

“Total syntheses of D-*allo*-1-deoxynojirimycin and L-*talo*-1-deoxyonojirimycin *via* reductive cyclisation”

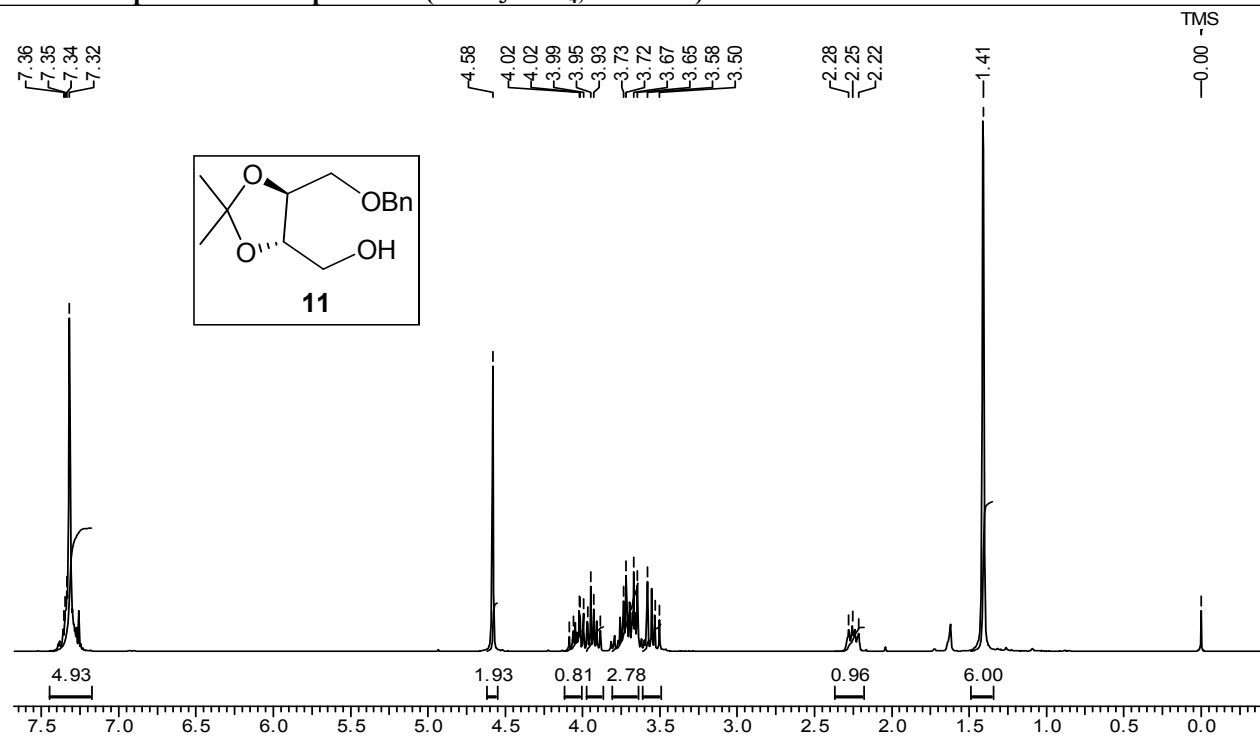
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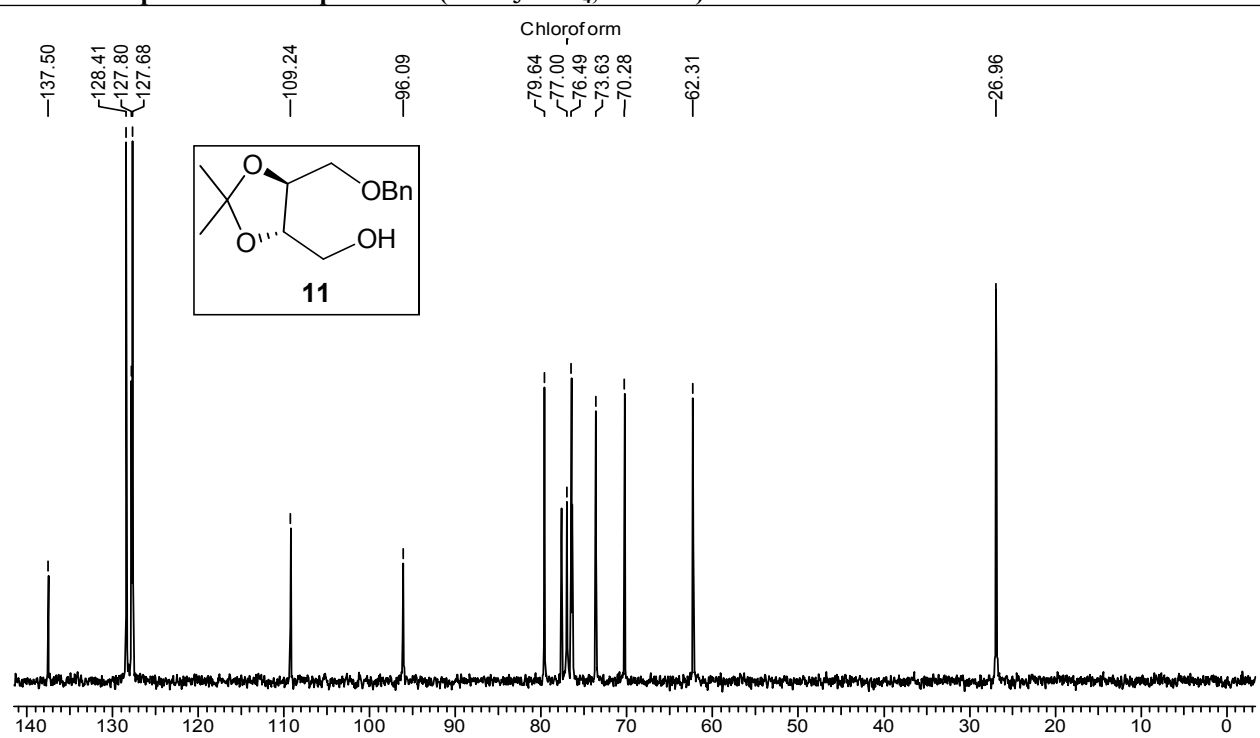
Supporting Information:

Copies of ^1H and ^{13}C NMR

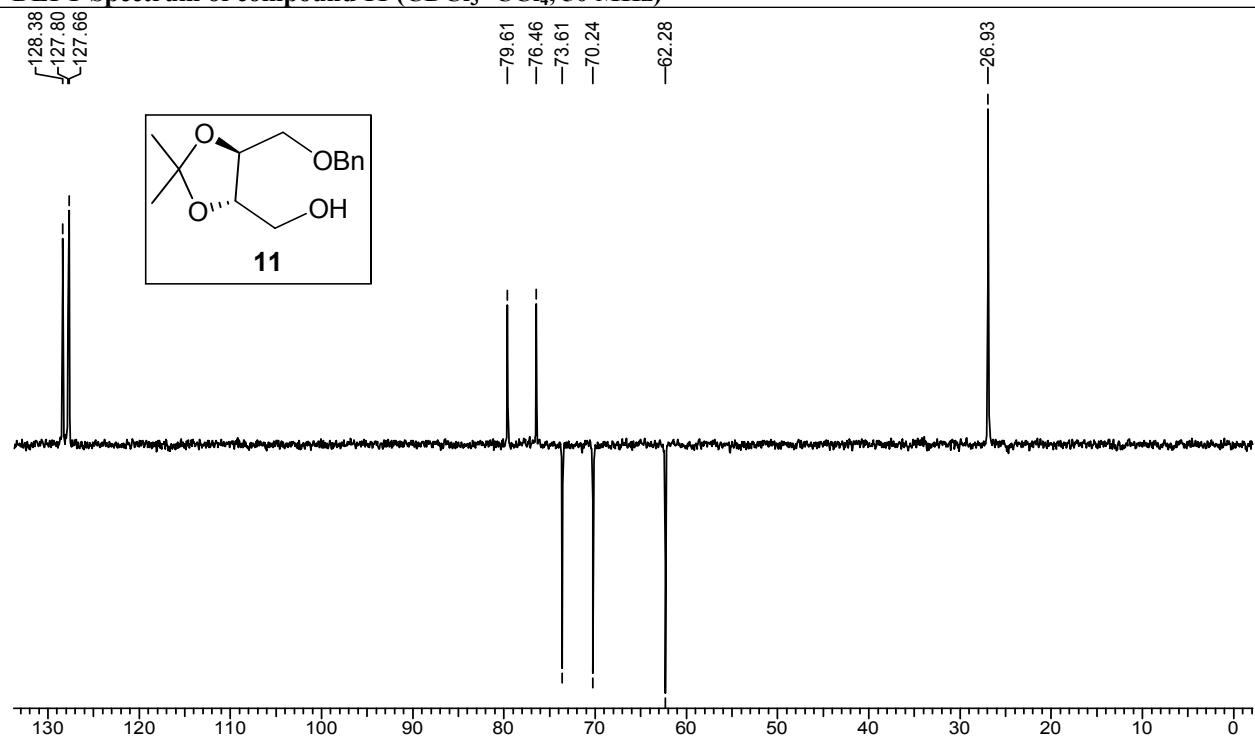
¹H NMR Spectrum of compound 11 (CDCl₃+CCl₄, 200 MHz)



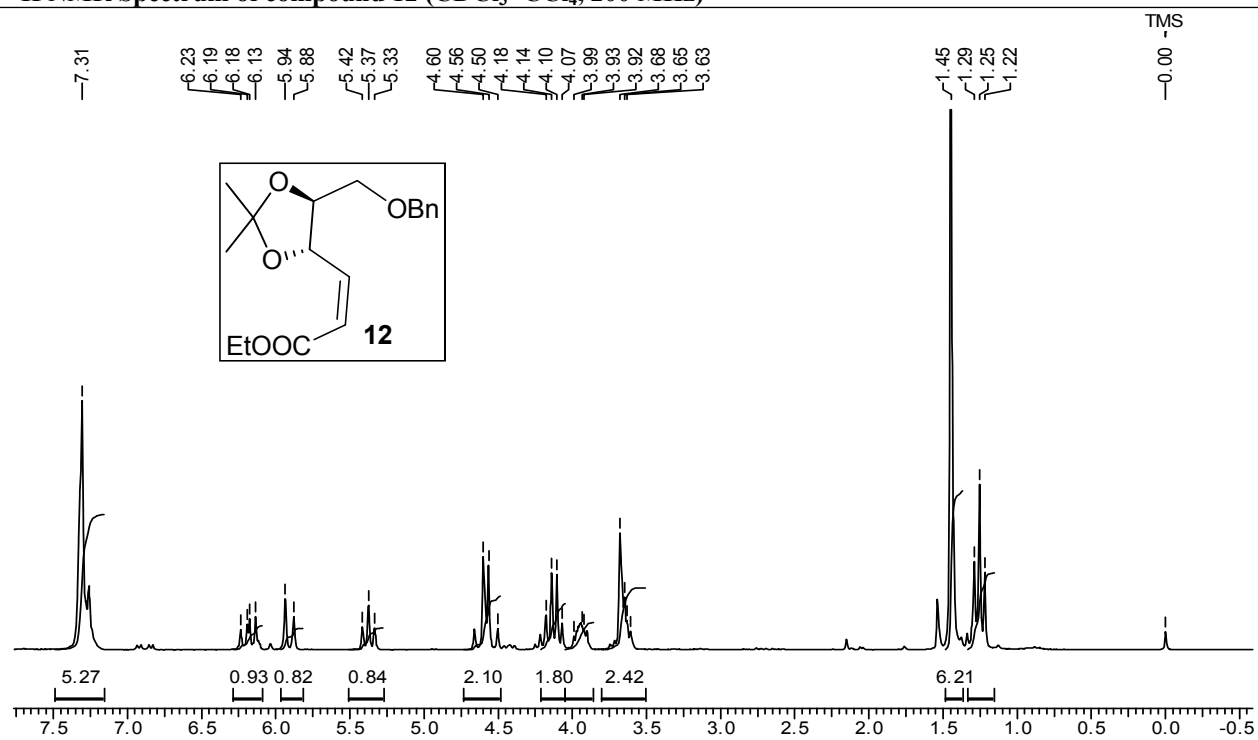
¹³C NMR Spectrum of compound 11 (CDCl₃+CCl₄, 50 MHz)



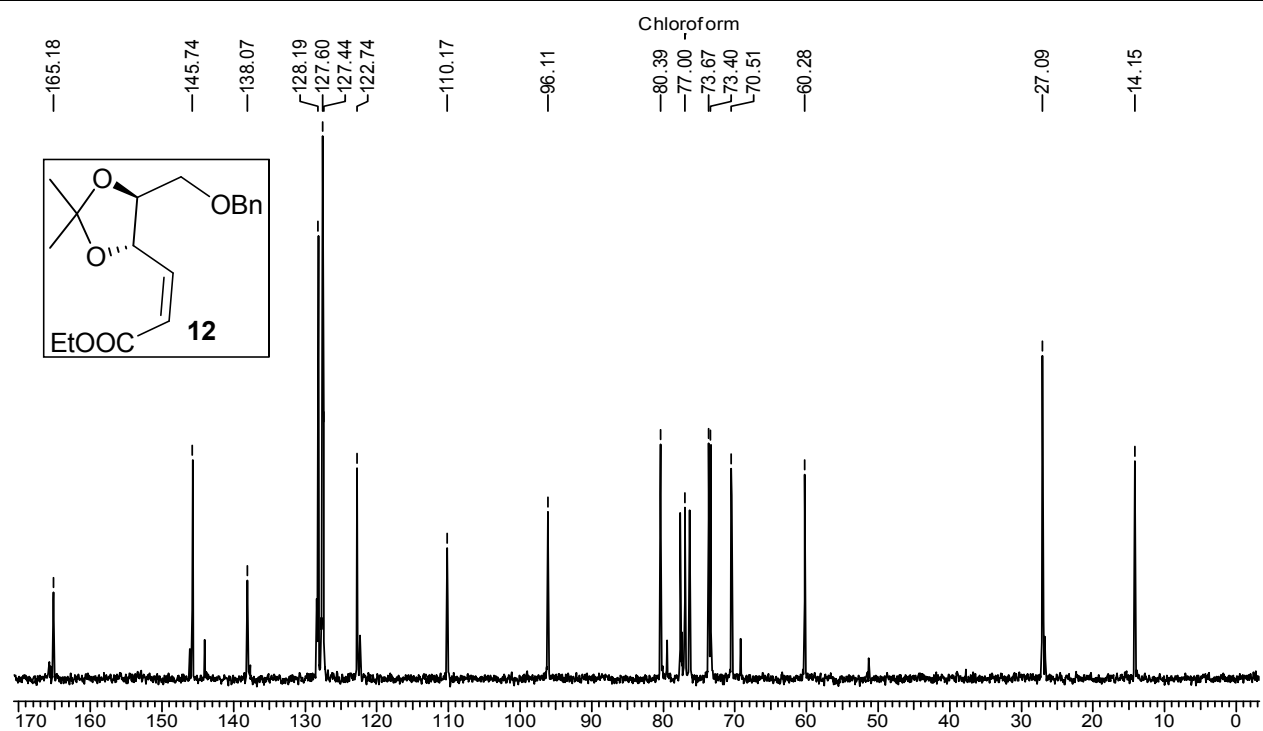
DEPT Spectrum of compound 11 (CDCl₃+CCl₄, 50 MHz)



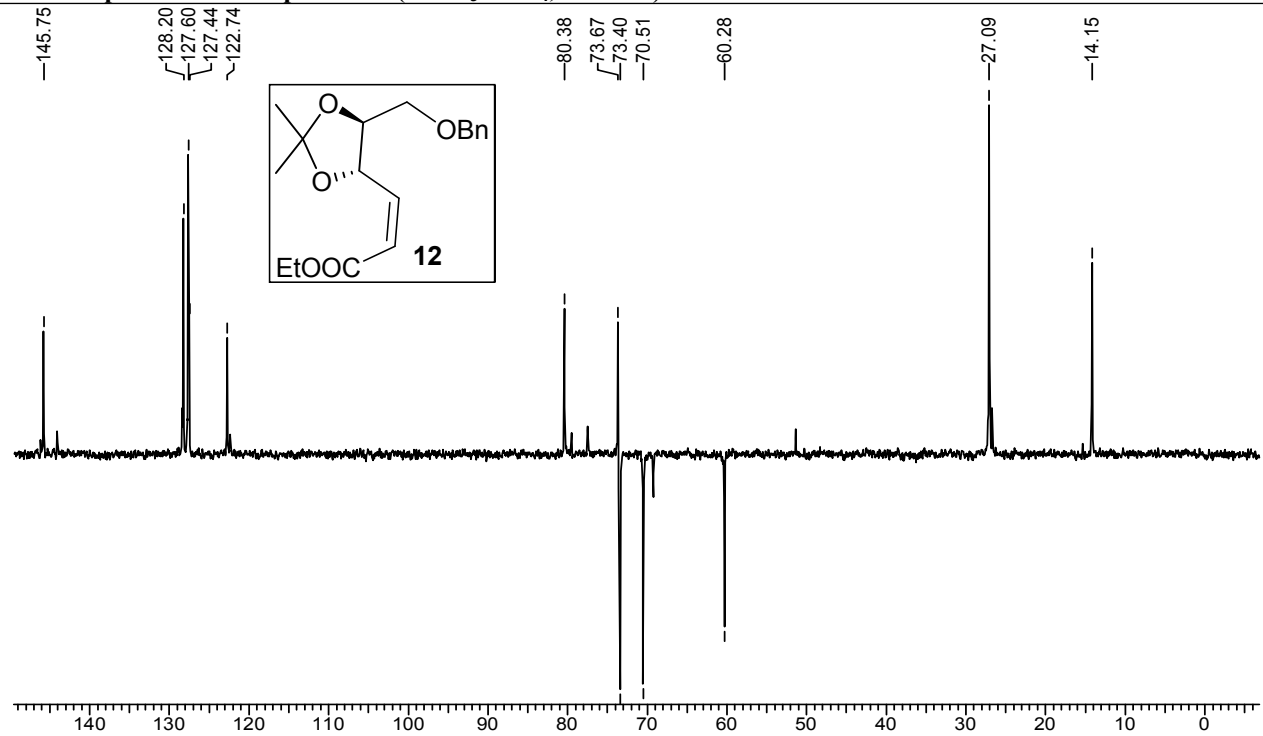
¹H NMR Spectrum of compound 12 (CDCl₃+CCl₄, 200 MHz)



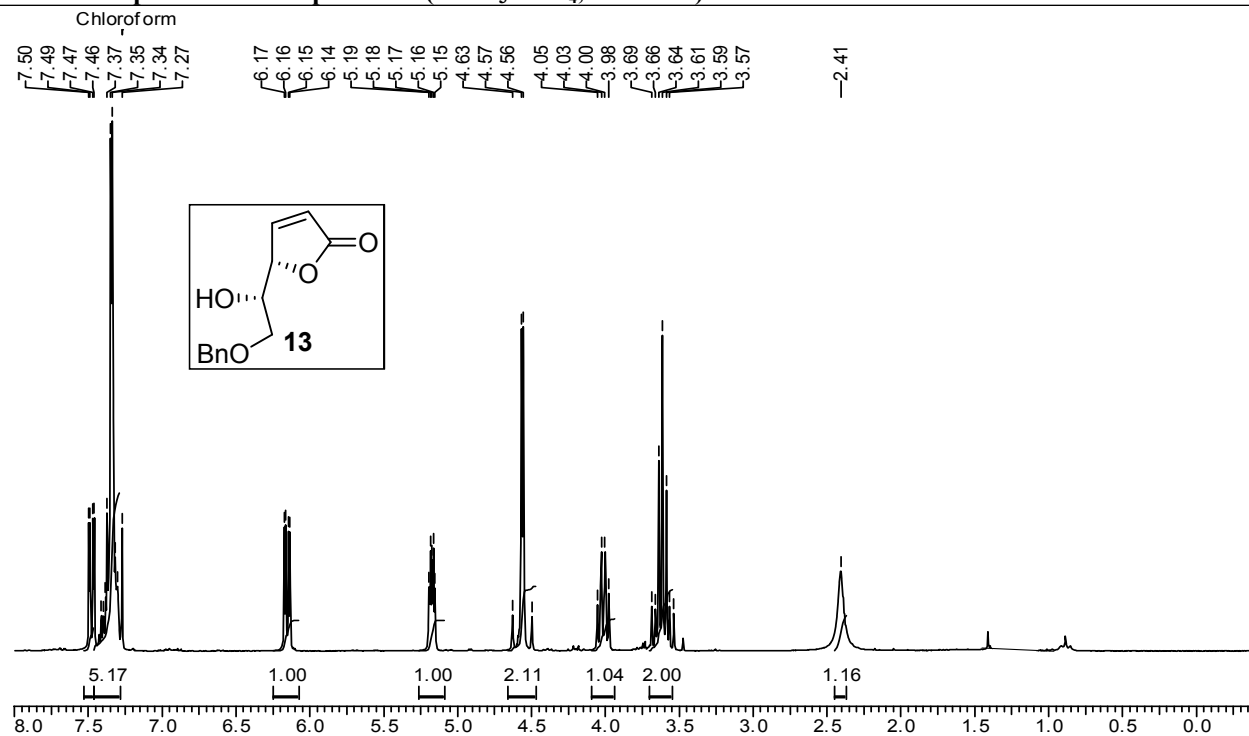
^{13}C NMR Spectrum of compound 12 ($\text{CDCl}_3 + \text{CCl}_4$, 50 MHz)



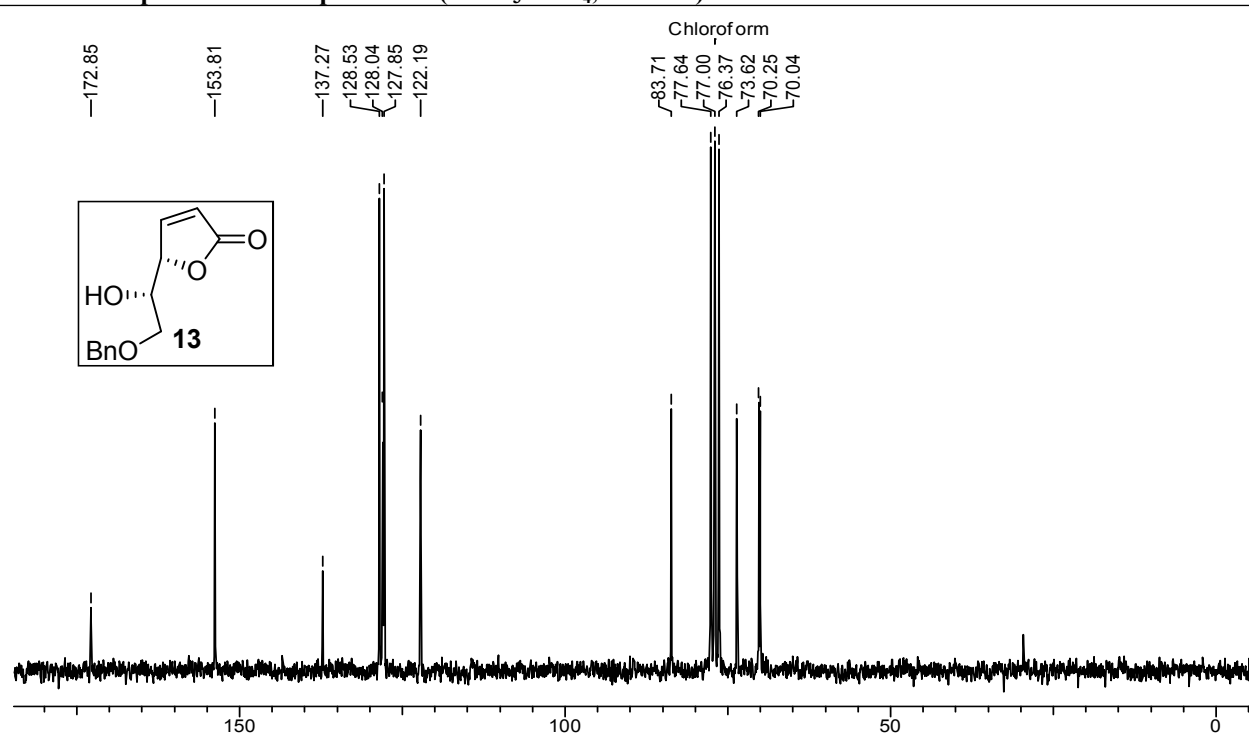
DEPT Spectrum of compound 12 ($\text{CDCl}_3 + \text{CCl}_4$, 50 MHz)



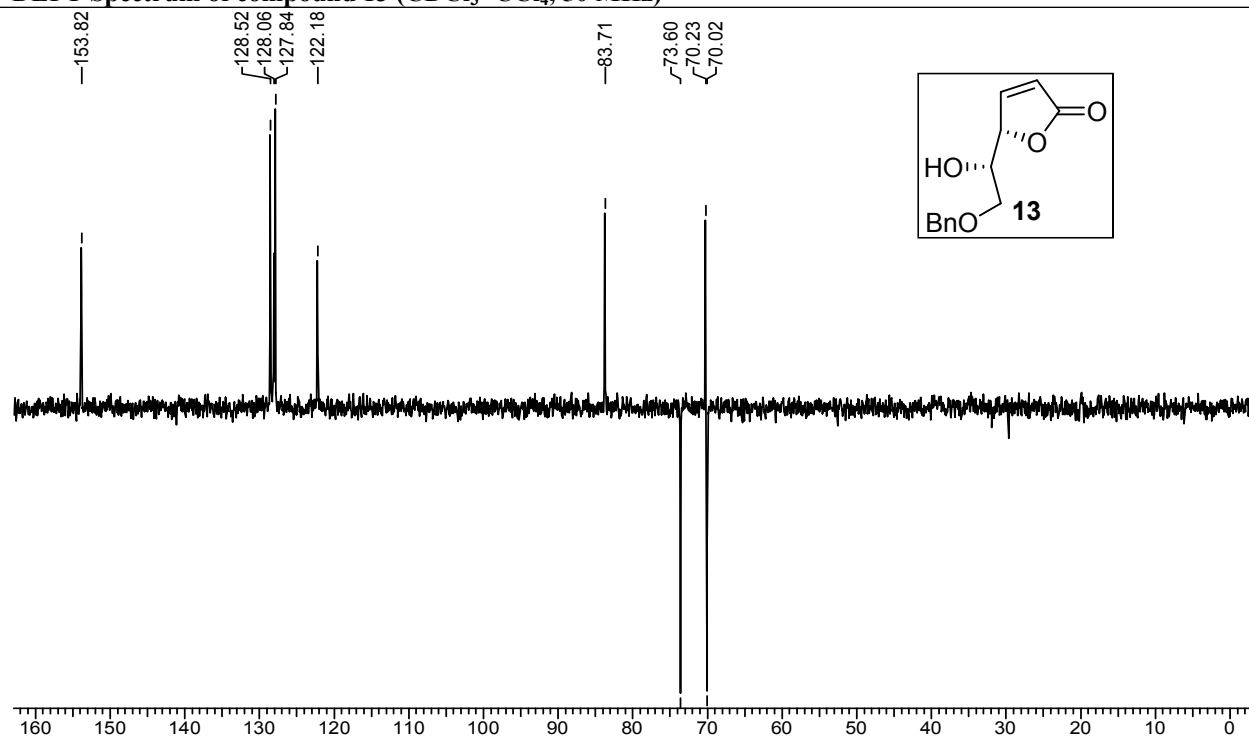
¹H NMR Spectrum of compound 13 (CDCl₃+CCl₄, 200 MHz)



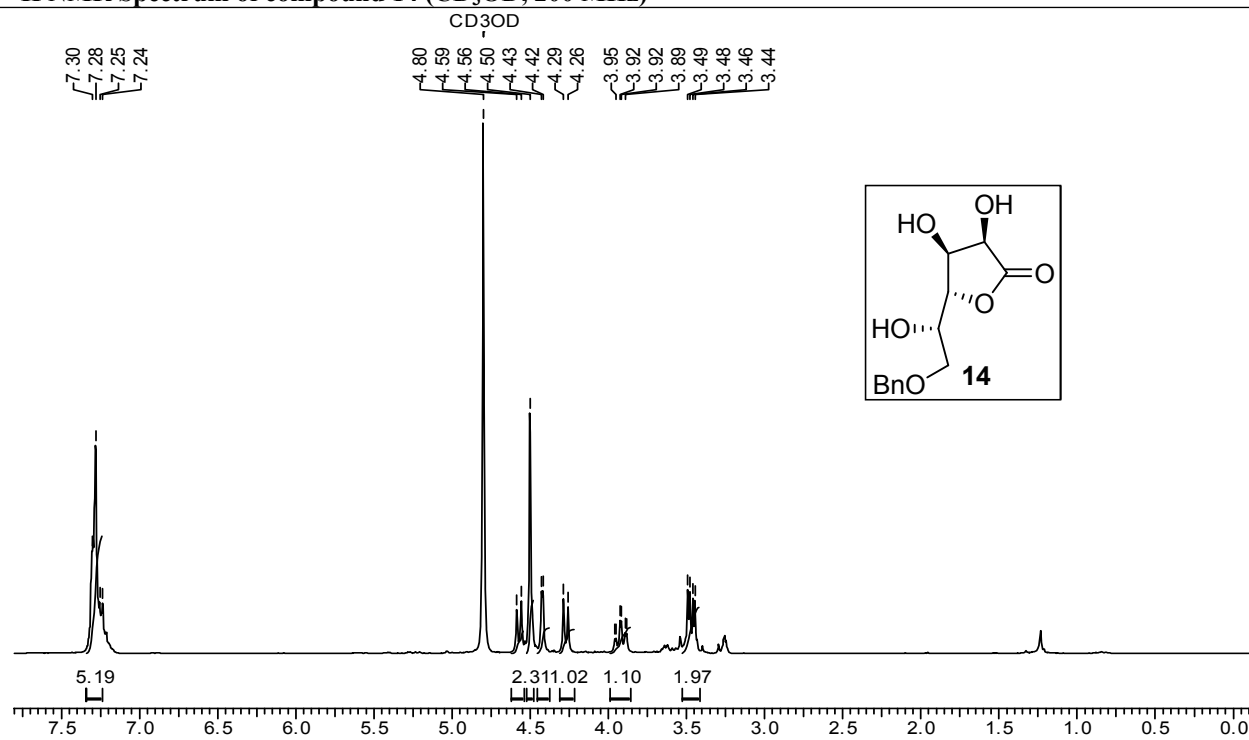
¹³C NMR Spectrum of compound 13 (CDCl₃+CCl₄, 50 MHz)



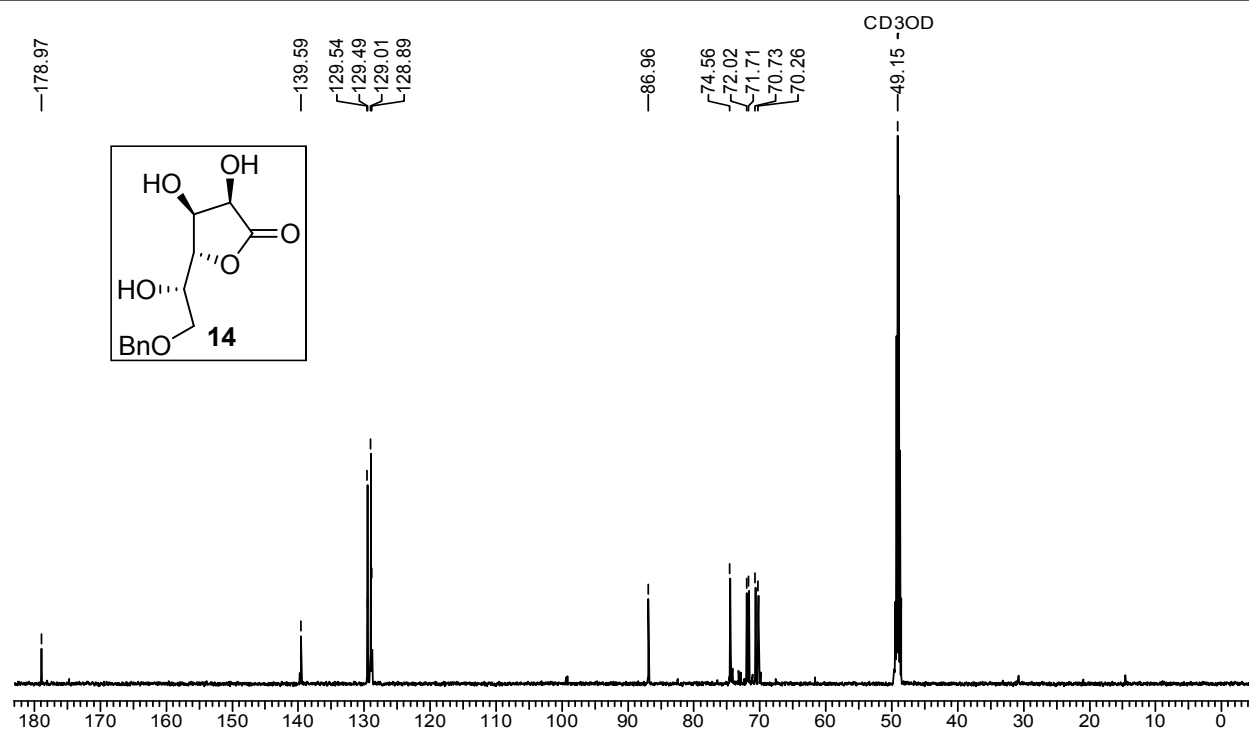
DEPT Spectrum of compound 13 (CDCl₃+CCl₄, 50 MHz)



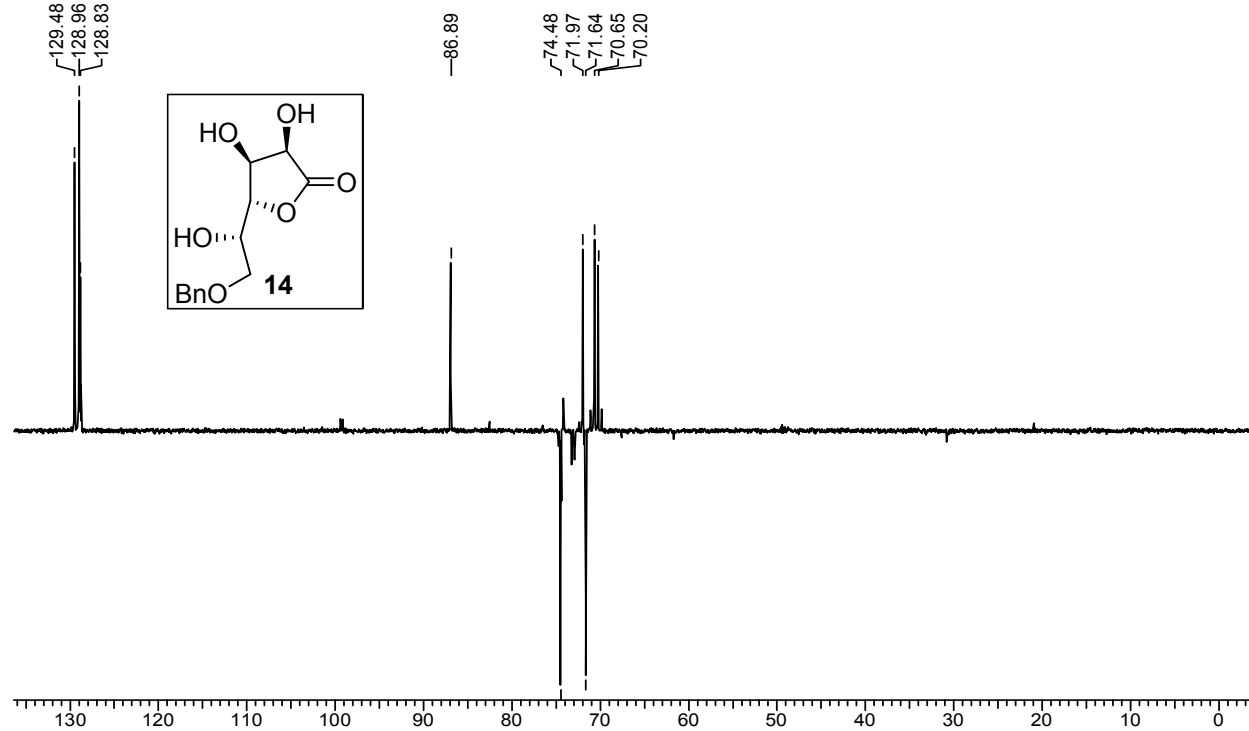
¹H NMR Spectrum of compound 14 (CD₃OD, 200 MHz)



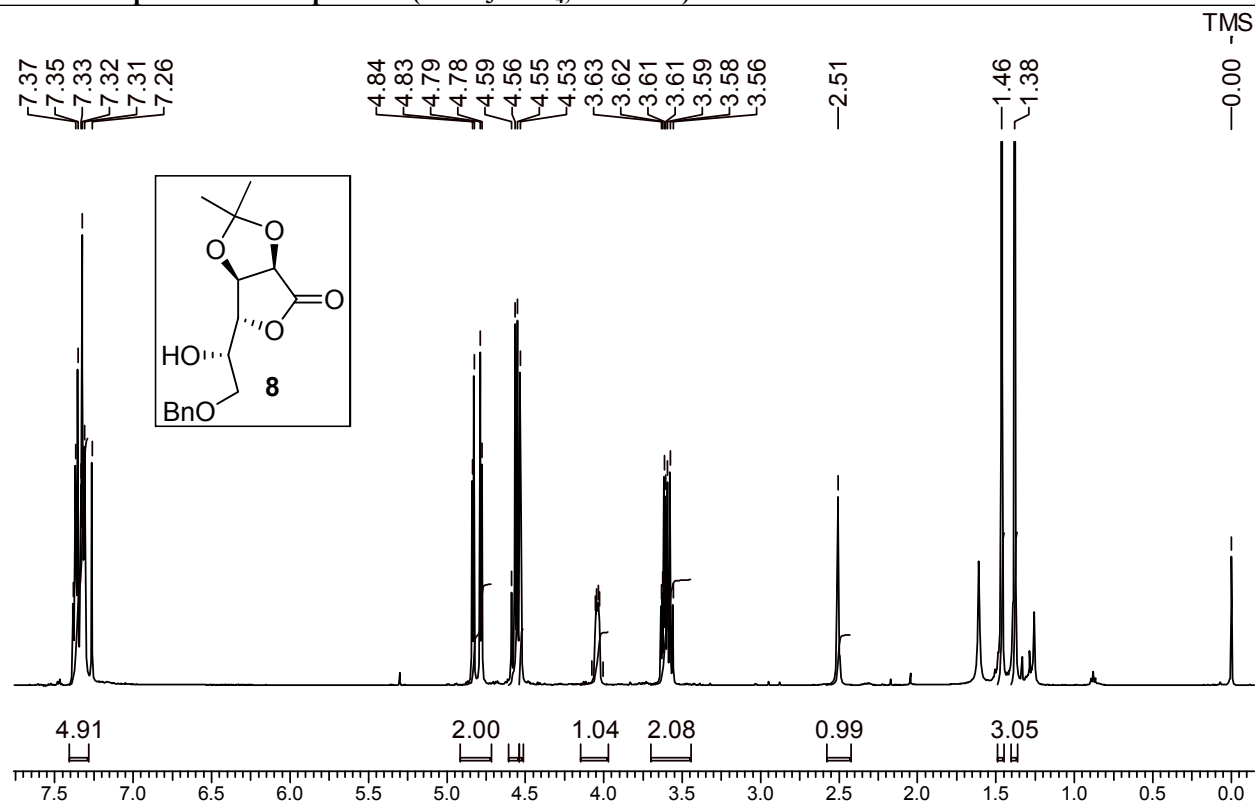
^{13}C NMR Spectrum of compound 14 (CD_3OD , 125 MHz)



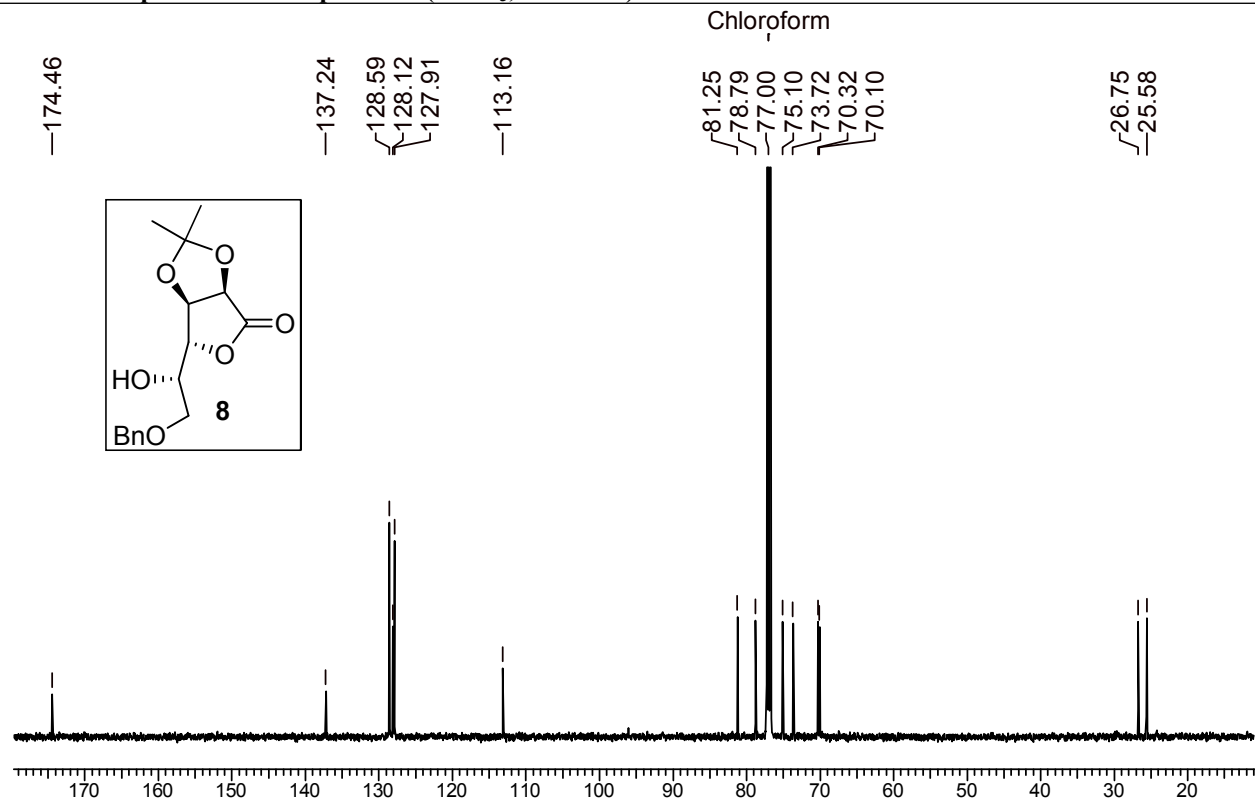
DEPT Spectrum of compound 14 (CD_3OD , 125 MHz)



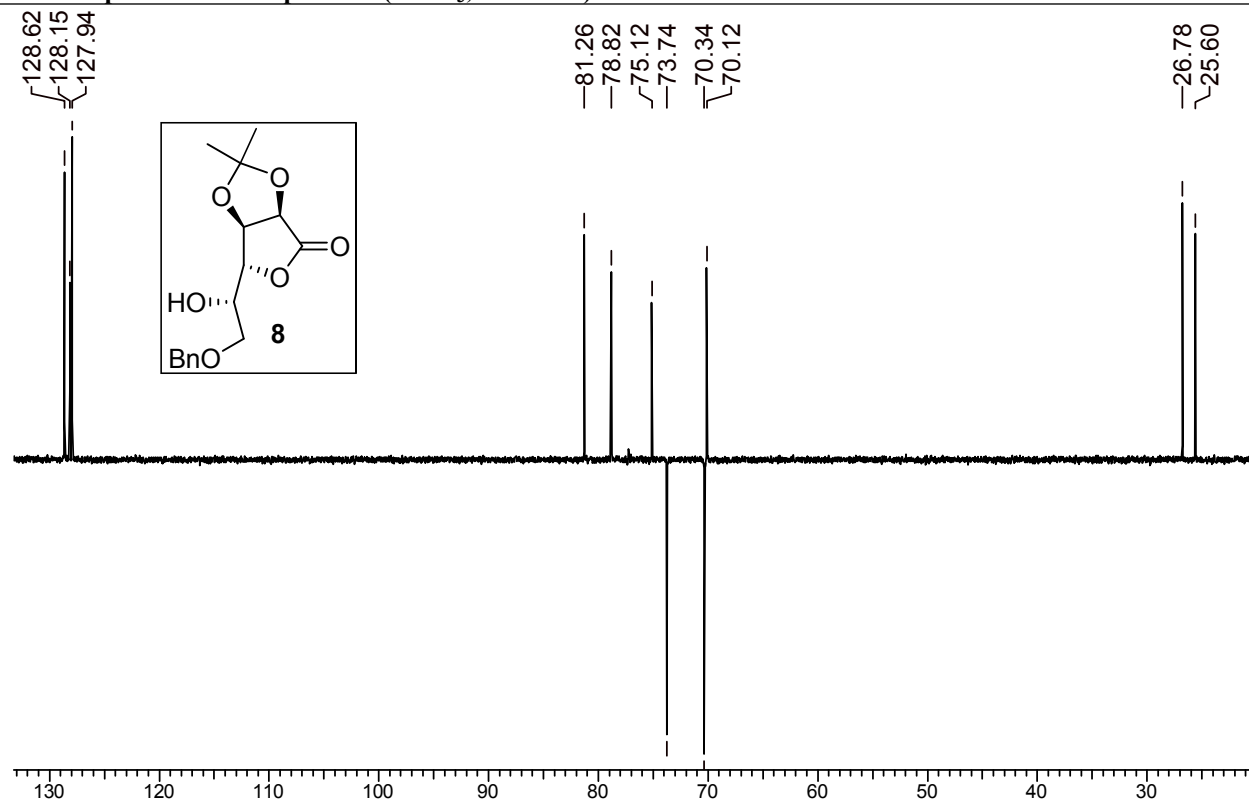
¹H NMR Spectrum of compound 8 (CDCl₃+CCl₄, 500 MHz)



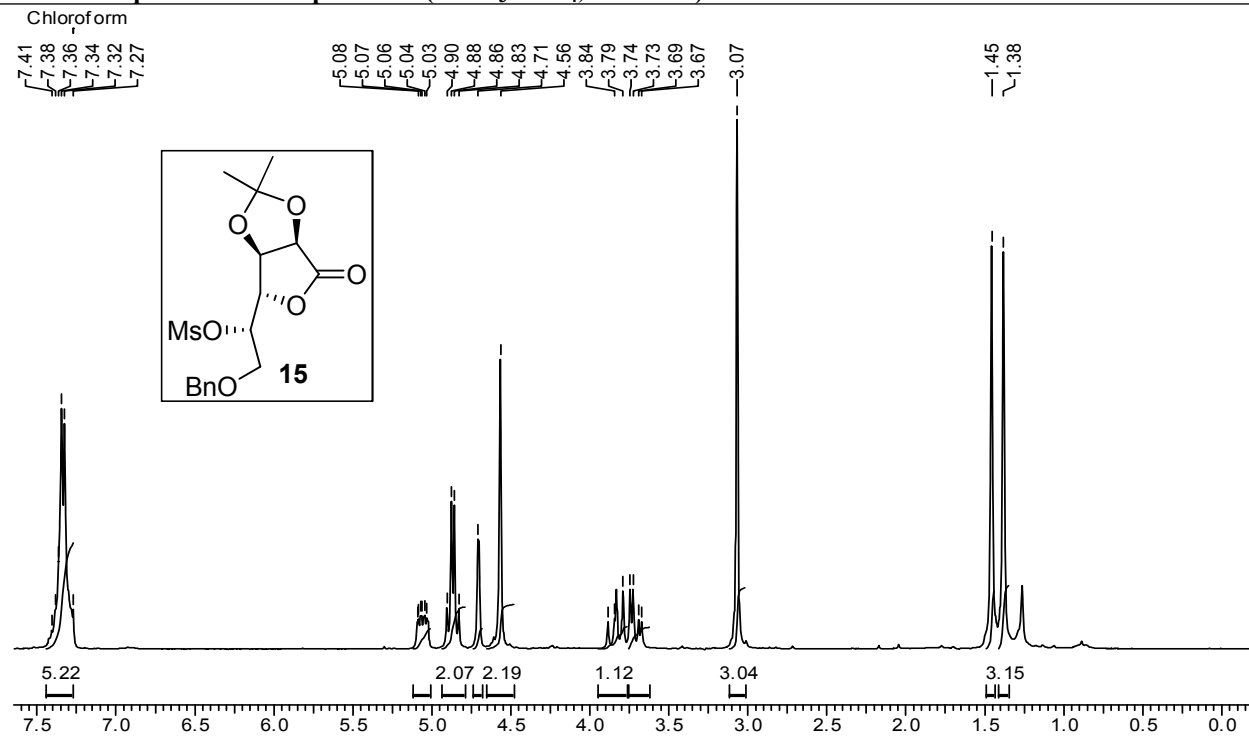
¹³C NMR Spectrum of compound 8 (CDCl₃, 125 MHz)



DEPT Spectrum of compound **8** (CDCl₃, 125 MHz)



¹H NMR Spectrum of compound **15** (CDCl₃+CCl₄, 200 MHz)



Chemical structure of compound **15** is shown in the inset. The structure is a substituted furan derivative with a methanesulfonyl (MsO) group, a benzyl (BnO) group, and a tert-butyl group.

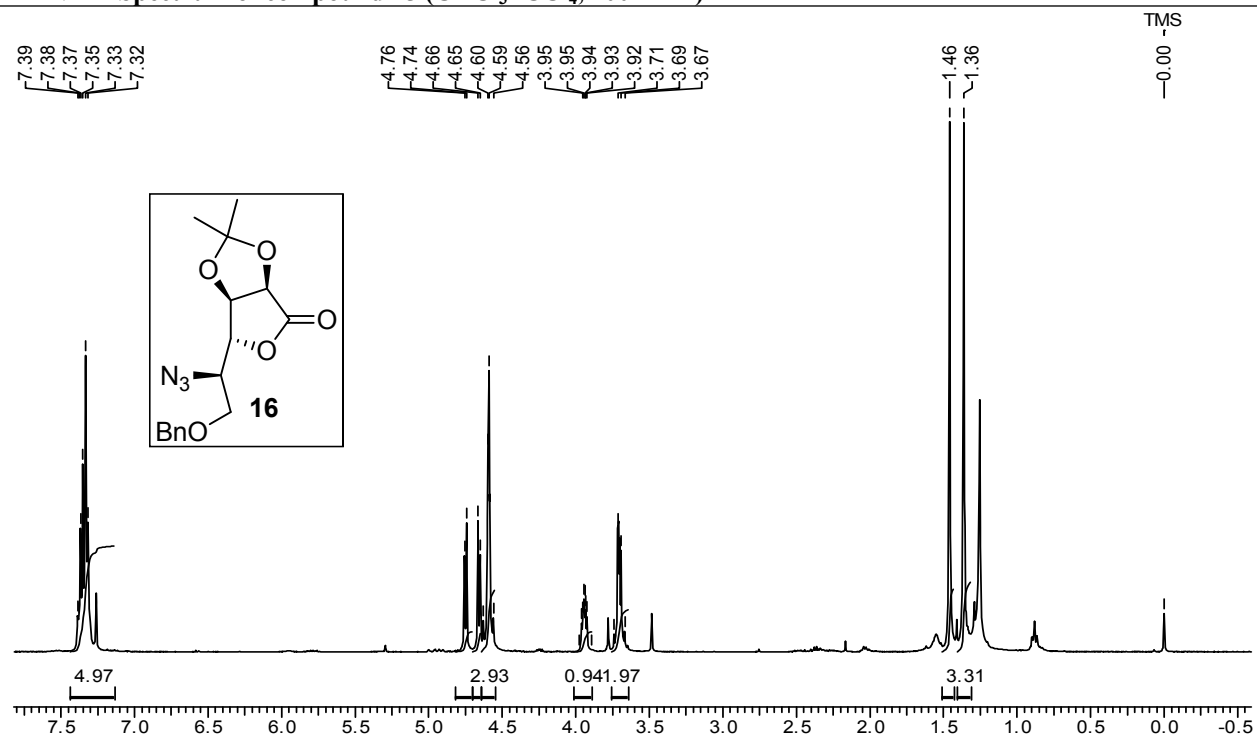
The ¹³C NMR spectrum (CDCl₃) shows the following chemical shifts (ppm):

- 172.94
- 136.60
- 128.74
- 128.41
- 128.02
- 113.64
- 96.23
- 80.37
- 79.41
- 78.08
- 77.31
- 77.00
- 76.69
- 74.49
- 73.79
- 68.70
- 39.08
- 26.80
- 25.67

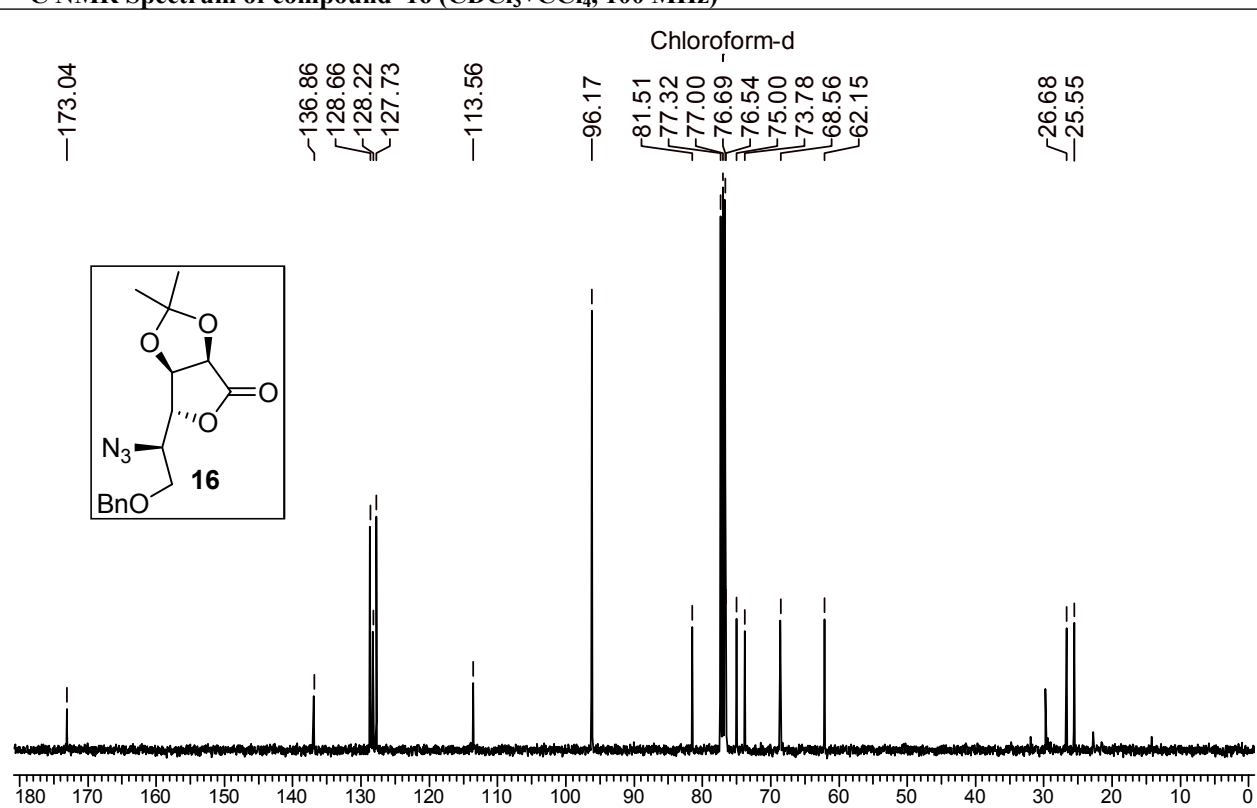
Chemical structure of compound **15** is shown in the inset. The structure is a bicyclic acetal with a mesyloxy (MsO) group and a benzyloxy (BnO) group.

¹³C NMR spectrum (CDCl₃) of compound **15** is shown. The spectrum displays peaks at the following chemical shifts (ppm): 128.74, 128.41, 128.02, 80.37, 79.41, 78.08, 74.49, 73.79, 68.69, 39.07, 26.80, and 25.67.

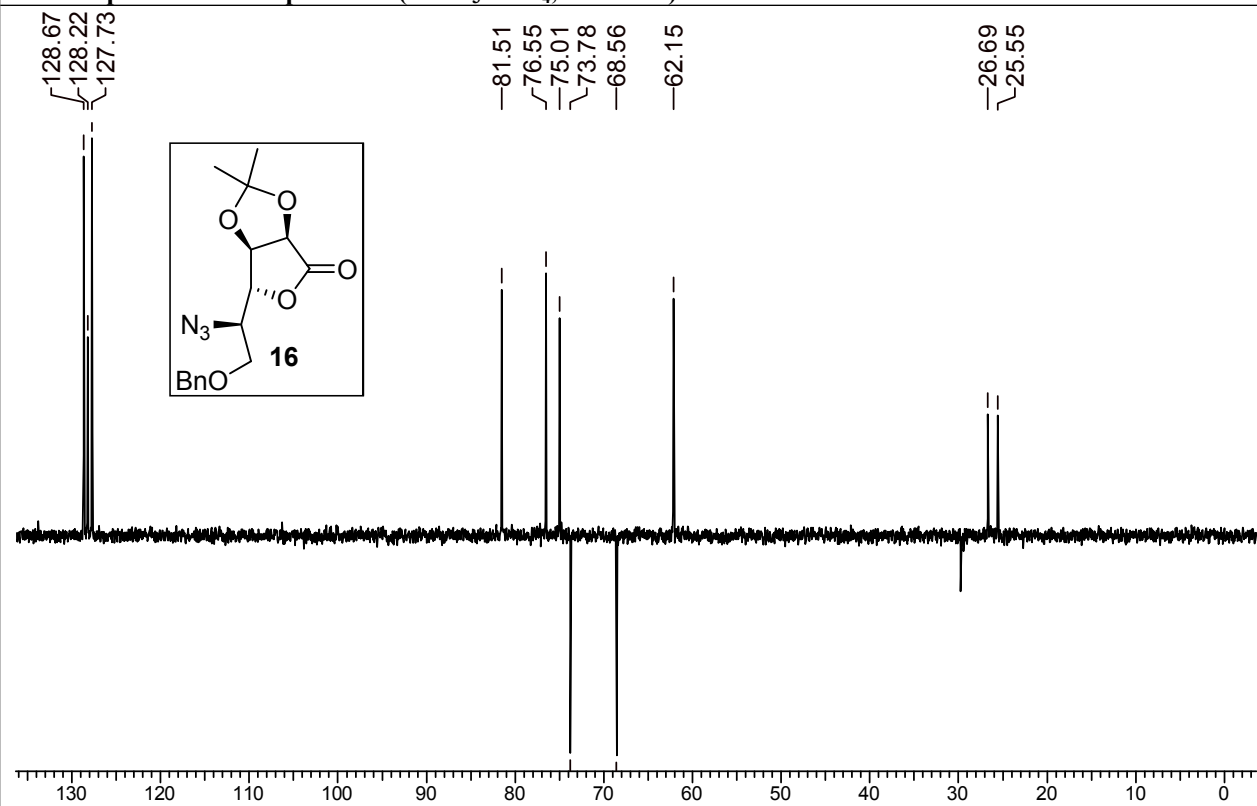
¹H NMR Spectrum of compound 15 (CDCl₃+CCl₄, 400 MHz)



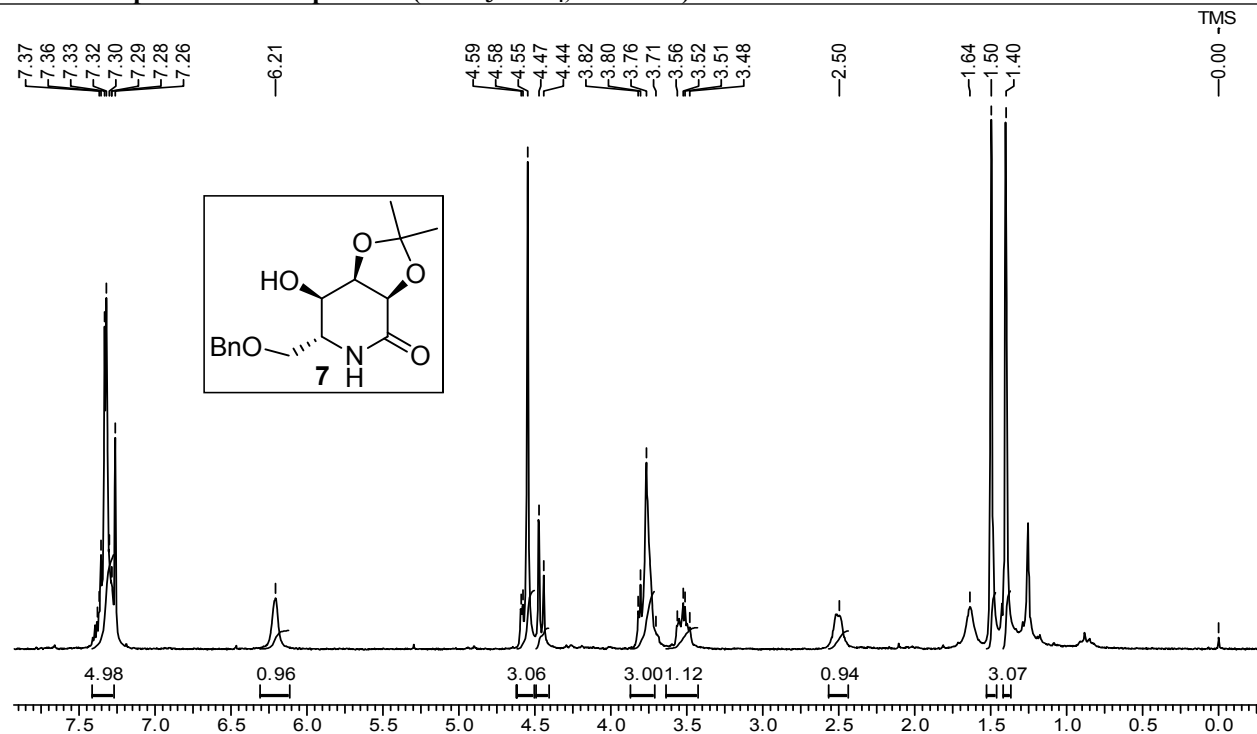
¹³C NMR Spectrum of compound 16 (CDCl₃+CCl₄, 100 MHz)



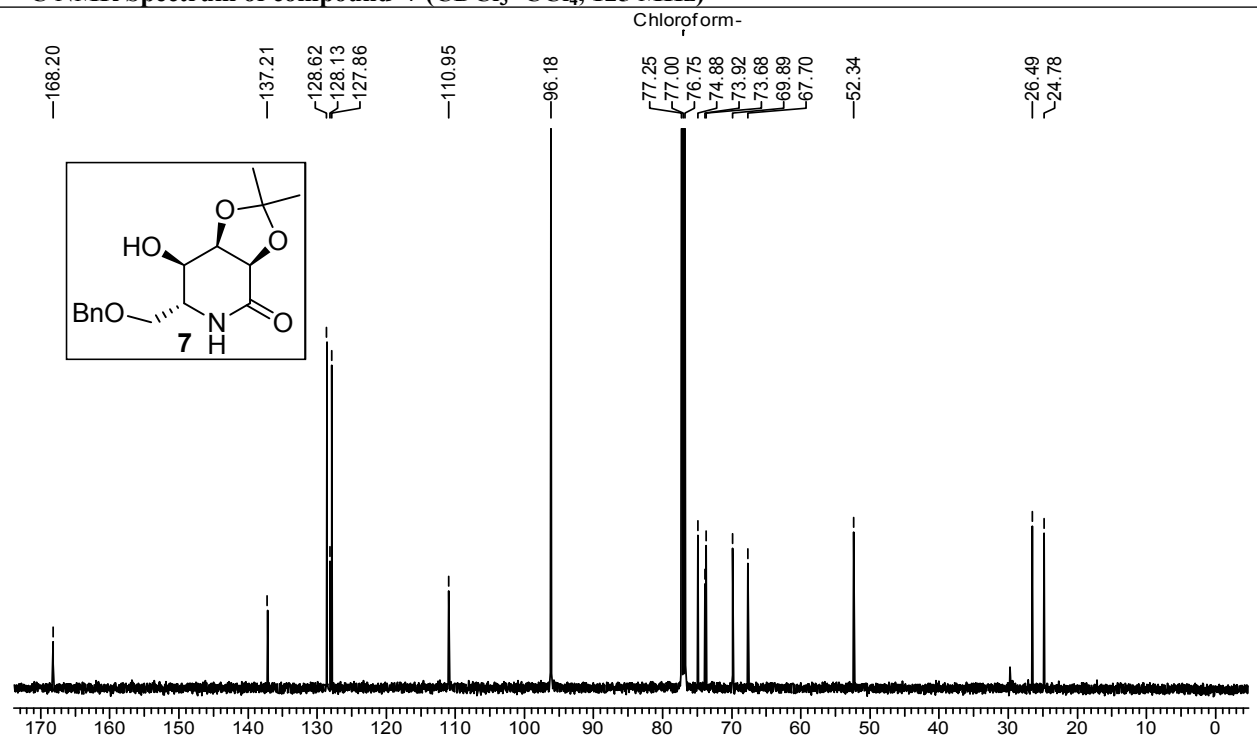
DEPT Spectrum of compound 16 (CDCl₃+CCl₄, 100 MHz)



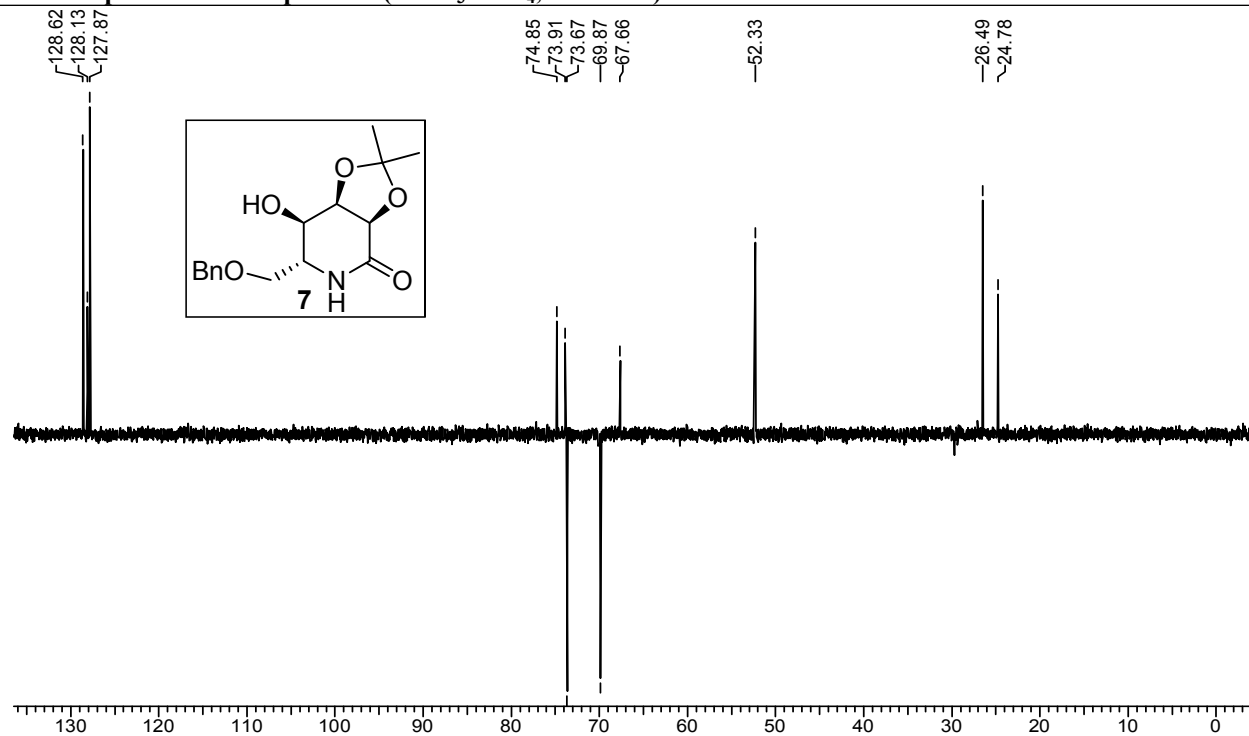
¹H NMR Spectrum of compound 7 (CDCl₃+CCl₄, 200 MHz)



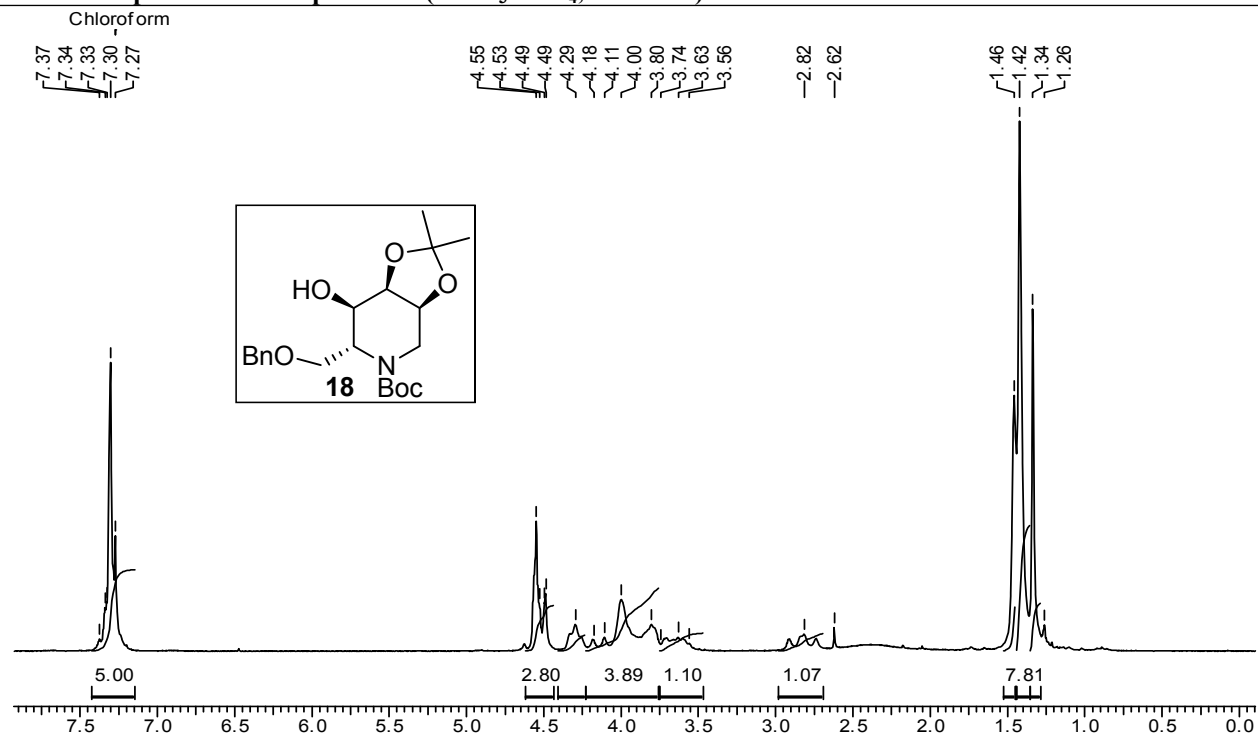
¹³C NMR Spectrum of compound 7 (CDCl₃+CCl₄, 125 MHz)



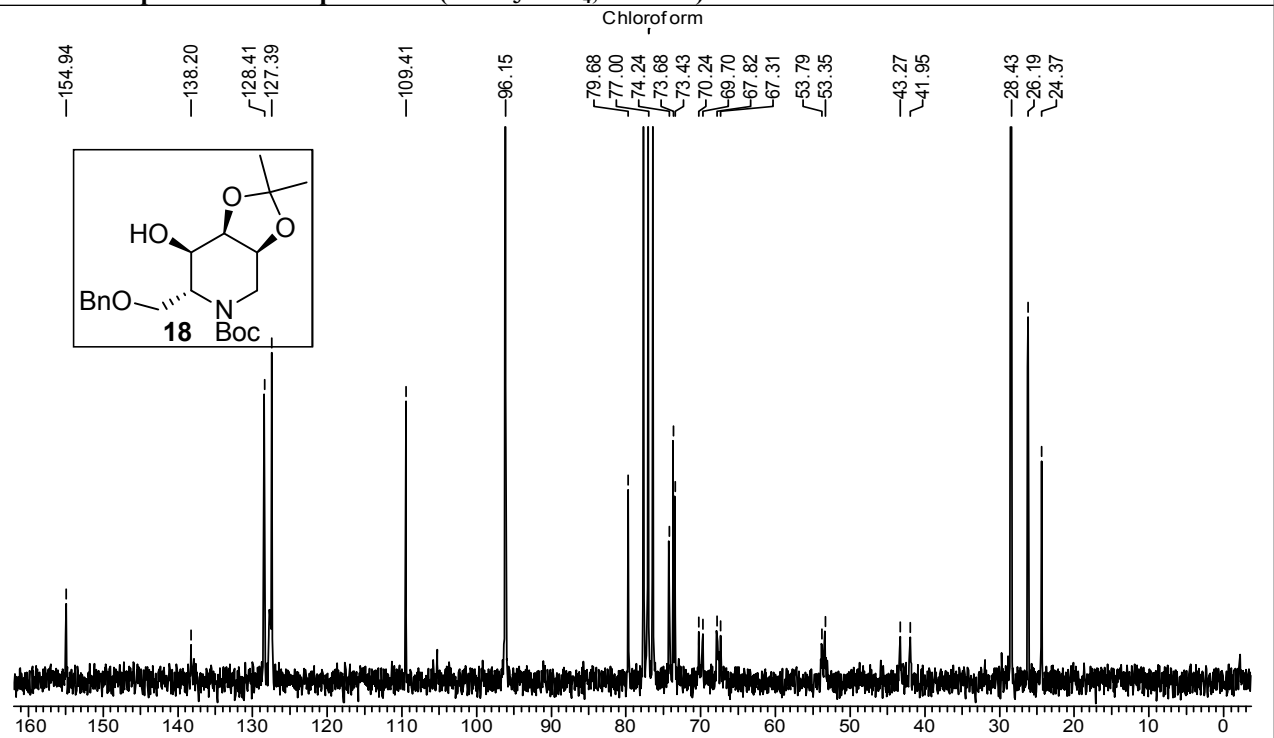
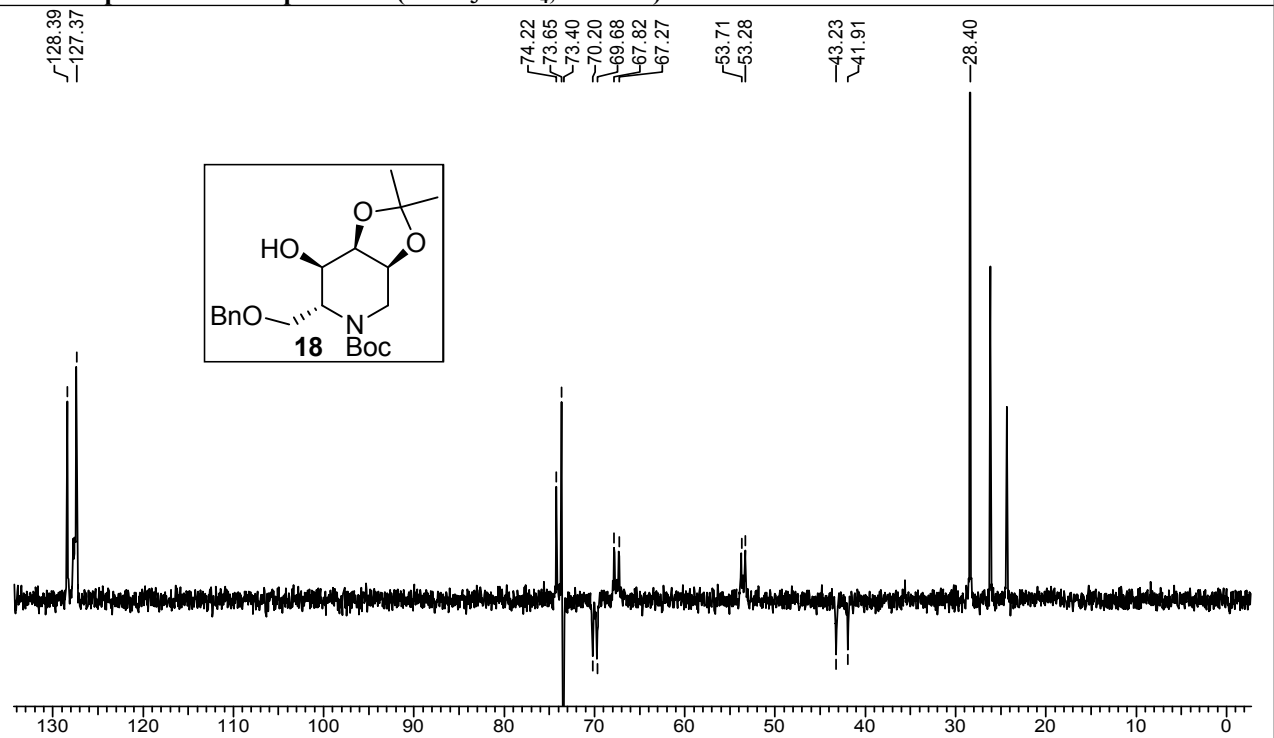
DEPT Spectrum of compound 7 (CDCl₃+CCl₄, 125 MHz)



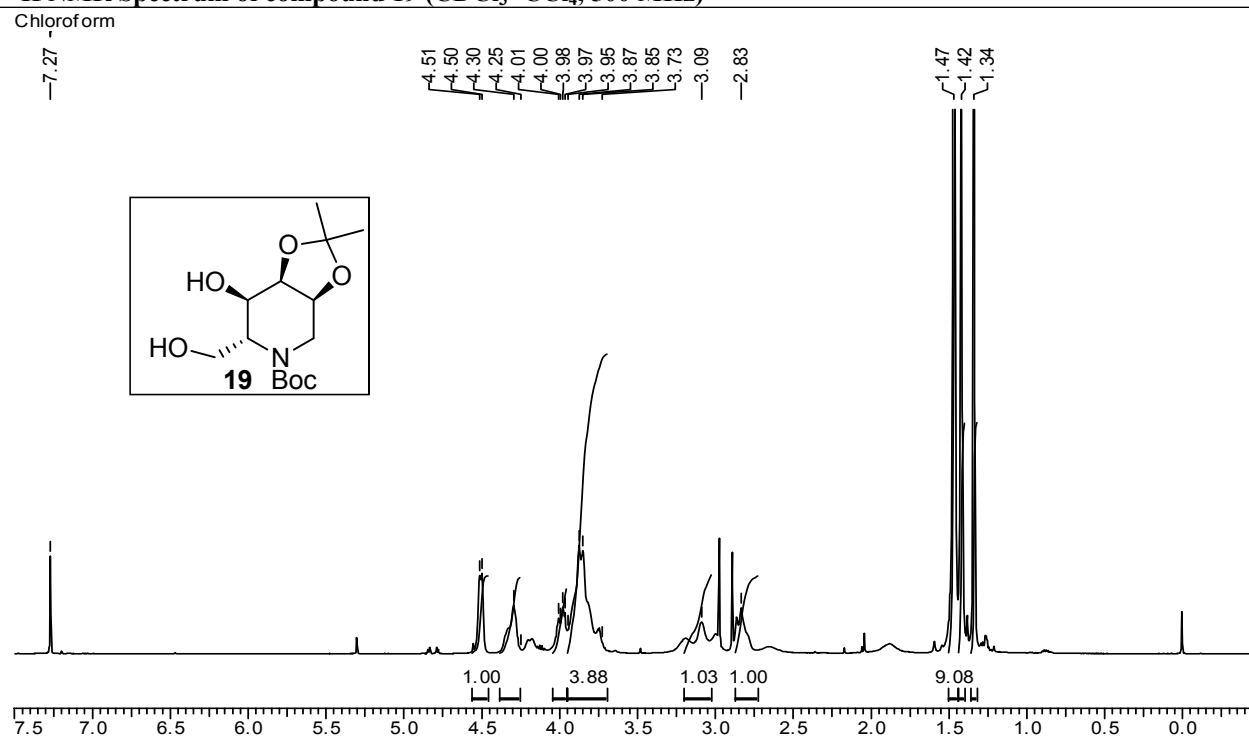
¹H NMR Spectrum of compound 18 (CDCl₃+CCl₄, 200 MHz)



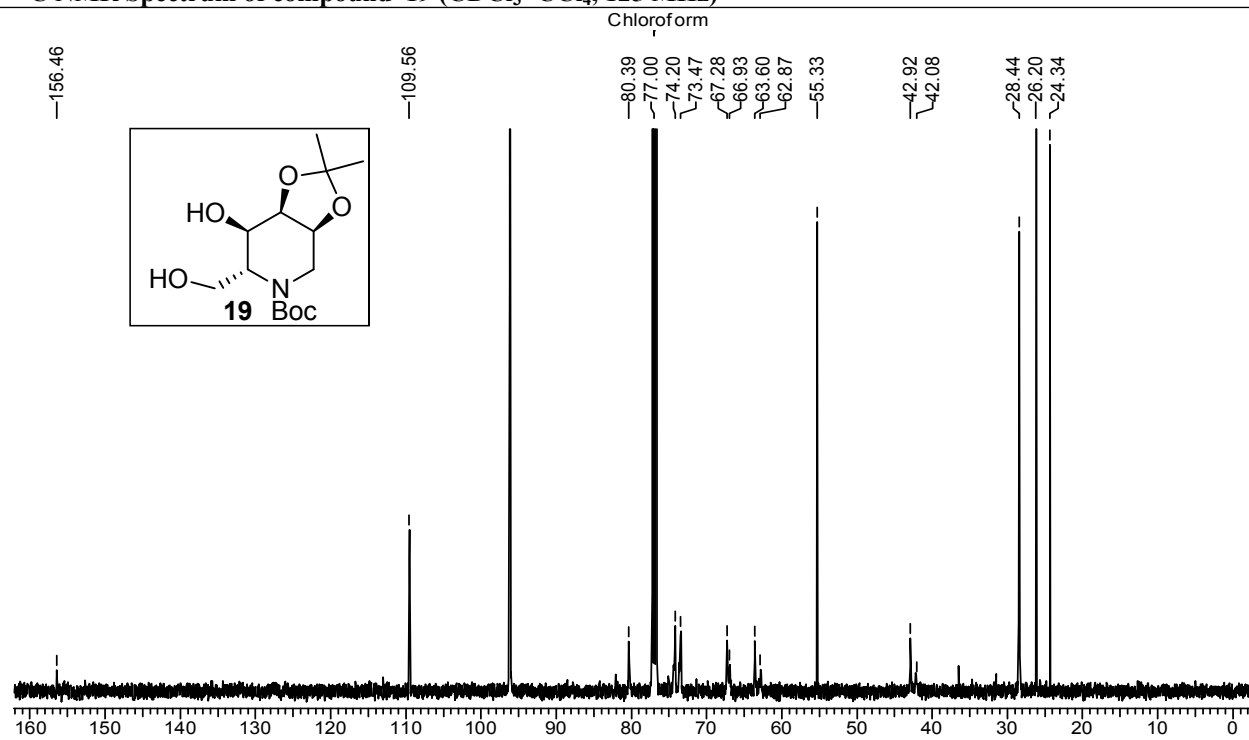
¹³C NMR Spectrum of compound 18 (CDCl₃+CCl₄, 50 MHz)

DEPT Spectrum of compound 18 (CDCl₃+CCl₄, 50 MHz)

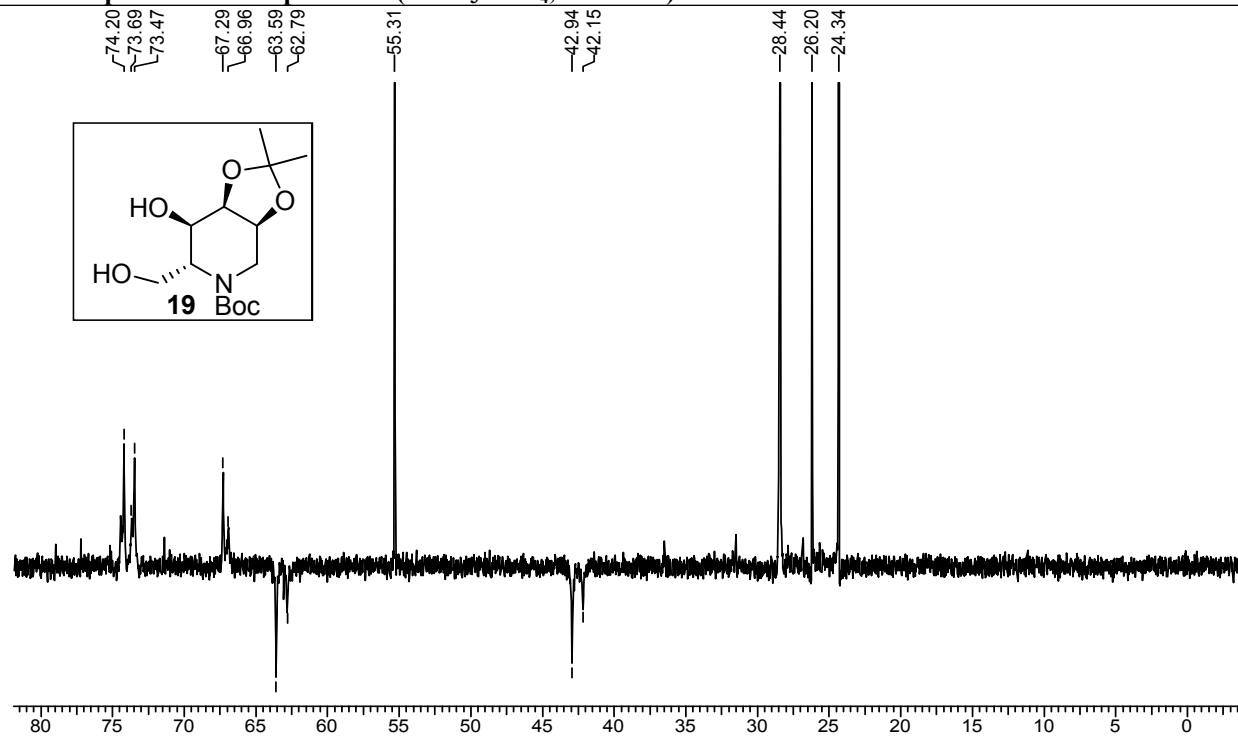
¹H NMR Spectrum of compound 19 (CDCl₃+CCl₄, 500 MHz)



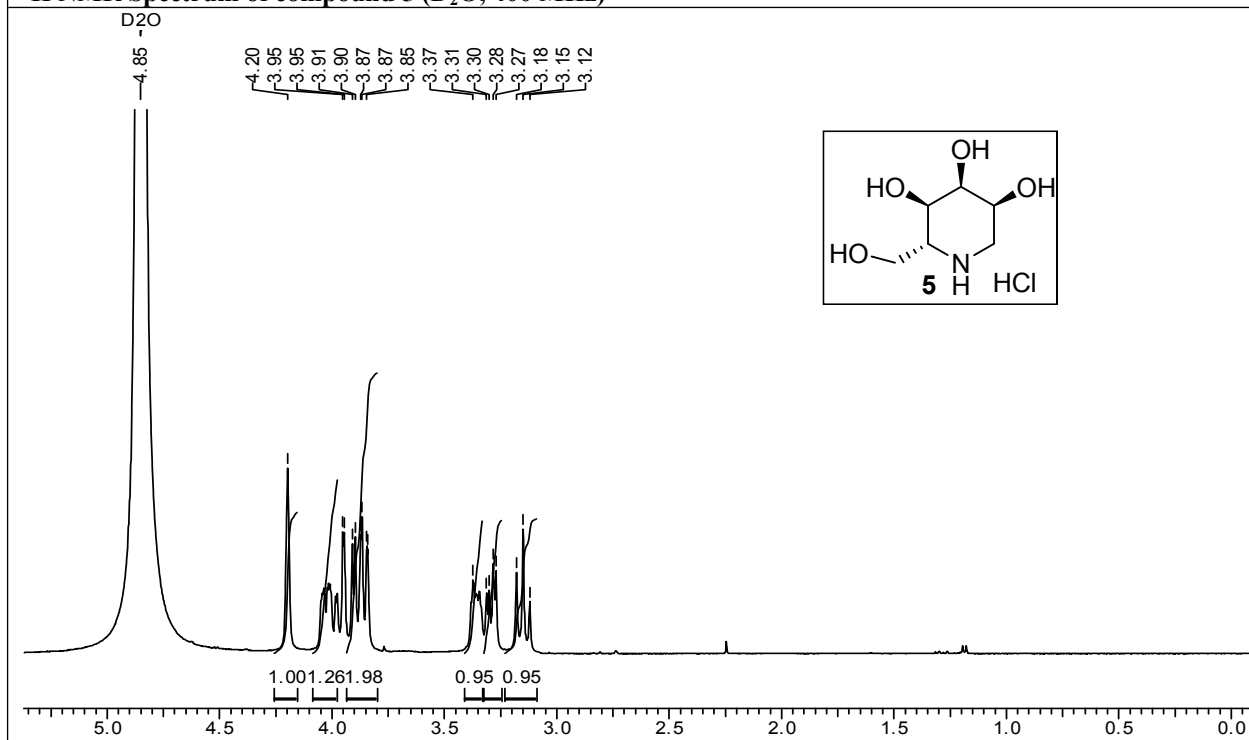
¹³C NMR Spectrum of compound 19 (CDCl₃+CCl₄, 125 MHz)



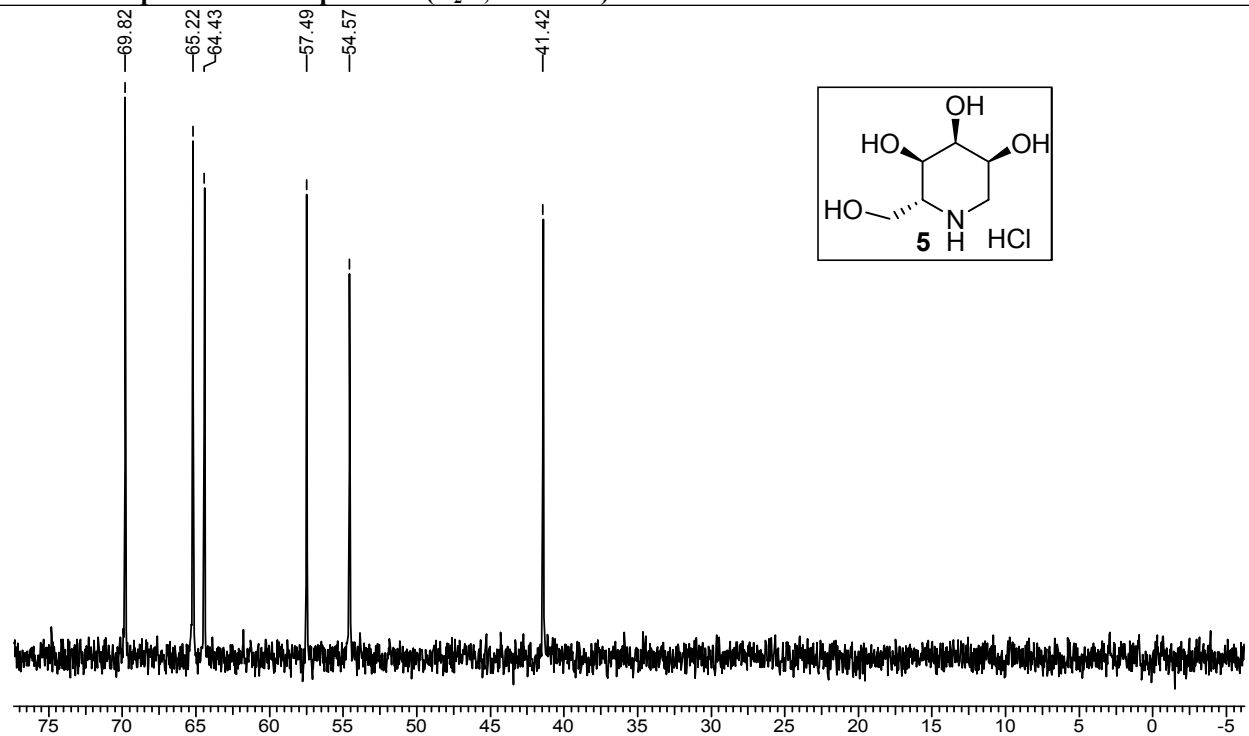
DEPT Spectrum of compound 19 (CDCl₃+CCl₄, 125 MHz)



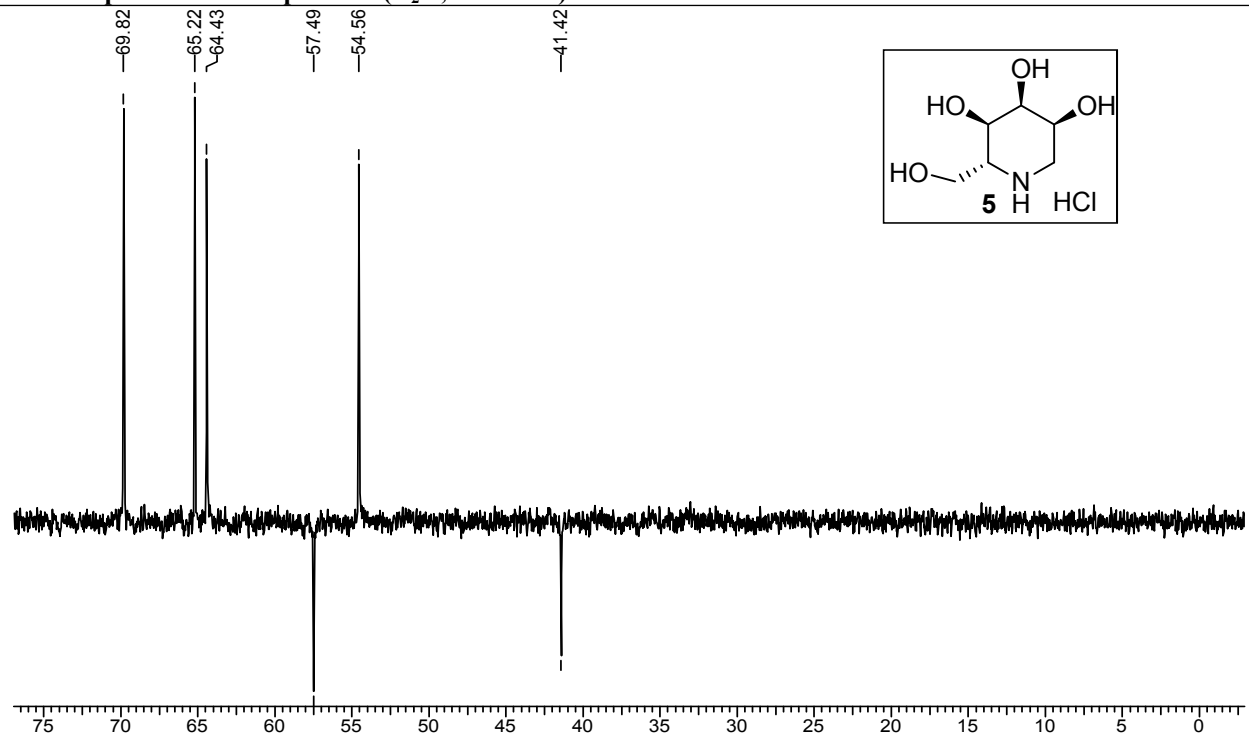
¹H NMR Spectrum of compound 5 (D₂O, 400 MHz)



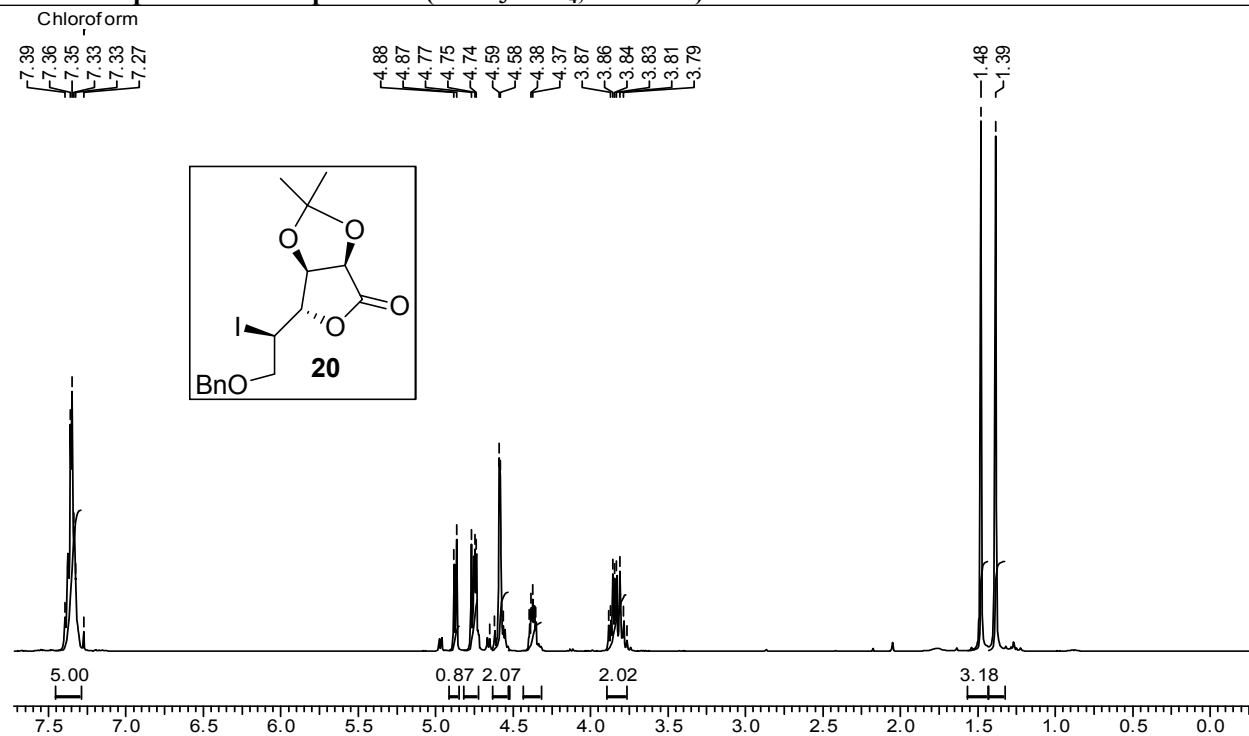
^{13}C NMR Spectrum of compound 5 (D_2O , 100 MHz)



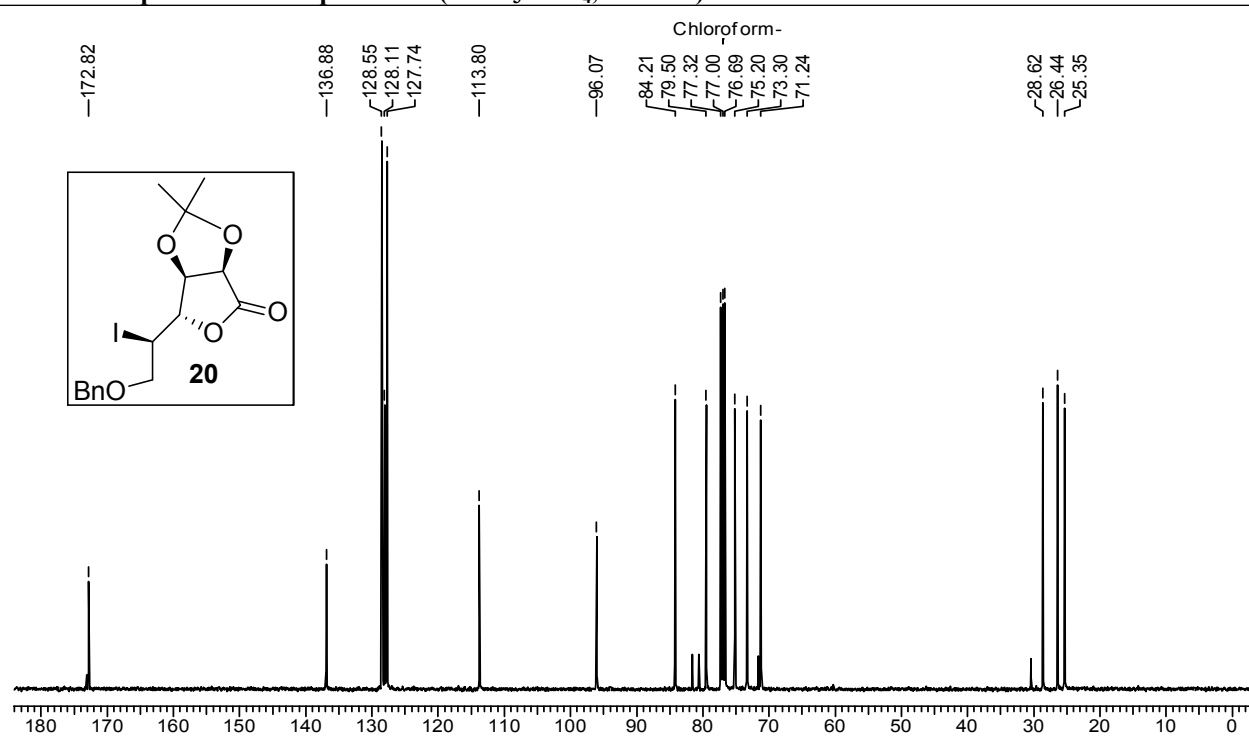
DEPT Spectrum of compound 5 (D_2O , 100 MHz)



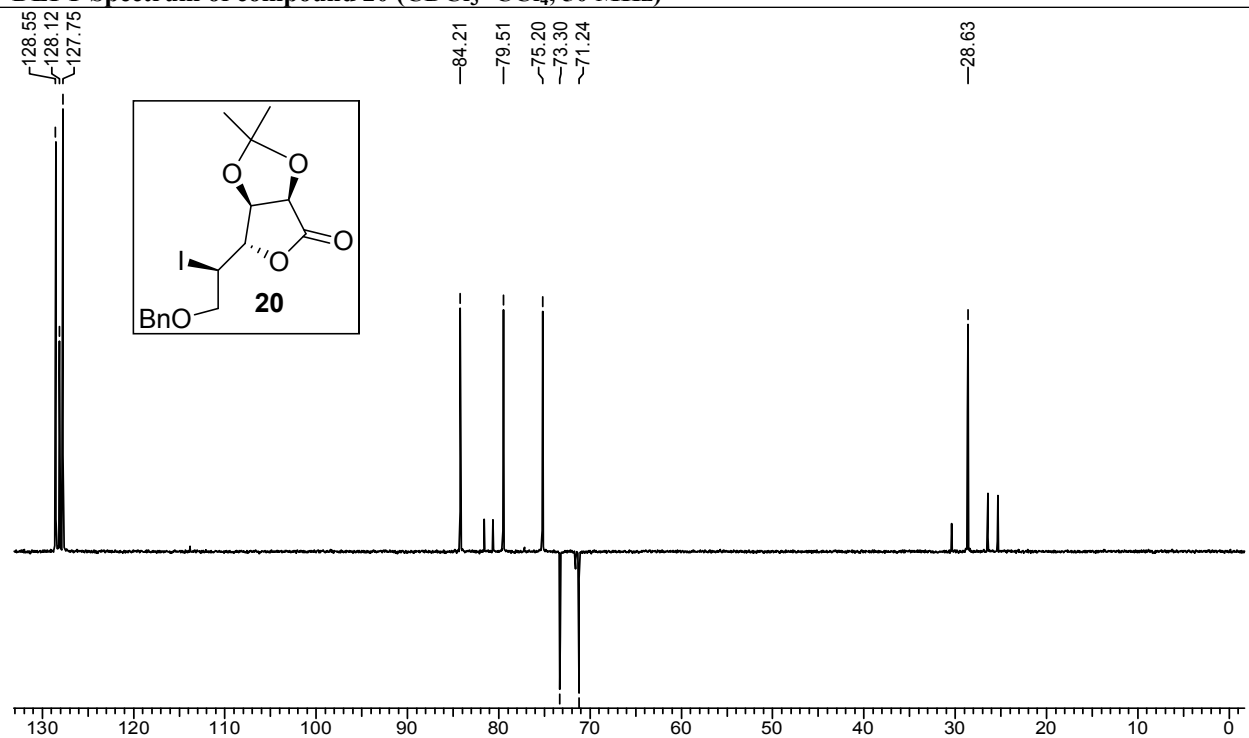
¹H NMR Spectrum of compound 20 (CDCl₃+CCl₄, 400 MHz)



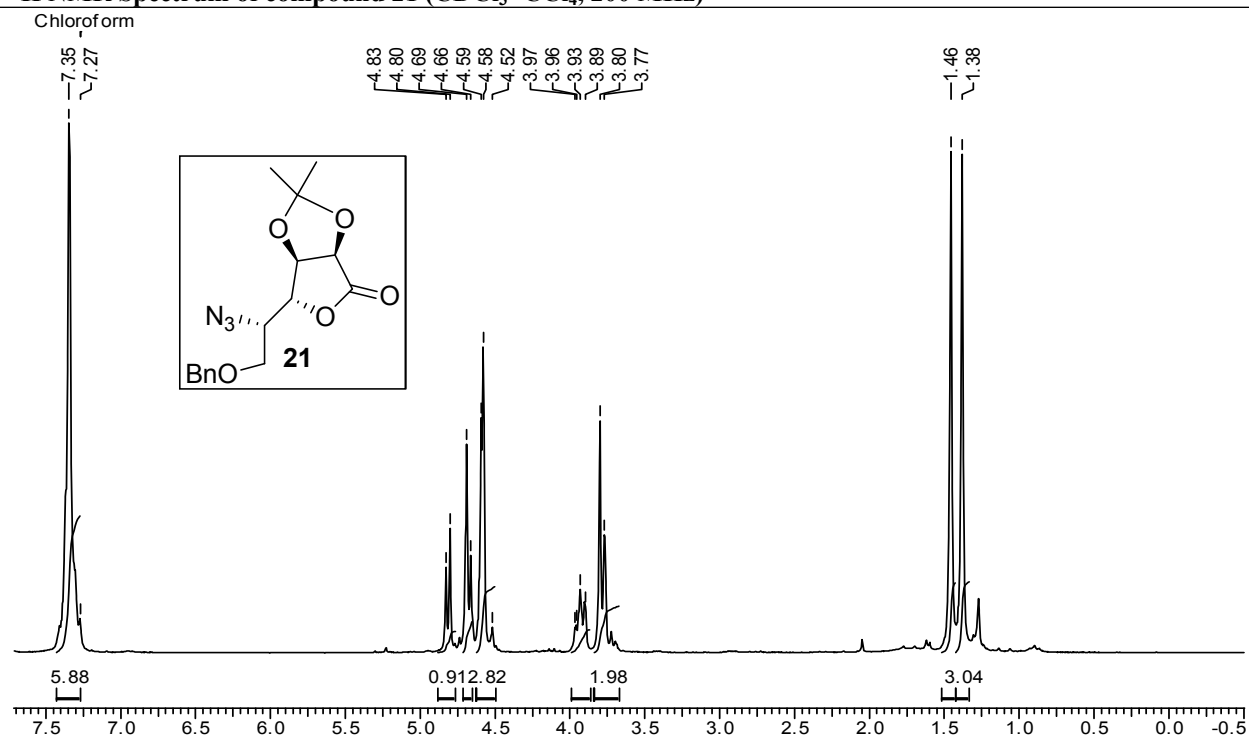
¹³C NMR Spectrum of compound 20 (CDCl₃+CCl₄, 50 MHz)



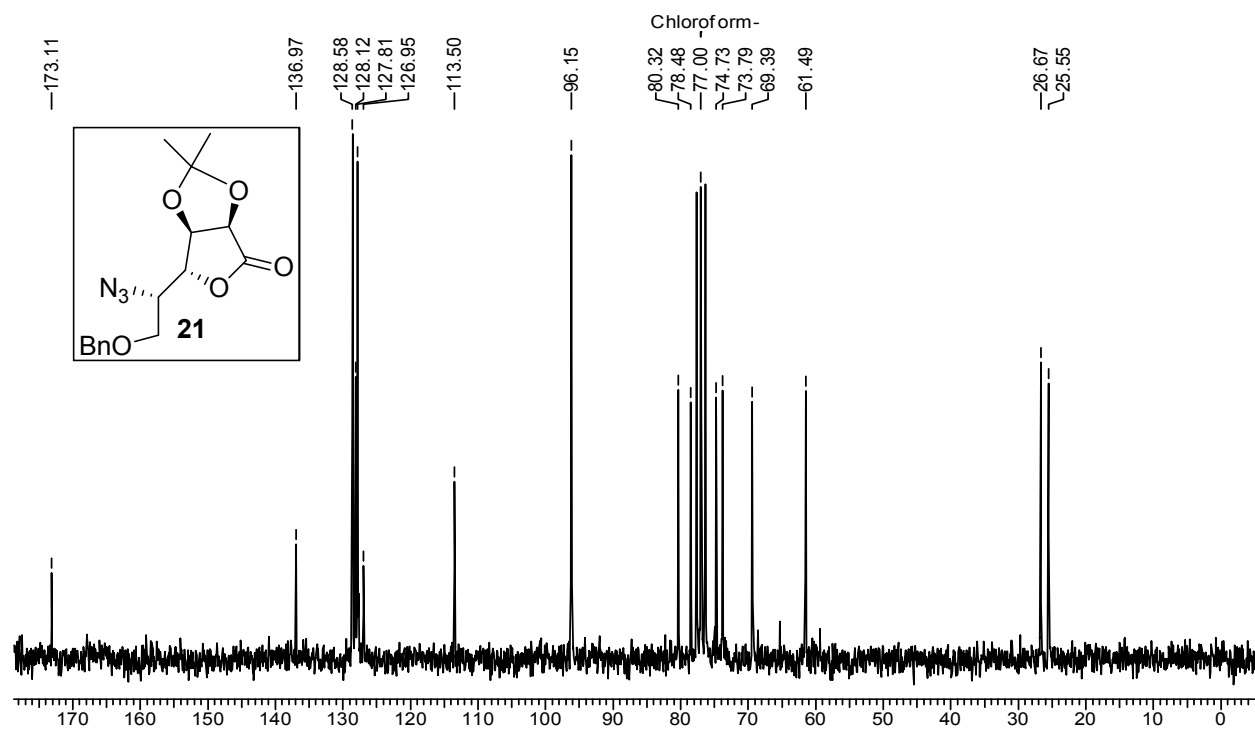
DEPT Spectrum of compound 20 (CDCl₃+CCl₄, 50 MHz)



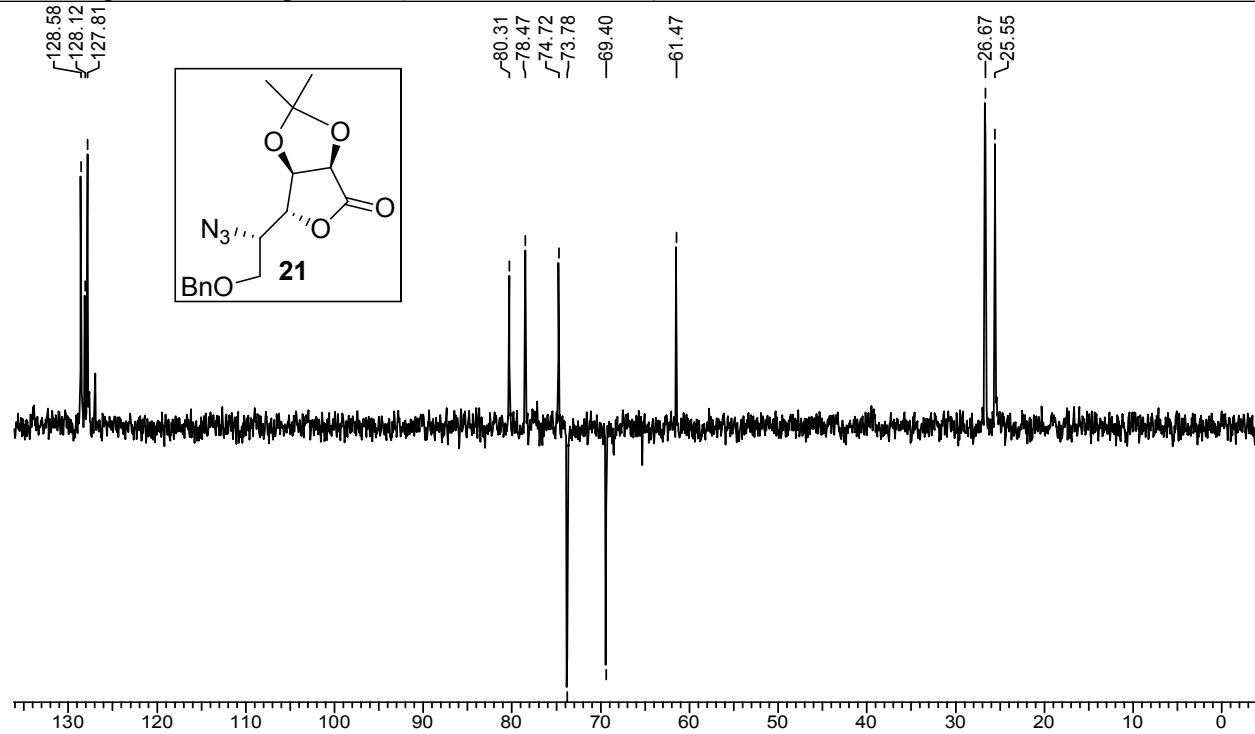
¹H NMR Spectrum of compound 21 (CDCl₃+CCl₄, 200 MHz)



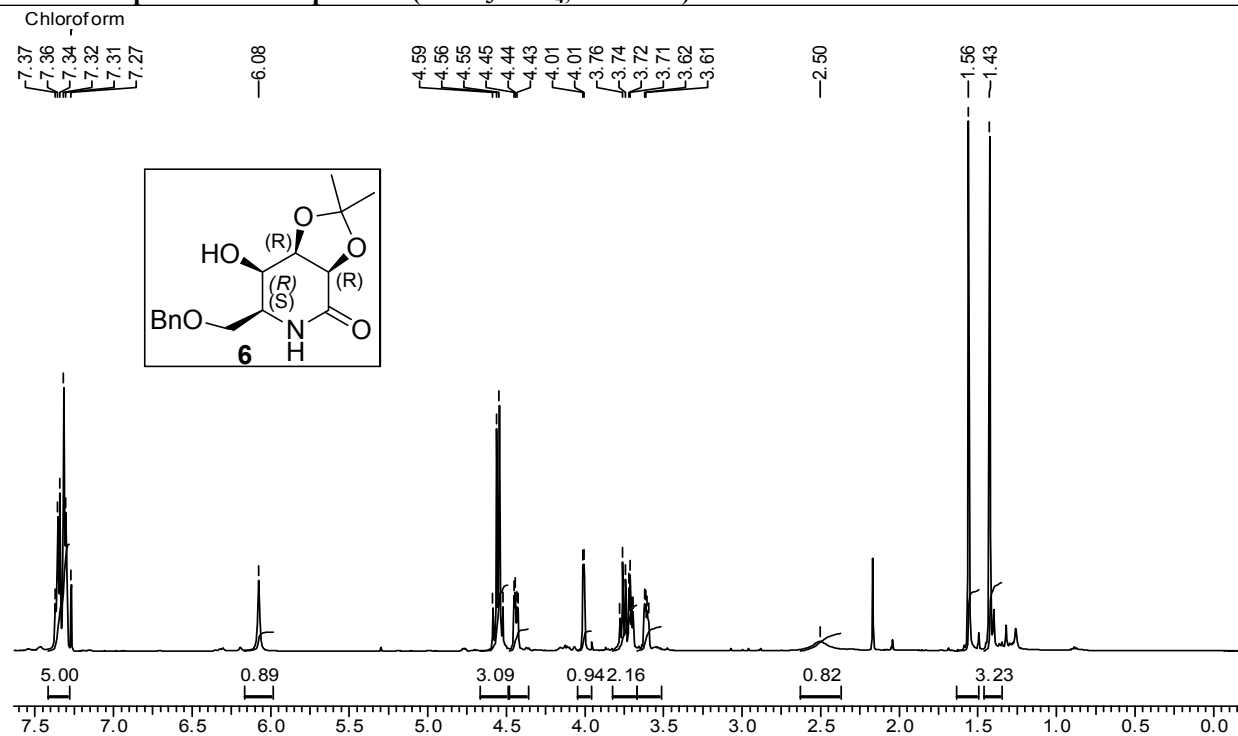
^{13}C NMR Spectrum of compound 21 ($\text{CDCl}_3 + \text{CCl}_4$, 50 MHz)



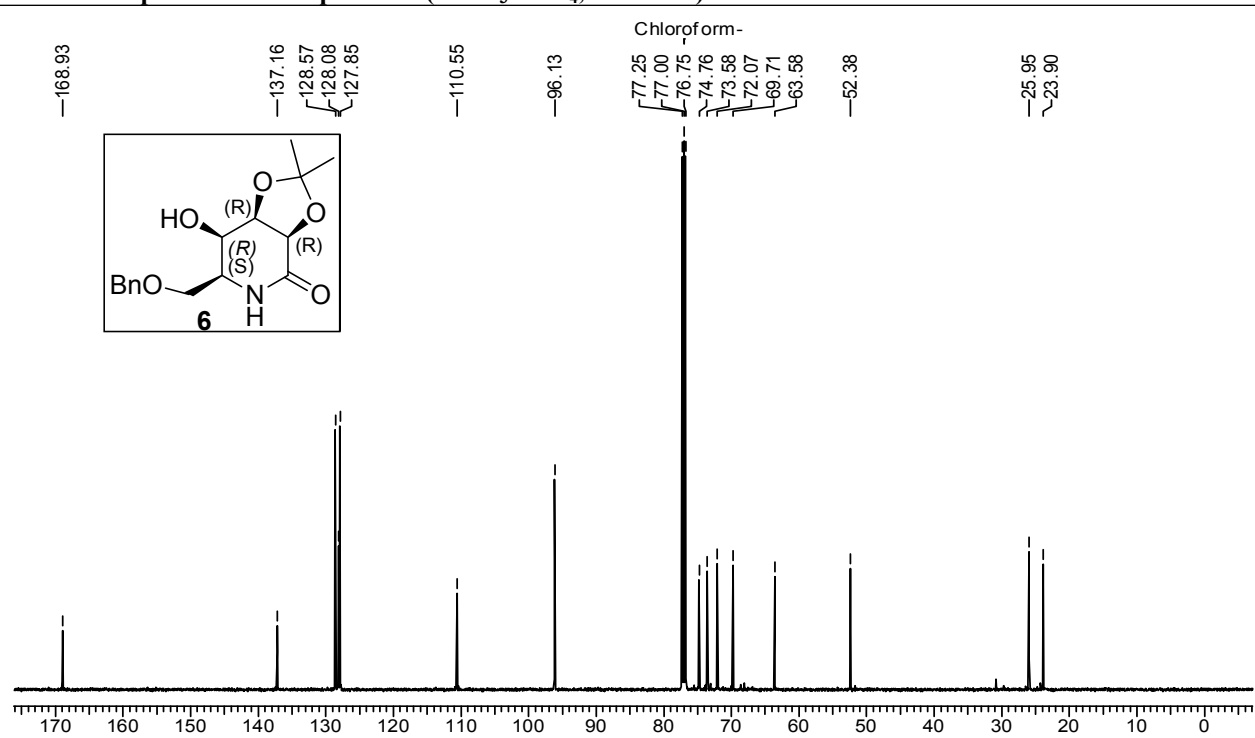
DEPT Spectrum of compound 21 ($\text{CDCl}_3 + \text{CCl}_4$, 50 MHz)



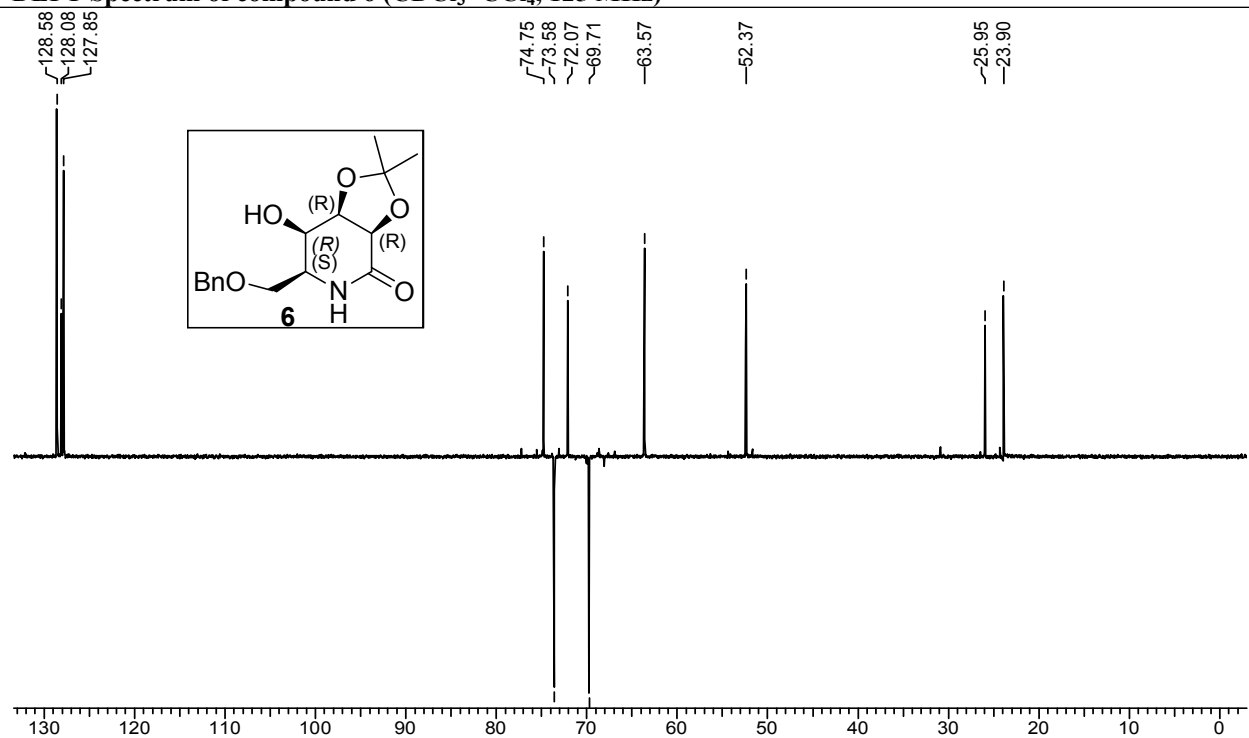
¹H NMR Spectrum of compound 6 (CDCl₃+CCl₄, 500 MHz)



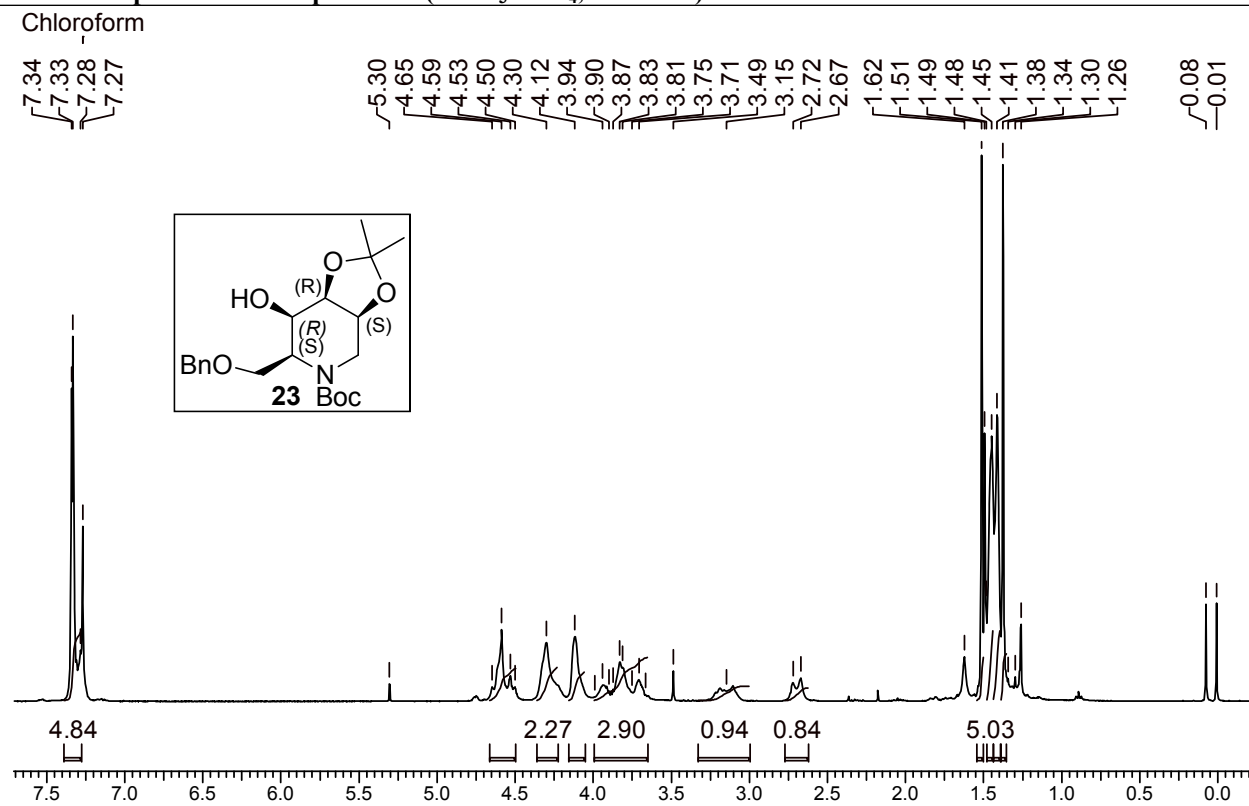
¹³C NMR Spectrum of compound 6 (CDCl₃+CCl₄, 125 MHz)



DEPT Spectrum of compound 6 (CDCl₃+CCl₄, 125 MHz)



¹H NMR Spectrum of compound 23 (CDCl₃+CCl₄, 400 MHz)



Chemical structure of compound **23** is shown in the inset. The structure is a bicyclic molecule with a benzyl group (BnO), a hydroxyl group (HO), and a Boc-protected amine (Boc-N). The stereochemistry is indicated as (R), (R), (S), and (S).

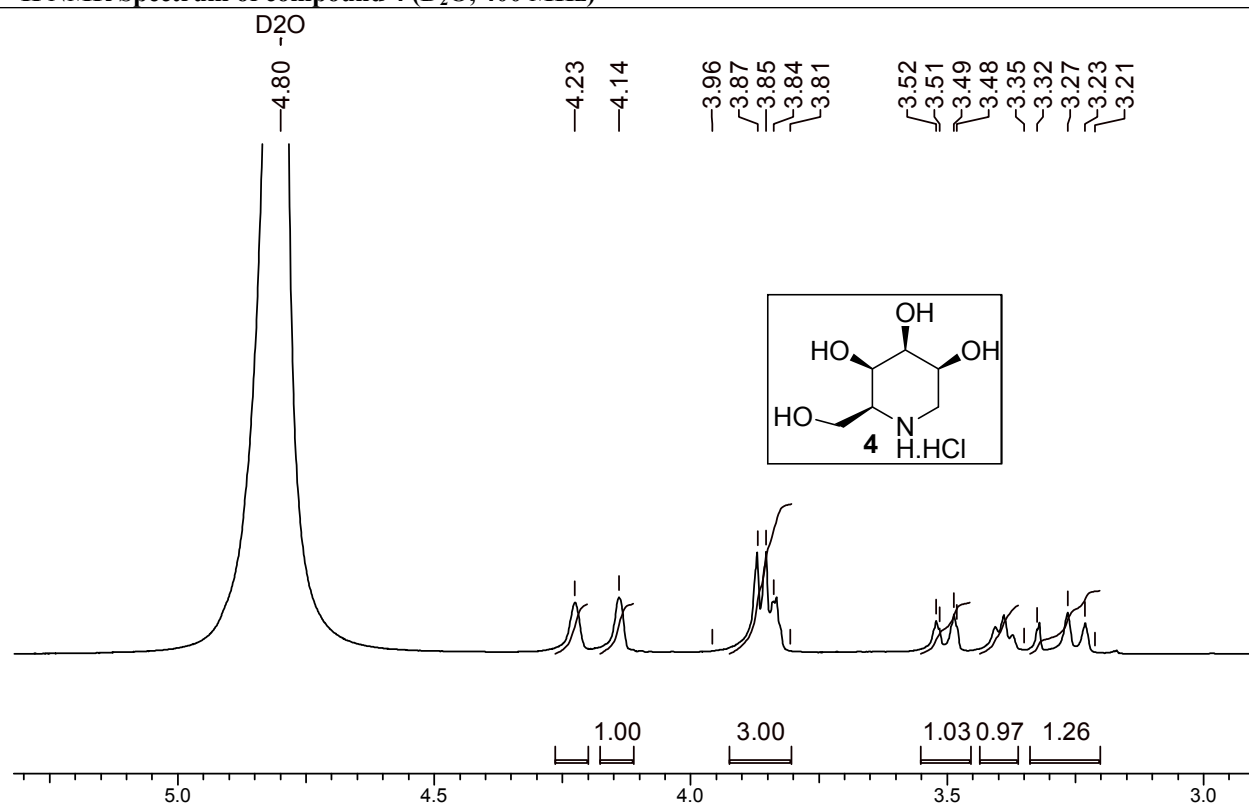
The ¹³C NMR spectrum (CDCl₃) shows the following chemical shifts (ppm):

- 154.68
- 138.32
- 128.38
- 127.68
- 109.64
- 80.30
- 77.00
- 74.78
- 73.29
- 71.31
- 66.83
- 65.59
- 53.02
- 52.25
- 42.26
- 40.88
- 28.37
- 27.77
- 26.52

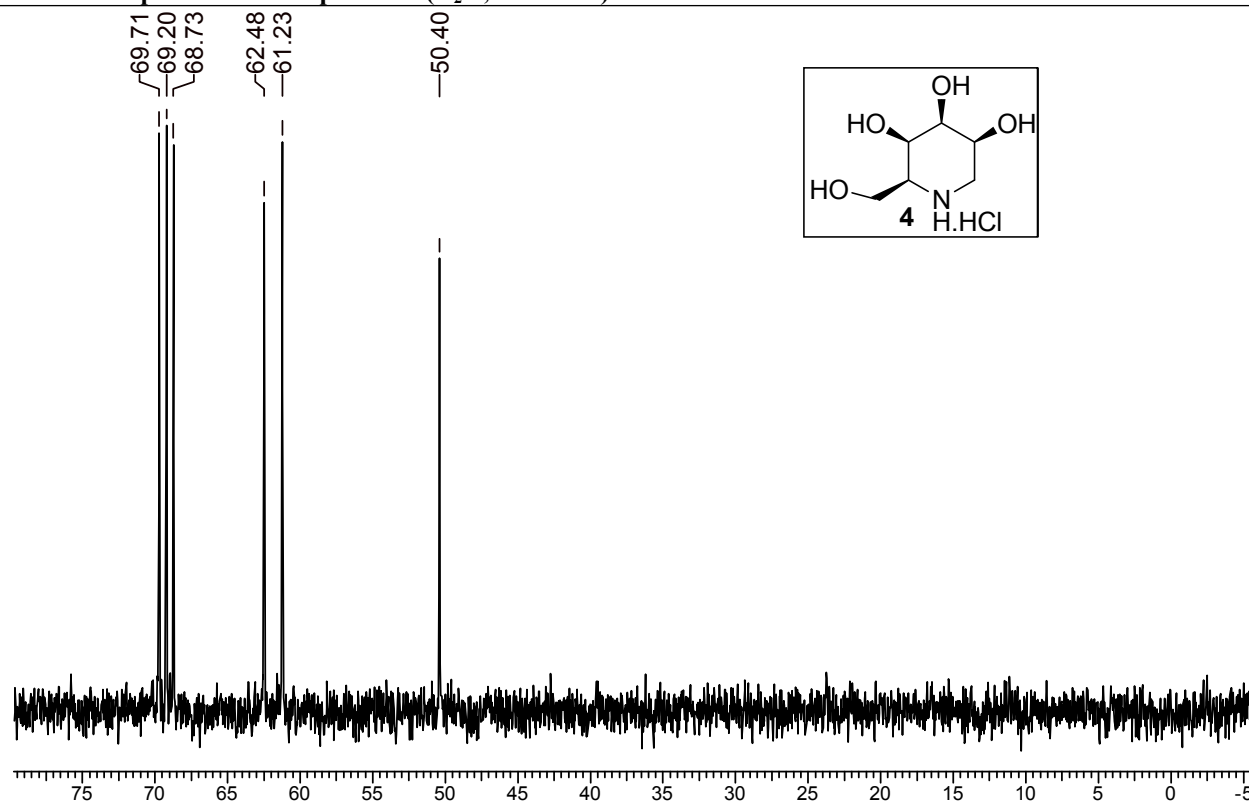
Chemical structure of compound **23** is shown in the inset. The structure is a bicyclic molecule with a Boc-protected amine, a benzyl ether, and a hydroxyl group. The stereochemistry is indicated as (R), (S), and (S).

The ¹³C NMR spectrum (CDCl₃) shows the following chemical shifts (ppm): 128.39, 127.68, 74.78, 73.29, 71.55, 71.28, 66.83, 65.58, 53.02, 52.26, 42.26, 40.89, 28.37, 27.78, and 26.52.

¹H NMR Spectrum of compound 4 (D₂O, 400 MHz)



¹³C NMR Spectrum of compound 4 (D₂O, 100 MHz)



DEPT Spectrum of compound 4 (D₂O, 100 MHz)

