

Electronic Supplementary Information II

NMR spectra

Irreversible inhibition of BoNT/A protease: Proximity-driven reactivity contingent upon a bifunctional approach

Lewis D. Turner^{a,*}, Alexander L. Nielsen^{a,b,*}, Lucy Lin^a, Sabine Pellett^c, Takashi Sugane^a, Margaret E. Olson^{a,d}, Eric A. Johnson^c and Kim D. Janda^{a,†}

^aDepartments of Chemistry and Immunology, The Skaggs Institute for Chemical Biology, Worm Institute of Research and Medicine (WIRM), Scripps Research, 10550 N Torrey Pines Road, La Jolla, CA 92037, United States.

^bCenter for Biopharmaceuticals & Department of Drug Design and Pharmacology, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, DK-2100, Copenhagen, Denmark.

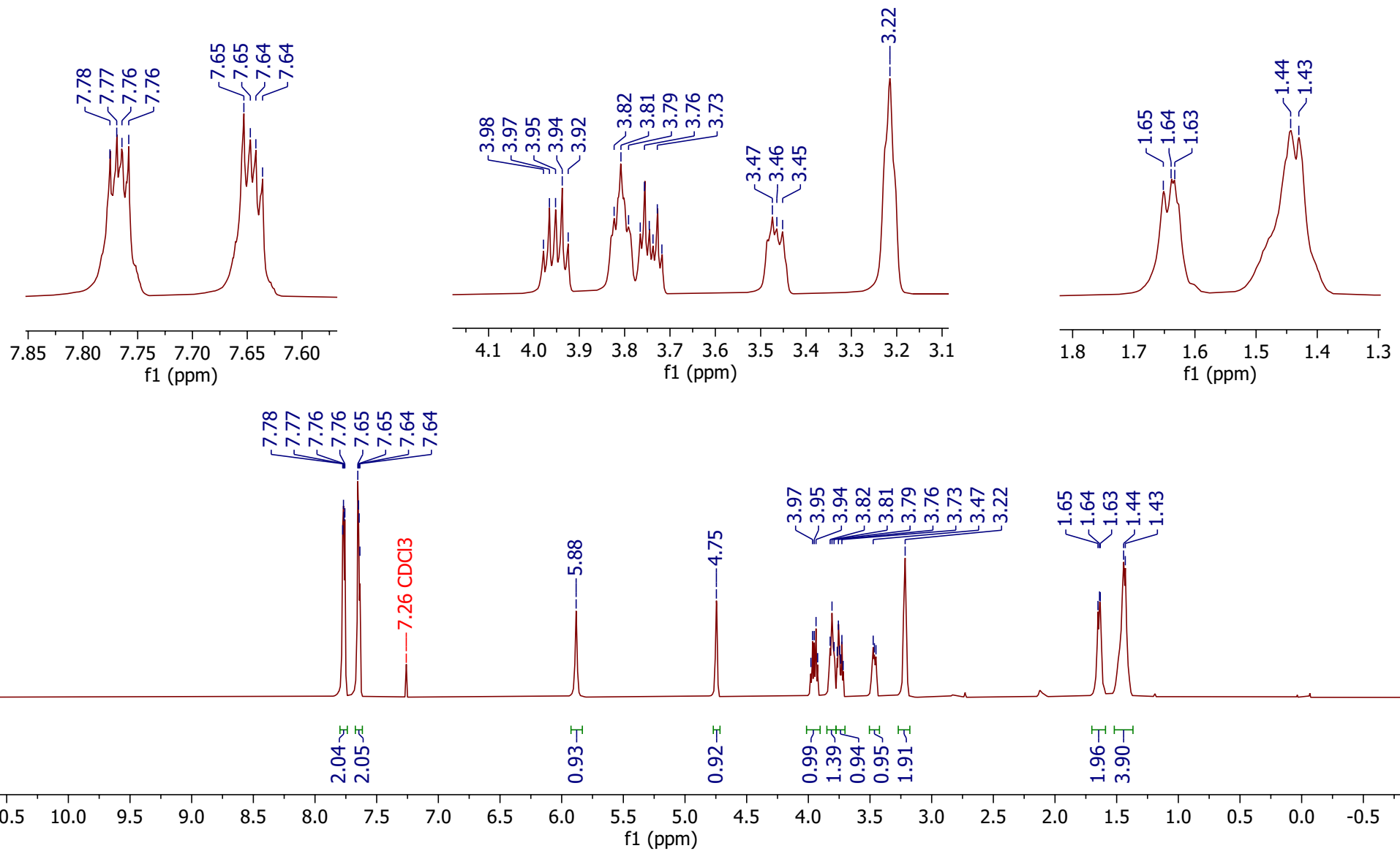
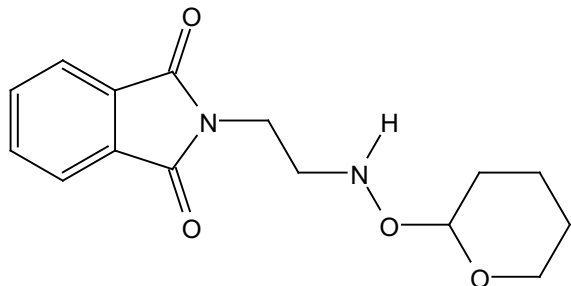
^cDepartment of Bacteriology, University of Wisconsin, 1550 Linden Drive, Madison, WI 53706, United States.

^dCollege of Pharmacy, Roosevelt University, Schaumburg, IL 60173, United States.

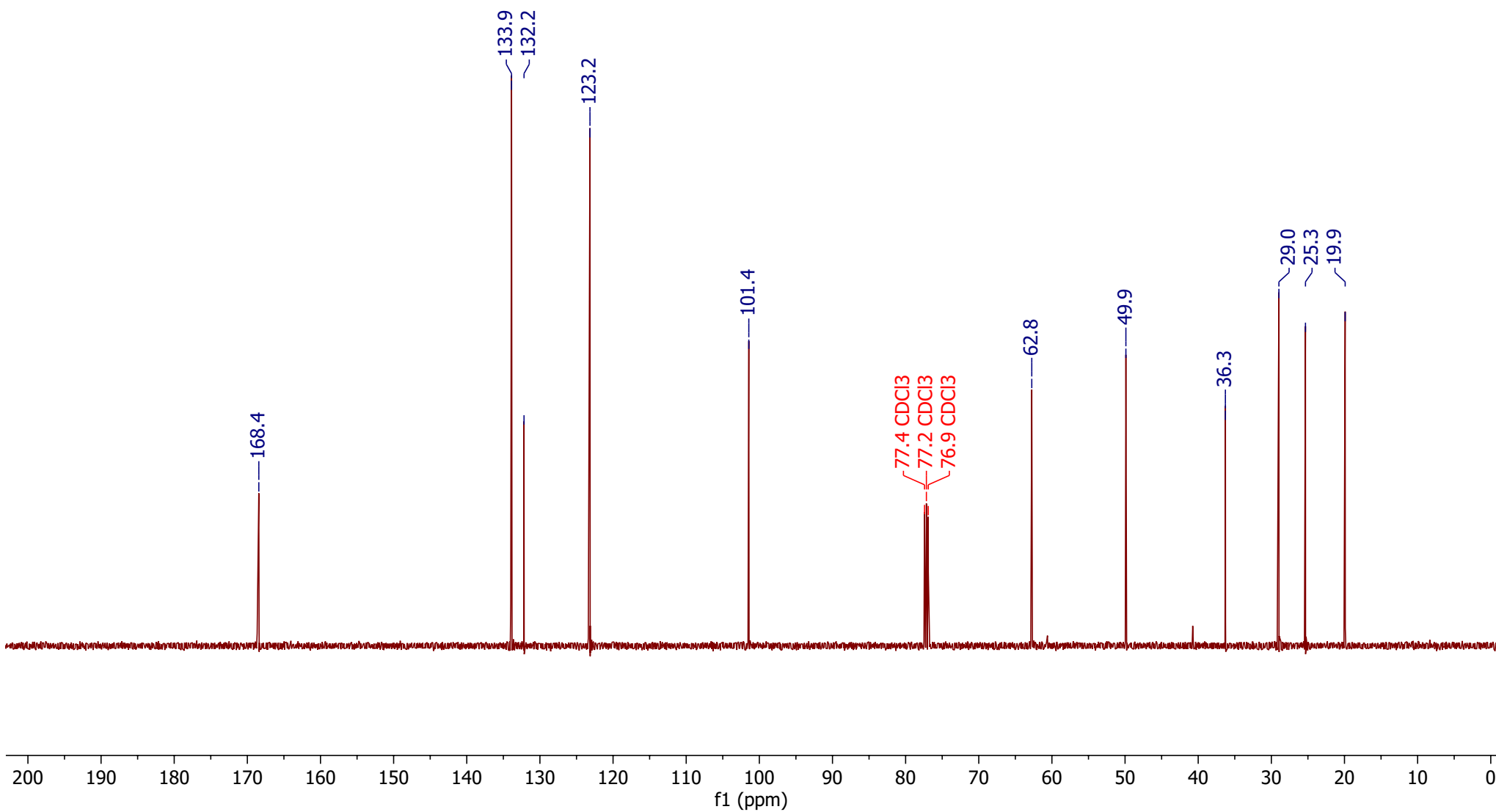
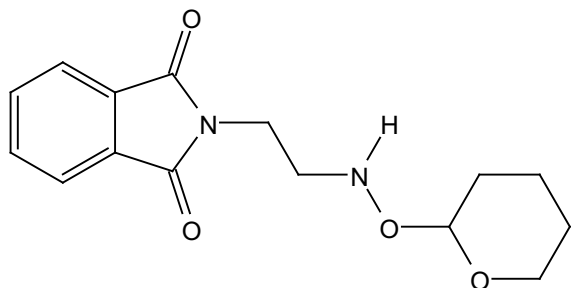
*These authors contributed equally to this work.

†Correspondence to: kdjanda@scripps.edu

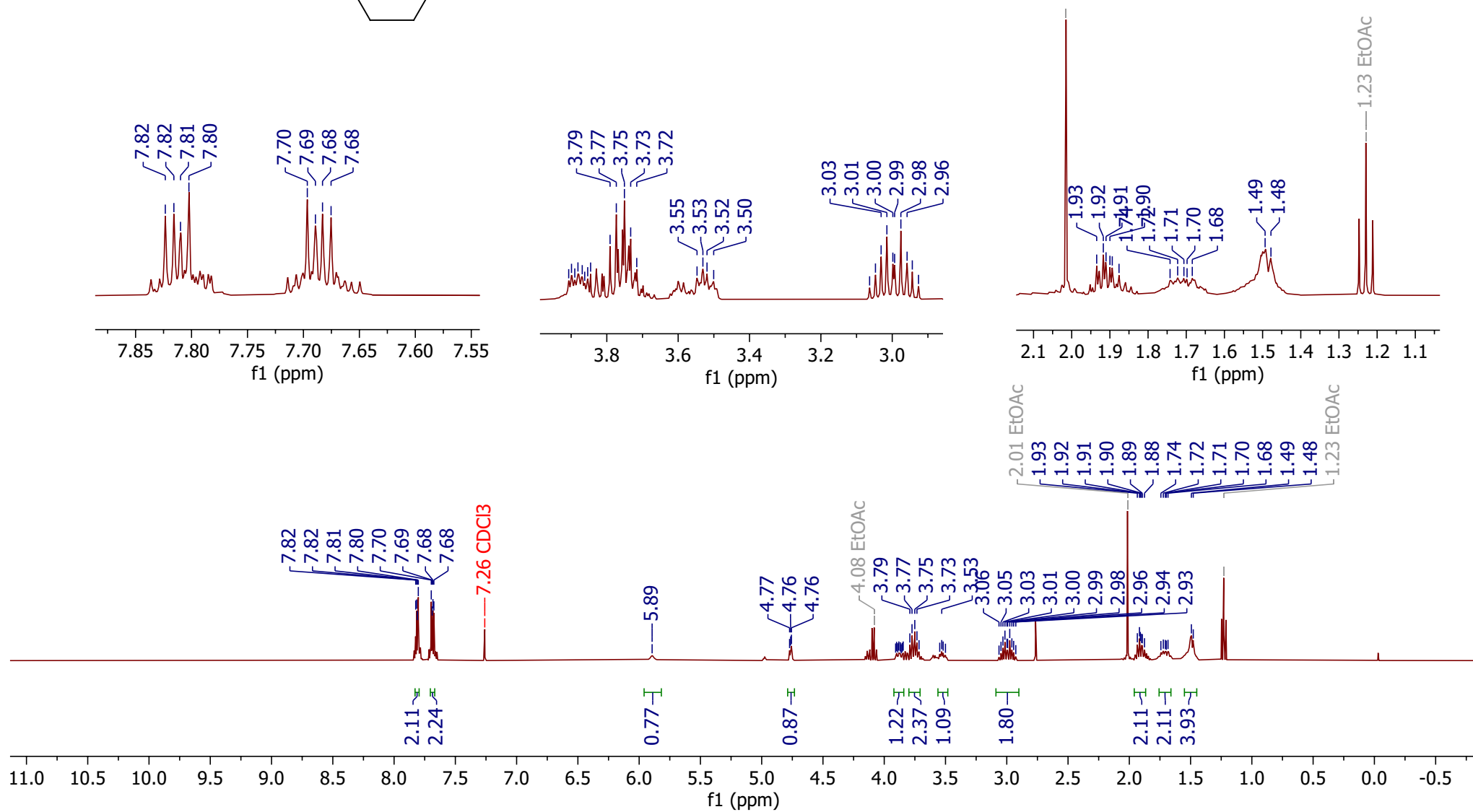
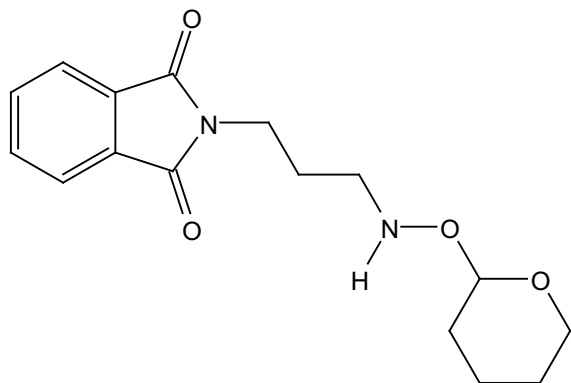
Compound S1
¹H NMR (500 MHz, CDCl₃)



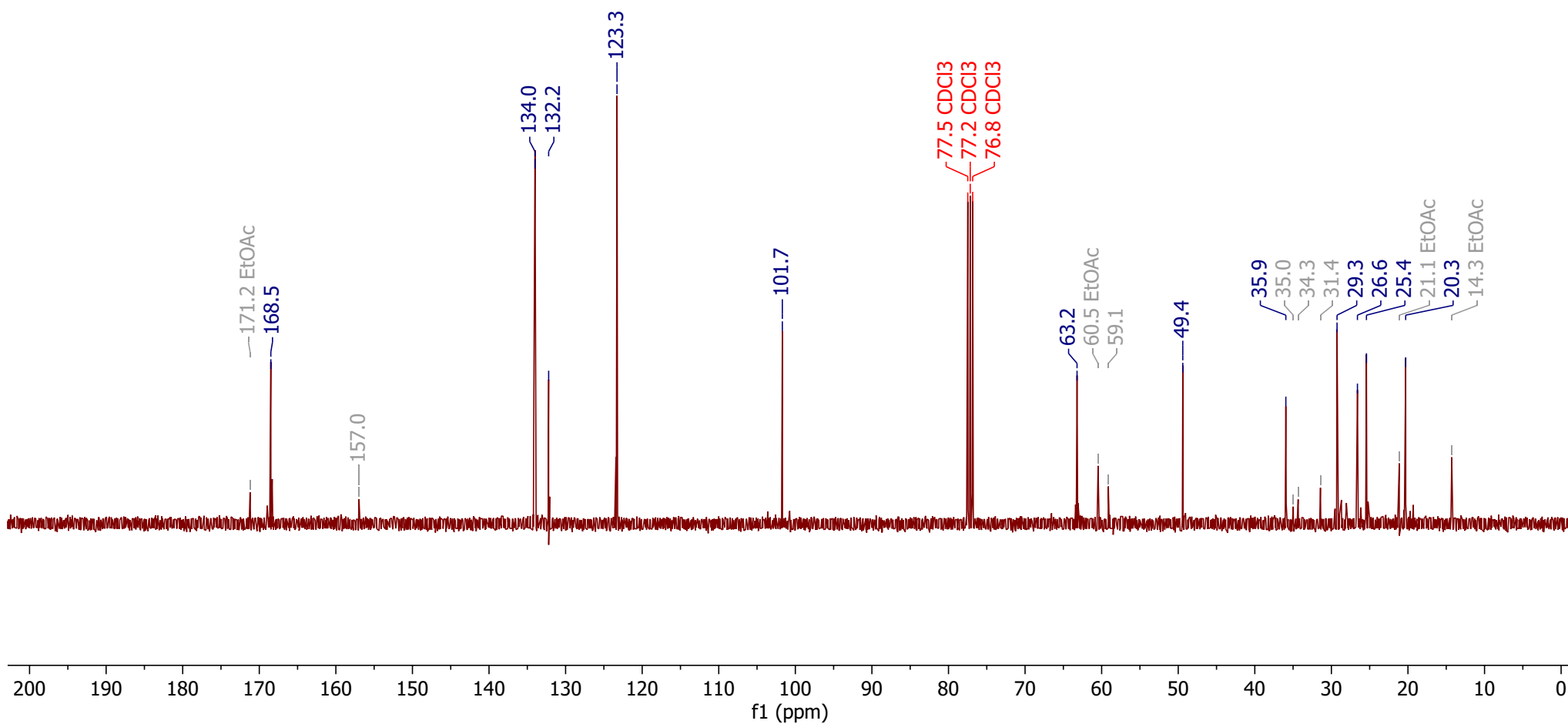
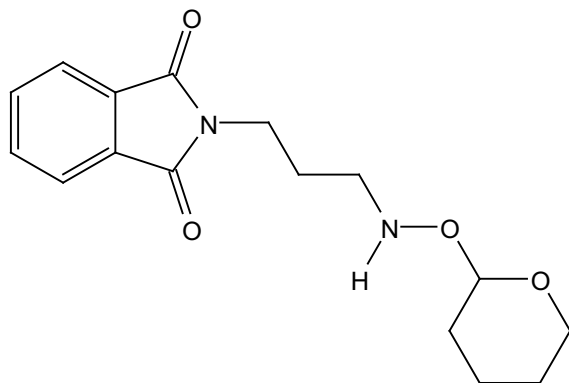
Compound S1
 ^{13}C NMR (126 MHz, CDCl_3)



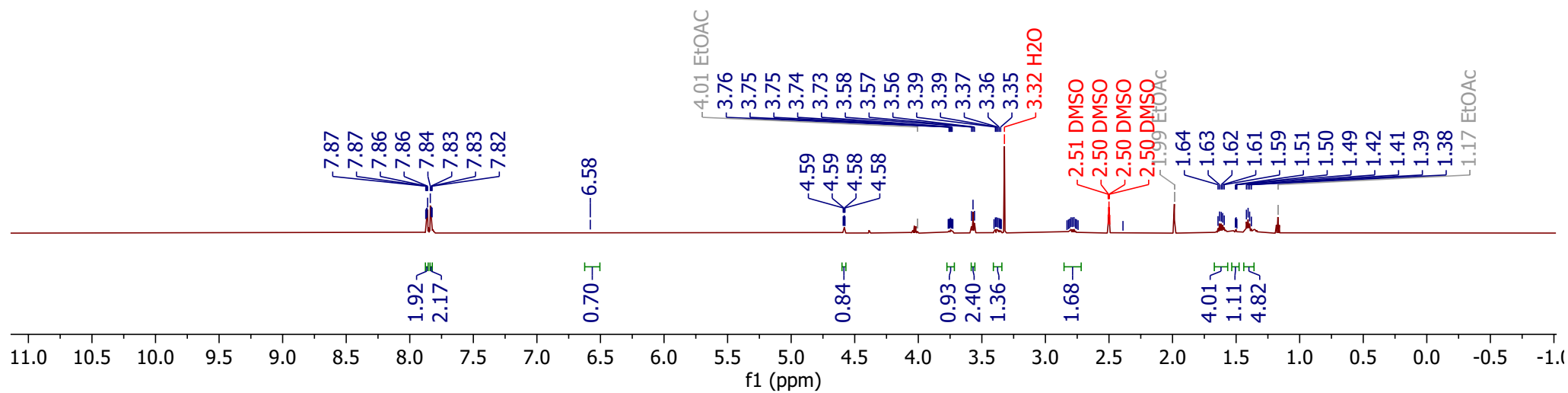
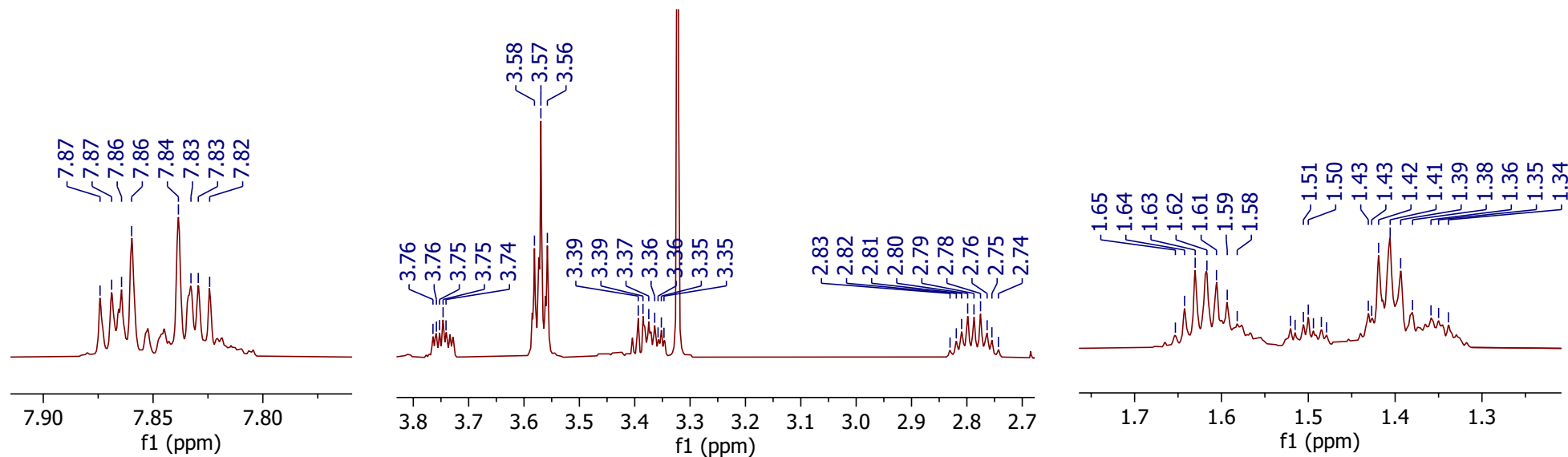
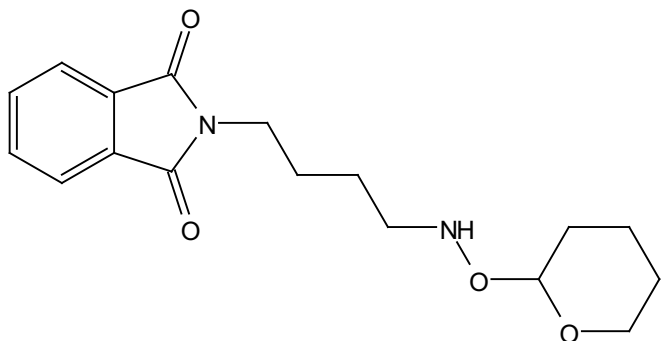
Compound S2
¹H NMR (400 MHz, CDCl₃)



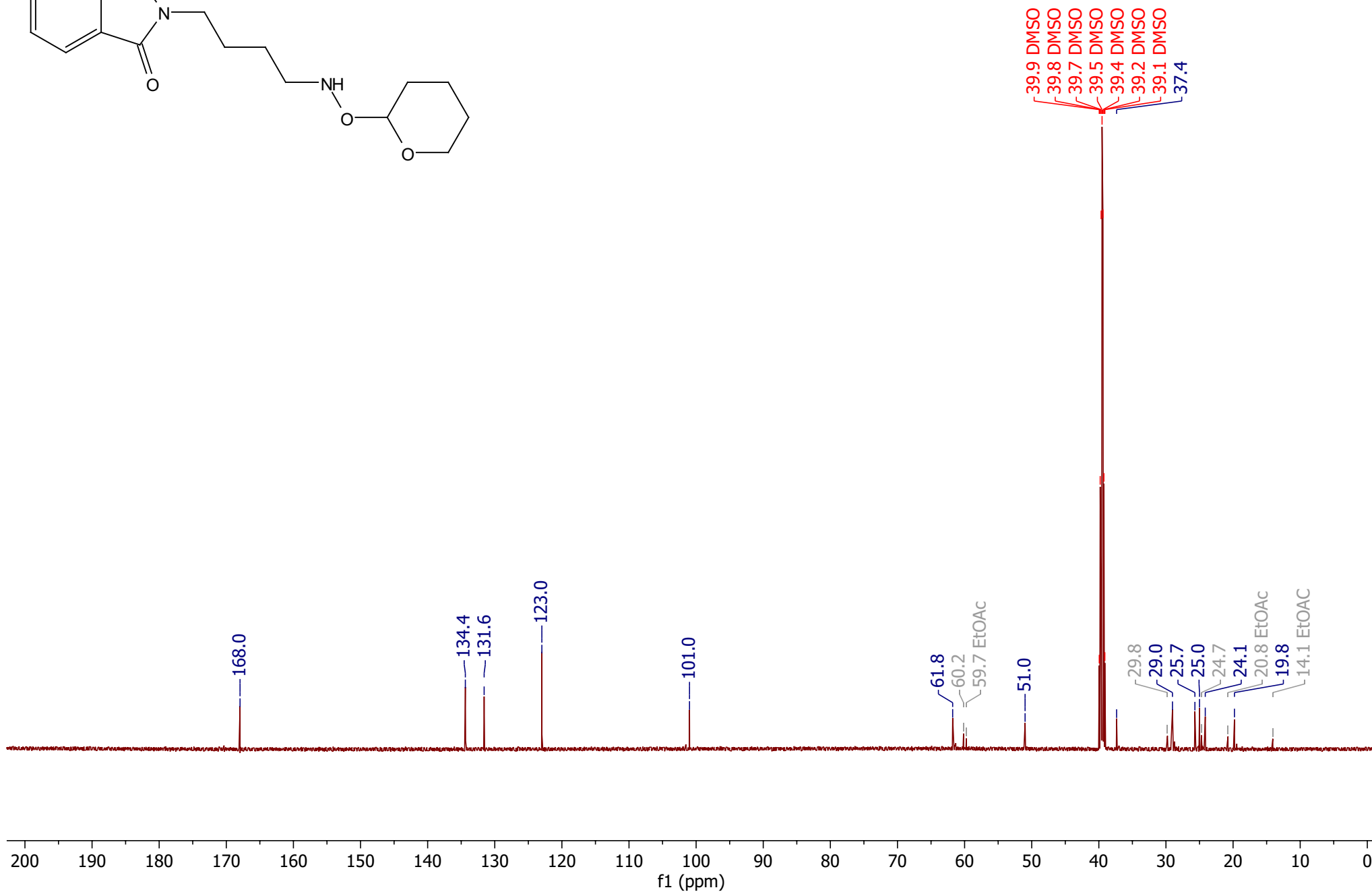
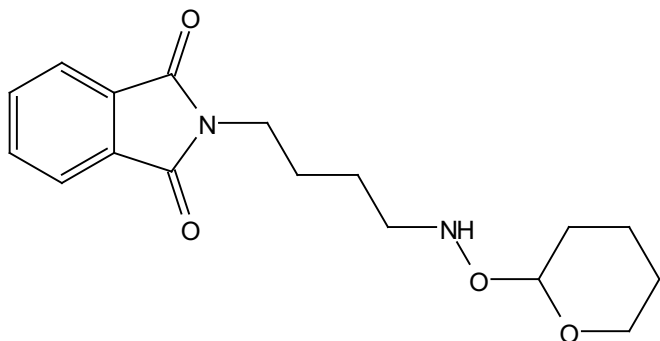
Compound S2
¹³C NMR (101 MHz, CDCl₃)



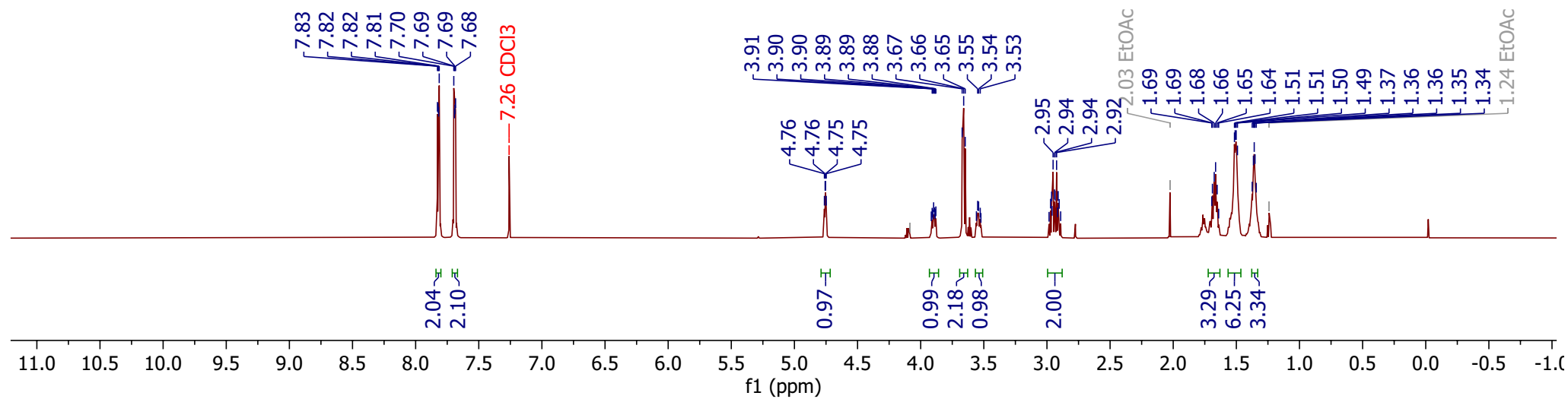
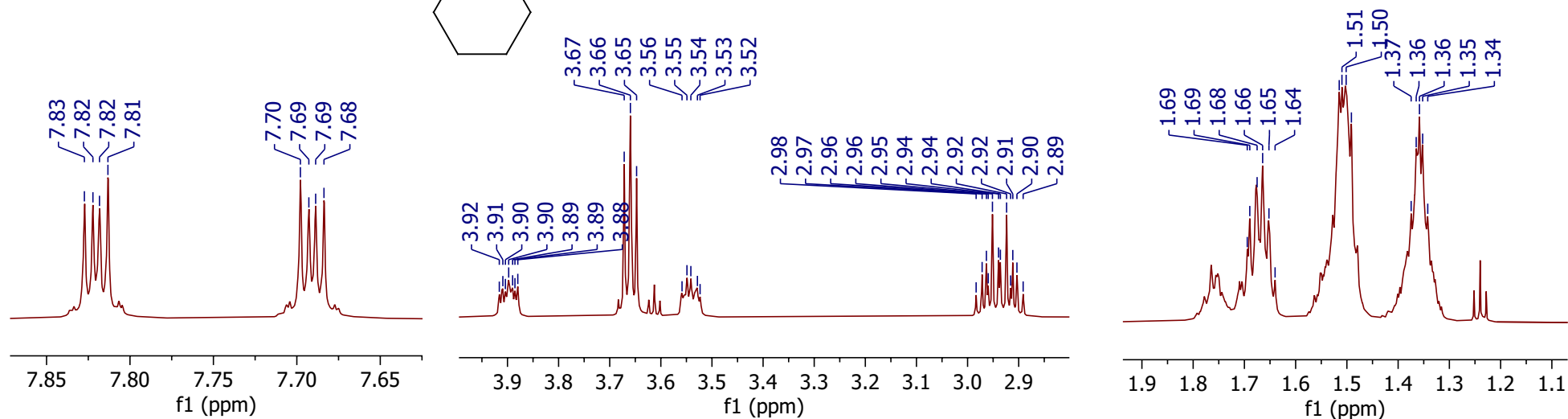
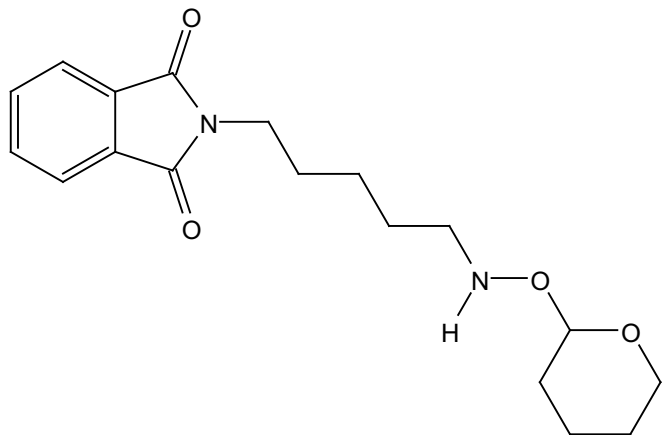
Compound S3
¹H NMR (600 MHz, DMSO-d₆)



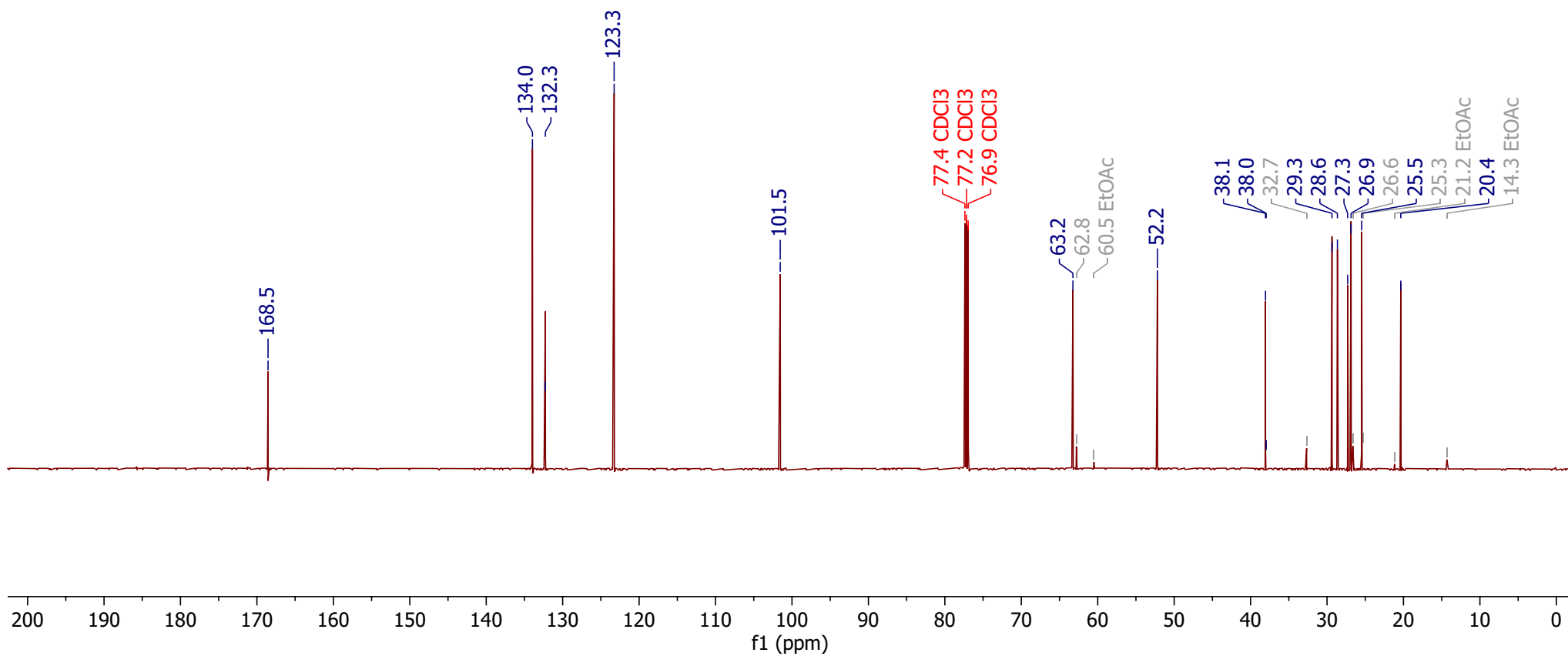
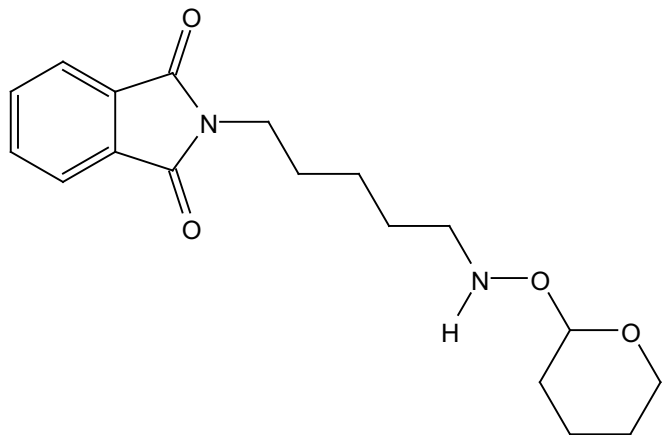
Compound S3
¹³C NMR (151 MHz, DMSO-d6)



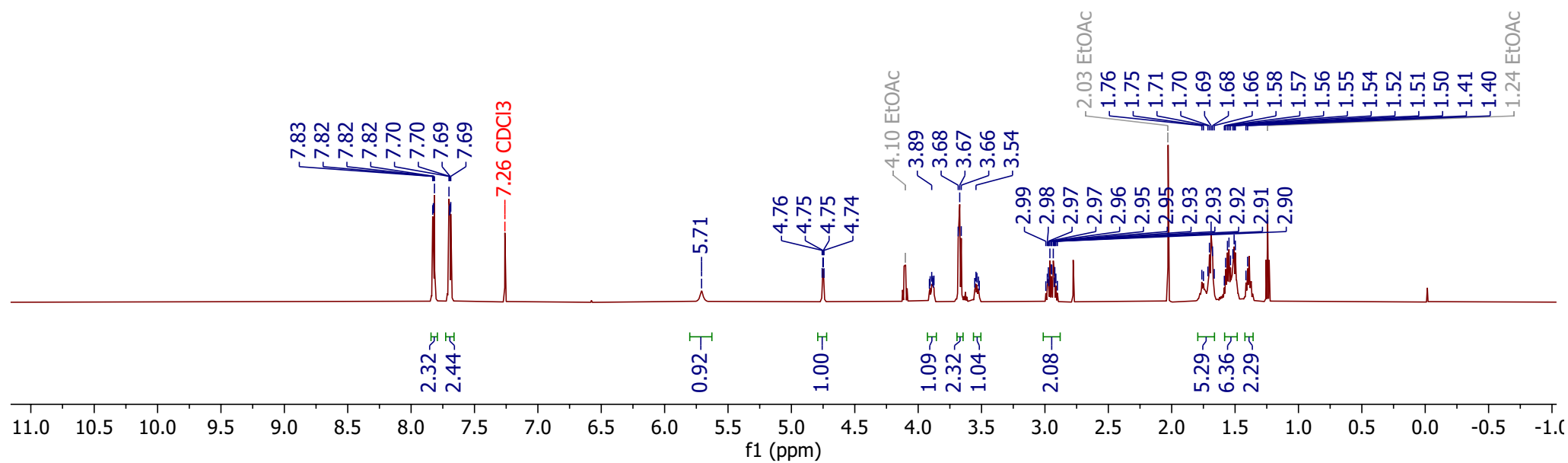
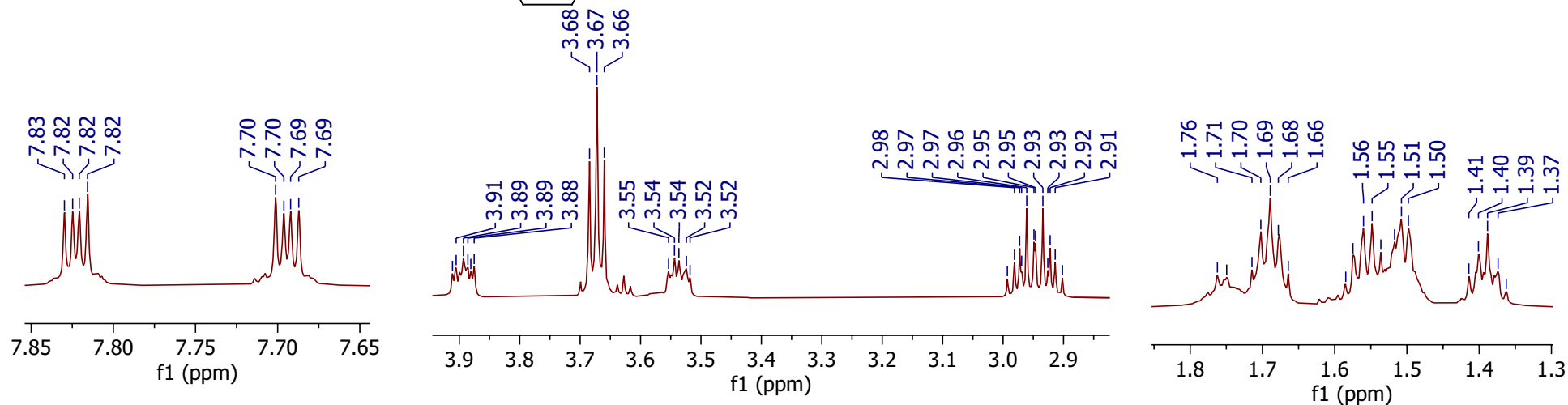
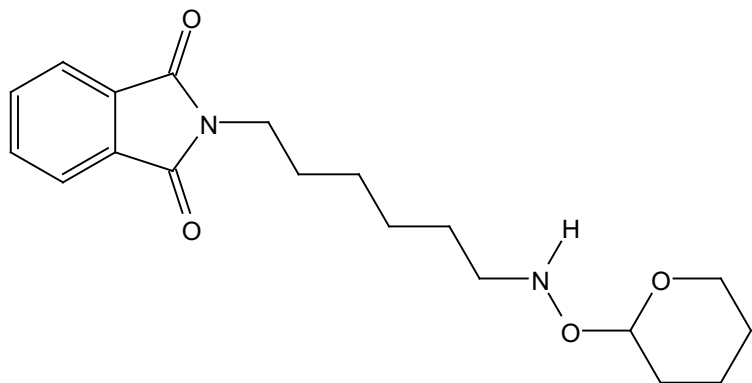
Compound S4
¹H NMR (600 MHz, CDCl₃)



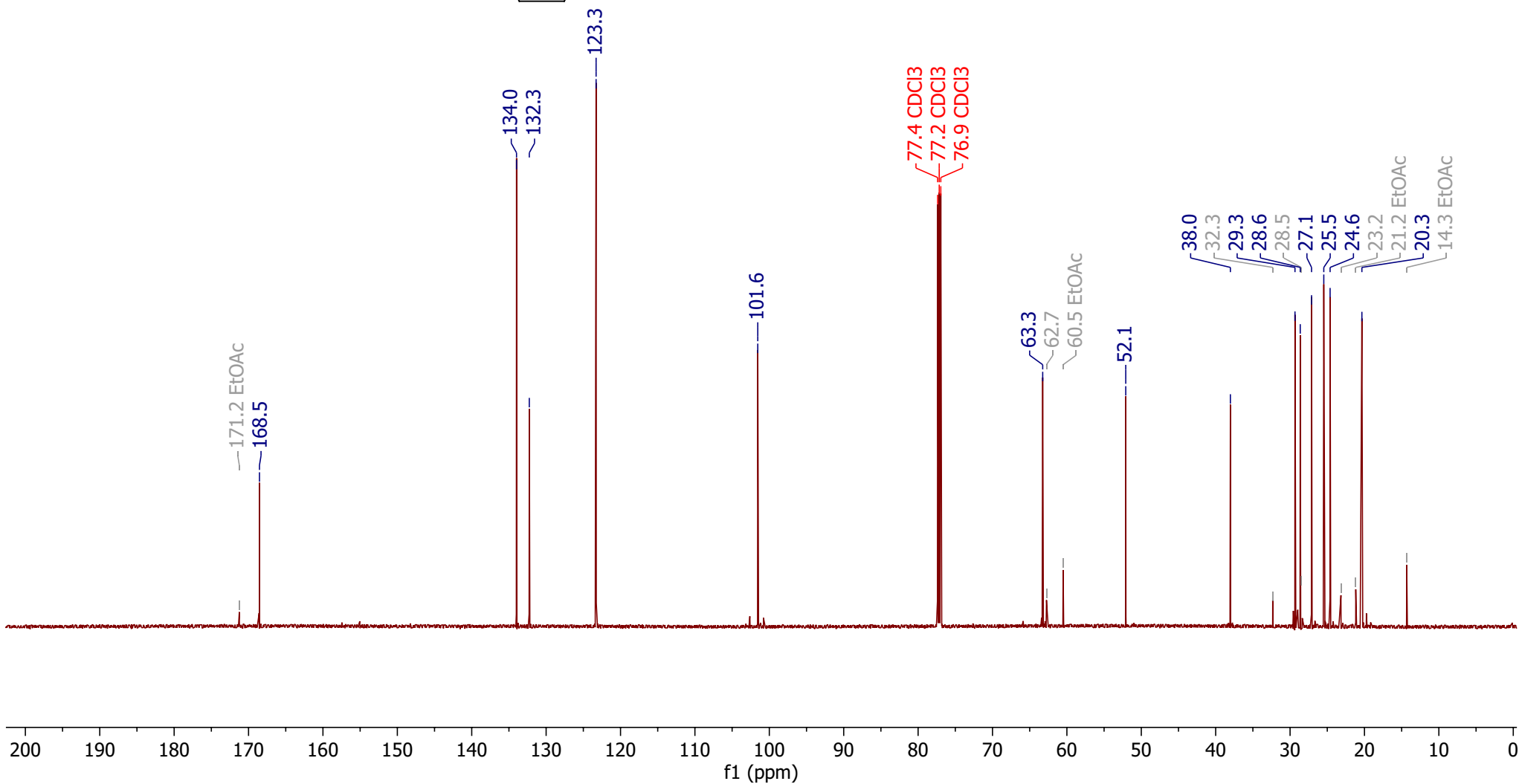
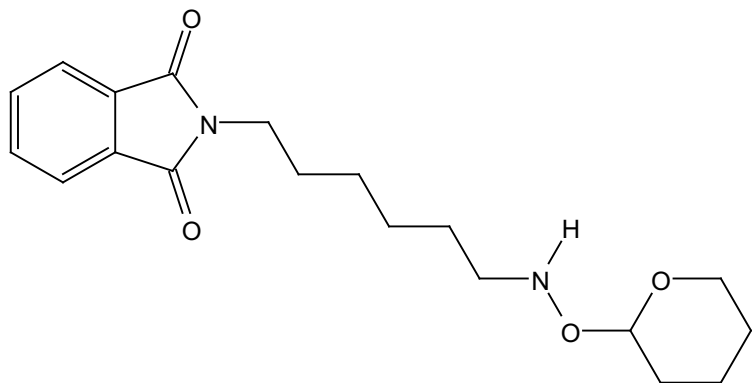
Compound S4
¹³C NMR (151 MHz, CDCl₃)



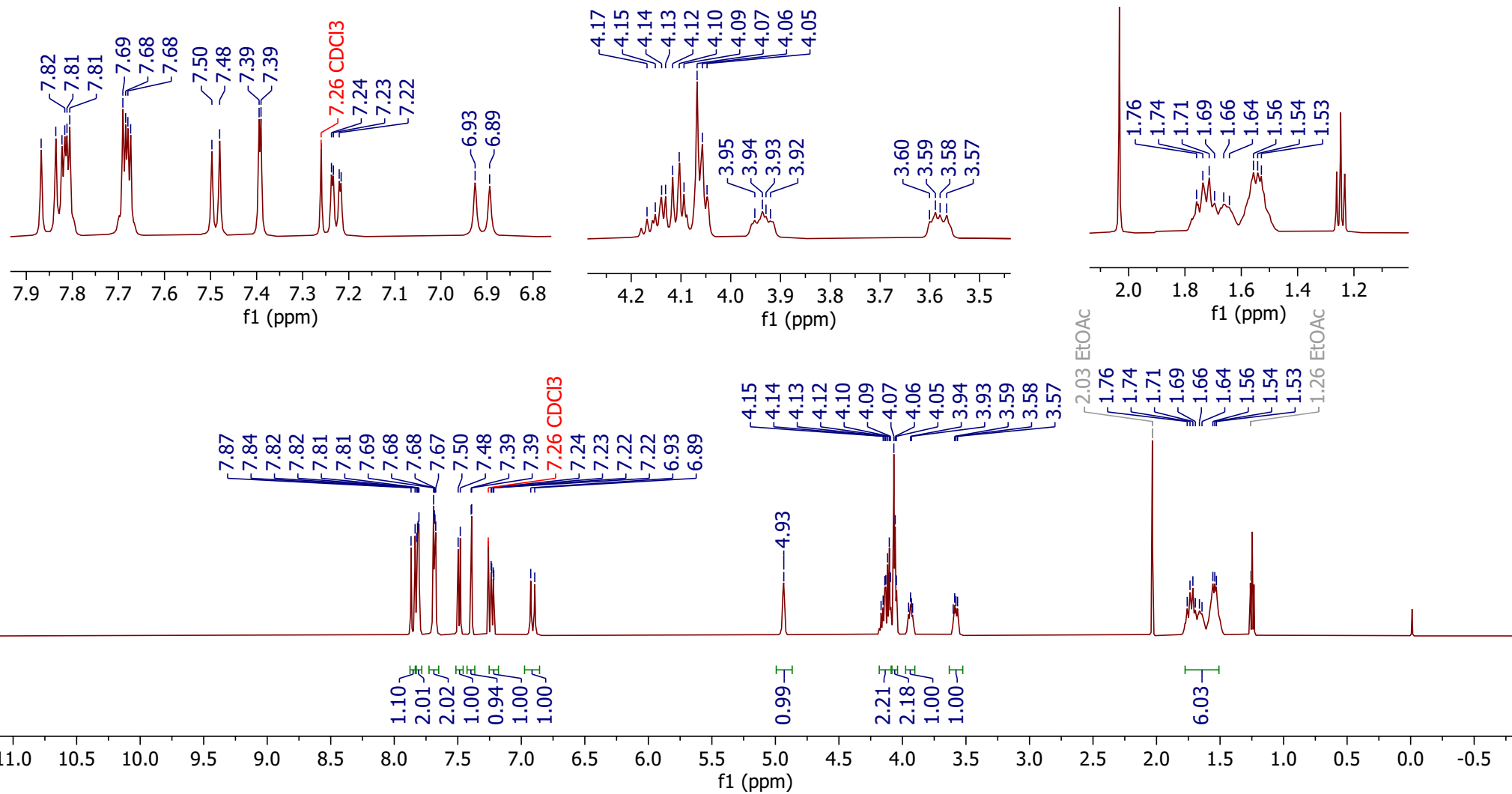
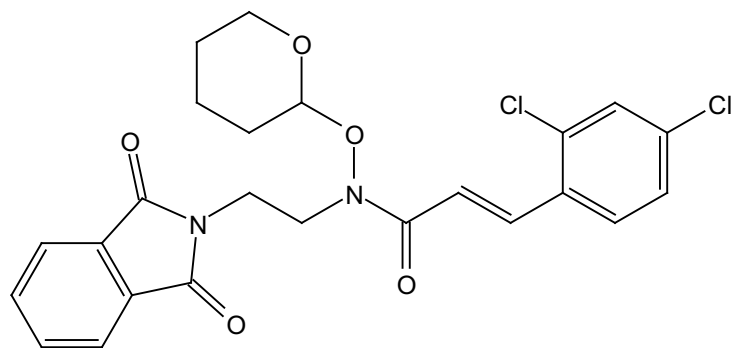
Compound S5
¹H NMR (600 MHz, CDCl₃)



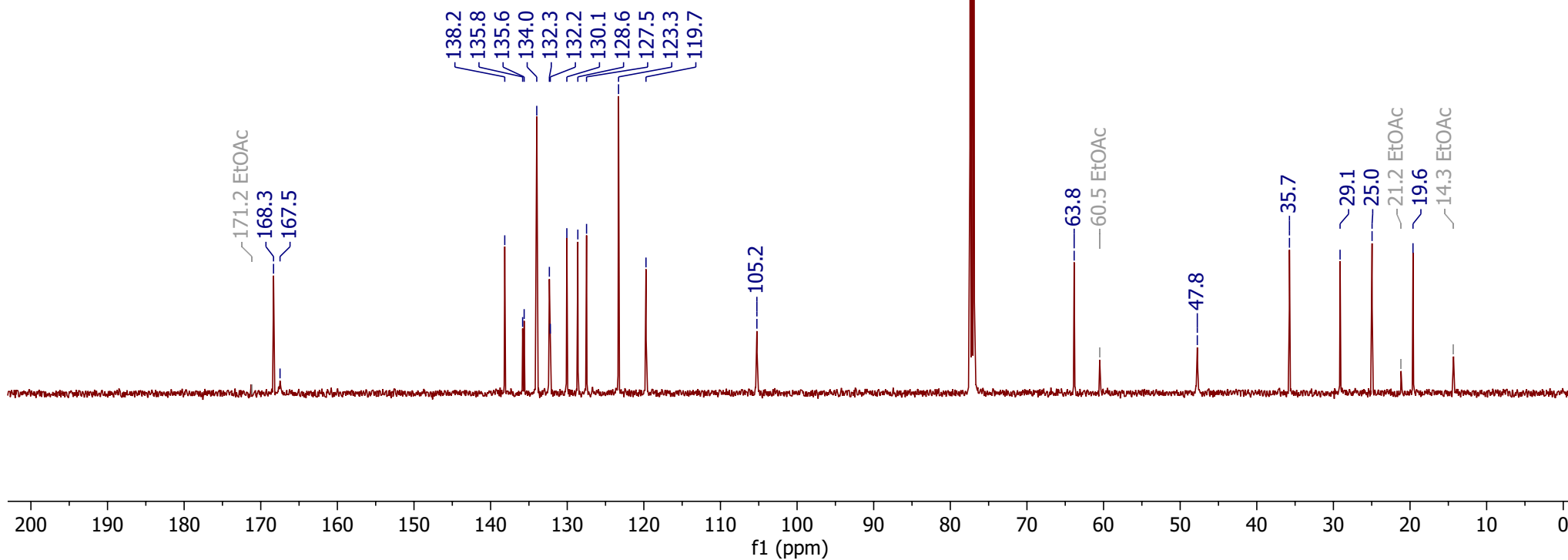
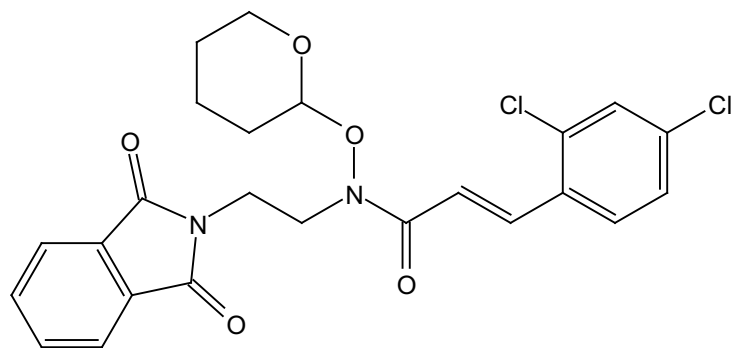
Compound S5
¹³C NMR (151 MHz, CDCl₃)



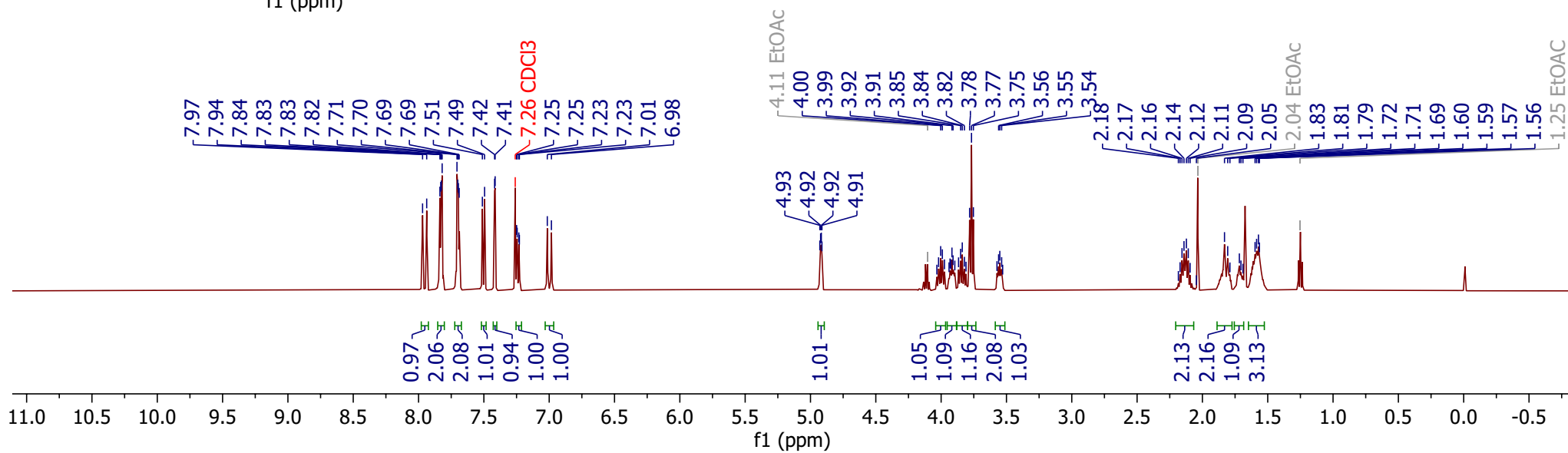
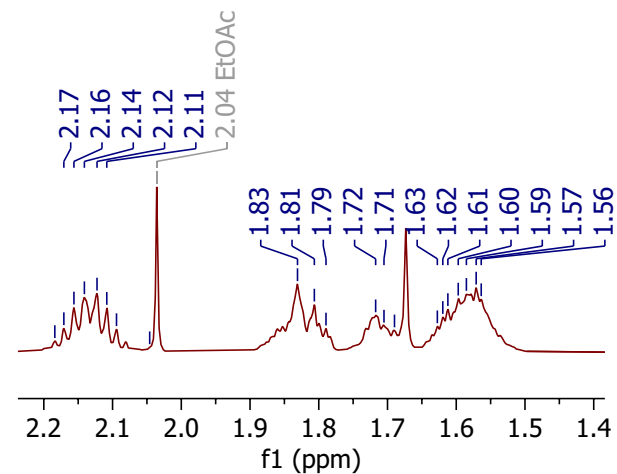
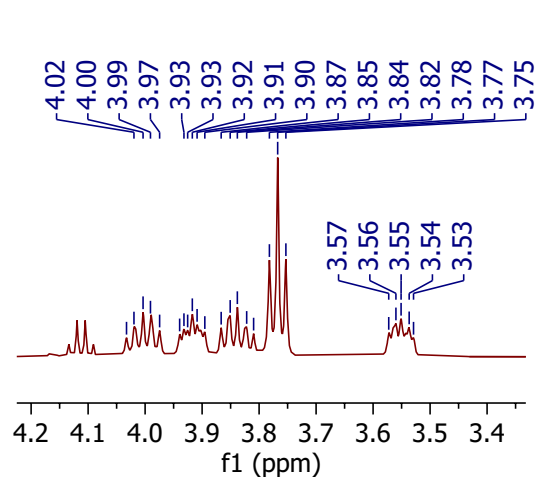
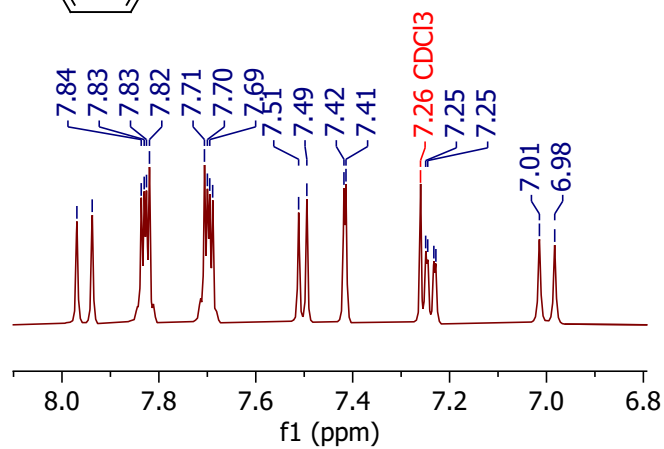
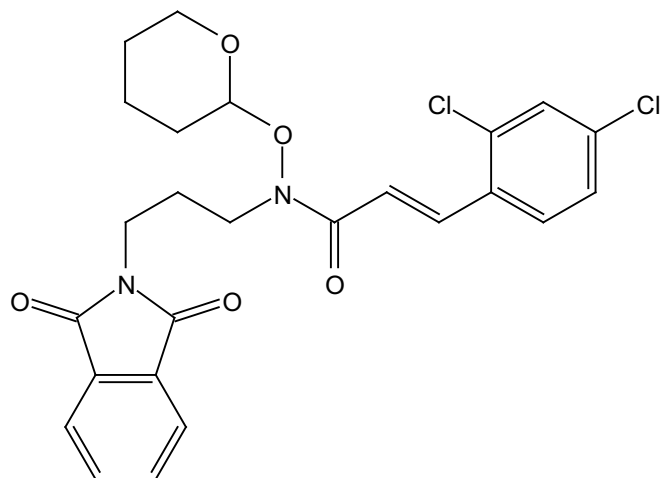
¹H NMR (500 MHz, CDCl₃)



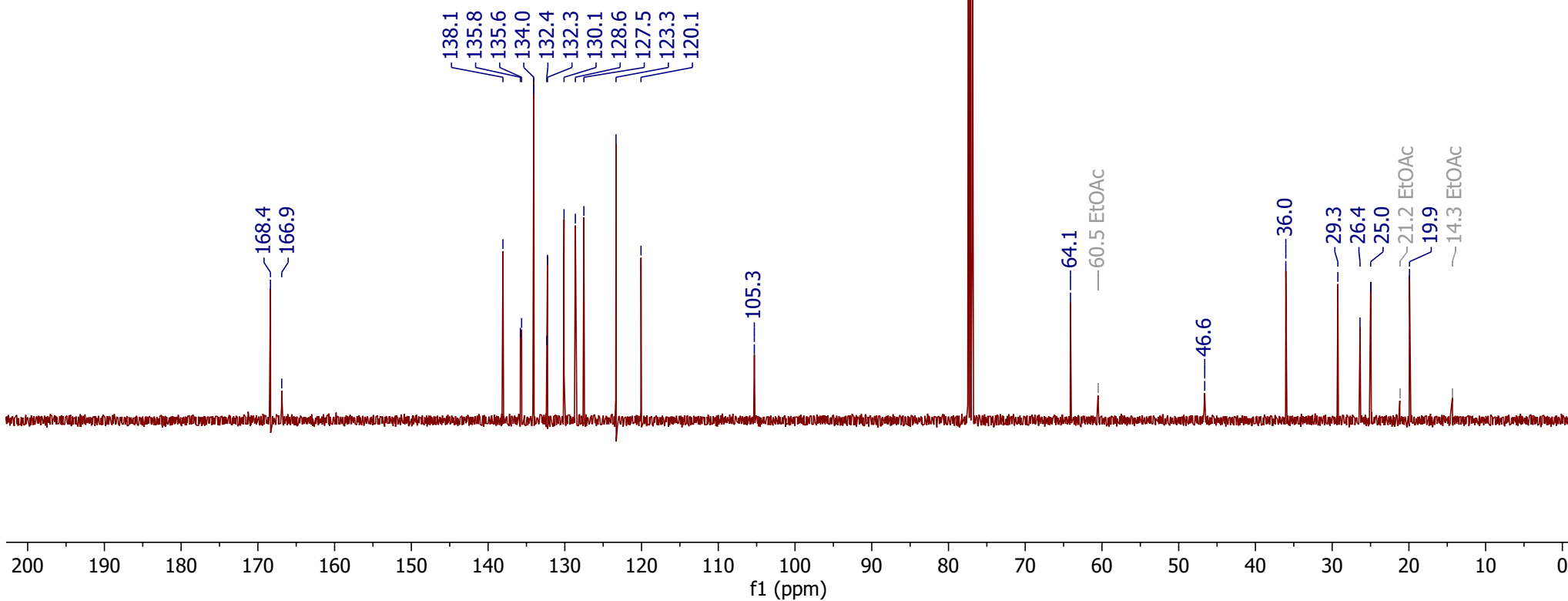
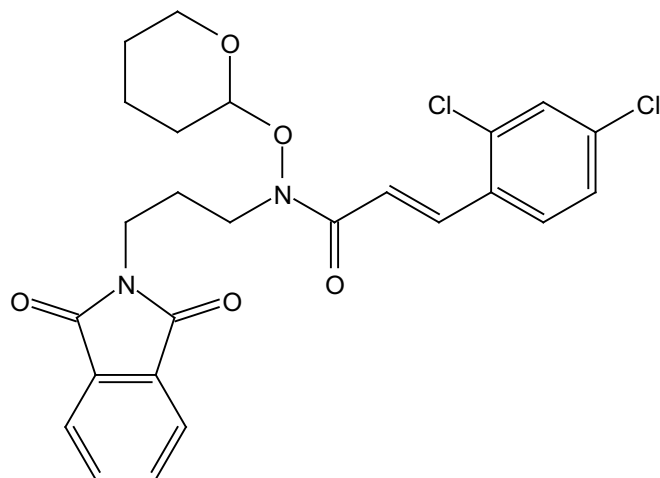
Compound S6
¹³C NMR (126 MHz, CDCl₃)



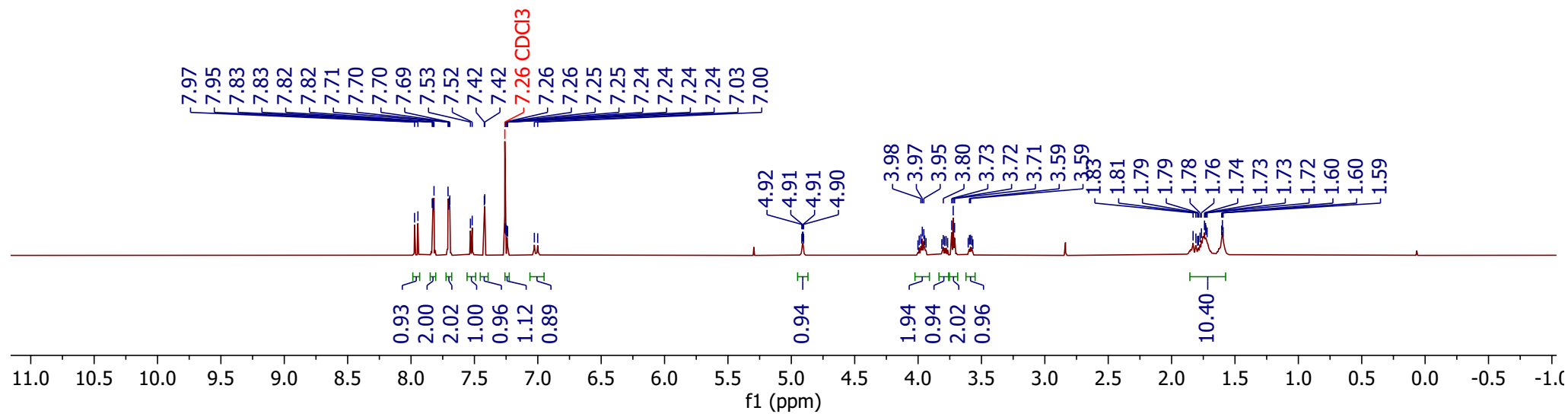
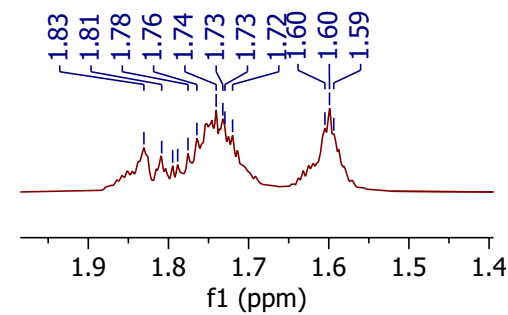
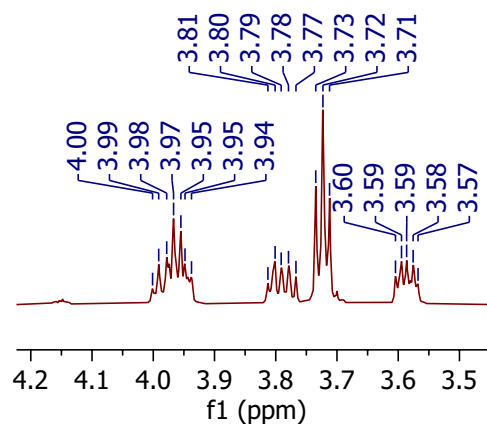
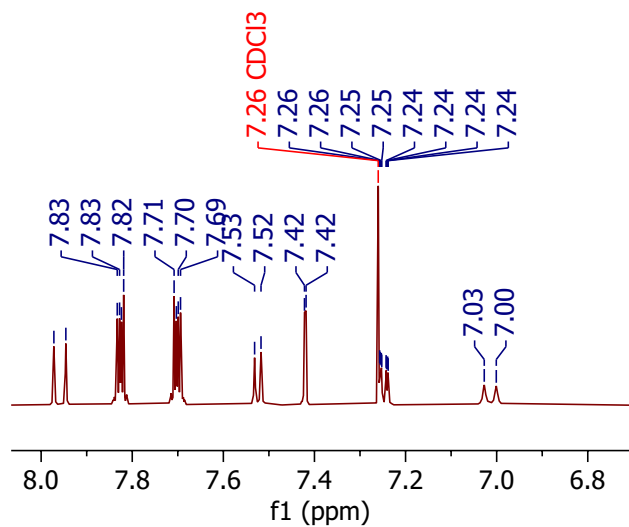
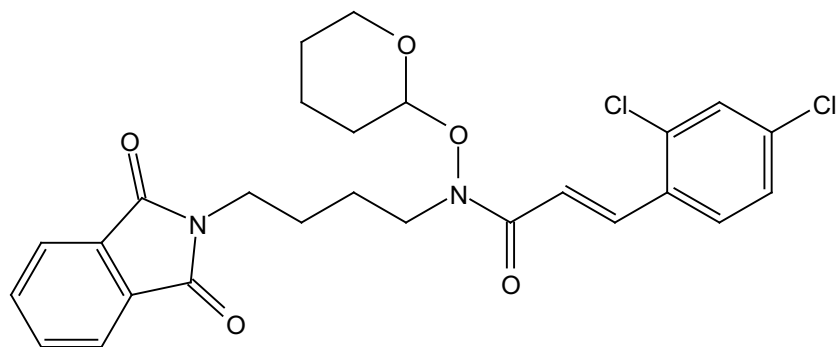
Compound S7
¹H NMR (500 MHz, CDCl₃)



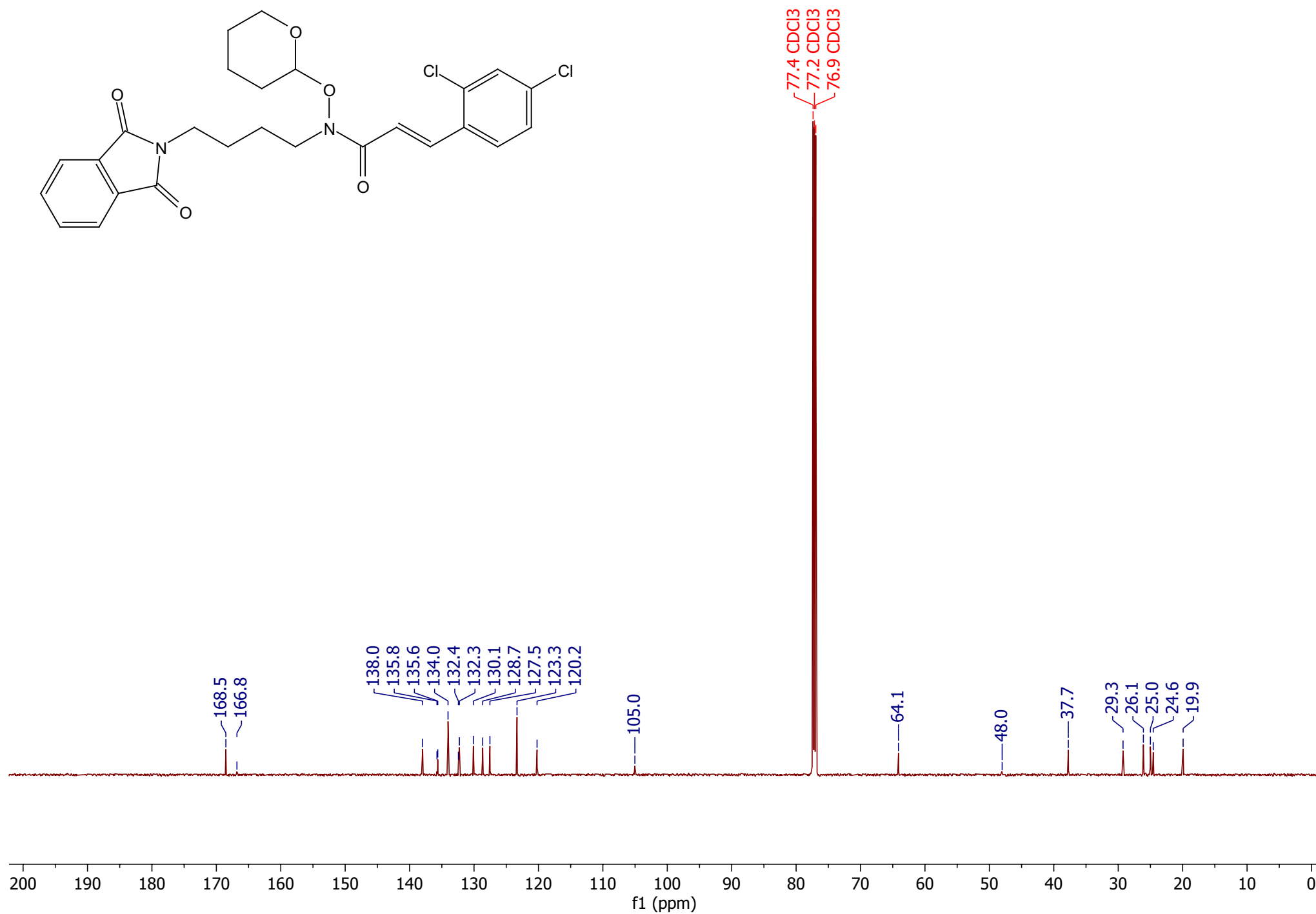
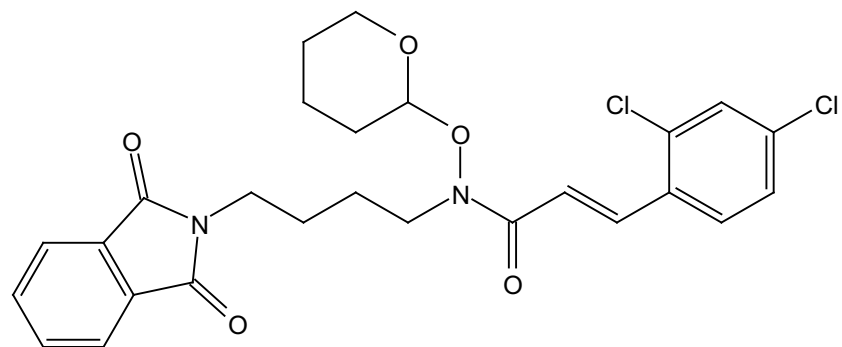
Compound S7
 ^{13}C NMR (126 MHz, CDCl_3)



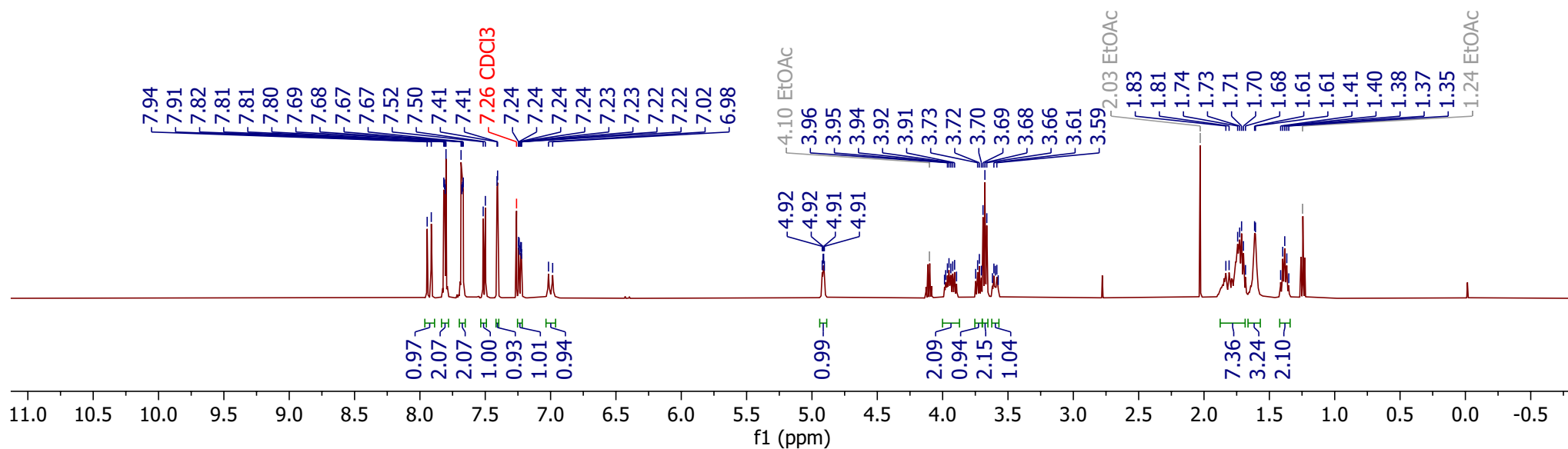
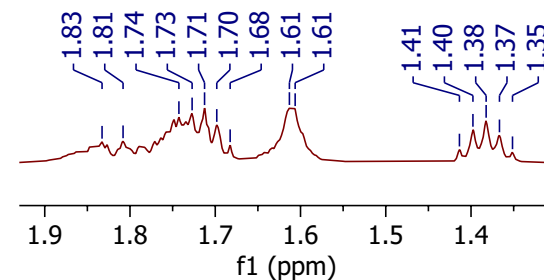
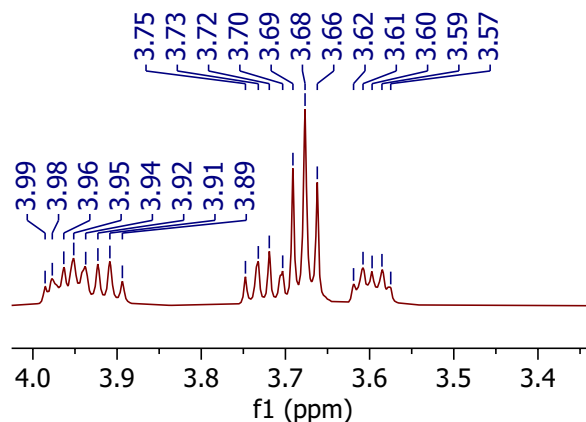
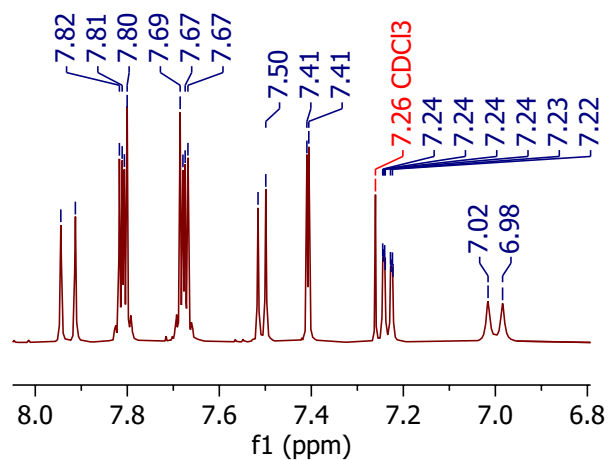
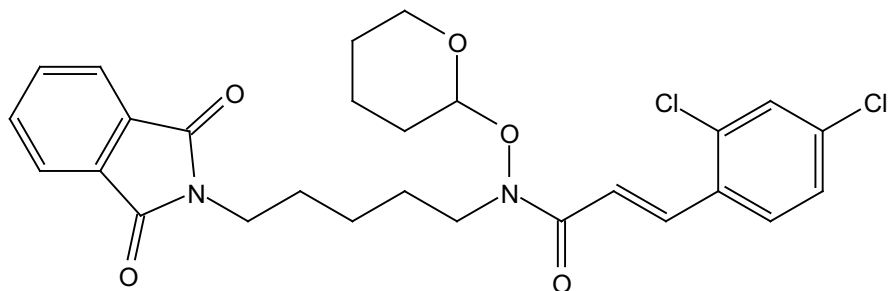
Compound S8
¹H NMR (600 MHz, CDCl₃)



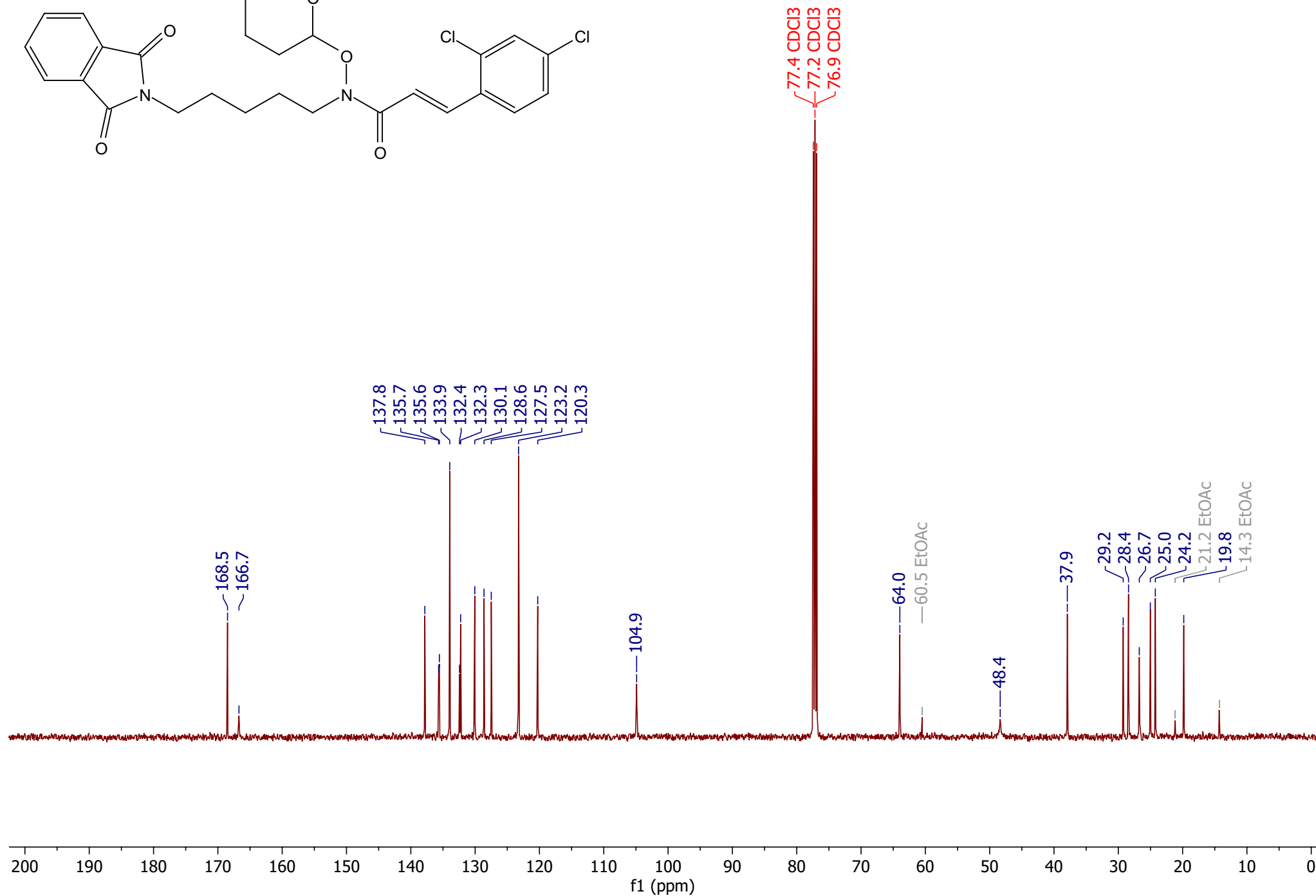
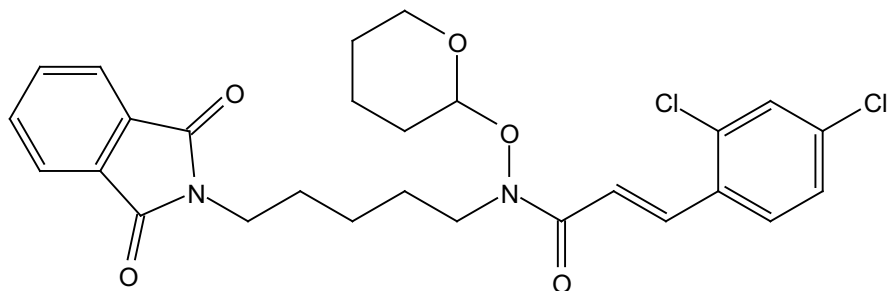
Compound S8
¹³C NMR (151 MHz, CDCl₃)



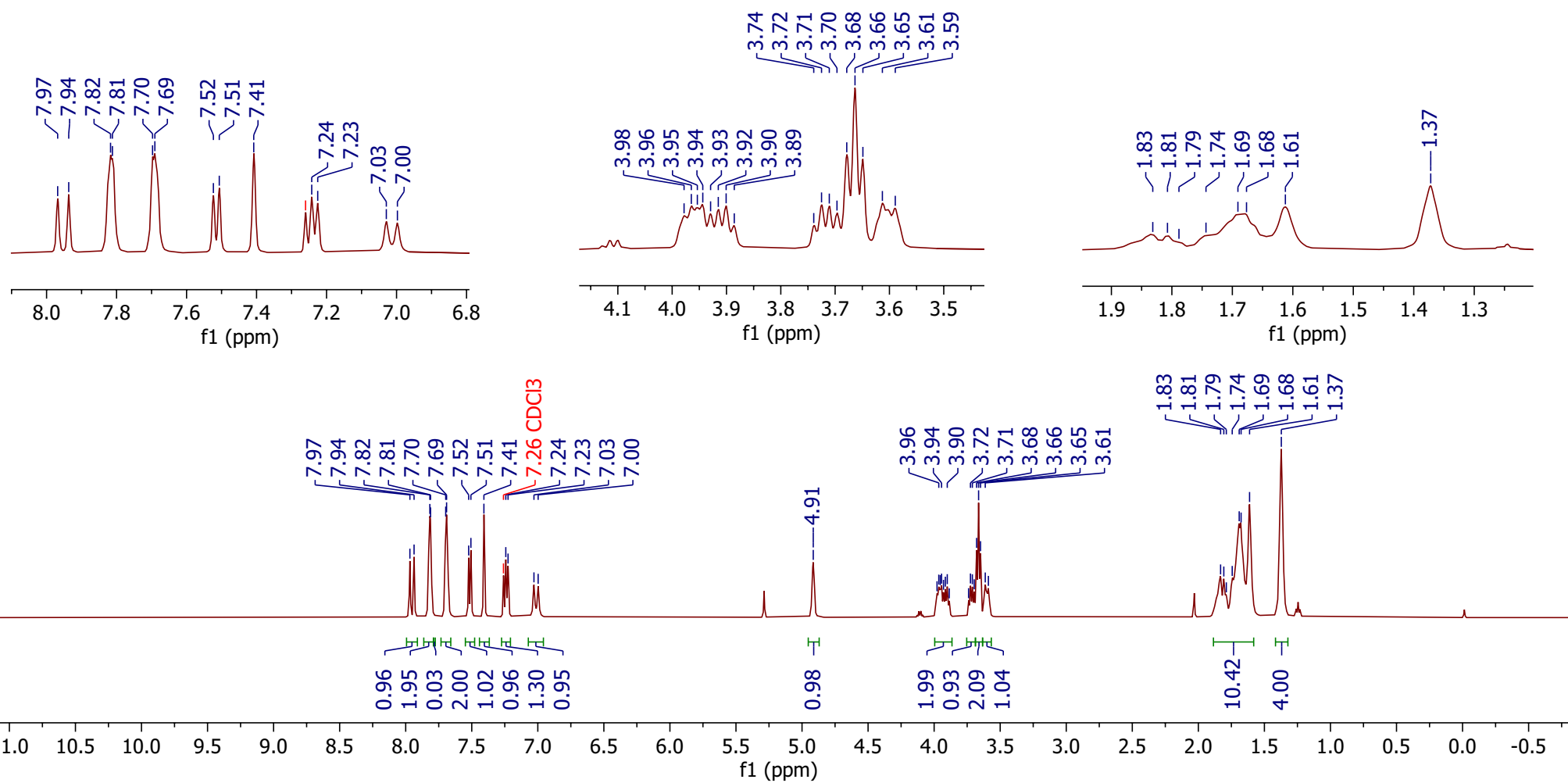
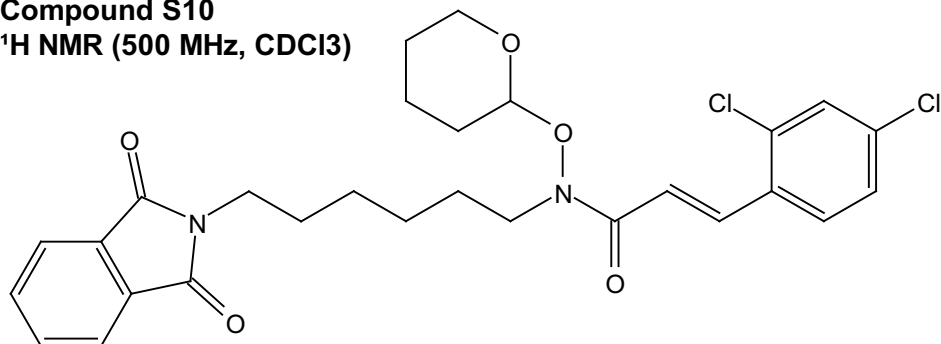
Compound S9
¹H NMR (500 MHz, CDCl₃)



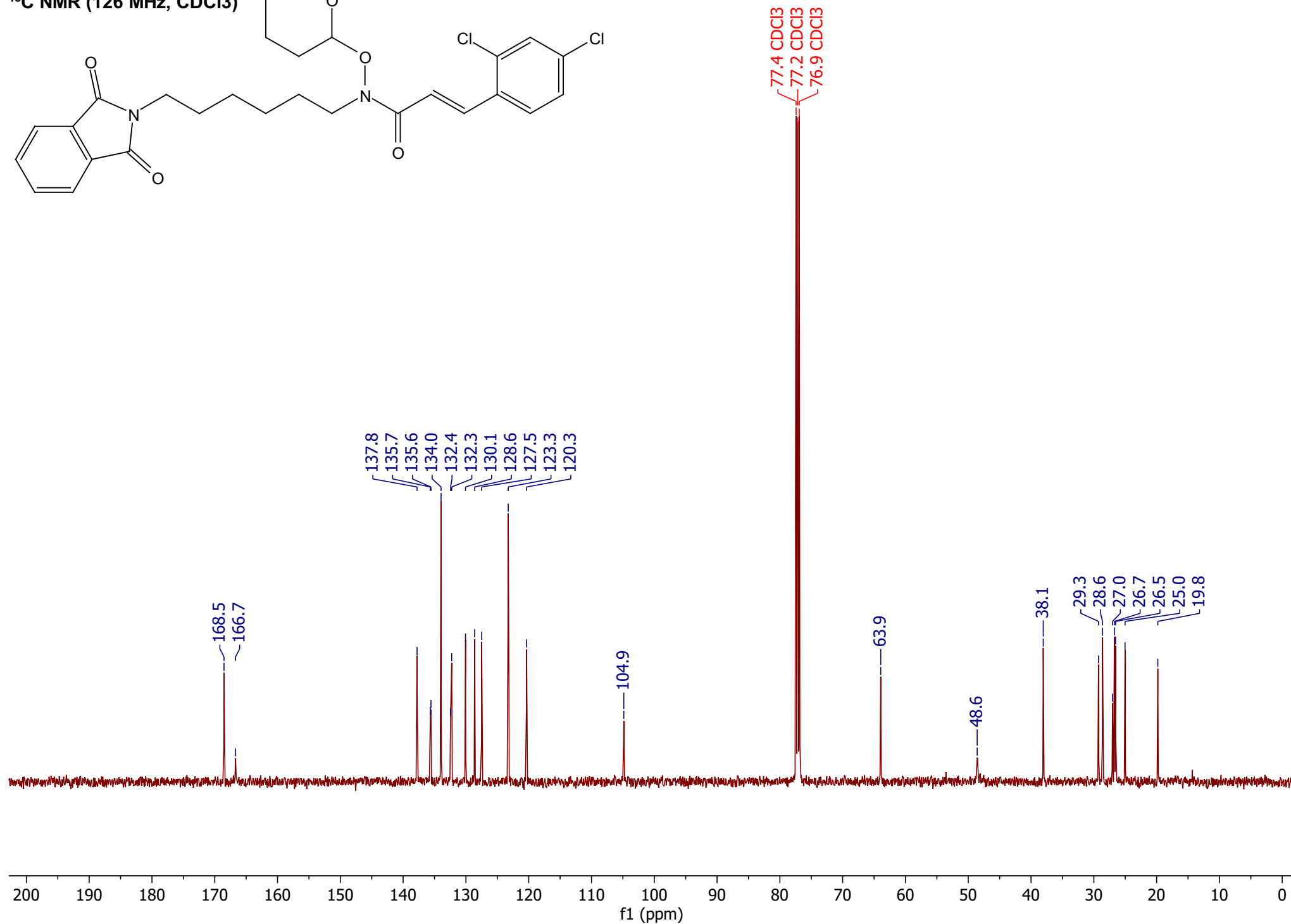
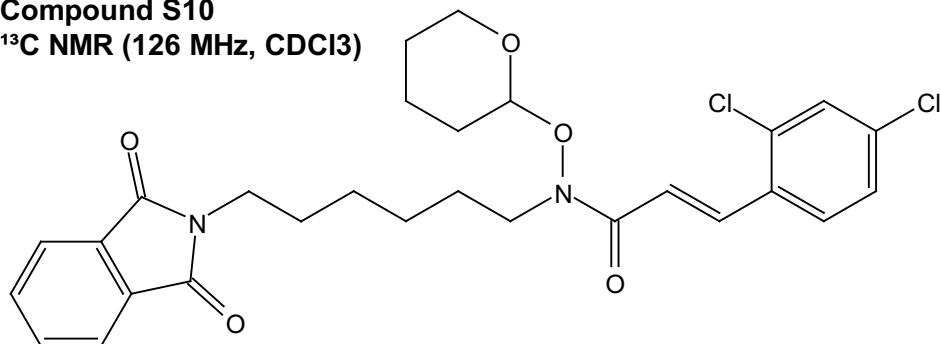
Compound S9
¹³C NMR (126 MHz, CDCl₃)



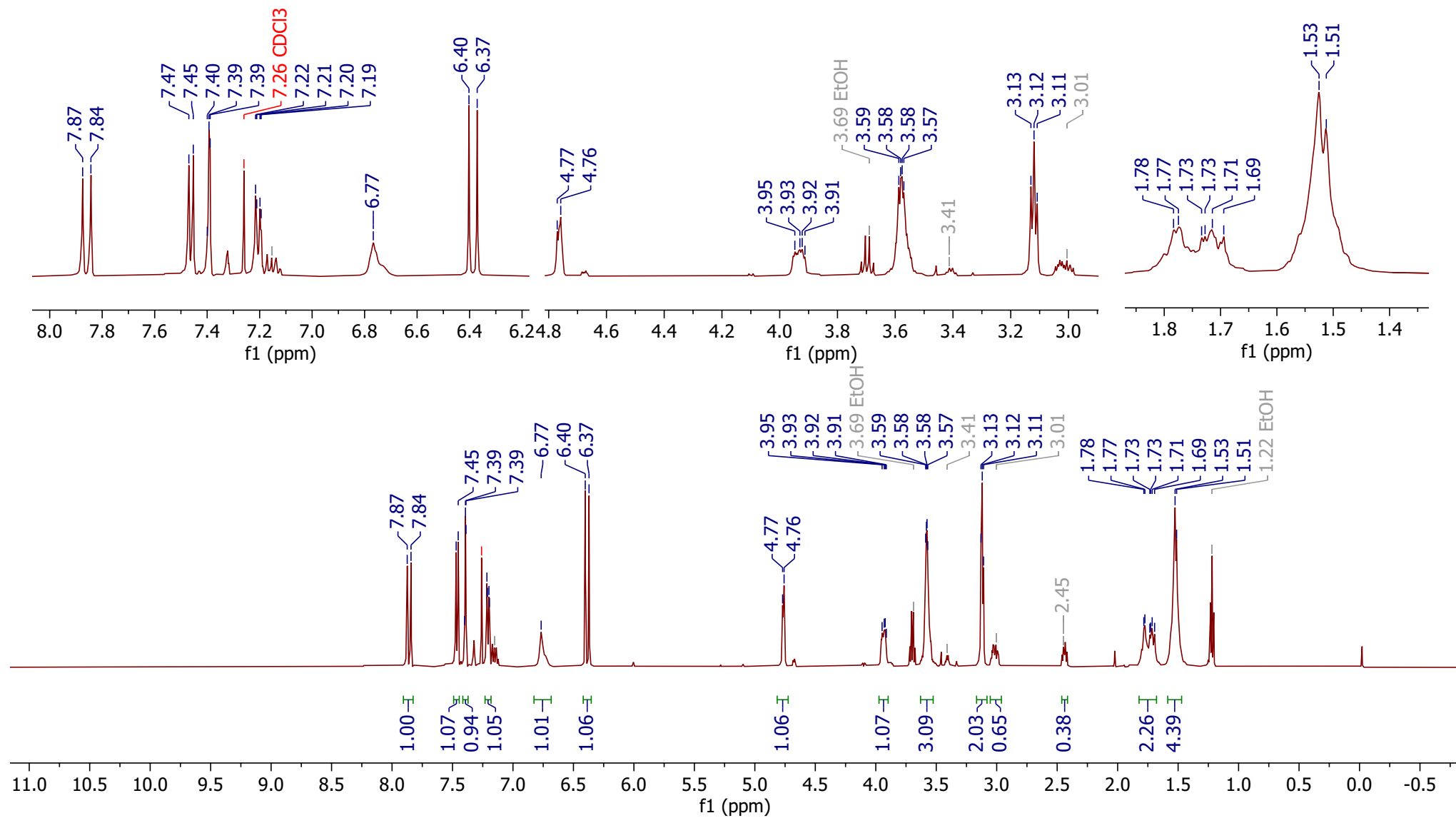
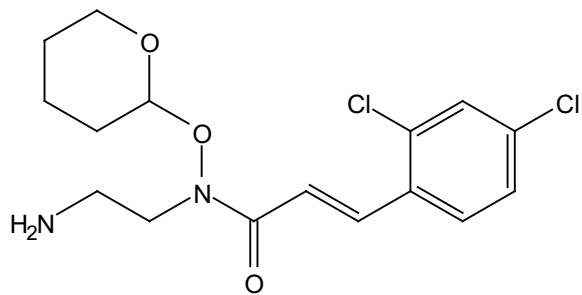
Compound S10
¹H NMR (500 MHz, CDCl₃)



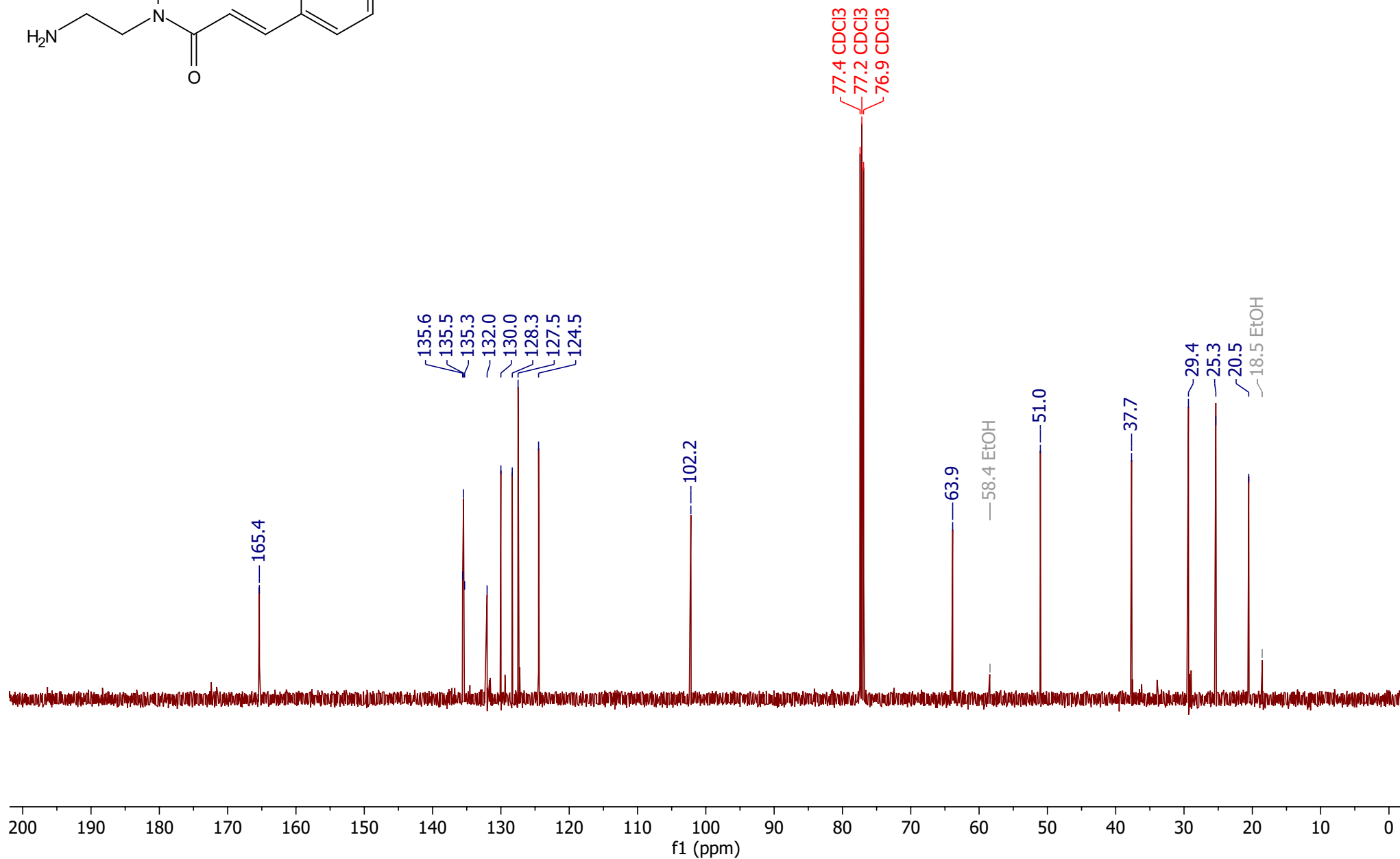
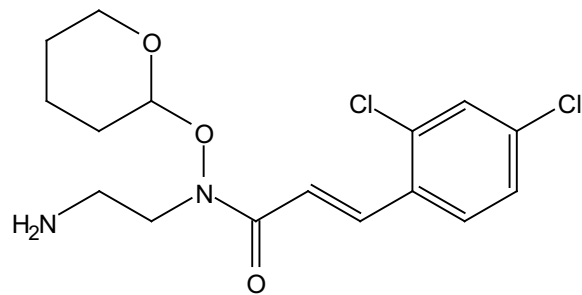
Compound S10
¹³C NMR (126 MHz, CDCl₃)



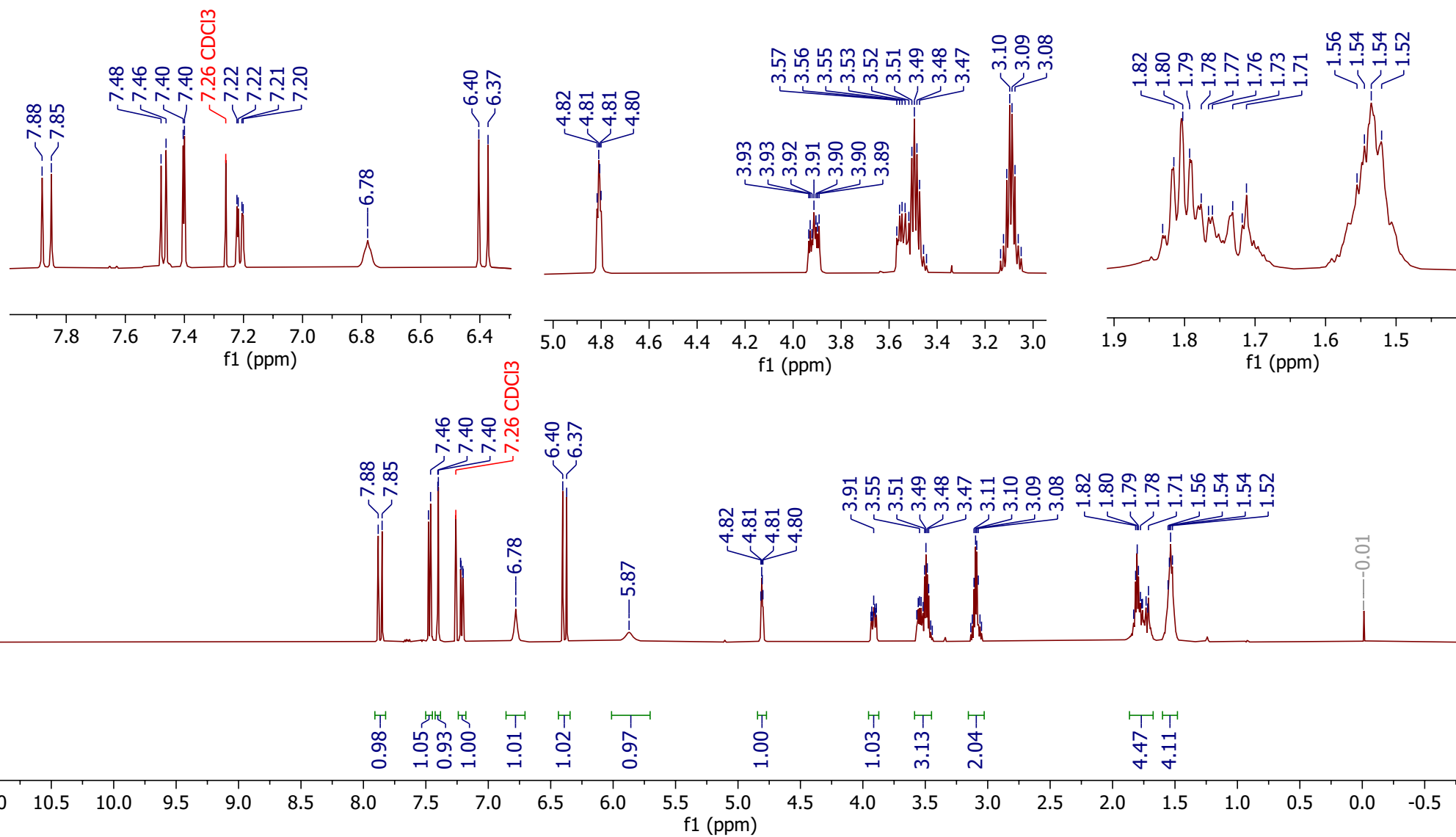
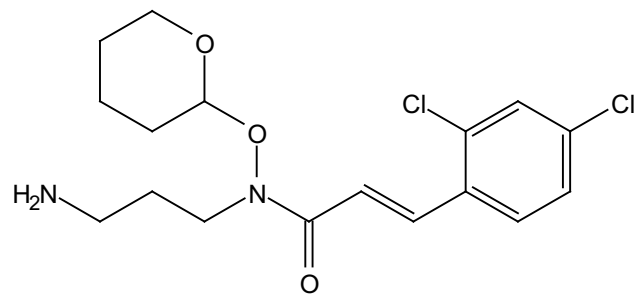
Compound S11
¹H NMR (500 MHz, CDCl₃)



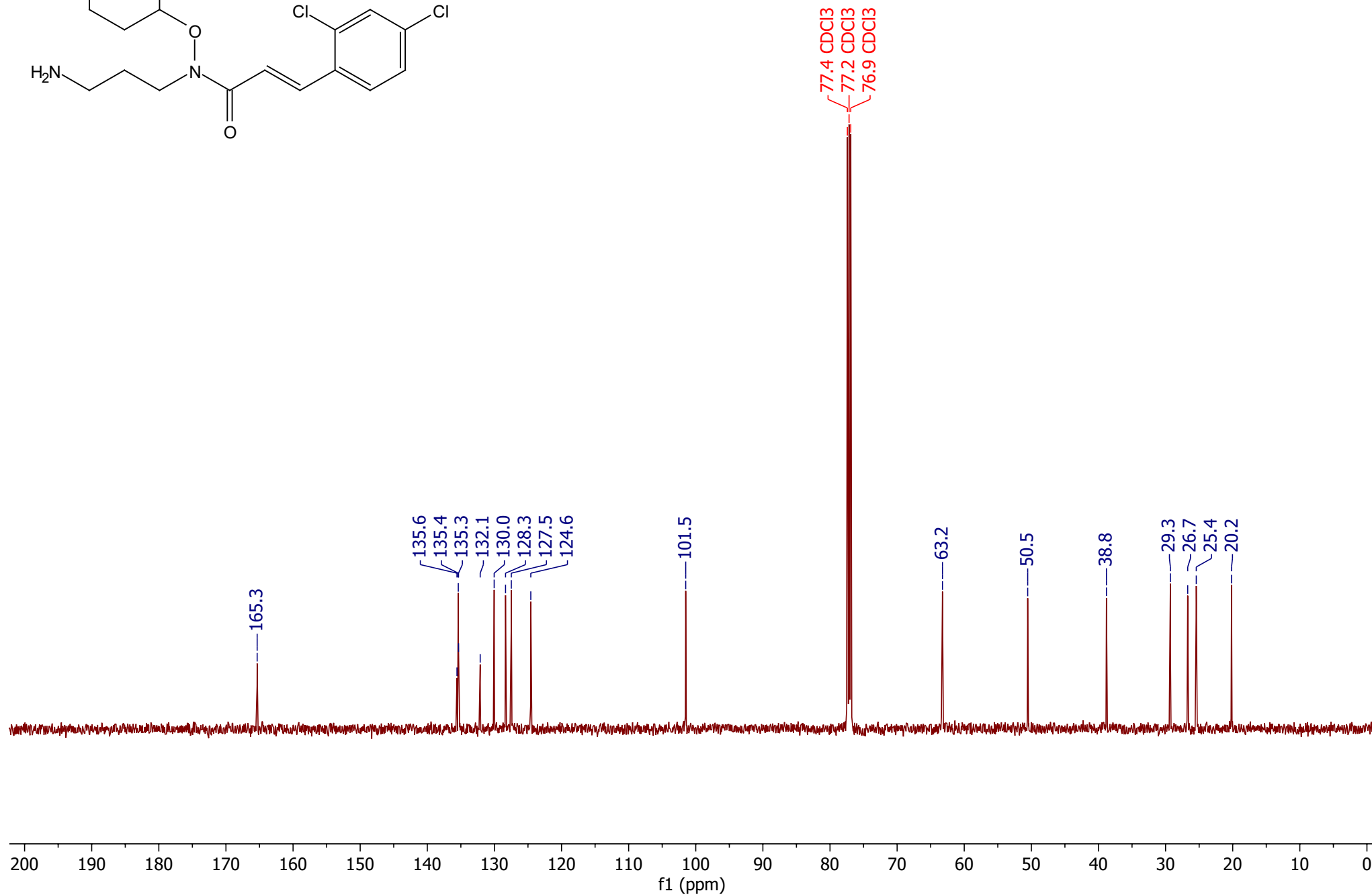
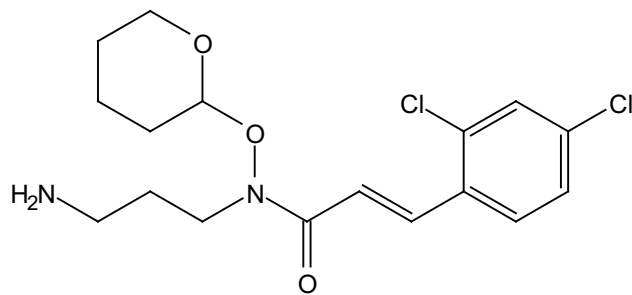
Compound S11
 ^{13}C NMR (126 MHz, CDCl_3)



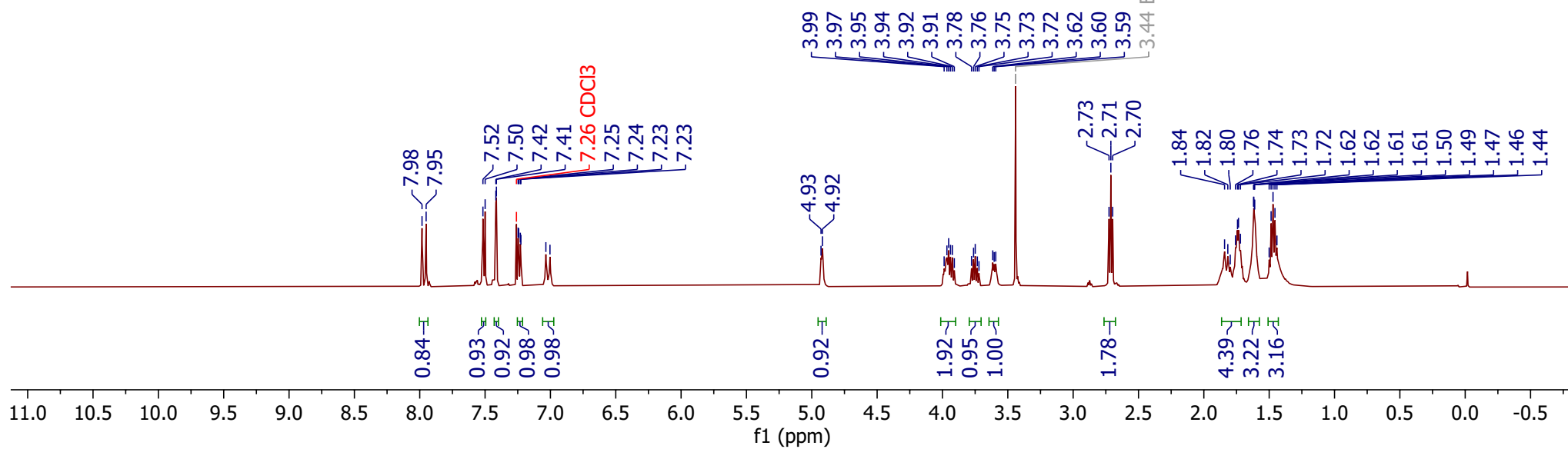
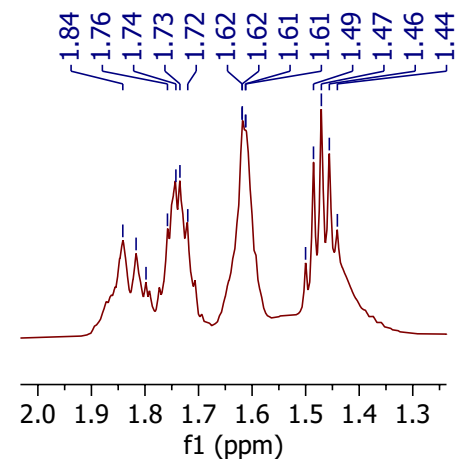
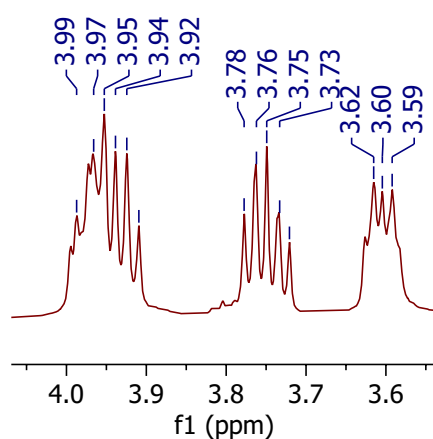
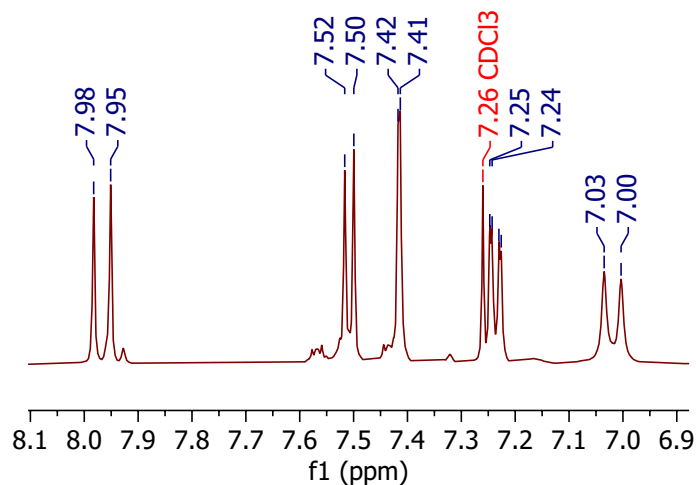
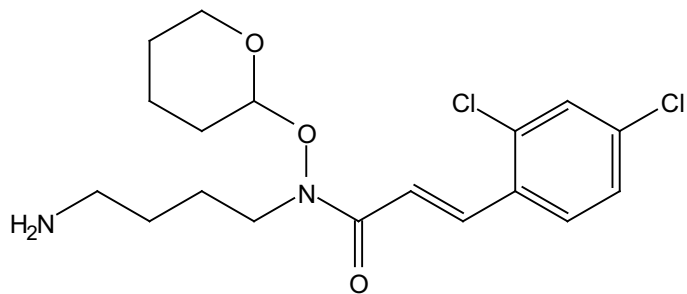
Compound S12
¹H NMR (500 MHz, CDCl₃)



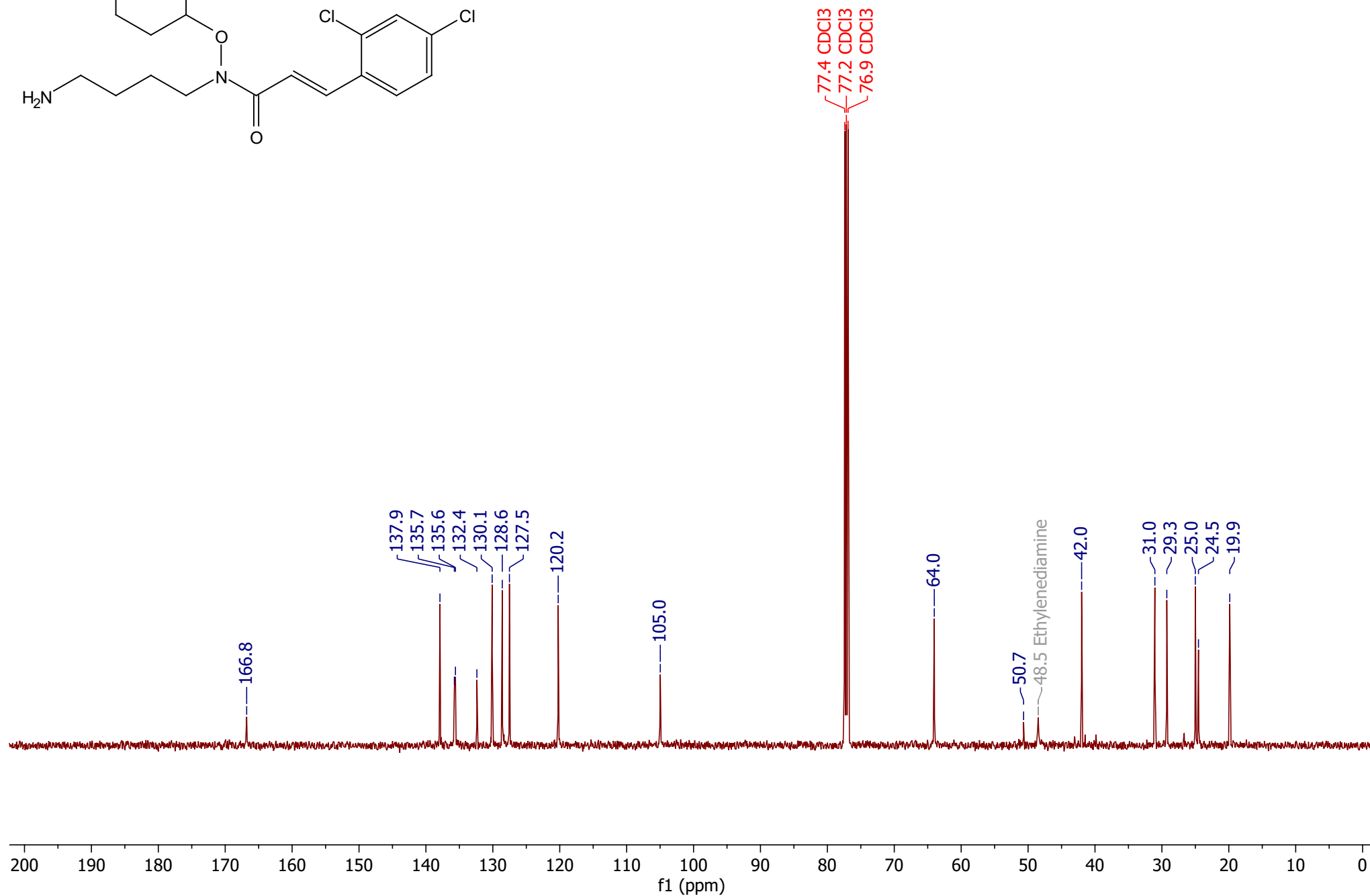
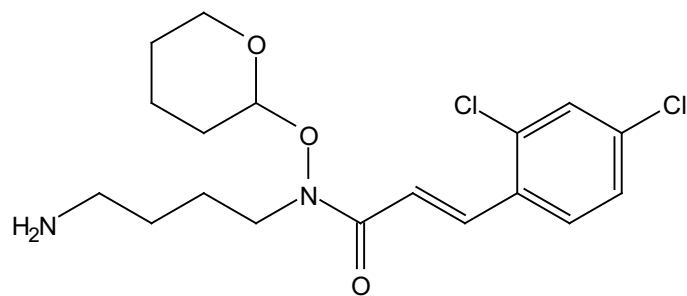
Compound S12
¹³C NMR (126 MHz, CDCl₃)



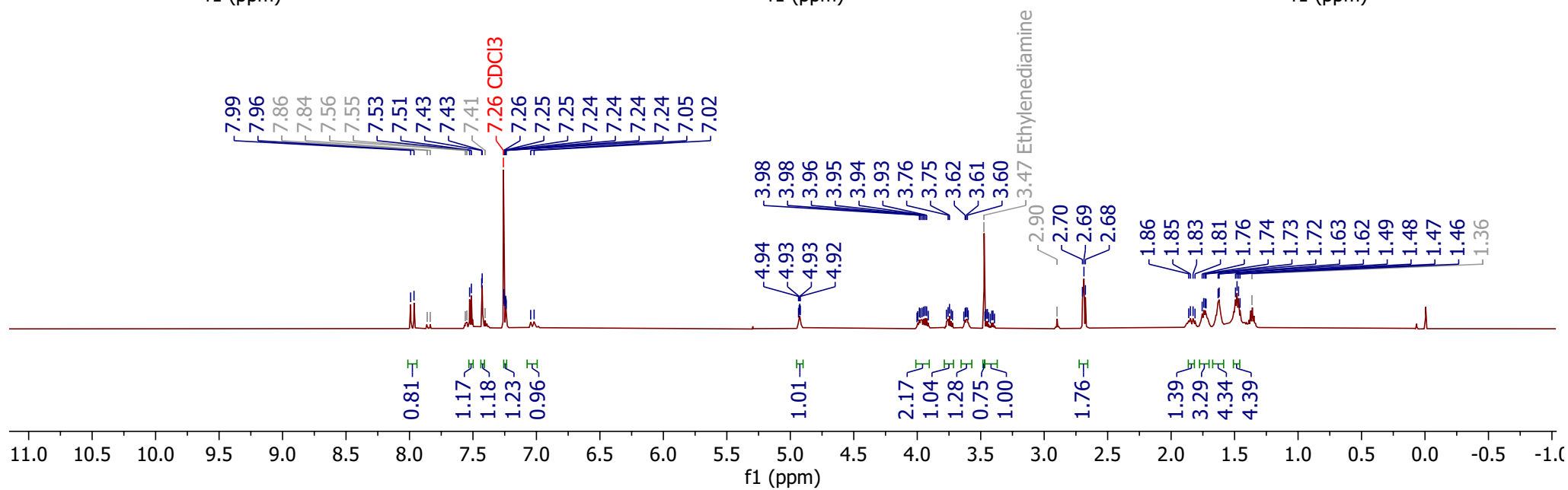
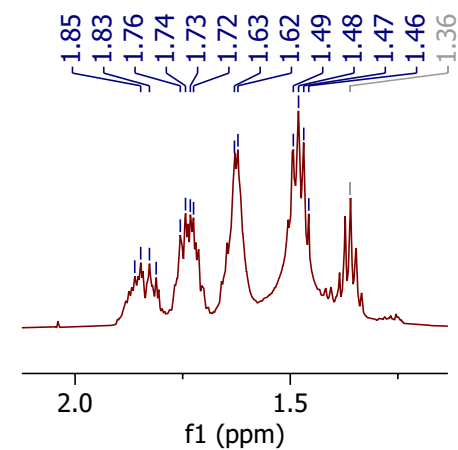
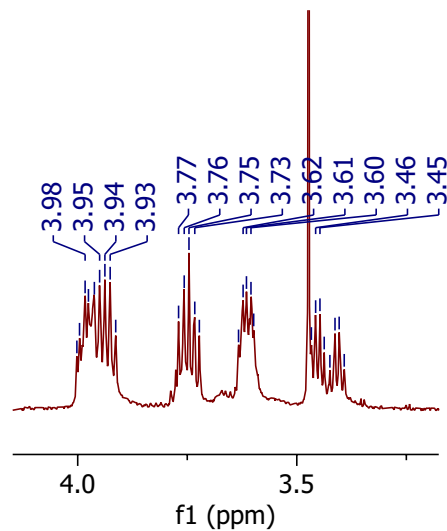
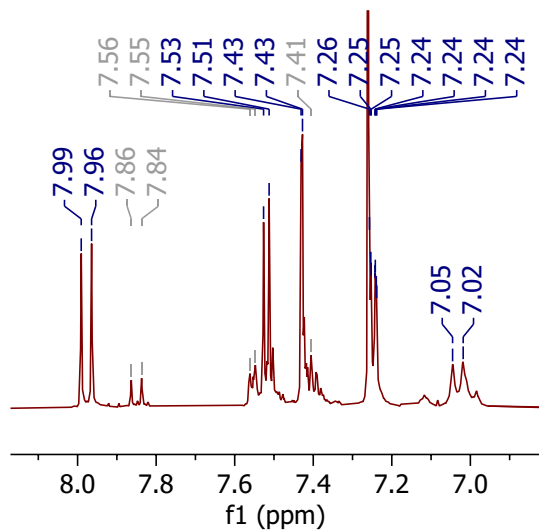
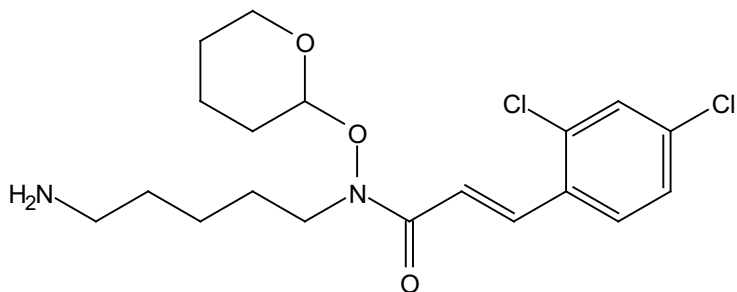
Compound S13
¹H NMR (500 MHz, CDCl₃)



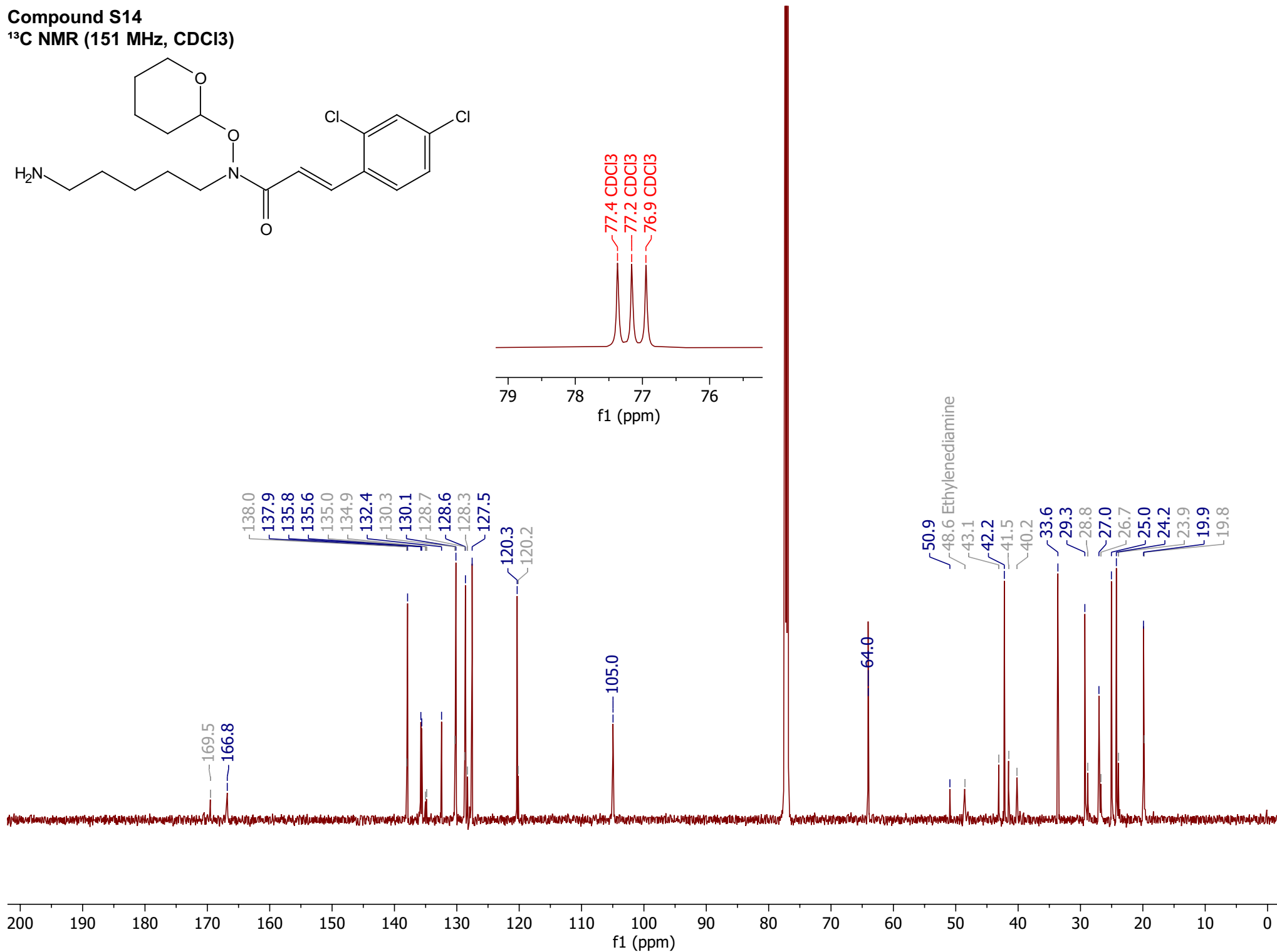
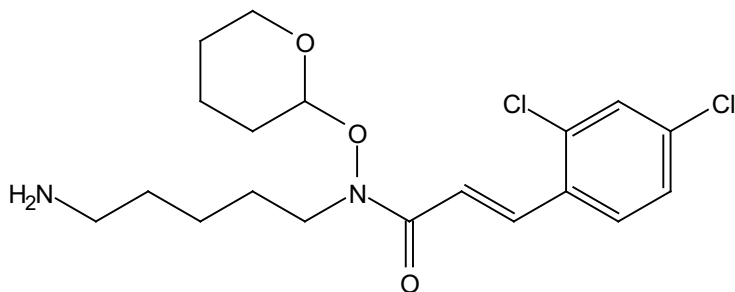
Compound S13
 ^{13}C NMR (126 MHz, CDCl_3)



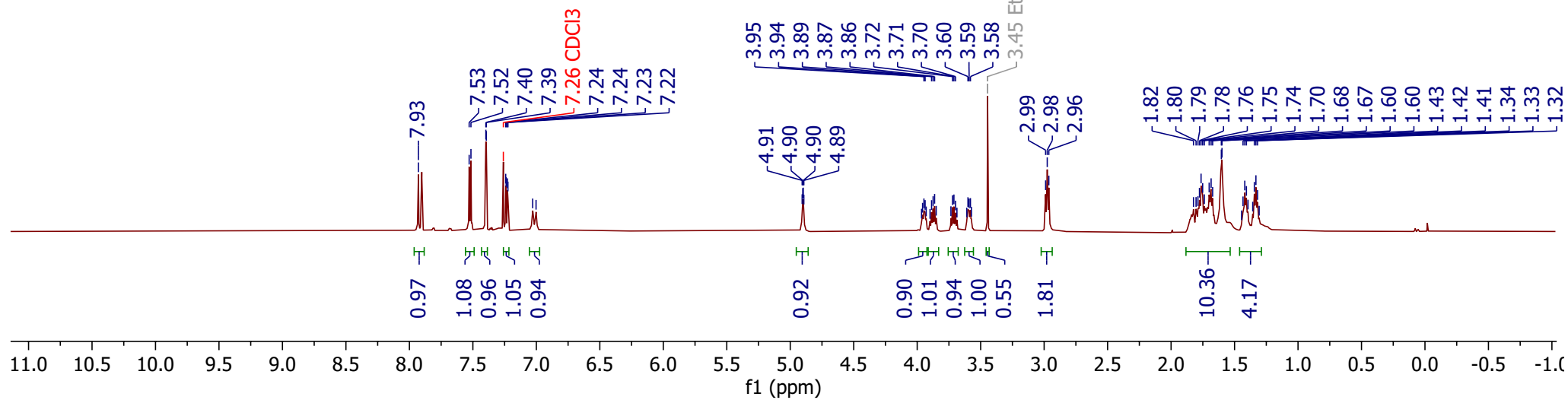
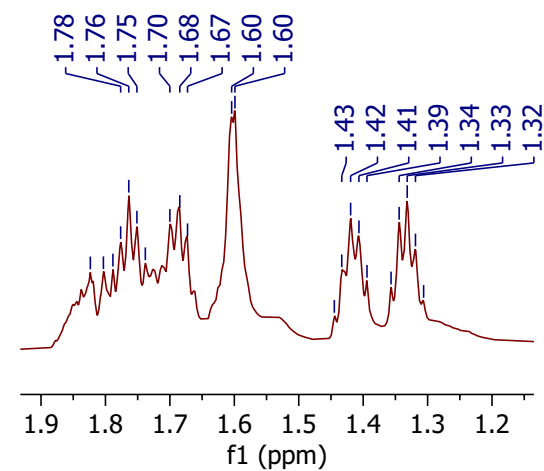
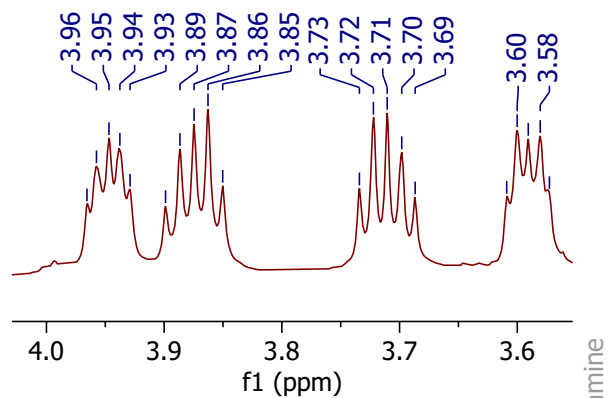
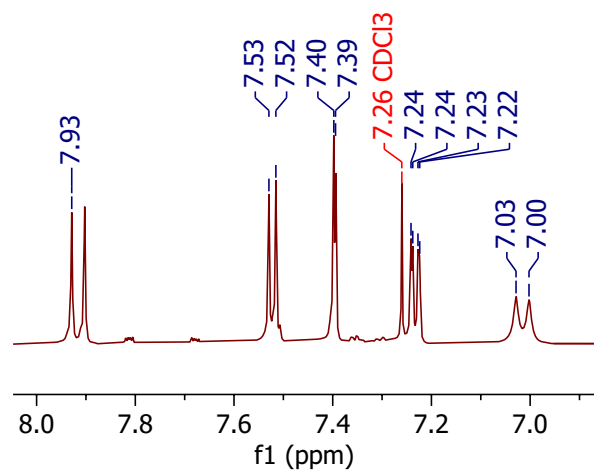
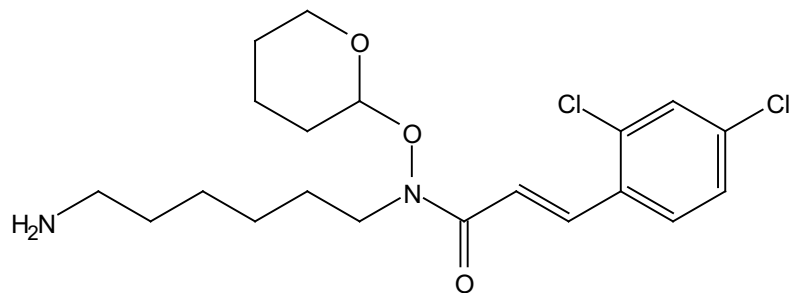
¹H NMR (600 MHz, CDCl₃)



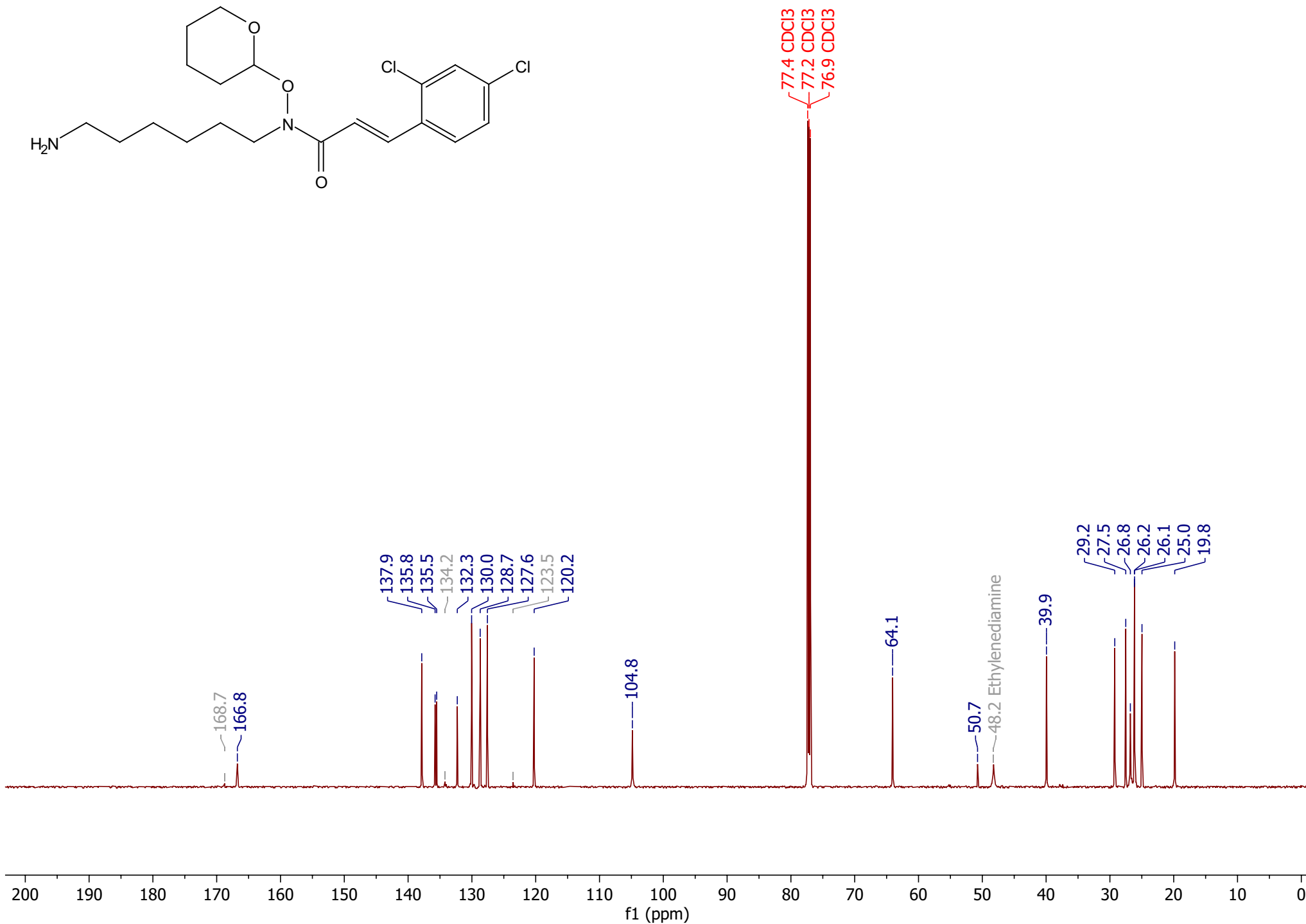
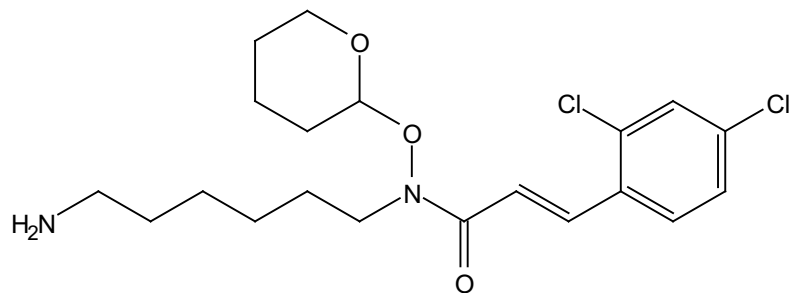
¹³C NMR (151 MHz, CDCl₃)



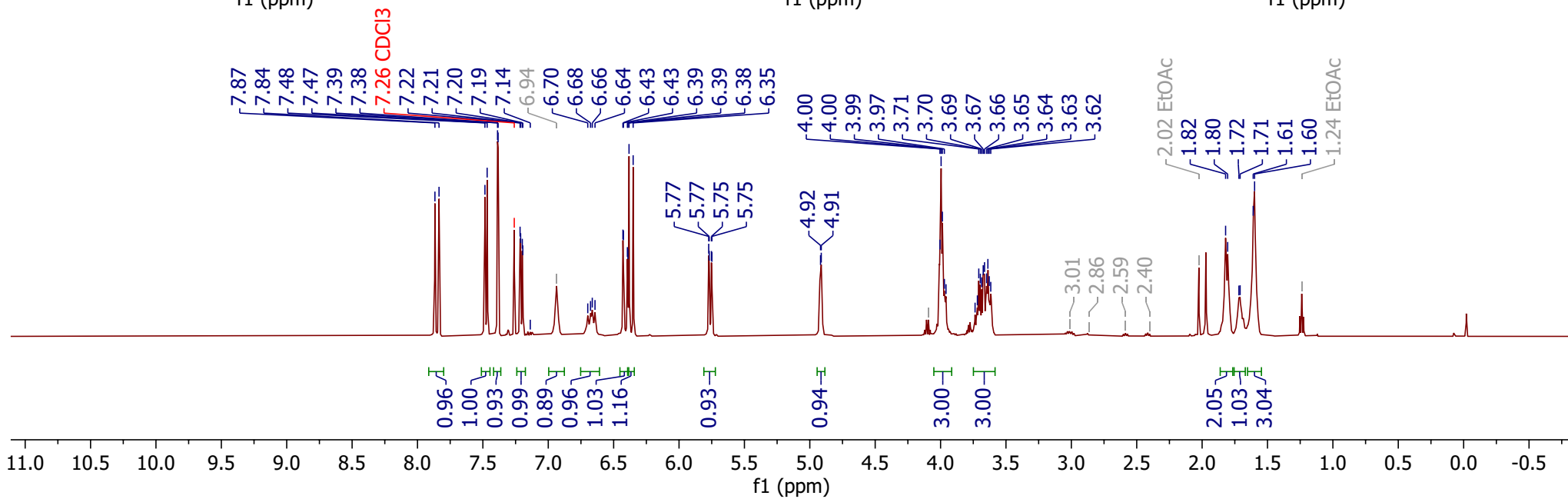
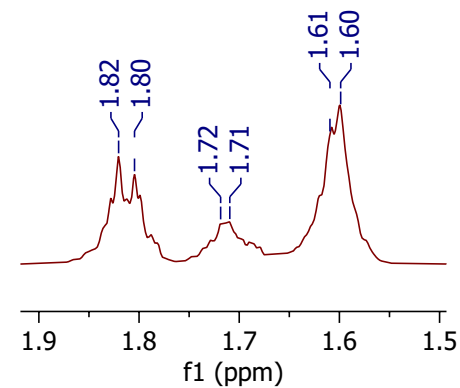
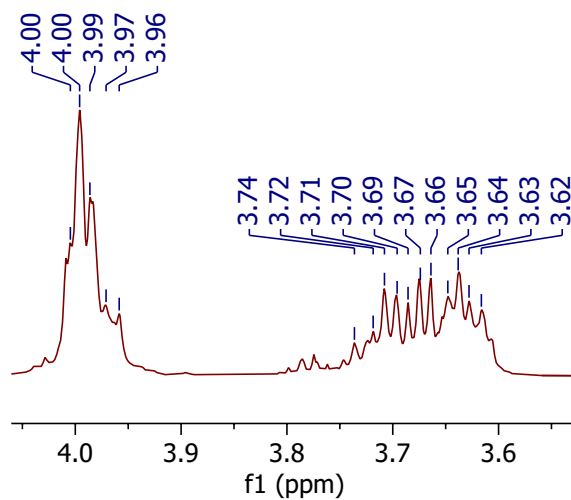
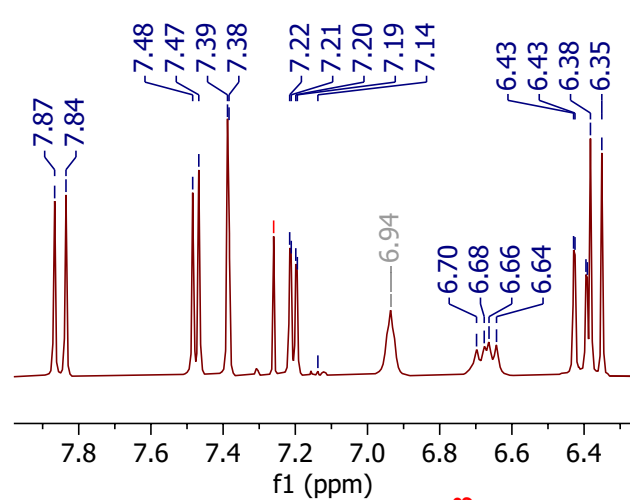
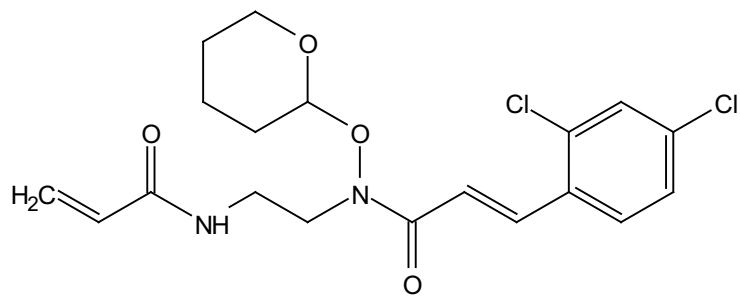
Compound S15
¹H NMR (600 MHz, CDCl₃)



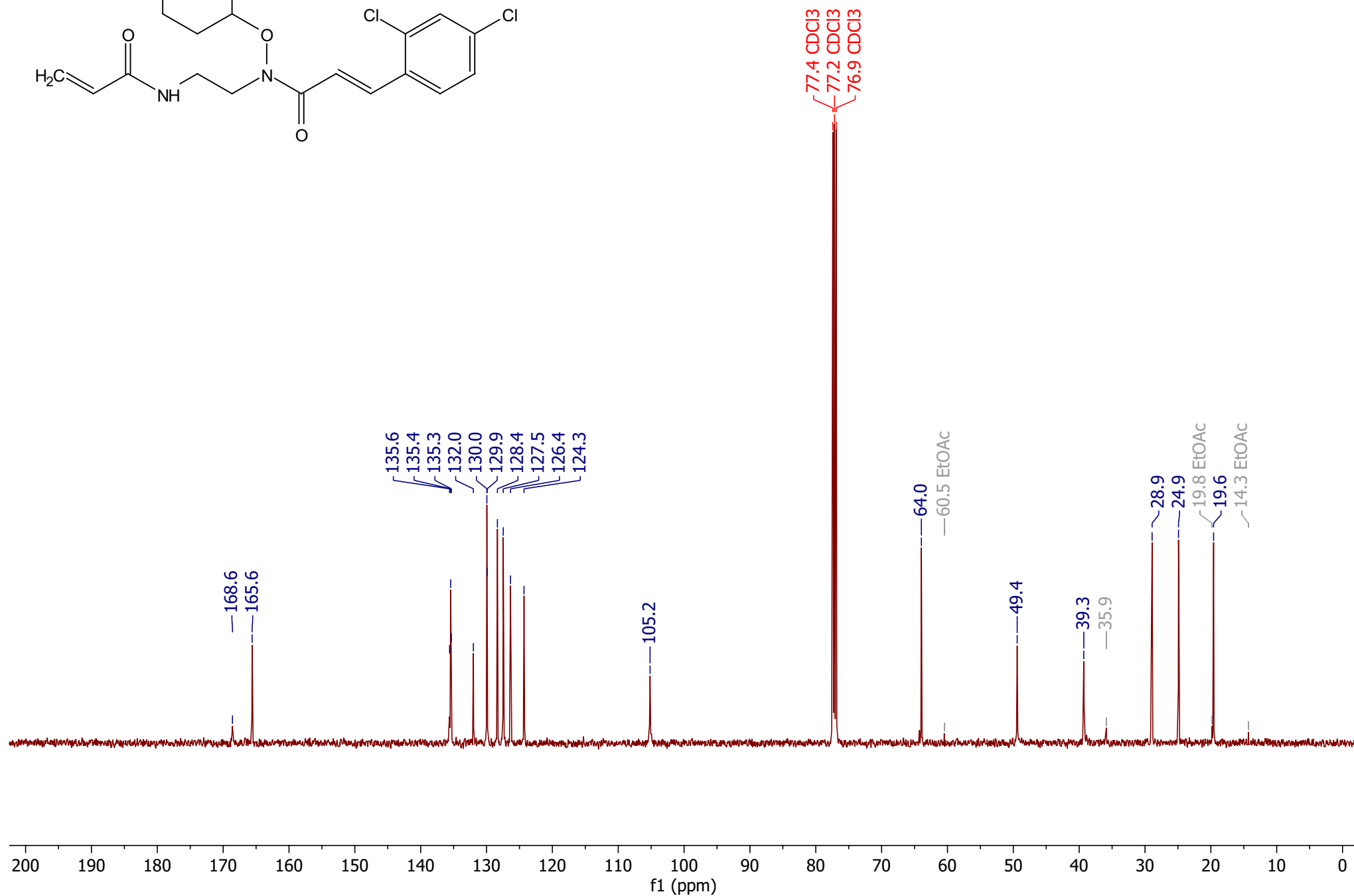
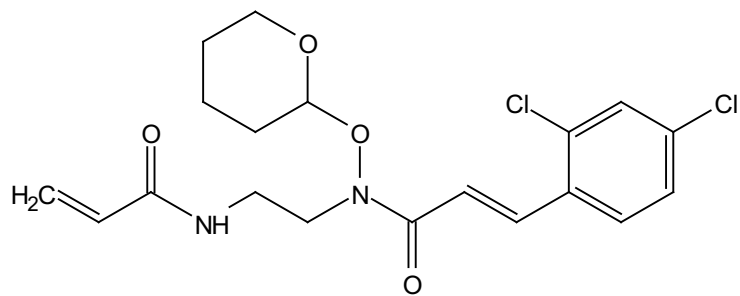
Compound S15
¹³C NMR (151 MHz, CDCl₃)



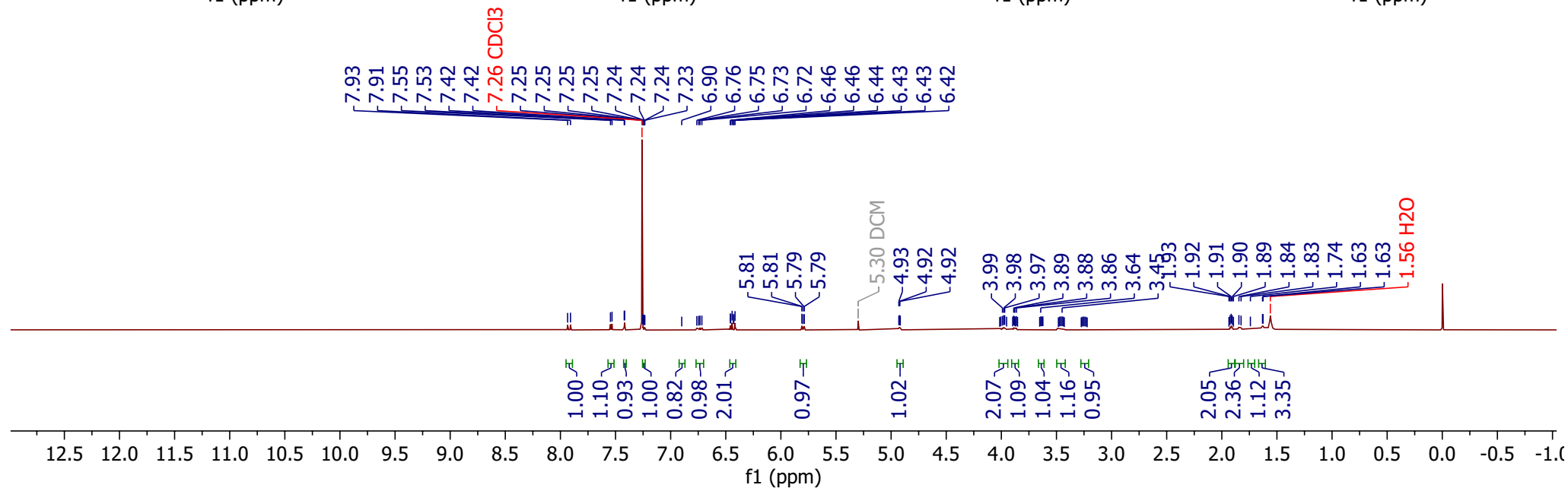
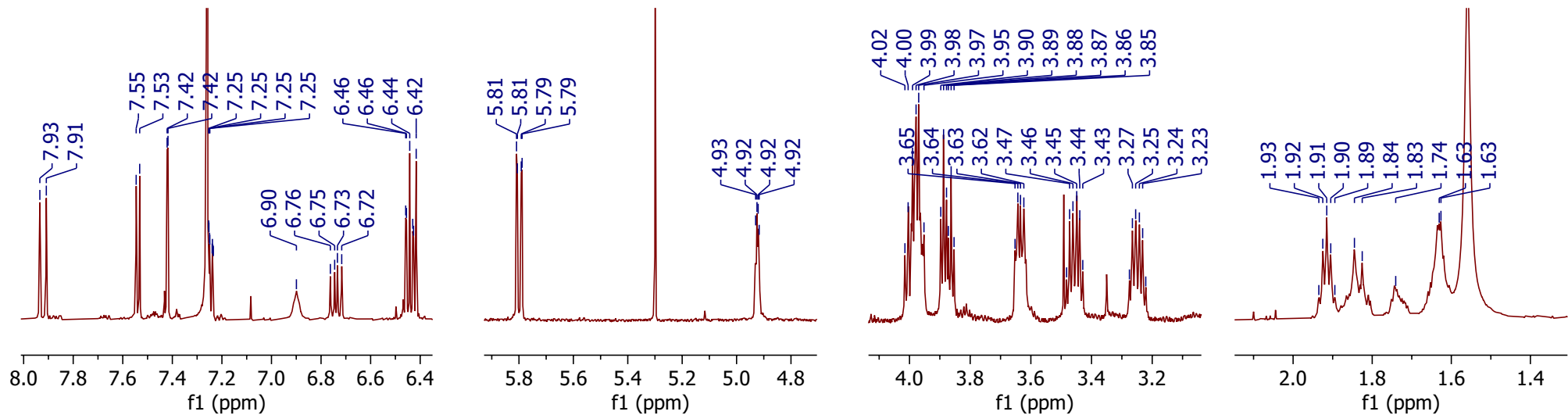
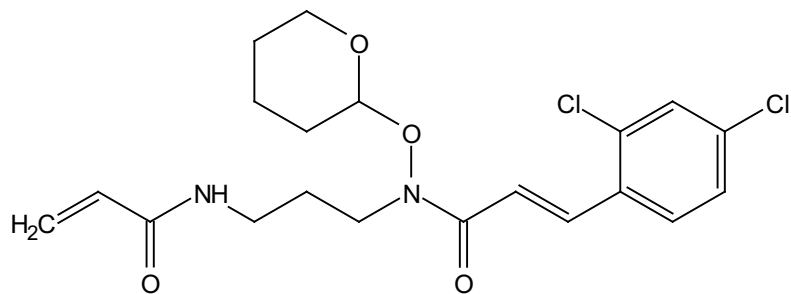
Compound S16
¹H NMR (500 MHz, CDCl₃)



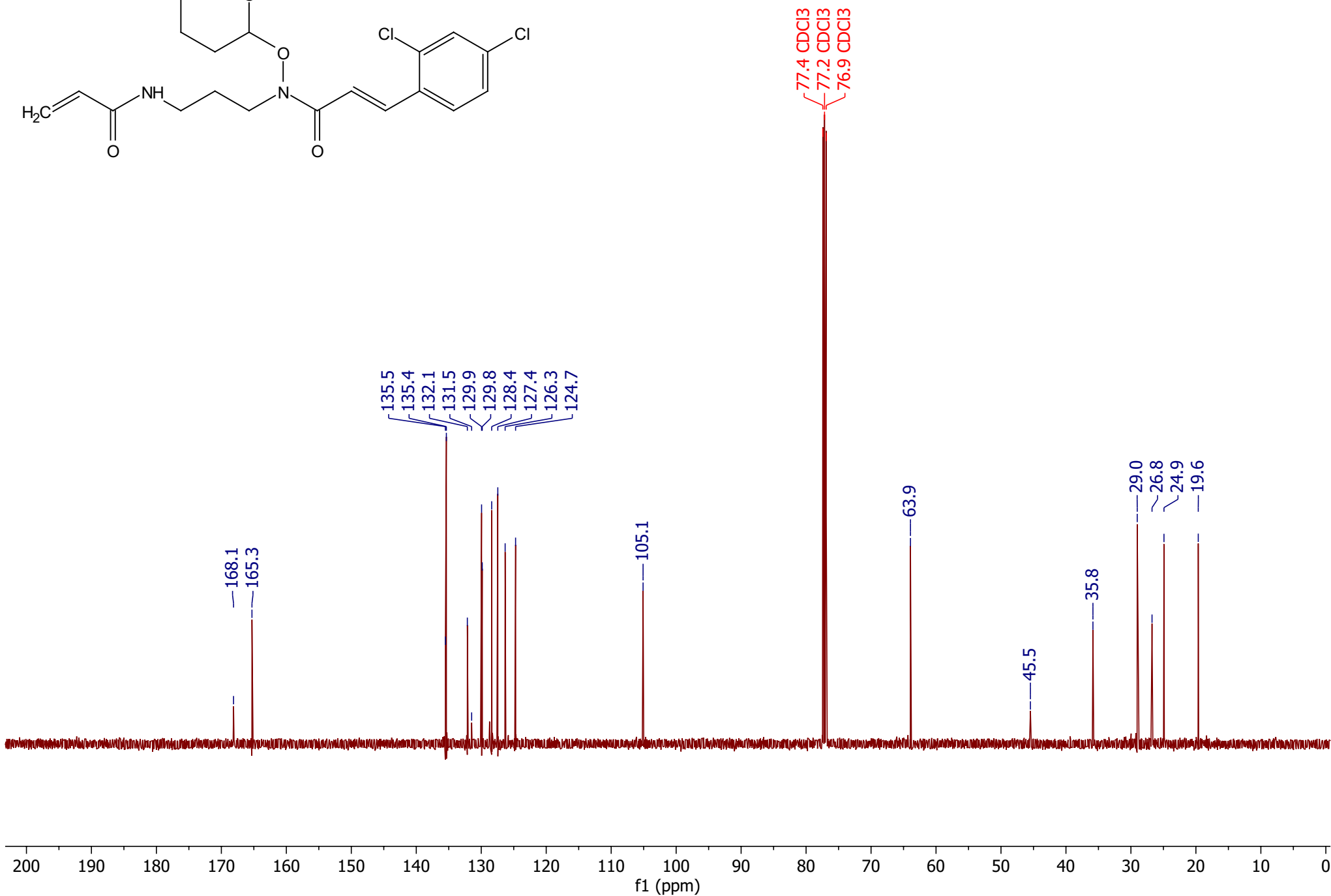
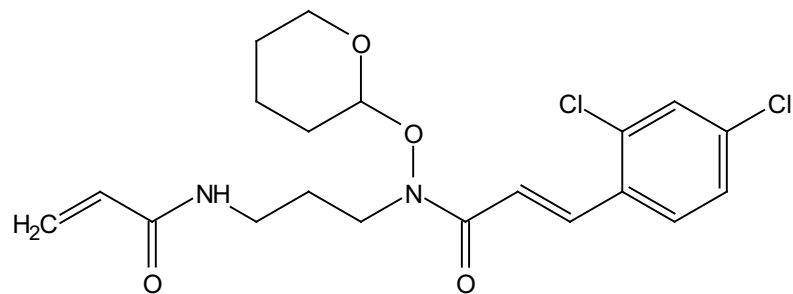
Compound S16
 ^{13}C NMR (126 MHz, CDCl_3)



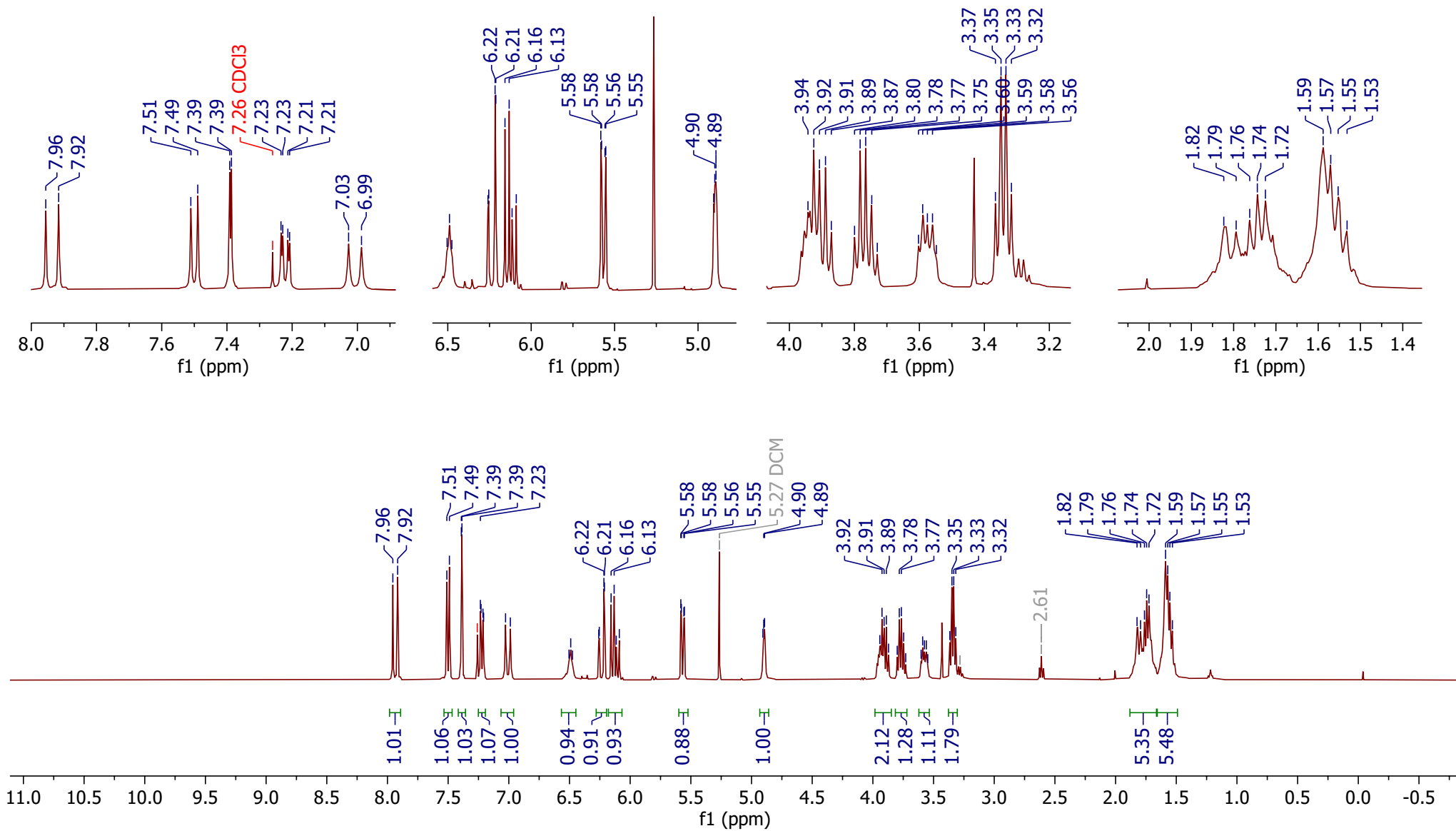
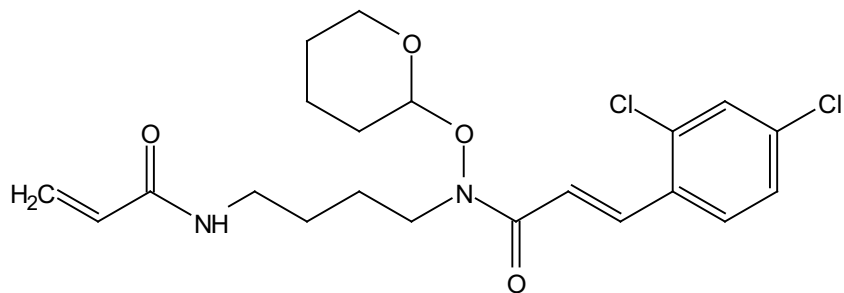
Compound S17
¹H NMR (600 MHz, CDCl₃)



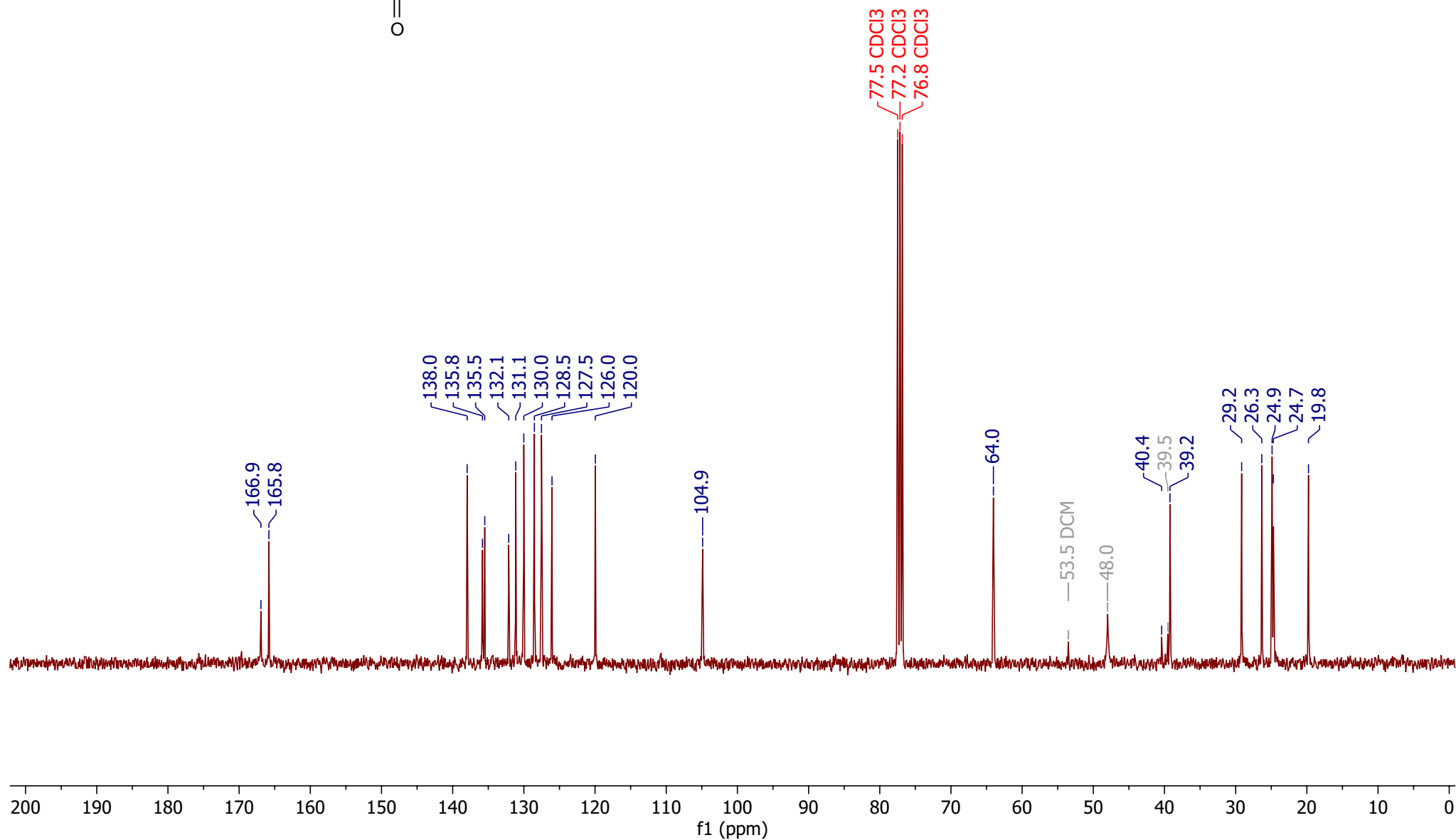
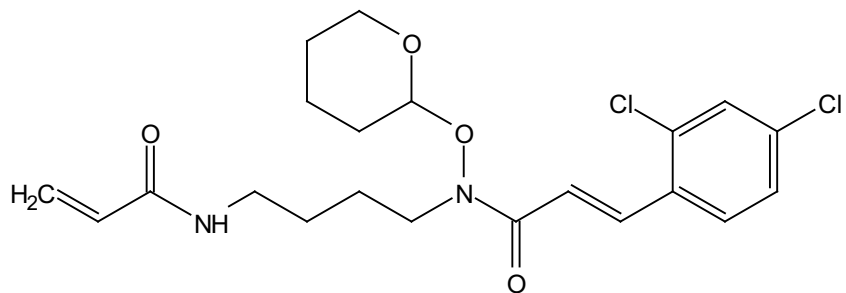
Compound S17
 ^{13}C NMR (126 MHz, CDCl_3)



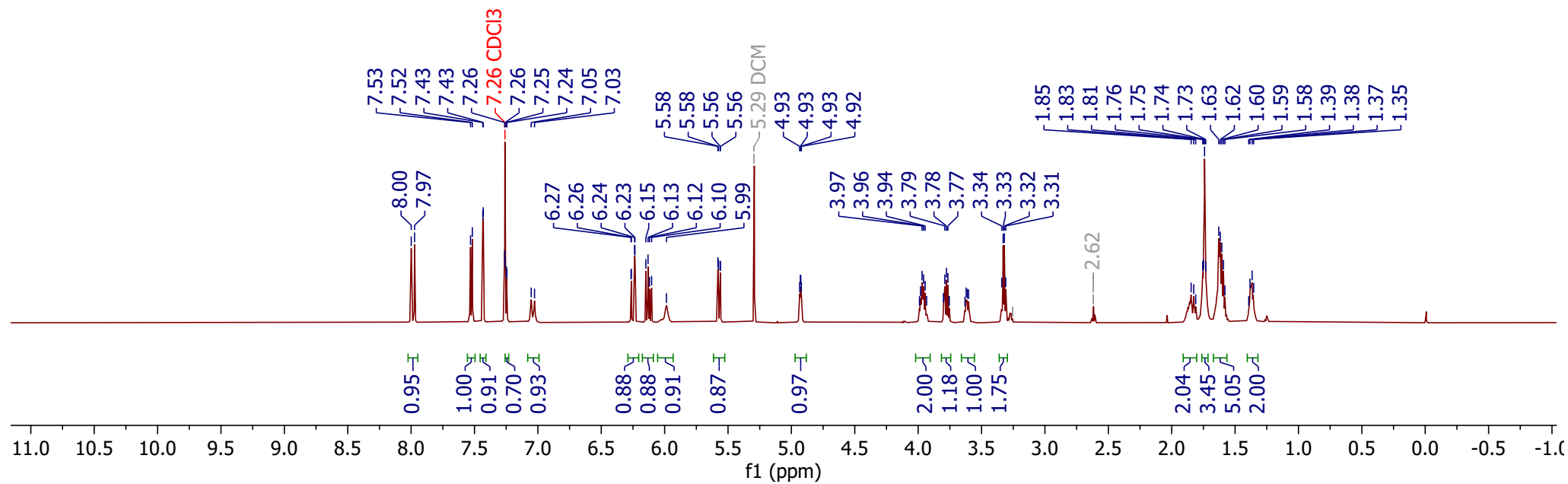
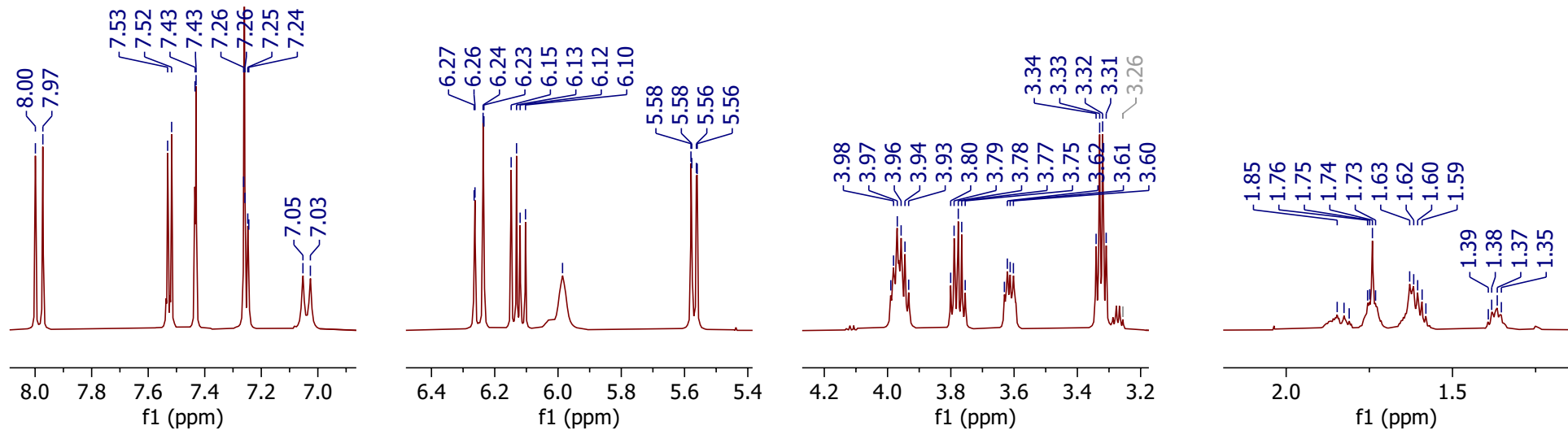
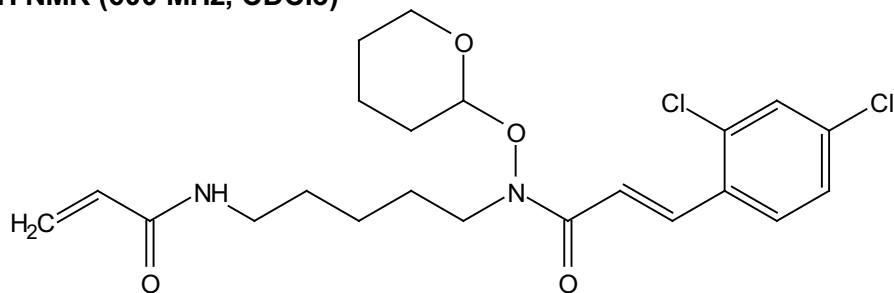
Compound S18
¹H NMR (400 MHz, CDCl₃)



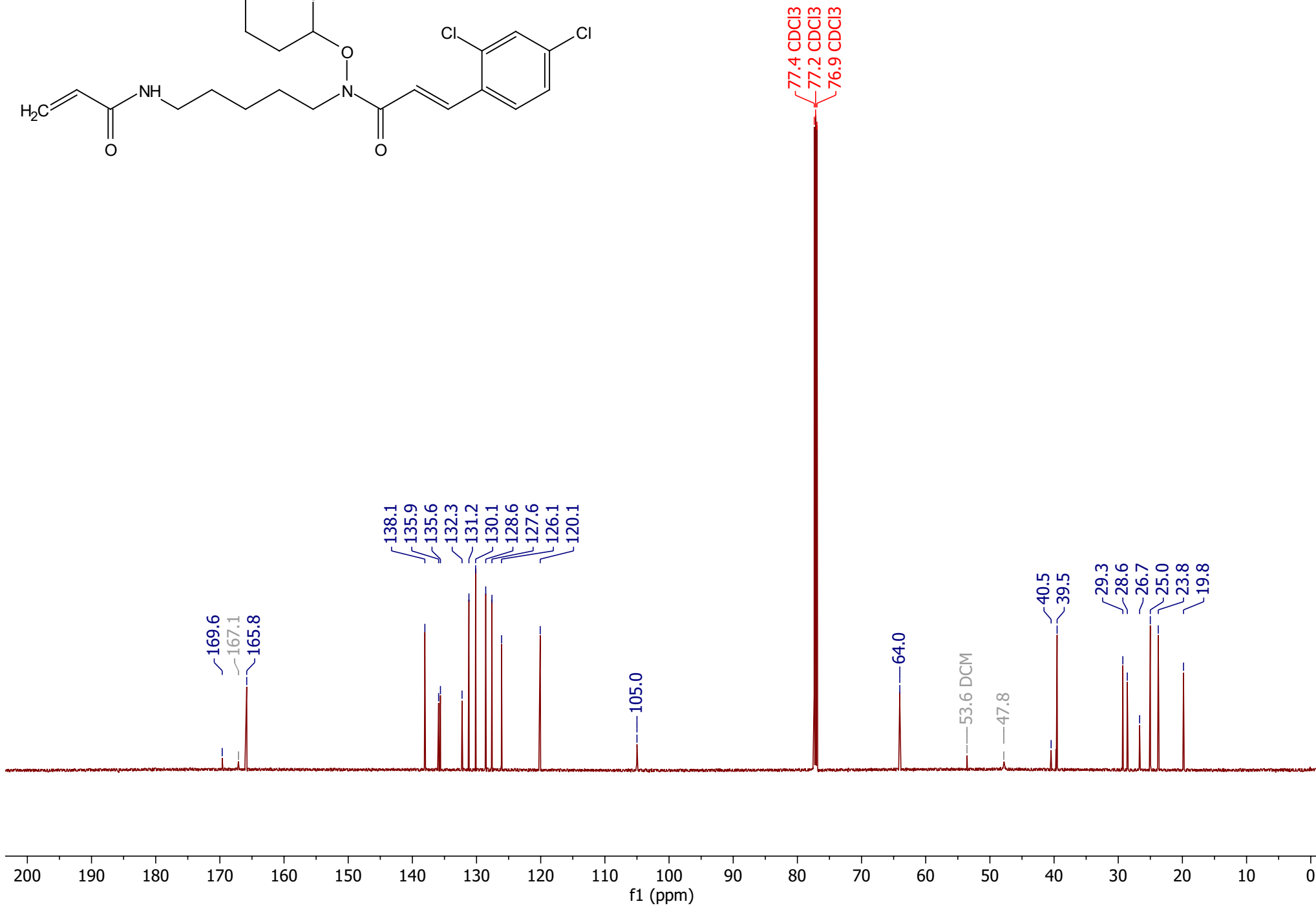
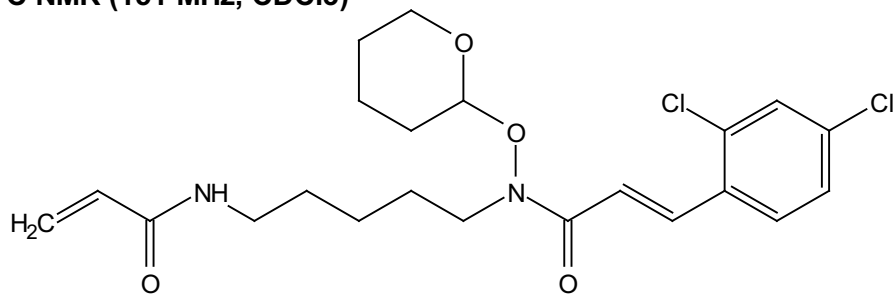
Compound S18
¹³C NMR (101 MHz, CDCl₃)



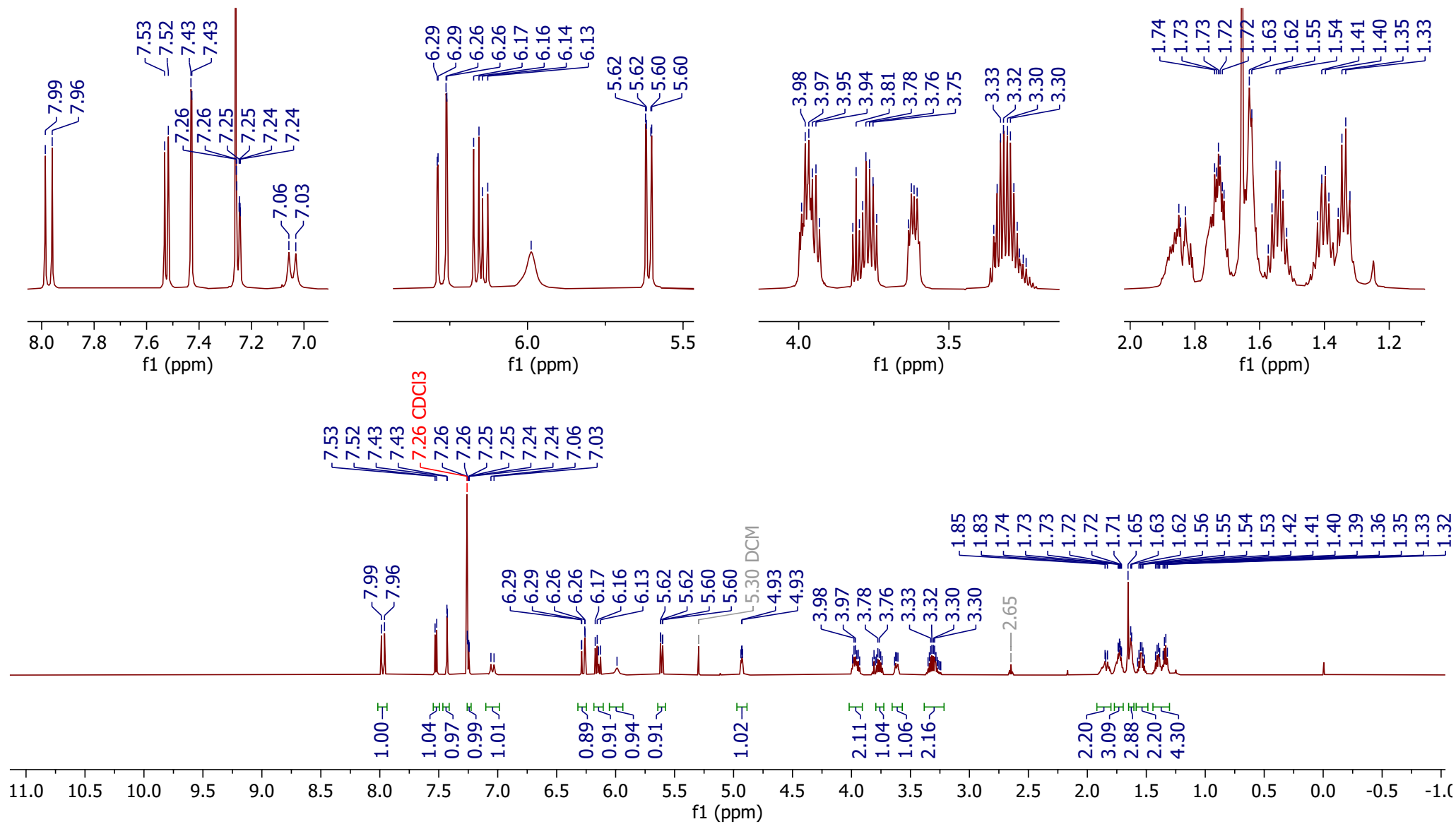
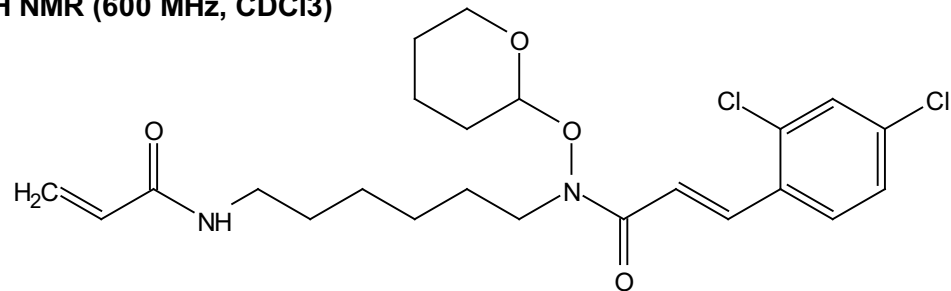
Compound S19
¹H NMR (600 MHz, CDCl₃)



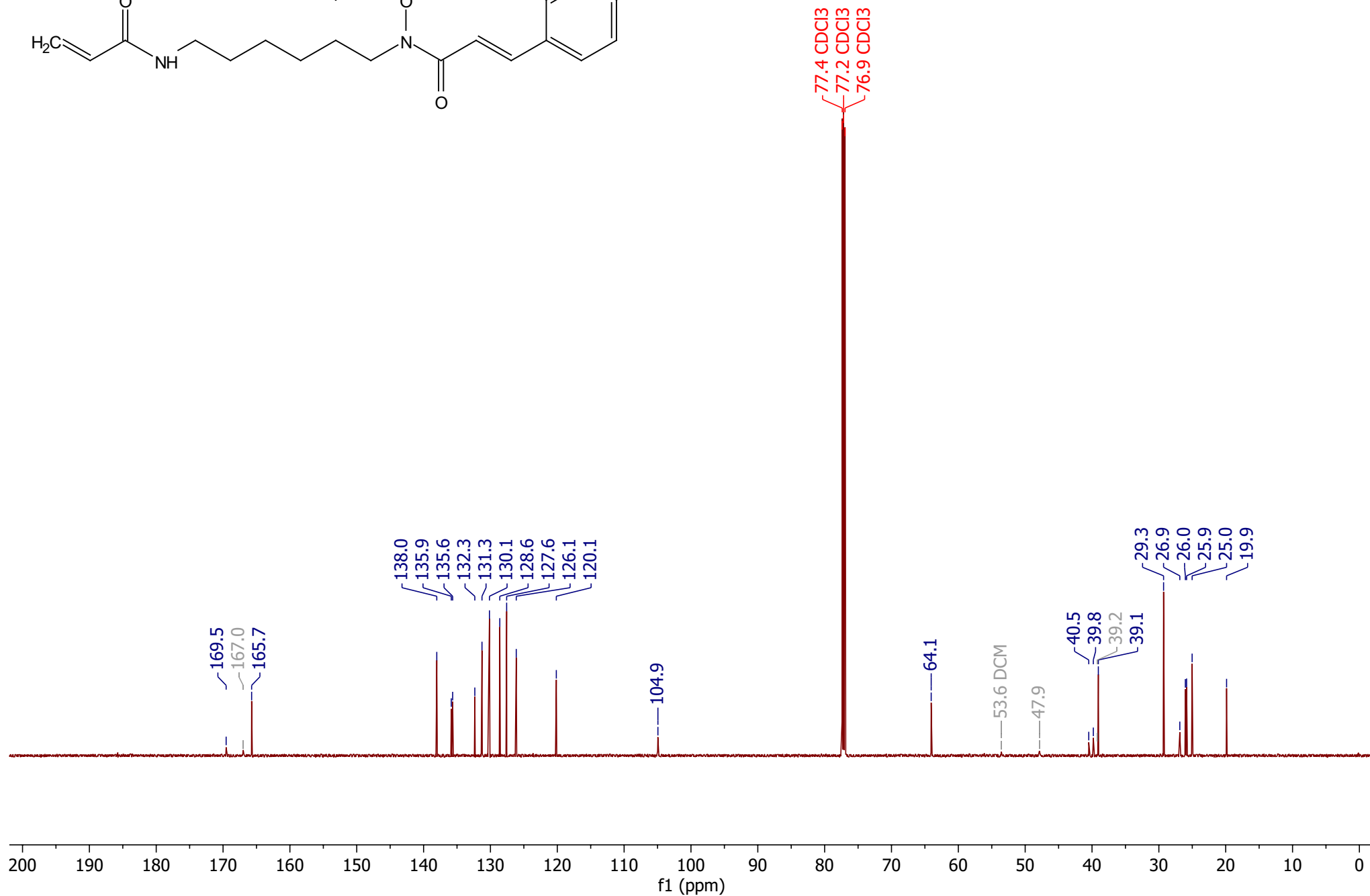
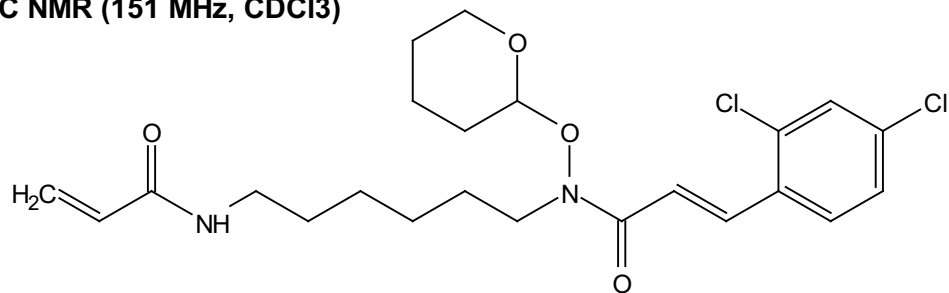
Compound S19
¹³C NMR (151 MHz, CDCl₃)



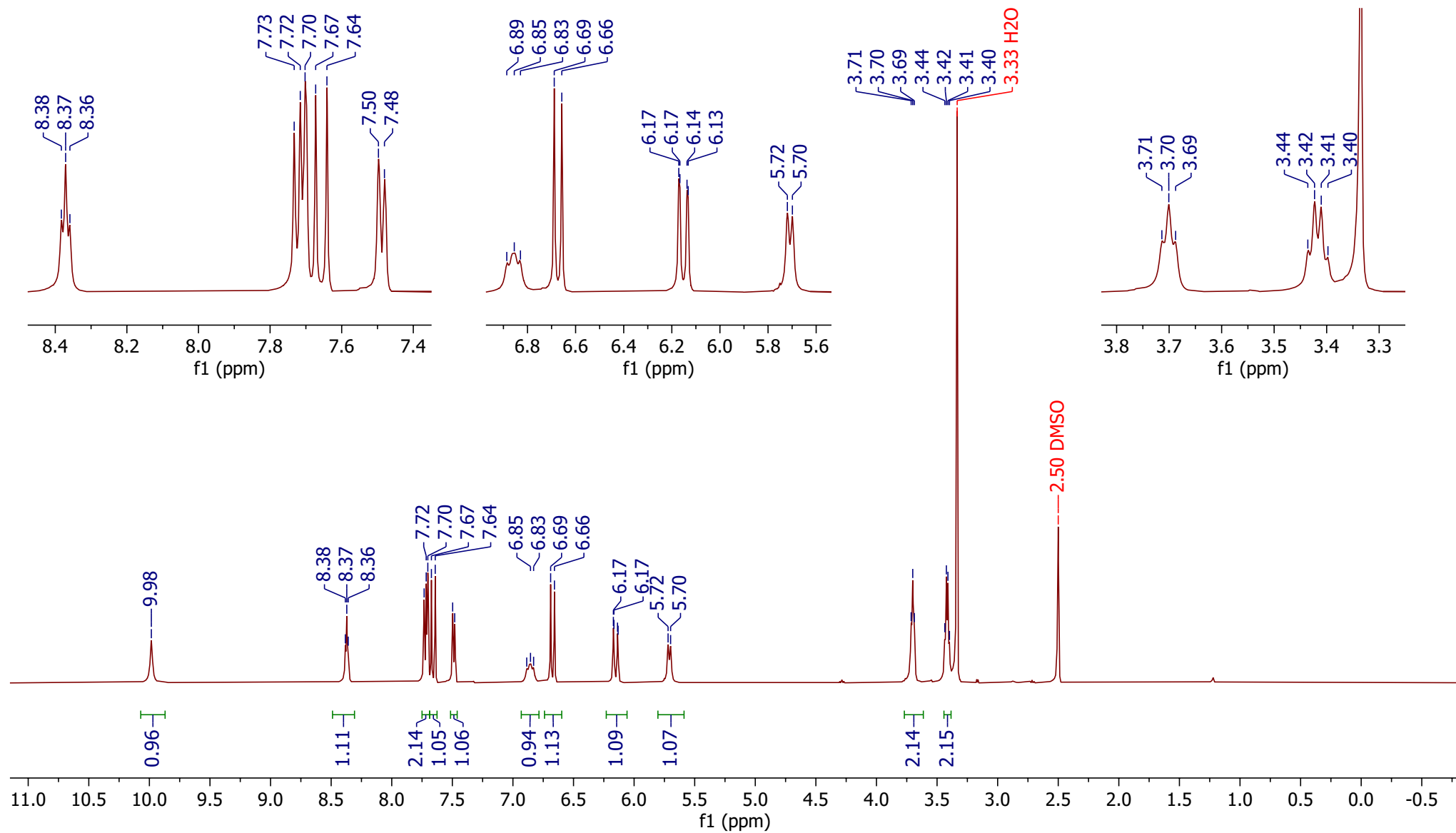
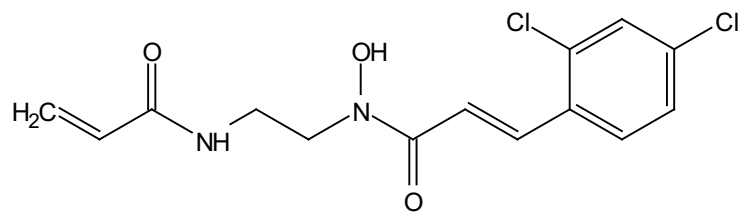
Compound S20
¹H NMR (600 MHz, CDCl₃)



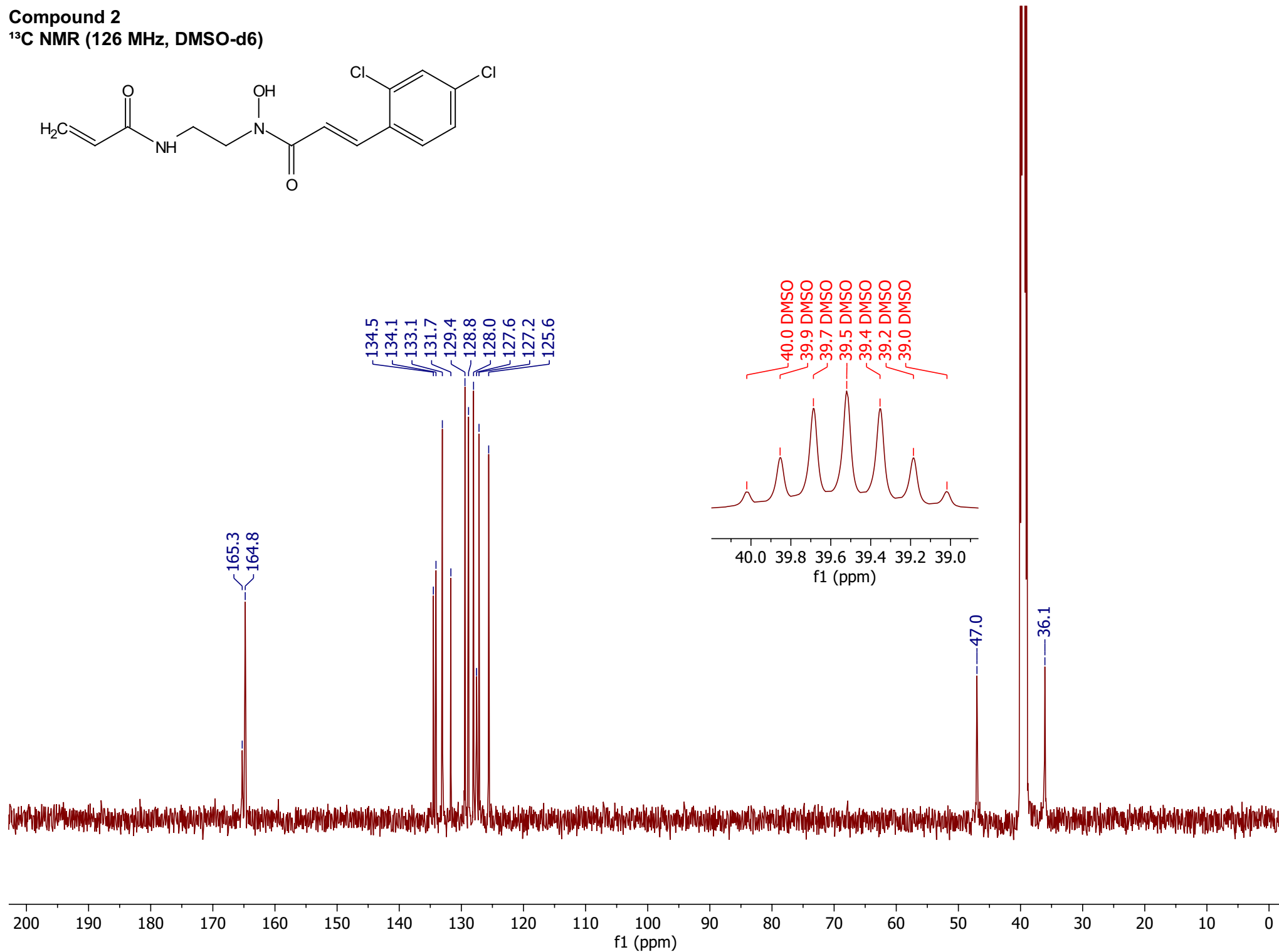
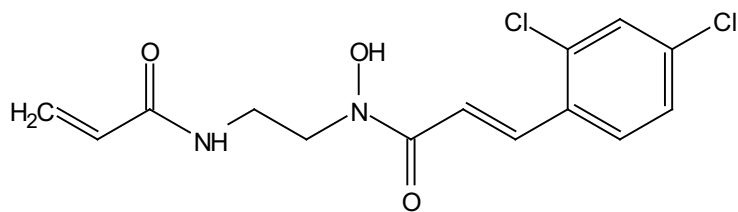
Compound S20
¹³C NMR (151 MHz, CDCl₃)



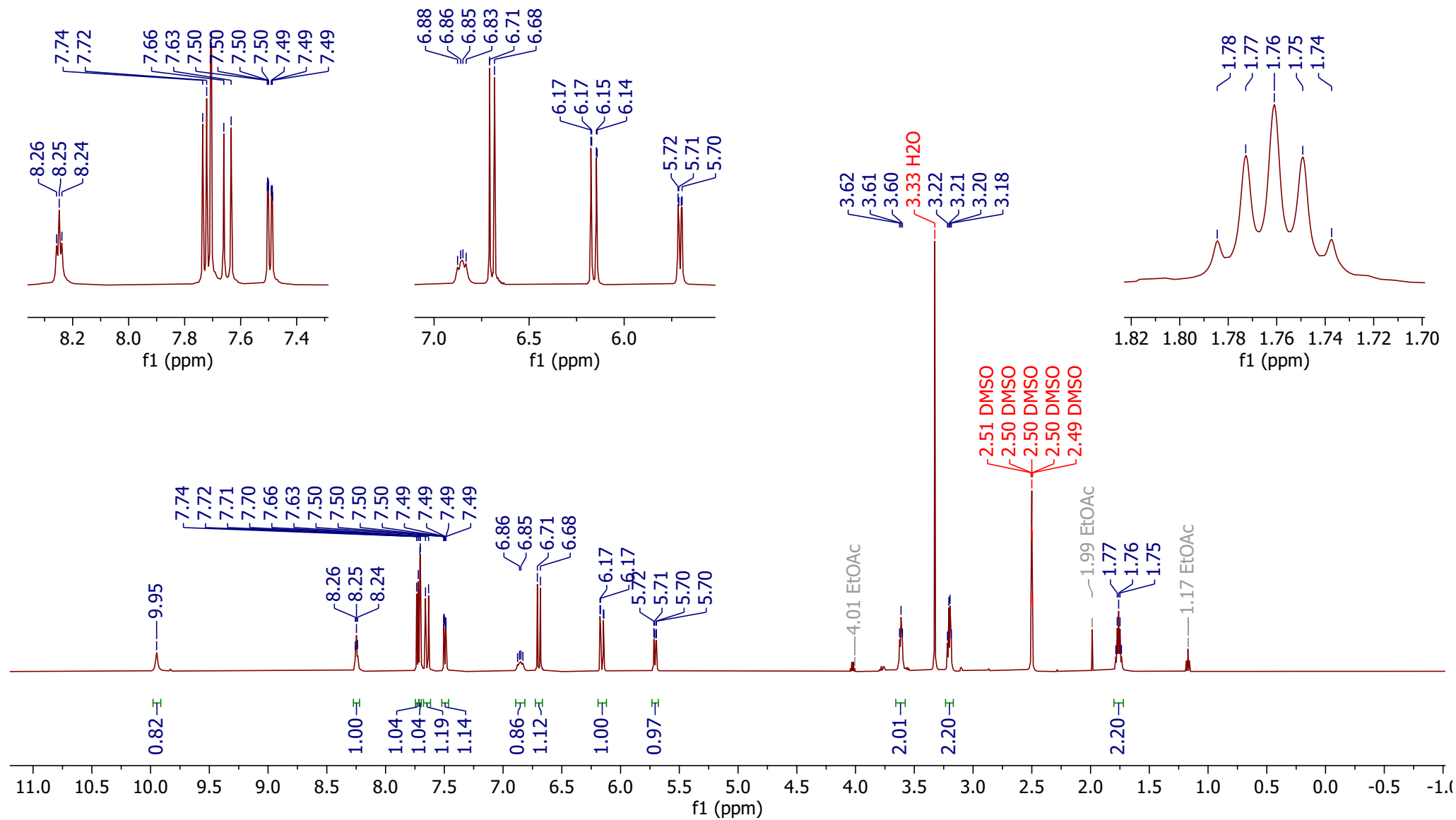
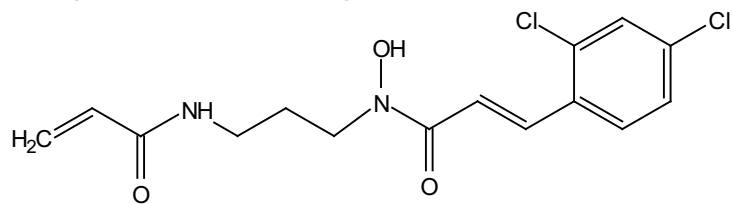
Compound 2
¹H NMR (500 MHz, DMSO-d₆)



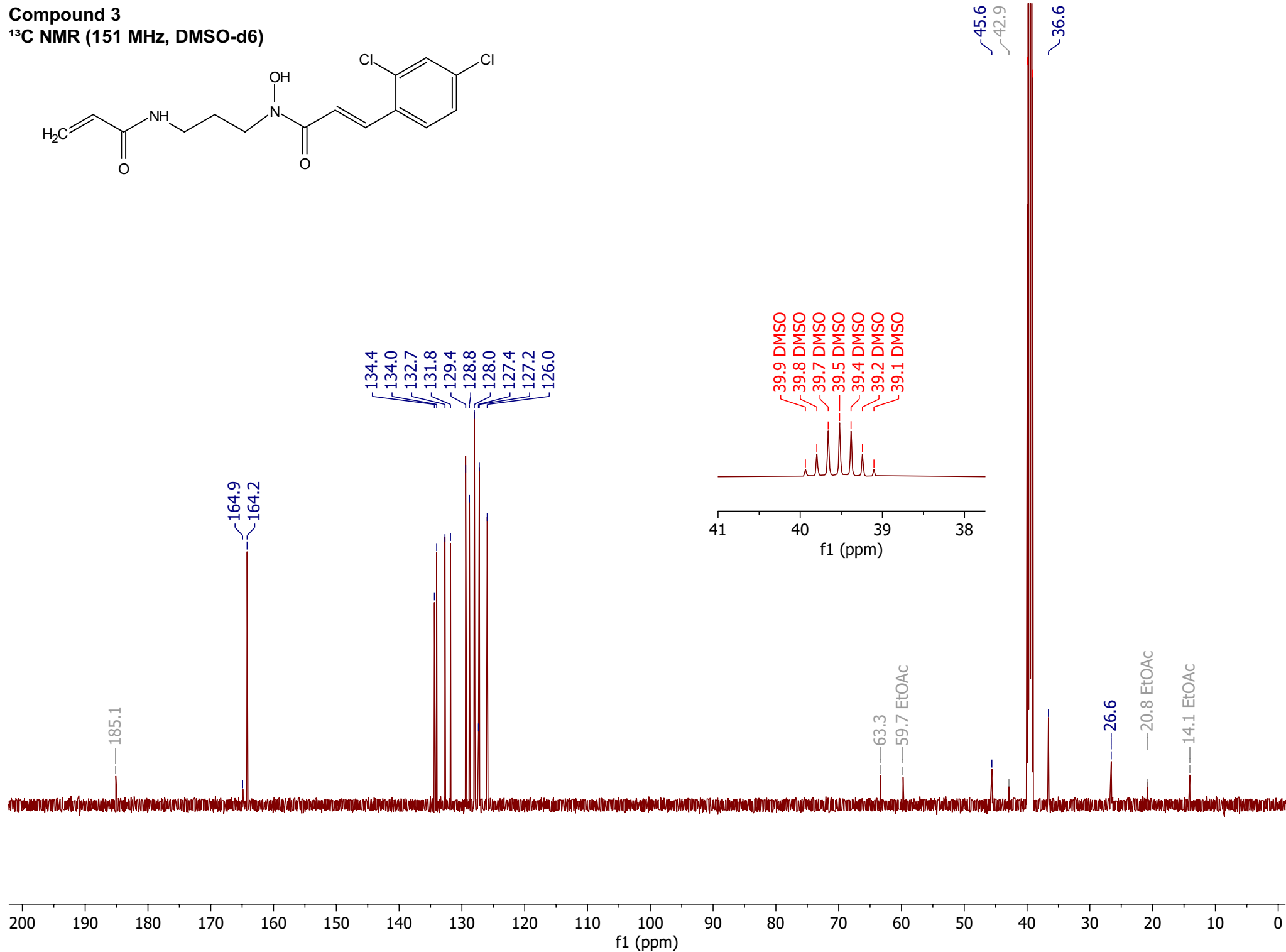
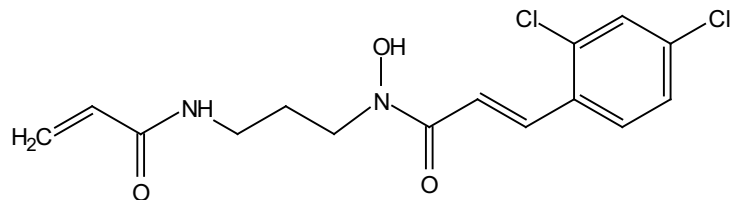
Compound 2
 ^{13}C NMR (126 MHz, DMSO- d_6)



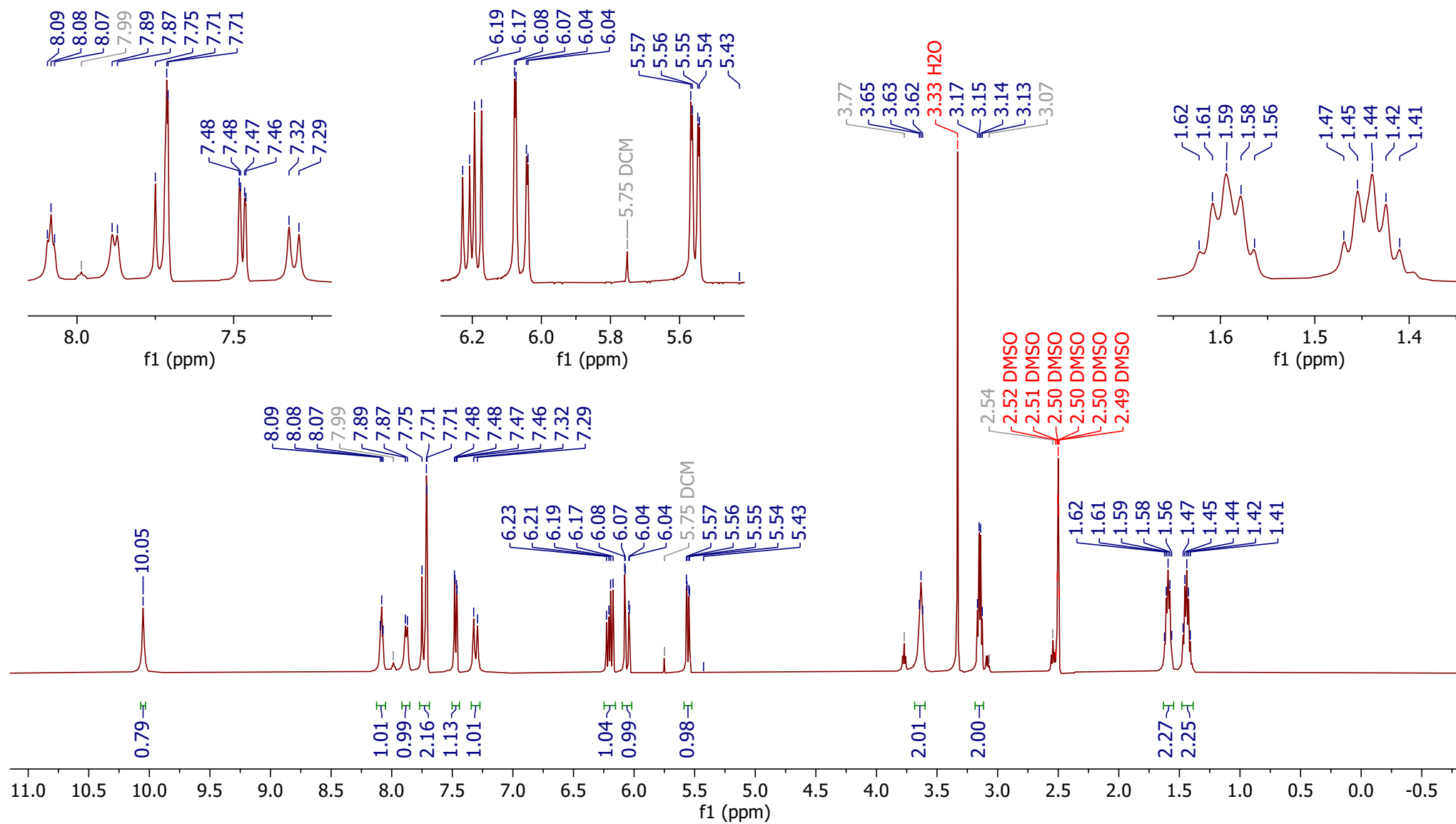
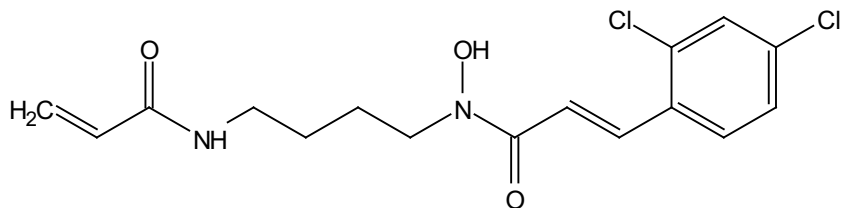
Compound 3
¹H NMR (600 MHz, DMSO-d6)



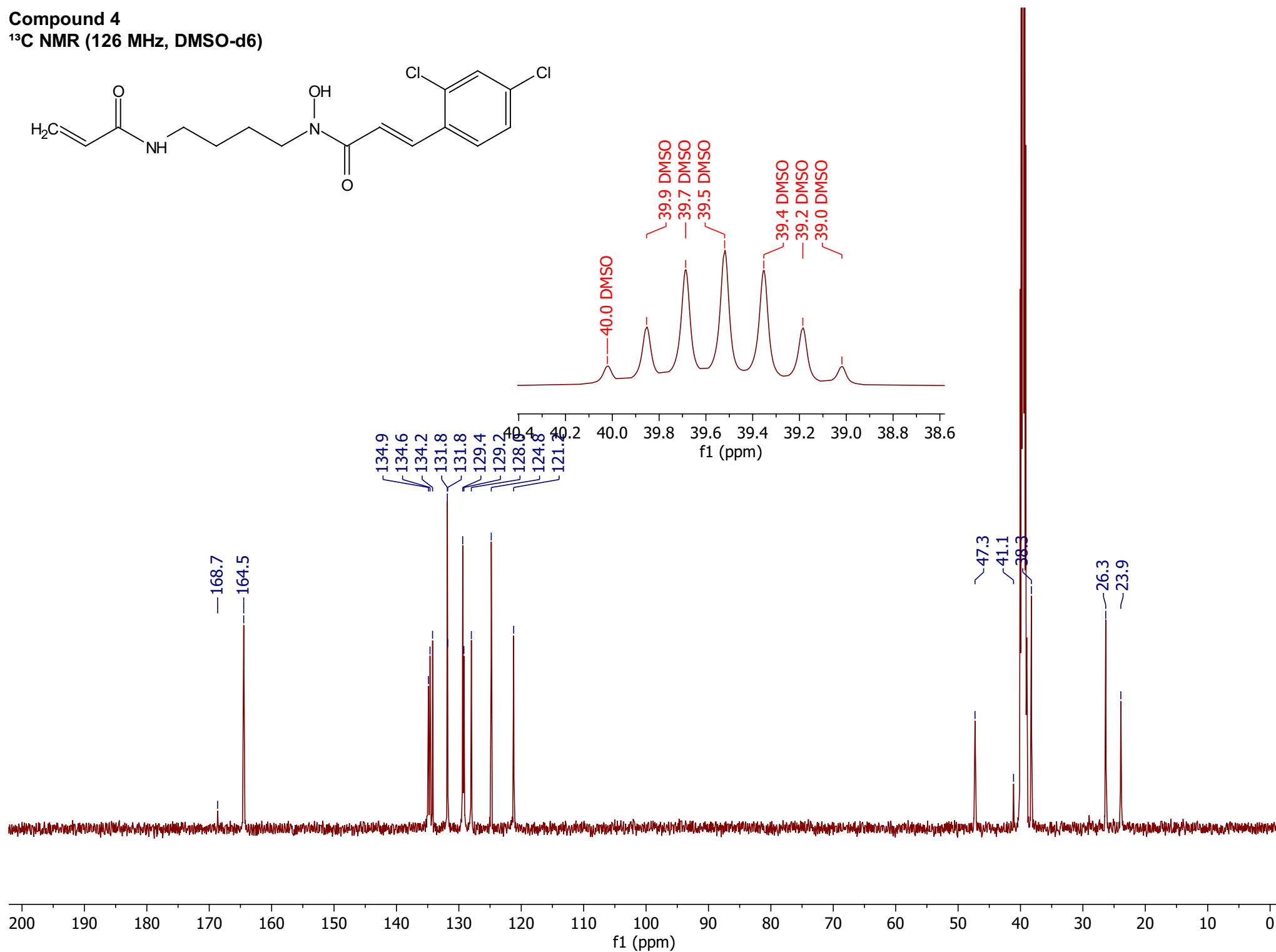
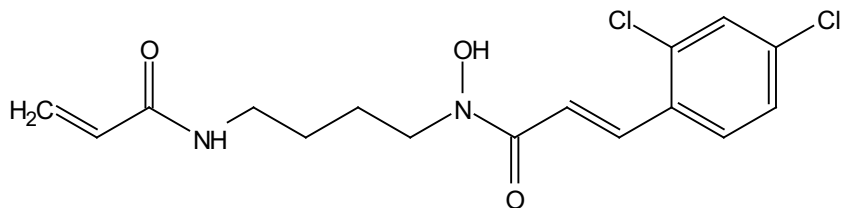
Compound 3
¹³C NMR (151 MHz, DMSO-d₆)



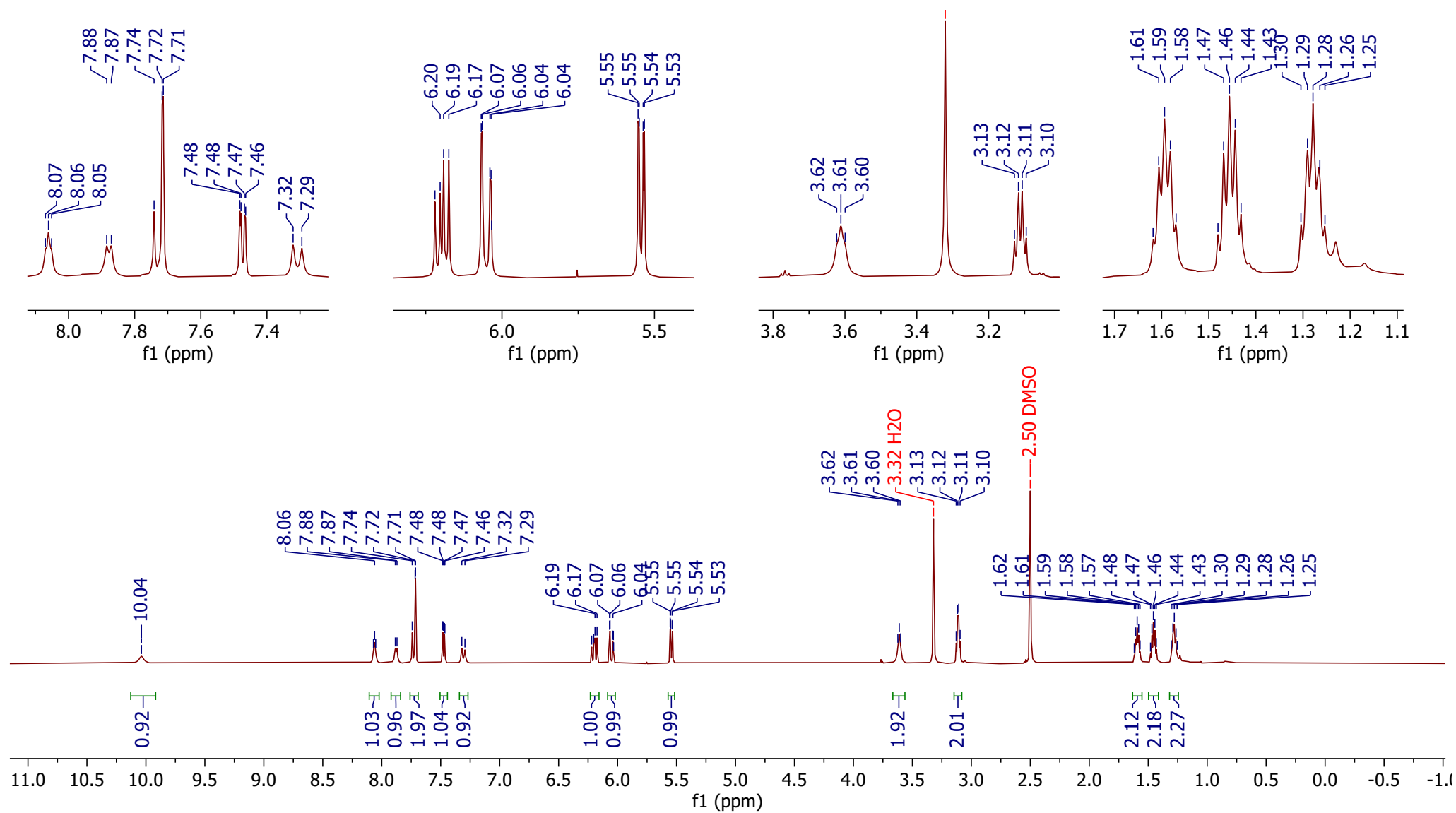
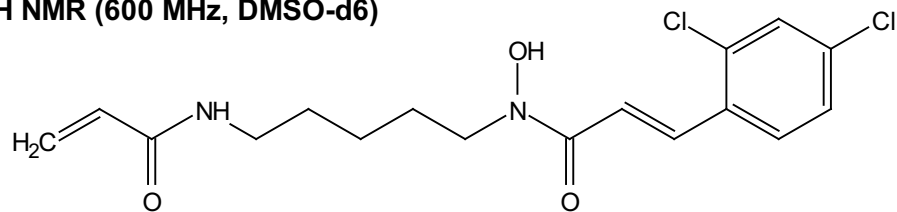
Compound 4
¹H NMR (500 MHz, DMSO-d6)



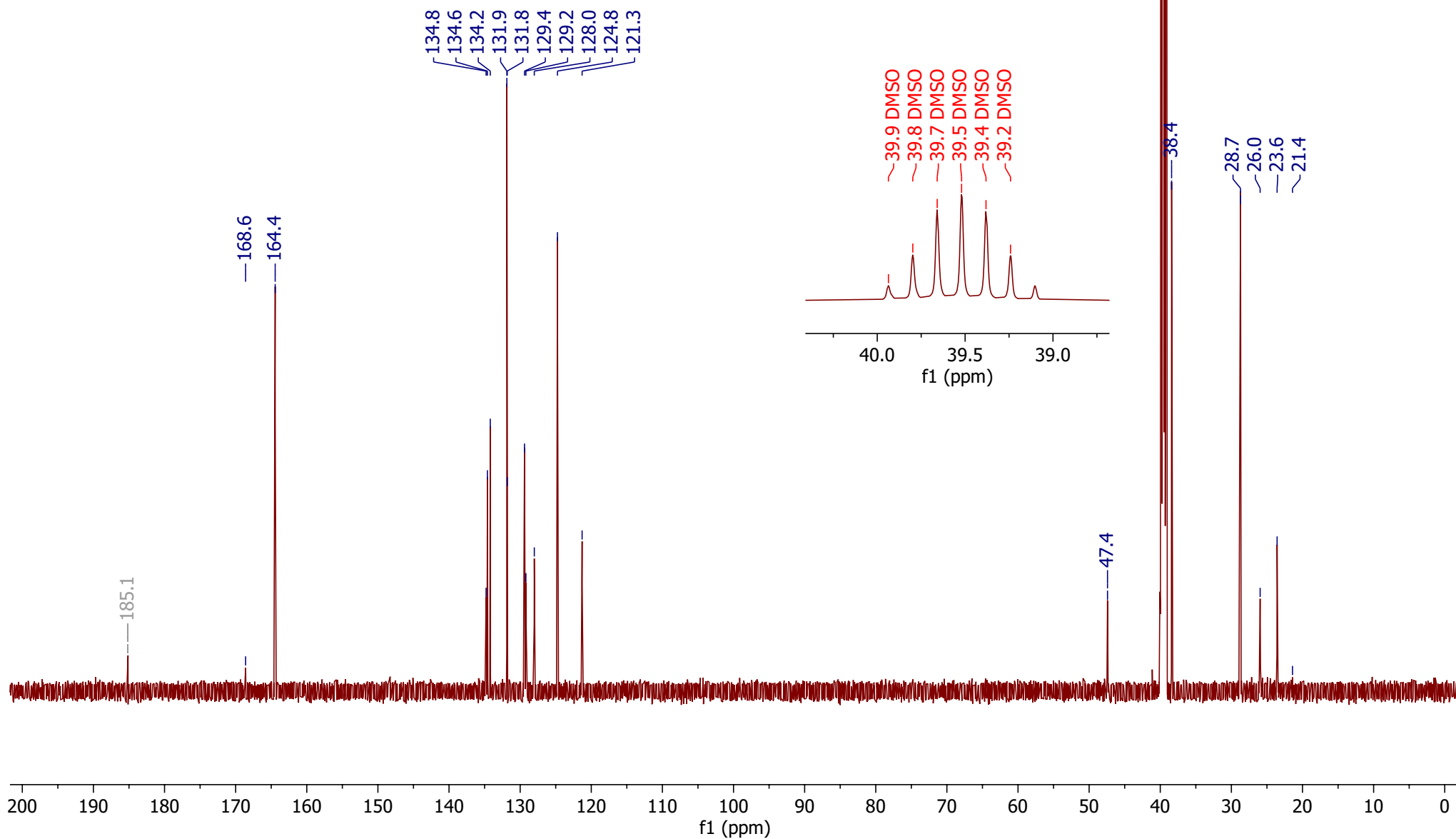
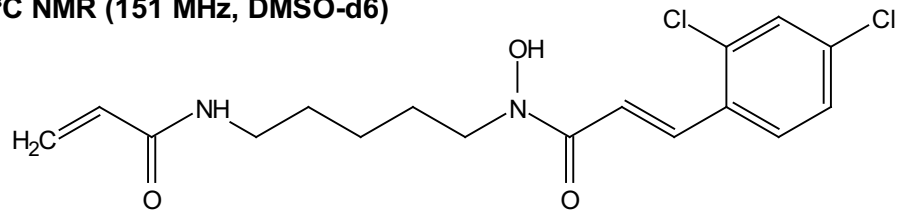
Compound 4
¹³C NMR (126 MHz, DMSO-d6)



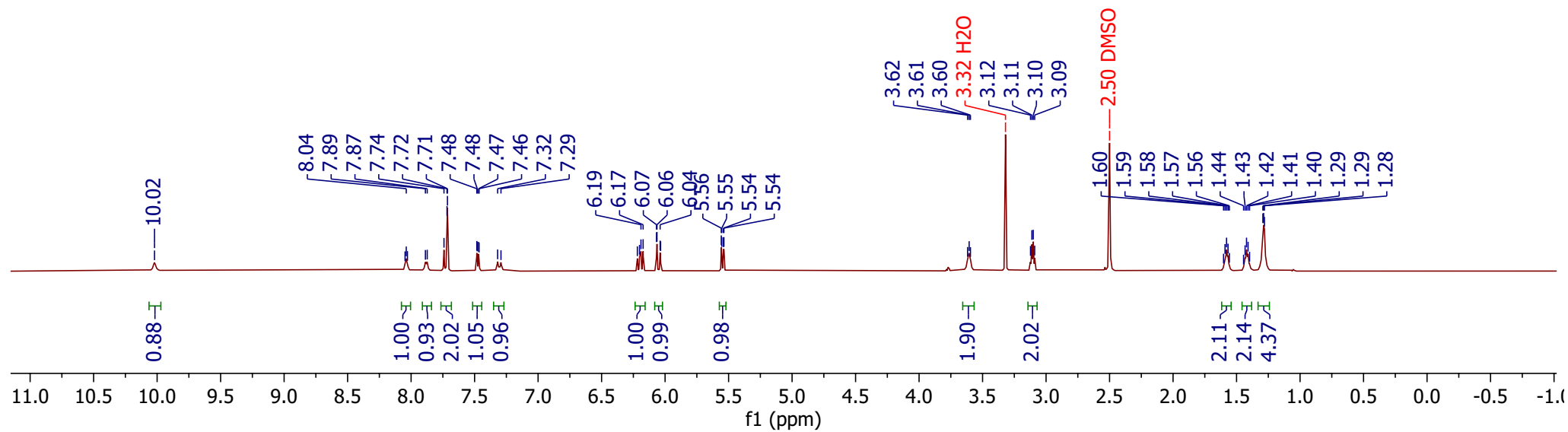
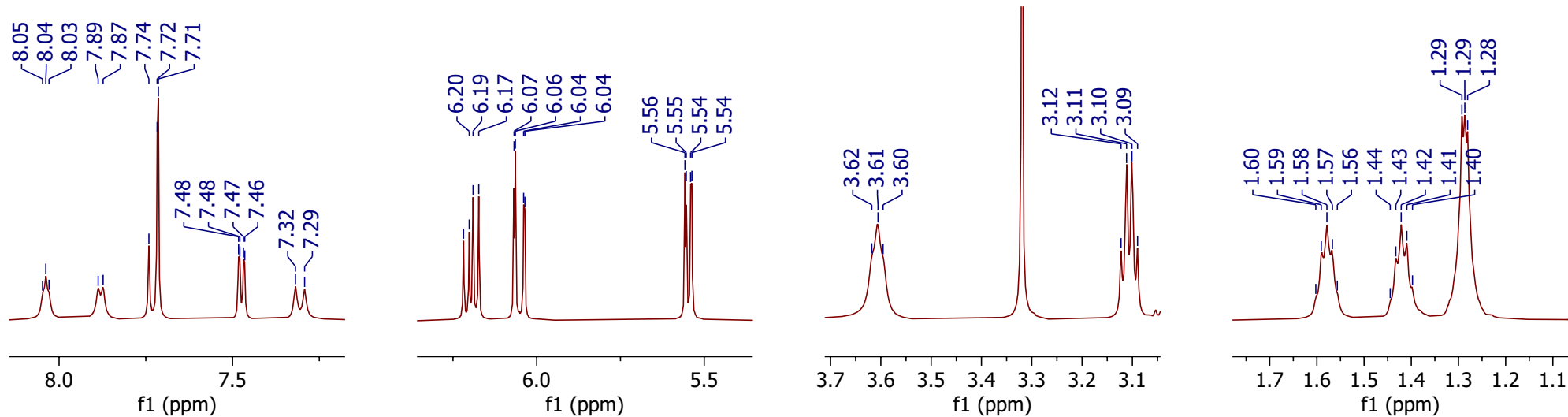
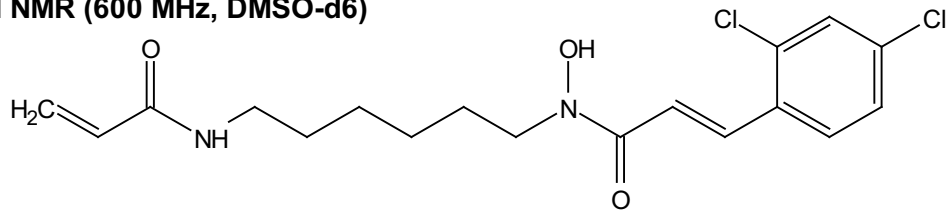
Compound 5
¹H NMR (600 MHz, DMSO-d₆)



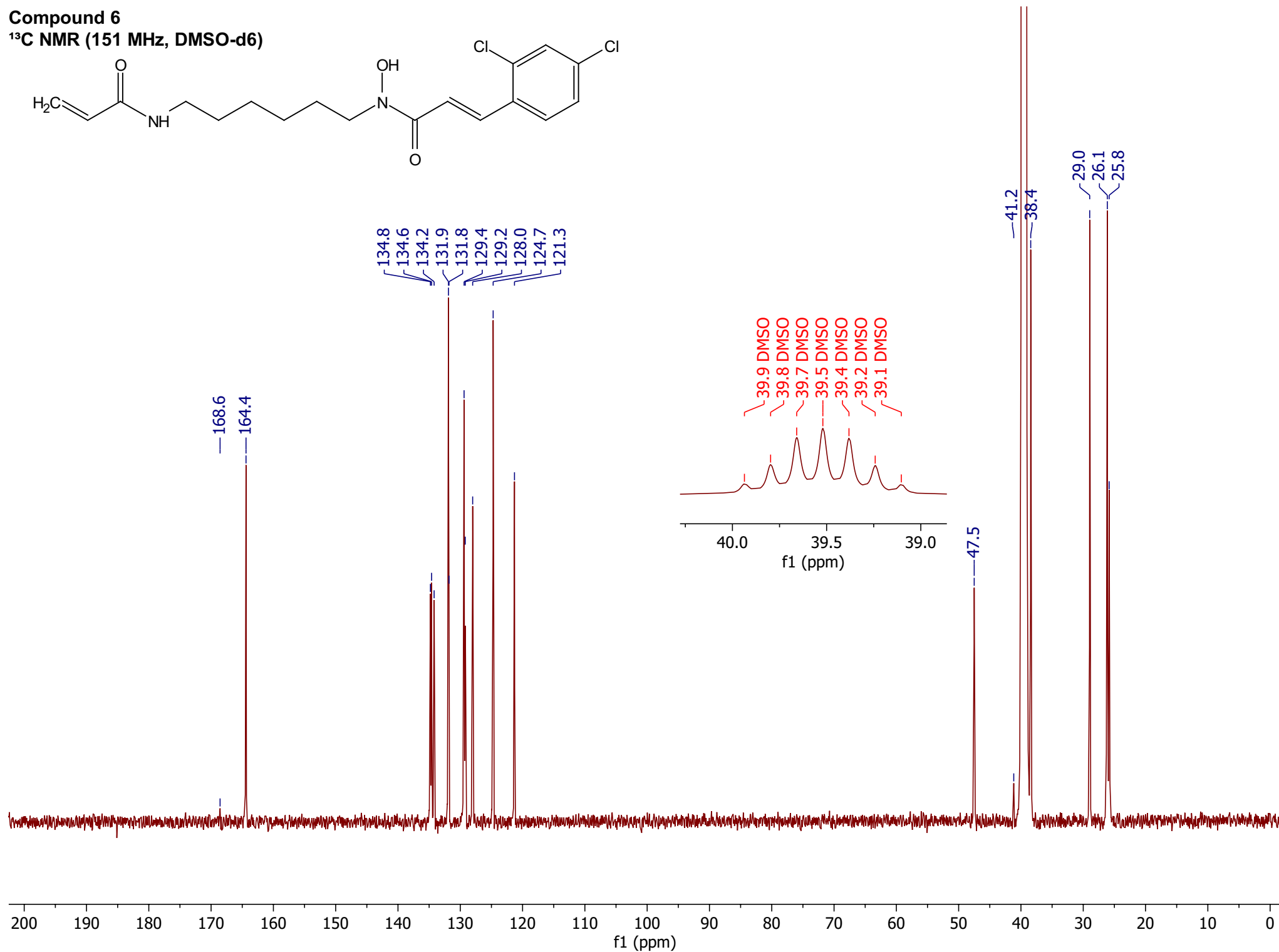
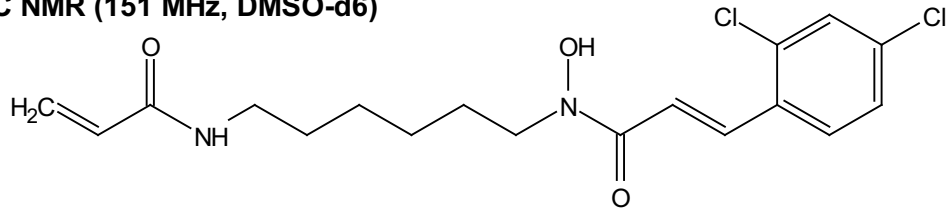
Compound 5
¹³C NMR (151 MHz, DMSO-d6)



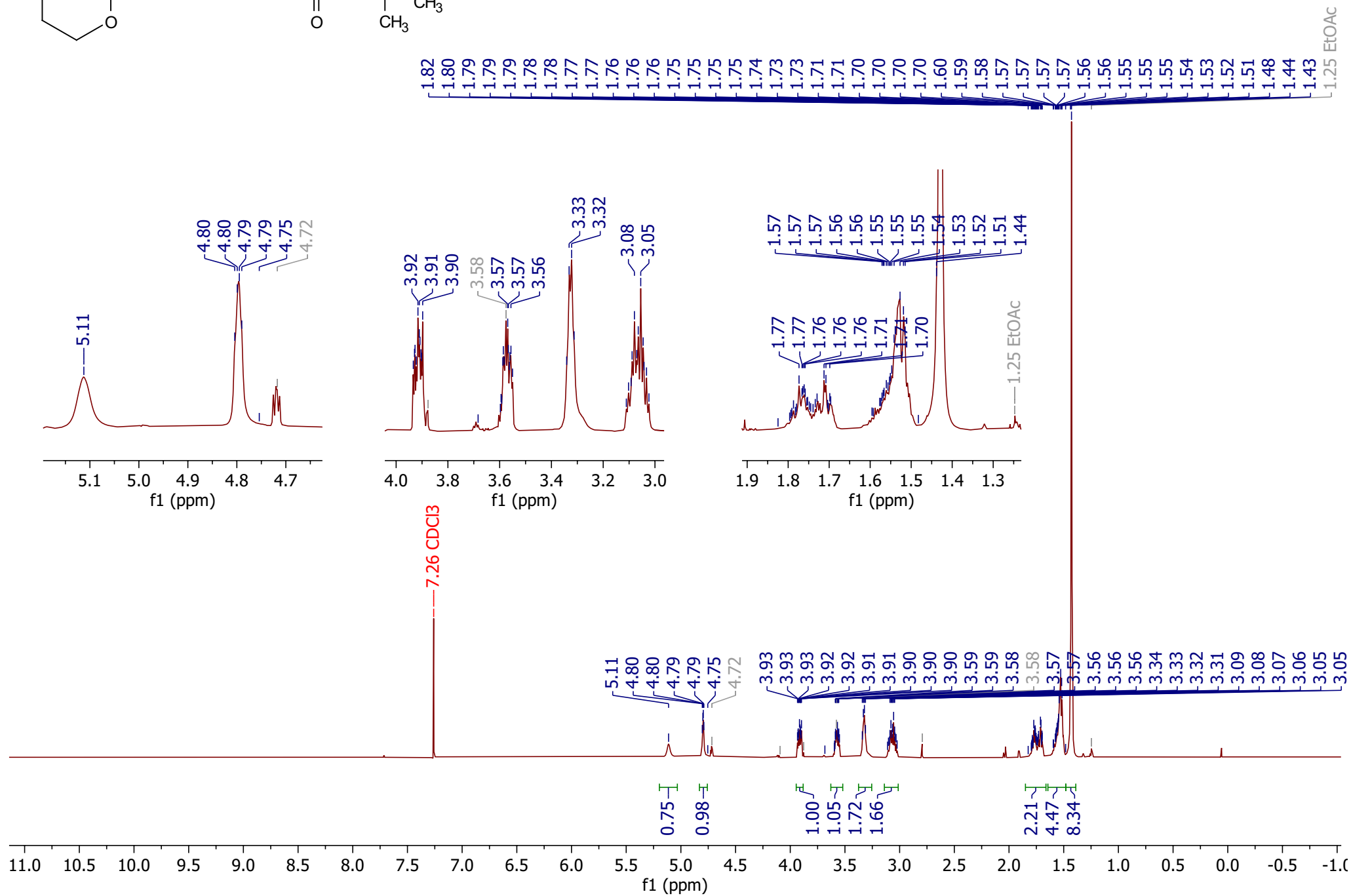
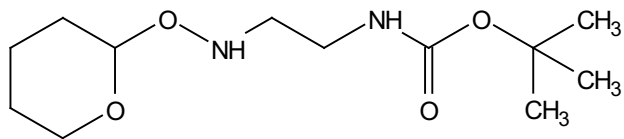
Compound 6
¹H NMR (600 MHz, DMSO-d₆)



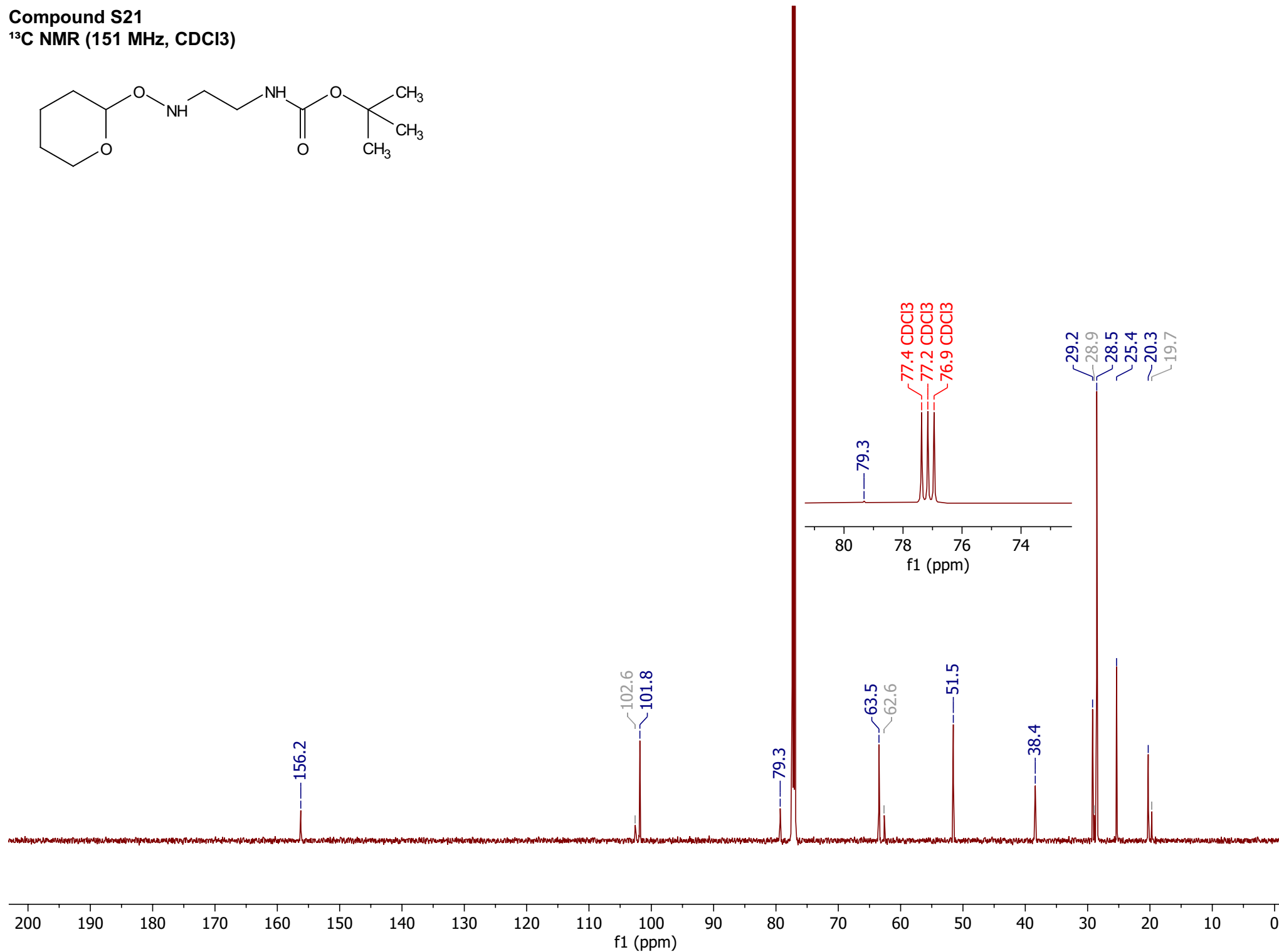
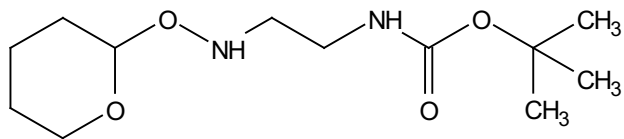
Compound 6
¹³C NMR (151 MHz, DMSO-d6)



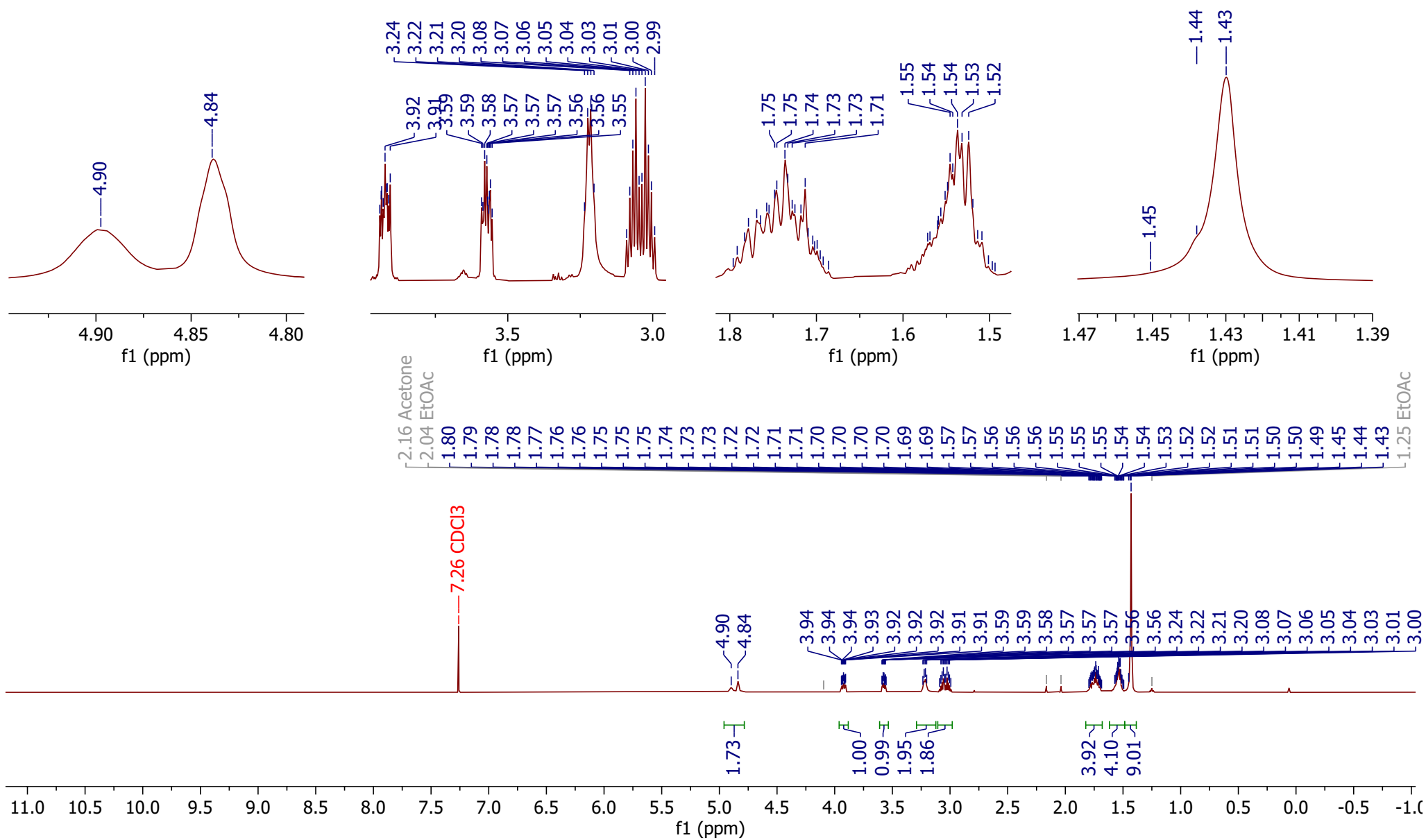
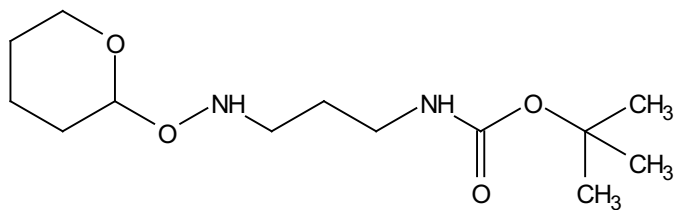
Compound S21
¹H NMR (600 MHz, CDCl₃)

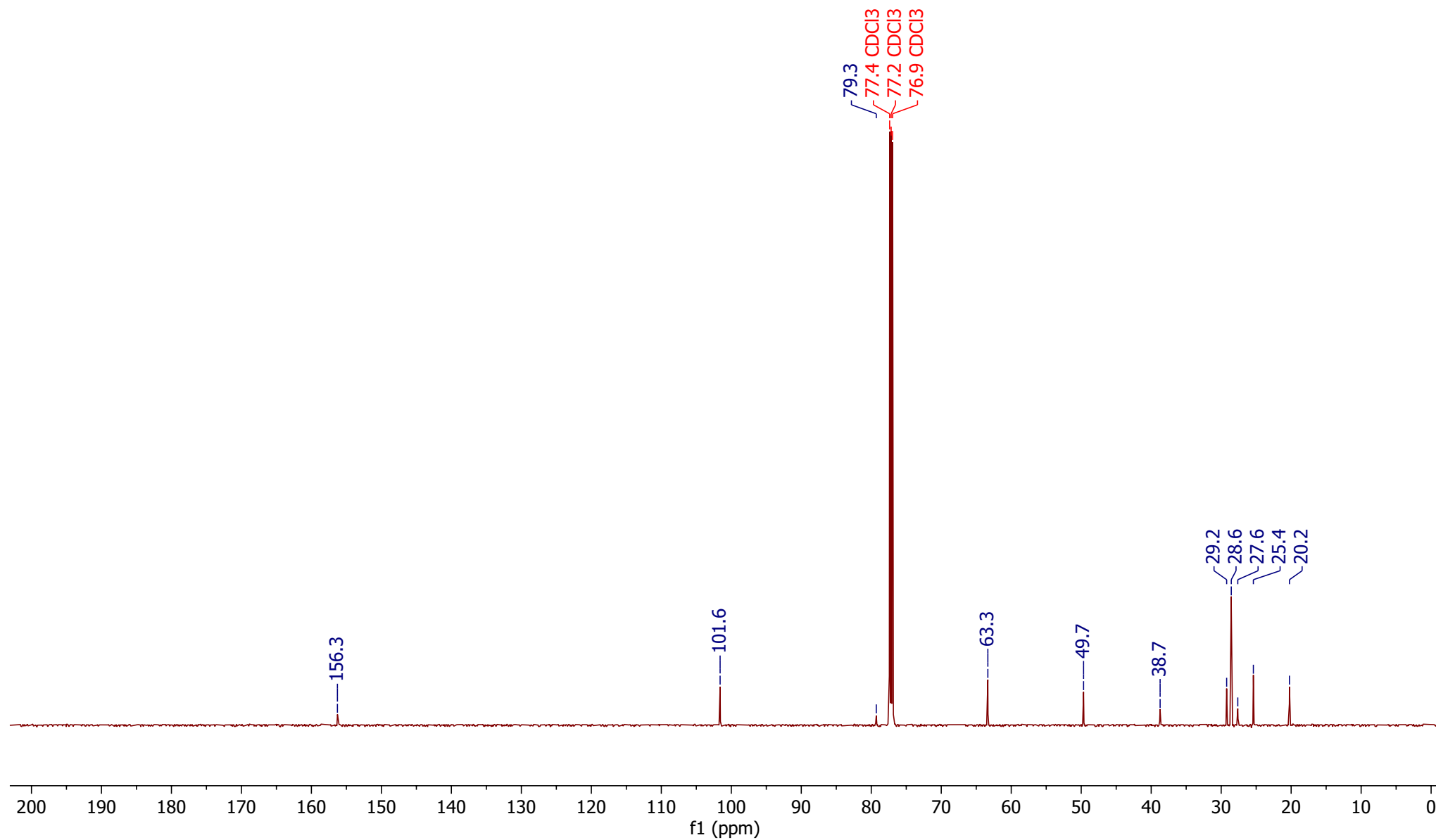
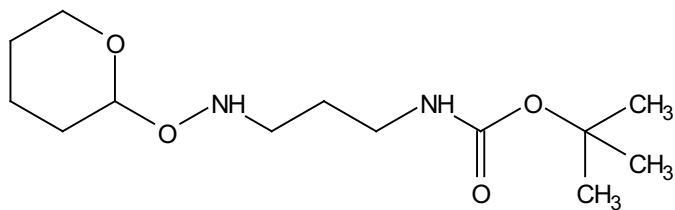


Compound S21
 ^{13}C NMR (151 MHz, CDCl_3)

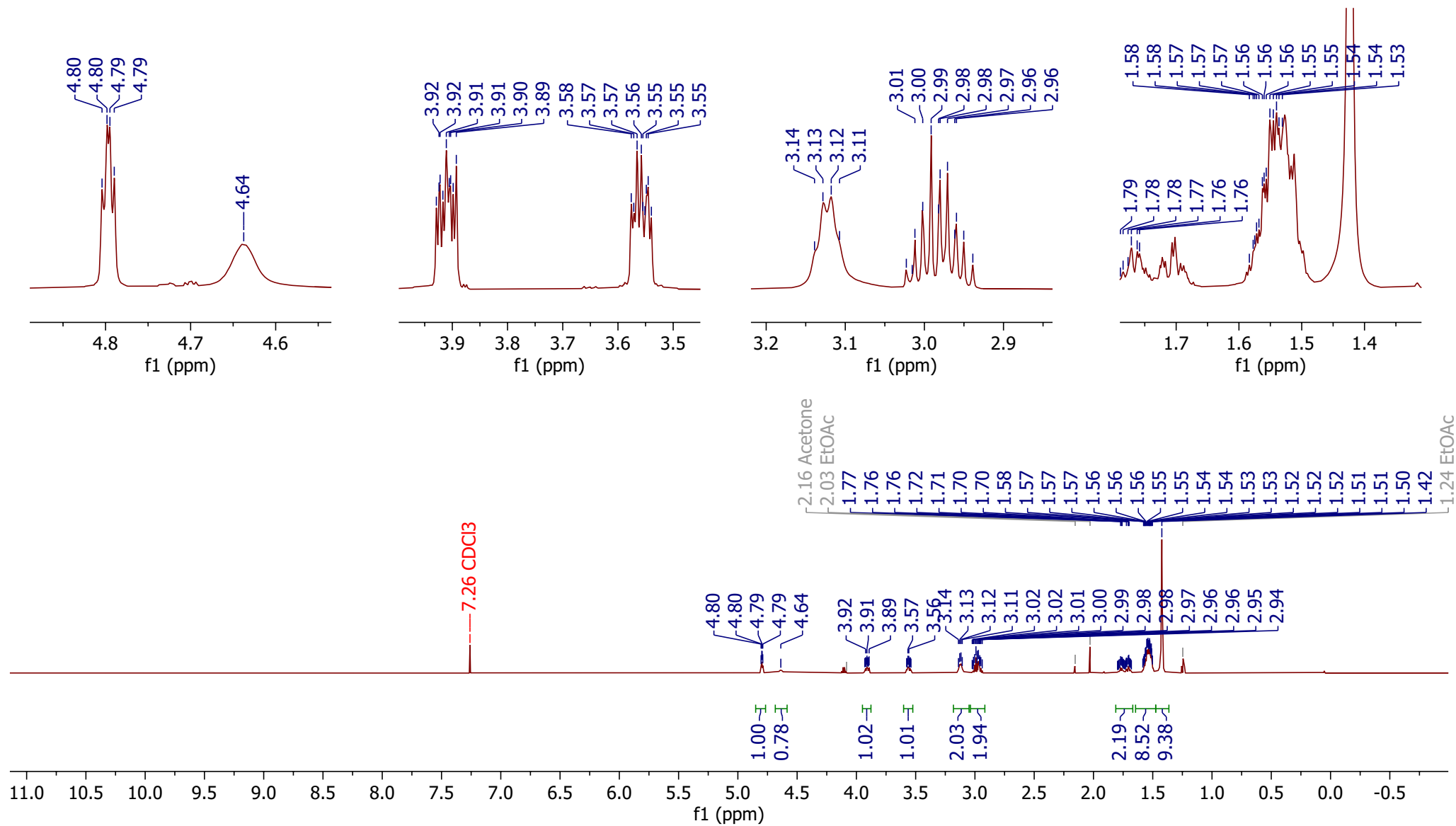
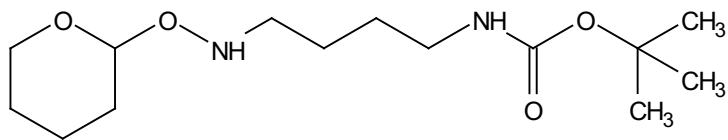


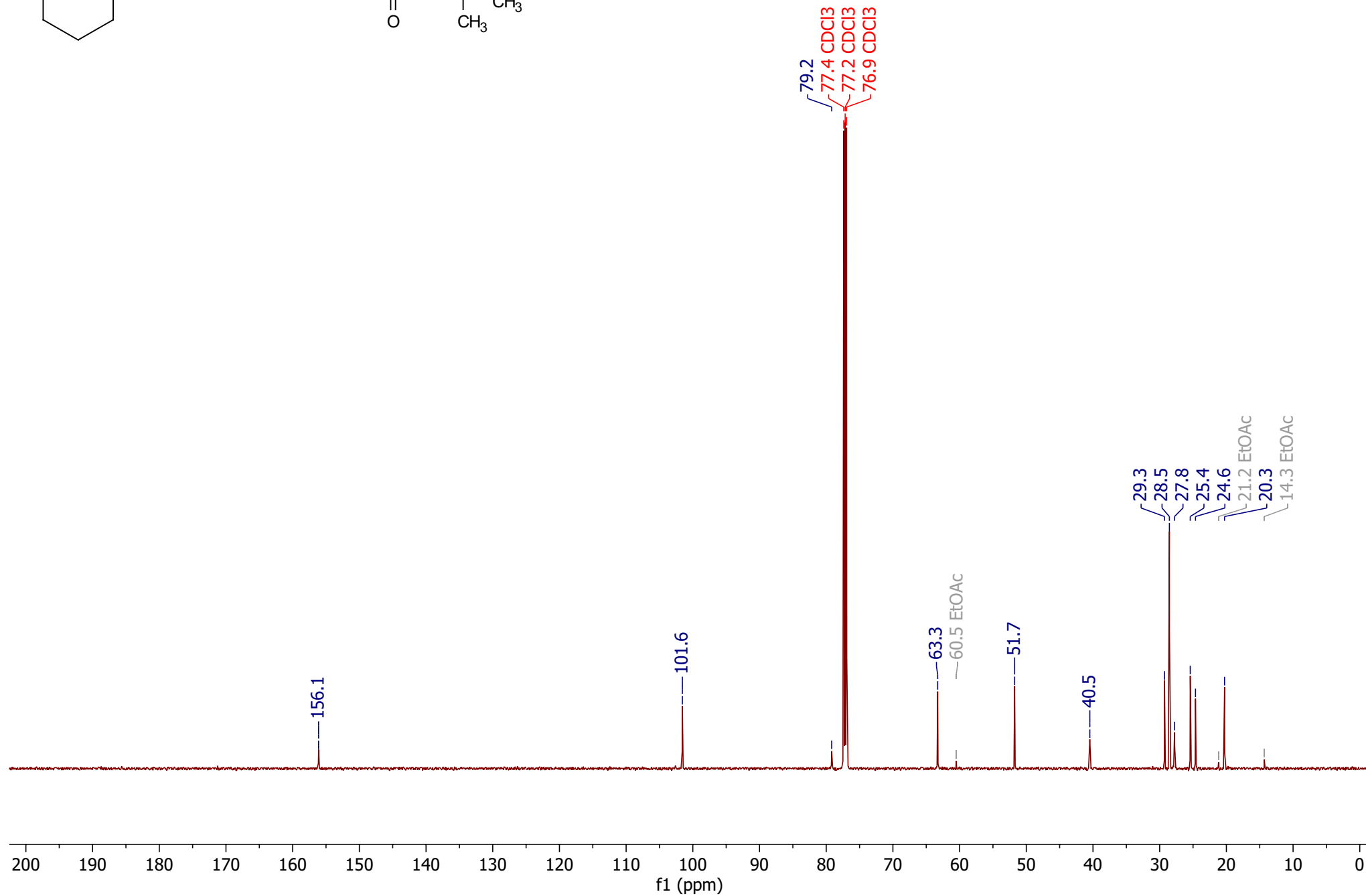
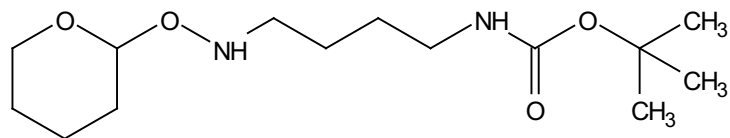
Compound S22
¹H NMR (600 MHz, CDCl₃)



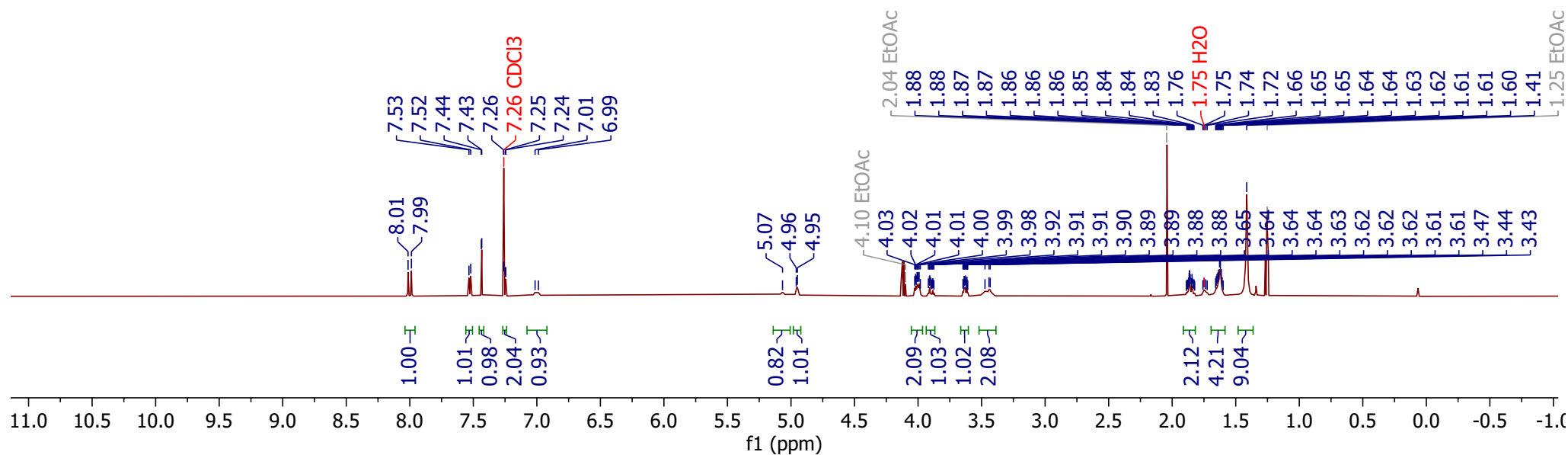
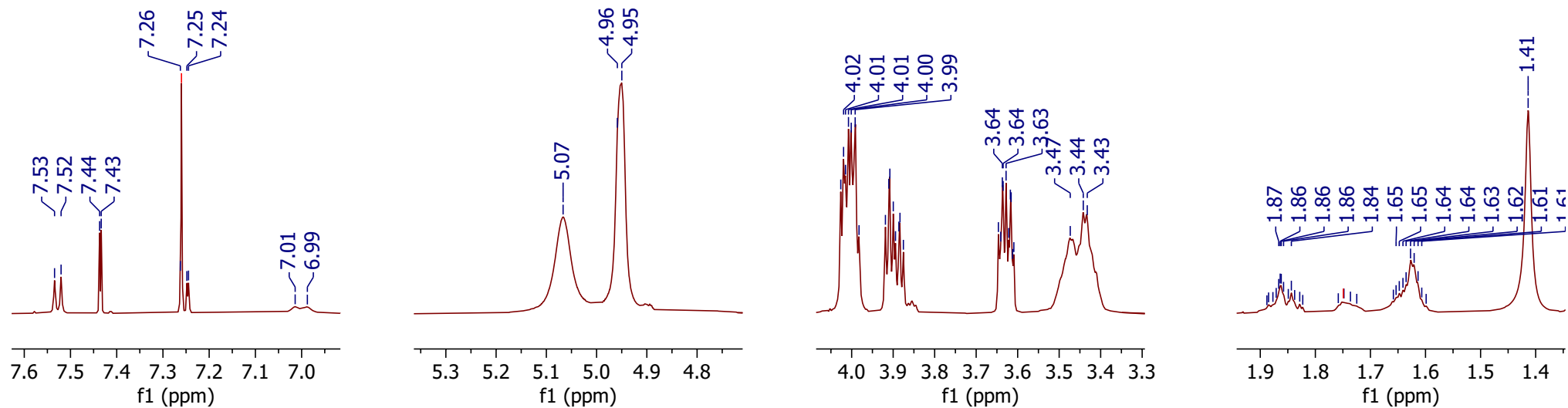
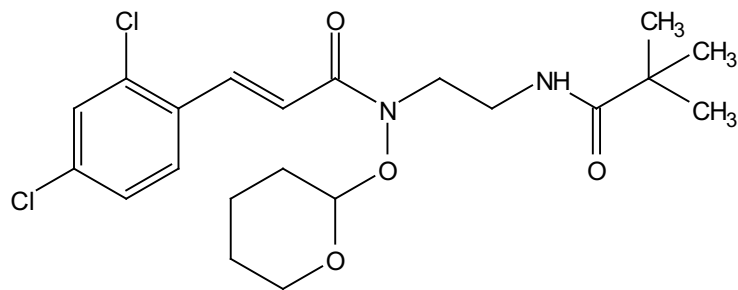
Compound S22 **^{13}C NMR (151 MHz, CDCl_3)**

Compound S23
¹H NMR (600 MHz, CDCl₃)

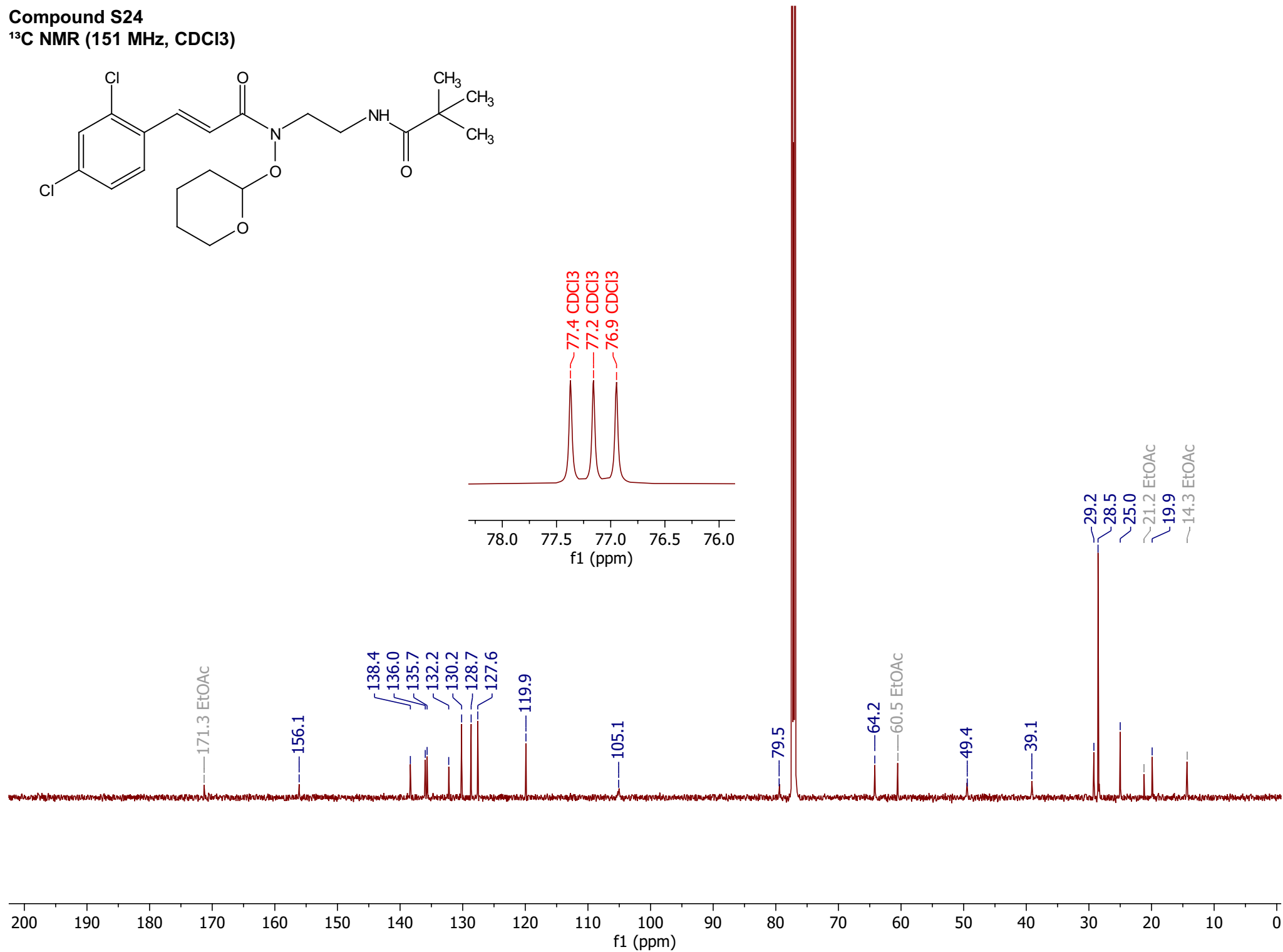
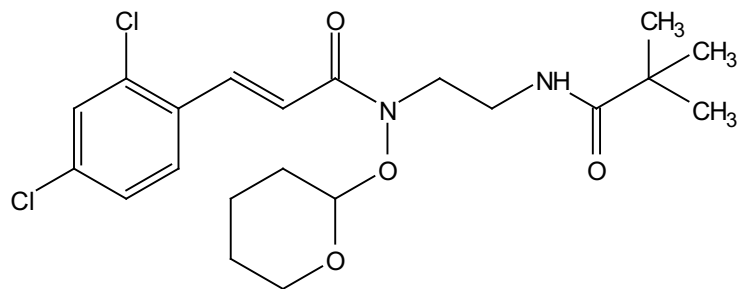


Compound S23 **^{13}C NMR (151 MHz, CDCl_3)**

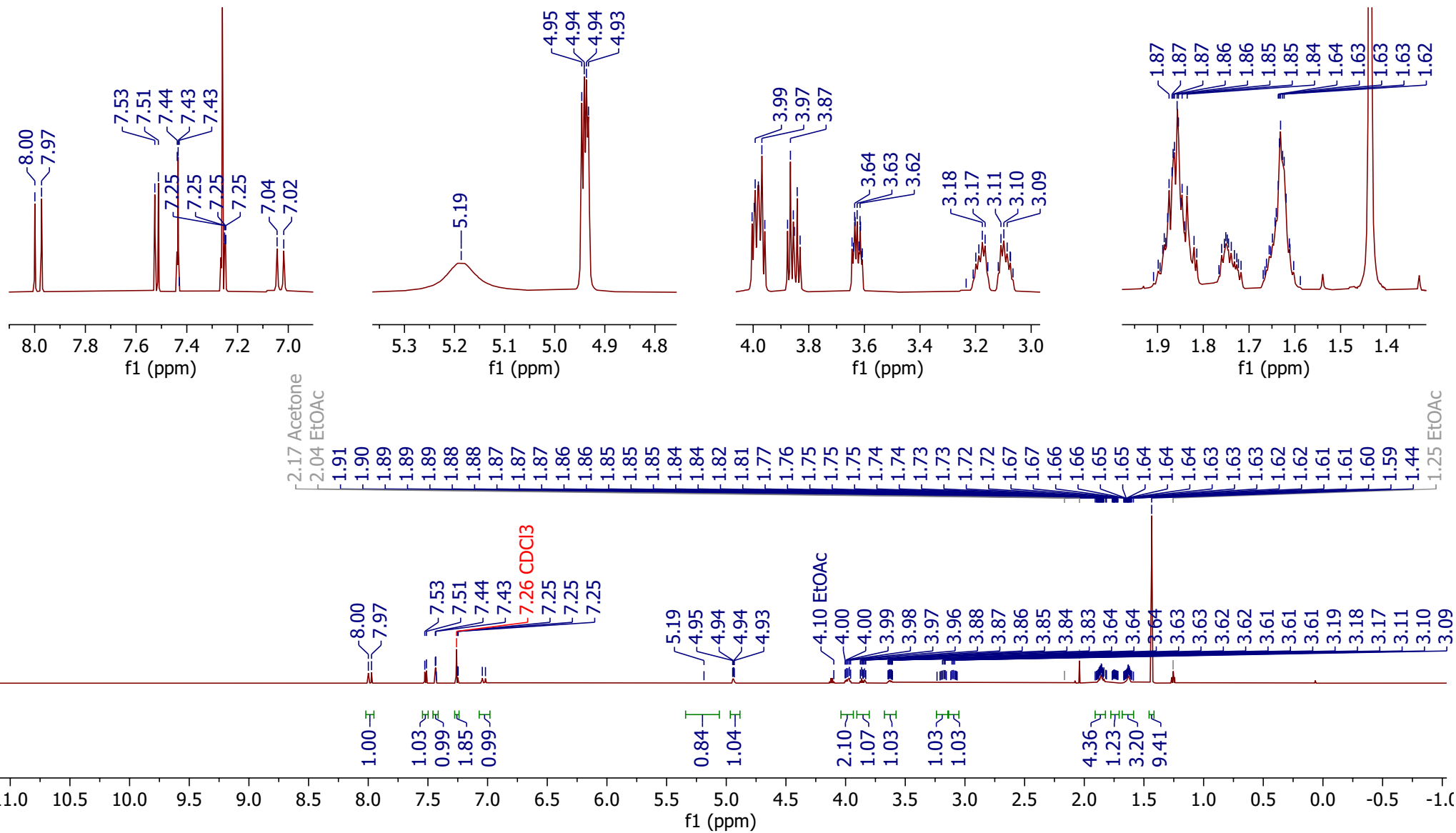
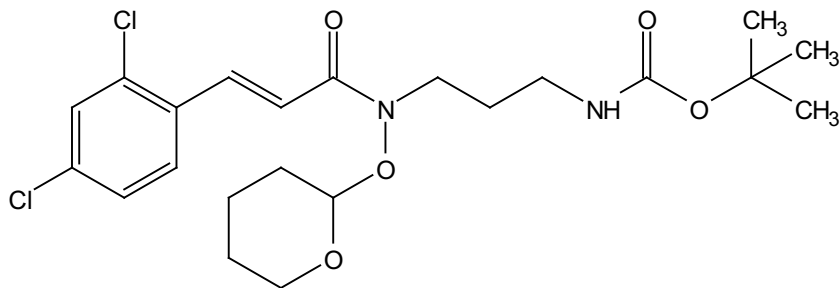
Compound S24
¹H NMR (600 MHz, CDCl₃)



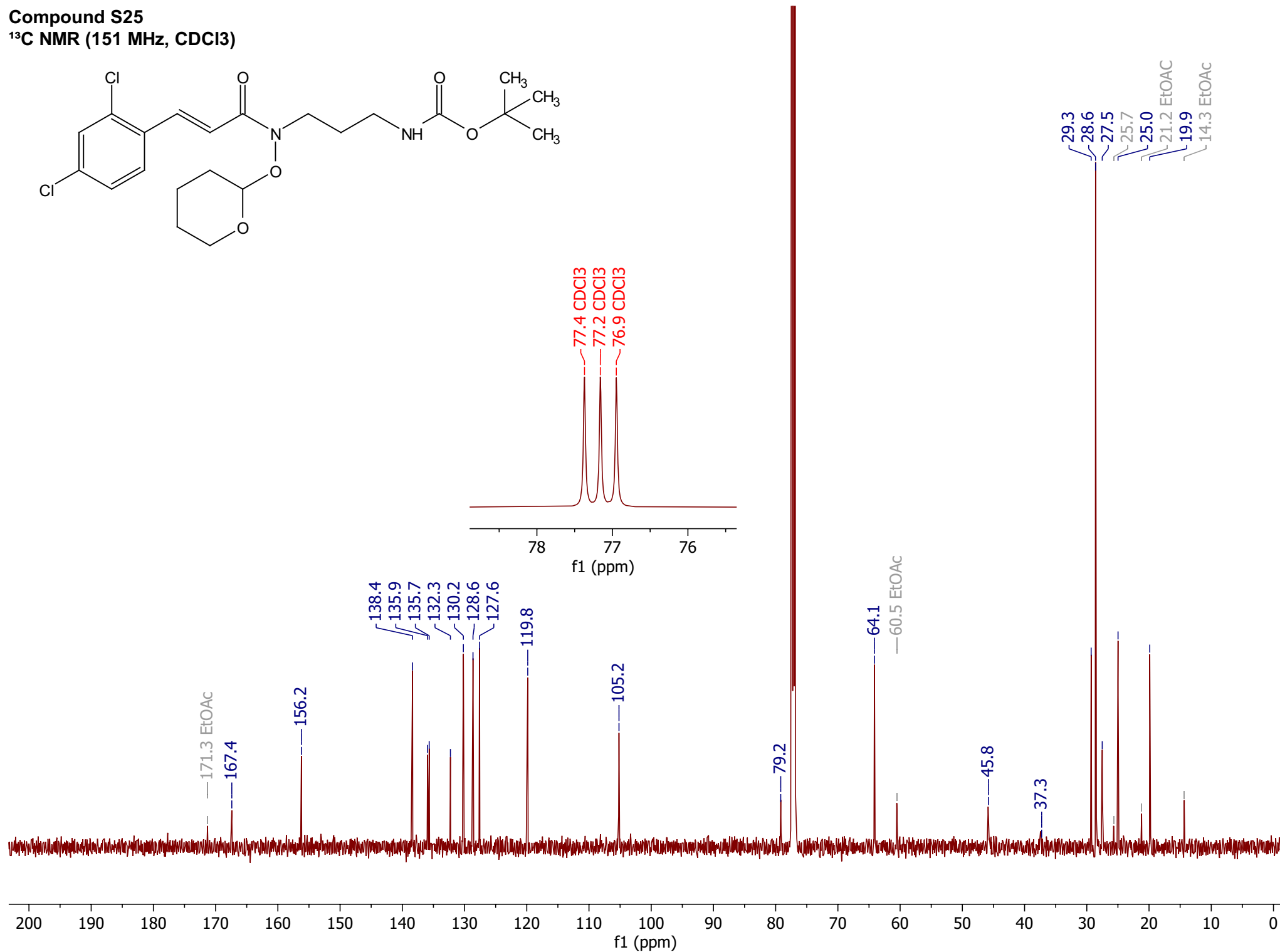
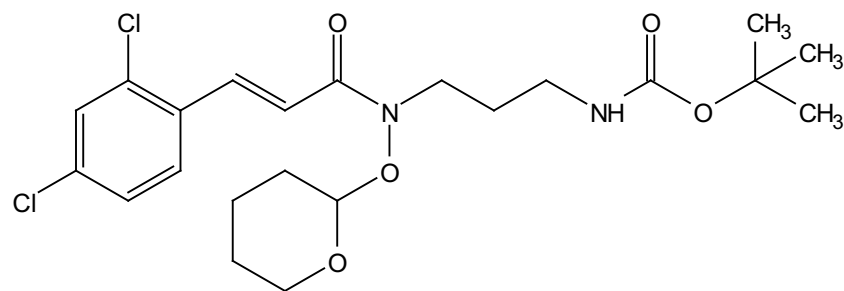
Compound S24
¹³C NMR (151 MHz, CDCl₃)



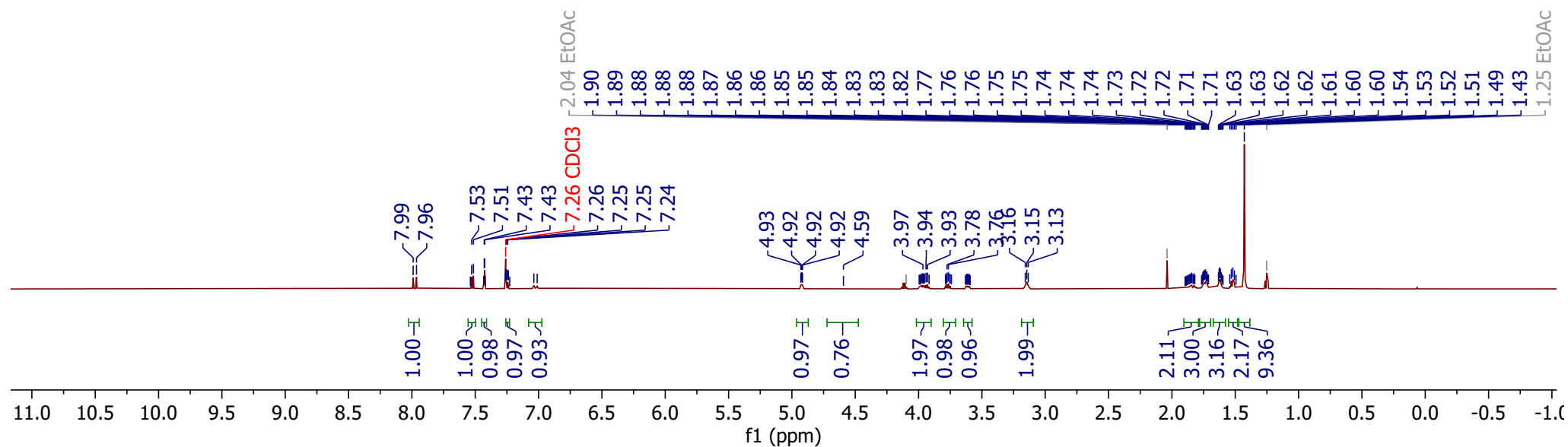
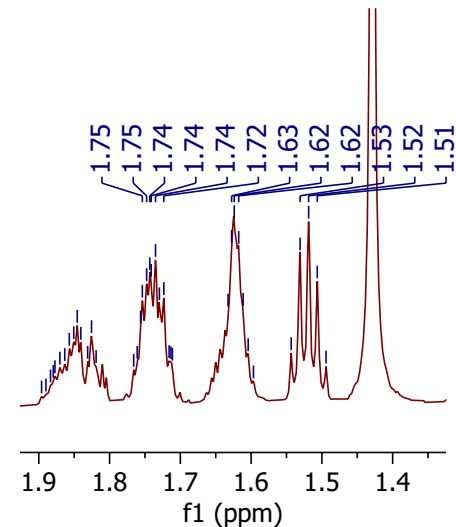
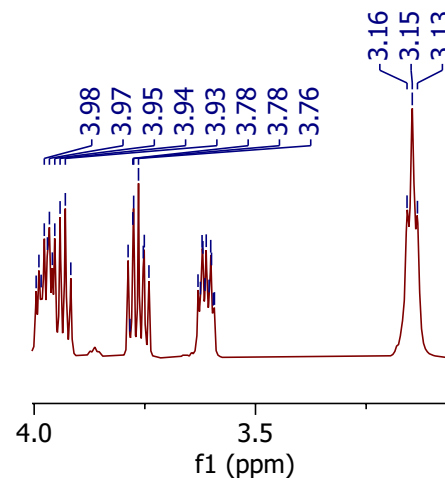
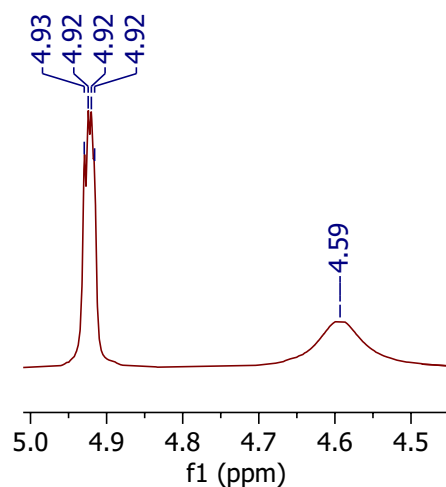
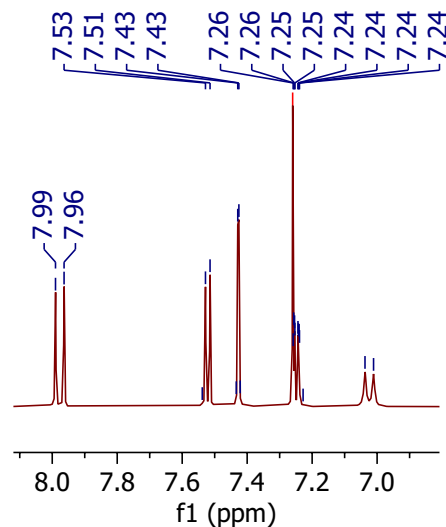
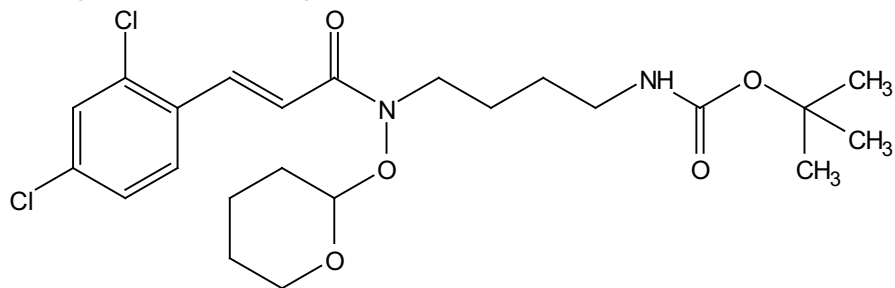
Compound S25
¹H NMR (600 MHz, CDCl₃)



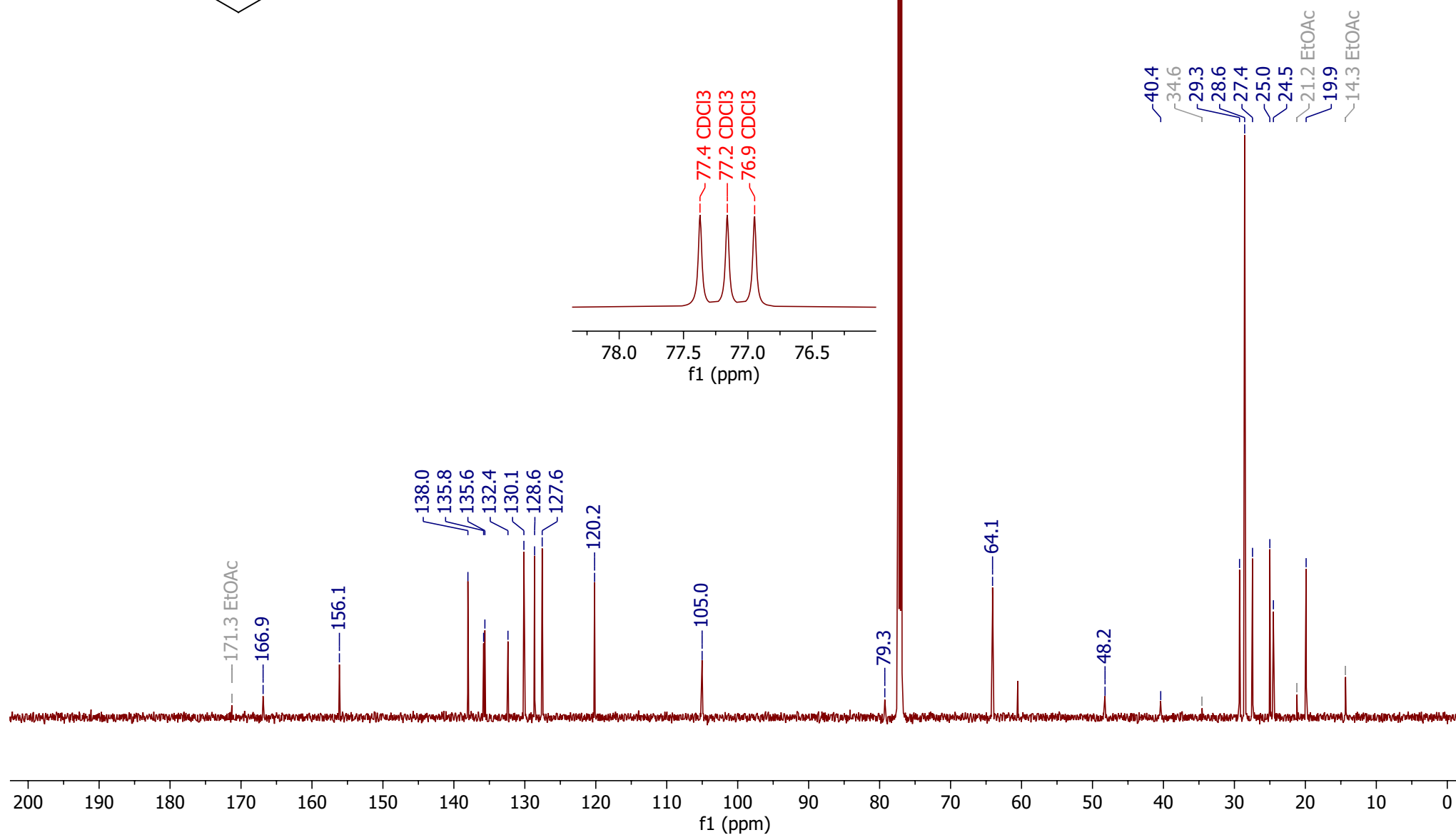
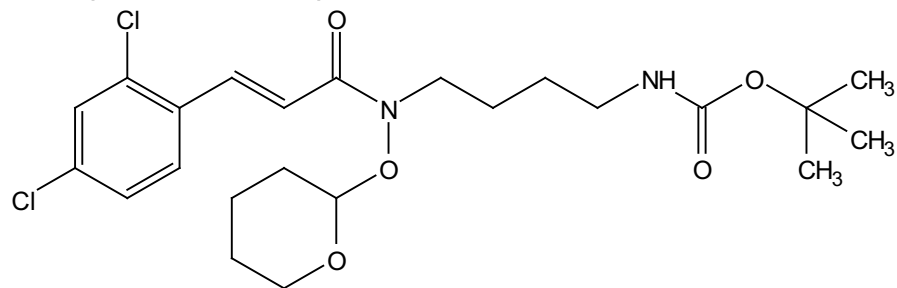
Compound S25
 ^{13}C NMR (151 MHz, CDCl_3)



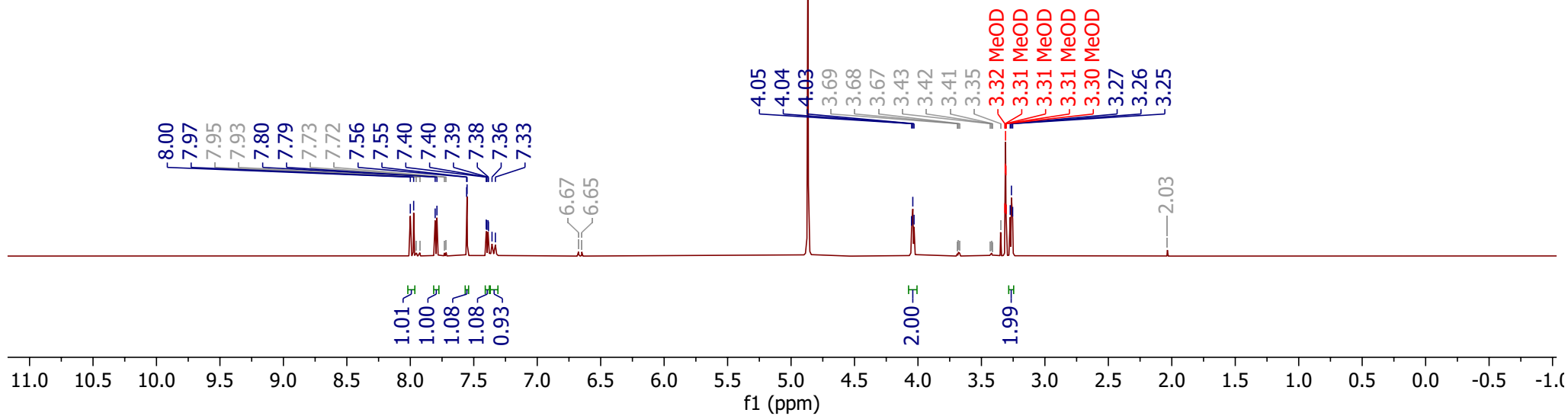
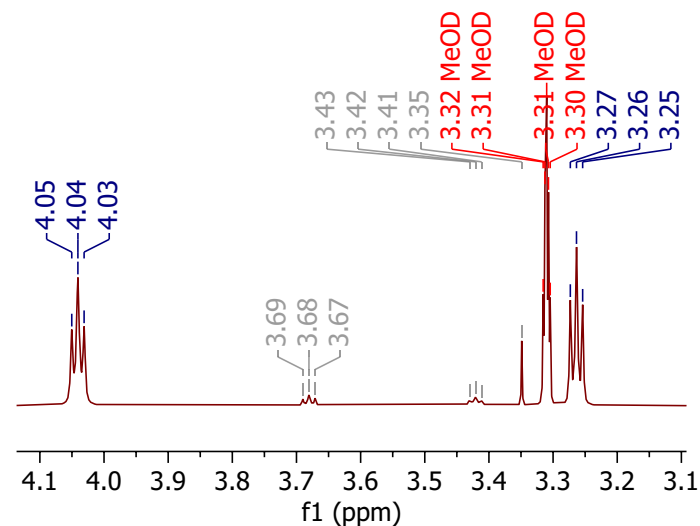
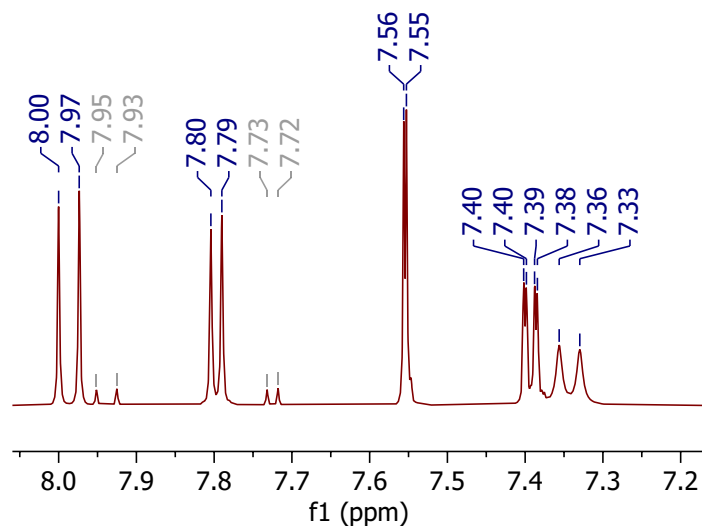
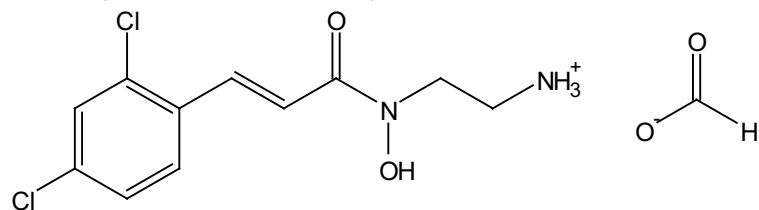
Compound S26
¹H NMR (600 MHz, CDCl₃)

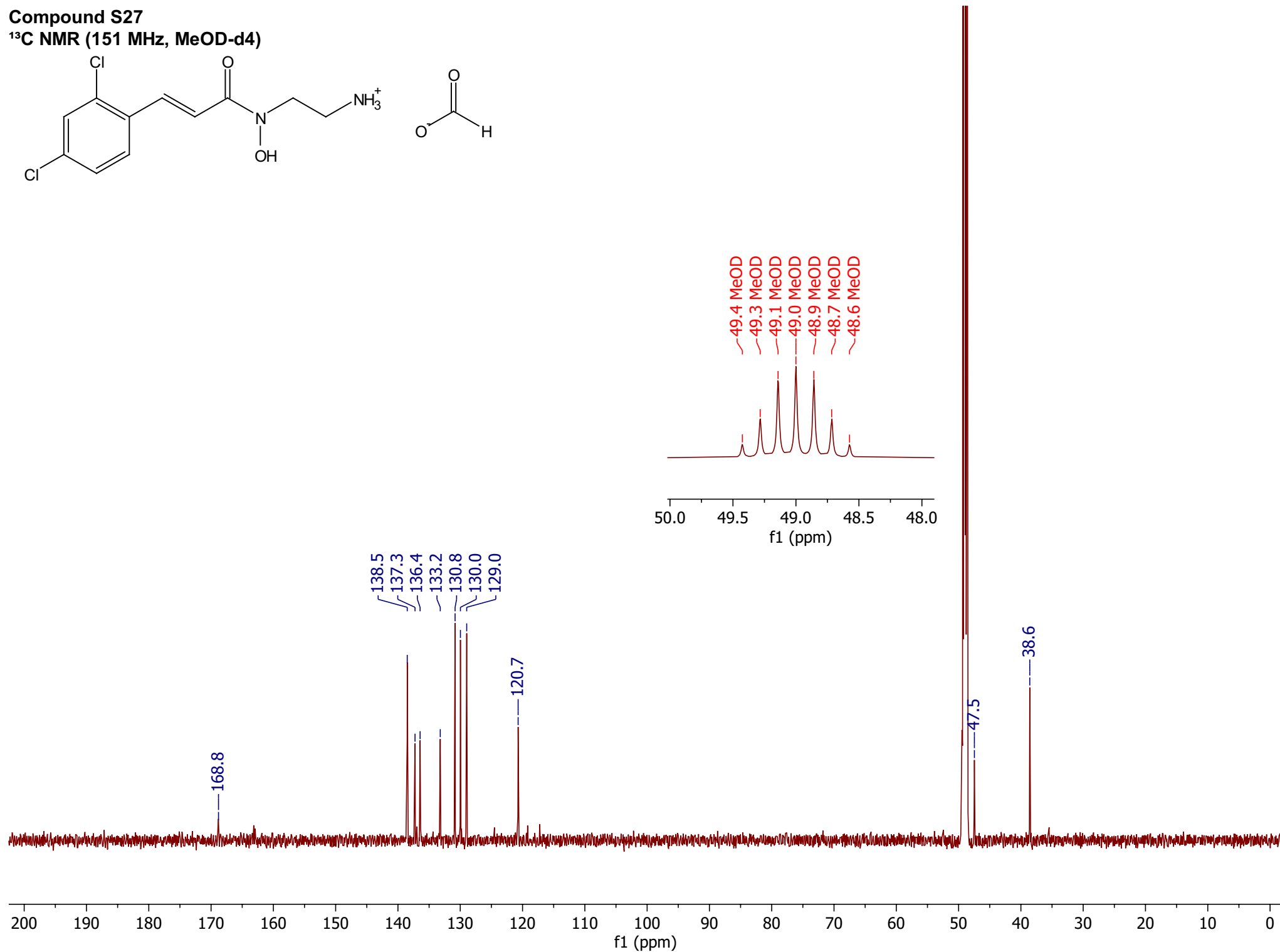
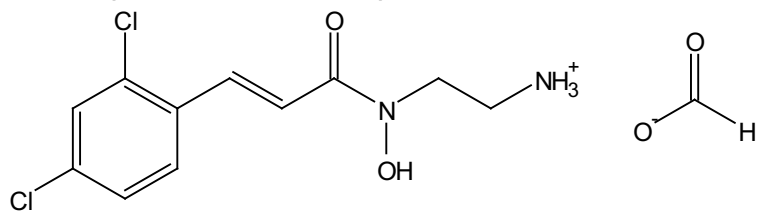


Compound S26
 ^{13}C NMR (151 MHz, CDCl_3)



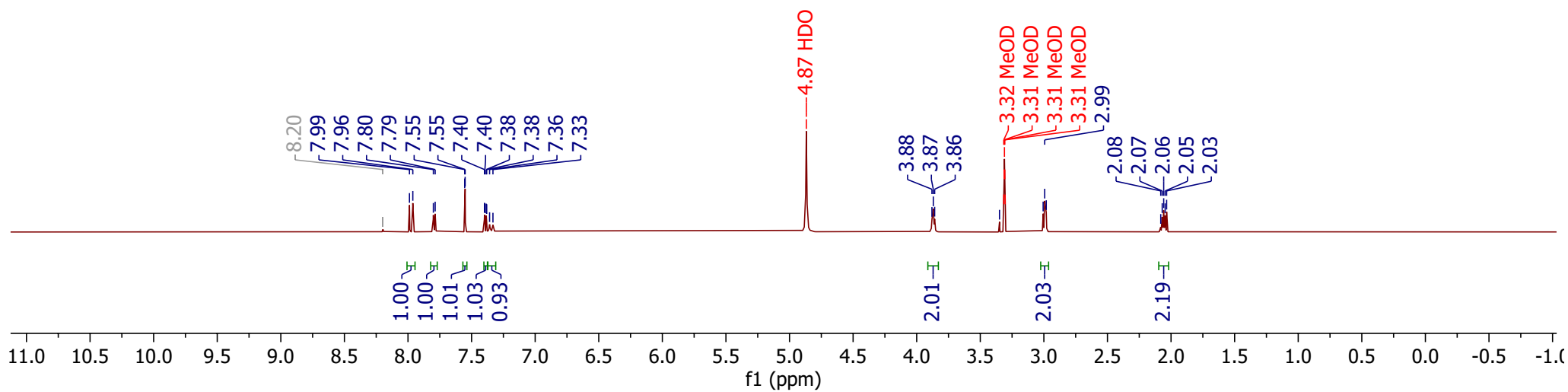
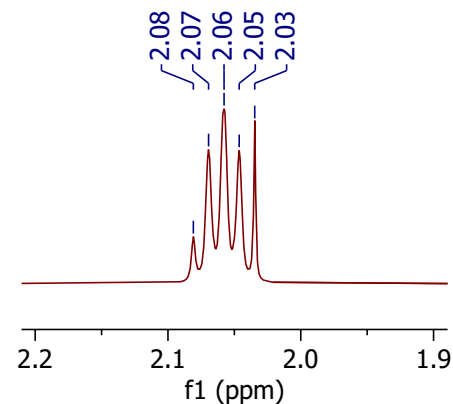
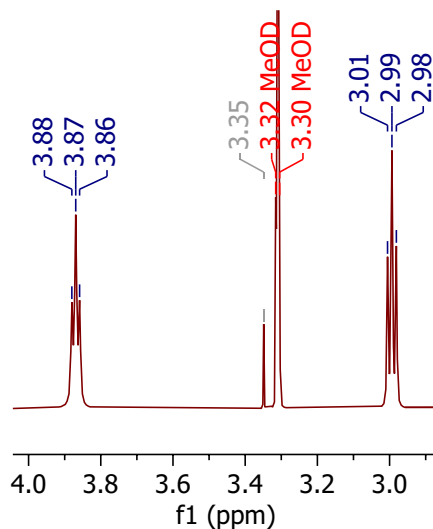
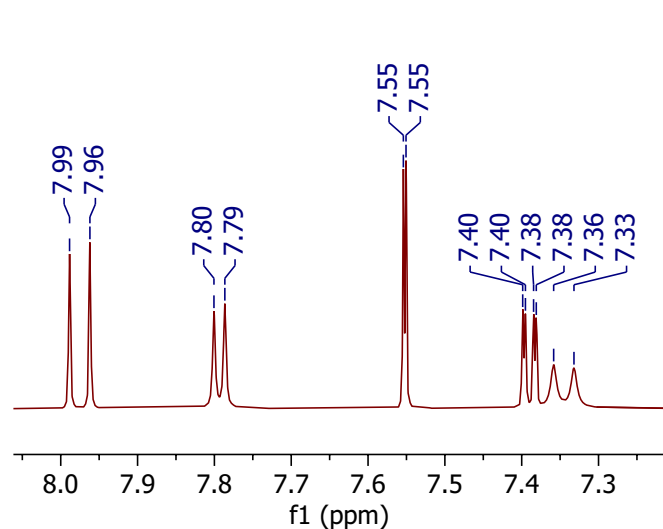
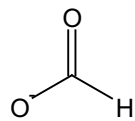
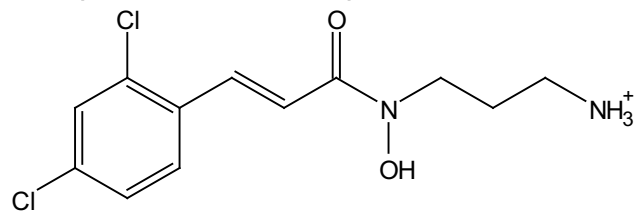
Compound S27
¹H NMR (600 MHz, MeOD-d4)



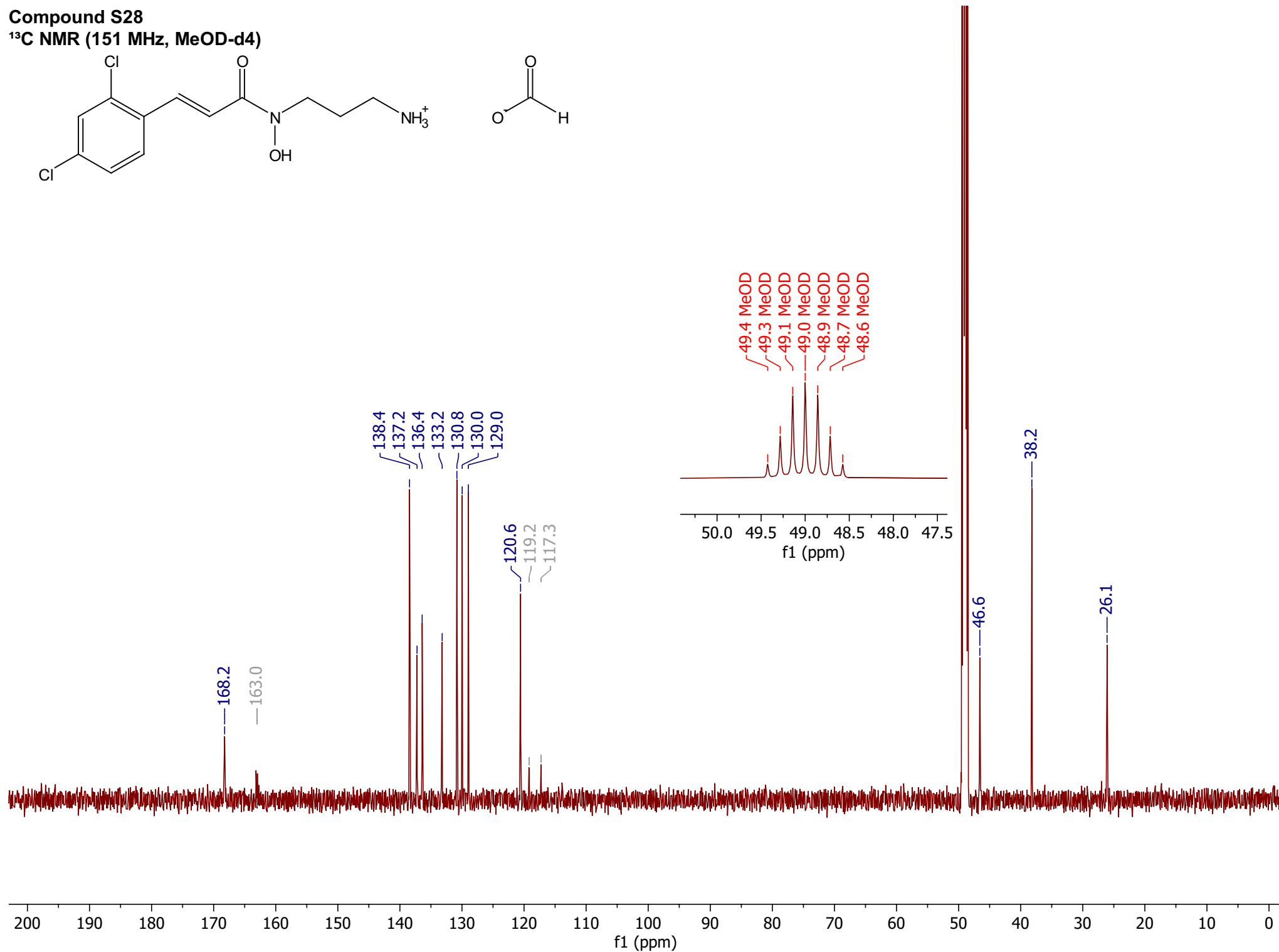
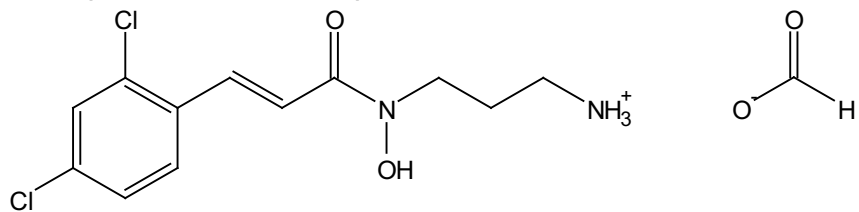
Compound S27 **^{13}C NMR (151 MHz, MeOD-d₄)**

Compound S28

¹H NMR (600 MHz, MeOD-d₄)

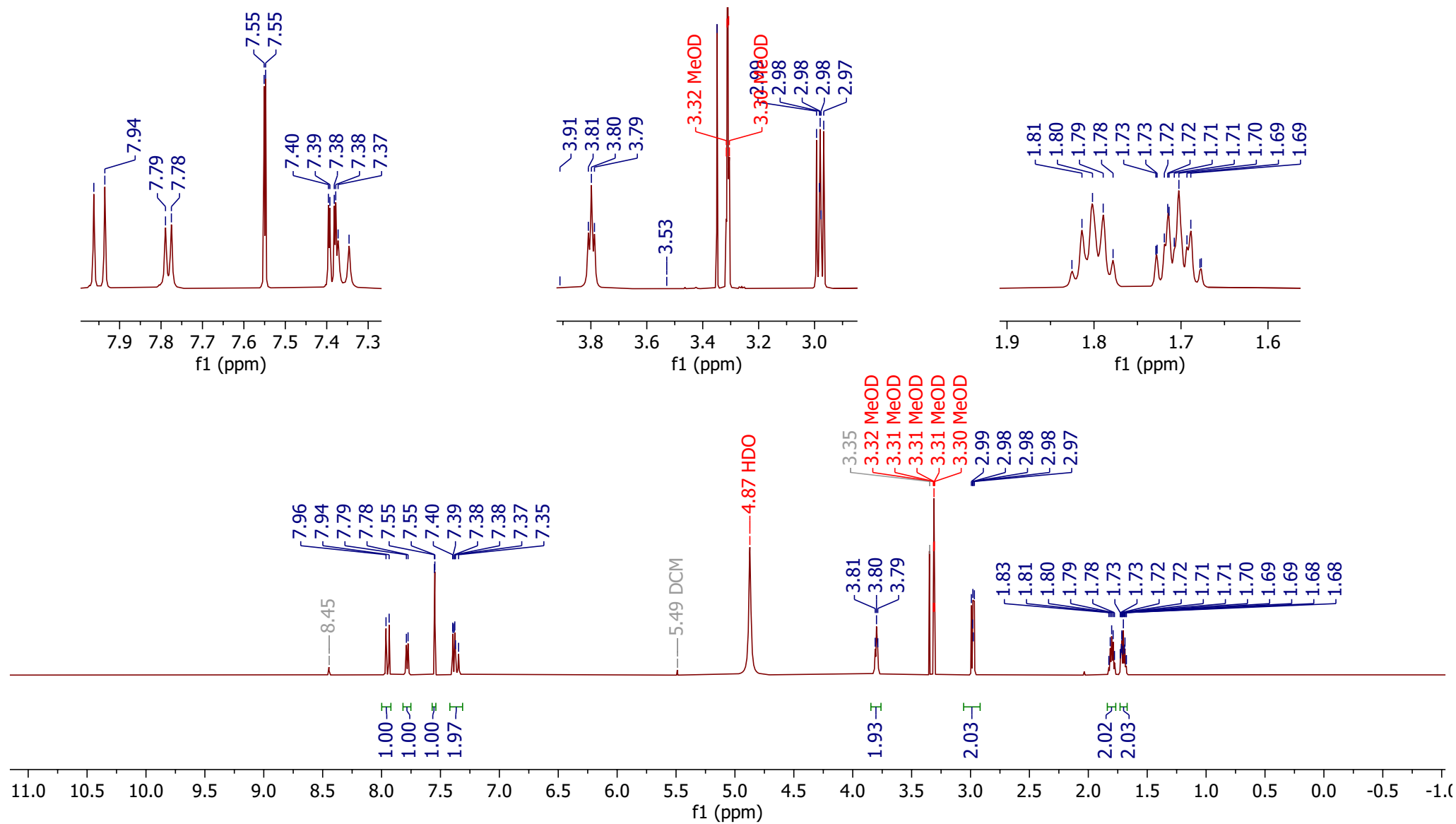
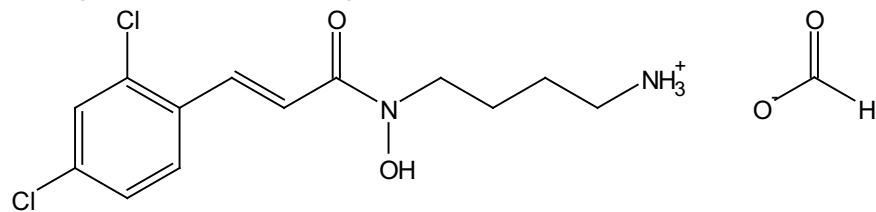


Compound S28
 ^{13}C NMR (151 MHz, MeOD- d_4)

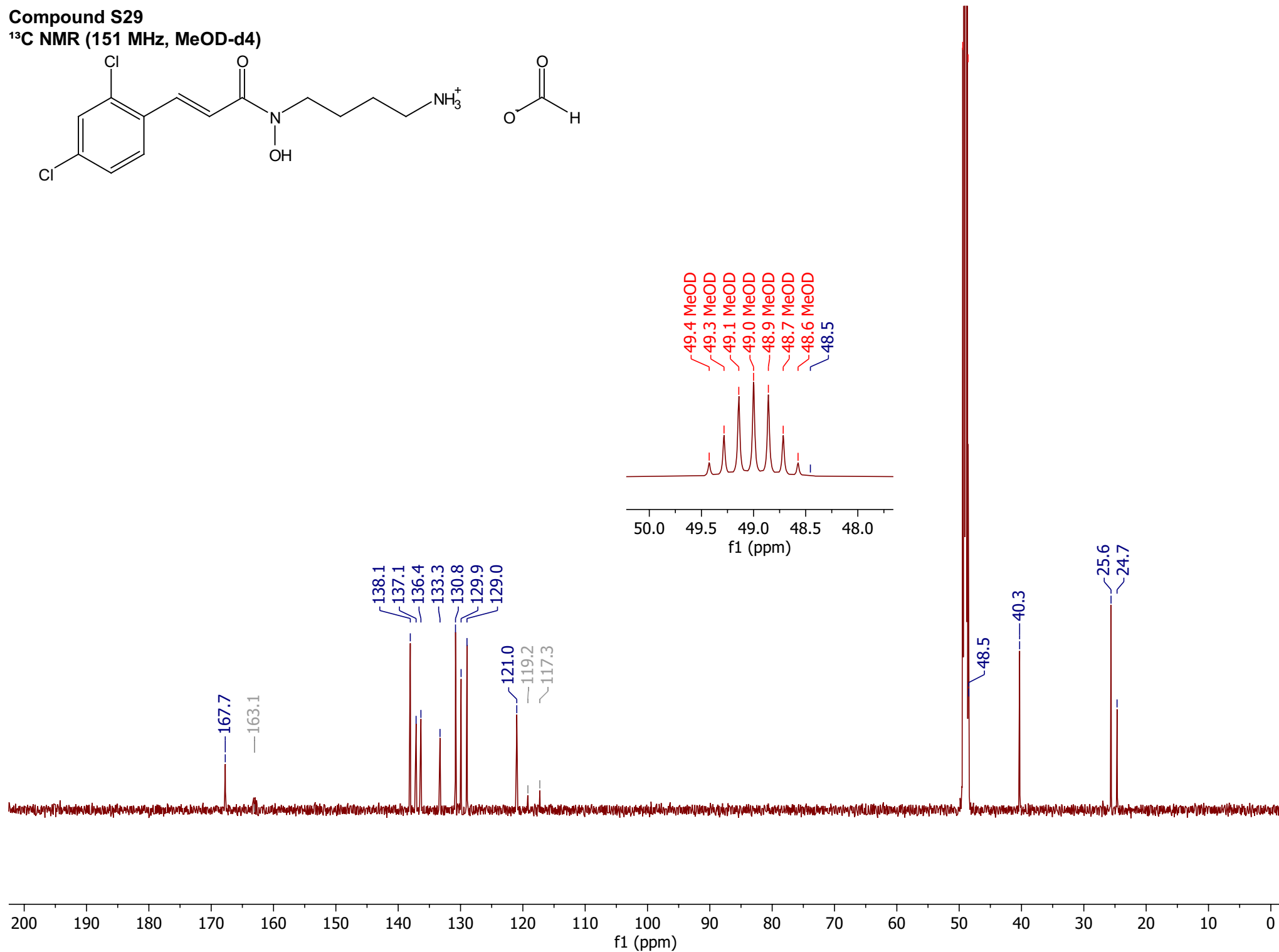
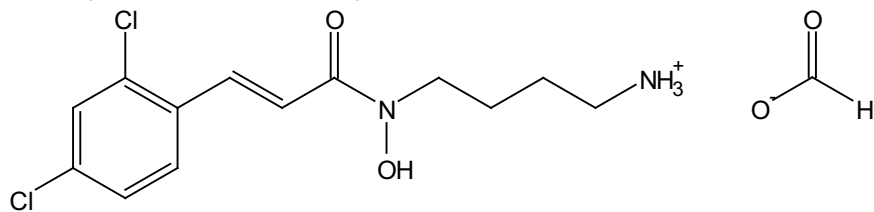


Compound S29

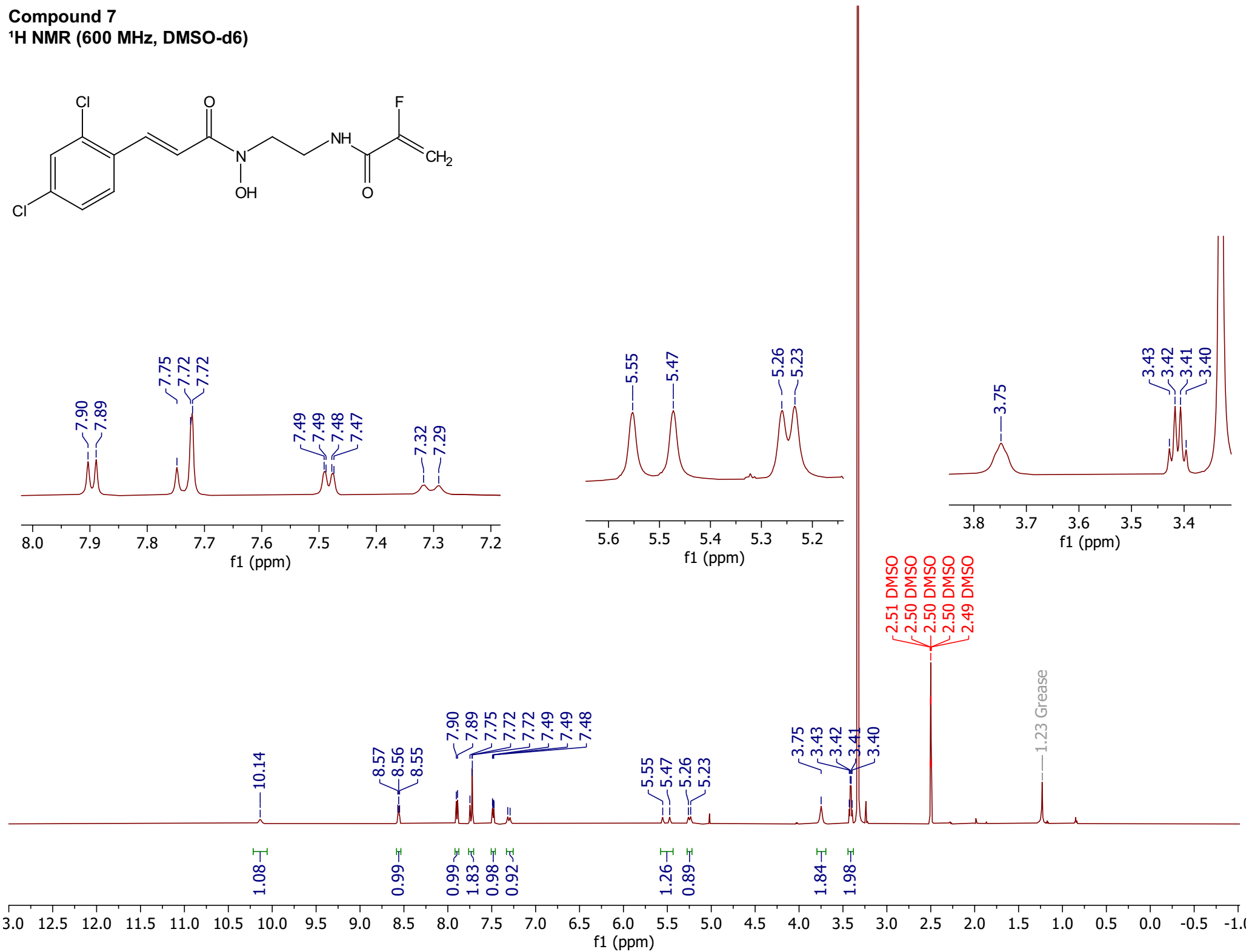
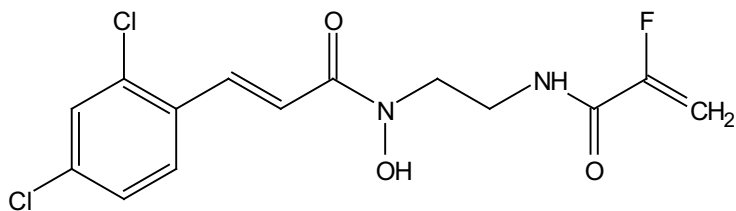
¹H NMR (600 MHz, MeOD-d₄)



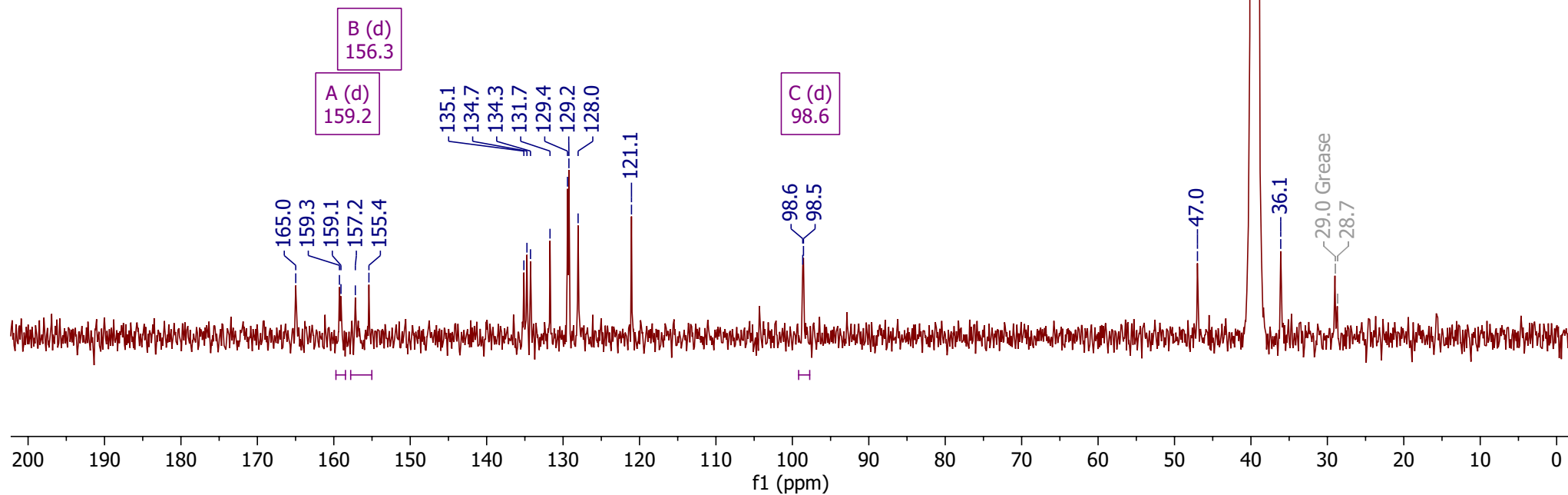
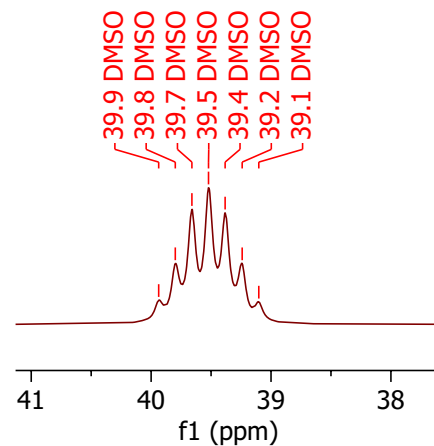
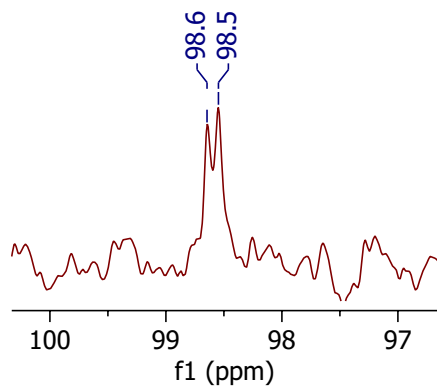
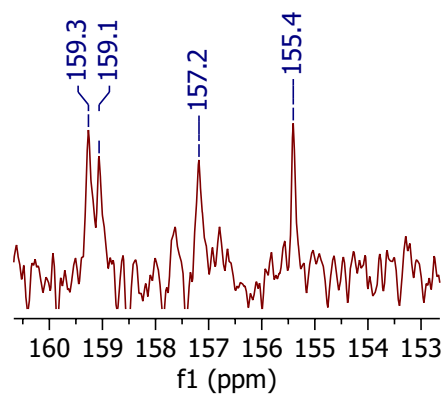
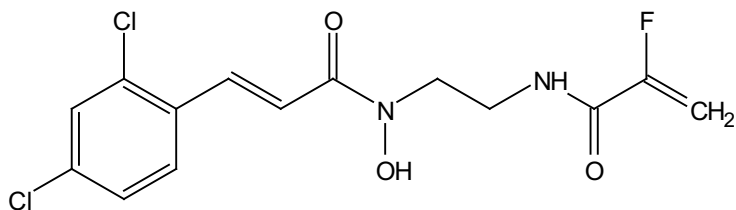
Compound S29
¹³C NMR (151 MHz, MeOD-d4)



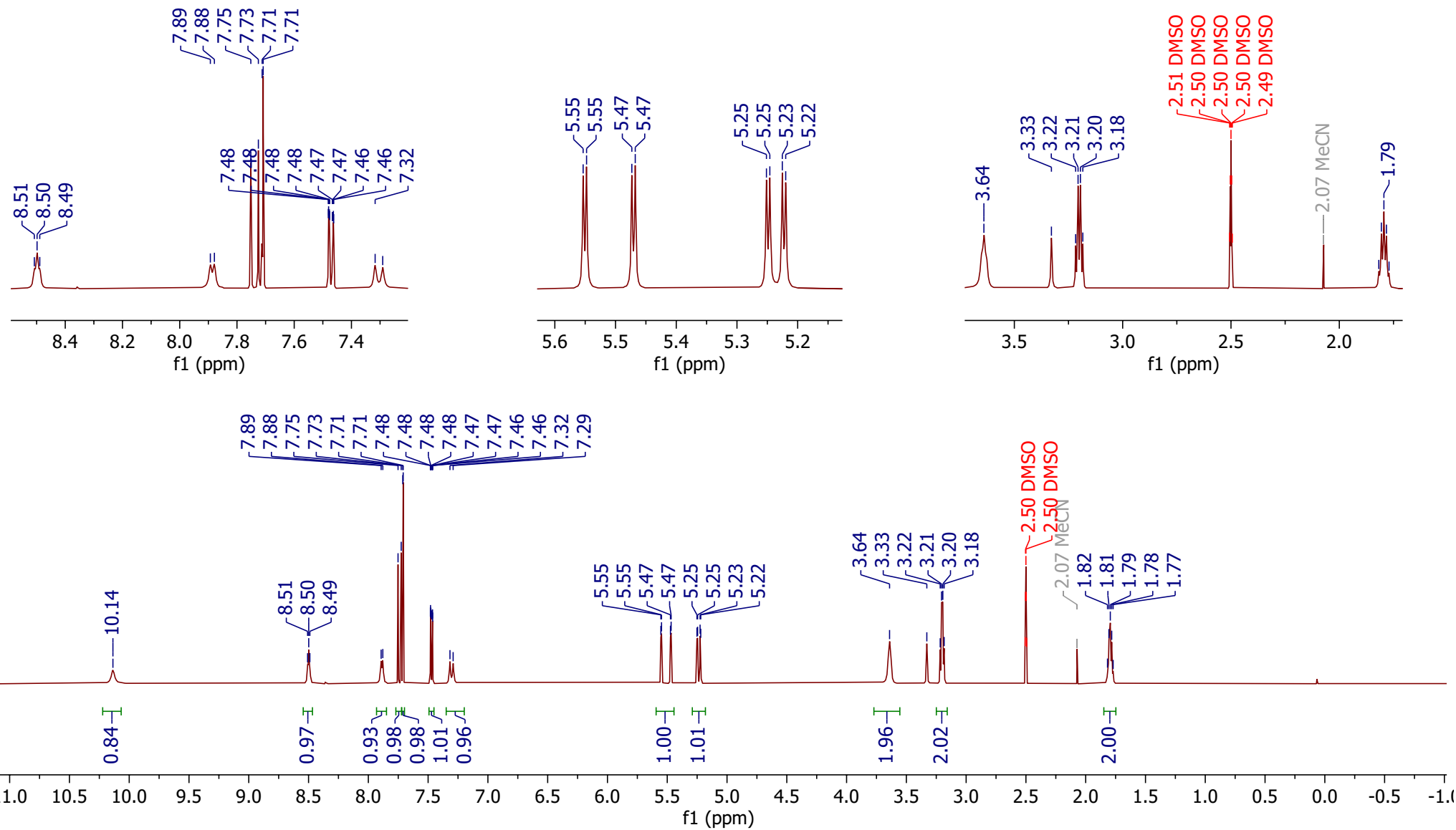
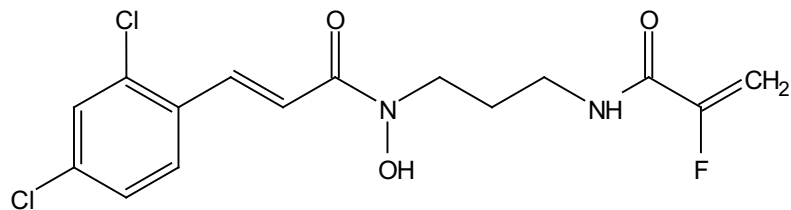
Compound 7
¹H NMR (600 MHz, DMSO-d₆)



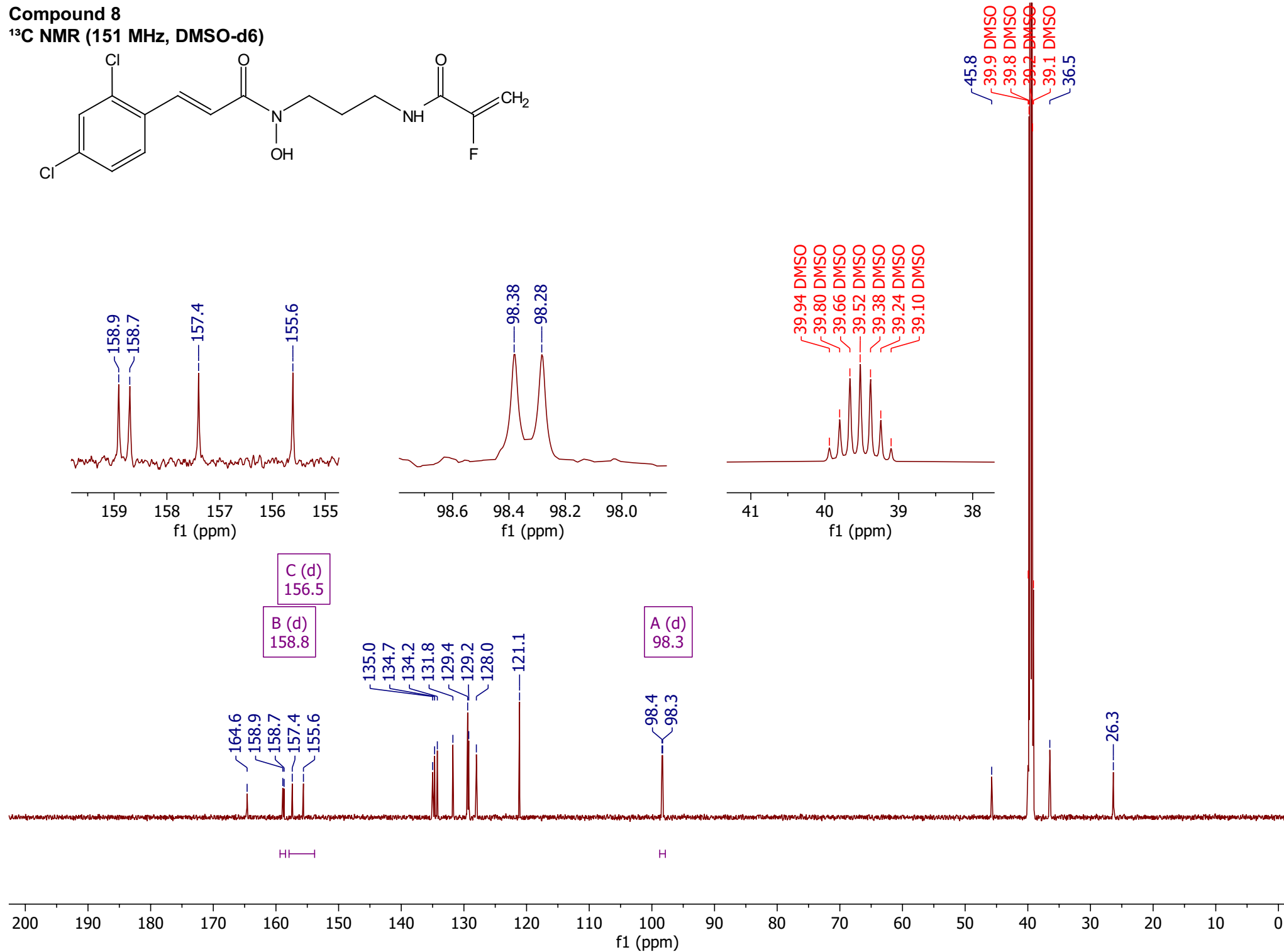
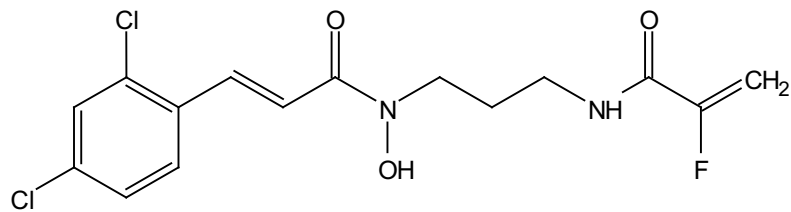
Compound 7
¹³C NMR (151 MHz, DMSO-d6)



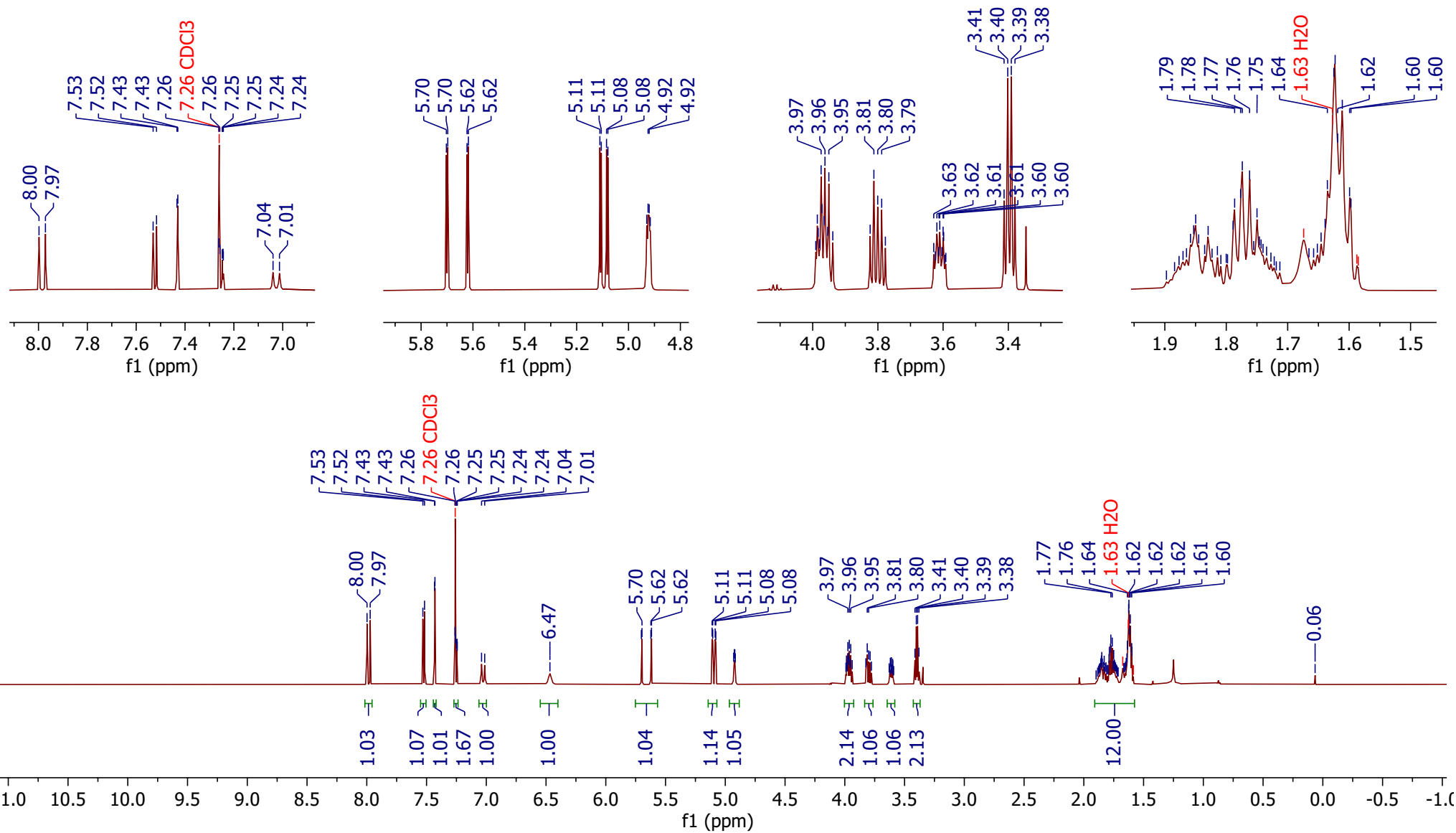
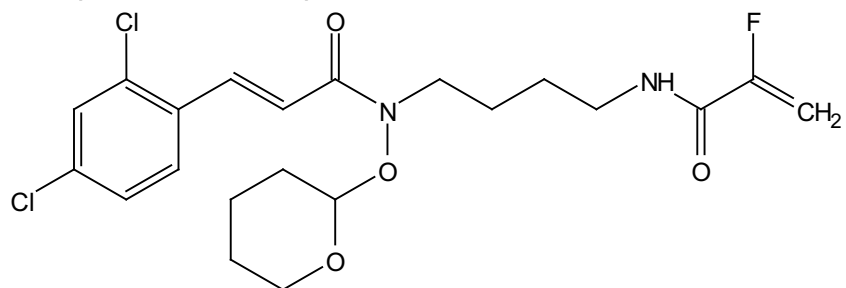
Compound 8
¹H NMR (600 MHz, DMSO-d₆)



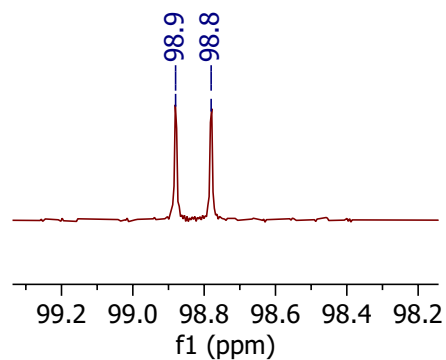
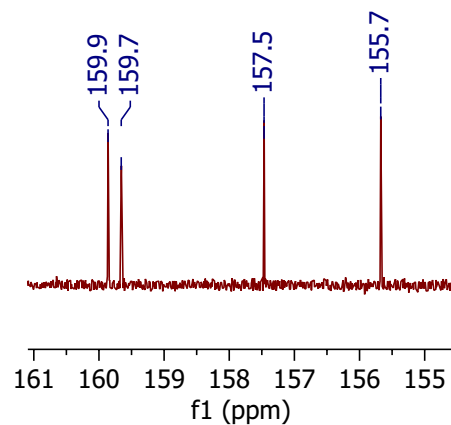
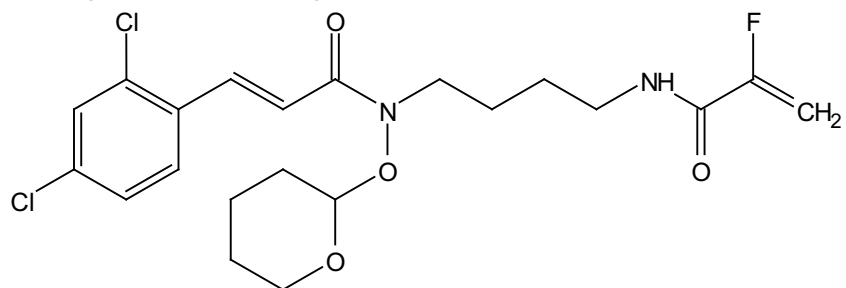
Compound 8
¹³C NMR (151 MHz, DMSO-d₆)



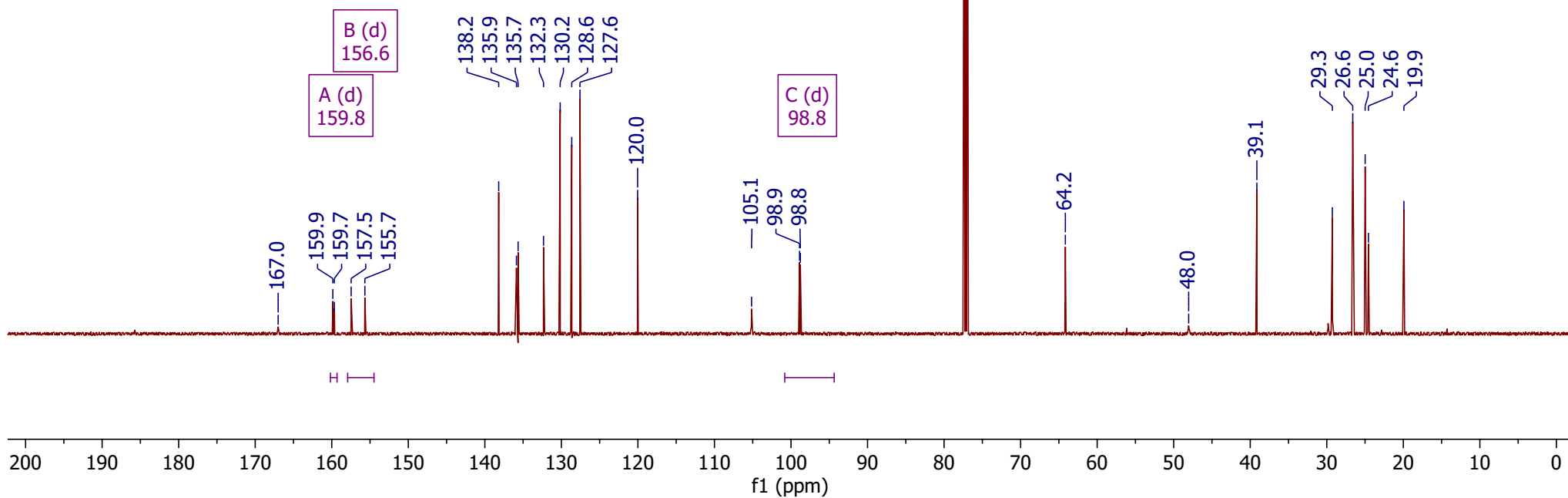
Compound S30
¹H NMR (600 MHz, CDCl₃)



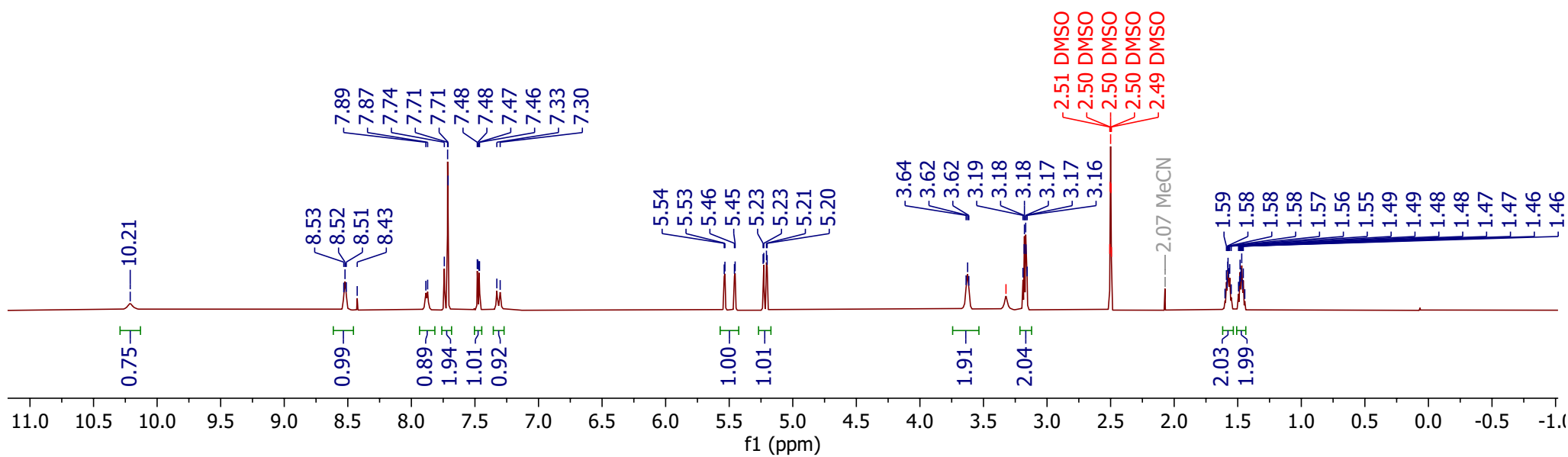
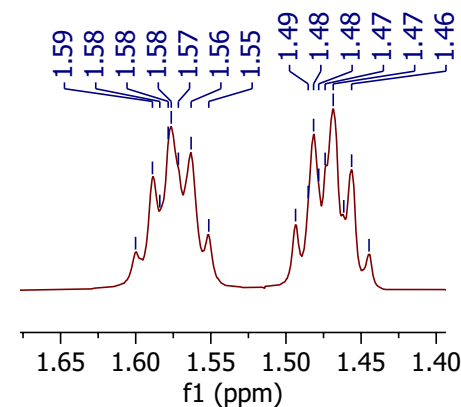
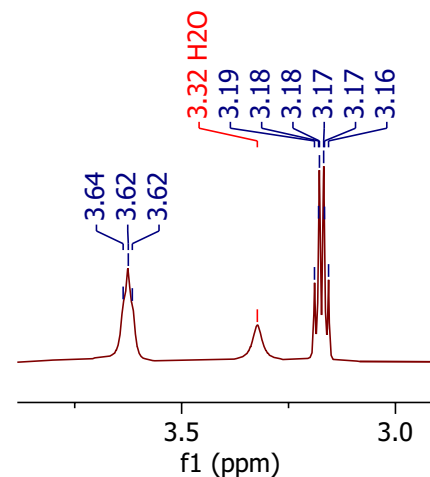
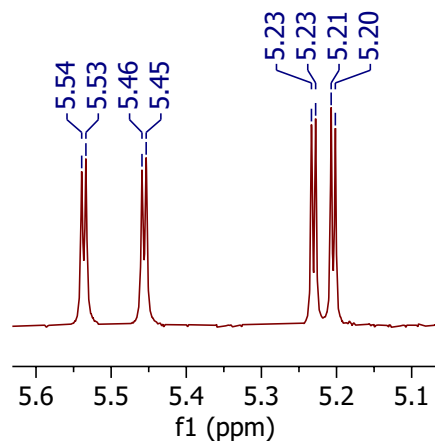
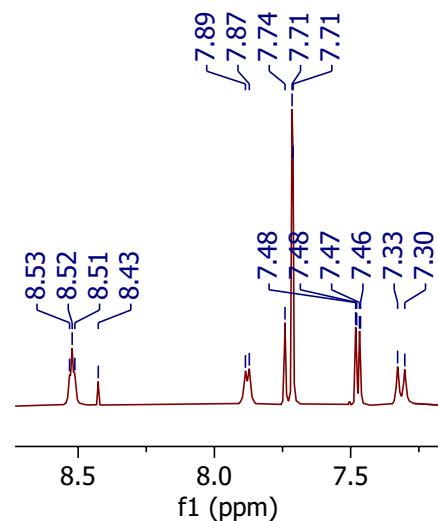
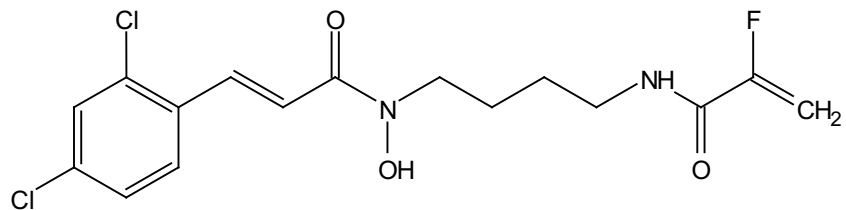
Compound S30
 ^{13}C NMR (151 MHz, CDCl_3)



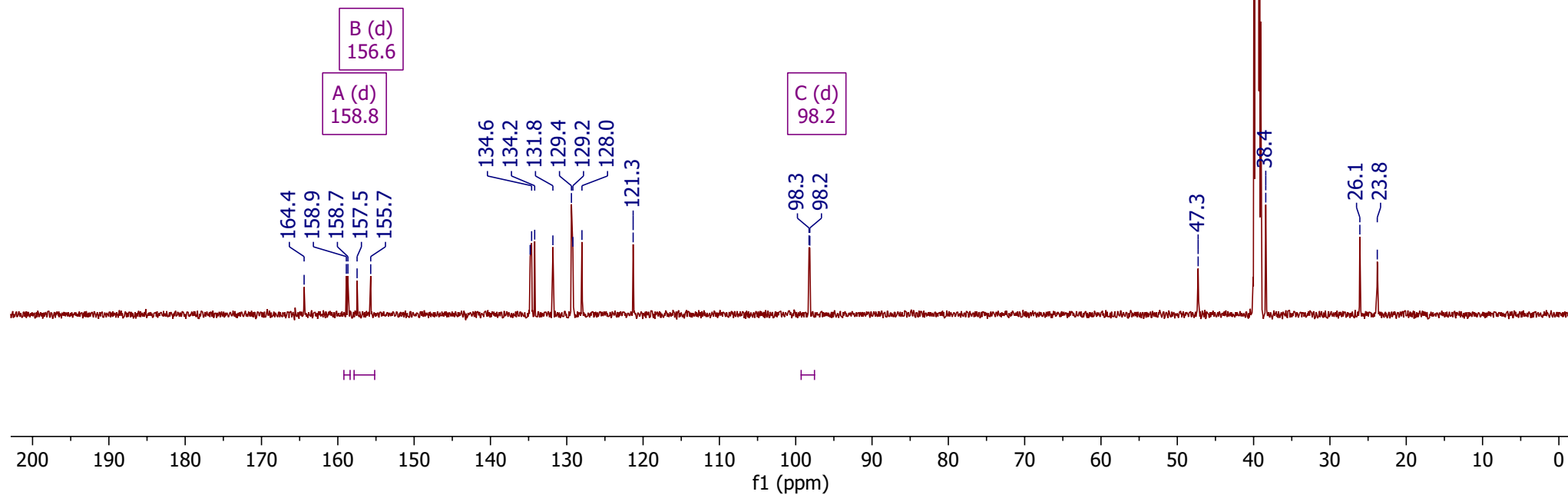
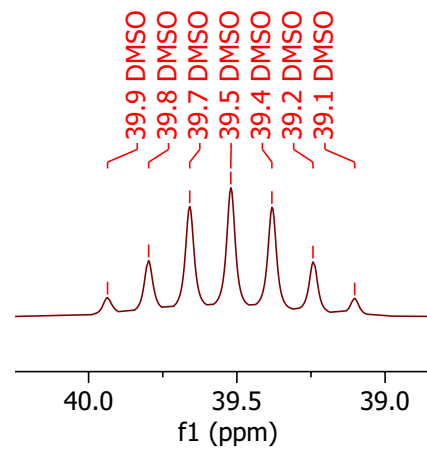
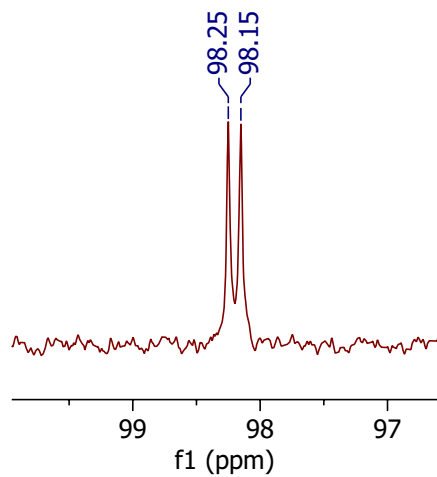
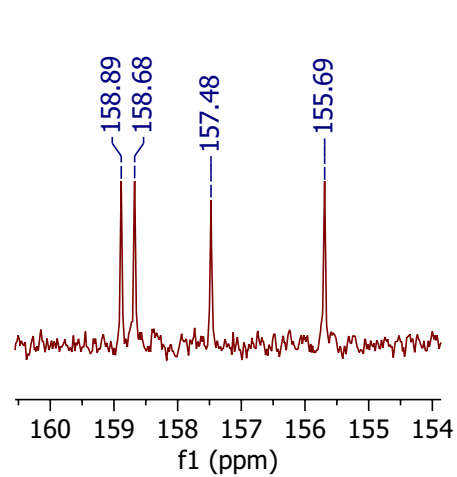
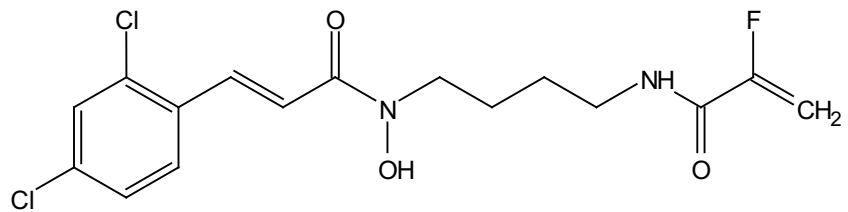
77.4 CDCl_3
77.2 CDCl_3
76.9 CDCl_3



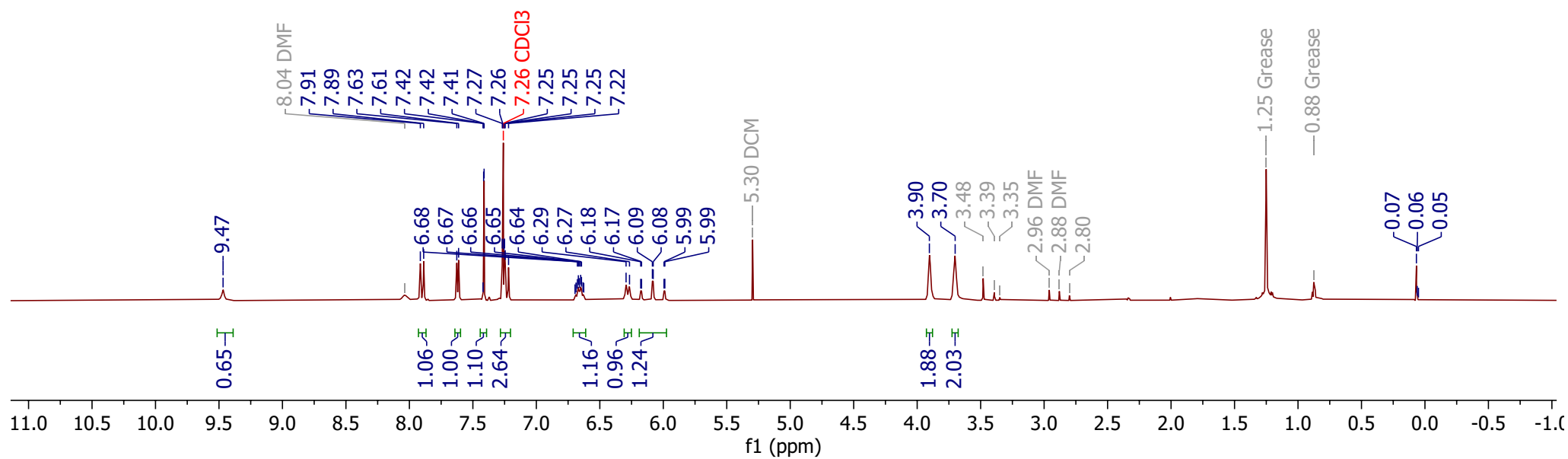
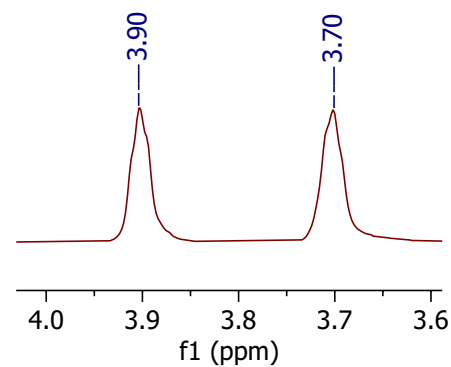
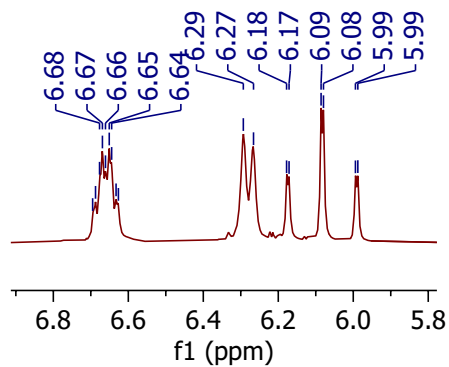
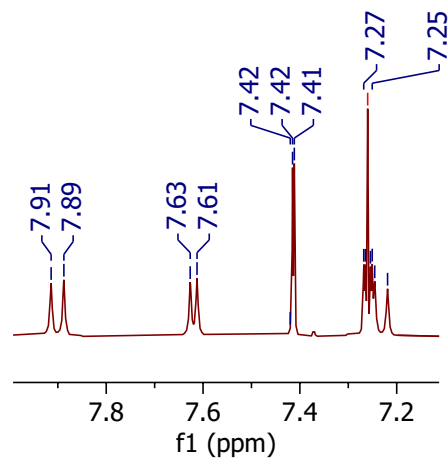
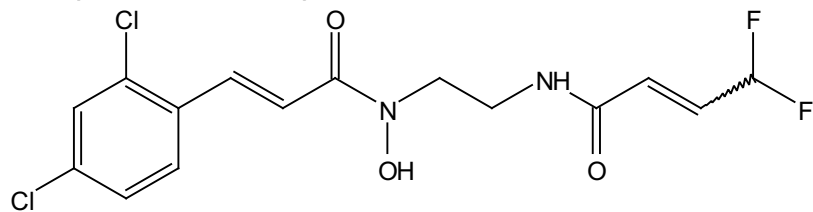
Compound 9
¹H NMR (600 MHz, DMSO-d₆)



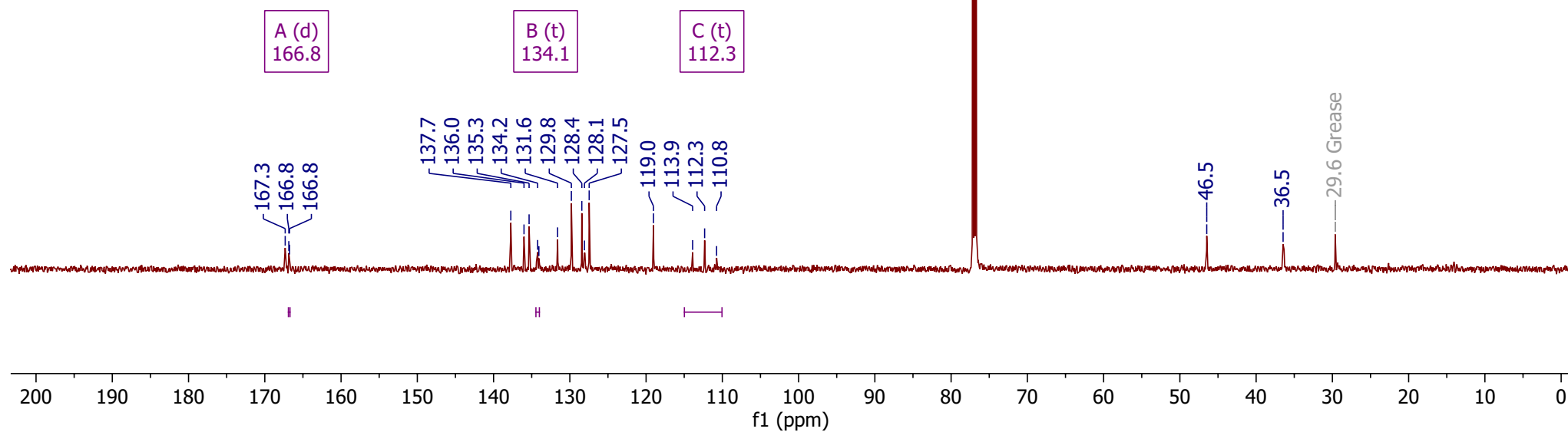
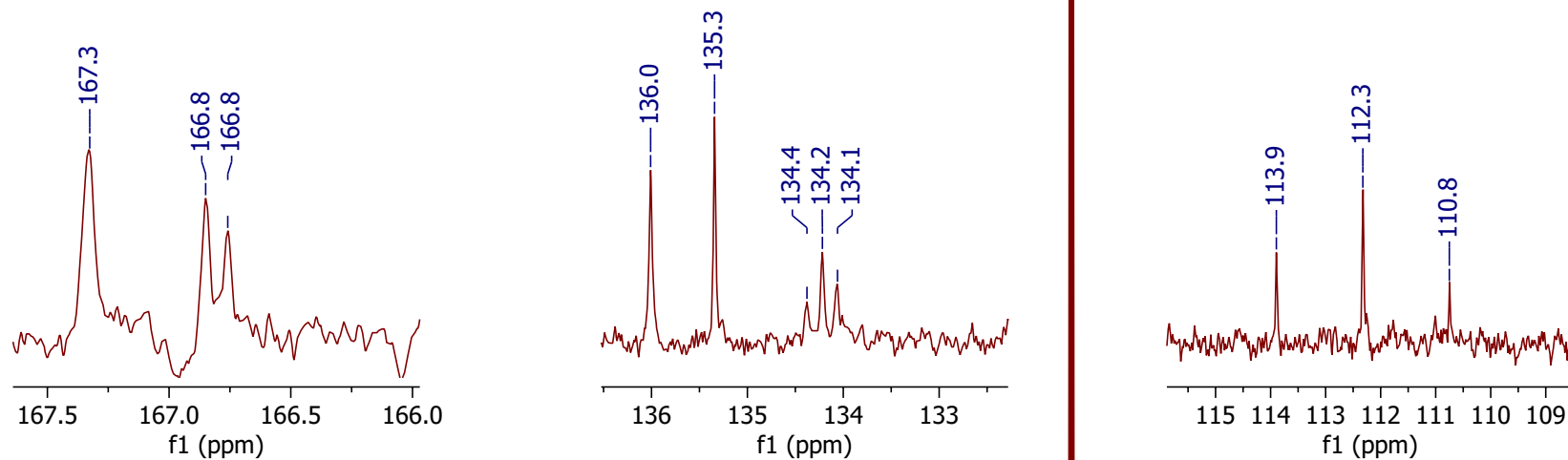
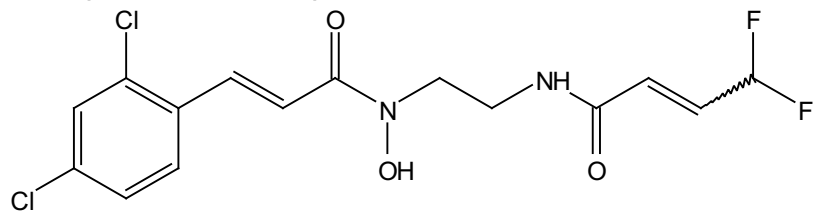
Compound 9
¹³C NMR (151 MHz, DMSO-d₆)



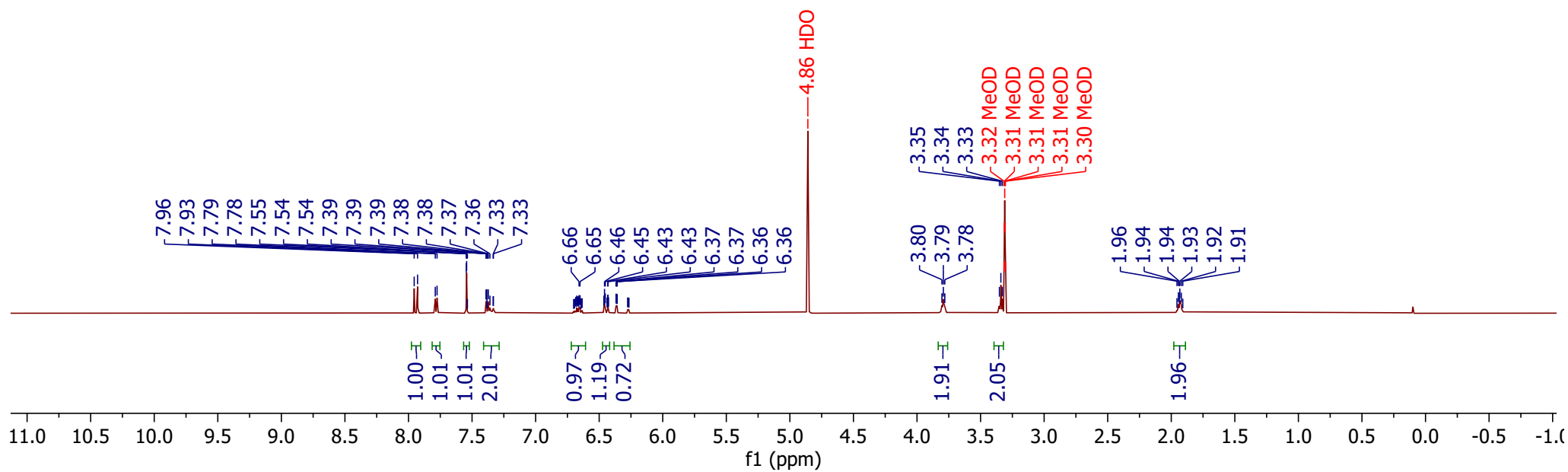
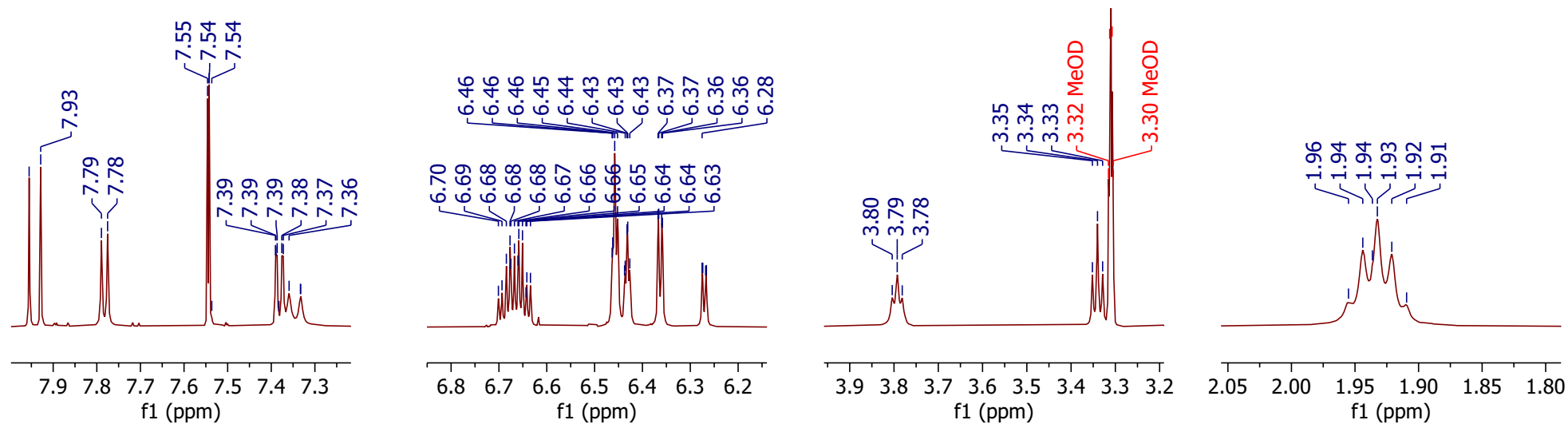
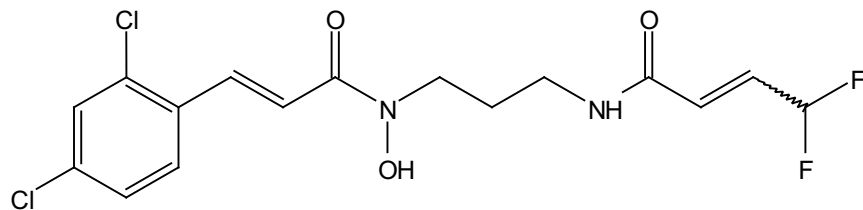
Compound 10
¹H NMR (600 MHz, CDCl₃)



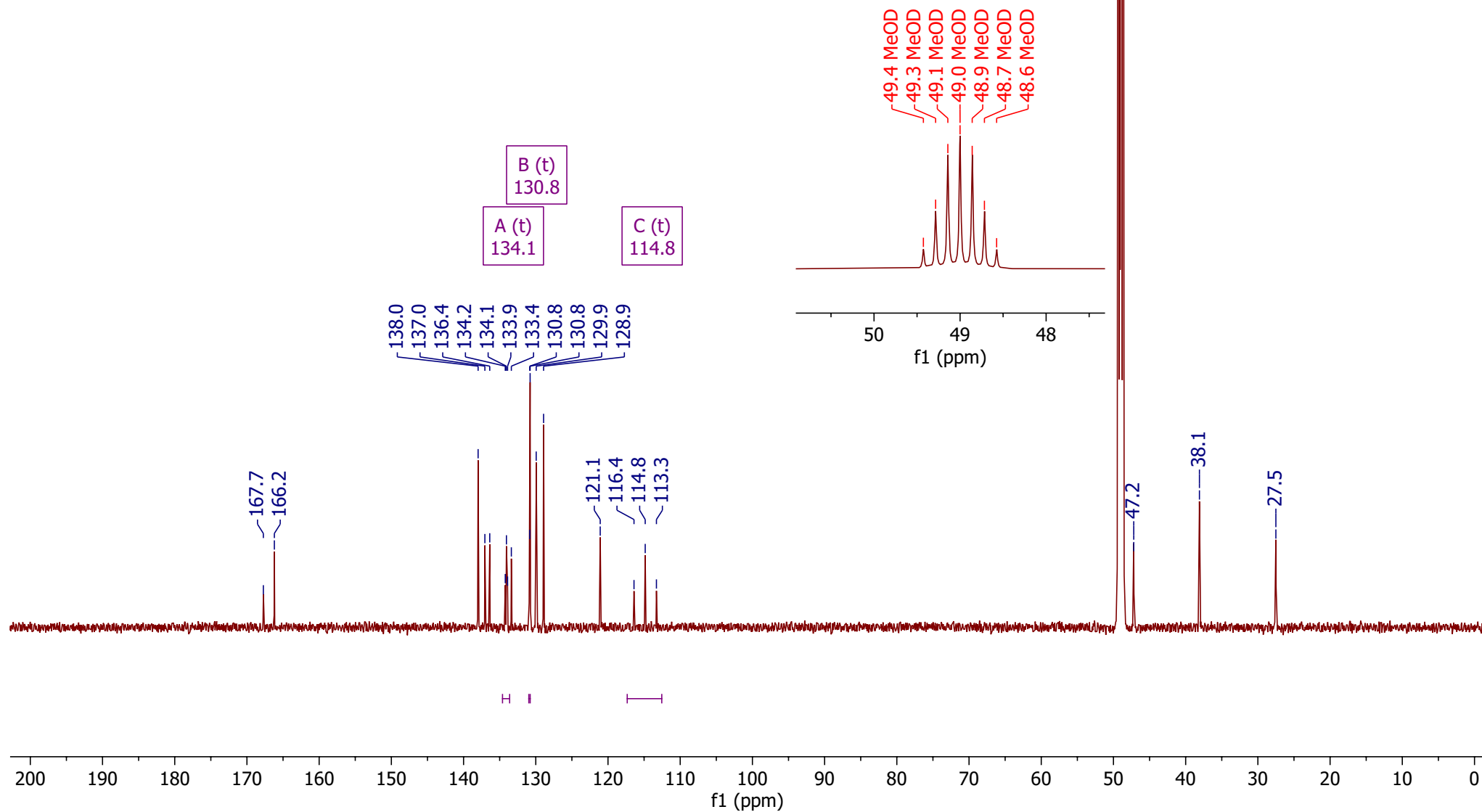
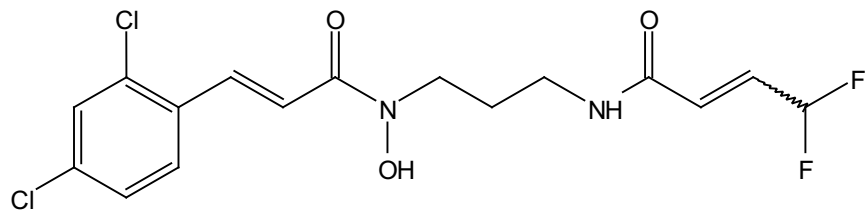
Compound 10
 ^{13}C NMR (151 MHz, CDCl_3)



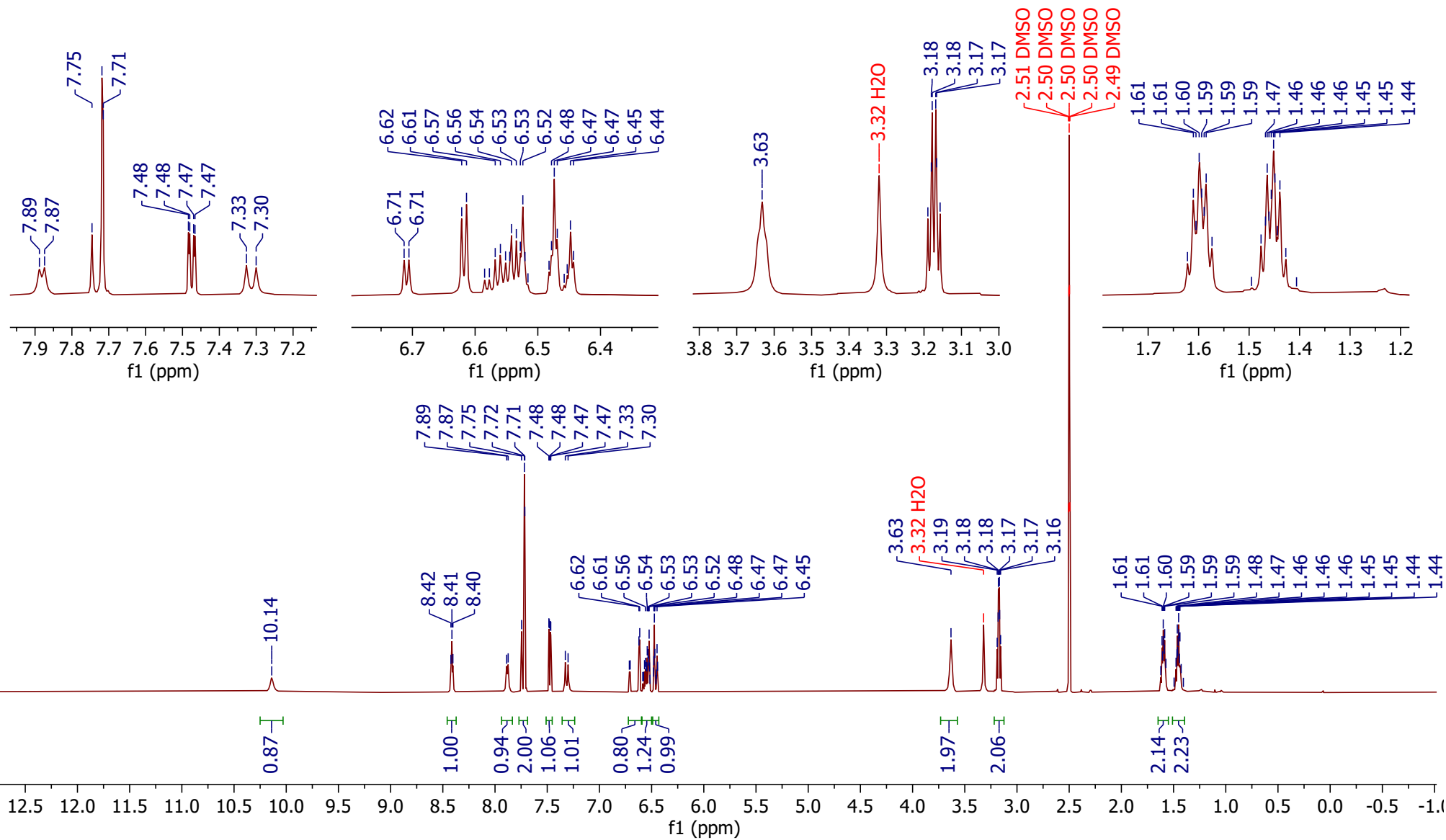
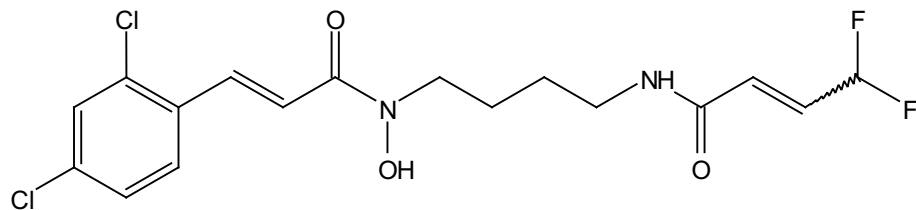
Compound 11
¹H NMR (600 MHz, MeOD-d₄)



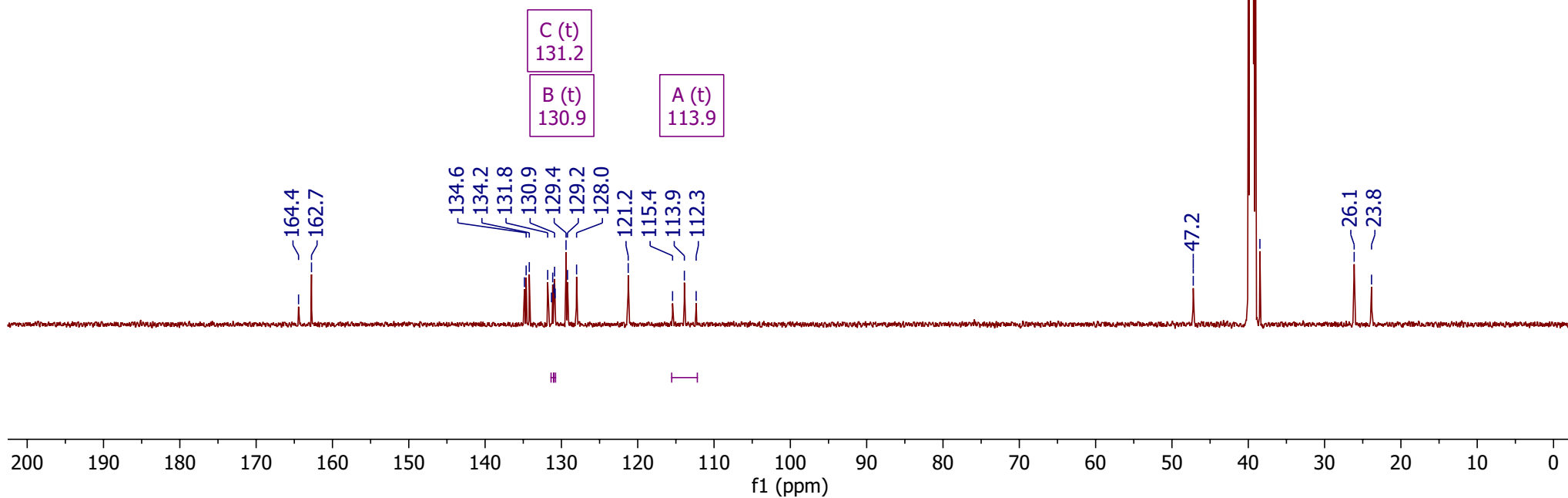
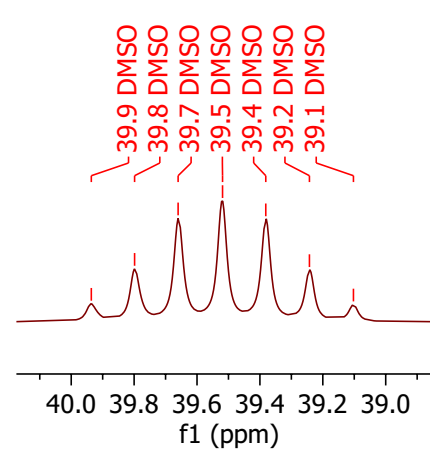
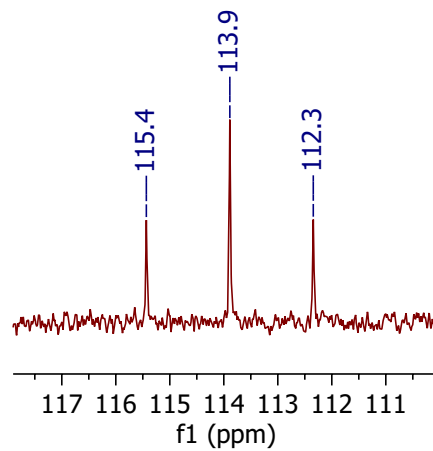
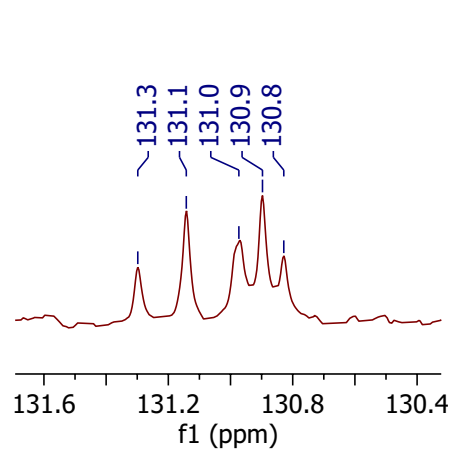
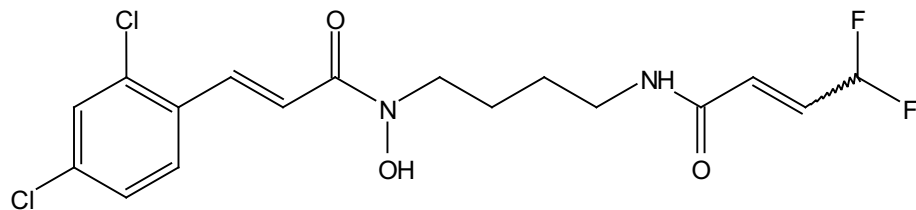
Compound 11
¹³C NMR (151 MHz, MeOD-d4)



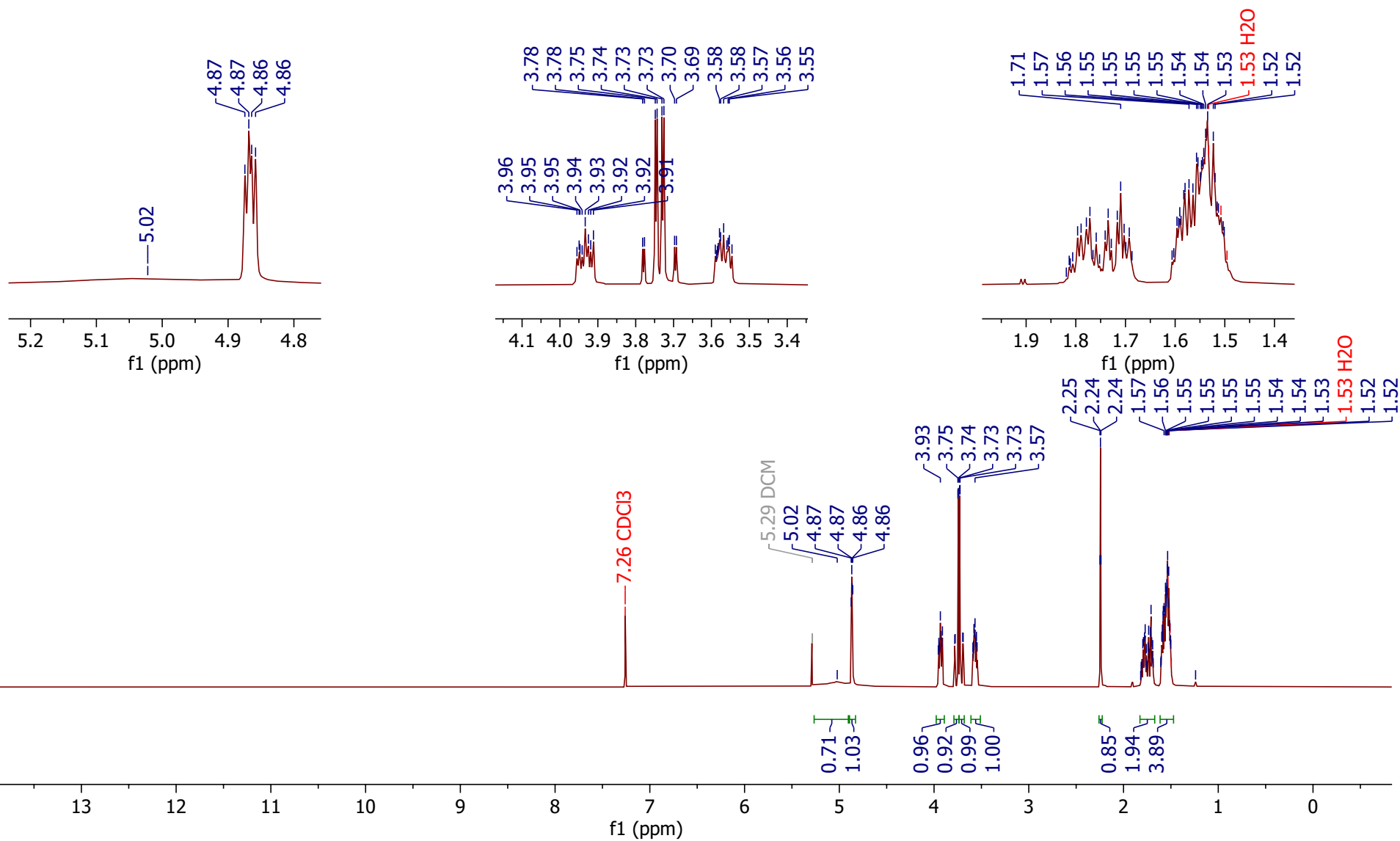
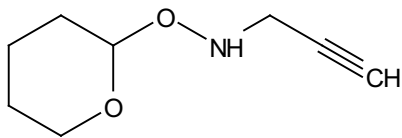
Compound 12
¹H NMR (600 MHz, DMSO-d₆)



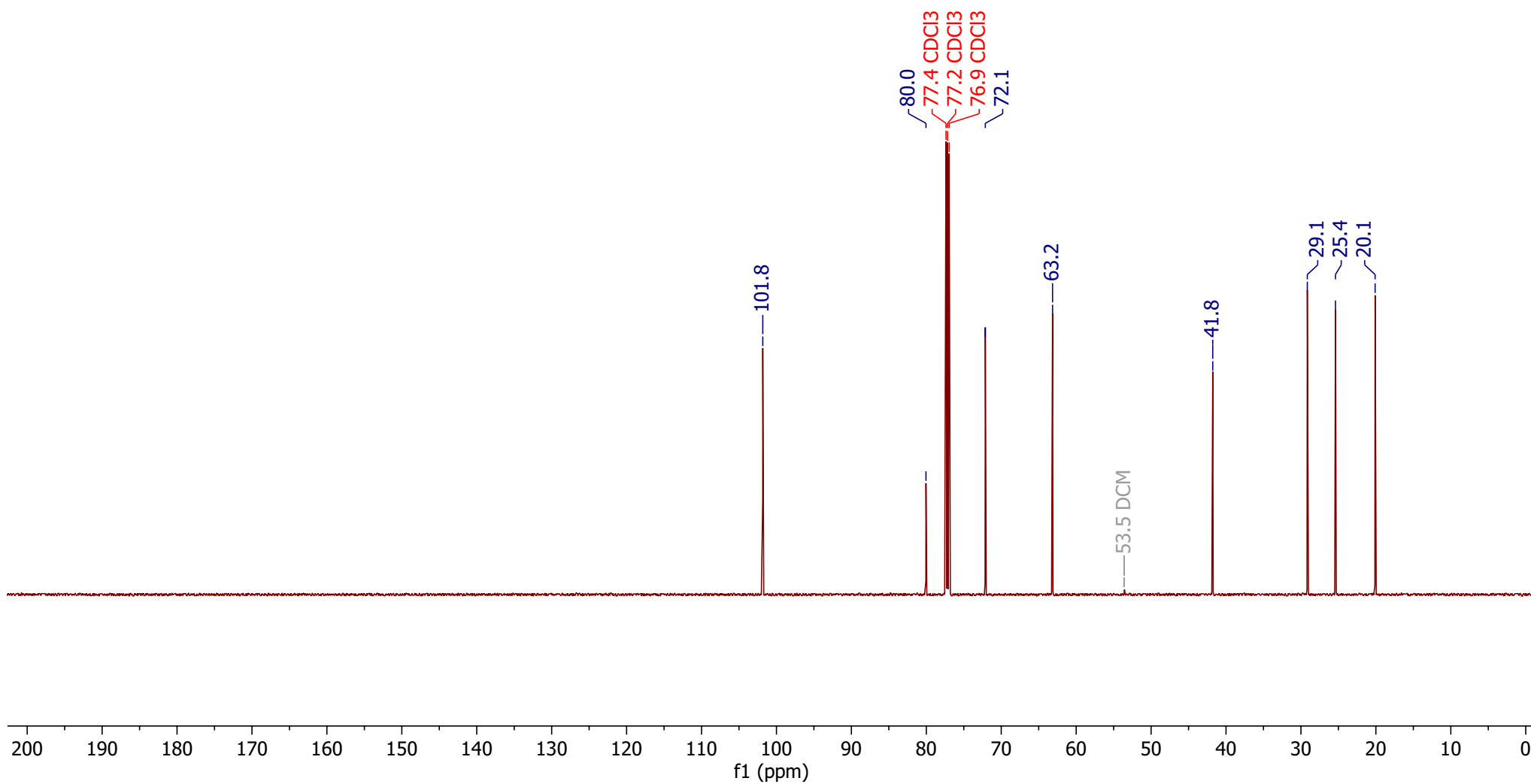
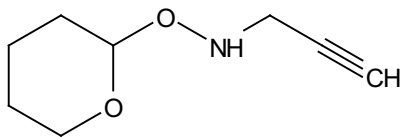
Compound 12
¹³C NMR (151 MHz, DMSO-d6)



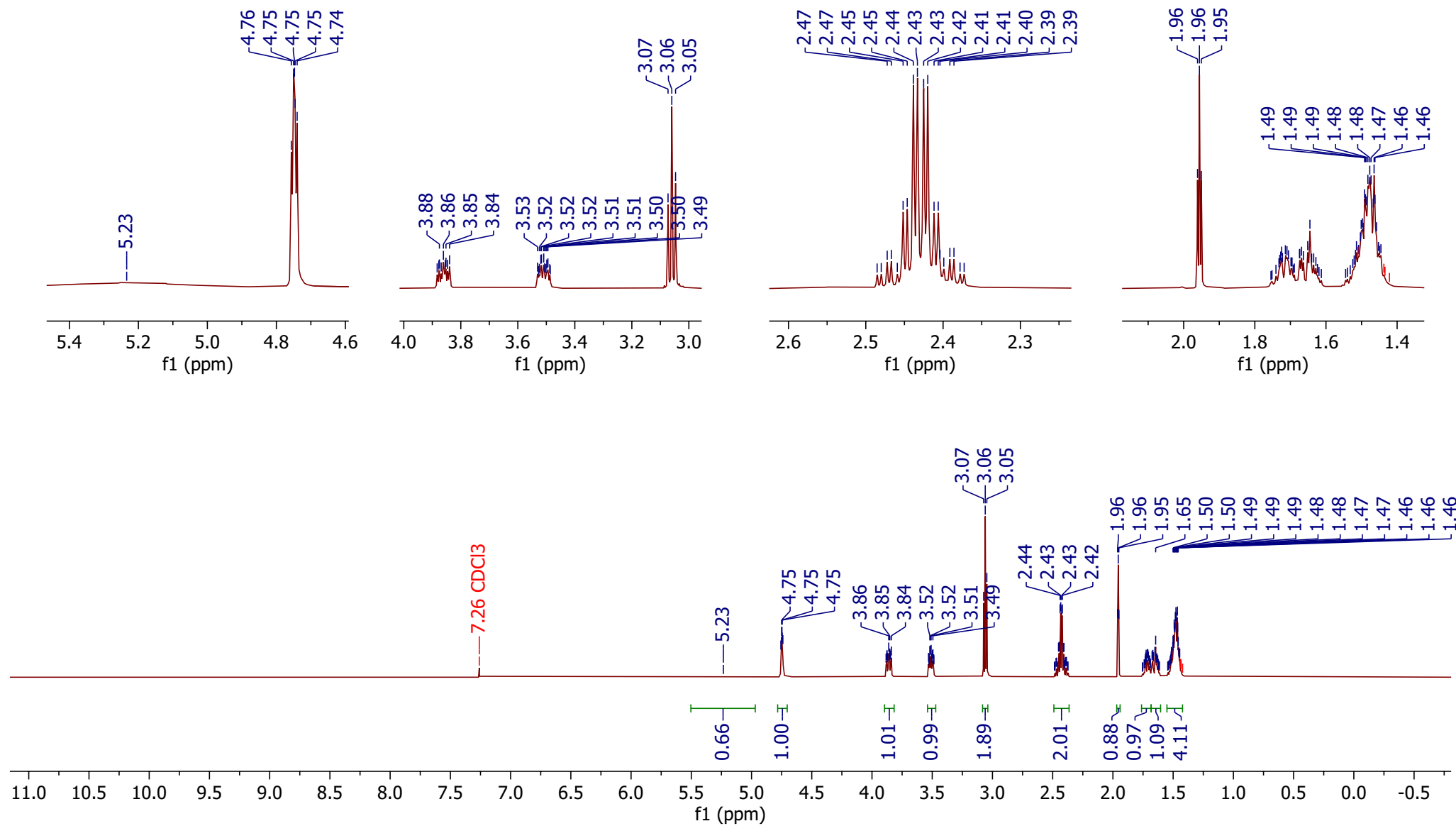
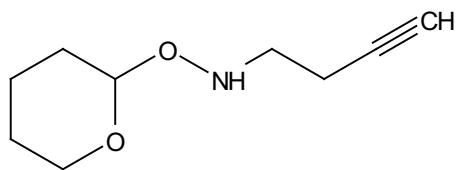
Compound S31
¹H NMR (500 MHz, CDCl₃)



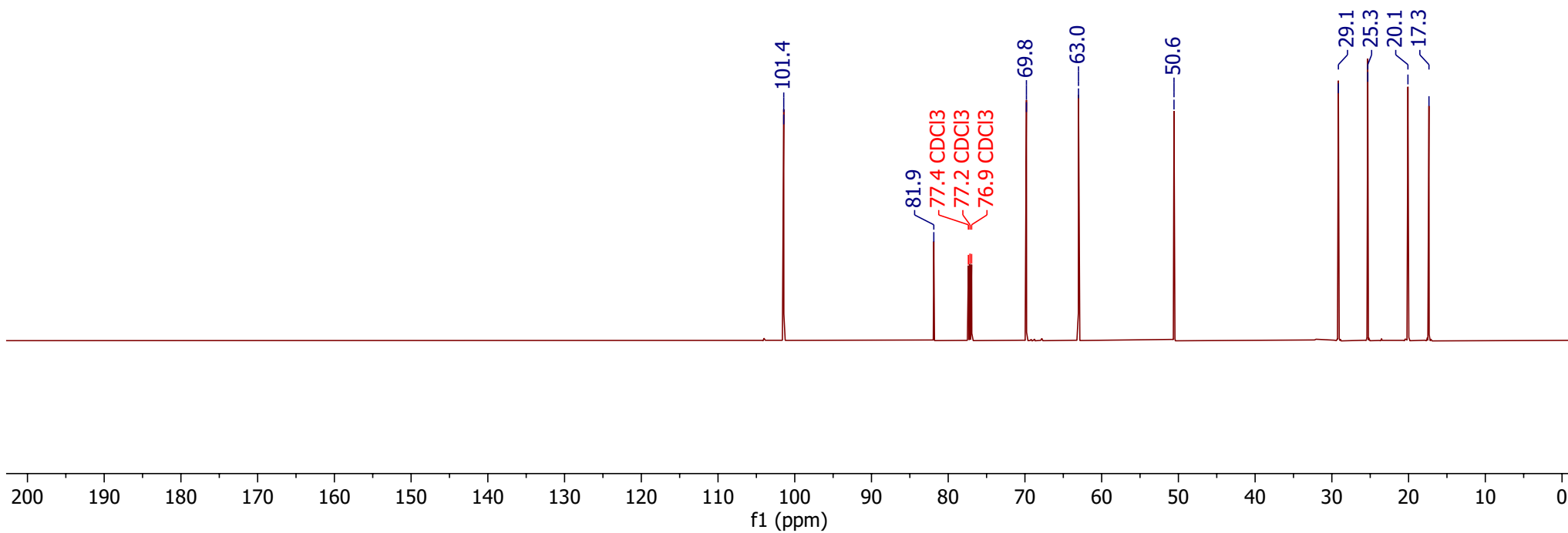
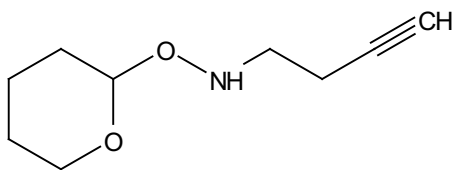
Compound S31
¹³C NMR (151 MHz, CDCl₃)



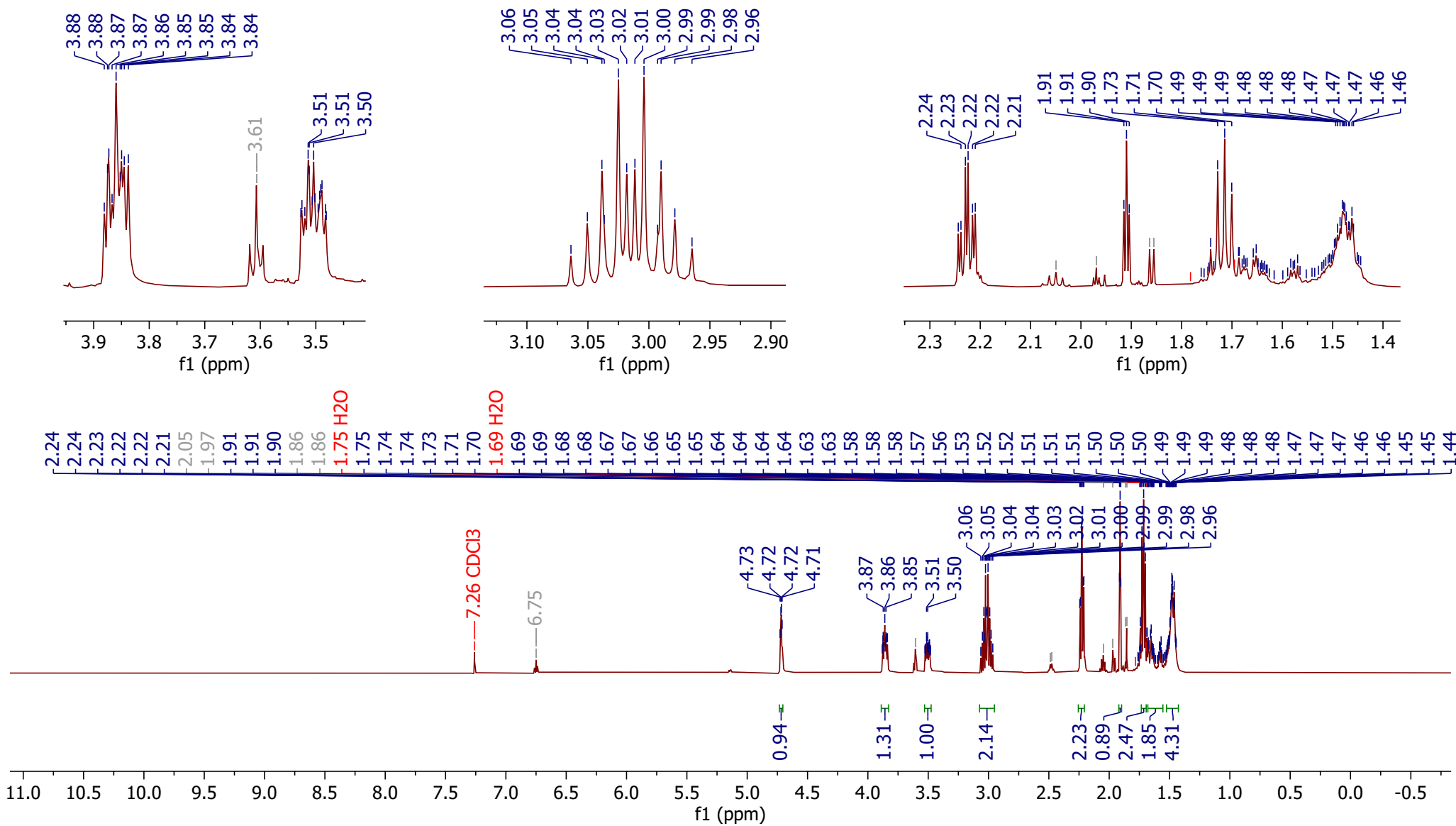
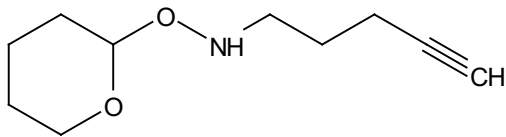
Compound S32
¹H NMR (500 MHz, CDCl₃)



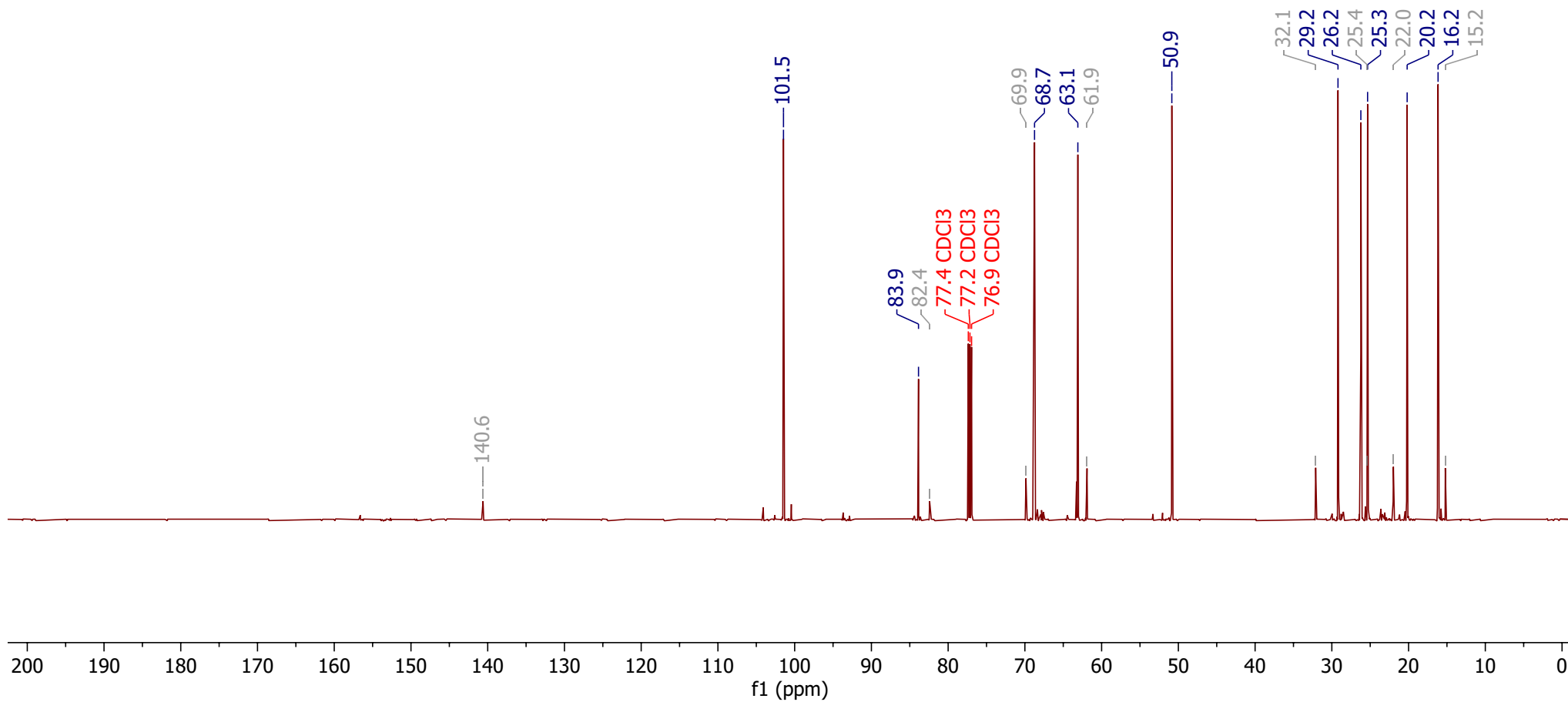
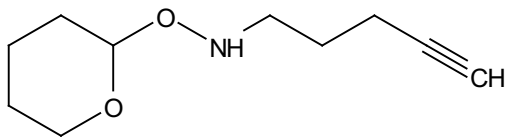
Compound S32
¹³C NMR (151 MHz, CDCl₃)



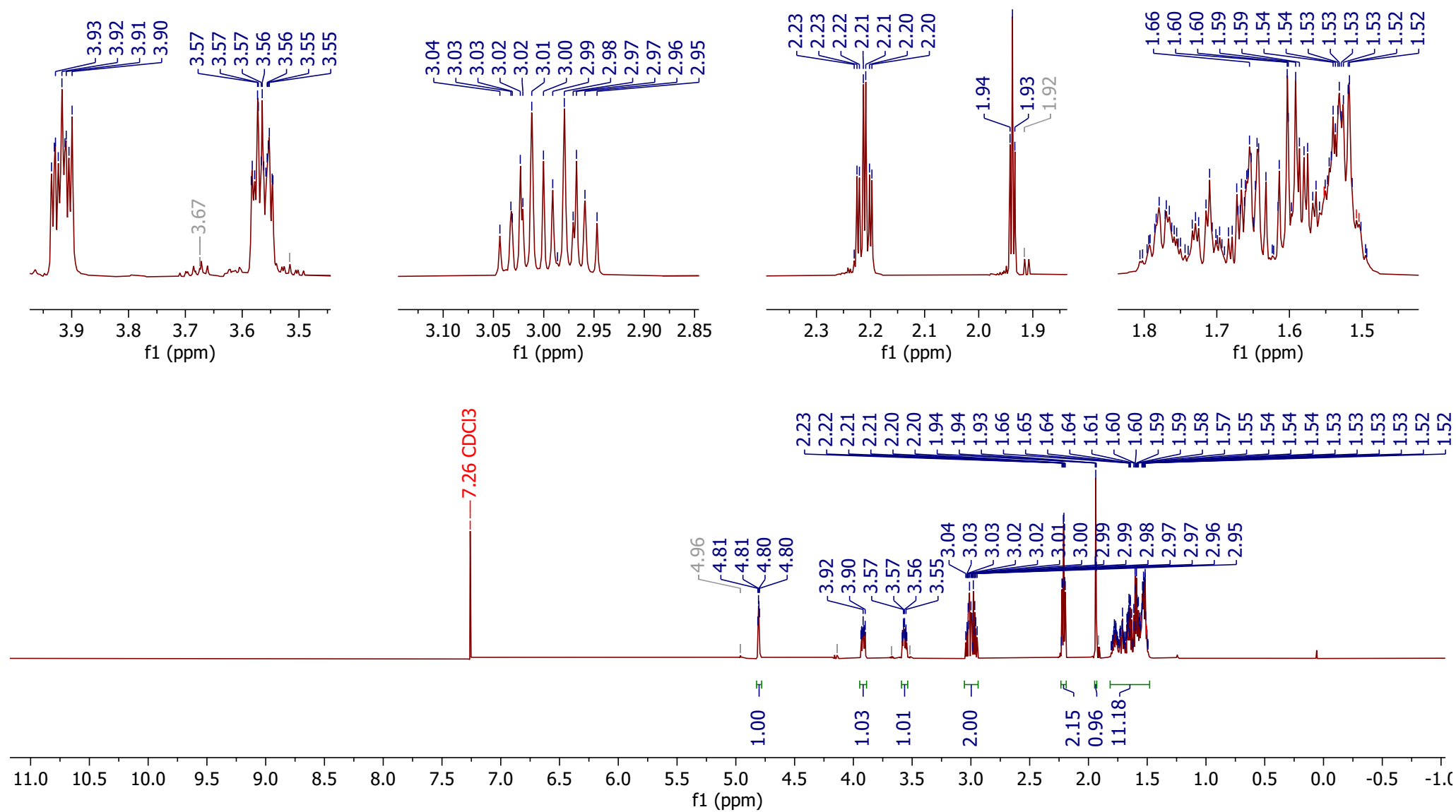
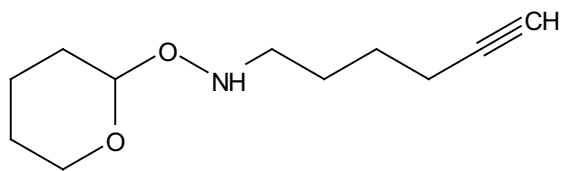
Compound S33
¹H NMR (500 MHz, CDCl₃)



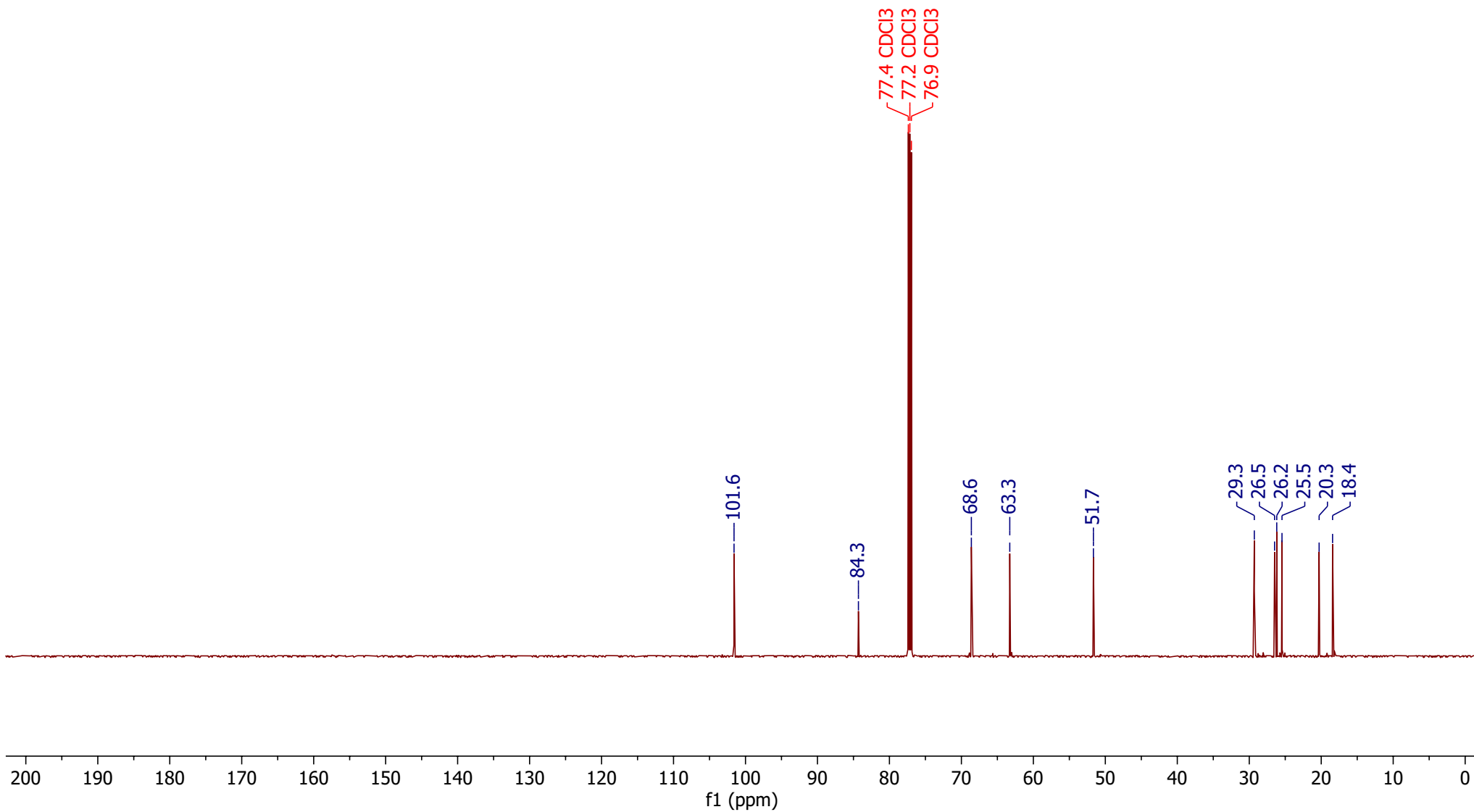
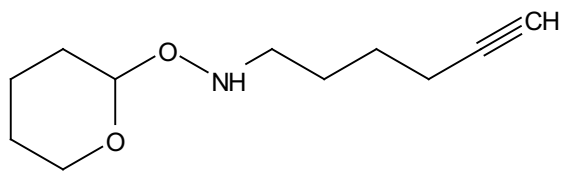
Compound S33
 ^{13}C NMR (151 MHz, CDCl_3)



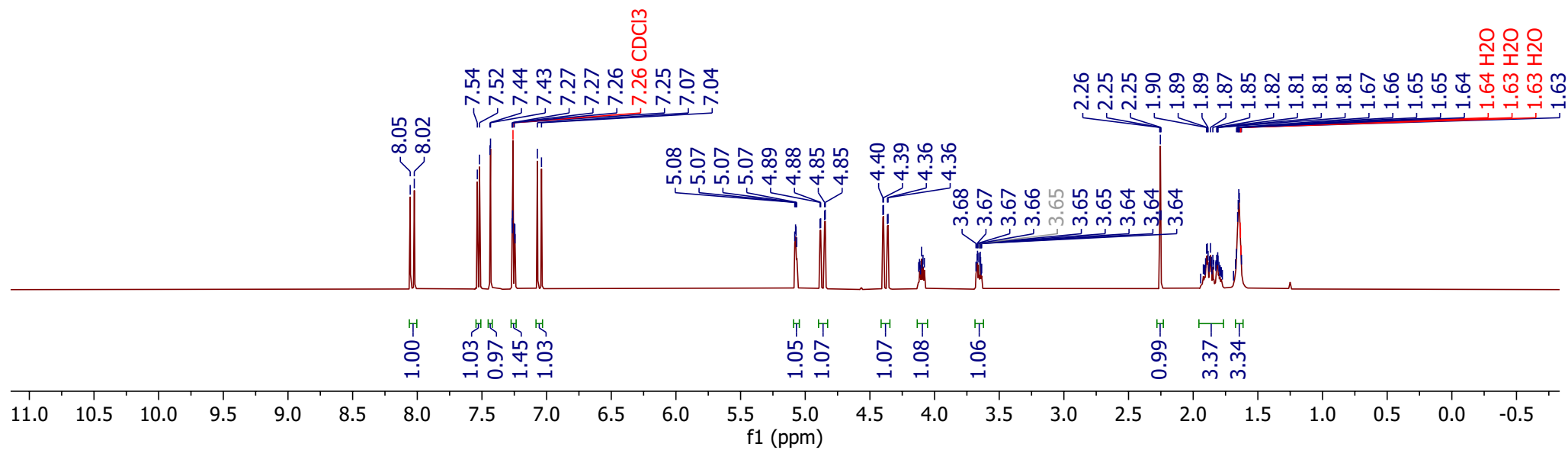
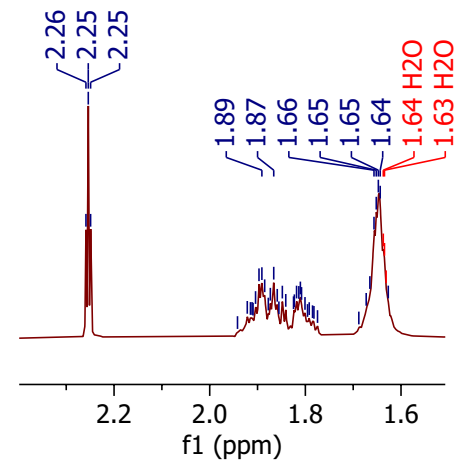
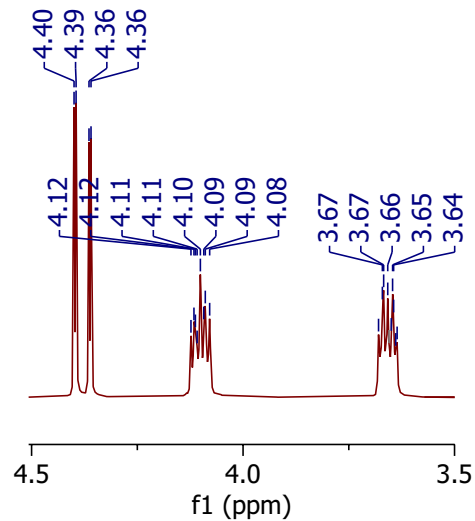
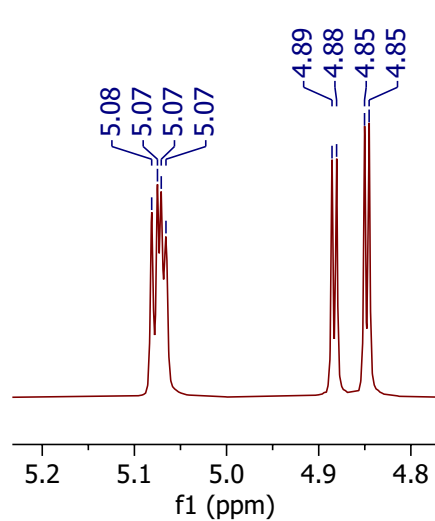
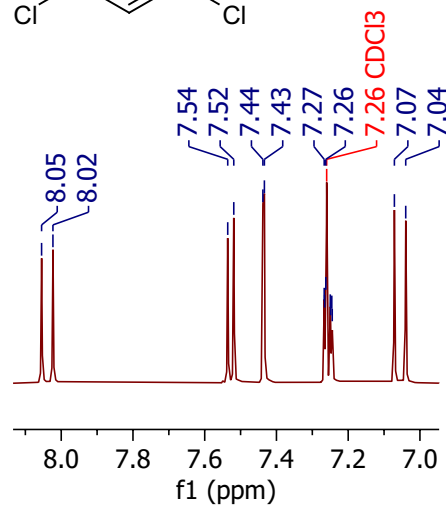
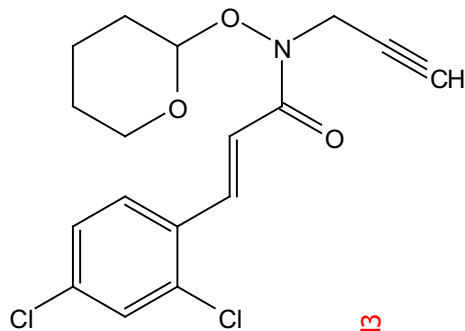
Compound S34
¹H NMR (600 MHz, CDCl₃)



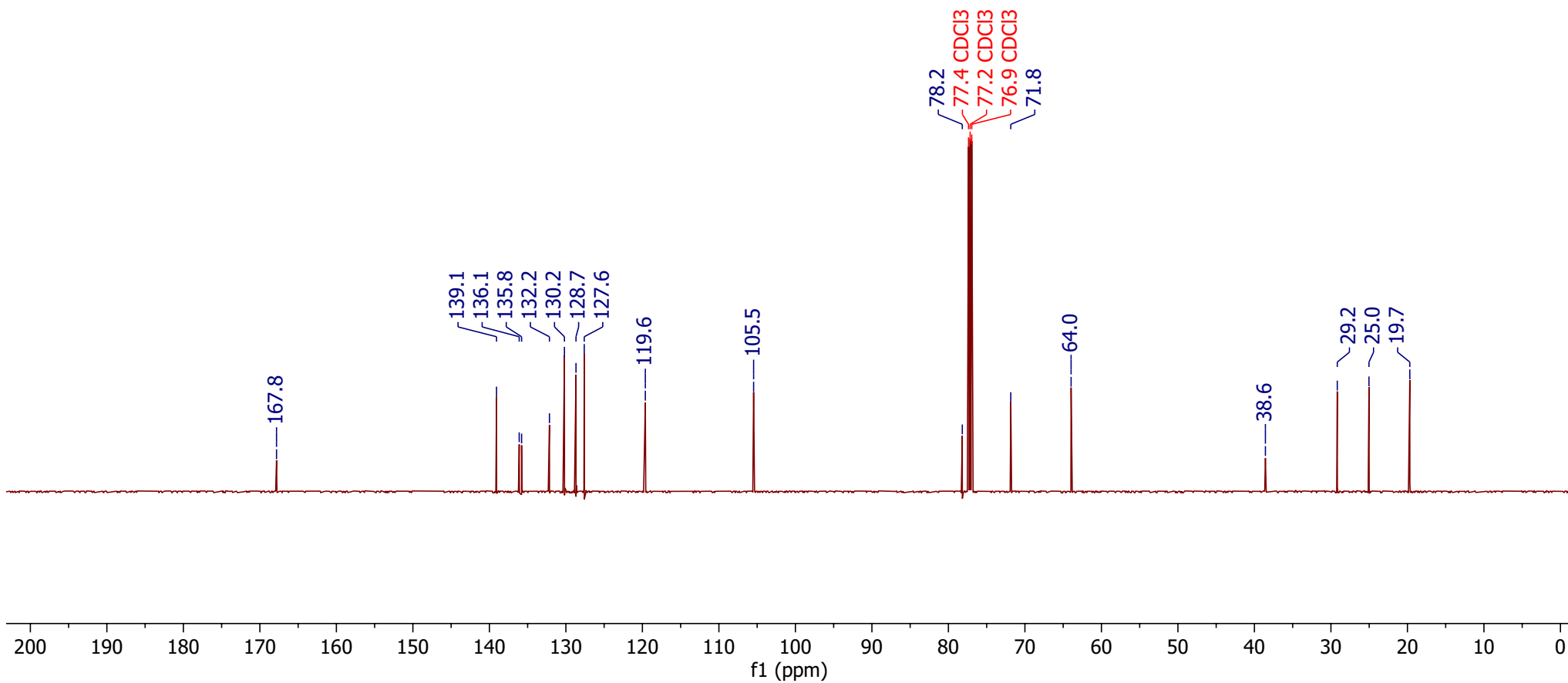
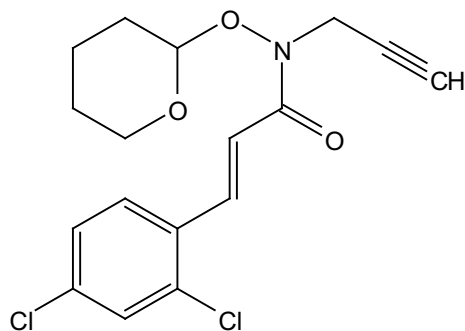
Compound S34
 ^{13}C NMR (151 MHz, CDCl_3)



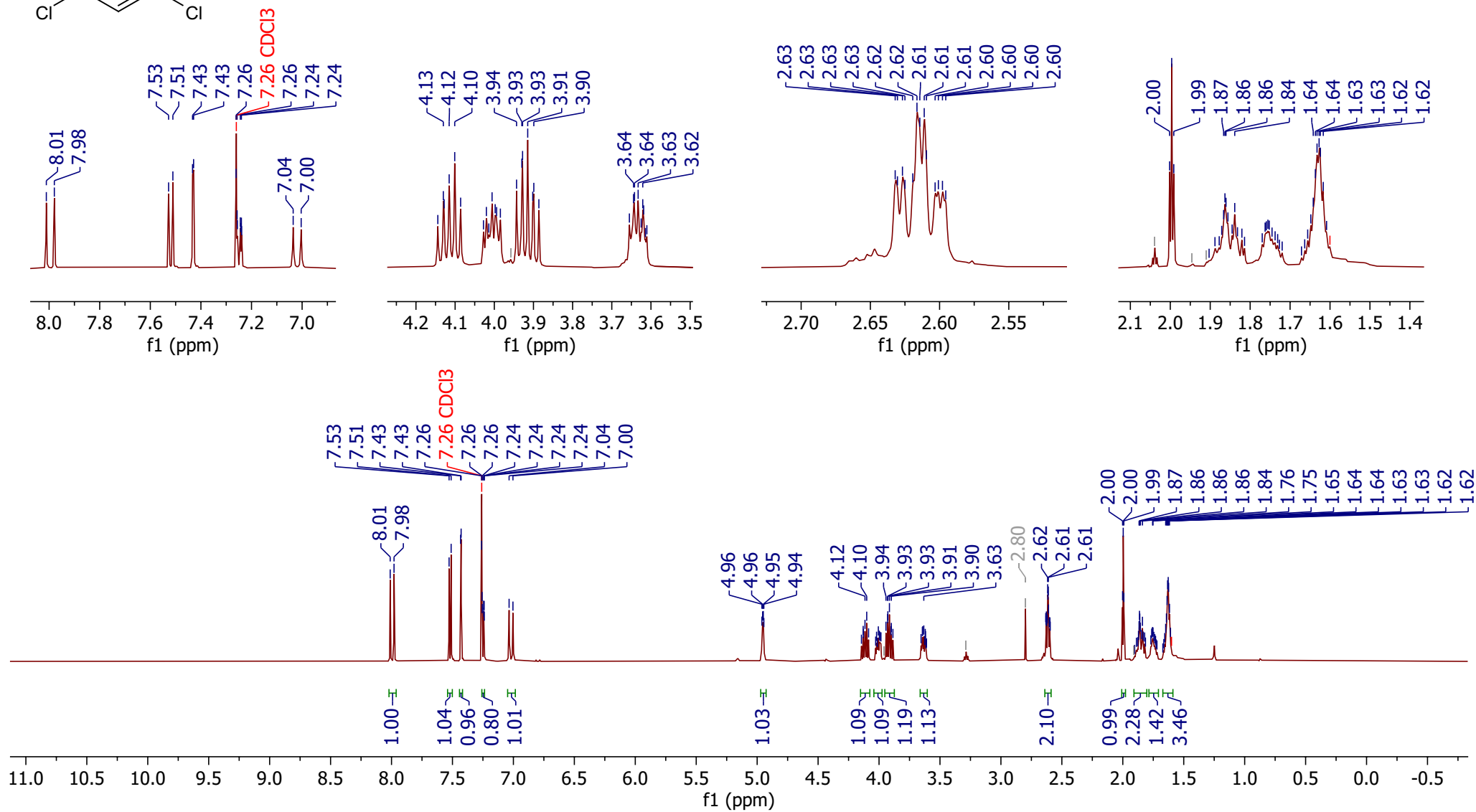
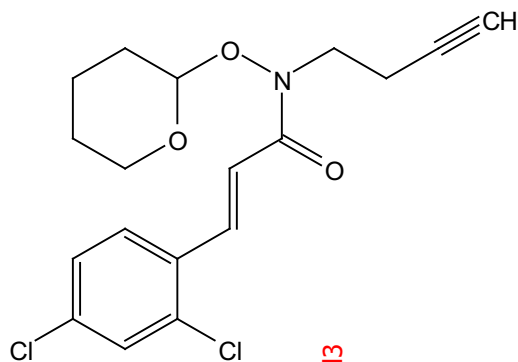
Compound S35
¹H NMR (500 MHz, CDCl₃)



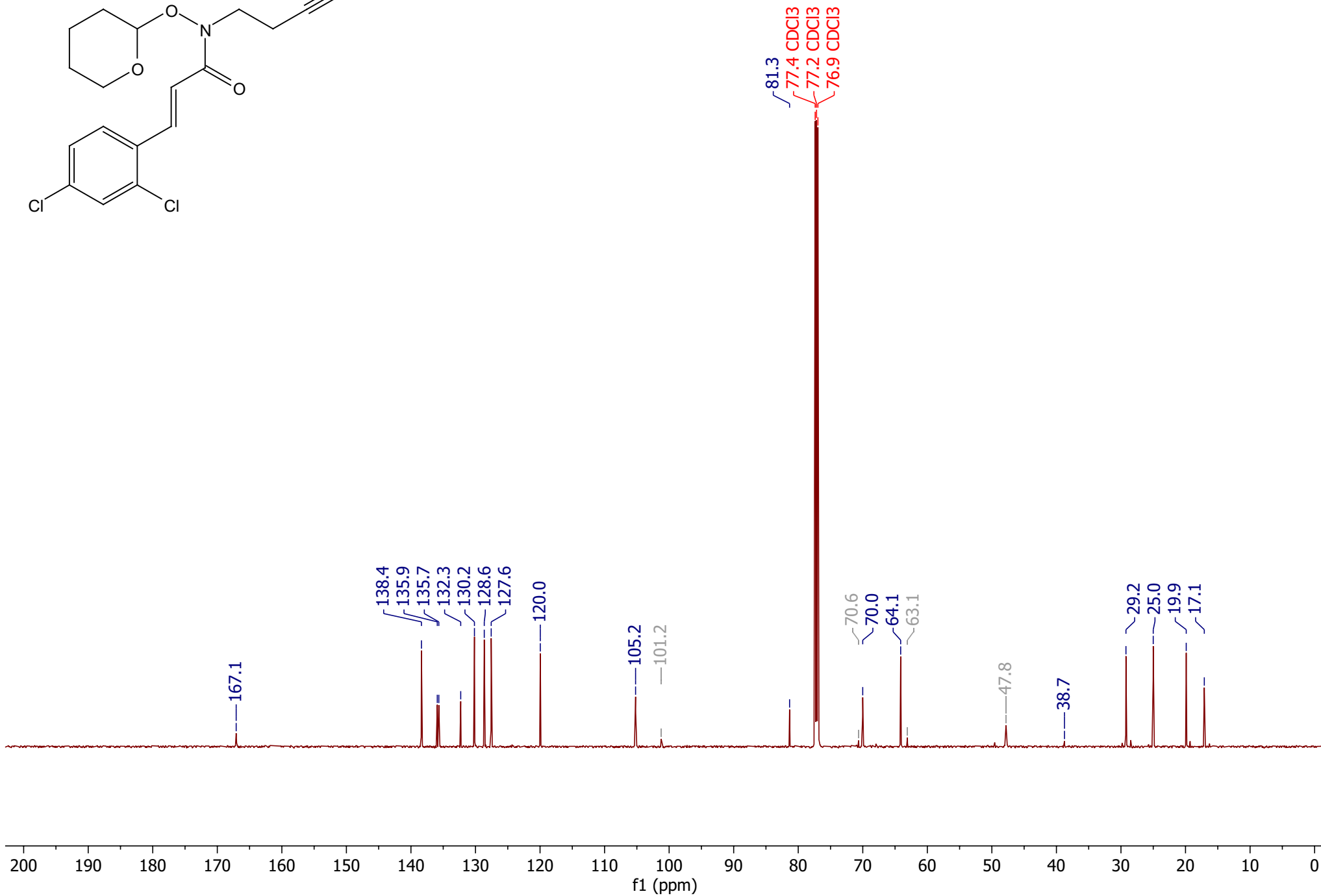
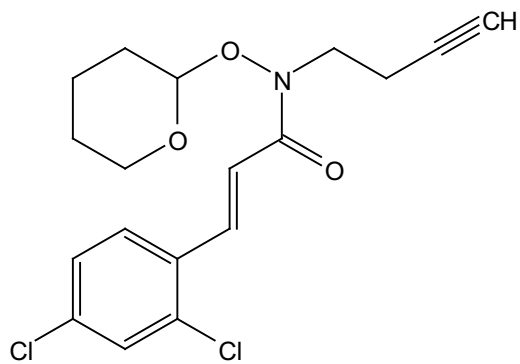
Compound S35
 ^{13}C NMR (151 MHz, CDCl_3)



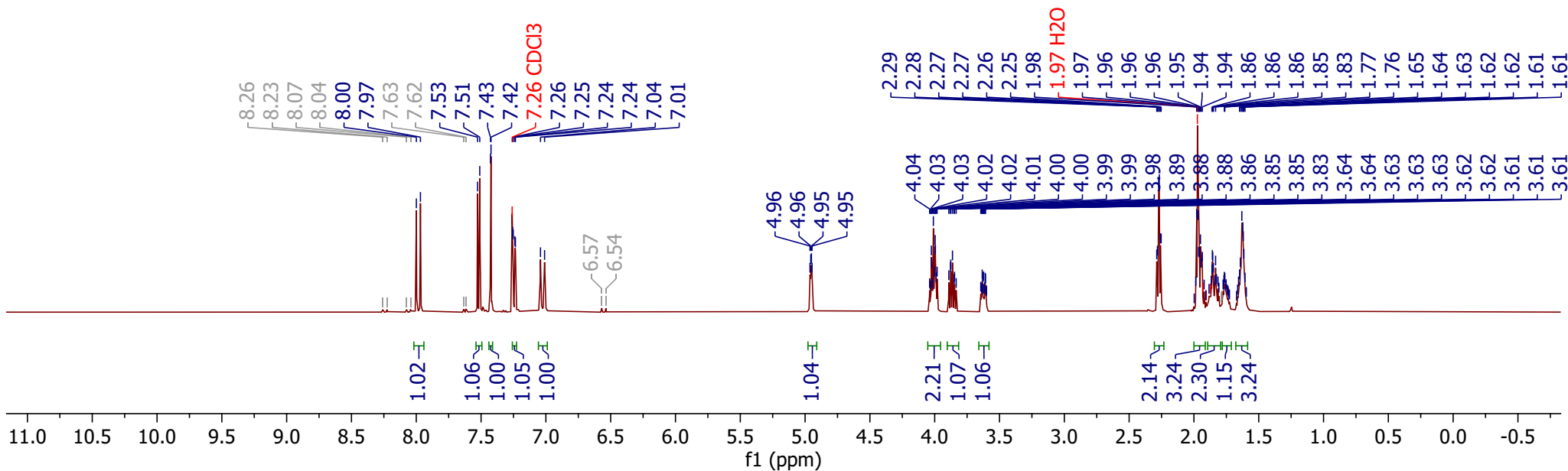
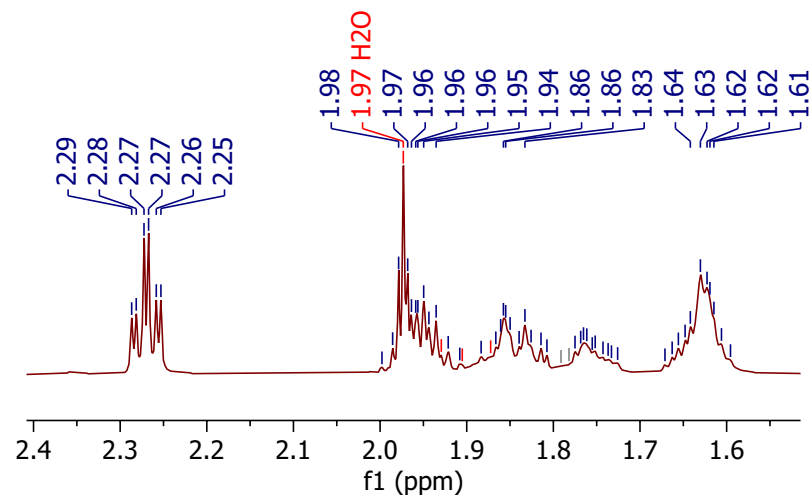
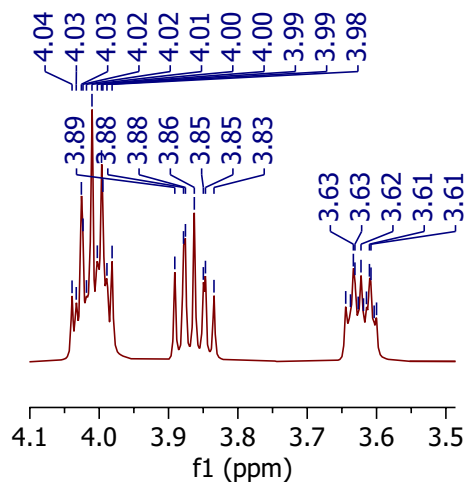
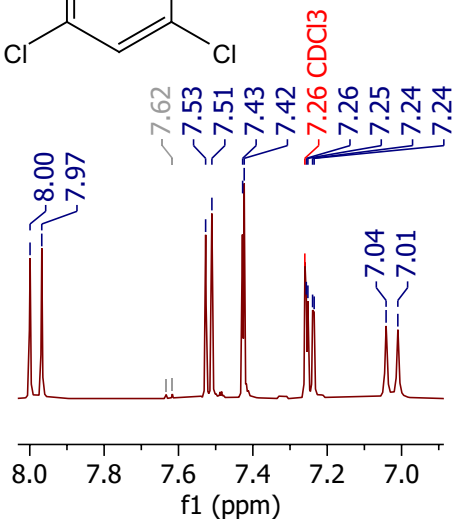
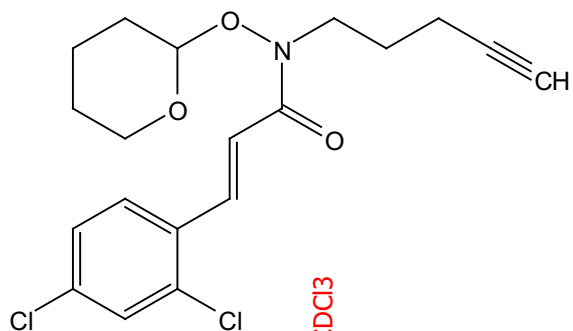
Compound S36
¹H NMR (500 MHz, CDCl₃)



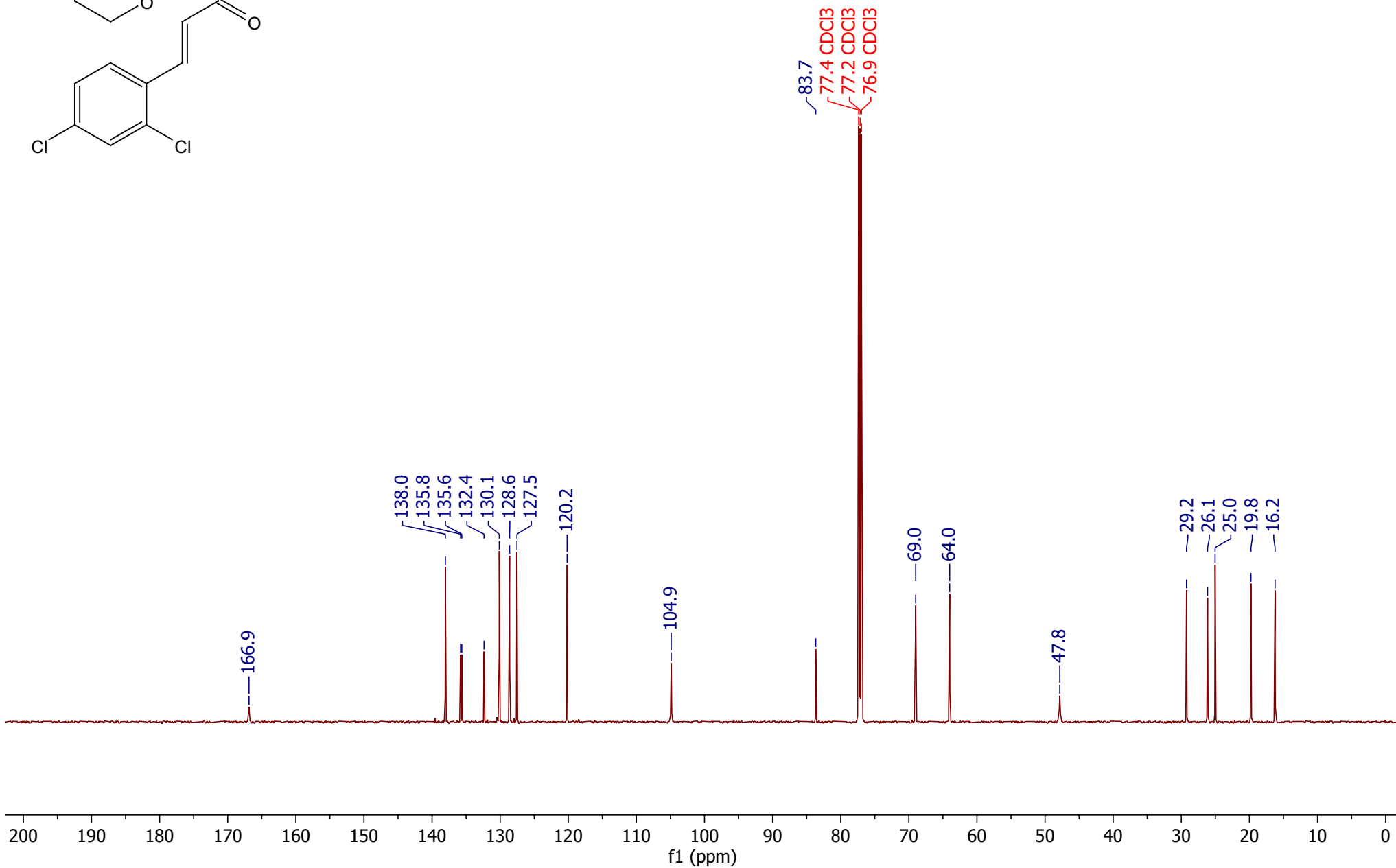
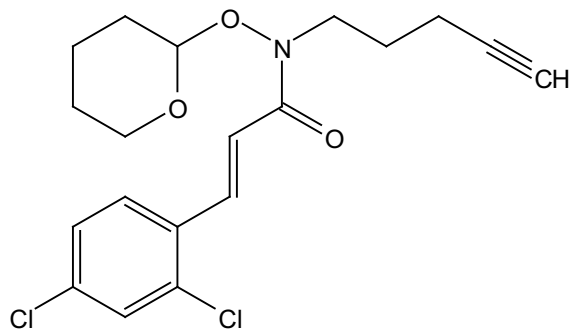
Compound S36
¹³C NMR (151 MHz, CDCl₃)



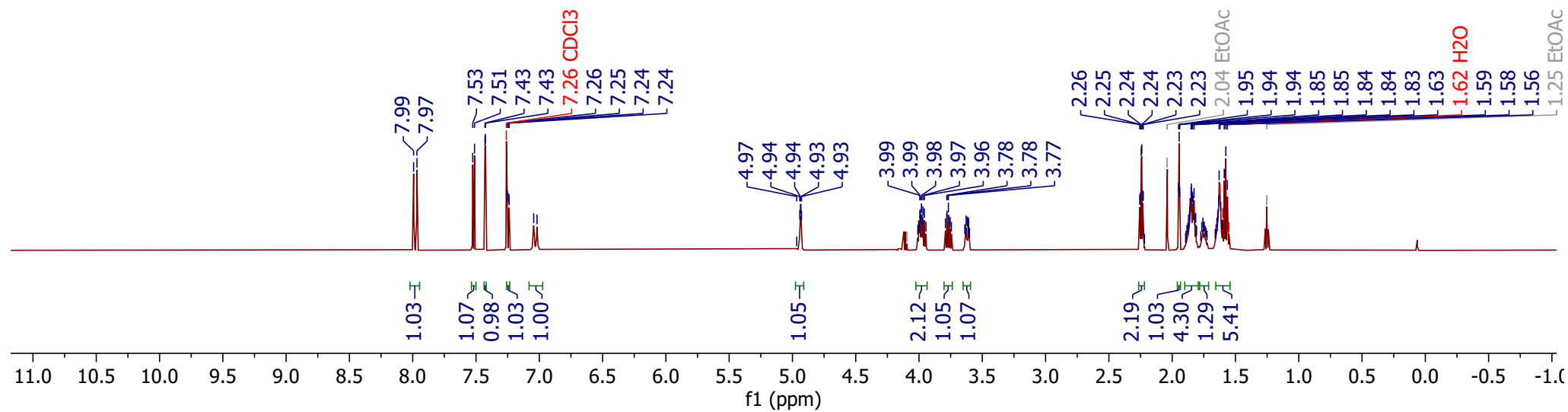
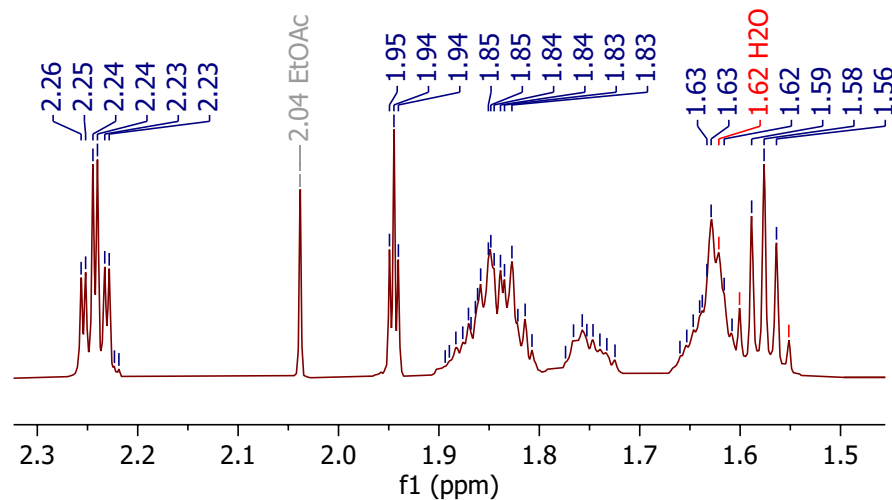
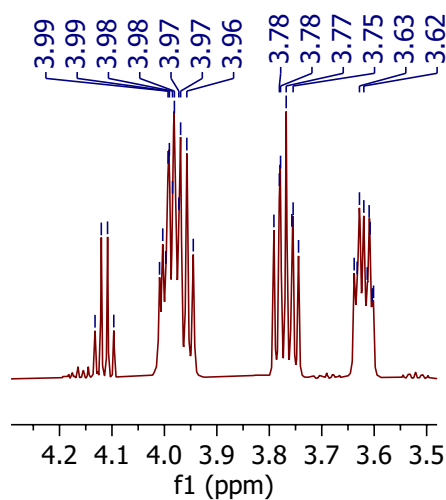
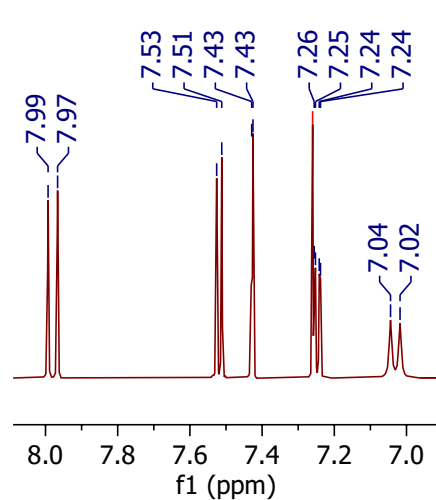
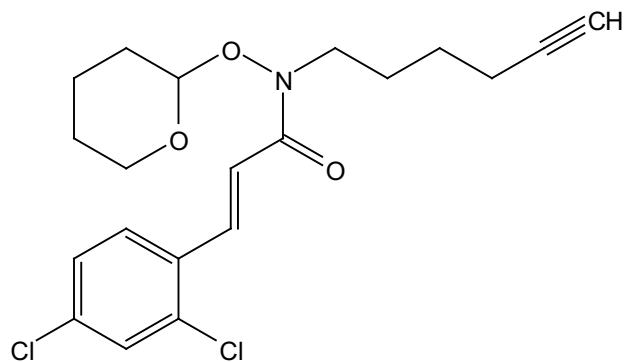
Compound S37
¹H NMR (500 MHz, CDCl₃)



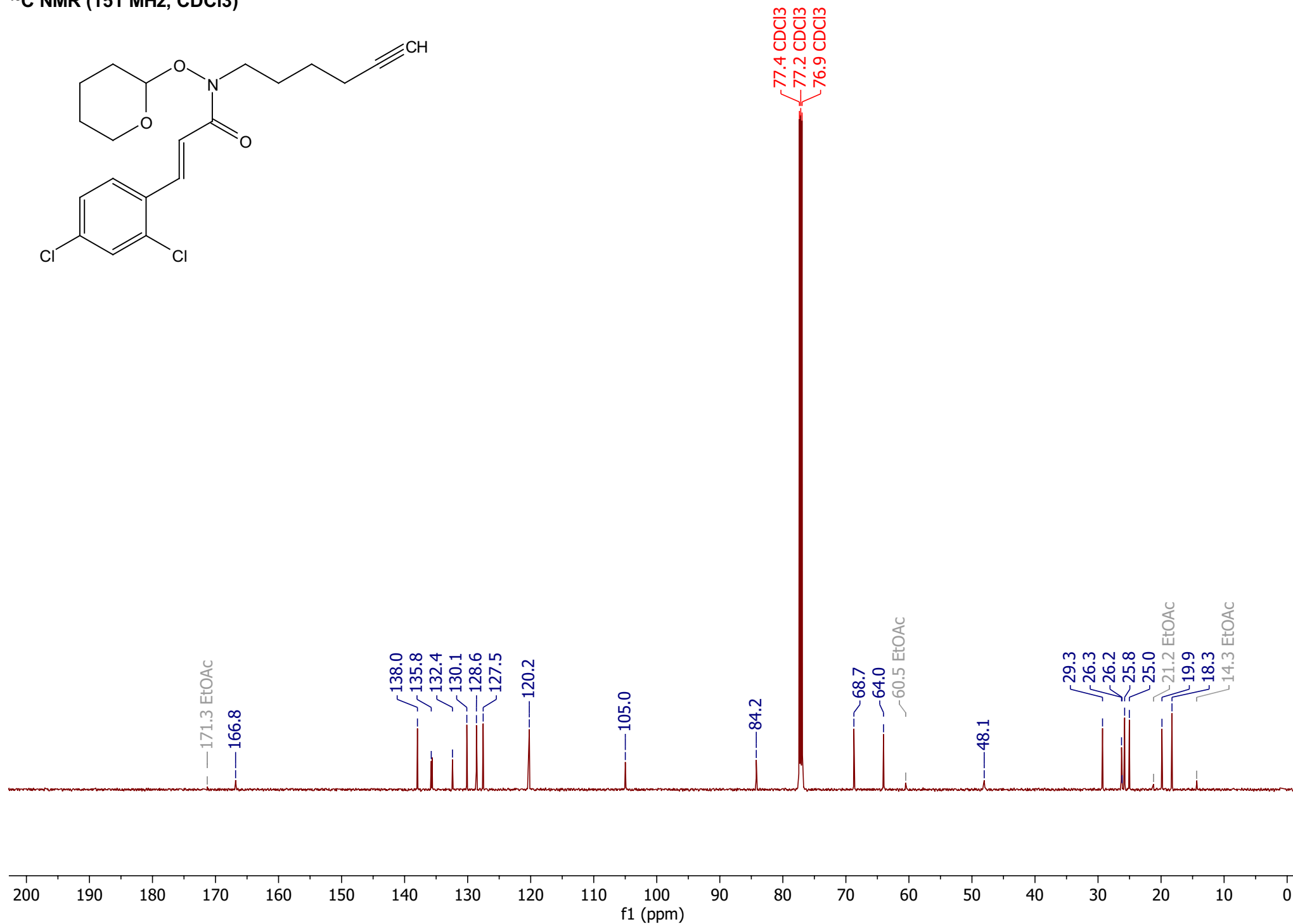
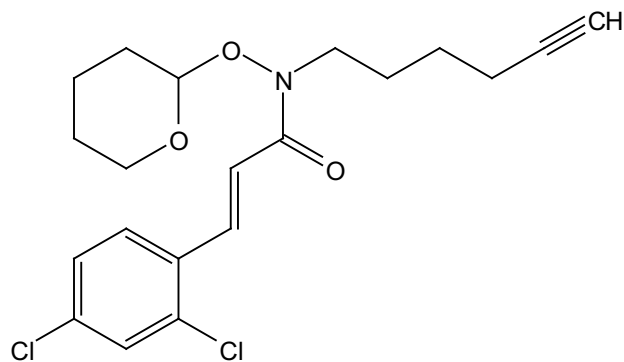
Compound S37
¹³C NMR (151 MHz, CDCl₃)



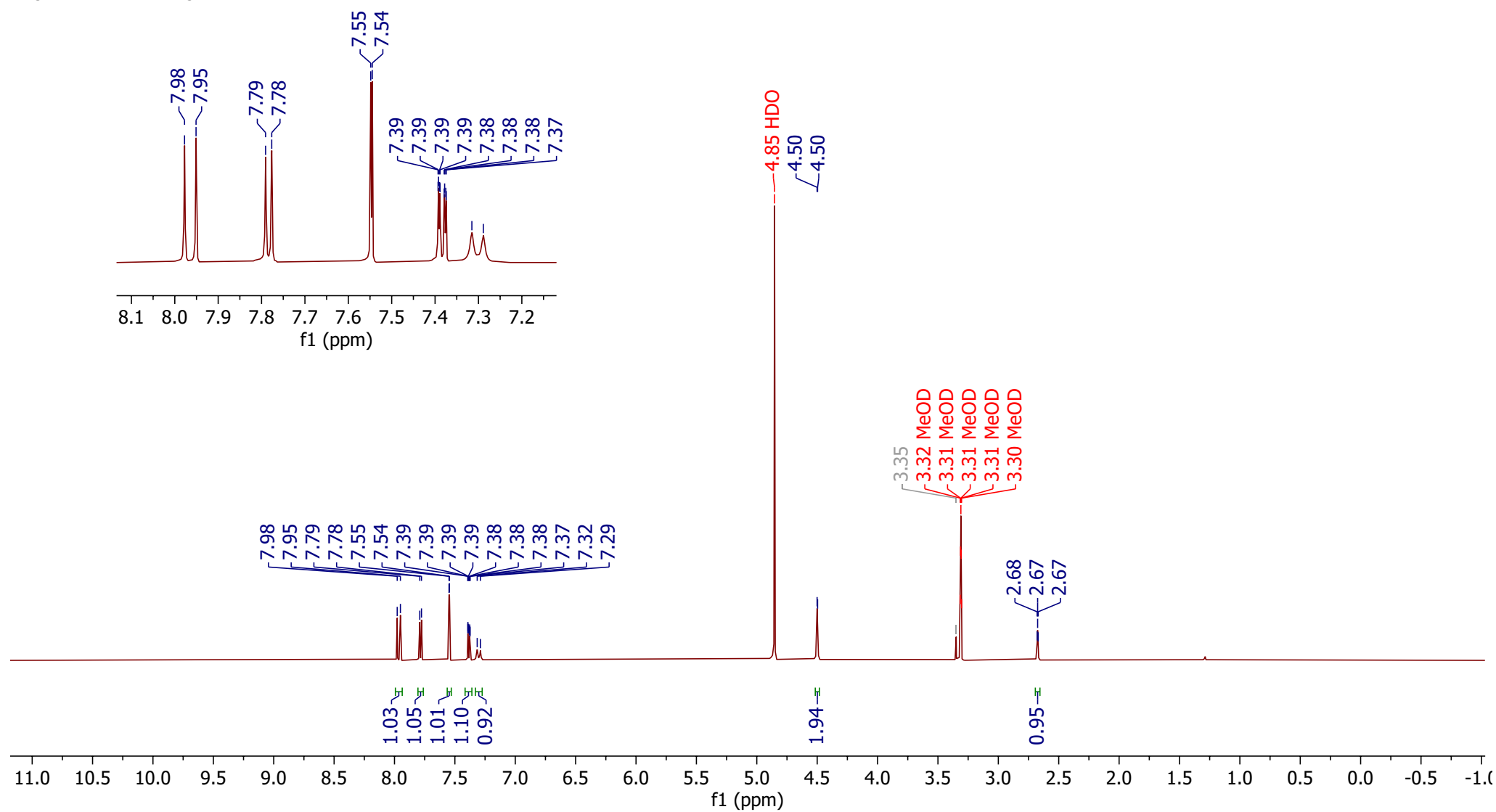
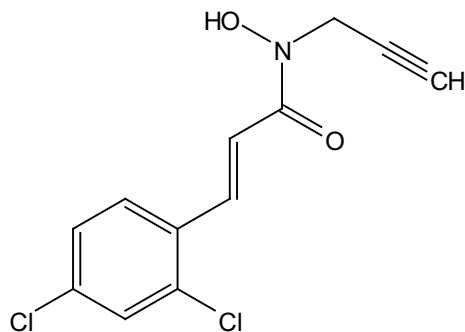
Compound S38
¹H NMR (600 MHz, CDCl₃)



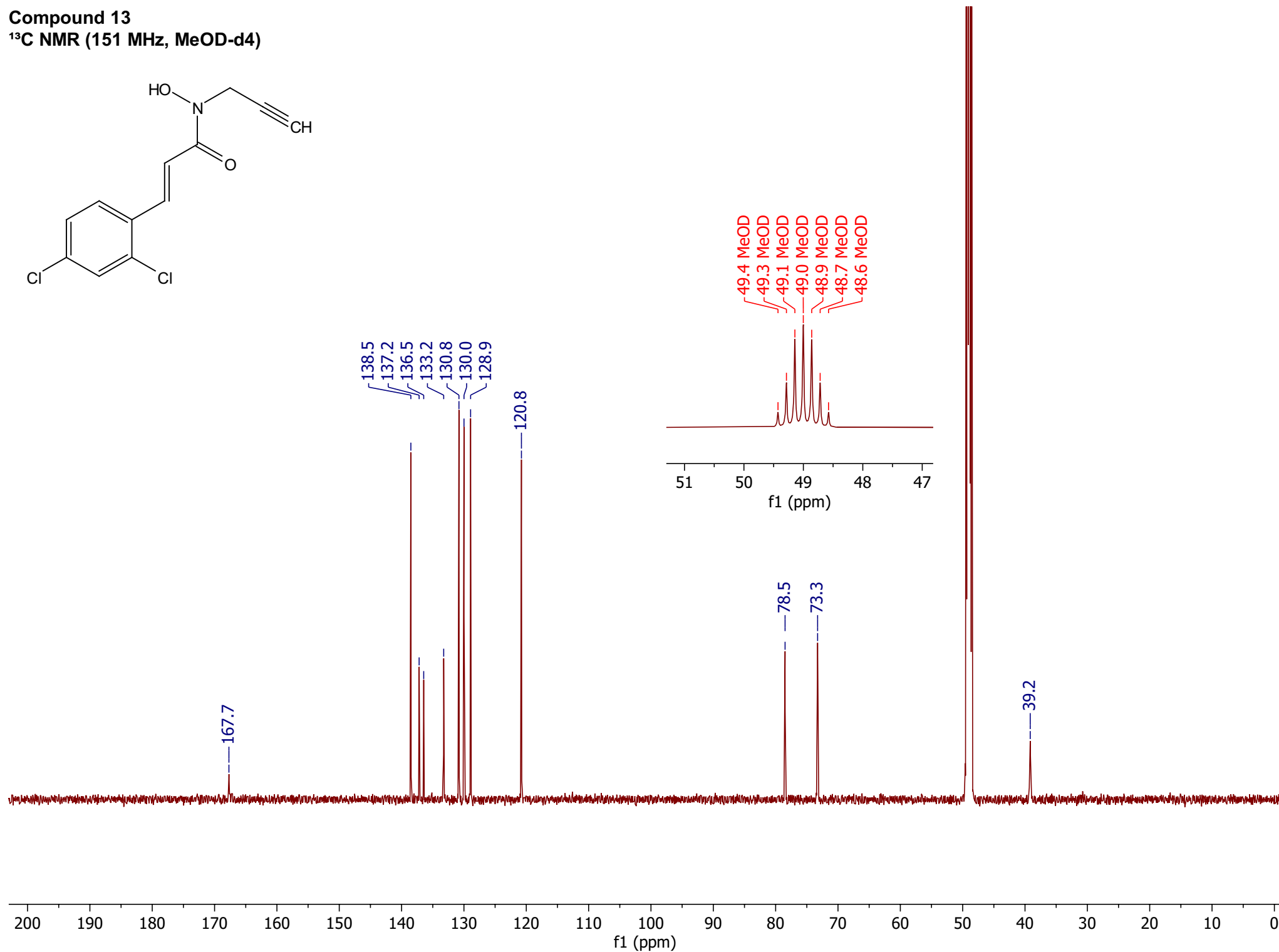
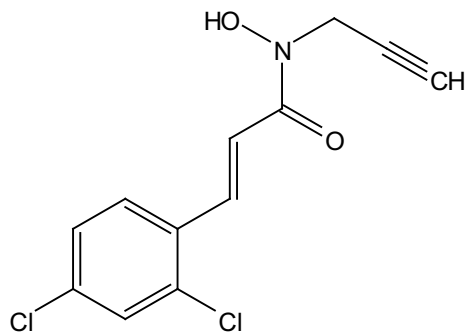
Compound S38
¹³C NMR (151 MHz, CDCl₃)



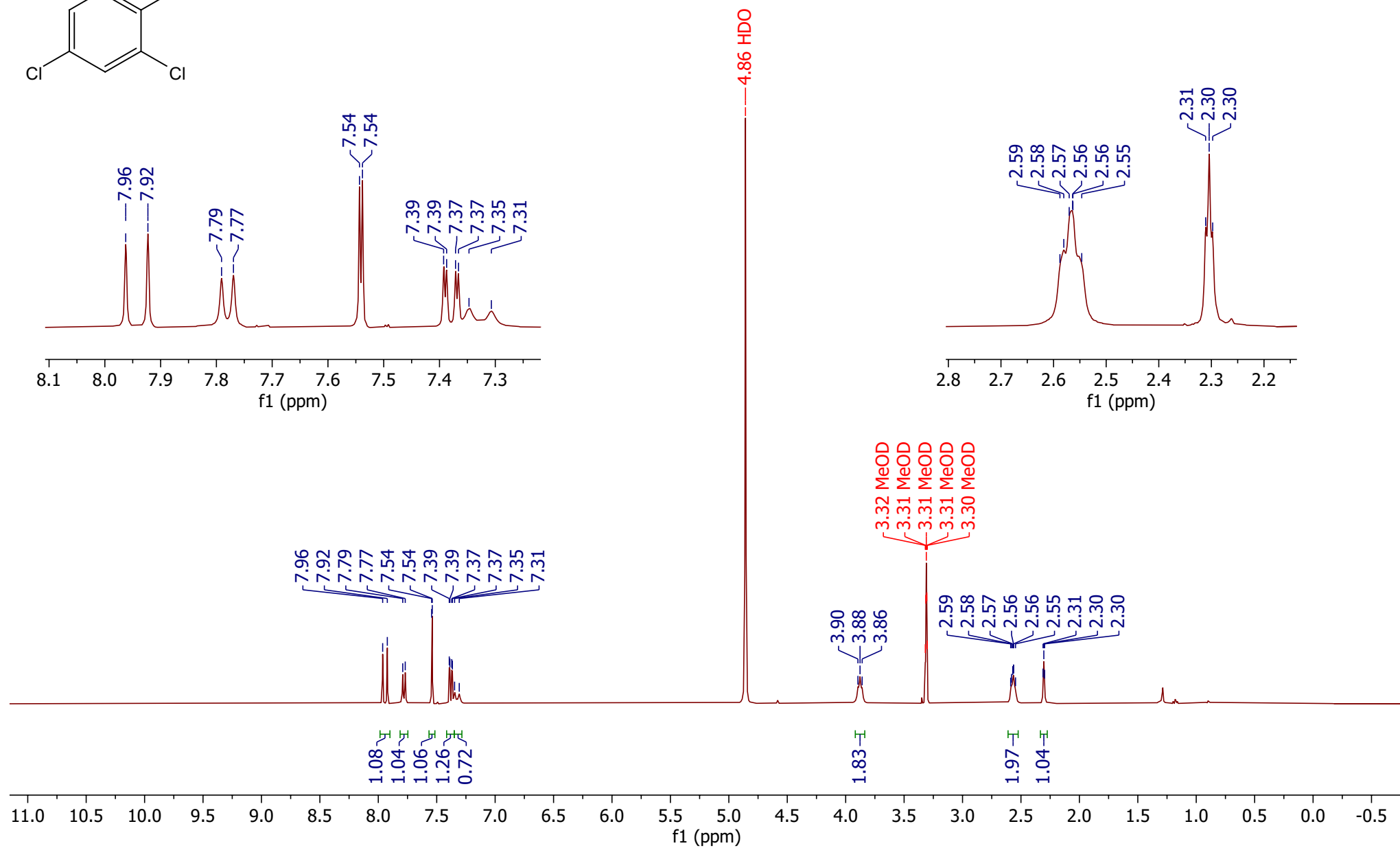
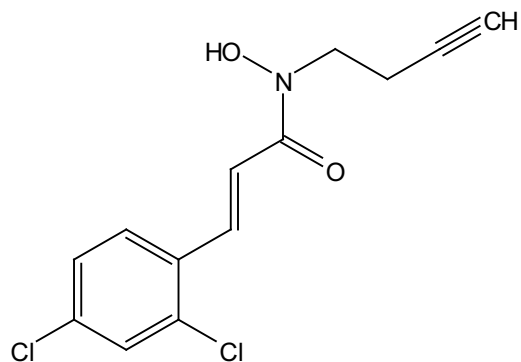
Compound 13
¹H NMR (600 MHz, MeOD-d₄)



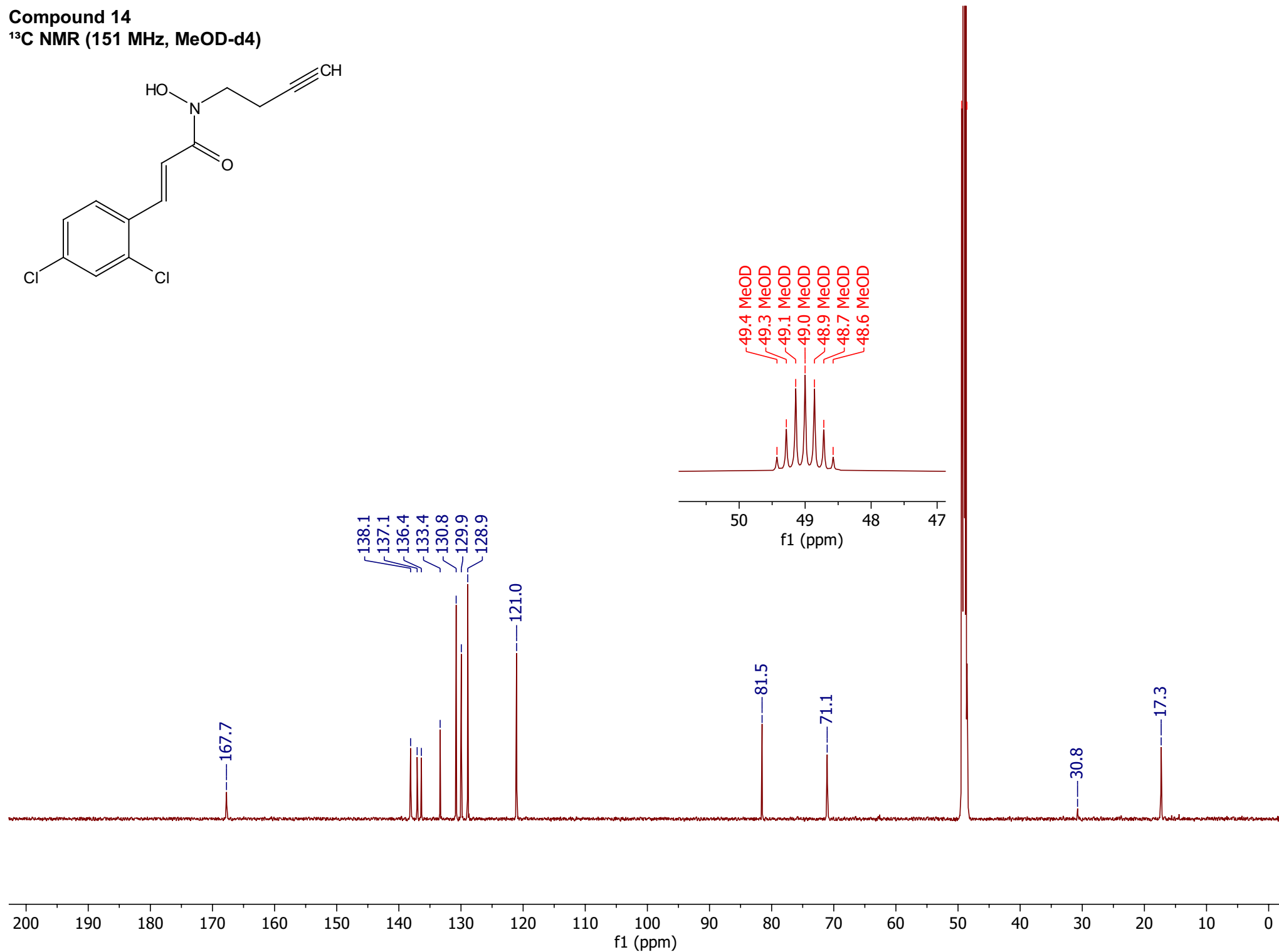
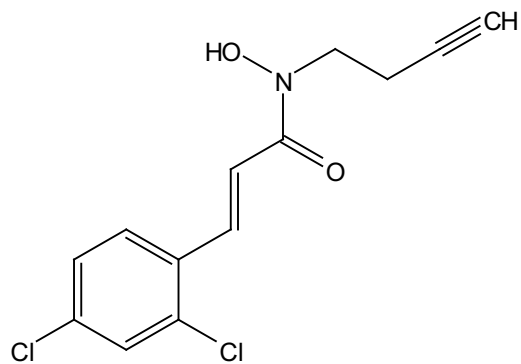
Compound 13
¹³C NMR (151 MHz, MeOD-d4)



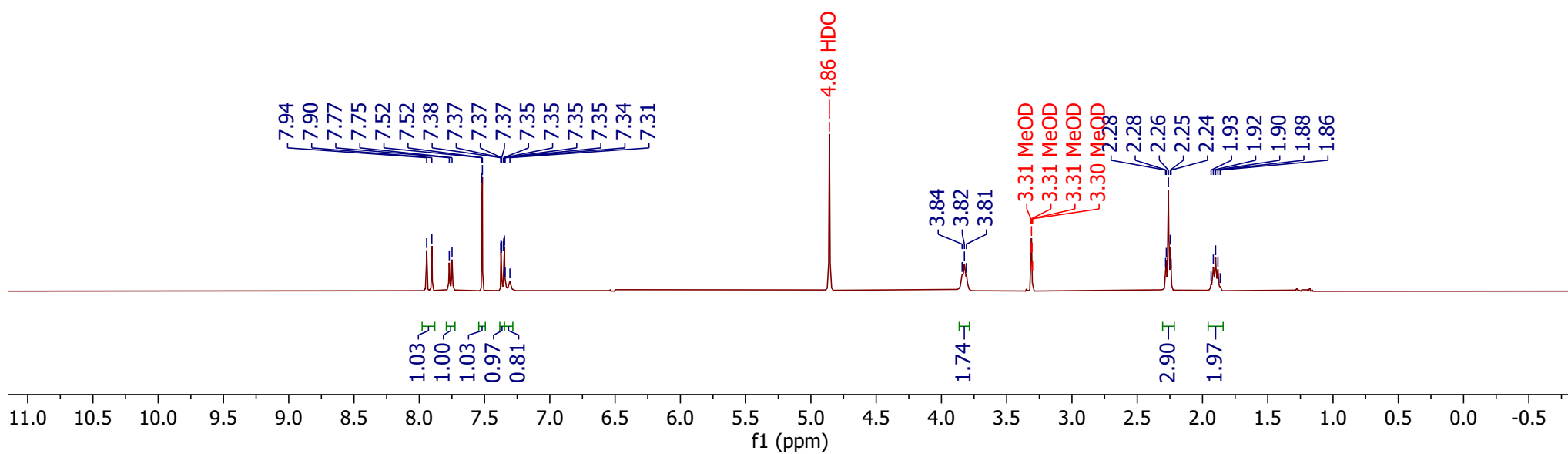
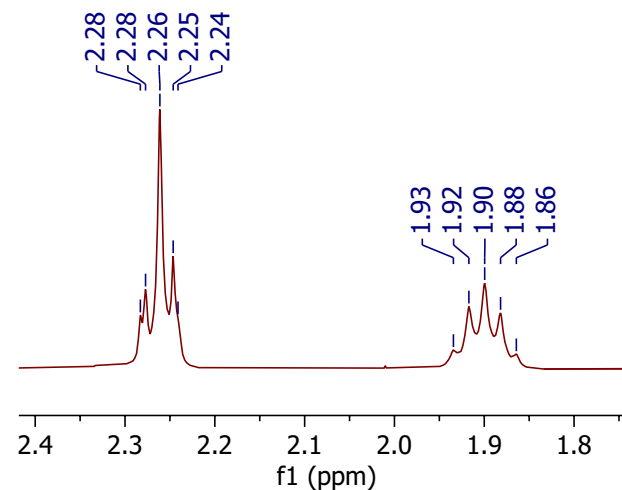
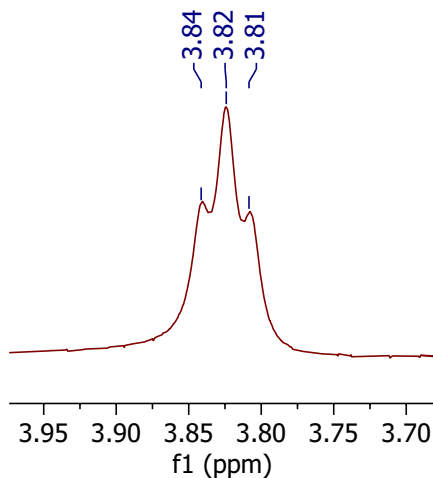
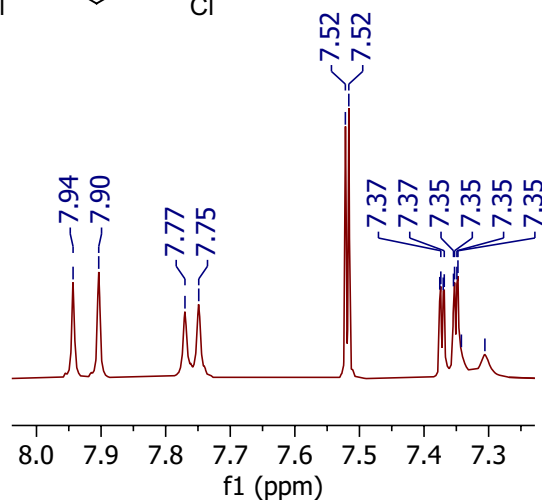
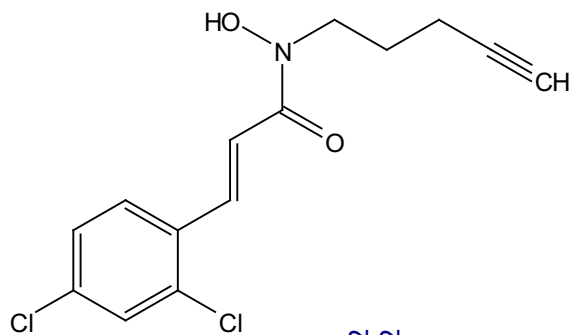
Compound 14
¹H NMR (400 MHz, MeOD-d₄)



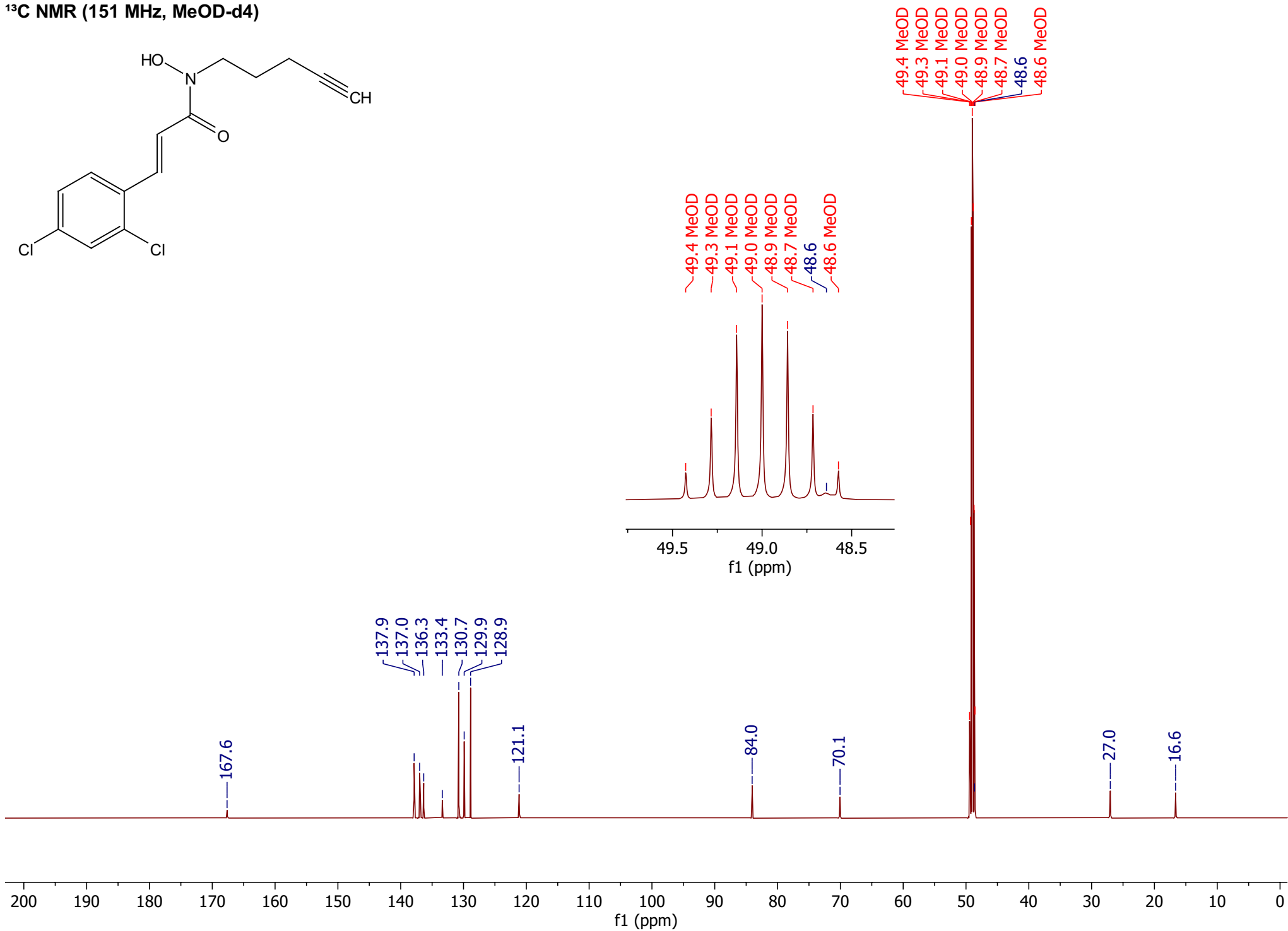
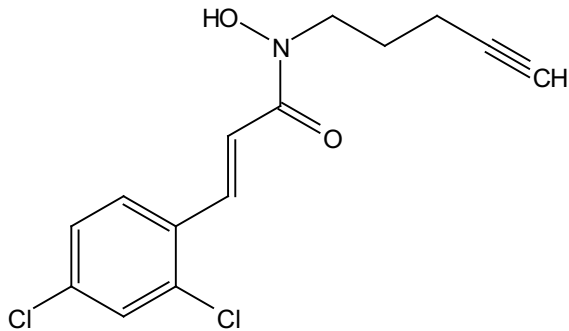
Compound 14
 ^{13}C NMR (151 MHz, MeOD- d_4)



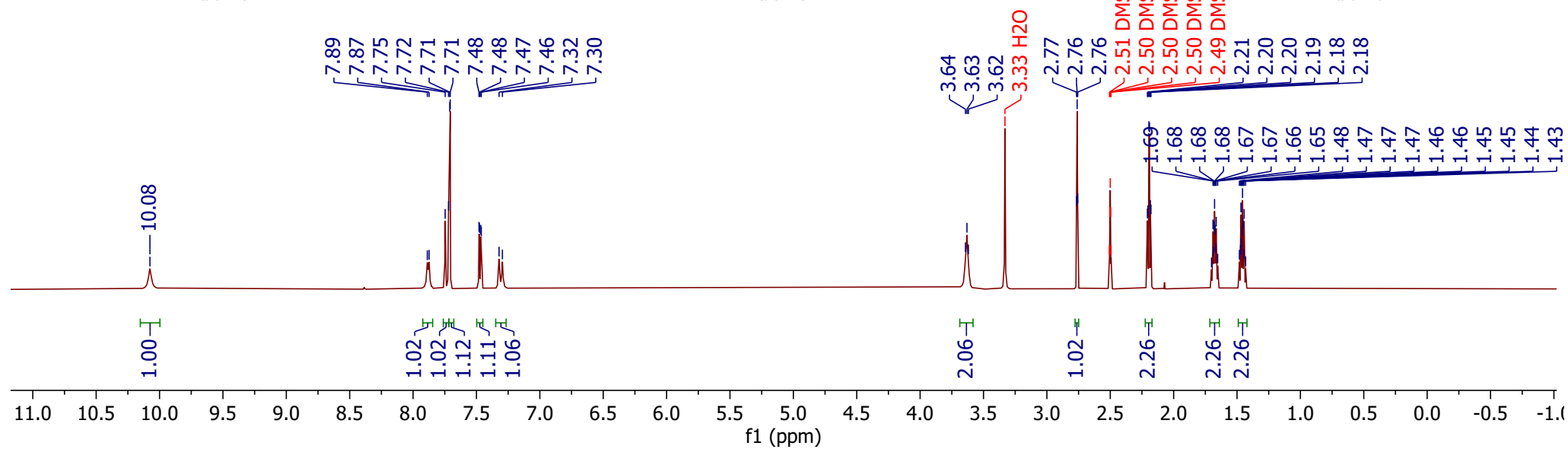
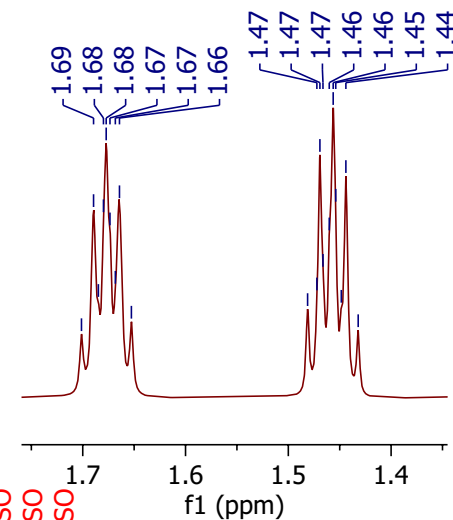
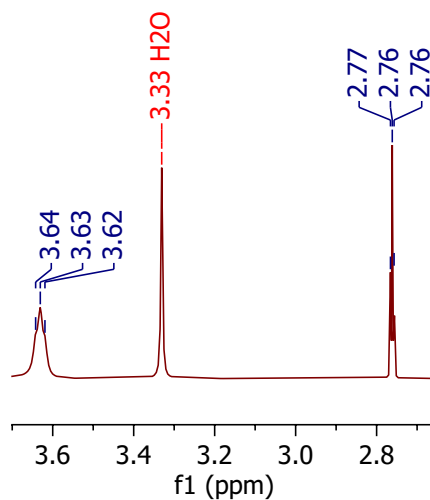
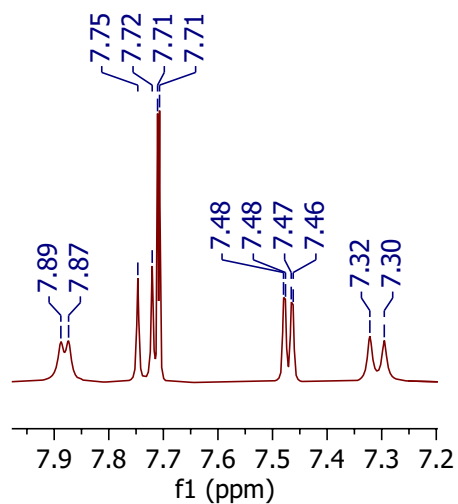
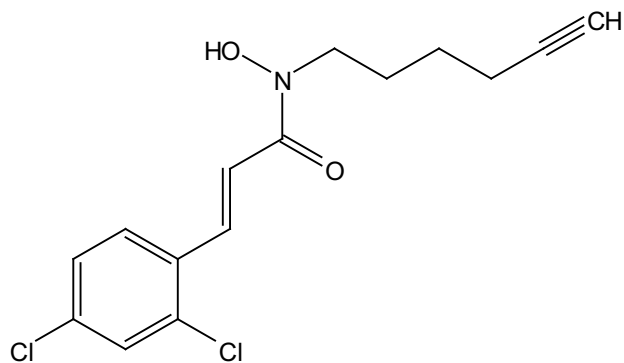
Compound 15
¹H NMR (400 MHz, MeOD-d₄)



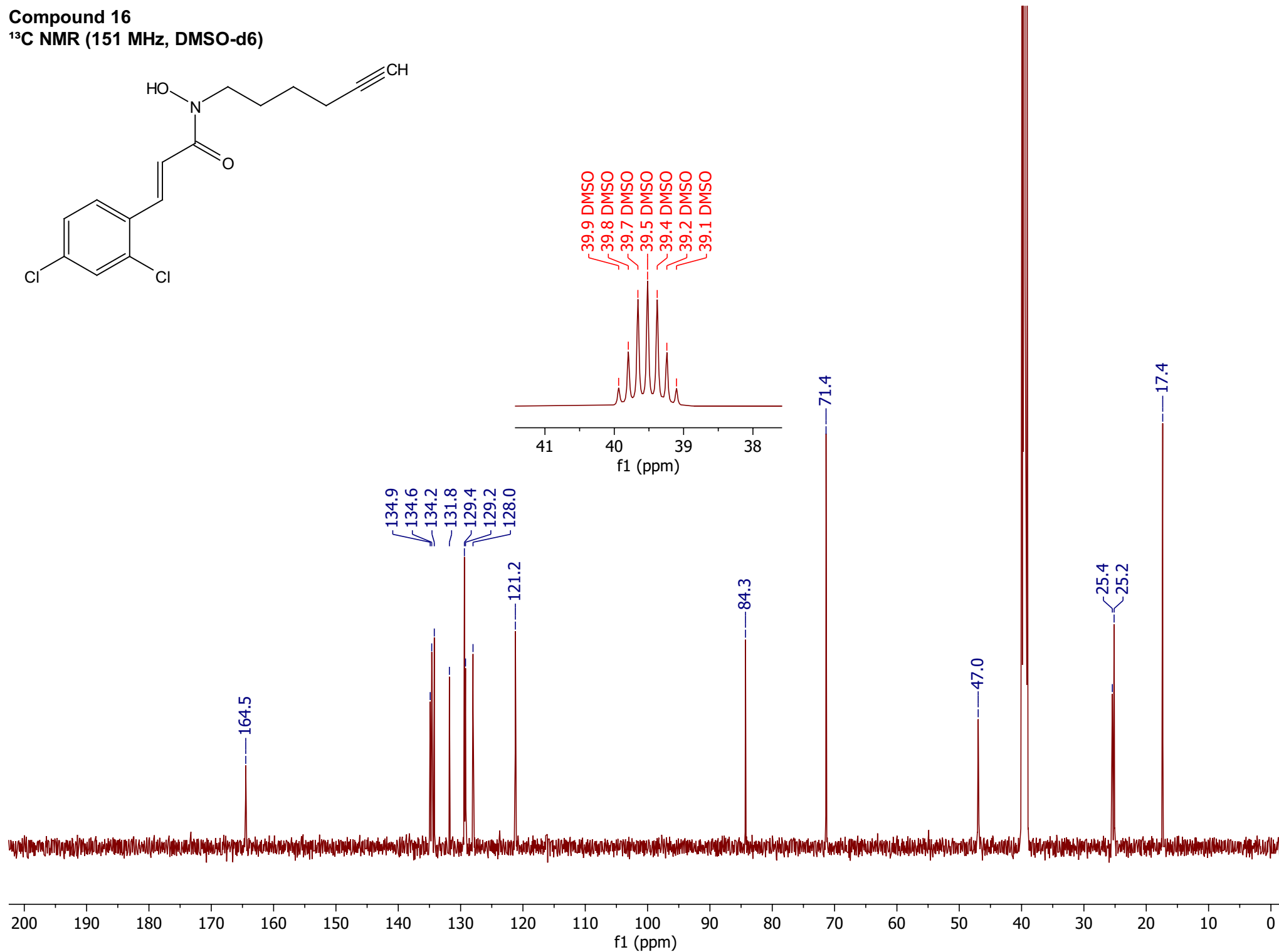
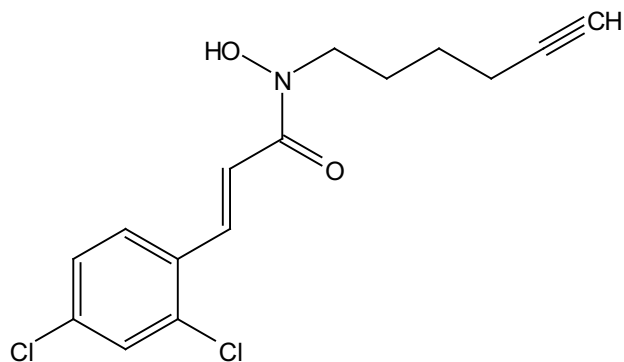
Compound 15
 ^{13}C NMR (151 MHz, MeOD- d_4)



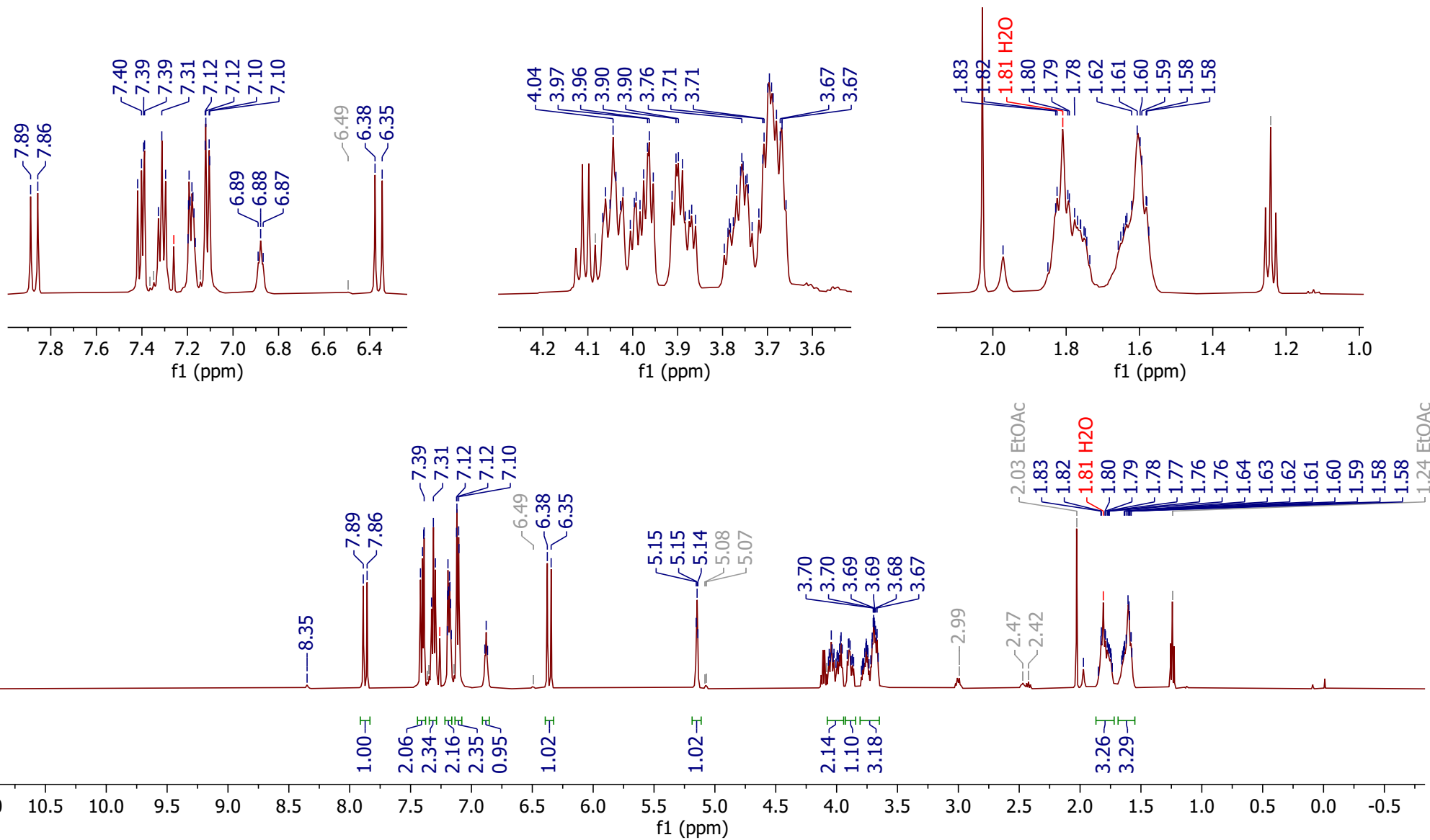
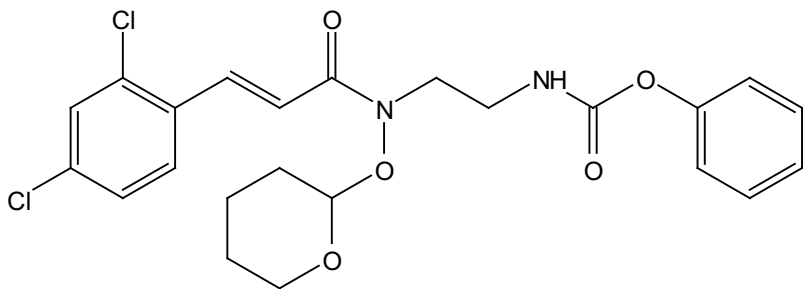
Compound 16
¹H NMR (600 MHz, DMSO-d₆)



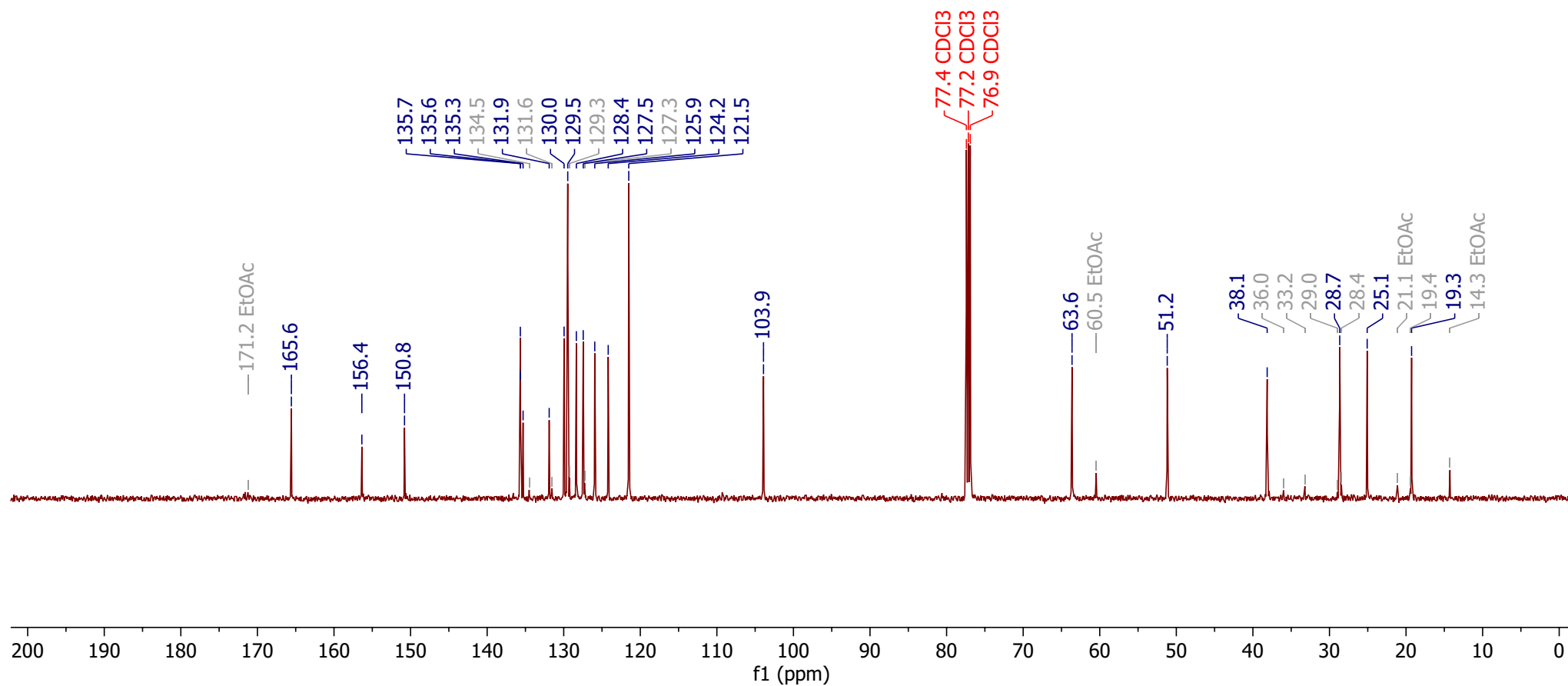
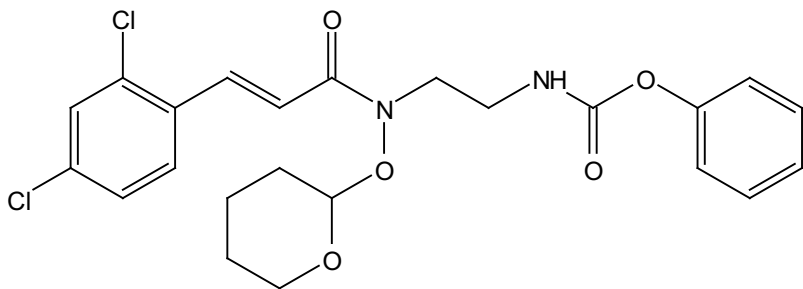
Compound 16
¹³C NMR (151 MHz, DMSO-d6)



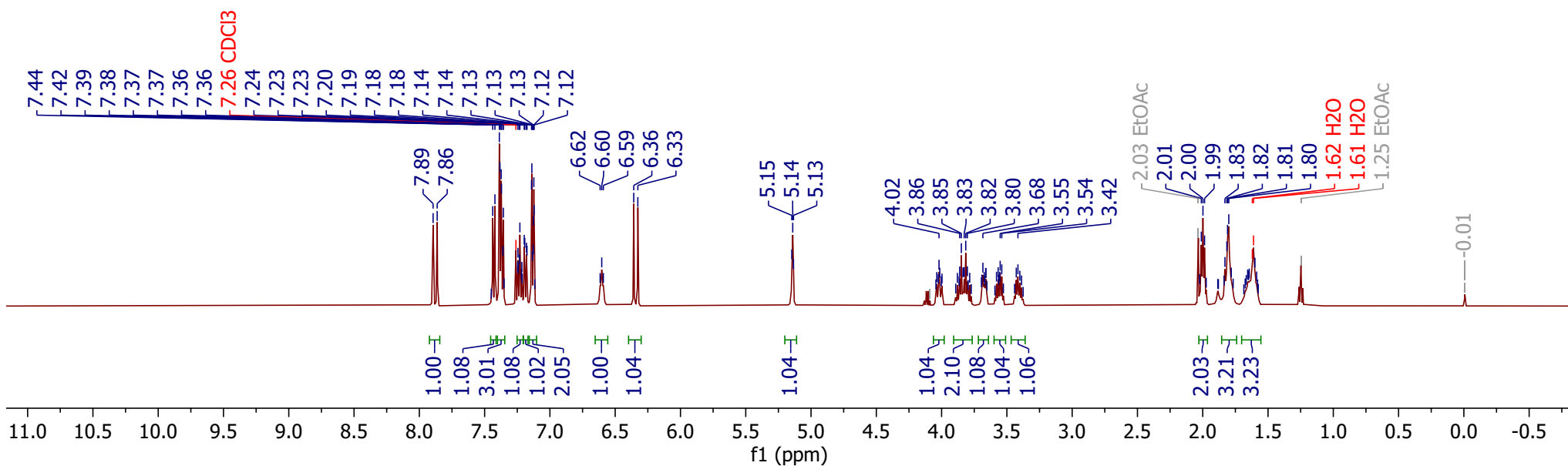
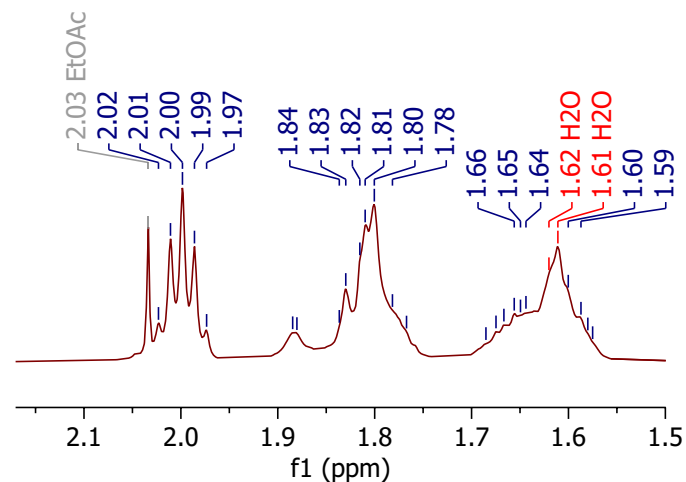
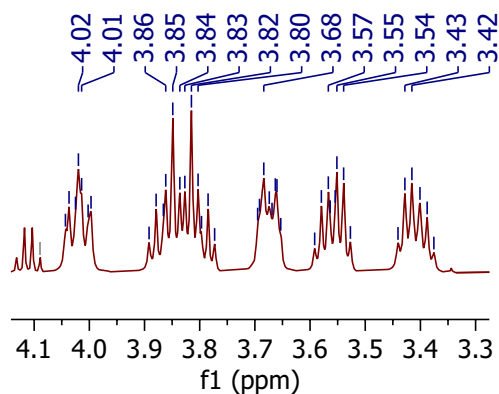
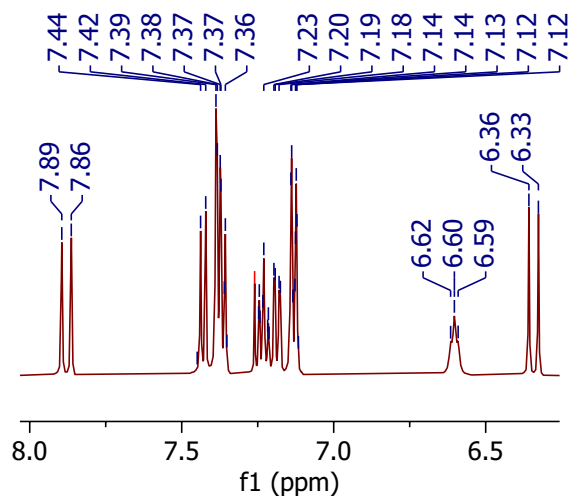
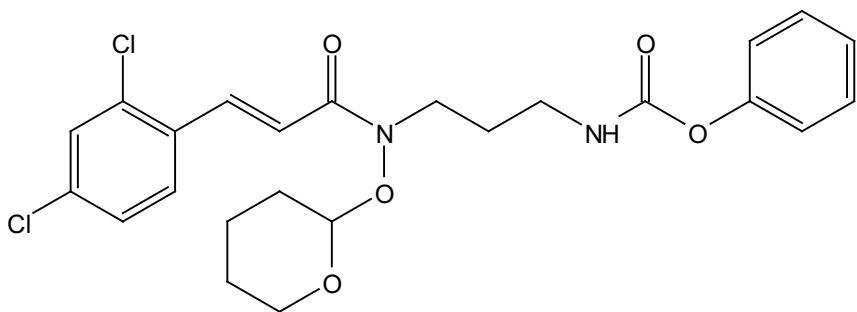
Compound S39
¹H NMR (500 MHz, CDCl₃)



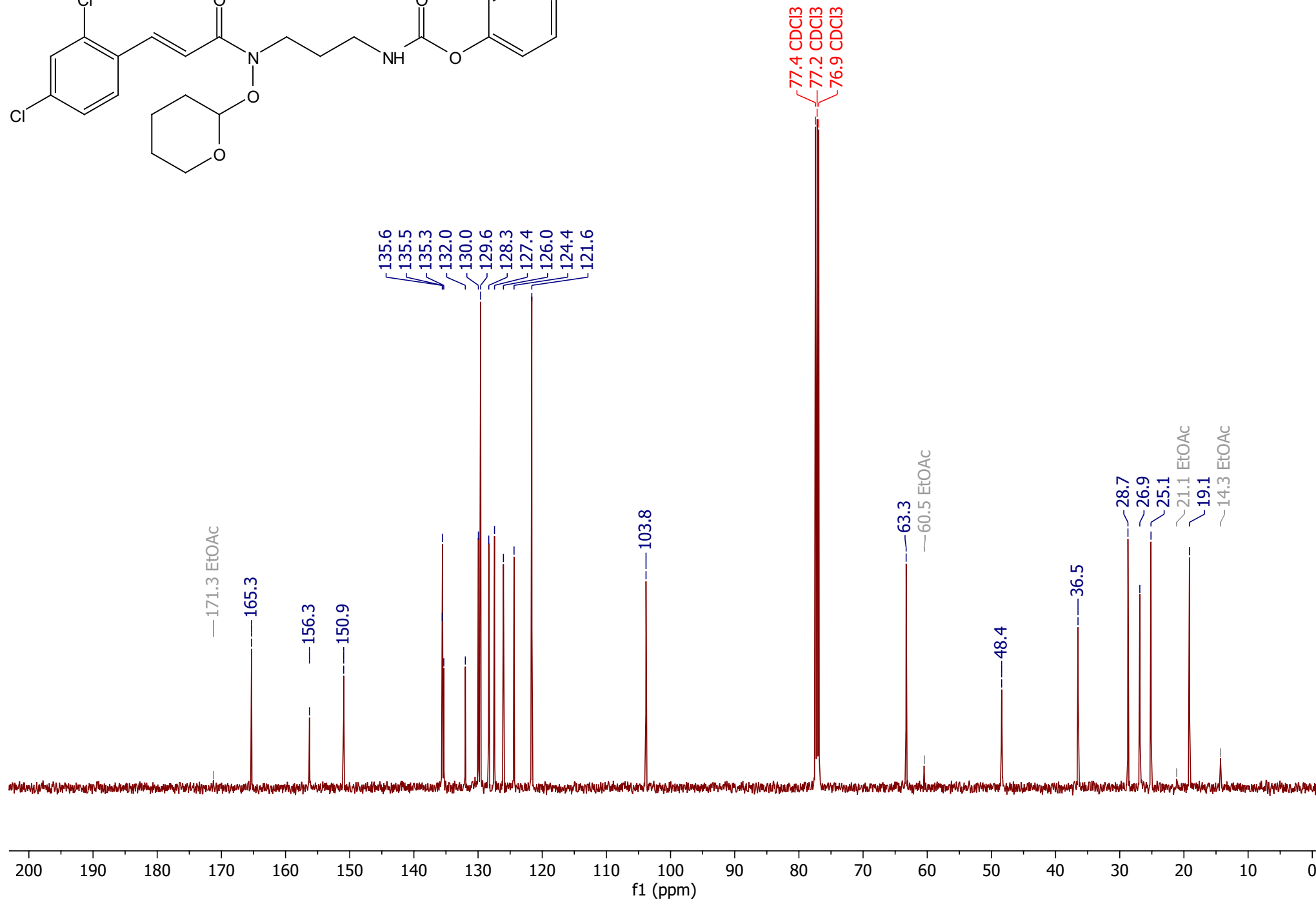
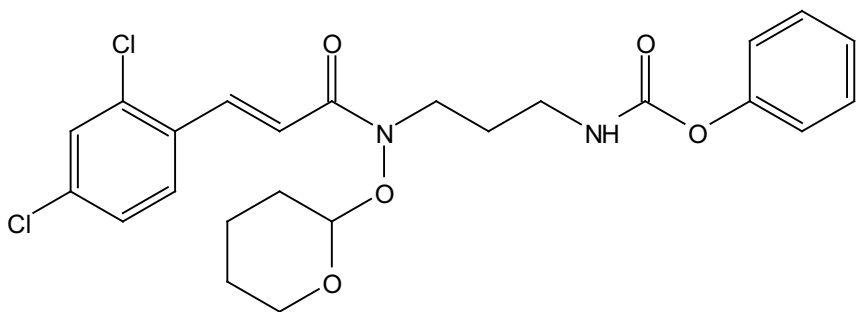
Compound S39
 ^{13}C NMR (126 MHz, CDCl_3)



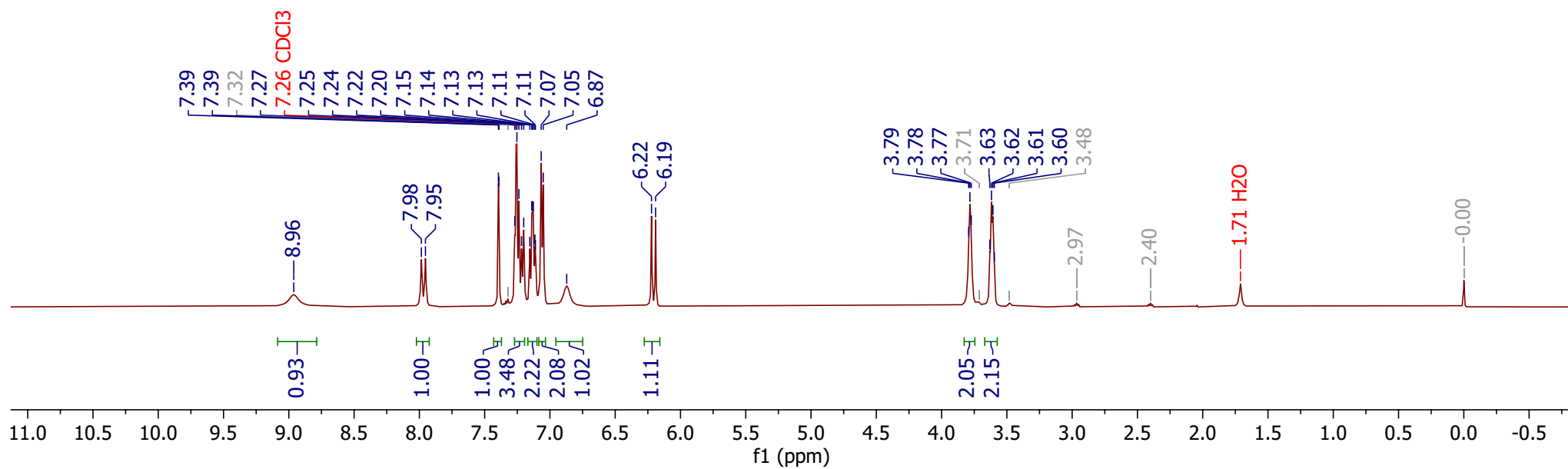
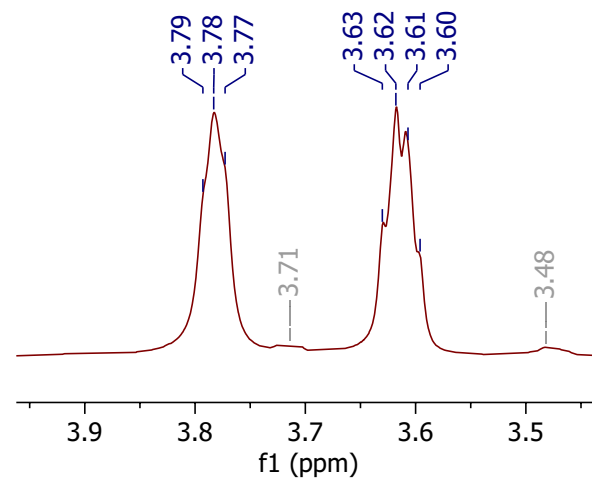
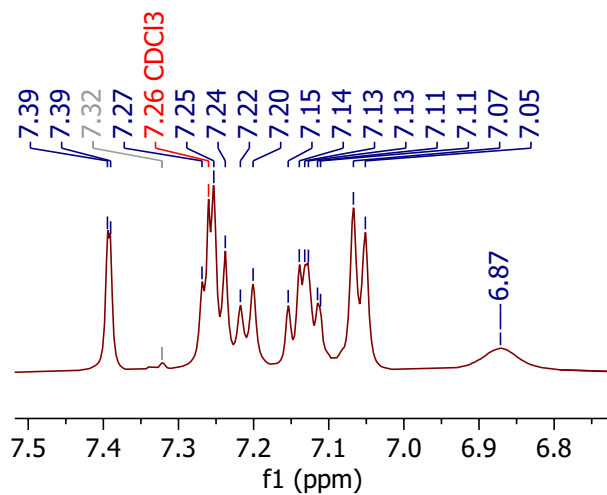
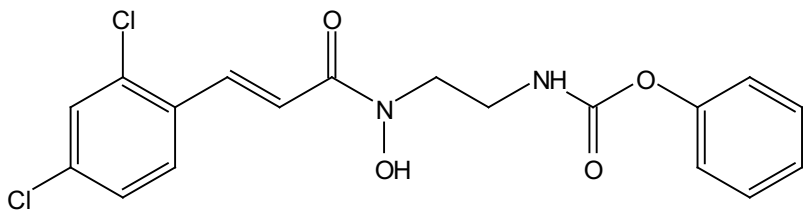
Compound S40
¹H NMR (500 MHz, CDCl₃)



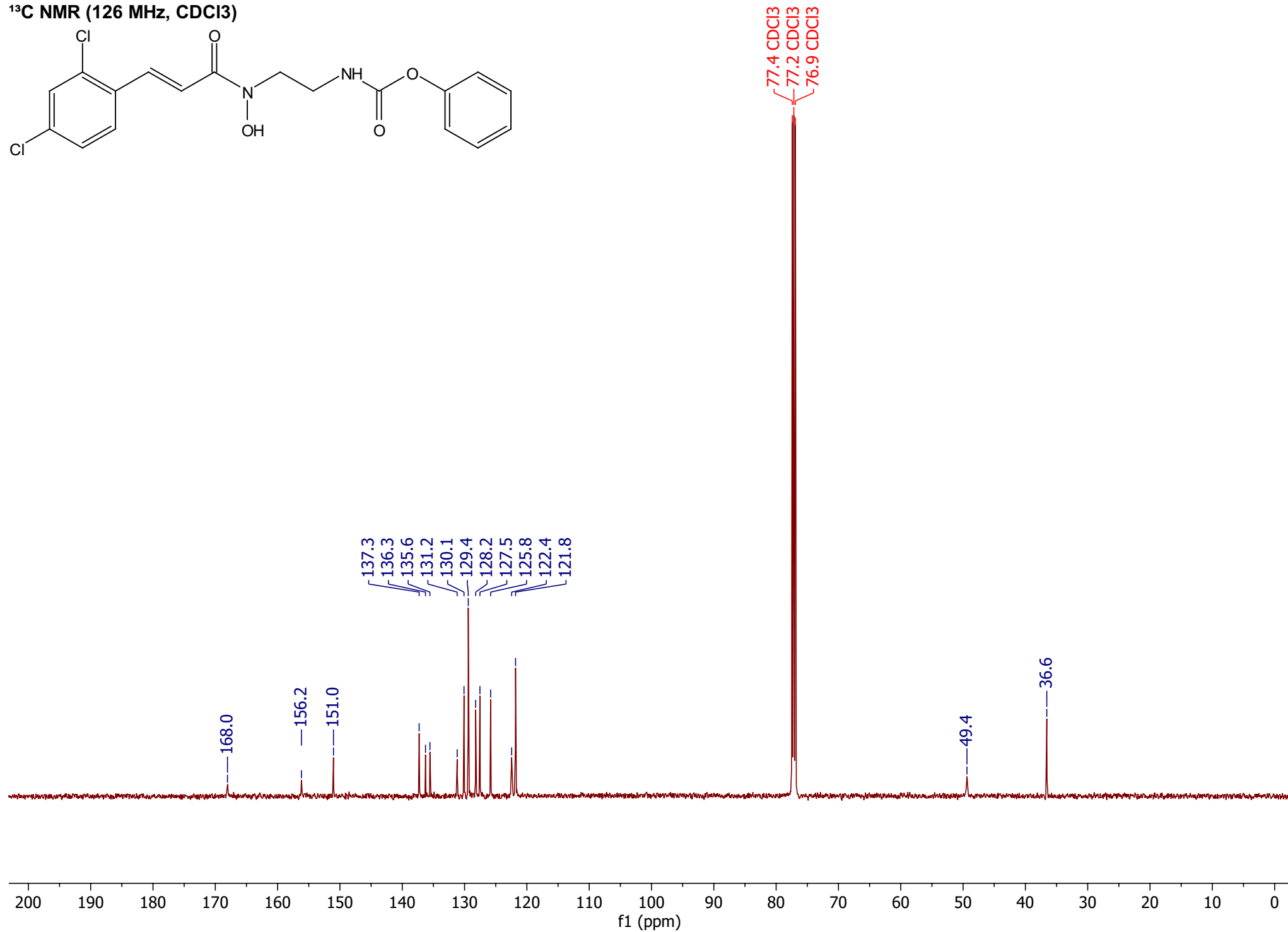
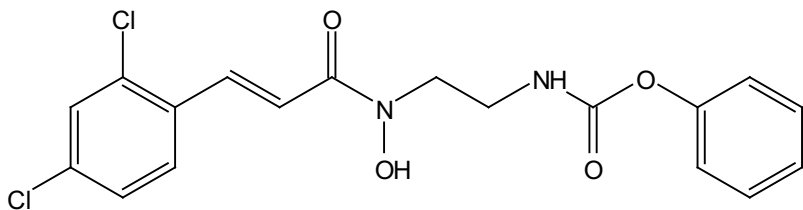
Compound S40
 ^{13}C NMR (126 MHz, CDCl_3)



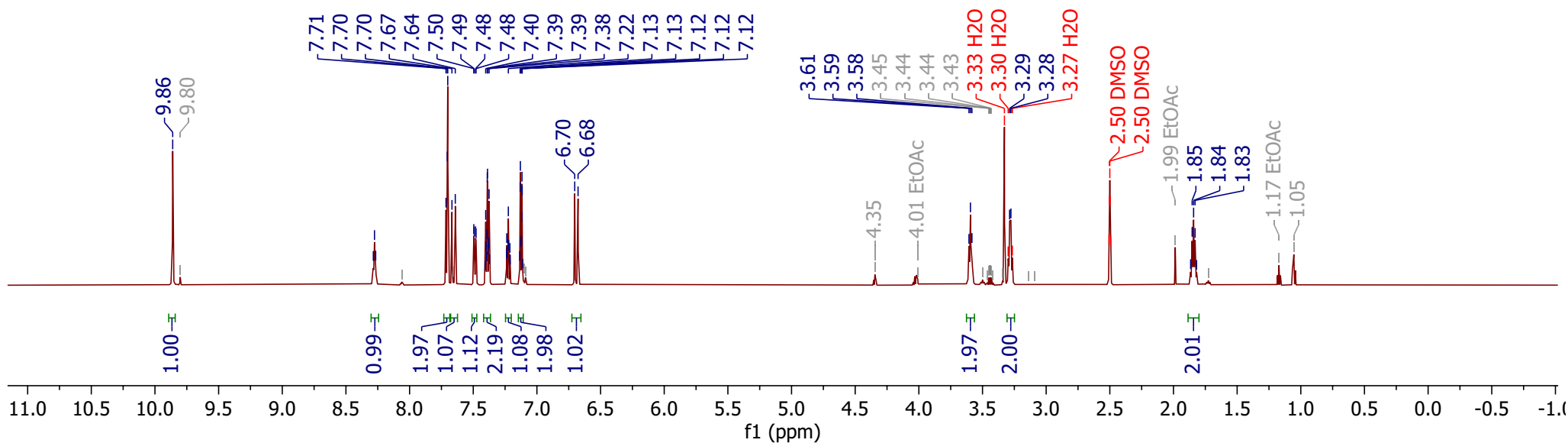
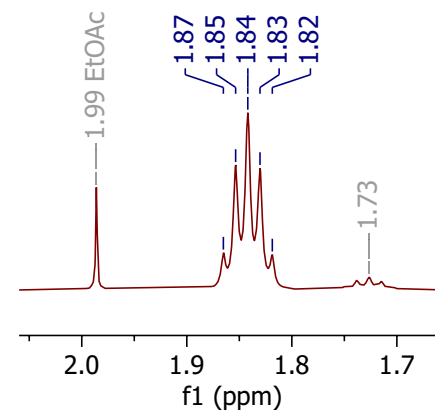
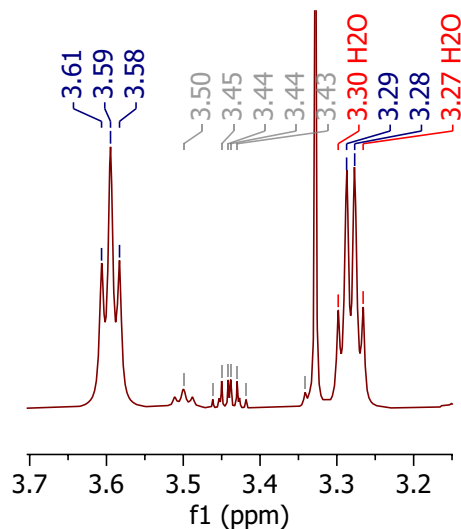
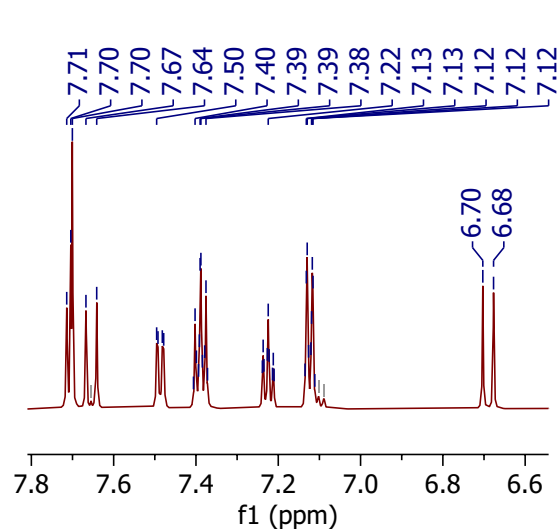
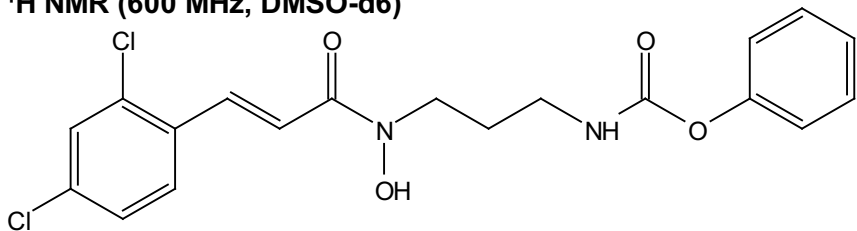
Compound 17
¹H NMR (500 MHz, CDCl₃)

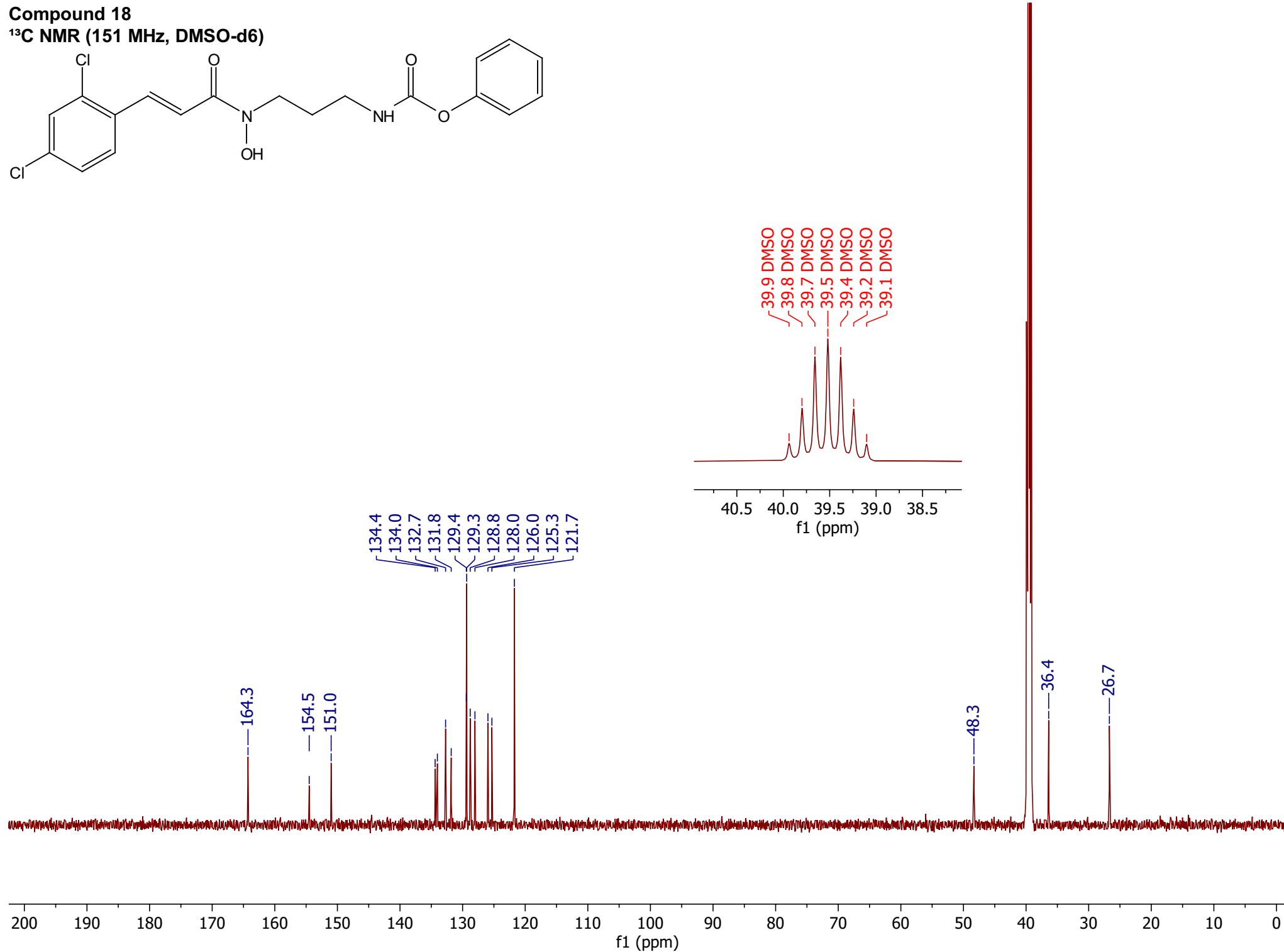
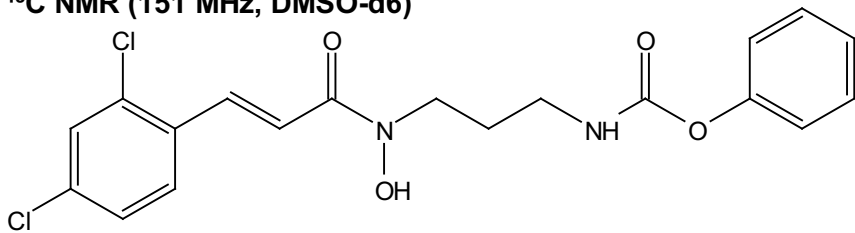


Compound 17
 ^{13}C NMR (126 MHz, CDCl_3)

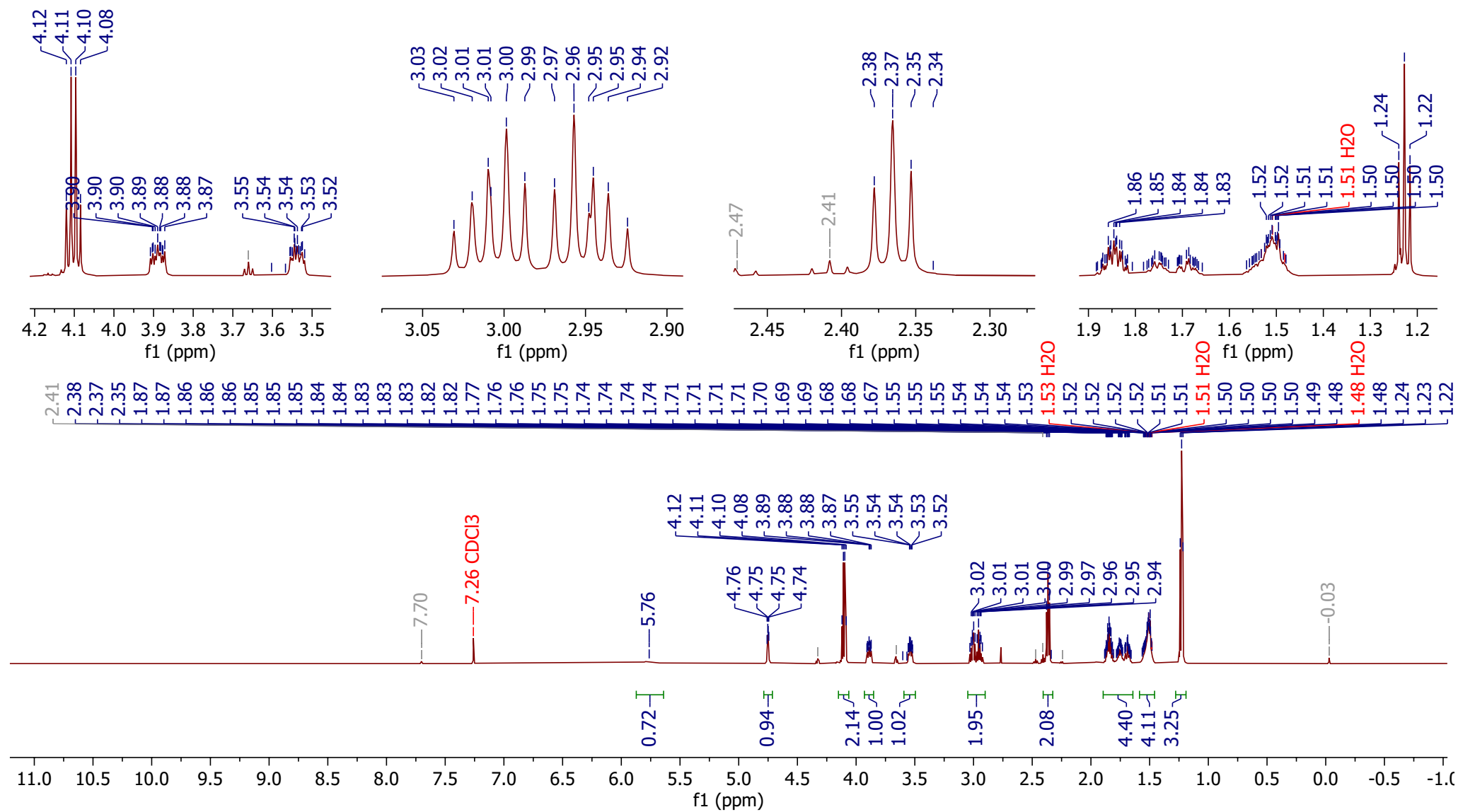
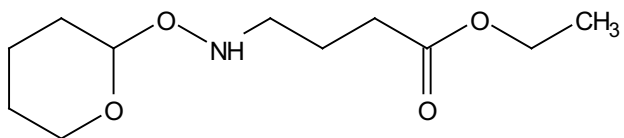


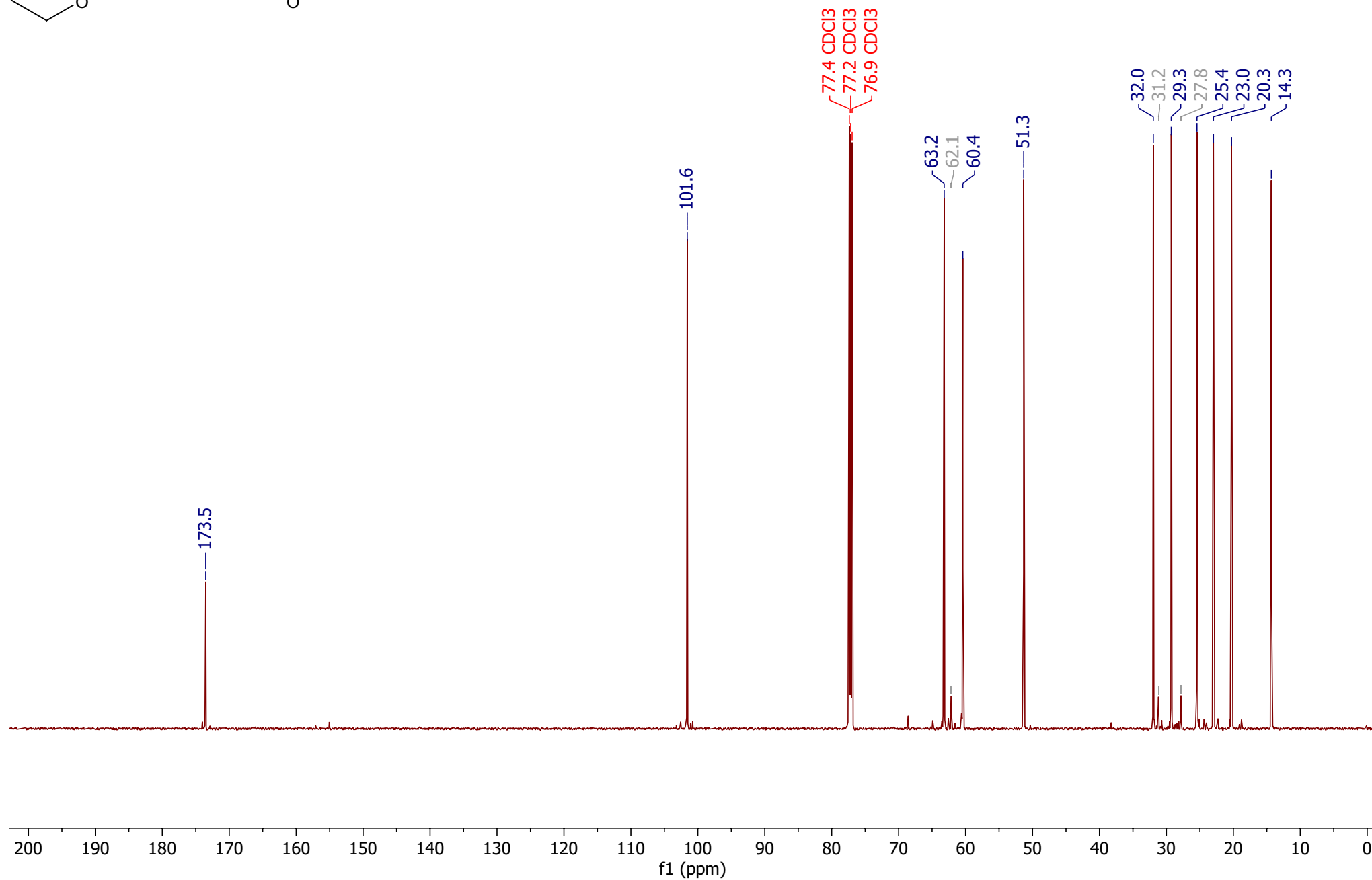
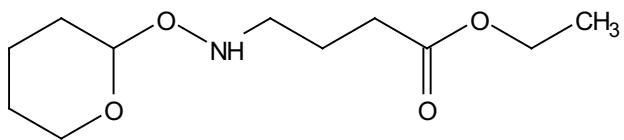
Compound 18
¹H NMR (600 MHz, DMSO-d₆)



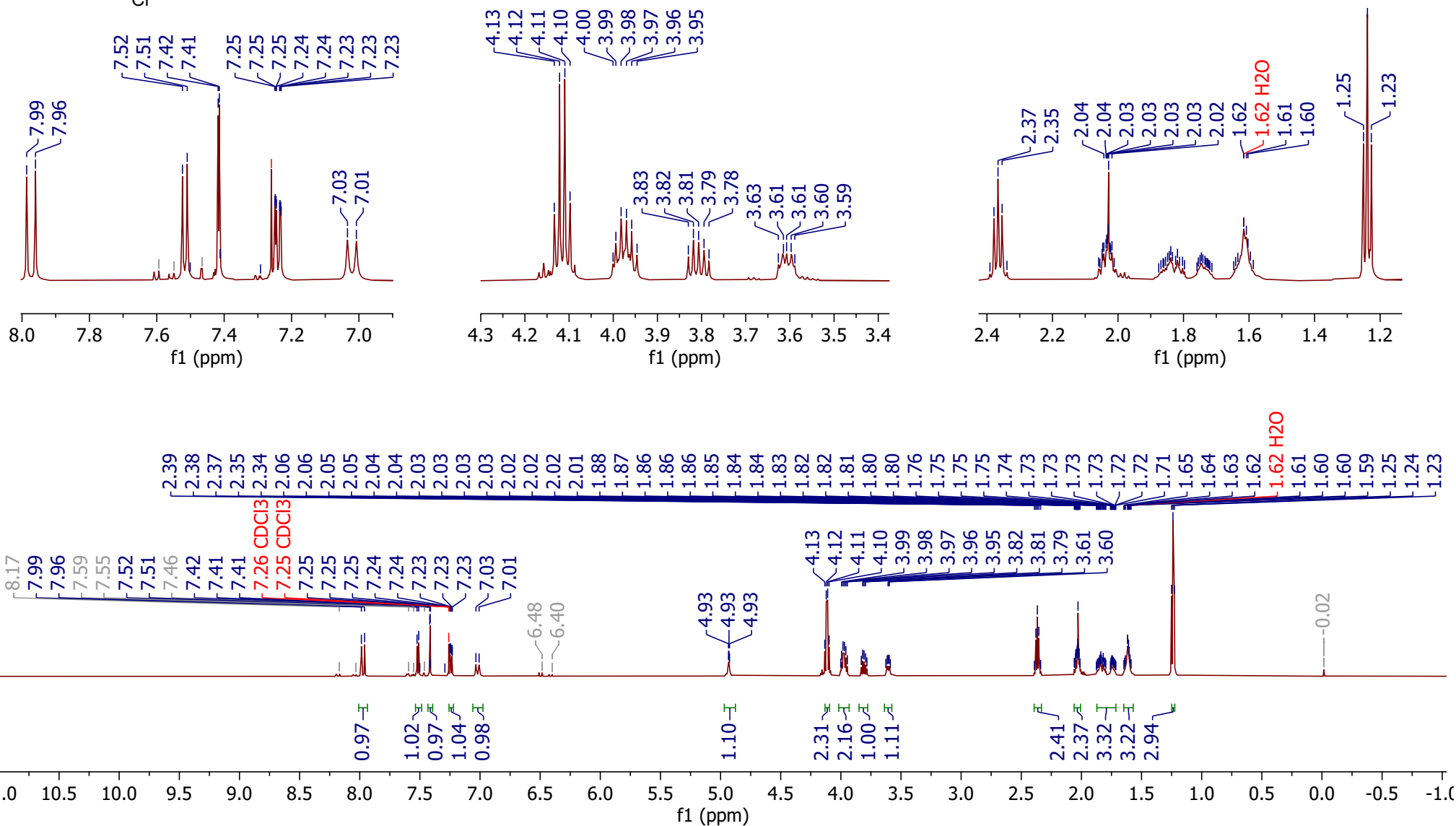
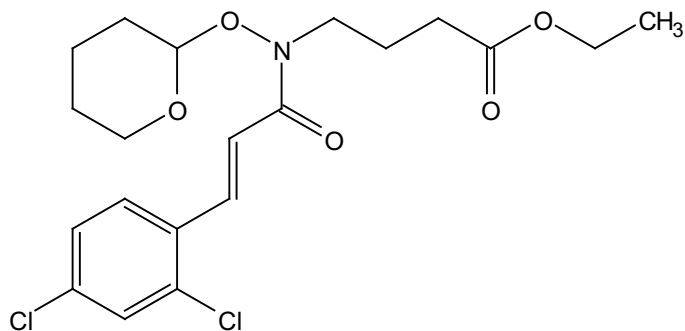
Compound 18 **^{13}C NMR (151 MHz, DMSO- d_6)**

Compound S41
¹H NMR (600 MHz, CDCl₃)

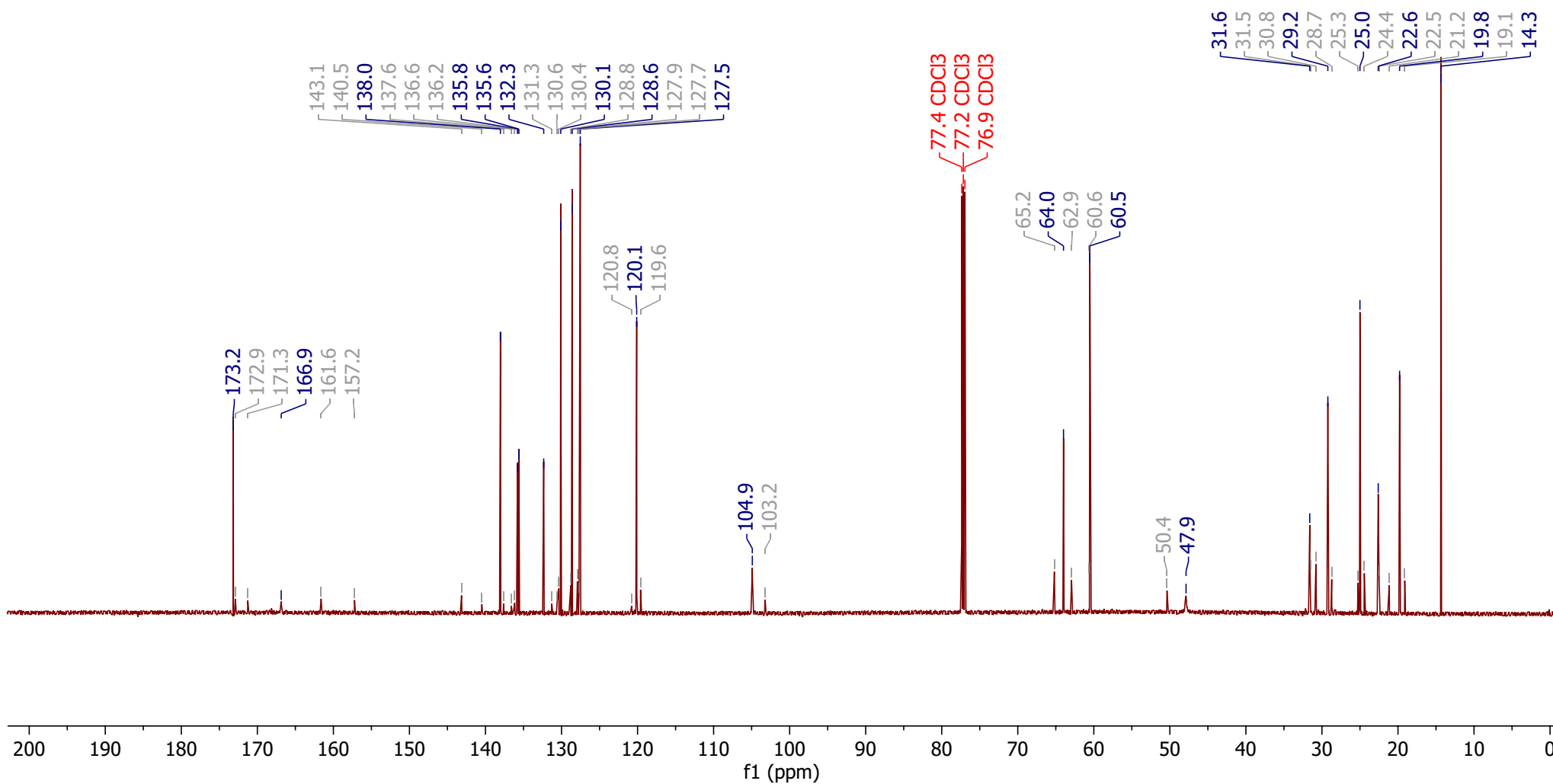
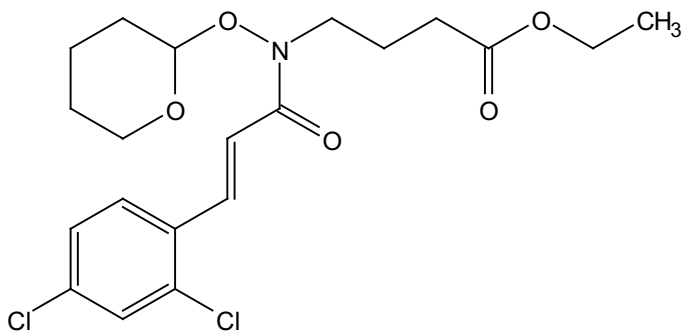


Compound S41¹³C NMR (151 MHz, CDCl₃)

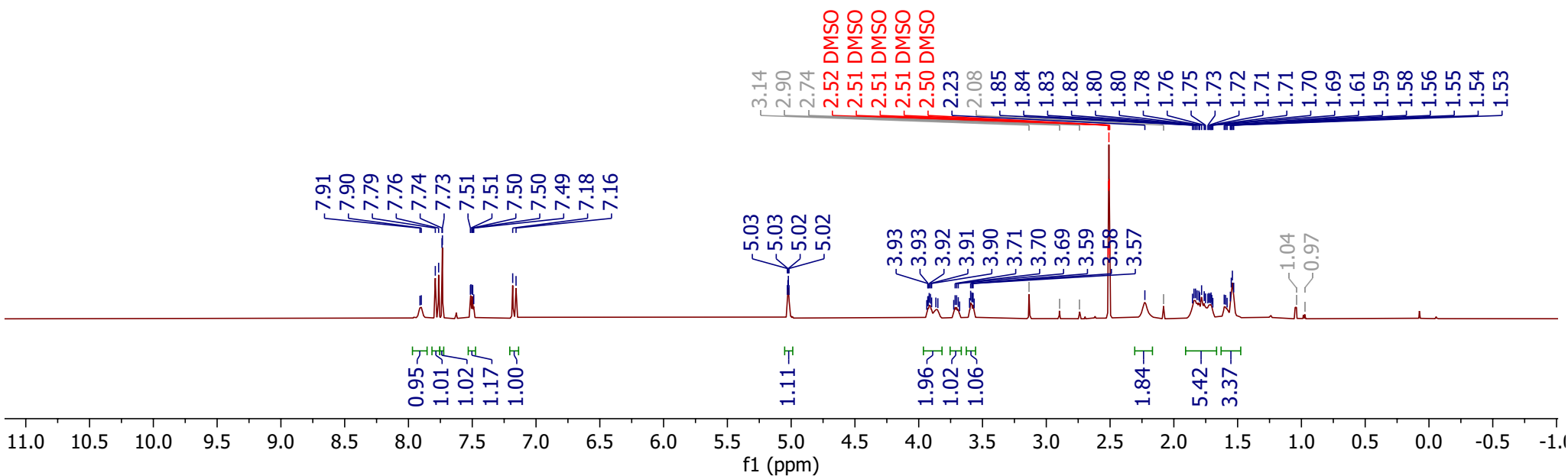
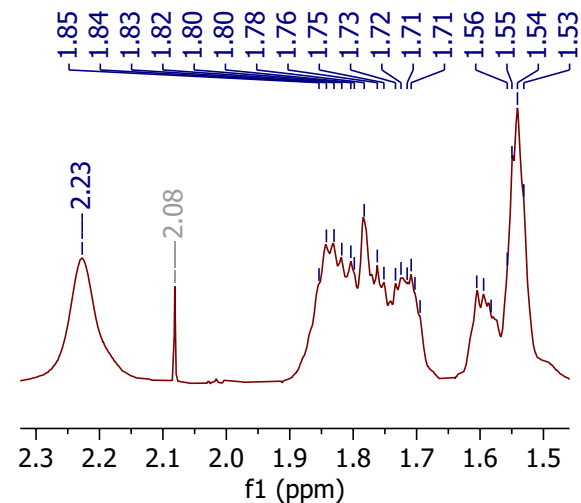
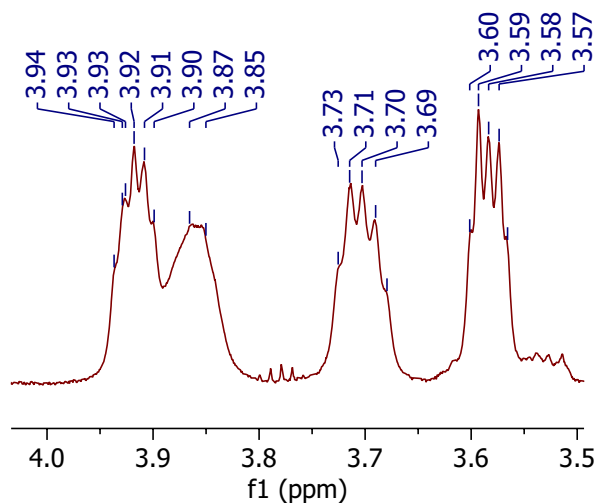
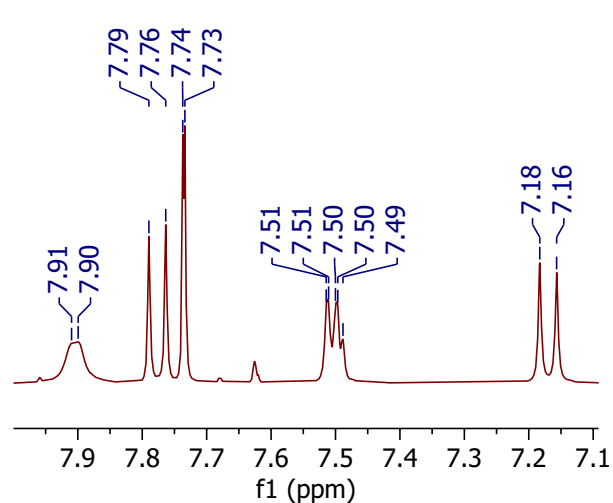
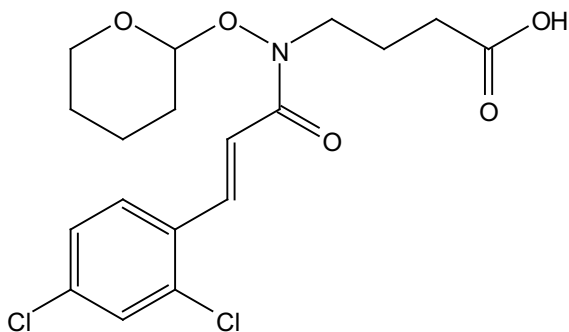
Compound S42
¹H NMR (600 MHz, CDCl₃)



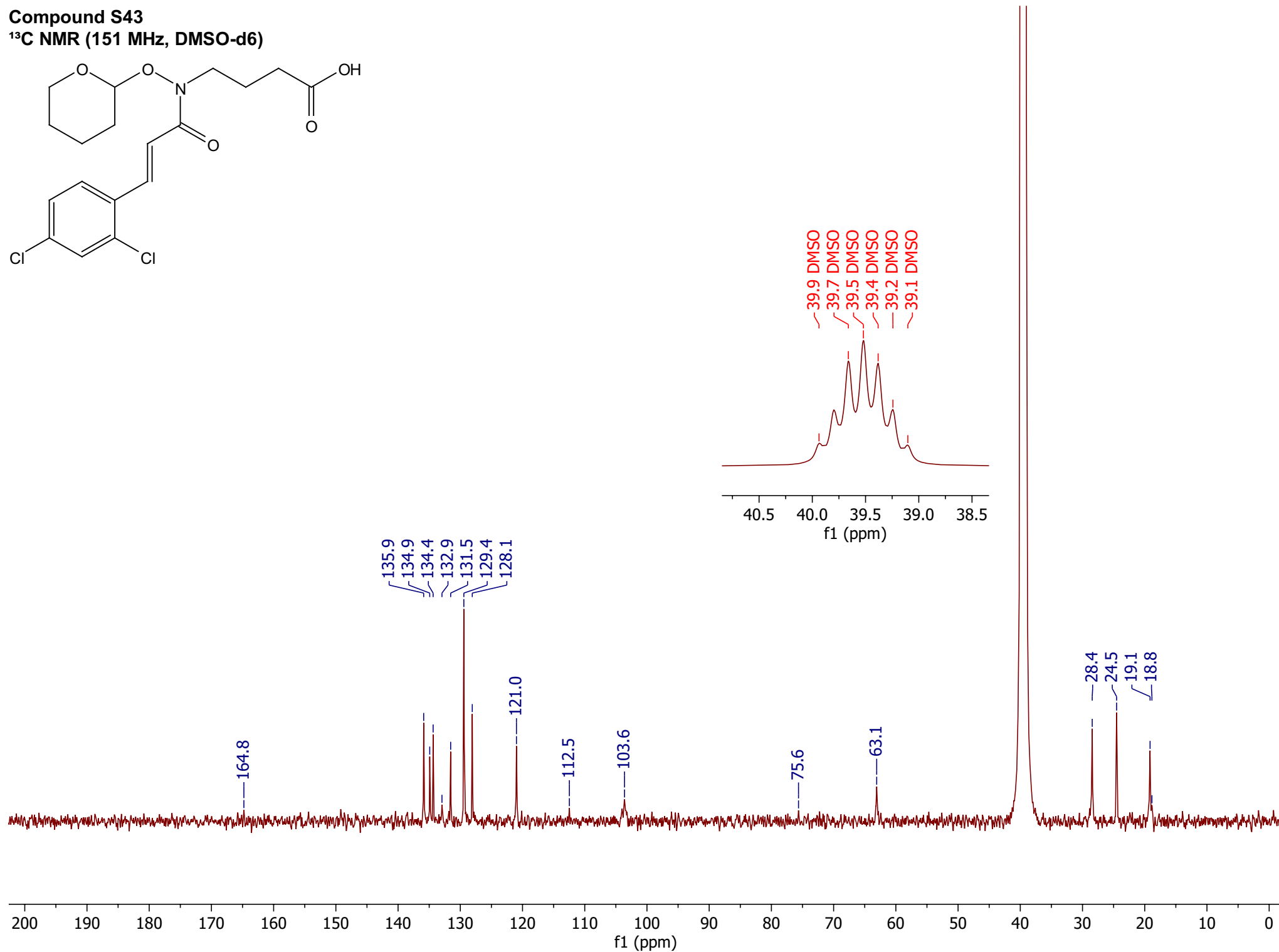
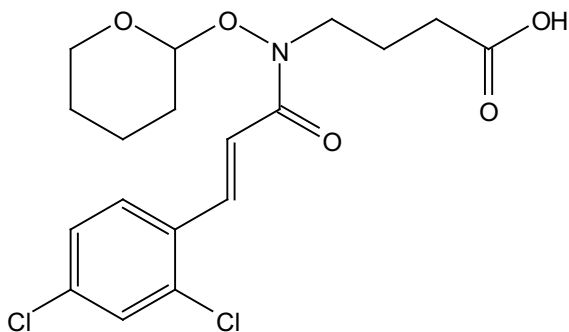
Compound S42
¹³C NMR (151 MHz, CDCl₃)



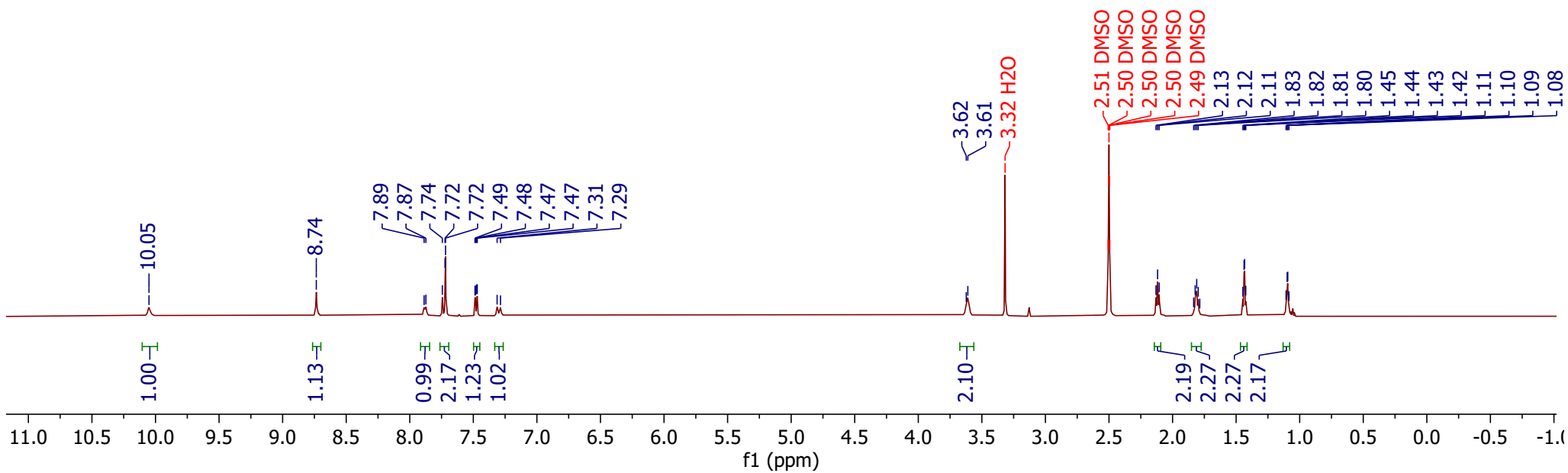
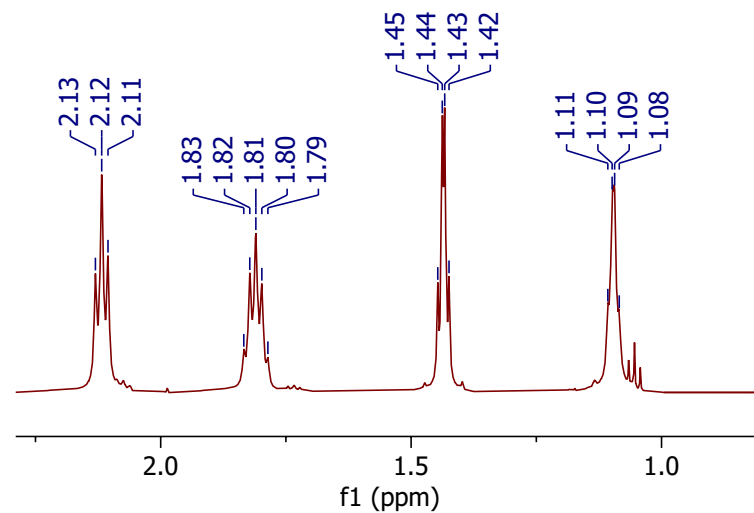
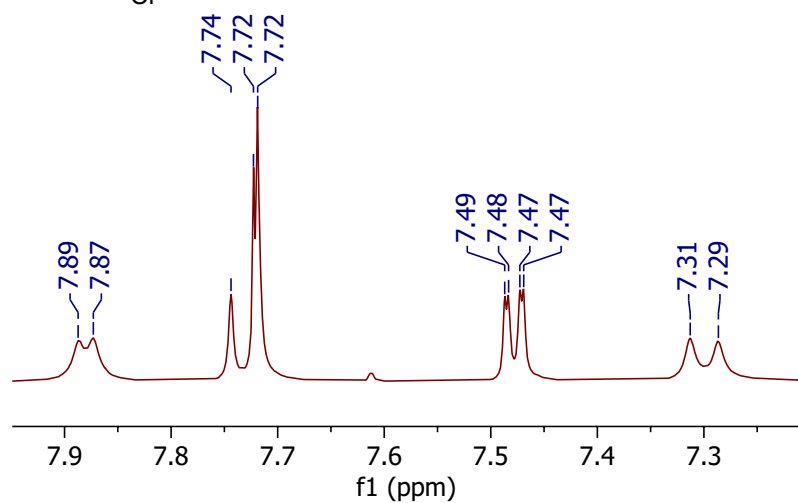
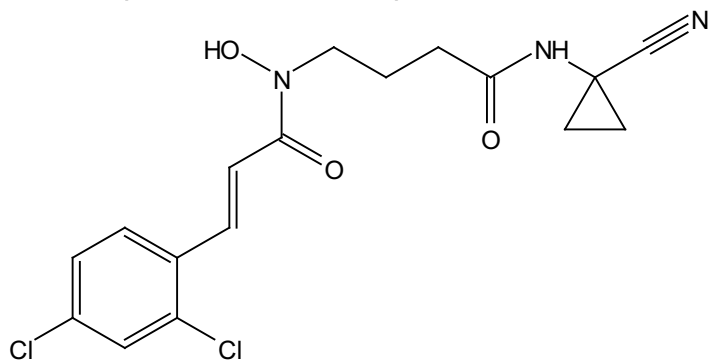
¹H NMR (600 MHz, DMSO-d6)



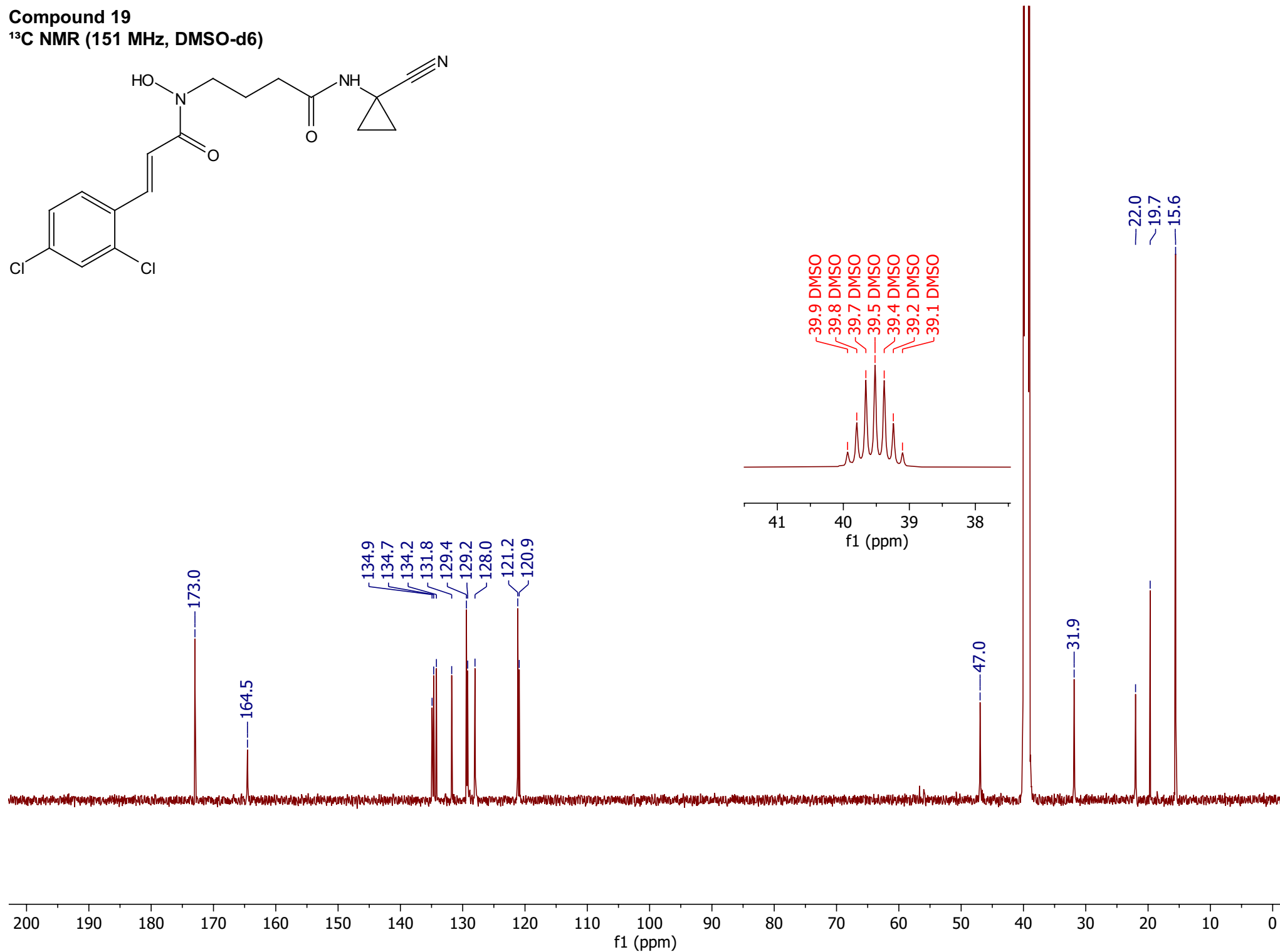
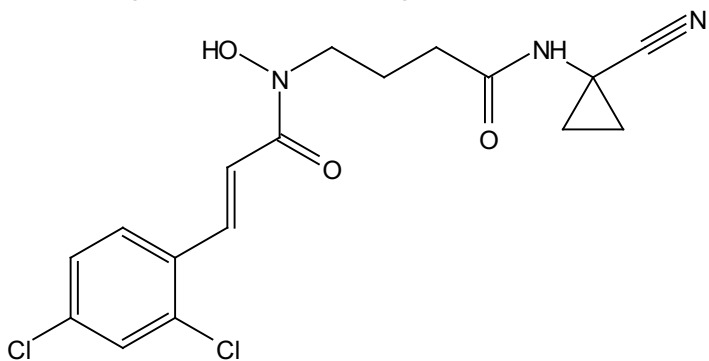
Compound S43
¹³C NMR (151 MHz, DMSO-d₆)



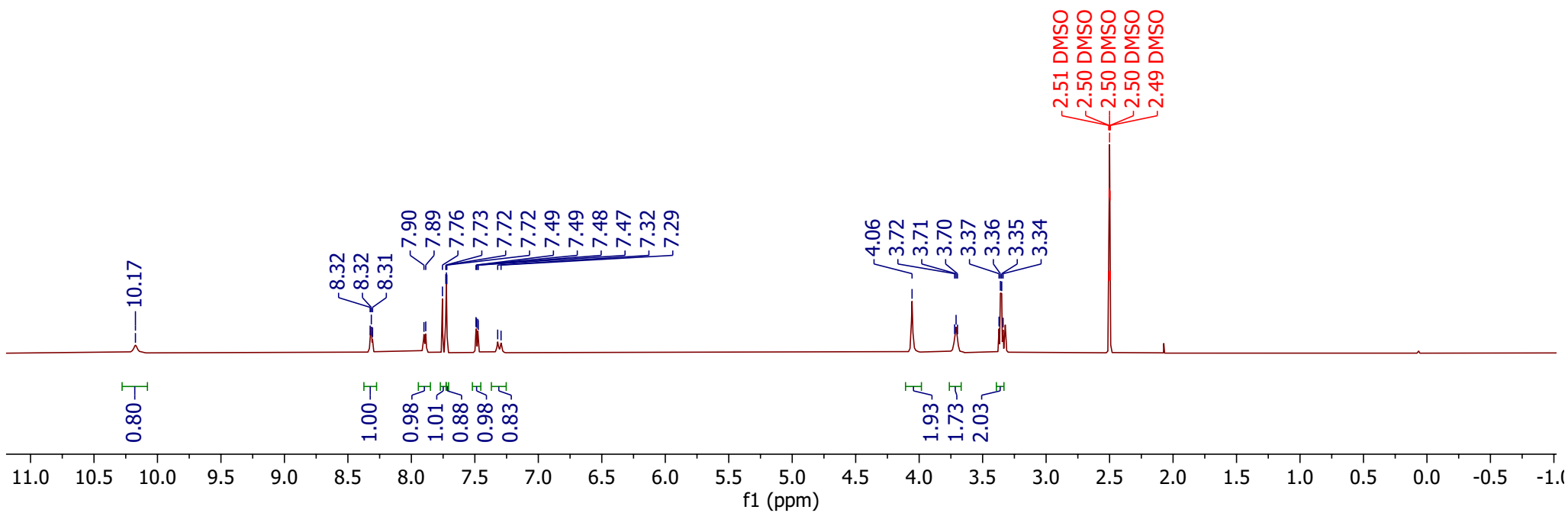
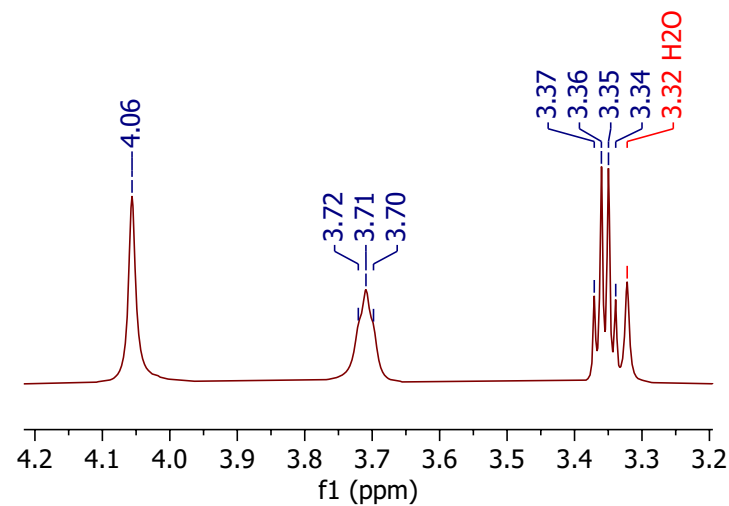
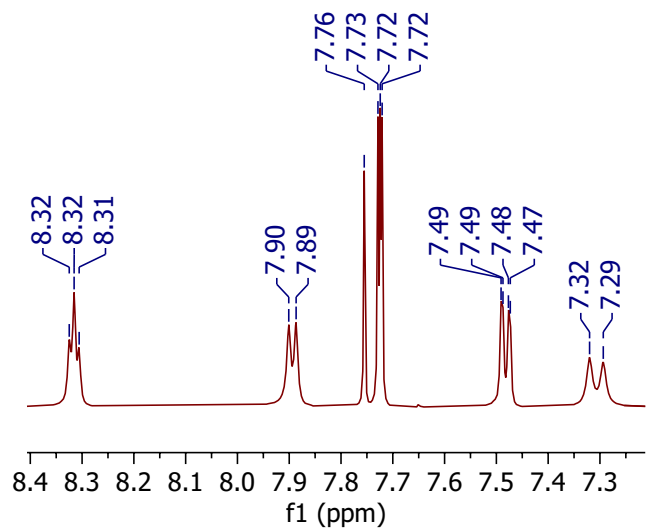
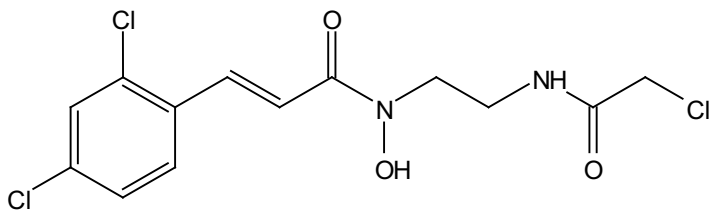
Compound 19
¹H NMR (600 MHz, DMSO-d6)



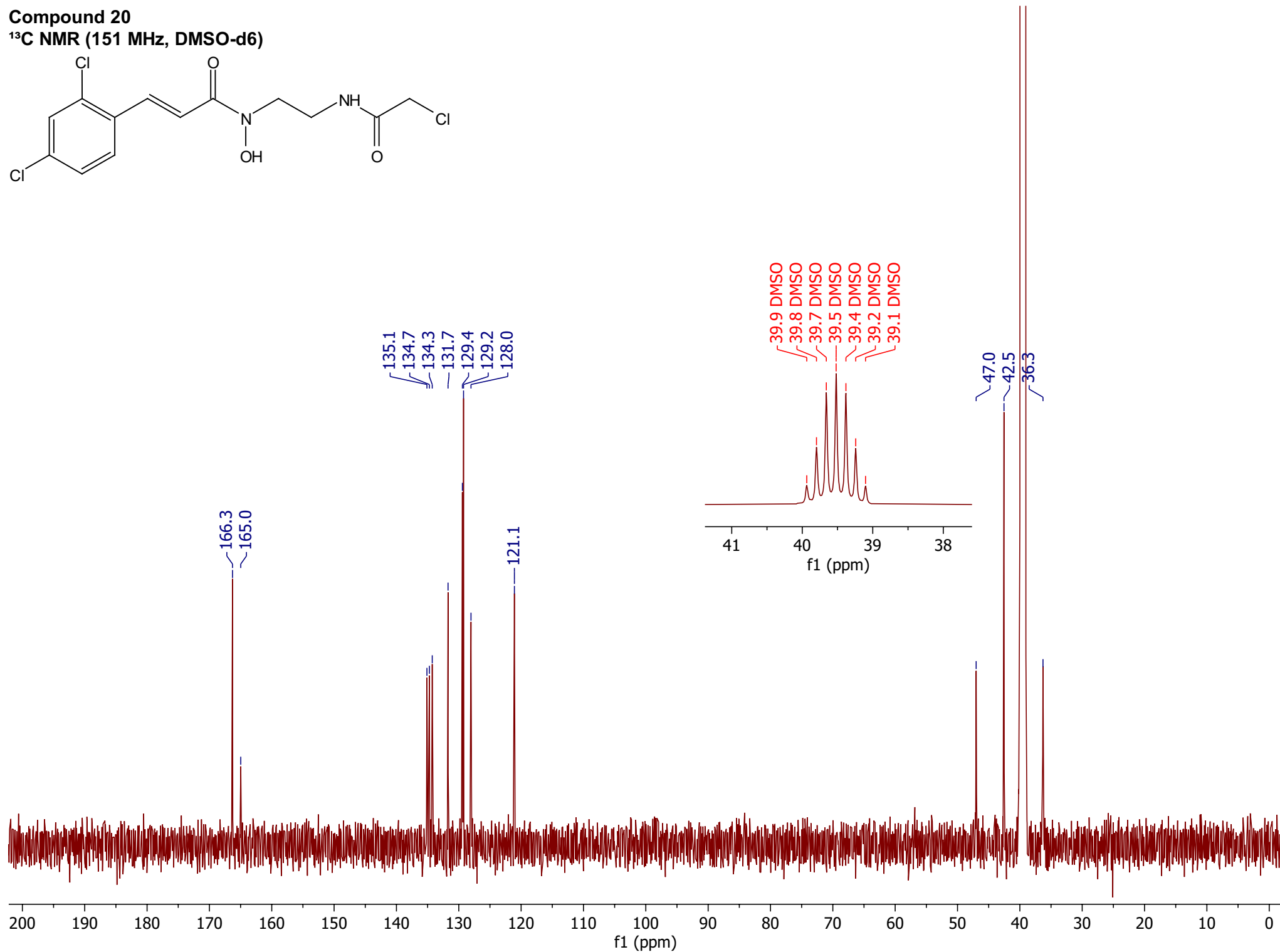
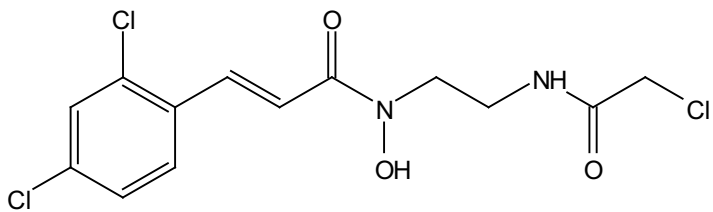
Compound 19
 ^{13}C NMR (151 MHz, DMSO- d_6)



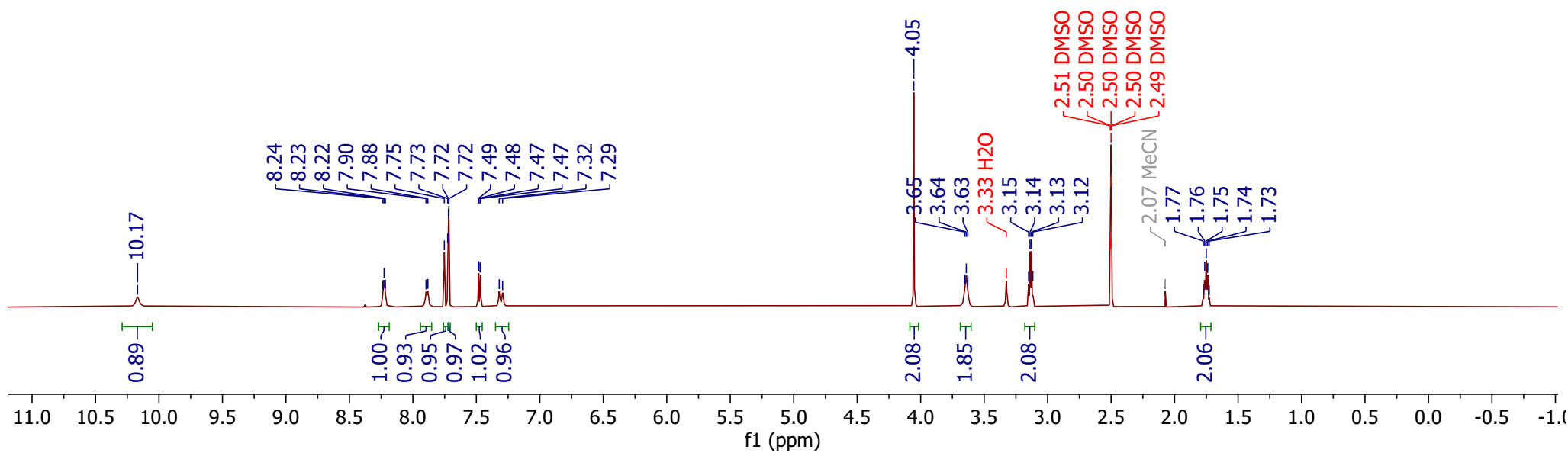
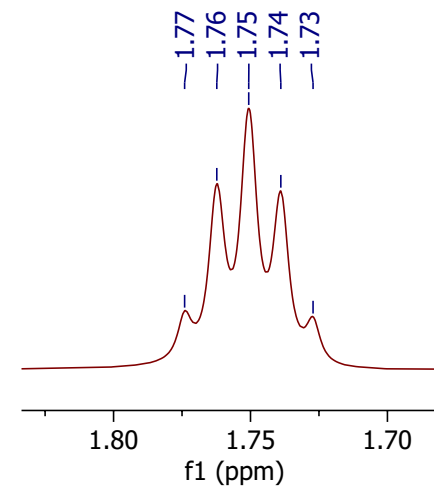
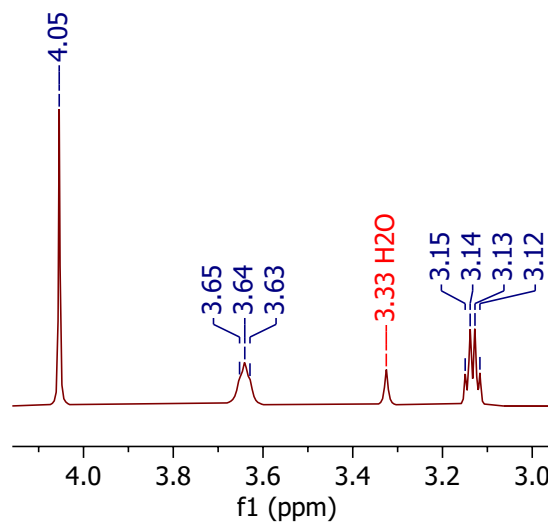
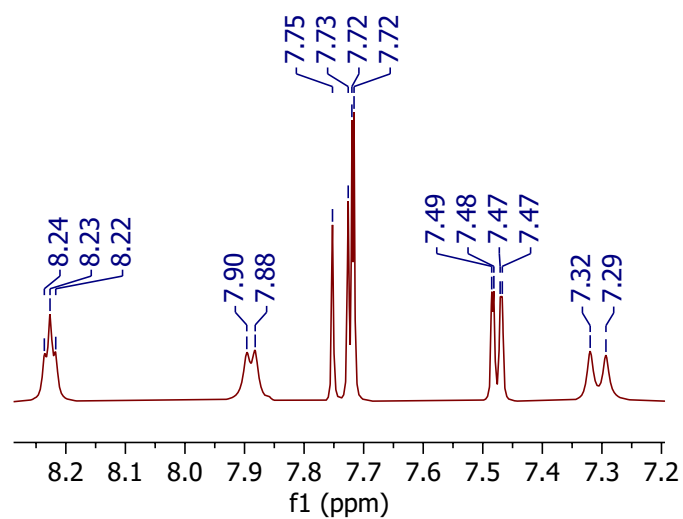
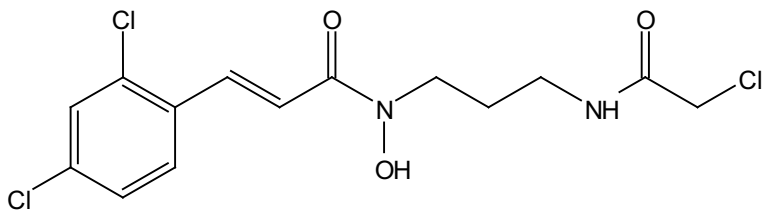
Compound 20
¹H NMR (600 MHz, DMSO-d₆)



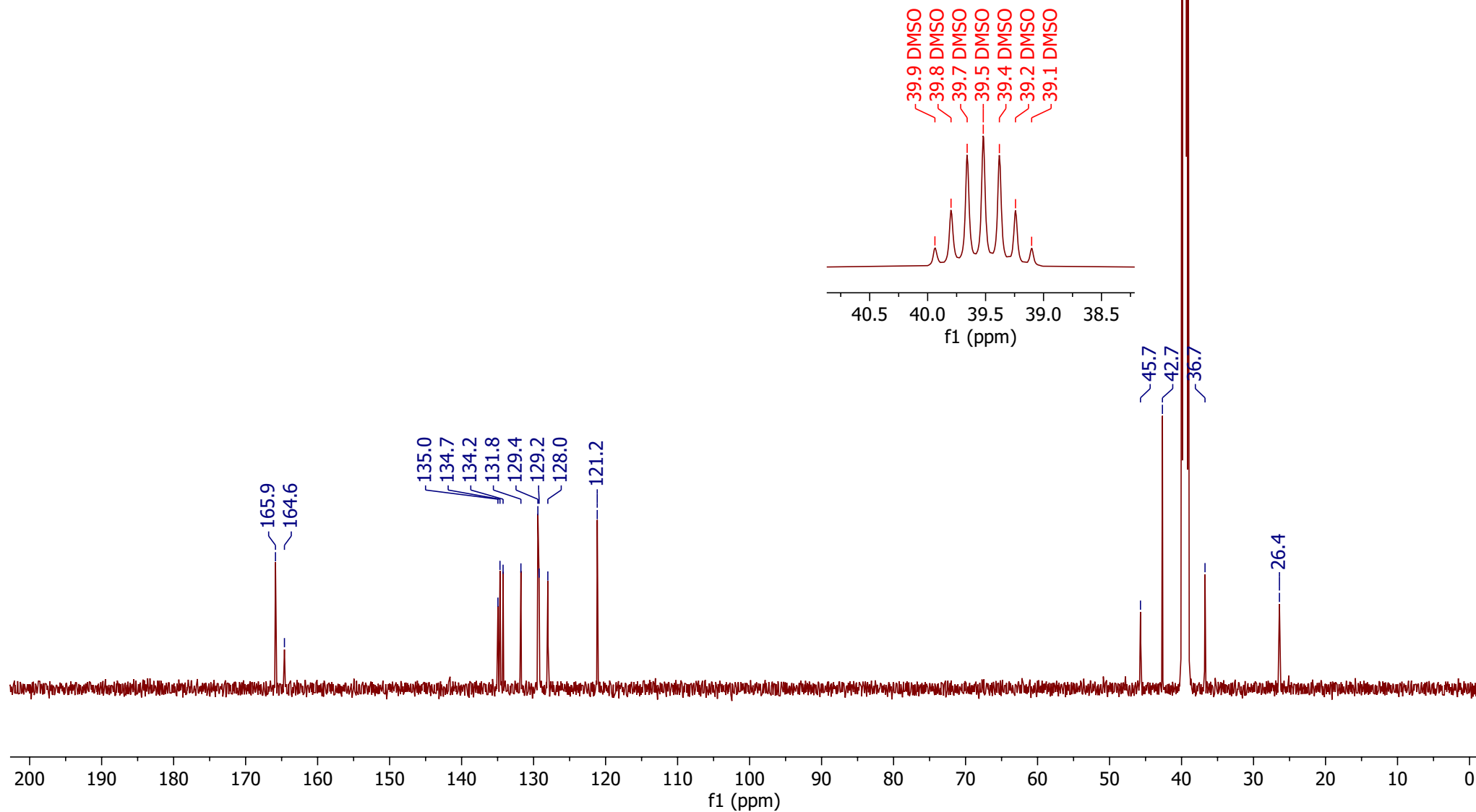
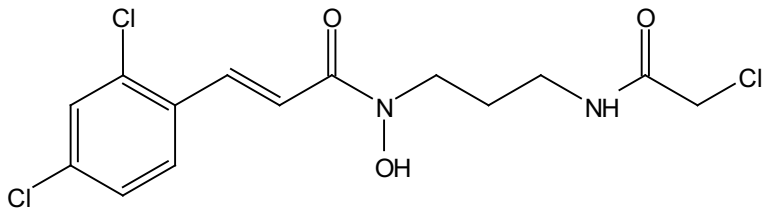
Compound 20
 ^{13}C NMR (151 MHz, DMSO- d_6)



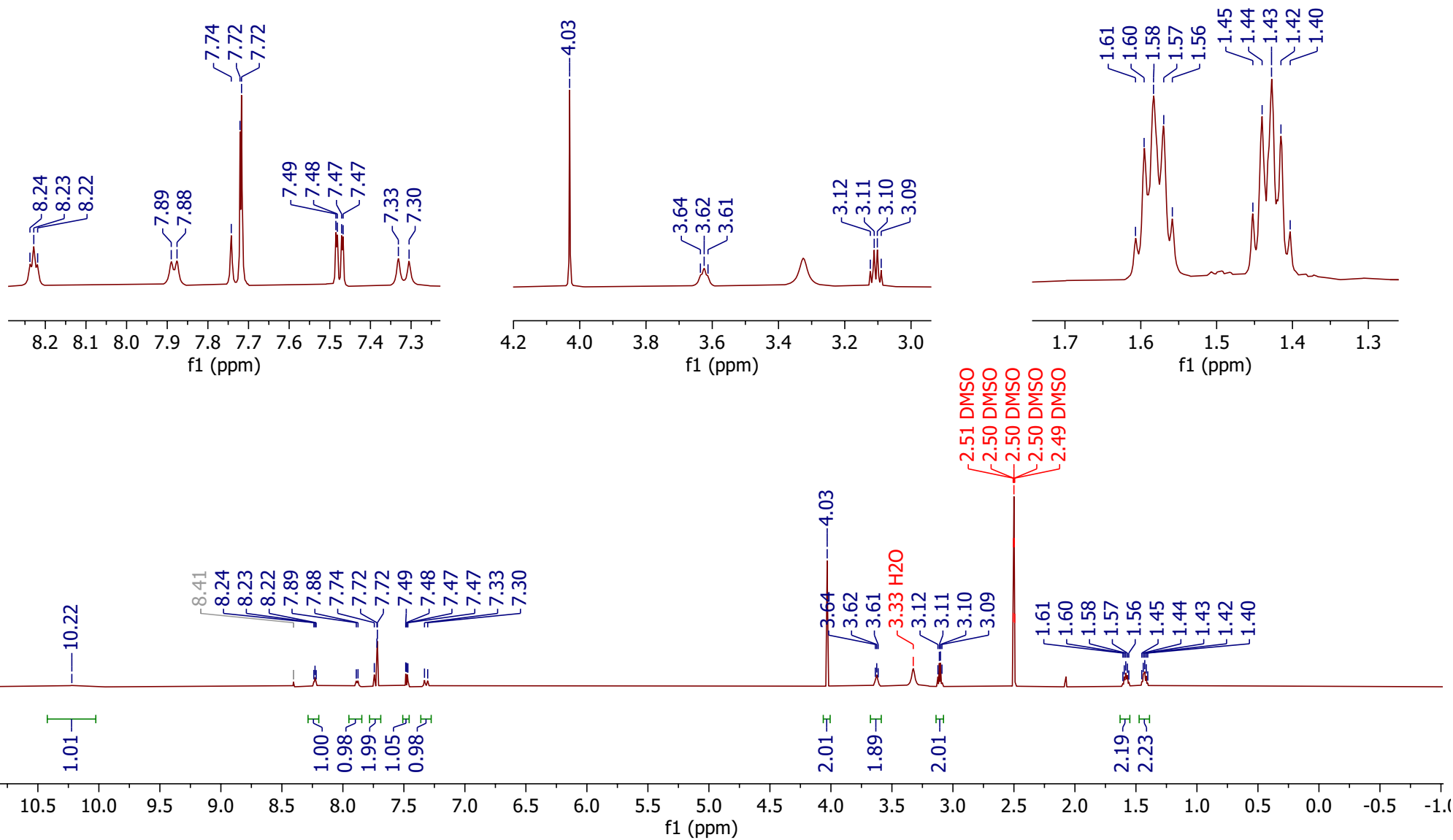
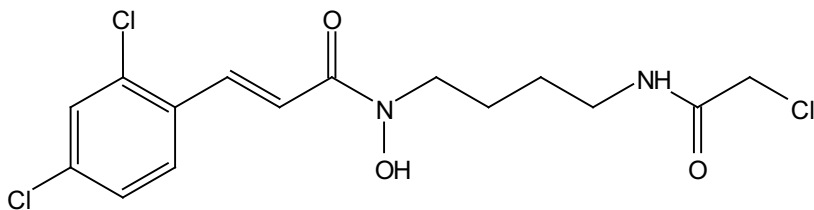
Compound 21
¹H NMR (600 MHz, DMSO-d₆)



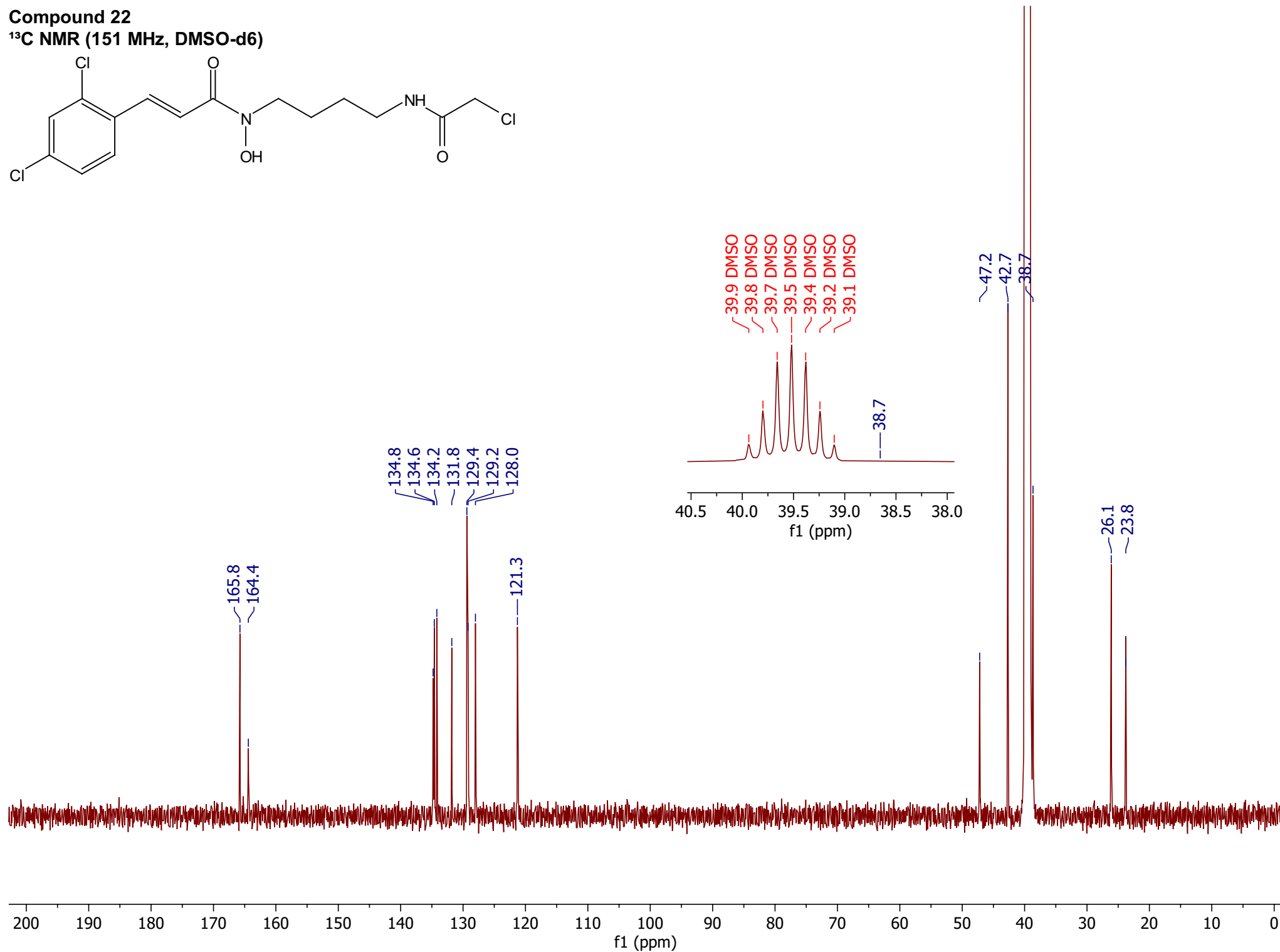
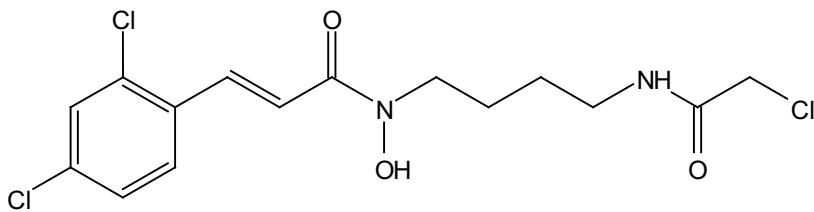
Compound 21
 ^{13}C NMR (151 MHz, DMSO- d_6)



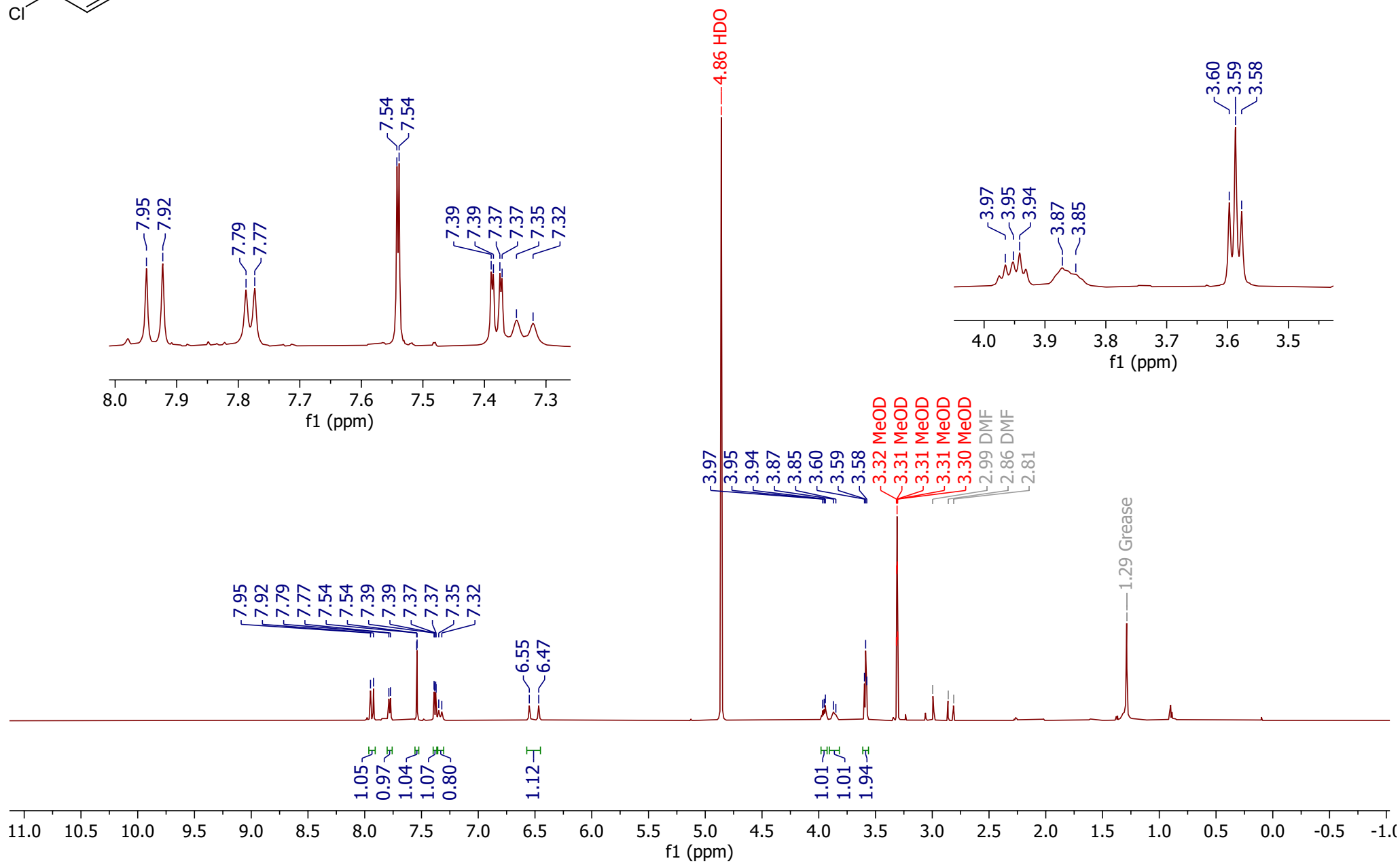
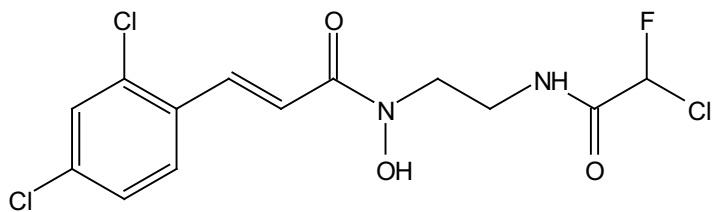
Compound 22
¹H NMR (600 MHz, DMSO-d₆)



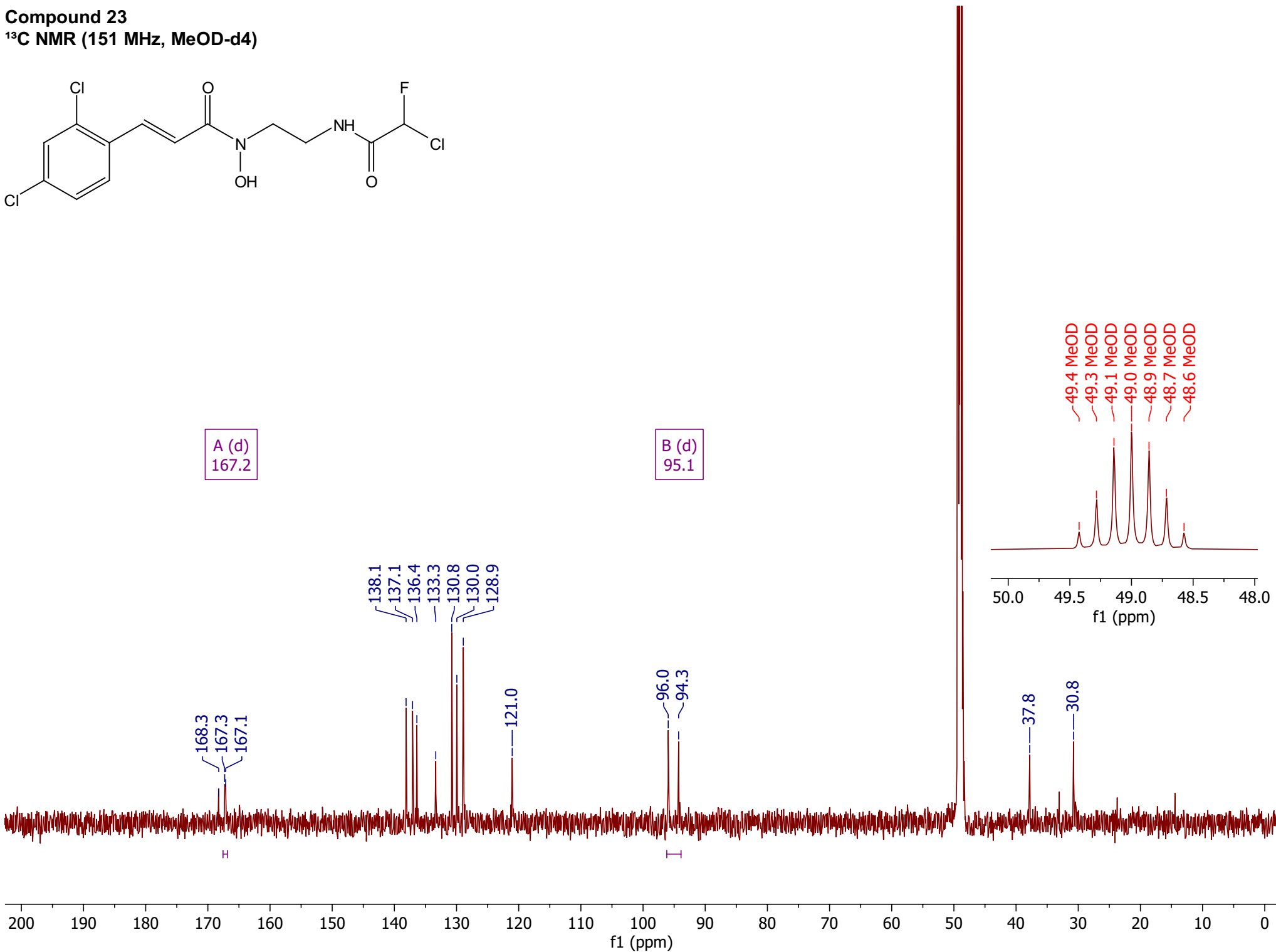
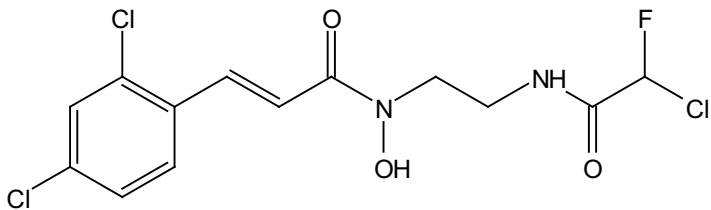
Compound 22
 ^{13}C NMR (151 MHz, DMSO- d_6)



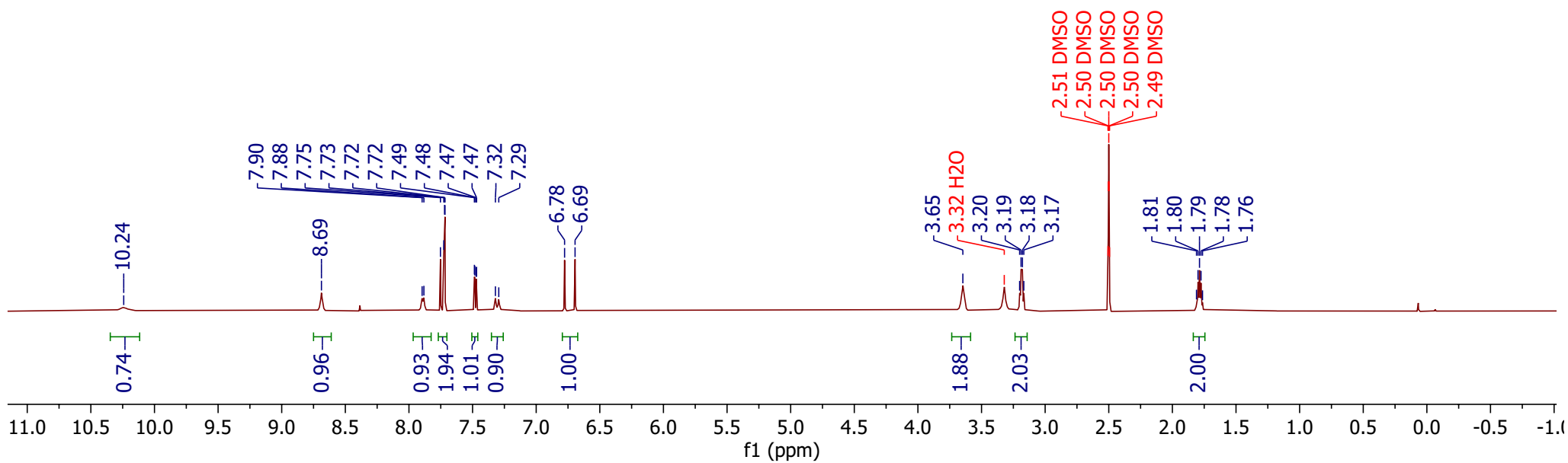
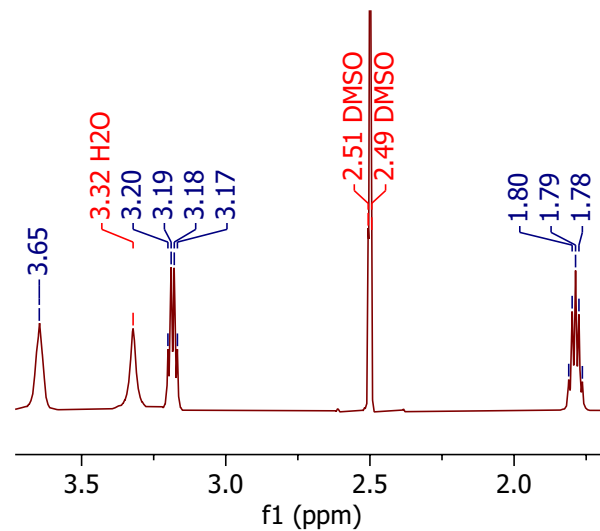
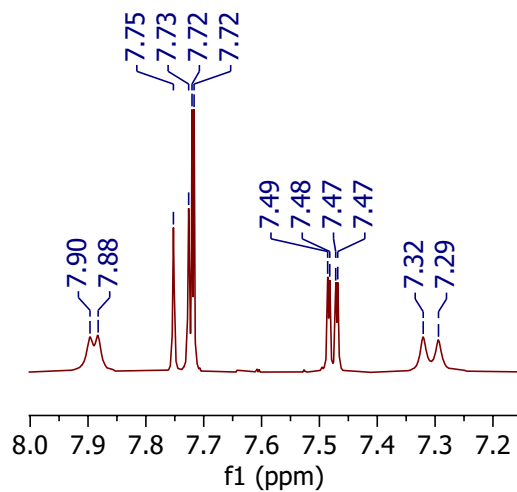
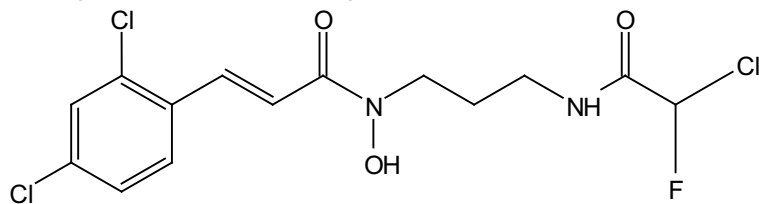
Compound 23
¹H NMR (600 MHz, MeOD-d₄)



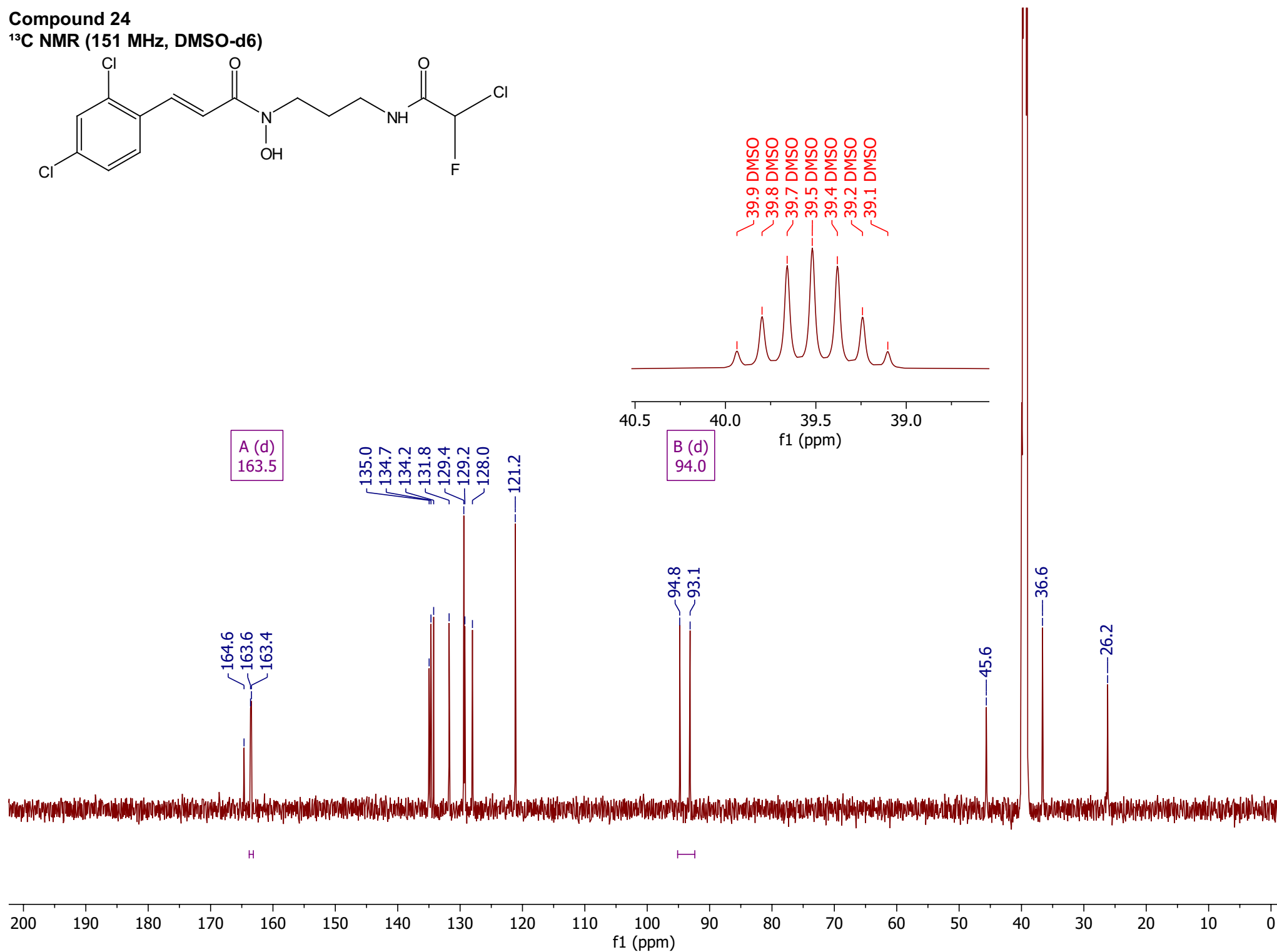
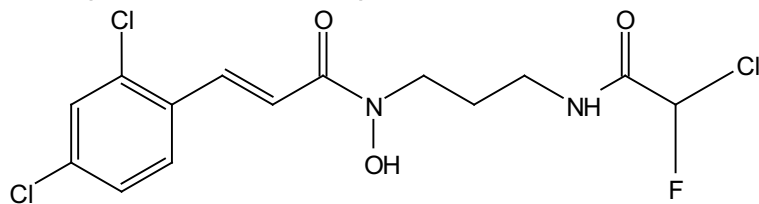
Compound 23
 ^{13}C NMR (151 MHz, MeOD-d₄)



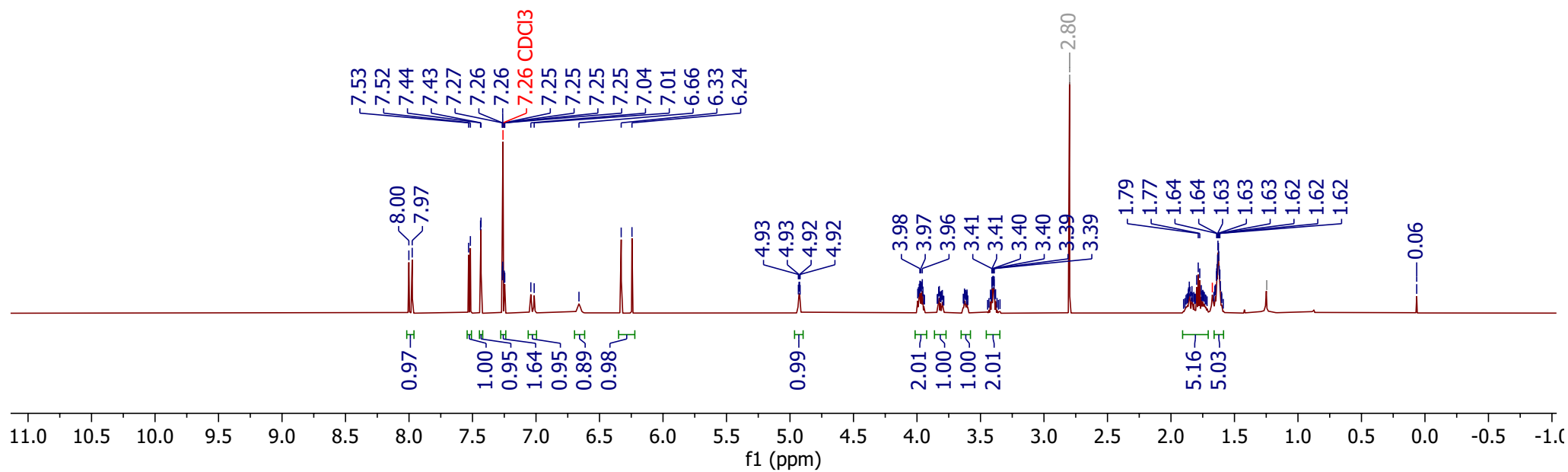
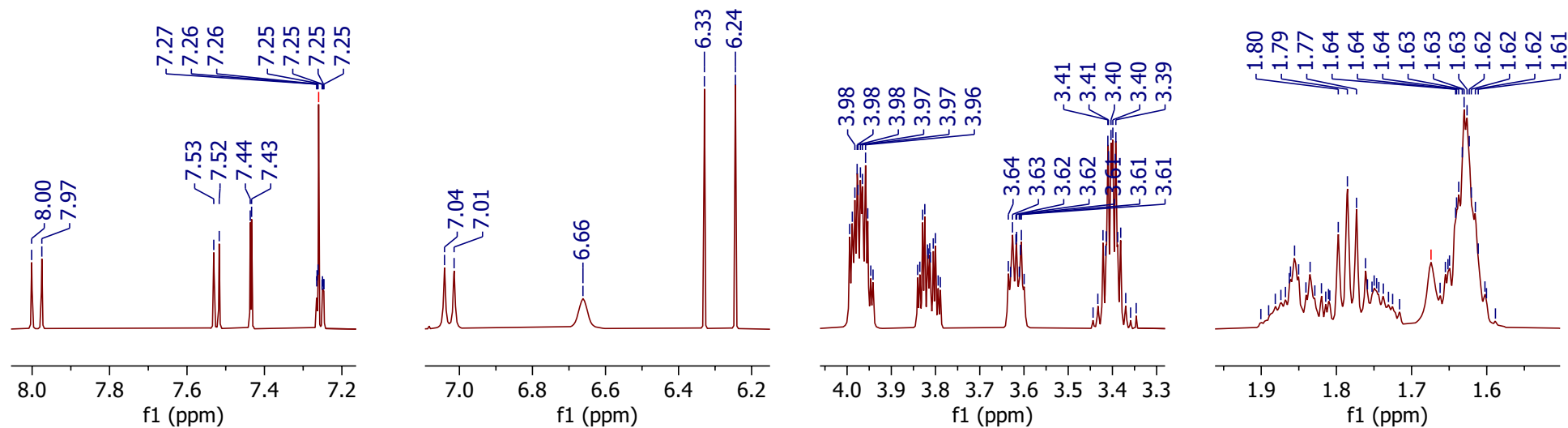
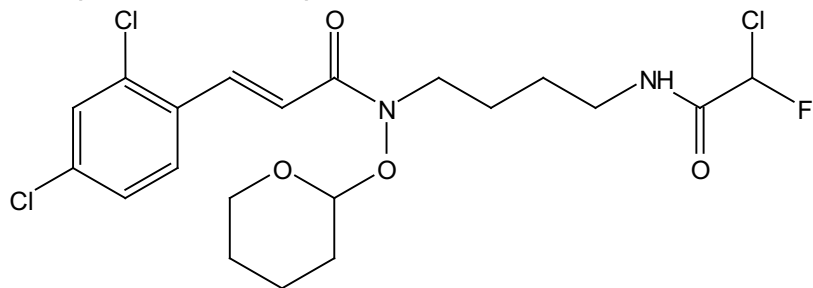
Compound 24
¹H NMR (600 MHz, DMSO-d₆)

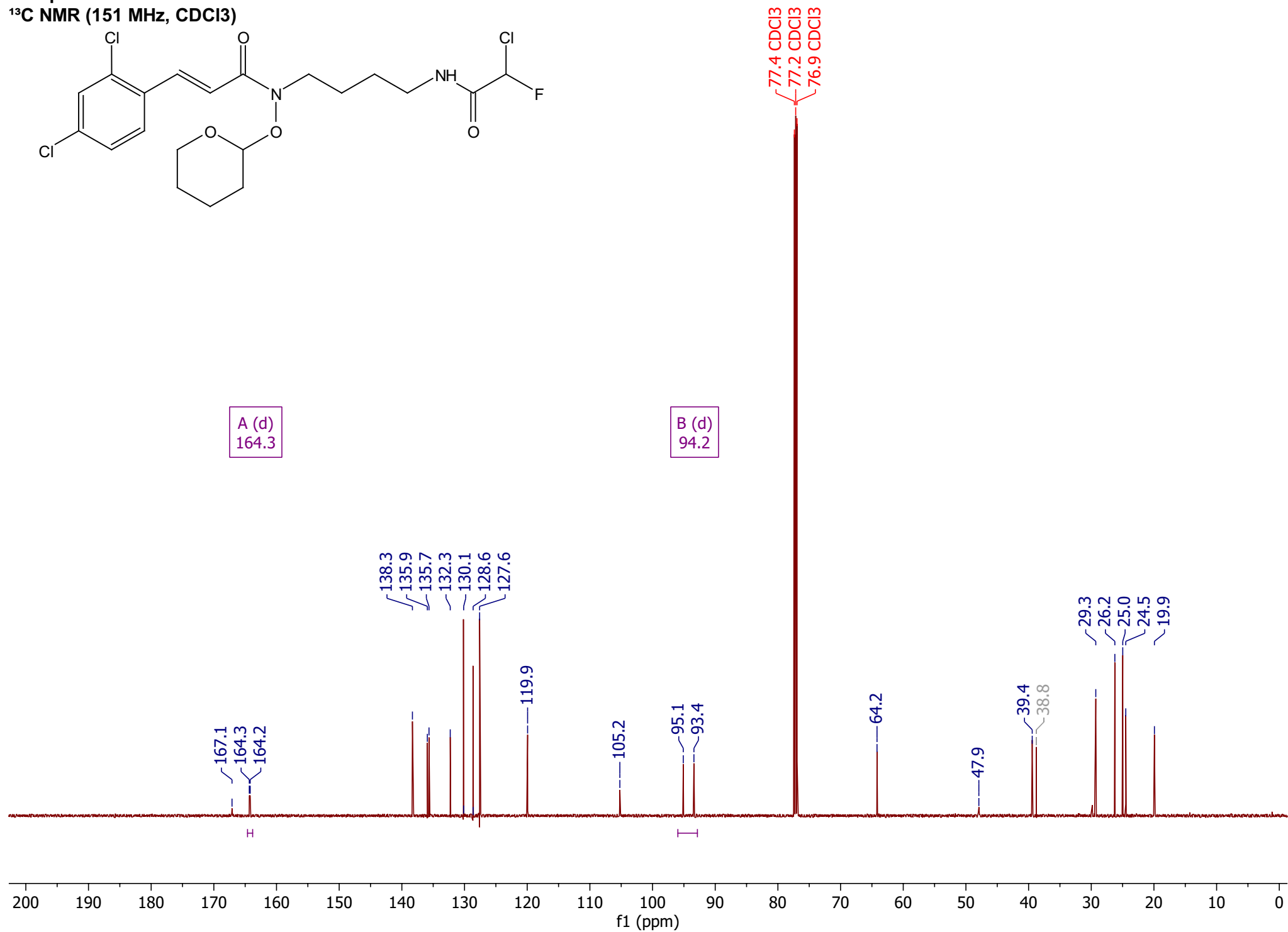
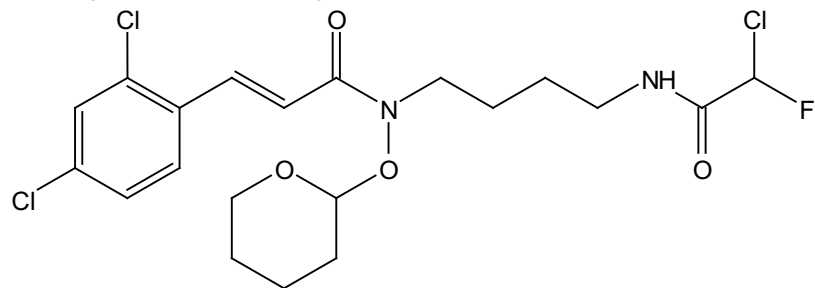


Compound 24
 ^{13}C NMR (151 MHz, DMSO- d_6)

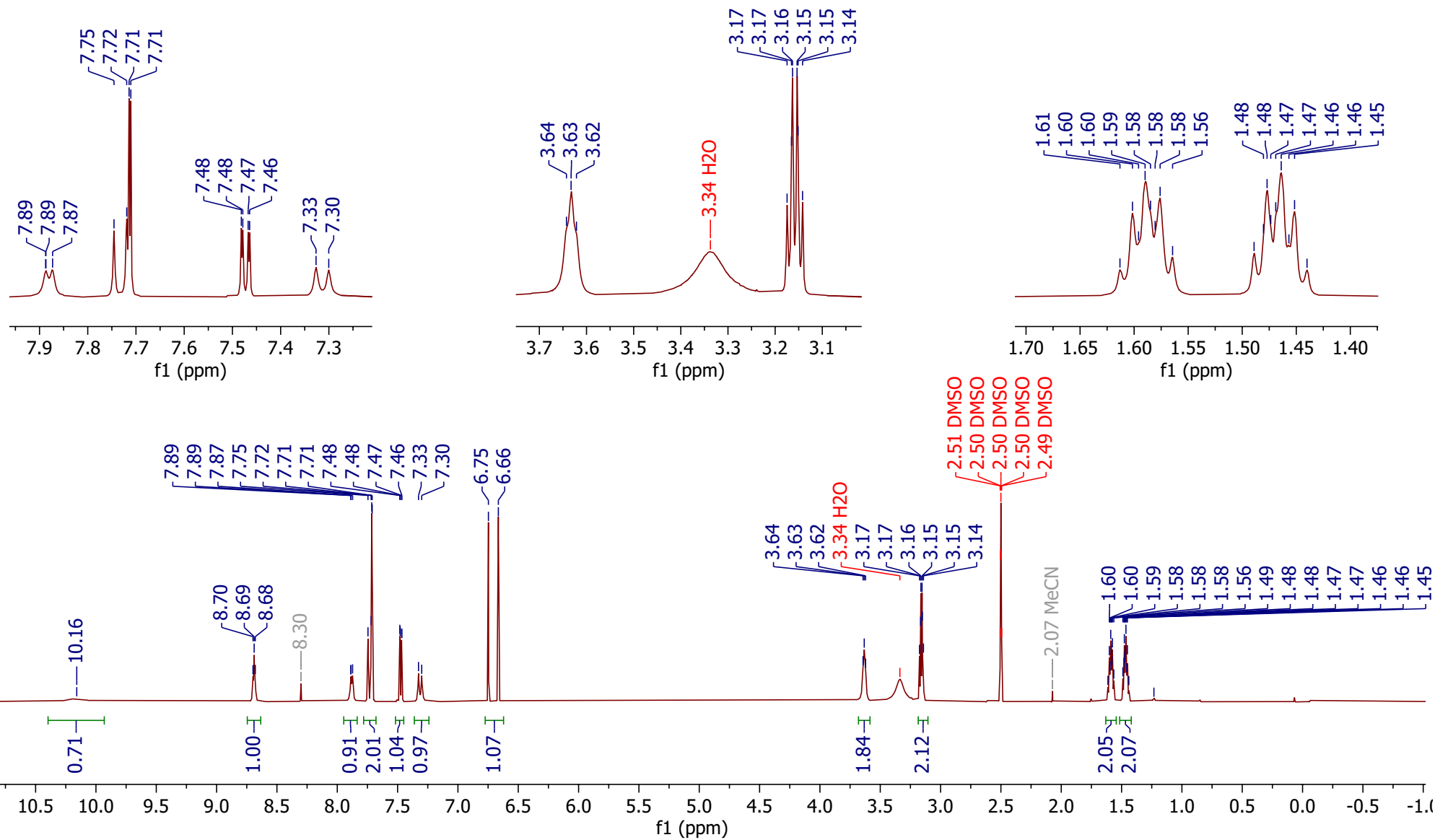
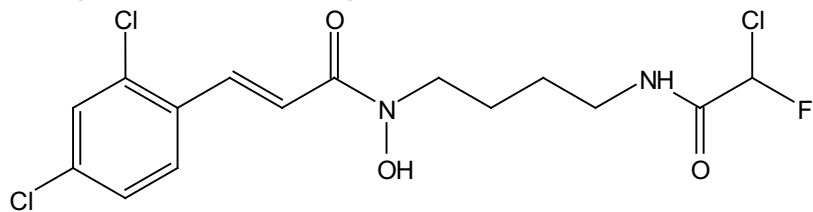


Compound S45
¹H NMR (600 MHz, CDCl₃)

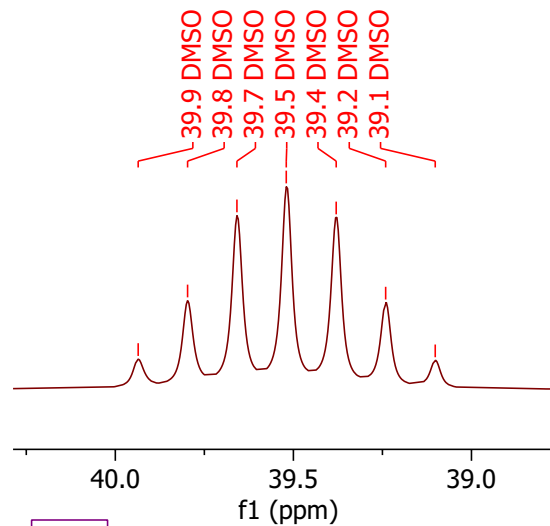
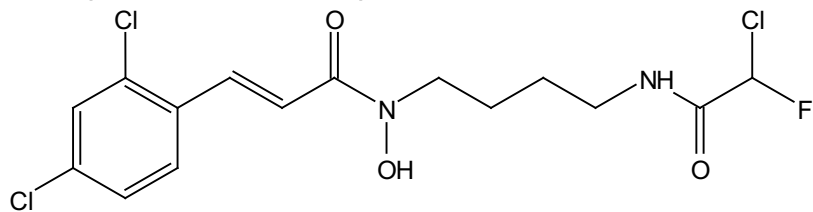


Compound S45 **^{13}C NMR (151 MHz, CDCl_3)**

Compound 25
¹H NMR (600 MHz, DMSO-d₆)

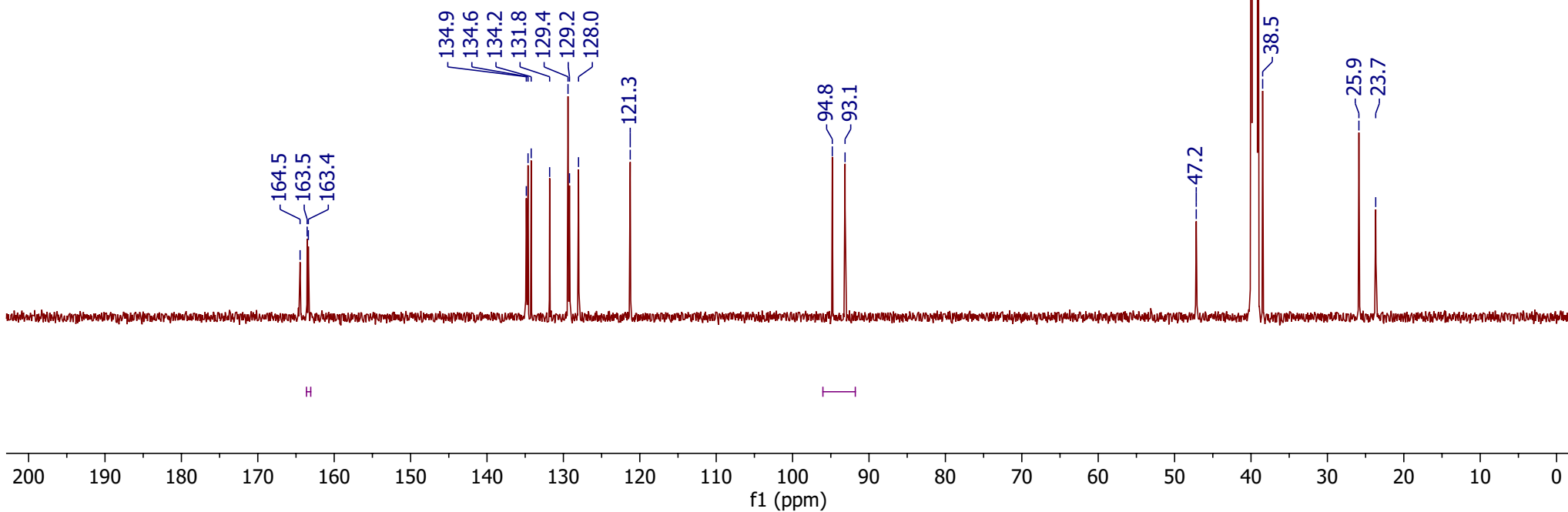


Compound 25
 ^{13}C NMR (151 MHz, DMSO- d_6)

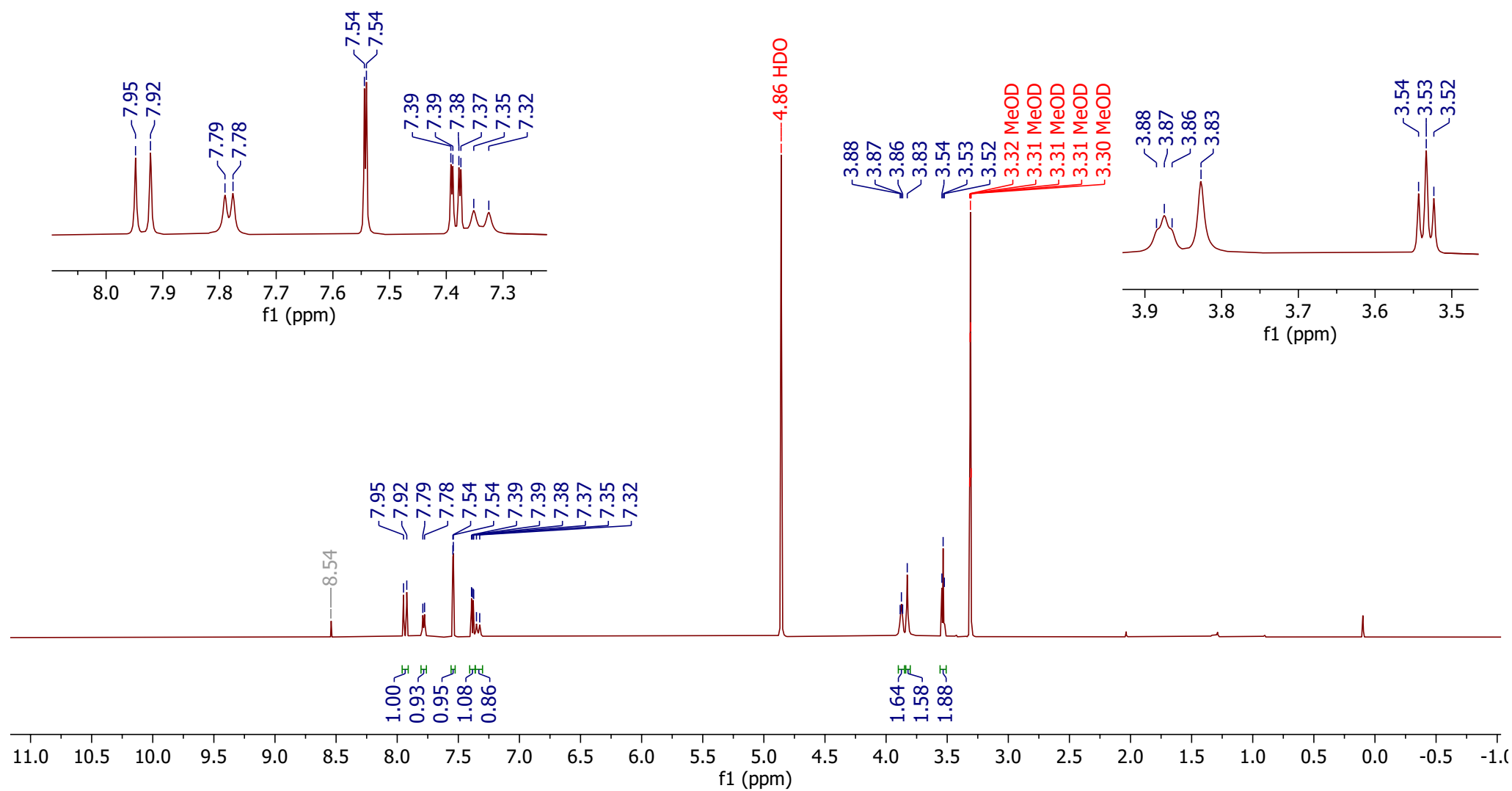
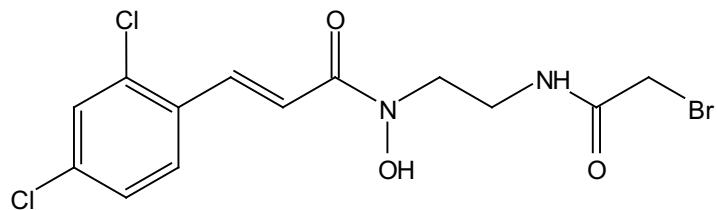


A (d)
163.5

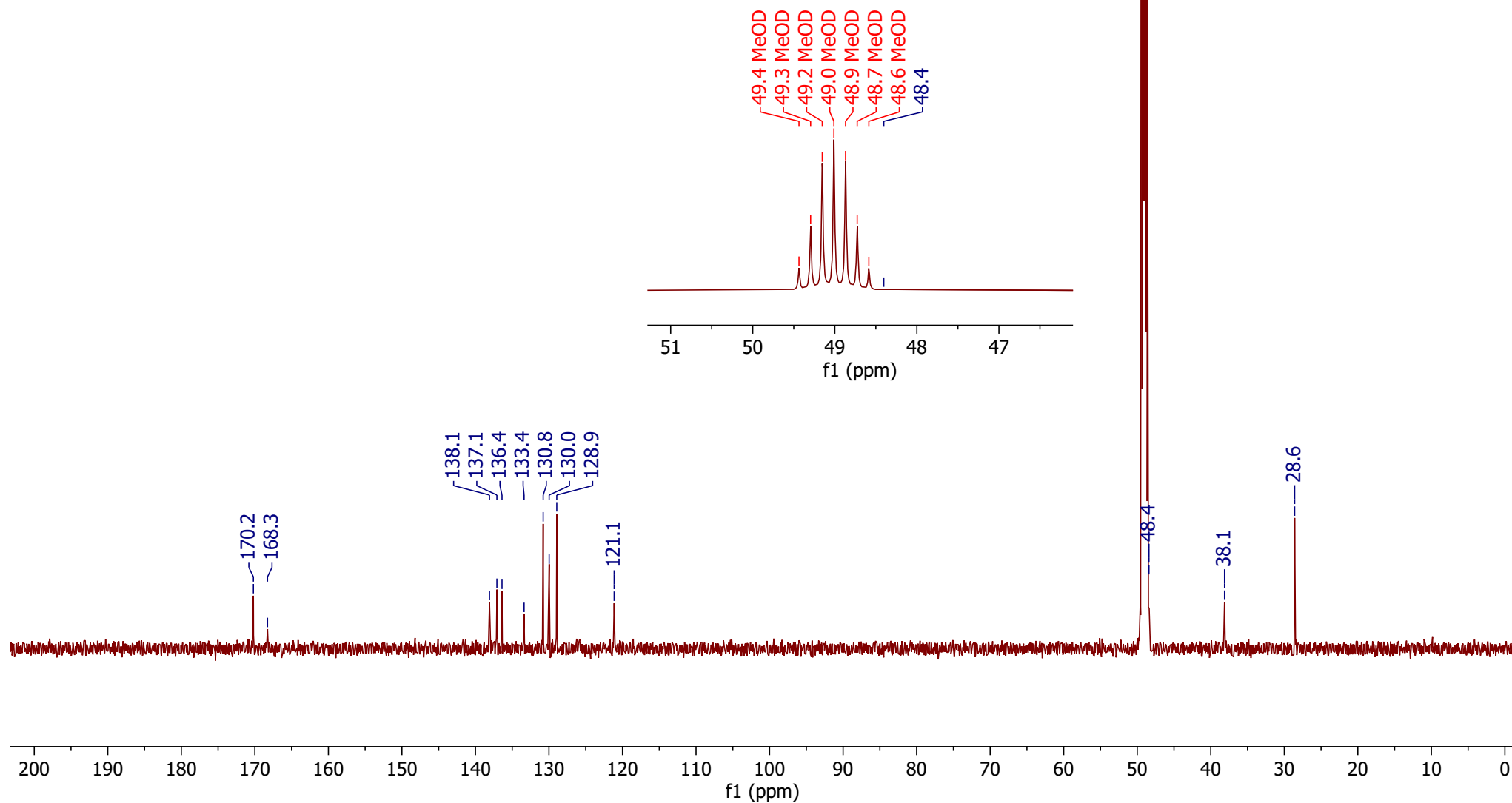
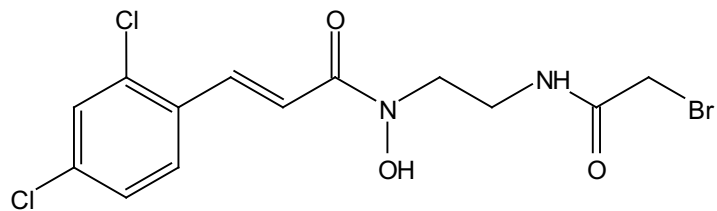
B (d)
94.0



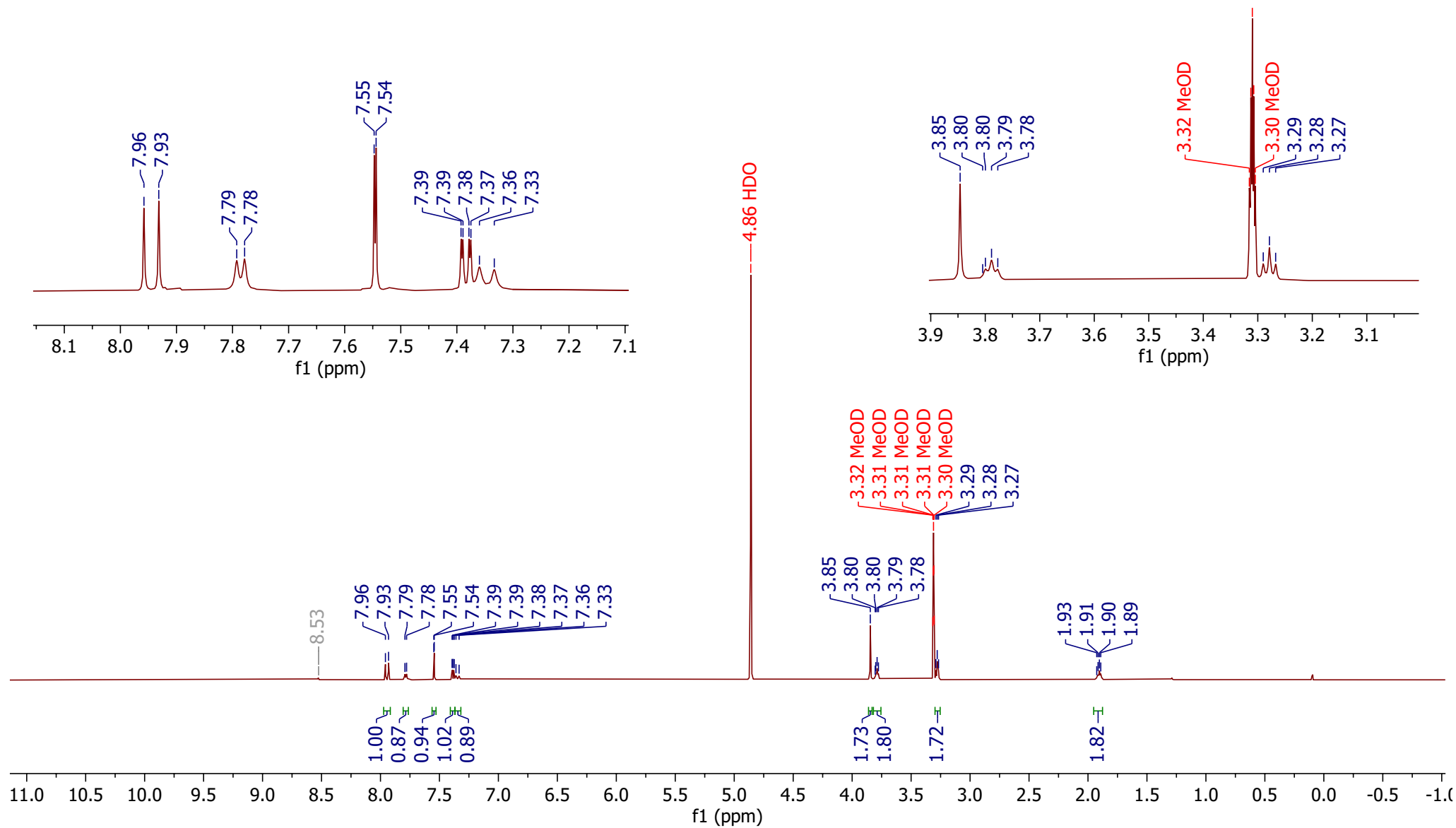
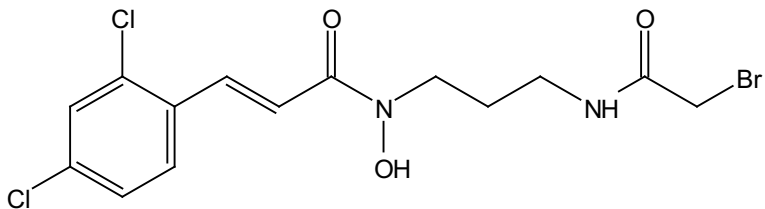
Compound 26
¹H NMR (600 MHz, MeOD-d₄)



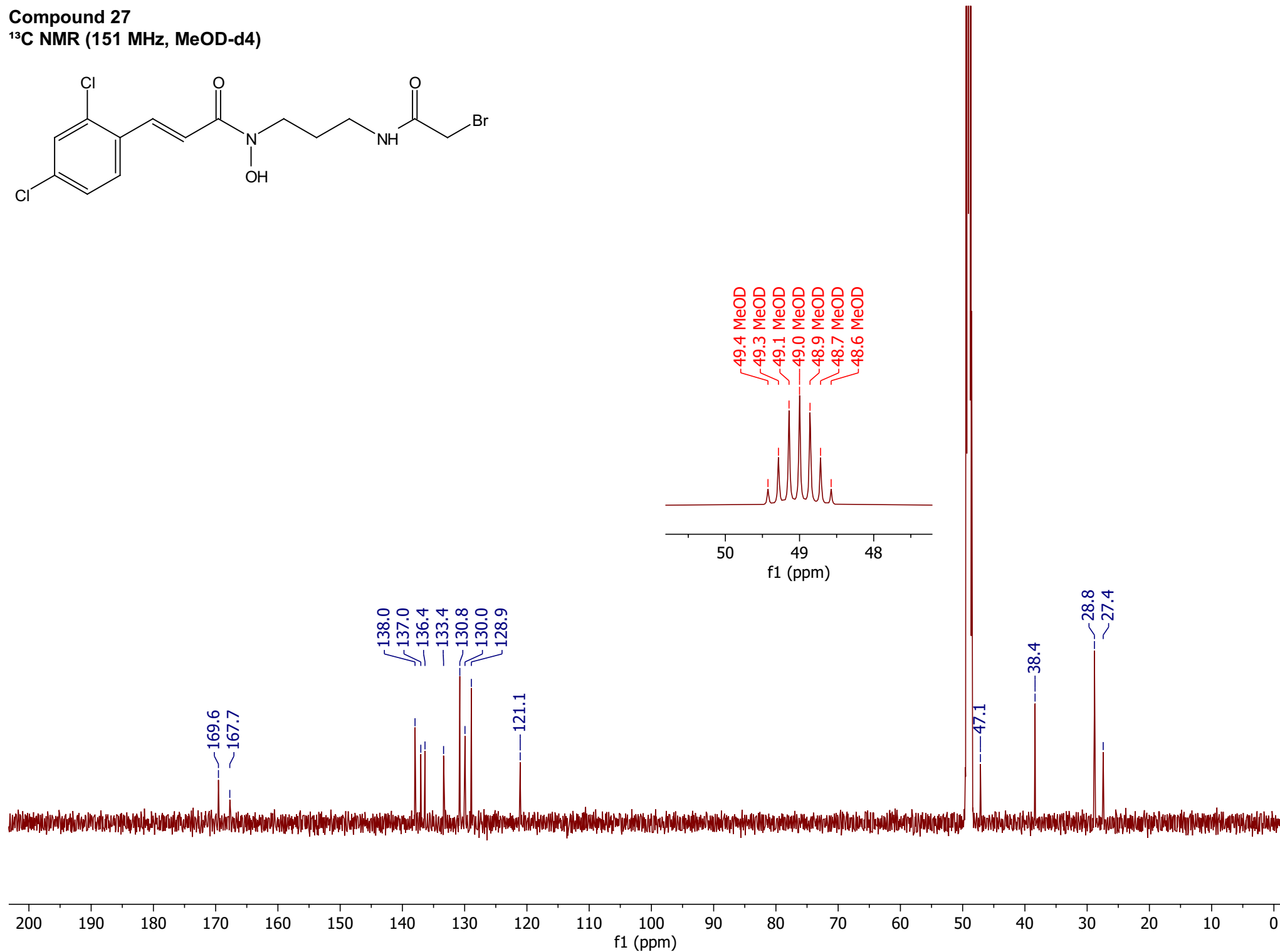
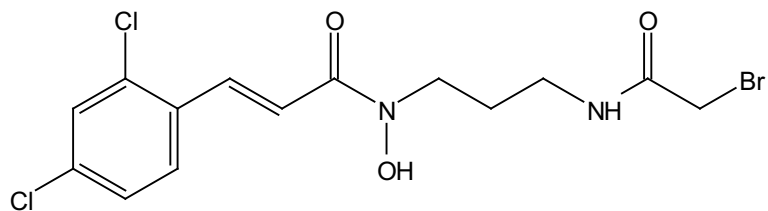
Compound 26
 ^{13}C NMR (151 MHz, MeOD-d₄)



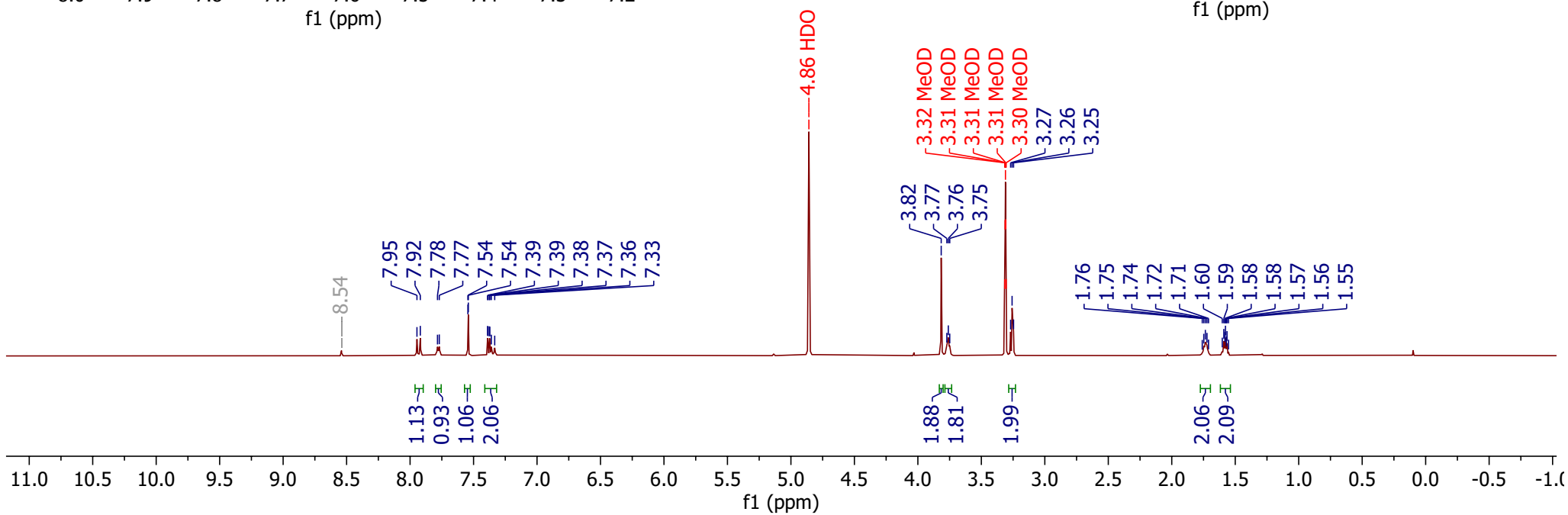
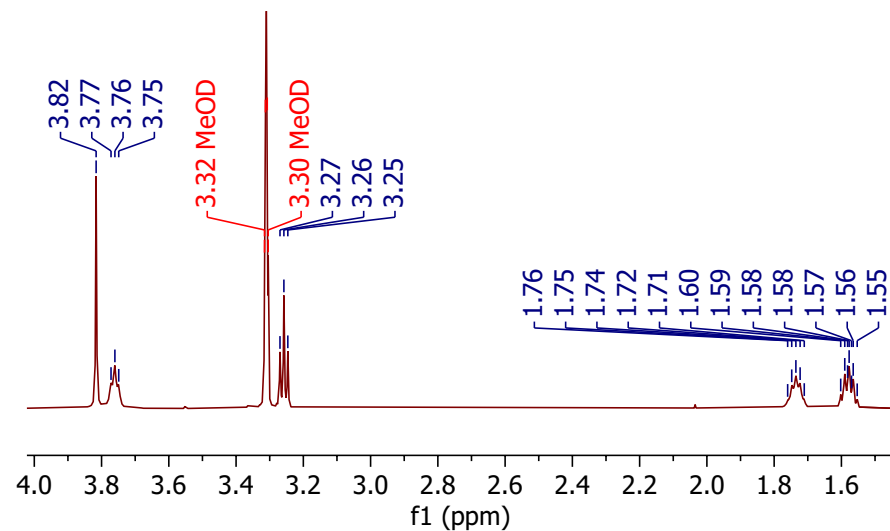
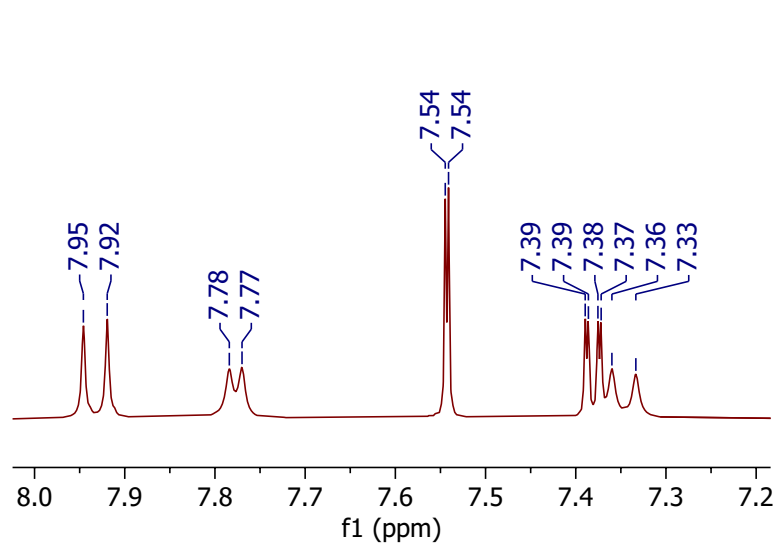
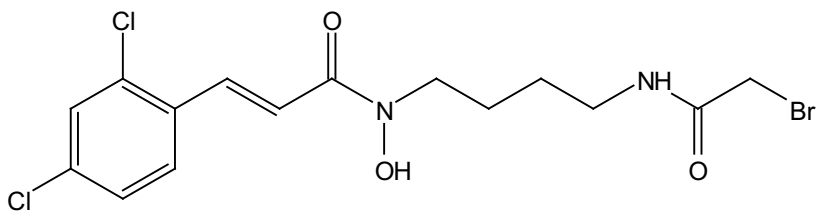
Compound 27
¹H NMR (600 MHz, MeOD-d₄)



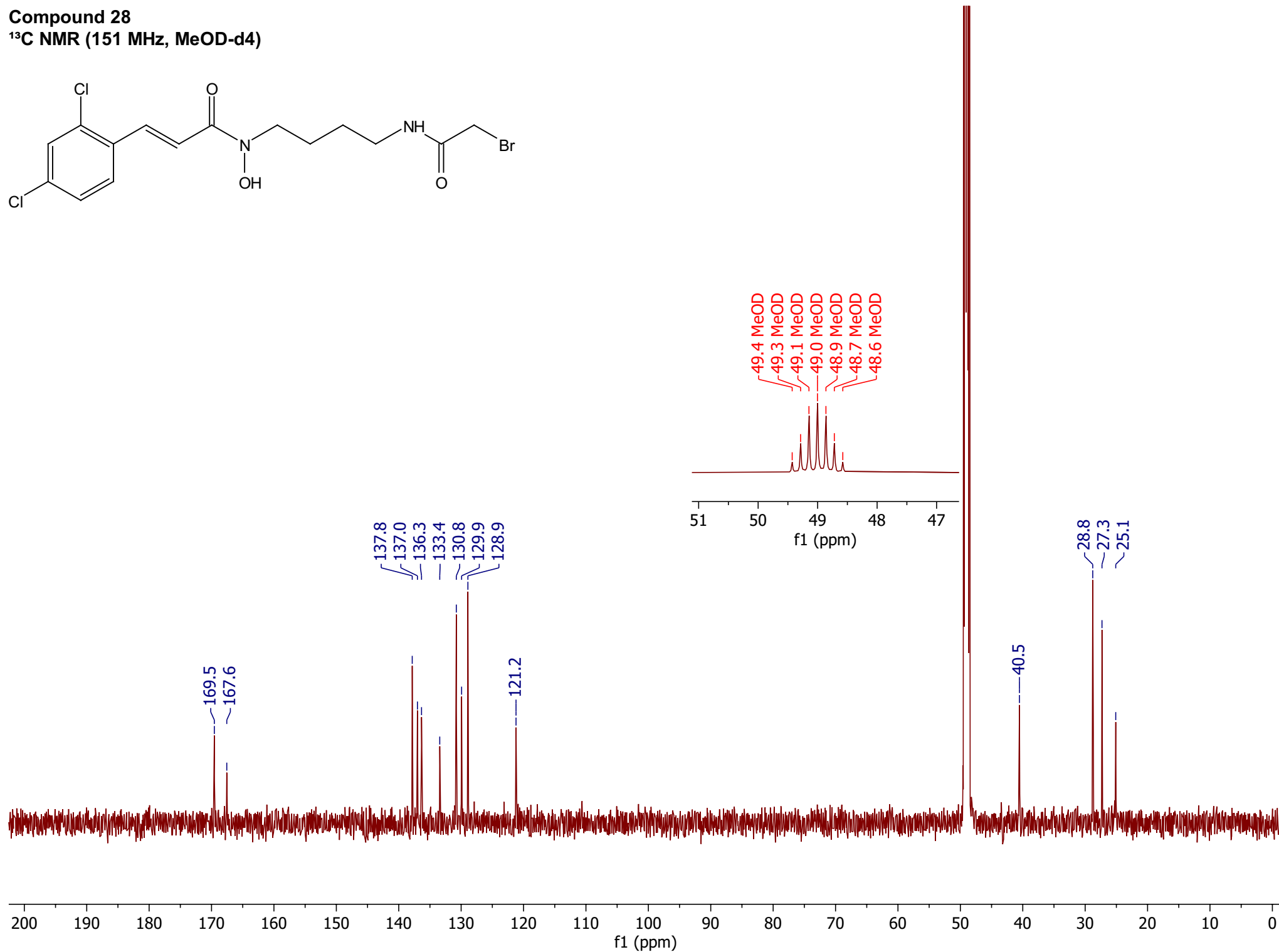
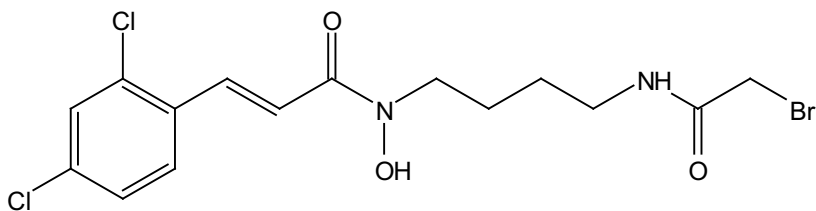
Compound 27
¹³C NMR (151 MHz, MeOD-d4)



Compound 28
¹H NMR (600 MHz, MeOD-d₄)

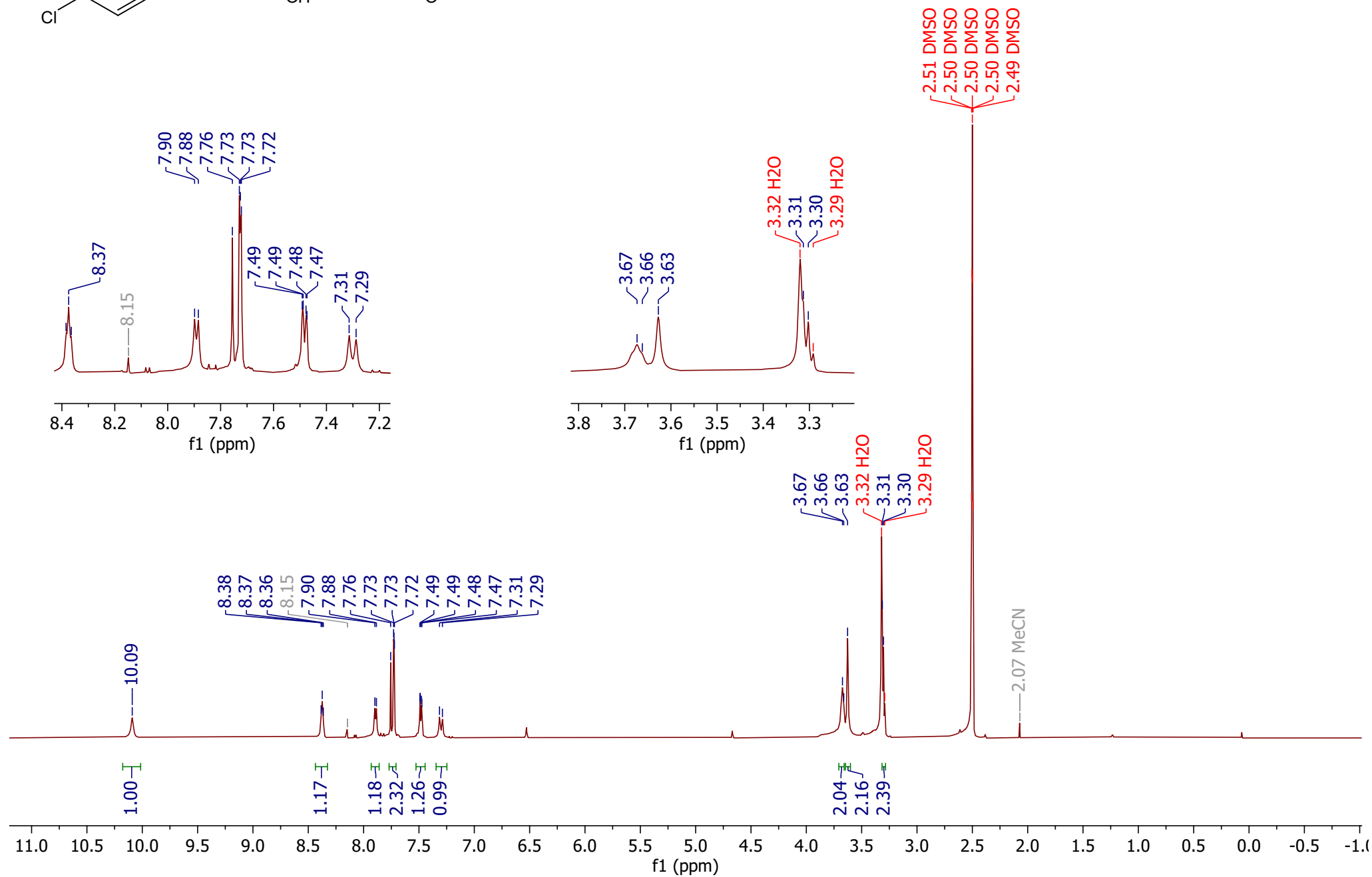
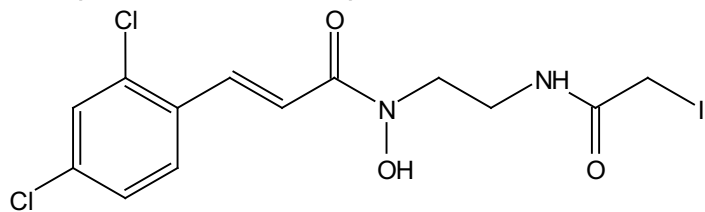


Compound 28
 ^{13}C NMR (151 MHz, MeOD-d₄)

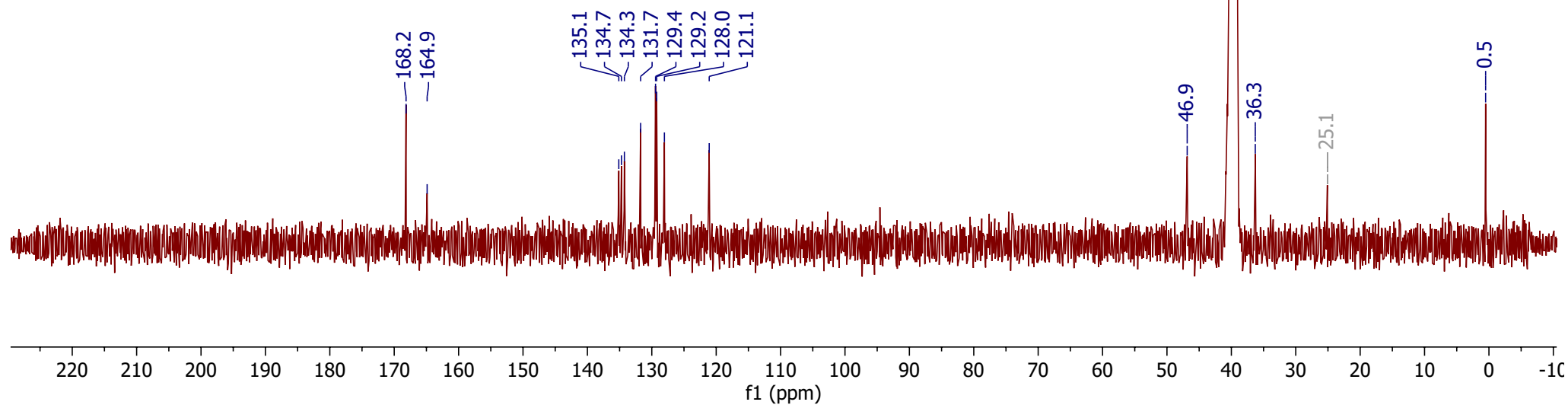
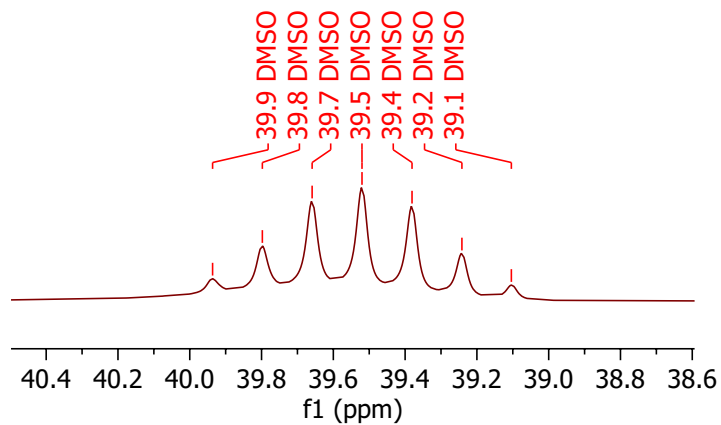
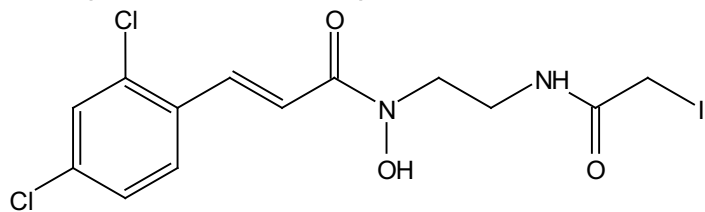


Compound 29

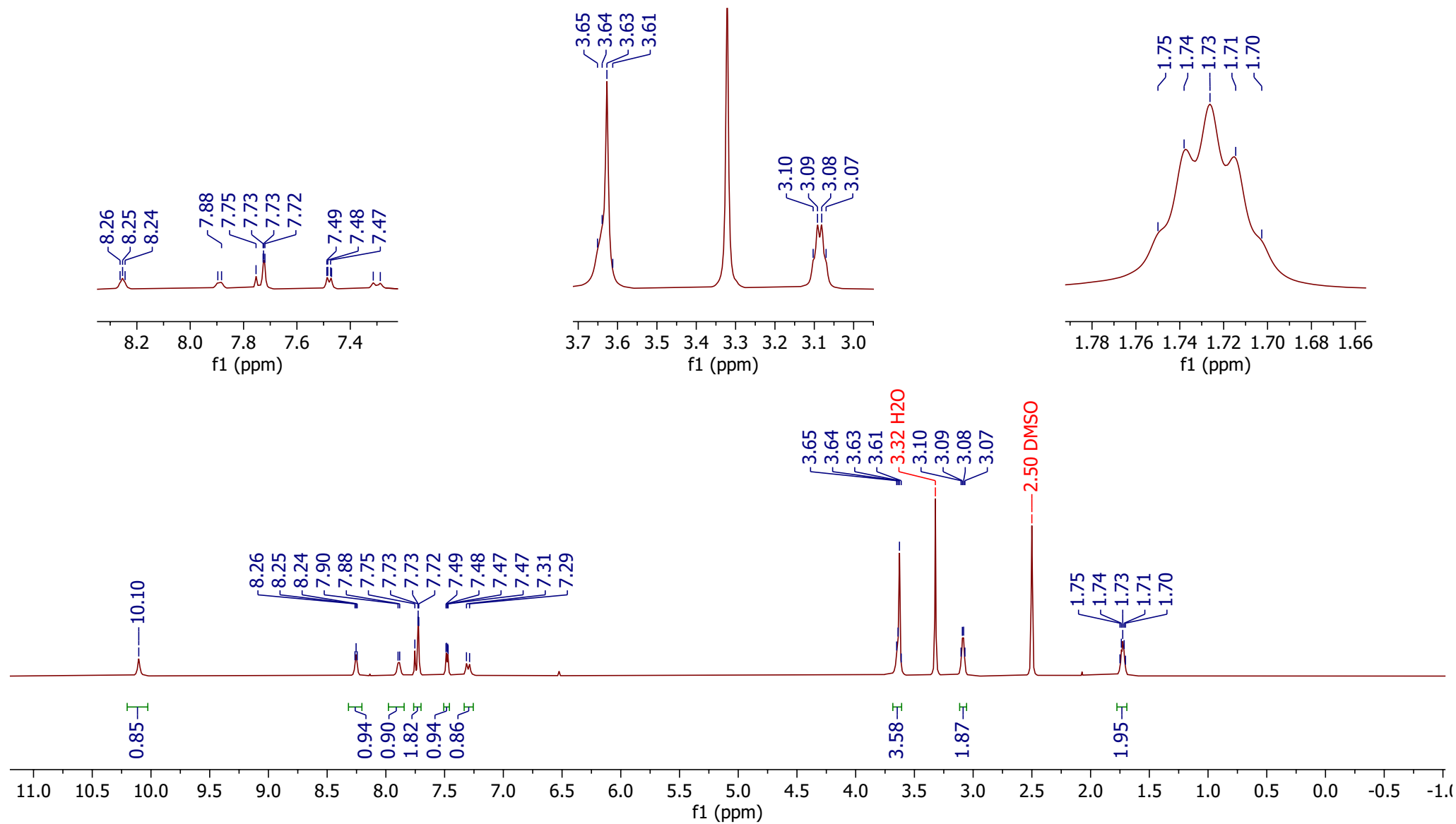
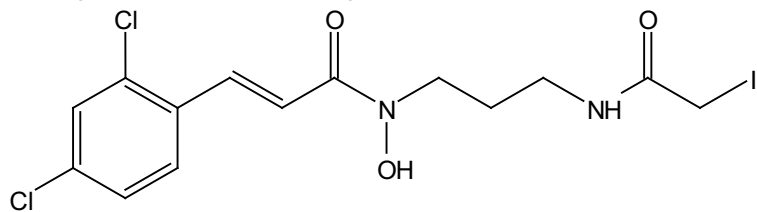
¹H NMR (600 MHz, DMSO-d₆)



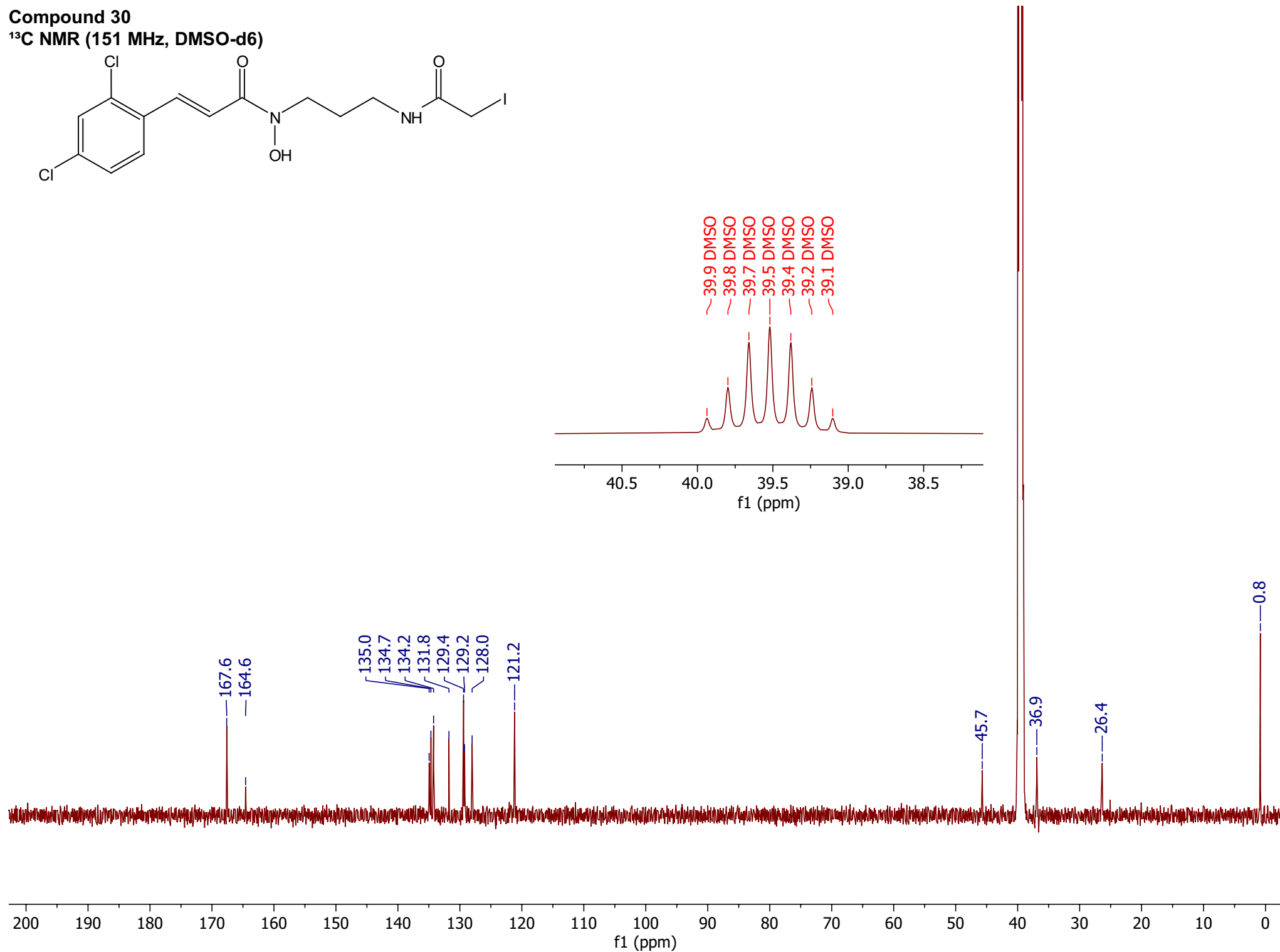
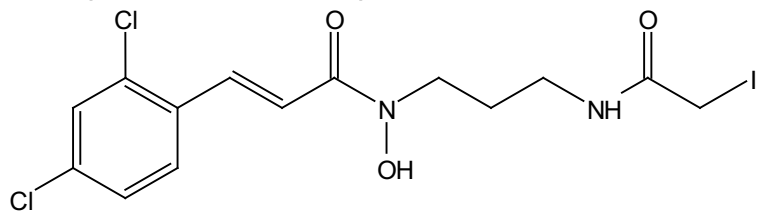
Compound 29
 ^{13}C NMR (151 MHz, DMSO- d_6)



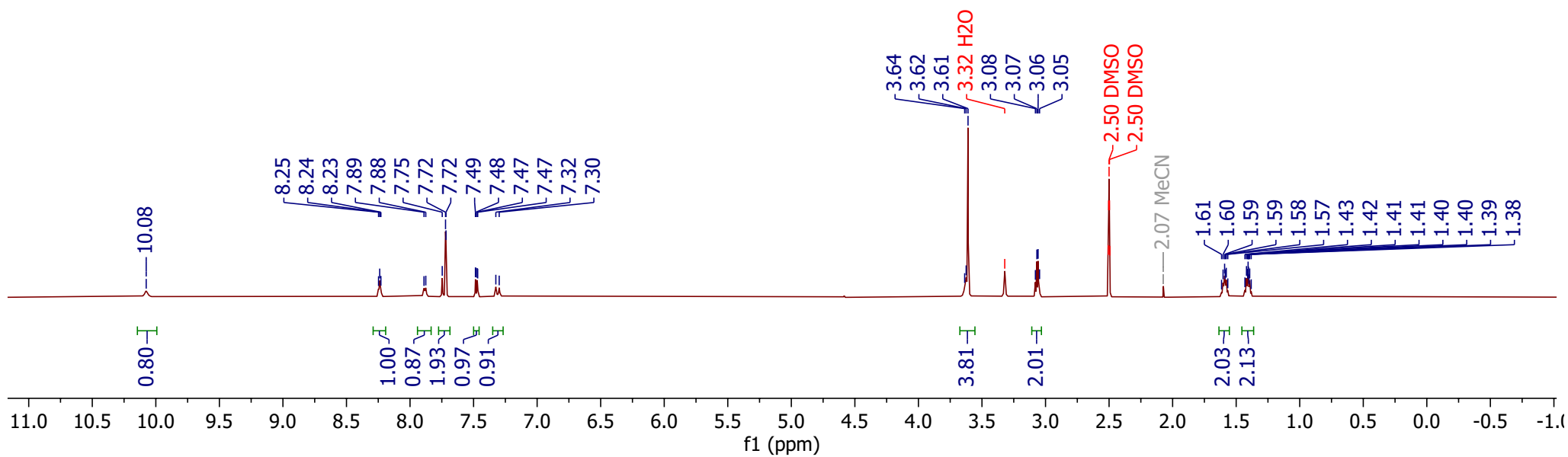
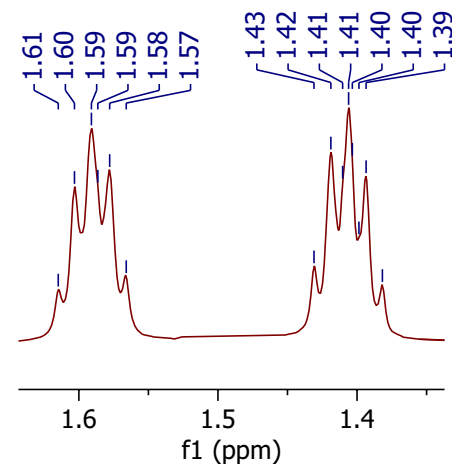
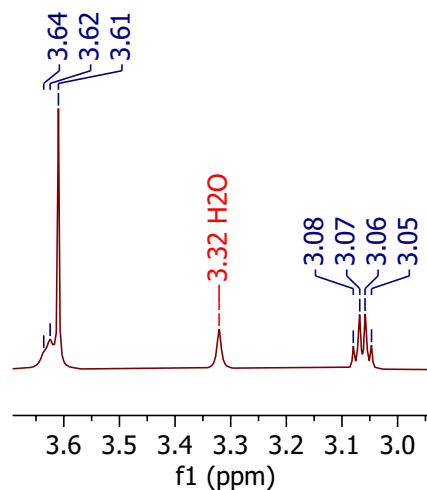
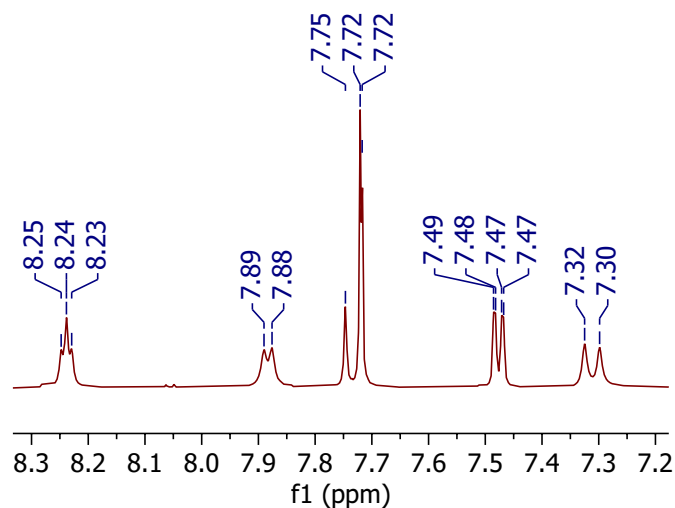
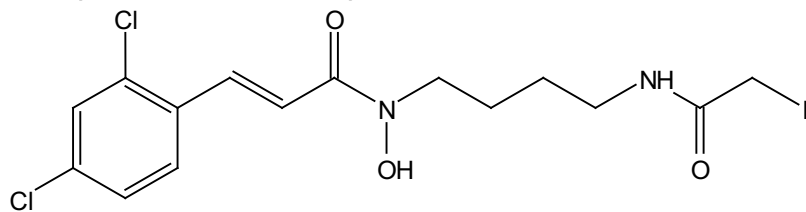
Compound 30
¹H NMR (600 MHz, DMSO-d₆)



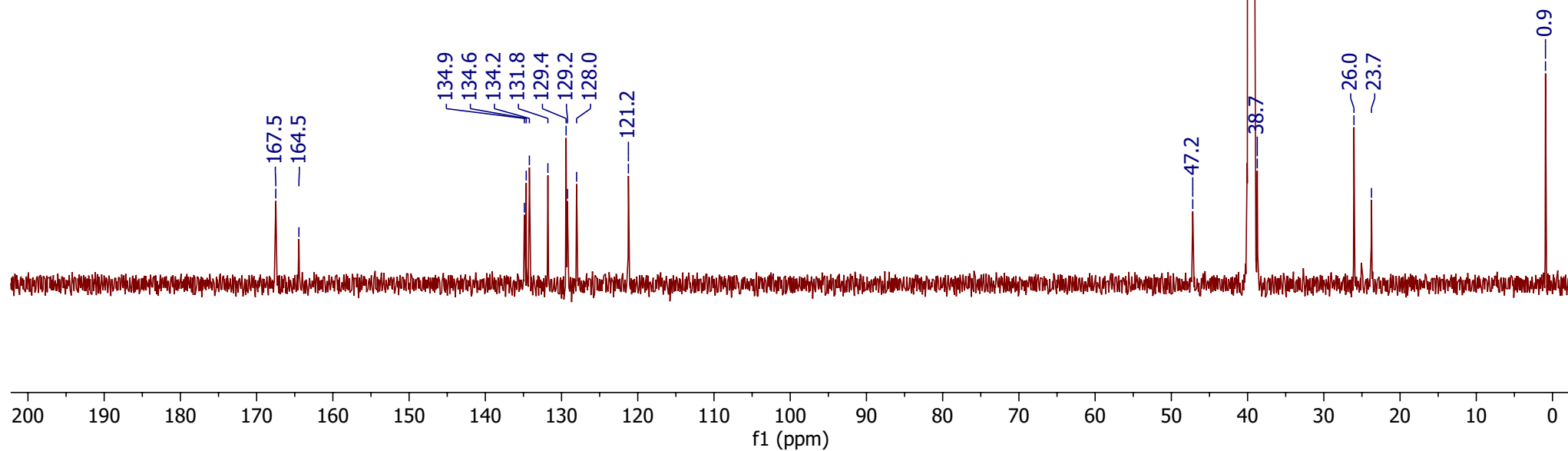
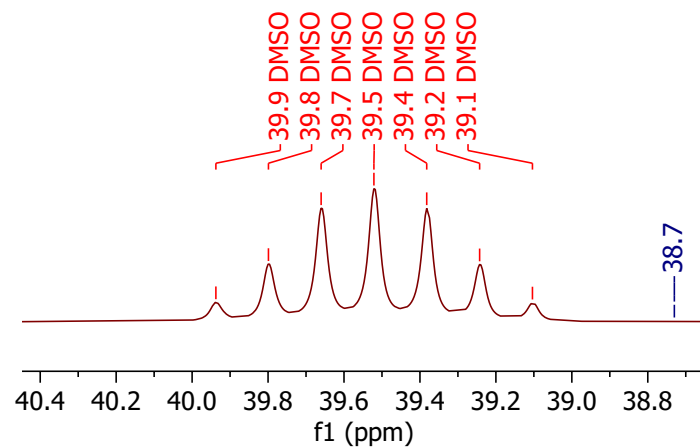
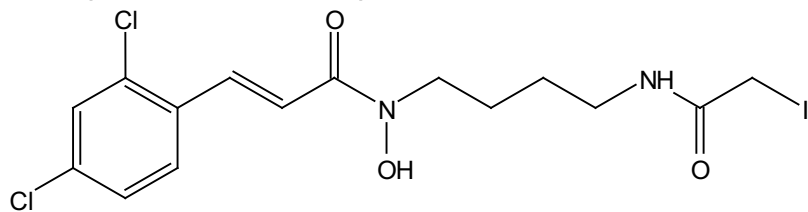
Compound 30
 ^{13}C NMR (151 MHz, DMSO- d_6)



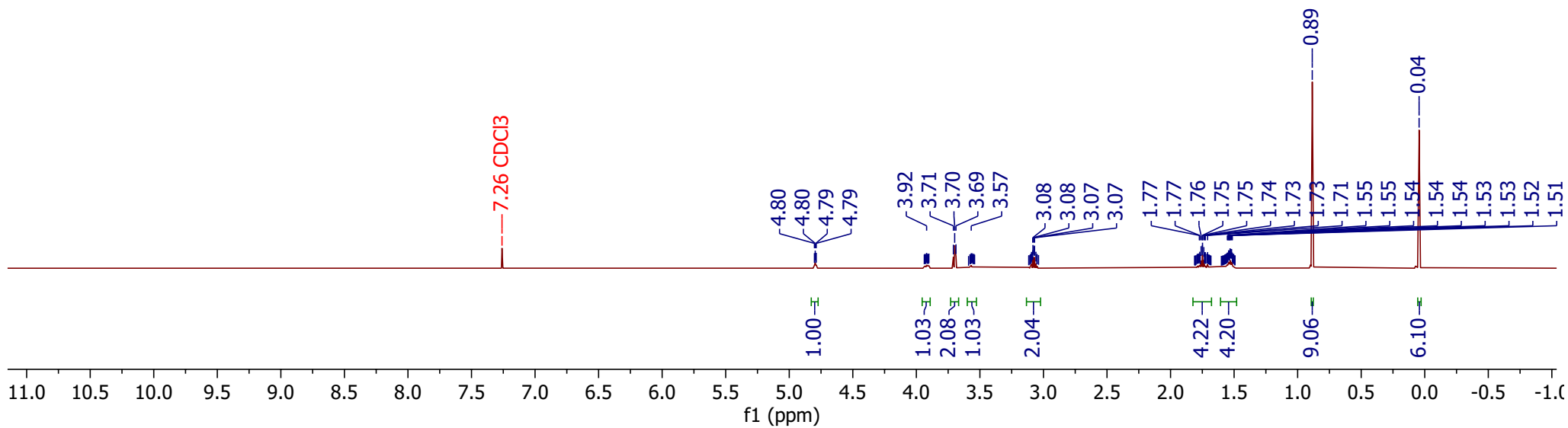
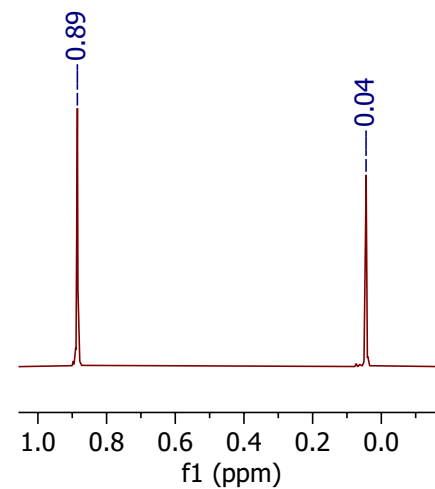
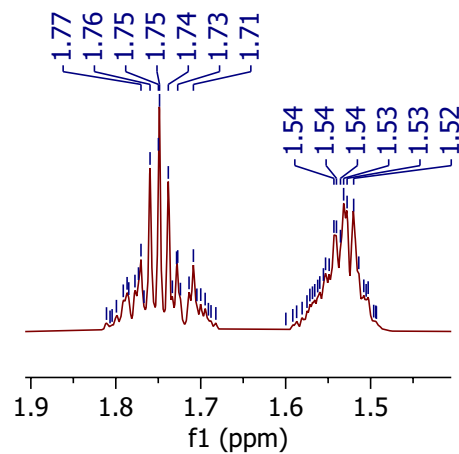
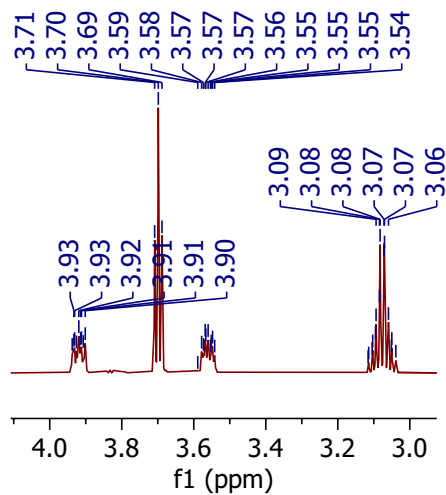
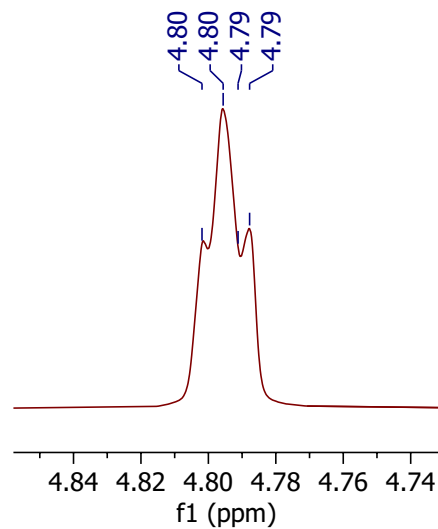
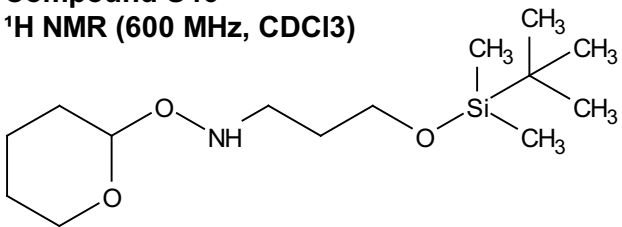
Compound 31
¹H NMR (600 MHz, DMSO-d₆)



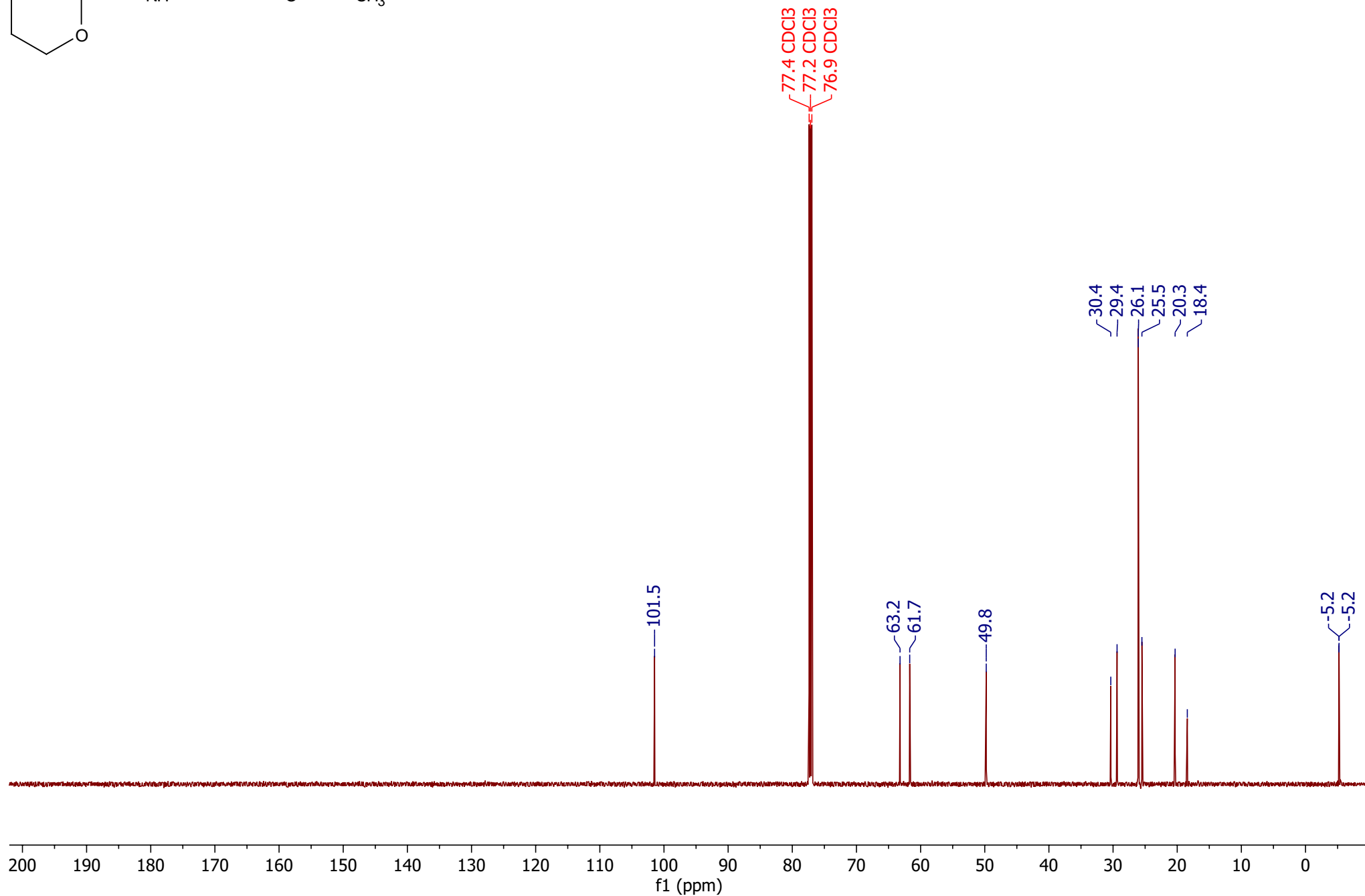
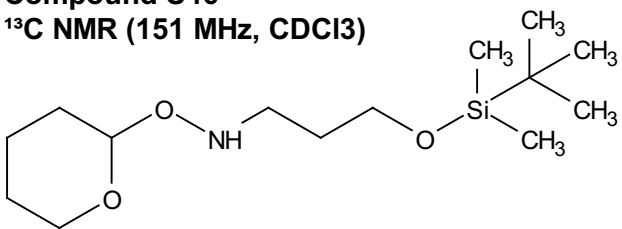
Compound 31
 ^{13}C NMR (151 MHz, DMSO- d_6)



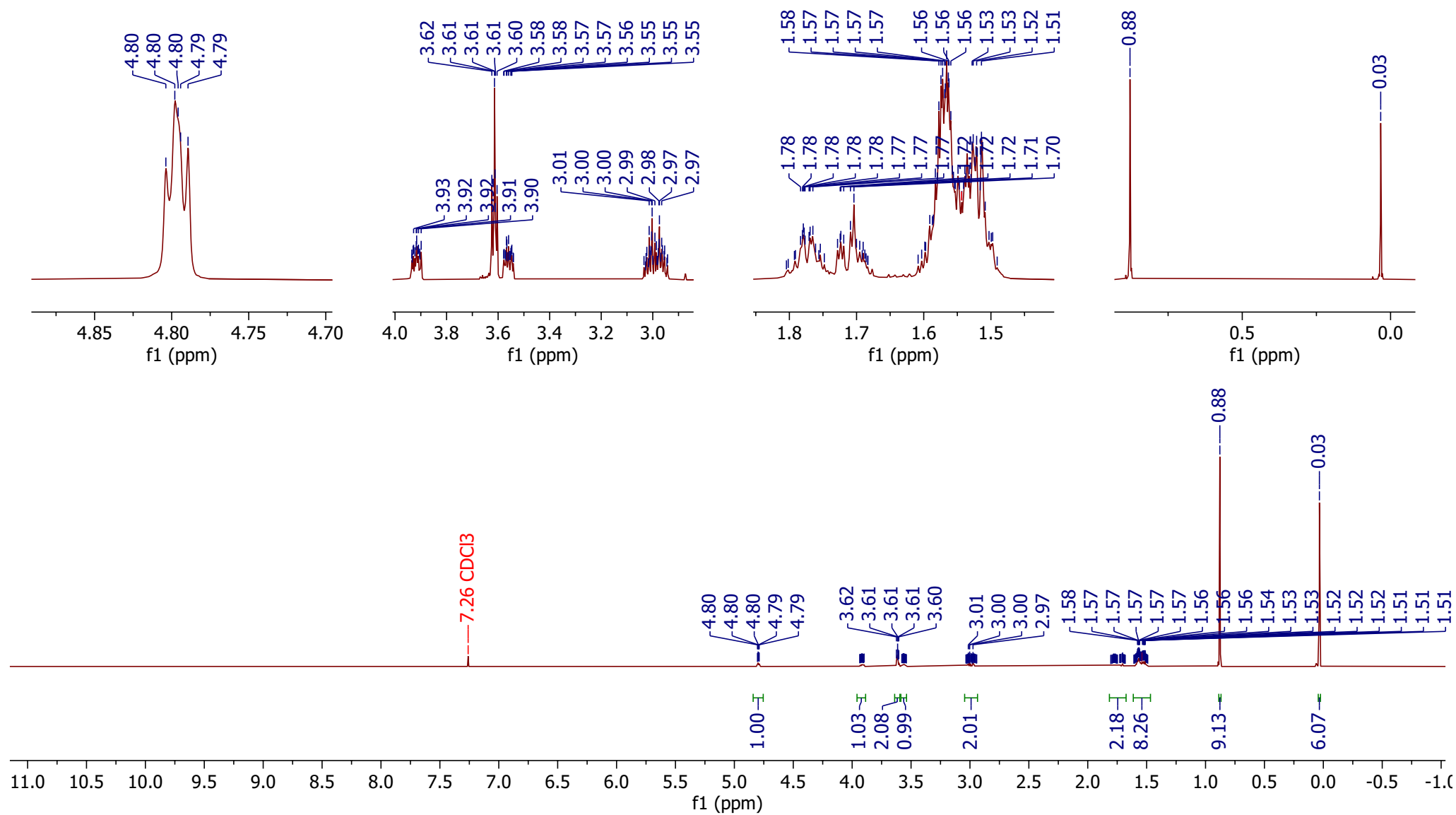
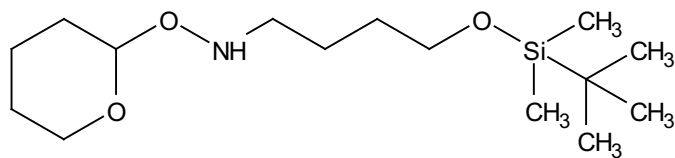
¹H NMR (600 MHz, CDCl₃)

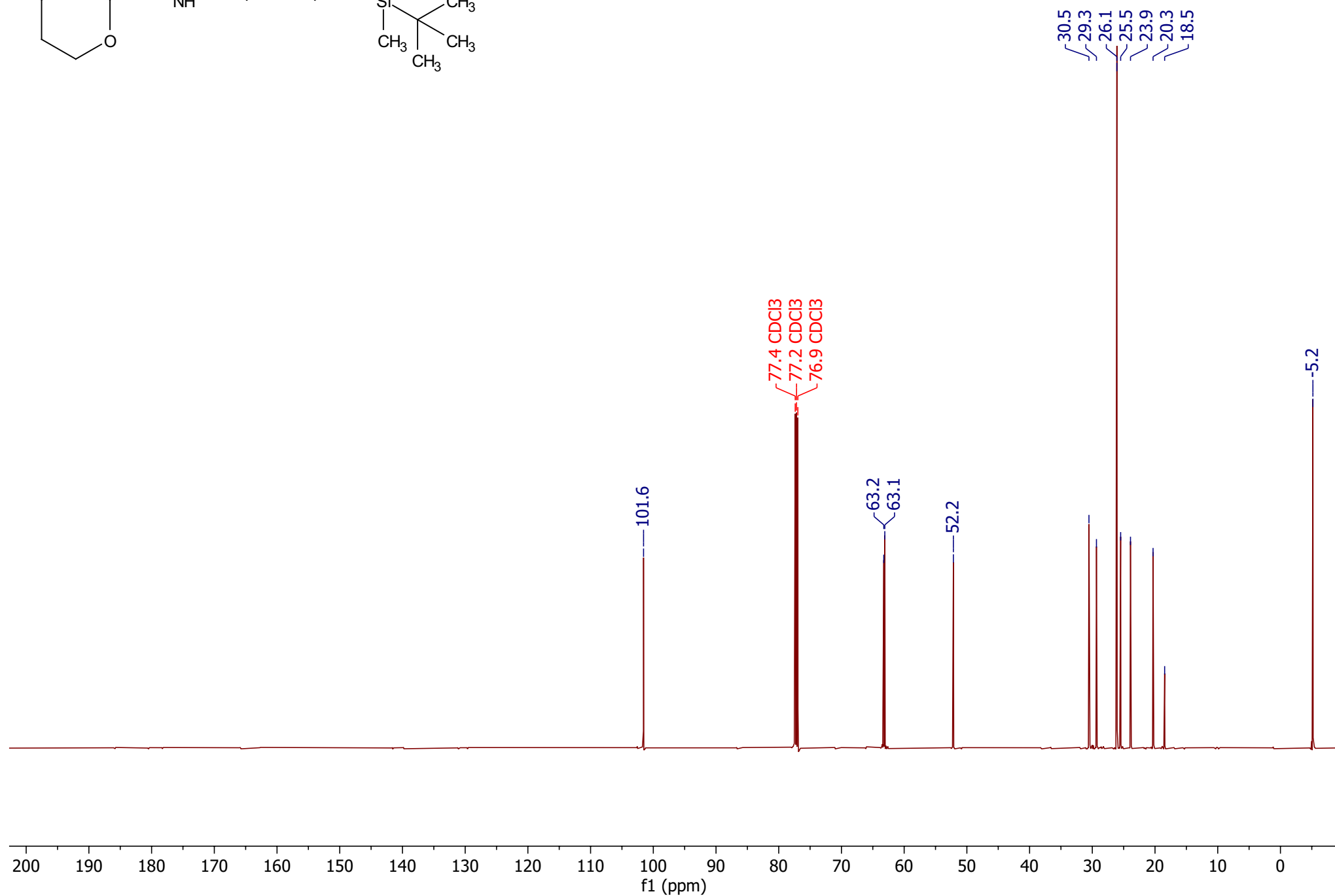
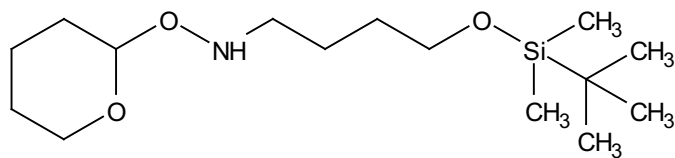


Compound S46
 ^{13}C NMR (151 MHz, CDCl_3)

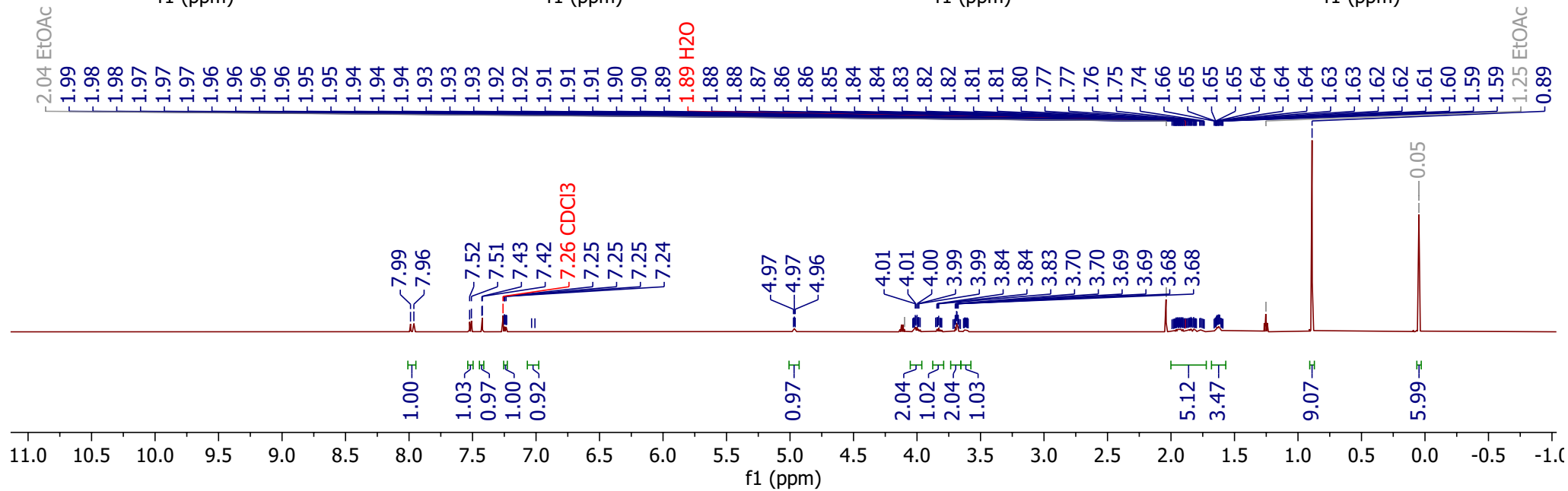
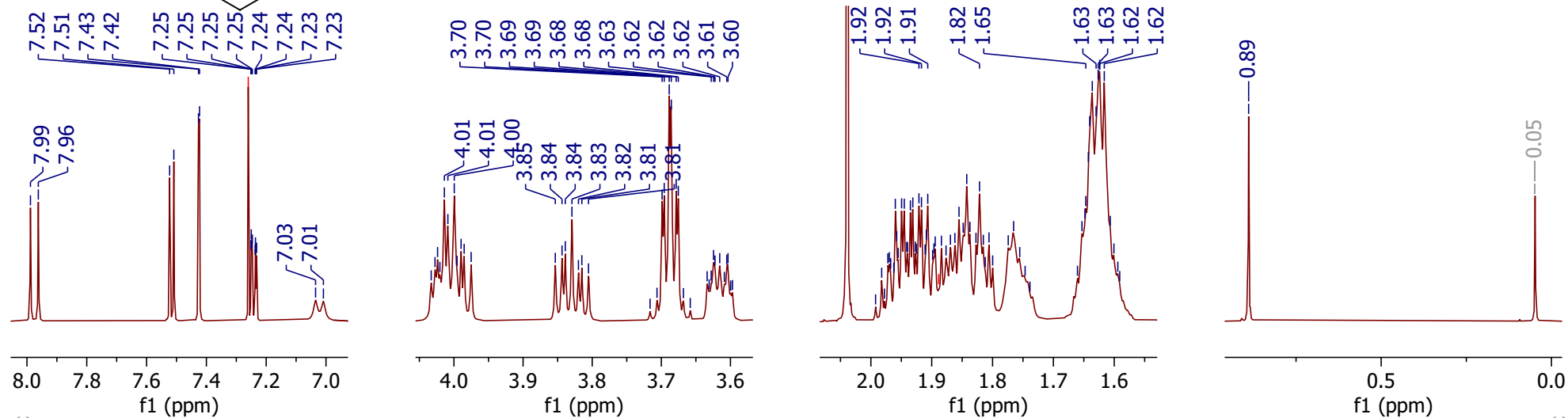
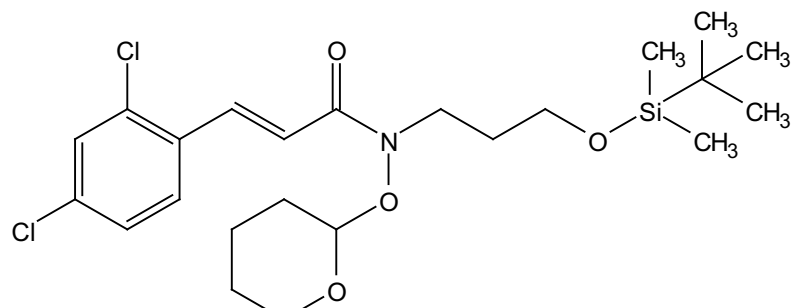


Compound S47
¹H NMR (600 MHz, CDCl₃)

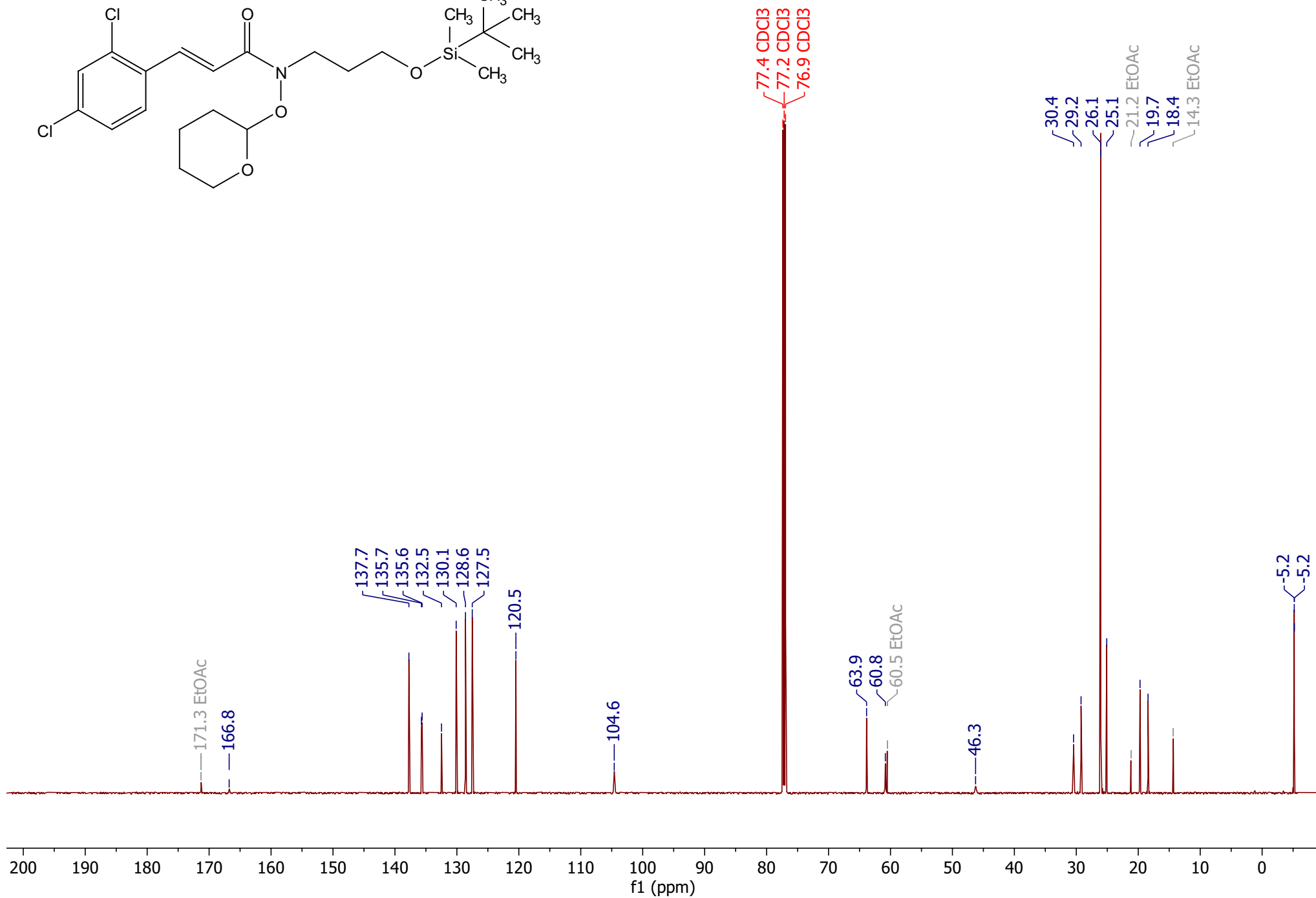
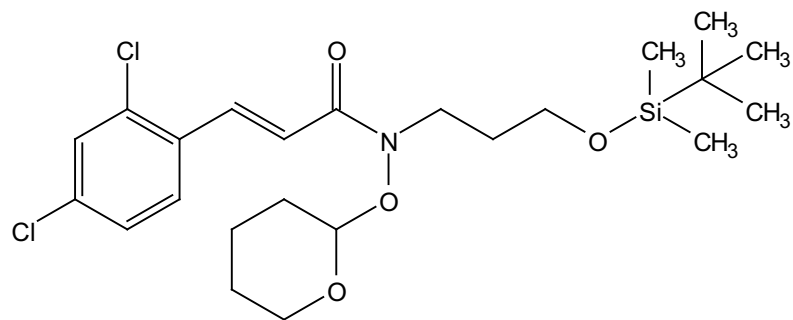


Compound S47 **^{13}C NMR (151 MHz, CDCl_3)**

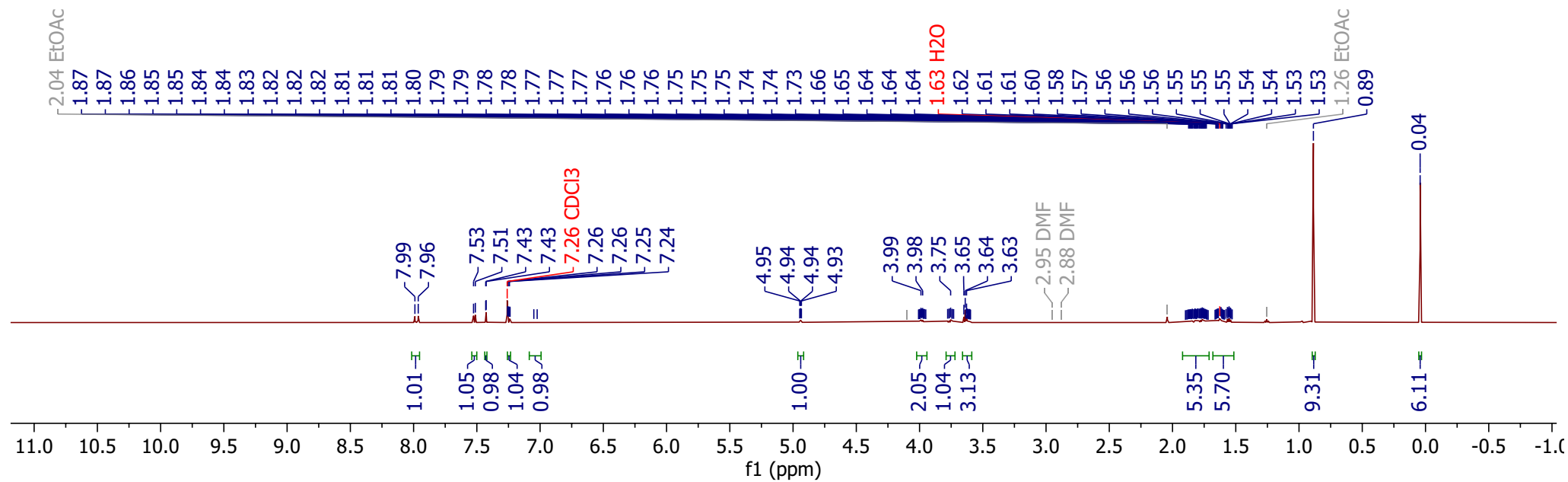
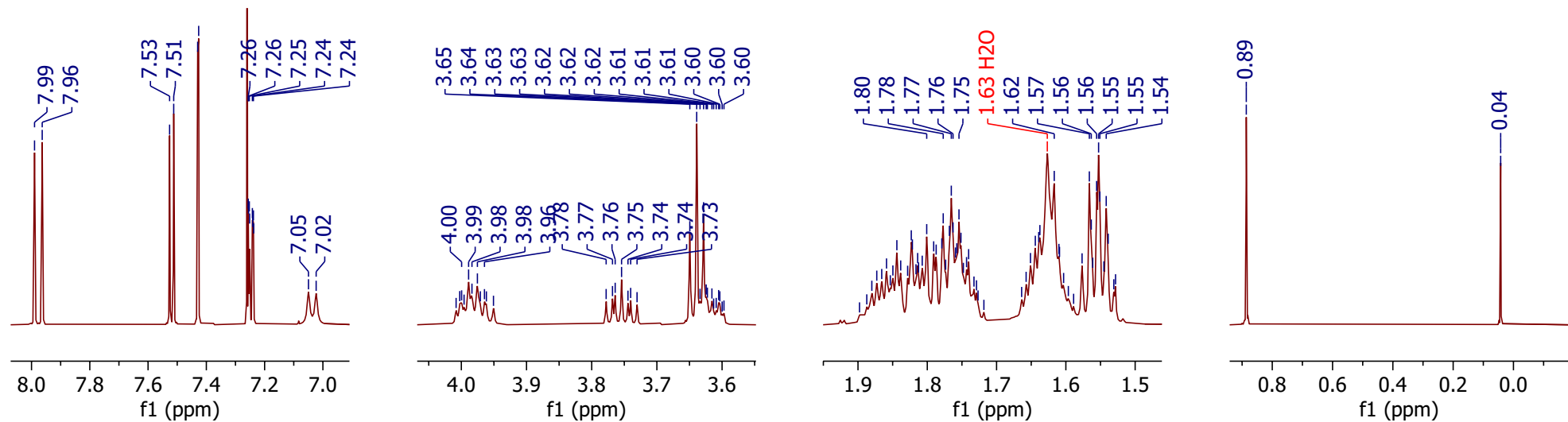
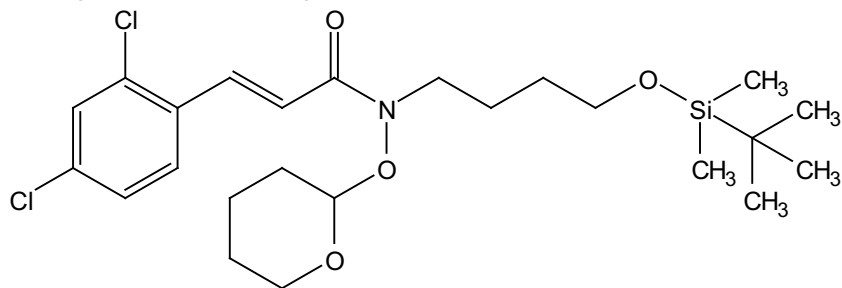
Compound S48
¹H NMR (600 MHz, CDCl₃)

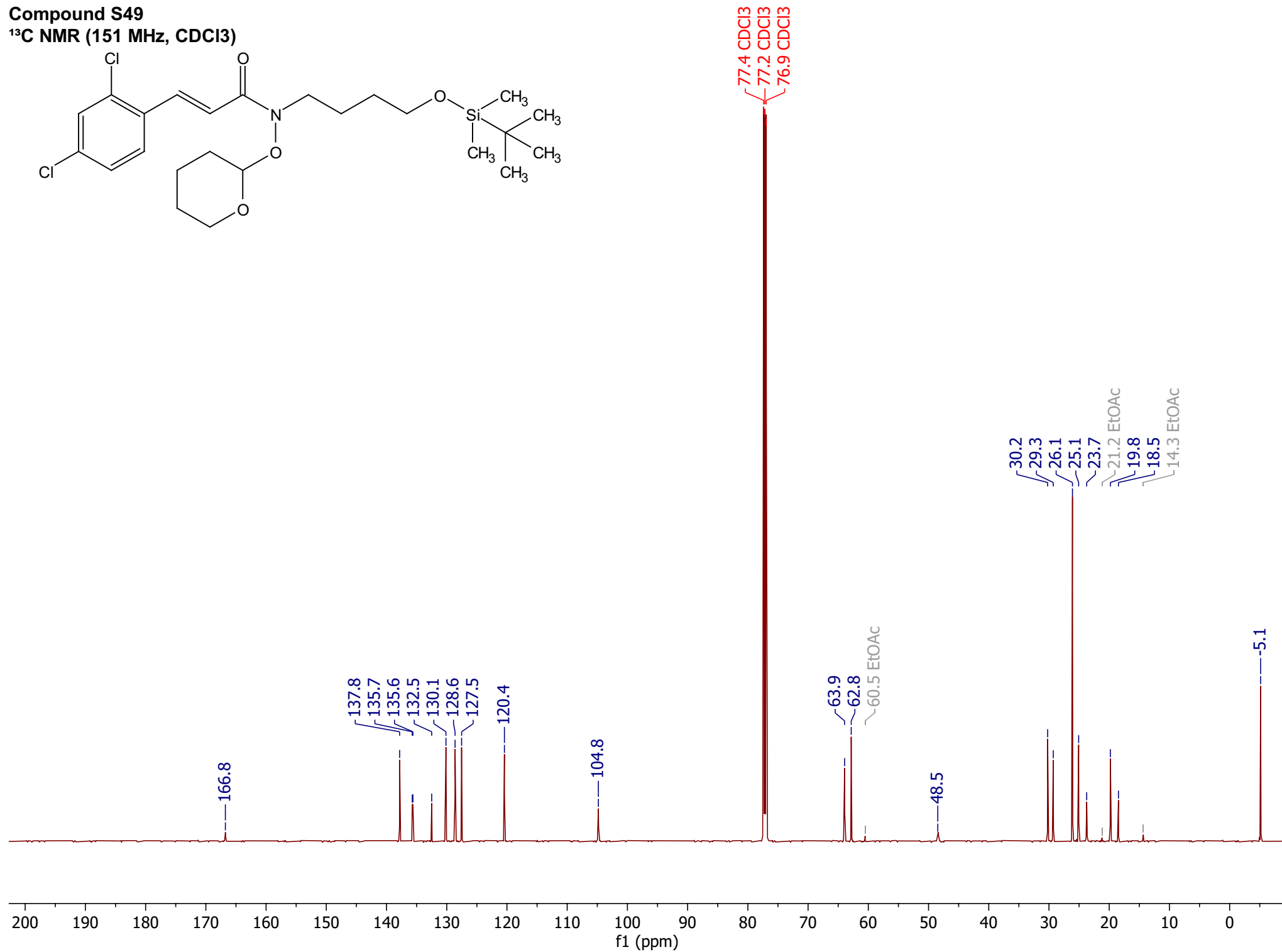
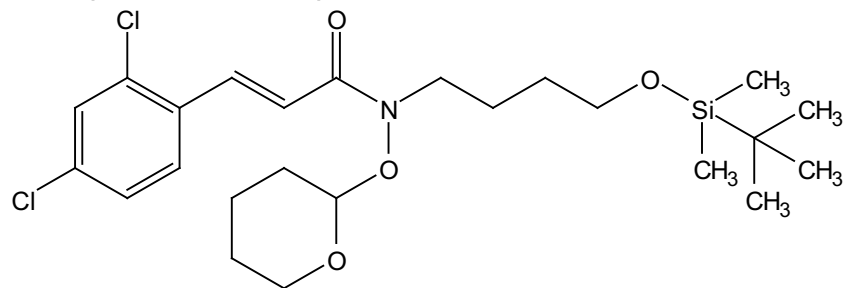


Compound S48
 ^{13}C NMR (151 MHz, CDCl_3)

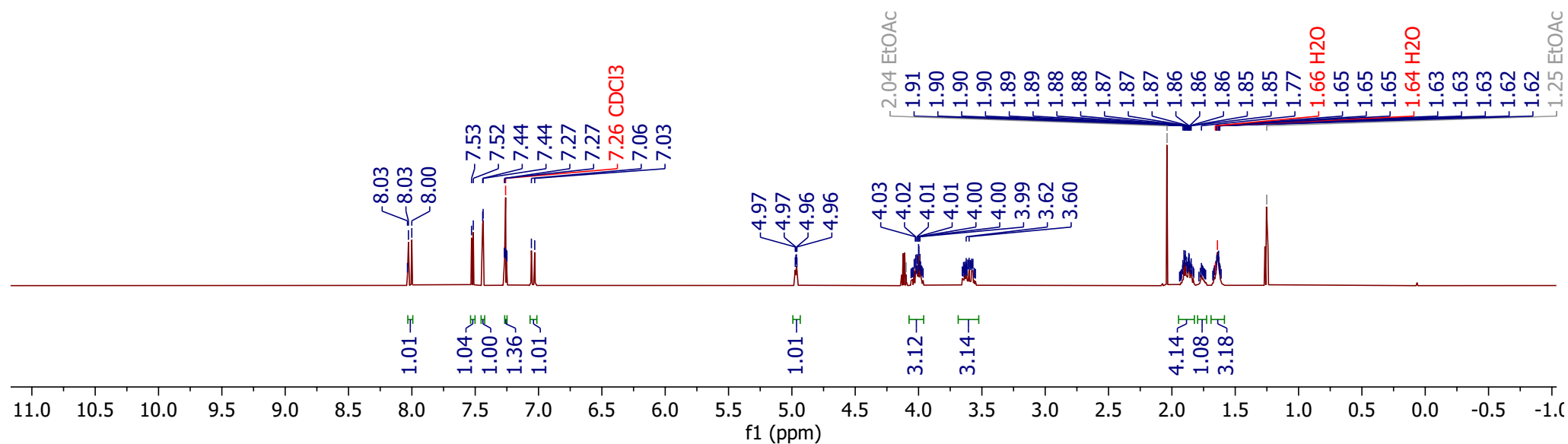
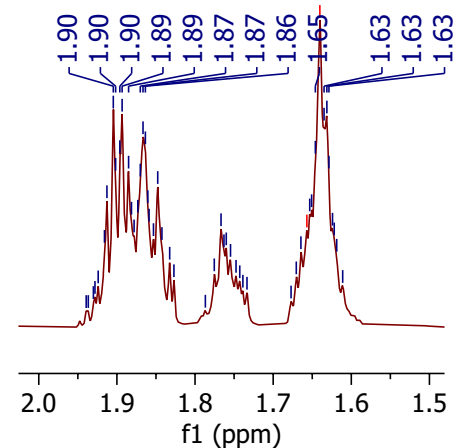
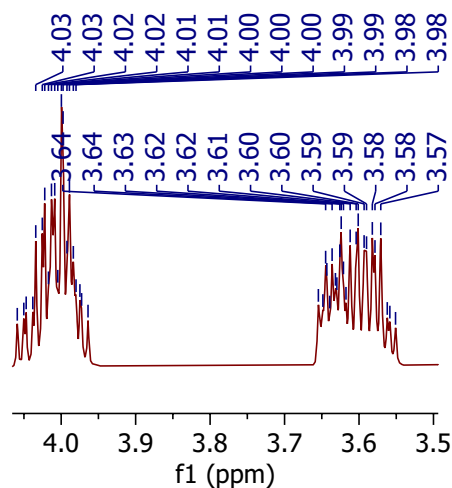
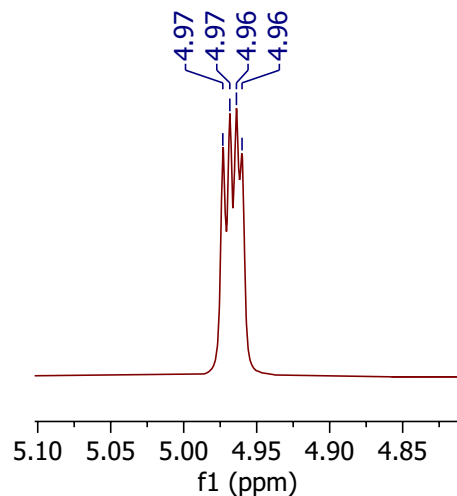
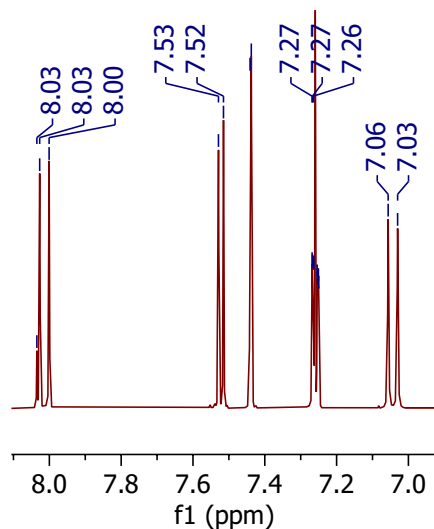
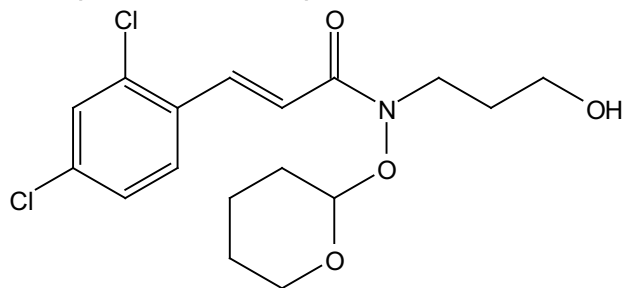


Compound S49
¹H NMR (600 MHz, CDCl₃)

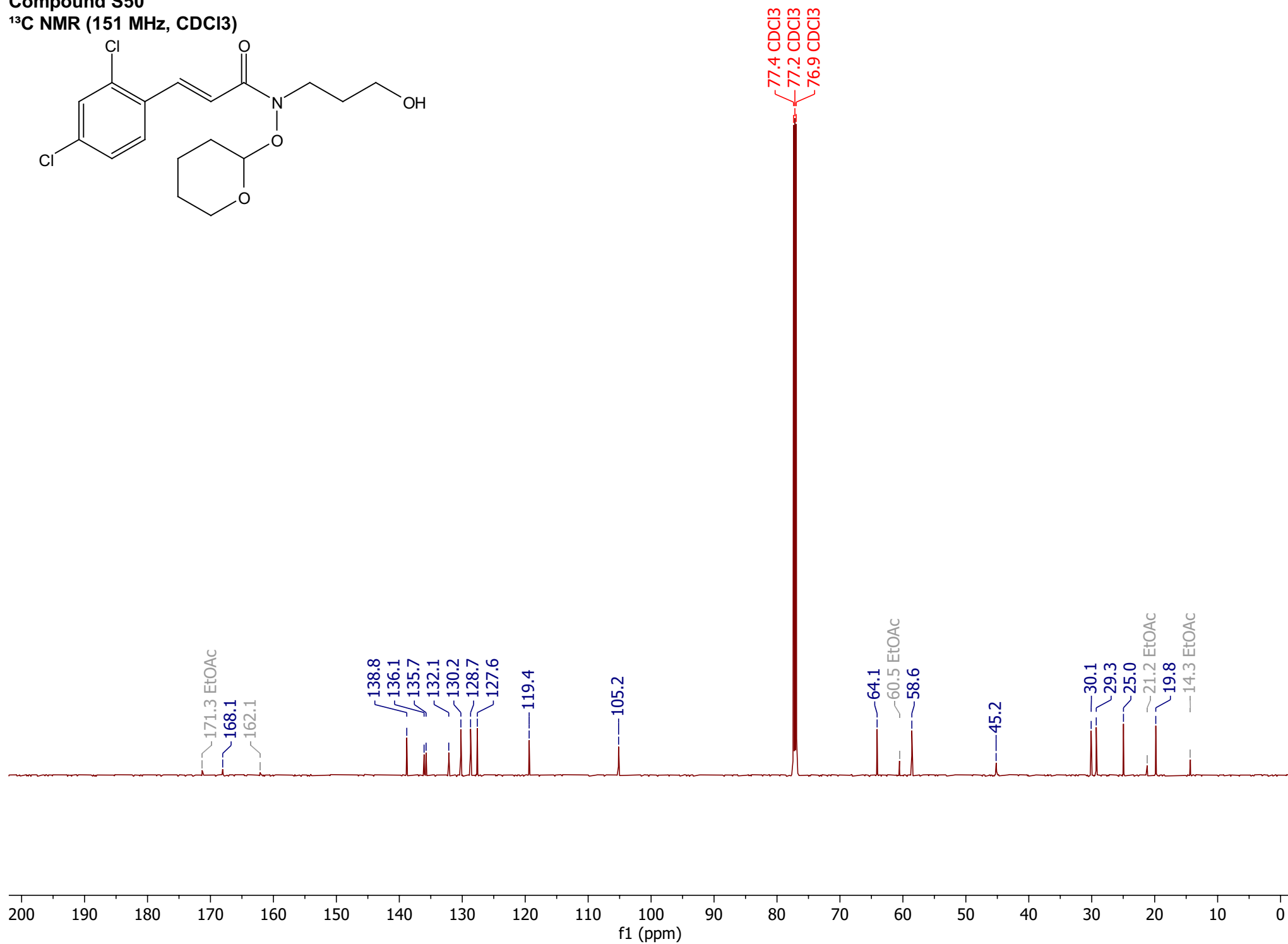
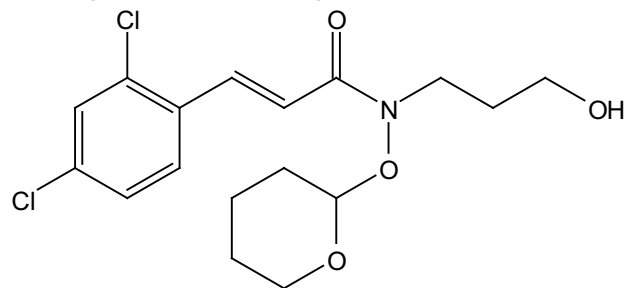


Compound S49 **^{13}C NMR (151 MHz, CDCl_3)**

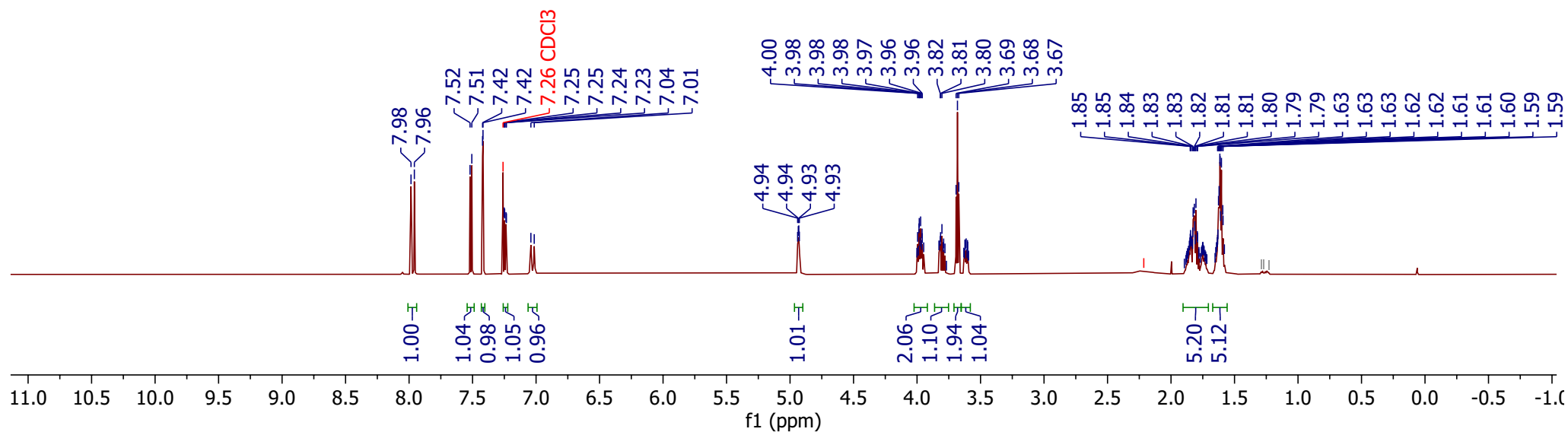
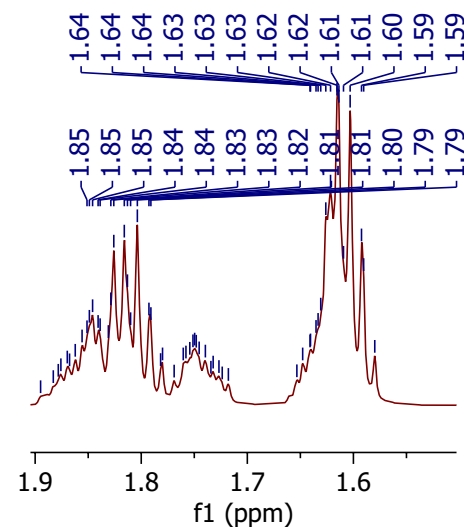
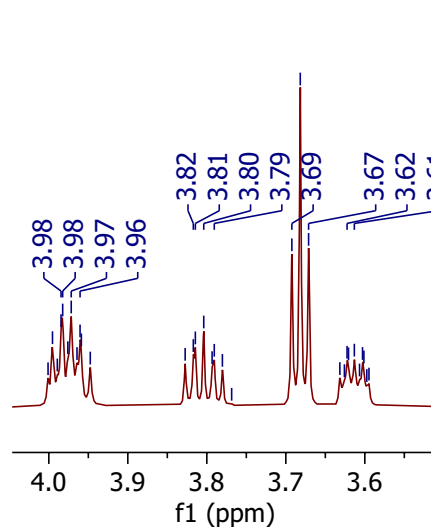
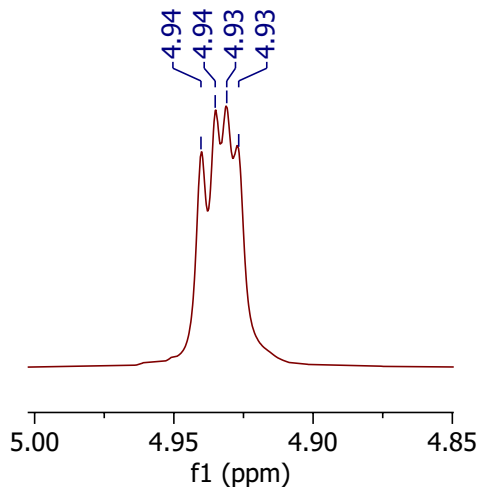
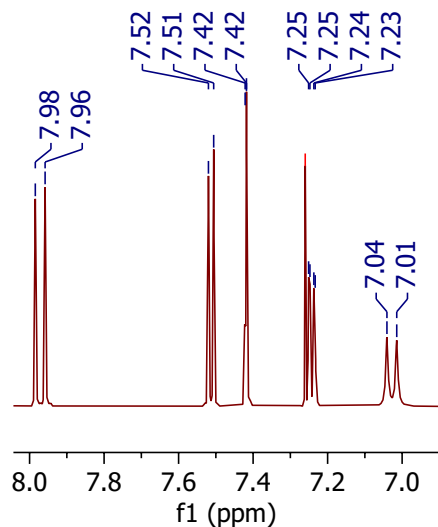
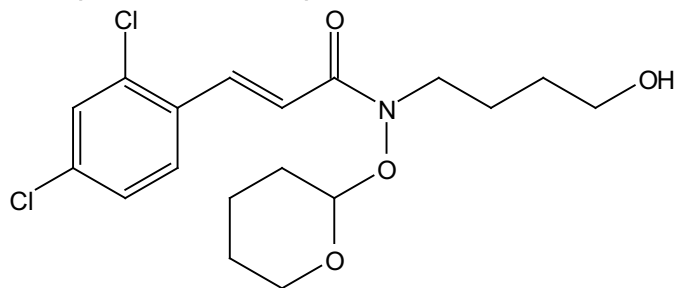
Compound S50
¹H NMR (600 MHz, CDCl₃)



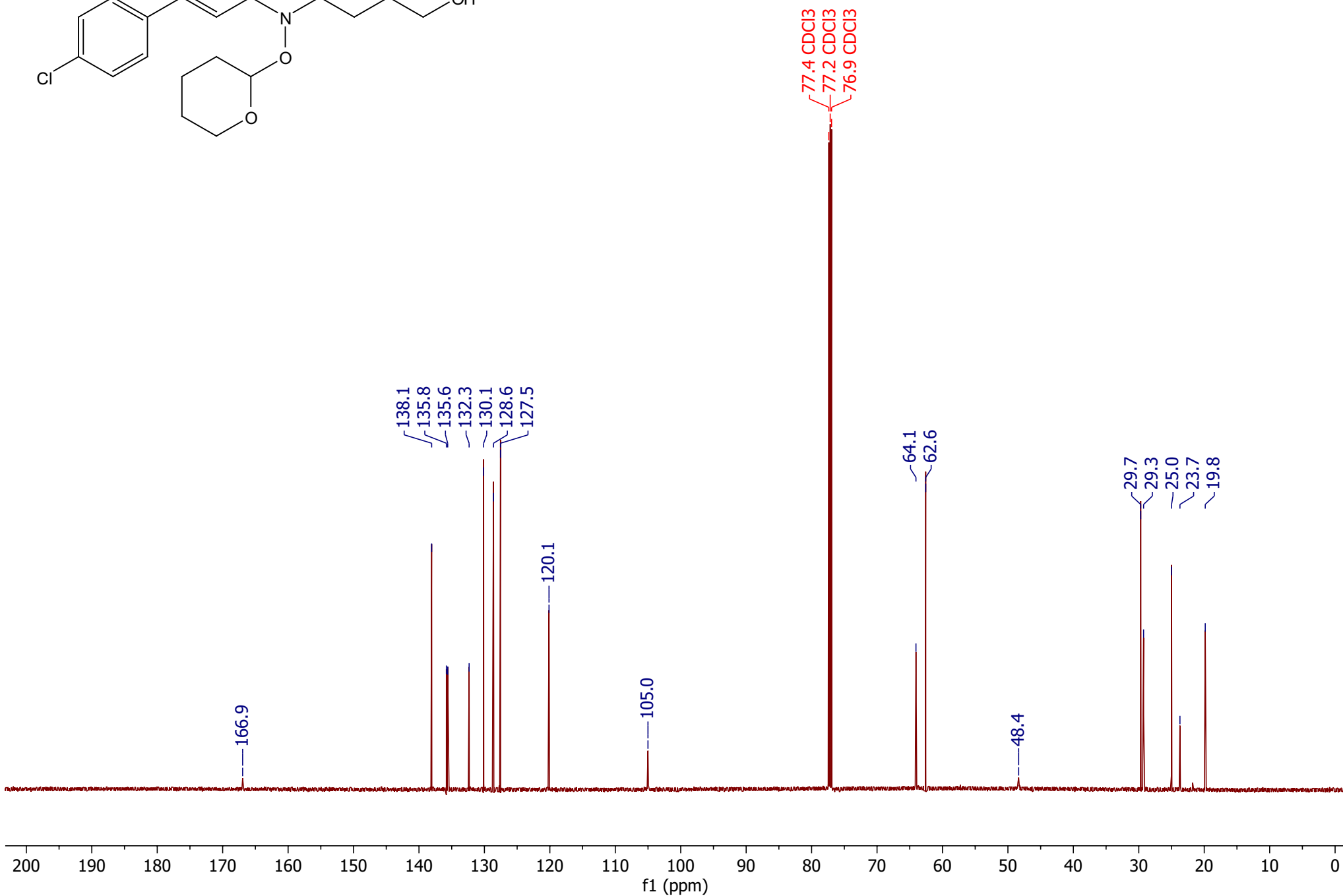
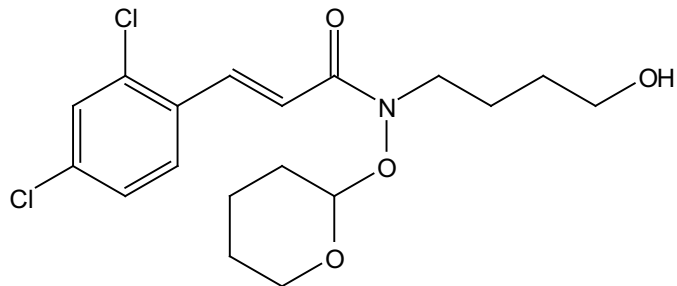
Compound S50
¹³C NMR (151 MHz, CDCl₃)



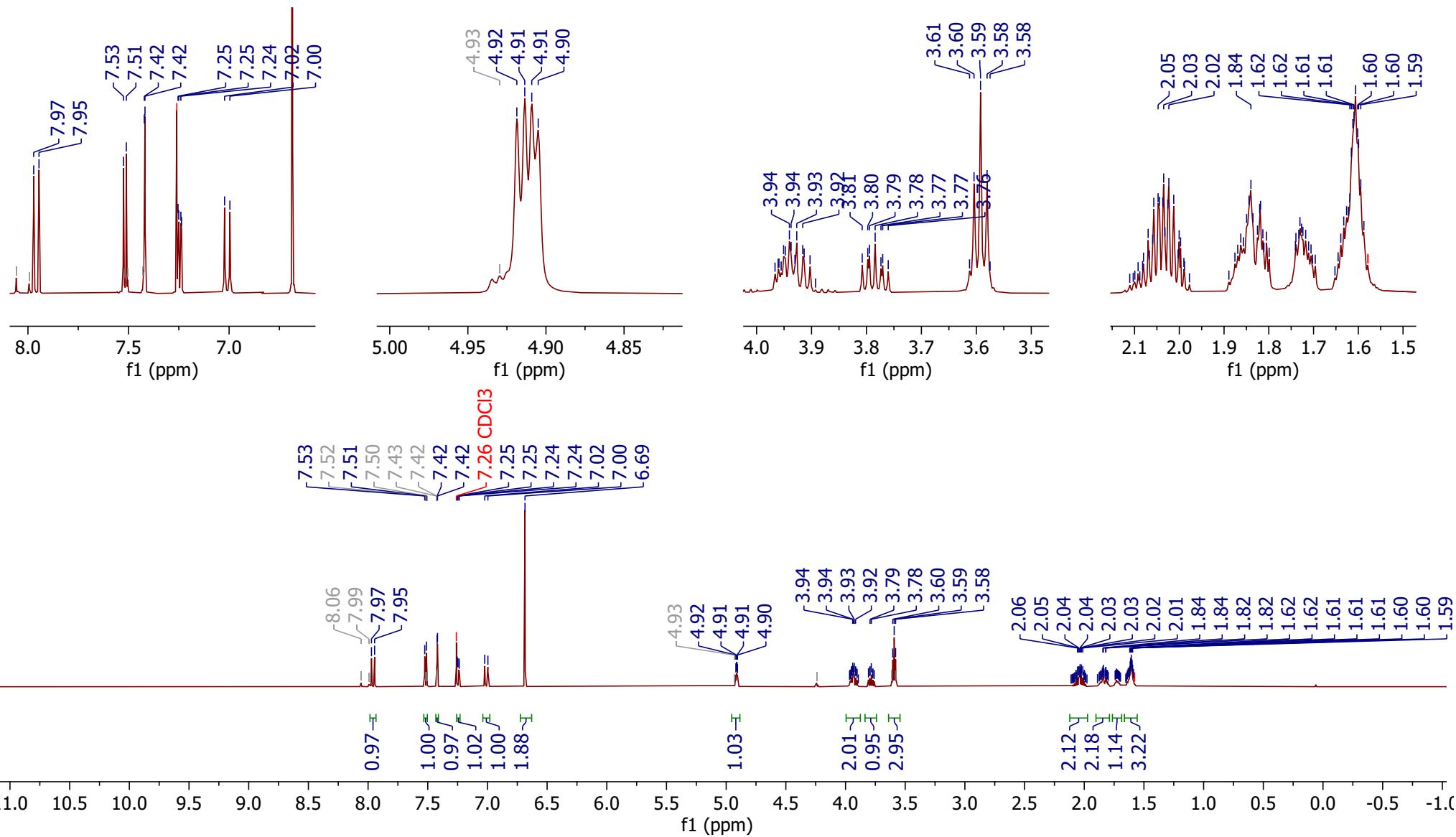
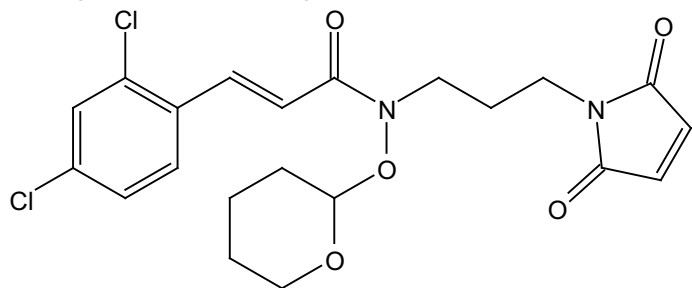
Compound S51
¹H NMR (600 MHz, CDCl₃)

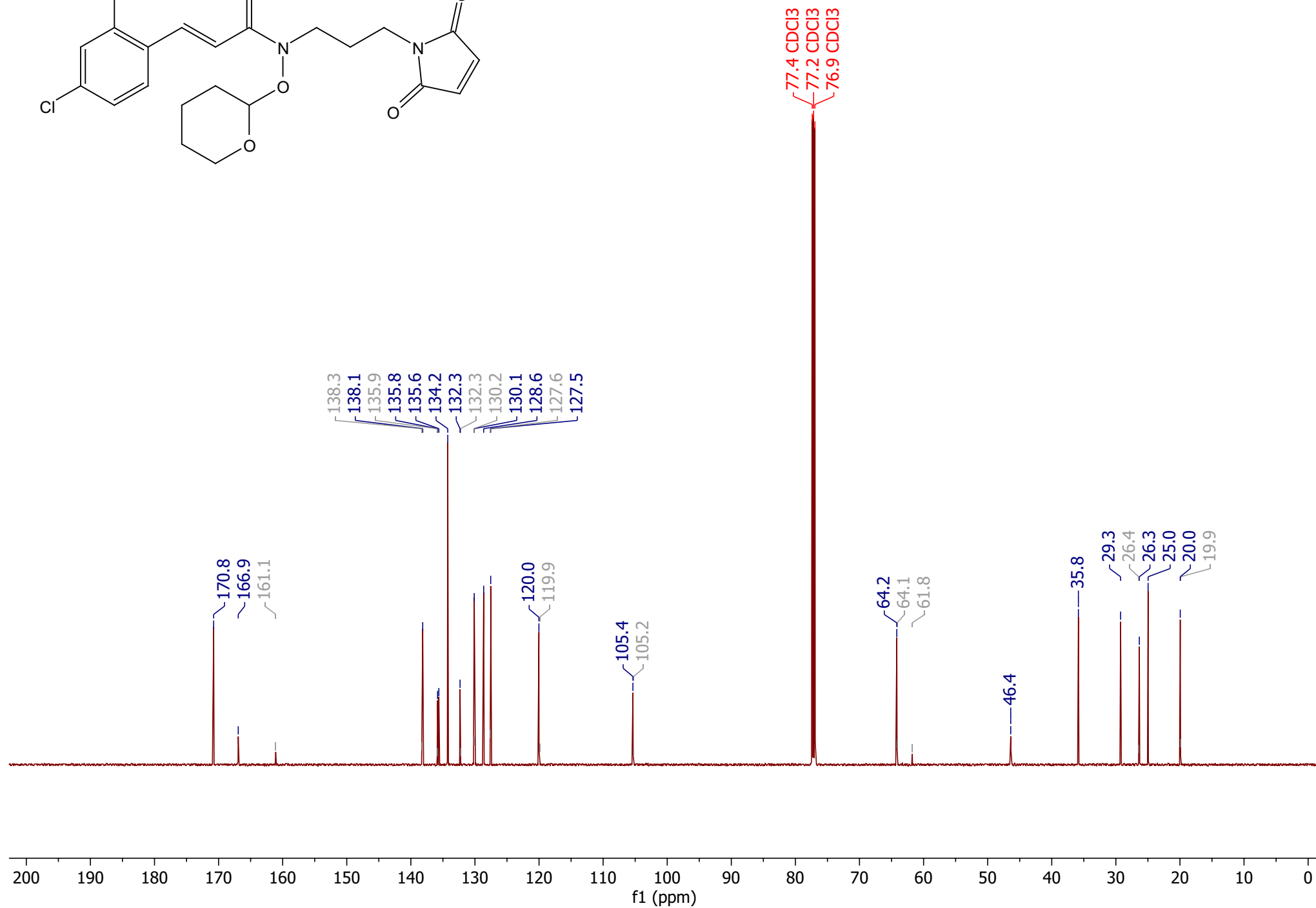
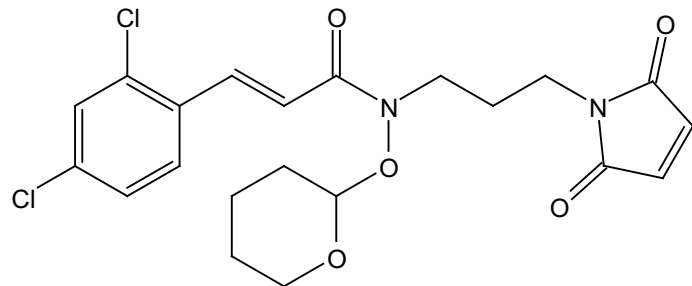


Compound S51
 ^{13}C NMR (151 MHz, CDCl_3)

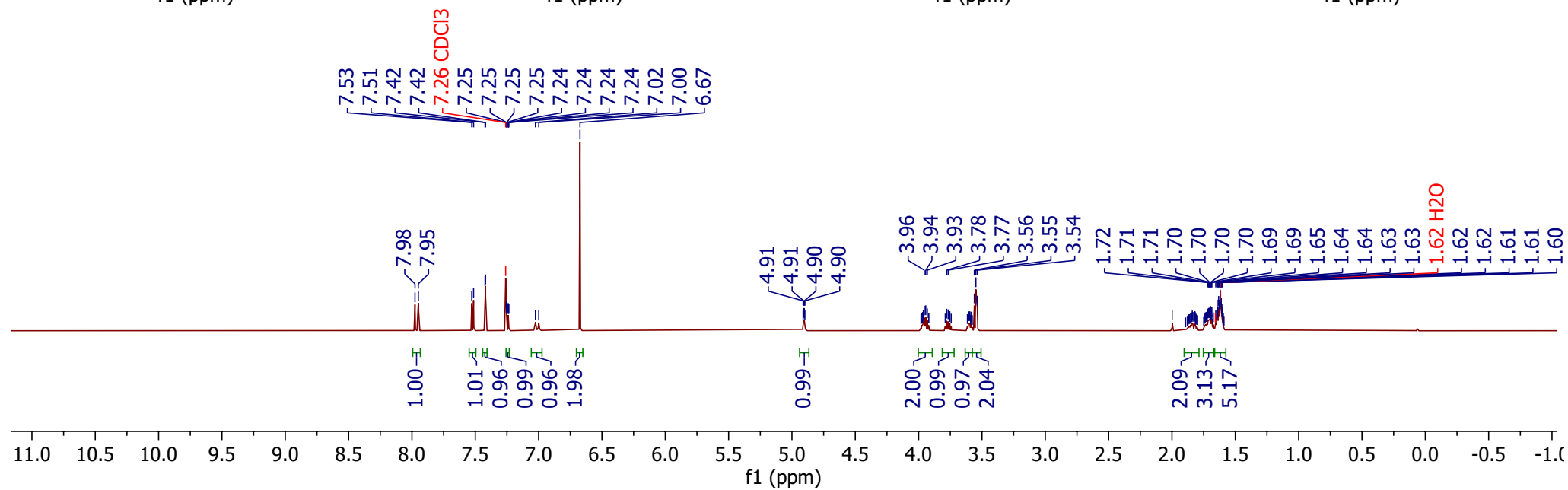
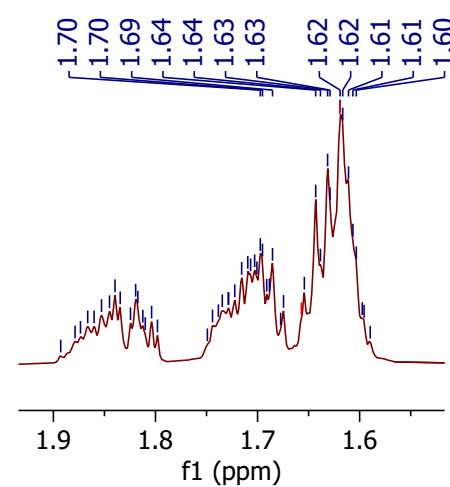
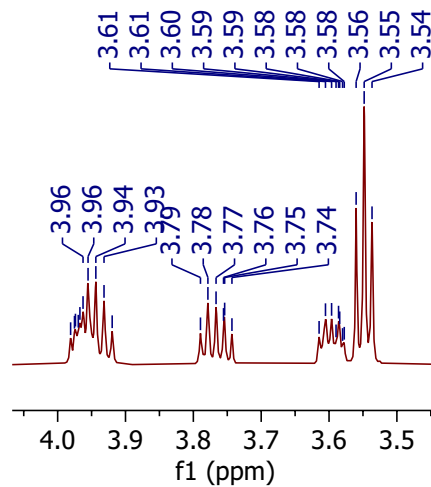
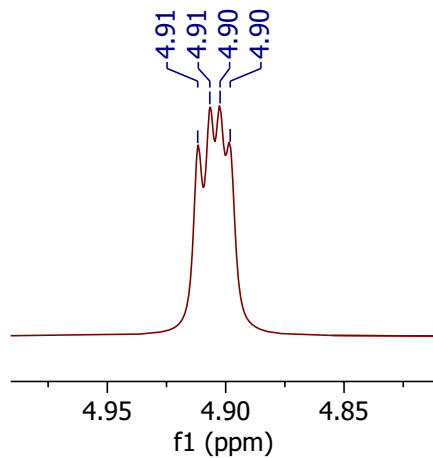
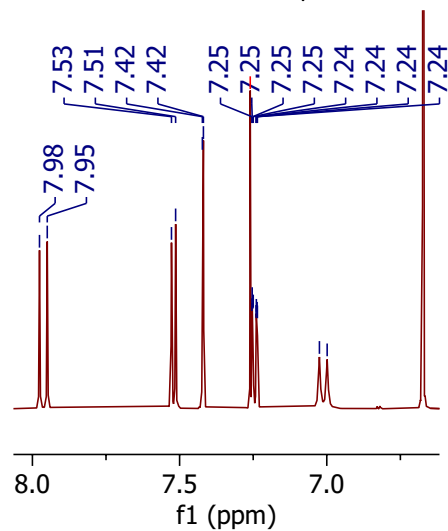
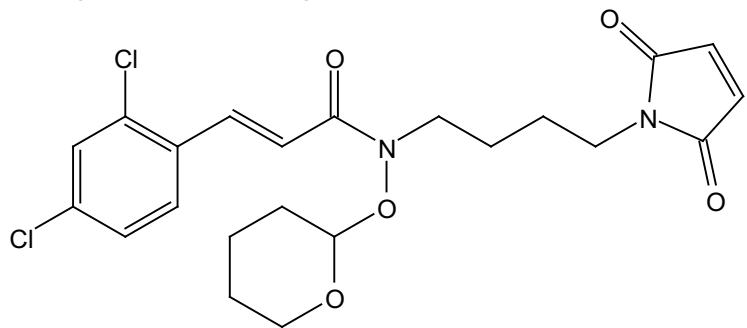


Compound S52
¹H NMR (600 MHz, CDCl₃)

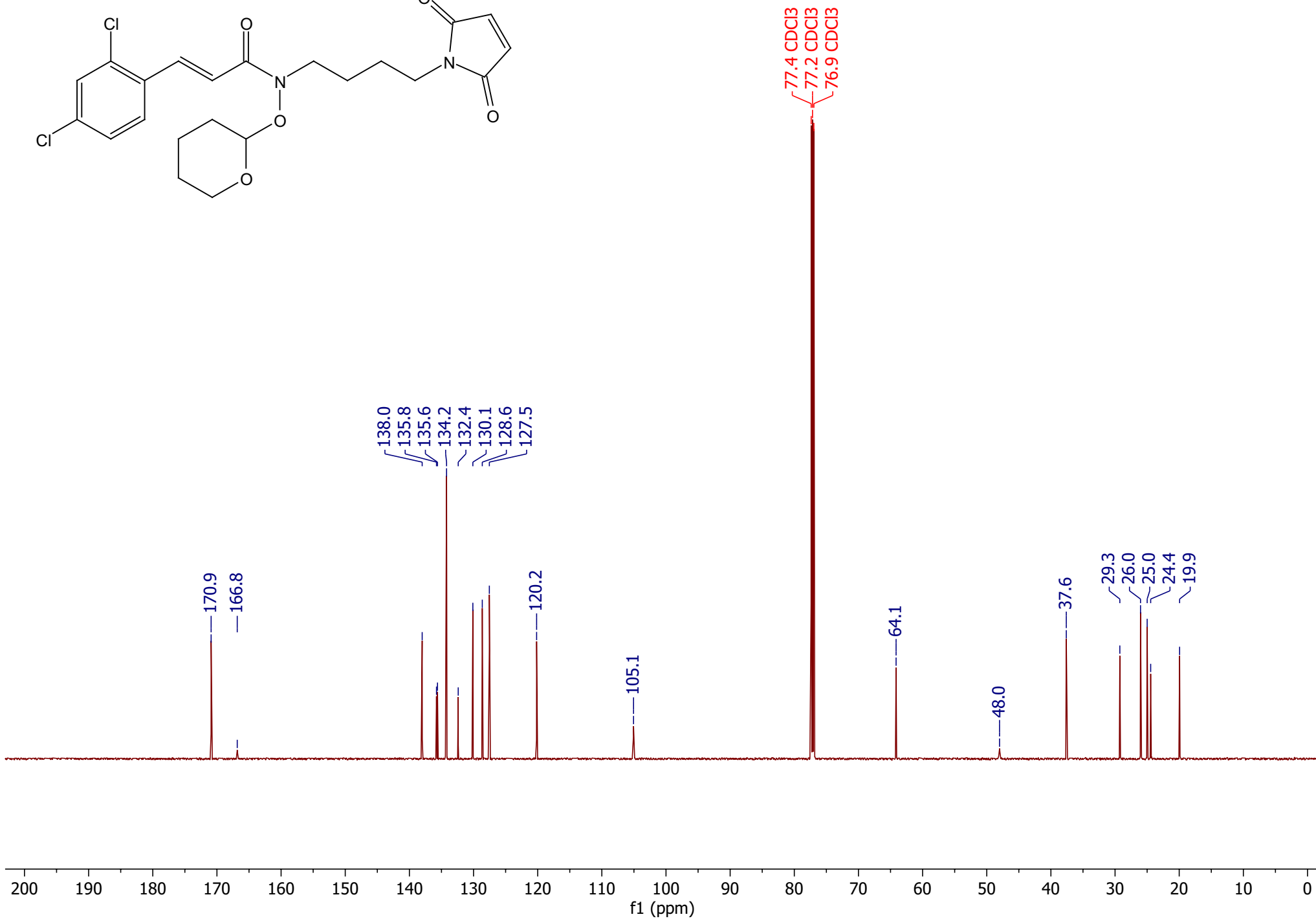
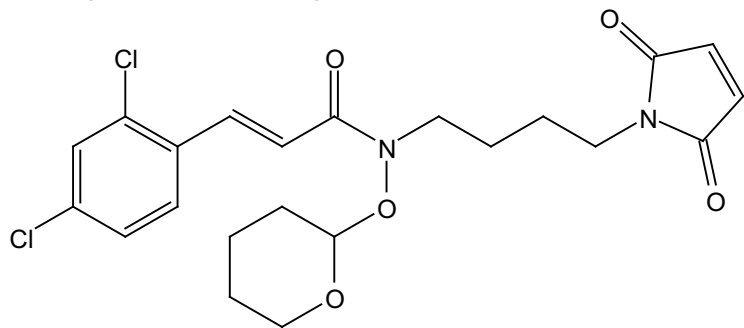


Compound S52 **^{13}C NMR (151 MHz, CDCl_3)**

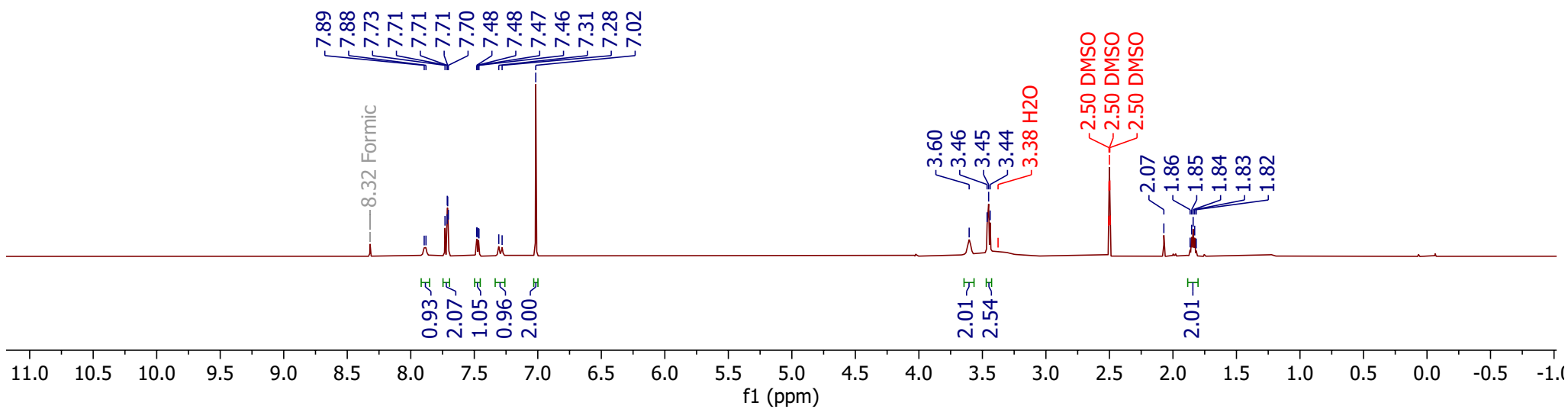
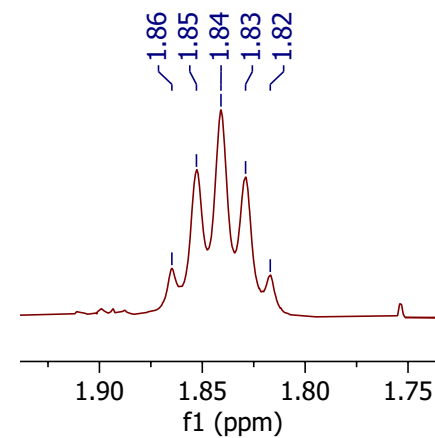
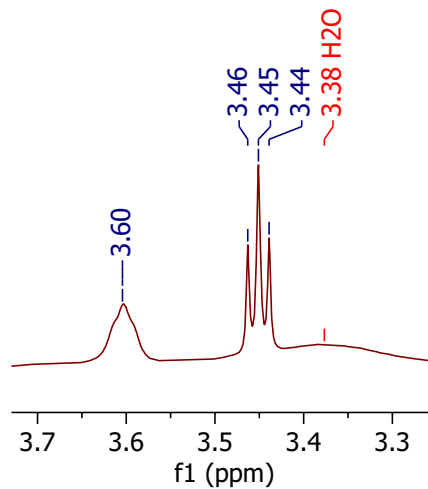
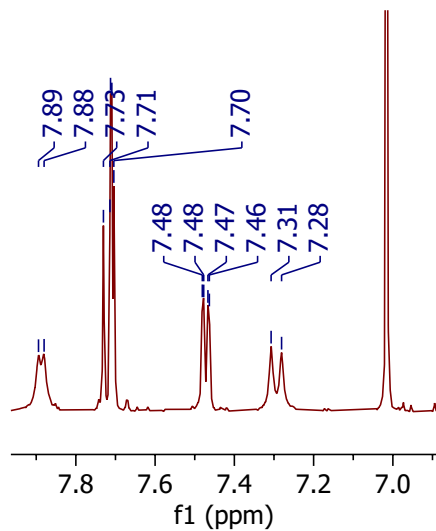
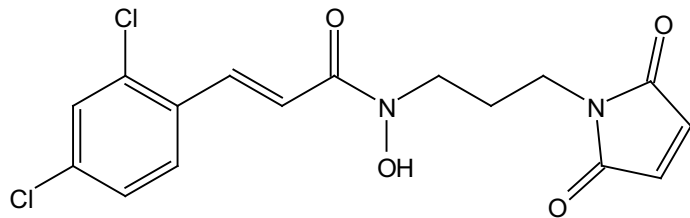
Compound S53
¹H NMR (600 MHz, CDCl₃)



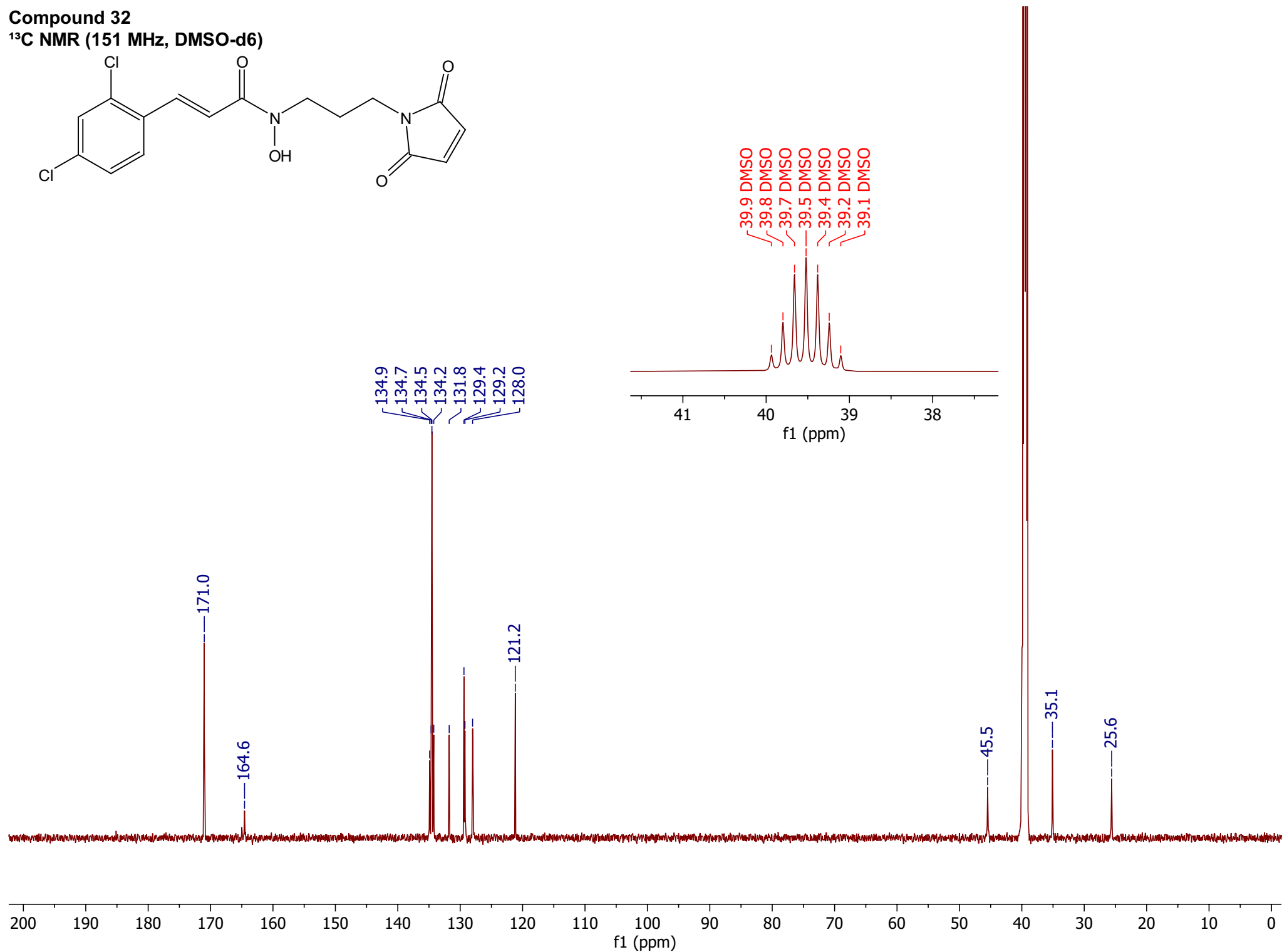
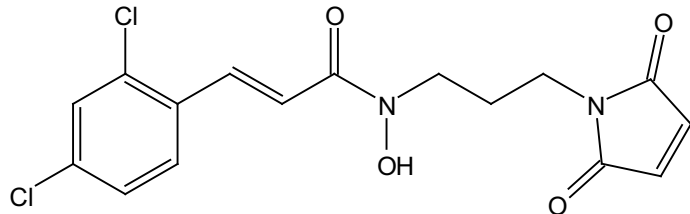
Compound S53
¹³C NMR (151 MHz, CDCl₃)



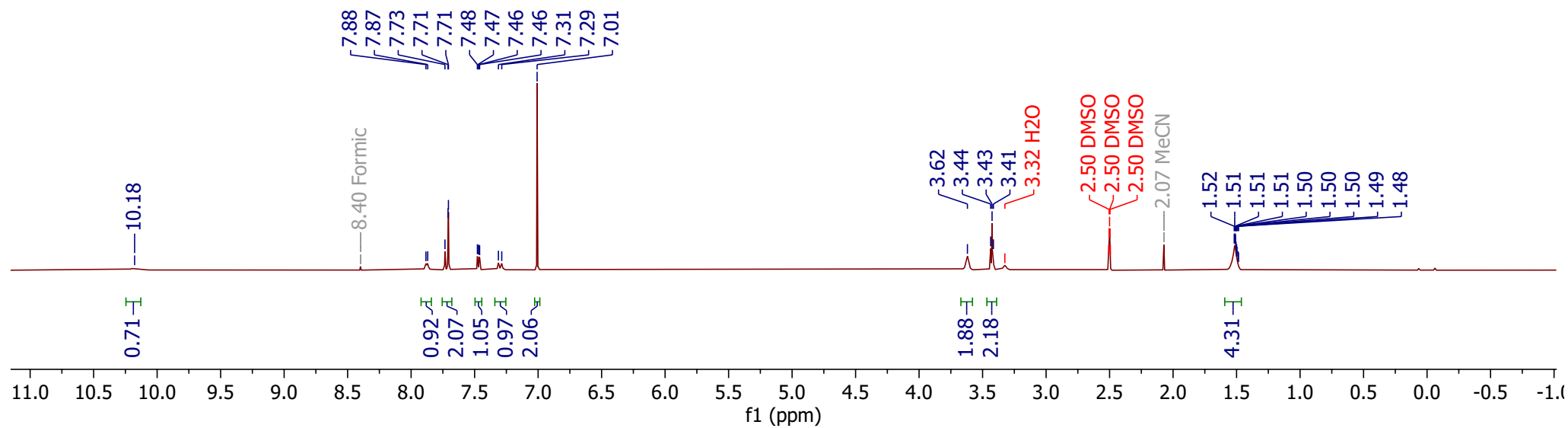
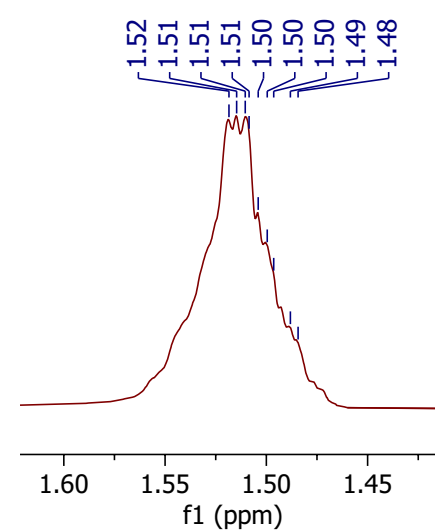
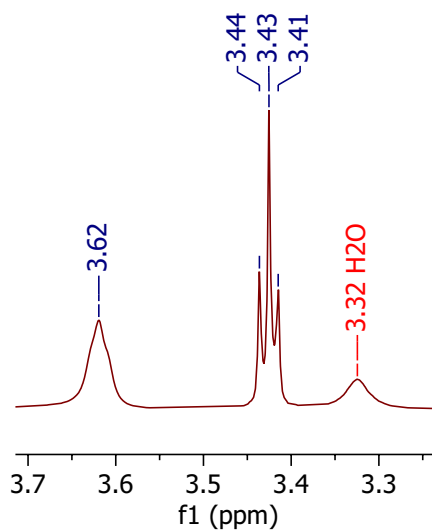
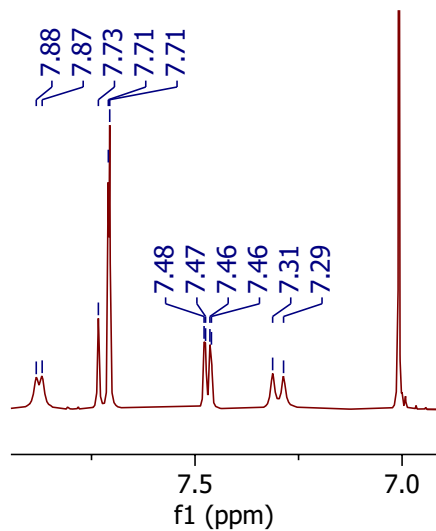
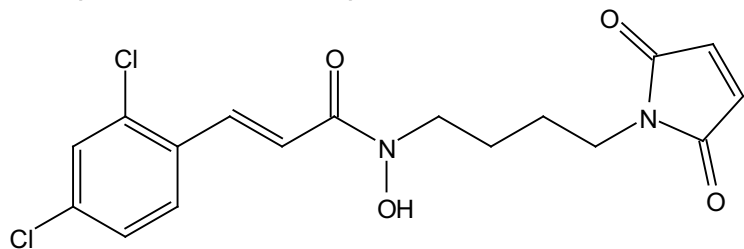
Compound 32
¹H NMR (600 MHz, DMSO-d₆)



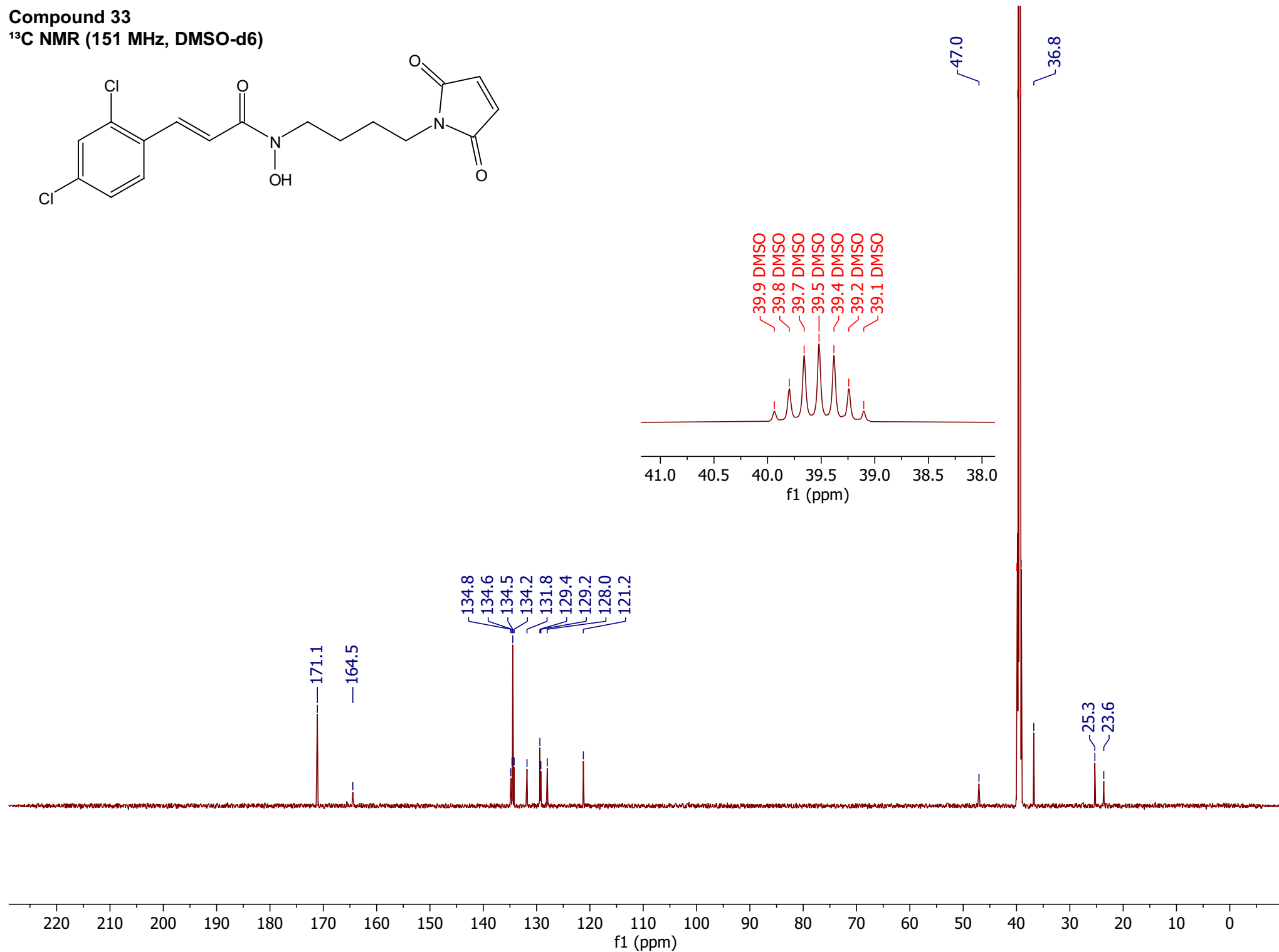
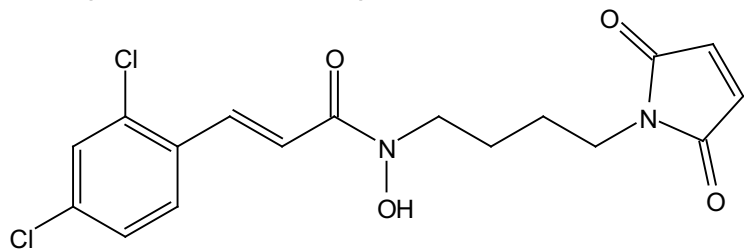
Compound 32
¹³C NMR (151 MHz, DMSO-d₆)



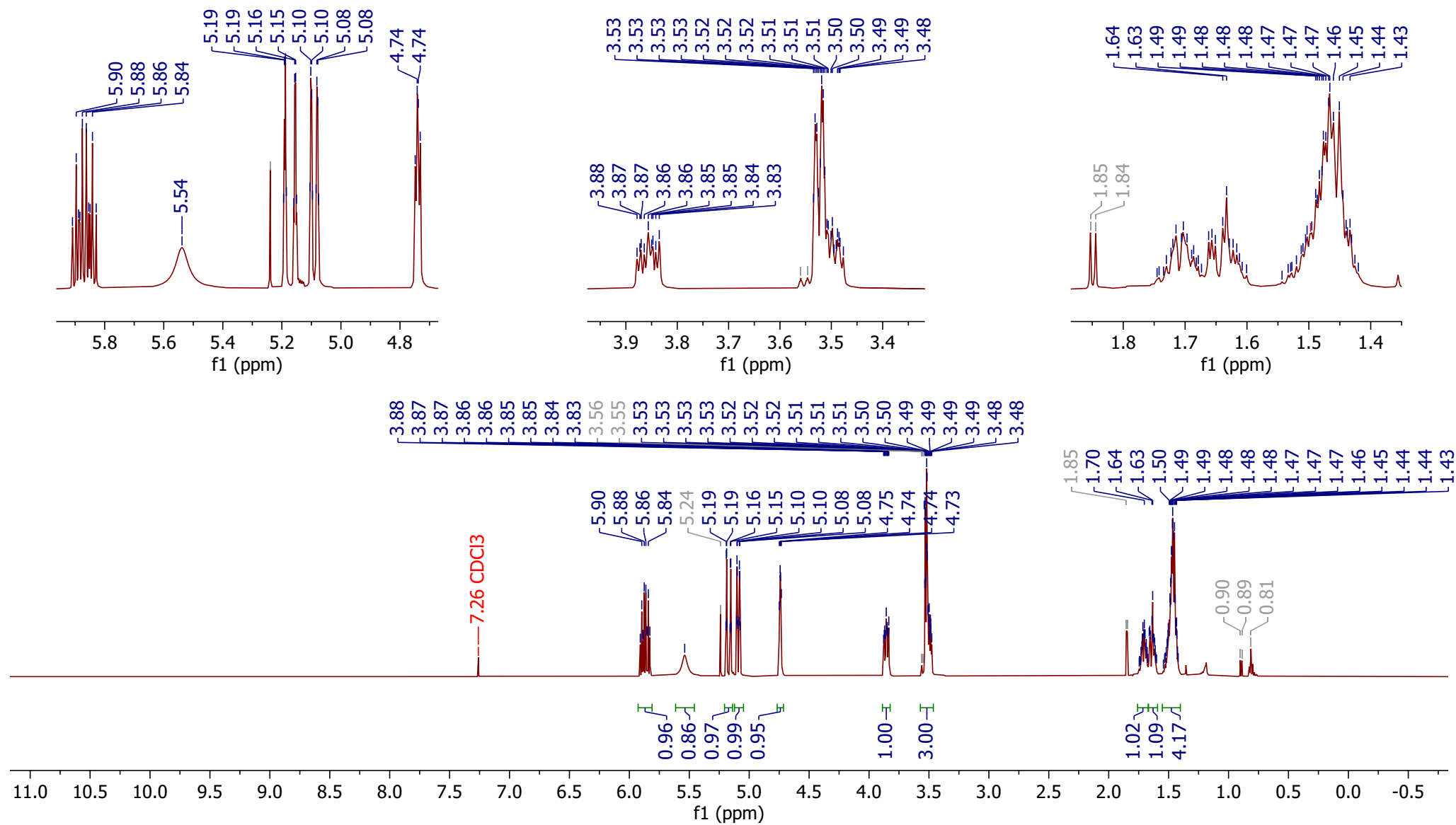
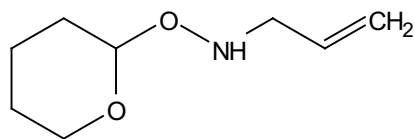
Compound 33
¹H NMR (600 MHz, DMSO-d₆)

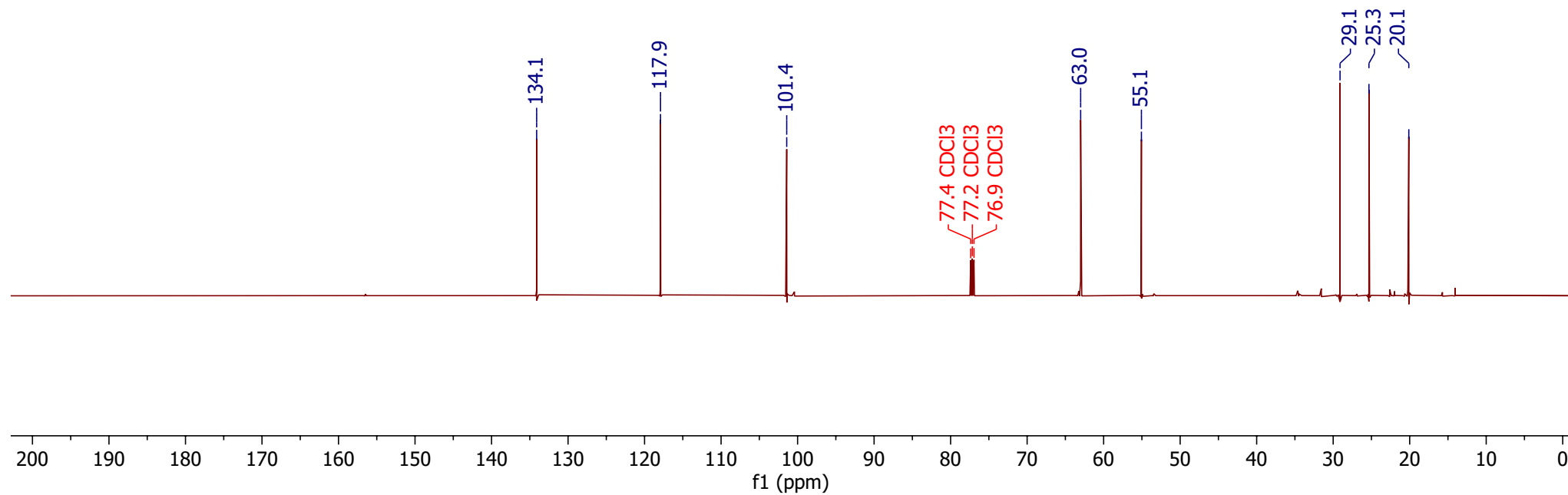
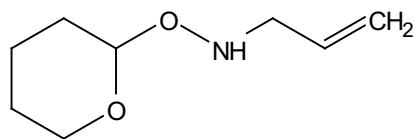


Compound 33
 ^{13}C NMR (151 MHz, DMSO- d_6)



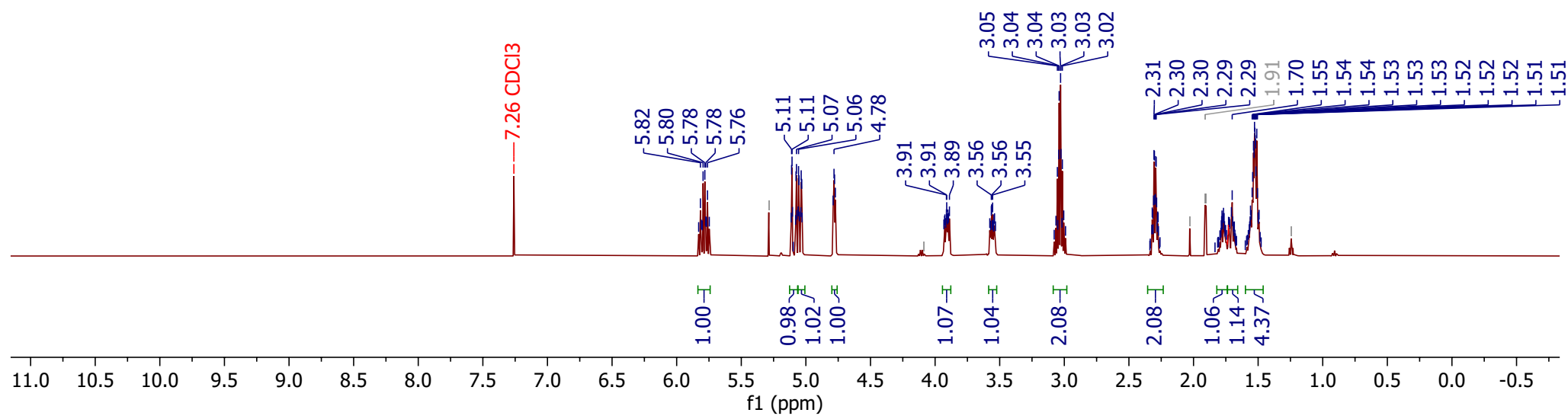
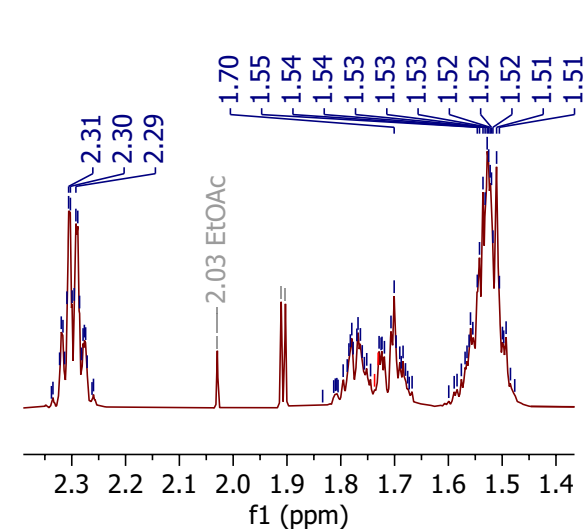
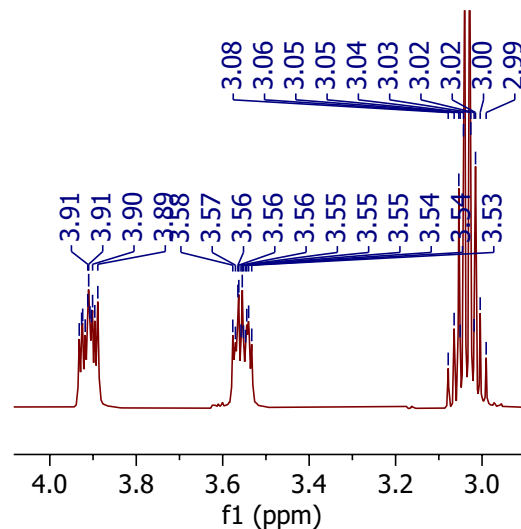
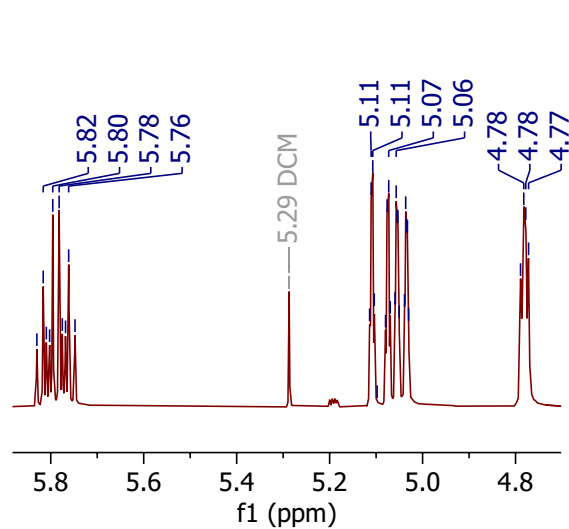
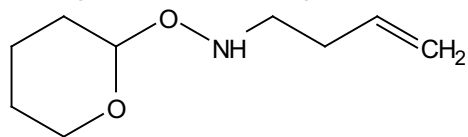
Compound S54
¹H NMR (500 MHz, CDCl₃)

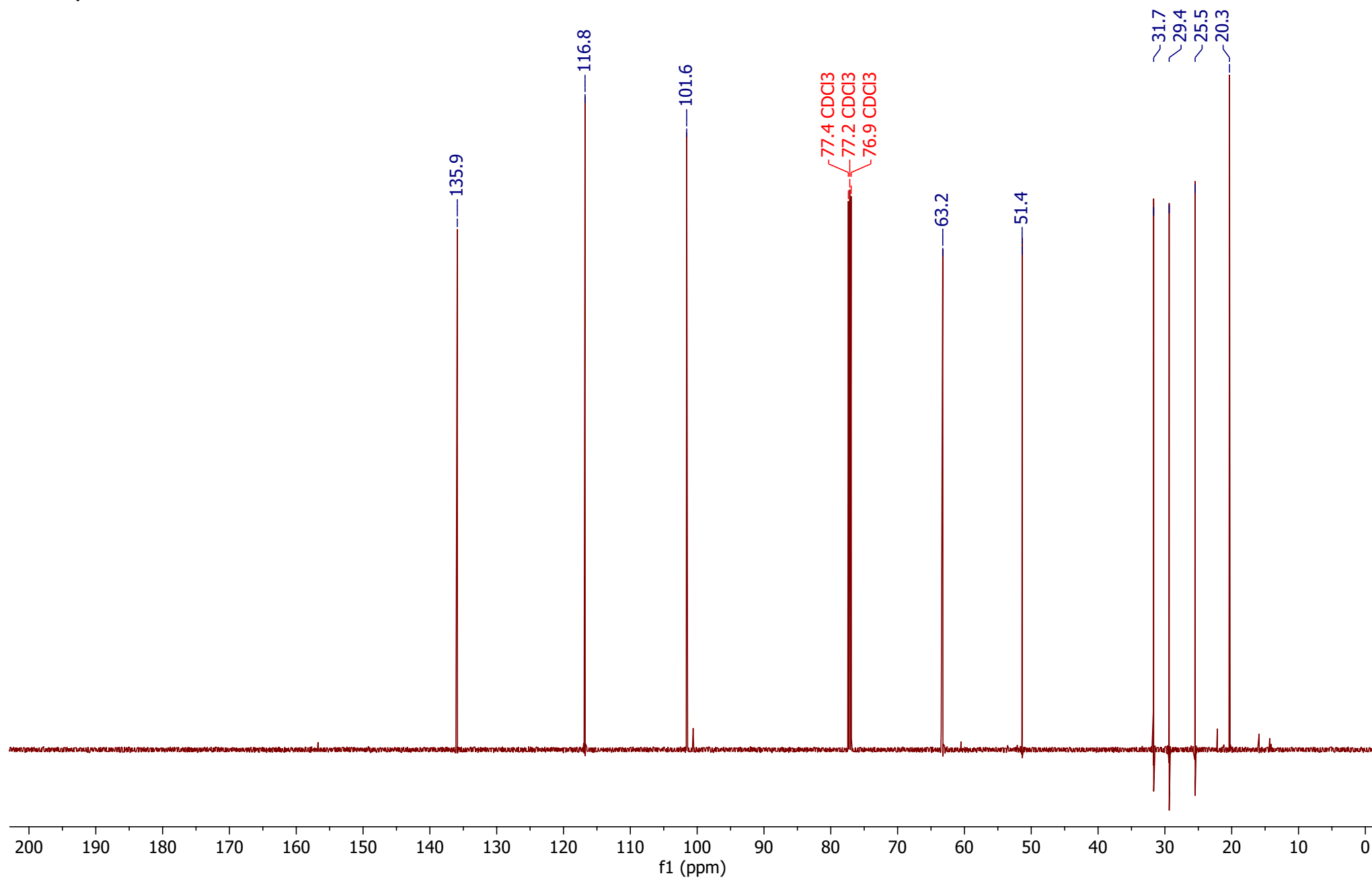
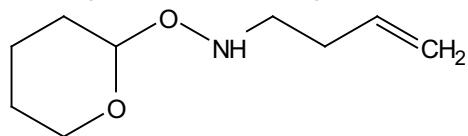


Compound S54 **^{13}C NMR (151 MHz, CDCl_3)**

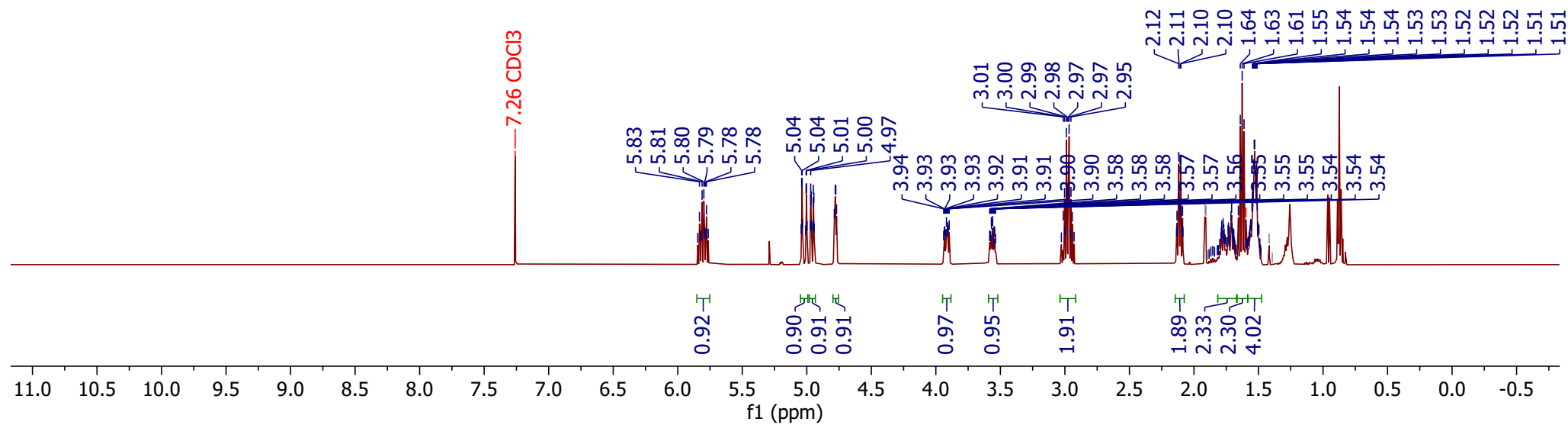
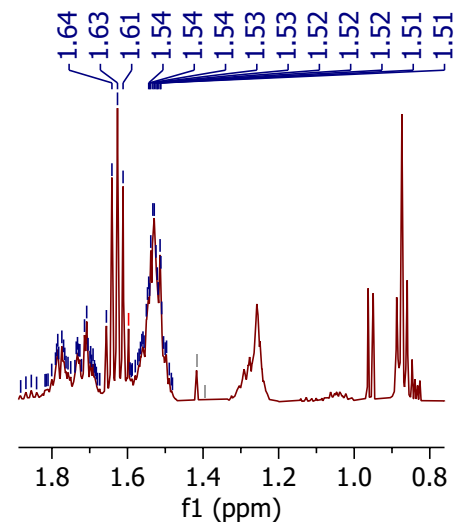
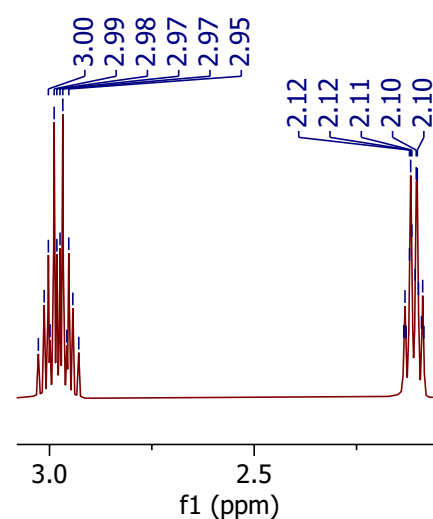
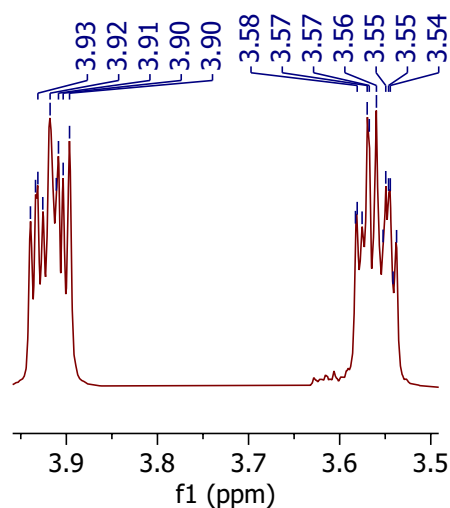
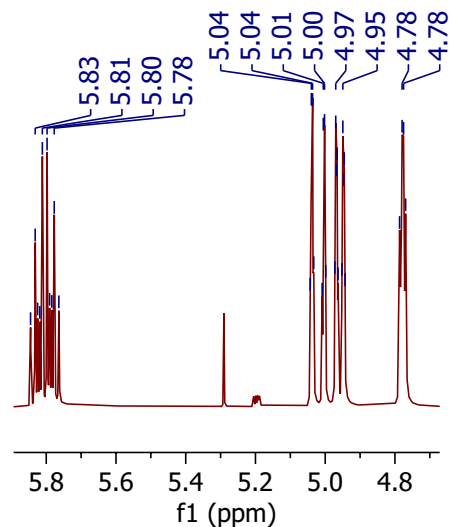
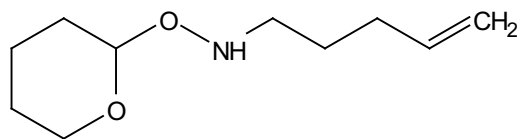
Compound S55

¹H NMR (500 MHz, CDCl₃)

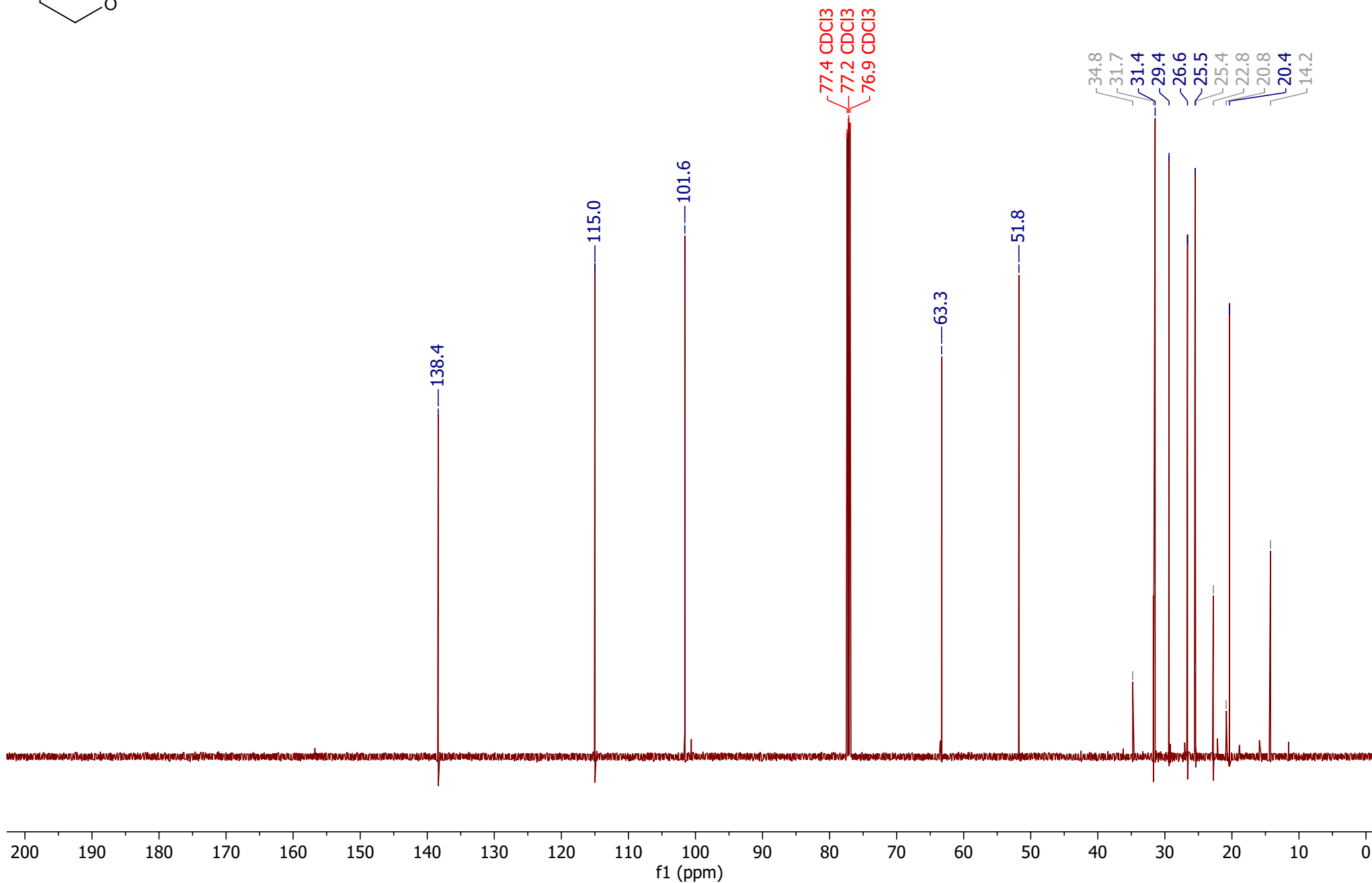
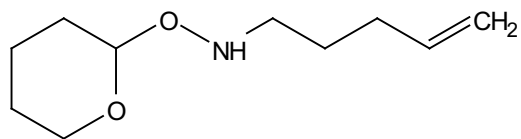


Compound S55¹³C NMR (151 MHz, CDCl₃)

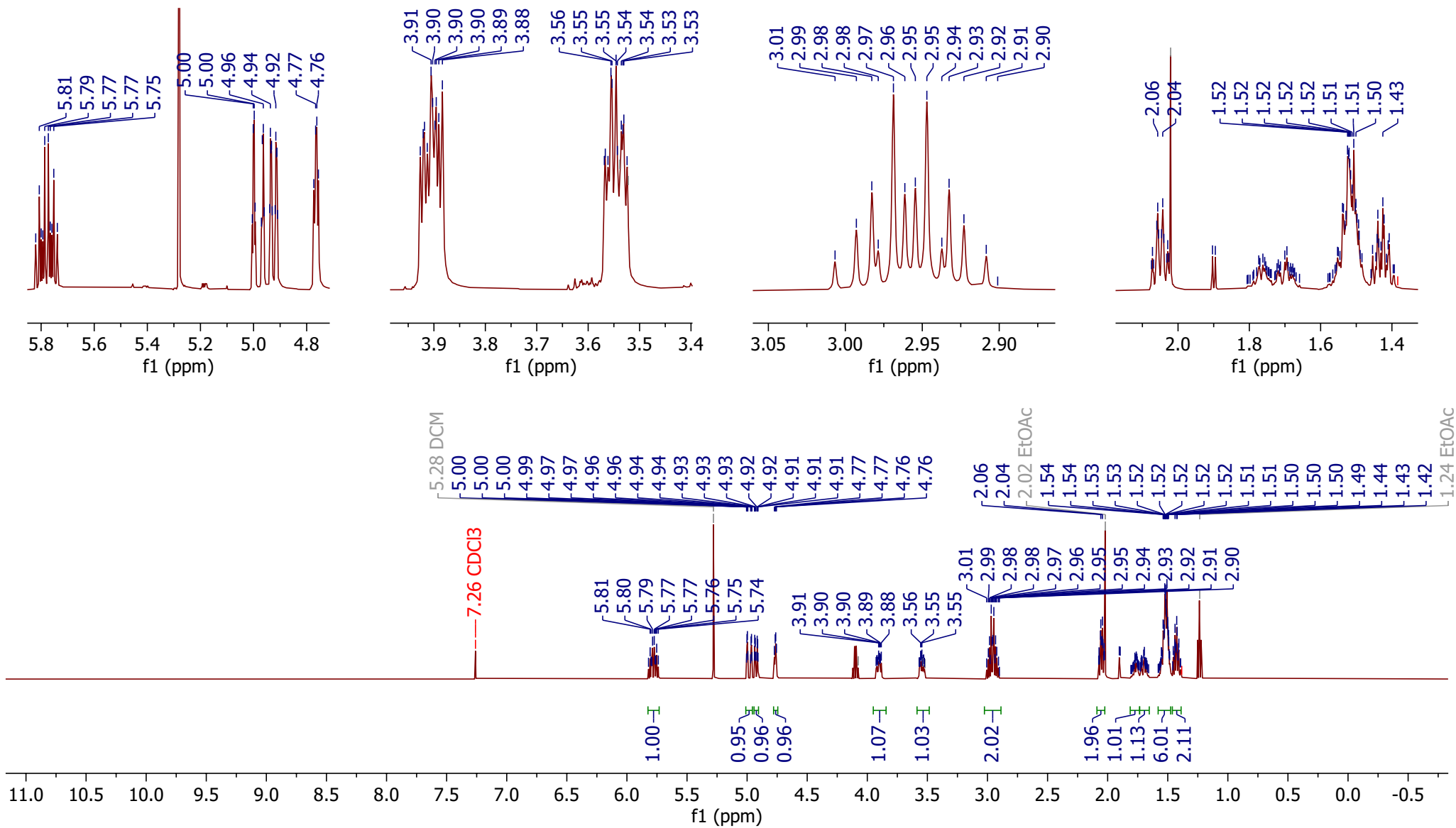
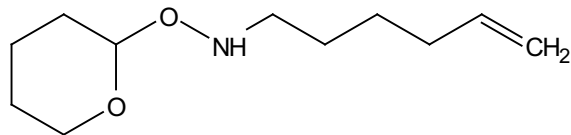
Compound S56
¹H NMR (500 MHz, CDCl₃)

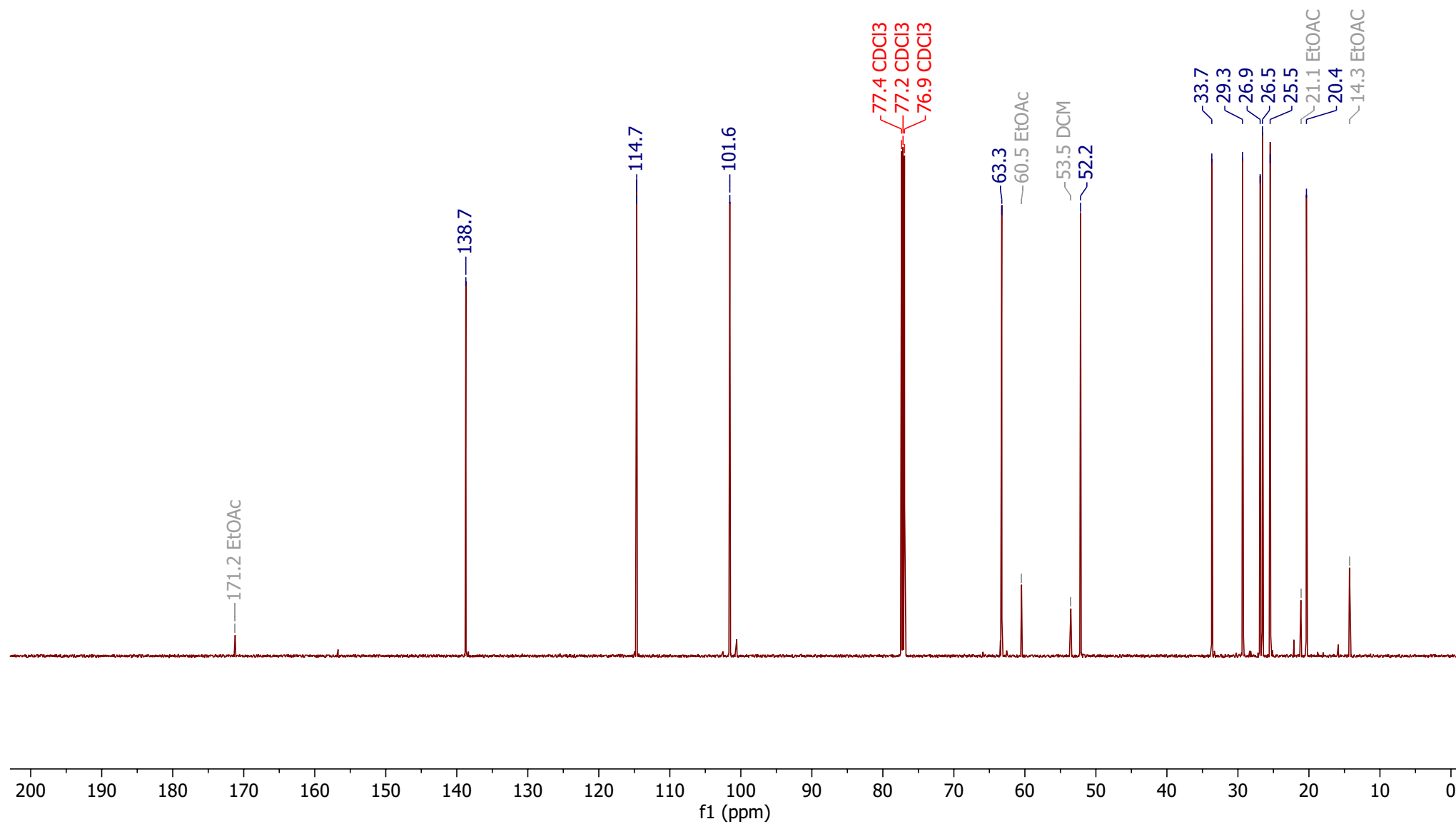
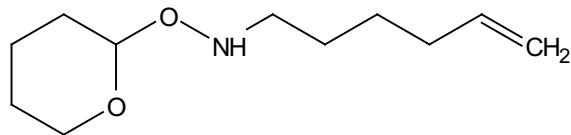


Compound S56
¹³C NMR (151 MHz, CDCl₃)

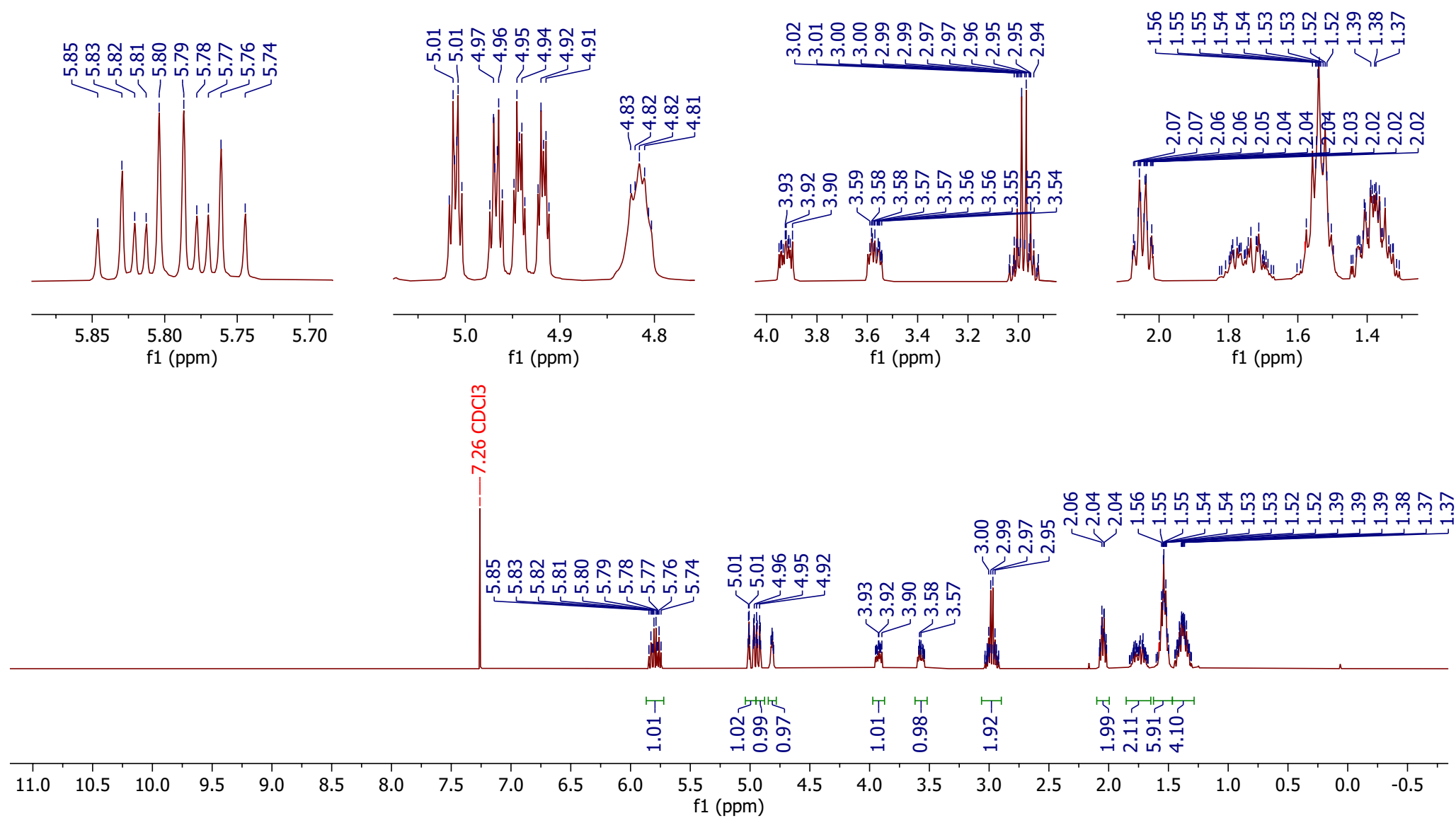
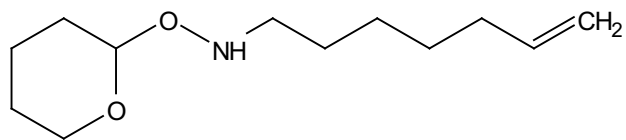


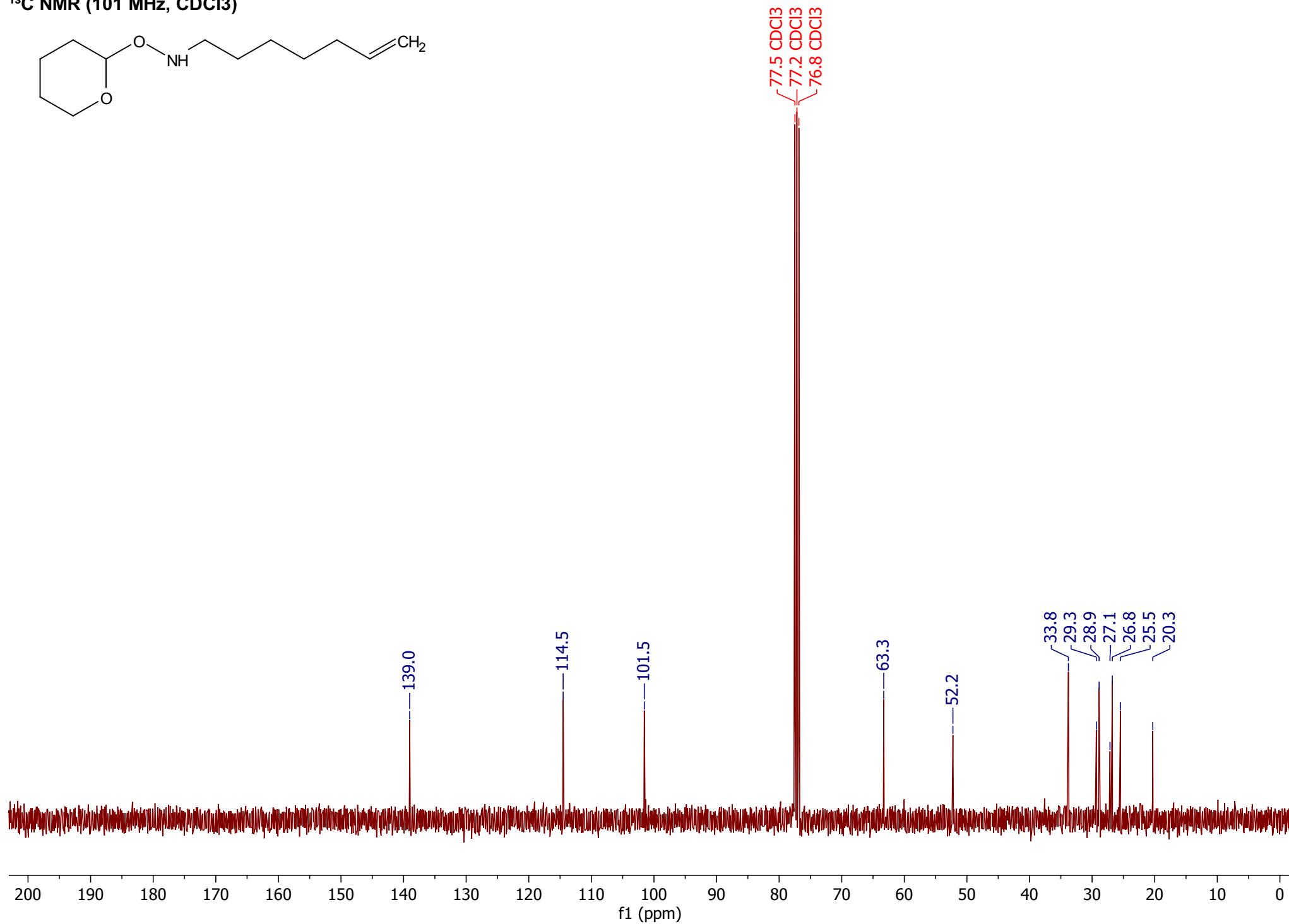
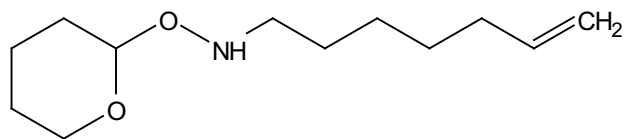
Compound S57
¹H NMR (500 MHz, CDCl₃)



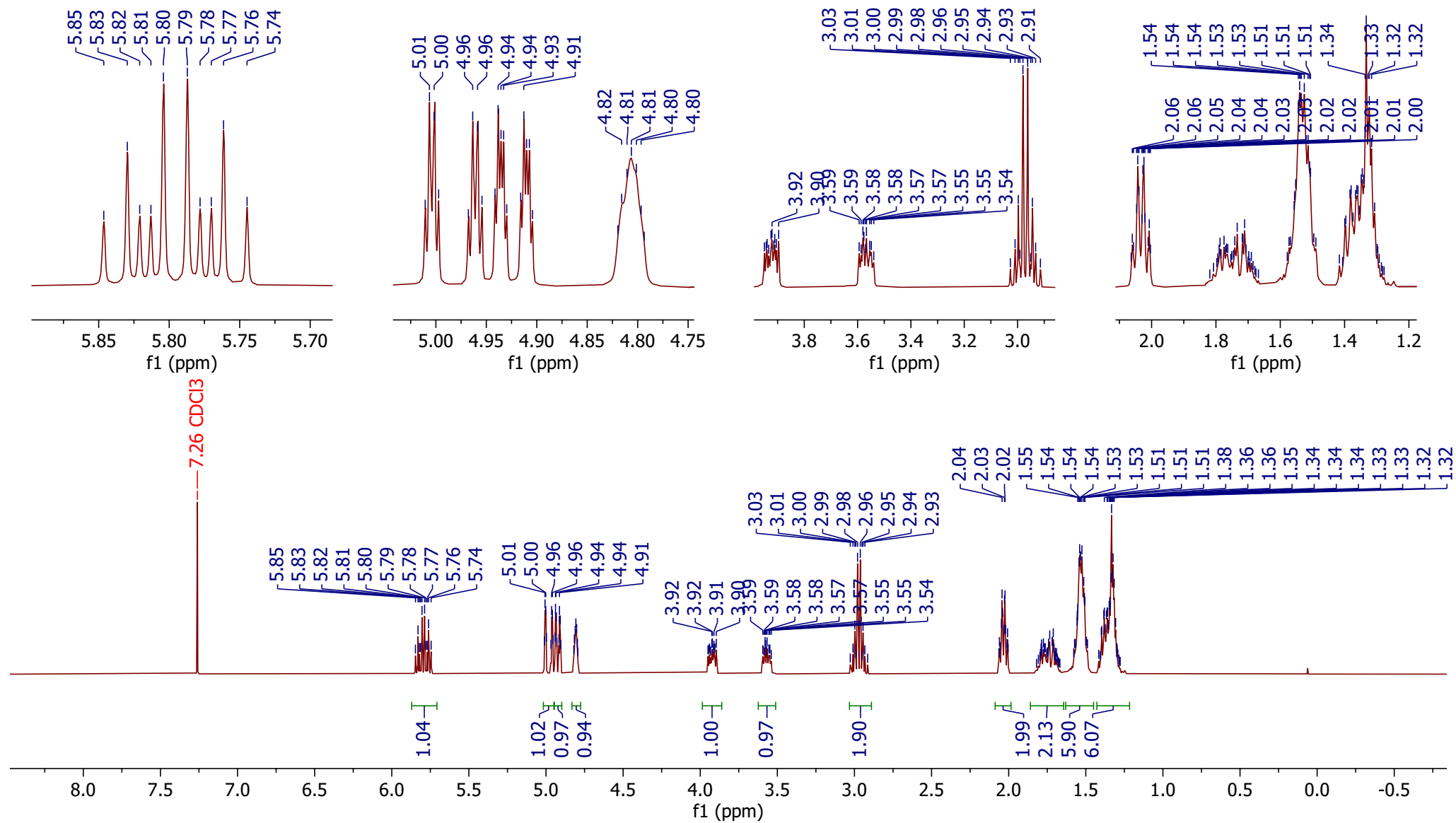
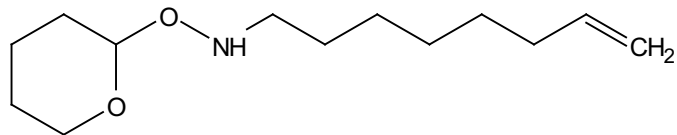
Compound S57 **^{13}C NMR (151 MHz, CDCl_3)**

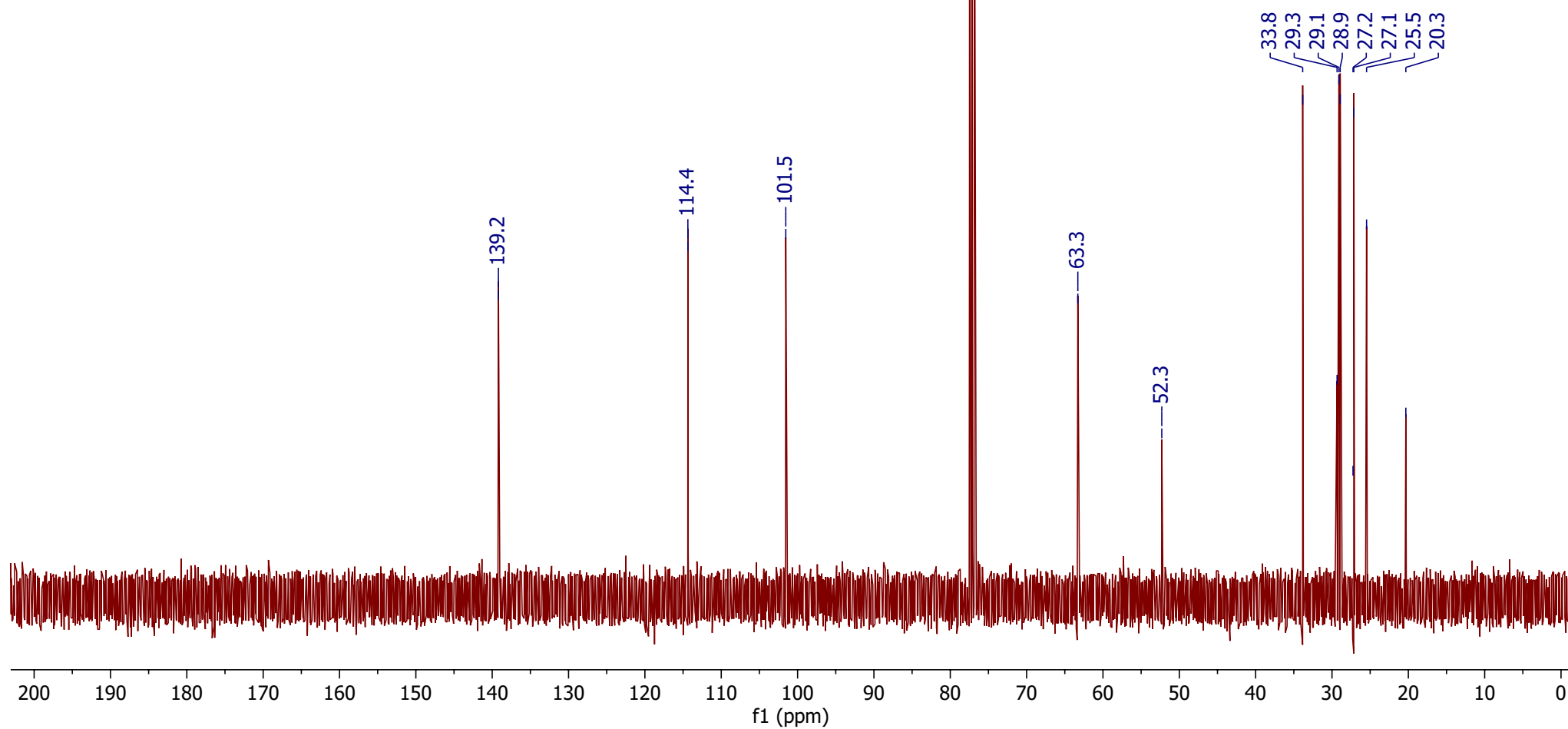
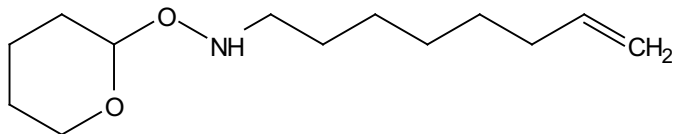
Compound S58
¹H NMR (400 MHz, CDCl₃)



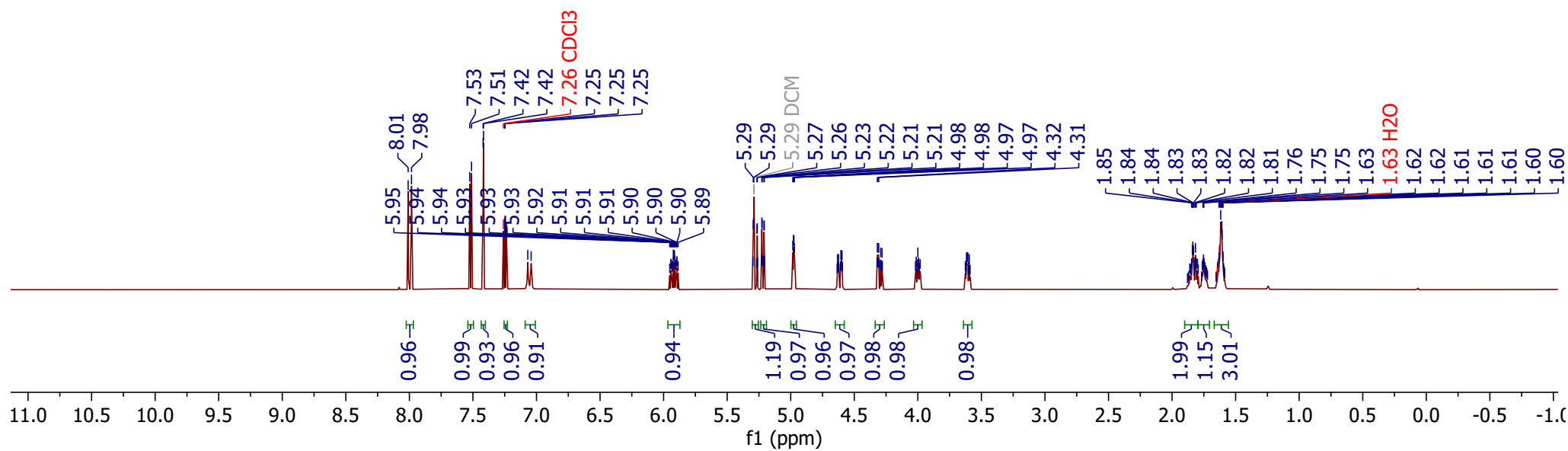
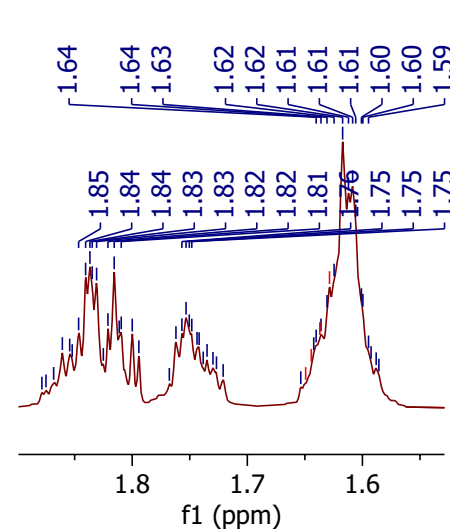
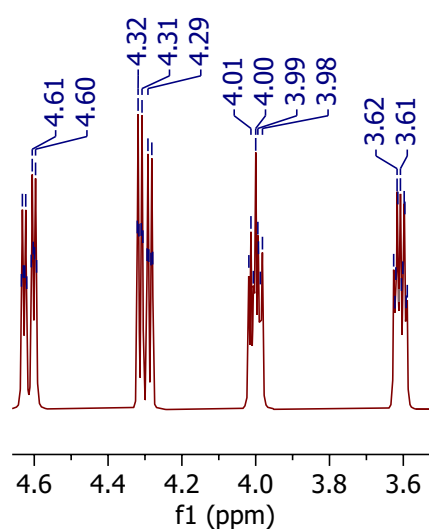
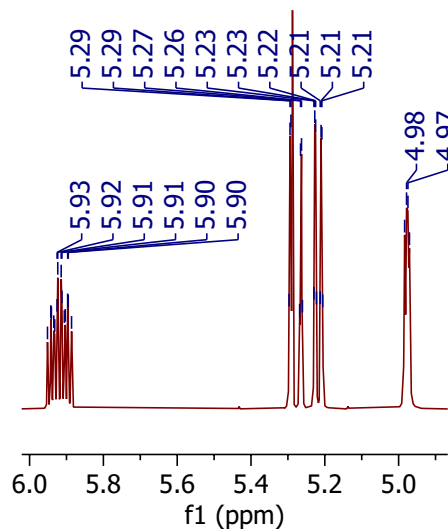
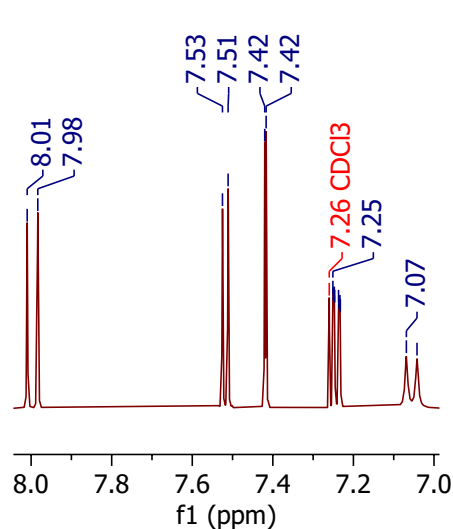
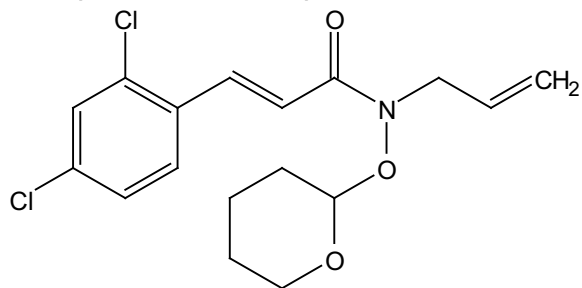
Compound S58 **^{13}C NMR (101 MHz, CDCl_3)**

Compound S59
¹H NMR (400 MHz, CDCl₃)

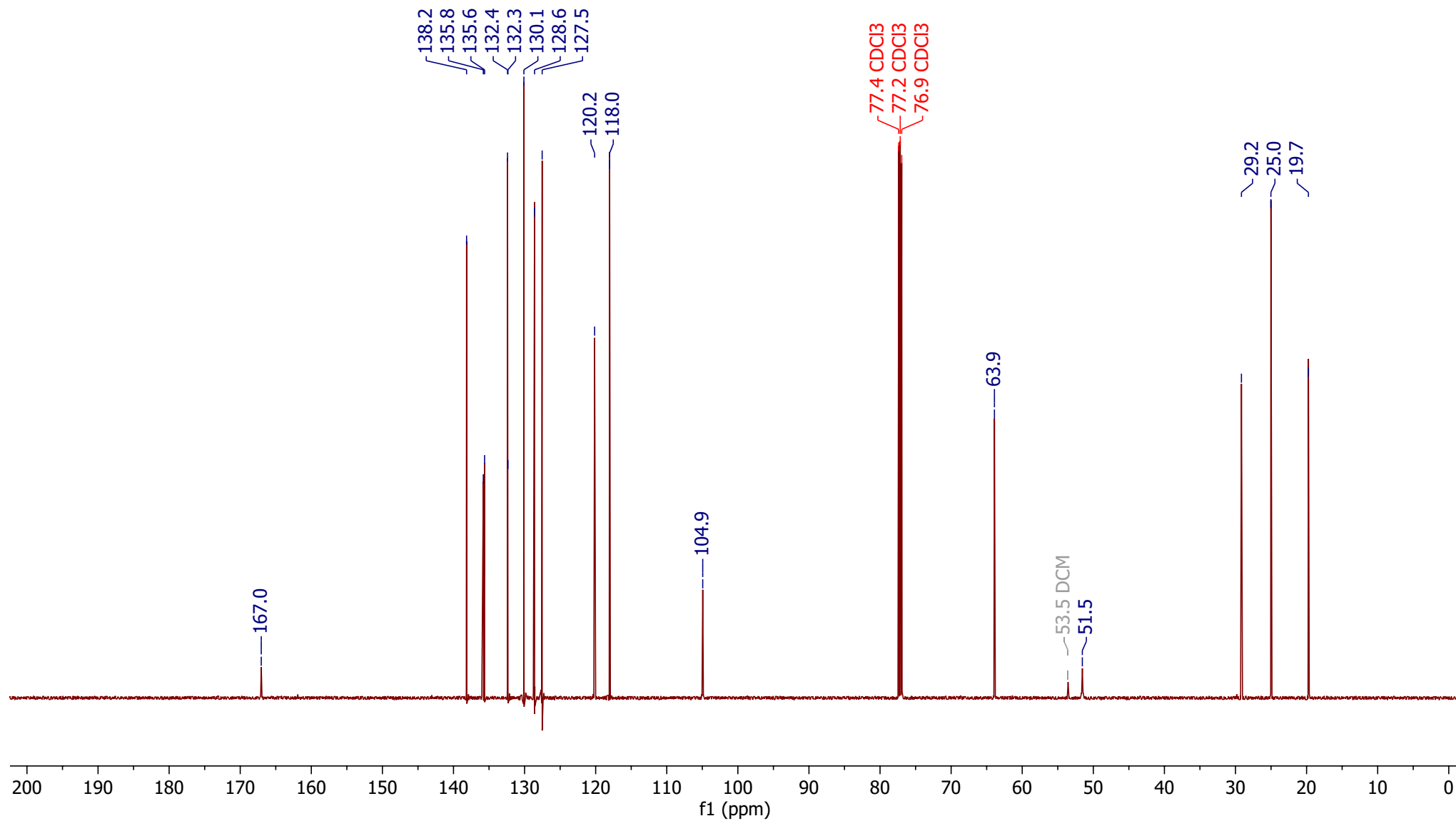
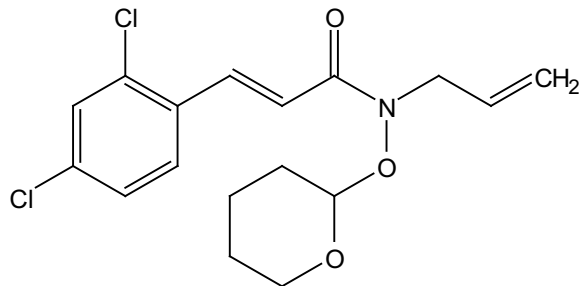


Compound S59 **^{13}C NMR (101 MHz, CDCl_3)**

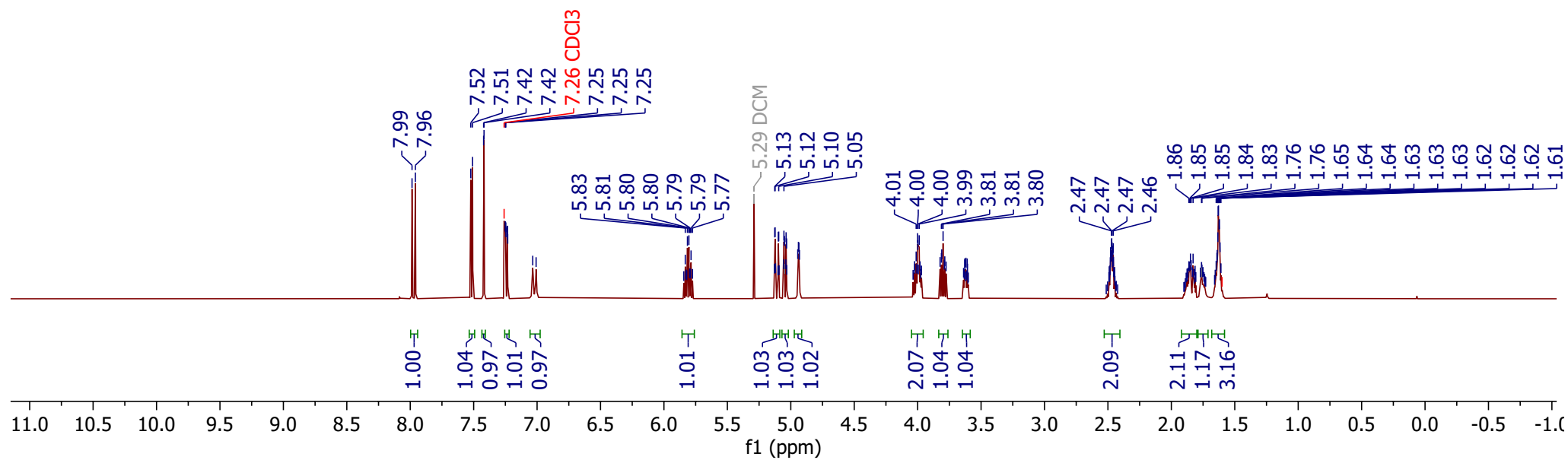
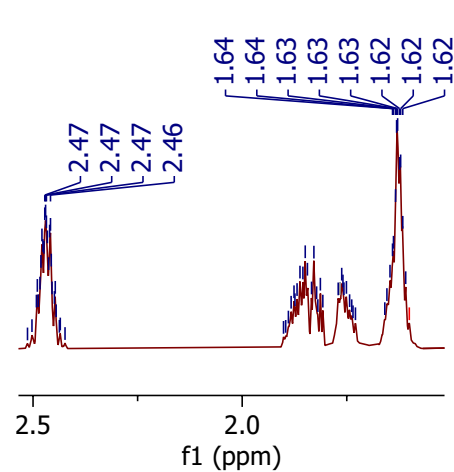
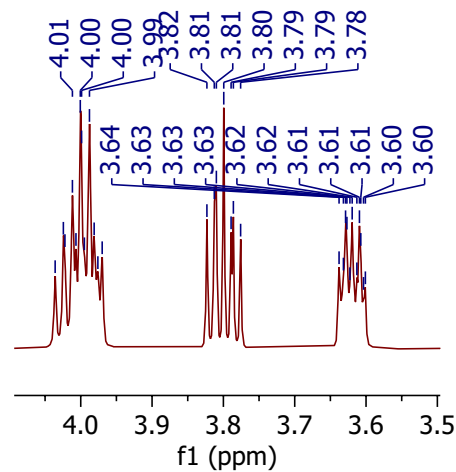
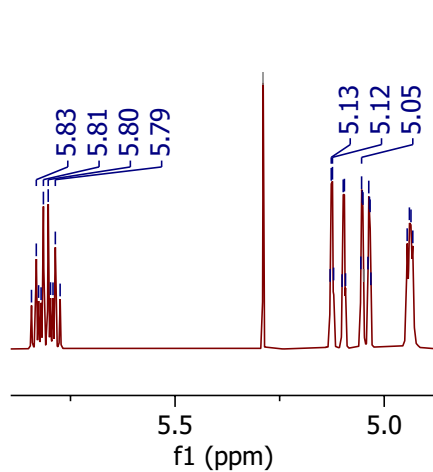
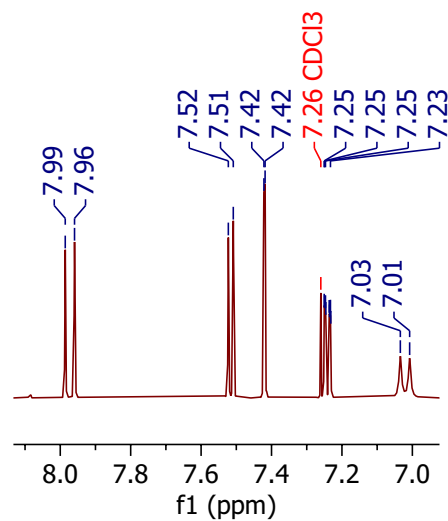
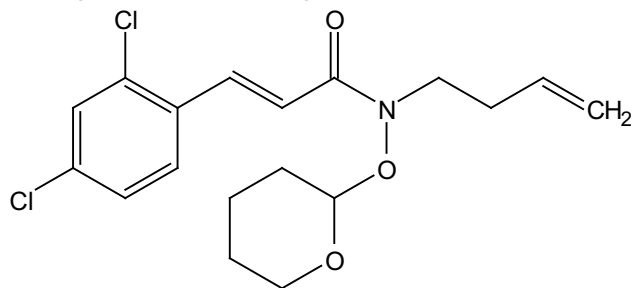
Compound S60
¹H NMR (600 MHz, CDCl₃)



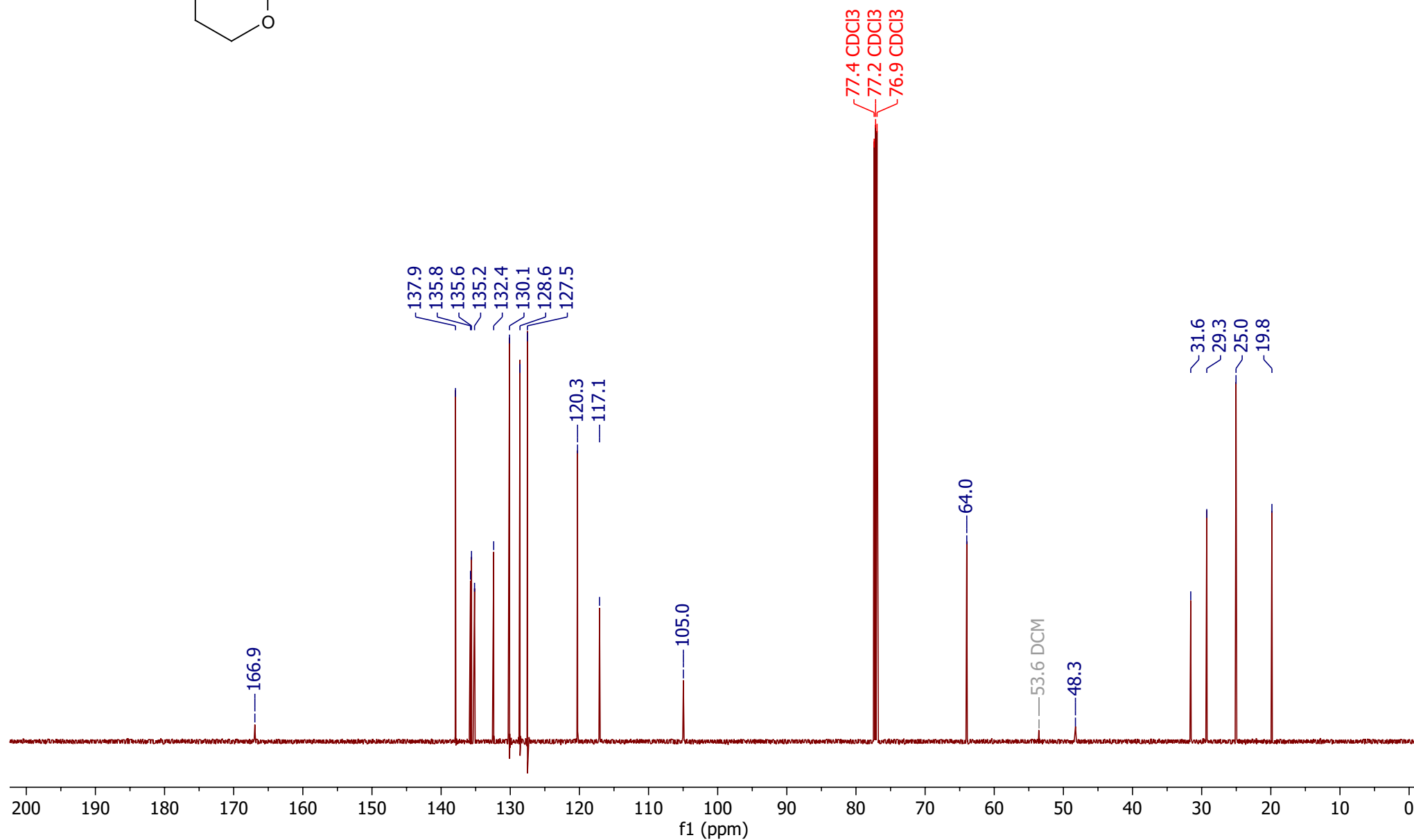
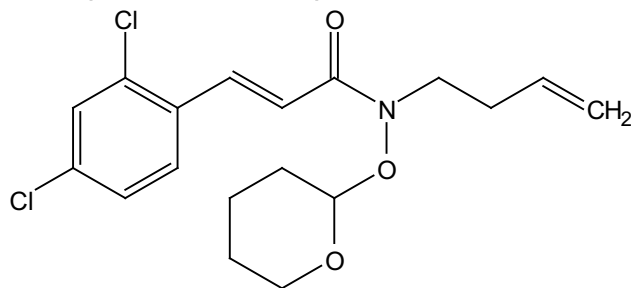
Compound S60
¹³C NMR (151 MHz, CDCl₃)



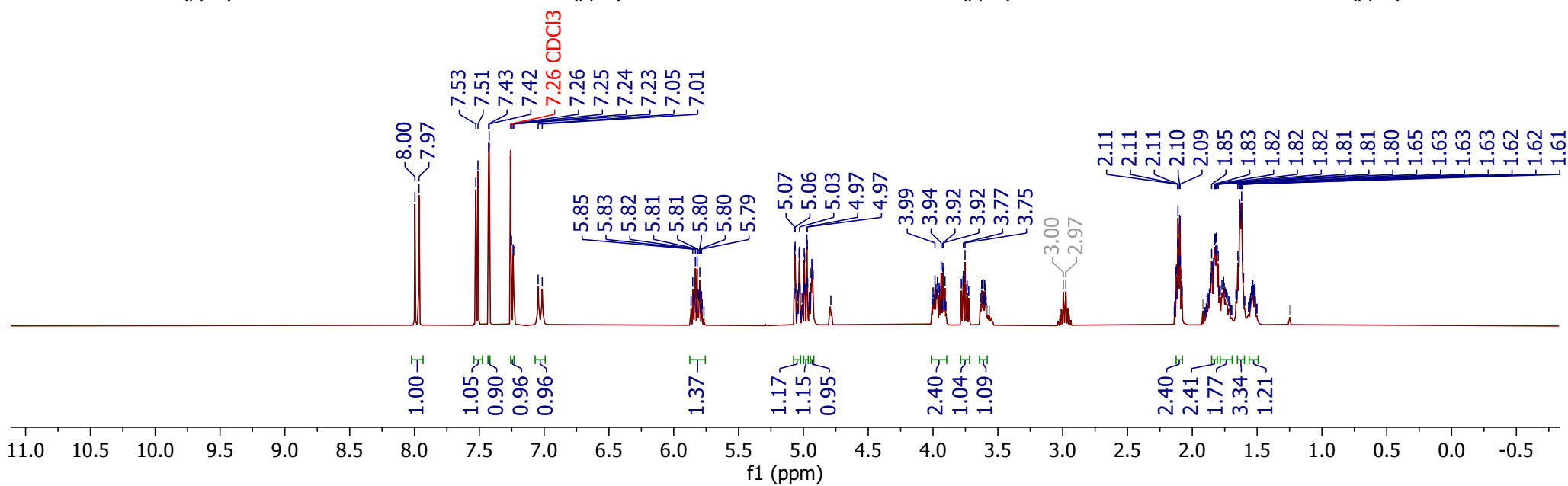
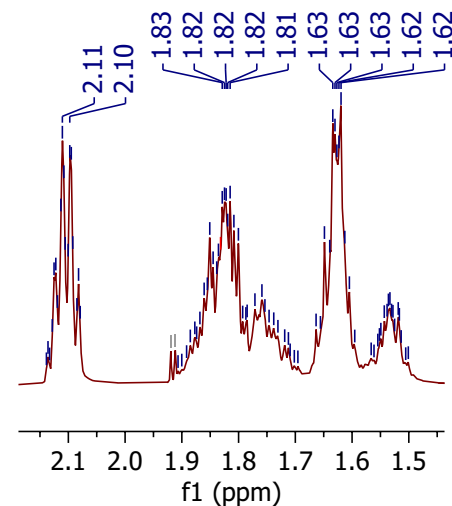
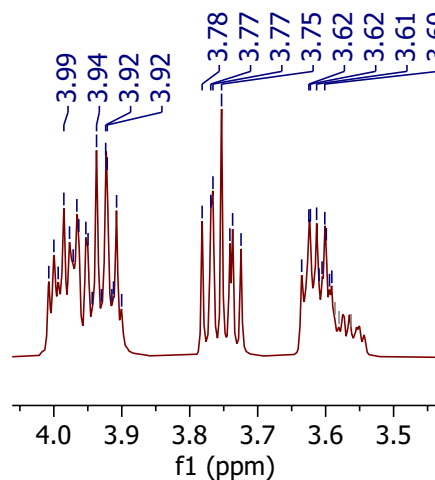
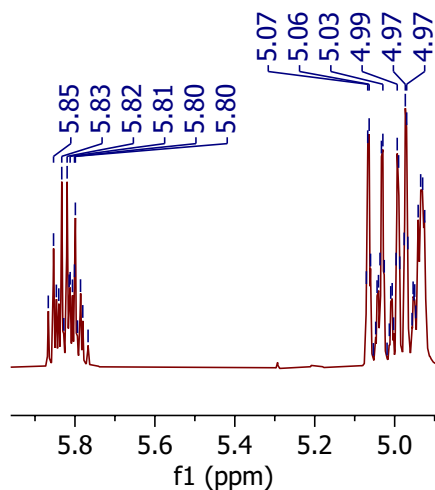
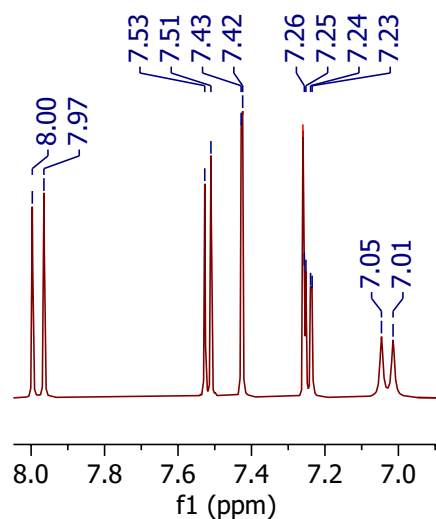
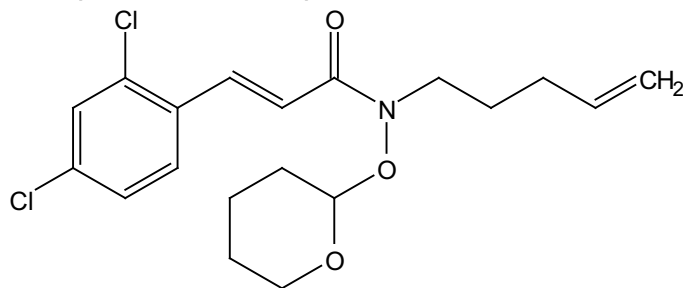
Compound S61
¹H NMR (600 MHz, CDCl₃)



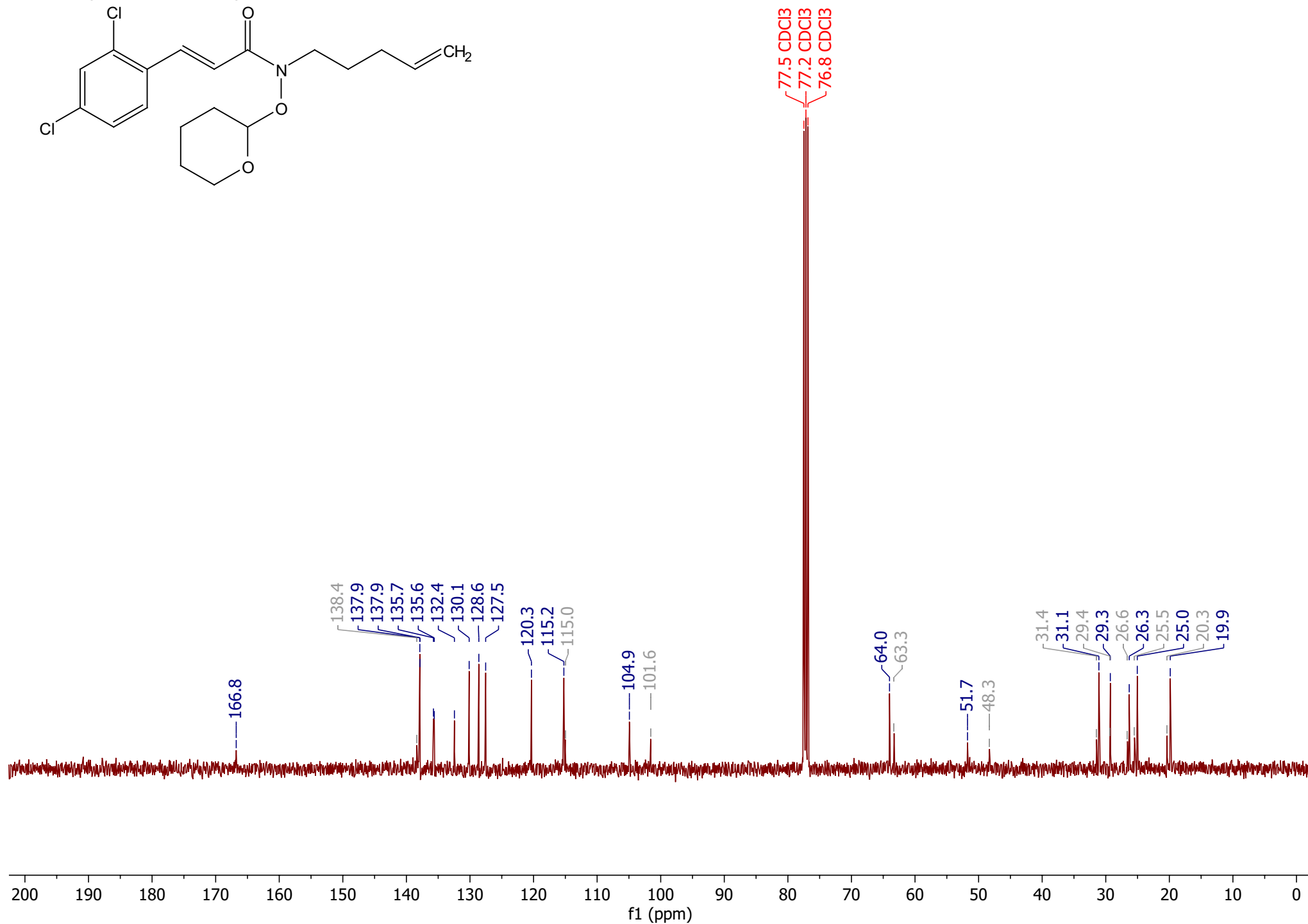
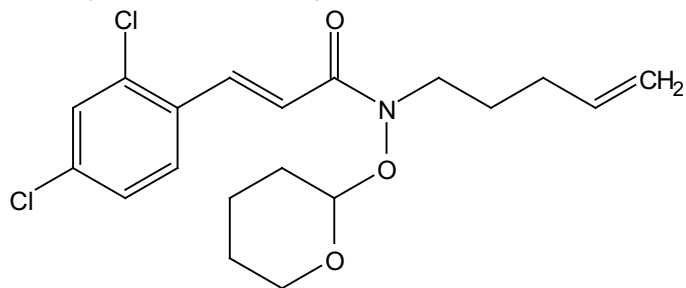
Compound S61
 ^{13}C NMR (151 MHz, CDCl_3)



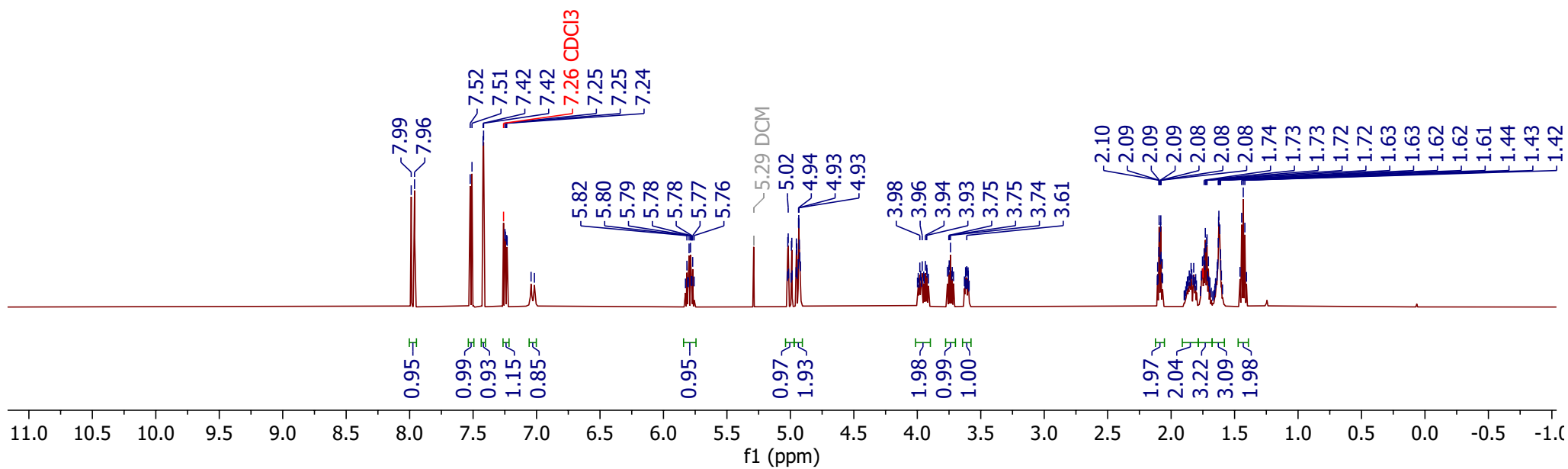
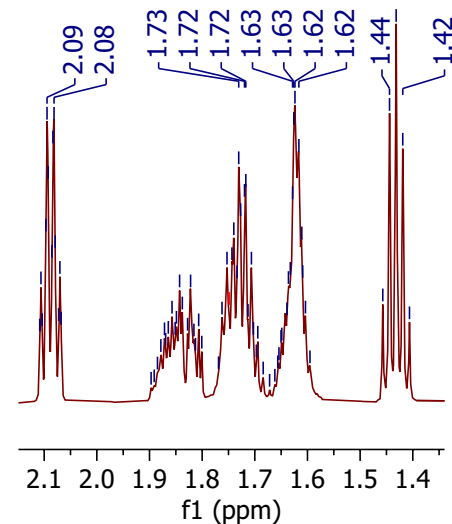
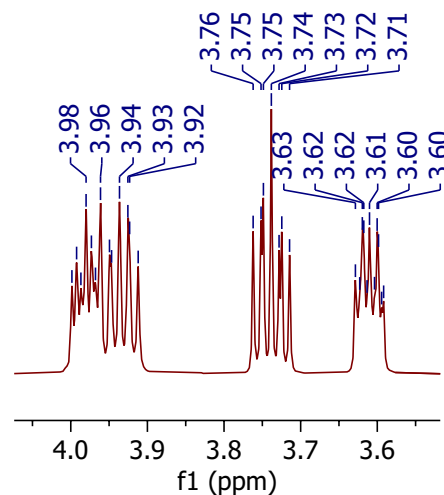
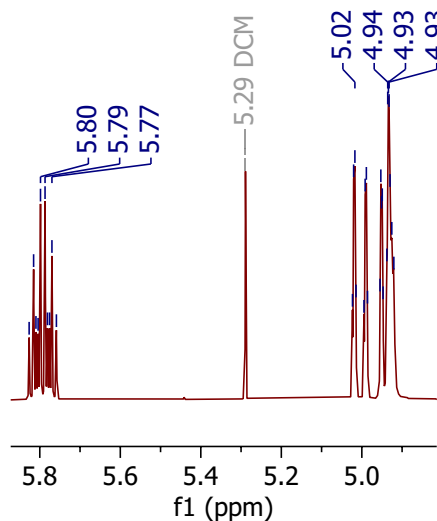
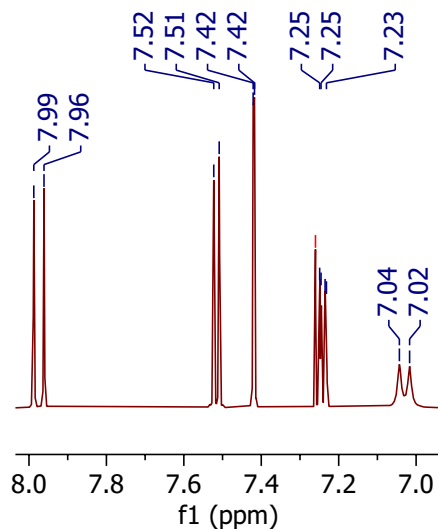
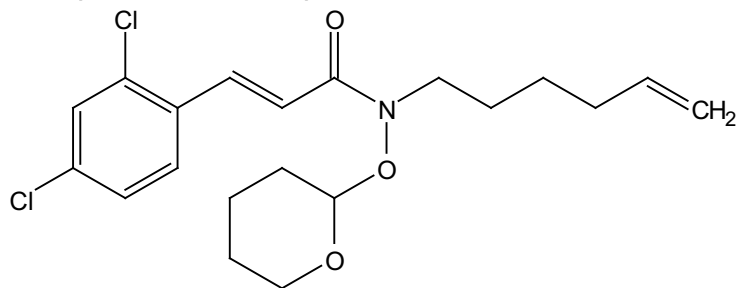
Compound S62
¹H NMR (500 MHz, CDCl₃)



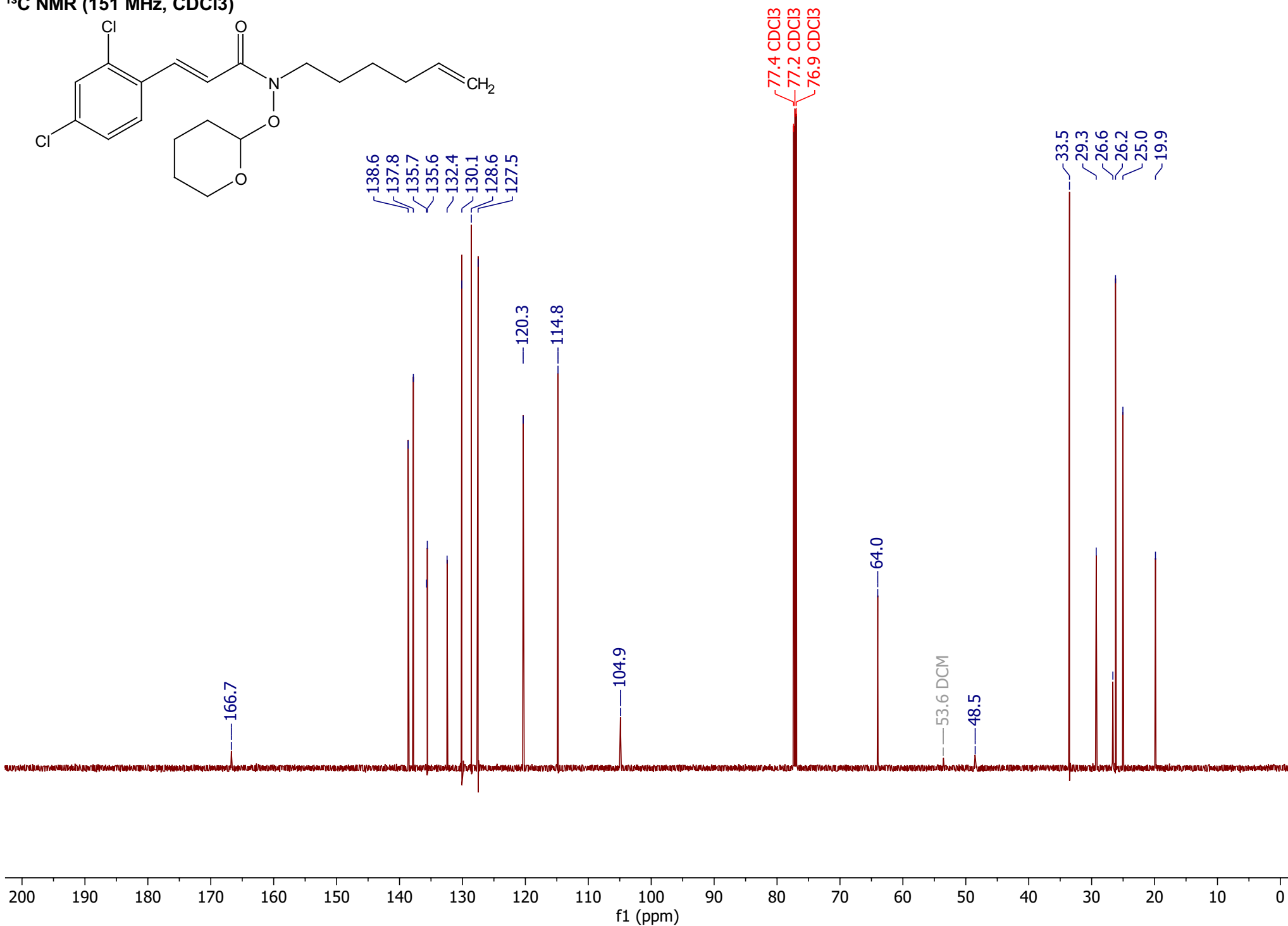
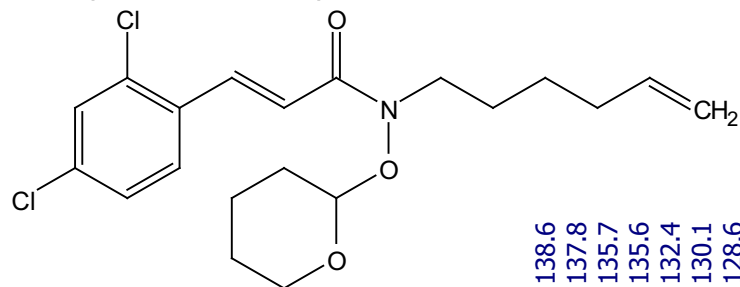
Compound S62
¹³C NMR (101 MHz, CDCl₃)



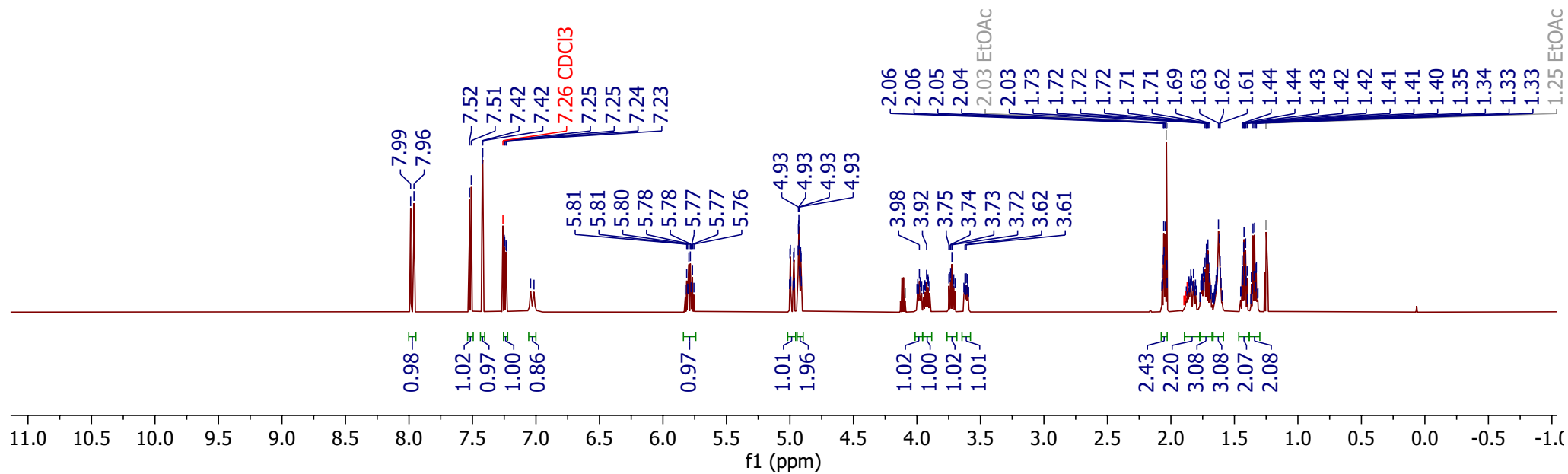
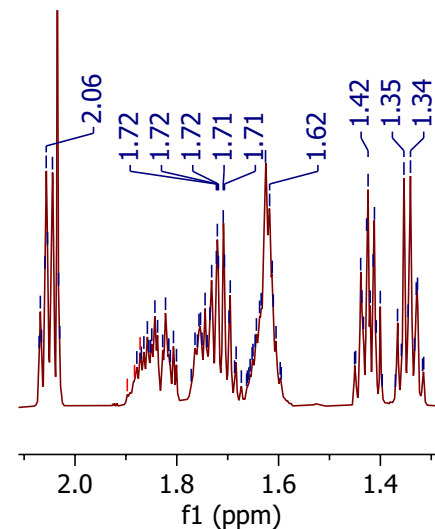
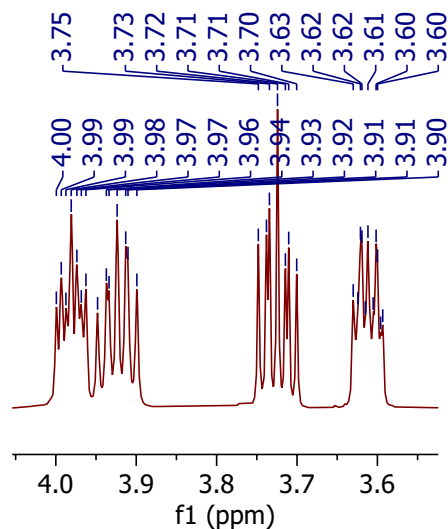
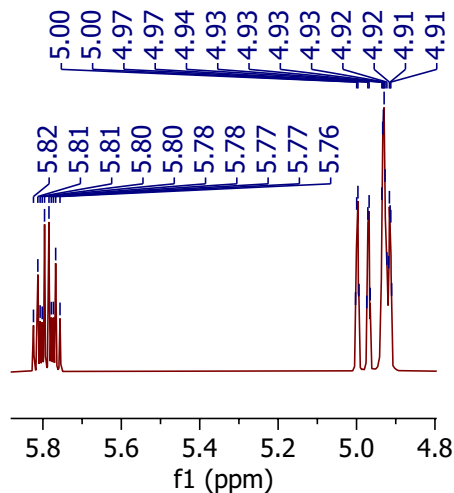
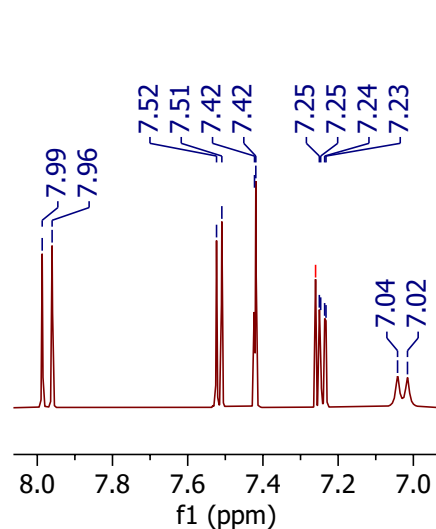
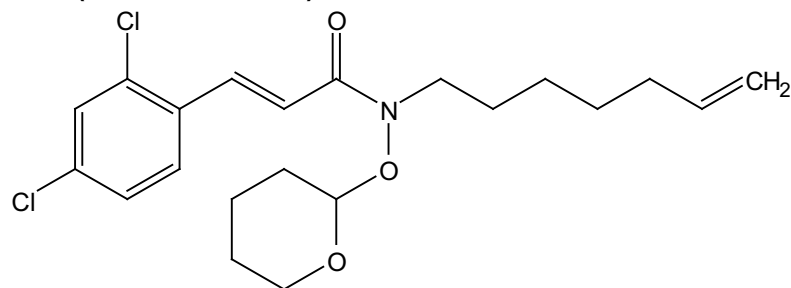
Compound S63
¹H NMR (600 MHz, CDCl₃)

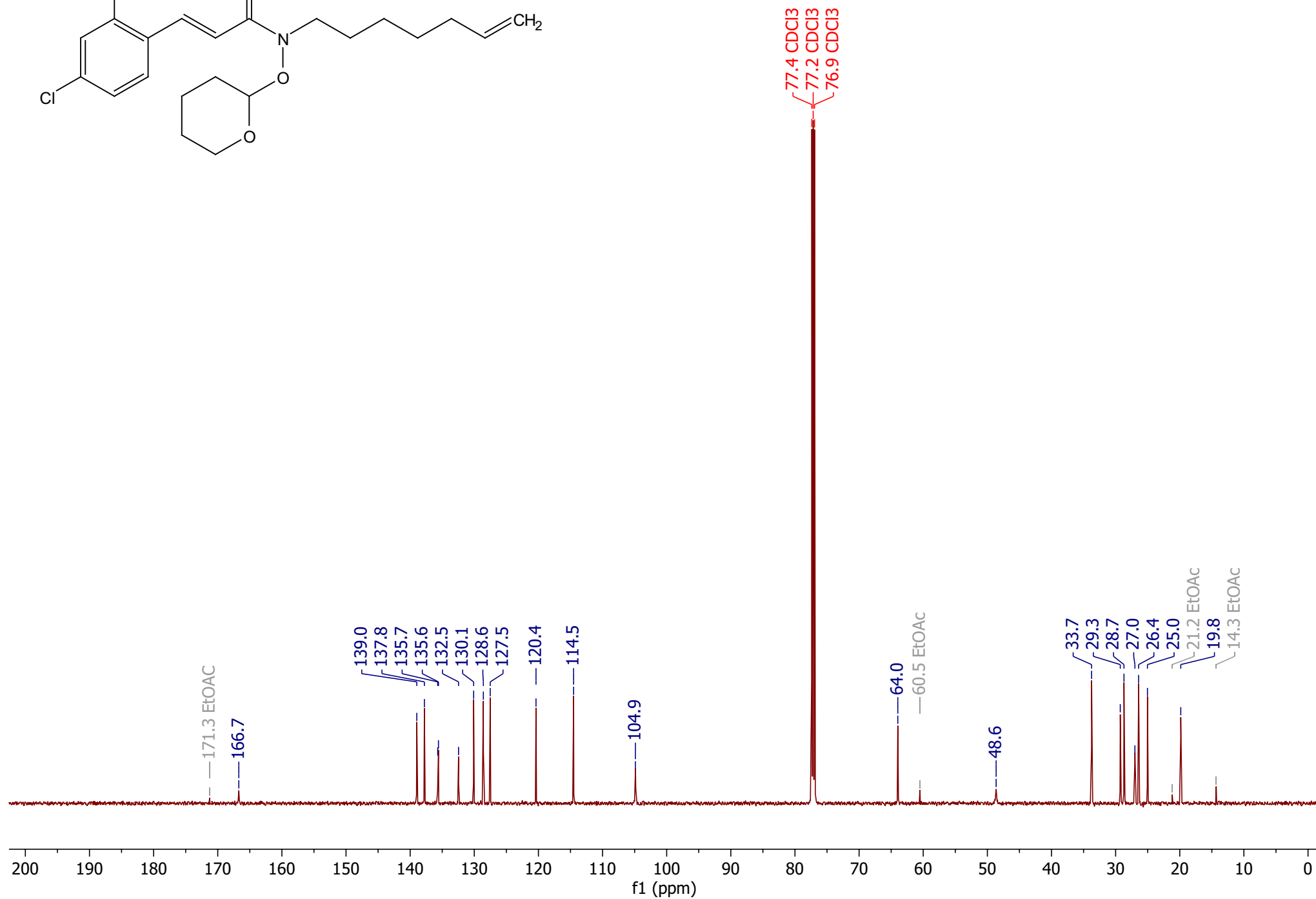
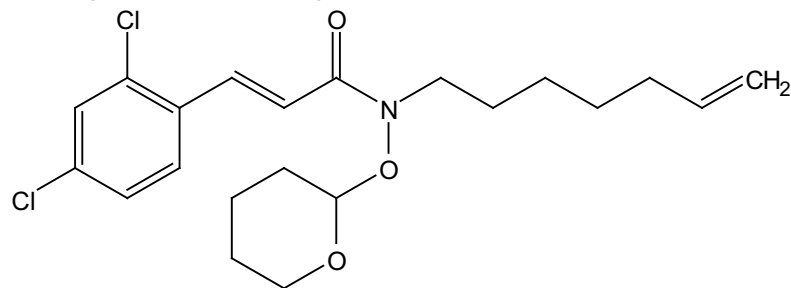


Compound S63
 ^{13}C NMR (151 MHz, CDCl_3)

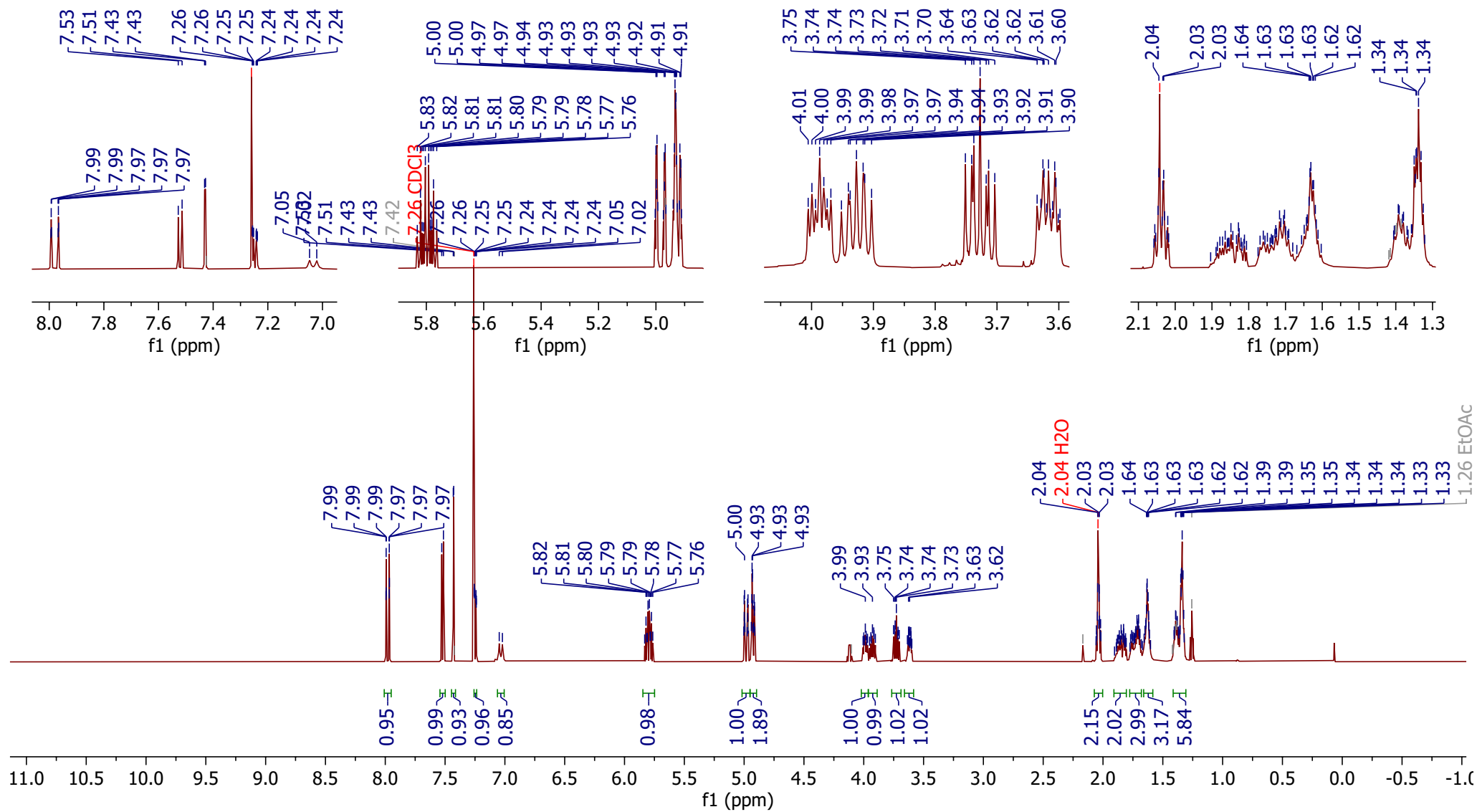
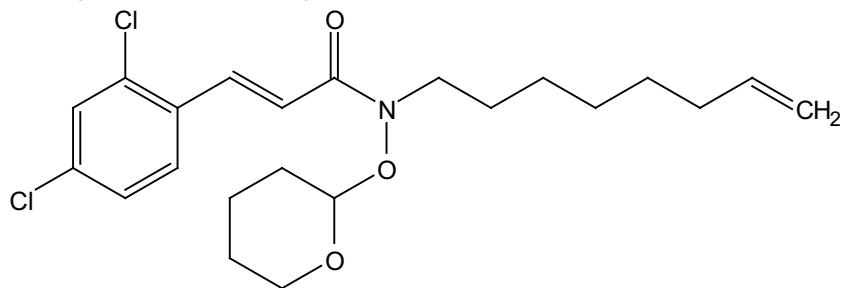


Compound S64
¹H NMR (600 MHz, CDCl₃)

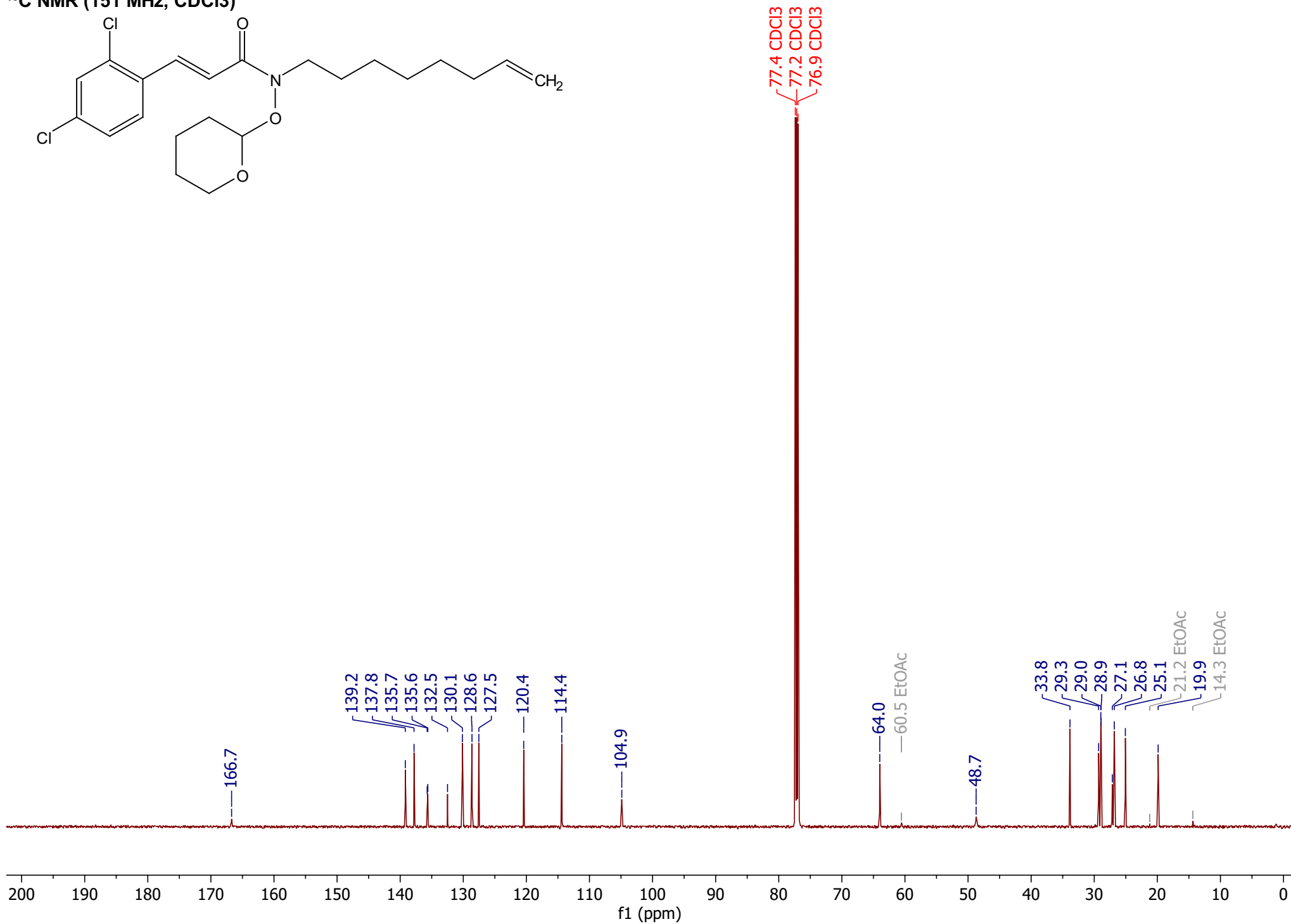
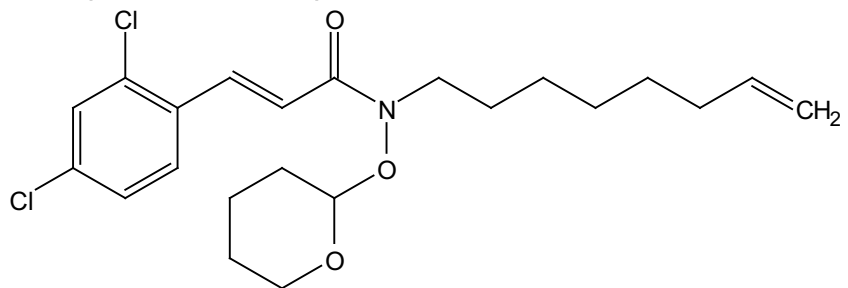


Compound S64 **^{13}C NMR (151 MHz, CDCl_3)**

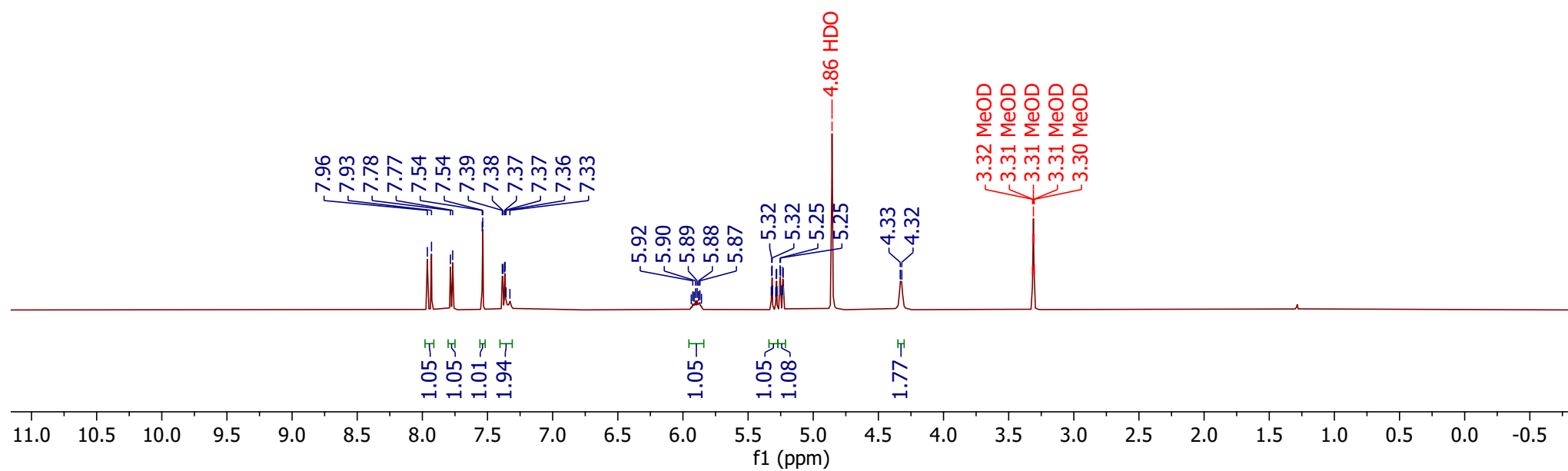
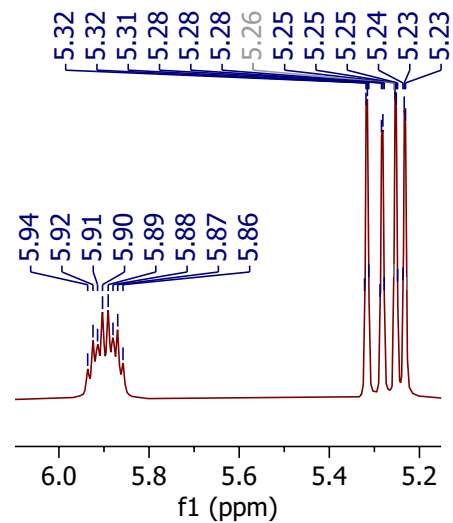
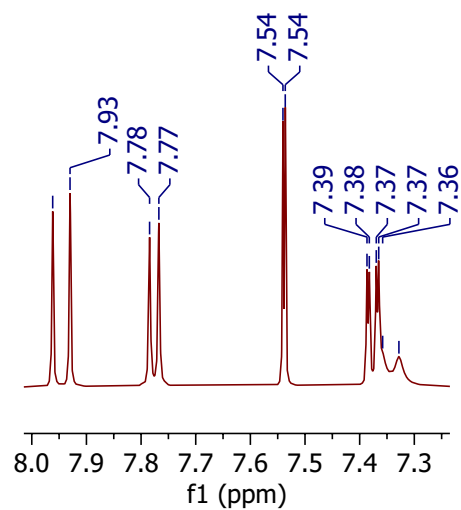
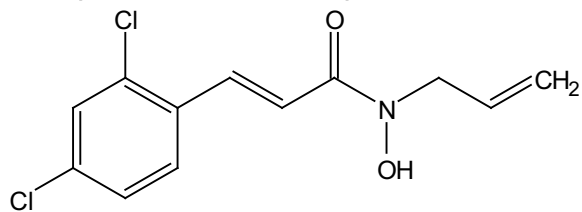
Compound S65
¹H NMR (600 MHz, CDCl₃)

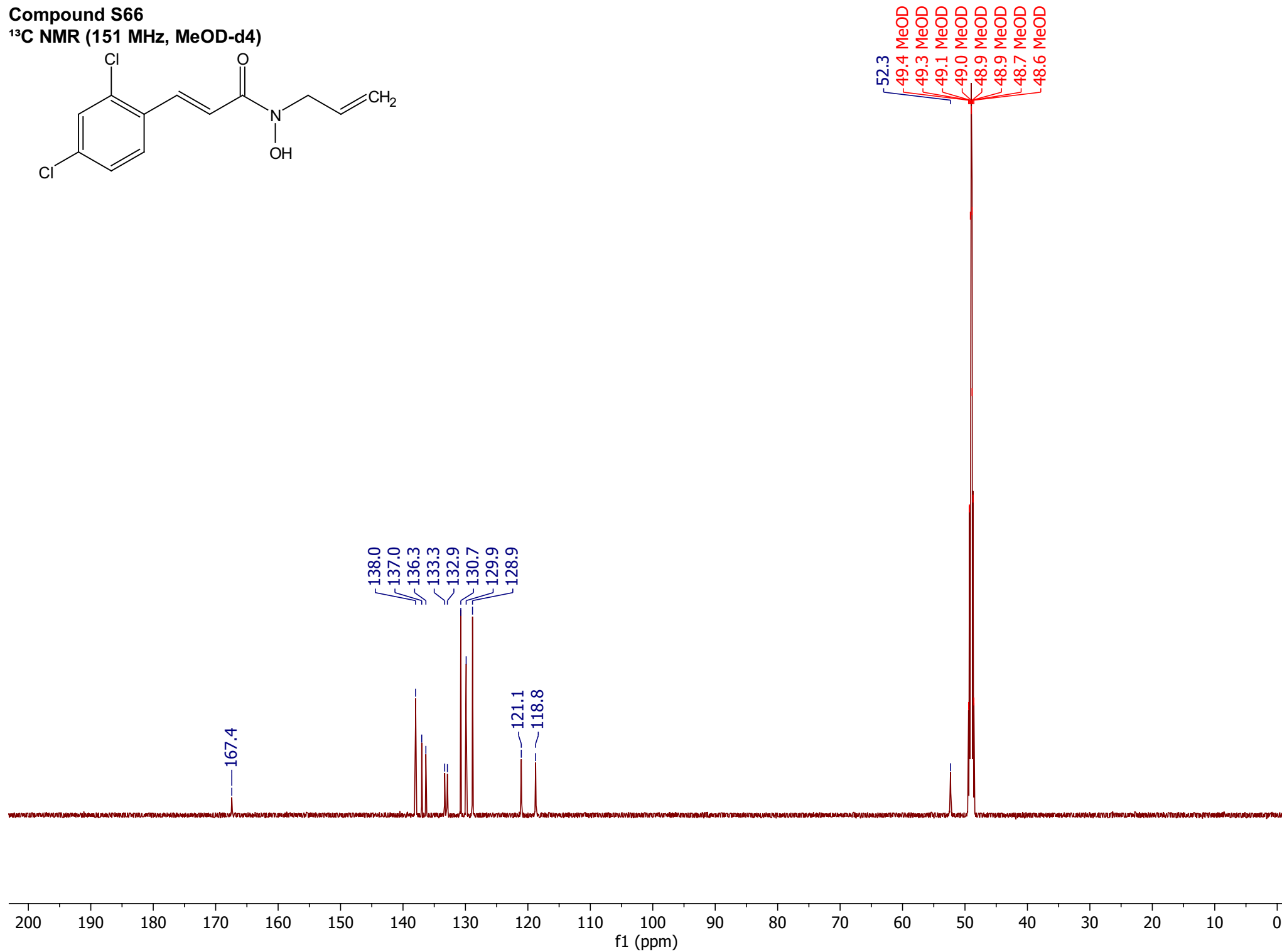
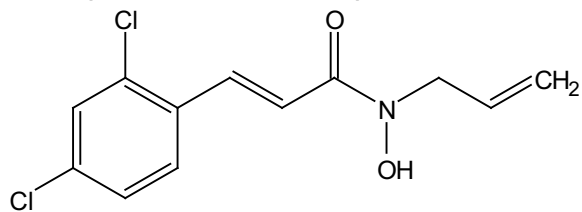


Compound S65
¹³C NMR (151 MHz, CDCl₃)

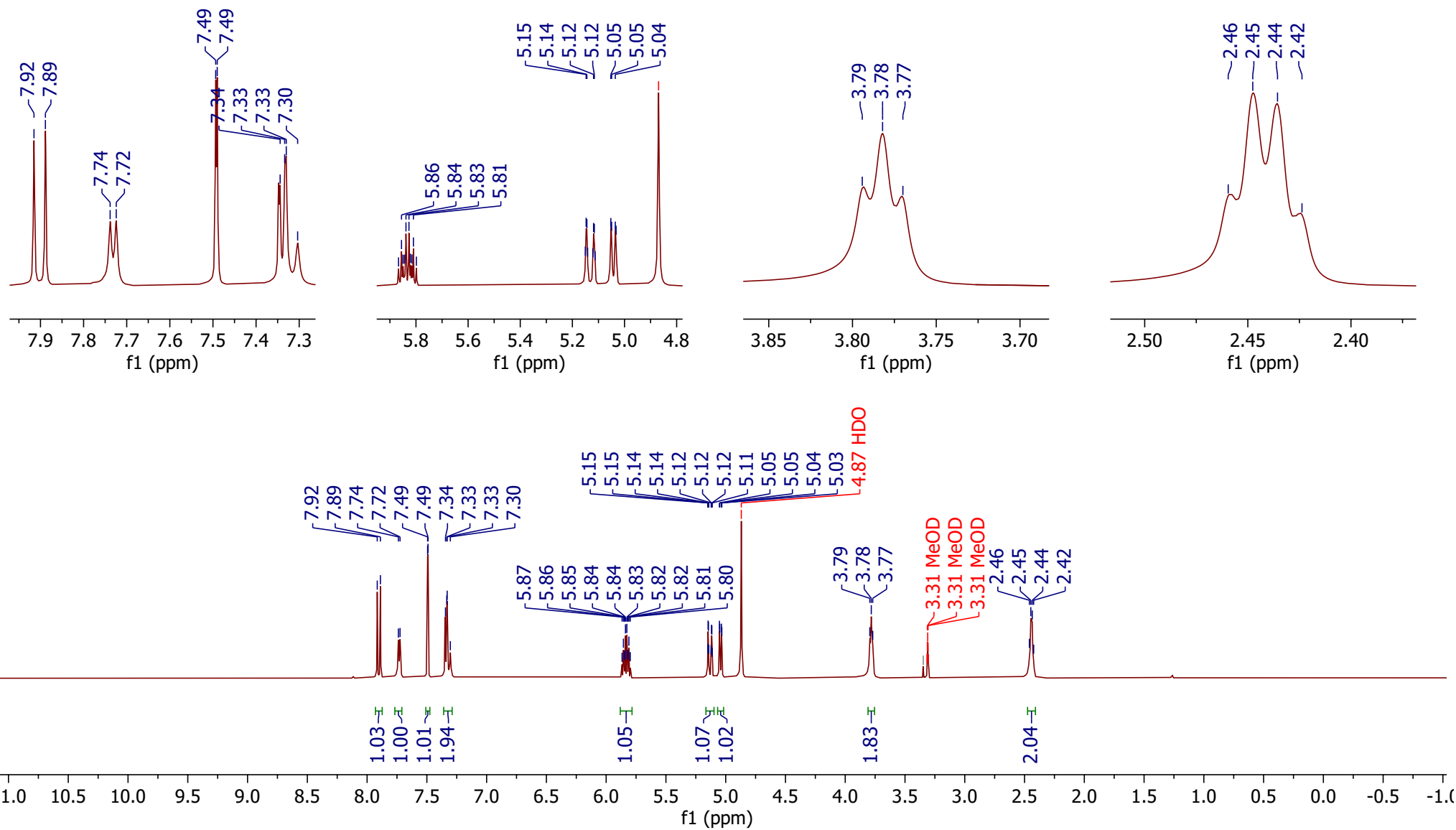
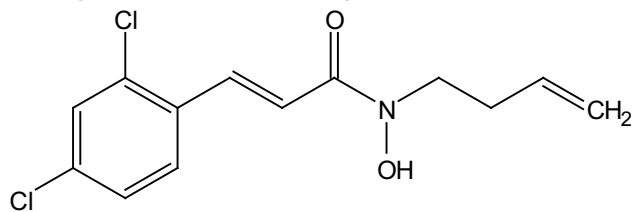


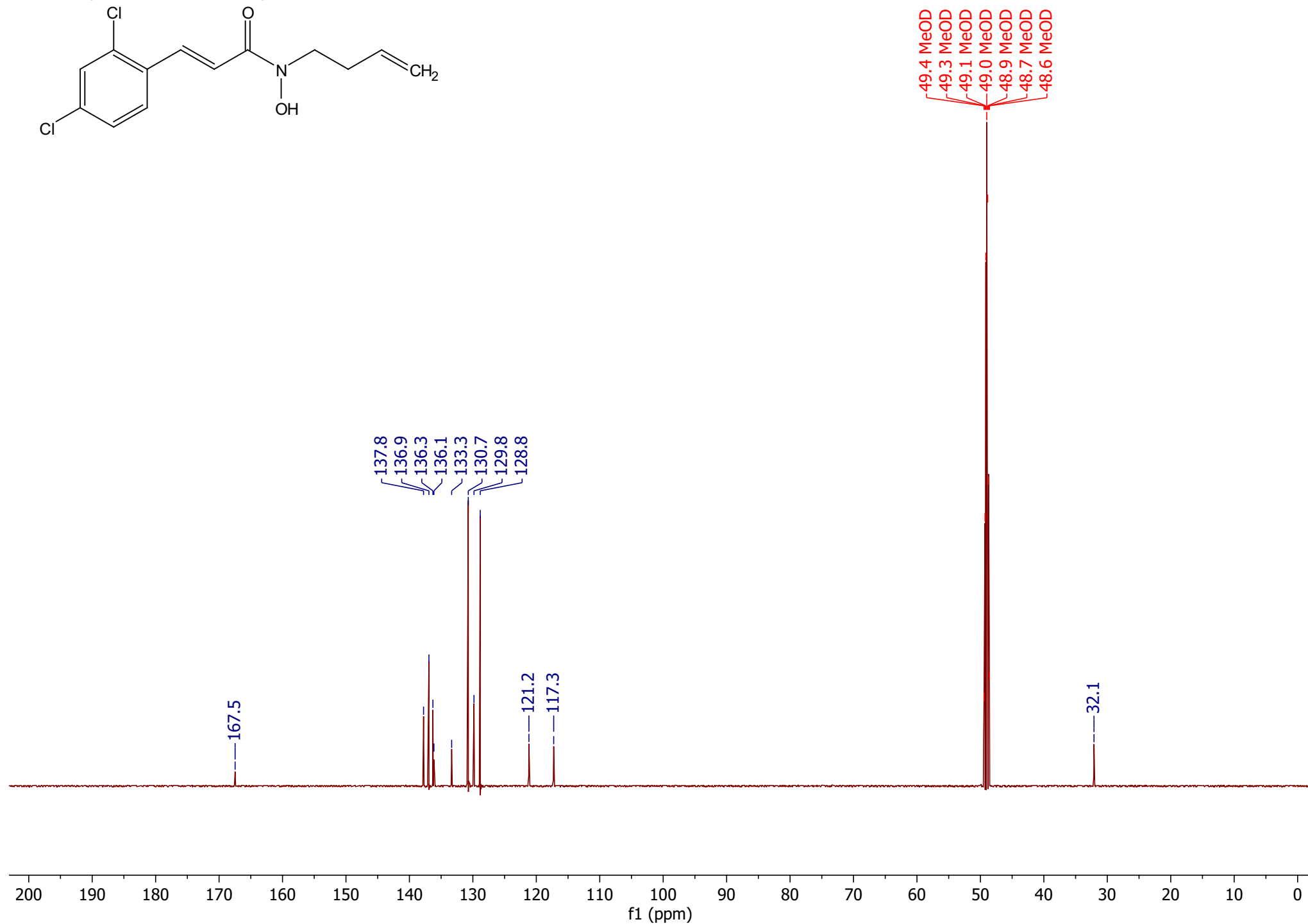
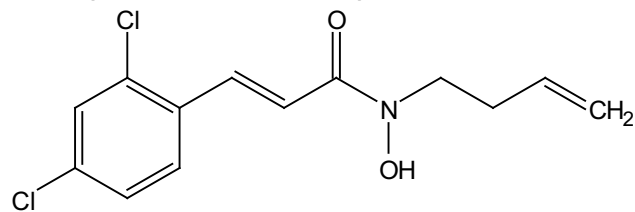
Compound S66
¹H NMR (500 MHz, MeOD-d4)



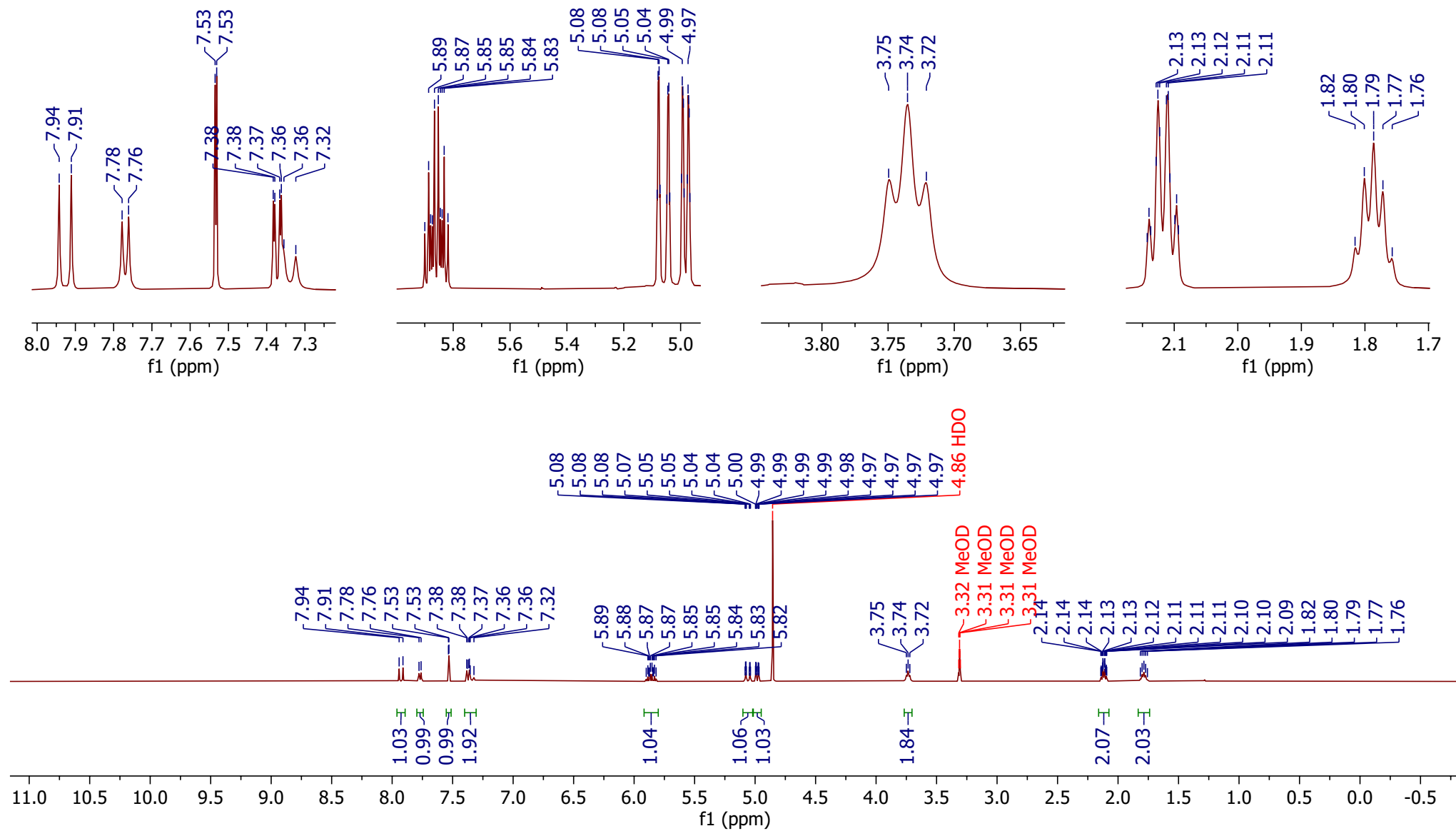
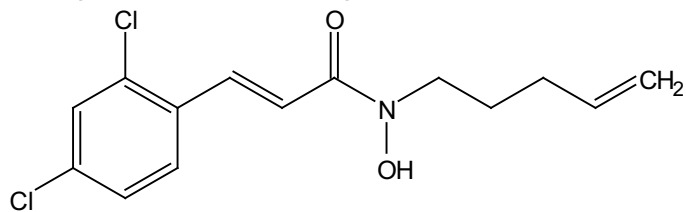
Compound S66 **^{13}C NMR (151 MHz, MeOD- d_4)**

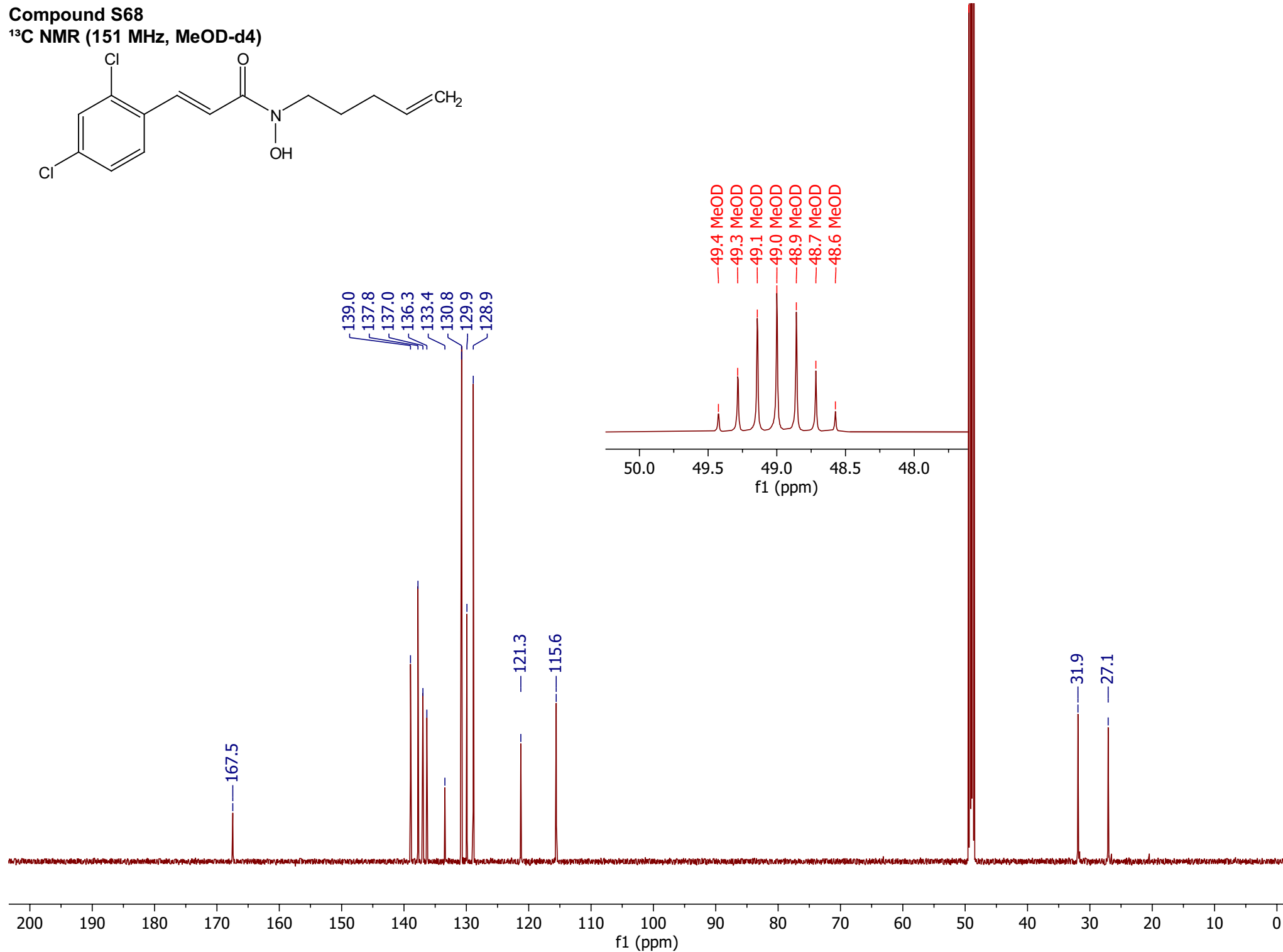
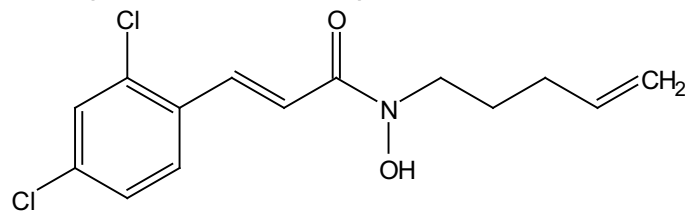
Compound S67
¹H NMR (600 MHz, MeOD-d₄)

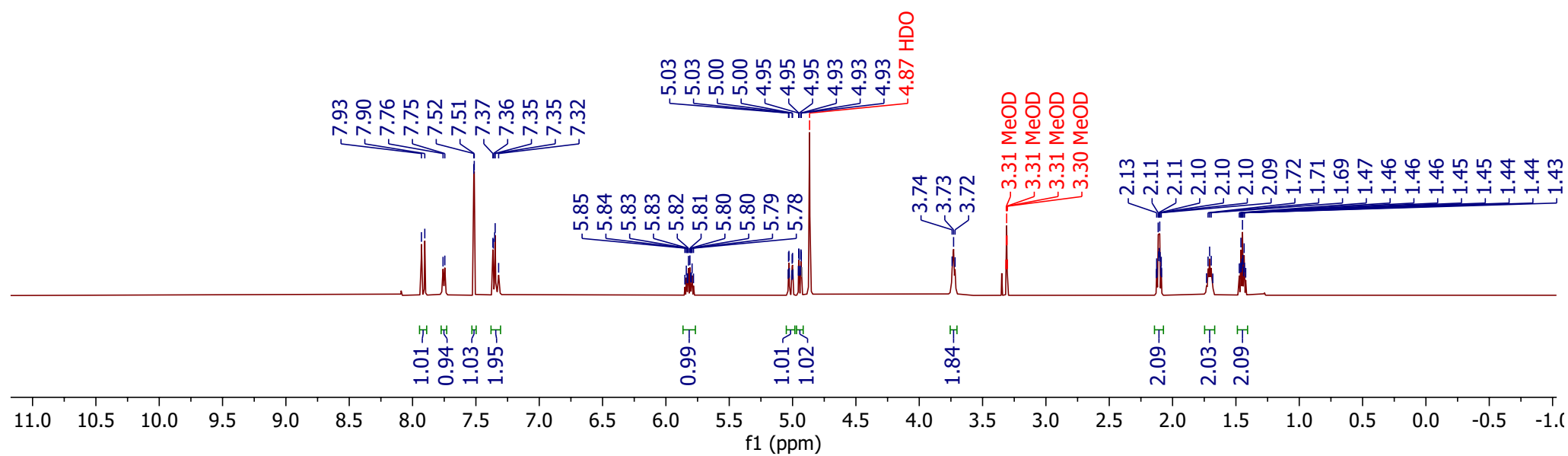
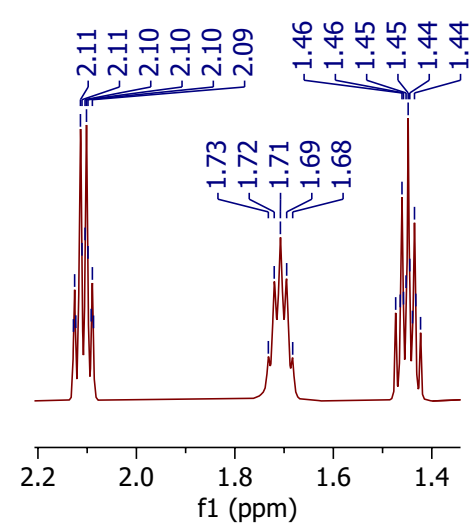
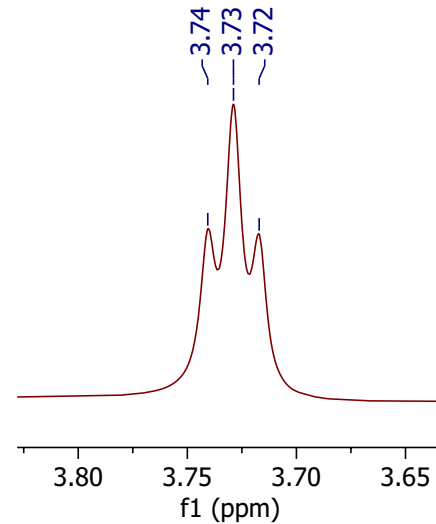
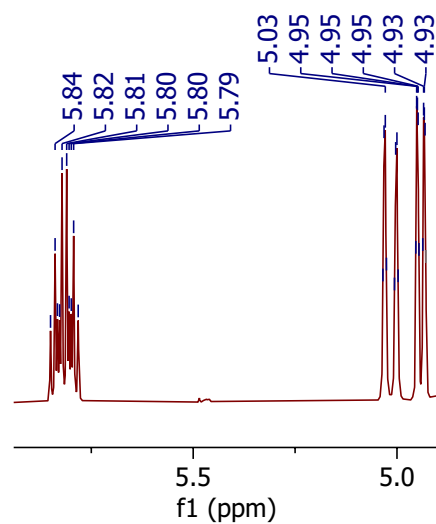
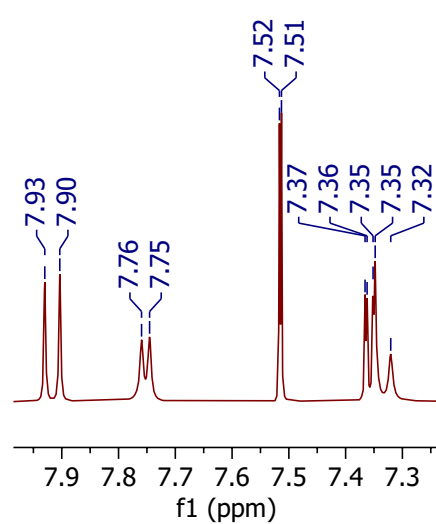
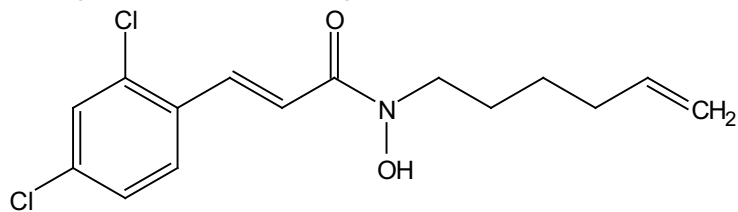


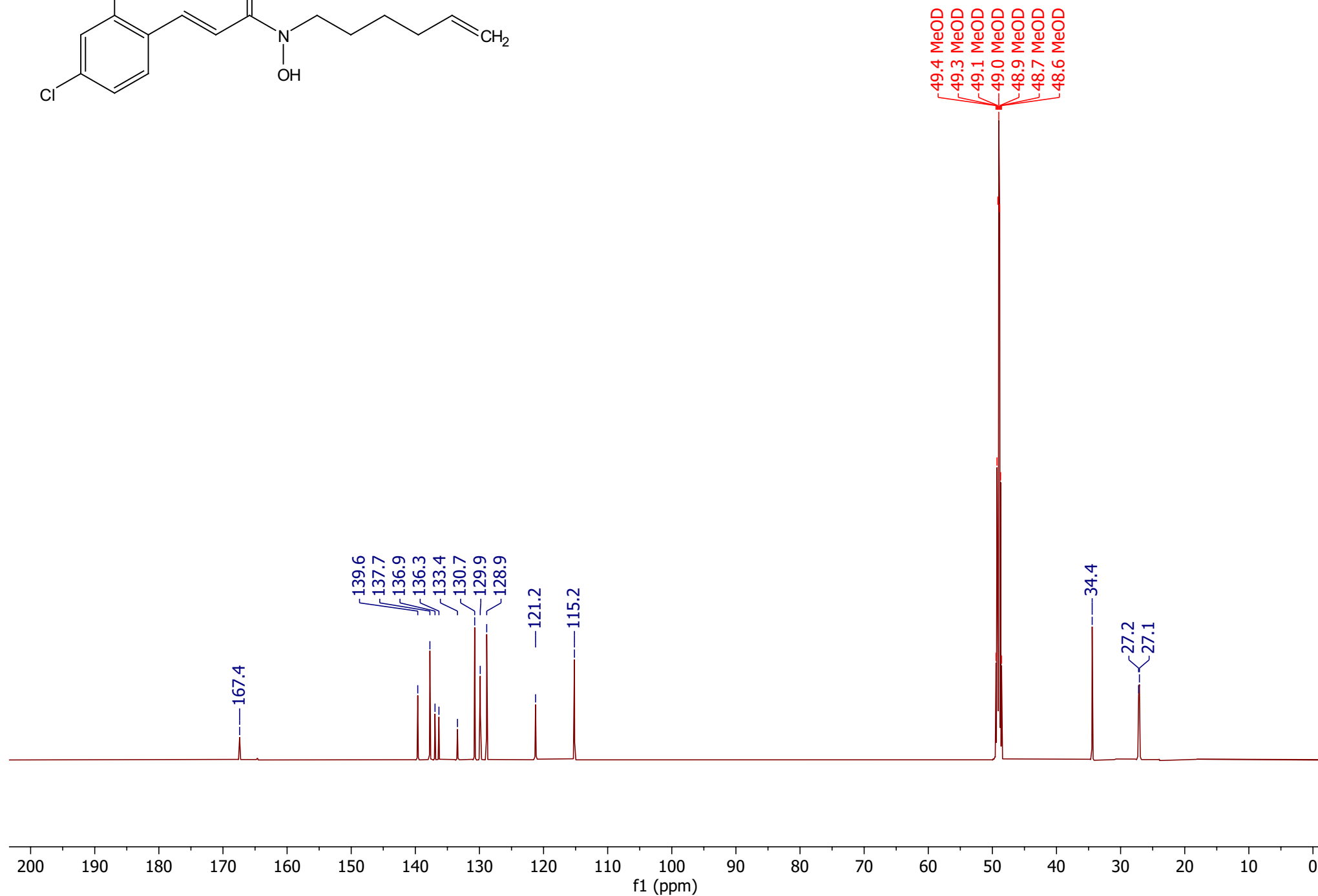
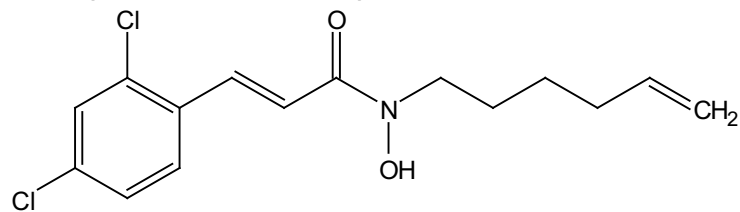
Compound S67 **^{13}C NMR (151 MHz, MeOD- d_4)**

Compound S68
¹H NMR (500 MHz, MeOD-d₄)

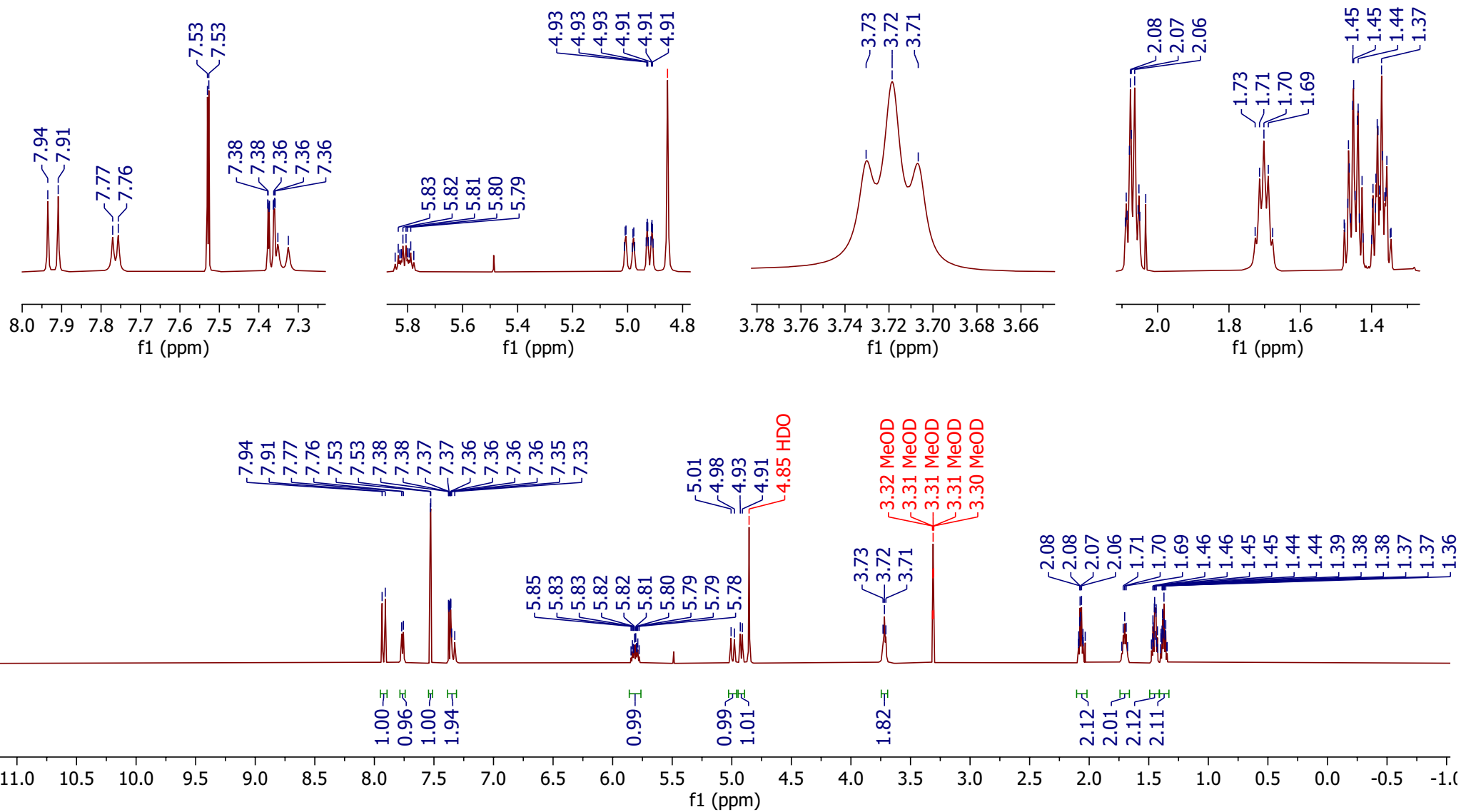
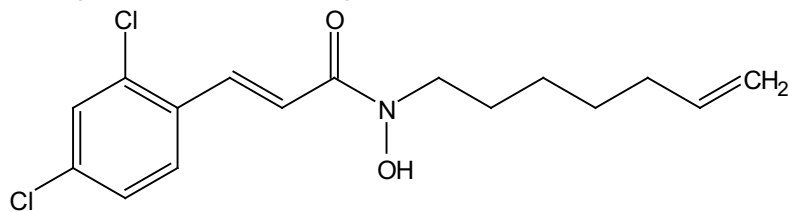


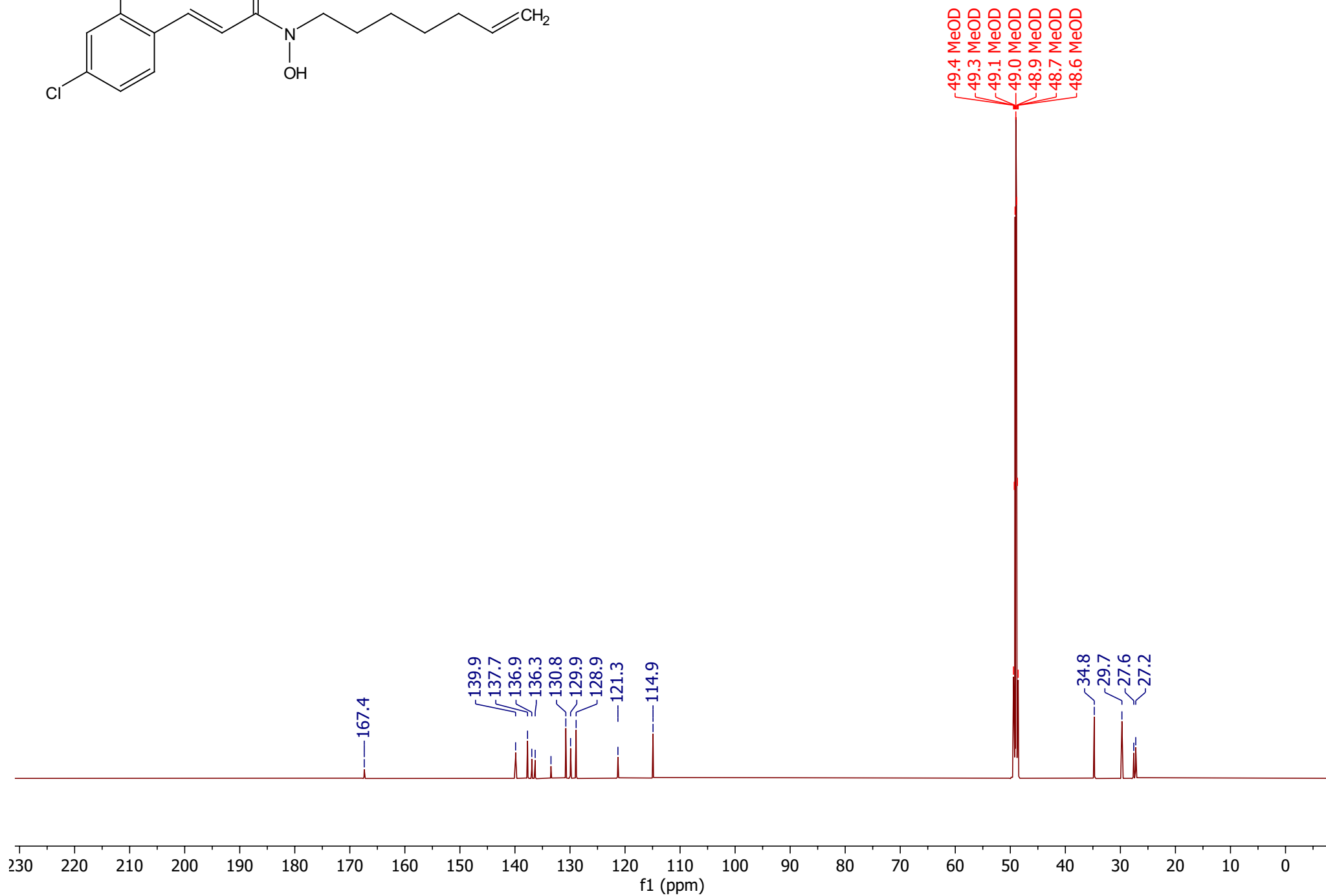
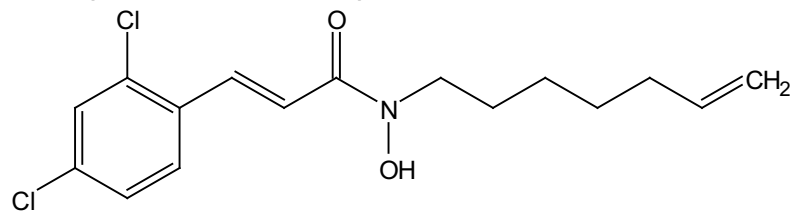
Compound S68 **^{13}C NMR (151 MHz, MeOD- d_4)**

Compound S69**¹H NMR (600 MHz, MeOD-d₄)**

Compound S69 **^{13}C NMR (151 MHz, MeOD-d₄)**

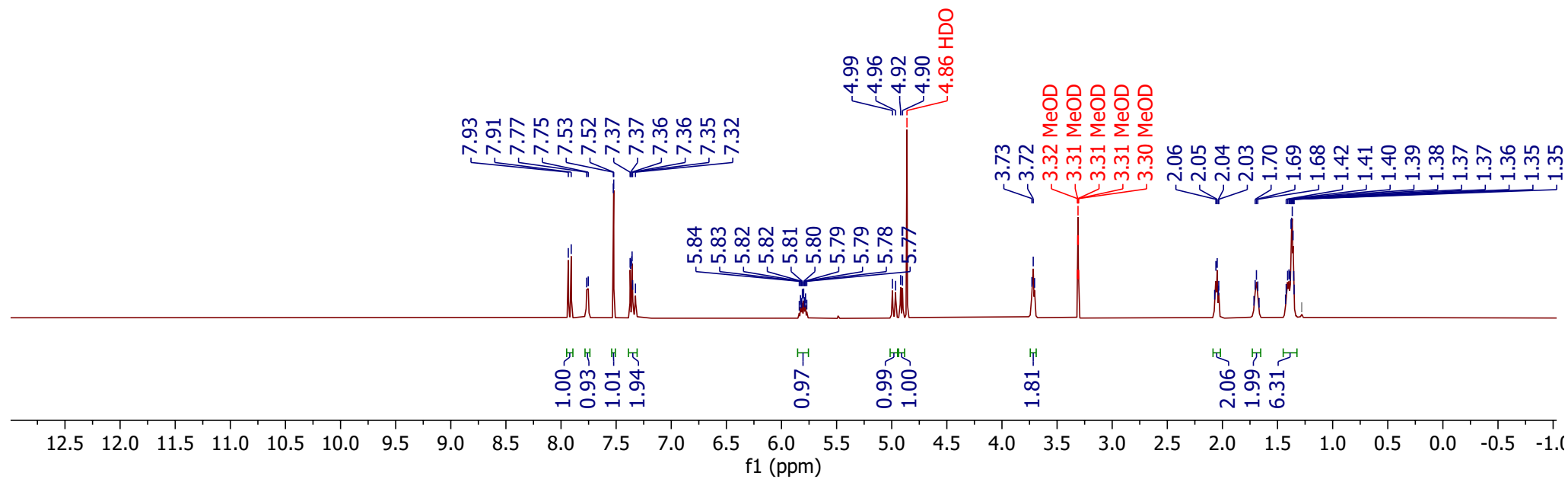
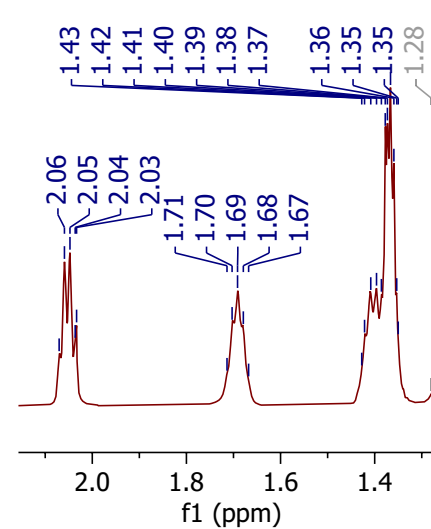
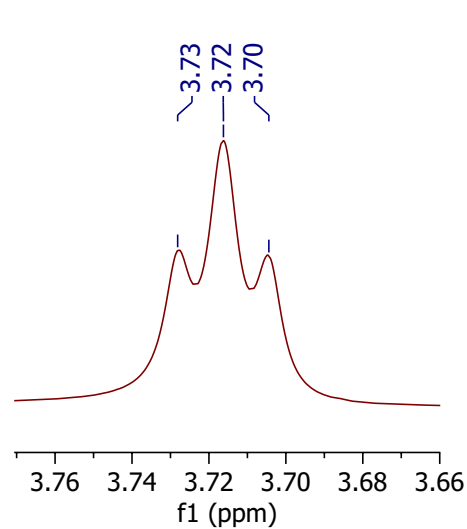
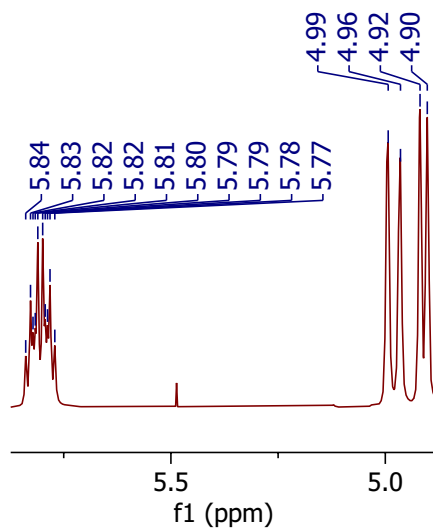
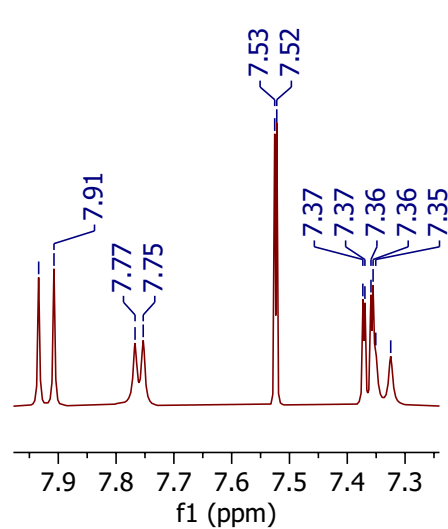
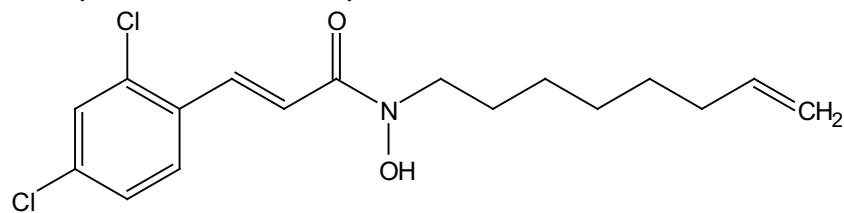
Compound S70
¹H NMR (600 MHz, MeOD-d4)

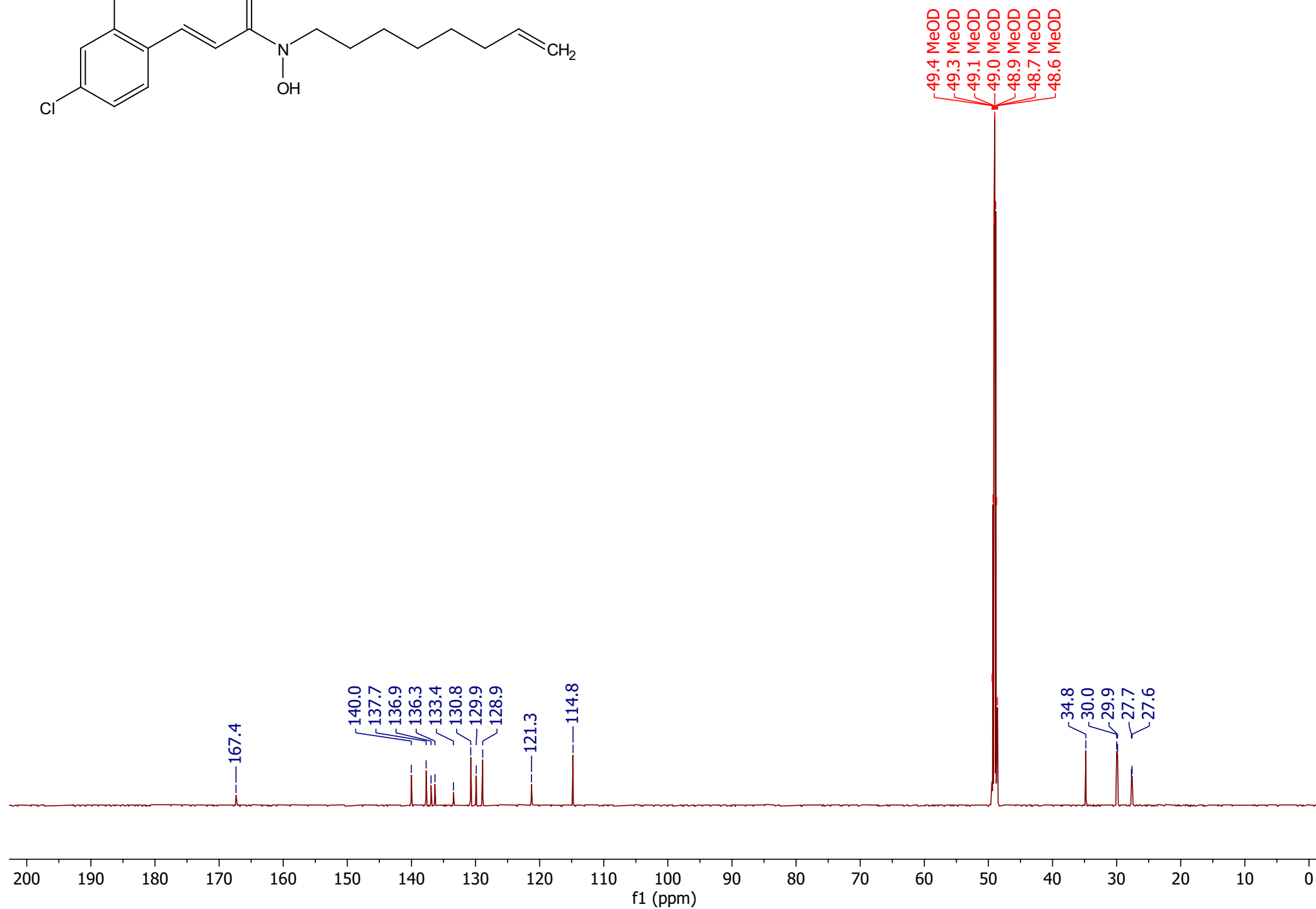
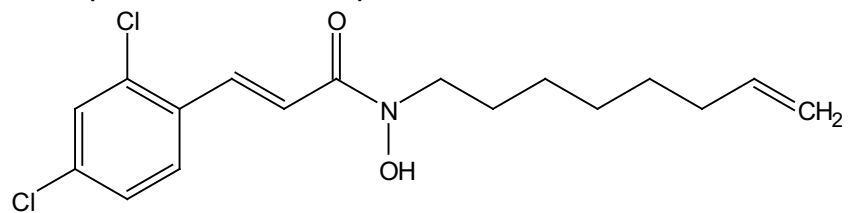


Compound S70 **^{13}C NMR (151 MHz, MeOD- d_4)**

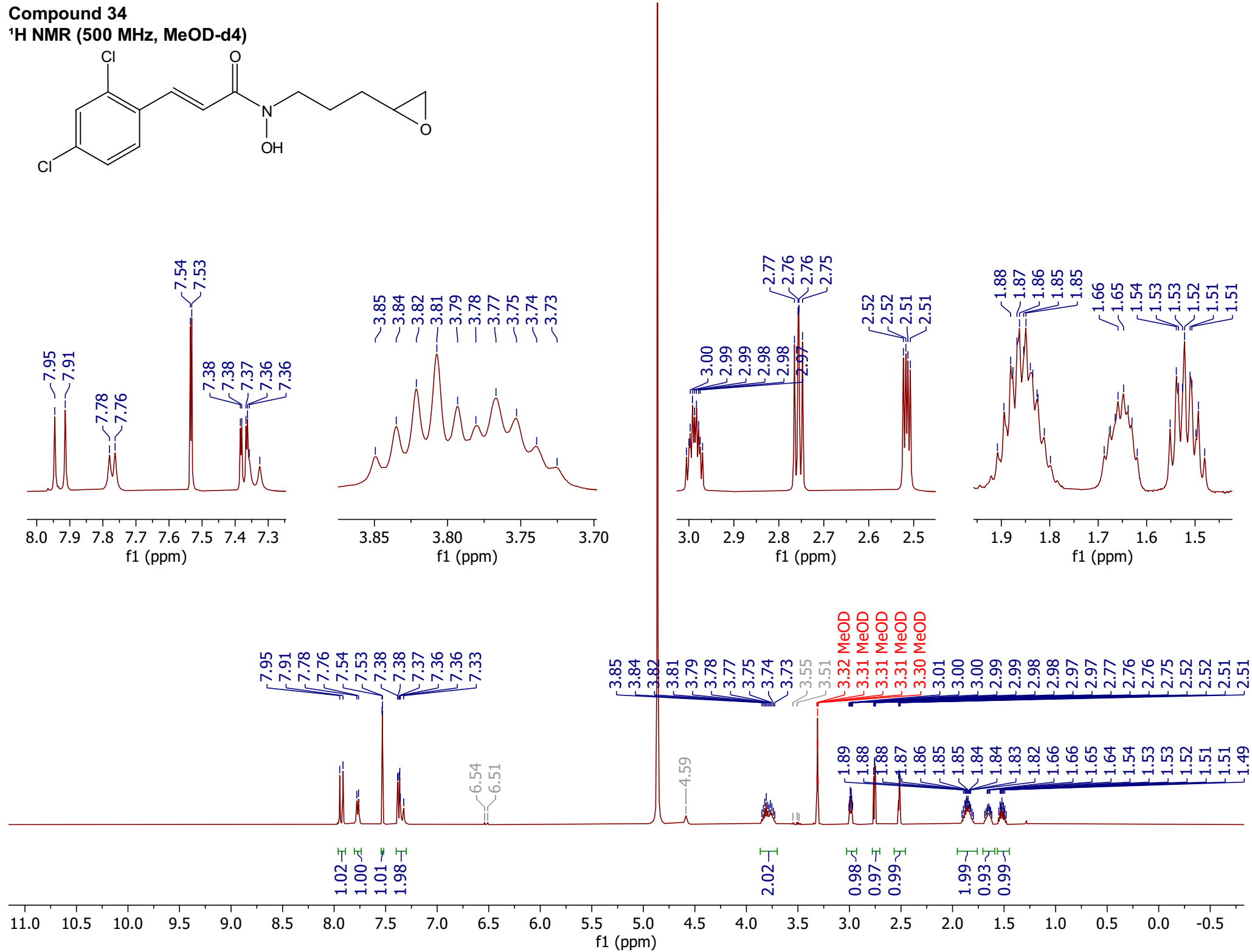
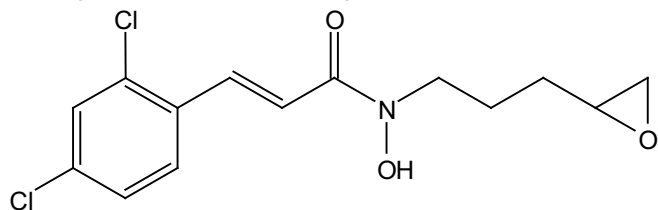
Compound S71

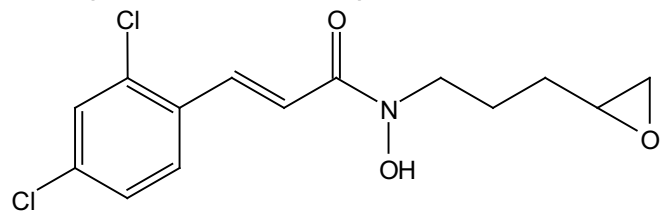
¹H NMR (600 MHz, MeOD-d₄)



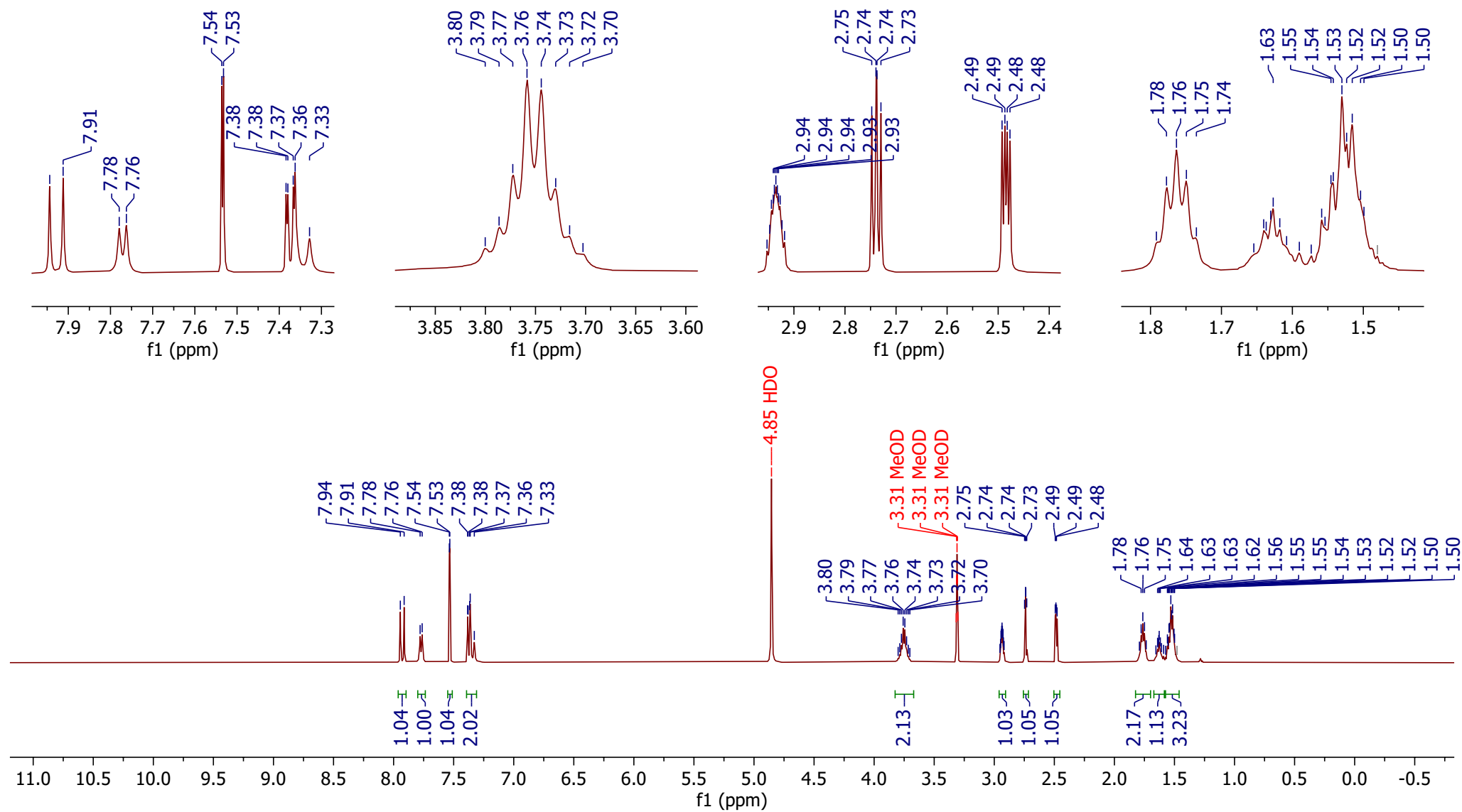
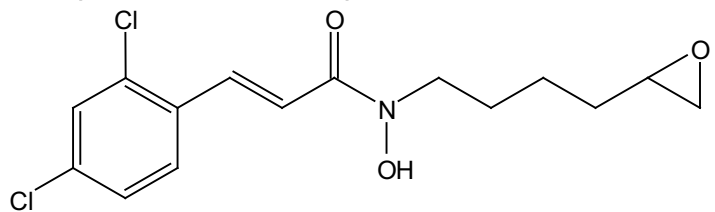
Compound S71 **^{13}C NMR (151 MHz, MeOD- d_4)**

Compound 34
¹H NMR (500 MHz, MeOD-d₄)

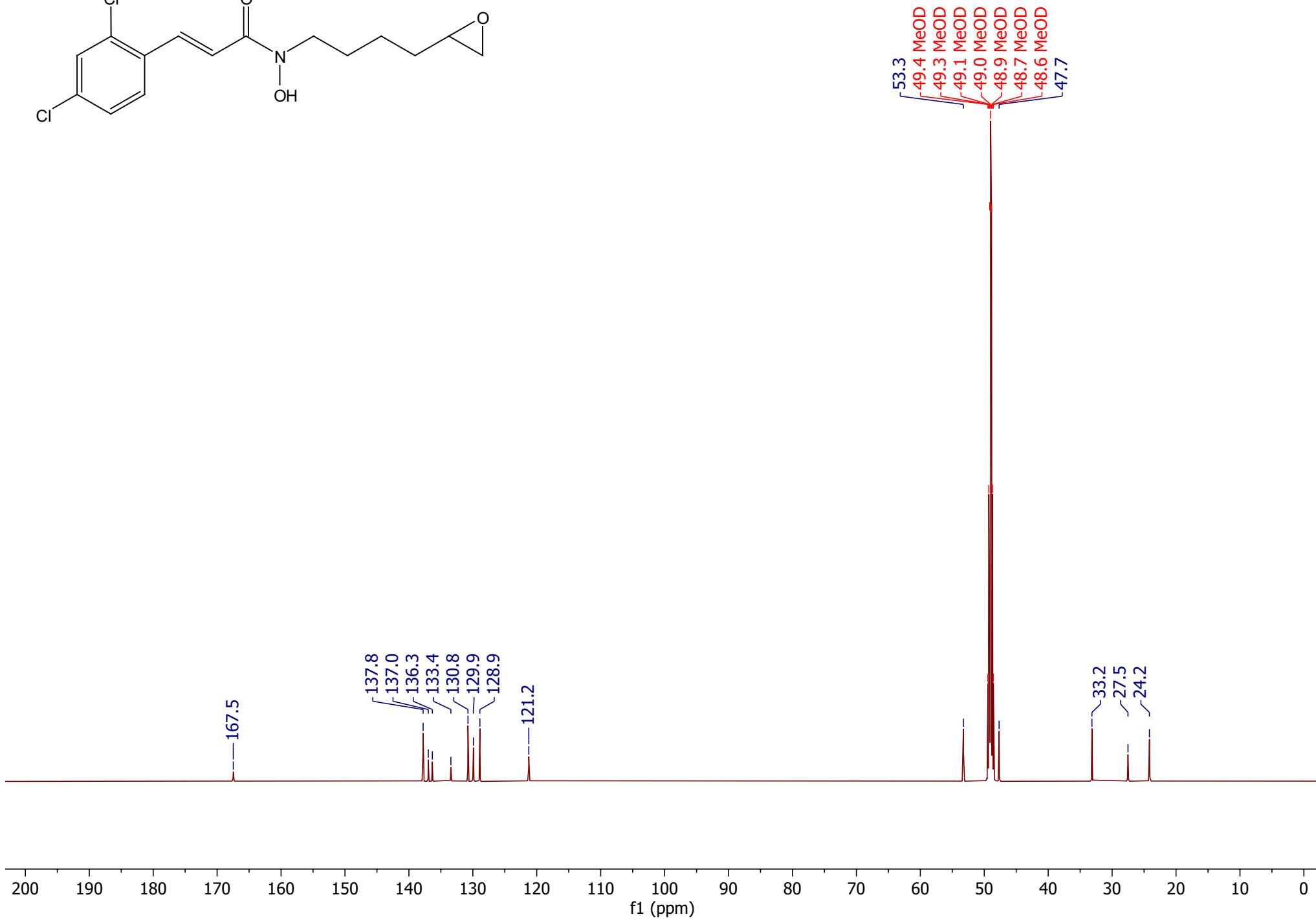
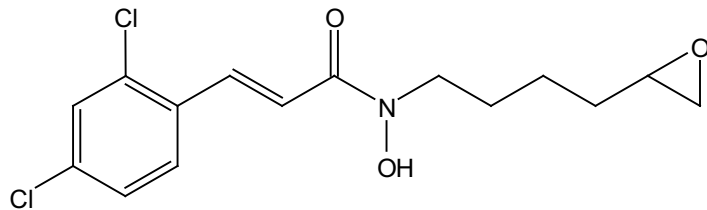


Compound 34 **^{13}C NMR (151 MHz, MeOD-d₄)**

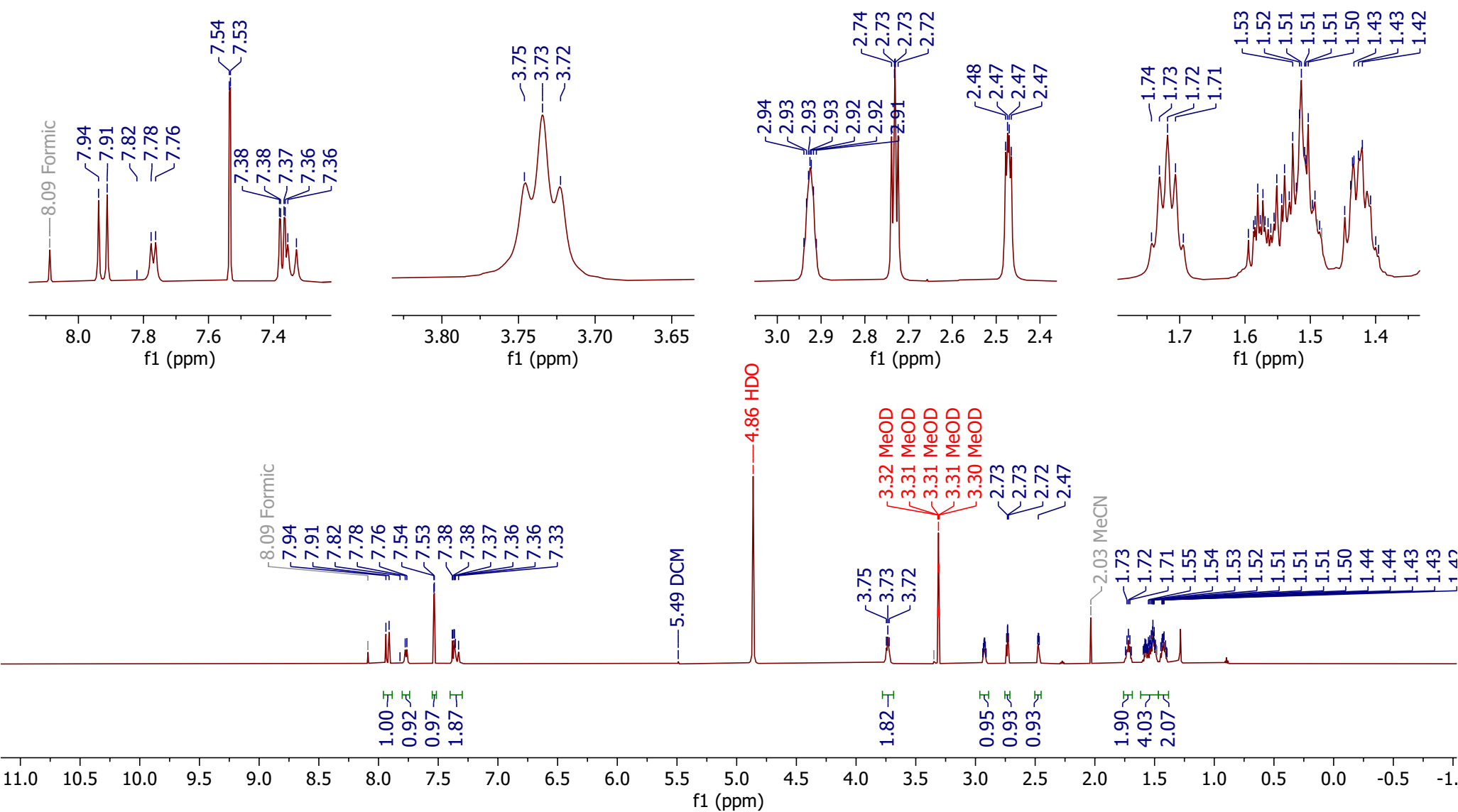
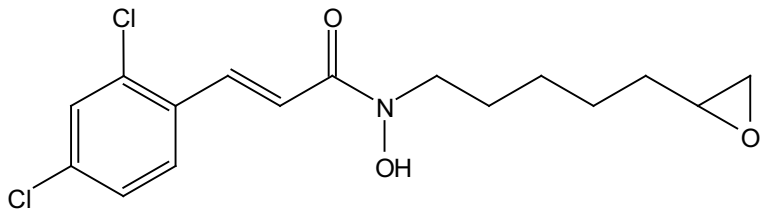
Compound 35
¹H NMR (500 MHz, MeOD-d₄)

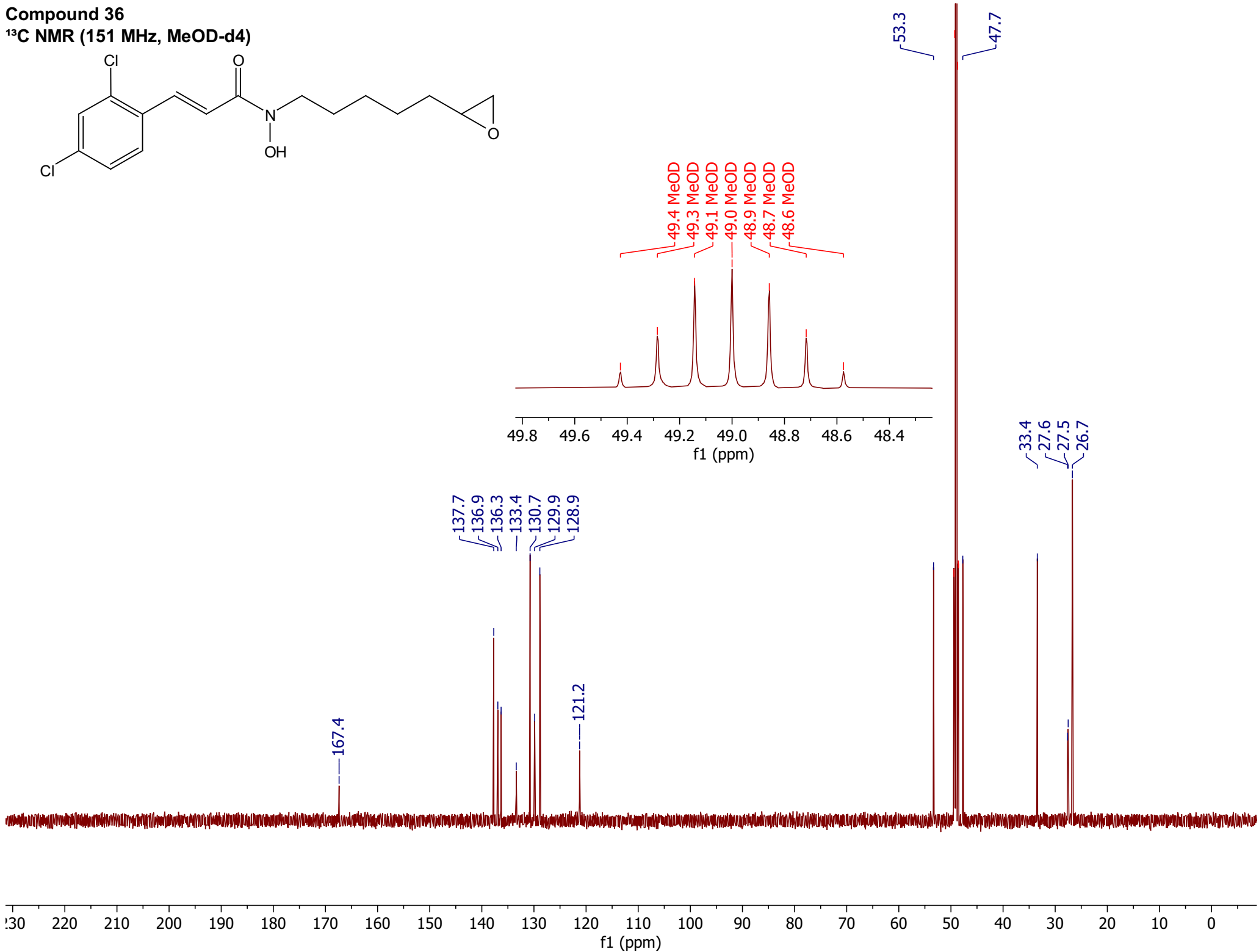
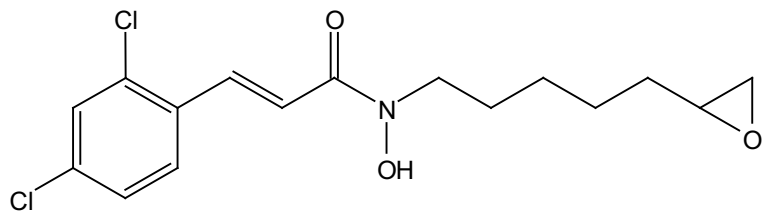


Compound 35
¹³C NMR (151 MHz, MeOD-d4)

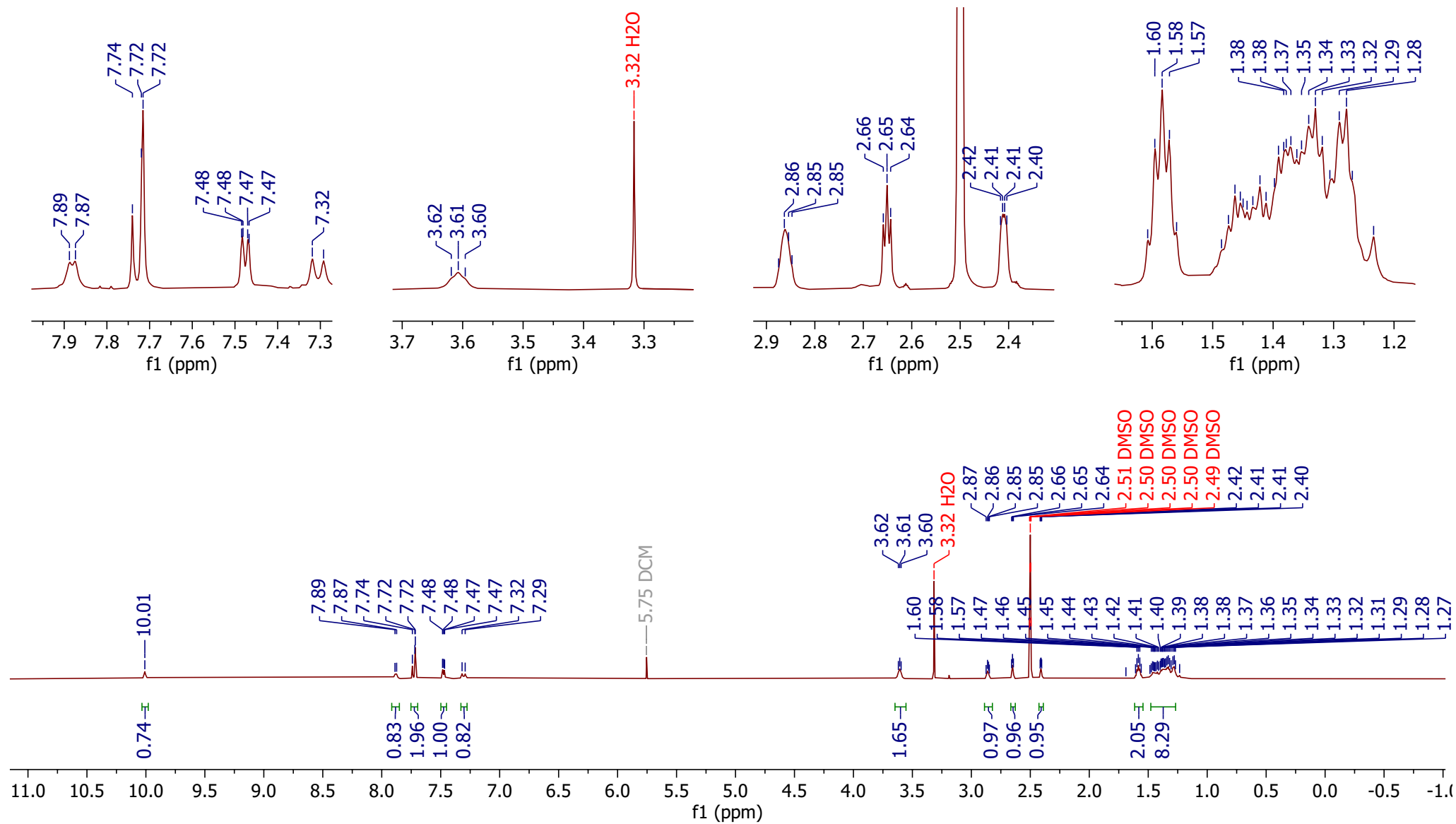
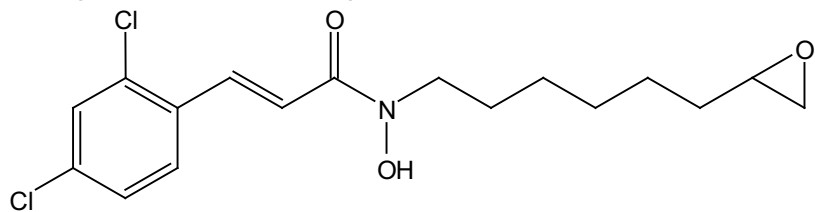


Compound 36
¹³C NMR (600 MHz, MeOD-d₄)

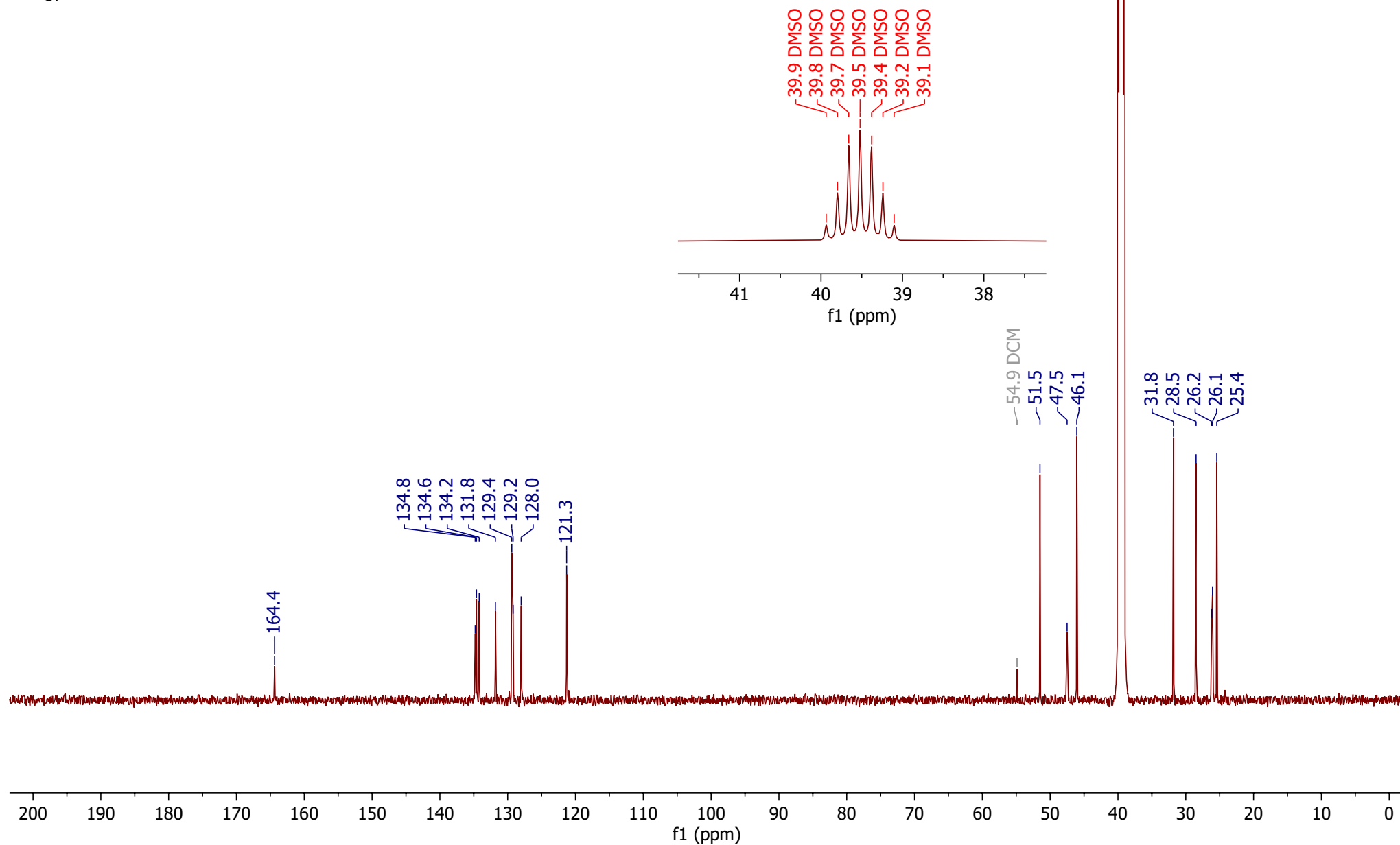
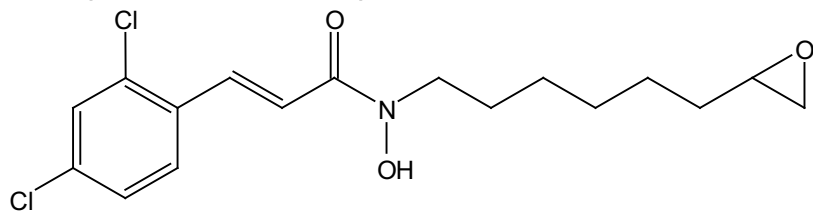


Compound 36 **^{13}C NMR (151 MHz, MeOD- d_4)**

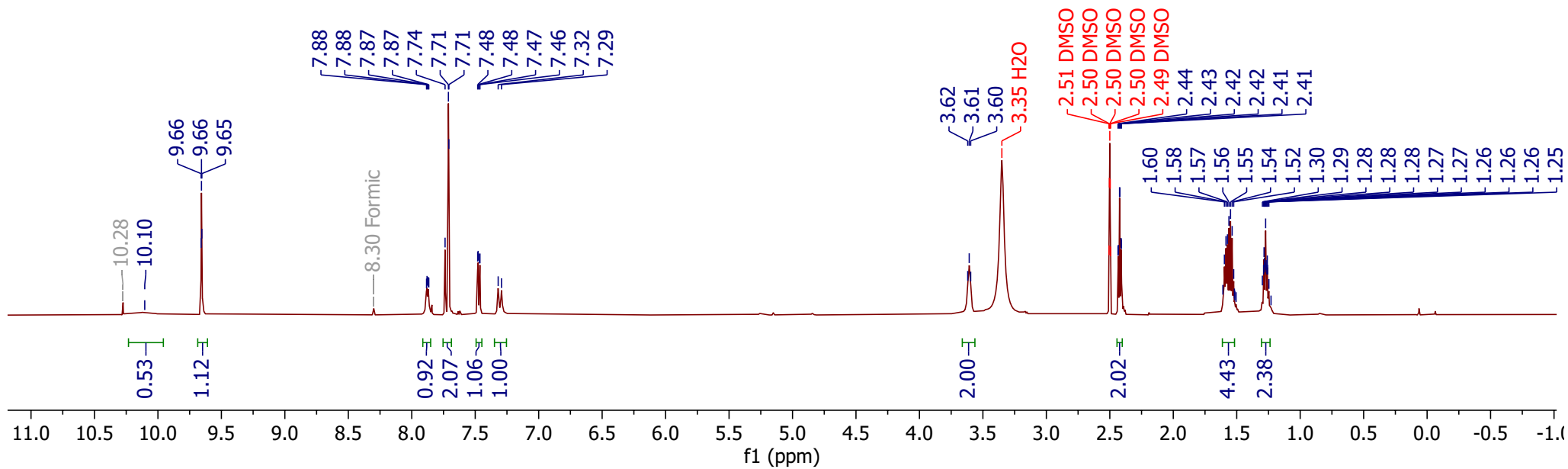
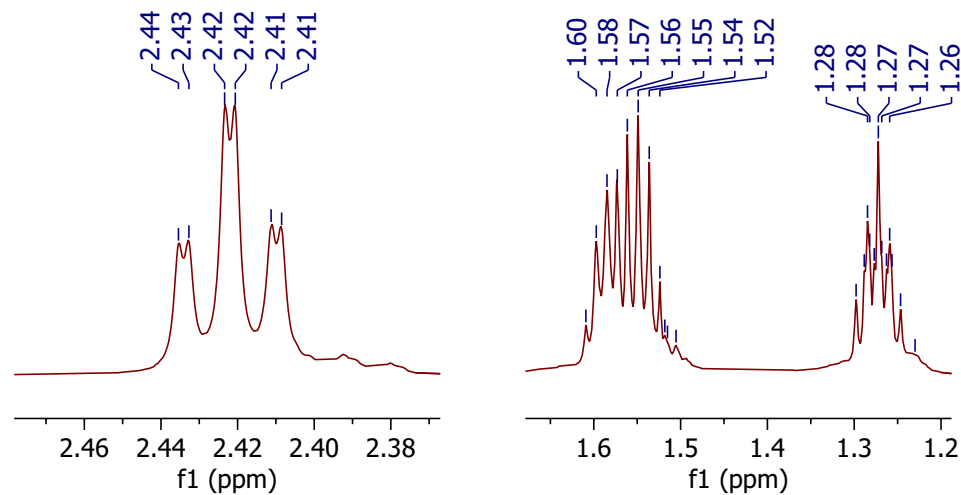
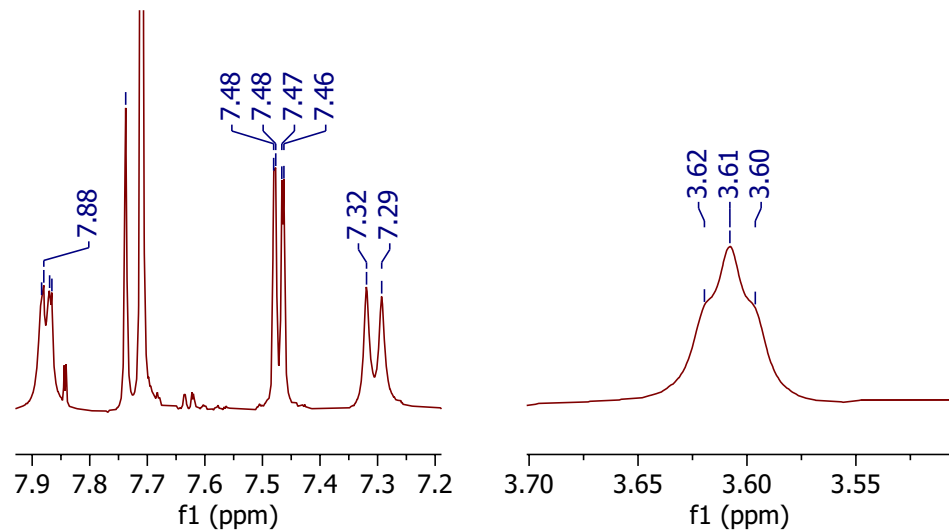
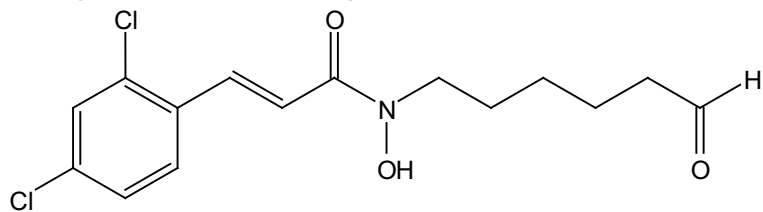
Compound 37
¹H NMR (600 MHz, DMSO-d₆)



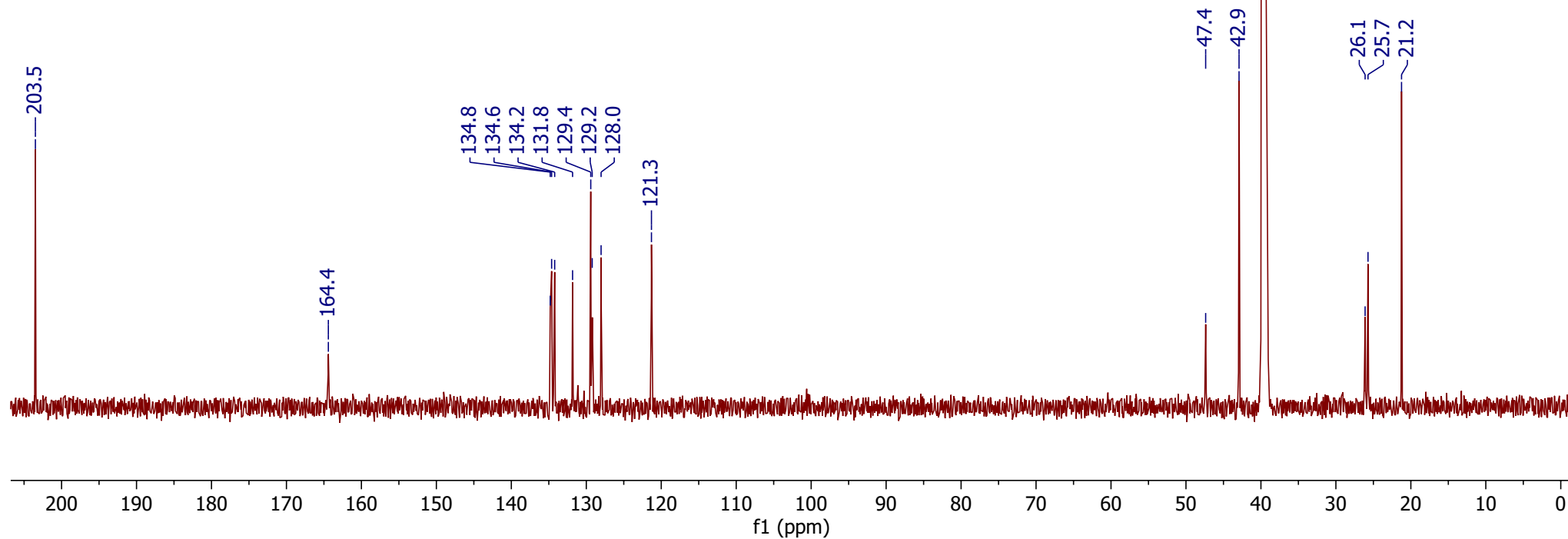
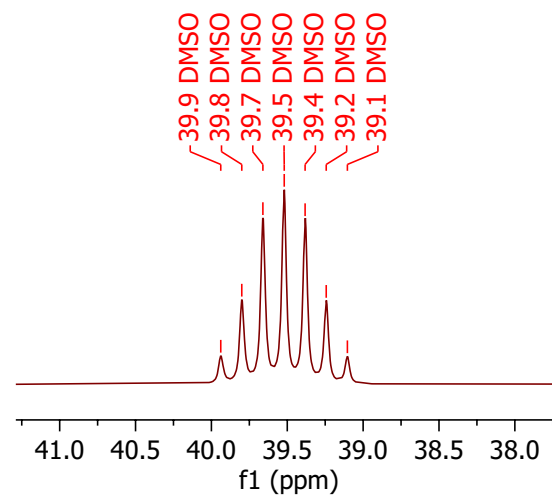
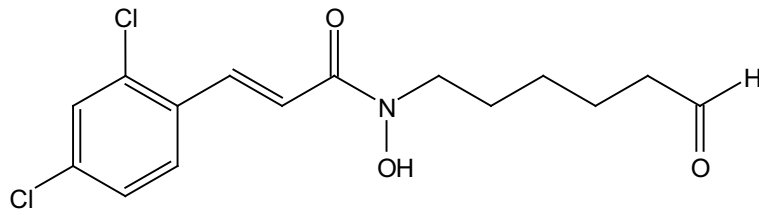
Compound 37
 ^{13}C NMR (151 MHz, DMSO- d_6)

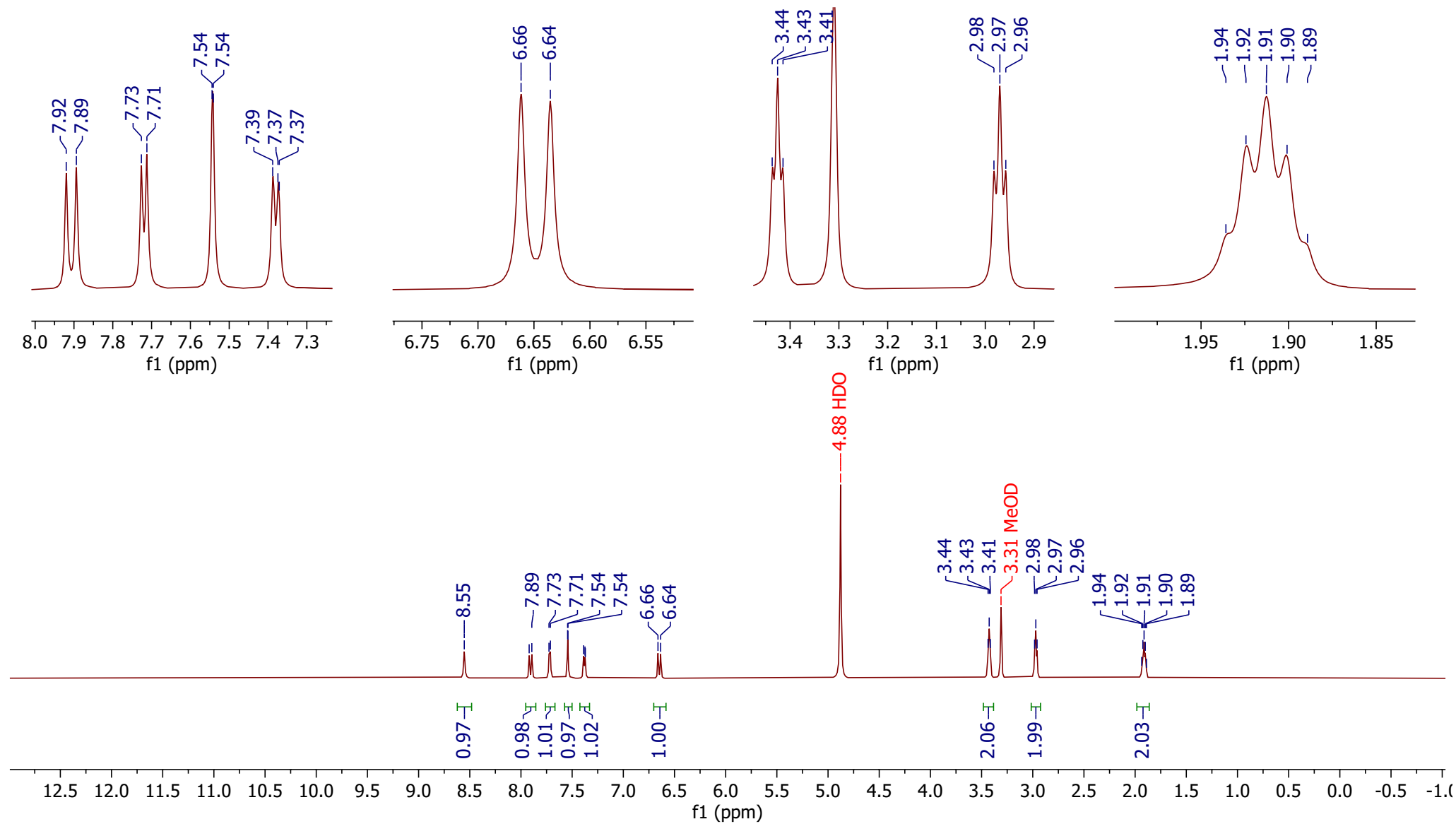
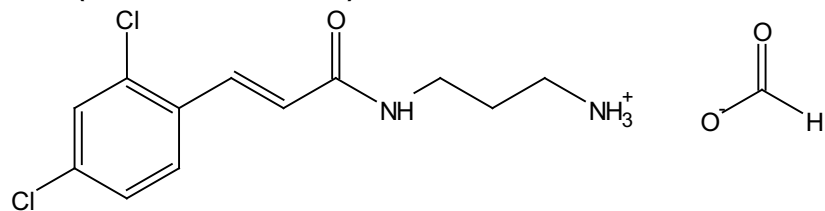


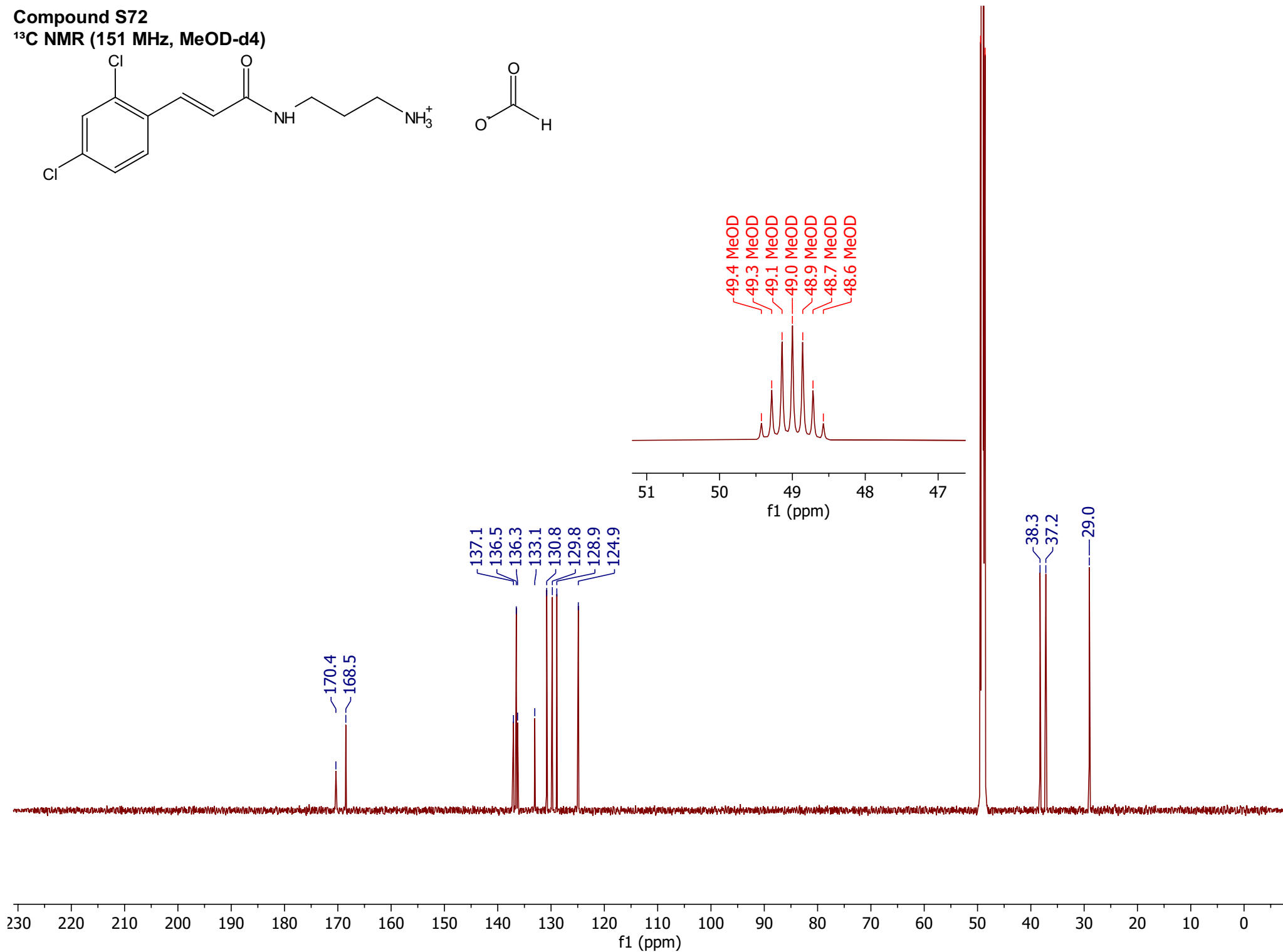
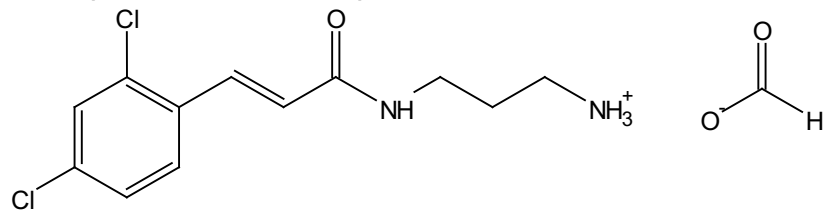
¹H NMR (600 MHz, DMSO-d6)



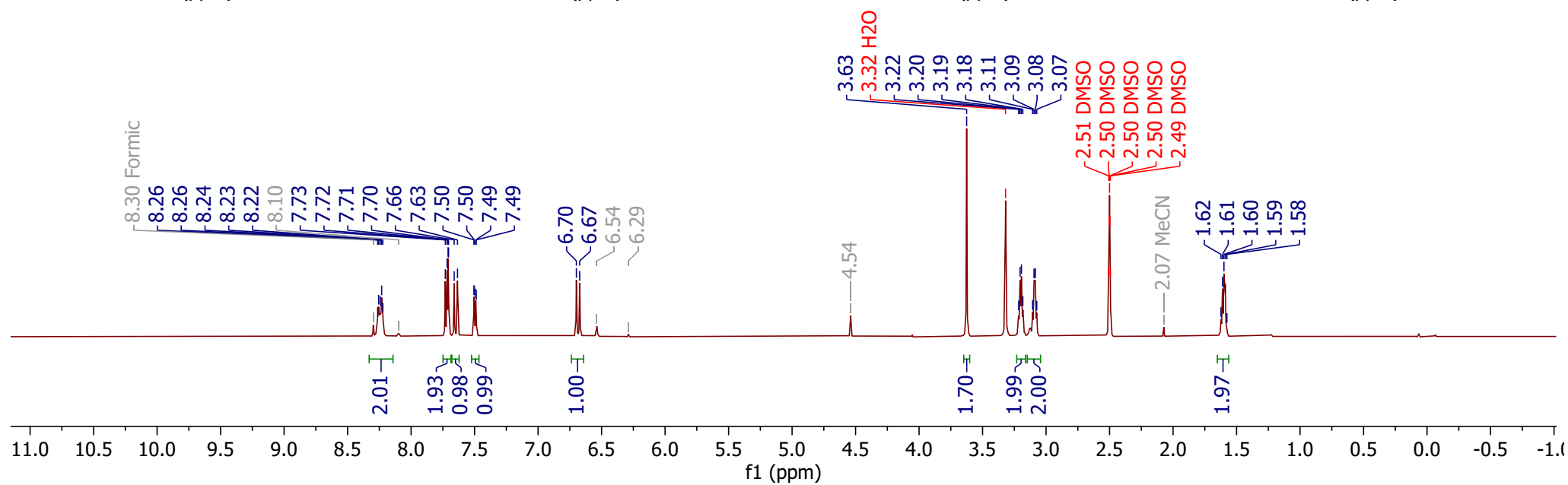
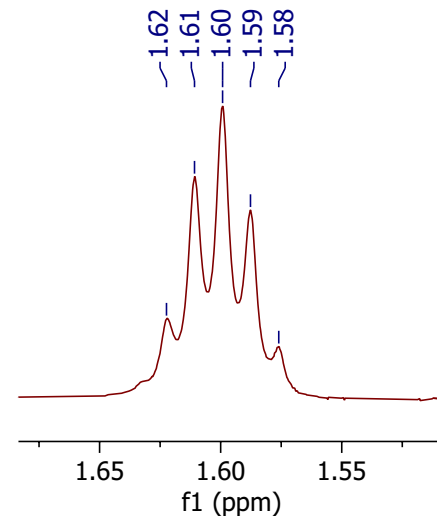
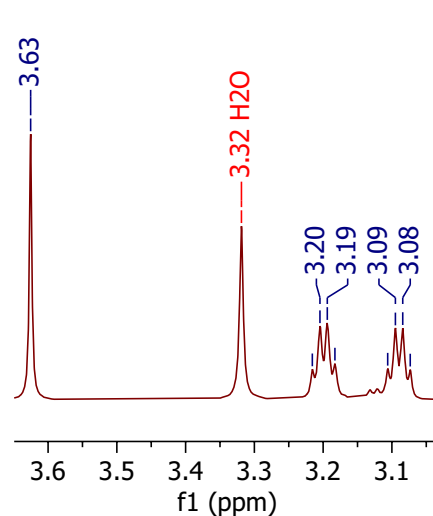
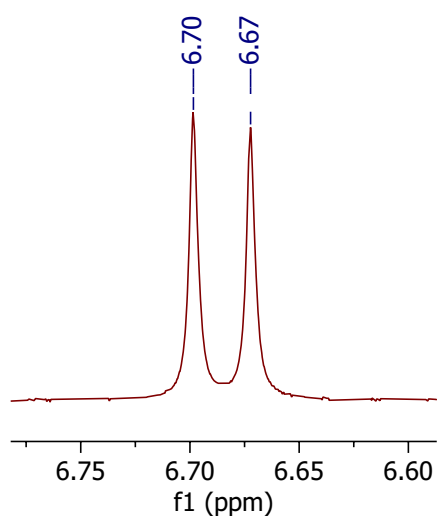
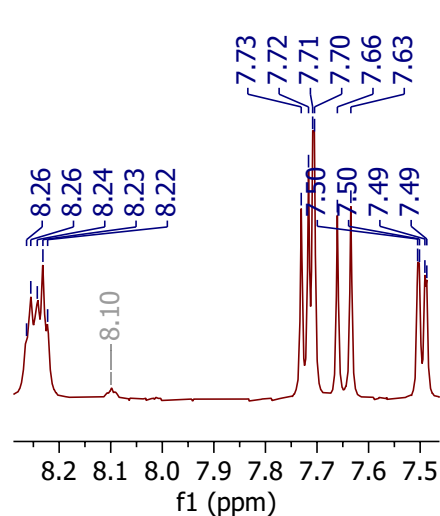
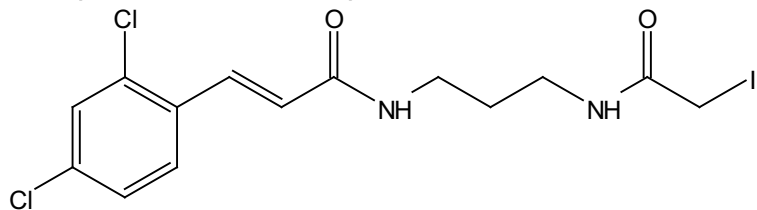
Compound 38
 ^{13}C NMR (151 MHz, DMSO- d_6)



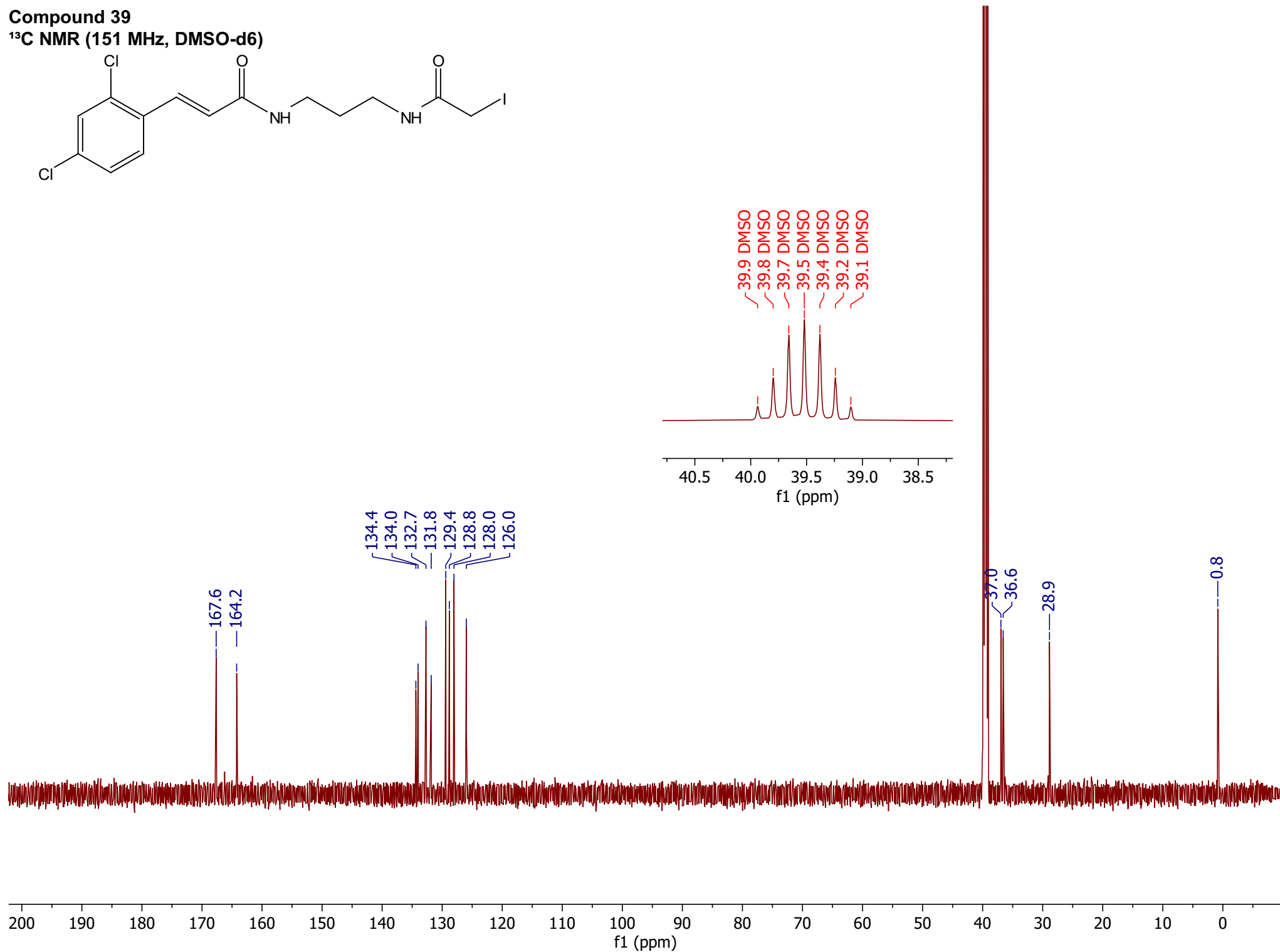
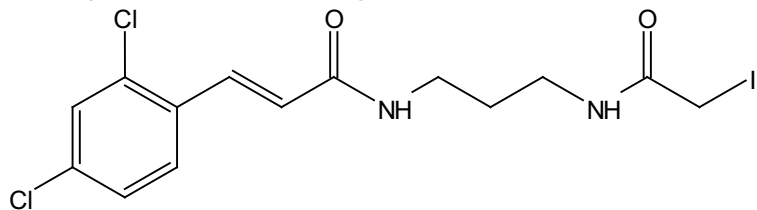
Compound S72**¹H NMR (600 MHz, MeOD-d₄)**

Compound S72 **^{13}C NMR (151 MHz, MeOD- d_4)**

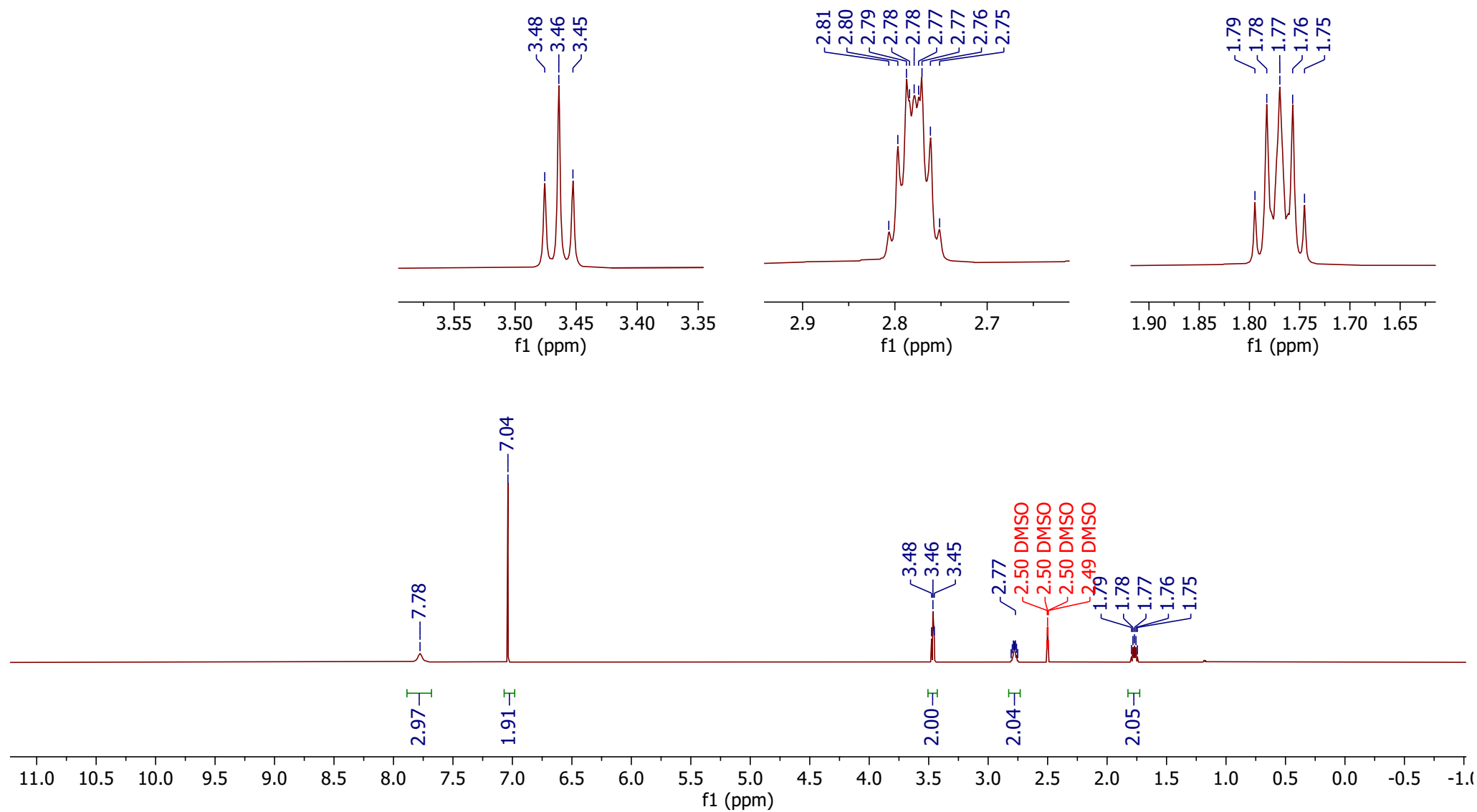
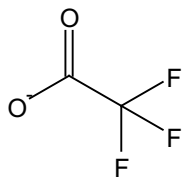
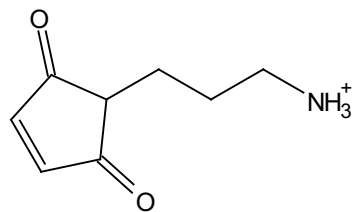
Compound 39
¹H NMR (600 MHz, DMSO-d₆)

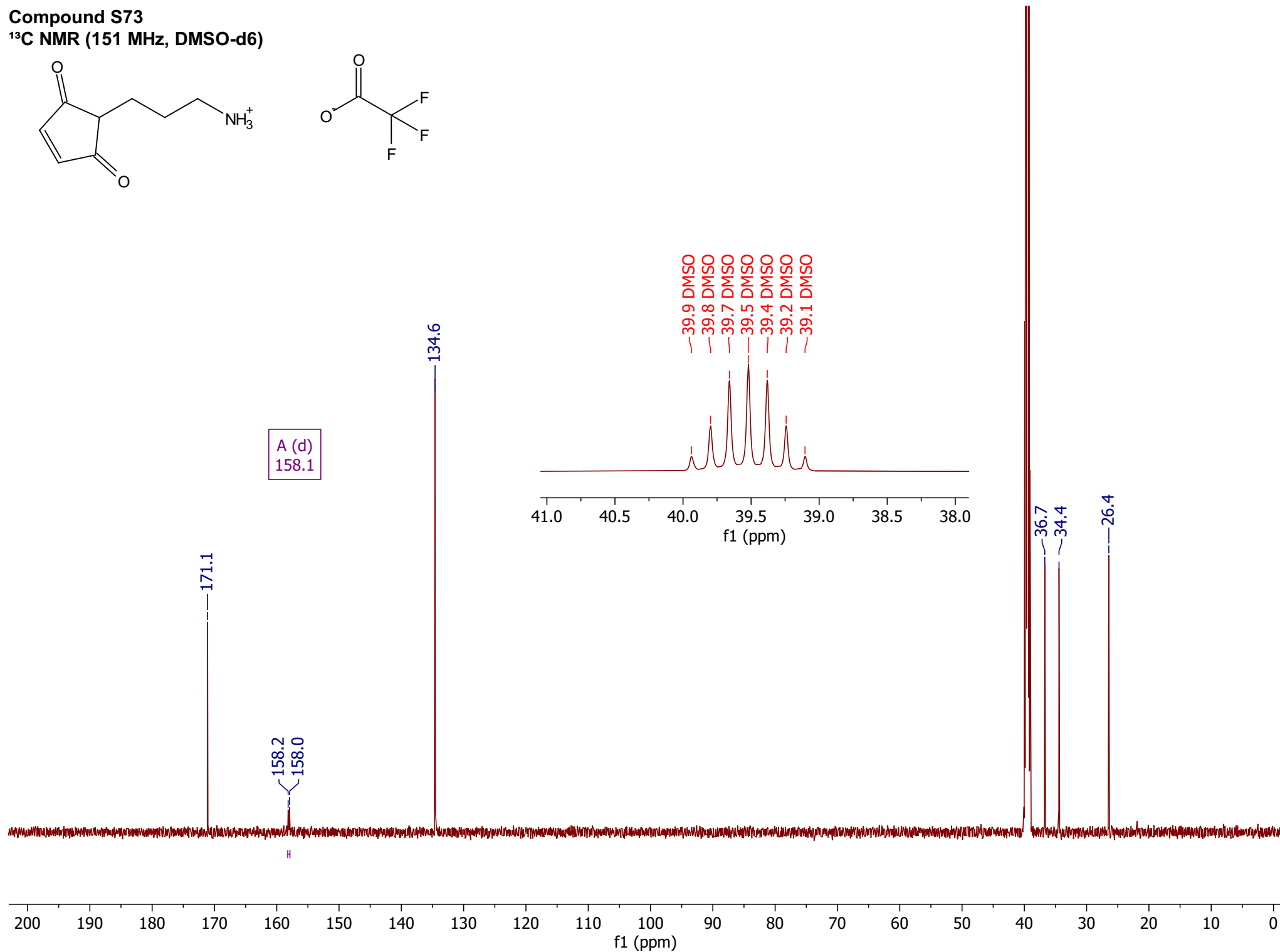
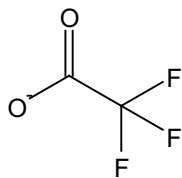
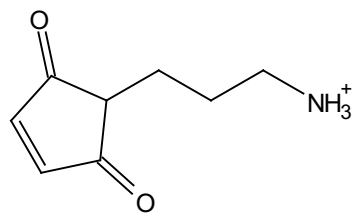


Compound 39
 ^{13}C NMR (151 MHz, DMSO- d_6)

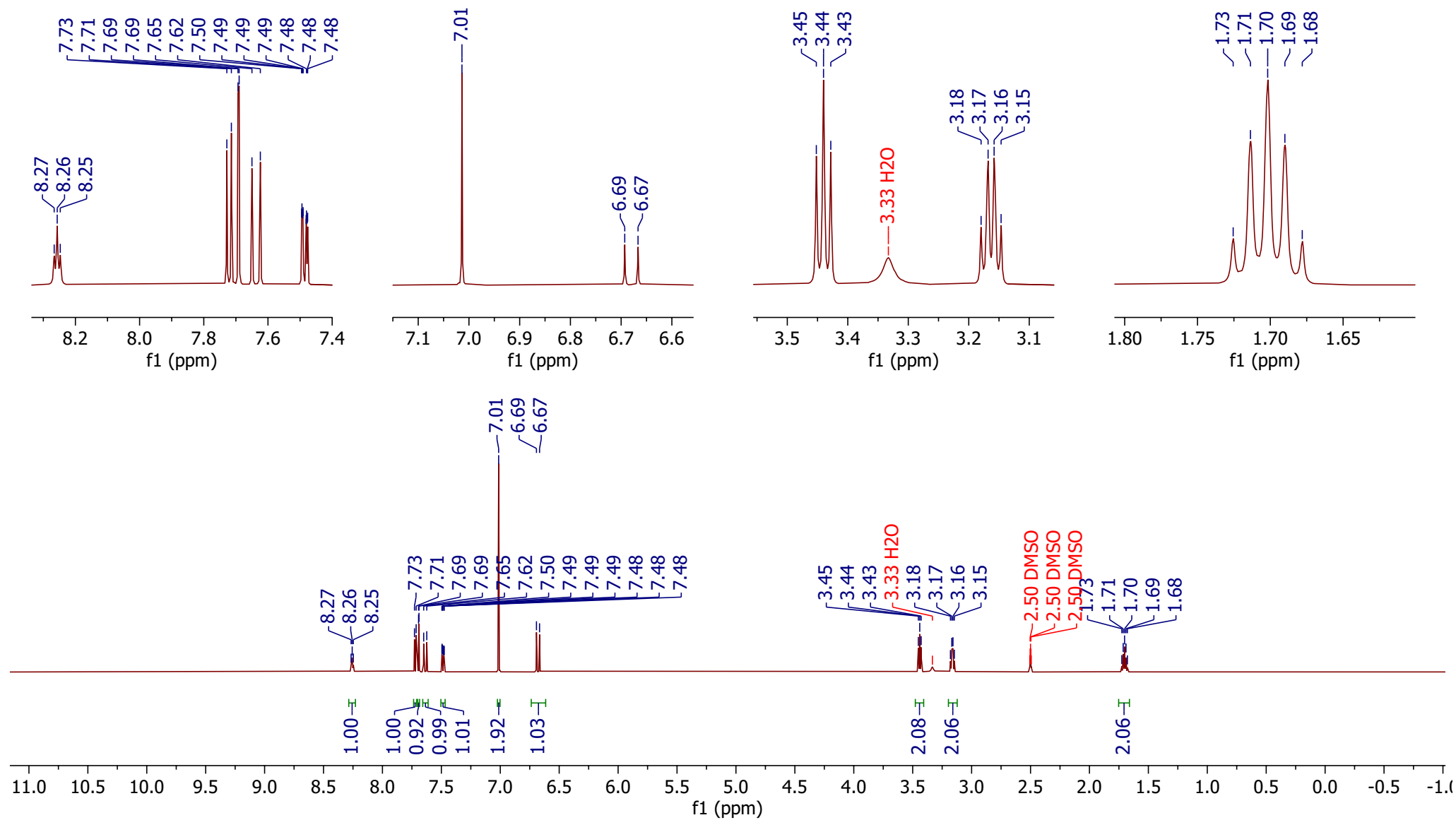
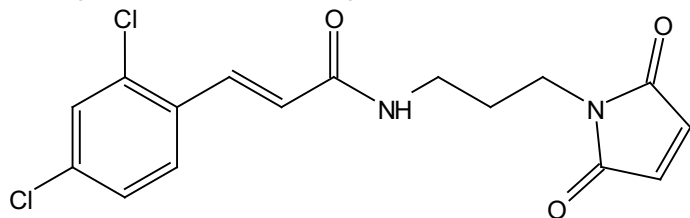


Compound S73
¹H NMR (600 MHz, DMSO-d₆)

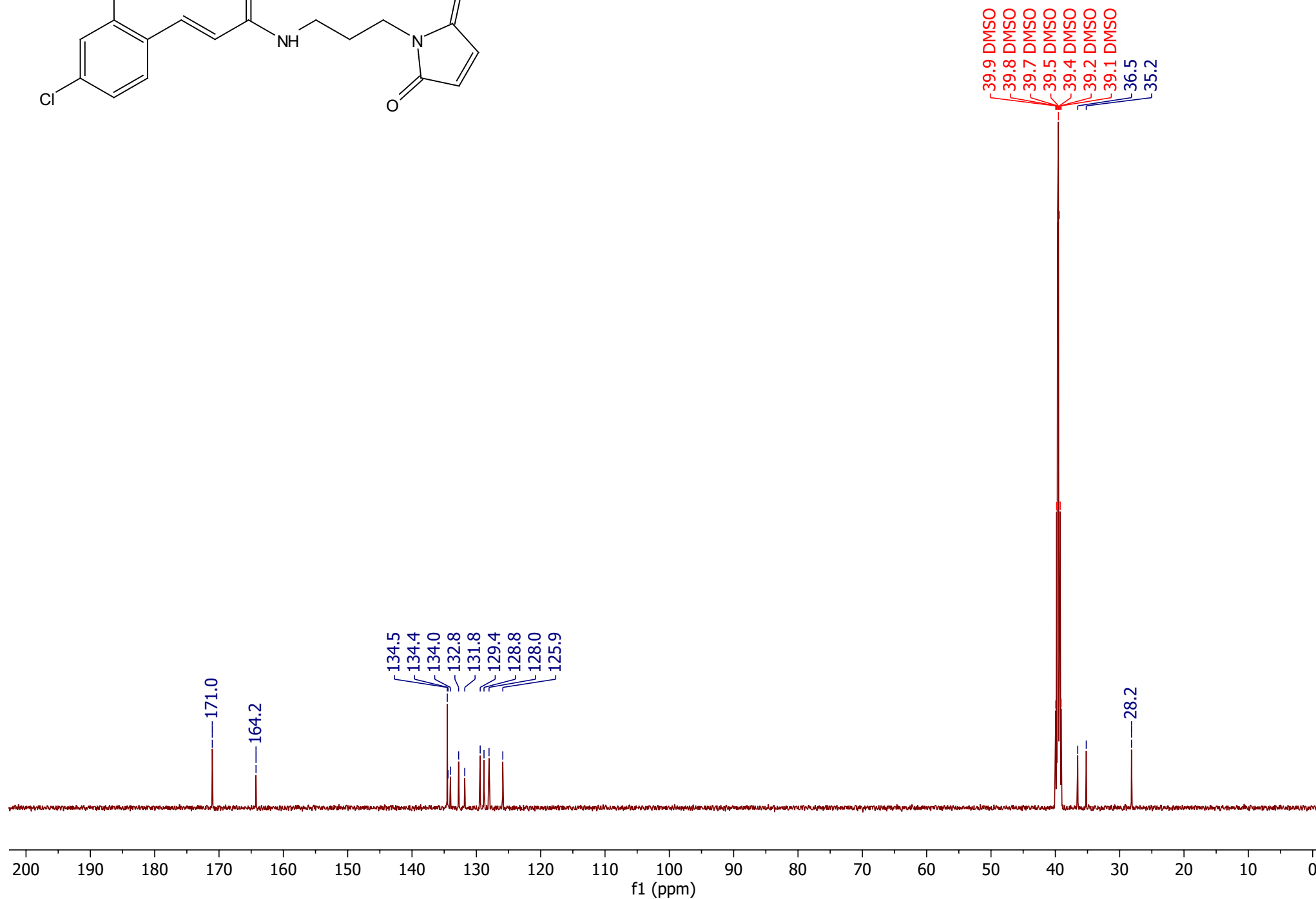
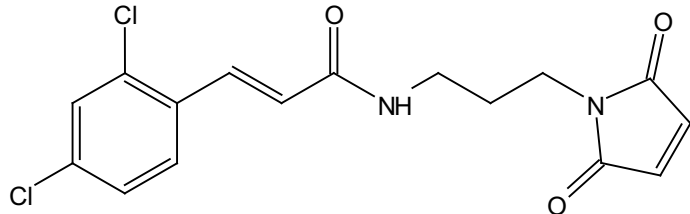


Compound S73¹³C NMR (151 MHz, DMSO-d₆)

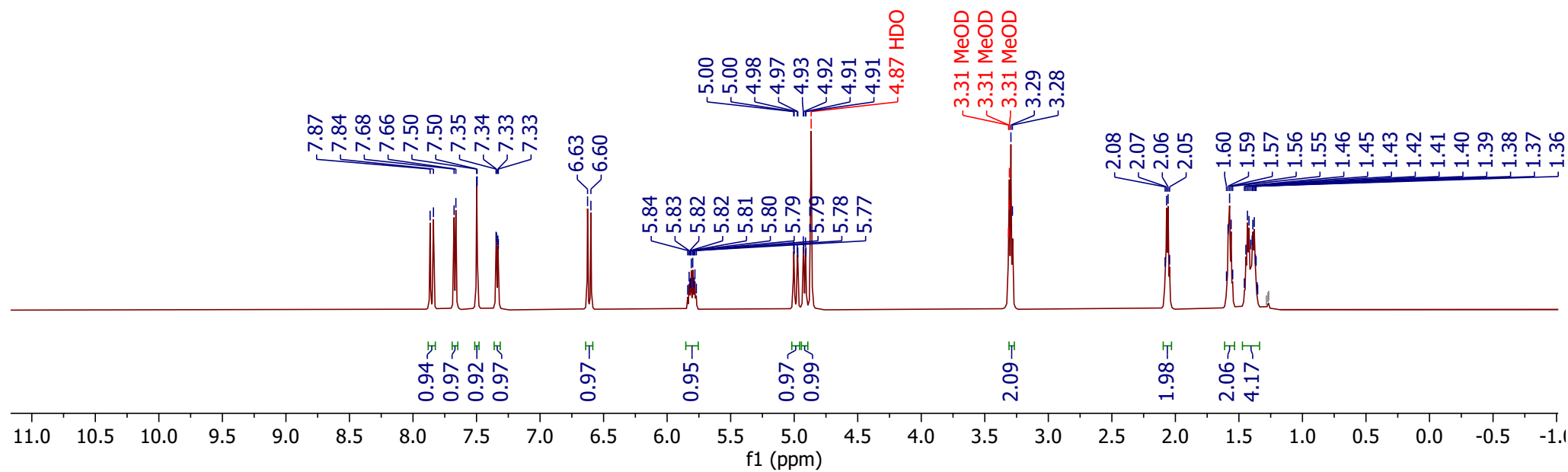
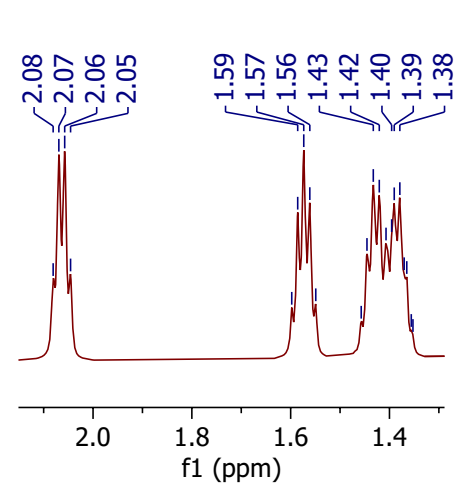
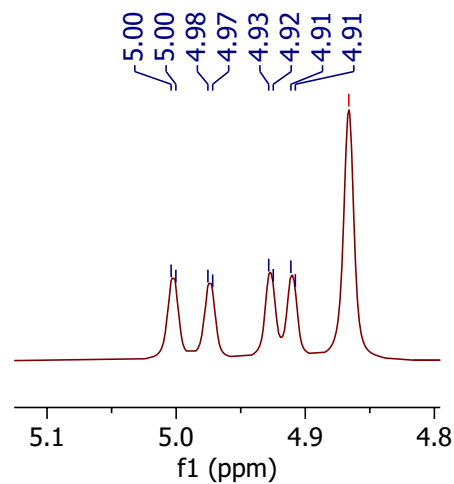
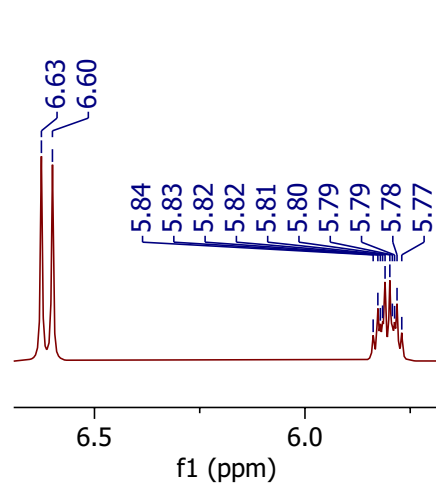
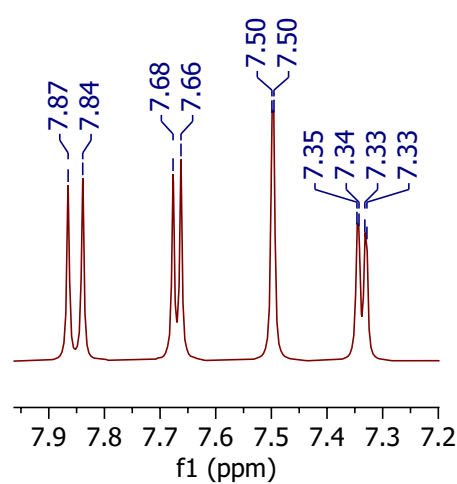
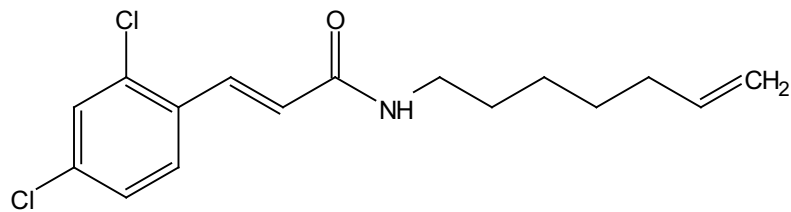
Compound 40
¹H NMR (600 MHz, DMSO-d₆)

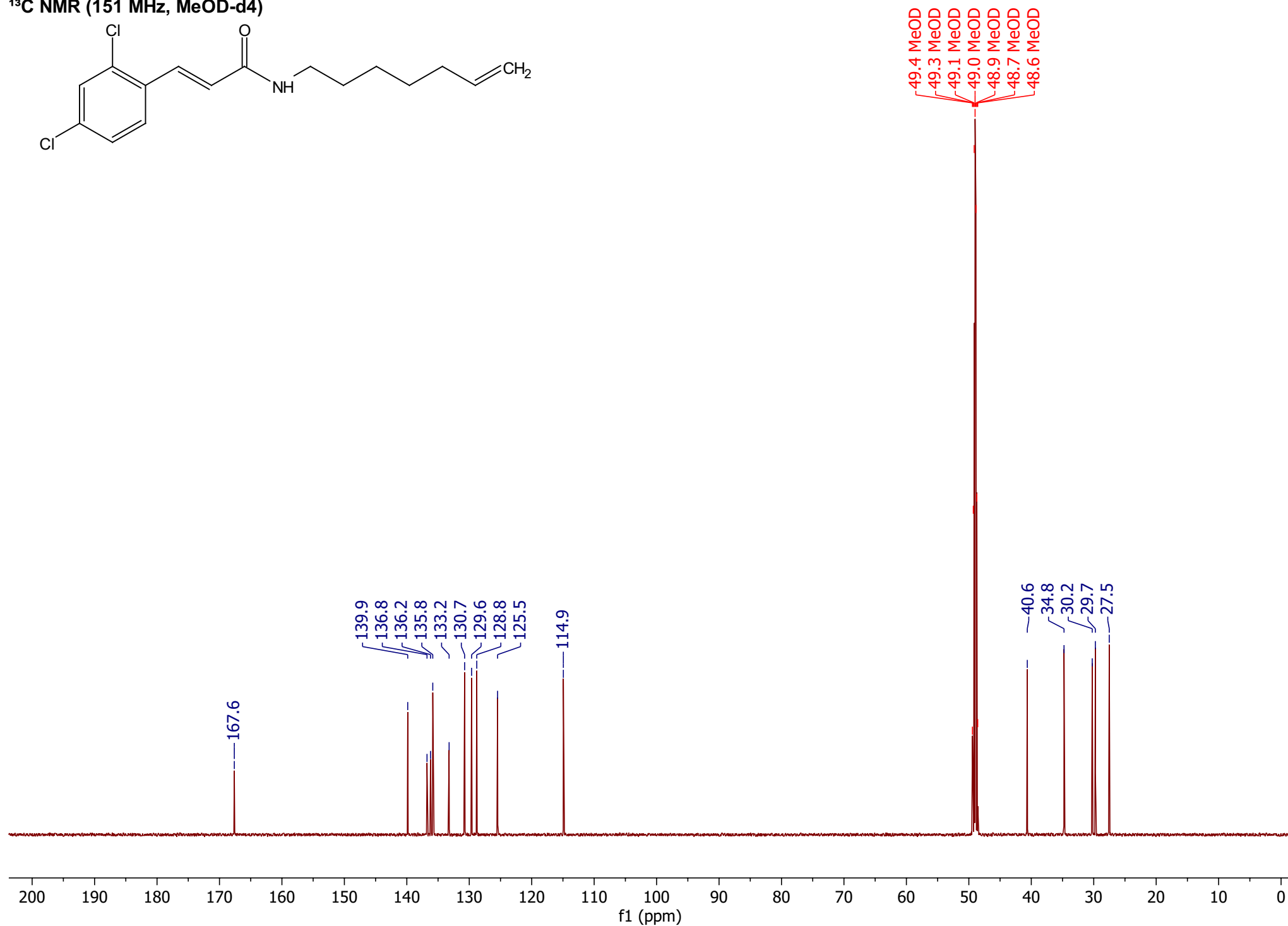
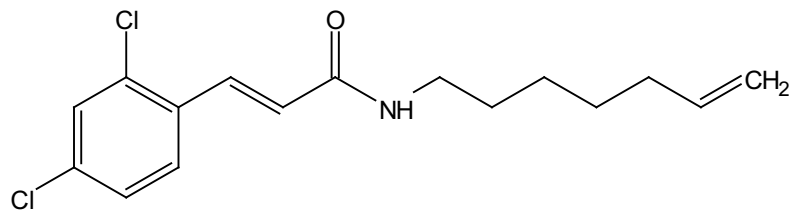


Compound 40
 ^{13}C NMR (151 MHz, DMSO- d_6)

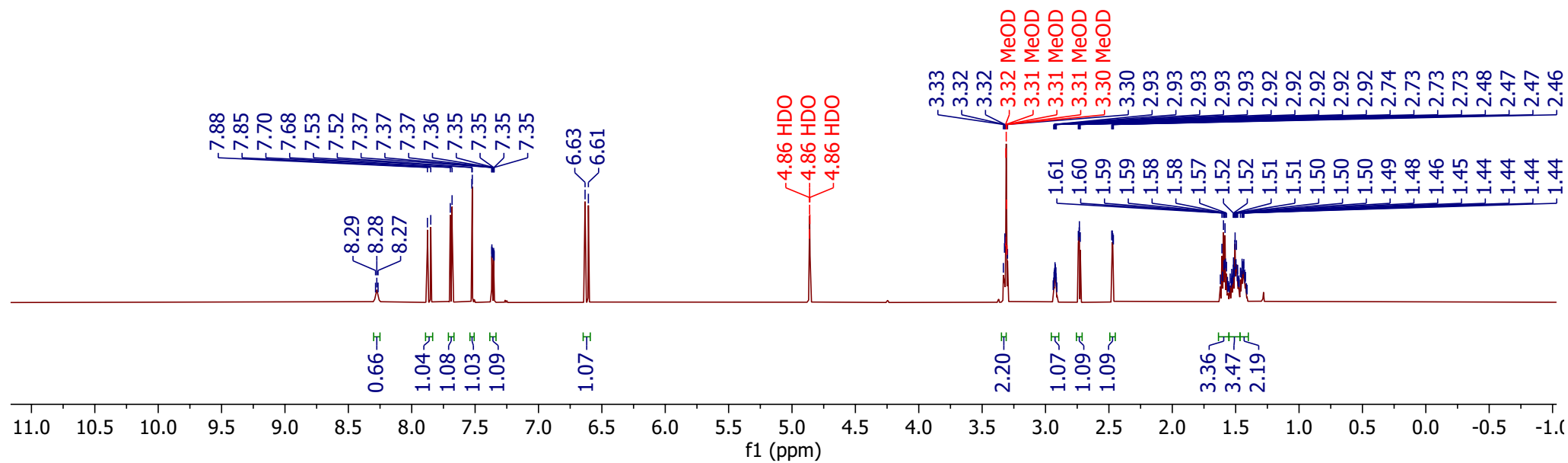
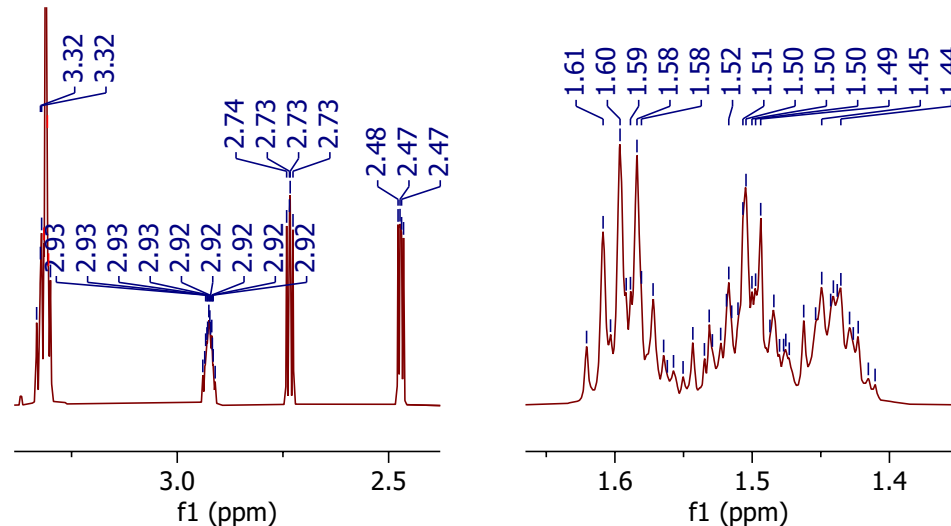
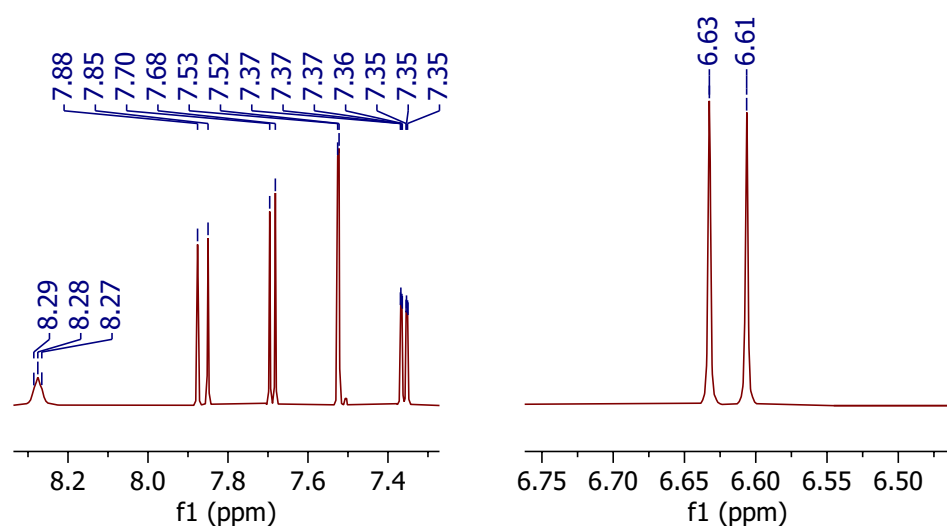
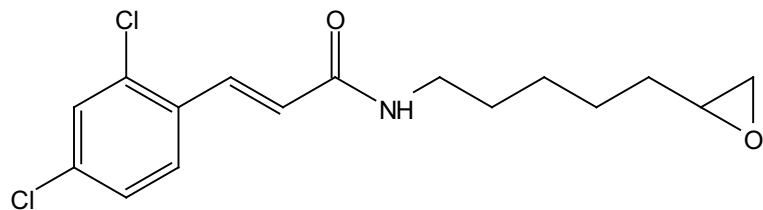


Compound S74
¹H NMR (600 MHz, MeOD-d4)

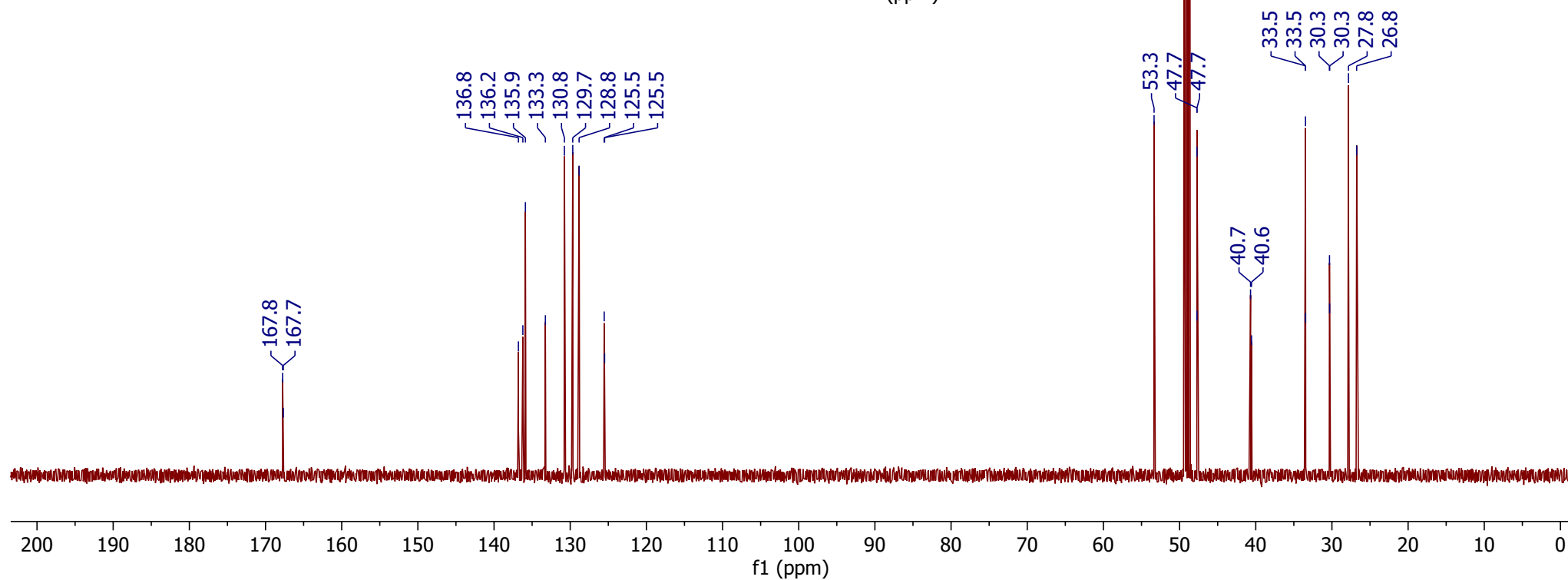
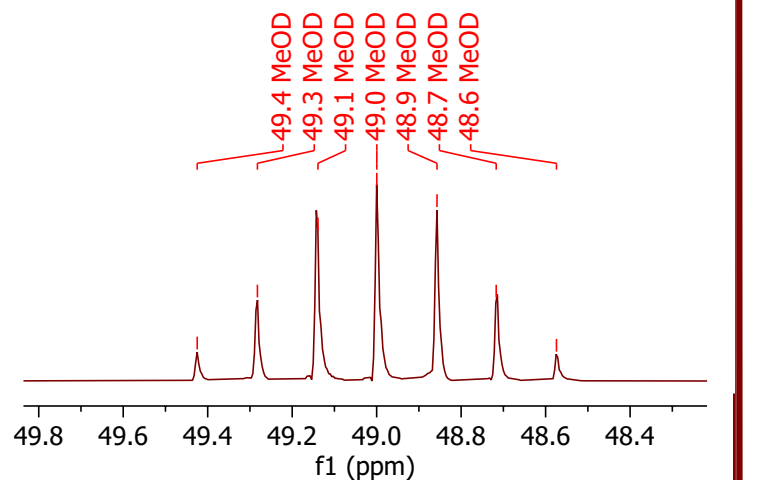
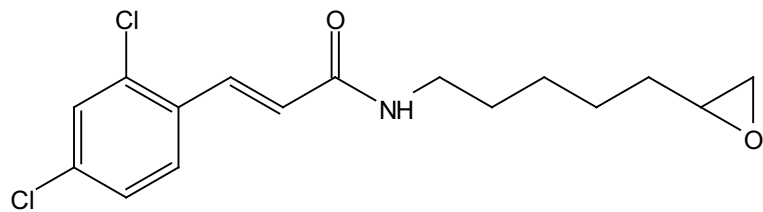


Compound S74 **^{13}C NMR (151 MHz, MeOD- d_4)**

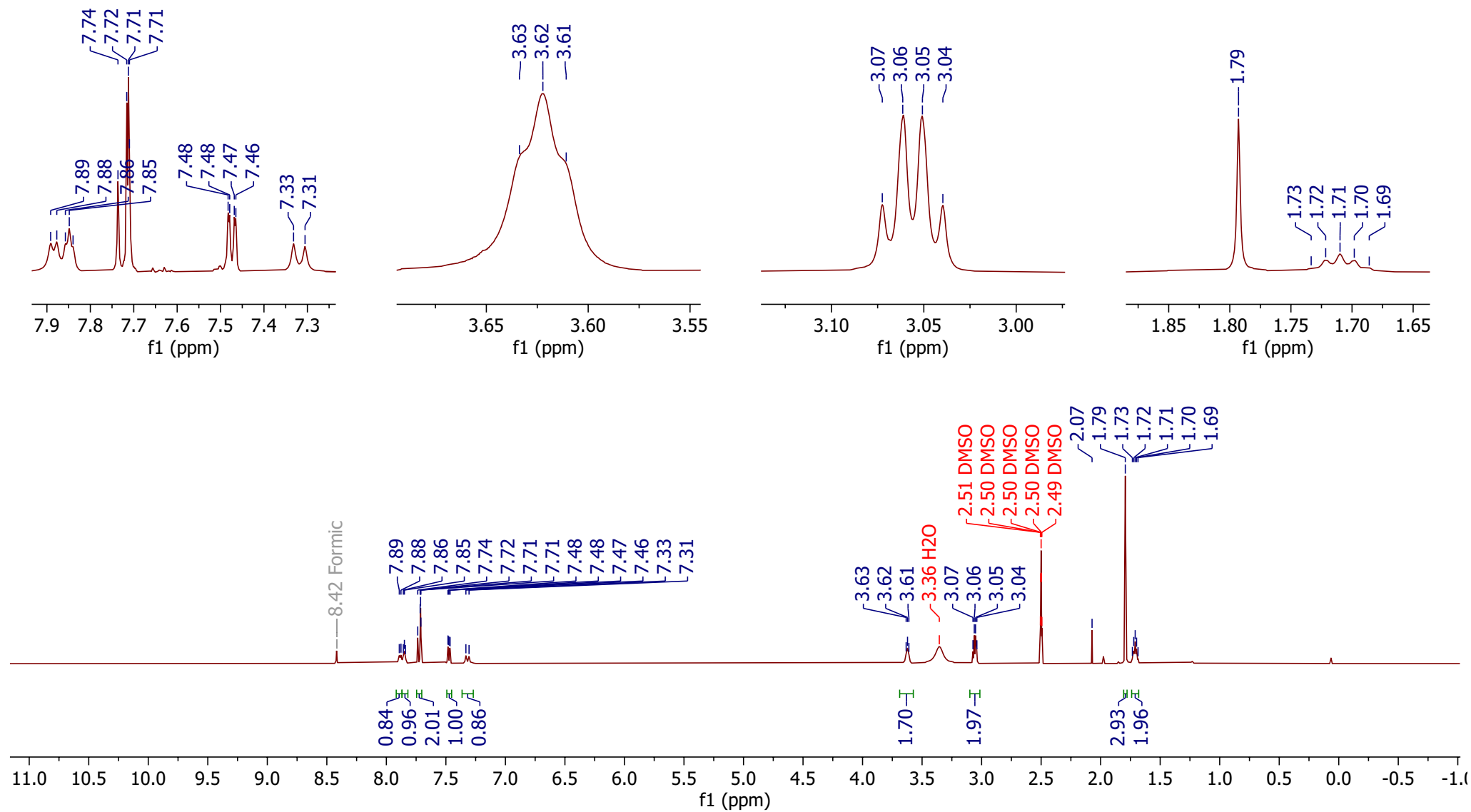
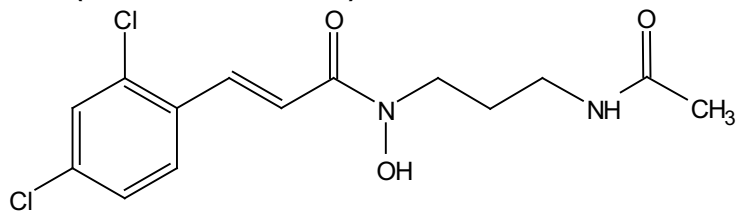
Compound 41
¹H NMR (600 MHz, MeOD-d₄)



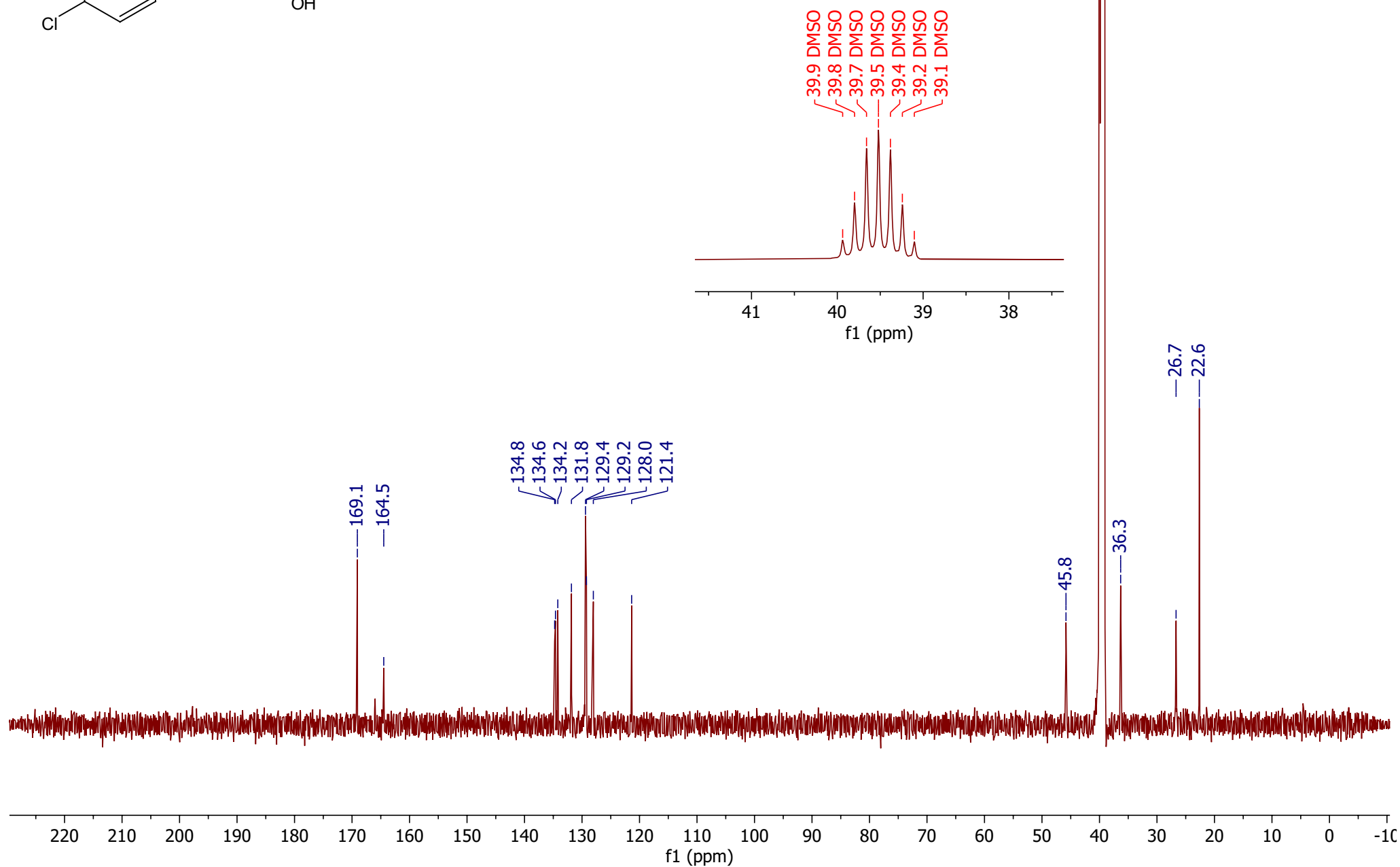
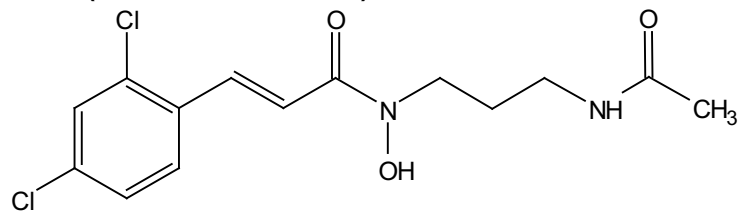
Compound 41
 ^{13}C NMR (151 MHz, MeOD-d₄)



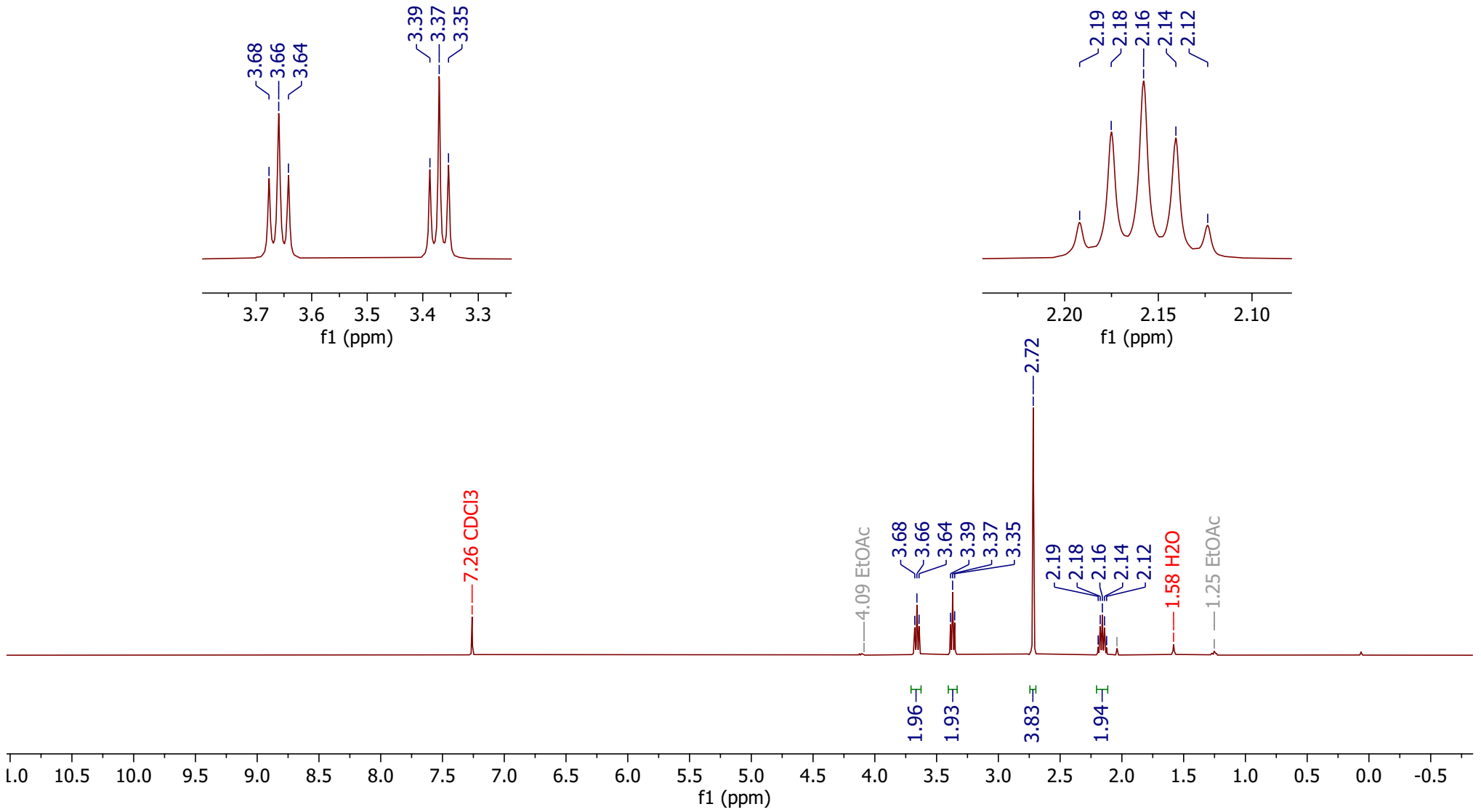
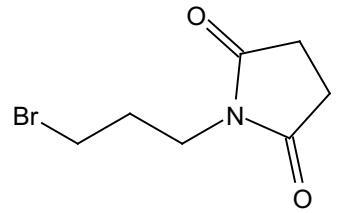
Compound 42
¹H NMR (600 MHz, DMSO-d₆)



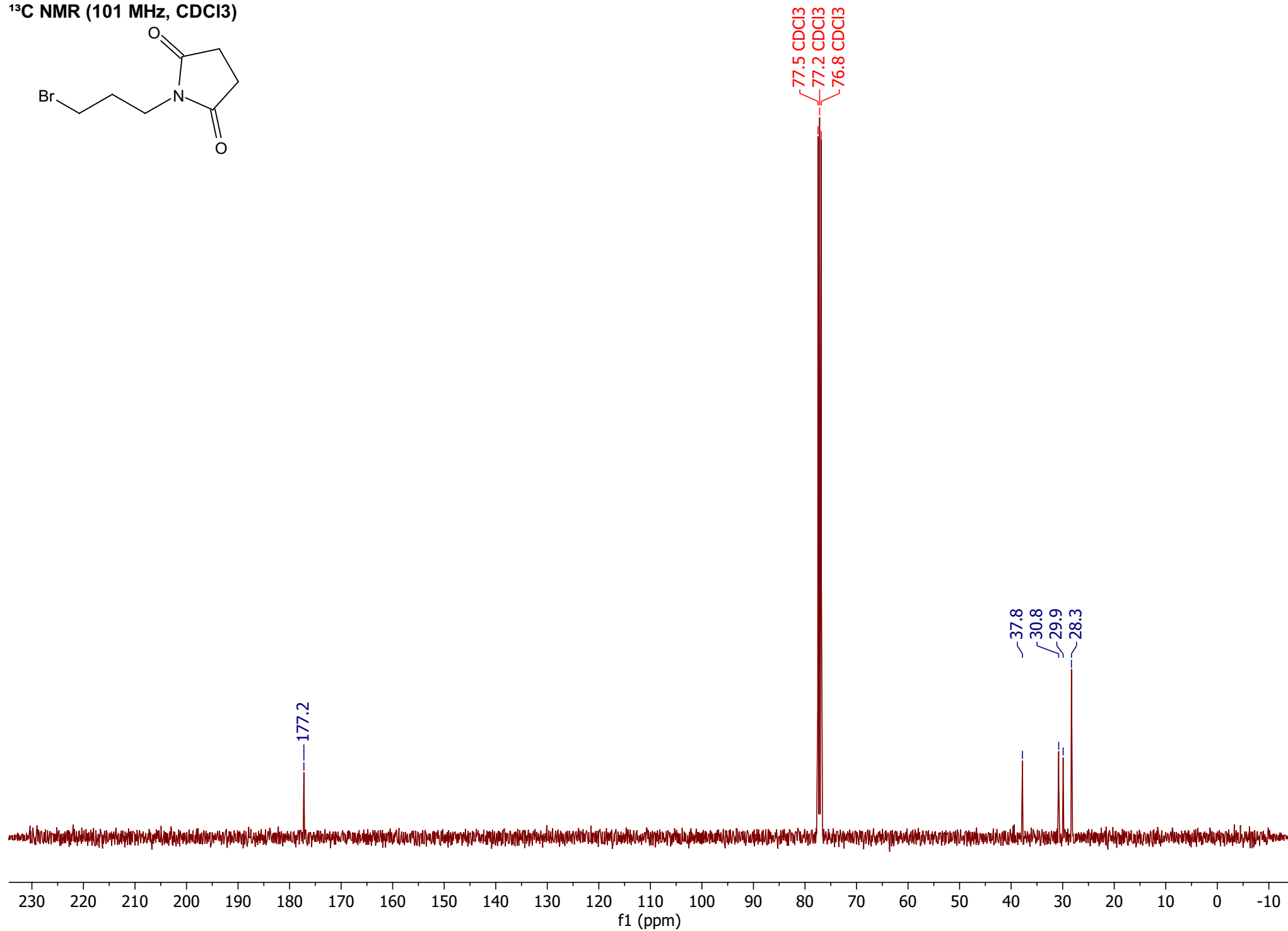
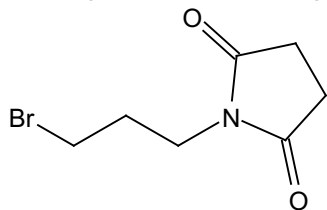
Compound 42
¹³C NMR (151 MHz, DMSO-d₆)



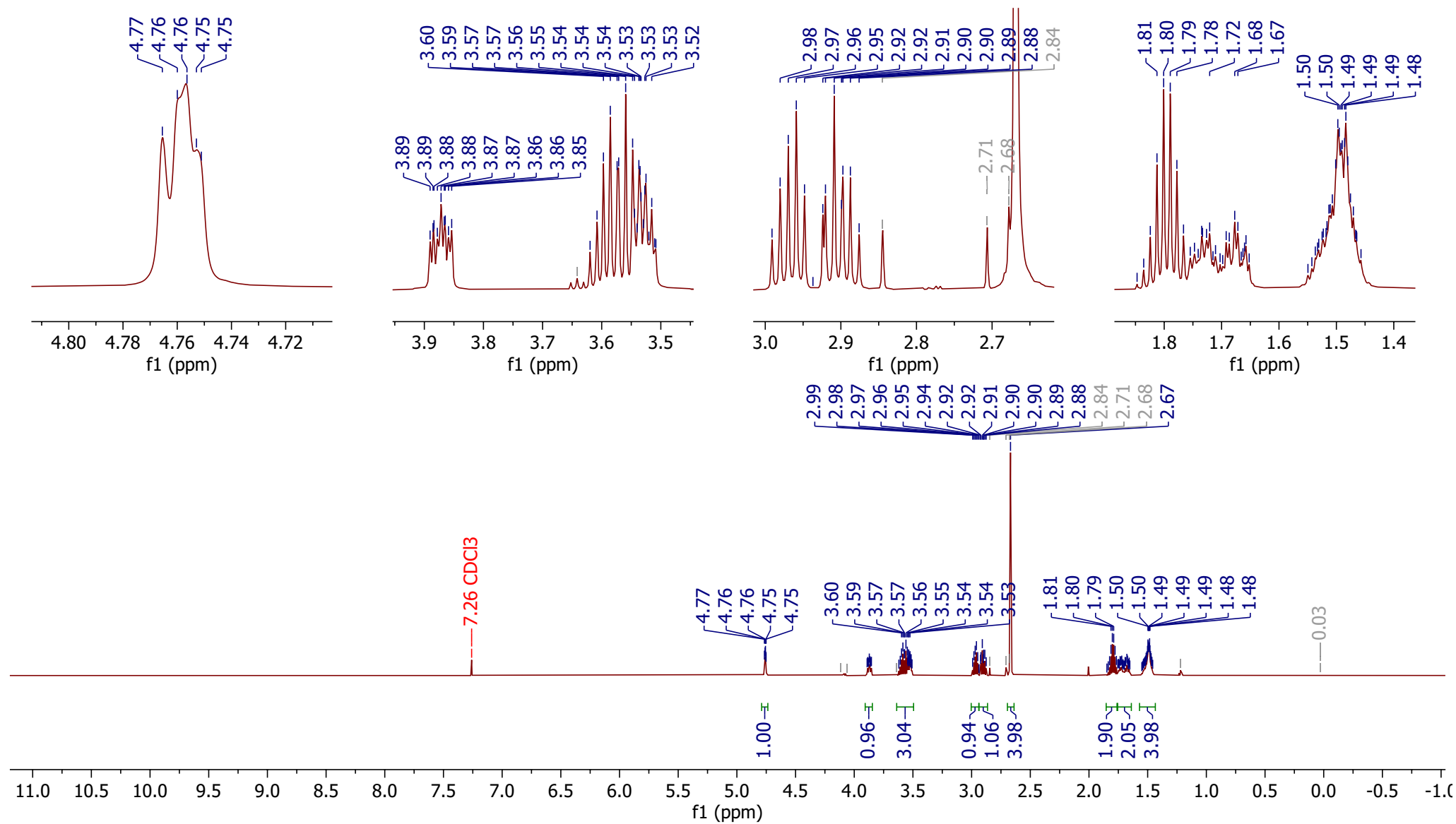
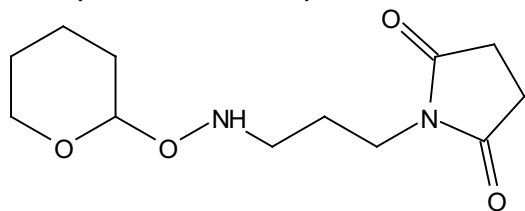
Compound S75
1H NMR (400 MHz, CDCl3)

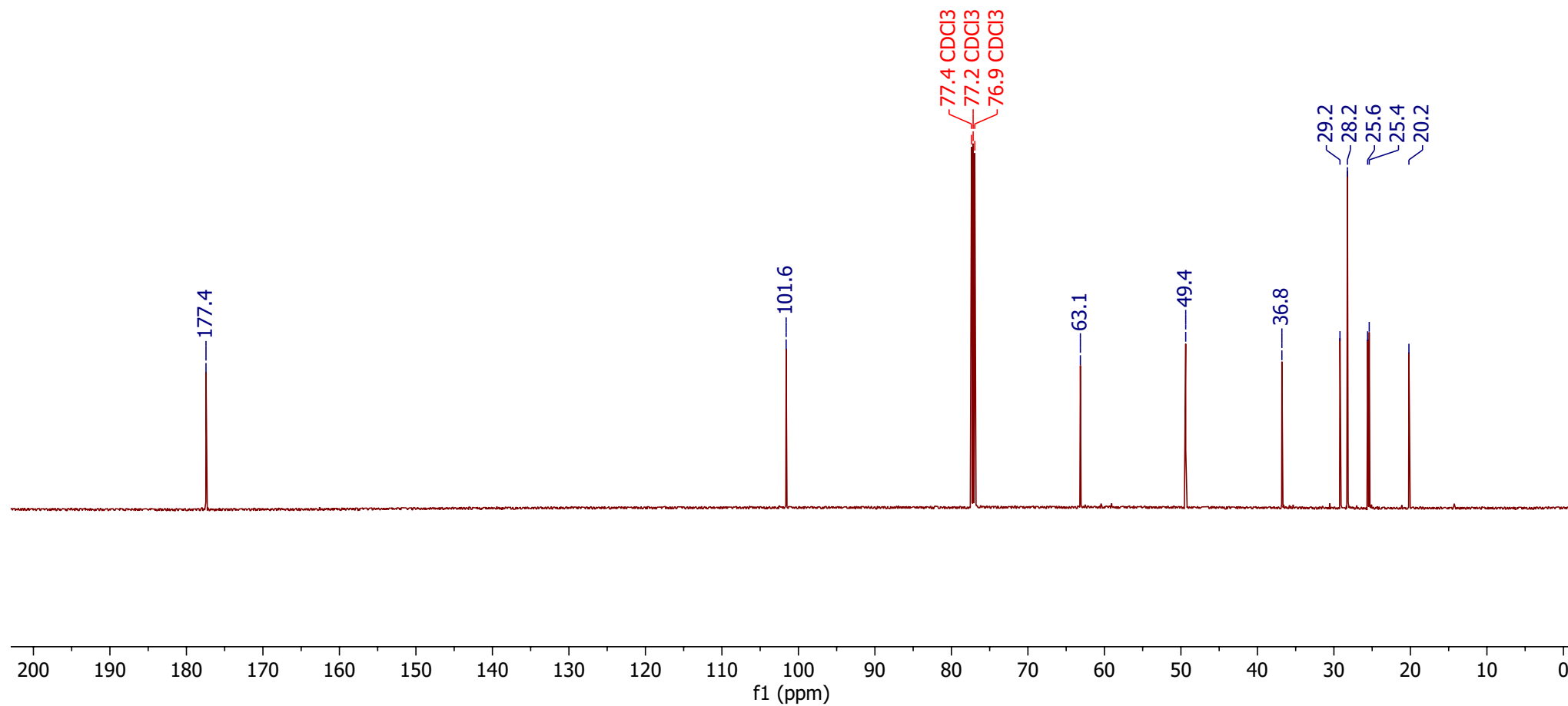
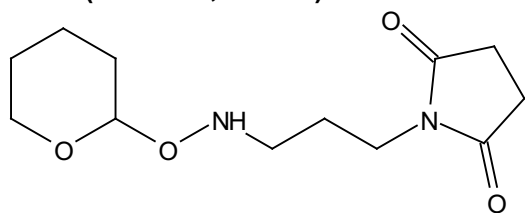


Compound S75
¹³C NMR (101 MHz, CDCl₃)

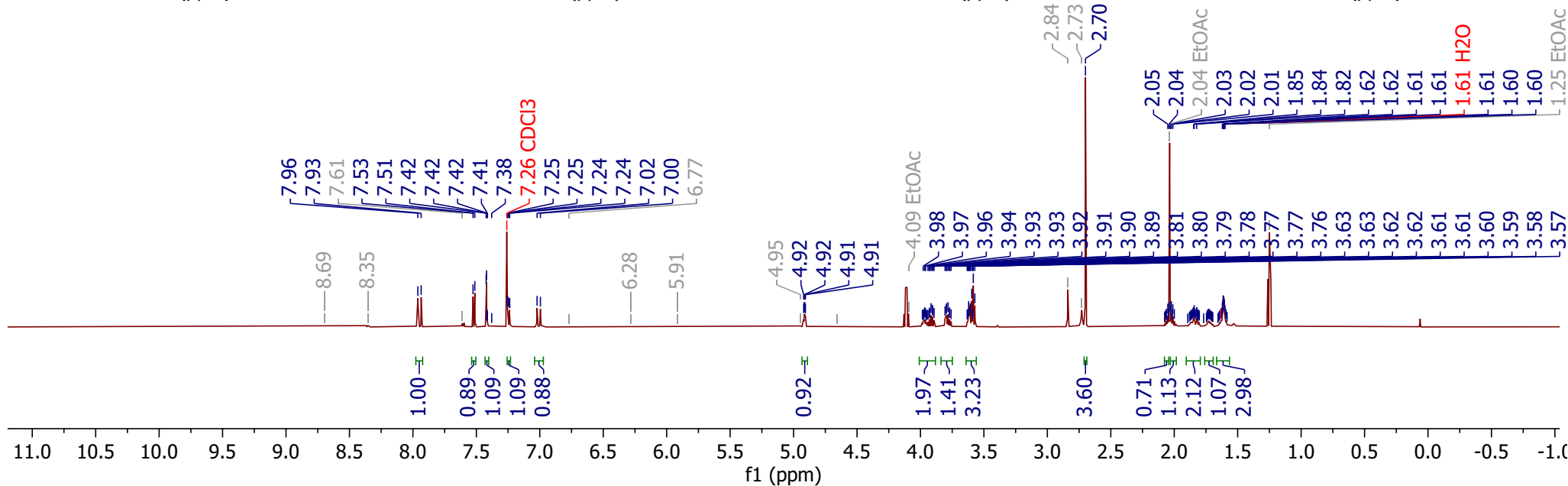
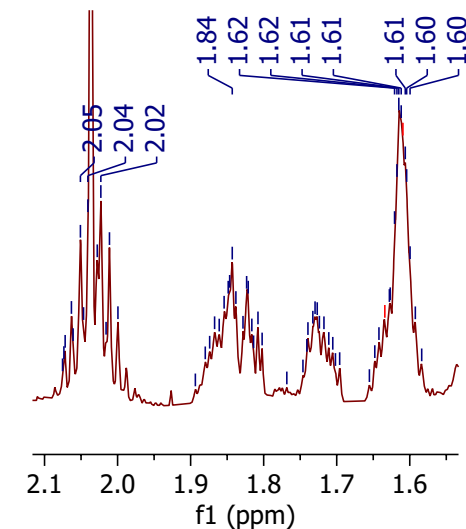
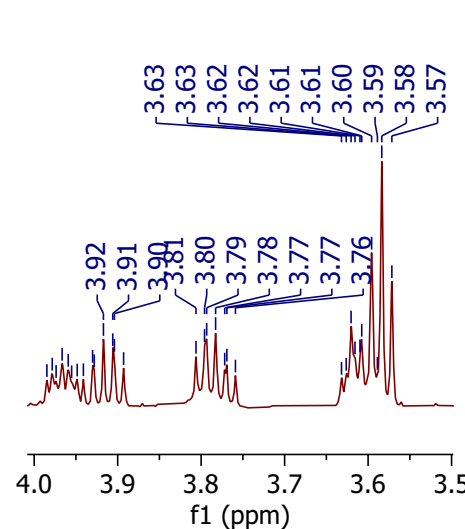
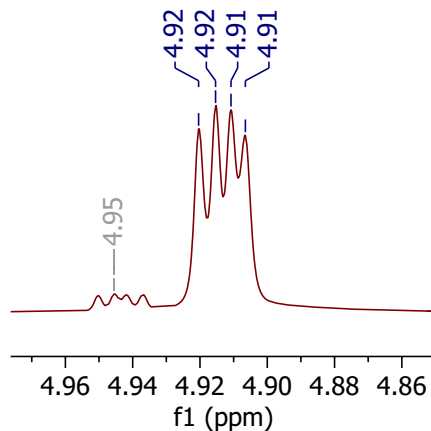
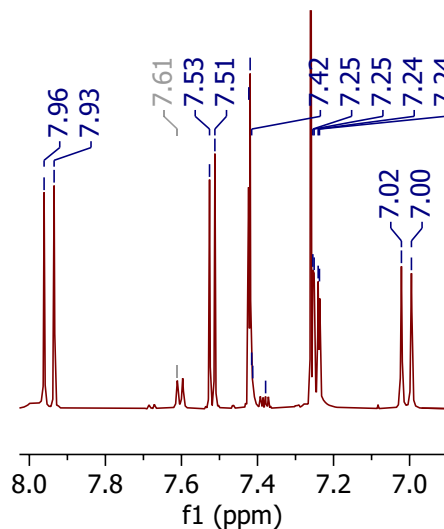
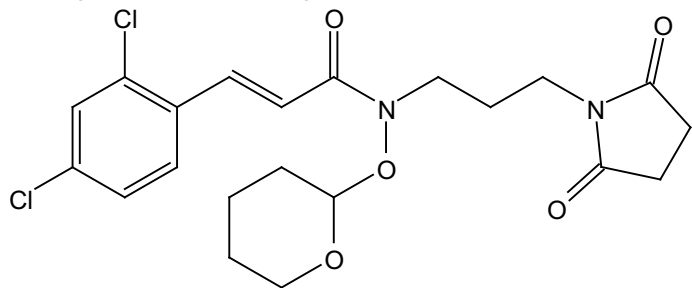


Compound S76
¹H NMR (600 MHz, CDCl₃)

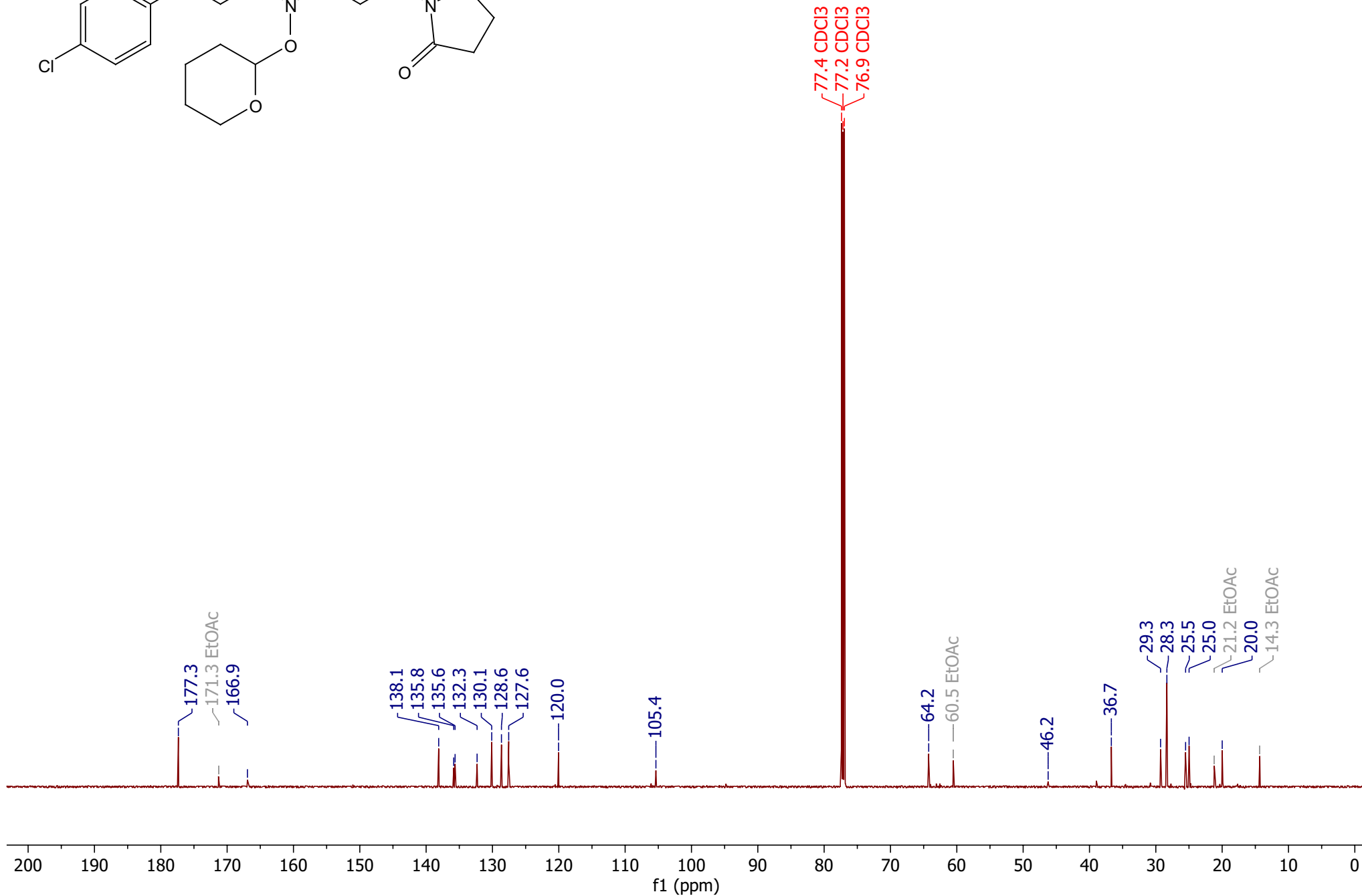
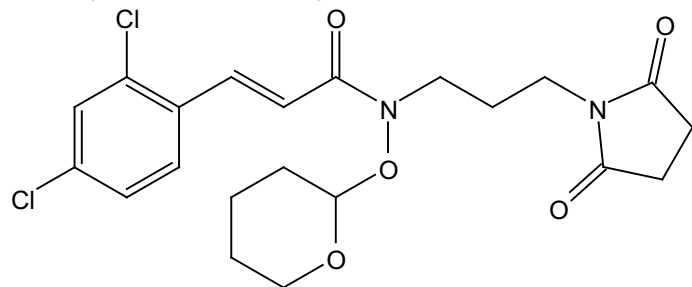


Compound S76 **^{13}C NMR (151 MHz, CDCl_3)**

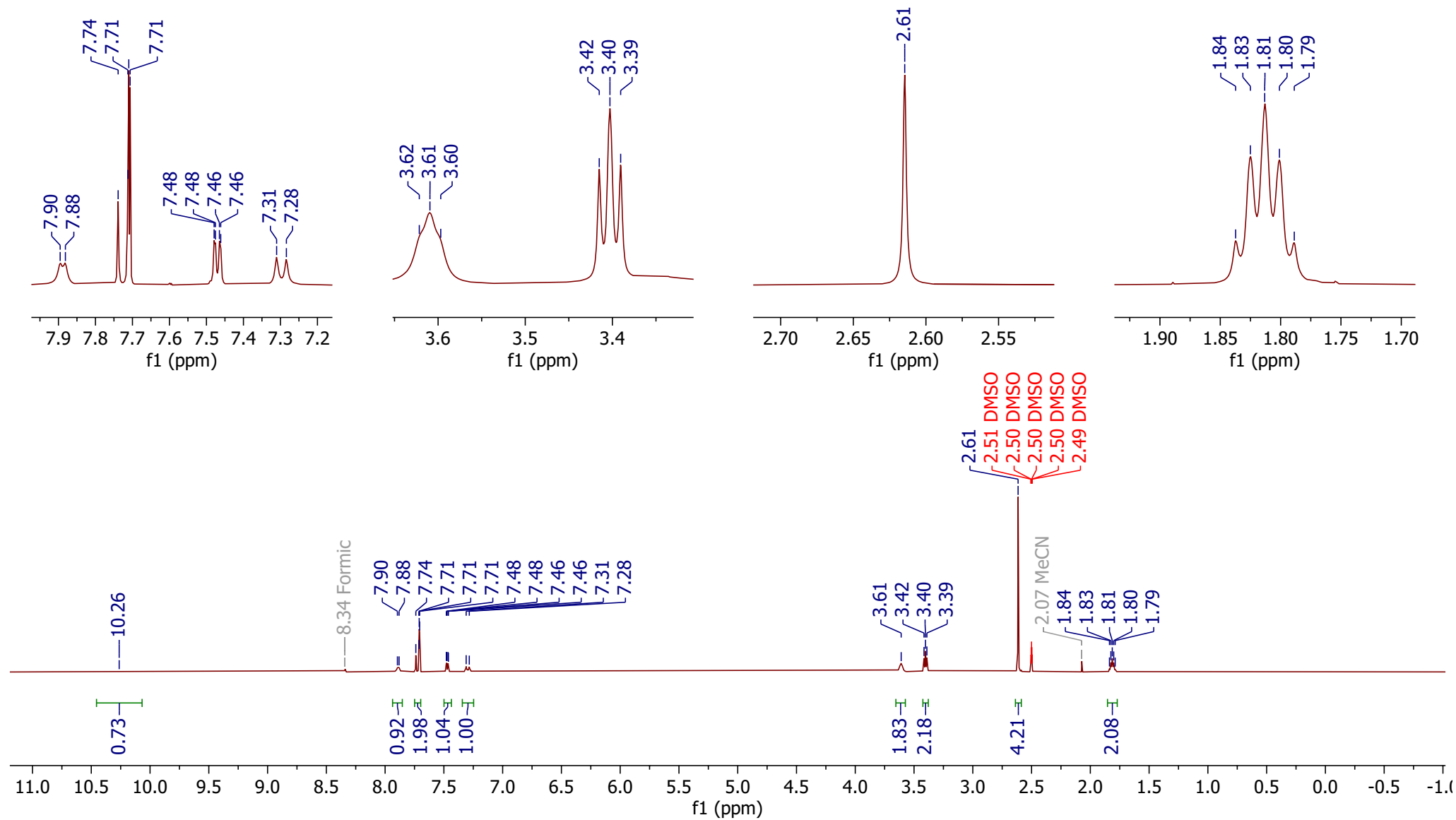
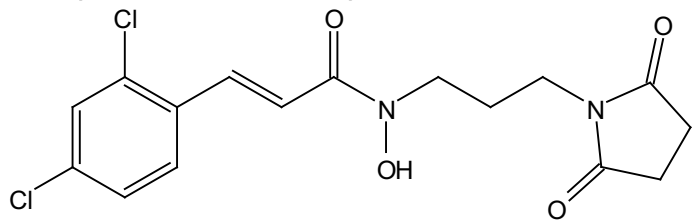
Compound S77
¹H NMR (600 MHz, CDCl₃)



Compound S77
¹³C NMR (151 MHz, CDCl₃)



Compound 43
¹H NMR (600 MHz, DMSO-d₆)



Compound 43
 ^{13}C NMR (151 MHz, DMSO- d_6)

