



Supporting Information

for

Metal-free glycosylation with glycosyl fluorides in liquid SO₂

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Beilstein J. Org. Chem. **2021**, *17*, 964–976. doi:10.3762/bjoc.17.78

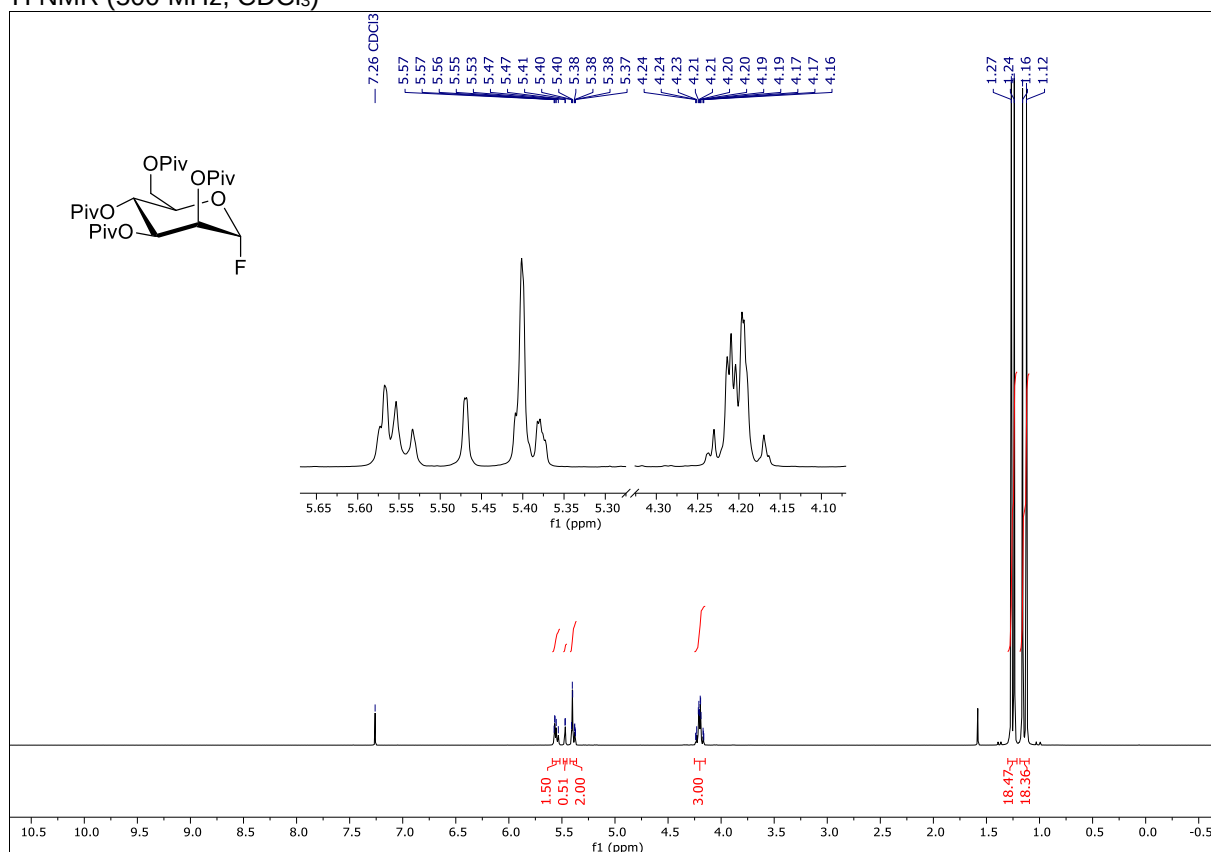
Copies of NMR spectra

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4. Side-products	S2-88

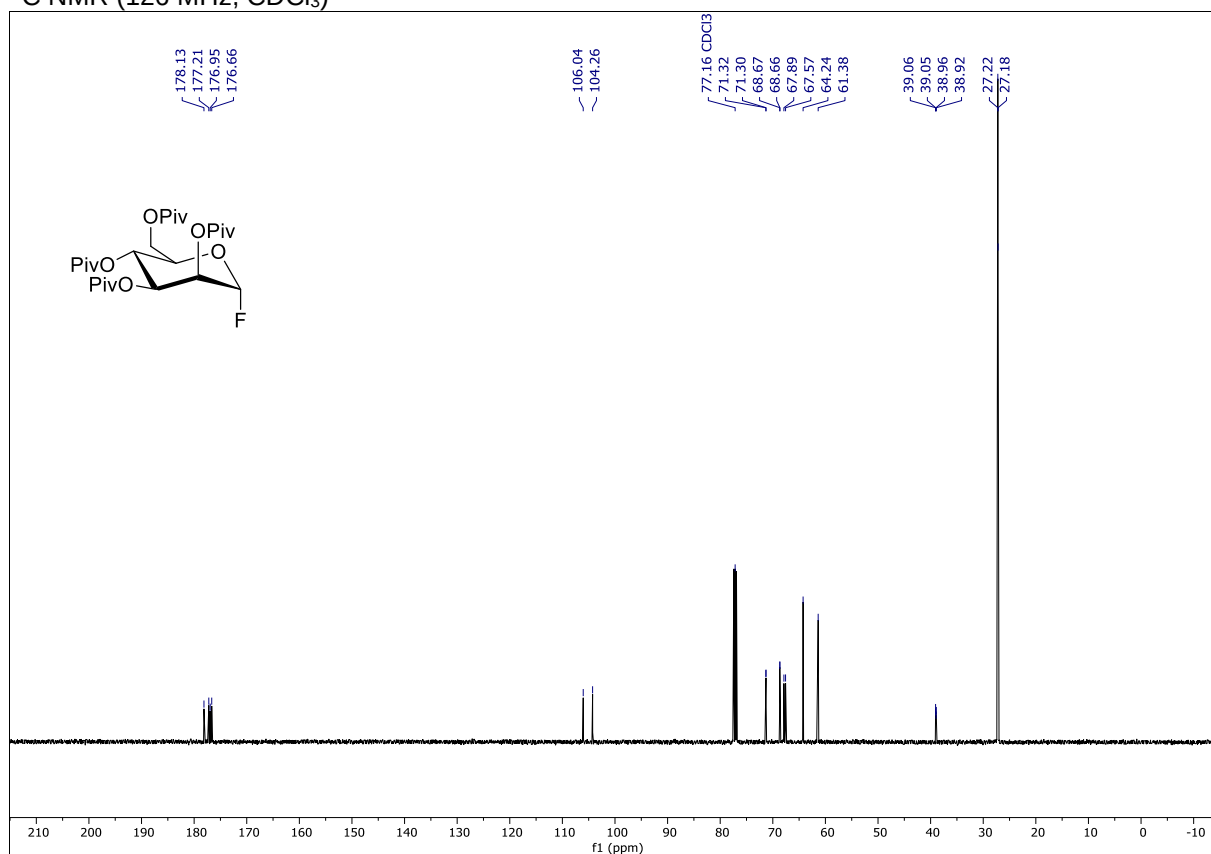
1. GLYCOSYL DONORS

α -1a

^1H NMR (500 MHz, CDCl_3)

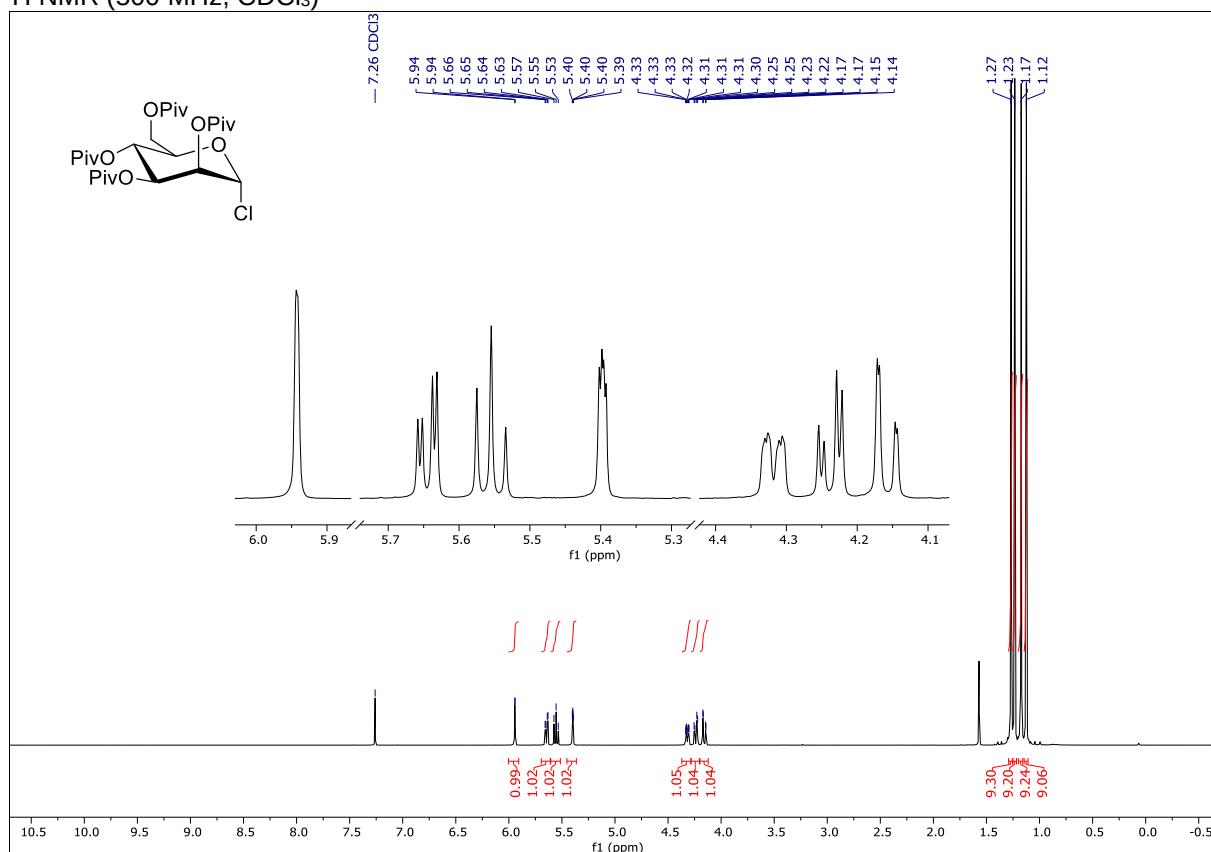


^{13}C NMR (126 MHz, CDCl_3)

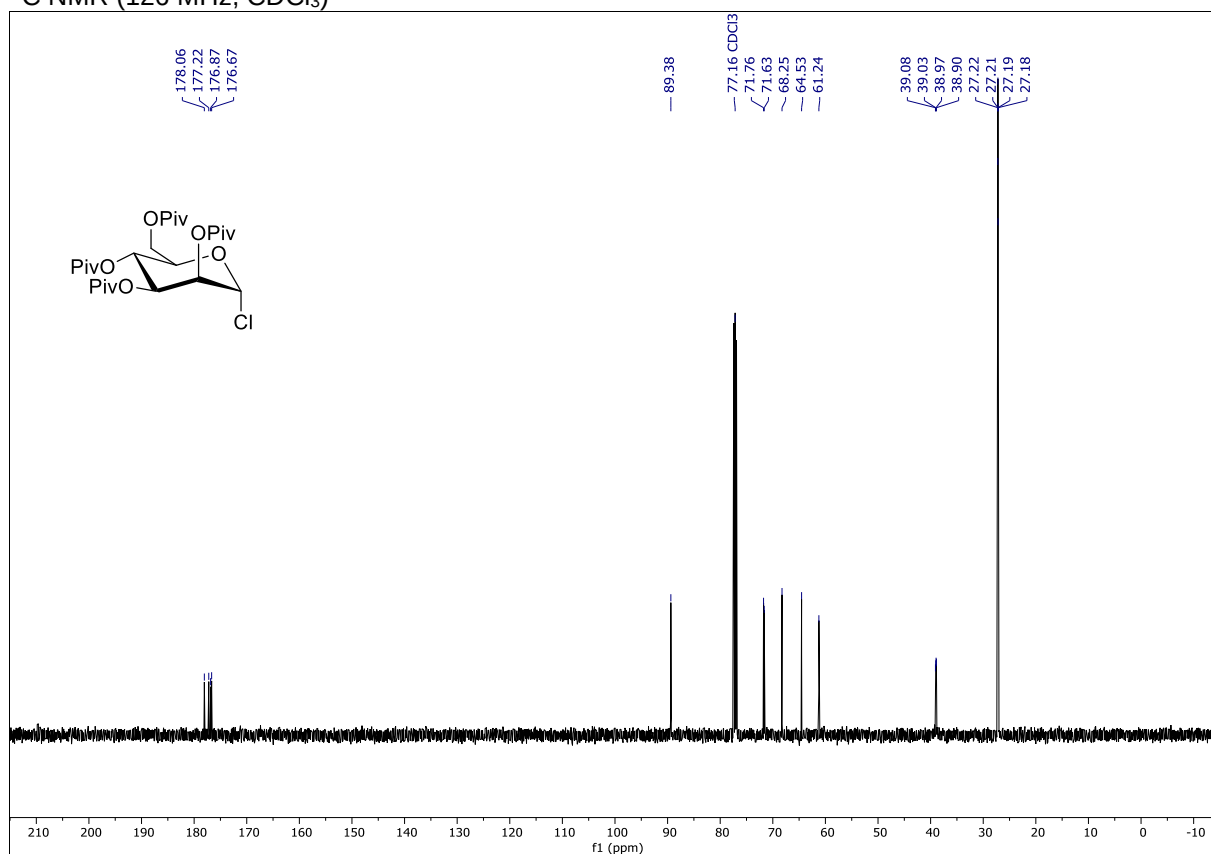


α -1b

^1H NMR (500 MHz, CDCl_3)

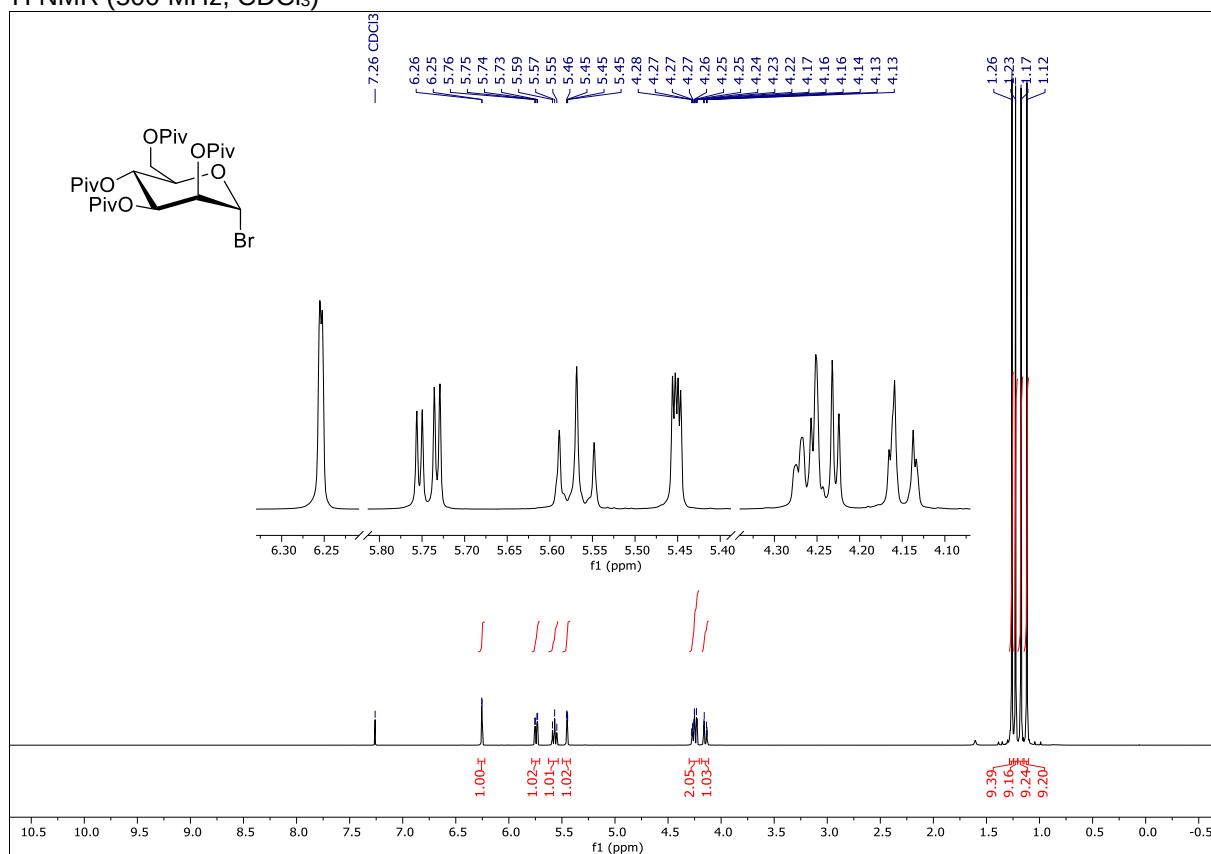


^{13}C NMR (126 MHz, CDCl_3)

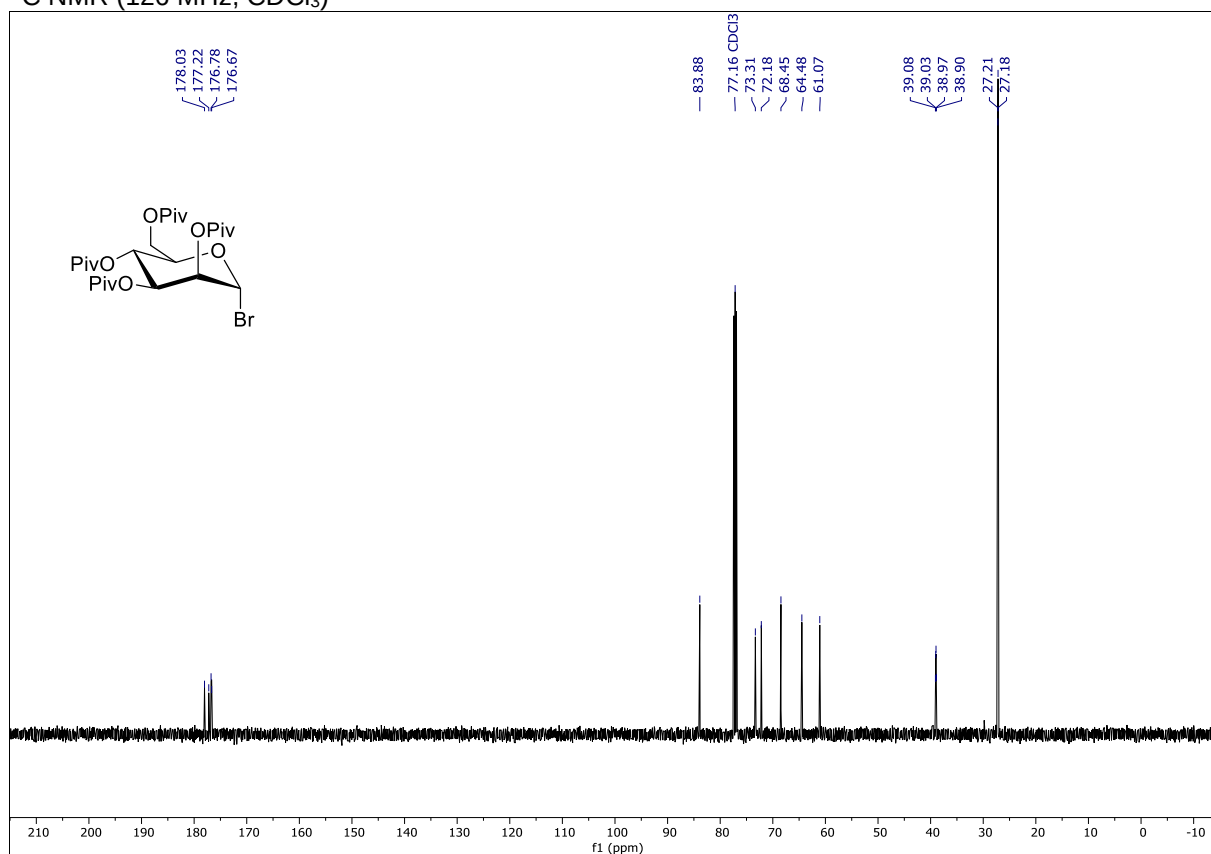


α -1c

^1H NMR (500 MHz, CDCl_3)

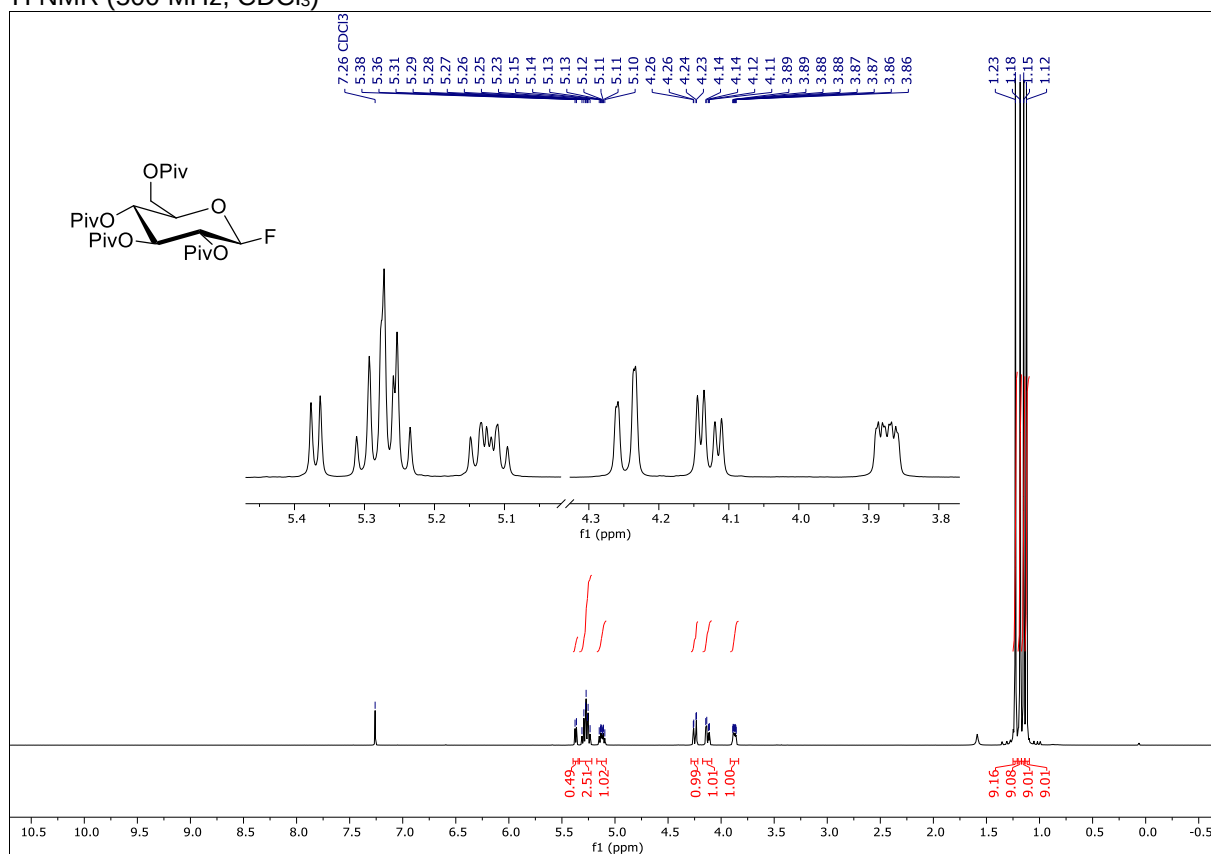


^{13}C NMR (126 MHz, CDCl_3)

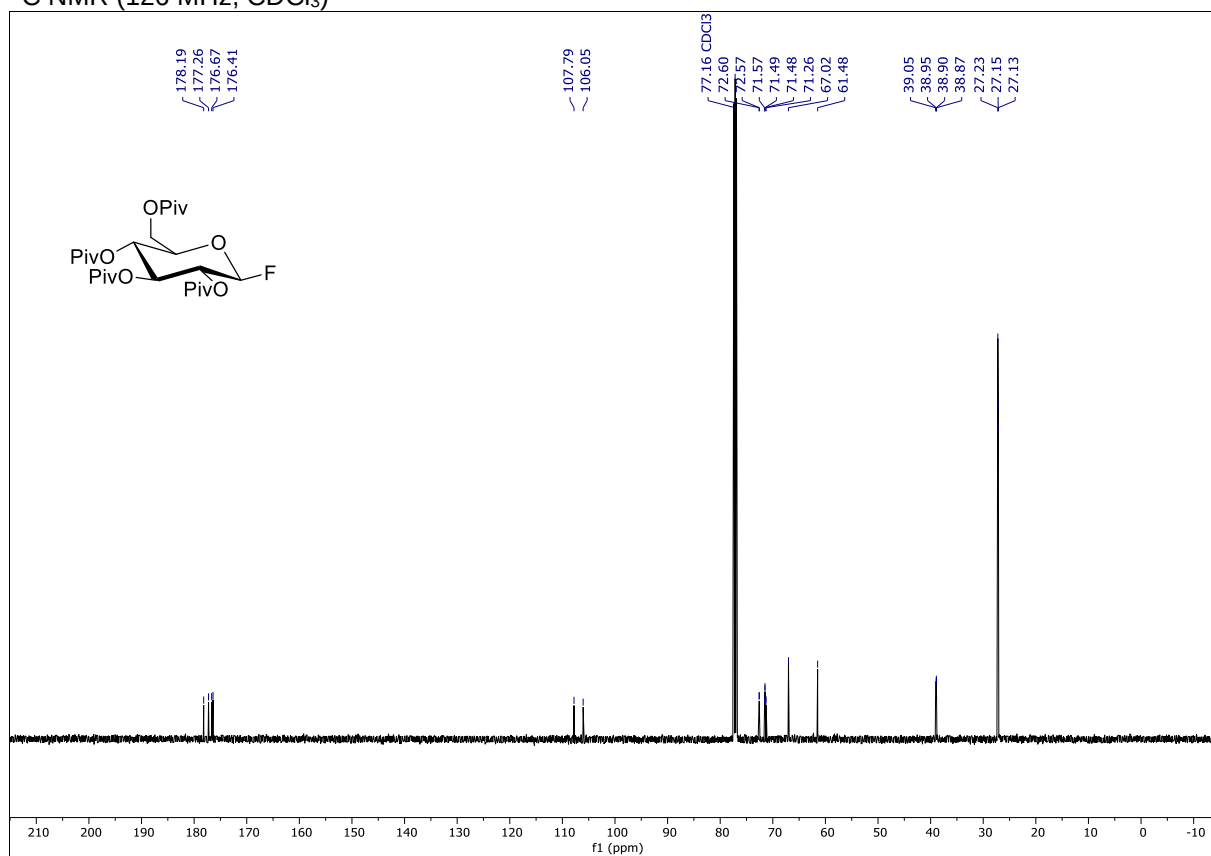


β -9

^1H NMR (500 MHz, CDCl_3)

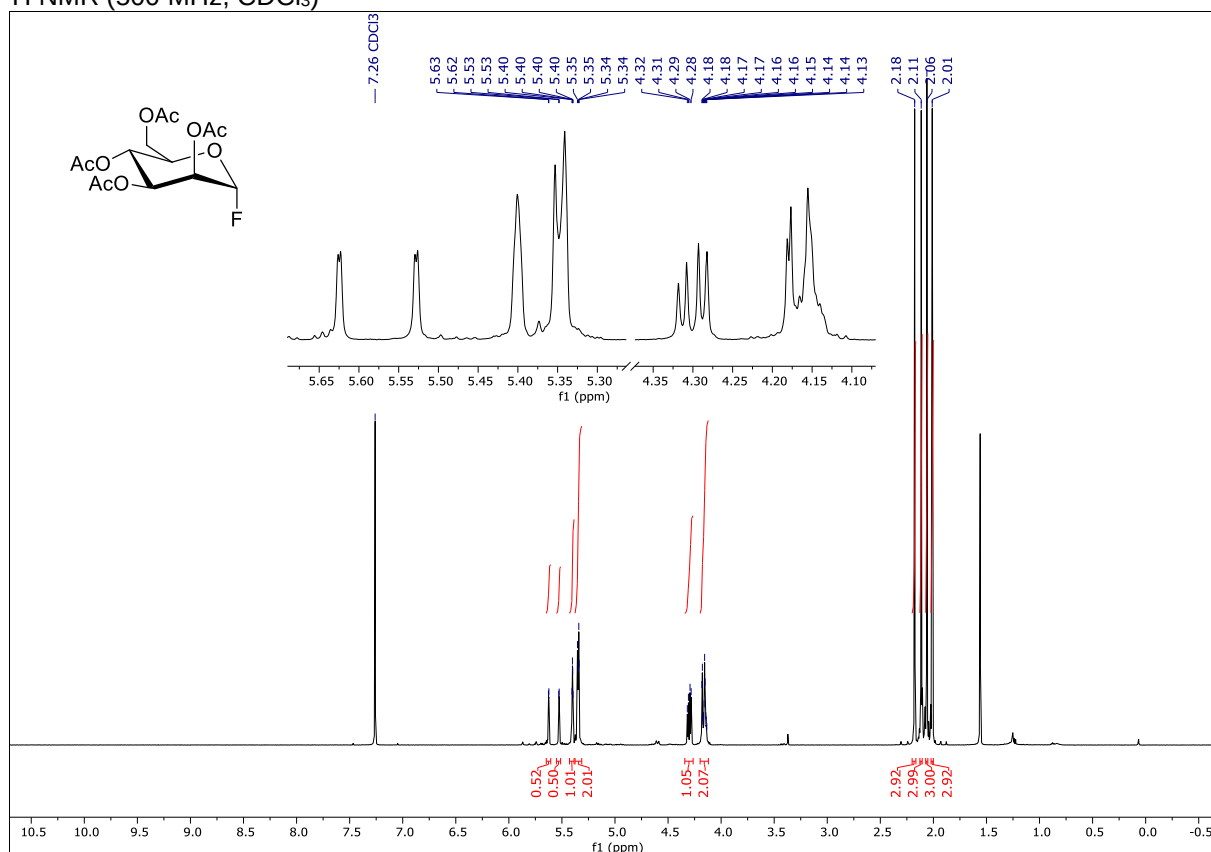


^{13}C NMR (126 MHz, CDCl_3)

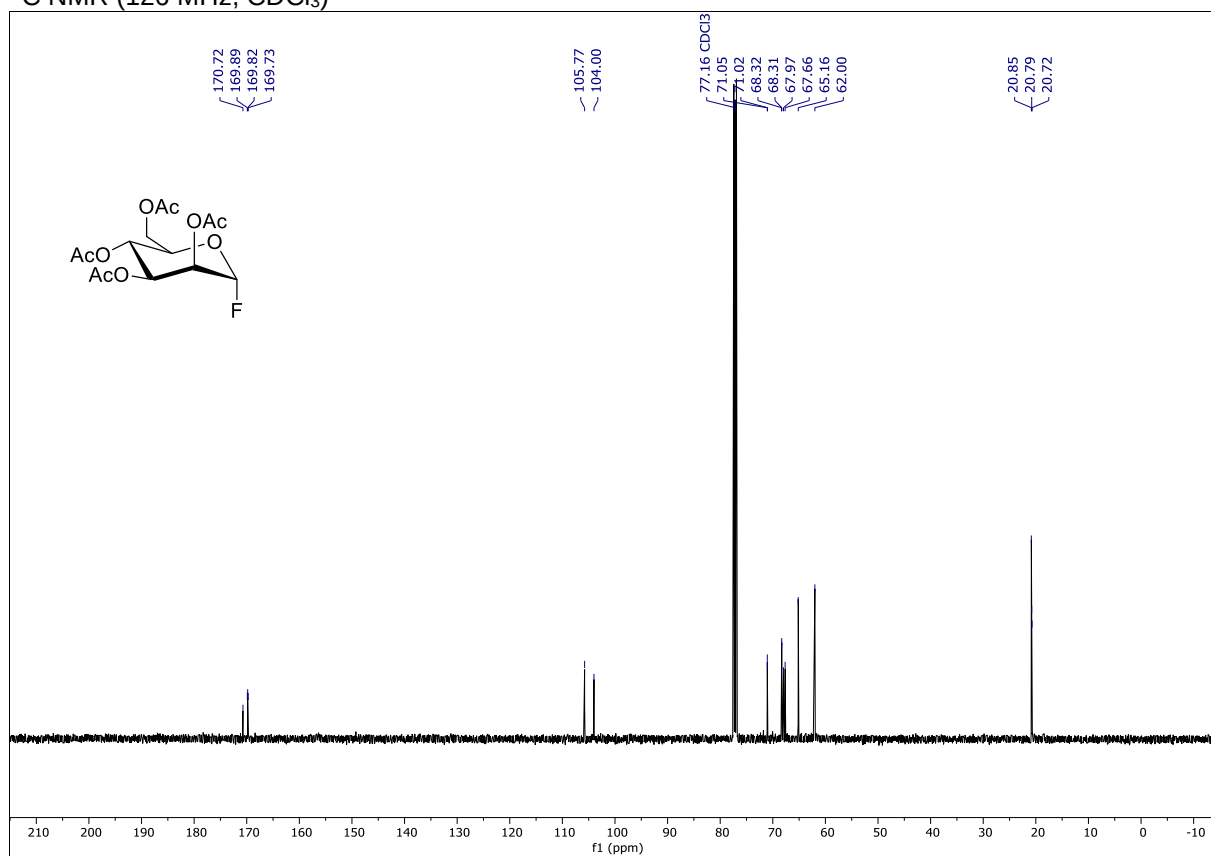


α -11

^1H NMR (500 MHz, CDCl_3)

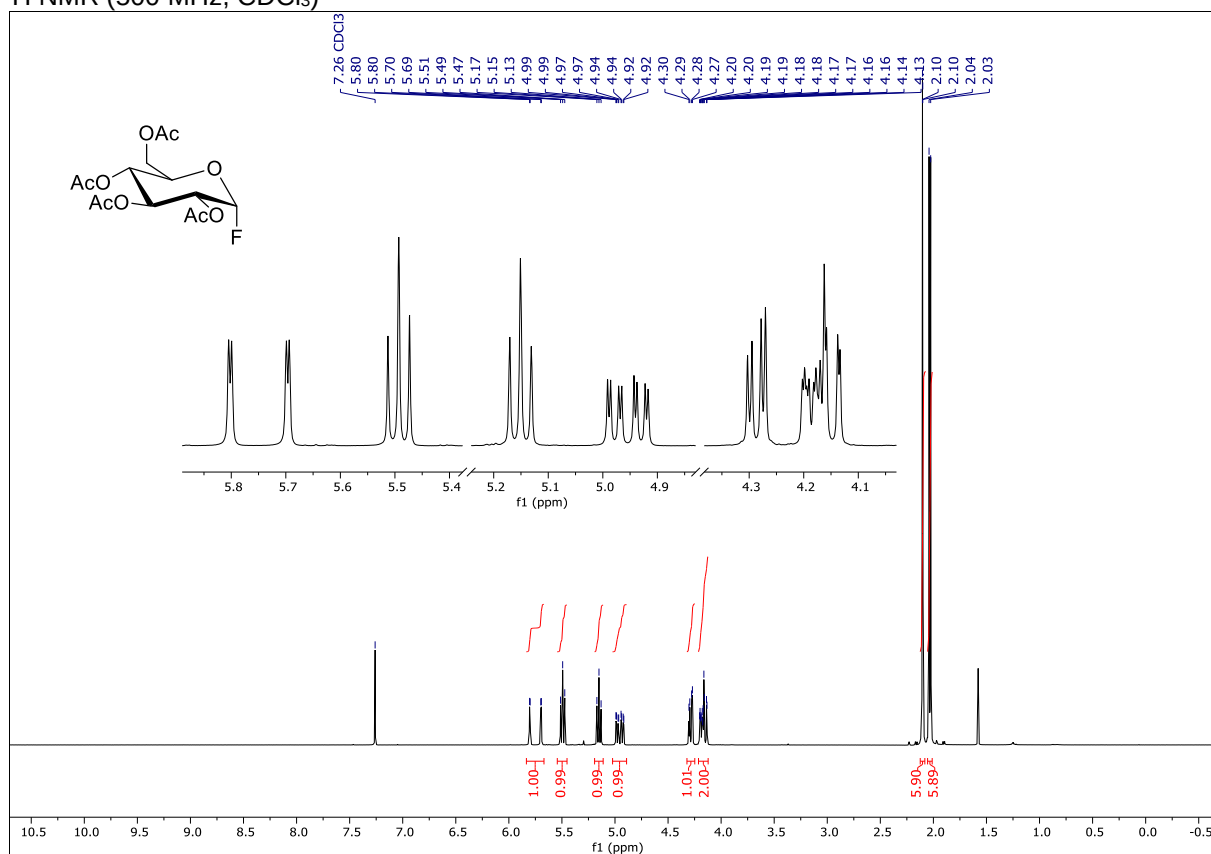


^{13}C NMR (126 MHz, CDCl_3)

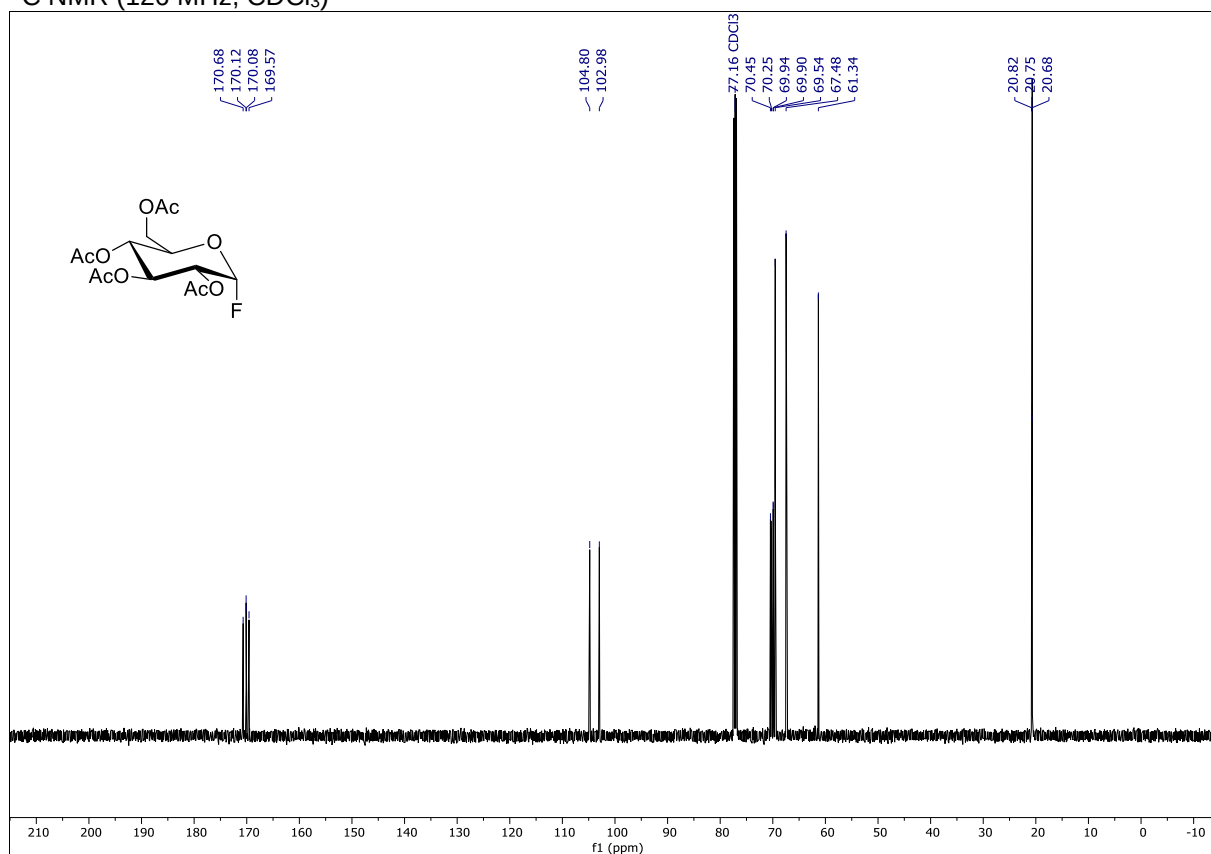


α -12

^1H NMR (500 MHz, CDCl_3)

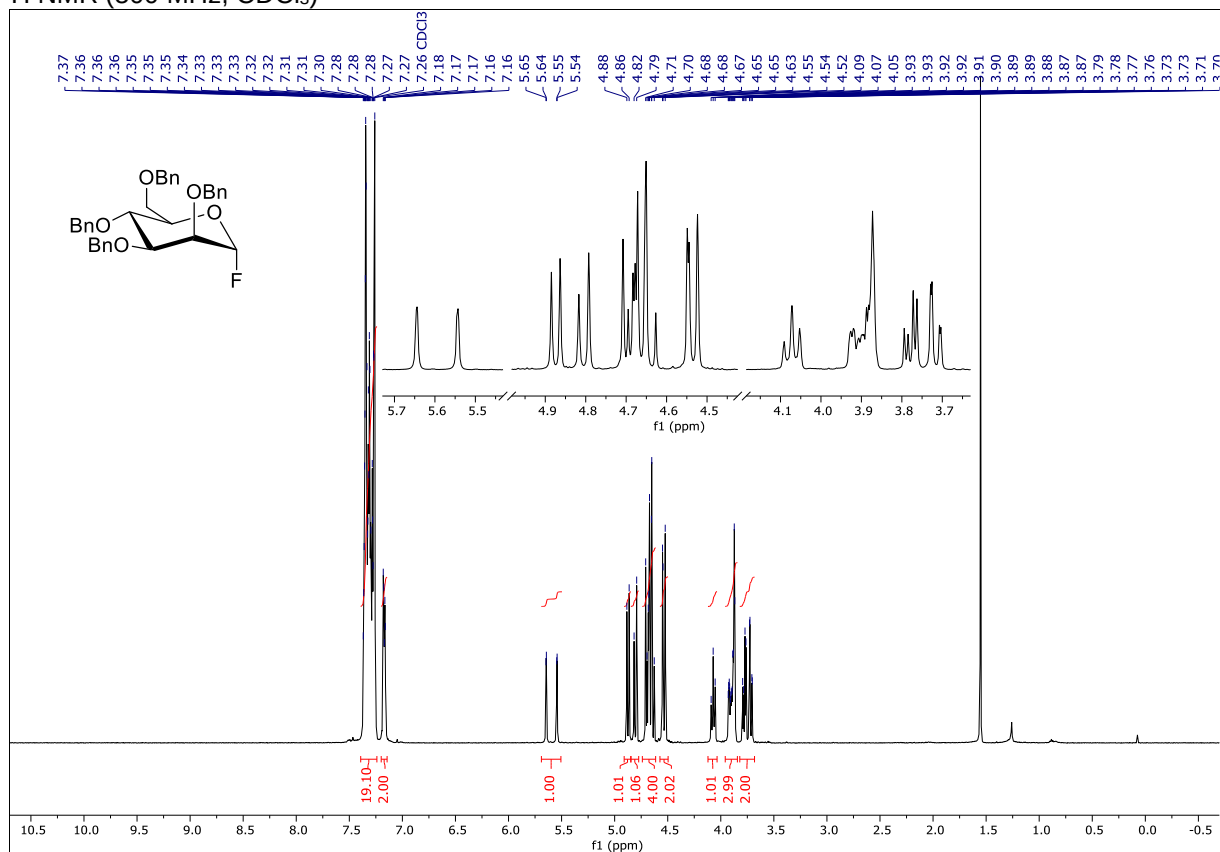


^{13}C NMR (126 MHz, CDCl_3)

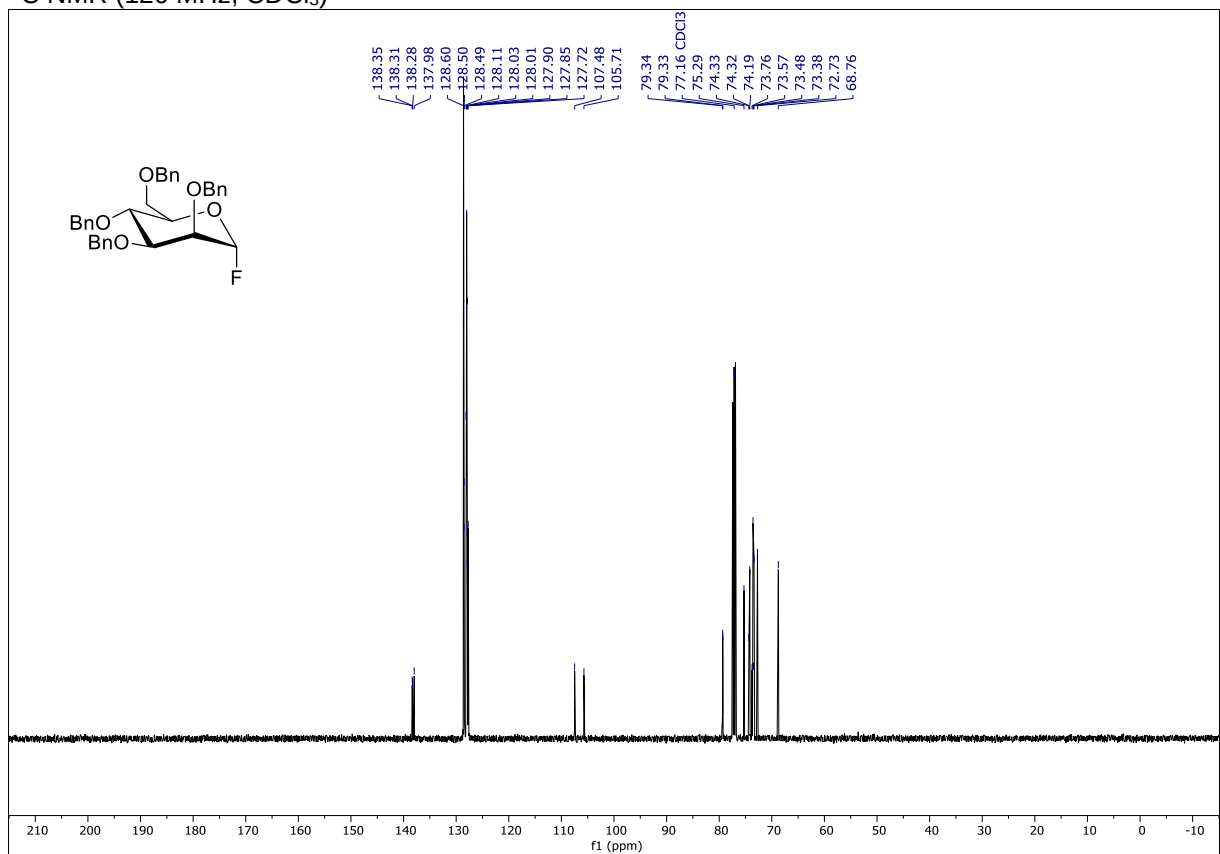


α -15

^1H NMR (500 MHz, CDCl_3)

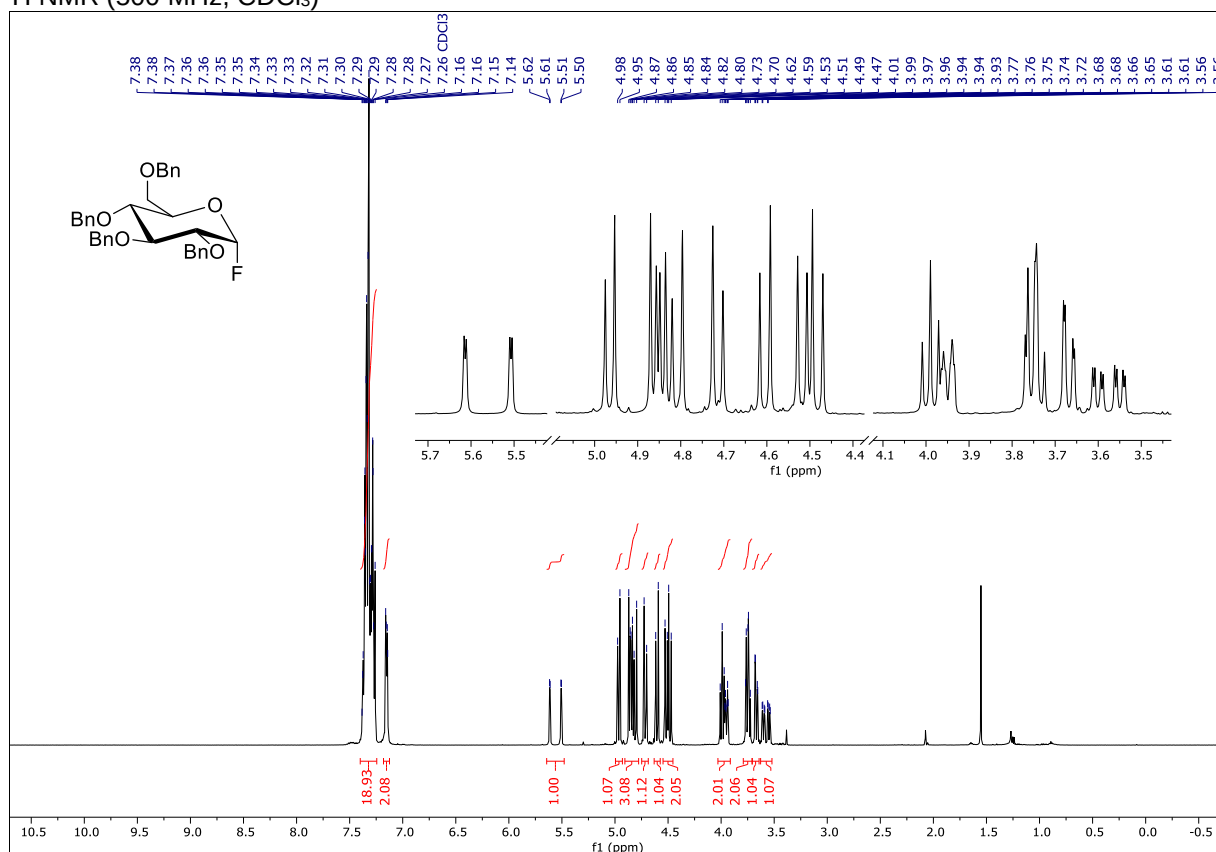


^{13}C NMR (126 MHz, CDCl_3)

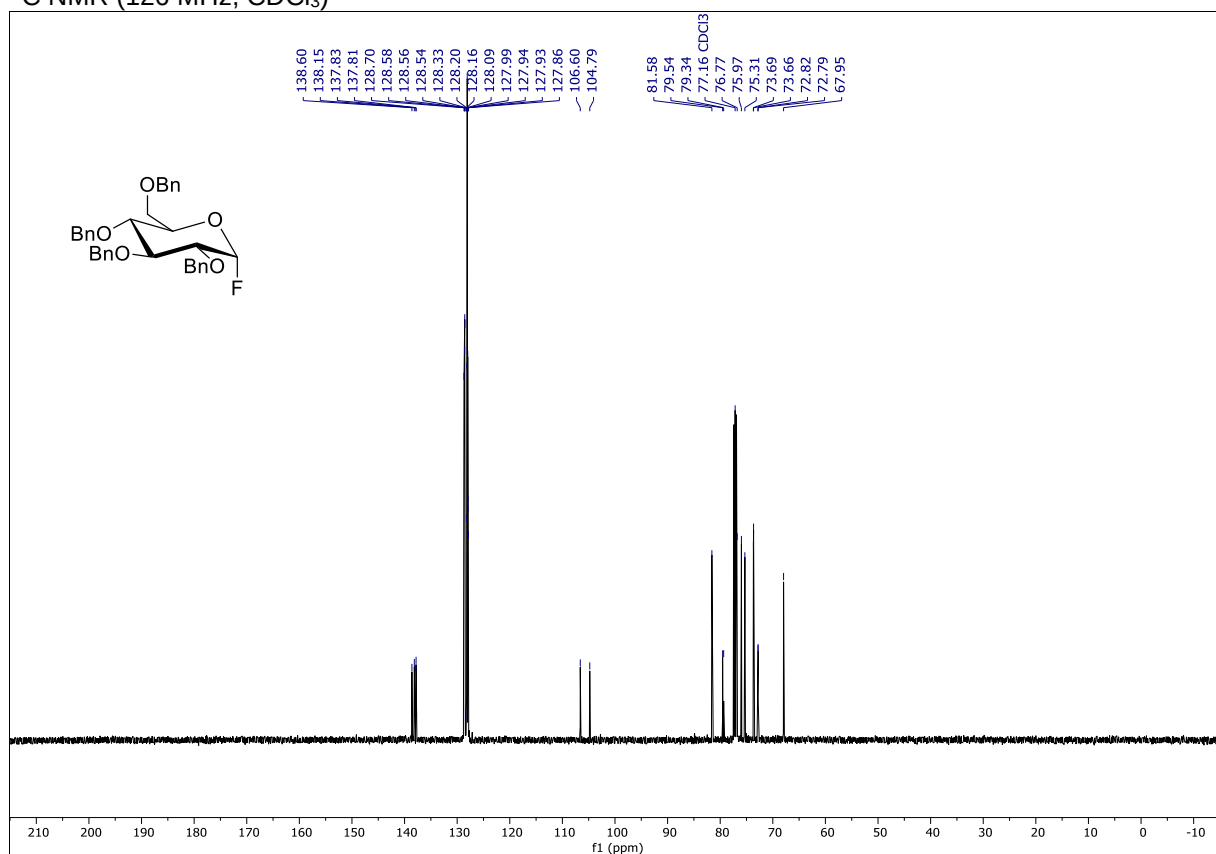


α -16

^1H NMR (500 MHz, CDCl_3)

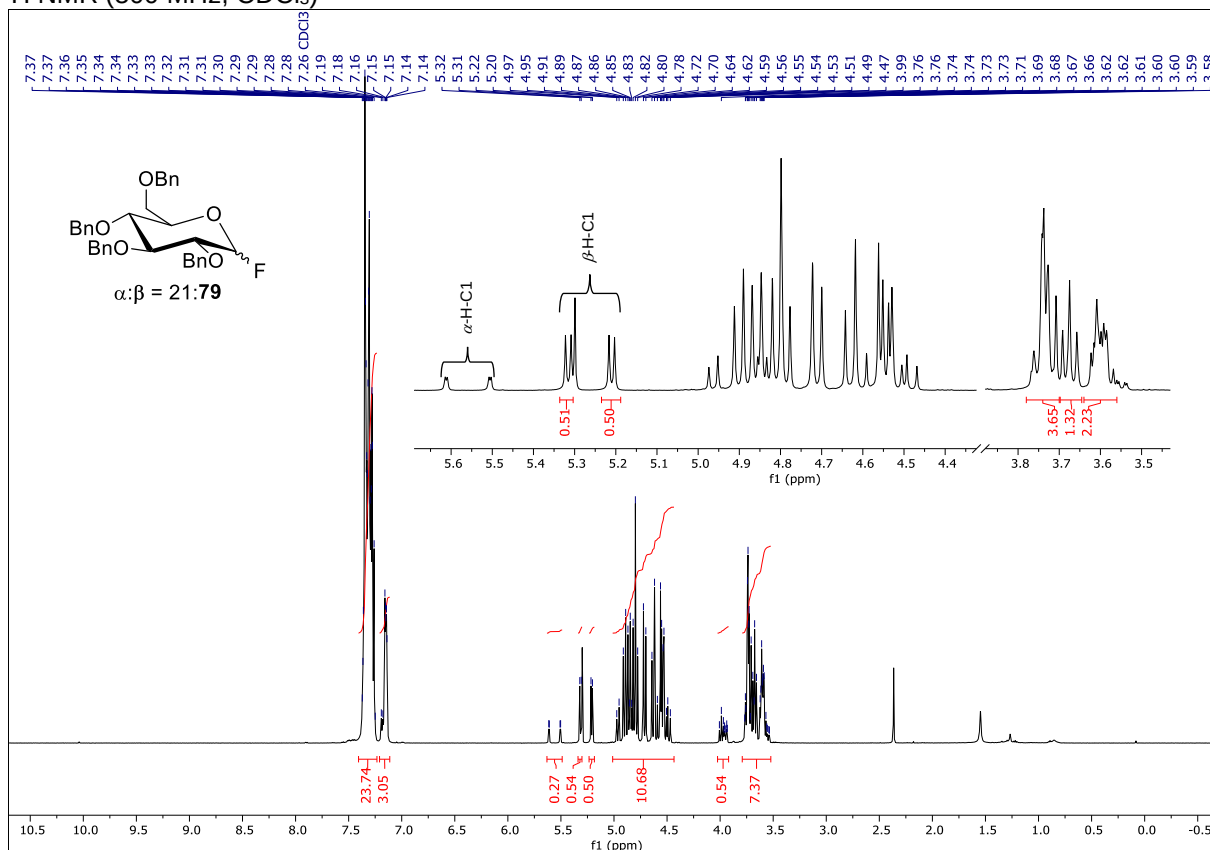


^{13}C NMR (126 MHz, CDCl_3)

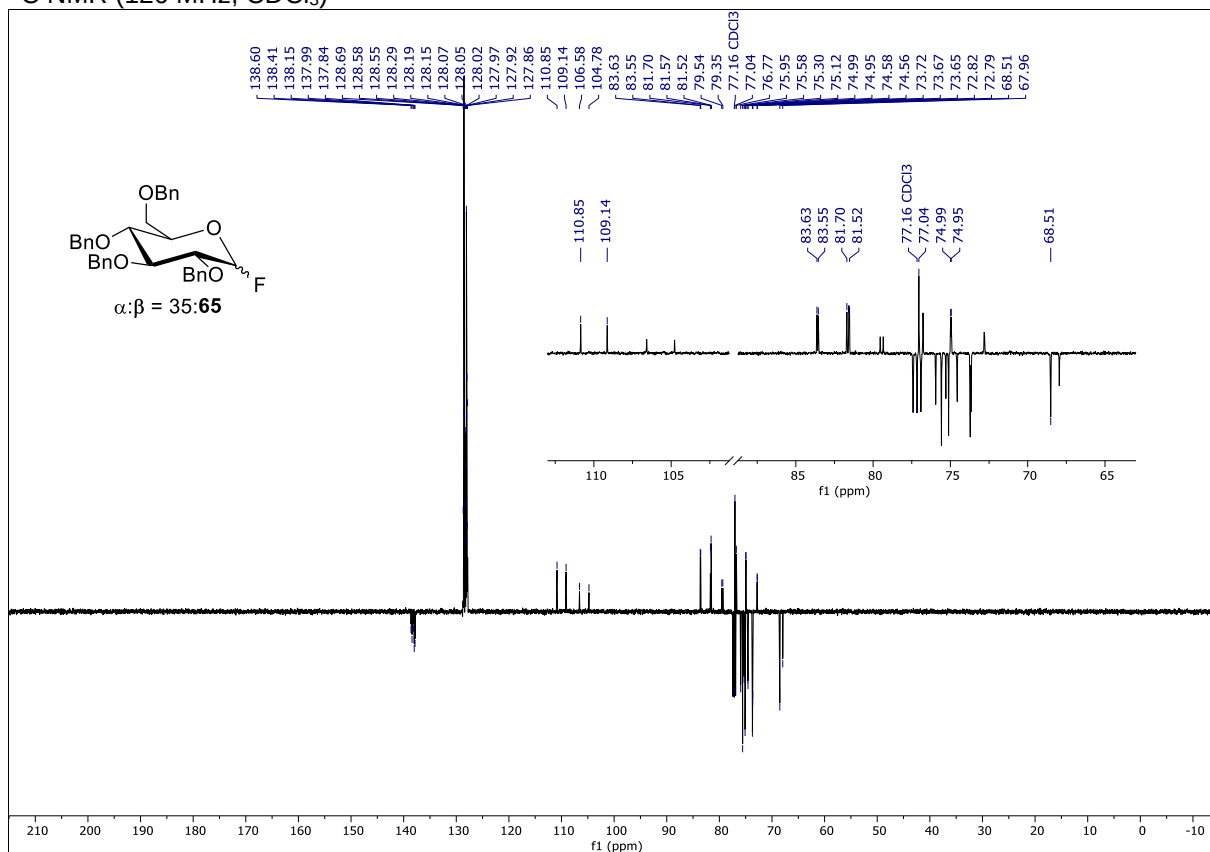


β -16

^1H NMR (500 MHz, CDCl_3)

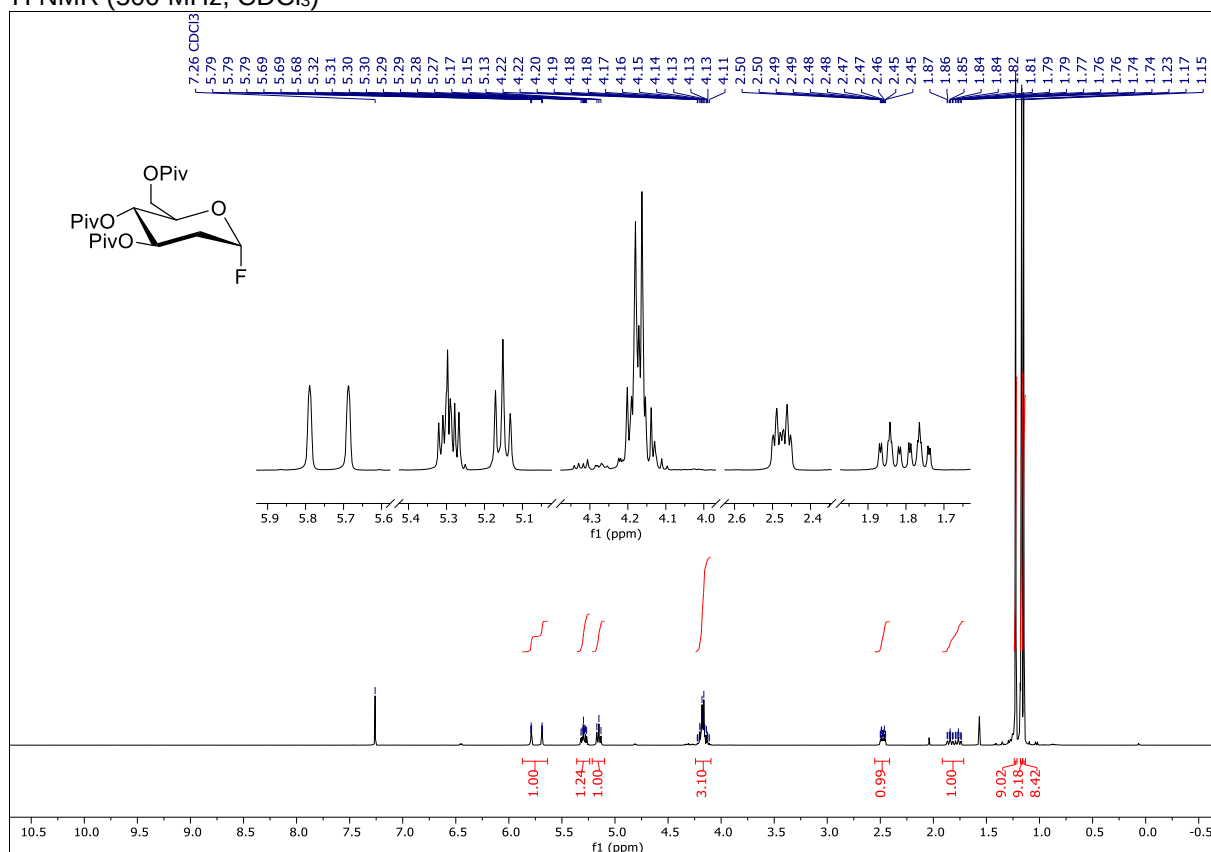


^{13}C NMR (126 MHz, CDCl_3)

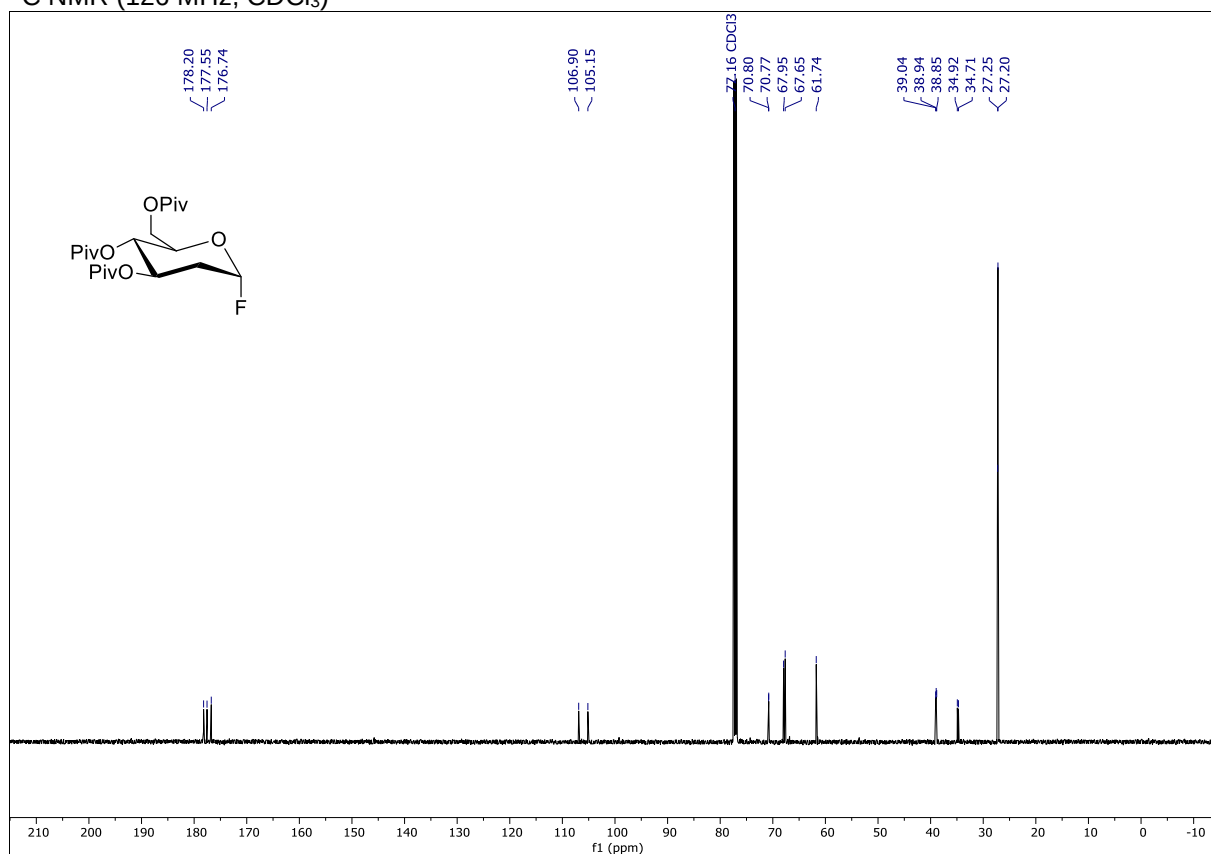


α -19

^1H NMR (500 MHz, CDCl_3)

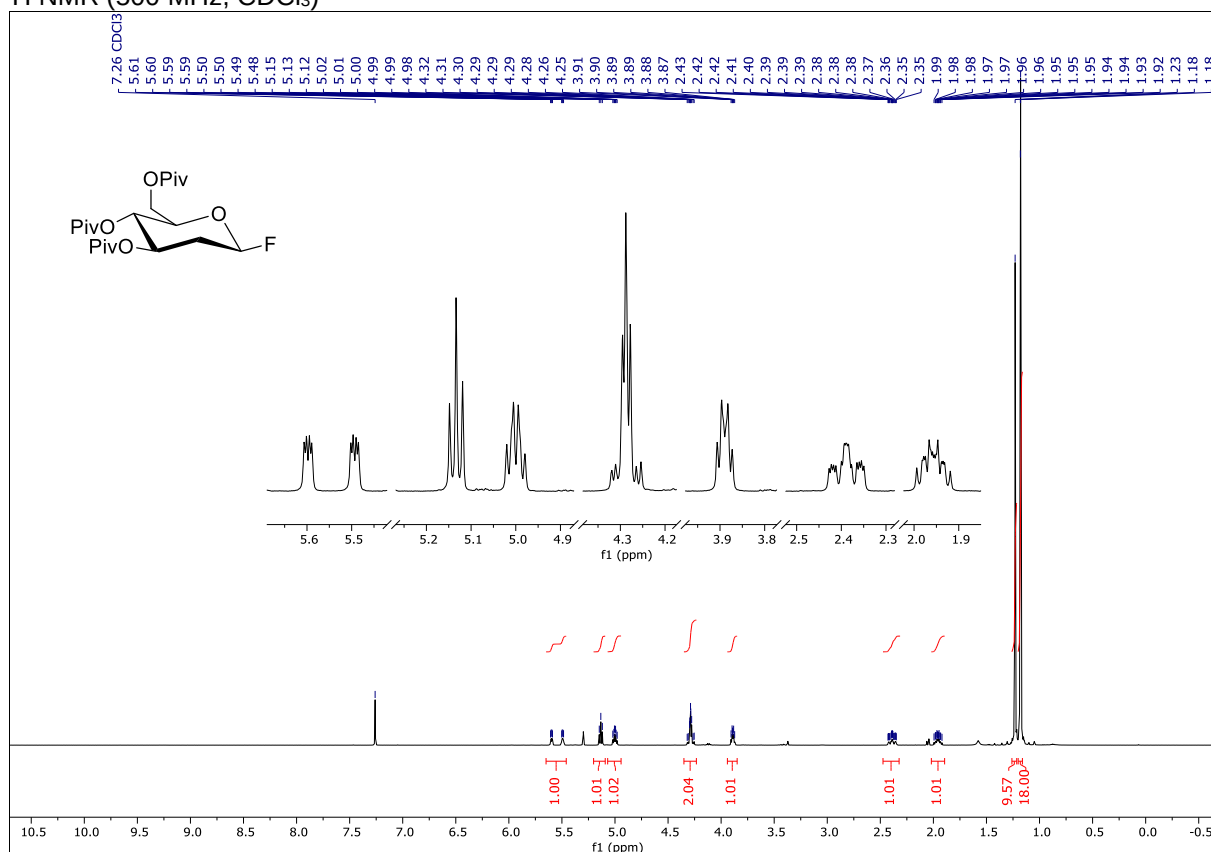


^{13}C NMR (126 MHz, CDCl_3)

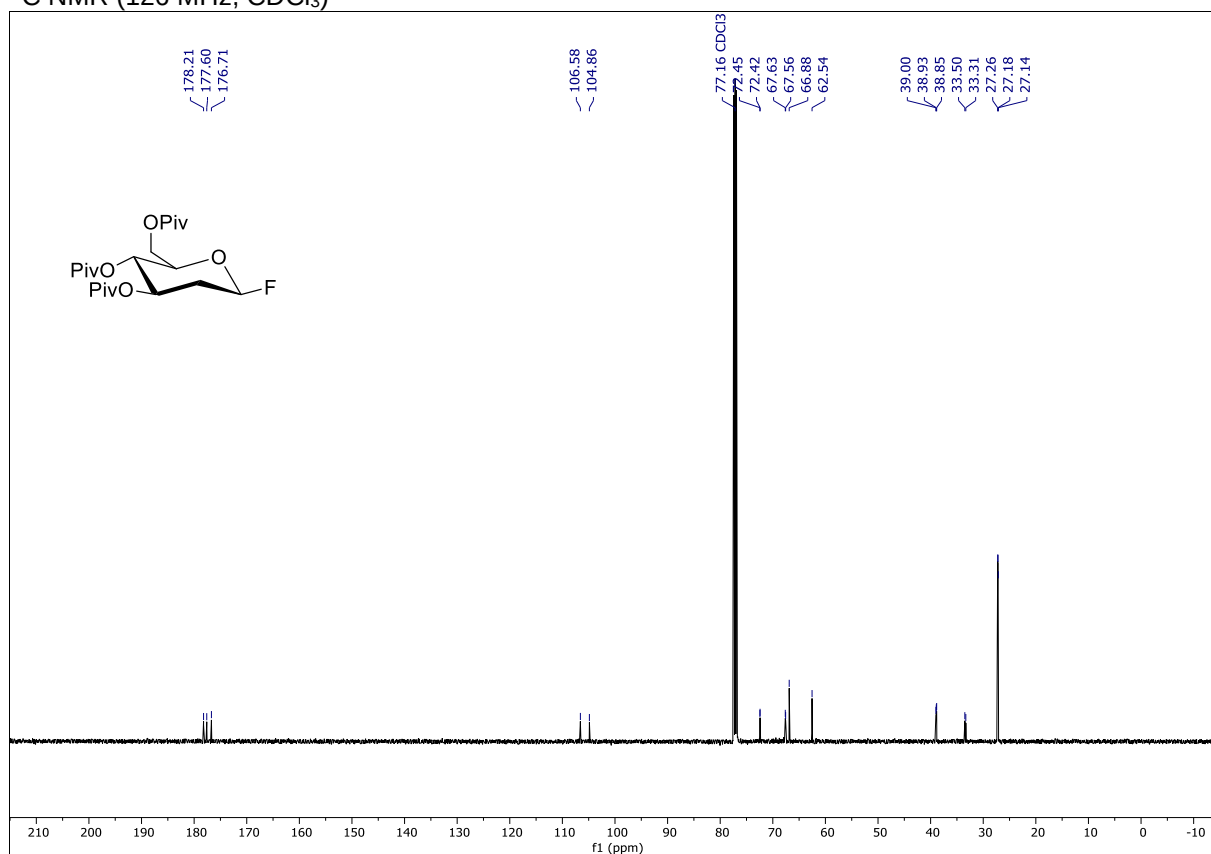


β -19

^1H NMR (500 MHz, CDCl_3)

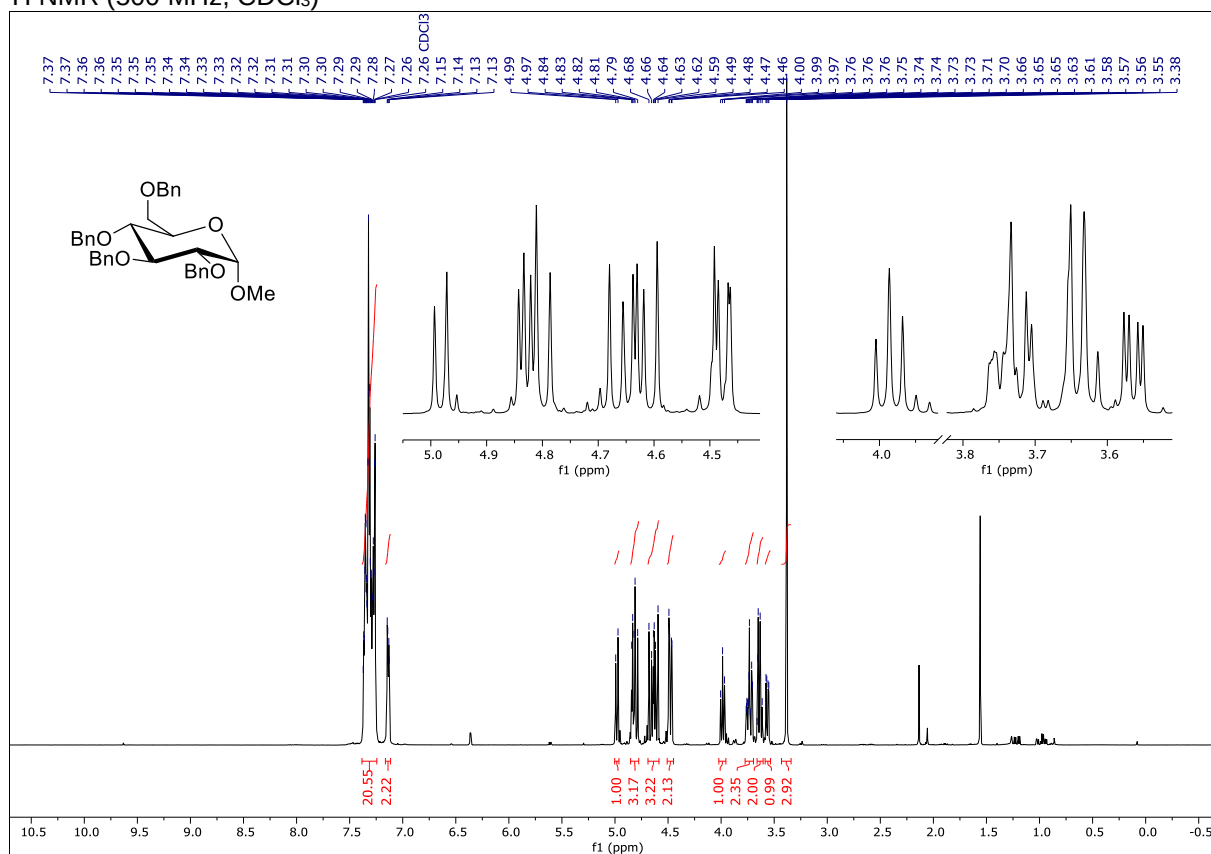


^{13}C NMR (126 MHz, CDCl_3)

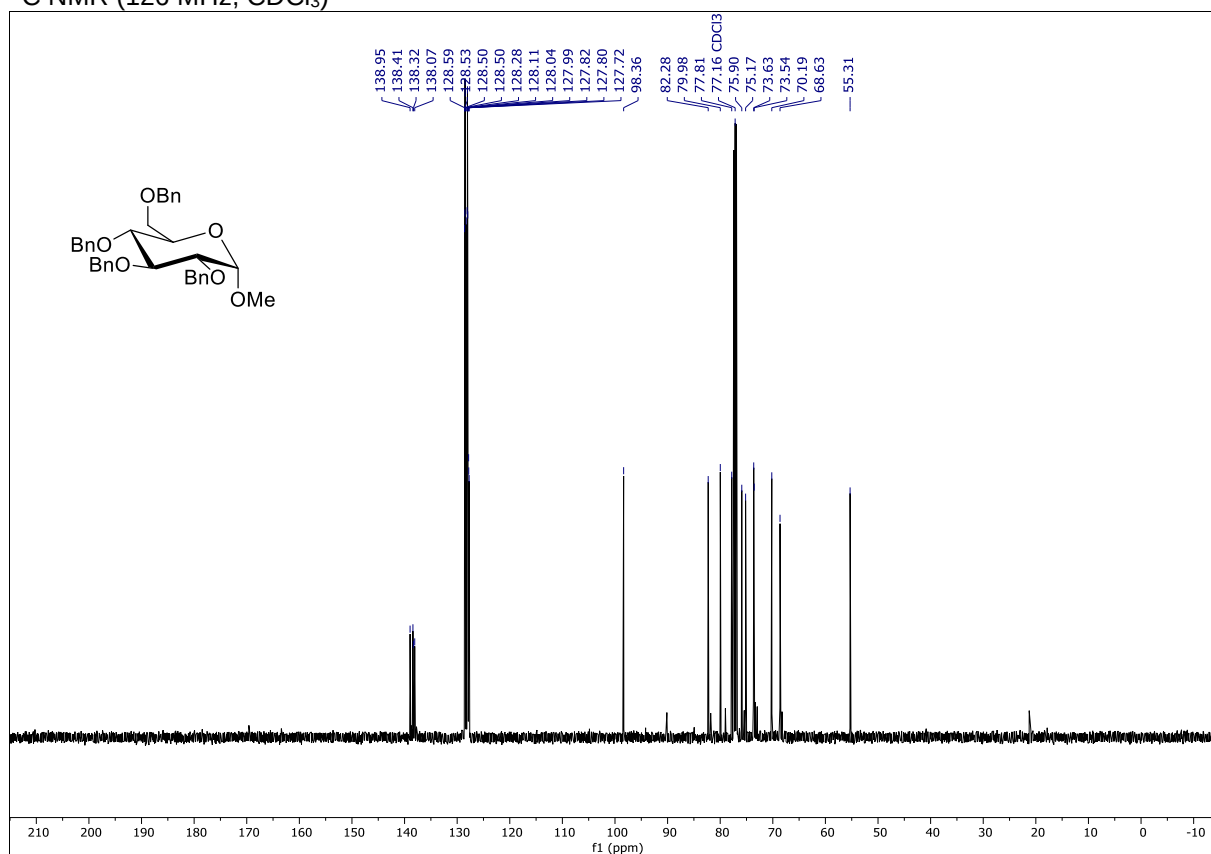


α -S9

^1H NMR (500 MHz, CDCl_3)

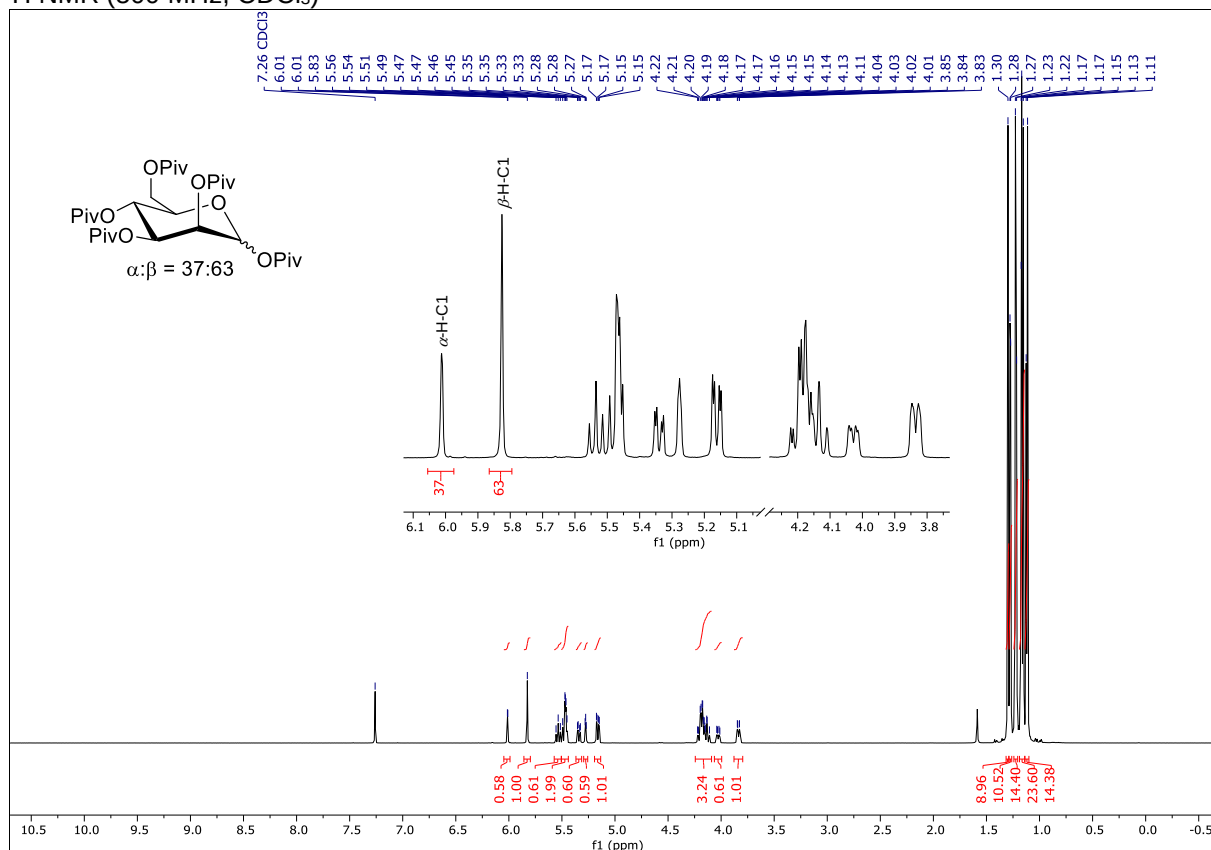


^{13}C NMR (126 MHz, CDCl_3)

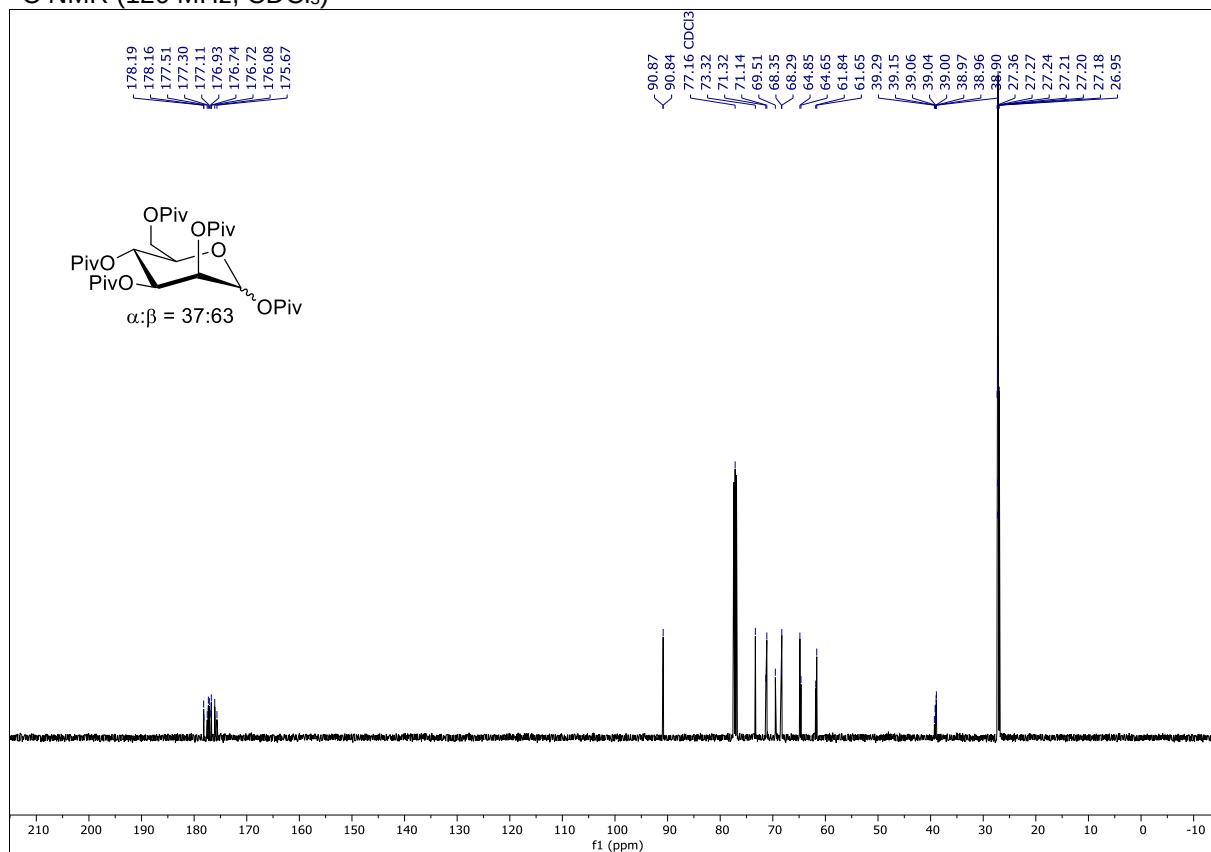


S10

^1H NMR (500 MHz, CDCl_3)

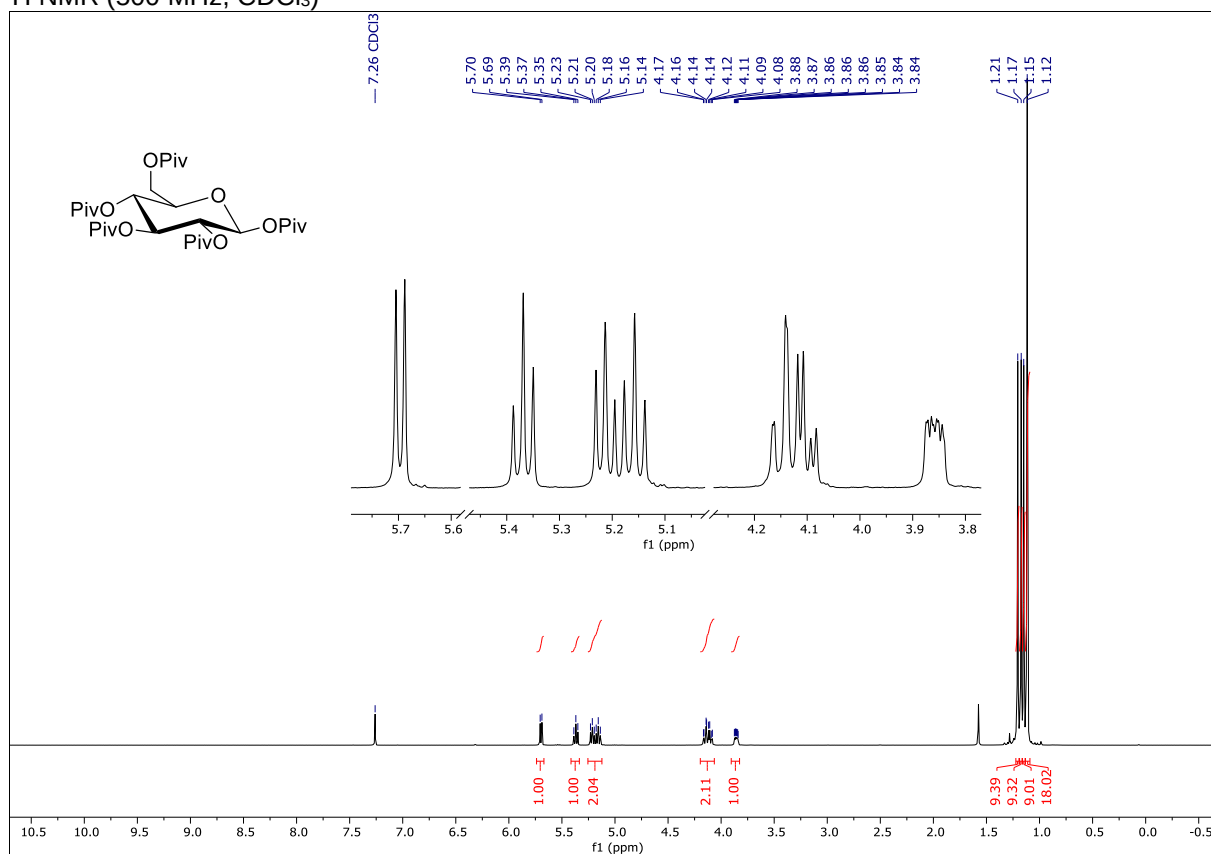


^{13}C NMR (126 MHz, CDCl_3)

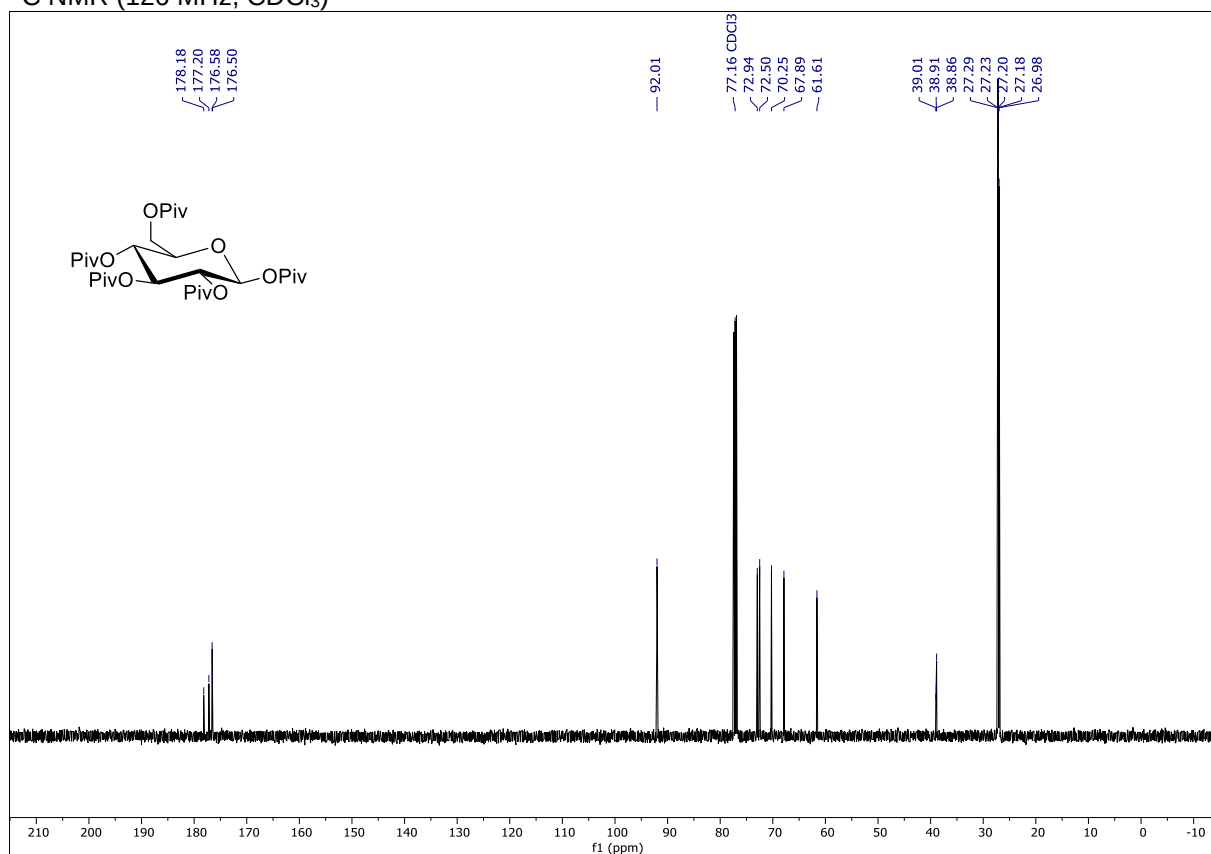


β -S11

^1H NMR (500 MHz, CDCl_3)

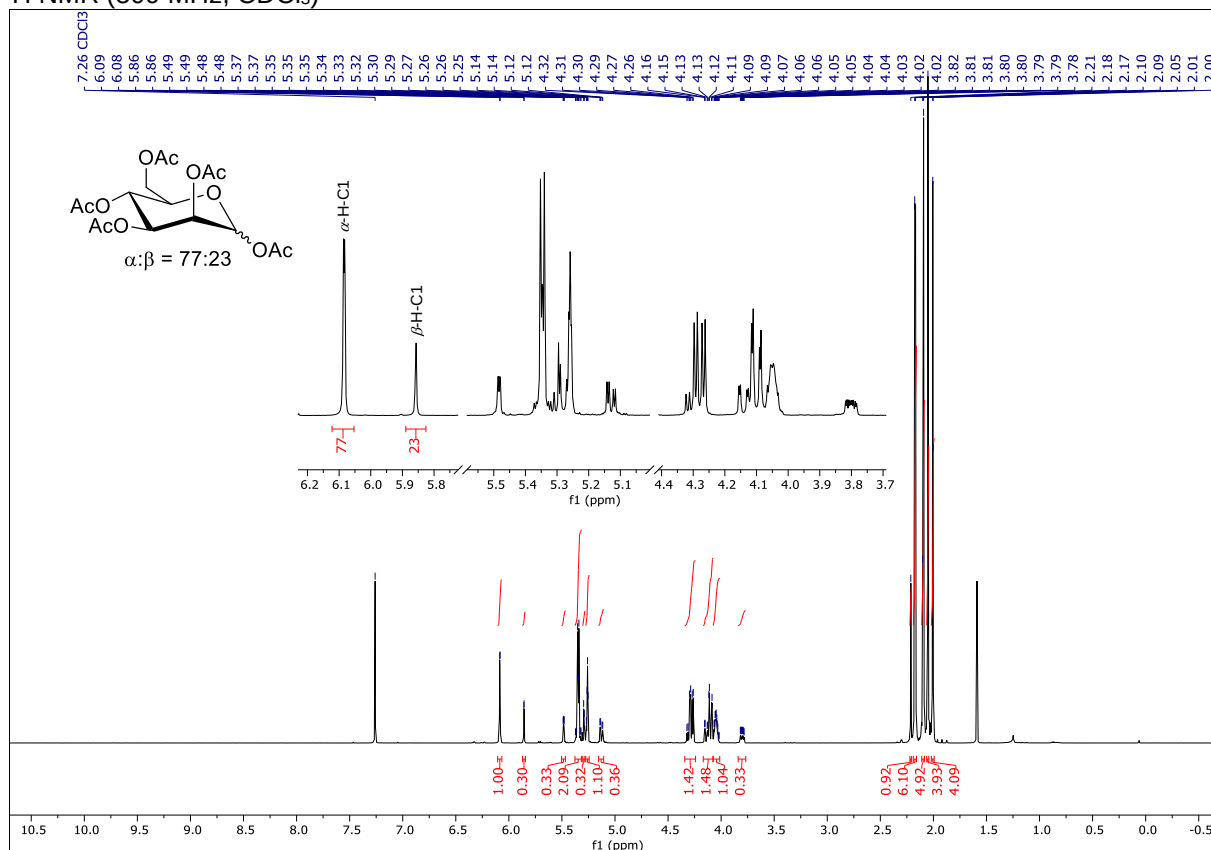


^{13}C NMR (126 MHz, CDCl_3)

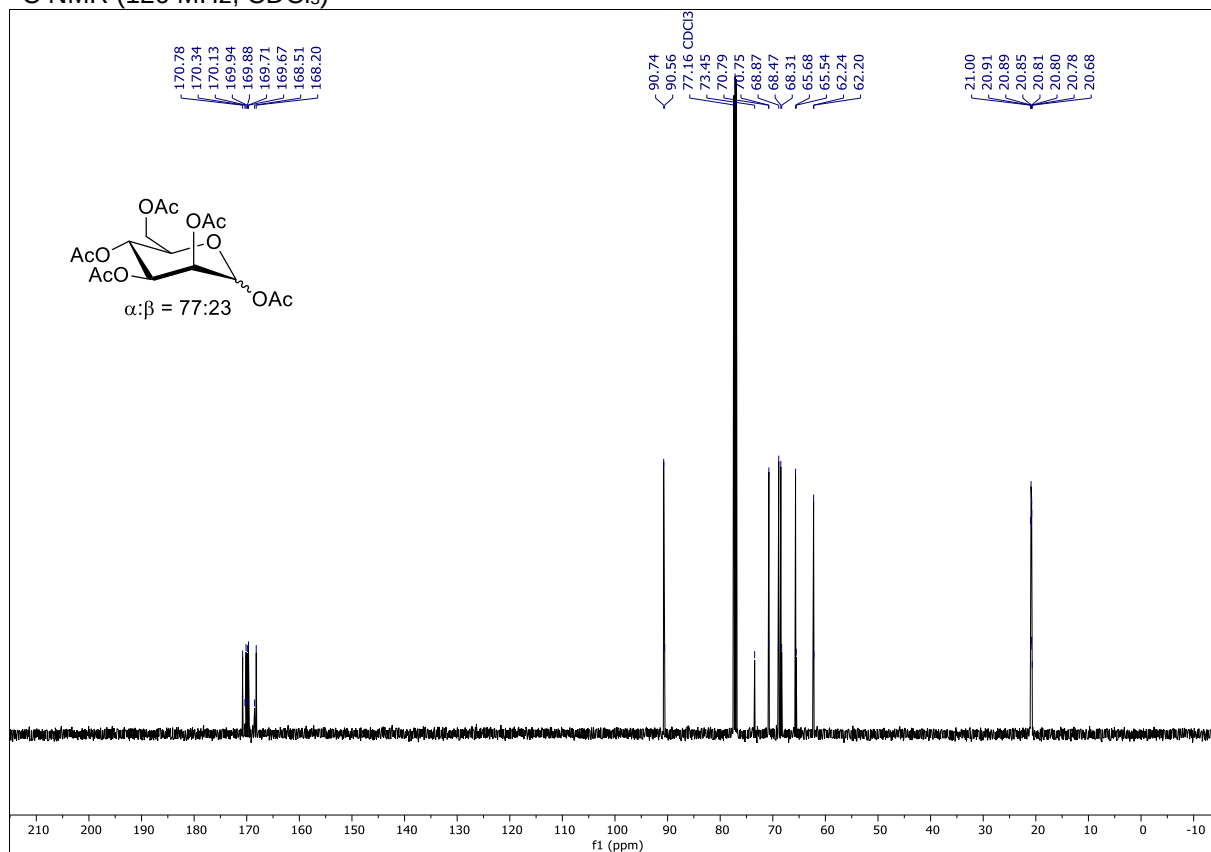


S12

^1H NMR (500 MHz, CDCl_3)

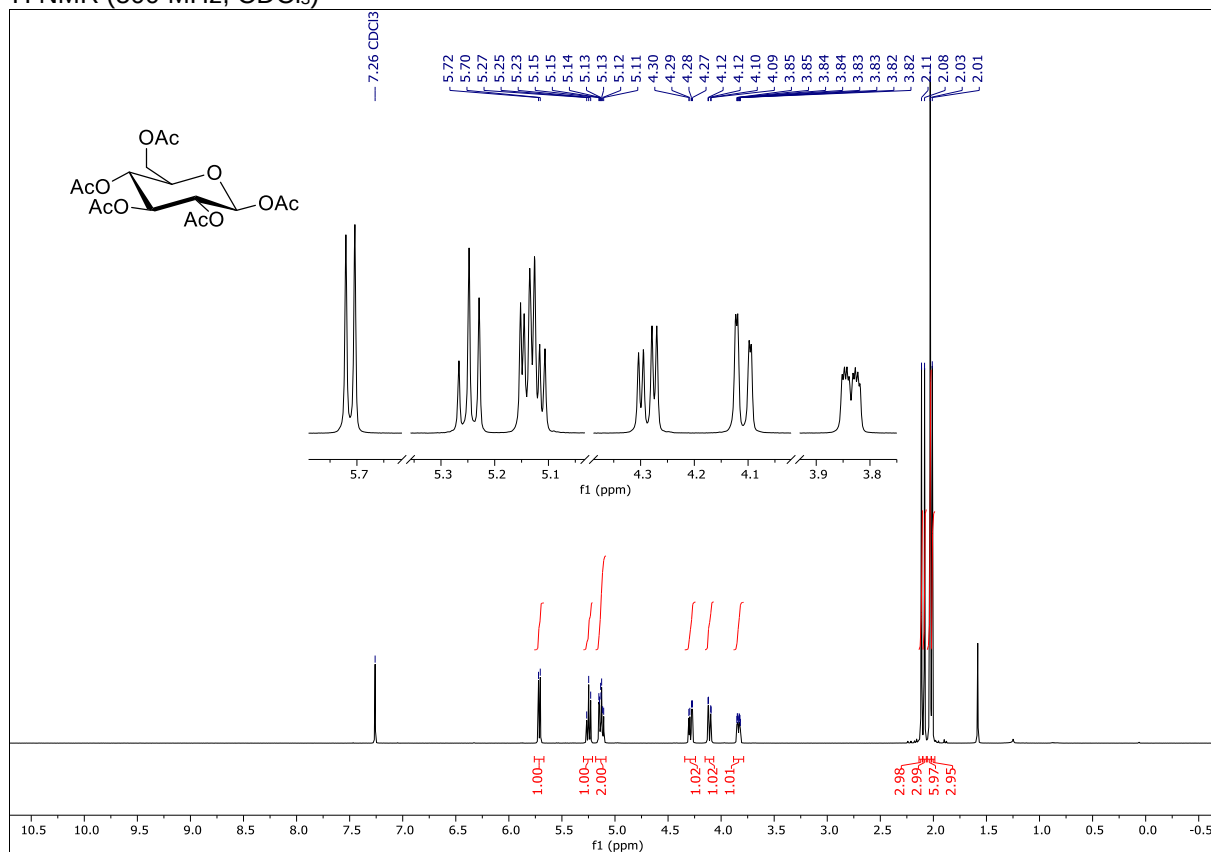


^{13}C NMR (126 MHz, CDCl_3)

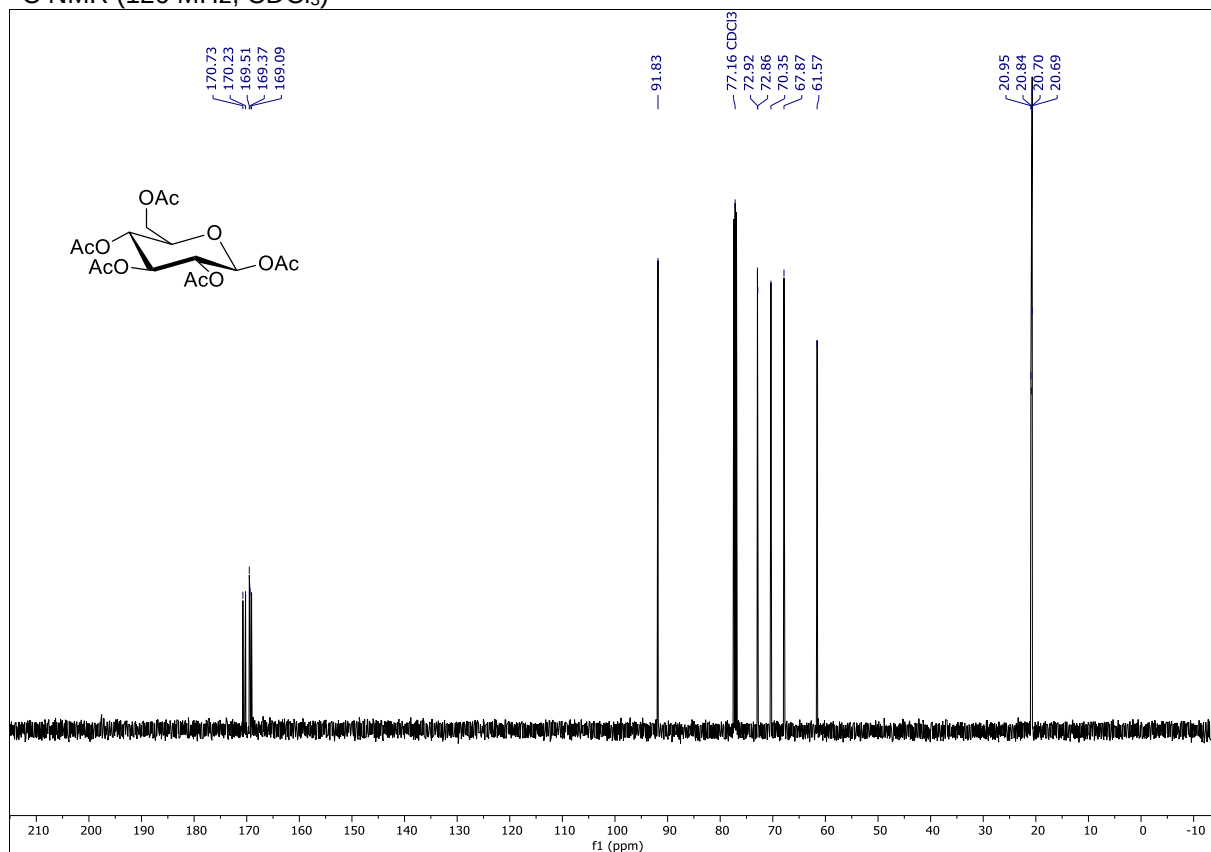


β -S13

^1H NMR (500 MHz, CDCl_3)



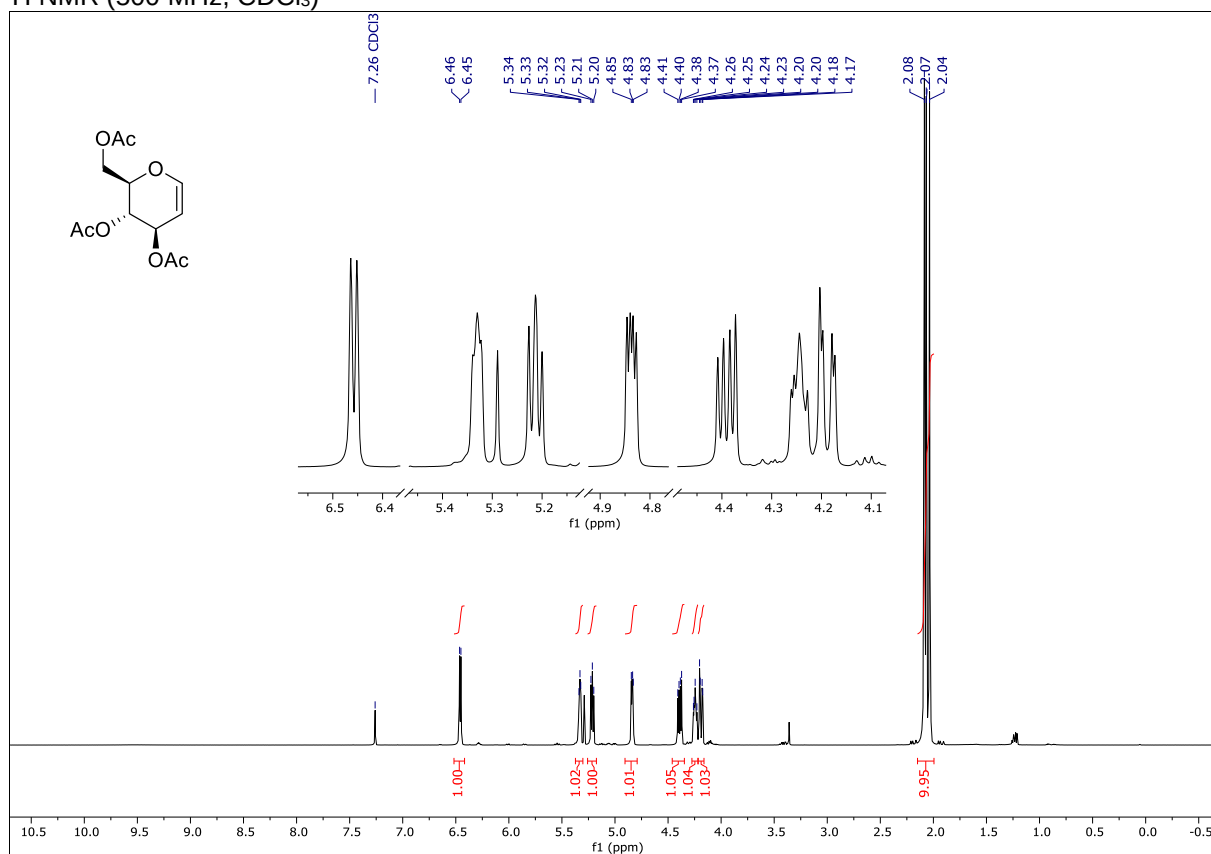
^{13}C NMR (126 MHz, CDCl_3)



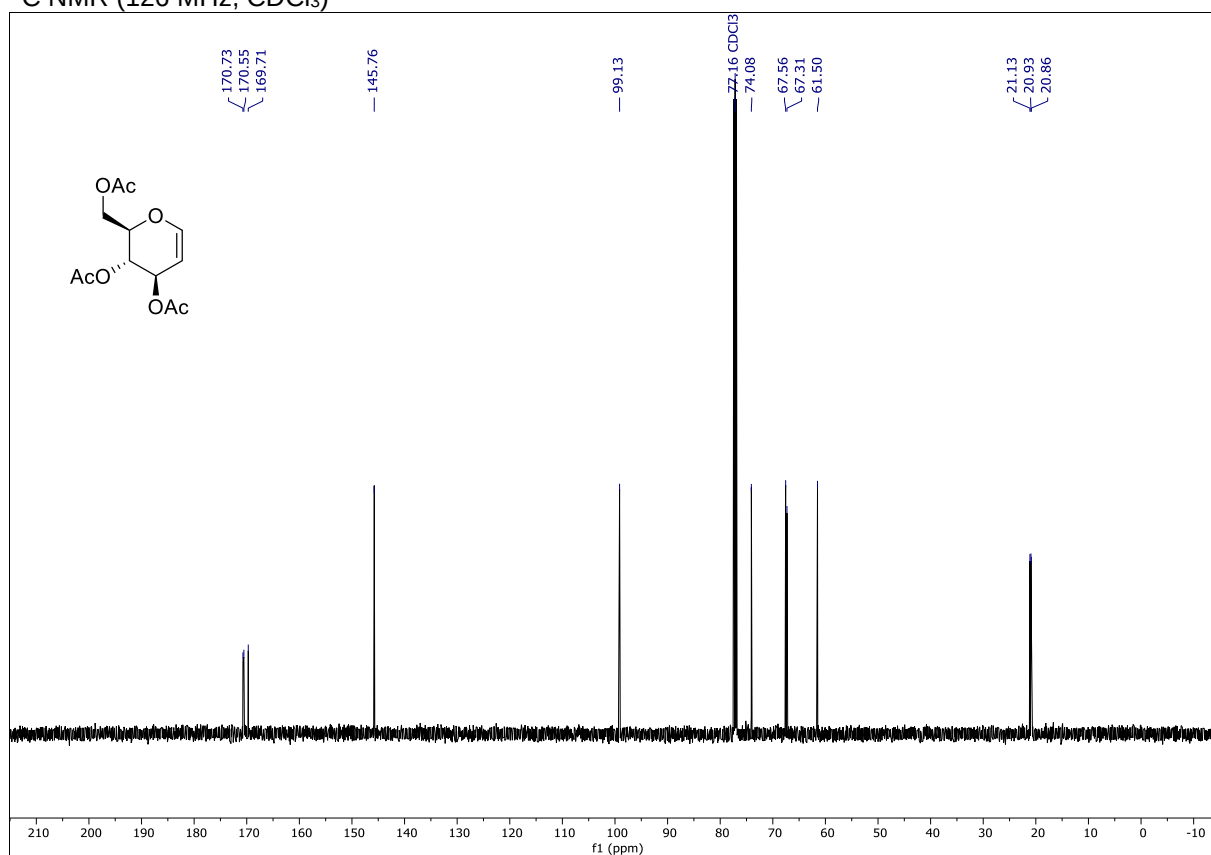
**2. INTERMEDIATES ISOLATED IN THE SYNTHESIS OF
2-DEOXY GLUCOSYL FLUORIDE α -19**

S1

^1H NMR (500 MHz, CDCl_3)



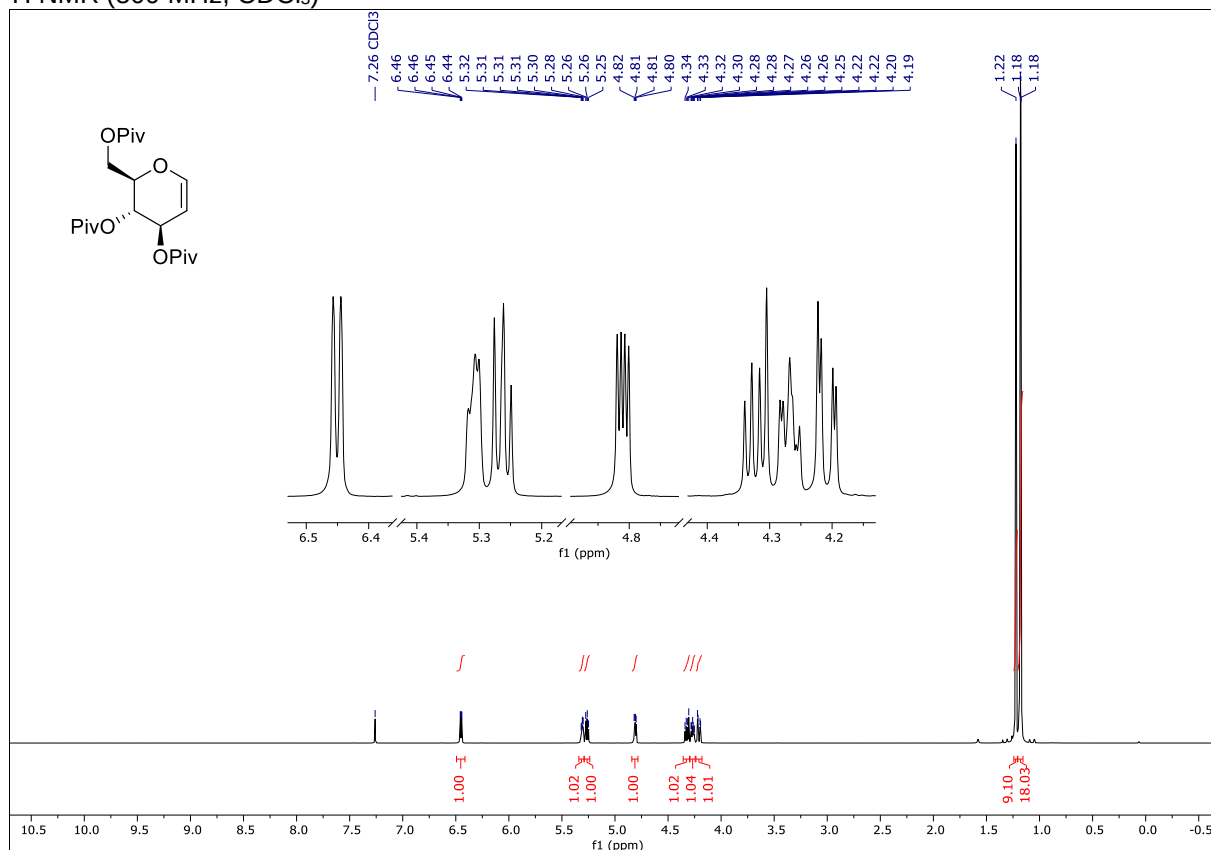
^{13}C NMR (126 MHz, CDCl_3)



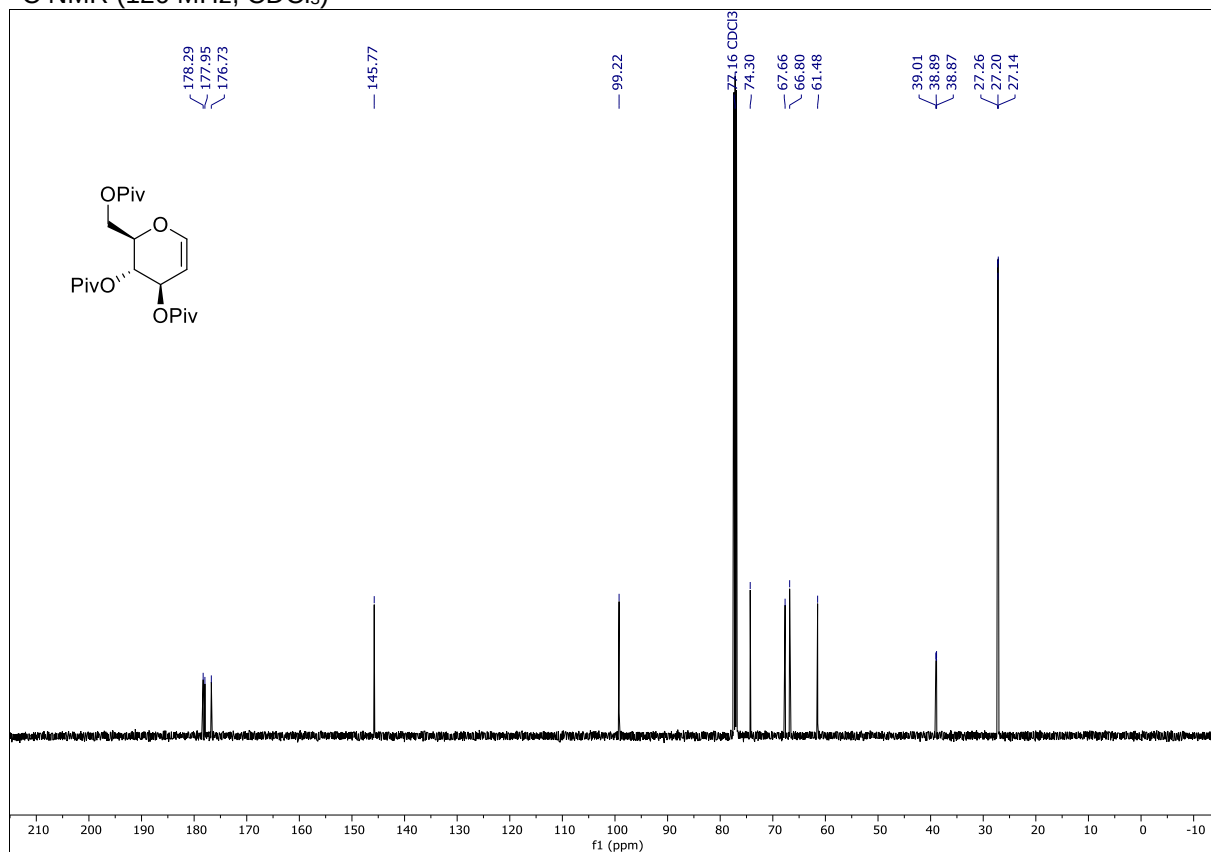
S2-20

S2

^1H NMR (500 MHz, CDCl_3)



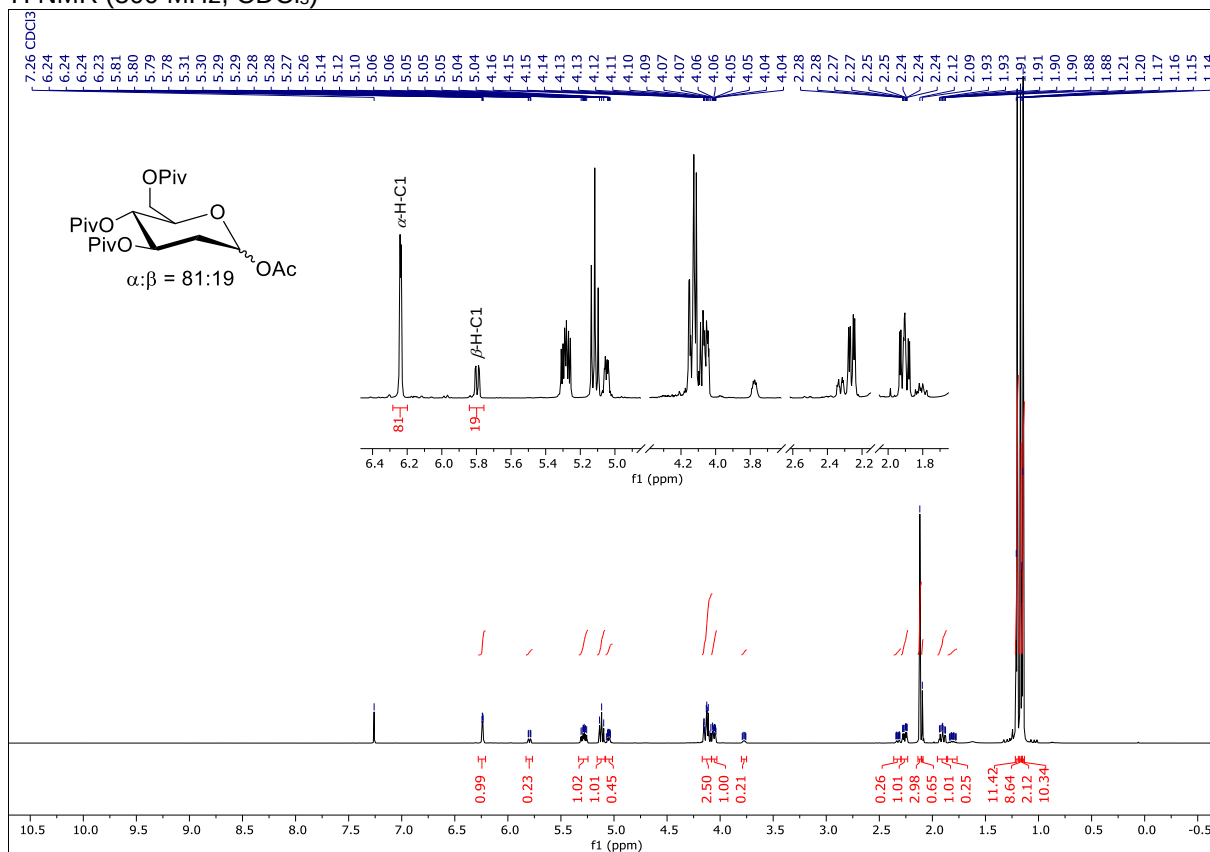
^{13}C NMR (126 MHz, CDCl_3)



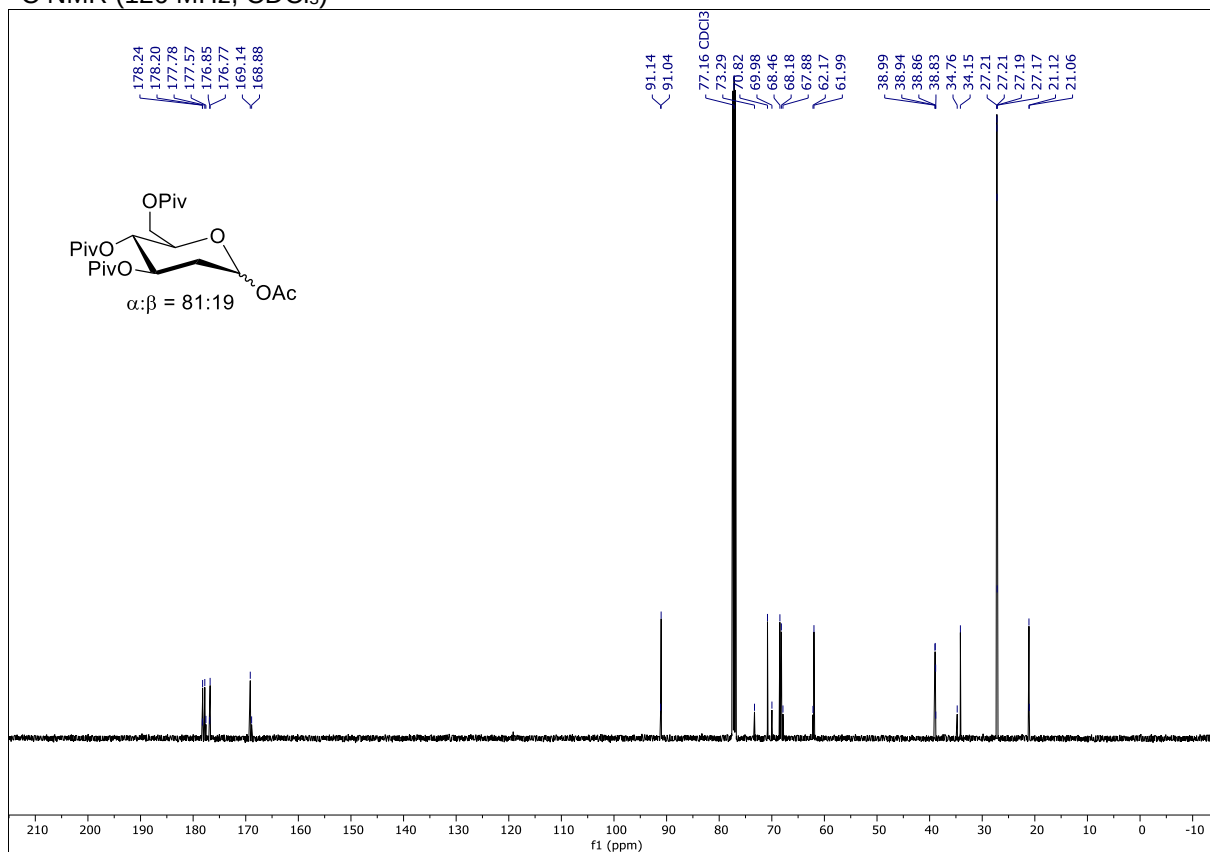
S2-21

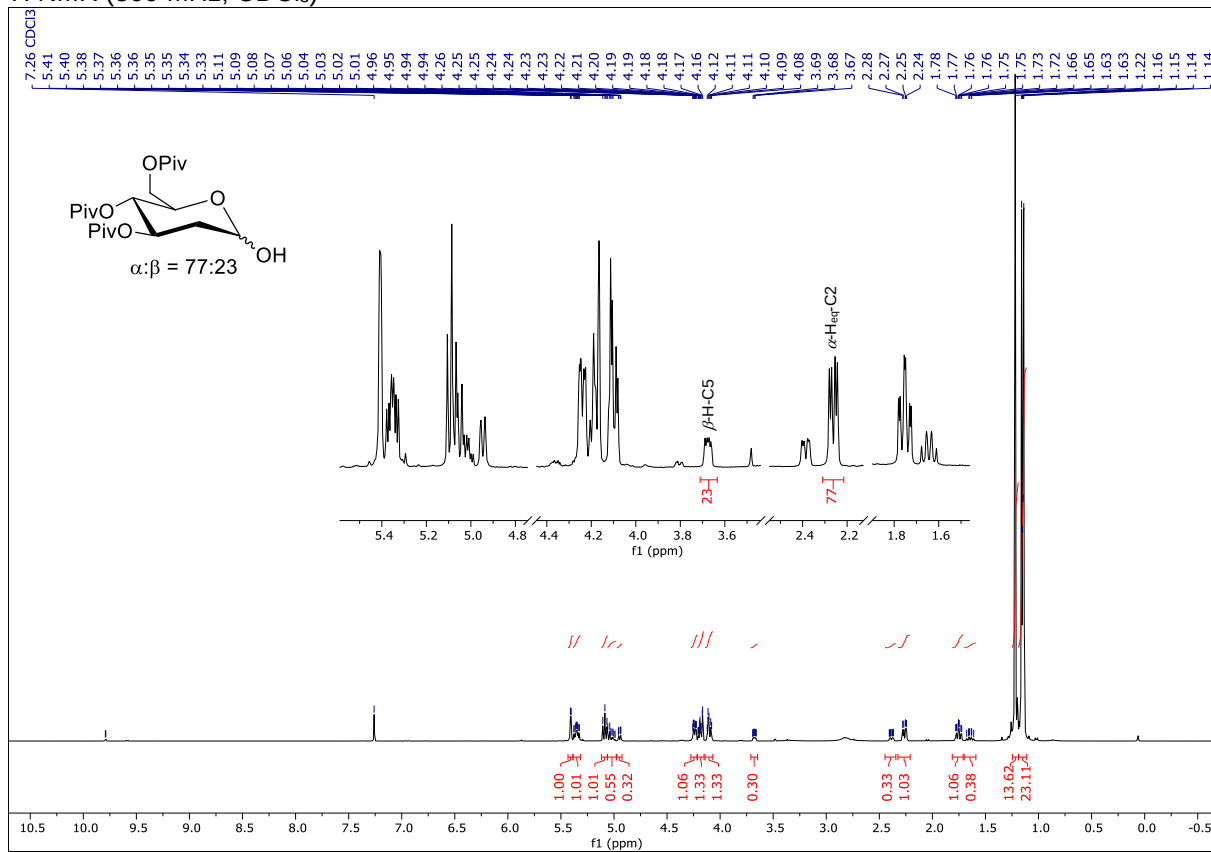
S3

^1H NMR (500 MHz, CDCl_3)



^{13}C NMR (126 MHz, CDCl_3)

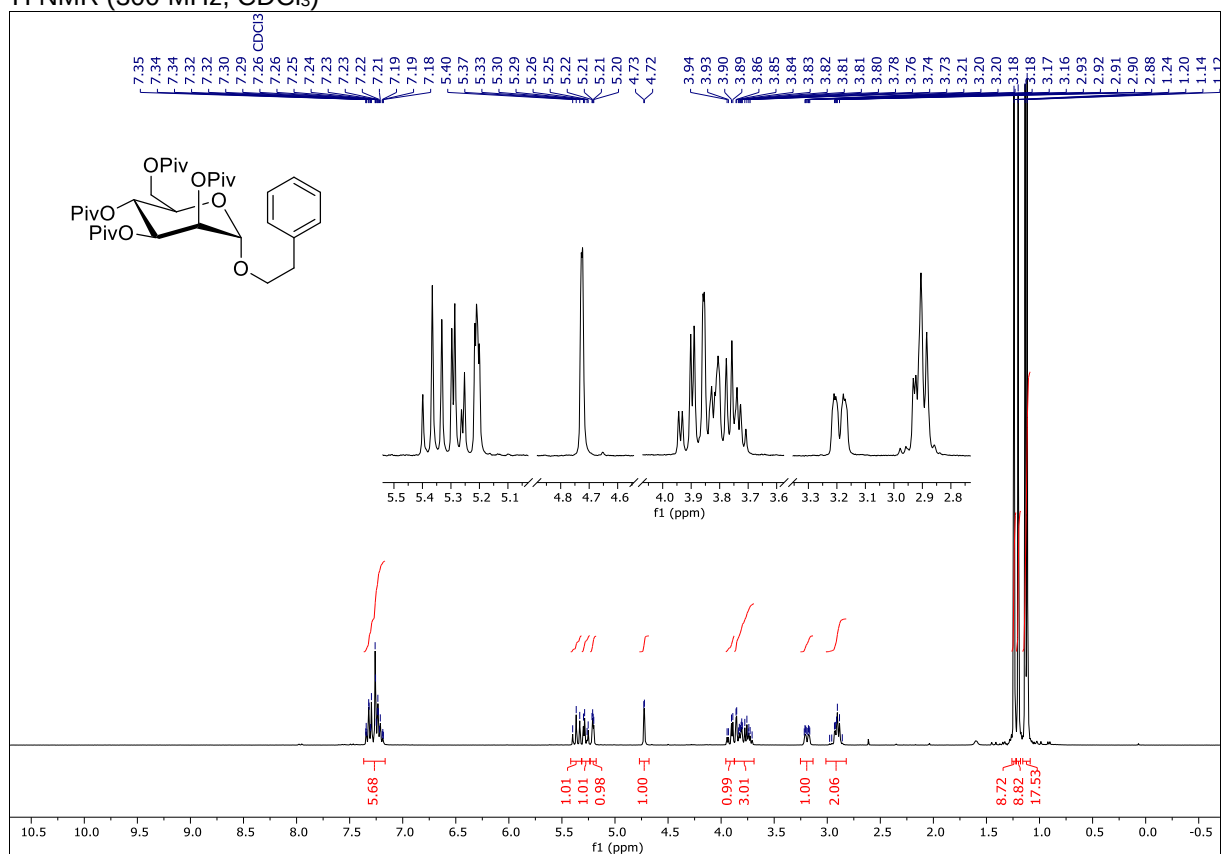


¹H NMR (500 MHz, CDCl₃)

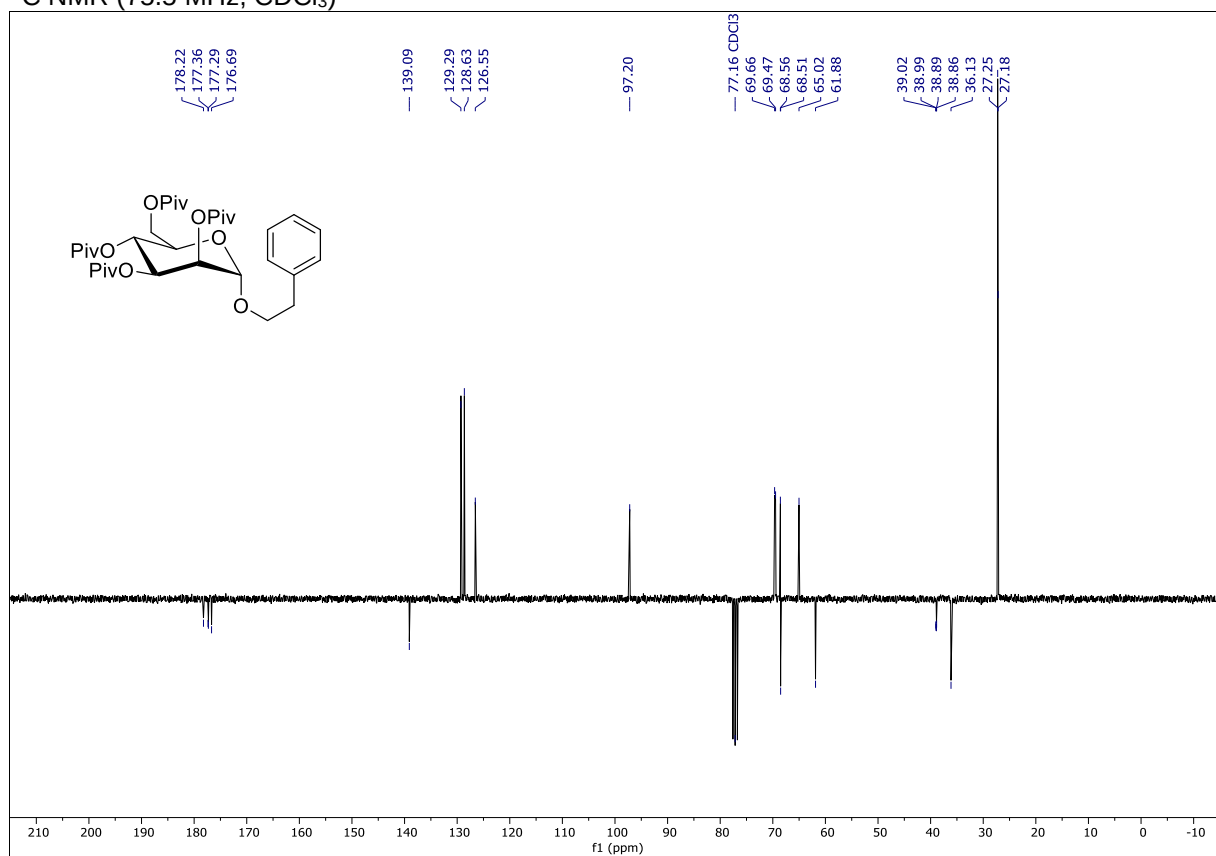
3. TARGET GLYCOSIDES

α -3a

^1H NMR (300 MHz, CDCl_3)

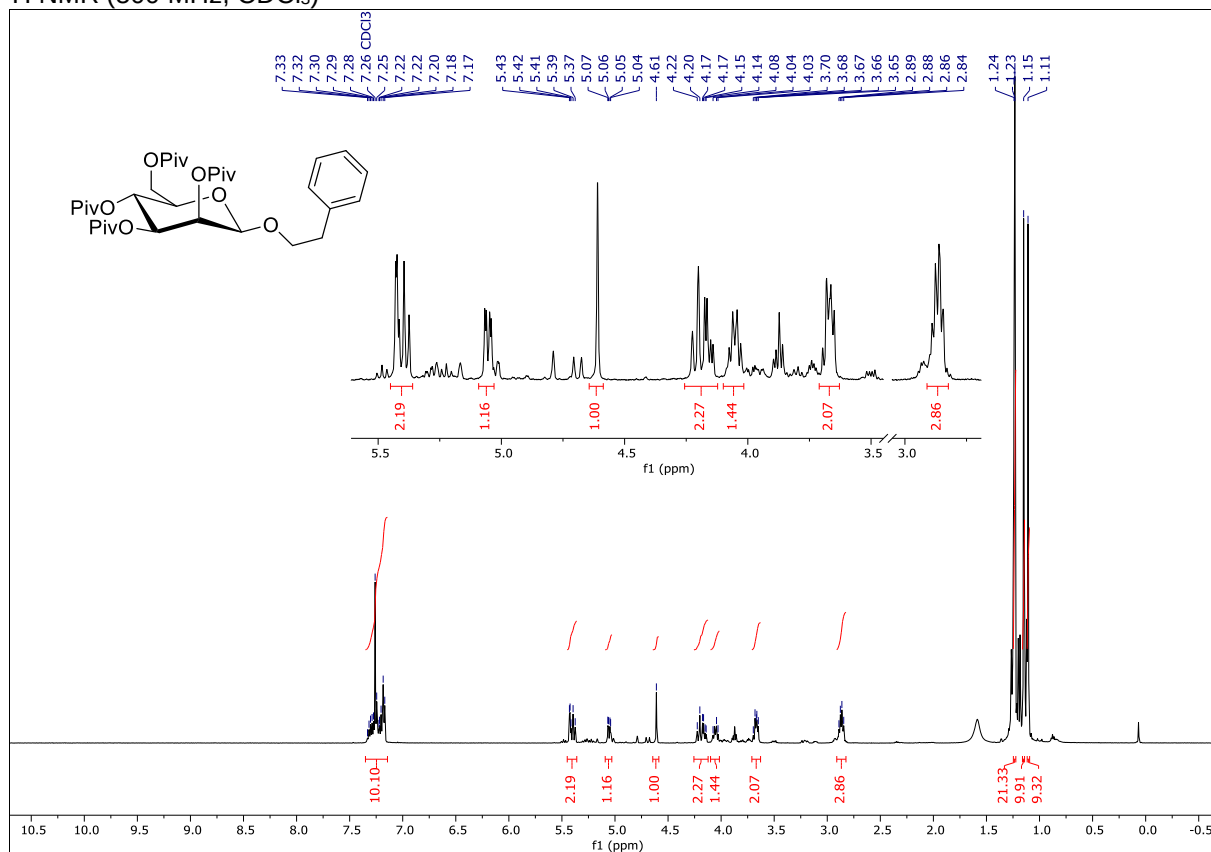


^{13}C NMR (75.5 MHz, CDCl_3)

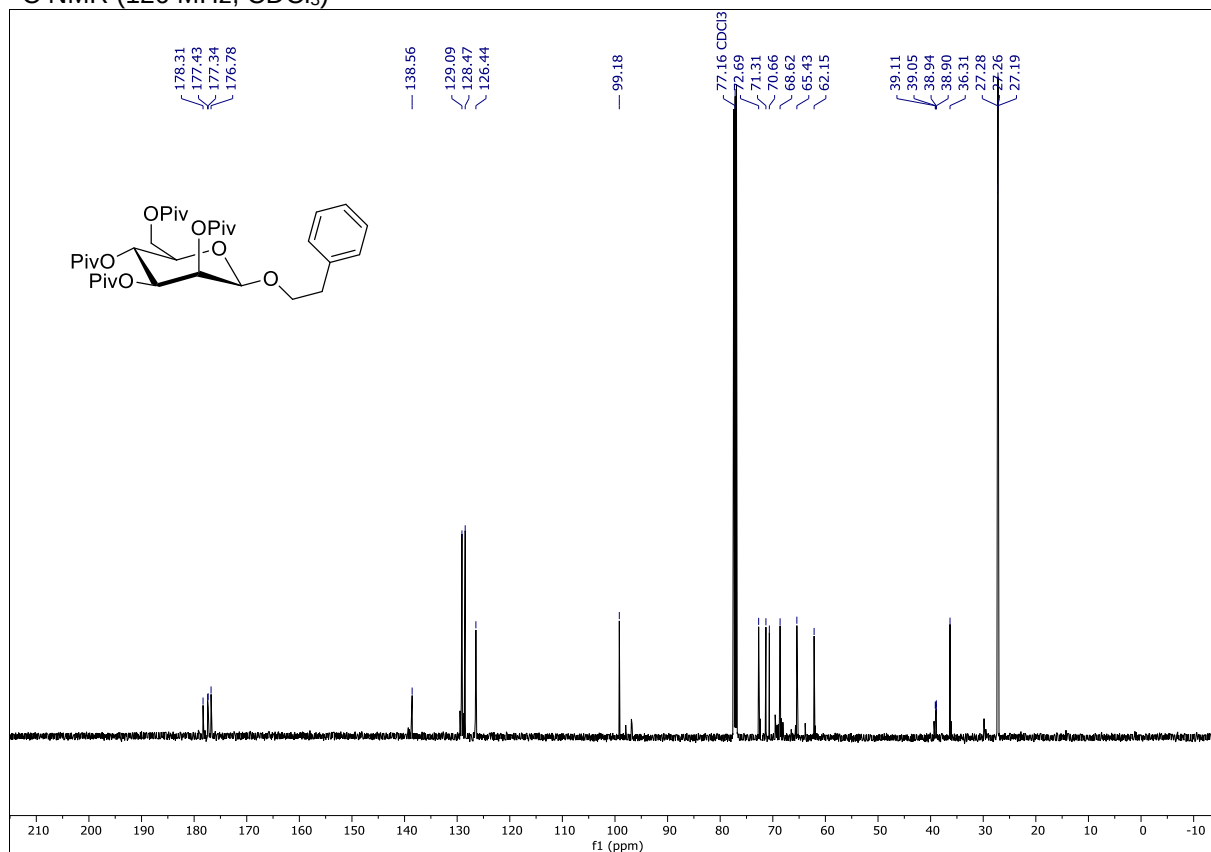


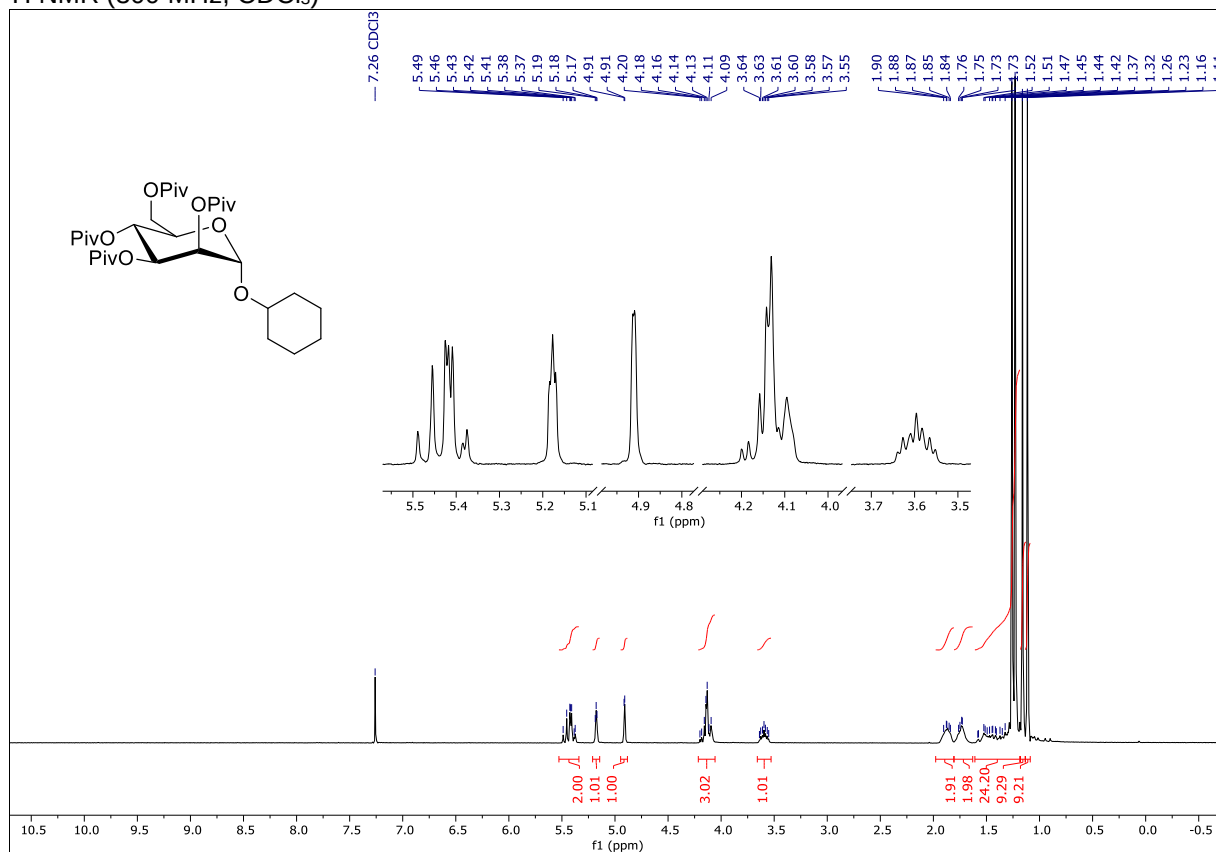
β -3a

^1H NMR (500 MHz, CDCl_3)

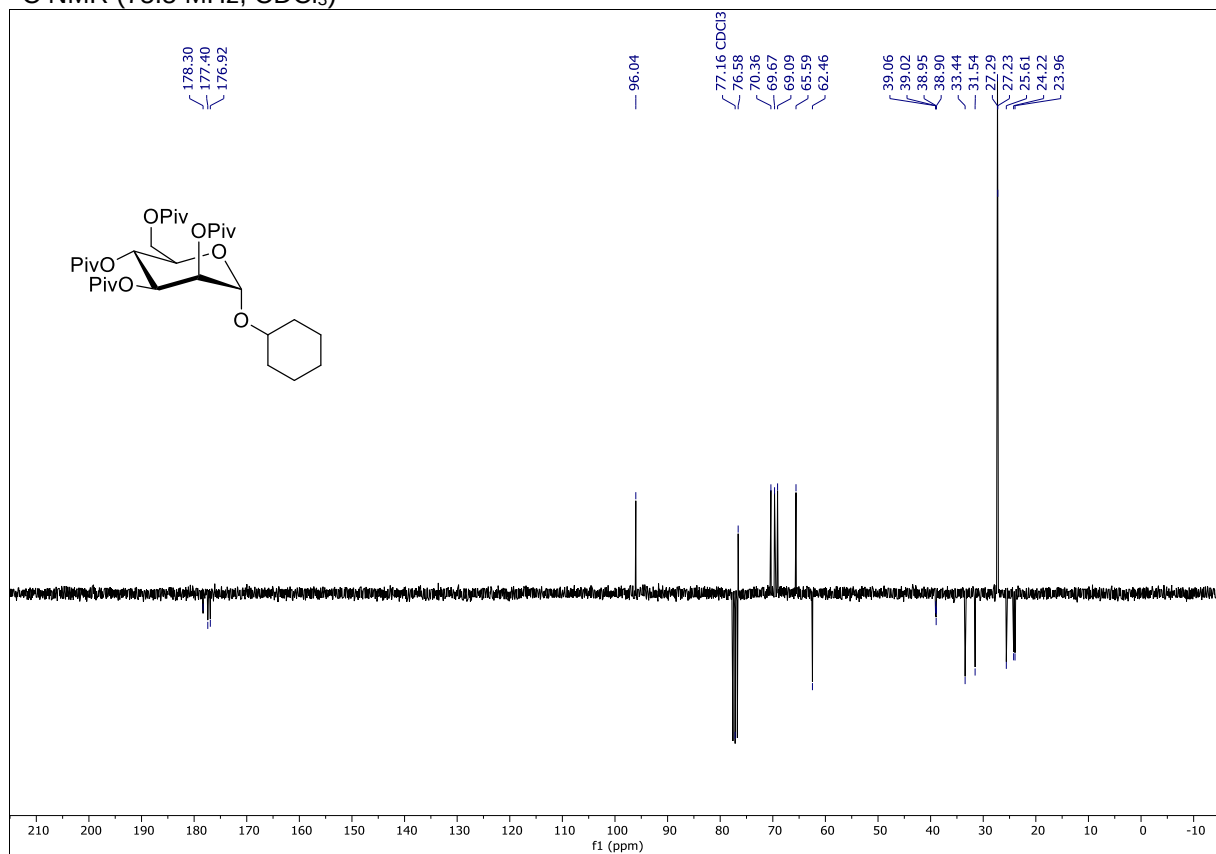


^{13}C NMR (126 MHz, CDCl_3)



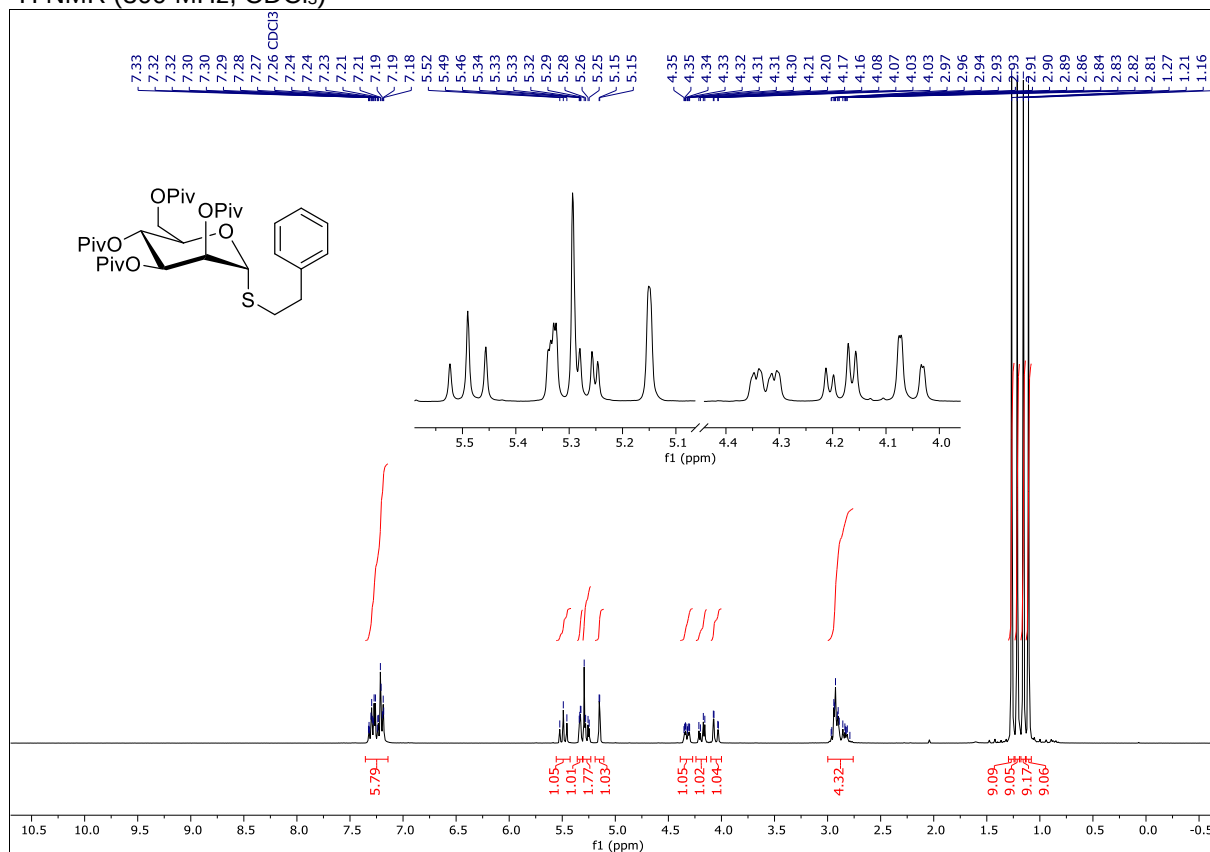
α -3b¹H NMR (300 MHz, CDCl₃)

^{13}C NMR (75.5 MHz, CDCl_3)

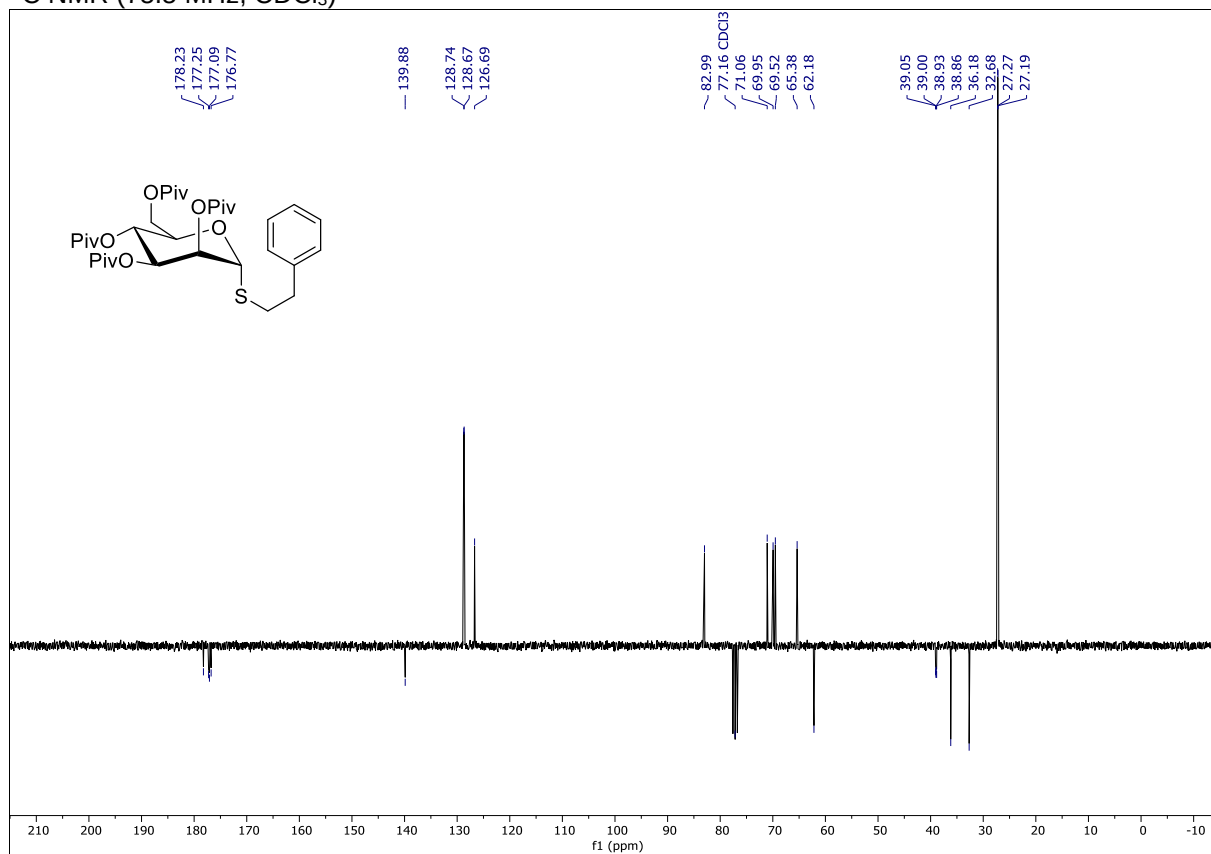


α -3c

^1H NMR (300 MHz, CDCl_3)

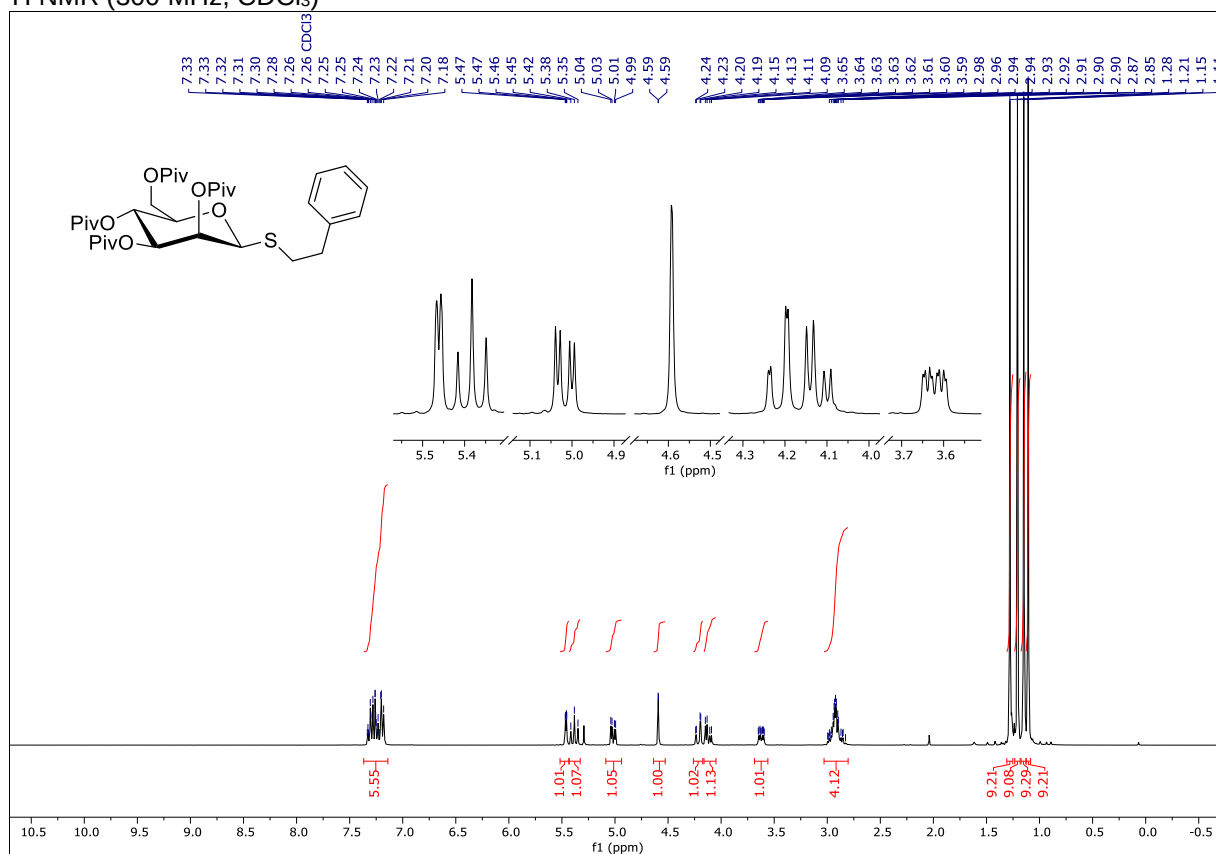


^{13}C NMR (75.5 MHz, CDCl_3)

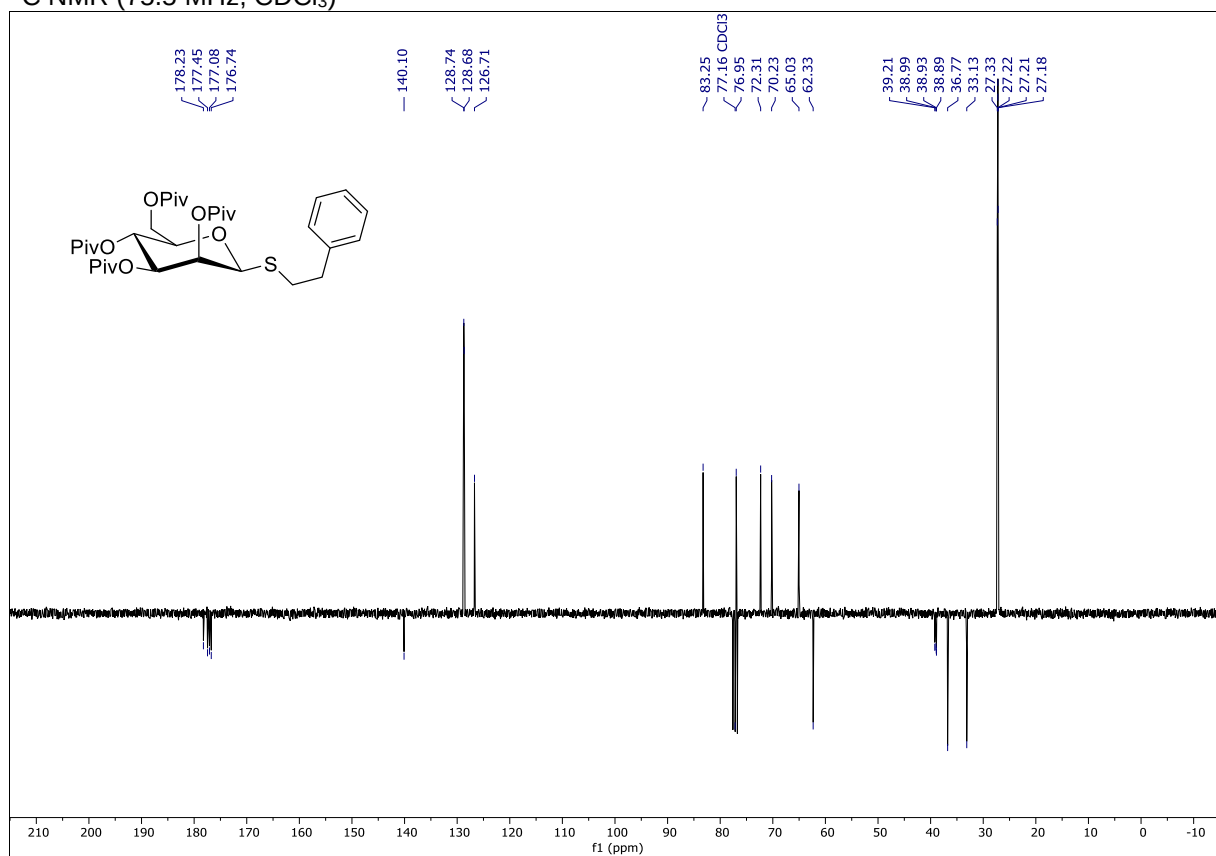


β -3c

^1H NMR (300 MHz, CDCl_3)

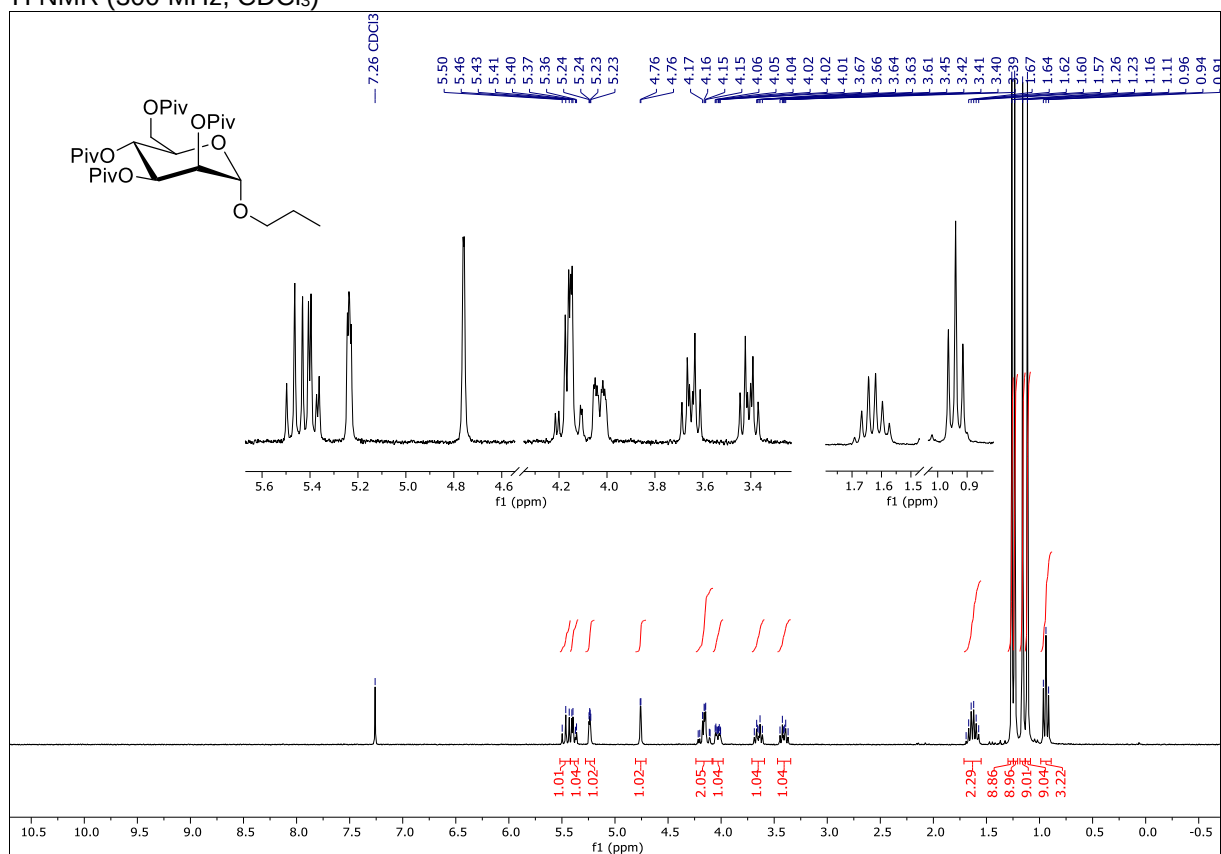


^{13}C NMR (75.5 MHz, CDCl_3)

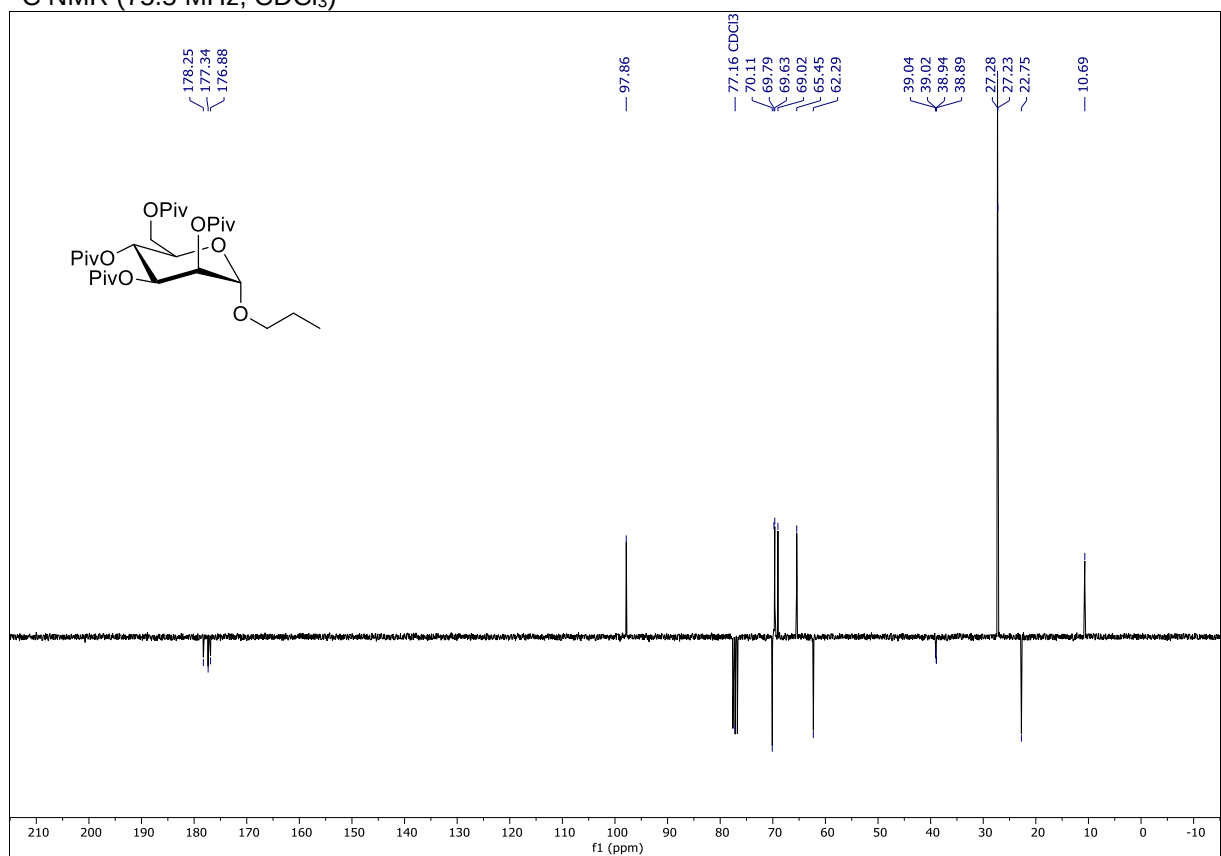


α -3d

^1H NMR (300 MHz, CDCl_3)

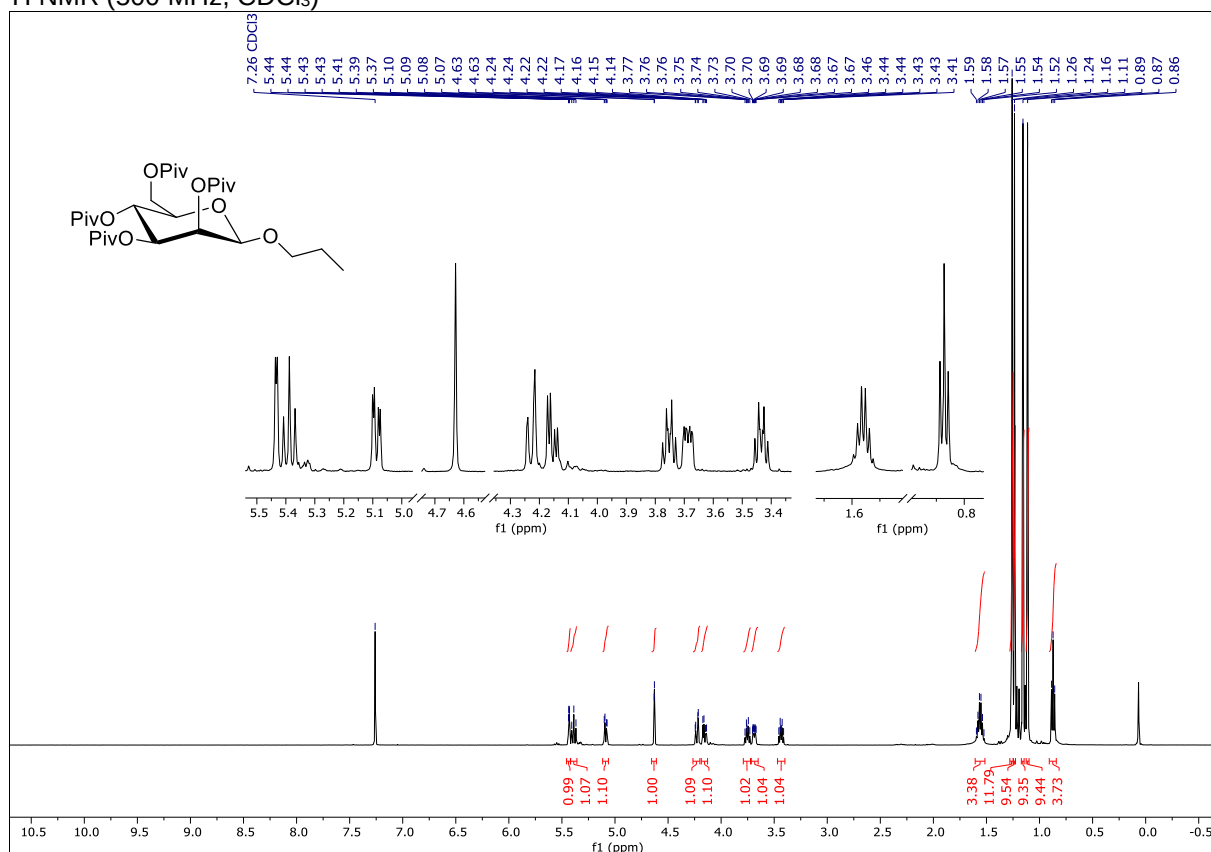


^{13}C NMR (75.5 MHz, CDCl_3)

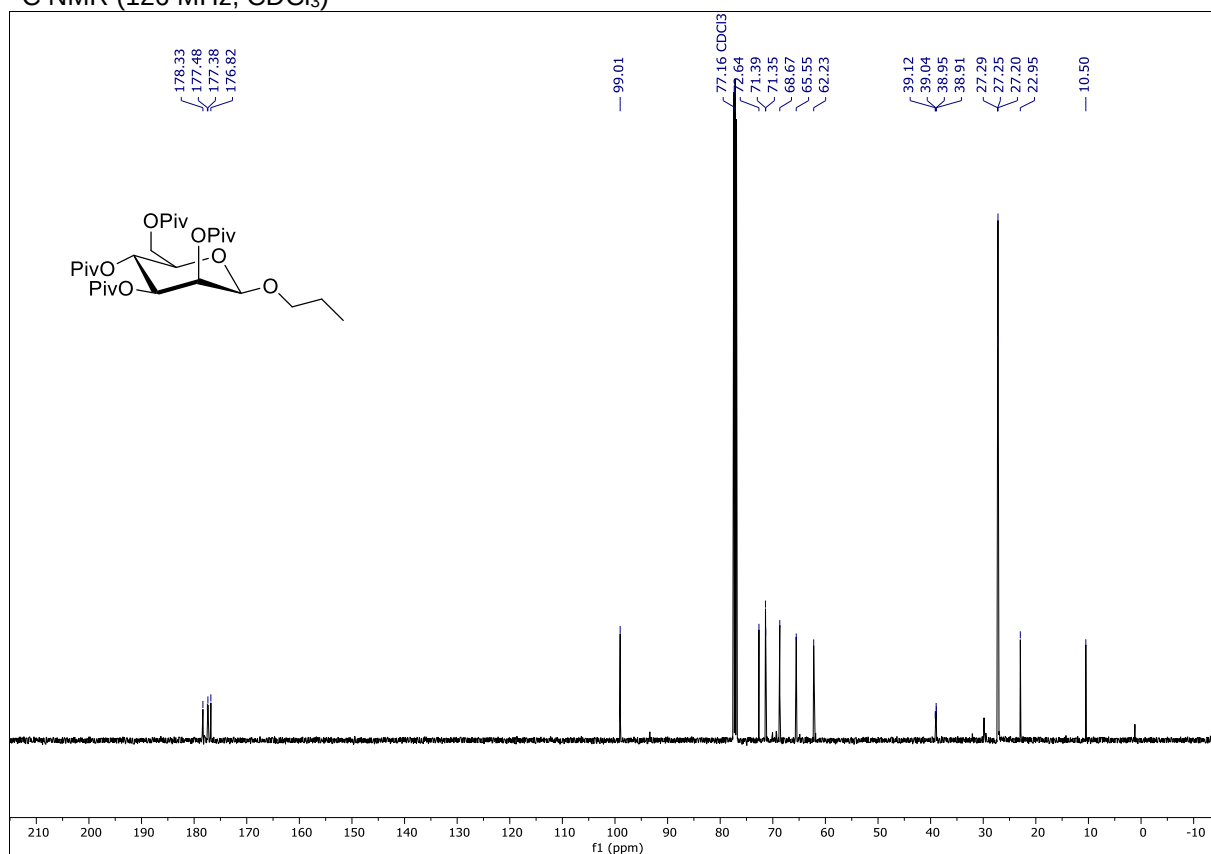


β -3d

^1H NMR (500 MHz, CDCl_3)

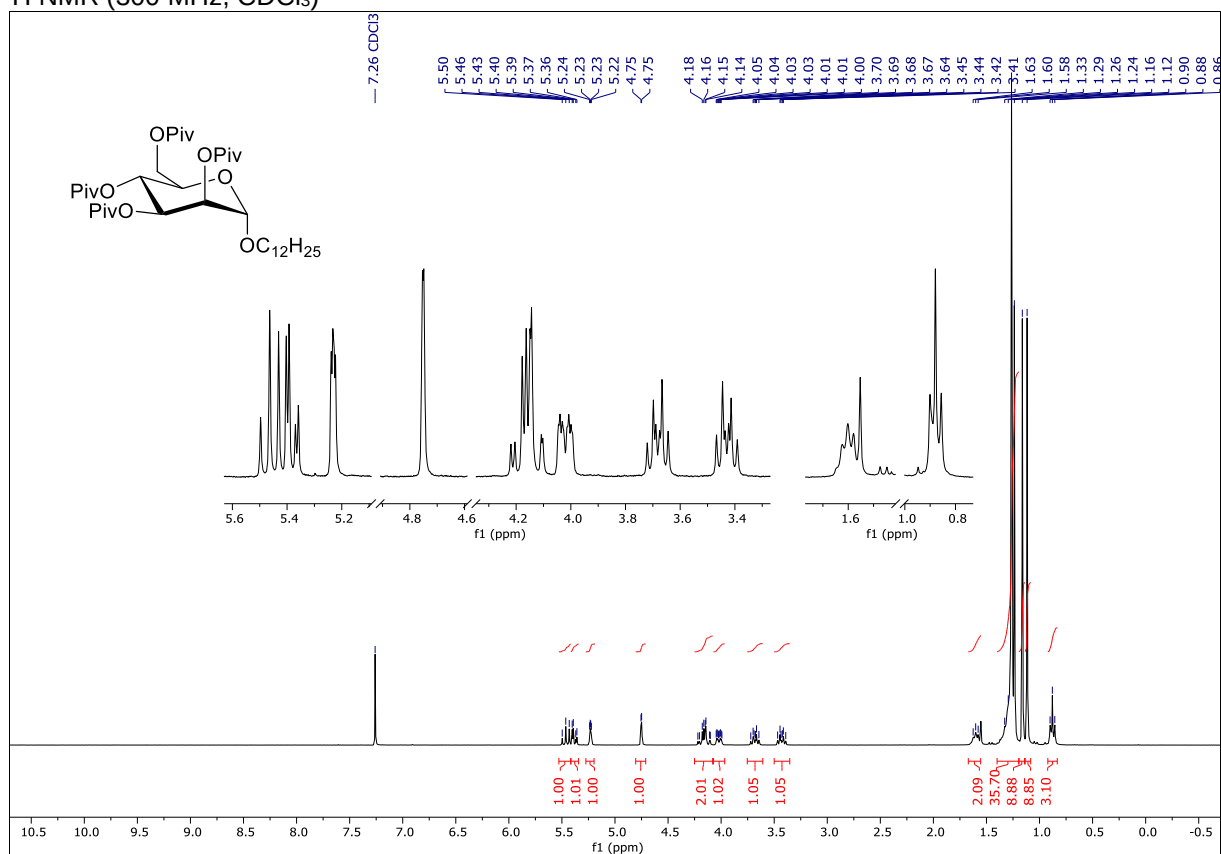


^{13}C NMR (126 MHz, CDCl_3)

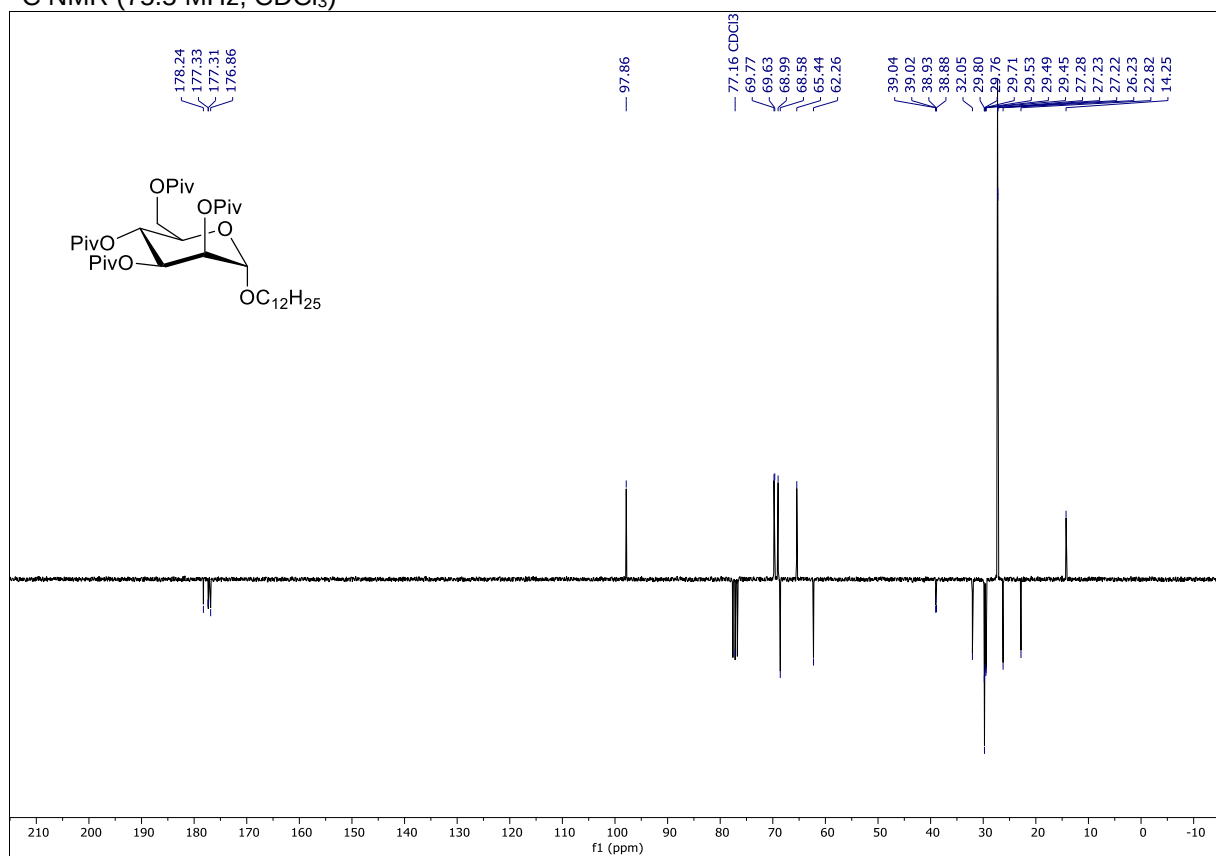


α -3e

^1H NMR (300 MHz, CDCl_3)

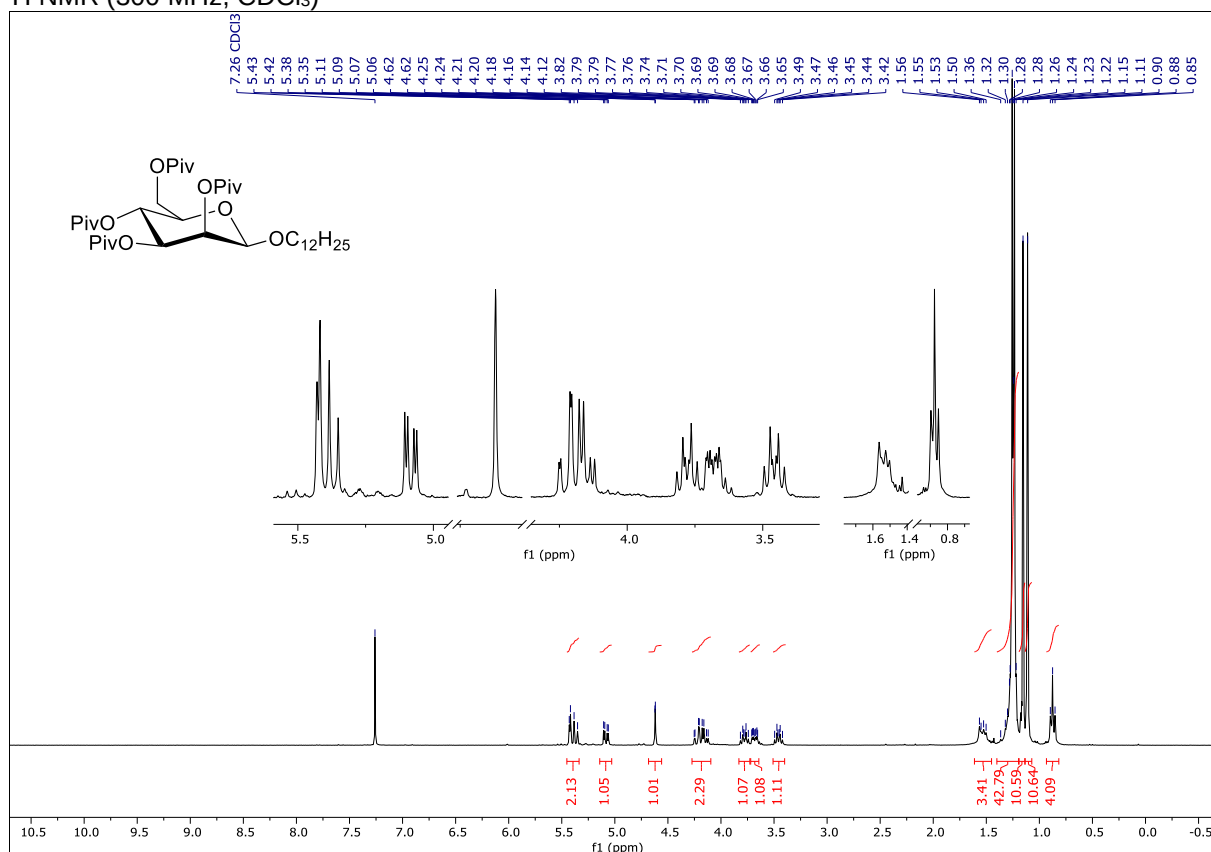


^{13}C NMR (75.5 MHz, CDCl_3)

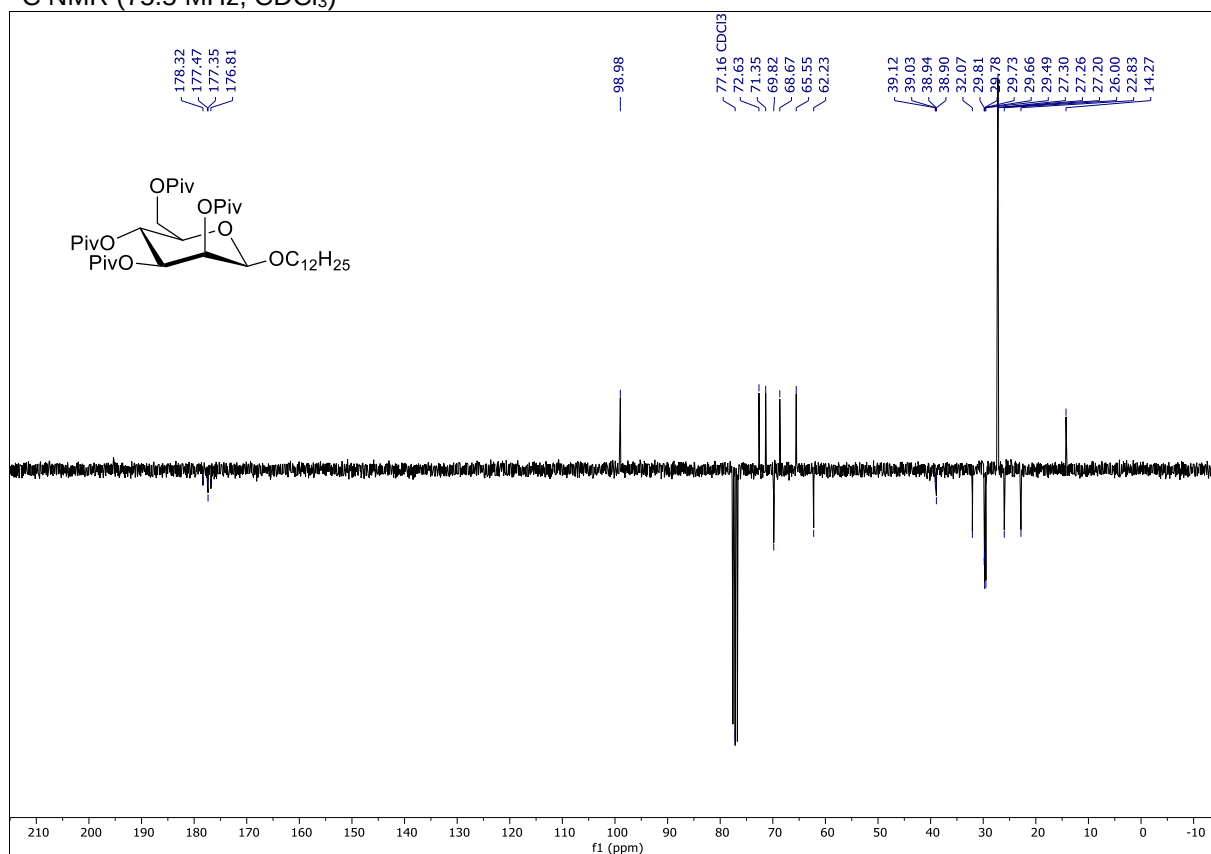


β -3e

^1H NMR (300 MHz, CDCl_3)

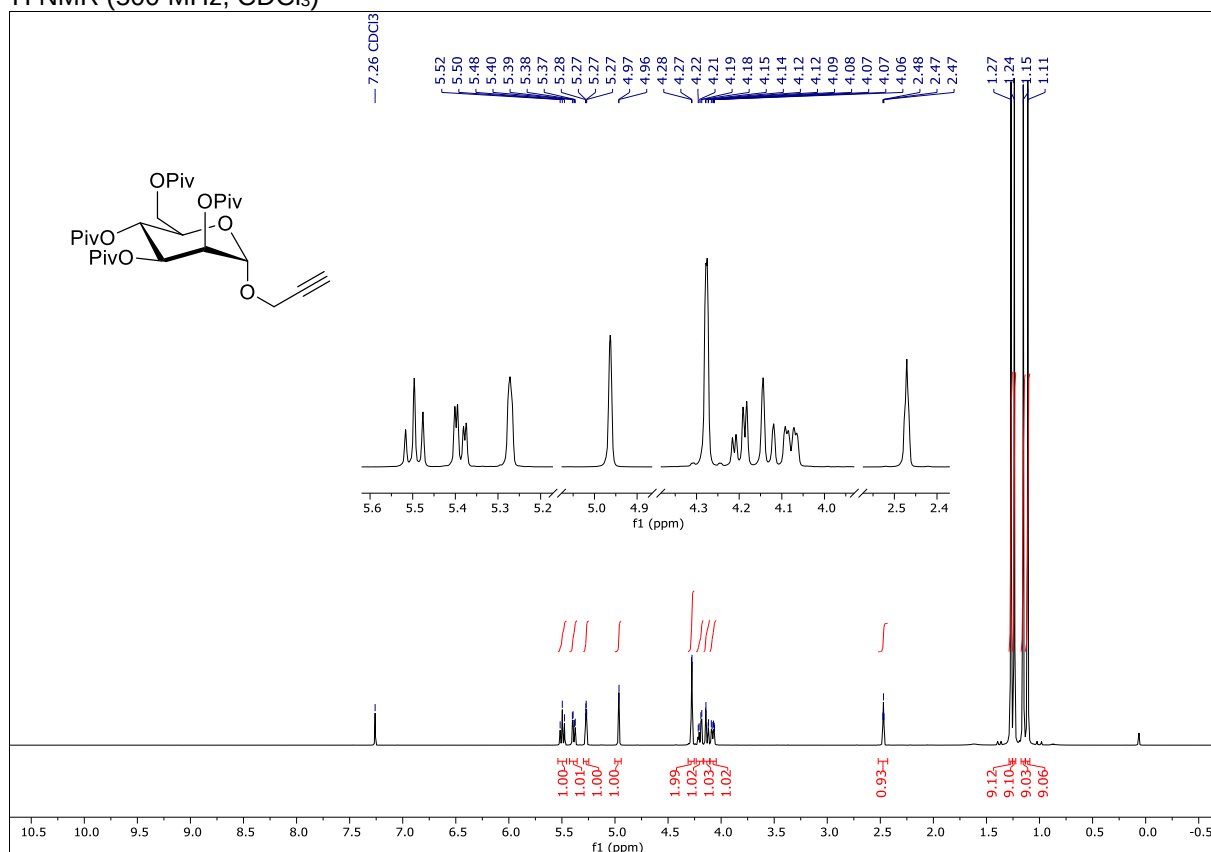


^{13}C NMR (75.5 MHz, CDCl_3)

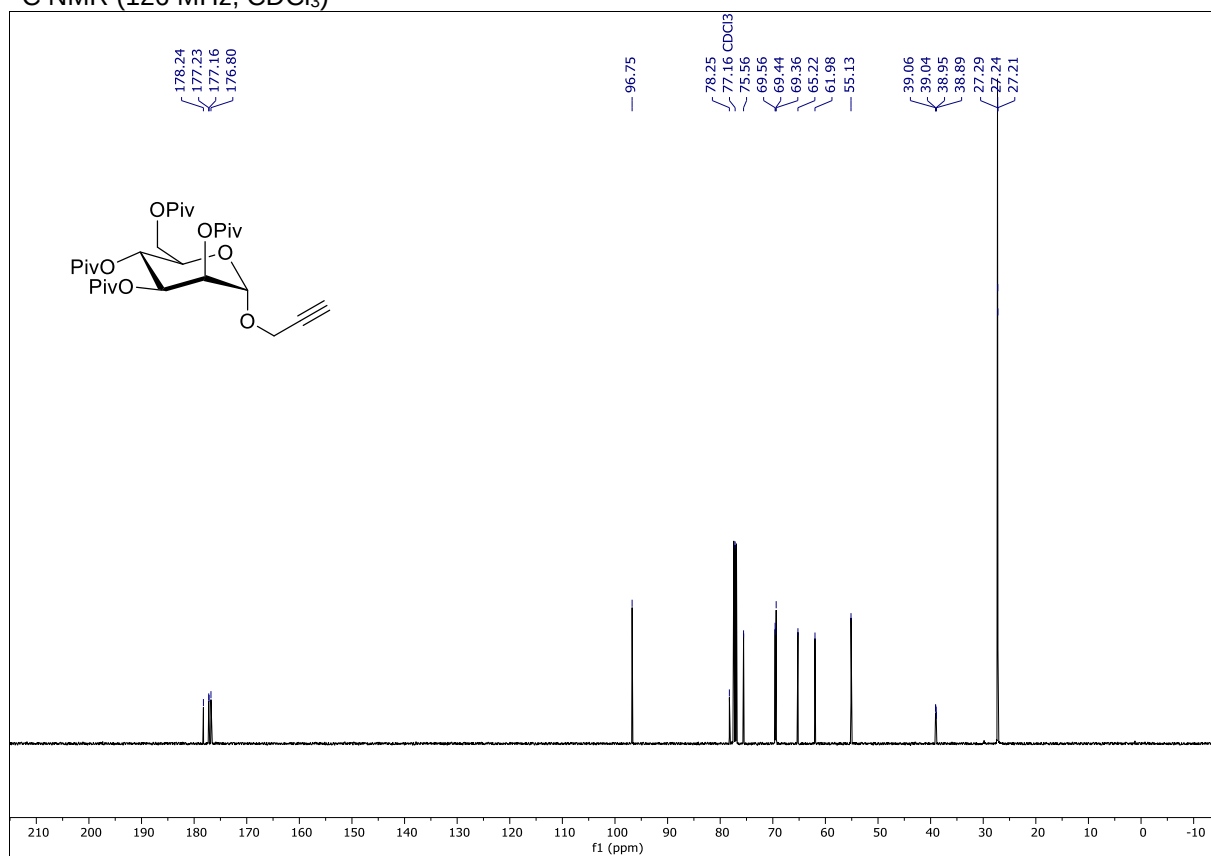


α -3f

^1H NMR (500 MHz, CDCl_3)

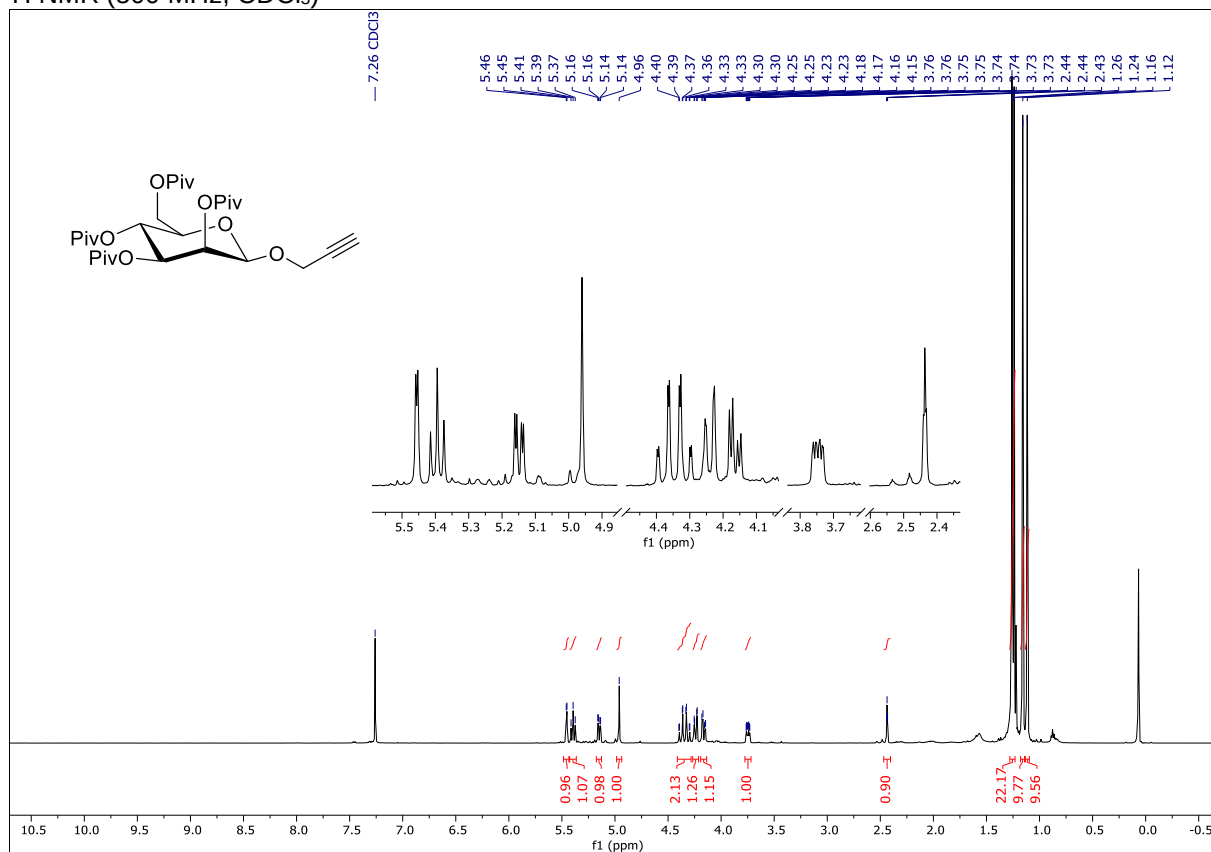


^{13}C NMR (126 MHz, CDCl_3)

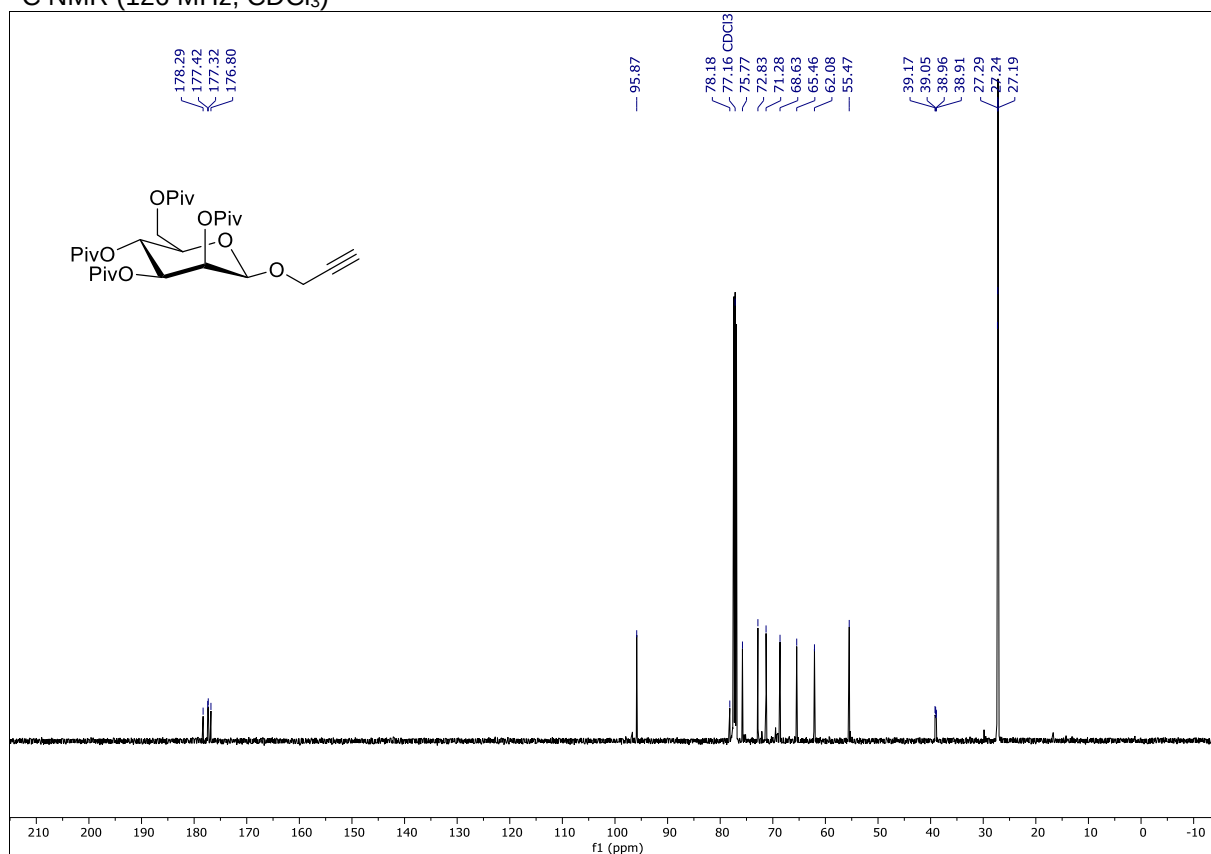


β -3f

^1H NMR (500 MHz, CDCl_3)

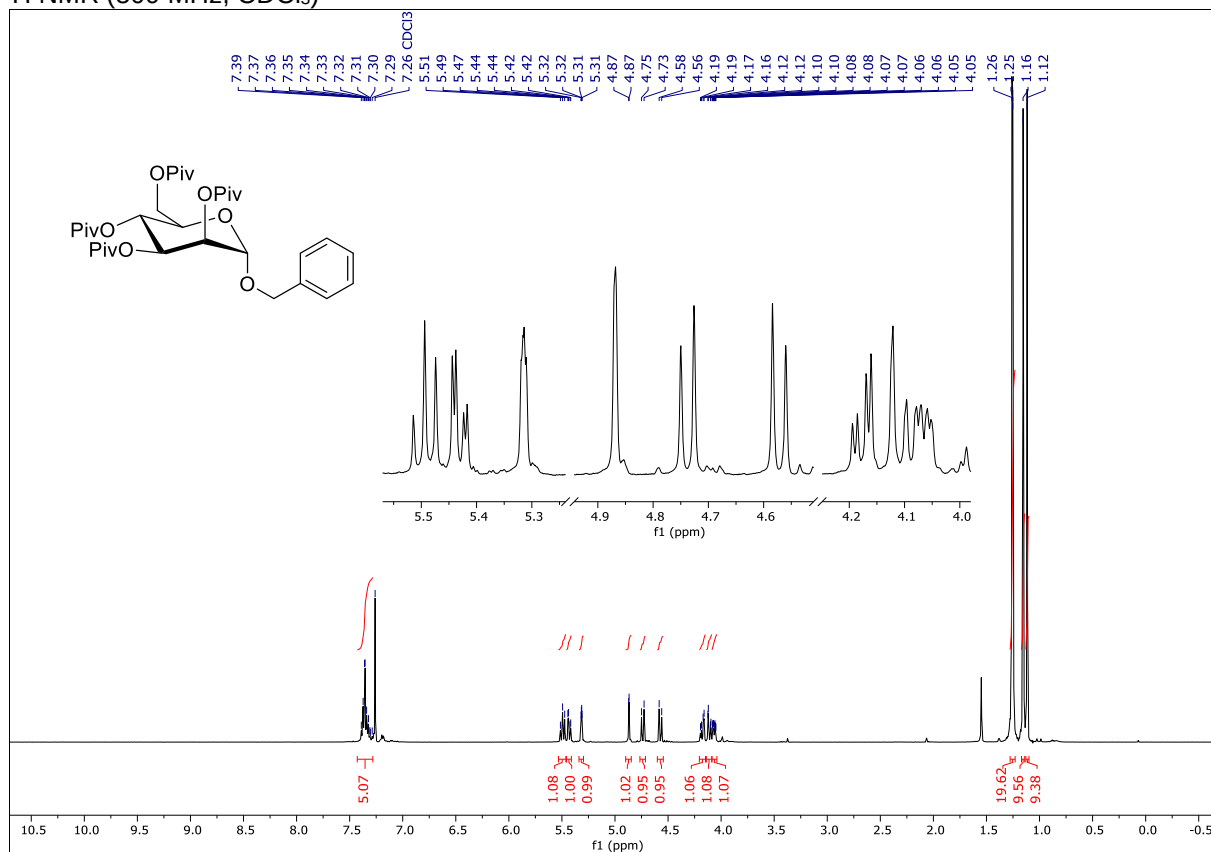


^{13}C NMR (126 MHz, CDCl_3)

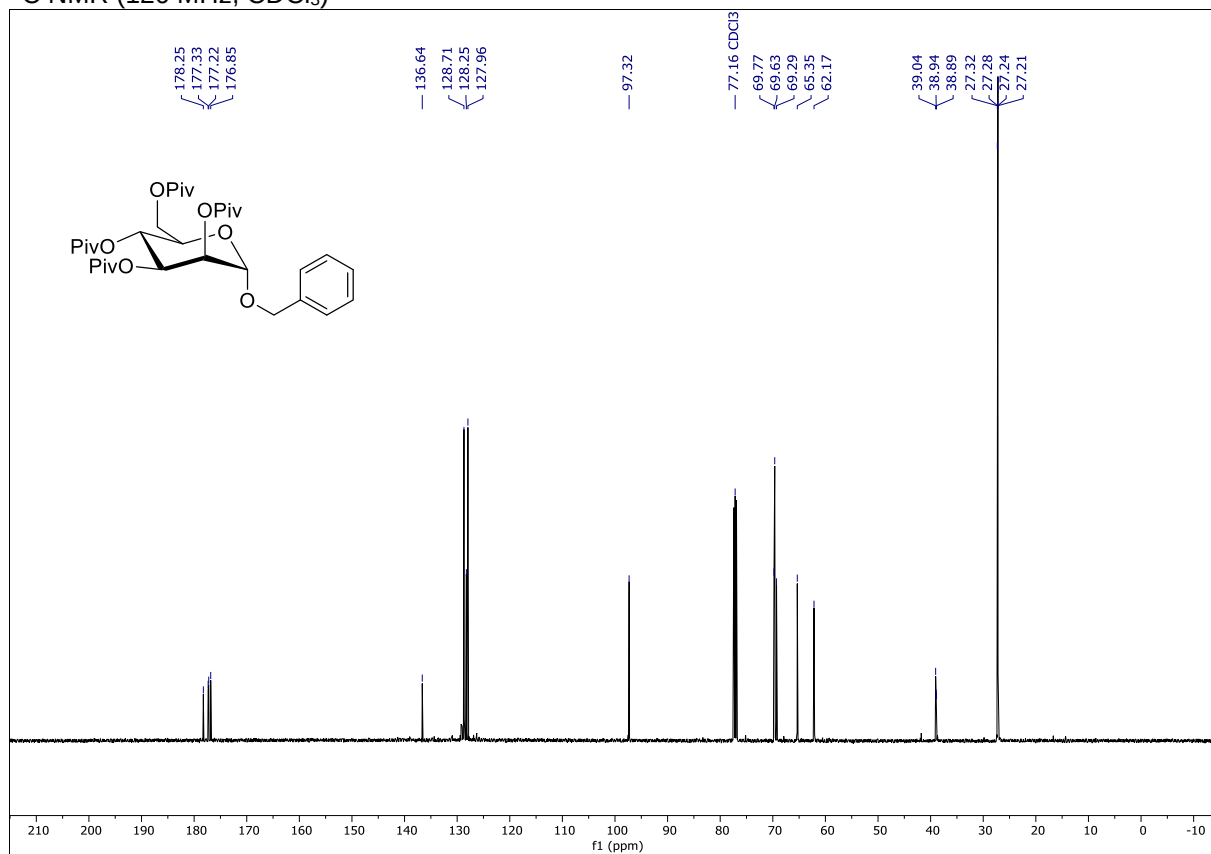


α -3g

^1H NMR (500 MHz, CDCl_3)

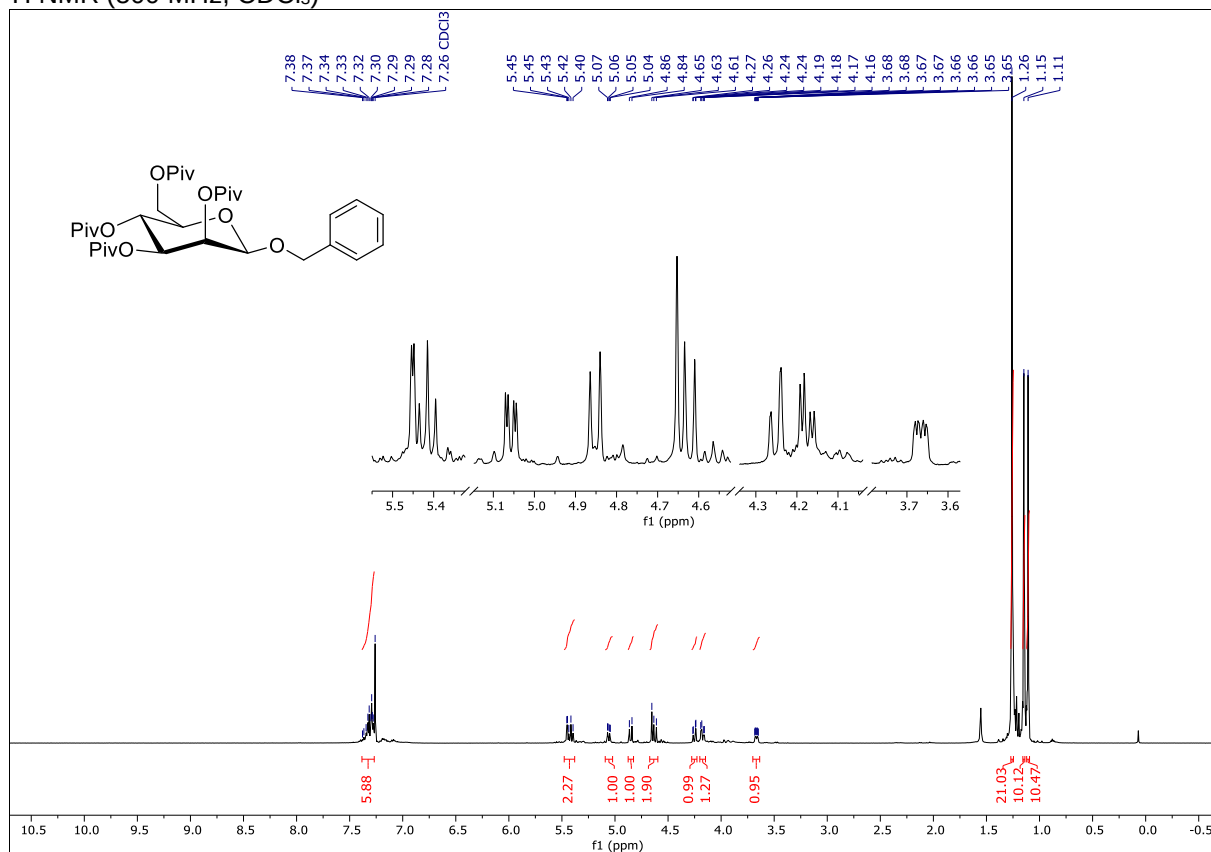


^{13}C NMR (126 MHz, CDCl_3)

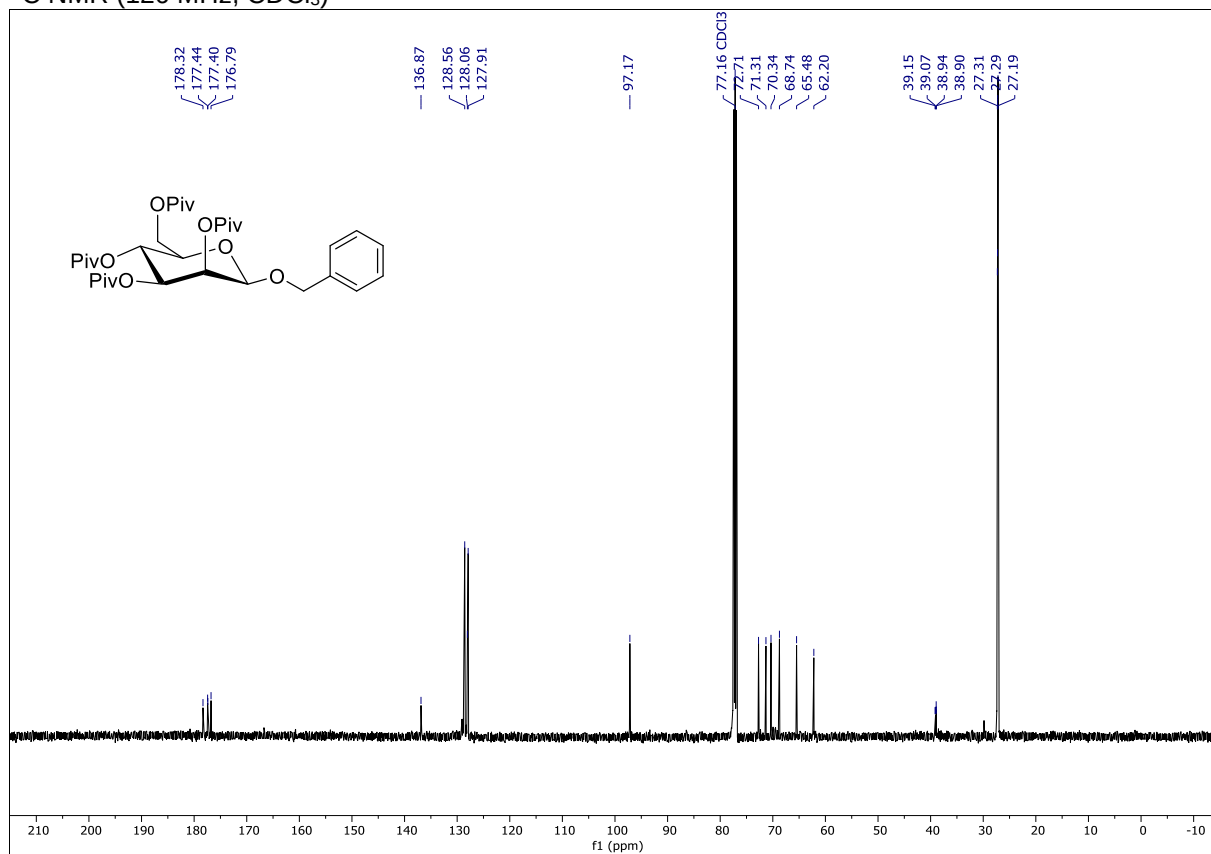


β -3g

^1H NMR (500 MHz, CDCl_3)

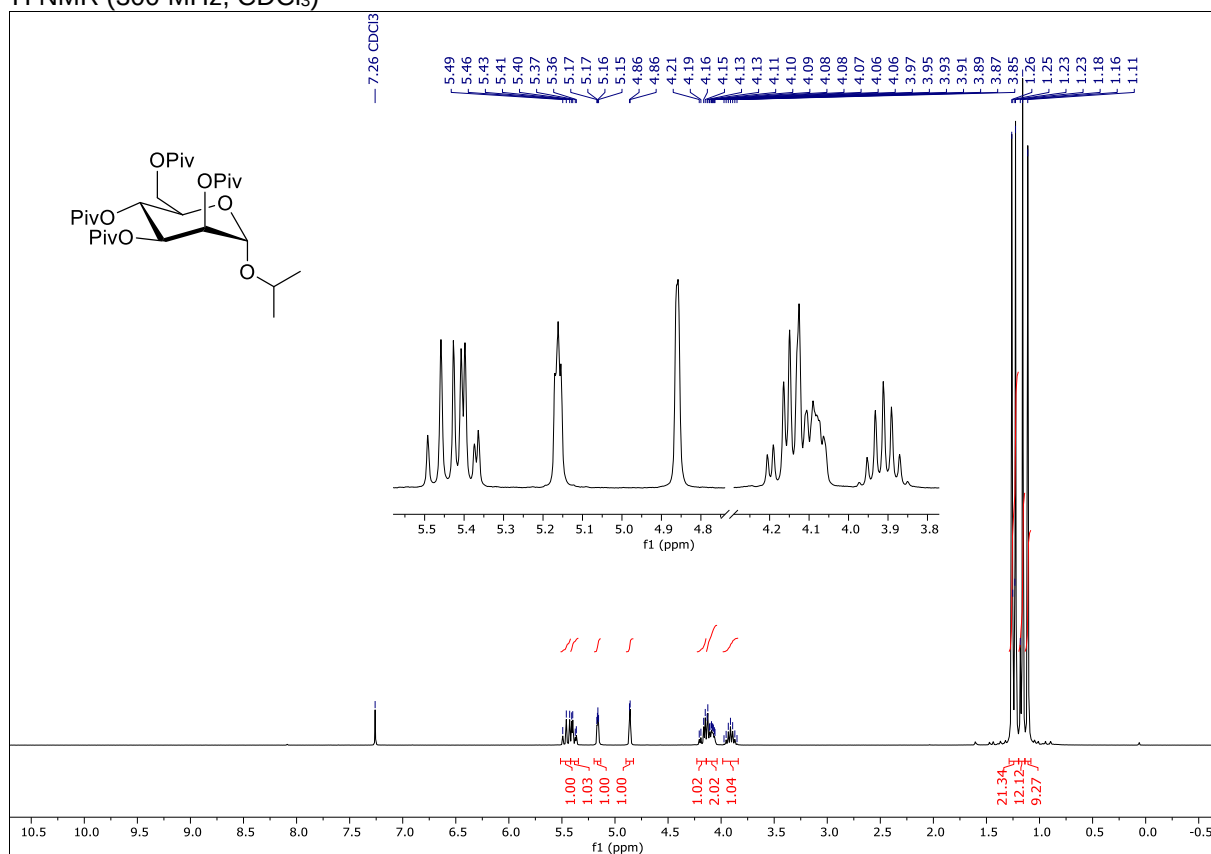


^{13}C NMR (126 MHz, CDCl_3)

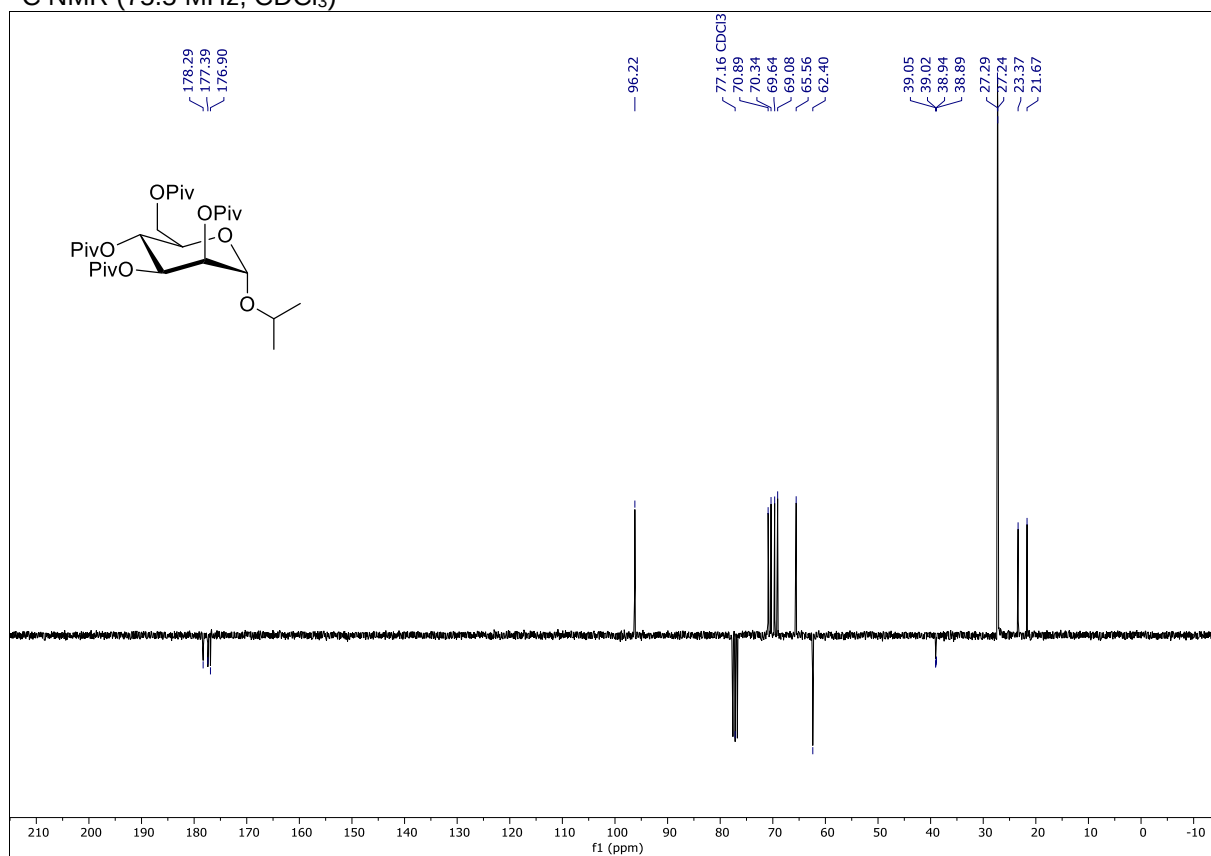


α -3h

^1H NMR (300 MHz, CDCl_3)

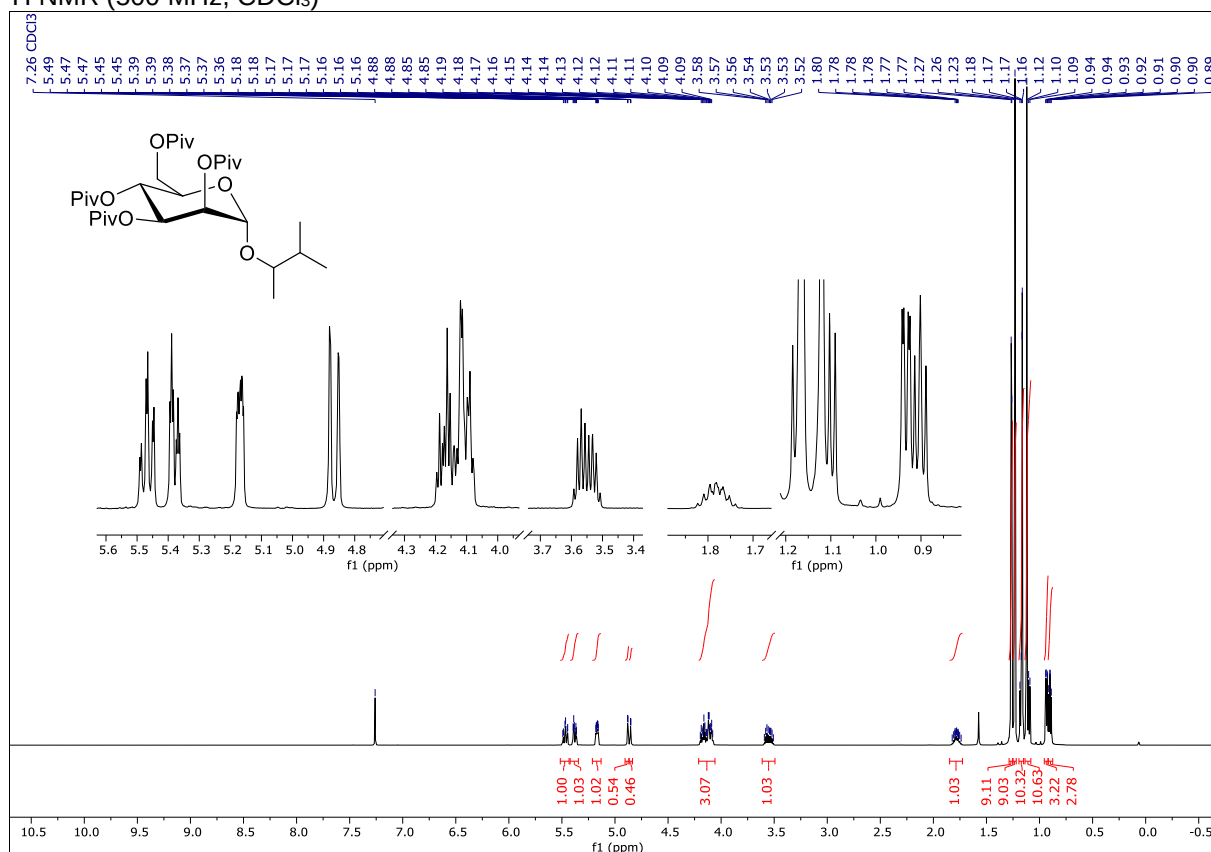


^{13}C NMR (75.5 MHz, CDCl_3)

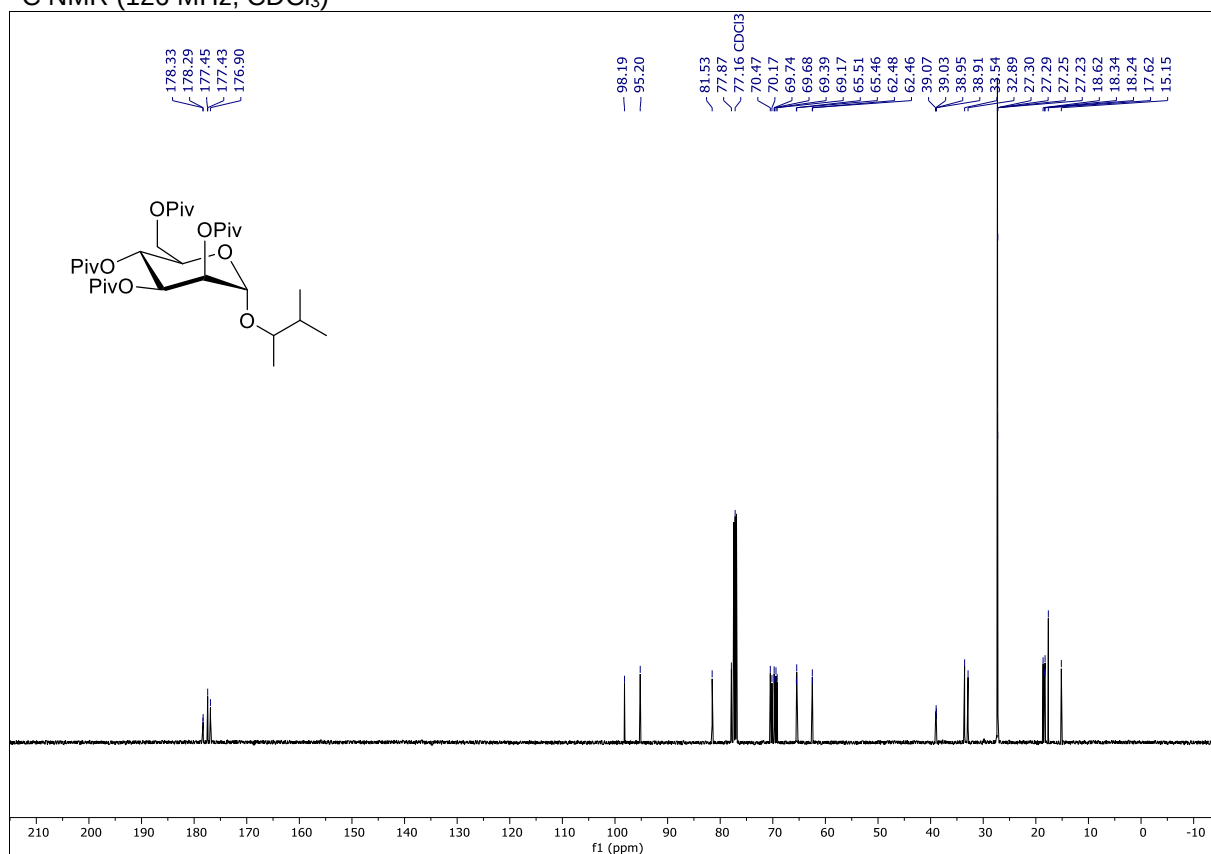


α -3i

^1H NMR (500 MHz, CDCl_3)

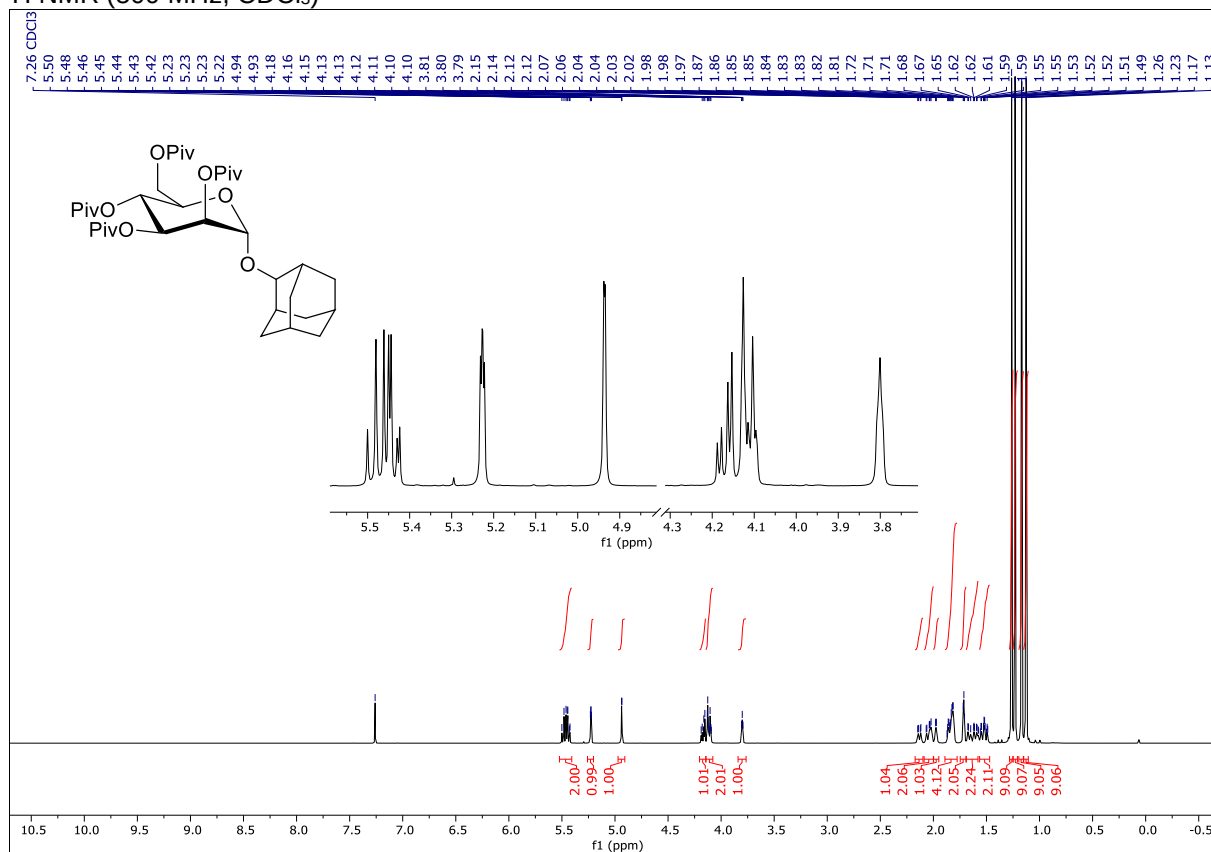


^{13}C NMR (126 MHz, CDCl_3)

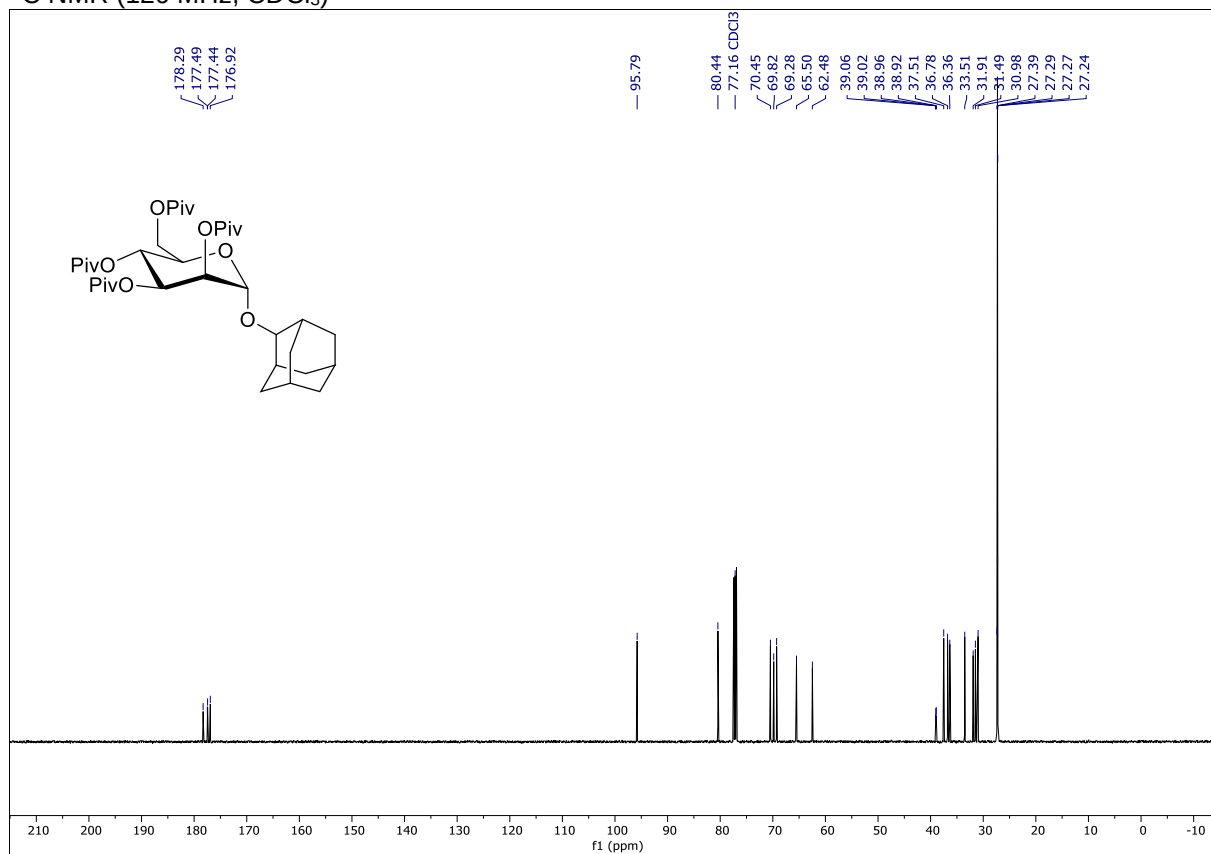


$\alpha\text{-3j}$

¹H NMR (500 MHz, CDCl₃)

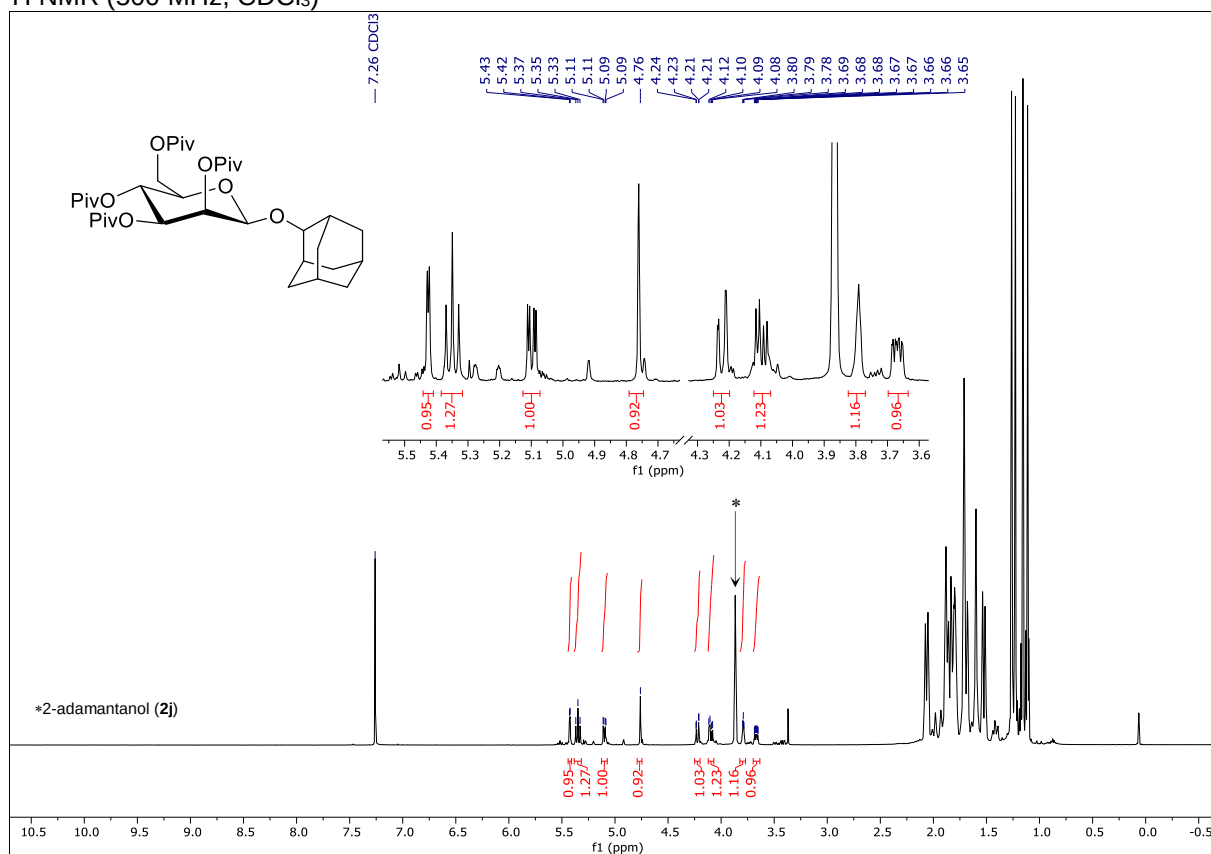


¹³C NMR (126 MHz, CDCl₃)



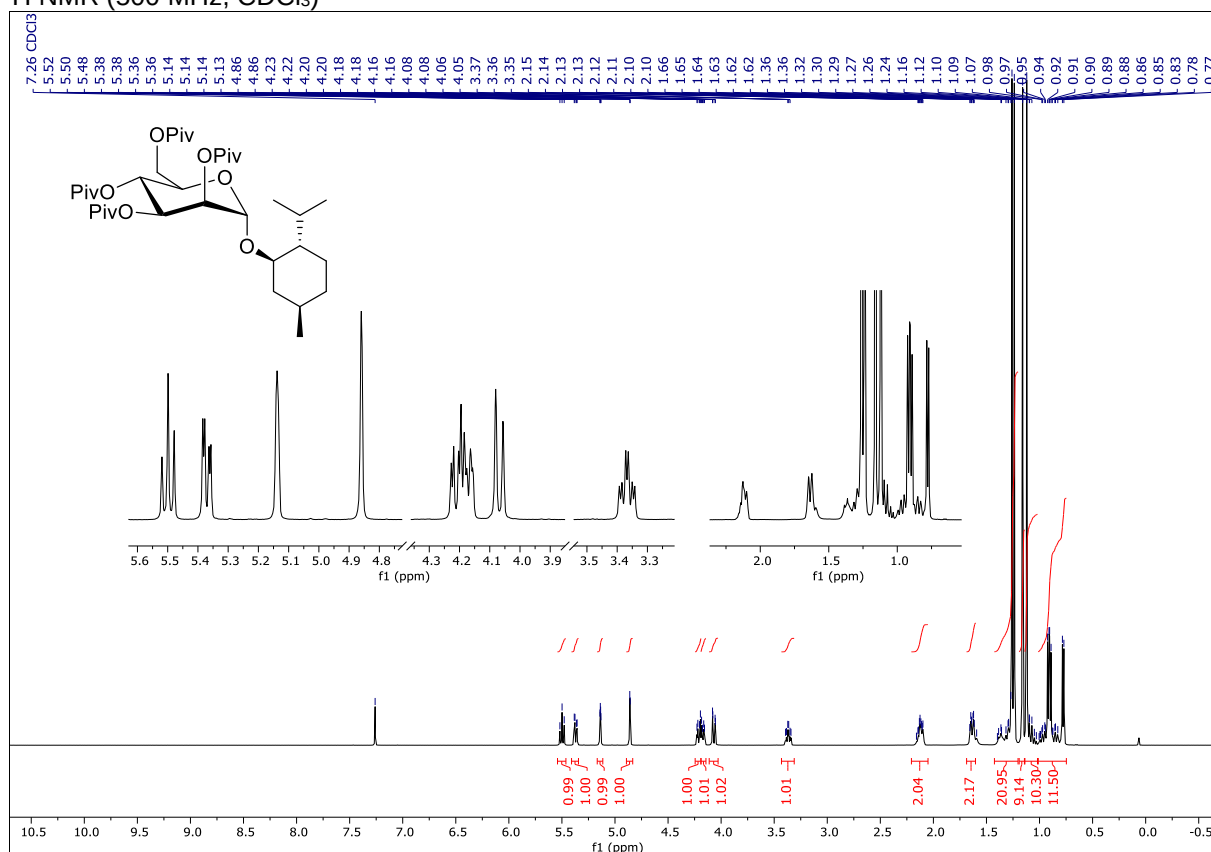
β -3j

^1H NMR (500 MHz, CDCl_3)

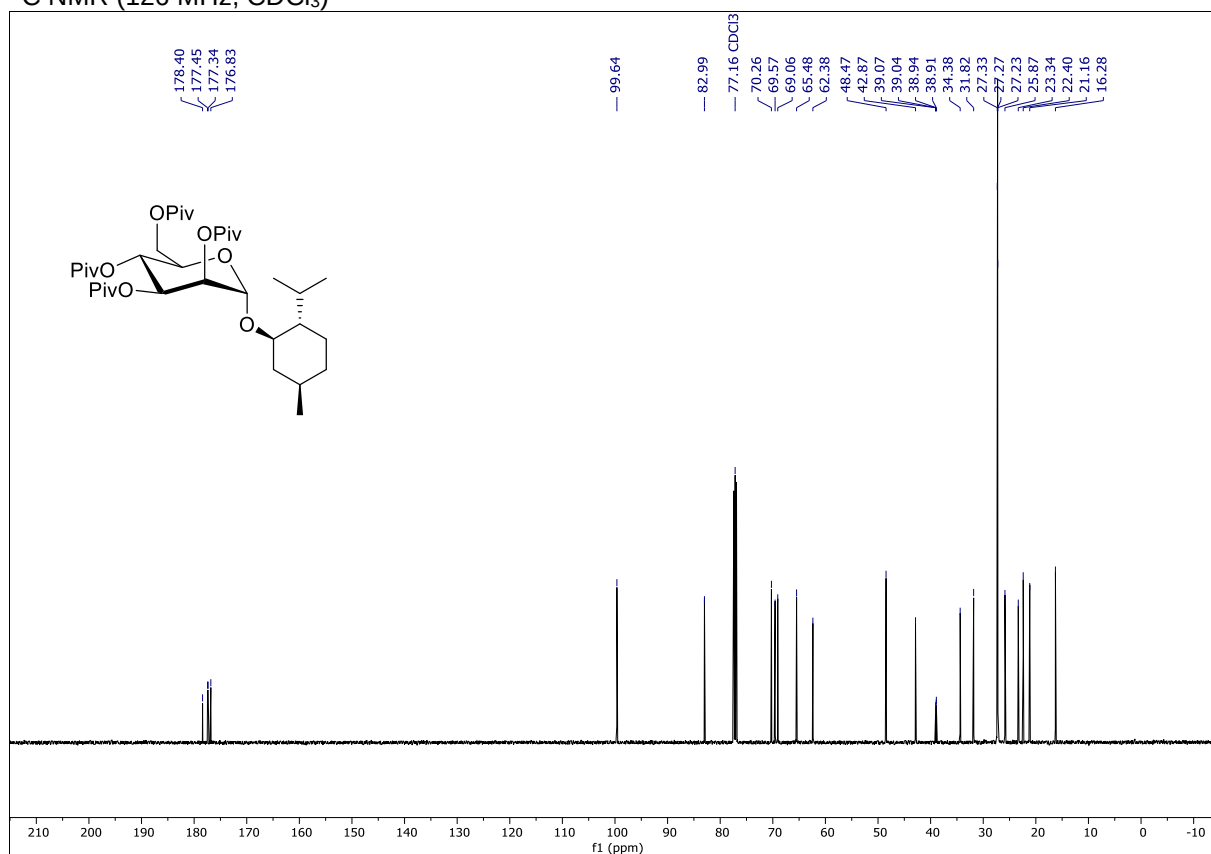


α -3k

^1H NMR (500 MHz, CDCl_3)

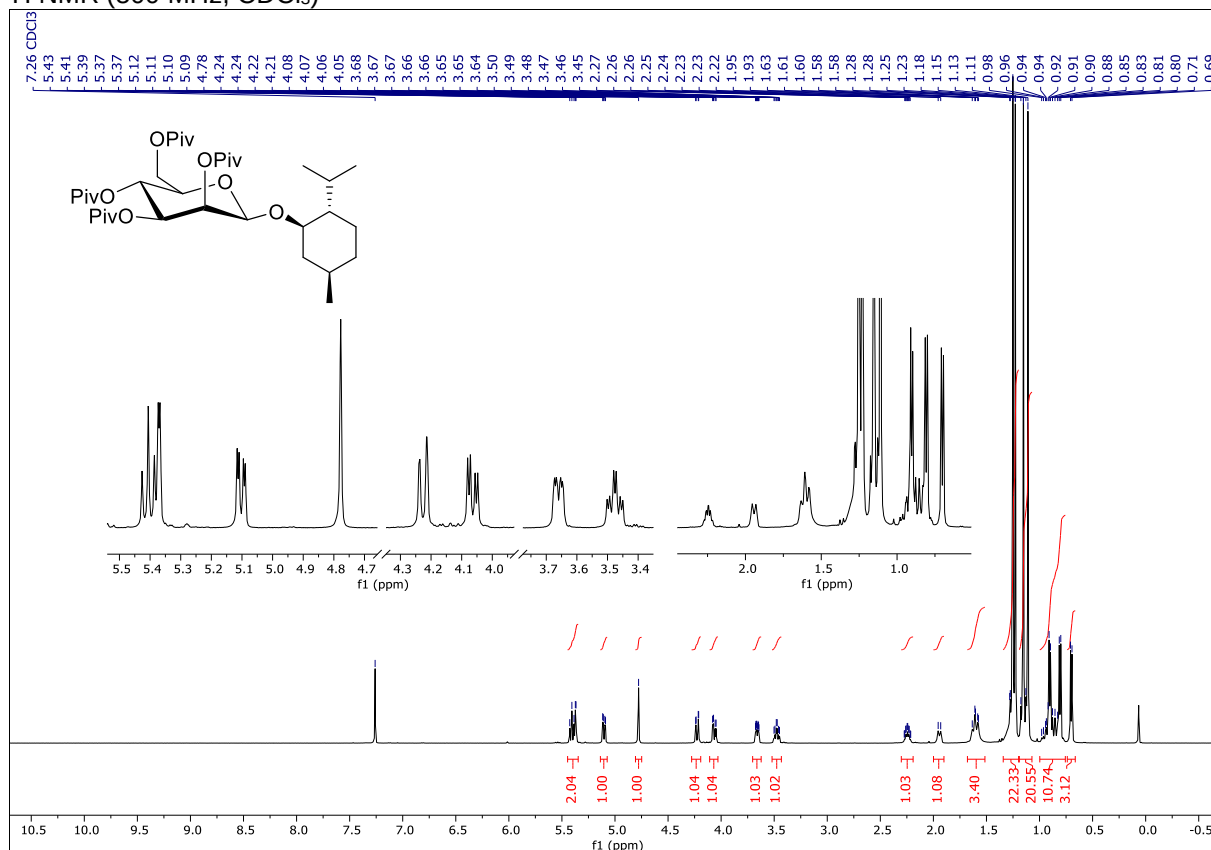


^{13}C NMR (126 MHz, CDCl_3)

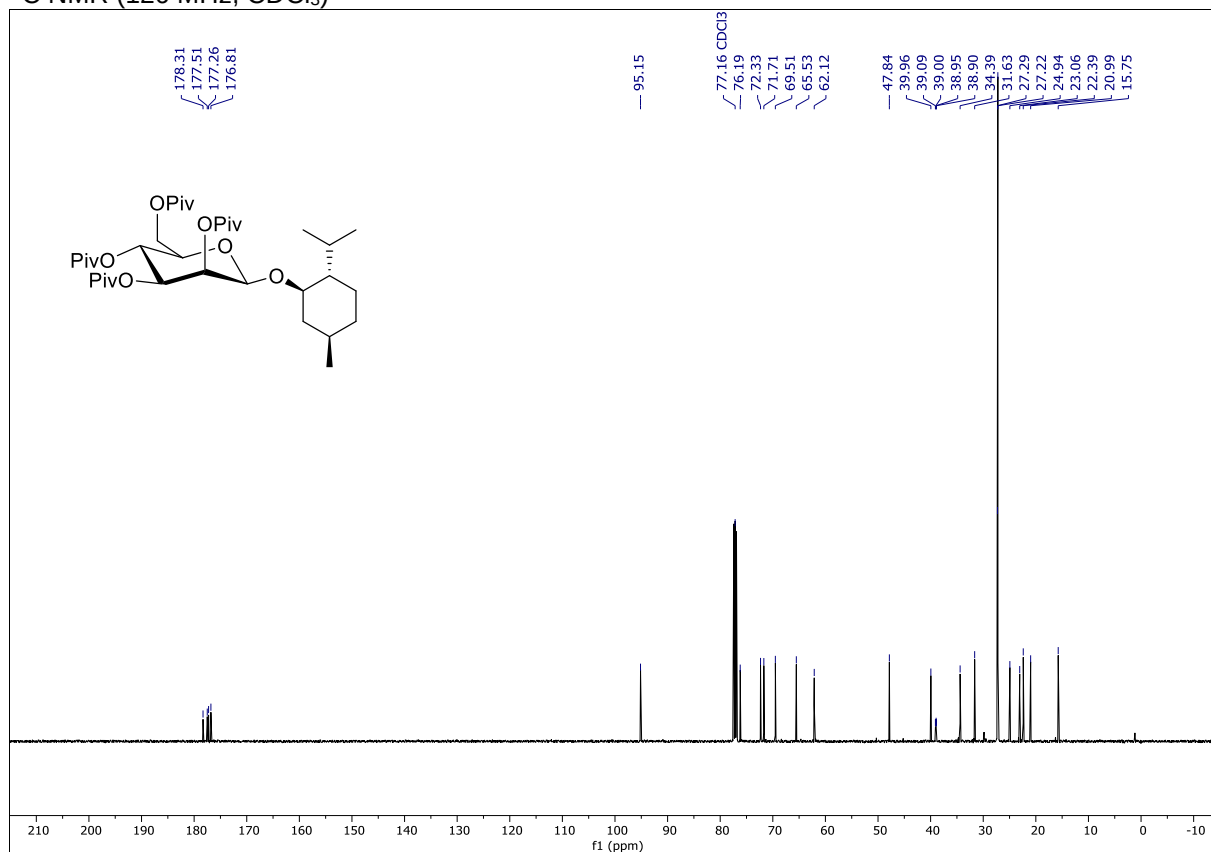


β -3k

^1H NMR (500 MHz, CDCl_3)

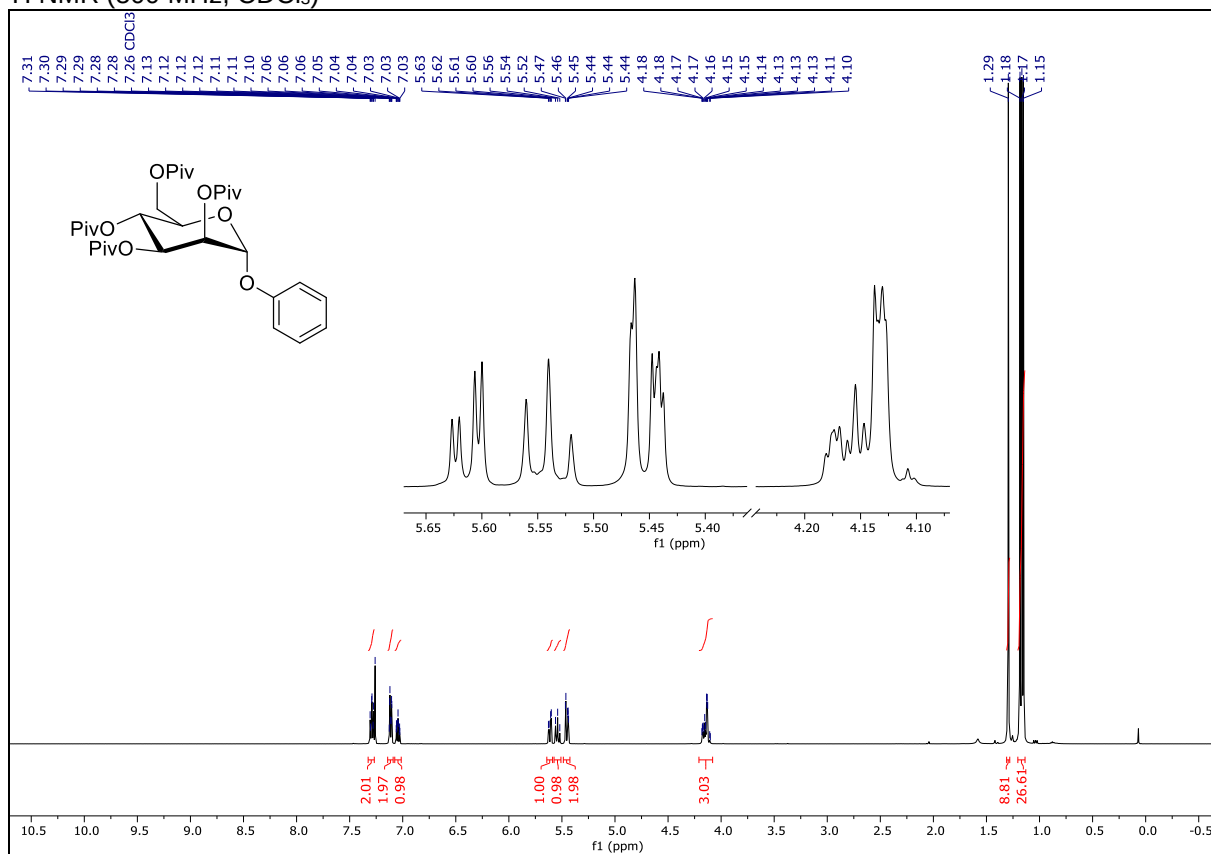


^{13}C NMR (126 MHz, CDCl_3)

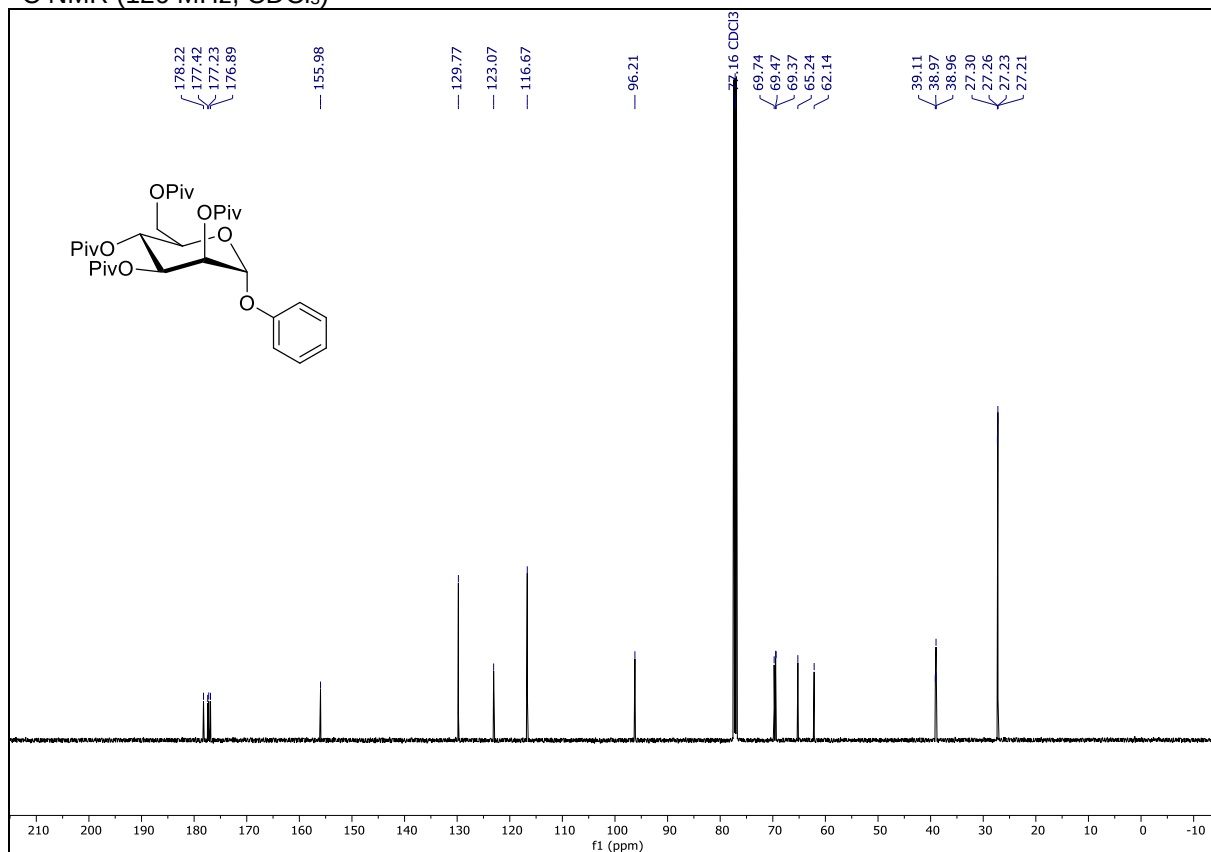


α -3I

^1H NMR (500 MHz, CDCl_3)

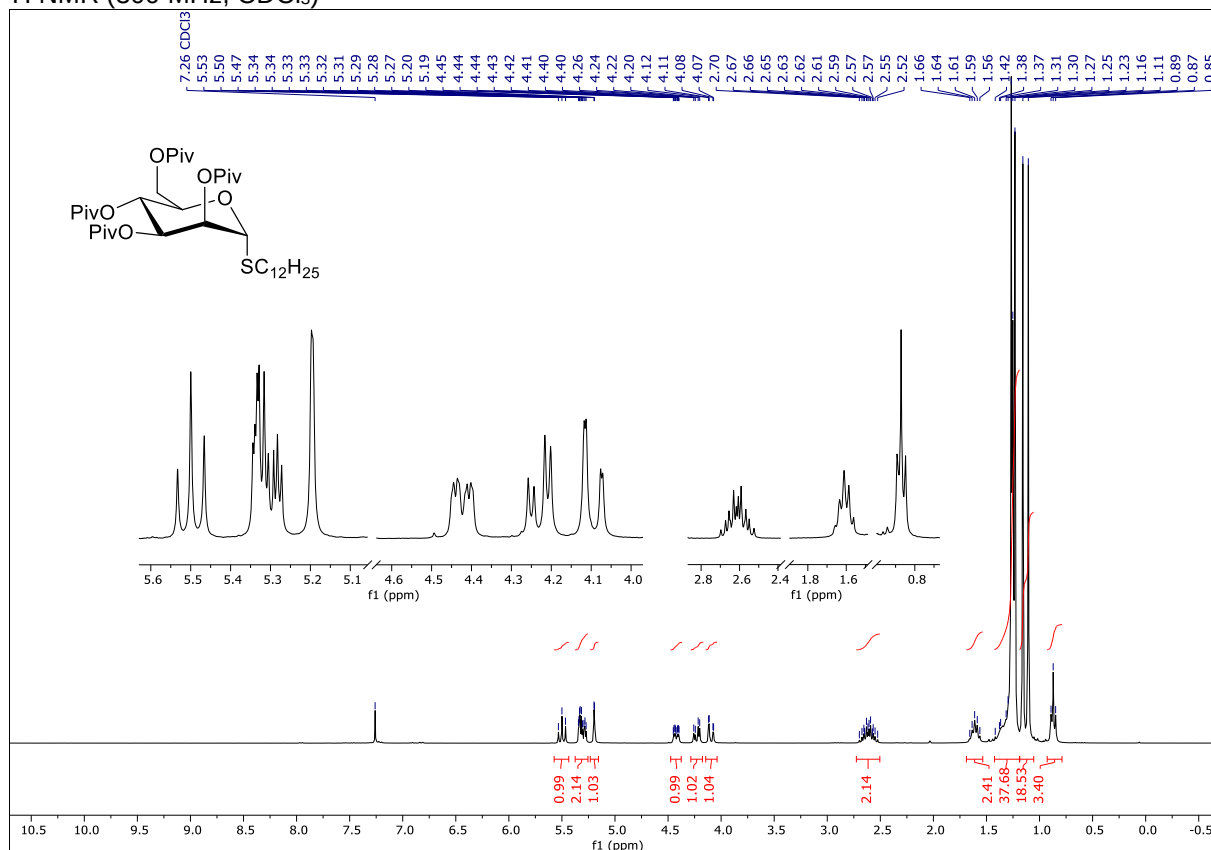


^{13}C NMR (126 MHz, CDCl_3)

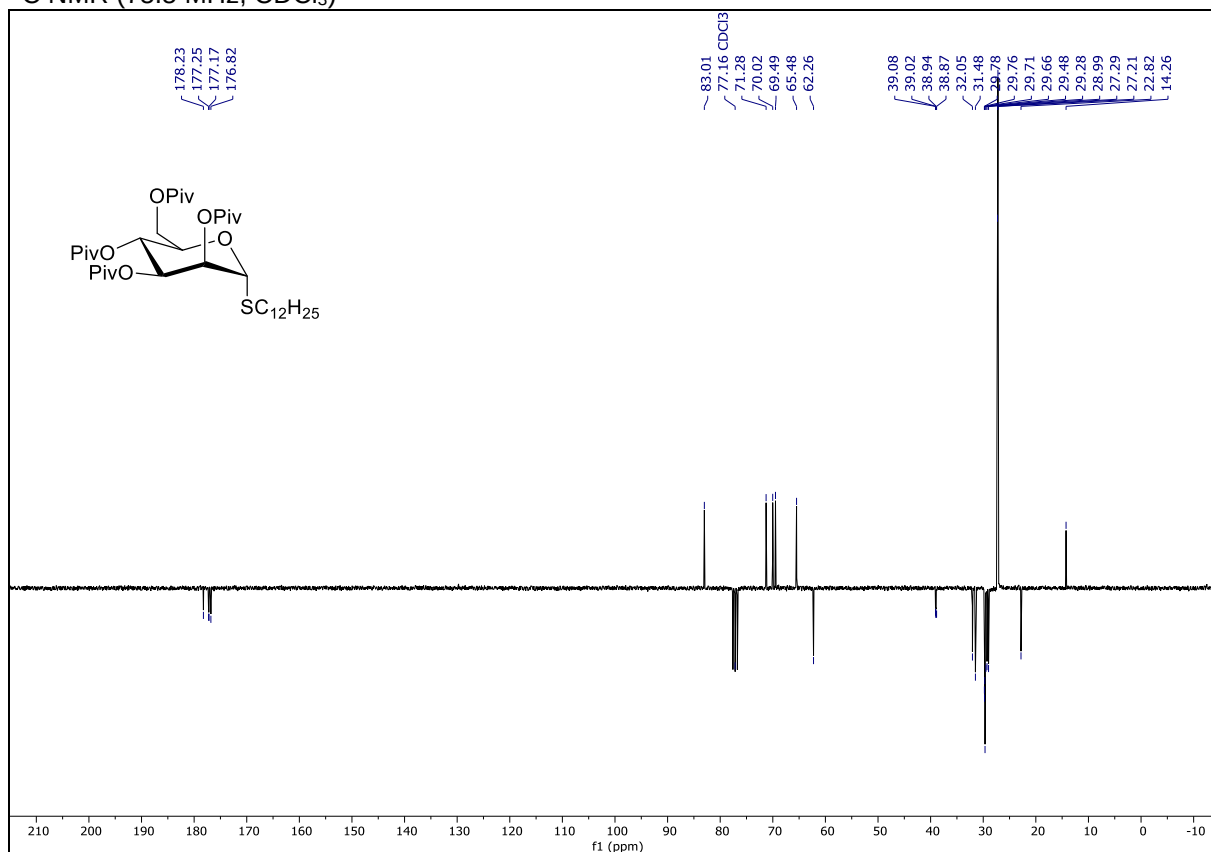


α -3m

^1H NMR (300 MHz, CDCl_3)

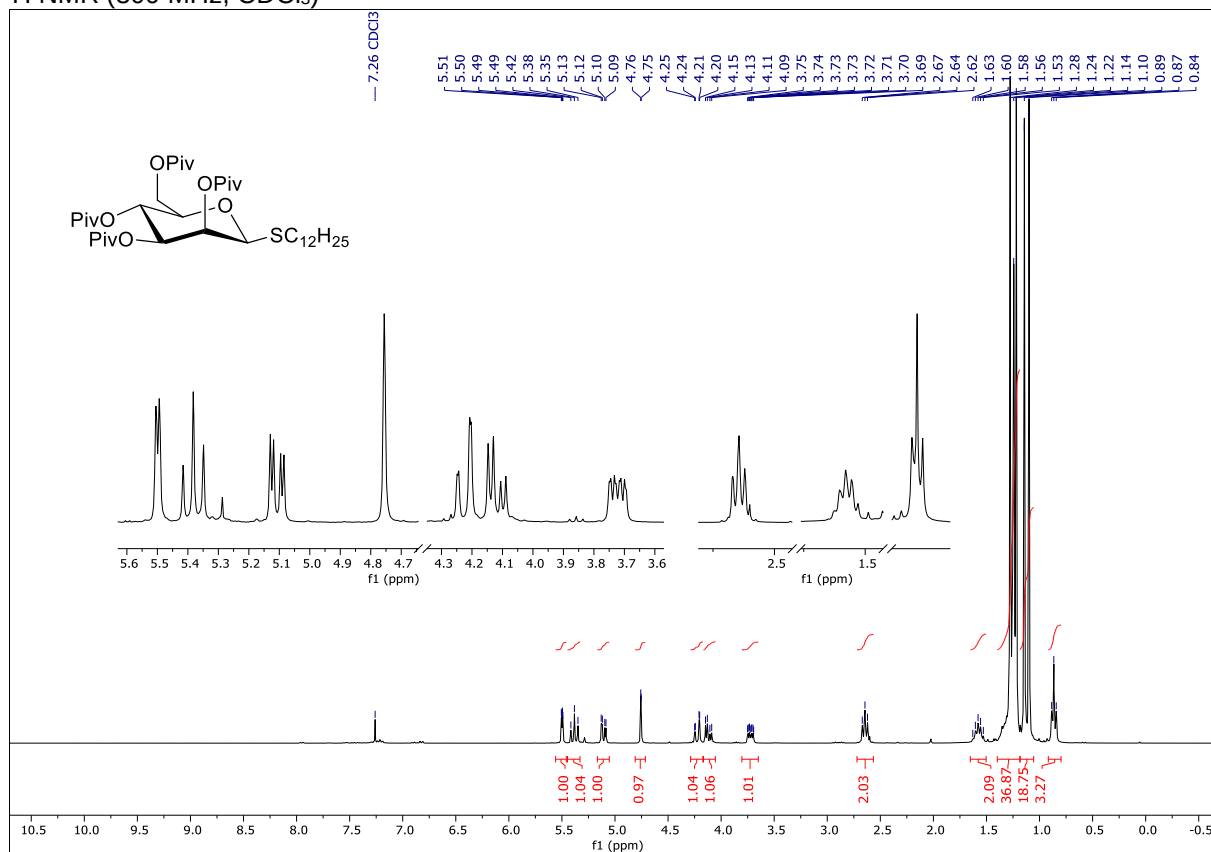


^{13}C NMR (75.5 MHz, CDCl_3)

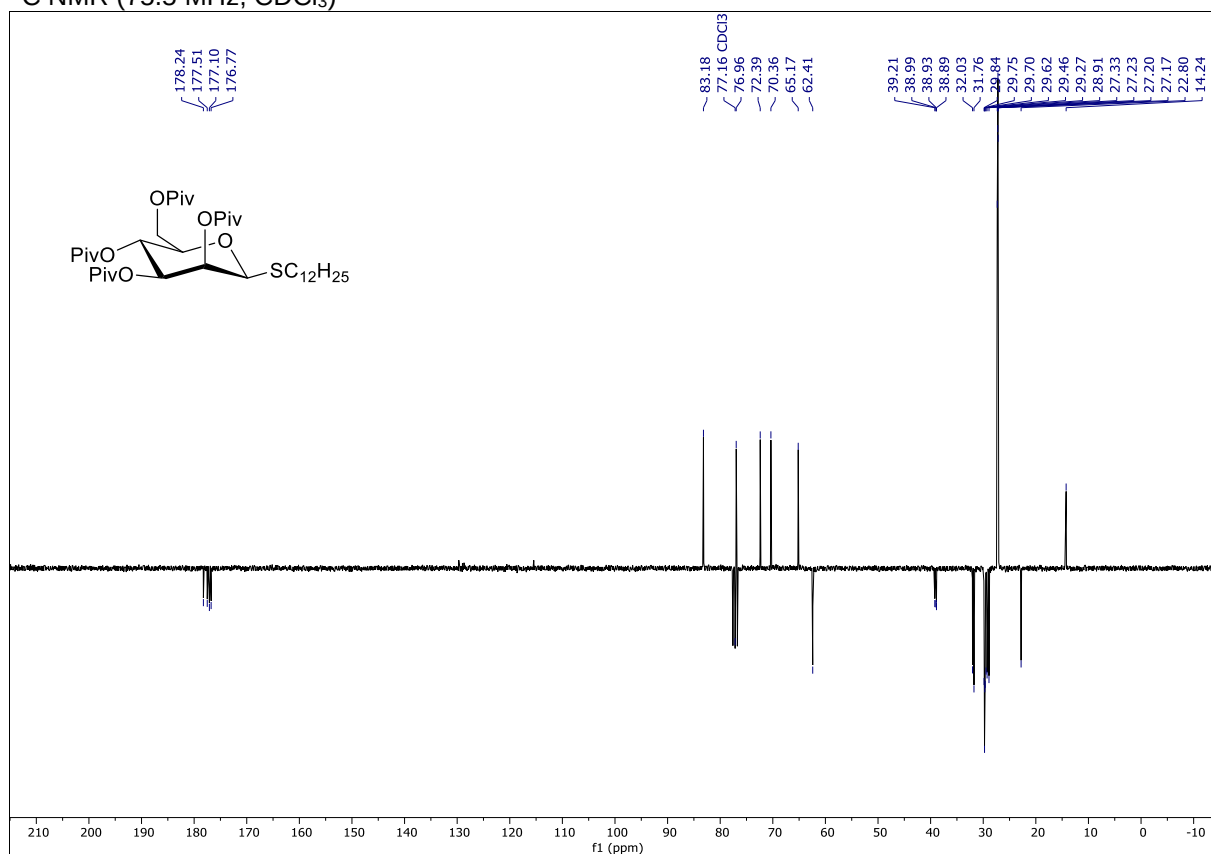


β -3m

^1H NMR (300 MHz, CDCl_3)

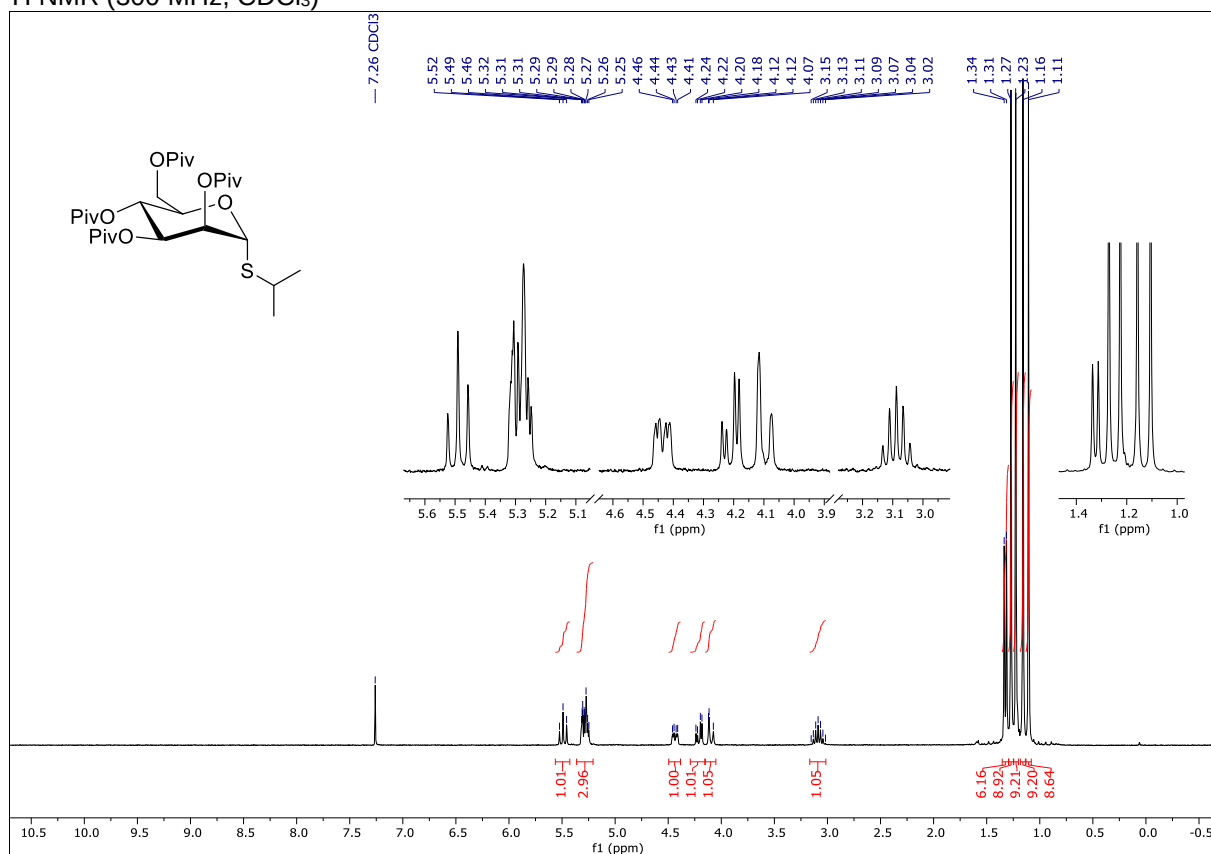


^{13}C NMR (75.5 MHz, CDCl_3)

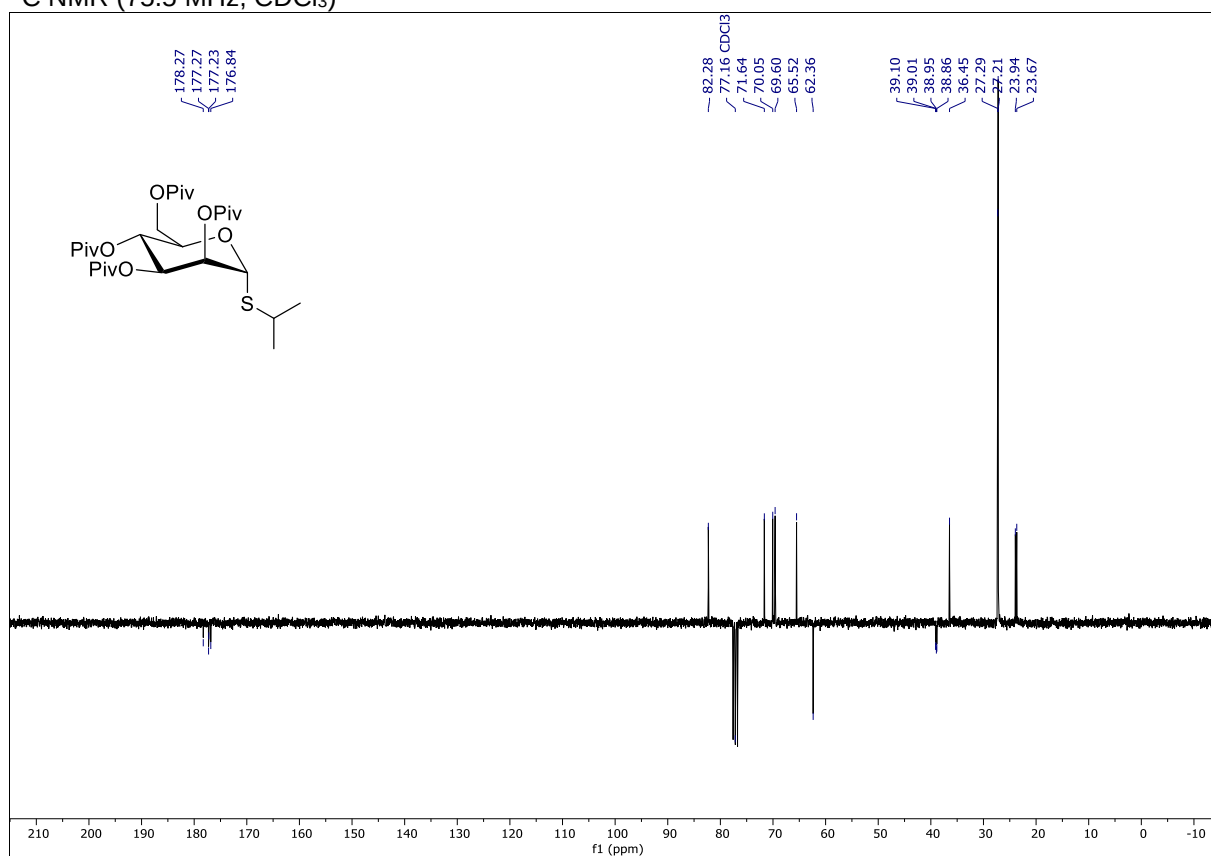


α -3n

^1H NMR (300 MHz, CDCl_3)

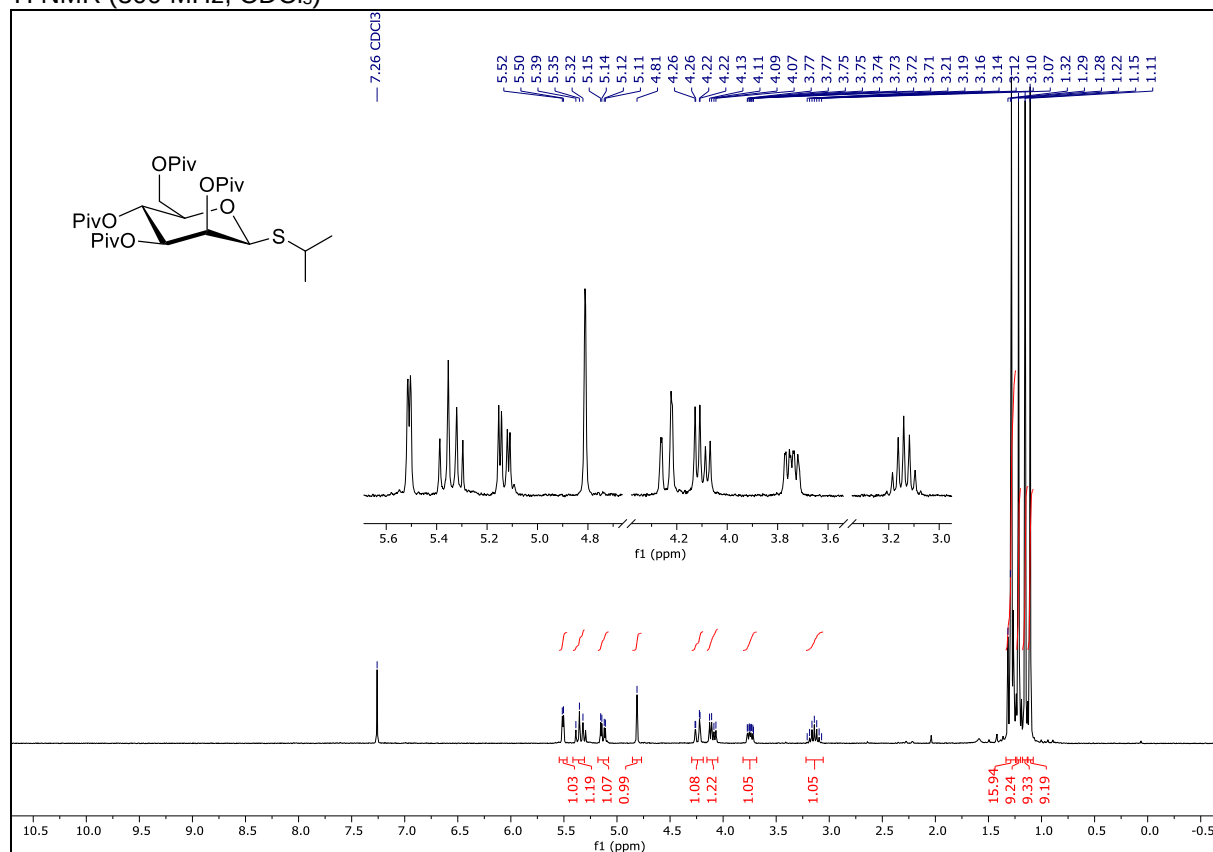


^{13}C NMR (75.5 MHz, CDCl_3)

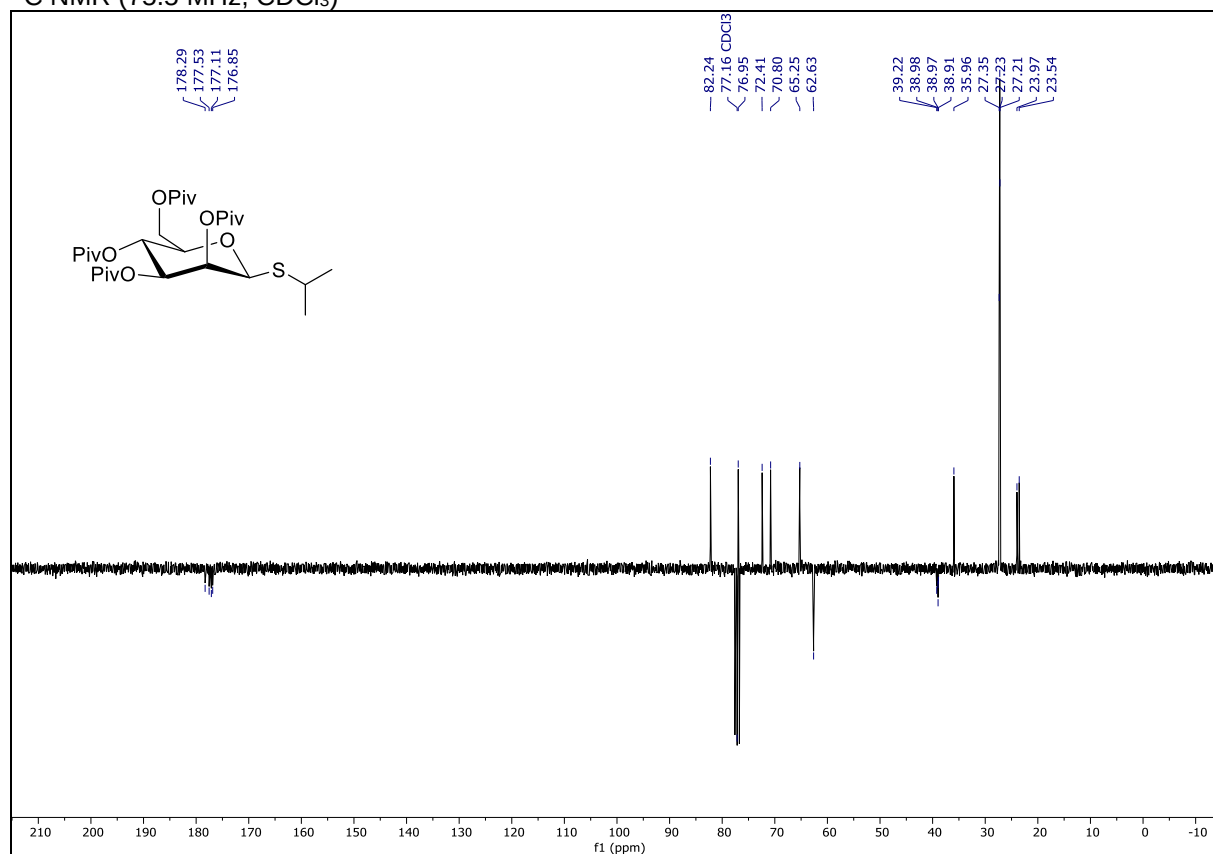


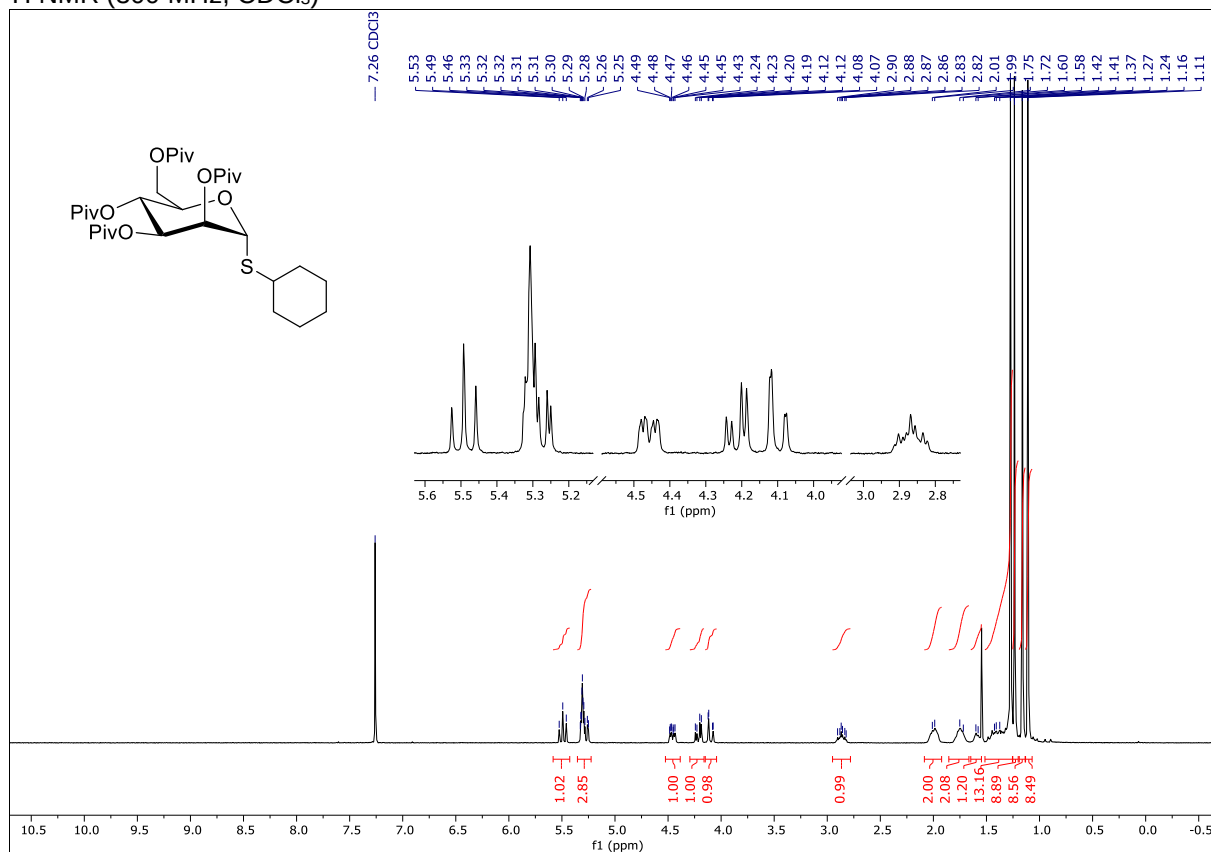
β -3n

^1H NMR (300 MHz, CDCl_3)

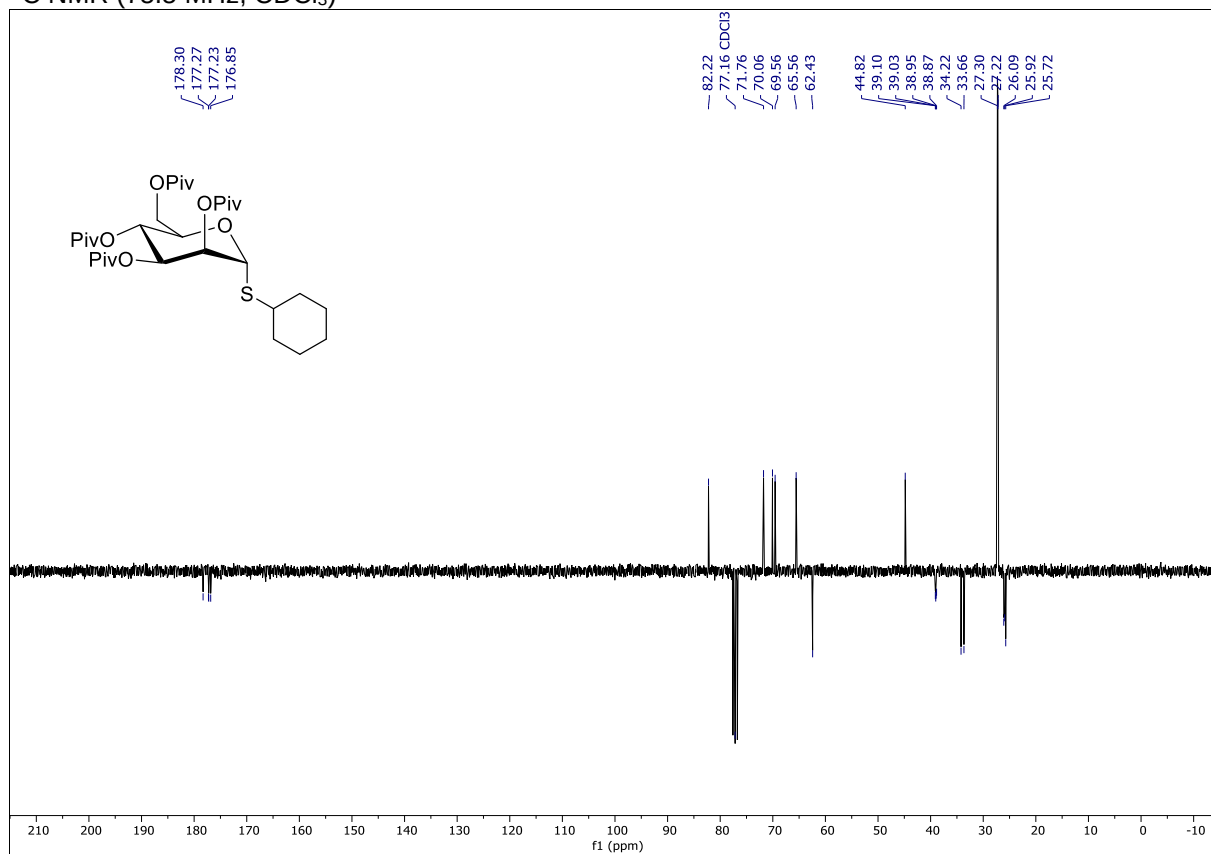


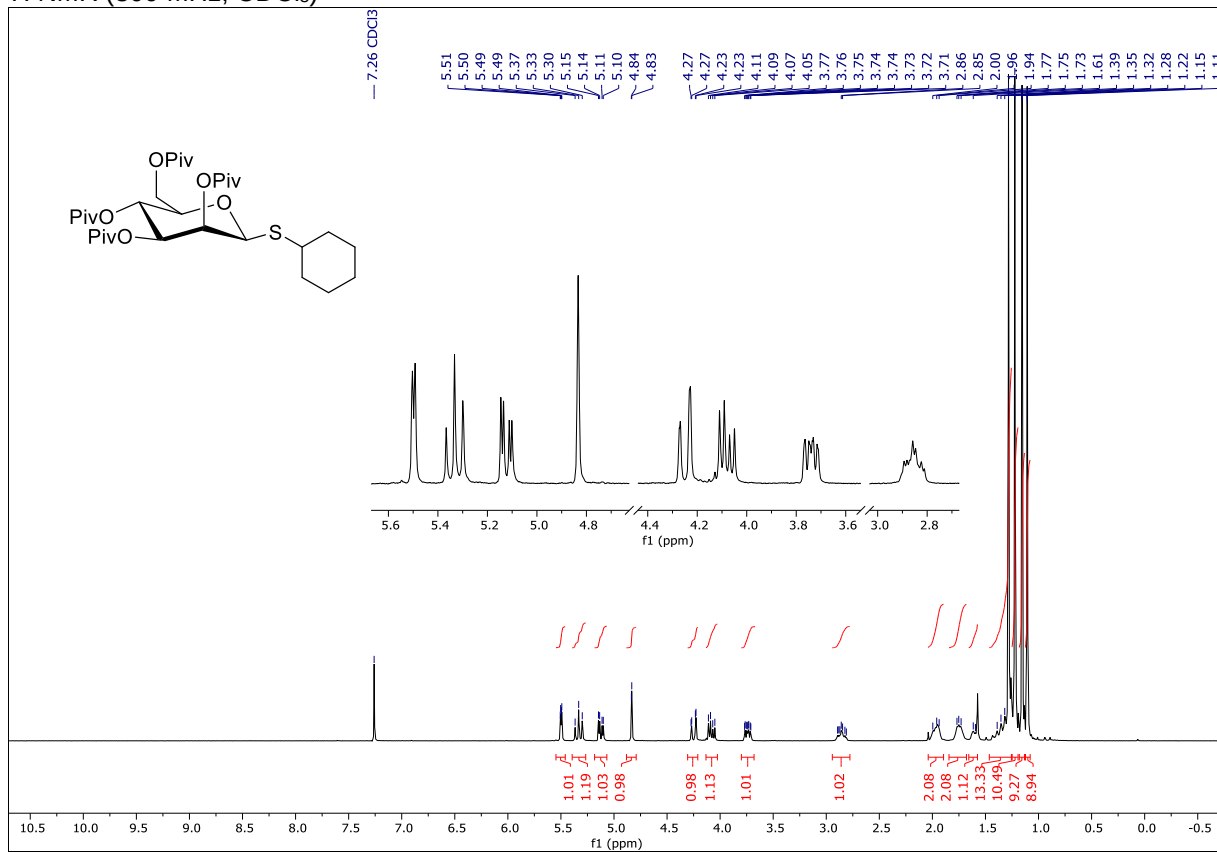
^{13}C NMR (75.5 MHz, CDCl_3)



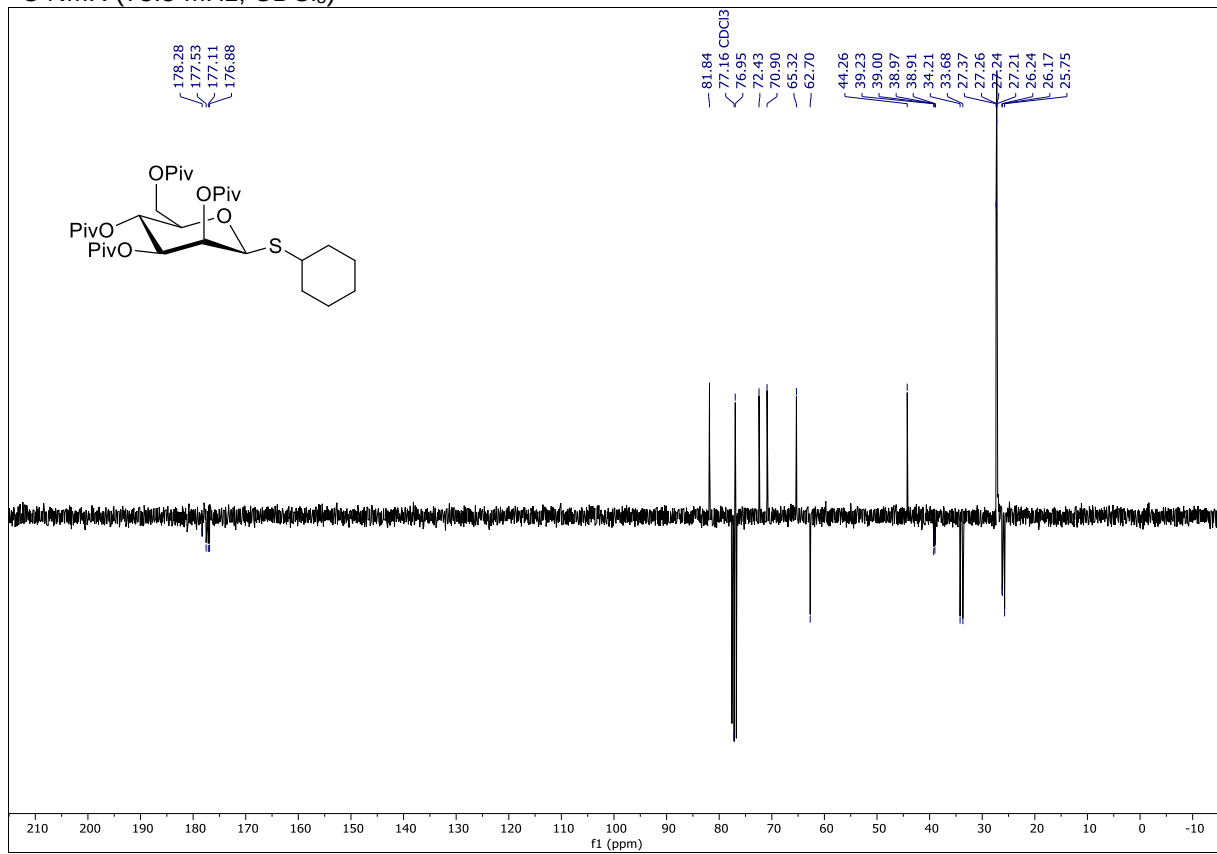
α -30¹H NMR (300 MHz, CDCl₃)

^{13}C NMR (75.5 MHz, CDCl_3)



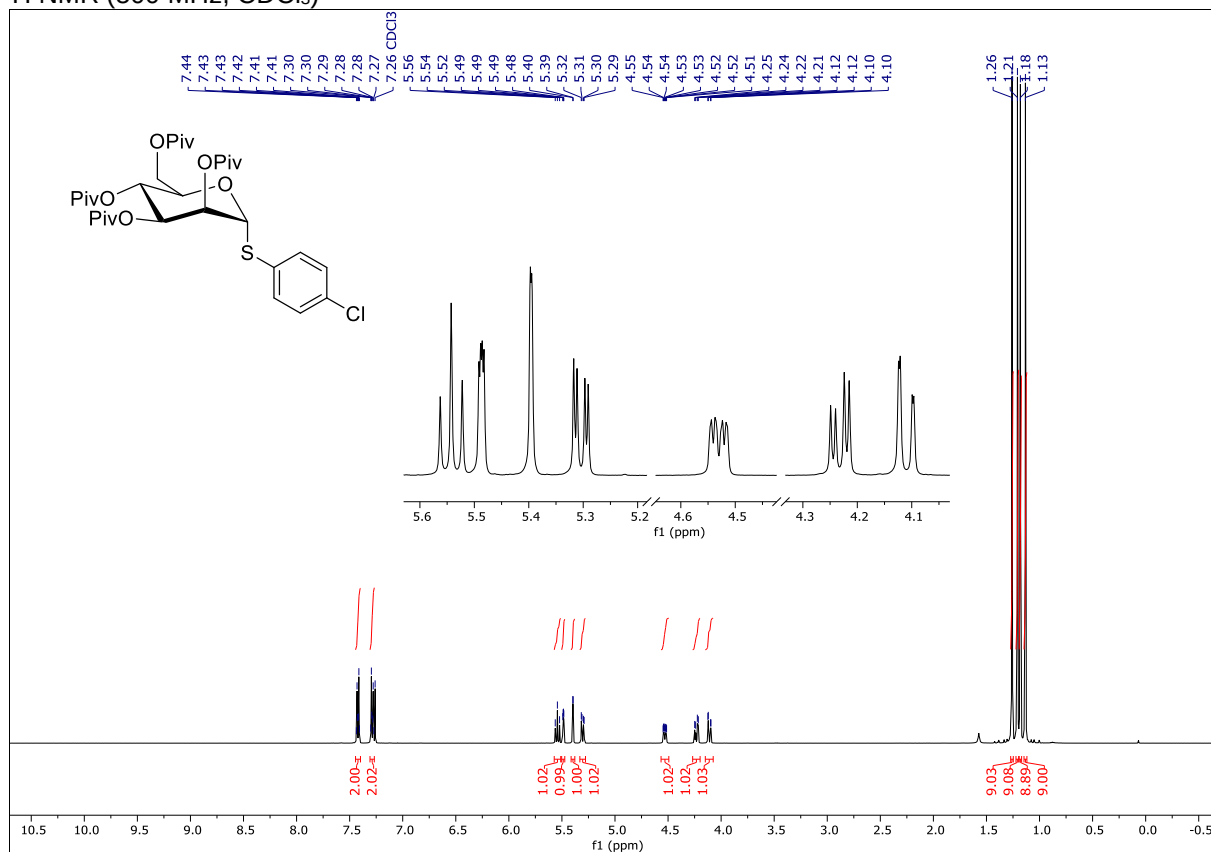
β -3o¹H NMR (300 MHz, CDCl₃)

^{13}C NMR (75.5 MHz, CDCl_3)

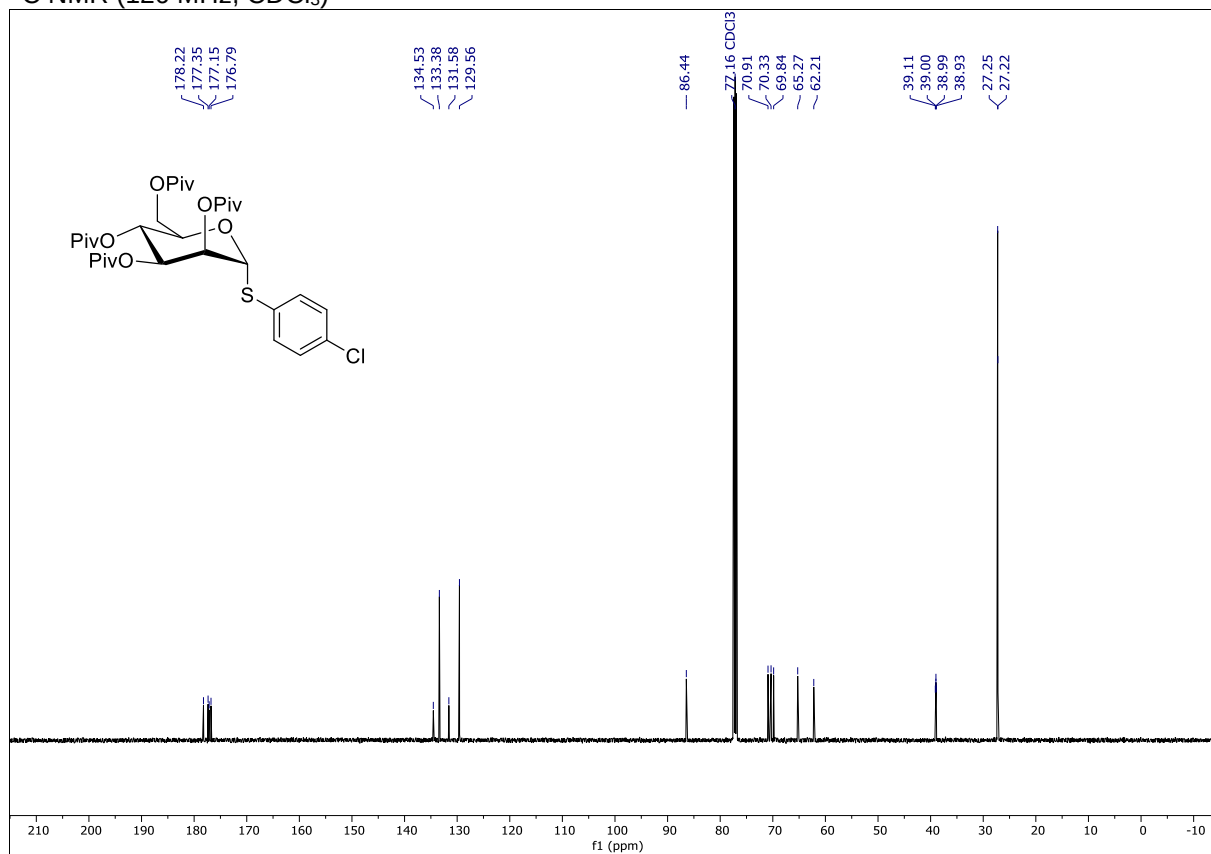


α -3p

^1H NMR (500 MHz, CDCl_3)

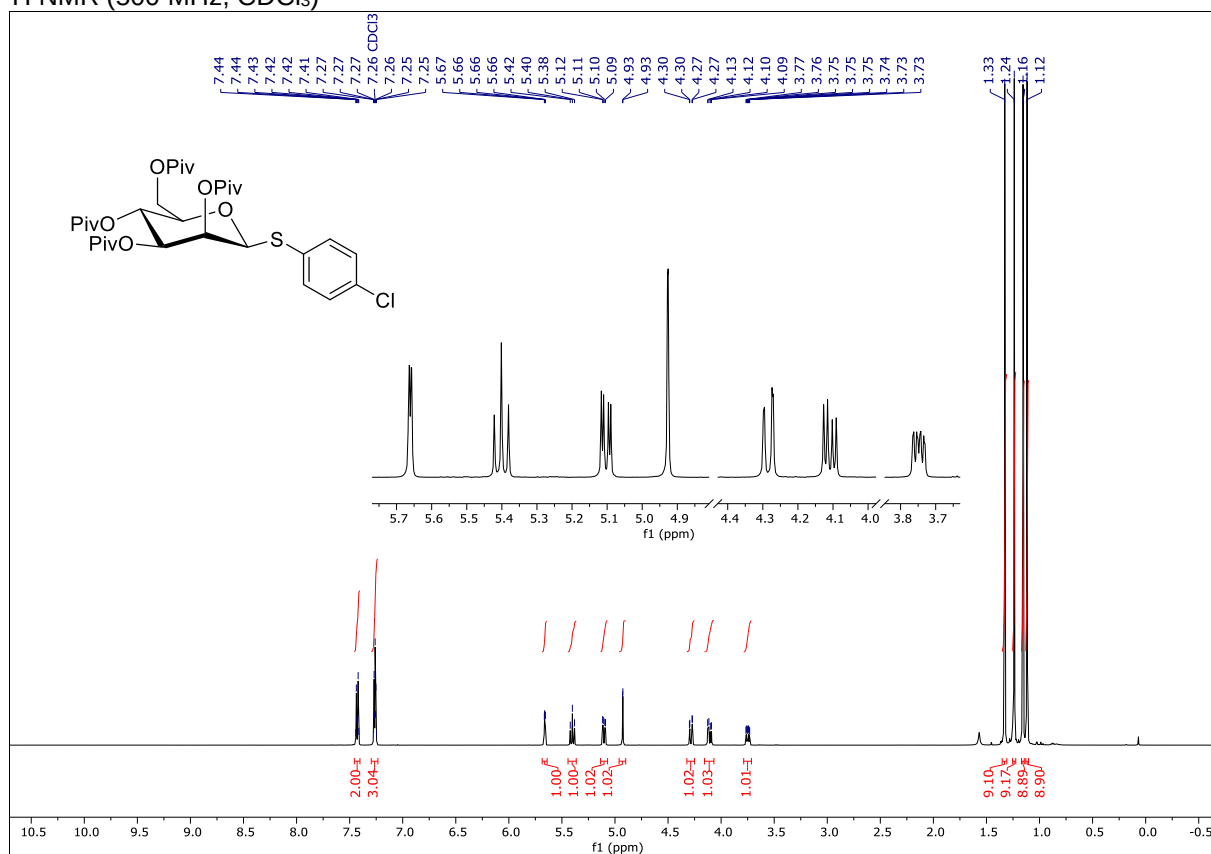


^{13}C NMR (126 MHz, CDCl_3)

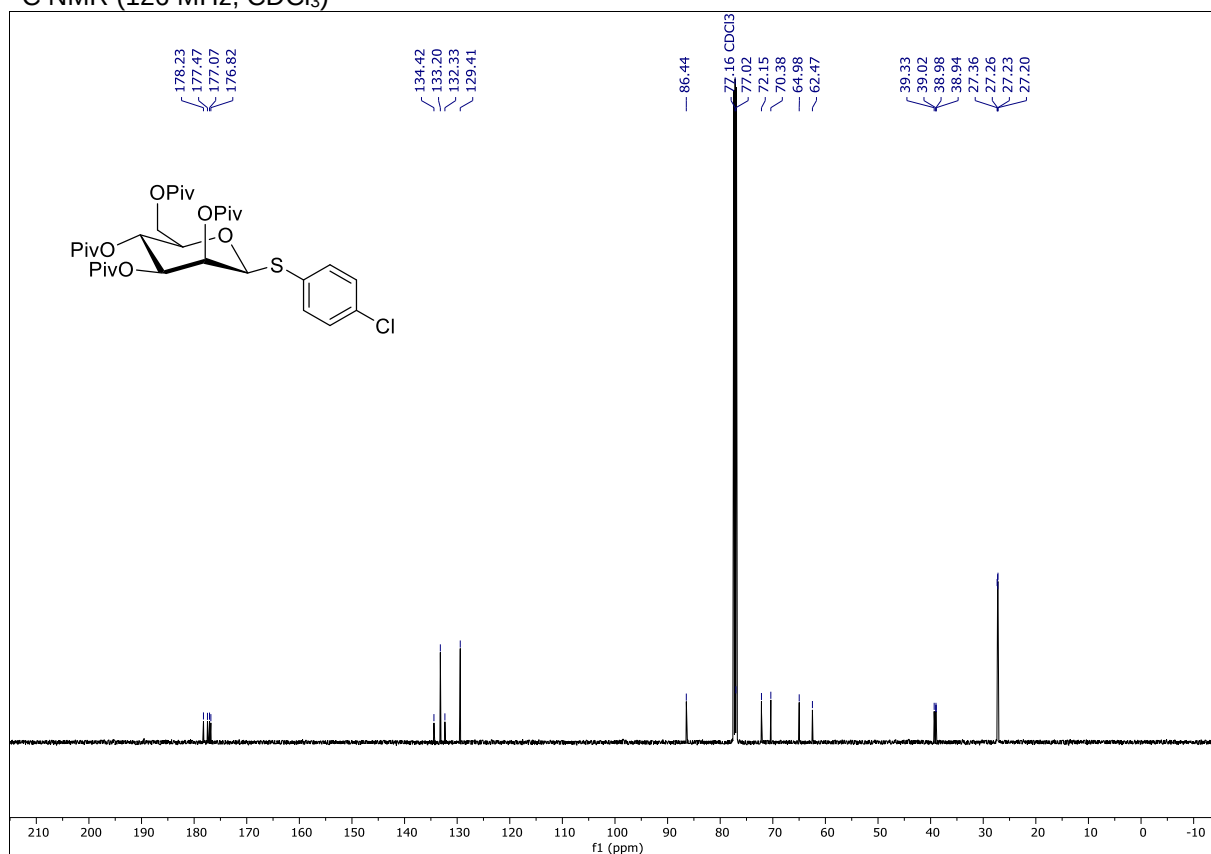


β -3p

^1H NMR (500 MHz, CDCl_3)

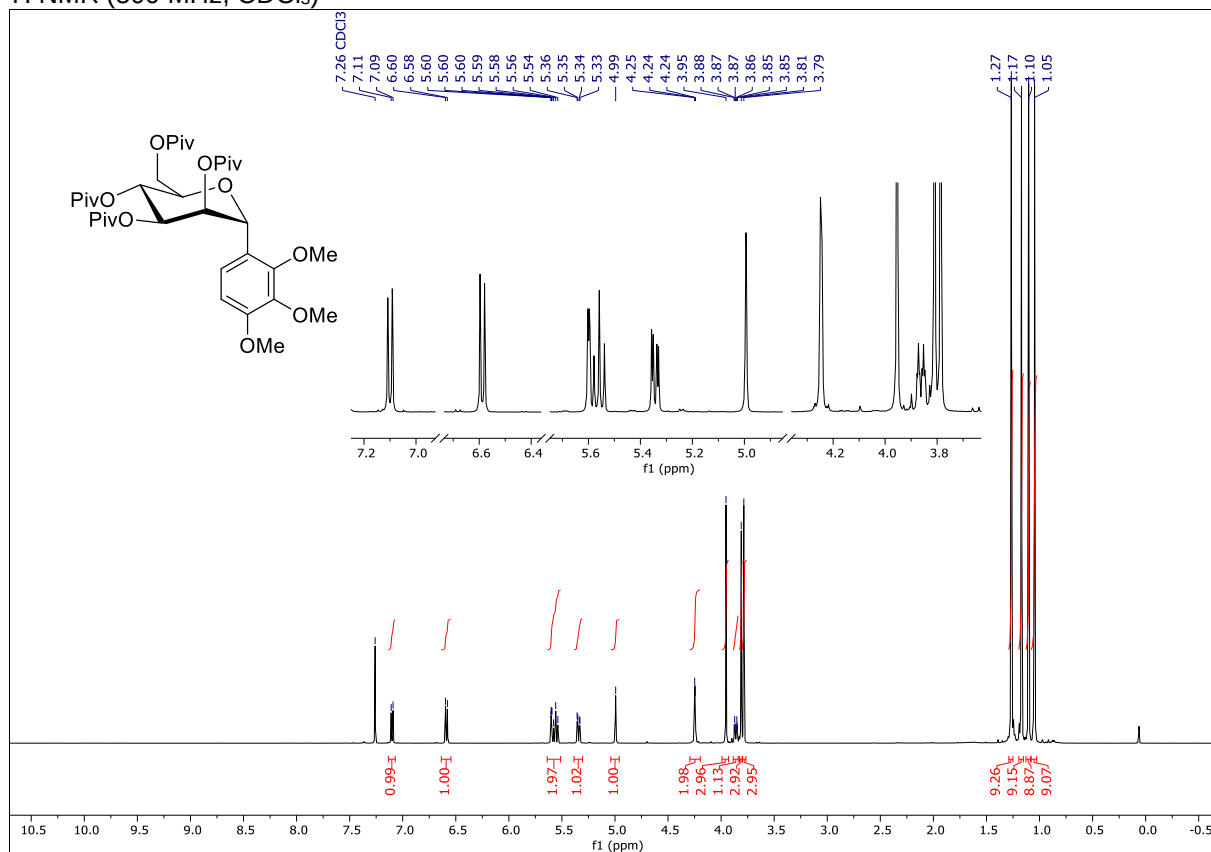


^{13}C NMR (126 MHz, CDCl_3)

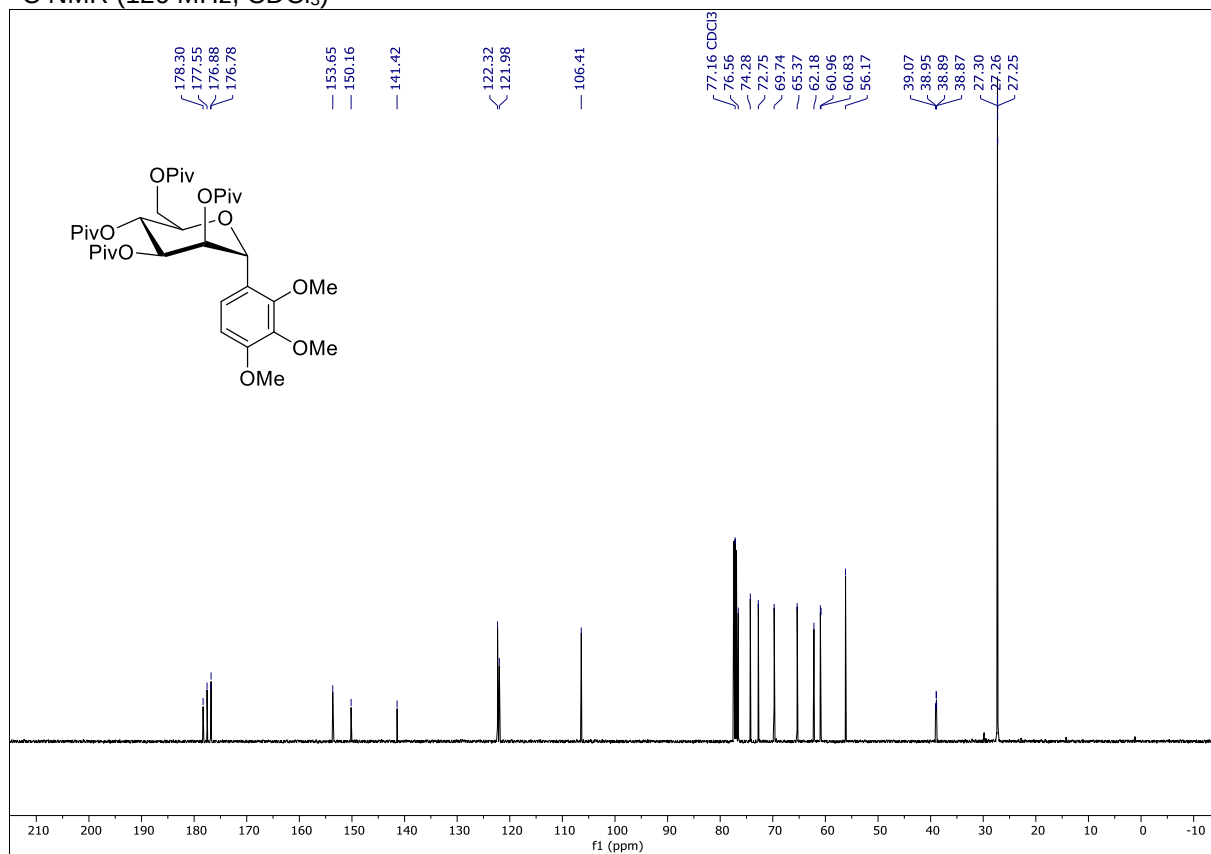


α -3q

^1H NMR (500 MHz, CDCl_3)

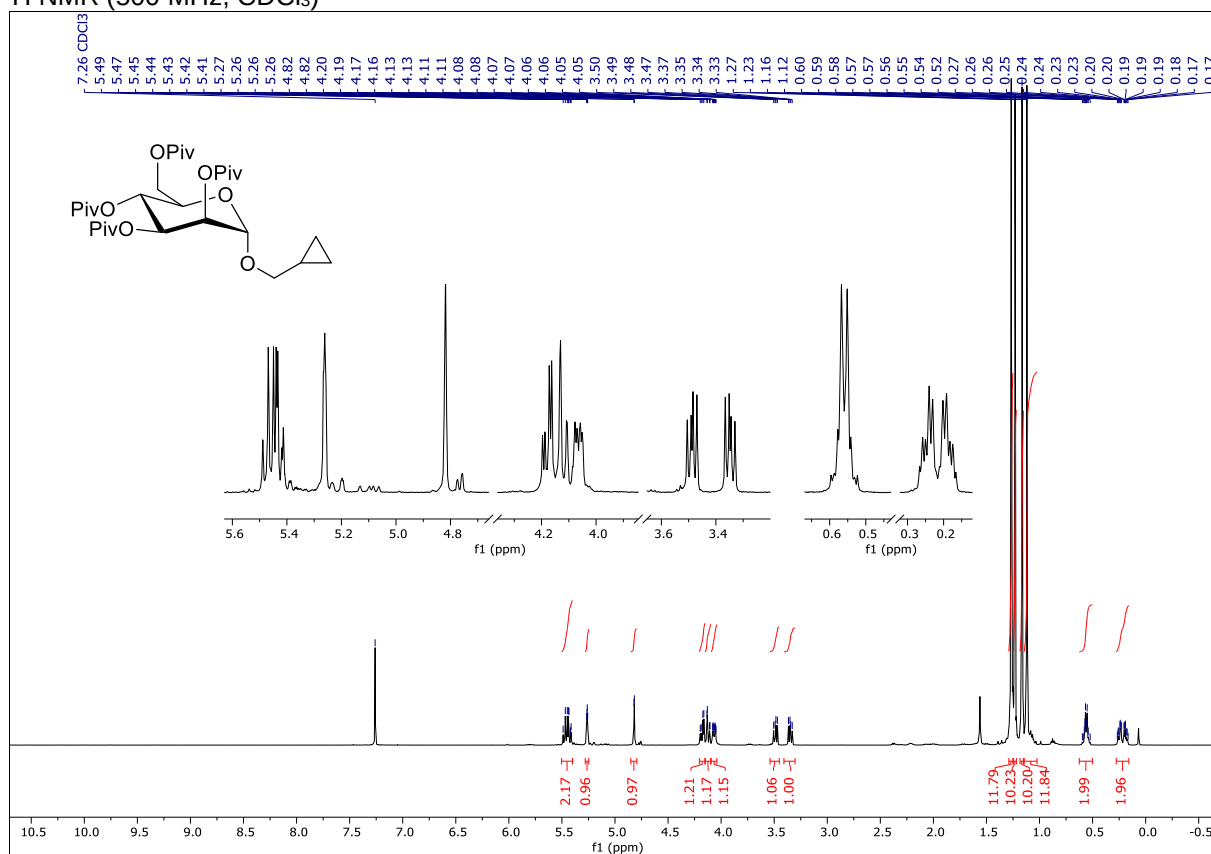


^{13}C NMR (126 MHz, CDCl_3)

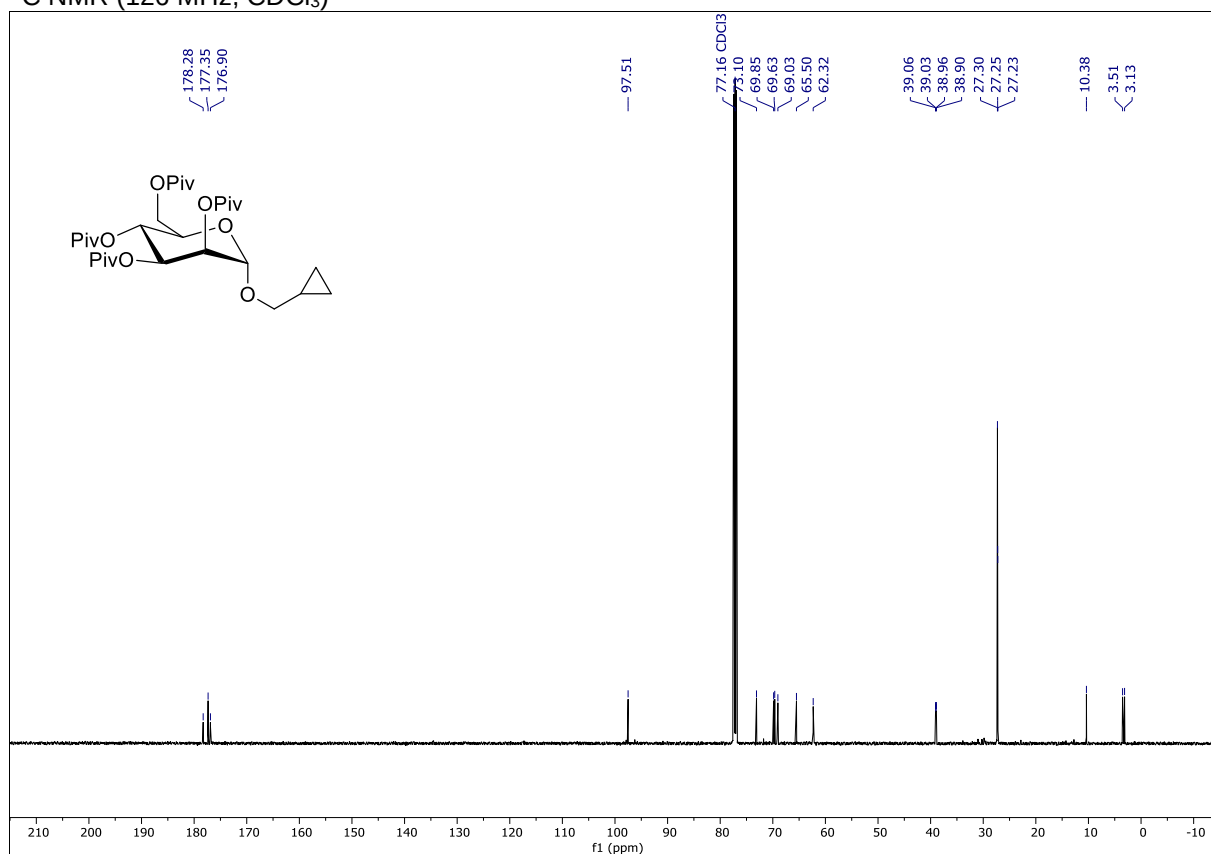


***α*-3r**

¹H NMR (500 MHz, CDCl₃)

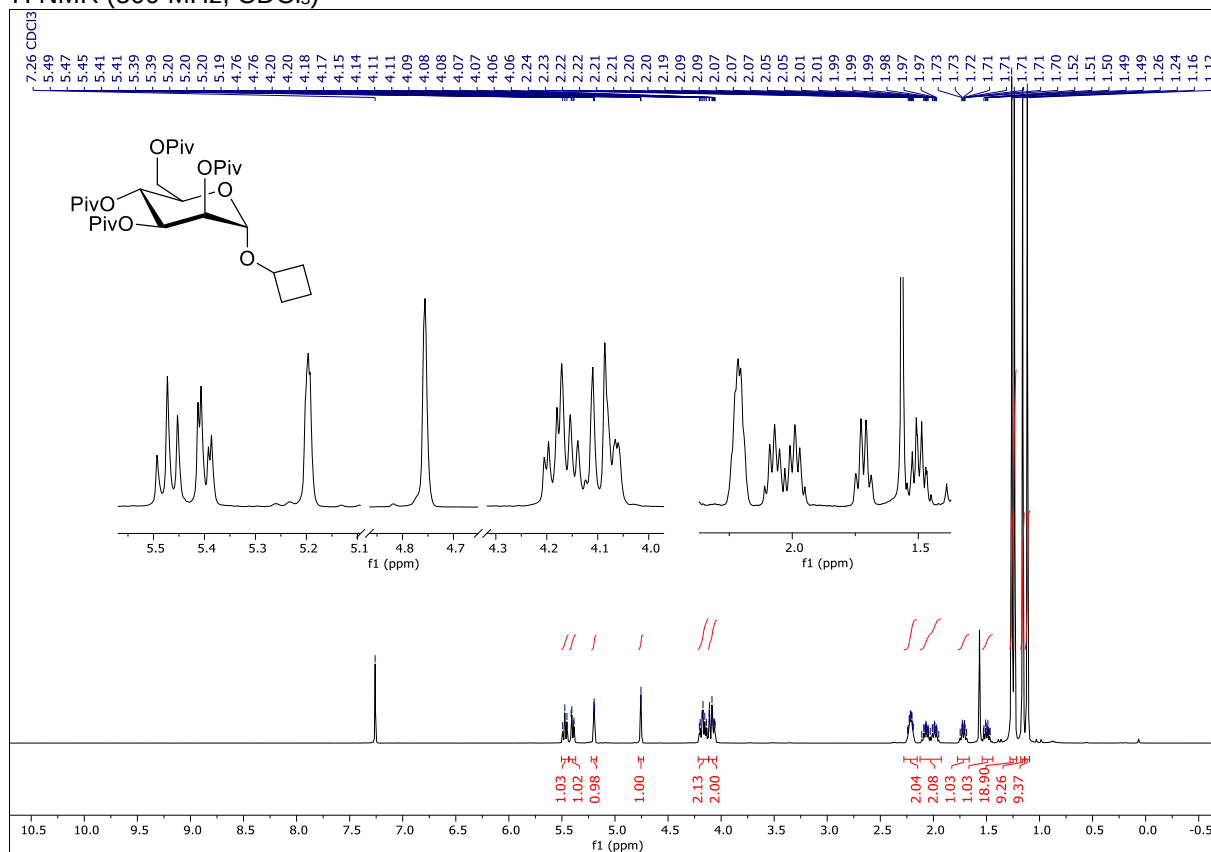


¹³C NMR (126 MHz, CDCl₃)

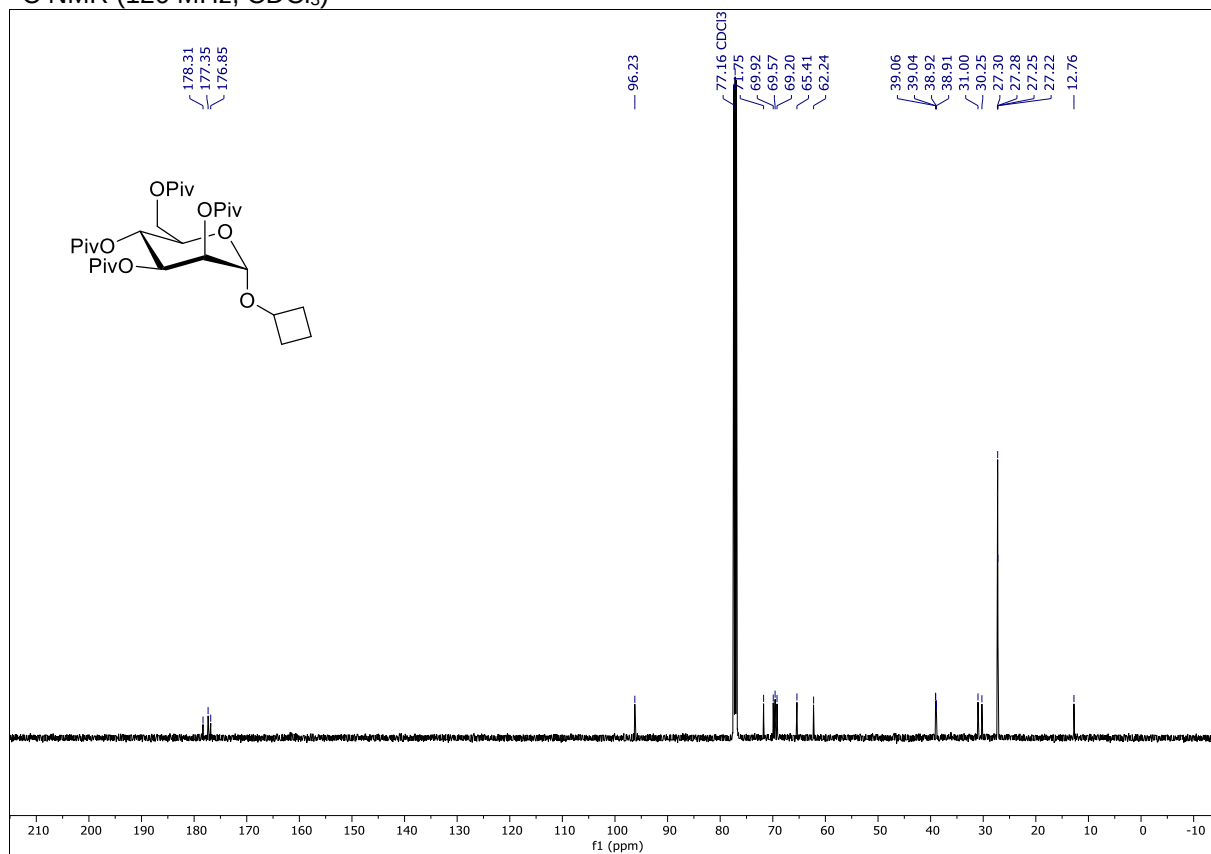


α -3s

^1H NMR (500 MHz, CDCl_3)

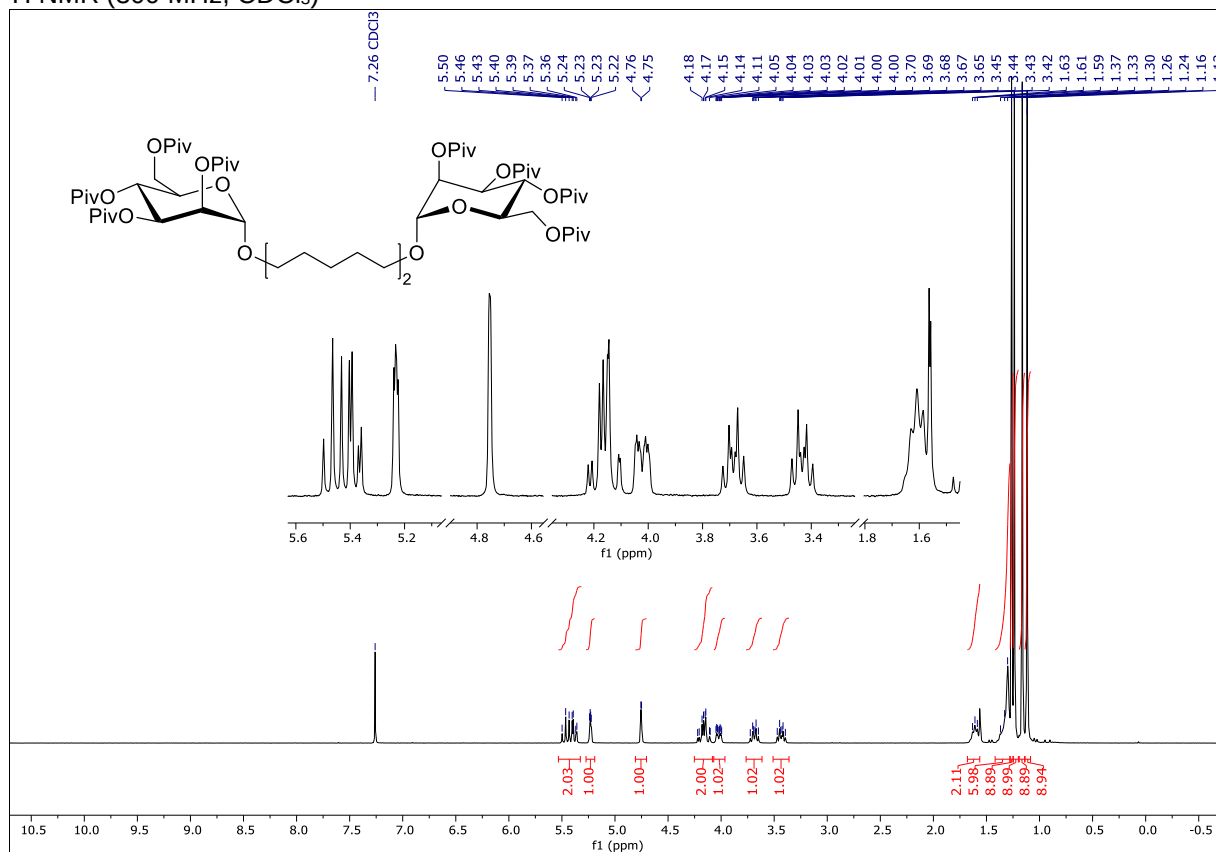


^{13}C NMR (126 MHz, CDCl_3)

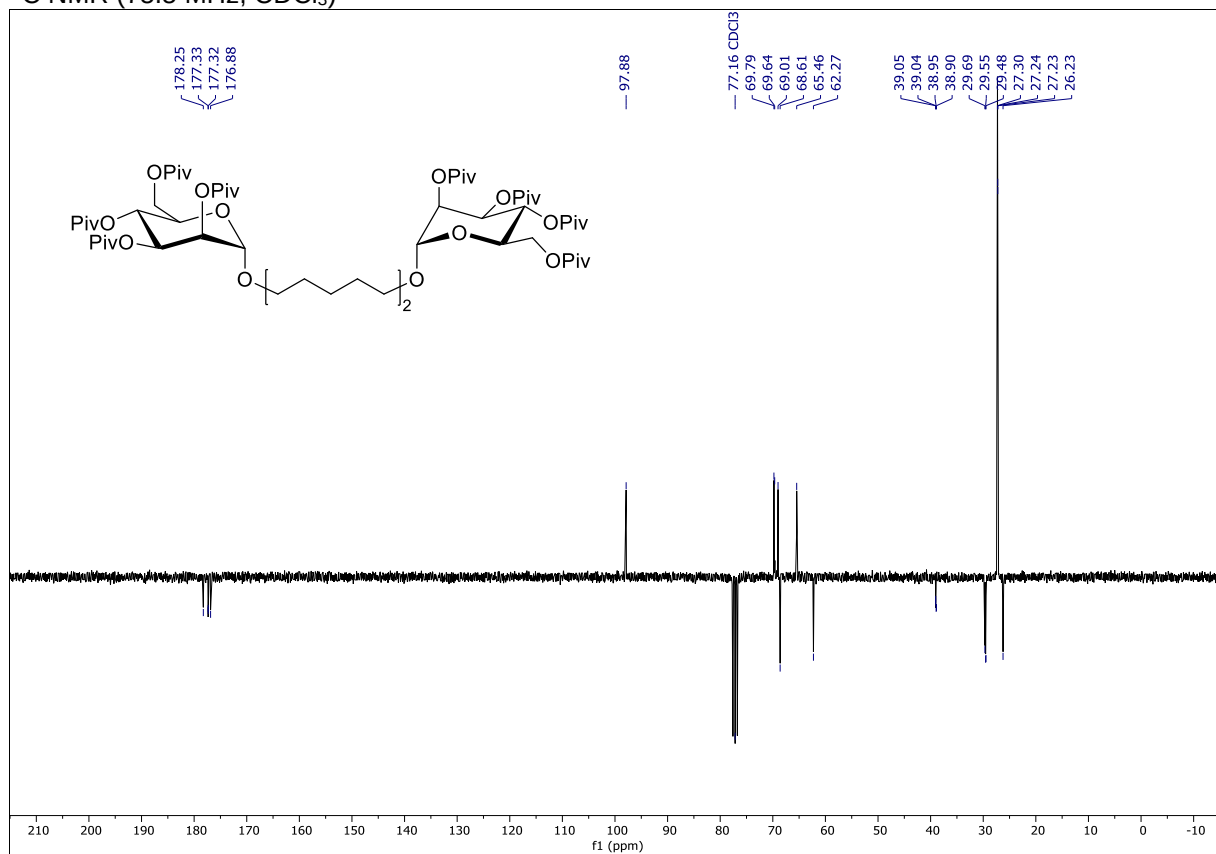


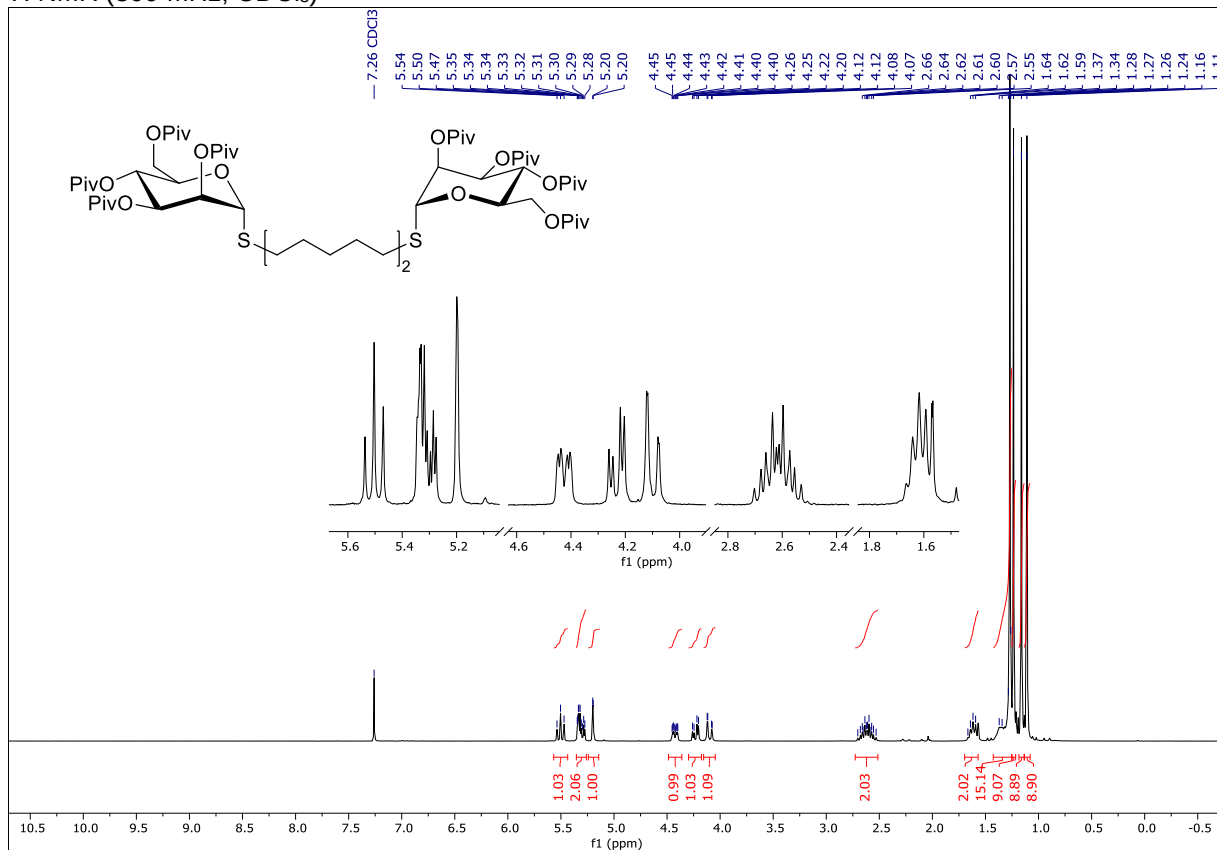
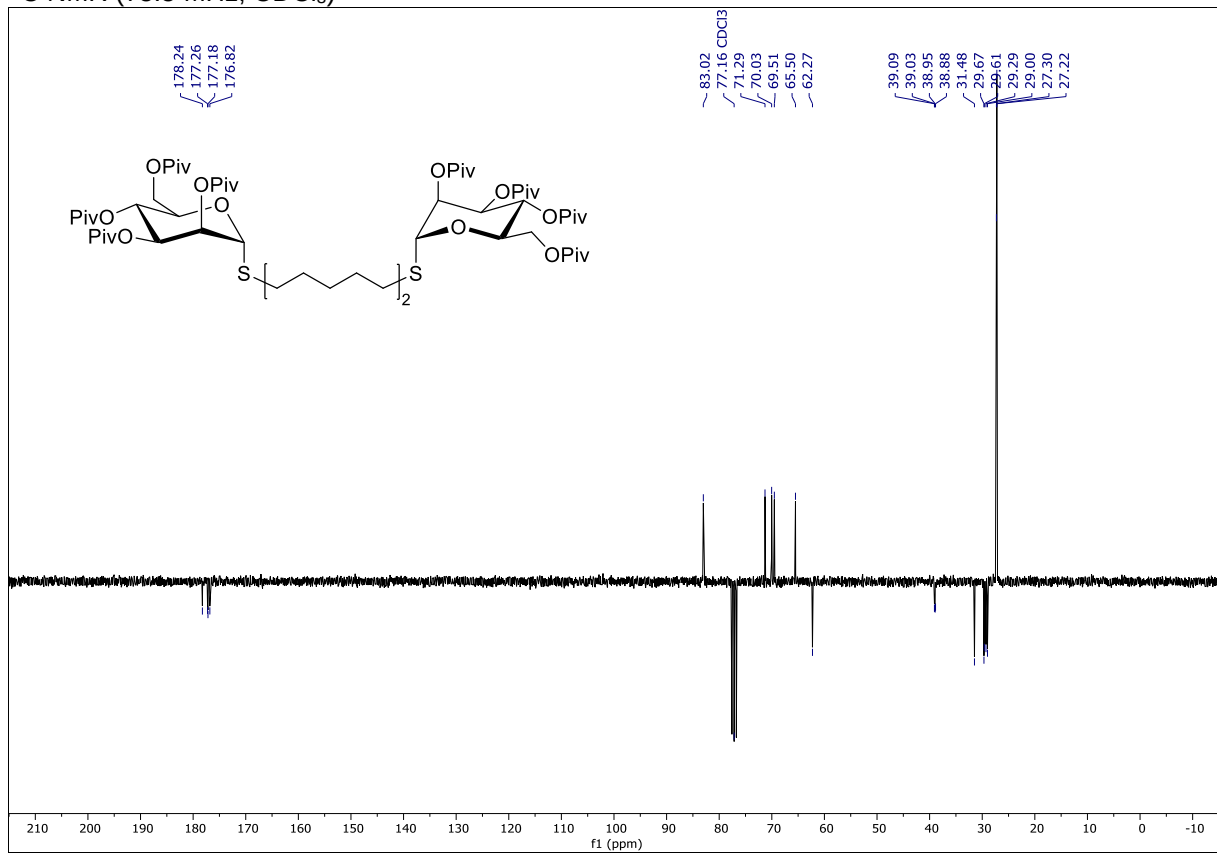
α -8a

^1H NMR (300 MHz, CDCl_3)



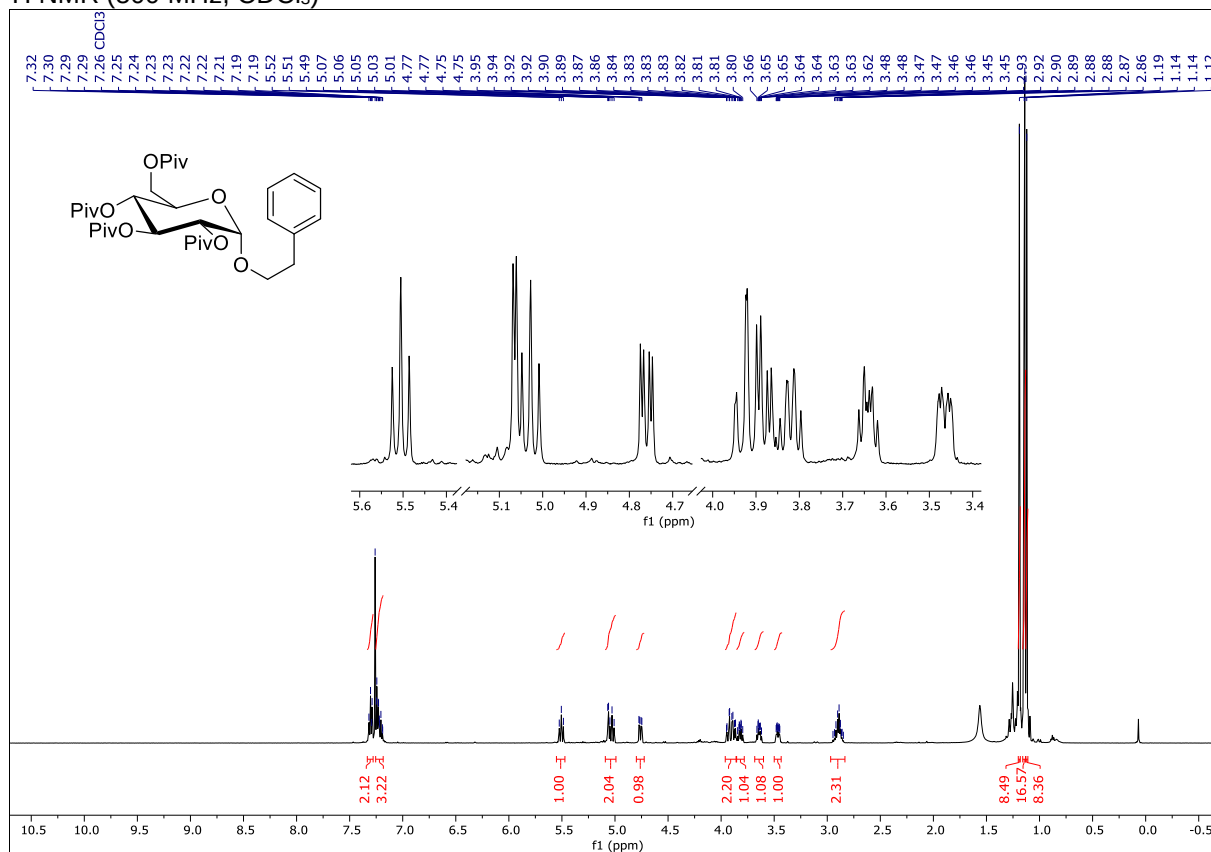
^{13}C NMR (75.5 MHz, CDCl_3)



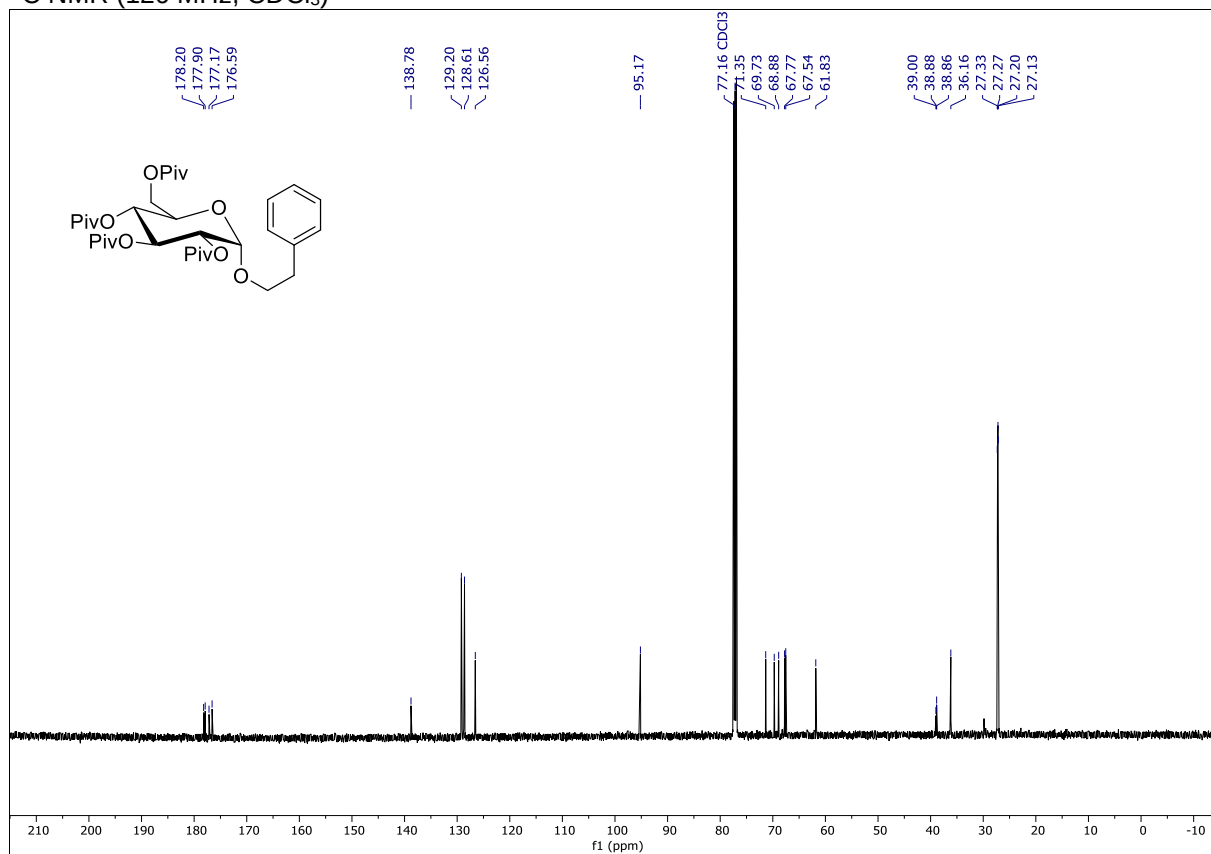
α -8b¹H NMR (300 MHz, CDCl₃) ^{13}C NMR (75.5 MHz, CDCl_3)

α -10a

^1H NMR (500 MHz, CDCl_3)

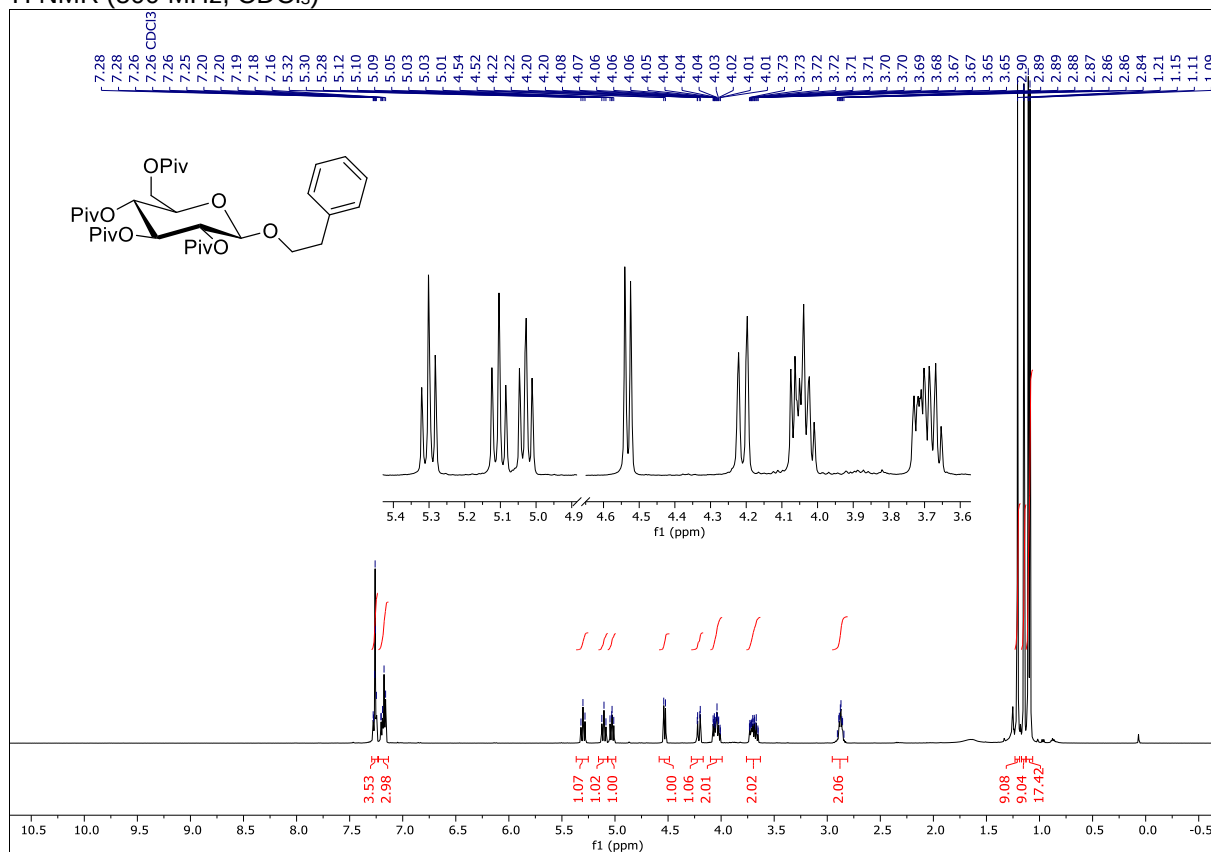


^{13}C NMR (126 MHz, CDCl_3)

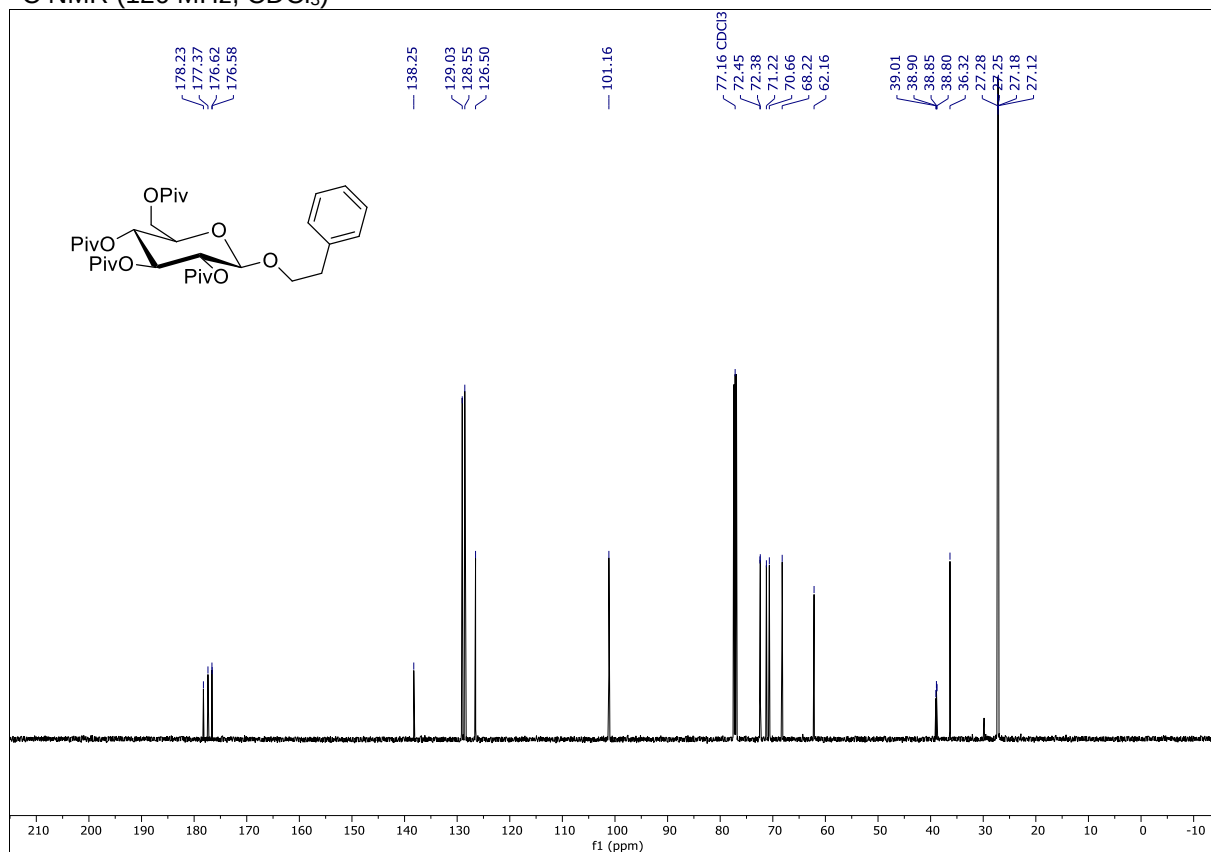


β -10a

^1H NMR (500 MHz, CDCl_3)

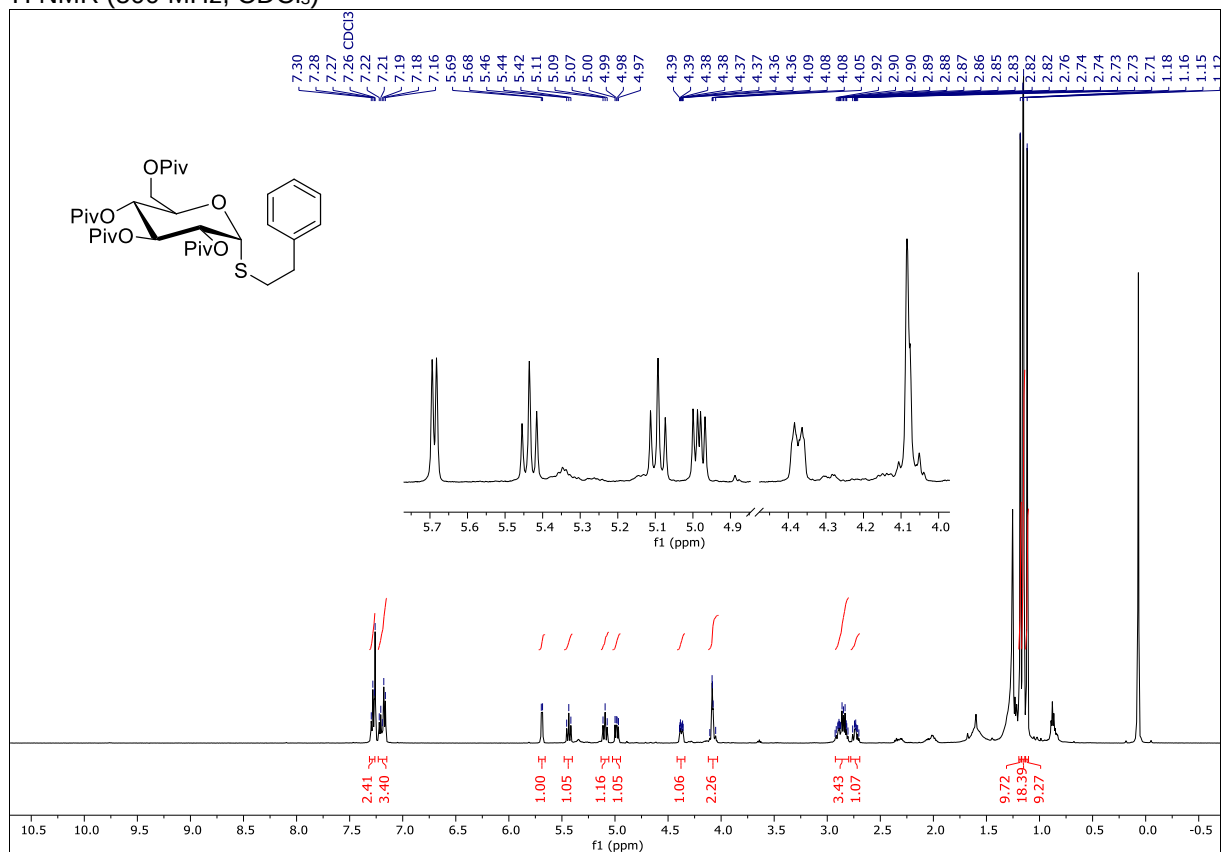


^{13}C NMR (126 MHz, CDCl_3)

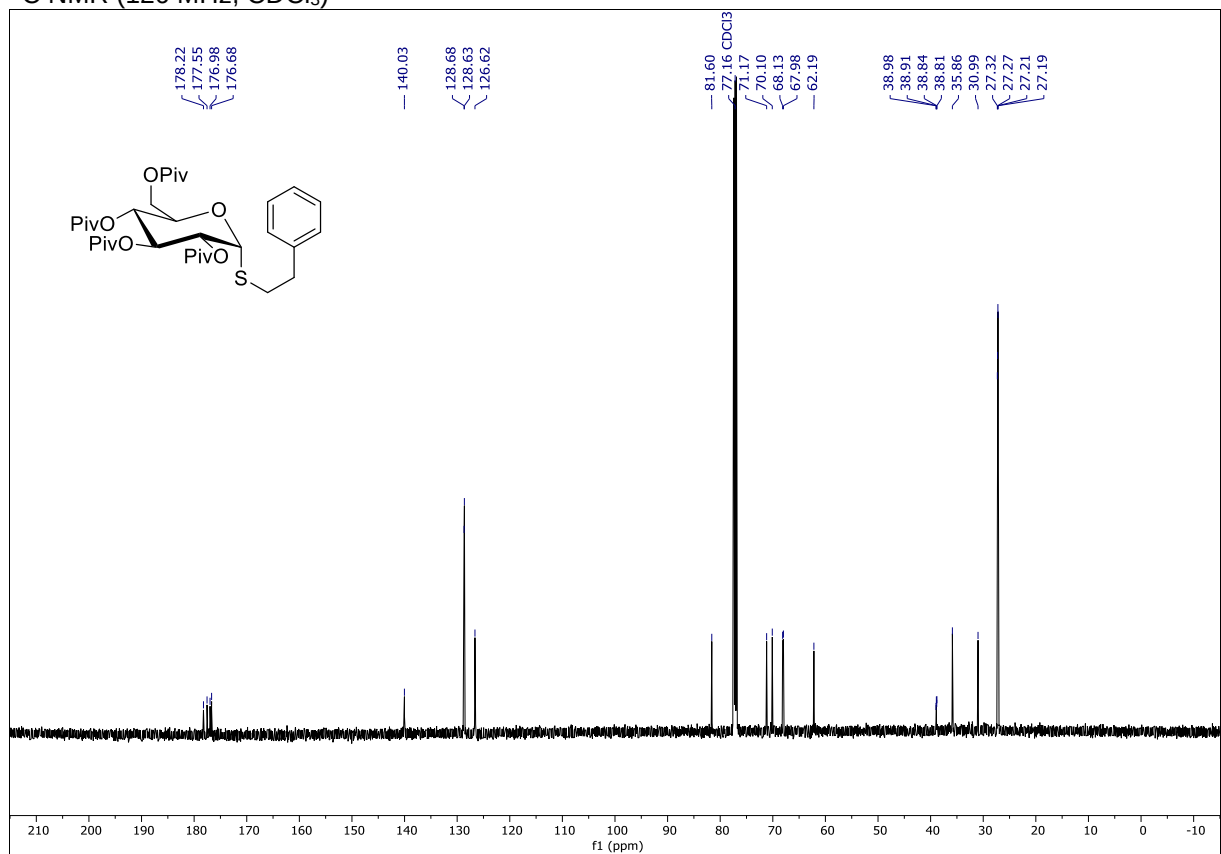


α -10b

^1H NMR (500 MHz, CDCl_3)

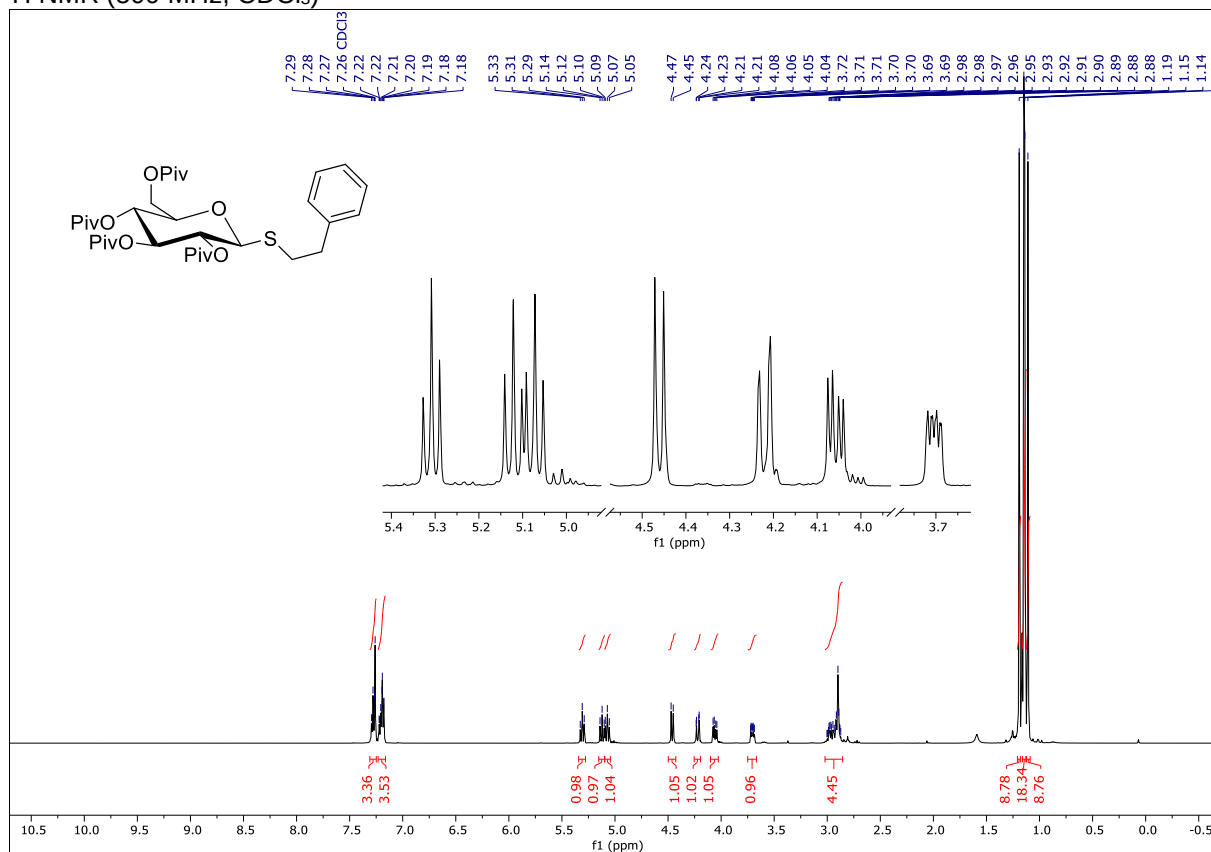


^{13}C NMR (126 MHz, CDCl_3)

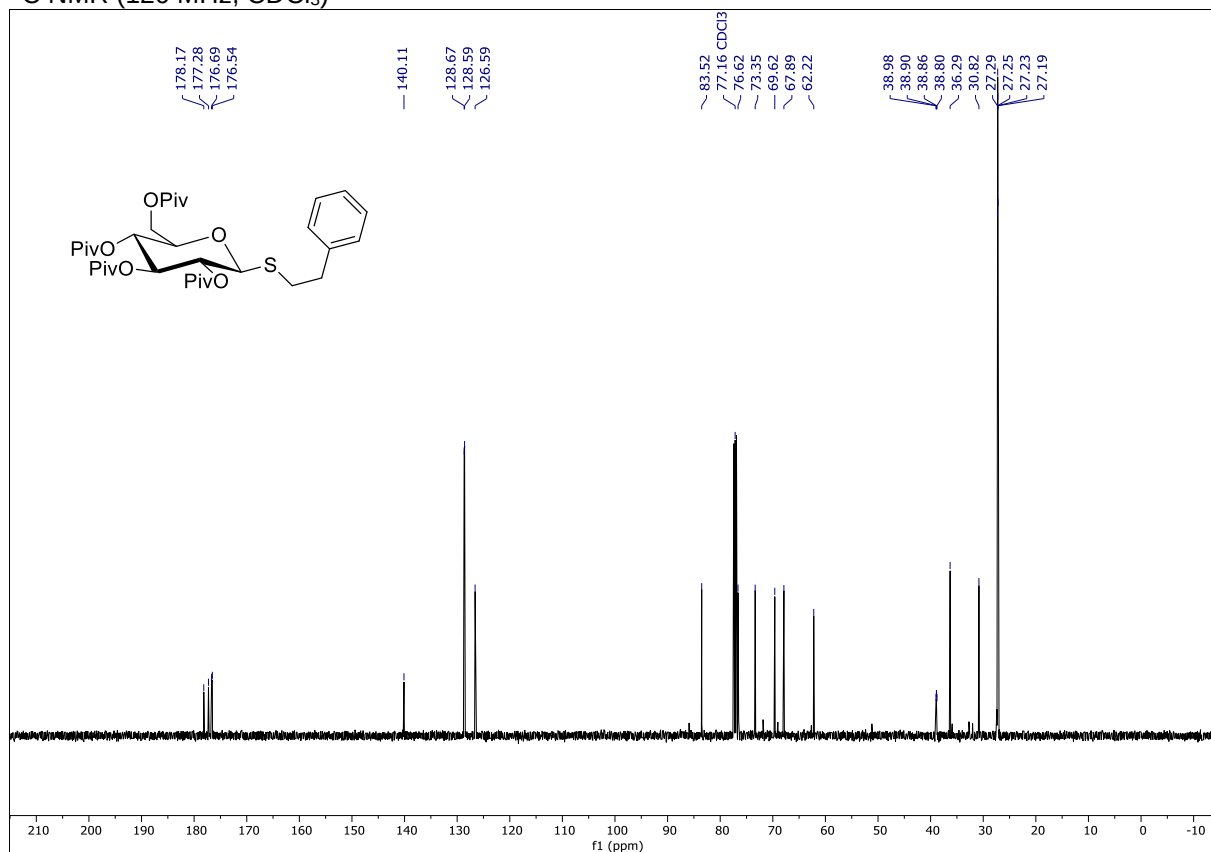


β -10b

^1H NMR (500 MHz, CDCl_3)

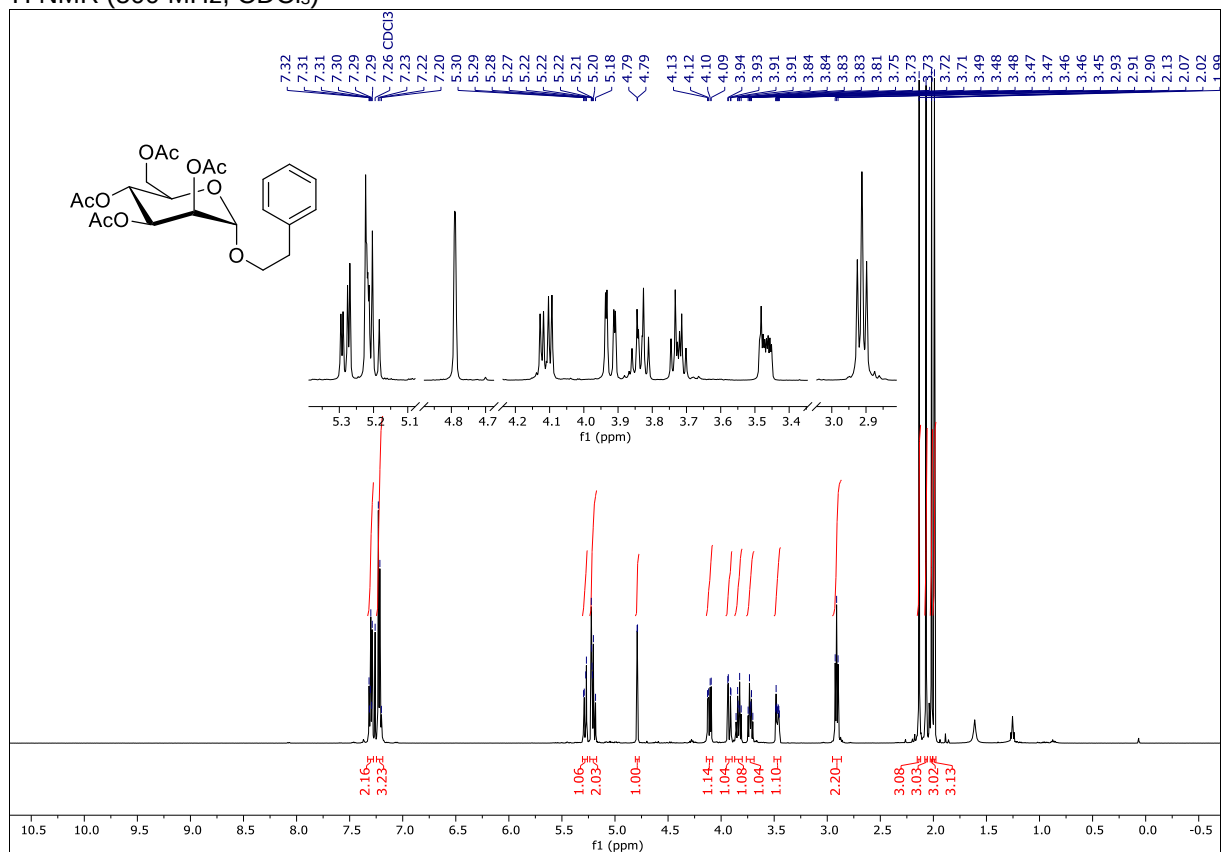


^{13}C NMR (126 MHz, CDCl_3)

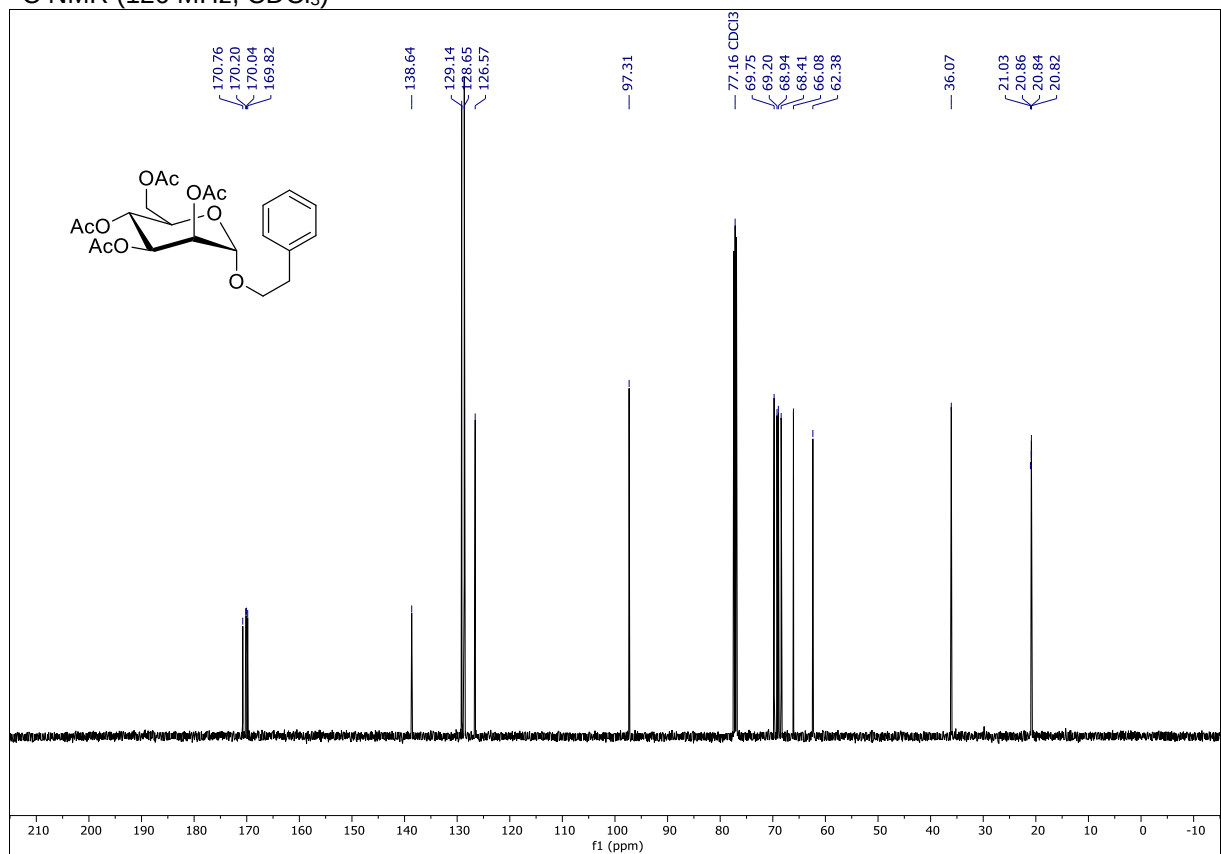


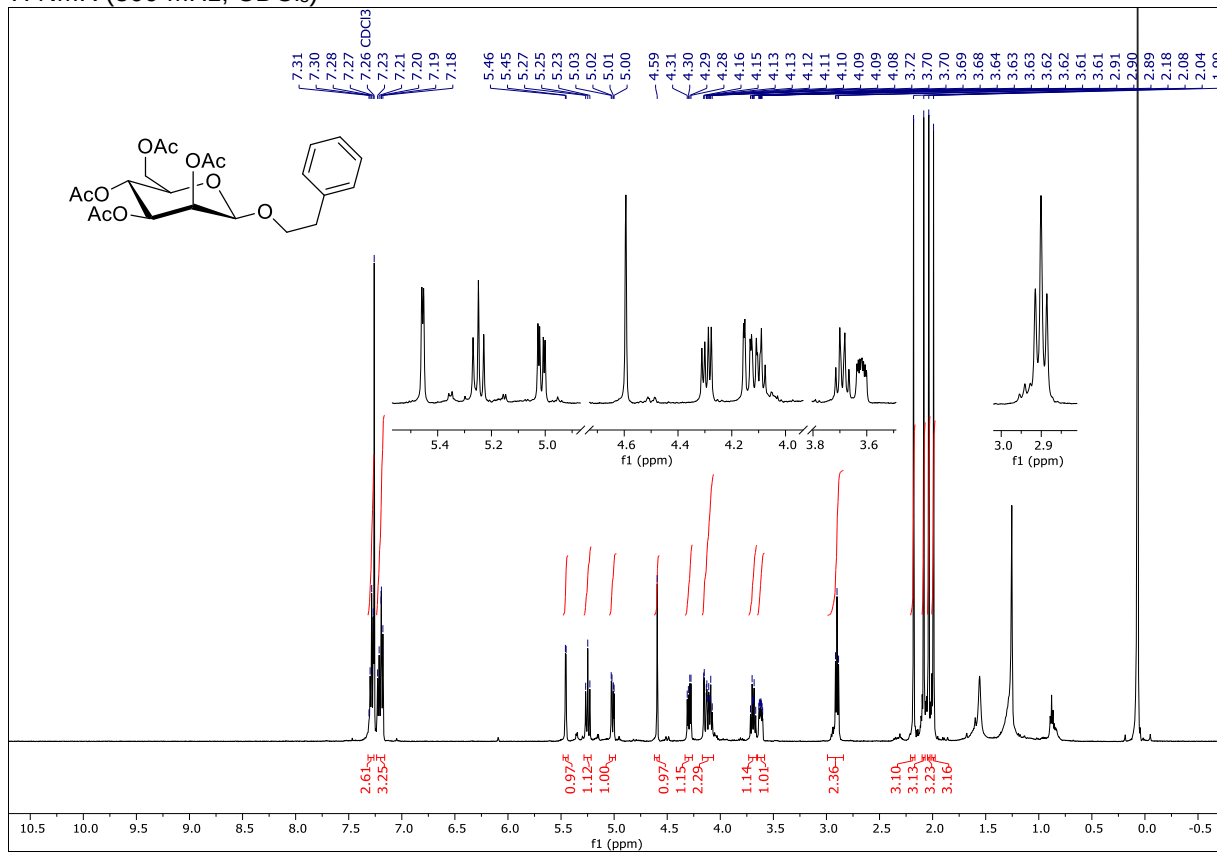
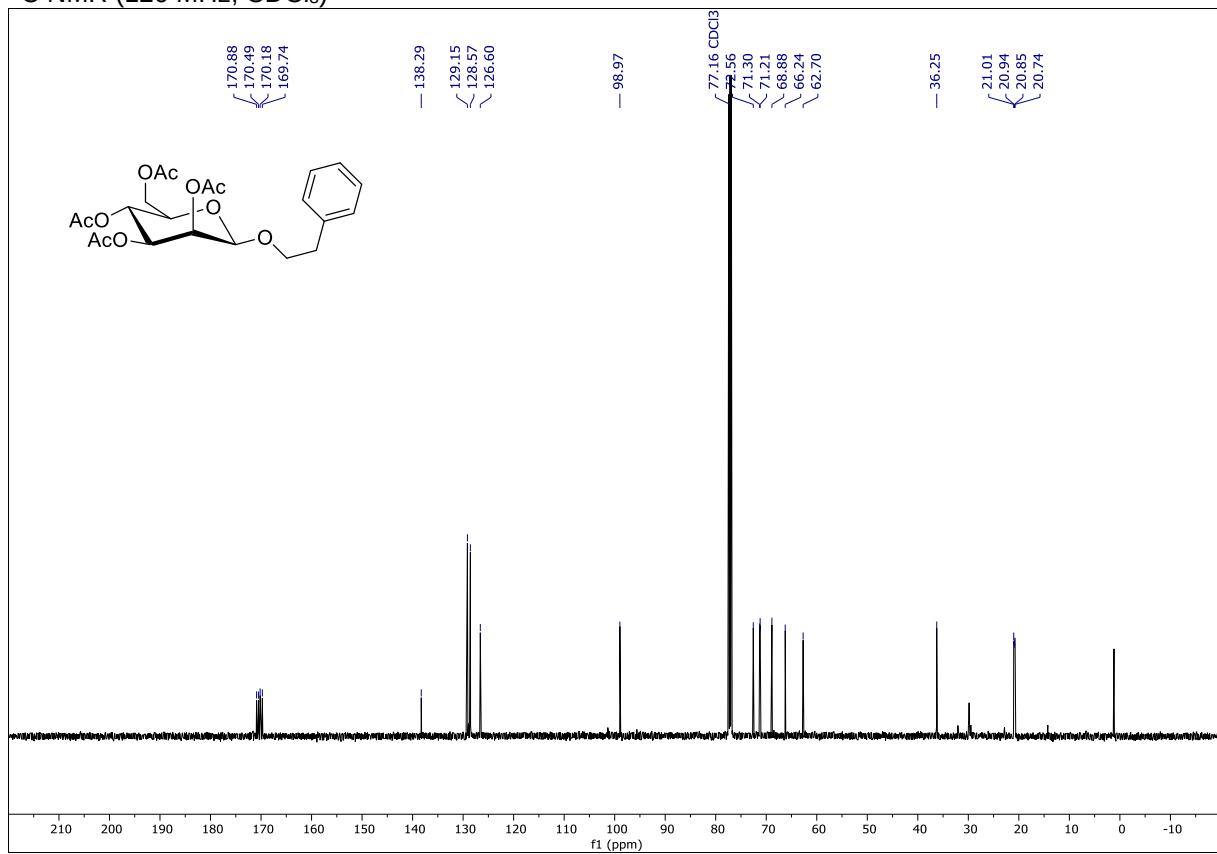
α -13a

^1H NMR (500 MHz, CDCl_3)

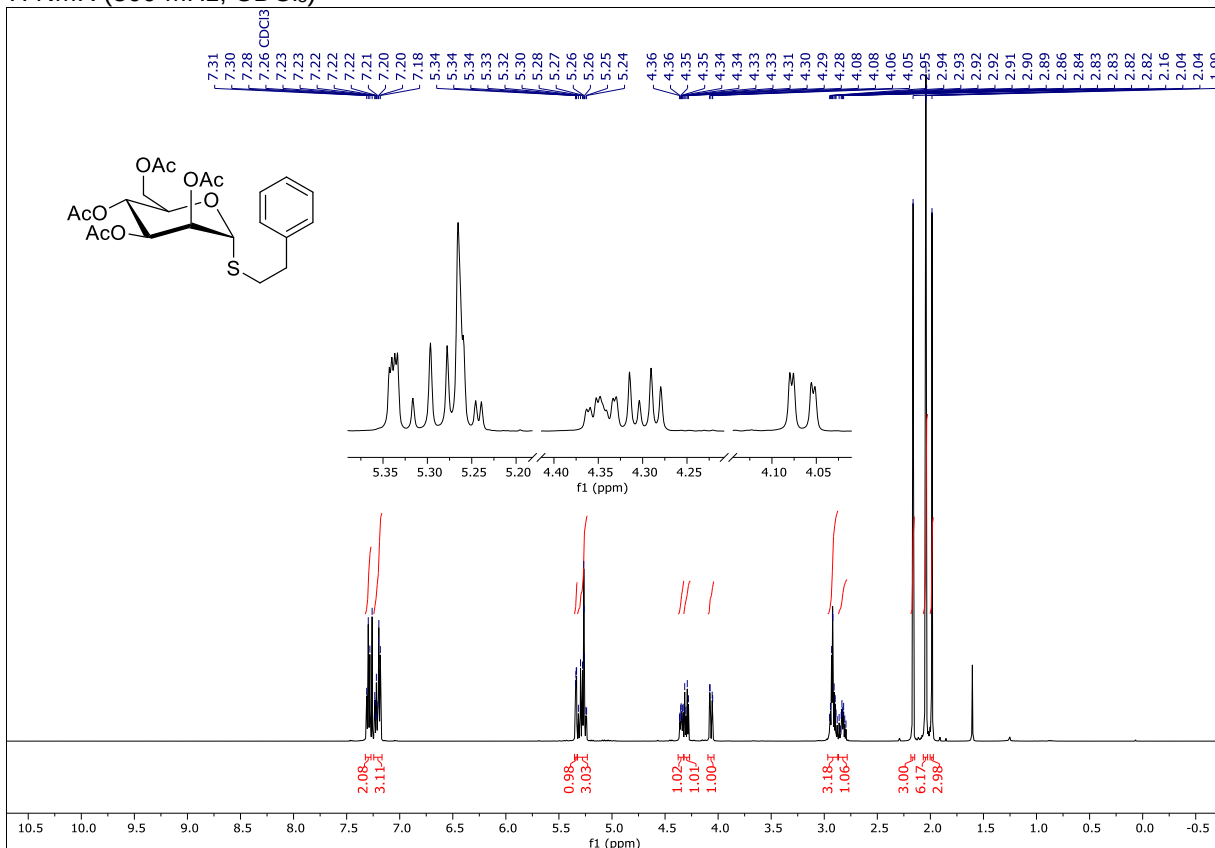
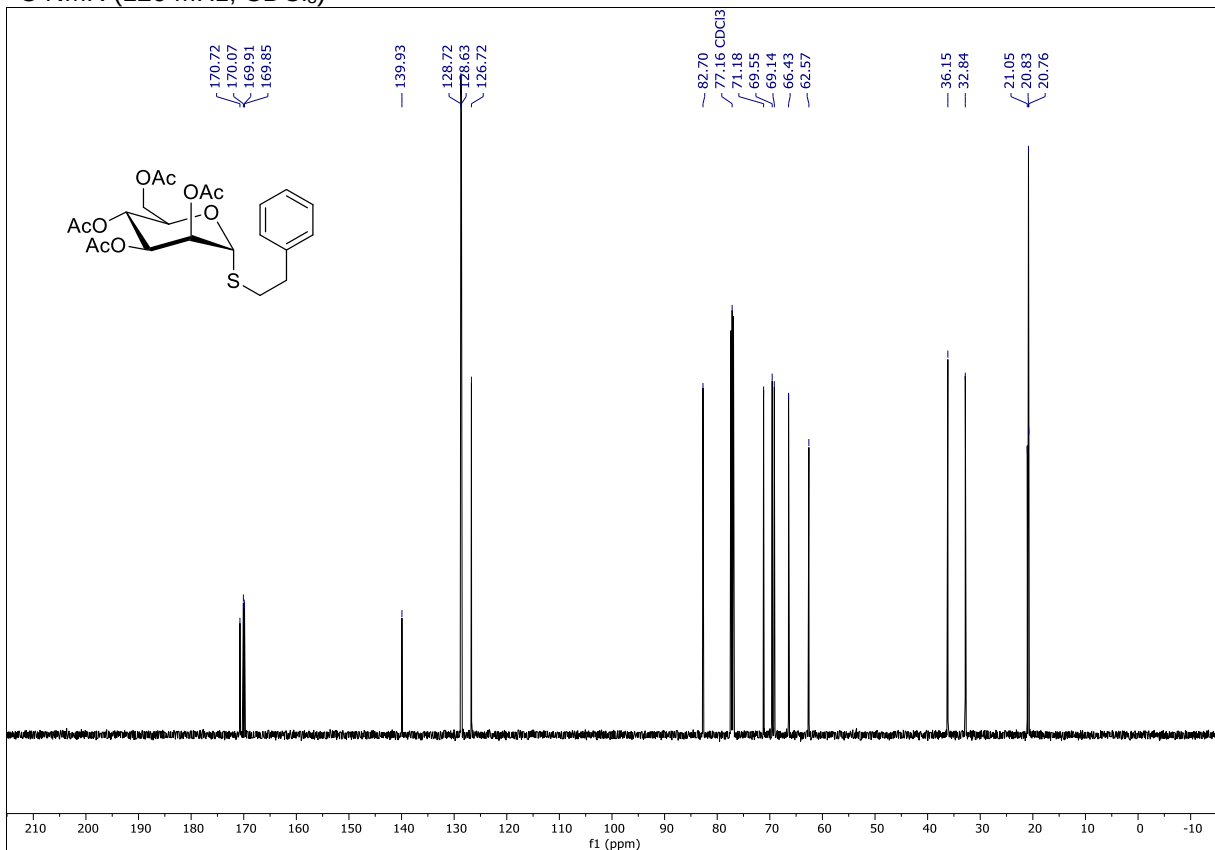


^{13}C NMR (126 MHz, CDCl_3)



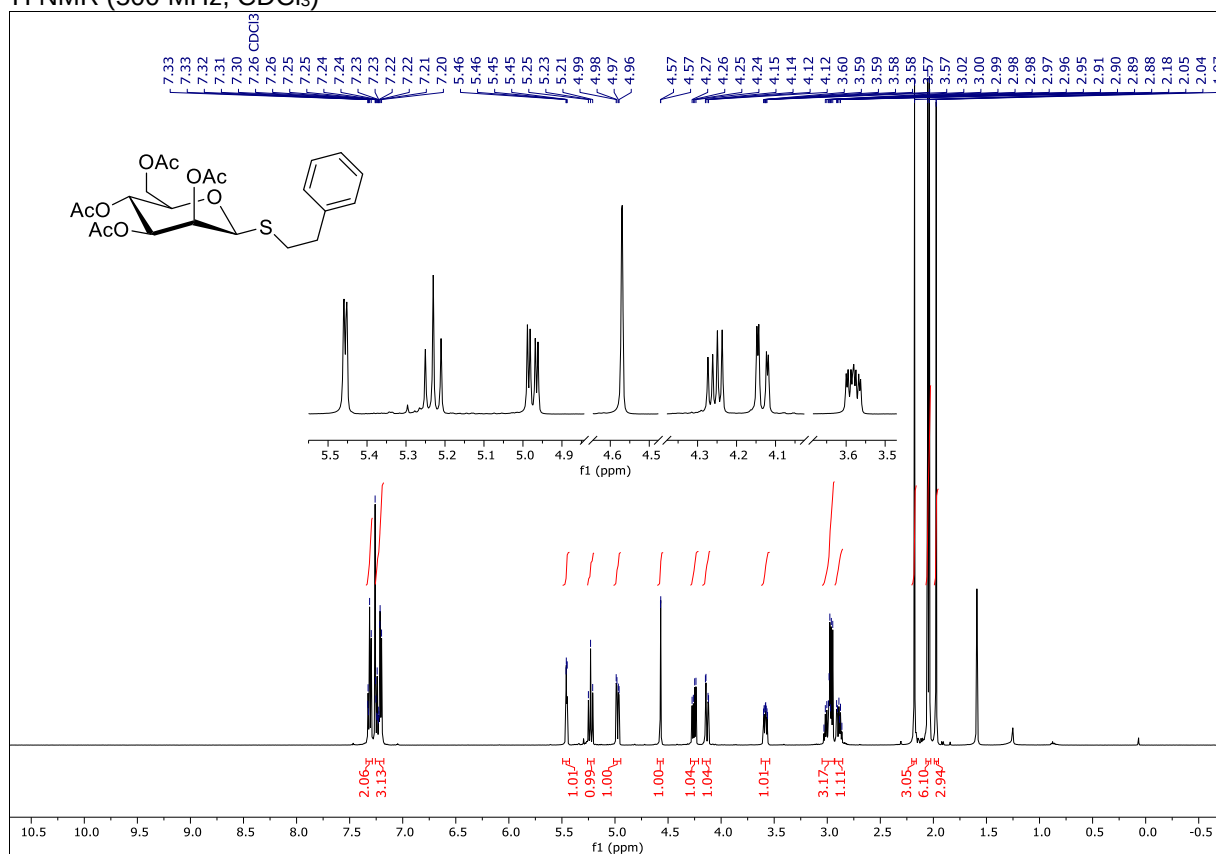
β -13a¹H NMR (500 MHz, CDCl₃) ^{13}C NMR (126 MHz, CDCl_3)

α -13b

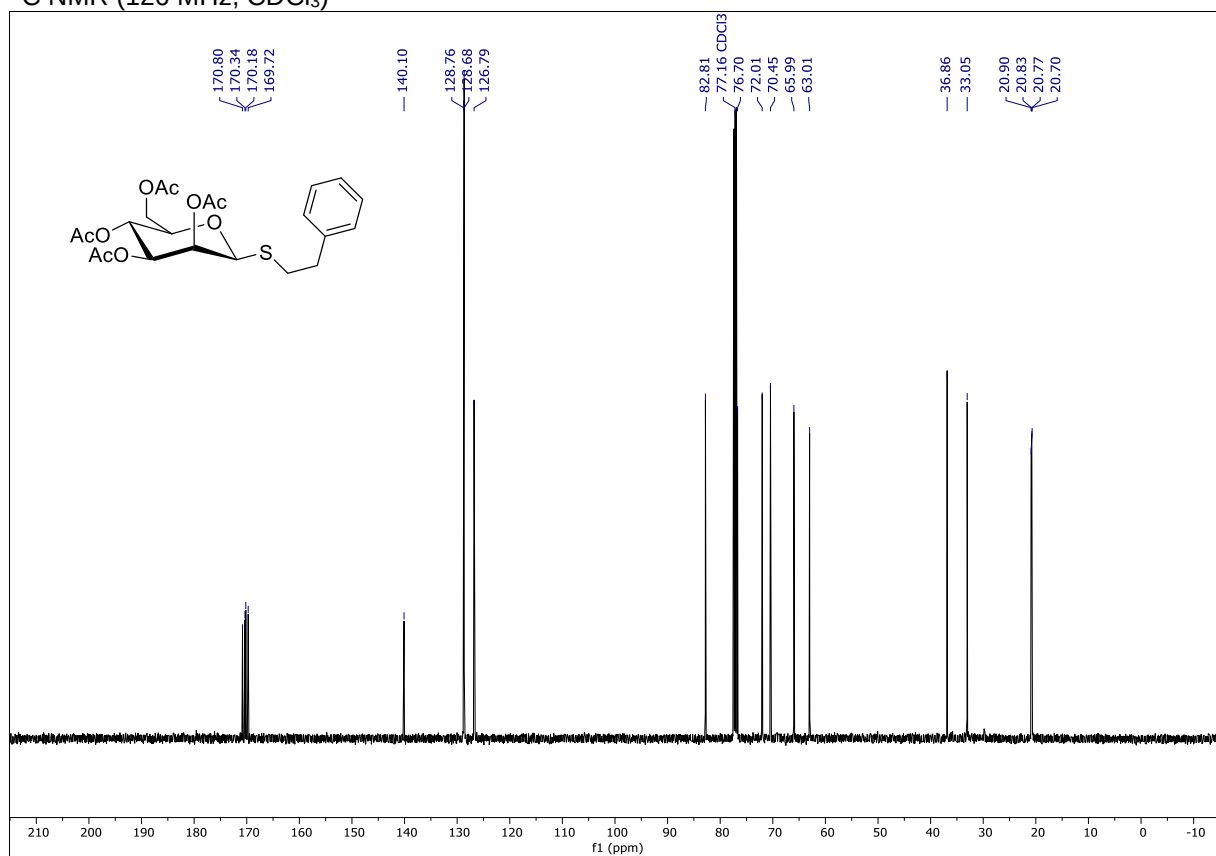
¹H NMR (500 MHz, CDCl₃) ^{13}C NMR (126 MHz, CDCl_3)

β -13b

^1H NMR (500 MHz, CDCl_3)

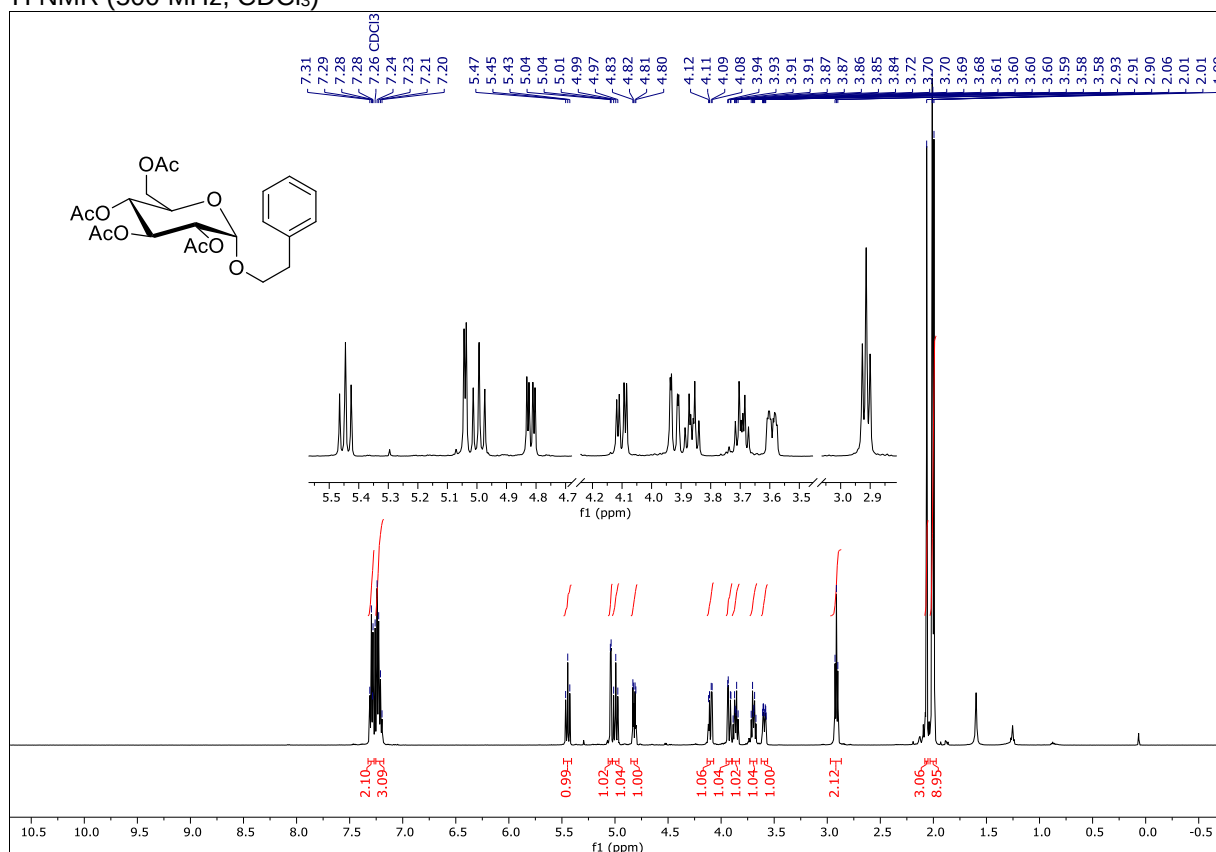


^{13}C NMR (126 MHz, CDCl_3)

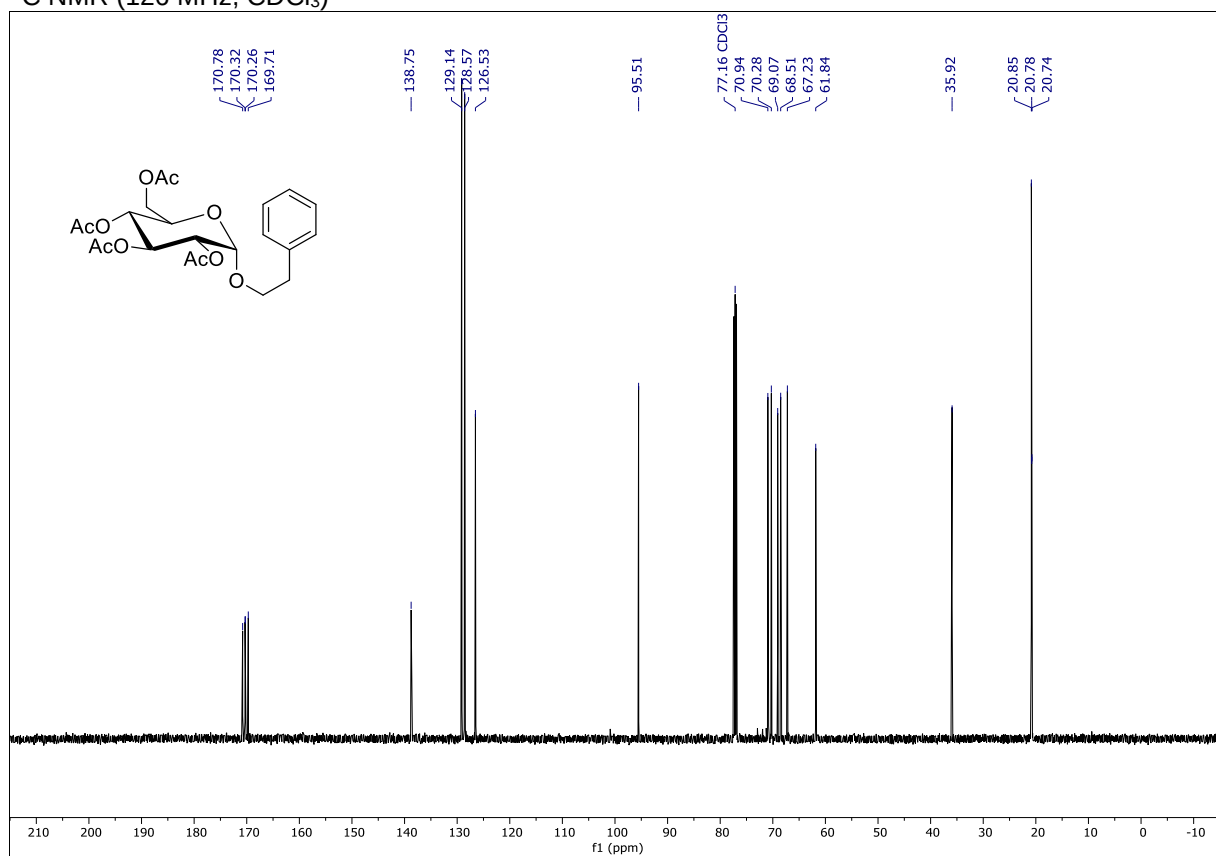


α -14a

^1H NMR (500 MHz, CDCl_3)

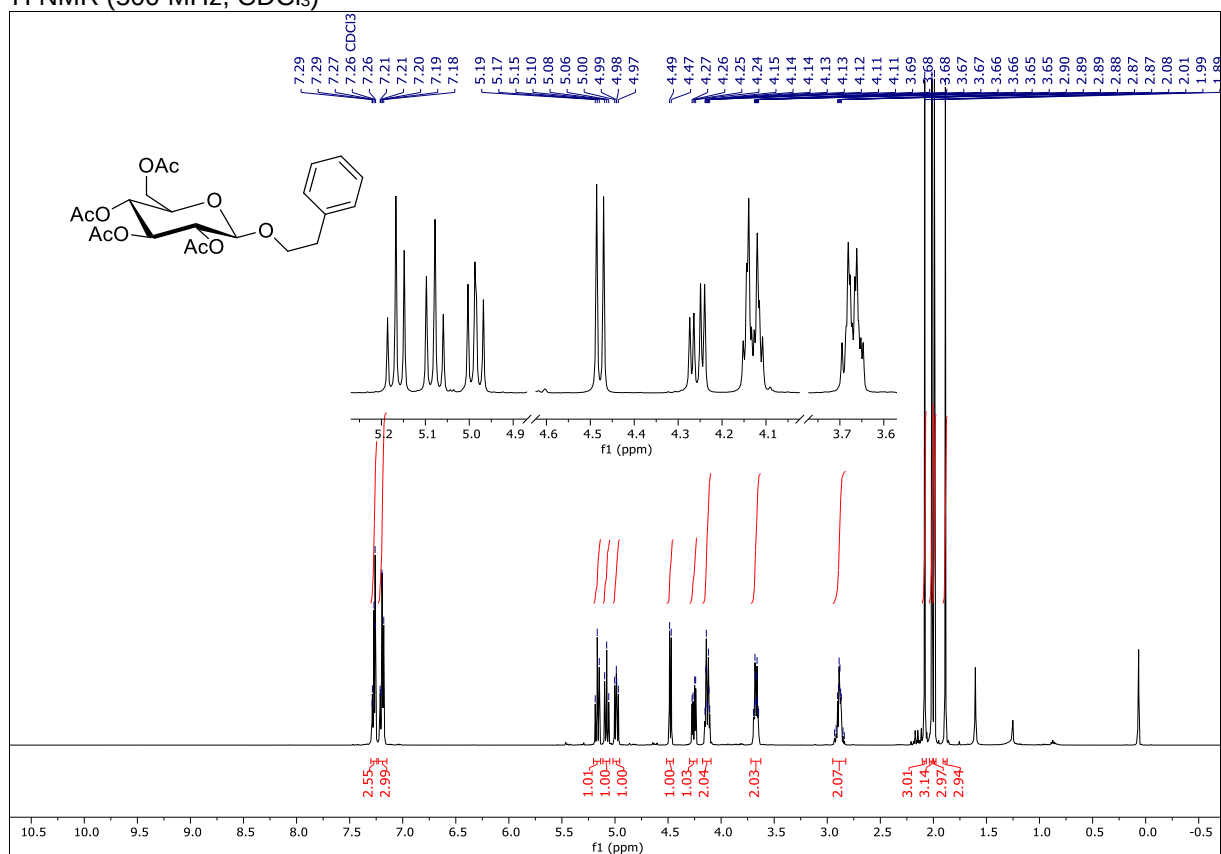


^{13}C NMR (126 MHz, CDCl_3)

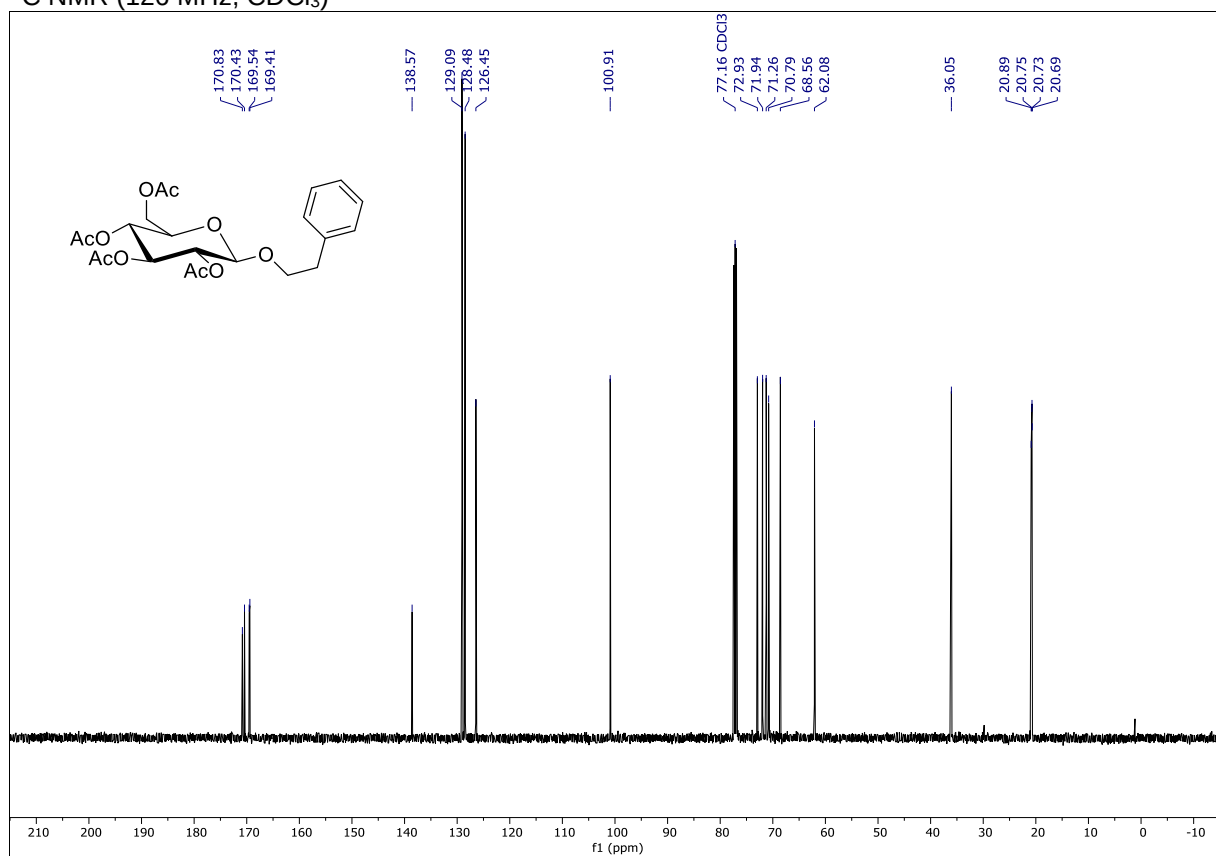


β -14a

^1H NMR (500 MHz, CDCl_3)

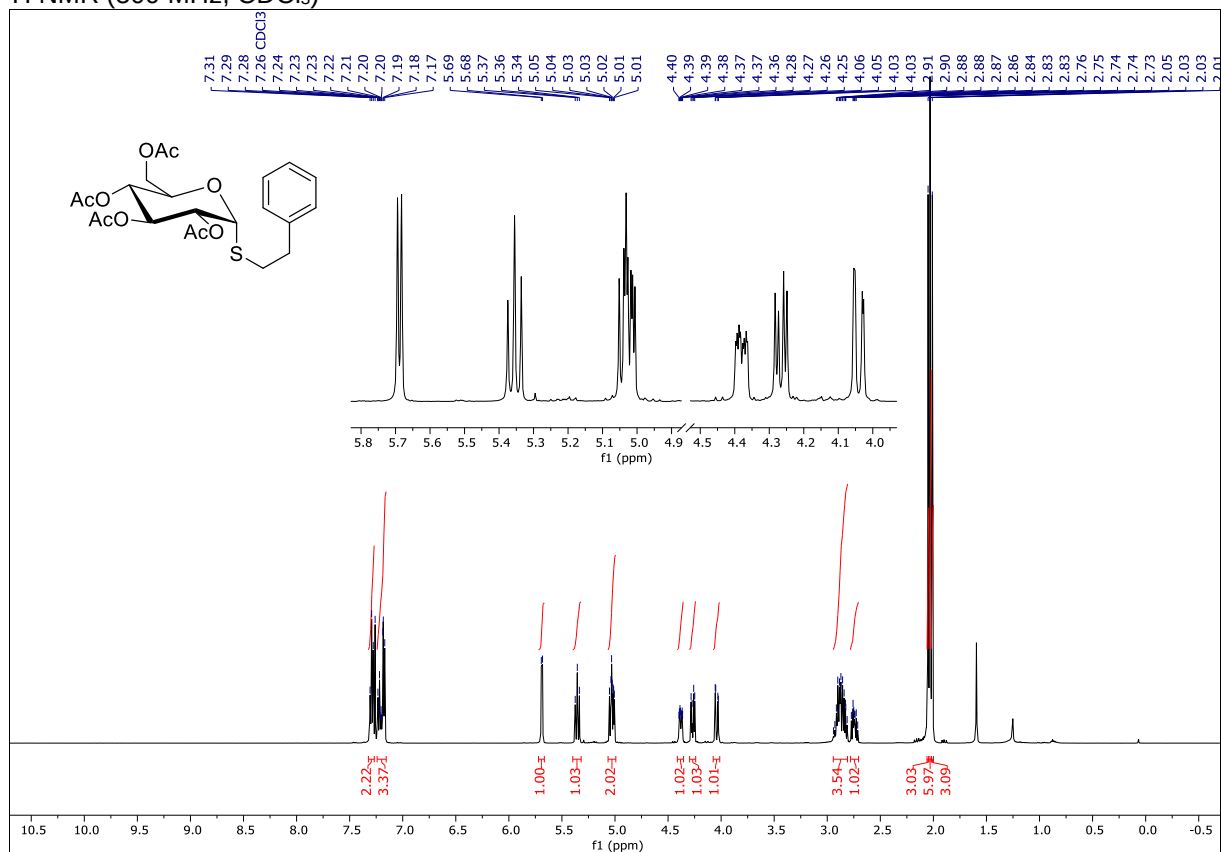


^{13}C NMR (126 MHz, CDCl_3)

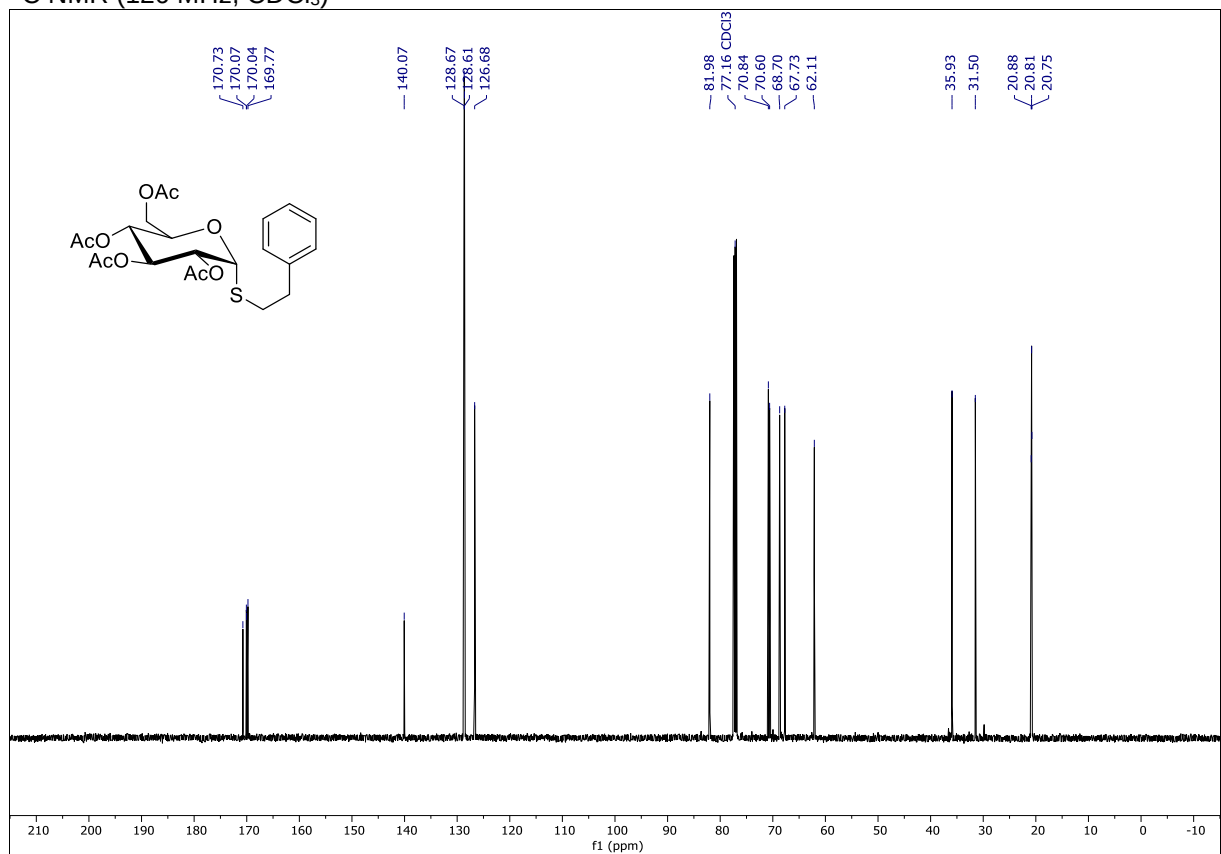


α -14b

^1H NMR (500 MHz, CDCl_3)

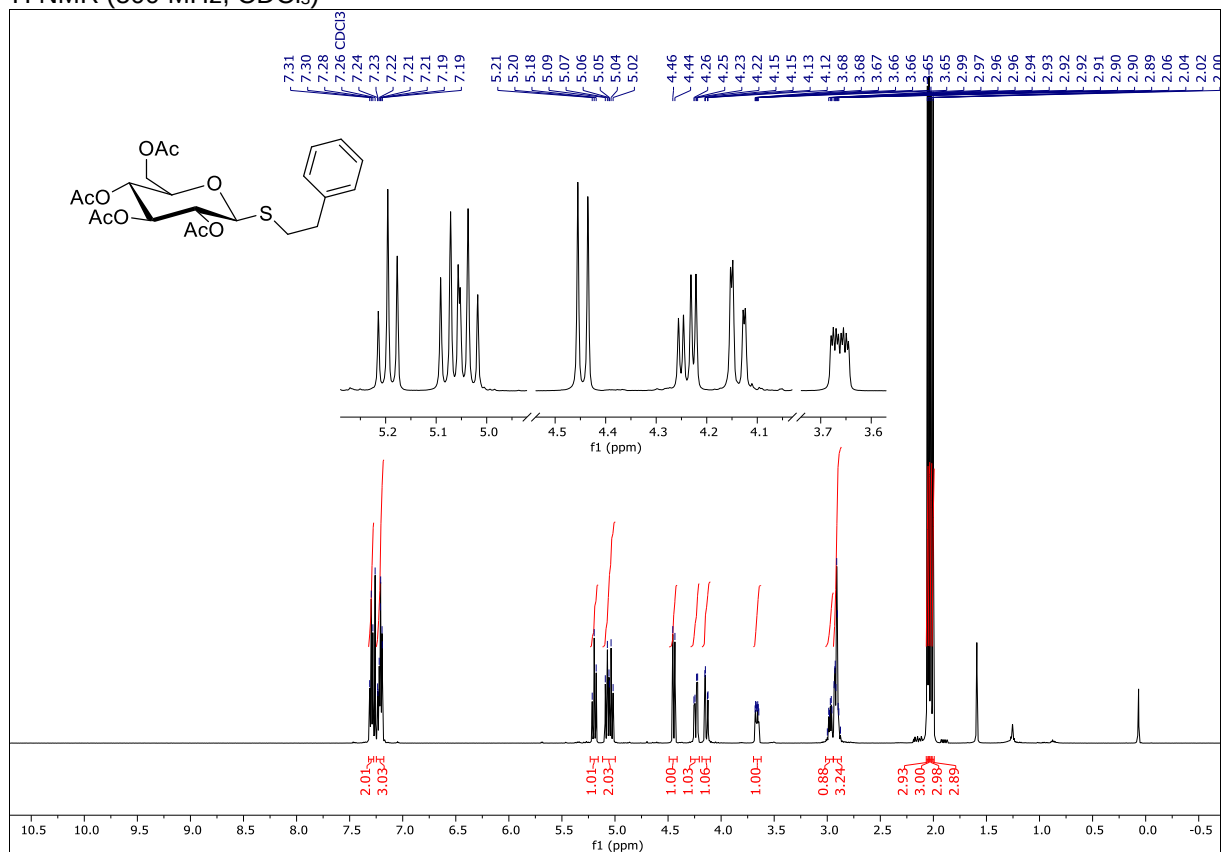


^{13}C NMR (126 MHz, CDCl_3)

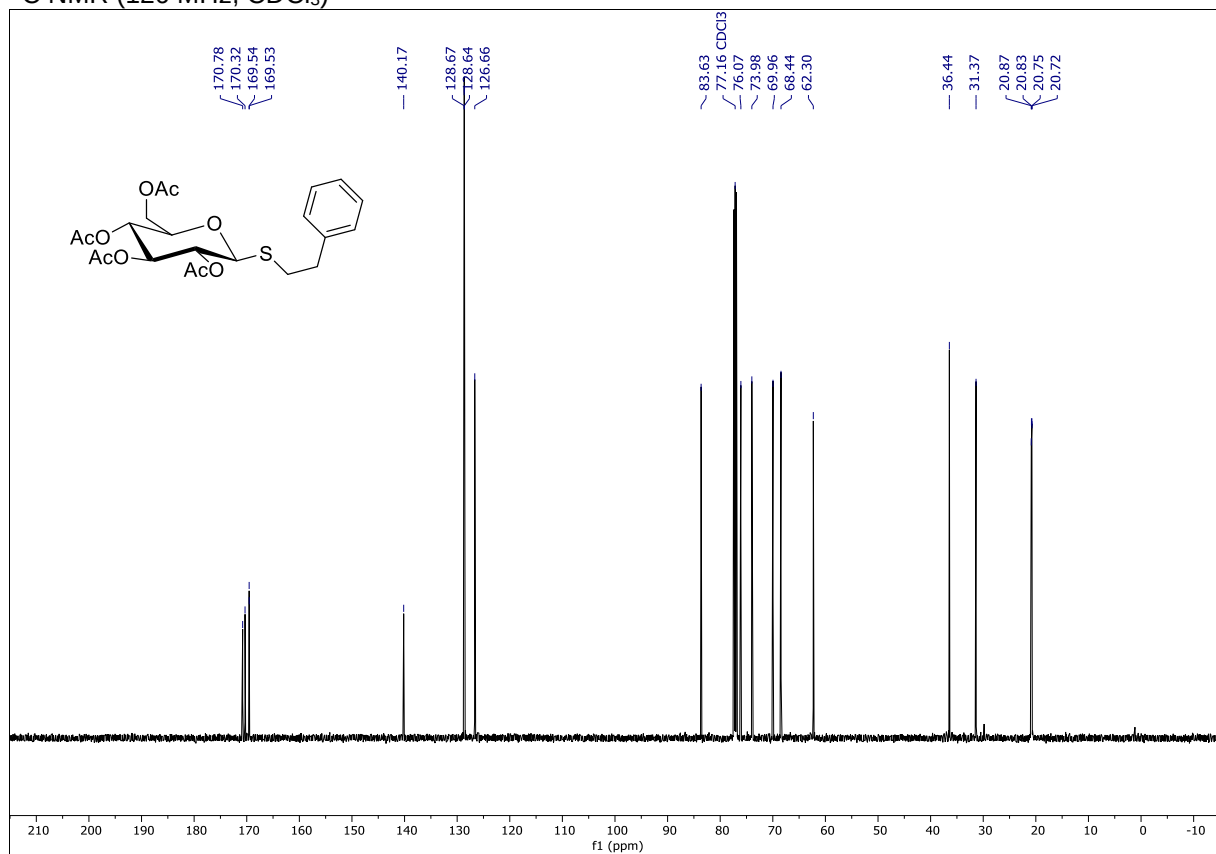


β -14b

^1H NMR (500 MHz, CDCl_3)

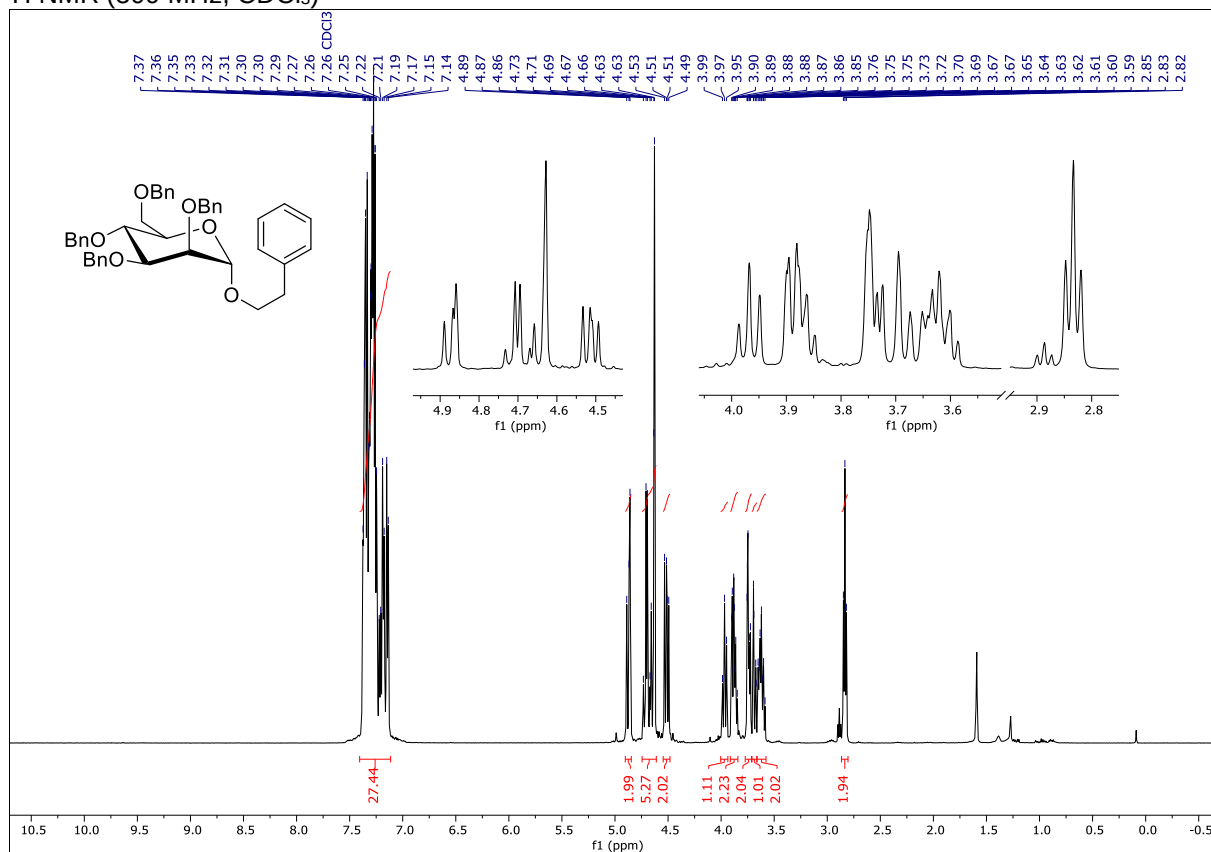


^{13}C NMR (126 MHz, CDCl_3)

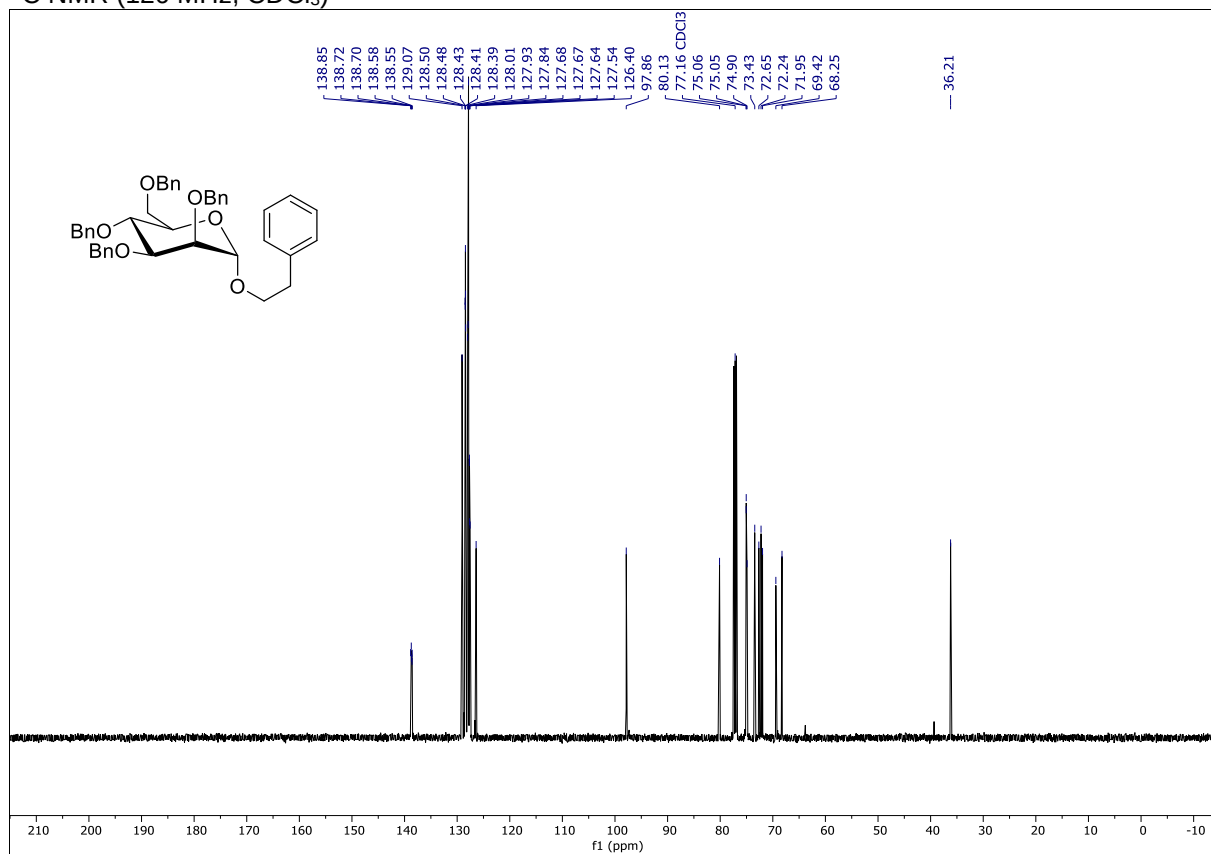


α -17a

^1H NMR (500 MHz, CDCl_3)

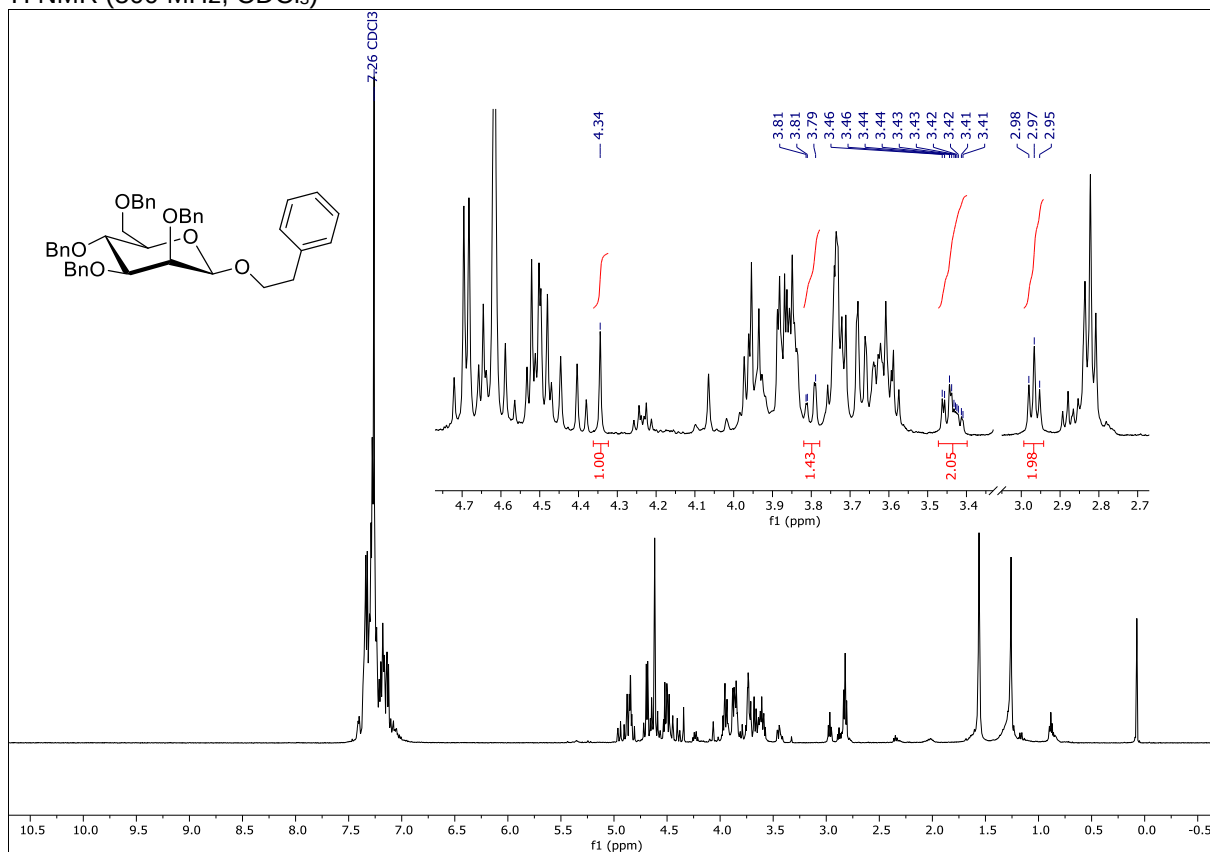


^{13}C NMR (126 MHz, CDCl_3)

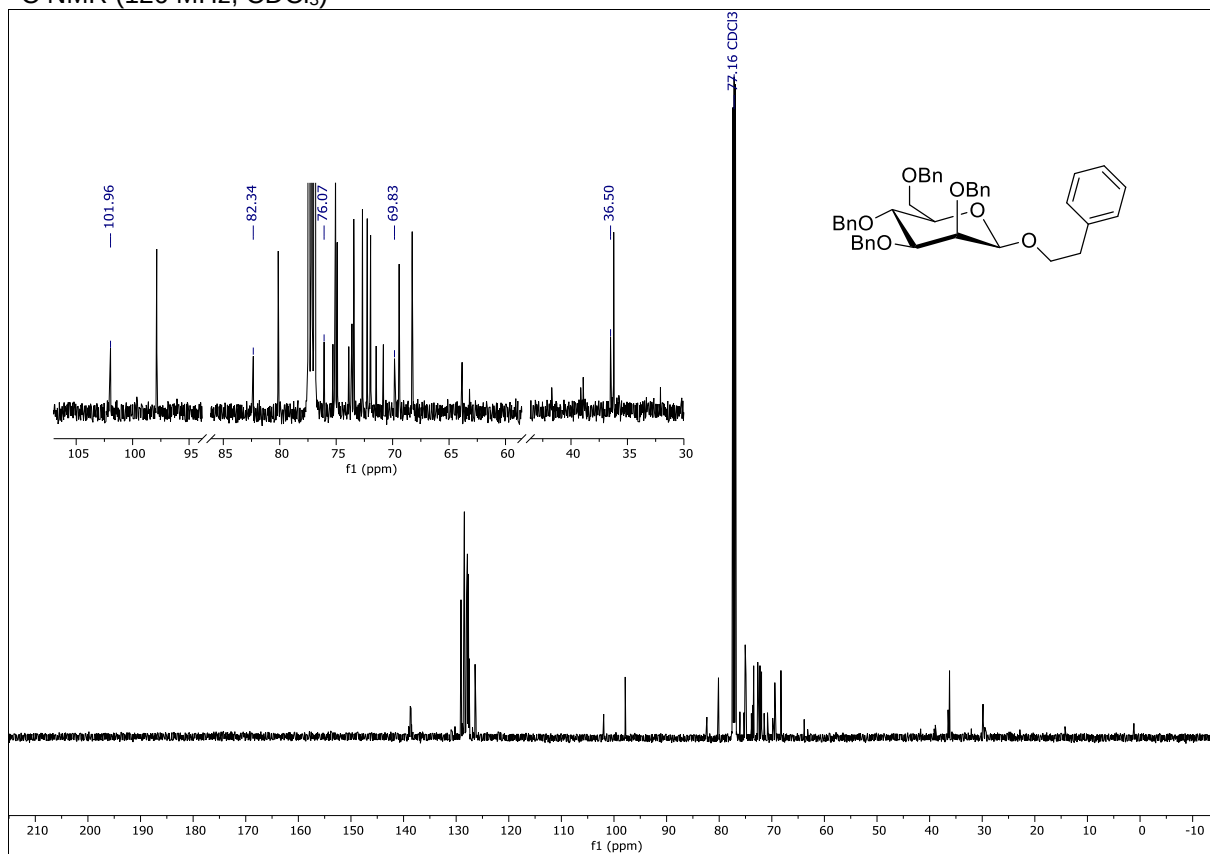


β -17a

^1H NMR (500 MHz, CDCl_3)

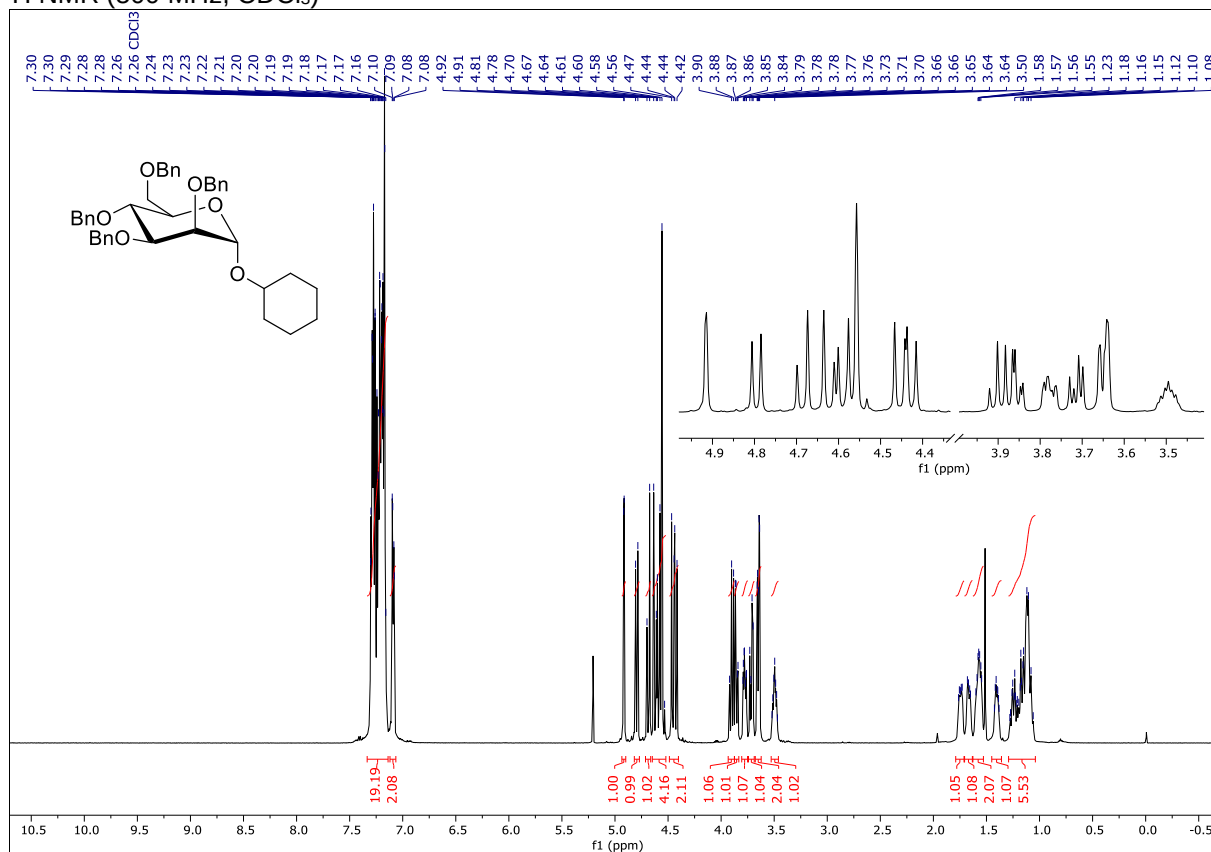


^{13}C NMR (126 MHz, CDCl_3)

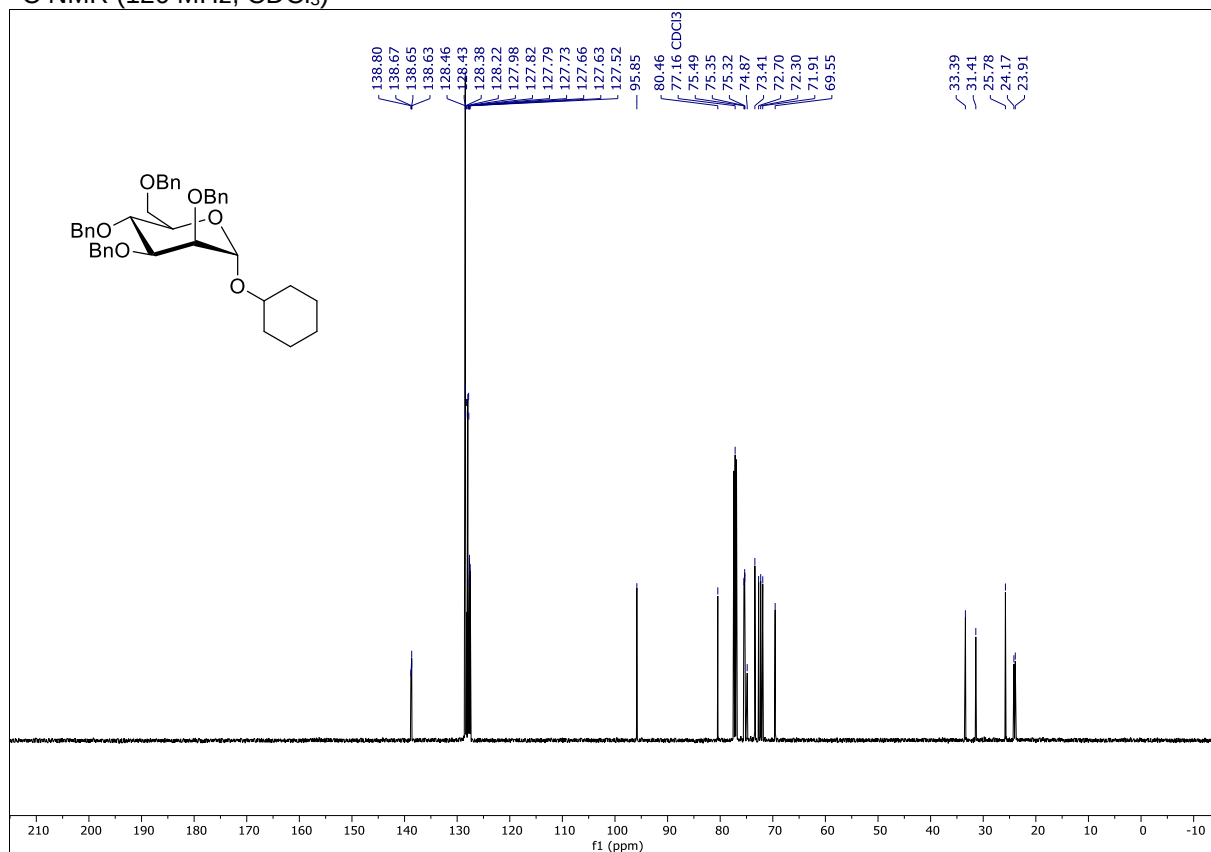


α -17b

^1H NMR (500 MHz, CDCl_3)

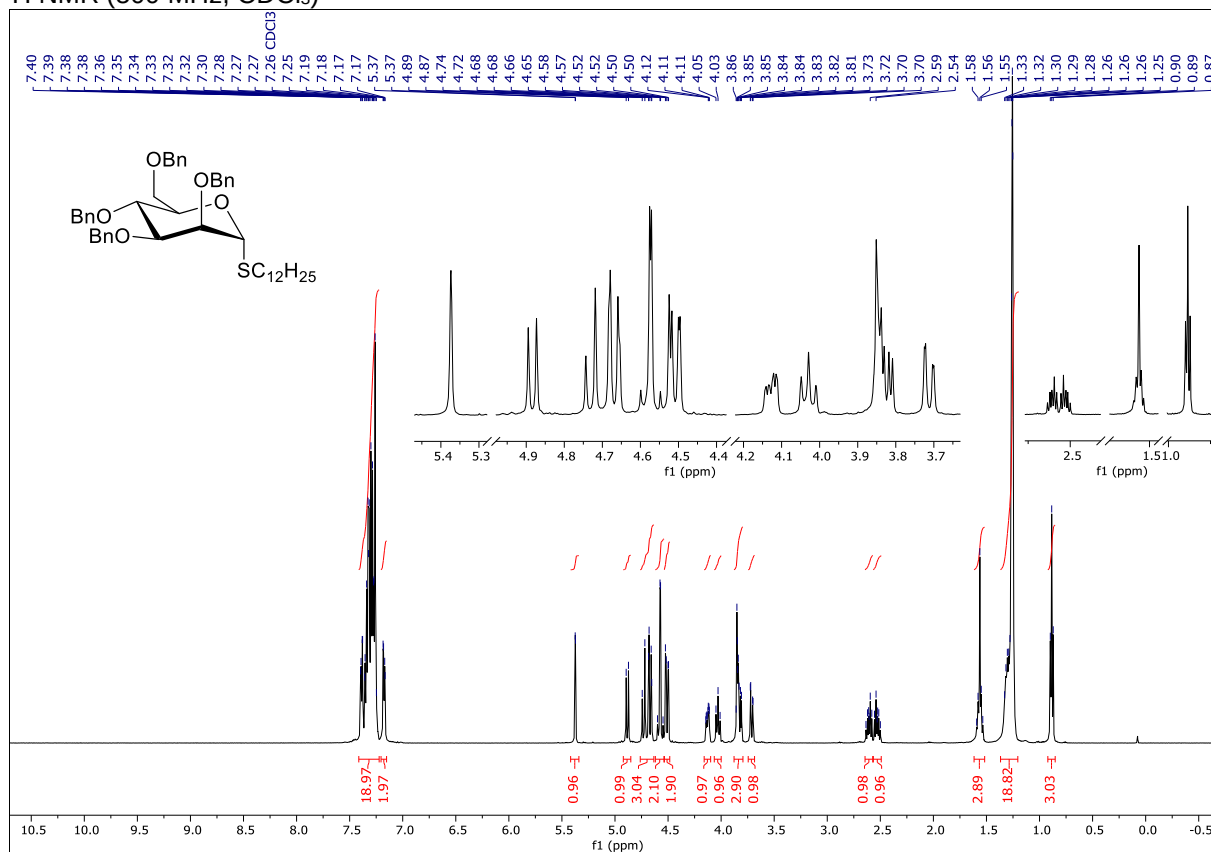


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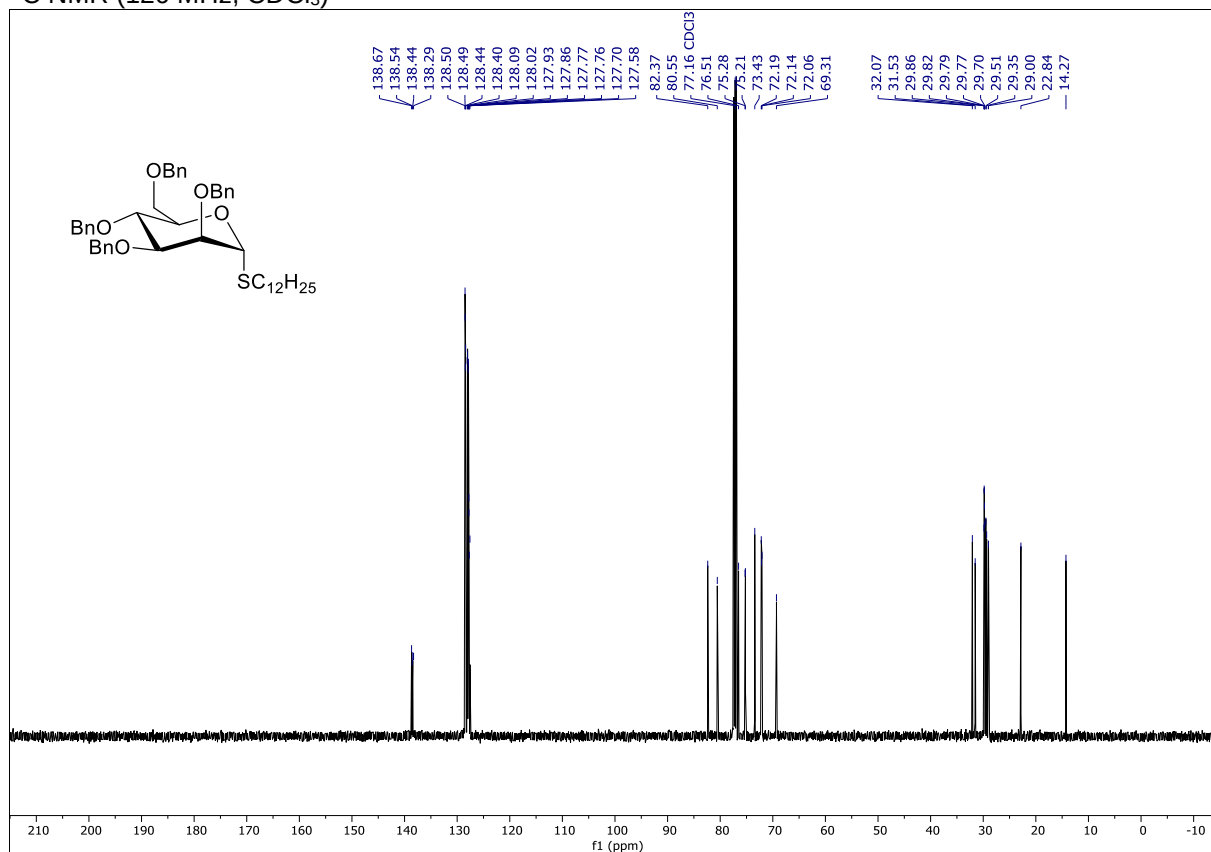


α -17c

^1H NMR (500 MHz, CDCl_3)

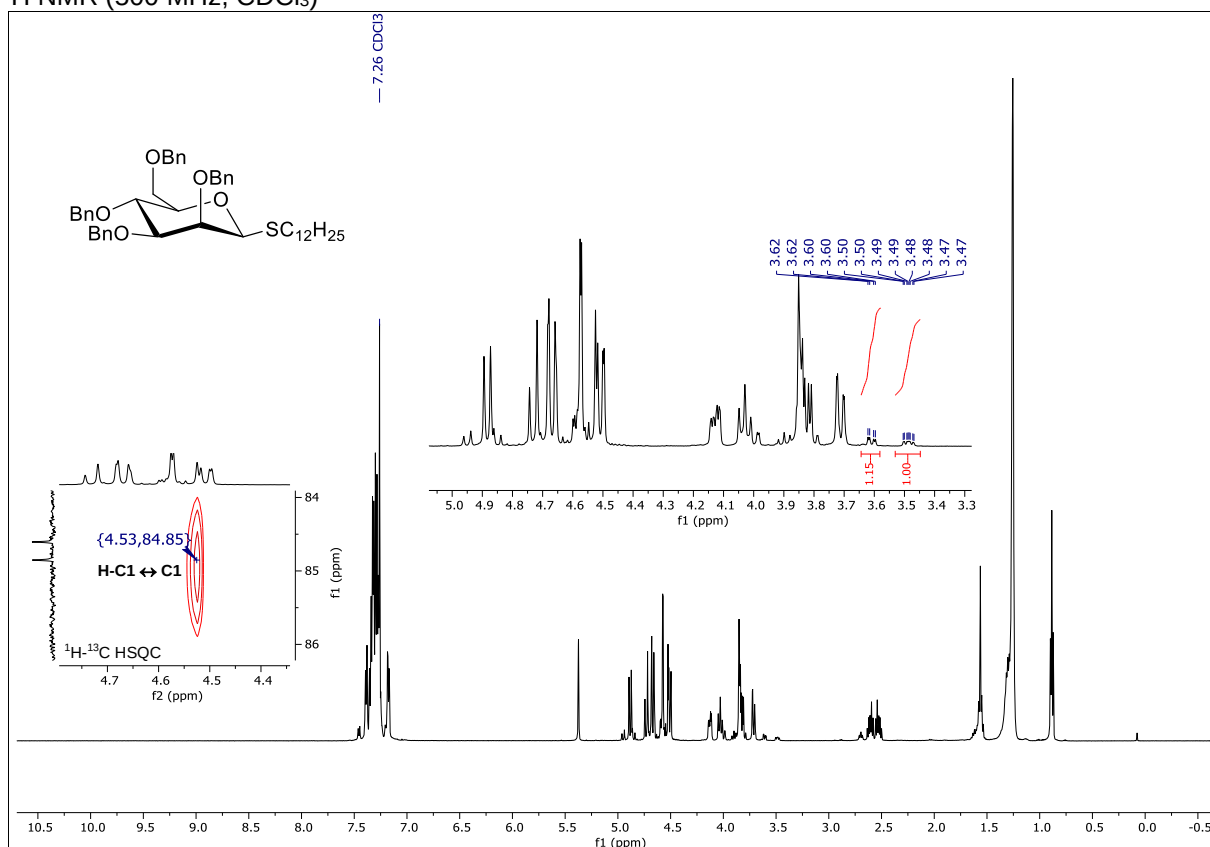


^{13}C NMR (126 MHz, CDCl_3)

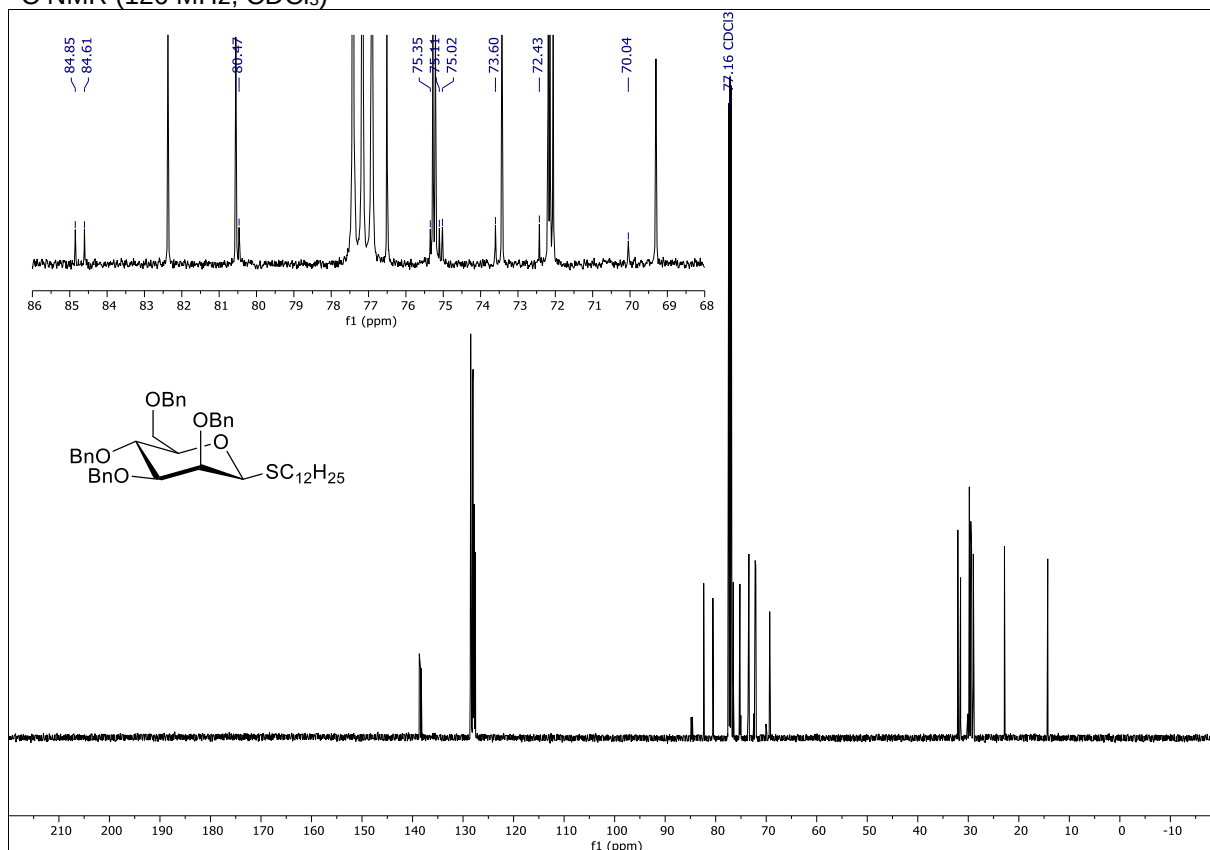


β -17c

^1H NMR (500 MHz, CDCl_3)

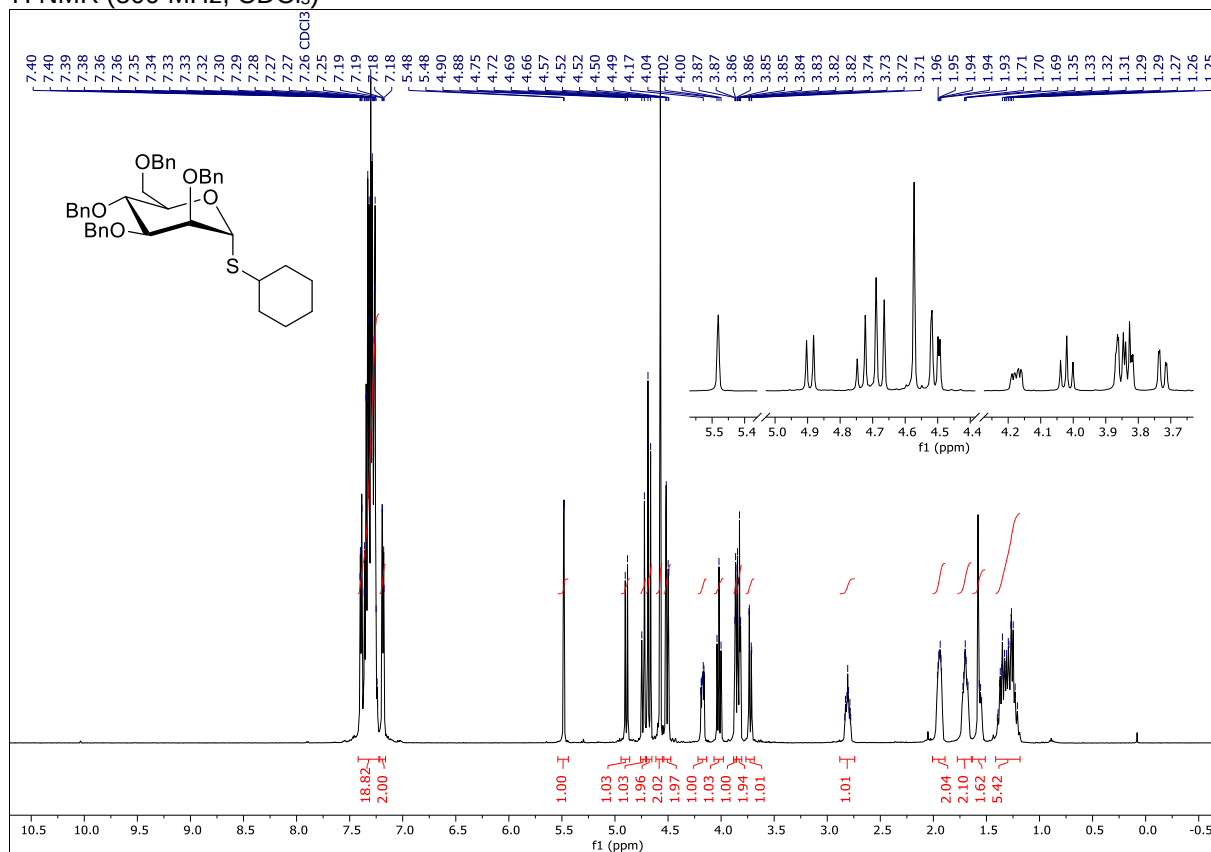


^{13}C NMR (126 MHz, CDCl_3)

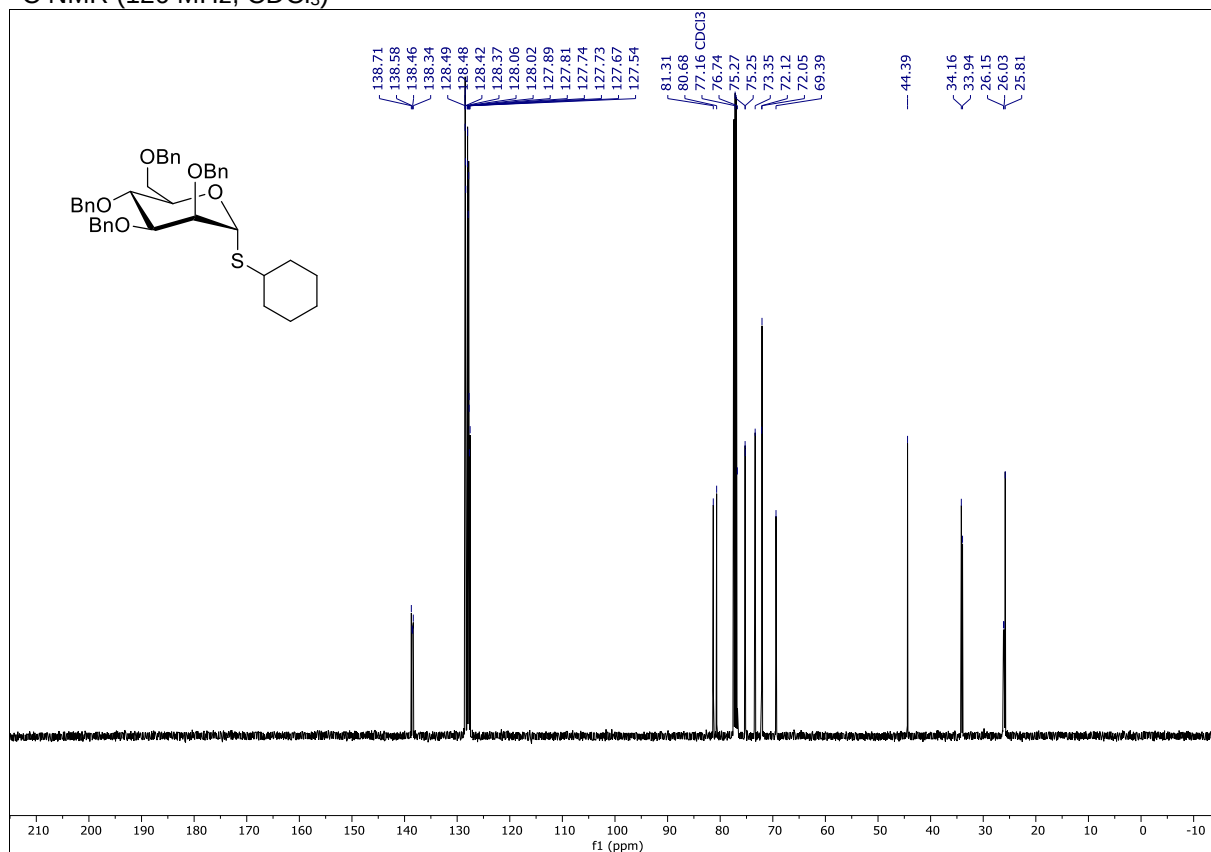


α -17d

^1H NMR (500 MHz, CDCl_3)

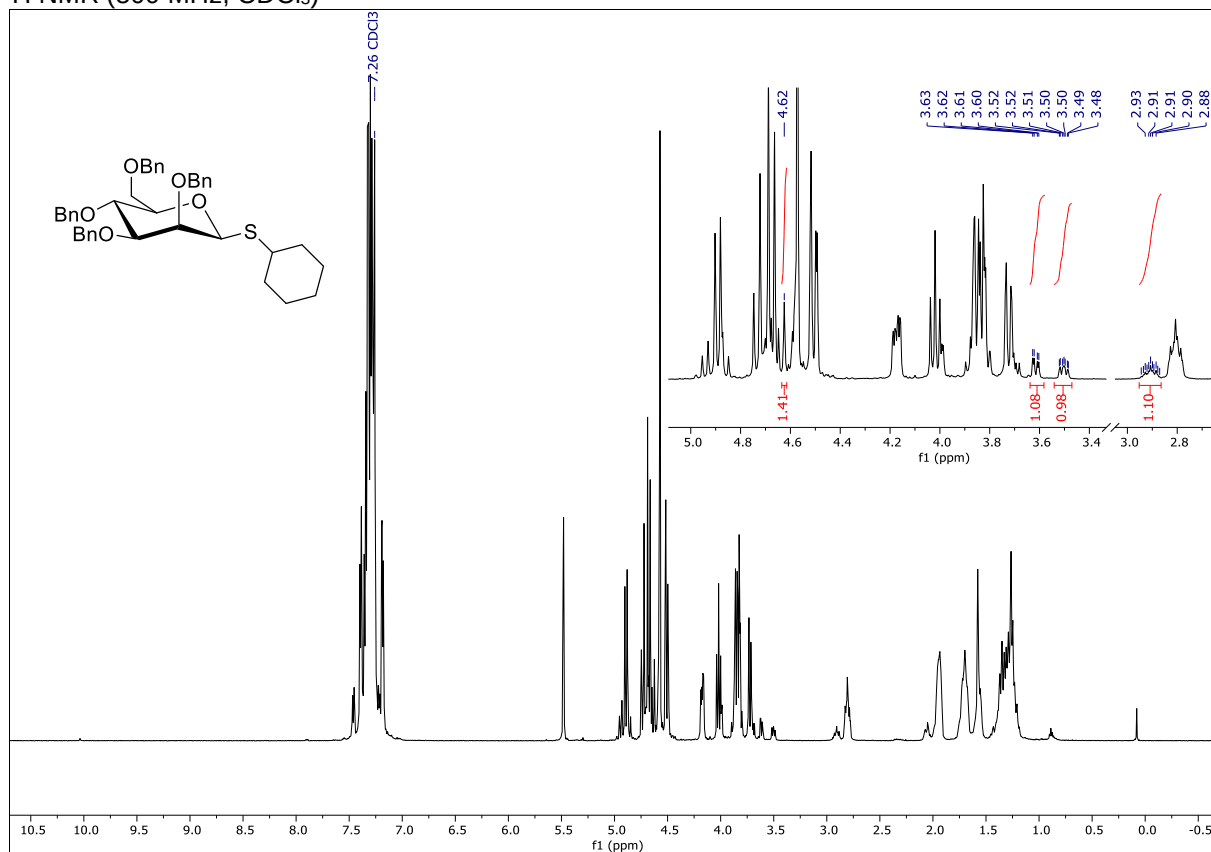


^{13}C NMR (126 MHz, CDCl_3)

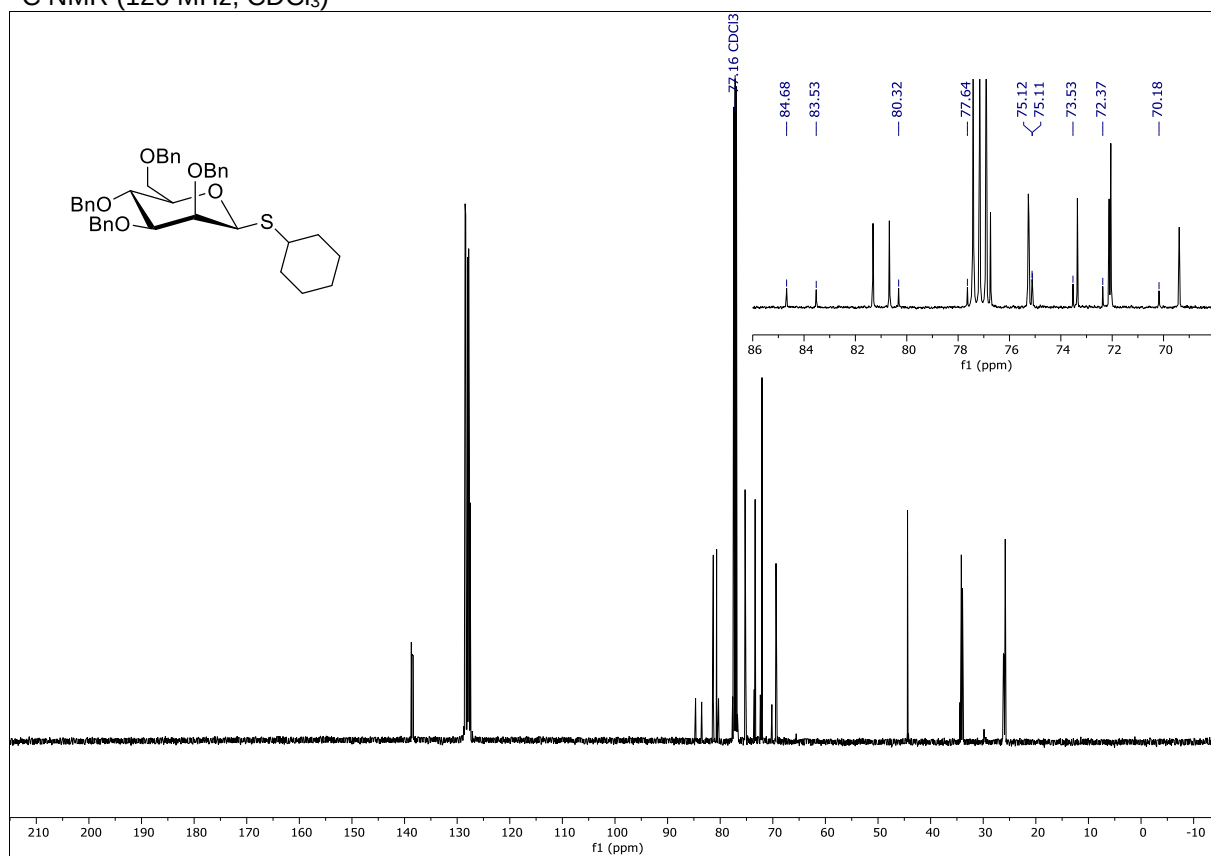


β -17d

^1H NMR (500 MHz, CDCl_3)

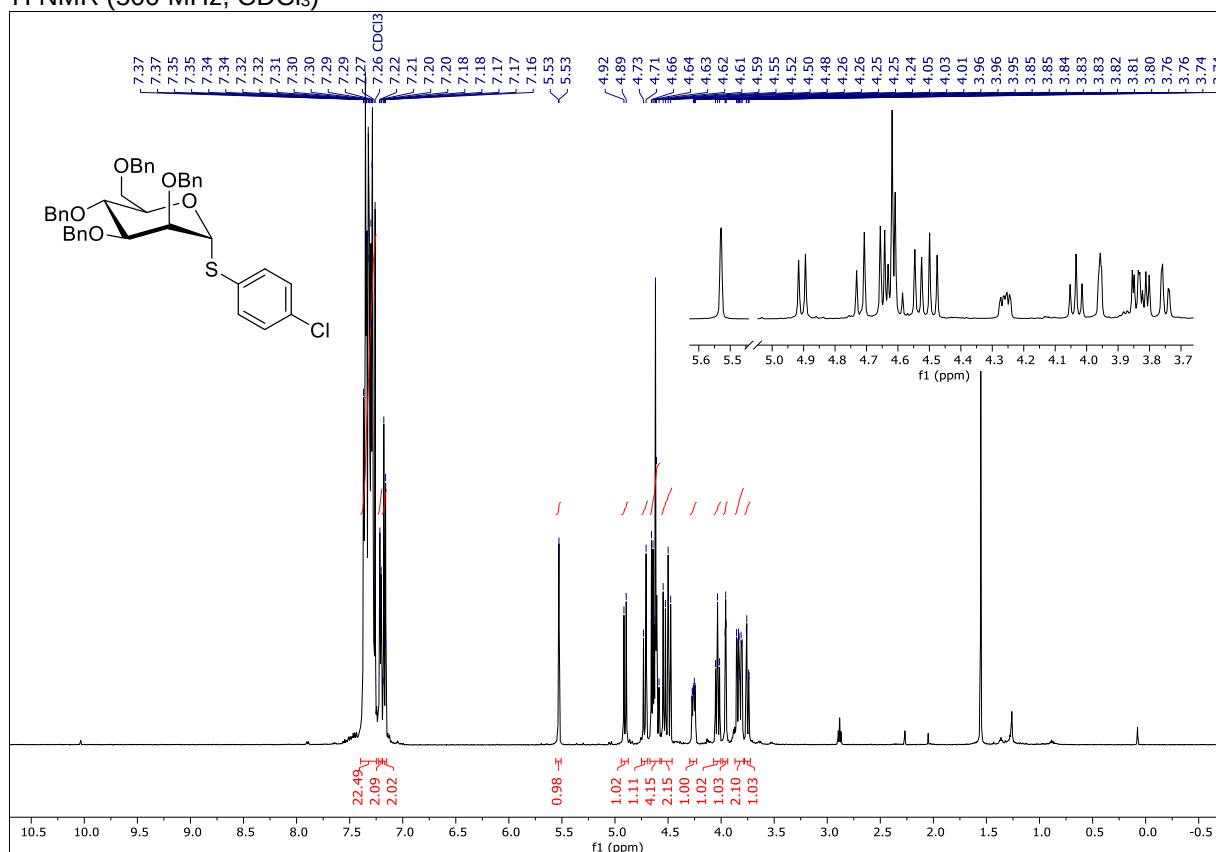


^{13}C NMR (126 MHz, CDCl_3)

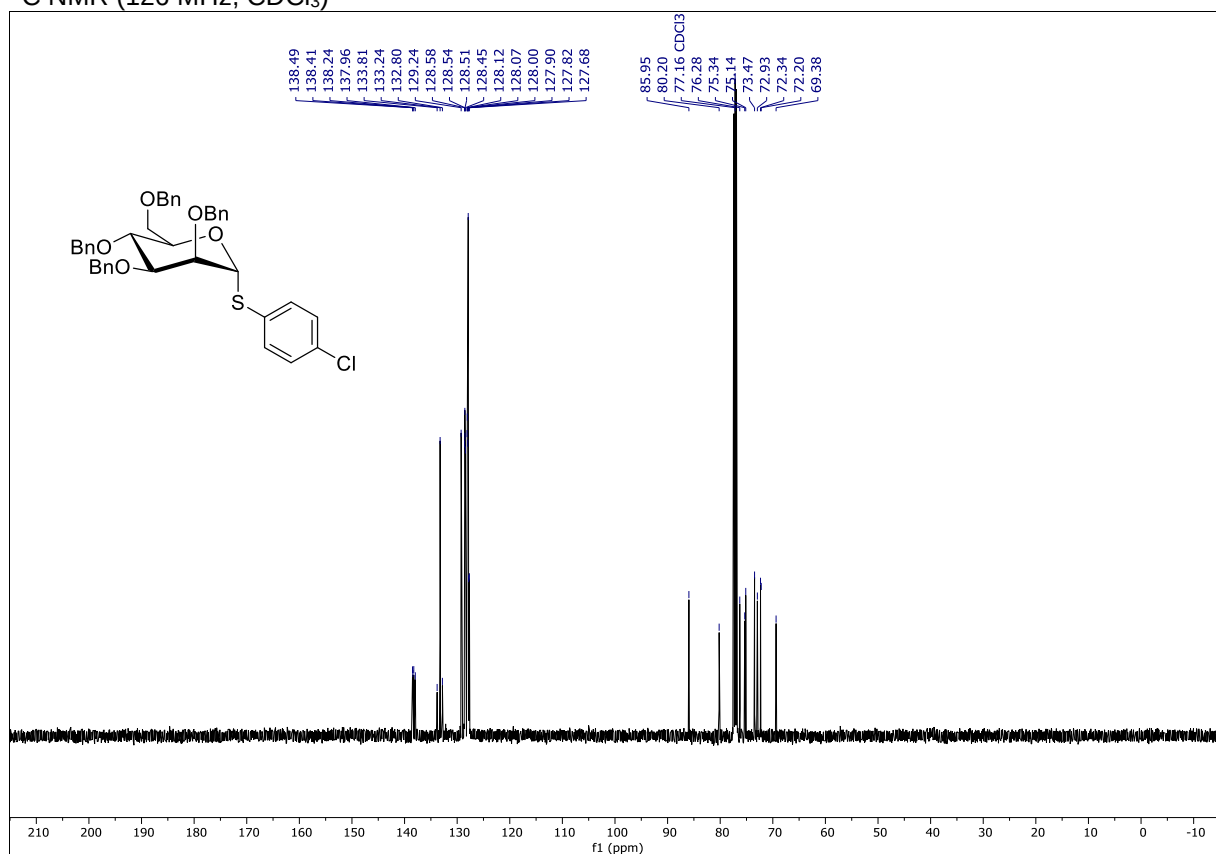


α -17e

^1H NMR (500 MHz, CDCl_3)

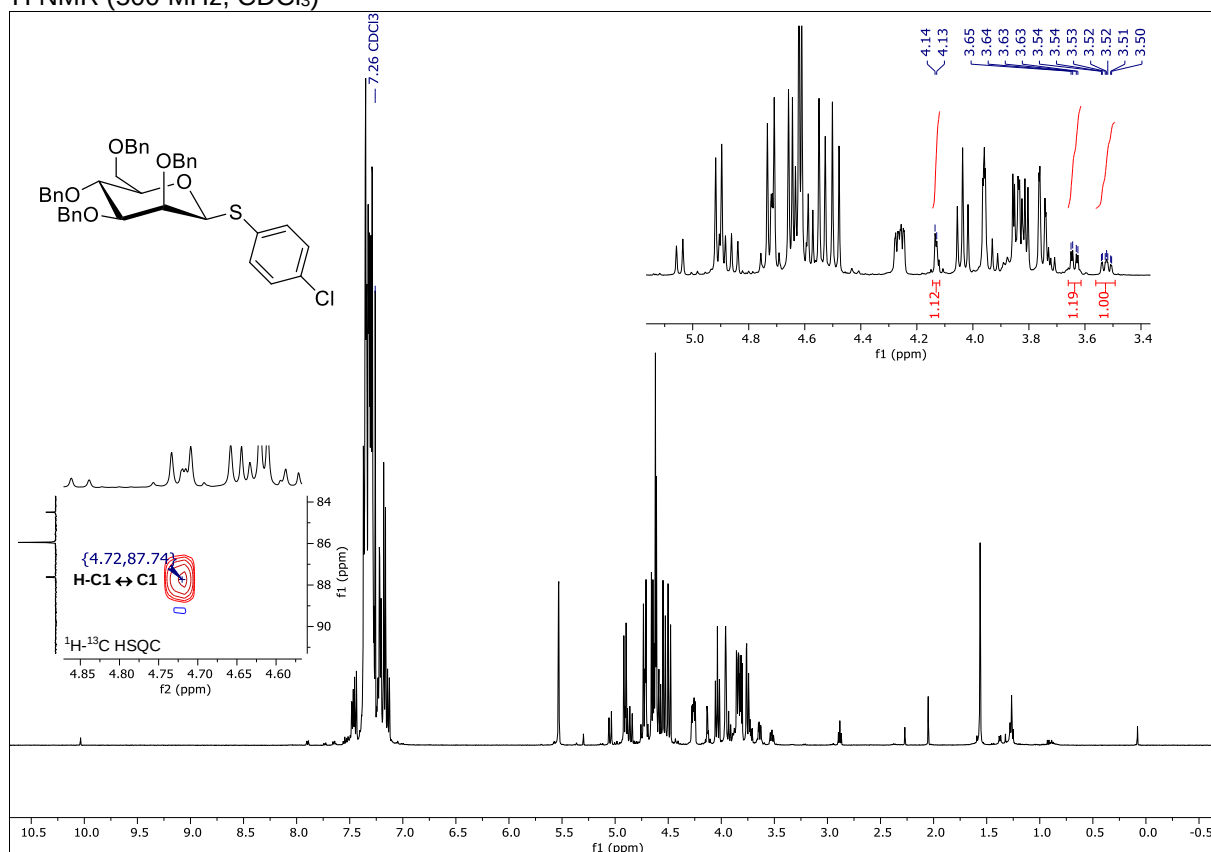


^{13}C NMR (126 MHz, CDCl_3)

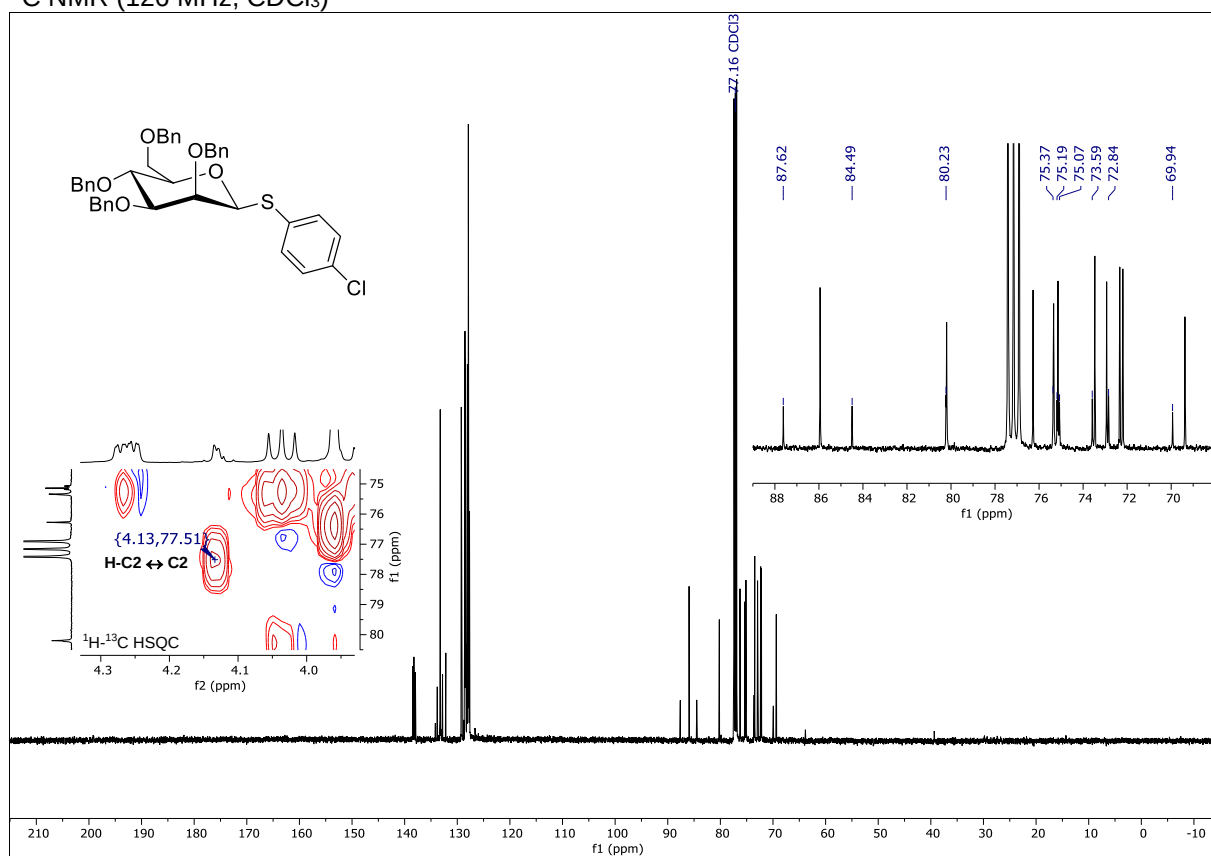


β -17e

^1H NMR (500 MHz, CDCl_3)

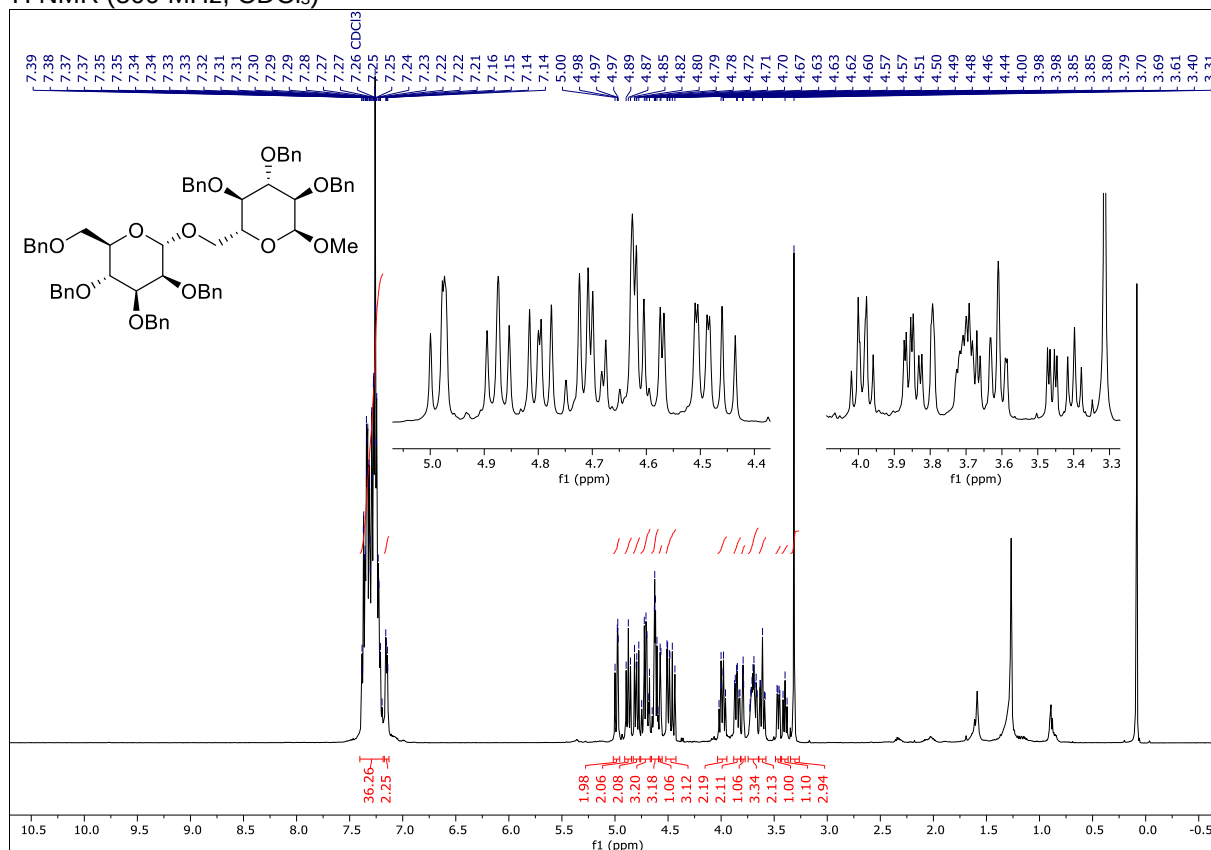


^{13}C NMR (126 MHz, CDCl_3)

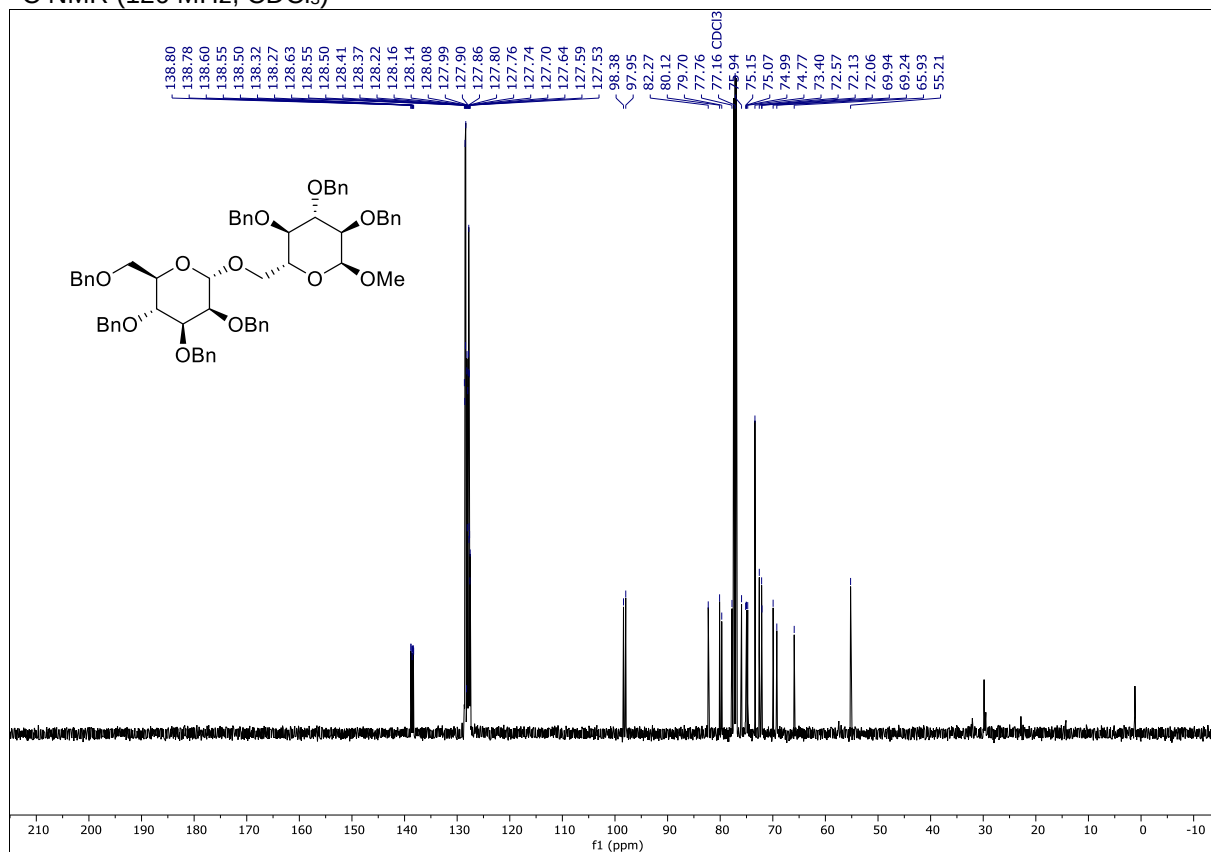


17f

^1H NMR (500 MHz, CDCl_3)

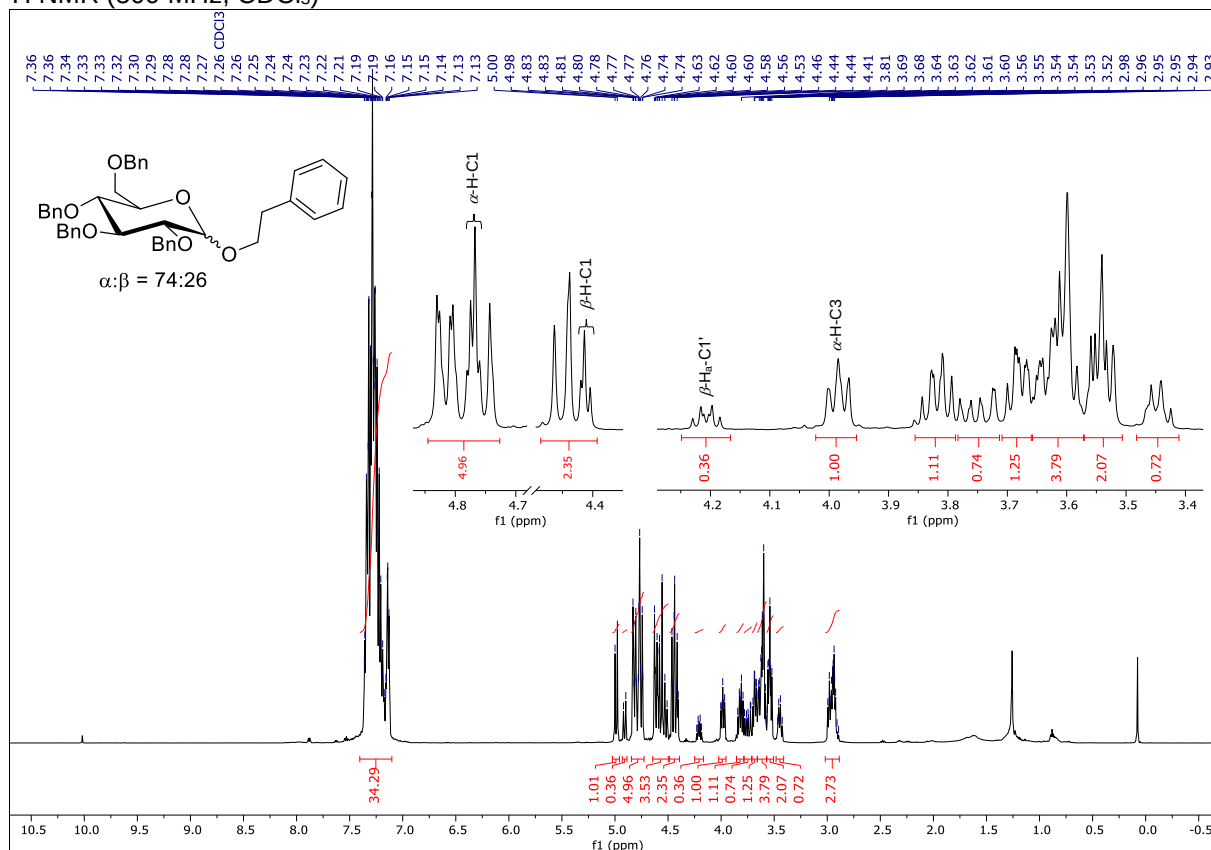


^{13}C NMR (126 MHz, CDCl_3)

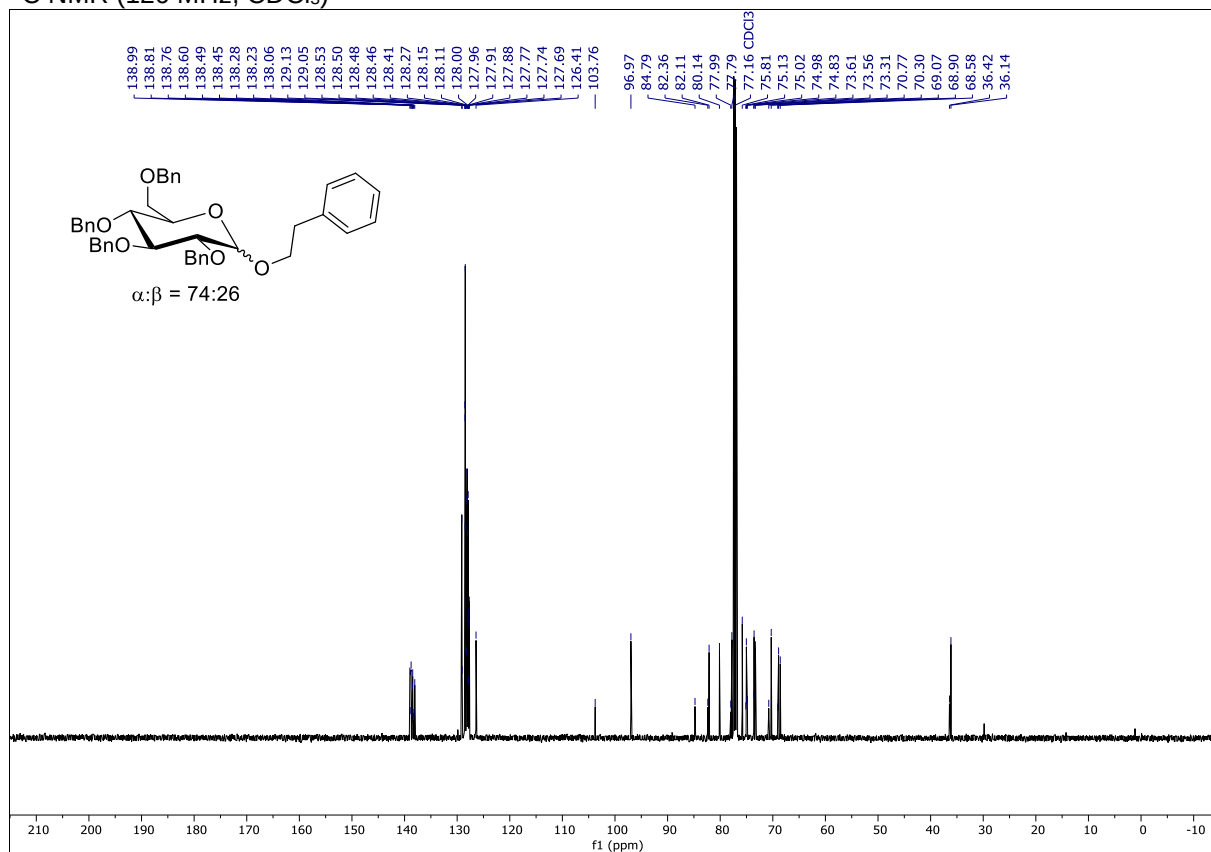


18a

¹H NMR (500 MHz, CDCl₃)

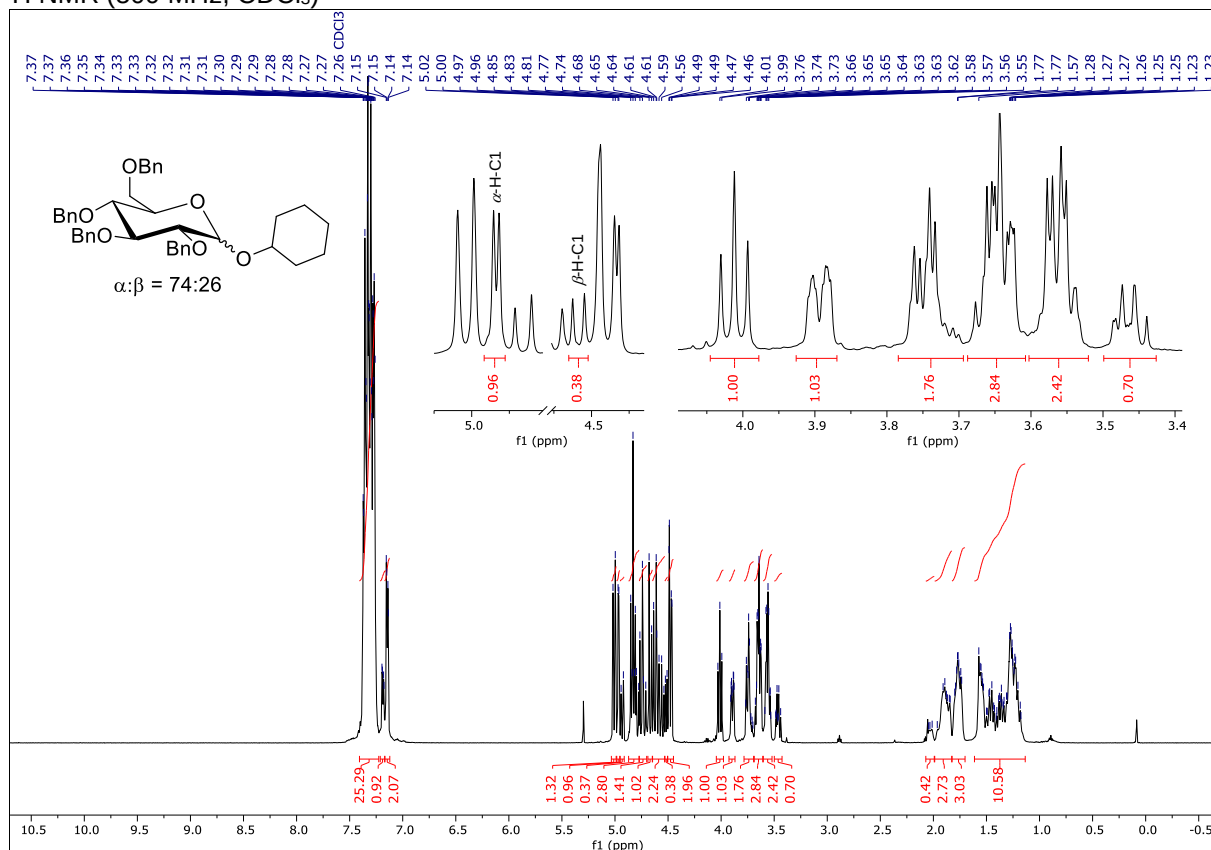


¹³C NMR (126 MHz, CDCl₃)

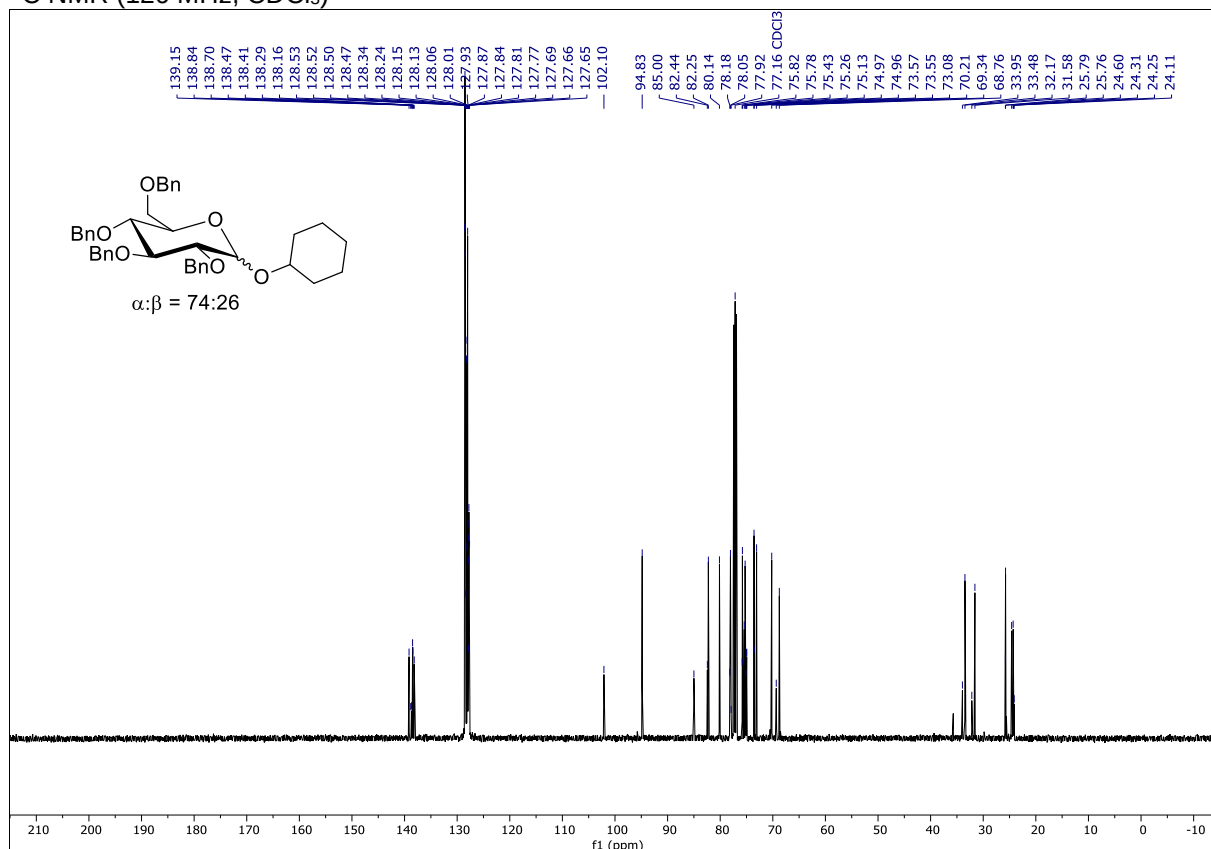


18b

¹H NMR (500 MHz, CDCl₃)

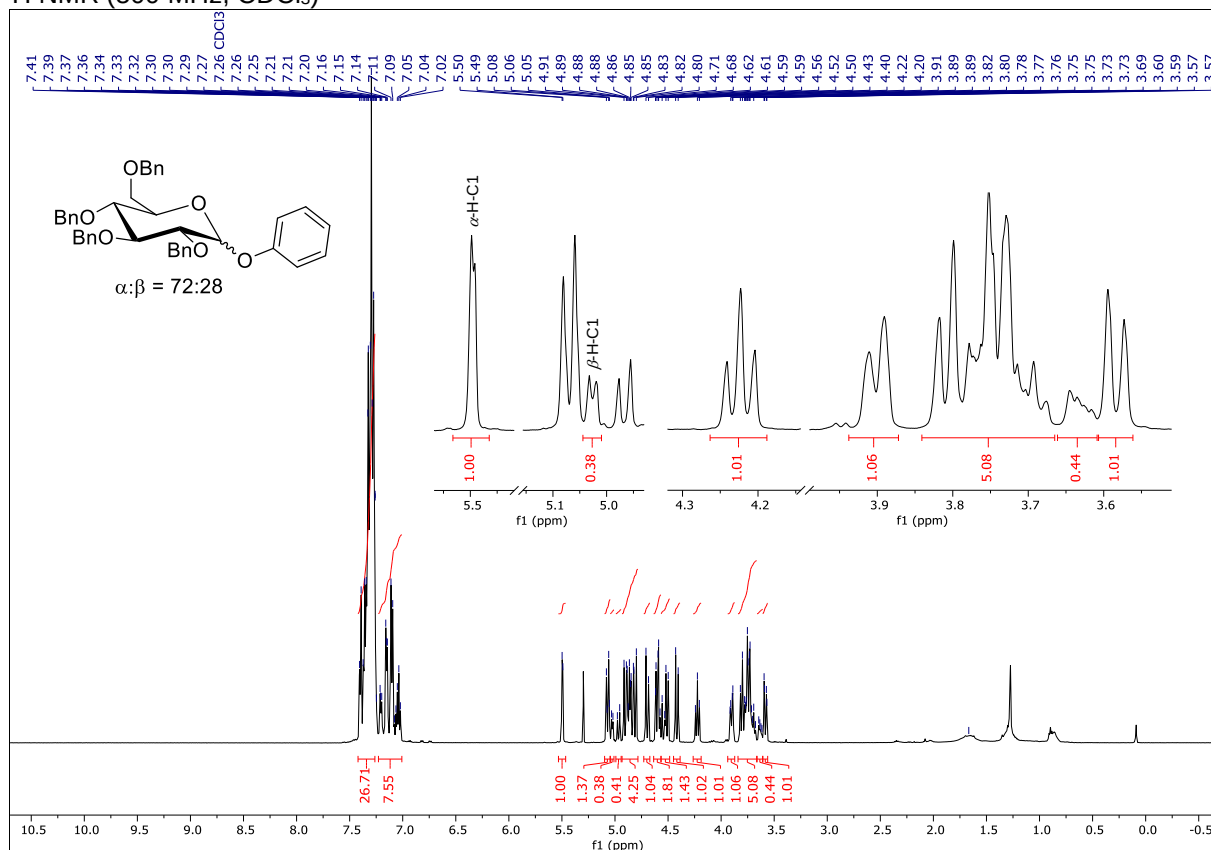


¹³C NMR (126 MHz, CDCl₃)

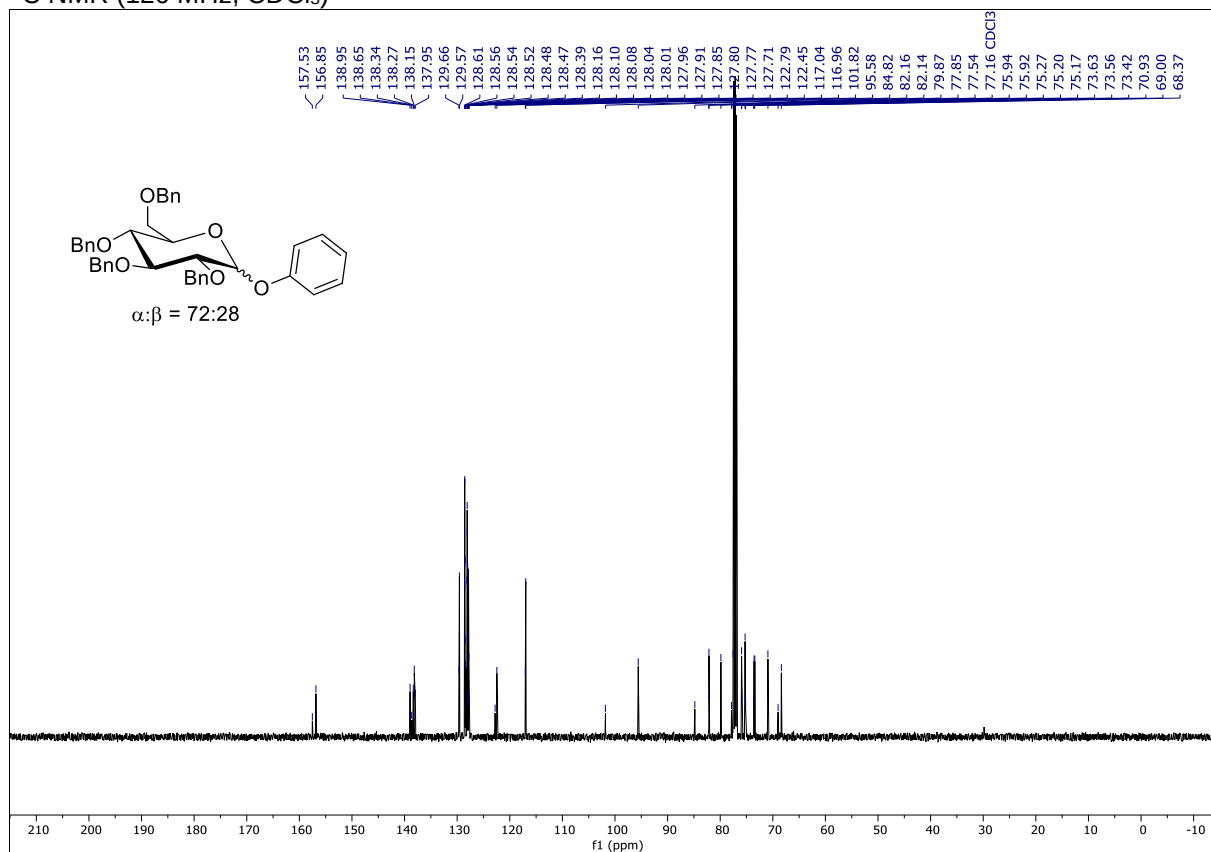


18c

¹H NMR (500 MHz, CDCl₃)

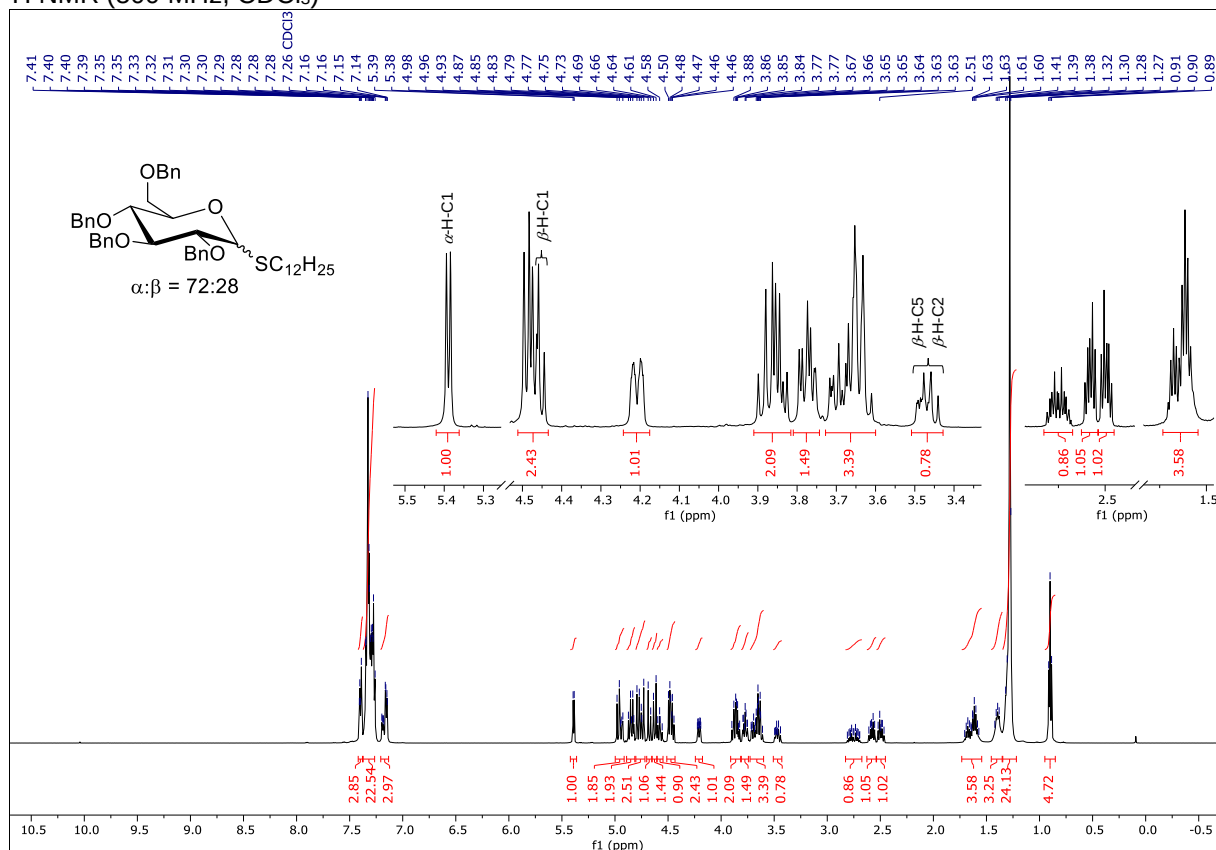


¹³C NMR (126 MHz, CDCl₃)

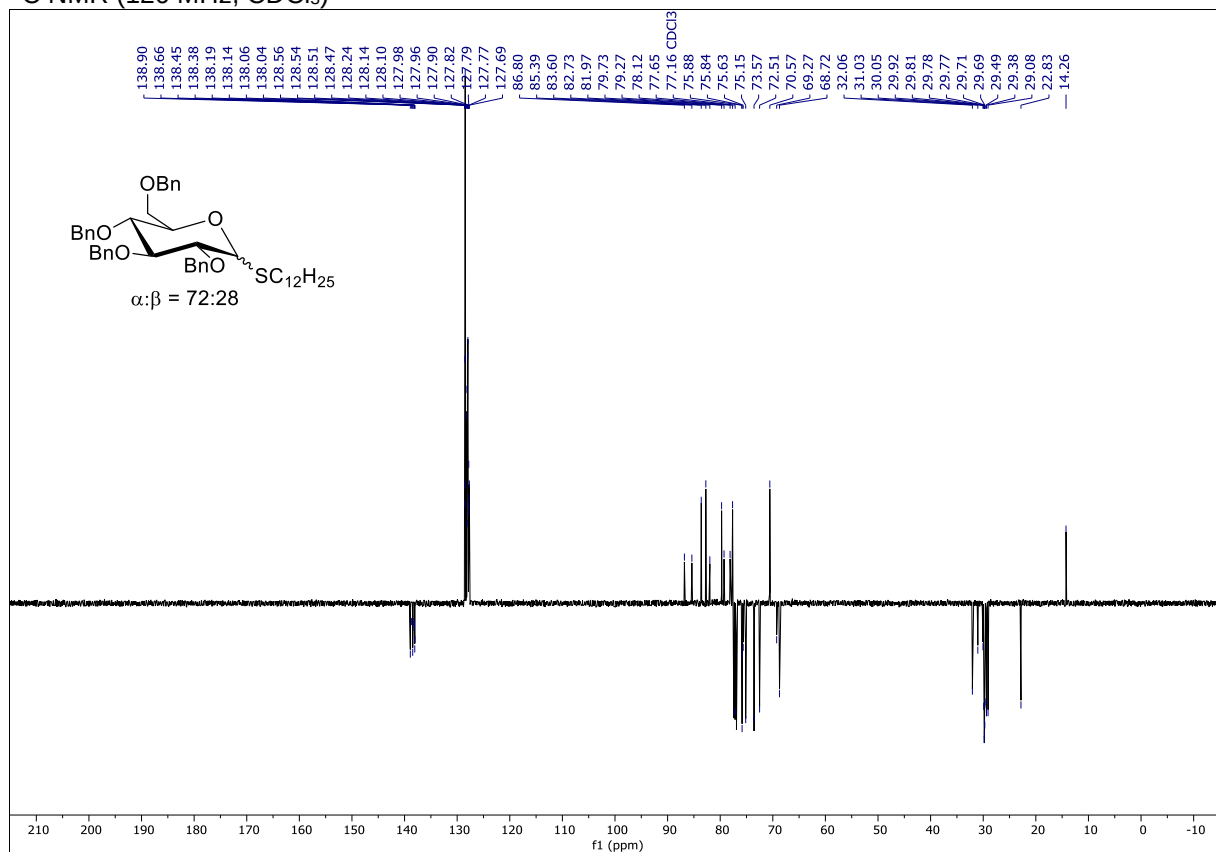


18d

^1H NMR (500 MHz, CDCl_3)

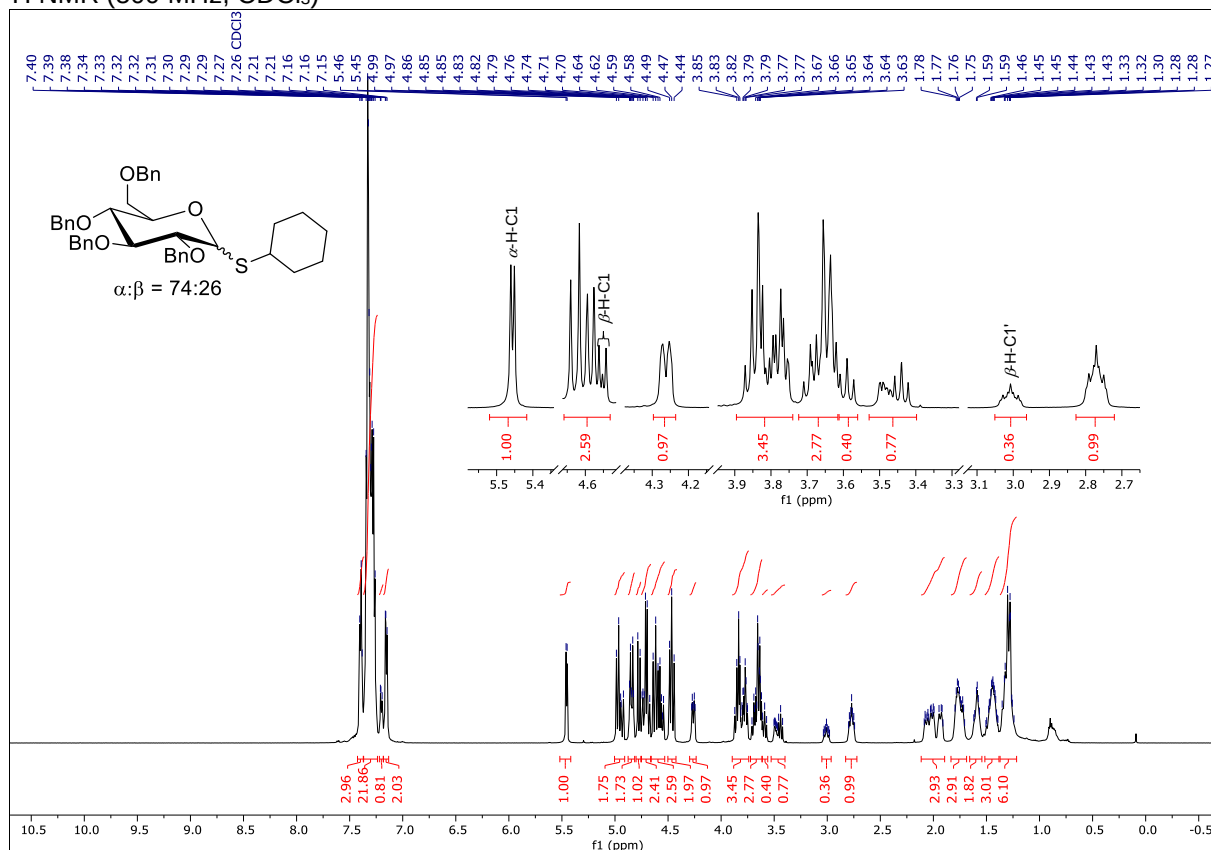


^{13}C NMR (126 MHz, CDCl_3)

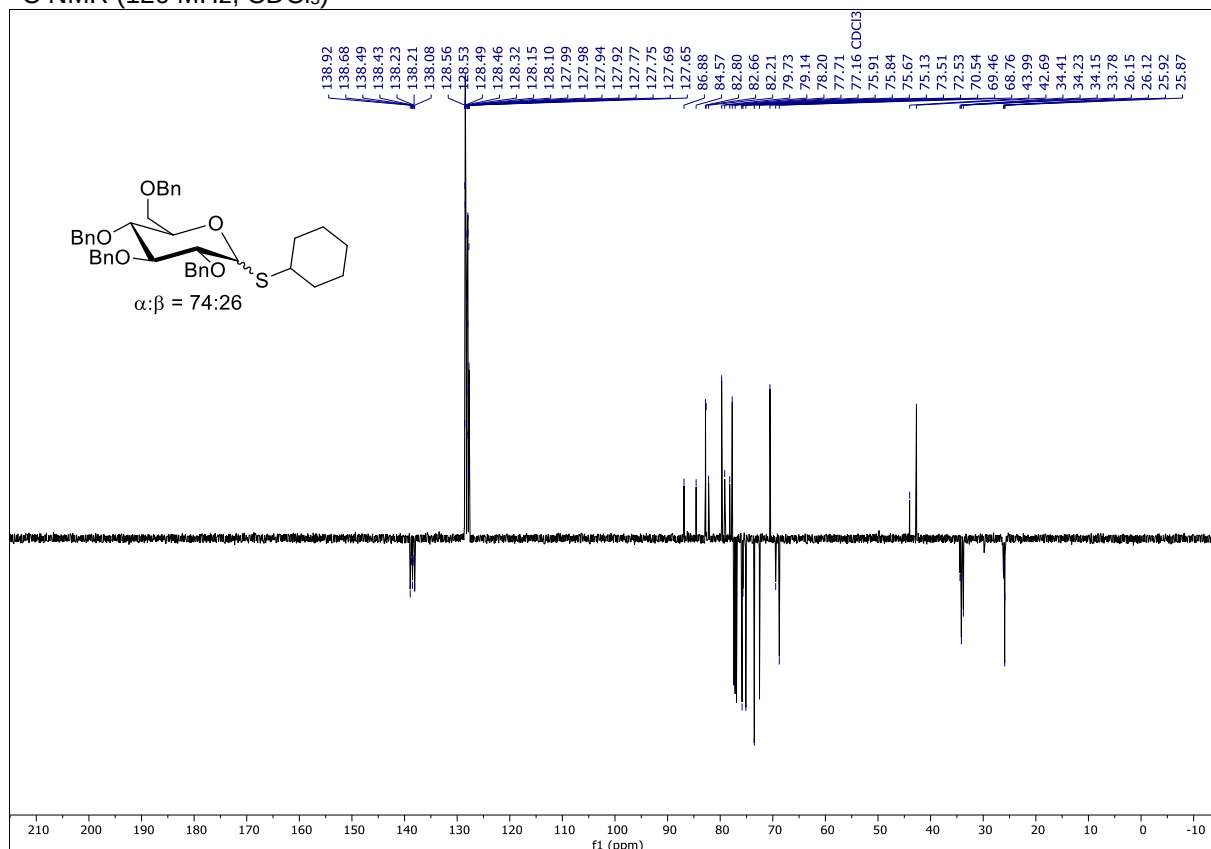


18e

^1H NMR (500 MHz, CDCl_3)

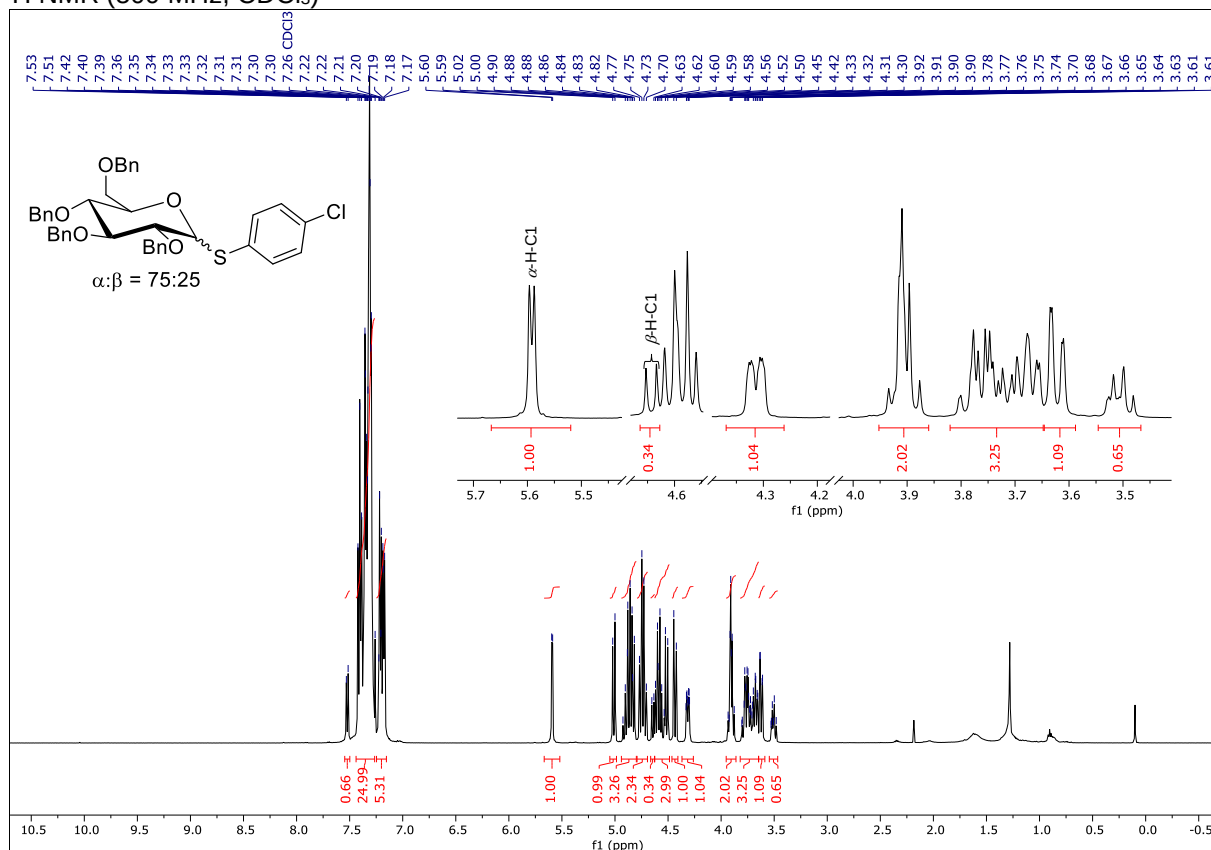


^{13}C NMR (126 MHz, CDCl_3)

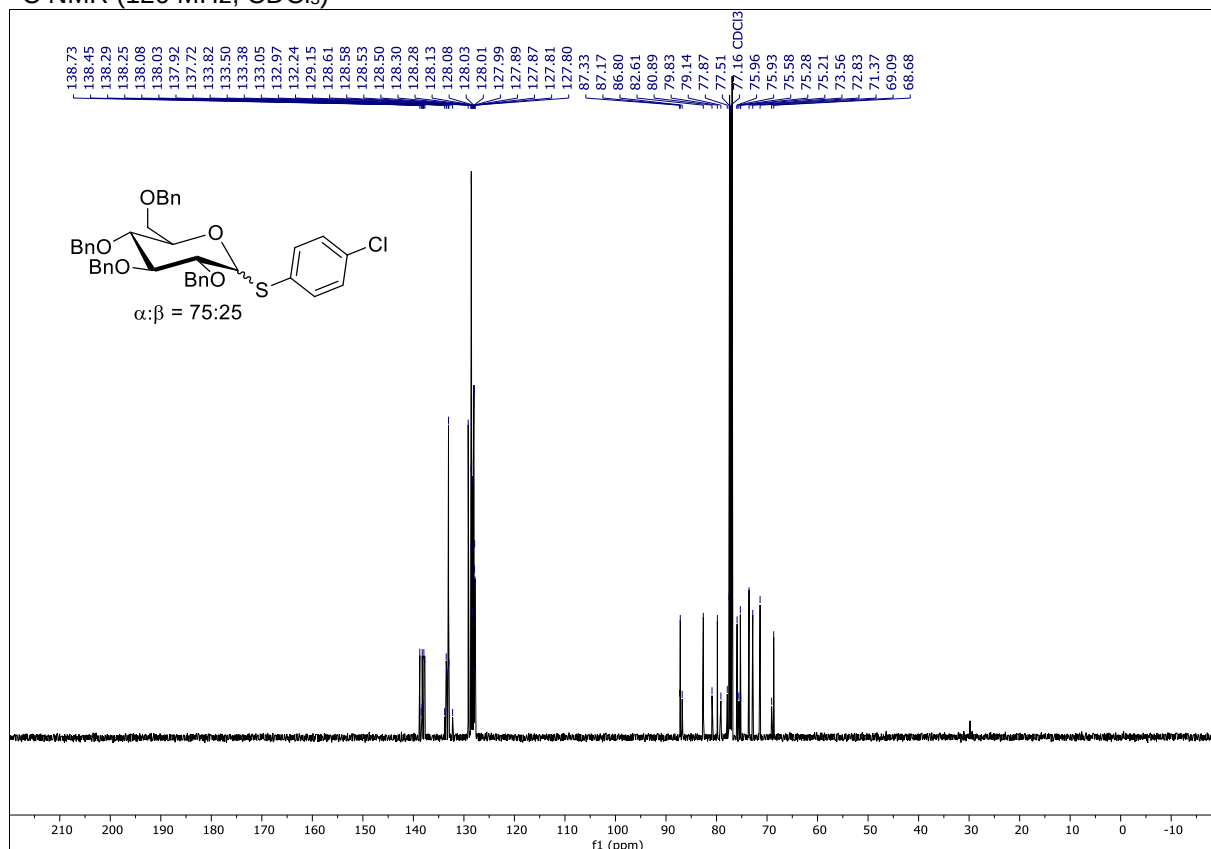


18f

^1H NMR (500 MHz, CDCl_3)

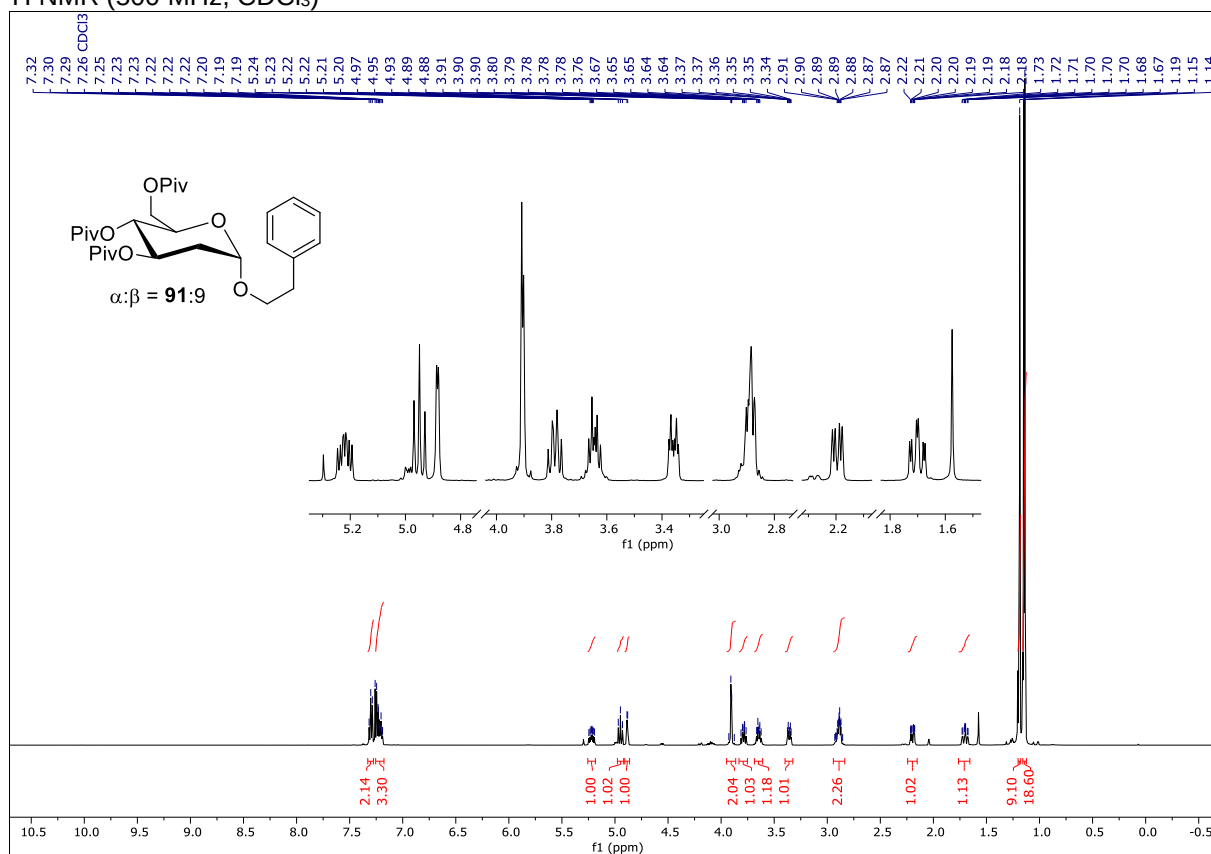


^{13}C NMR (126 MHz, CDCl_3)

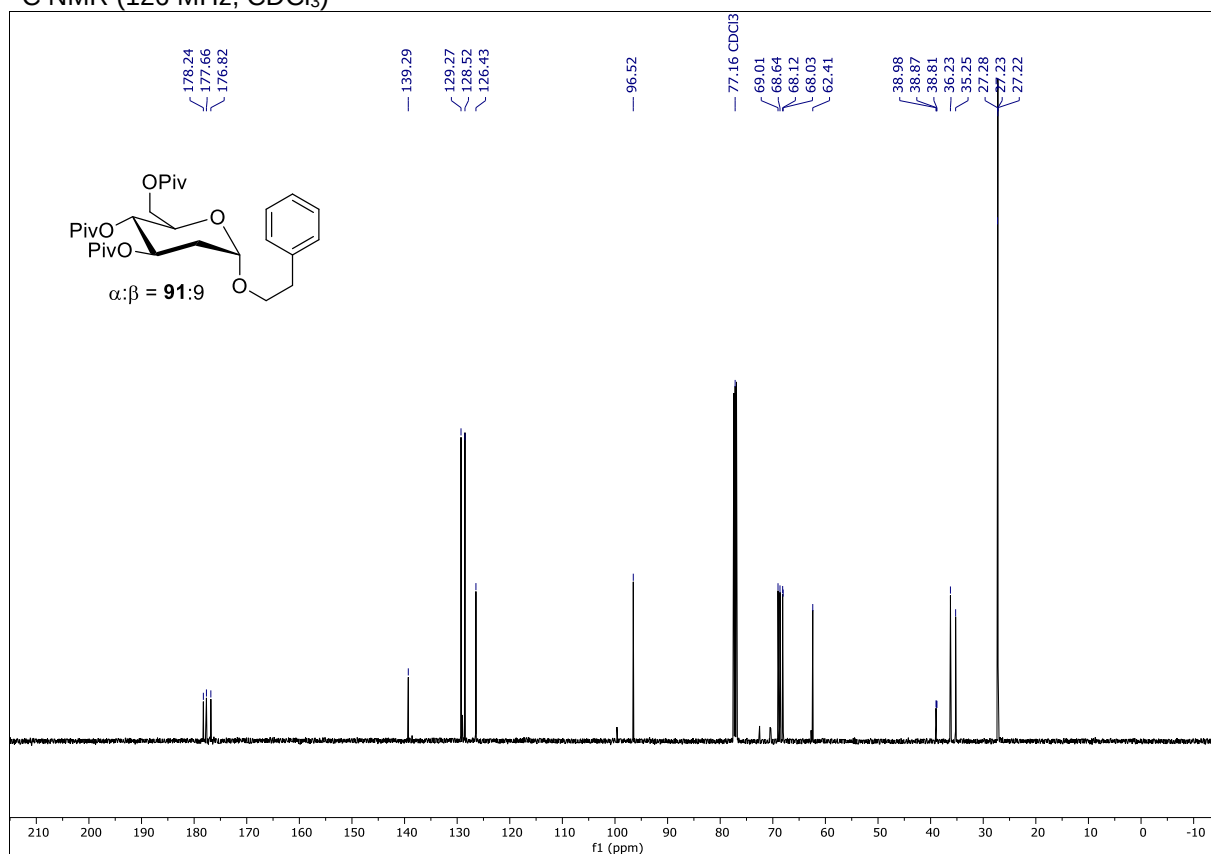


α -20

^1H NMR (500 MHz, CDCl_3)

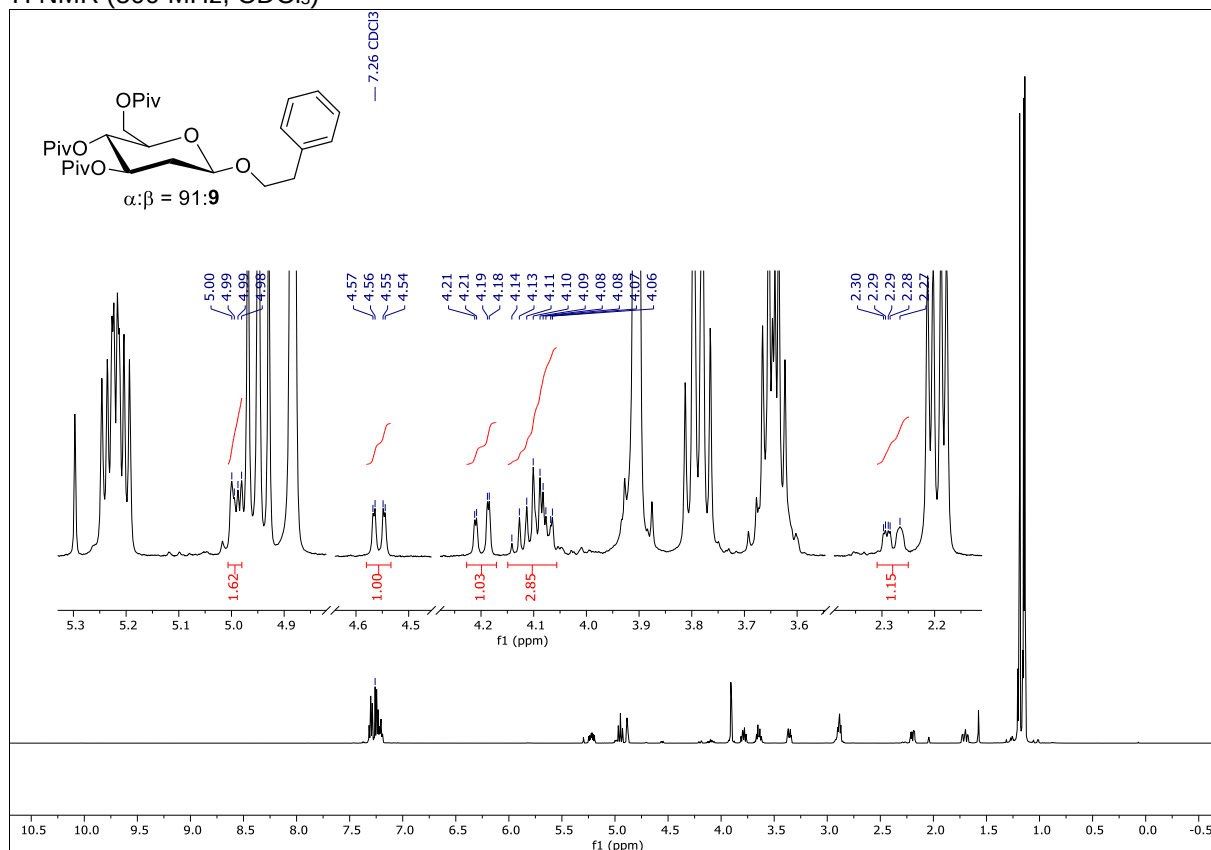


^{13}C NMR (126 MHz, CDCl_3)

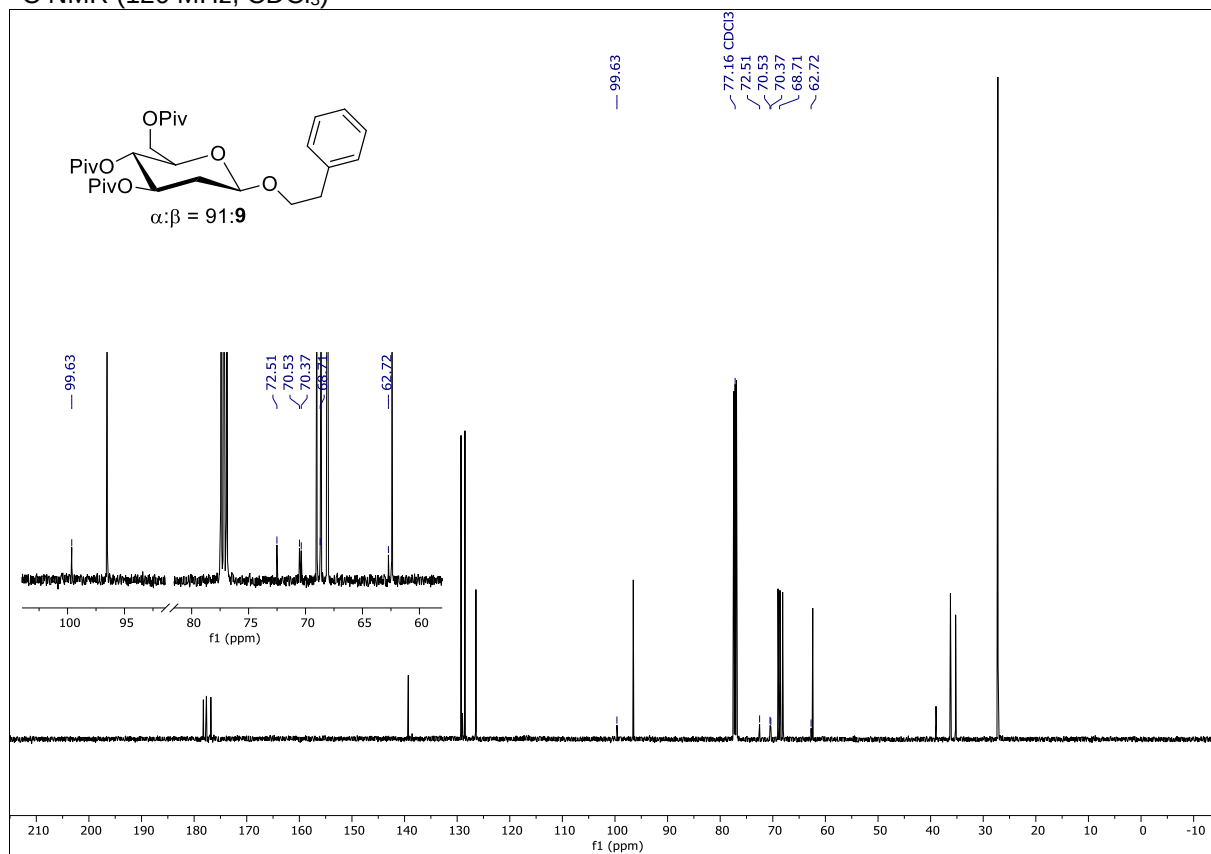


β -20

^1H NMR (500 MHz, CDCl_3)



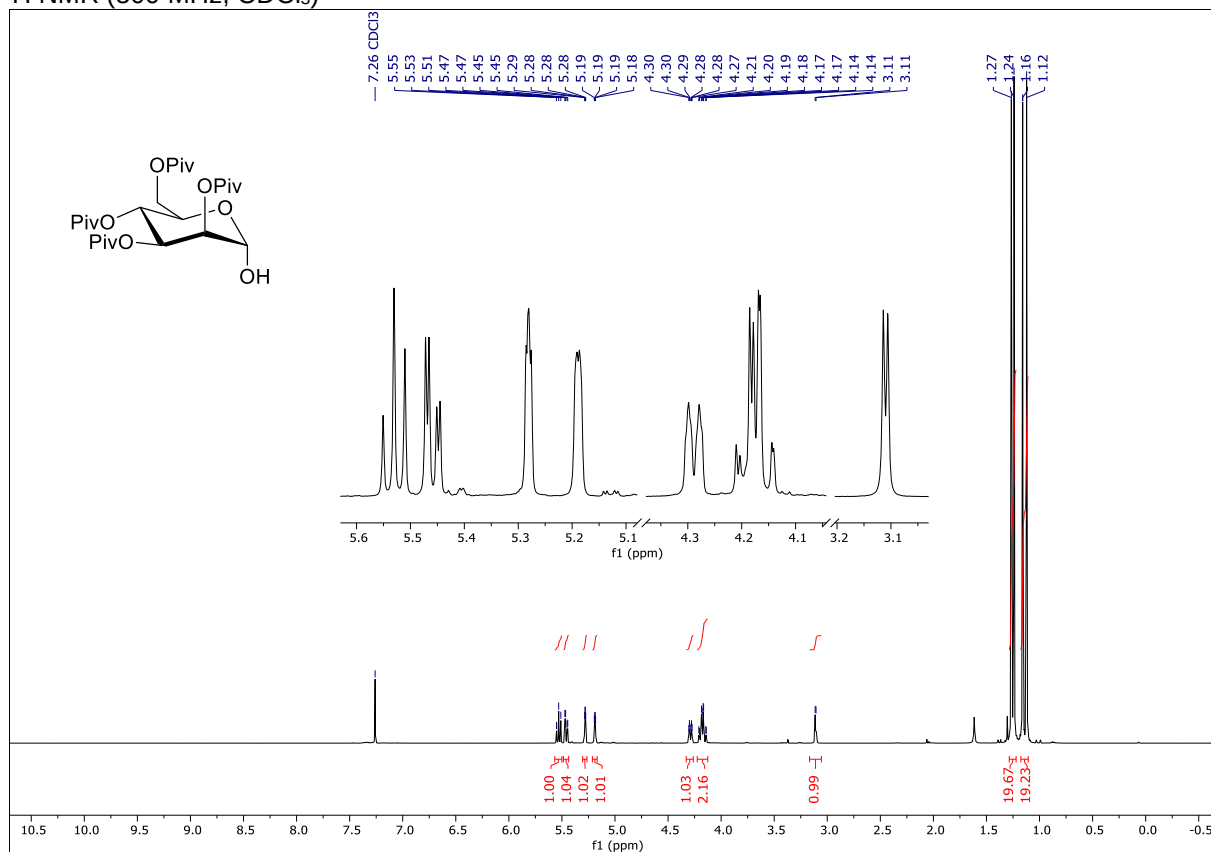
^{13}C NMR (126 MHz, CDCl_3)



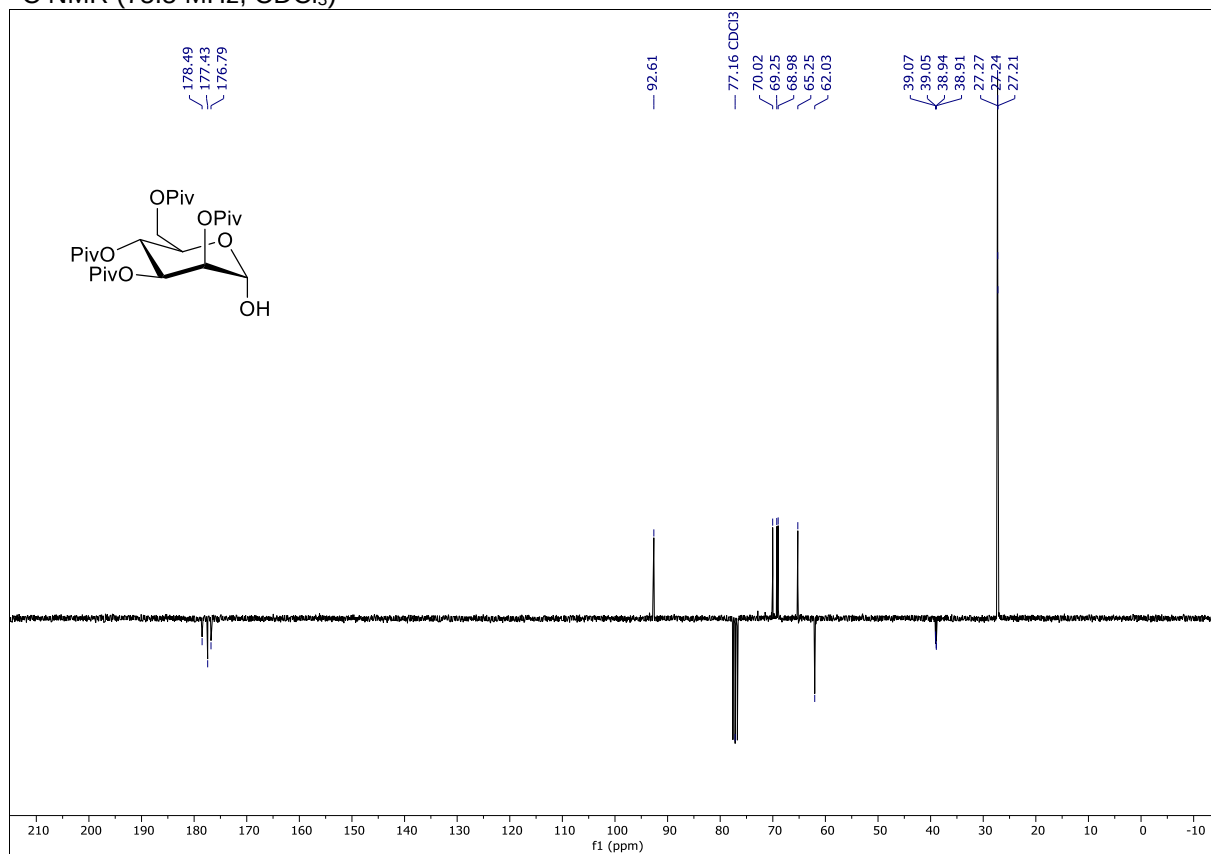
4. SIDE-PRODUCTS

α -4

^1H NMR (500 MHz, CDCl_3)

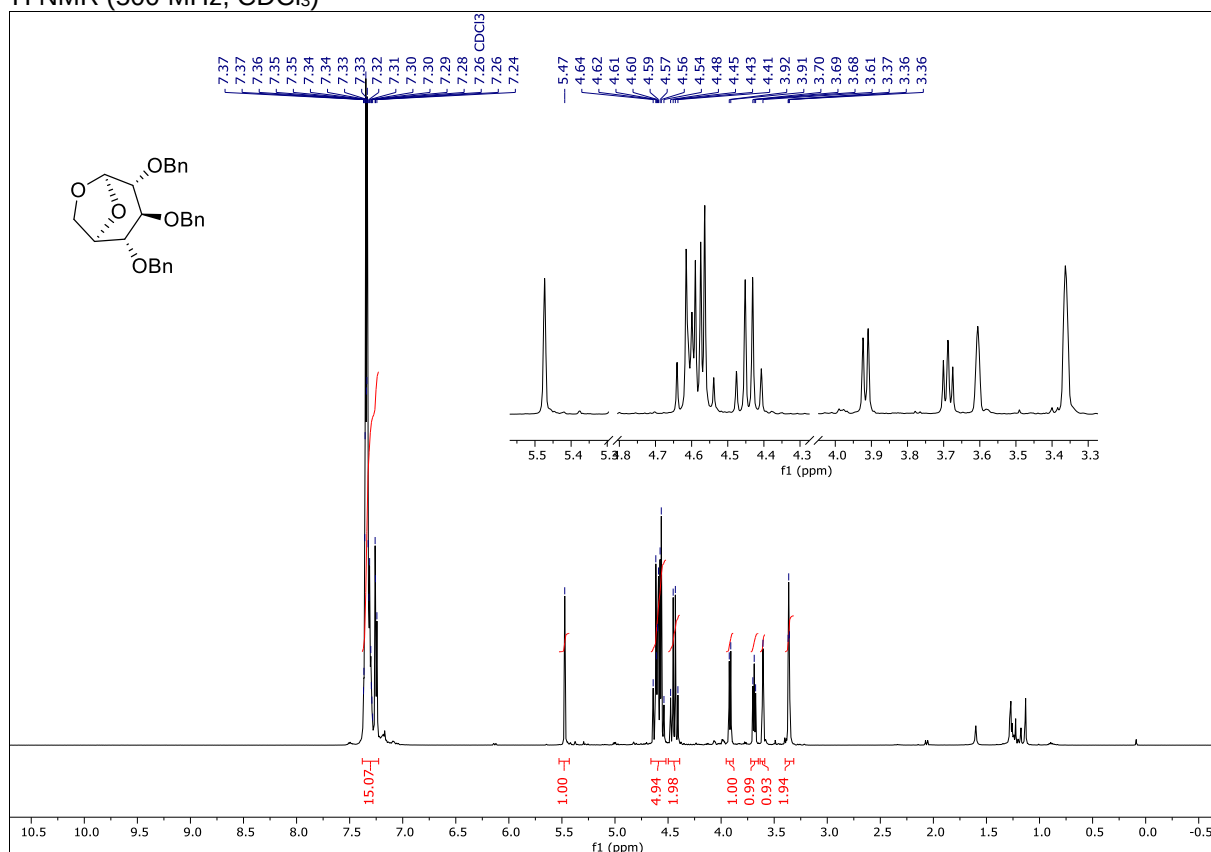


^{13}C NMR (75.5 MHz, CDCl_3)

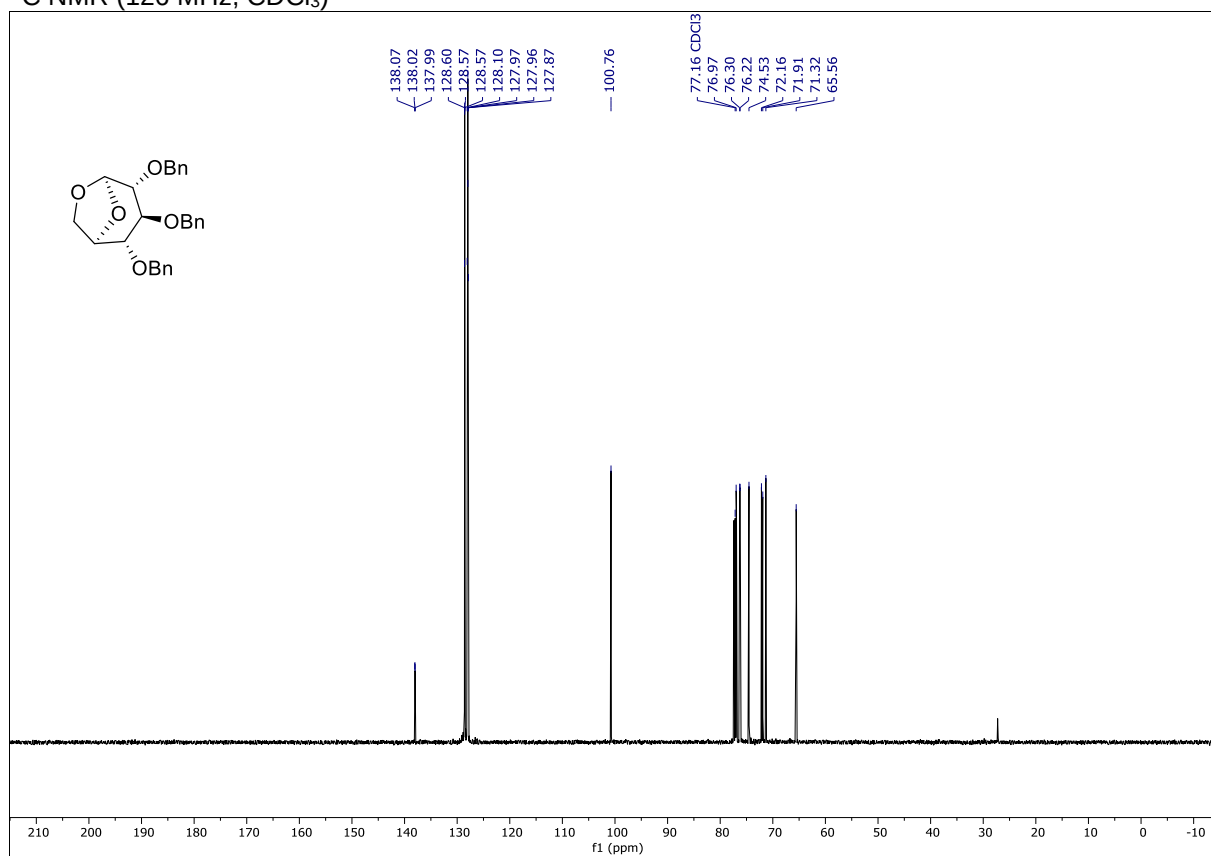


***β*-6**

¹H NMR (500 MHz, CDCl₃)

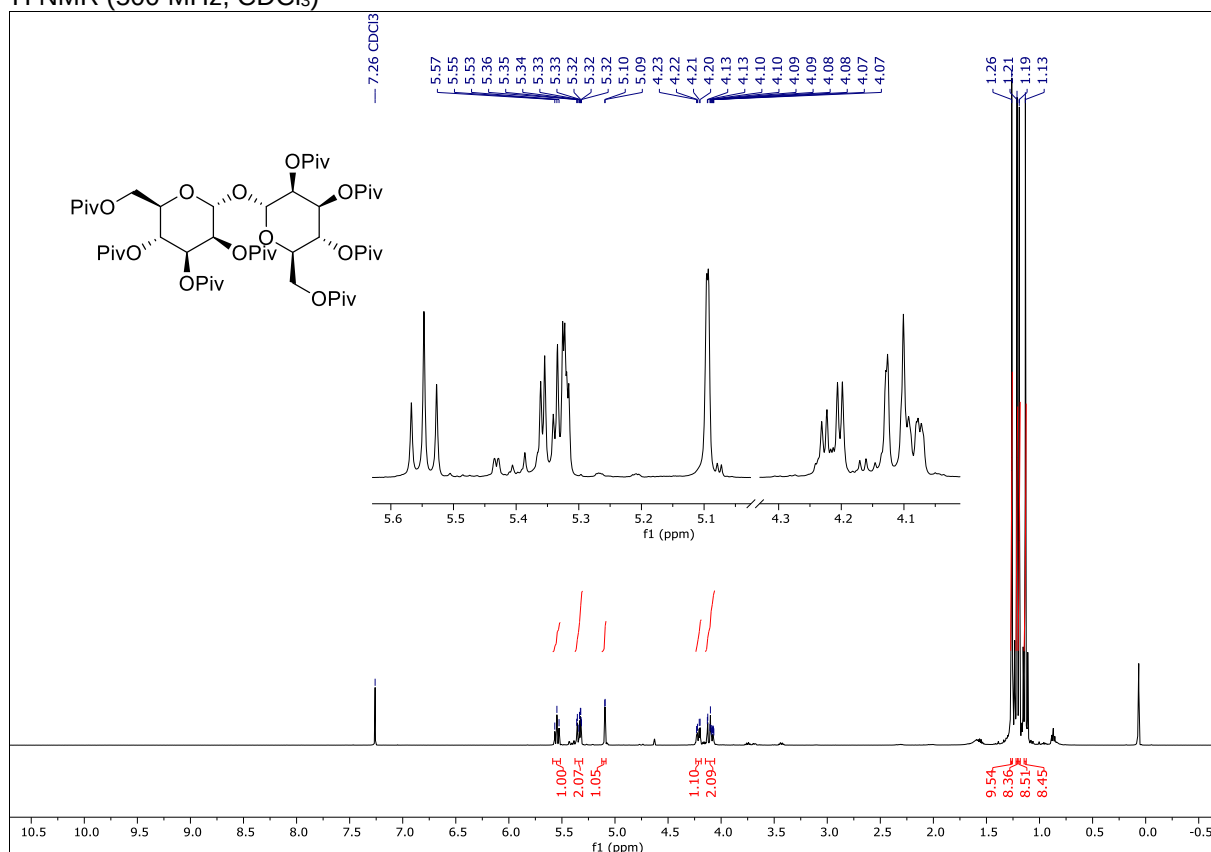


¹³C NMR (126 MHz, CDCl₃)

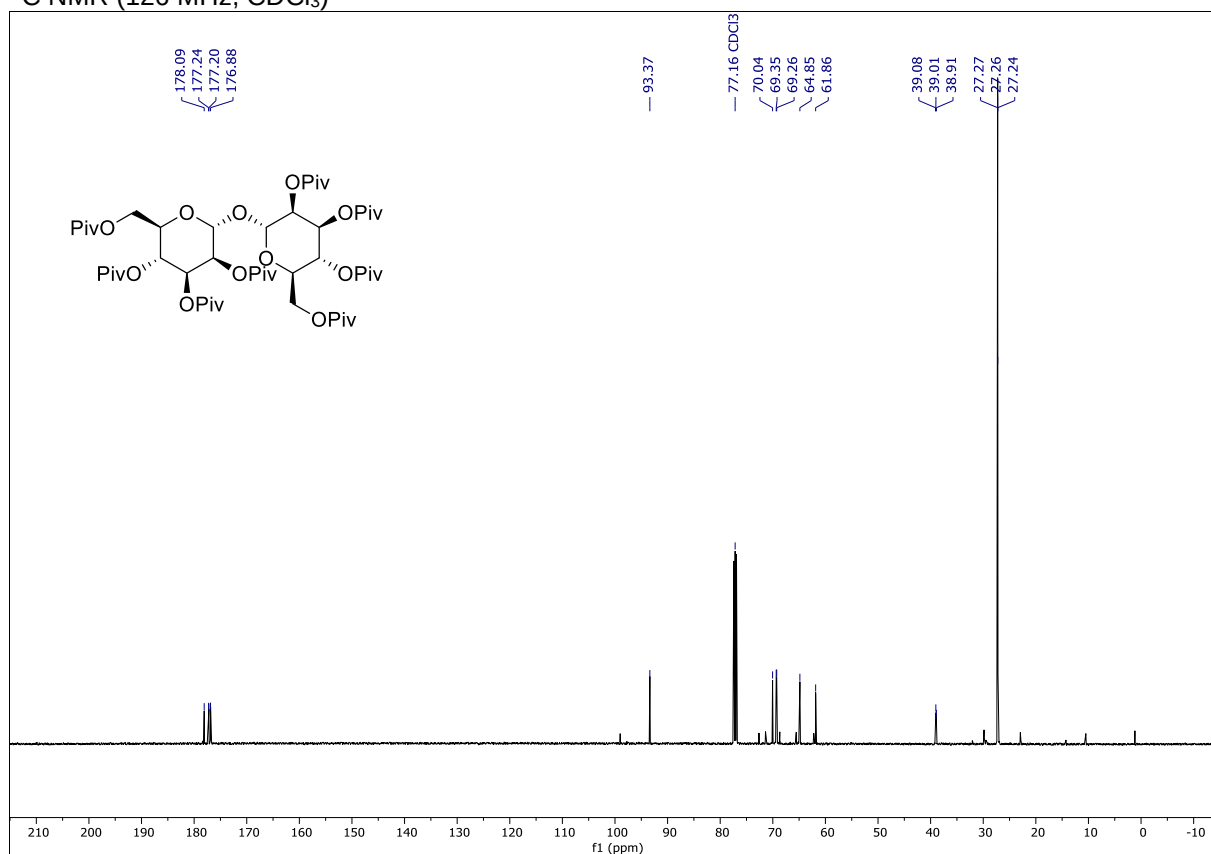


α, α -S14

^1H NMR (500 MHz, CDCl_3)

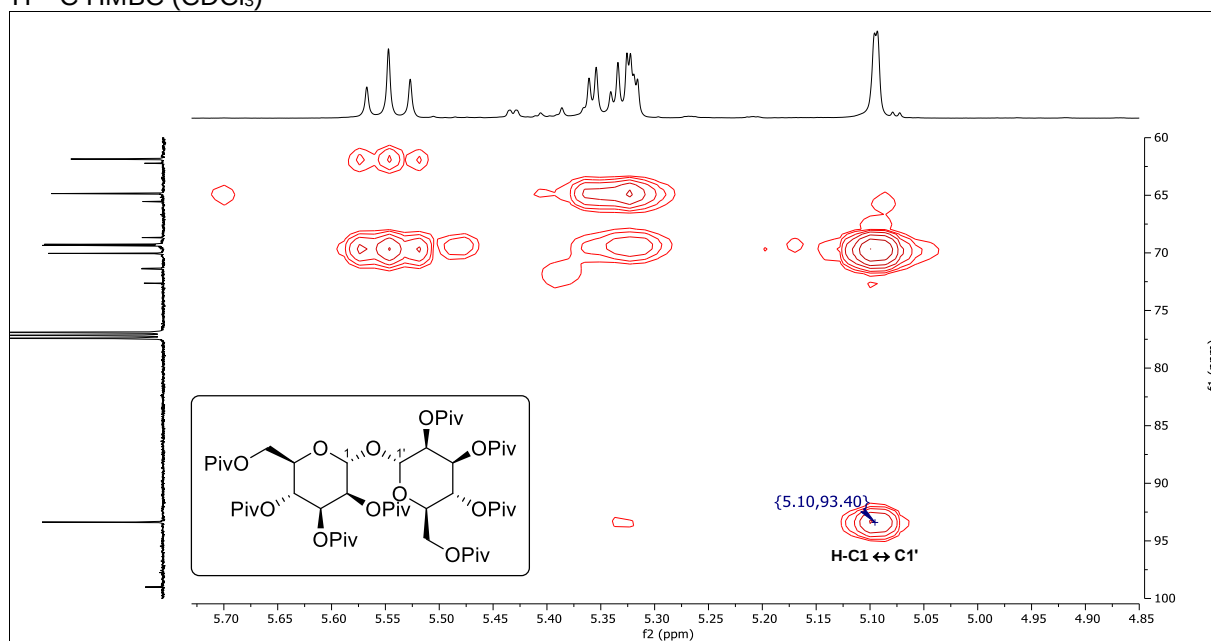


^{13}C NMR (126 MHz, CDCl_3)

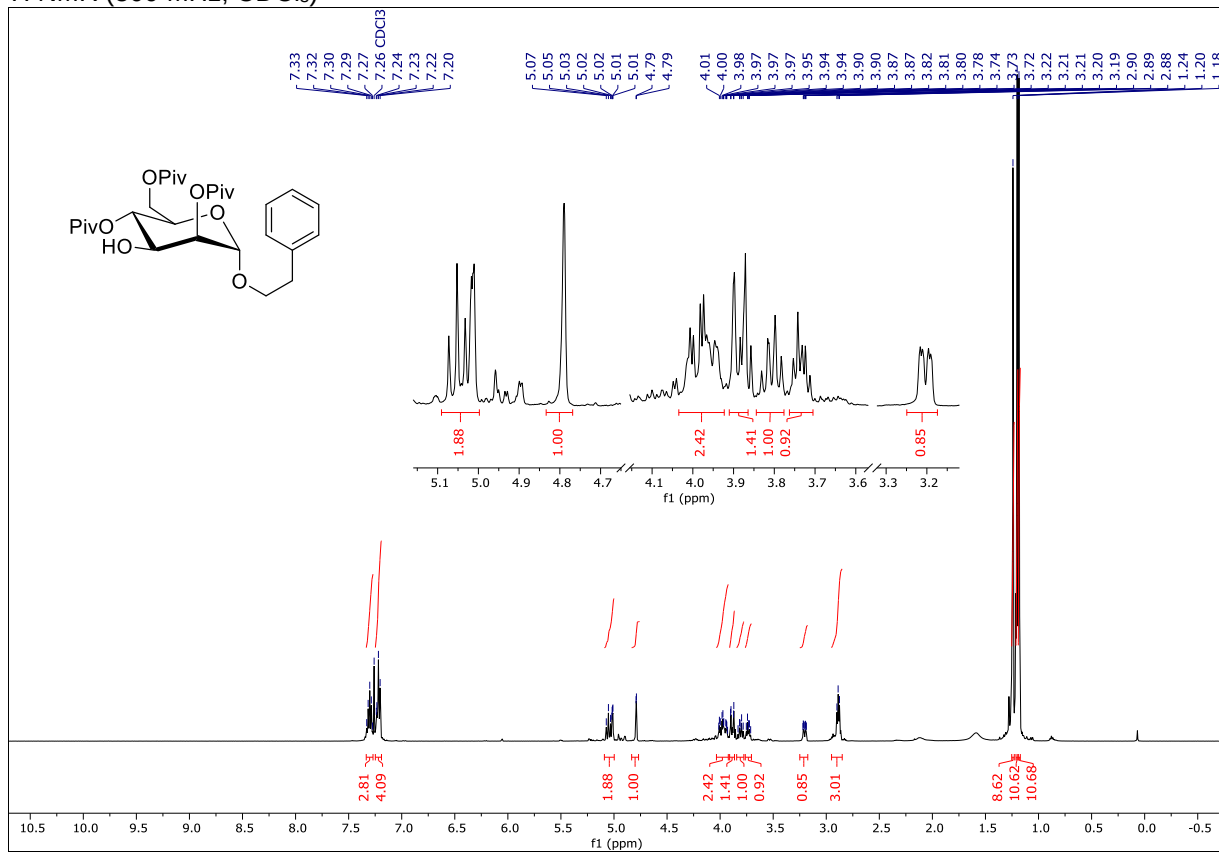
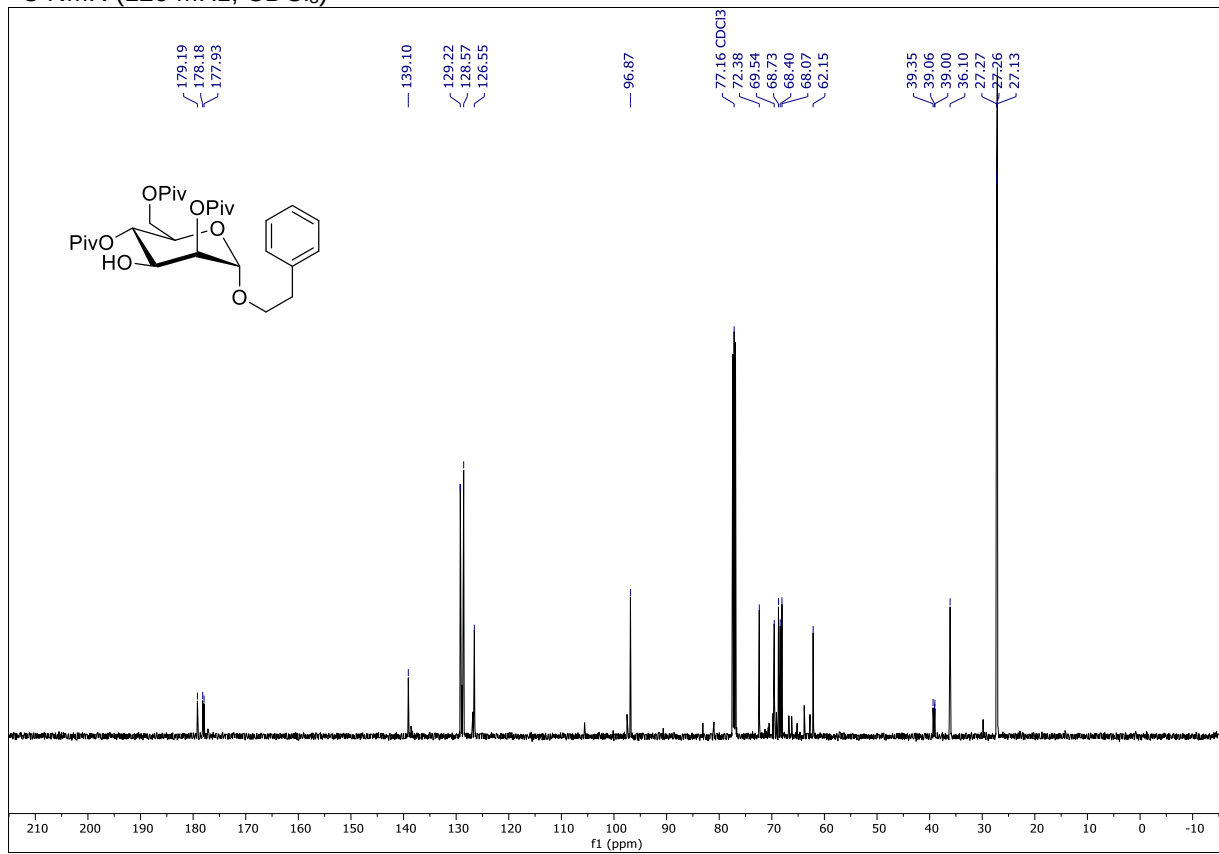


α, α -S14

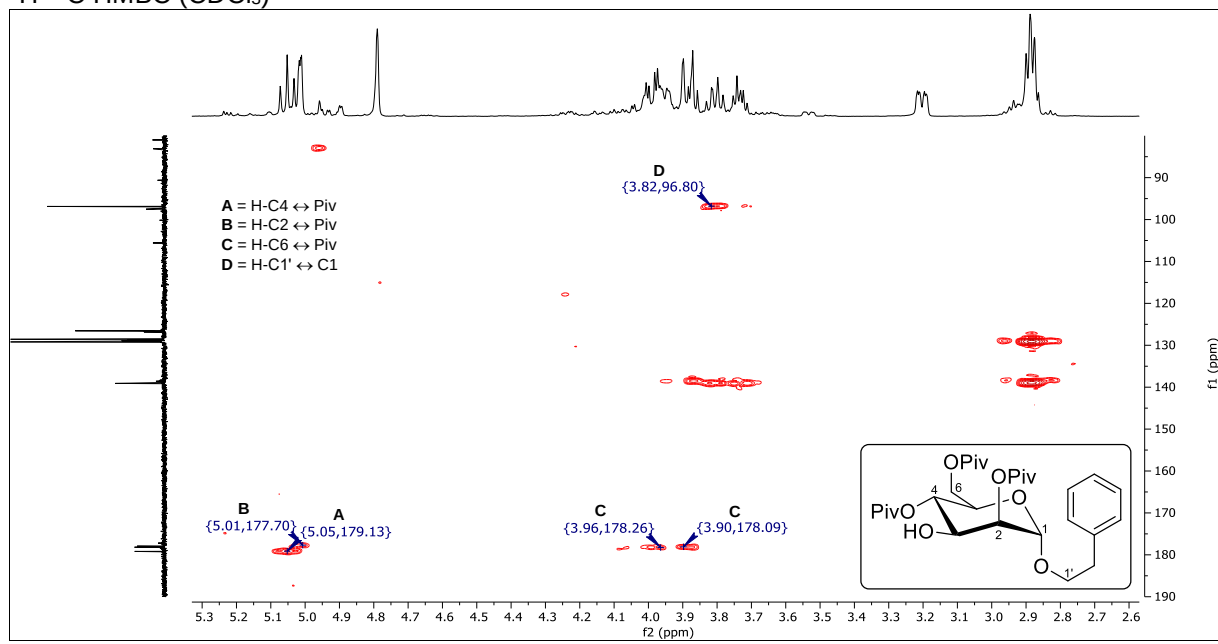
^1H - ^{13}C HMBC (CDCl_3)



***α*-S15**

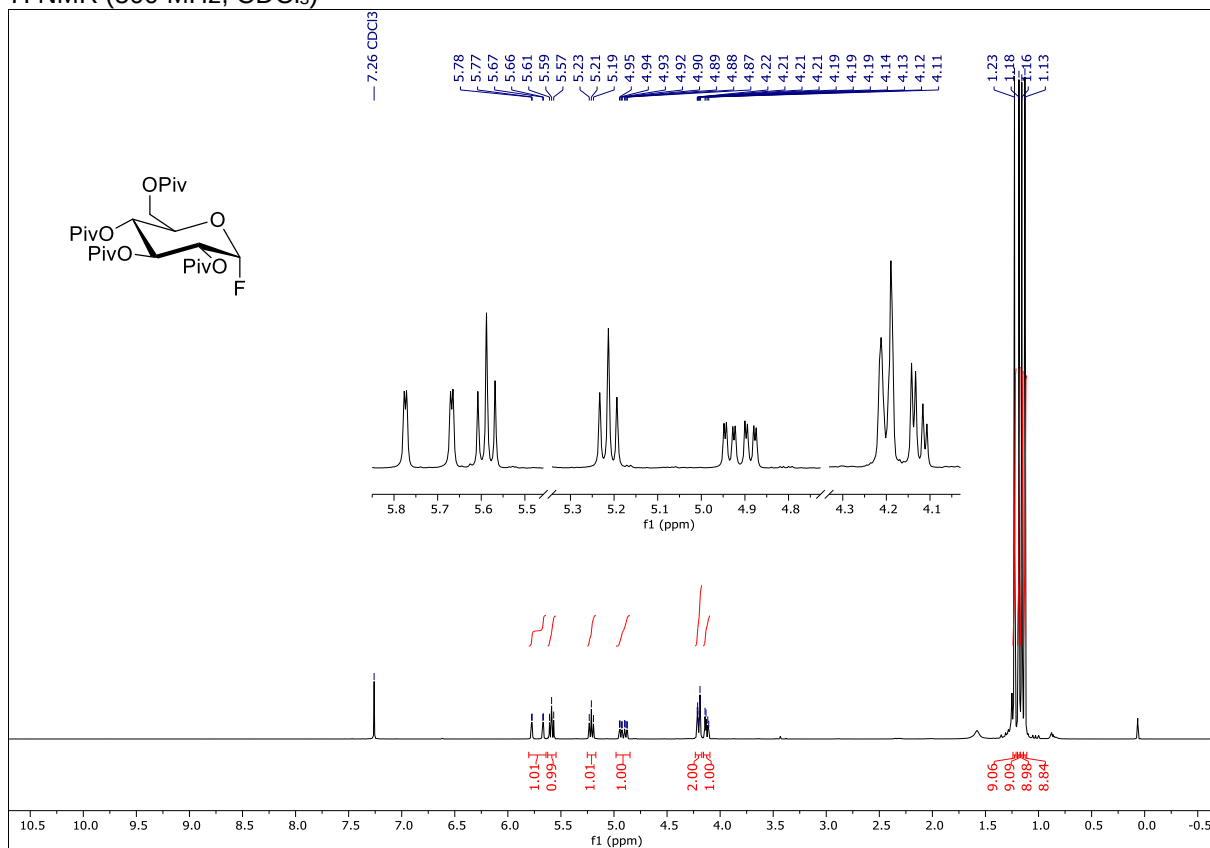
¹H NMR (500 MHz, CDCl₃) ^{13}C NMR (126 MHz, CDCl_3)

***α*-S15**

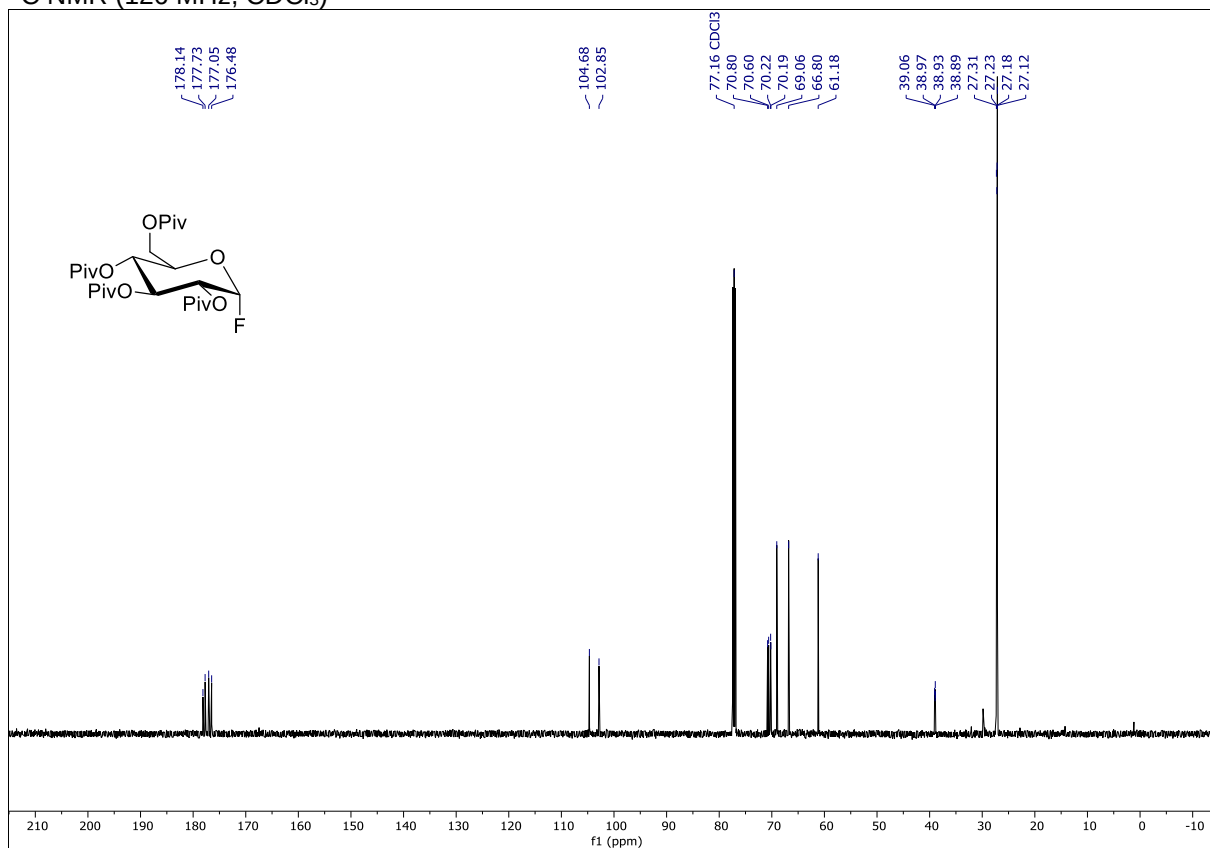
 ^1H - ^{13}C HMBC (CDCl_3)

α -S16

^1H NMR (500 MHz, CDCl_3)

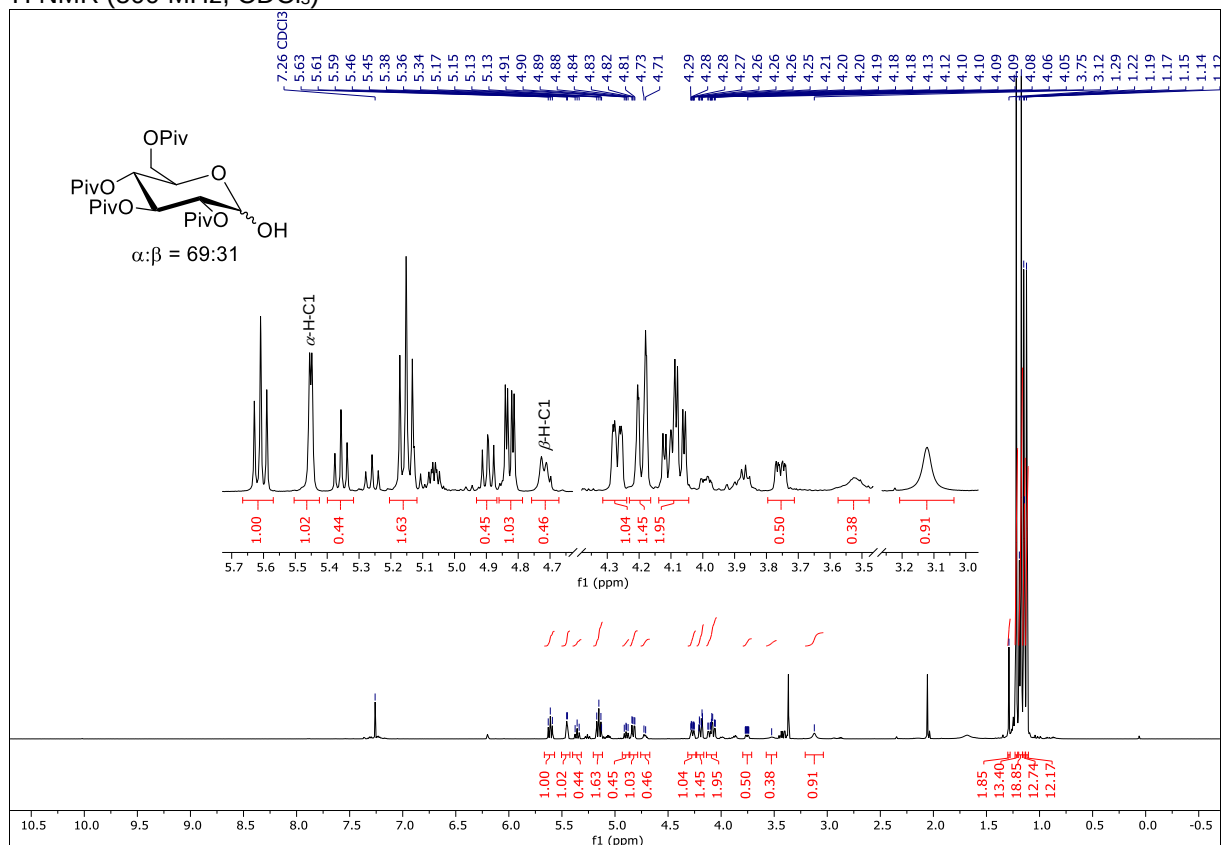


^{13}C NMR (126 MHz, CDCl_3)

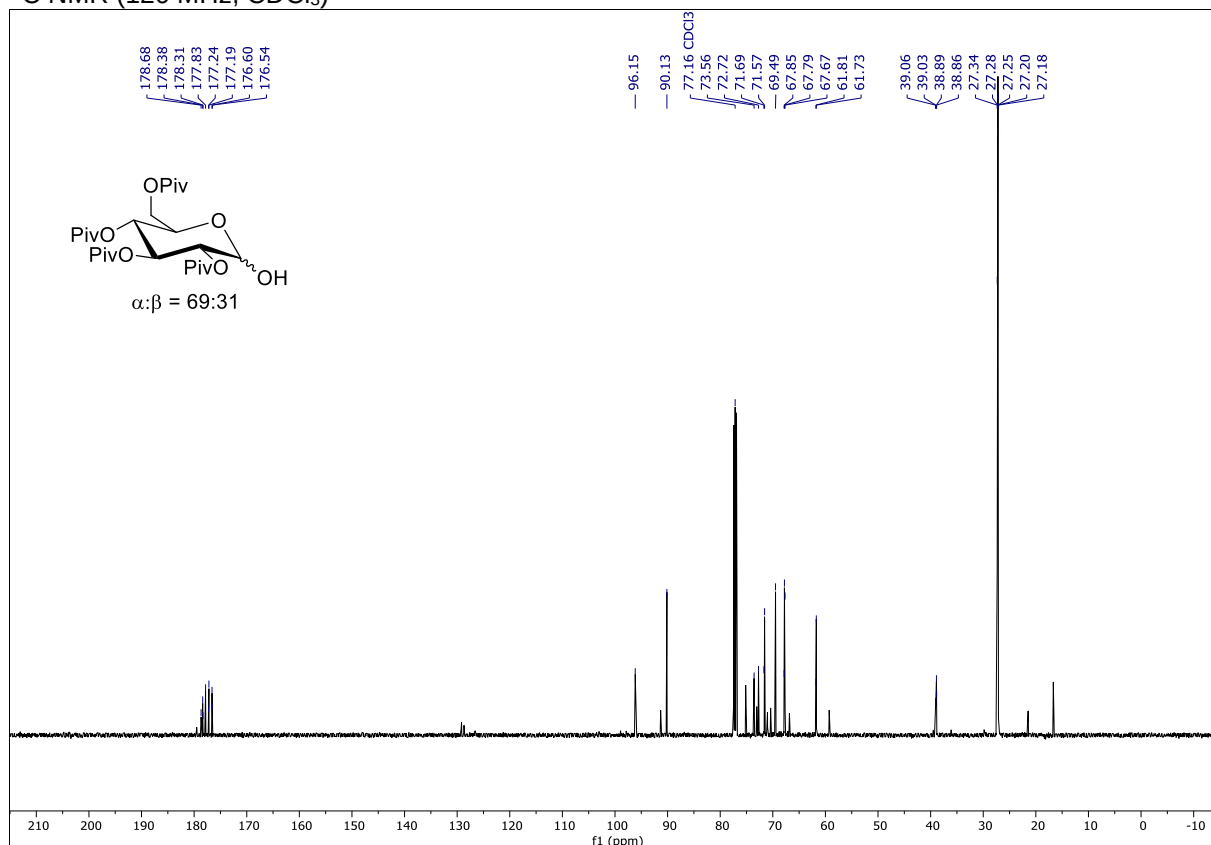


S17

^1H NMR (500 MHz, CDCl_3)

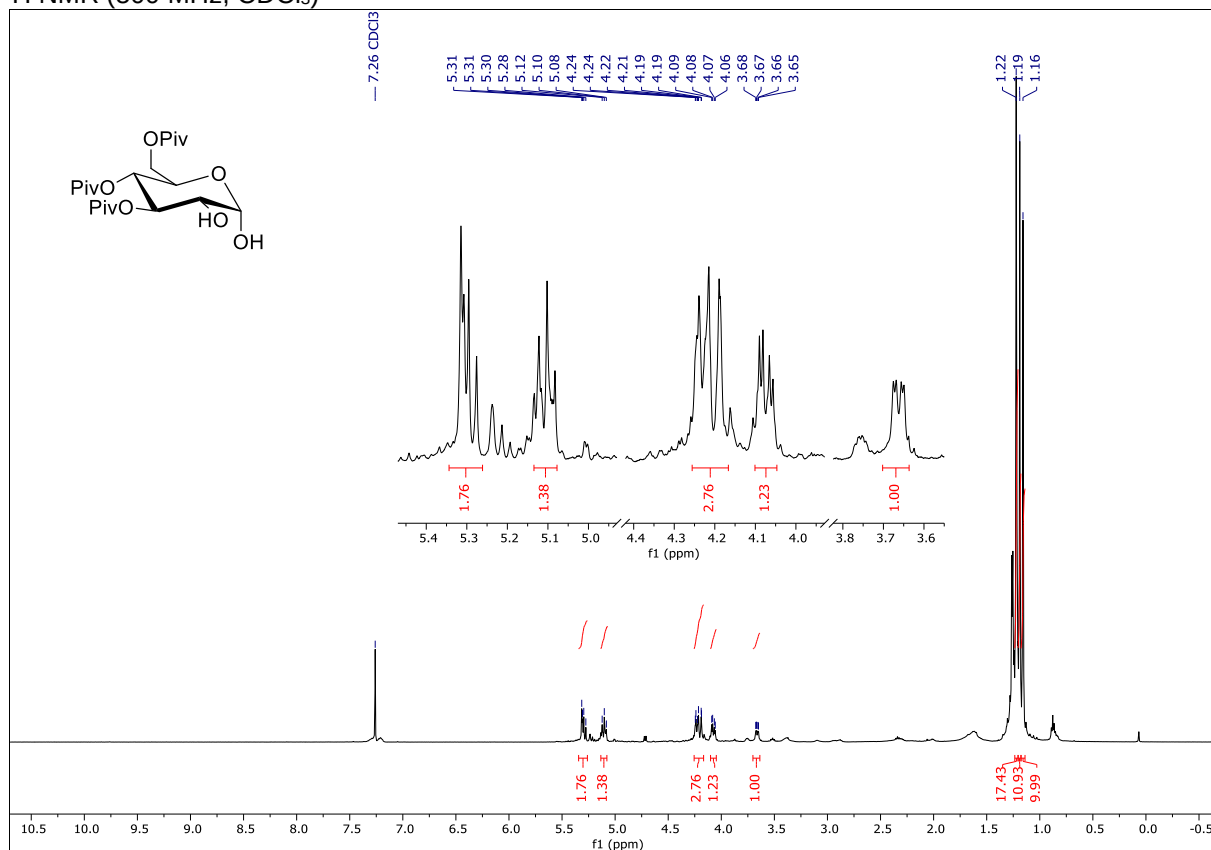


^{13}C NMR (126 MHz, CDCl_3)

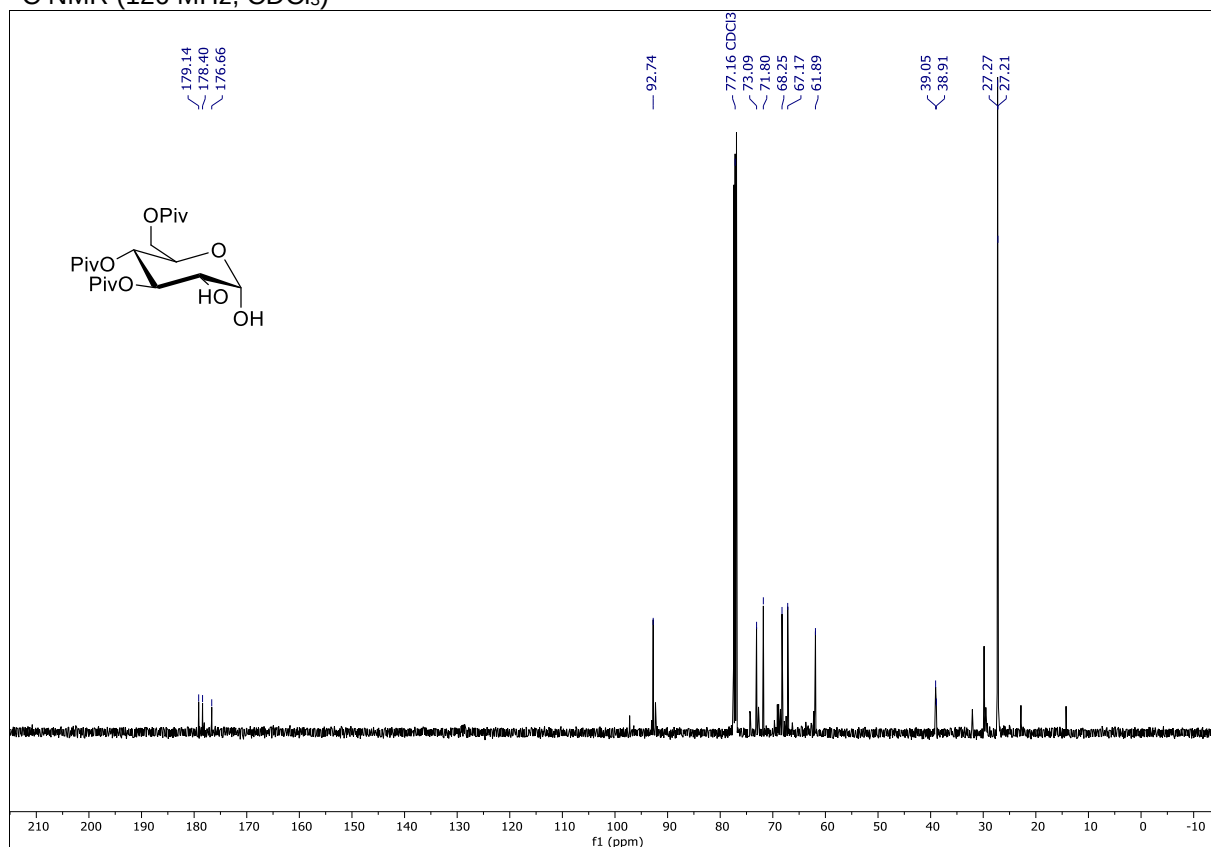


α -S18

^1H NMR (500 MHz, CDCl_3)

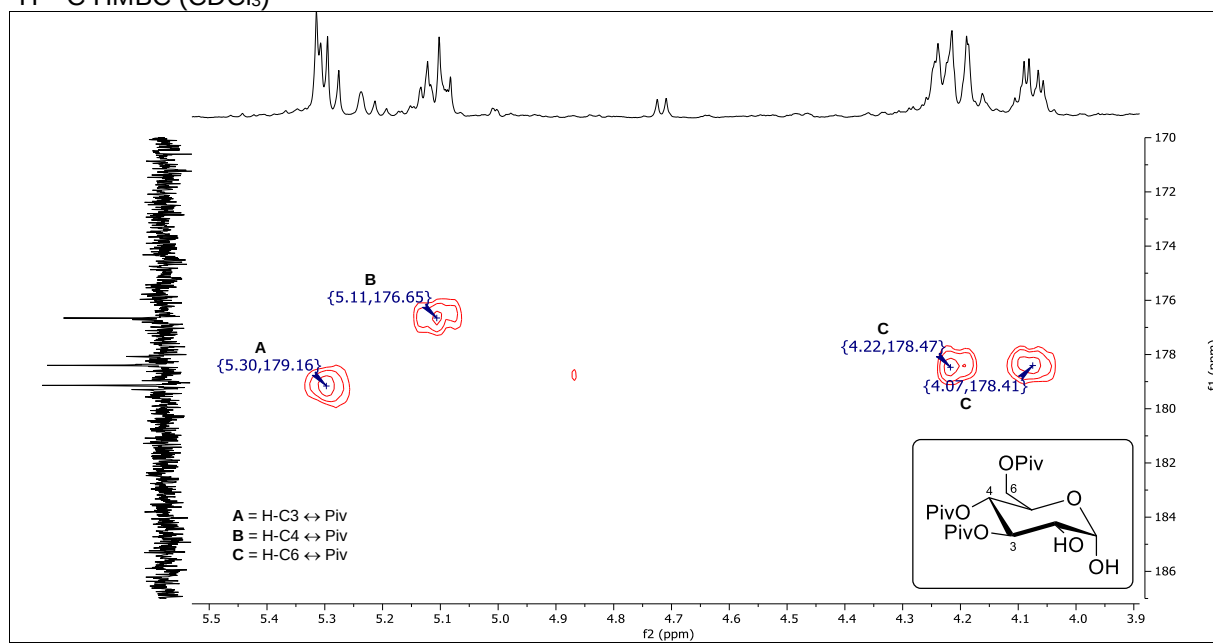


^{13}C NMR (126 MHz, CDCl_3)



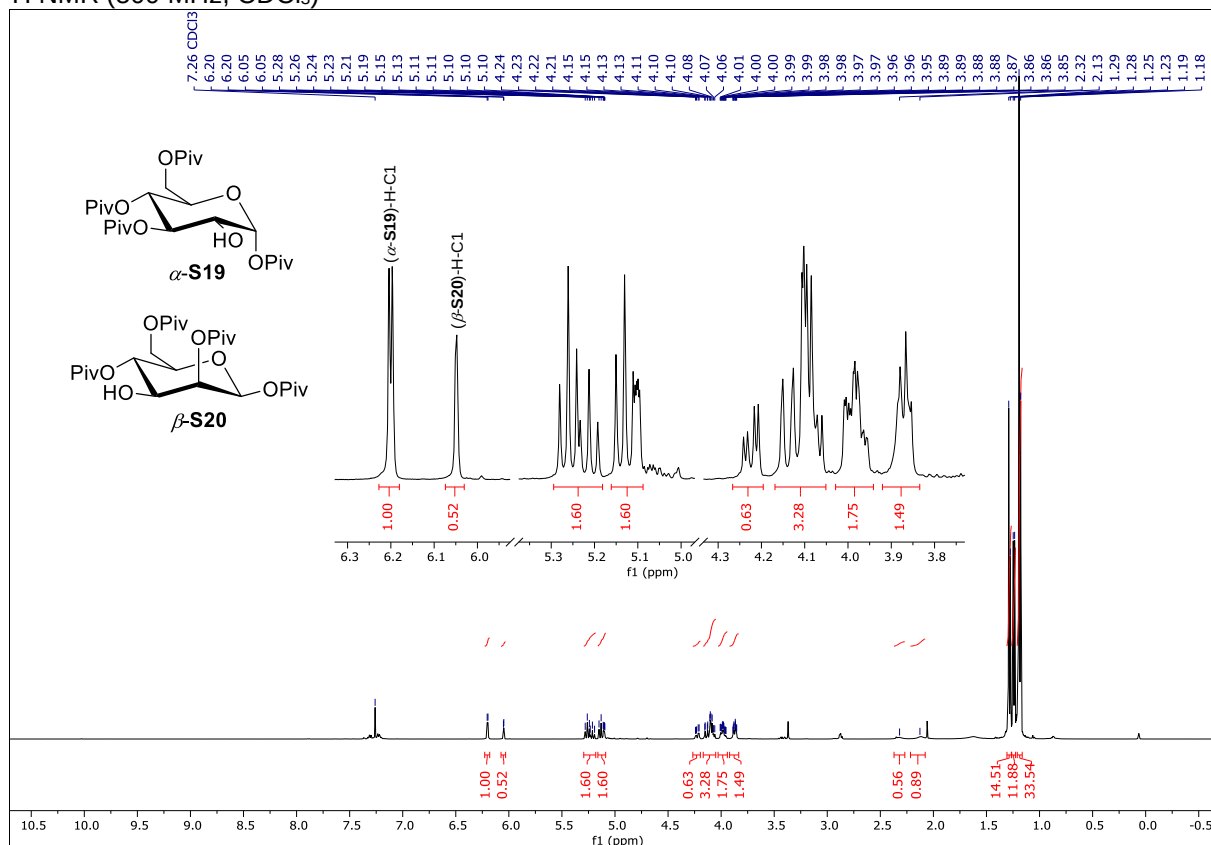
α -S18

^1H - ^{13}C HMBC (CDCl_3)

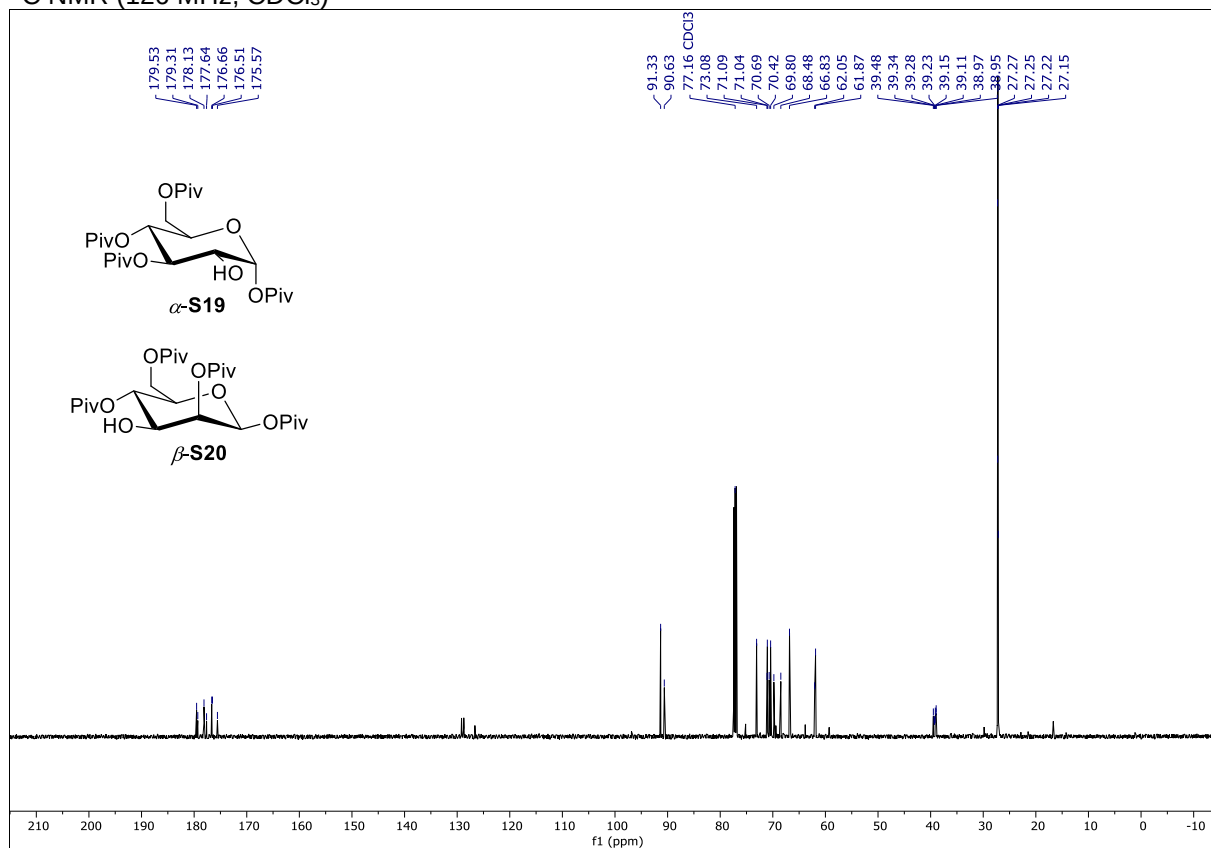


α -S19 & β -S20 (66:34)

^1H NMR (500 MHz, CDCl_3)

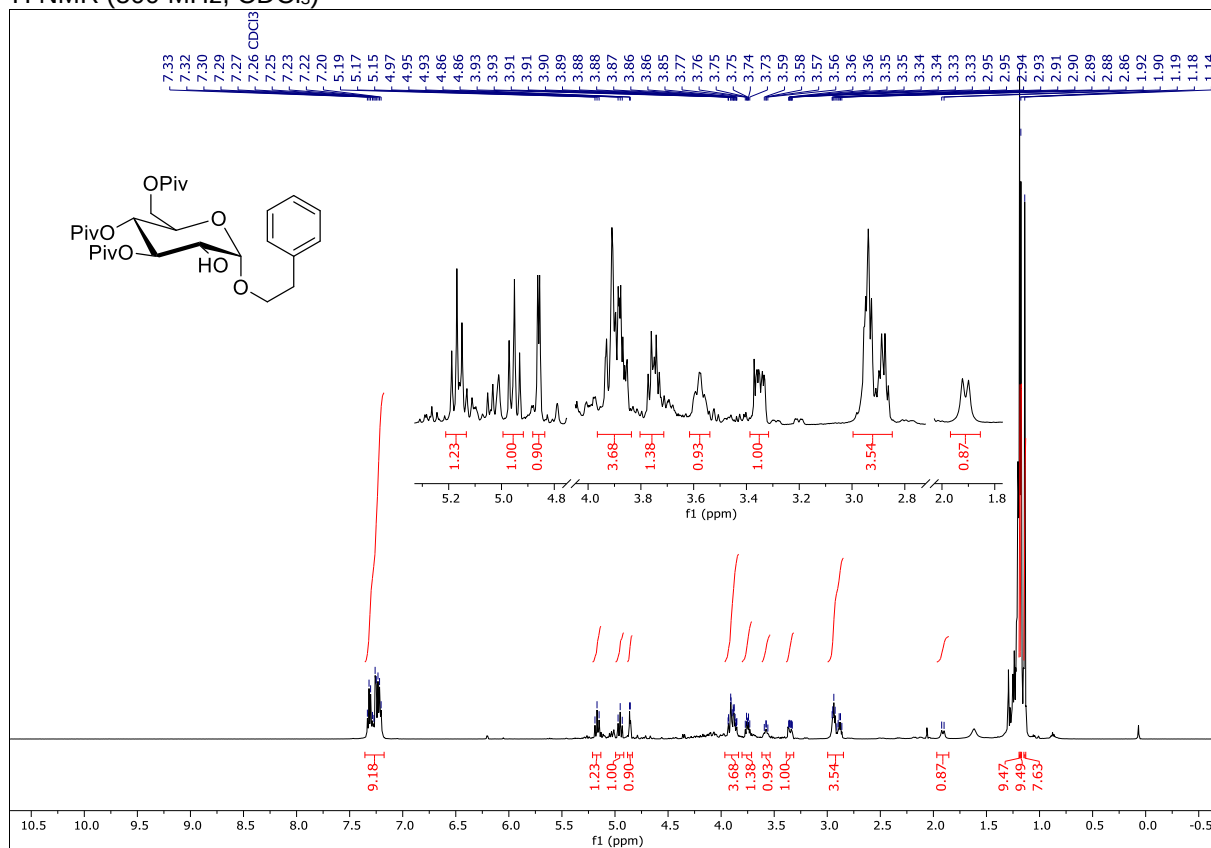


^{13}C NMR (126 MHz, CDCl_3)

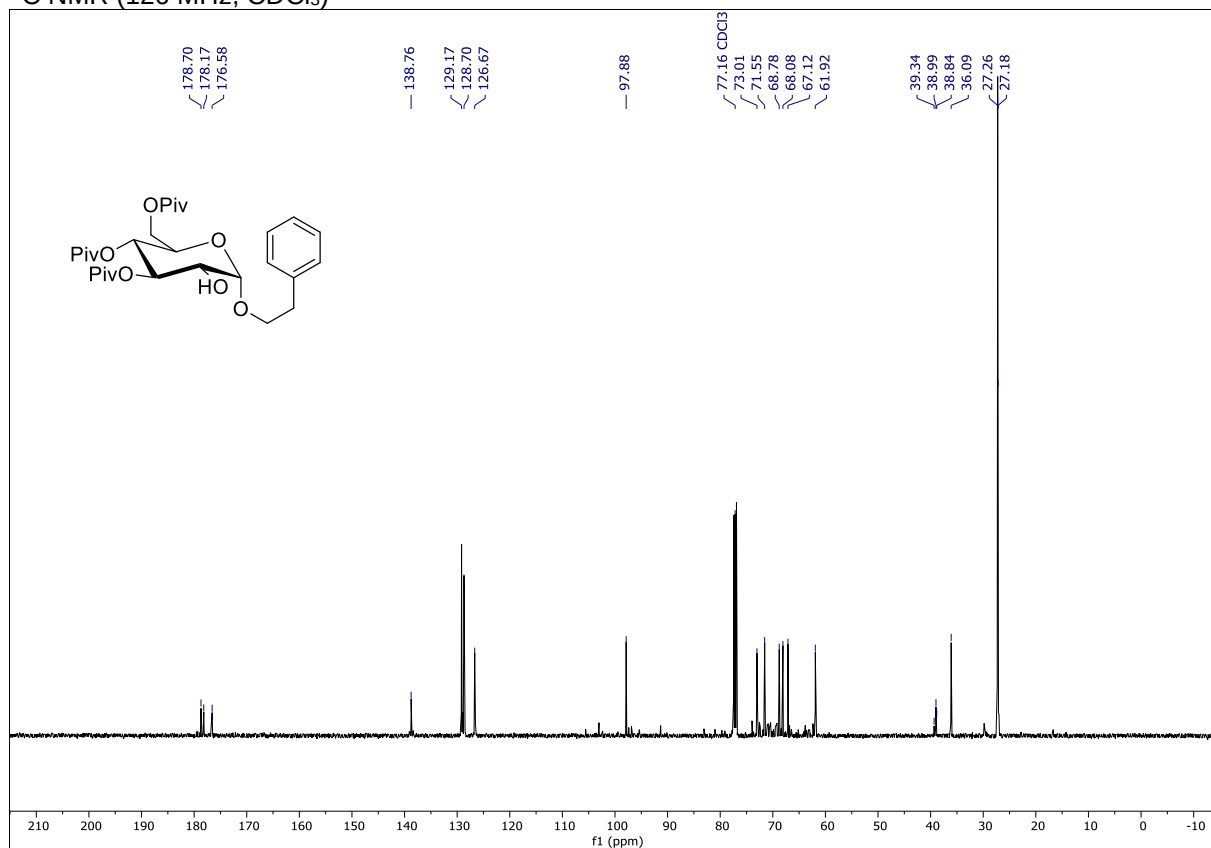


α -S21

^1H NMR (500 MHz, CDCl_3)

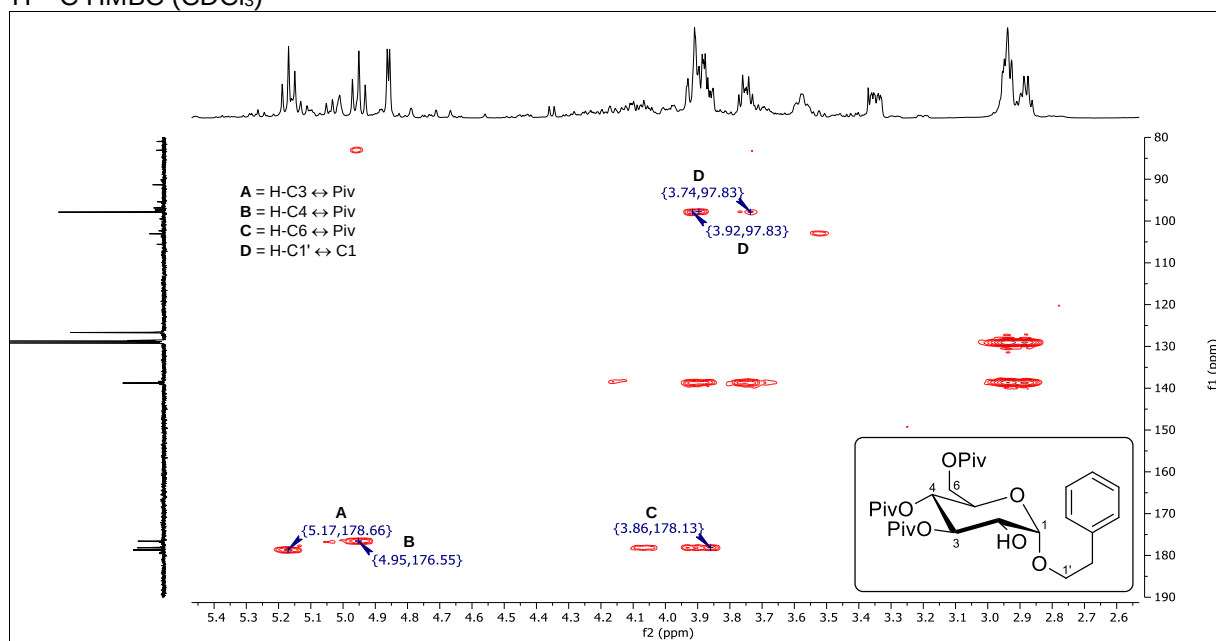


^{13}C NMR (126 MHz, CDCl_3)



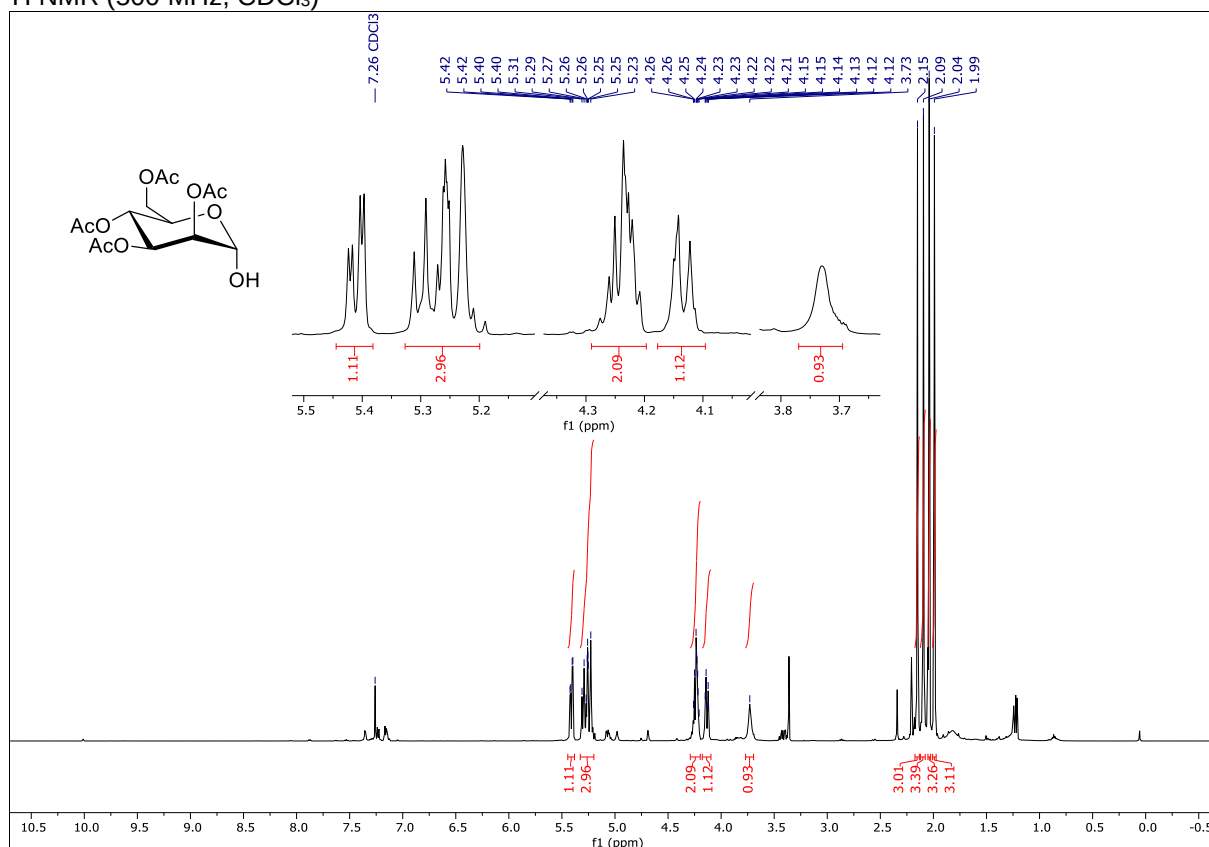
α -S21

^1H - ^{13}C HMBC (CDCl_3)

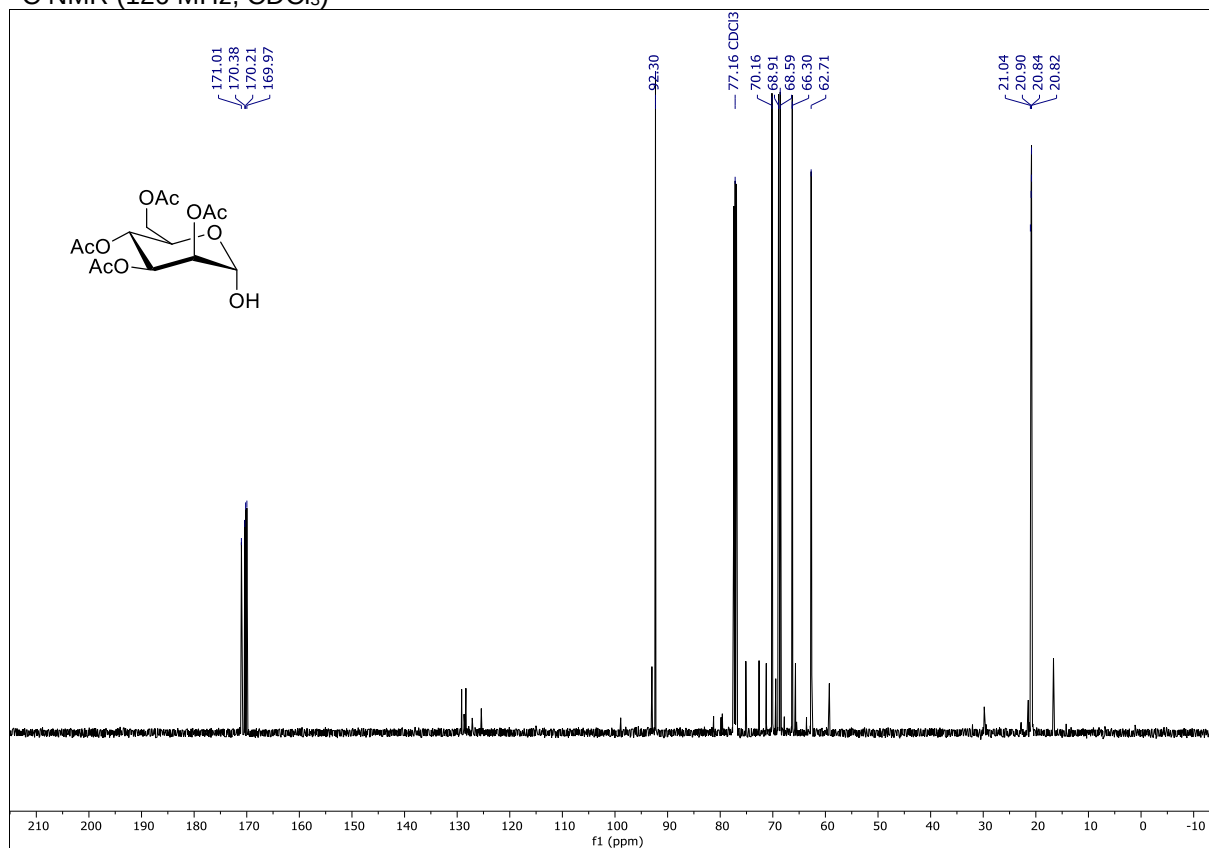


α -S22

¹H NMR (500 MHz, CDCl₃)

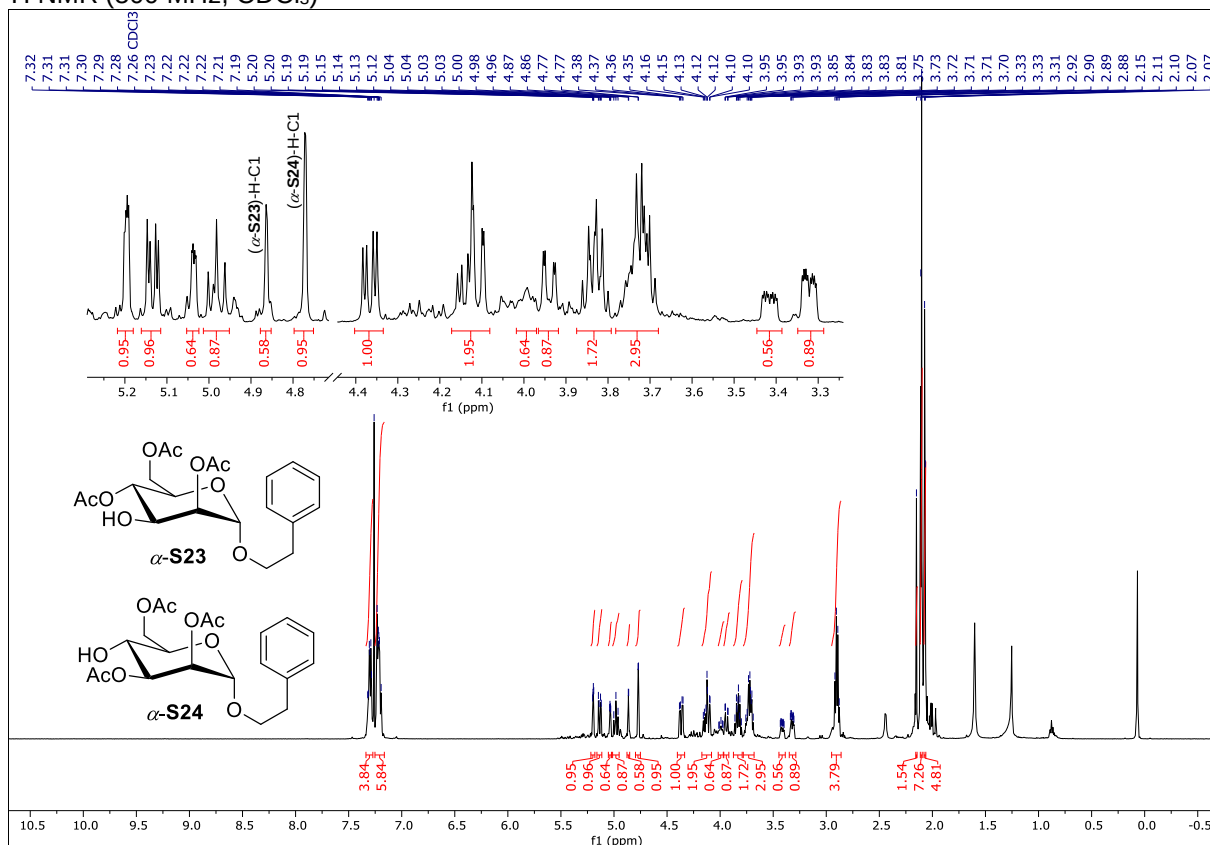


¹³C NMR (126 MHz, CDCl₃)

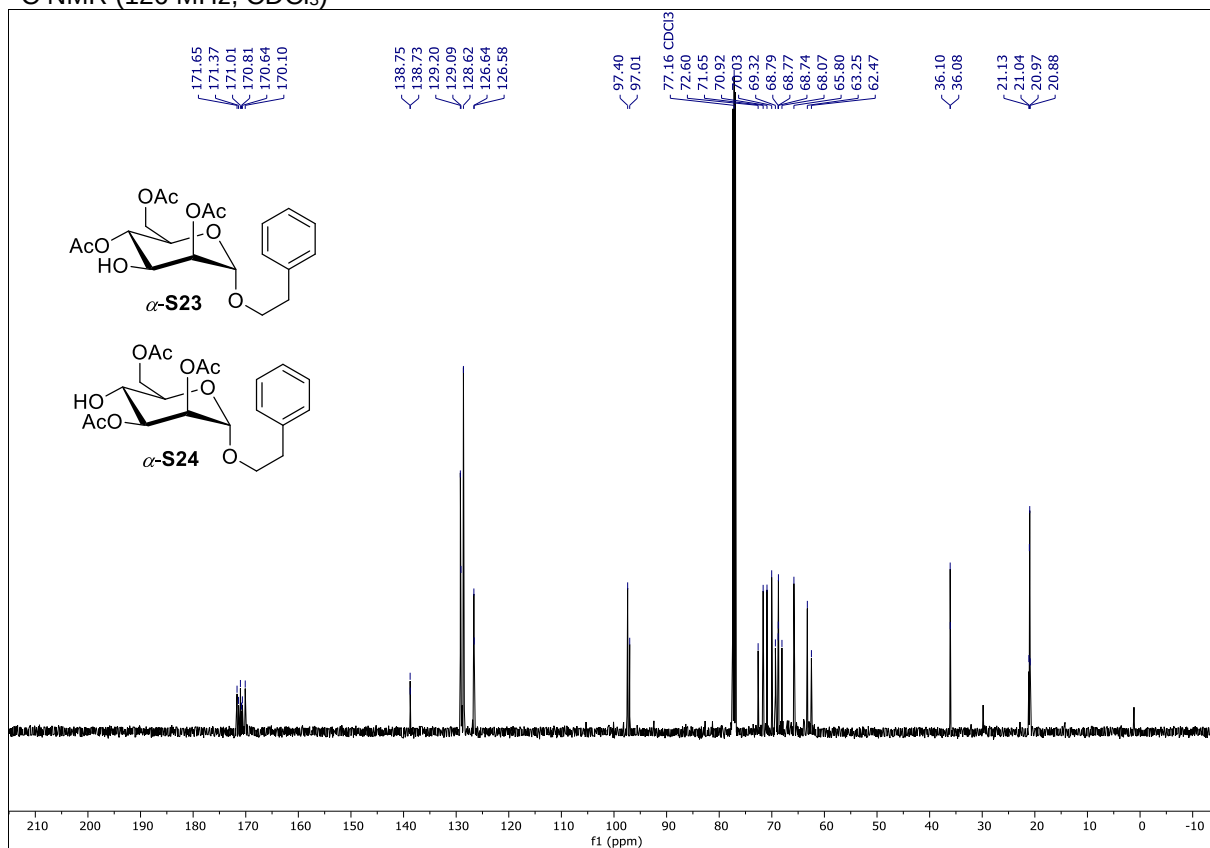


α -S23 & α -S24 (36:64)

^1H NMR (500 MHz, CDCl_3)

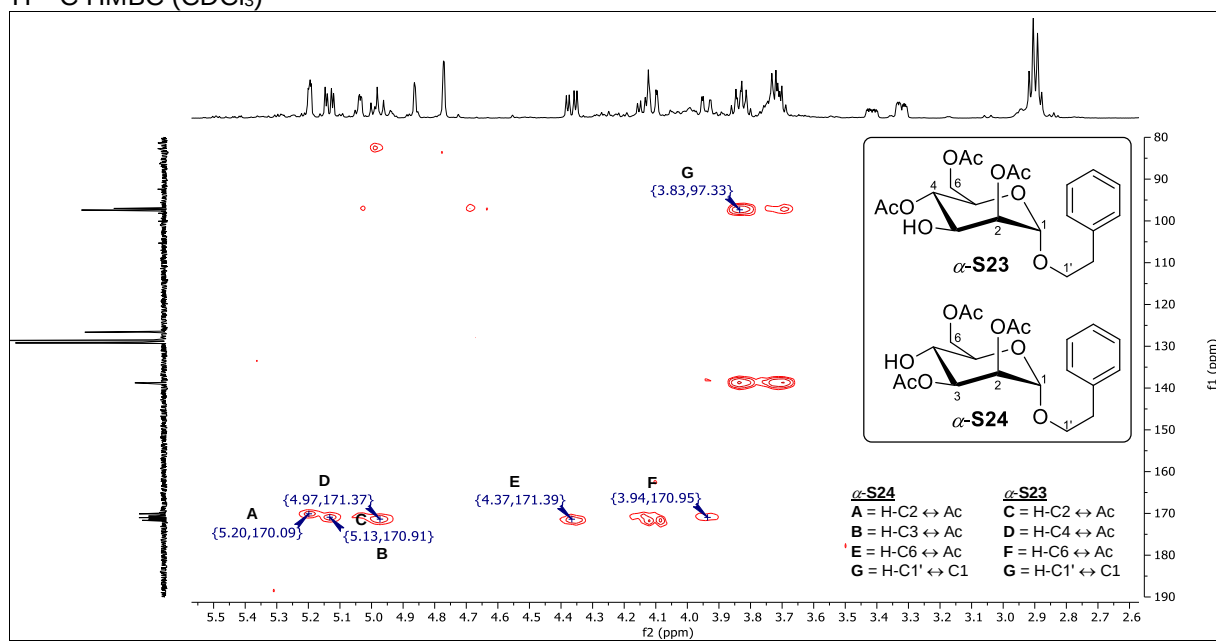


^{13}C NMR (126 MHz, CDCl_3)



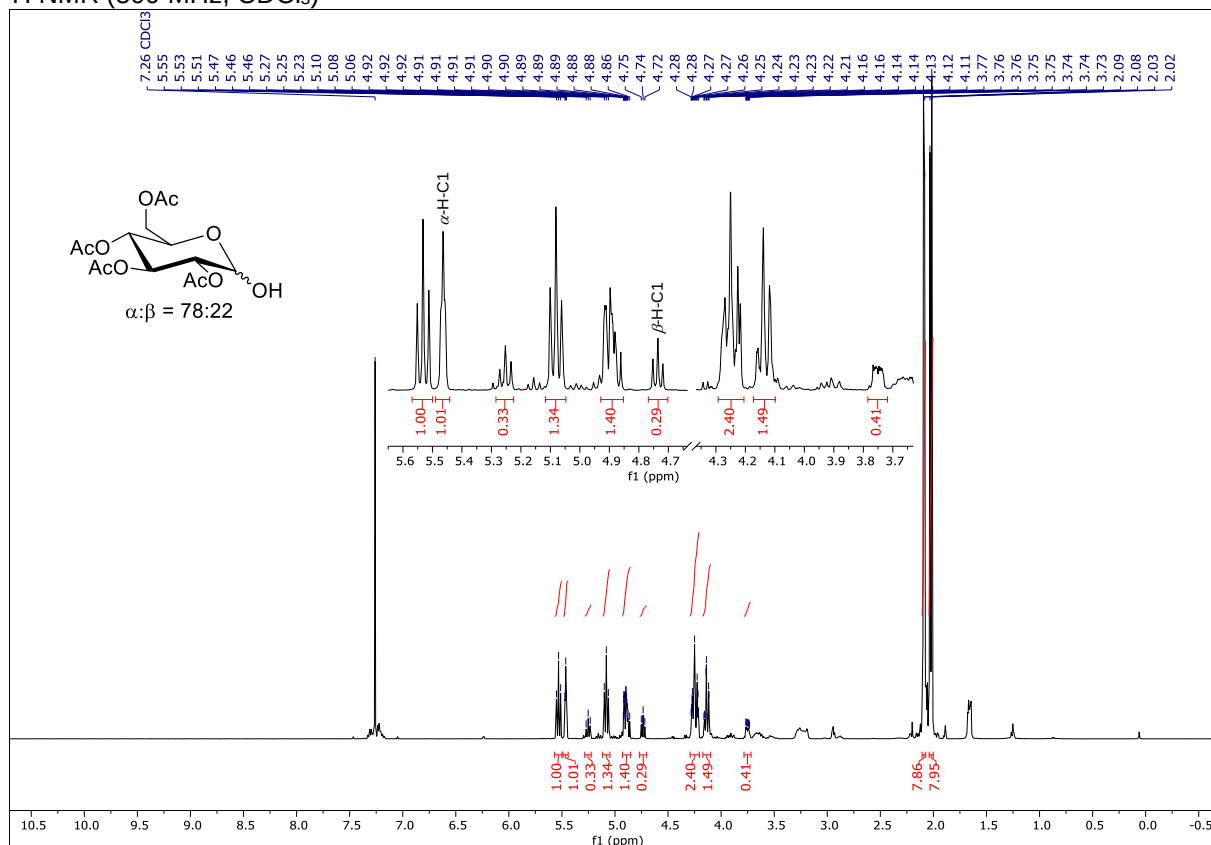
α -S23 & α -S24

^1H - ^{13}C HMBC (CDCl_3)

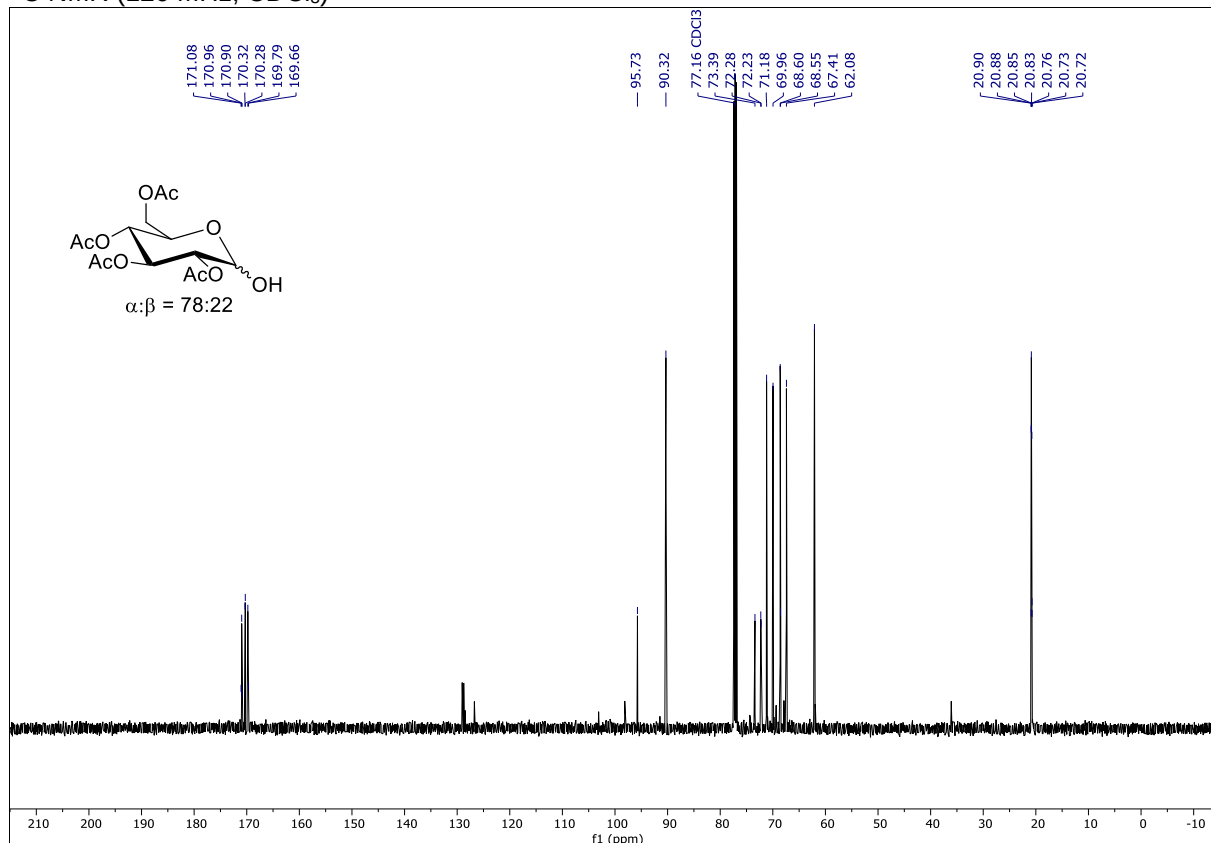


S25

¹H NMR (500 MHz, CDCl₃)

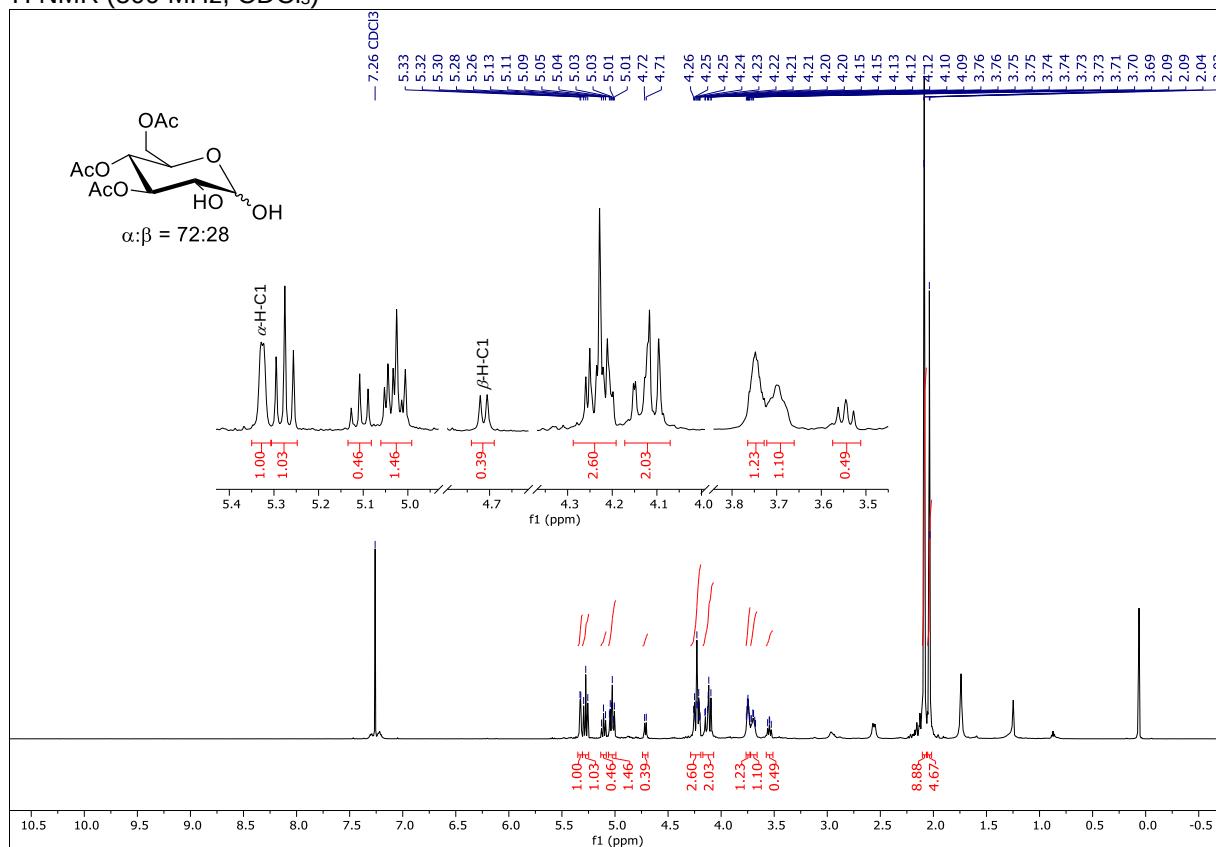


¹³C NMR (126 MHz, CDCl₃)

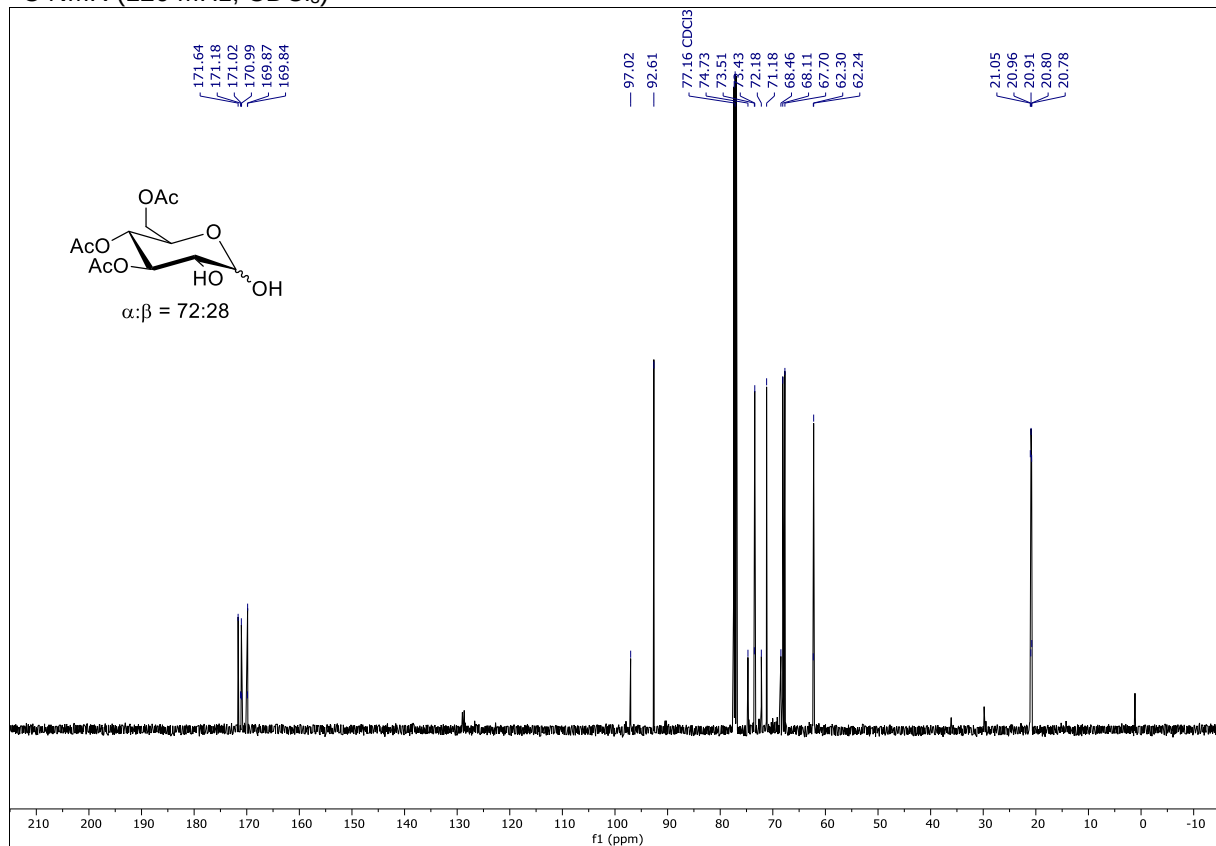


S26

^1H NMR (500 MHz, CDCl_3)

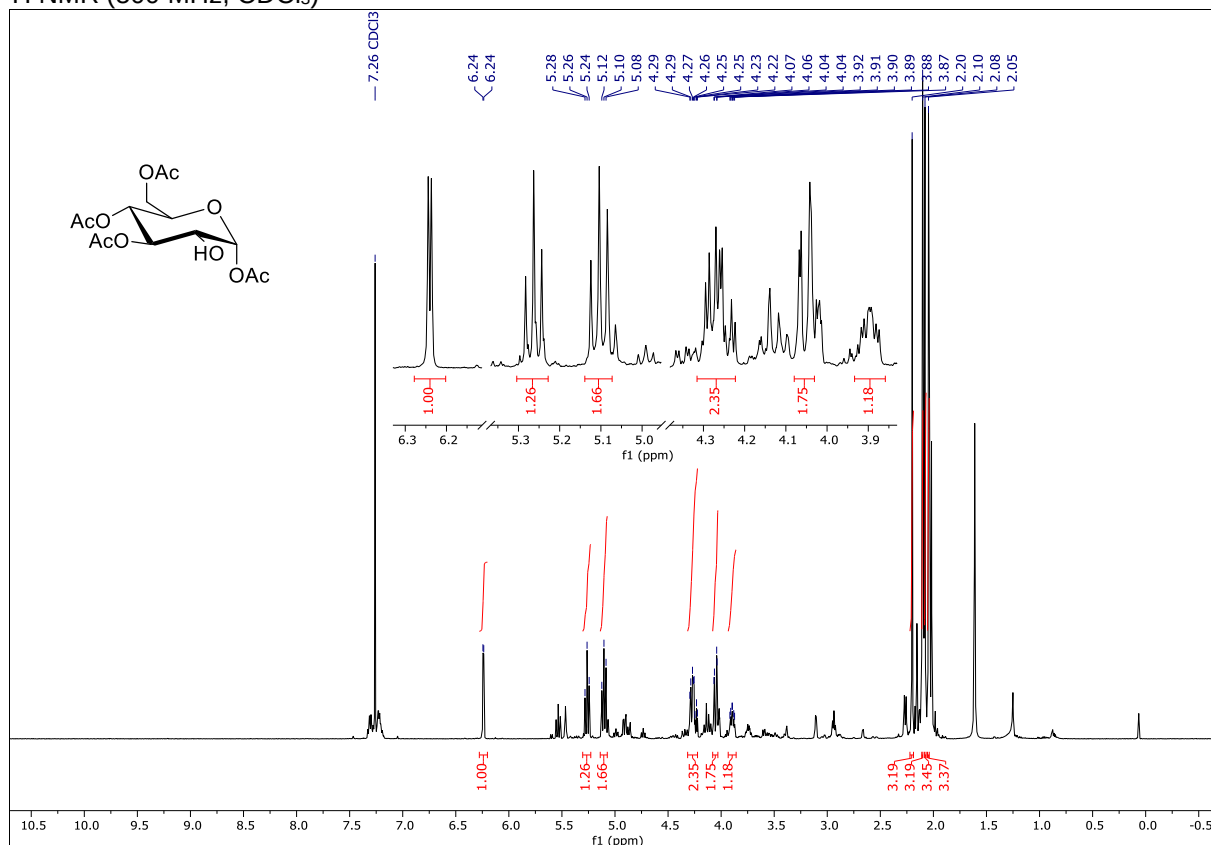


^{13}C NMR (126 MHz, CDCl_3)

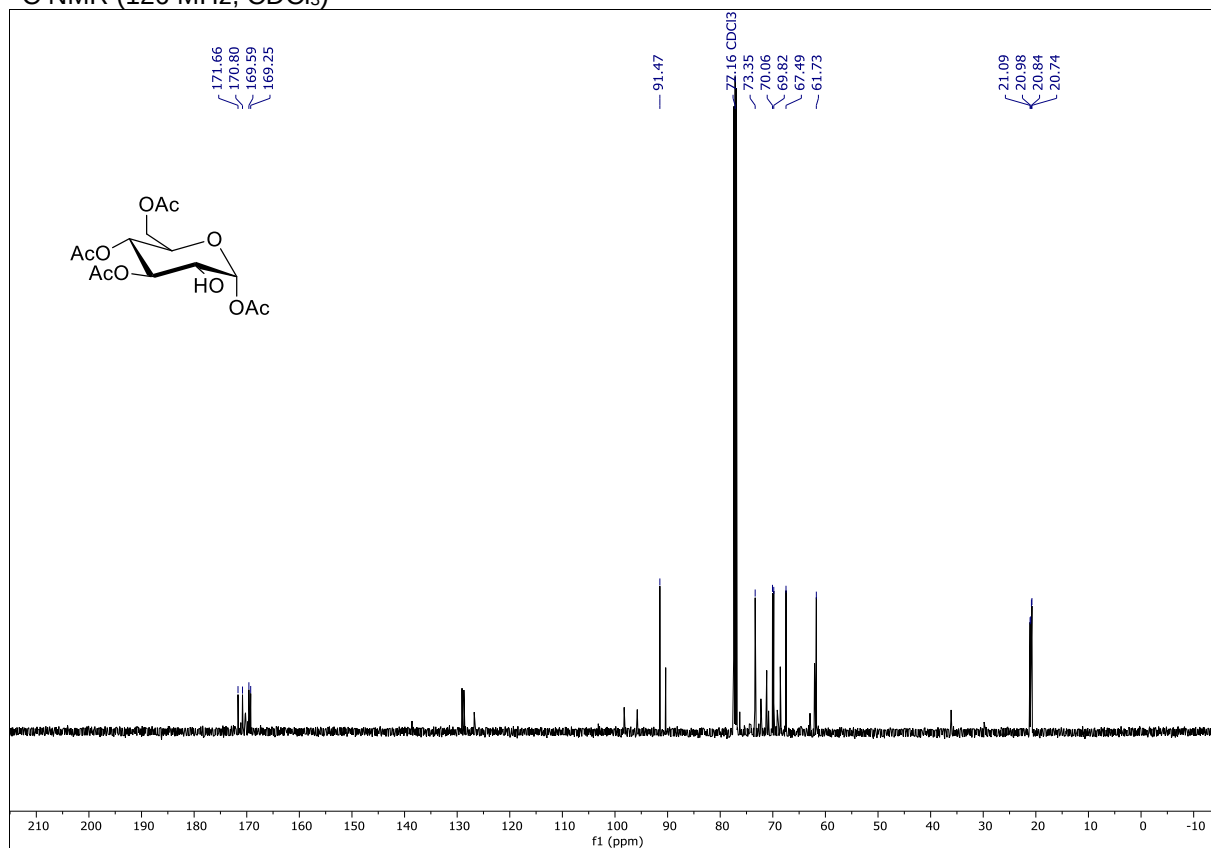


α -S27

^1H NMR (500 MHz, CDCl_3)

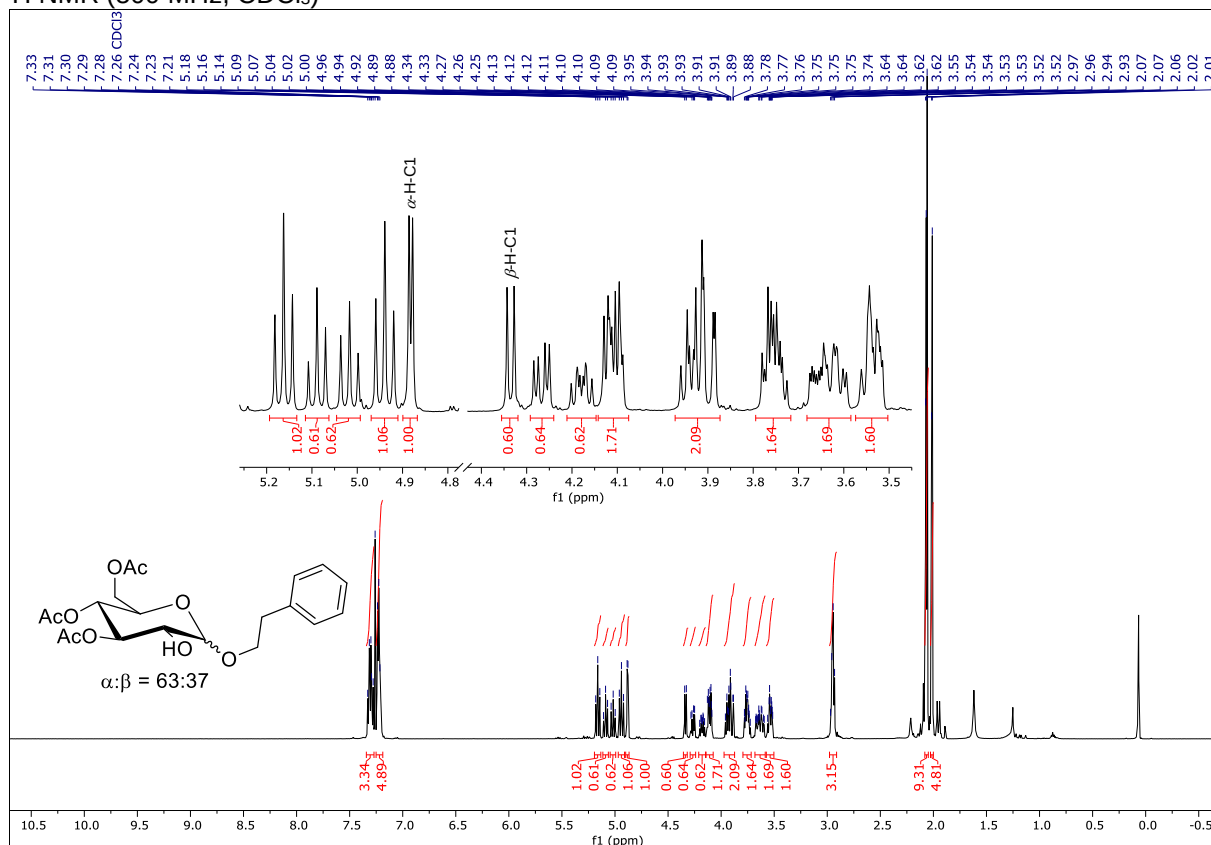


^{13}C NMR (126 MHz, CDCl_3)

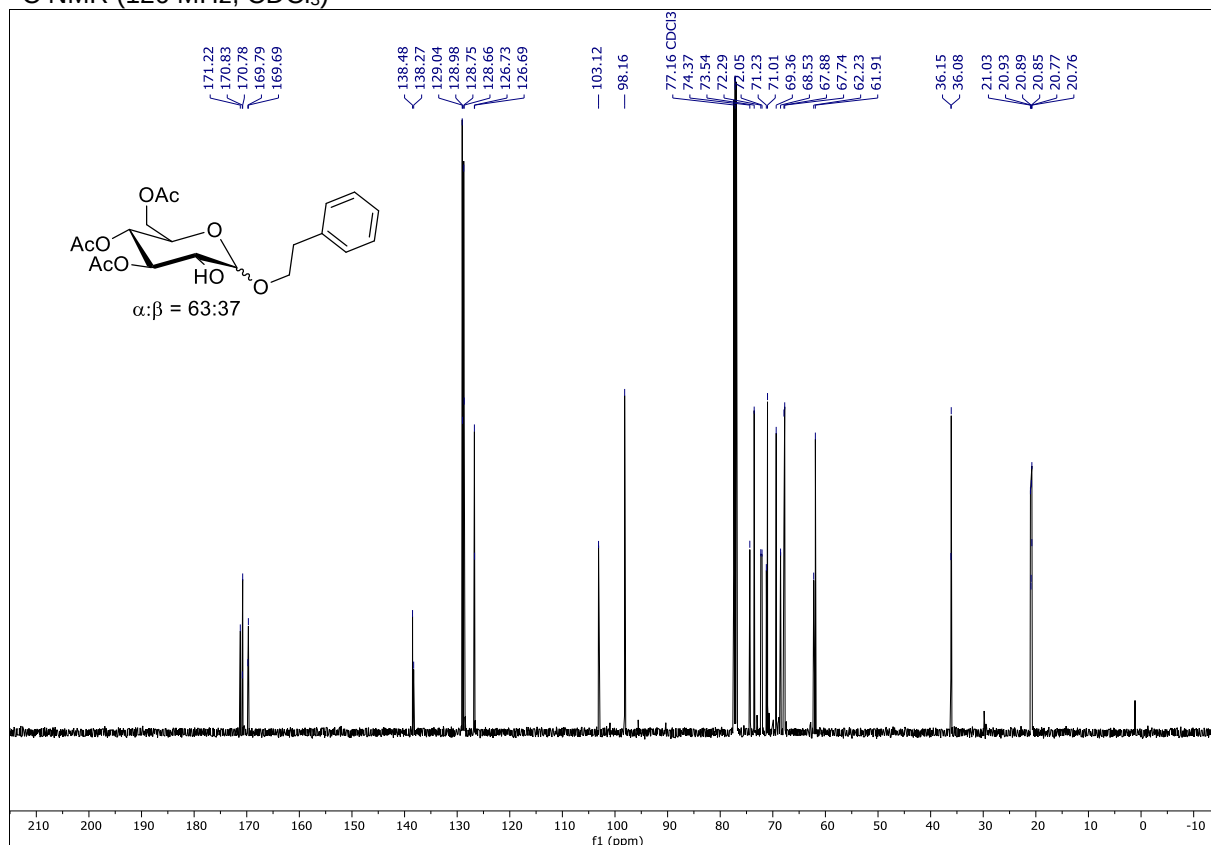


S28

¹H NMR (500 MHz, CDCl₃)

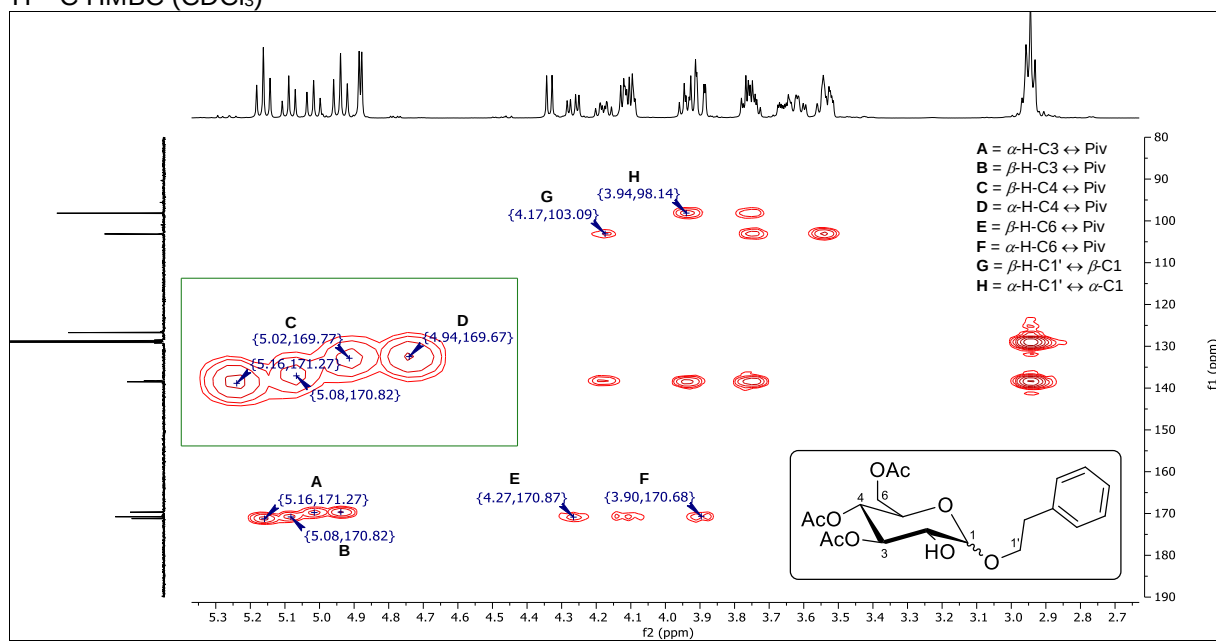


¹³C NMR (126 MHz, CDCl₃)



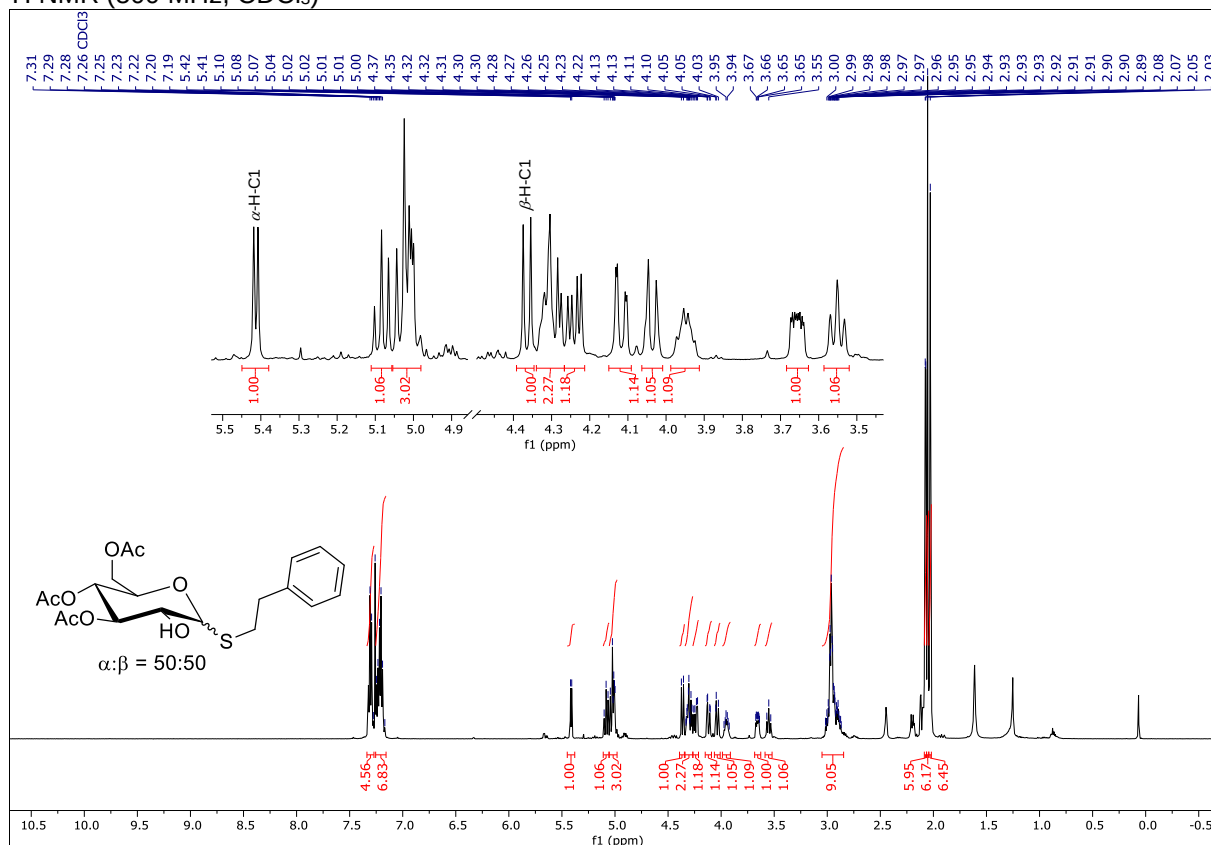
S28

^1H - ^{13}C HMBC (CDCl₃)

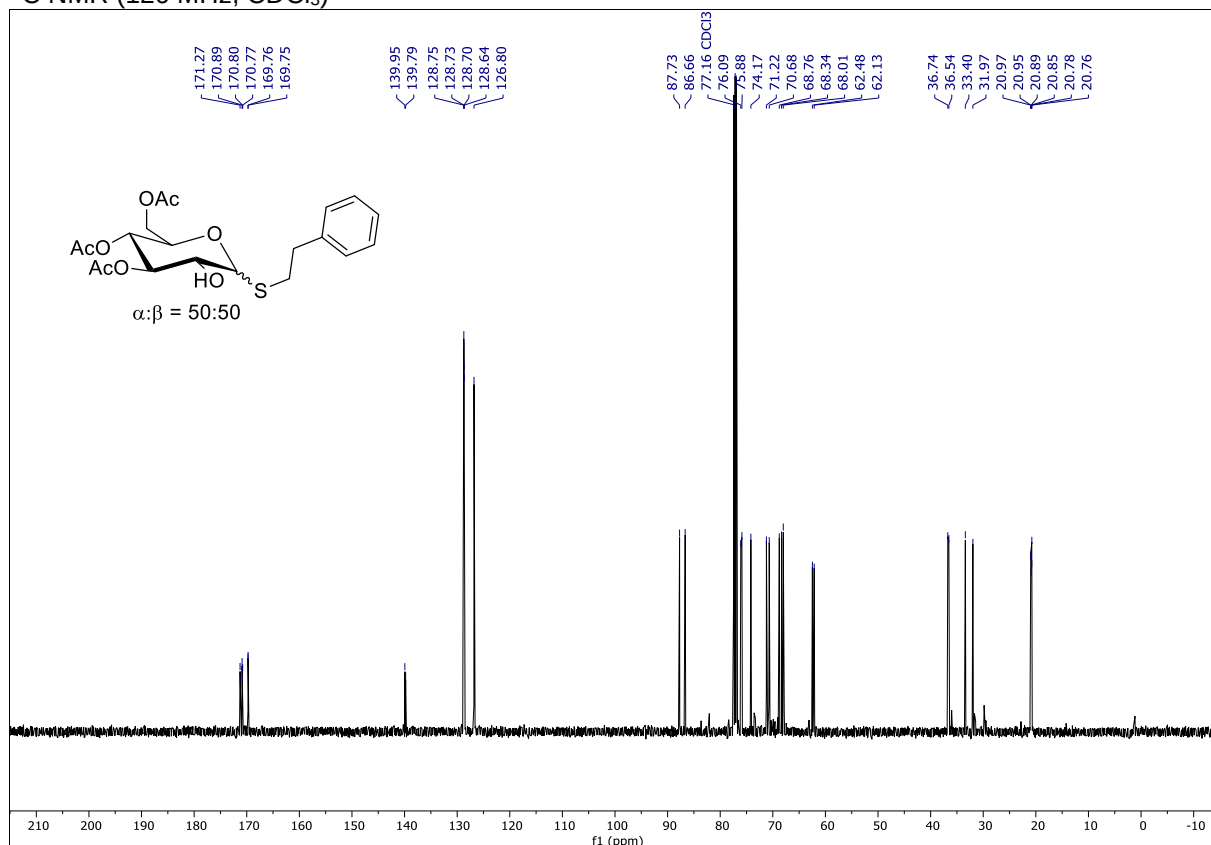


S29

¹H NMR (500 MHz, CDCl₃)

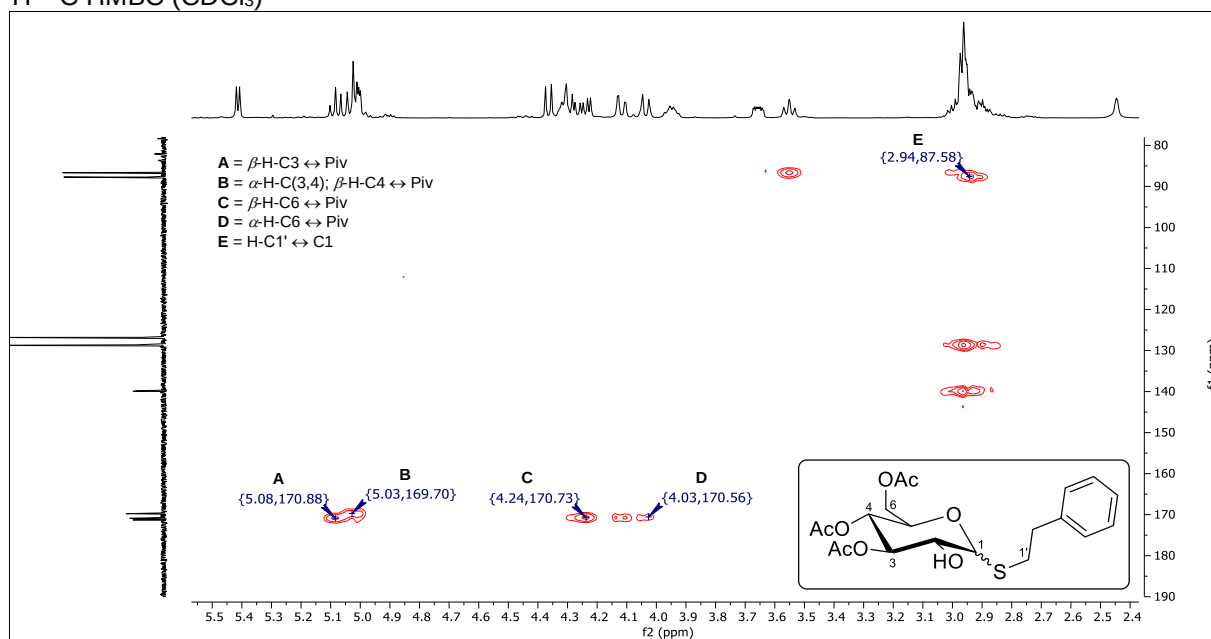


¹³C NMR (126 MHz, CDCl₃)



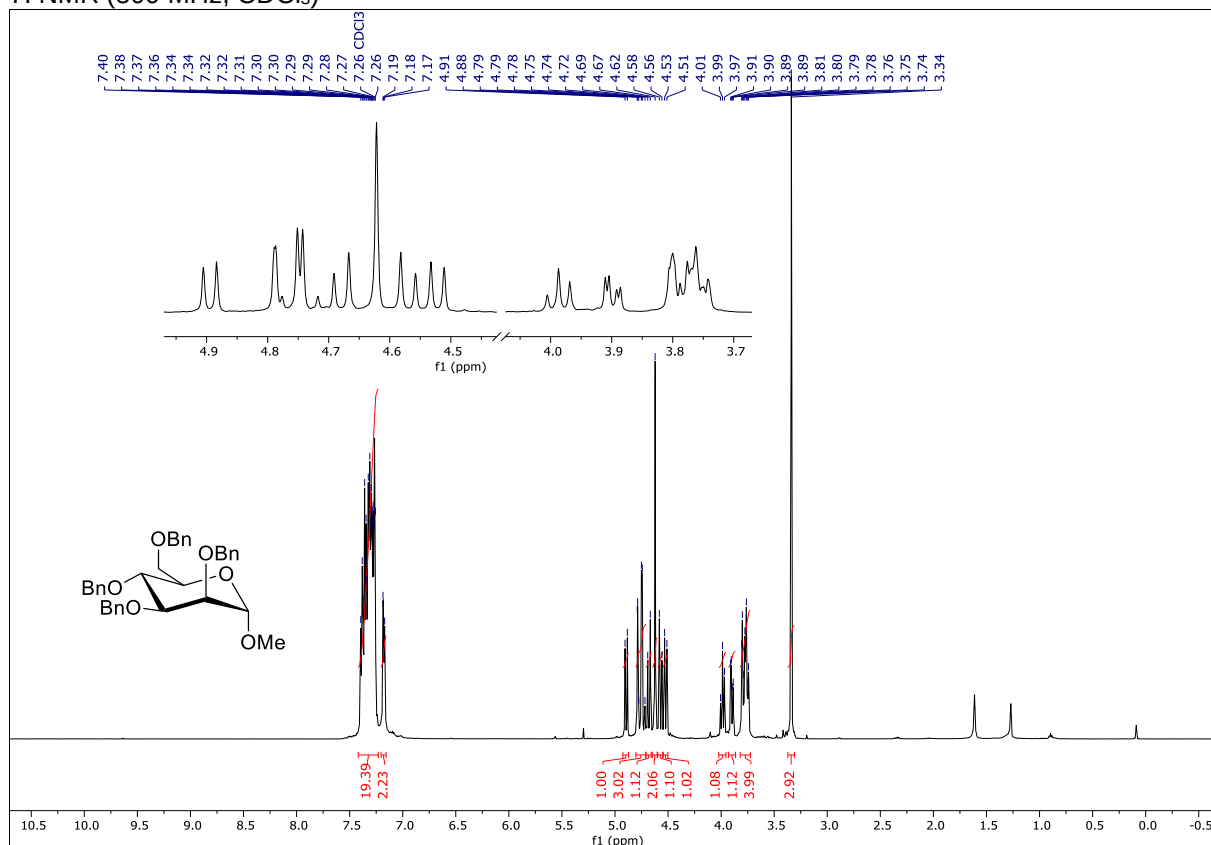
S29

^1H - ^{13}C HMBC (CDCl_3)

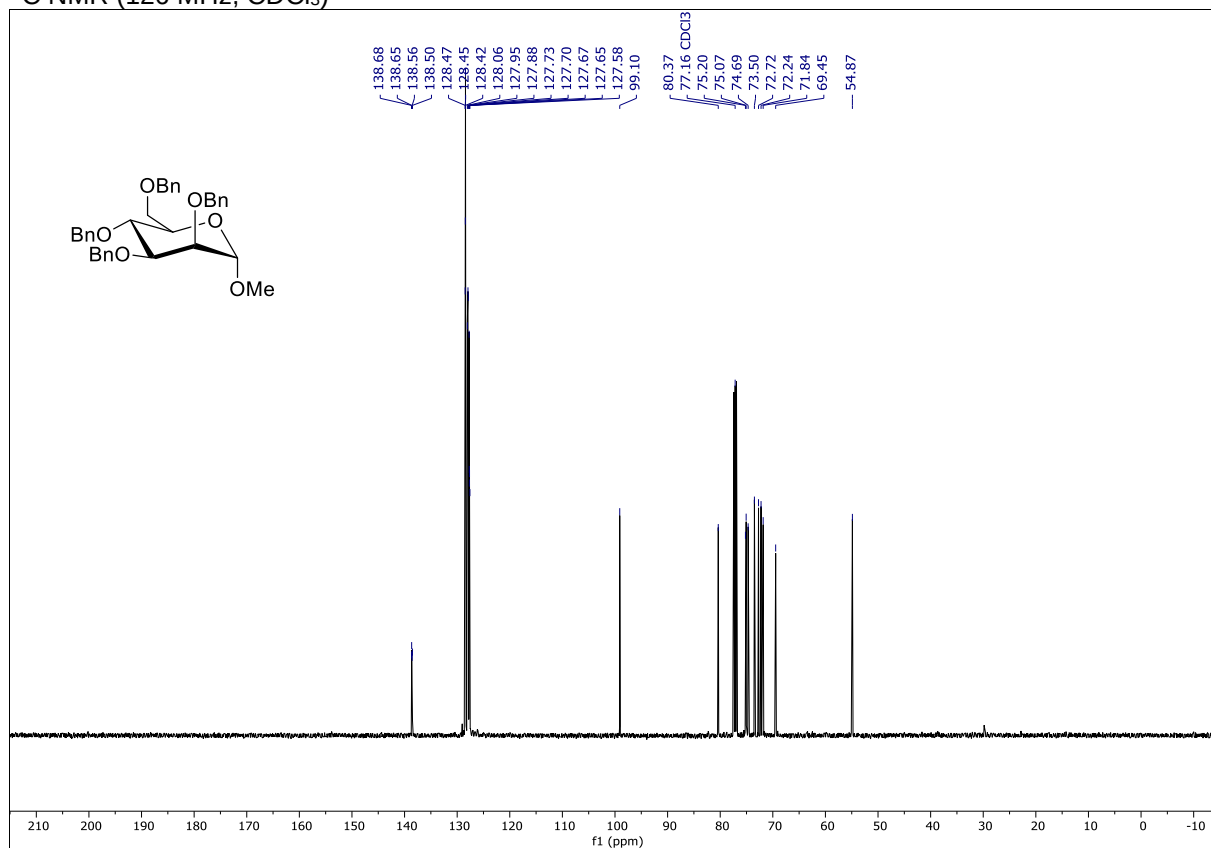


α -S30

^1H NMR (500 MHz, CDCl_3)

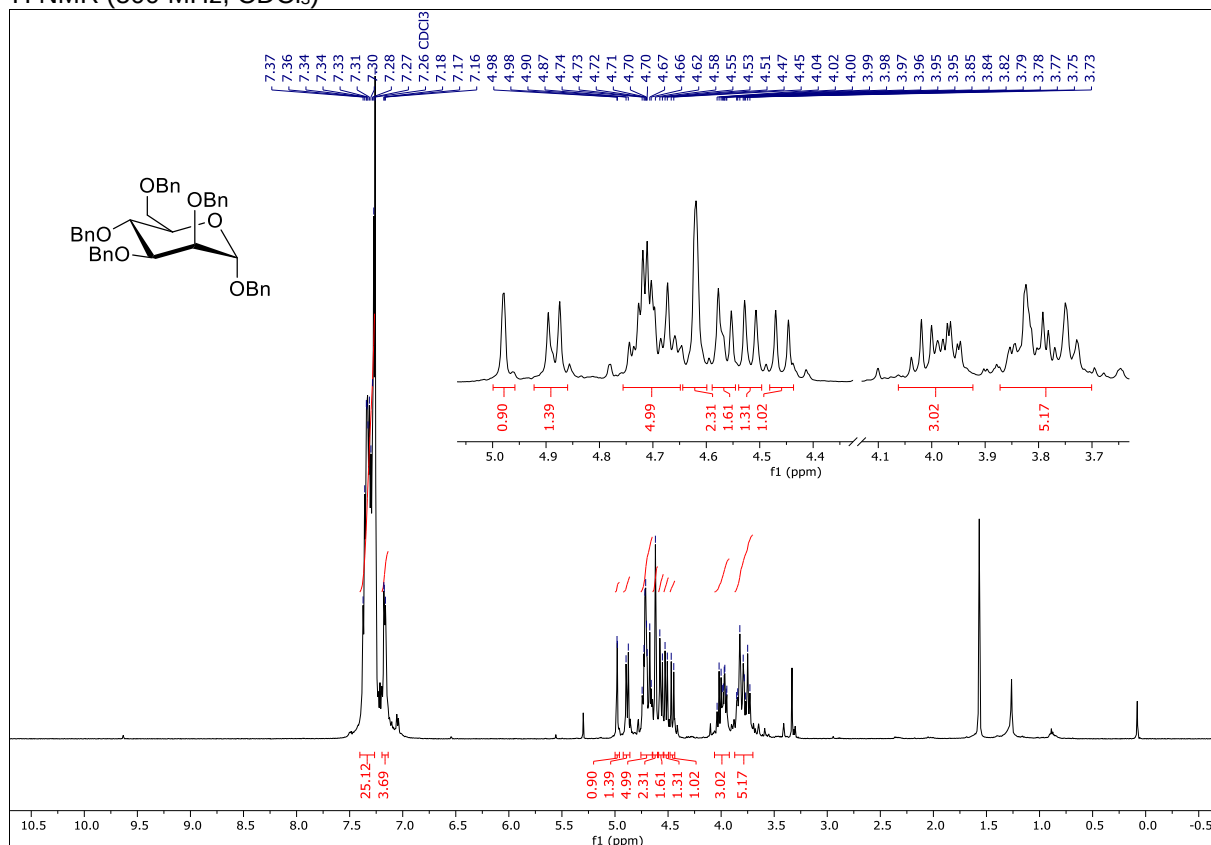


^{13}C NMR (126 MHz, CDCl_3)

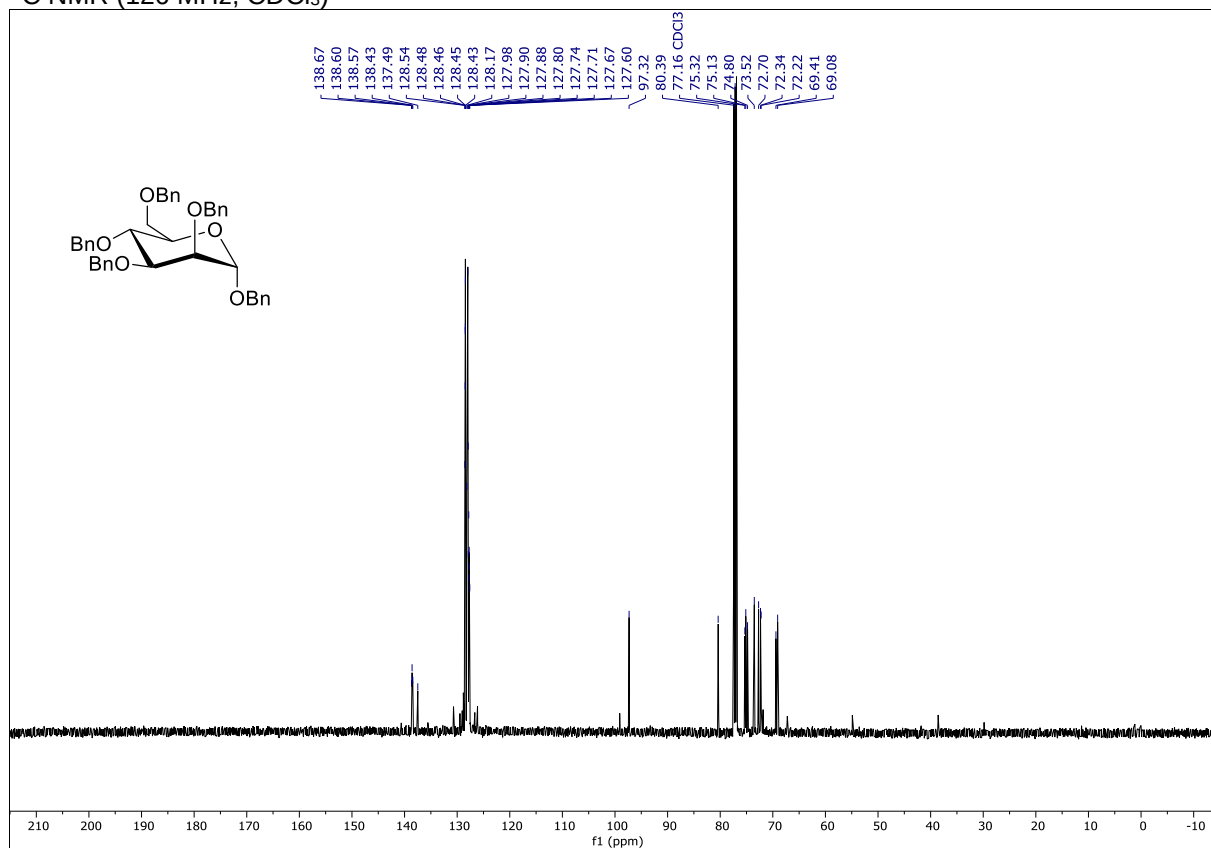


α -S31

^1H NMR (500 MHz, CDCl_3)

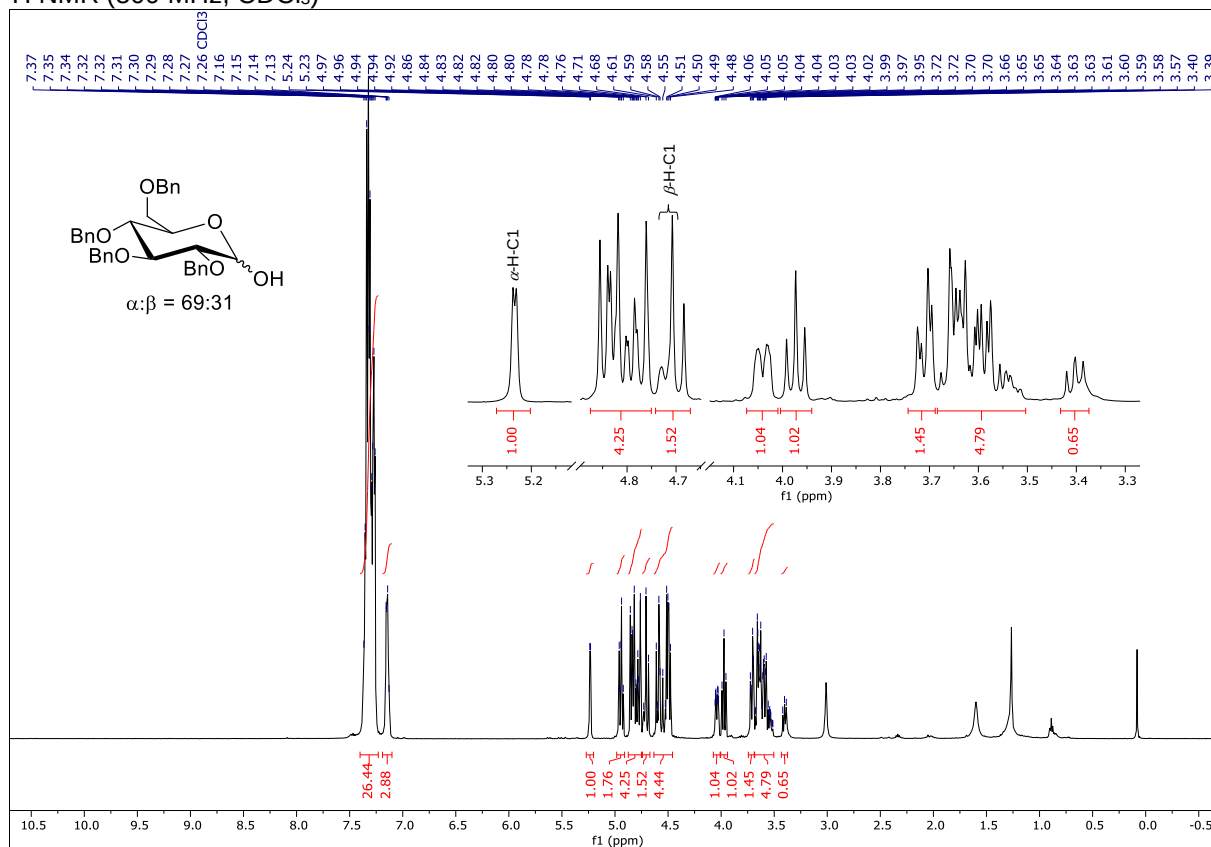


^{13}C NMR (126 MHz, CDCl_3)

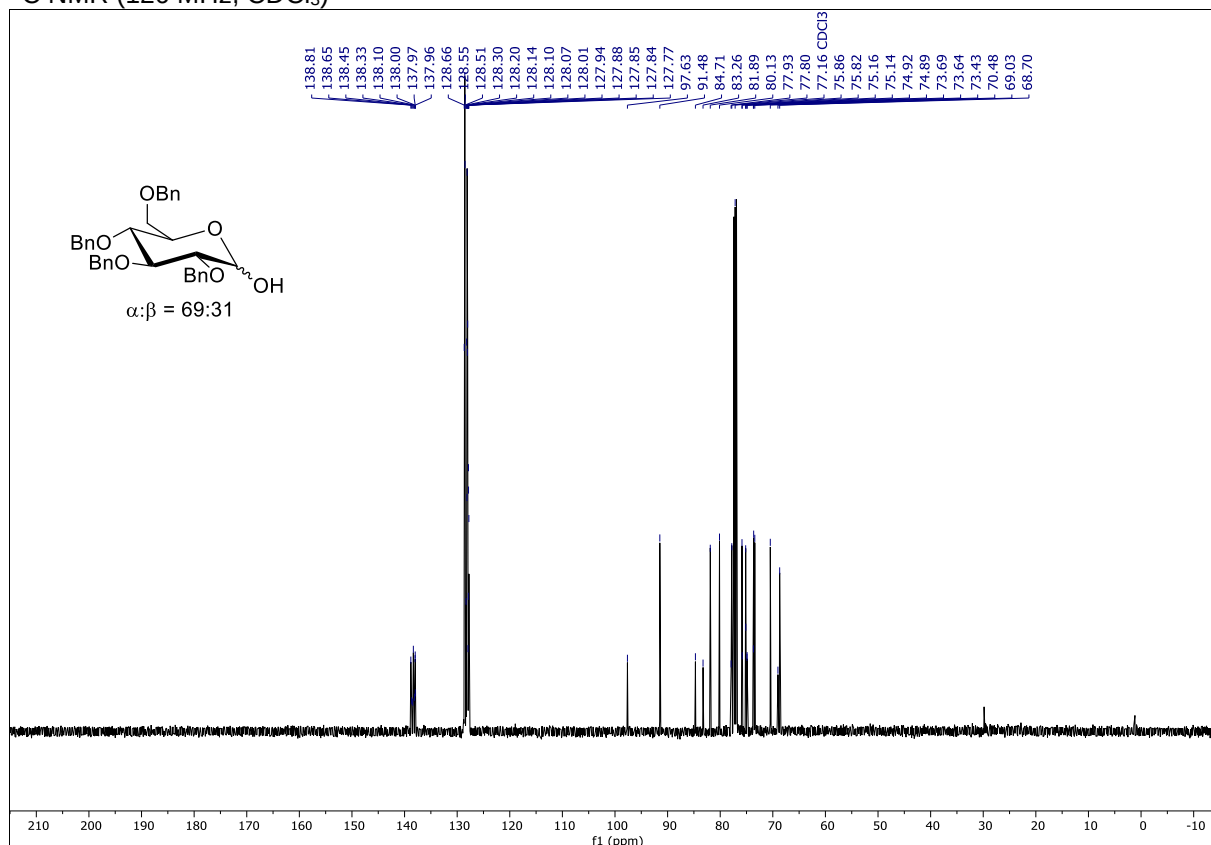


S32

¹H NMR (500 MHz, CDCl₃)

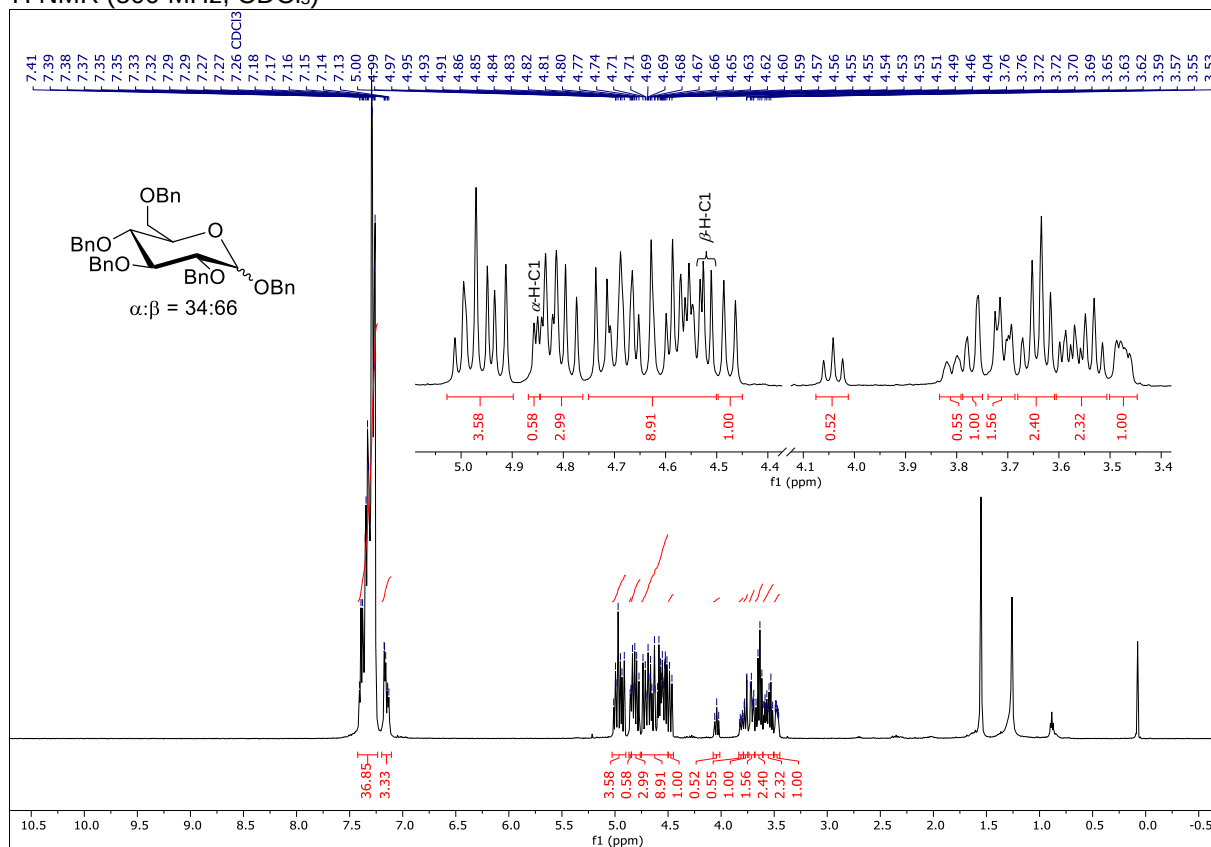


¹³C NMR (126 MHz, CDCl₃)



S33

¹H NMR (500 MHz, CDCl₃)



¹³C NMR (126 MHz, CDCl₃)

