

Chemistry–A European Journal

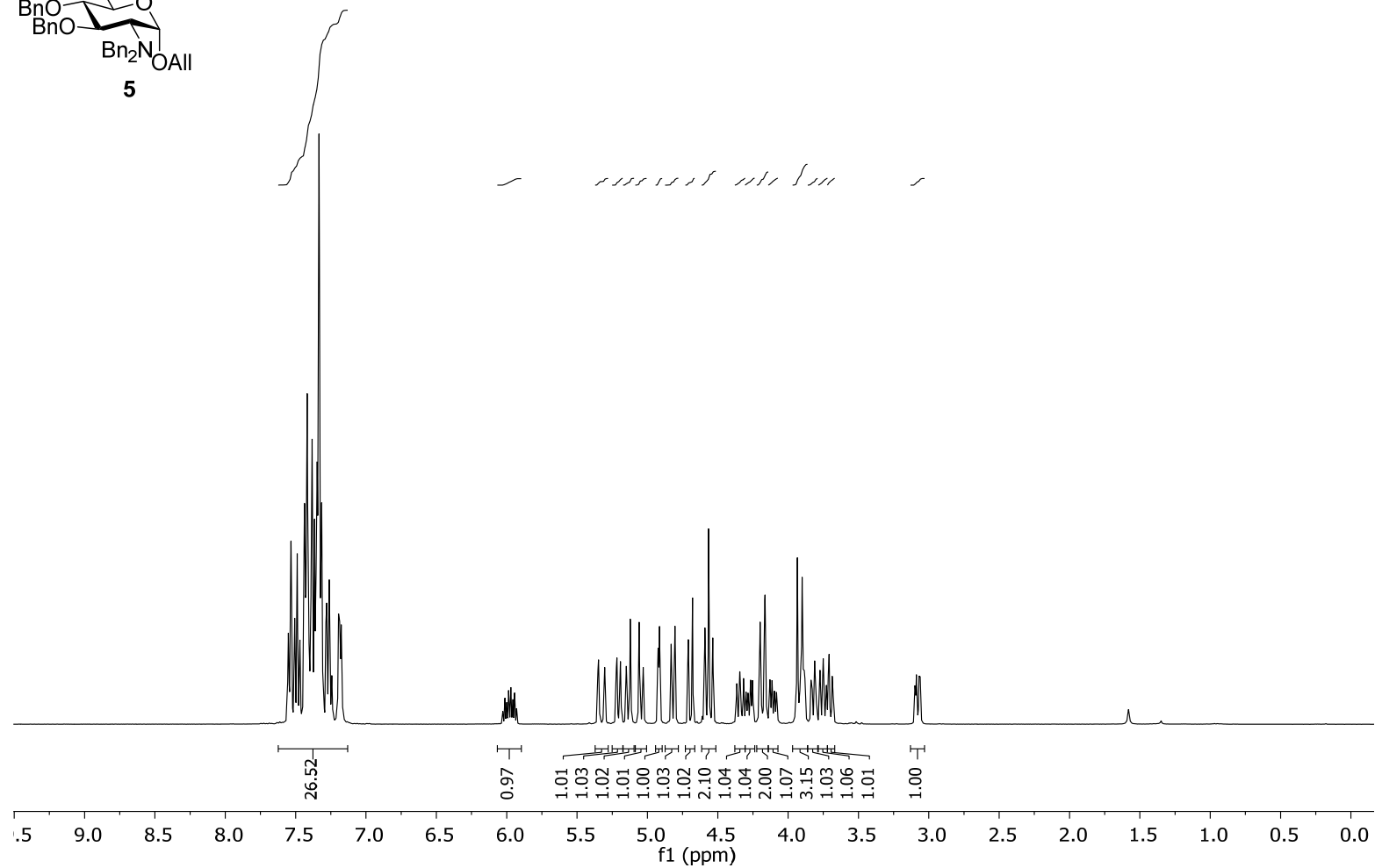
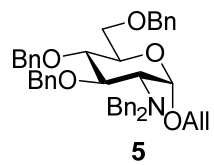
Supporting Information

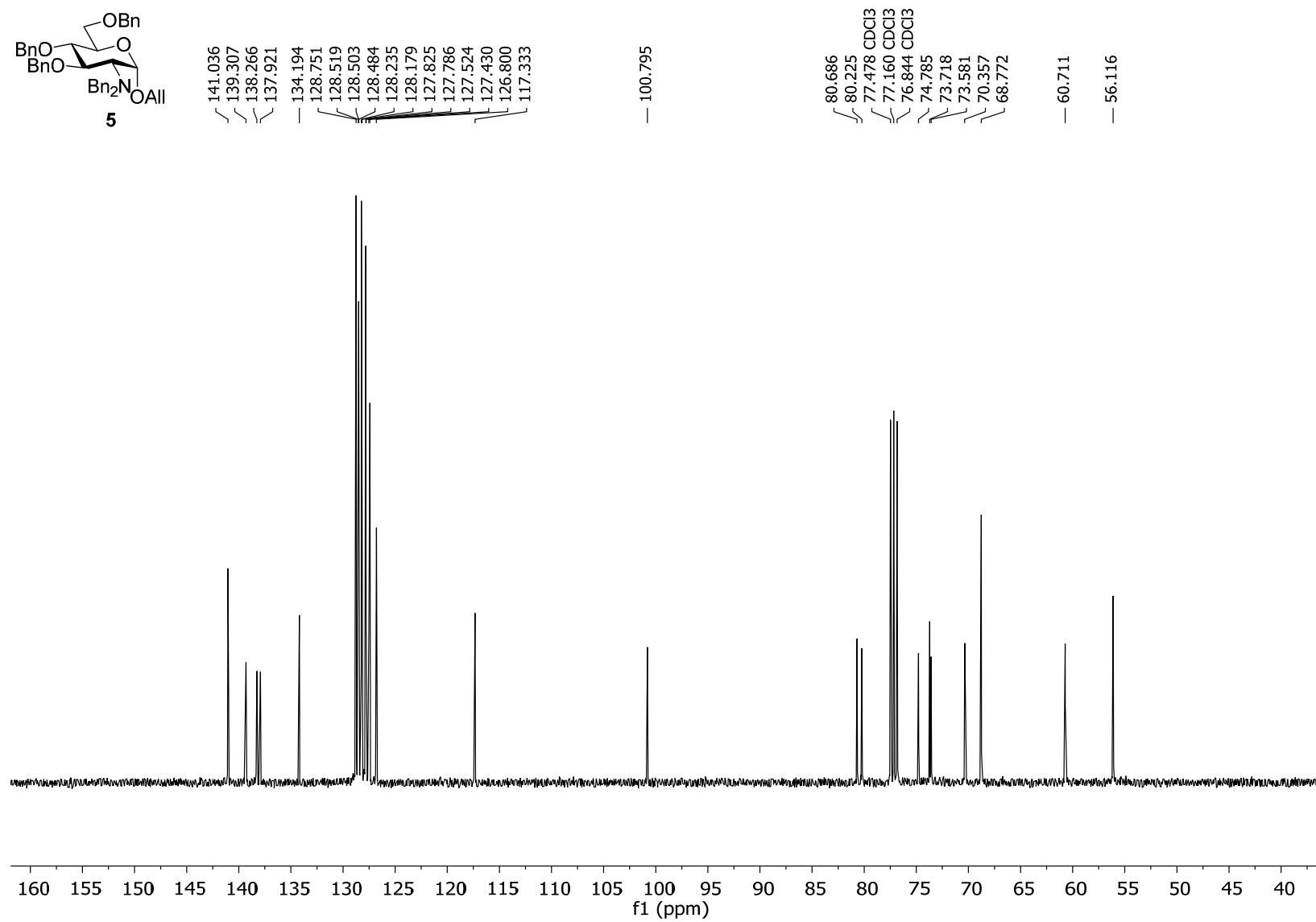
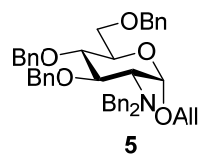
Carba-Sugar Analogs of Glucosamine-6-Phosphate: New Activators for the *glmS* Riboswitch

David Stängle, Bjarne Silkenath, Paul Gehle, Anna Esser, Günter Mayer,* and
Valentin Wittmann*

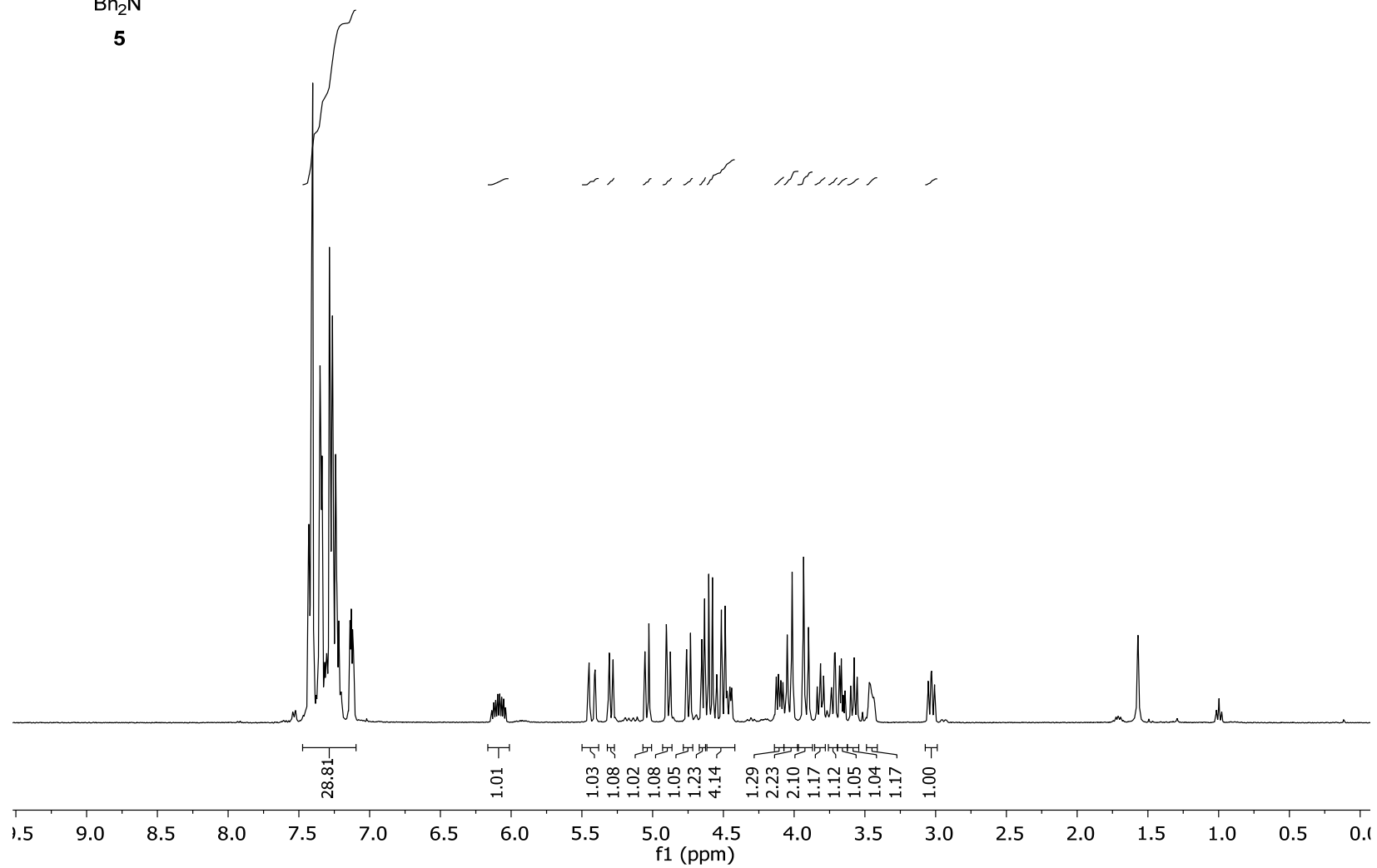
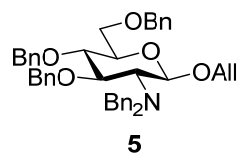
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NMR spectra of synthesized compounds

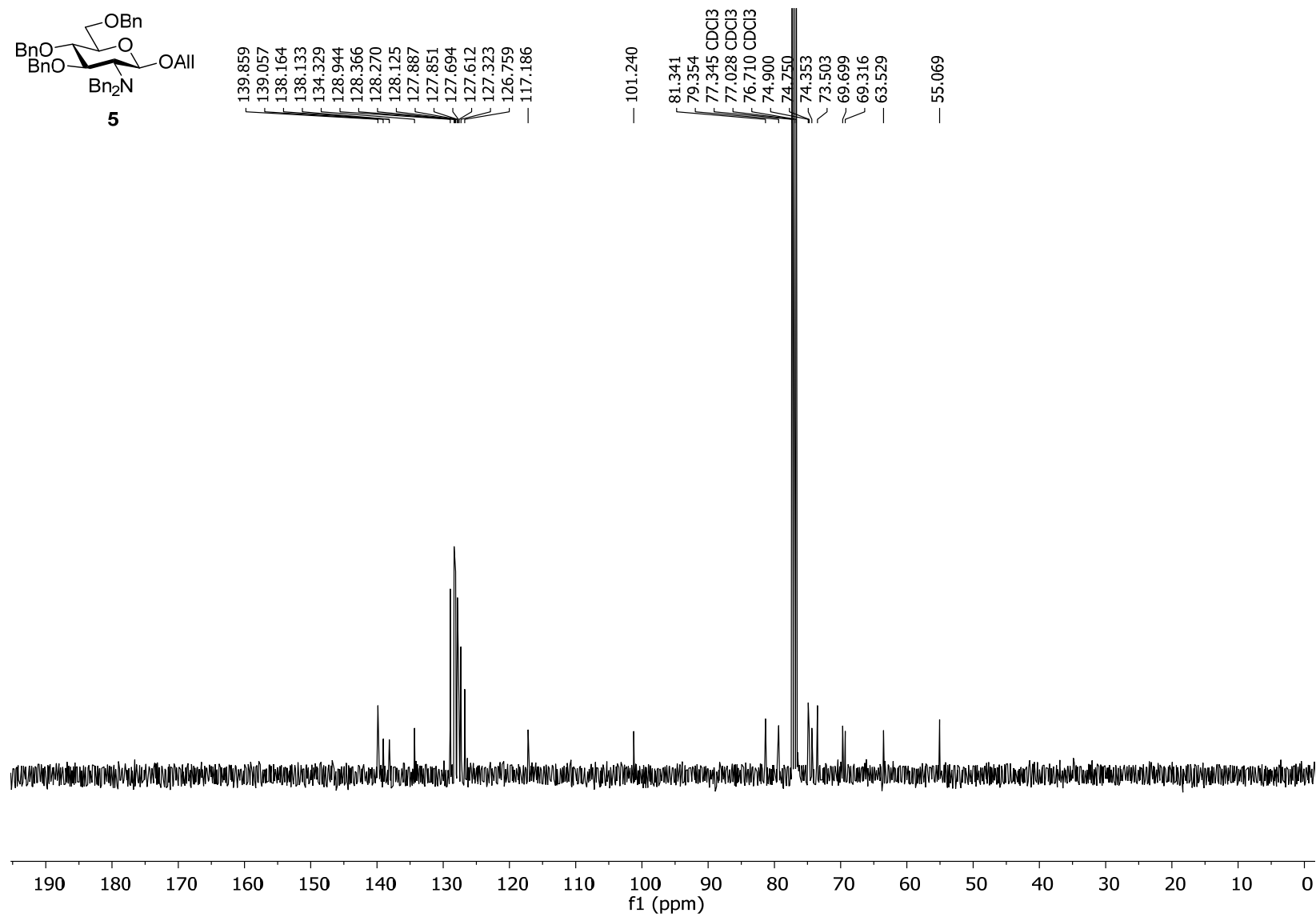
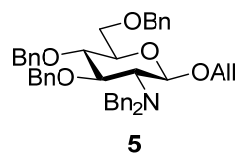




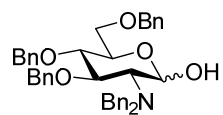
¹³C NMR spectrum (101 MHz, CDCl₃) of **5a**



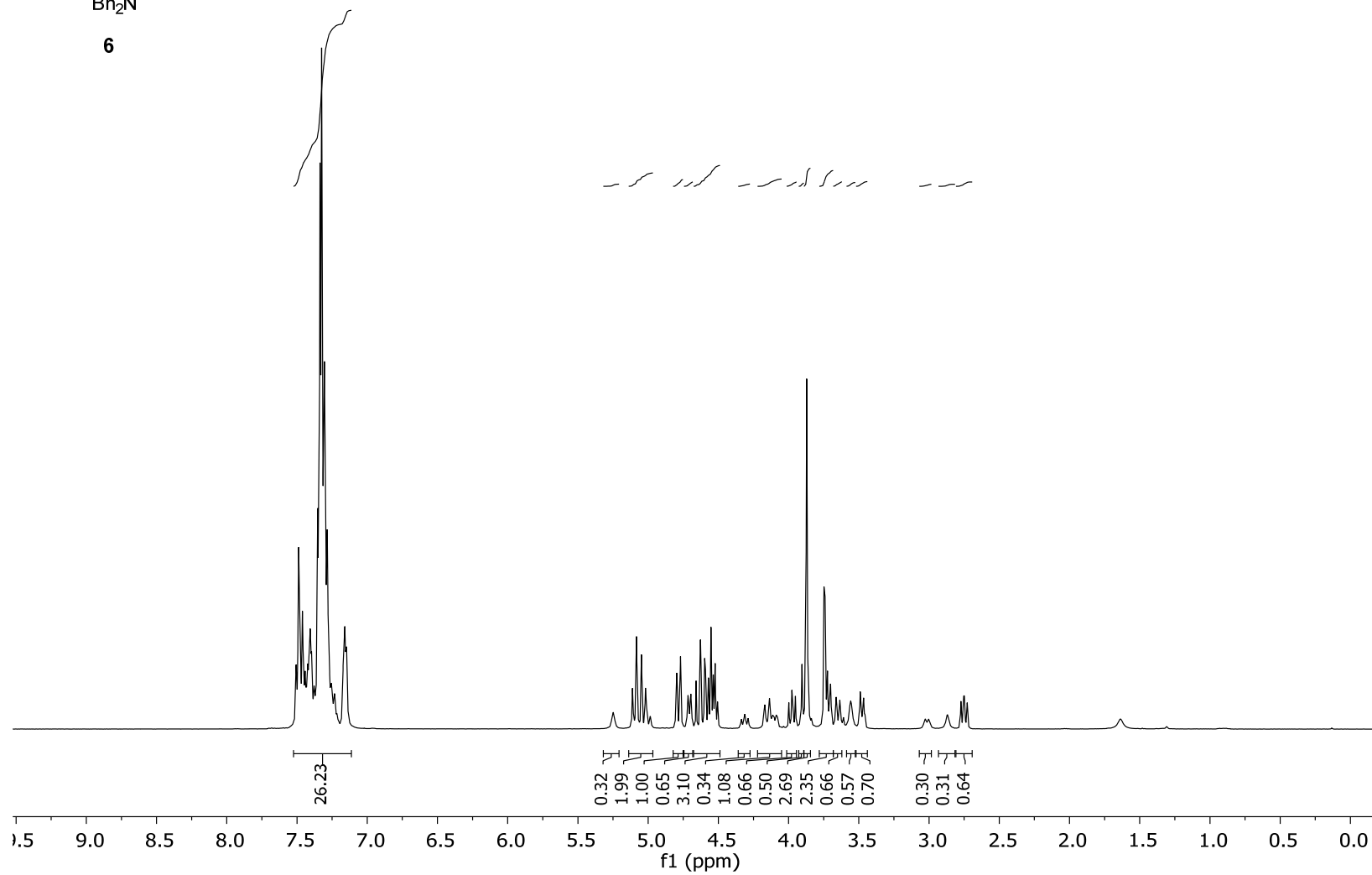
^1H NMR spectrum (400 MHz, CDCl_3) of **5 β**



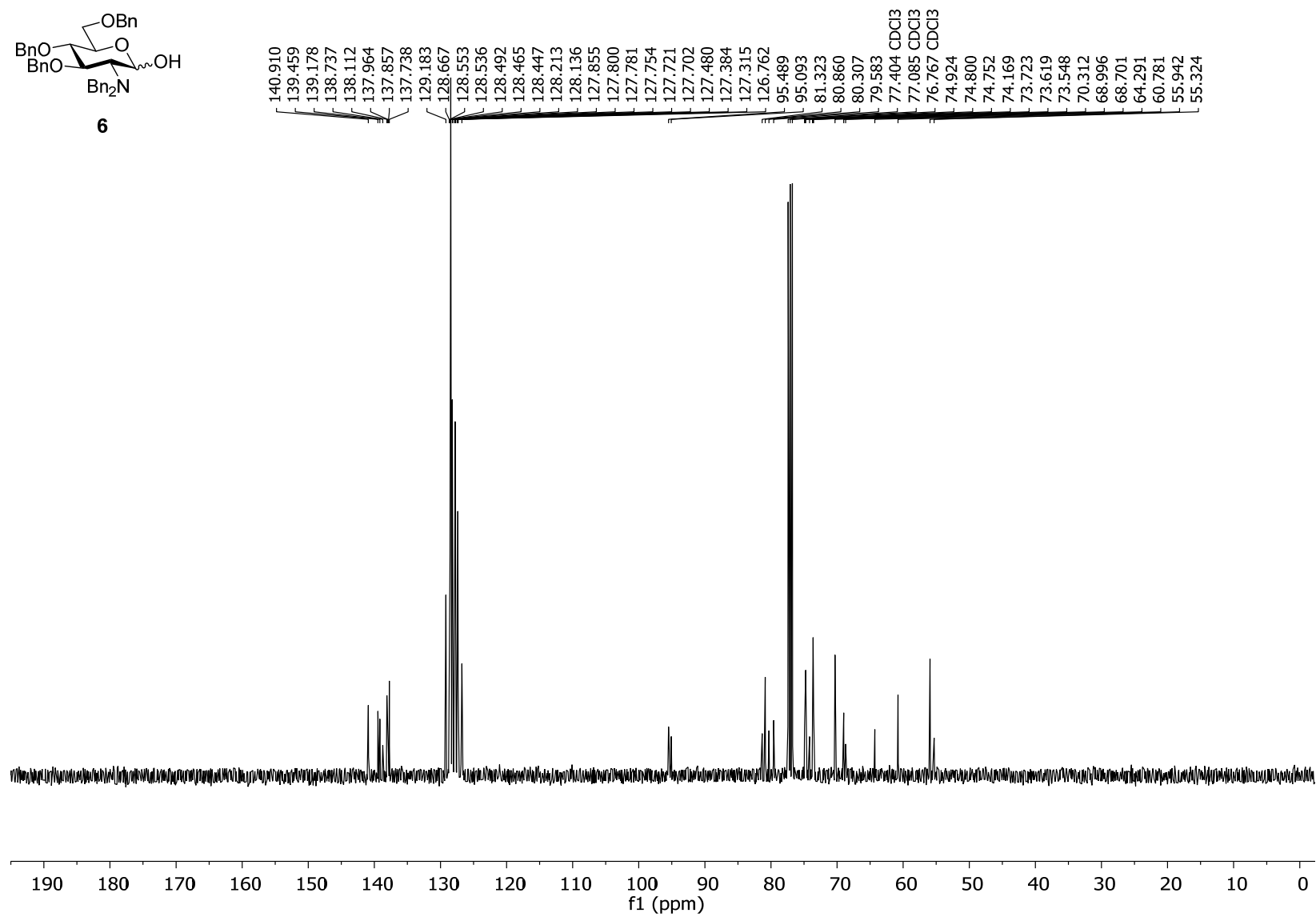
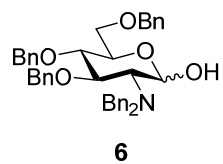
¹³C NMR spectrum (101 MHz, CDCl₃) of **5β**



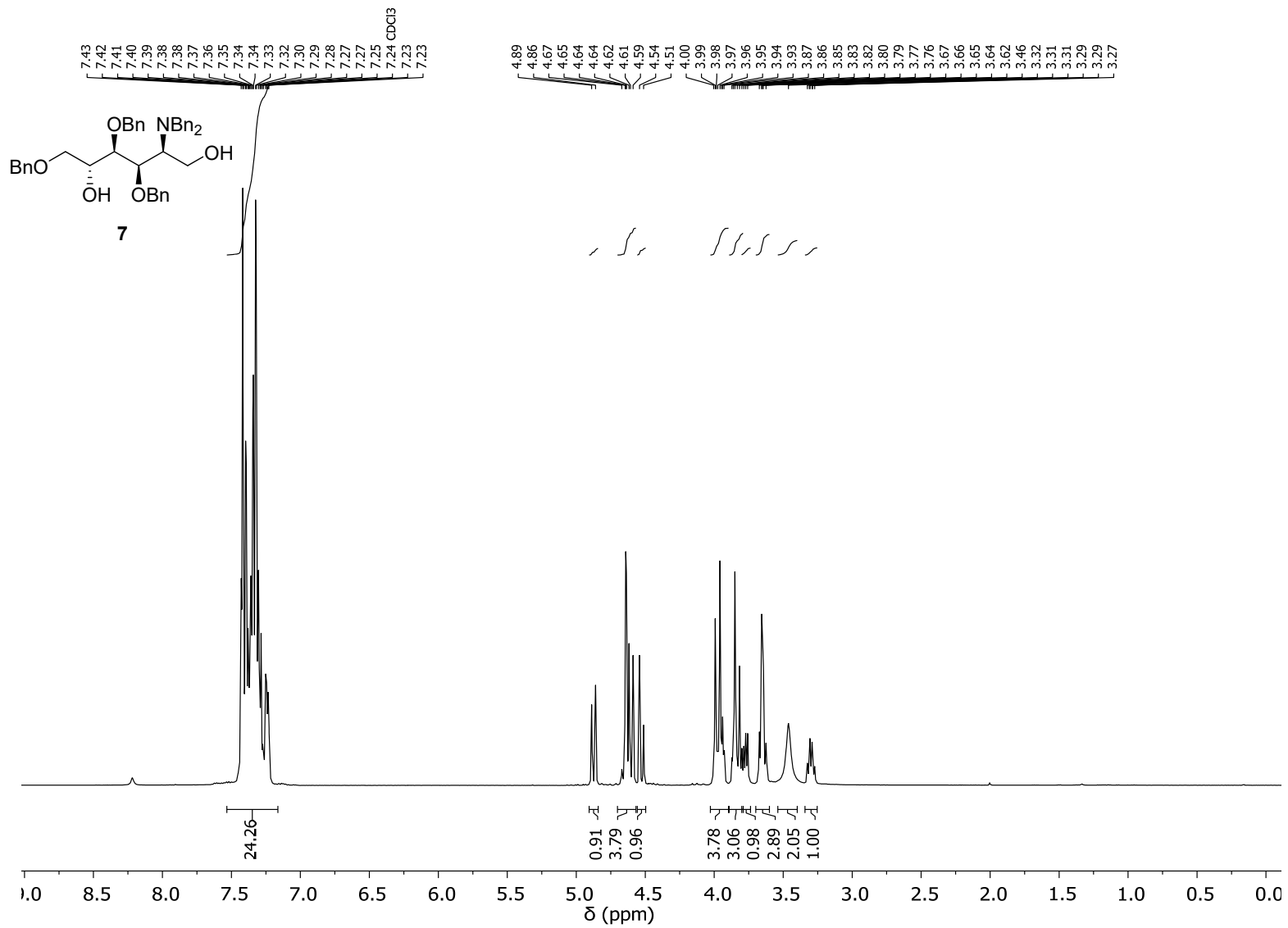
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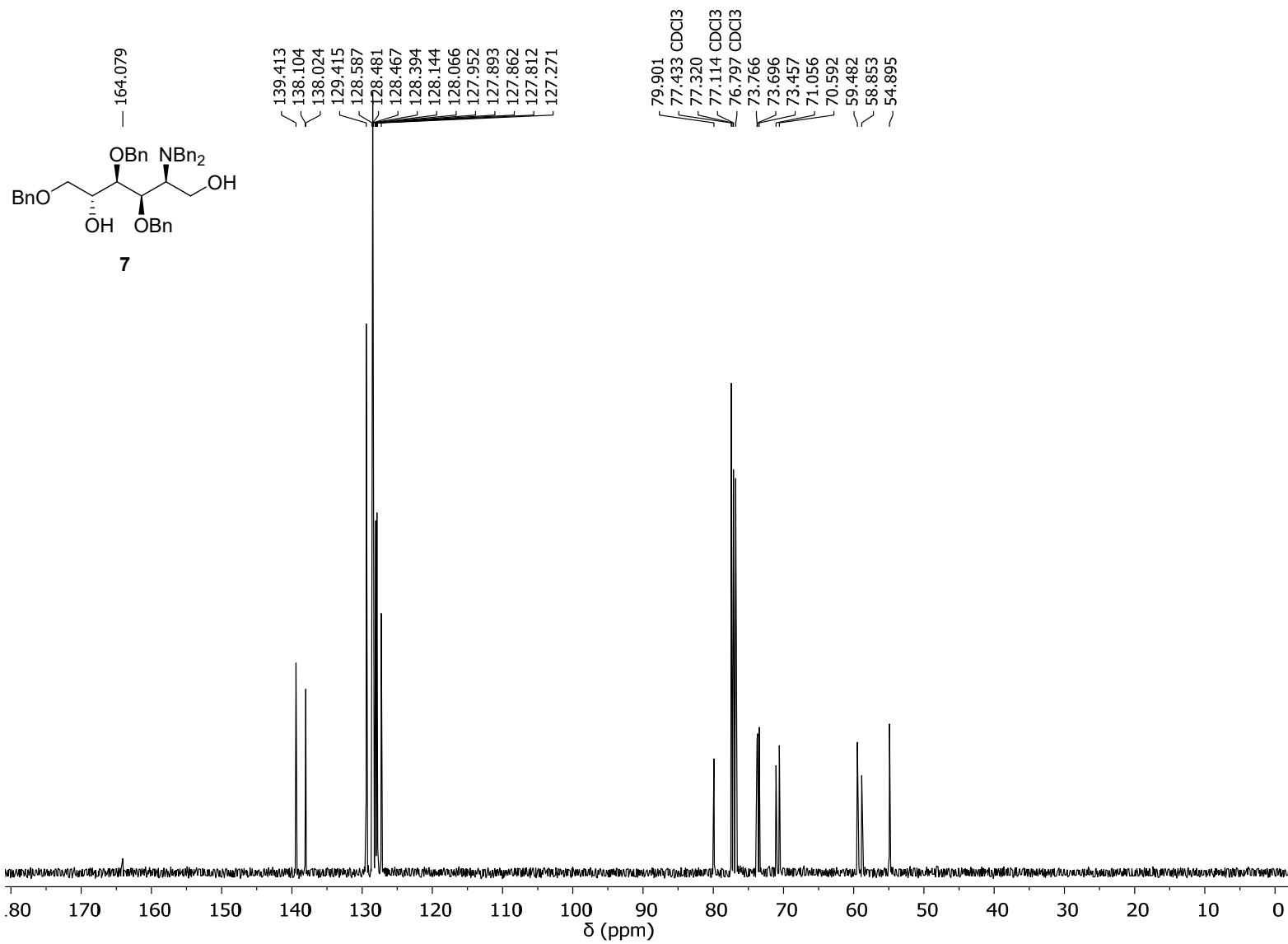
^1H NMR spectrum (400 MHz, CDCl_3) of **6**



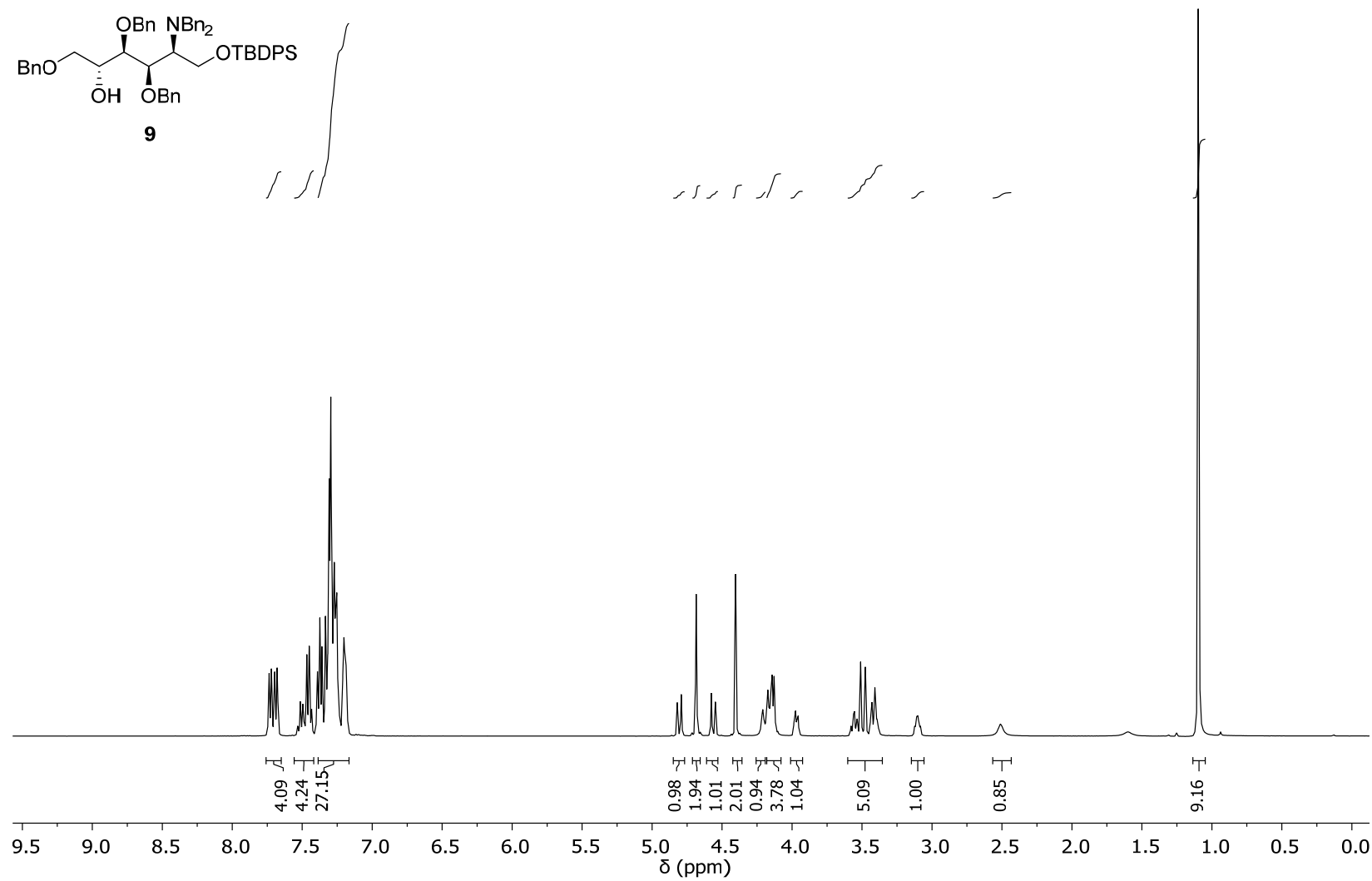
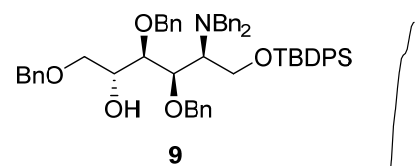
^{13}C NMR spectrum (101 MHz, CDCl_3) of **6**



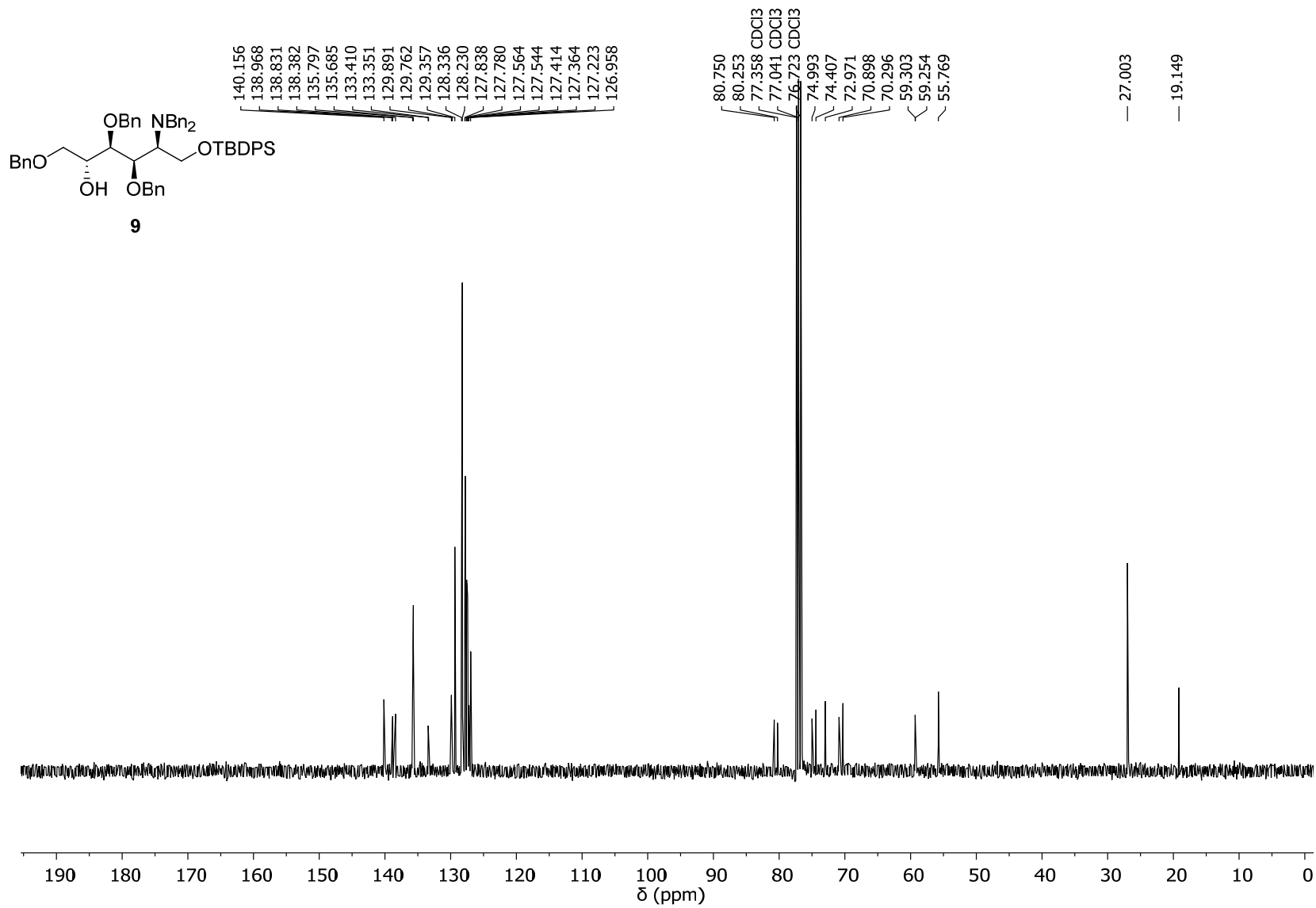
¹H NMR spectrum (400 MHz, CDCl₃) of **7**



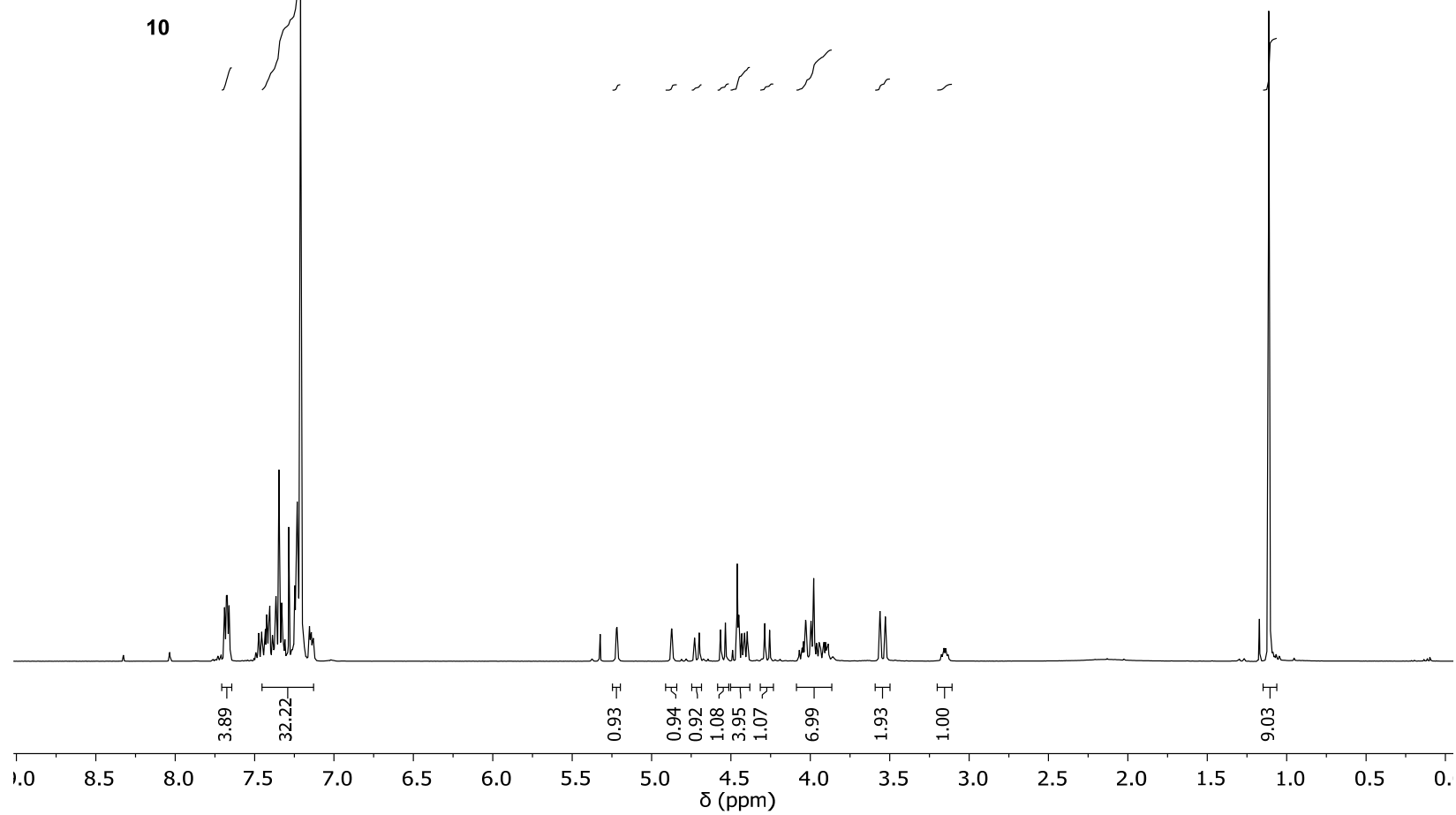
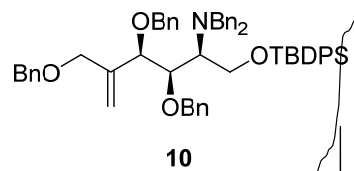
¹³C NMR spectrum (101 MHz, CDCl₃) of **7**



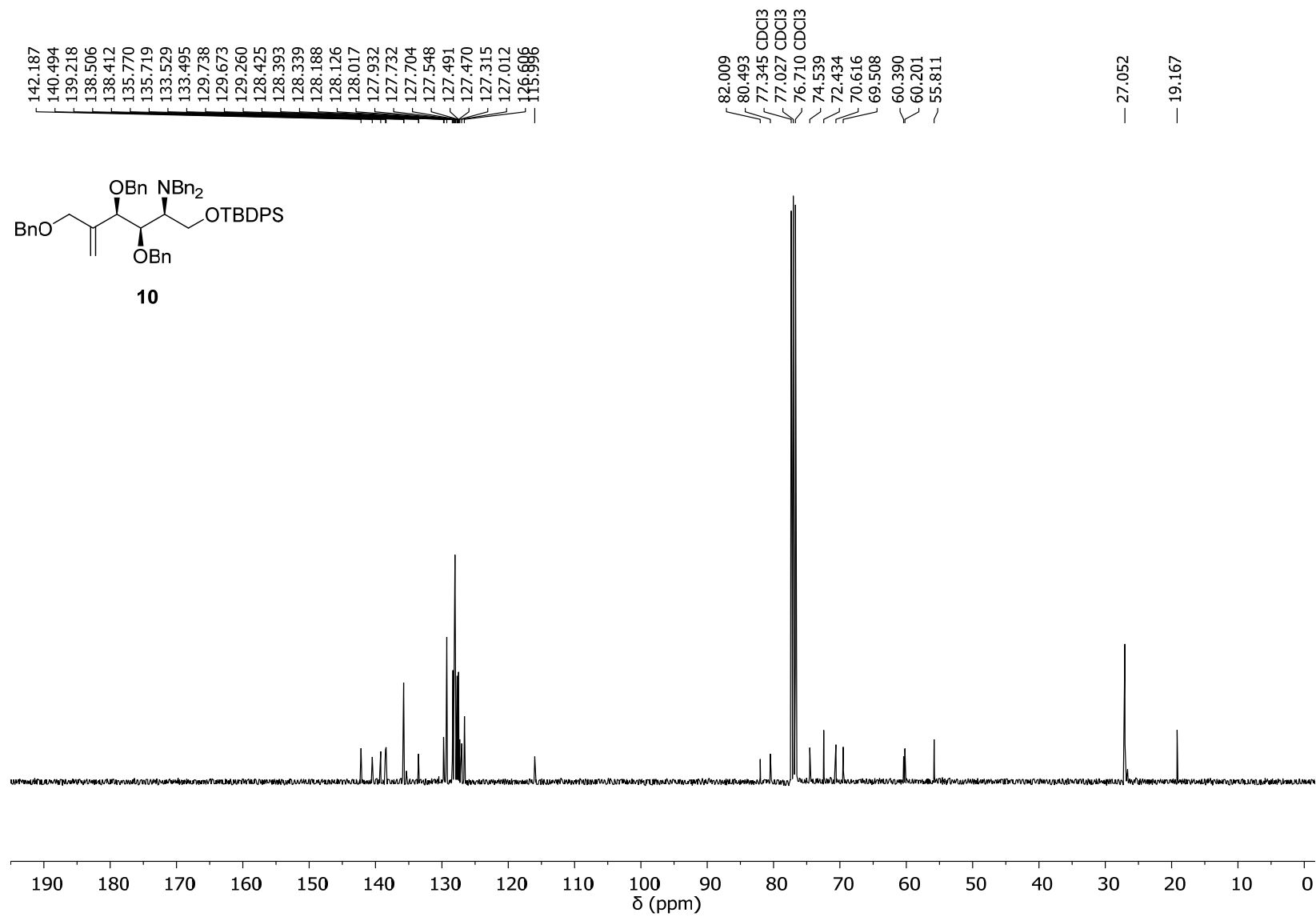
^1H NMR spectrum (400 MHz, CDCl_3) of **9**



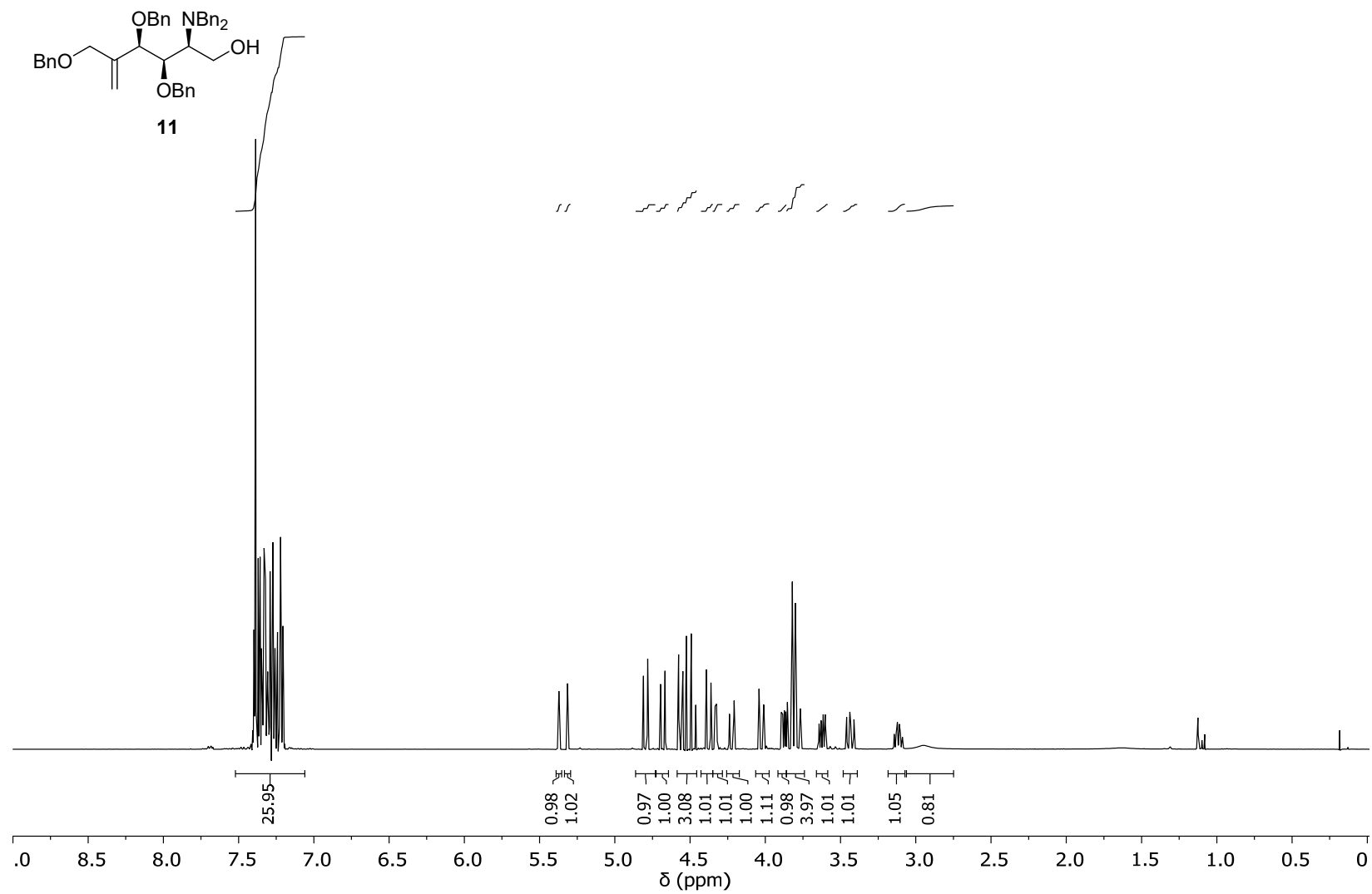
¹³C NMR spectrum (101 MHz, CDCl₃) of **9**



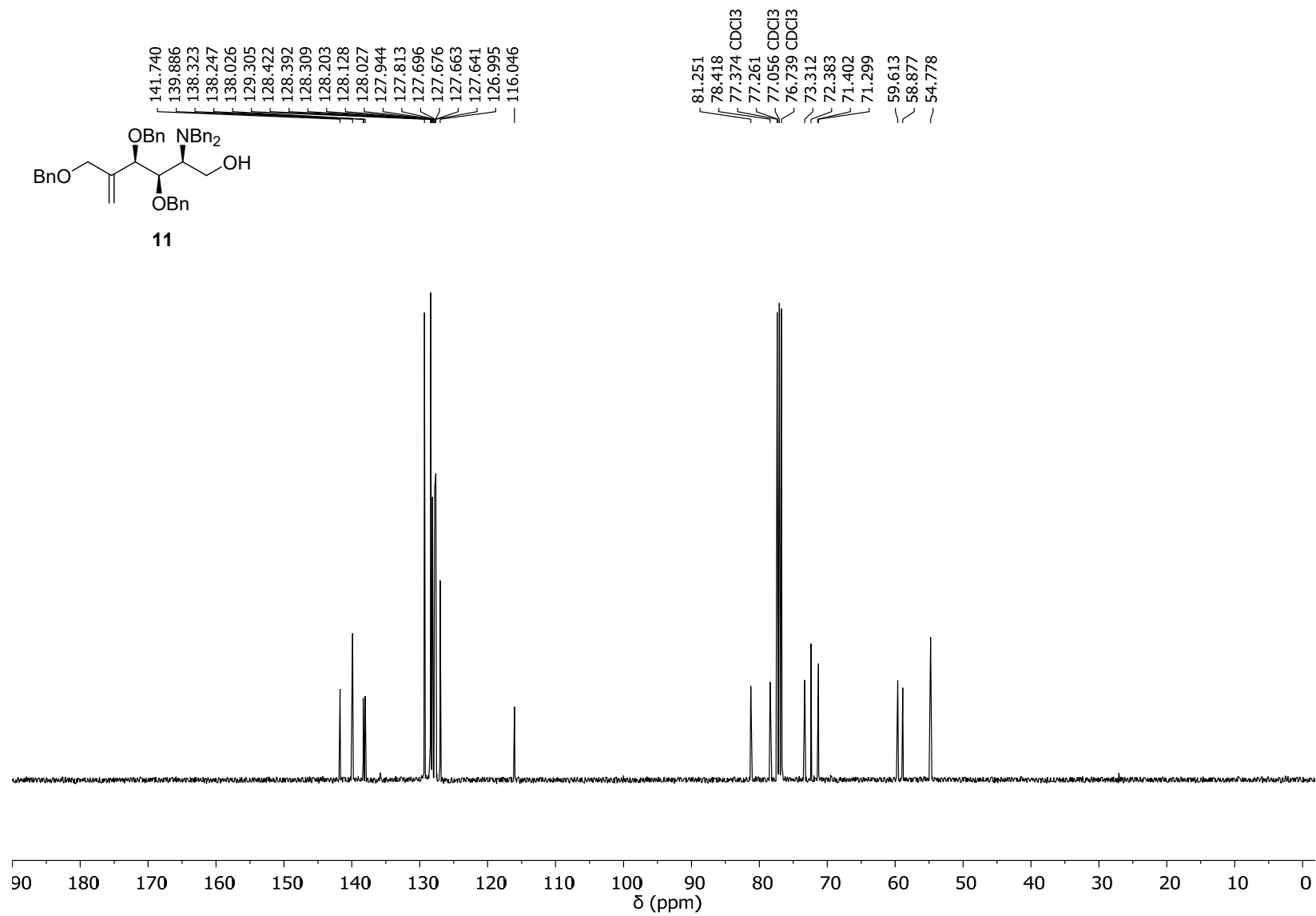
^1H NMR spectrum (400 MHz, CDCl_3) of **10**



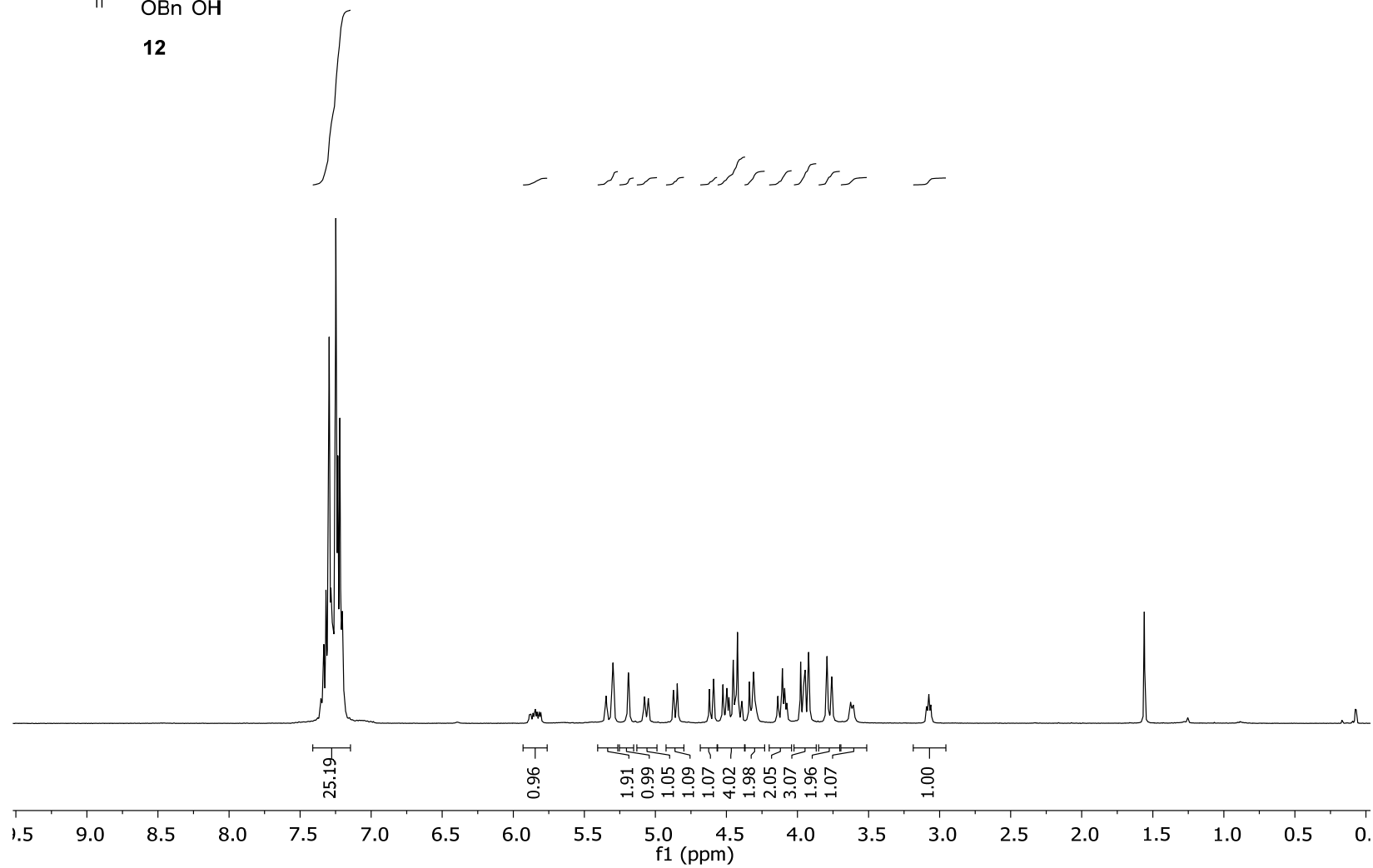
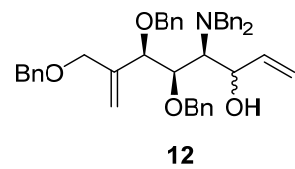
¹³C NMR spectrum (101 MHz, CDCl₃) of **10**



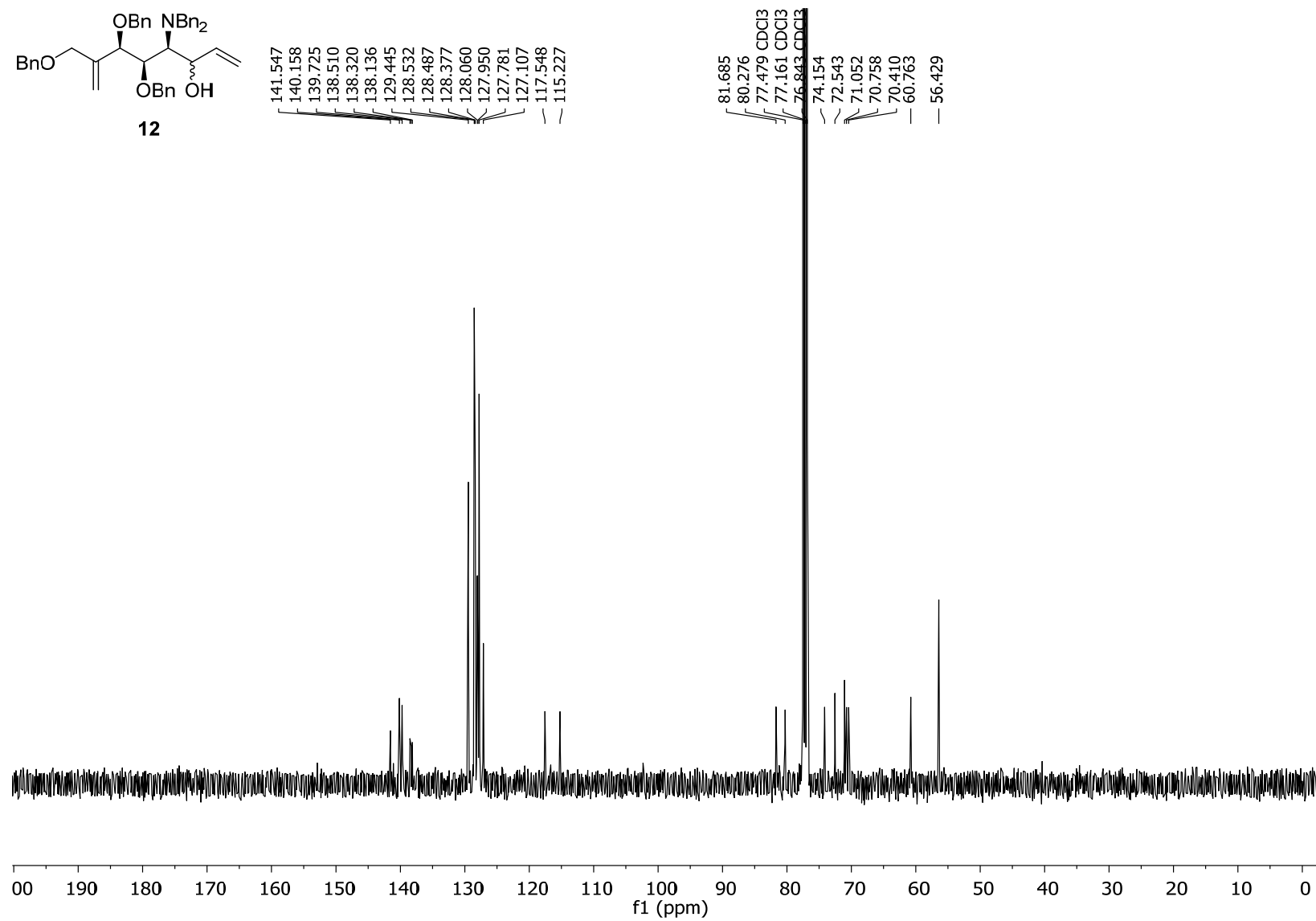
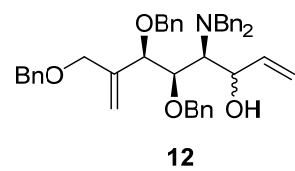
¹H NMR spectrum (400 MHz, CDCl₃) of **11**



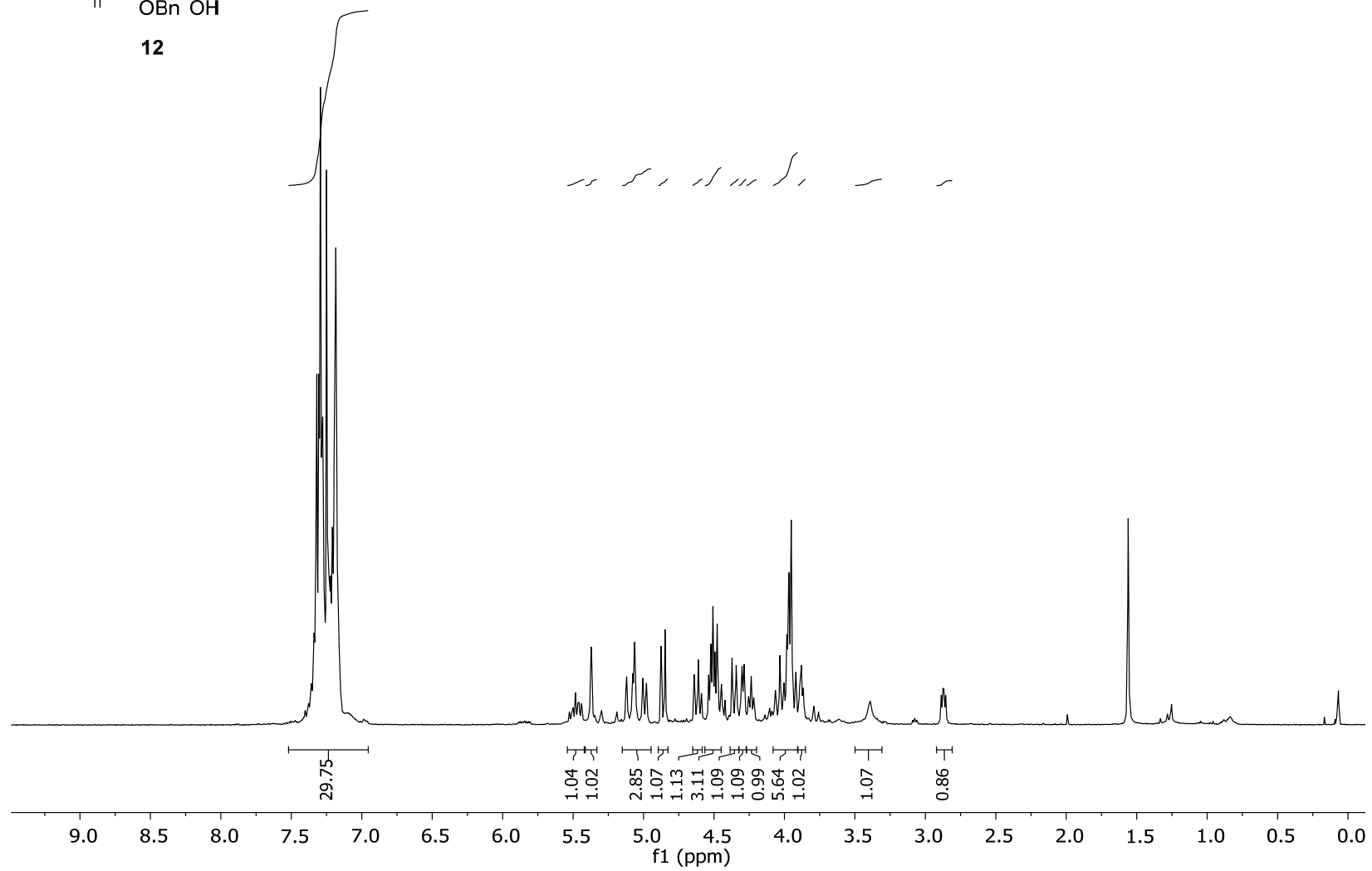
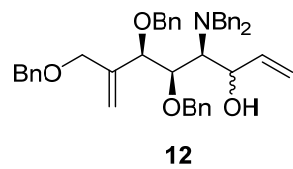
^{13}C NMR spectrum (101 MHz, CDCl_3) of **11**



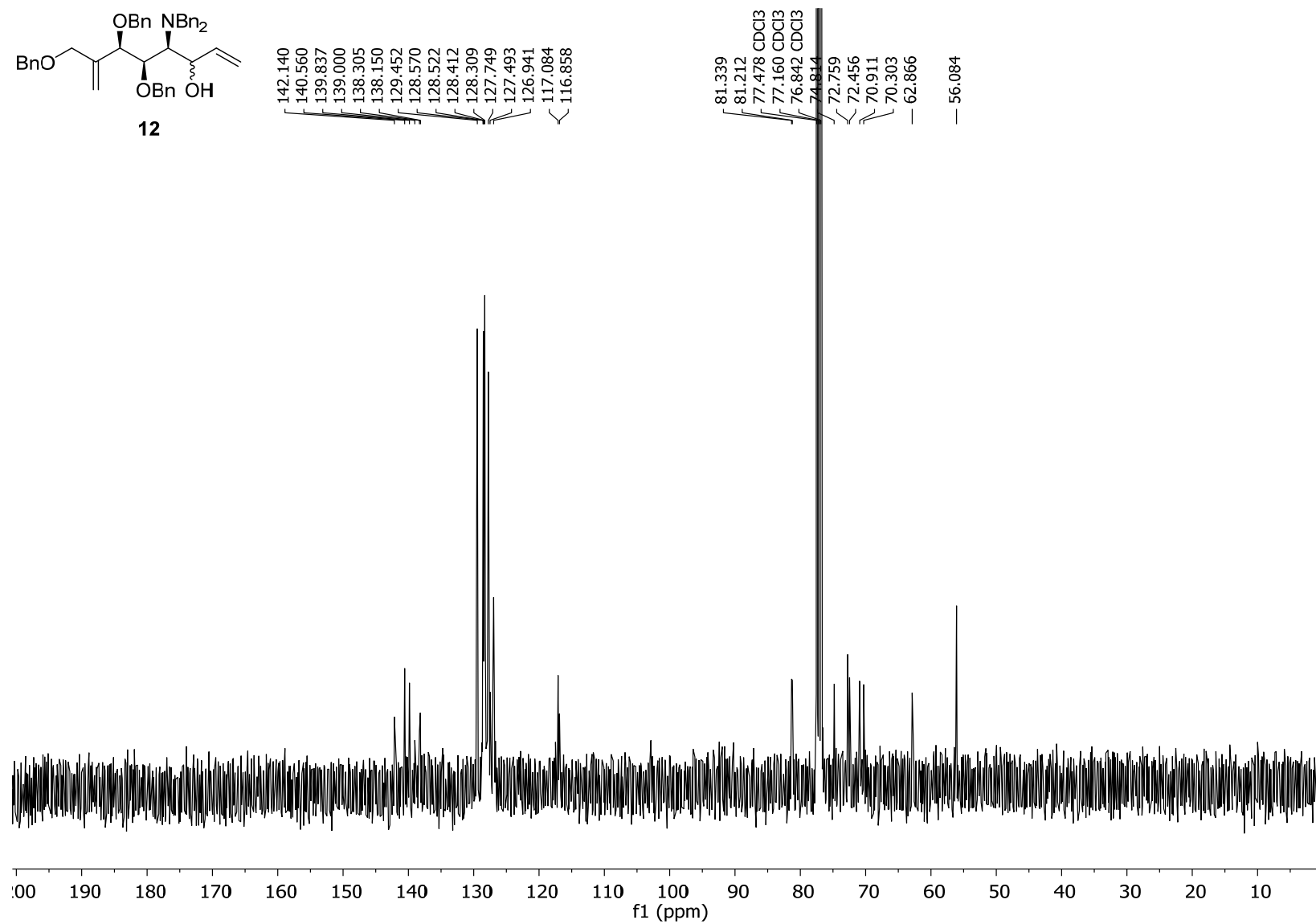
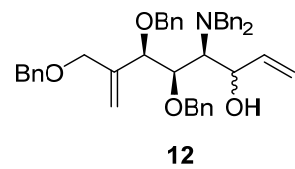
¹H NMR spectrum (400 MHz, CDCl₃) of **12** (isomer 1)



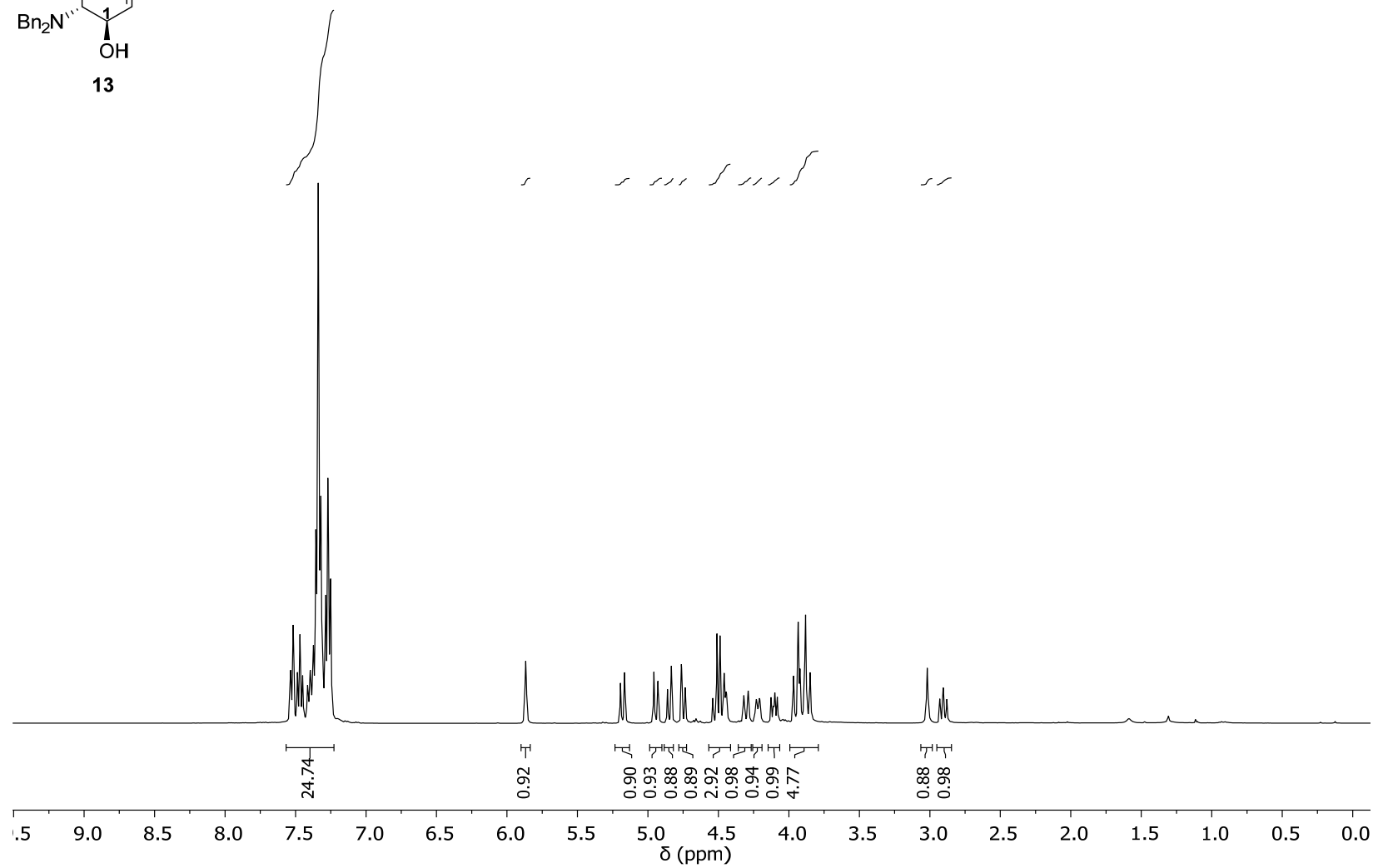
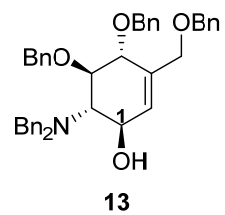
^{13}C NMR spectrum (101 MHz, CDCl_3) of **12** (isomer 1)



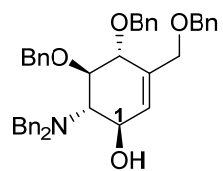
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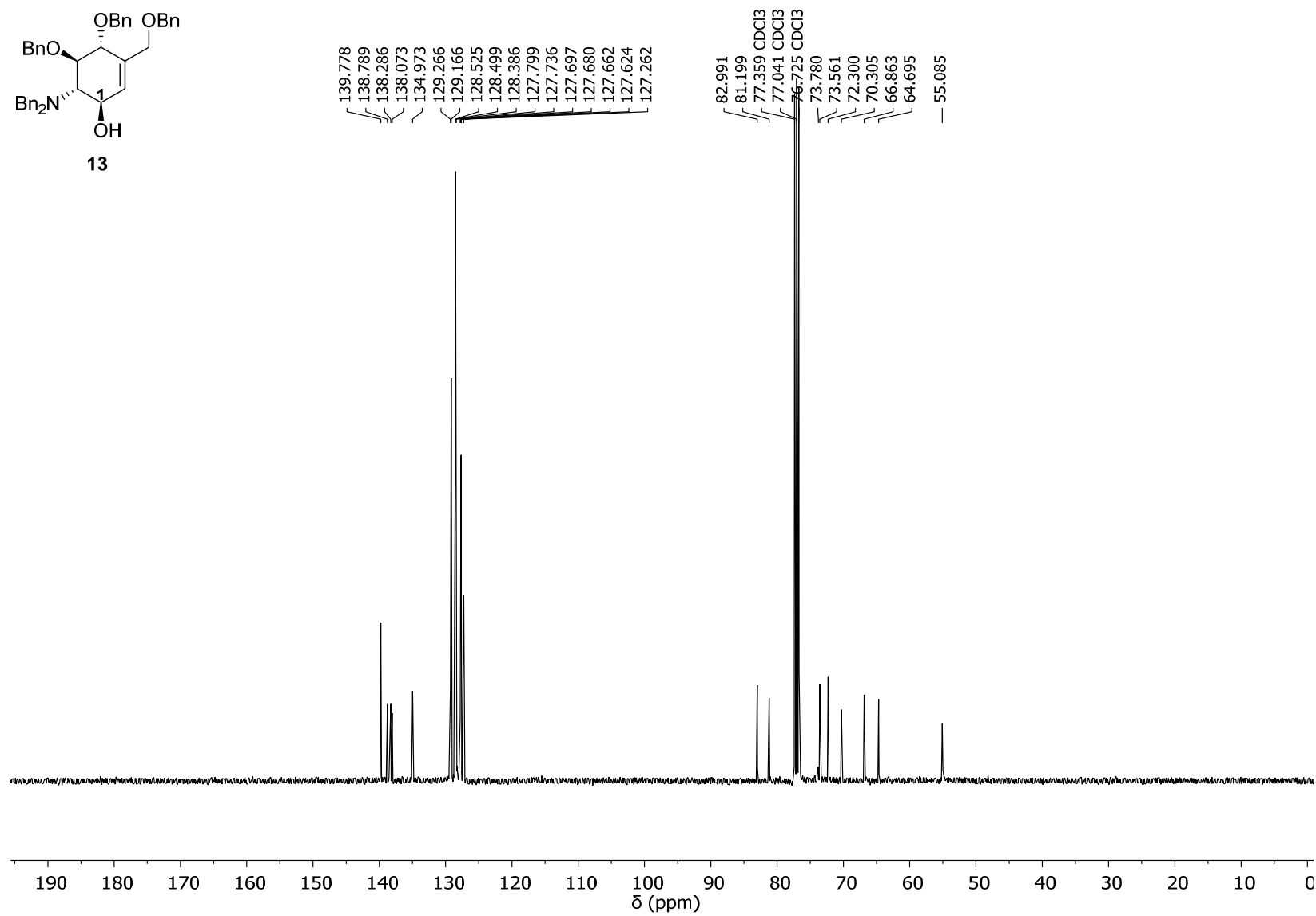
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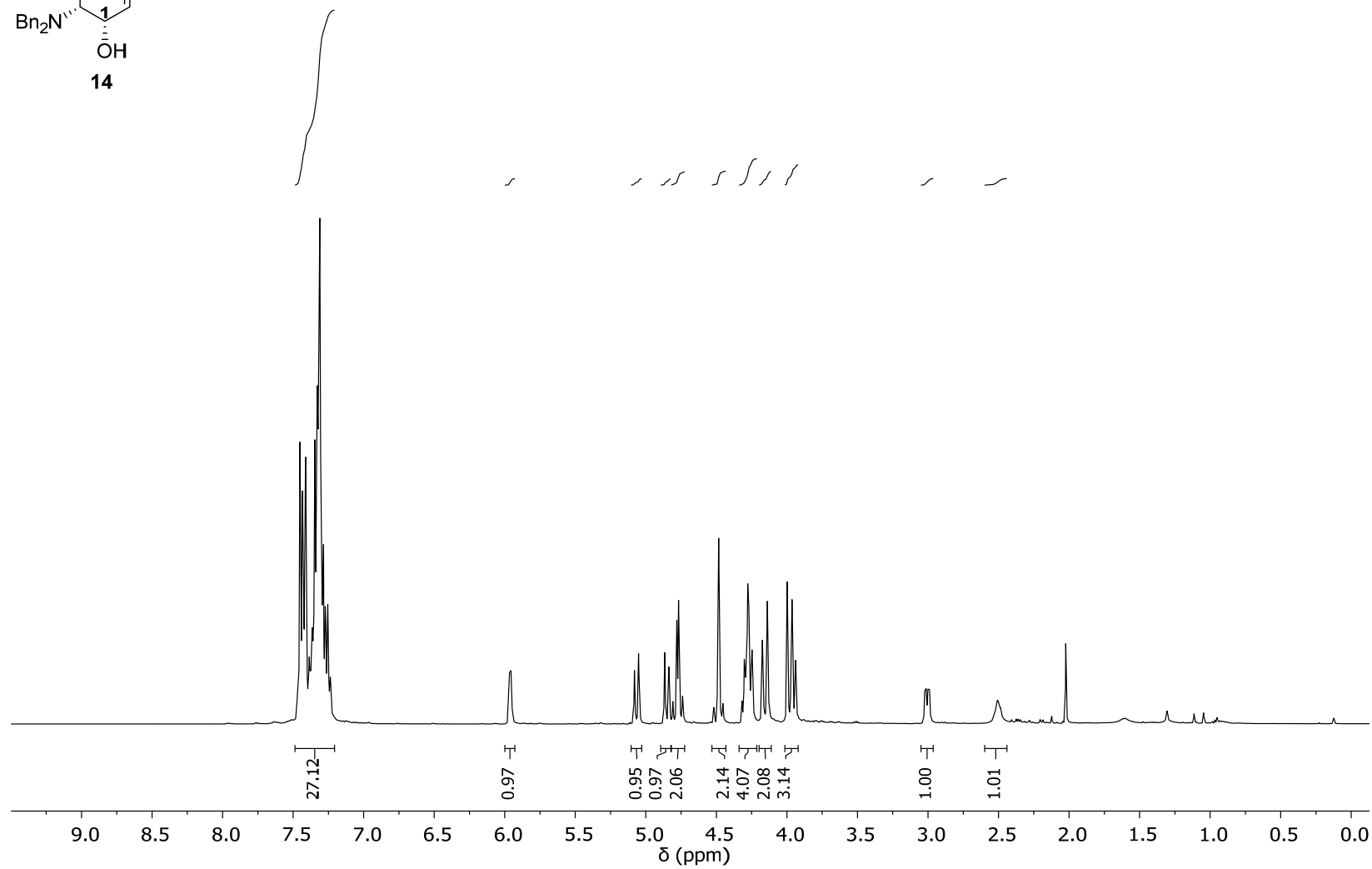
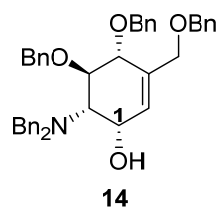
^1H NMR spectrum (400 MHz, CDCl_3) of **13**



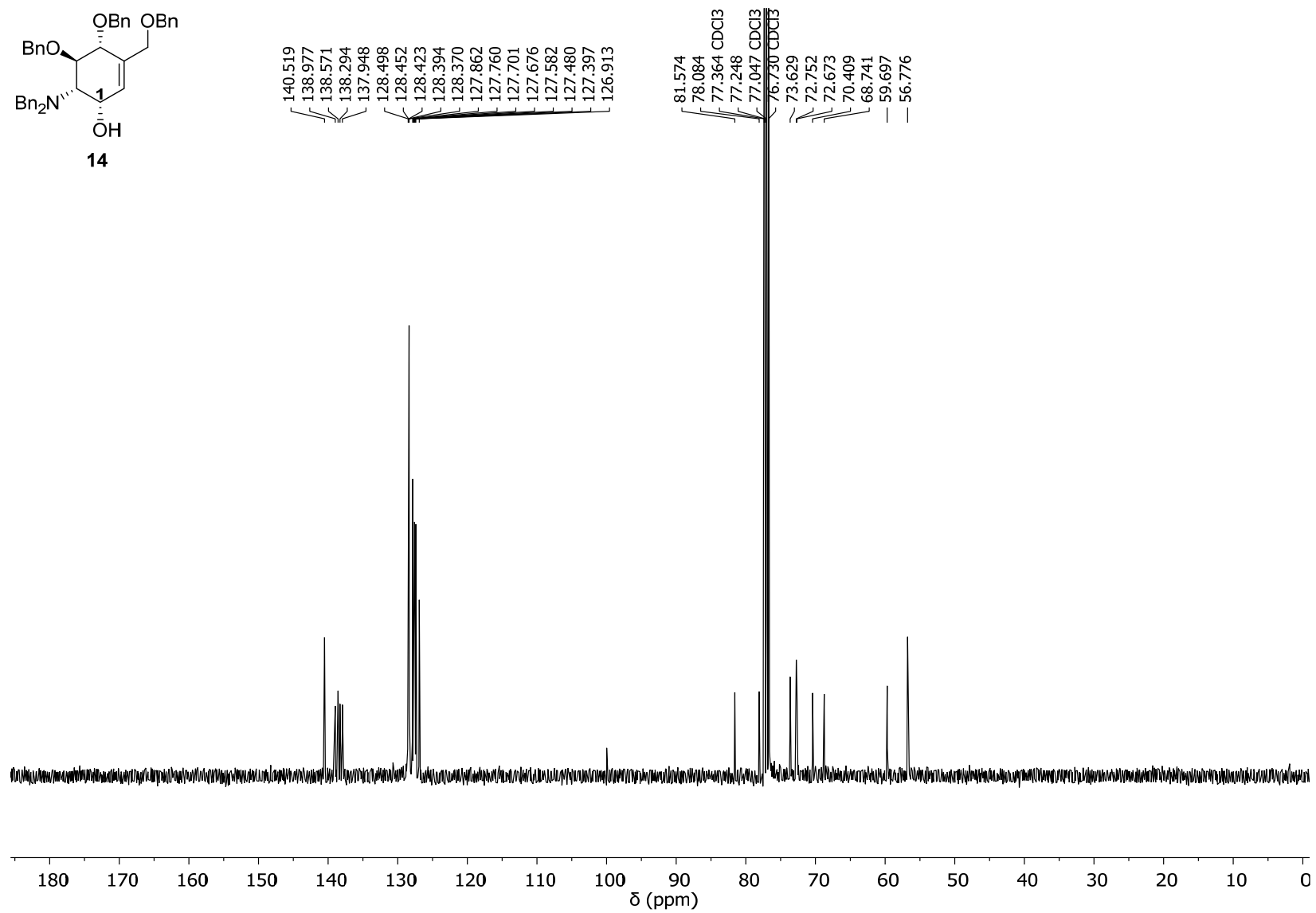
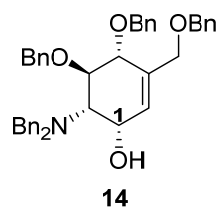
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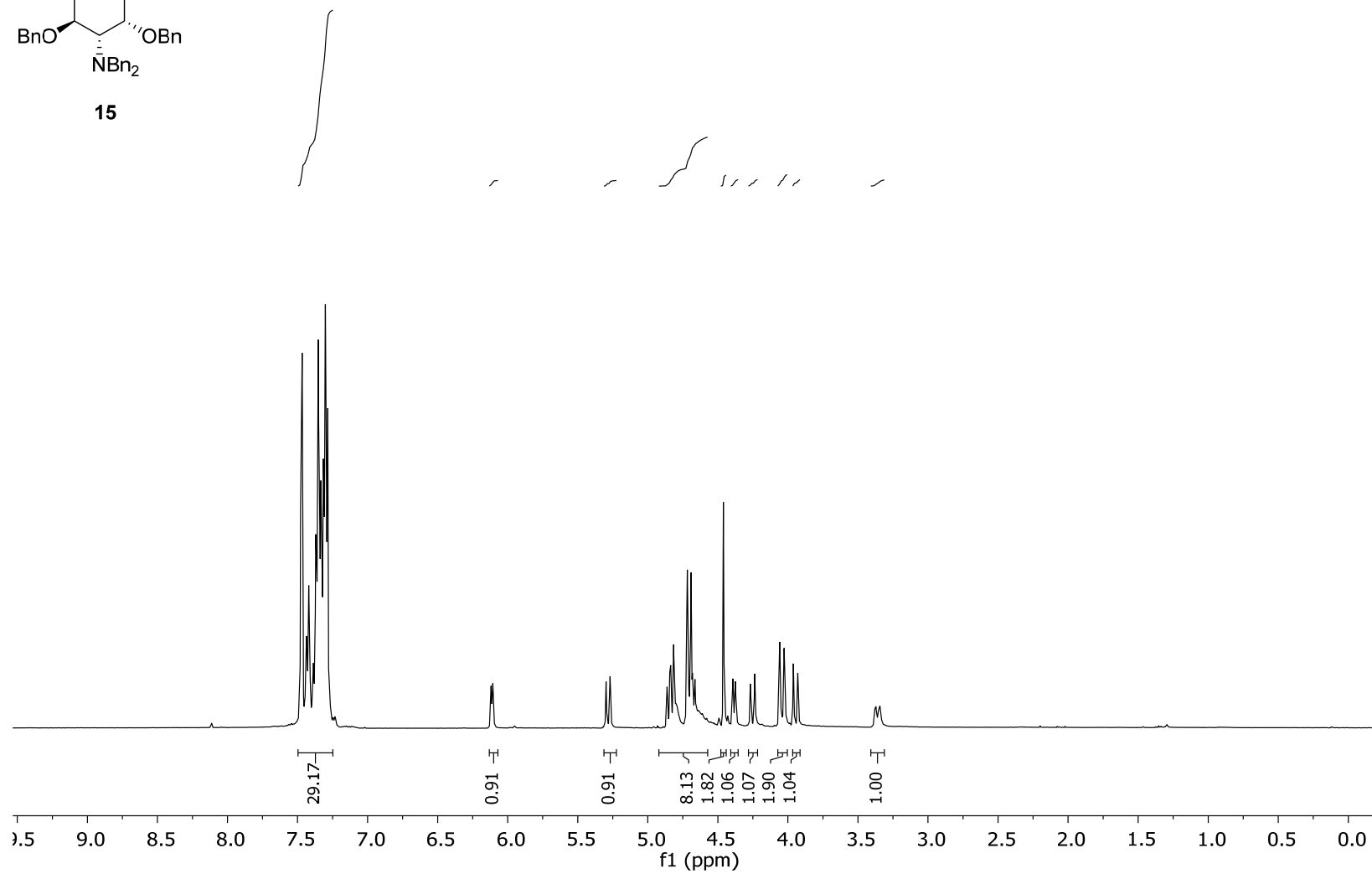
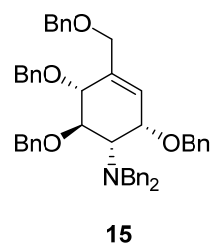
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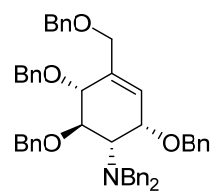
^1H NMR spectrum (400 MHz, CDCl_3) of **14**



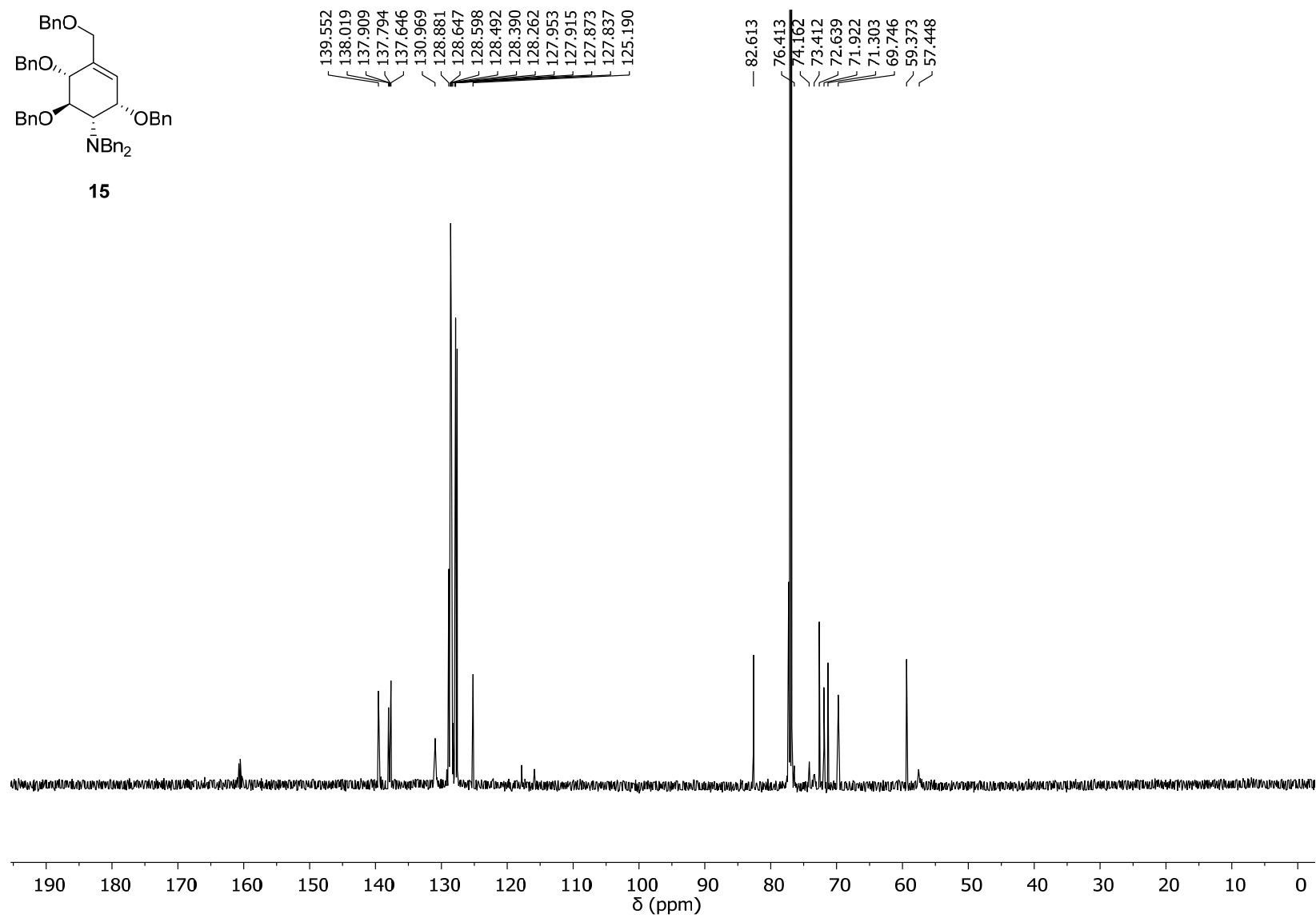
^{13}C NMR spectrum (101 MHz, CDCl_3) of **14**



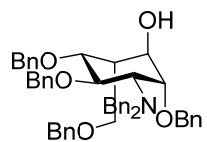
^1H NMR spectrum (400 MHz, CDCl_3) of **15**



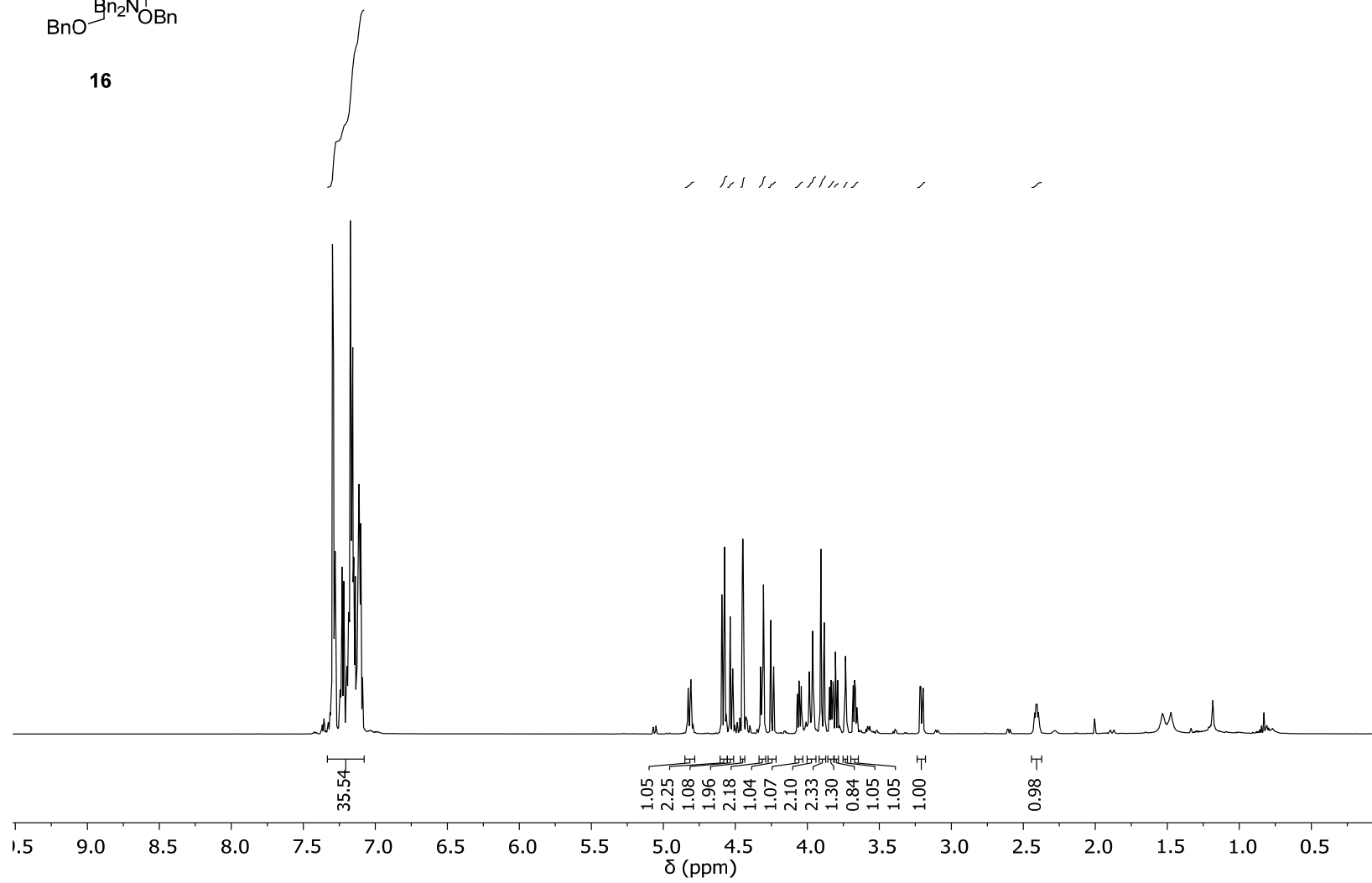
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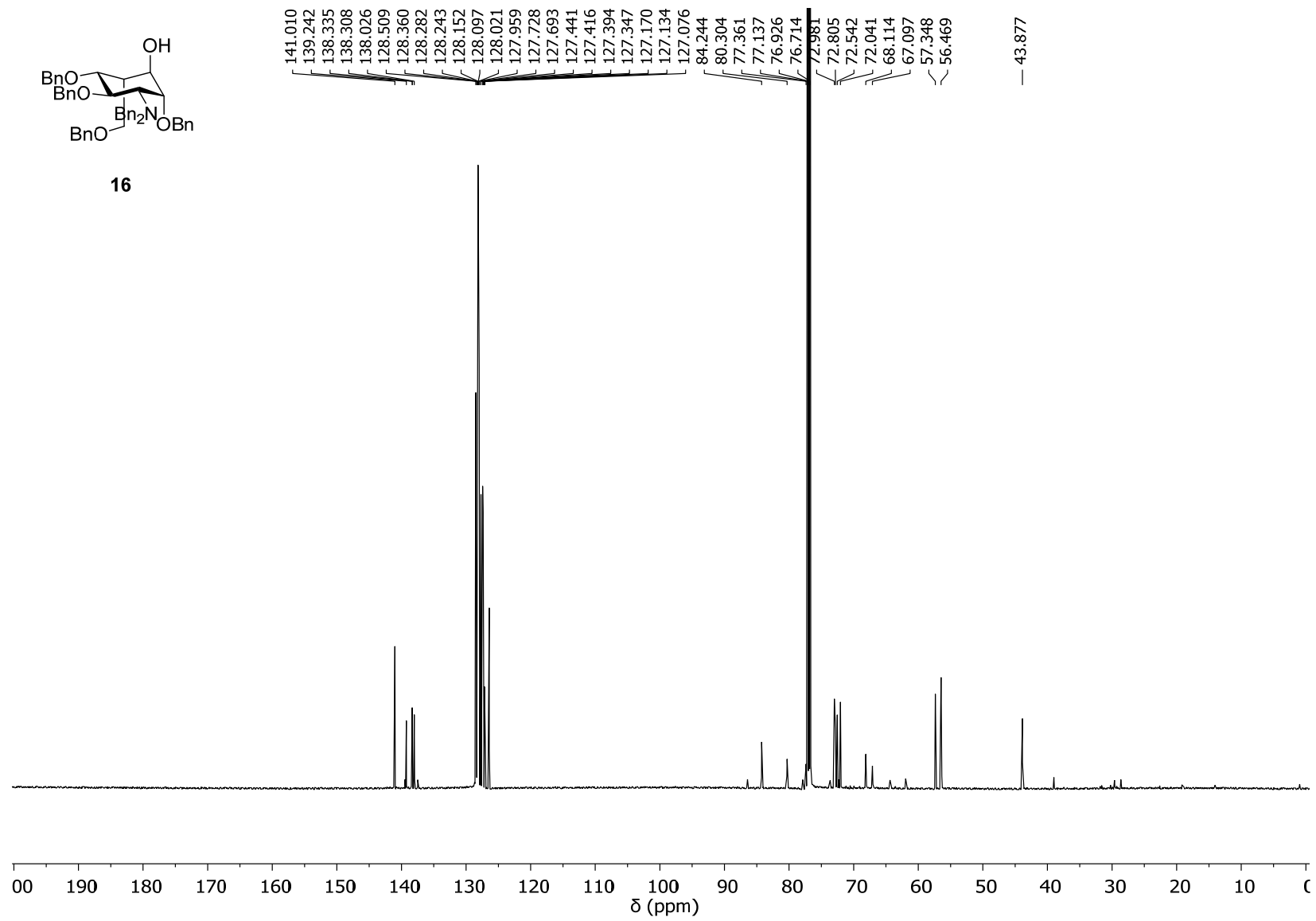
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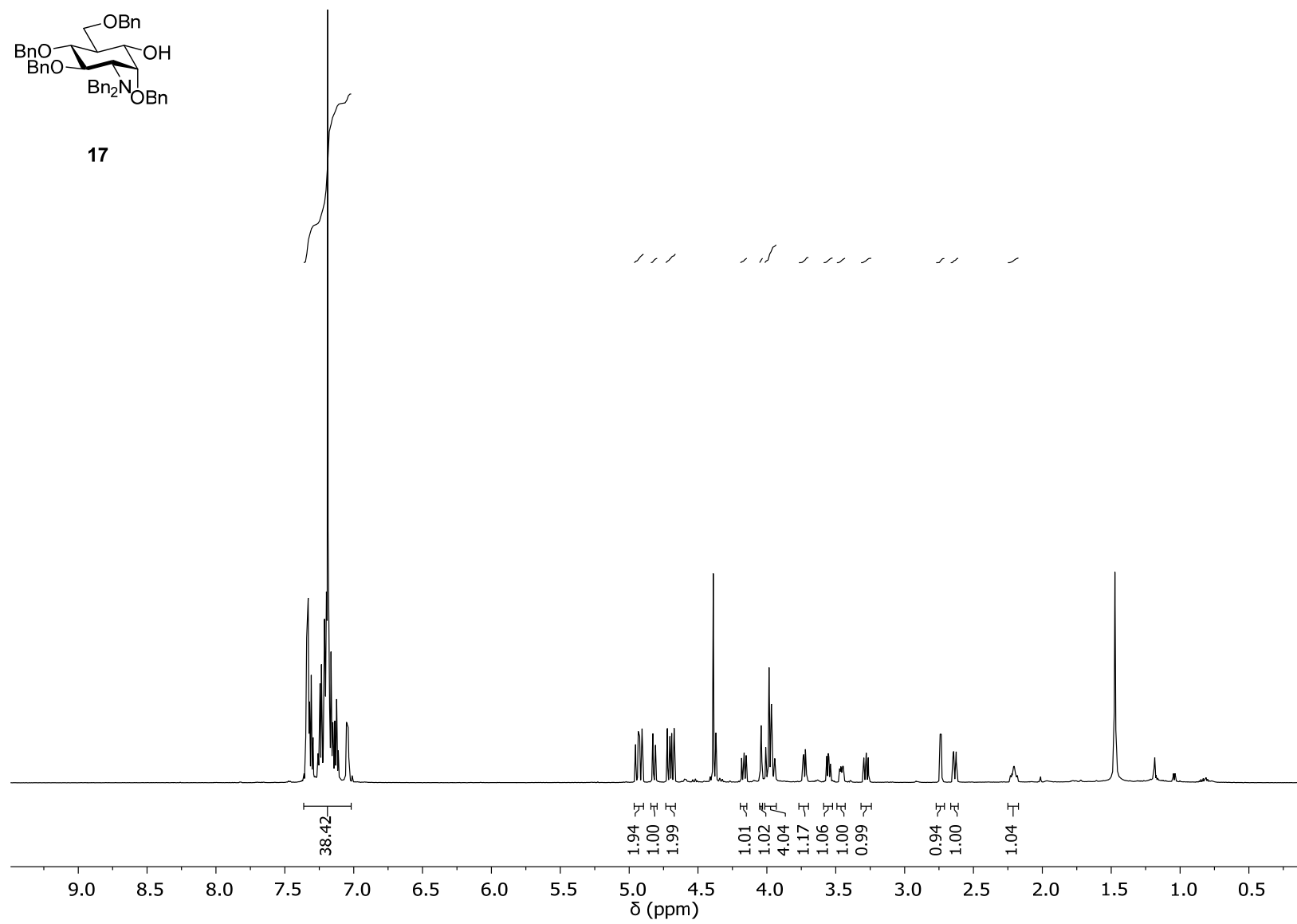
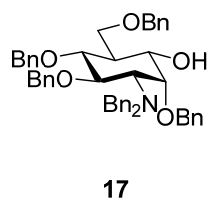
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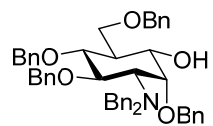
^1H NMR spectrum (600 MHz, CDCl_3) of **16**



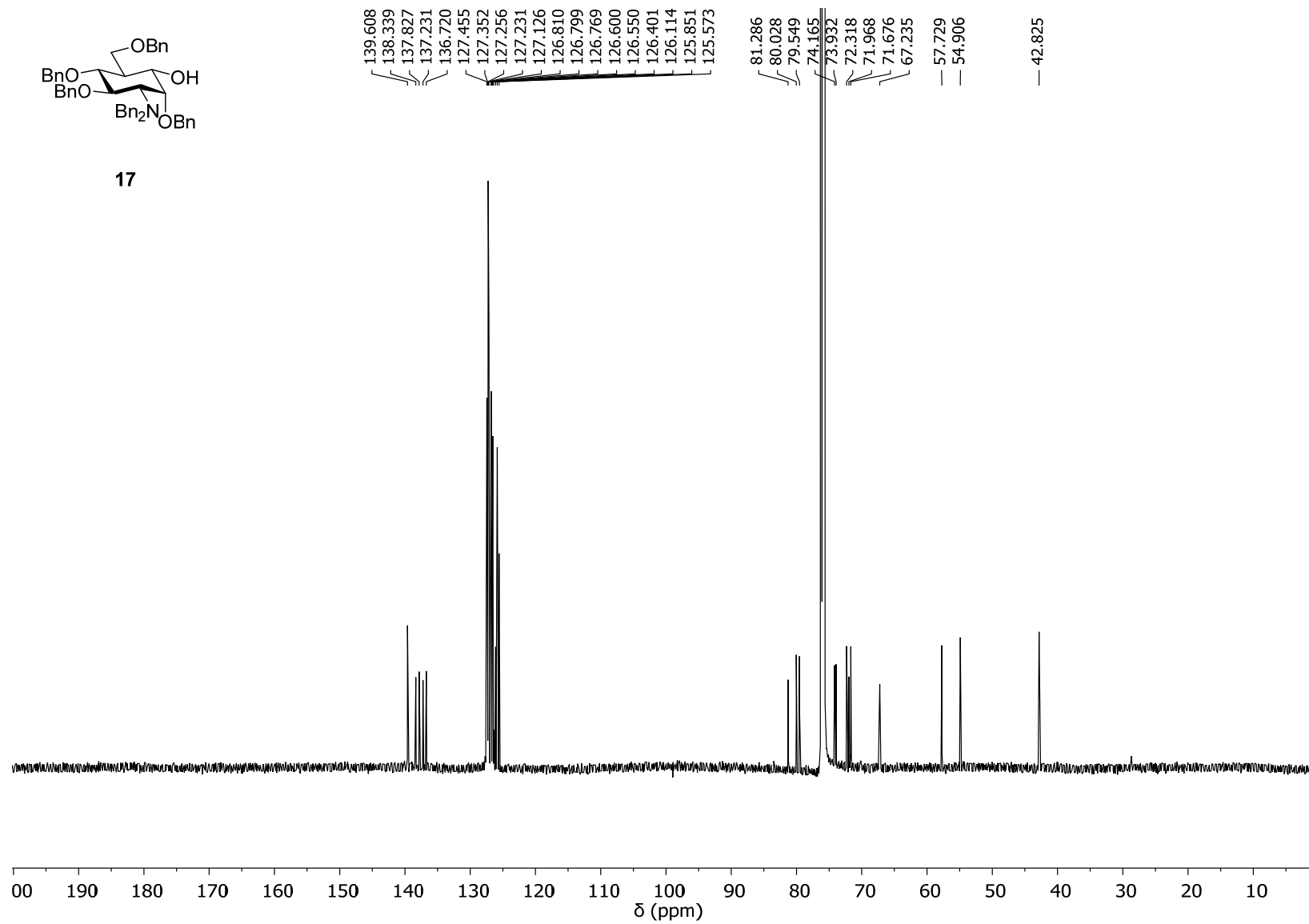
¹³C NMR spectrum (151 MHz, CDCl₃) of **16**



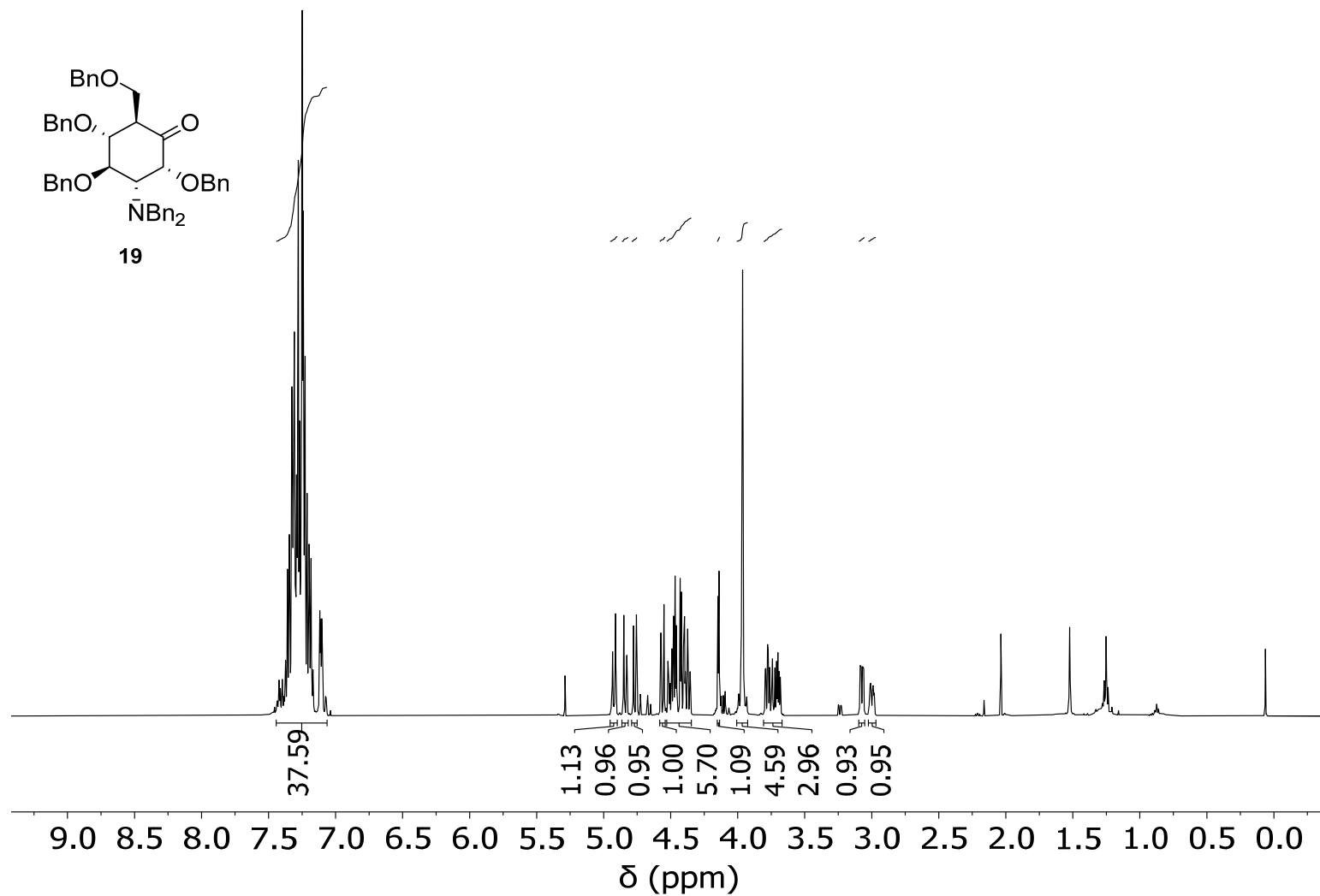
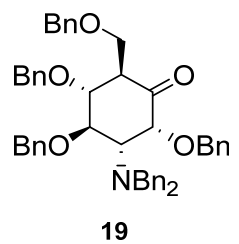
^1H NMR spectrum (600 MHz, CDCl_3) of **17**



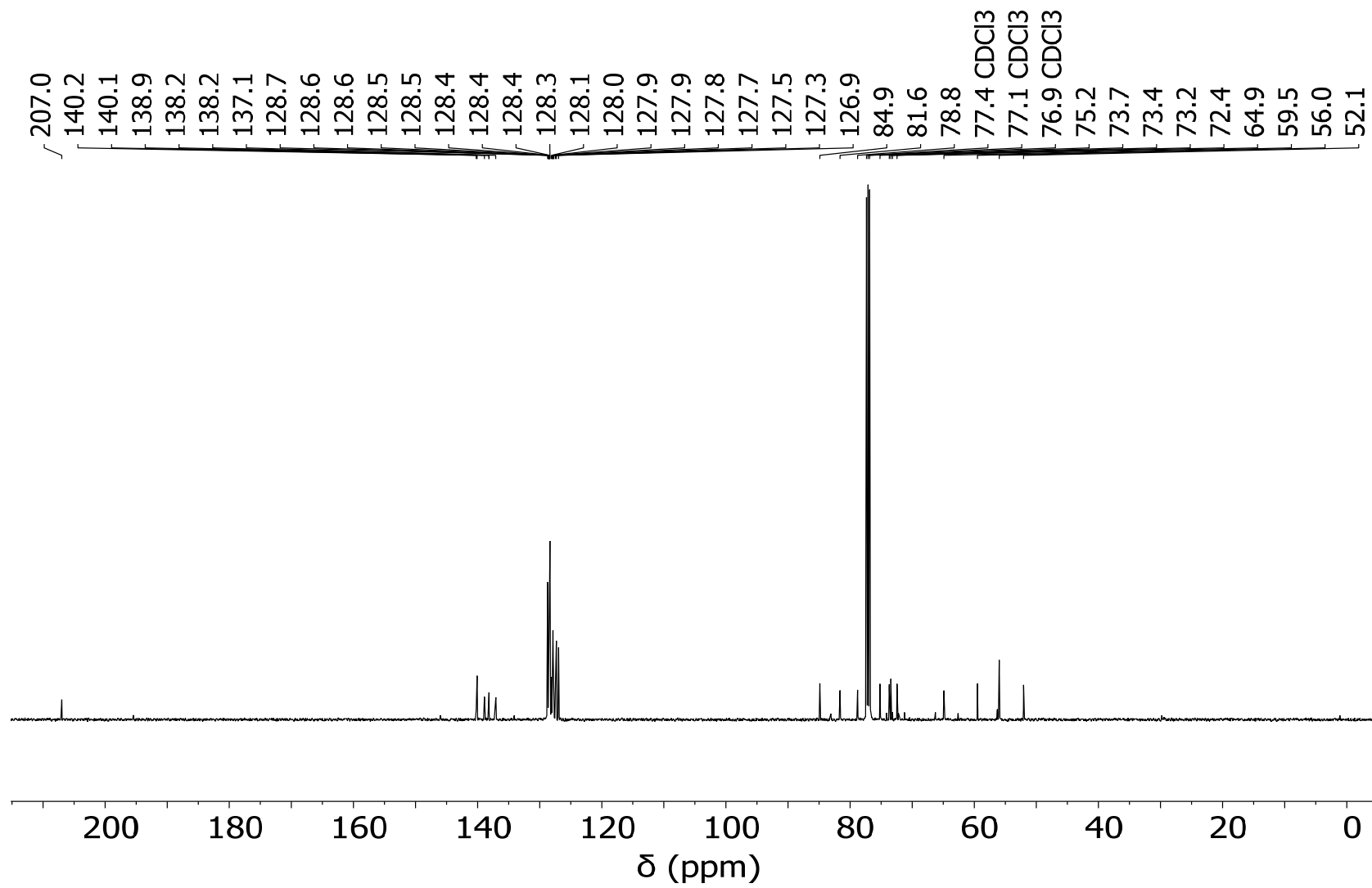
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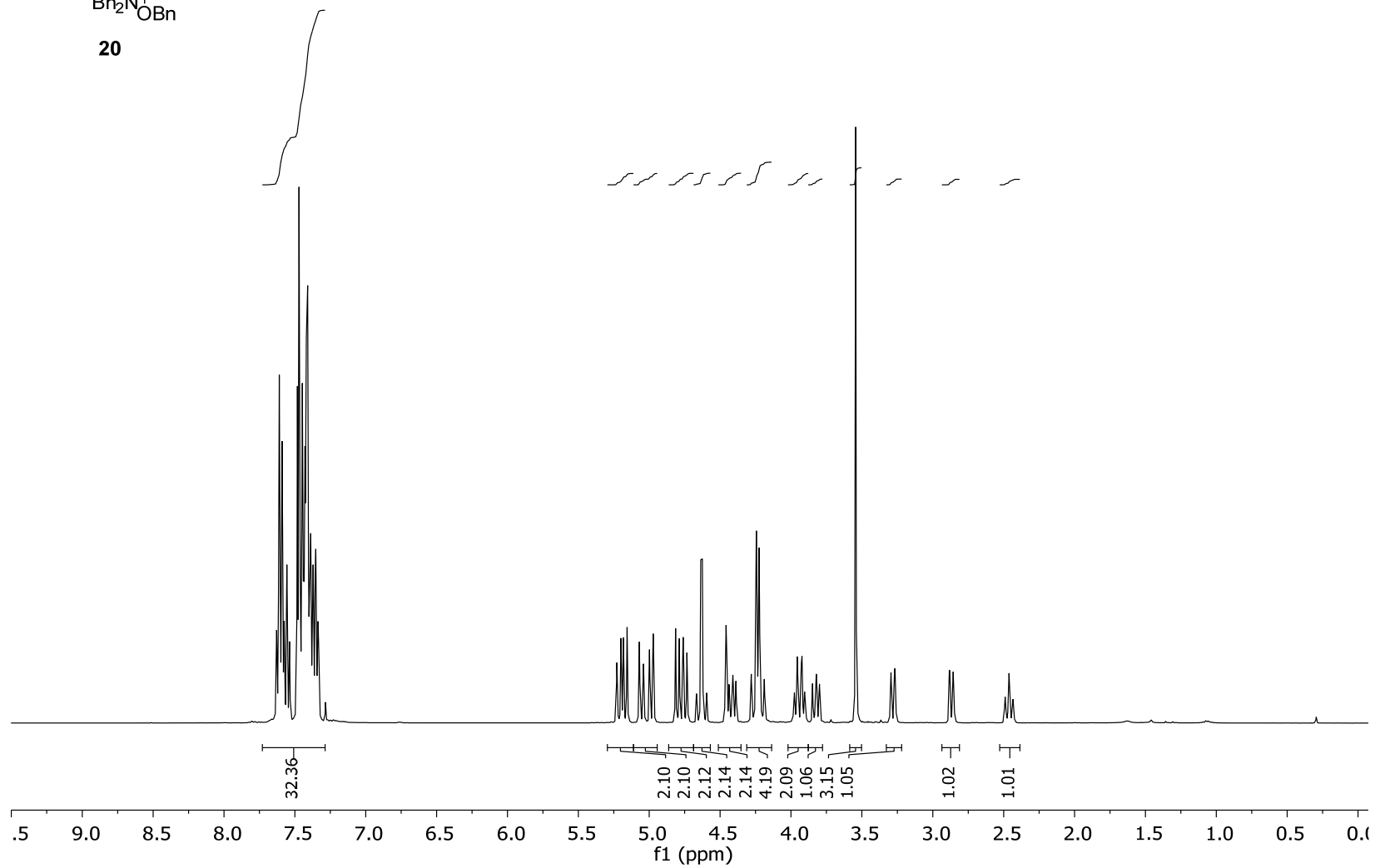
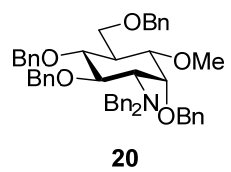
^{13}C NMR spectrum (151 MHz, CDCl_3) of **17**



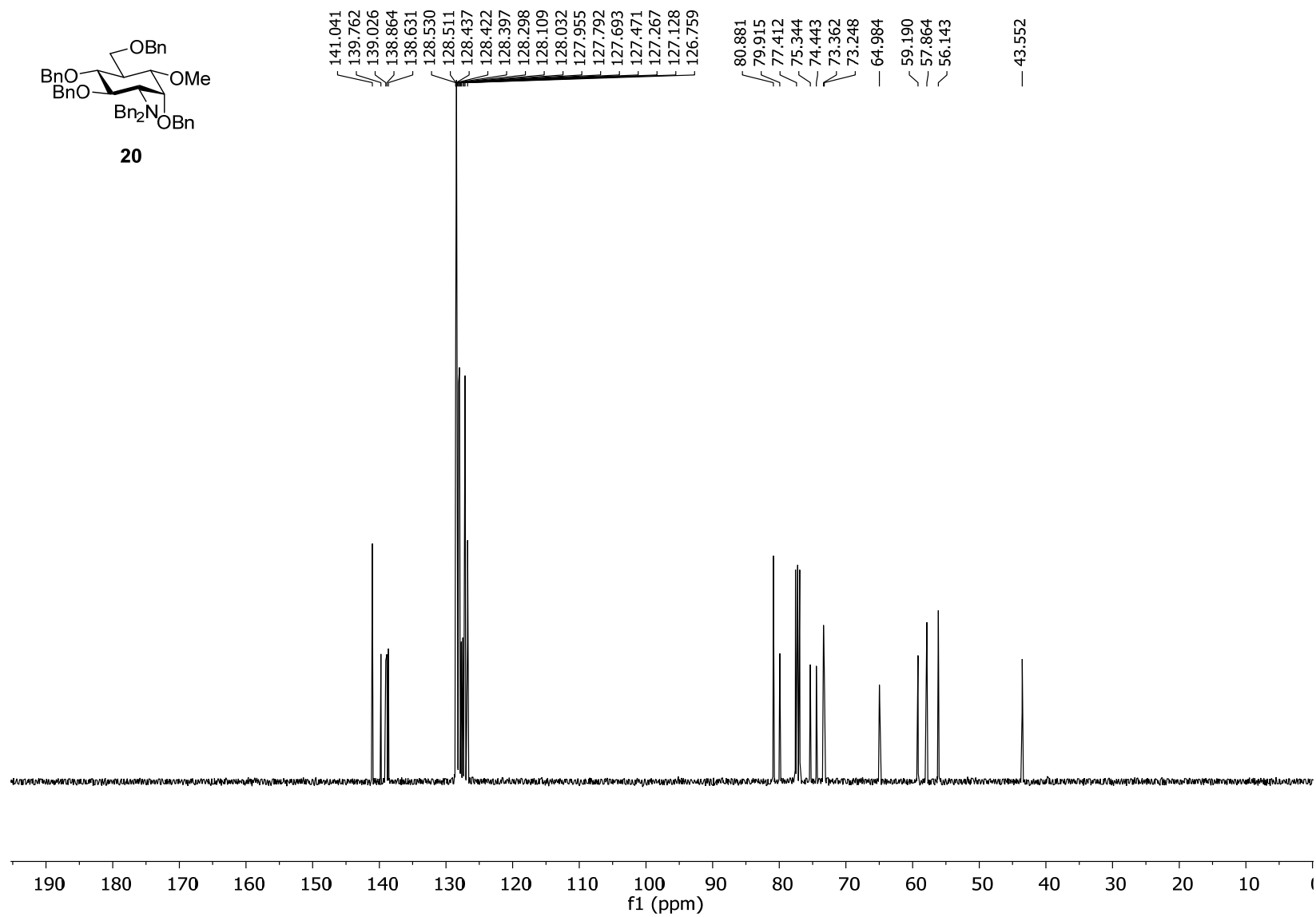
^1H NMR spectrum (500 MHz, CDCl_3) of **19**



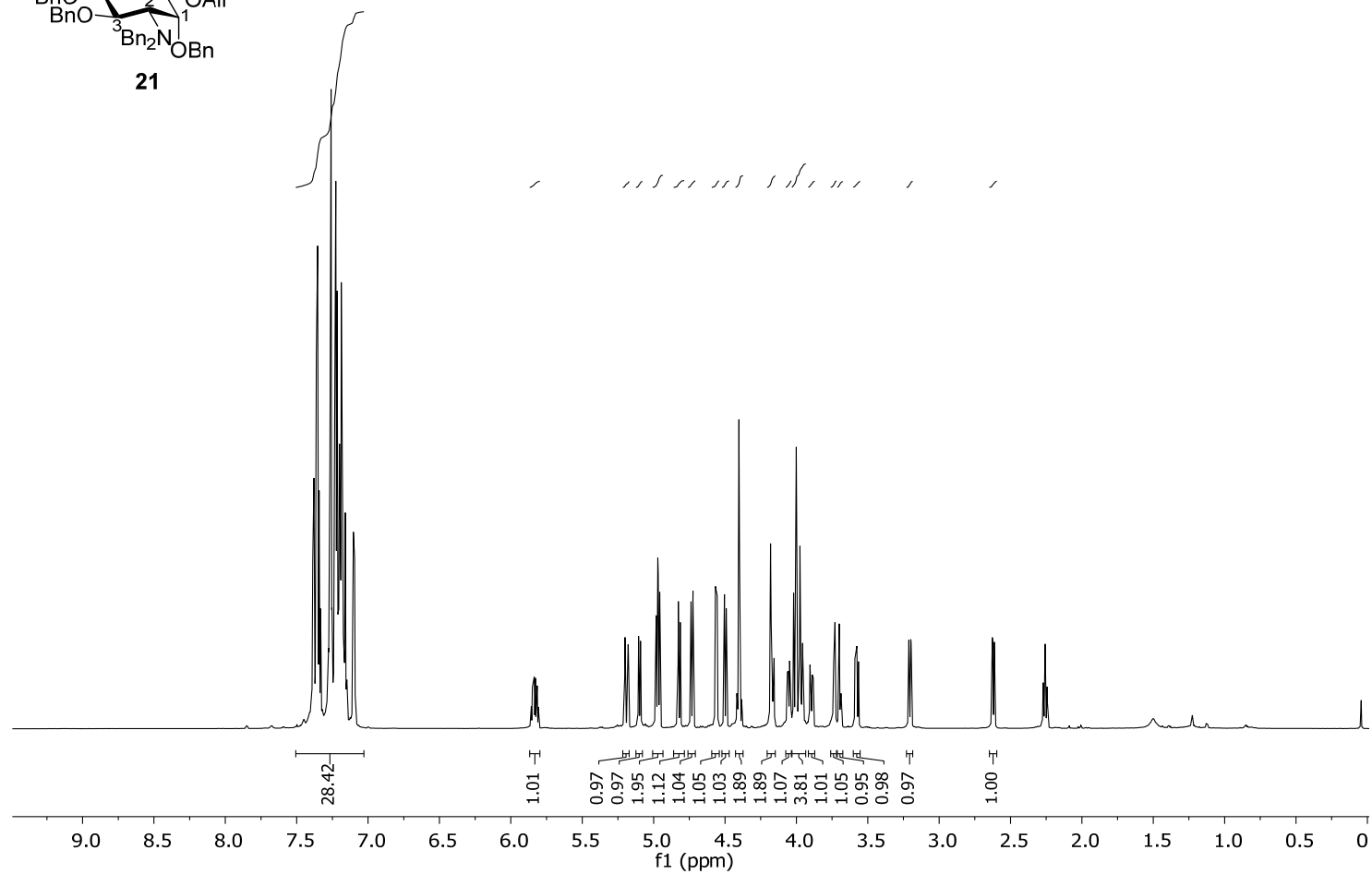
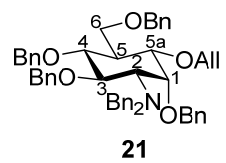
¹³C NMR spectrum (126 MHz, CDCl₃) of 19



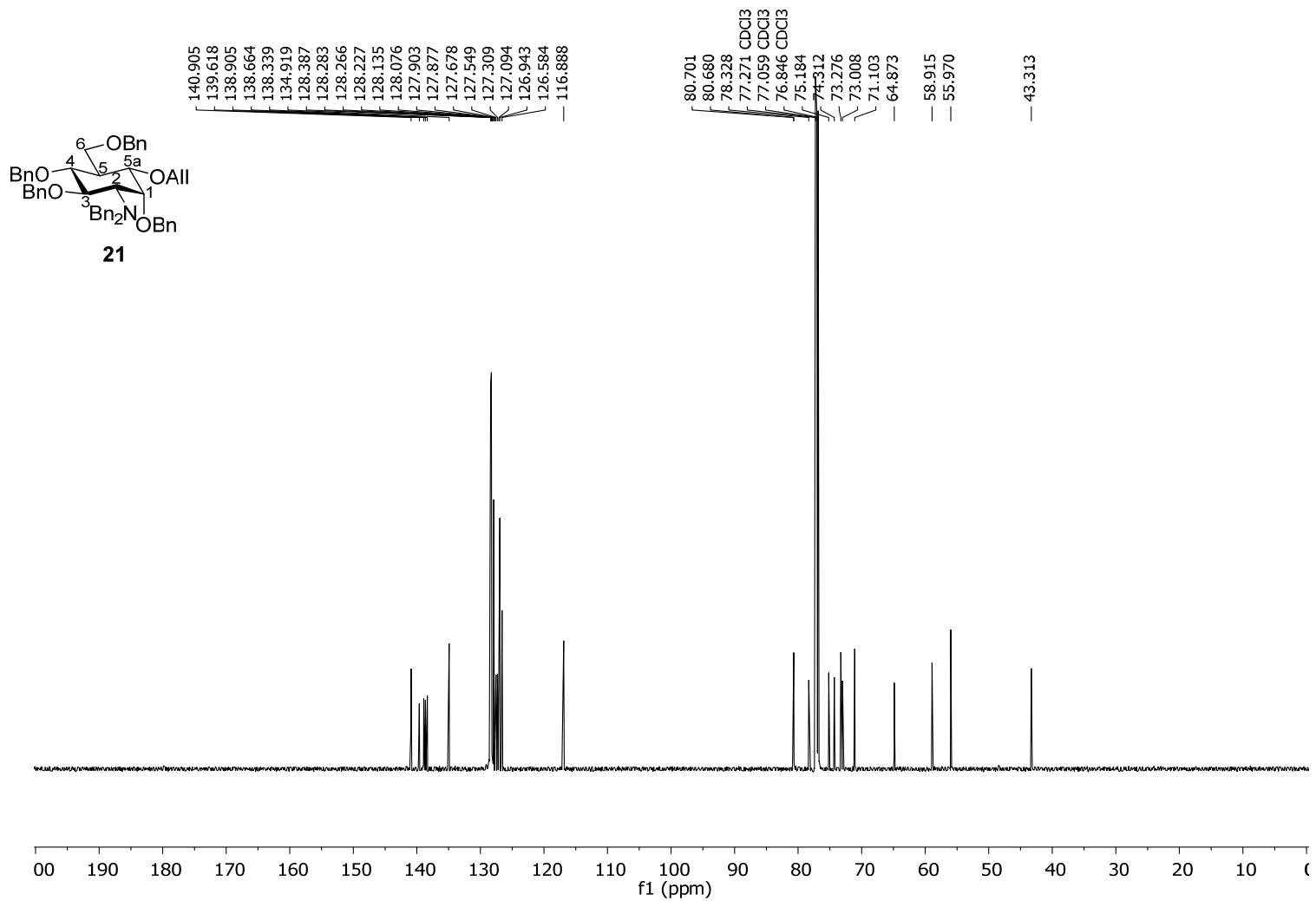
^1H NMR spectrum (400 MHz, CDCl_3) of **20**



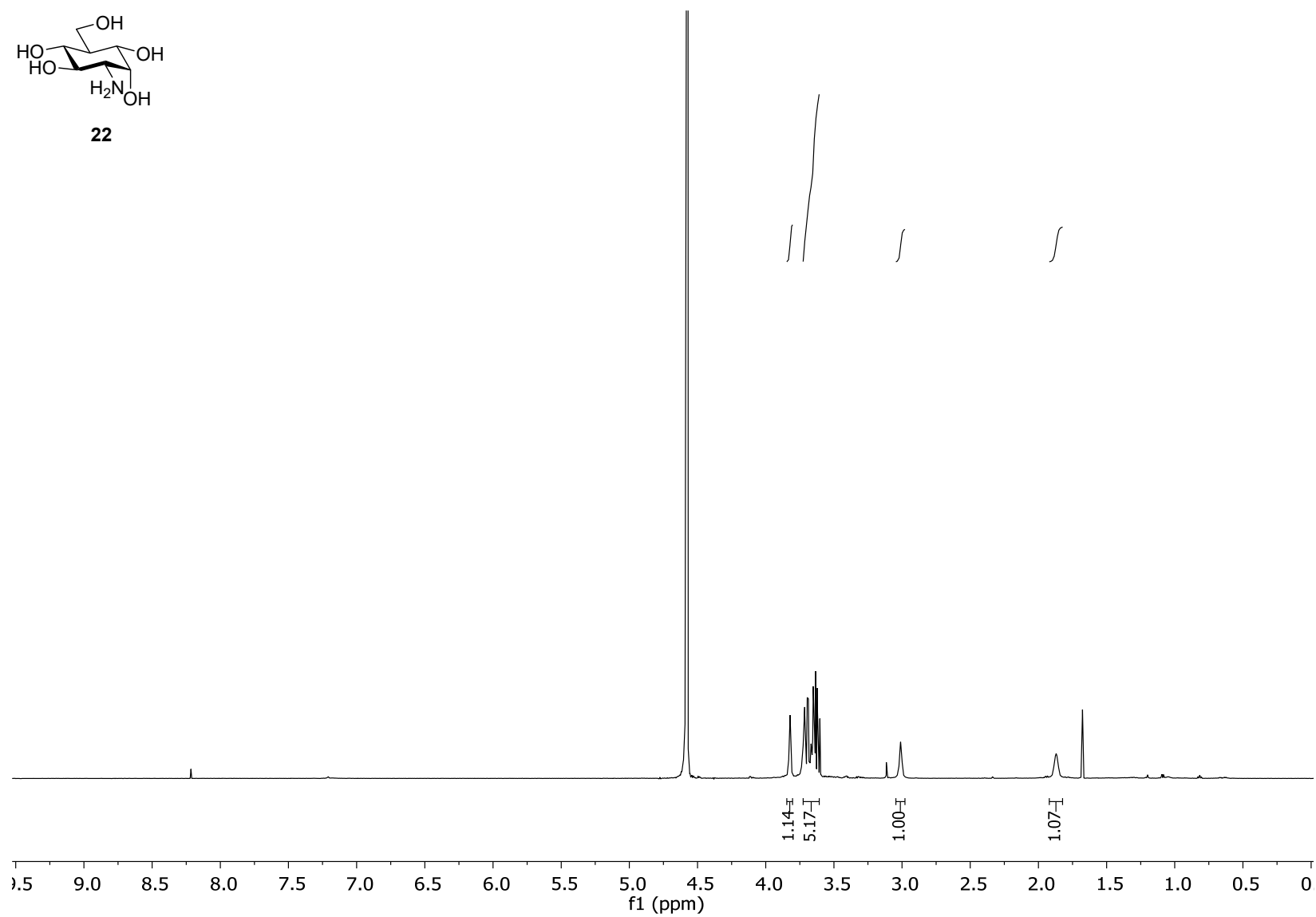
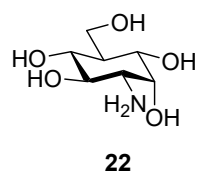
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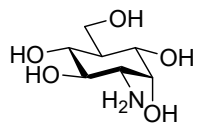
^1H NMR spectrum (800 MHz, CDCl_3) of **21**



¹³C NMR spectrum (151 MHz, CDCl₃) of **21**

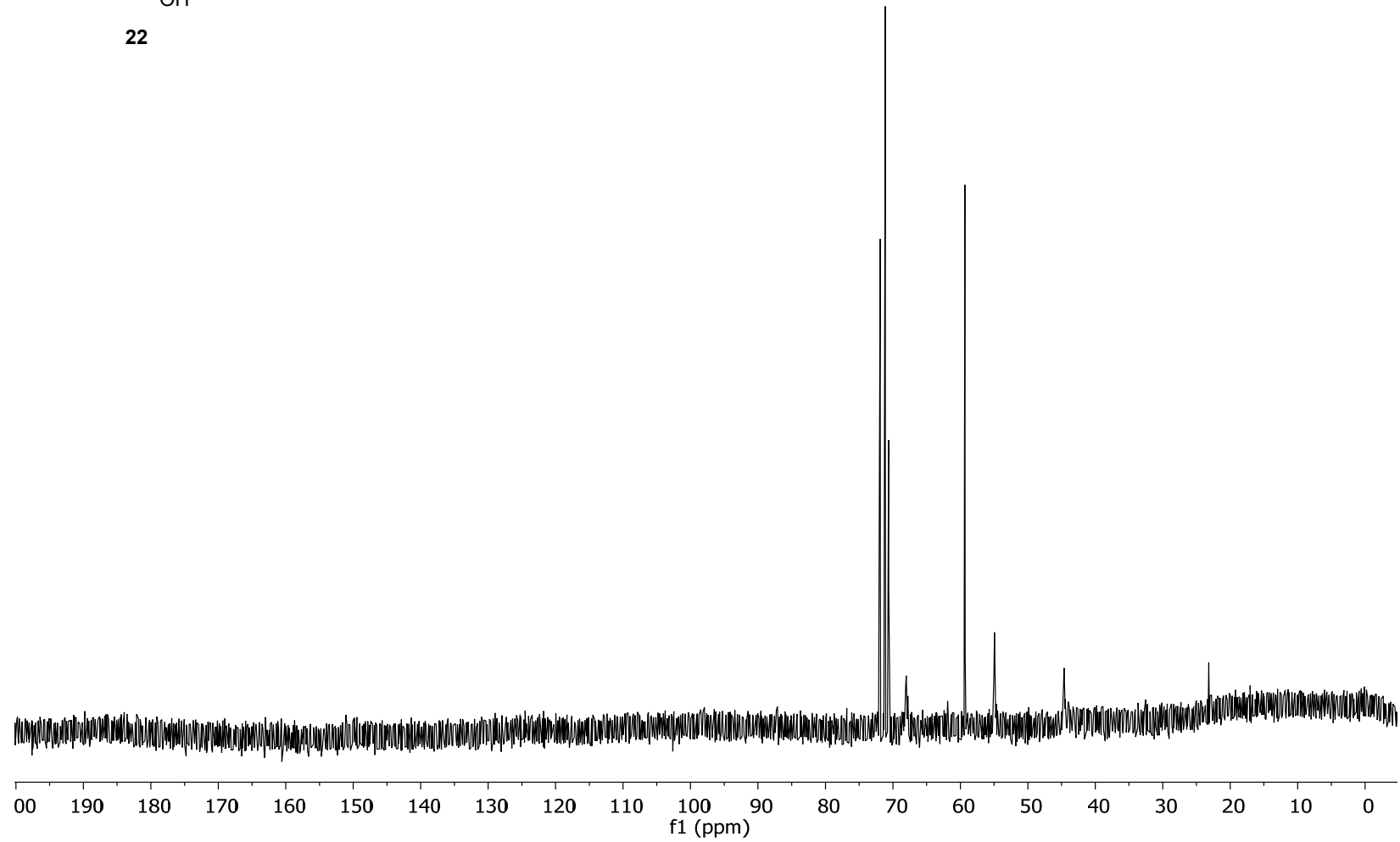


^1H NMR spectrum (600 MHz, D_2O) of **22**

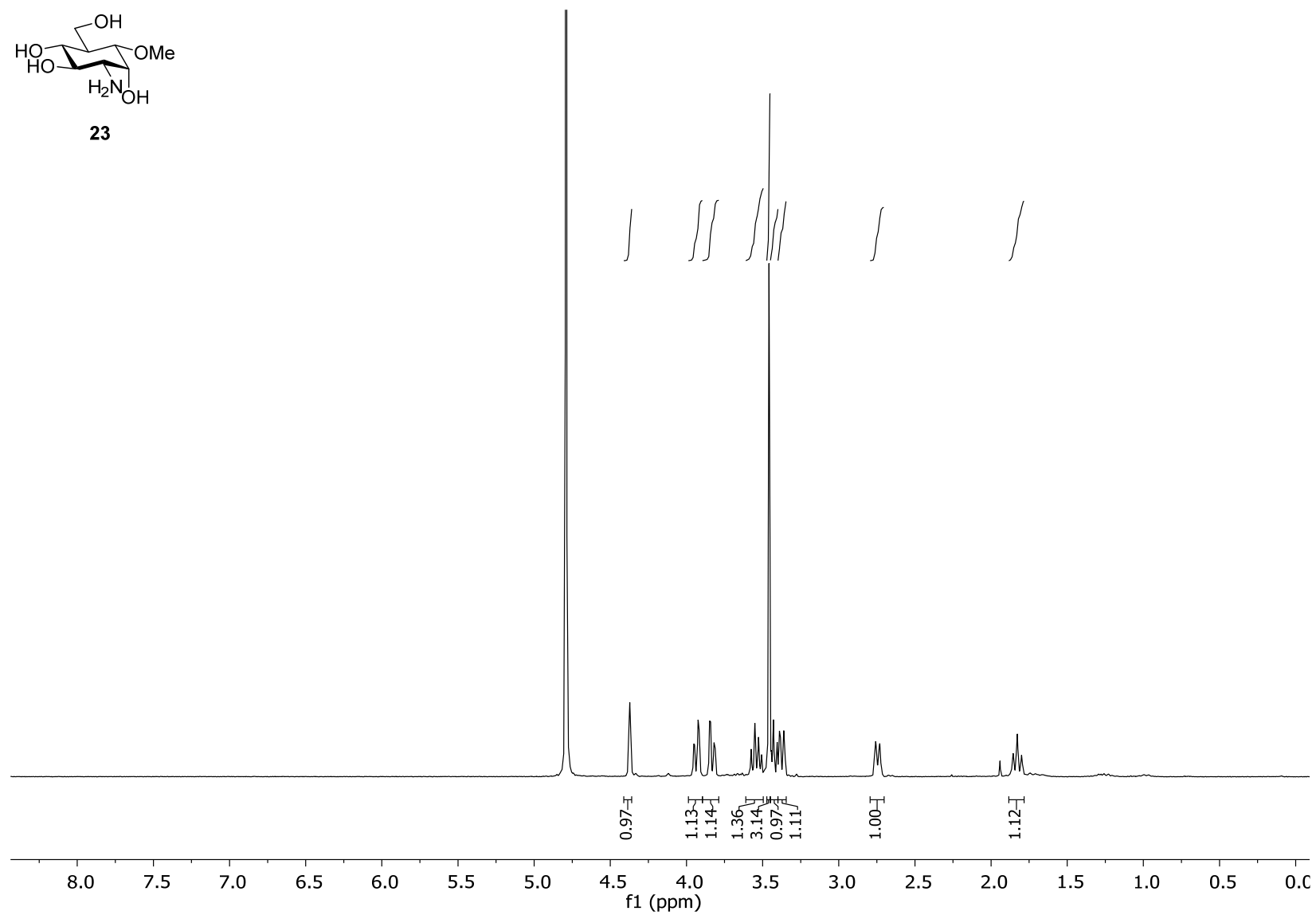
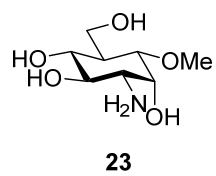


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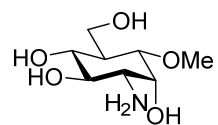
71.877
71.121
70.629
68.018
— 59.323
— 54.942
— 44.561



¹³C NMR spectrum (151 MHz, D₂O) of 22

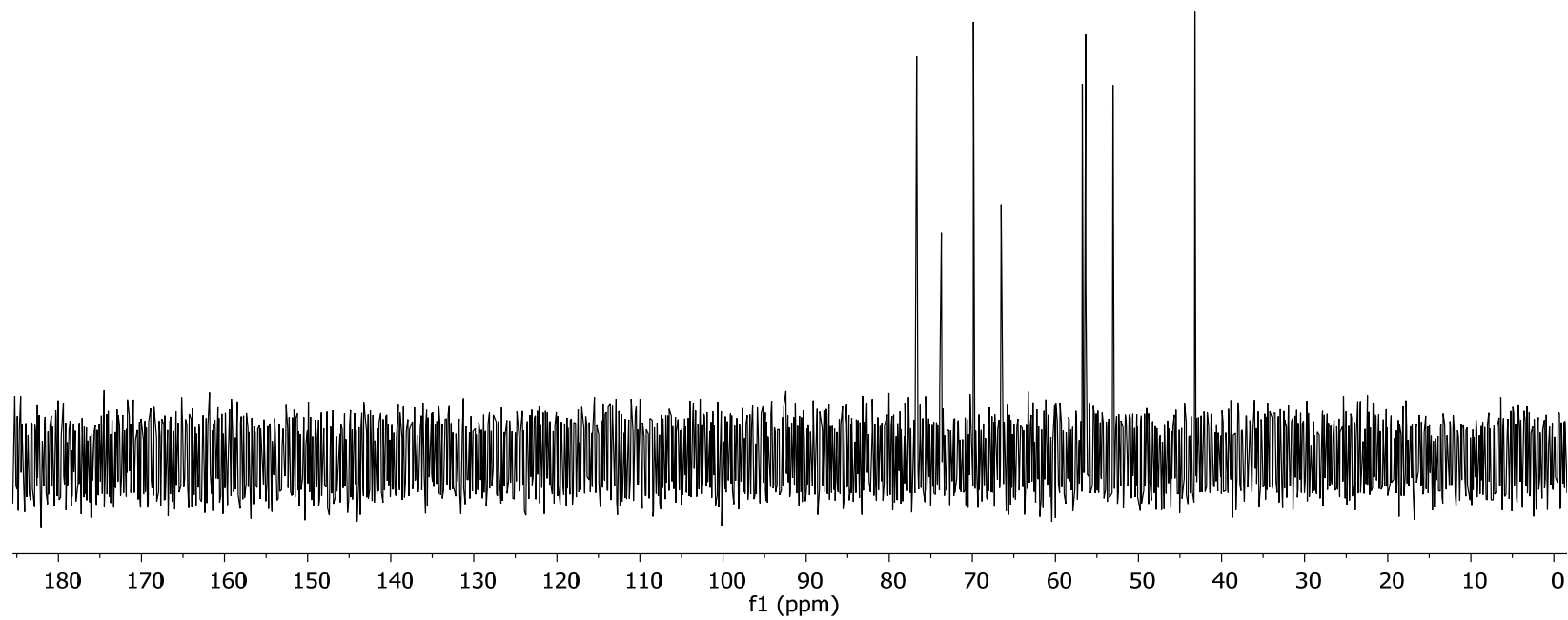


^1H NMR spectrum (400 MHz, D_2O) of **23**

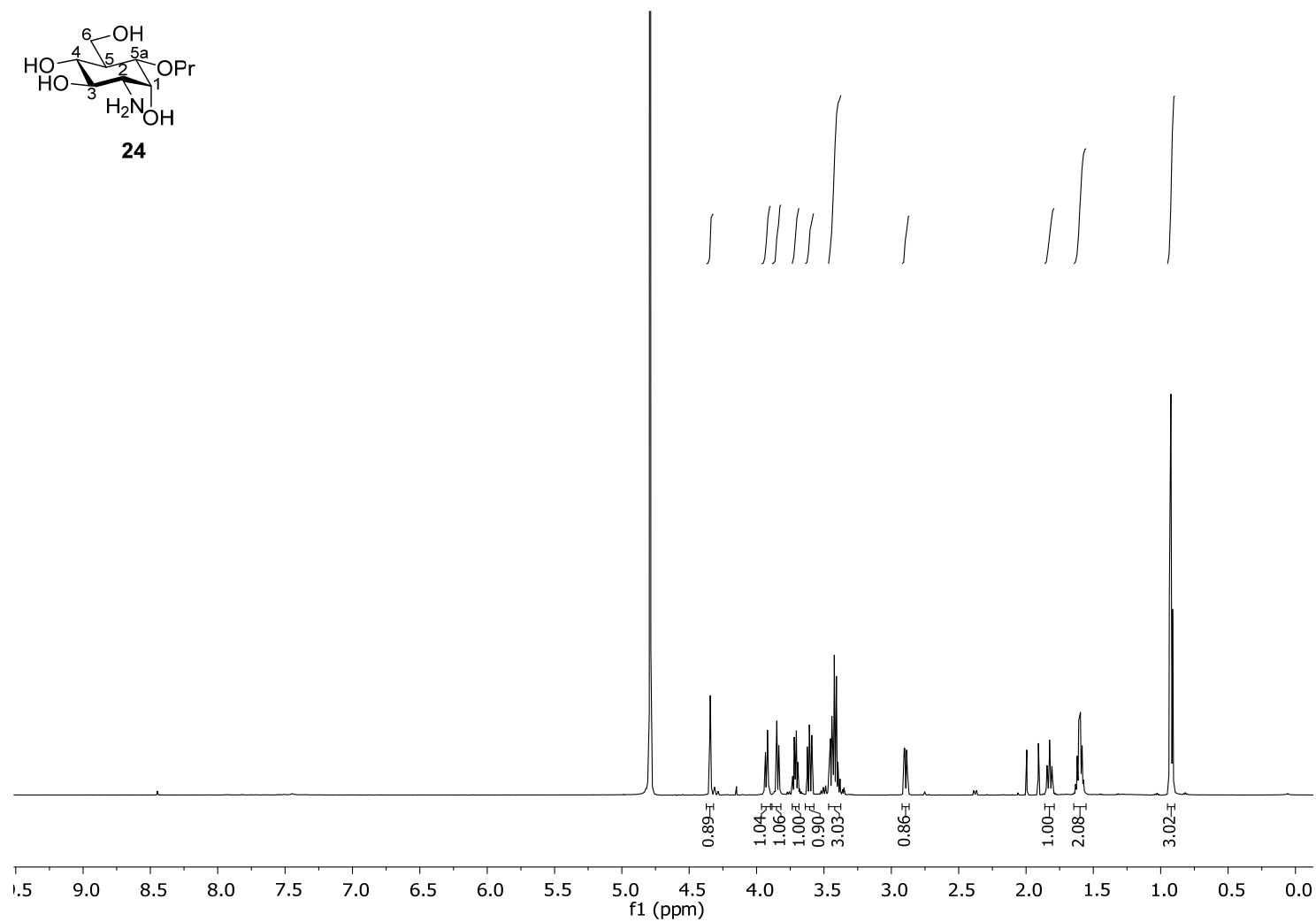
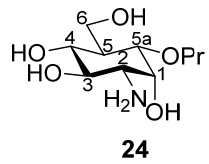


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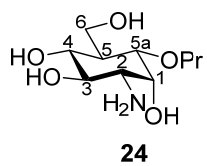
76.694
73.721
69.867
66.520
56.762
56.351
53.078
43.200



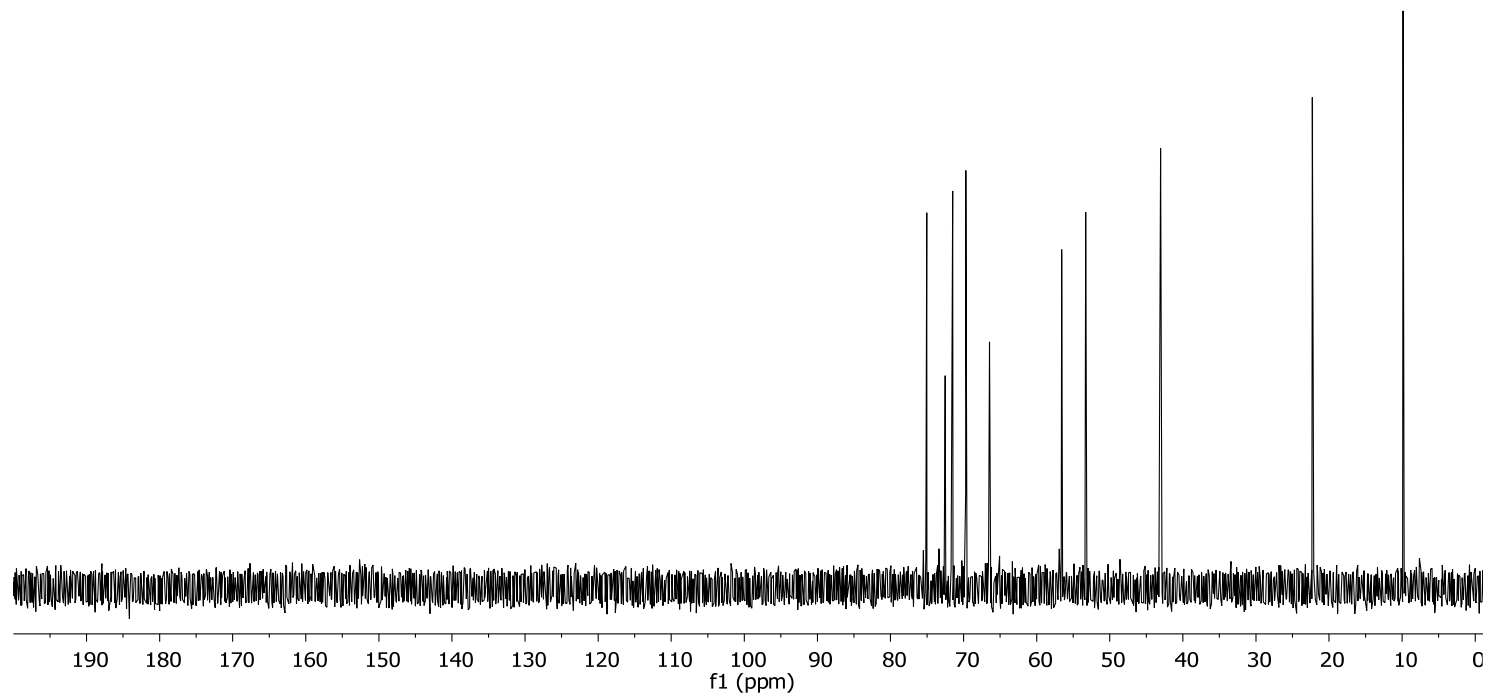
¹³C NMR spectrum (101 MHz, D₂O) of 23



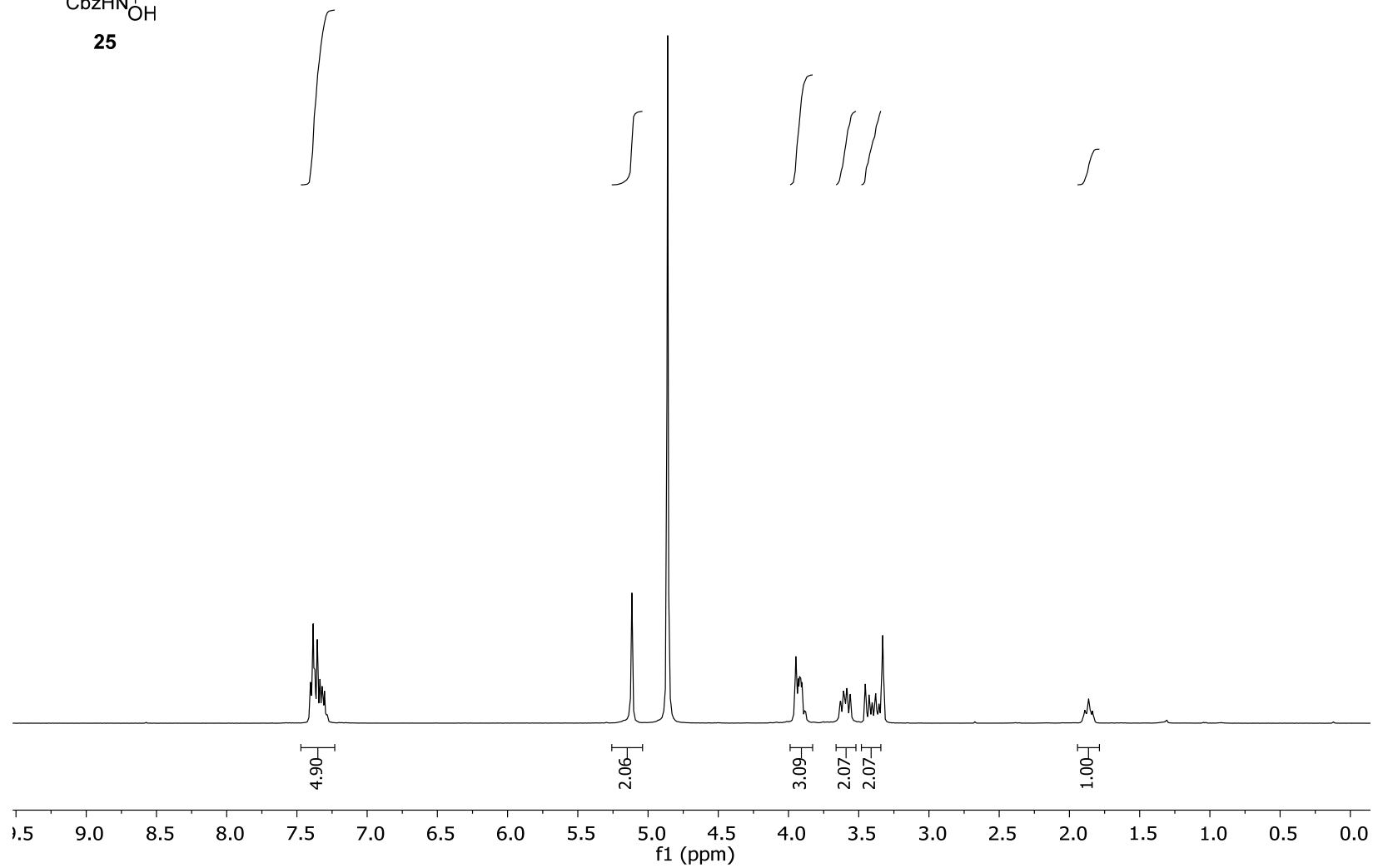
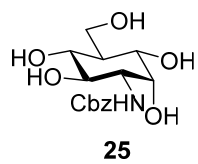
^1H NMR spectrum (600 MHz, D_2O) of **24**



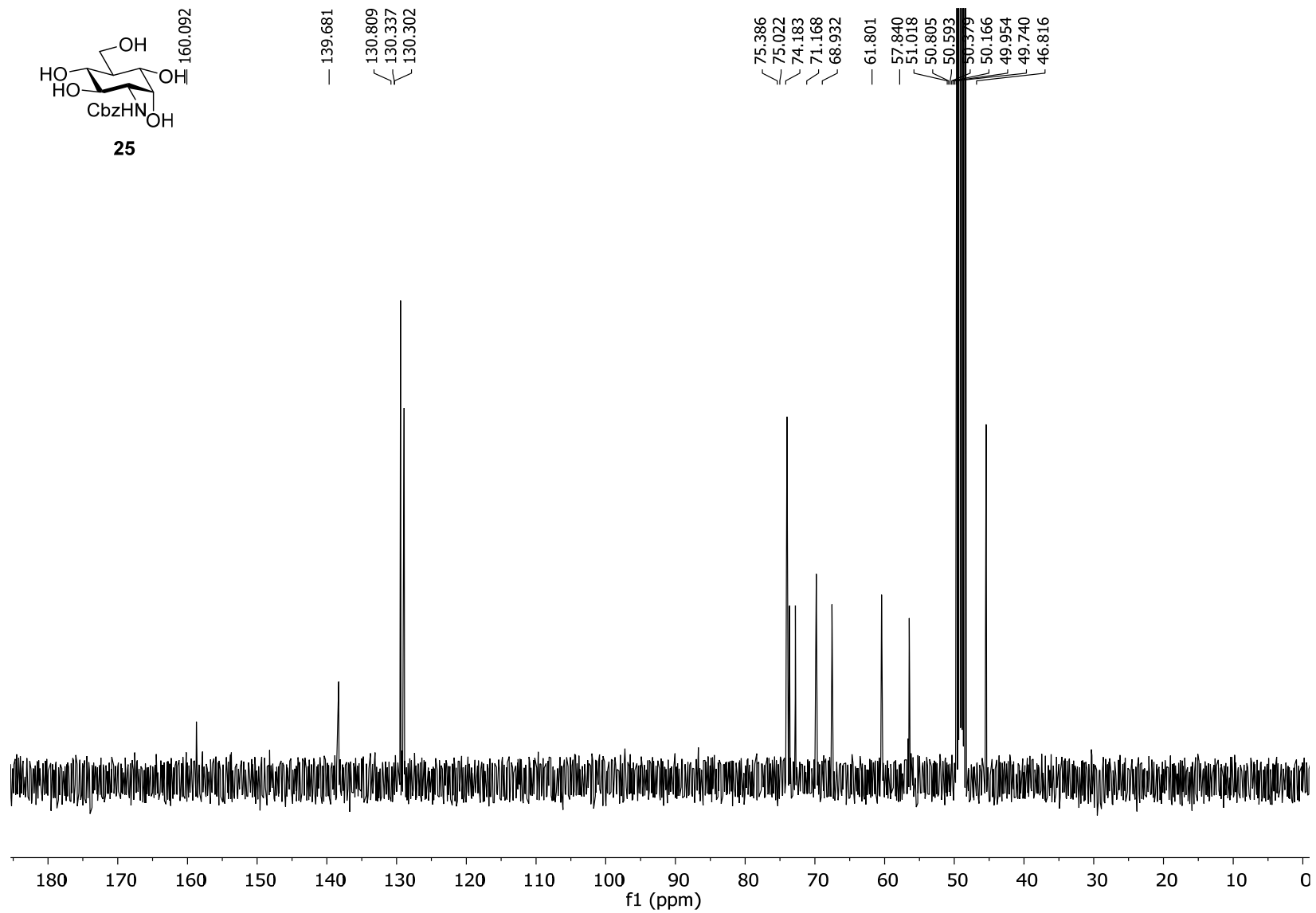
- 75.043
- 72.526
- 71.480
- 69.694
- 66.458
- 56.581
- 53.296
- 43.048
- 22.282
- 9.855



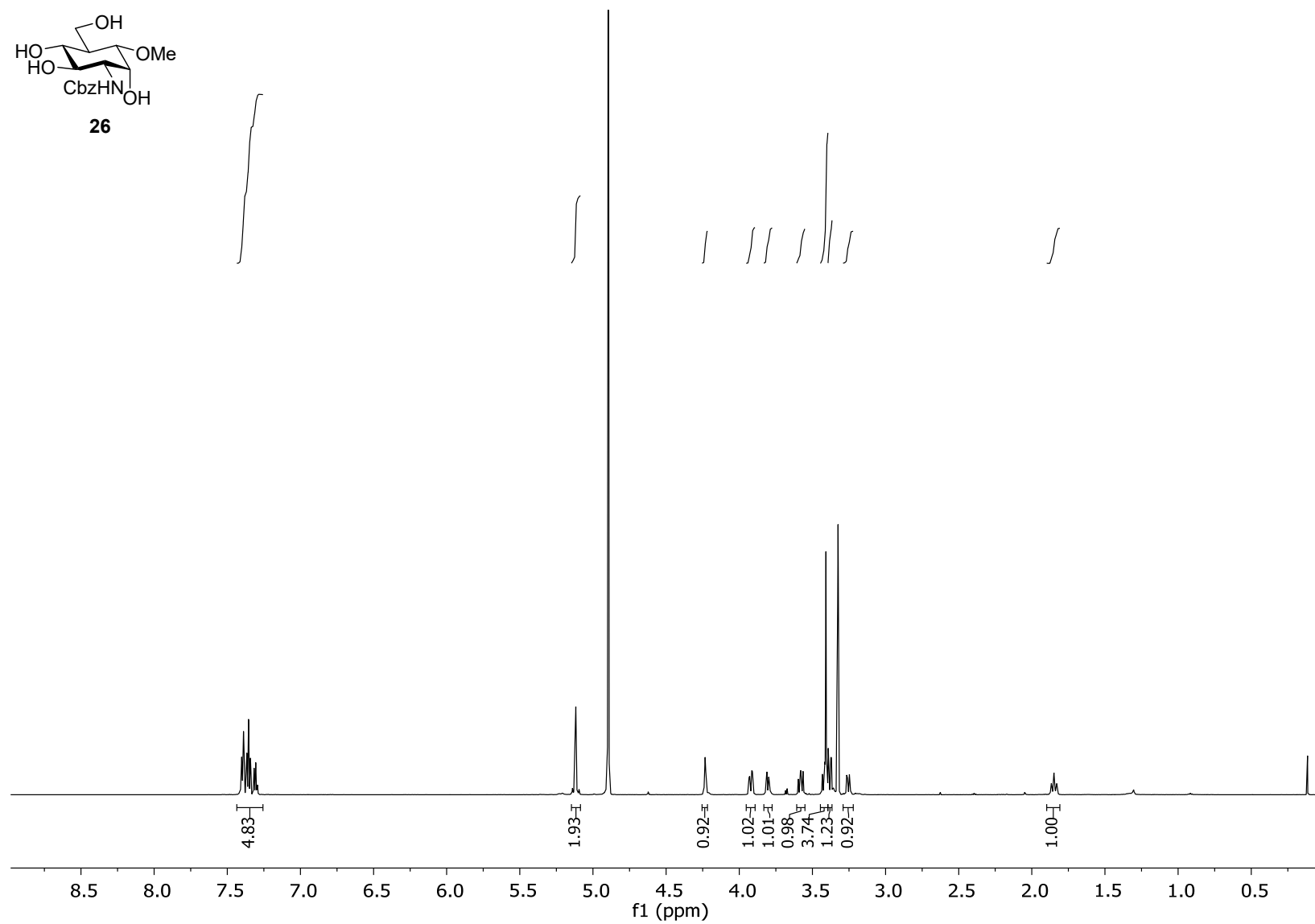
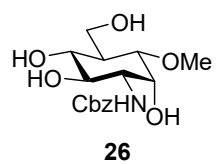
¹³C NMR spectrum (151 MHz, D₂O) of **24**



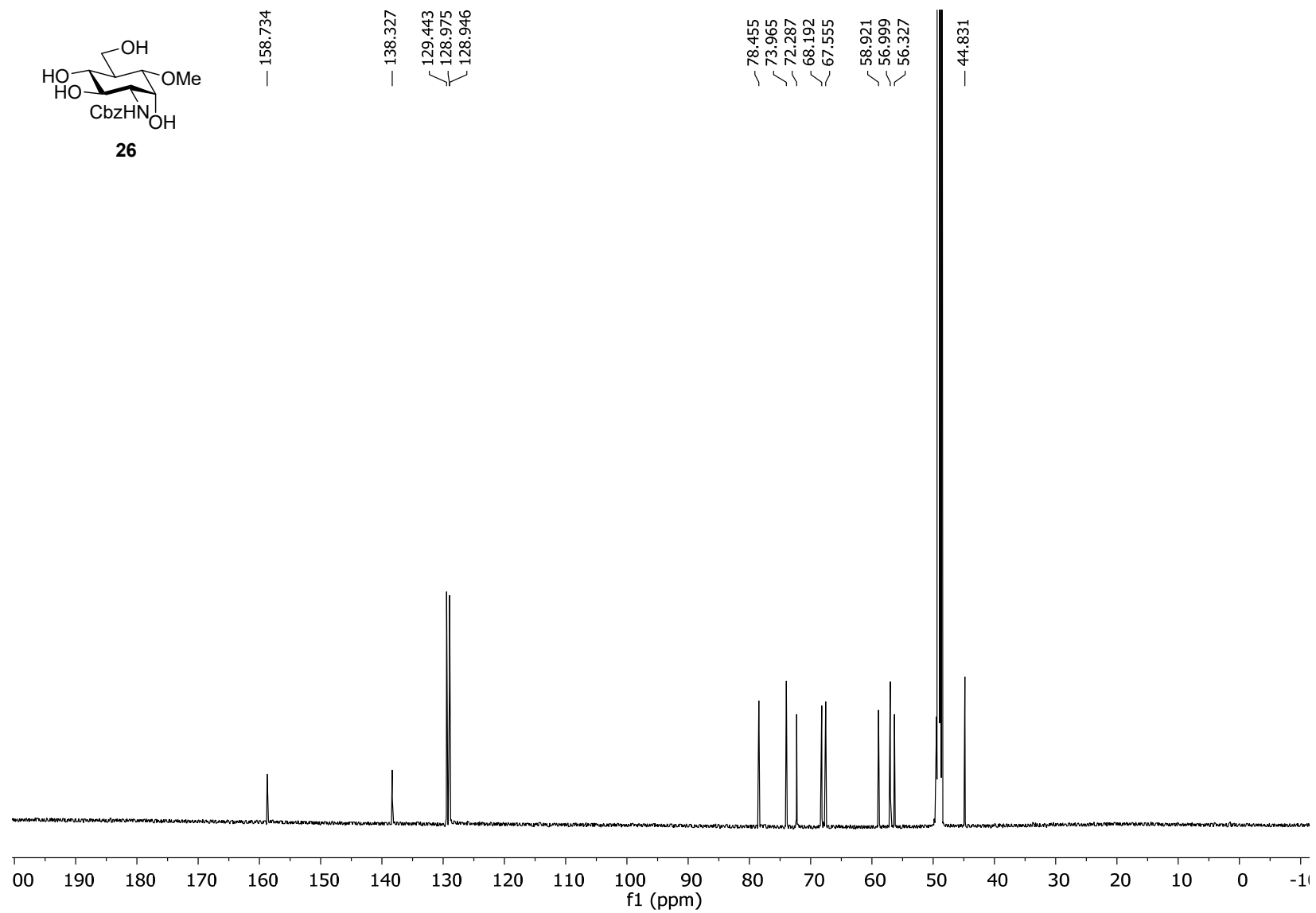
^1H NMR spectrum (400 MHz, CD_3OD) of **25**



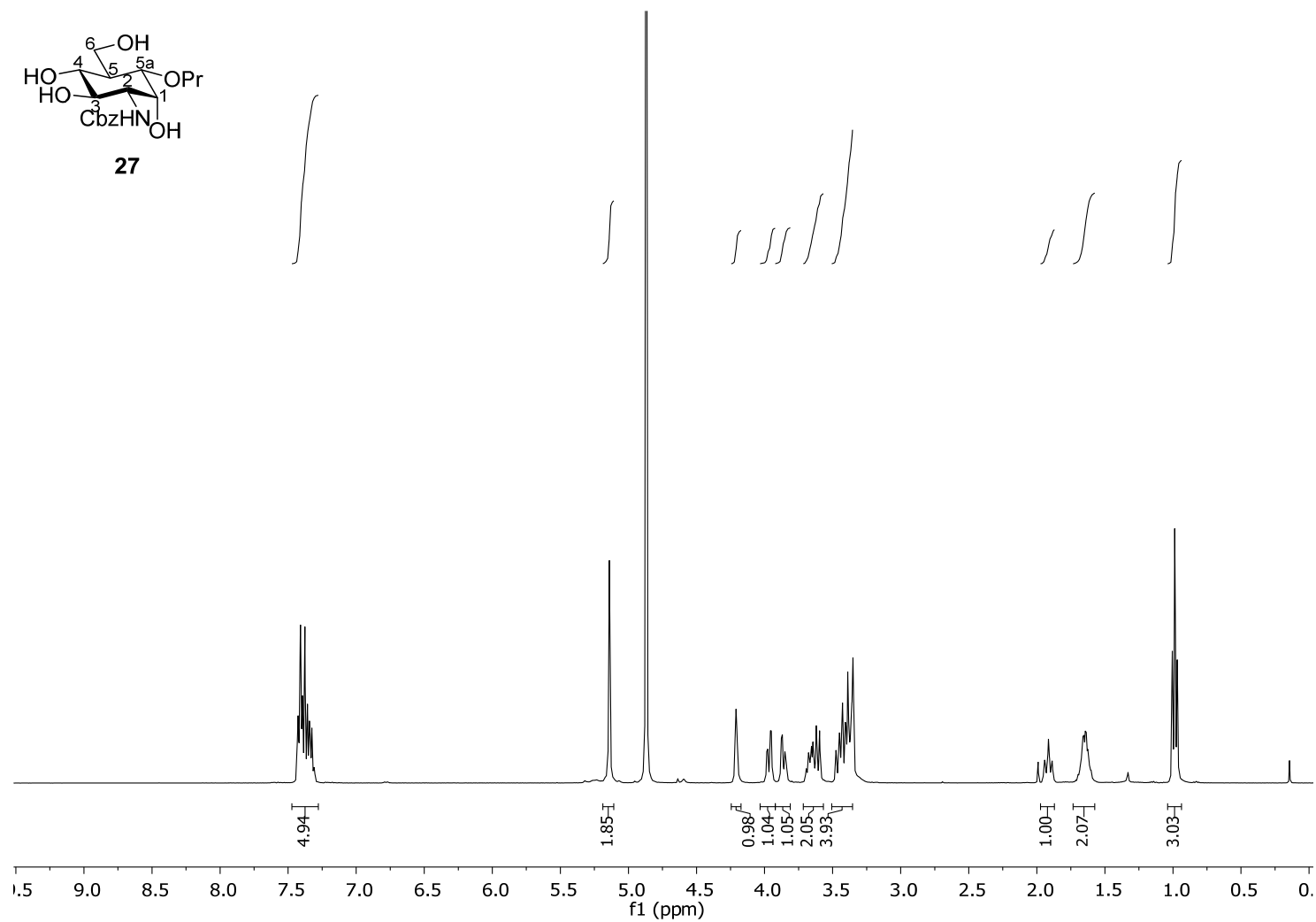
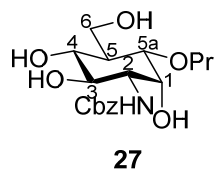
^{13}C NMR spectrum (101 MHz, CD_3OD) of **25**



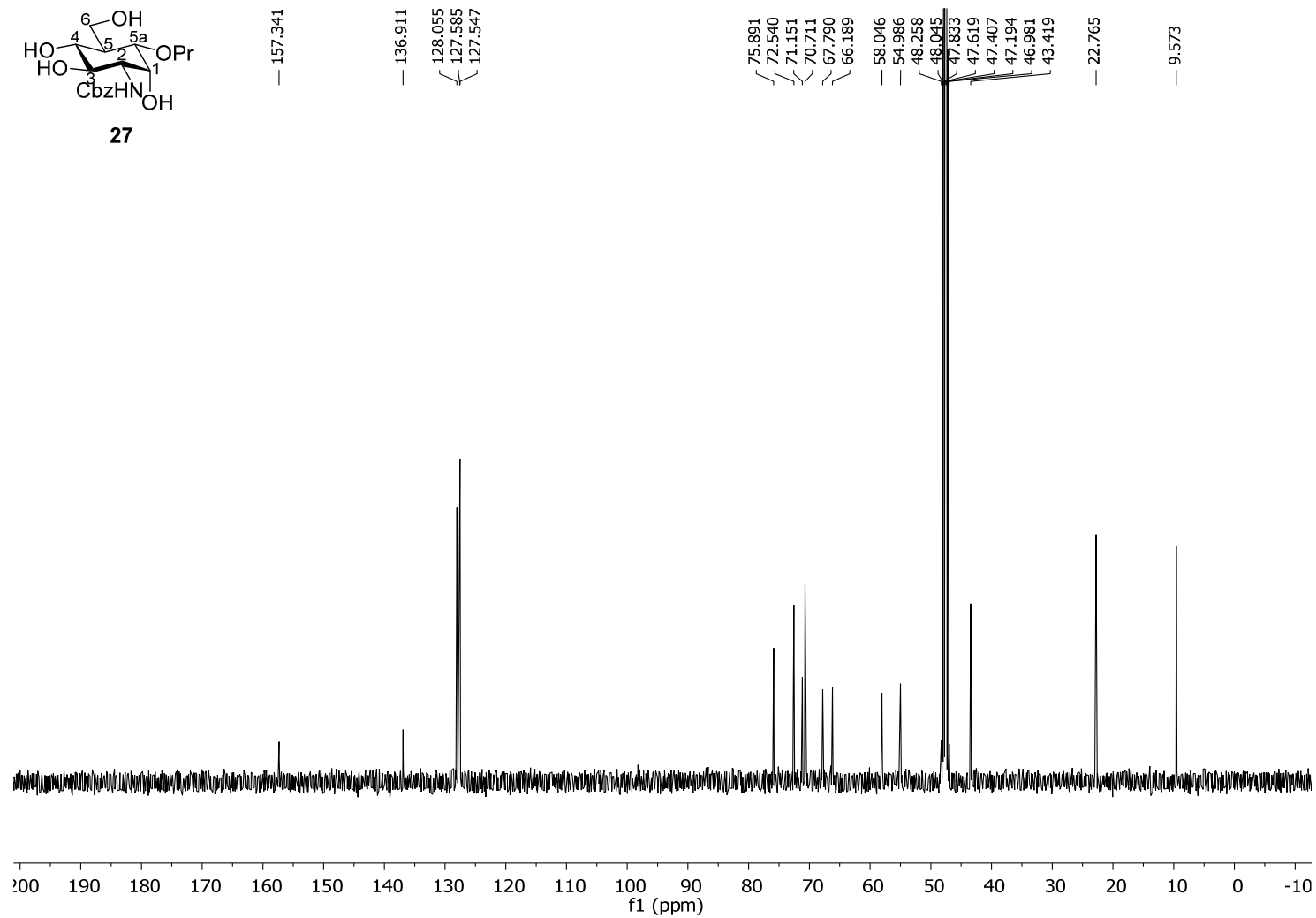
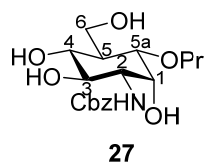
¹H NMR spectrum (400 MHz, CD₃OD) of **26**



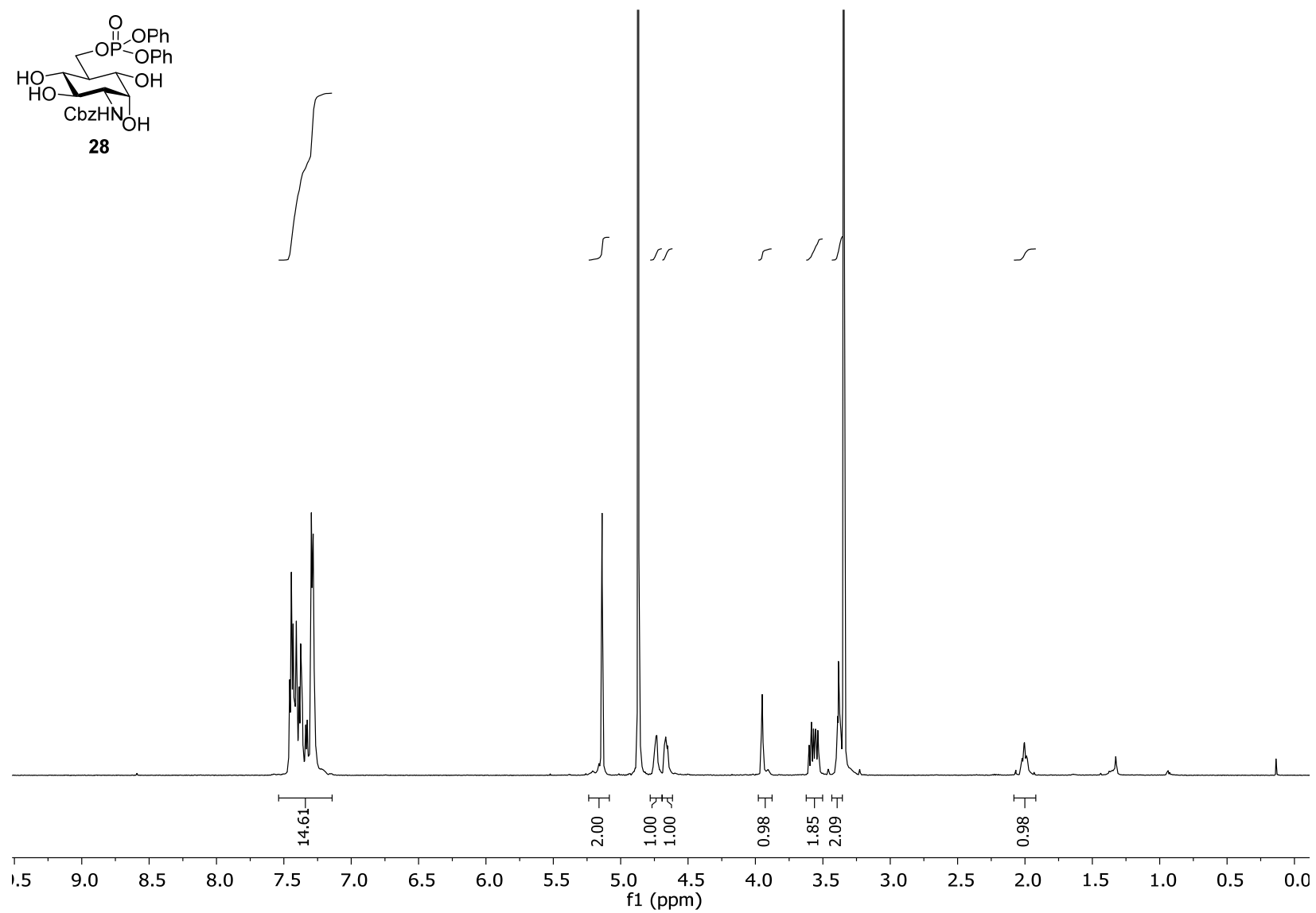
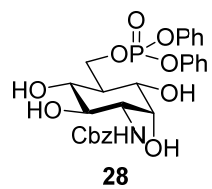
^{13}C NMR spectrum (101 MHz, CD_3OD) of **26**



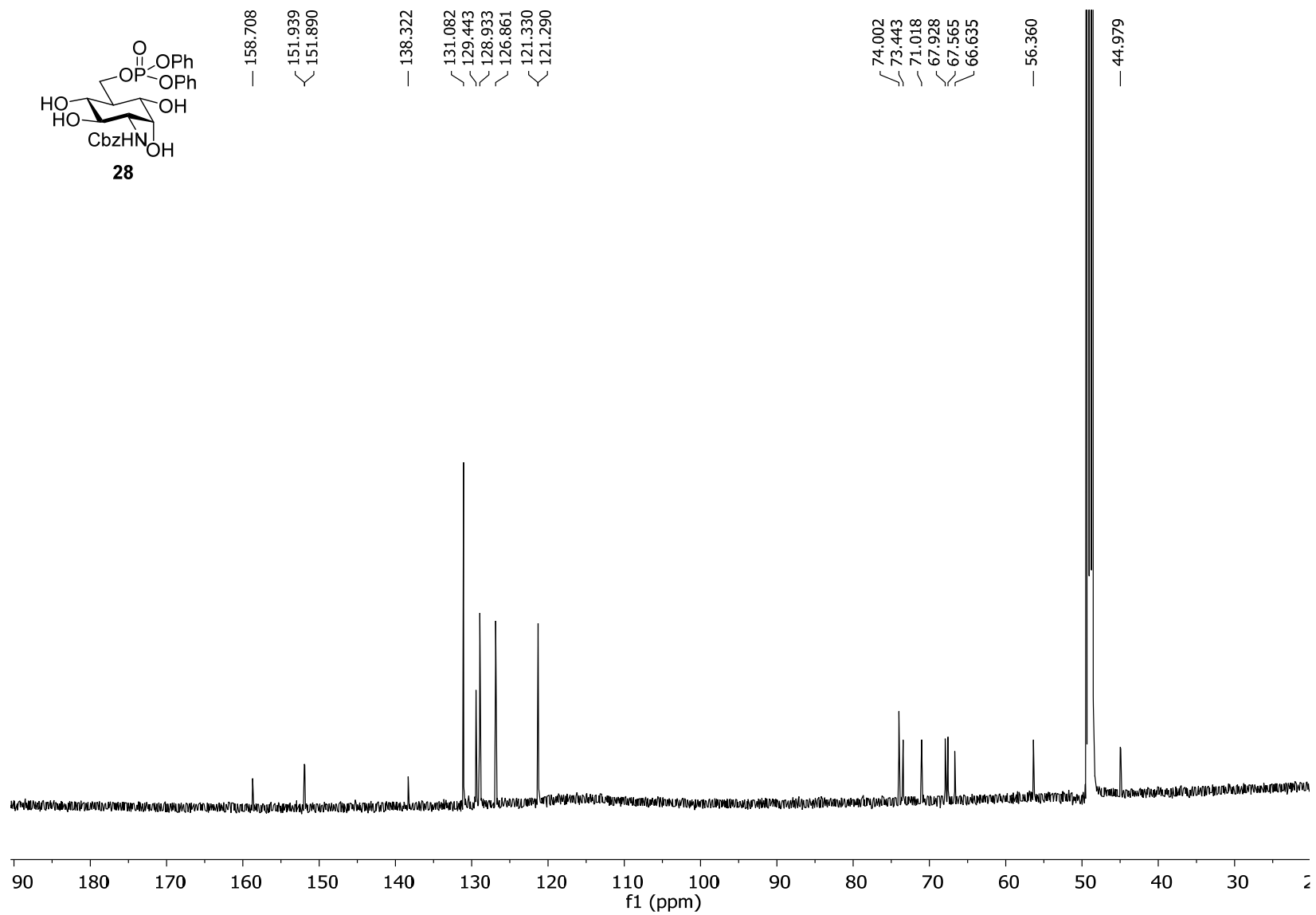
¹H NMR spectrum (400 MHz, CD₃OD) of **27**



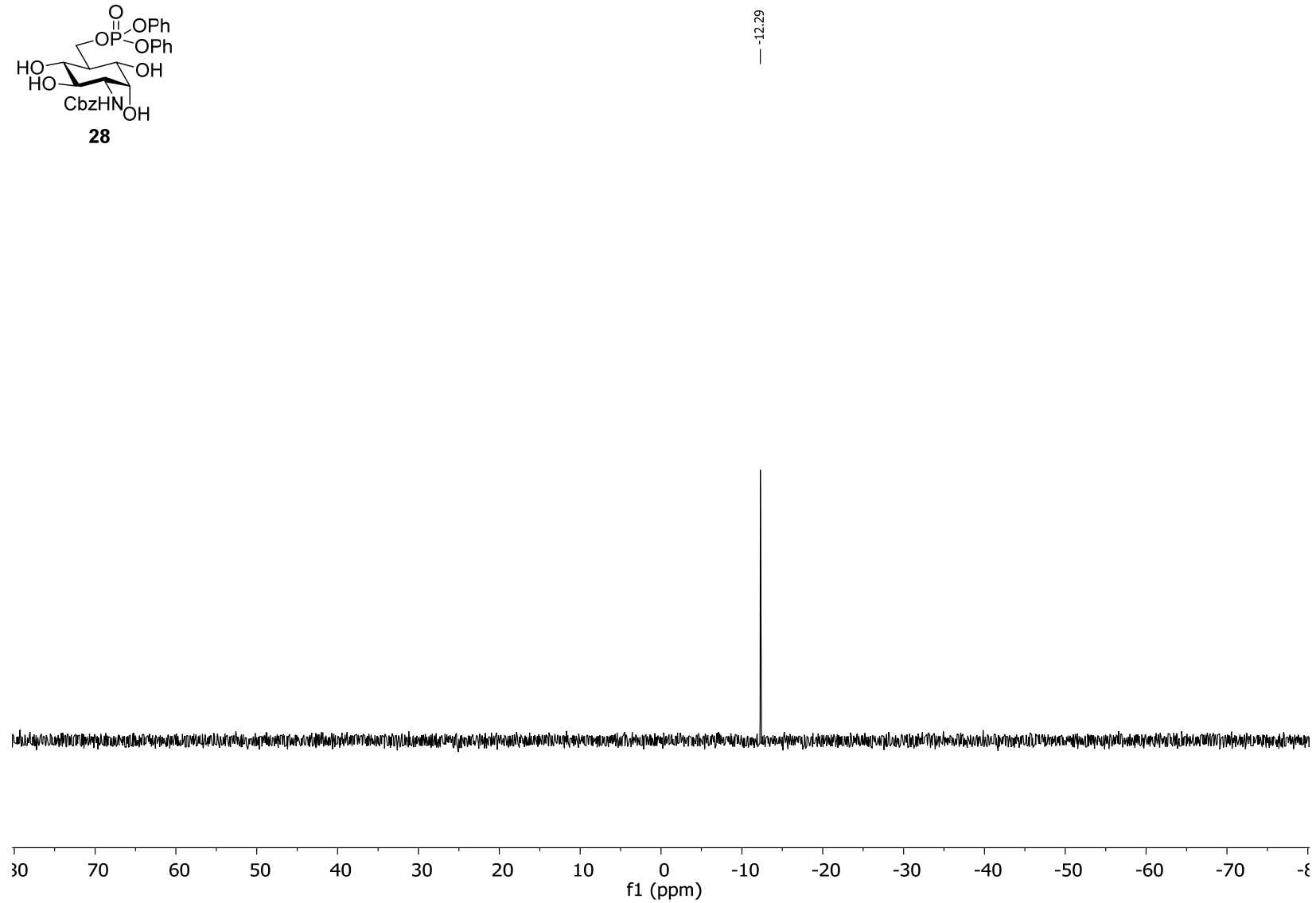
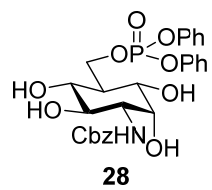
¹³C NMR spectrum (101 MHz, CD₃OD) of **27**



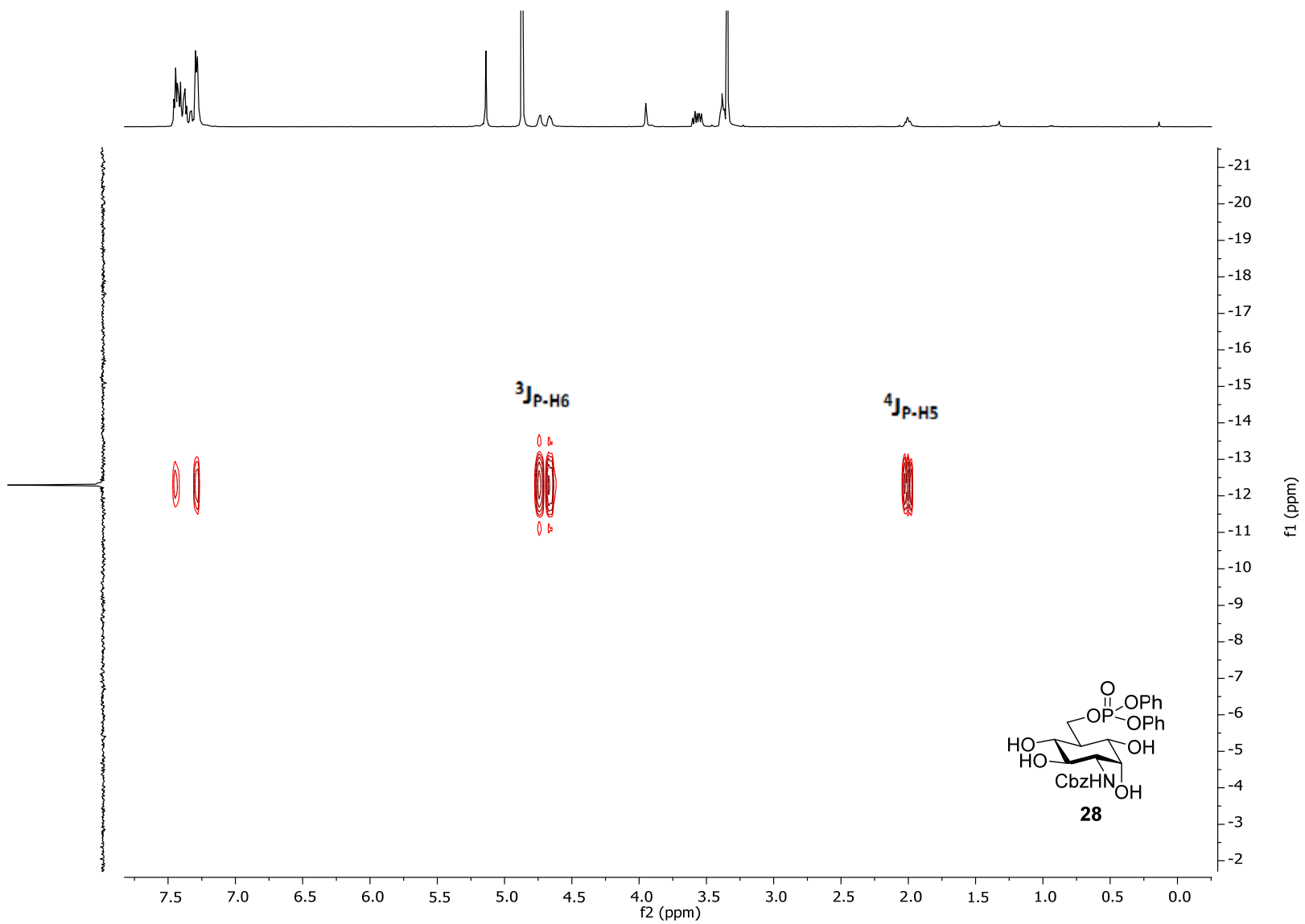
^1H NMR spectrum (600 MHz, CD_3OD) of **28**



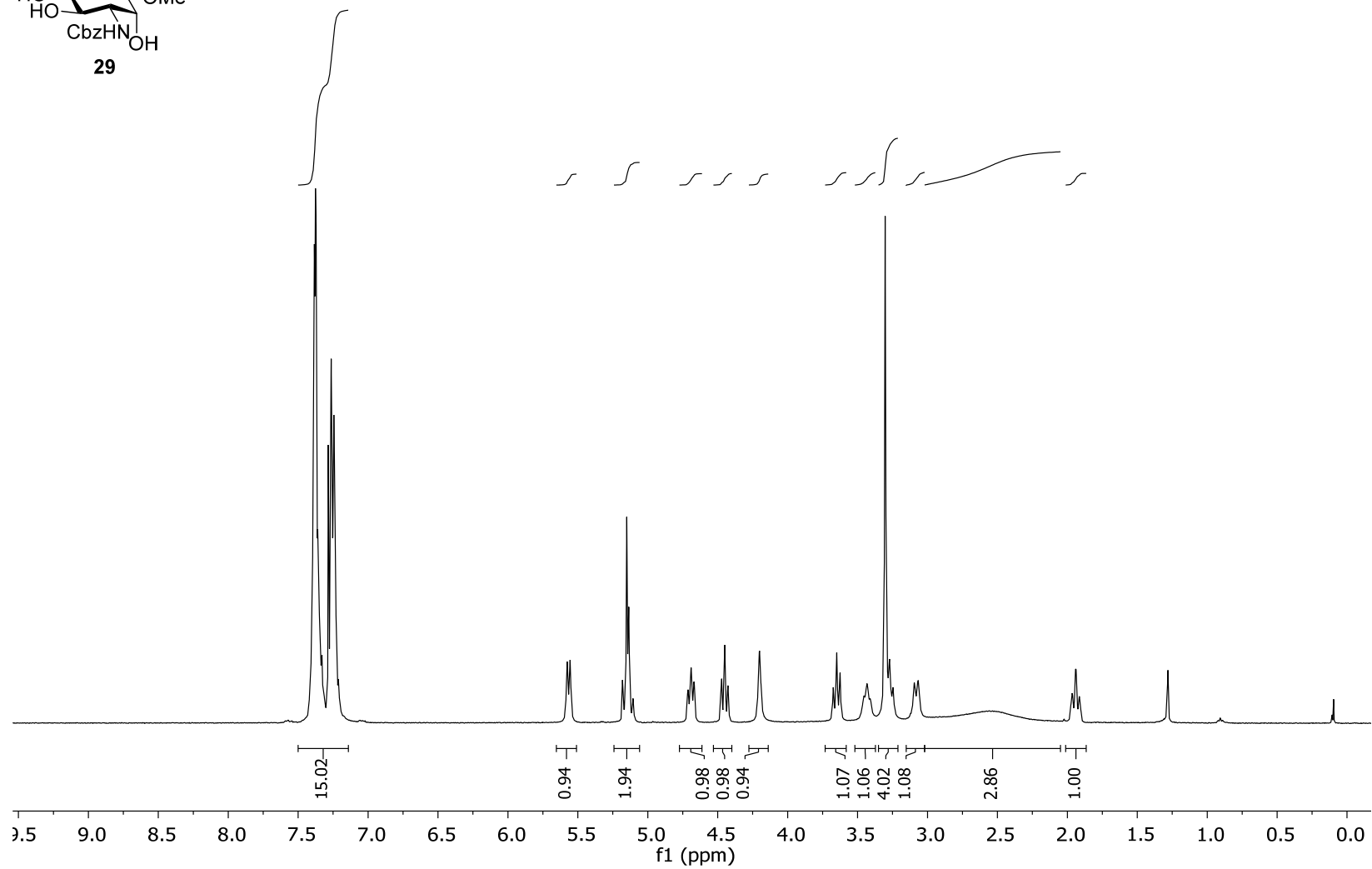
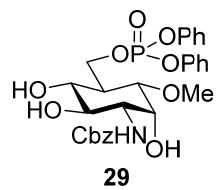
¹³C NMR spectrum (151 MHz, CD₃OD) of **28**



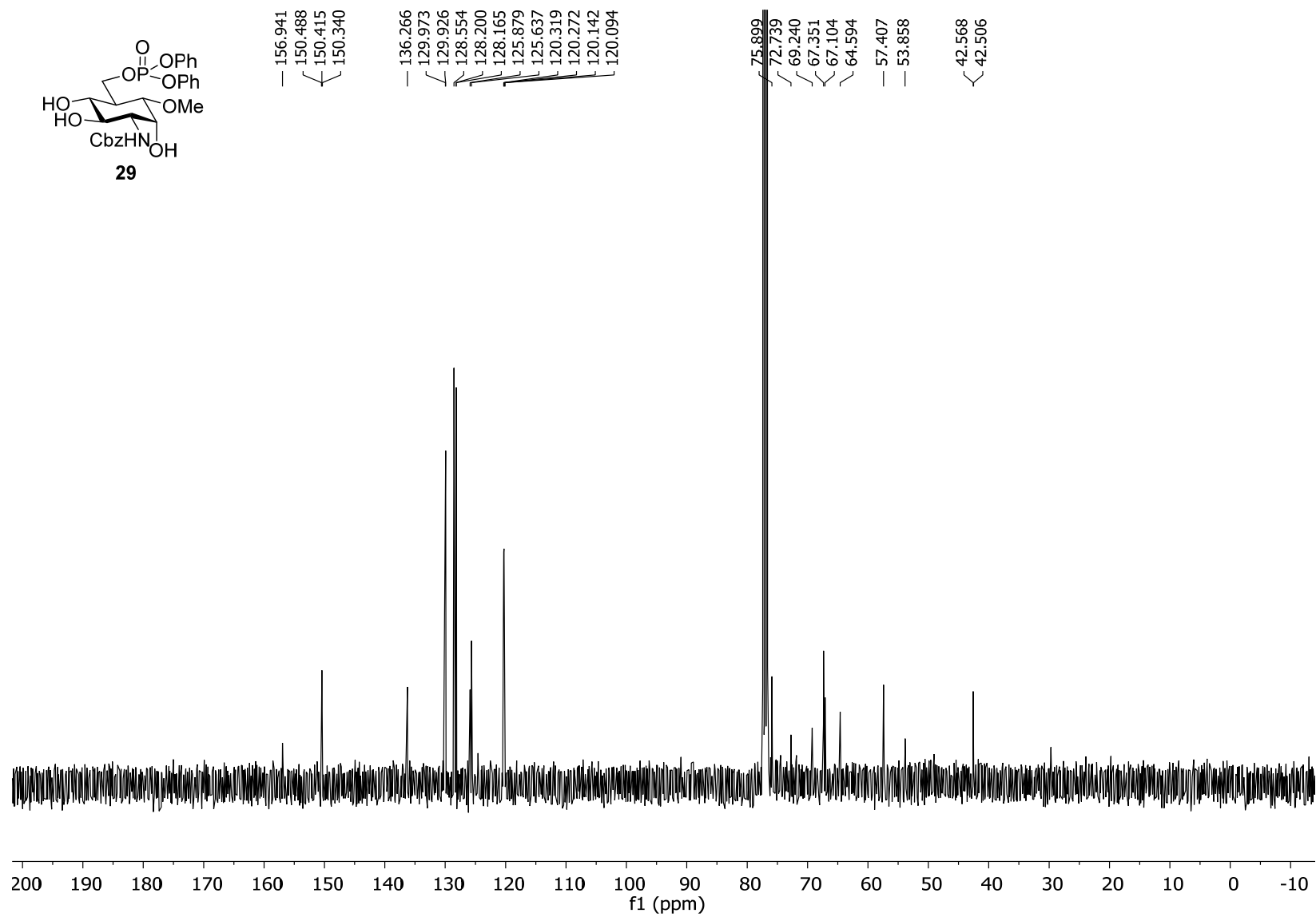
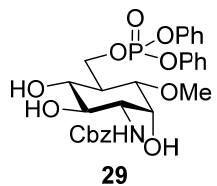
^{31}P NMR spectrum (162 MHz, CD_3OD) of **28**



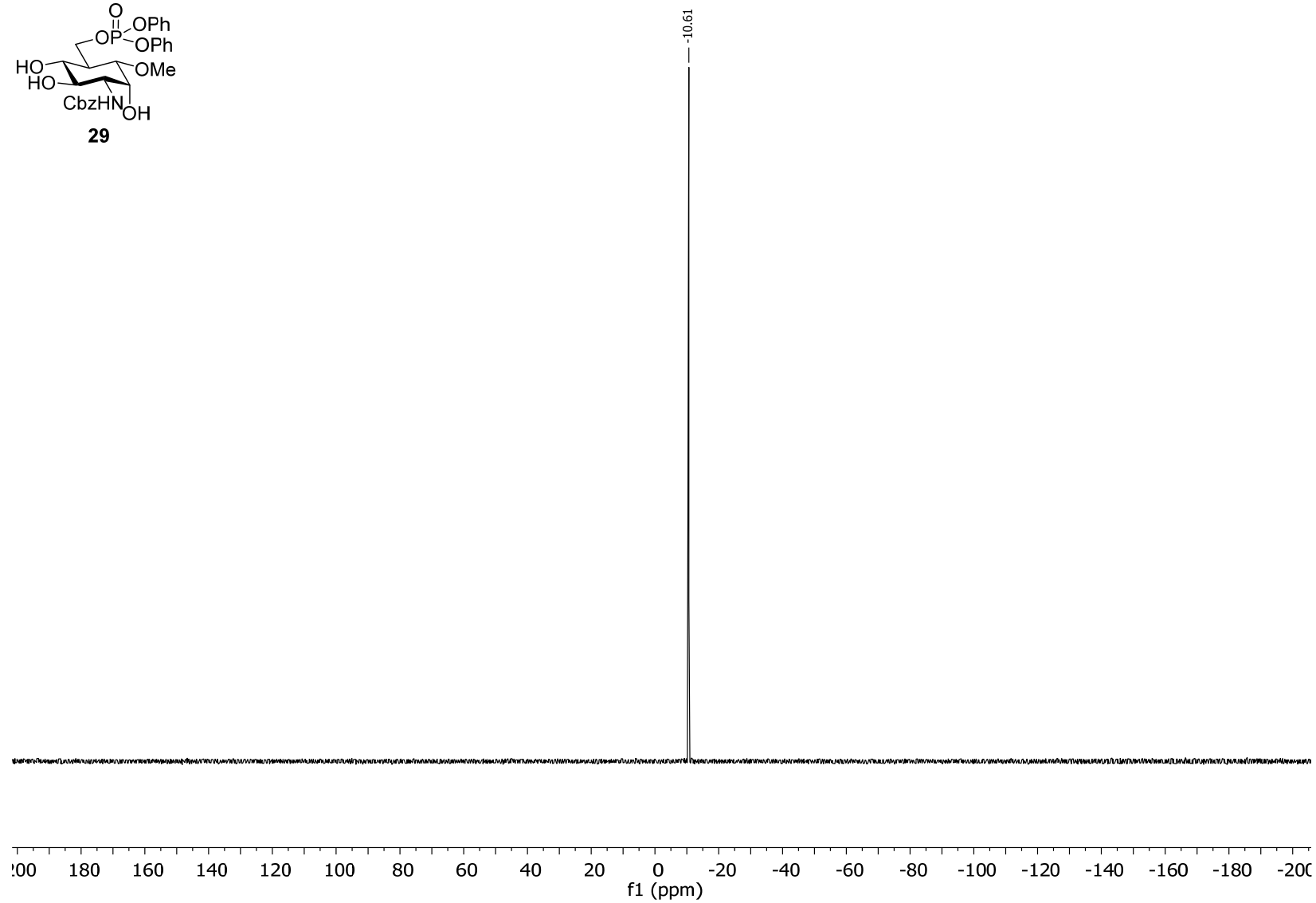
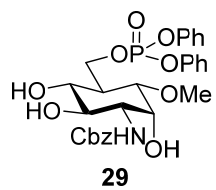
^{31}P - ^1H HMBC NMR spectrum (CD_3OD) of **28**



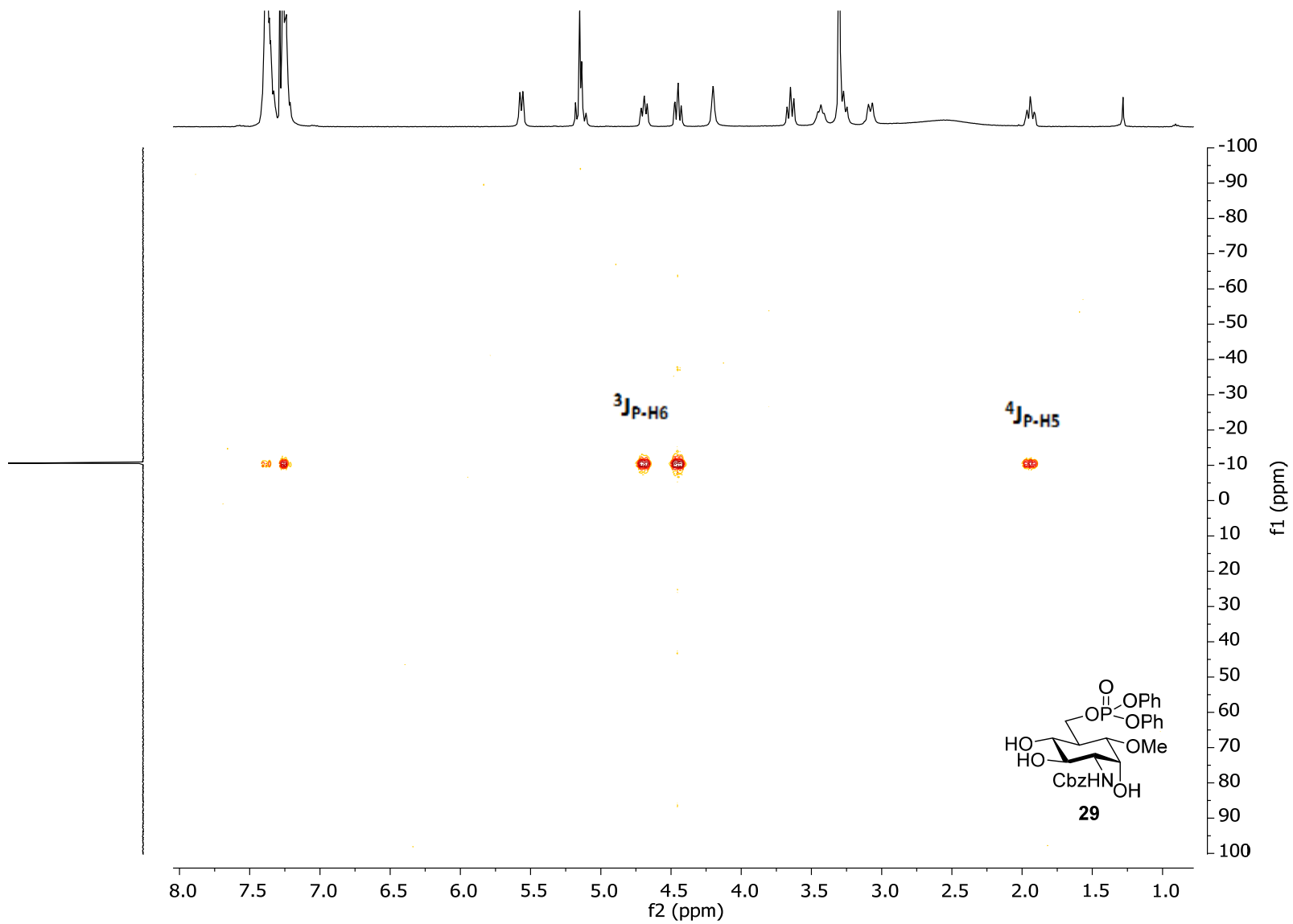
^1H NMR spectrum (400 MHz, CDCl_3) of **29**



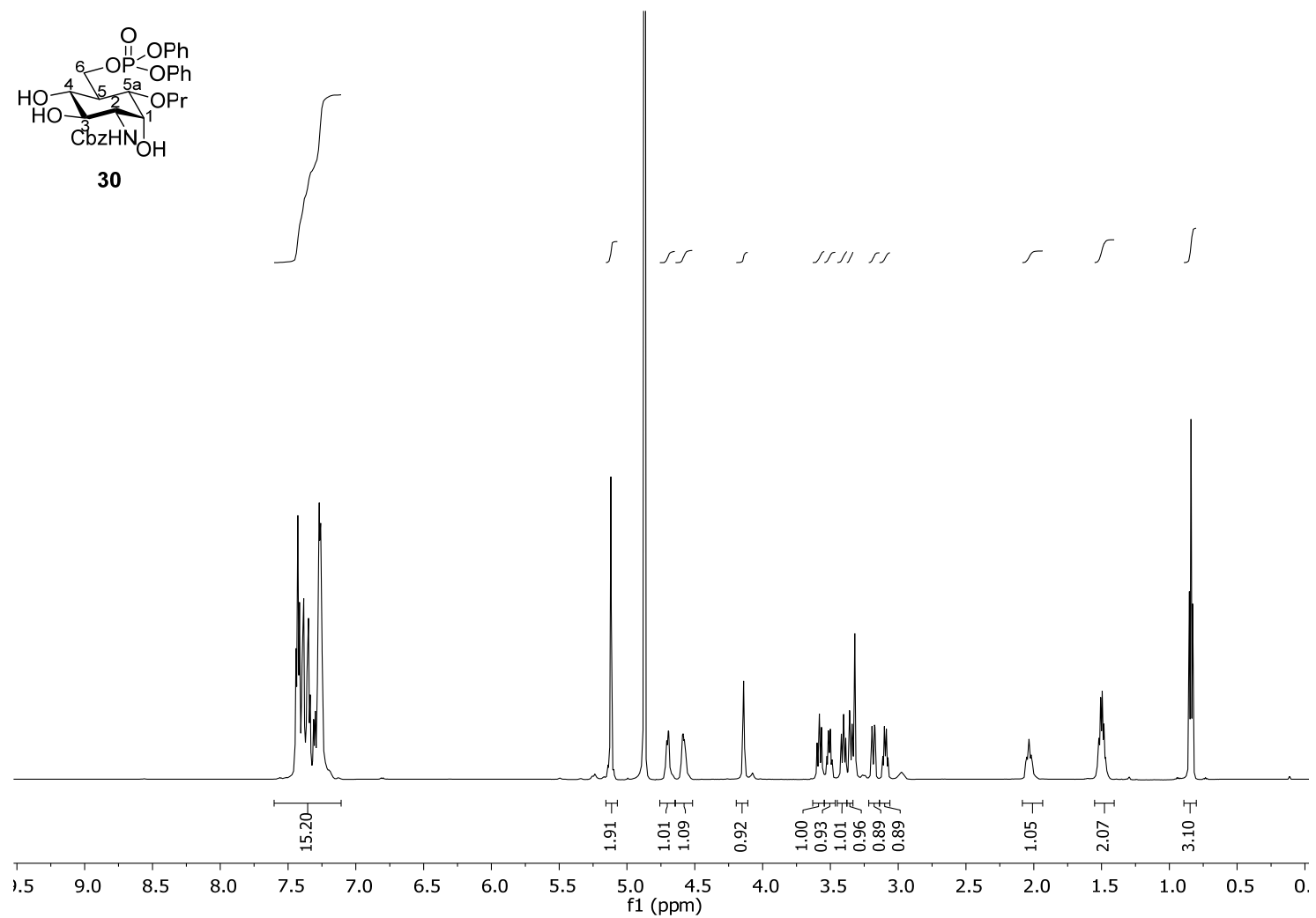
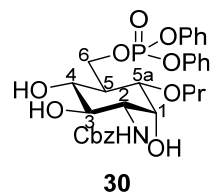
^{13}C NMR spectrum (101 MHz, CDCl_3) of **29**



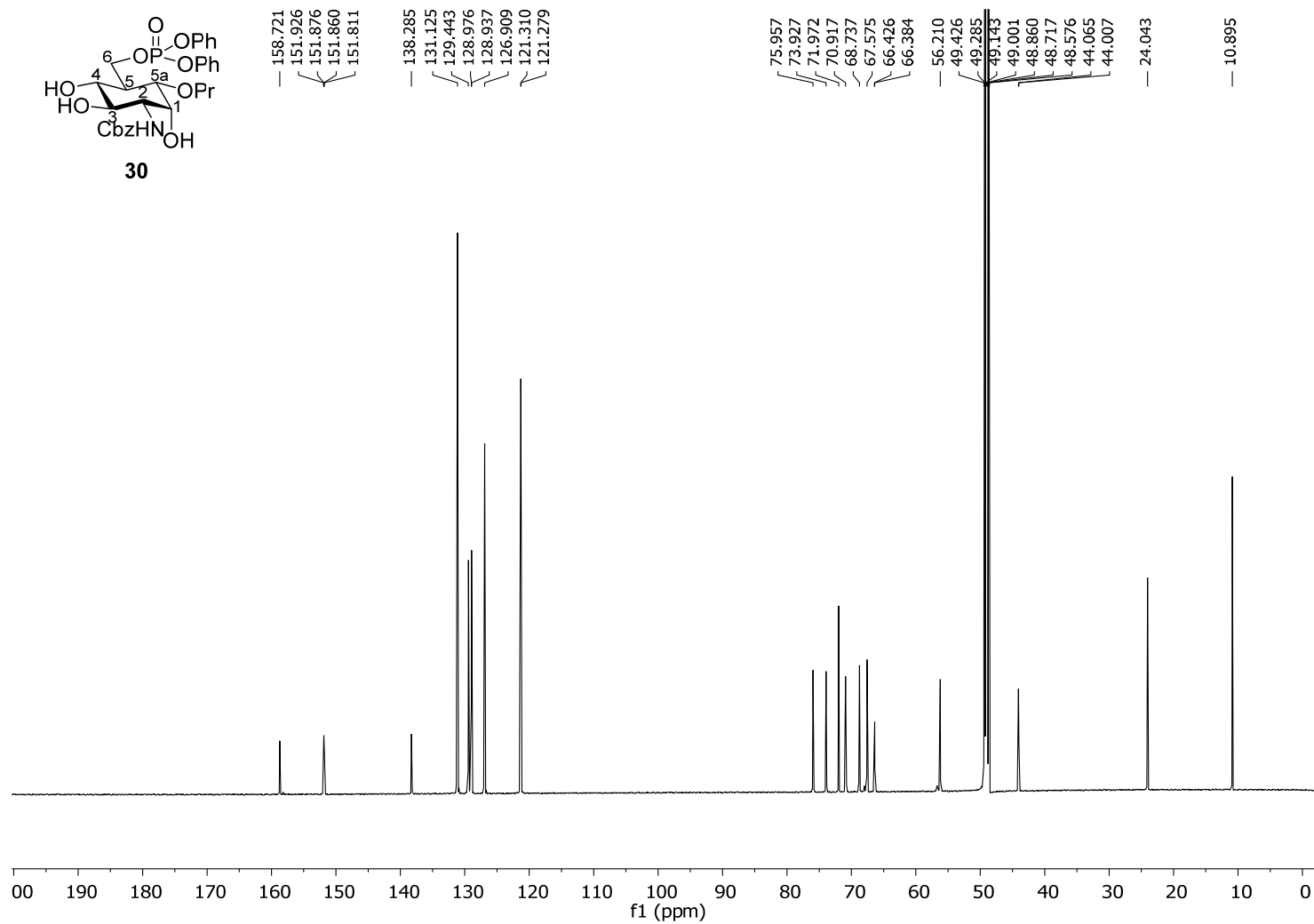
^{31}P NMR spectrum (162 MHz, CDCl_3) of **29**



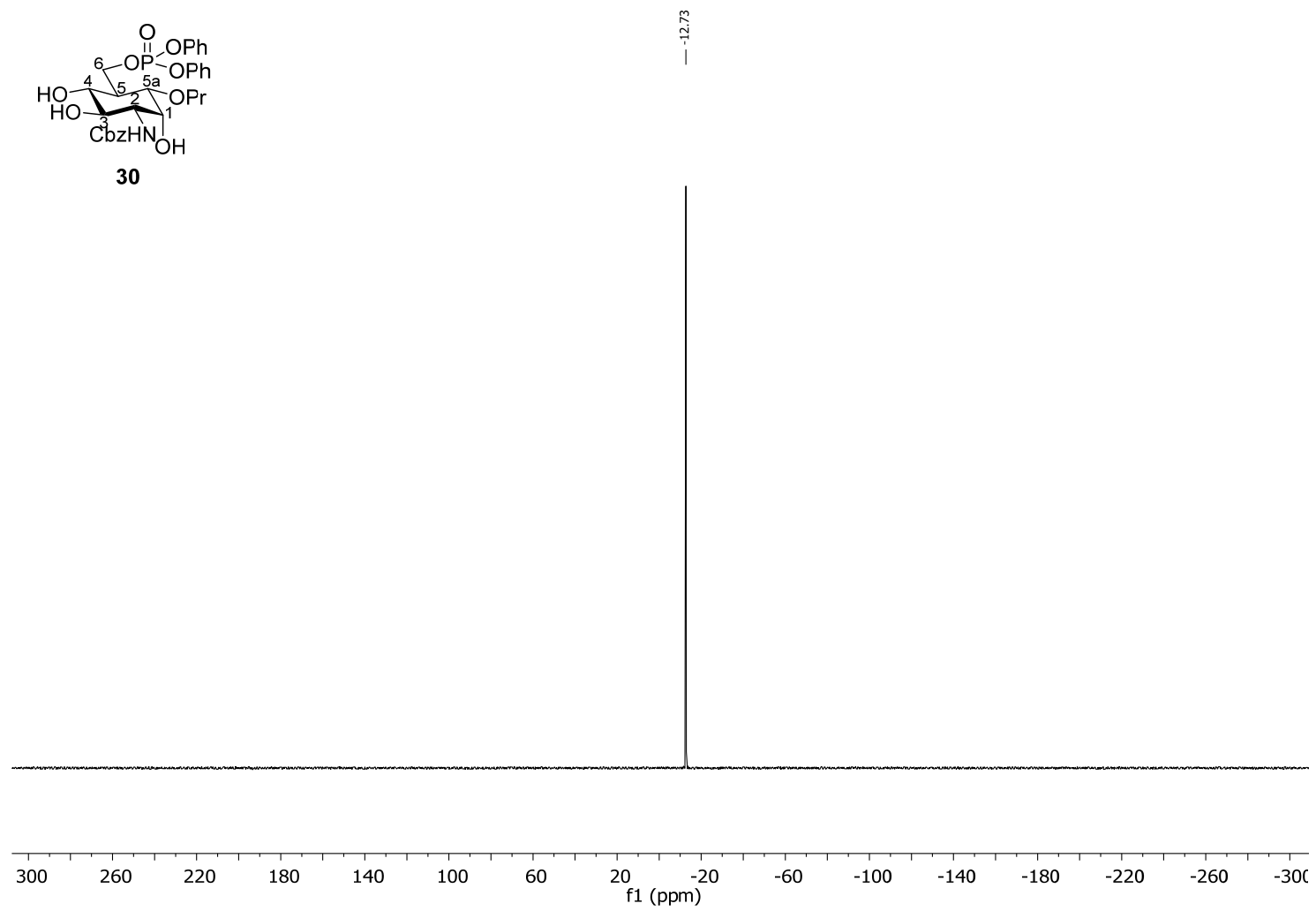
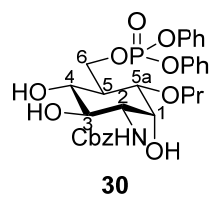
^{31}P - ^1H HMBC NMR spectrum (CDCl_3) of **29**



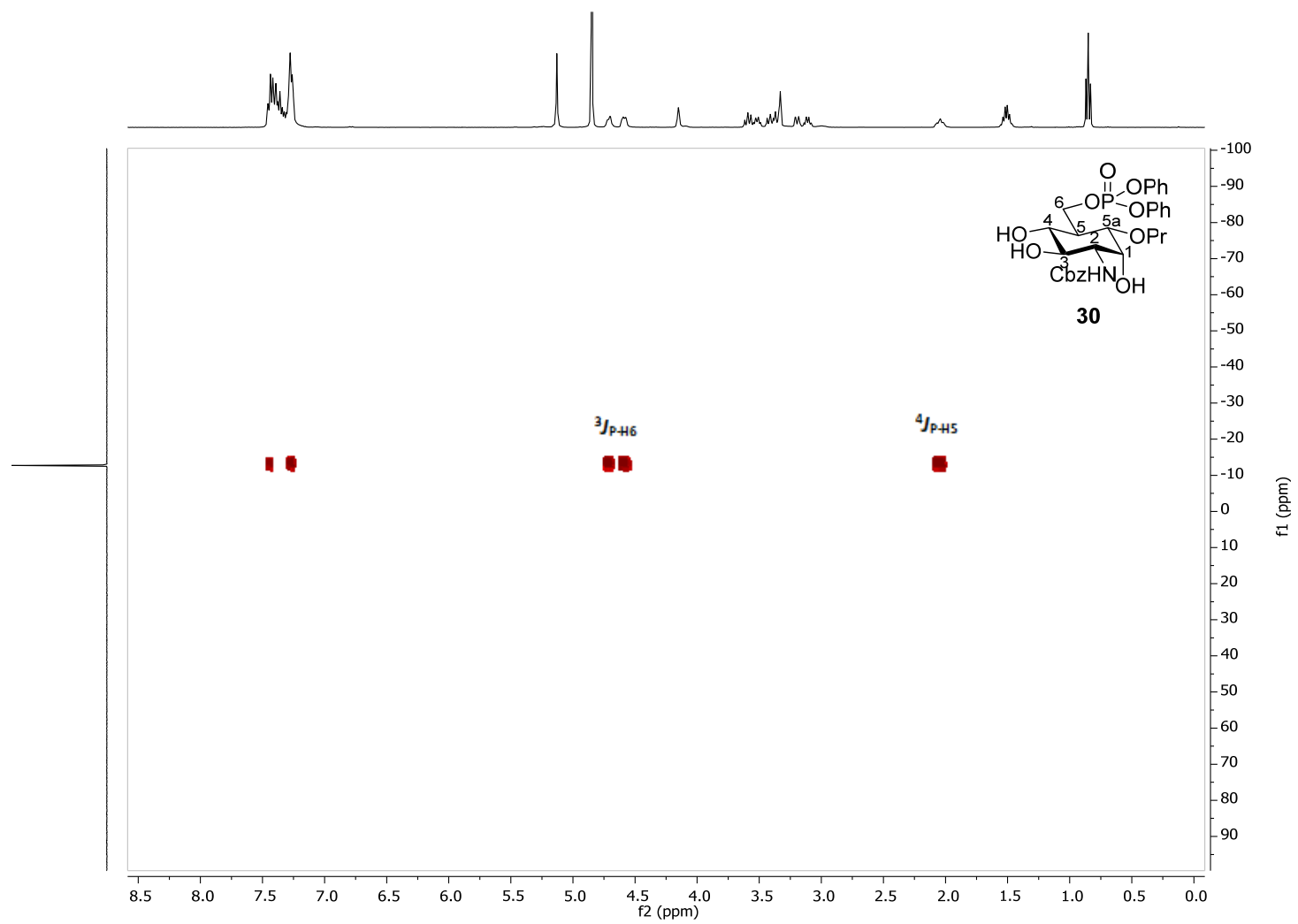
^1H NMR spectrum (400 MHz, CD_3OD) of **30**



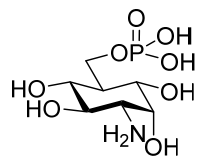
¹³C NMR spectrum (101 MHz, CD₃OD) of **30**



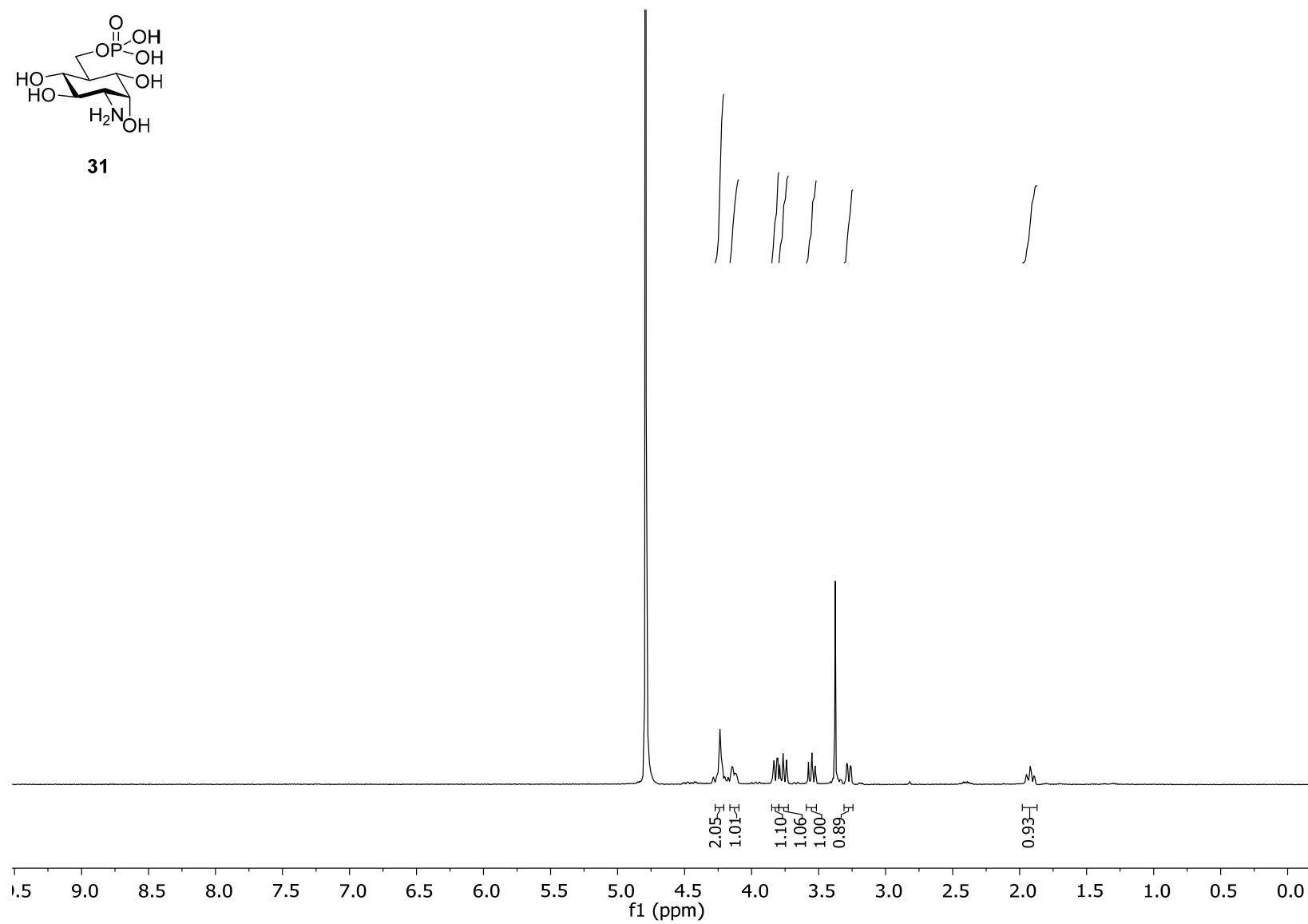
^{31}P NMR spectrum (162 MHz, CD_3OD) of **30**



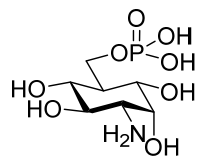
^{31}P - ^1H HMBC NMR spectrum (CD_3OD) of **30**



31

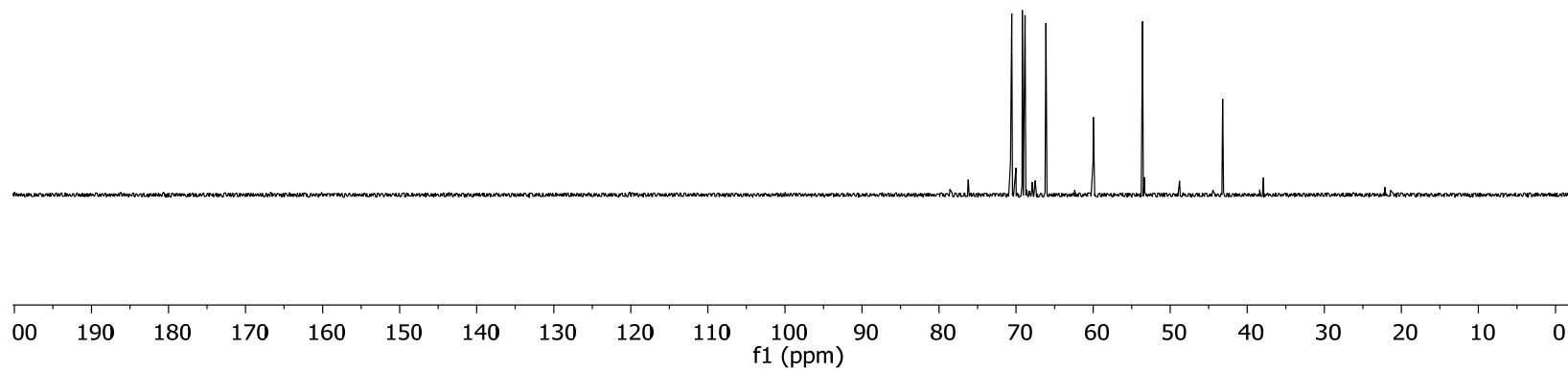


^1H NMR spectrum (400 MHz, D_2O) of **31**

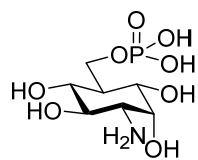


31

70.574
69.200
68.838
66.127
60.012
59.979
— 53.590
43.190
43.136

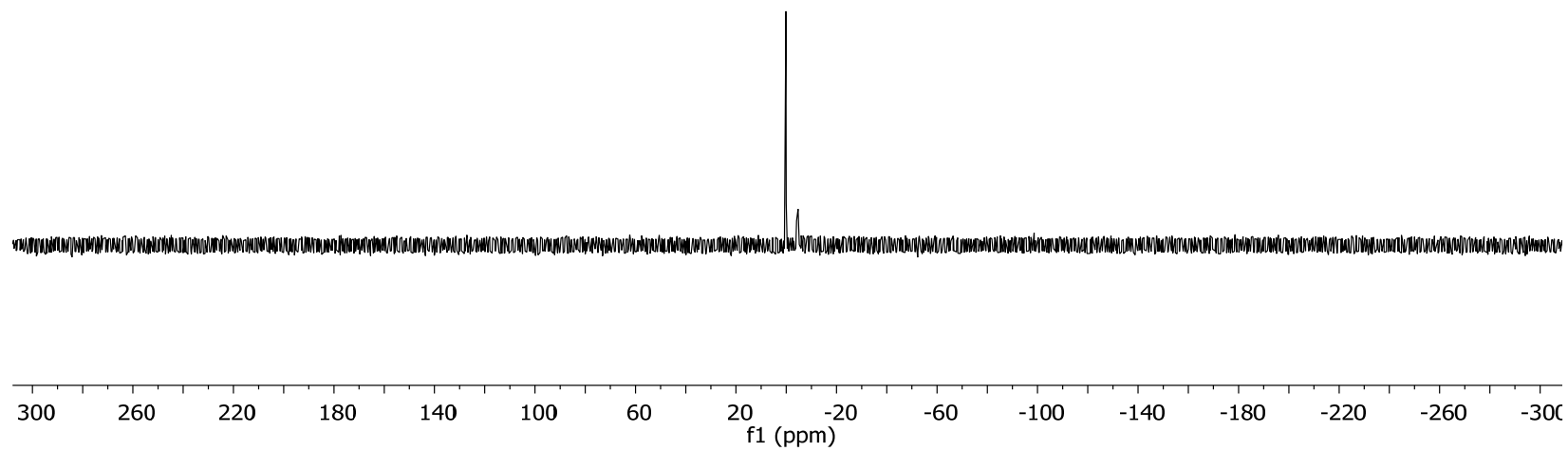


^{13}C NMR spectrum (151 MHz, D_2O) of **31**

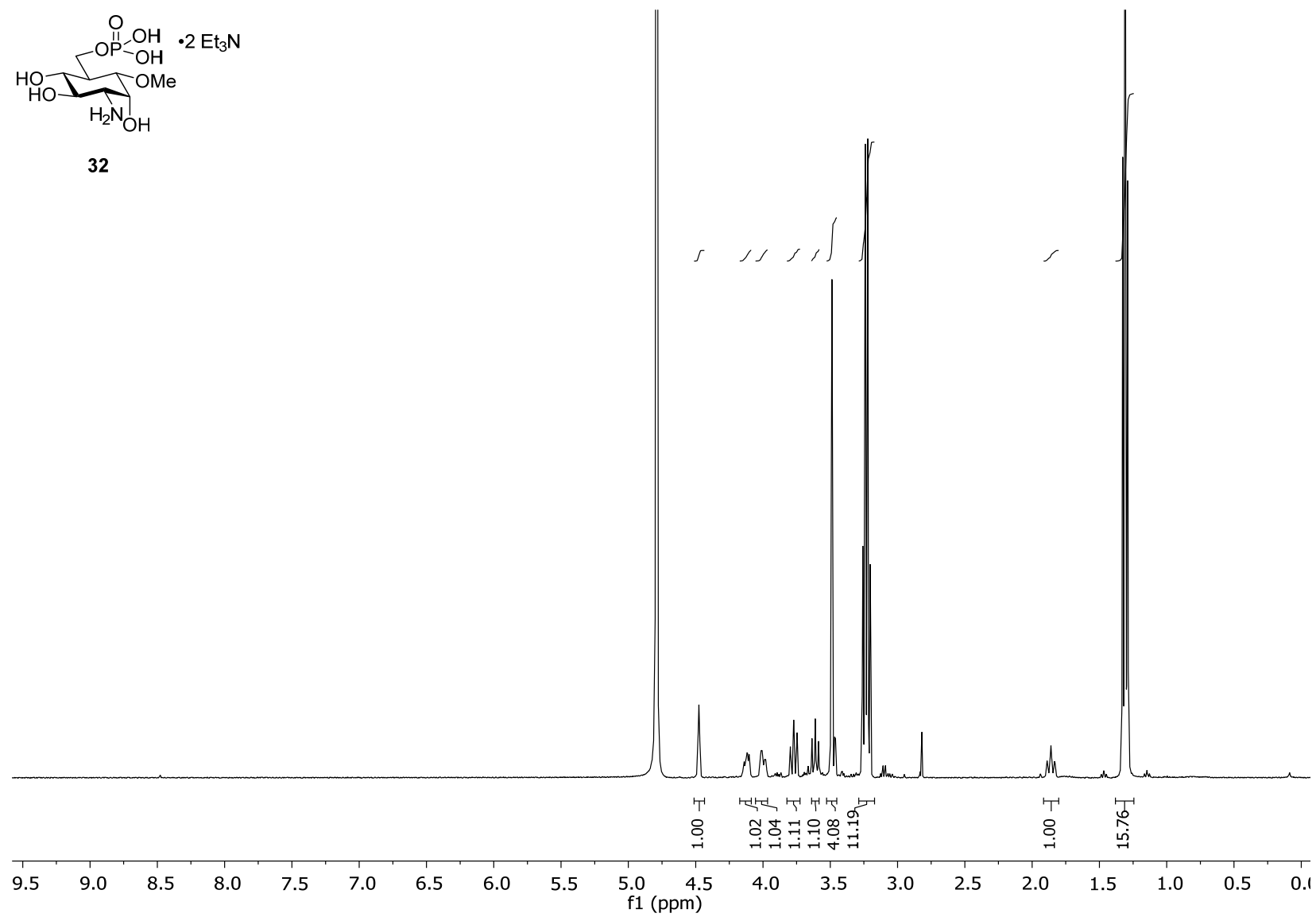
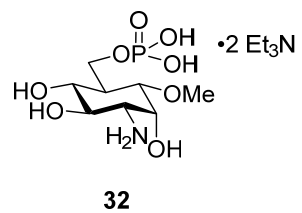


31

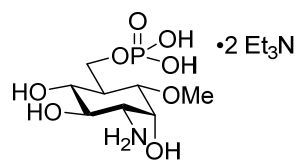
— 0.12



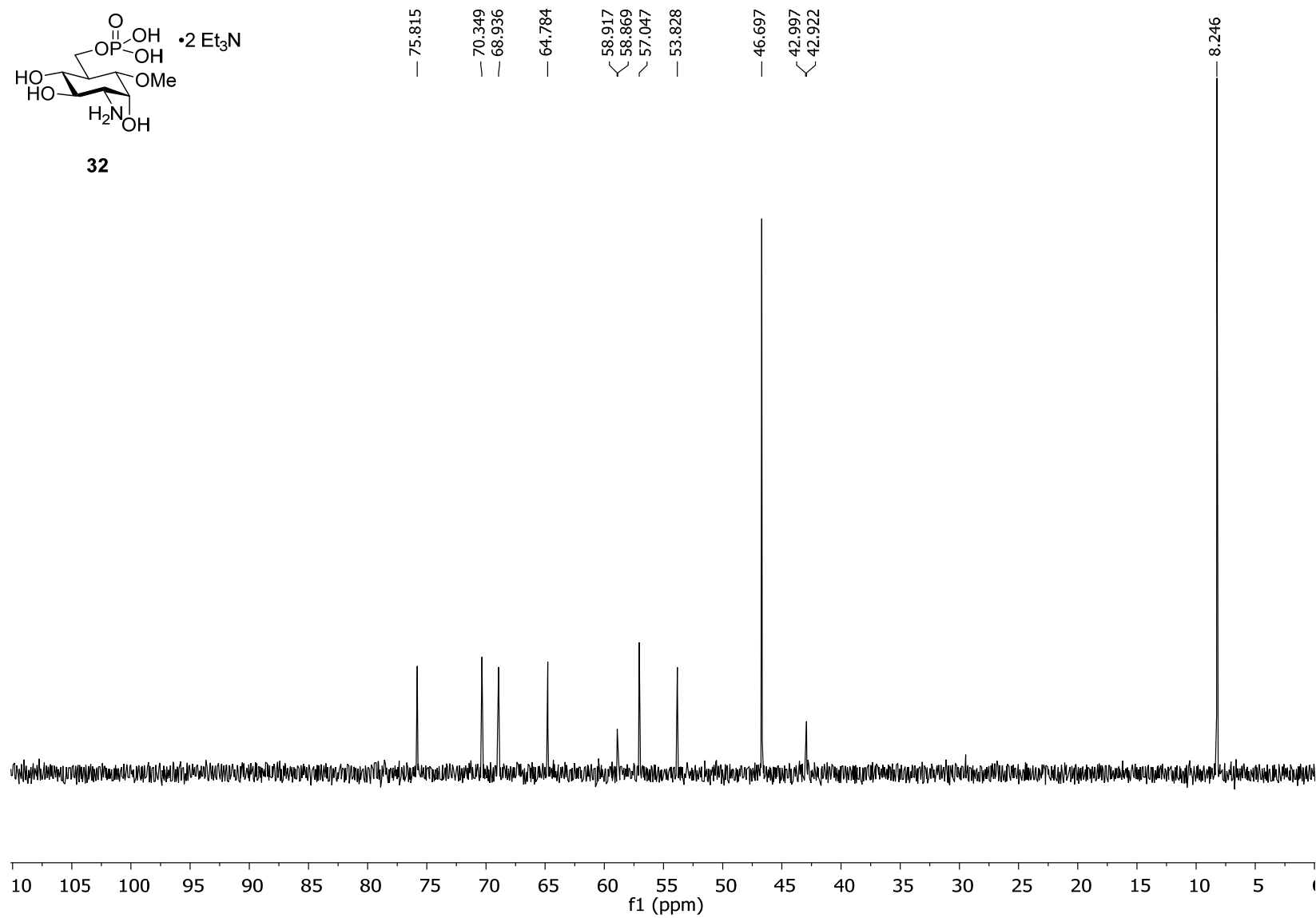
^{31}P NMR spectrum (CDCl₃) of **31**



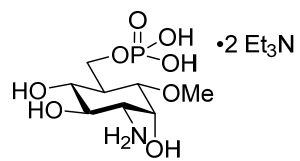
^1H NMR spectrum (400 MHz, D_2O) of **32**



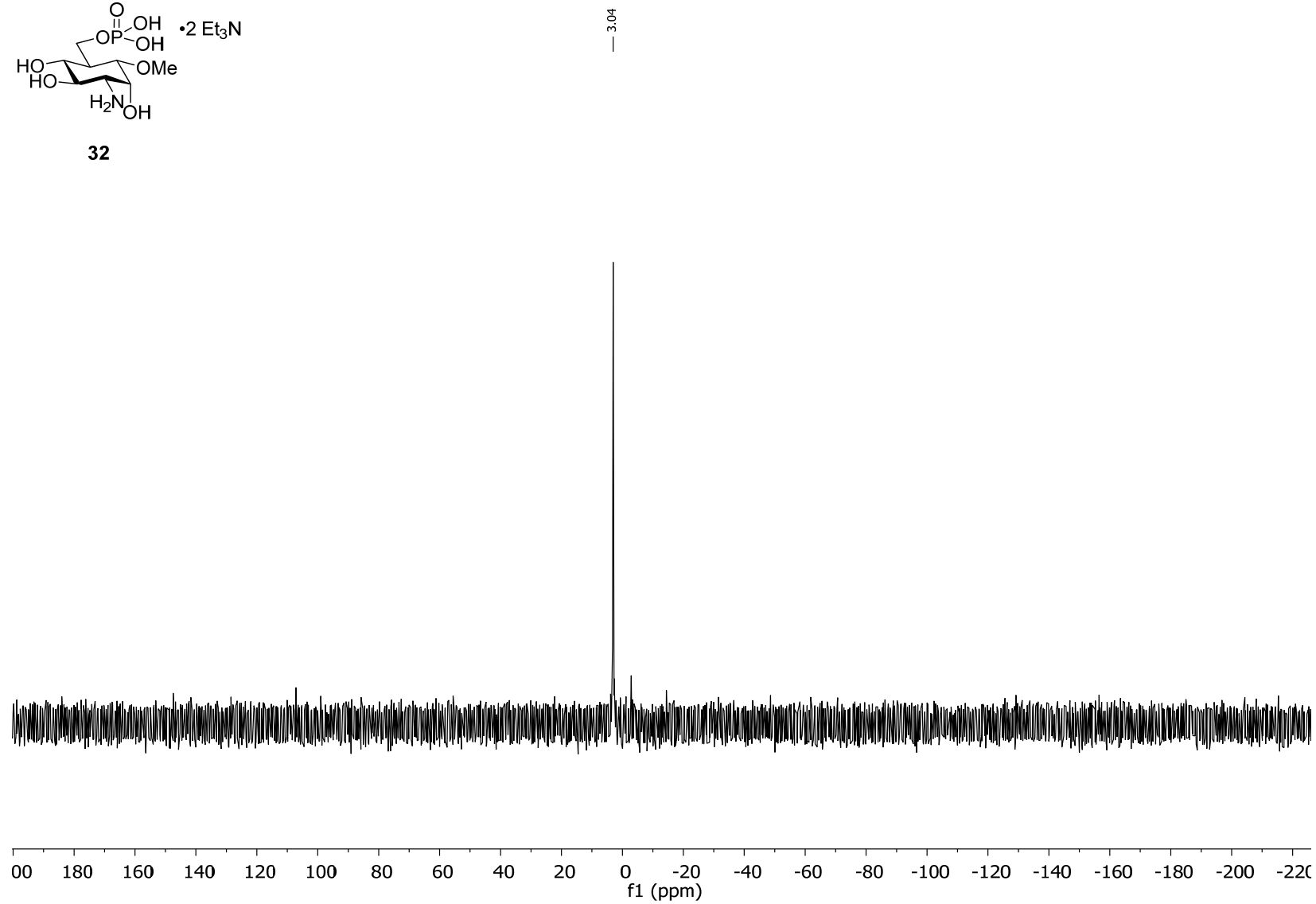
32



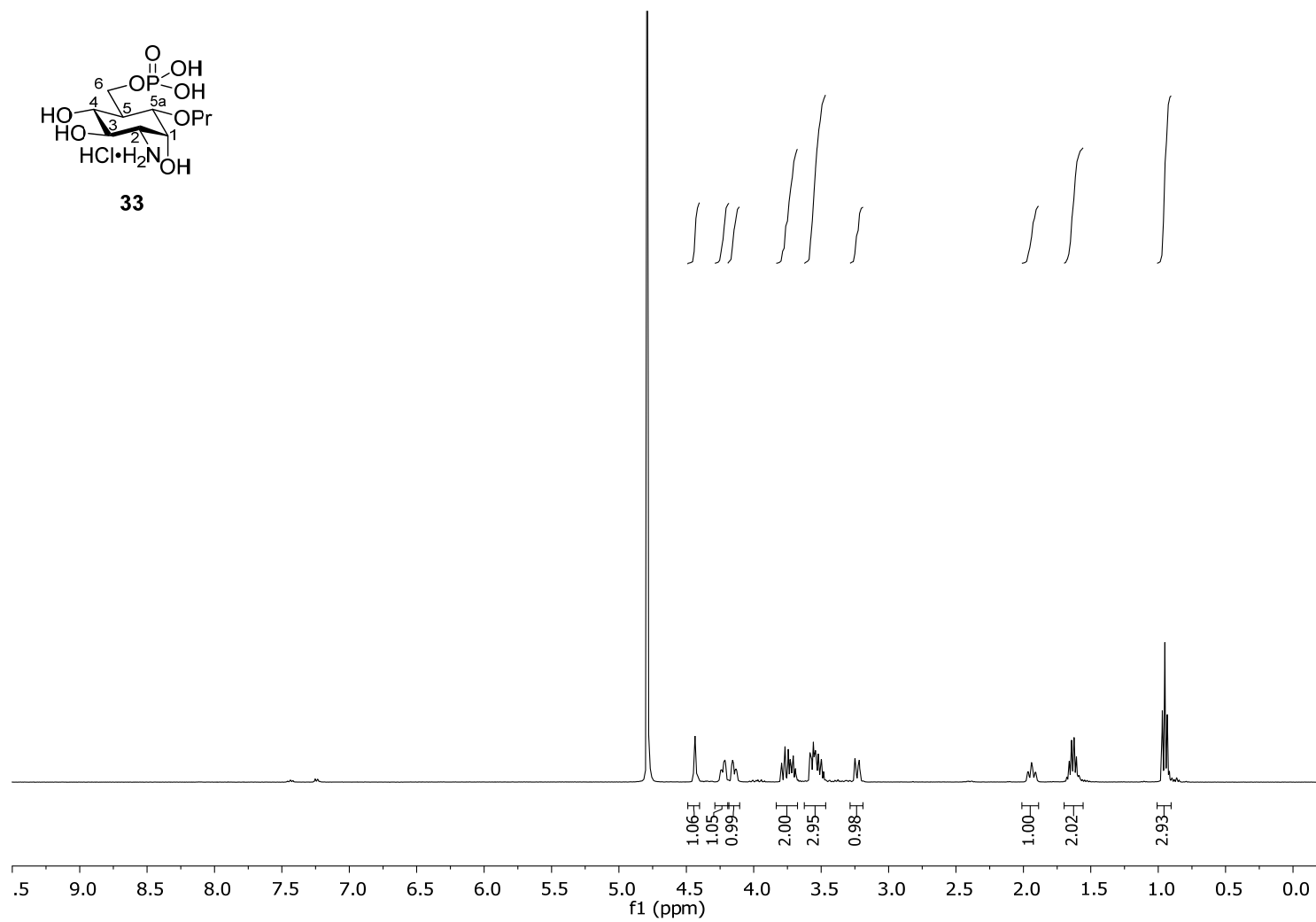
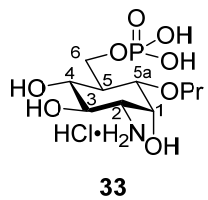
¹³C NMR spectrum (101 MHz, D₂O) of **32**



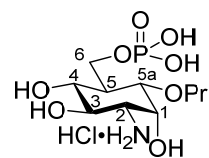
32



^3P NMR spectrum (162 MHz, D_2O) of **32**

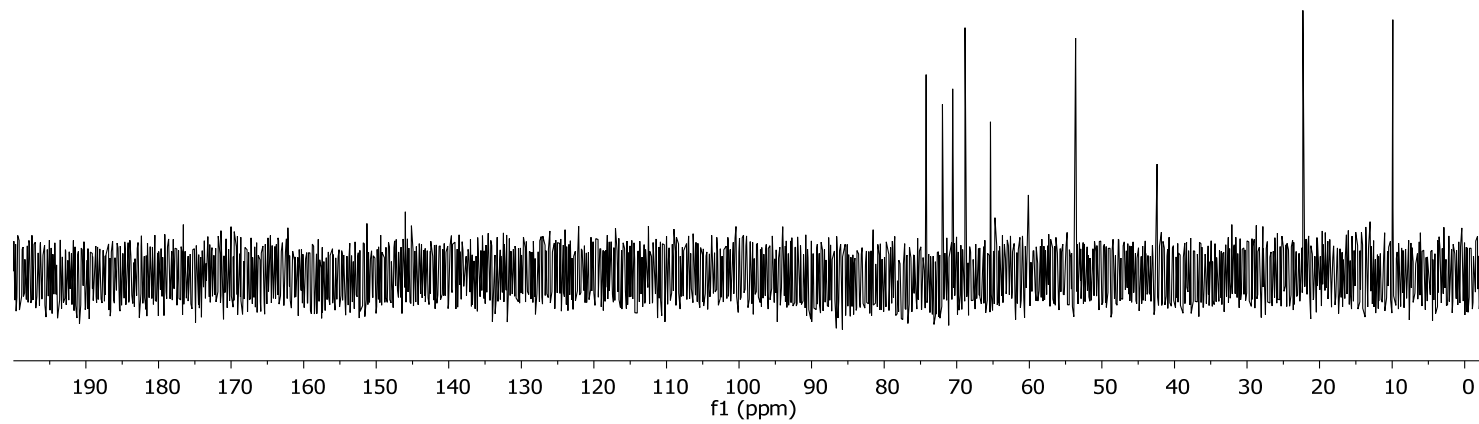


¹H NMR spectrum (400 MHz, D₂O) of **33**

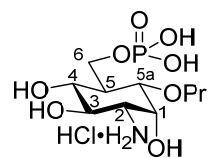


33

74.230
71.959
70.566
68.853
65.351
60.161
60.115
53.610
42.486
42.393
22.297
9.904

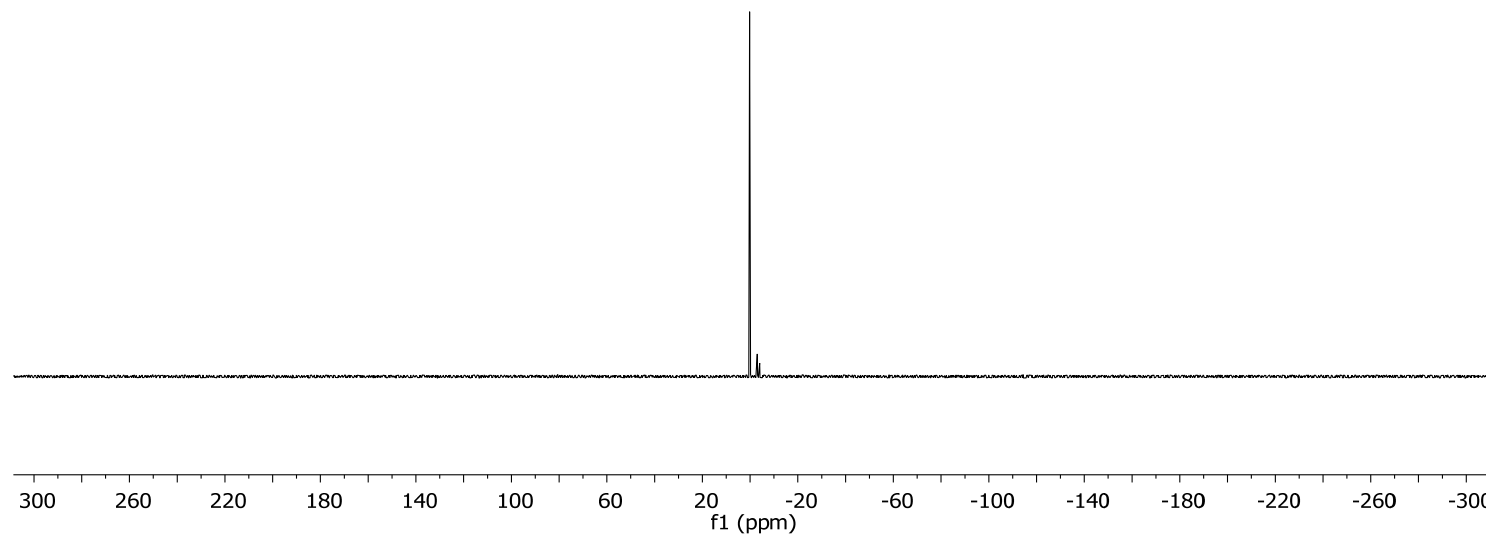


^{13}C NMR spectrum (101 MHz, D_2O) of **33**



33

— 0.20



^{31}P NMR spectrum (162 MHz, D_2O) of **33**