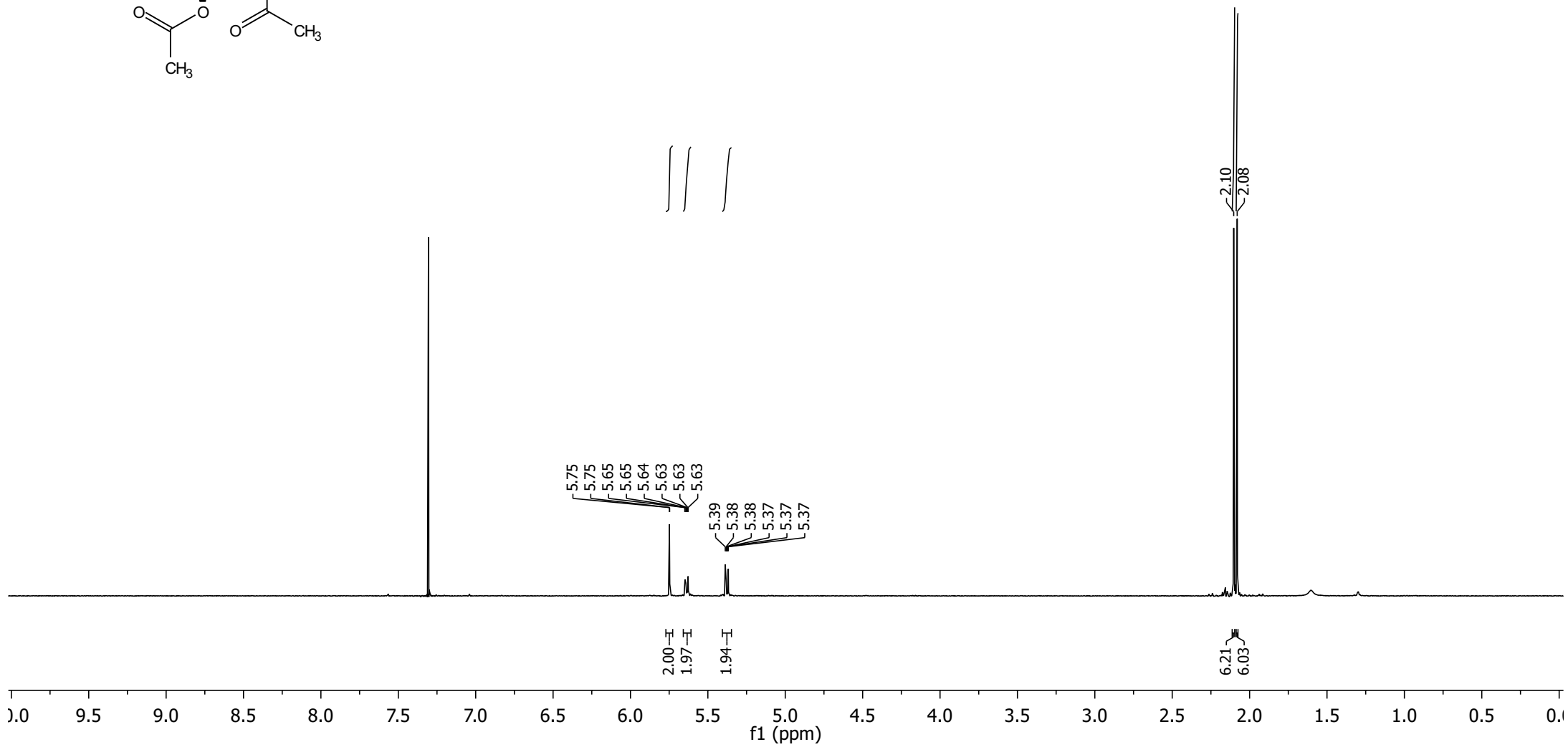
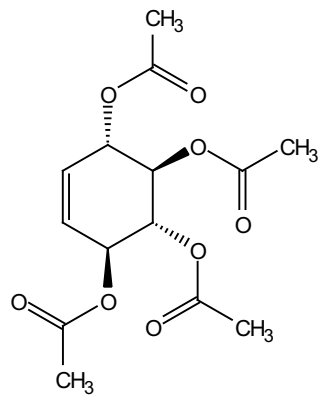
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (-)-54



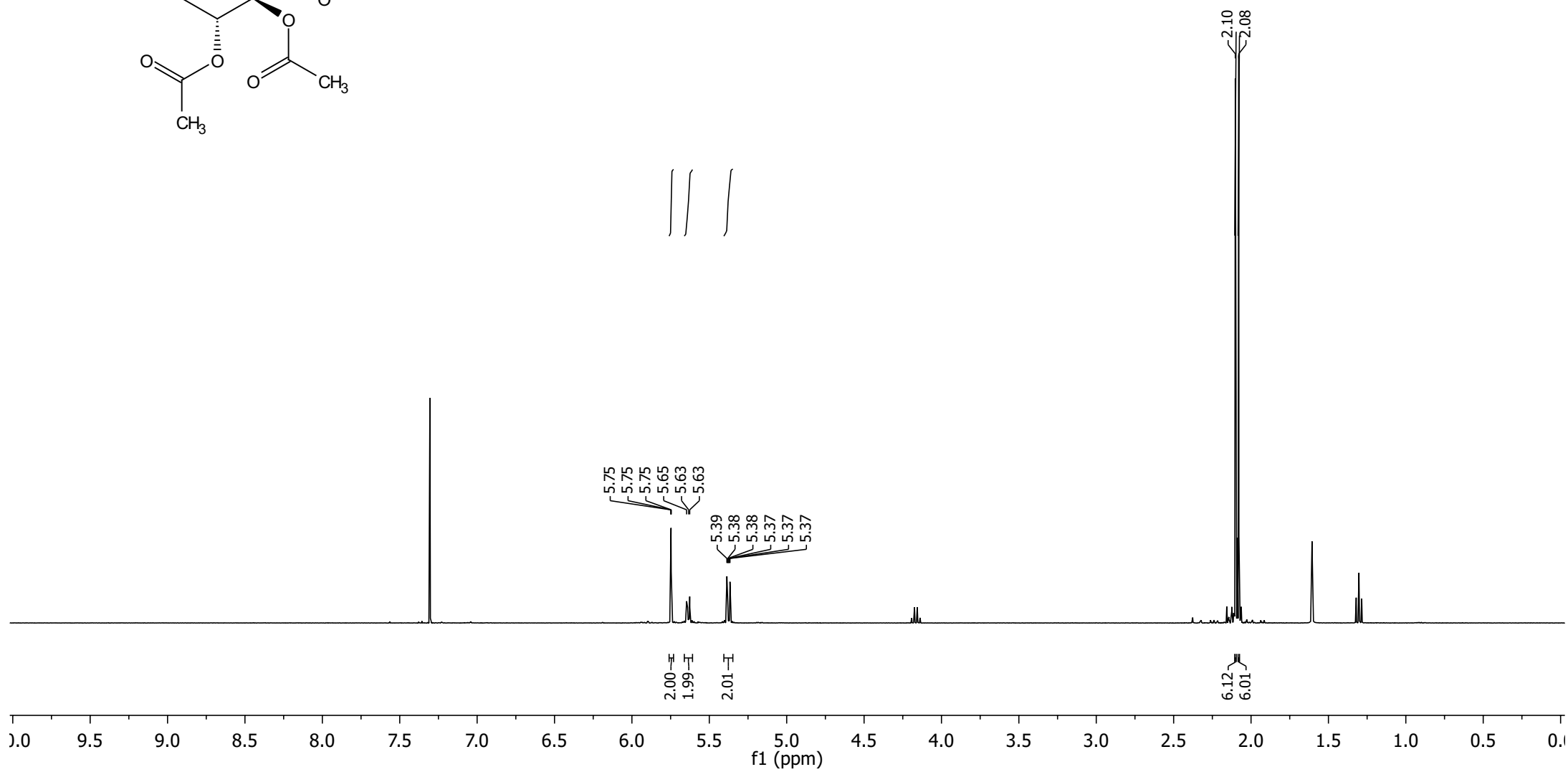
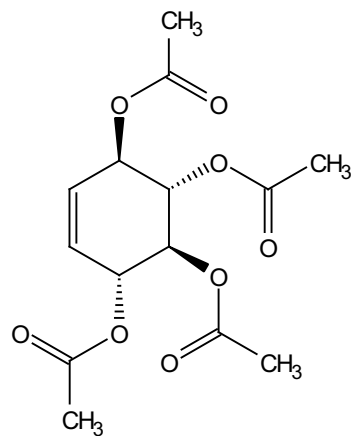
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (-)-54



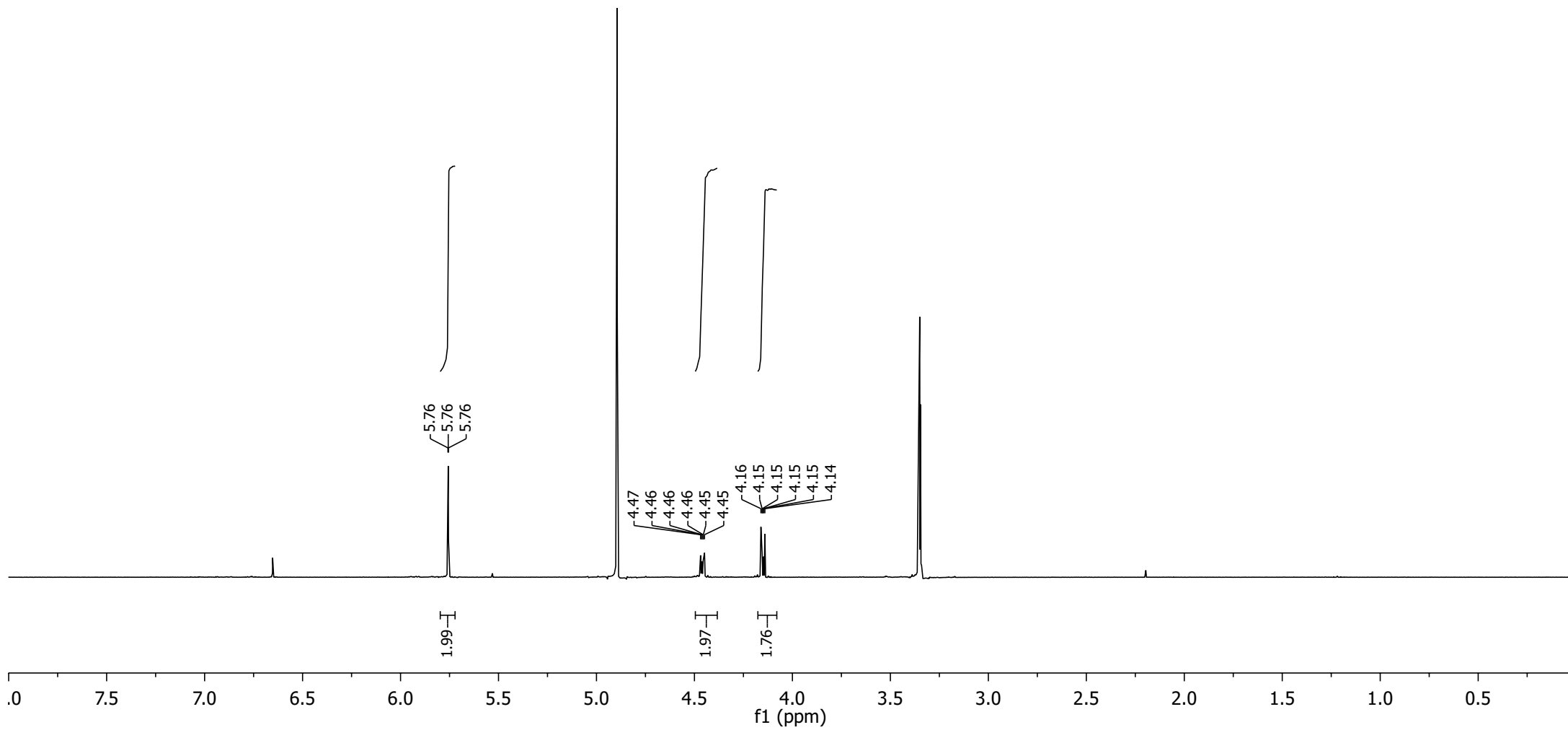
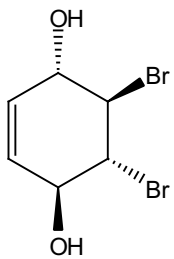
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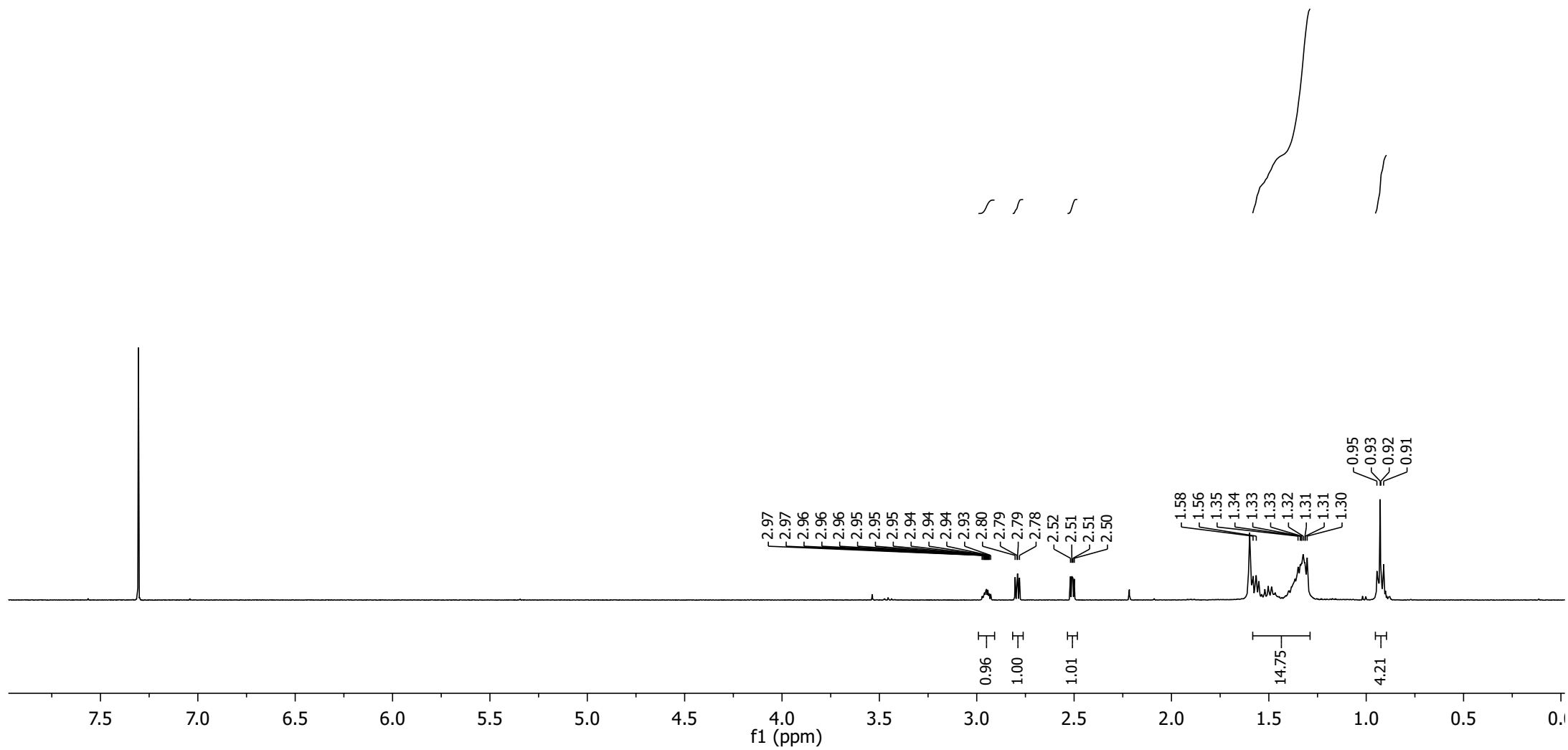
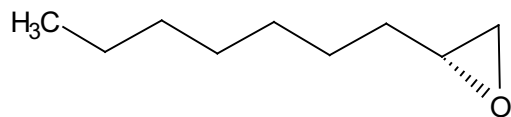
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (±)-49



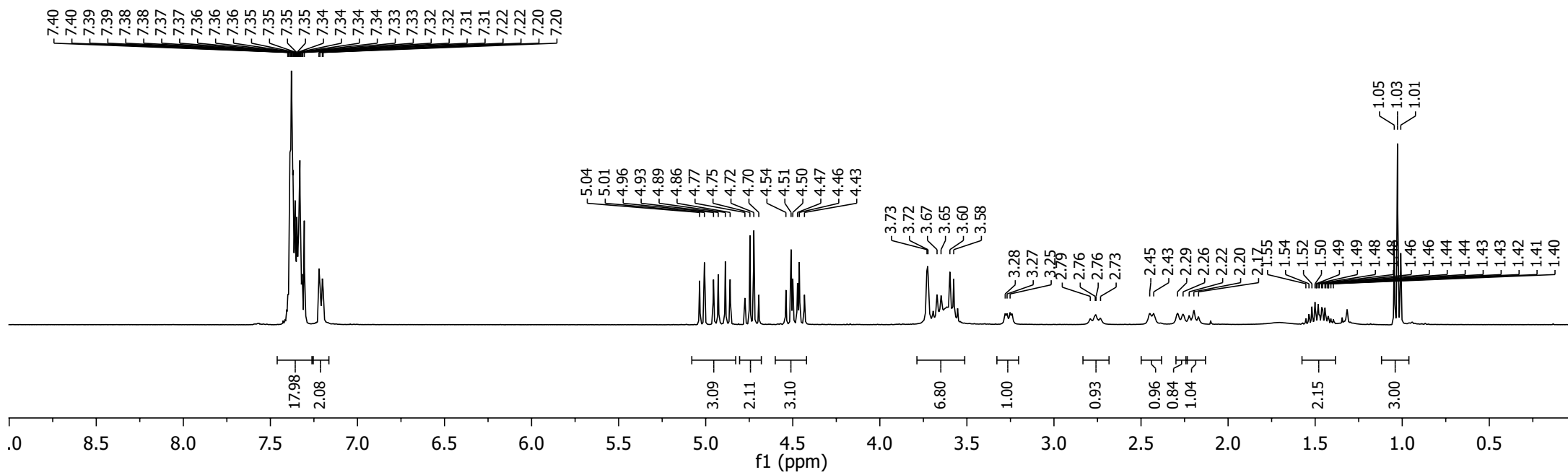
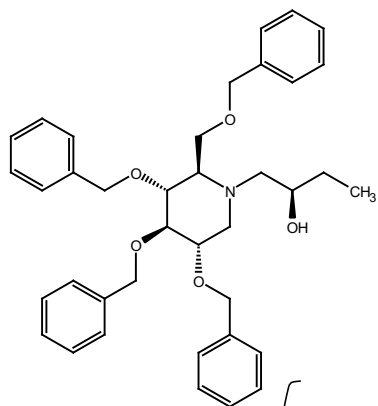
<sup>1</sup>H NMR (MeOD, 400 MHz) of (±)-53



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-83y

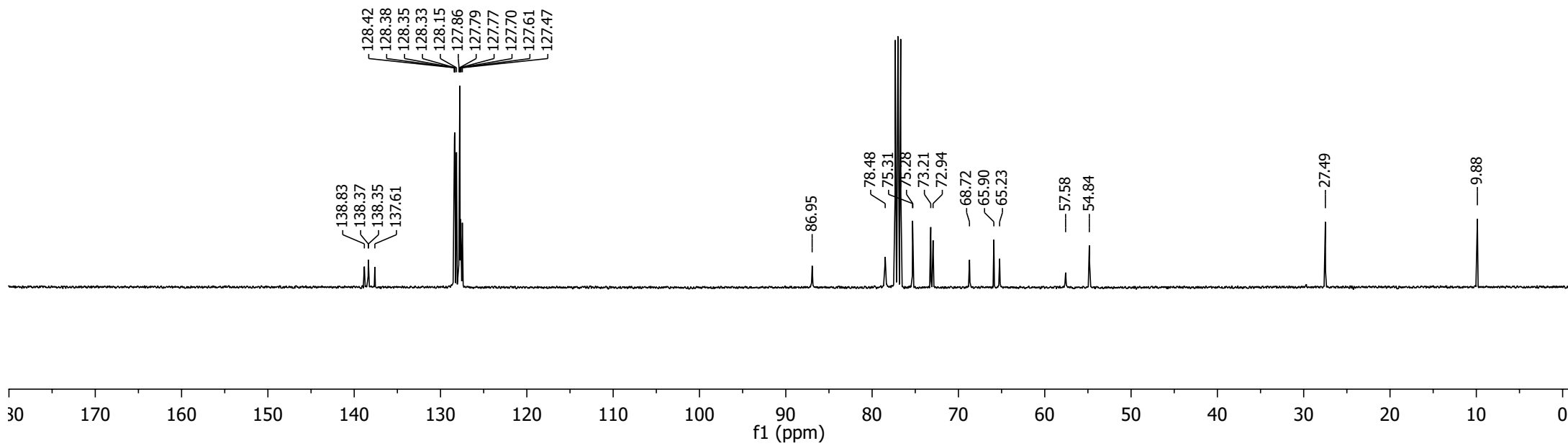
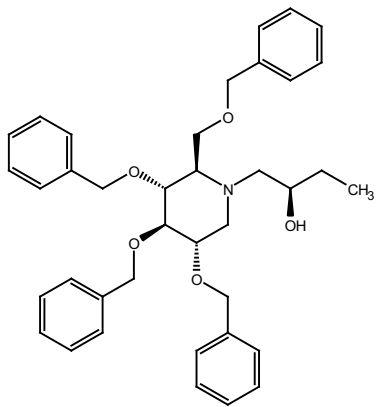


<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-84x

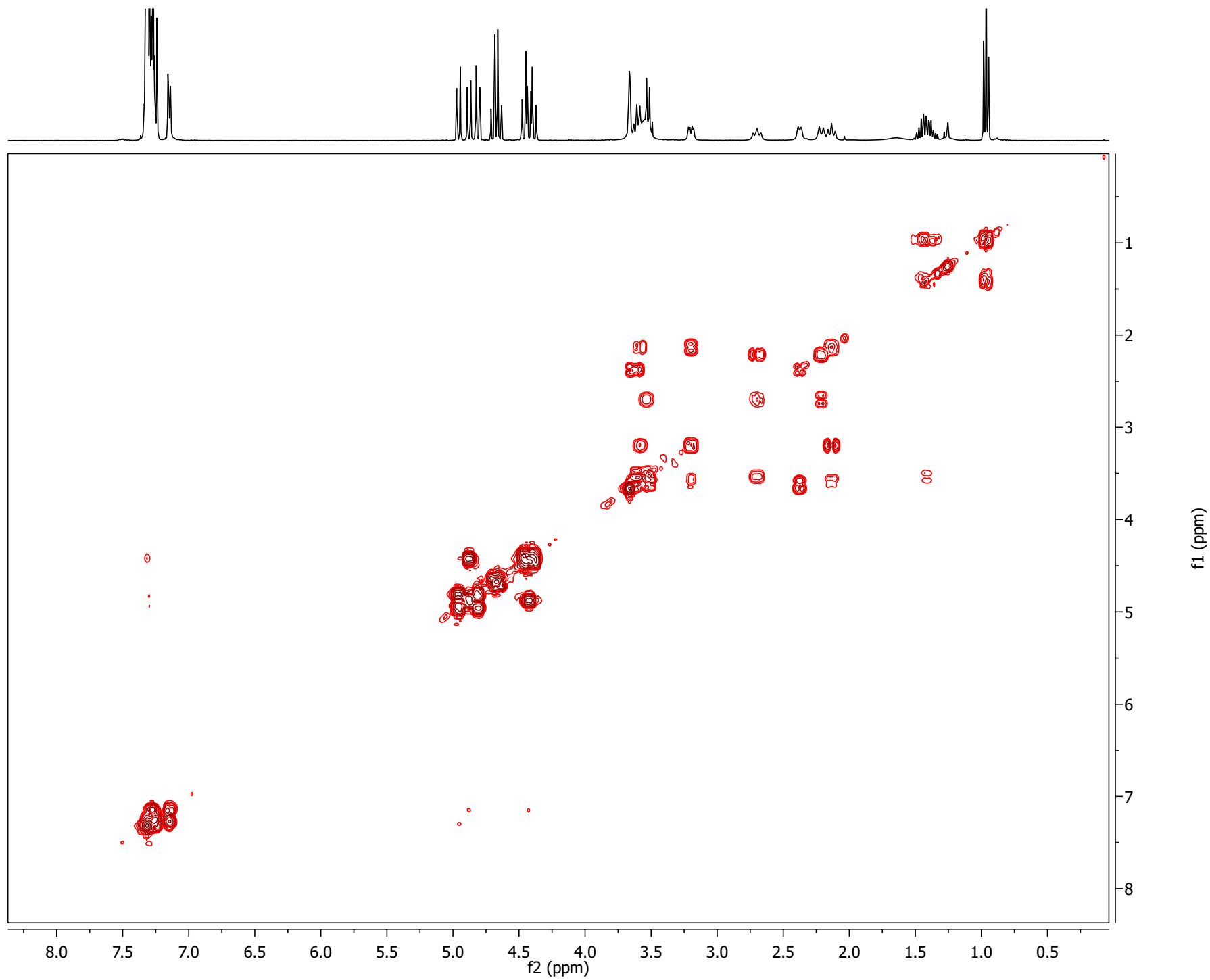
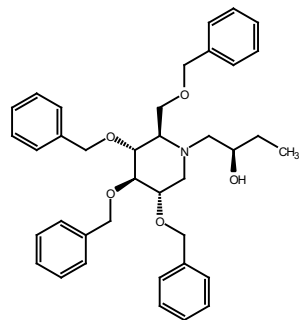




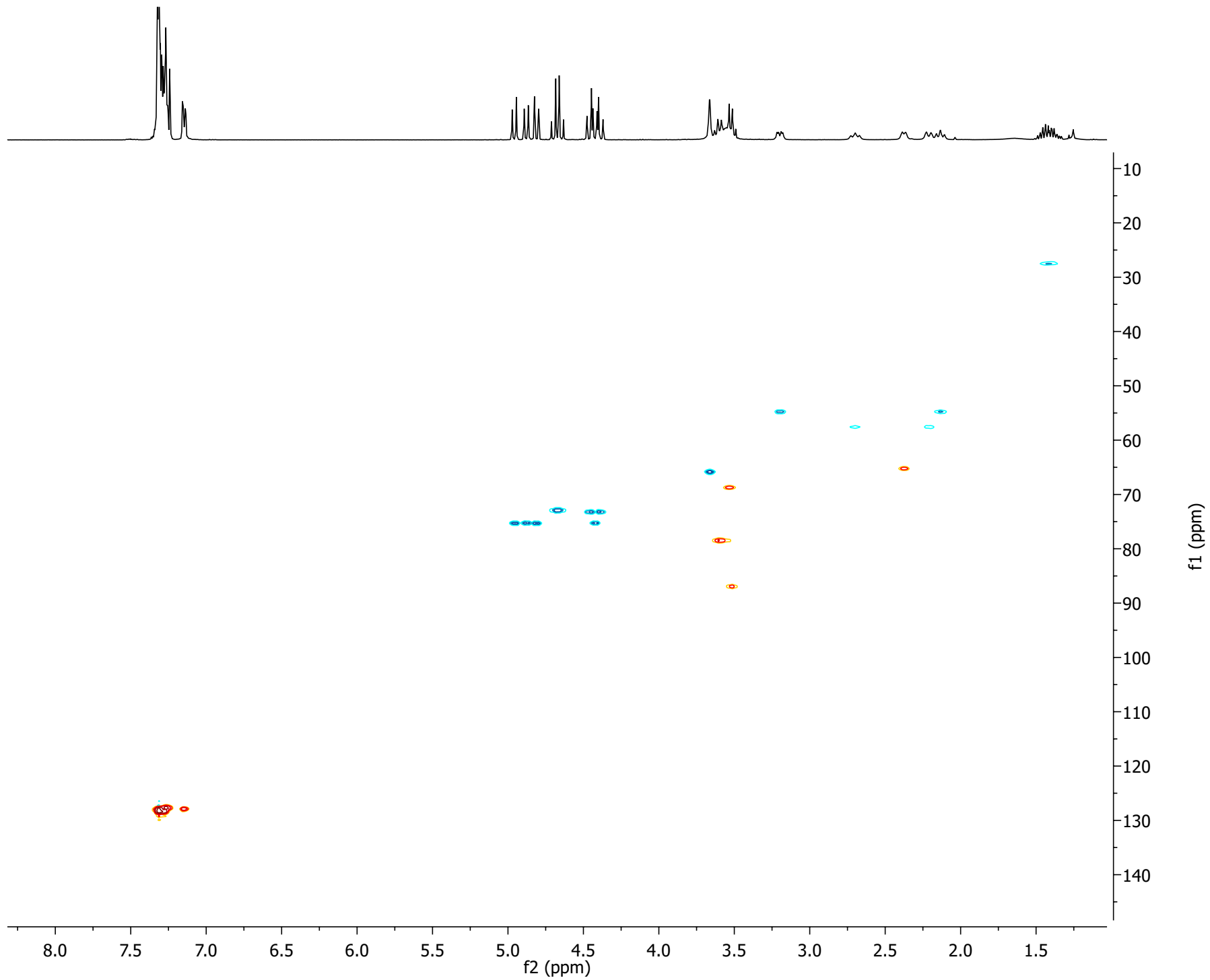
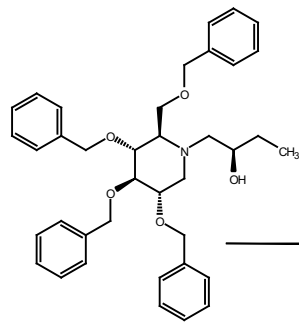
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-84x



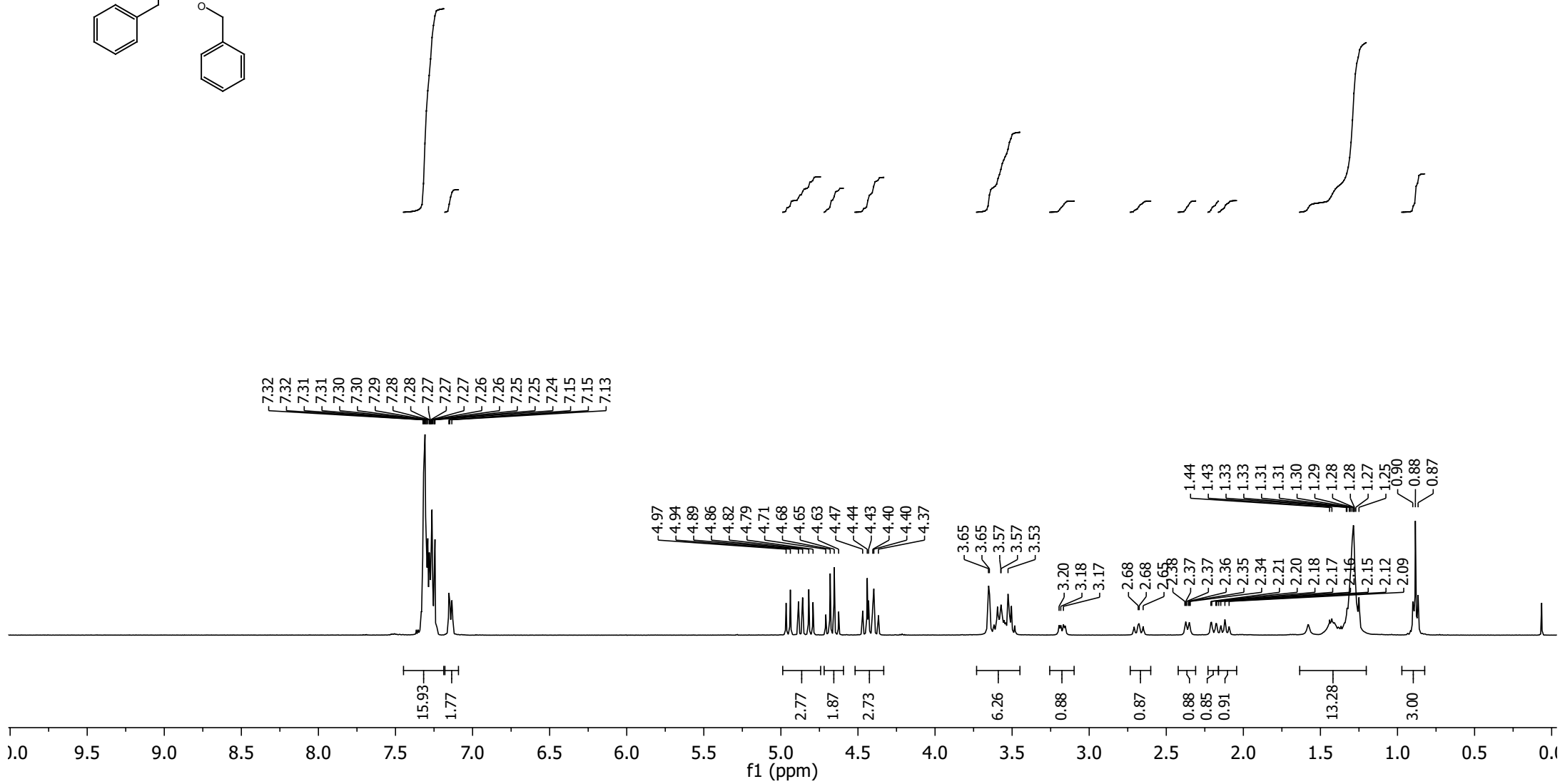
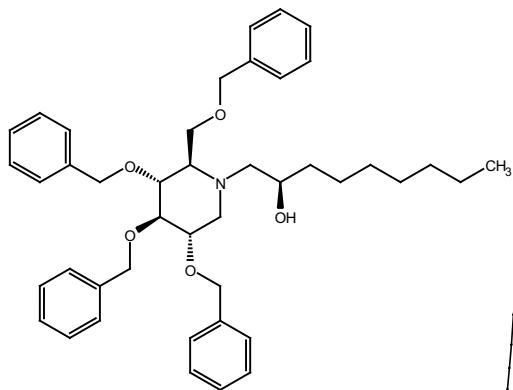
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (R)-84x



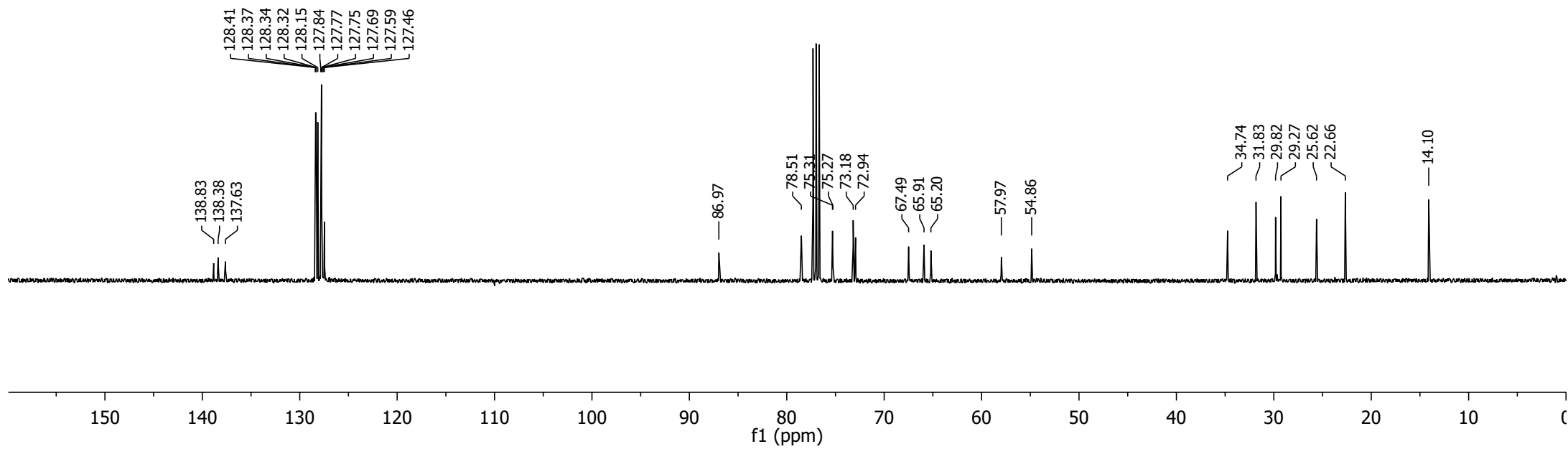
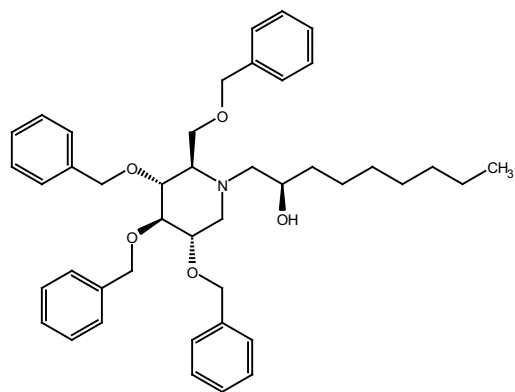
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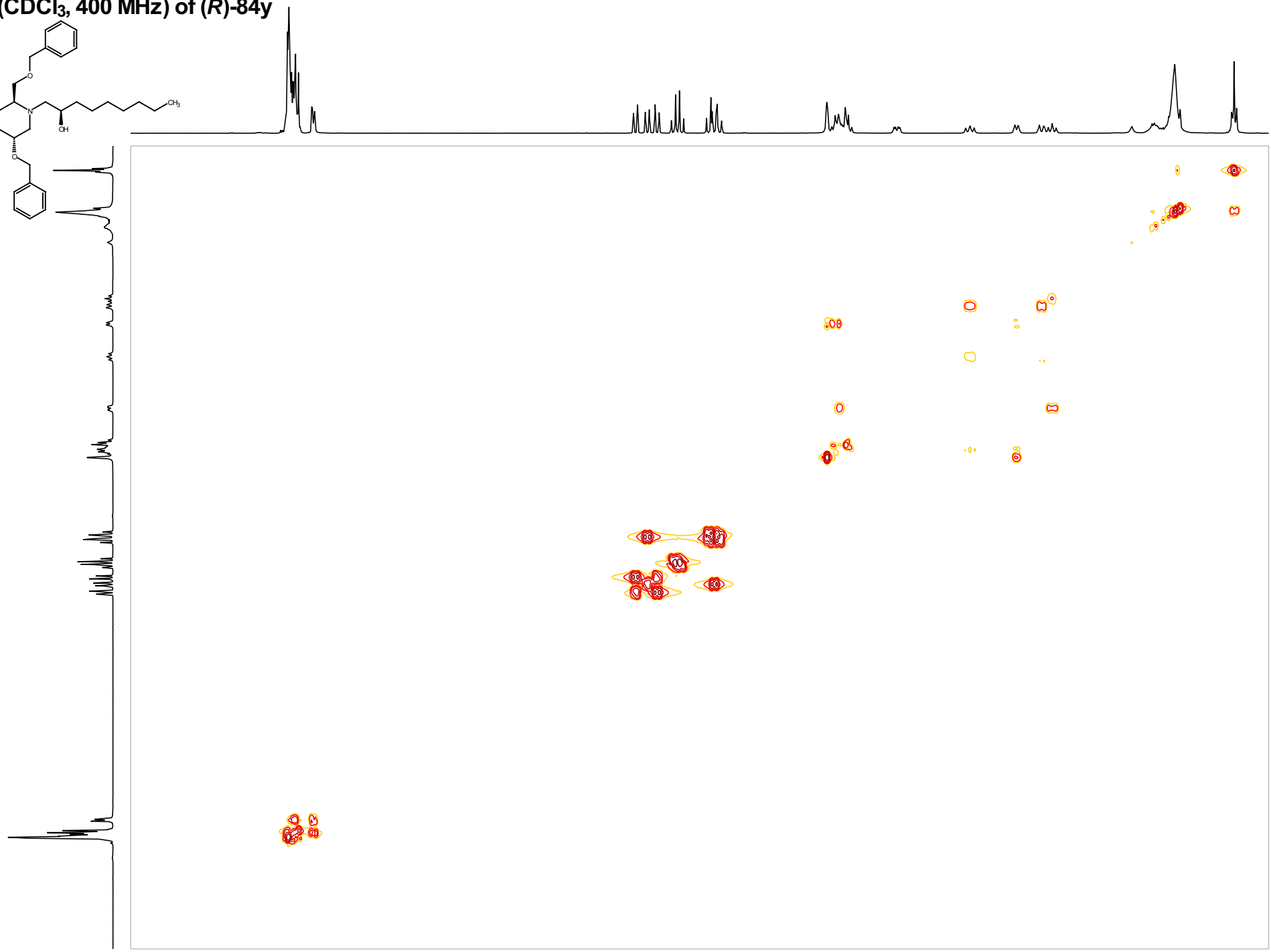
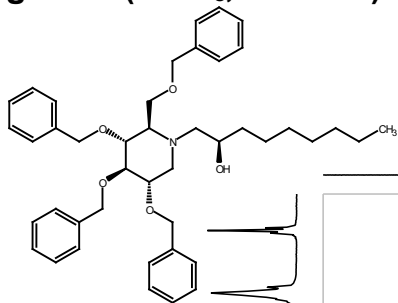
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-84y



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-84y



gCOSY (CDCl<sub>3</sub>, 400 MHz) of (R)-84y

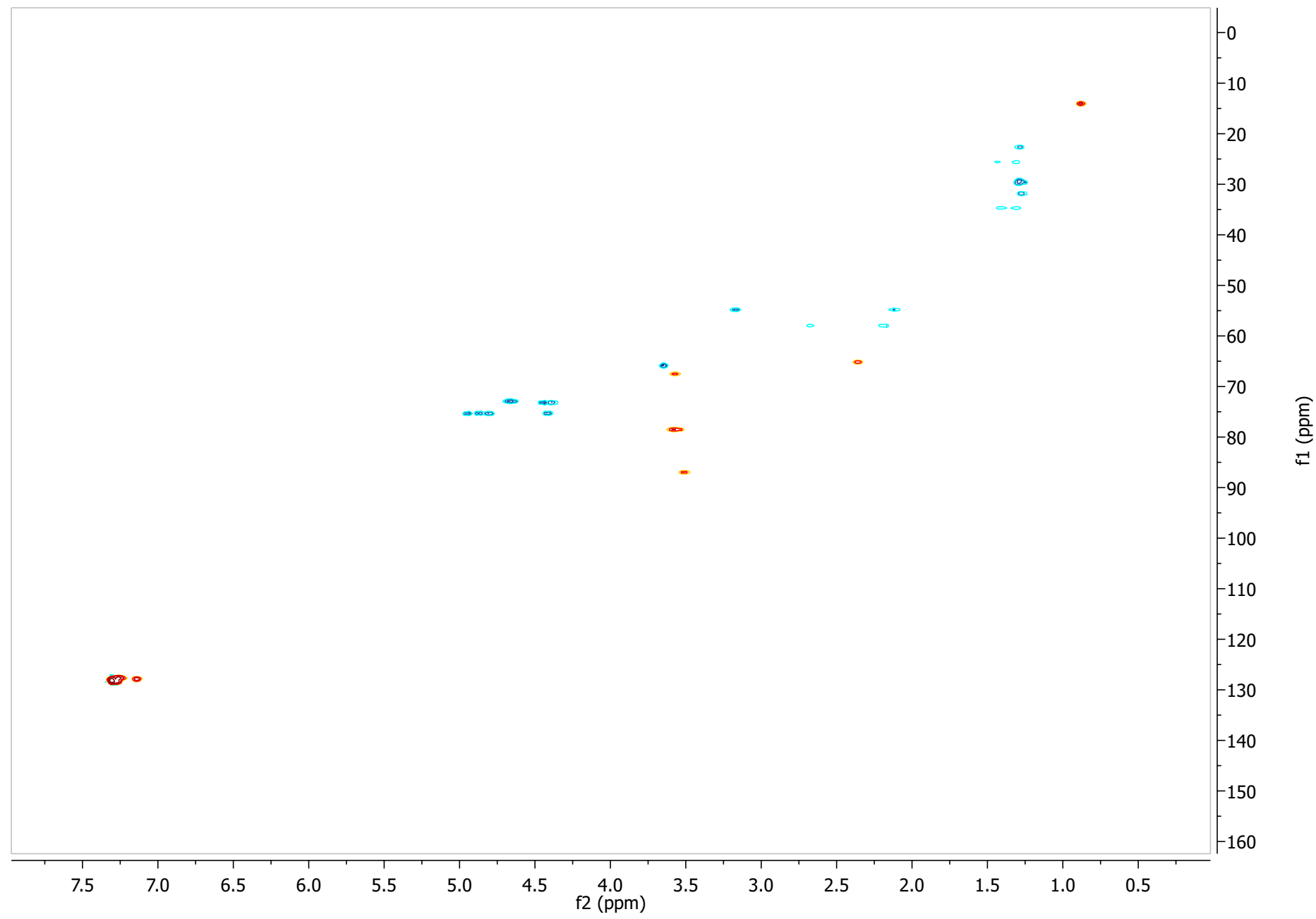
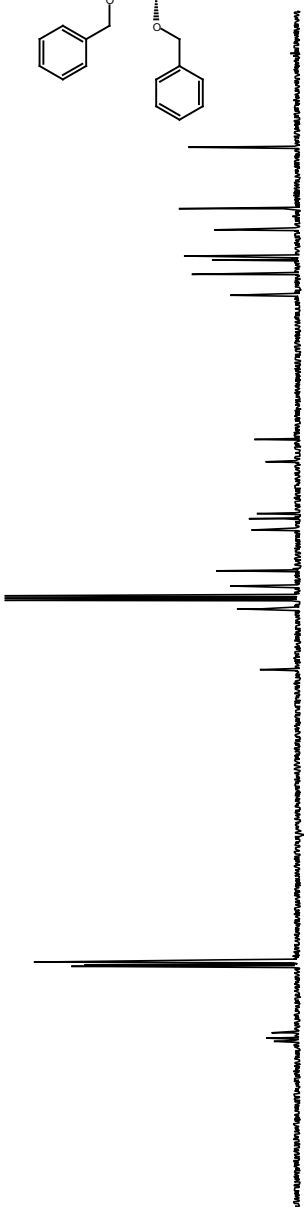
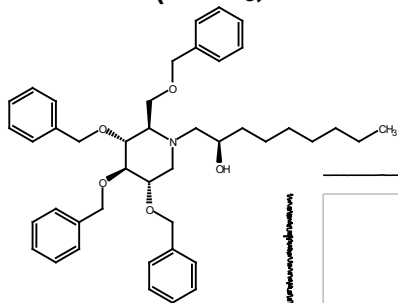


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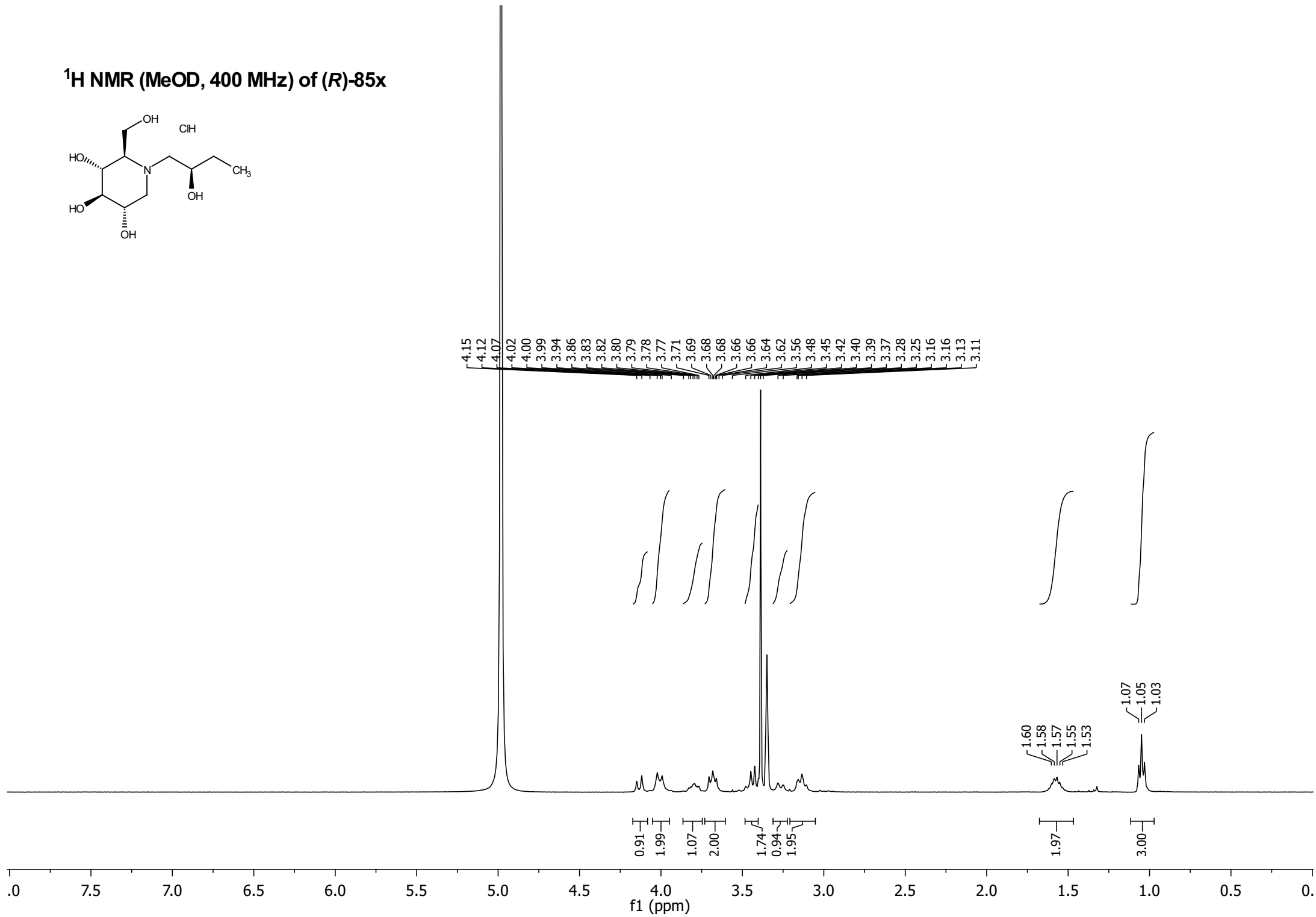
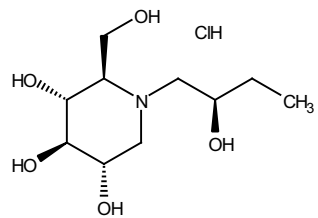
f2 (ppm)

f1 (ppm)

# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (R)-84y



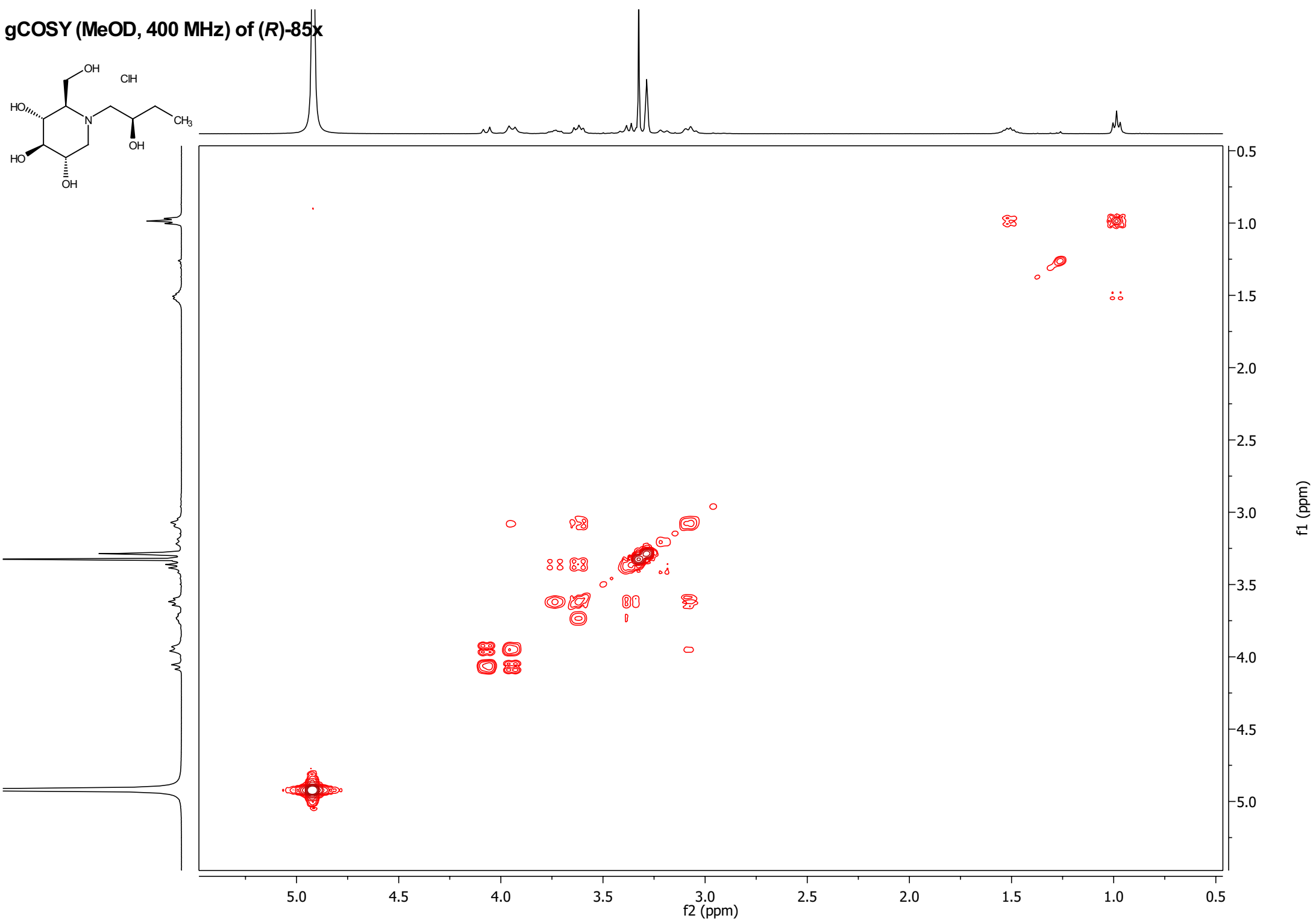
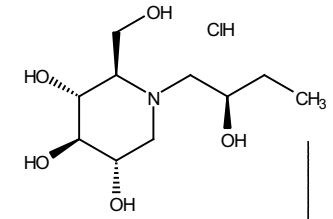
<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-85x



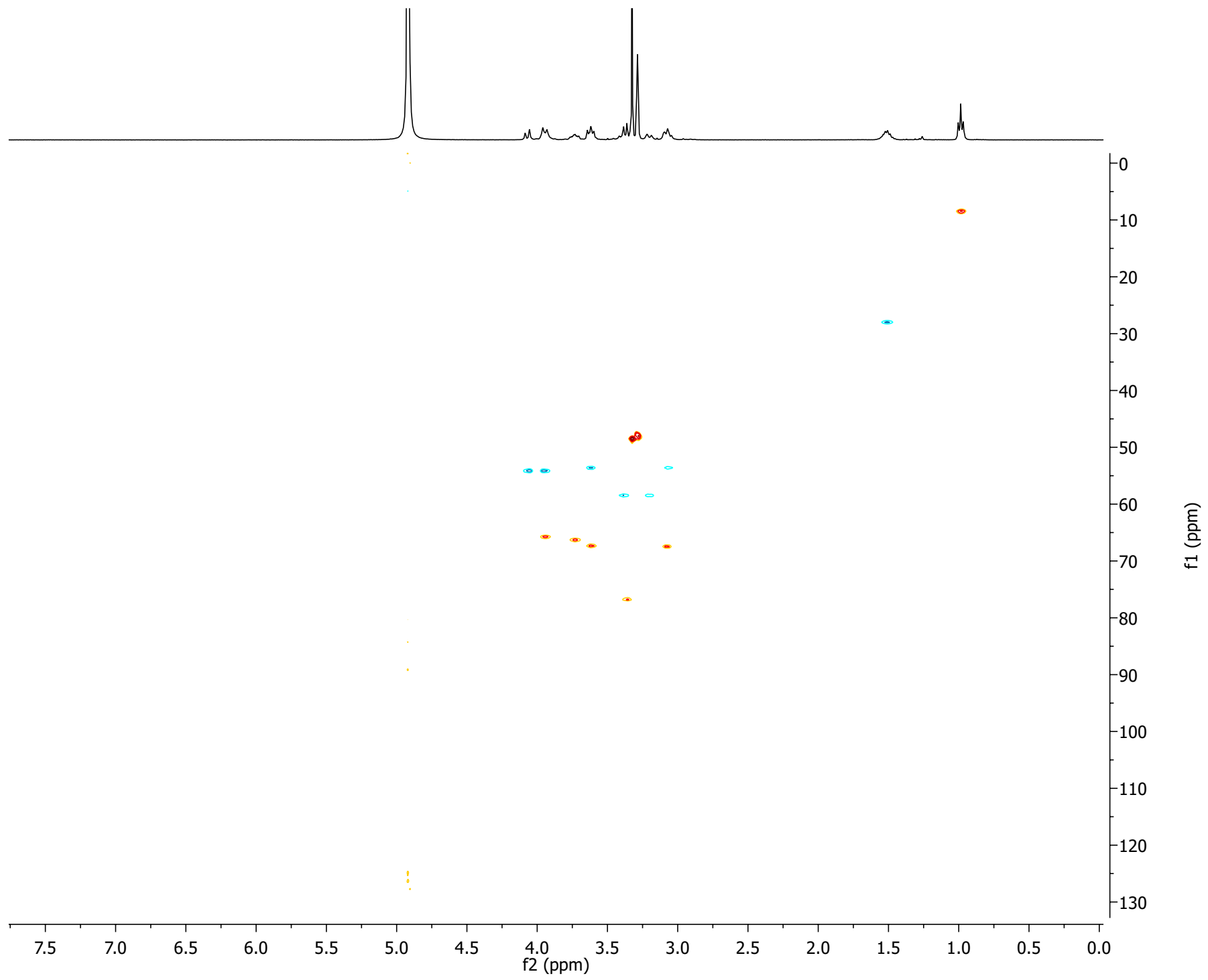
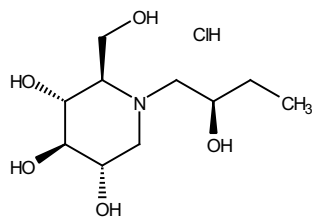




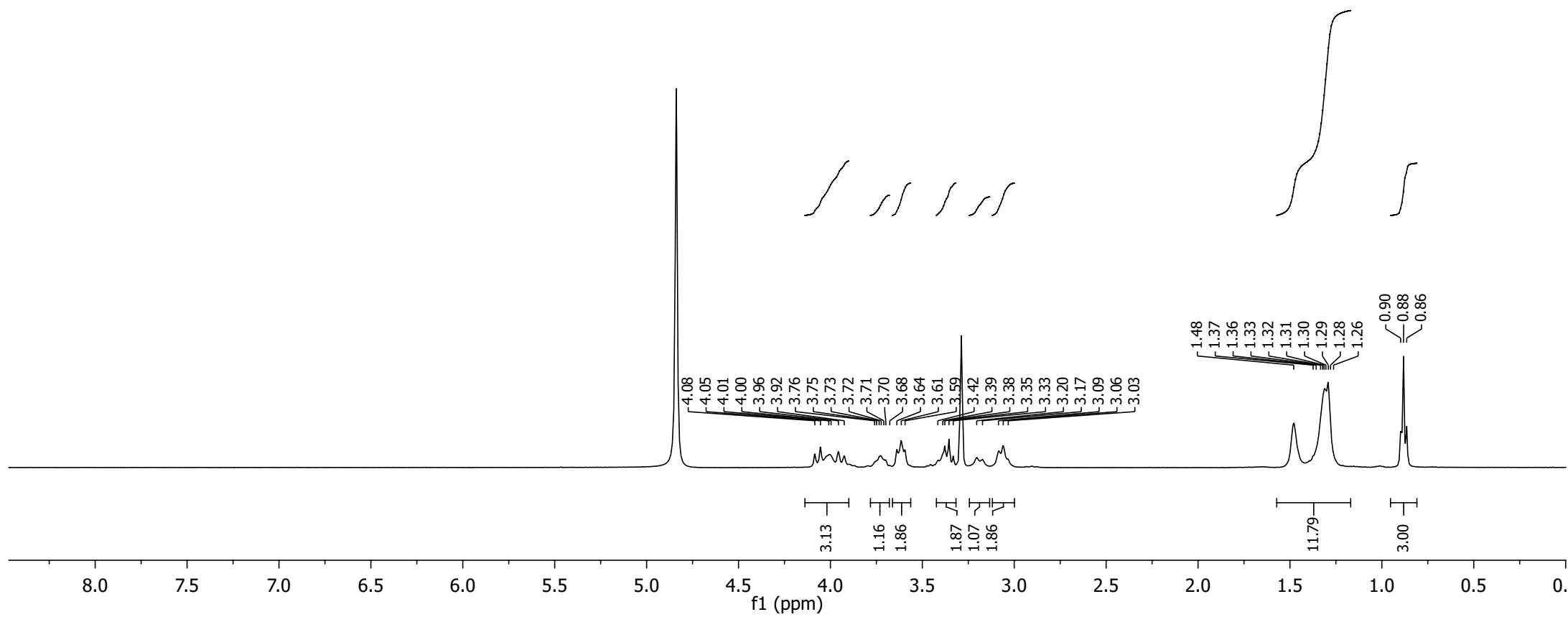
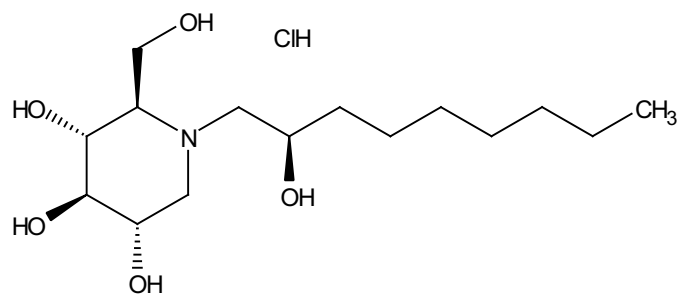
gCOSY (MeOD, 400 MHz) of (R)-85x



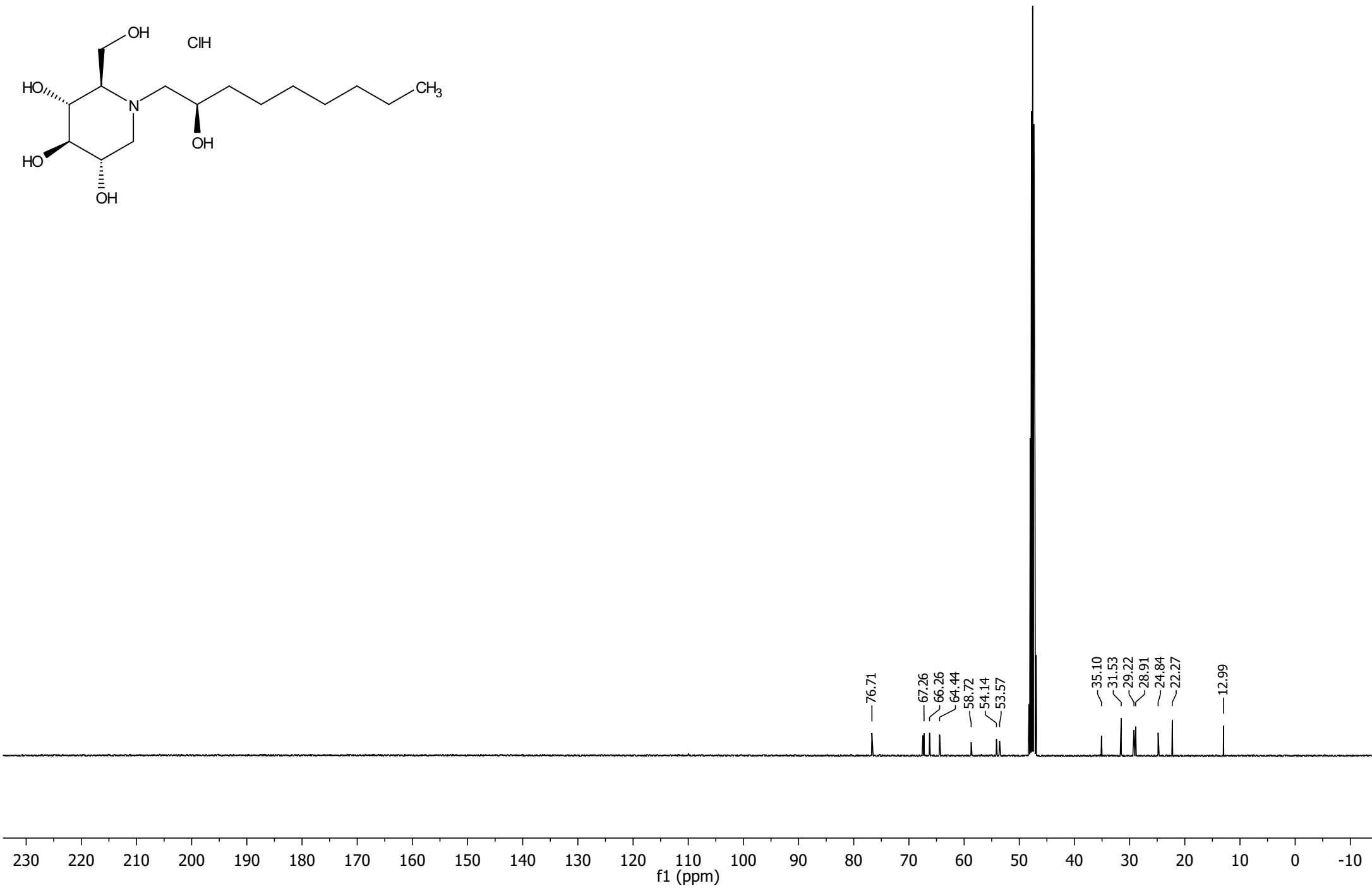
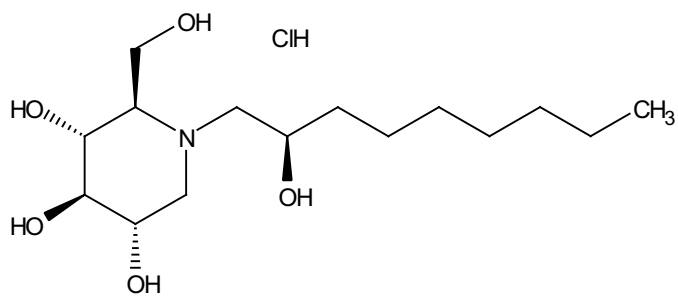
# gHSQC (MeOD, 400 MHz) of (R)-85x



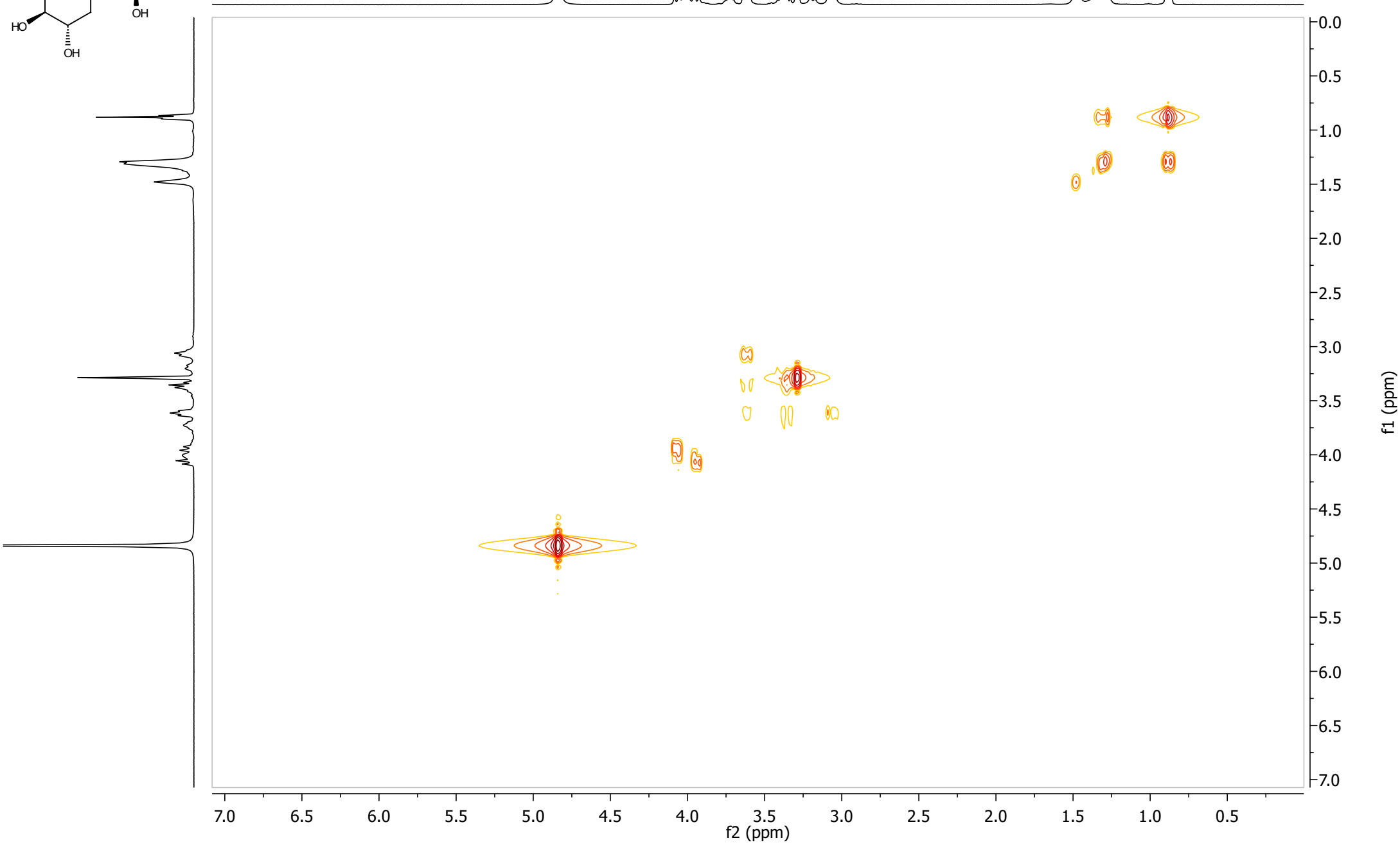
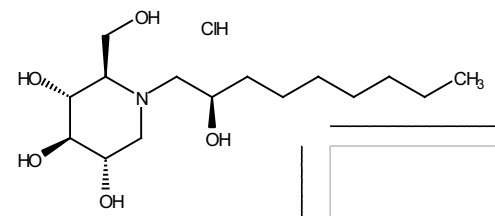
<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-85y



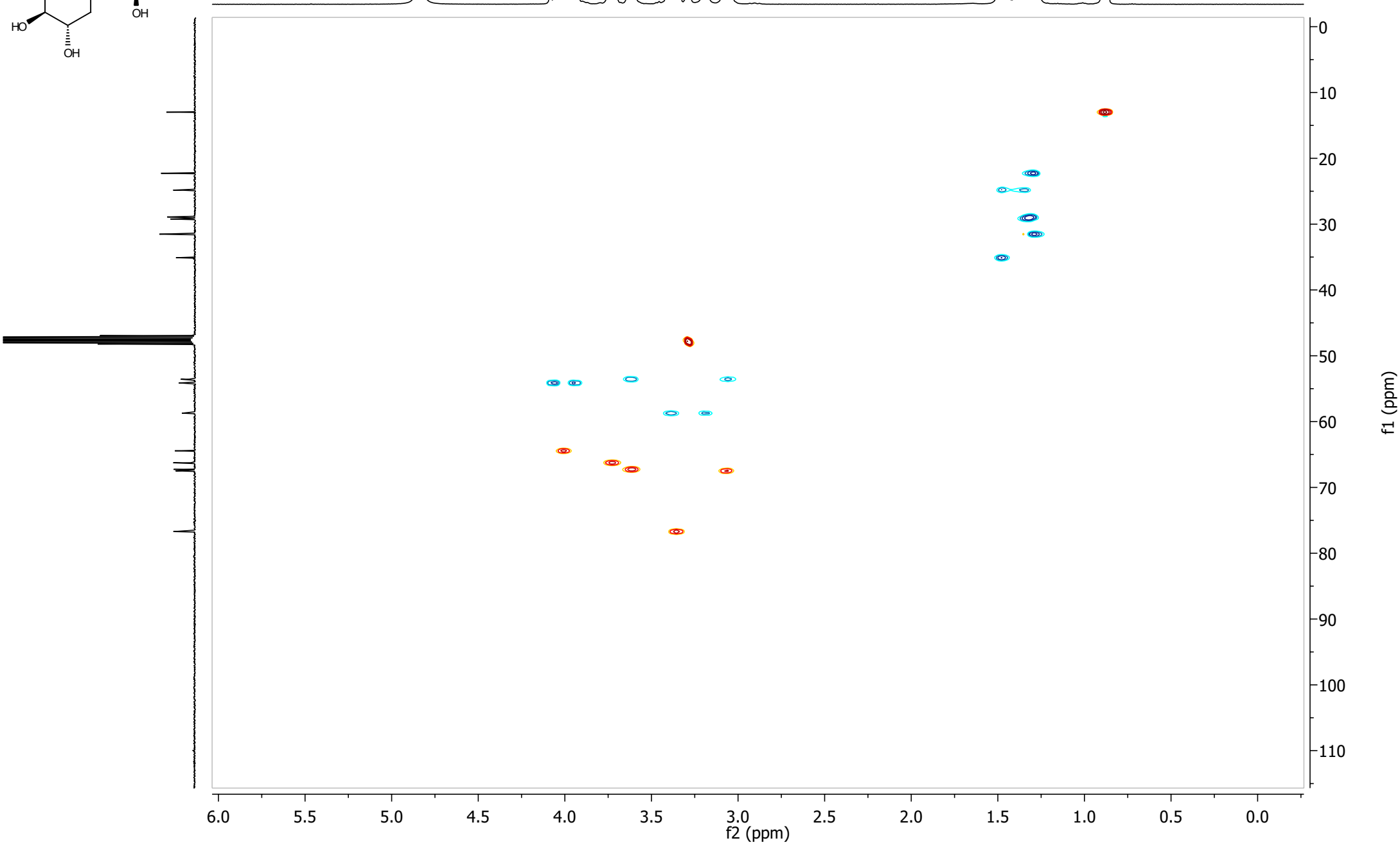
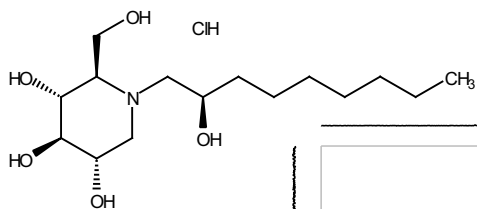
<sup>13</sup>C NMR (MeOD, 101 MHz) of (R)-85y



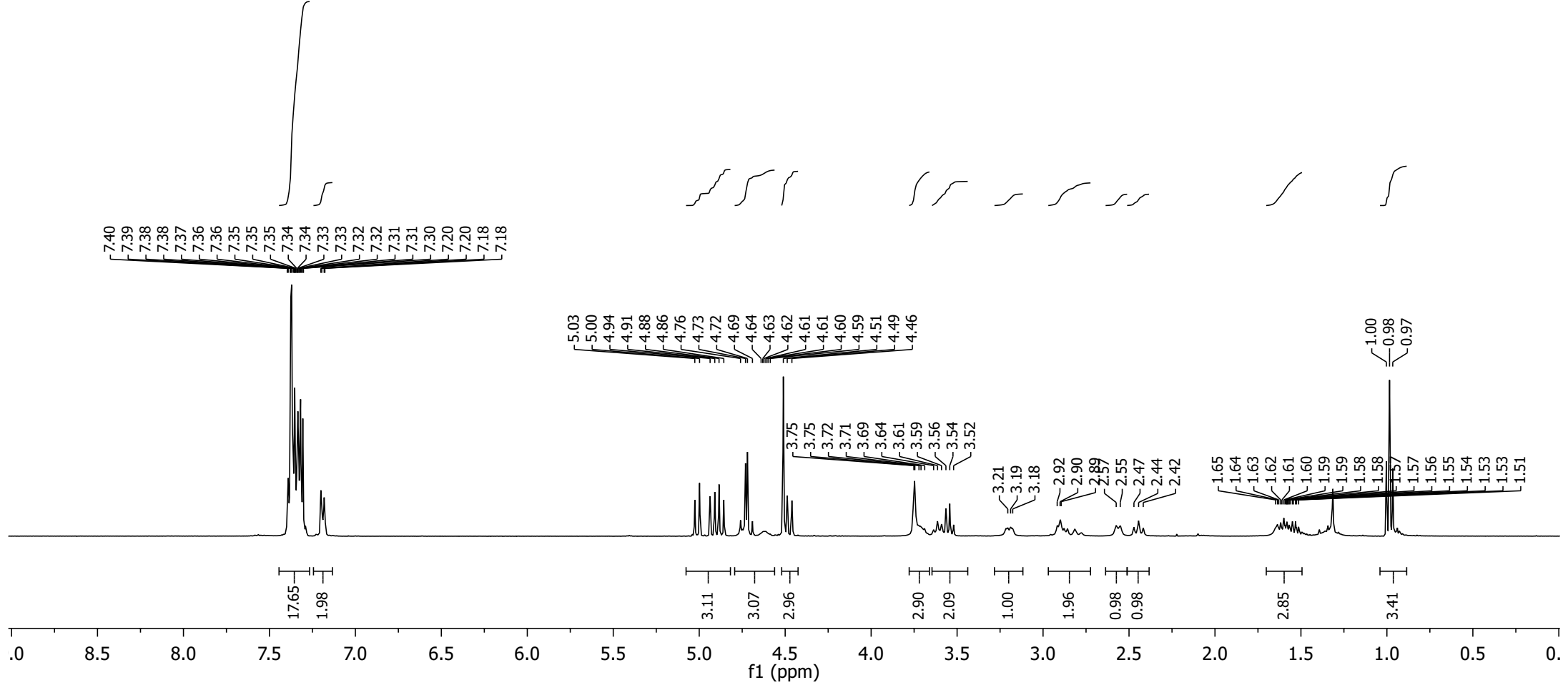
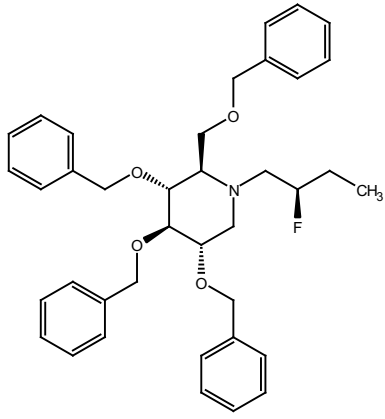
gCOSY (MeOD, 400 MHz) of (R)-85y



# HSQCAD (MeOD, 400 MHz) of (R)-85y

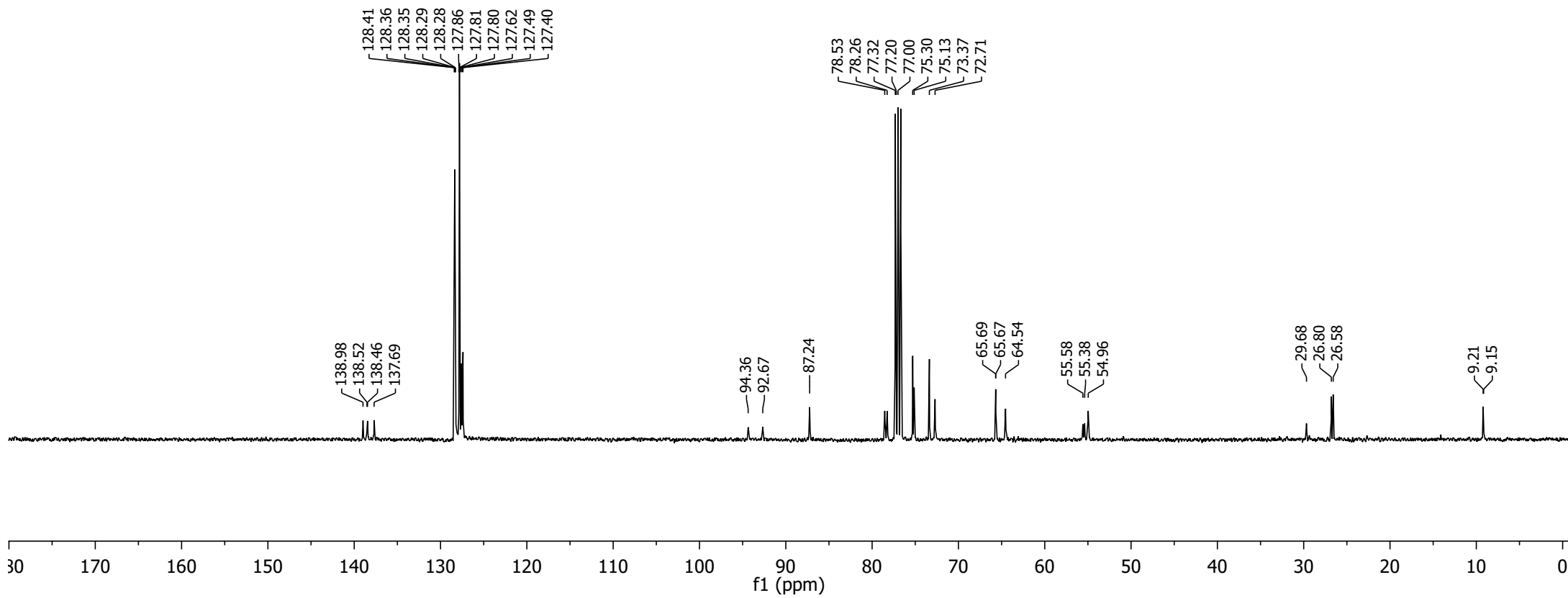
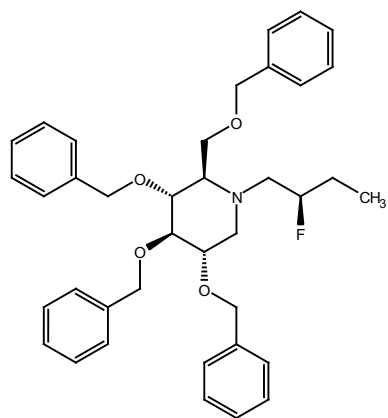


<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-86x

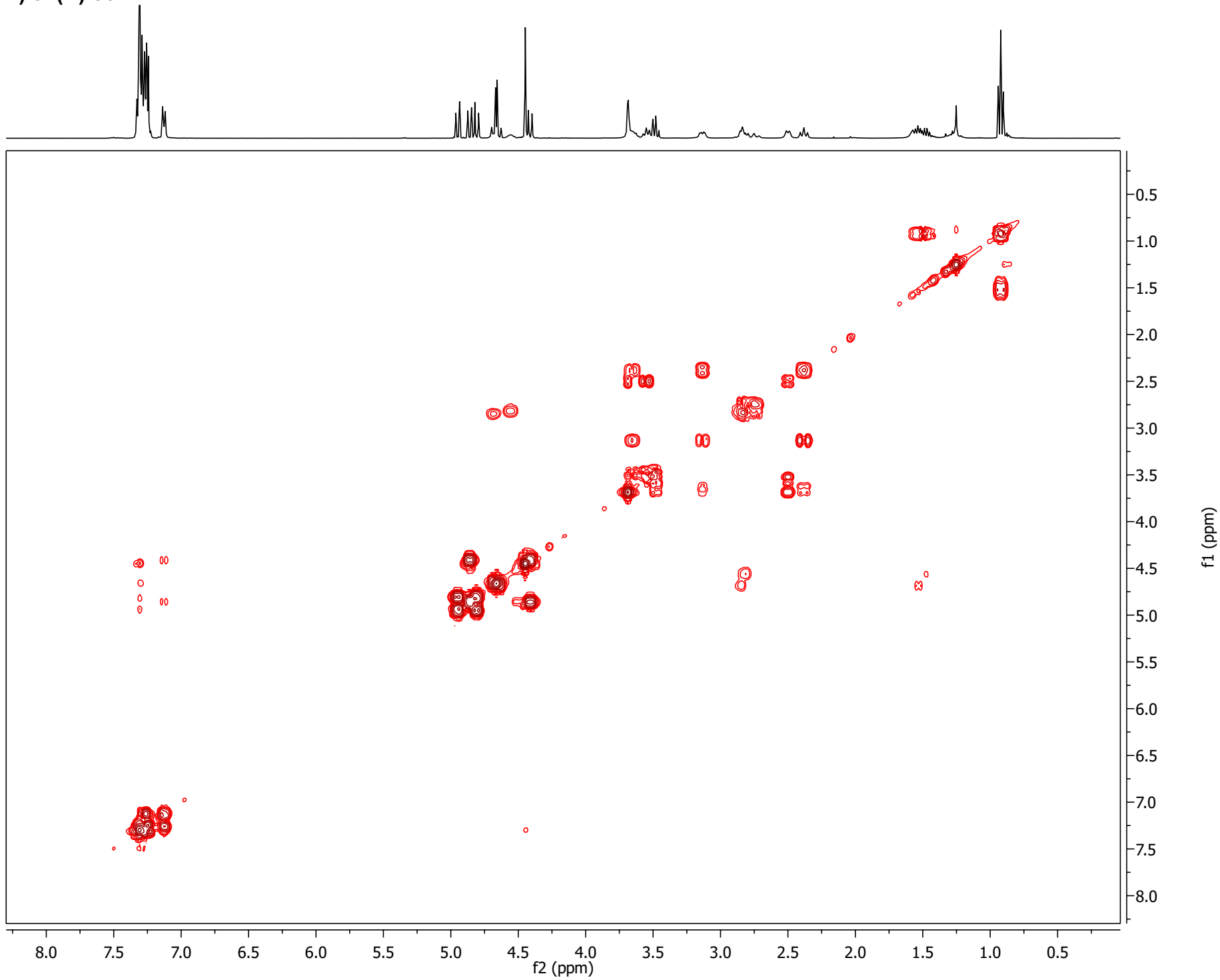
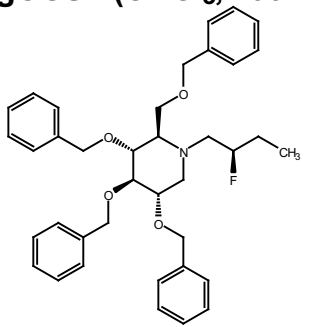




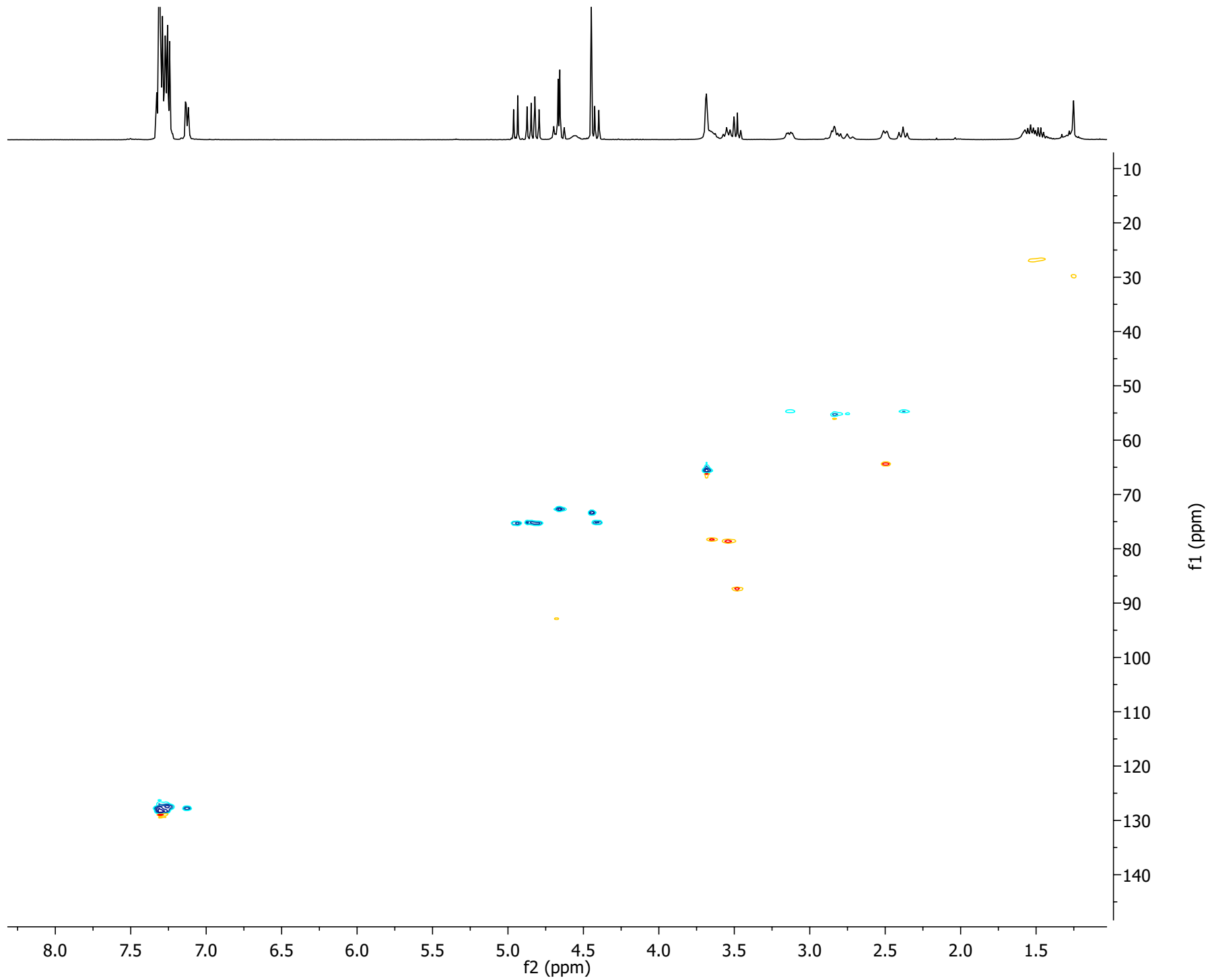
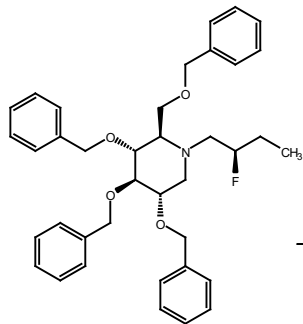
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-86x



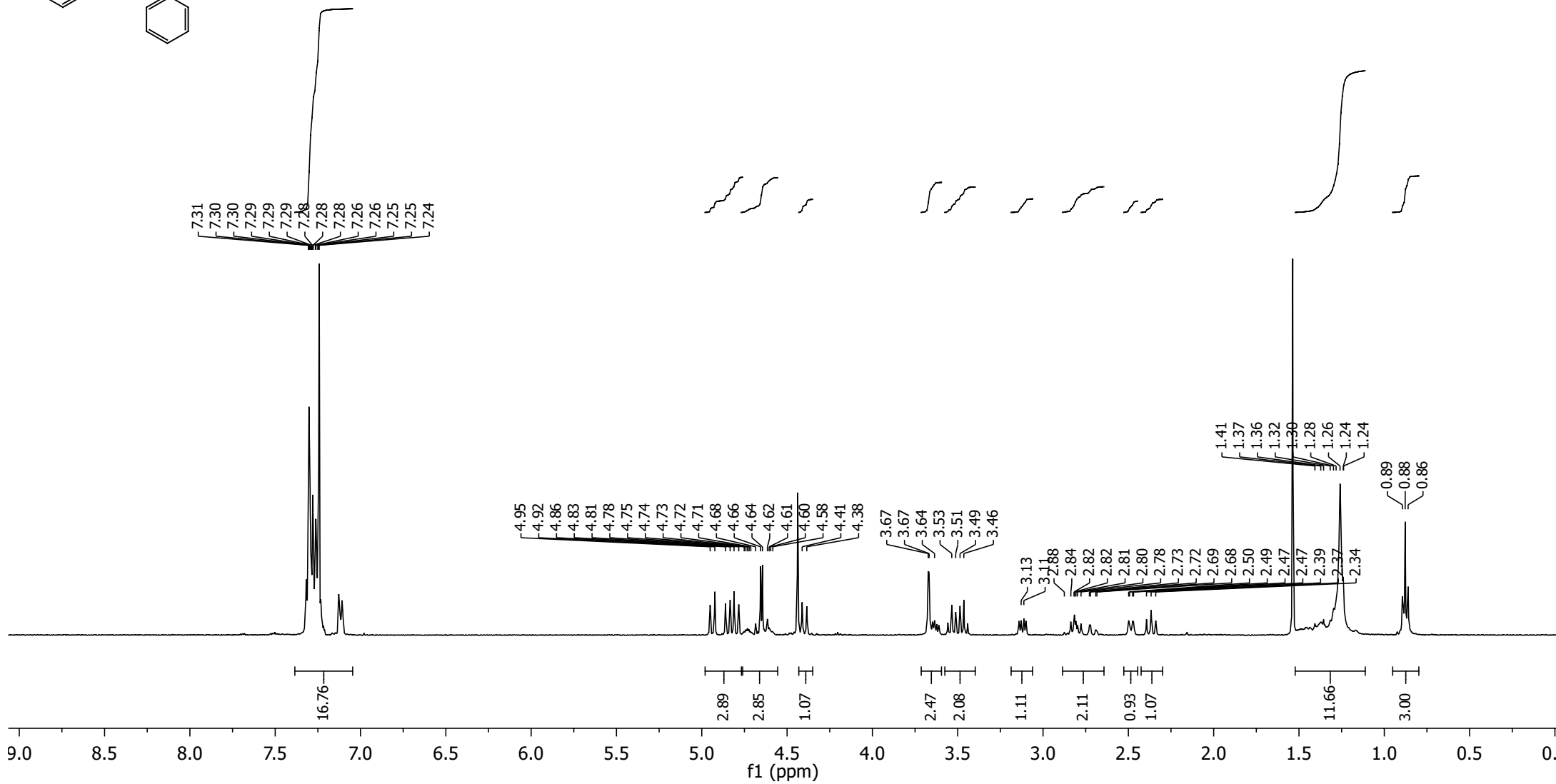
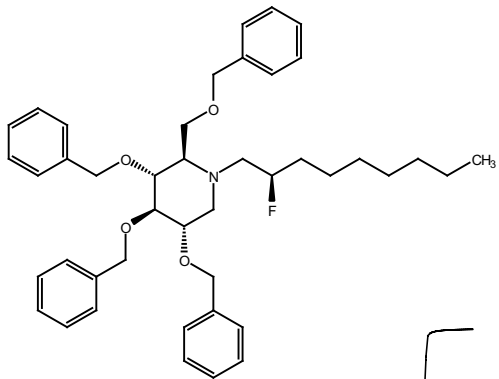
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (R)-86x



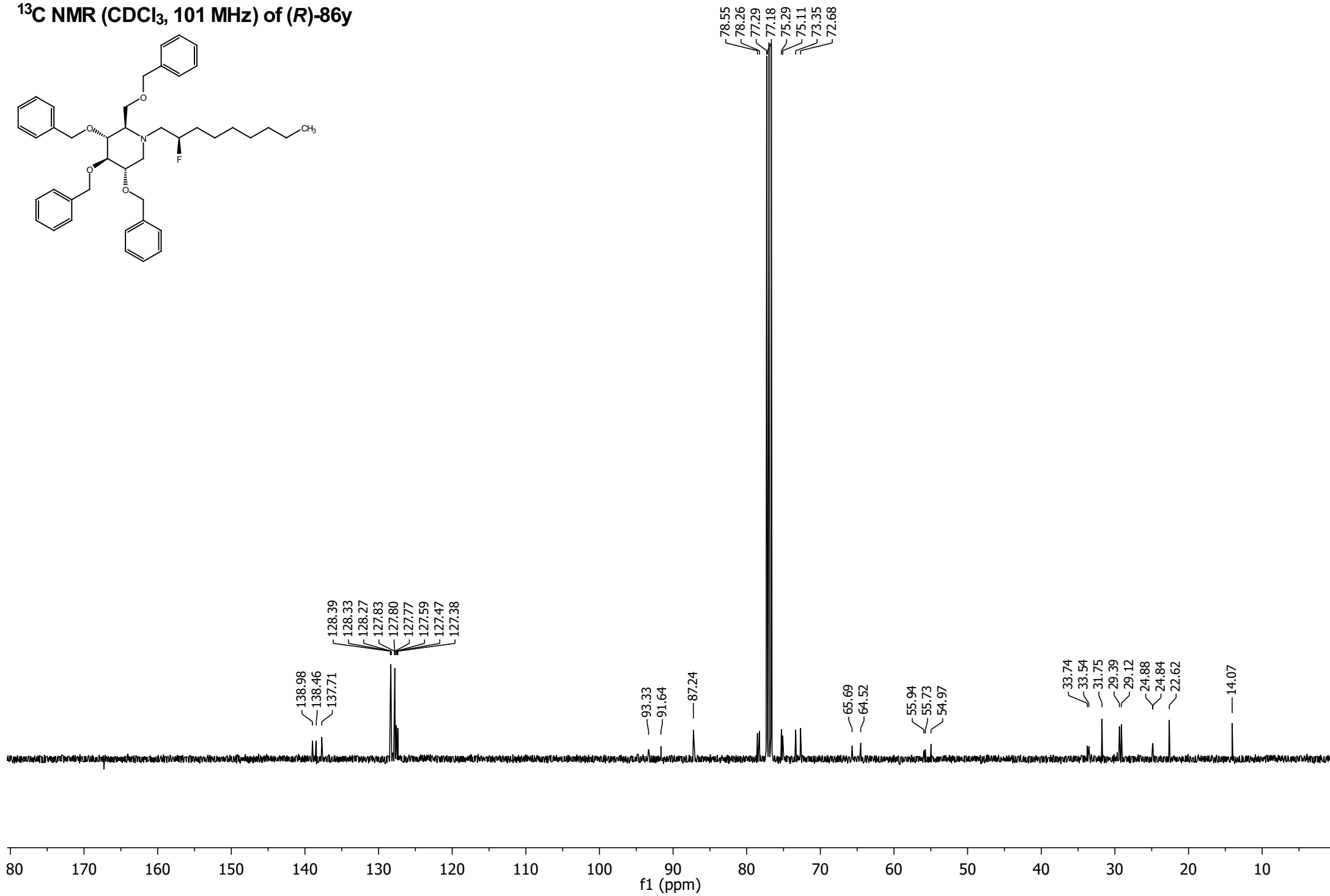
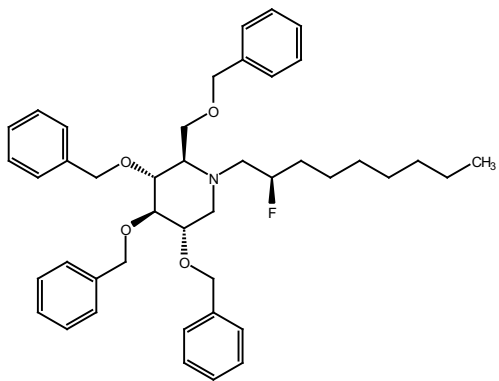
gHSQC (CDCl<sub>3</sub>, 400 MHz) of (R)-86x



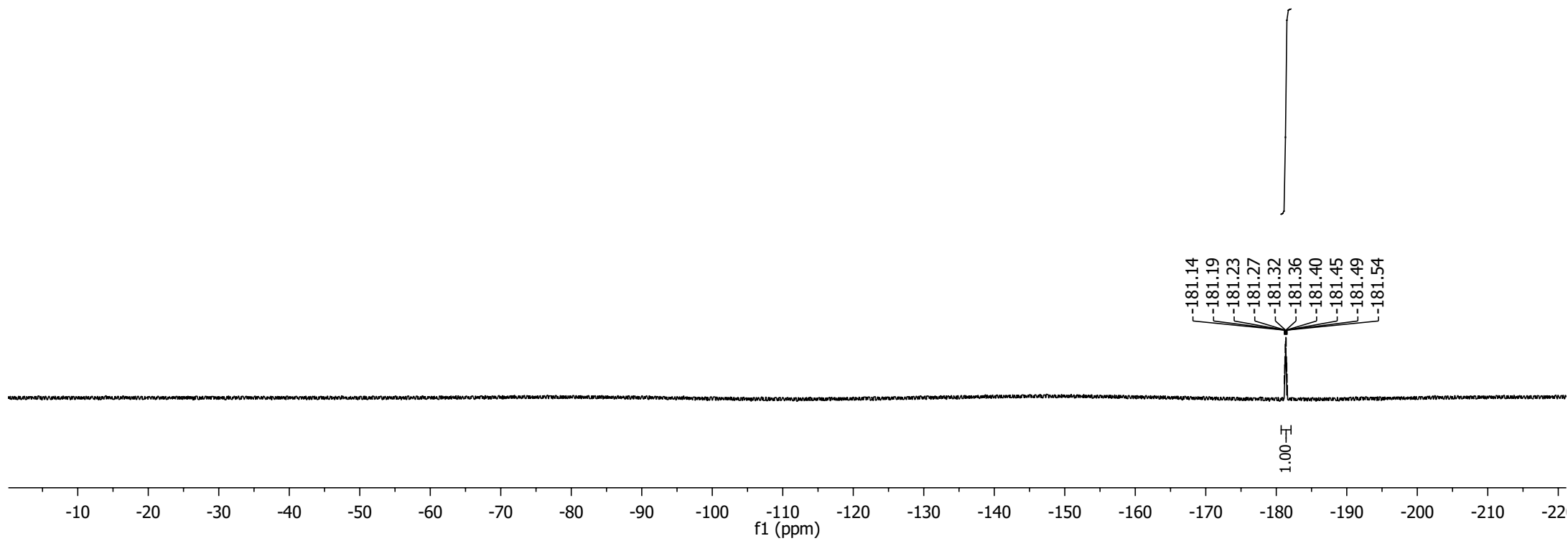
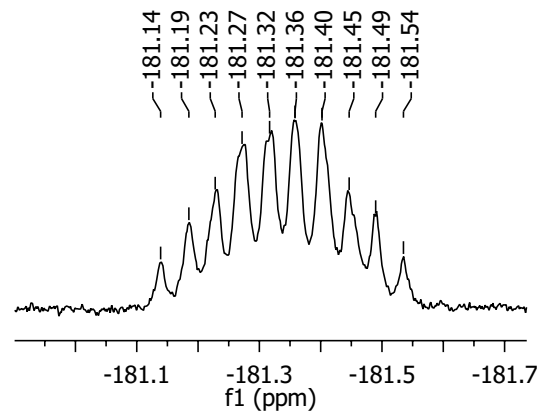
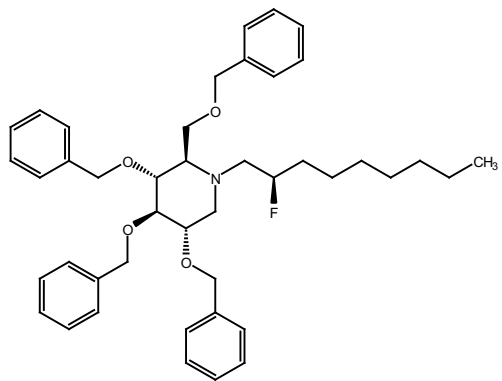
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-86y



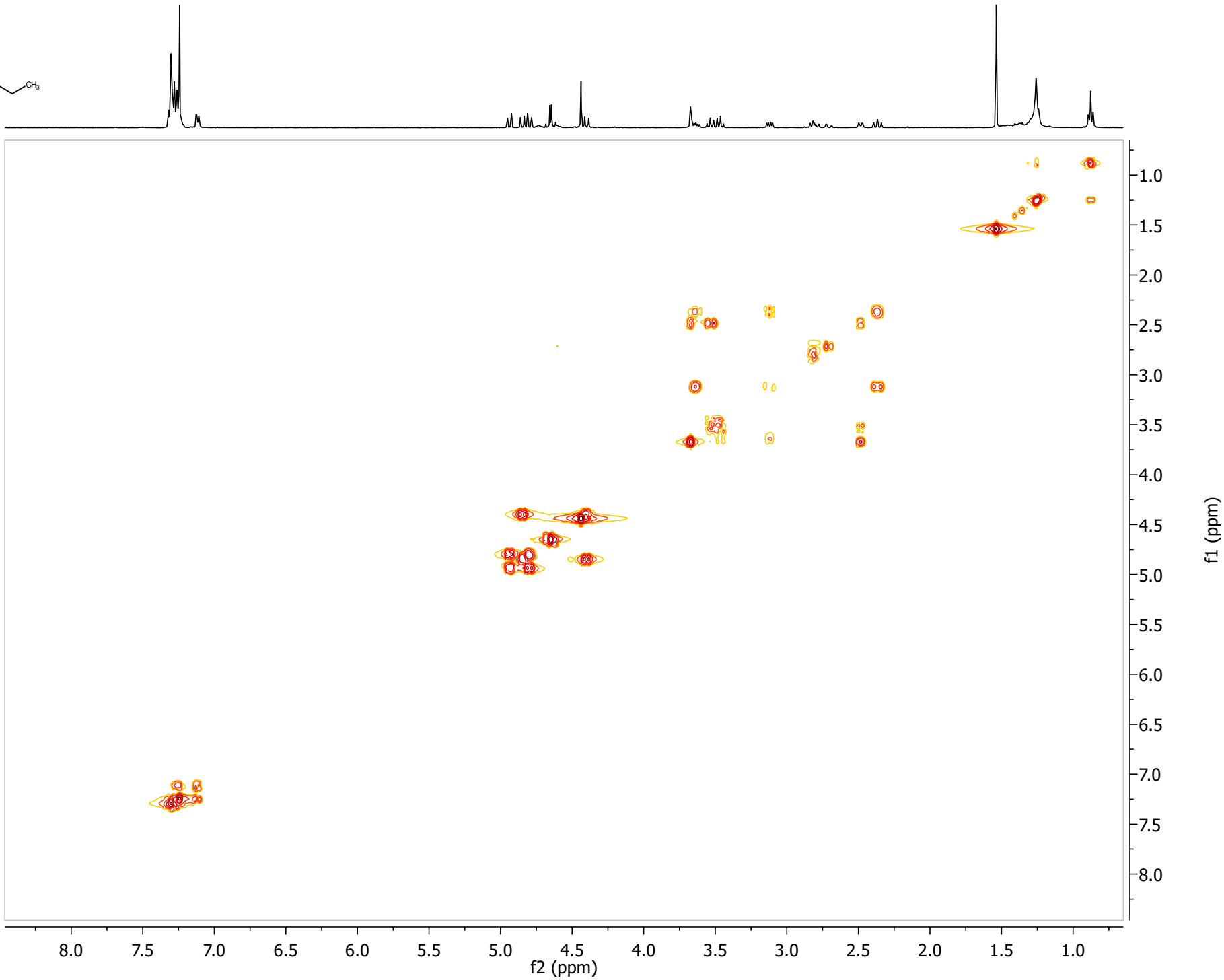
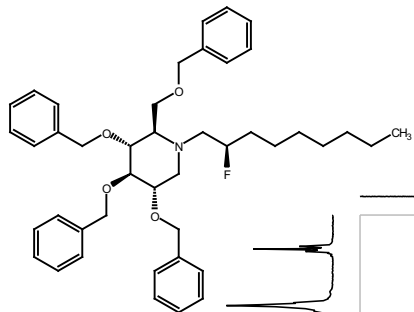
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-86y



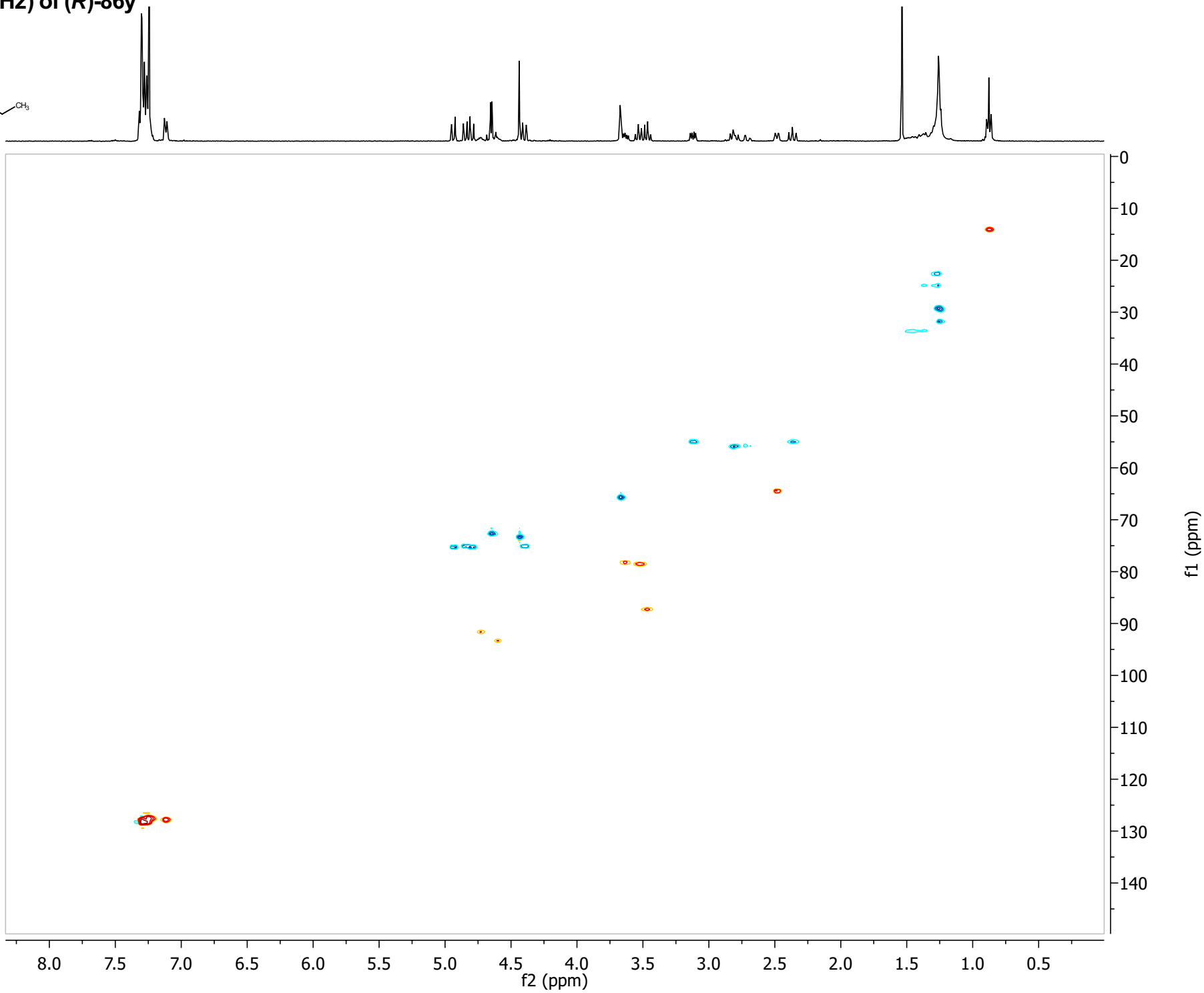
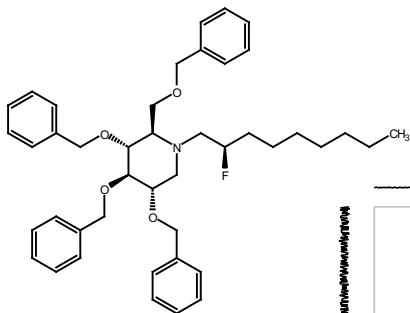
**$^{19}\text{F}$  NMR ( $\text{CDCl}_3$ , 376 MHz) of (*R*)-86y**



gCOSY (CDCl<sub>3</sub>, 400 MHz) of (R)-86y

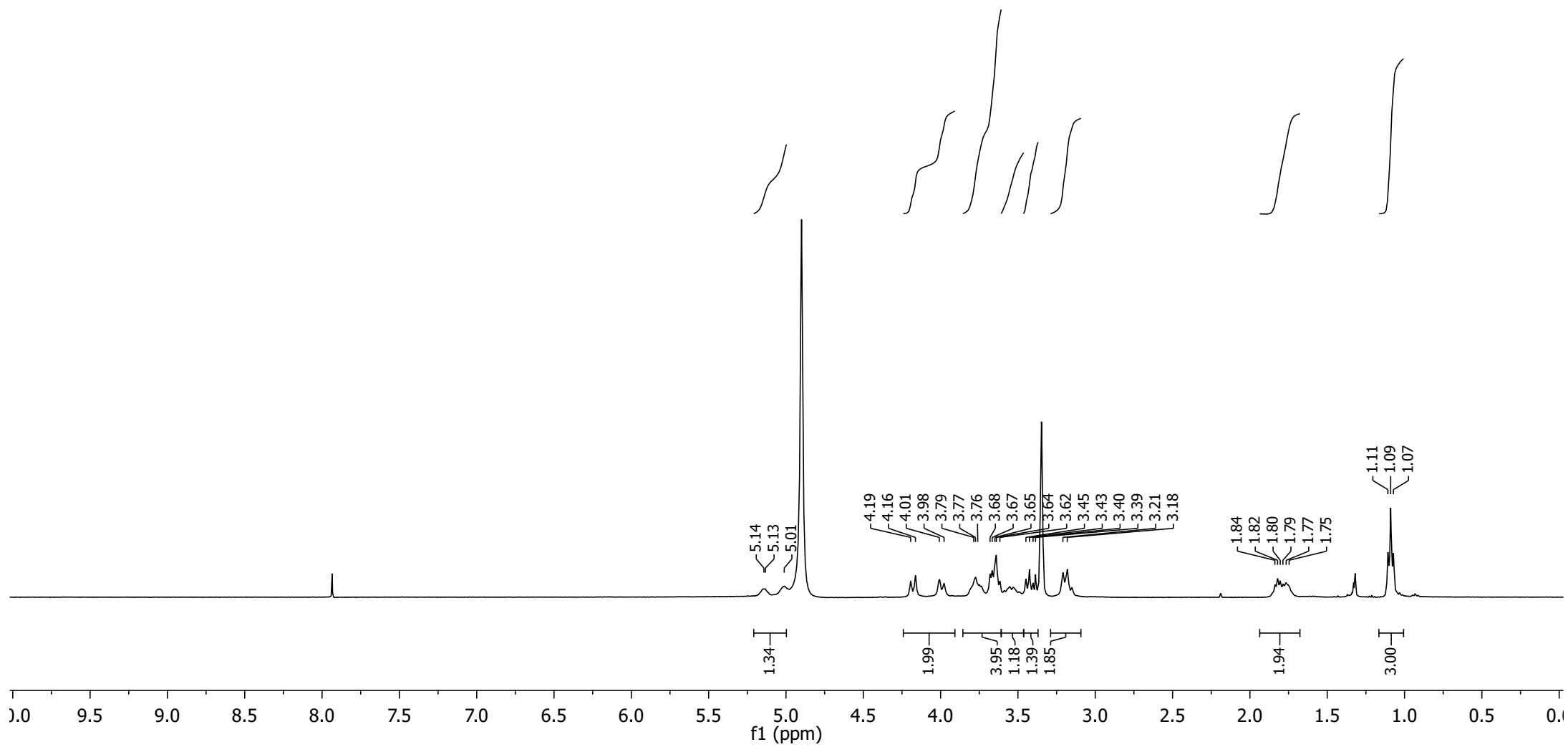
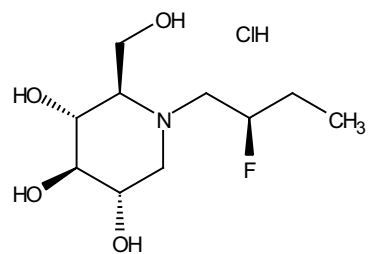


HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (*R*)-86y

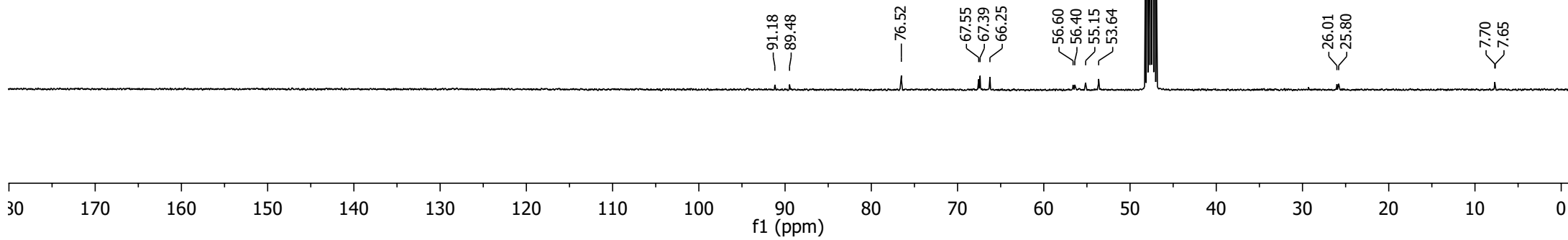
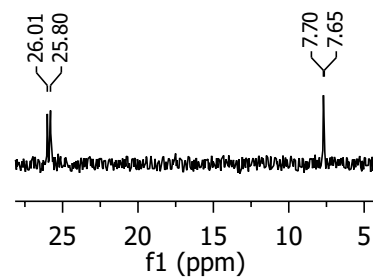
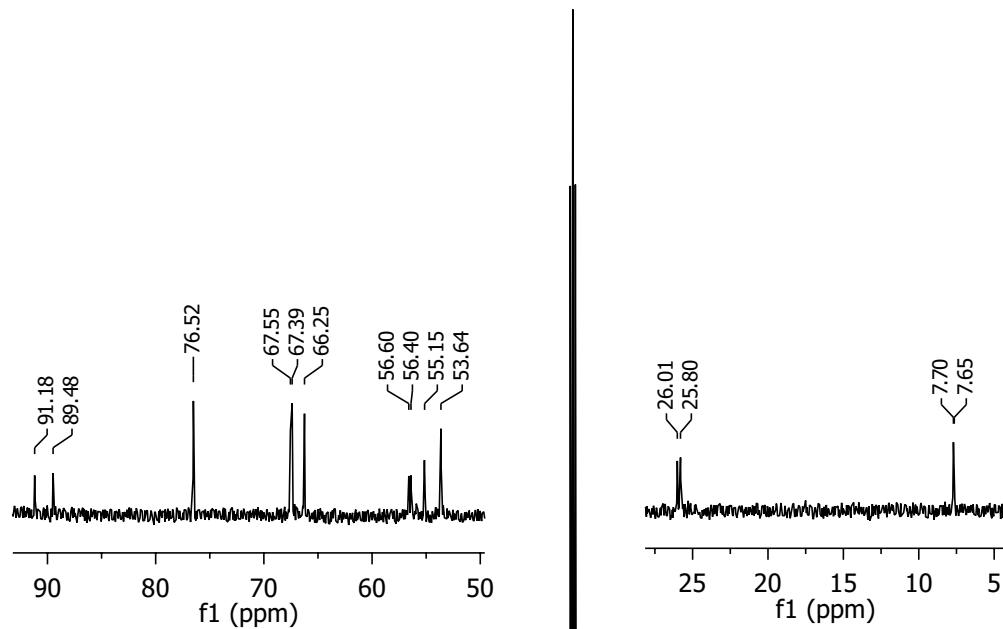
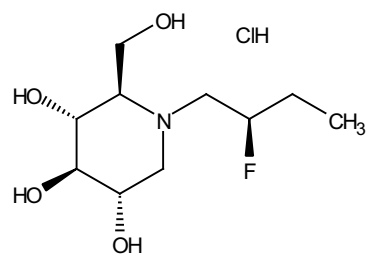




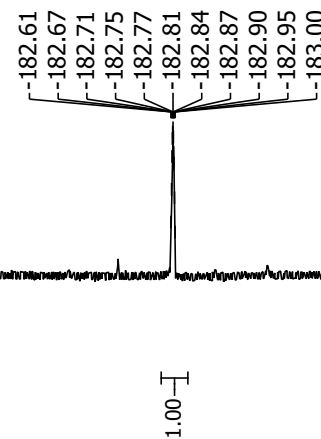
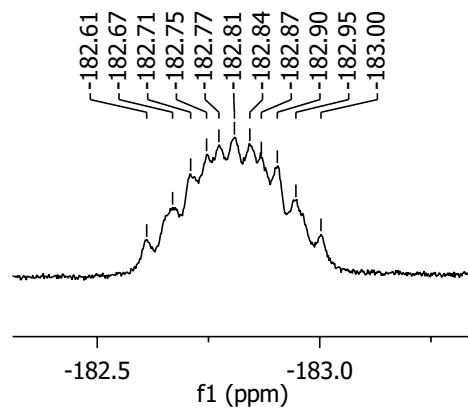
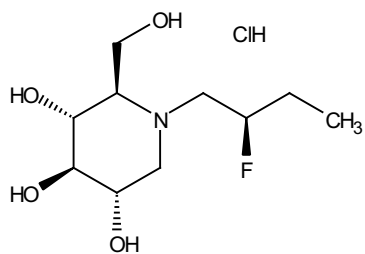
<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-87x



<sup>13</sup>C NMR (MeOD, 101 MHz) of (R)-87x

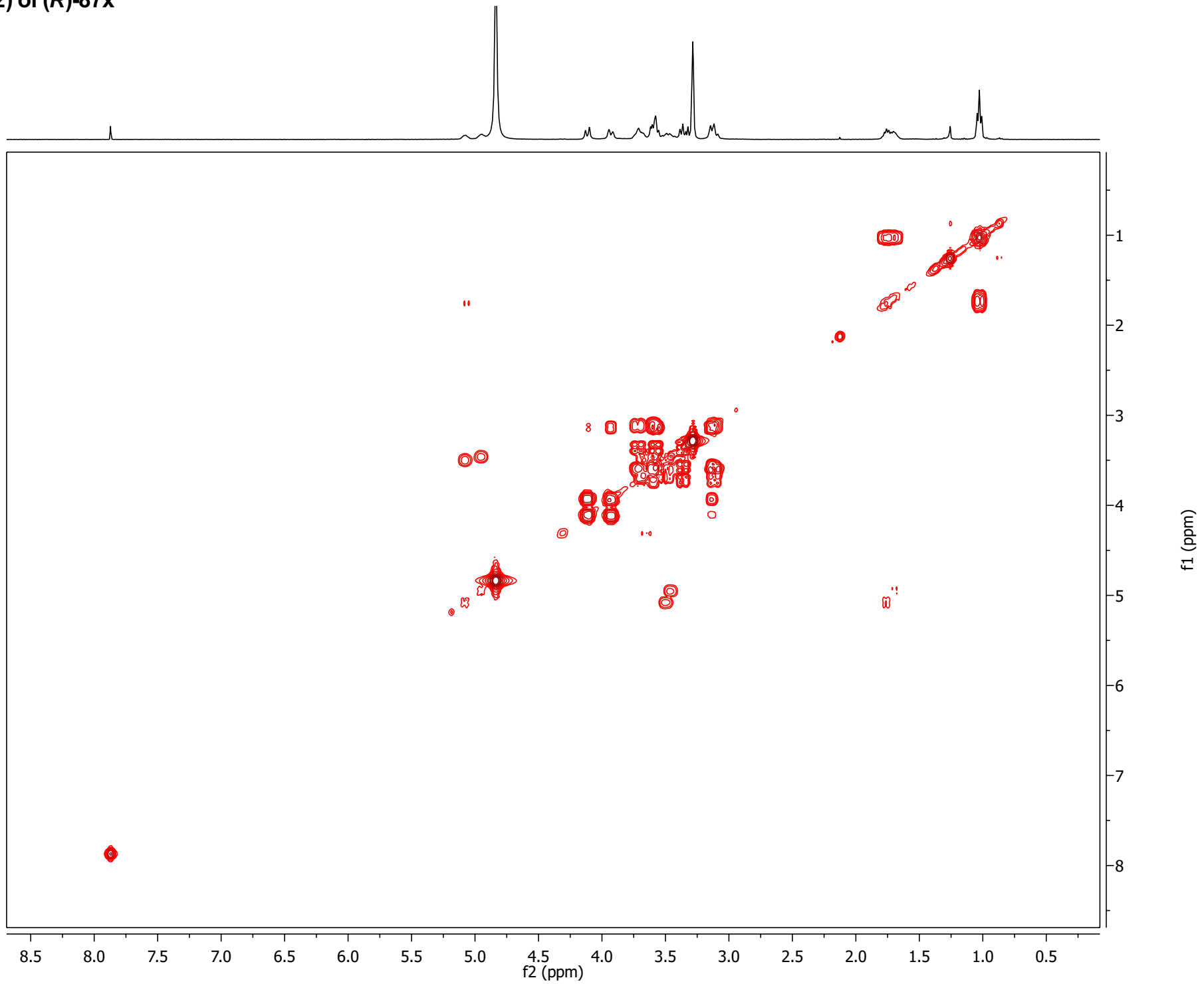
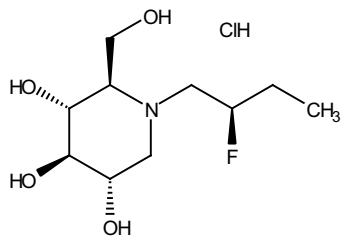


<sup>19</sup>F NMR (MeOD, 376 MHz) of (R)-87x

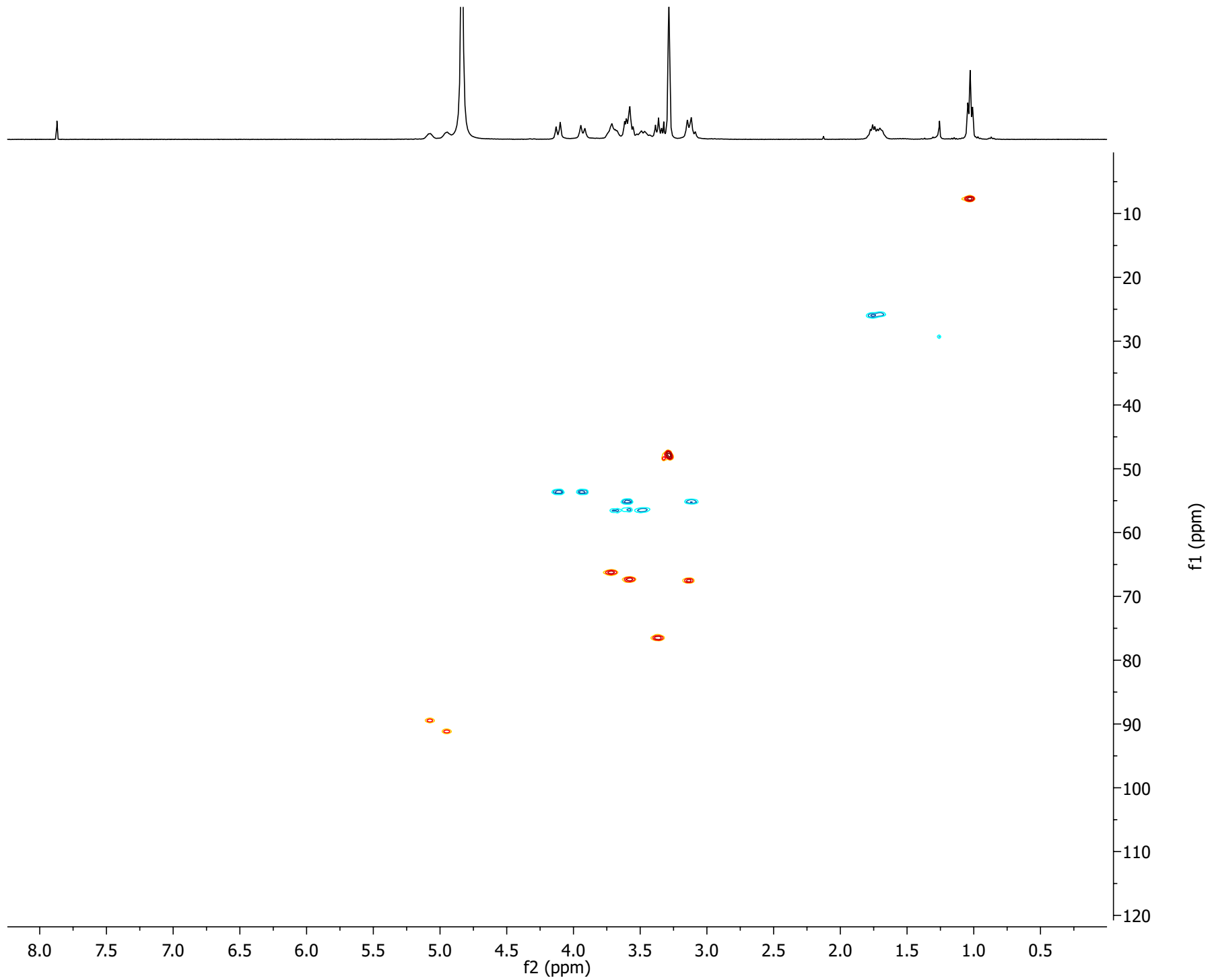
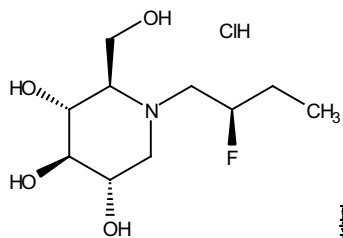


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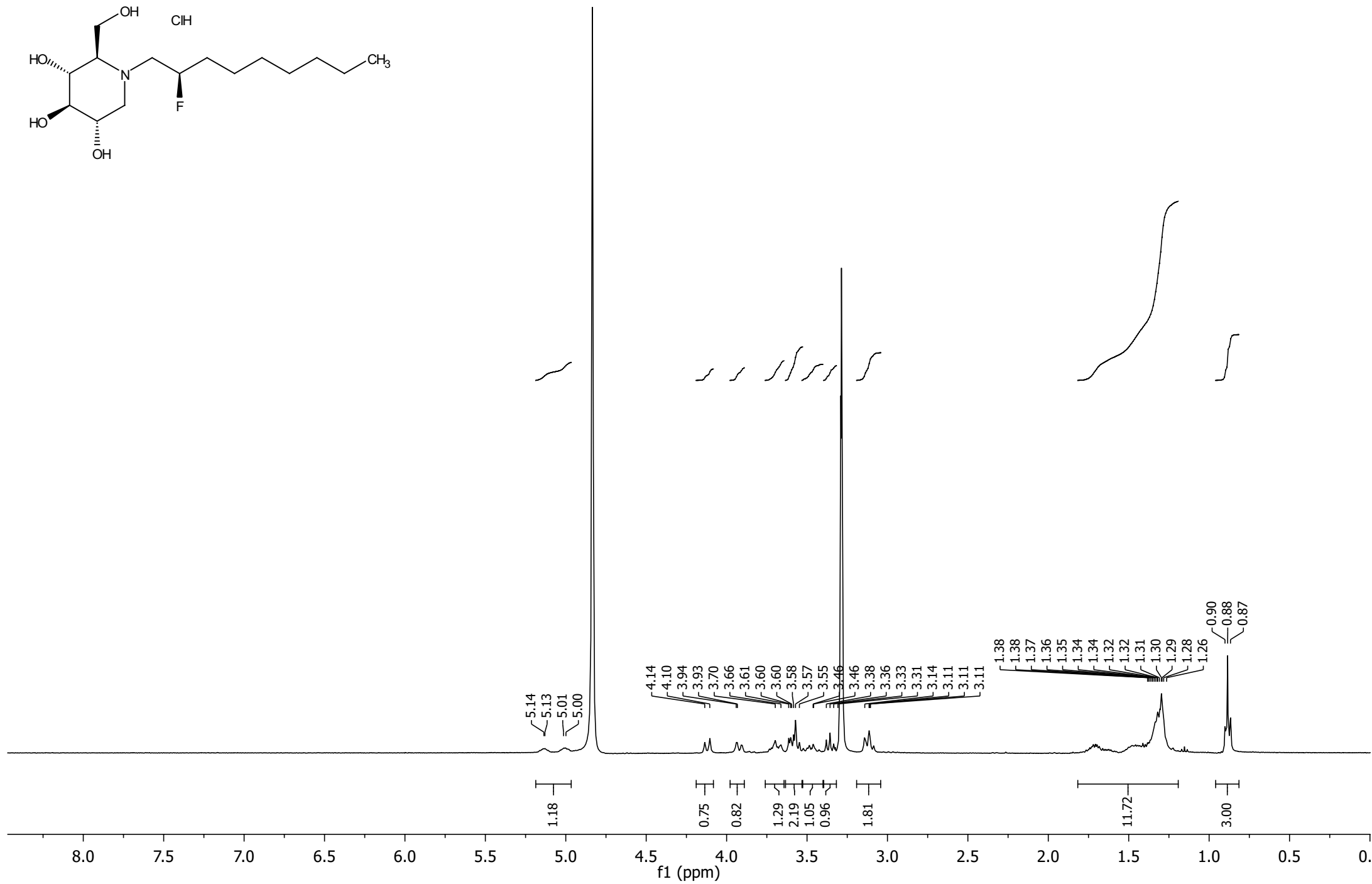
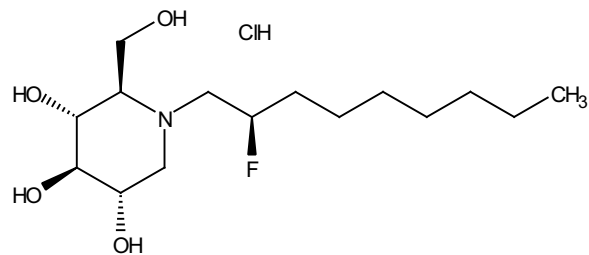
gCOSY (MeOD, 400 MHz) of (R)-87x



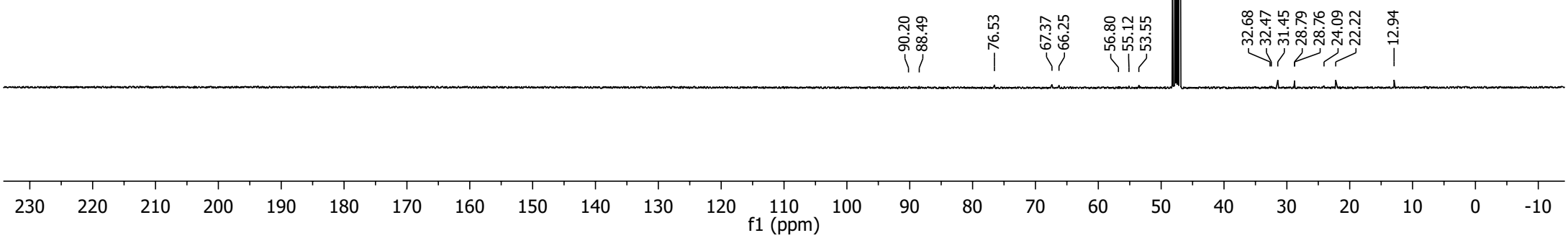
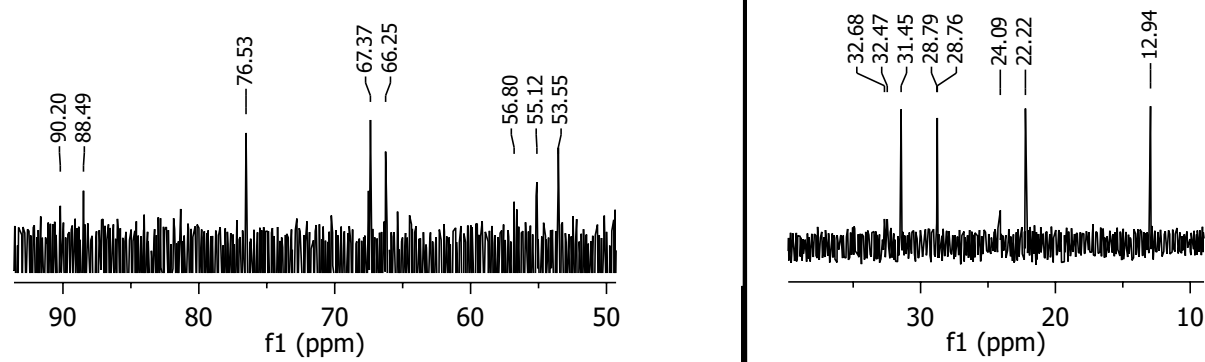
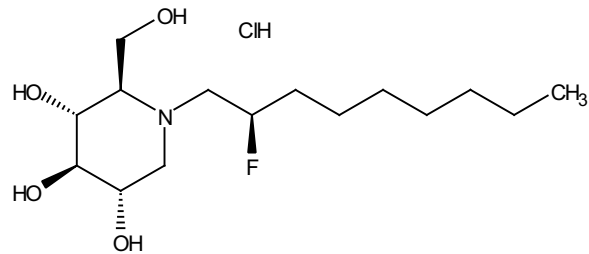
gHSQC (MeOD, 400 MHz) of (R)-87x



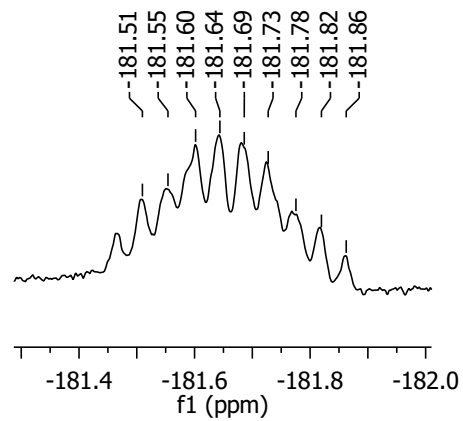
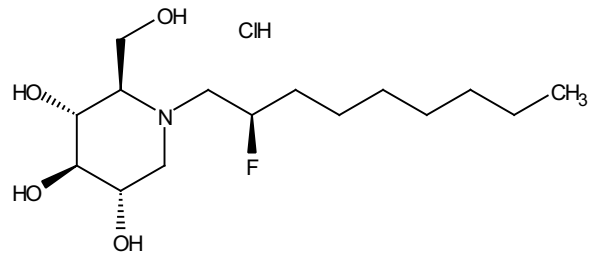
<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-87y



<sup>13</sup>C NMR (MeOD, 101 MHz) of (R)-87y



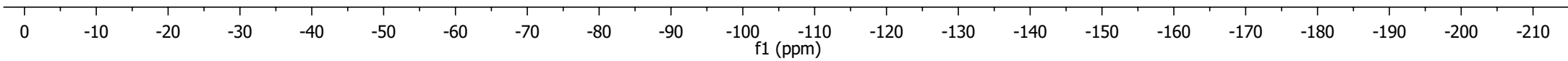
**<sup>19</sup>F NMR (MeOD, 376 MHz) of (R)-87y**



A (ddq)  
-181.69

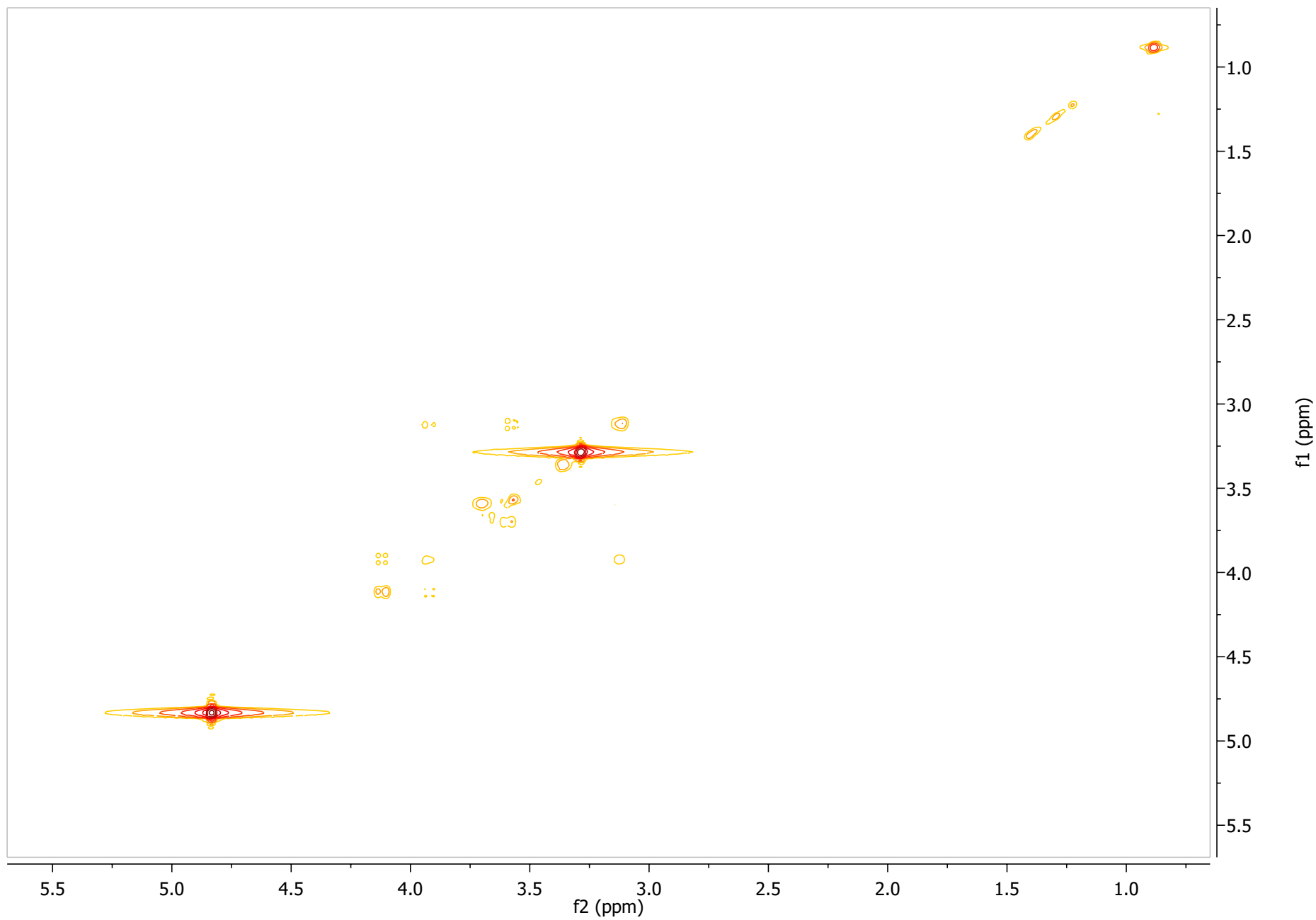
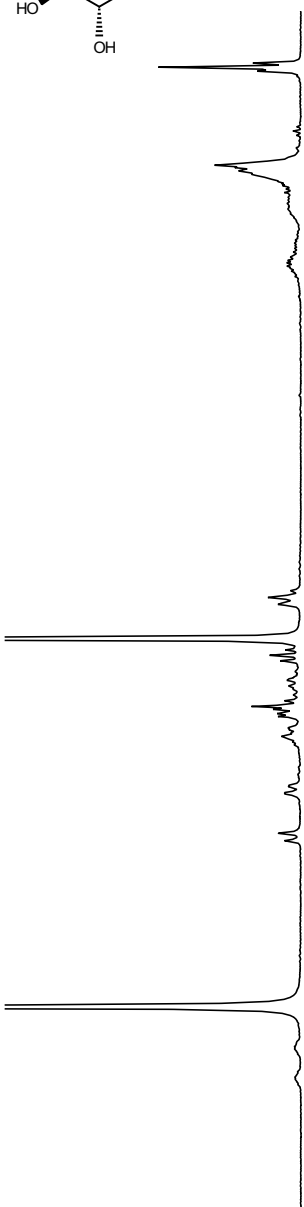
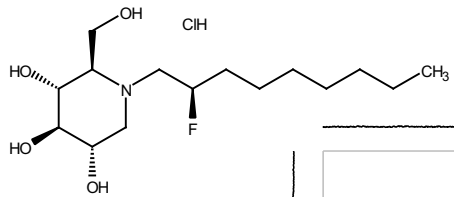
-181.51  
-181.55  
-181.60  
-181.64  
-181.69  
-181.73  
-181.78  
-181.82  
-181.86

1.00

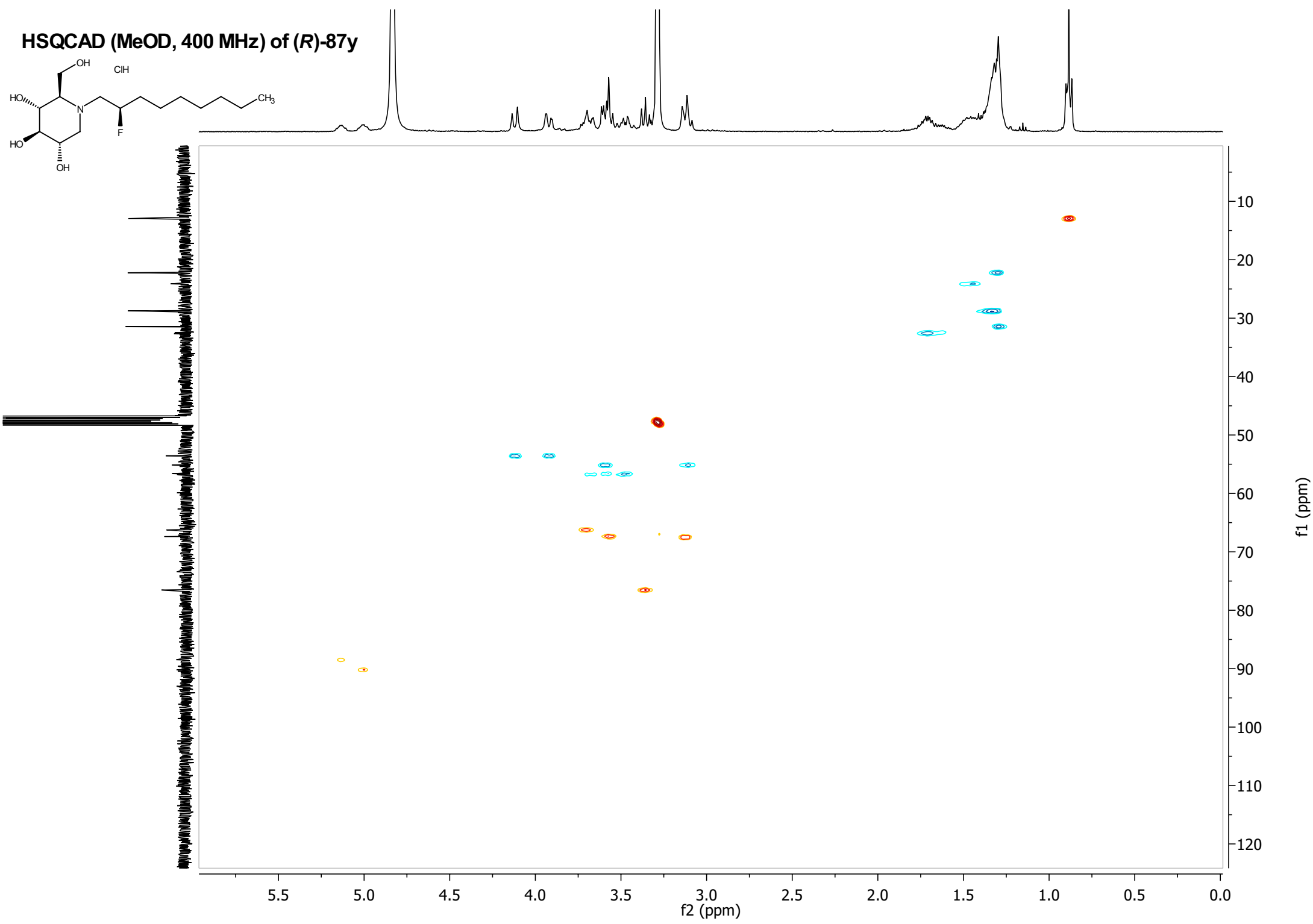
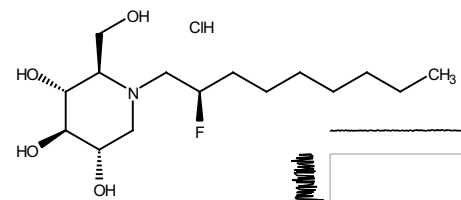




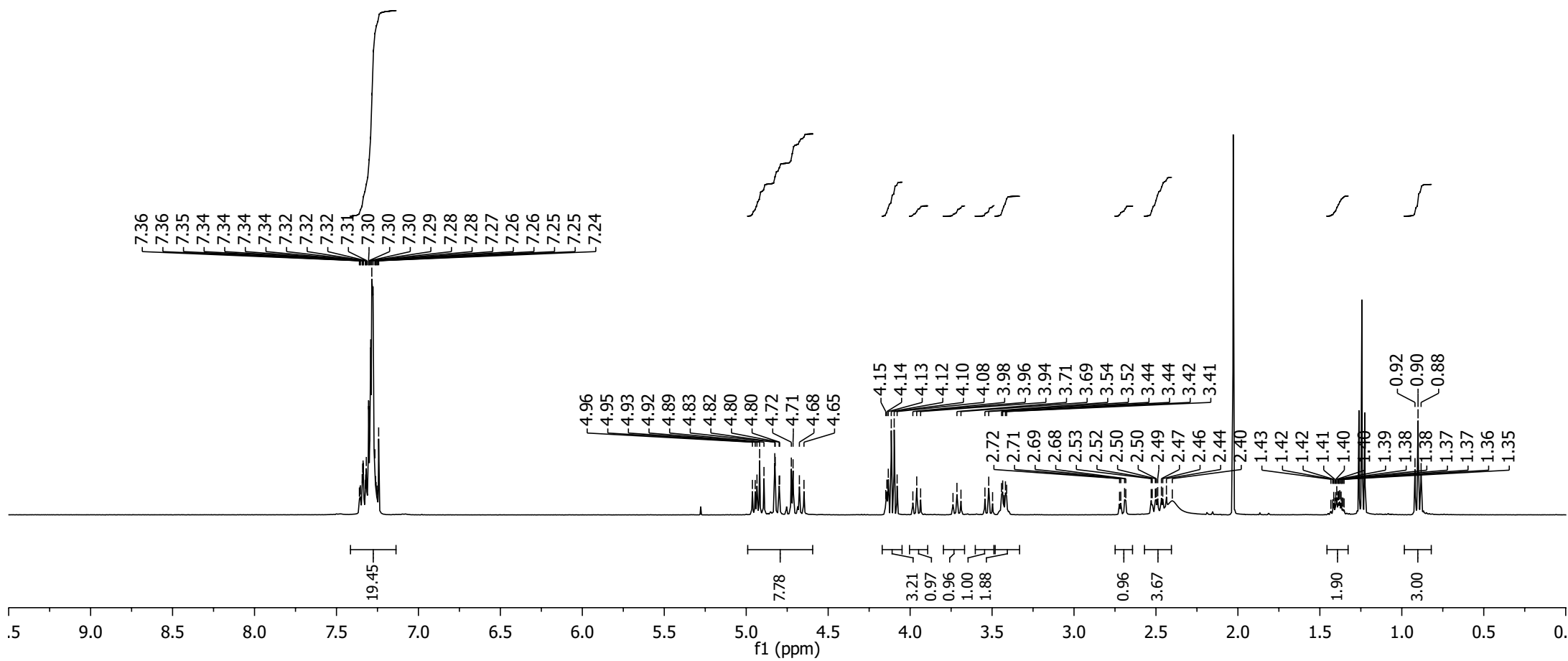
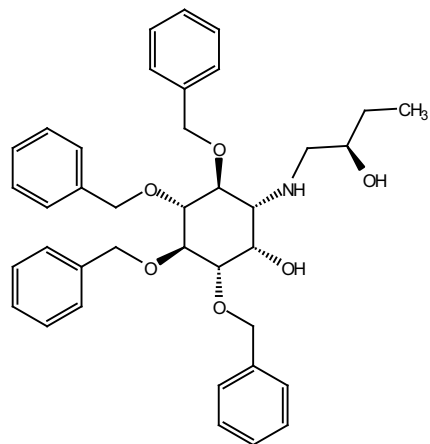
gCOSY (MeOD, 400 MHz) of (R)-87y



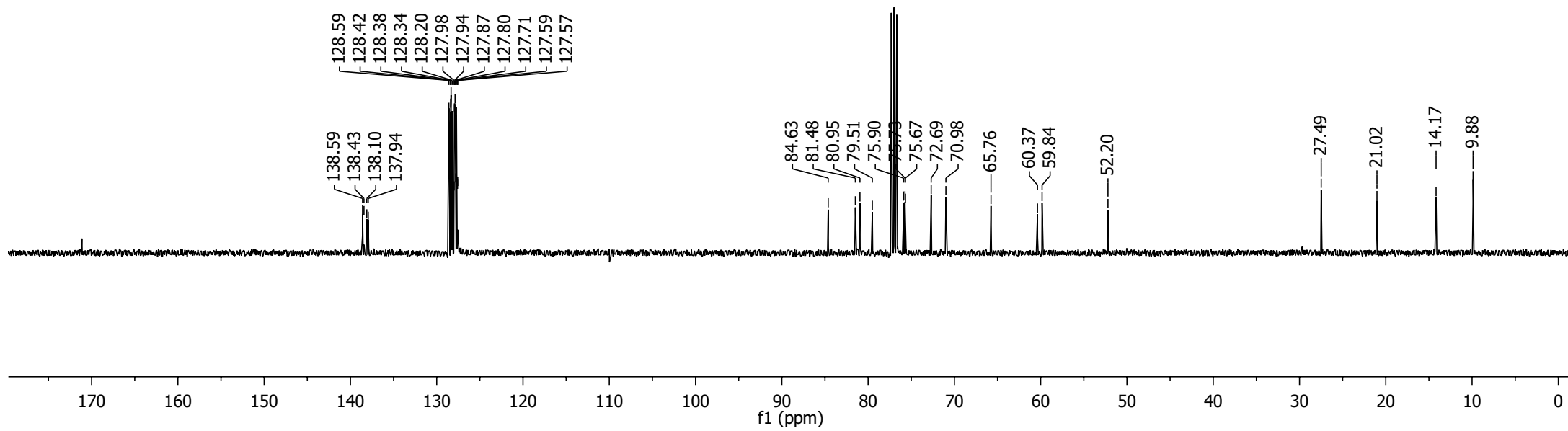
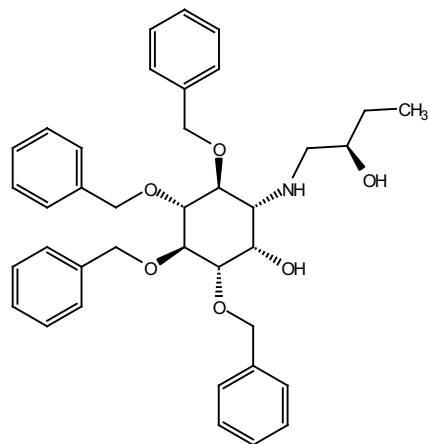
# HSQCAD (MeOD, 400 MHz) of (R)-87y



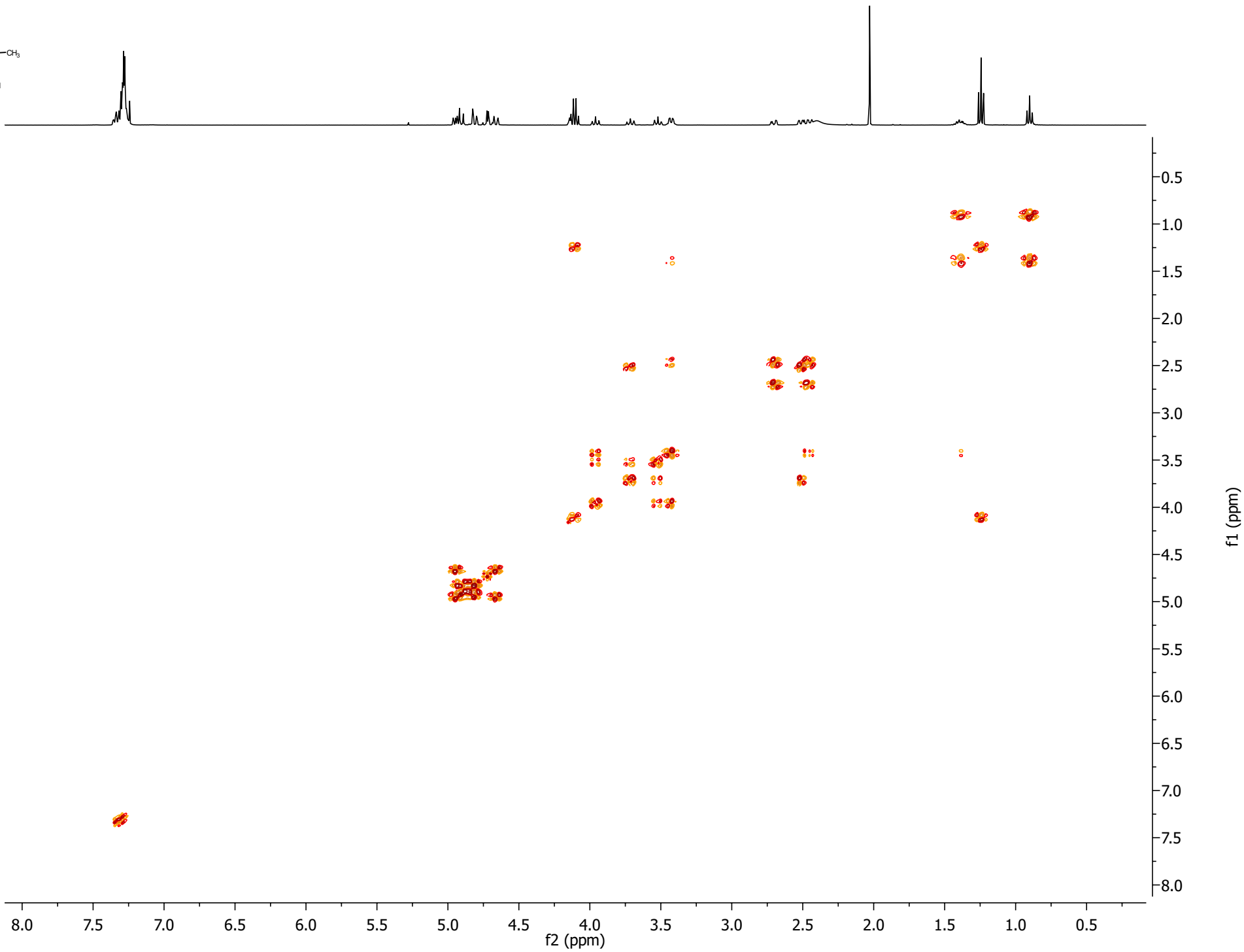
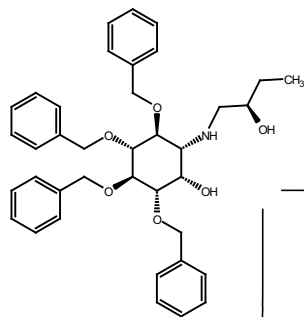
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-88x



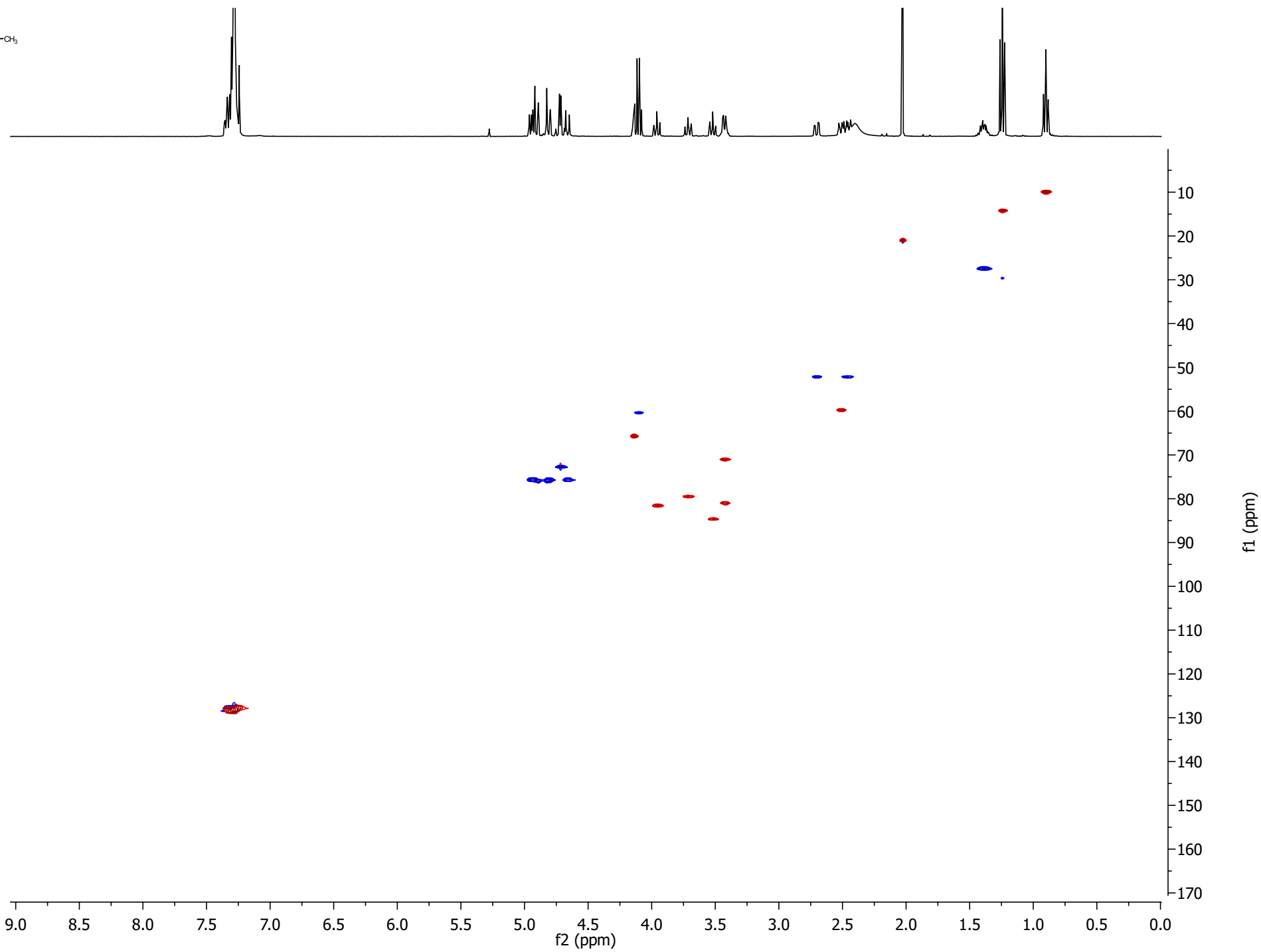
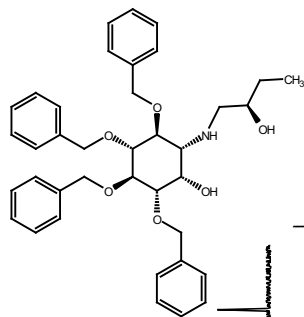
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-88x



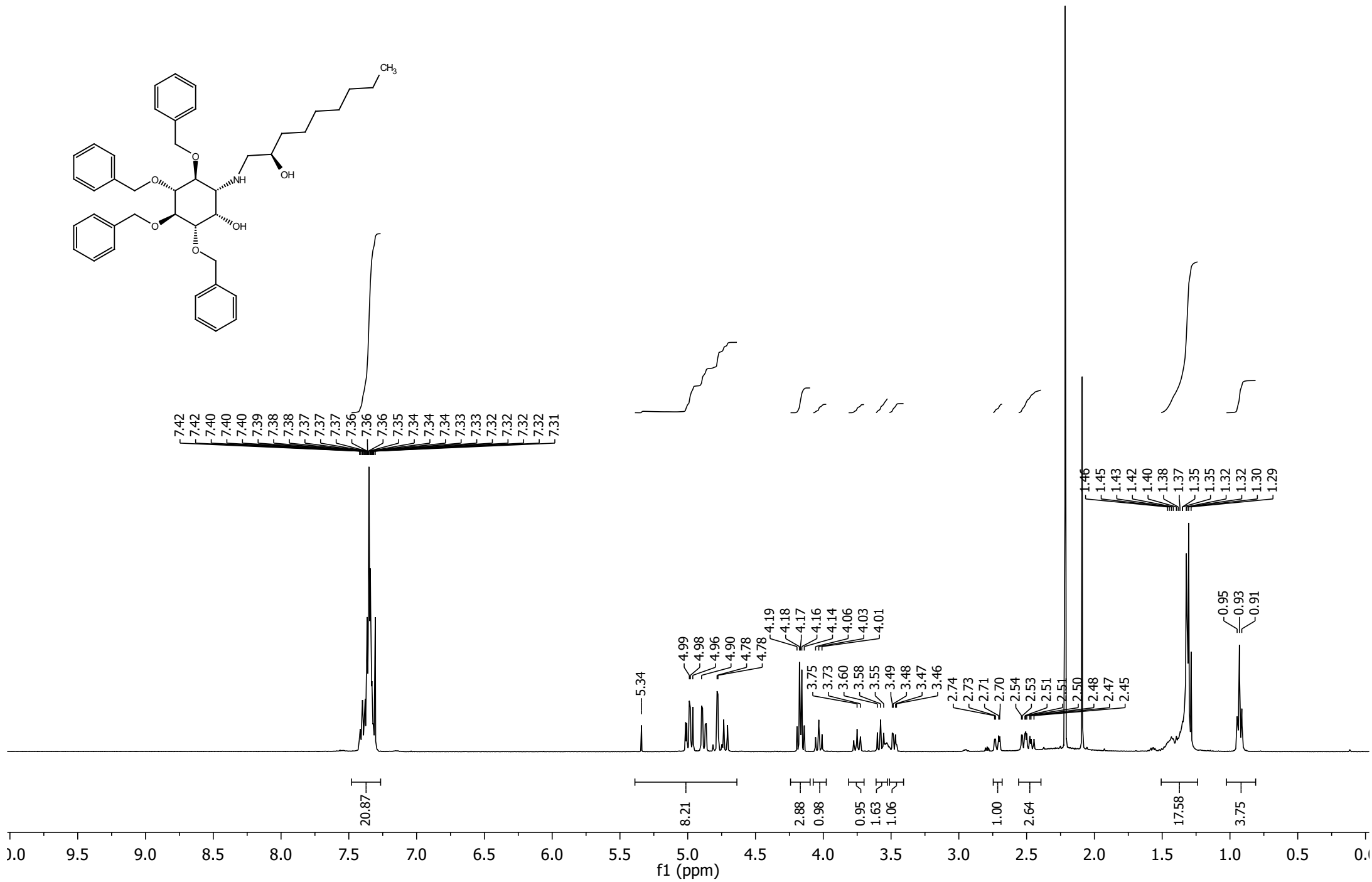
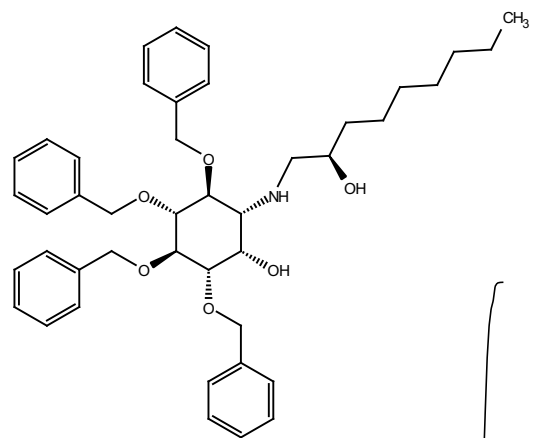
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of (R)-88x



# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (*R*)-88x



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-88y

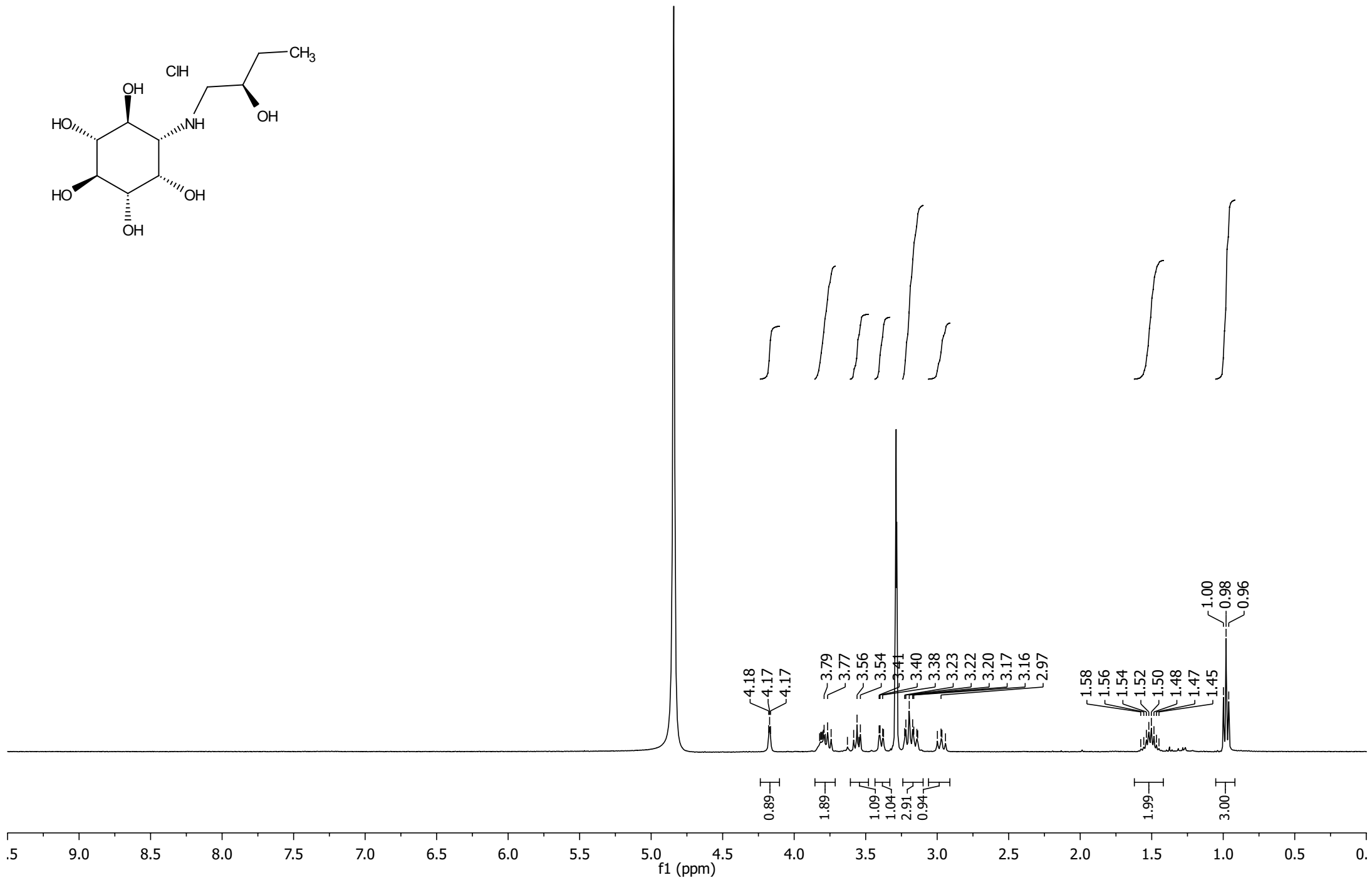
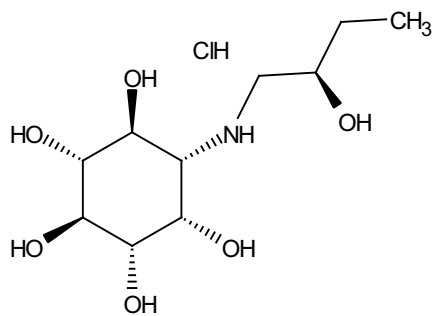


7.42  
7.42  
7.40  
7.40  
7.39  
7.38  
7.37  
7.37  
7.36  
7.36  
7.35  
7.34  
7.34  
7.33  
7.33  
7.32  
7.32  
7.32  
7.31

5.34  
4.99  
4.98  
4.96  
4.90  
4.78  
4.78  
4.19  
4.18  
4.17  
4.16  
4.14  
4.06  
4.03  
4.01  
3.75  
3.73  
3.60  
3.58  
3.55  
3.49  
3.48  
3.47  
3.46  
2.74  
2.73  
2.71  
2.70  
2.54  
2.53  
2.51  
2.51  
2.50  
2.48  
2.47  
2.45  
1.46  
1.45  
1.43  
1.42  
1.40  
1.38  
1.37  
1.35  
1.35  
1.32  
1.32  
1.30  
1.29  
0.95  
0.93  
0.91

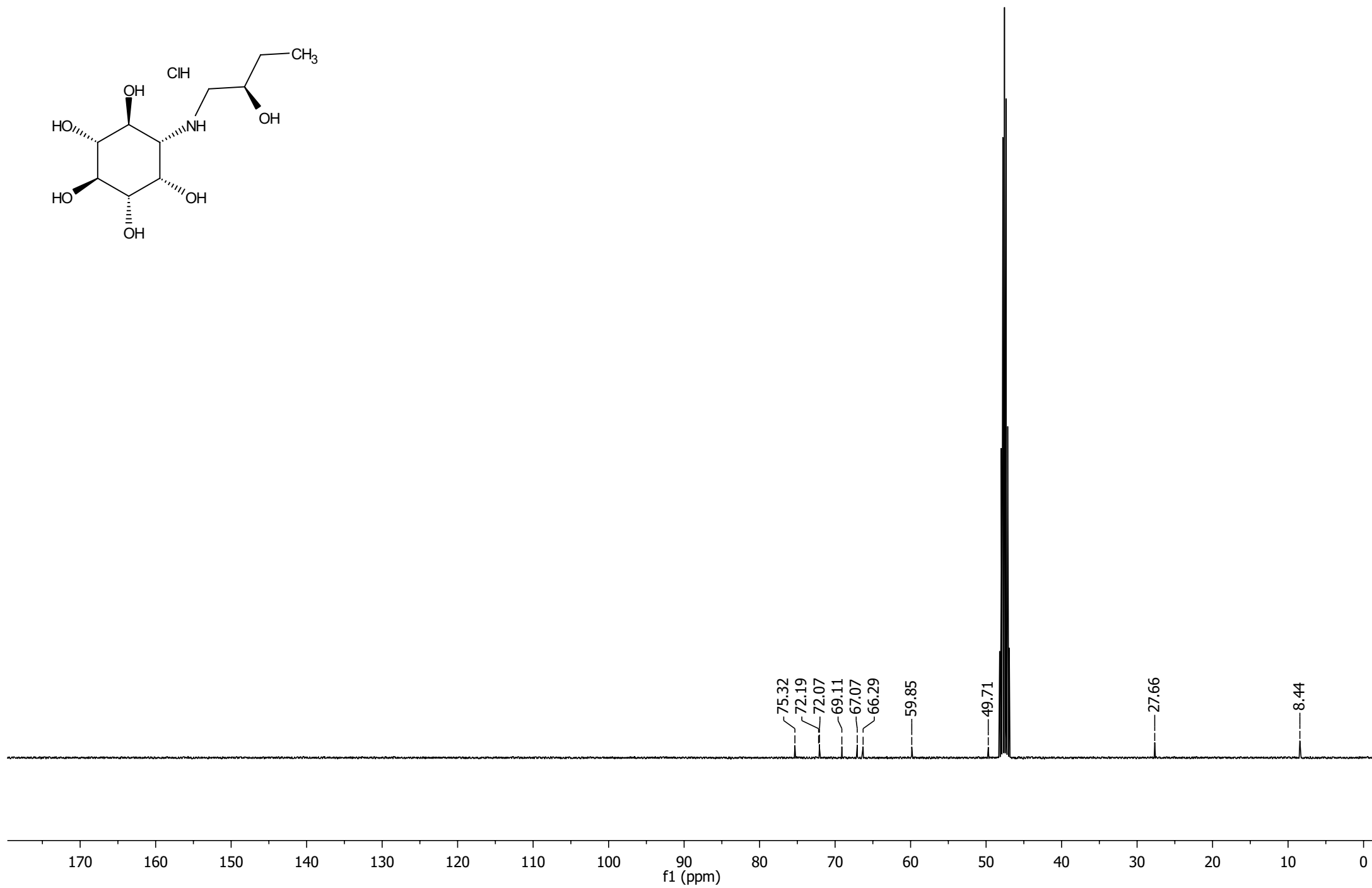
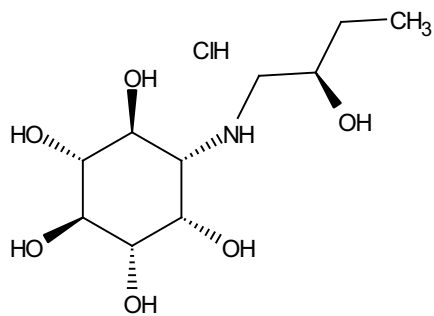
20.87  
8.21  
2.88  
0.98  
0.95  
1.63  
1.06  
1.00  
2.64  
17.58  
3.75

<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-89x

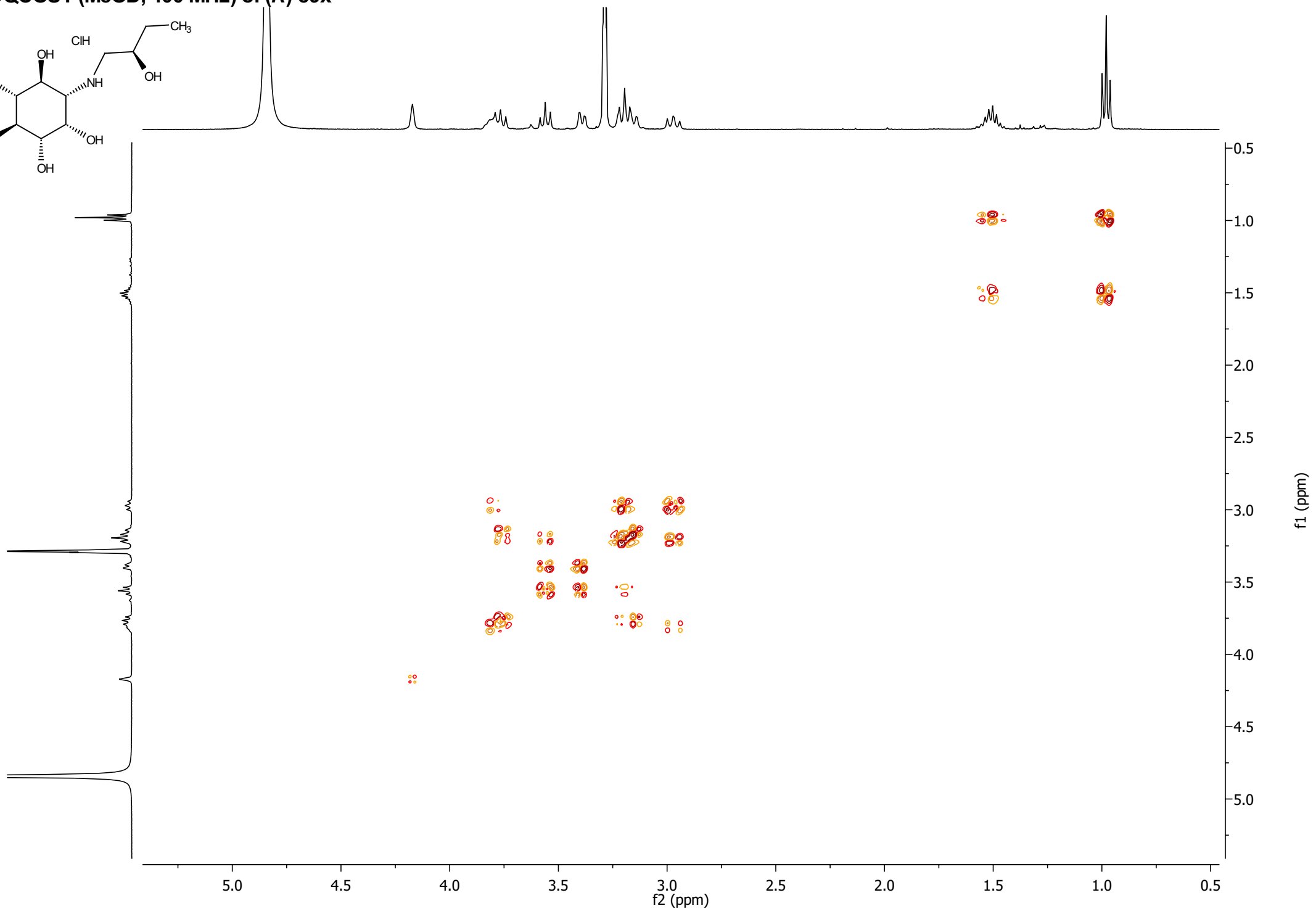
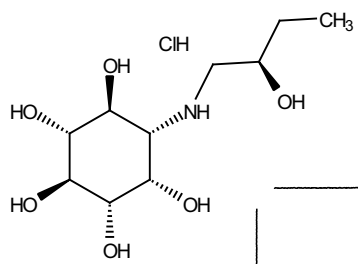




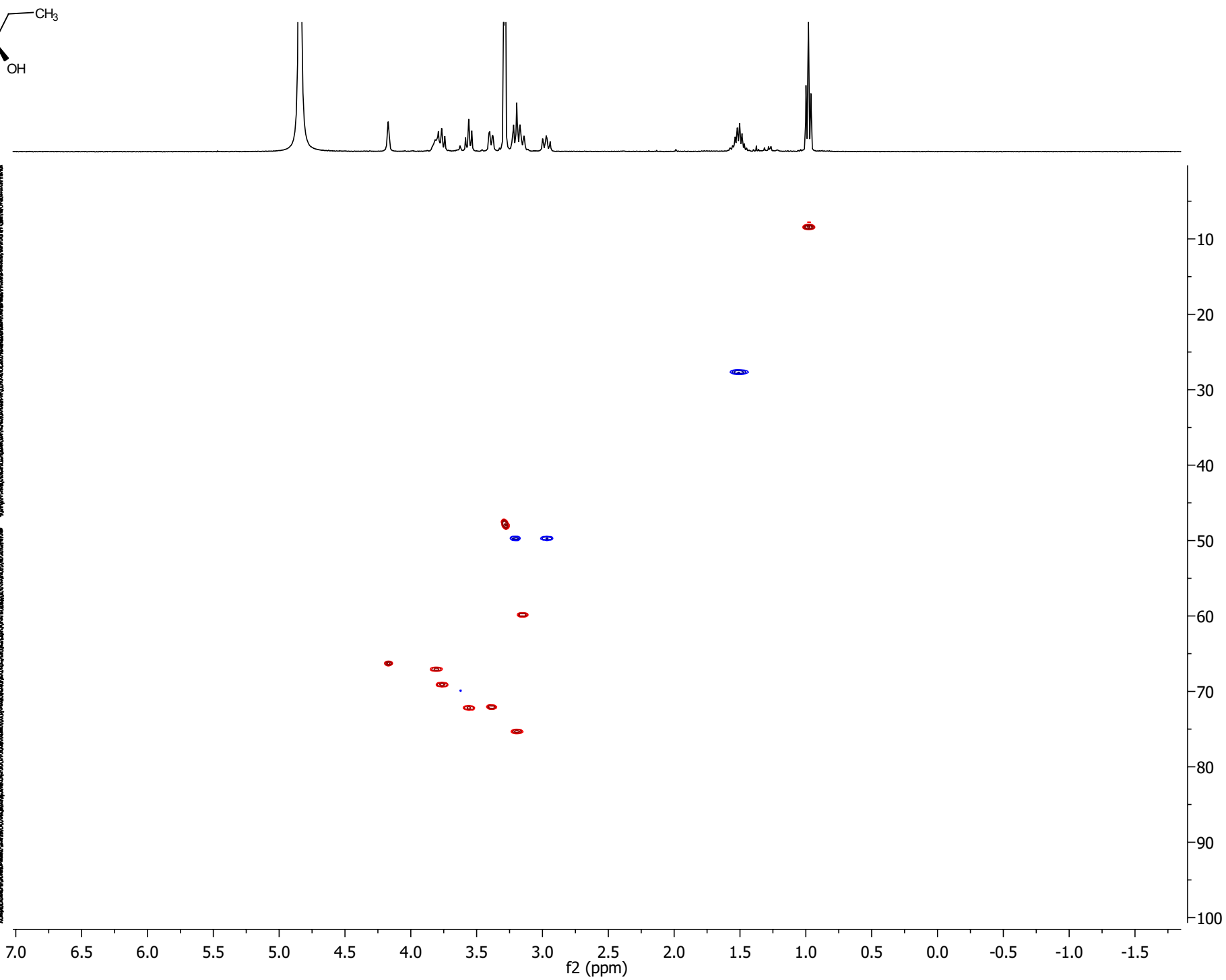
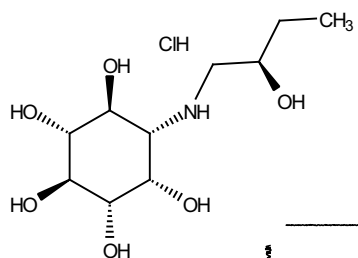
<sup>13</sup>C NMR (MeOD, 101 MHz) of (R)-89x



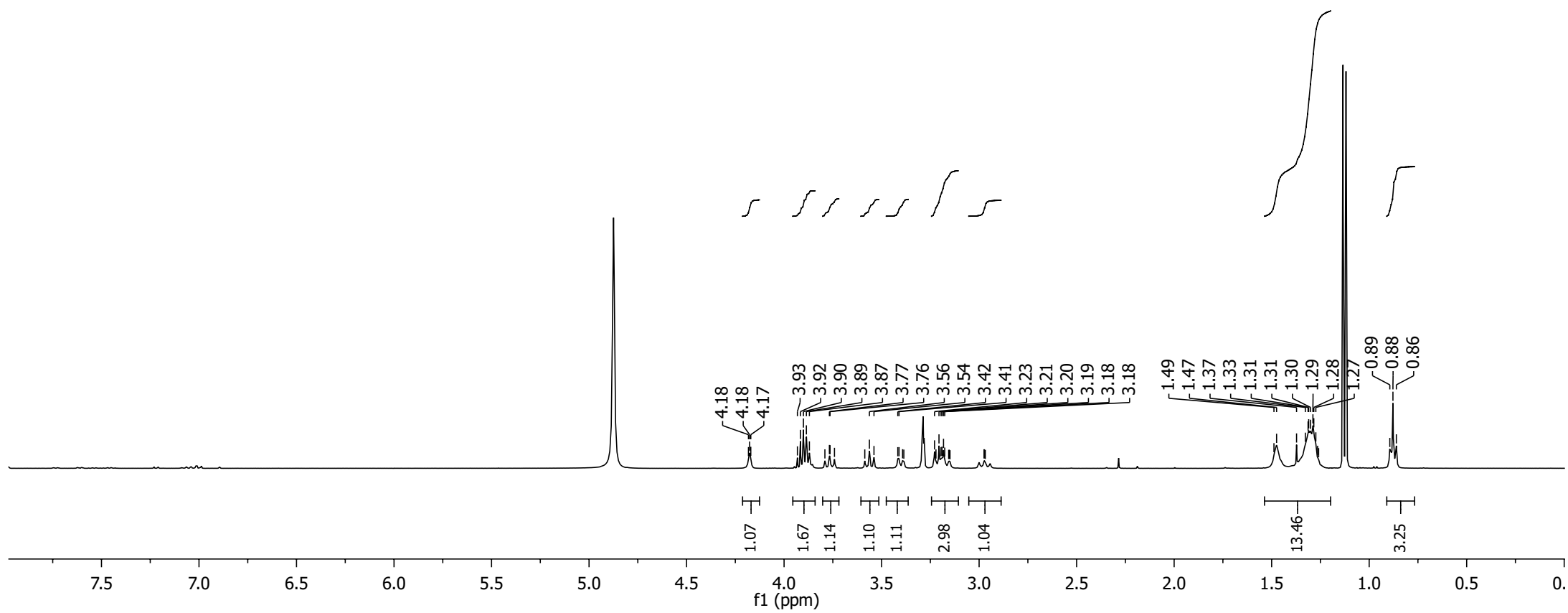
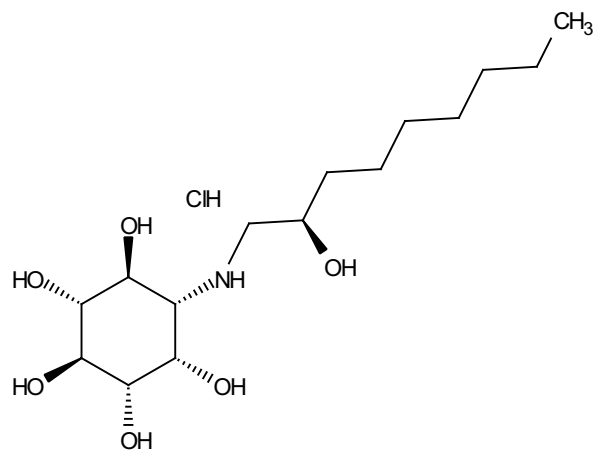
gDQCOSY (MeOD, 400 MHz) of (R)-89x



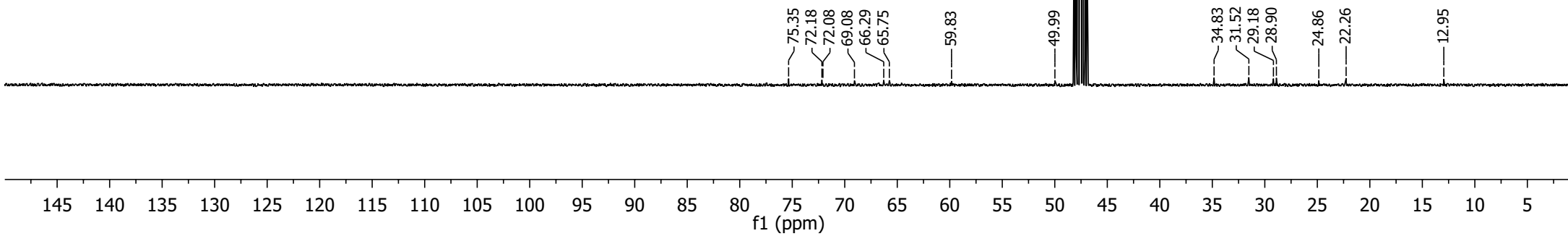
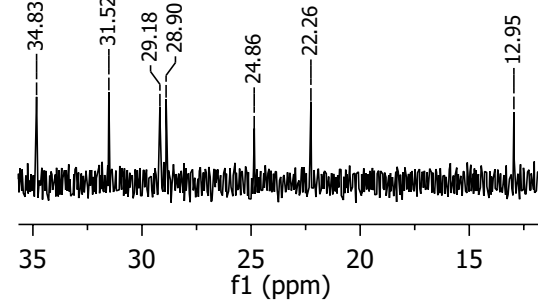
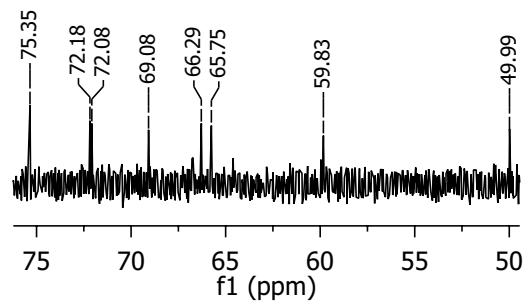
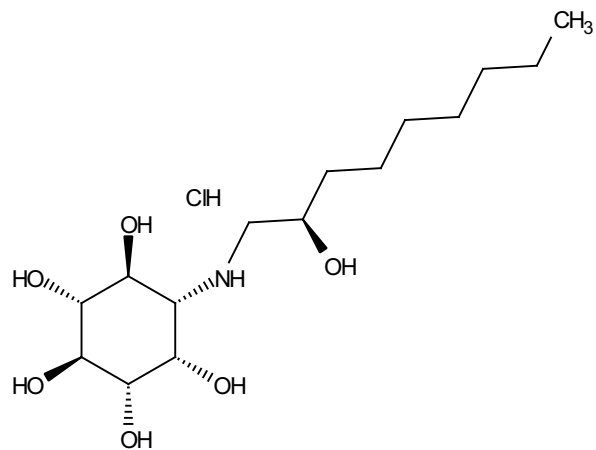
# HSQCAD (MeOD, 400 MHz) of (*R*)-89x



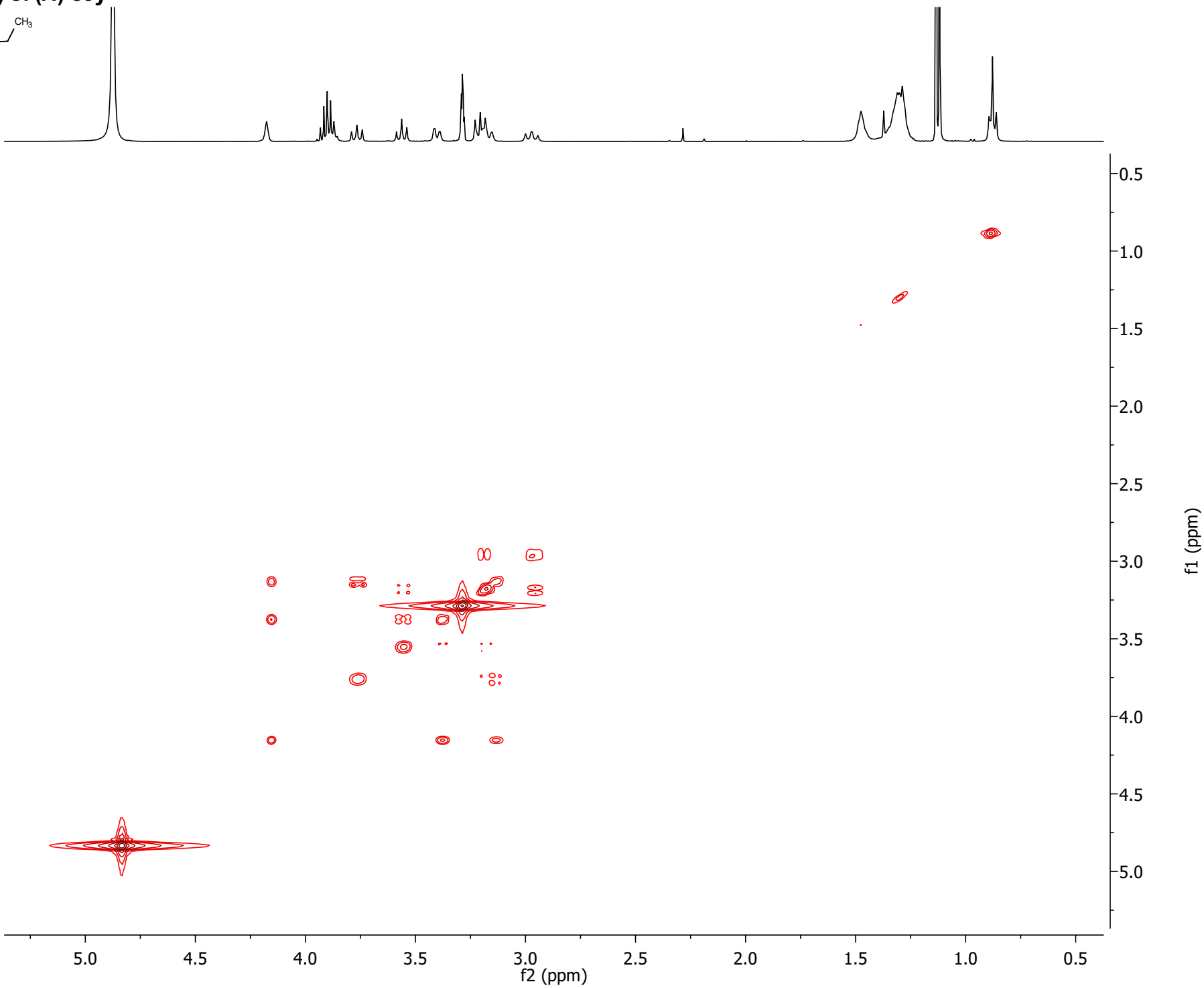
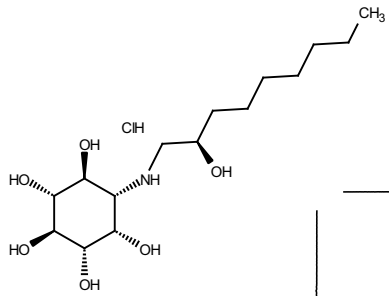
<sup>1</sup>H NMR (MeOD, 400 MHz) of (R)-89y



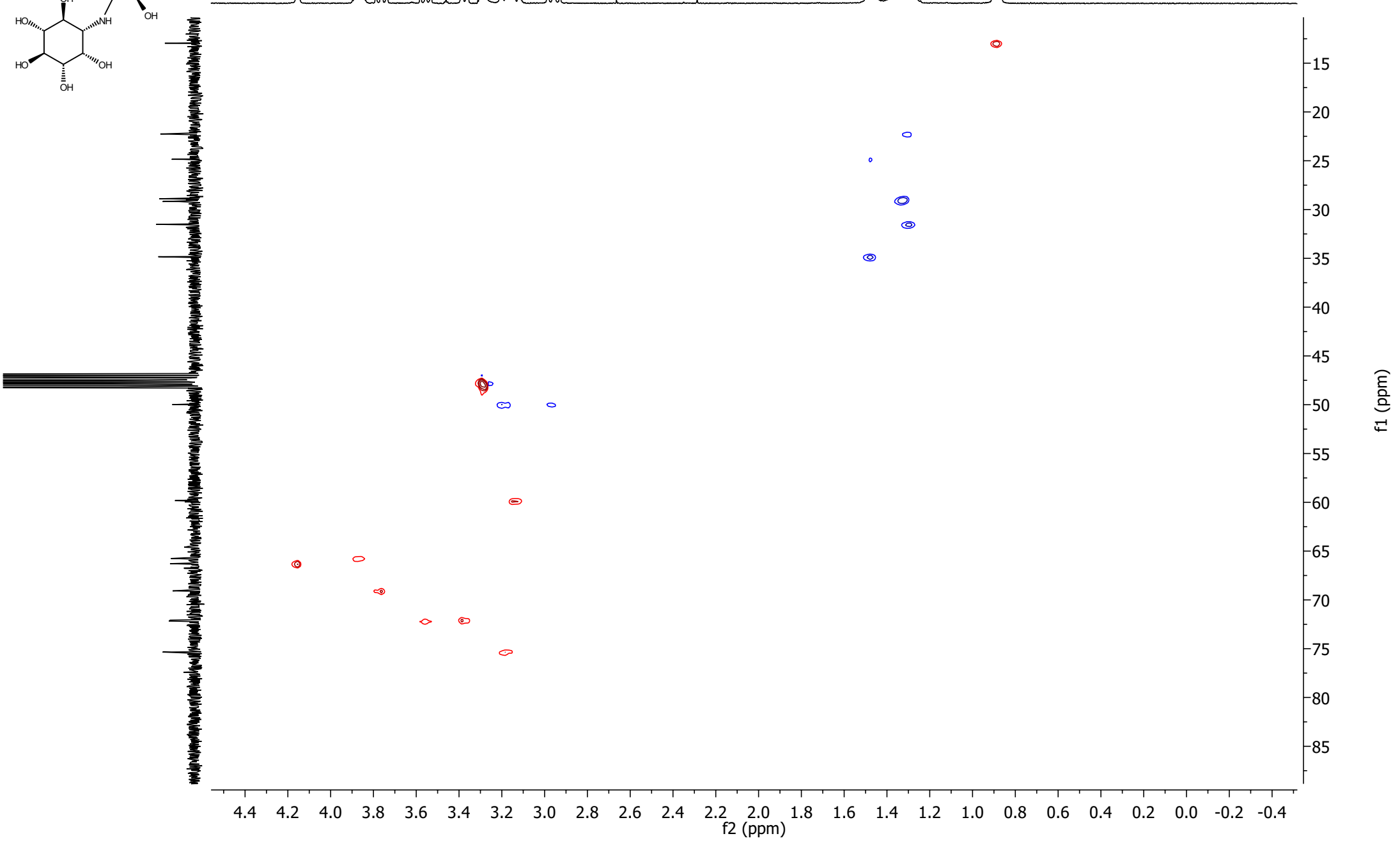
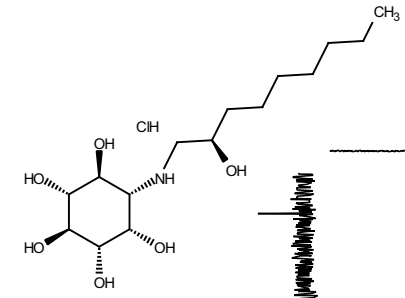
<sup>13</sup>C NMR (MeOD, 101 MHz) of (R)-89y



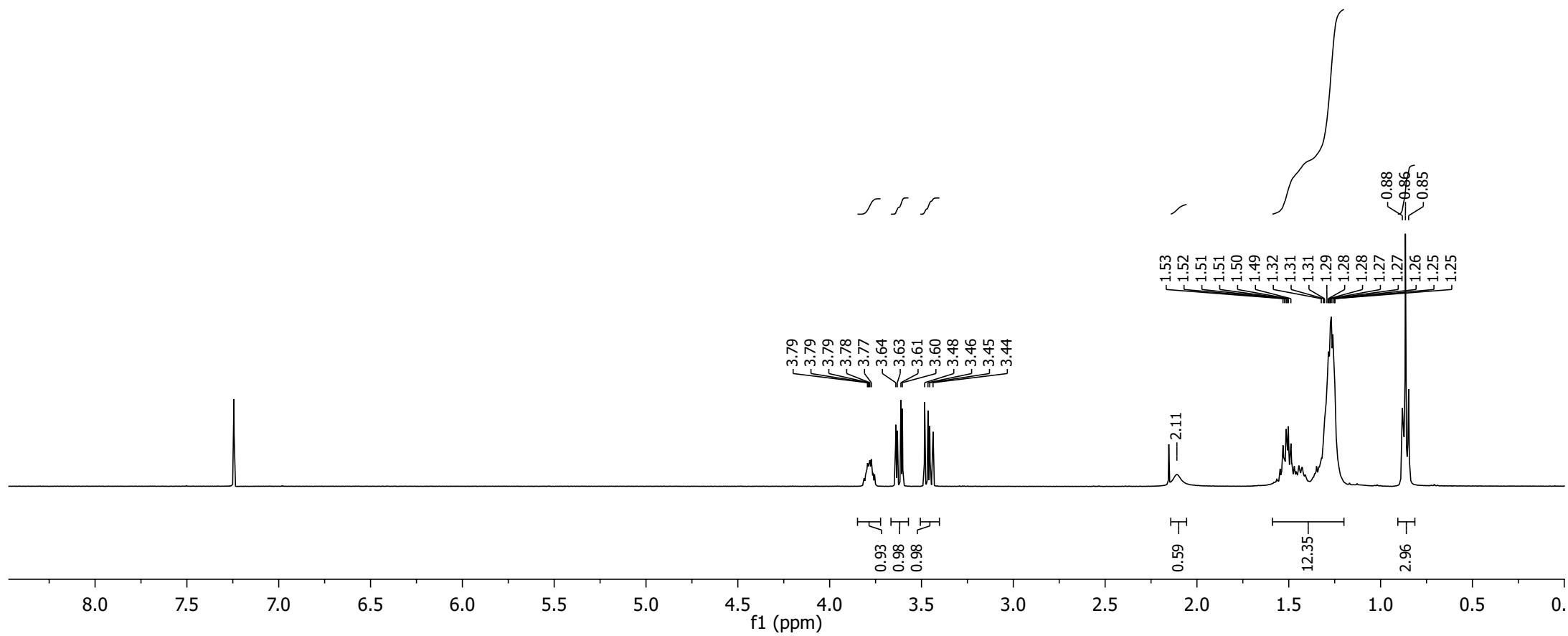
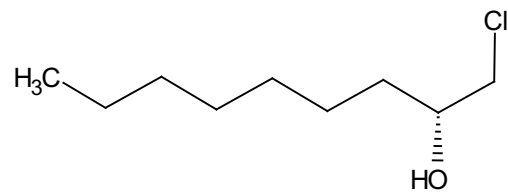
gCOSY (MeOD, 400 MHz) of (R)-89y



gHSQCAD (MeOD, 400 MHz) of (R)-89y

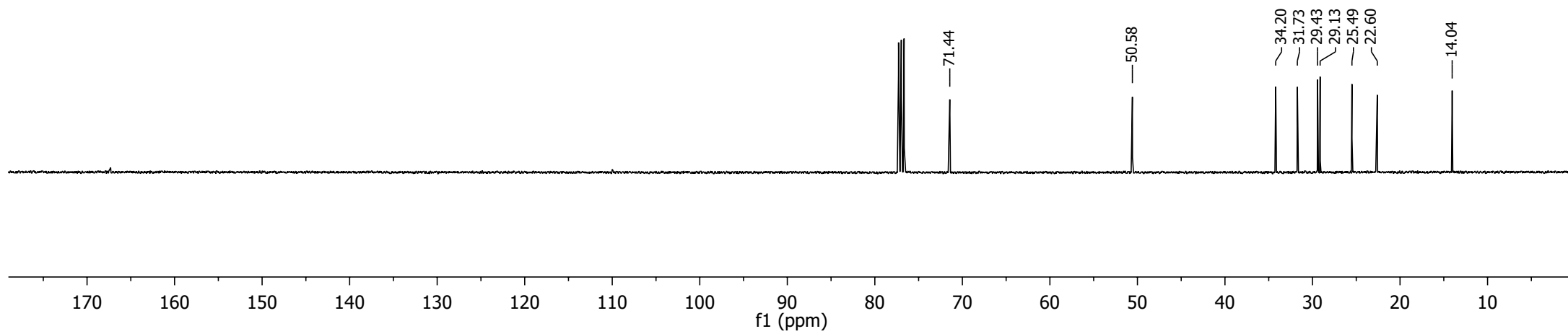
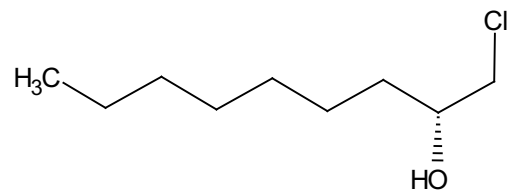


**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (R)-94**

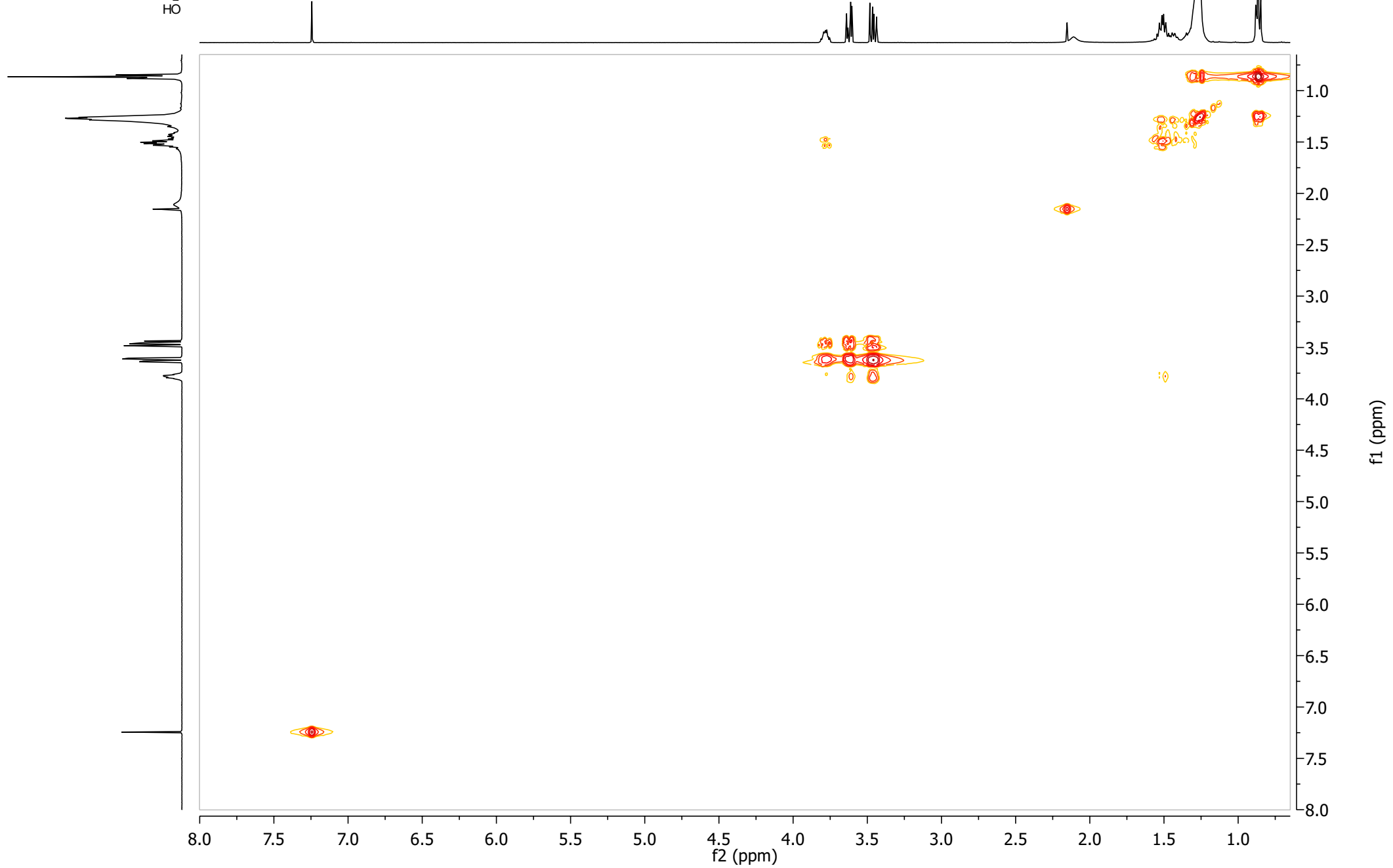
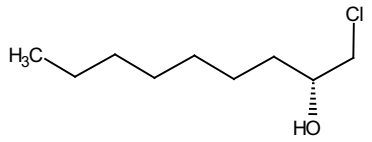




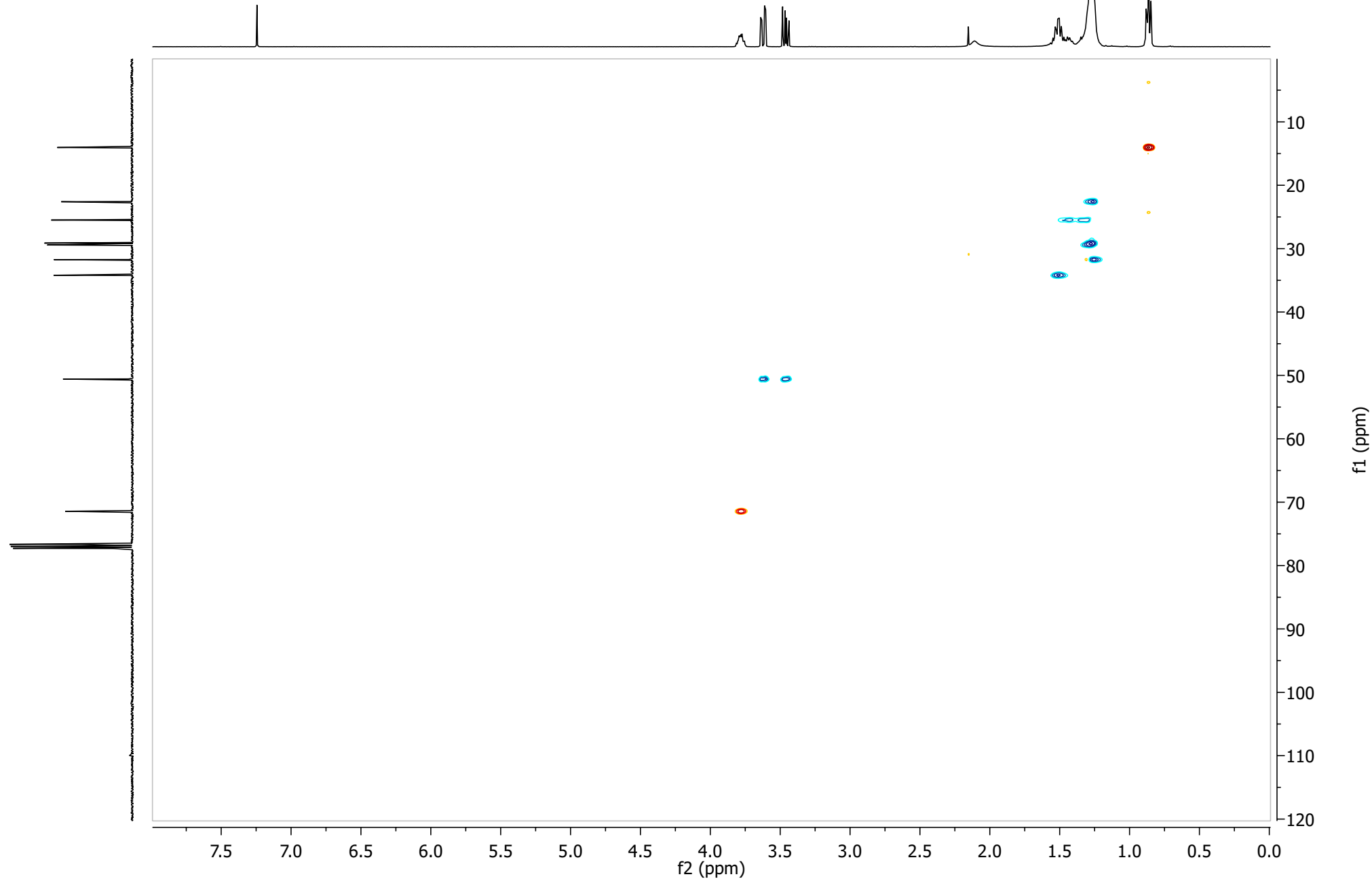
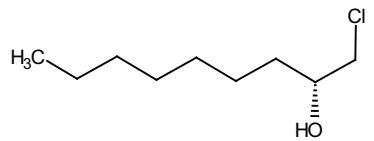
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (R)-94



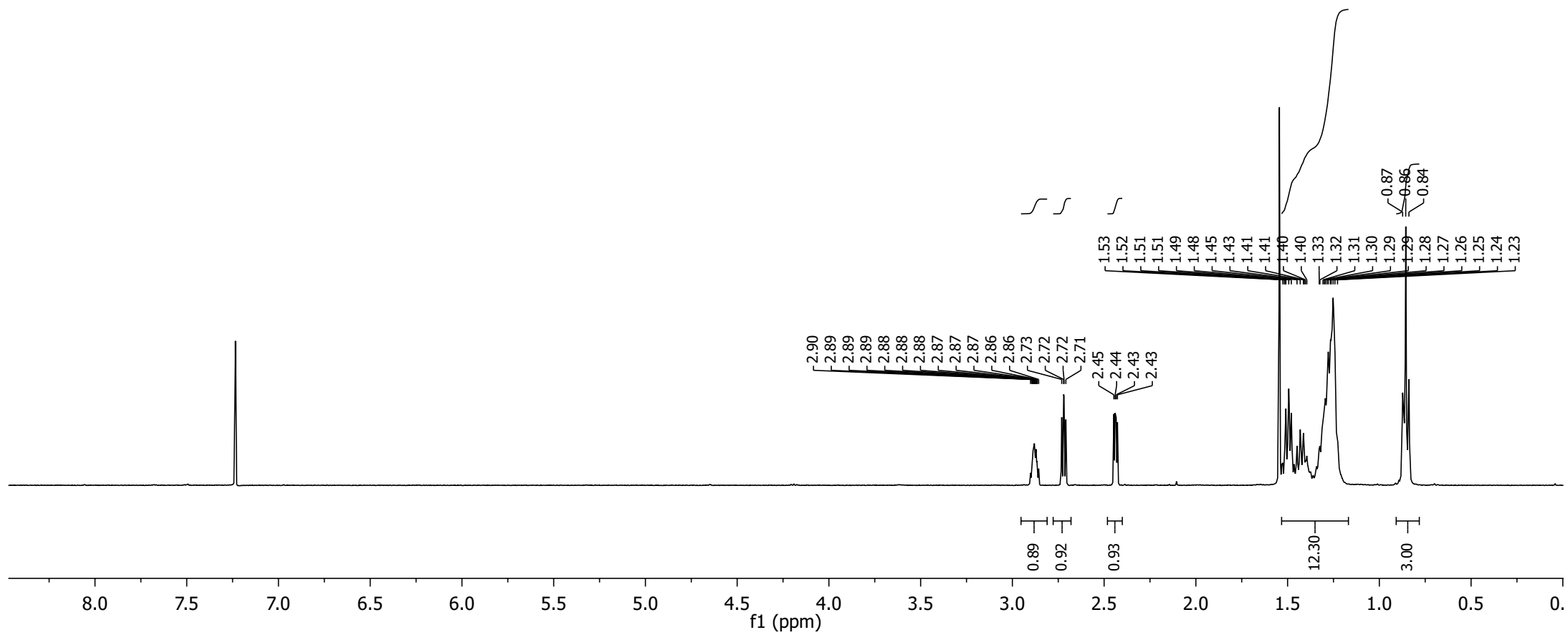
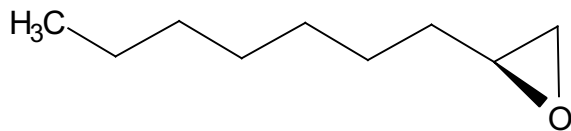
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (*R*)-94



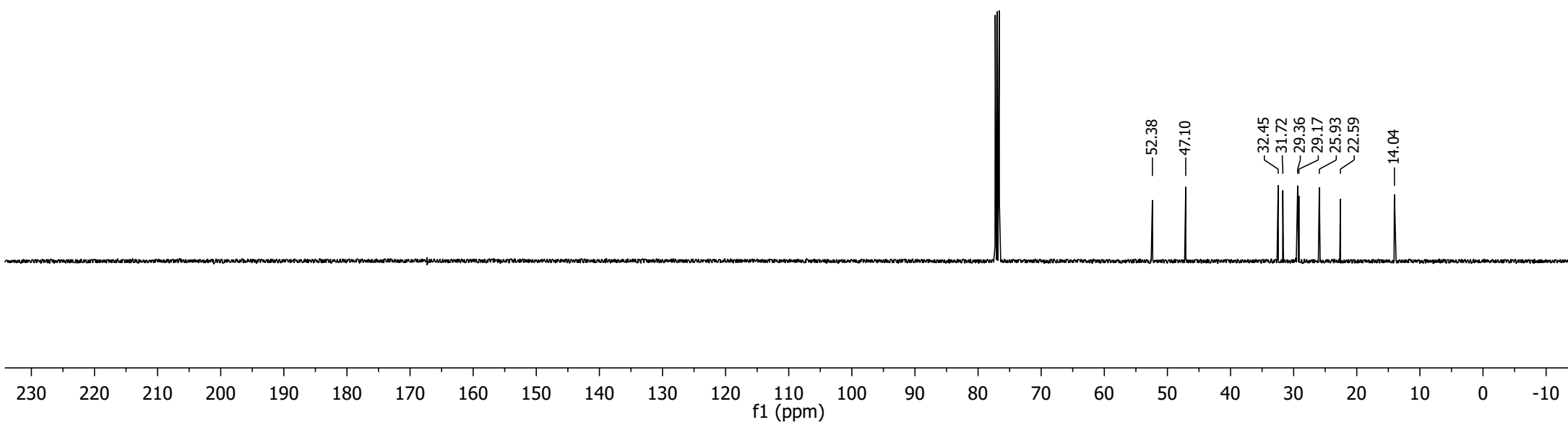
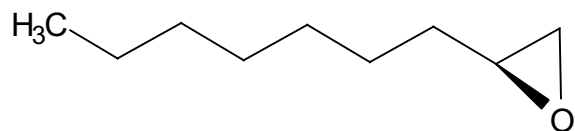
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (*R*)-94



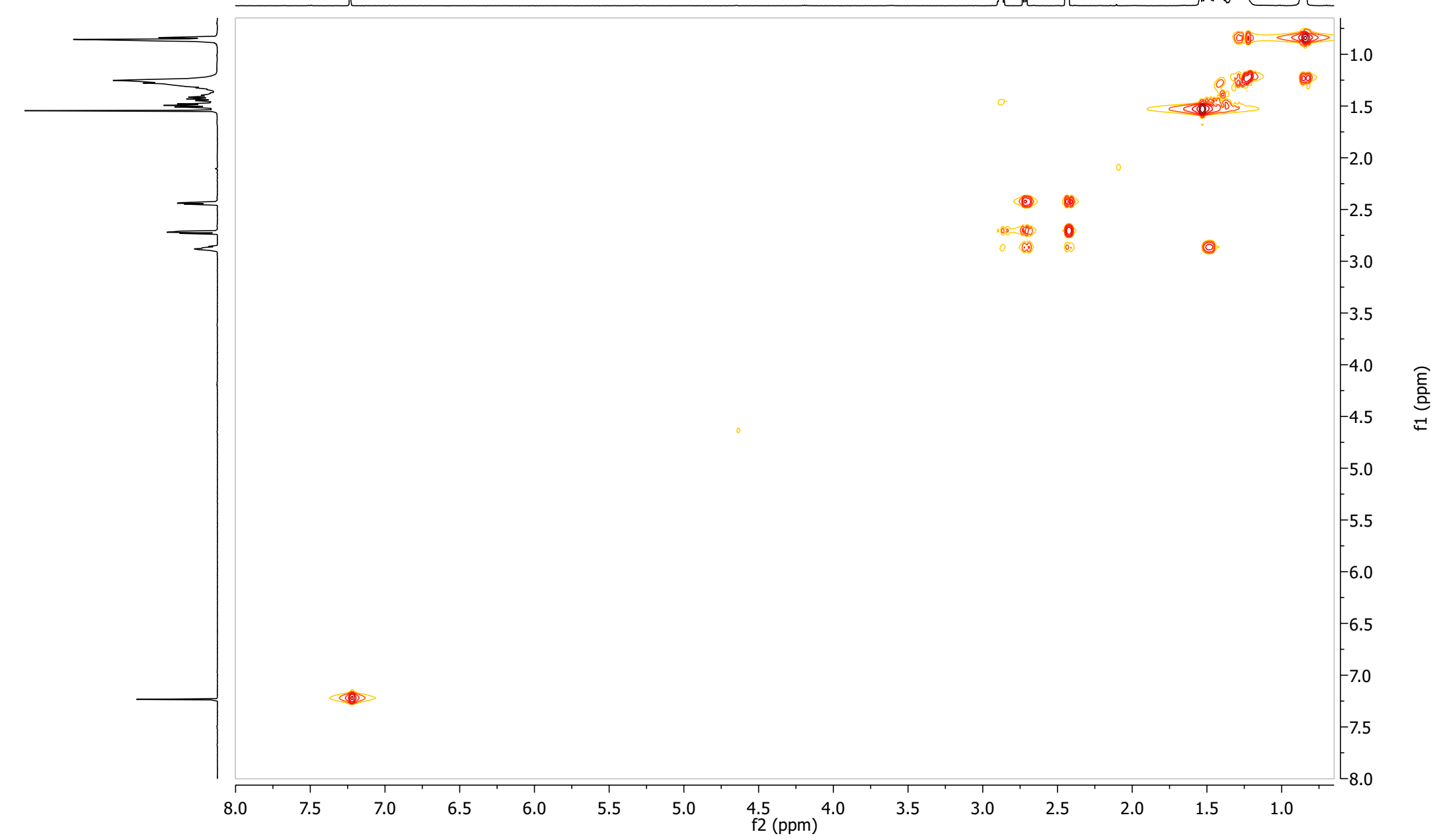
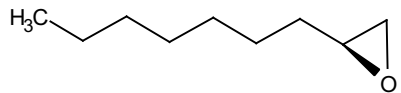
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-83y



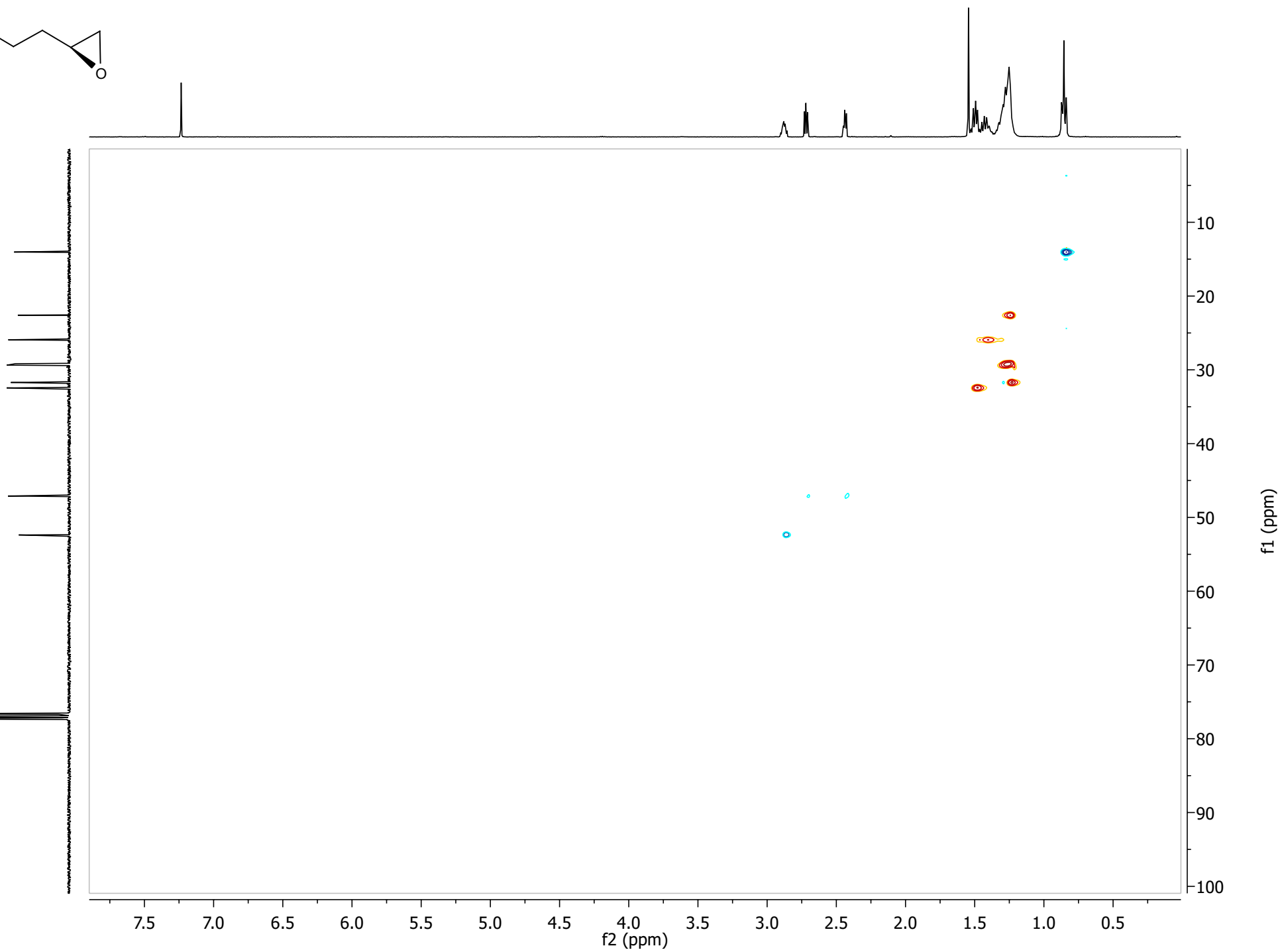
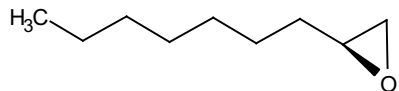
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-83y



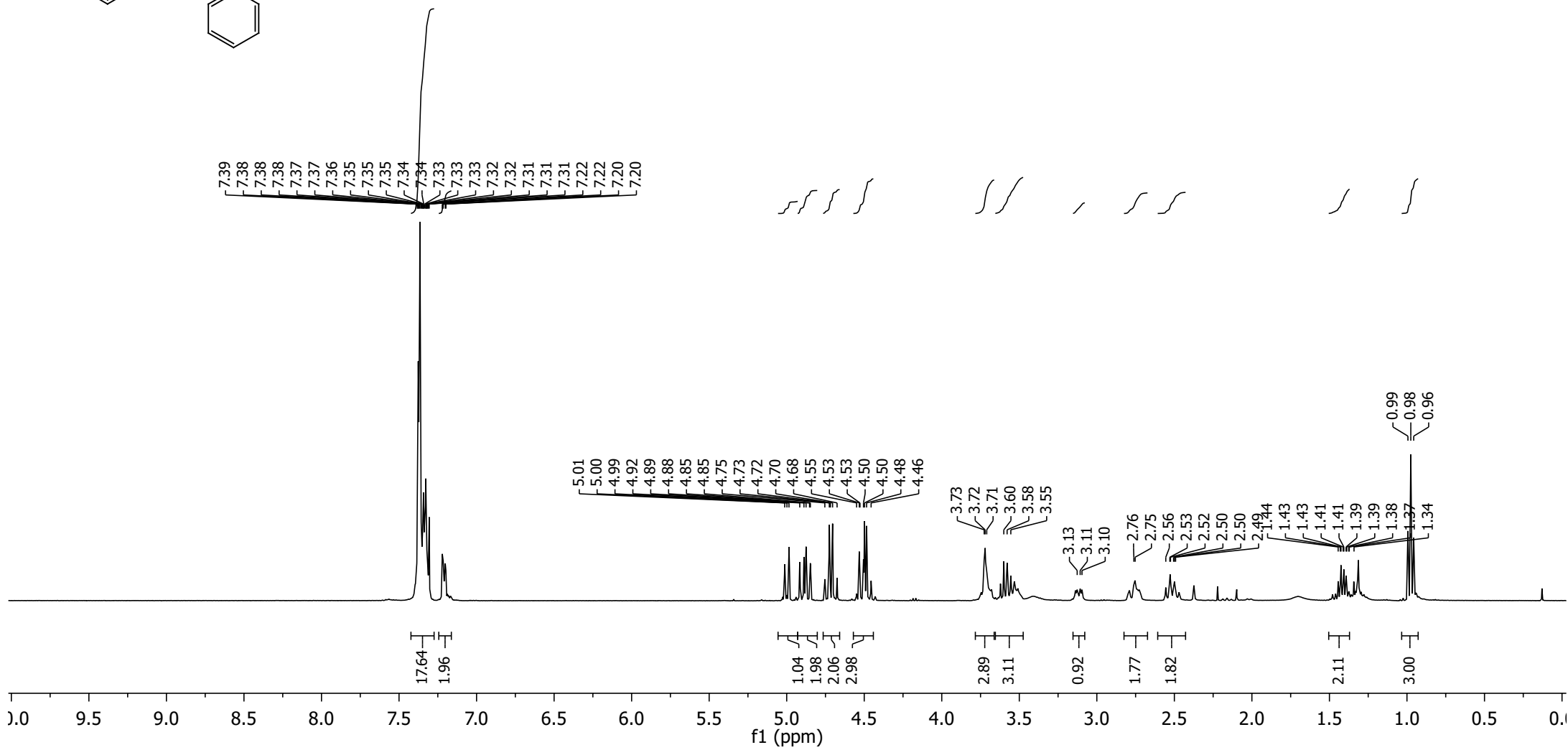
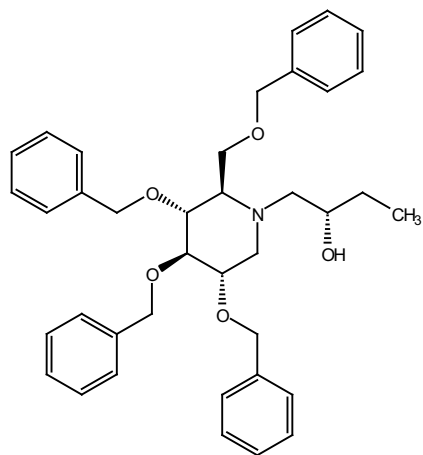
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-83y



# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-83y

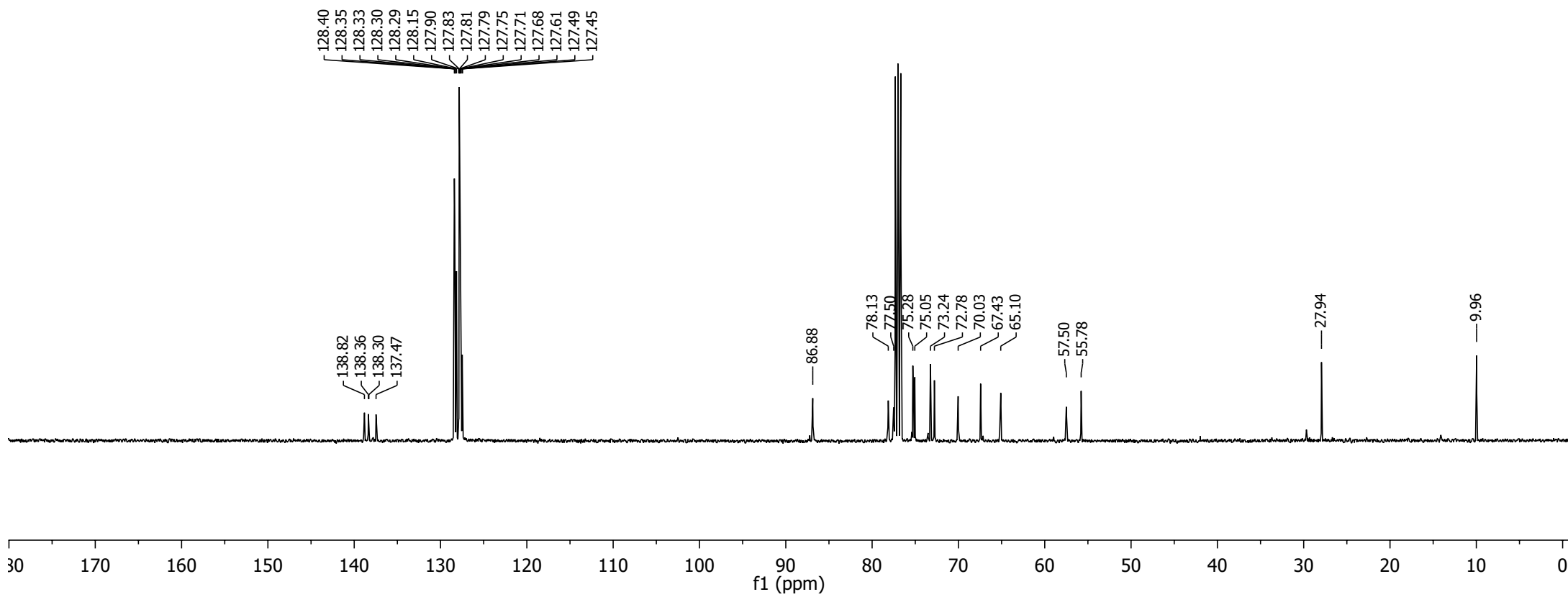
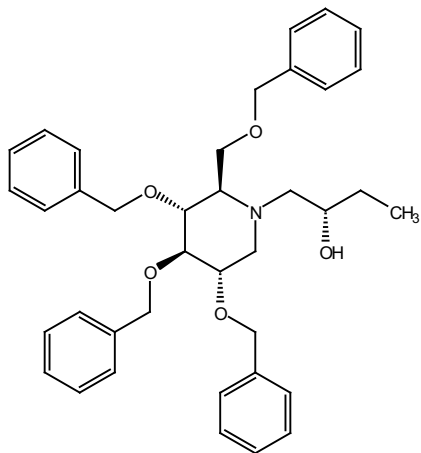


<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-84x

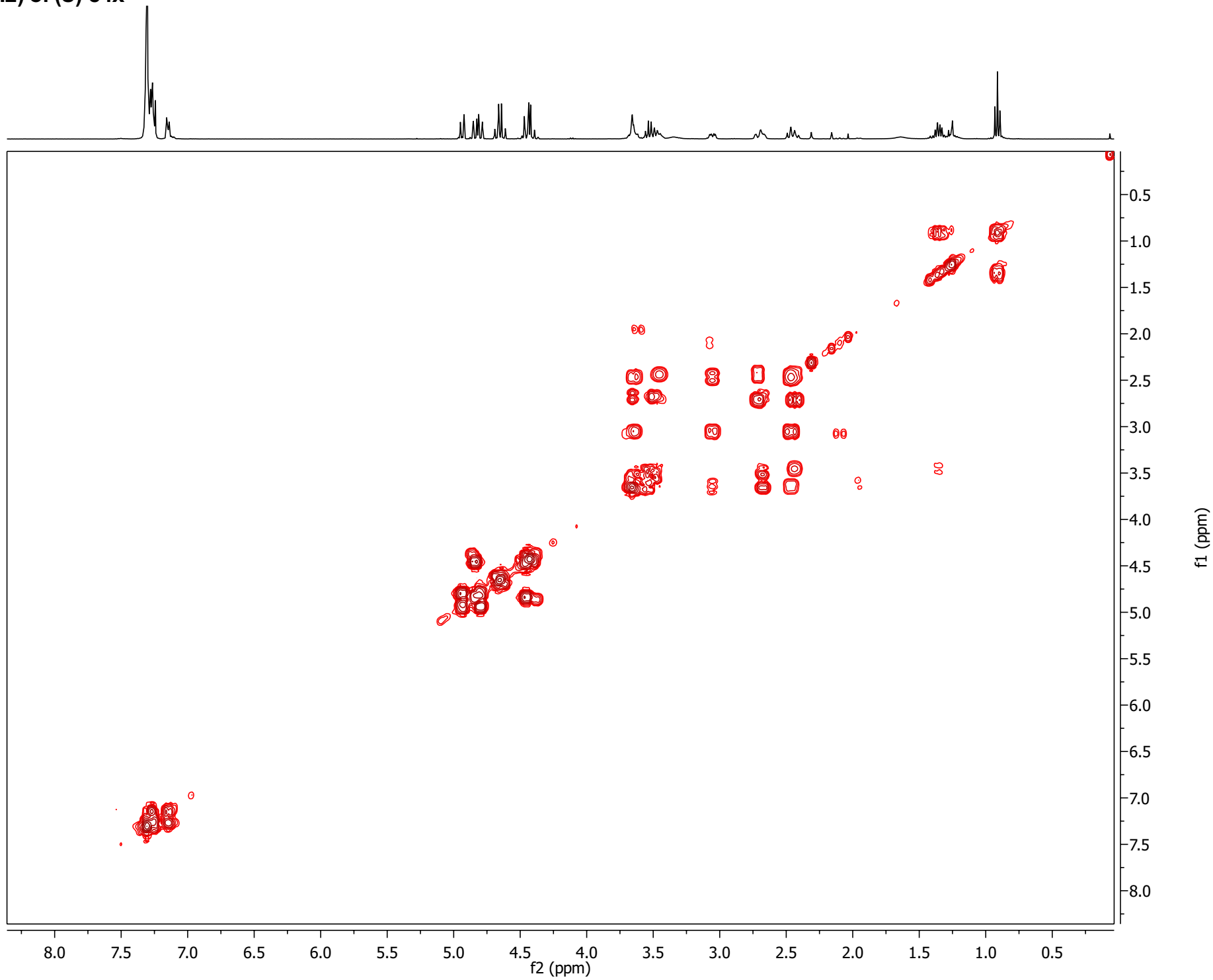
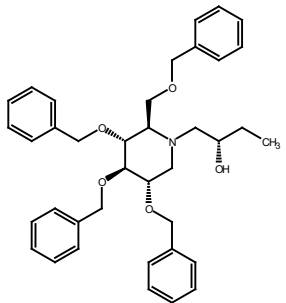




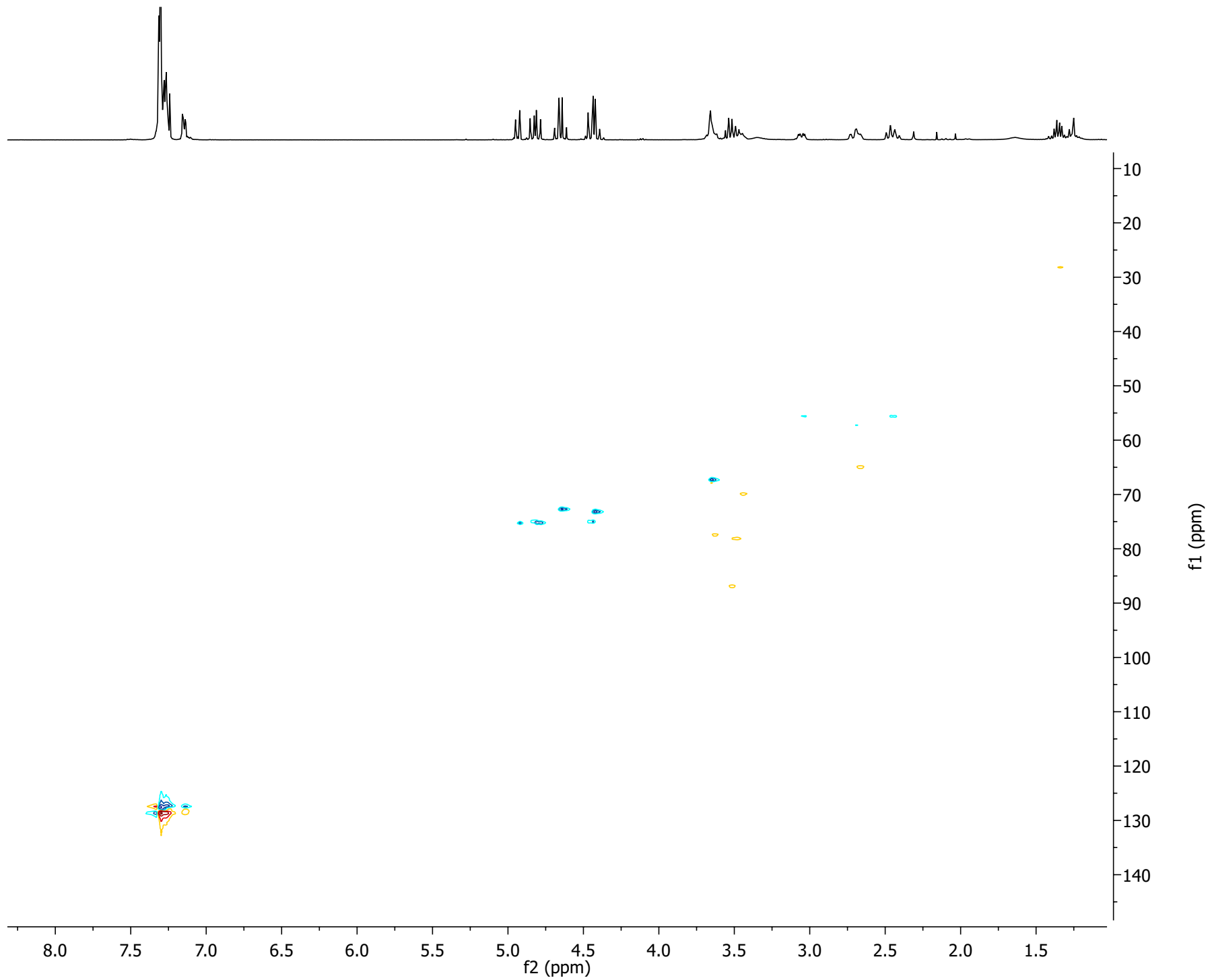
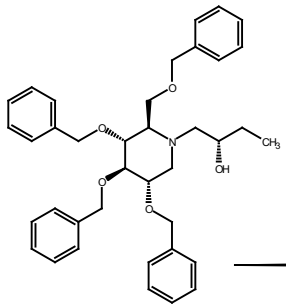
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-84x



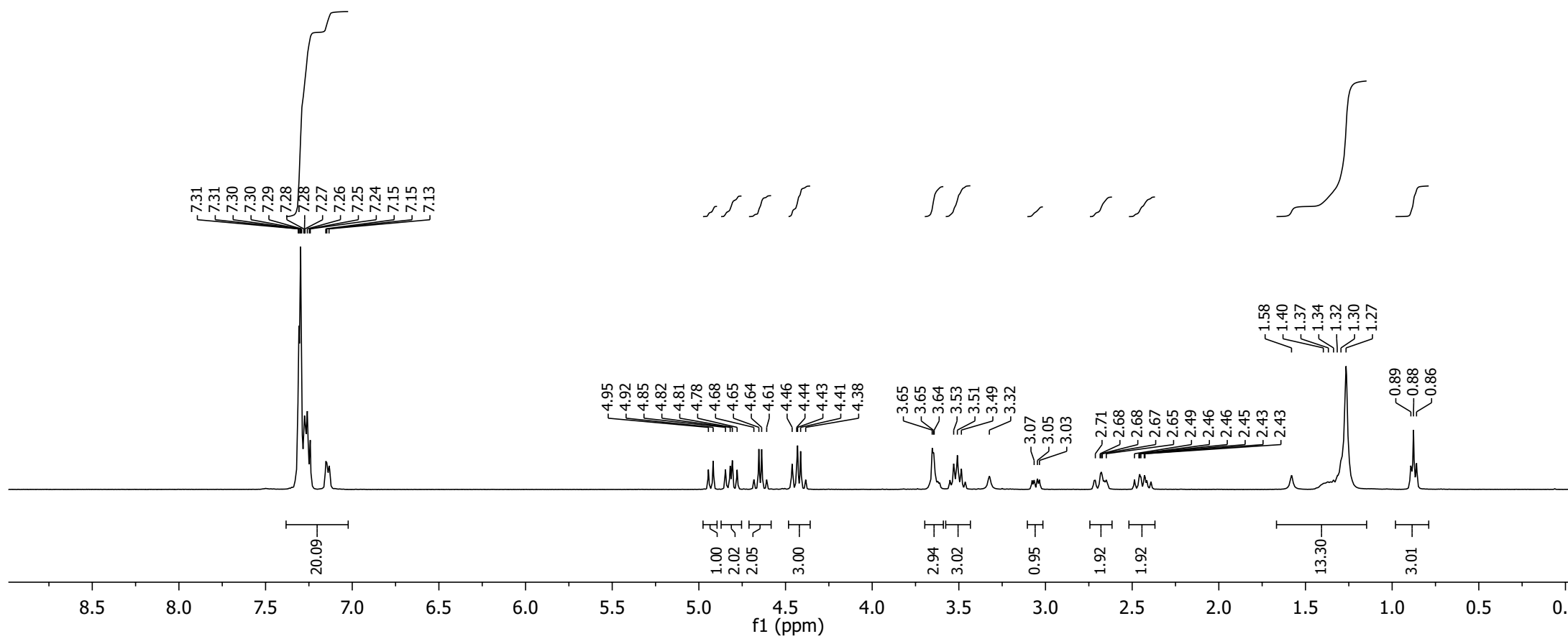
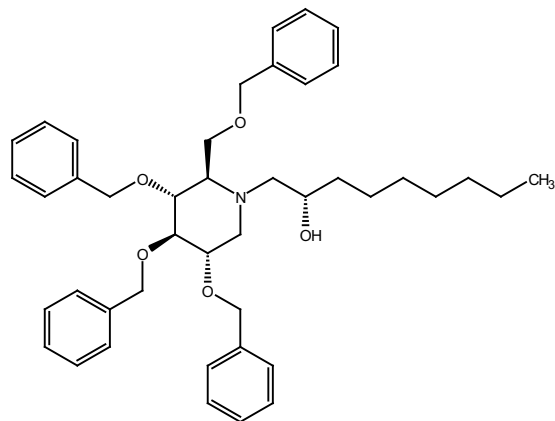
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-84x



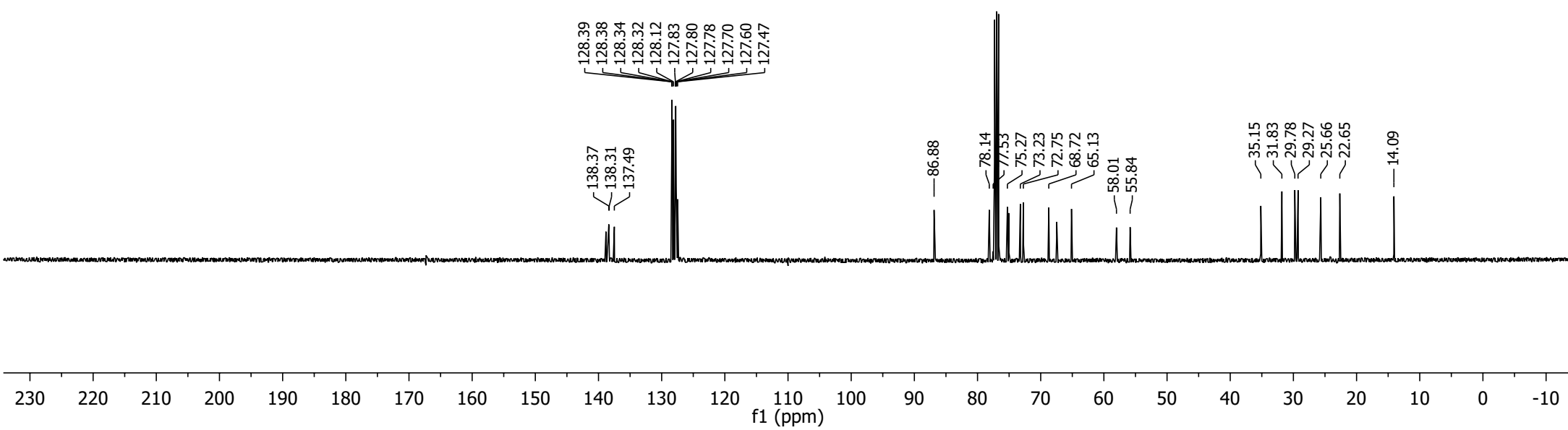
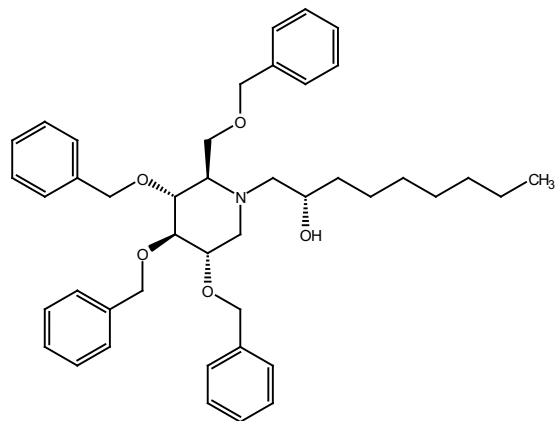
gHSQC (CDCl<sub>3</sub>, 400 MHz) of (S)-84x



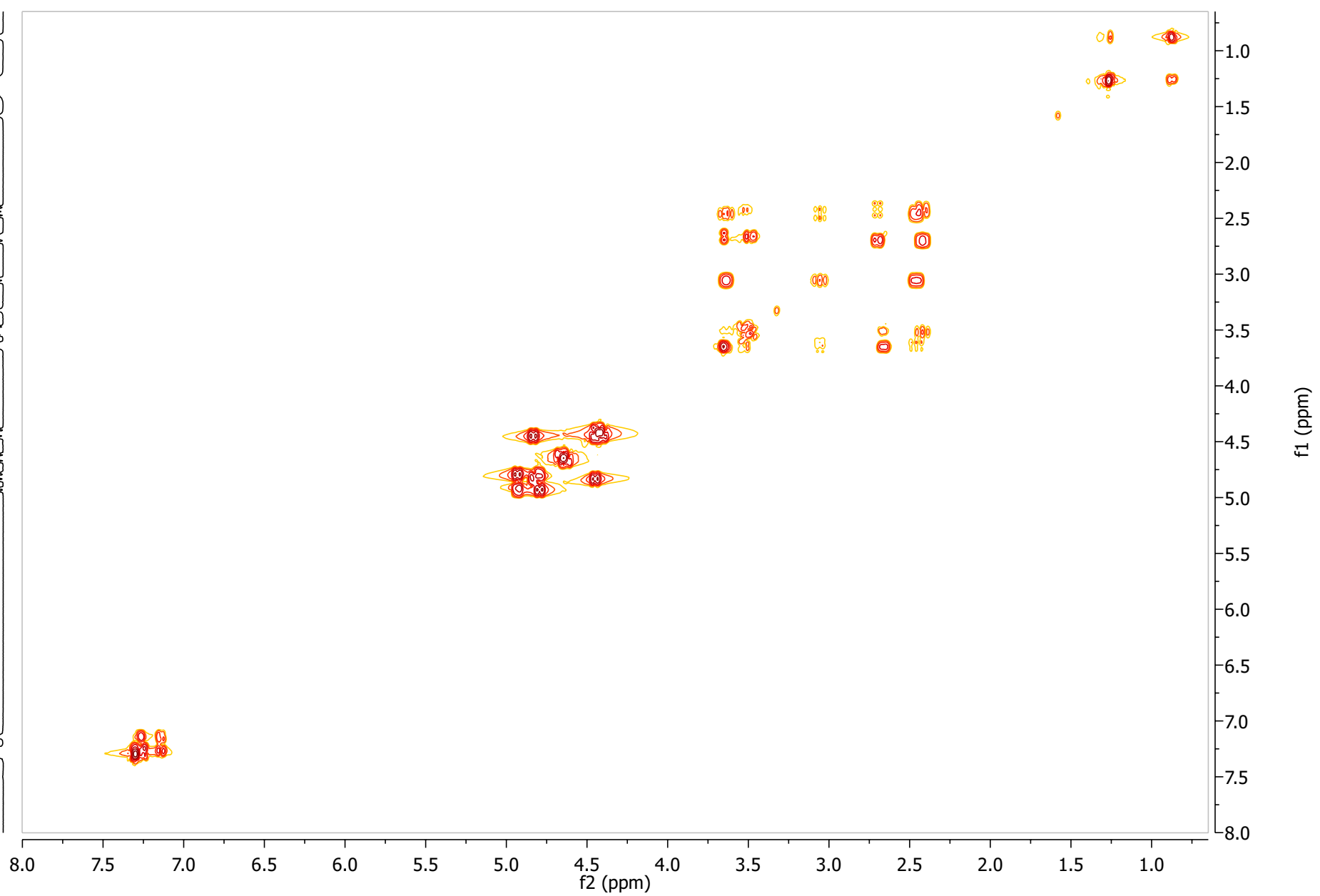
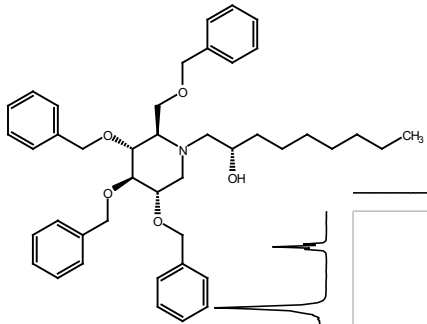
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-84y



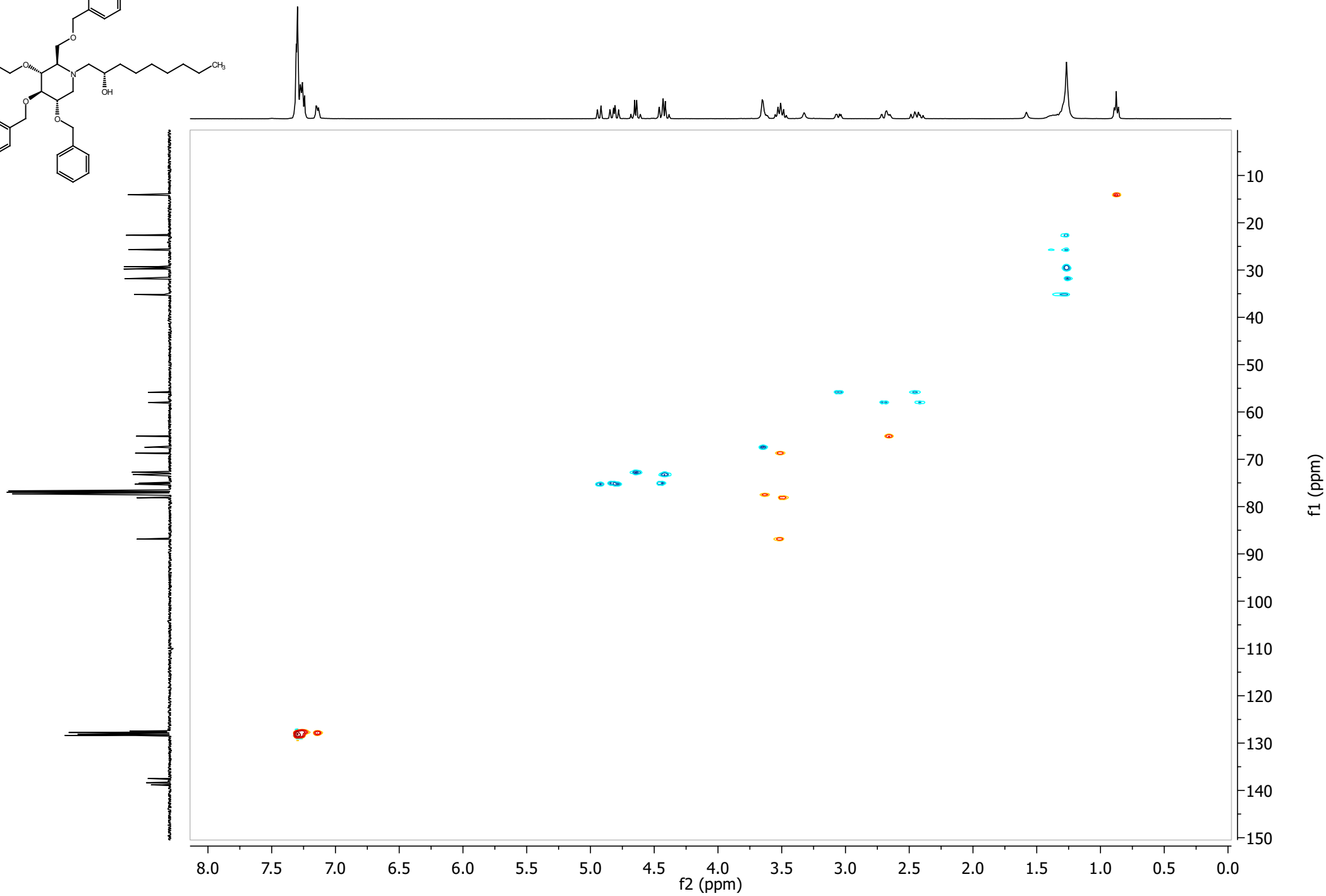
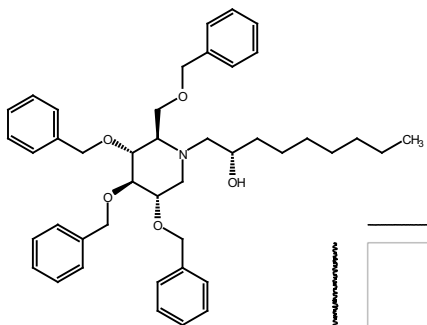
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-84y



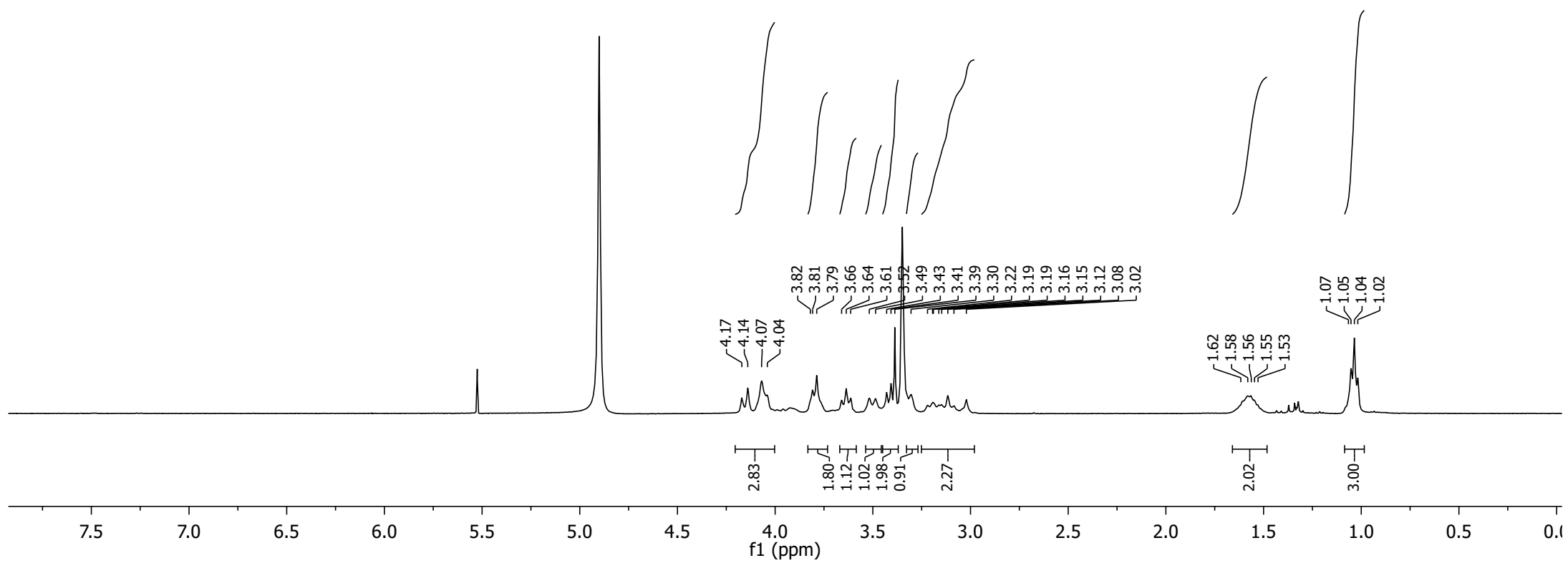
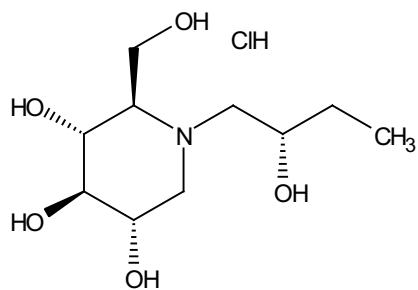
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-84y



# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-84y

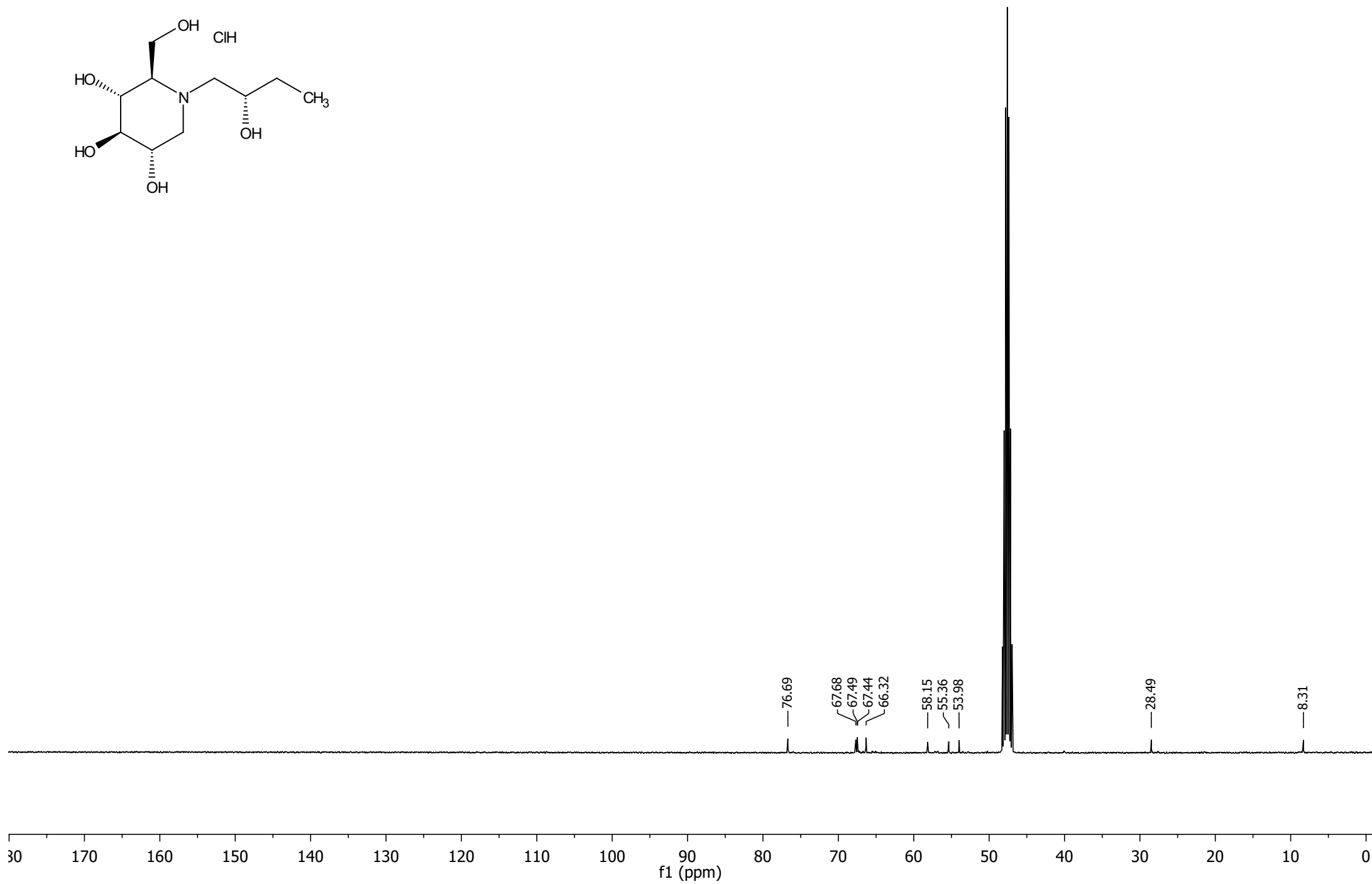
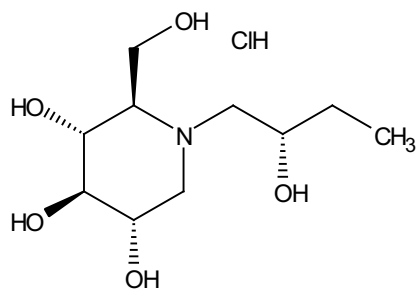


<sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-85x

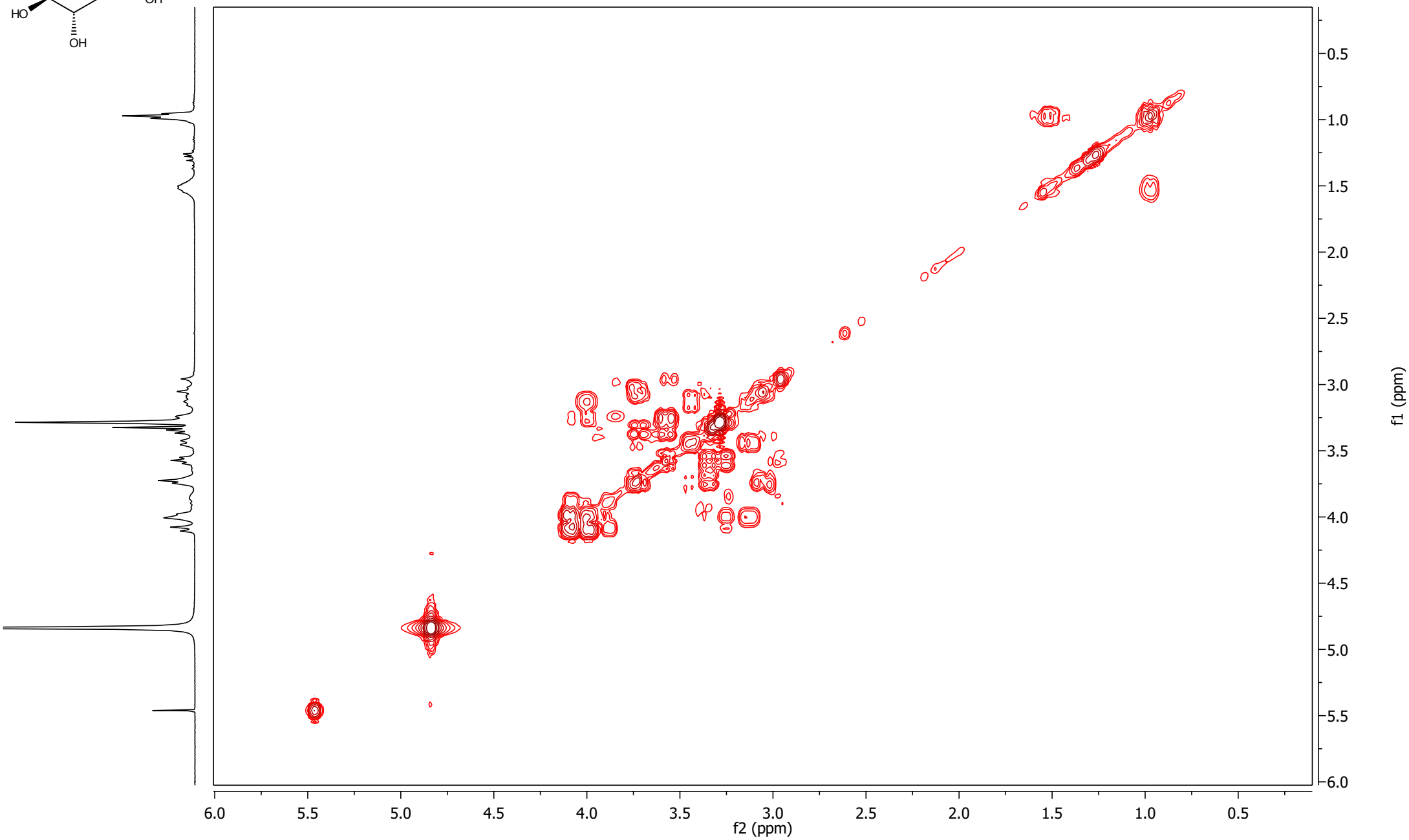
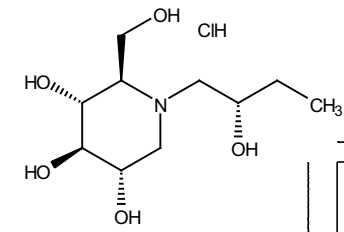




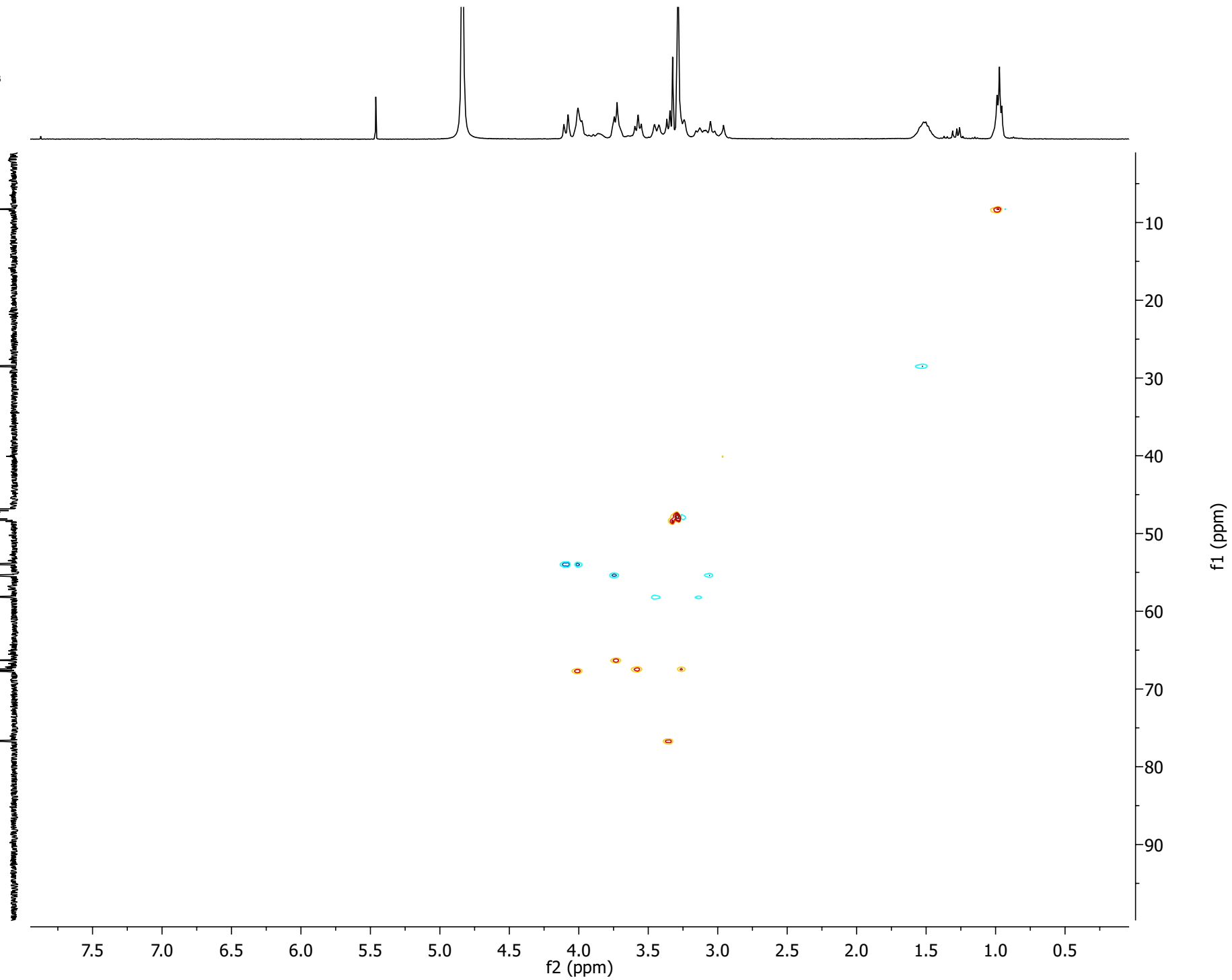
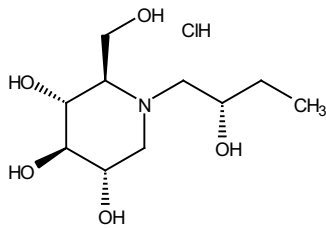
<sup>13</sup>C NMR (MeOD, 101 MHz) of (S)-85x



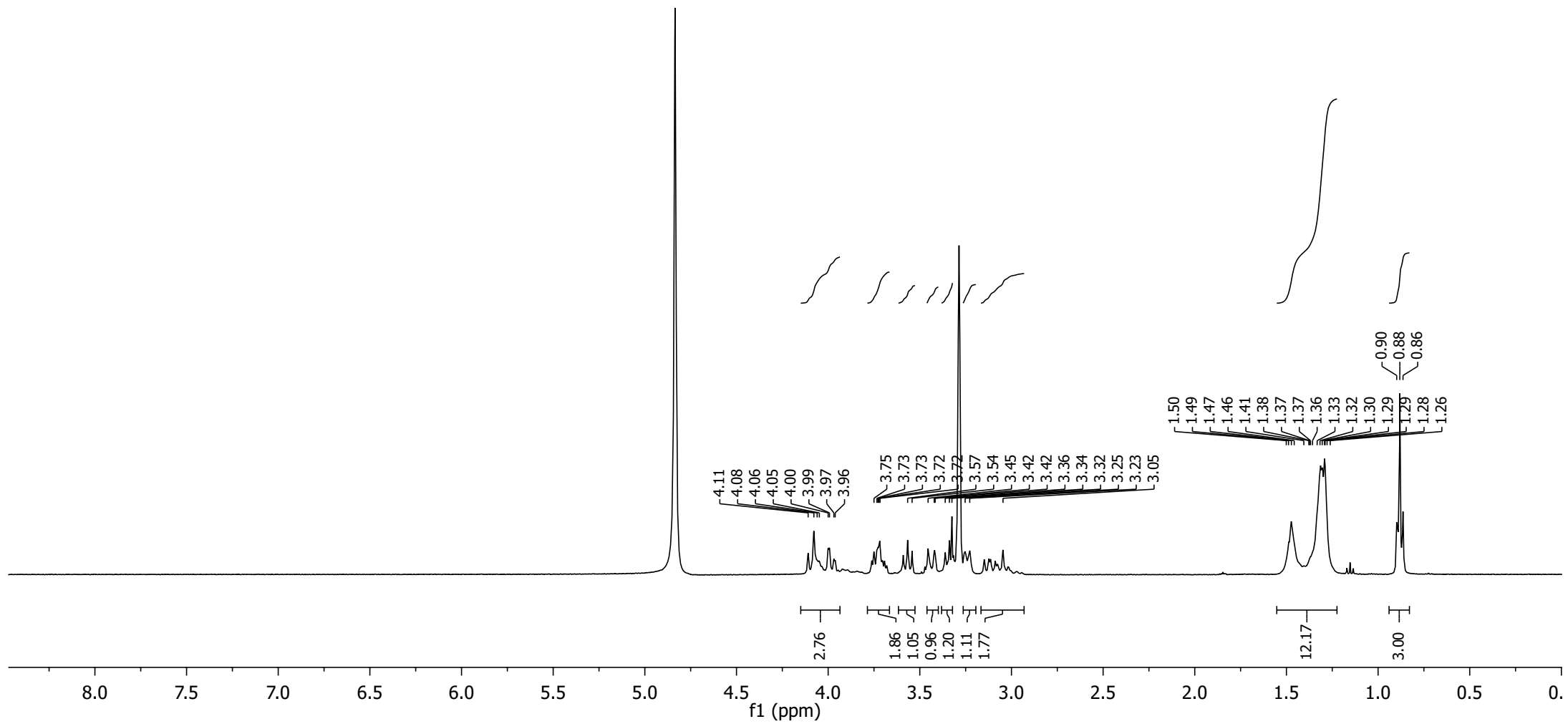
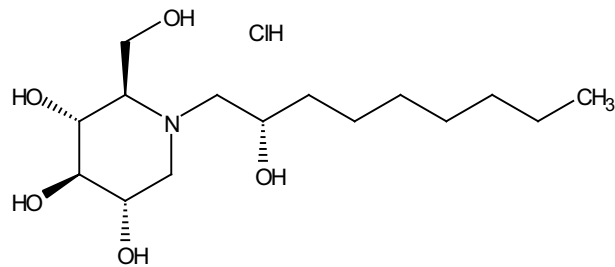
gCOSY (MeOD, 400 MHz) of (S)-85x



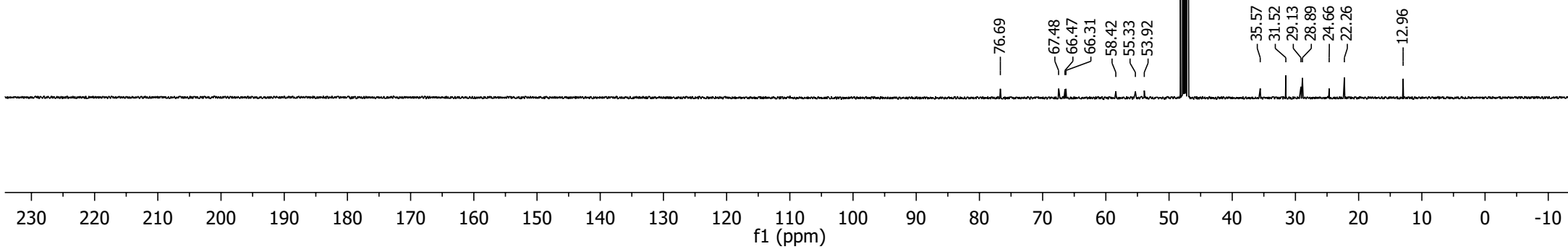
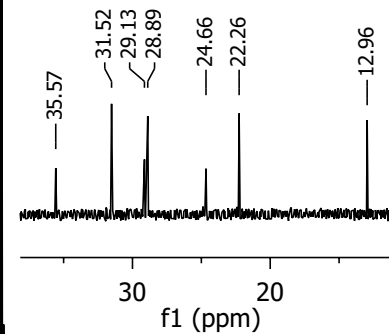
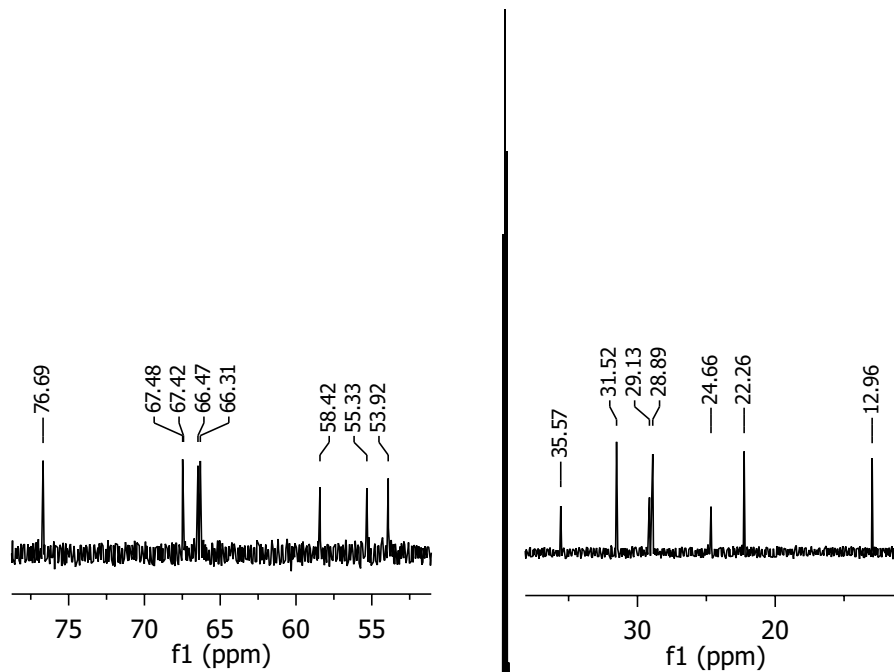
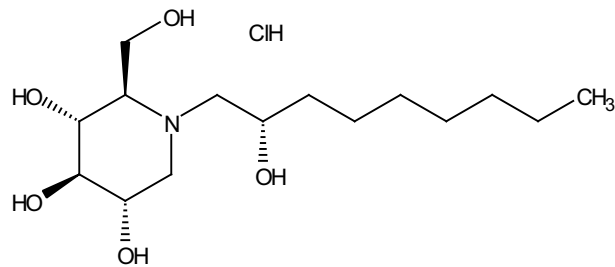
gHSQC (MeOD, 400 MHz) of (S)-85x



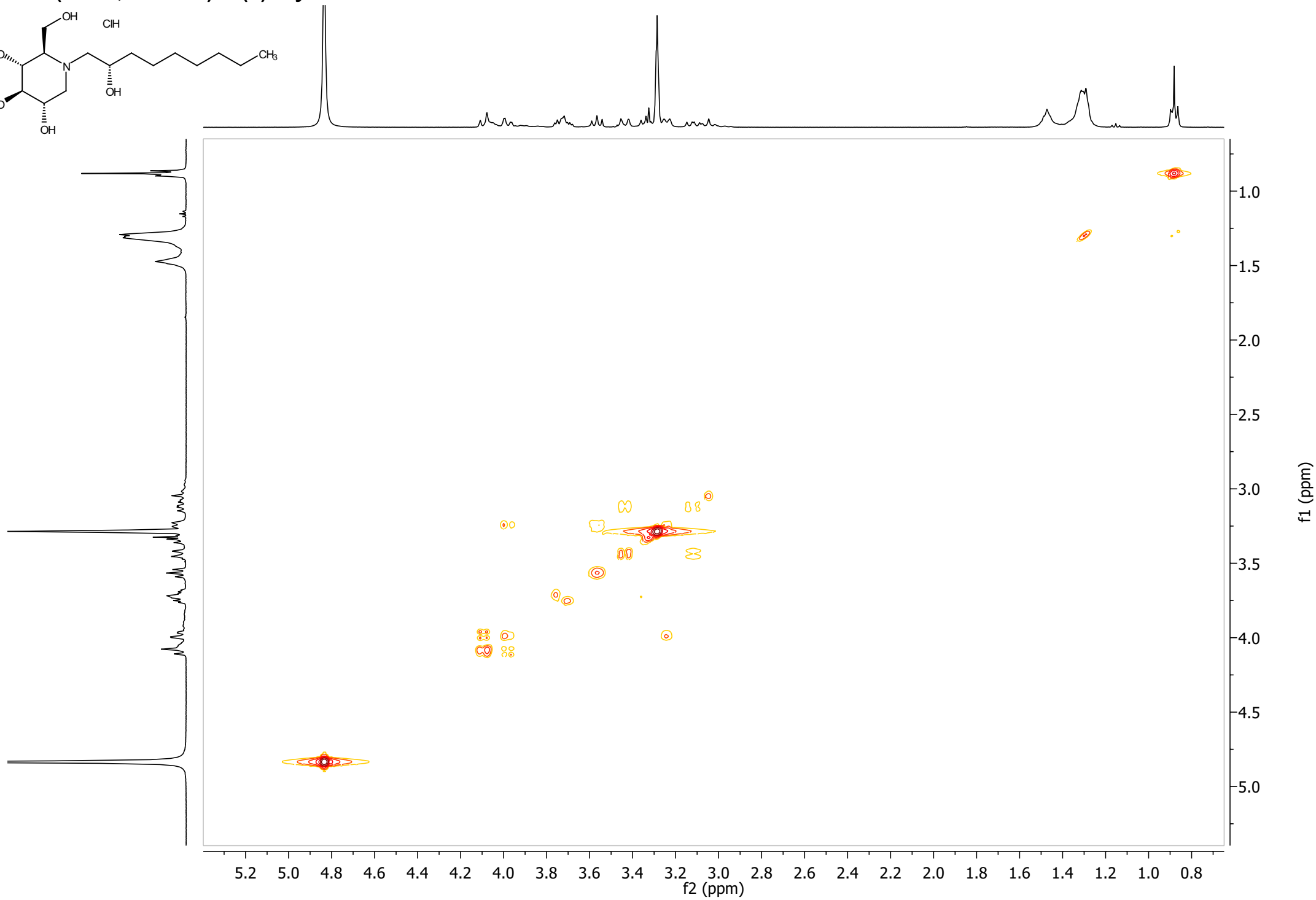
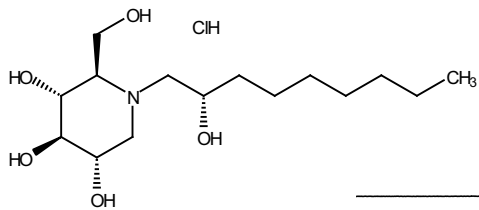
**<sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-85y**



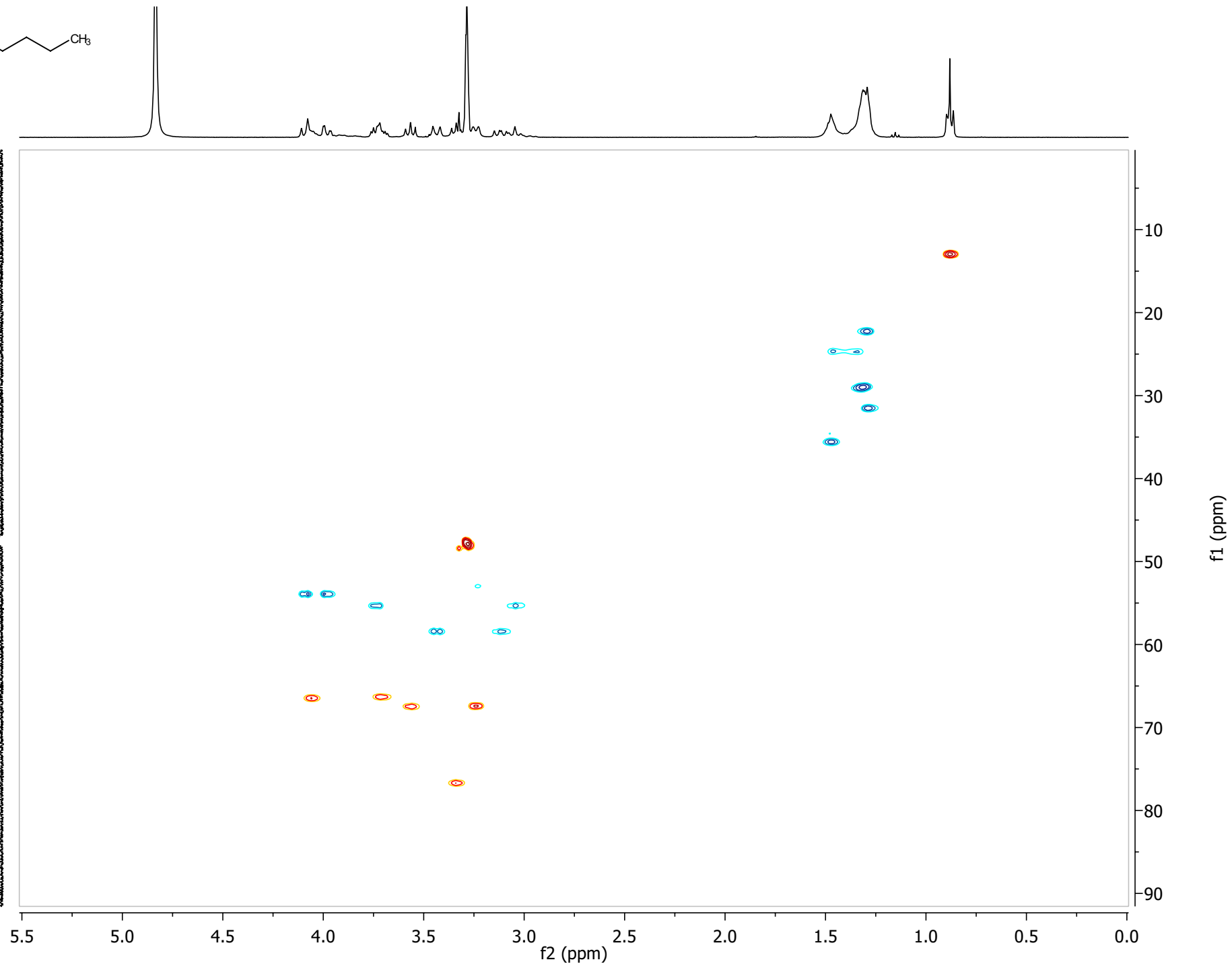
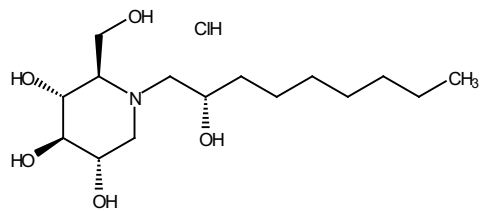
<sup>13</sup>C NMR (MeOD, 101 MHz) of (S)-85y



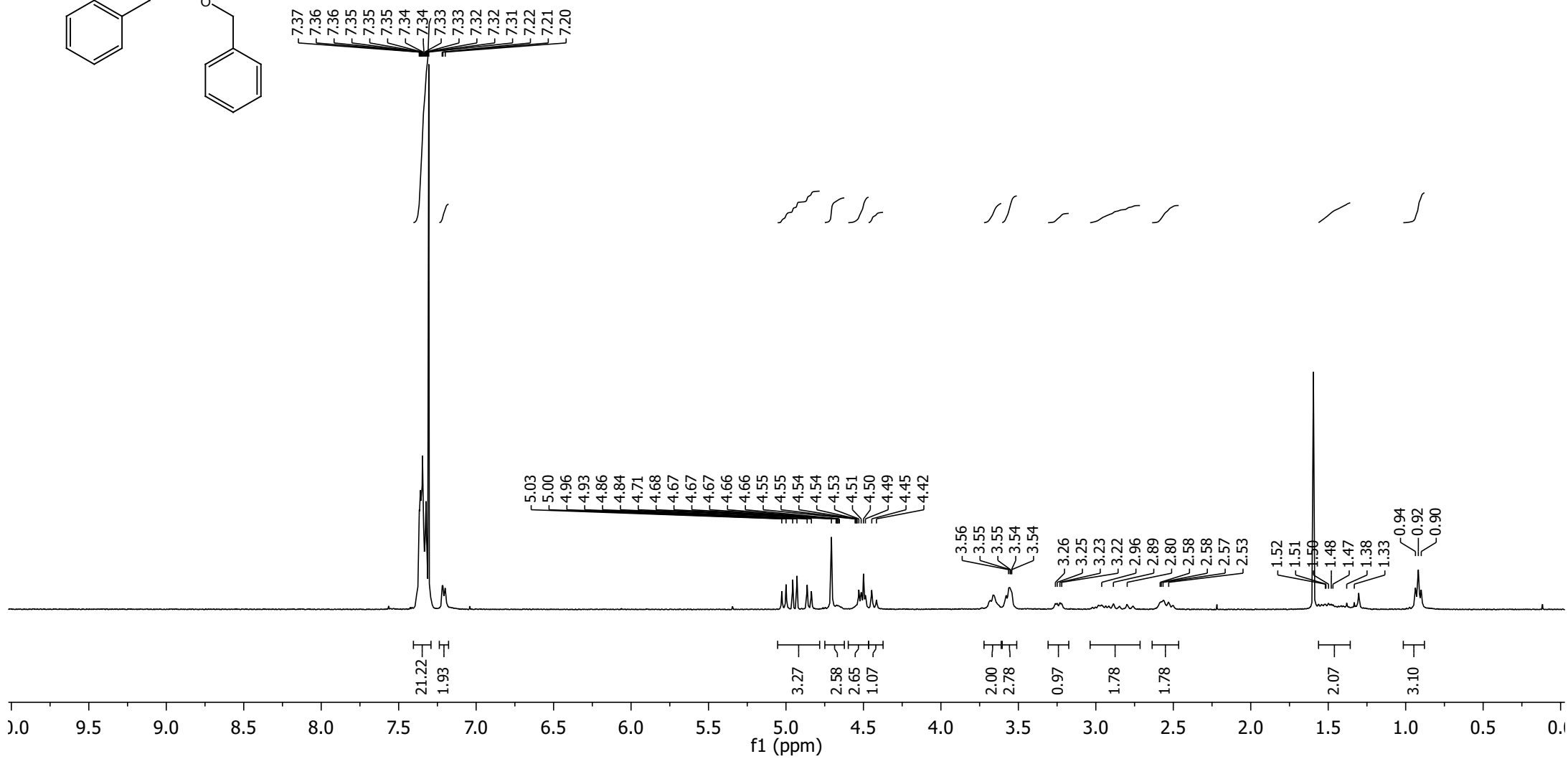
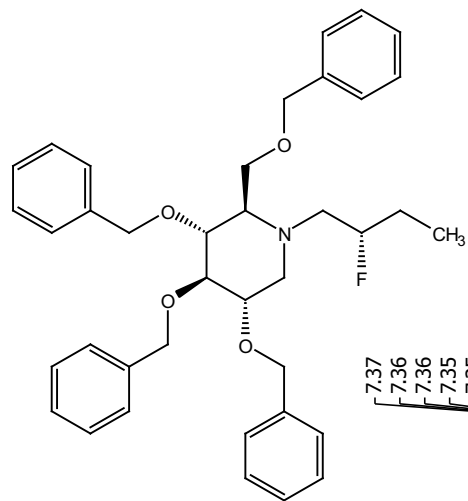
gCOSY (MeOD, 400 MHz) of (S)-85y



# HSQCAD (MeOD, 400 MHz) of (S)-85y

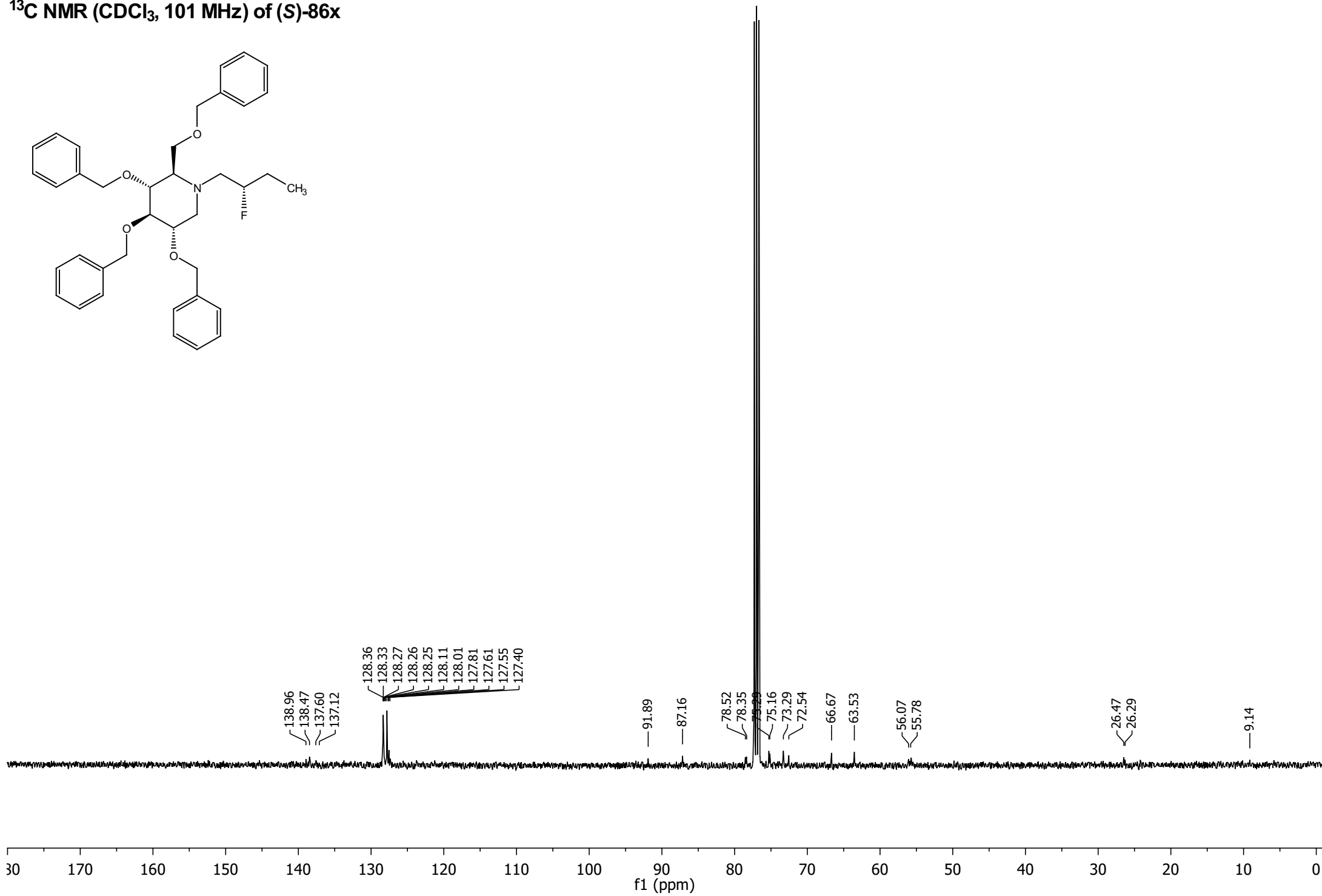
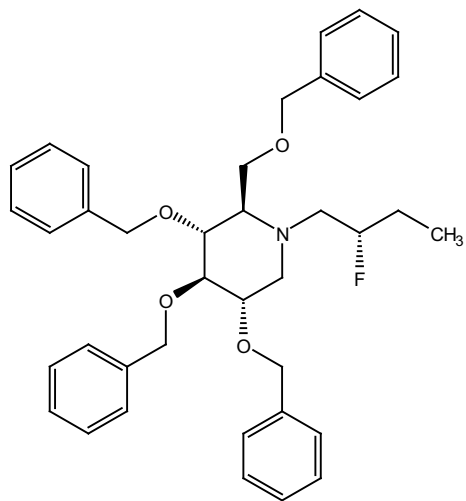


<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-86x

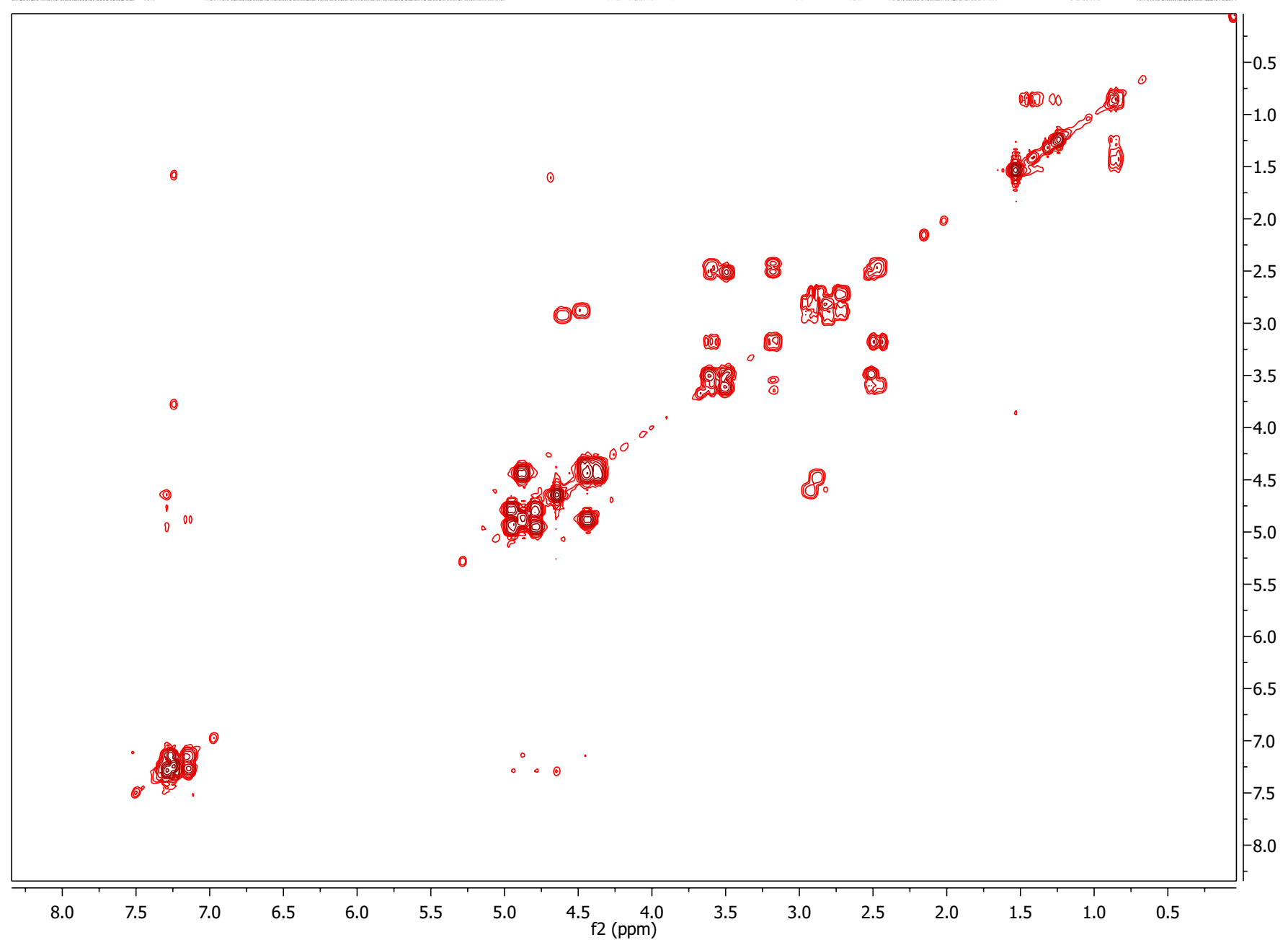
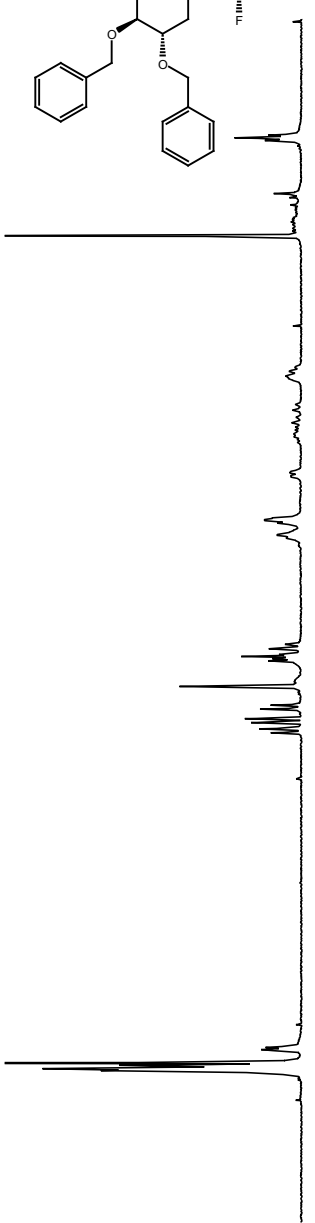
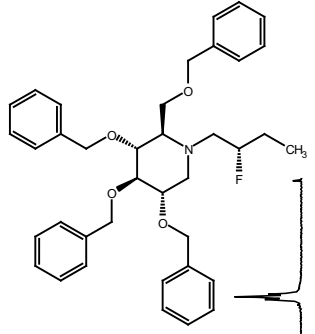




<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-86x



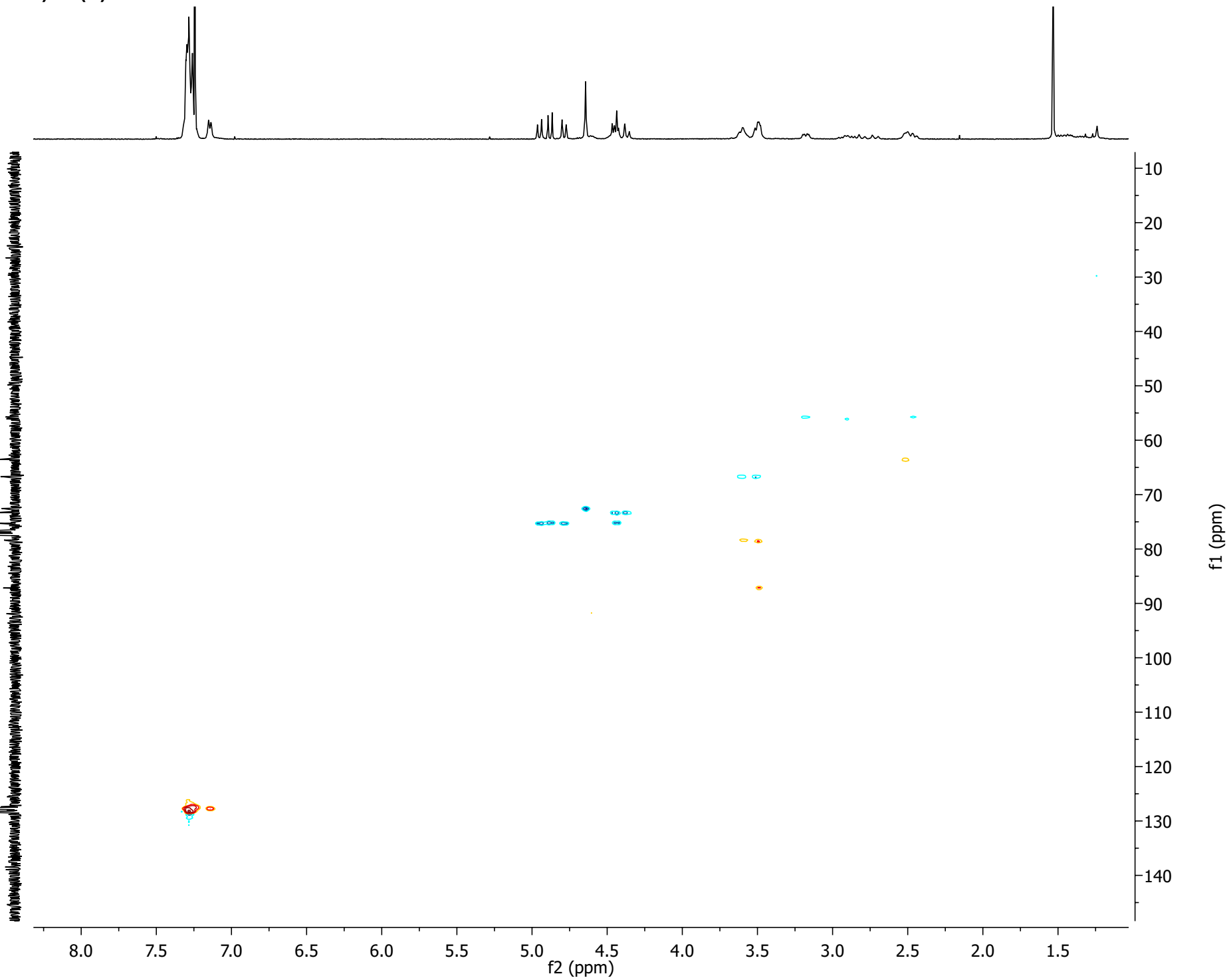
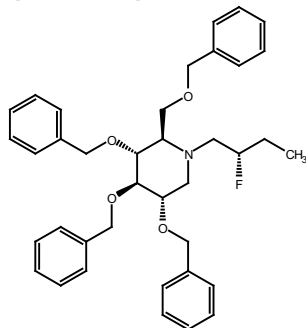
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-86x



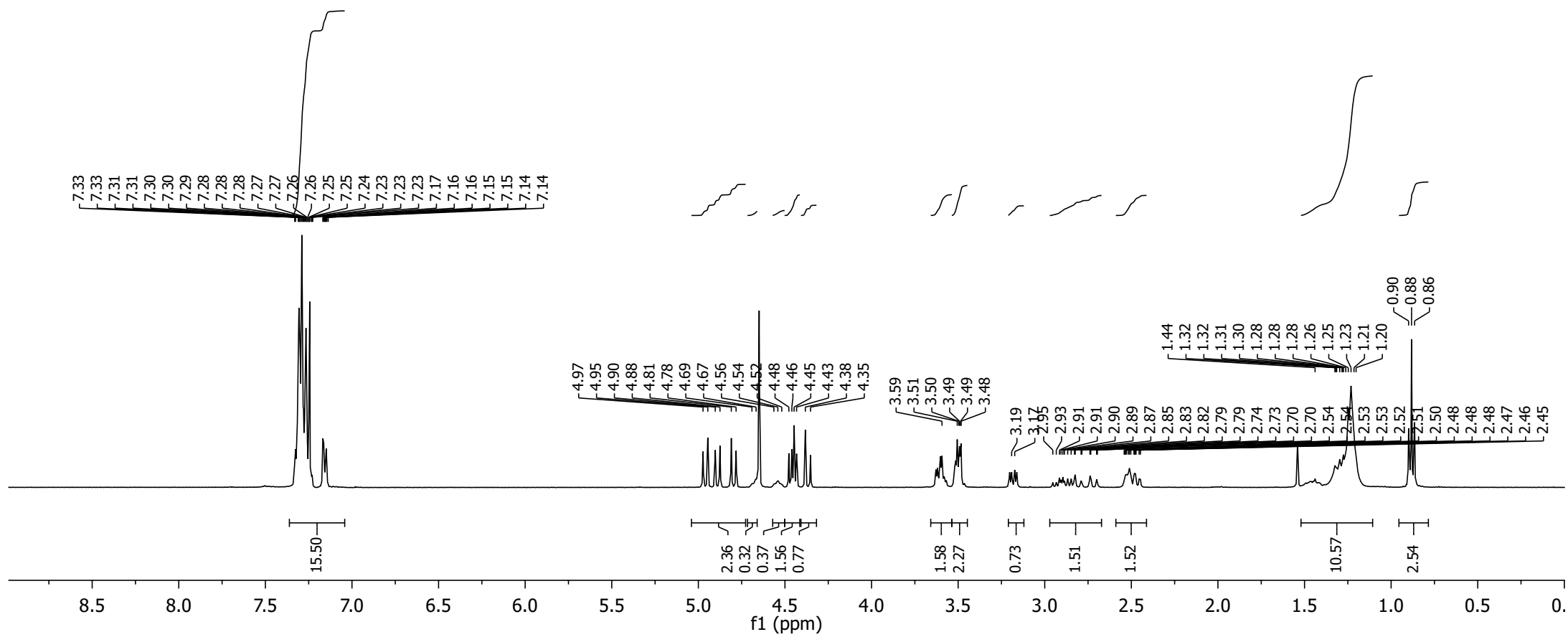
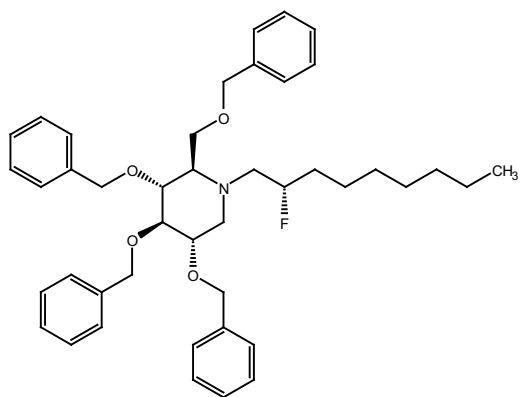
f1 (ppm)

f2 (ppm)

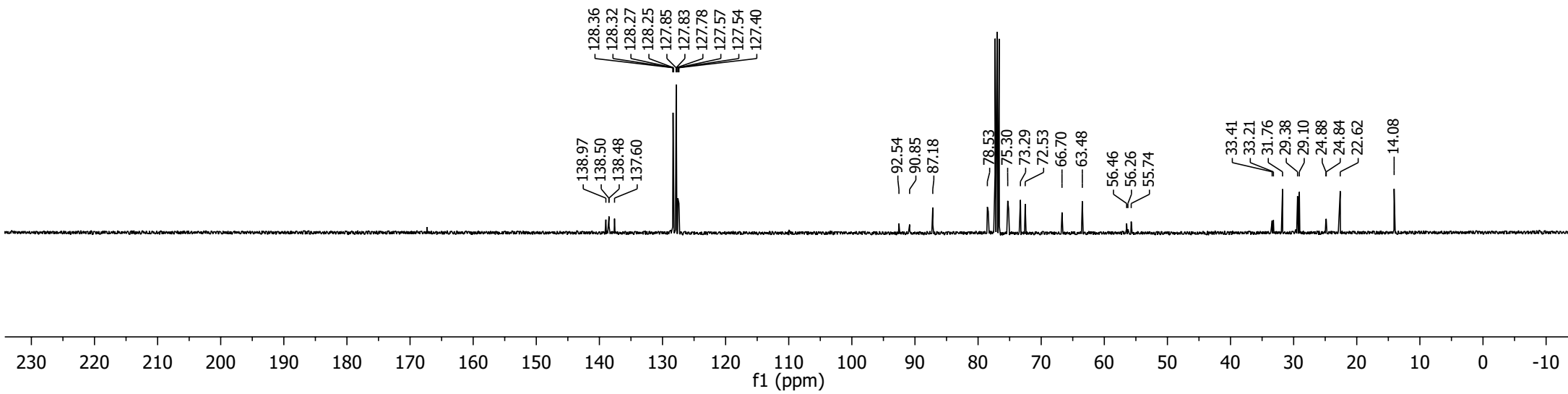
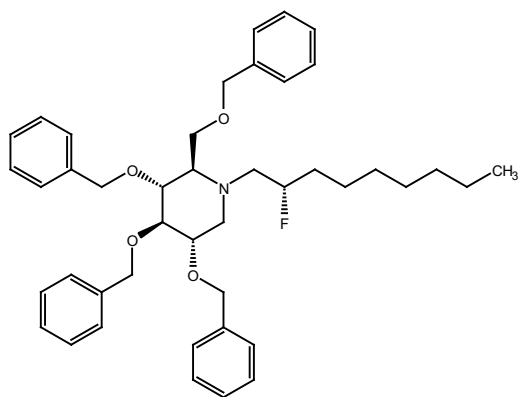
gHSQC (CDCl<sub>3</sub>, 400 MHz) of (S)-86x



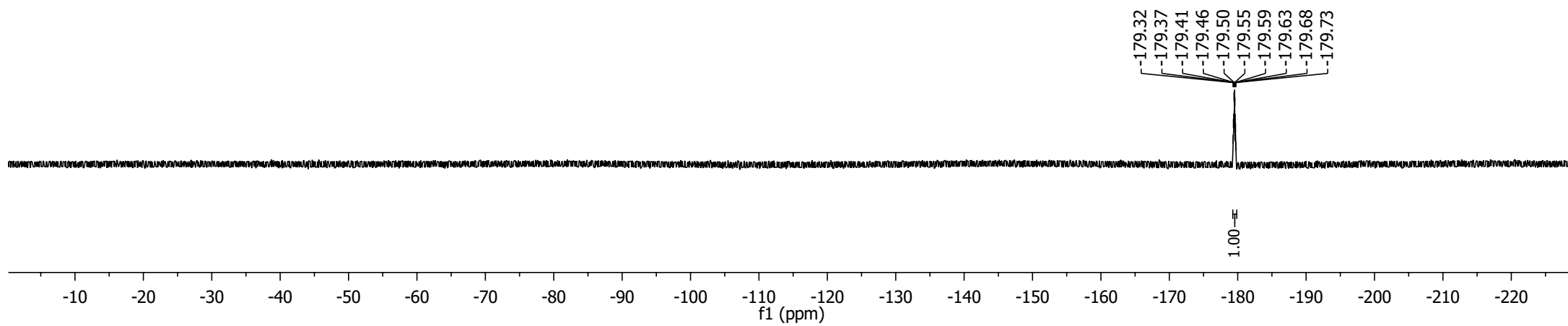
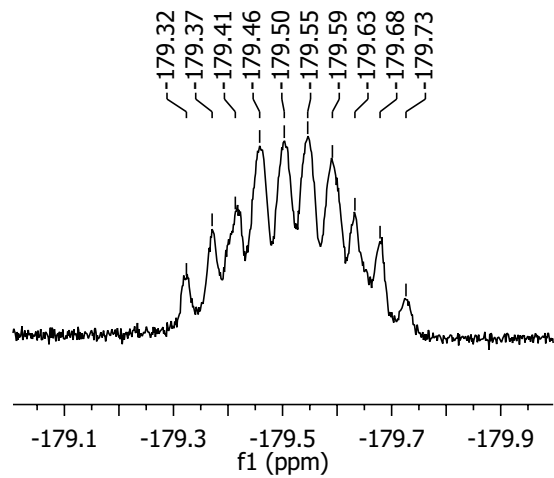
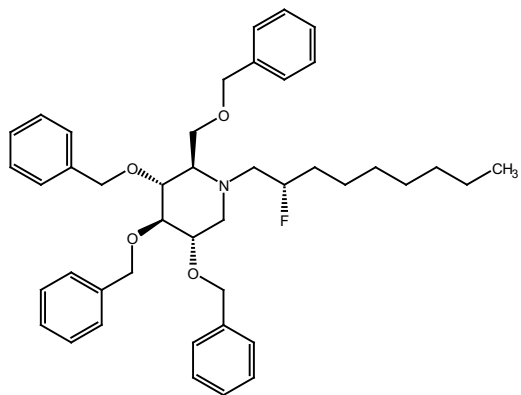
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-86y



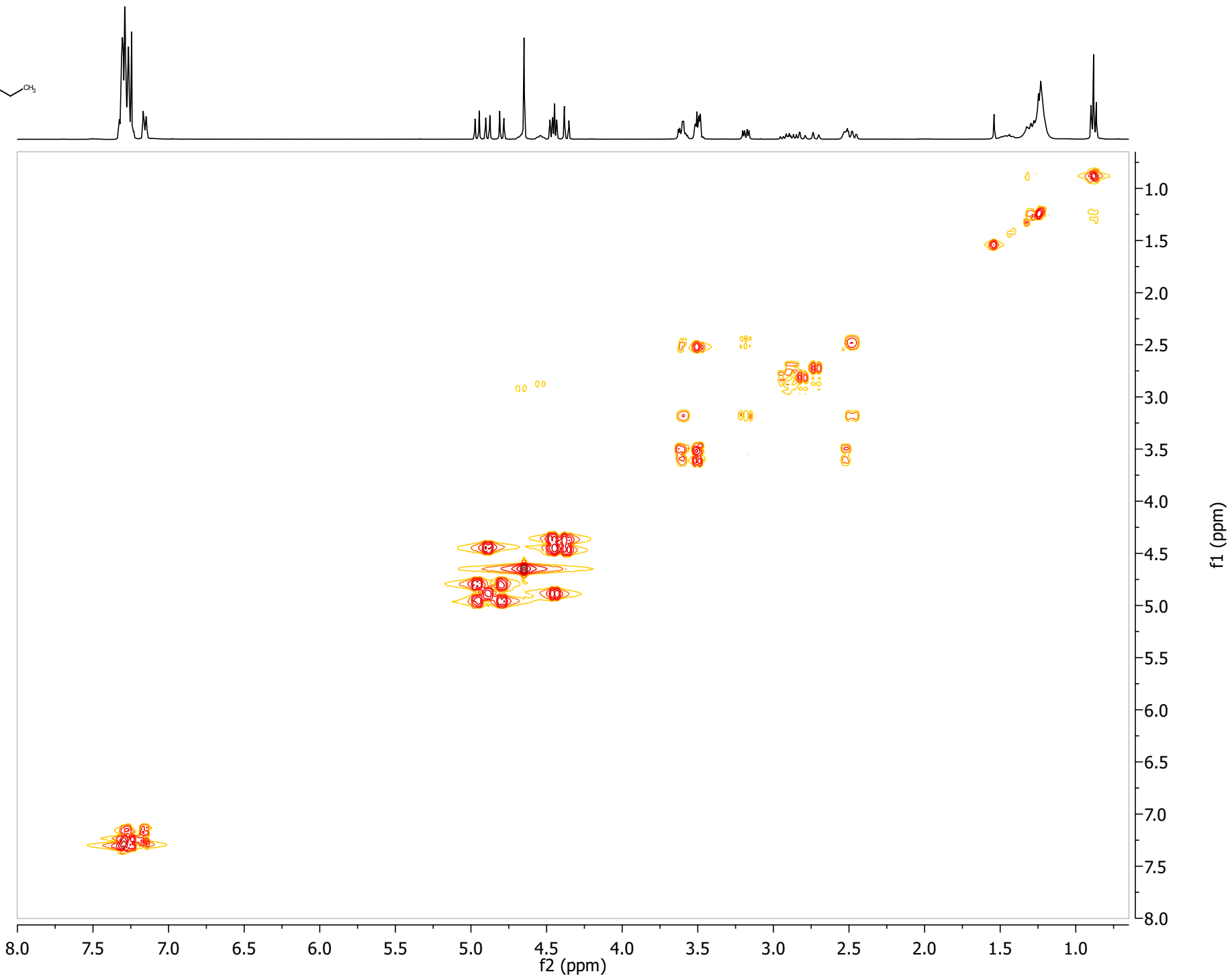
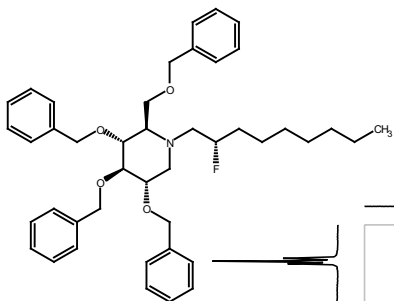
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-86y



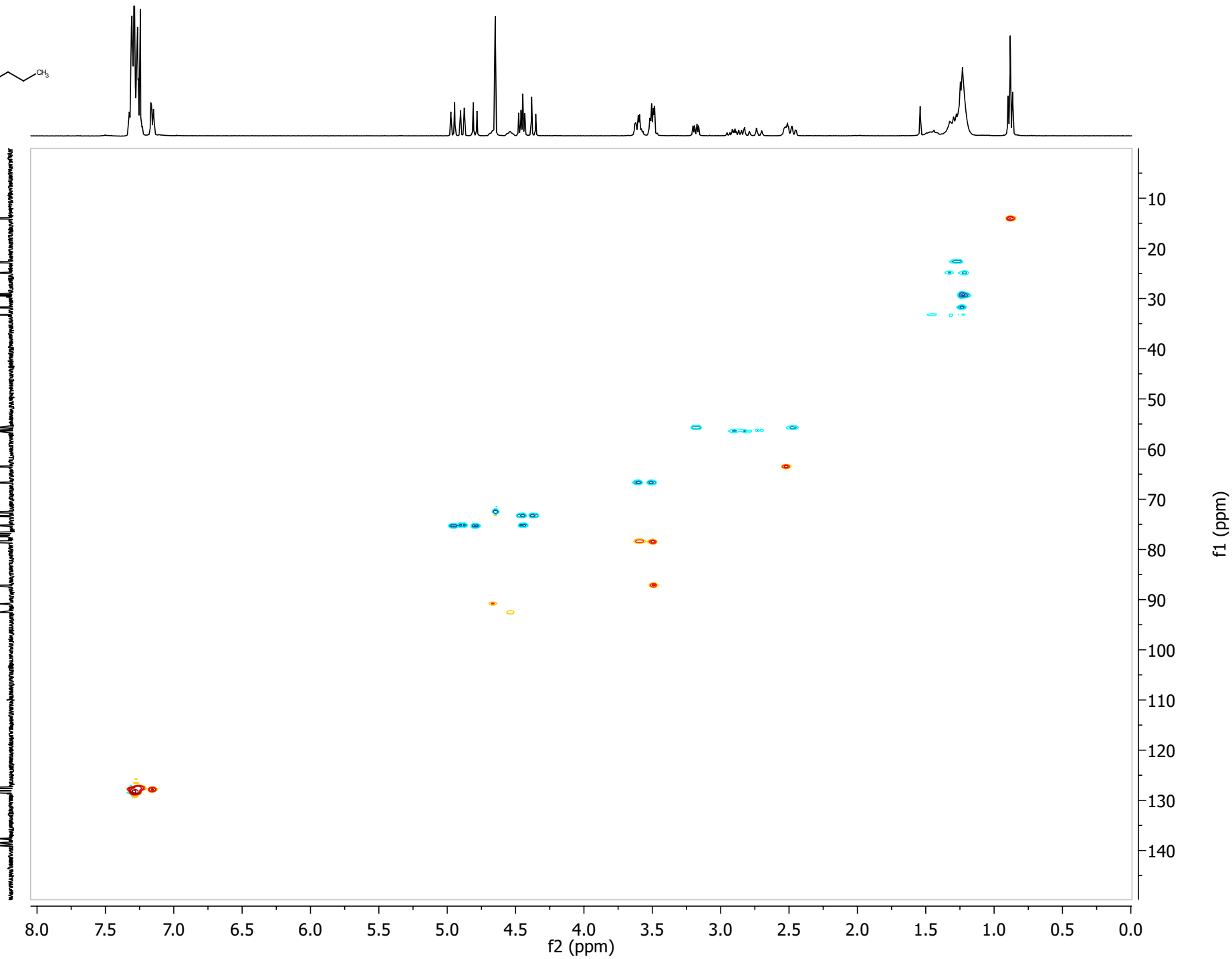
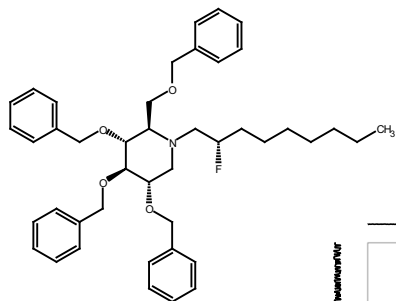
<sup>19</sup>F NMR (CDCl<sub>3</sub>, 376 MHz) of (S)-86y



gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-86y

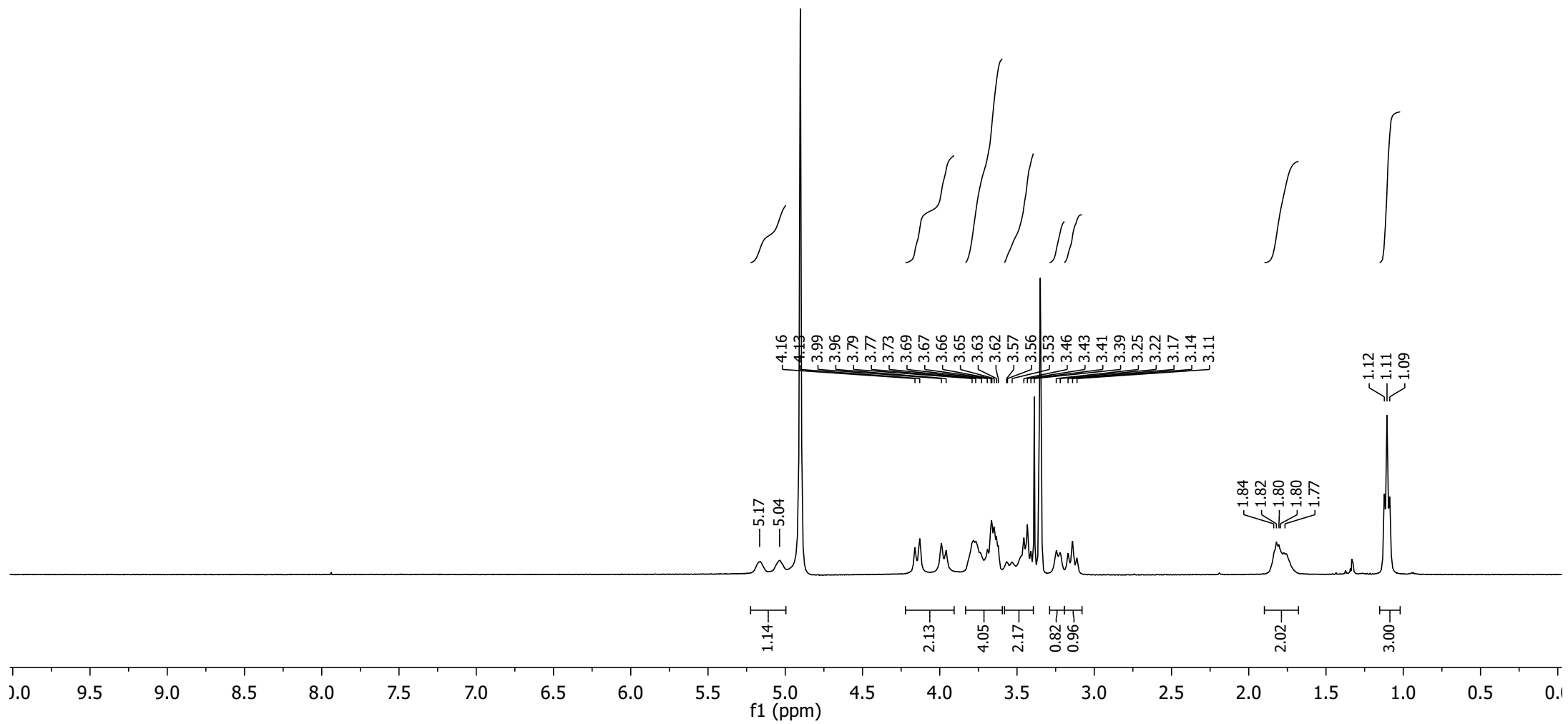
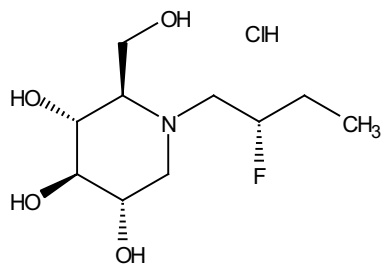


# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-86y

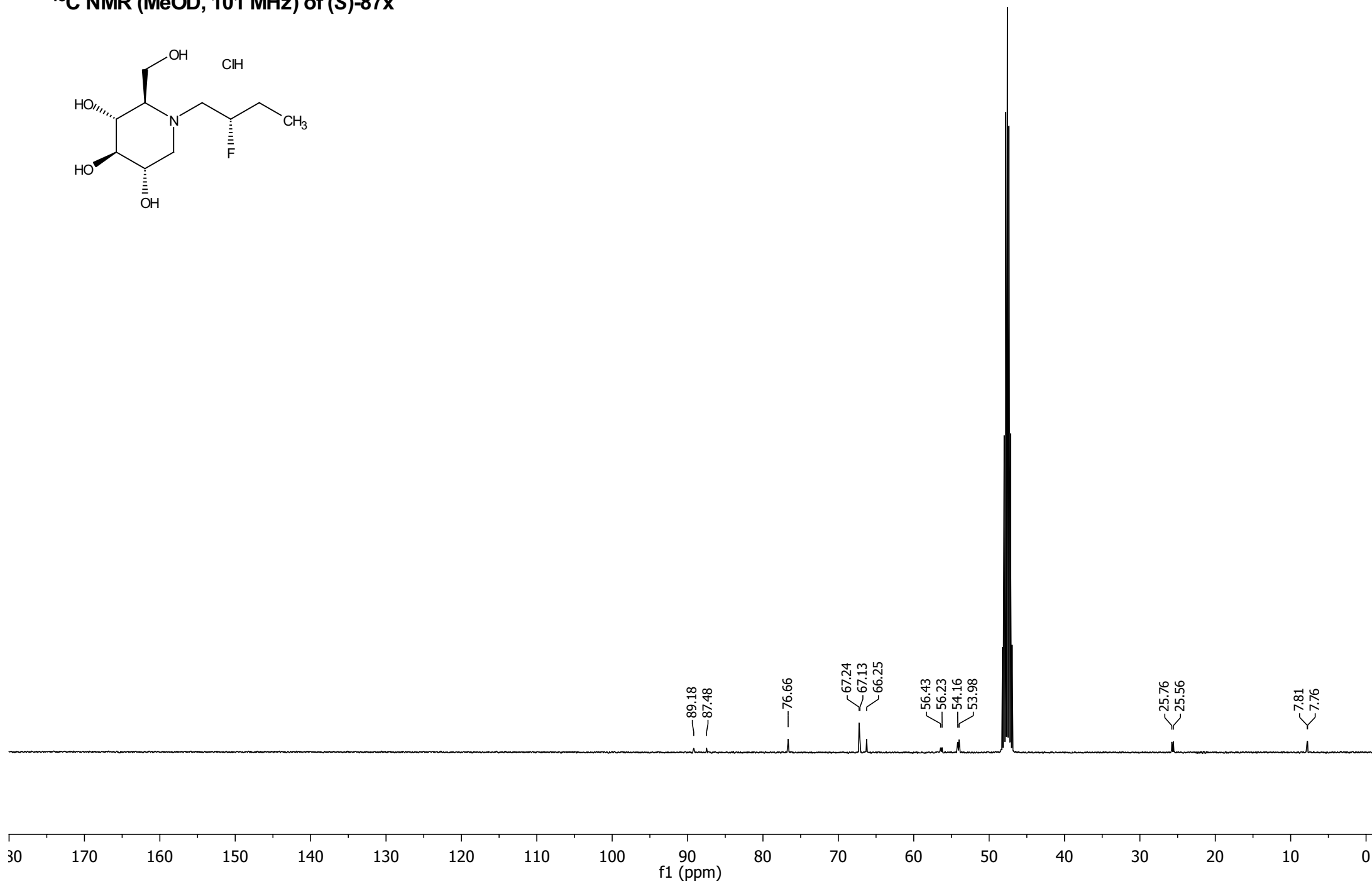
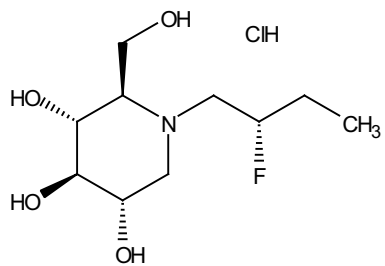




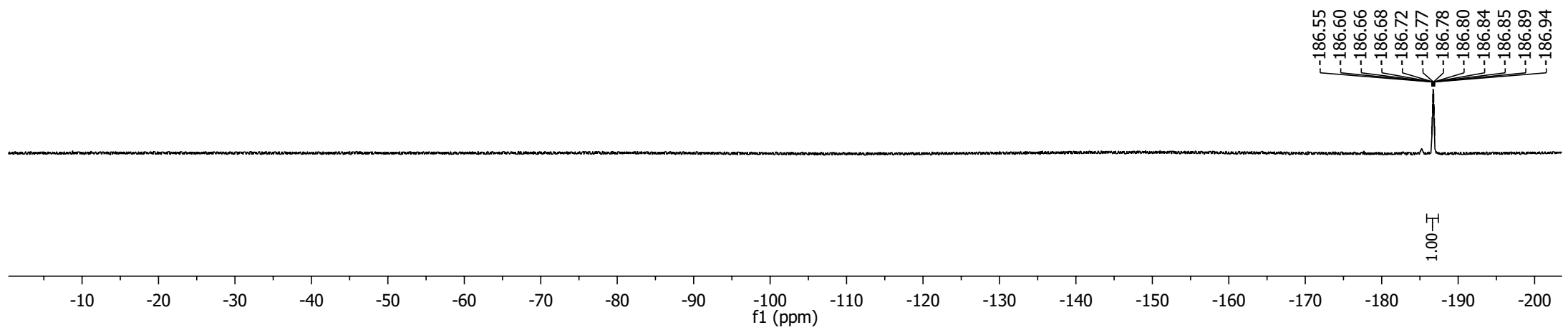
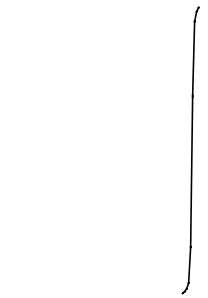
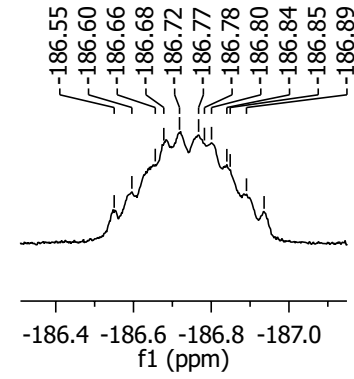
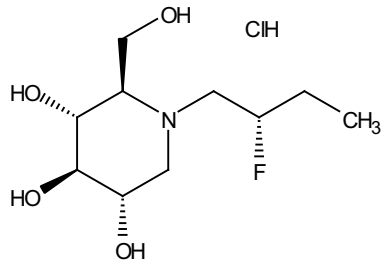
<sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-87x



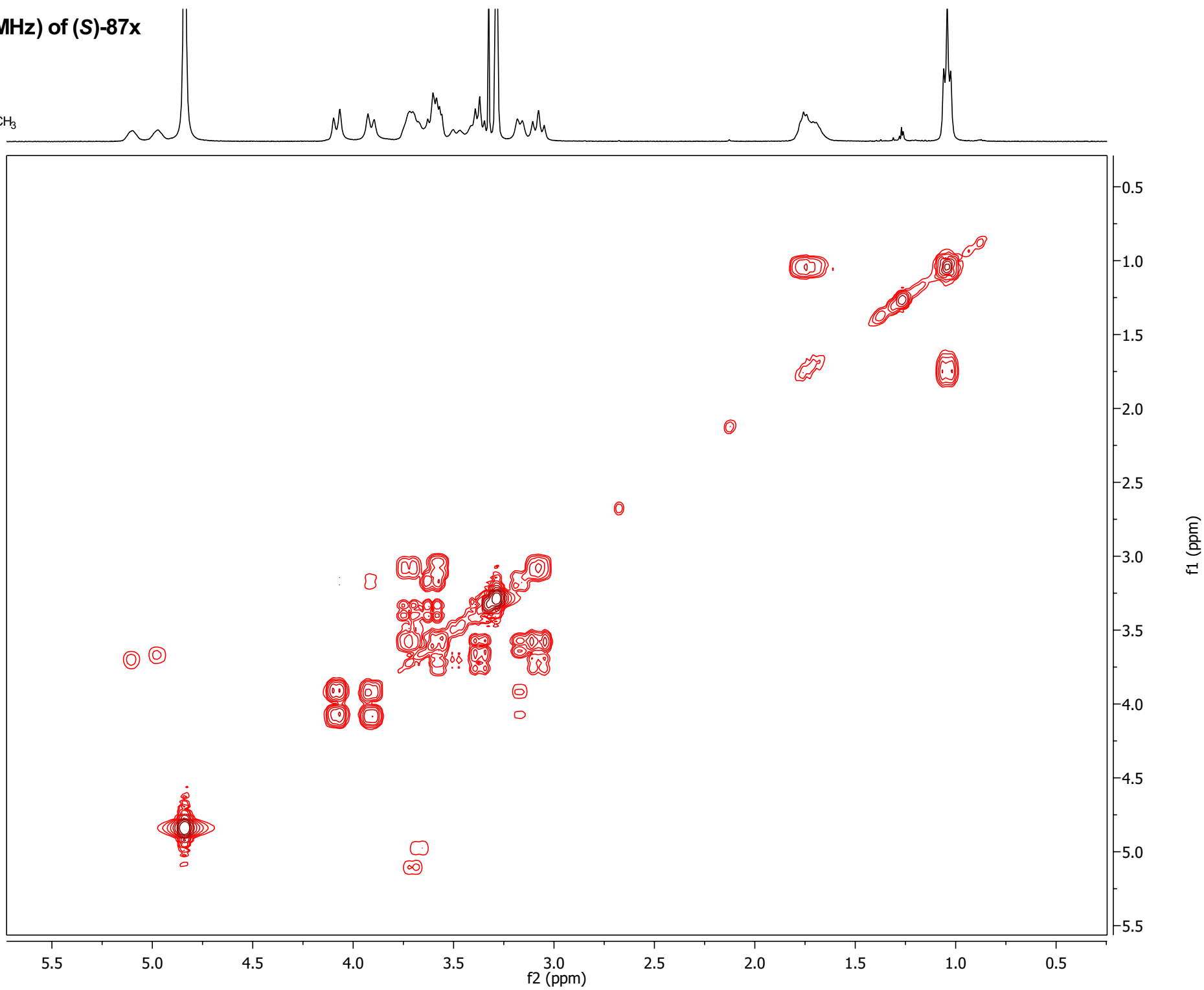
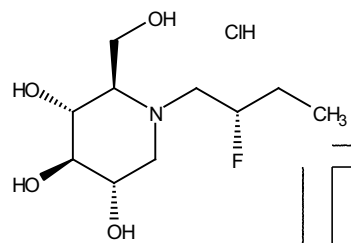
<sup>13</sup>C NMR (MeOD, 101 MHz) of (S)-87x



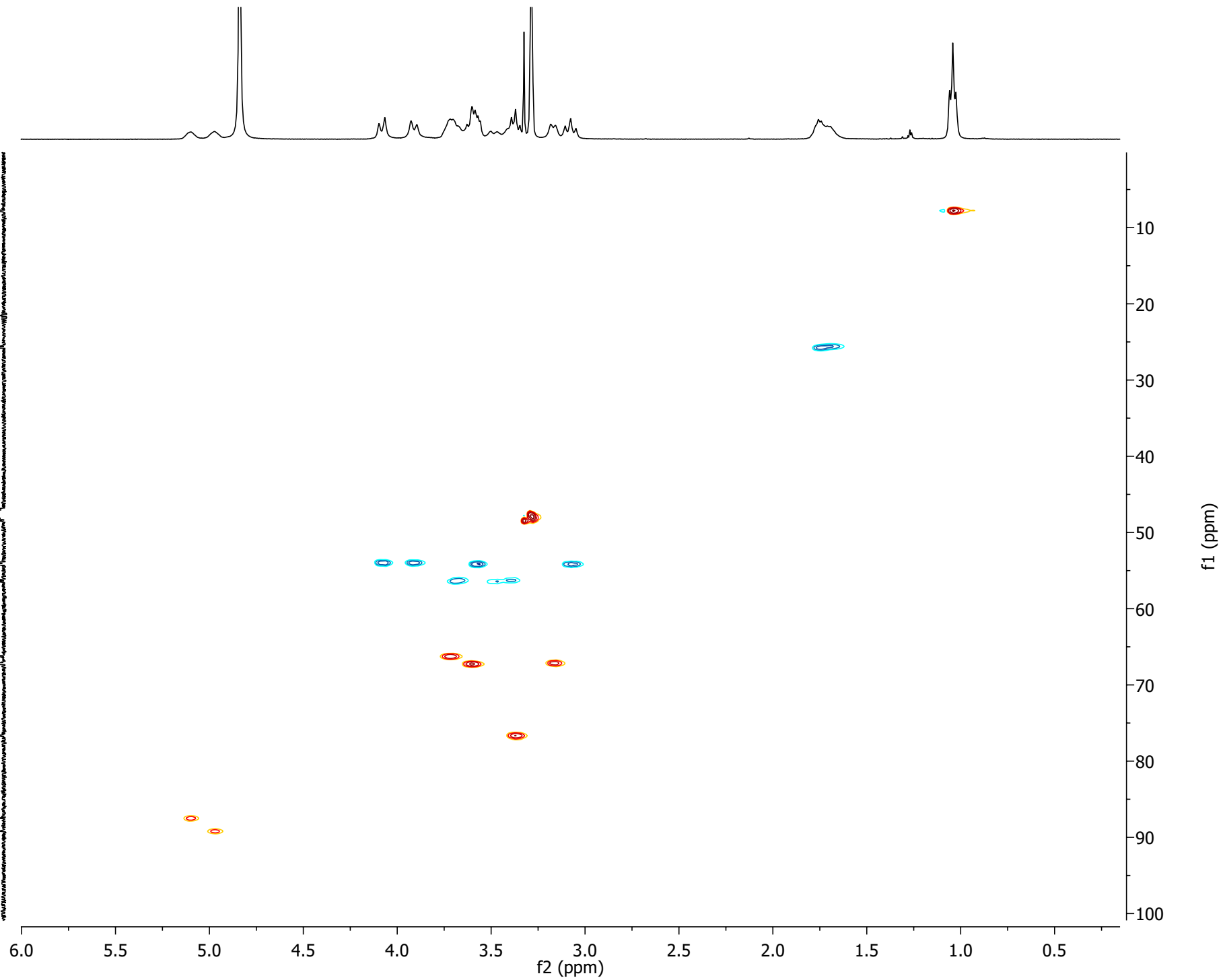
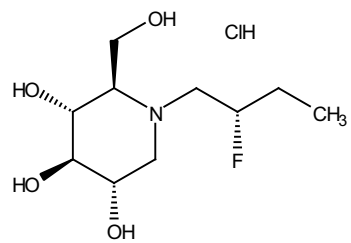
**<sup>19</sup>F NMR (MeOD, 376 MHz) of (S)-87x**



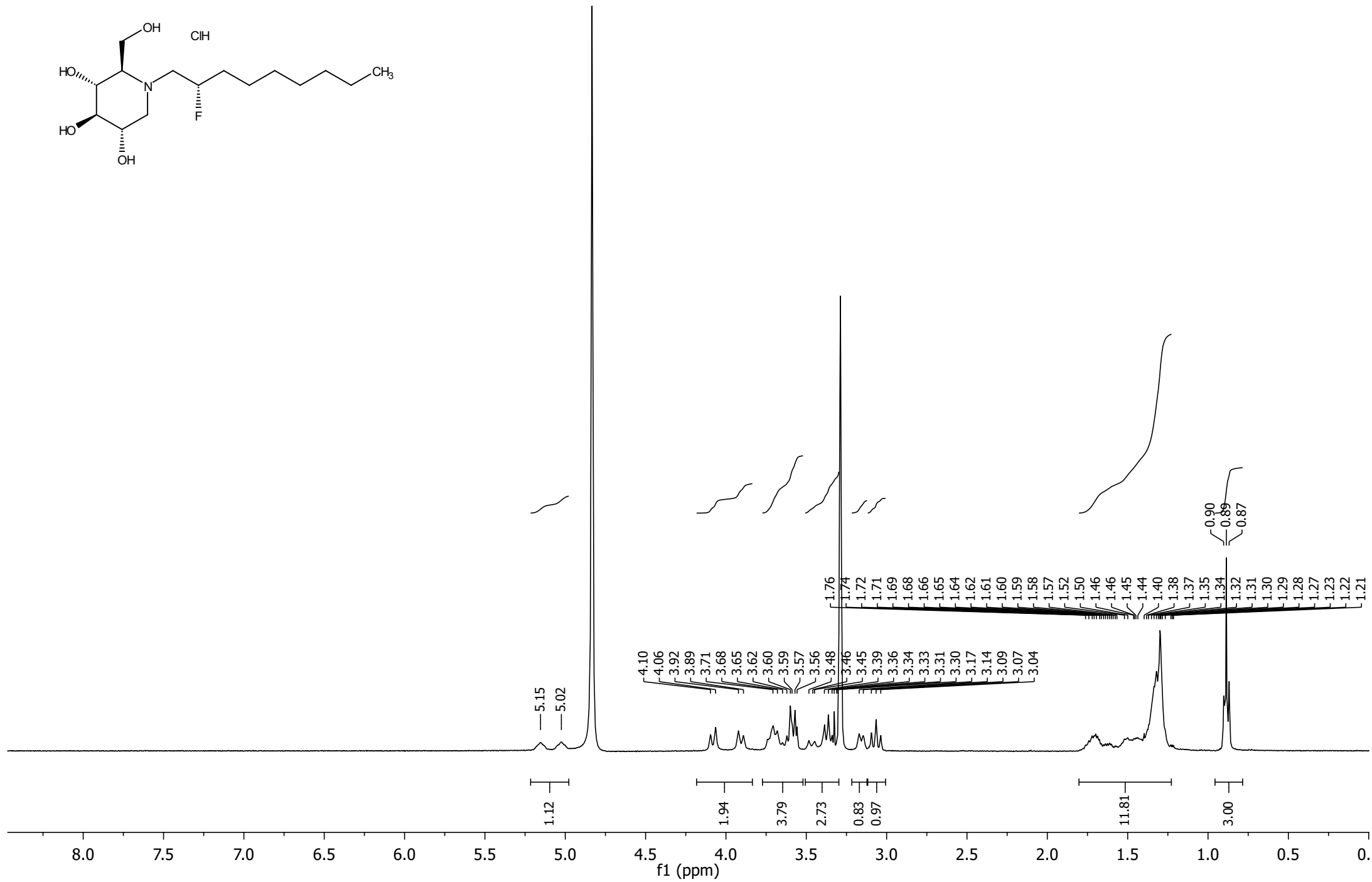
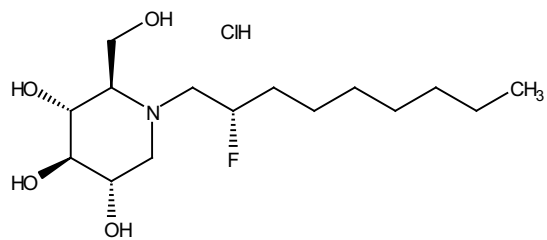
gCOSY (MeOD, 400 MHz) of (S)-87x



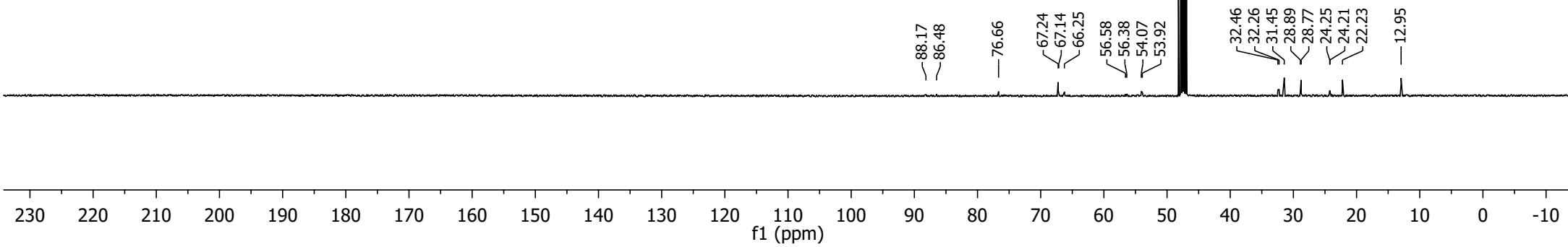
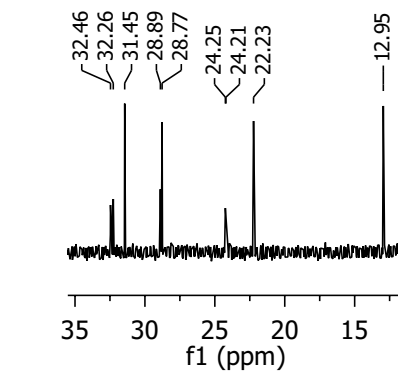
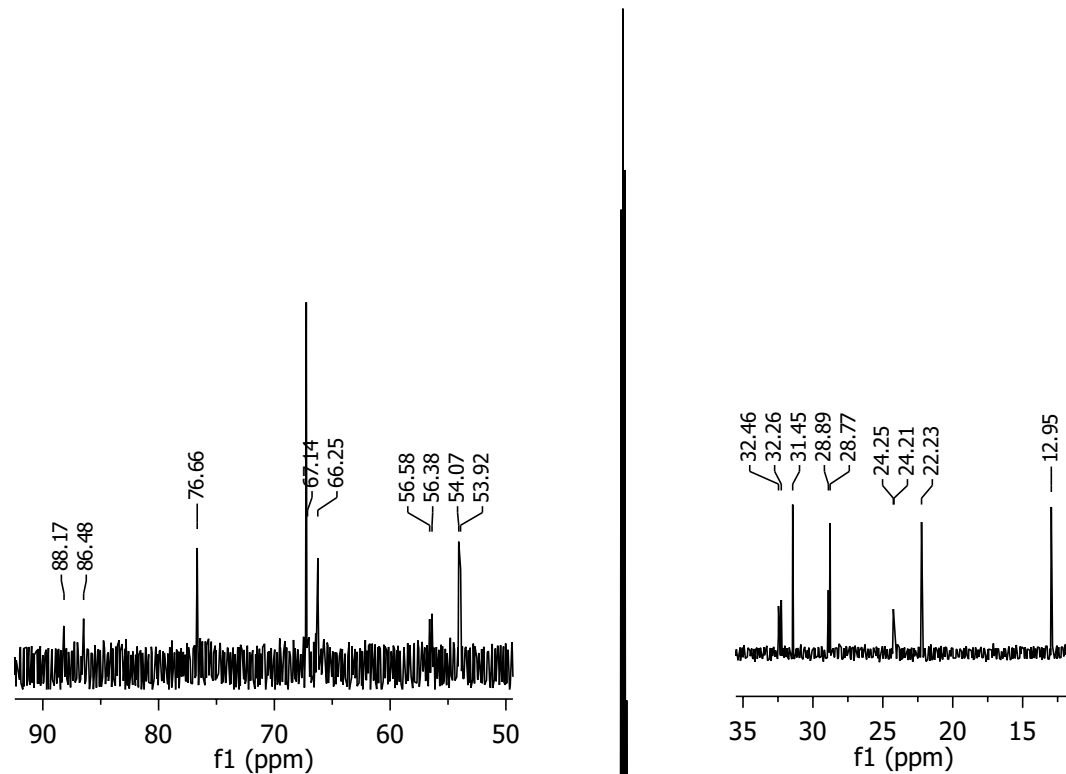
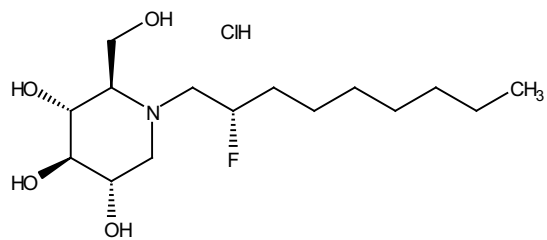
gHSQC (MeOD, 400 MHz) of (S)-87x



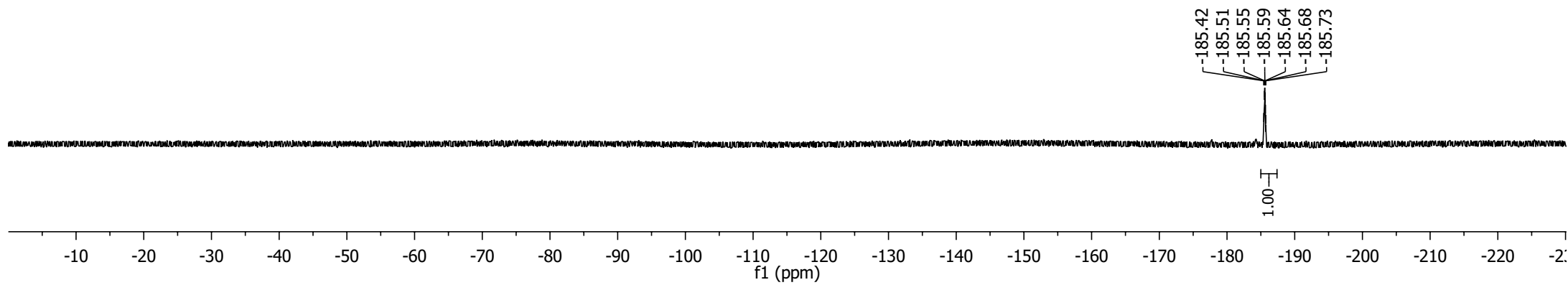
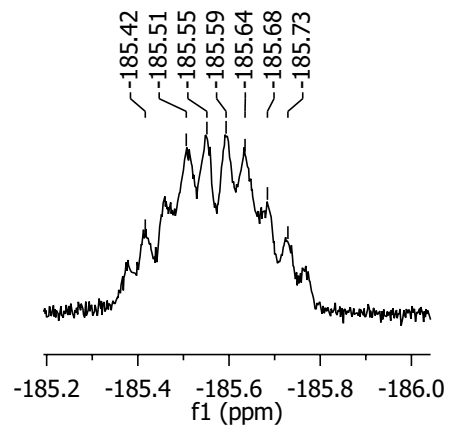
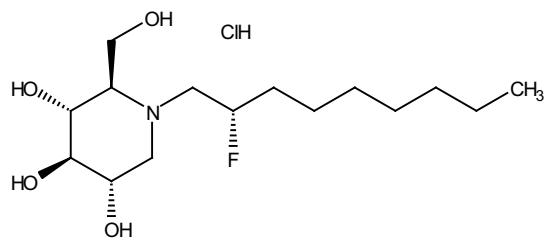
**<sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-87y**



<sup>13</sup>C NMR (MeOD, 101 MHz) of (S)-87y

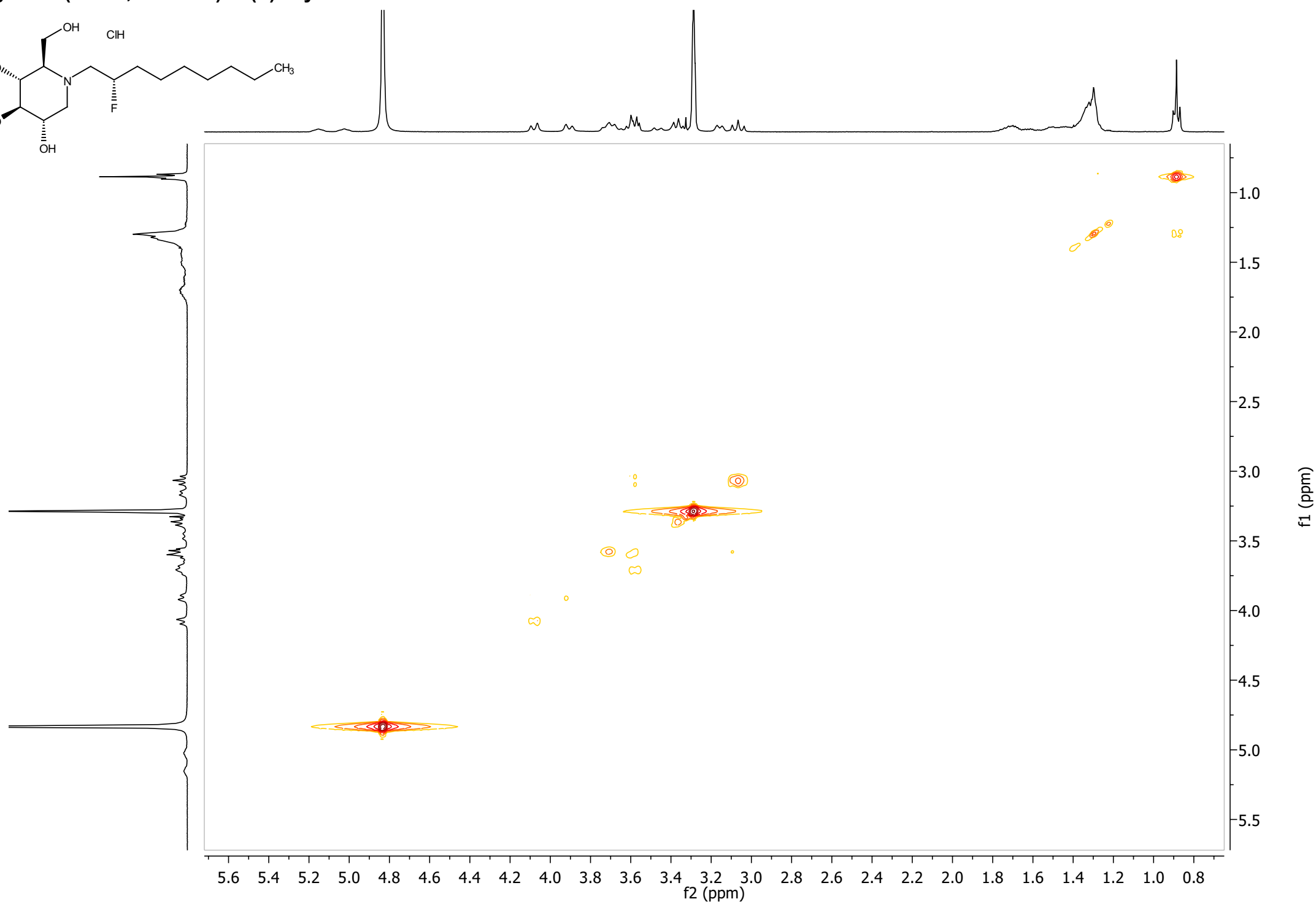
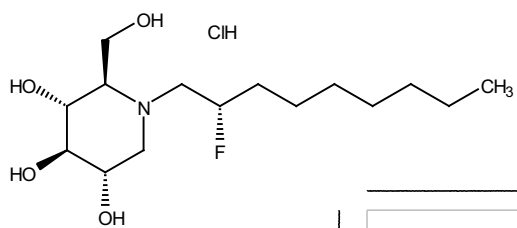


<sup>19</sup>F NMR (MeOD, 376 MHz) of (S)-87y

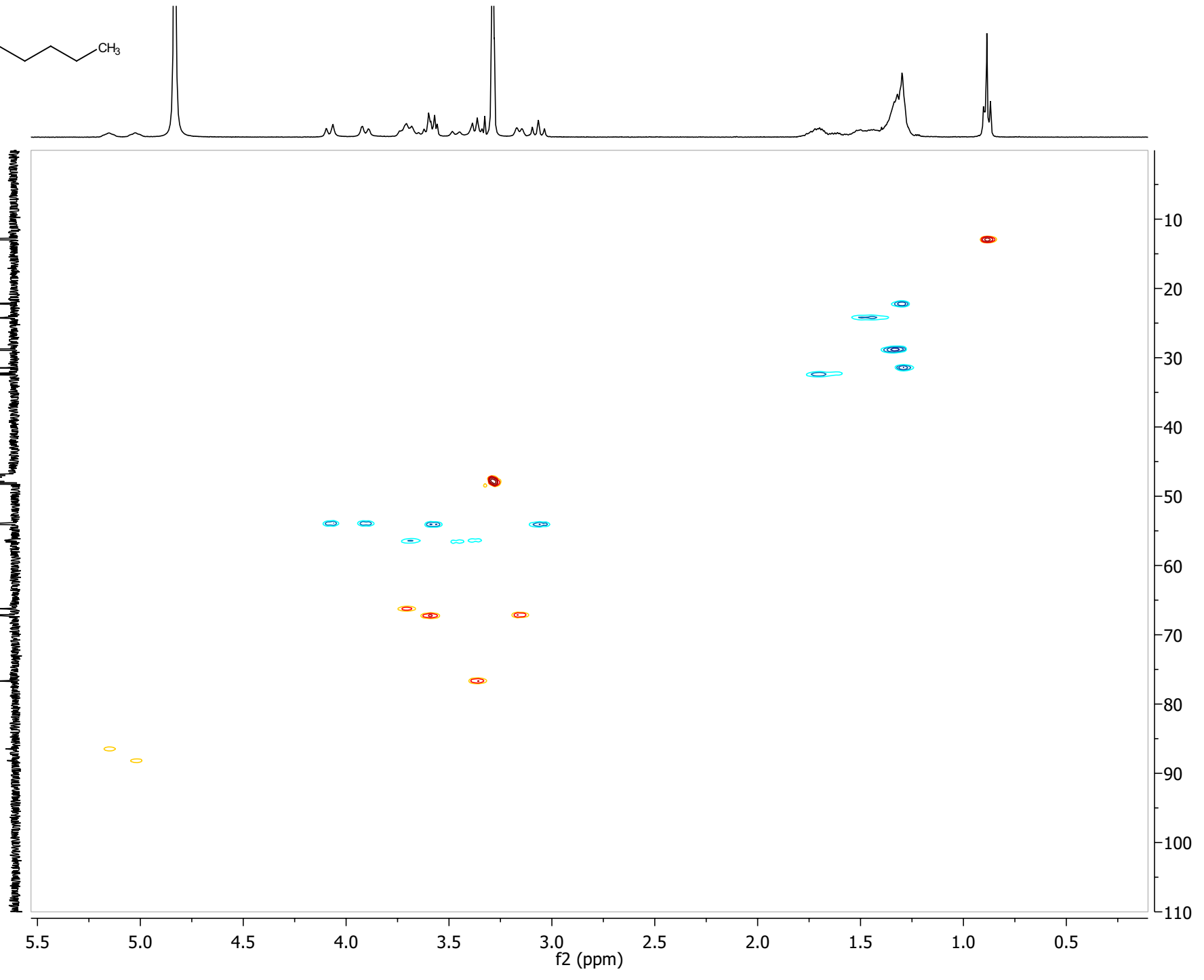
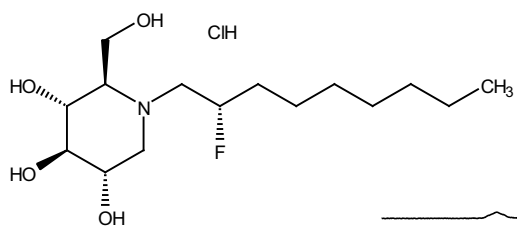




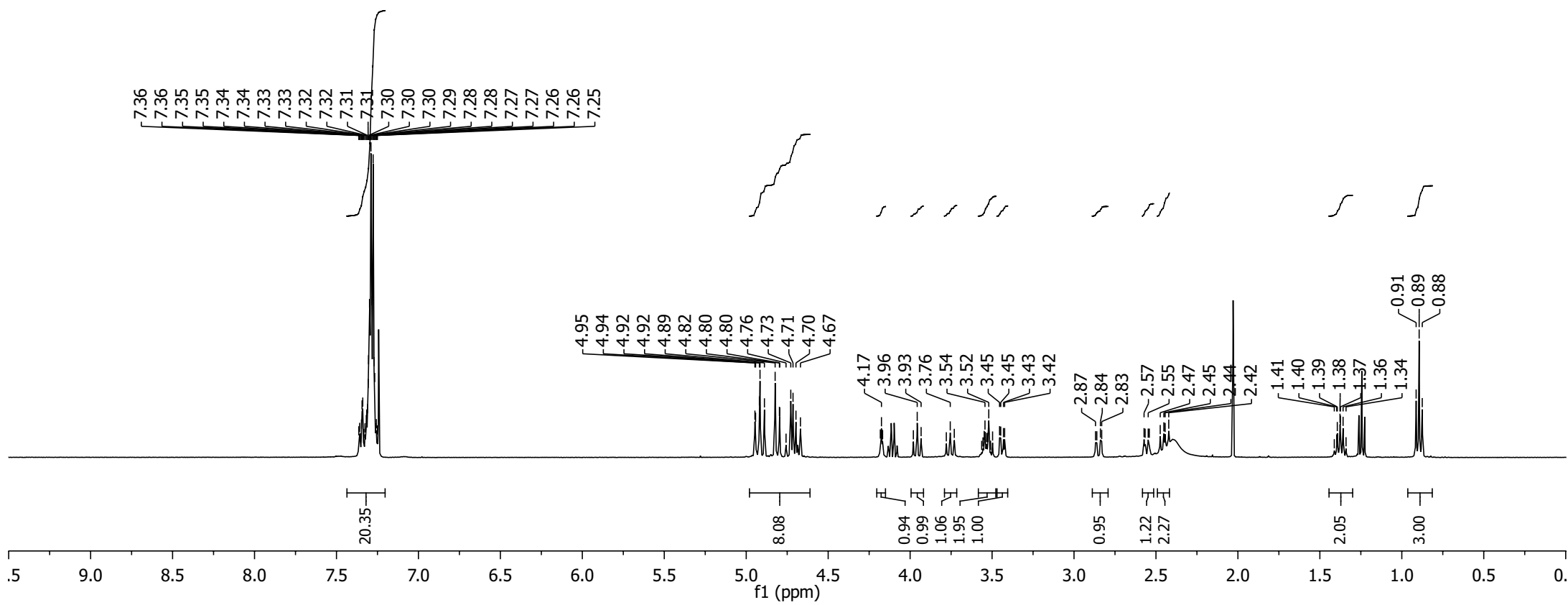
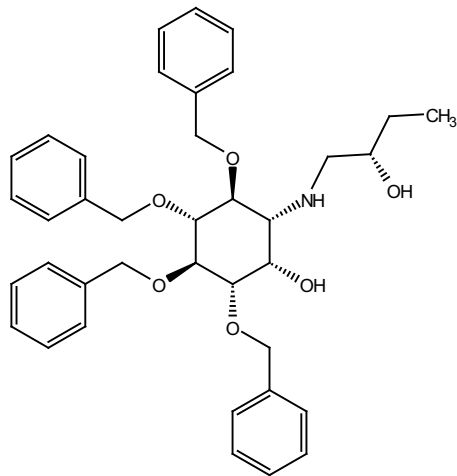
gCOSY (MeOD, 400 MHz) of (S)-87y



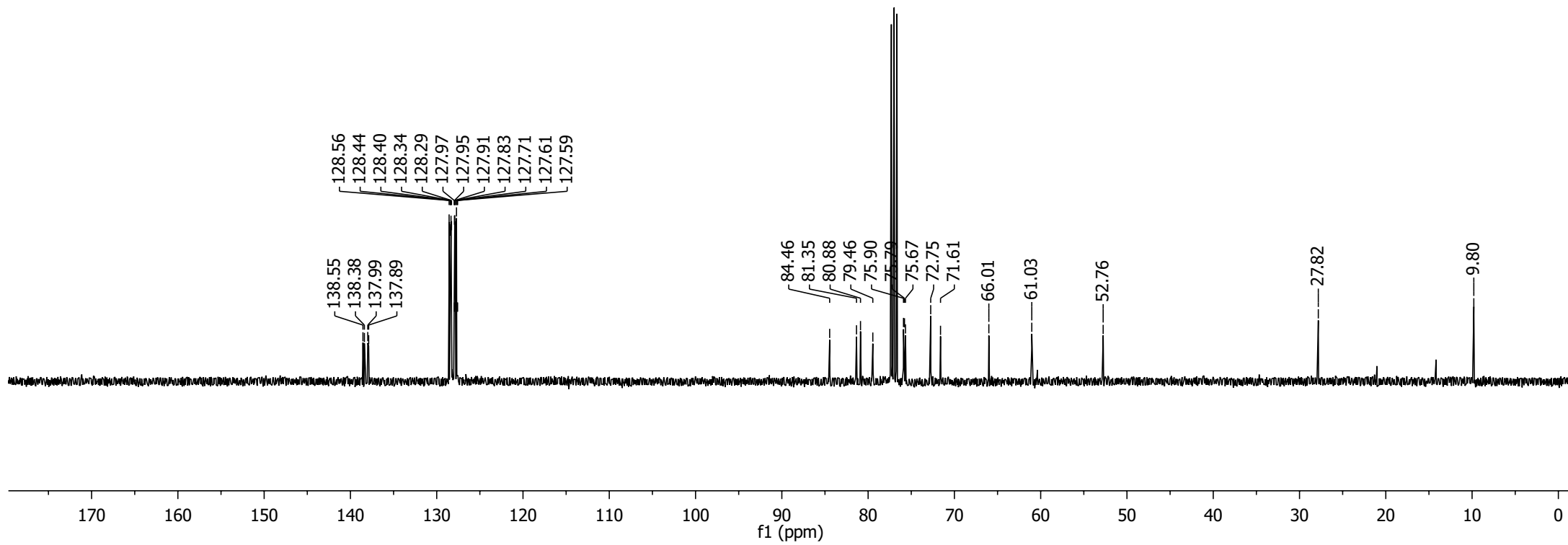
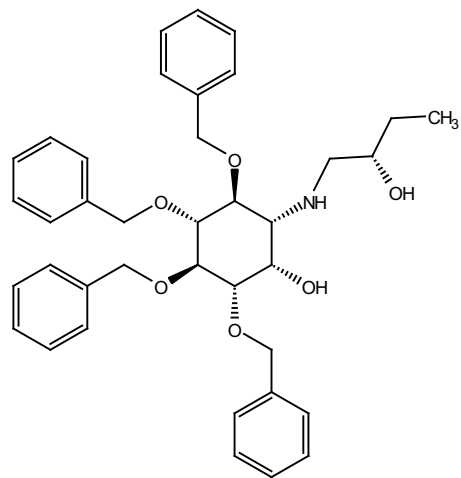
# HSQCAD (MeOD, 400 MHz) of (S)-87y



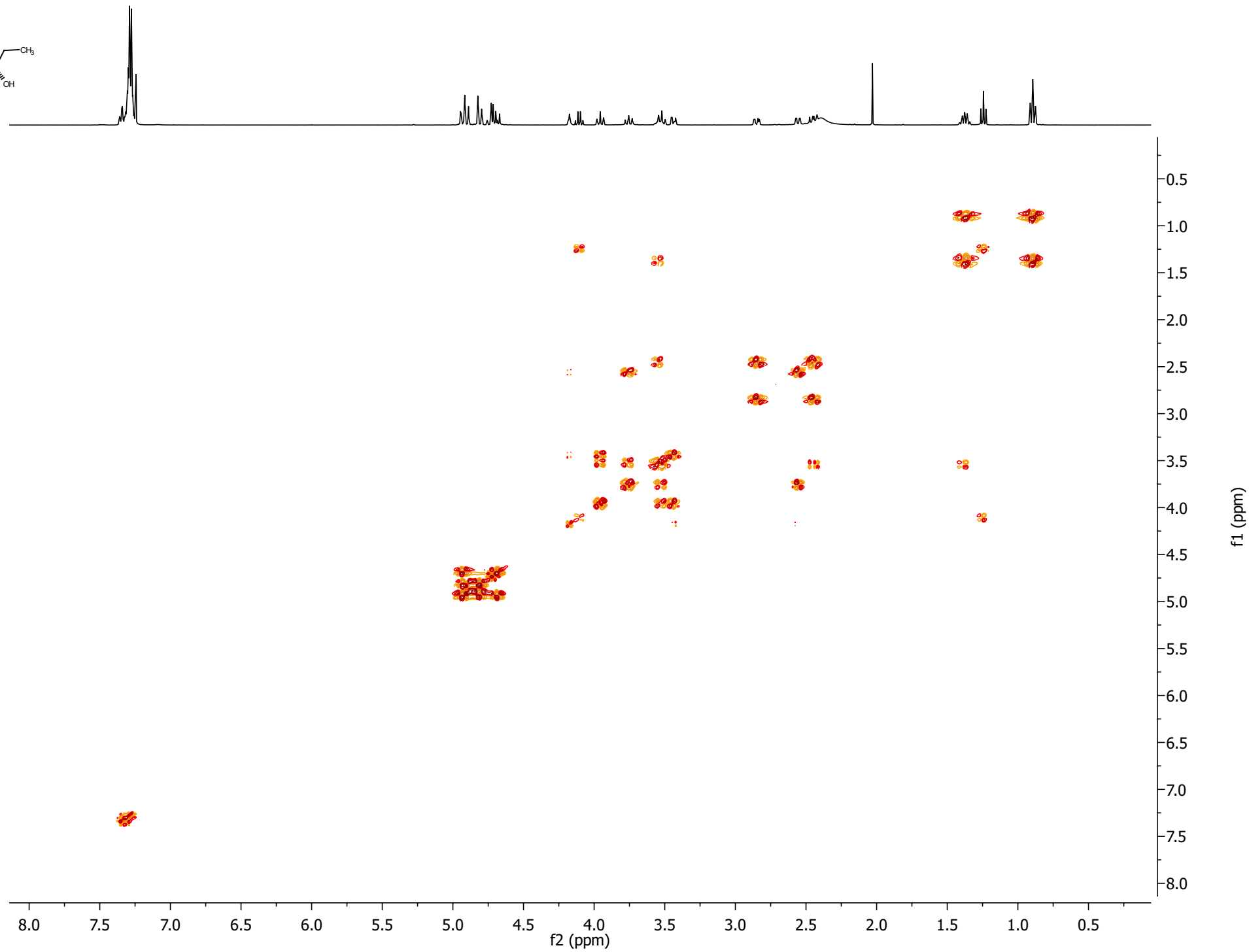
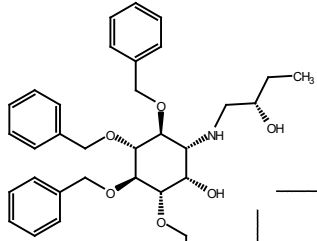
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-88x



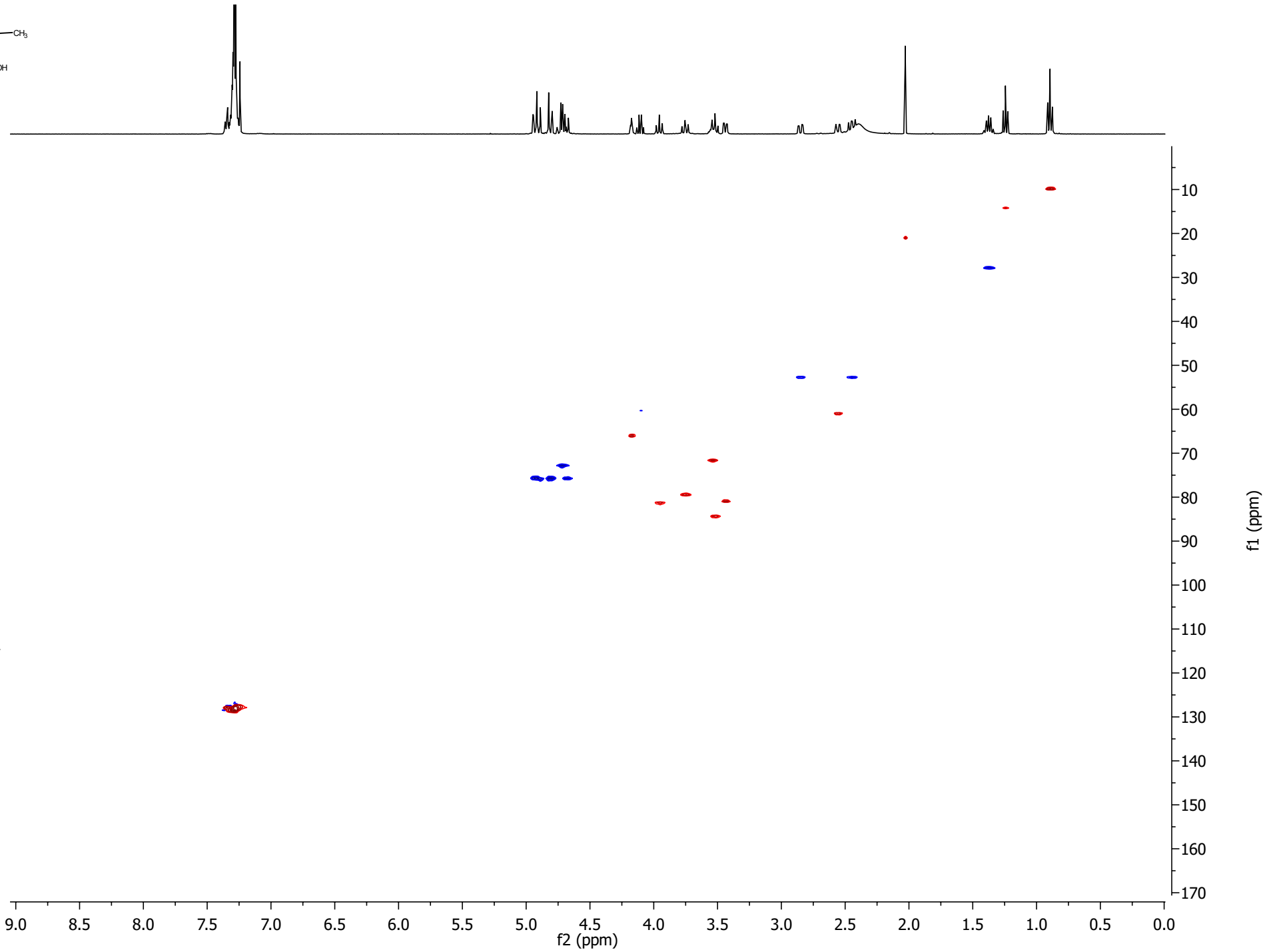
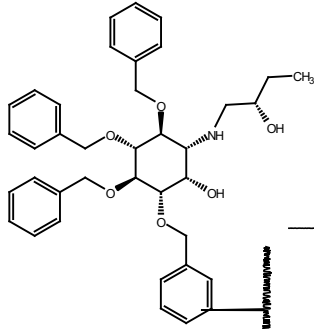
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-88x



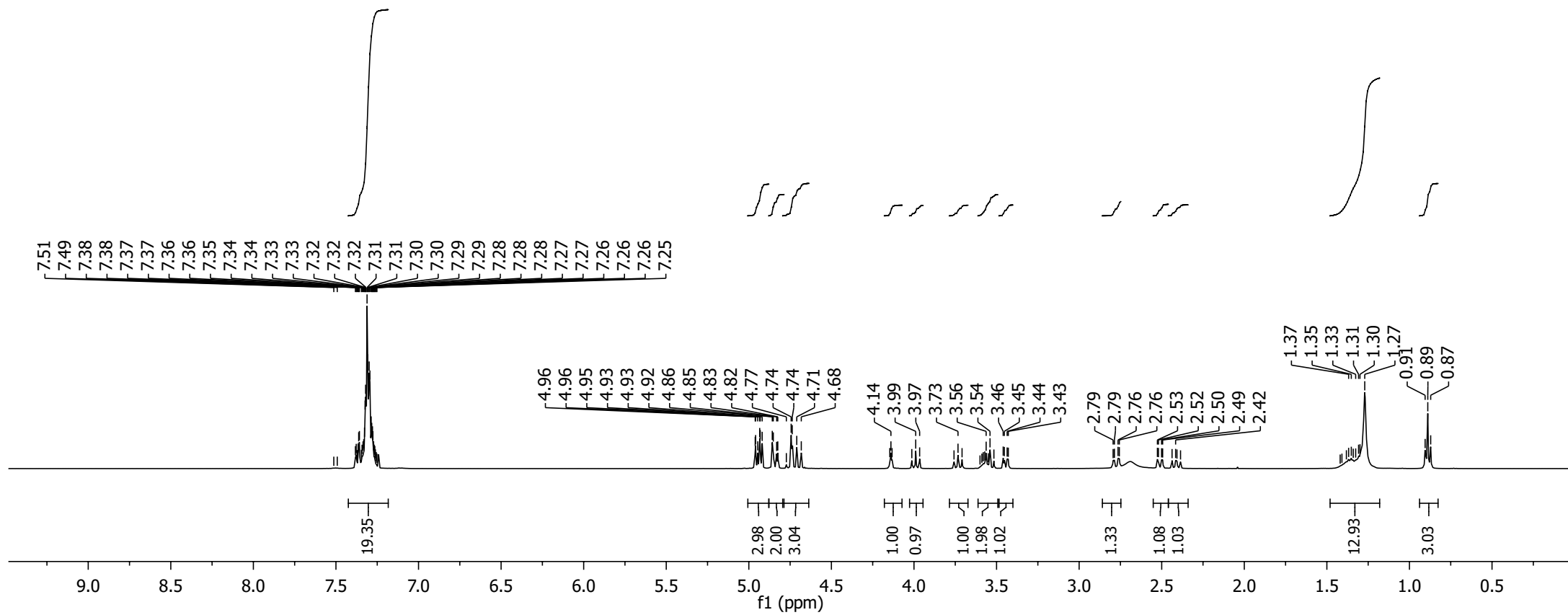
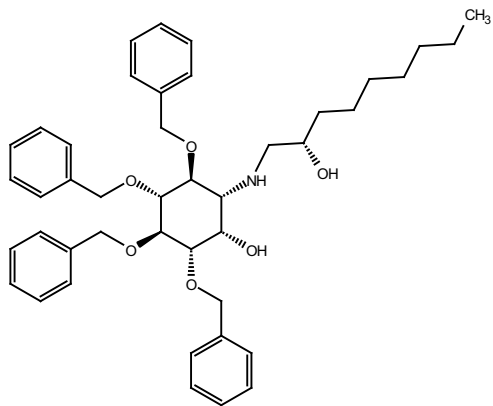
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-88x



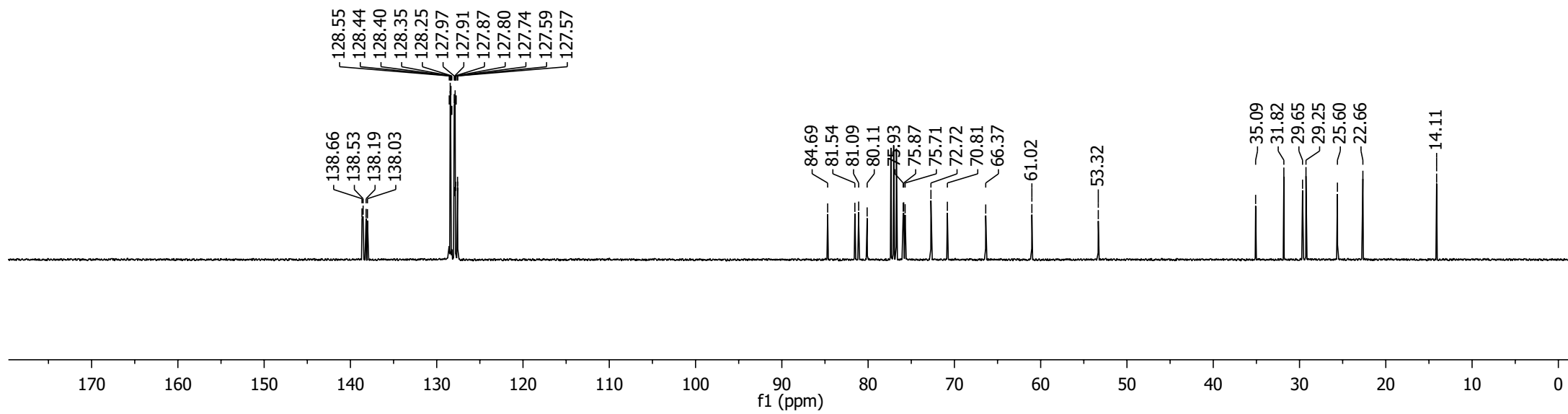
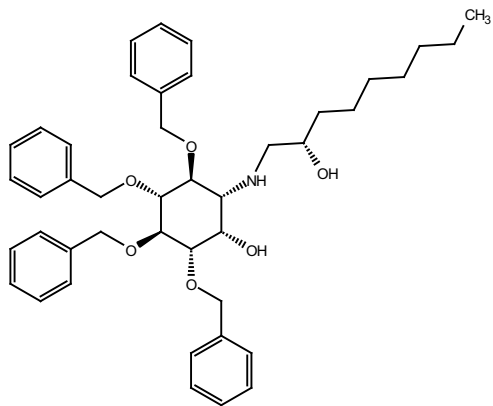
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-88x



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-88y

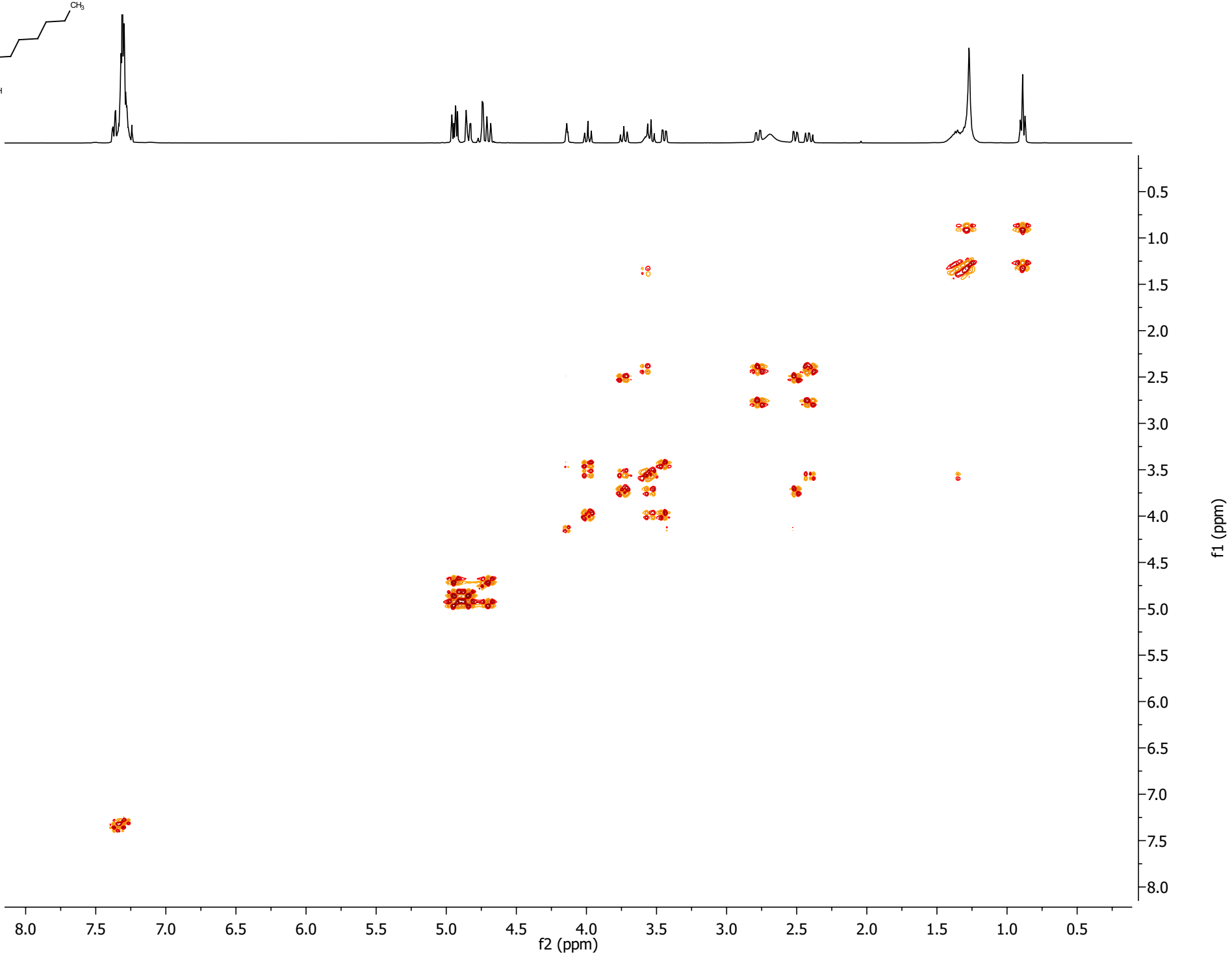
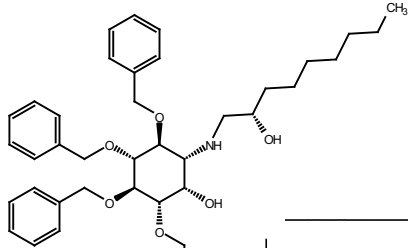


<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-88y

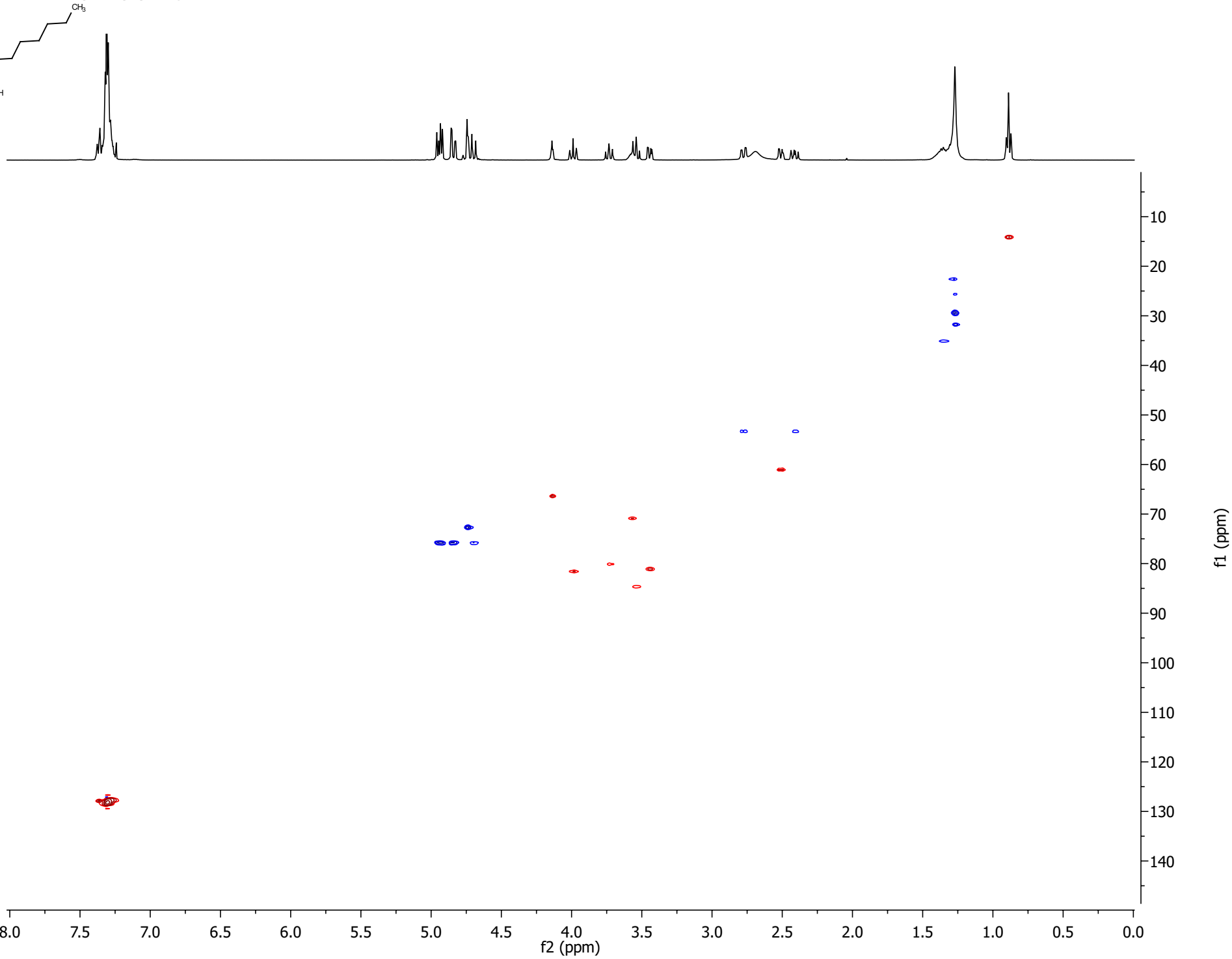
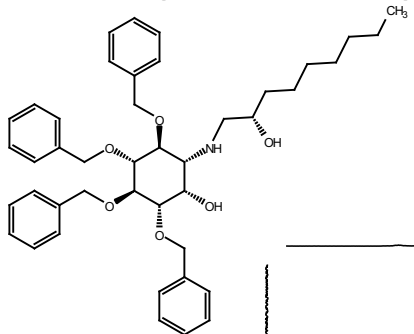




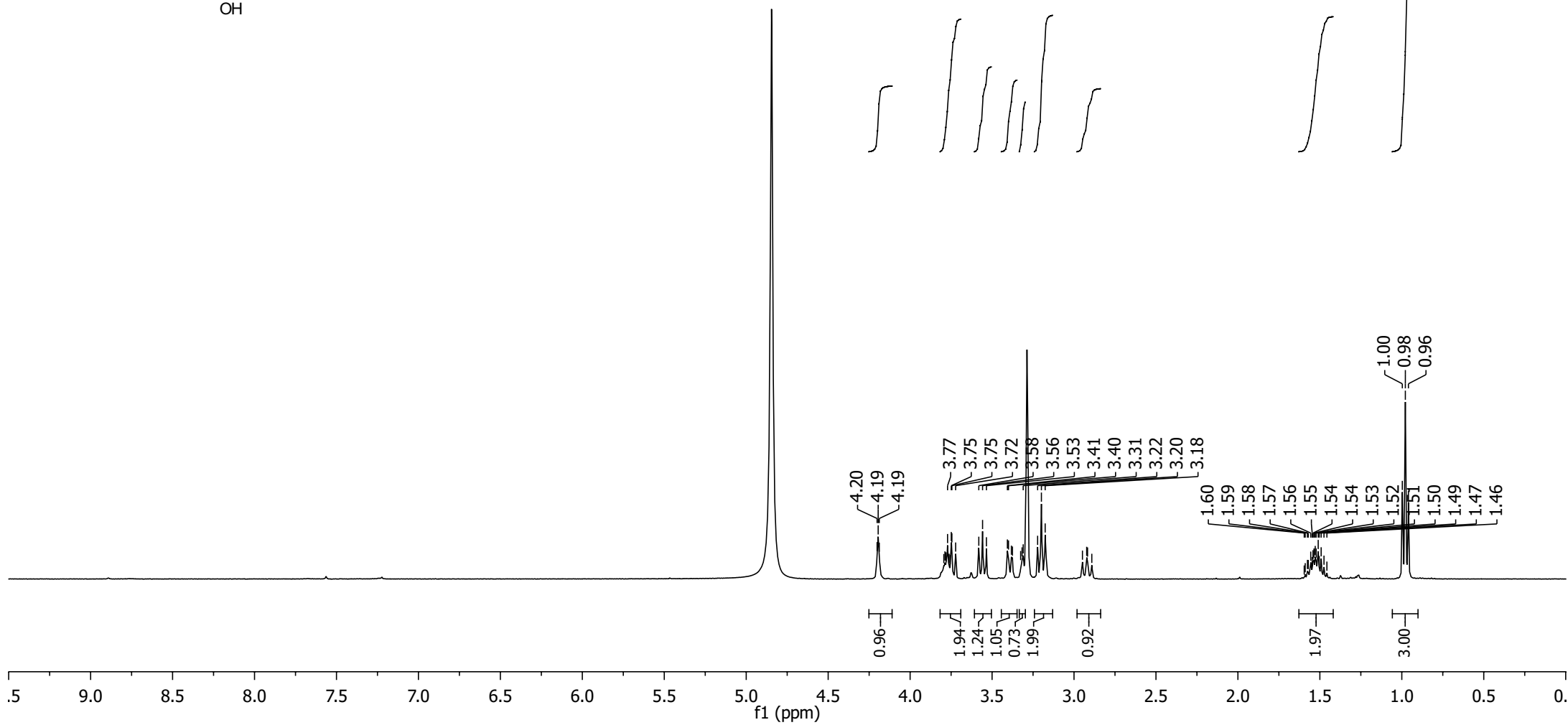
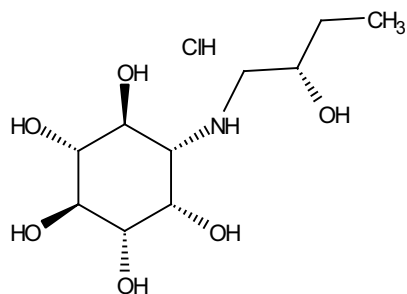
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-88y



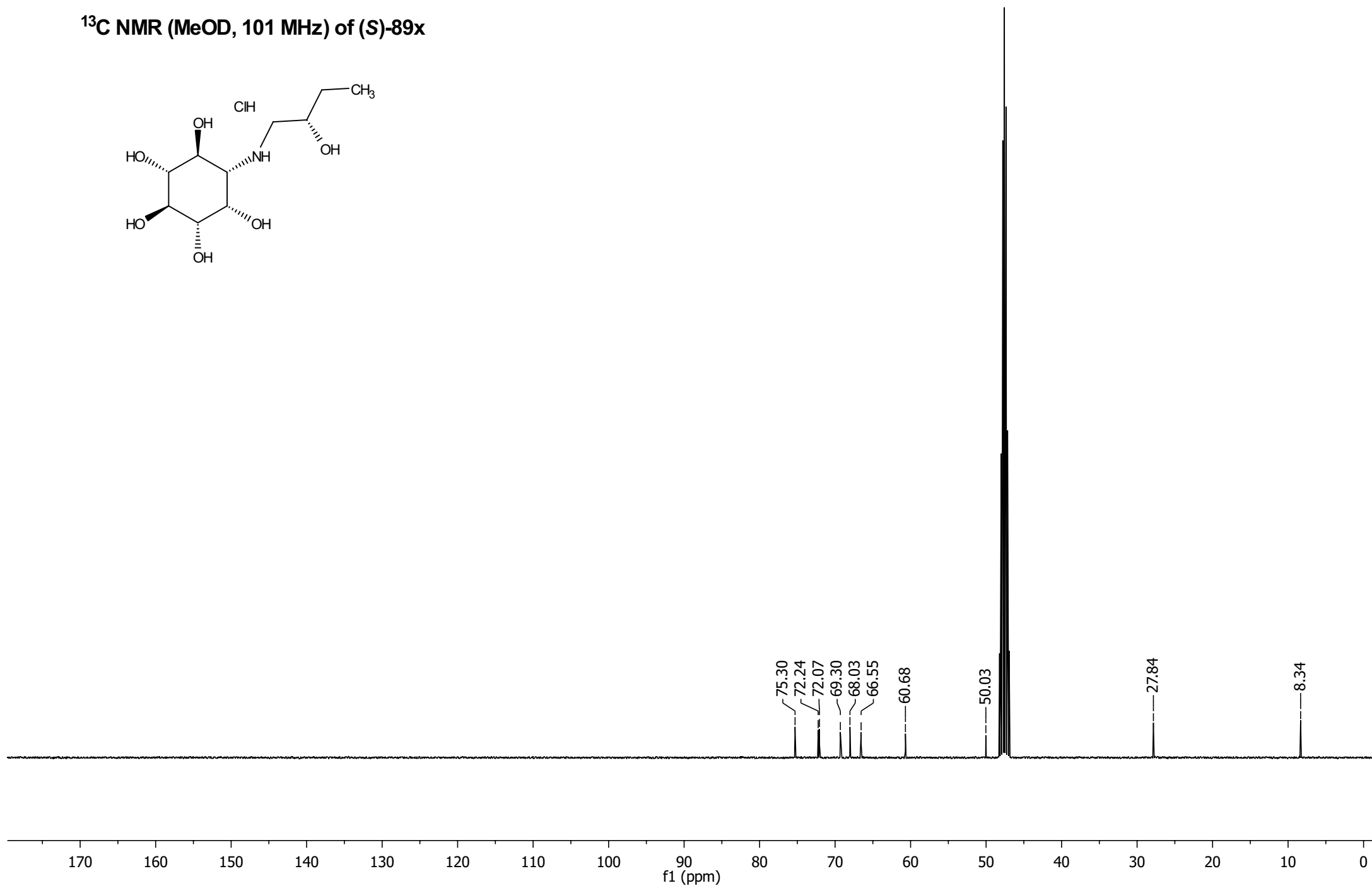
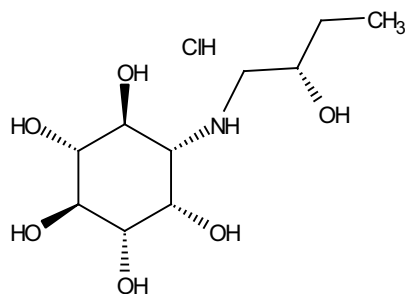
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-88y



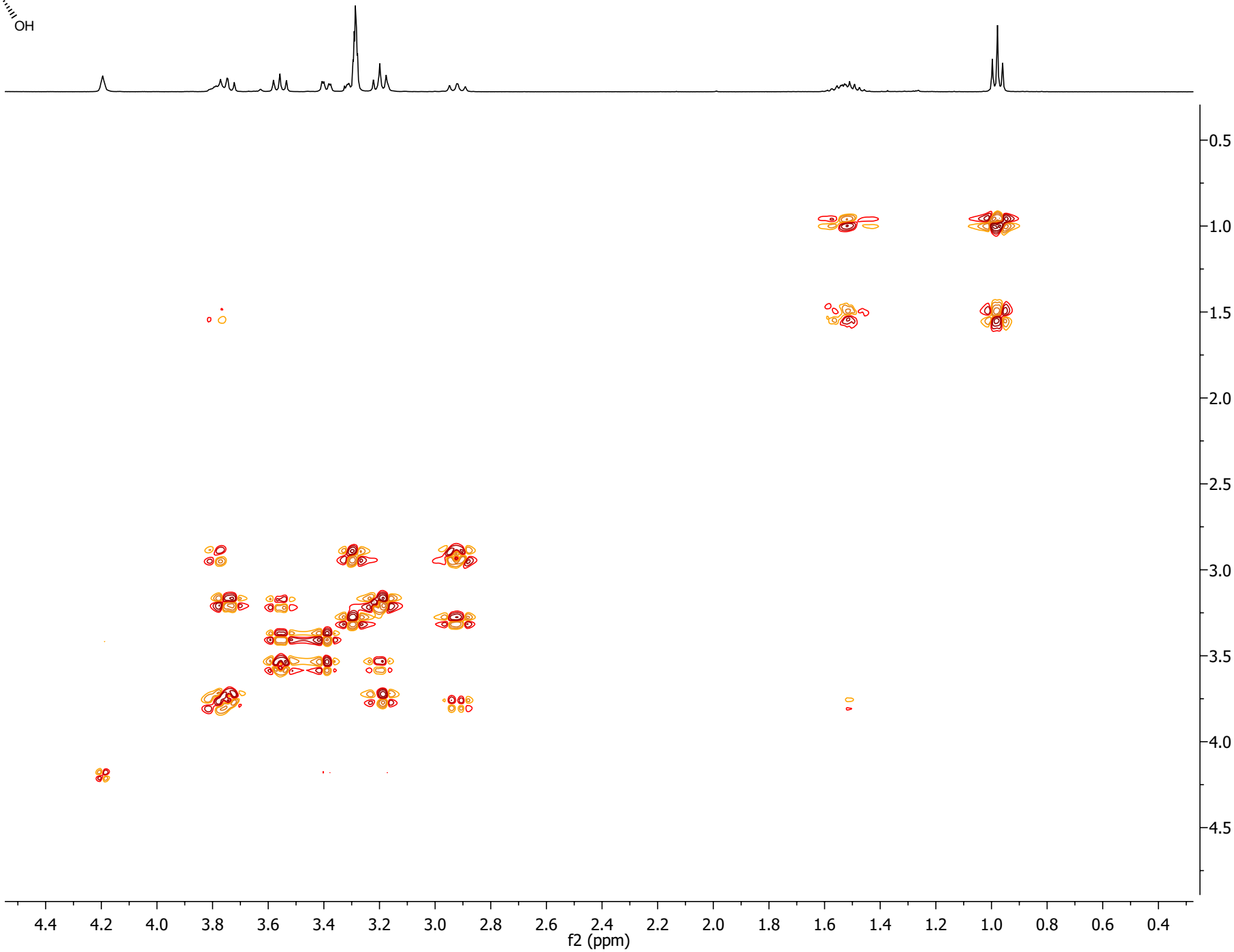
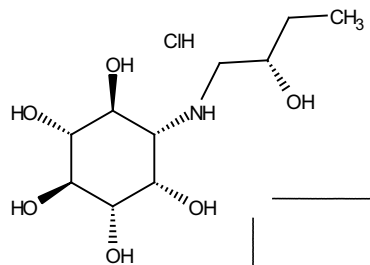
<sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-89x



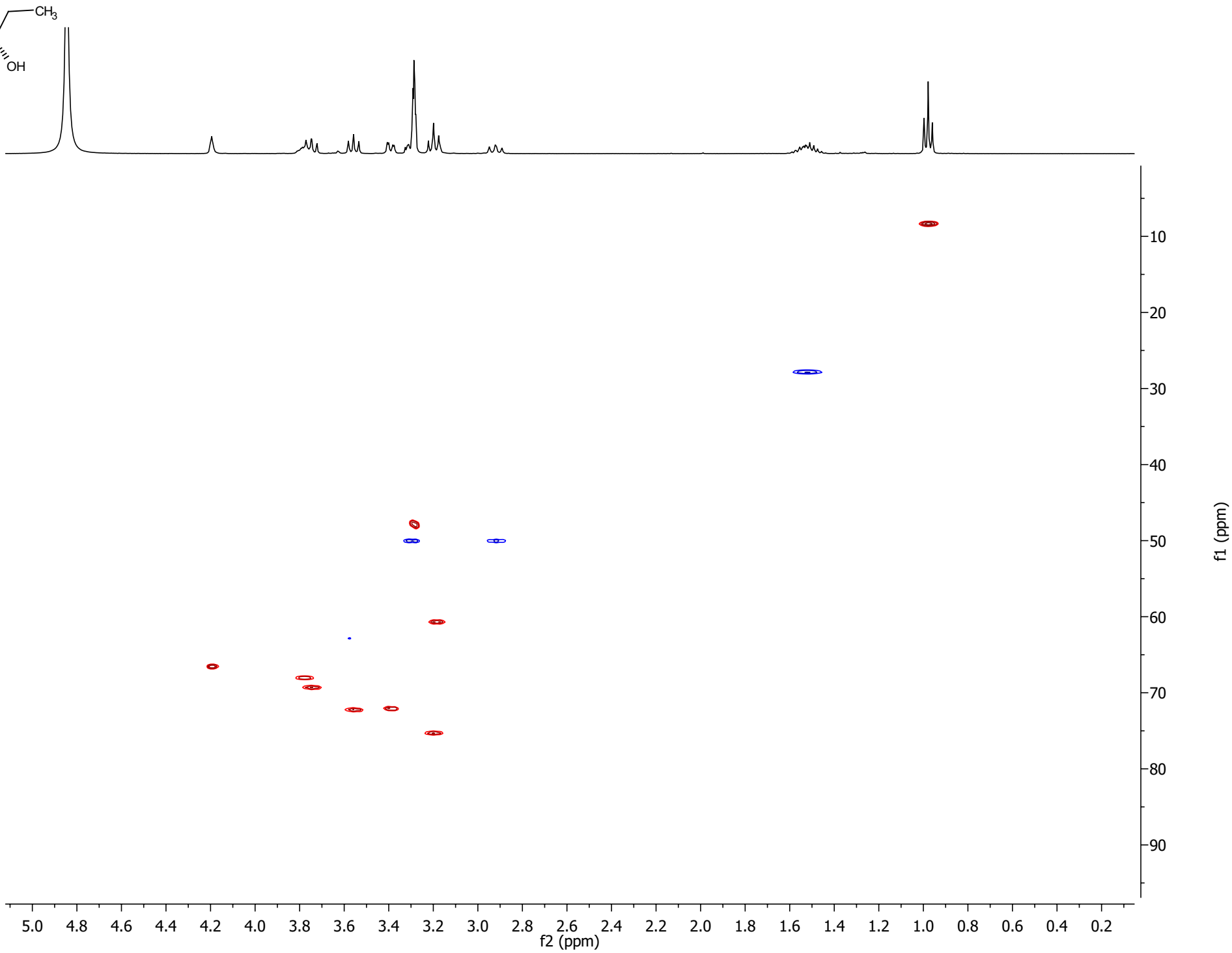
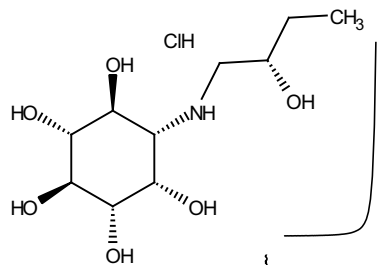
<sup>13</sup>C NMR (MeOD, 101 MHz) of (S)-89x



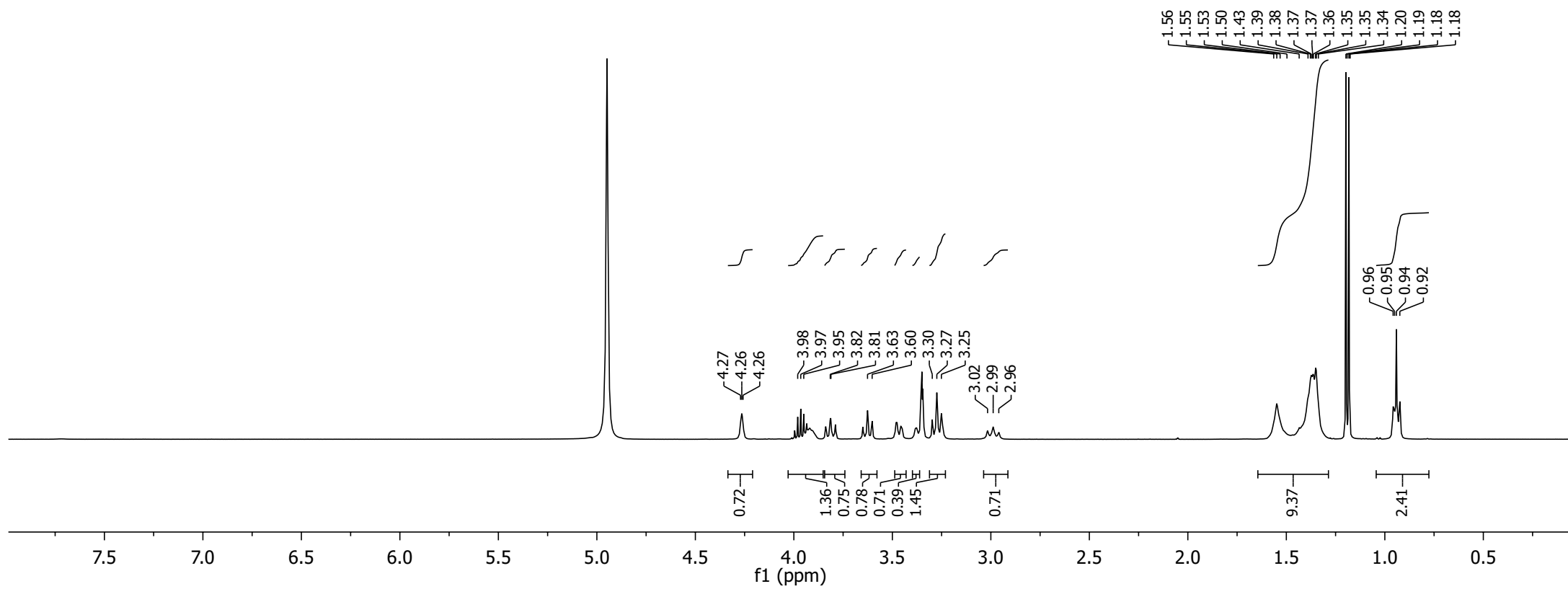
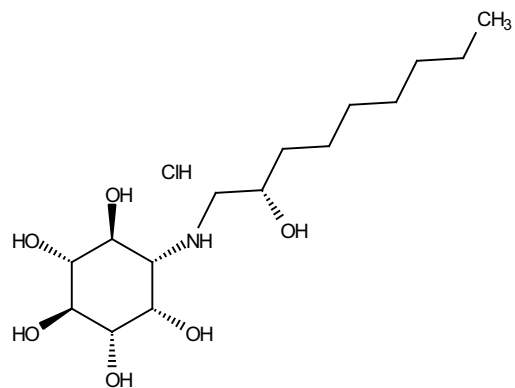
gDQCOSY (MeOD, 400 MHz) of (S)-89x



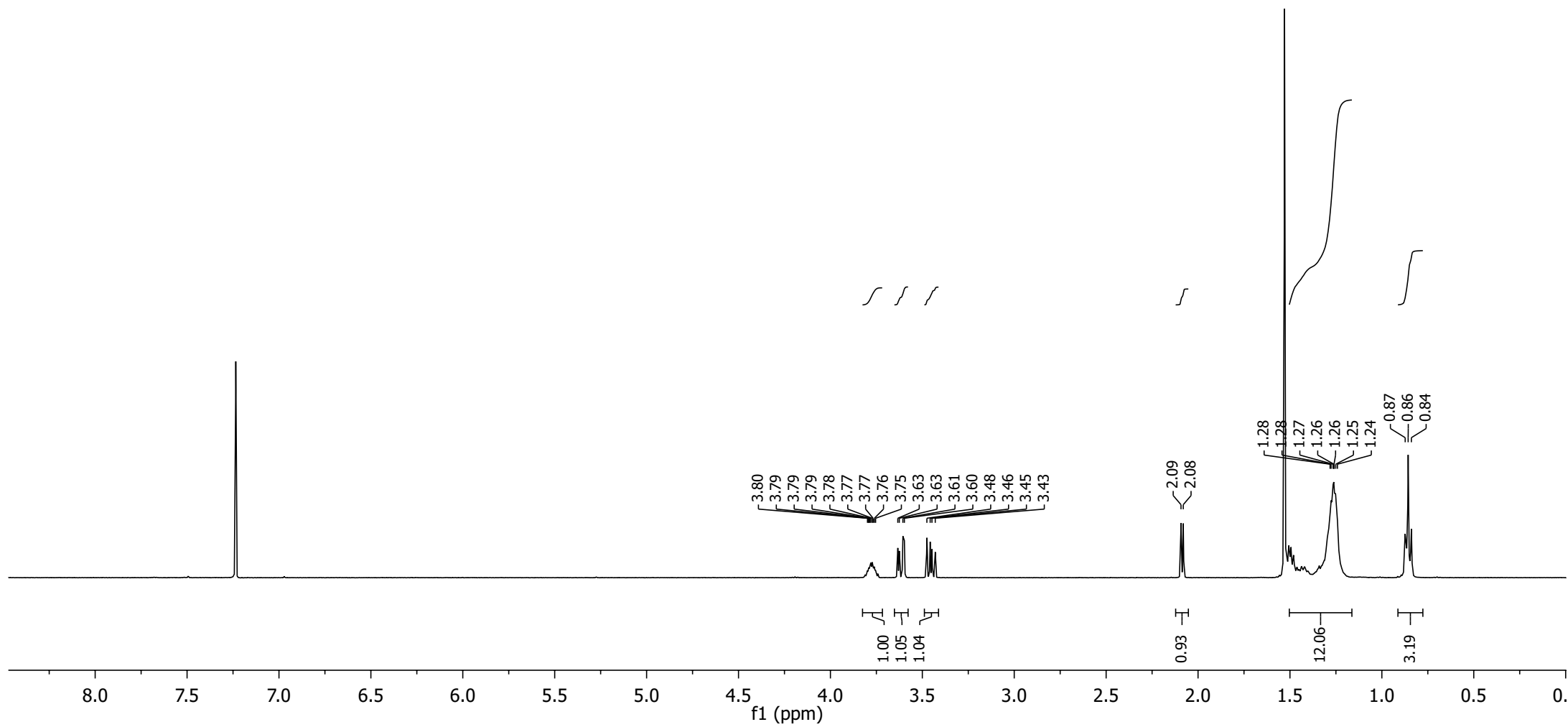
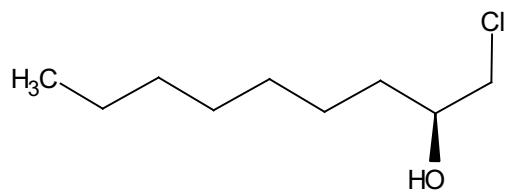
# HSQCAD (MeOD, 400 MHz) of (S)-89x



# <sup>1</sup>H NMR (MeOD, 400 MHz) of (S)-89y

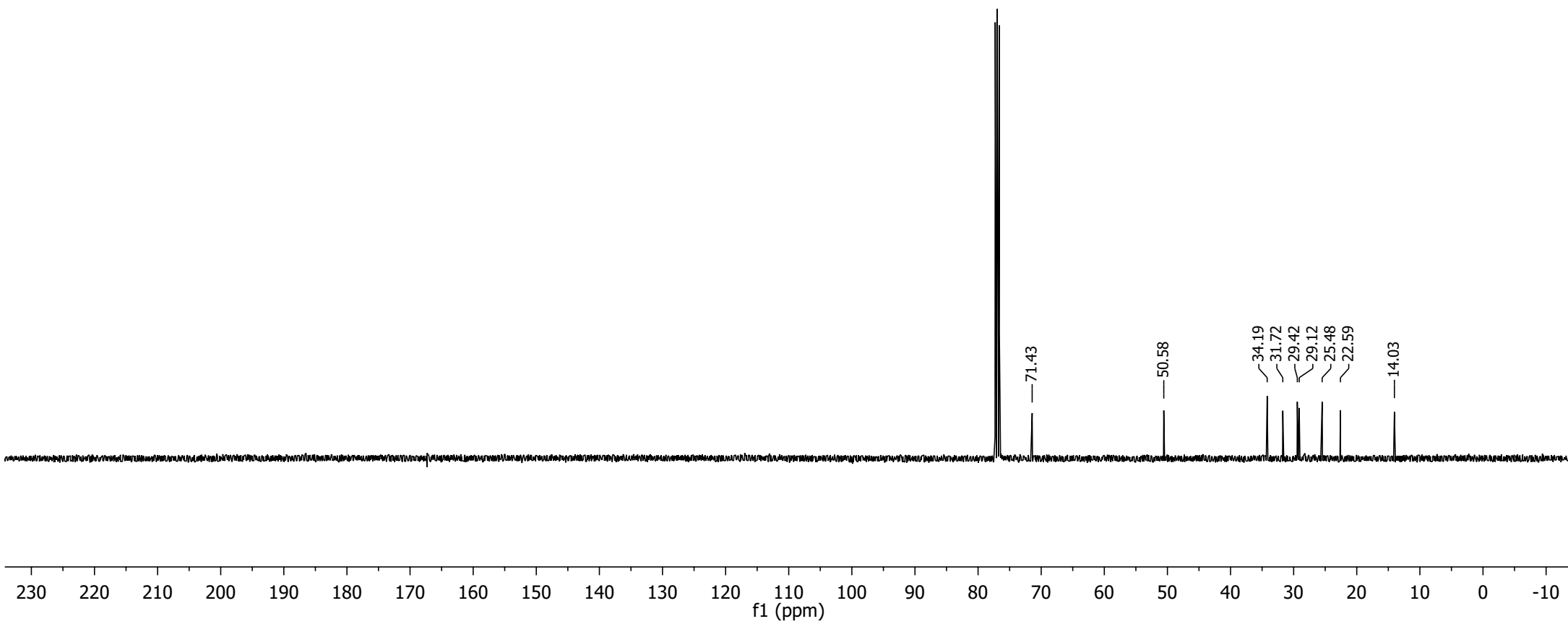
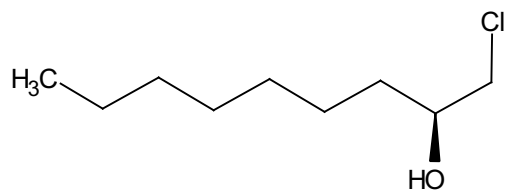


<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of (S)-94

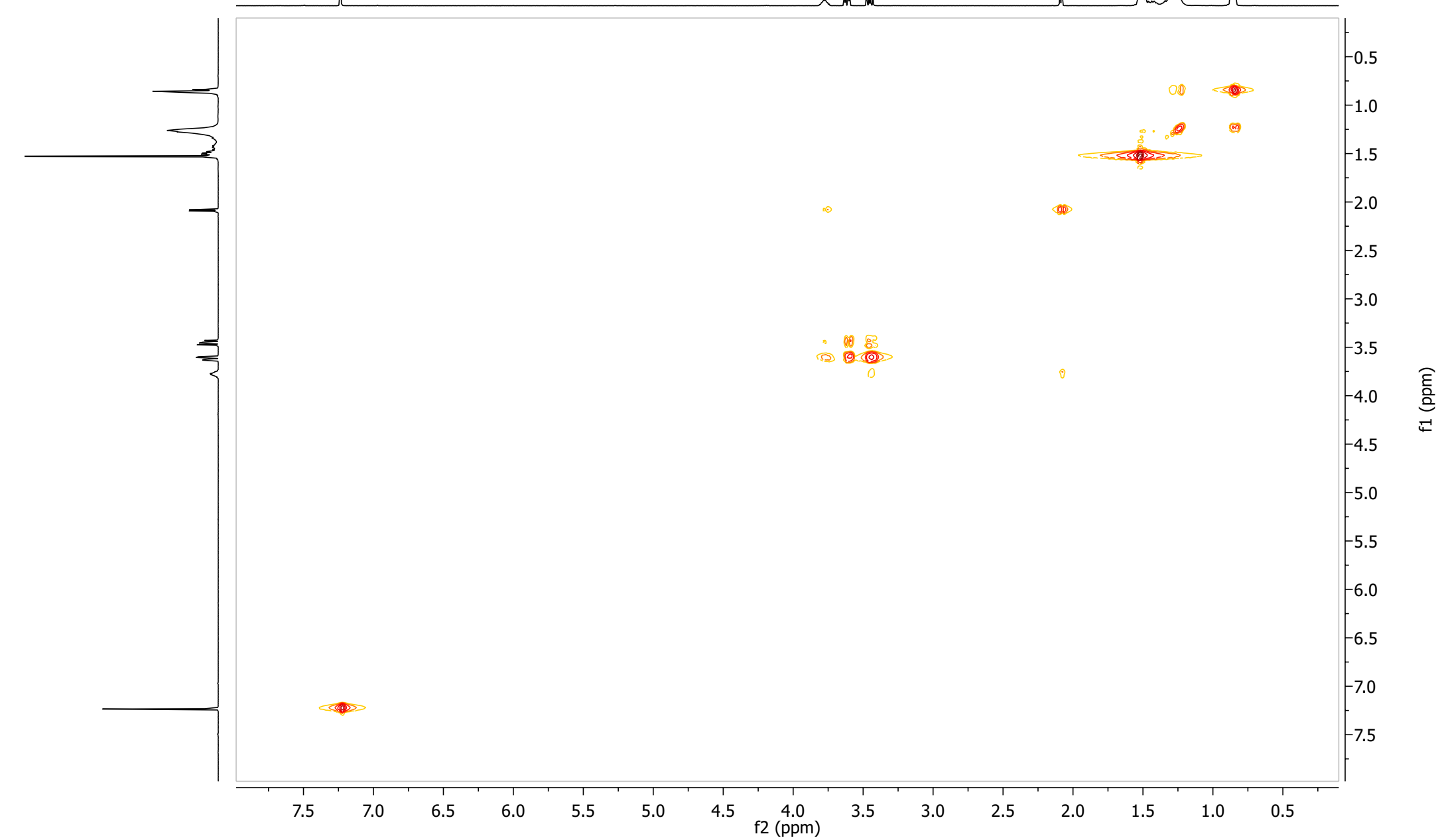
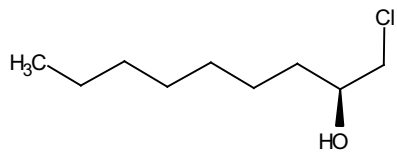




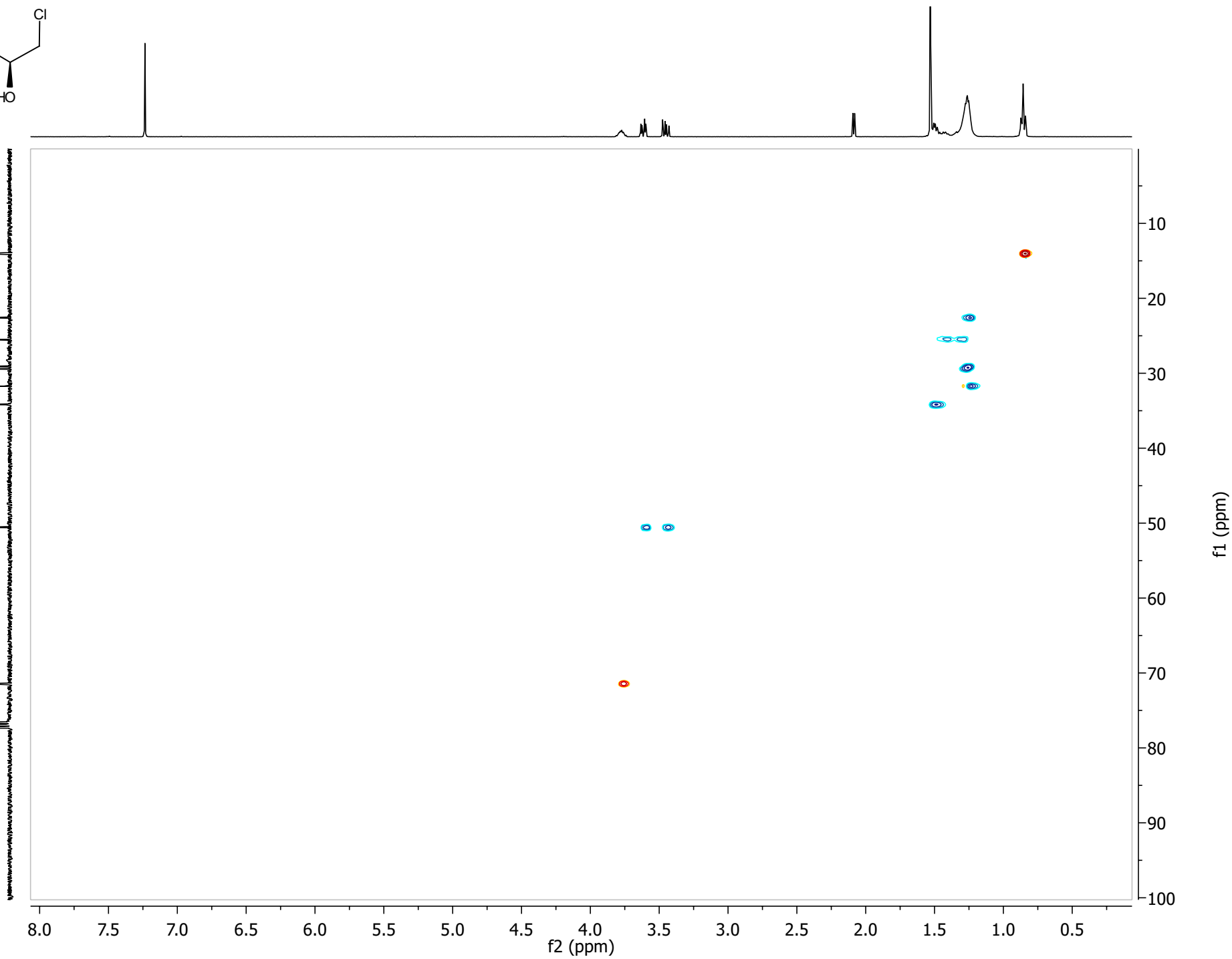
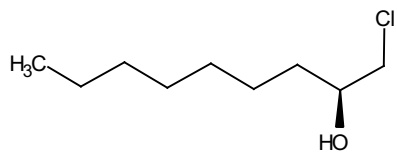
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of (S)-94



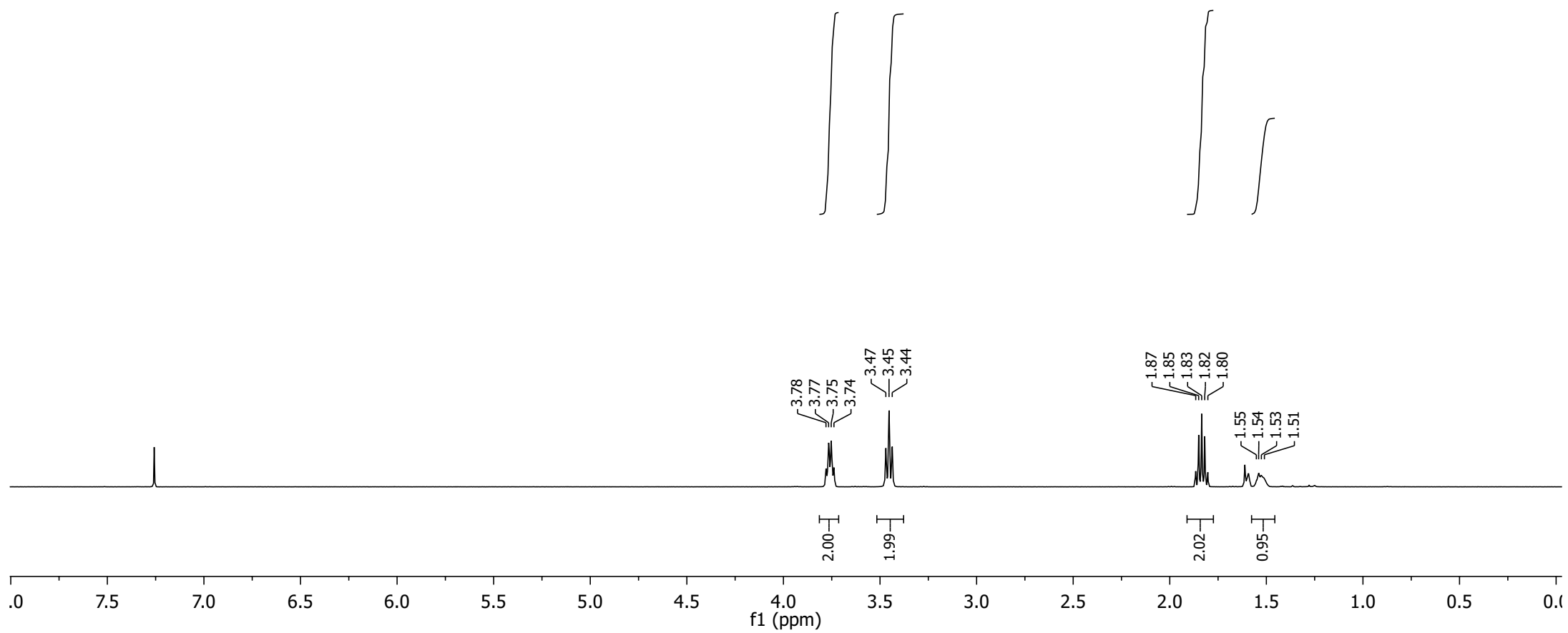
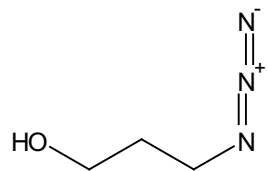
gCOSY (CDCl<sub>3</sub>, 400 MHz) of (S)-94



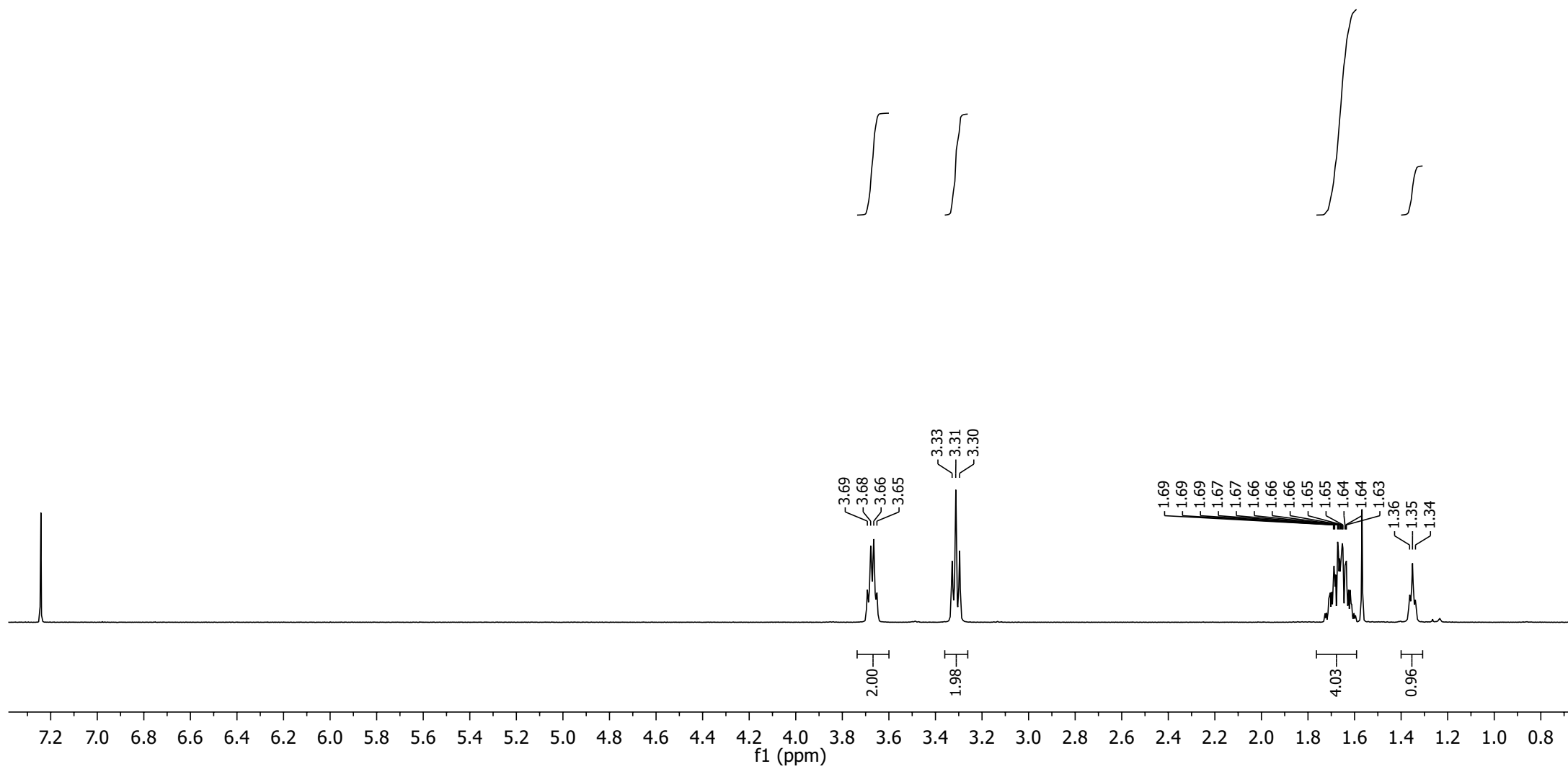
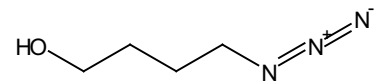
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of (S)-94



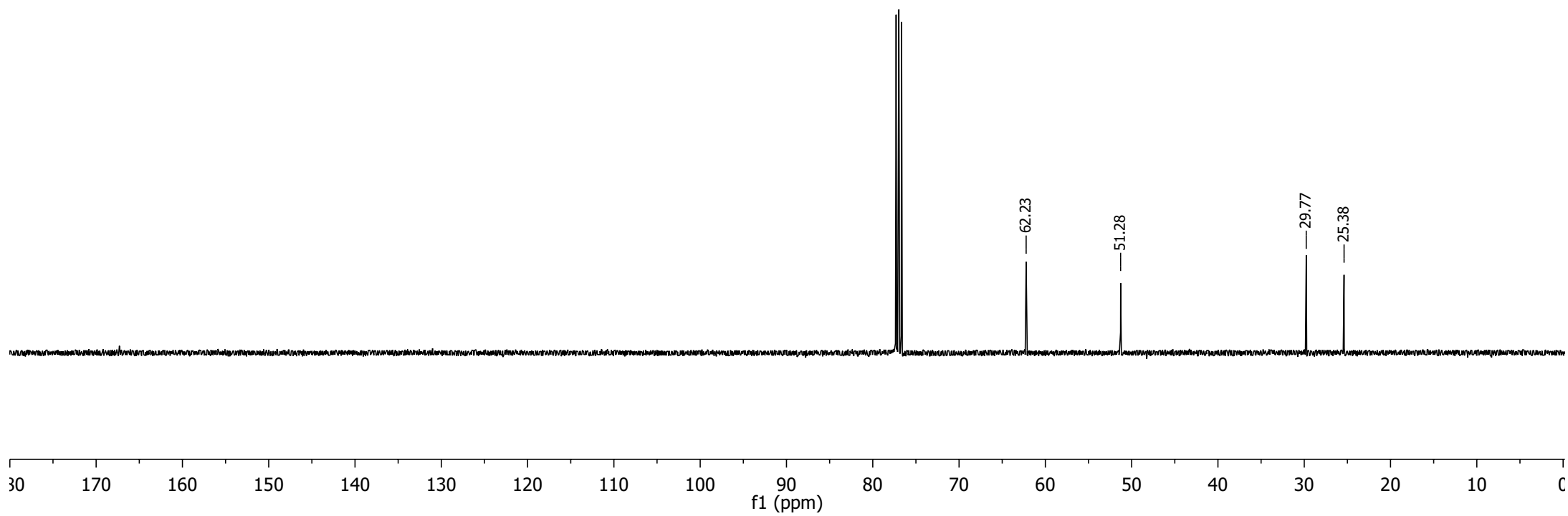
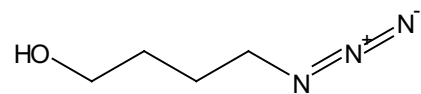
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 11a**



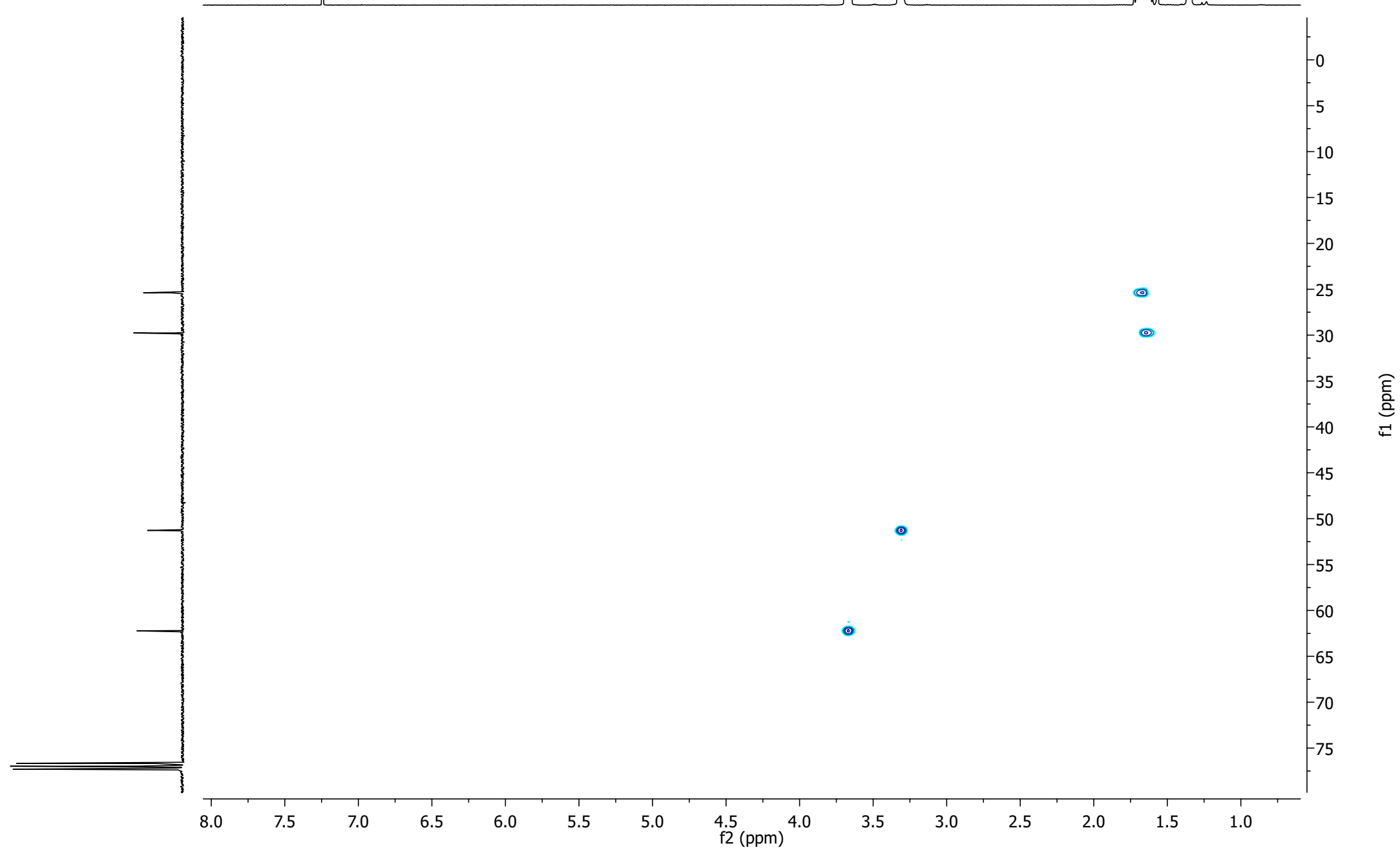
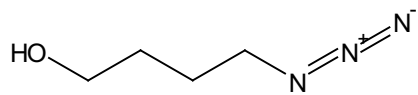
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 11b



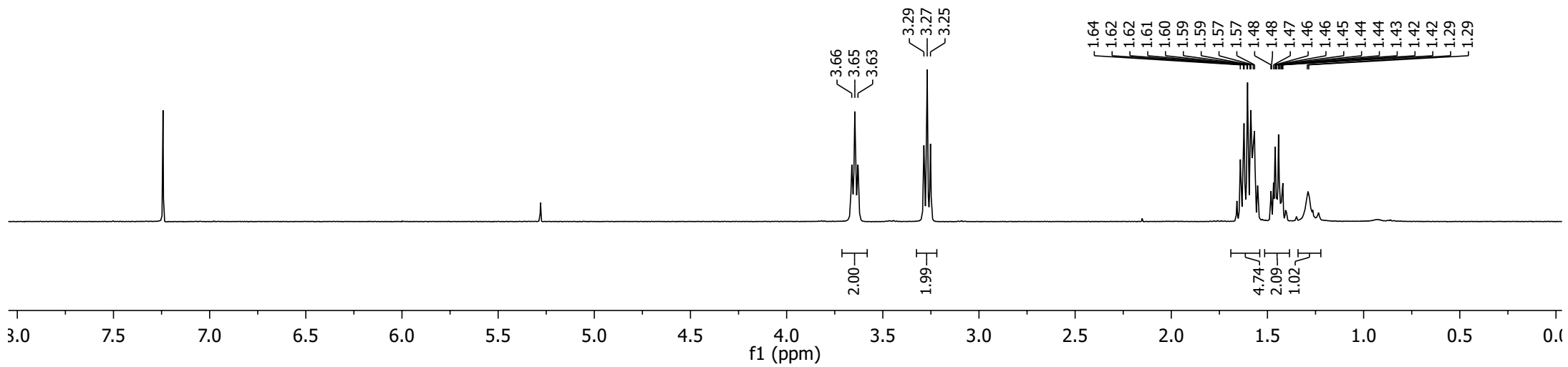
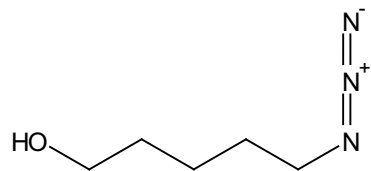
**$^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 101 MHz) of 11b**



HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 11b

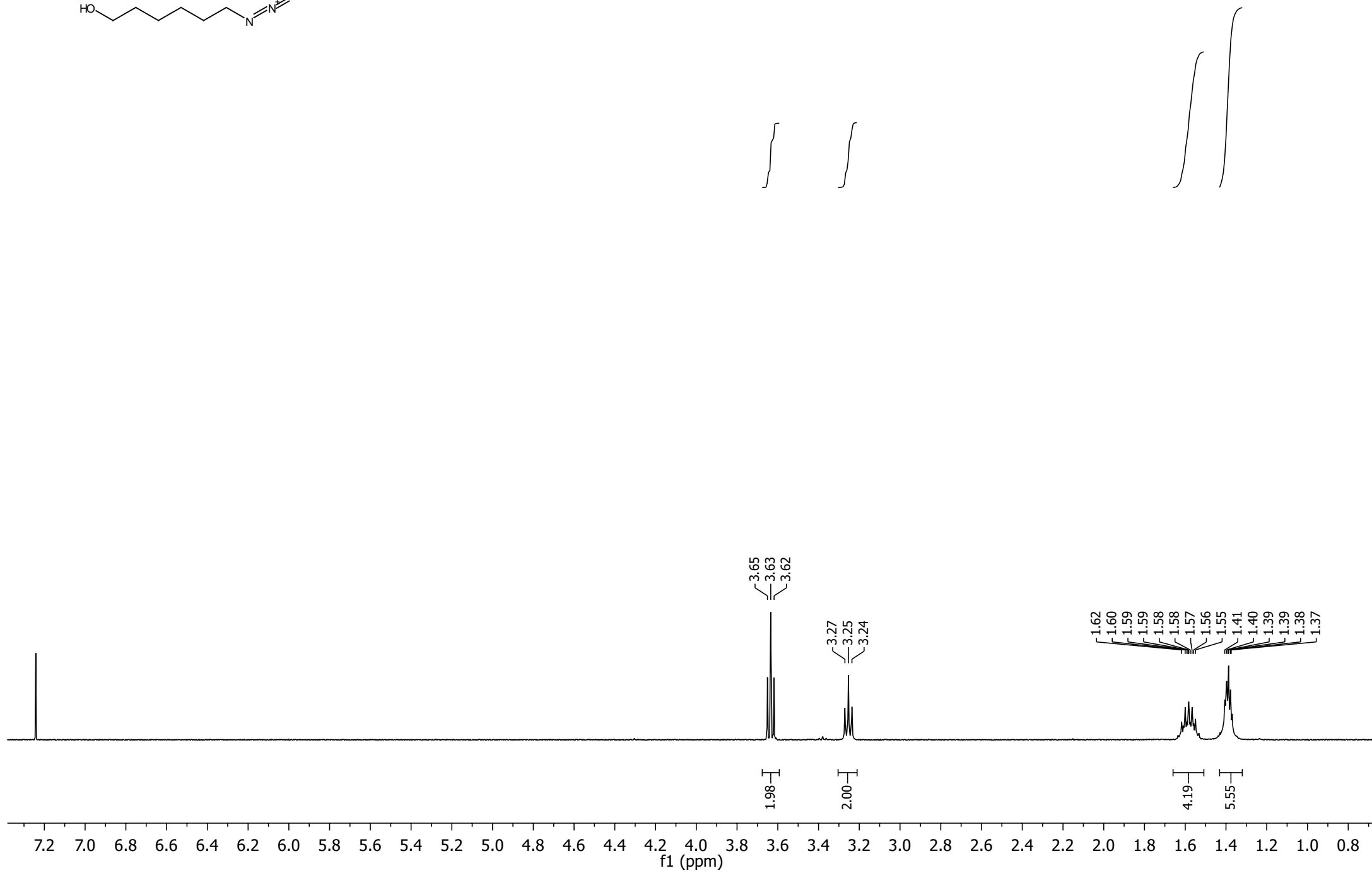
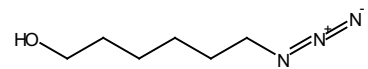


**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 11c**

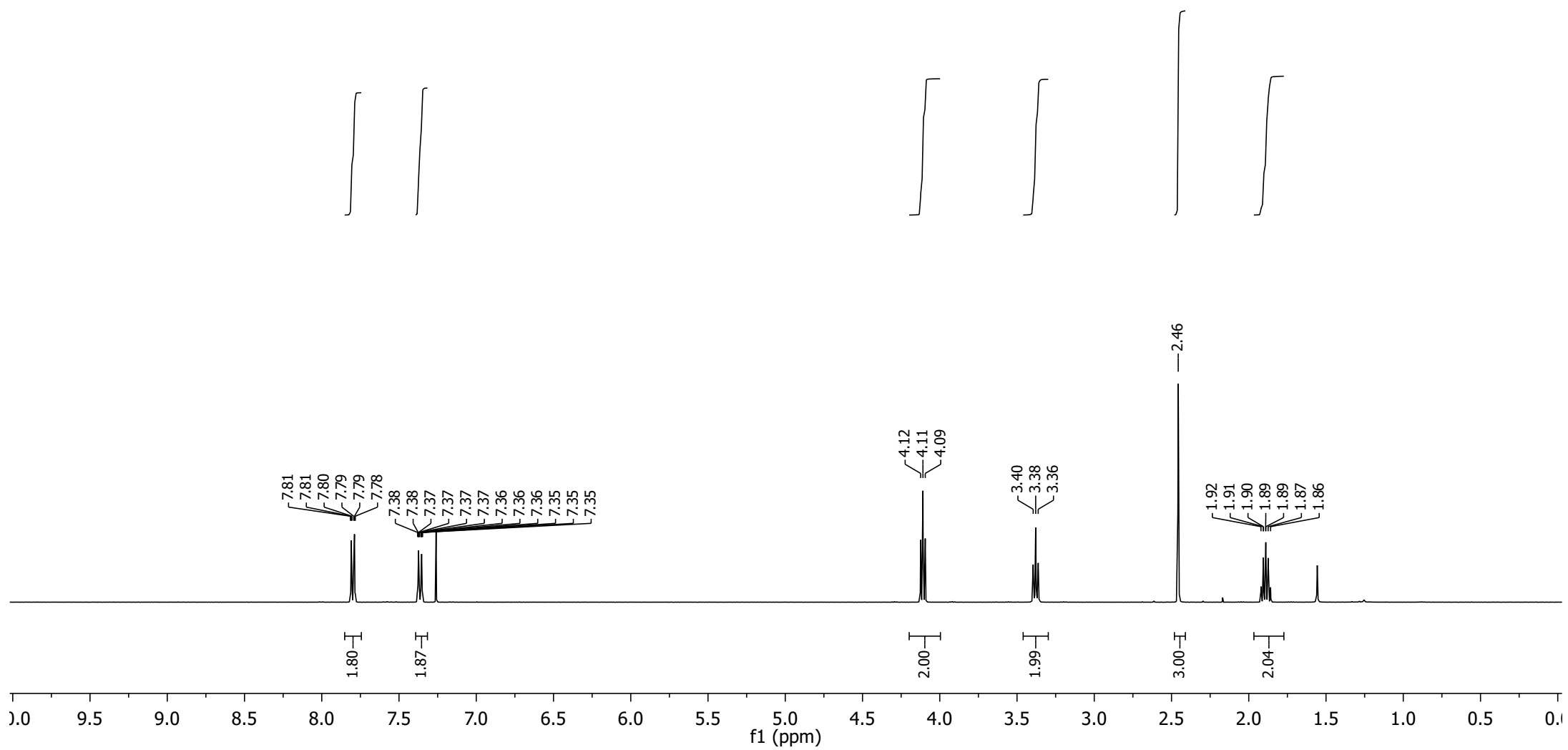
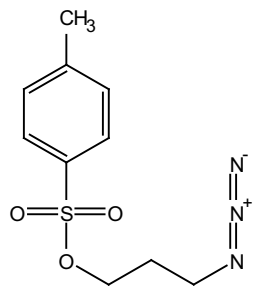




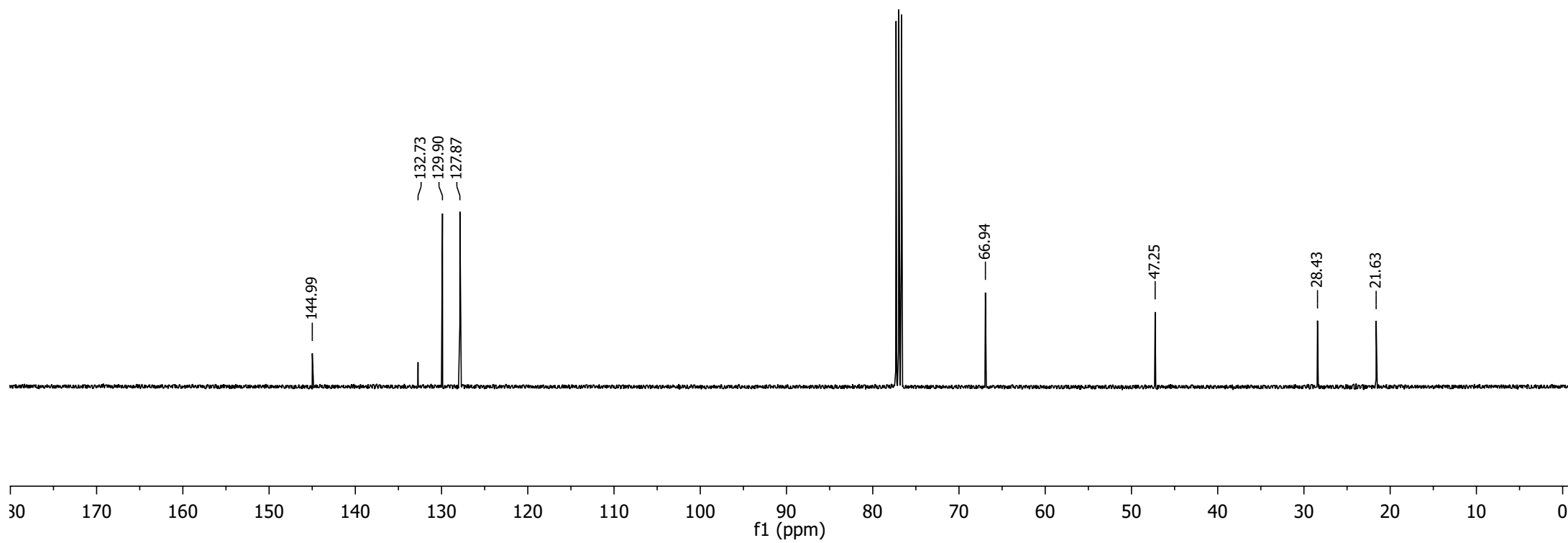
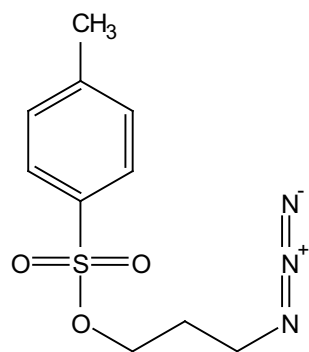
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 11d**



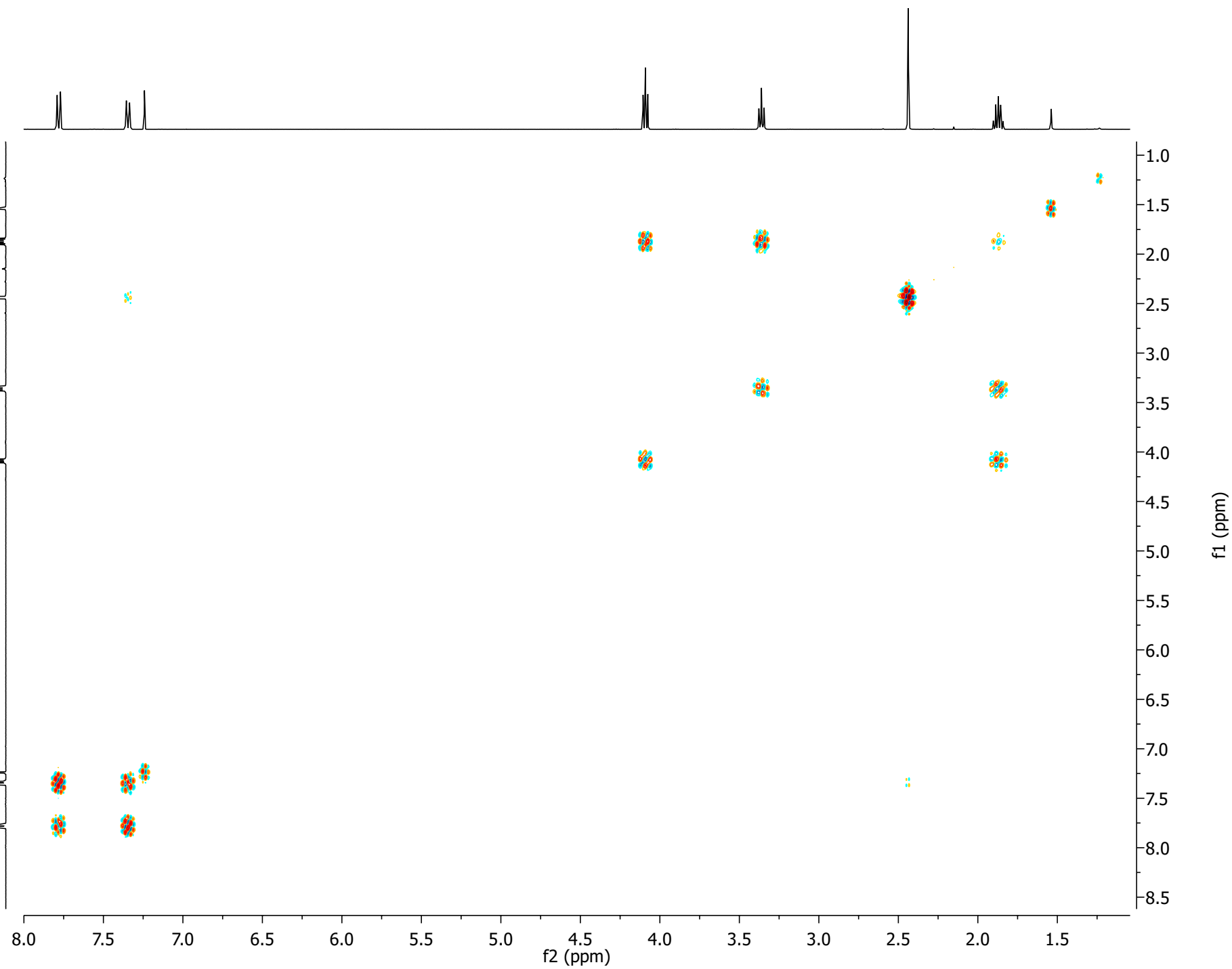
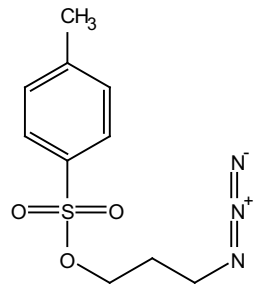
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 12a



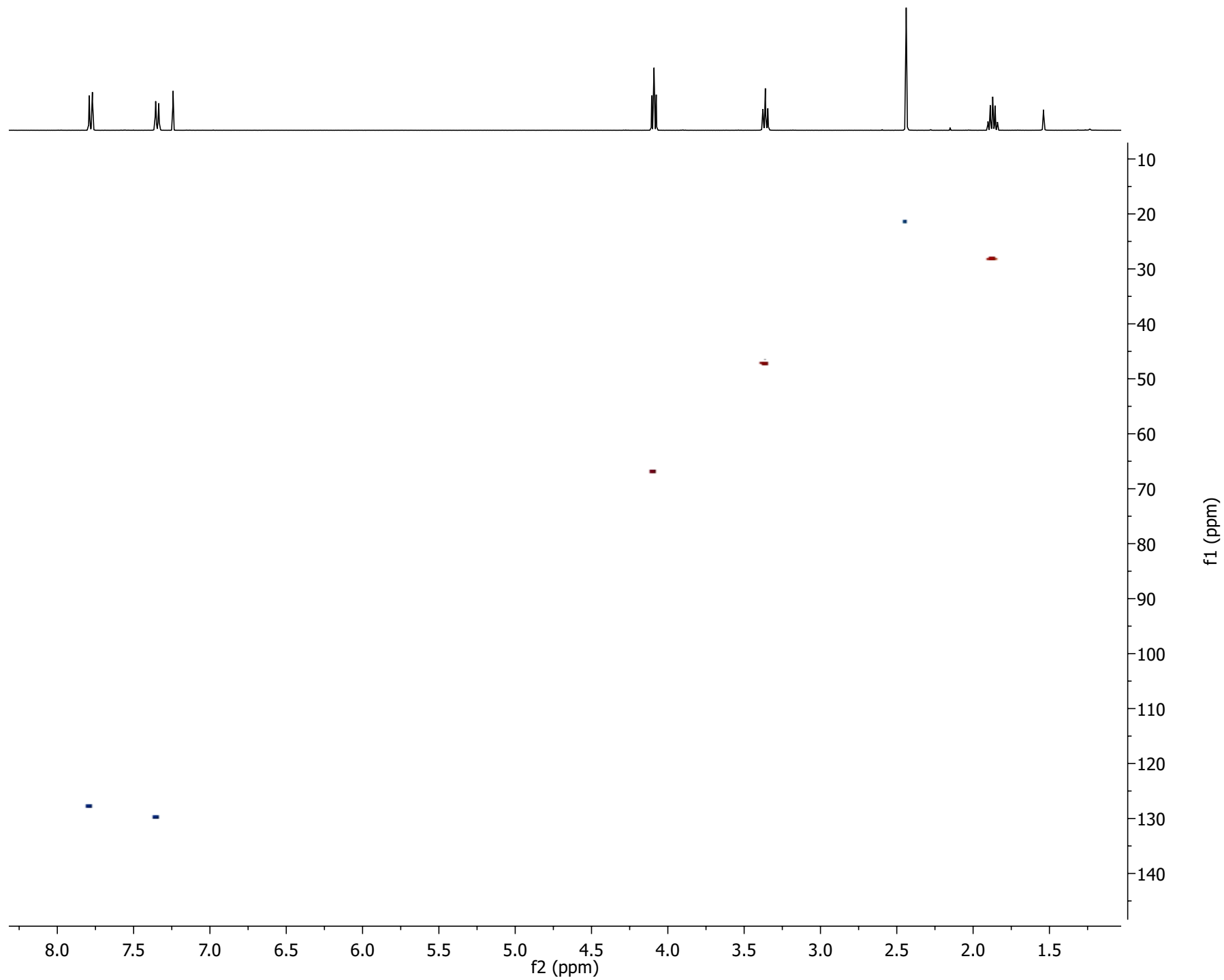
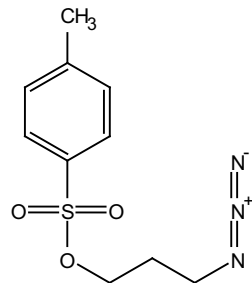
**$^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 101 MHz) of 12a**



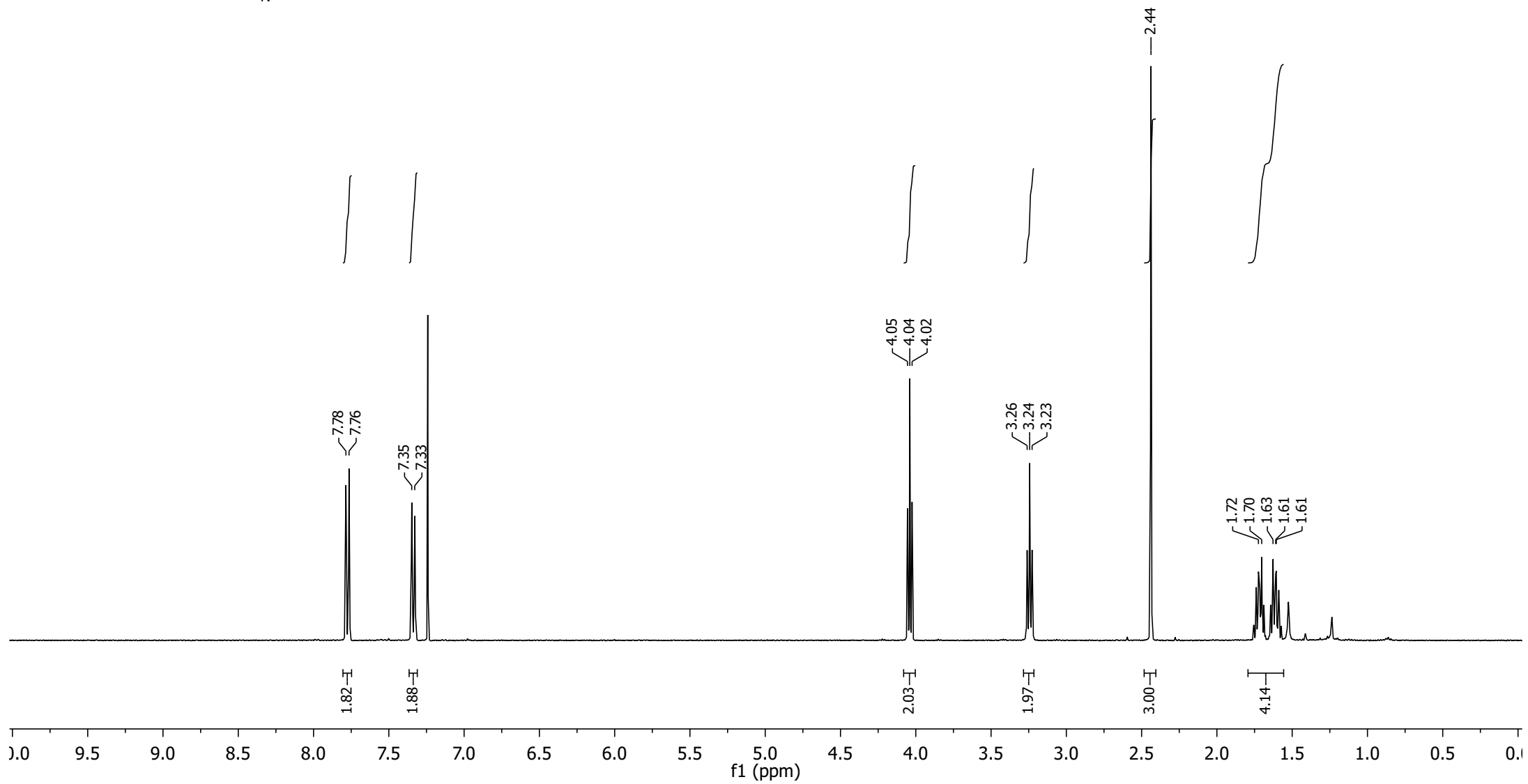
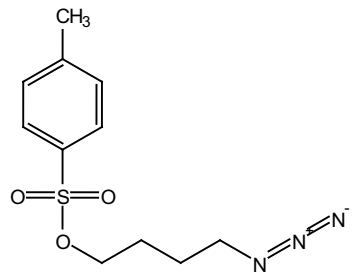
**gCOSY (CDCl<sub>3</sub>, 400 MHz) of 12a**



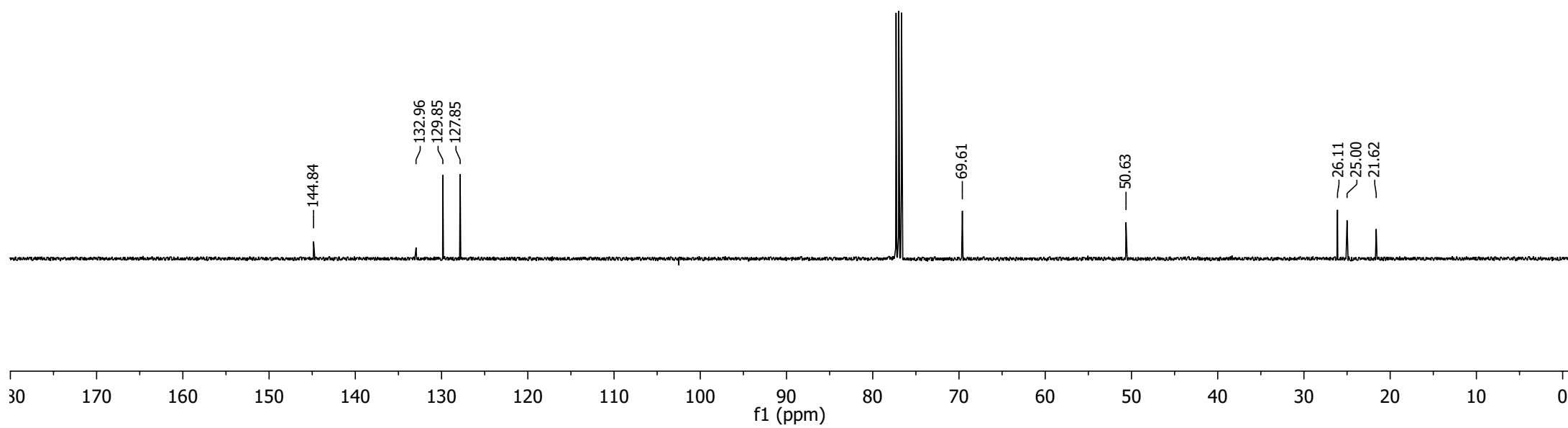
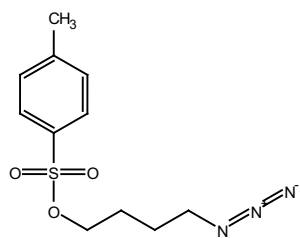
**gHSQC (CDCl<sub>3</sub>, 400 MHz) of 12a**



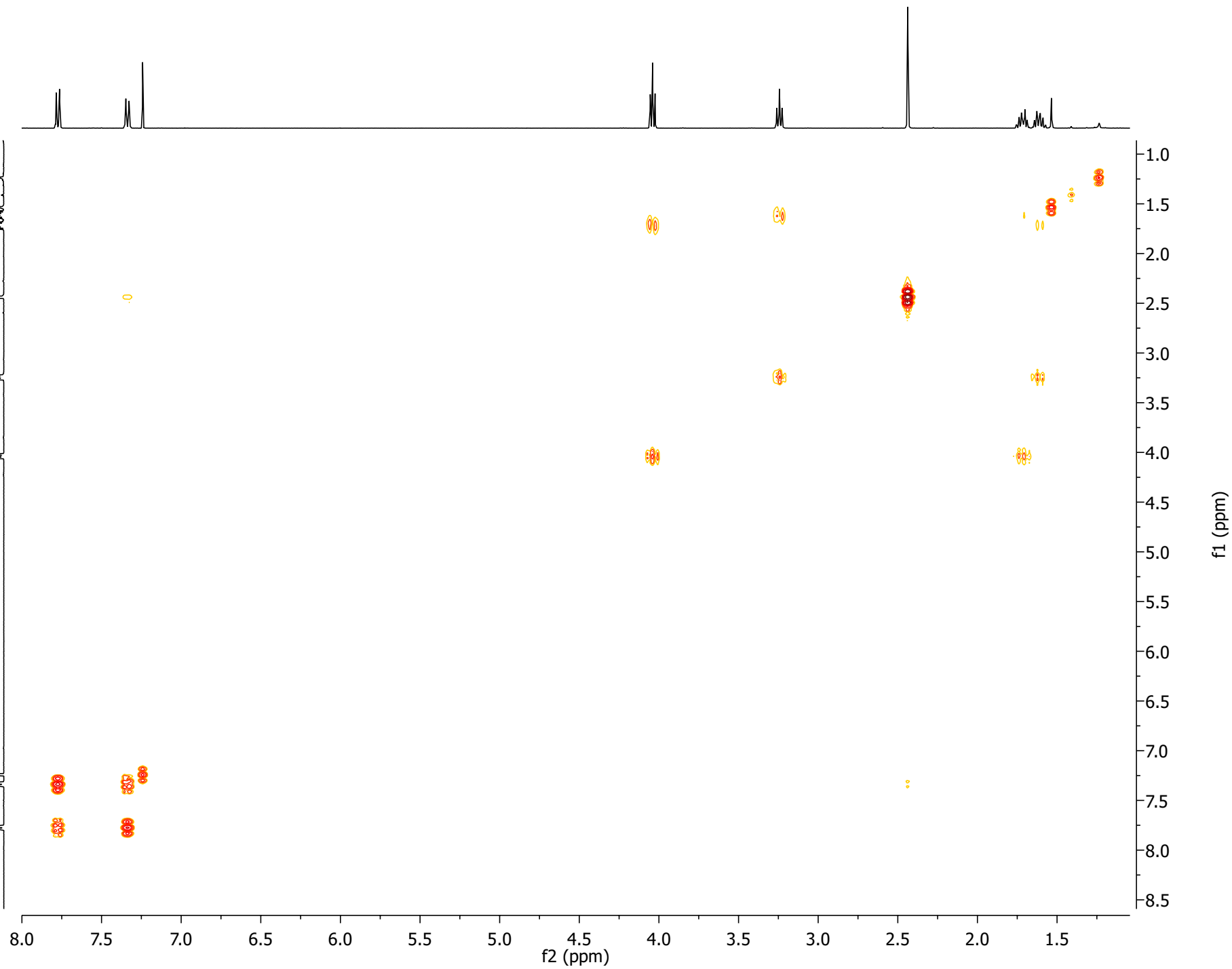
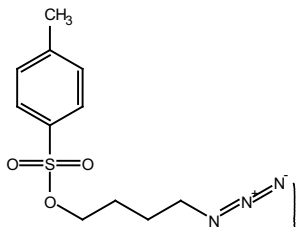
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 12b**



**$^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 101 MHz) of 12b**

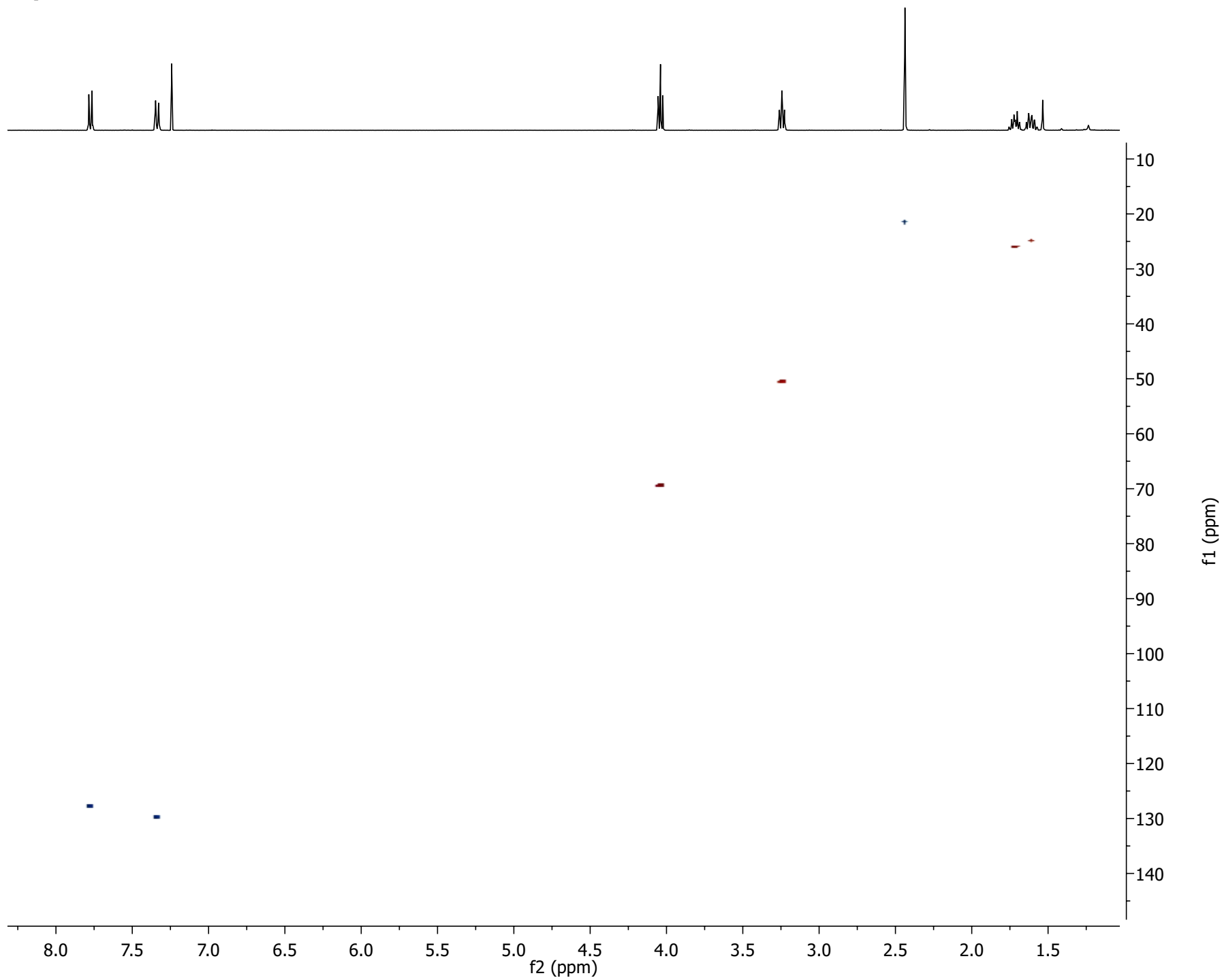
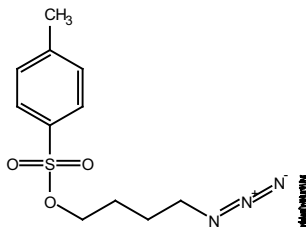


gCOSY (CDCl<sub>3</sub>, 400 MHz) of 12b

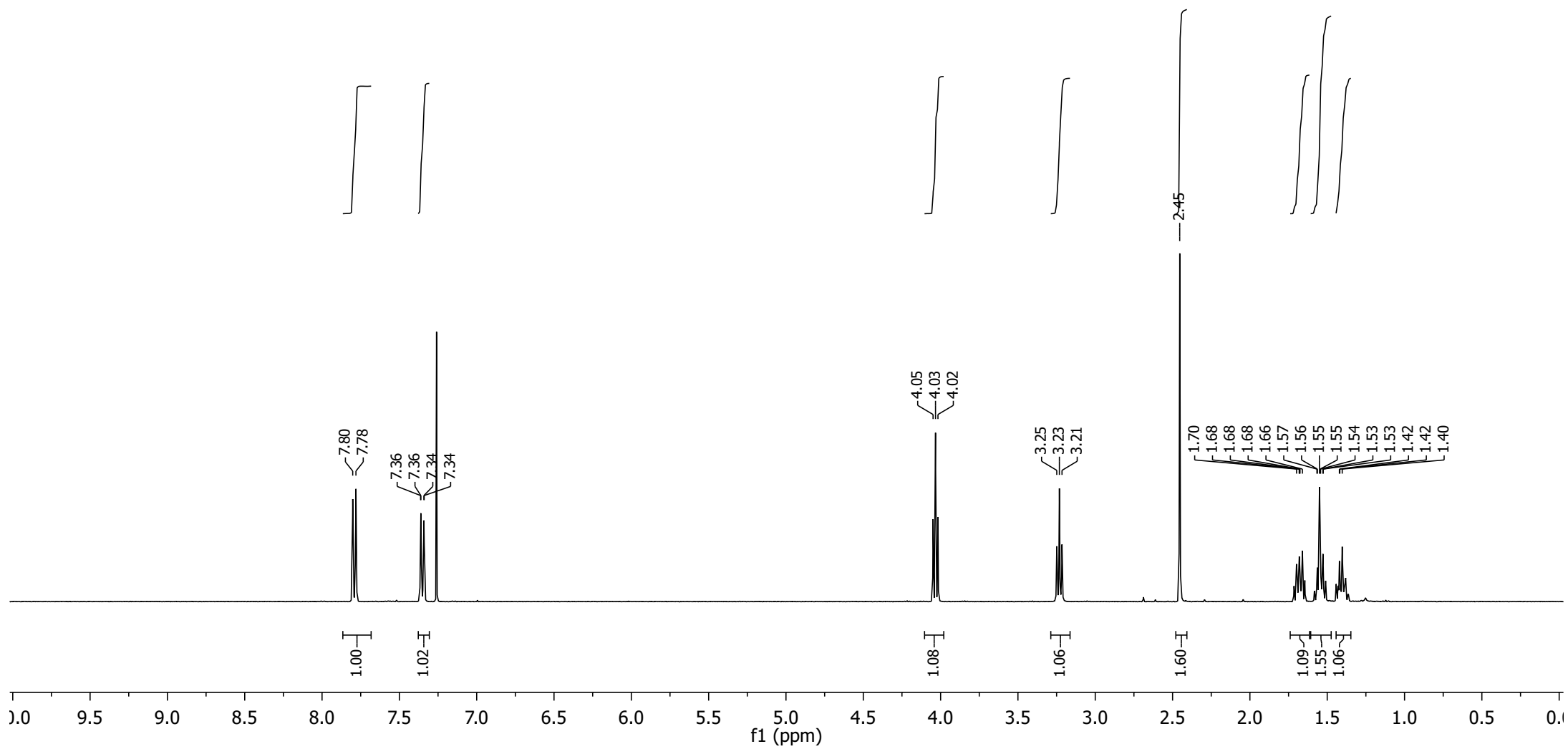
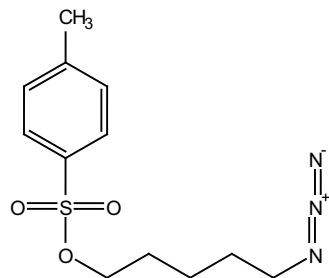




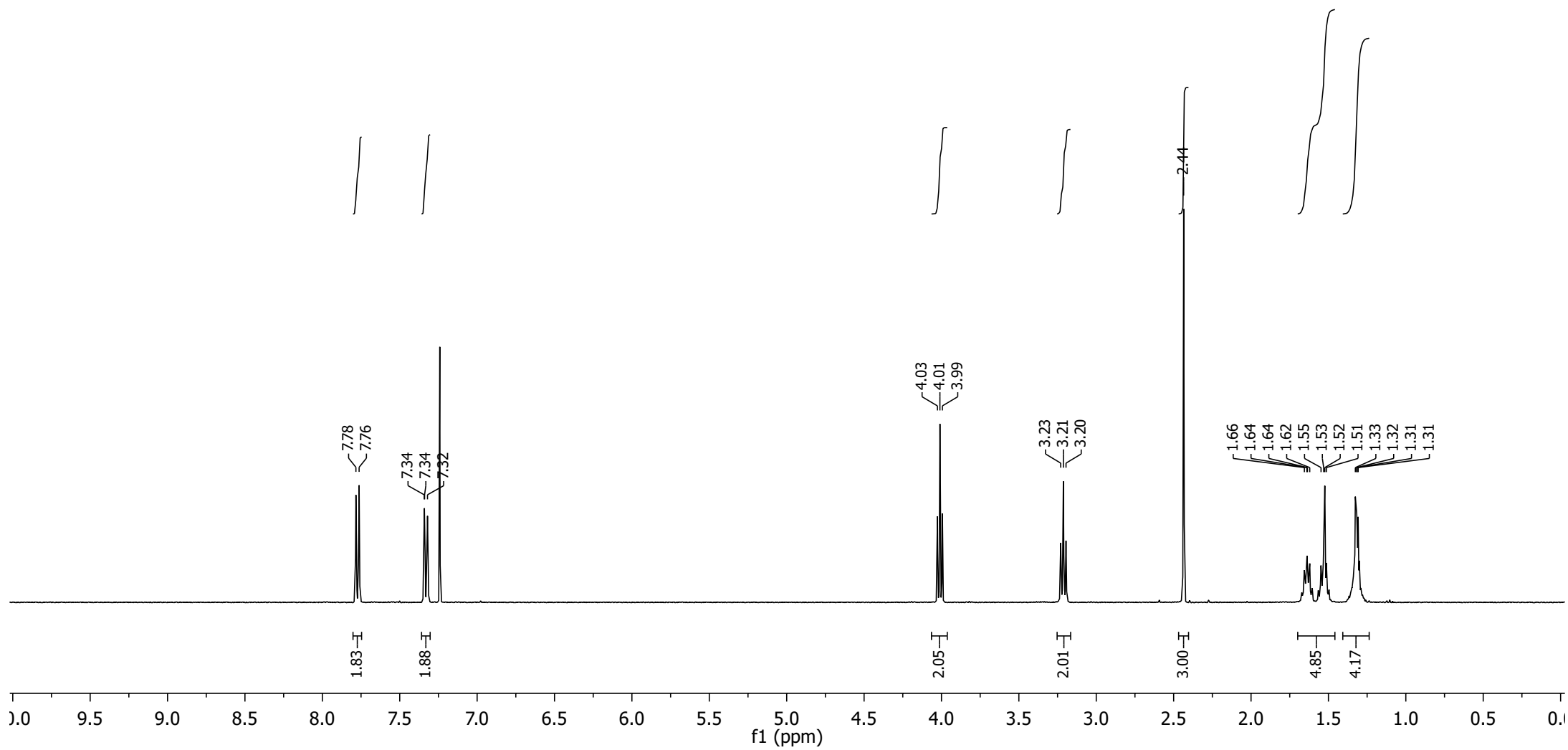
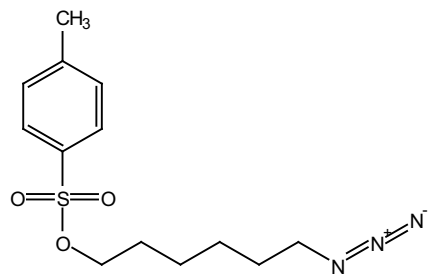
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 12b



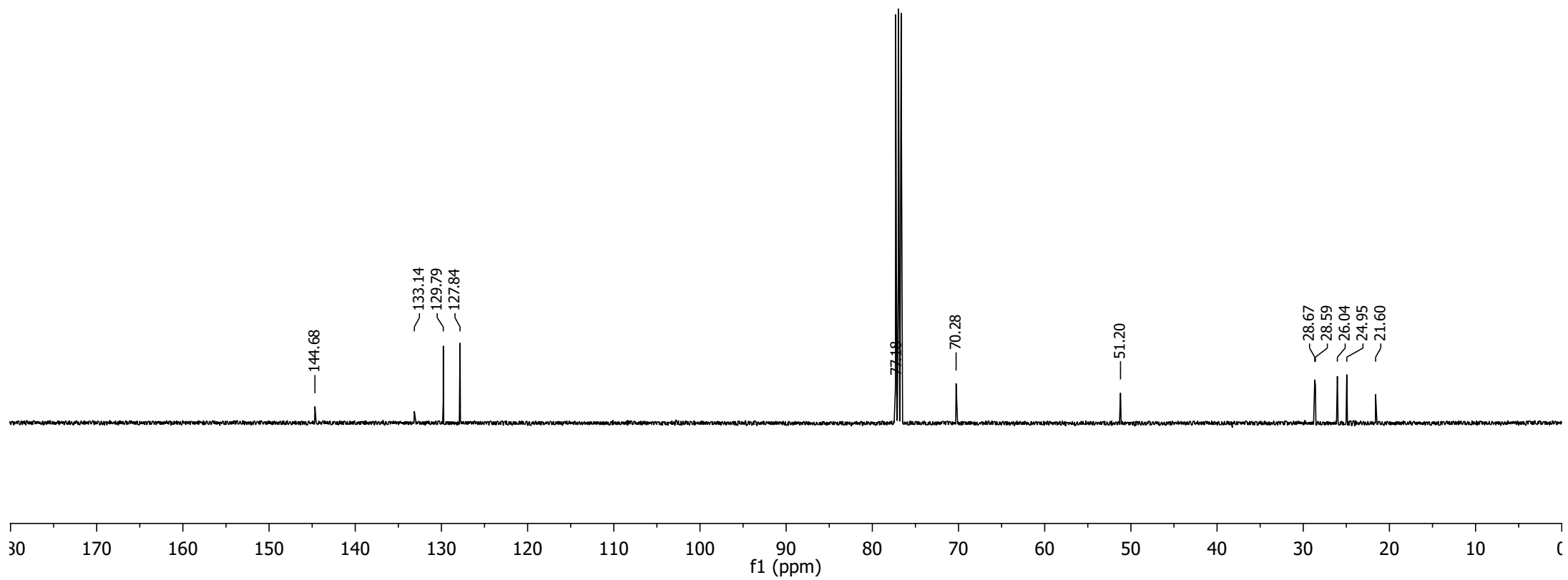
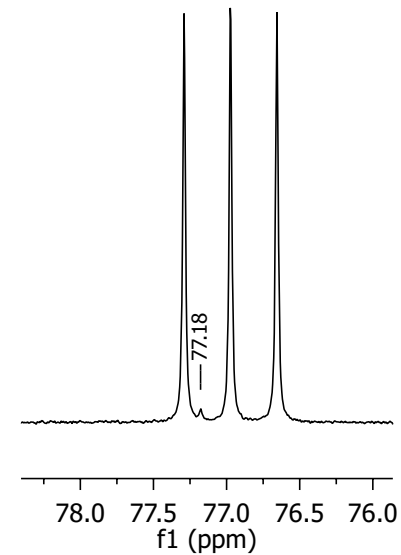
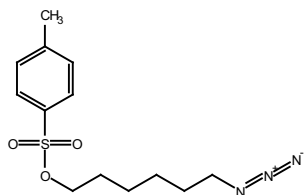
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 12c



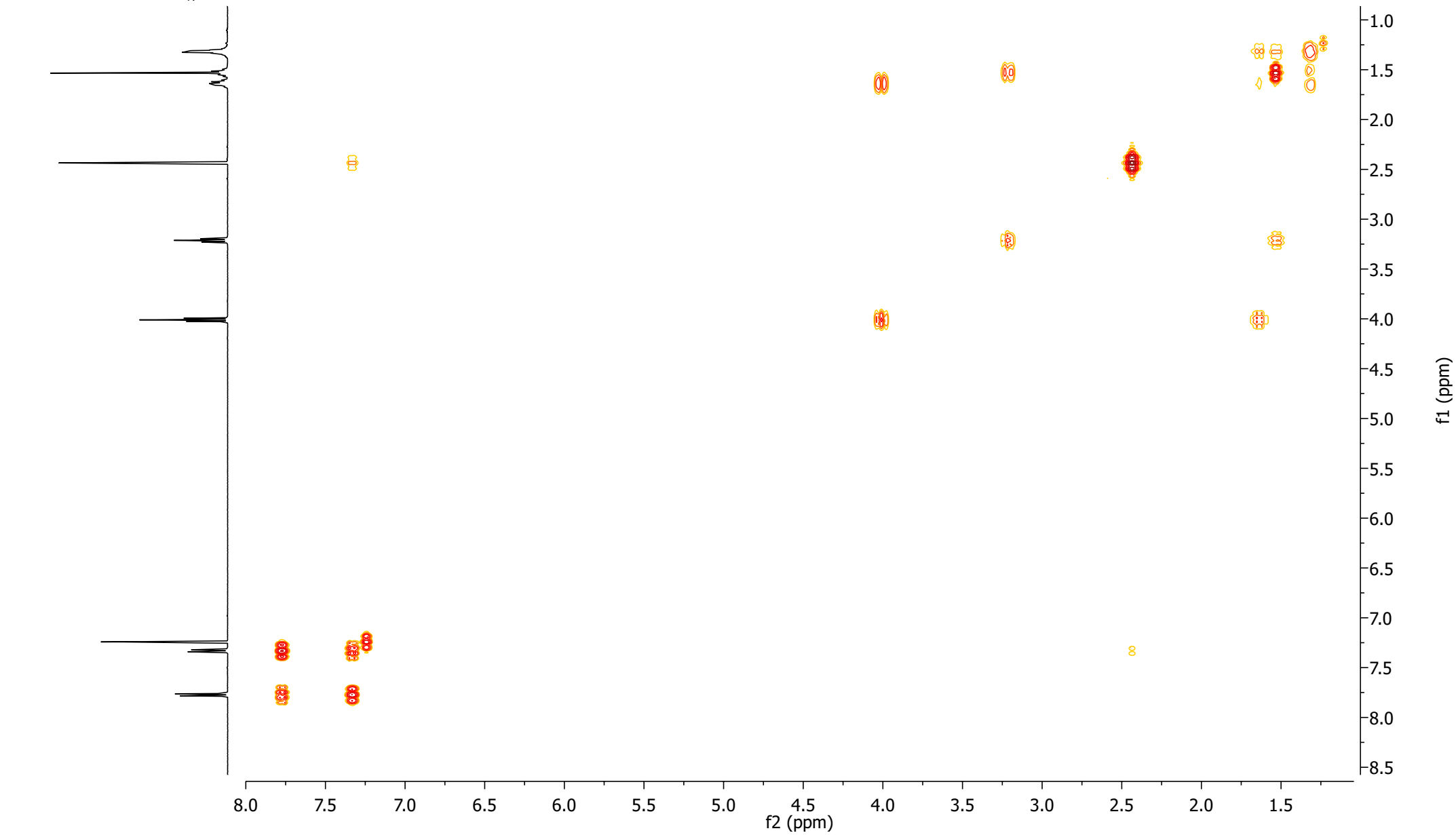
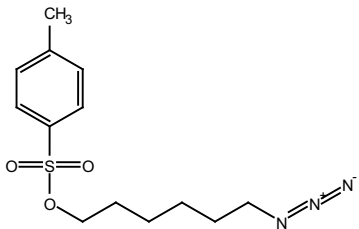
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 12d**



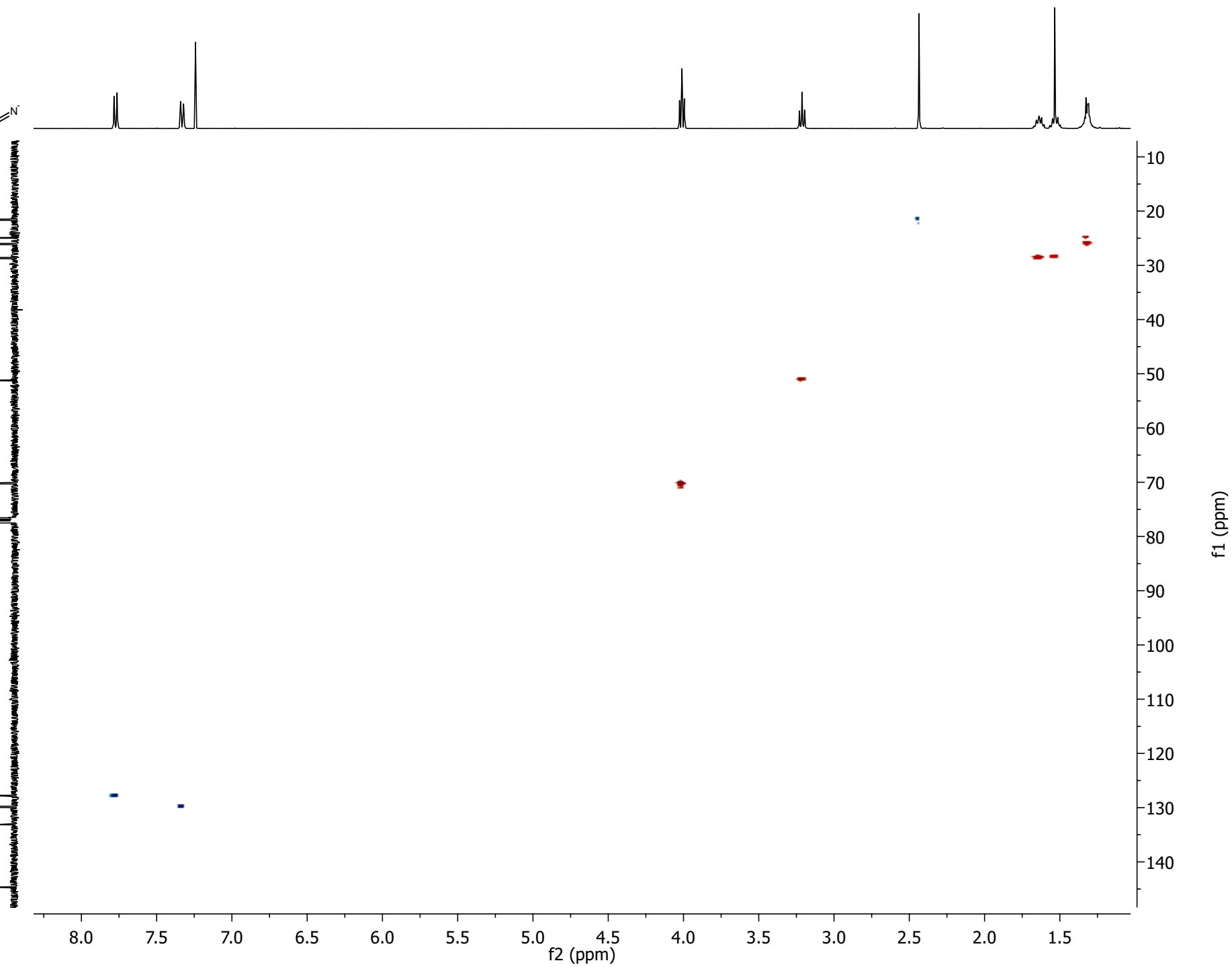
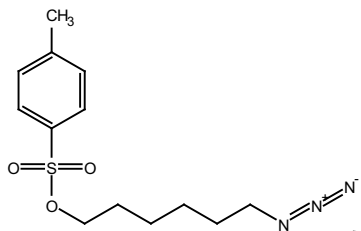
**$^{13}\text{C}$  NMR (CDCl<sub>3</sub>, 101 MHz) of 12d**



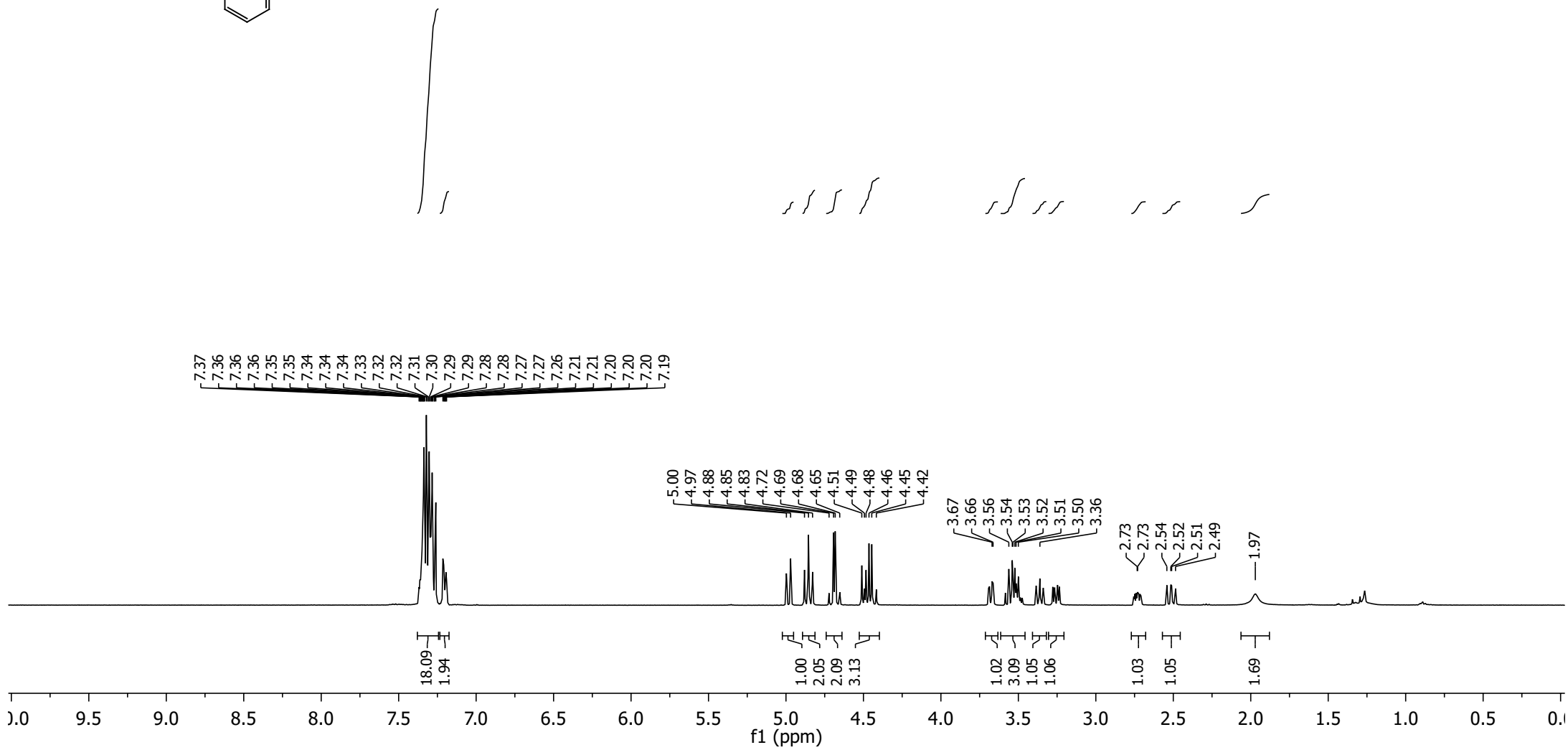
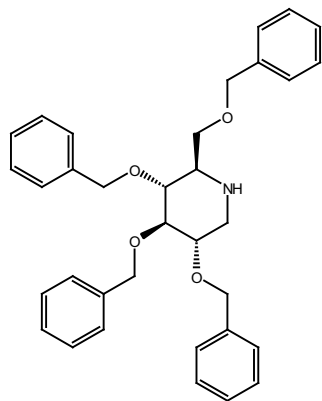
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 12d



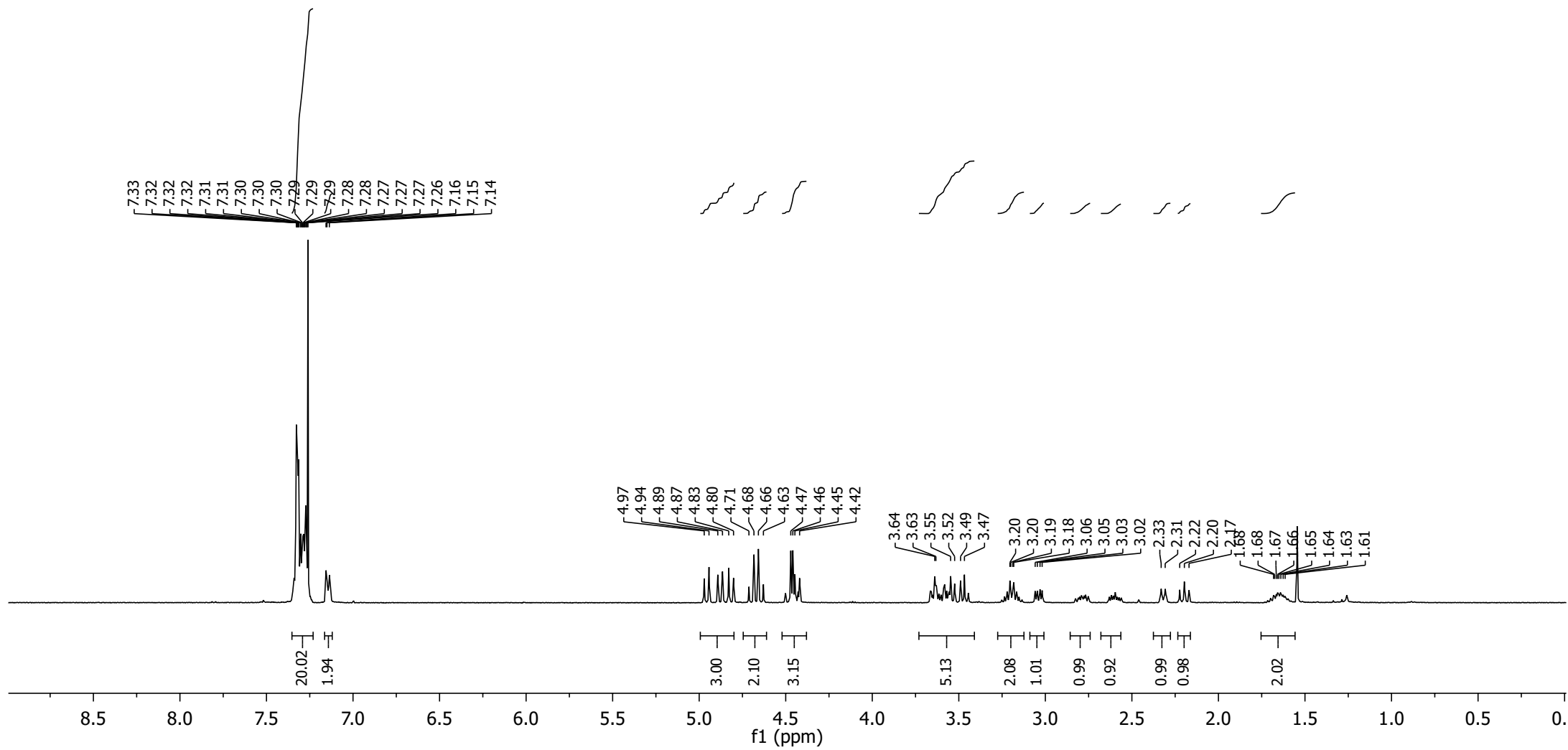
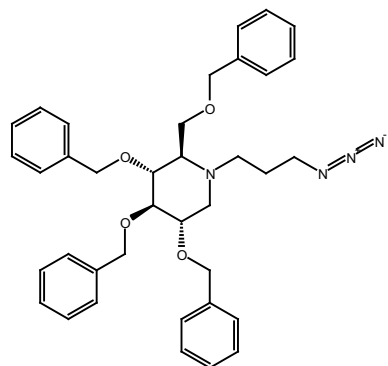
**gHSQC (CDCl<sub>3</sub>, 400 MHz) of 12d**



**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 13 (free base)**

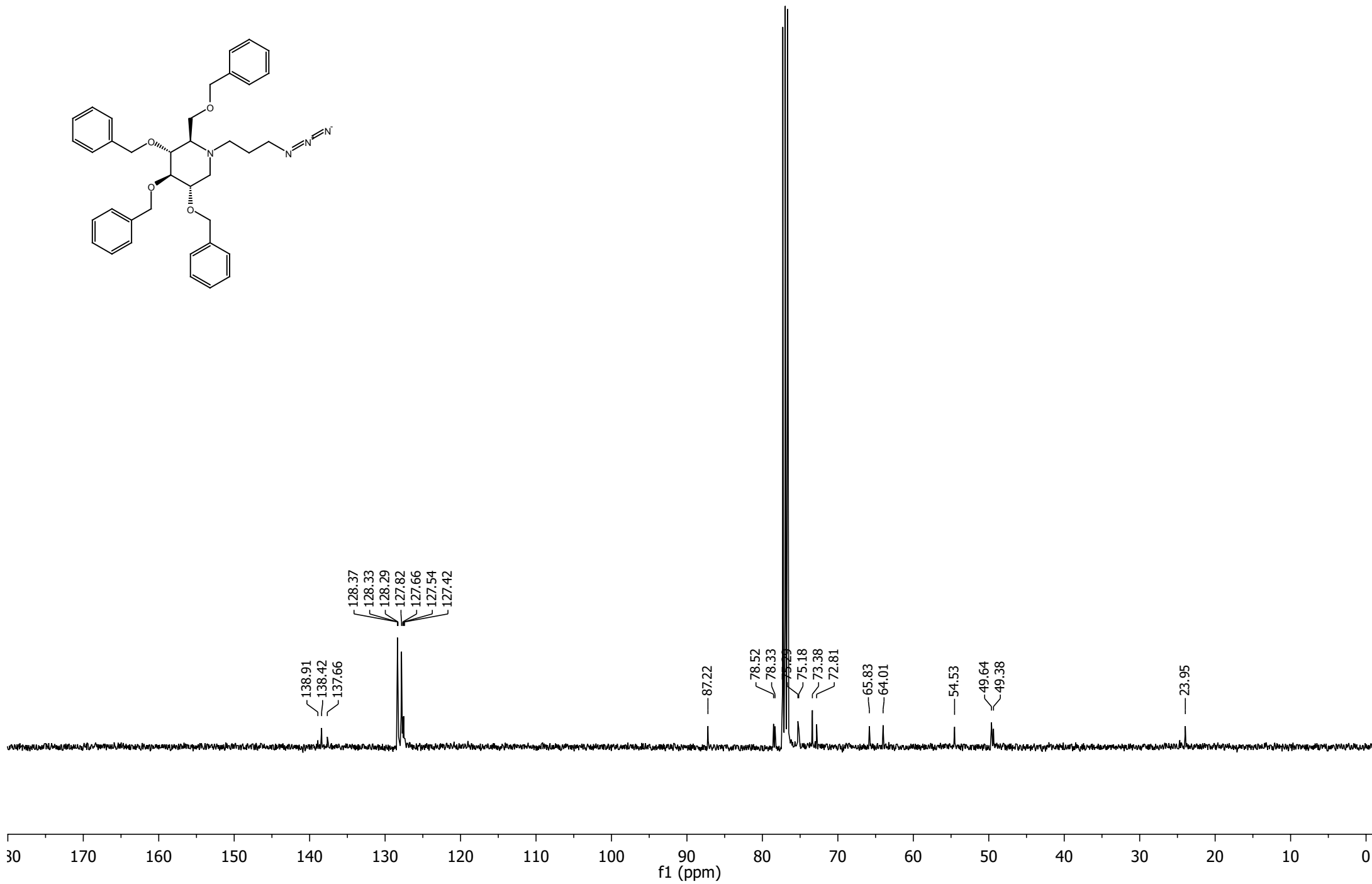
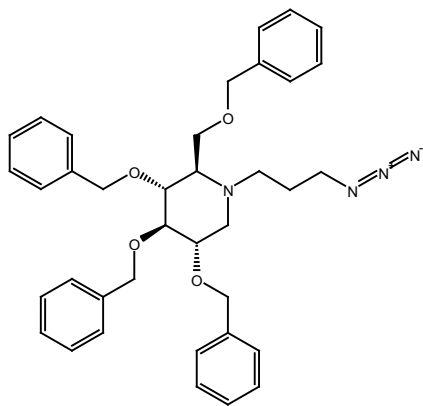


**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 14a**

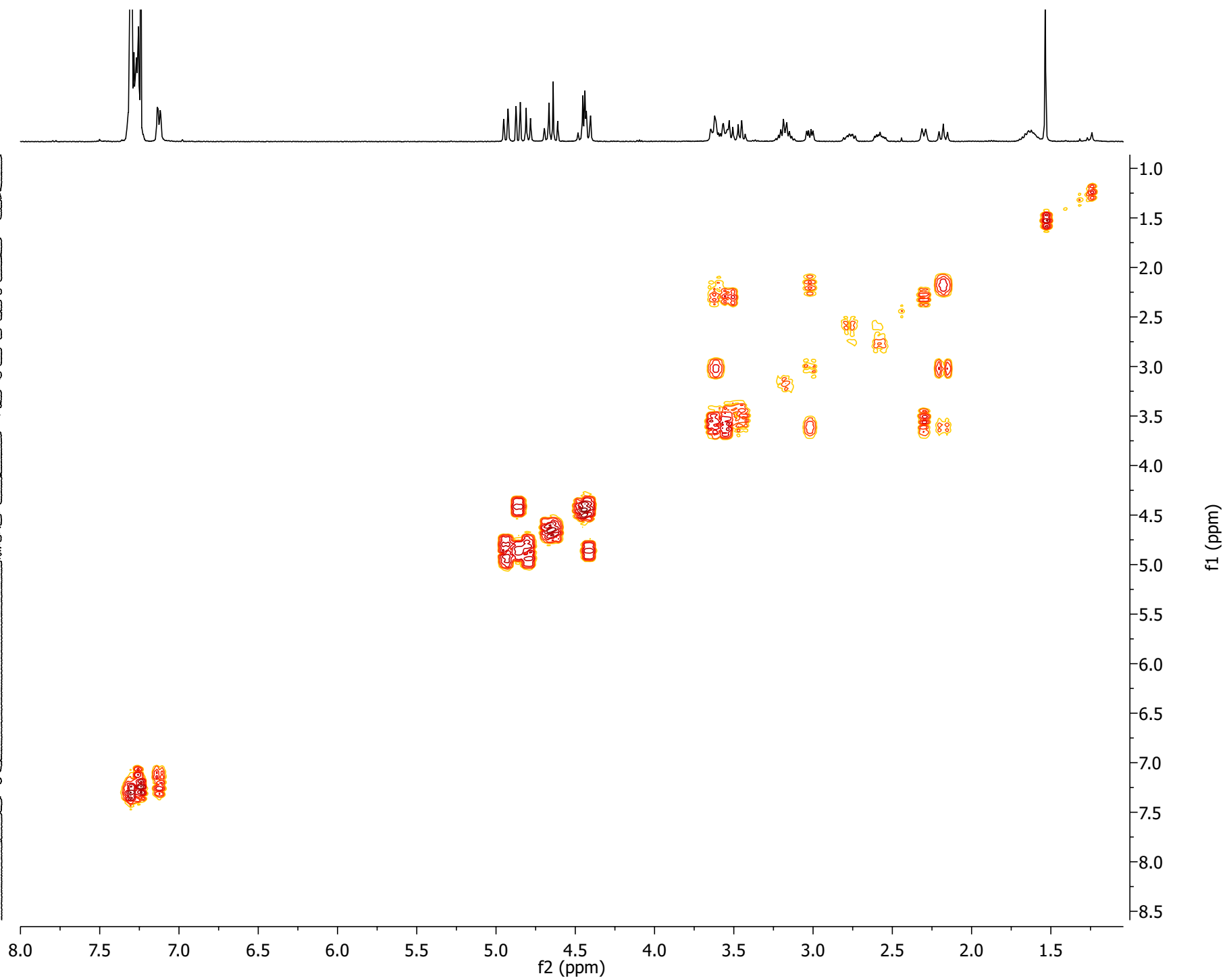
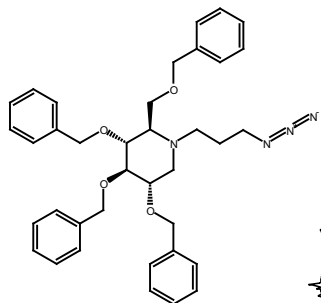




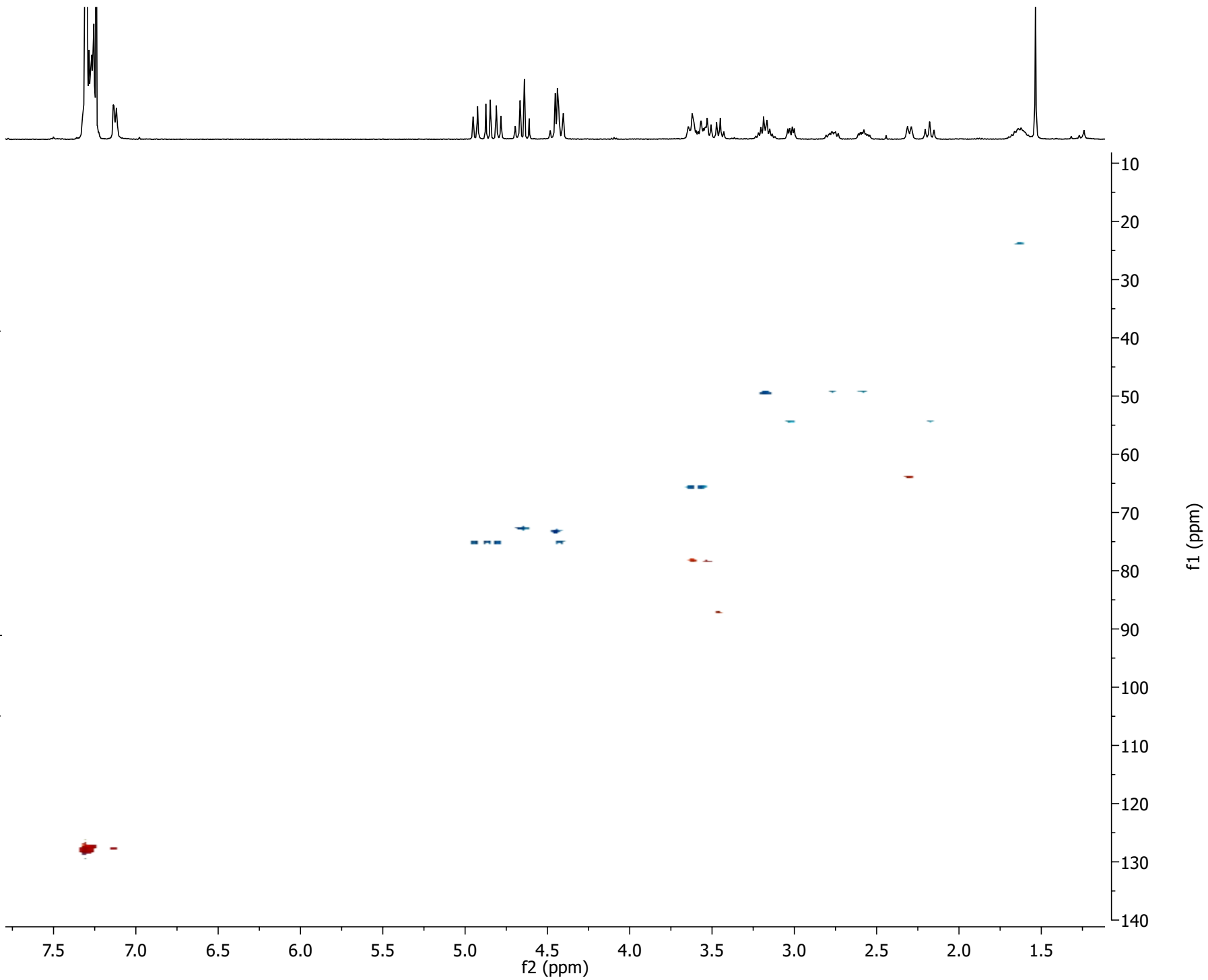
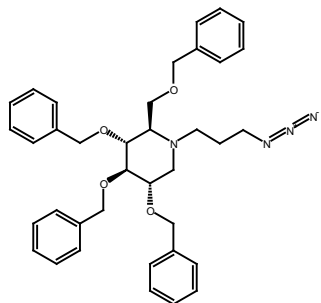
**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 14a**



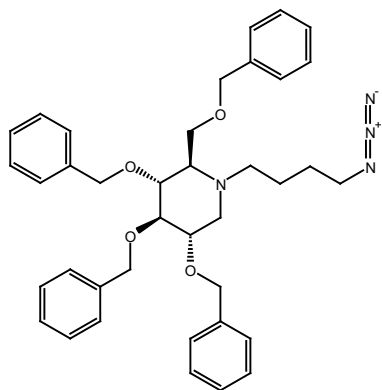
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 14a



gHSQC (CDCl<sub>3</sub>, 400 MHz) of 14a



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 14b



7.34  
7.34  
7.33  
7.32  
7.31  
7.31  
7.30  
7.29  
7.28  
7.28  
7.27  
7.27  
7.26  
7.26  
7.25  
7.24  
7.16  
7.15  
7.14  
7.14

4.97  
4.94  
4.89  
4.87  
4.83  
4.80  
4.71  
4.68  
4.66  
4.63  
4.50  
4.47  
4.45  
4.44  
4.42  
4.41

3.67  
3.65  
3.64  
3.63  
3.57  
3.54  
3.49  
3.47  
3.44

3.18  
3.18  
3.16

2.70  
2.67  
2.55  
2.31  
2.23  
2.20

1.50  
1.49  
1.48  
1.48  
1.46  
1.44  
1.44  
1.43  
1.42  
1.42  
1.41  
1.40  
1.39  
1.38

17.04  
2.00

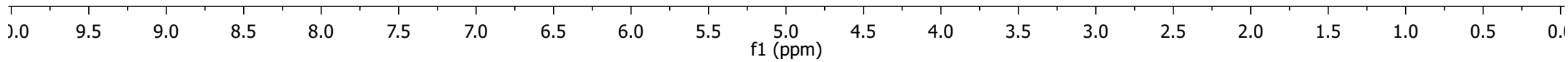
3.36  
2.38  
3.10

3.84  
1.23

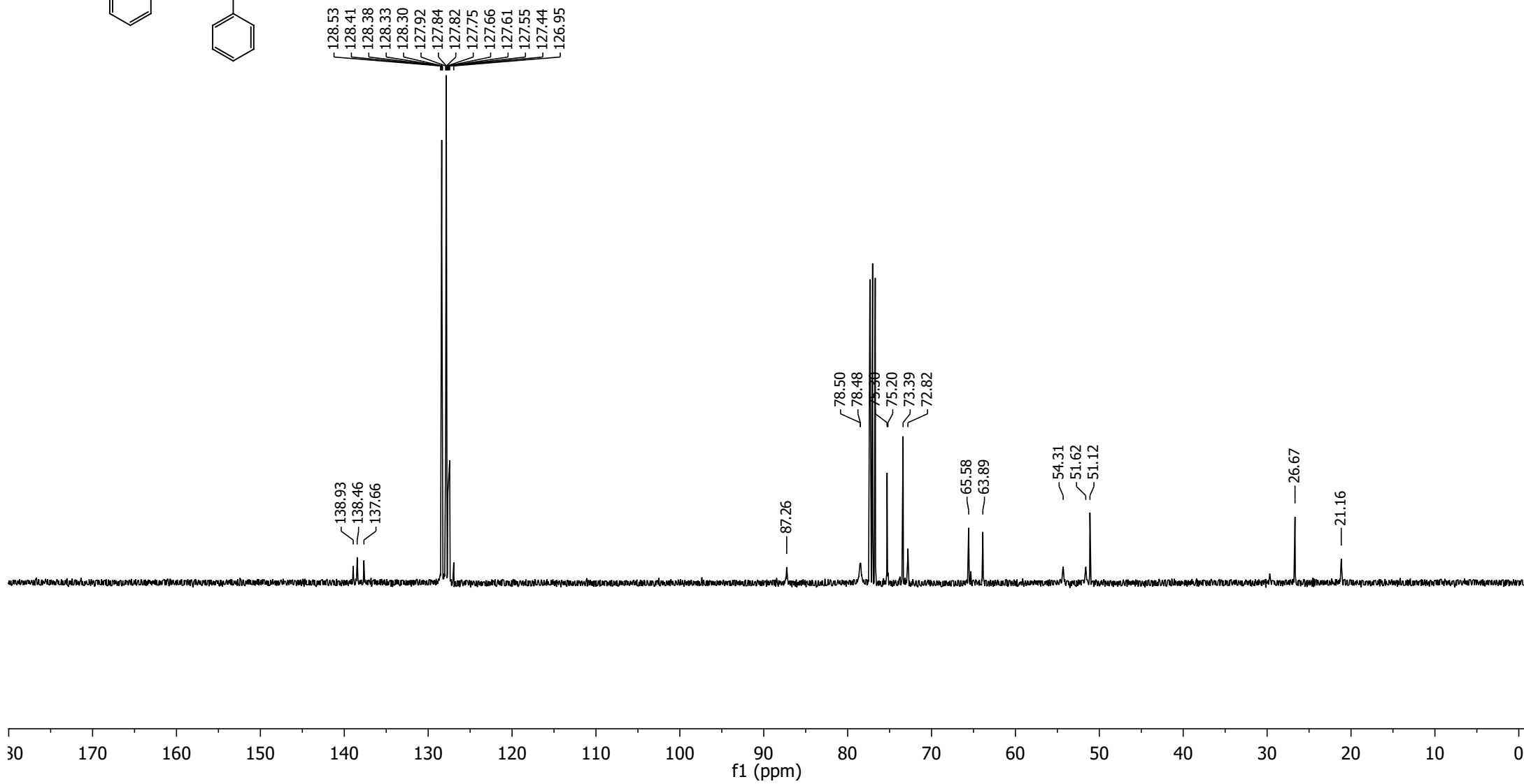
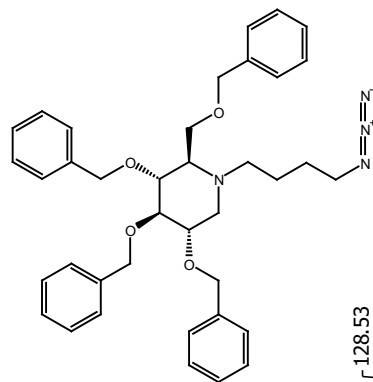
1.98  
1.04

1.26  
1.23  
1.10  
1.12

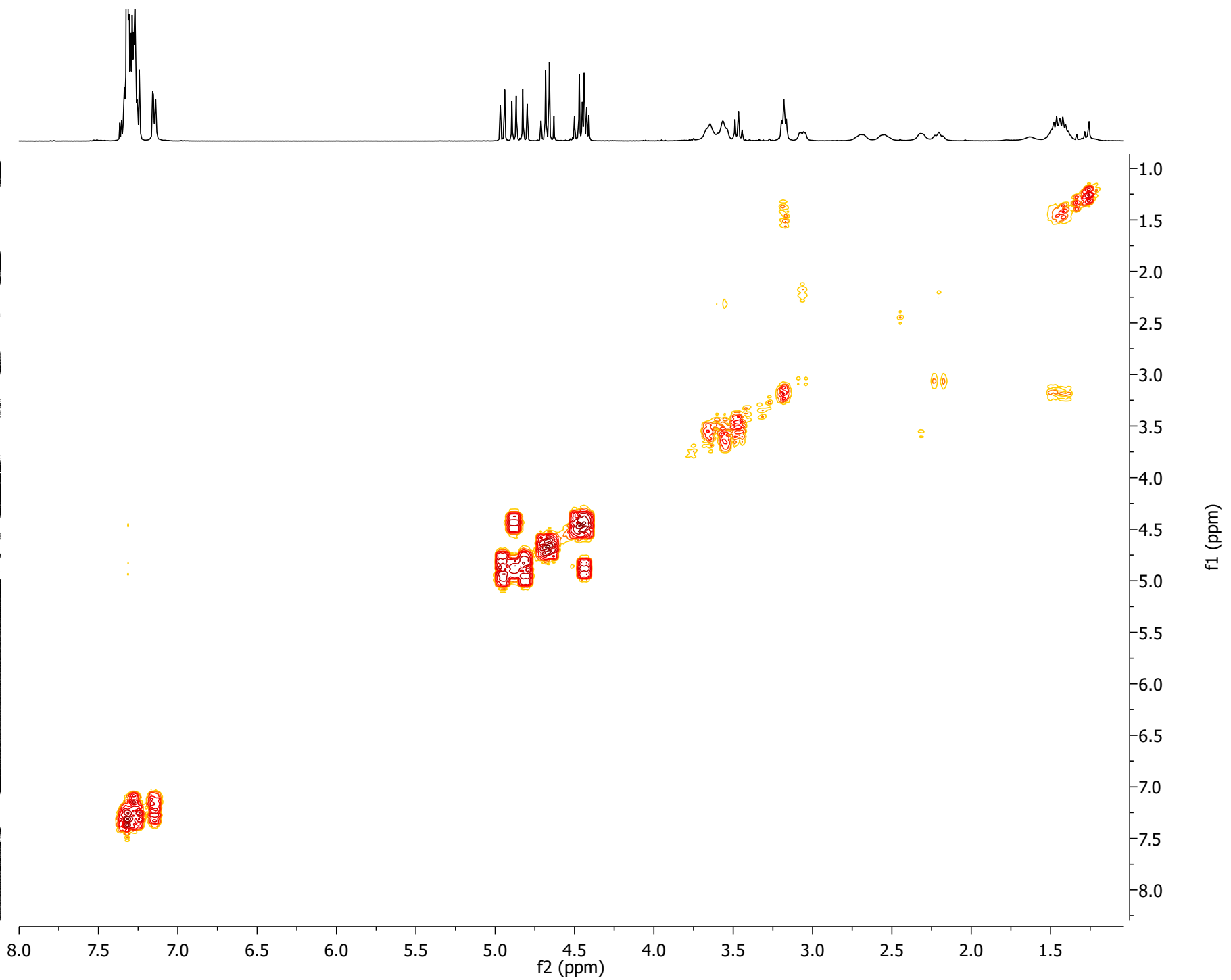
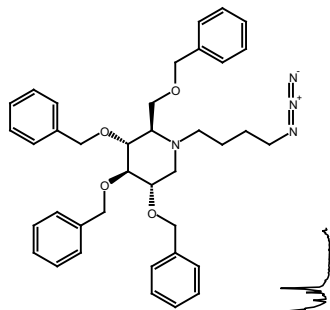
4.19



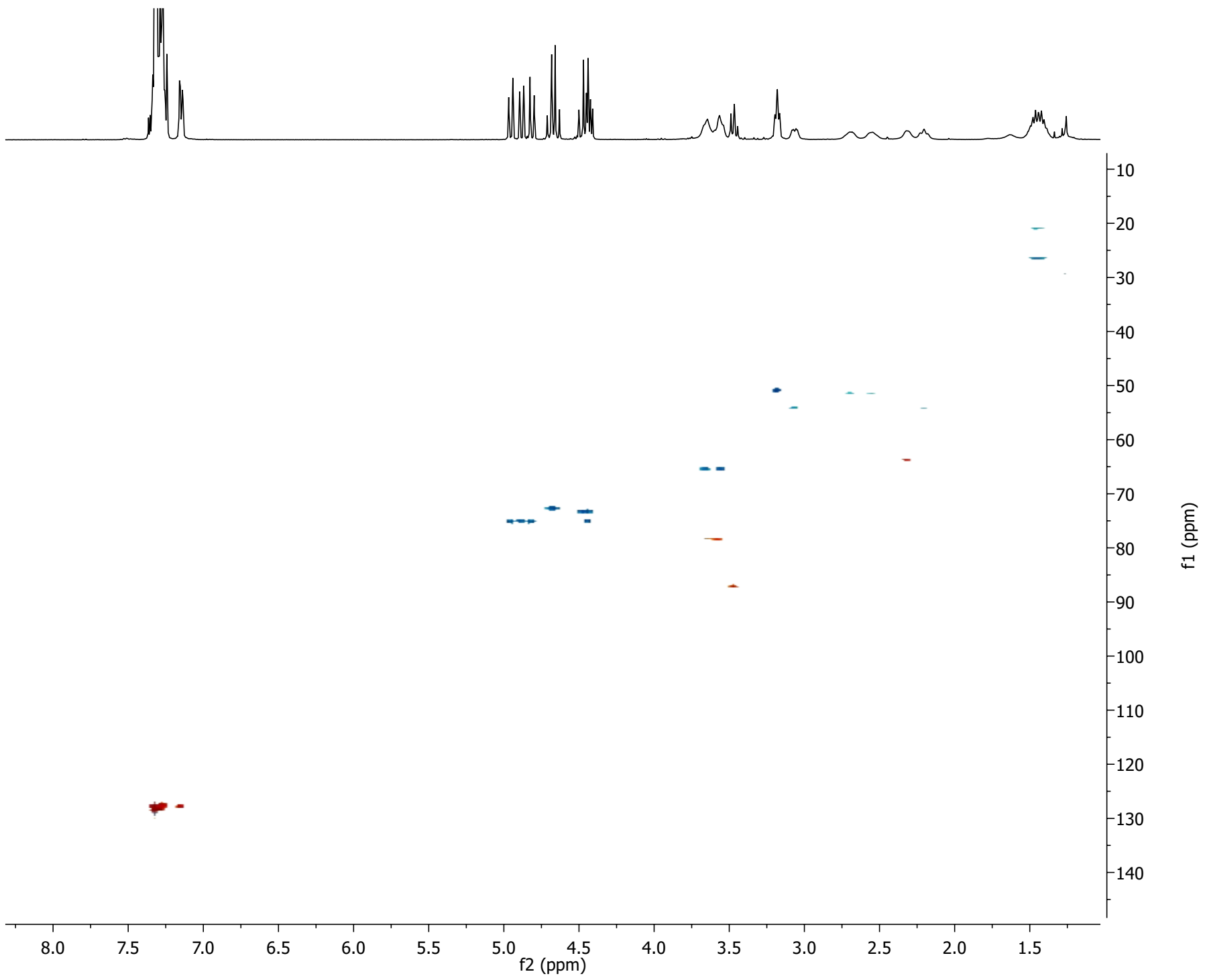
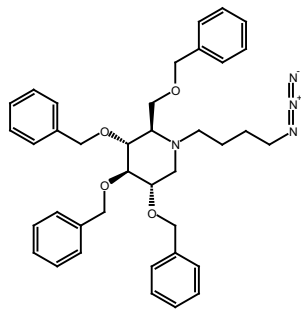
**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 14b**



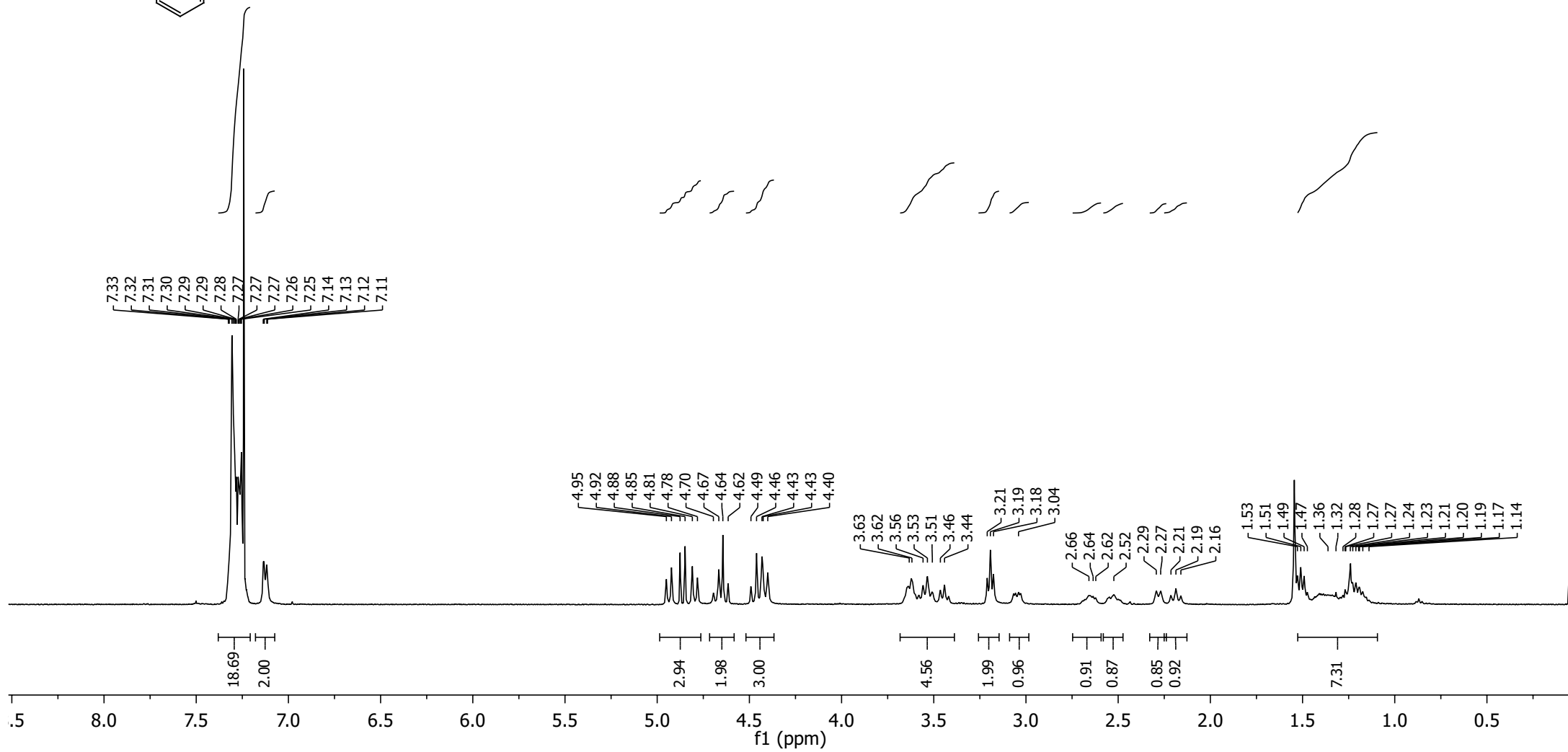
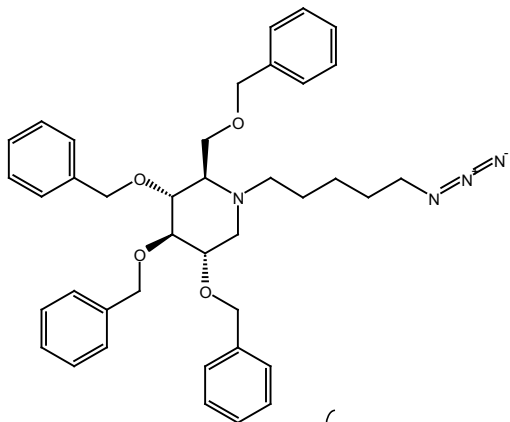
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 14b



gHSQC (CDCl<sub>3</sub>, 400 MHz) of 14b

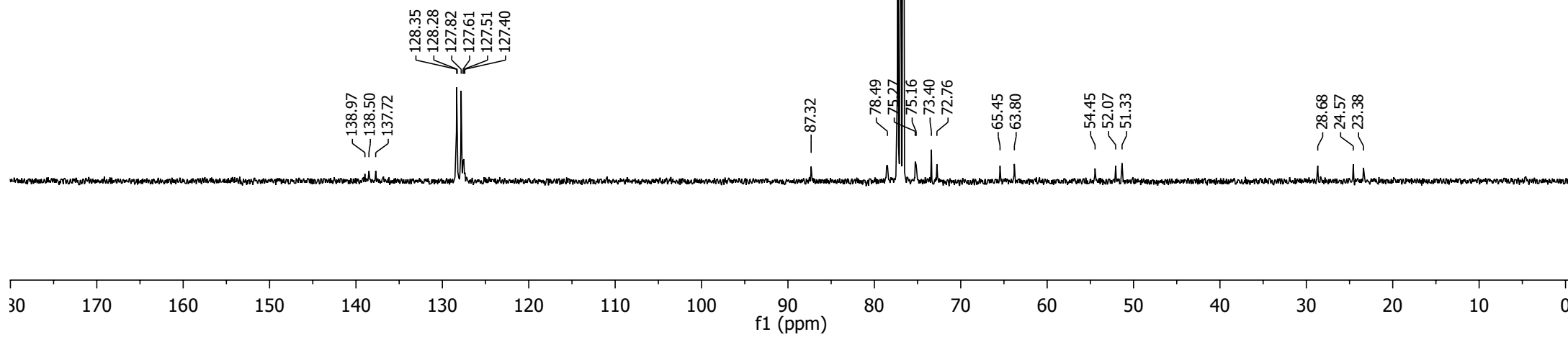
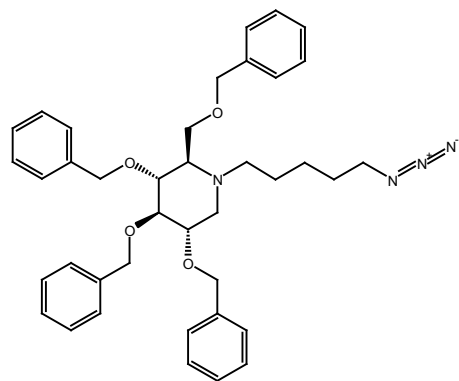


**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 14c**

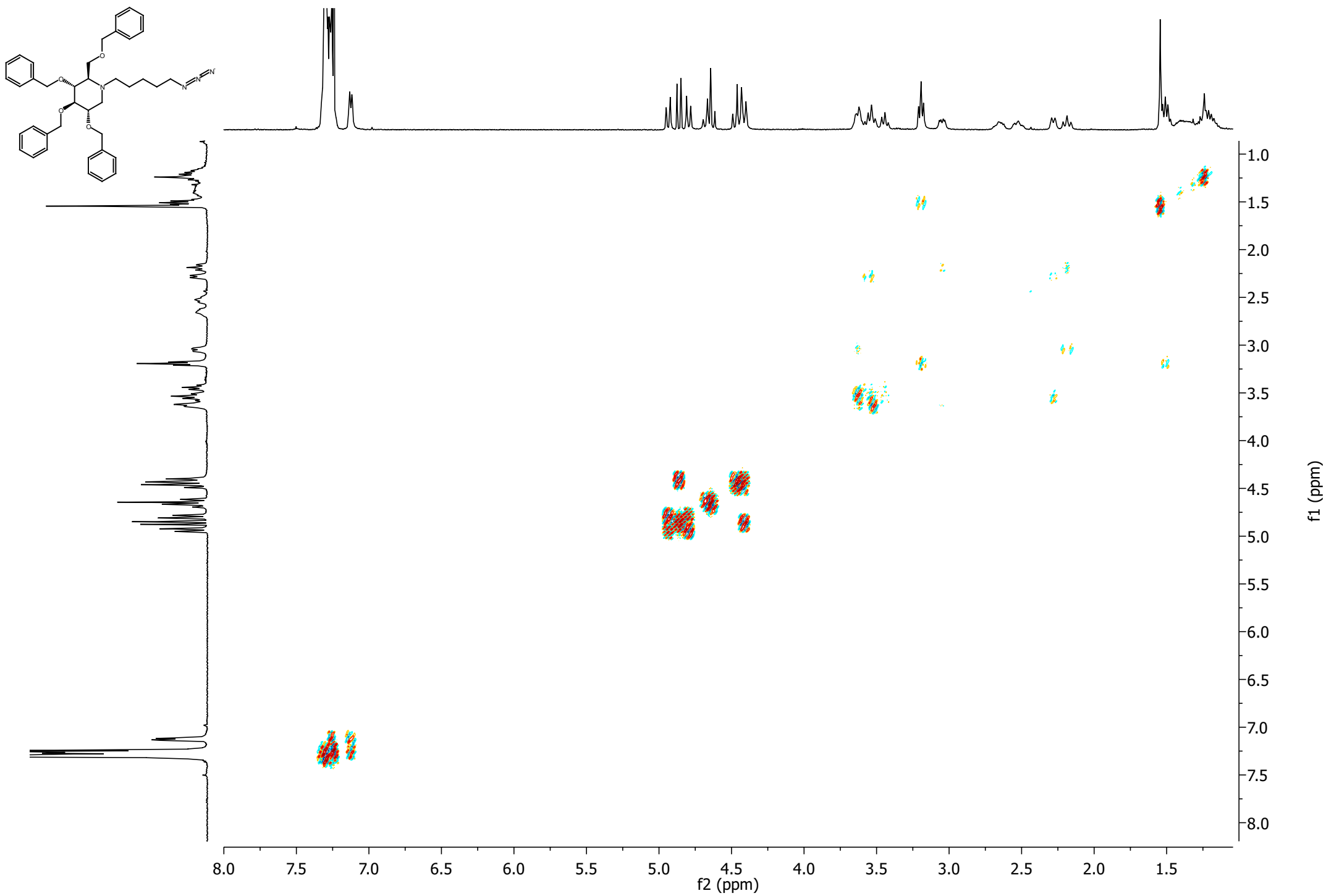
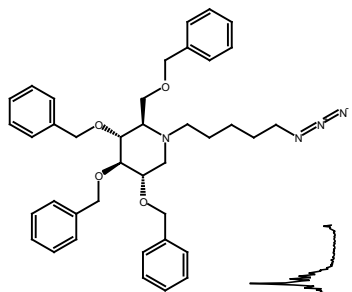




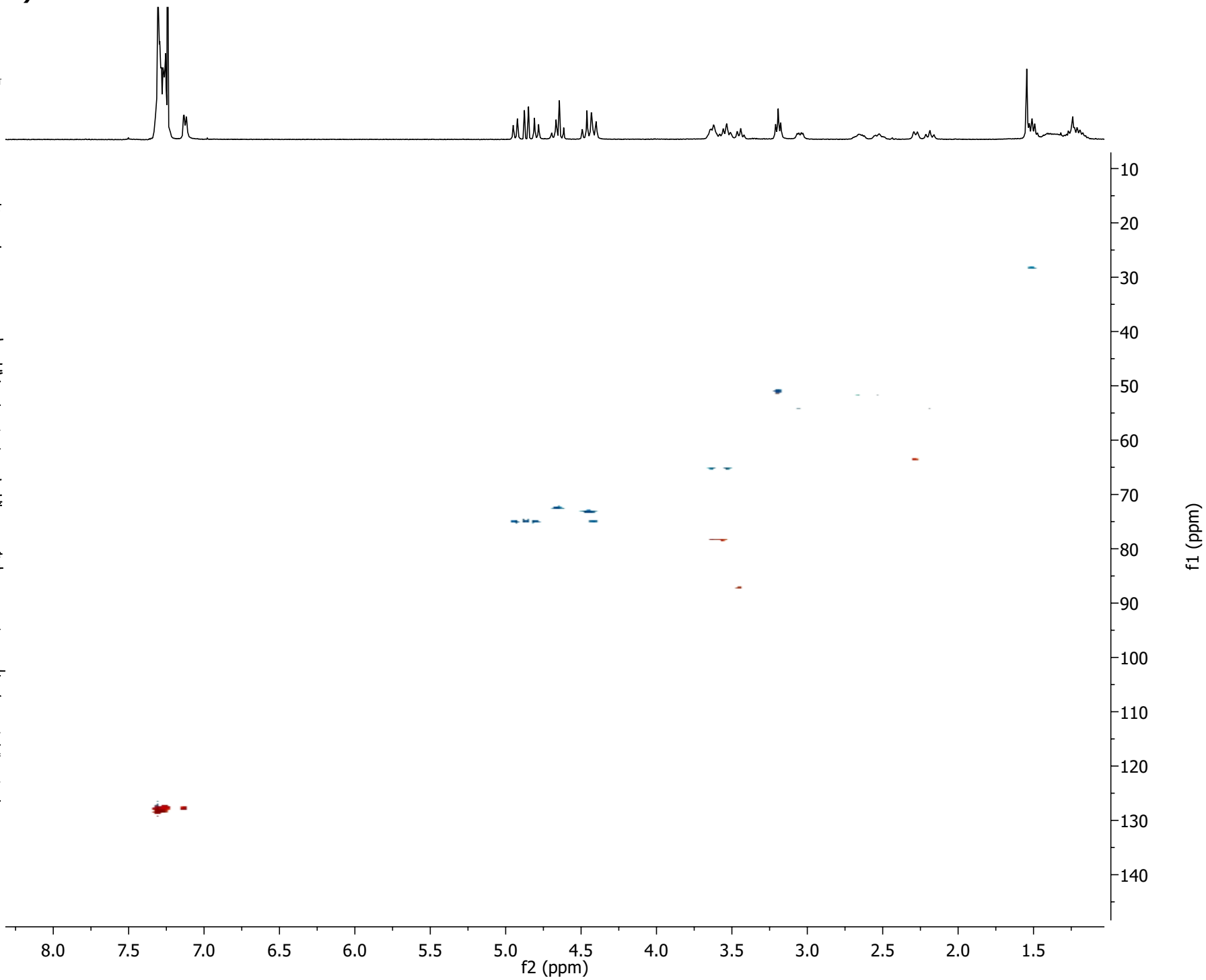
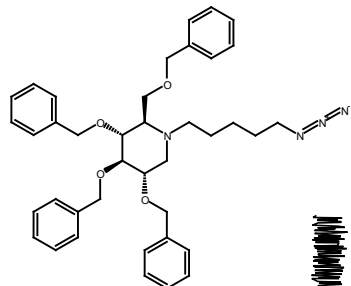
**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 14c**



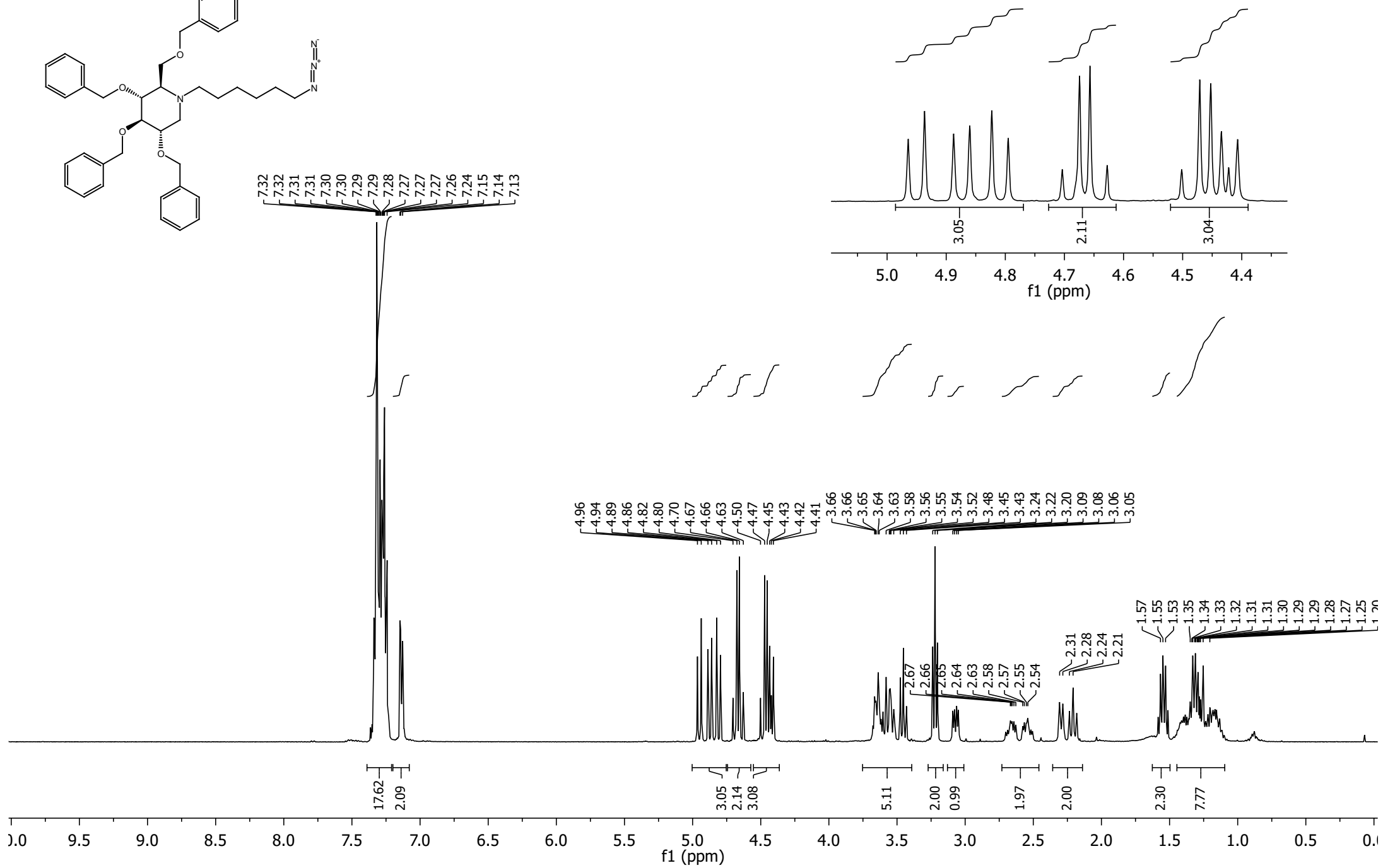
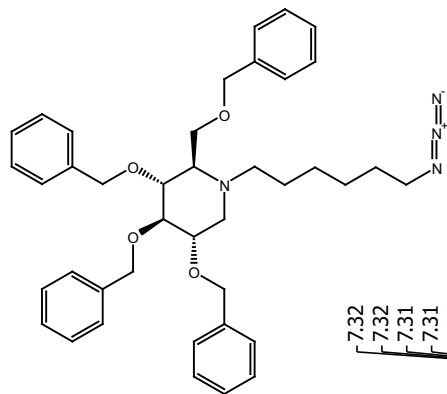
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 14c



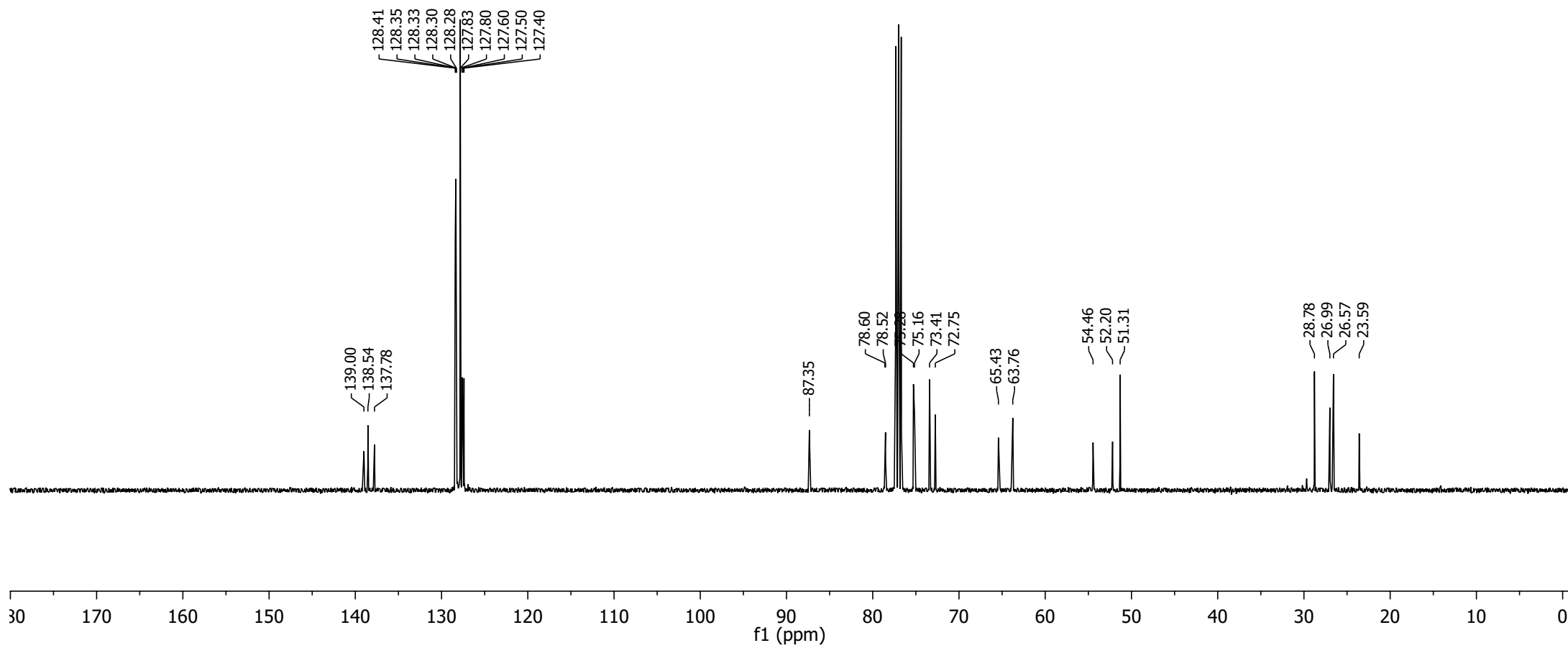
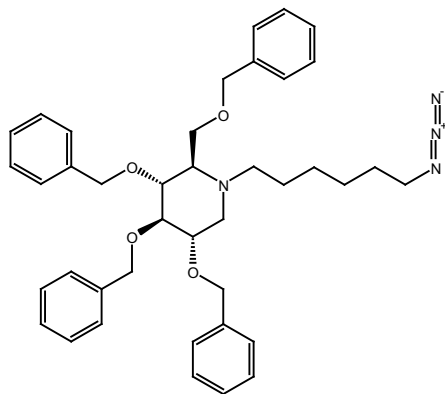
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 14c



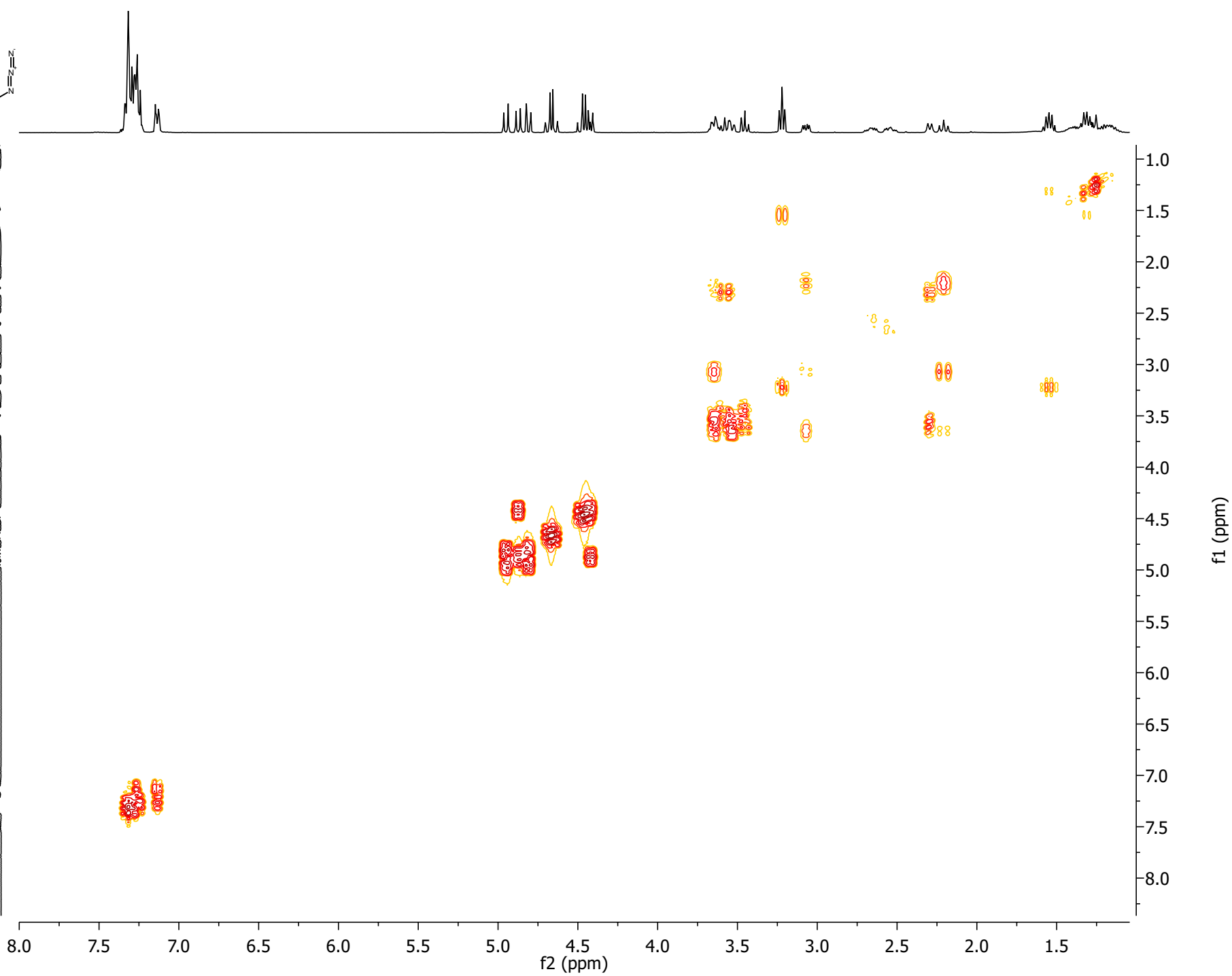
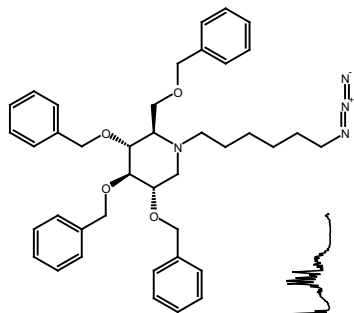
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 14d



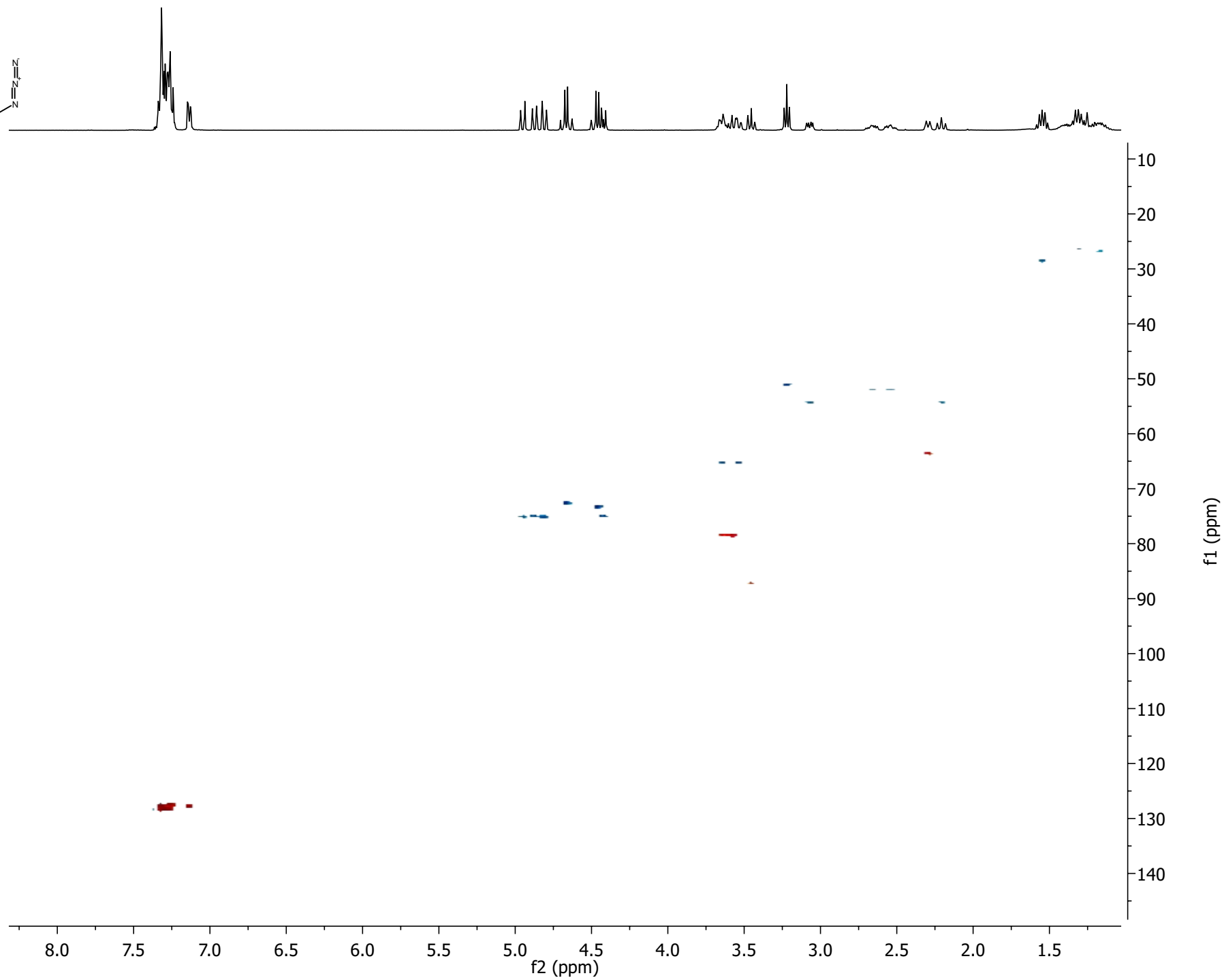
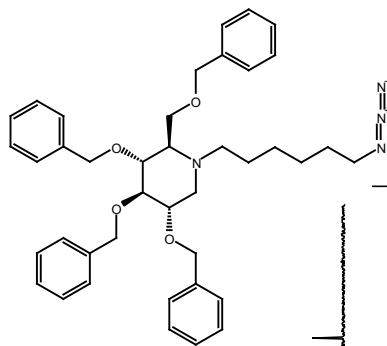
**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 14d**



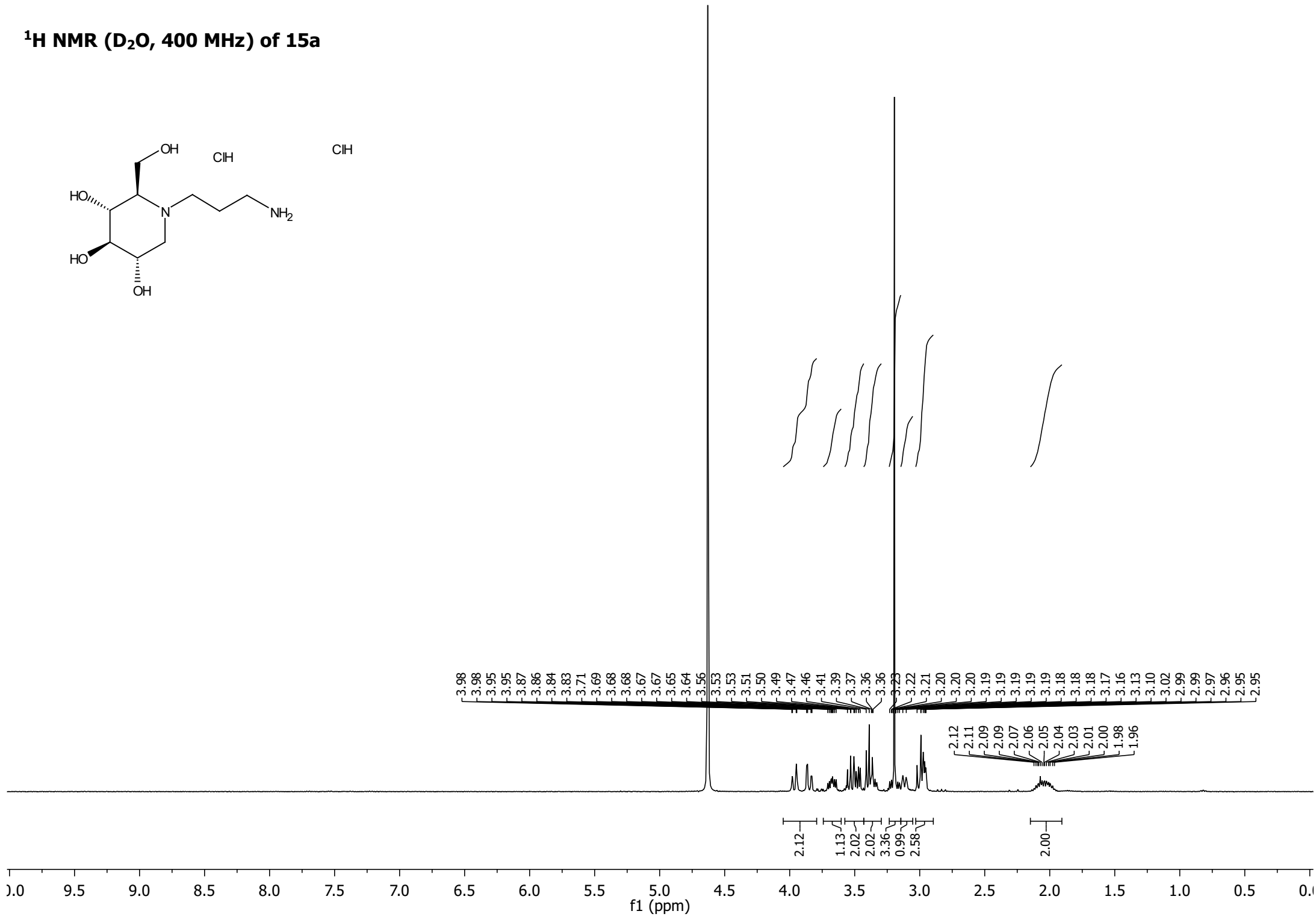
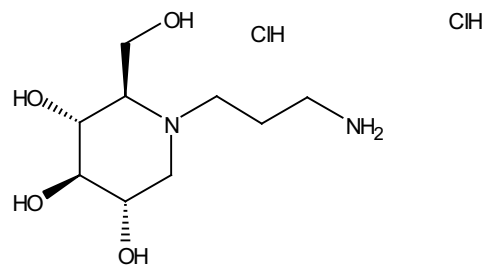
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 14d



gHSQC (CDCl<sub>3</sub>, 400 MHz) of 14d

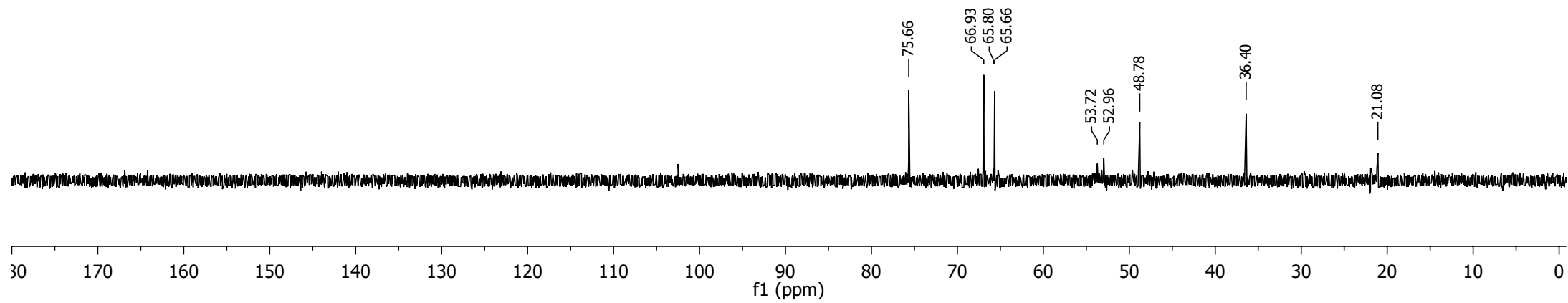
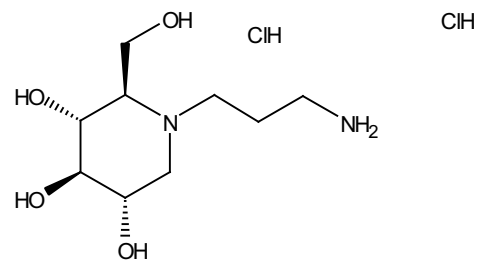


**<sup>1</sup>H NMR (D<sub>2</sub>O, 400 MHz) of 15a**

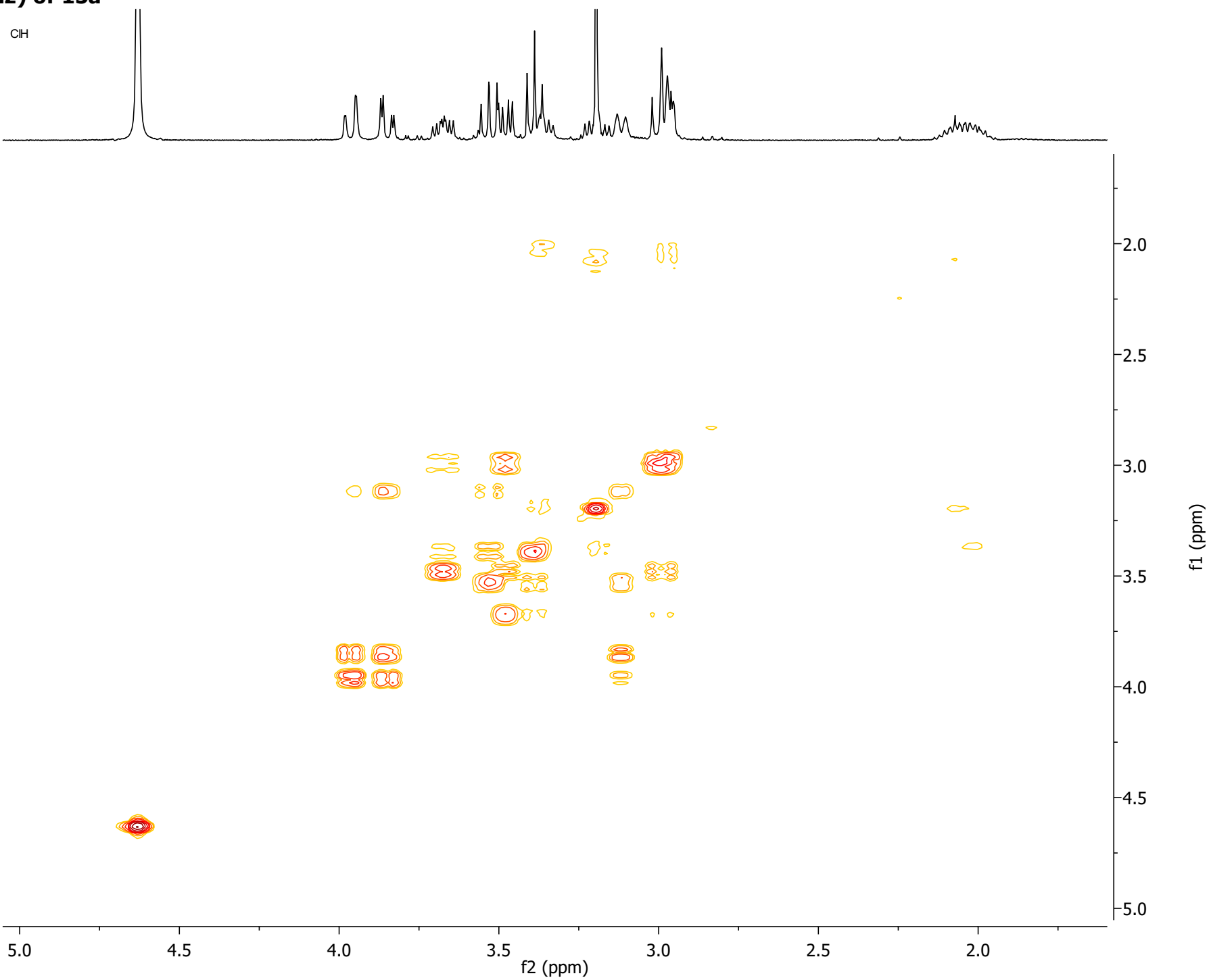
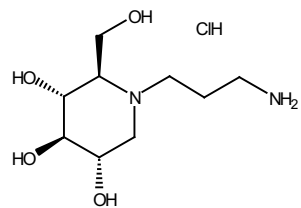




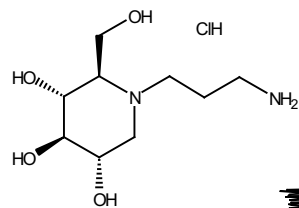
**$^{13}\text{C}$  NMR ( $\text{D}_2\text{O}$ , 400 MHz) of 15a**



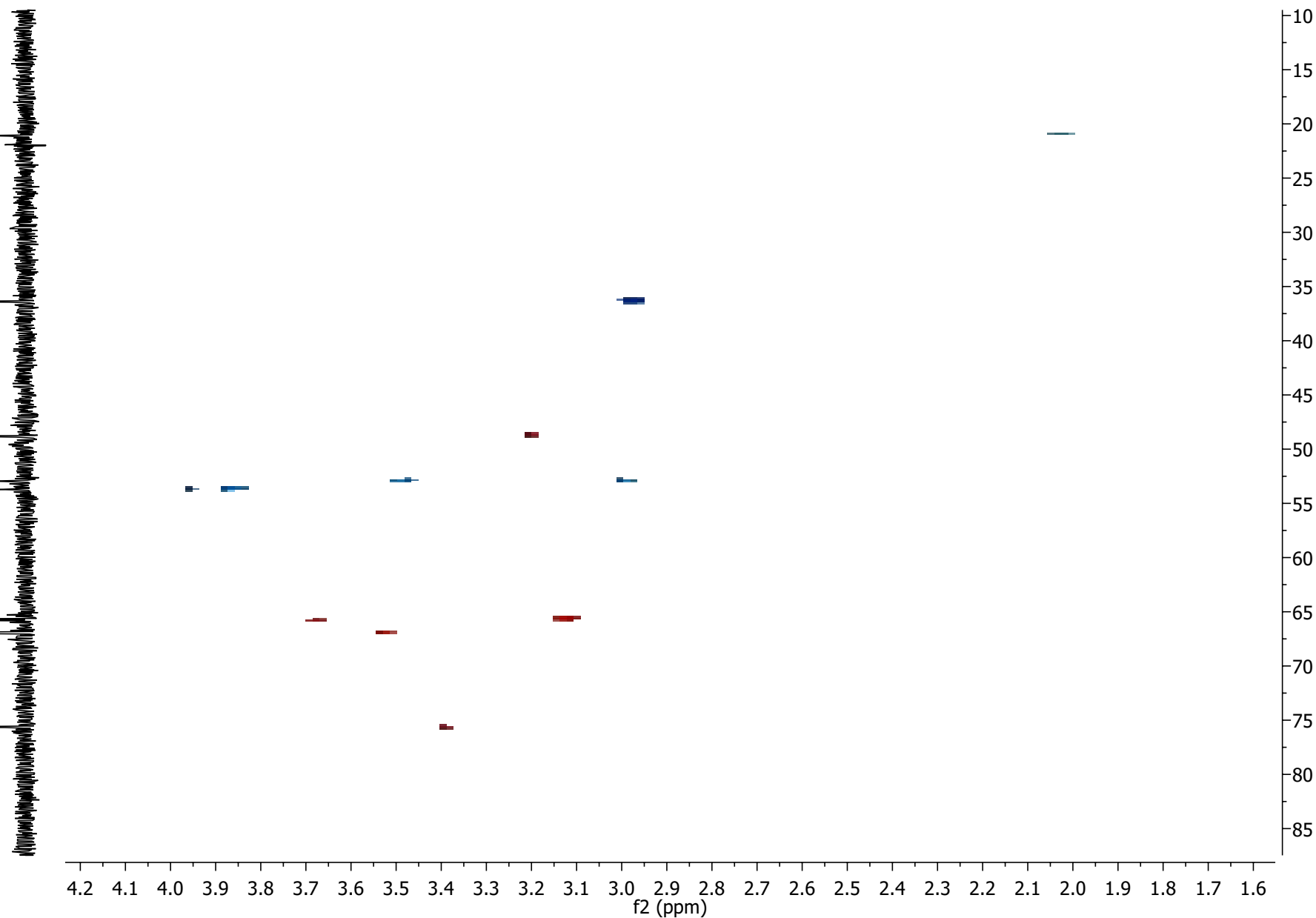
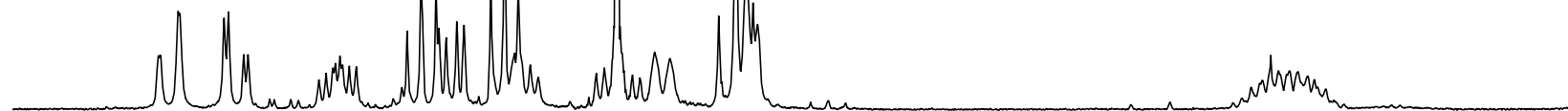
gCOSY (D<sub>2</sub>O, 400 MHz) of 15a



# gHSQC (D<sub>2</sub>O, 400 MHz) of 15a



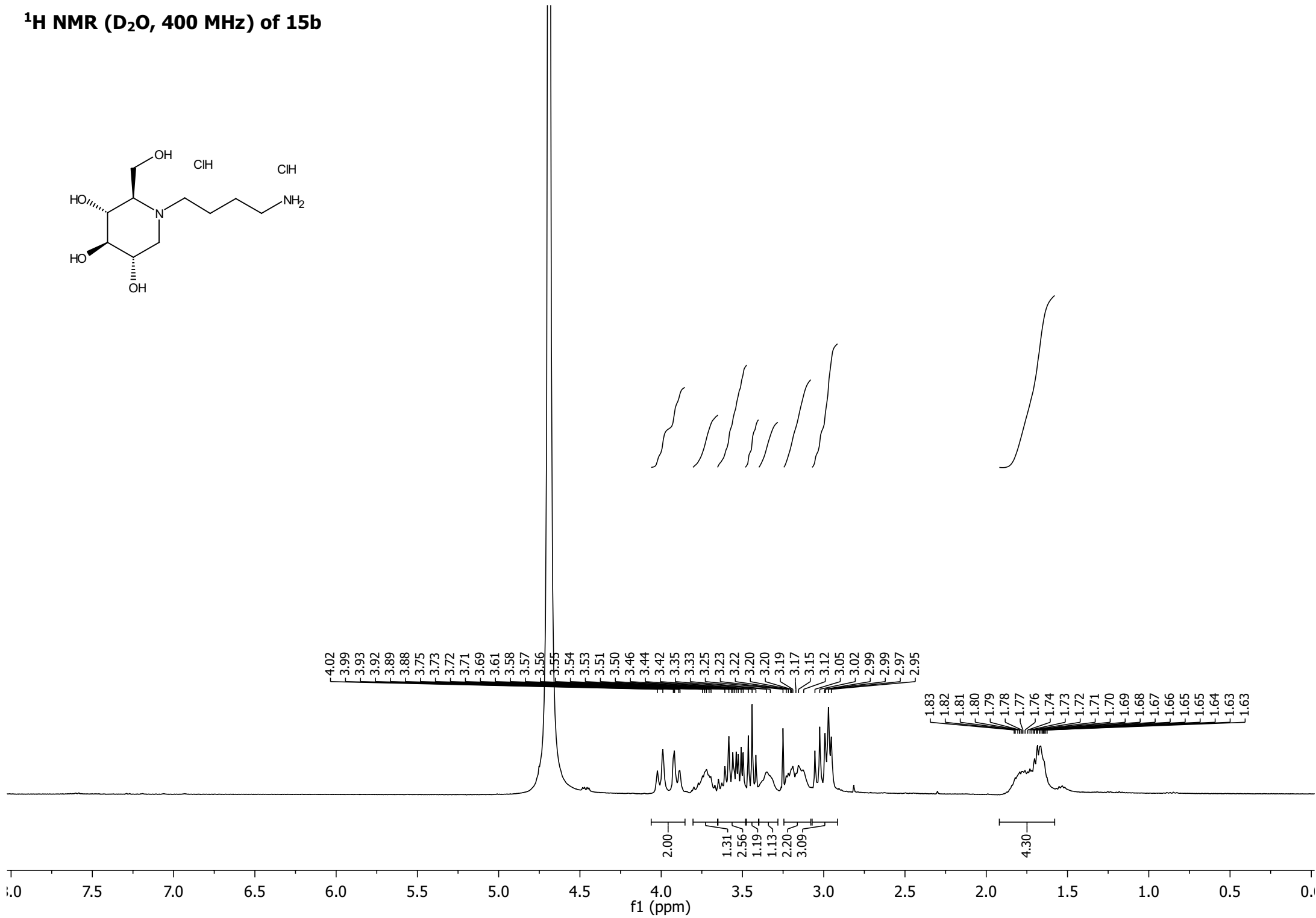
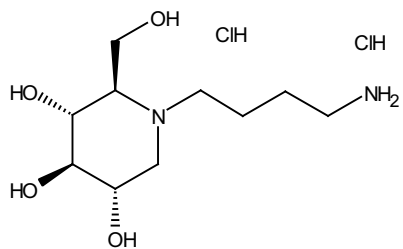
CH



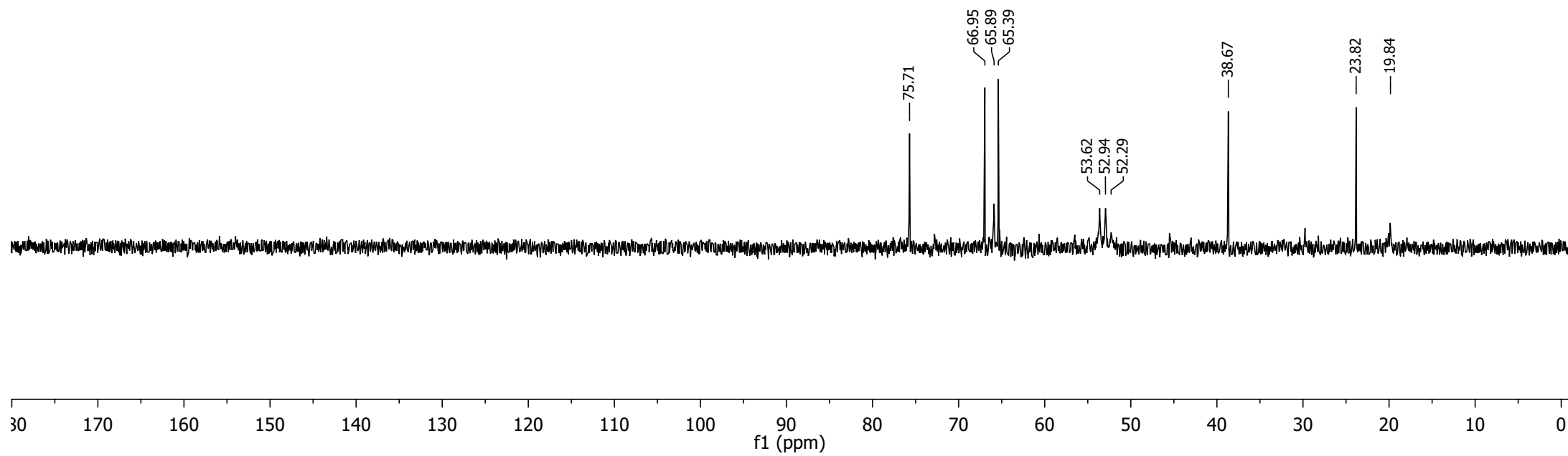
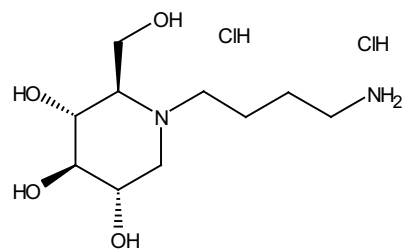
f1 (ppm)

f2 (ppm)

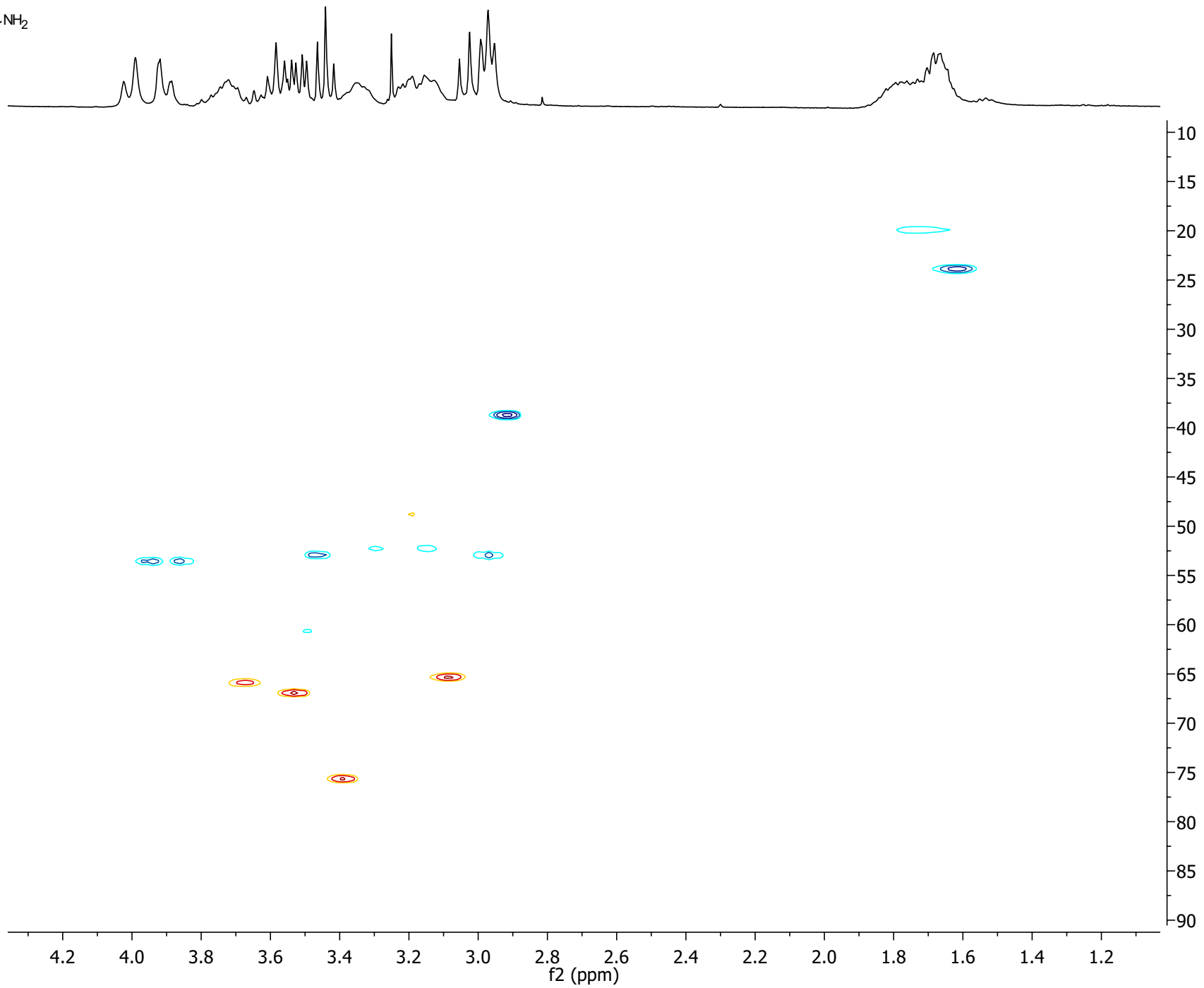
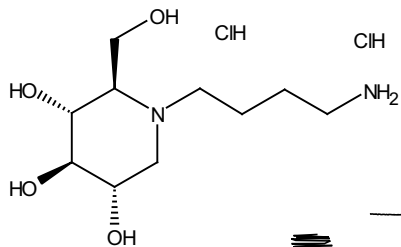
**<sup>1</sup>H NMR (D<sub>2</sub>O, 400 MHz) of 15b**



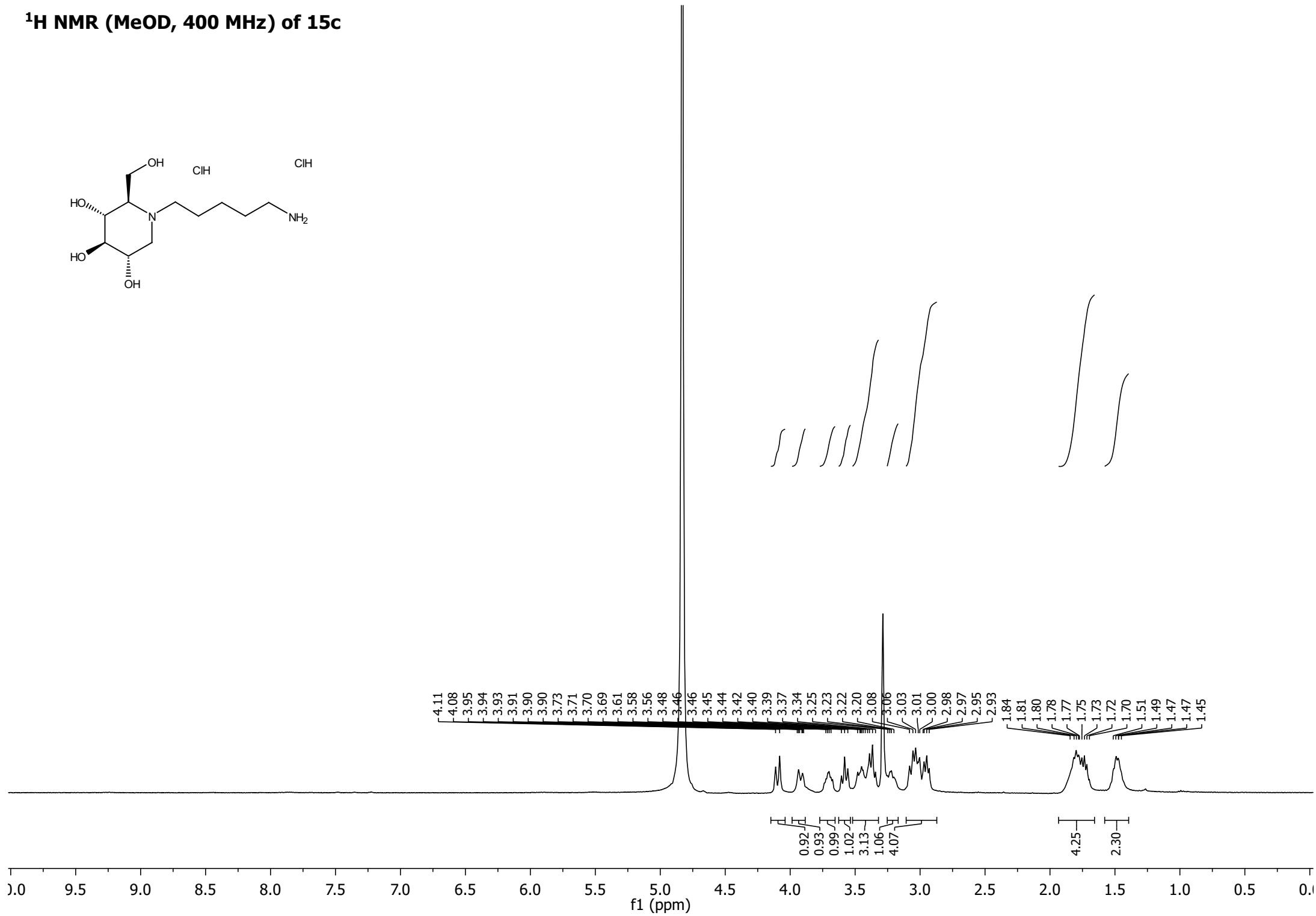
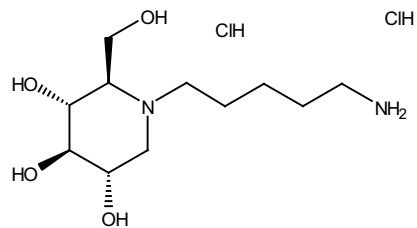
**$^{13}\text{C}$  NMR ( $\text{D}_2\text{O}$ , 101 MHz) of 15b**



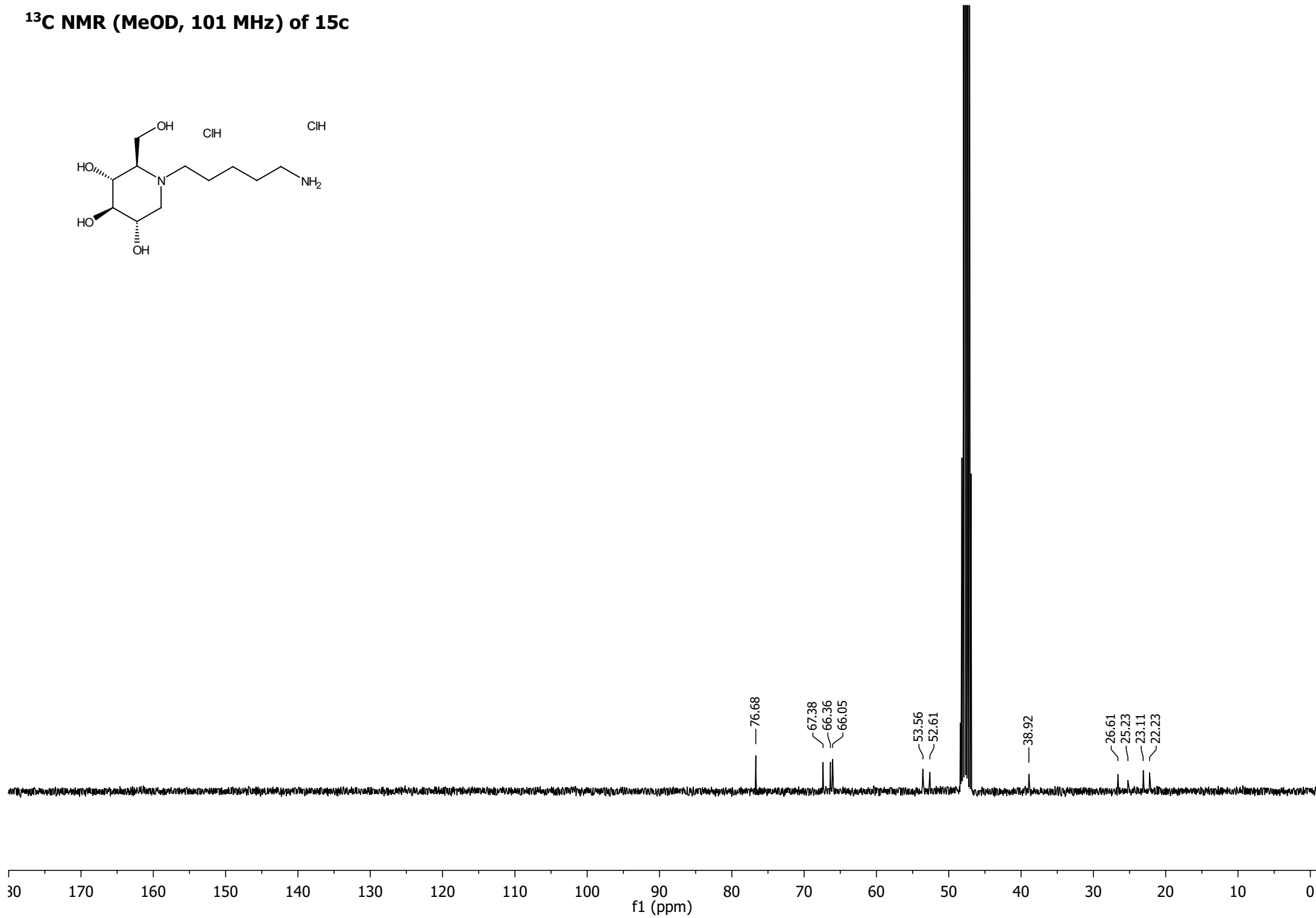
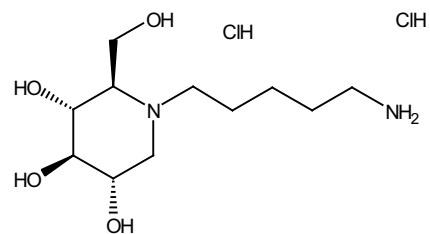
# gHSQCAD (D<sub>2</sub>O, 400 MHz) of 15b



<sup>1</sup>H NMR (MeOD, 400 MHz) of 15c

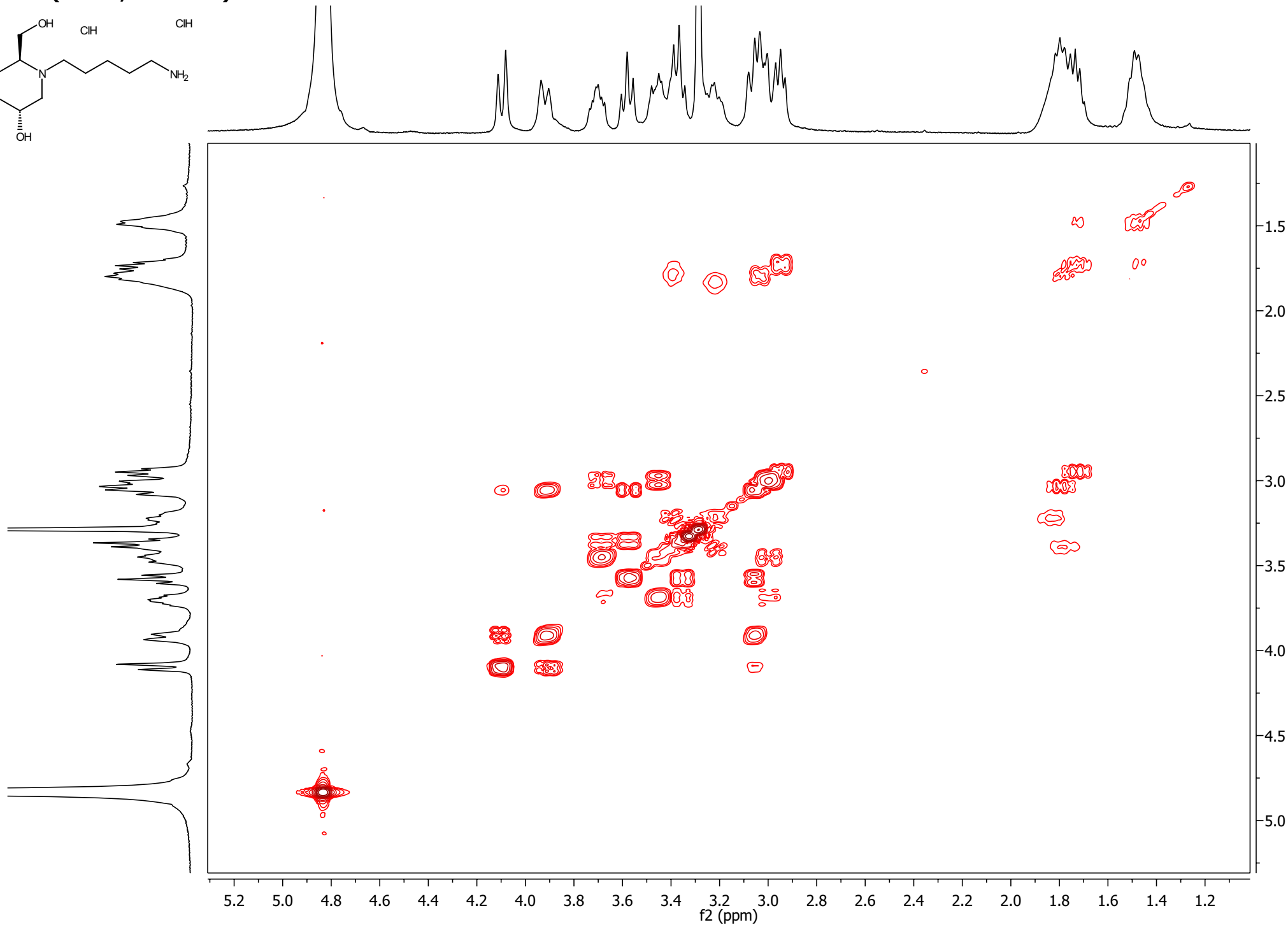
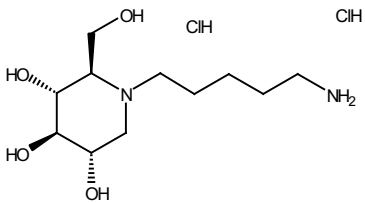


**<sup>13</sup>C NMR (MeOD, 101 MHz) of 15c**

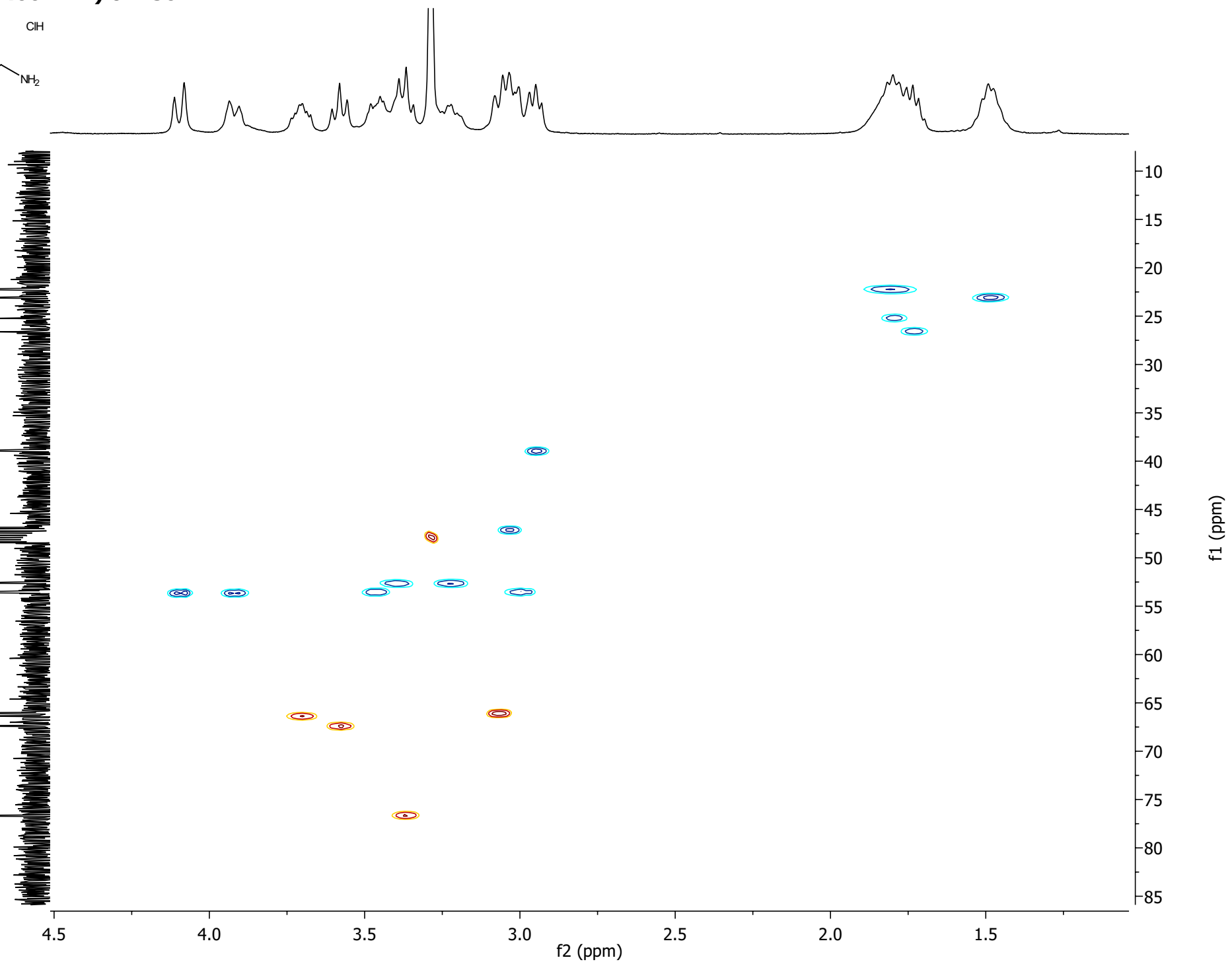
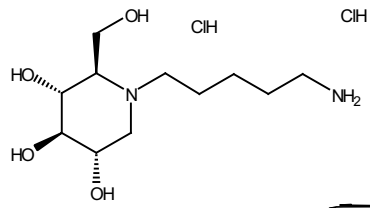




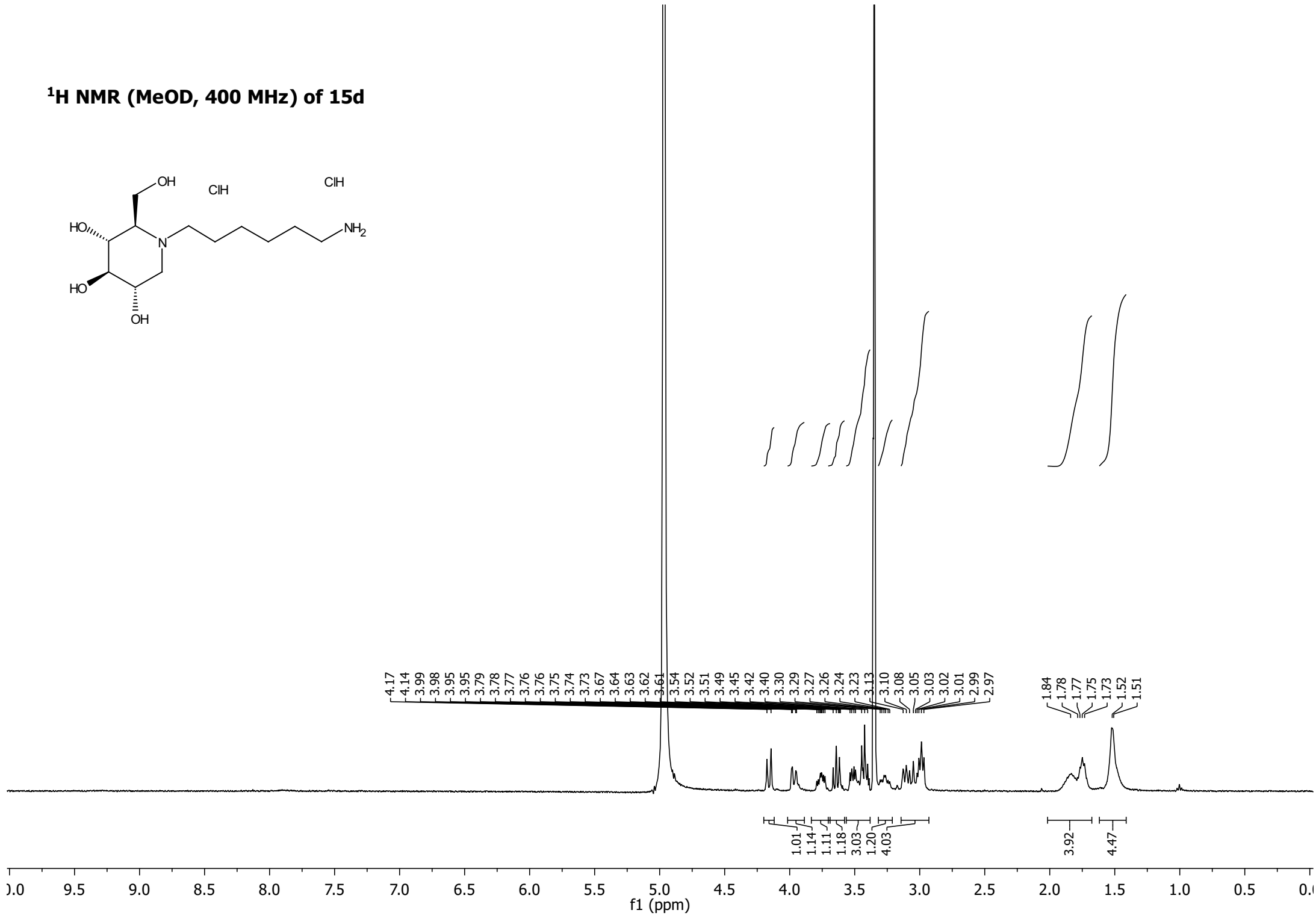
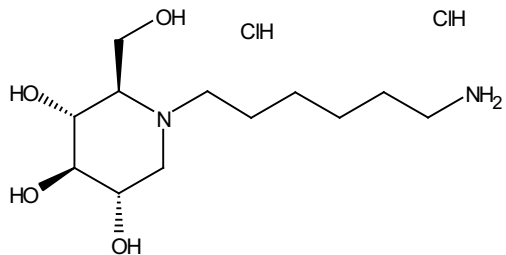
**gCOSY (MeOD, 400 MHz) of 15c**



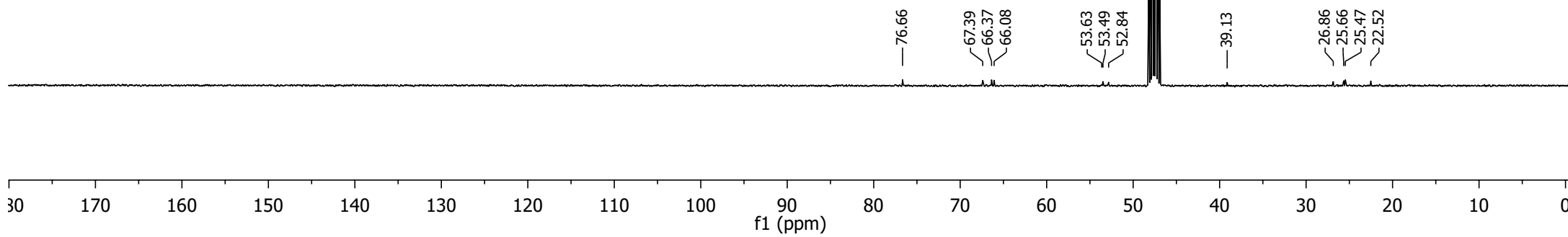
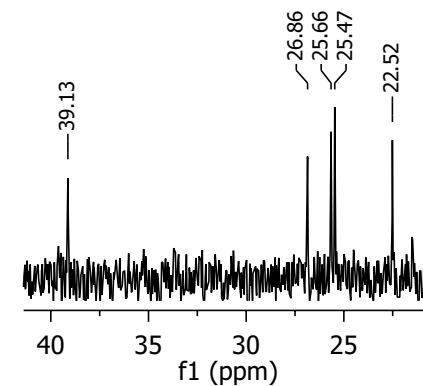
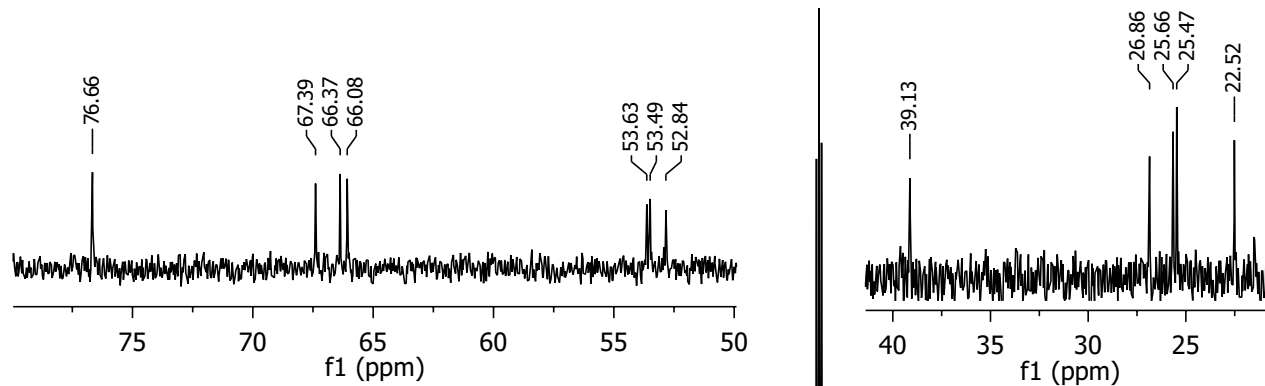
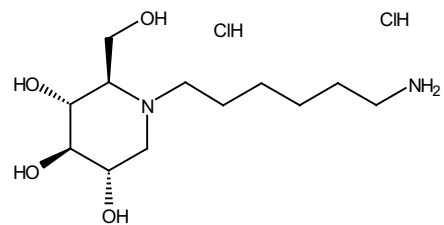
# HSQCAD (MeOD, 400 MHz) of 15c



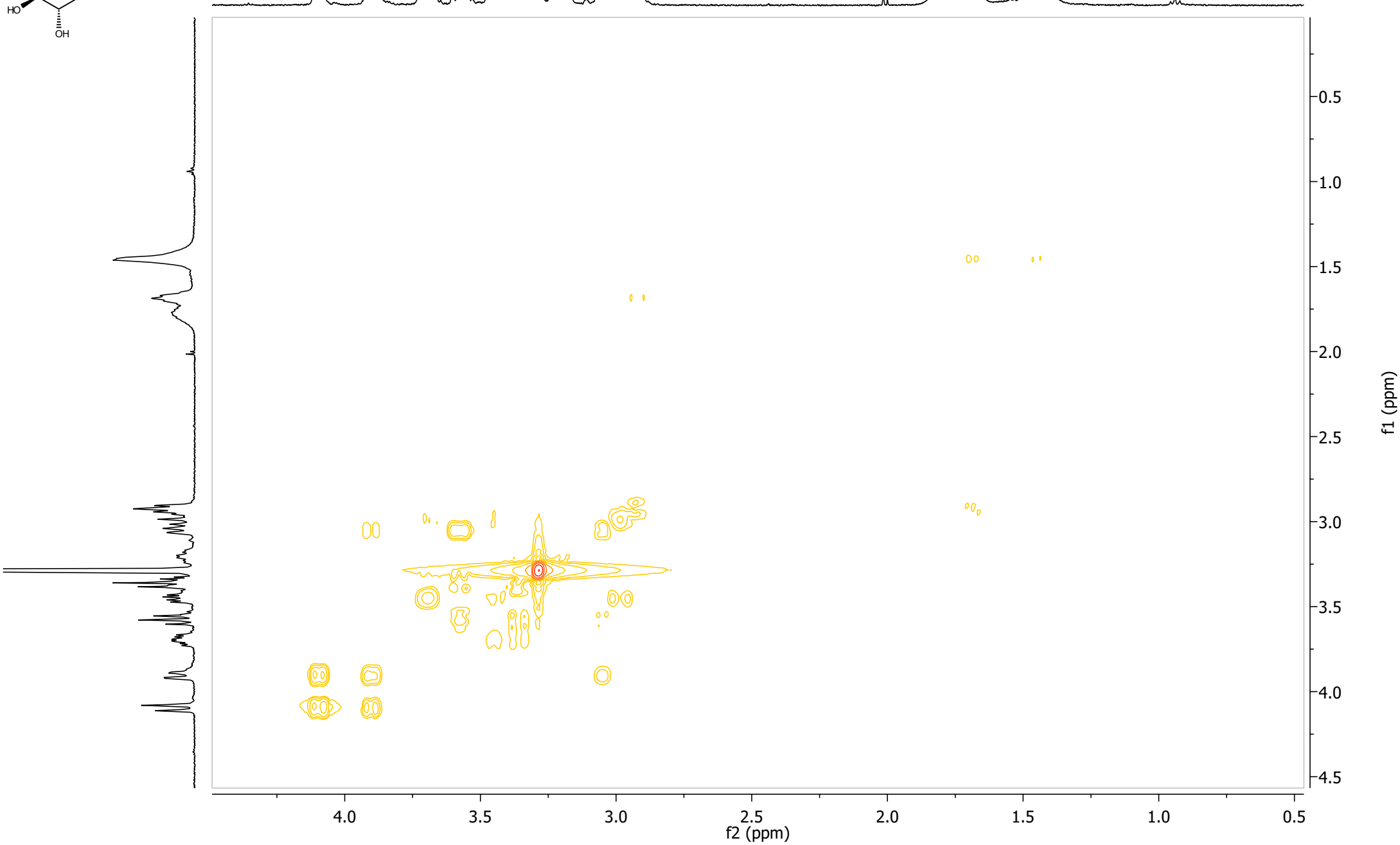
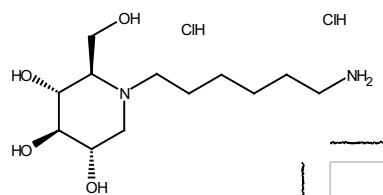
**$^1\text{H}$  NMR (MeOD, 400 MHz) of 15d**



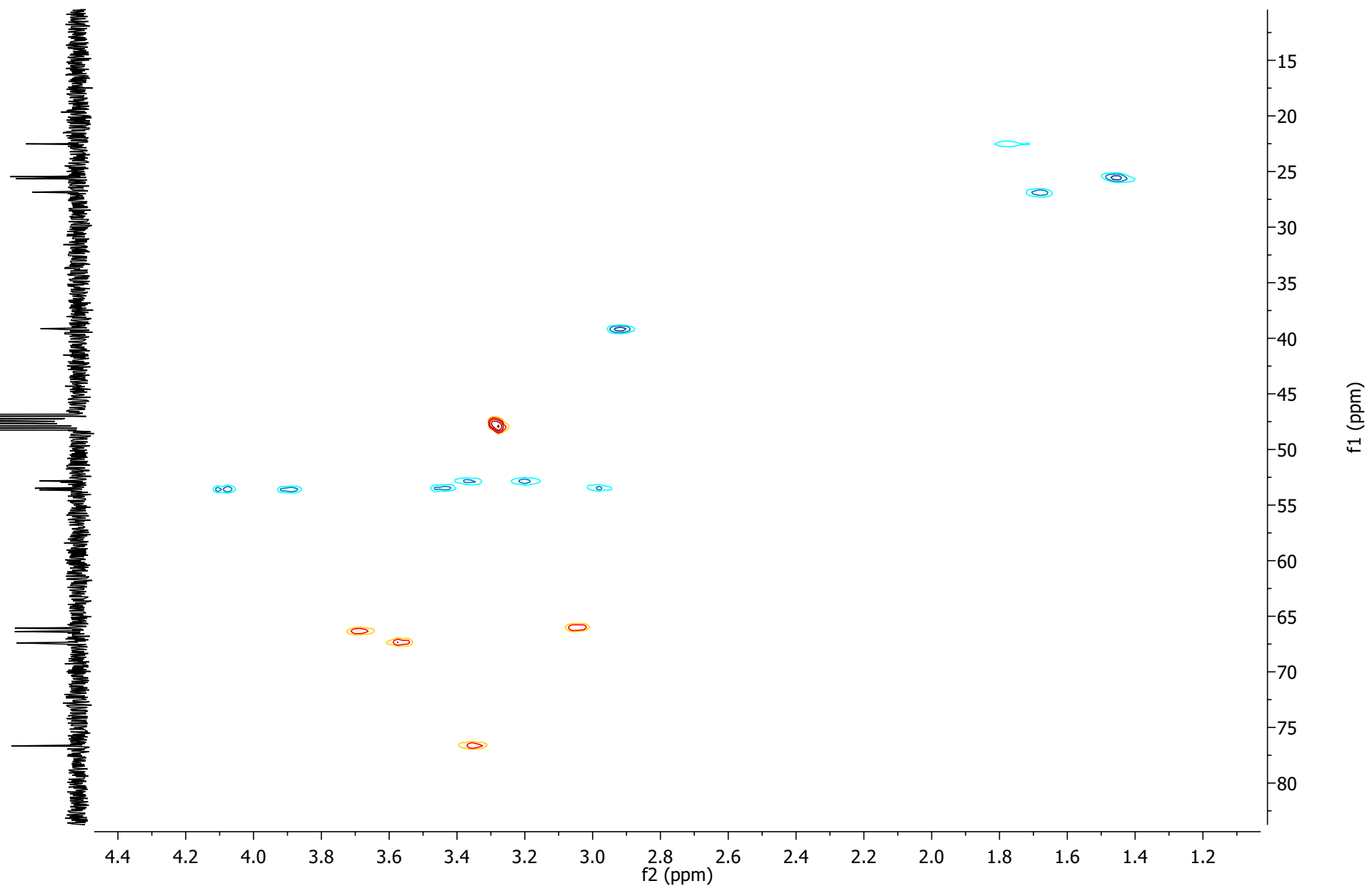
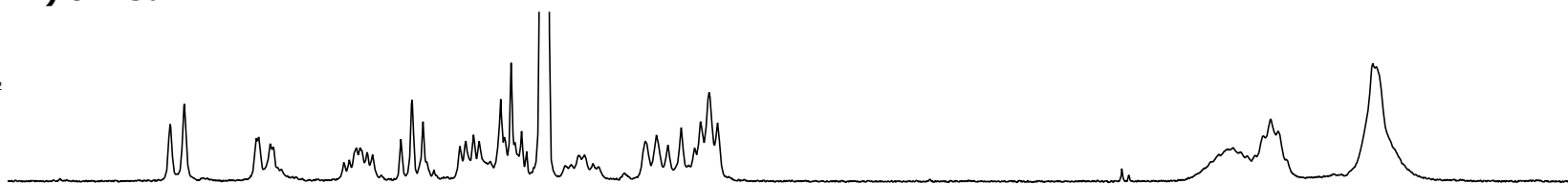
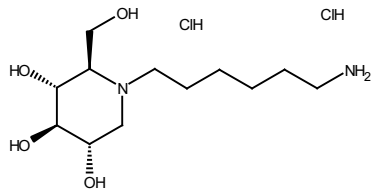
**<sup>13</sup>C NMR (MeOD, 101 MHz) of 15d**



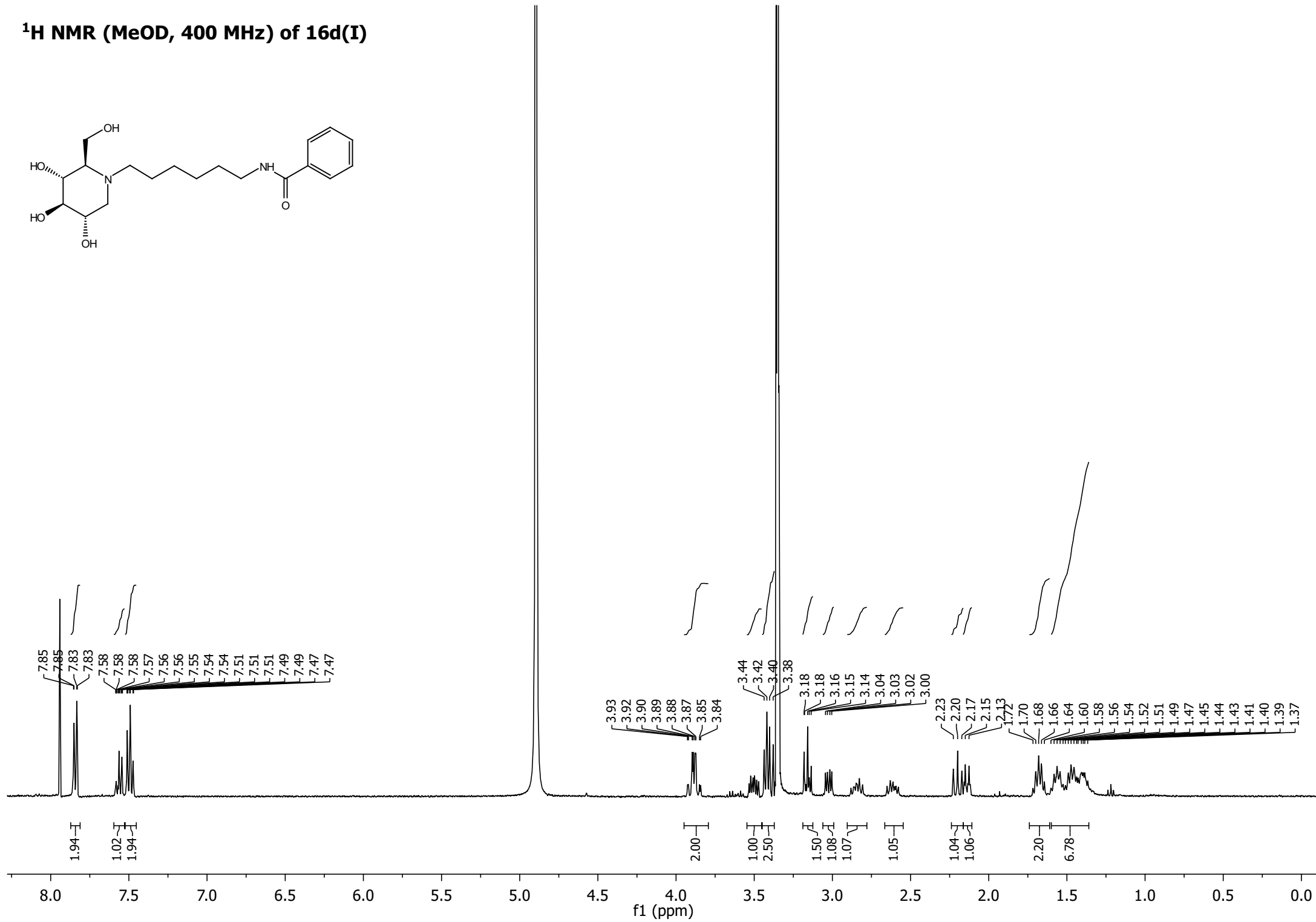
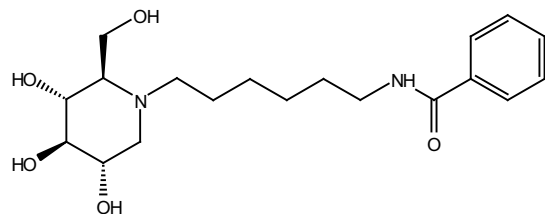
**gCOSY (MeOD, 400 MHz) of 15d**



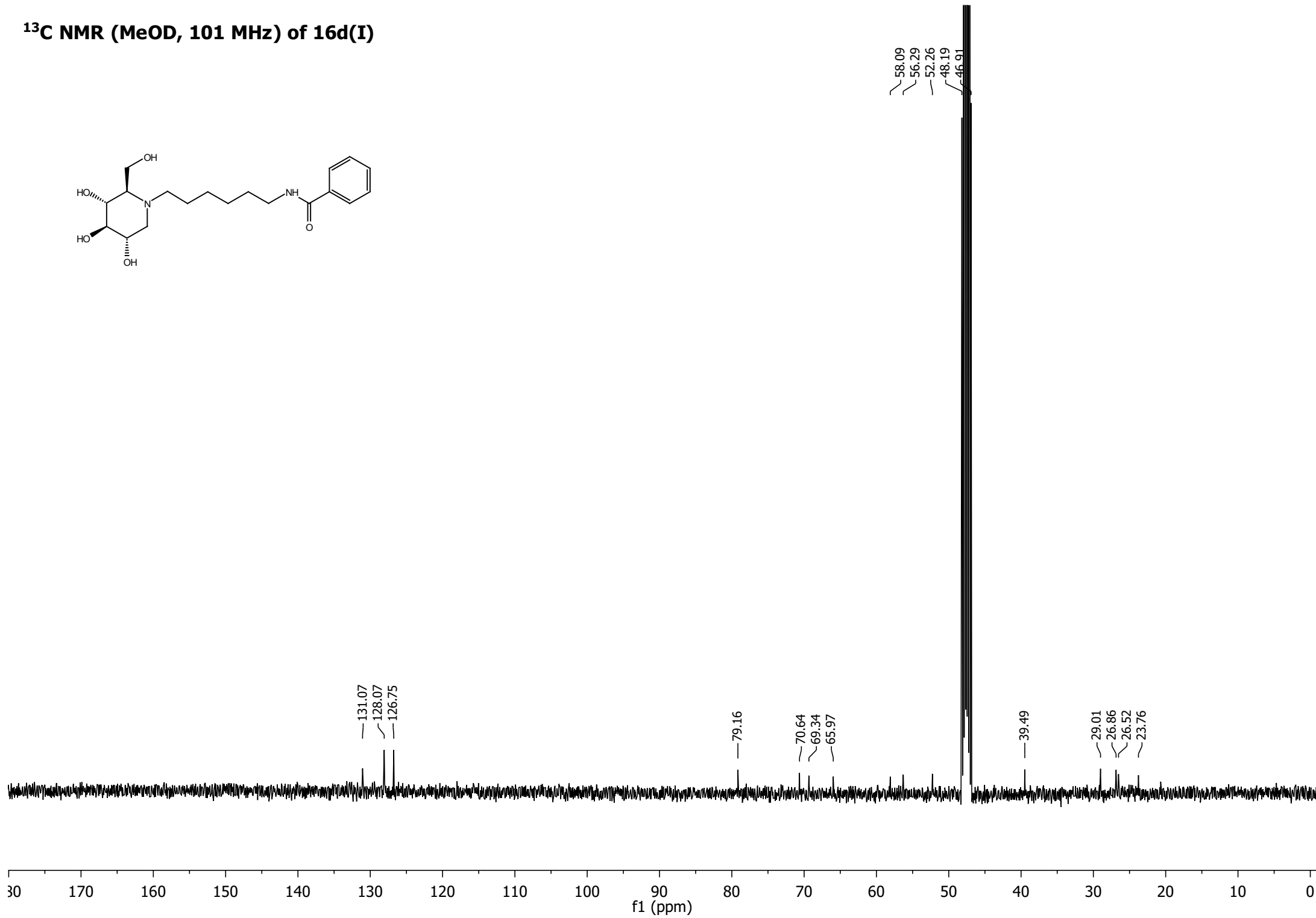
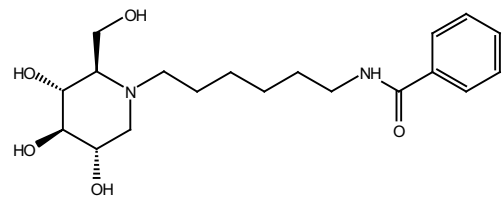
**gHSQC (MeOD, 400 MHz) of 15d**



**<sup>1</sup>H NMR (MeOD, 400 MHz) of 16d(I)**

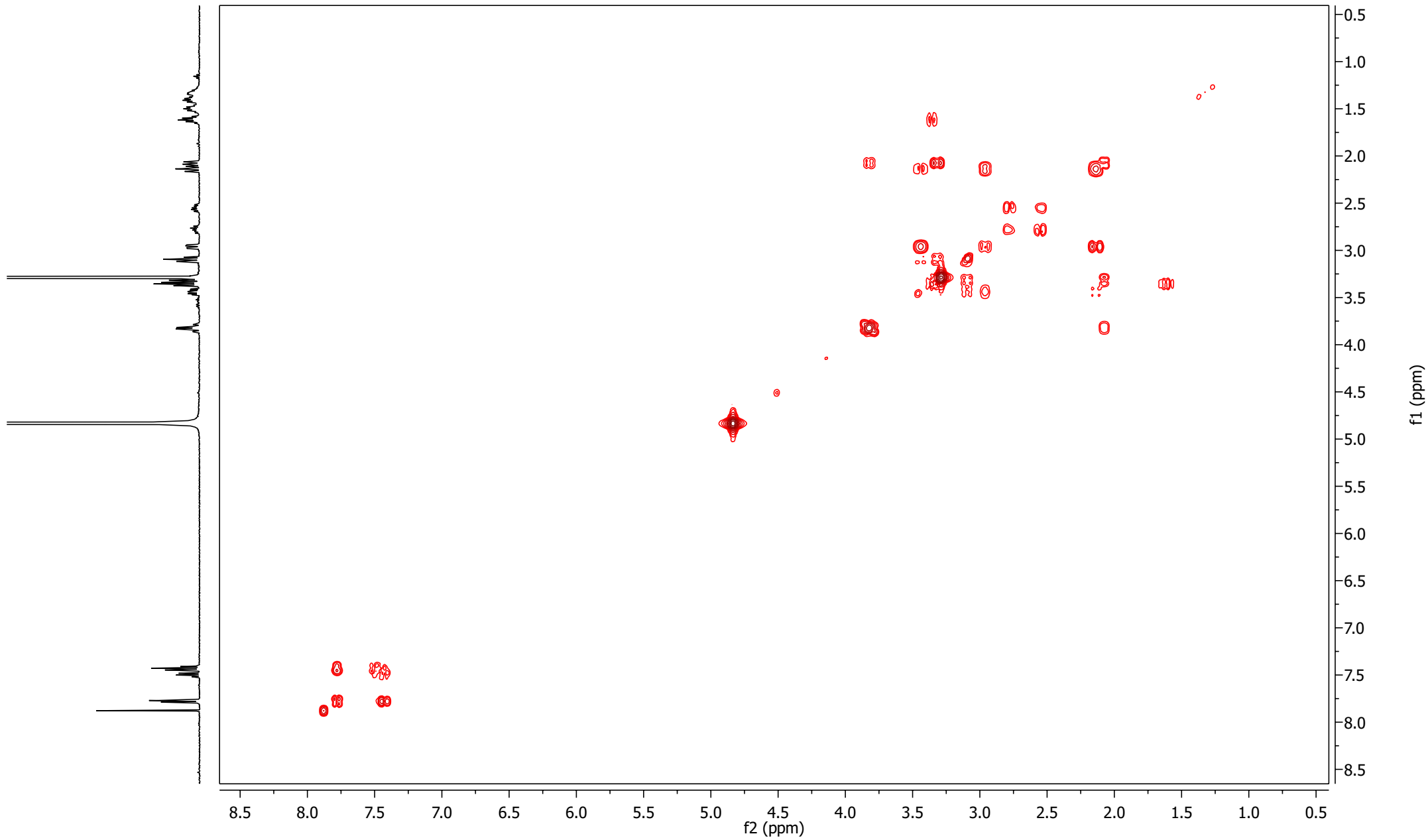
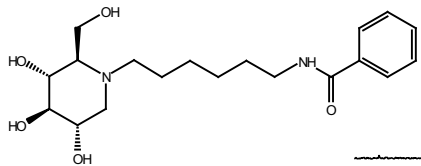


**<sup>13</sup>C NMR (MeOD, 101 MHz) of 16d(I)**

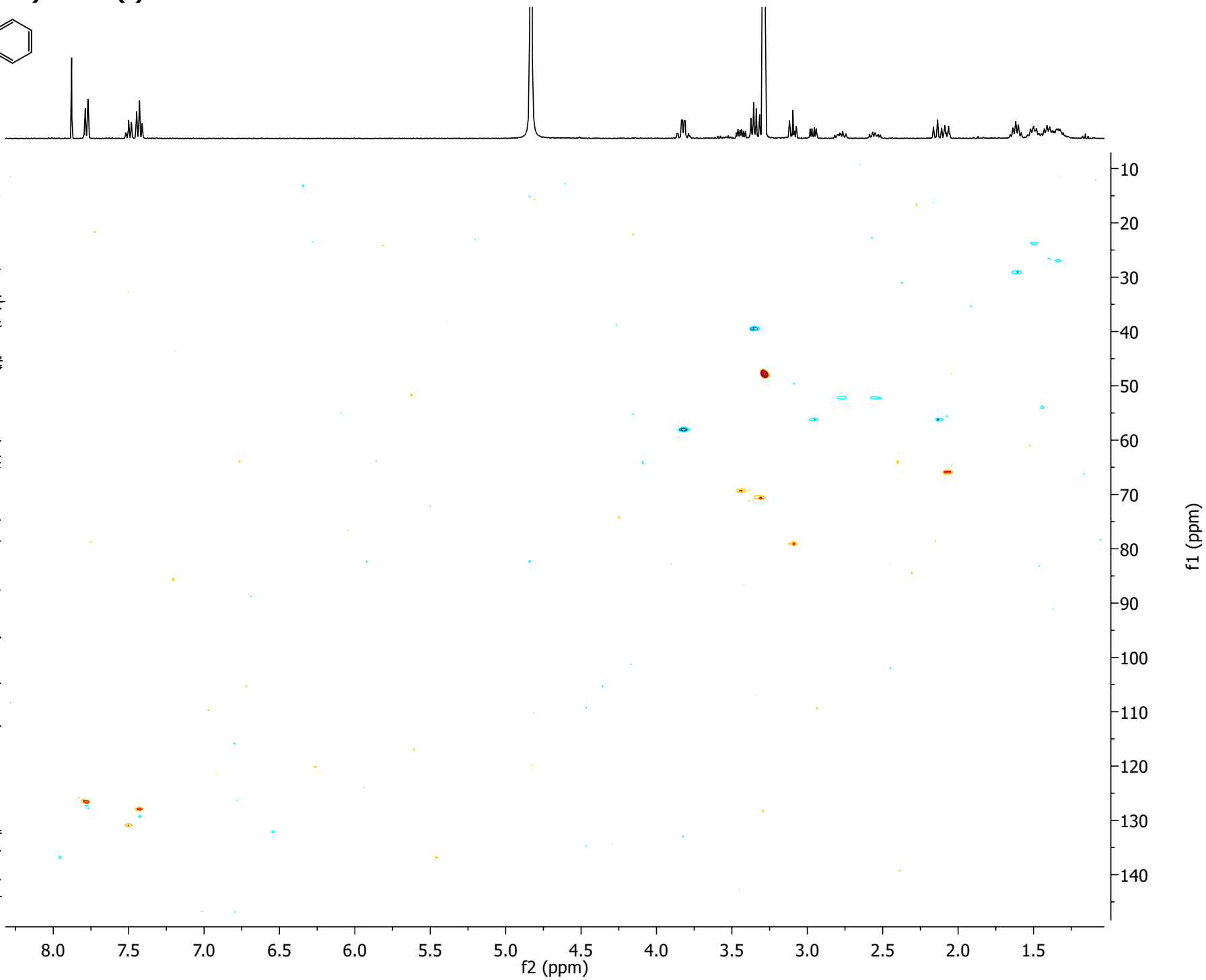
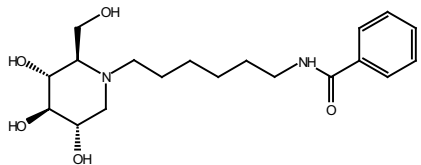


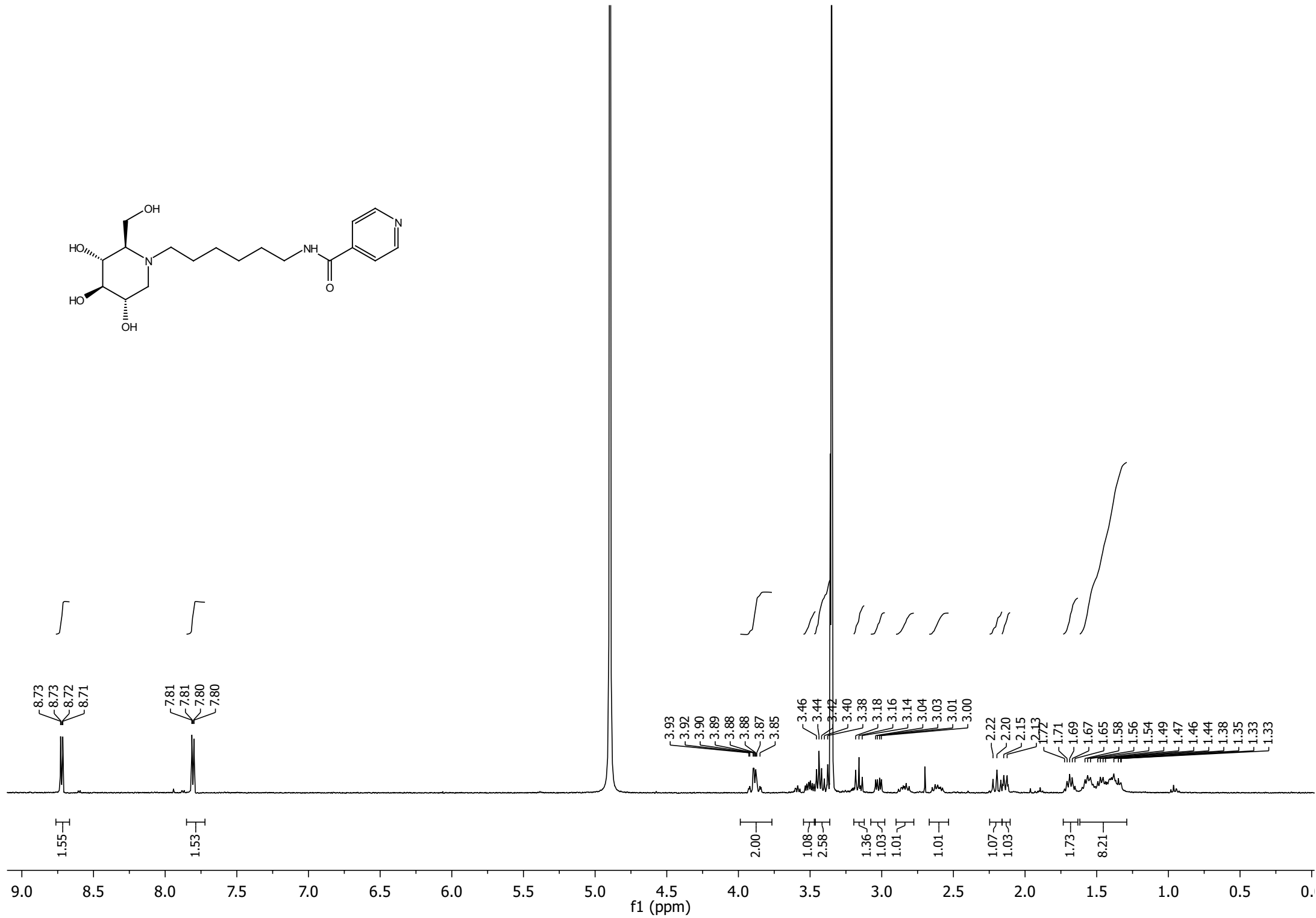
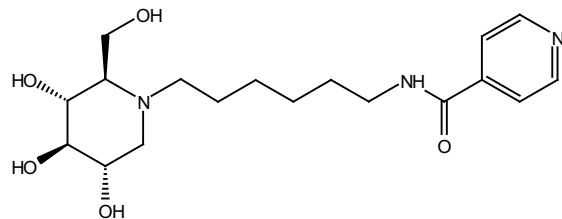


# gCOSY (MeOD, 400 MHz) of 16d(I)

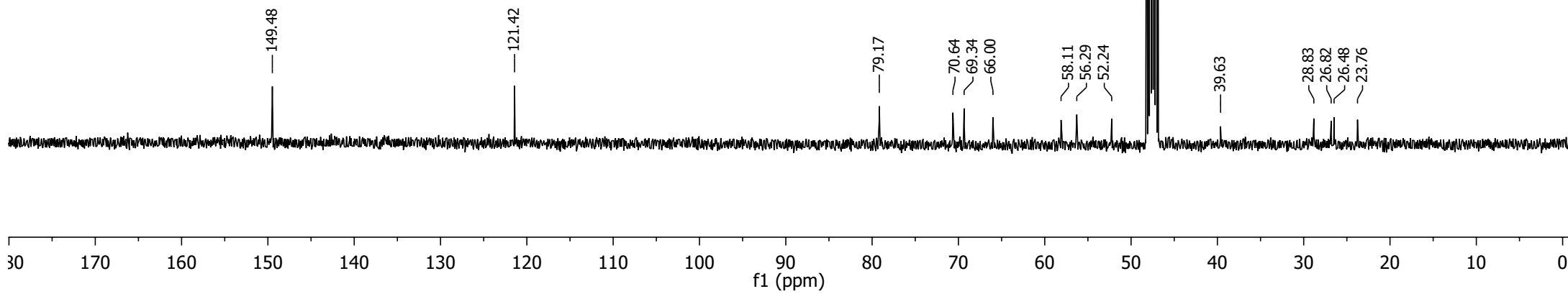
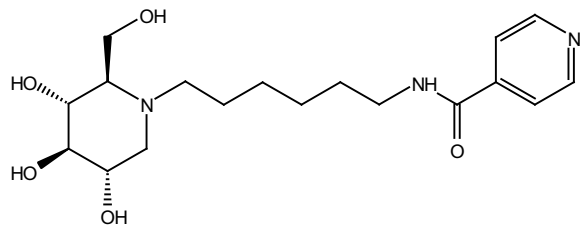


gHSQC (MeOD, 400 MHz) of 16d(I)

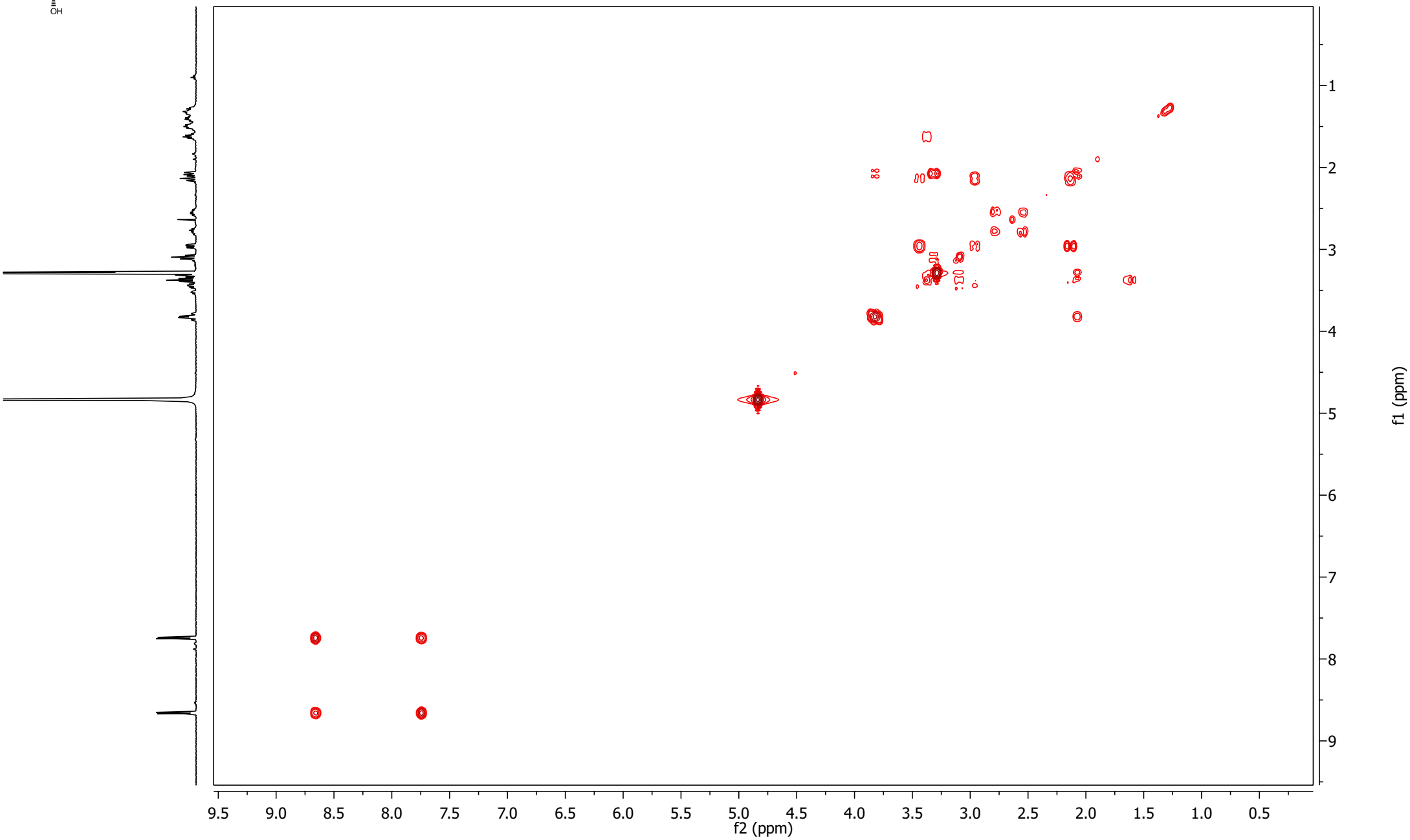
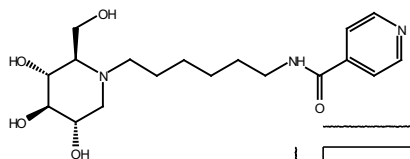




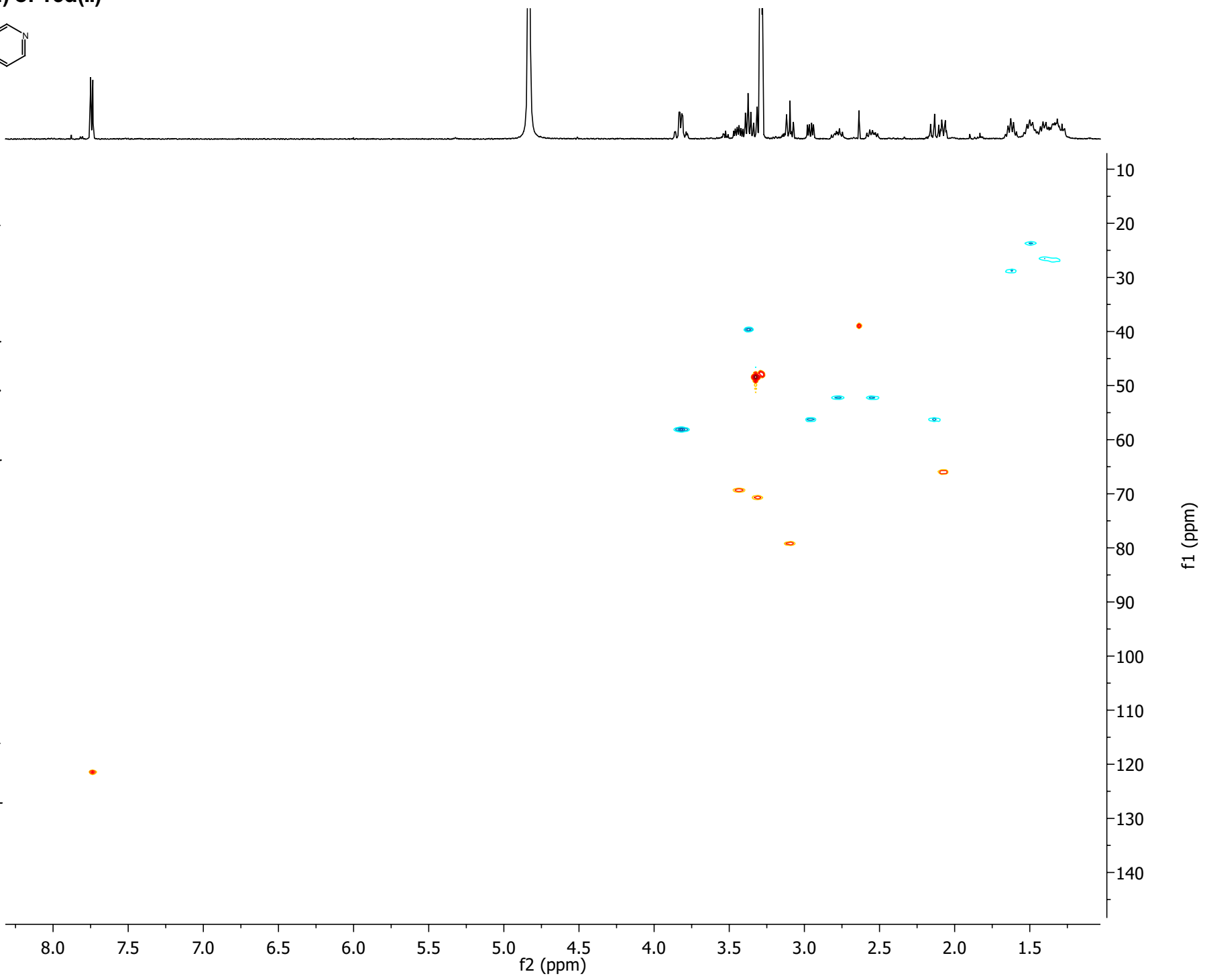
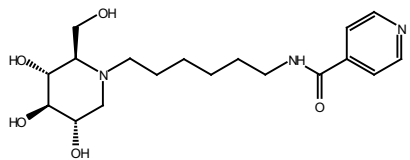
<sup>13</sup>C NMR (MeOH, 101 MHz) of 16d(II)



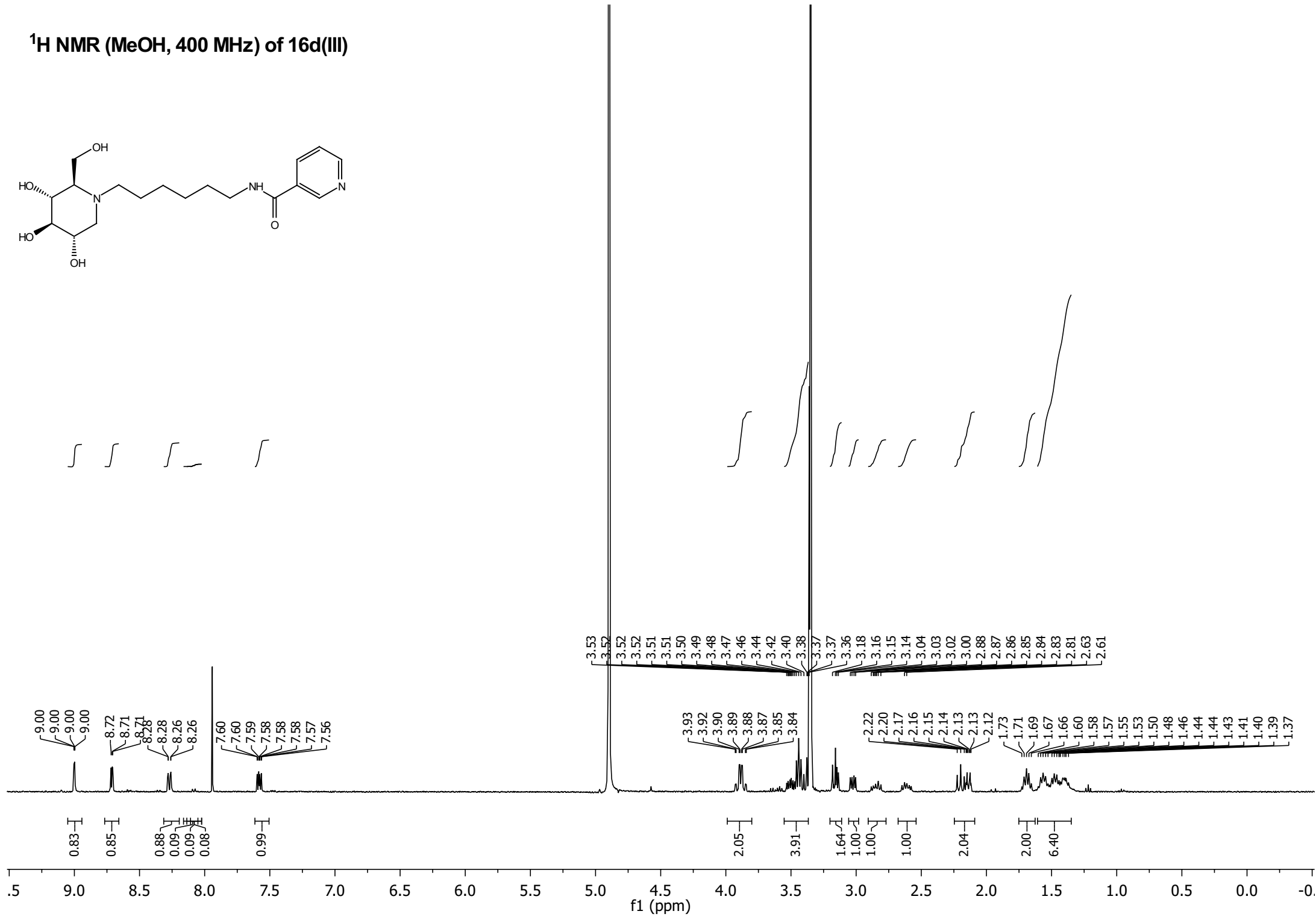
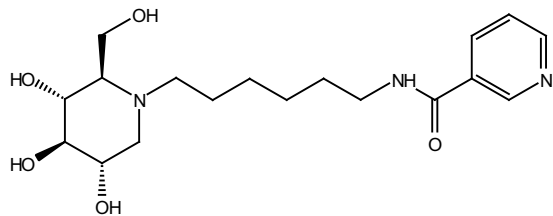
gCOSY (MeOH, 400 MHz) of 16d(II)



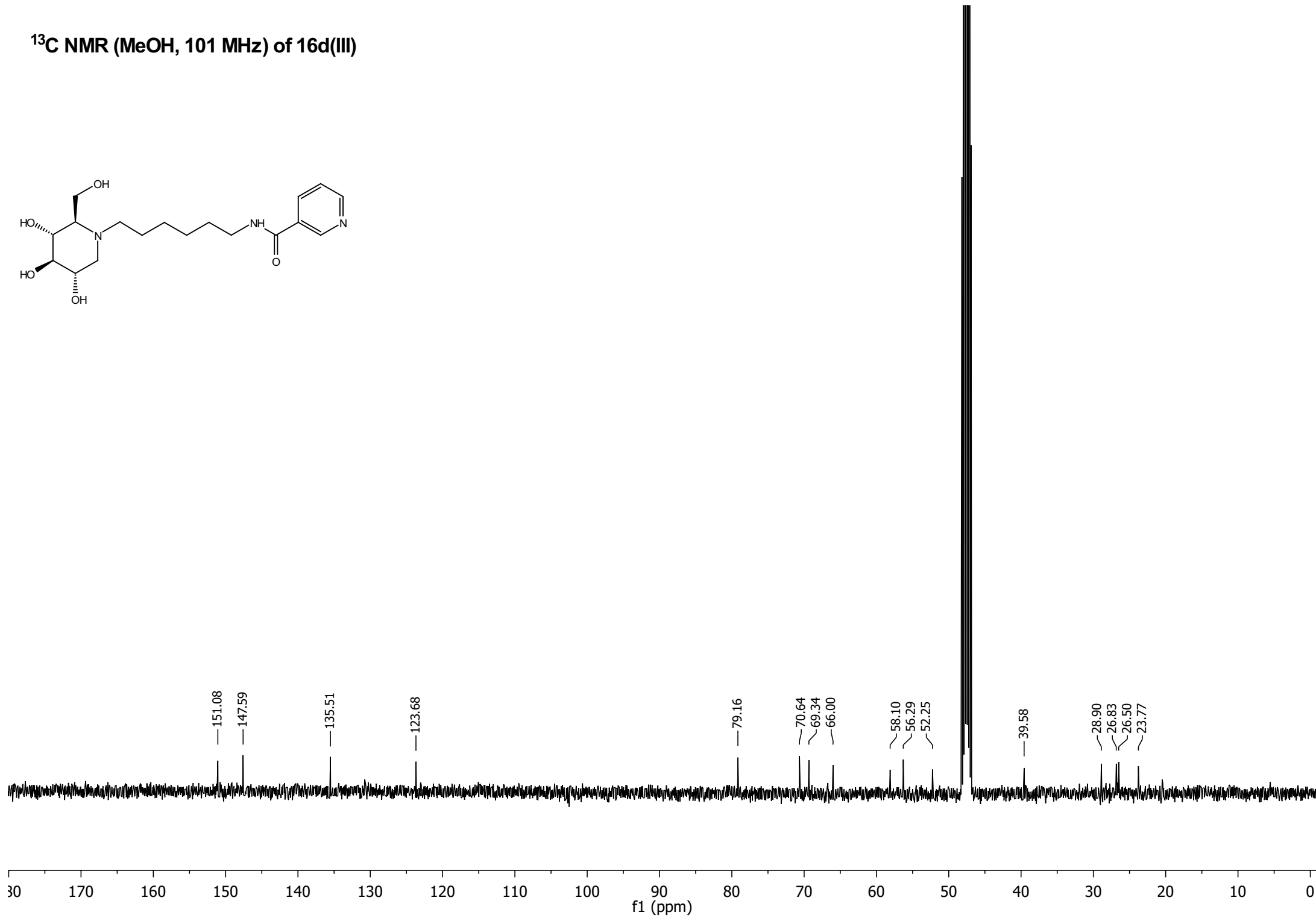
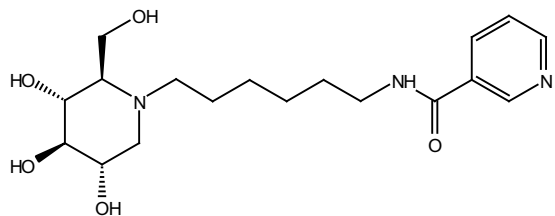
# gHSQC (MeOH, 400 MHz) of 16d(II)



<sup>1</sup>H NMR (MeOH, 400 MHz) of 16d(III)

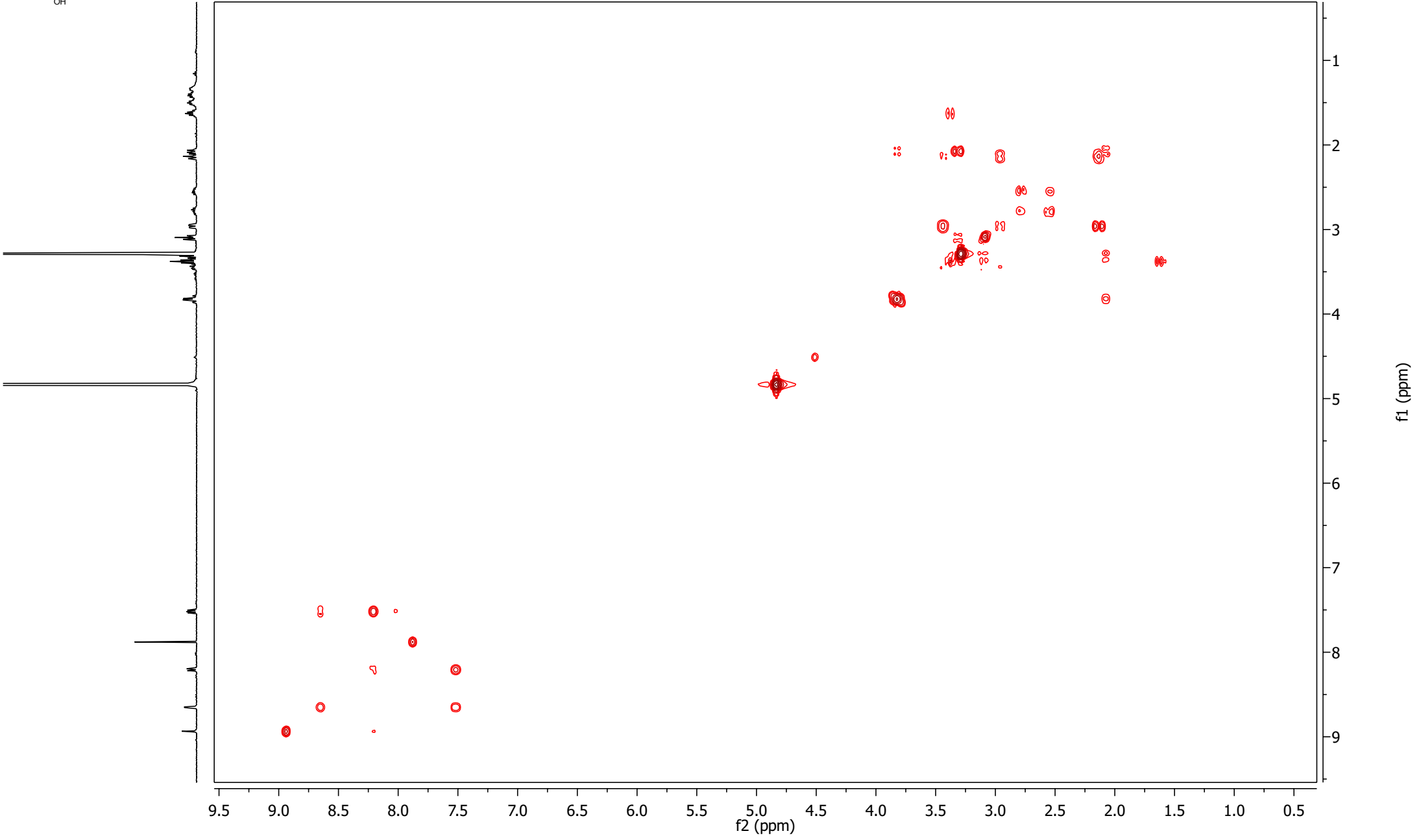
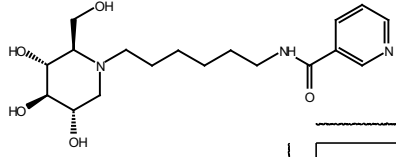


<sup>13</sup>C NMR (MeOH, 101 MHz) of 16d(III)

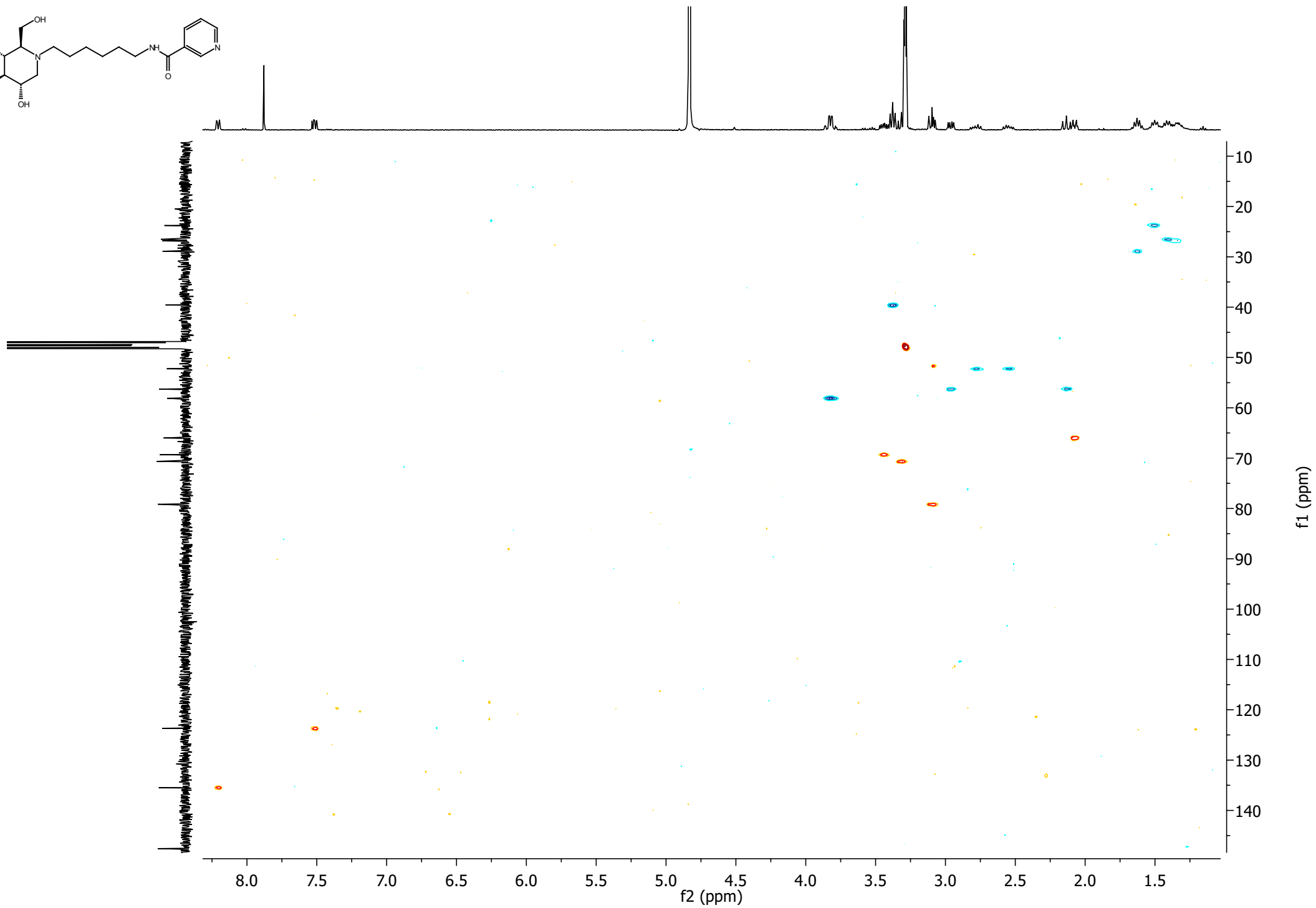
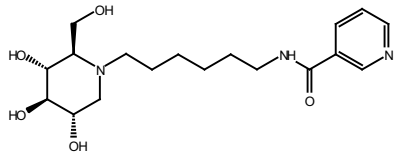




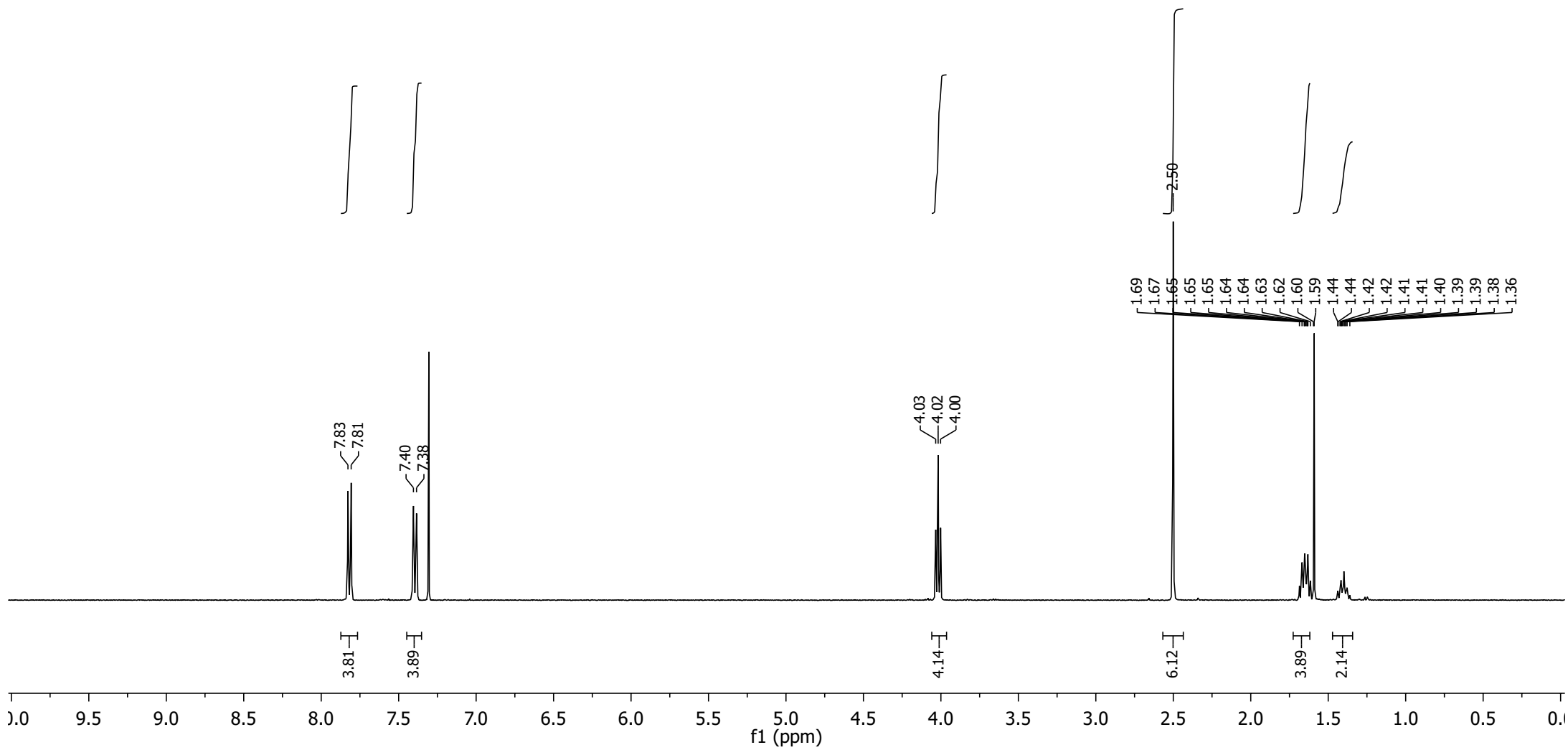
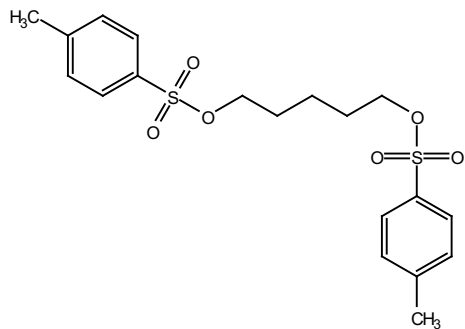
gCOSY (MeOH, 400 MHz) of 16d(III)



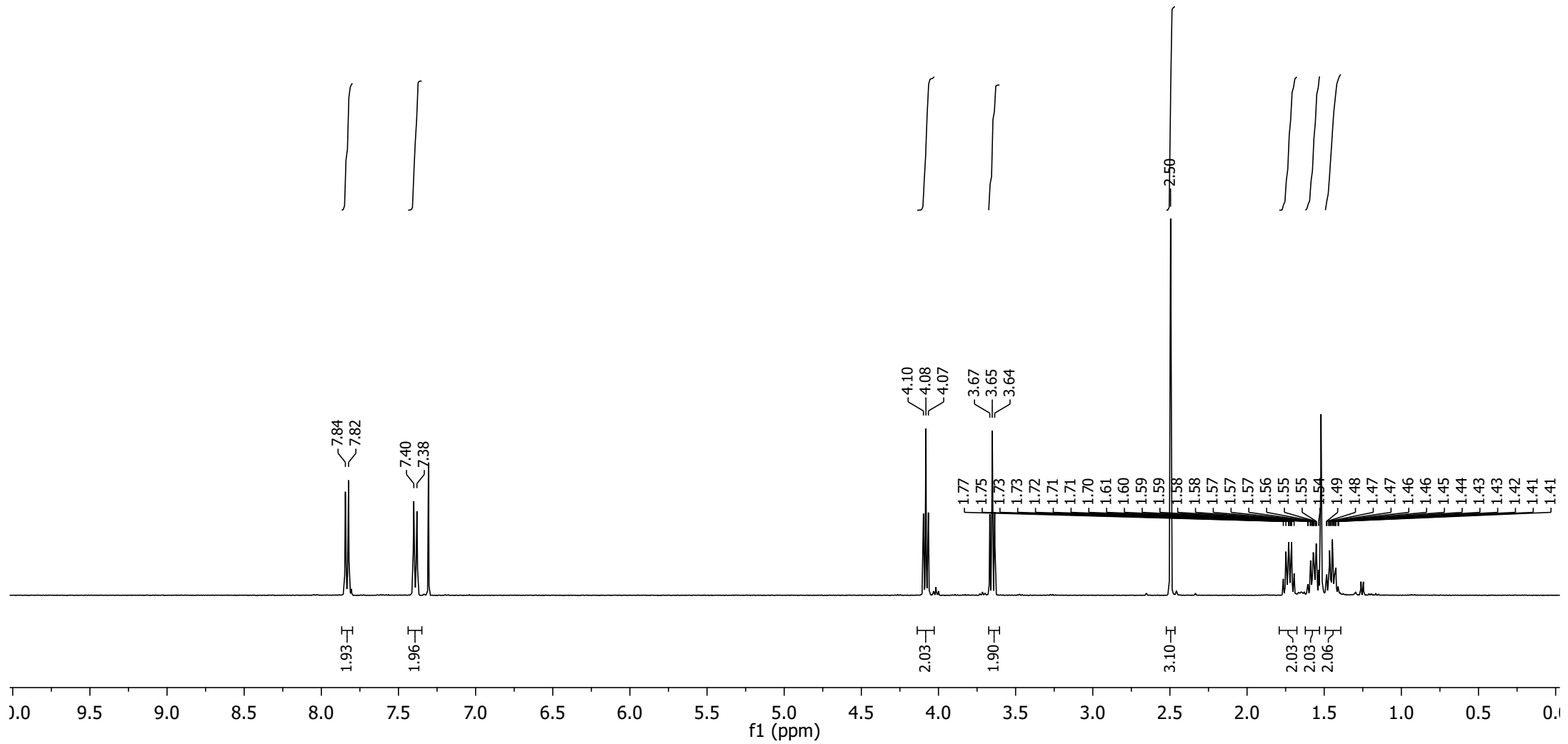
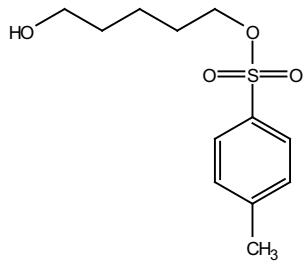
# gHSQC (MeOH, 400 MHz) of 16d(III)



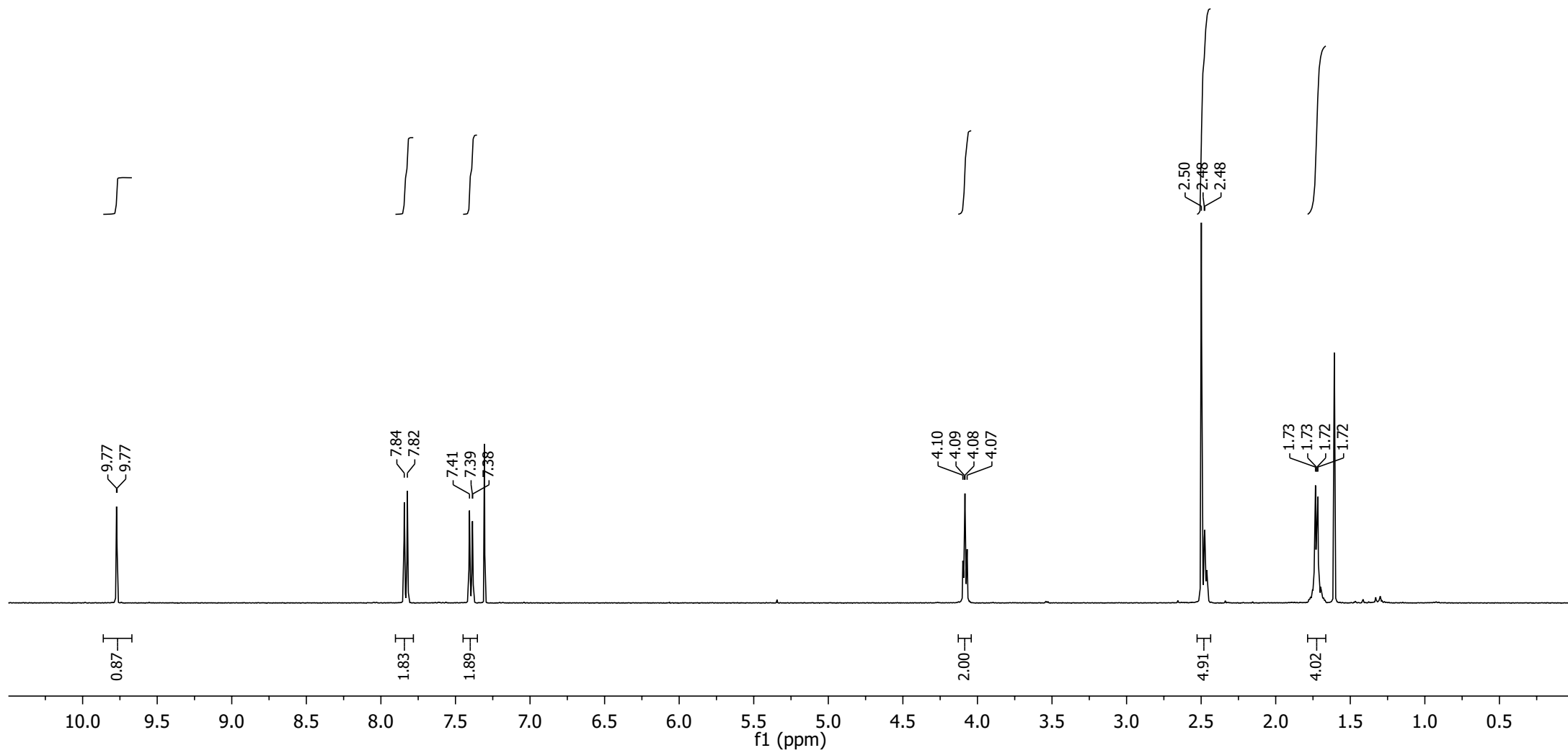
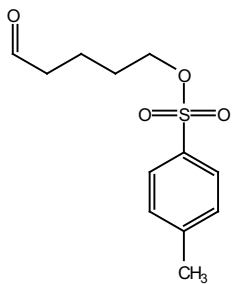
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 18



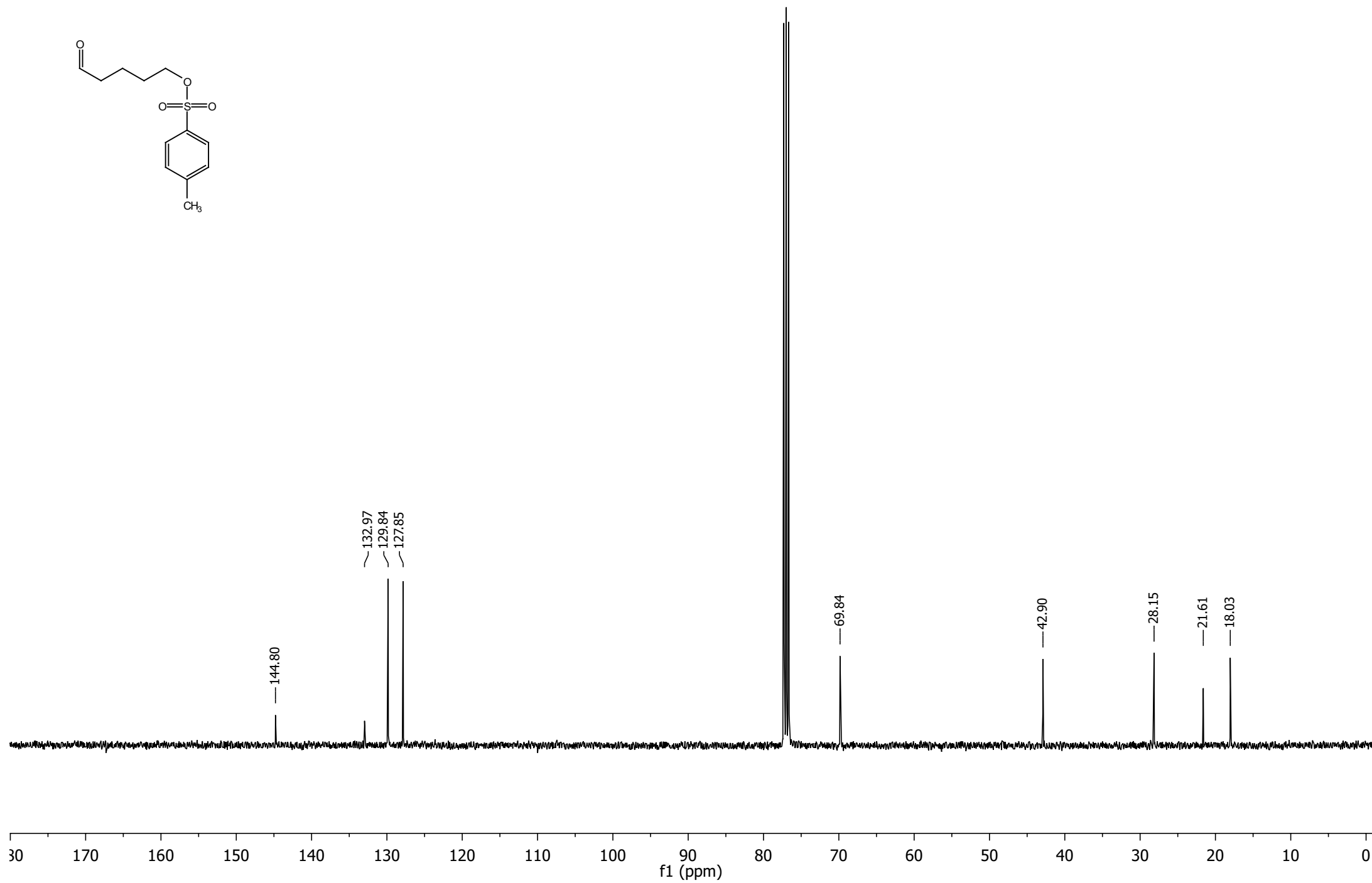
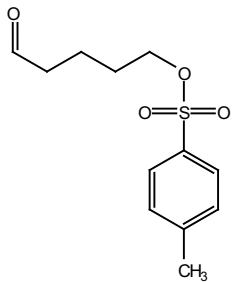
<sup>1</sup>H NMR (CDCl<sub>3</sub> 400 MHz) of 19



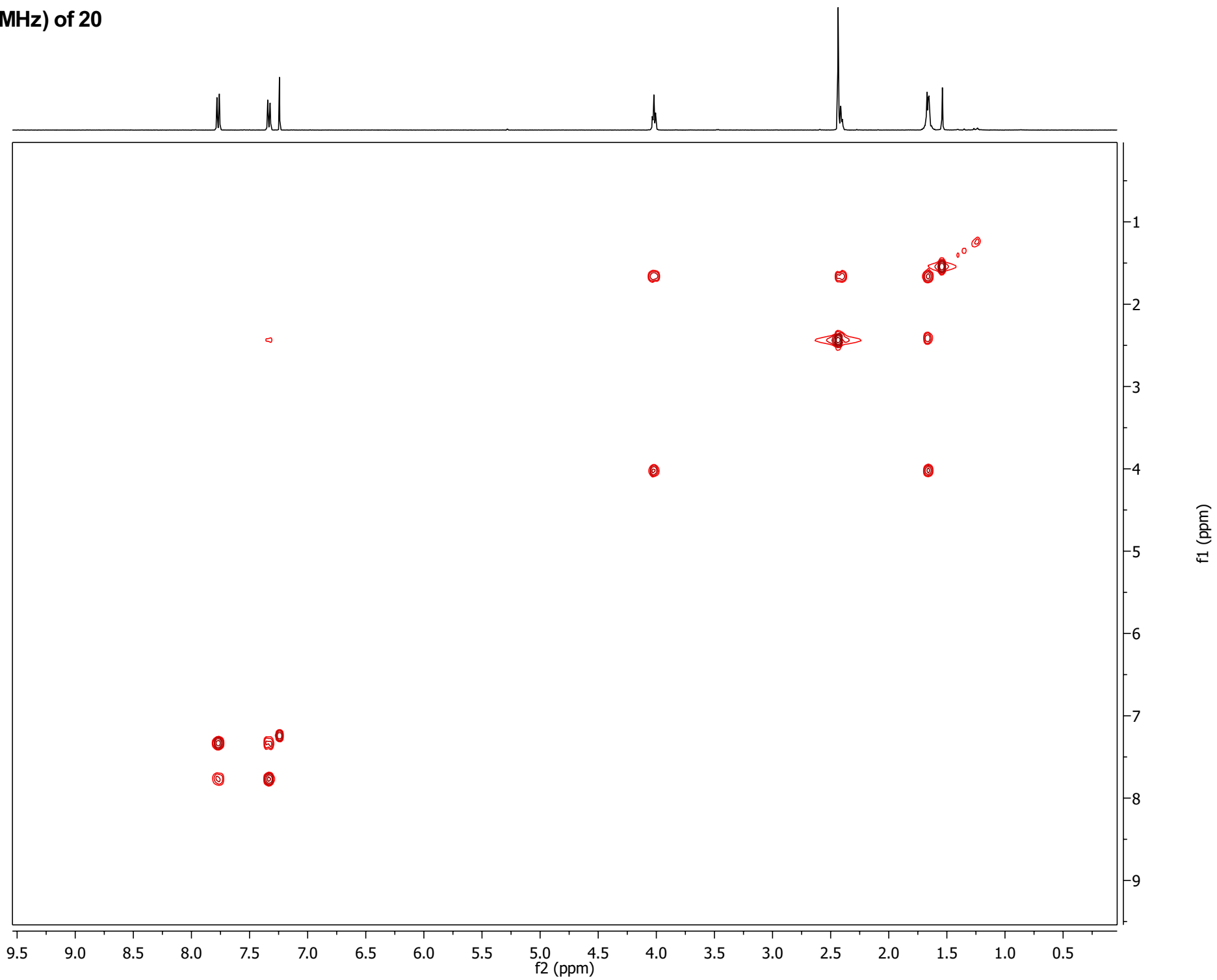
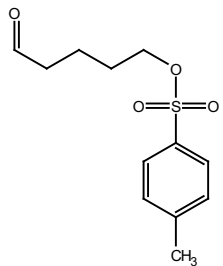
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 20



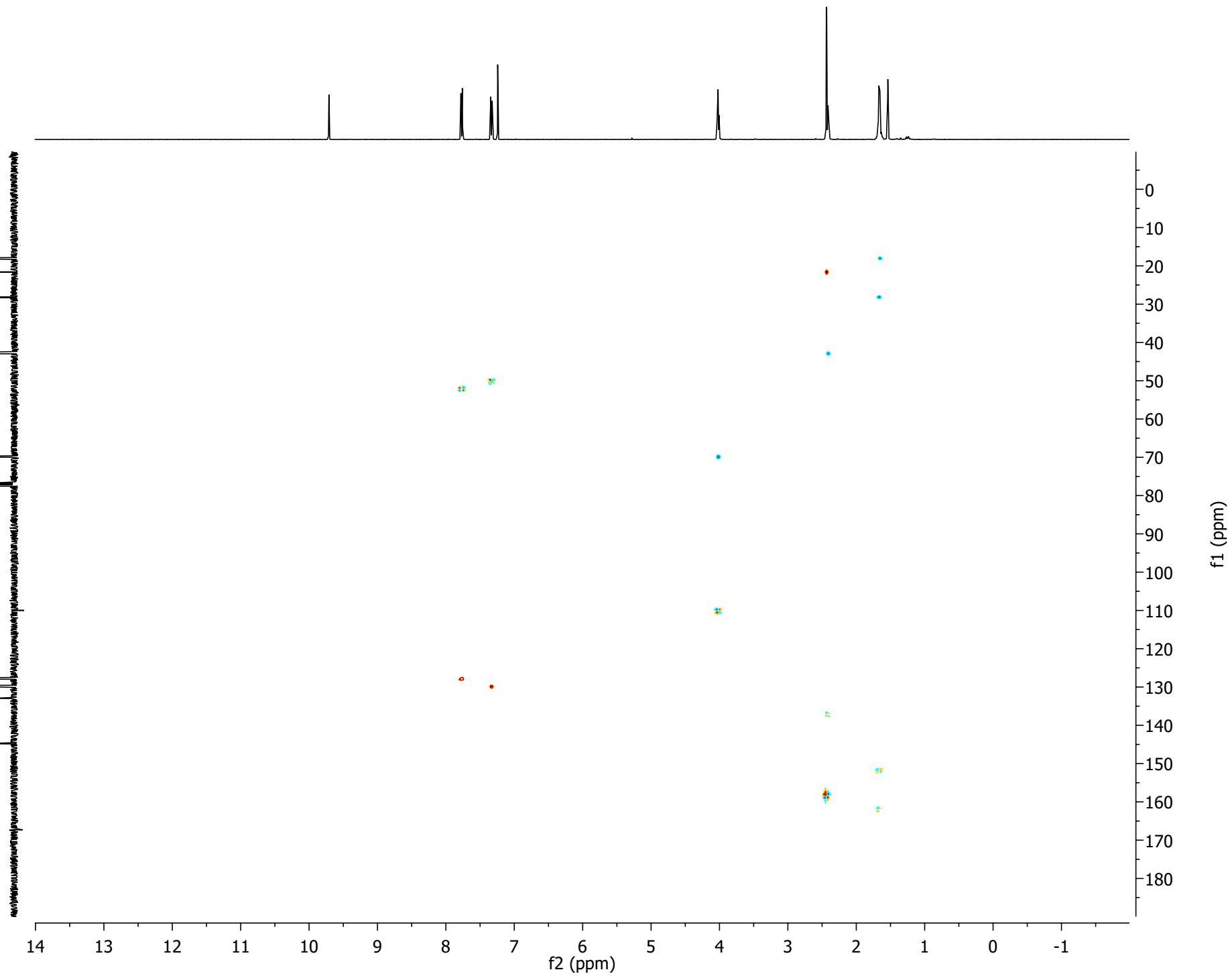
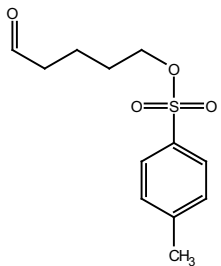
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 20



gCOSY (CDCl<sub>3</sub>, 400 MHz) of 20

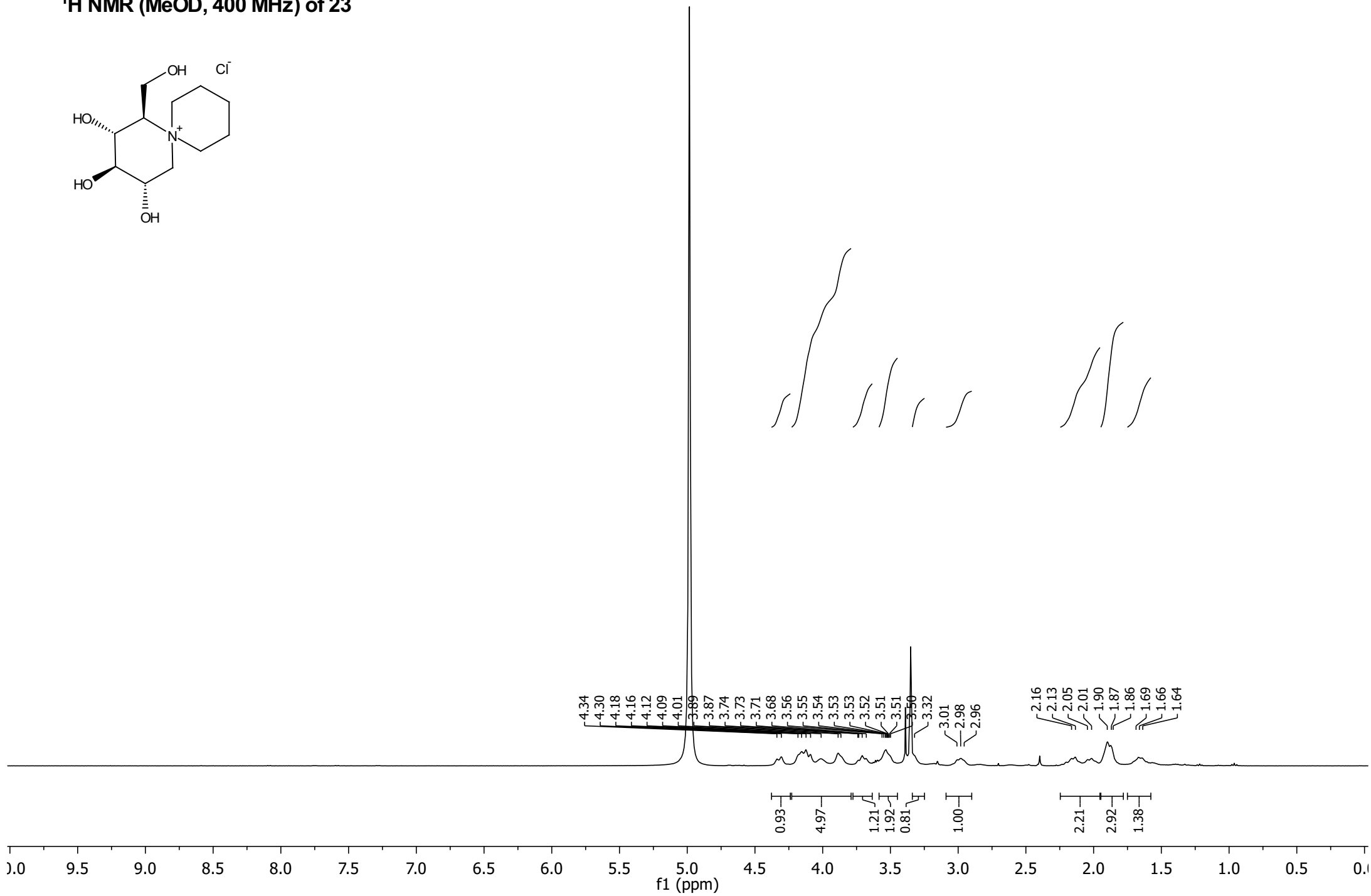
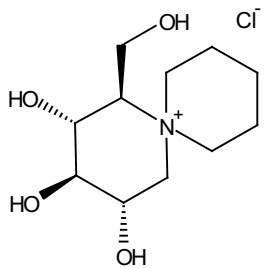


gHSQC (CDCl<sub>3</sub>, 400 MHz) of 20

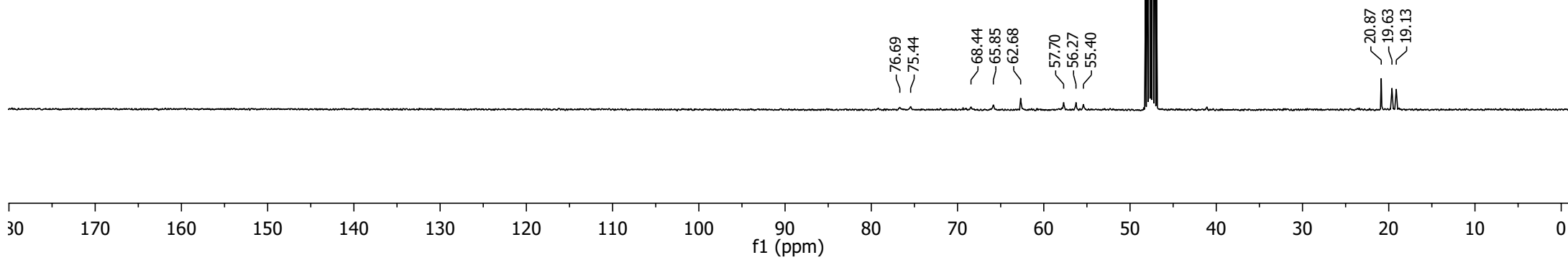
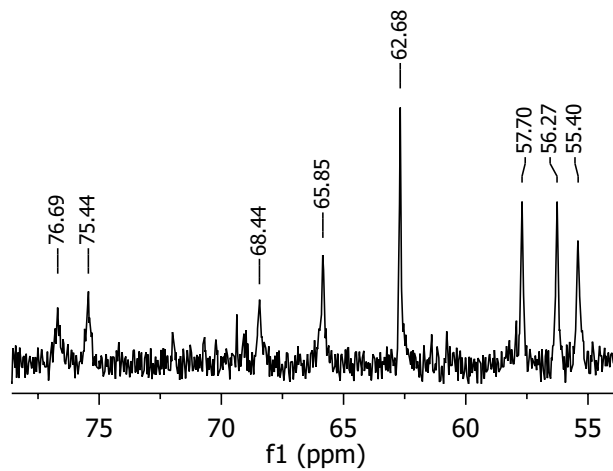
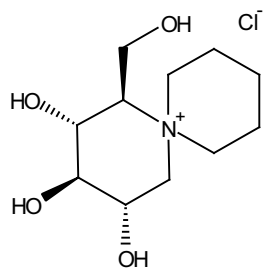




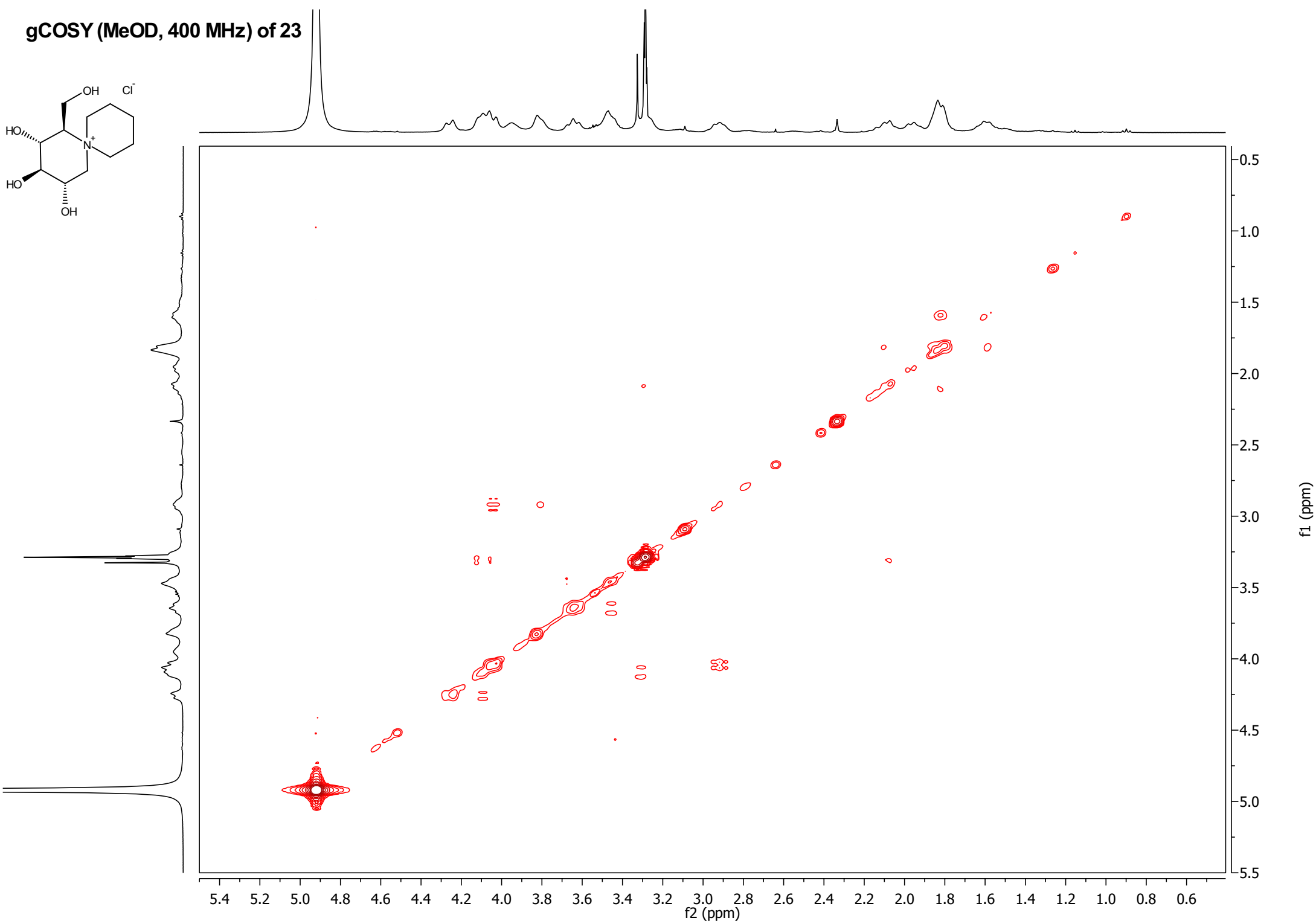
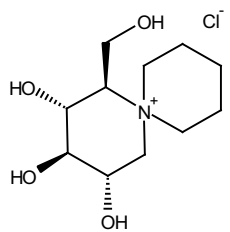
<sup>1</sup>H NMR (MeOD, 400 MHz) of 23



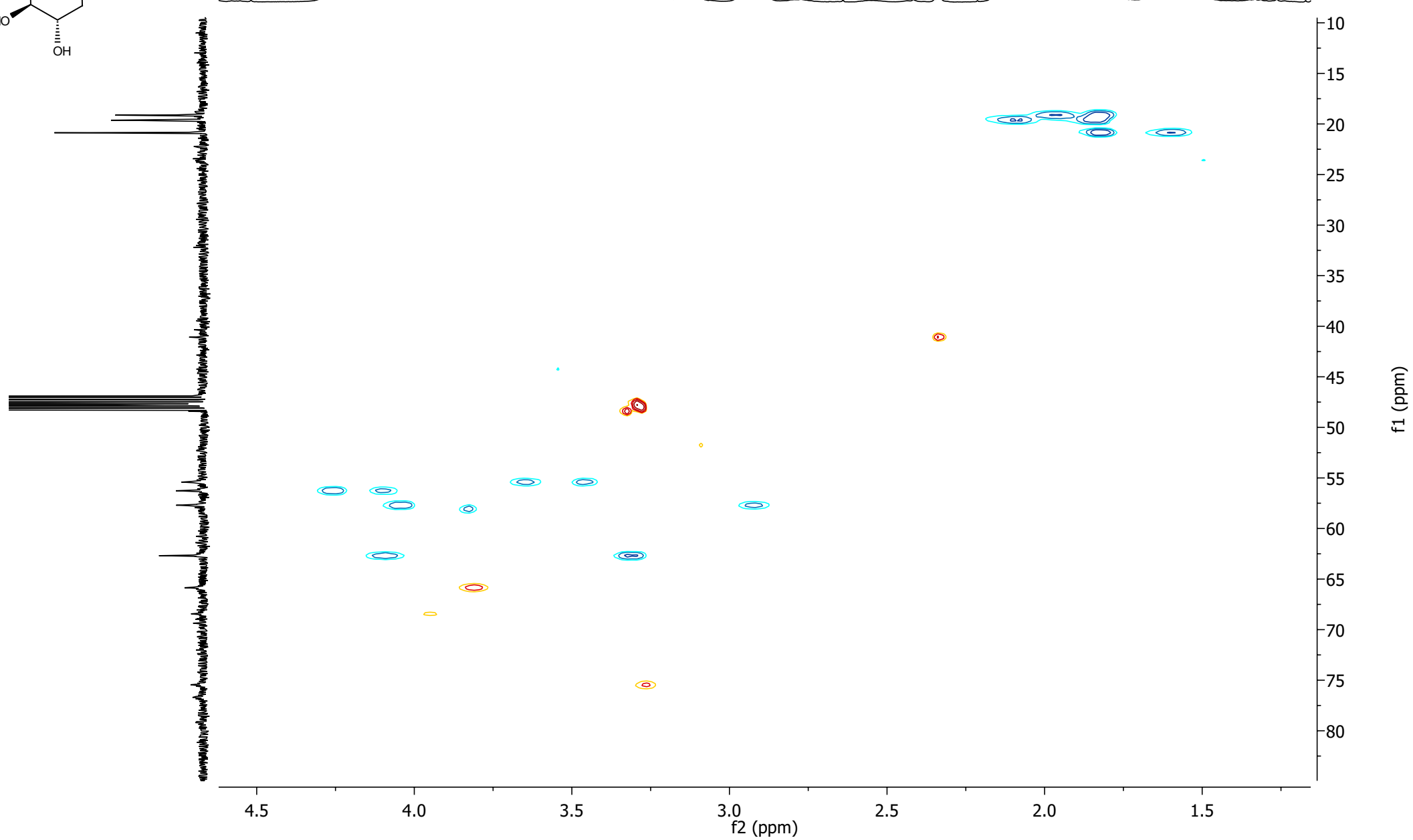
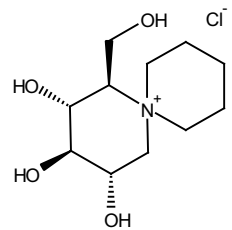
<sup>13</sup>C NMR (MeOD, 101 MHz) of 23



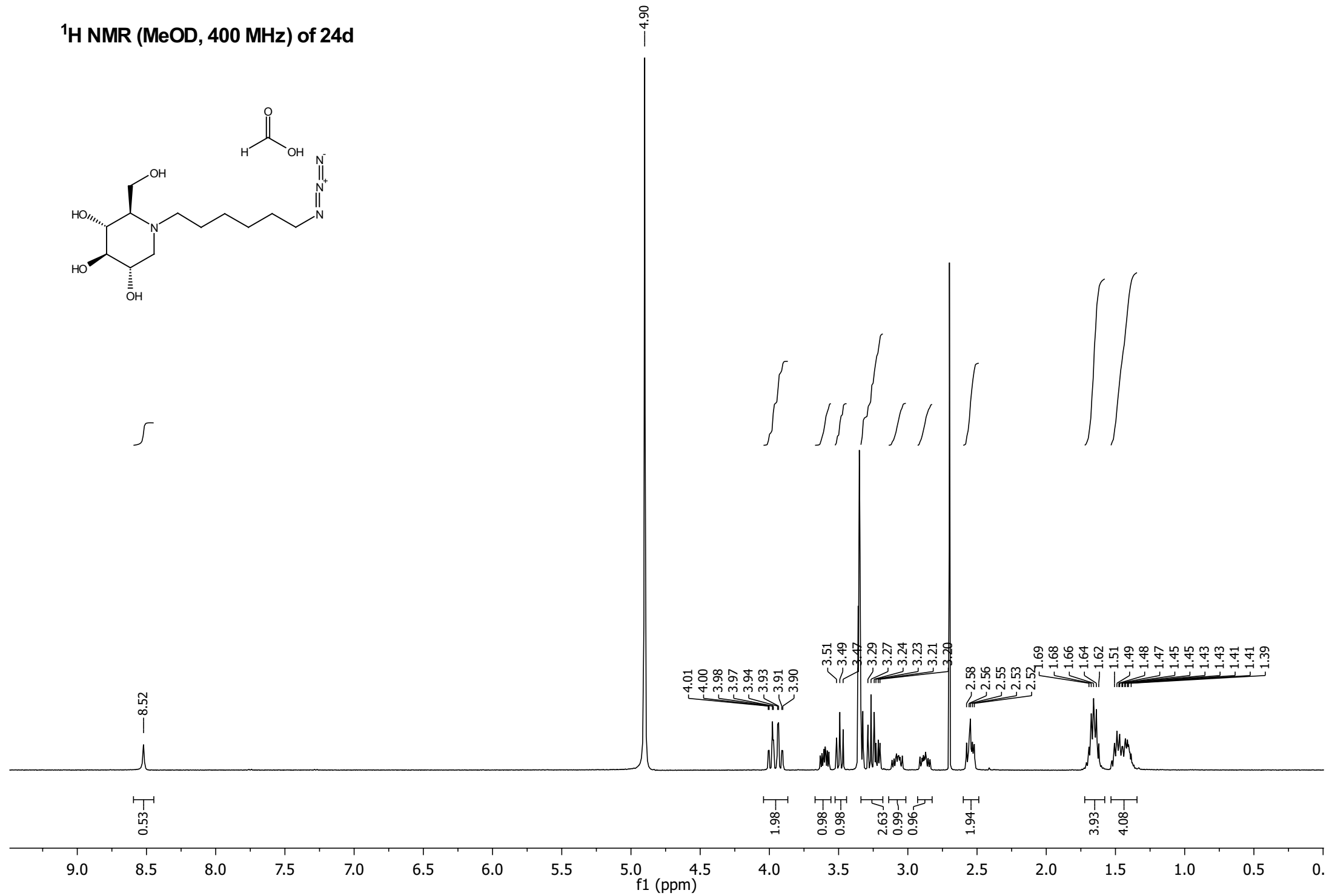
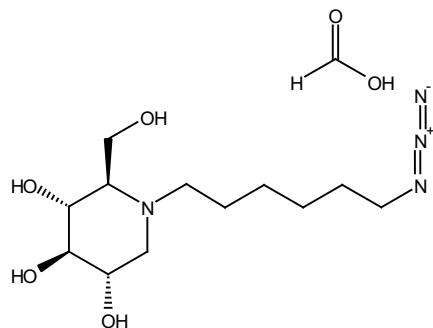
gCOSY (MeOD, 400 MHz) of 23



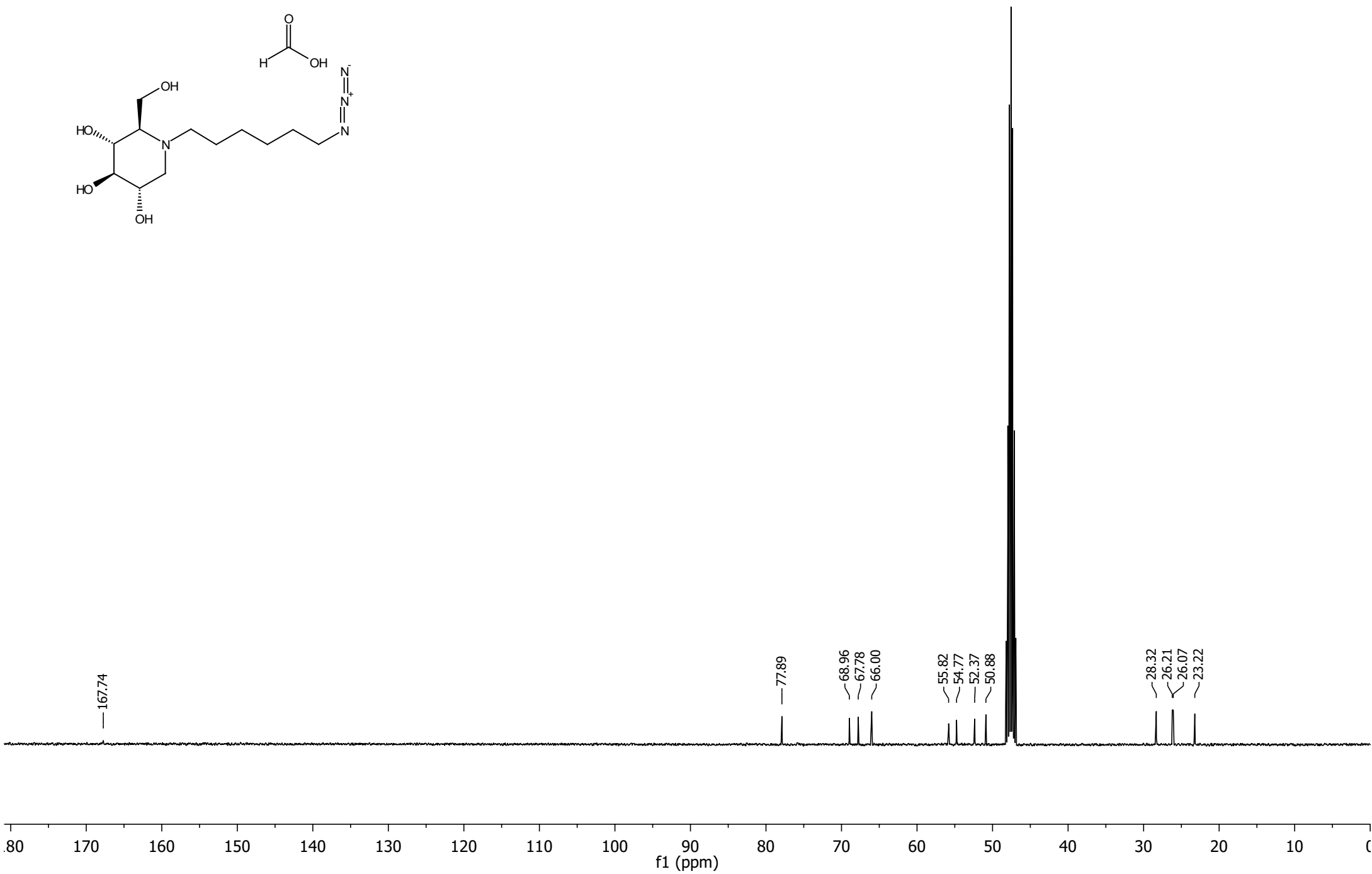
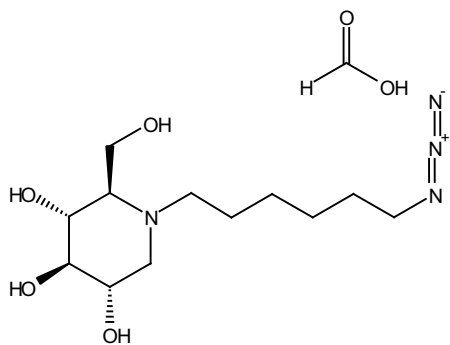
gHSQC (MeOD, 400 MHz) of 23



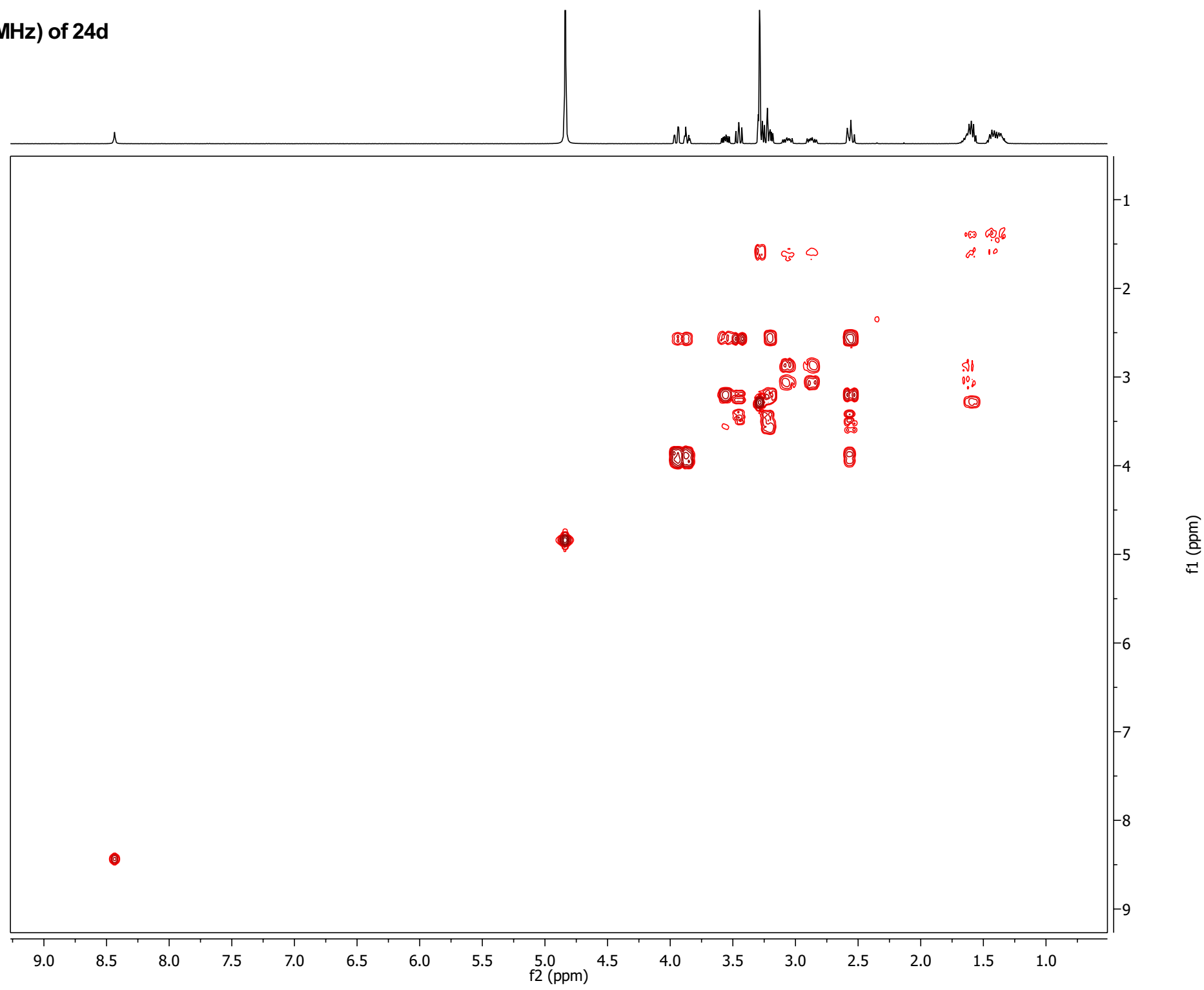
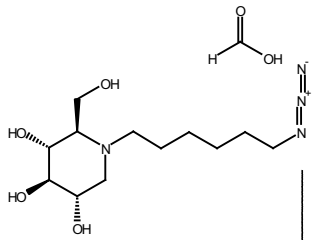
<sup>1</sup>H NMR (MeOD, 400 MHz) of 24d



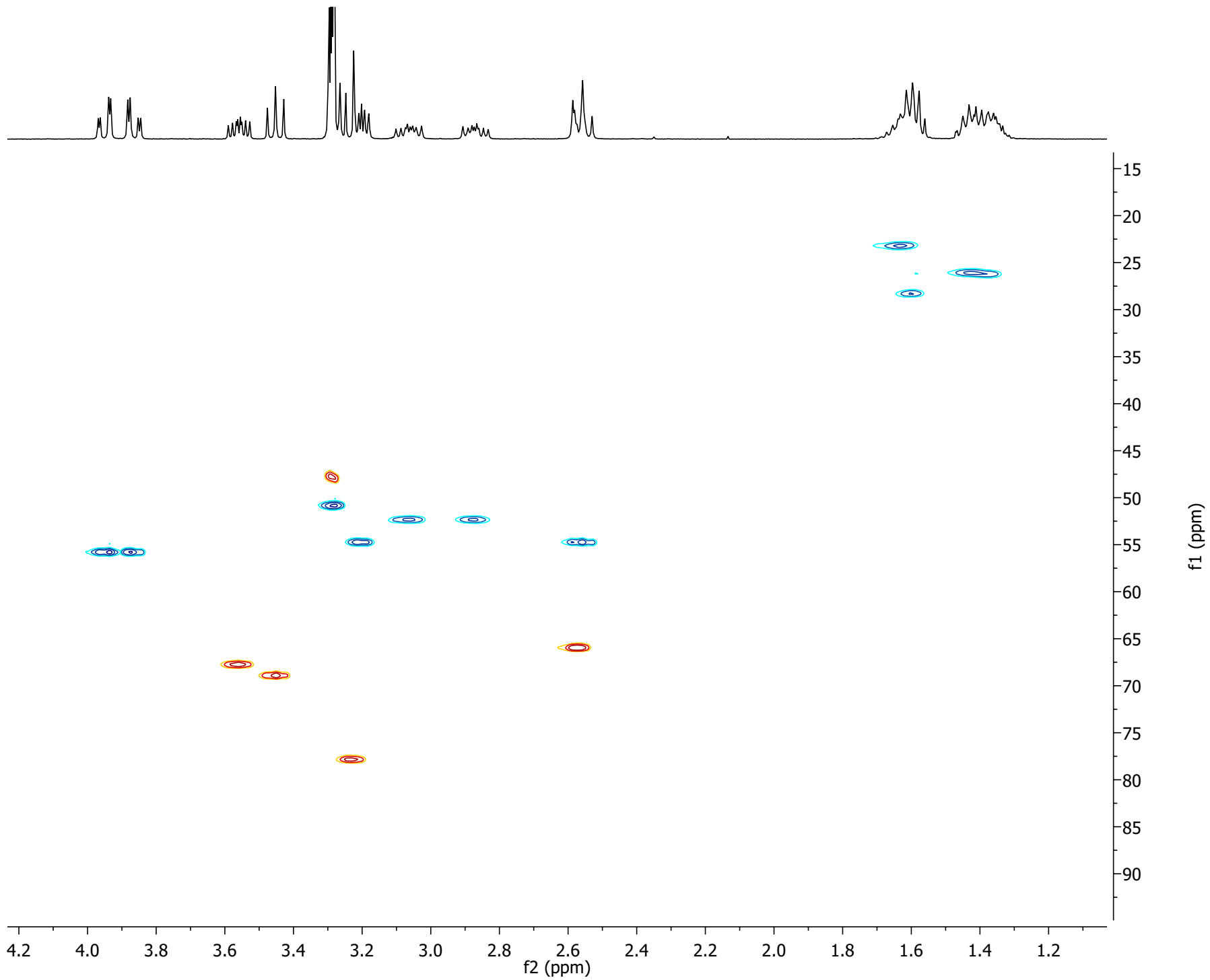
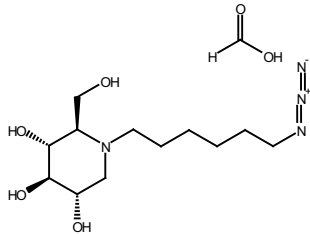
<sup>13</sup>C NMR (MeOD, 101 MHz) of 24d



gCOSY (MeOD, 400 MHz) of 24d

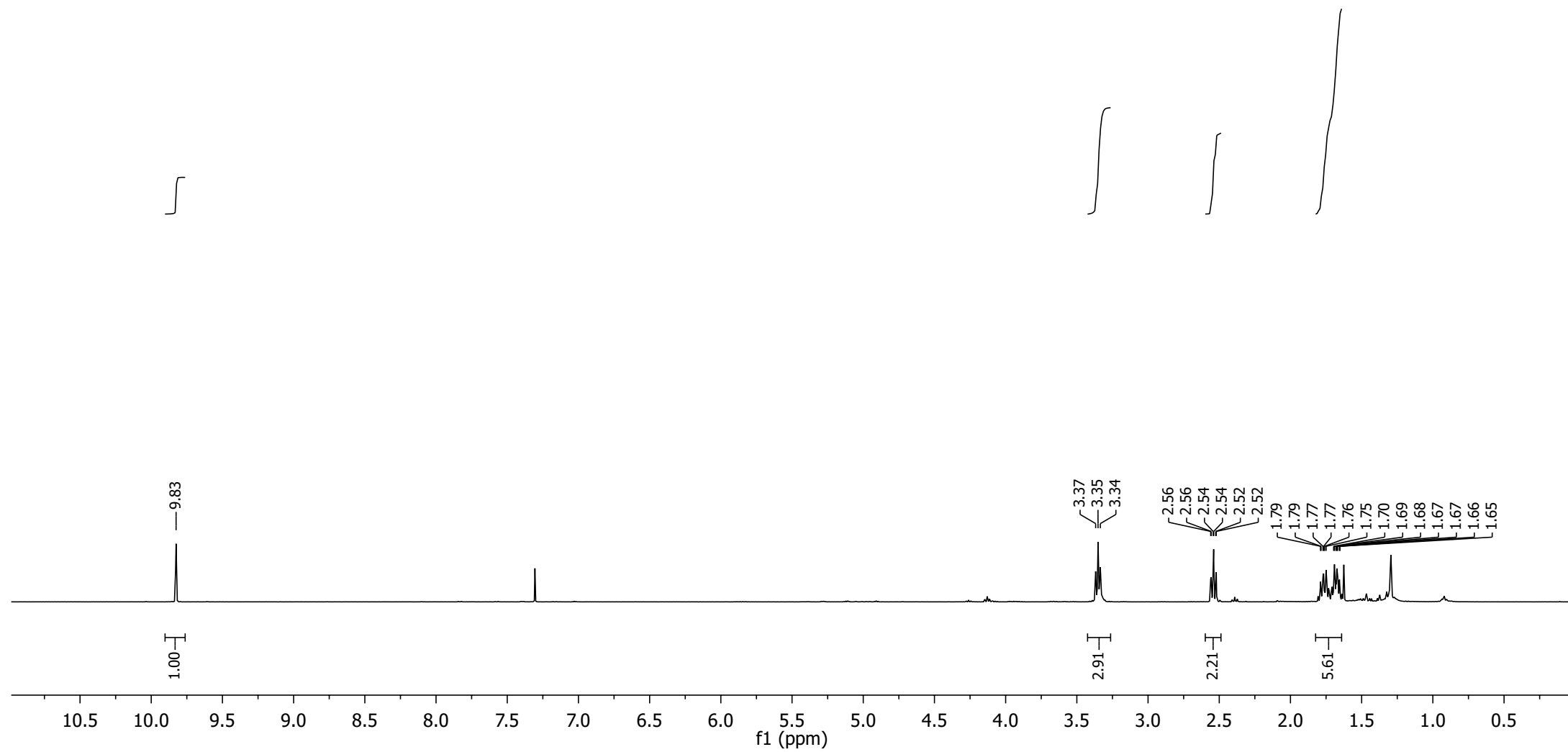
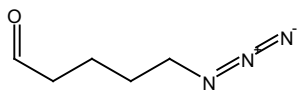


gHSQC (MeOD, 400 MHz) of 24d

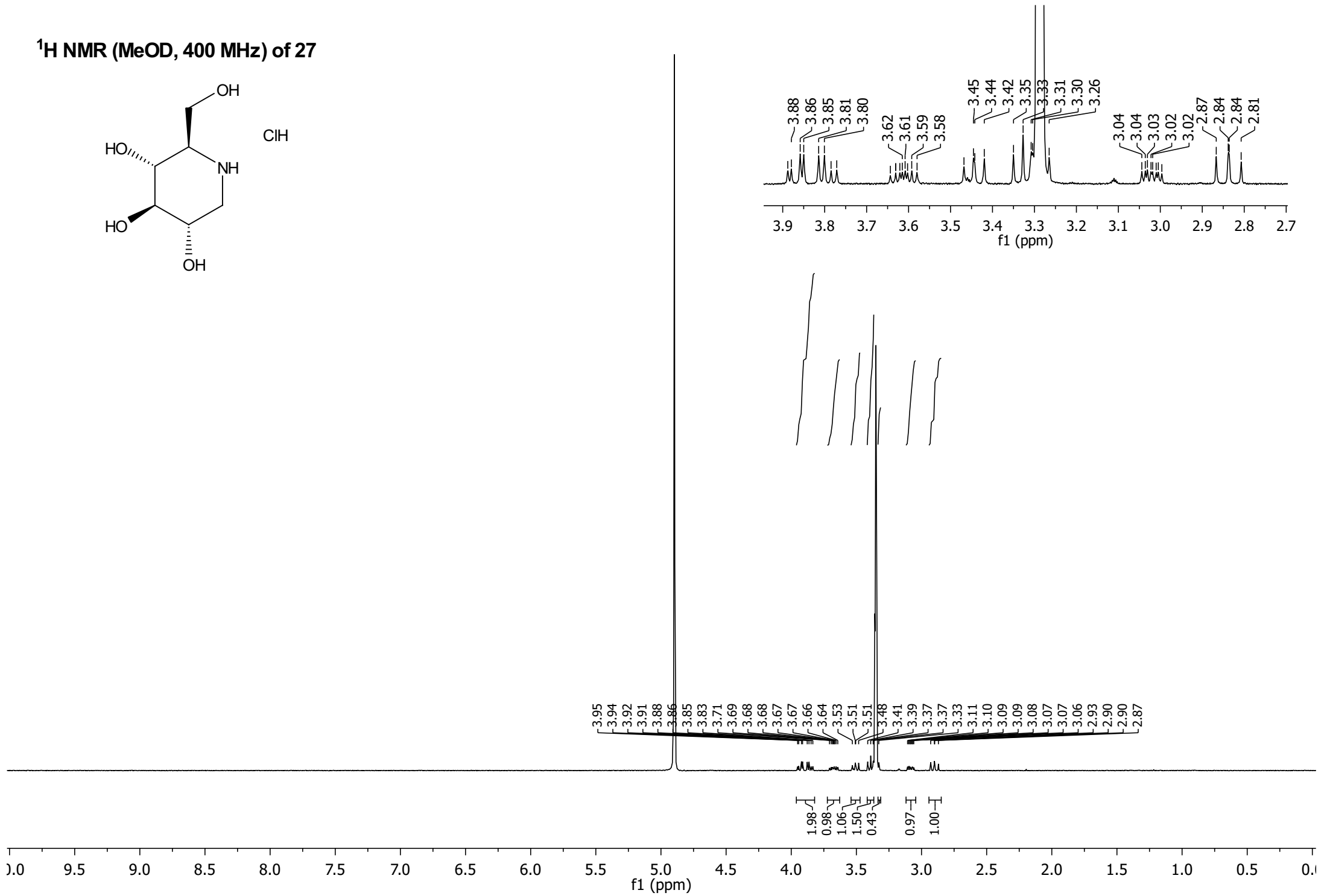
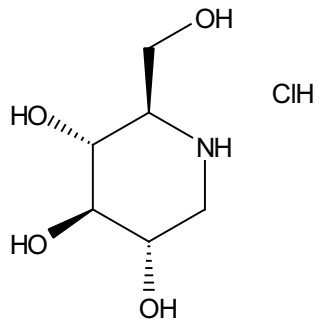




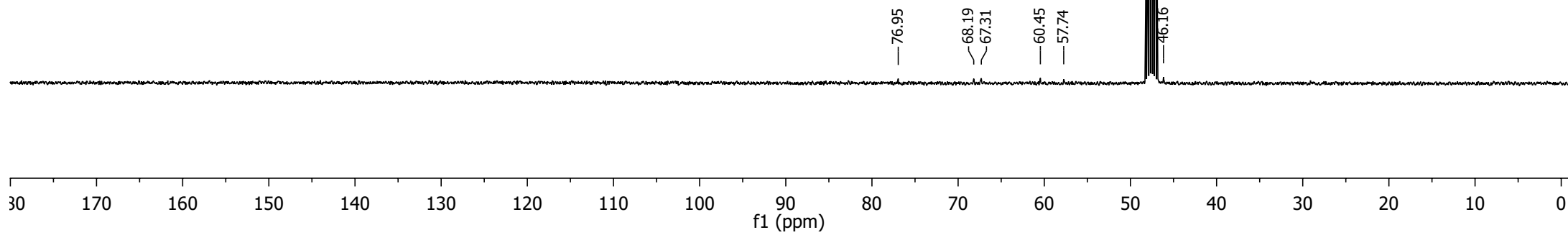
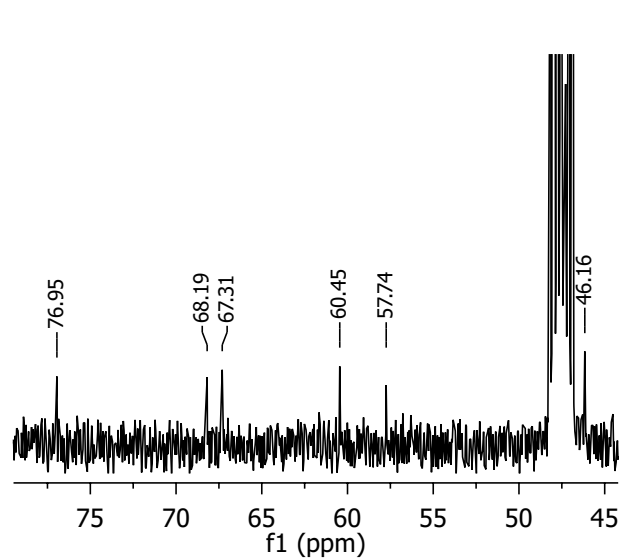
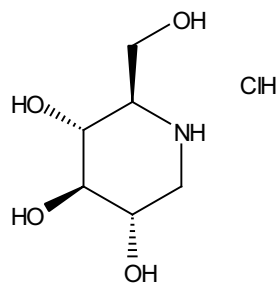
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 25



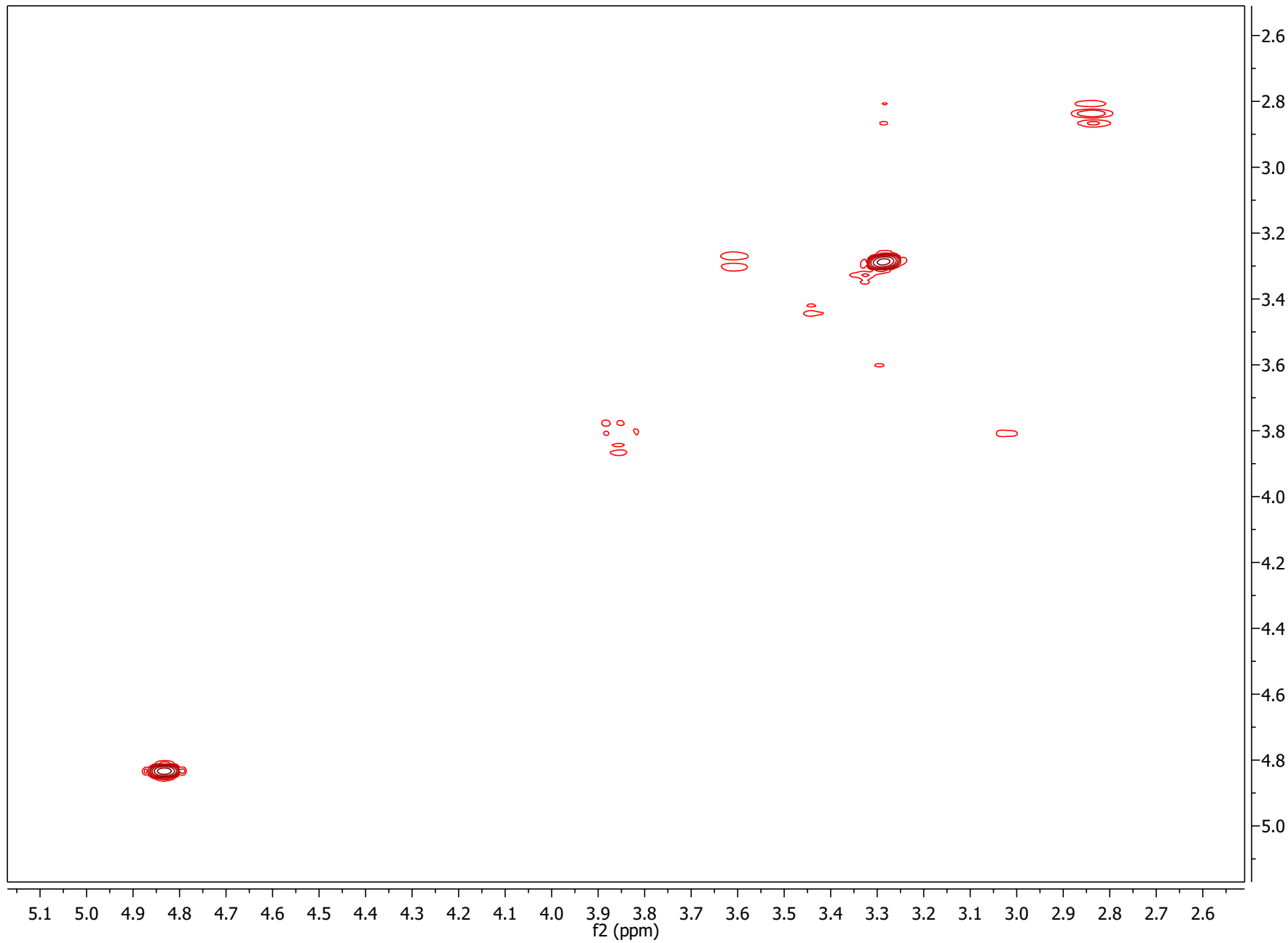
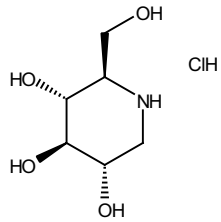
<sup>1</sup>H NMR (MeOD, 400 MHz) of 27



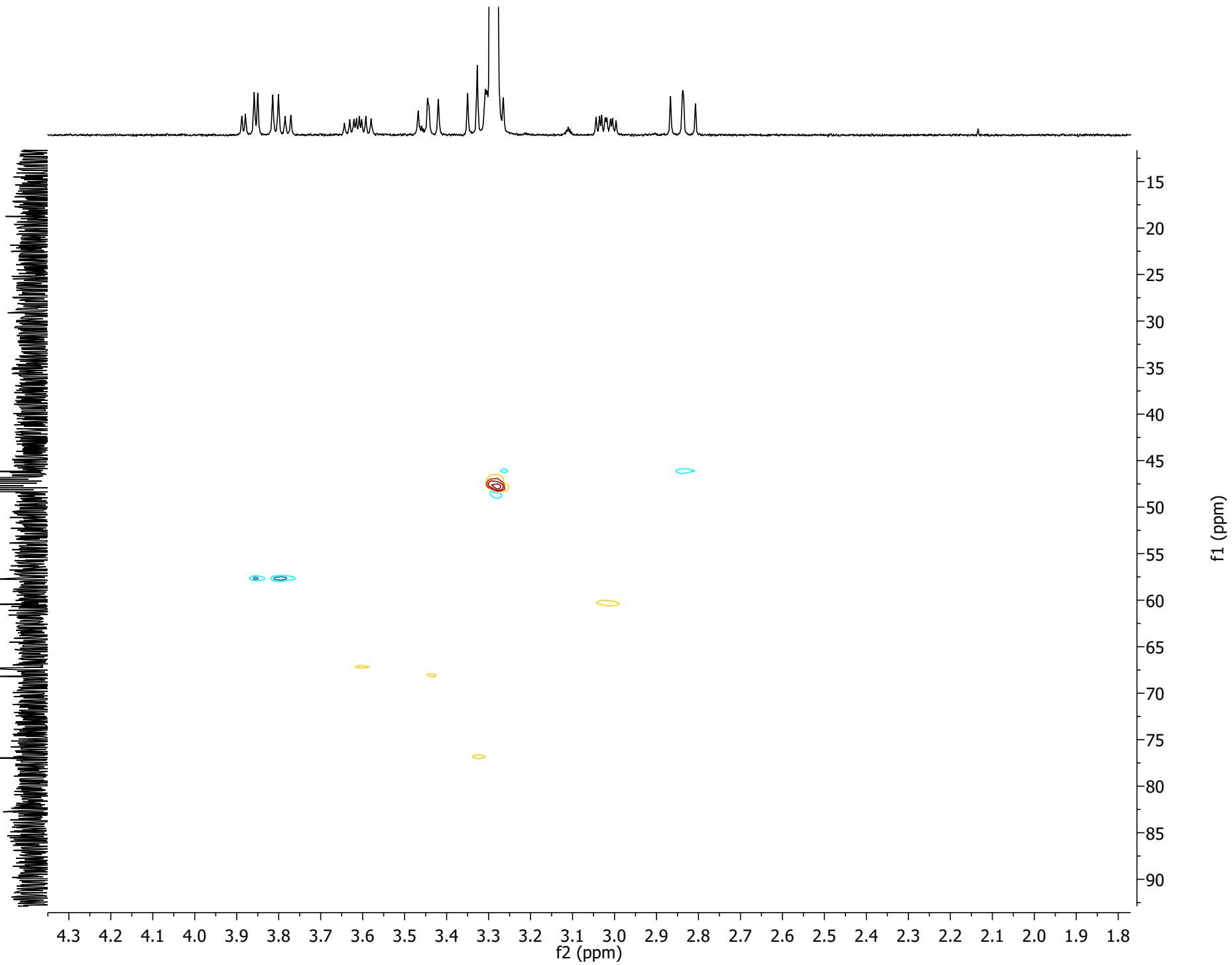
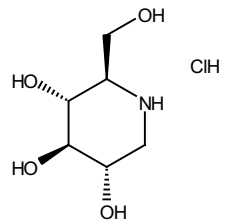
<sup>13</sup>C NMR (MeOD, 101 MHz) of 27



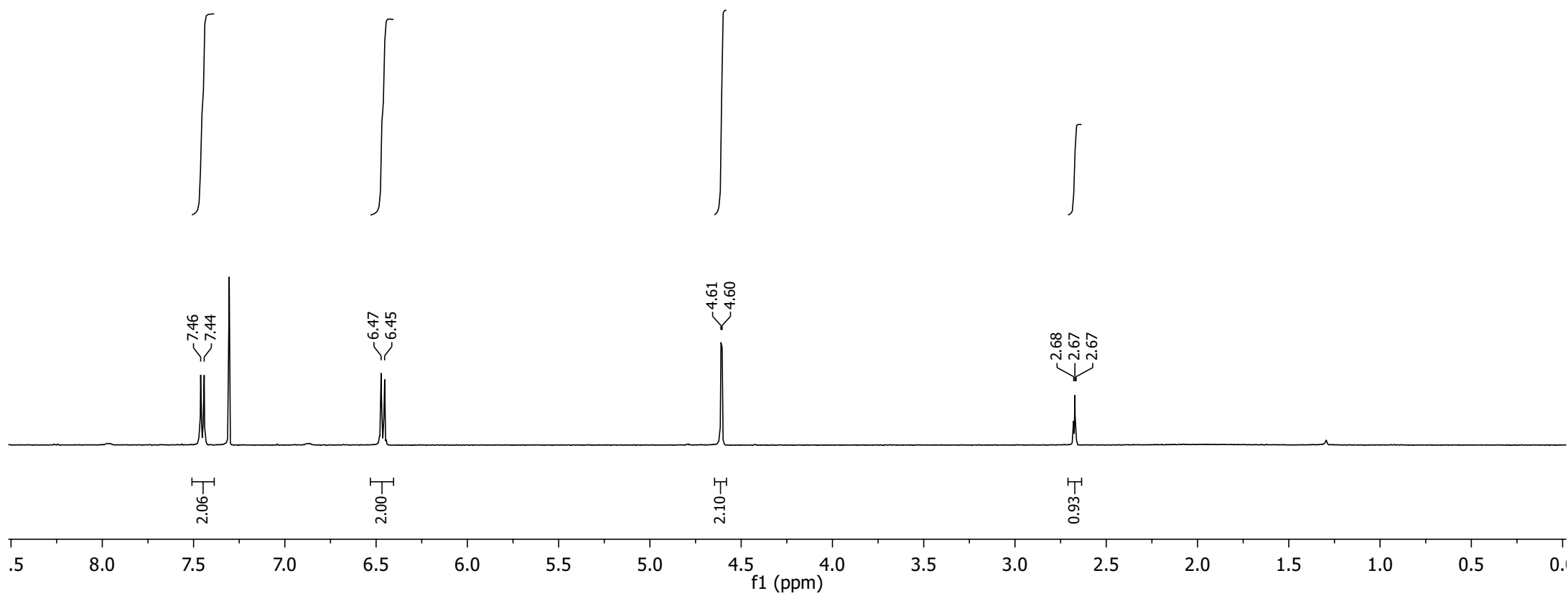
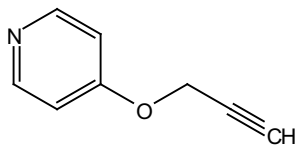
gCOSY (MeOD, 400 MHz) of 27



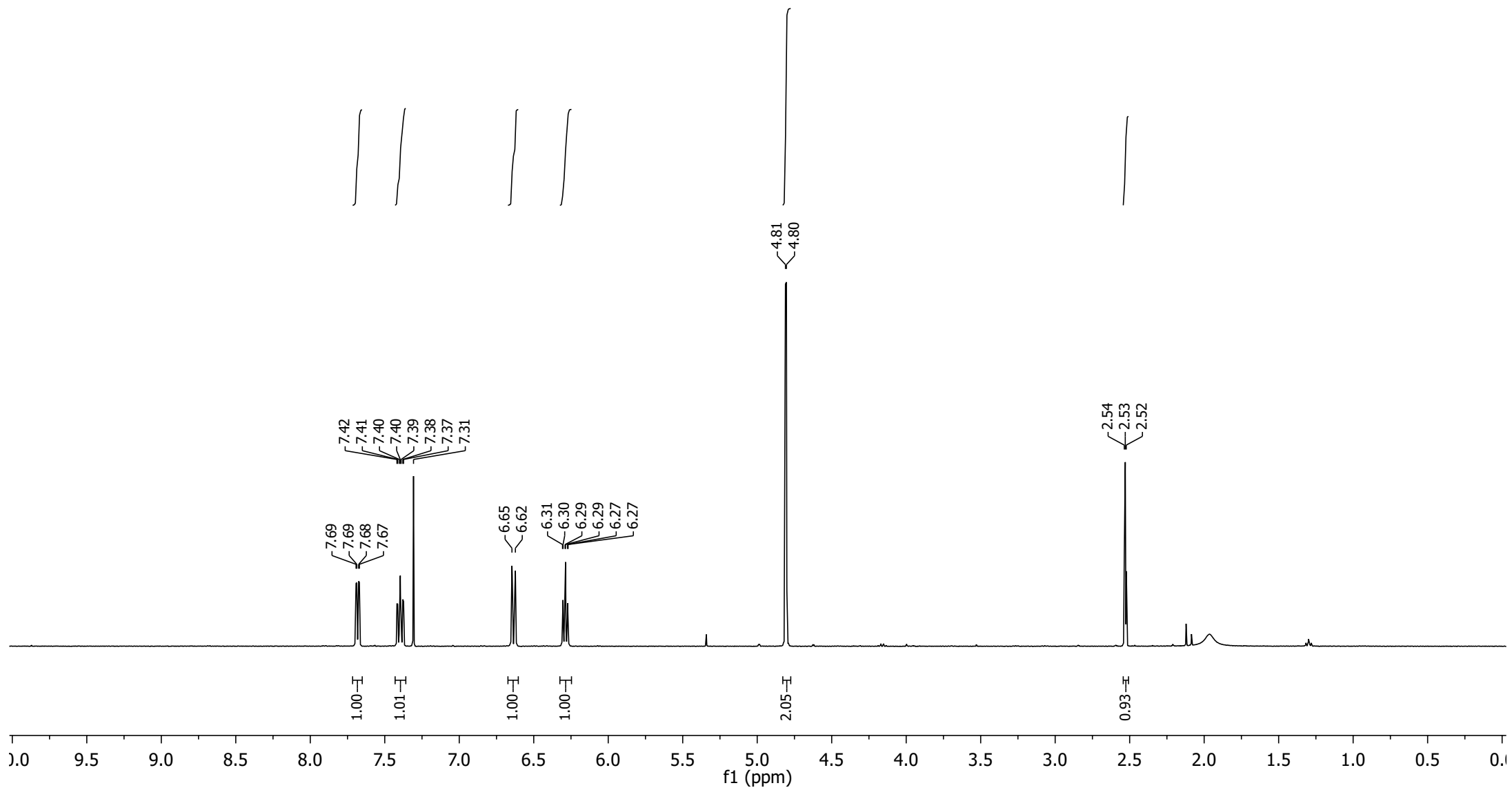
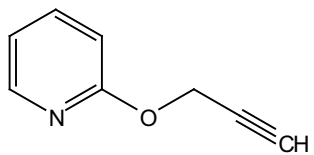
gHSQC (MeOD, 400 MHz) of 27



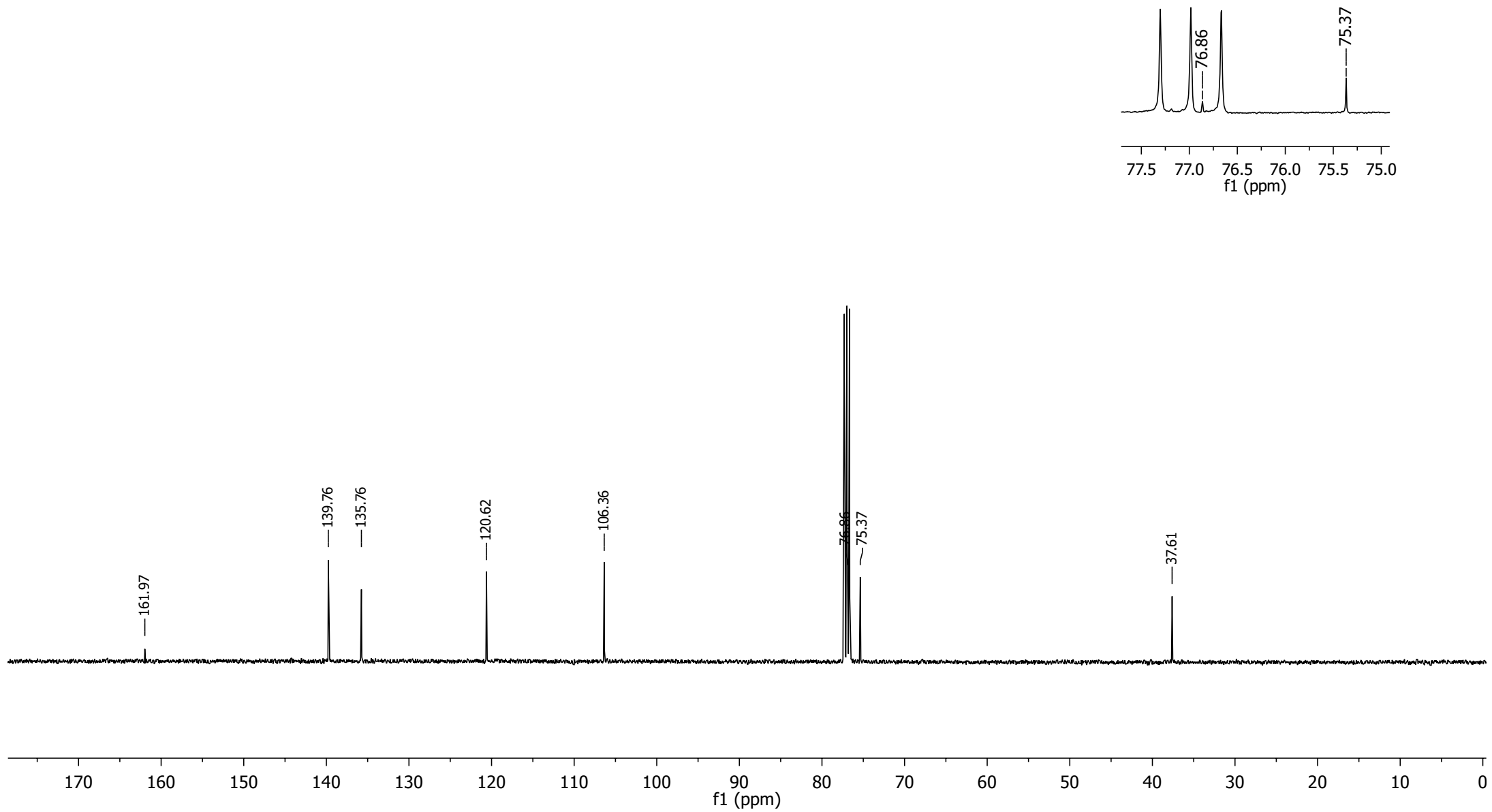
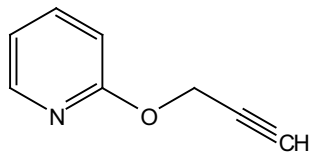
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400MHz) of 30(VI)



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 30(VII)

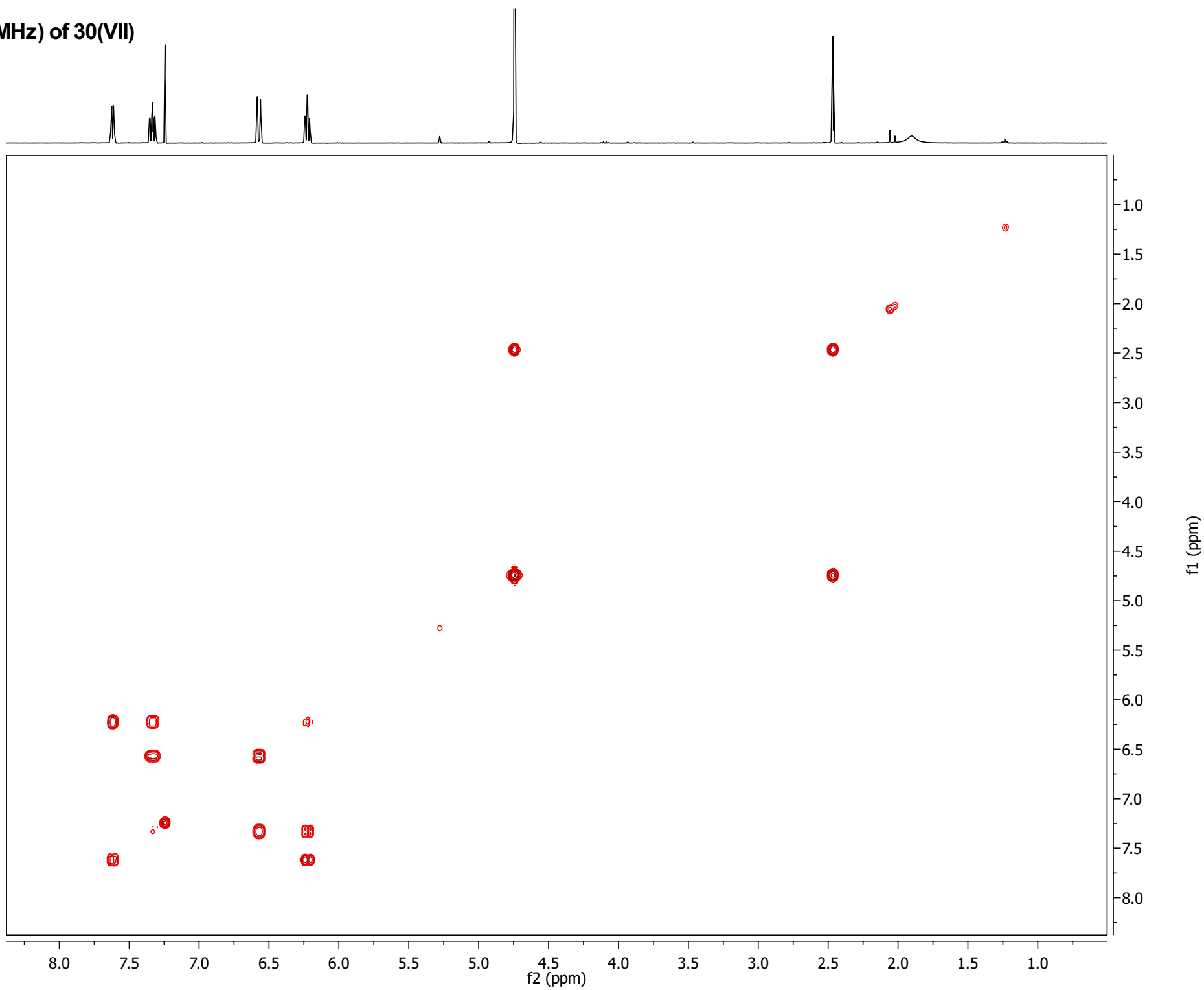
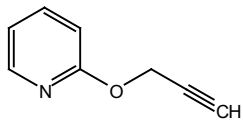


<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 30(VII)

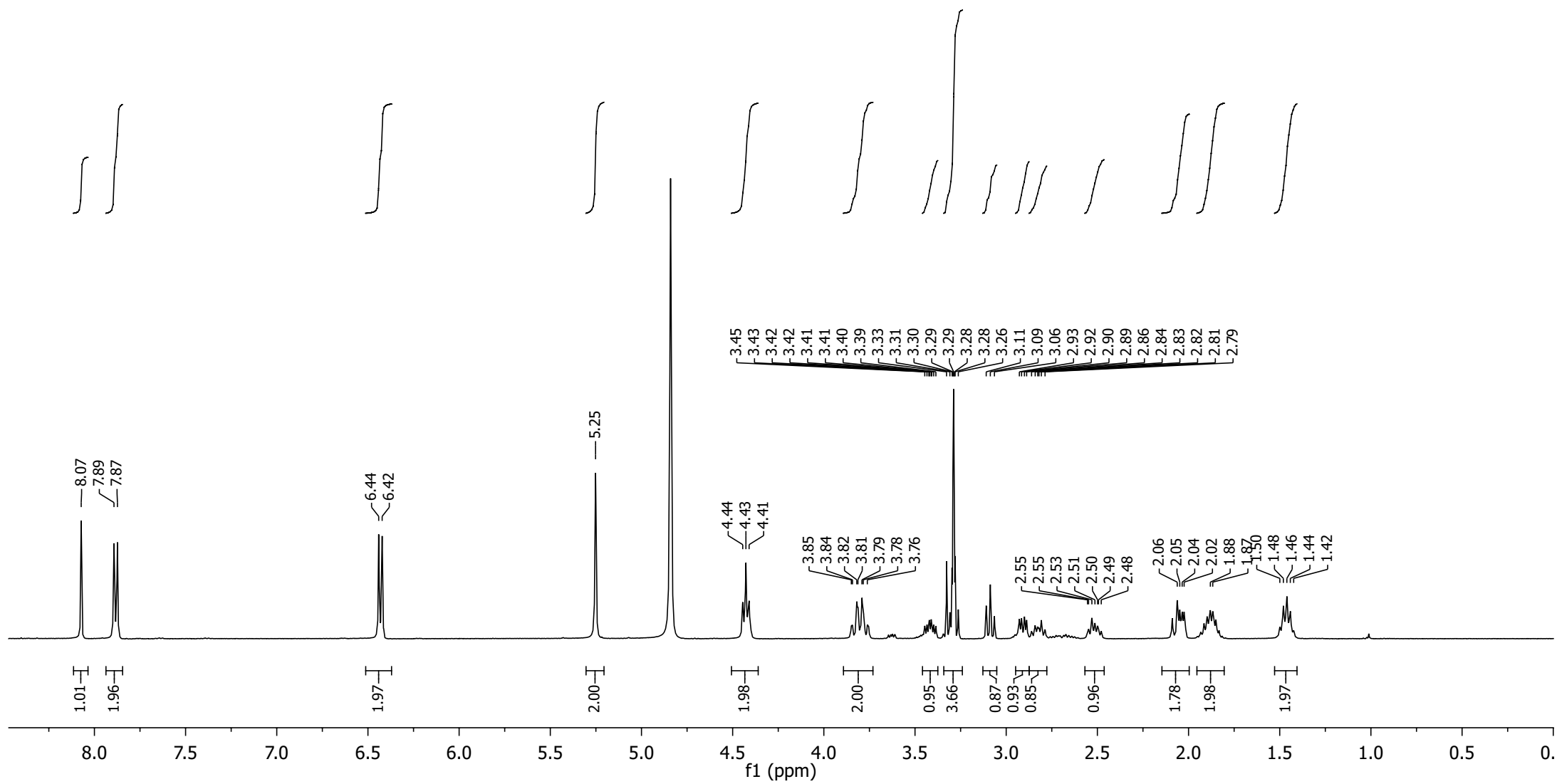
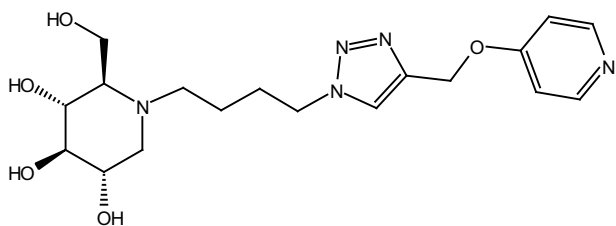




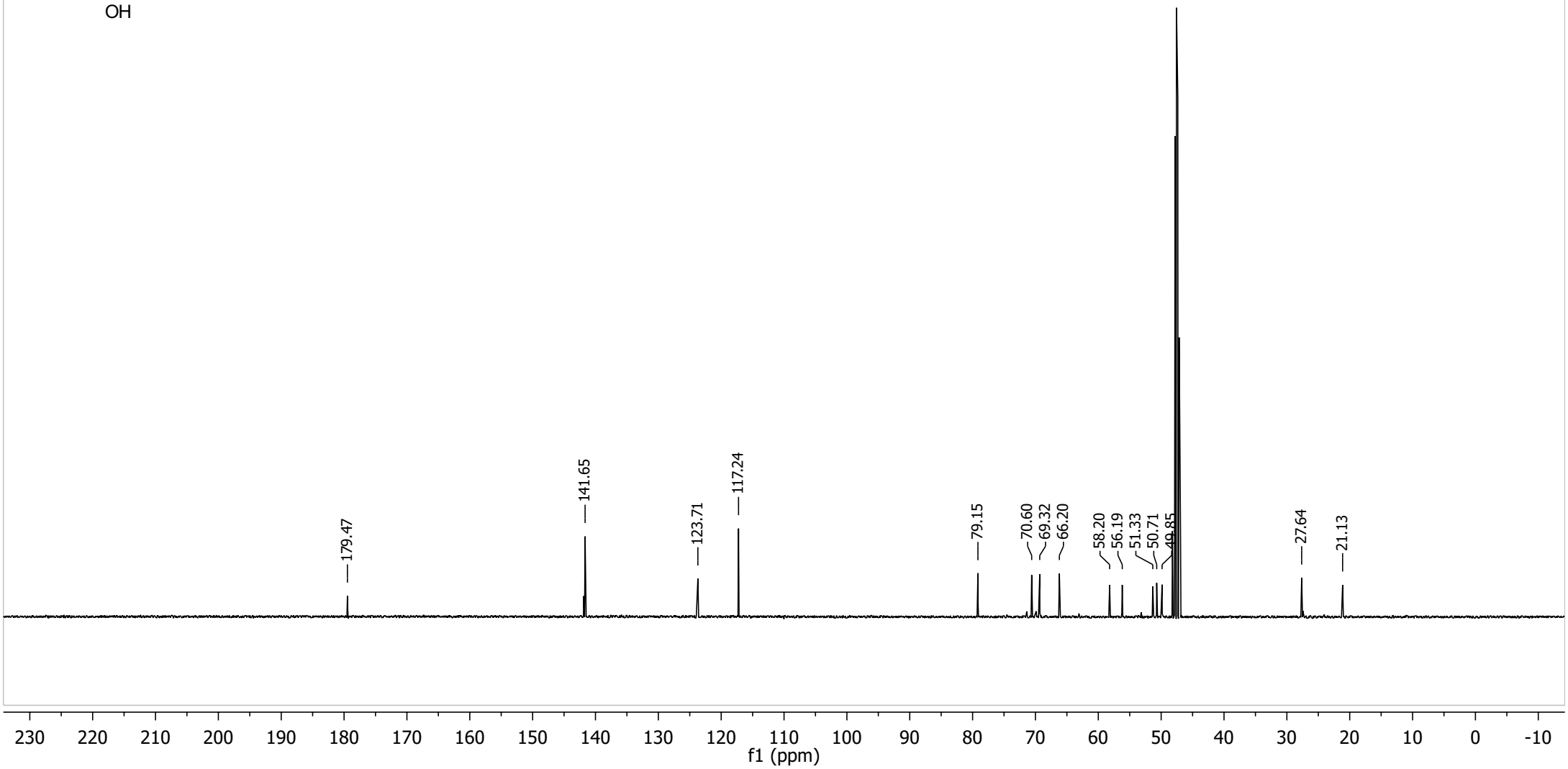
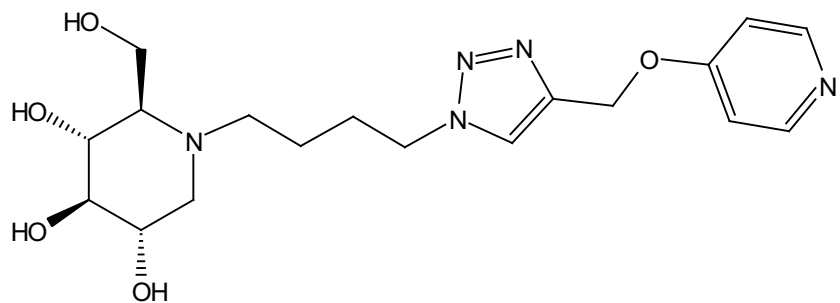
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 30(VII)



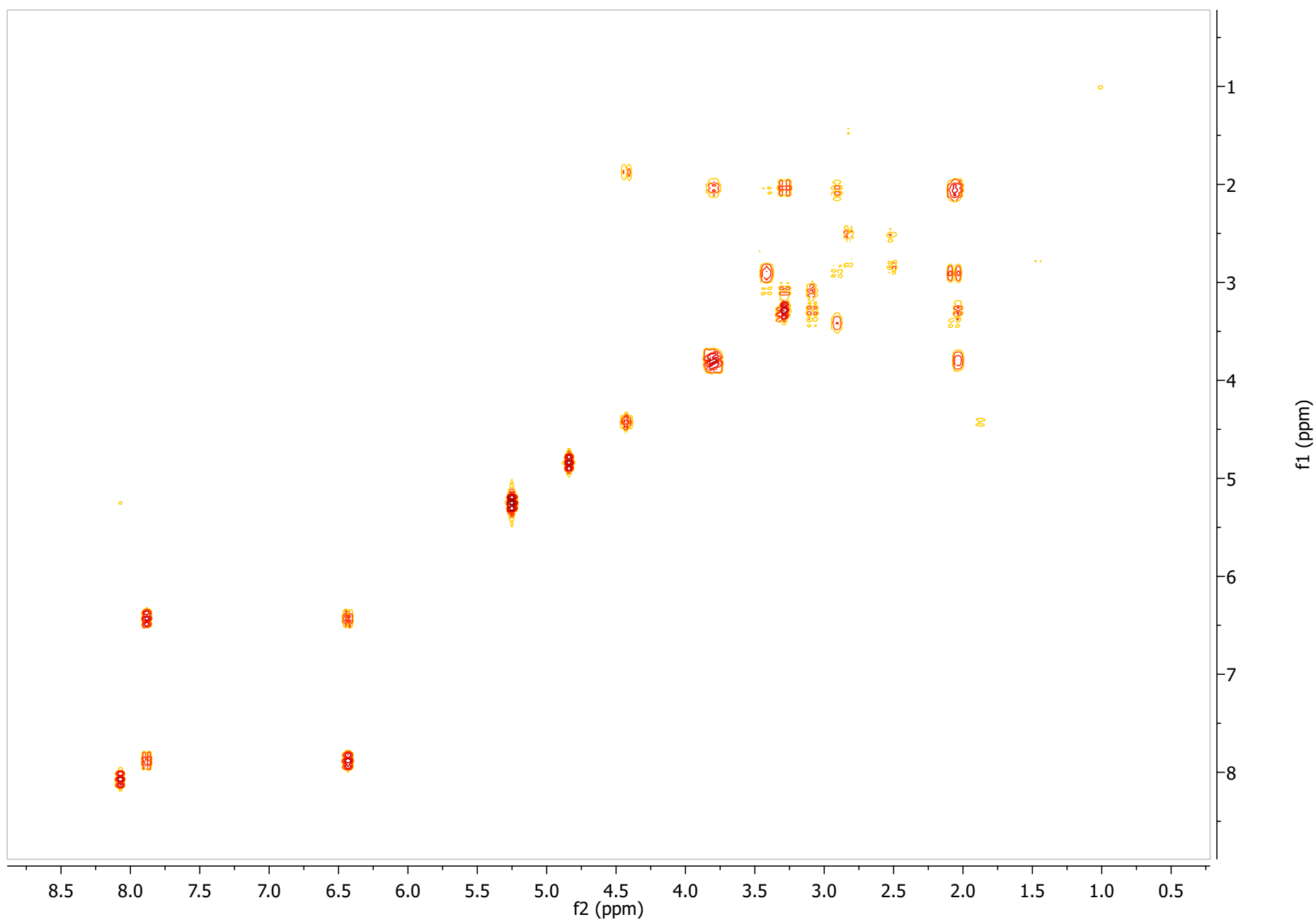
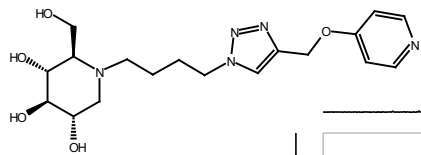
<sup>1</sup>H NMR (MeOD, 400 MHz) of 31b(VI)



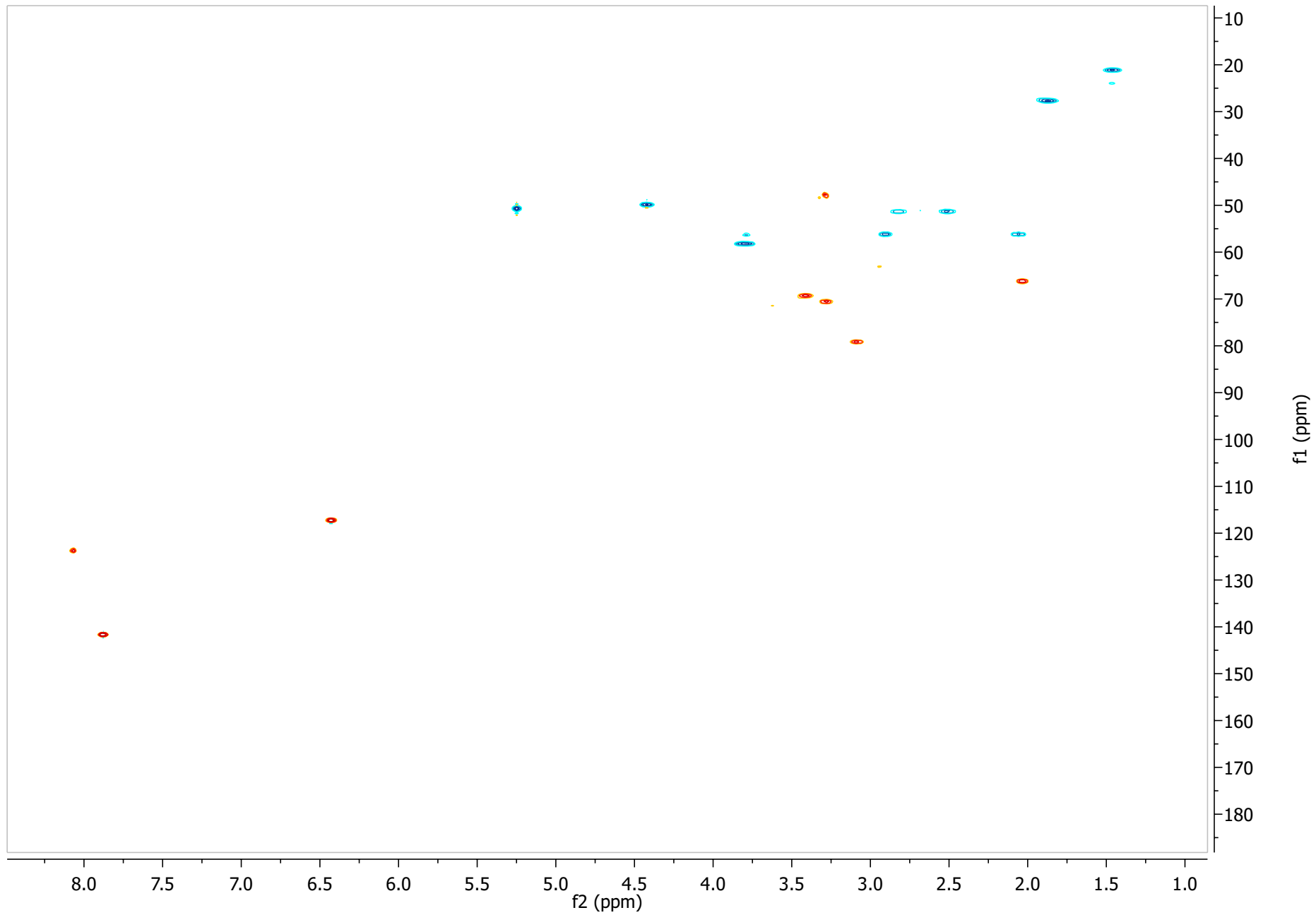
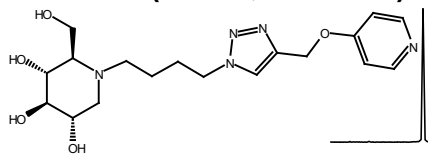
<sup>13</sup>C NMR (MeOD, 101 MHz) of 31b(VI)



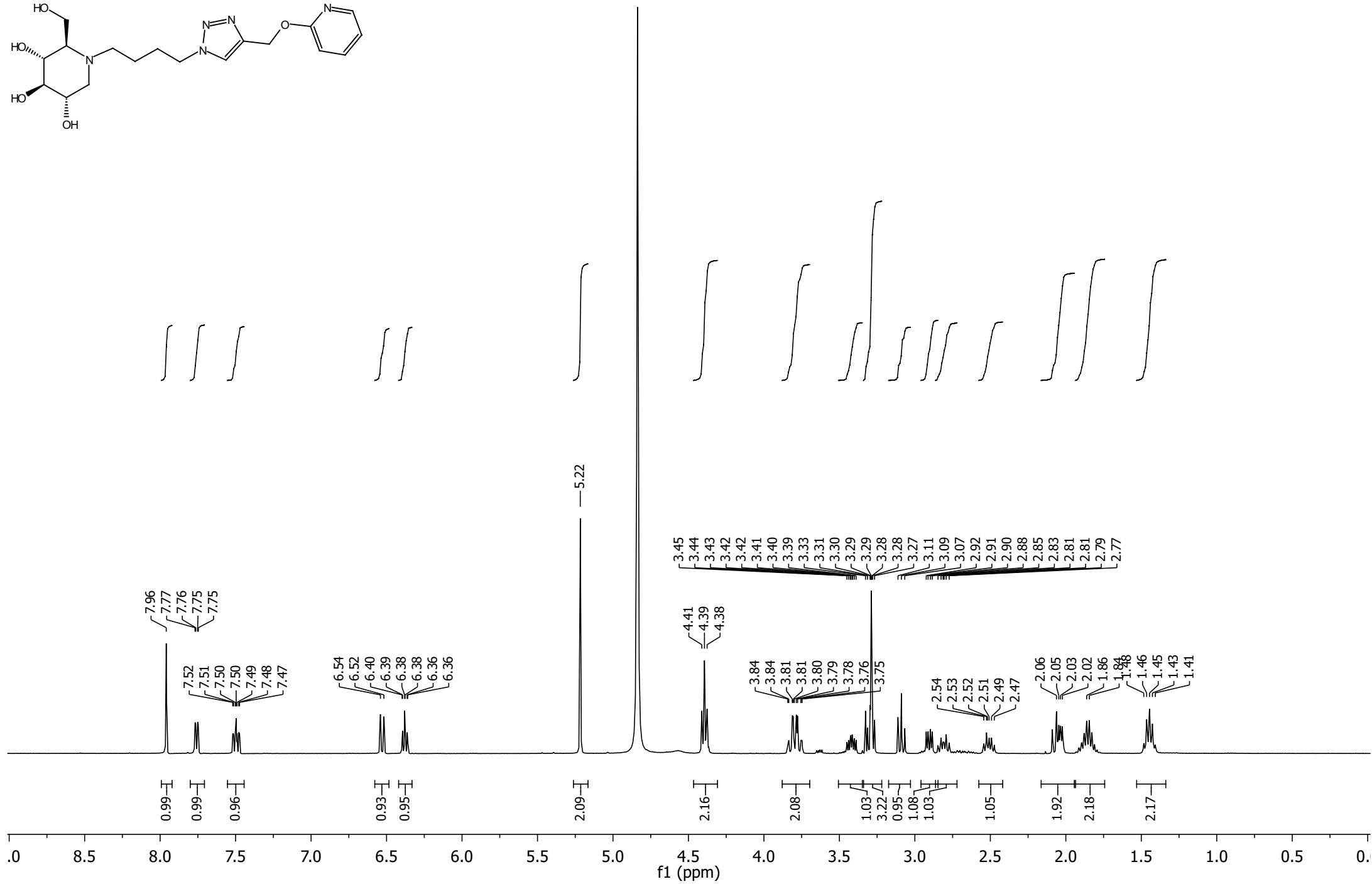
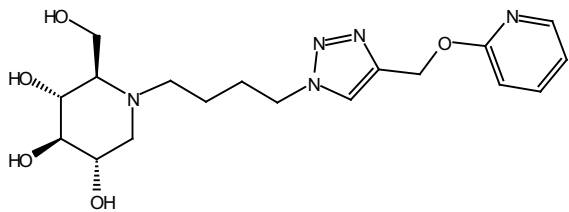
gCOSY (MeOD, 400 MHz) of 31b(VI)



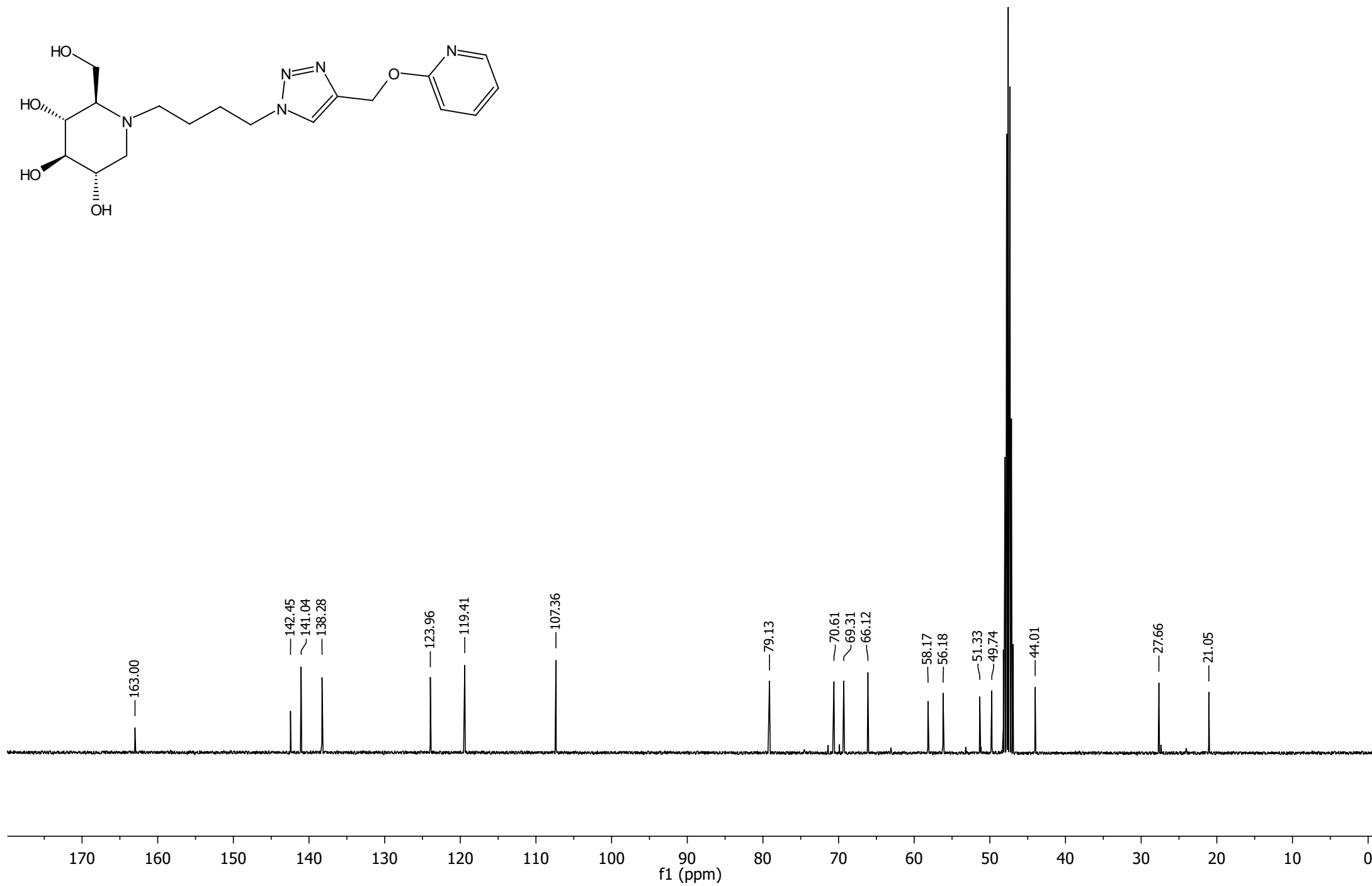
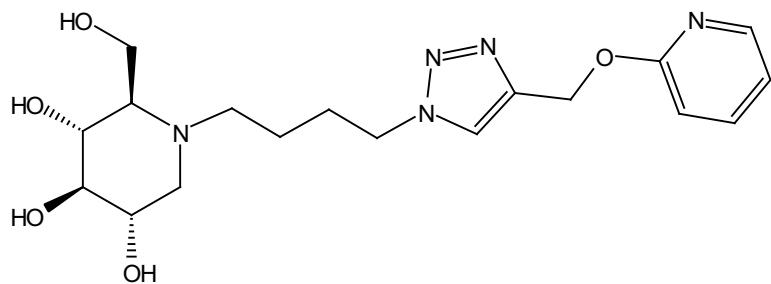
# HSQCAD (MeOD, 400 MHz) of 31b(VI)



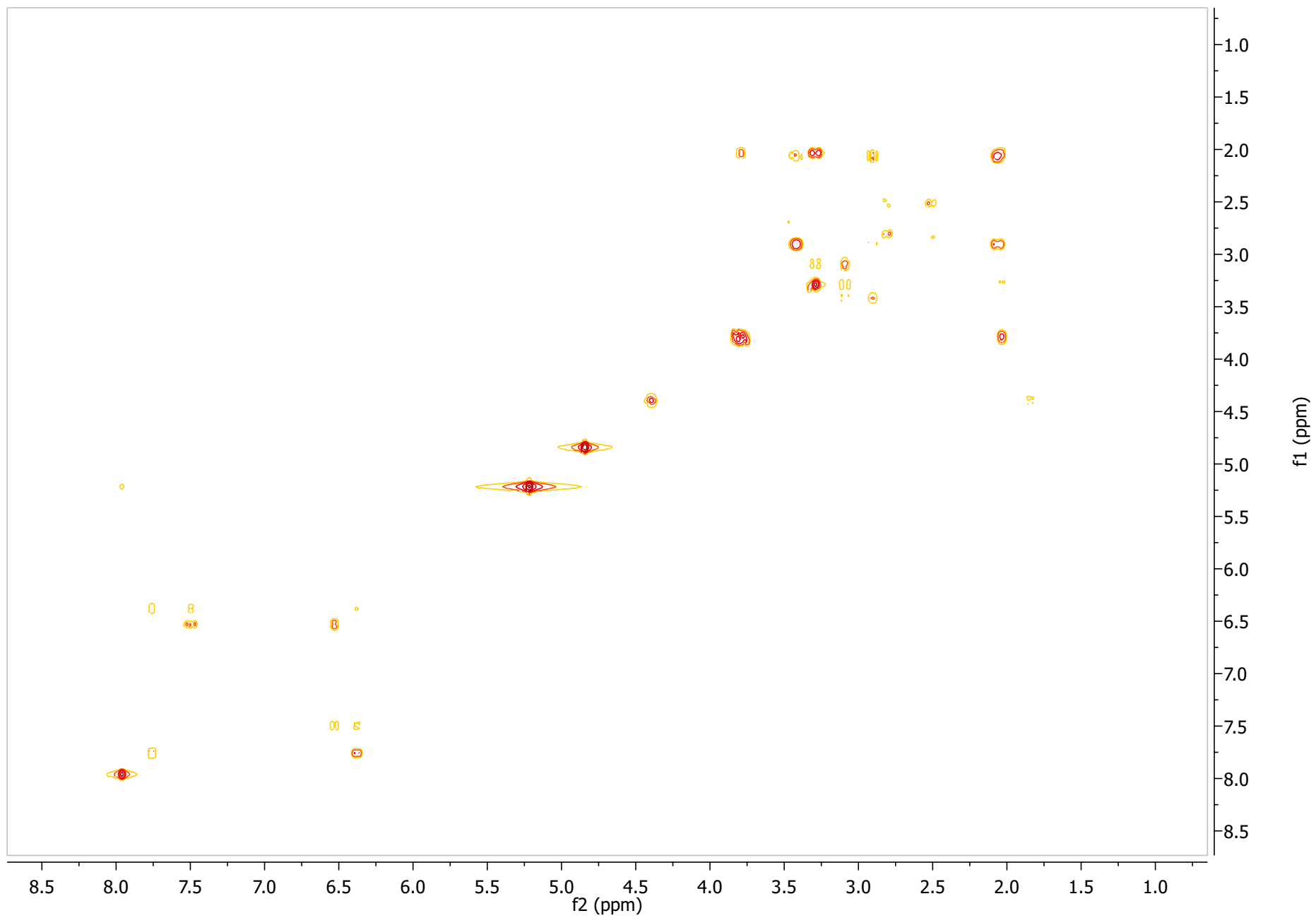
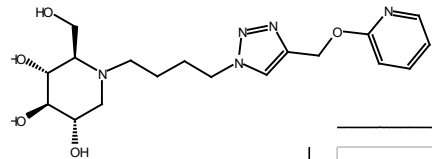
<sup>1</sup>H NMR (MeOD, 400 MHz) of 31b(VII)



<sup>13</sup>C NMR (MeOD, 101 MHz) of 31b(VII)

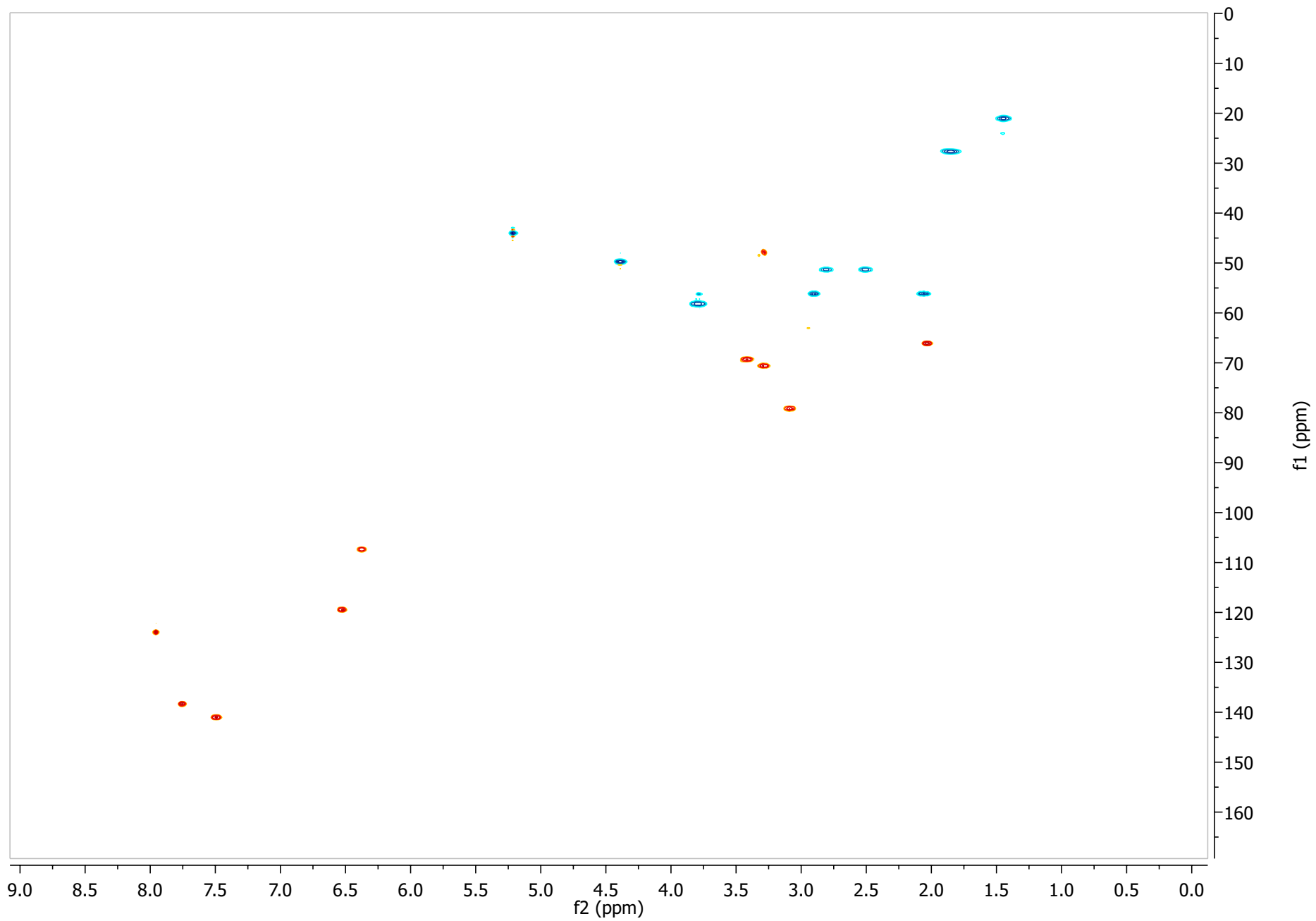
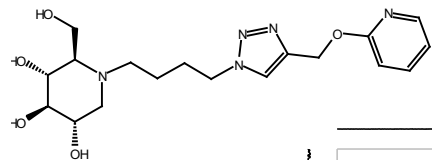


gCOSY (MeOD, 400 MHz) of 31b(VII)

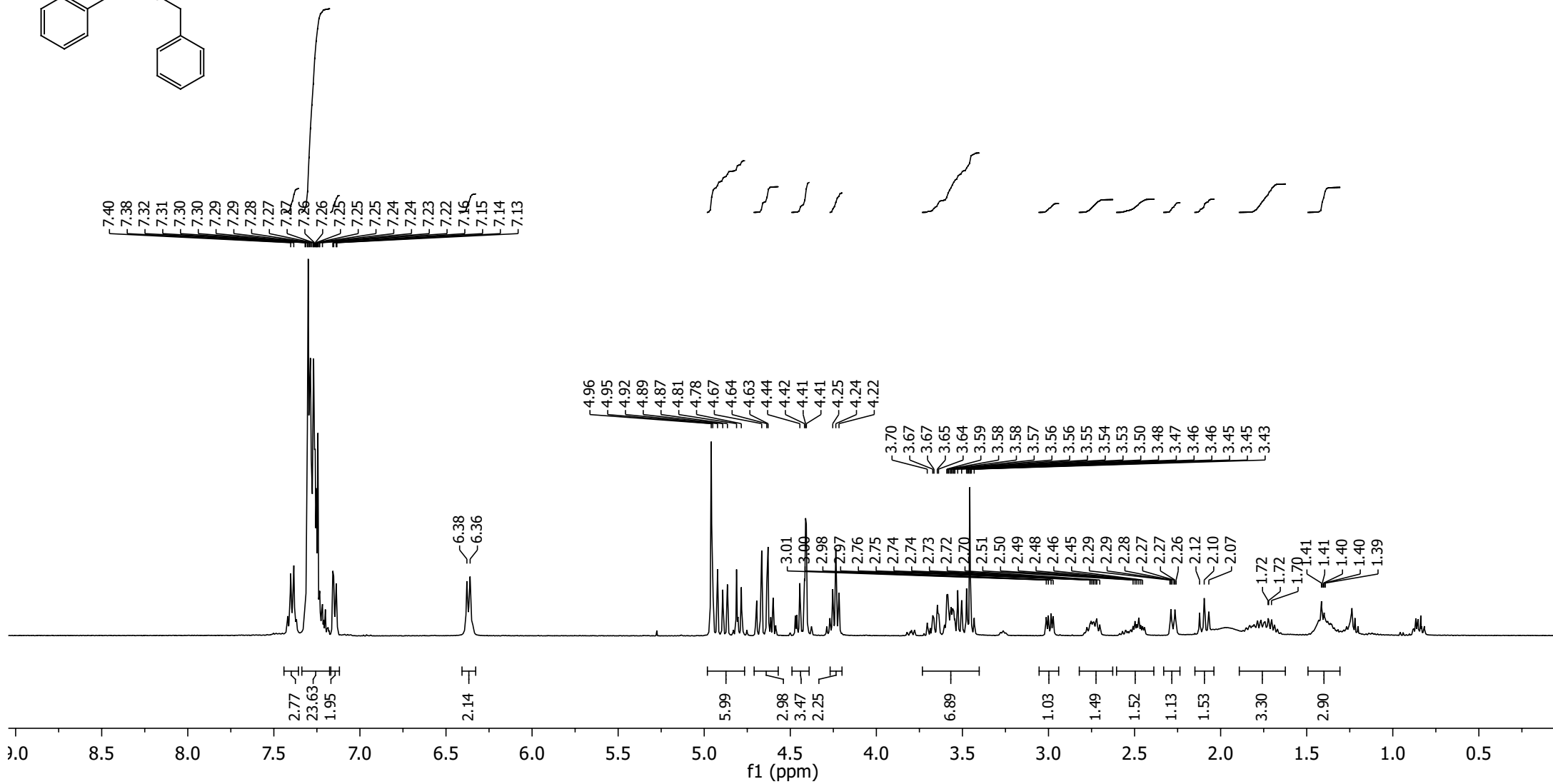
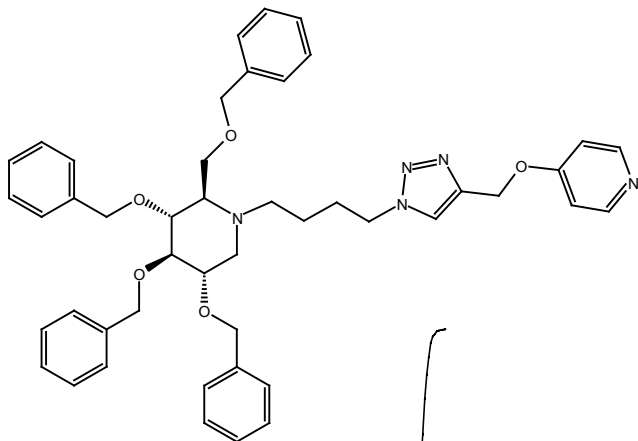




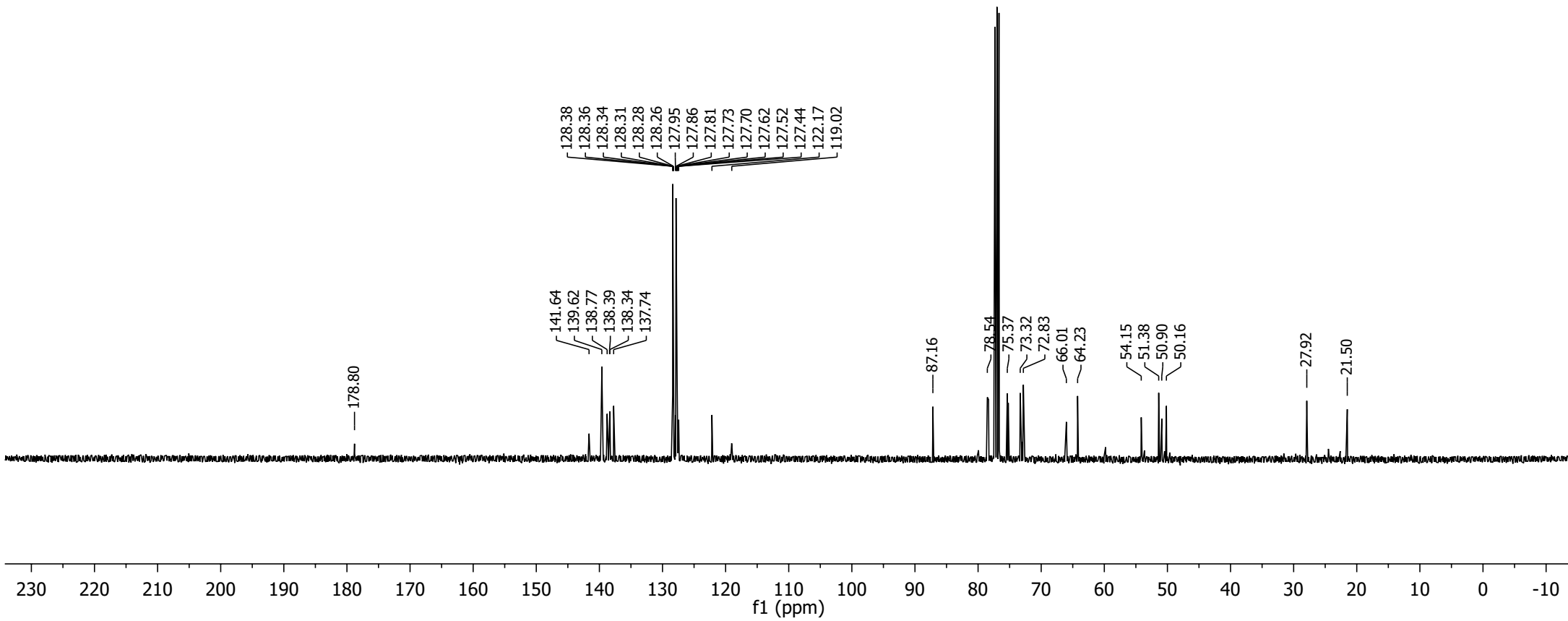
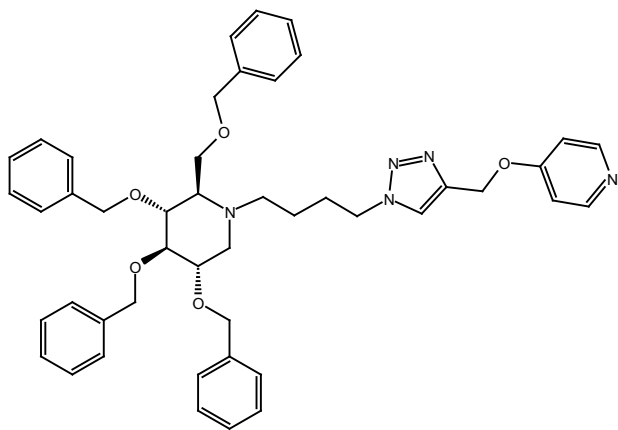
# HSQCAD (MeOD, 400 MHz) of 31b(VII)



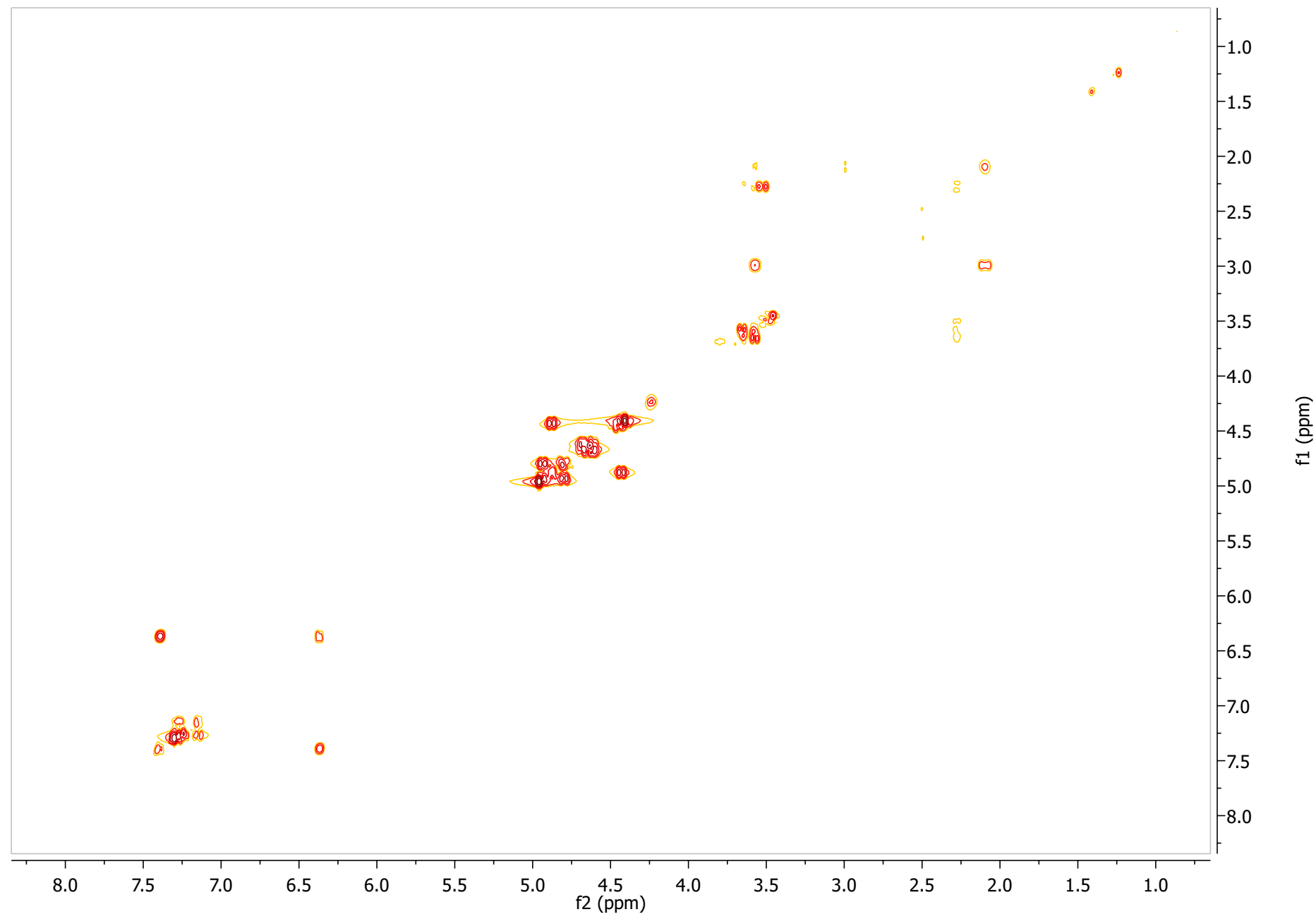
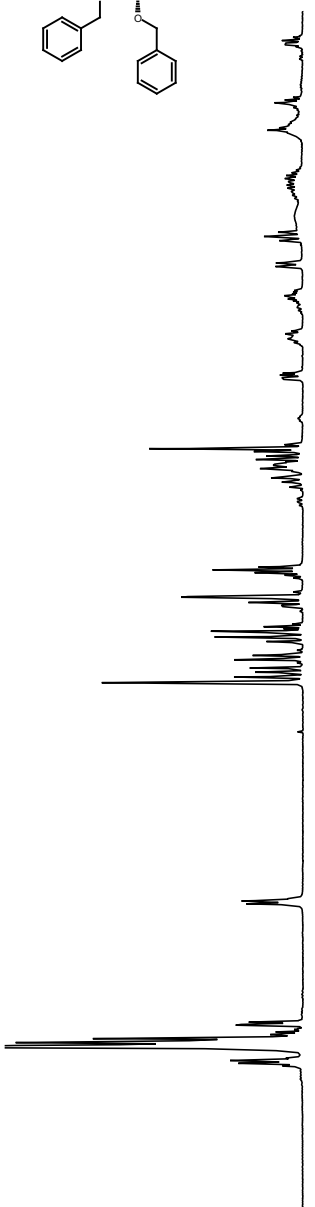
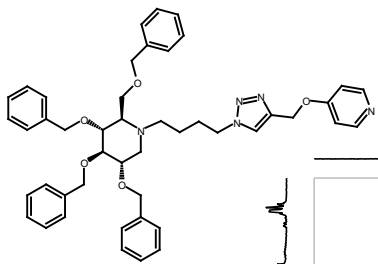
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 32b(VI)



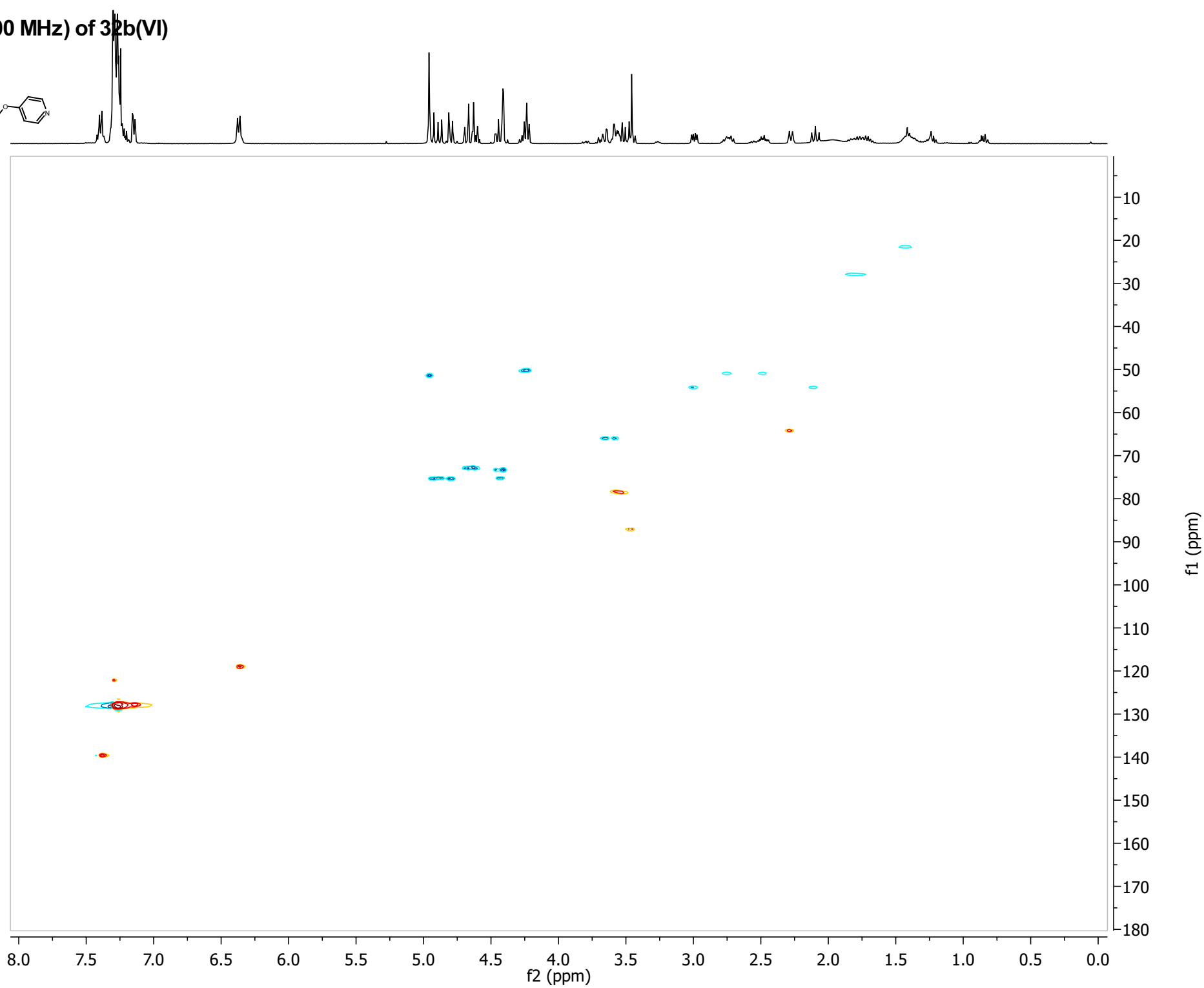
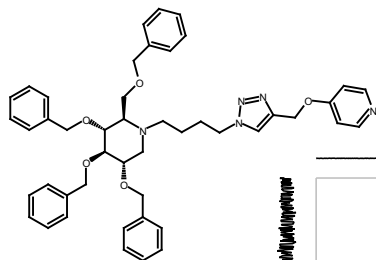
<sup>13</sup>H NMR (CDCl<sub>3</sub>, 101 MHz) of 32b(VI)



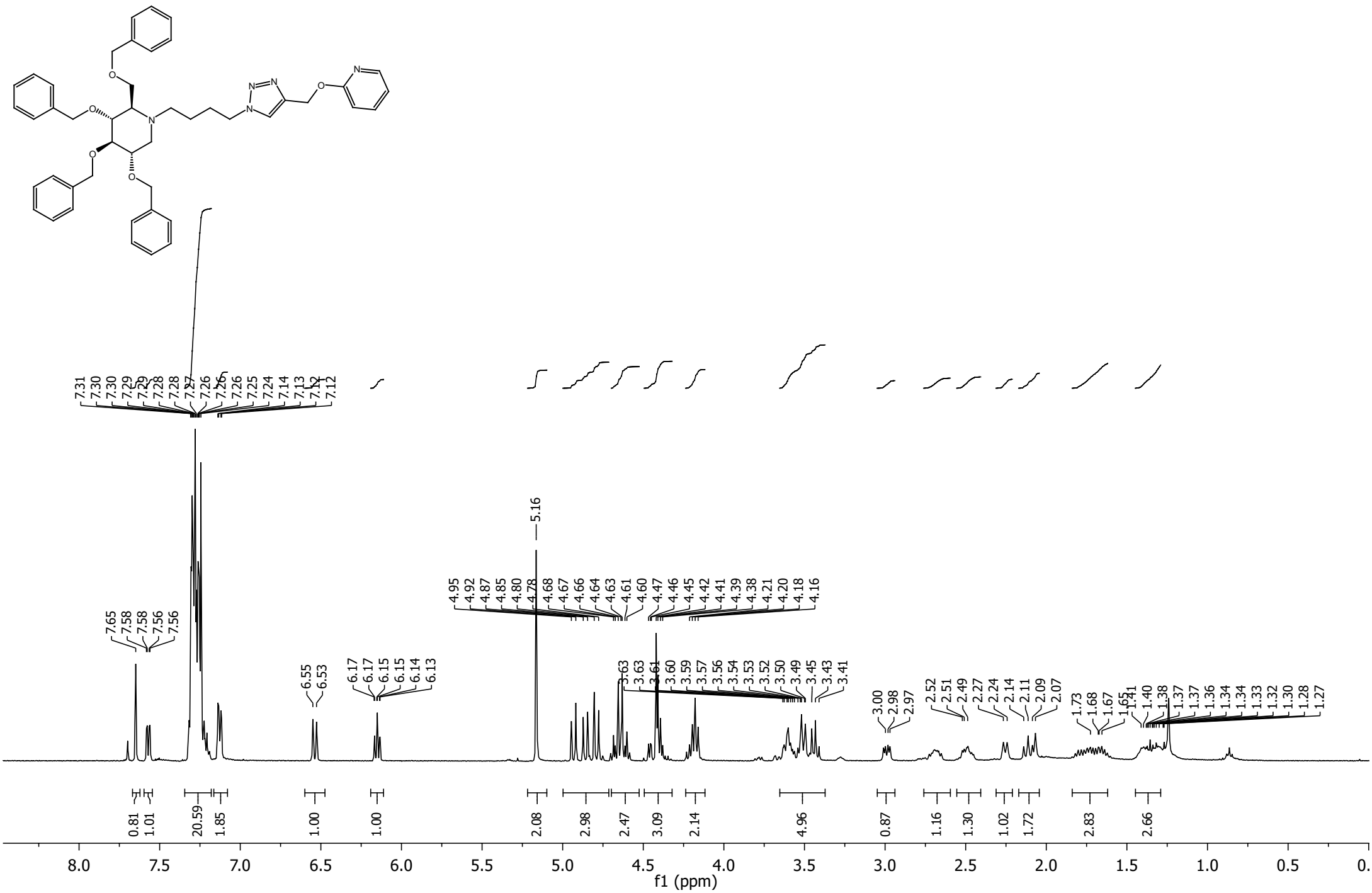
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 32b(VI)



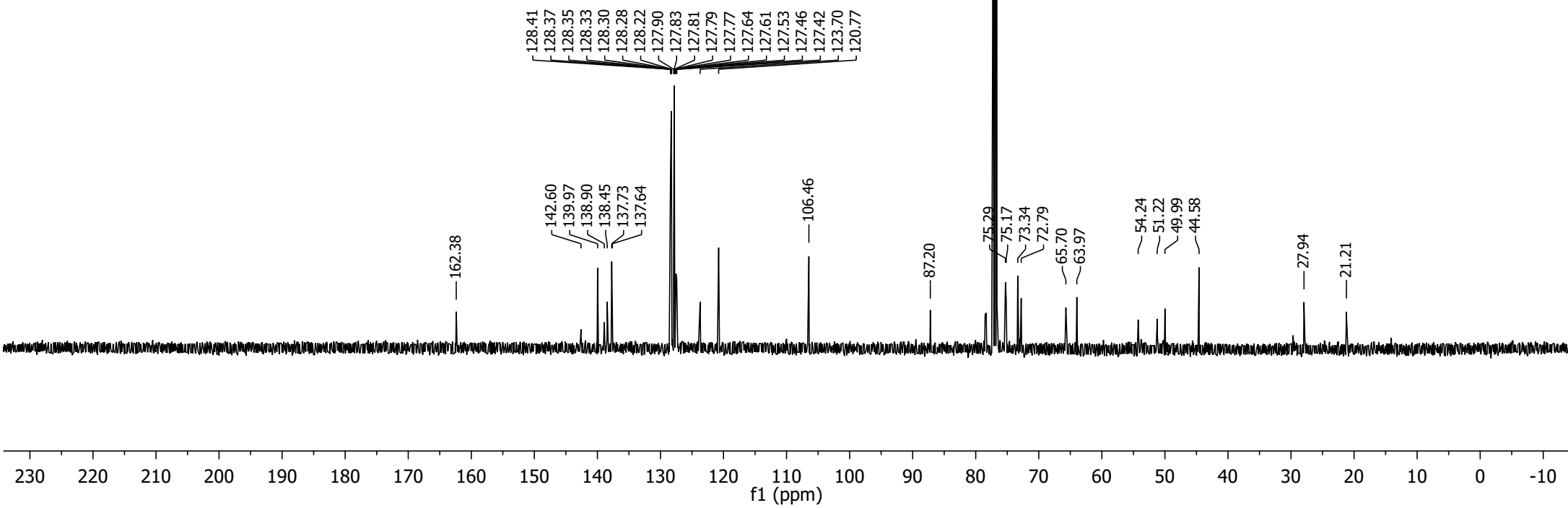
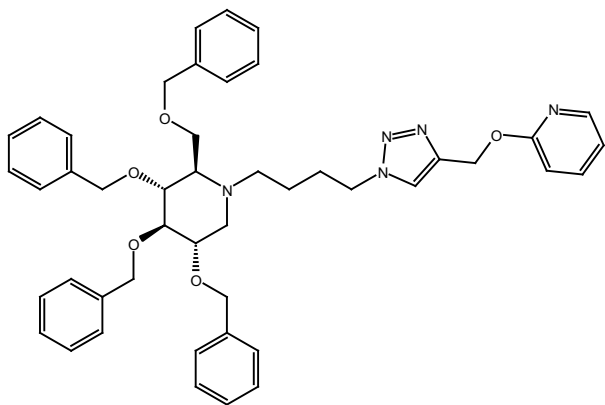
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 3b(VI)



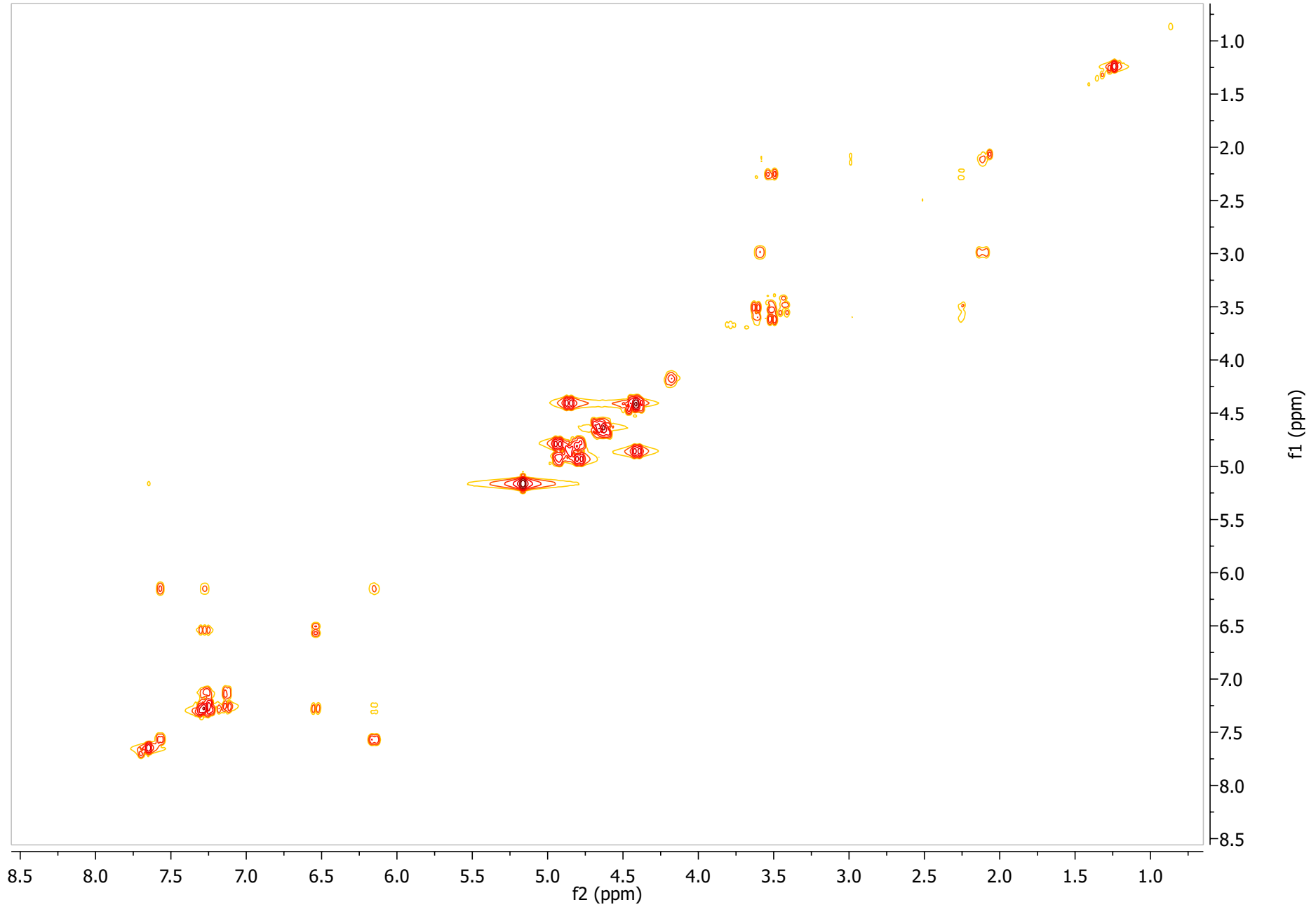
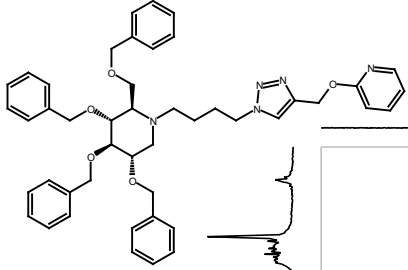
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 32b(VII)



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 32b(VII)

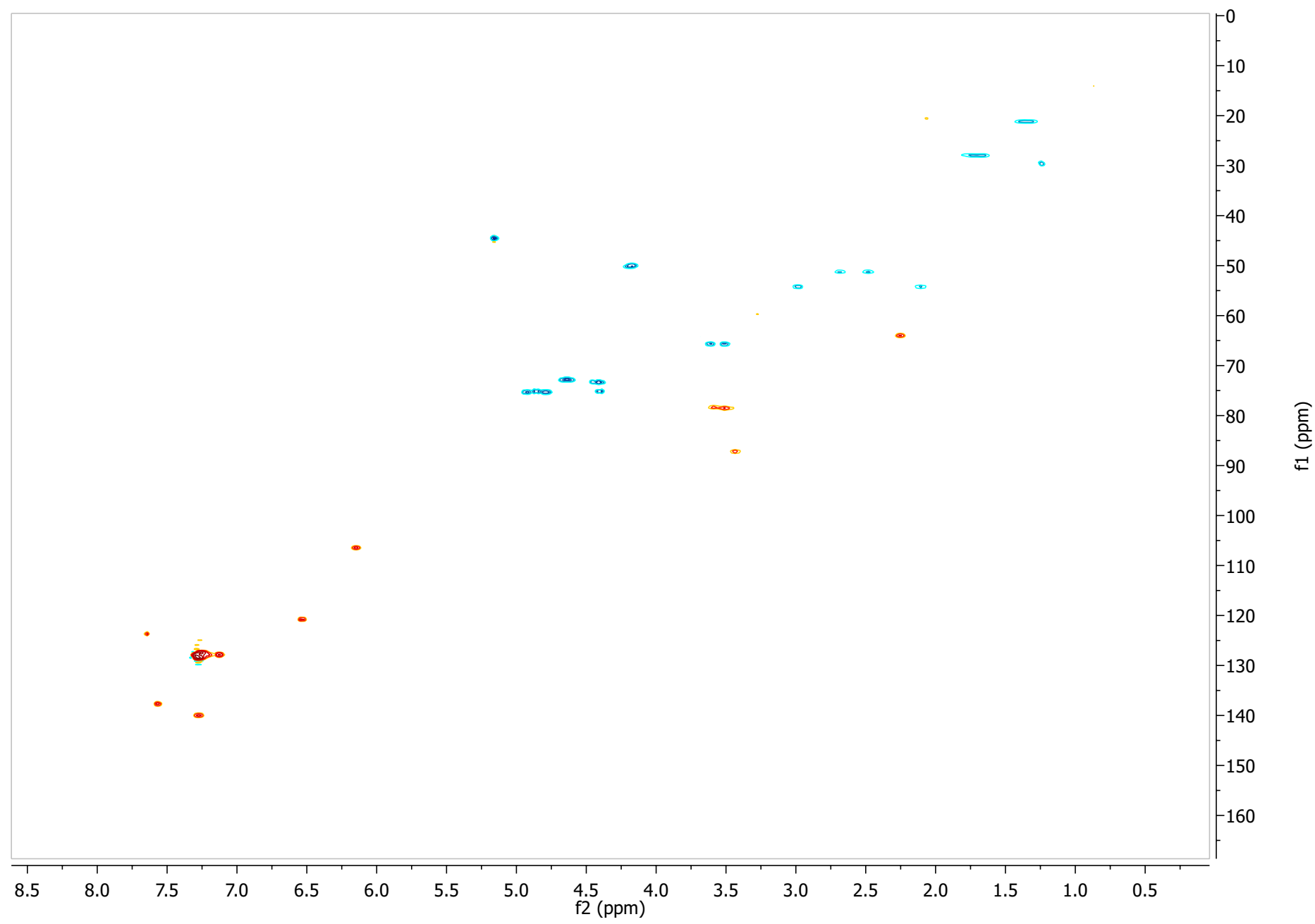
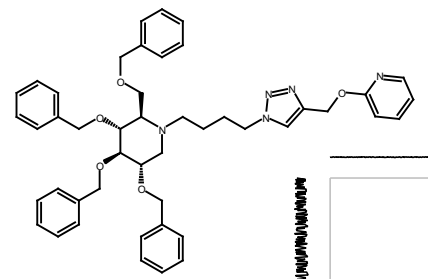


gCOSY (CDCl<sub>3</sub>, 400 MHz) of 32b(VII)

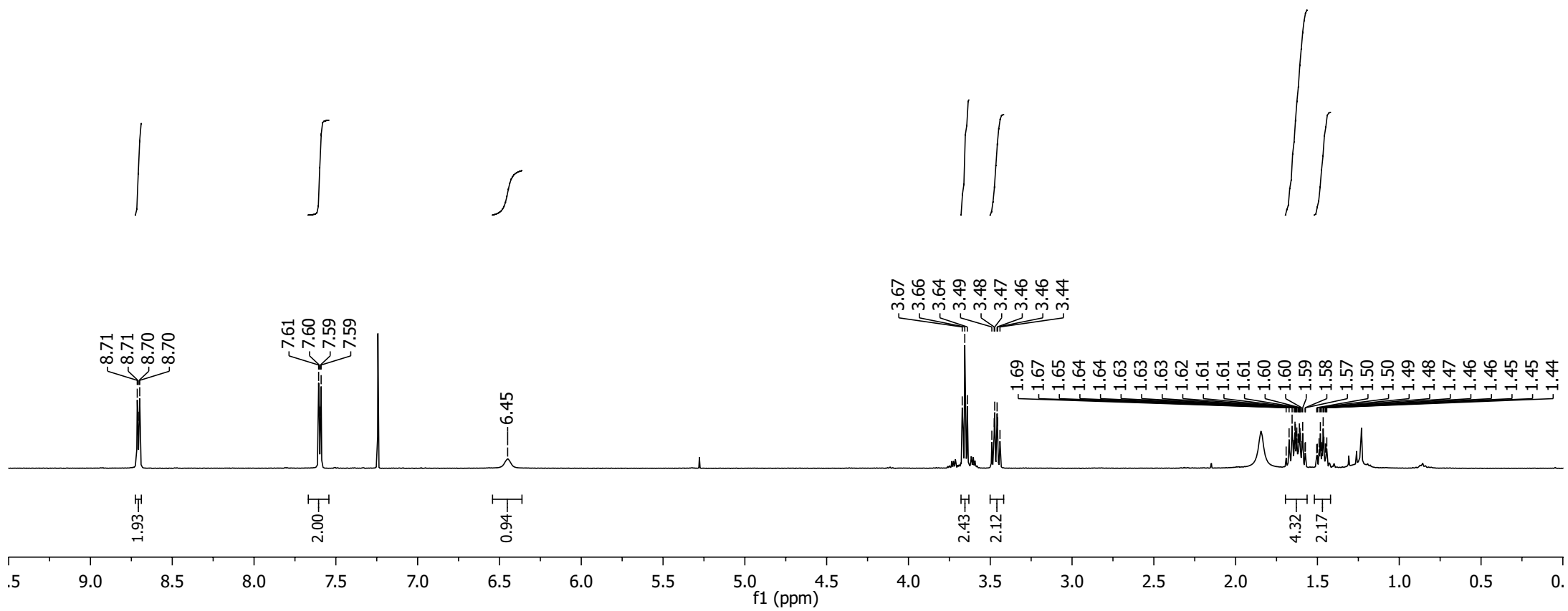
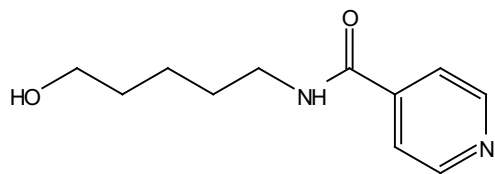




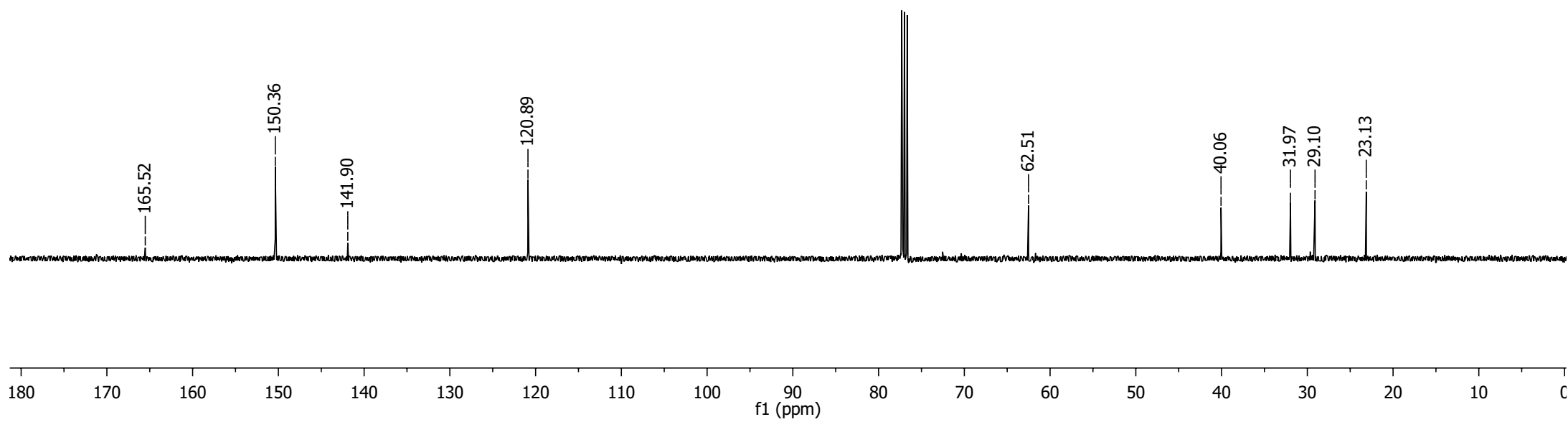
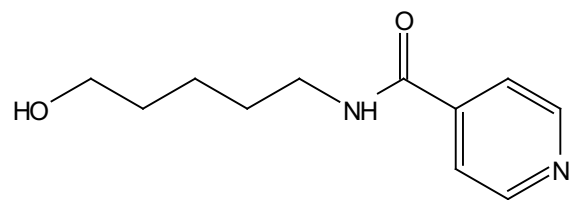
HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 32b(VII)



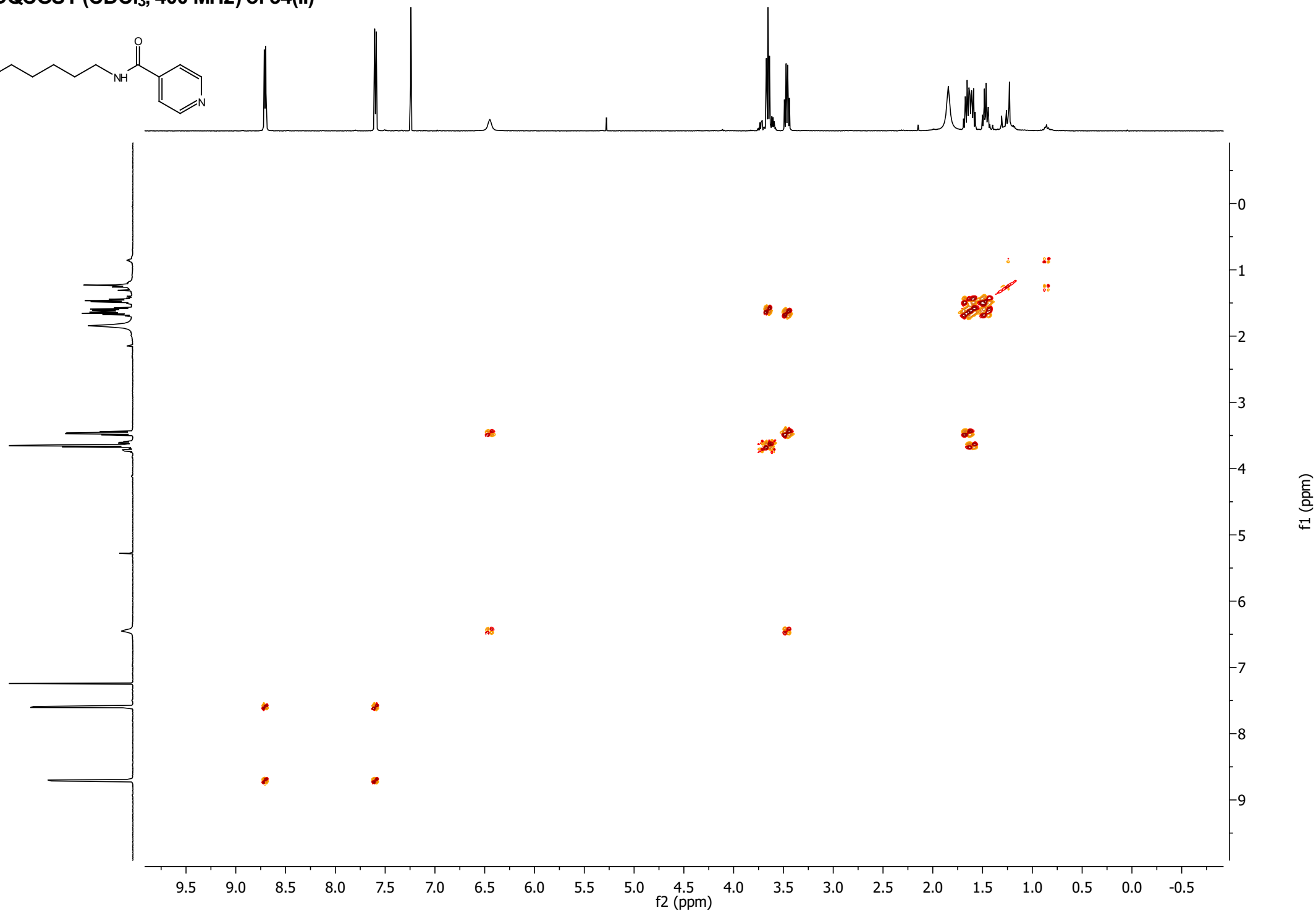
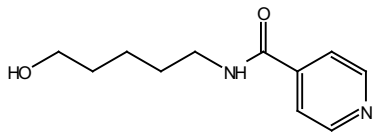
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 34(II)



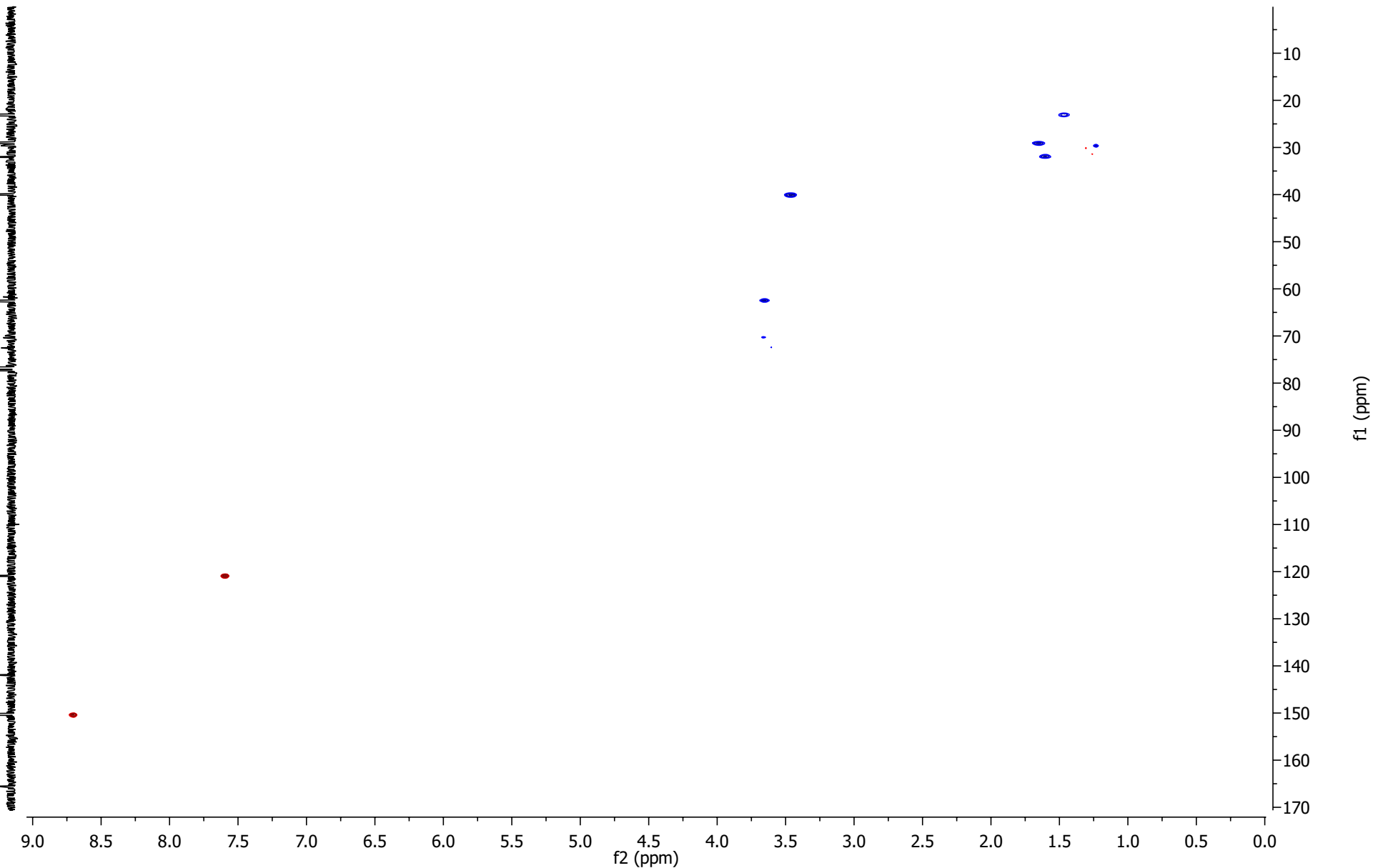
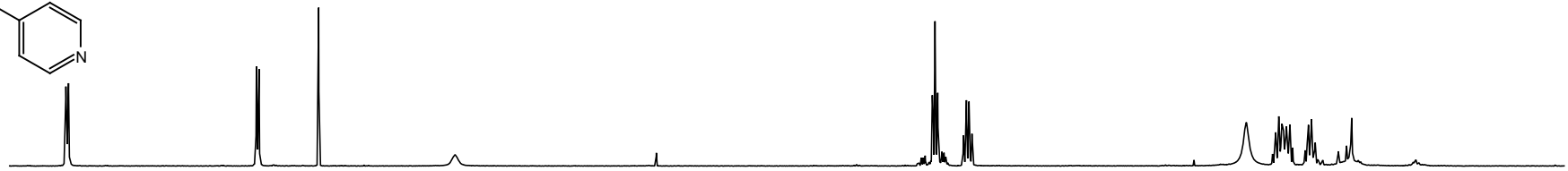
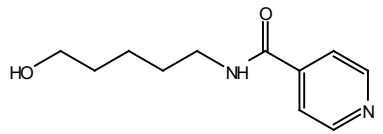
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 34(II)



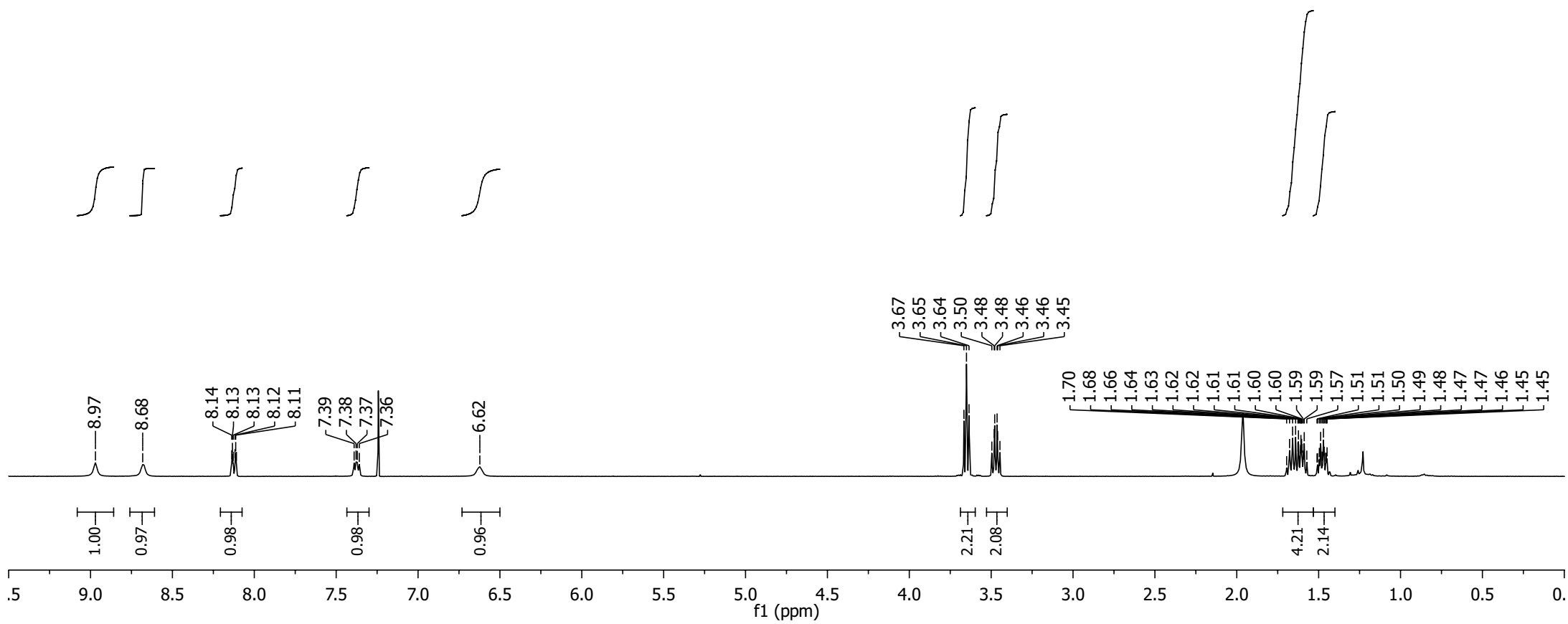
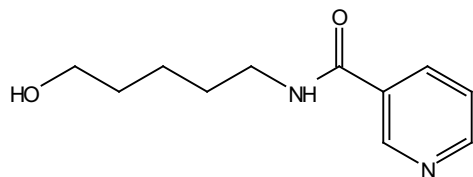
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 34(II)



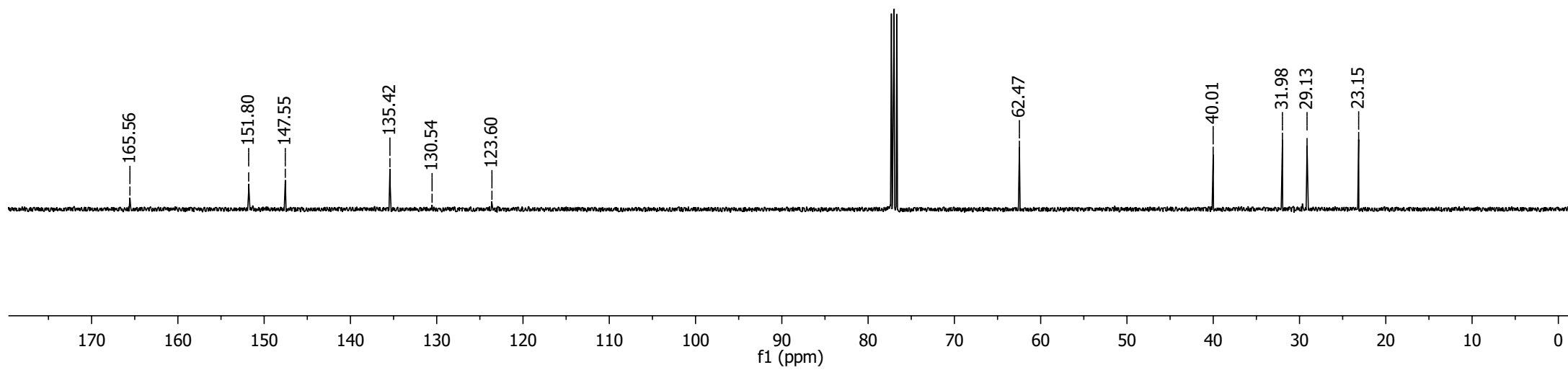
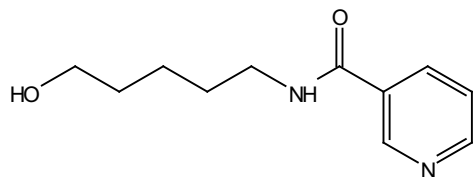
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 34(II)



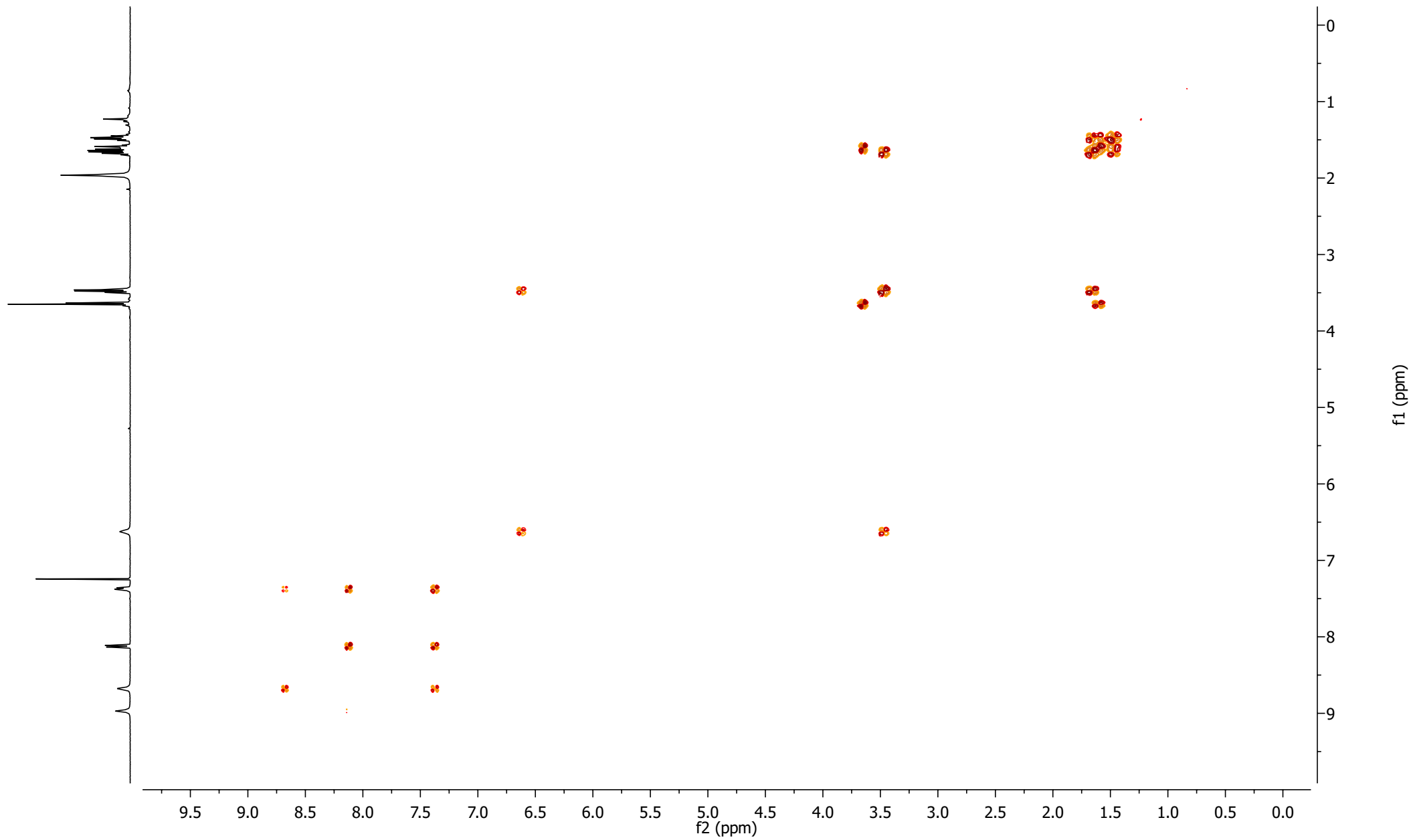
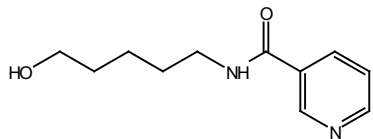
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 34(III)



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 34(III)

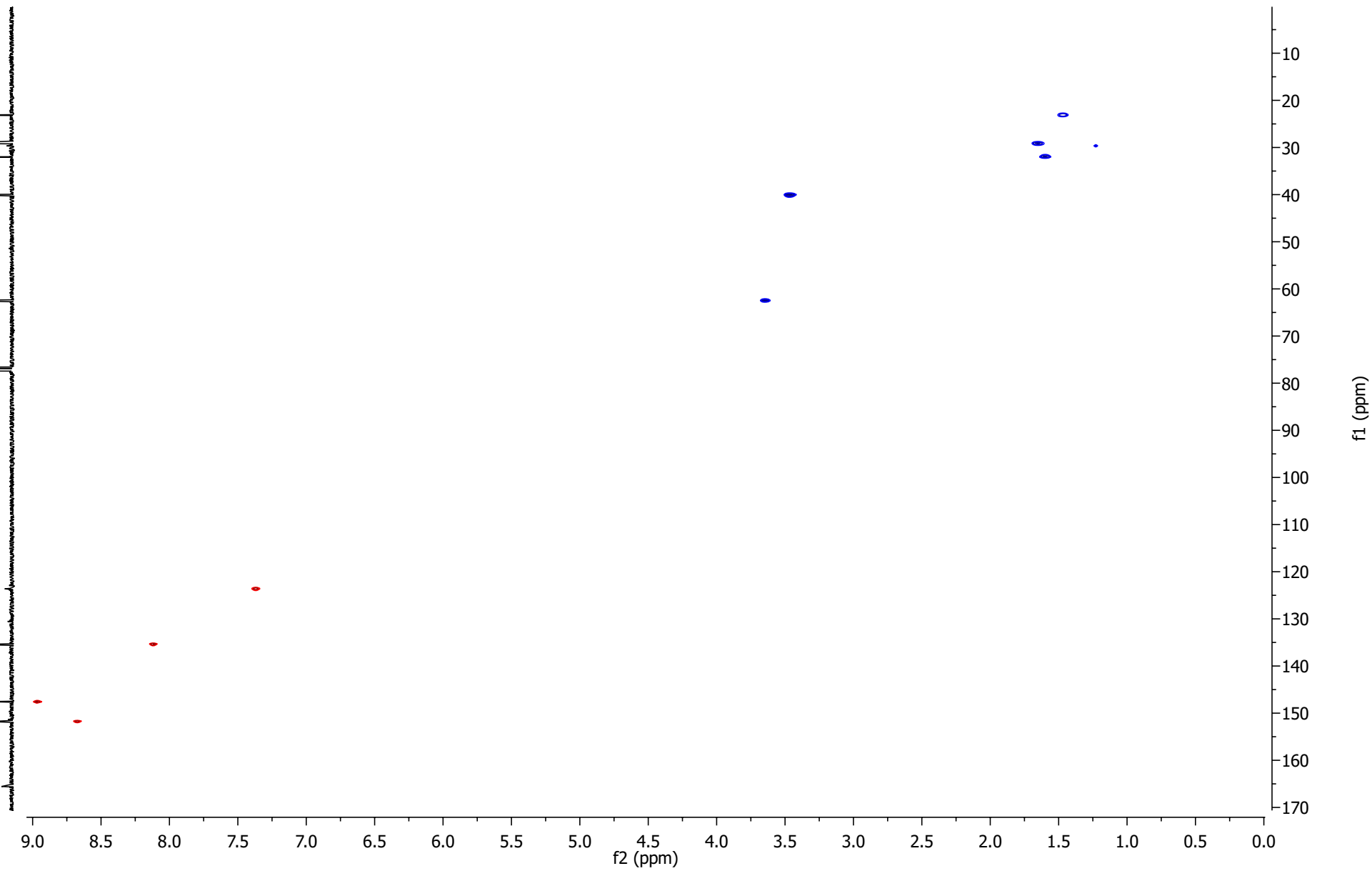
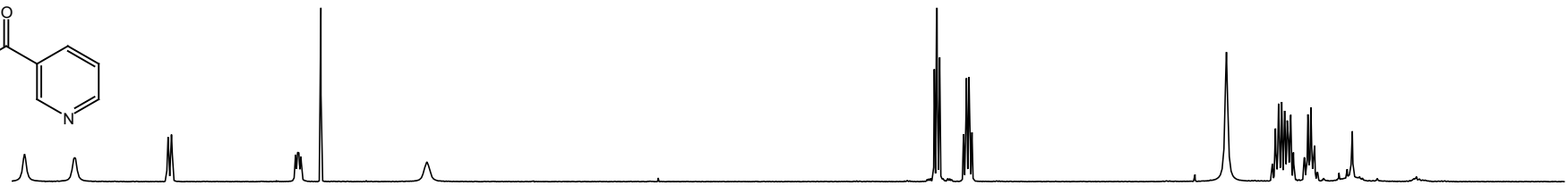
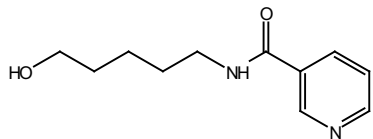


gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 34(III)

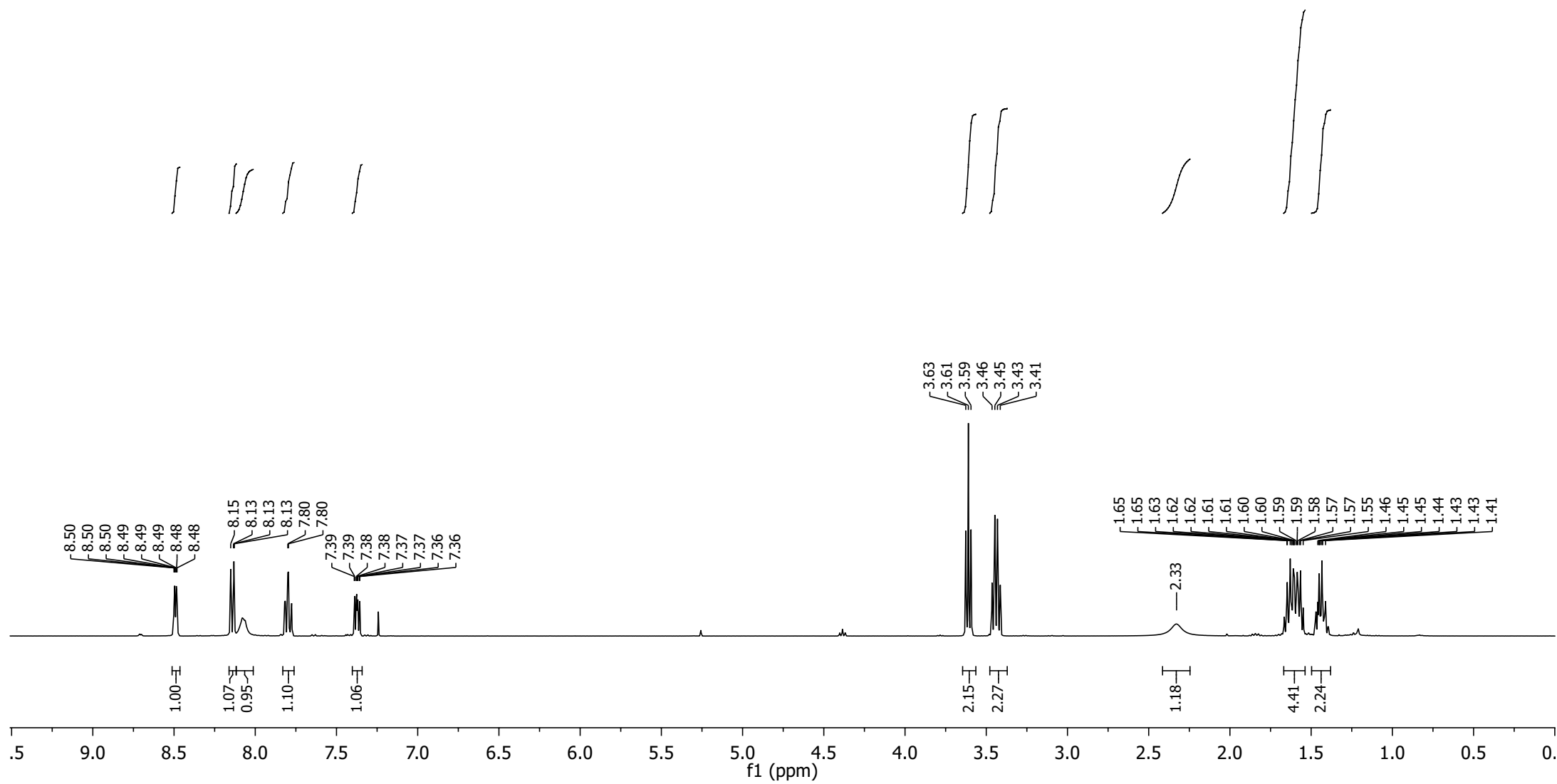
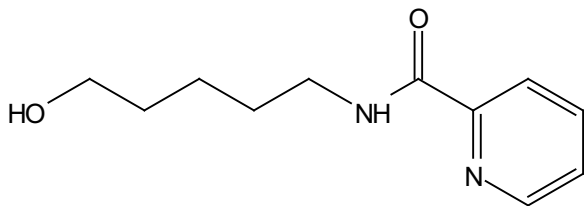




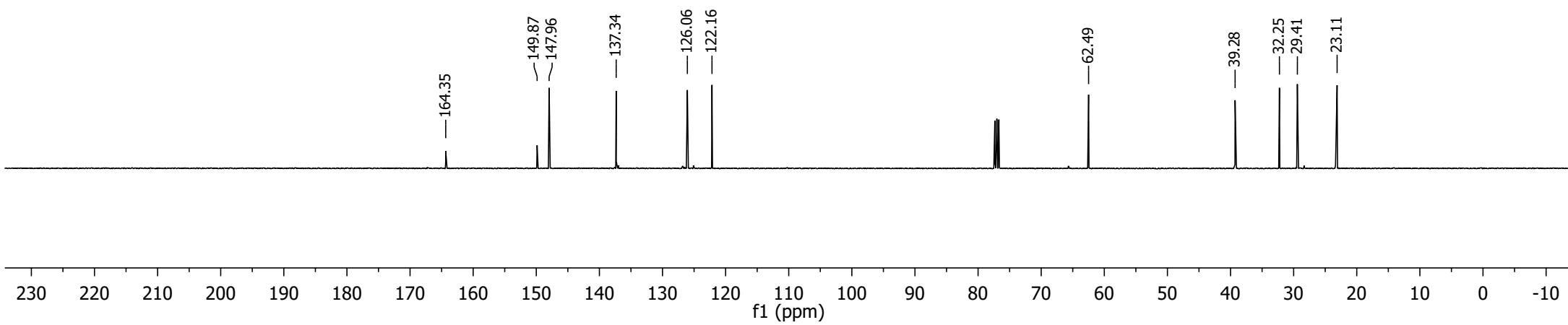
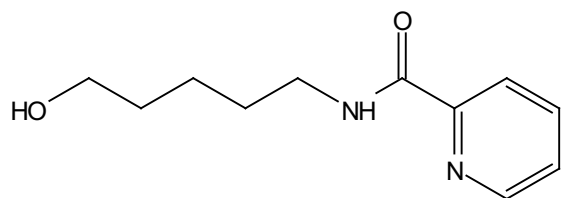
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 34(III)



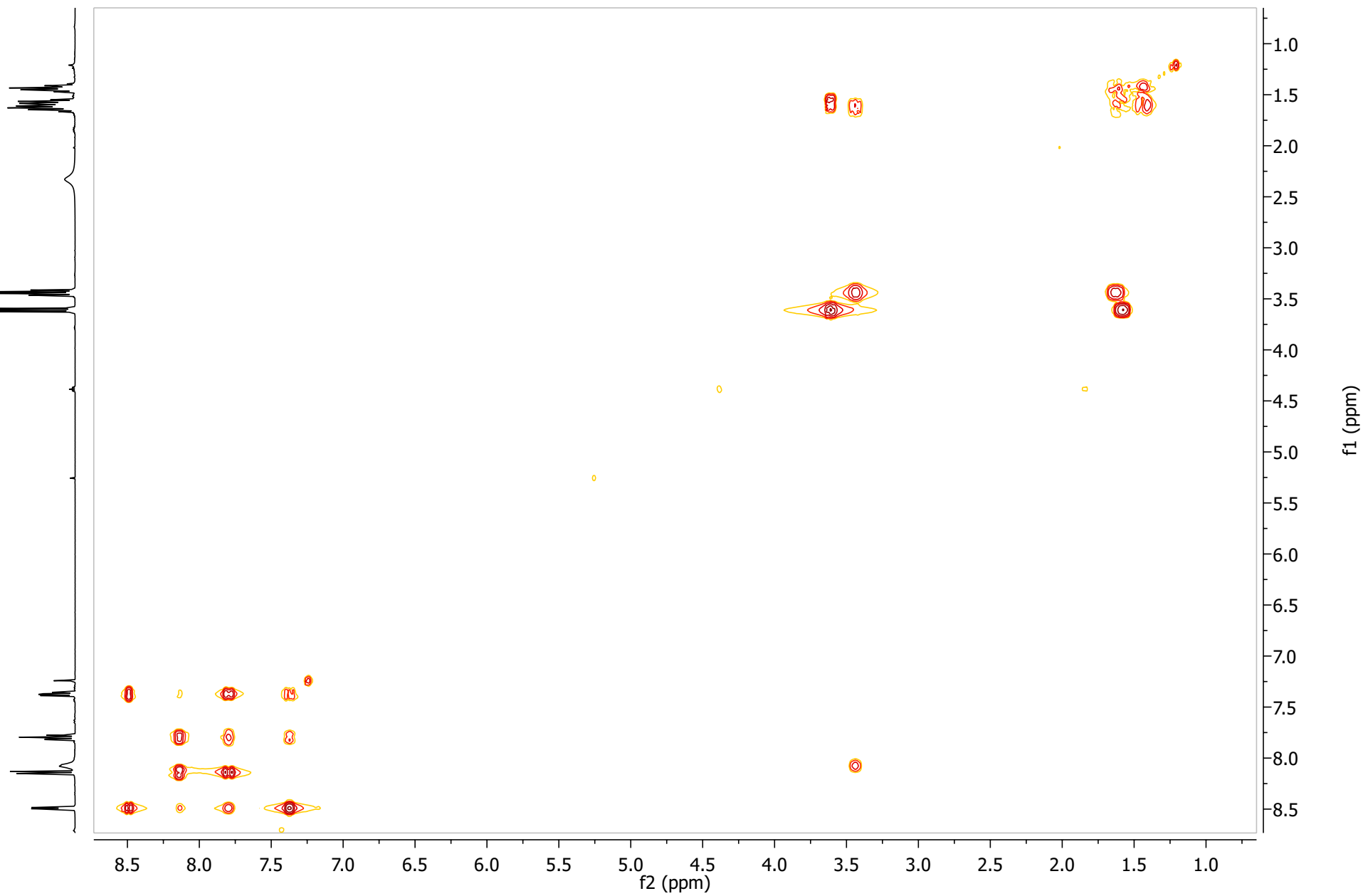
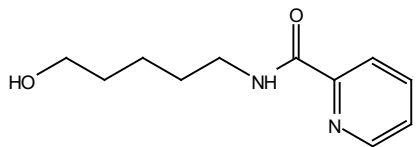
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 34(IV)



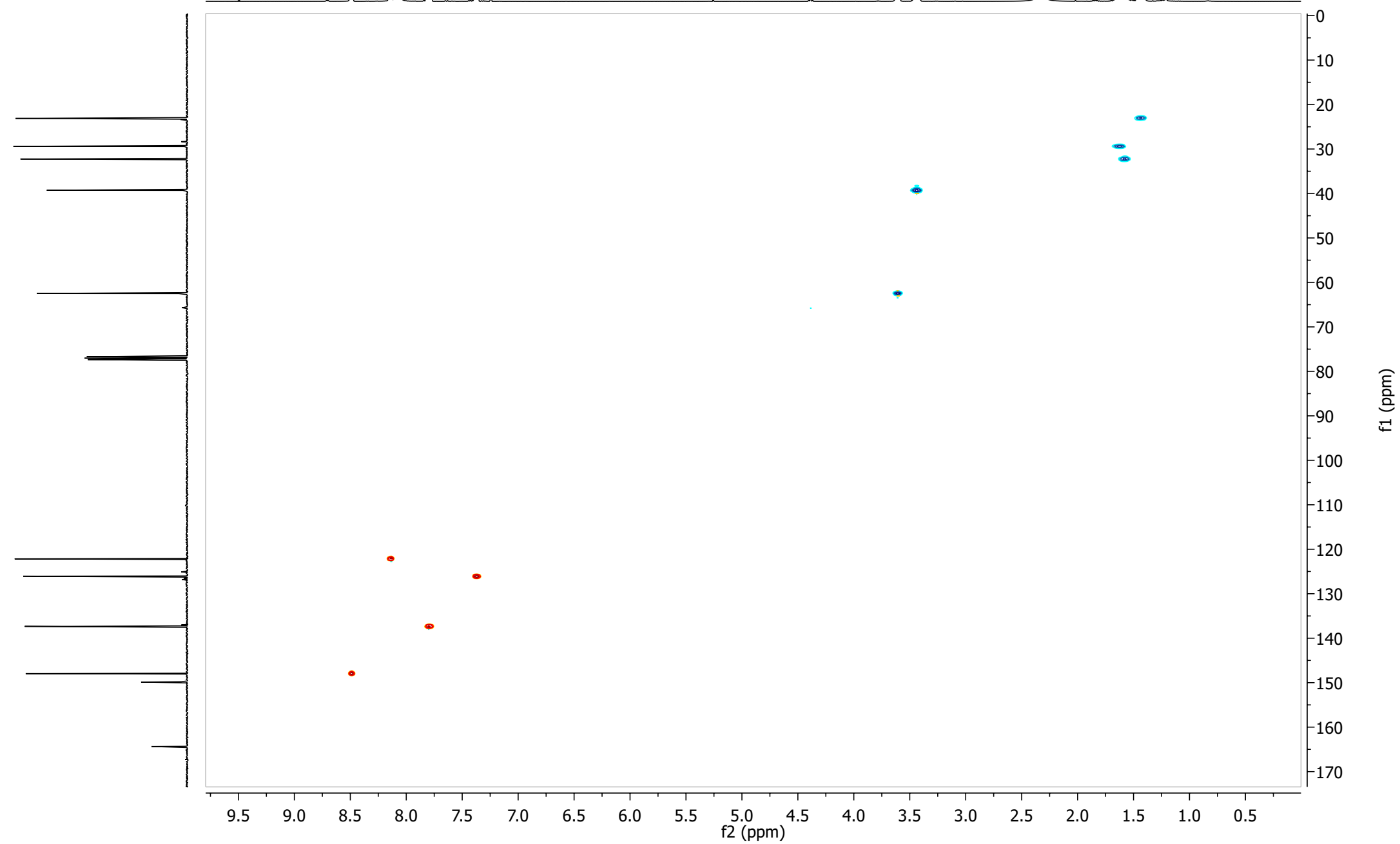
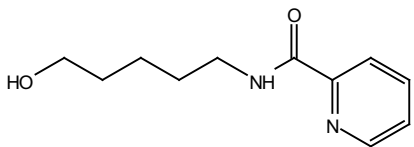
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 34(IV)



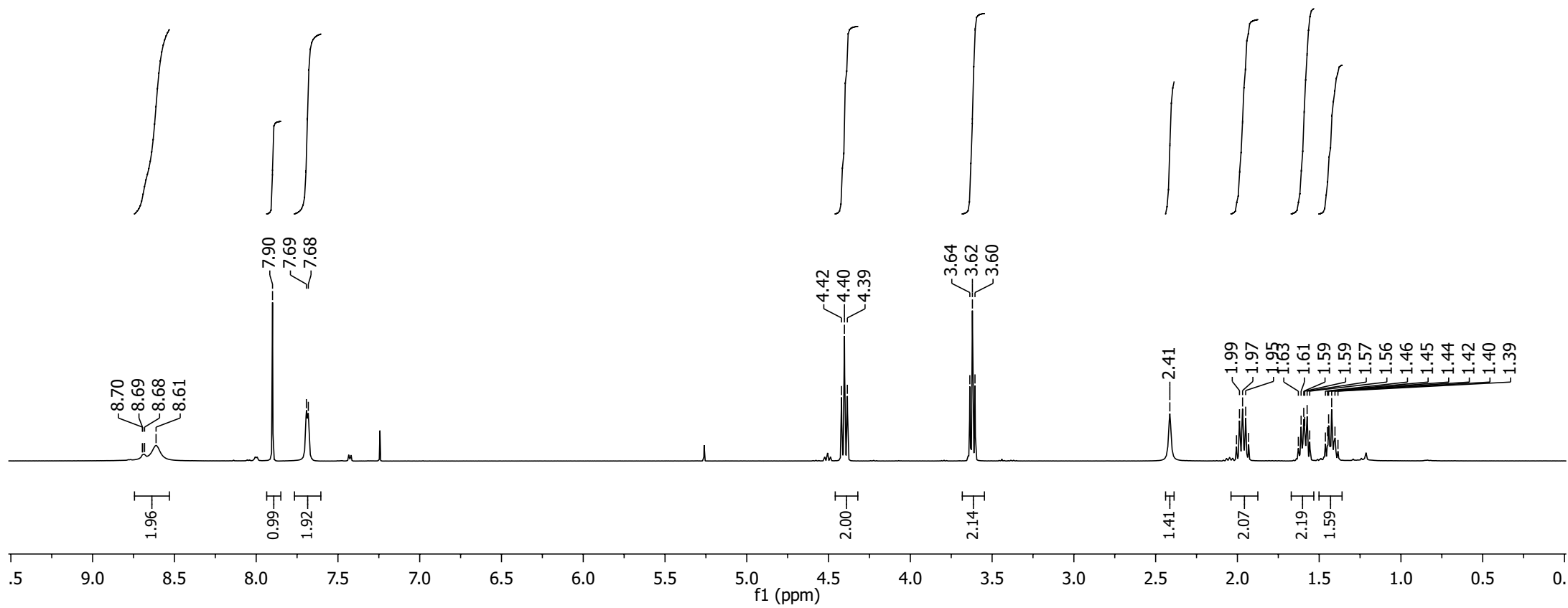
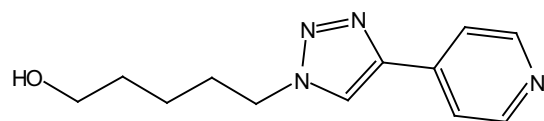
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 34(IV)



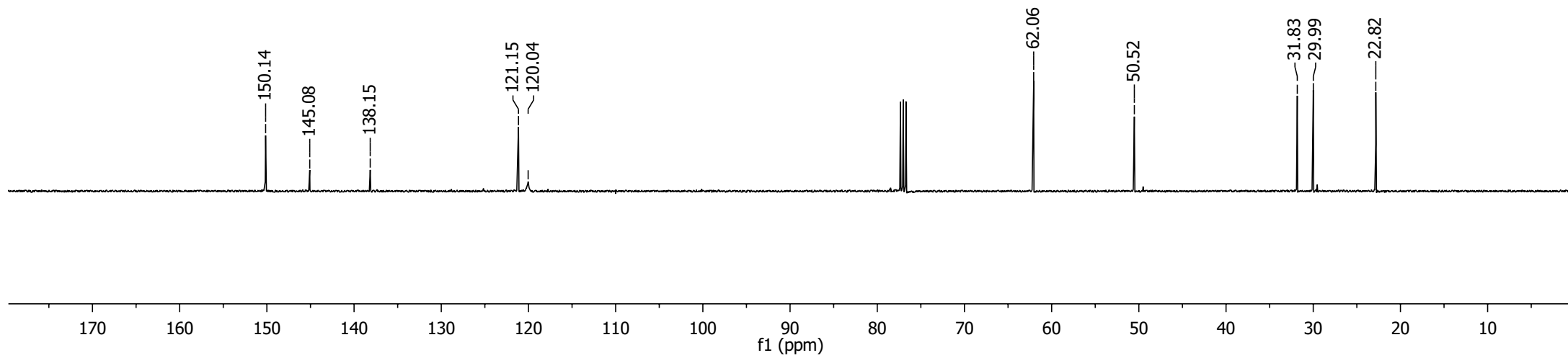
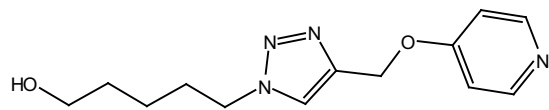
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 34(IV)



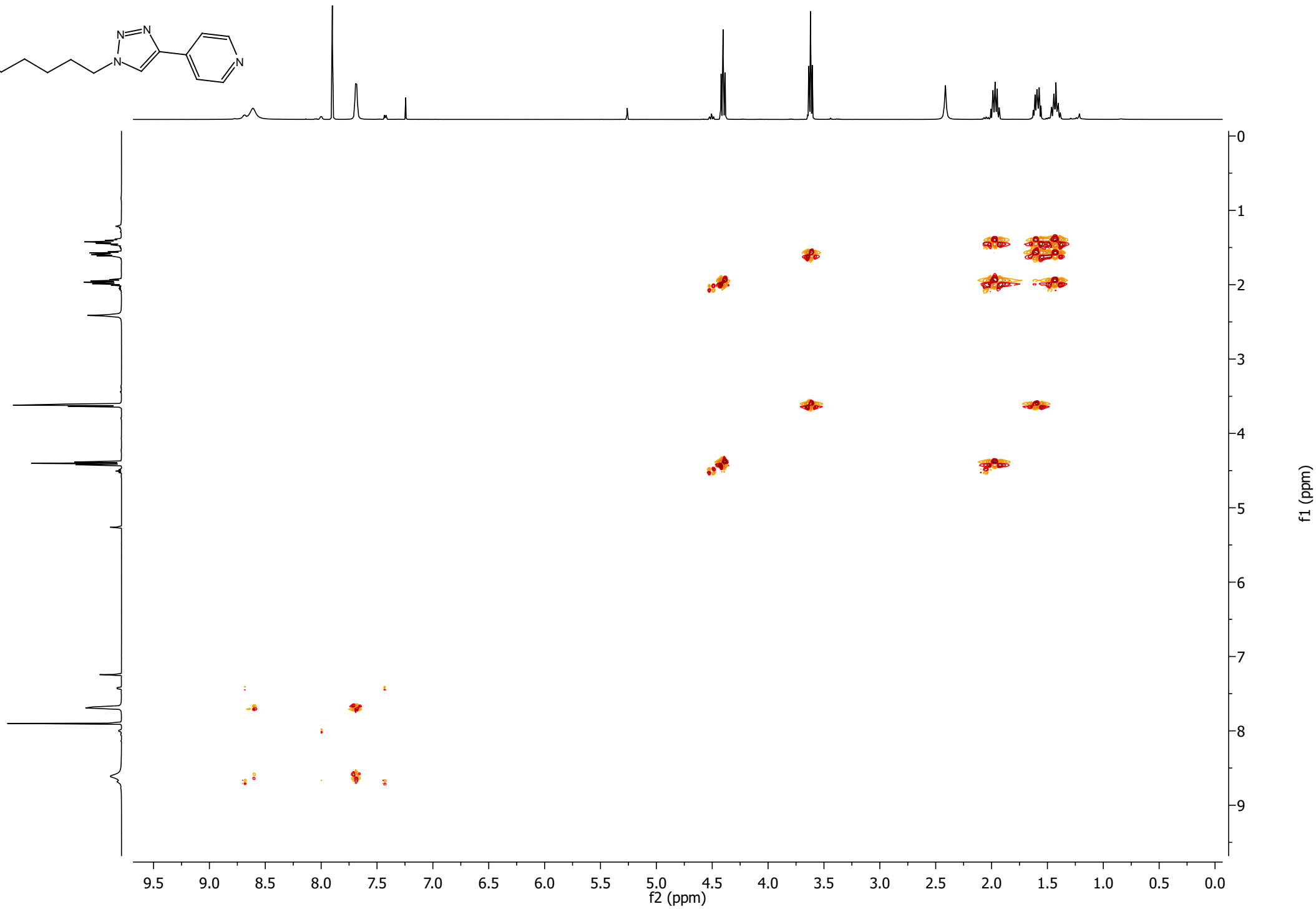
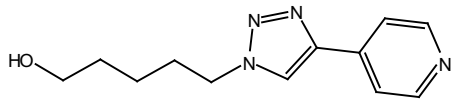
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 35(II)**



**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 35(II)**

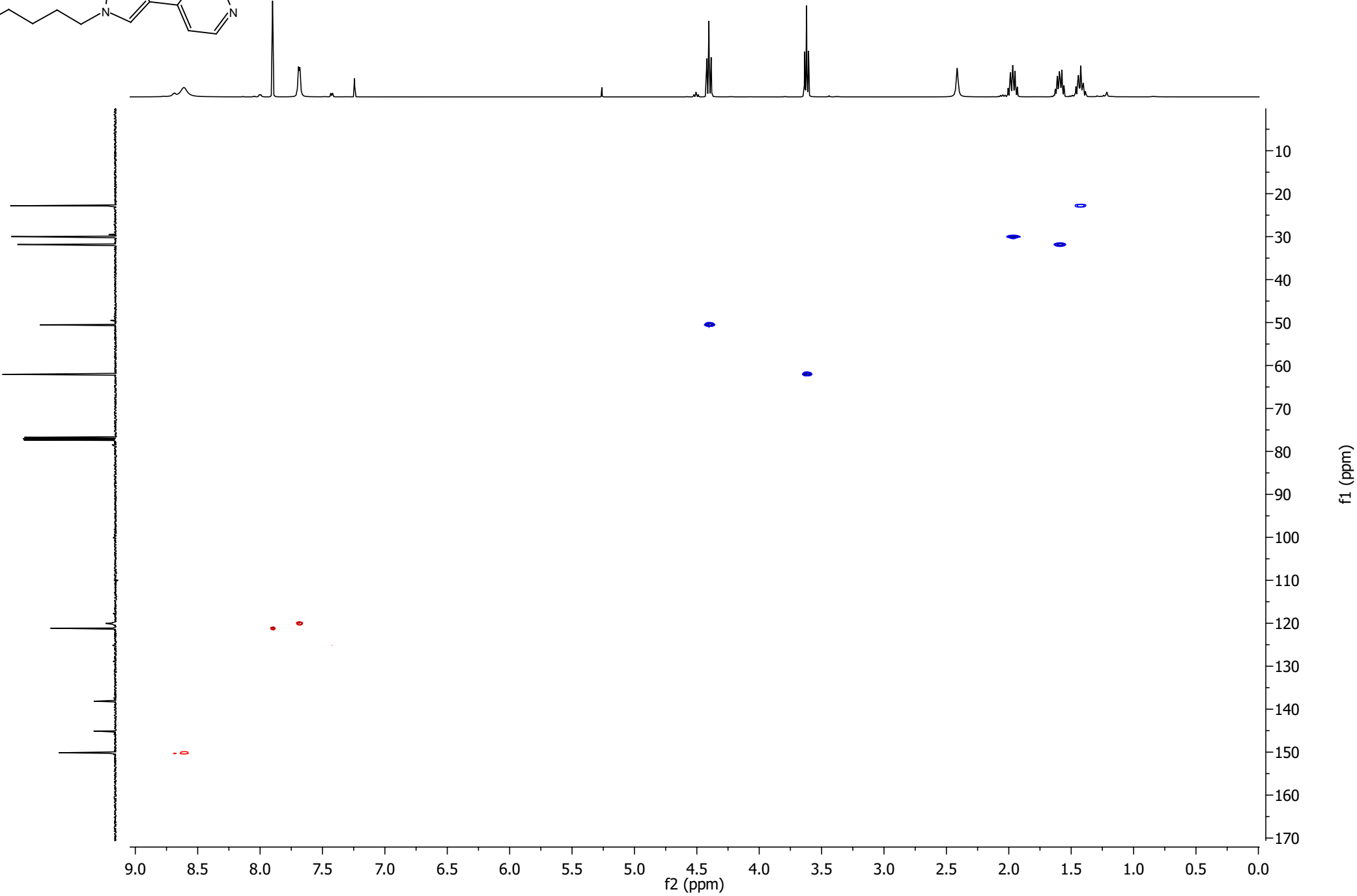
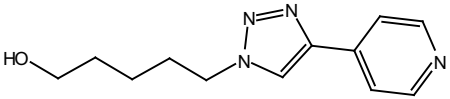


gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 35(II)

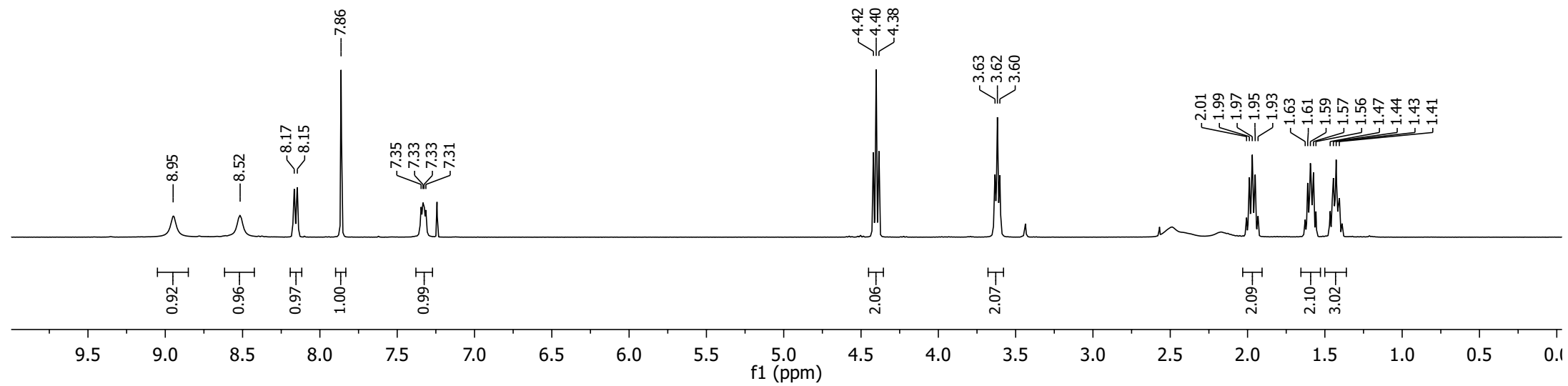
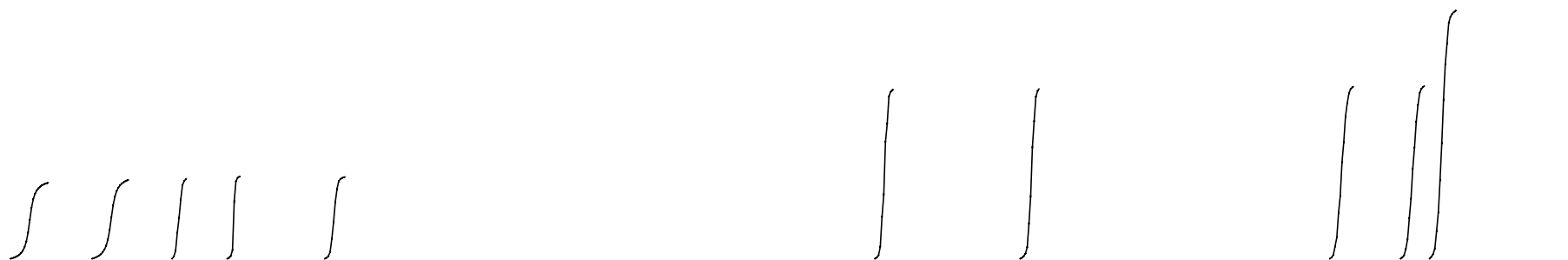
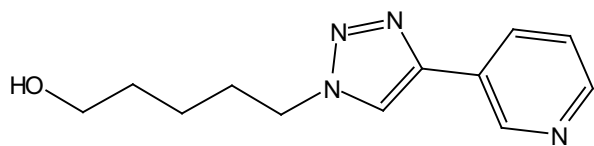




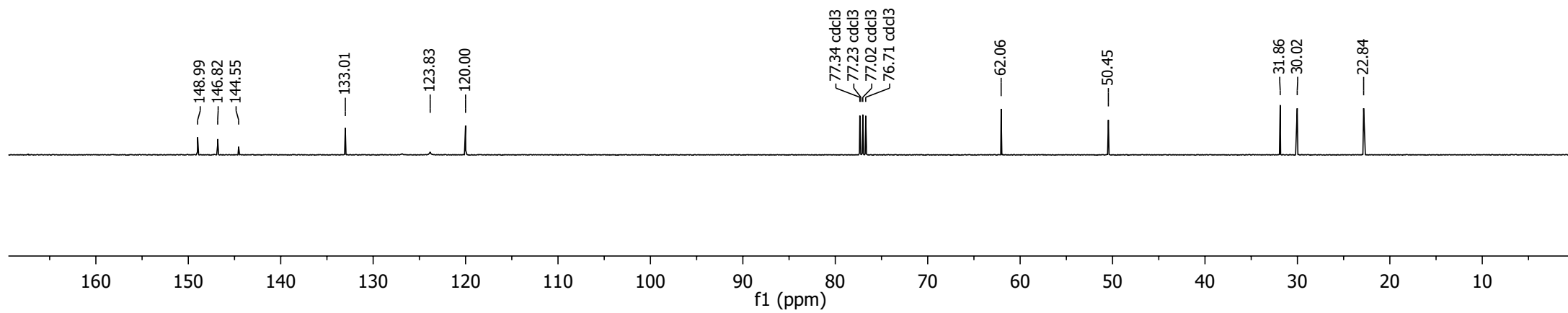
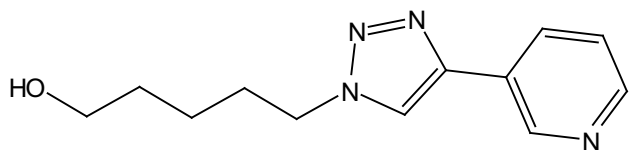
HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 35(II)



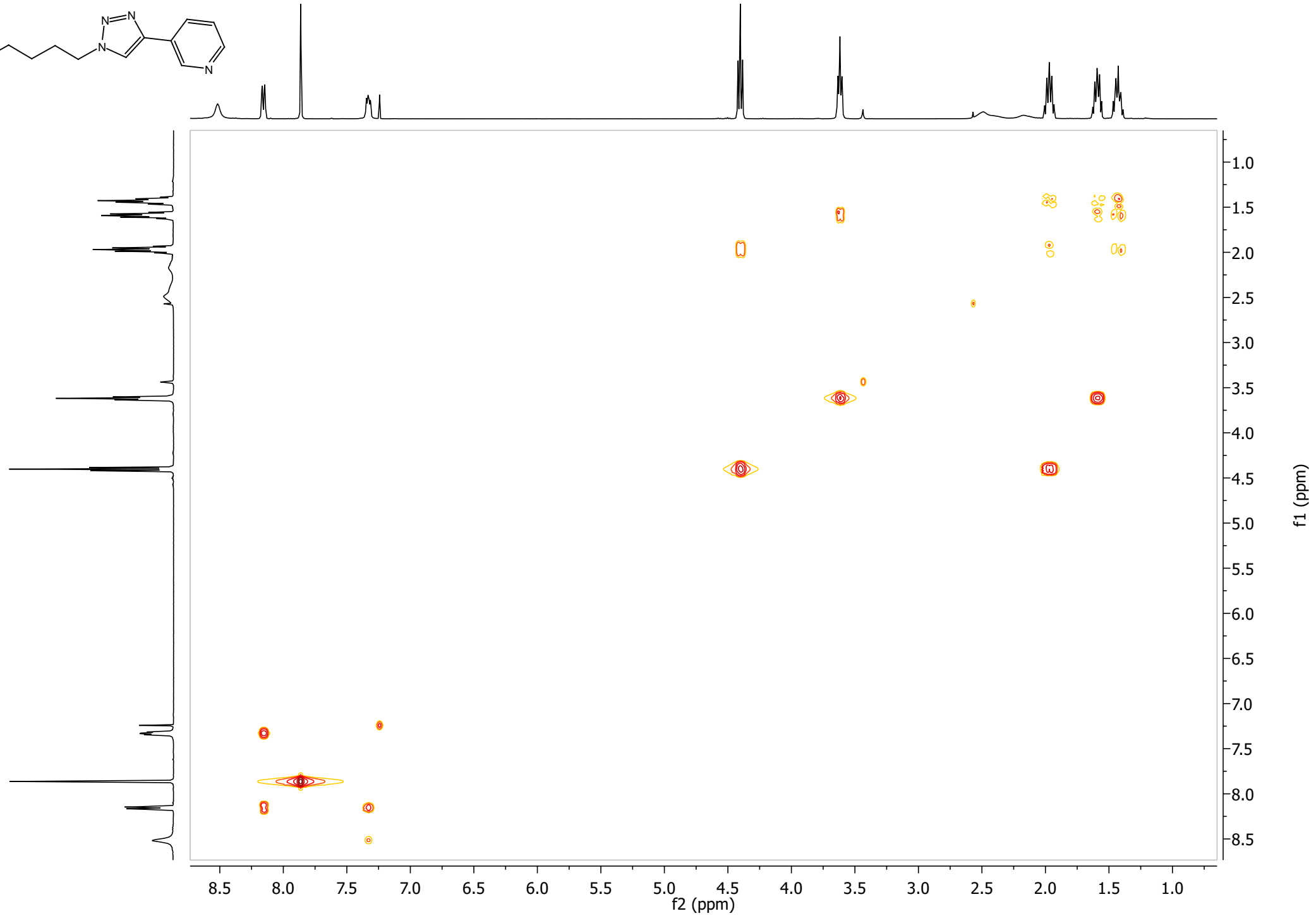
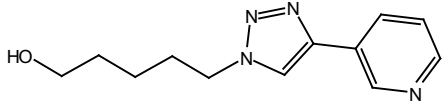
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 35(III)



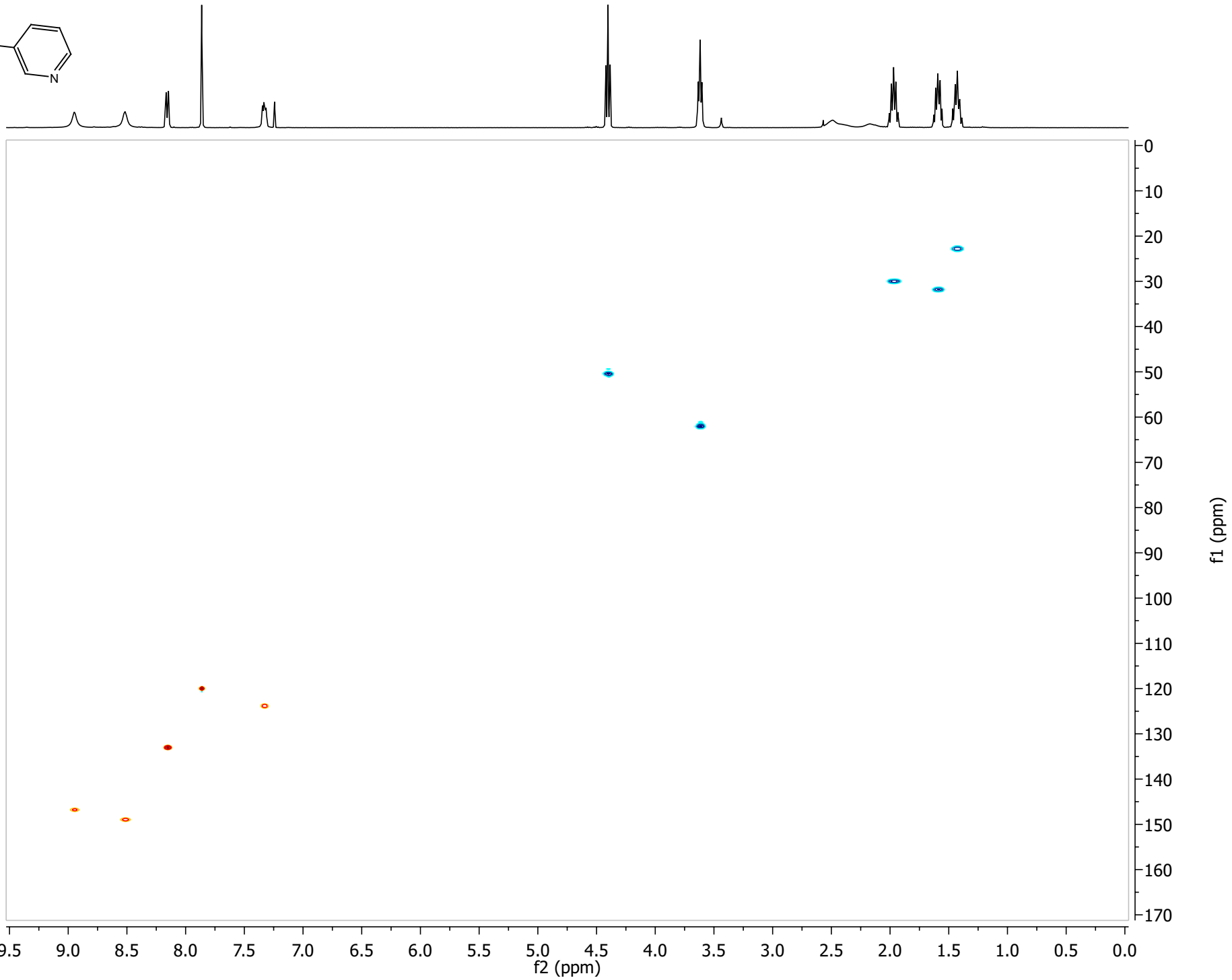
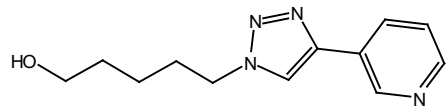
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 35(III)



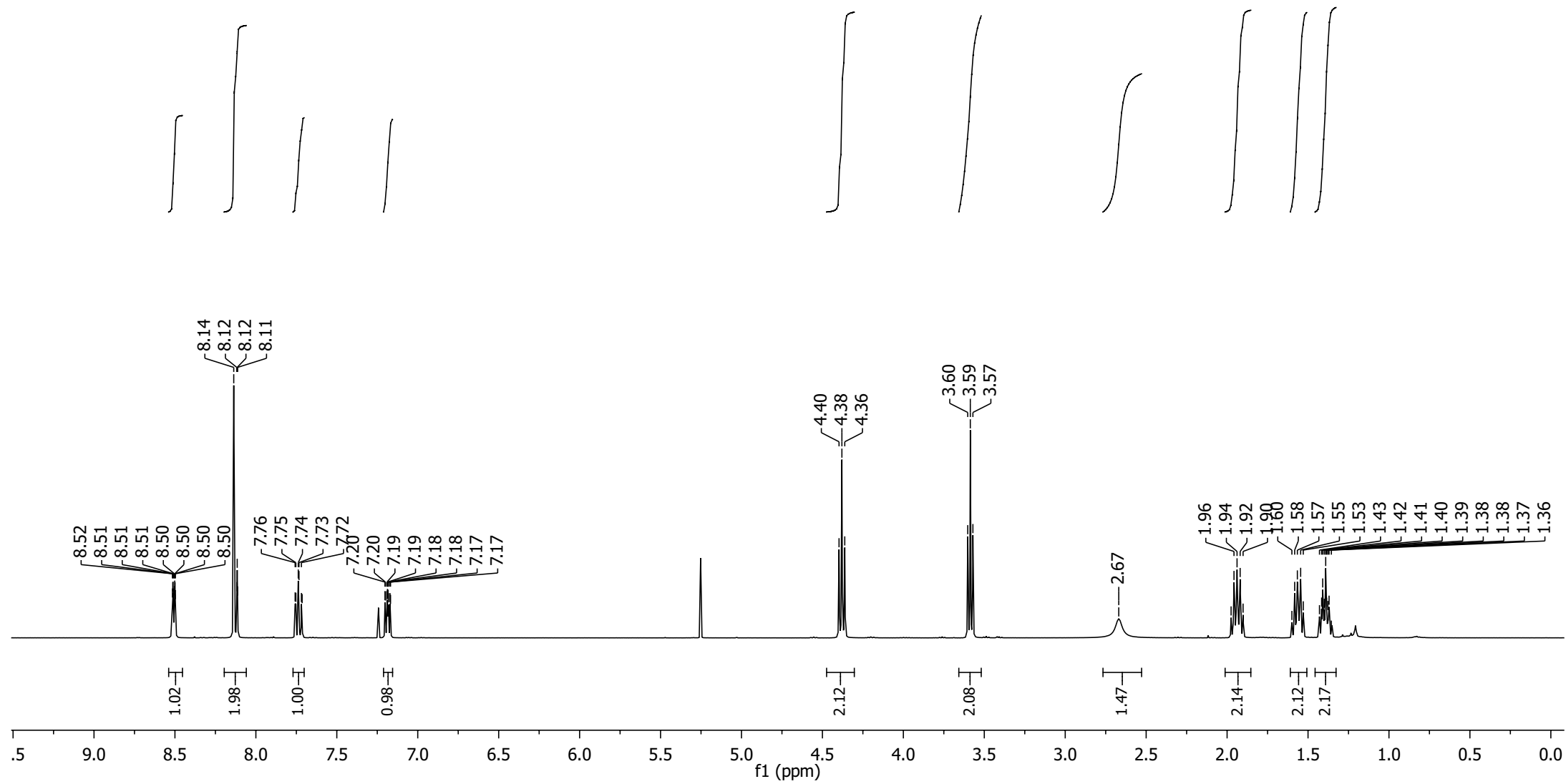
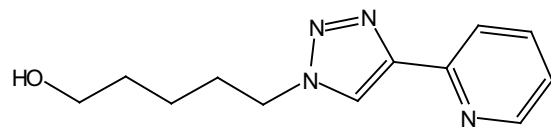
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 35(III)



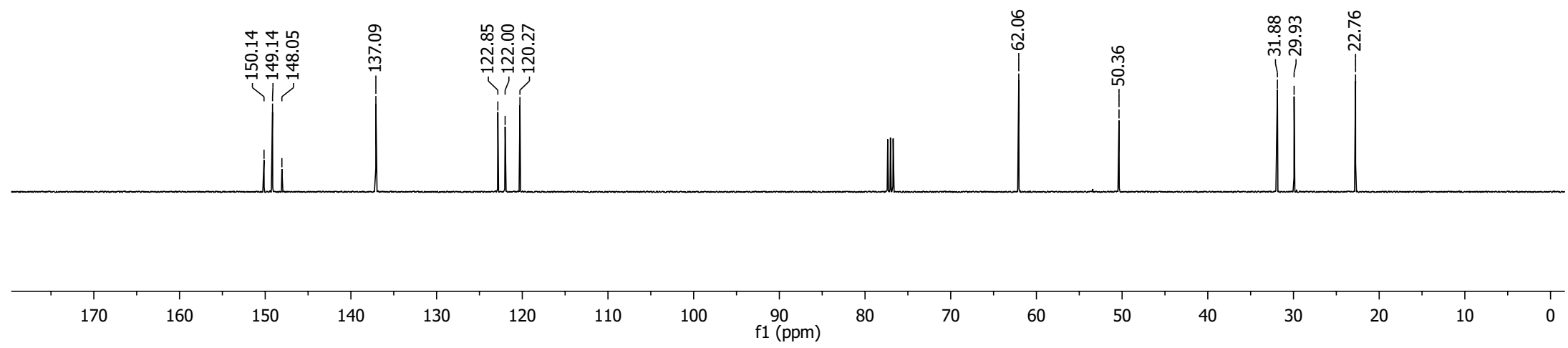
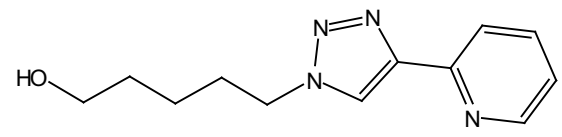
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 35(III)



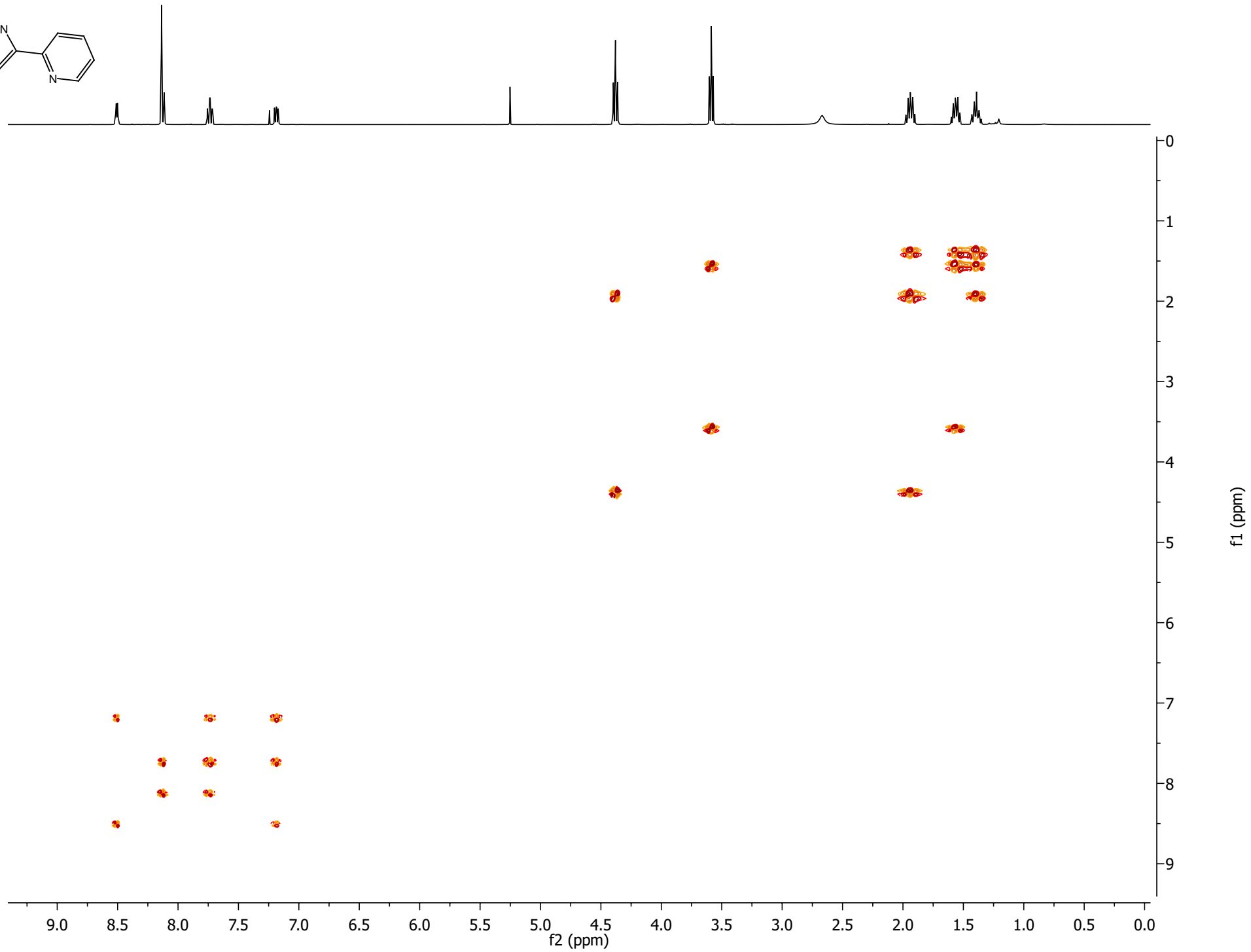
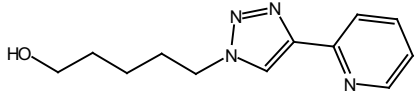
**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 35(IV)**



**<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 35(IV)**

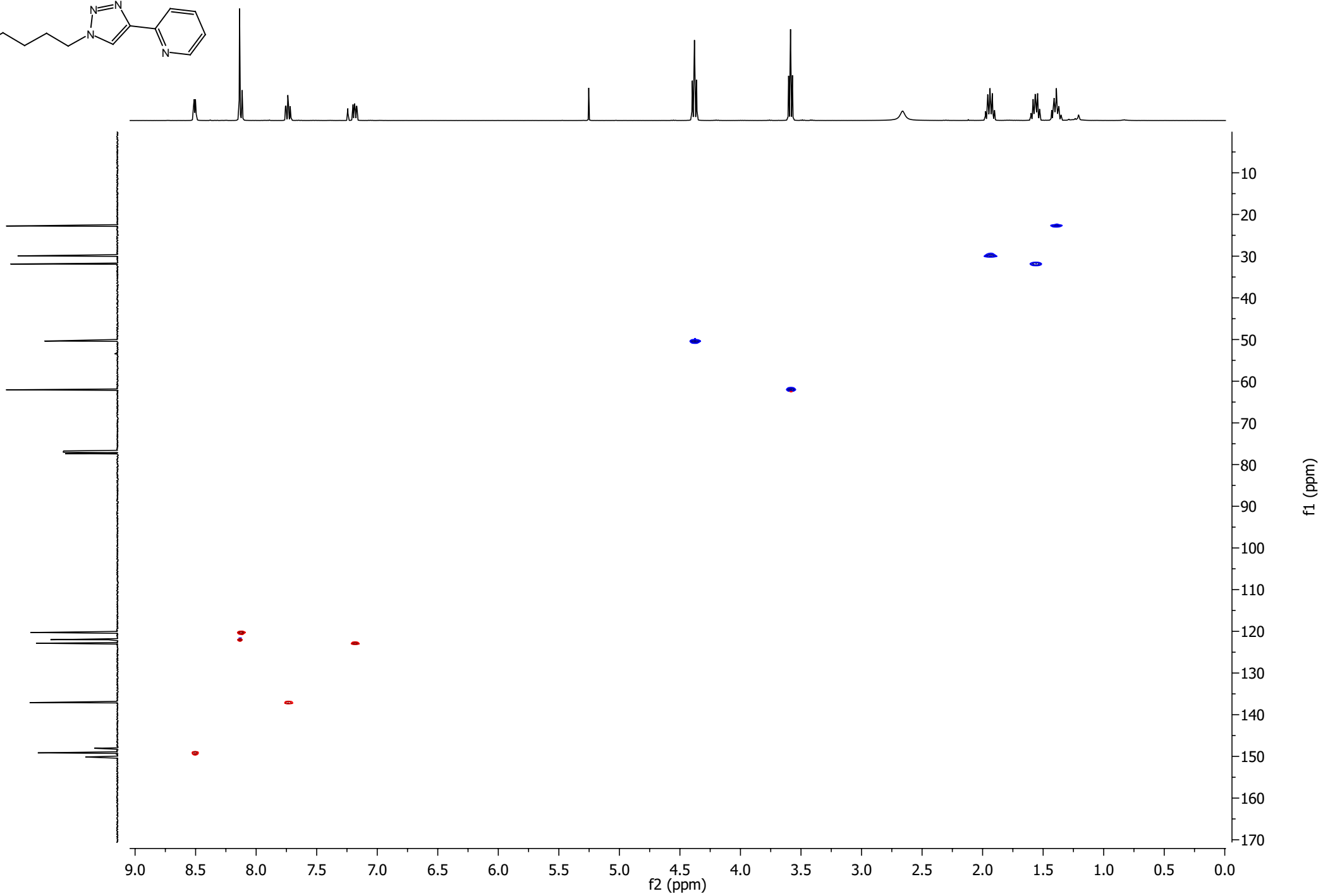
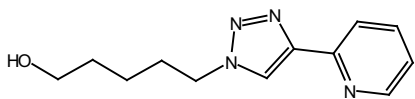


gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 35(IV)

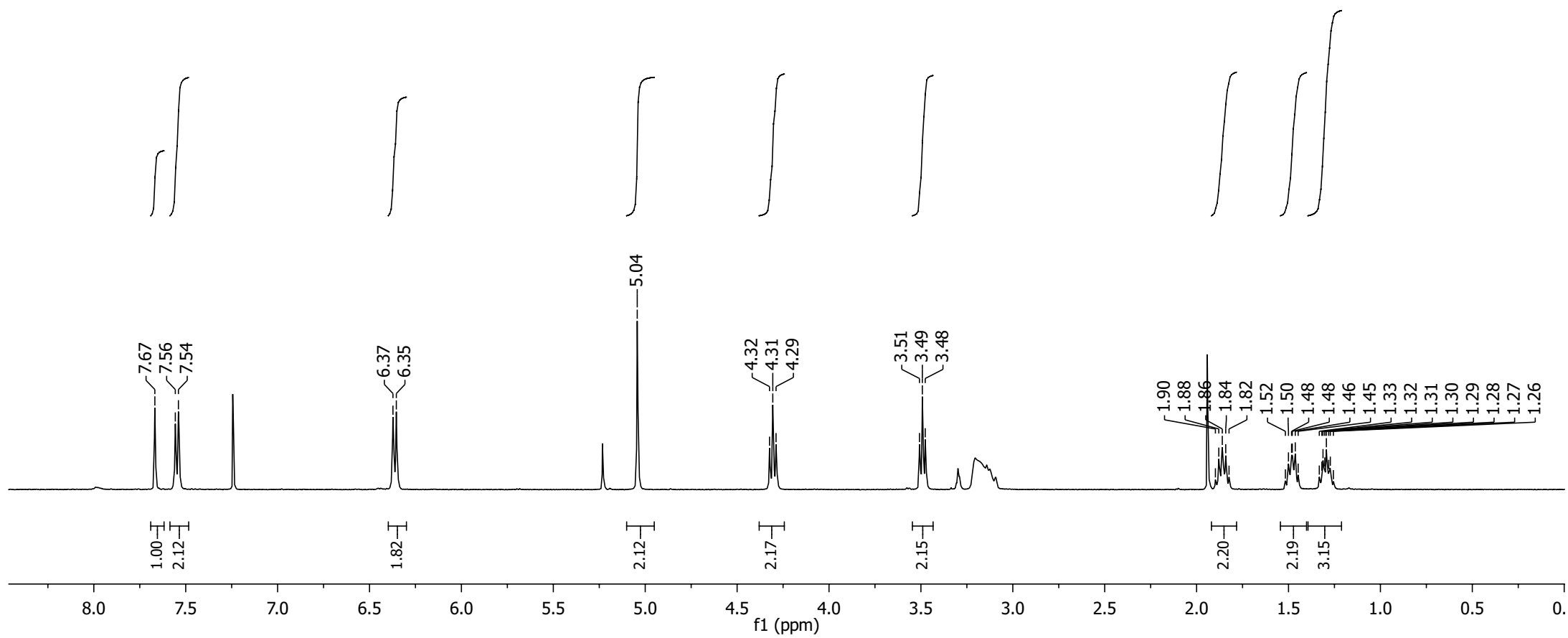
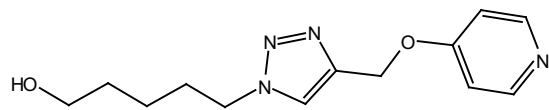




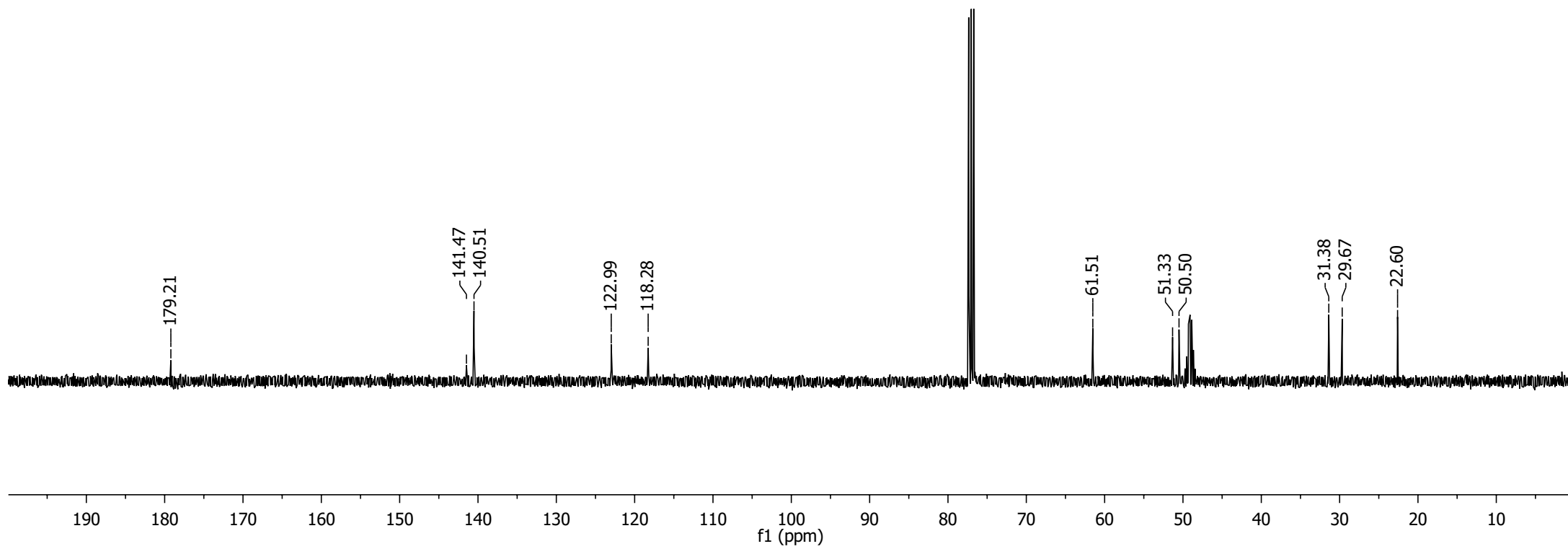
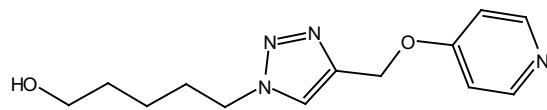
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 35(IV)



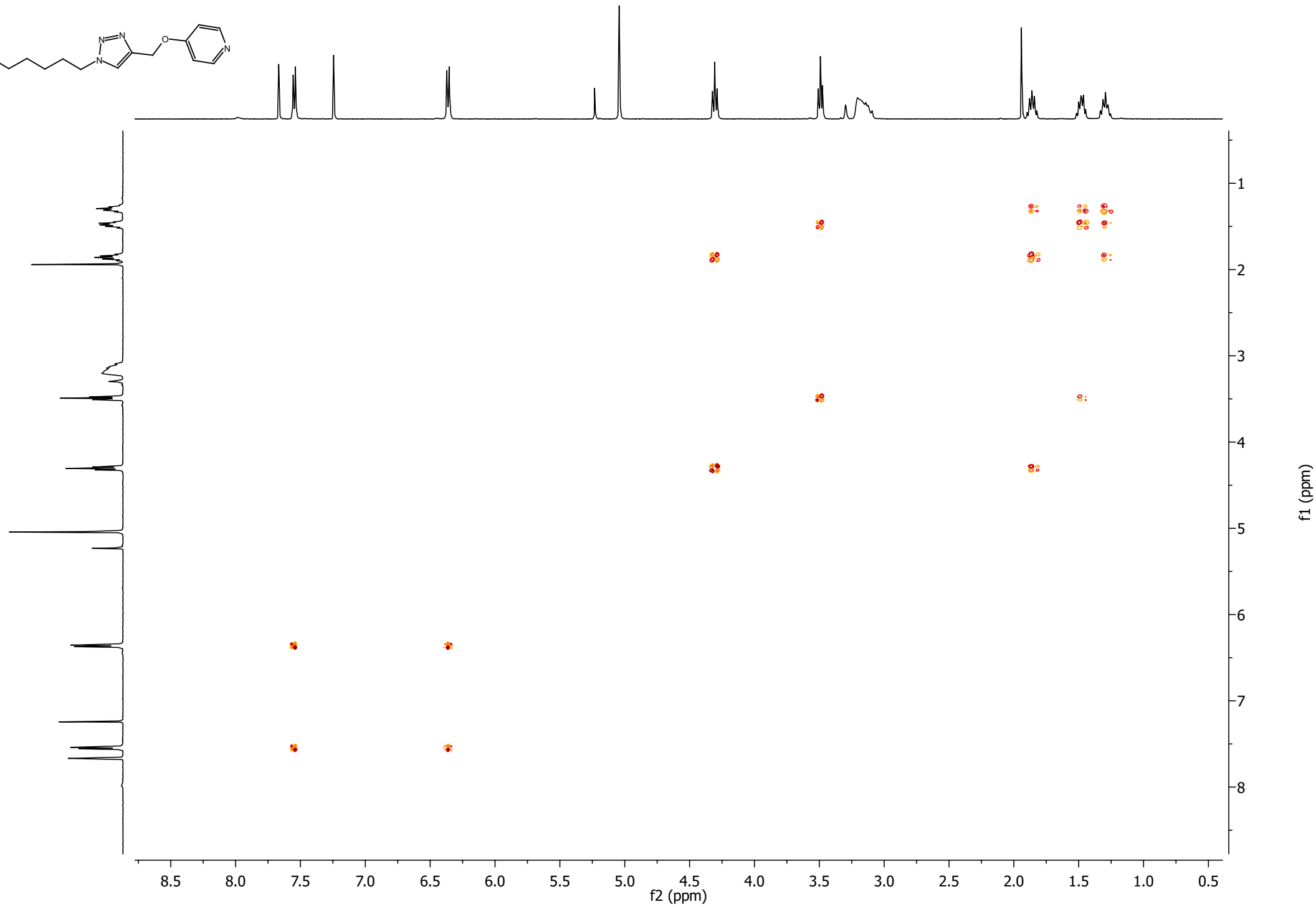
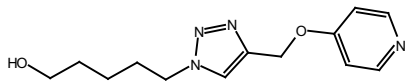
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 35(VI)



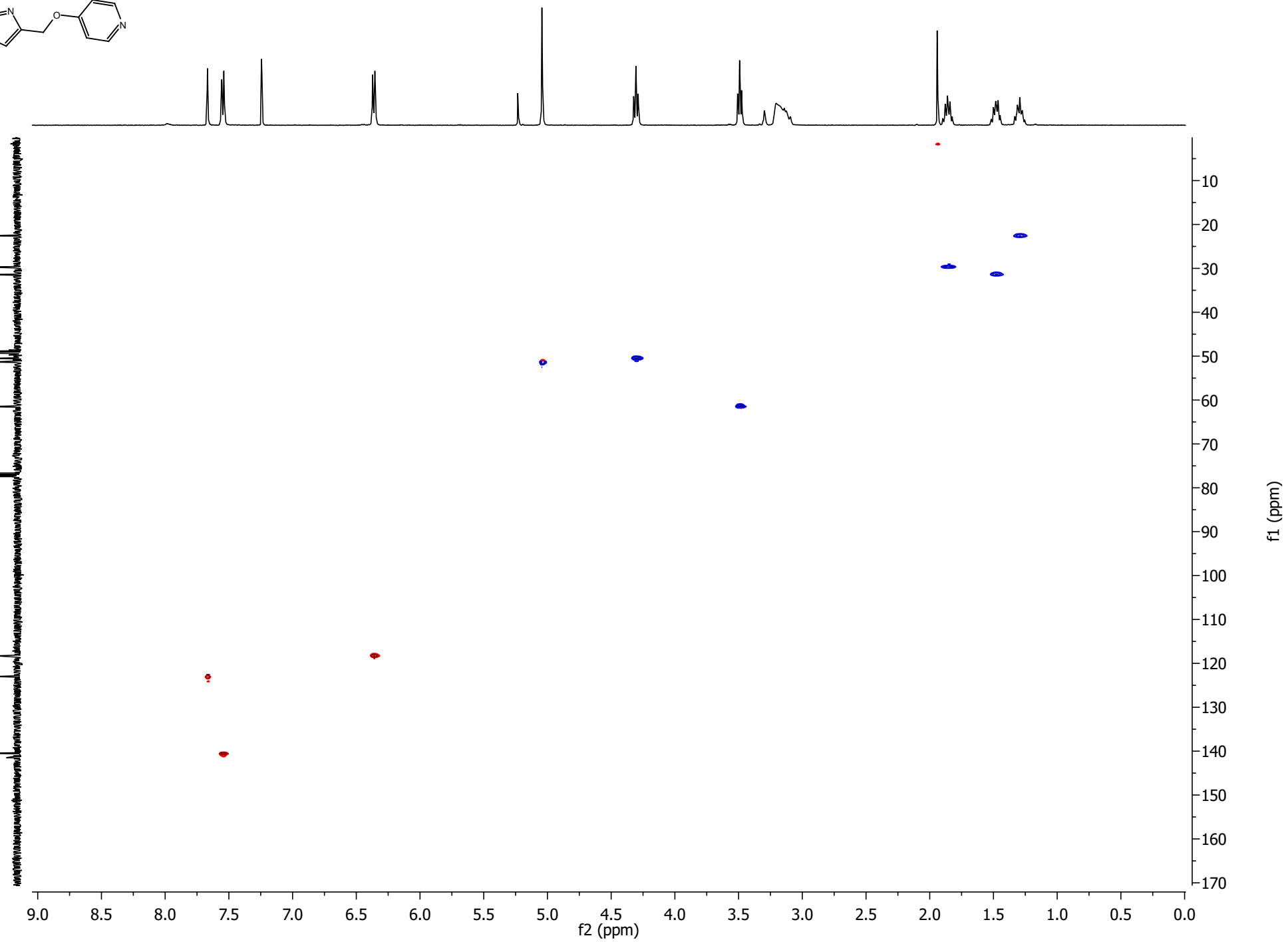
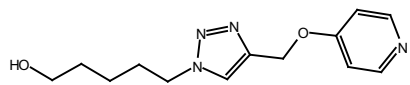
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 35(VI)



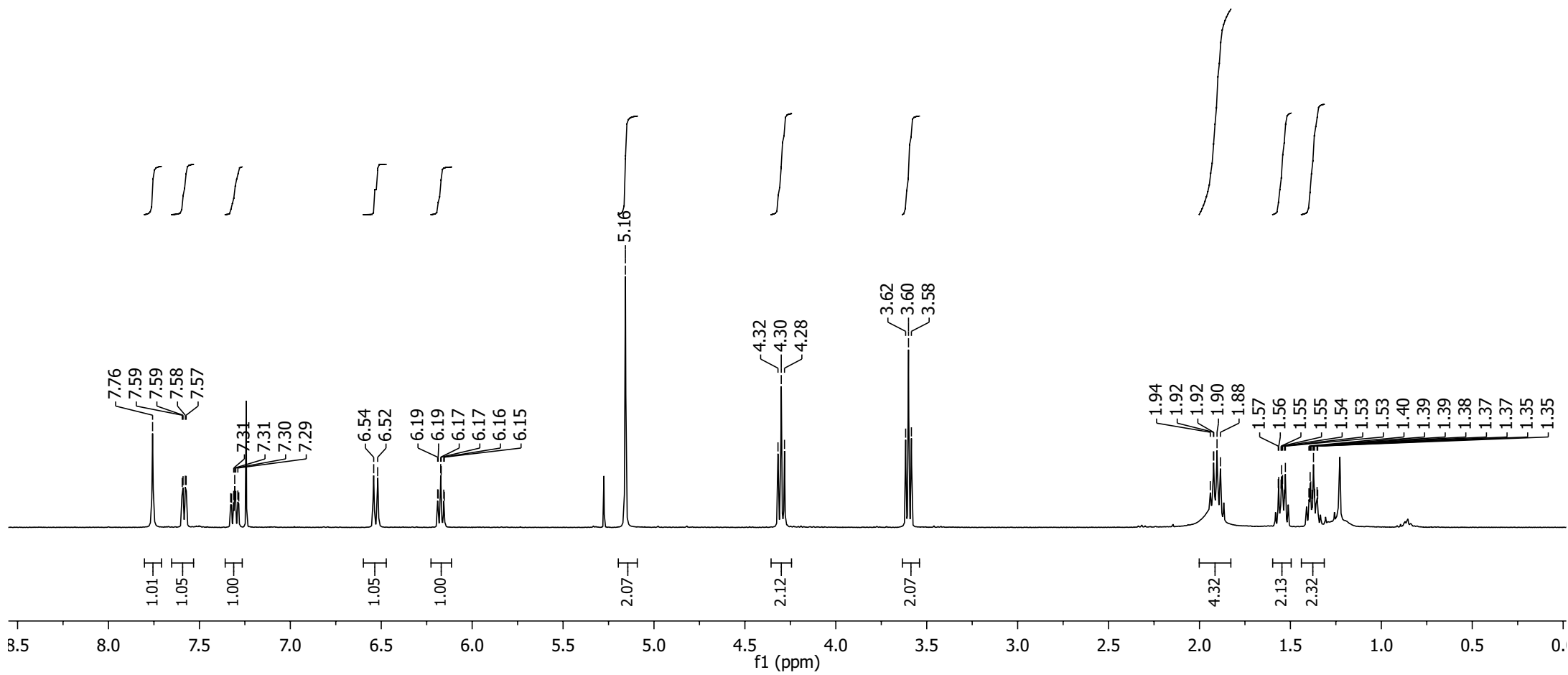
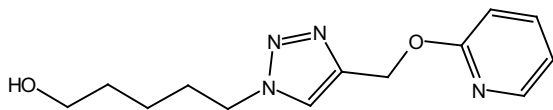
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 35(VI)



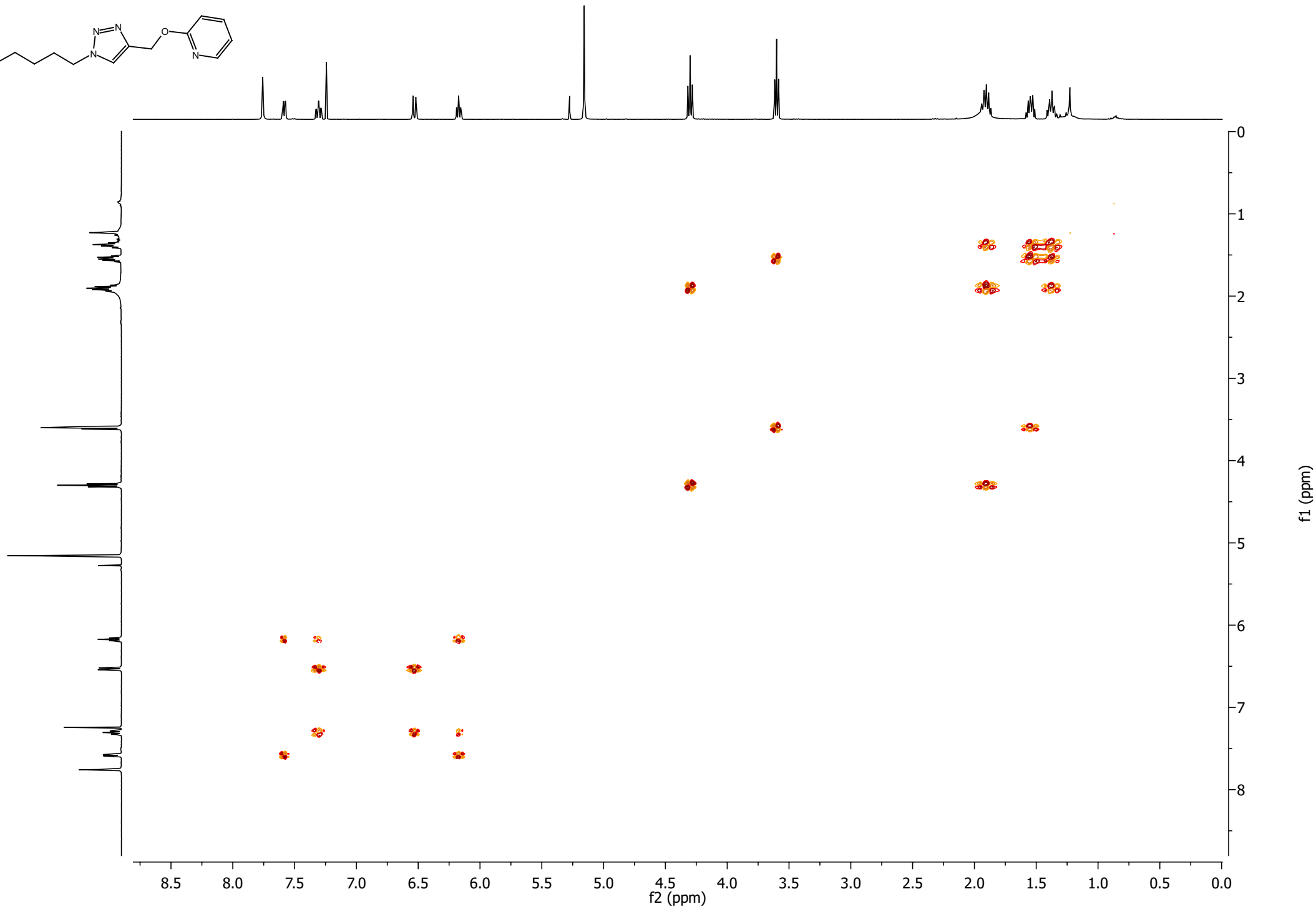
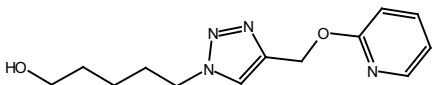
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 35(VI)



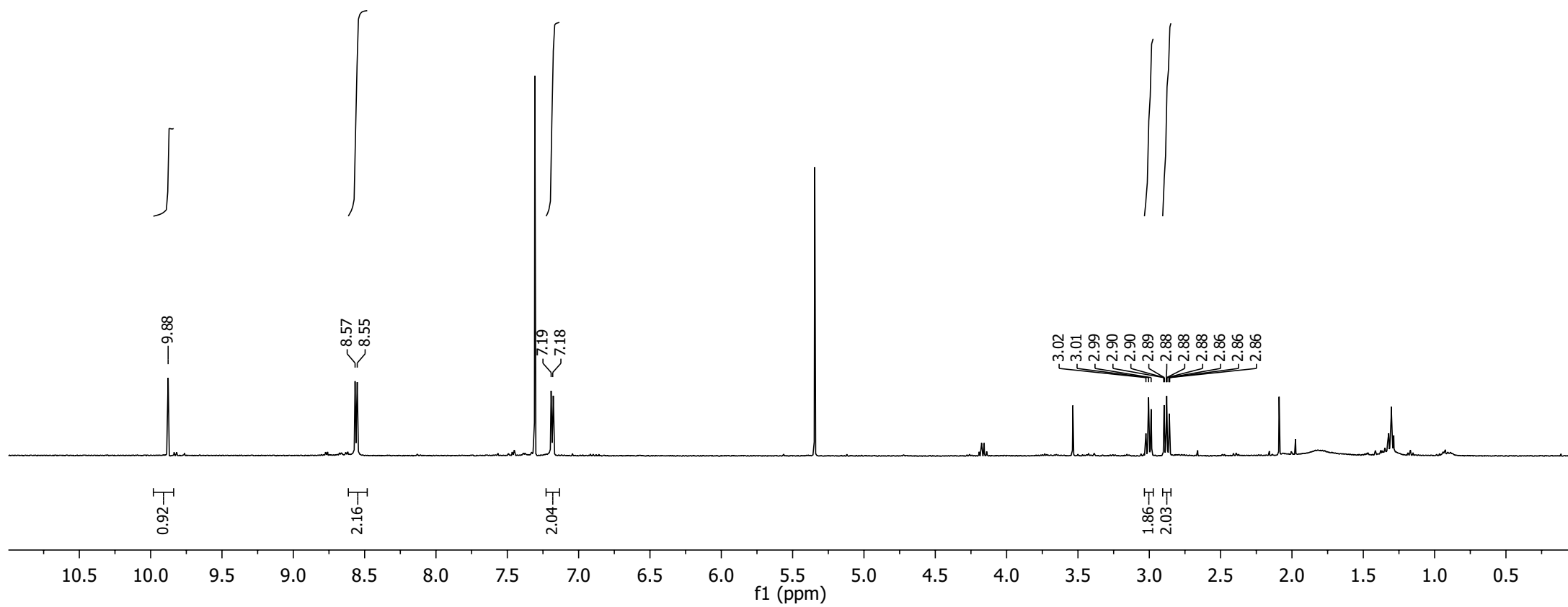
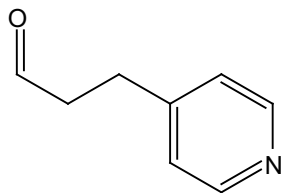
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400MHz) of 35(VII)



gDQCOSY (CDCl<sub>3</sub>, 400MHz) of 35(VII)

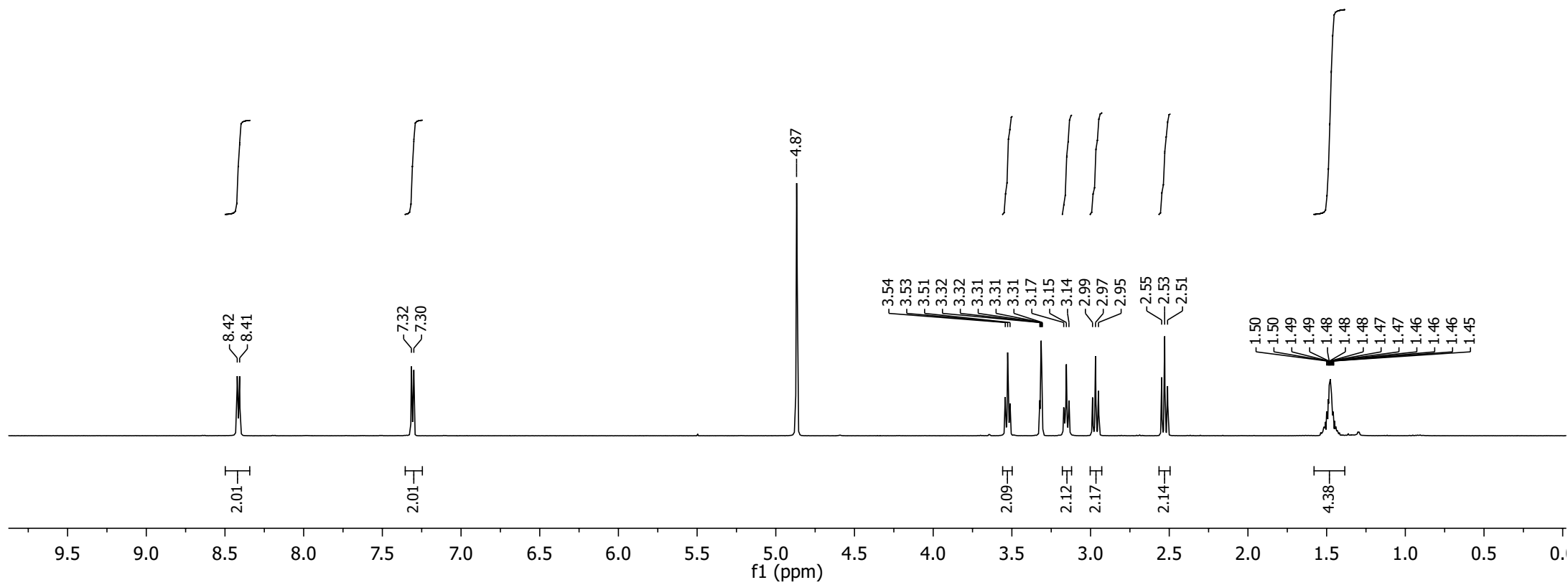
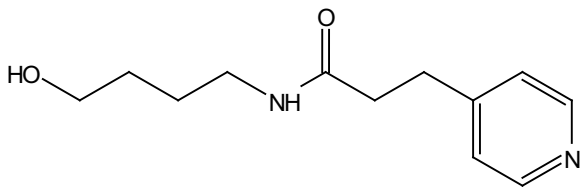


$^1\text{H}$  NMR ( $\text{CDCl}_3$ , 400MHz) of 37

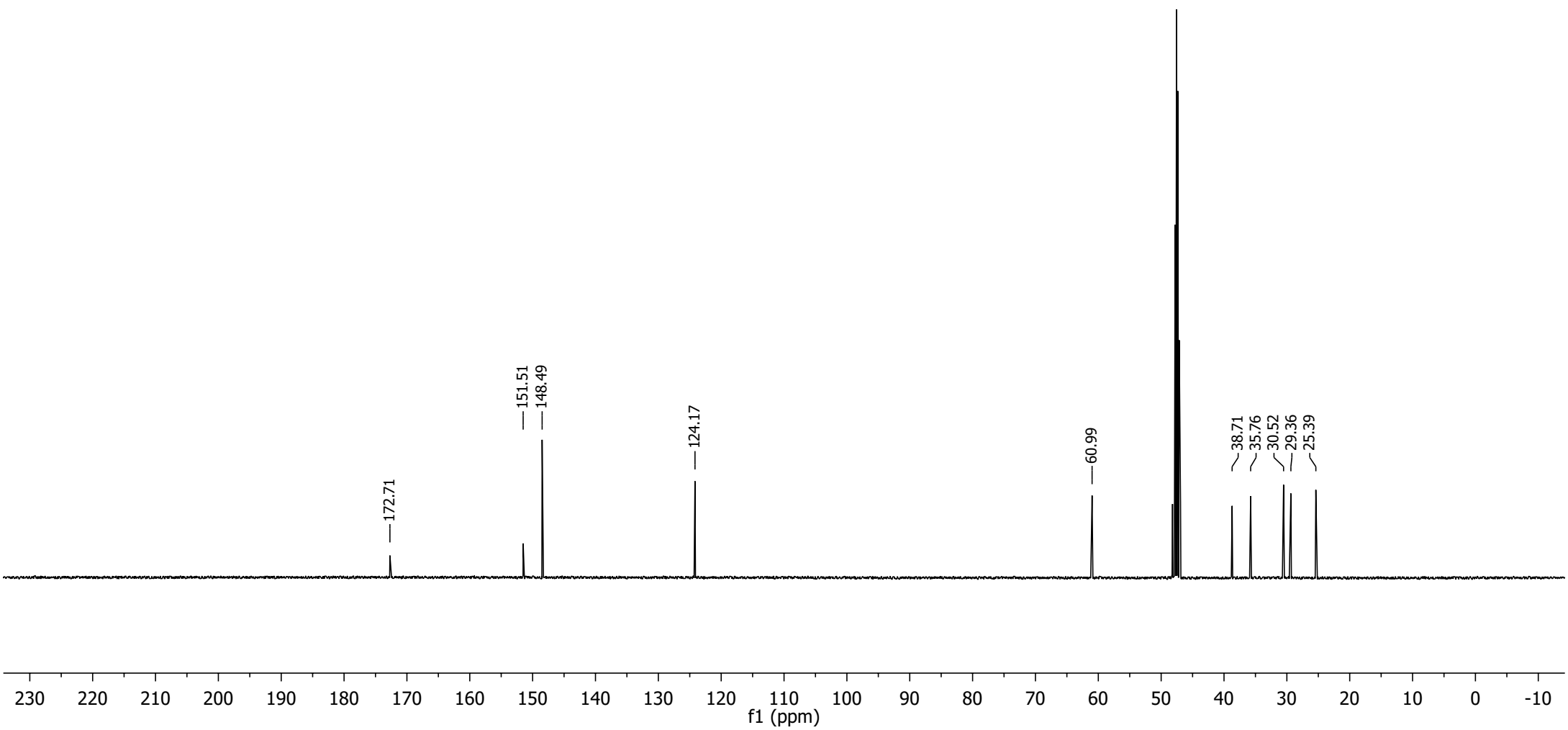
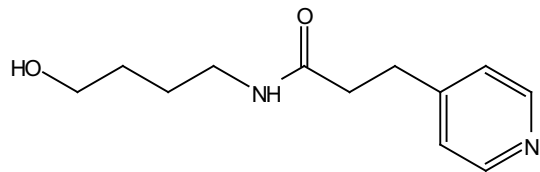




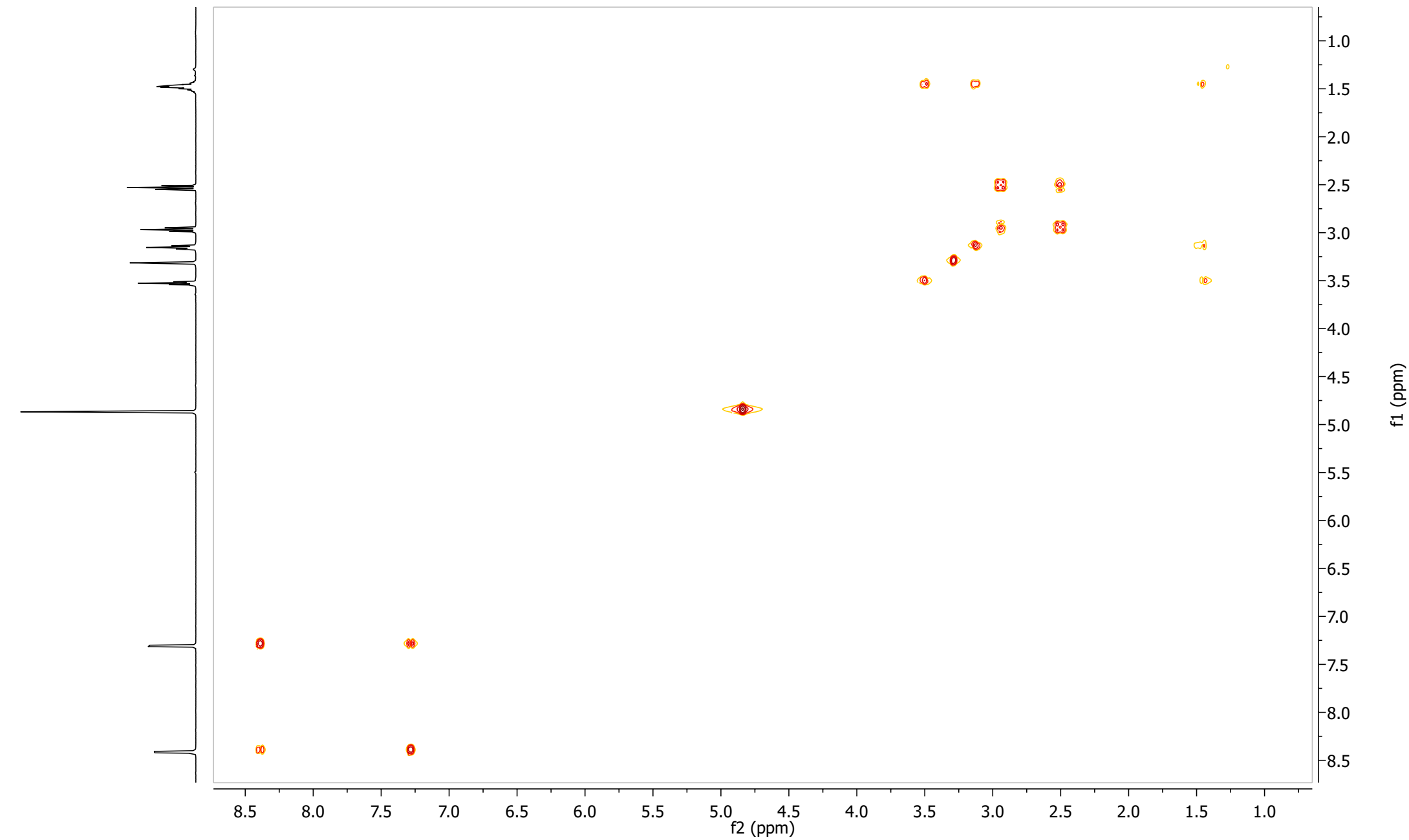
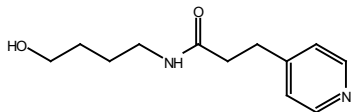
<sup>1</sup>H NMR (MeOD, 400 MHz) of 38



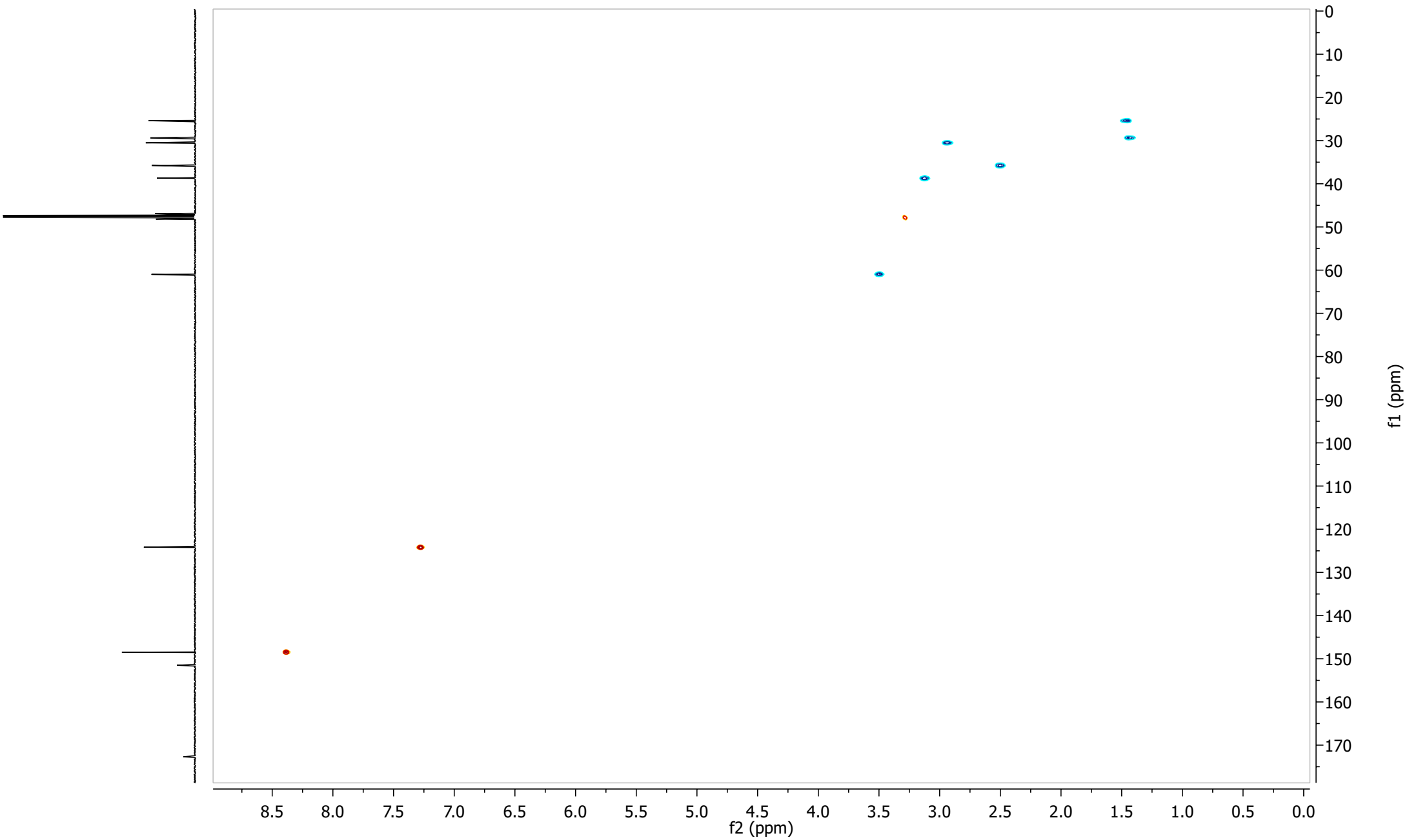
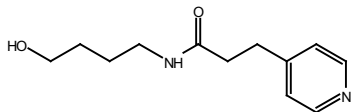
<sup>13</sup>C NMR (MeOD, 101 MHz) of 38



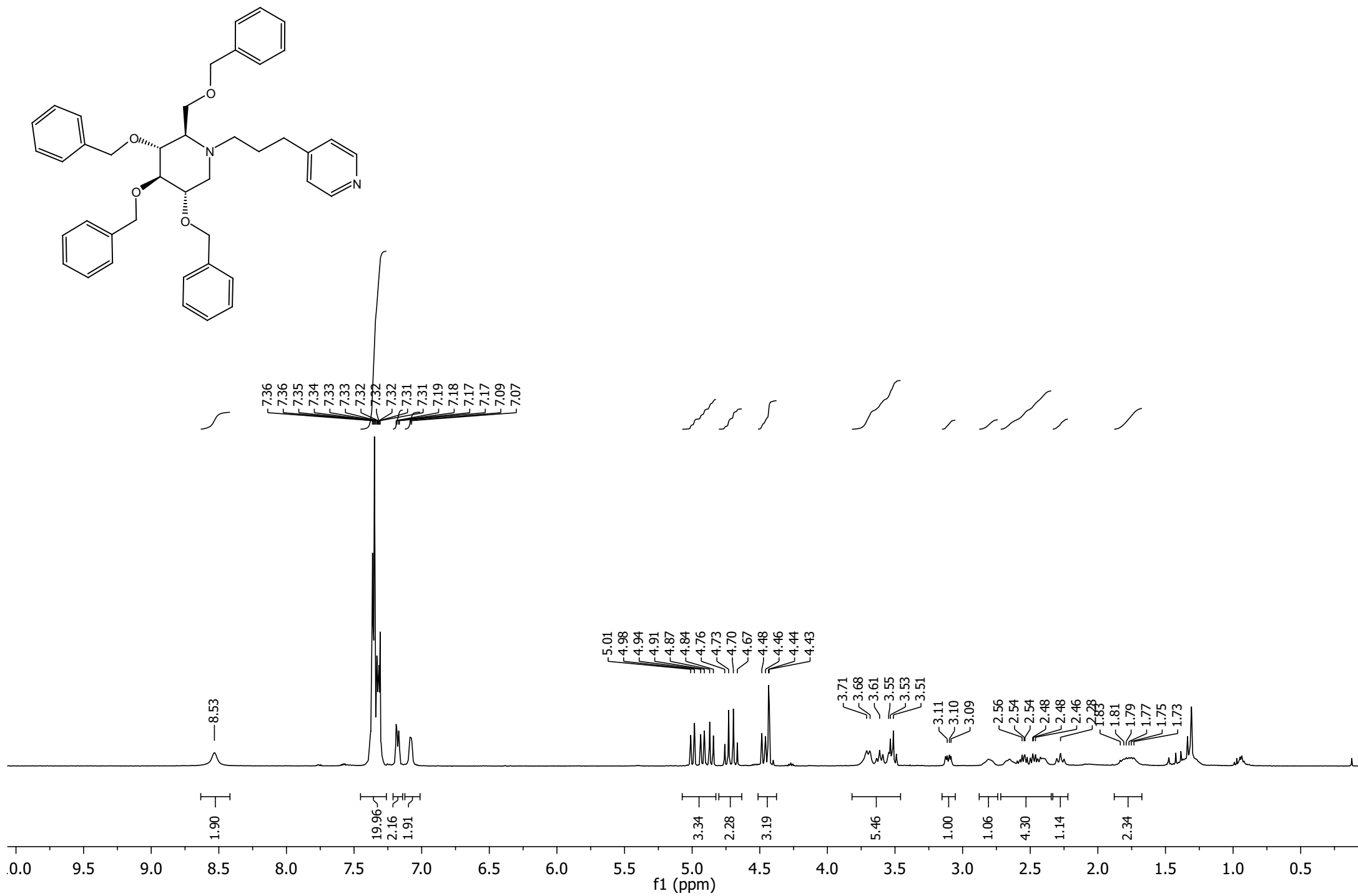
gCOSY (MeOD, 400 MHz) of 38



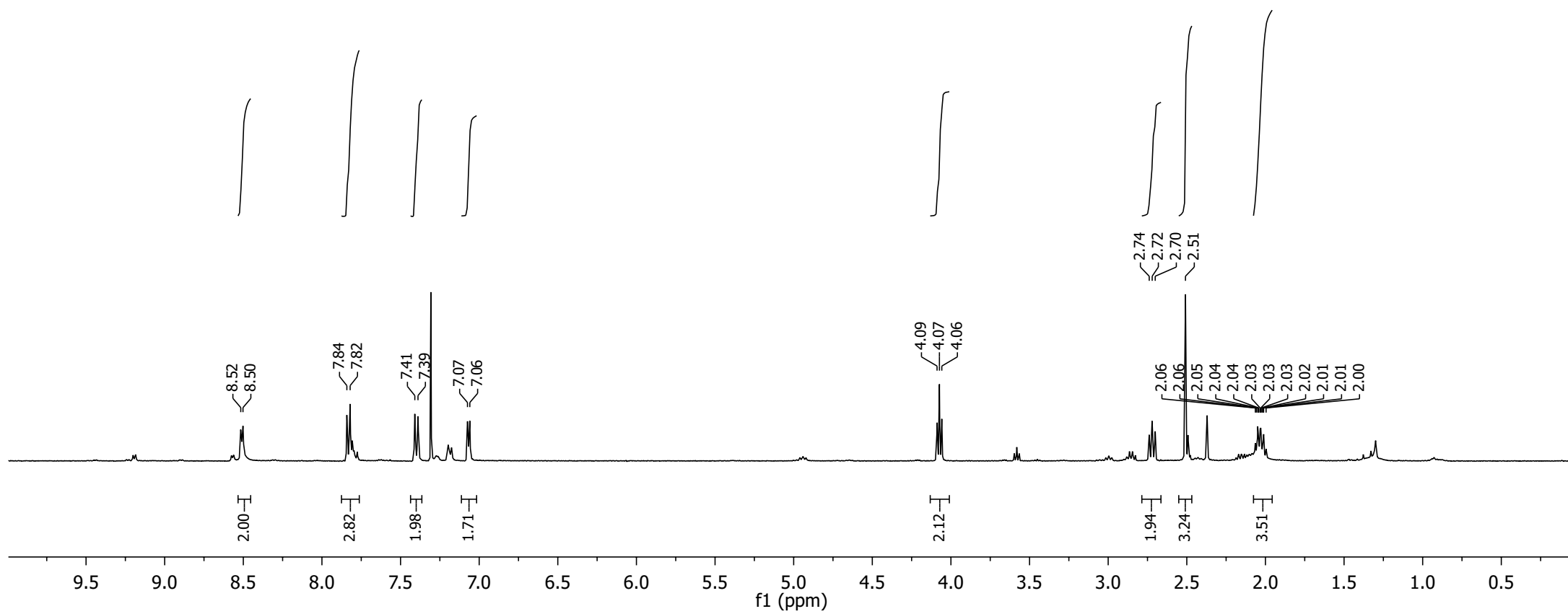
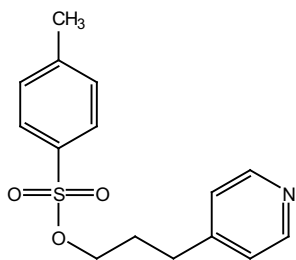
# HSQCAD (MeOD, 400 MHz) of 38



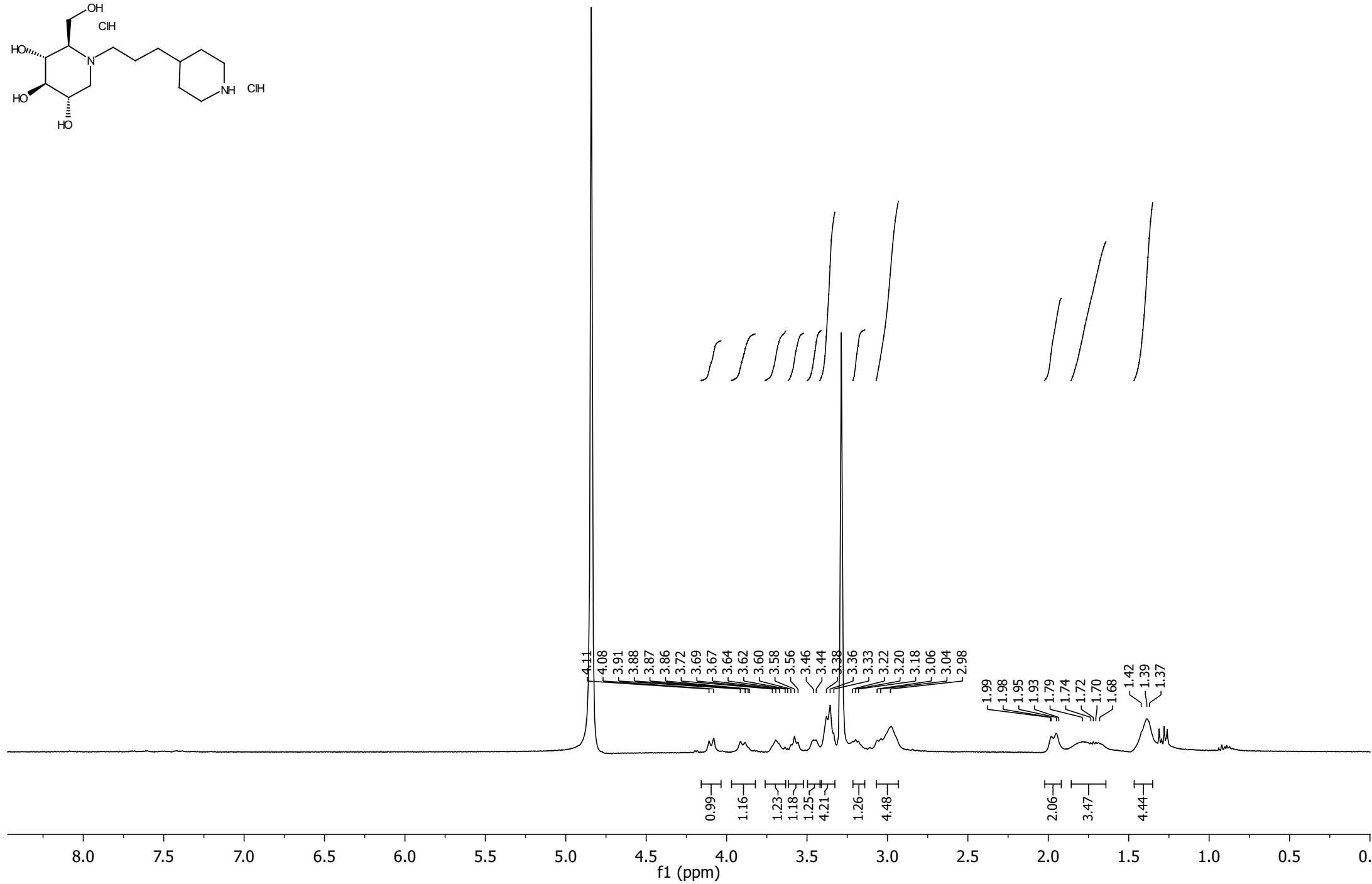
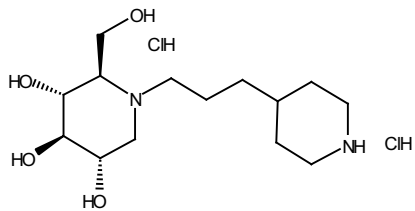
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 41



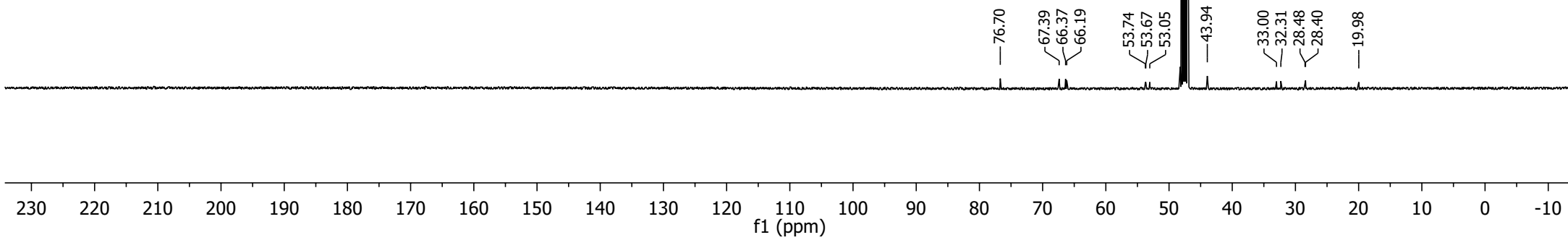
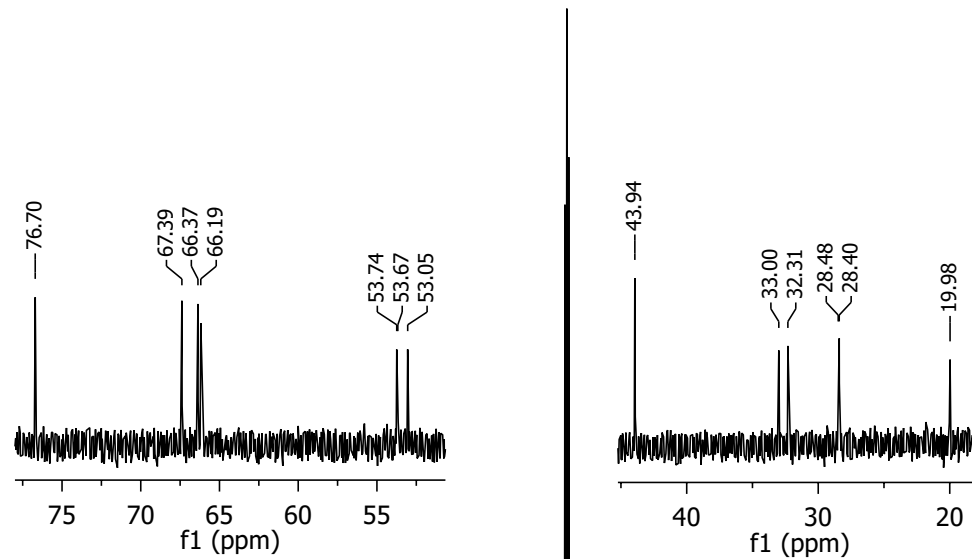
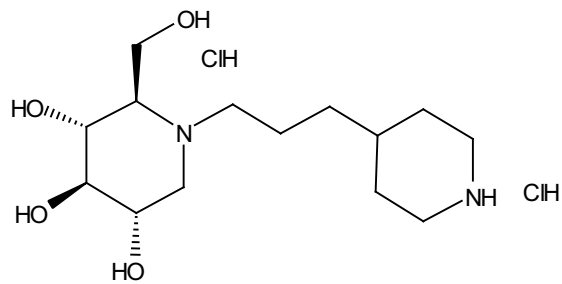
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 42



<sup>1</sup>H NMR (MeOD, 400 MHz) of 43

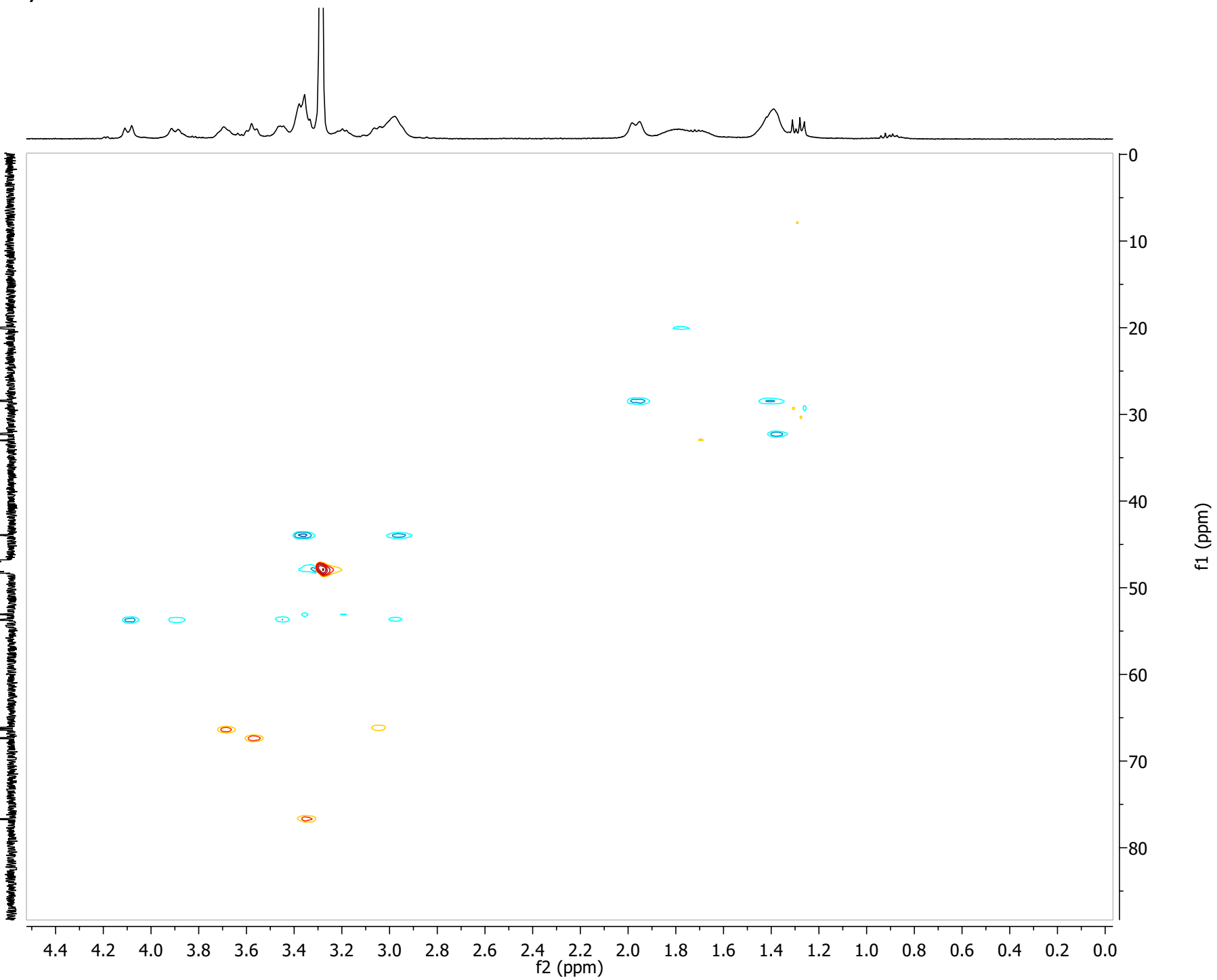
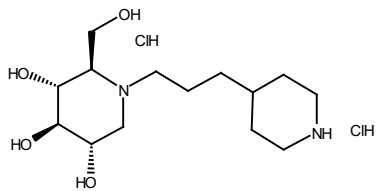


<sup>13</sup>C NMR (MeOD, 101 MHz) of 43

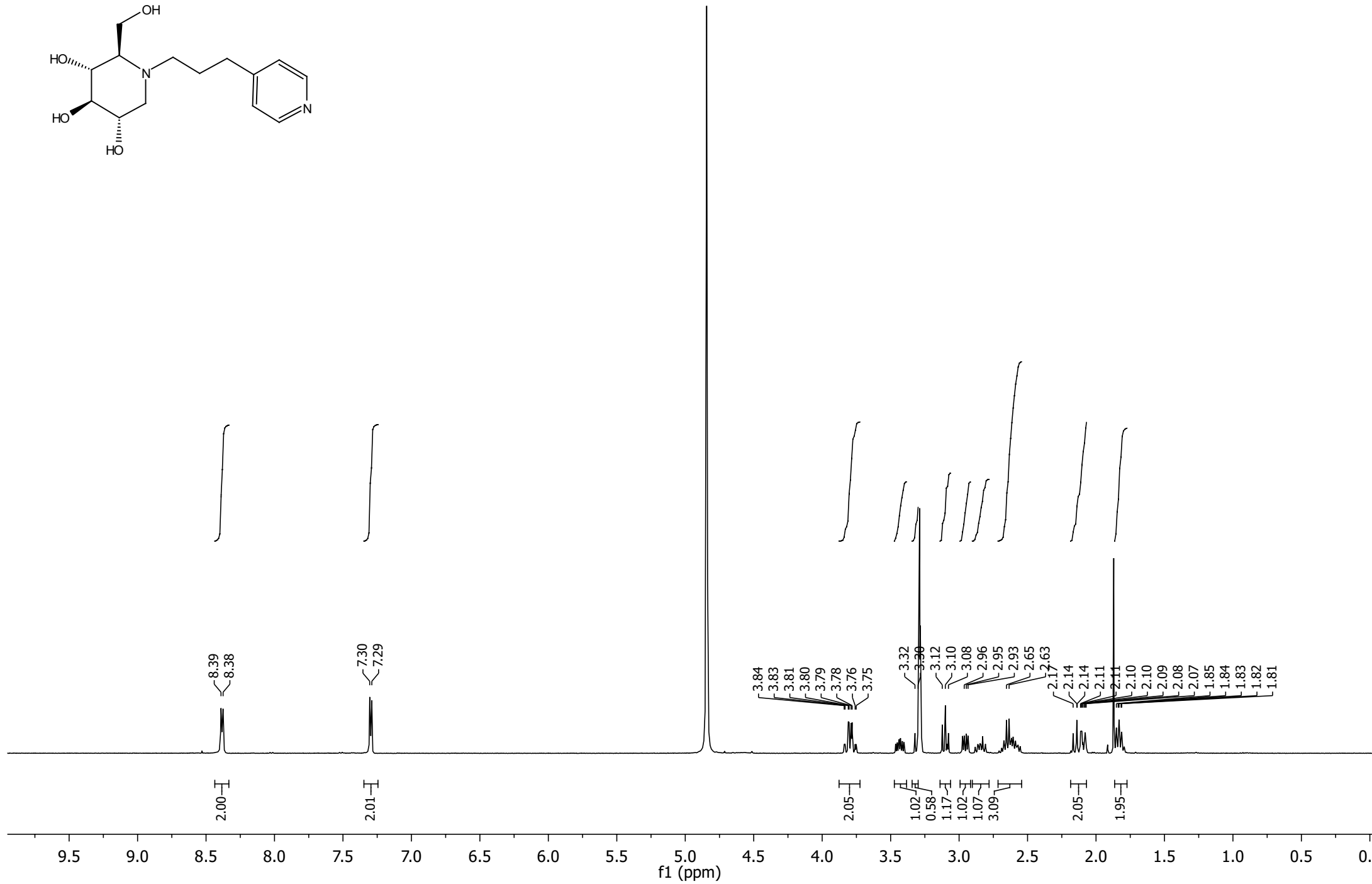
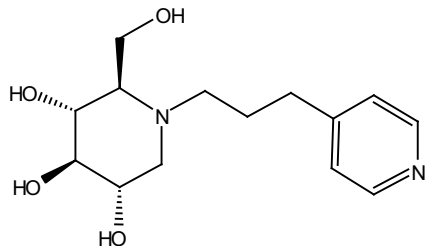




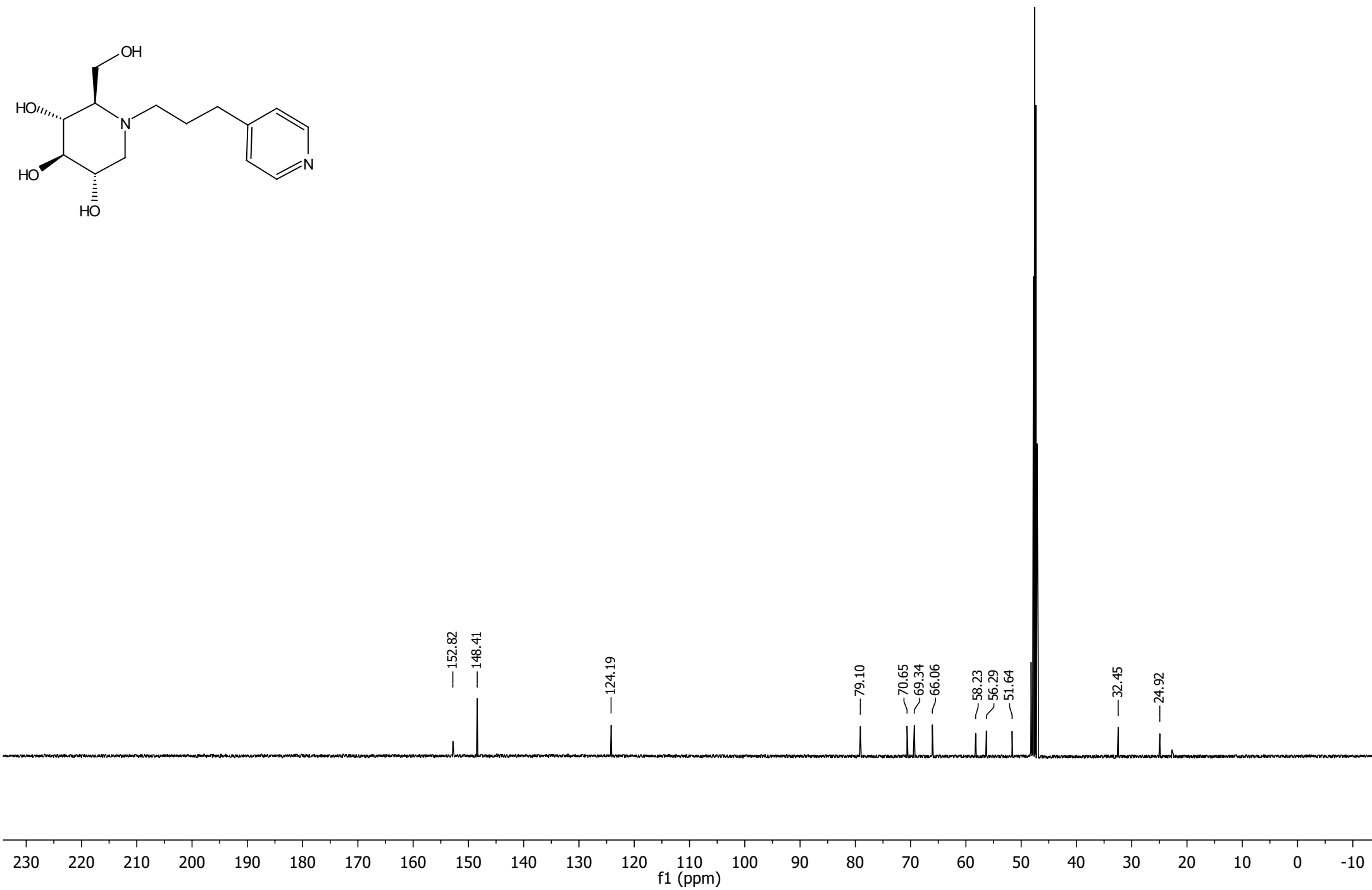
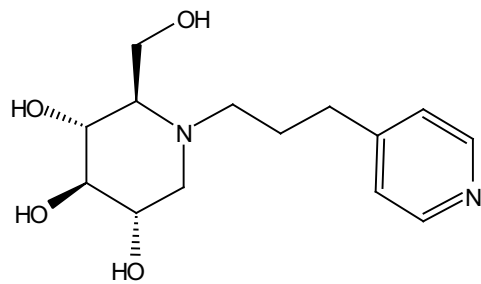
# HSQCAD (MeOD, 400 MHz) of 43



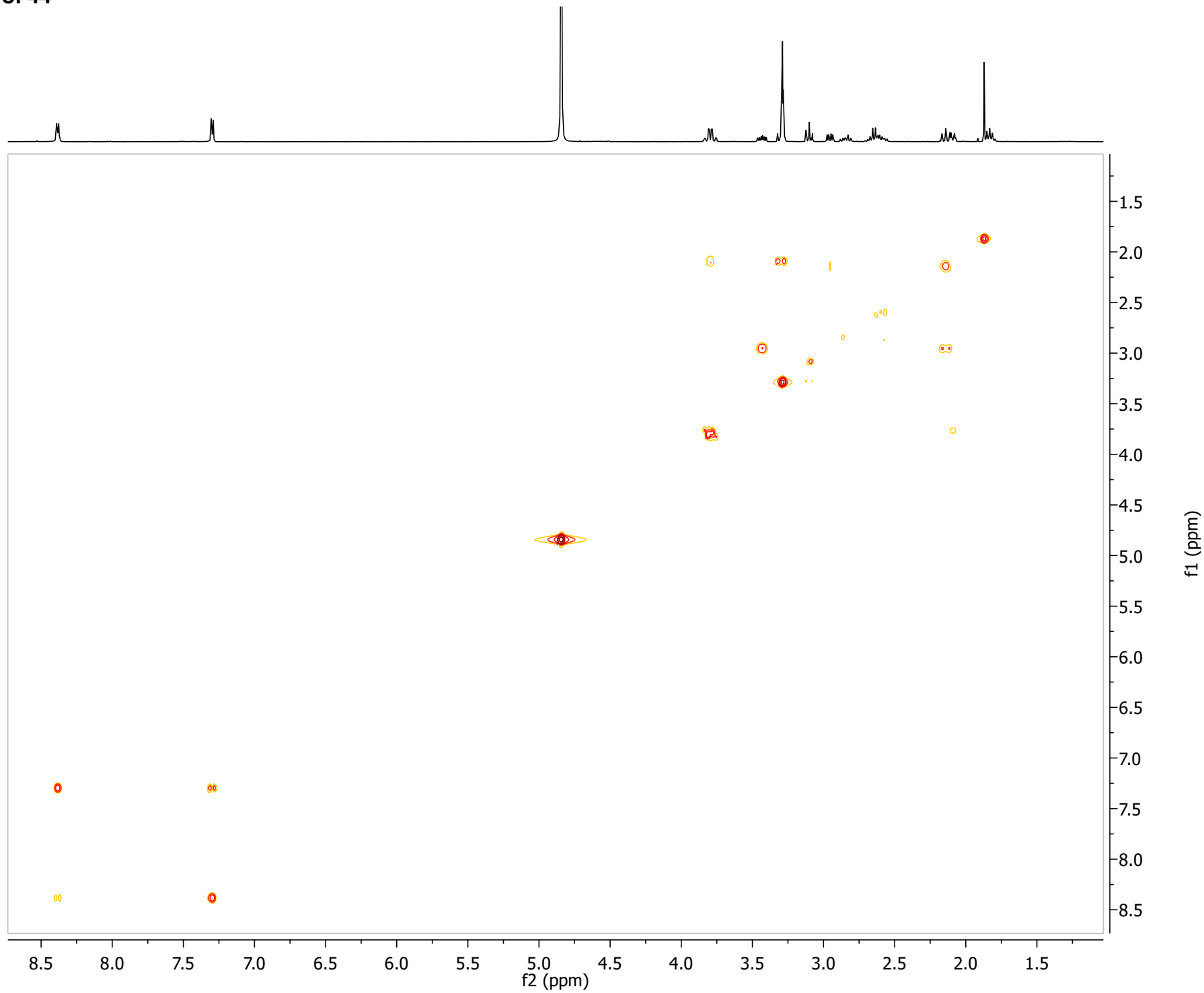
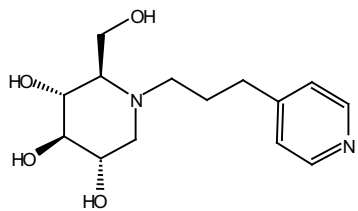
<sup>1</sup>H NMR (MeOD, 400 MHz) of 44



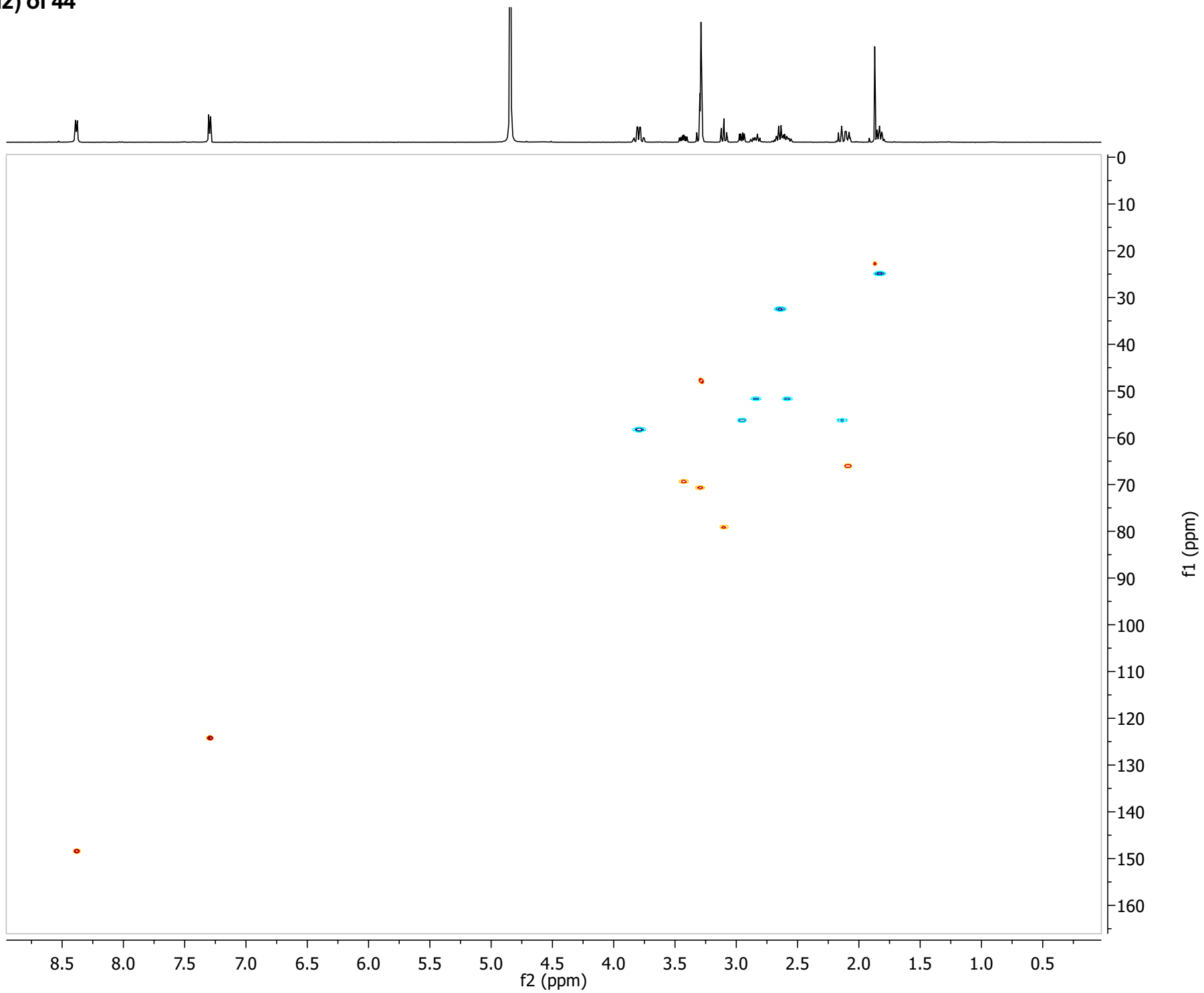
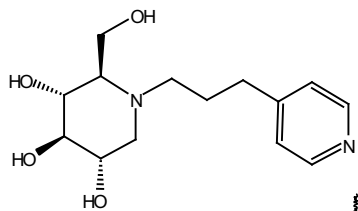
<sup>13</sup>C NMR (MeOD, 101 MHz) of 44



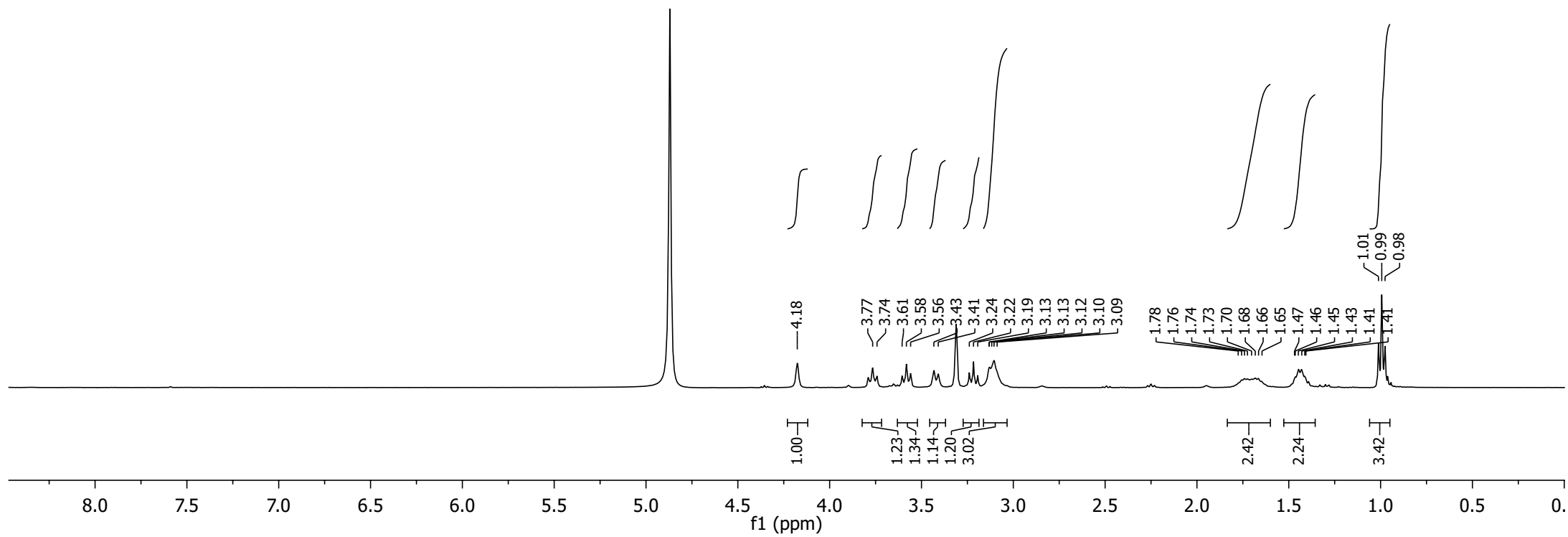
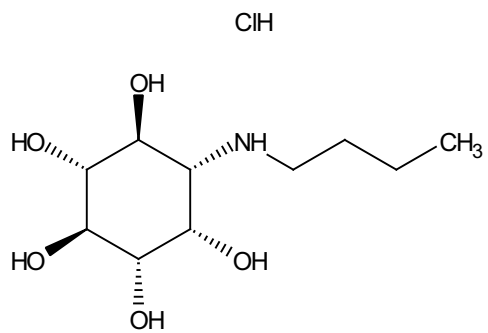
gCOSY (MeOD, 400 MHz) of 44



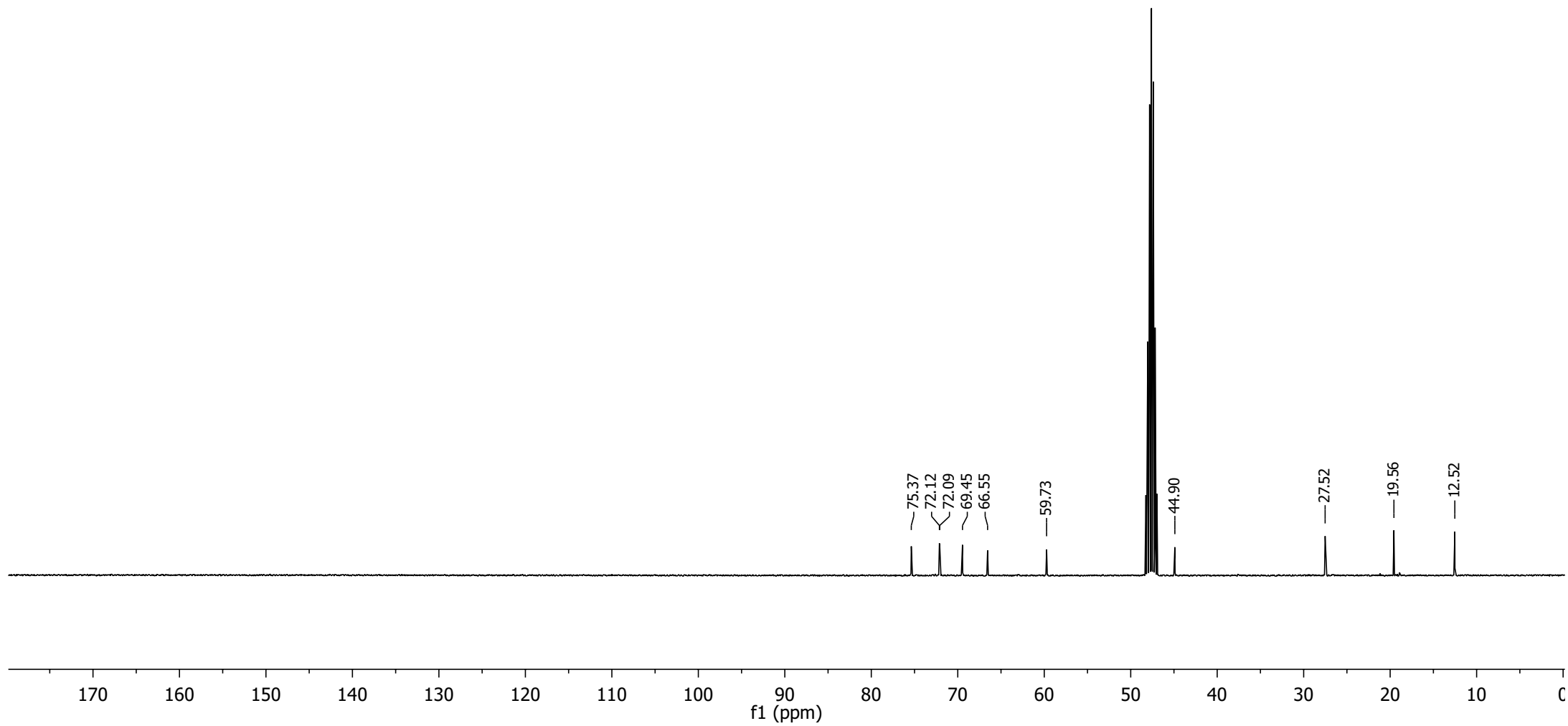
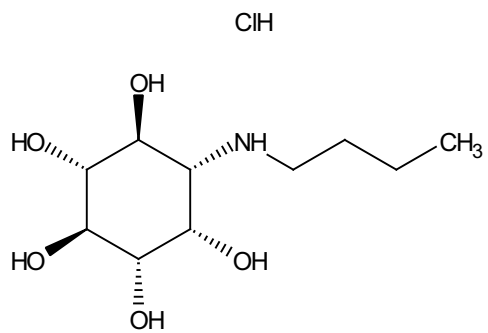
# HSQCAD (MeOD, 400 MHz) of 44



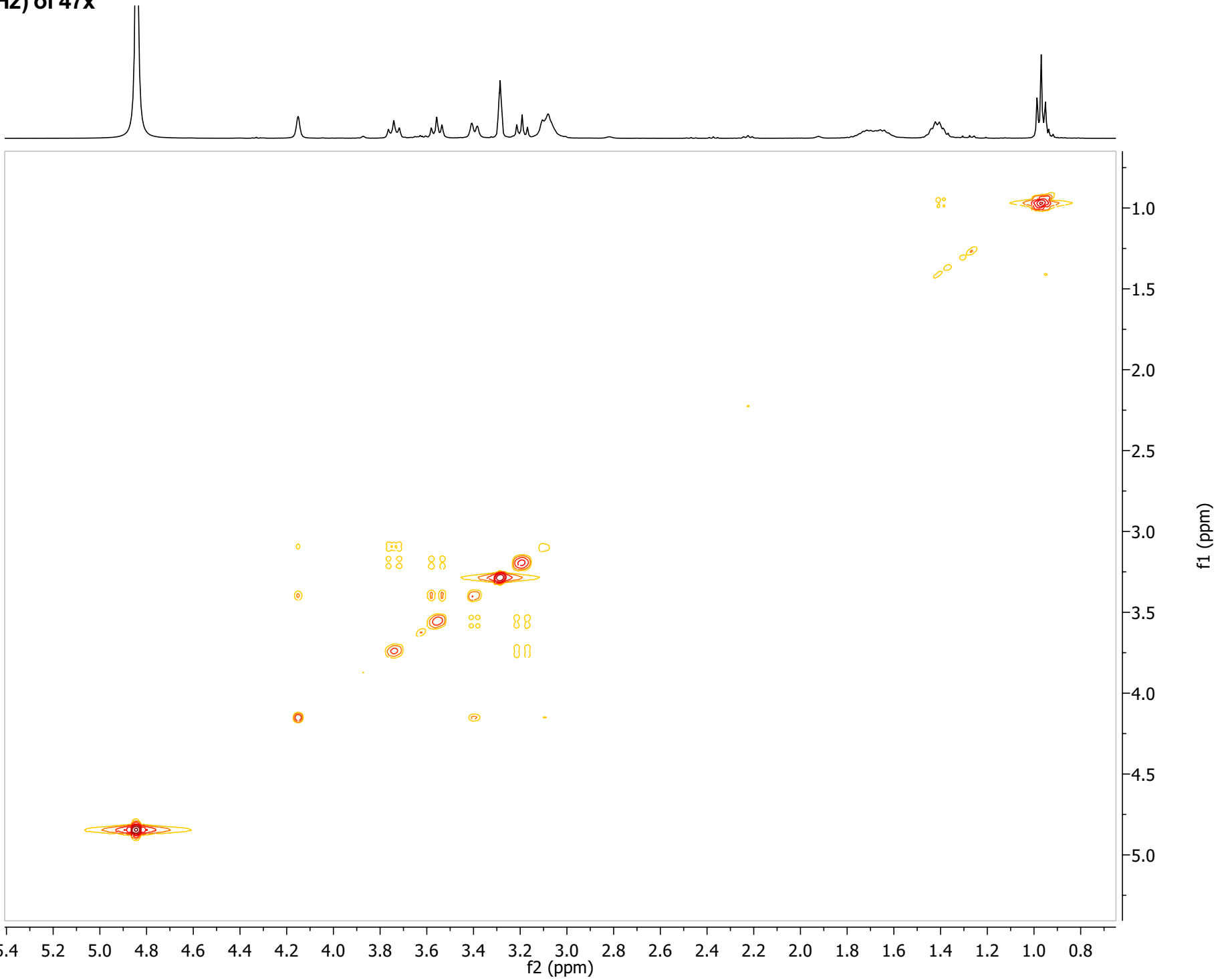
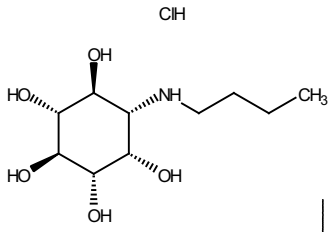
<sup>1</sup>H NMR (MeOD, 400 MHz) of 47x



<sup>13</sup>C NMR (MeOD, 101 MHz) of 47x

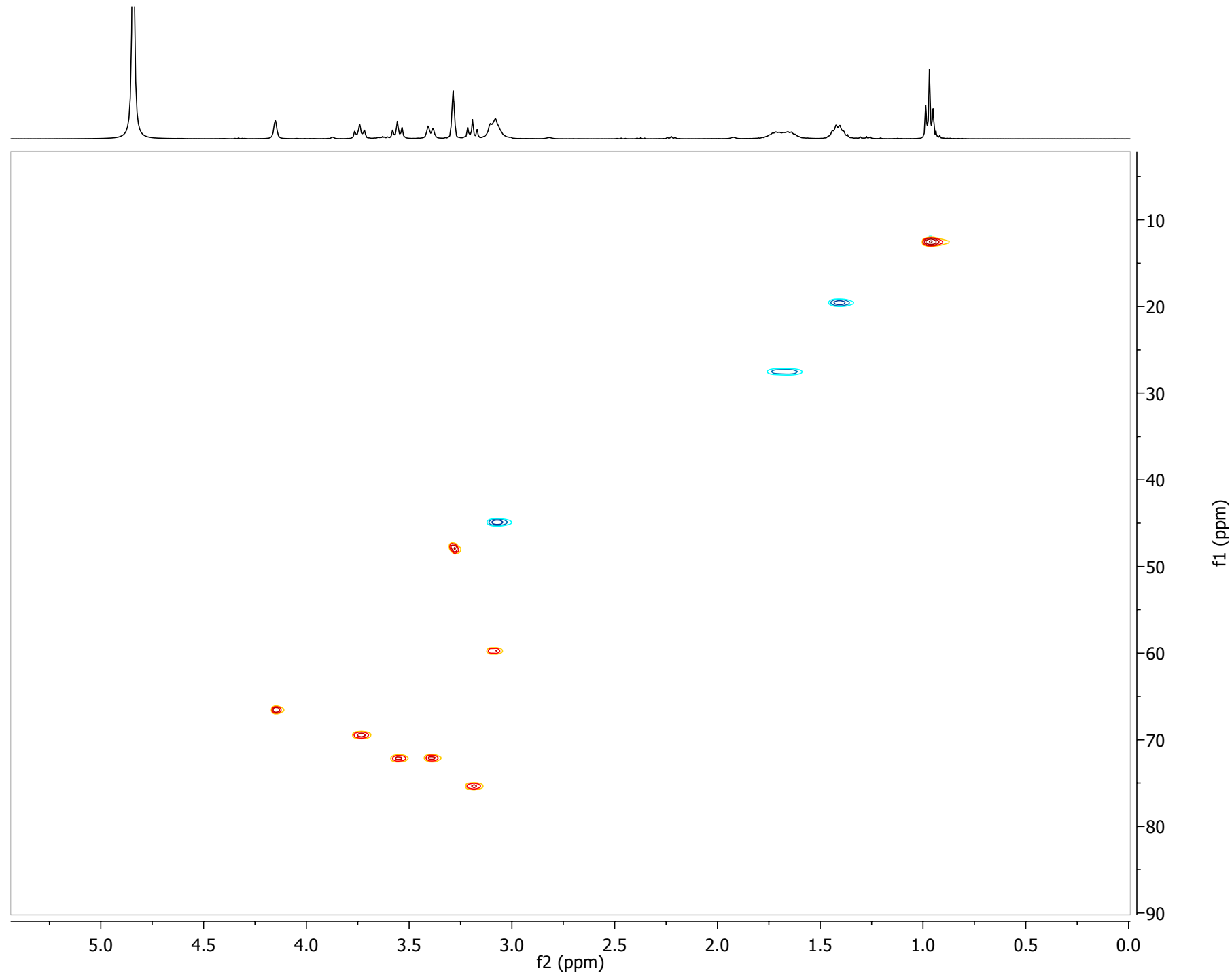
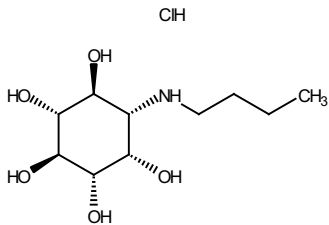


gCOSY (MeOD, 400 MHz) of 47x

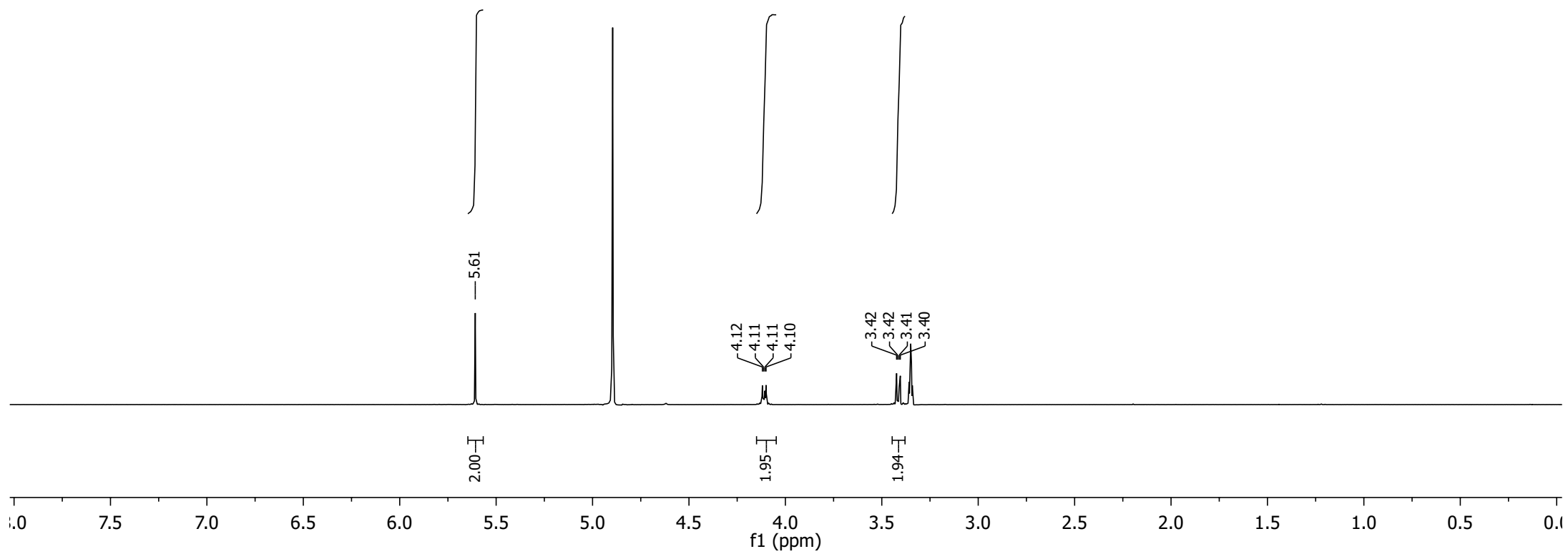
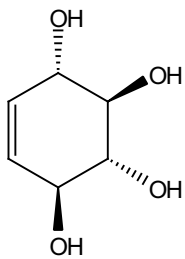




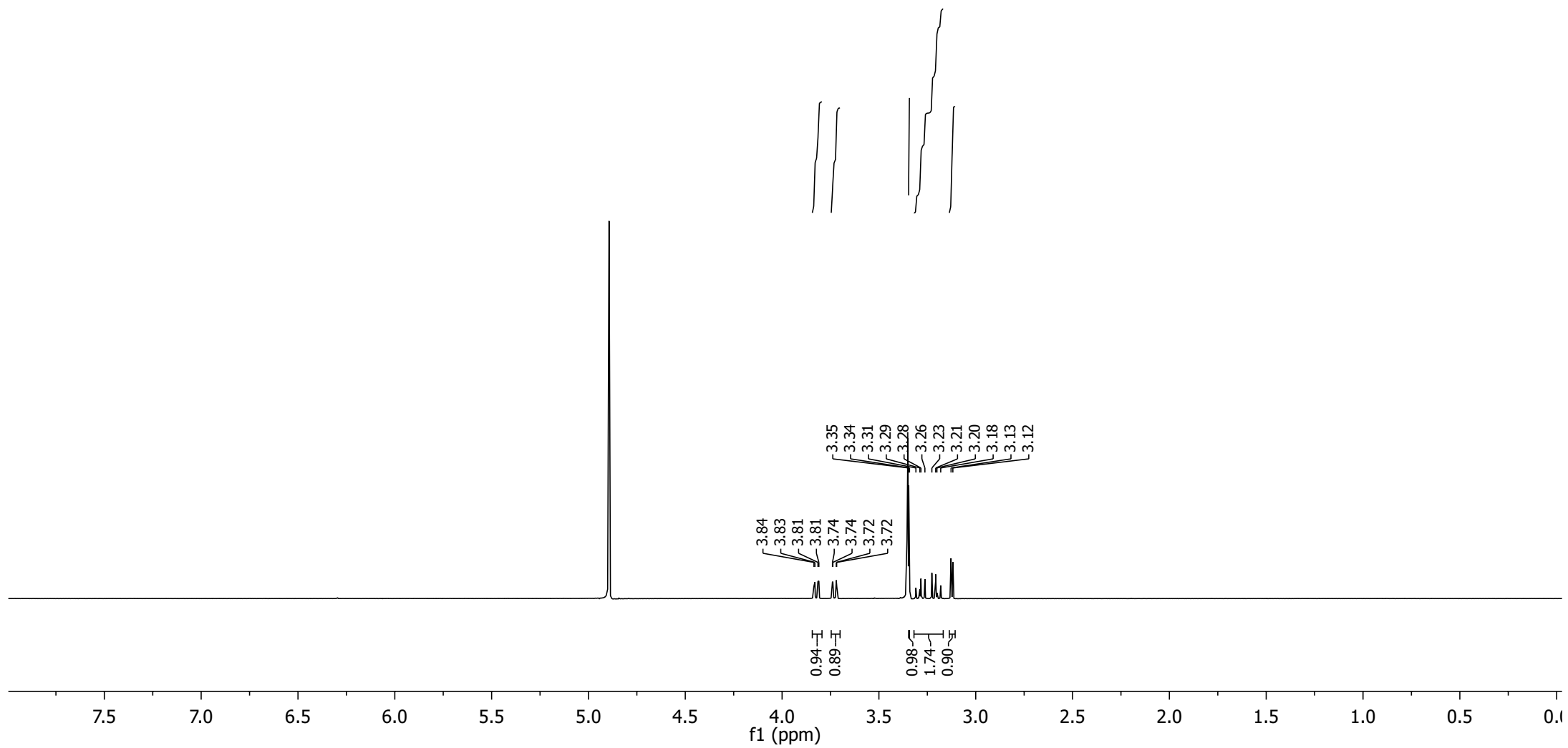
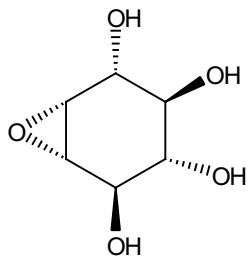
# HSQCAD (MeOD, 400 MHz) of 47x



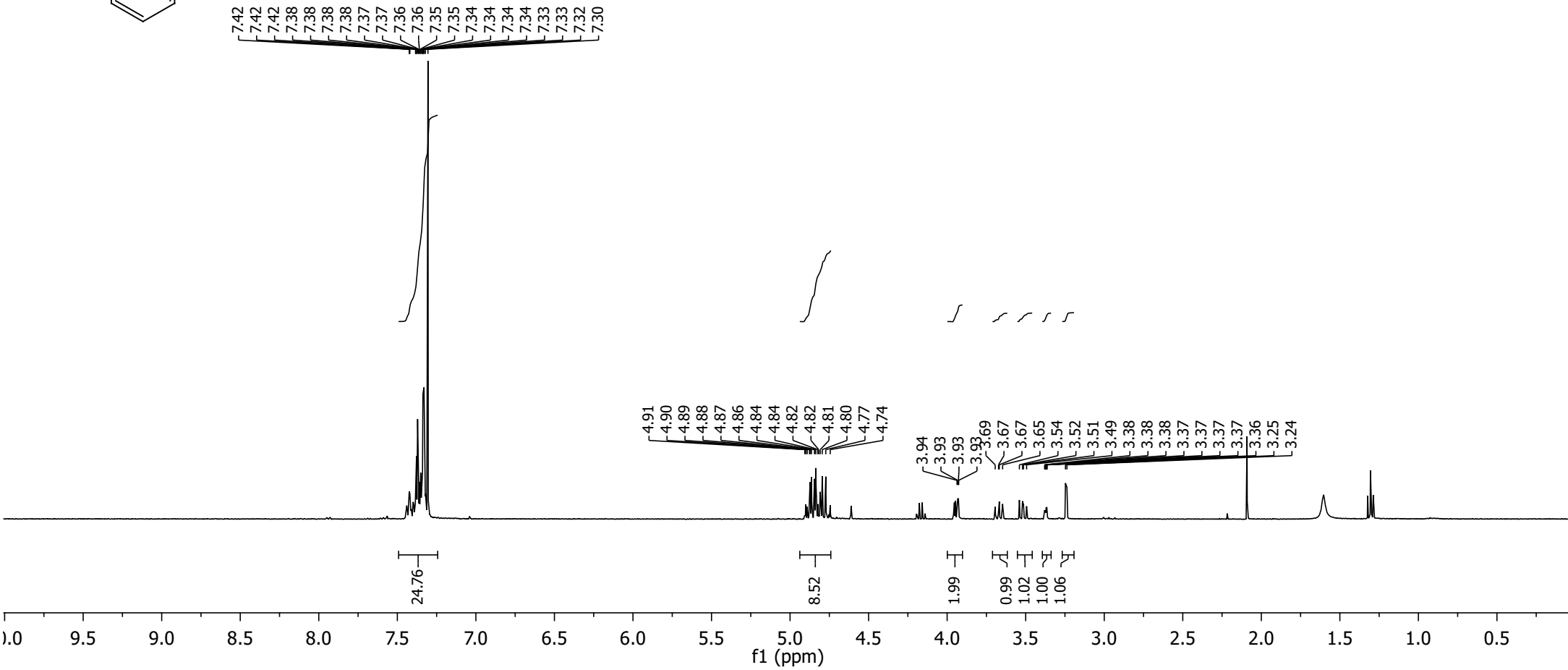
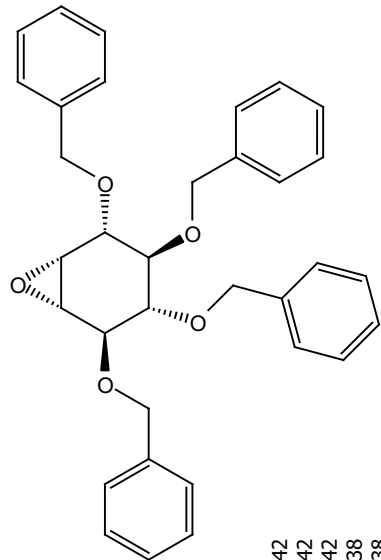
<sup>1</sup>H NMR (MeOD, 400 MHz) of 55



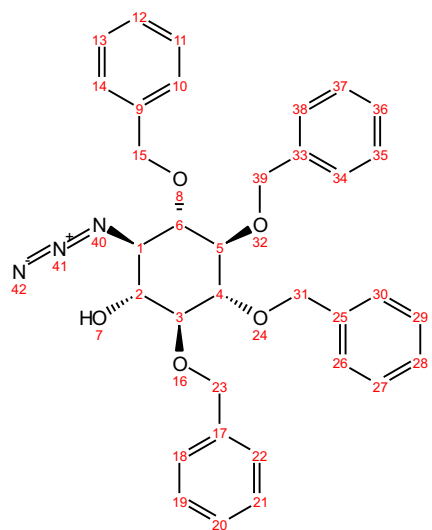
<sup>1</sup>H NMR (MeOD, 400 MHz) of 56



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 57



# <sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 58



7.32  
7.32  
7.32  
7.32  
7.31  
7.31  
7.31  
7.31  
7.31  
7.30  
7.30  
7.29  
7.28  
7.28  
7.27  
7.27  
7.27  
7.27  
7.26  
7.26  
7.26  
7.26  
7.25  
7.25  
7.25  
7.24

4.93  
4.91  
4.89  
4.86  
4.86  
4.85  
4.84  
4.83  
4.82  
4.75  
4.73

3.59  
3.58  
3.58  
3.57  
3.57  
3.56  
3.53  
3.52  
3.52  
3.52  
3.51  
3.51  
3.51  
3.50  
3.48  
3.40  
3.40  
3.39  
3.39  
3.38  
3.38  
3.37

22.03

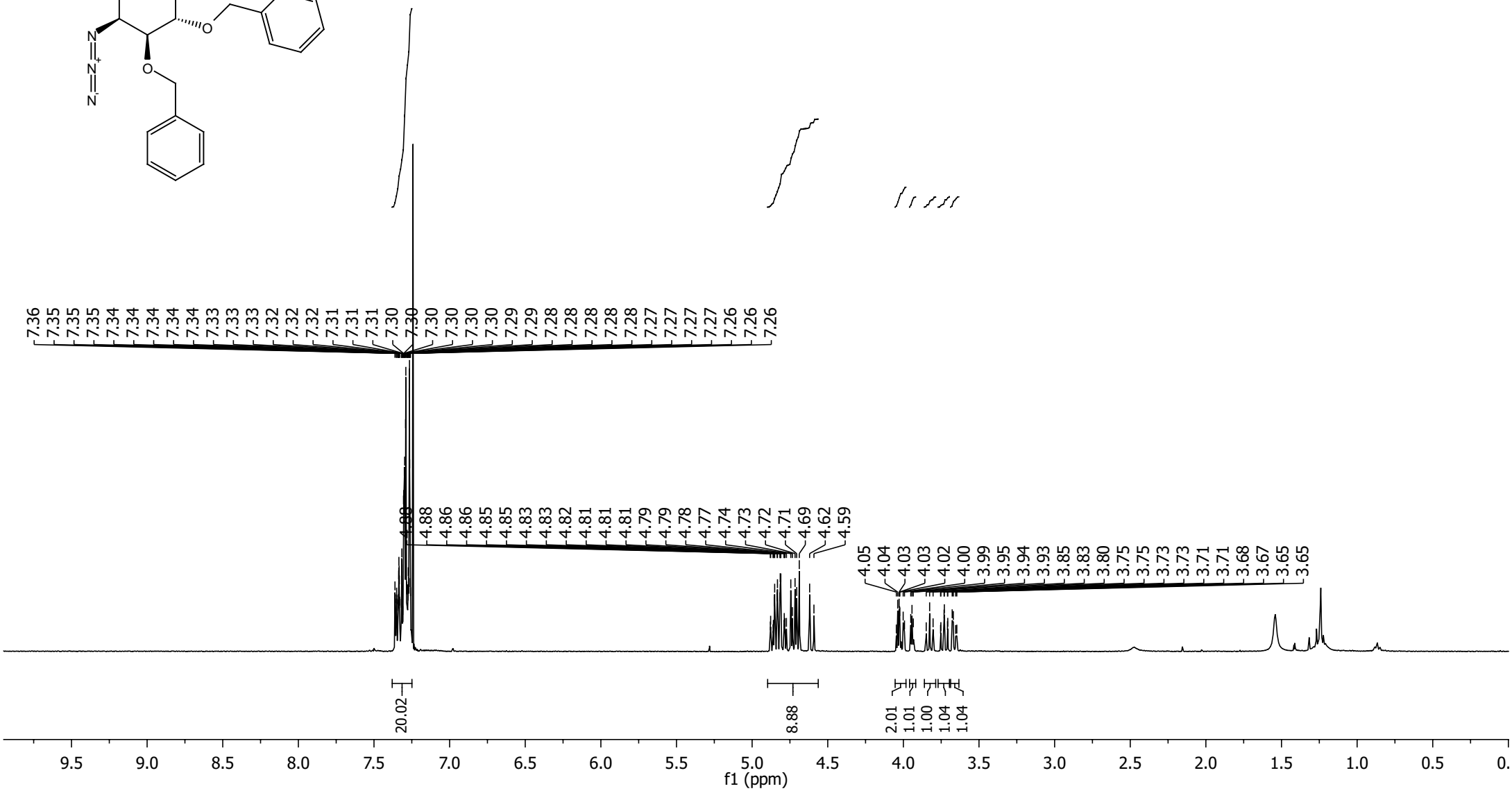
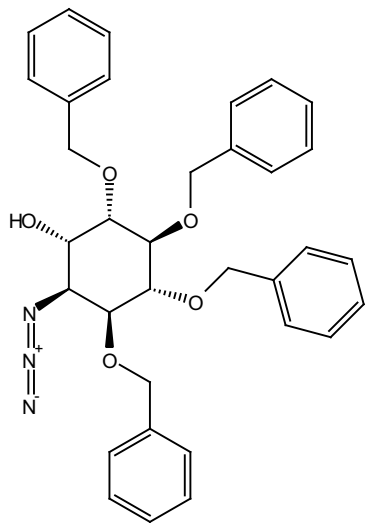
8.48

1.00  
1.10  
3.86

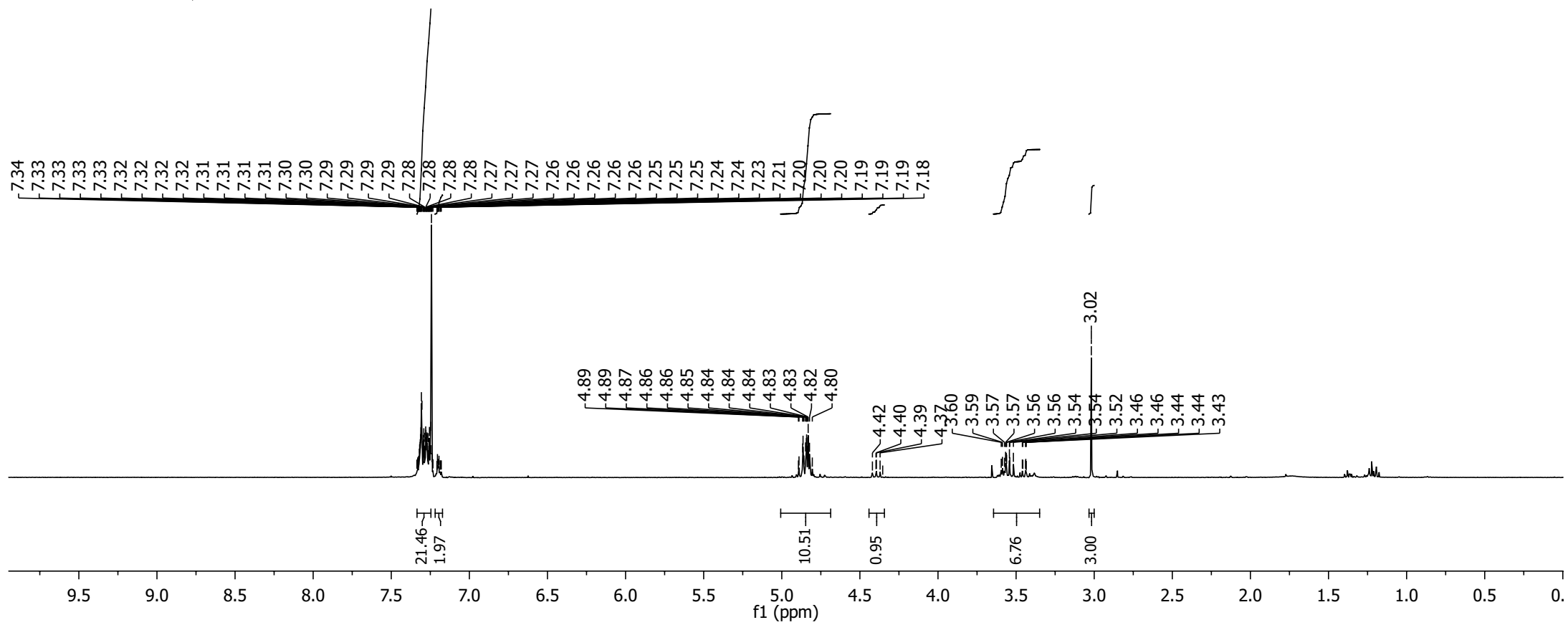
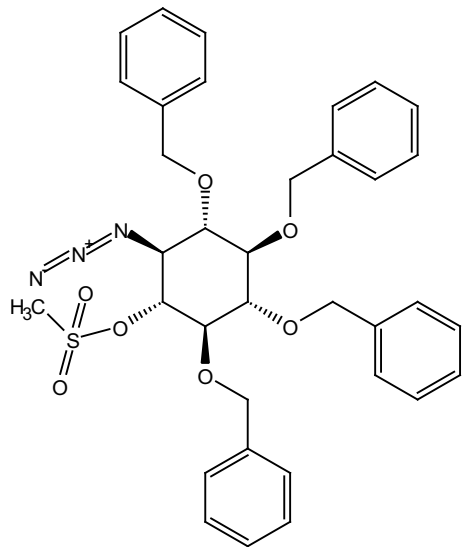
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5

f1 (ppm)

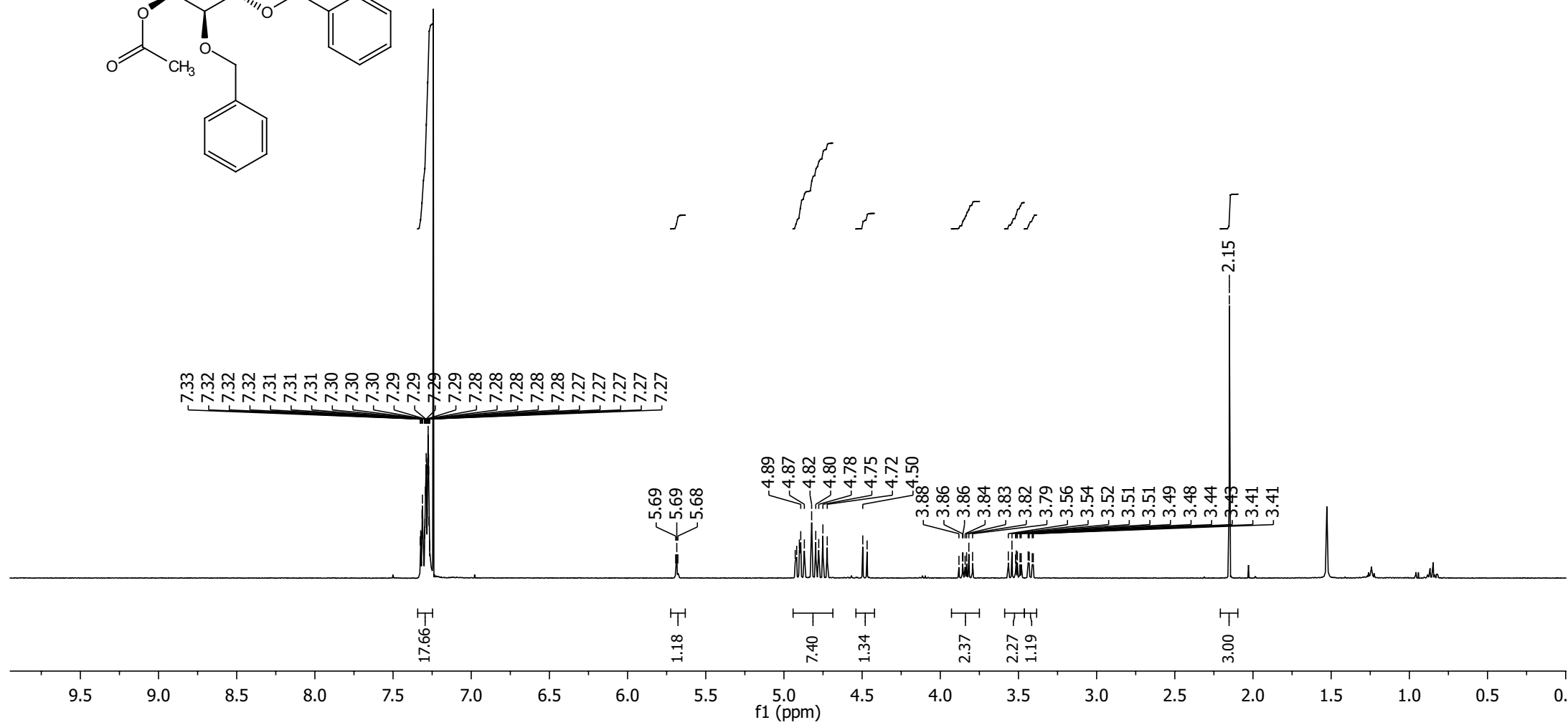
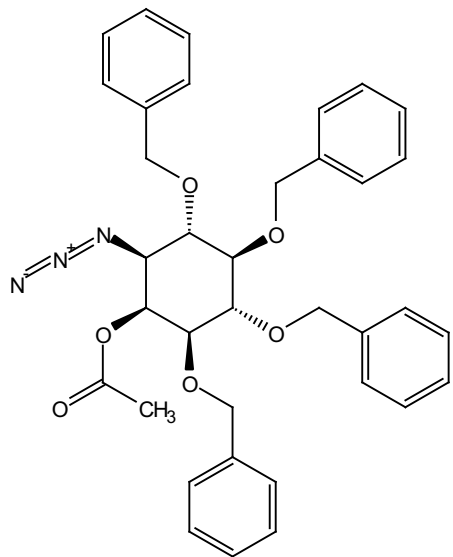
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400MHz) of 59



<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 60

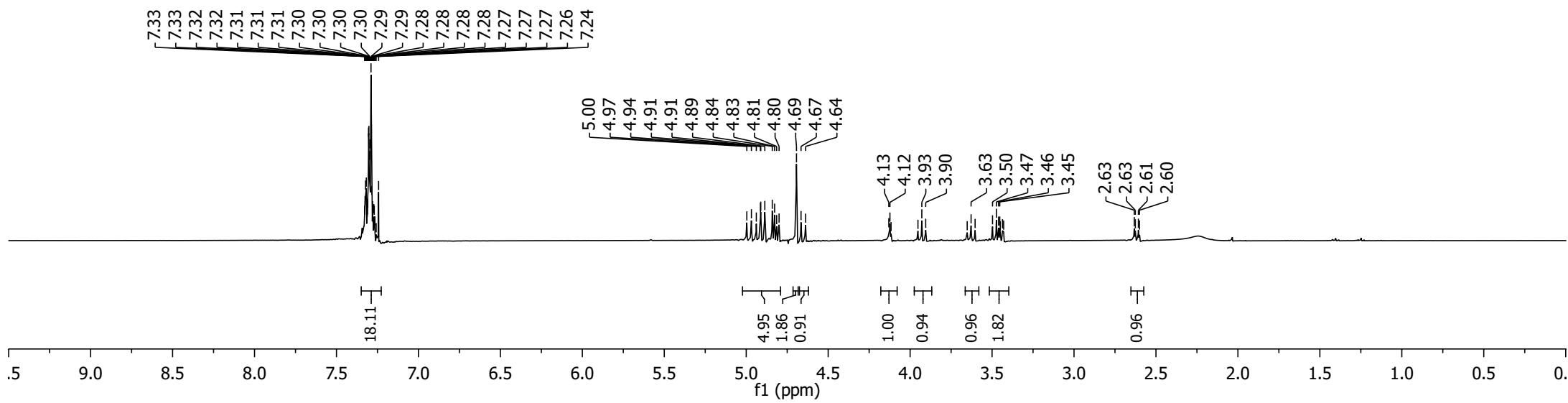
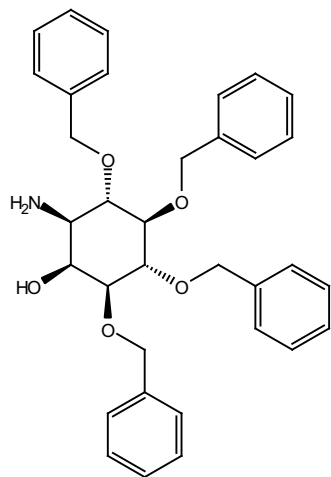


**<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 62**

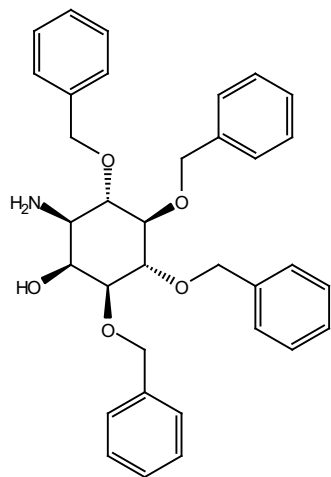




<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 63



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 63



128.53  
128.52  
128.48  
128.38  
128.34  
127.96  
127.94  
127.90  
127.88  
127.87  
127.86  
127.82  
127.75  
127.57  
127.56

138.66  
138.52  
138.43  
137.88

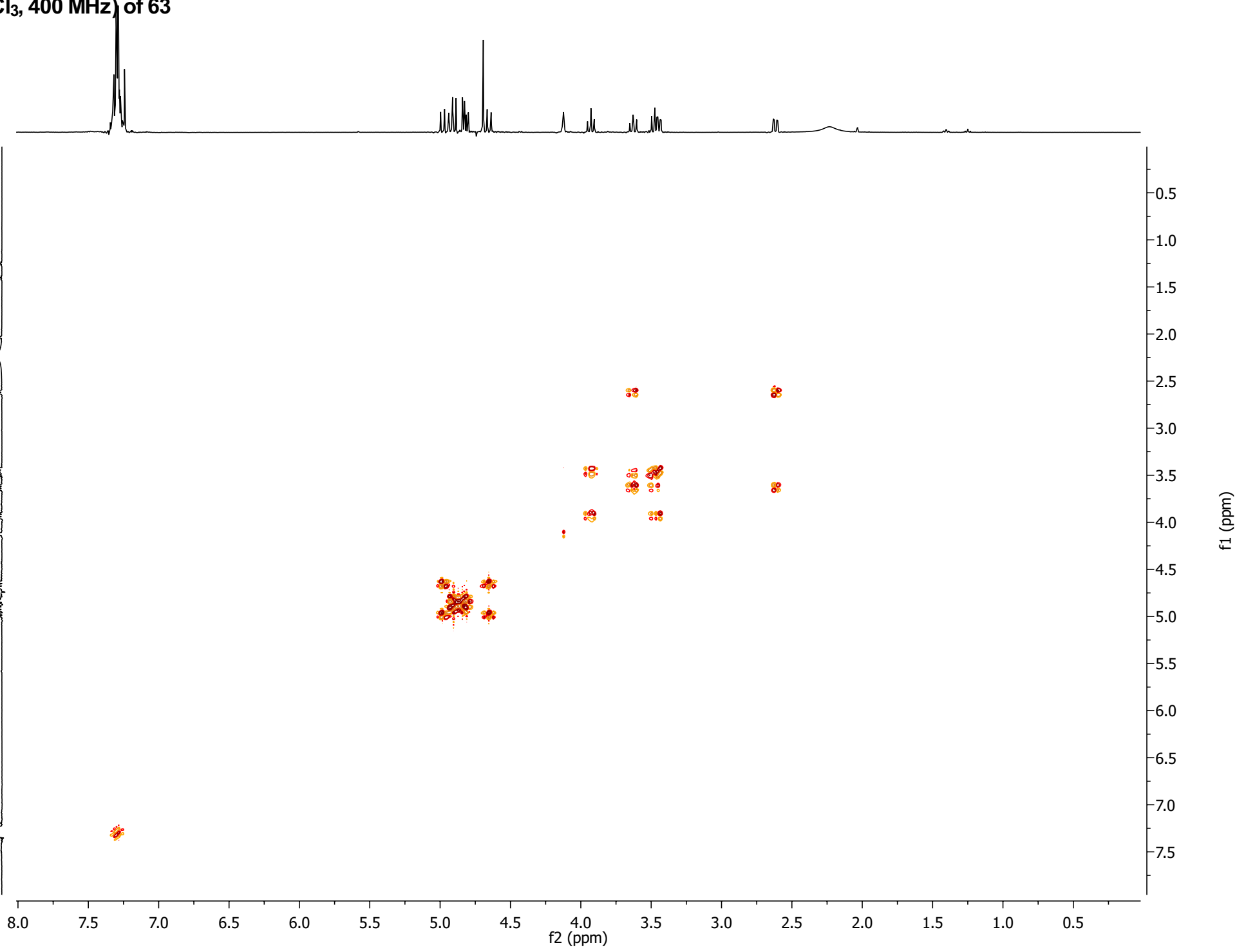
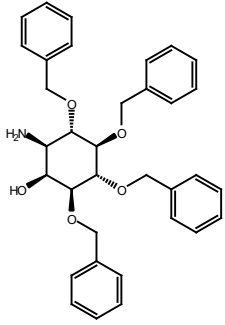
84.60  
81.86  
81.65  
81.24  
75.89  
75.71  
75.62  
72.66  
69.30

53.79

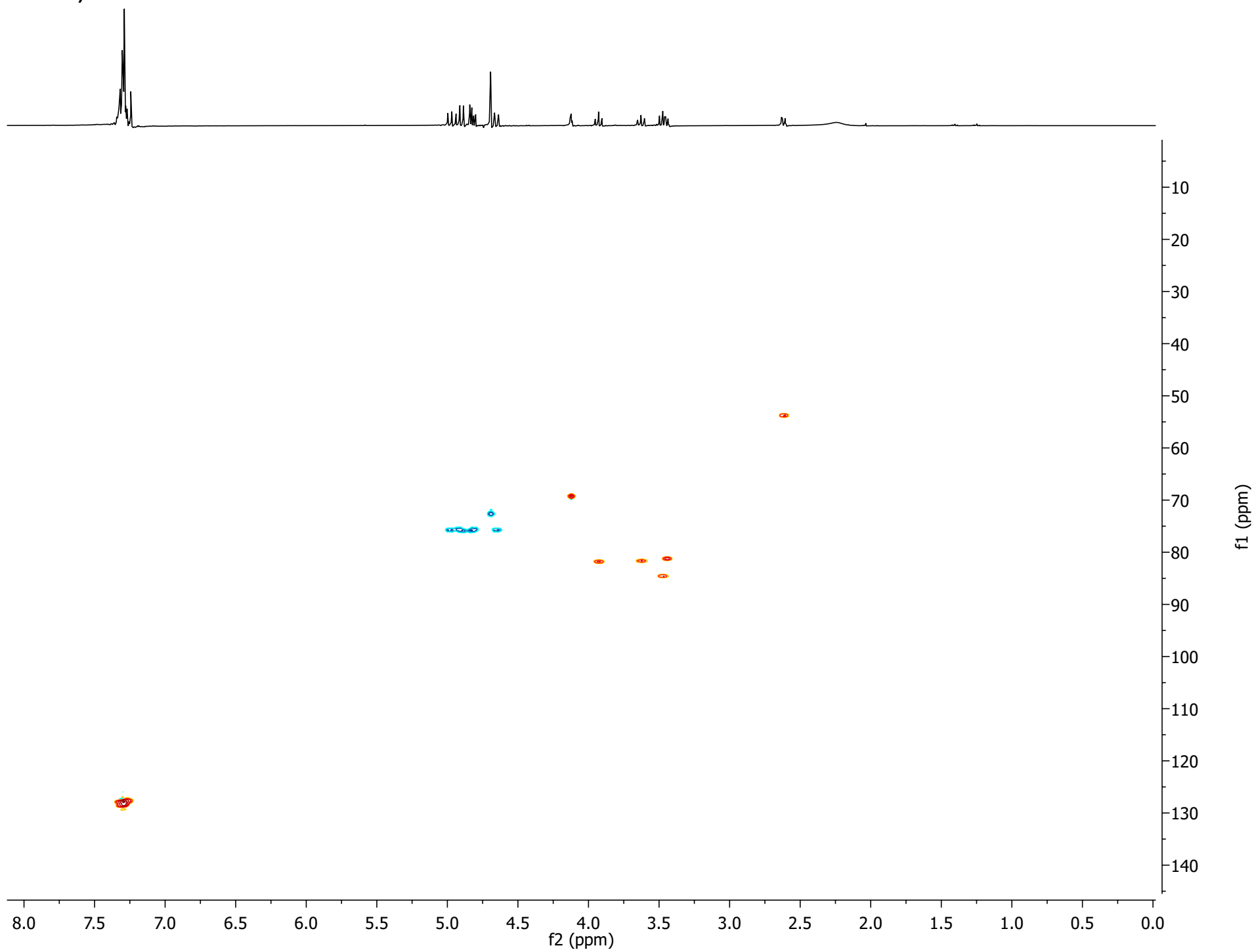
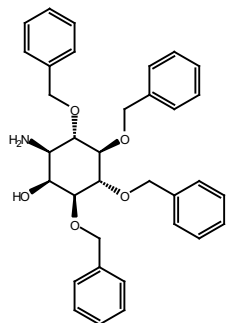
170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

f1 (ppm)

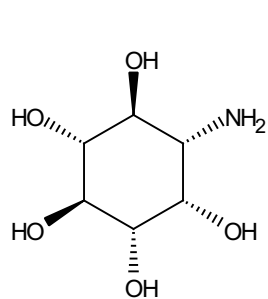
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 63



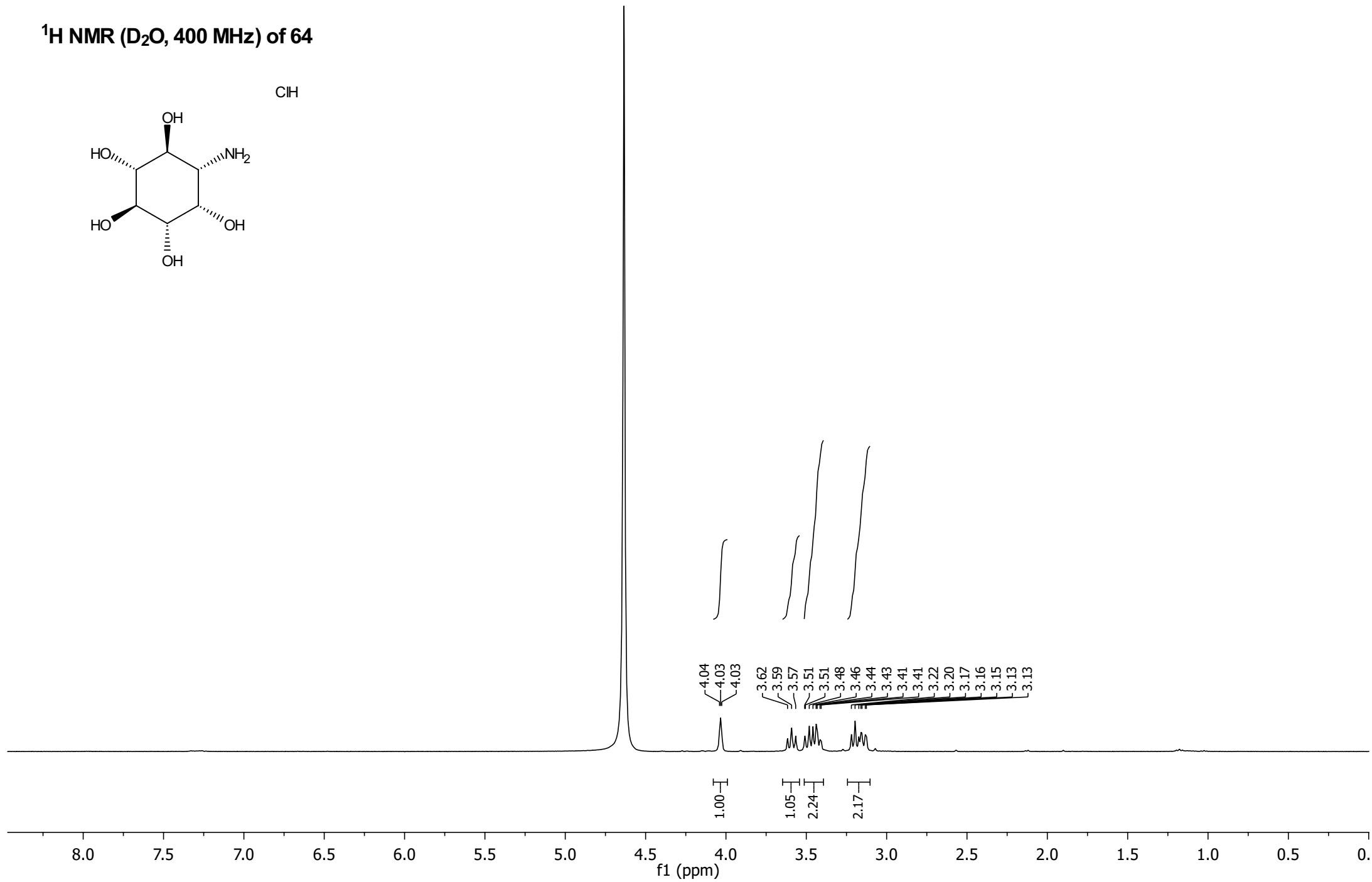
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 63



<sup>1</sup>H NMR (D<sub>2</sub>O, 400 MHz) of 64

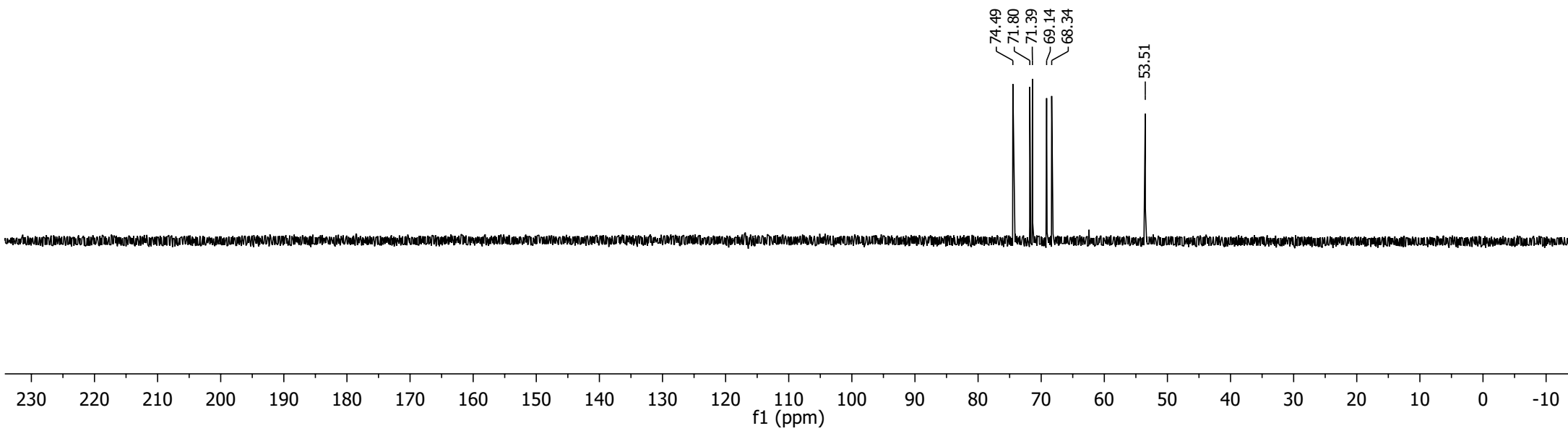
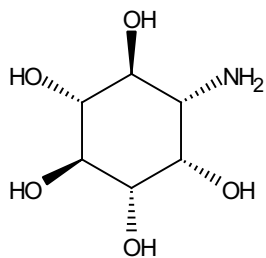


CH



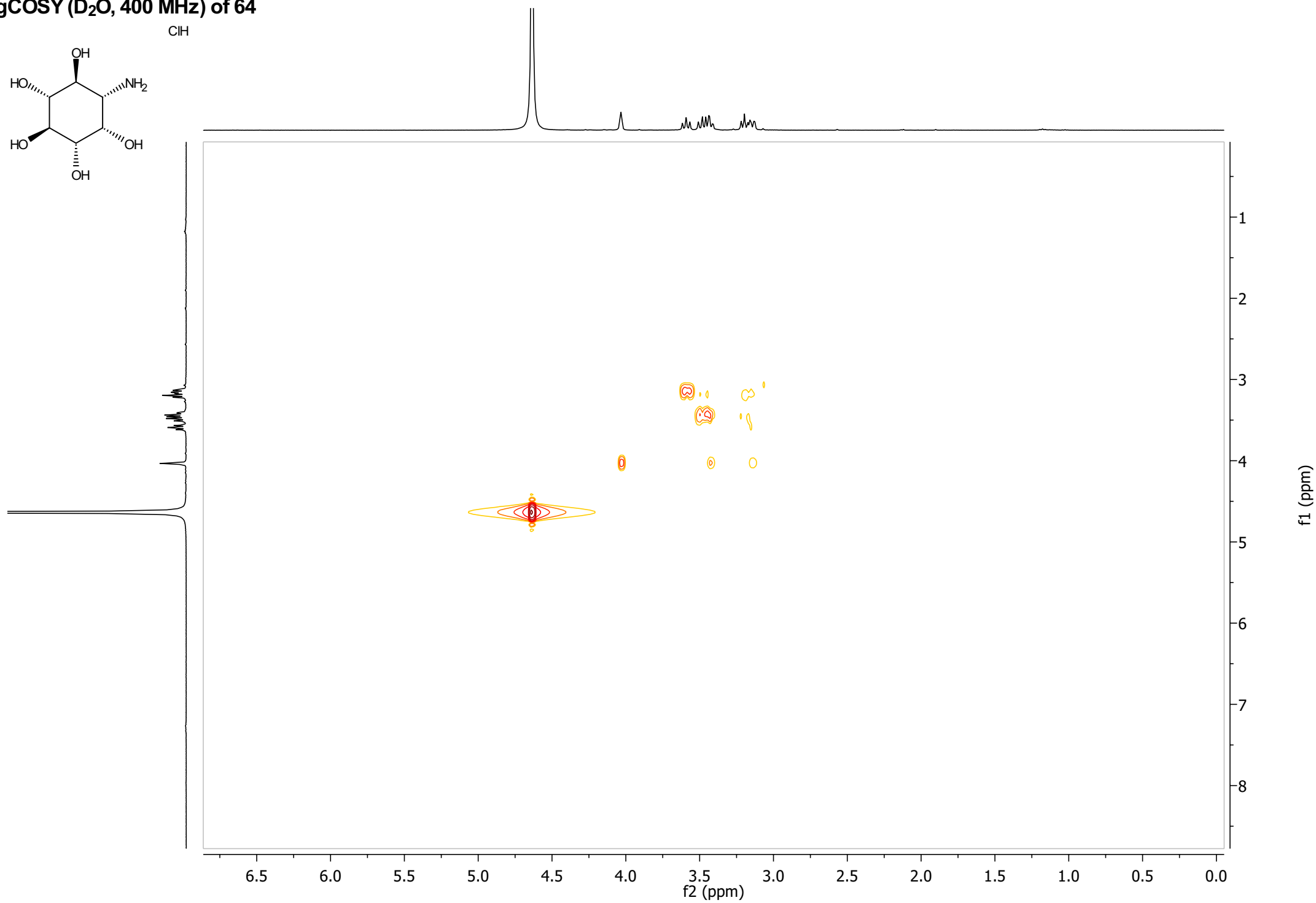
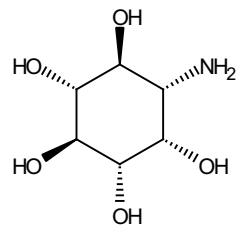
<sup>13</sup>C NMR (D<sub>2</sub>O, 101 MHz) of 64

ClH

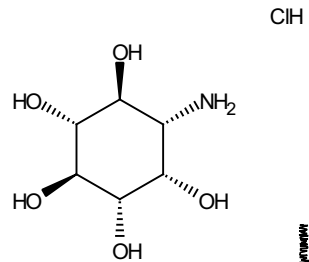


# gCOSY (D<sub>2</sub>O, 400 MHz) of 64

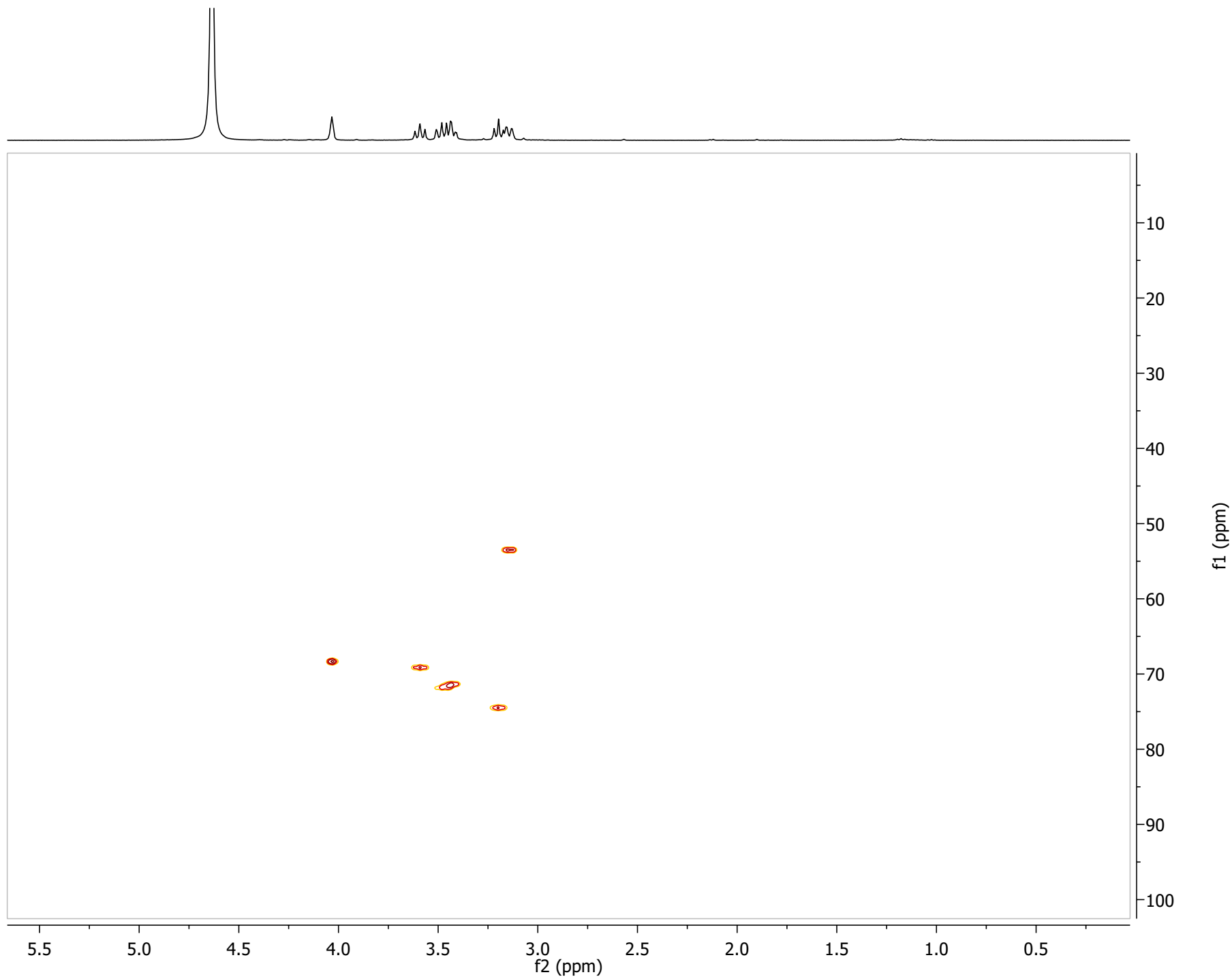
ClH



# HSQCAD (D<sub>2</sub>O, 400 MHz) of 64

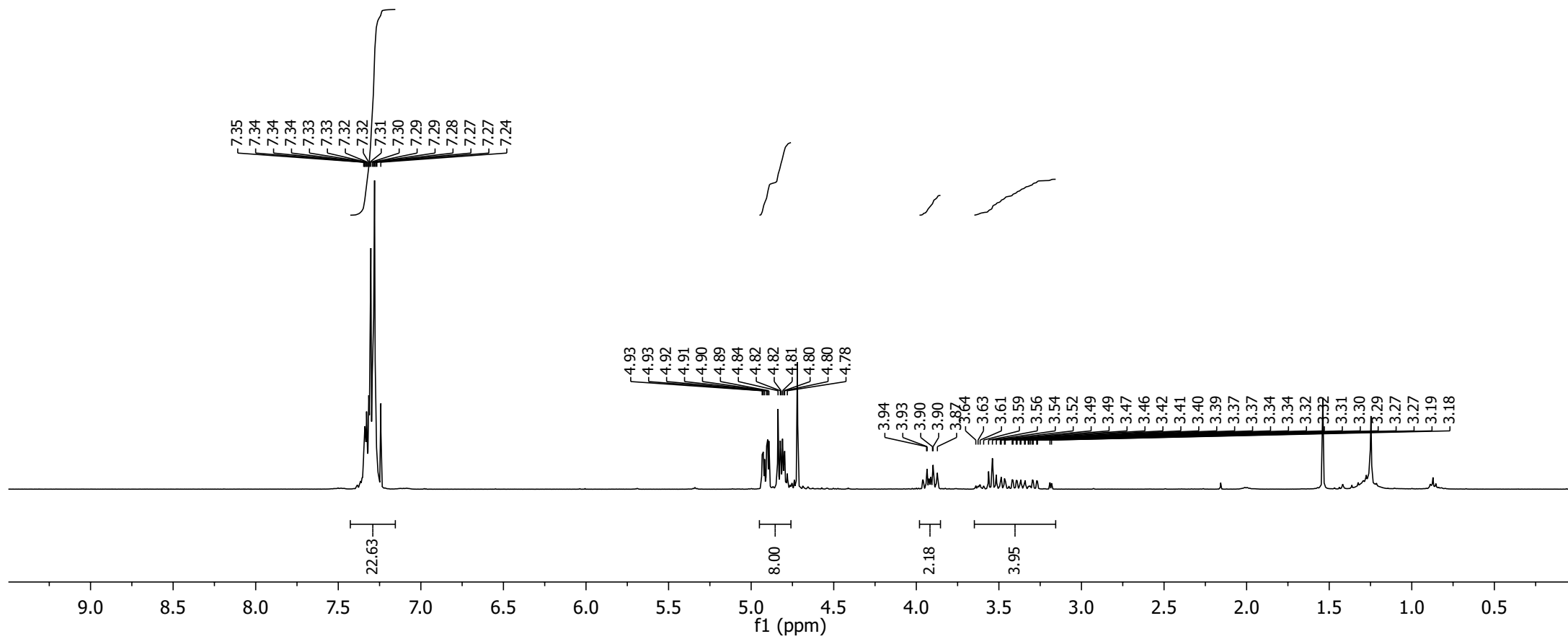
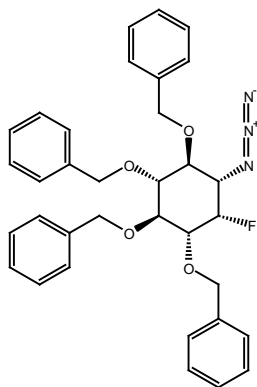


ClH

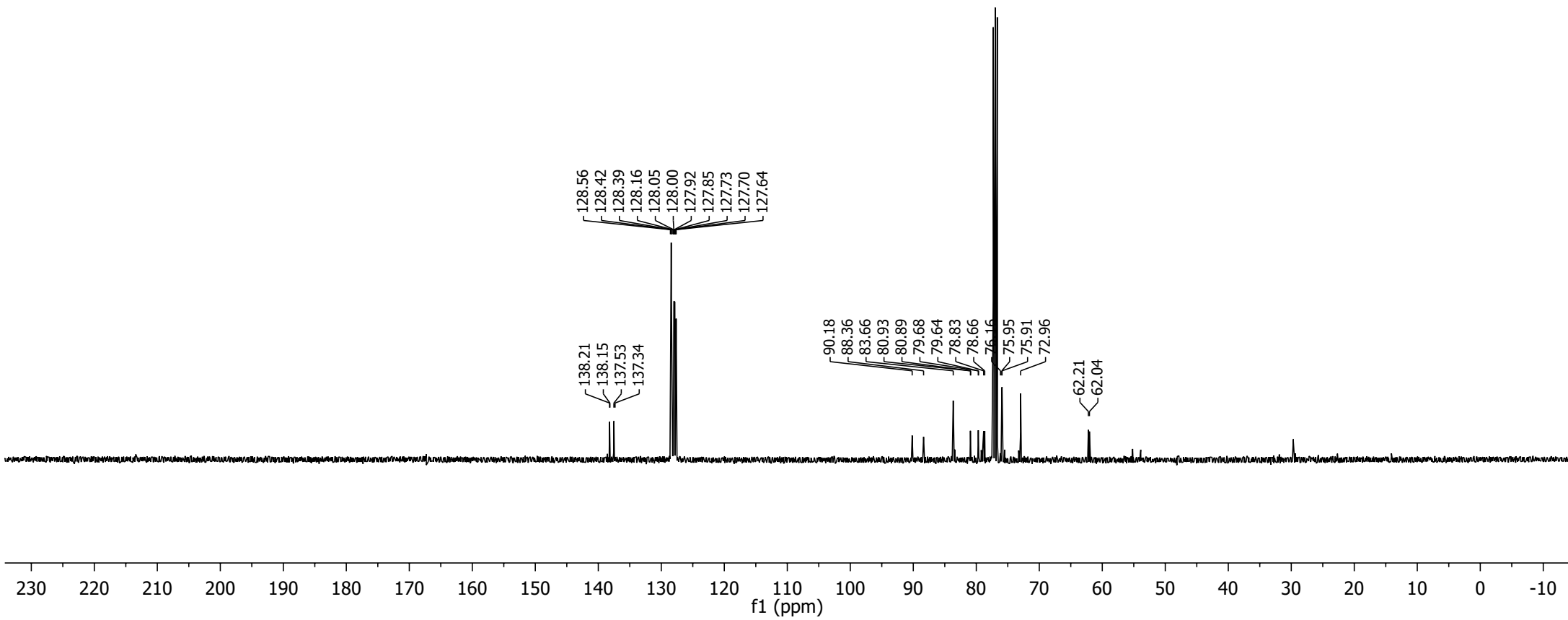
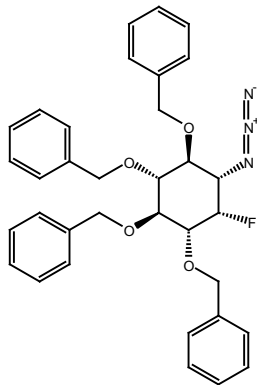




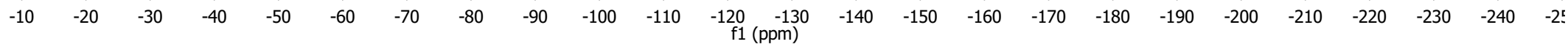
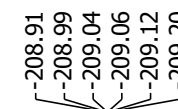
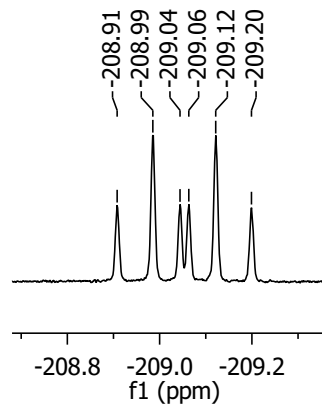
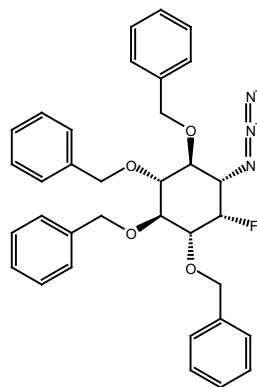
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 66



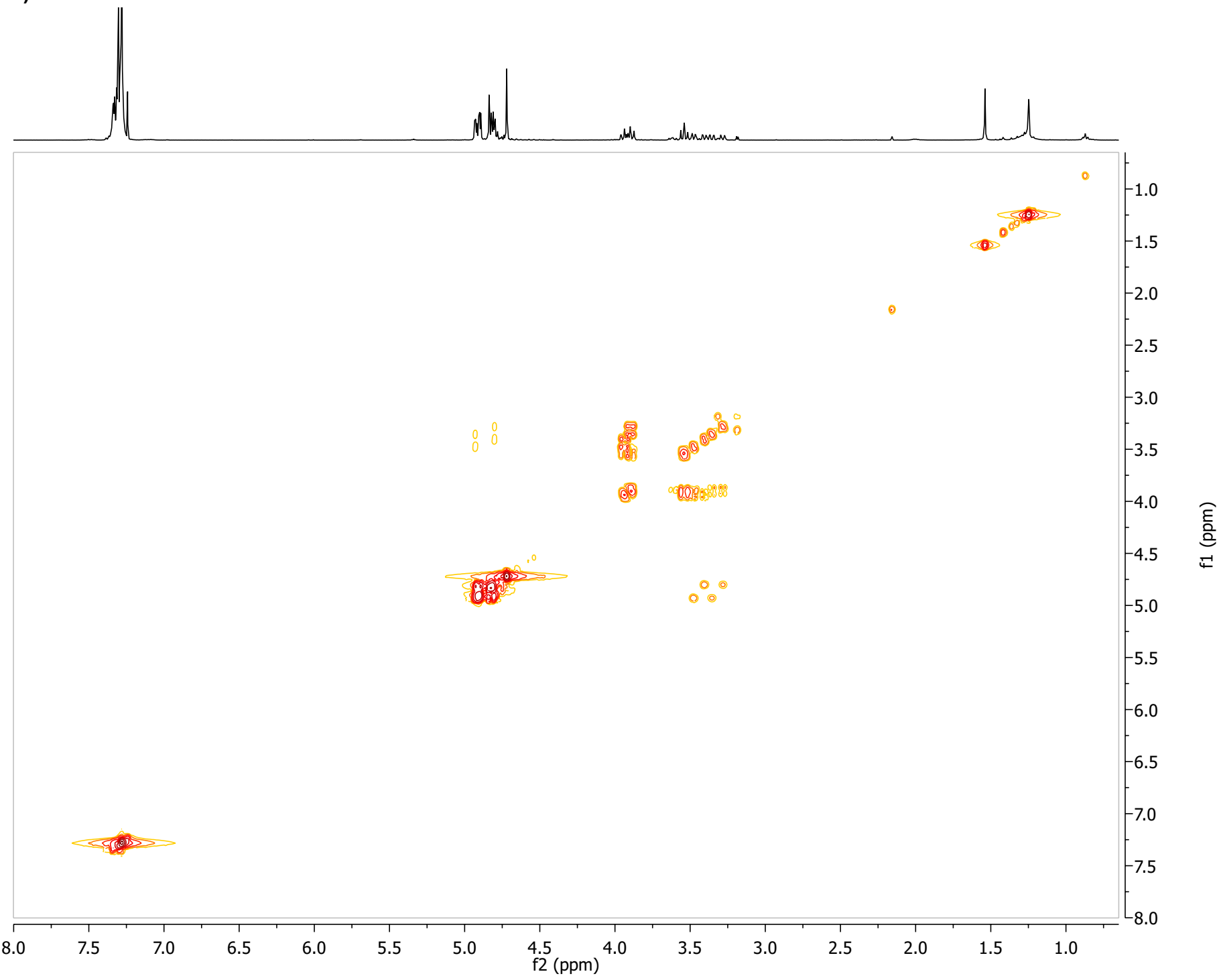
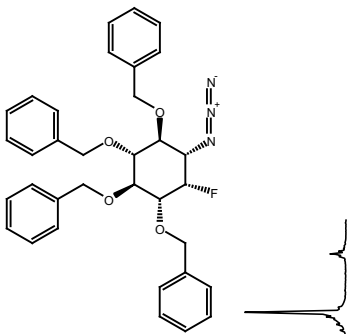
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 66



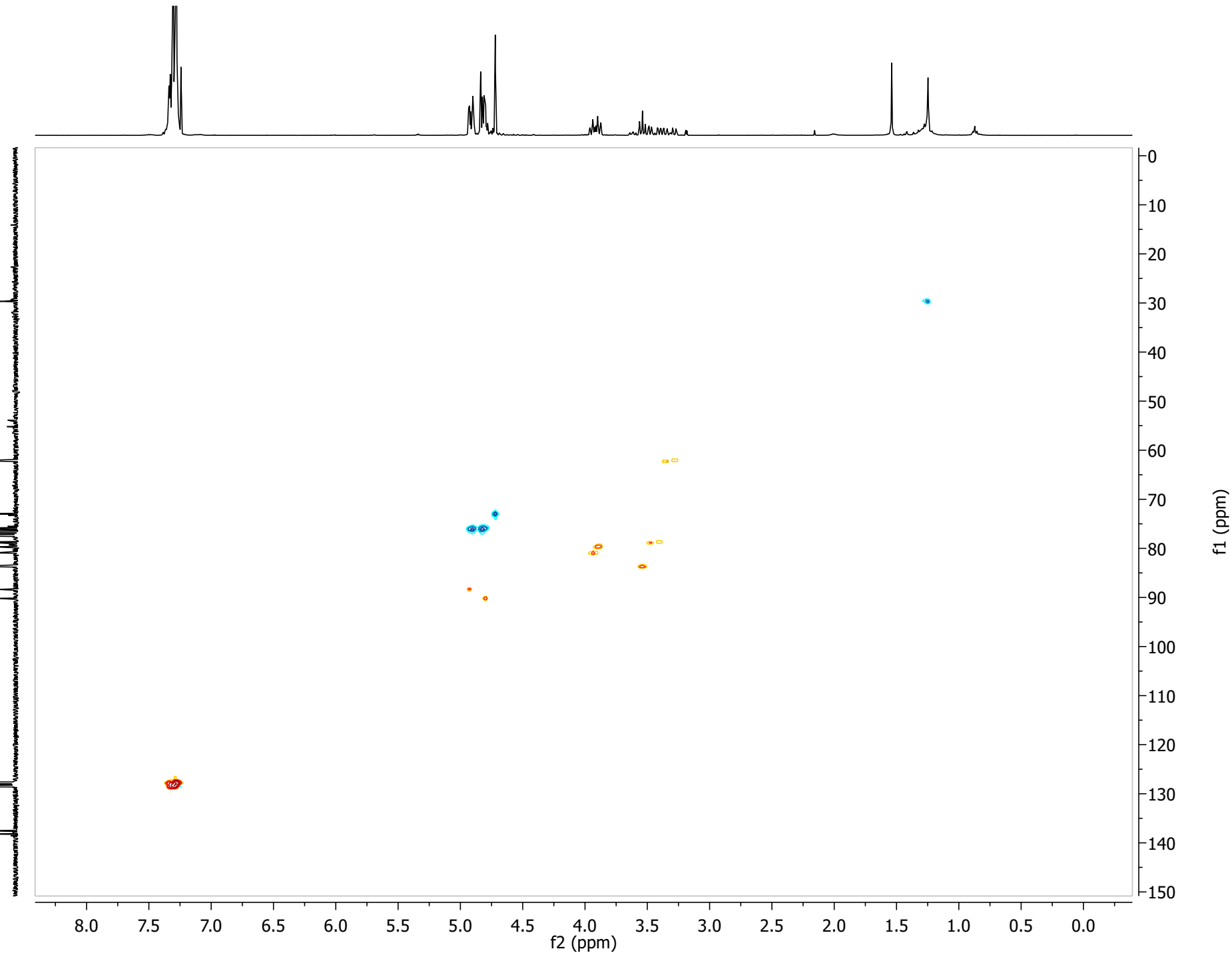
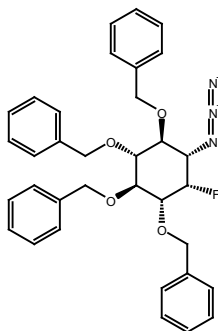
**$^{19}\text{F}$  NMR (CDCl<sub>3</sub>, 376 MHz) of 66**



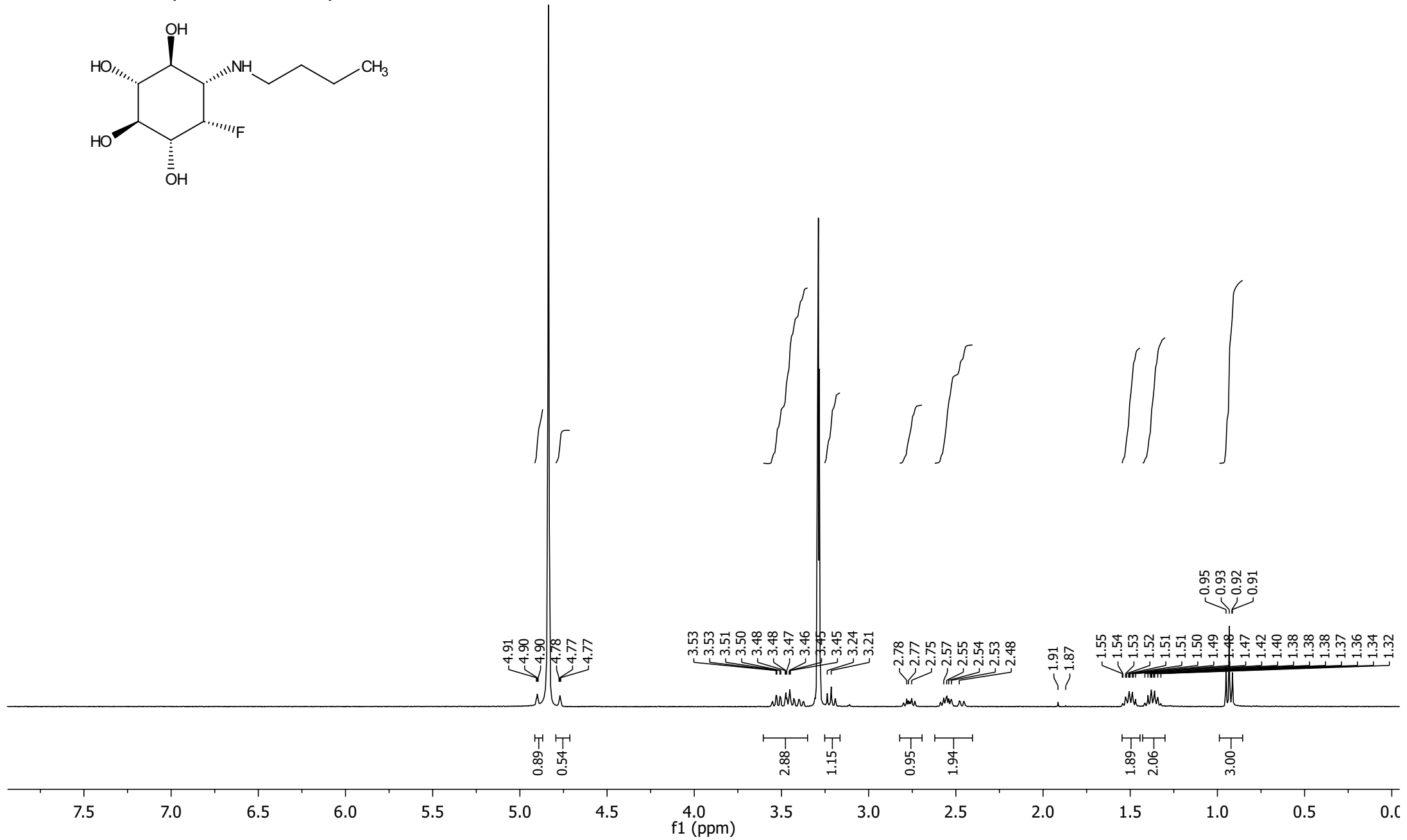
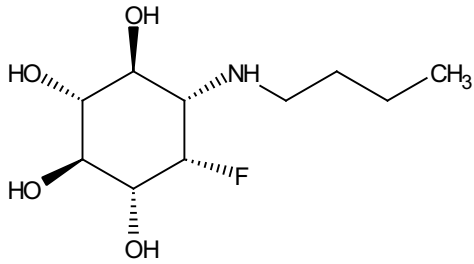
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 66



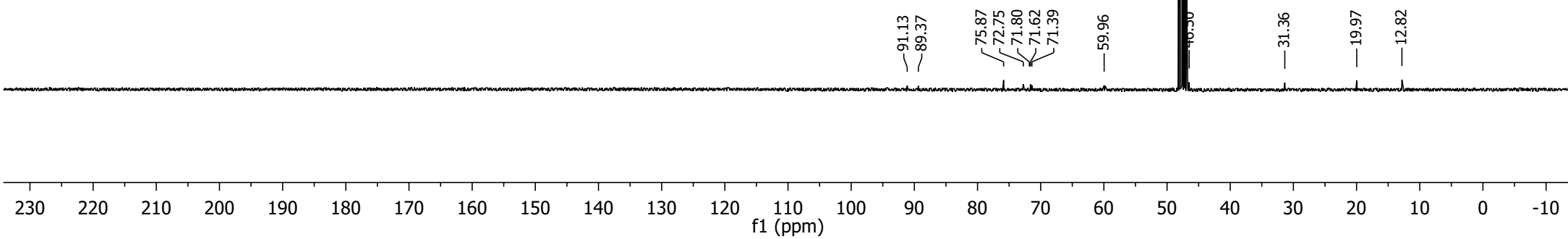
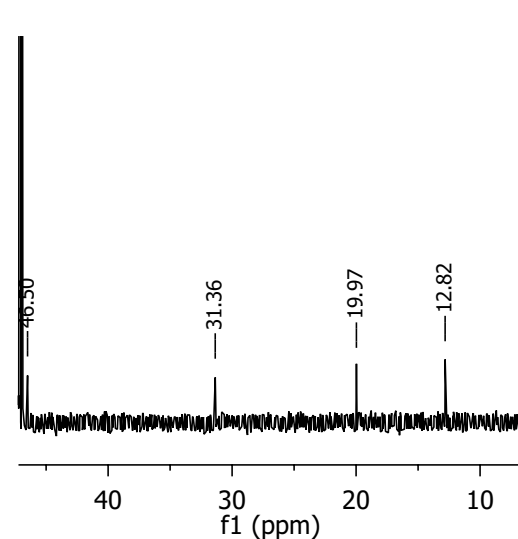
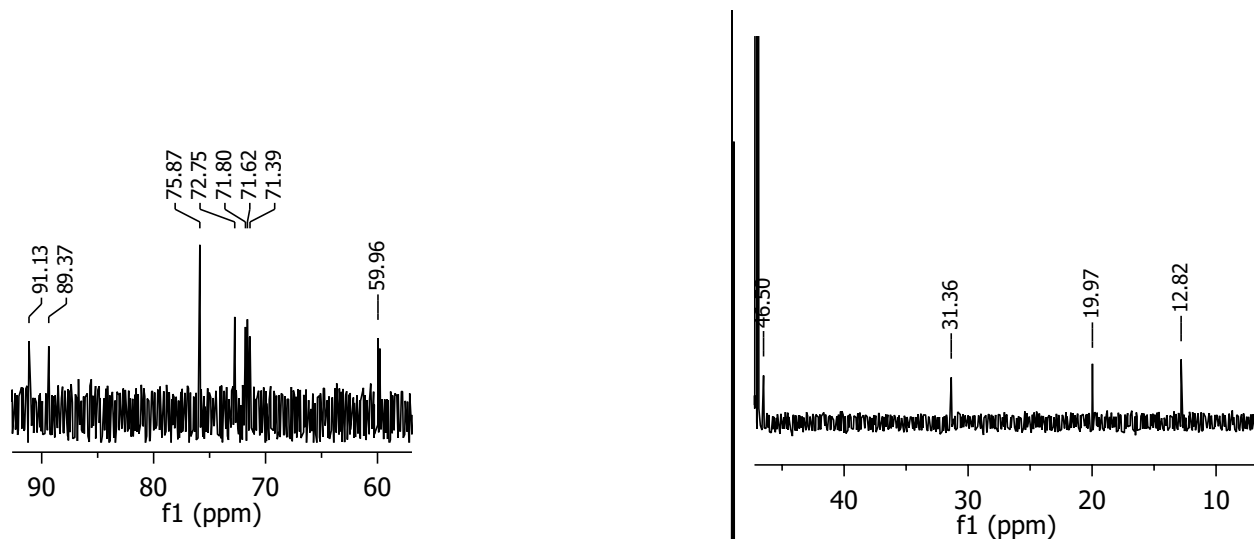
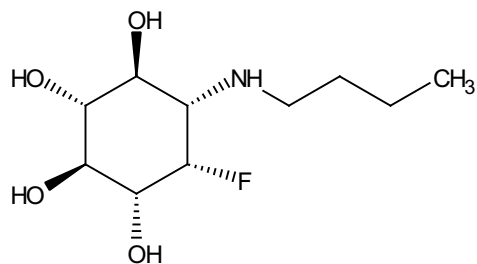
# HSQCAD (CDCl<sub>3</sub>, 400 MHz) of 66



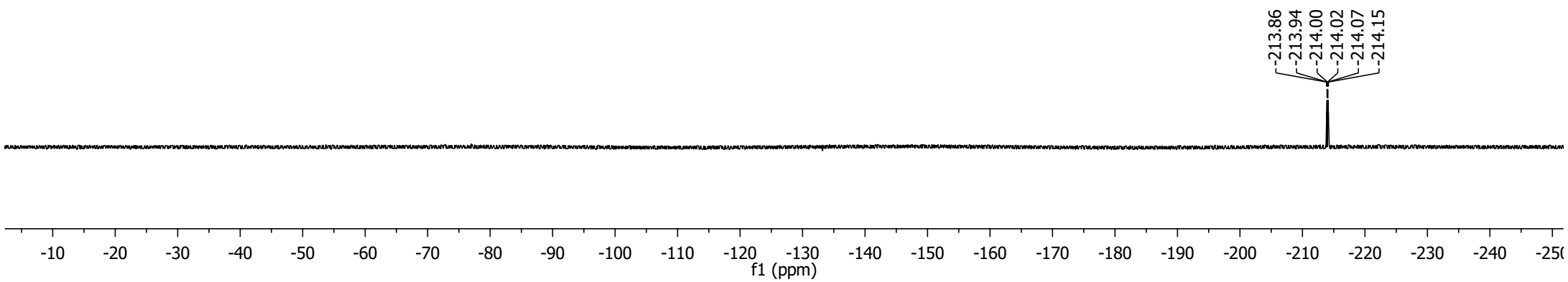
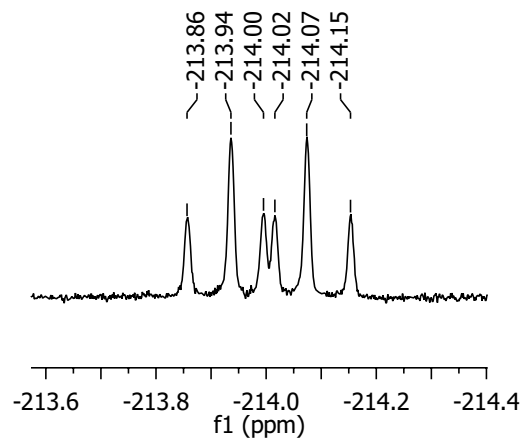
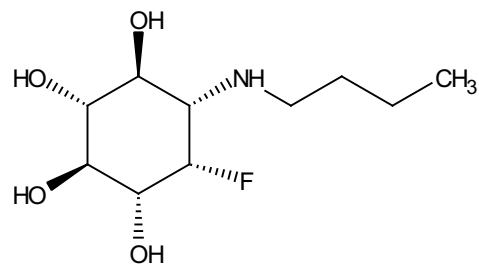
<sup>1</sup>H NMR (MeOD, 400 MHz) of 67x



<sup>13</sup>C NMR (MeOD, 101 MHz) of 67x

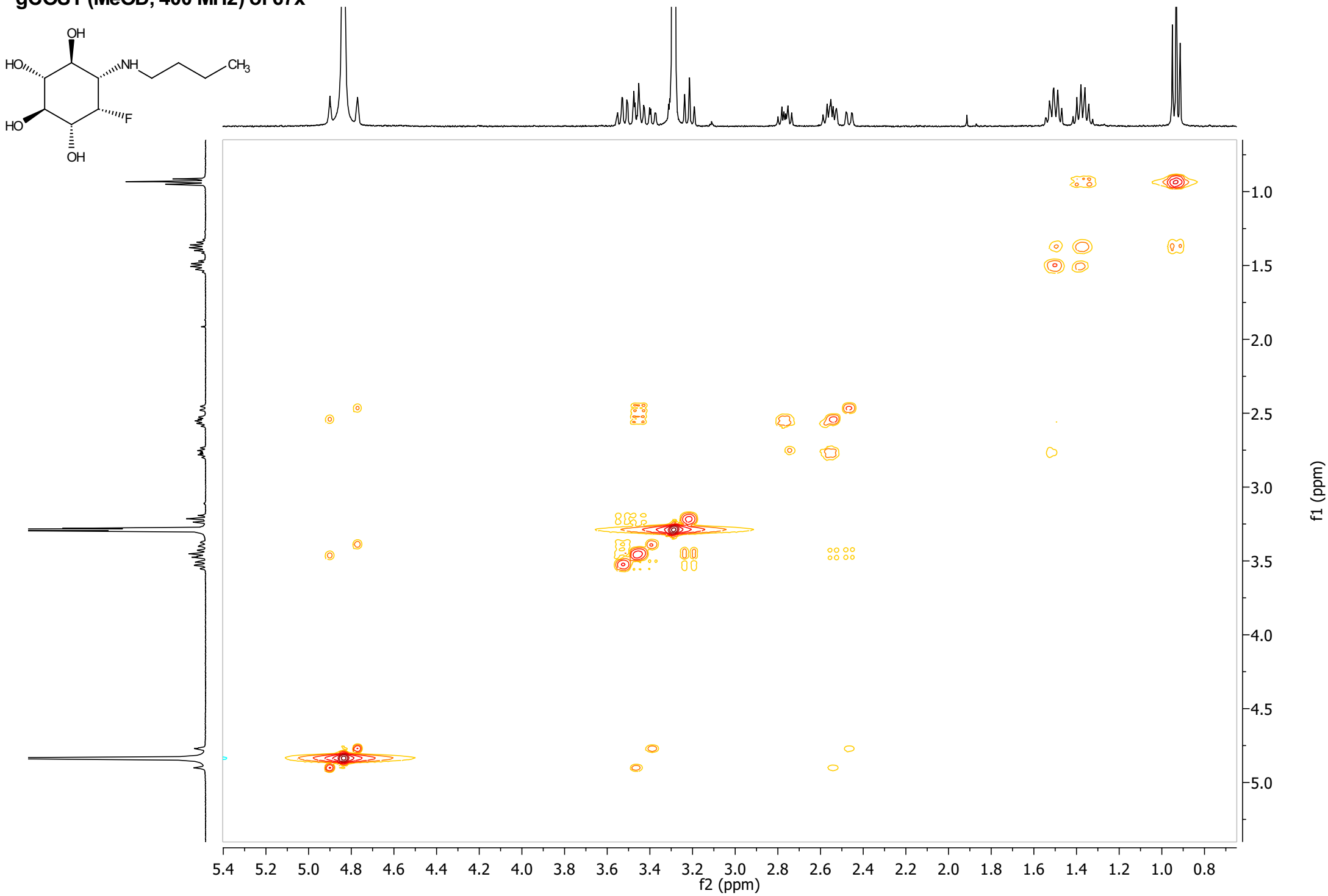
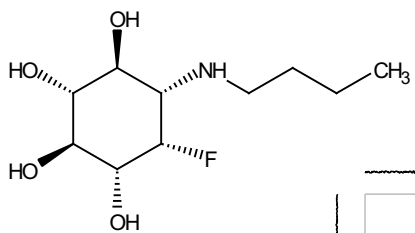


**$^{19}\text{F}$  NMR (MeOD, 376 MHz) of 67x**

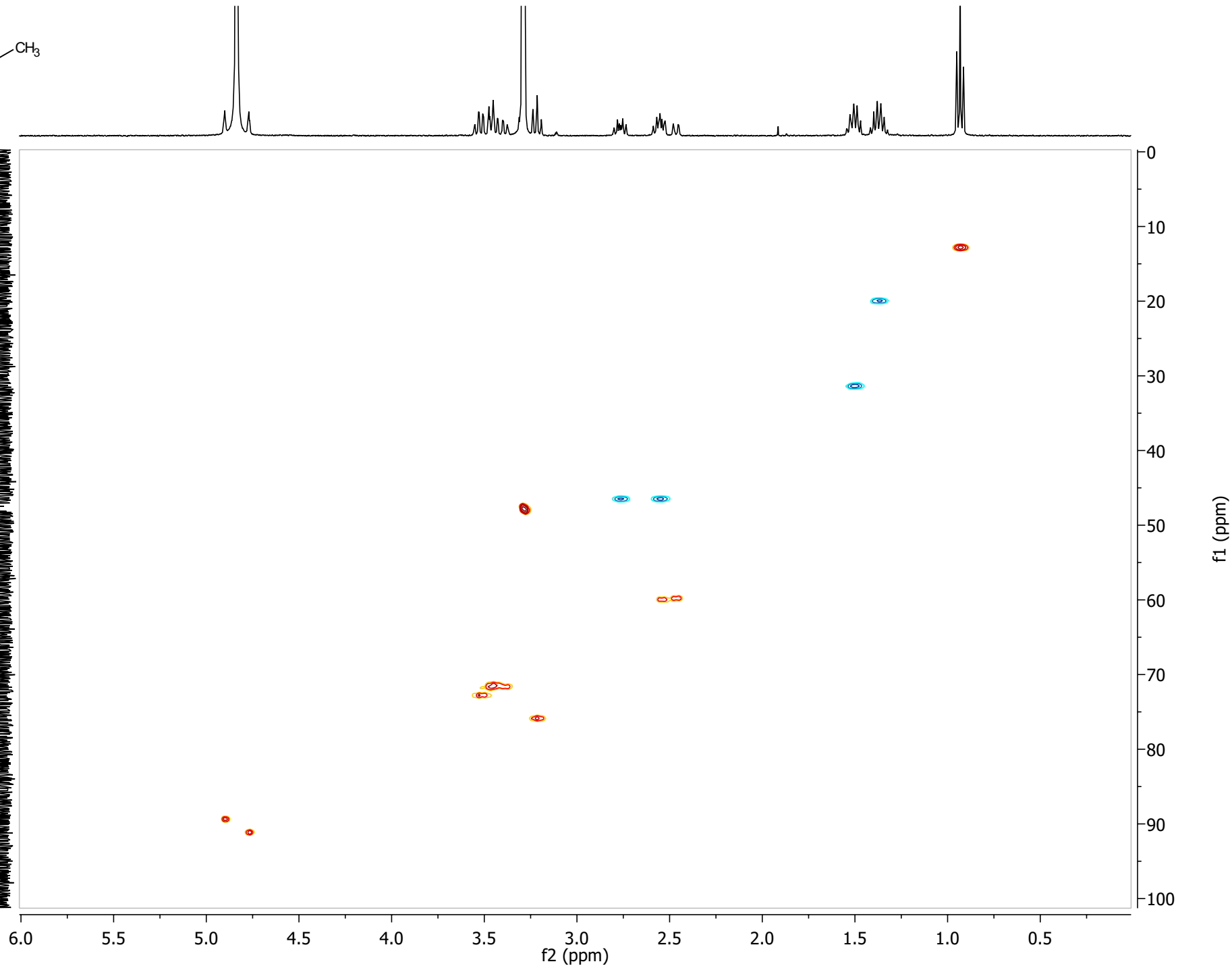
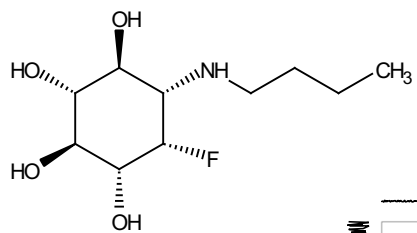




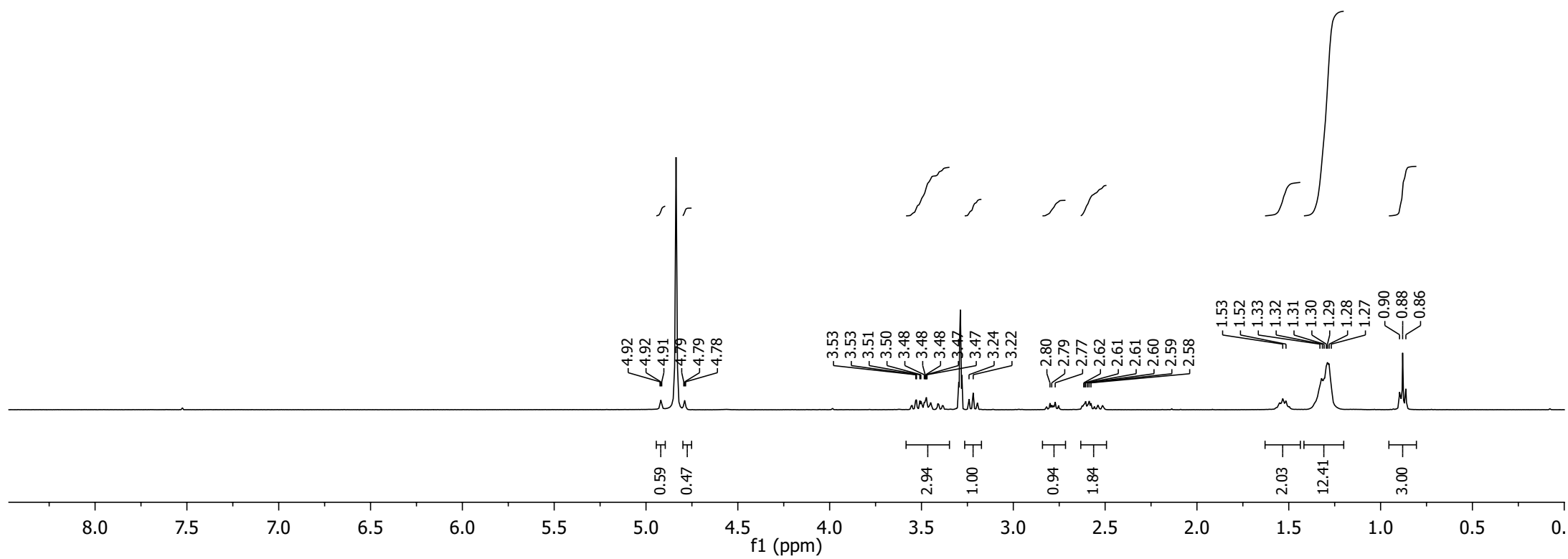
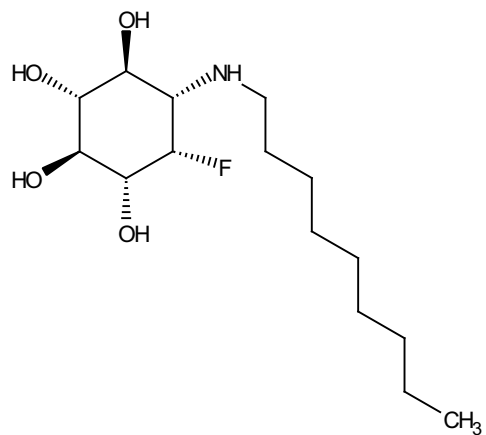
gCOSY (MeOD, 400 MHz) of 67x



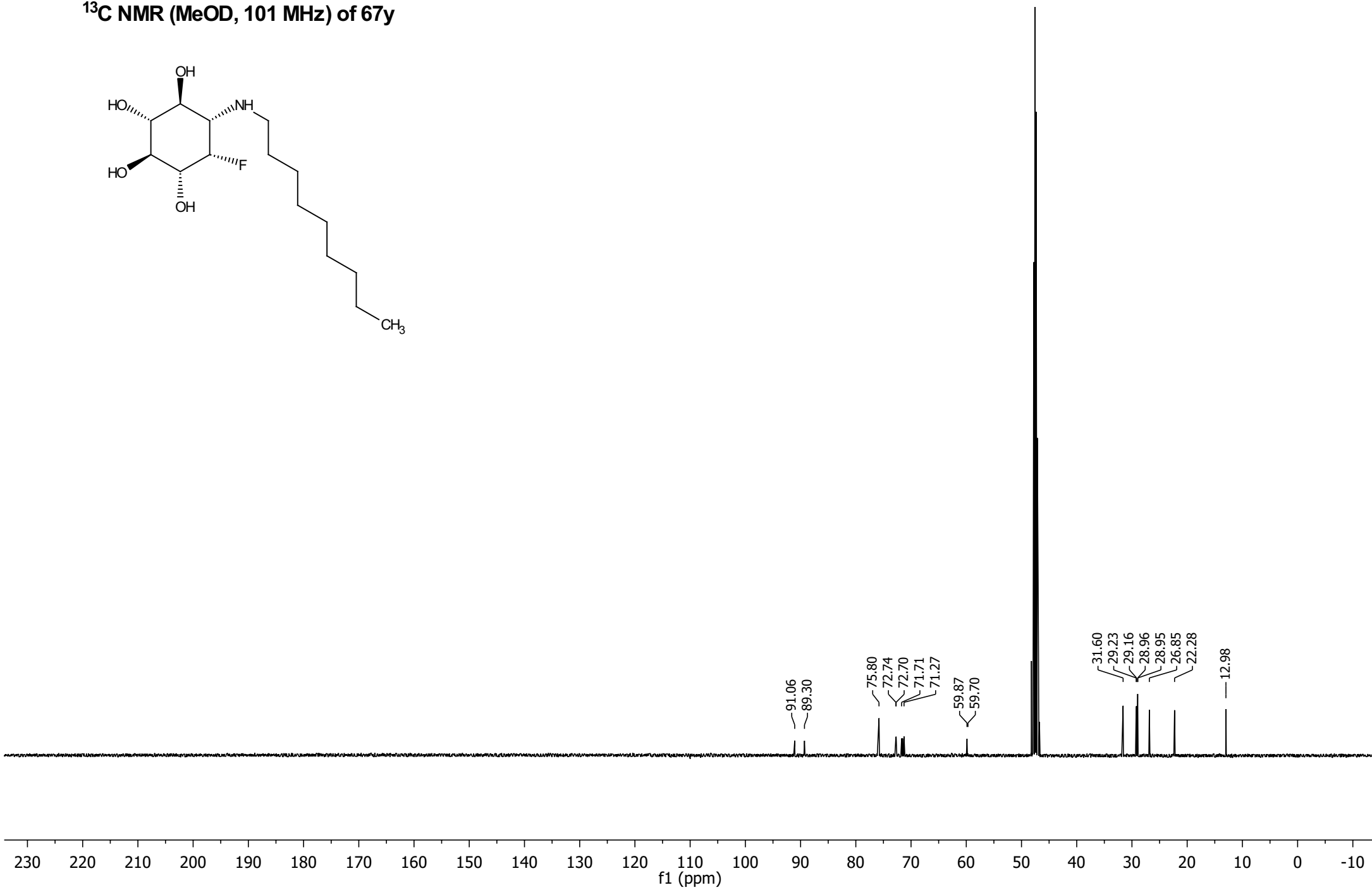
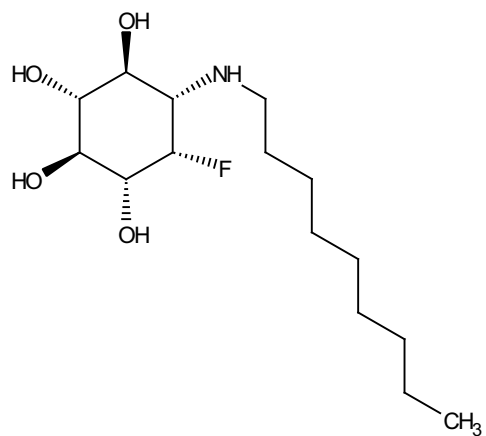
# HSQCAD (MeOD, 400 MHz) of 67x



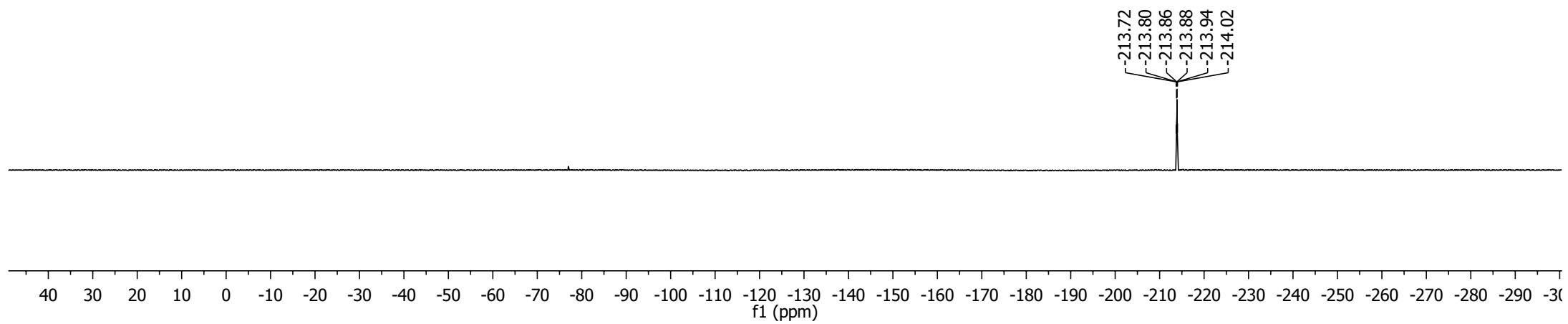
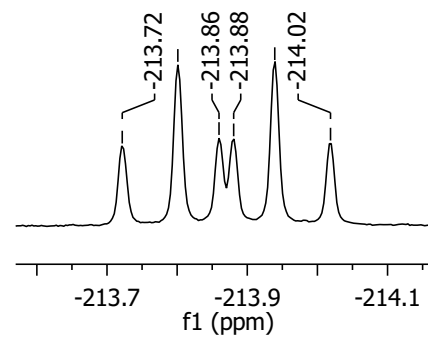
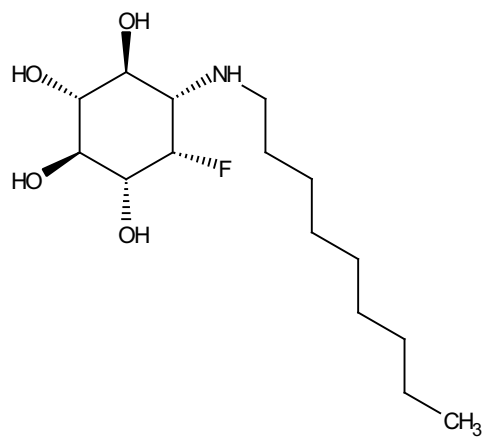
**<sup>1</sup>H NMR (MeOD, 400 MHz) of 67y**



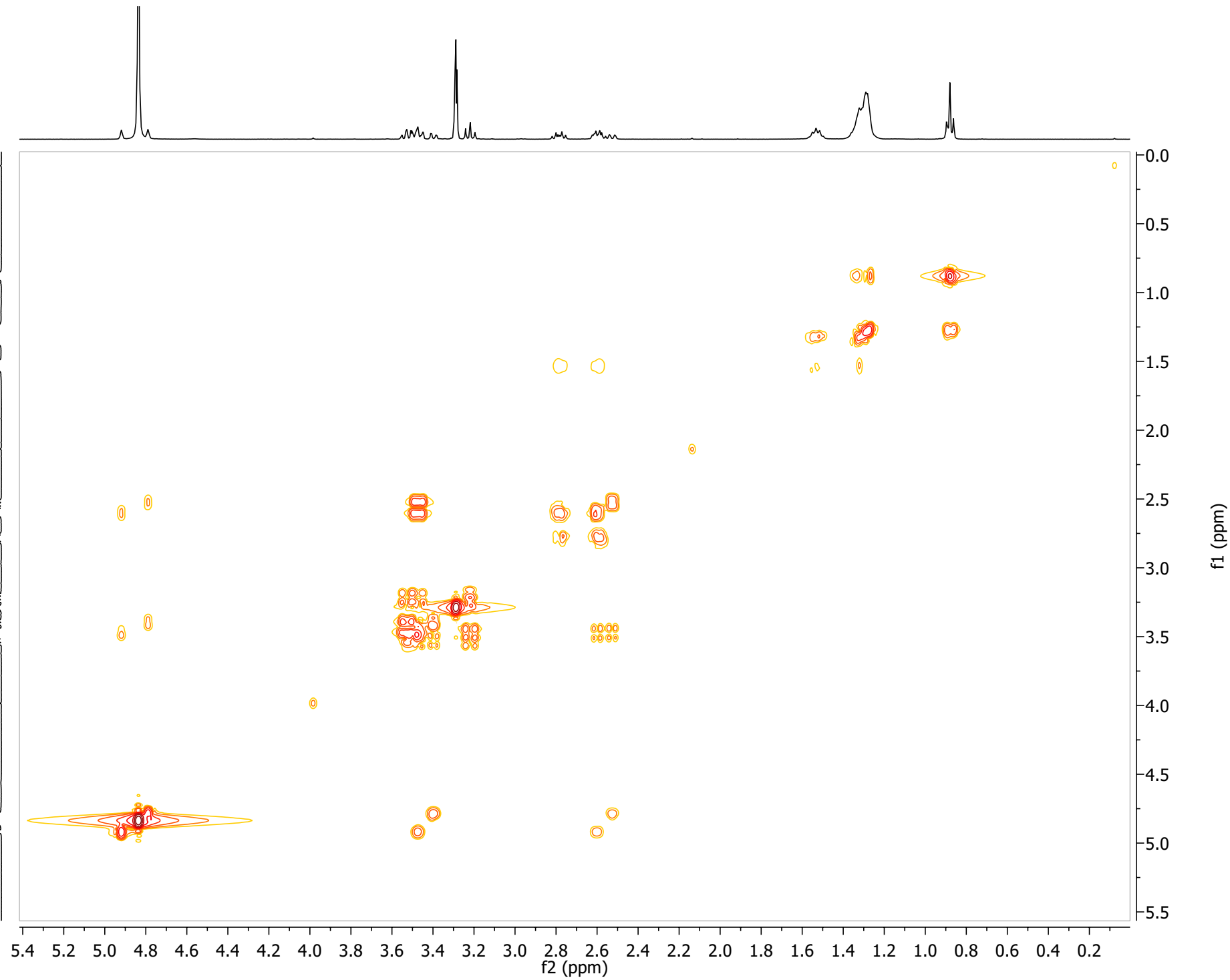
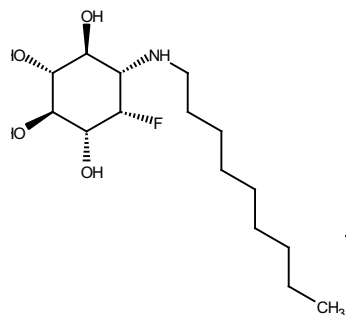
<sup>13</sup>C NMR (MeOD, 101 MHz) of 67y



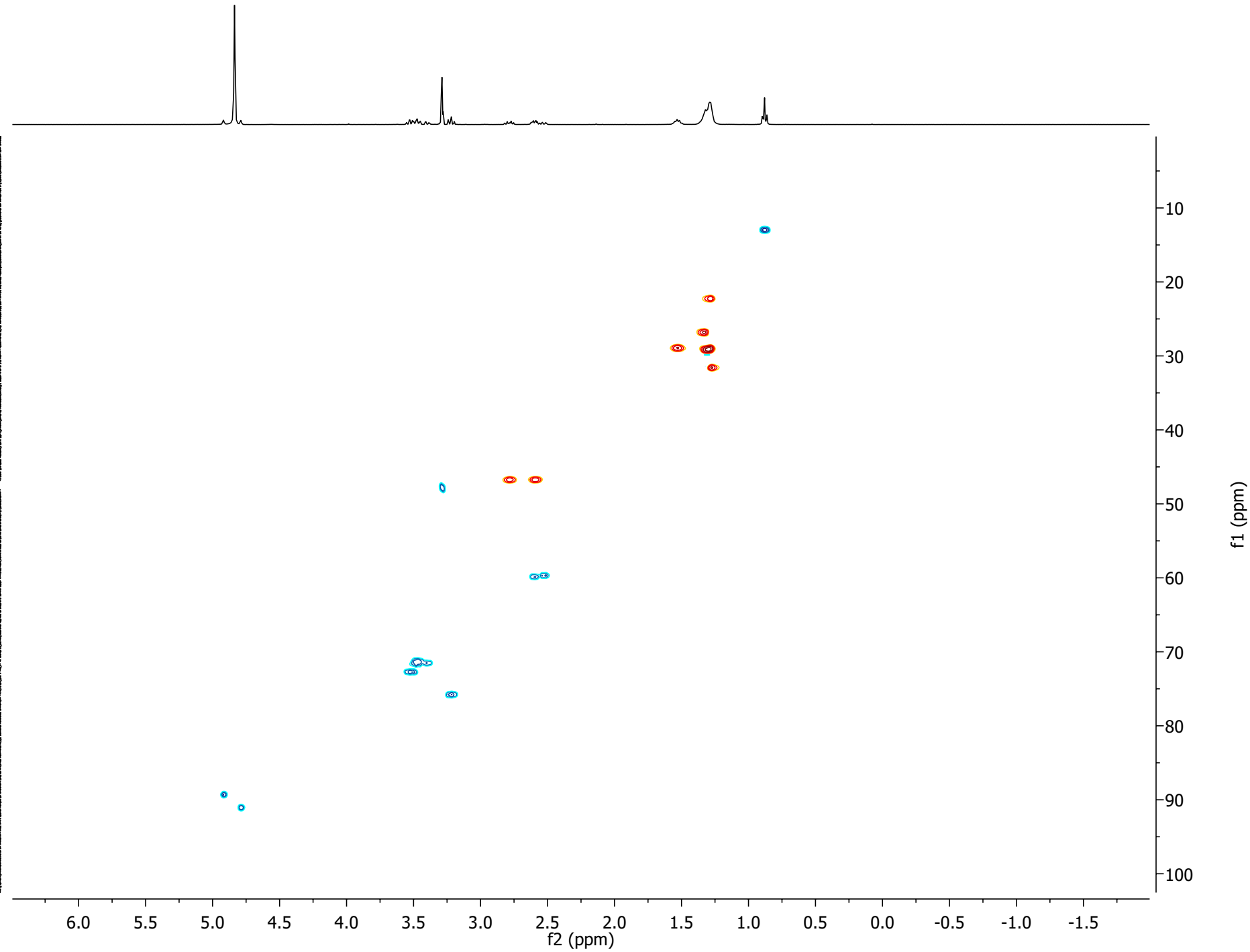
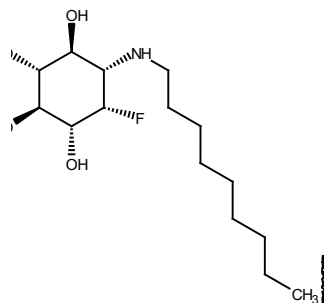
<sup>19</sup>F NMR (MeOD, 376 MHz) of 67y



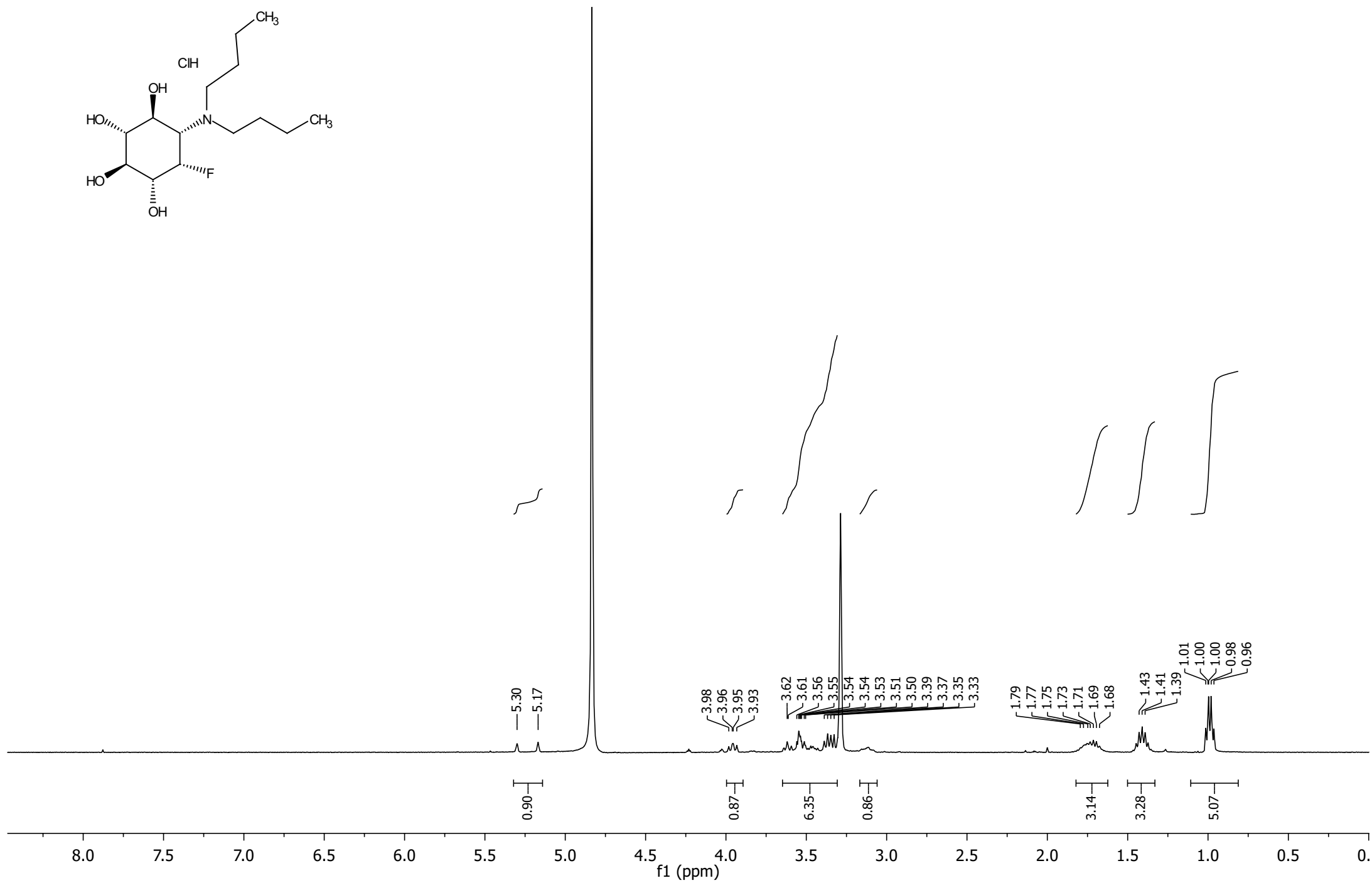
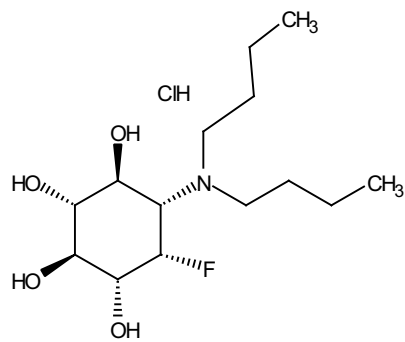
gCOSY (MeOD, 400 MHz) of 67y



gHSQCAD (MeOD, 400 MHz) of 67y

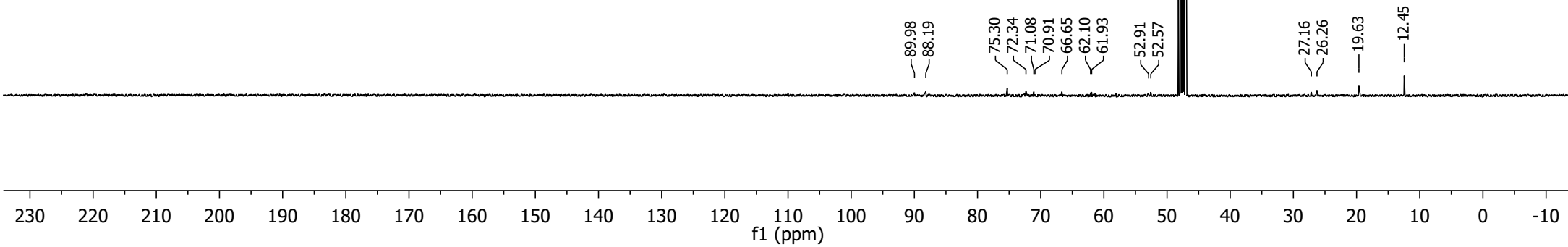
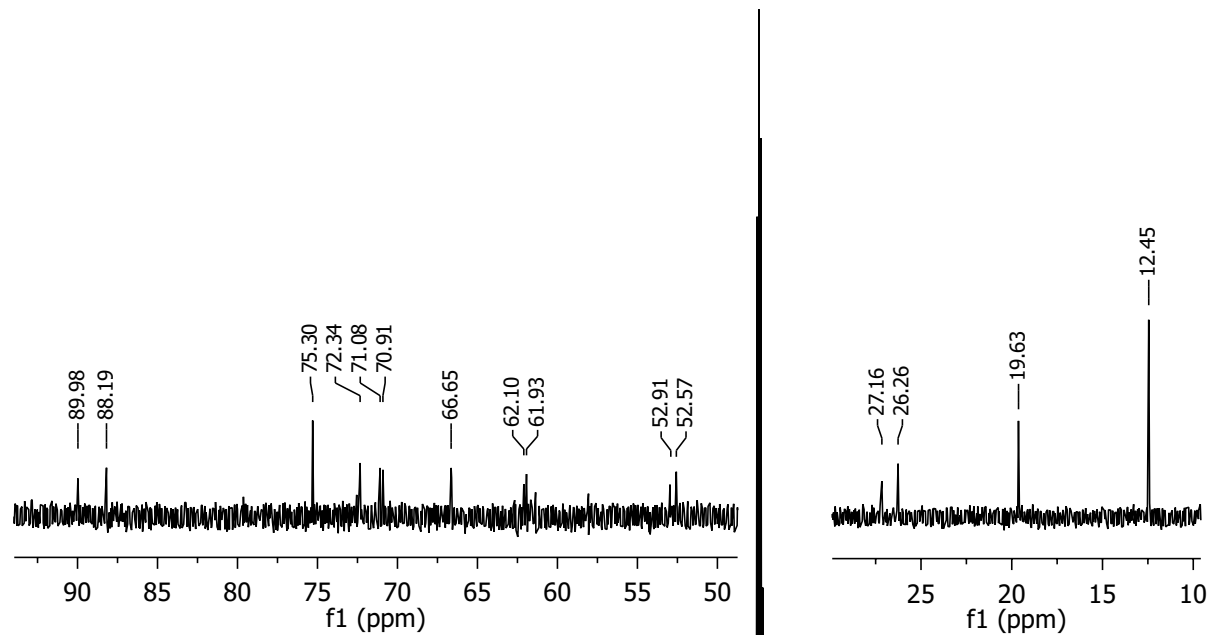
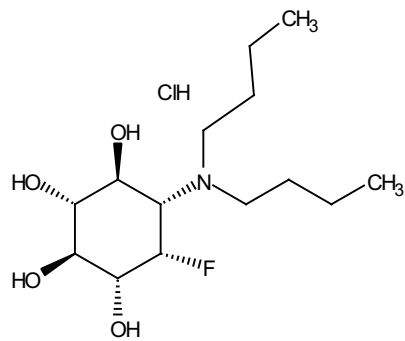


<sup>1</sup>H RMN (MeOD, 400 MHz) of 68x

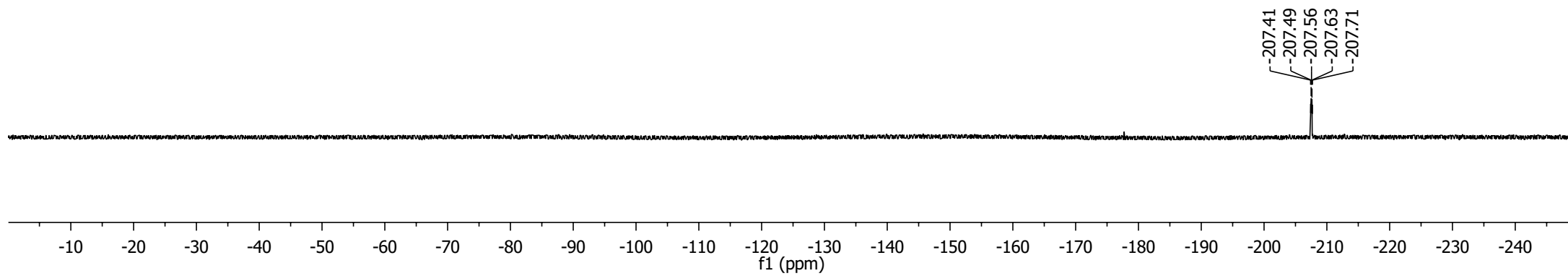
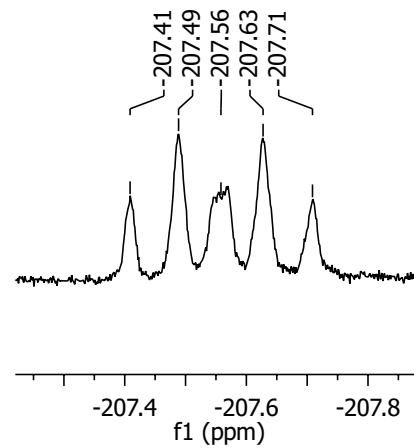
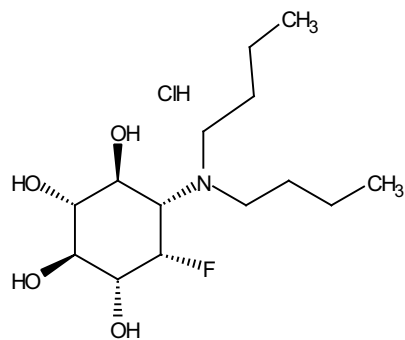




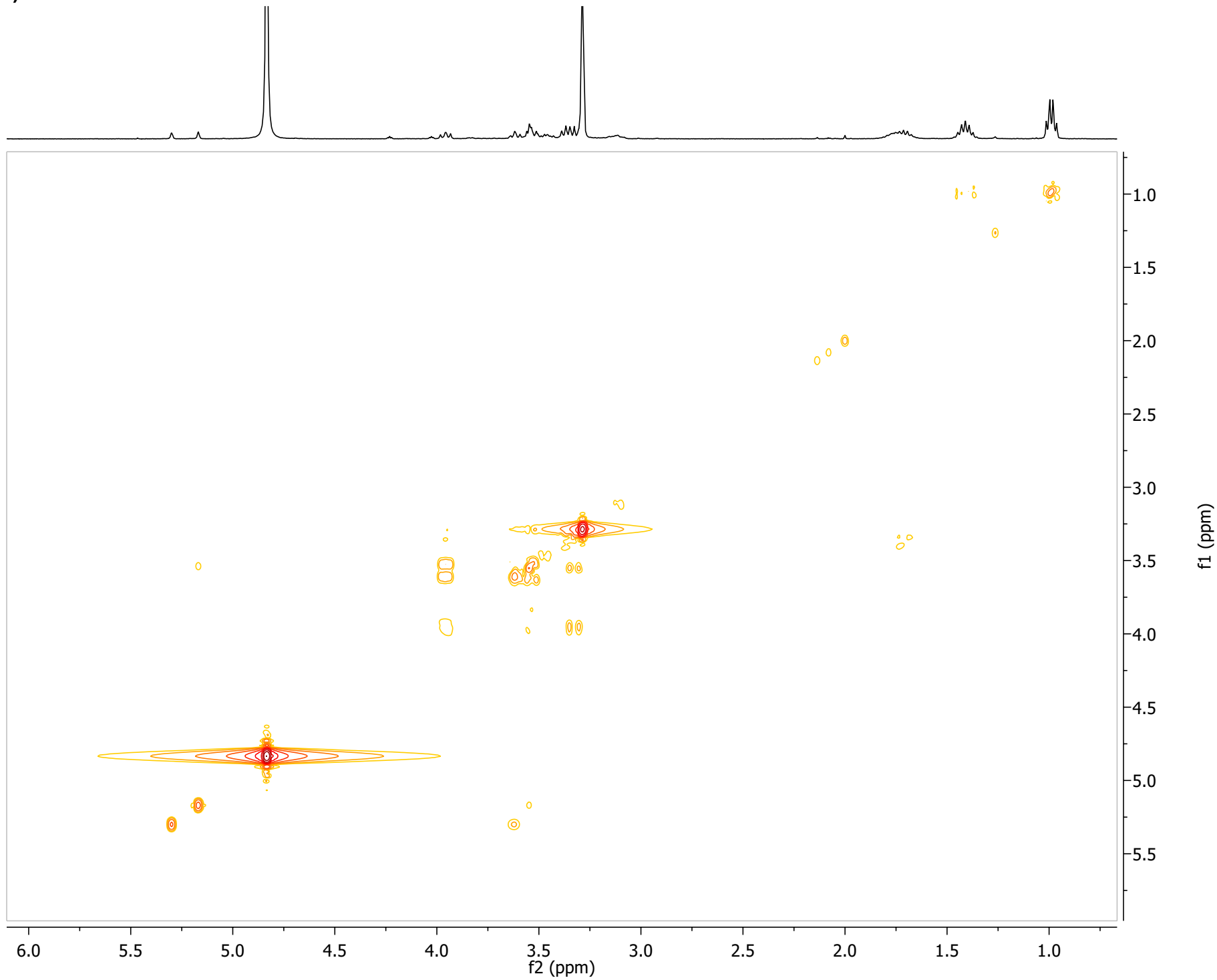
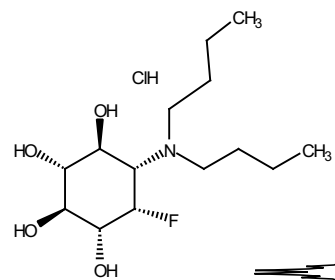
<sup>13</sup>C RMN (MeOD, 101 MHz) of 68x



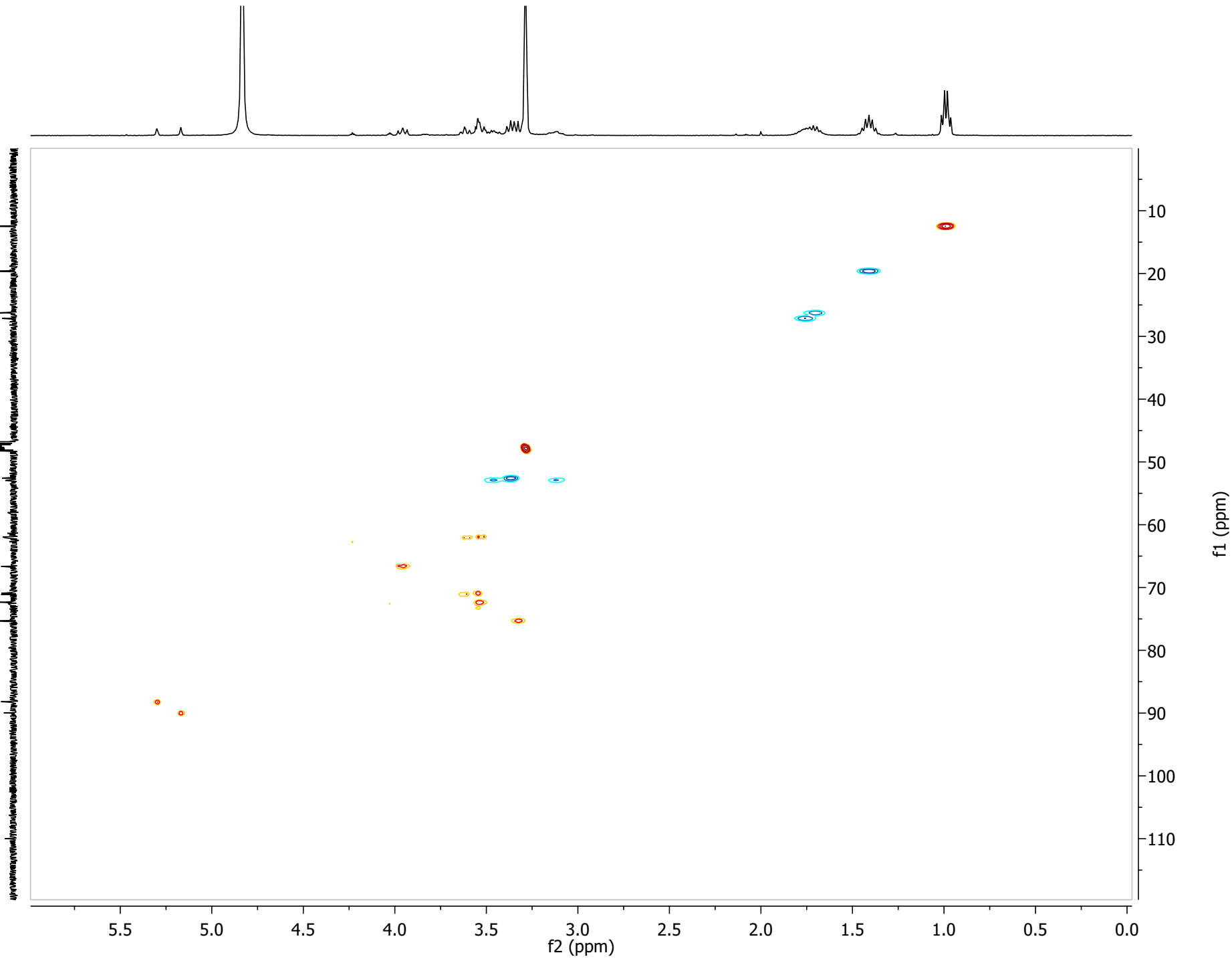
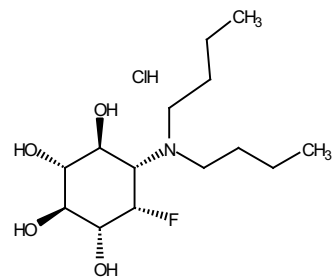
<sup>19</sup>F RMN (MeOD, 376 MHz) of 68x



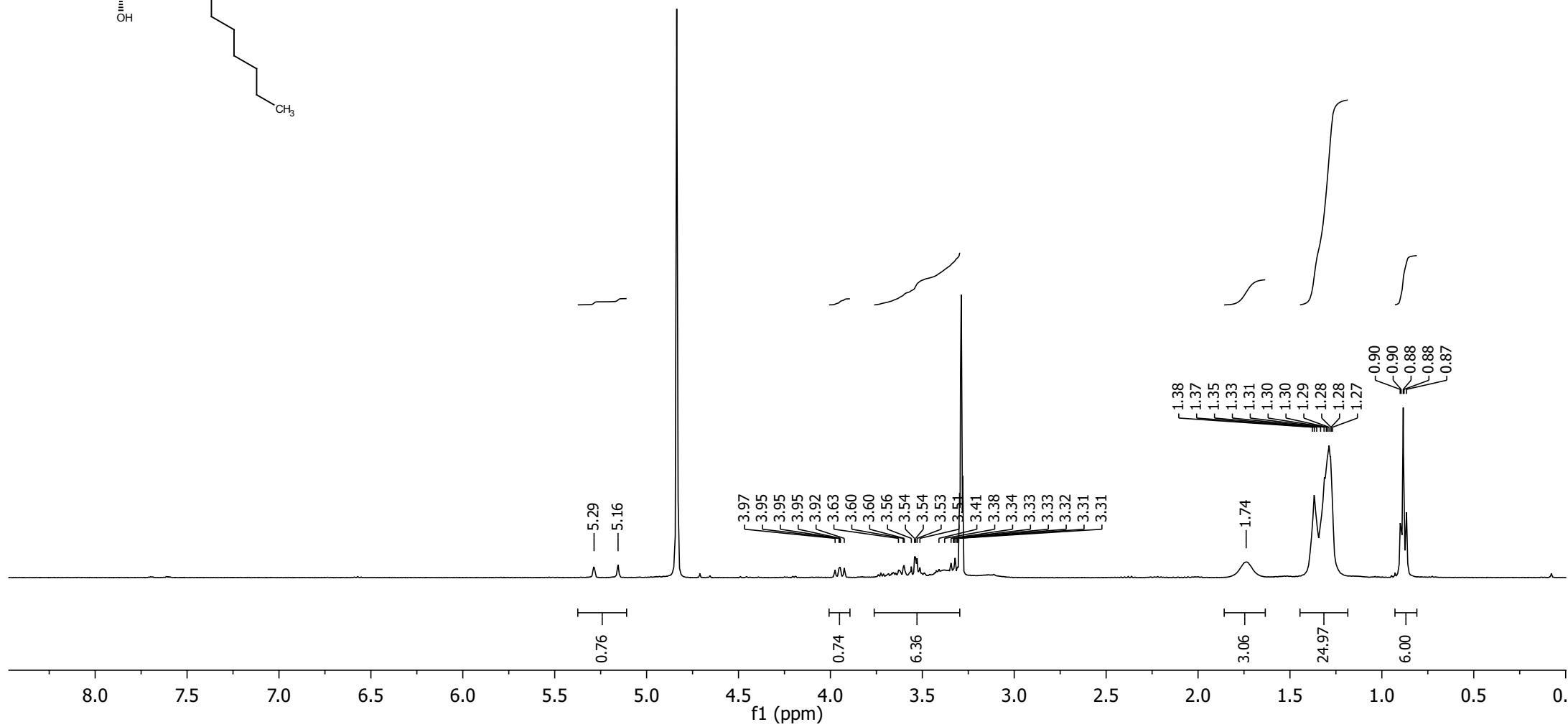
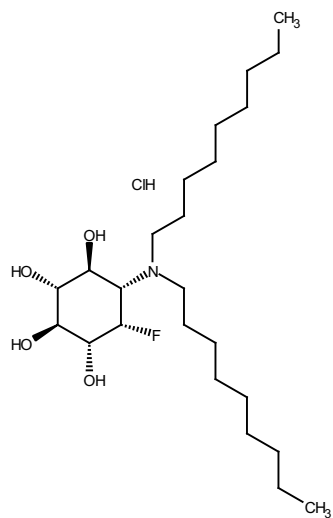
gCOSY (MeOD, 400 MHz) of 68x



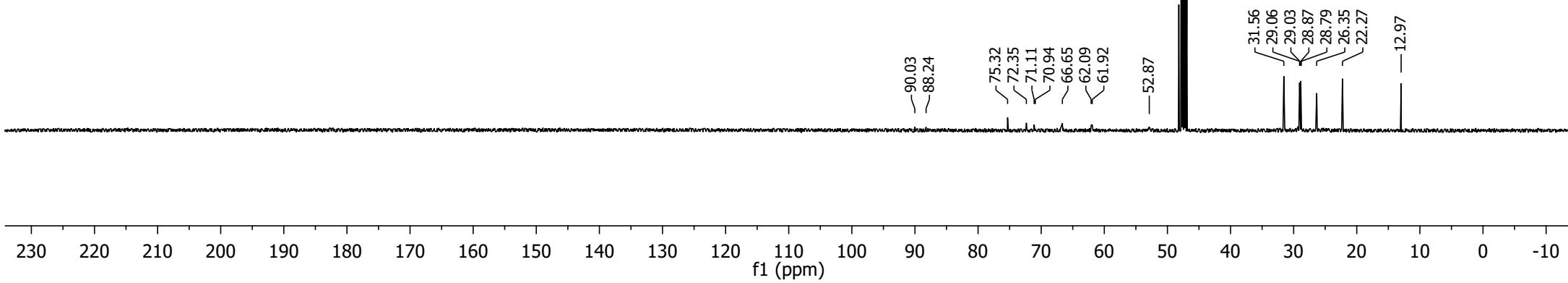
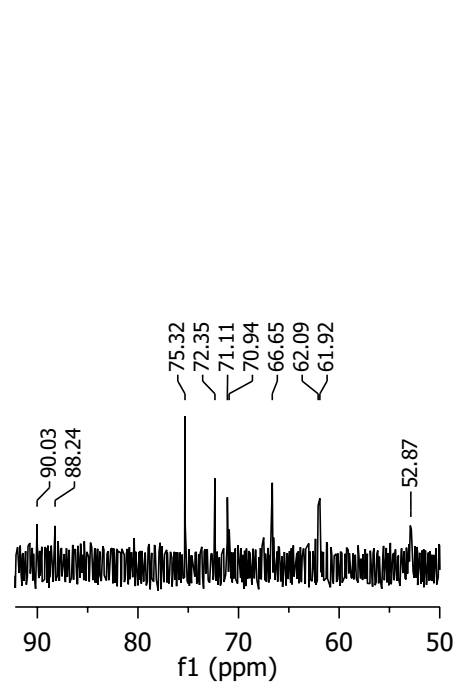
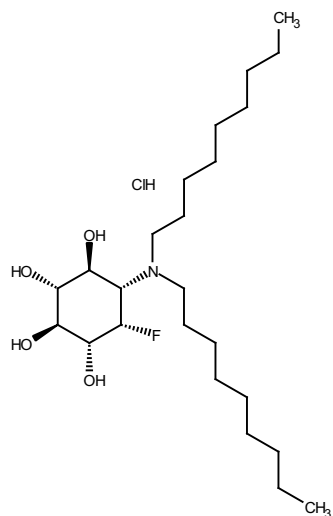
# HSQCAD (MeOD, 400 MHz) of 68x



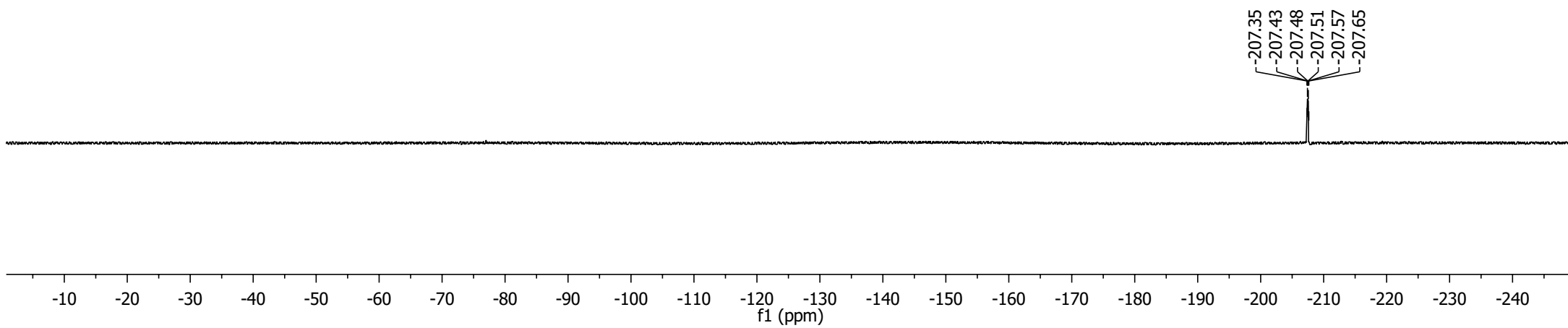
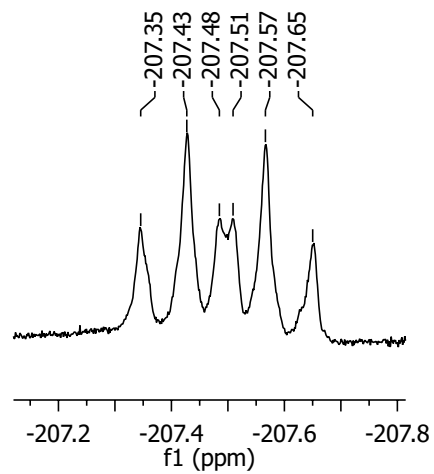
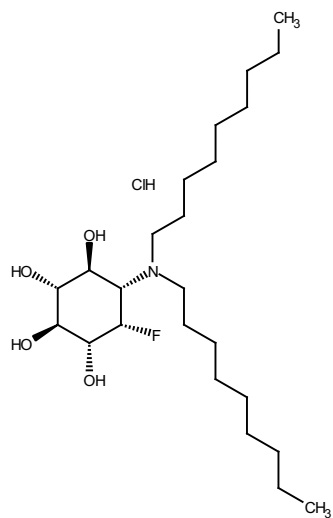
<sup>1</sup>H NMR (MeOD, 400 MHz) of 68y



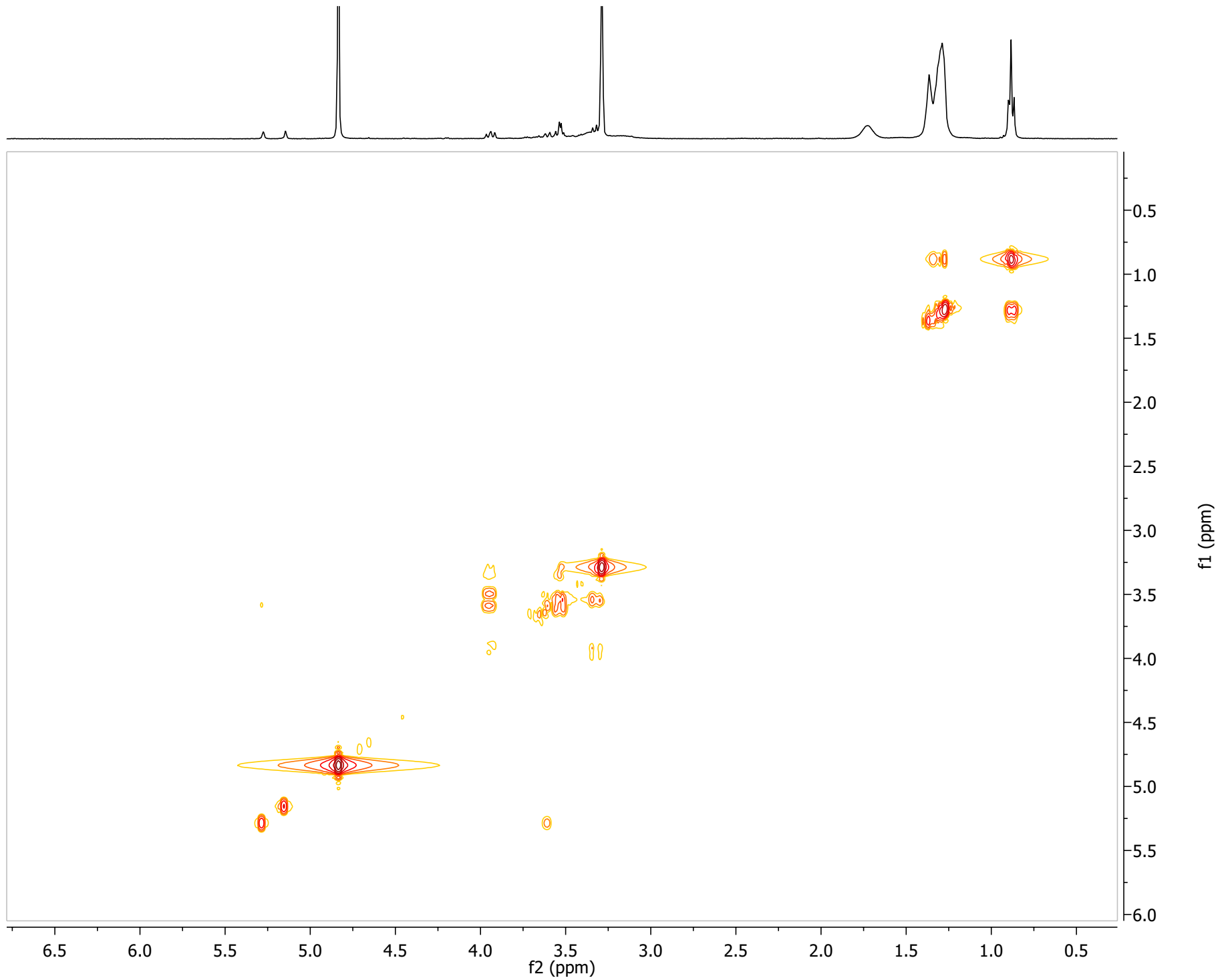
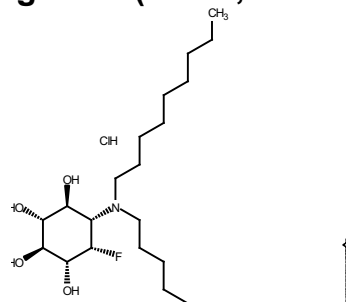
<sup>13</sup>C NMR (MeOD, 101 MHz) of 68y



**$^{19}\text{F}$  NMR (MeOD, 376 MHz) of 68y**

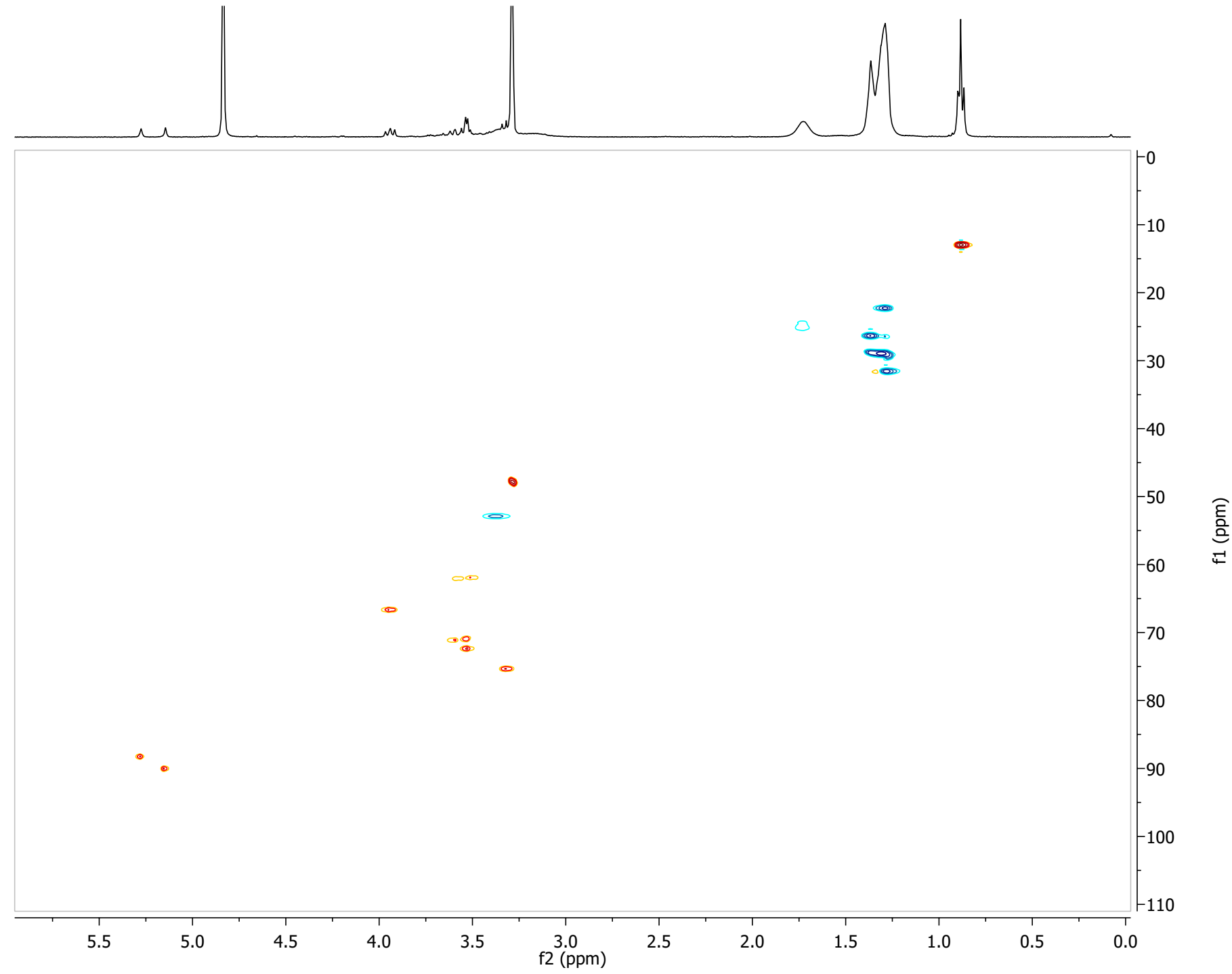
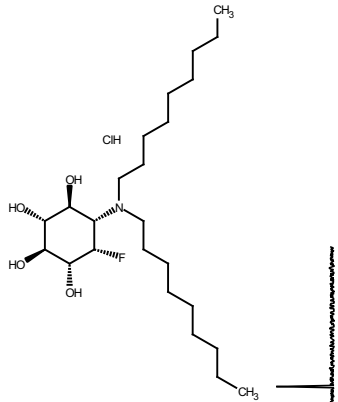


# gCOSY (MeOD, 400 MHz) of 68y

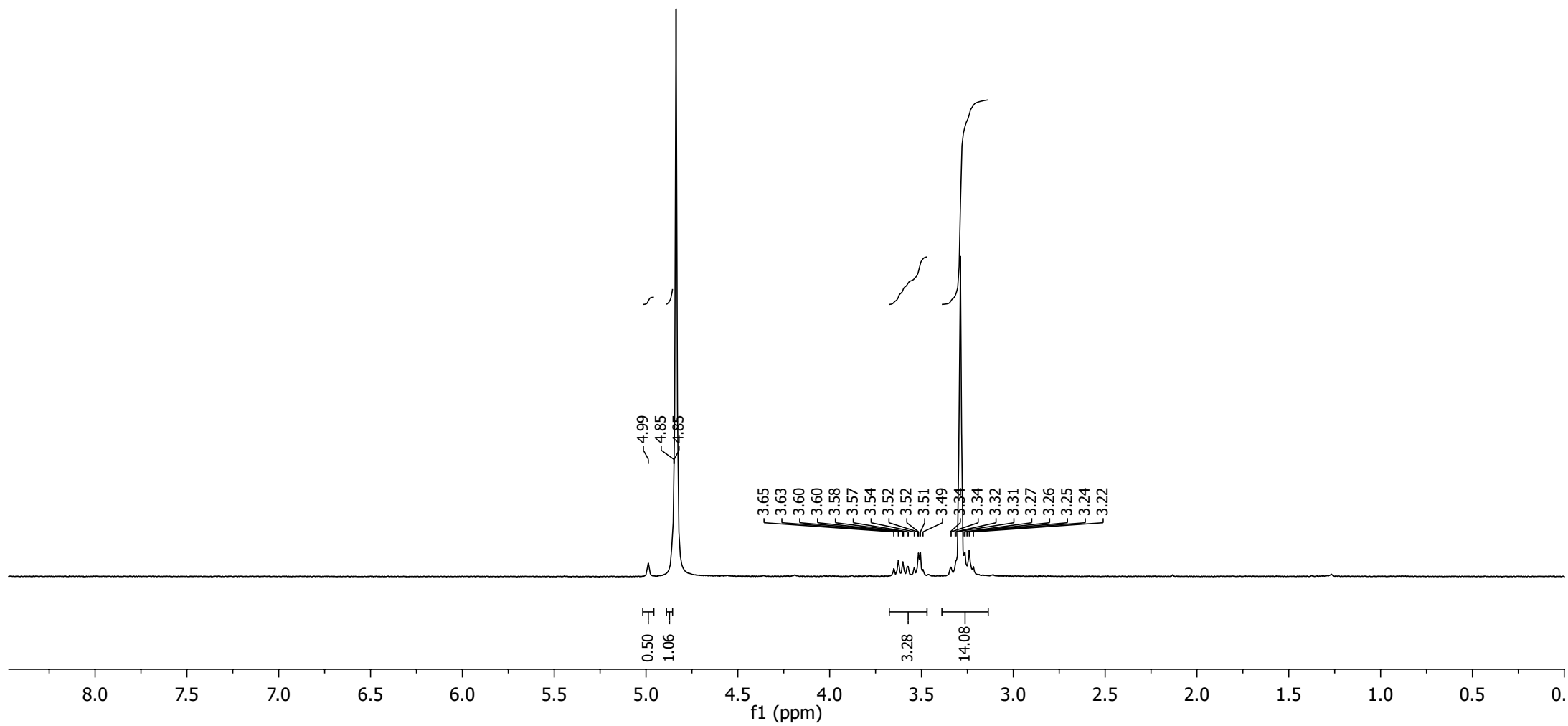
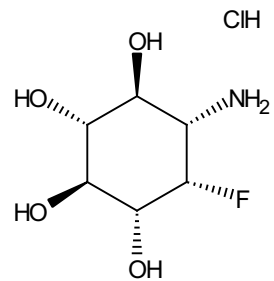




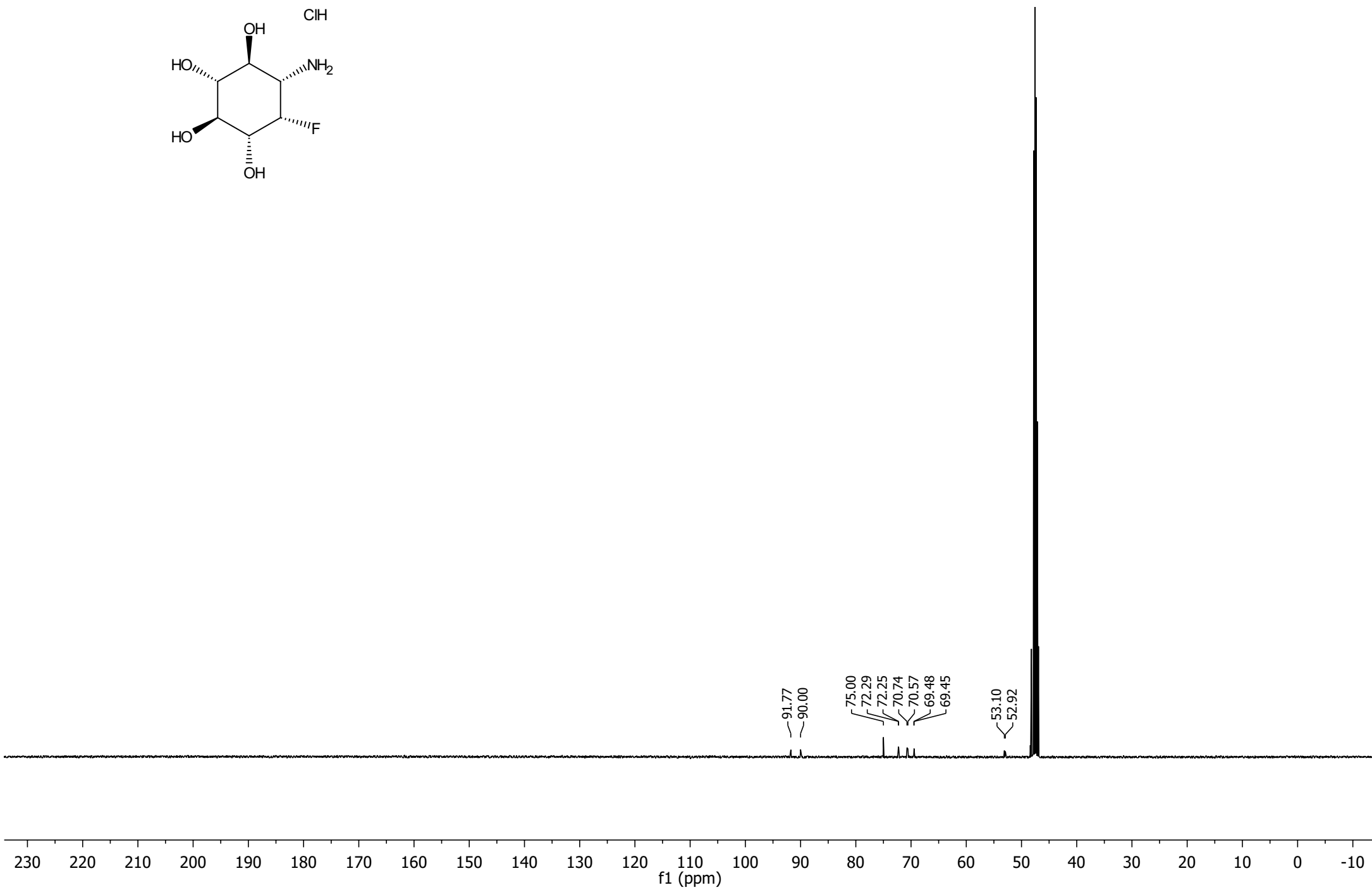
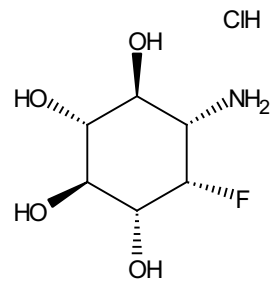
# HSQCAD (MeOD, 400 MHz) of 68y



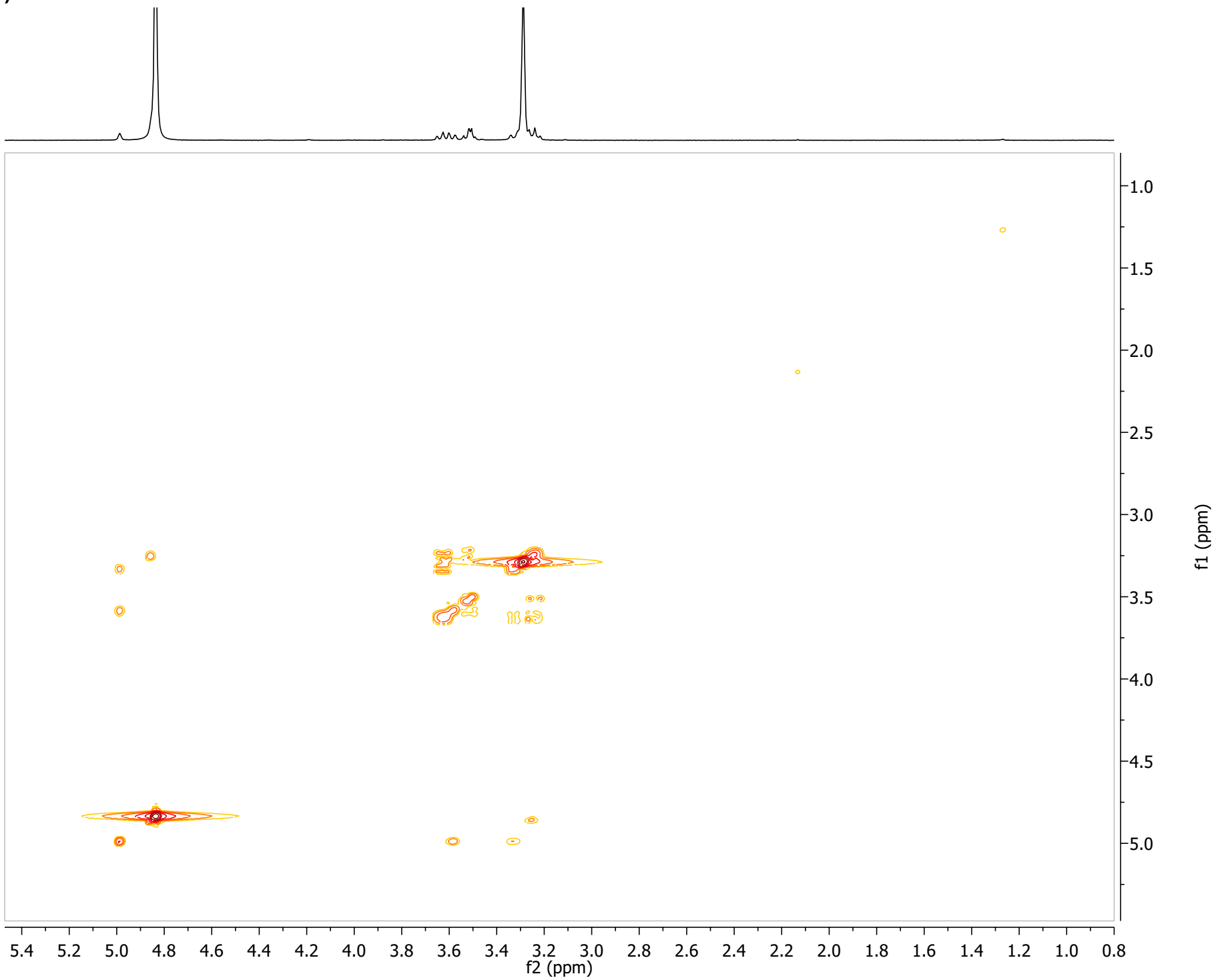
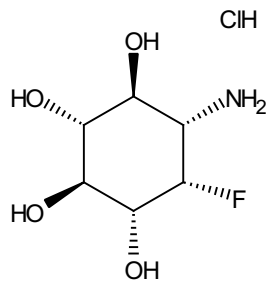
<sup>1</sup>H NMR (MeOD, 400 MHz) of 69



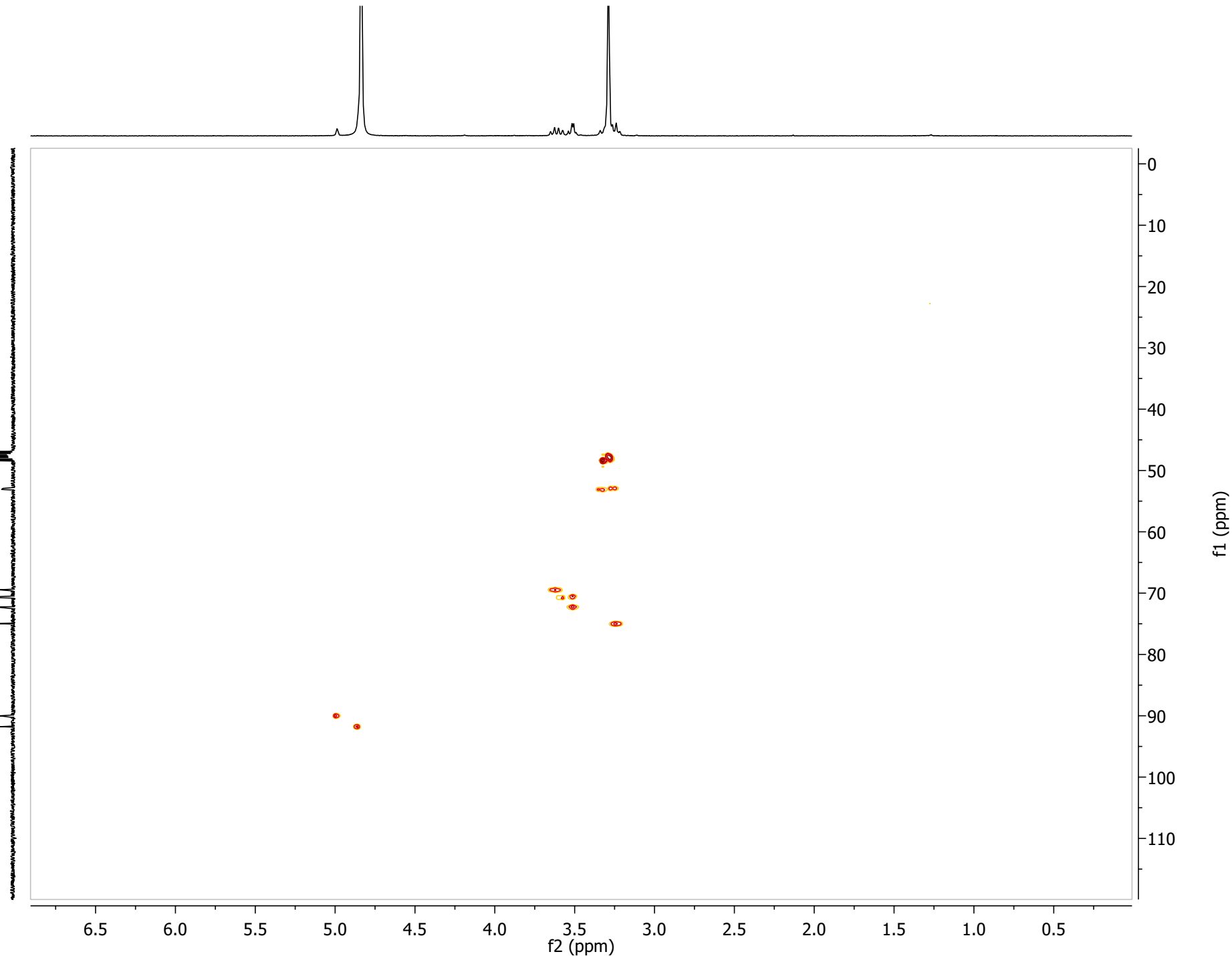
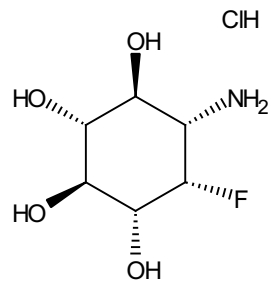
<sup>13</sup>C NMR (MeOD, 101 MHz) of 69



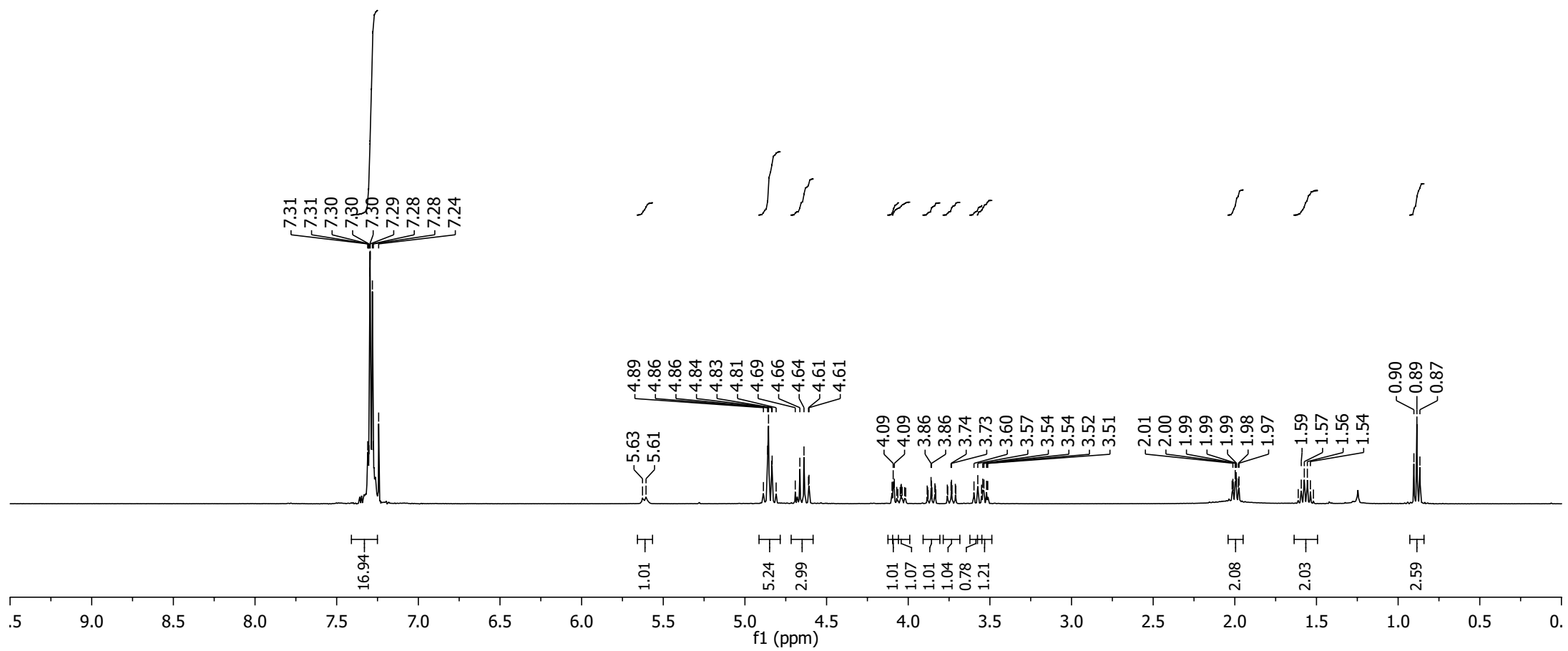
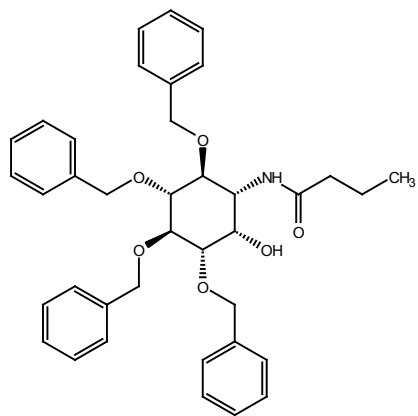
gCOSY (MeOD, 400 MHz) of 69



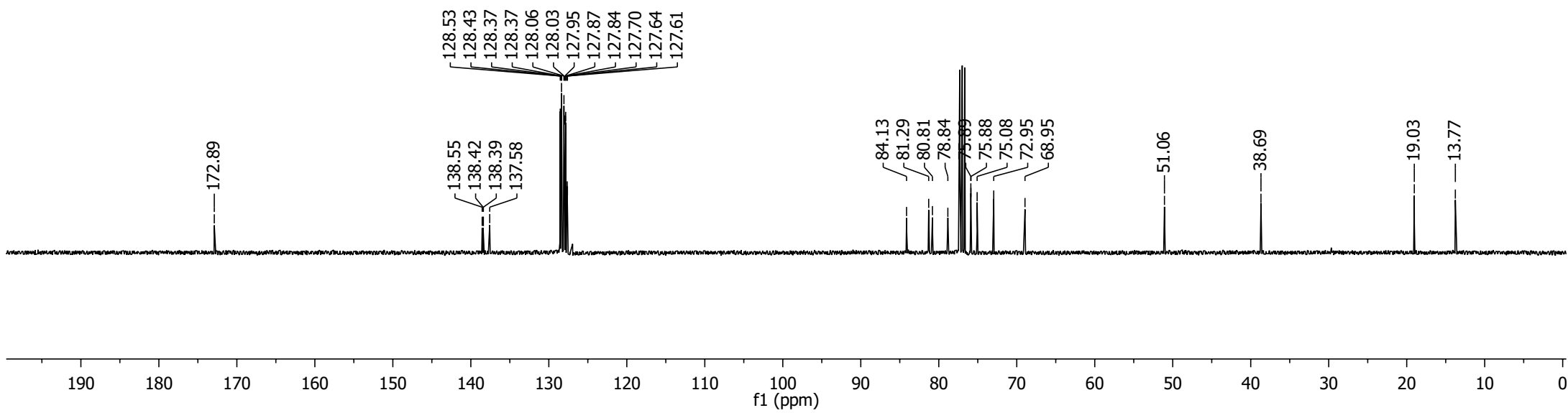
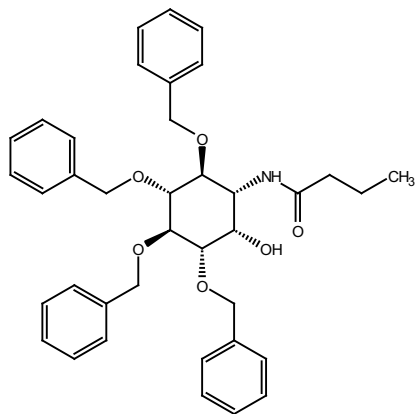
# HSQCAD (MeOD, 400 MHz) of 69



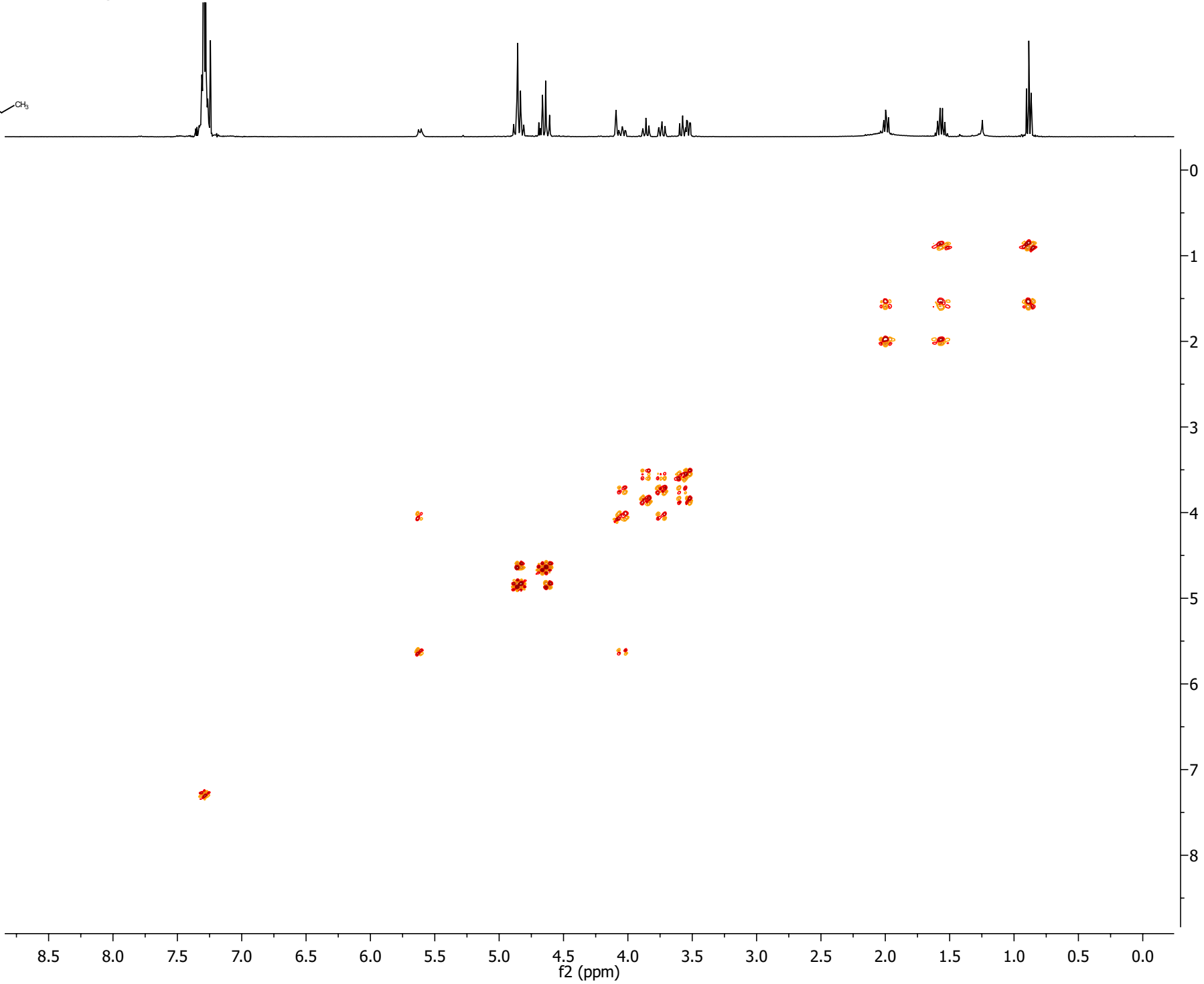
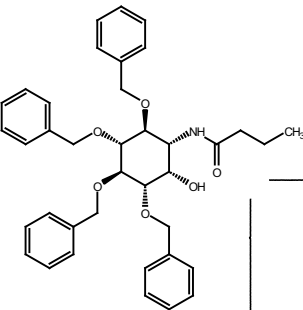
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 72



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 72



gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 72

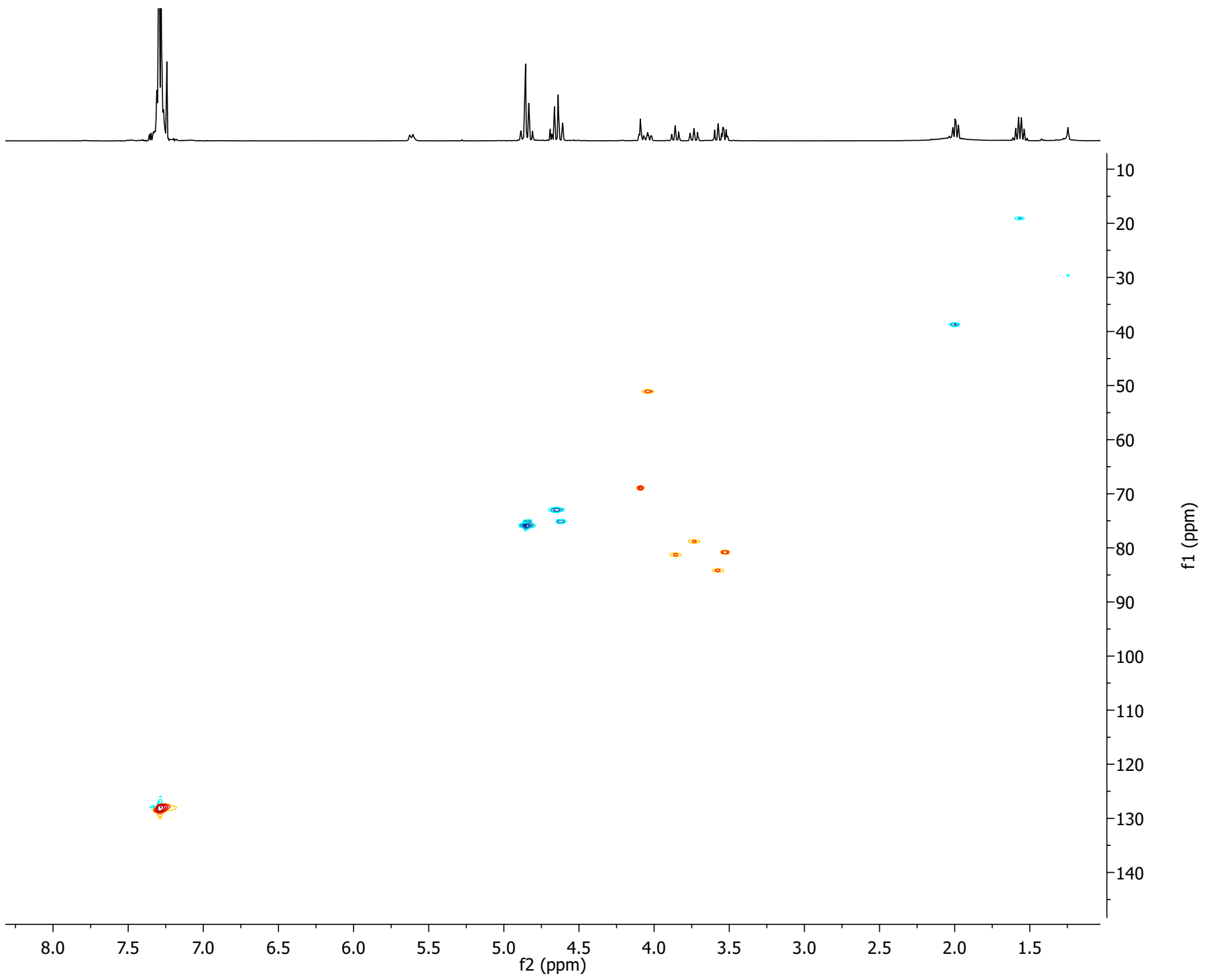
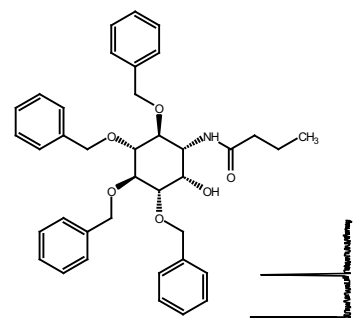


f1 (ppm)

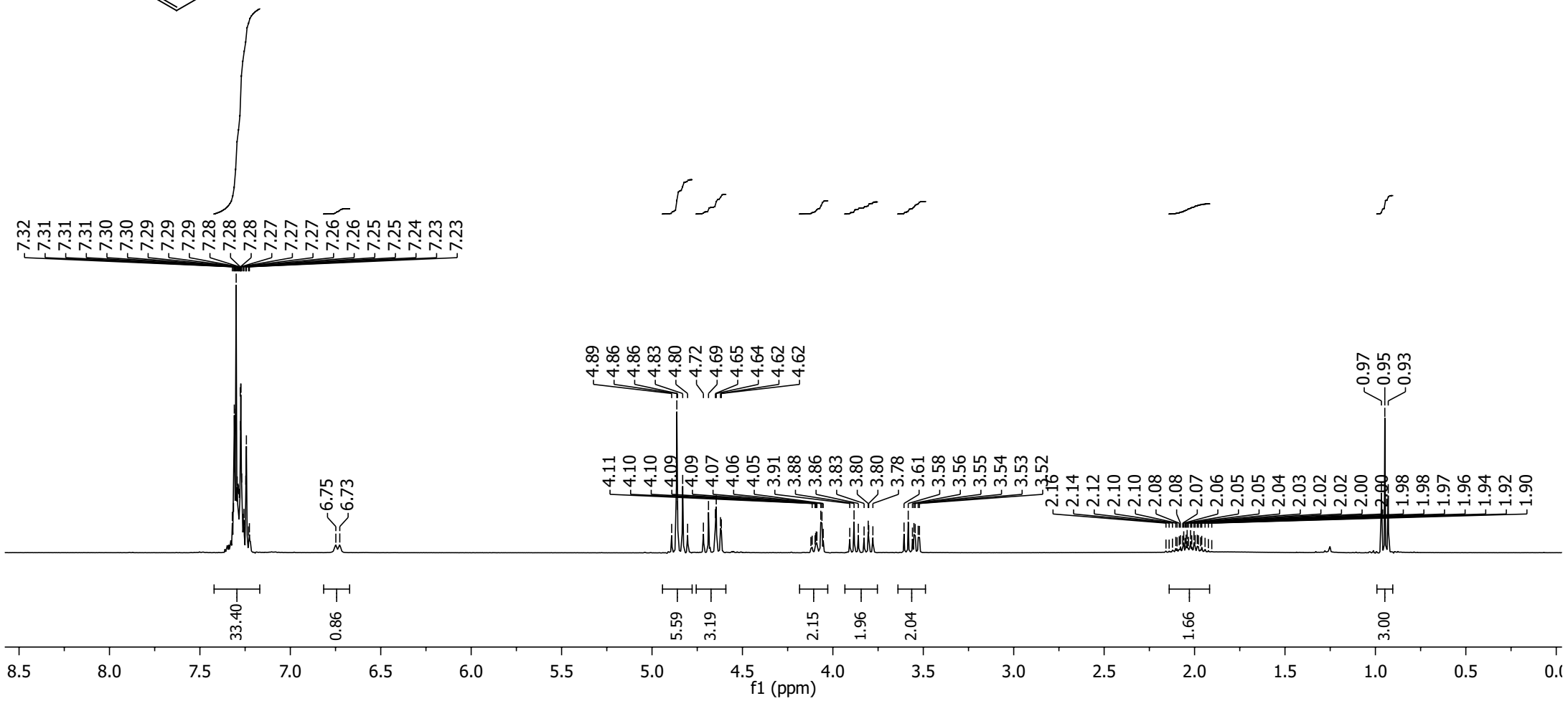
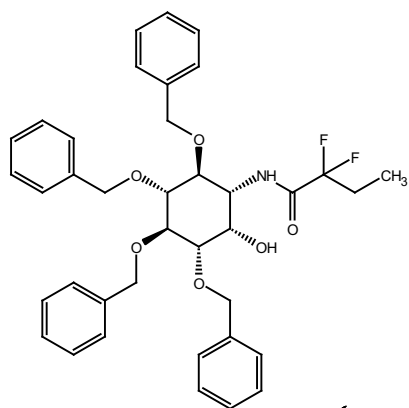
f2 (ppm)



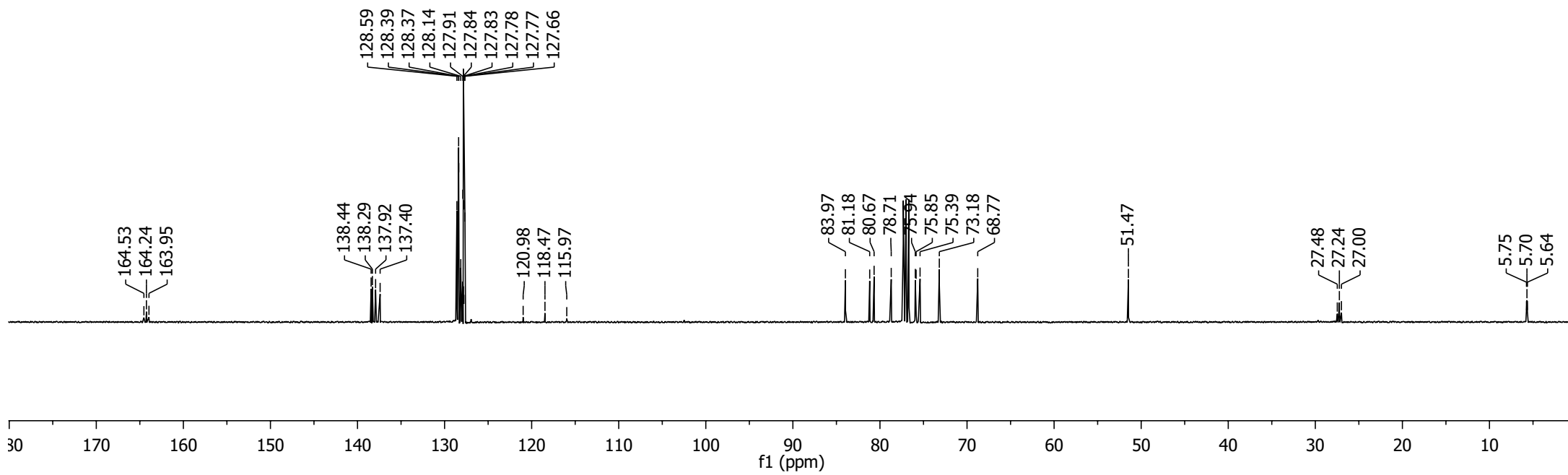
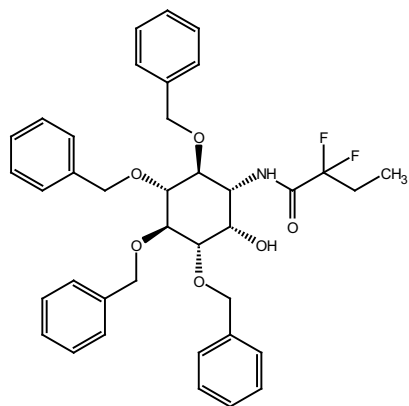
gHSQC(CDCl<sub>3</sub>, 400 MHz) of 72



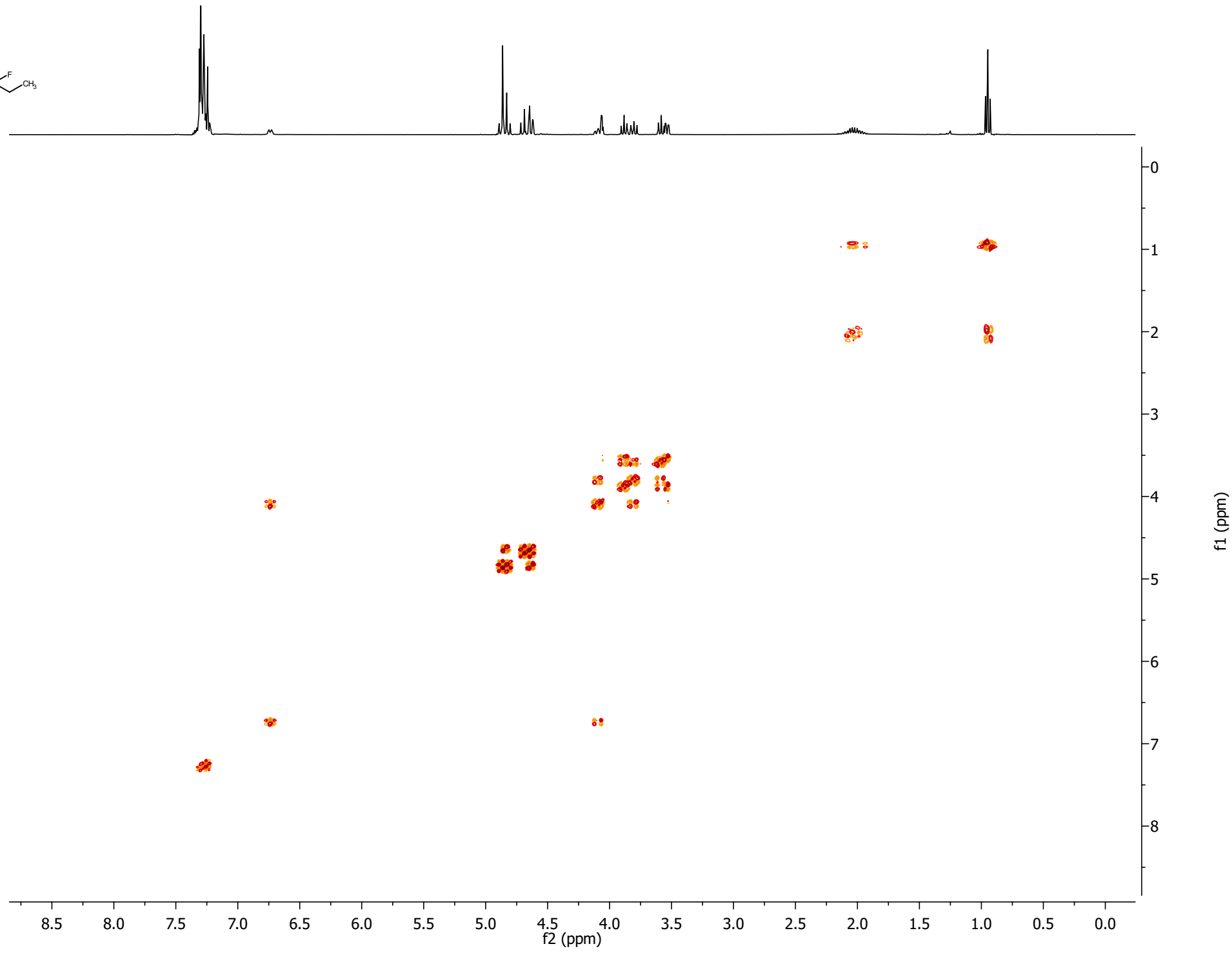
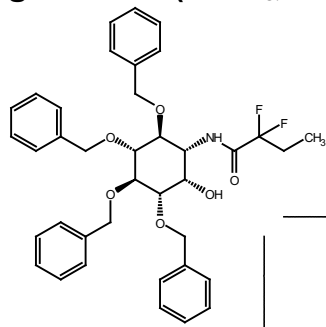
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 73



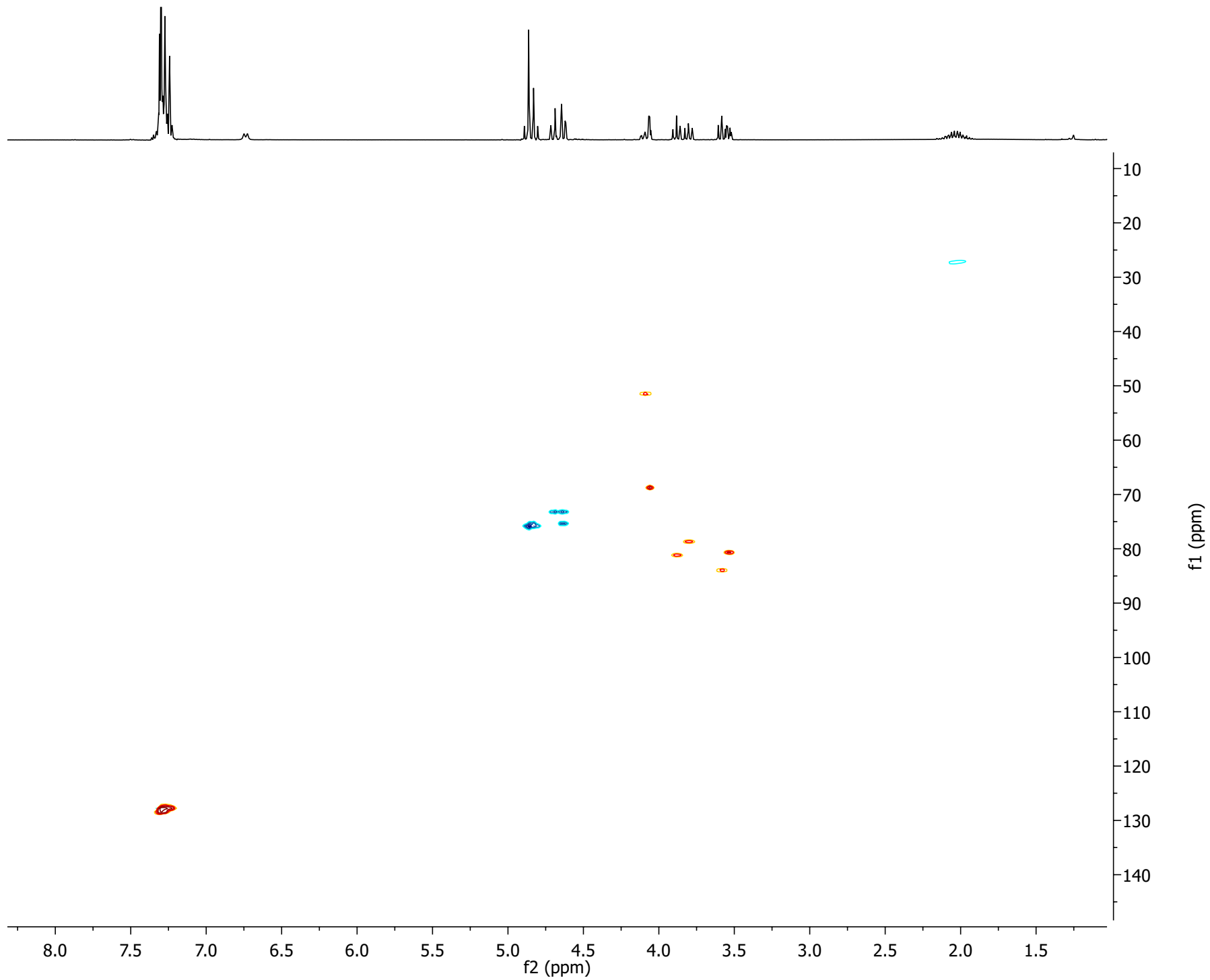
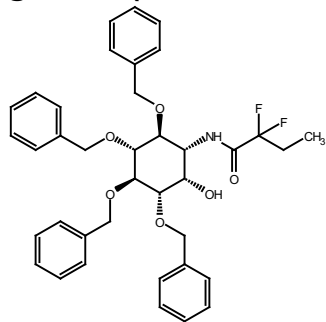
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 73



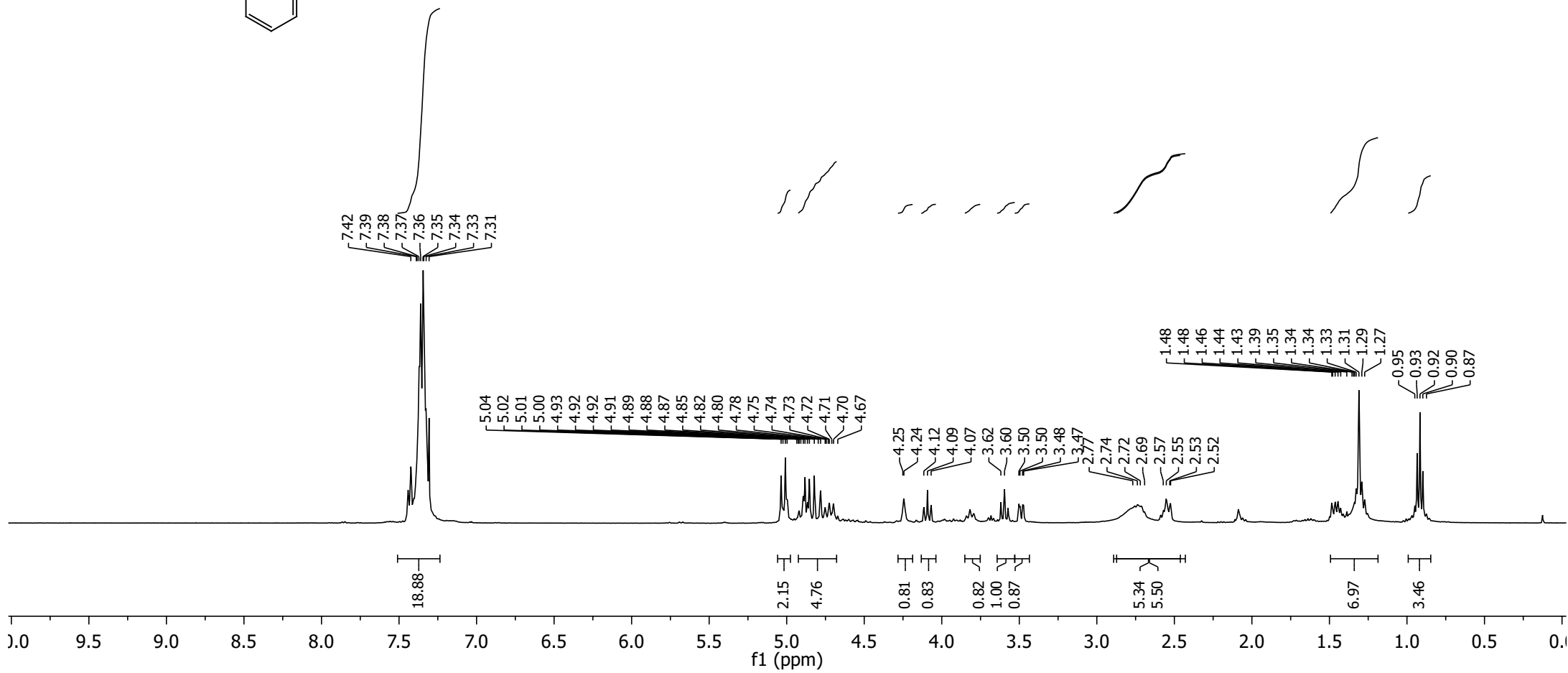
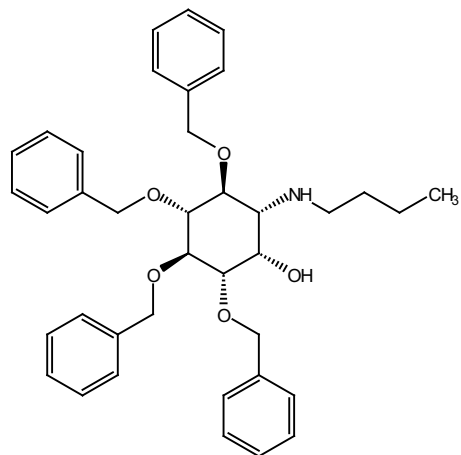
gDQCOSY (CDCl<sub>3</sub>, 400 MHz) of 73



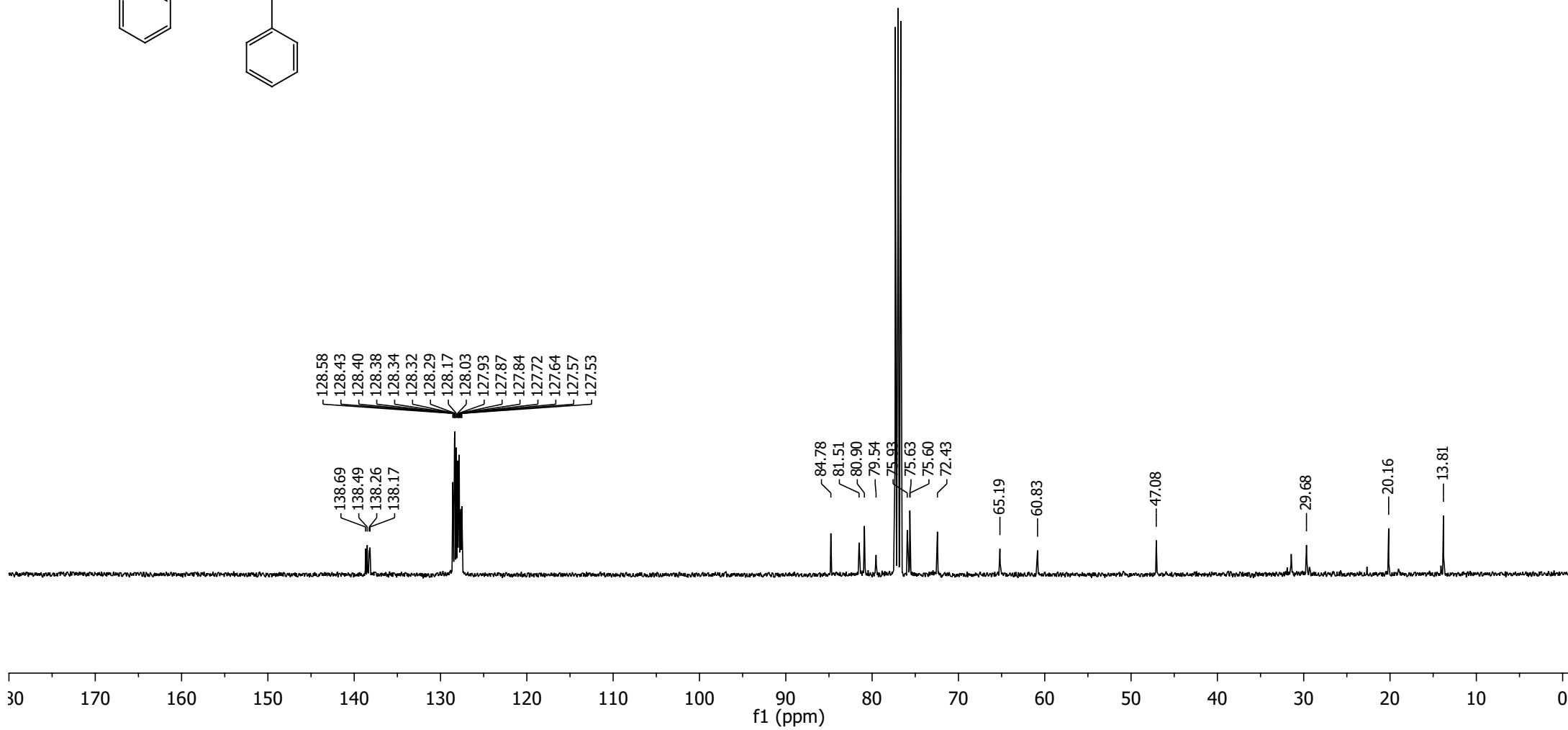
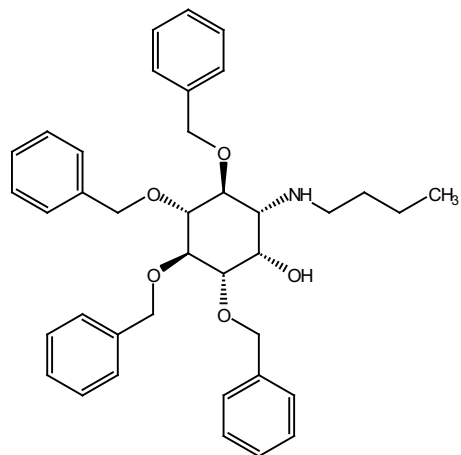
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 73



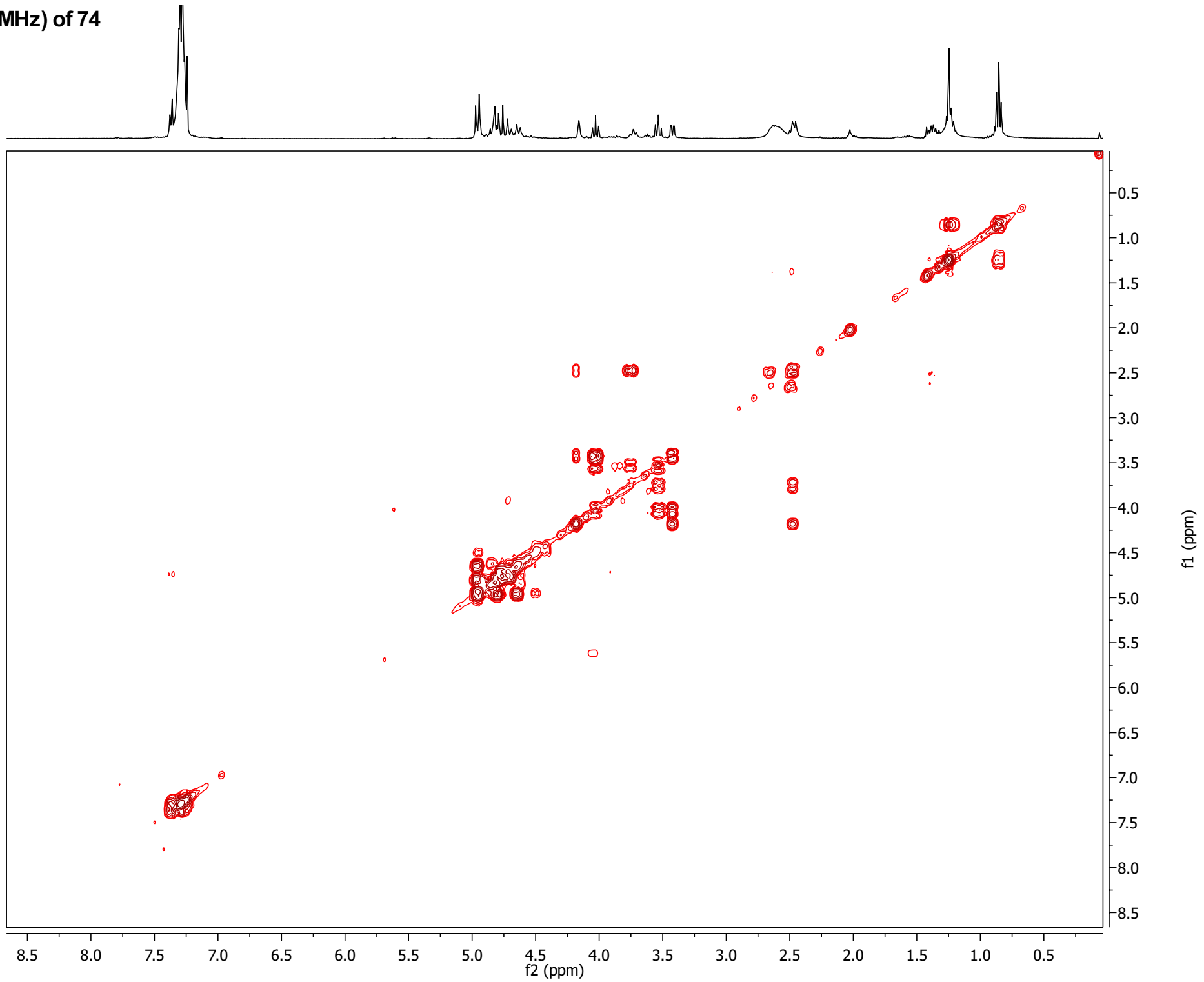
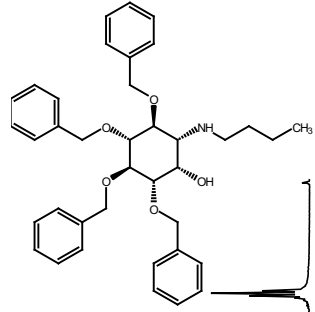
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 74



<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 74

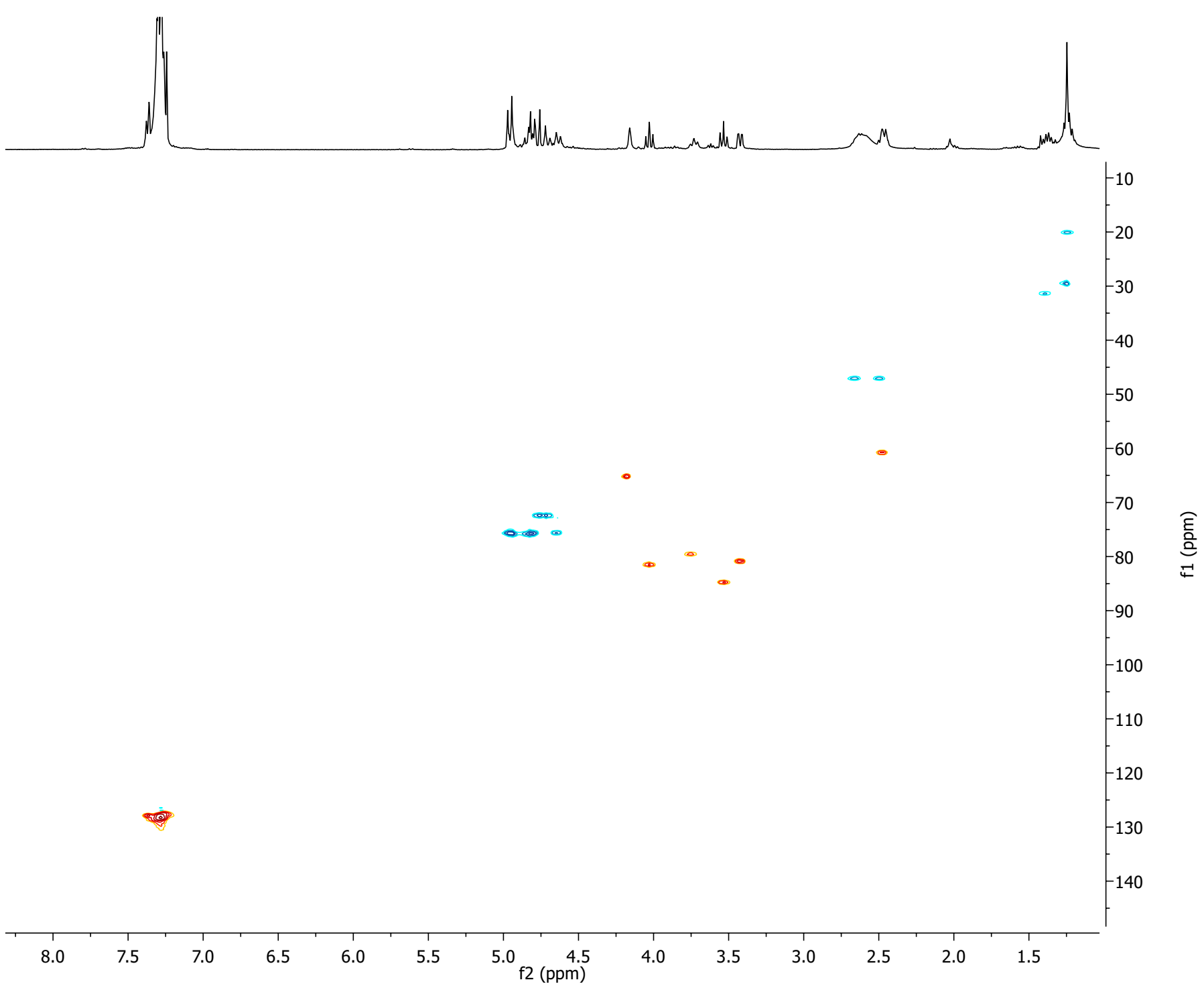
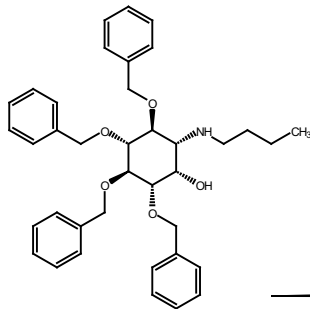


gCOSY (CDCl<sub>3</sub>, 400 MHz) of 74

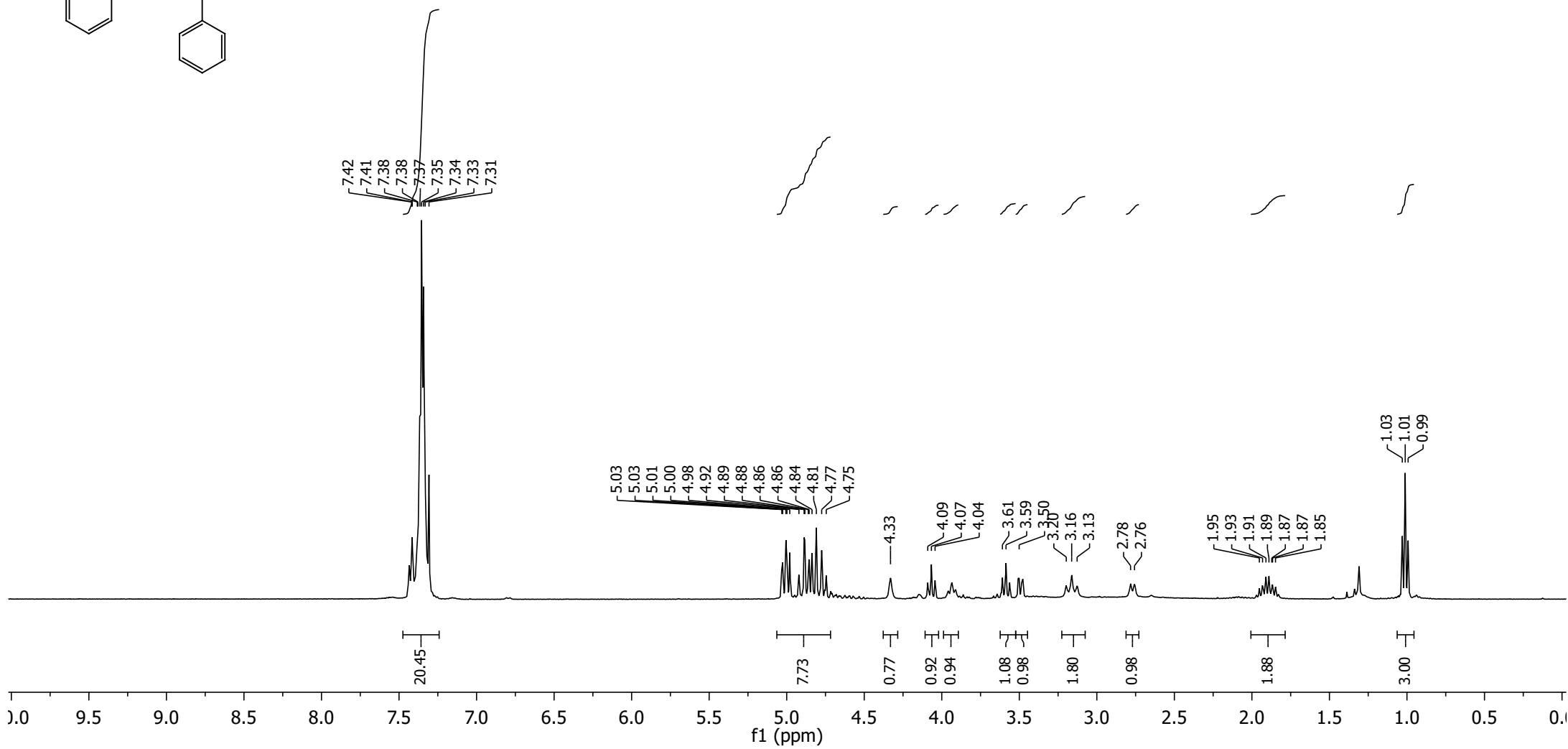
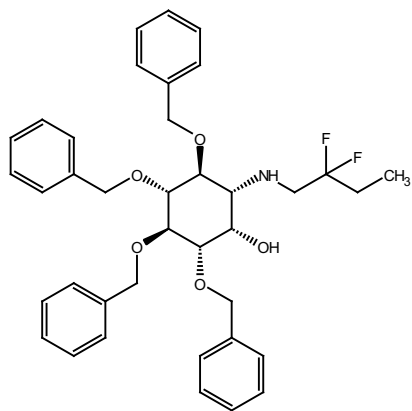




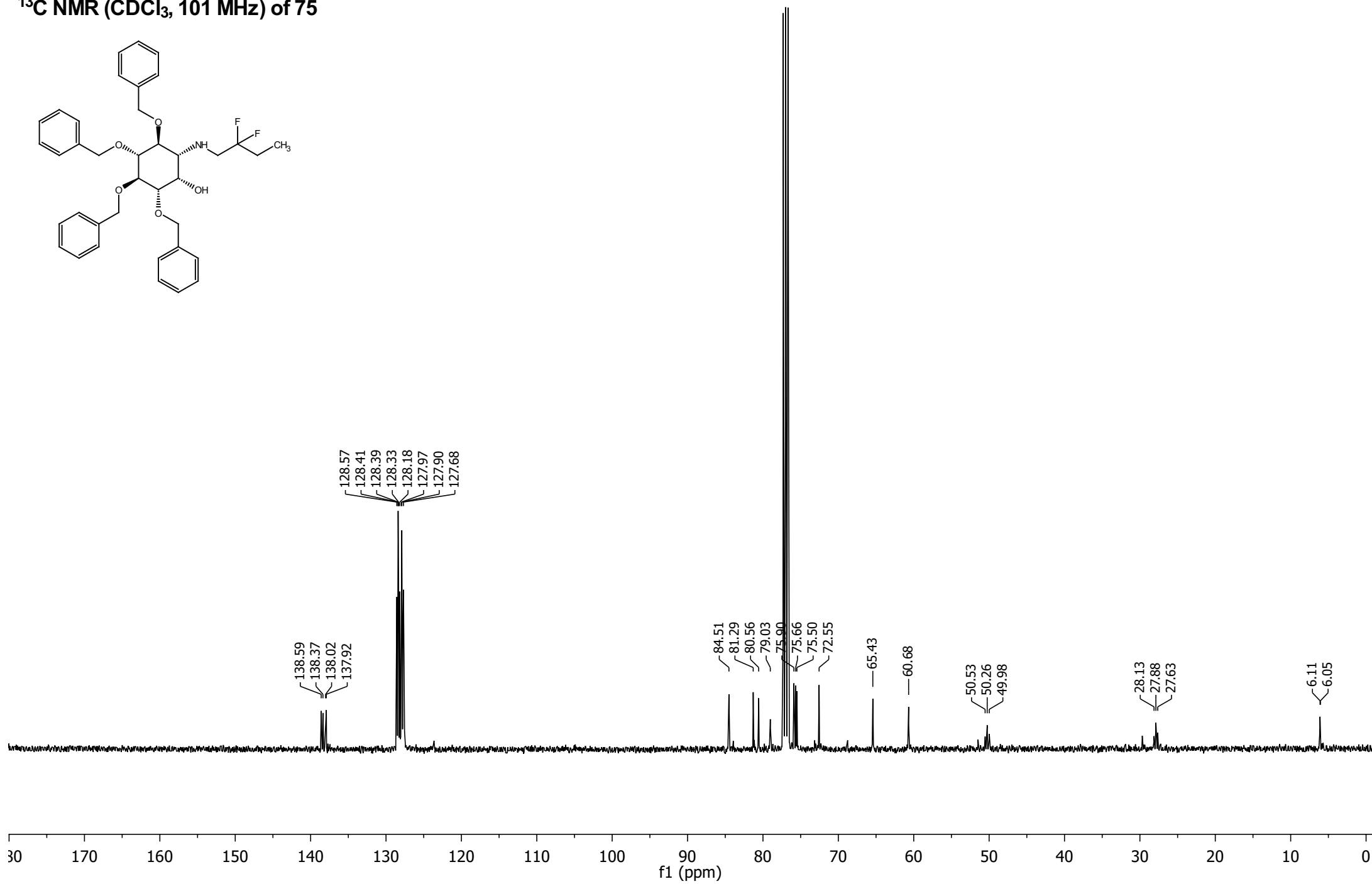
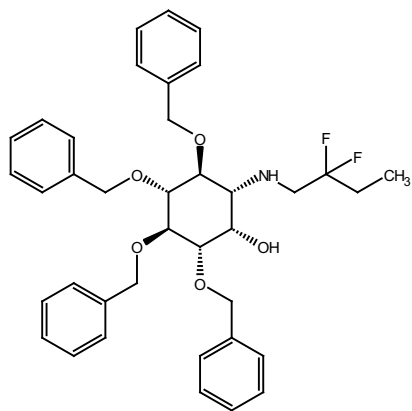
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 74



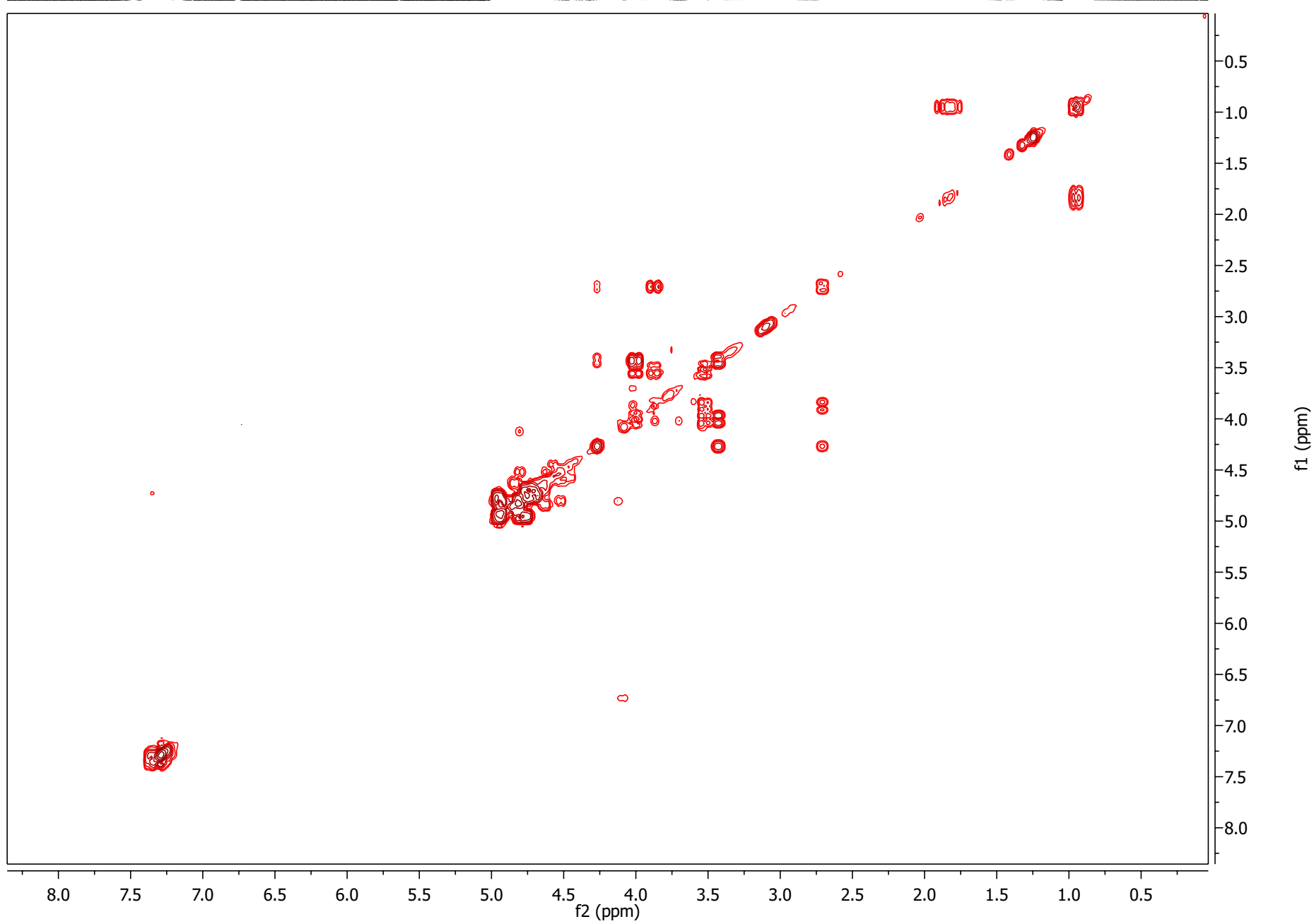
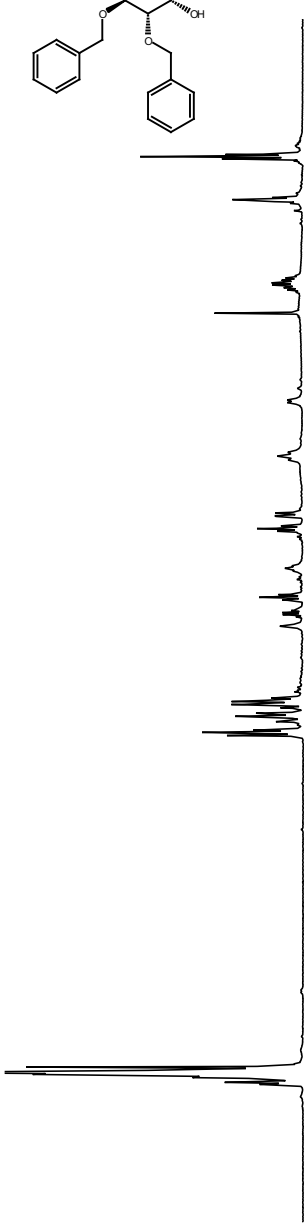
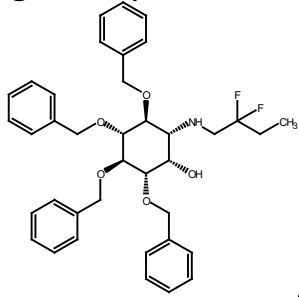
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 75



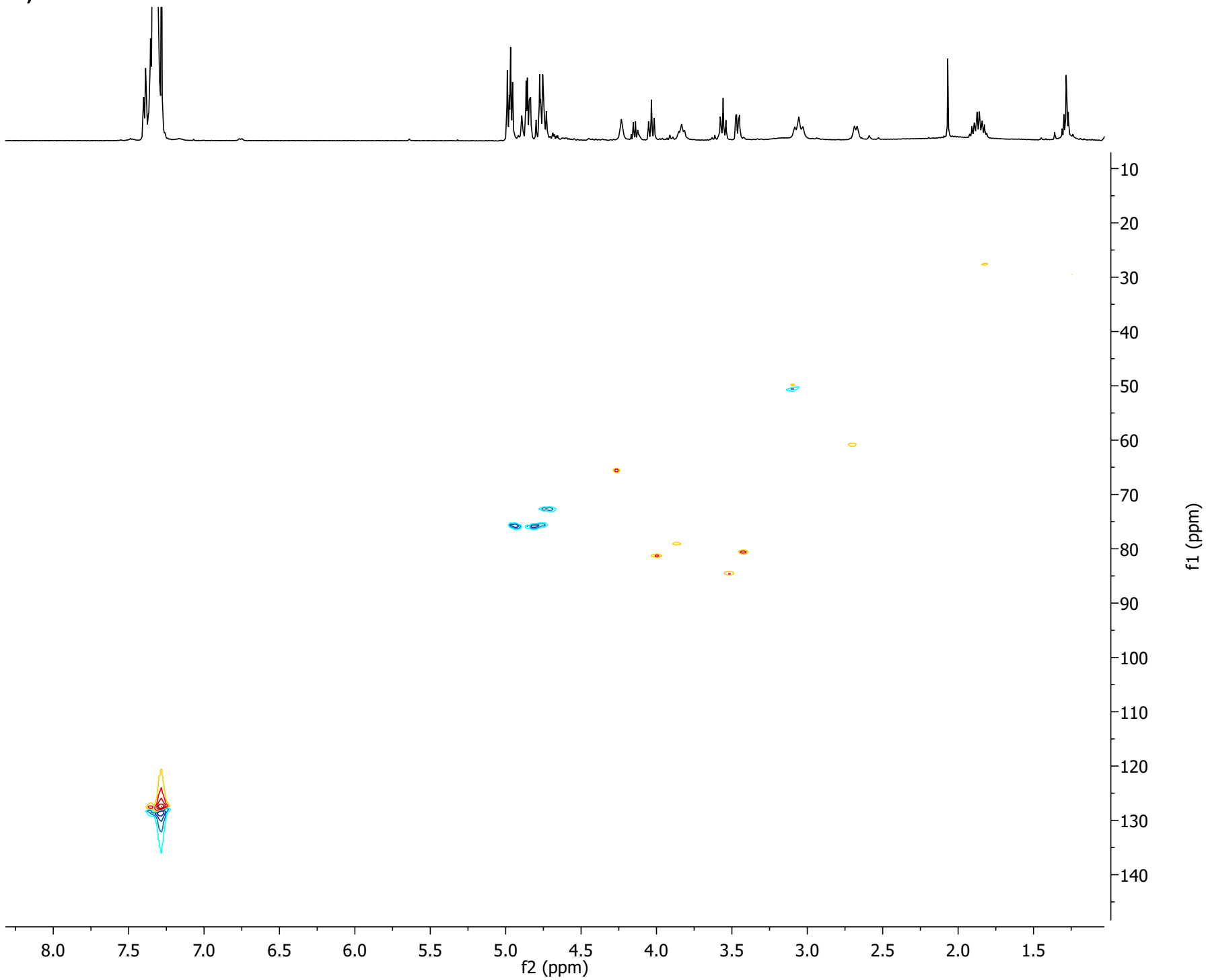
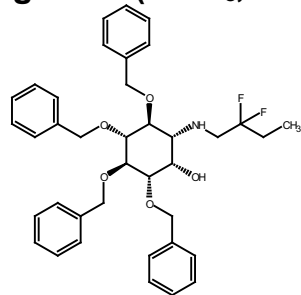
<sup>13</sup>C NMR (CDCl<sub>3</sub>, 101 MHz) of 75



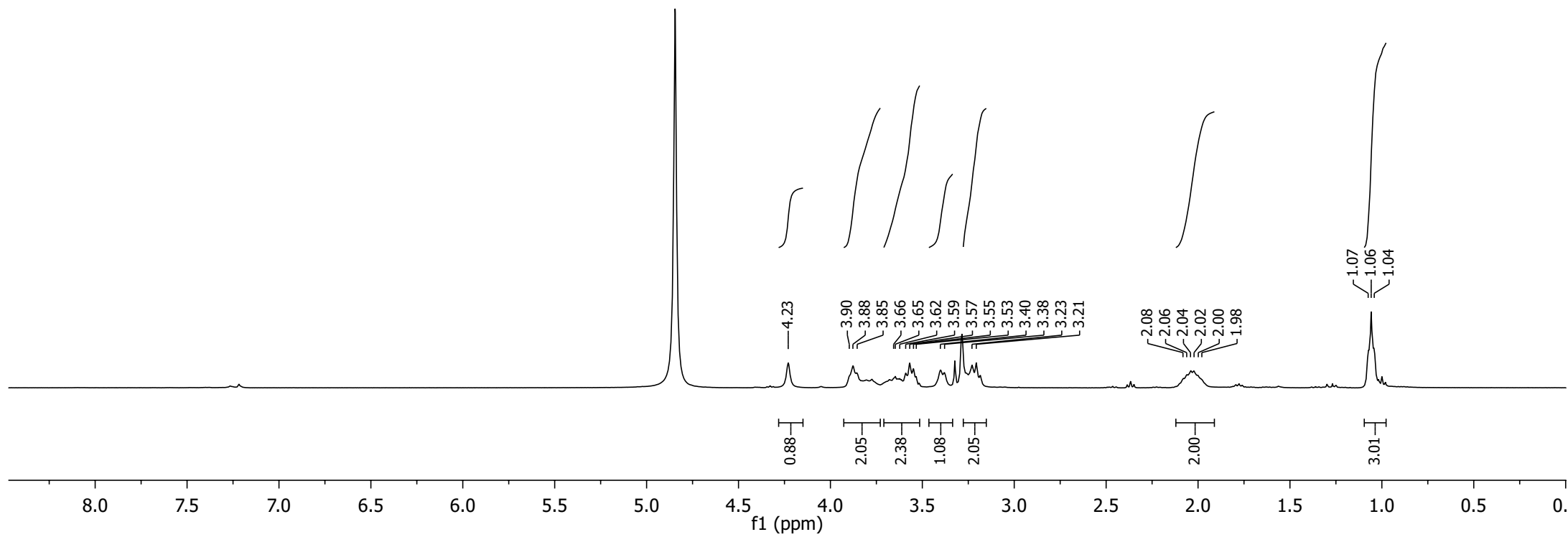
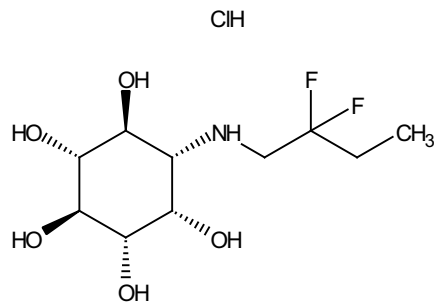
gCOSY (CDCl<sub>3</sub>, 400 MHz) of 75



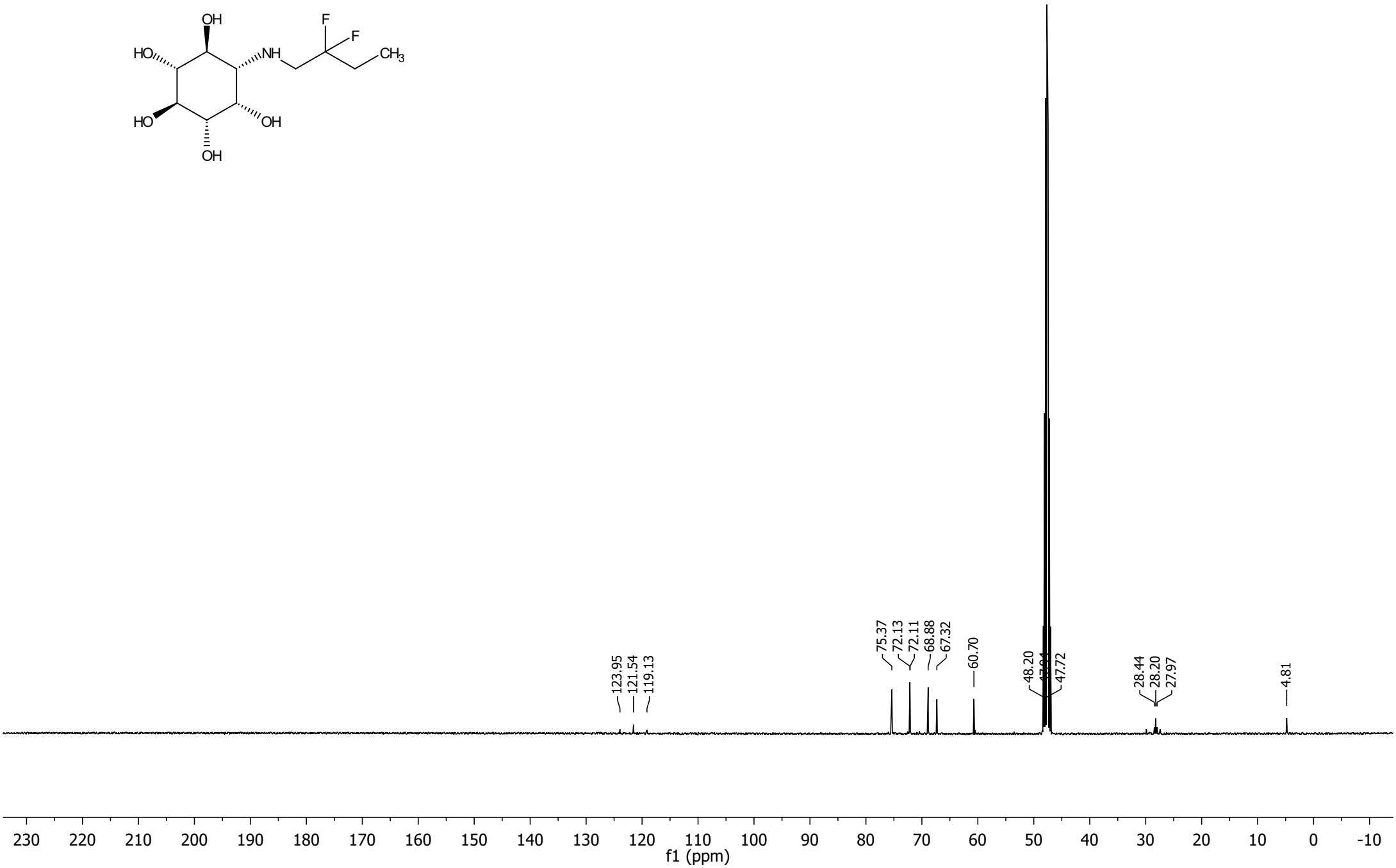
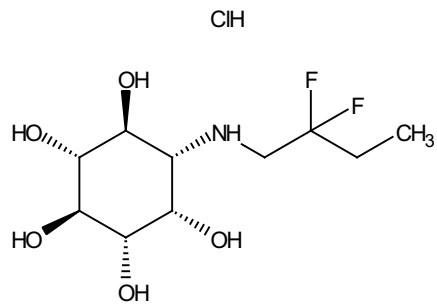
gHSQC (CDCl<sub>3</sub>, 400 MHz) of 75



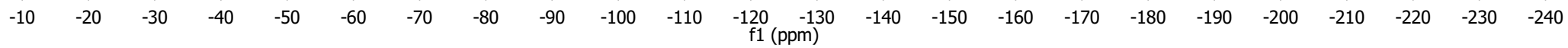
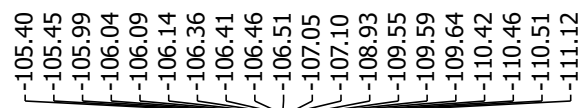
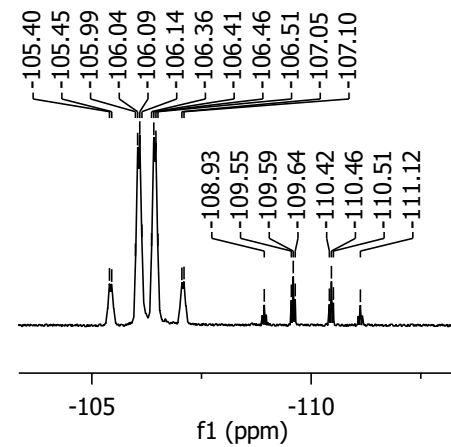
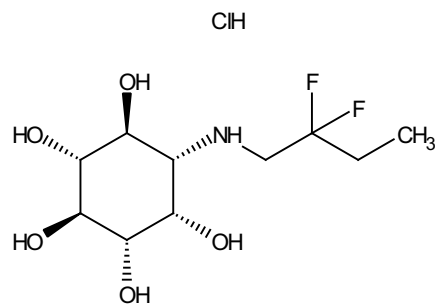
<sup>1</sup>H NMR (MeOD, 400 MHz) of 76



<sup>13</sup>C NMR (MeOD, 101 MHz) of 76

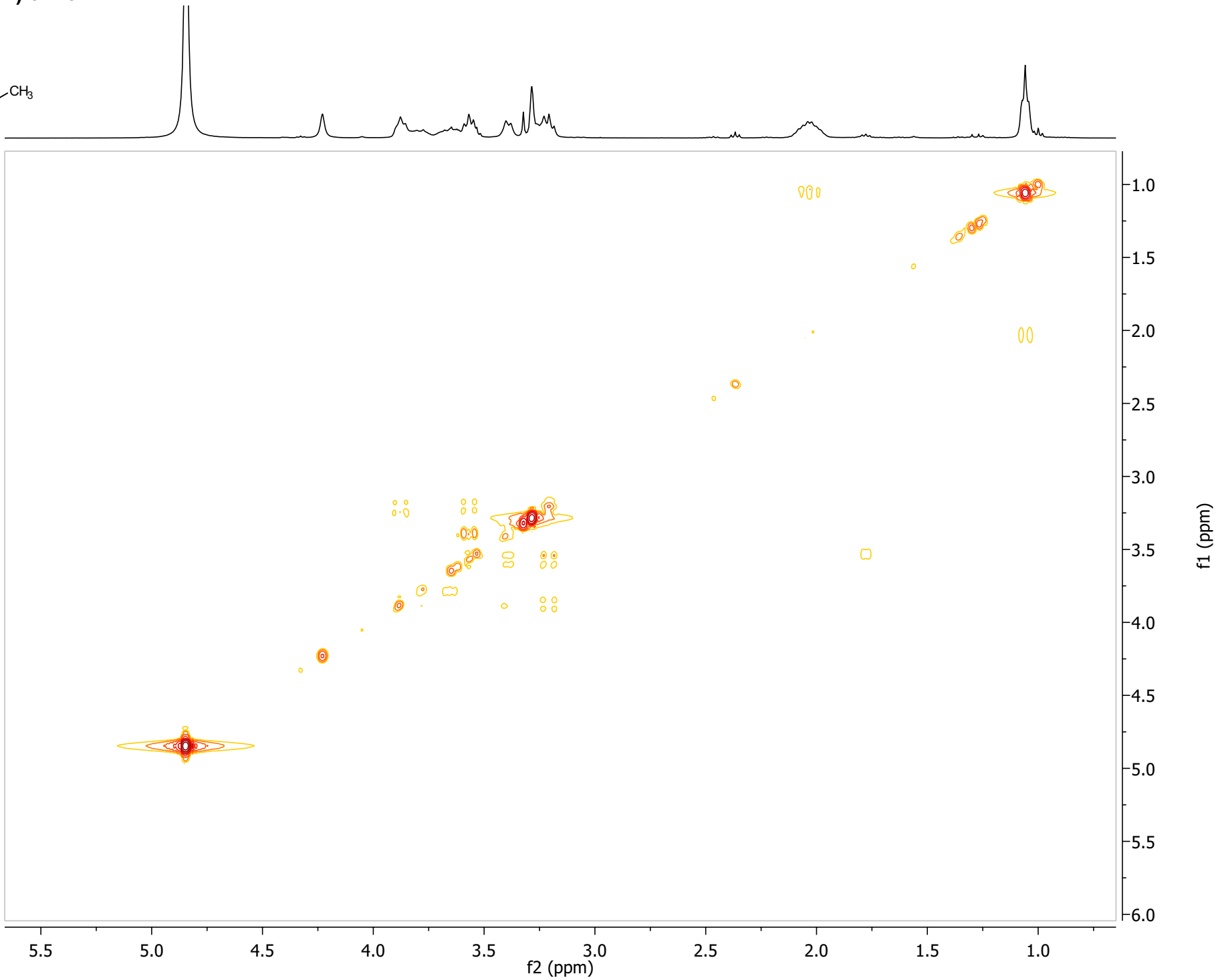
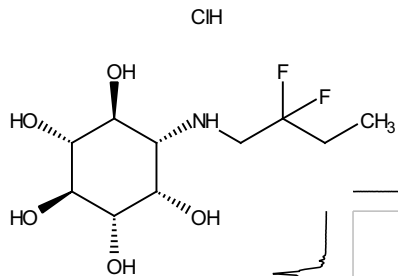


**$^{19}\text{F}$  NMR (MeOD, 376 MHz) of 76**



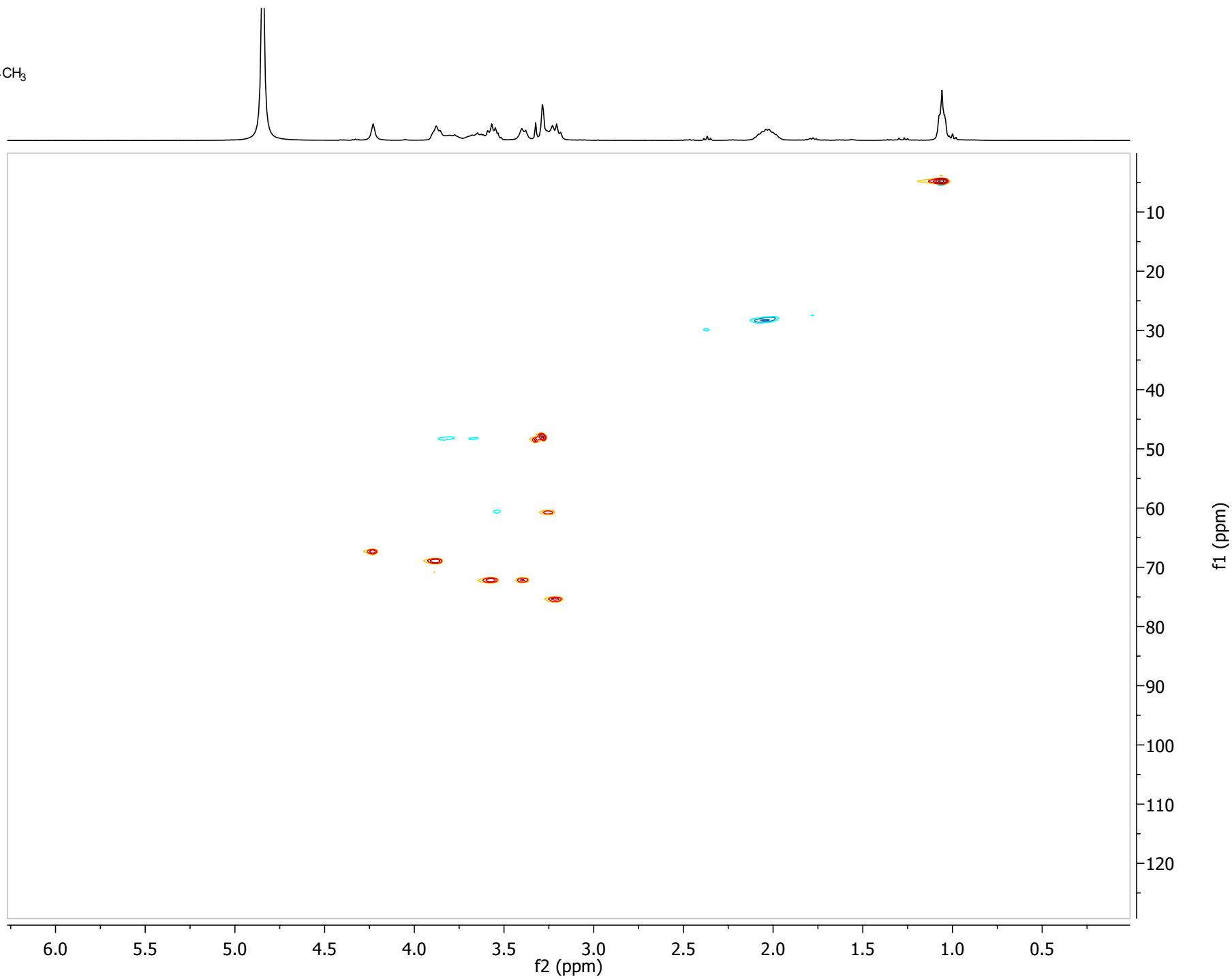
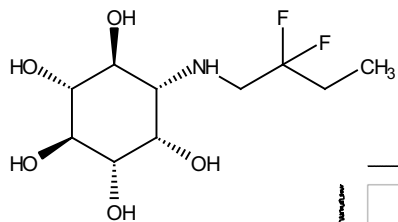


gCOSY (MeOD, 400 MHz) of 76

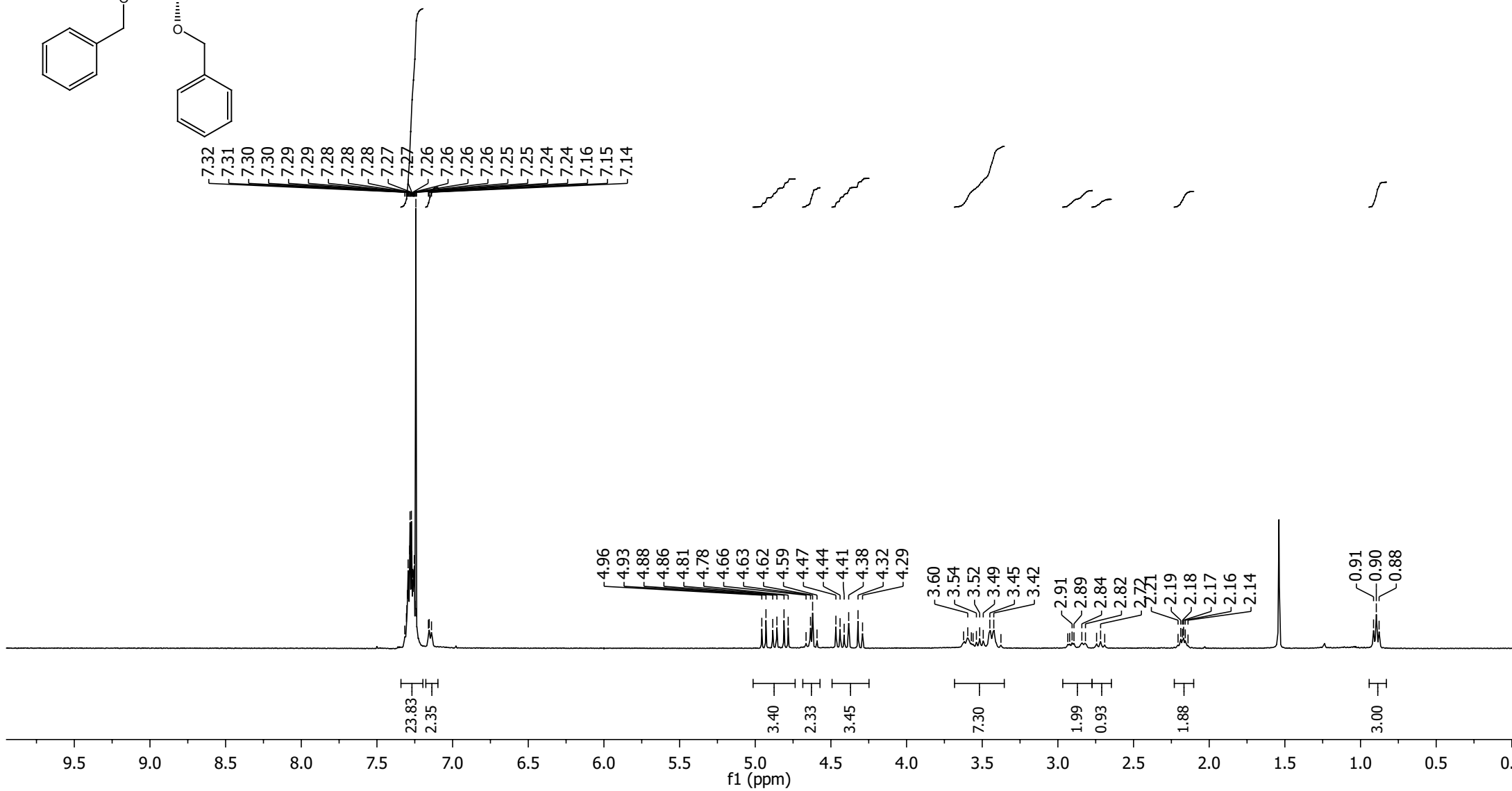
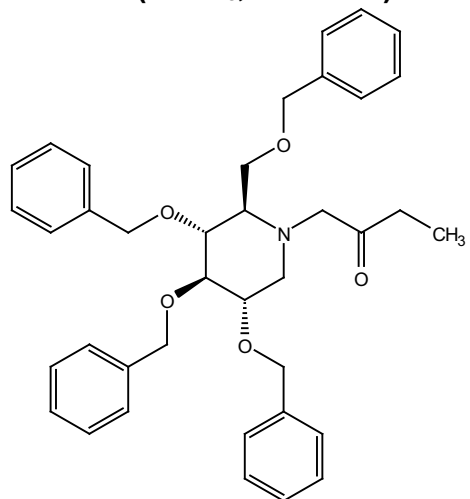


# HSQCAD (MeOD, 400 MHz) of 76

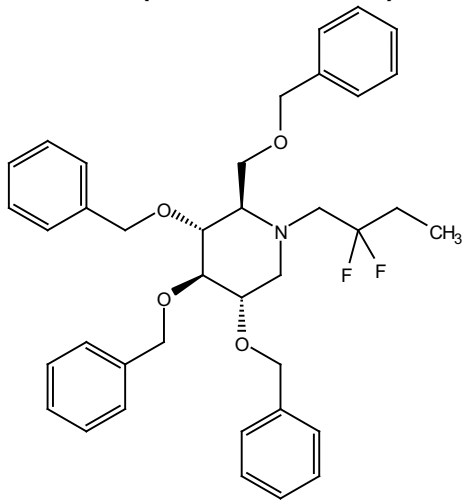
CH



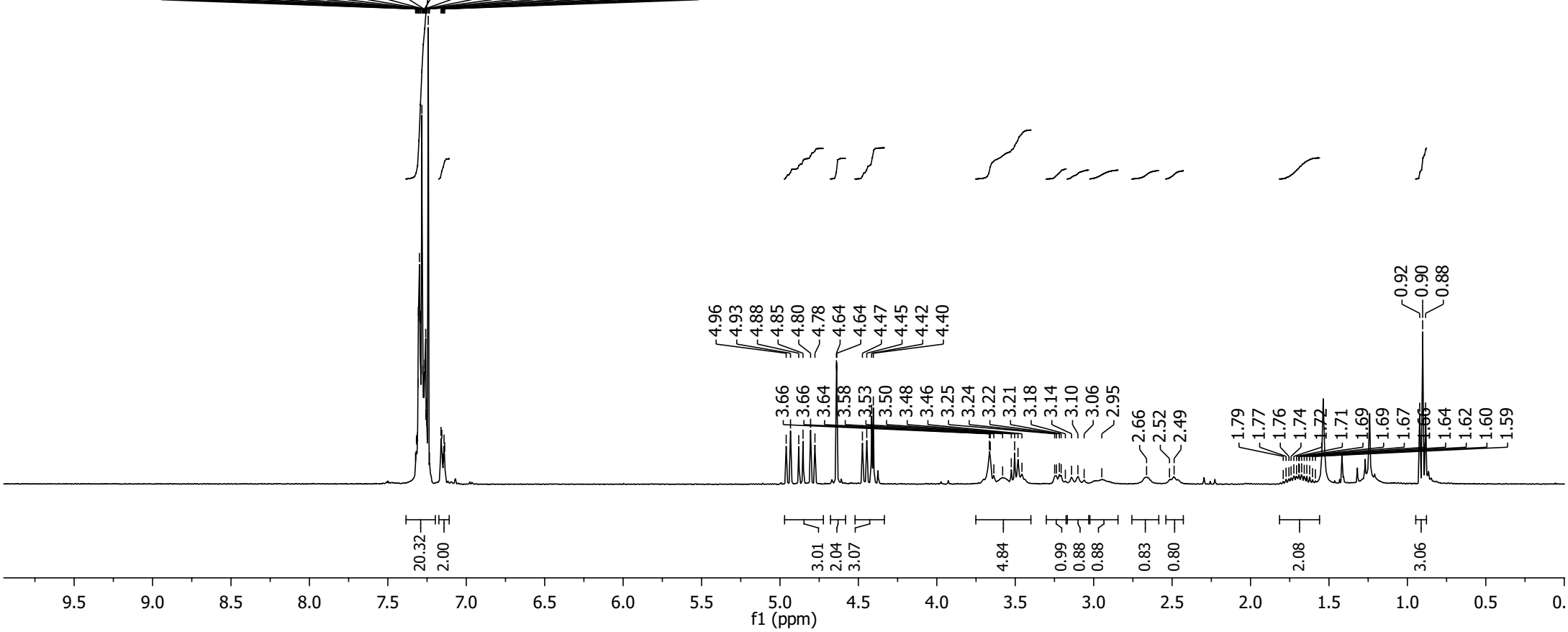
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 80



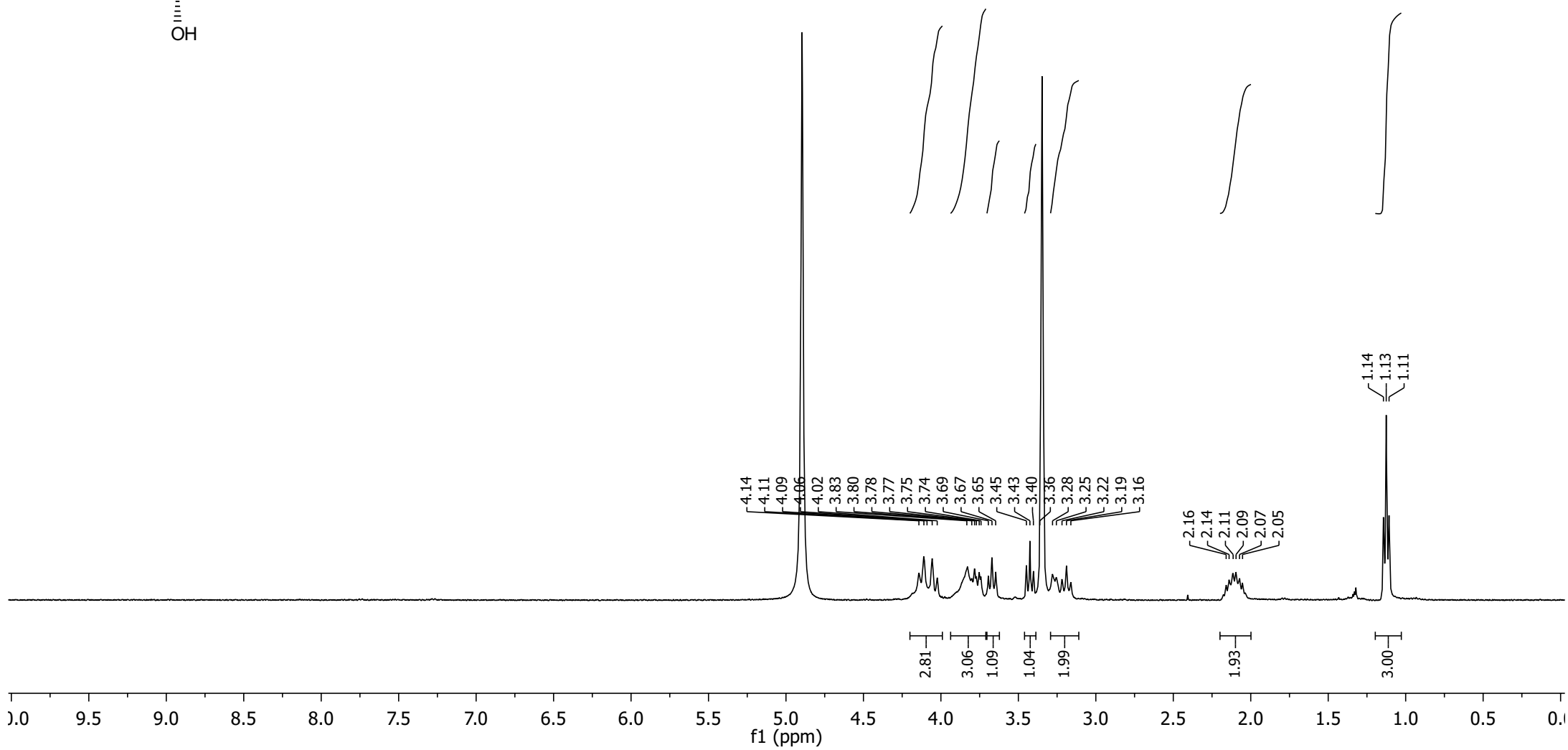
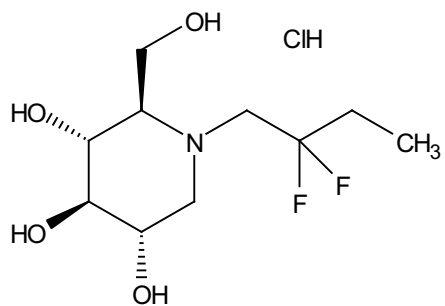
<sup>1</sup>H NMR (CDCl<sub>3</sub>, 400 MHz) of 81



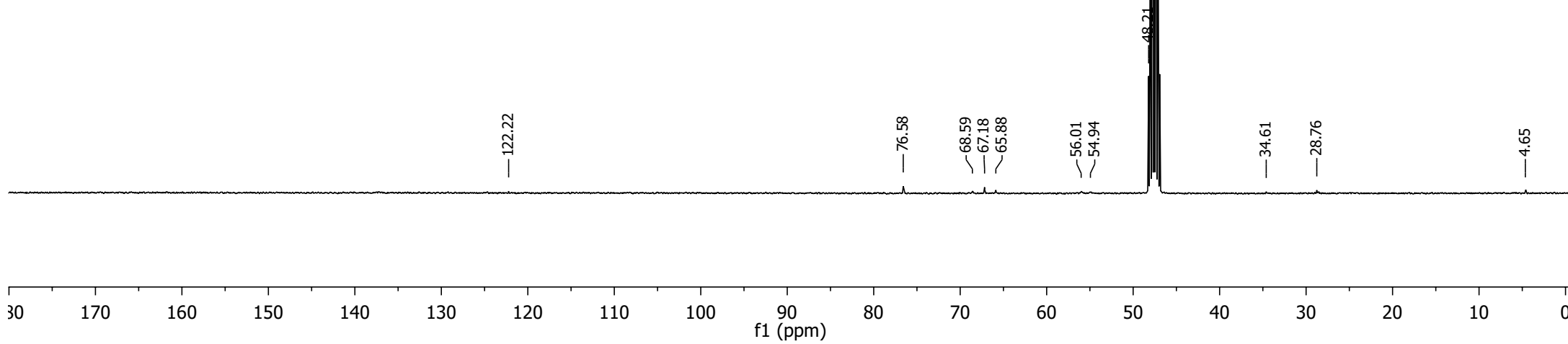
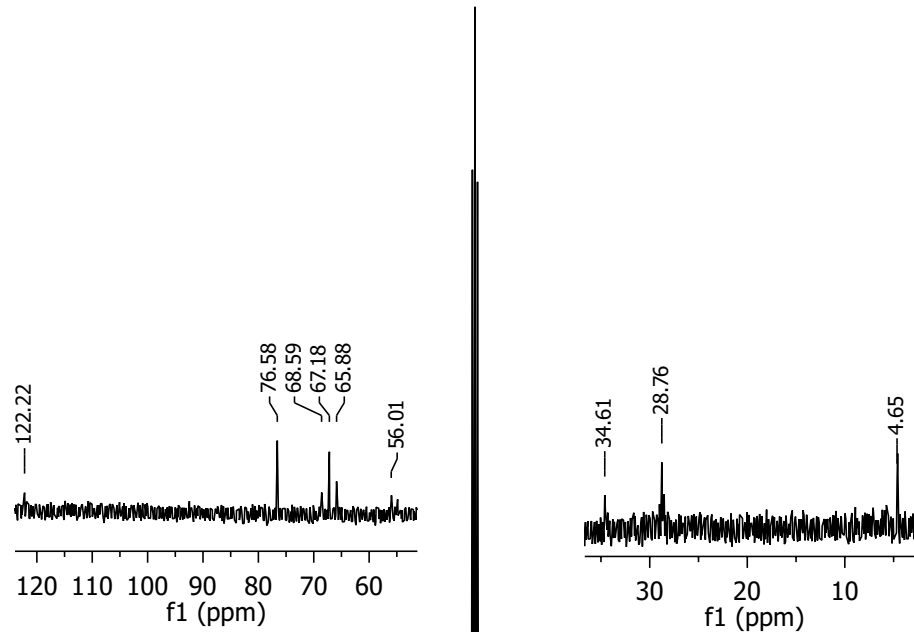
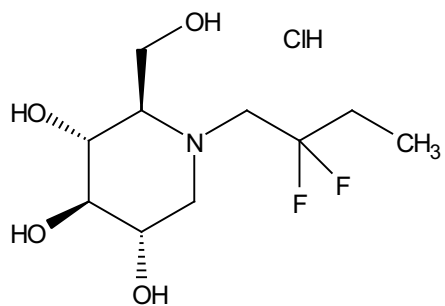
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7.14



<sup>1</sup>H NMR (MeOD, 400 MHz) of 82



<sup>13</sup>C NMR (MeOD, 101 MHz) of 82



gCOSY (MeOD, 400 MHz) of 82

