

Supporting Information

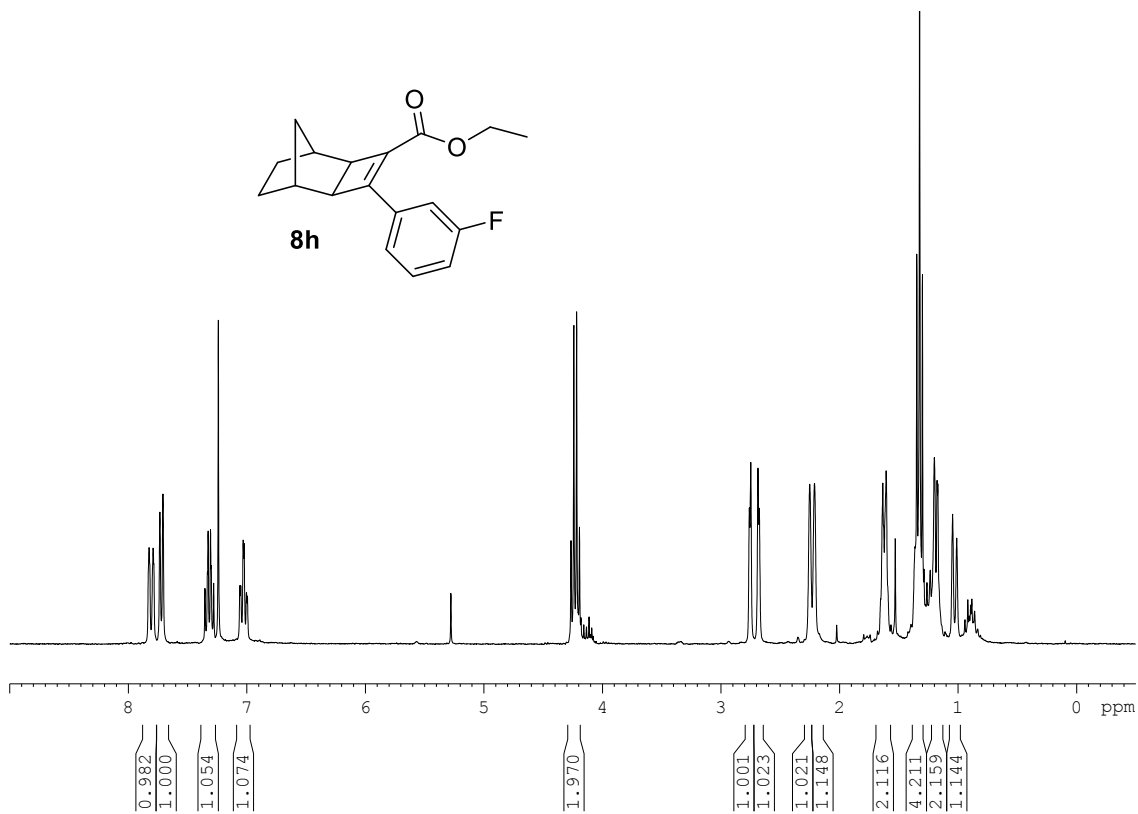
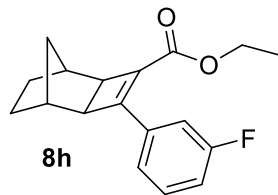
Ruthenium-Catalyzed Asymmetric [2+2] Cycloadditions between Chiral Acyl Camphorsultam-Substituted Alkynes and Bicyclic Alkenes

Jordan Goodreid, Karine Villeneuve, Emily Carlson, and William Tam*

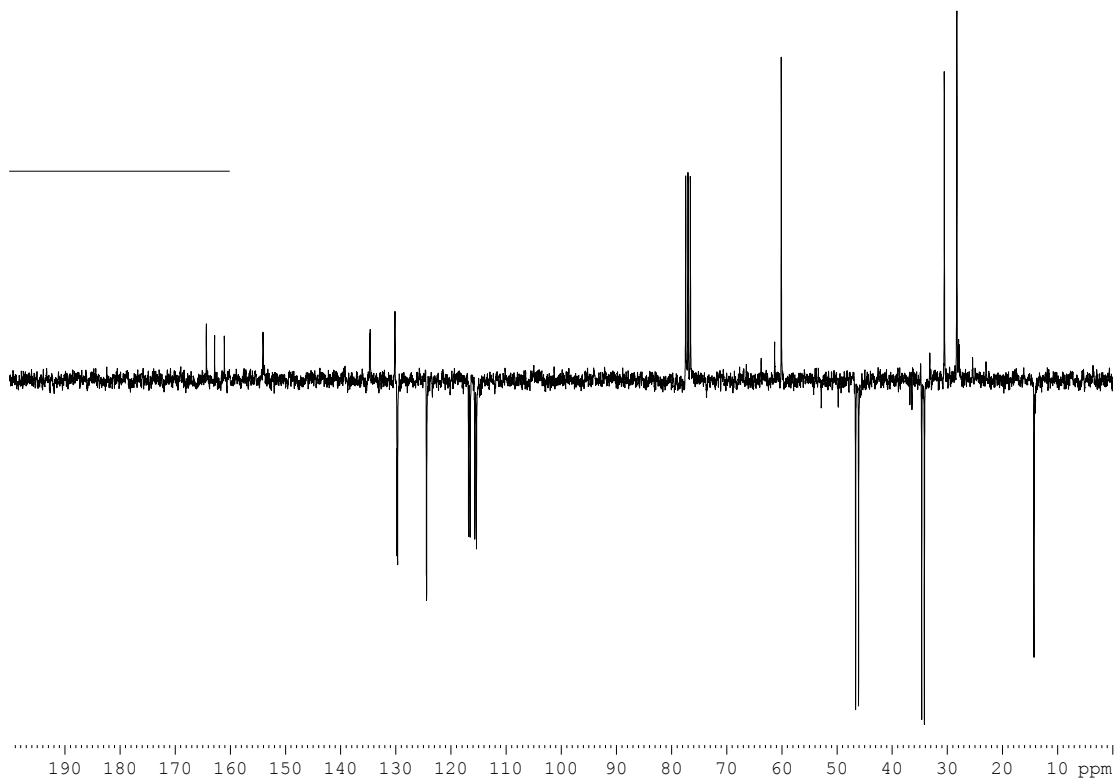
Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry, Department
of Chemistry, University of Guelph, Guelph, Ontario, Canada N1G 2W1

Contents

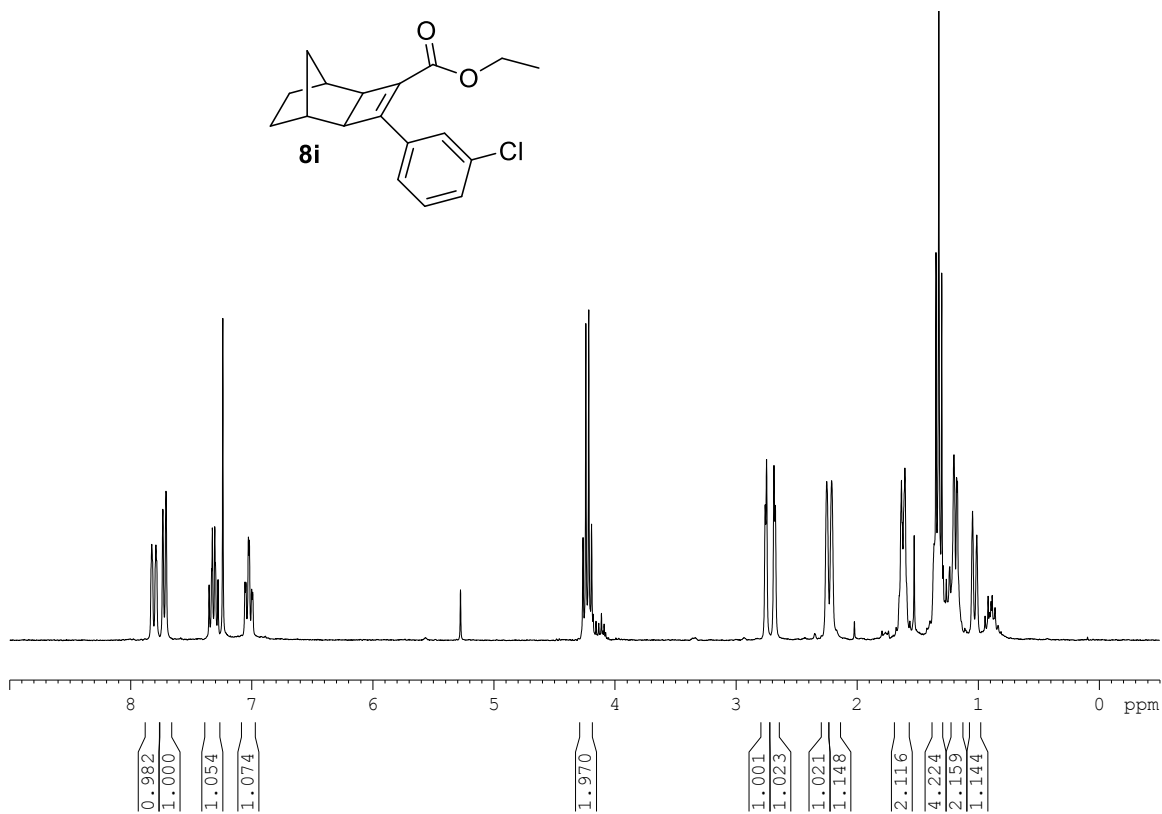
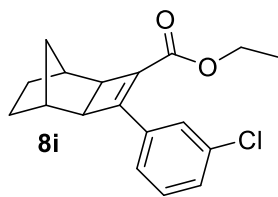
Part I:	¹ H and ¹³ C spectra of adducts 8h-q , 3/4c,j-v , 5g-o,r , and 13	S2-S34
Part II:	HPLC Chromatograms of adducts 5a-o,r and 13	S35-S43



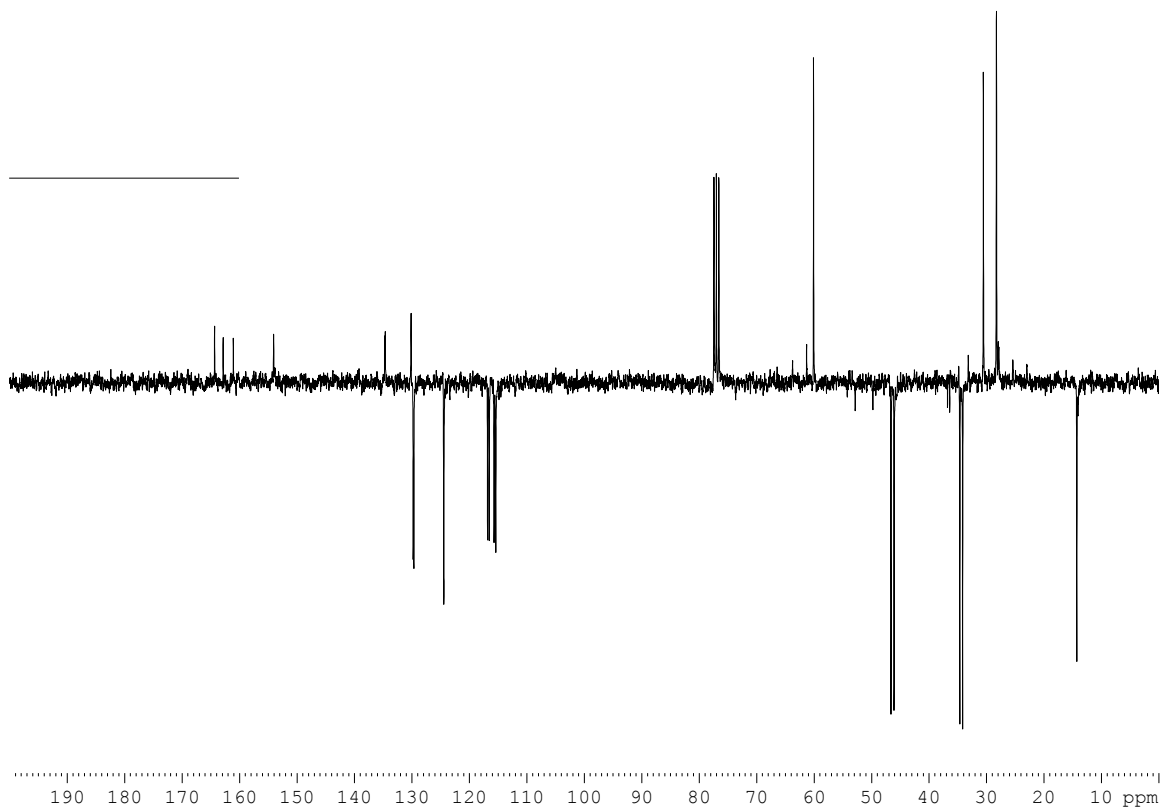
(300 MHz ^1H NMR Spectrum in CDCl_3)



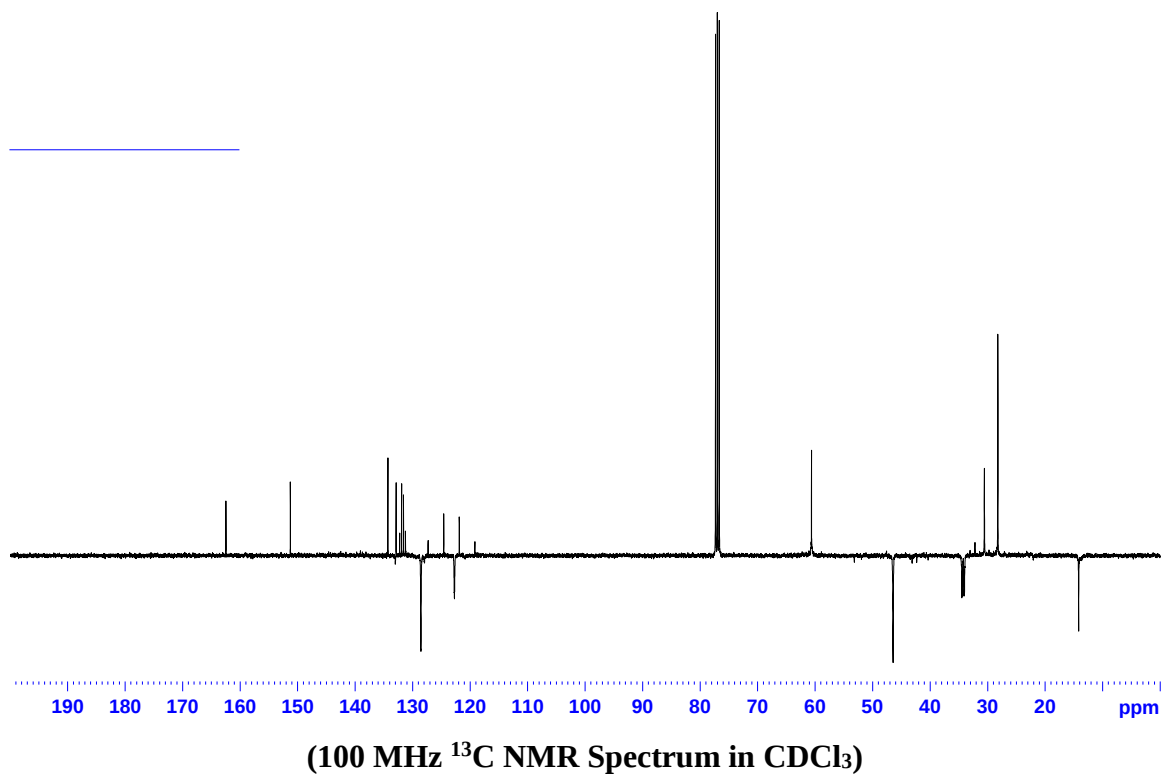
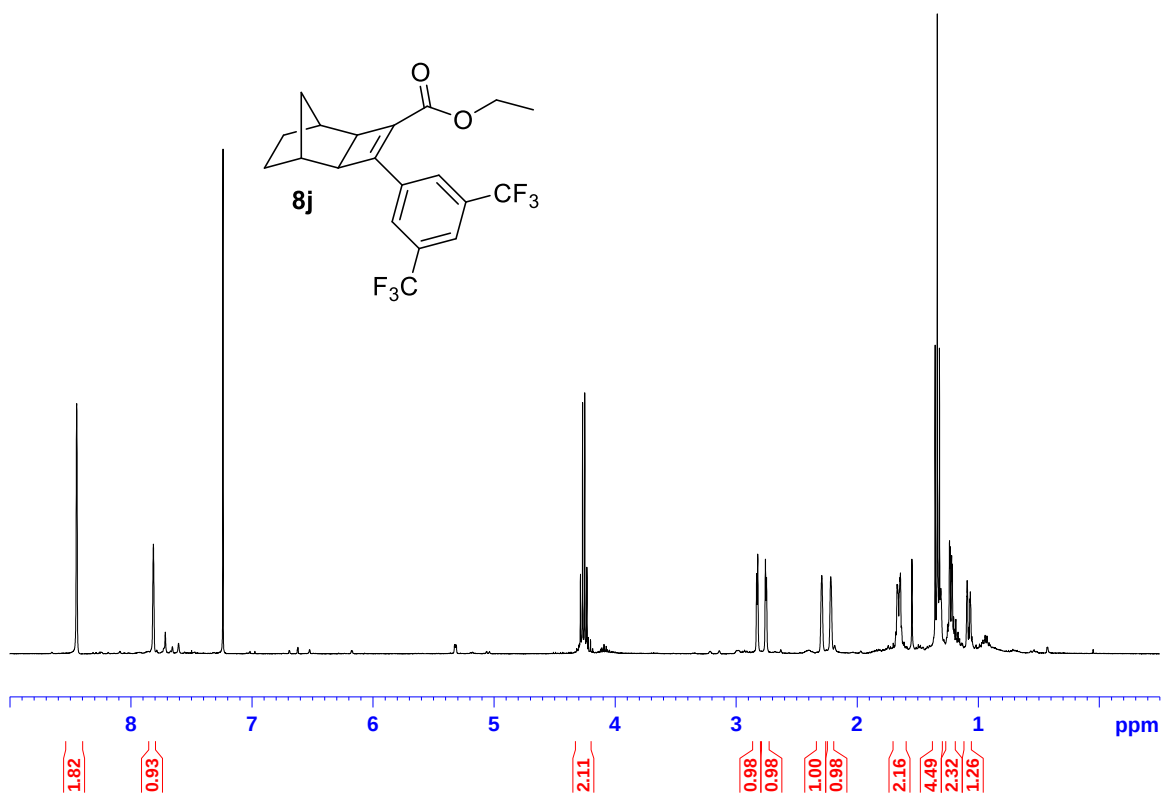
(75 MHz ^{13}C NMR Spectrum in CDCl_3)

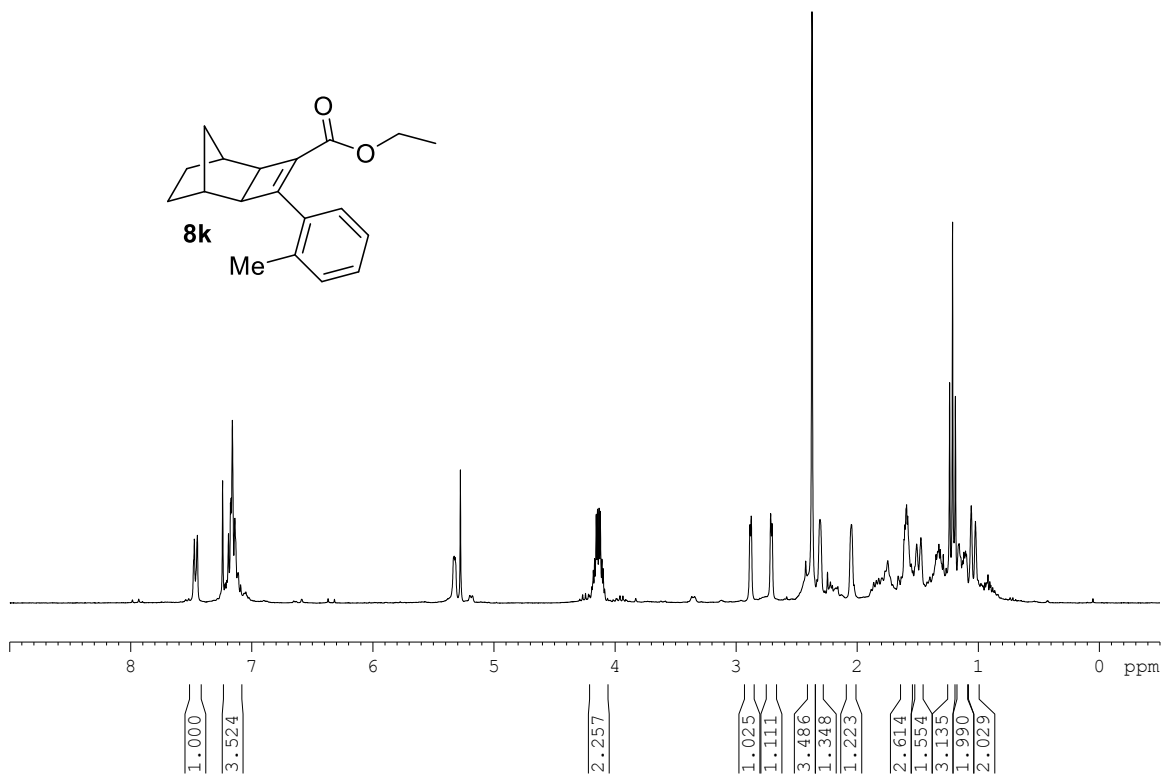
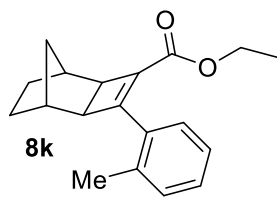


(300 MHz ^1H NMR Spectrum in CDCl_3)

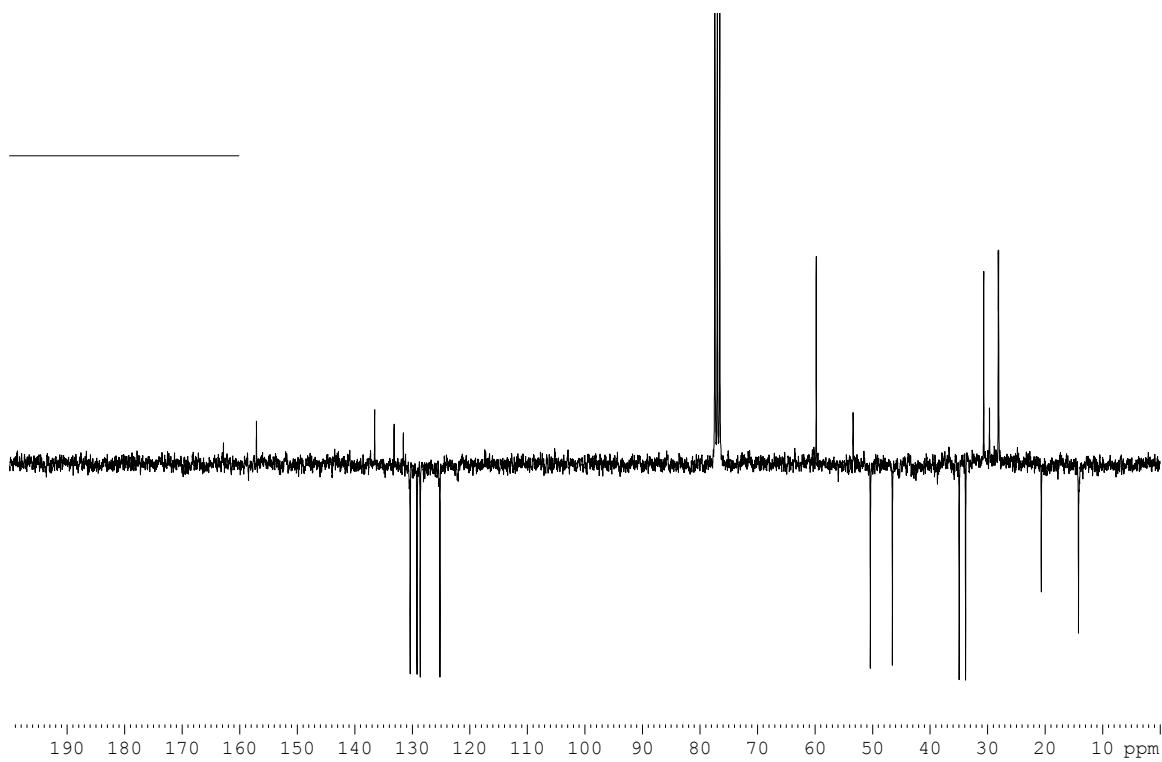


(75 MHz ^{13}C NMR Spectrum in CDCl_3)

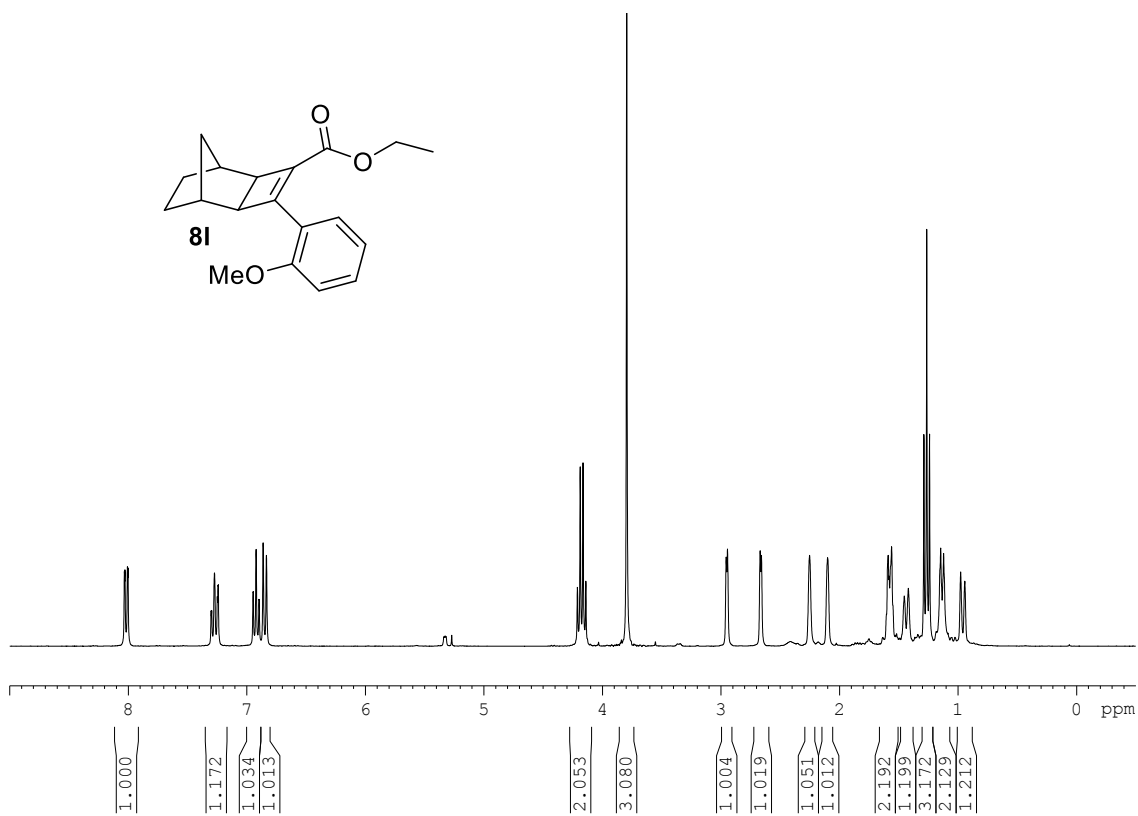




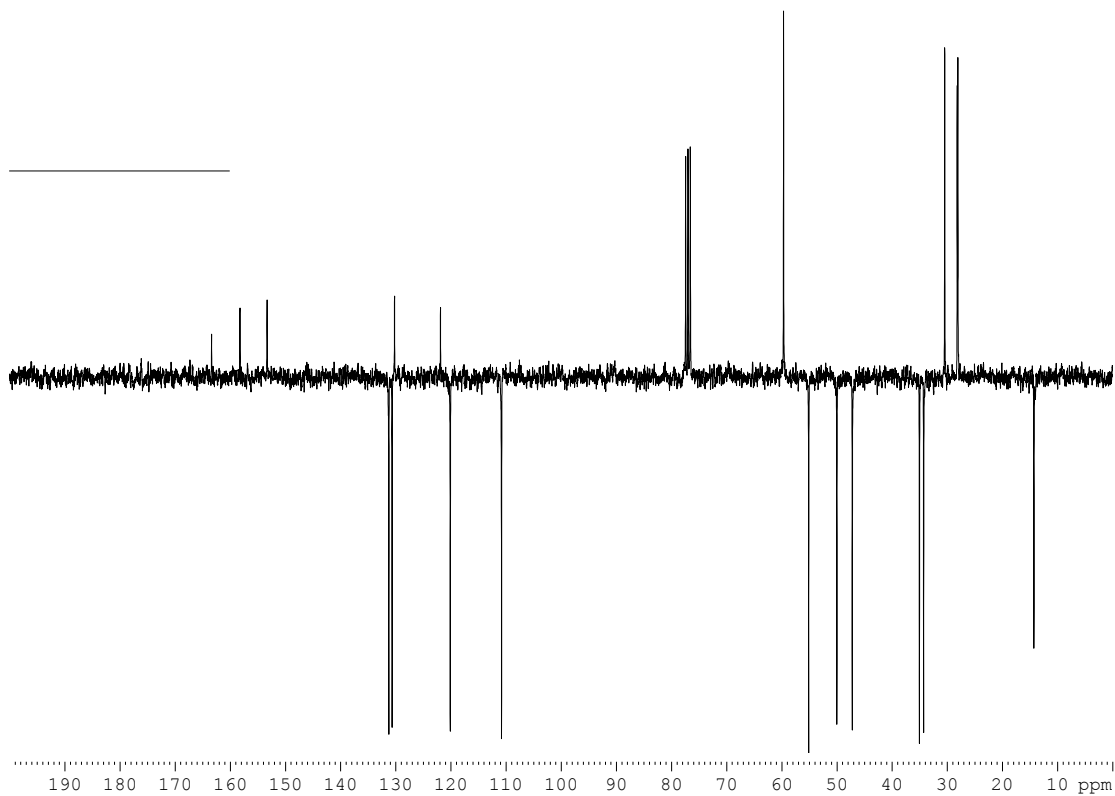
(300 MHz ^1H NMR Spectrum in CDCl_3)



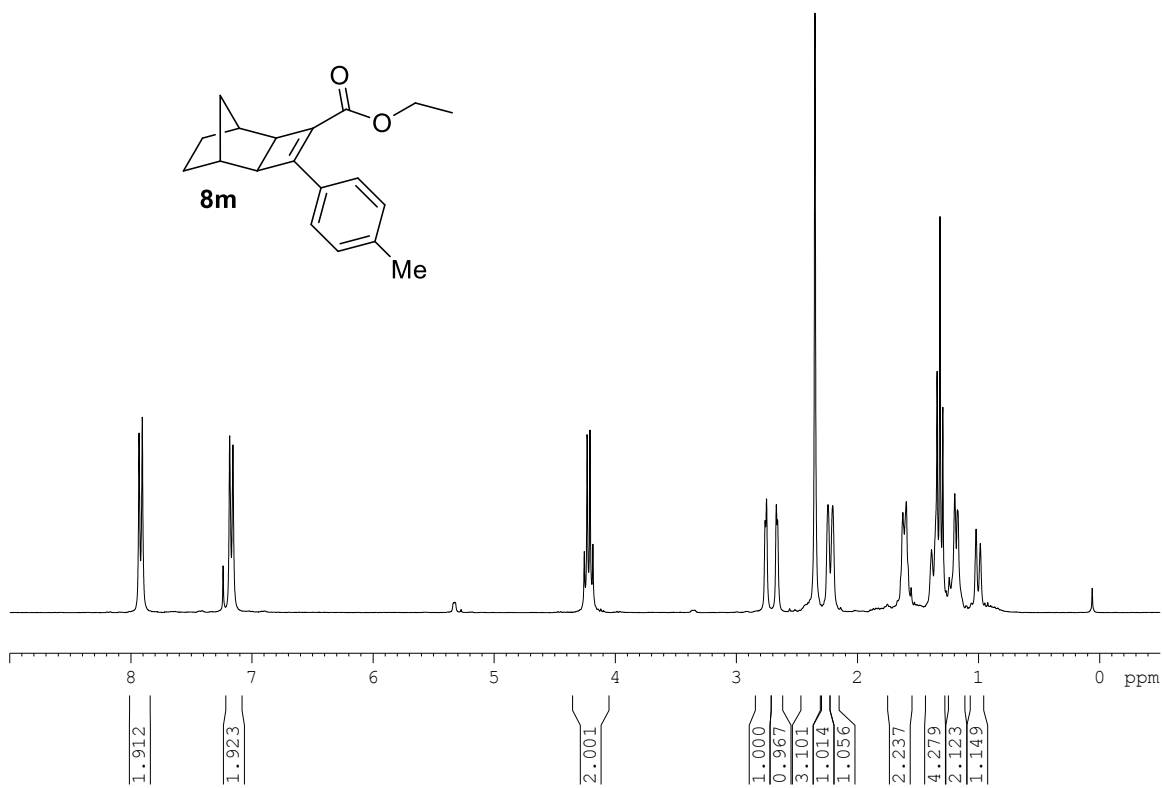
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



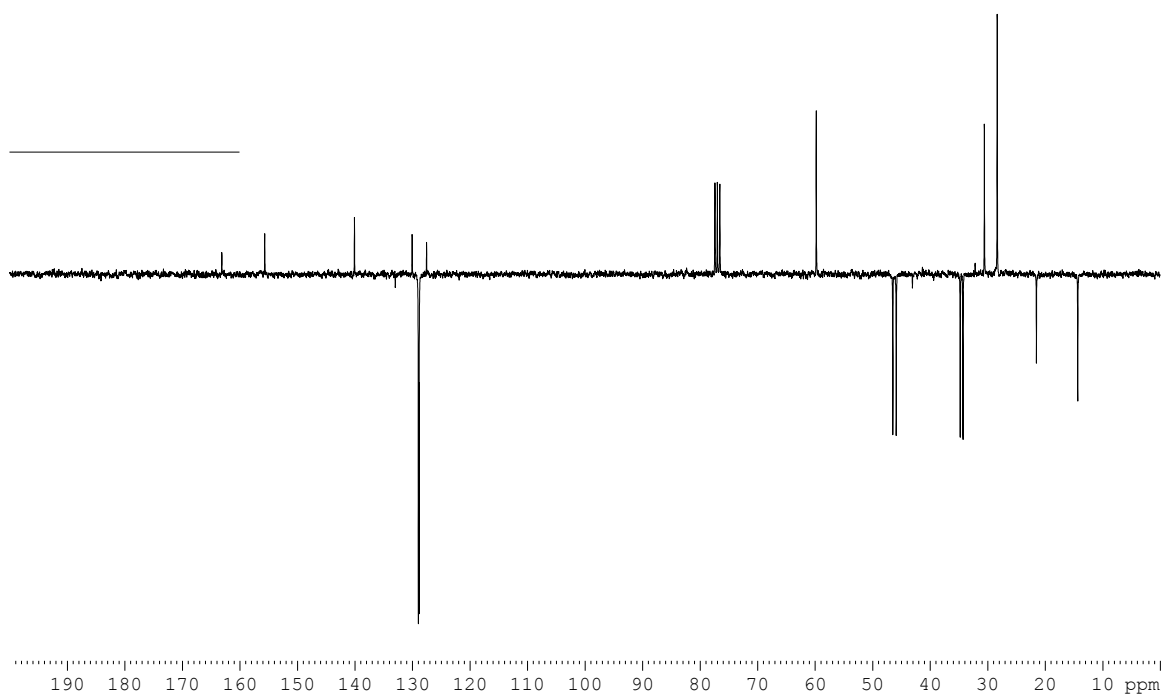
(300 MHz ^1H NMR Spectrum in CDCl_3)



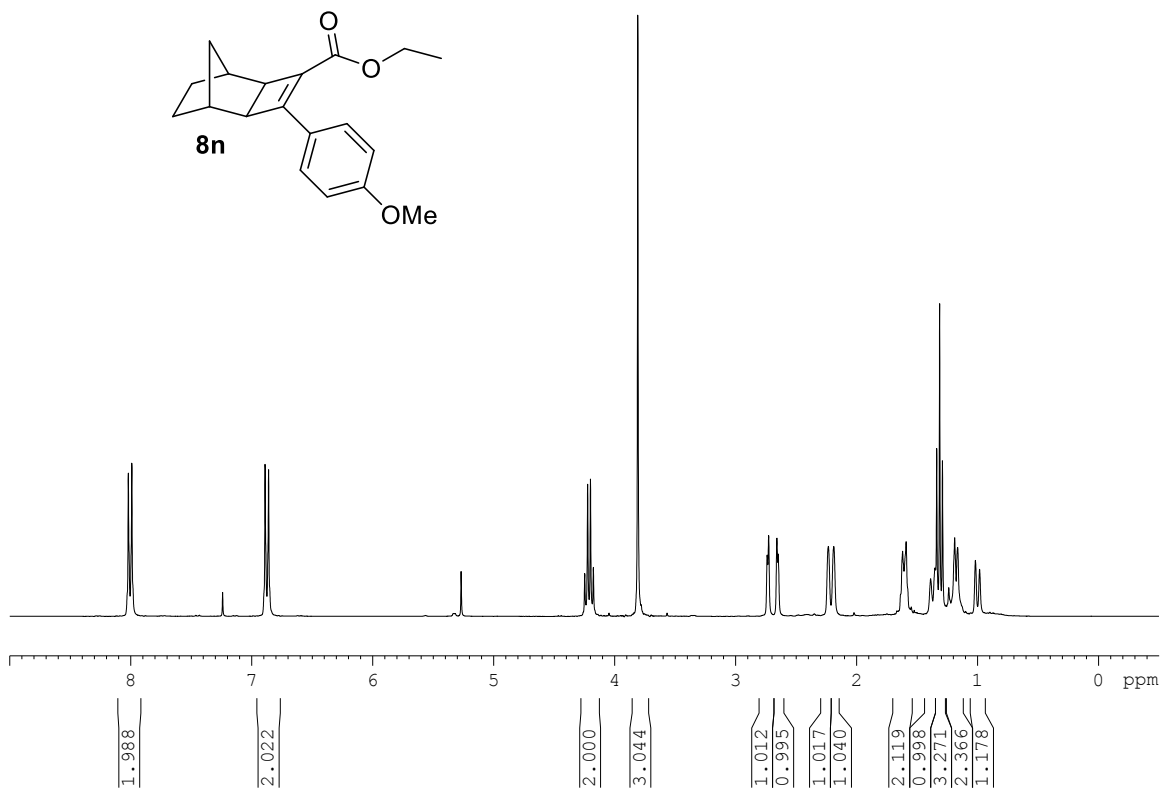
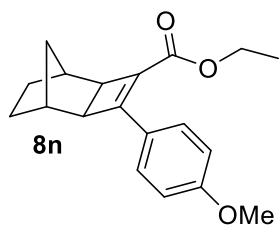
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



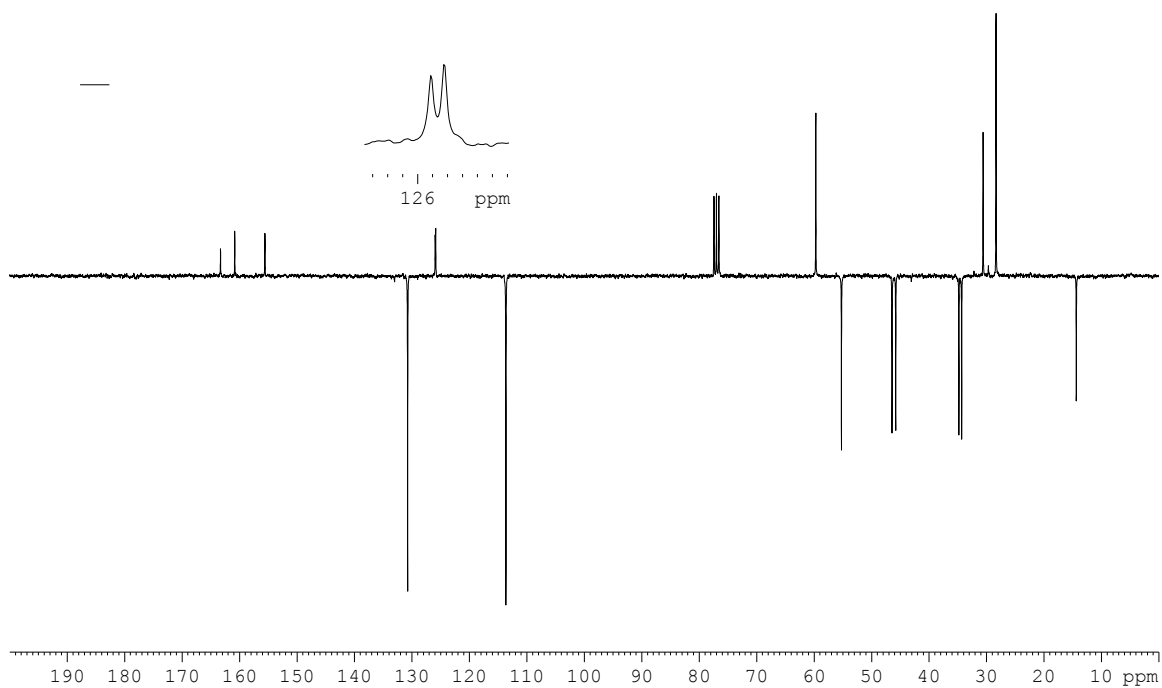
(300 MHz ¹H NMR Spectrum in CDCl₃)



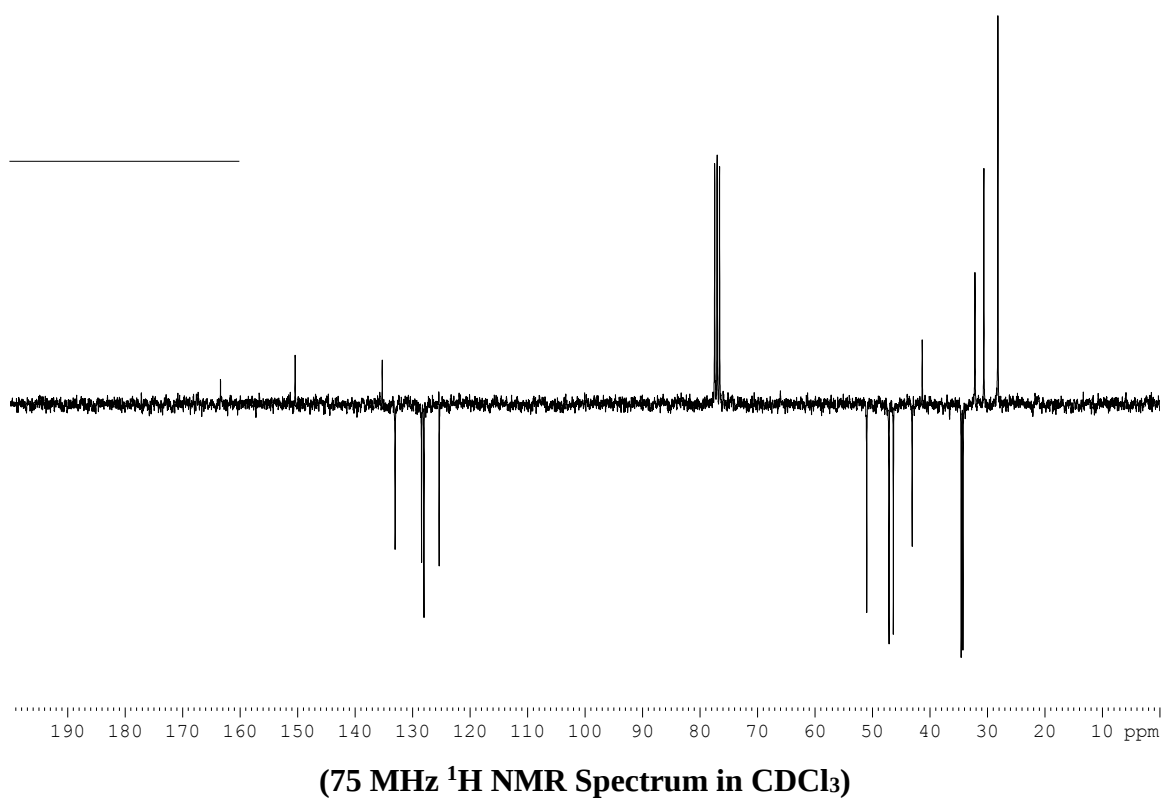
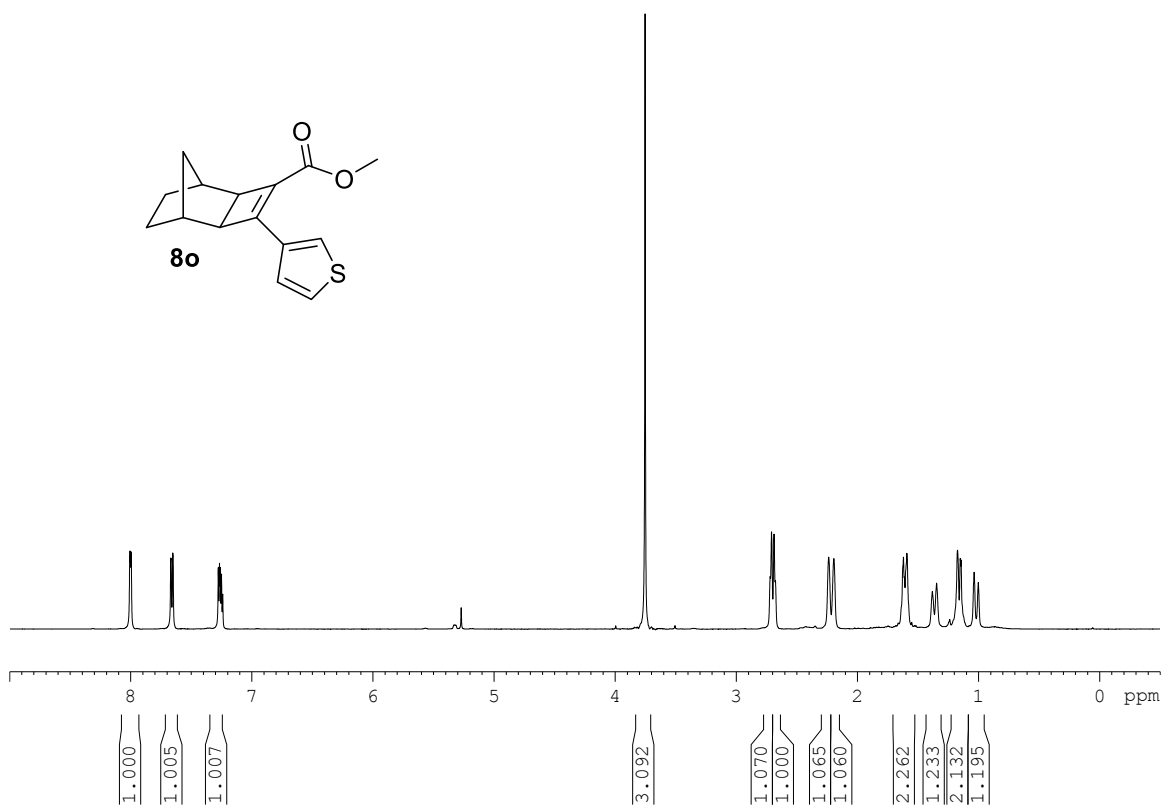
(75 MHz ¹³C NMR Spectrum in CDCl₃)

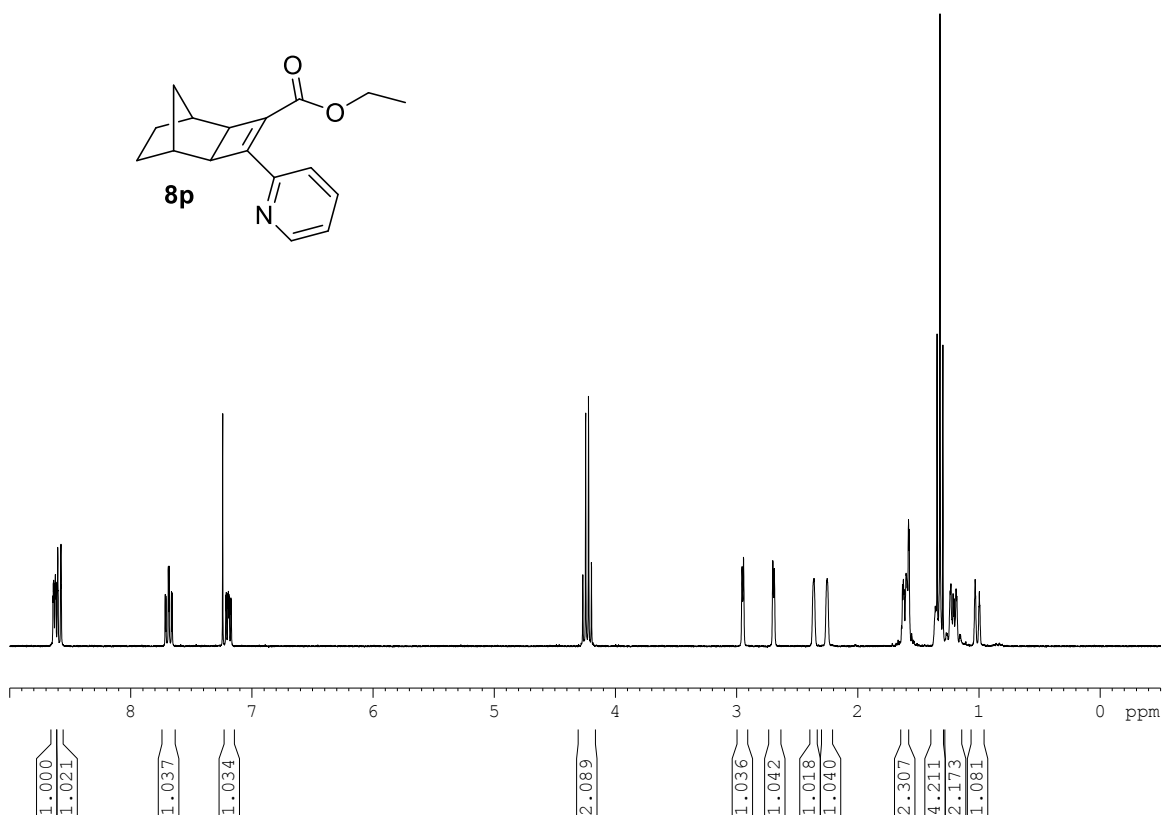
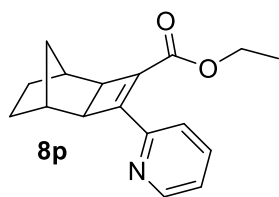


(300 MHz ^1H NMR Spectrum in CDCl_3)

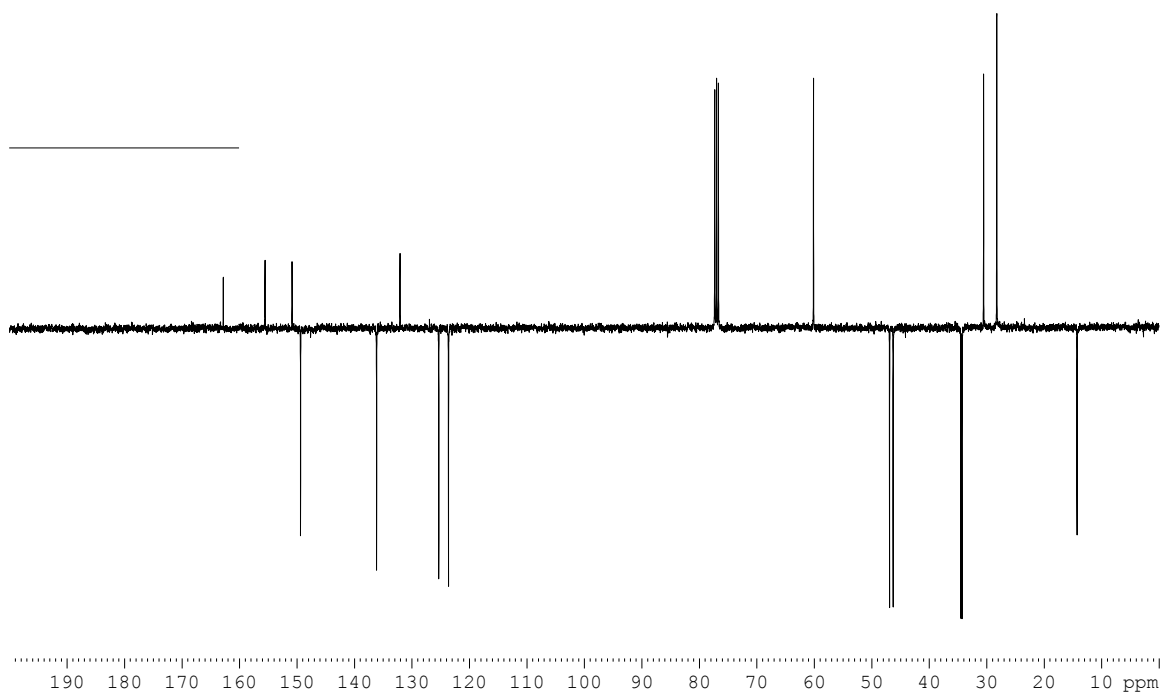


(75 MHz ^{13}C NMR Spectrum in CDCl_3)

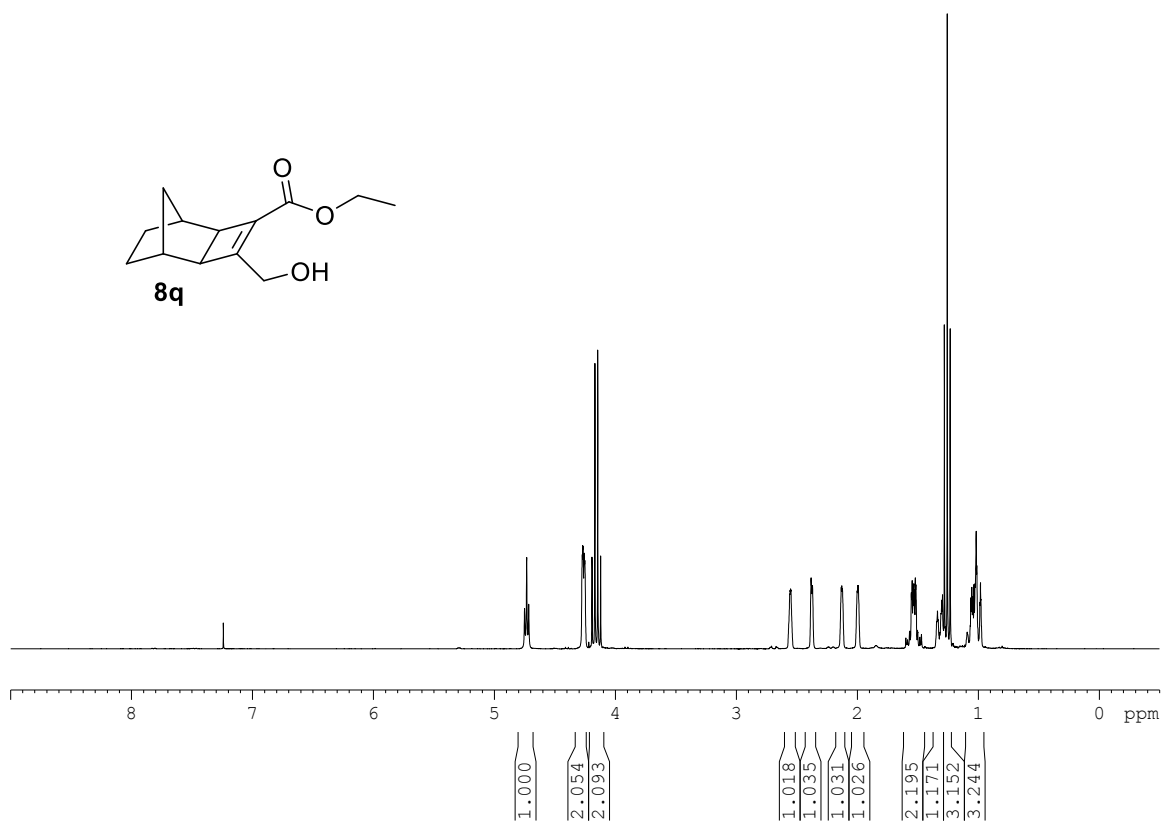
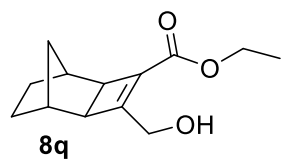




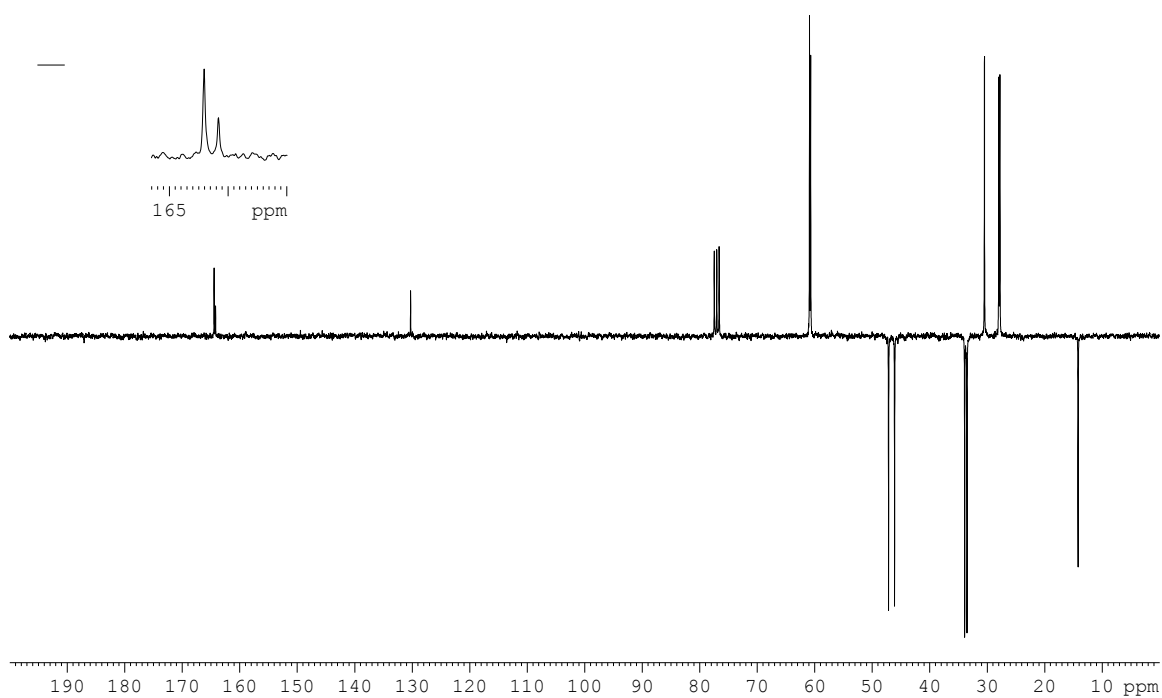
(300 MHz ^1H NMR Spectrum in CDCl_3)



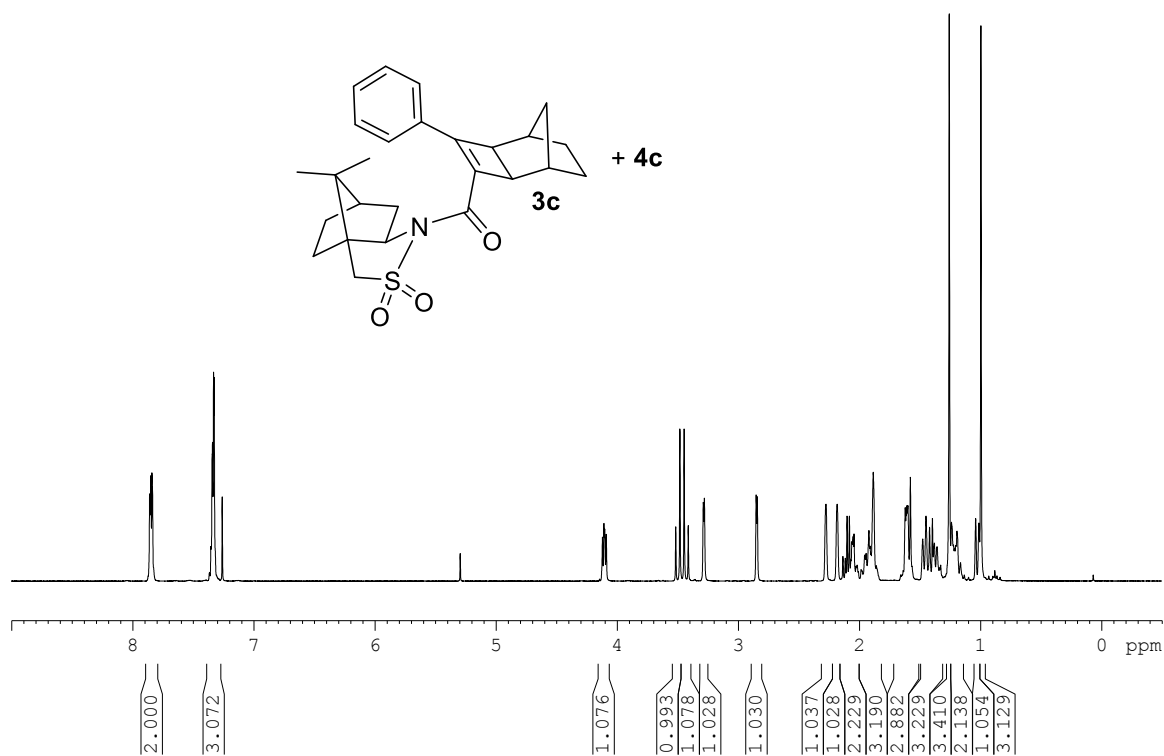
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



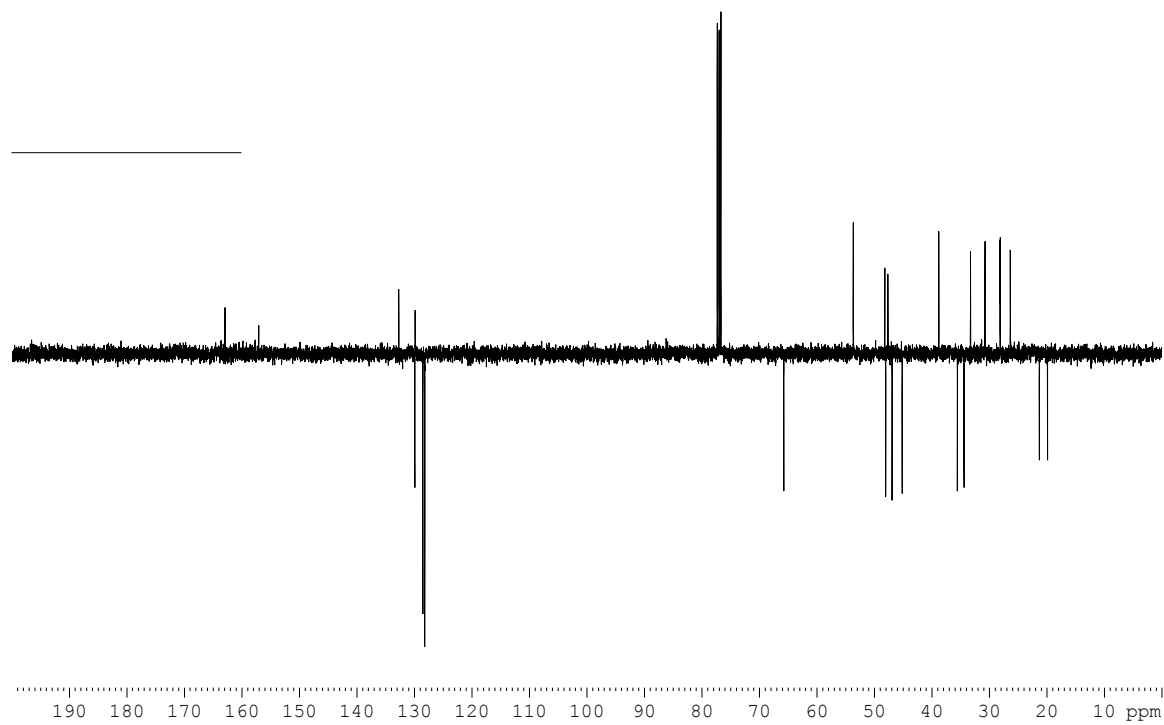
(300 MHz ^1H NMR Spectrum in CDCl_3)



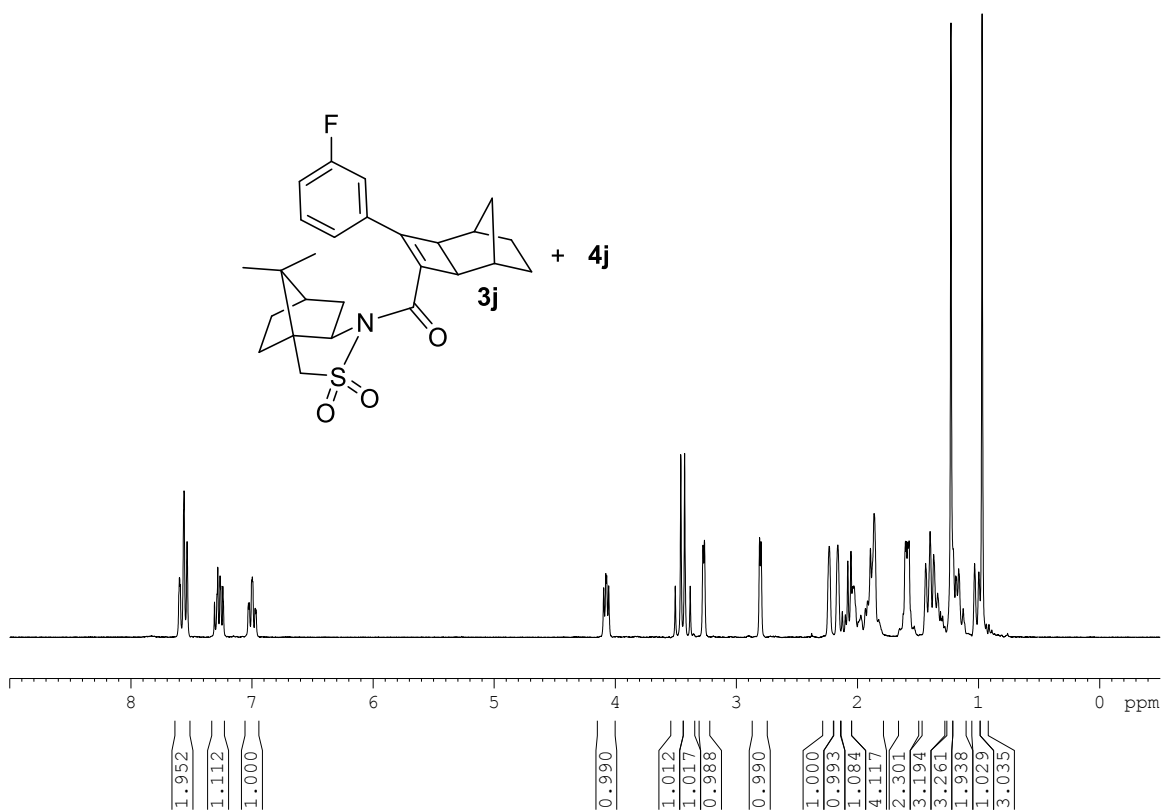
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



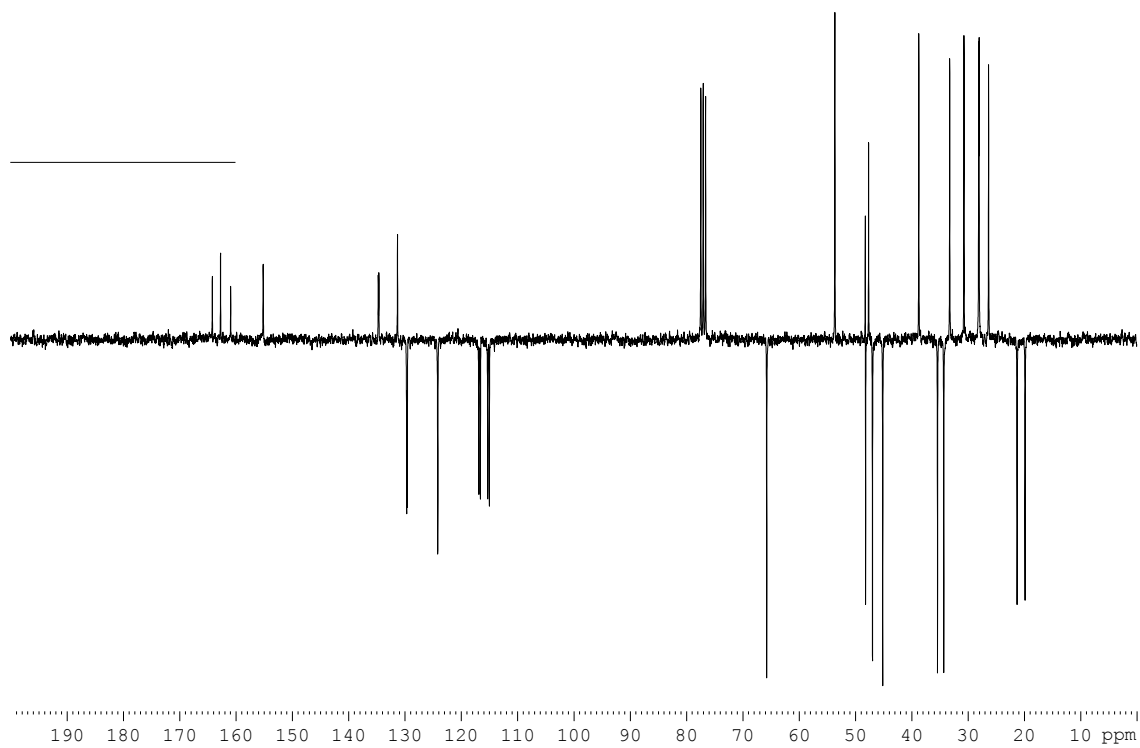
(400 MHz ^1H NMR Spectrum in CDCl_3)



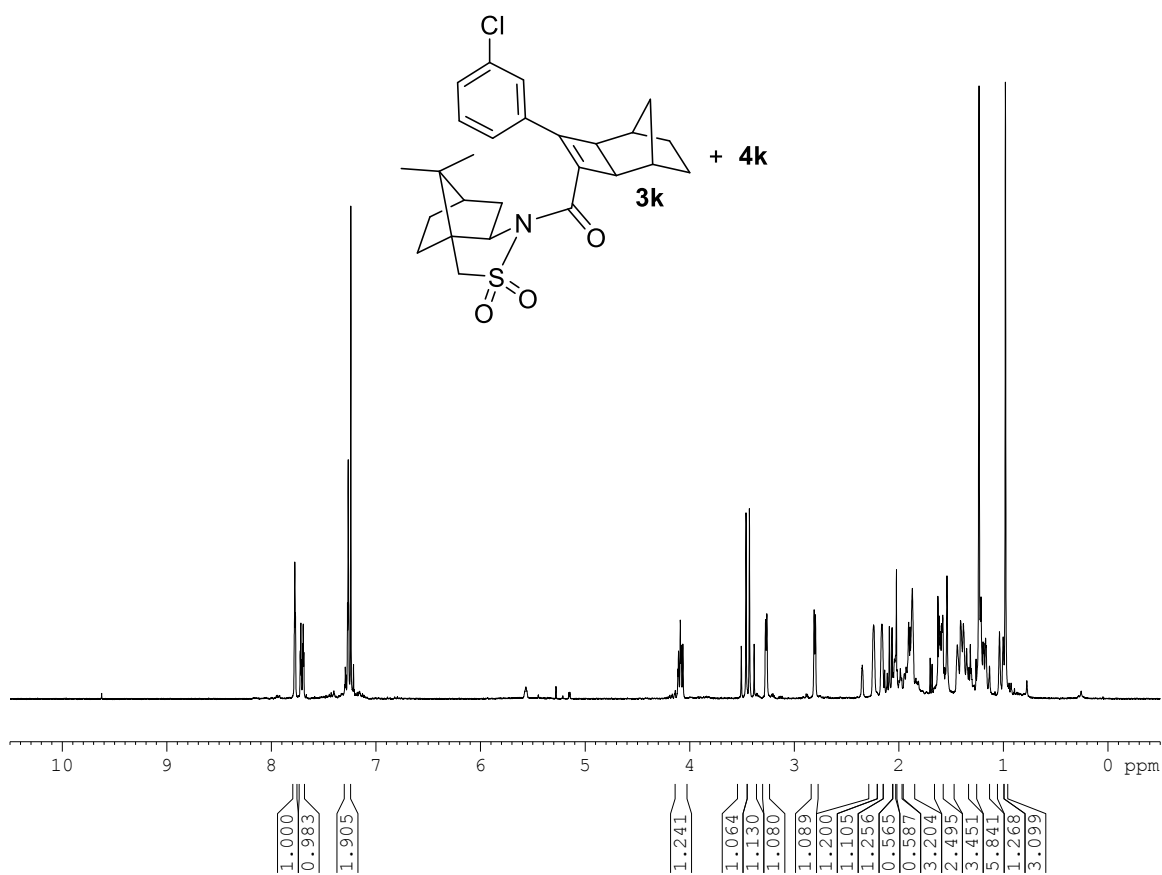
(100 MHz ^{13}C NMR Spectrum in CDCl_3)



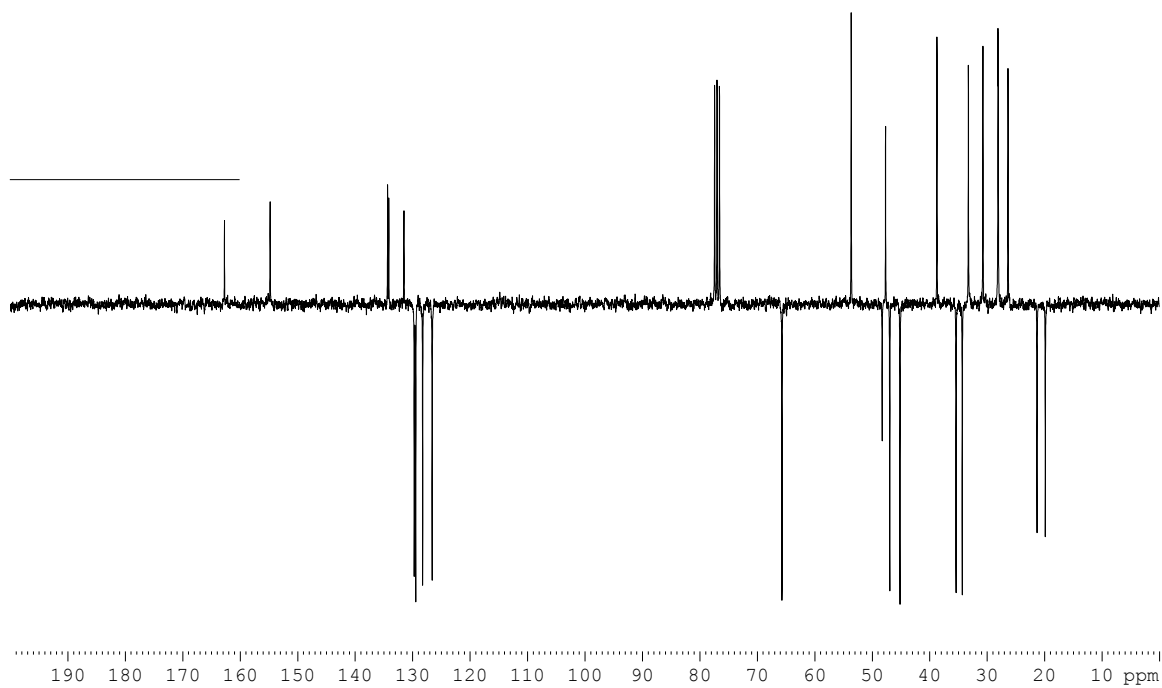
(300 MHz ¹H NMR Spectrum in CDCl₃)



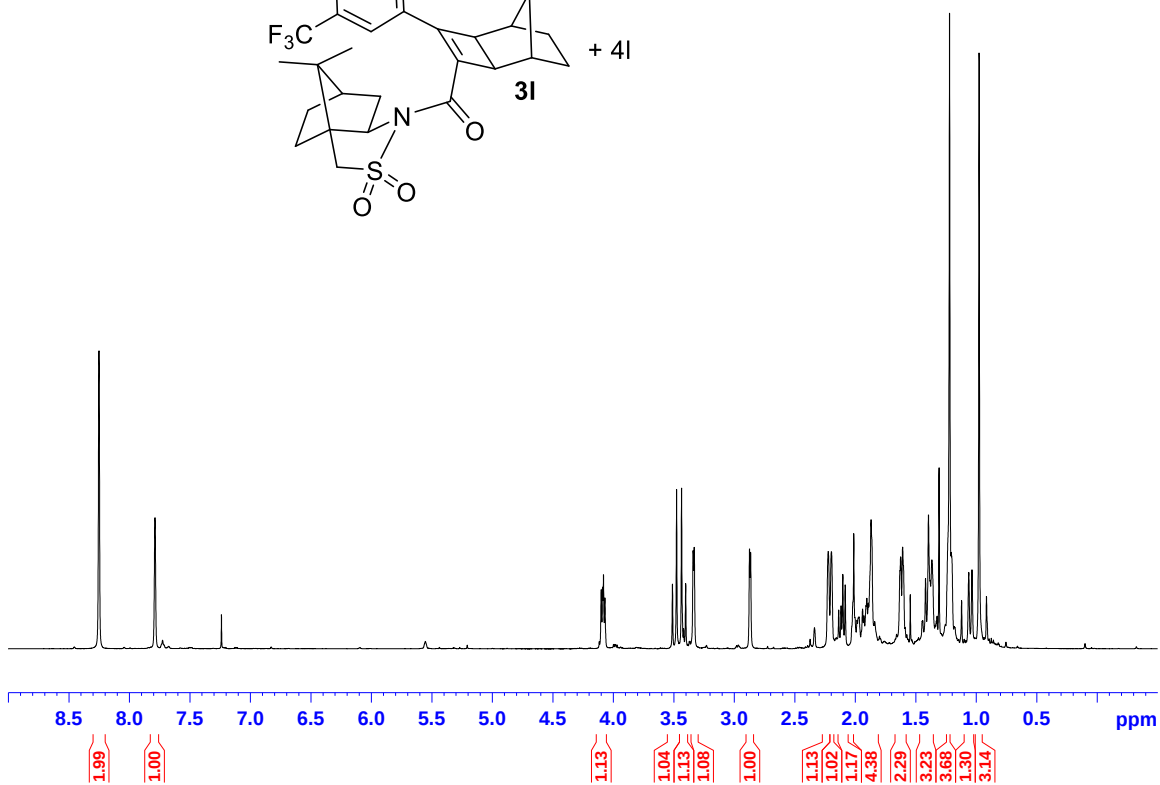
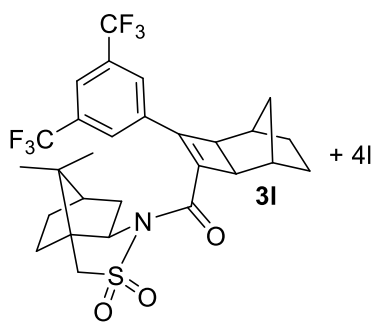
(75 MHz ¹H NMR Spectrum in CDCl₃)



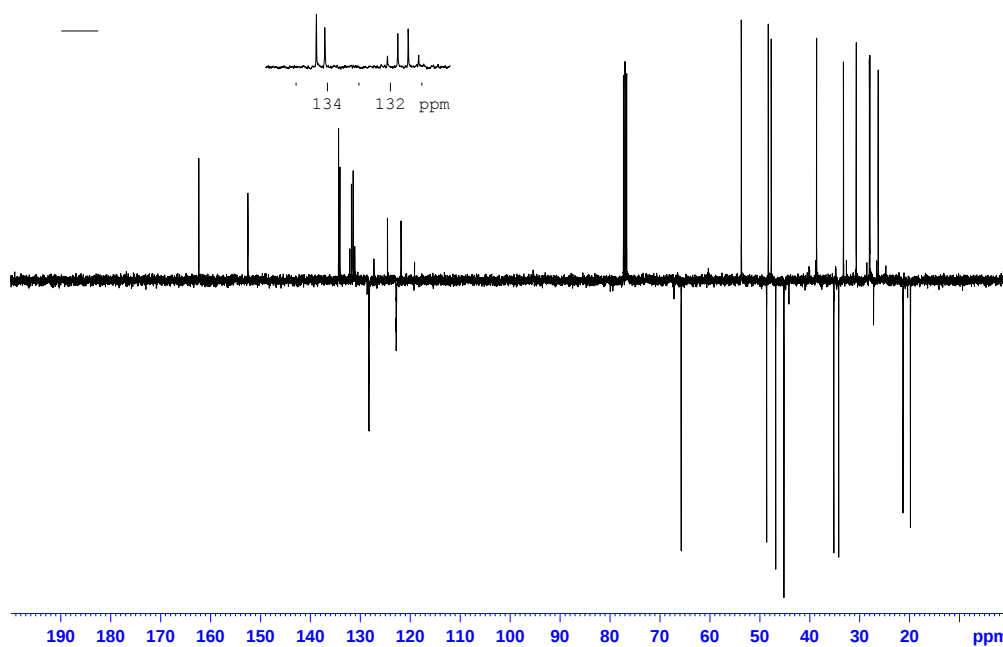
(300 MHz ¹H NMR Spectrum in CDCl₃)



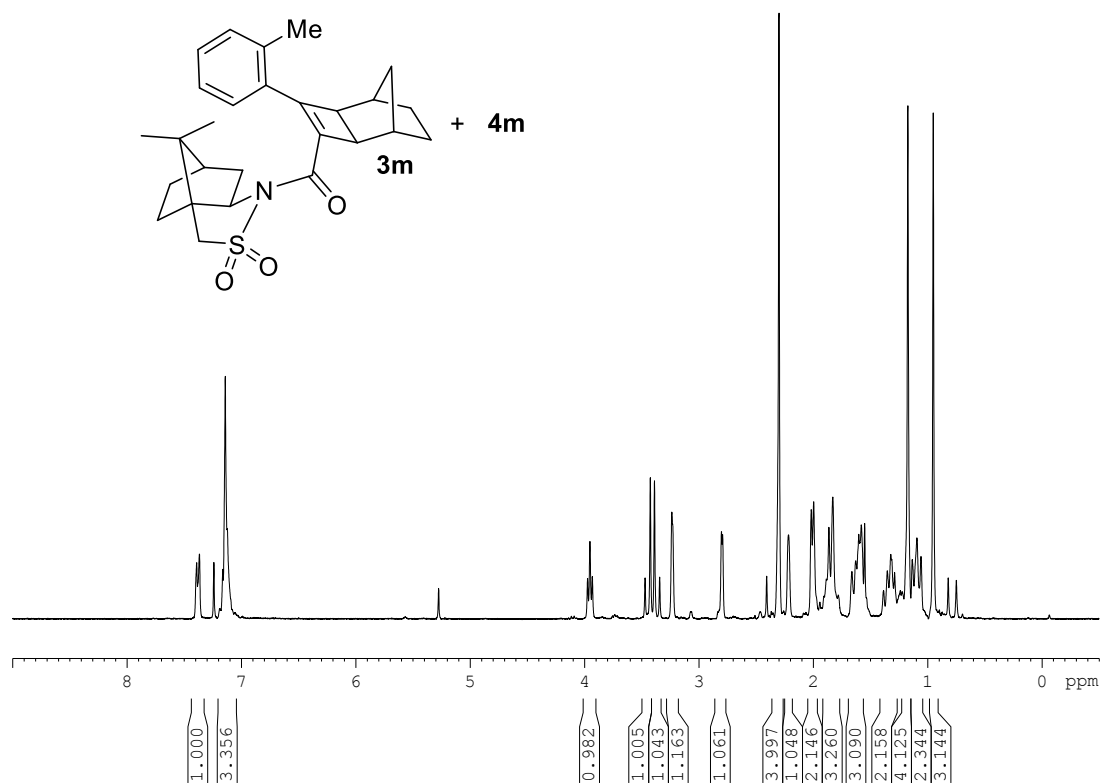
(75 MHz ¹³C NMR Spectrum in CDCl₃)



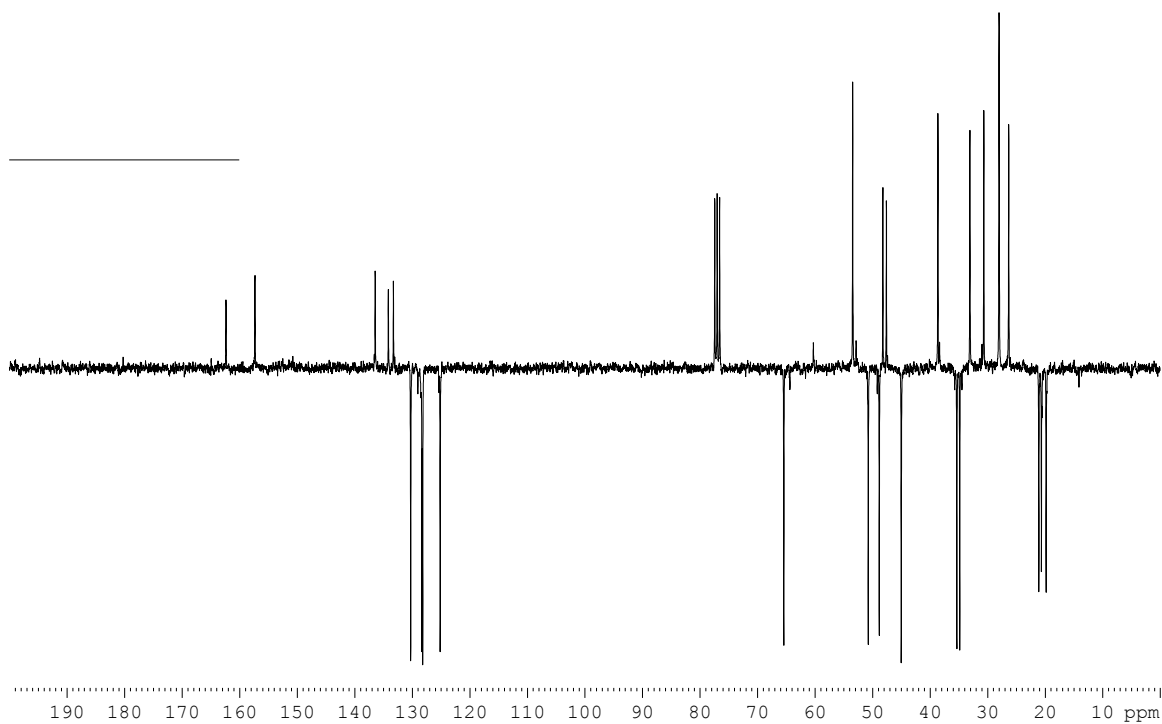
(400 MHz ¹H NMR Spectrum in CDCl₃)



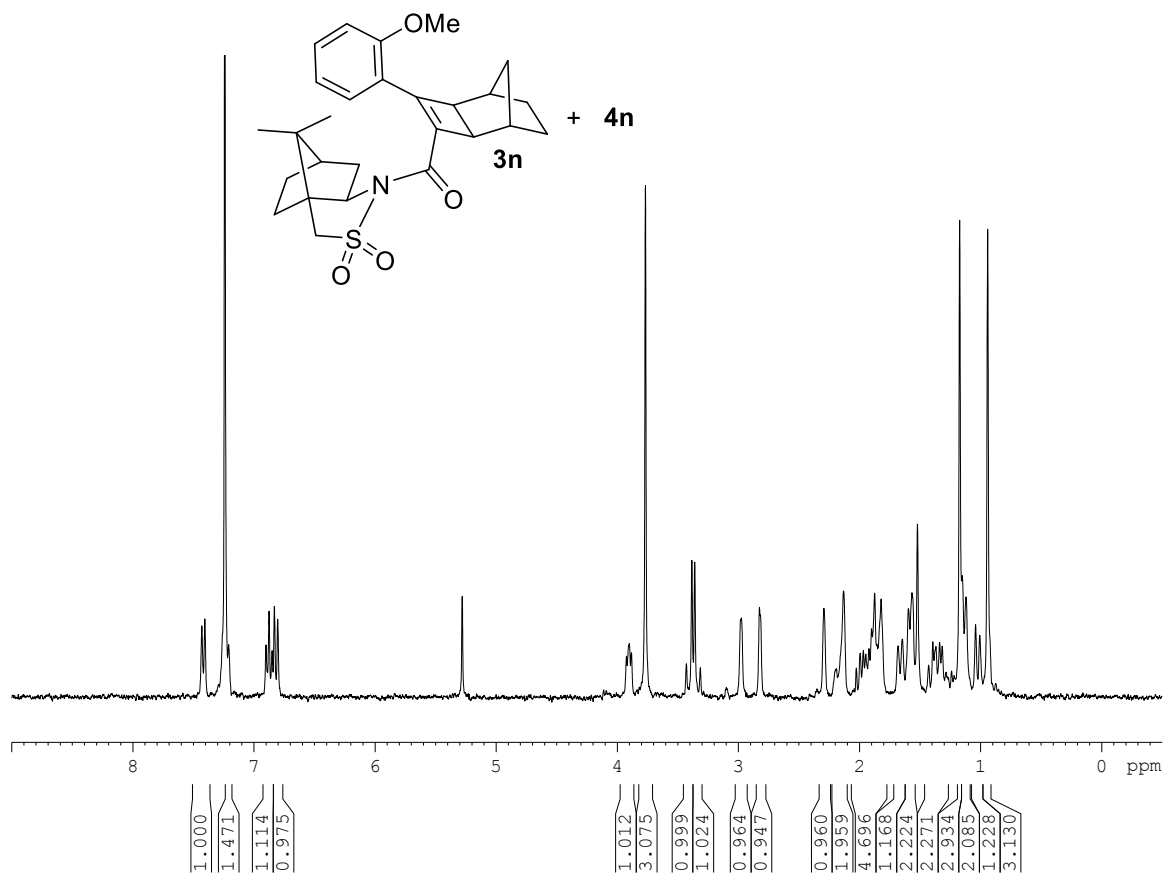
(100 MHz ¹³C NMR Spectrum in CDCl₃)



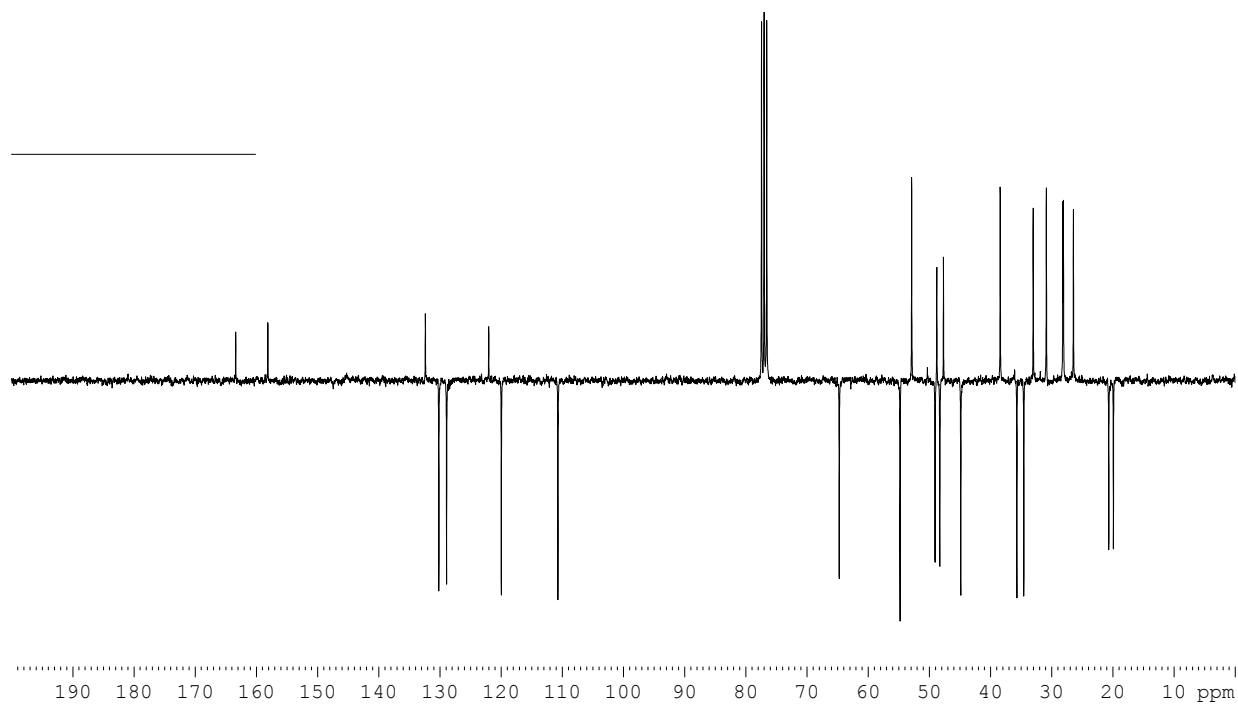
(300 MHz ^1H NMR Spectrum in CDCl_3)



(75 MHz ^{13}C NMR Spectrum in CDCl_3)

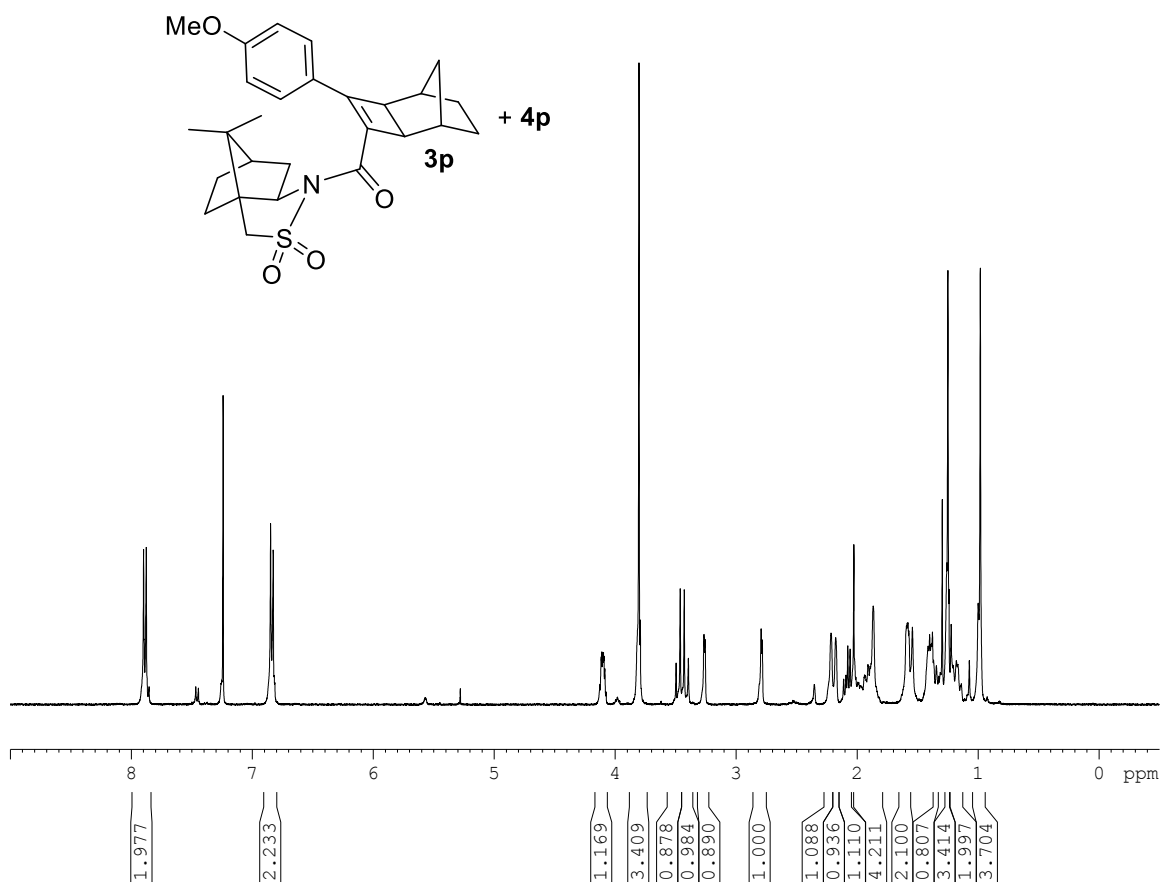


(300 MHz ^1H NMR Spectrum in CDCl_3)

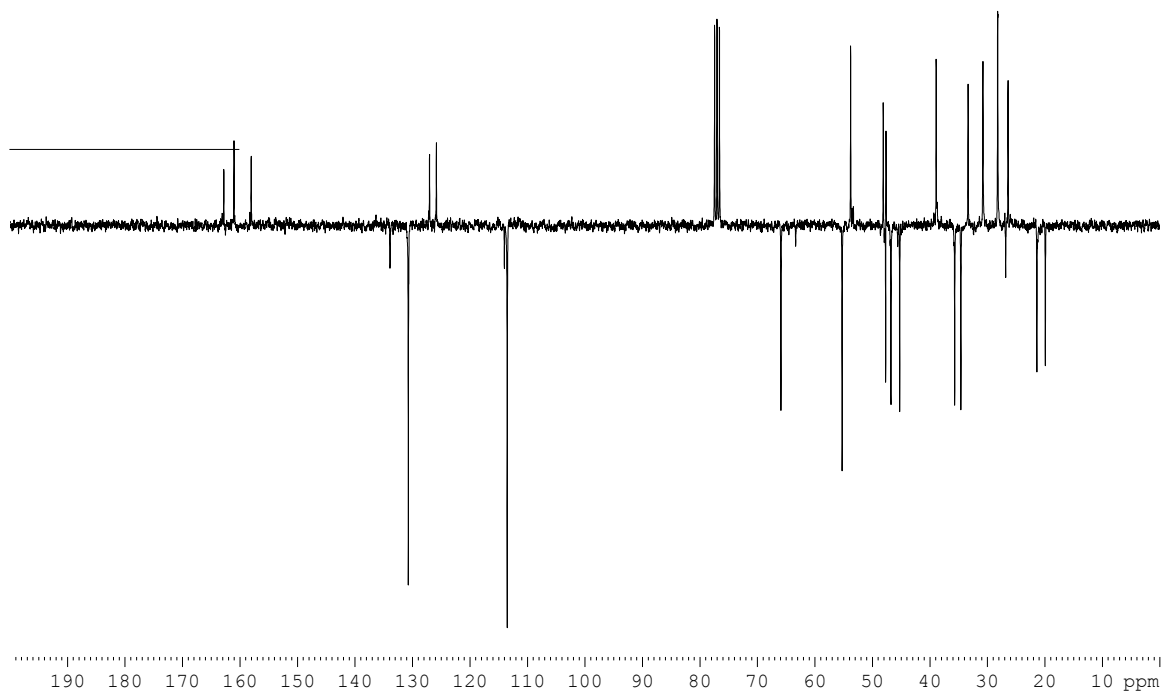


(75 MHz ^1H NMR Spectrum in CDCl_3)

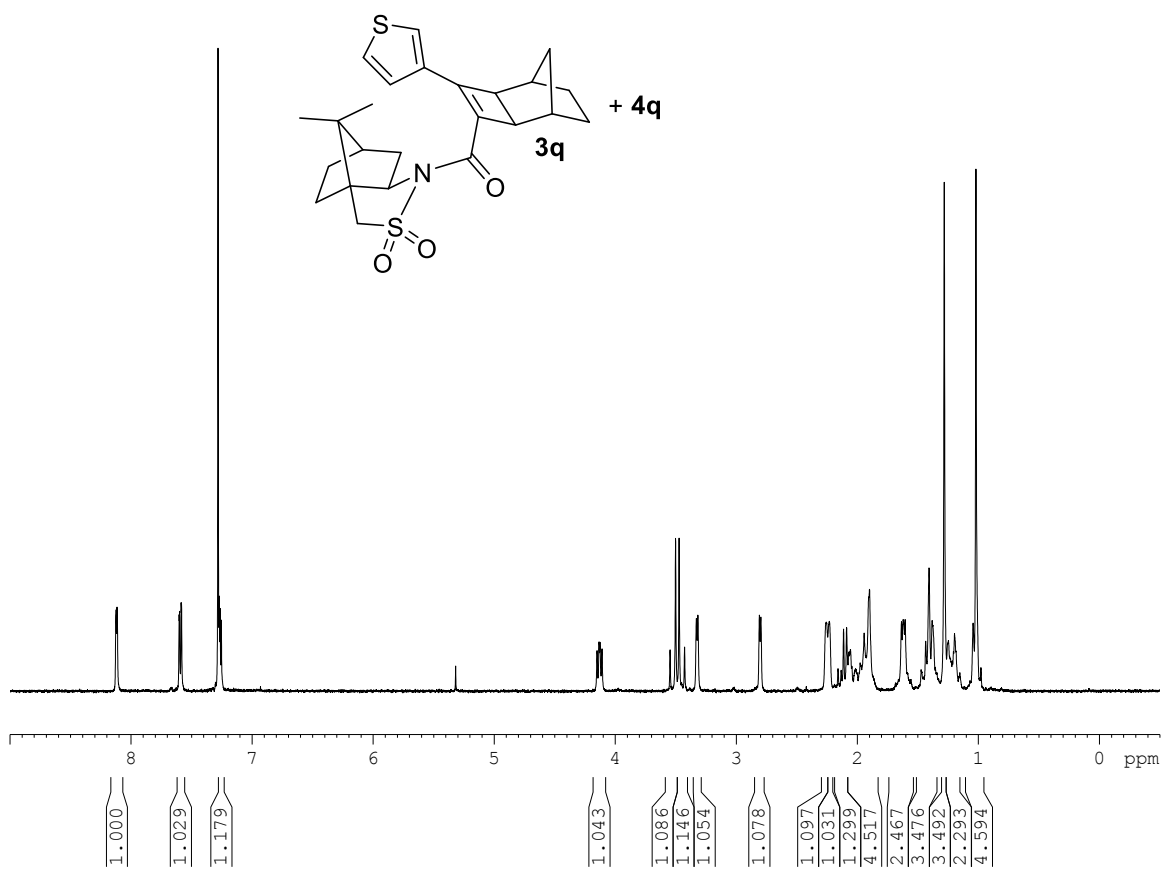




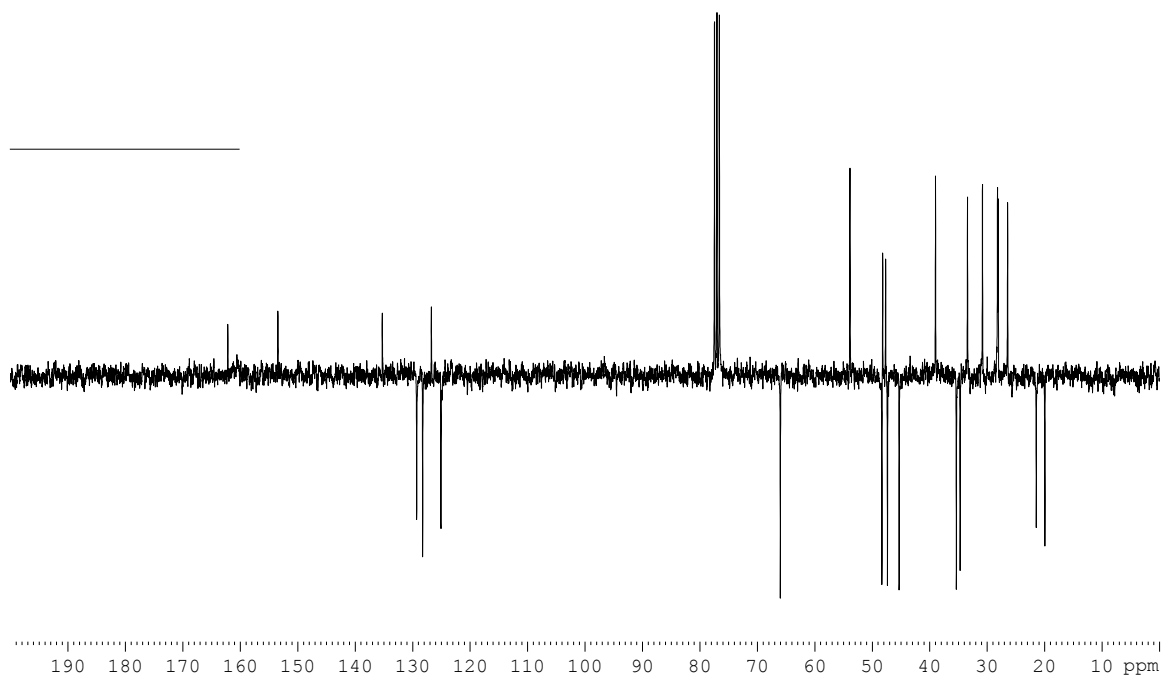
(400 MHz ¹H NMR Spectrum in CDCl₃)



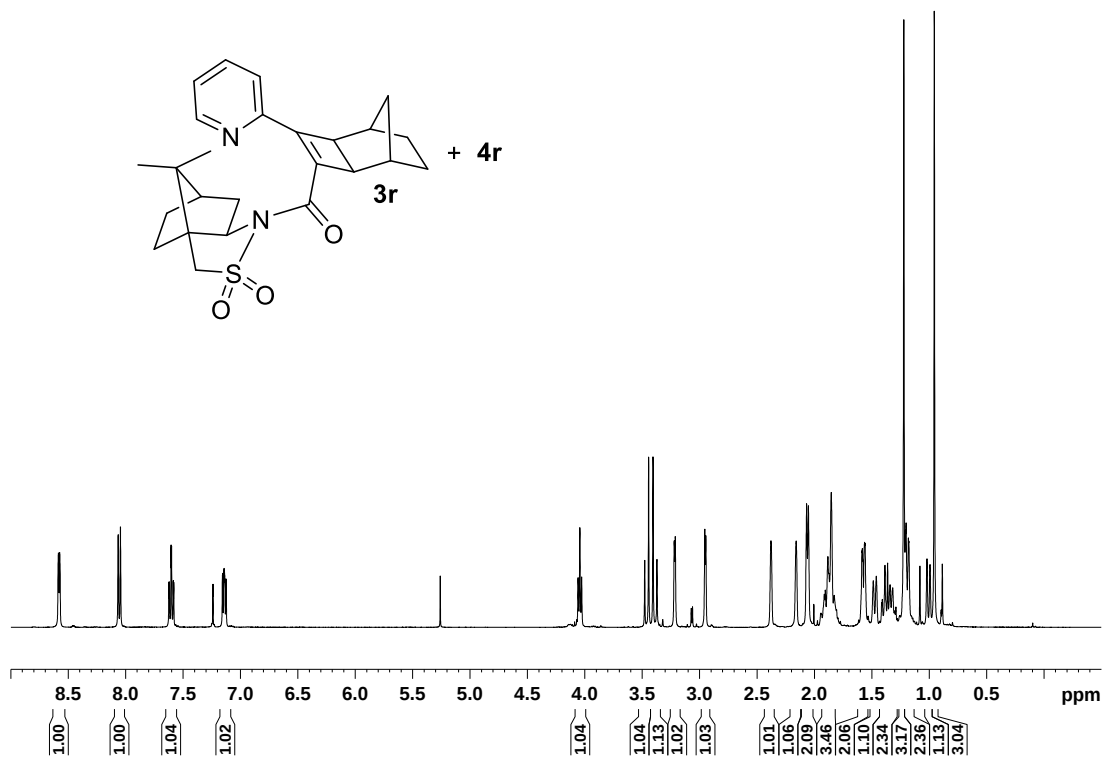
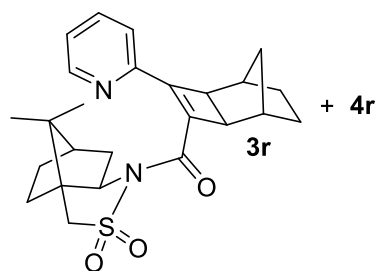
(75 MHz ¹³C NMR Spectrum in CDCl₃)



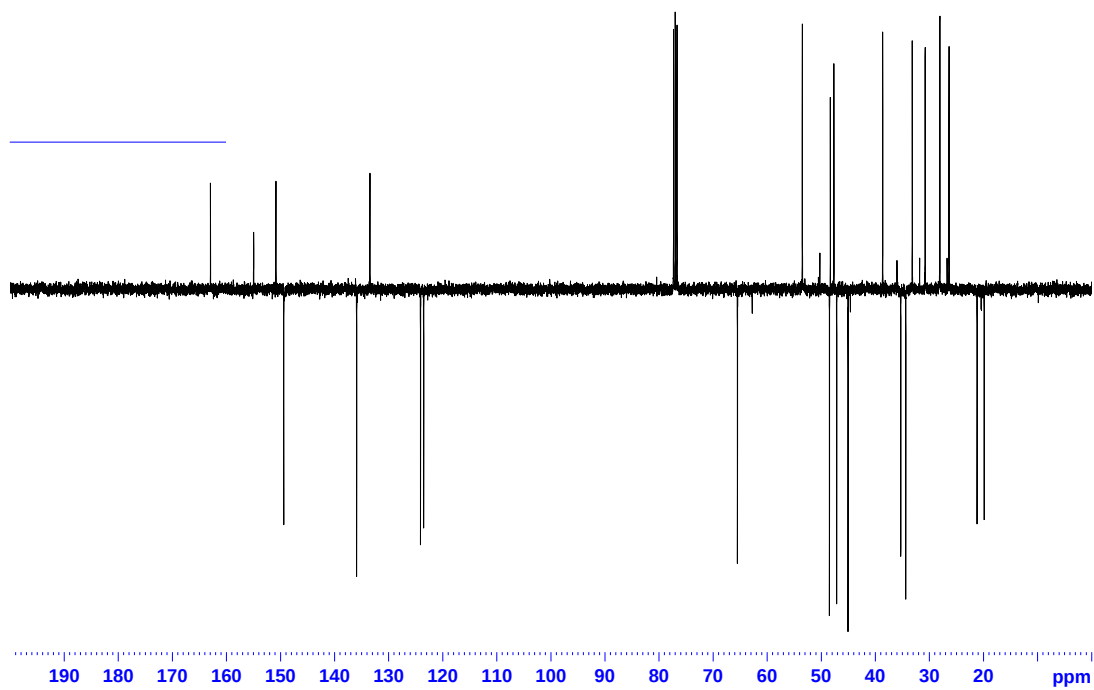
(300 MHz ^1H NMR Spectrum in CDCl_3)



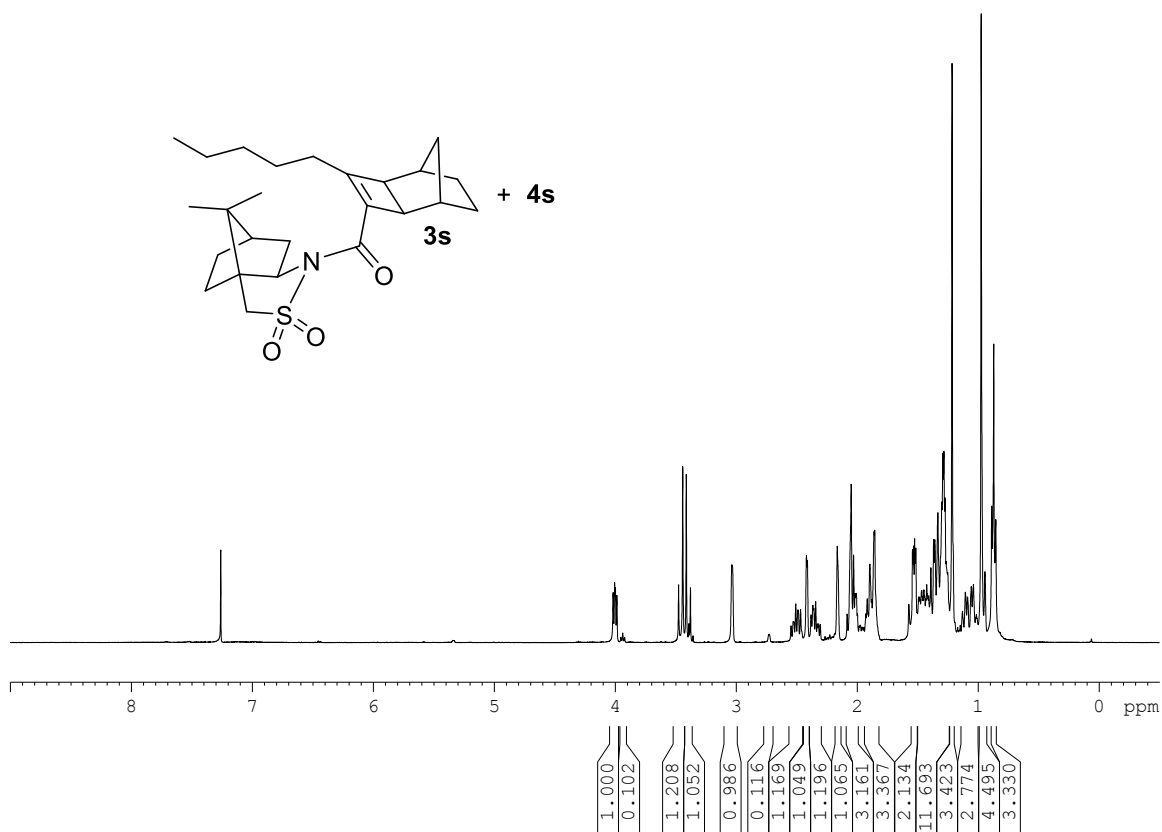
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



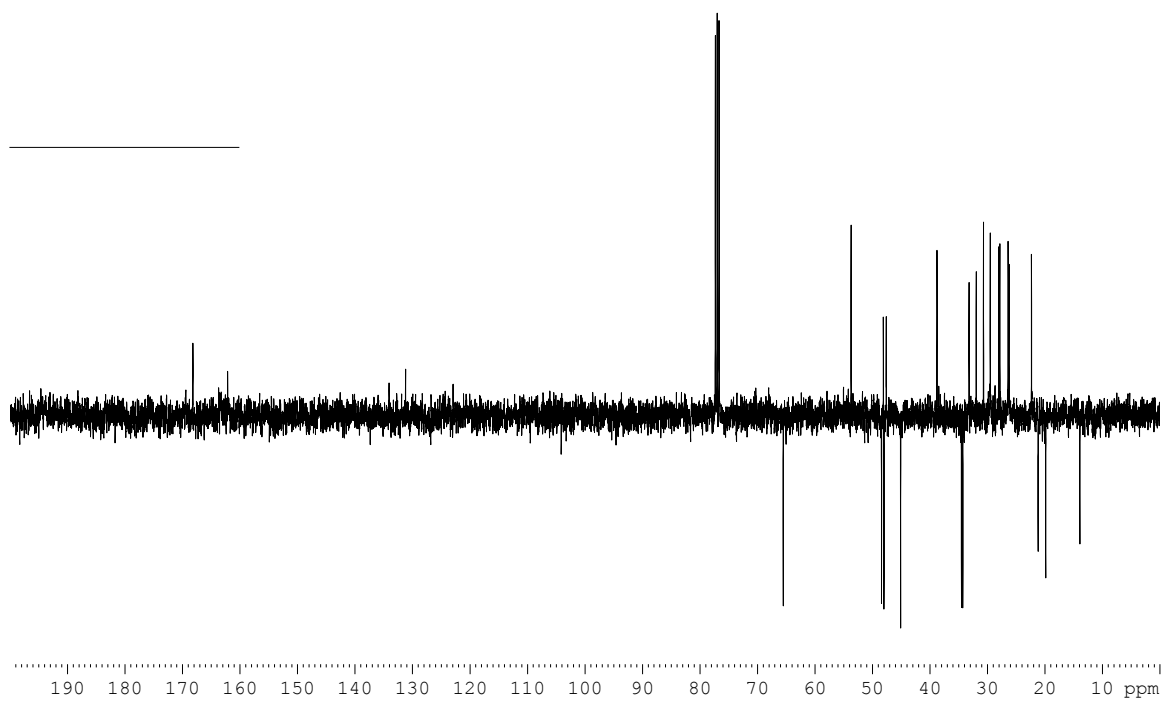
(400 MHz ^1H NMR Spectrum in CDCl_3)



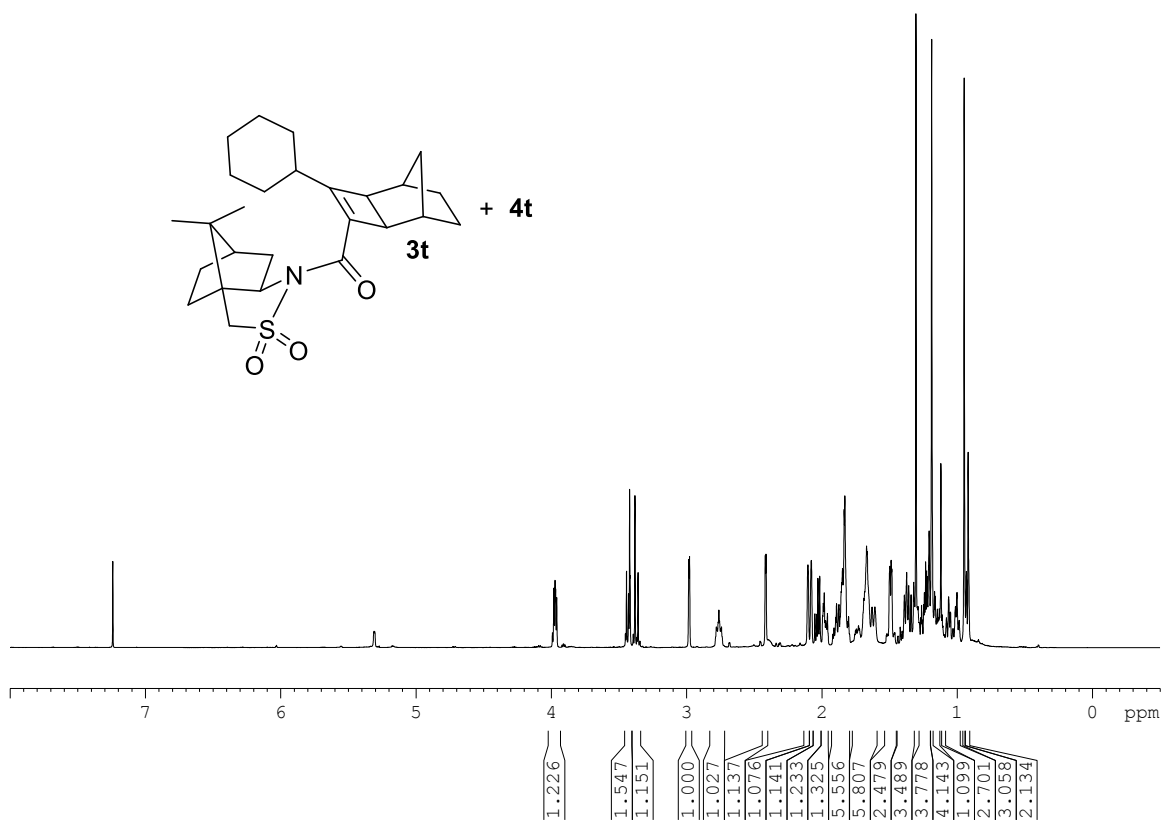
(100 MHz ^{13}C NMR Spectrum in CDCl_3)



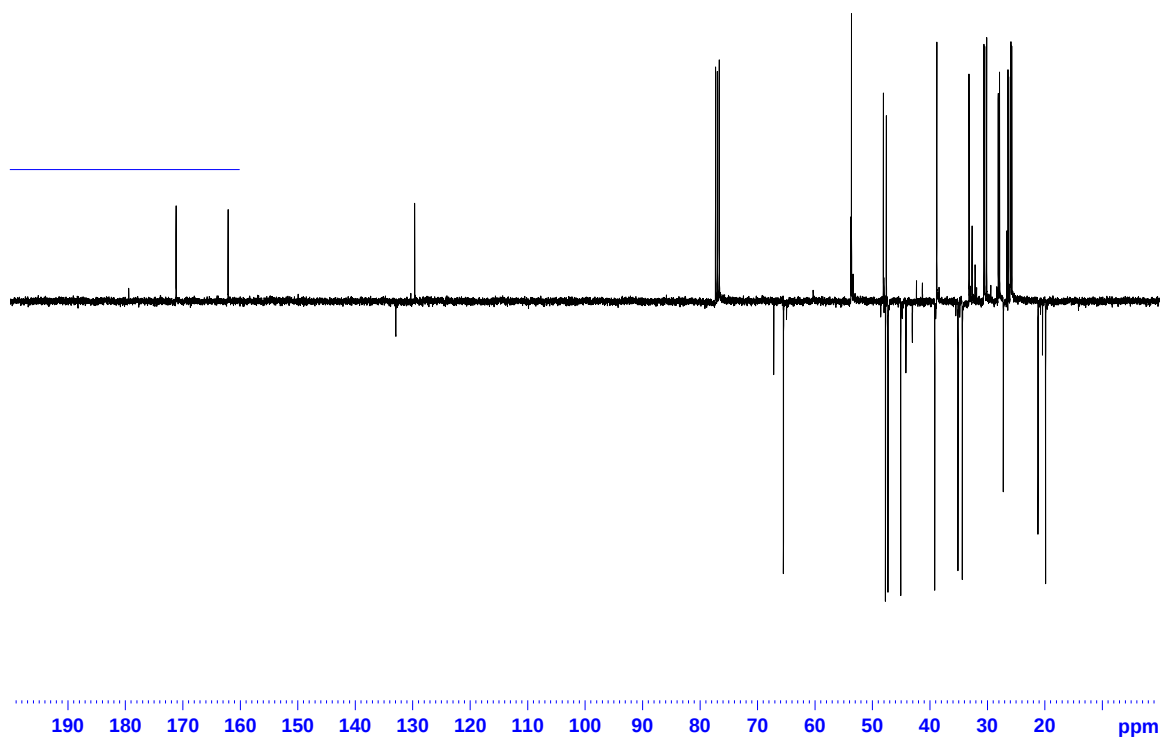
(400 MHz ¹H NMR Spectrum in CDCl₃)



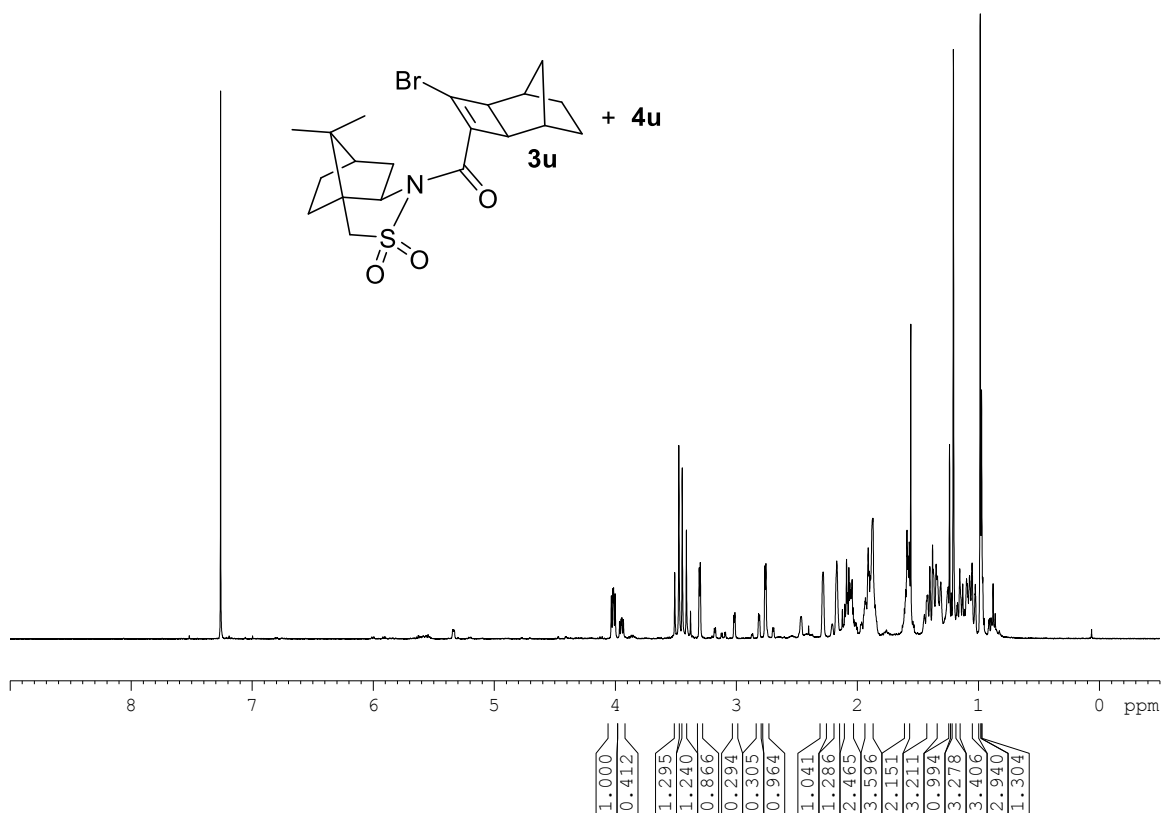
(100 MHz ¹³C NMR Spectrum in CDCl₃)



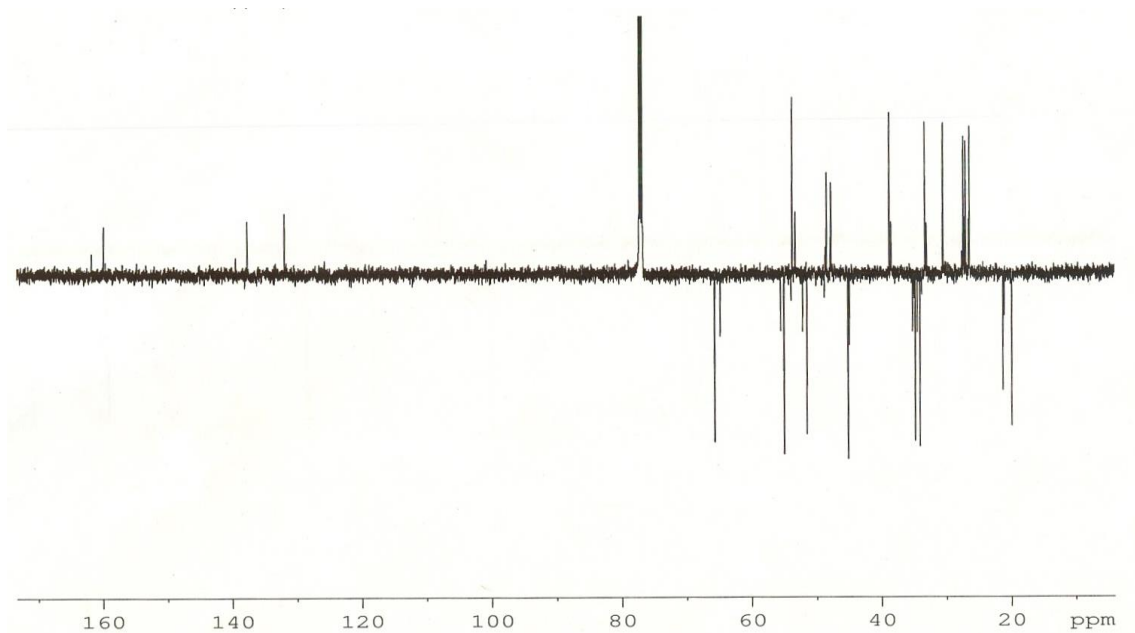
(600 MHz ^1H NMR Spectrum in CDCl_3)



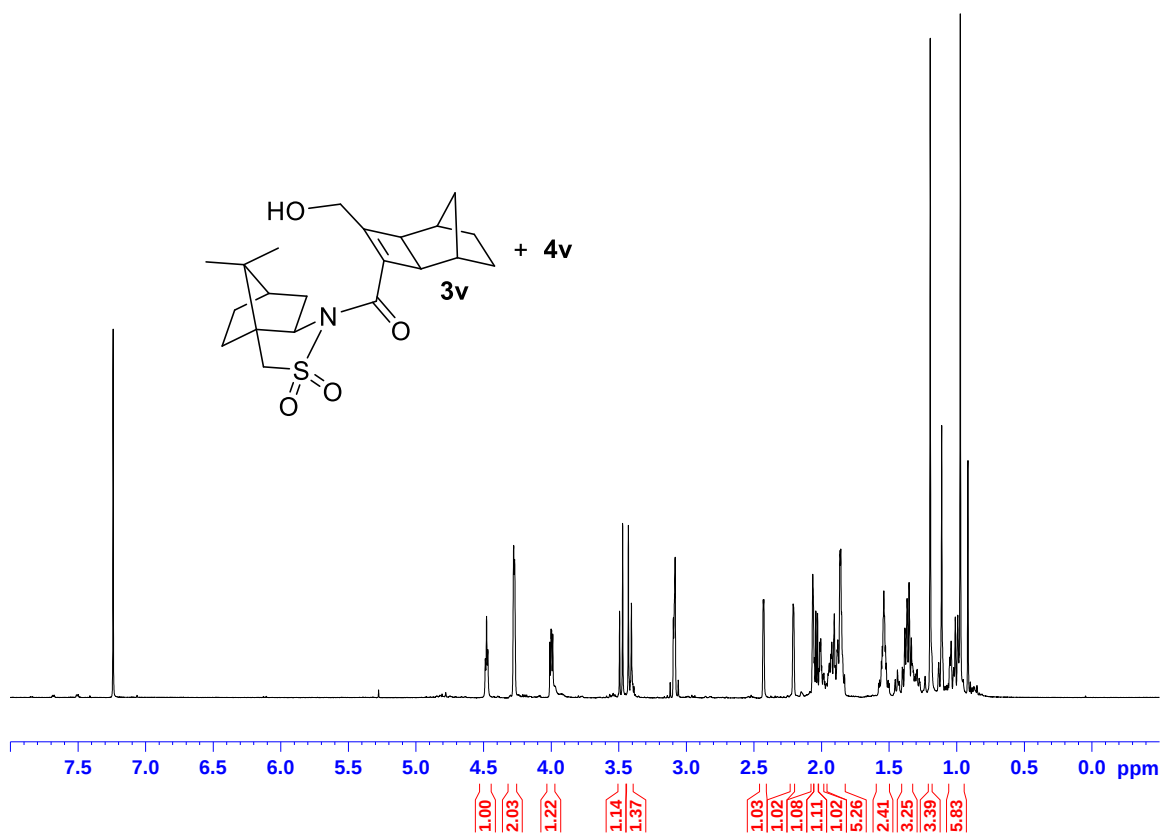
(100 MHz ^{13}C NMR Spectrum in CDCl_3)



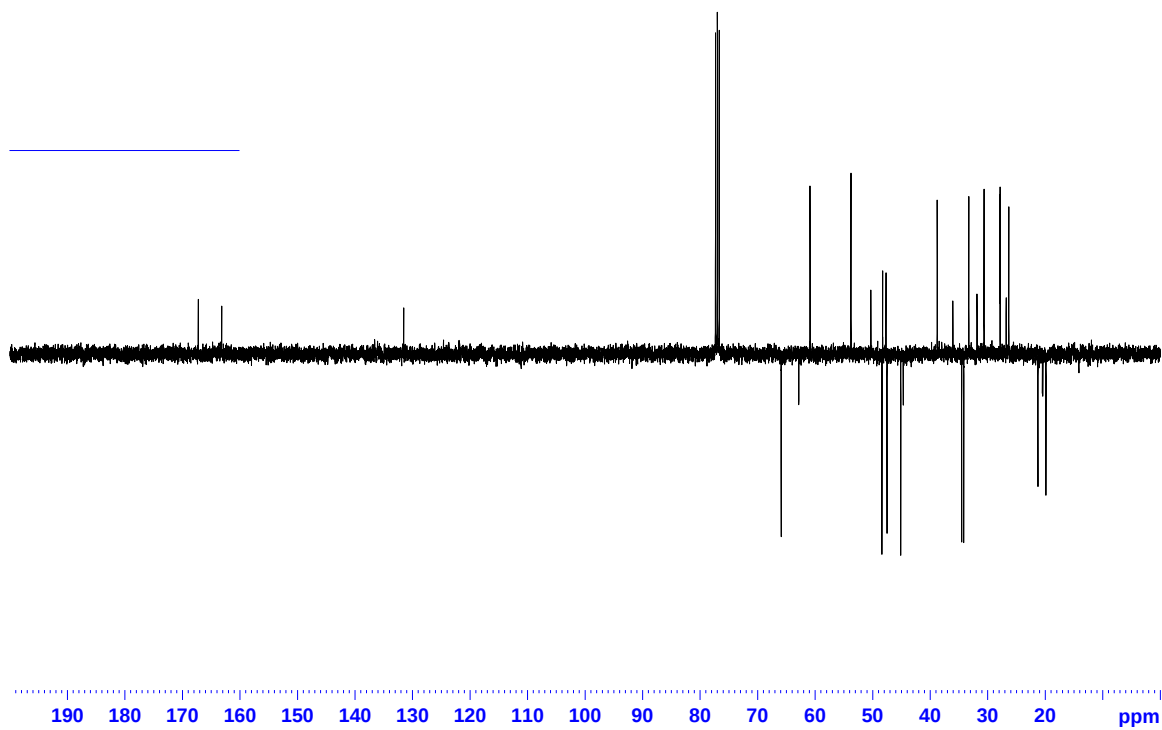
(400 MHz ¹H NMR Spectrum in CDCl₃)



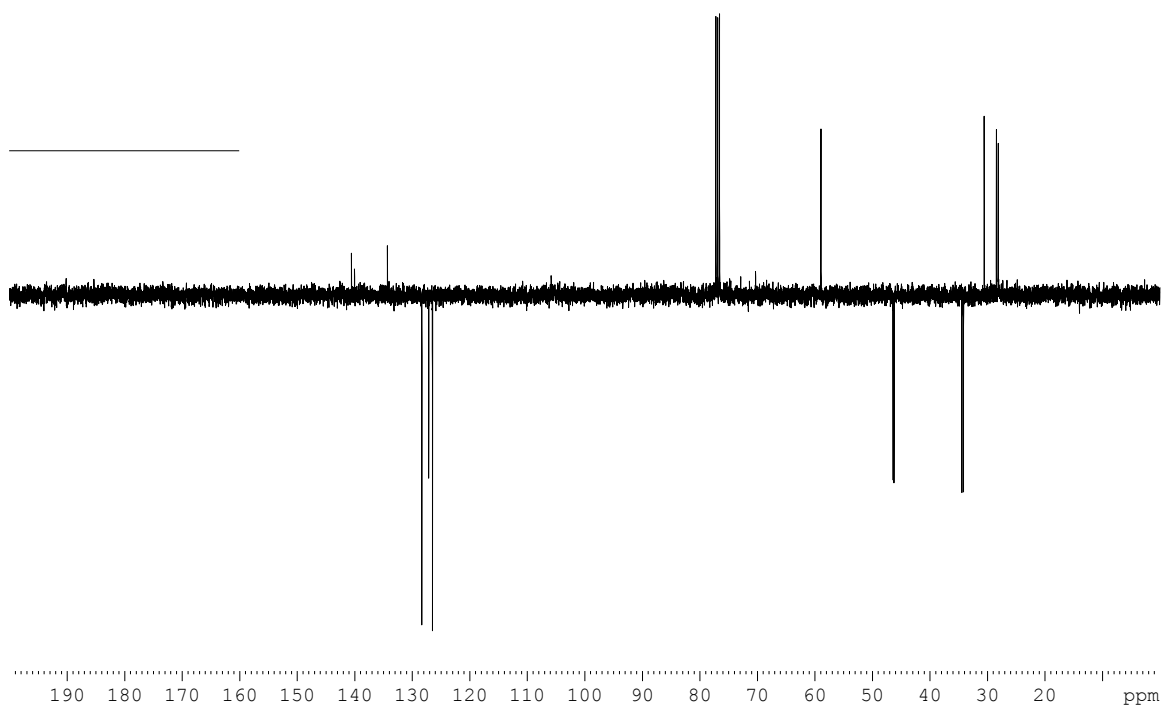
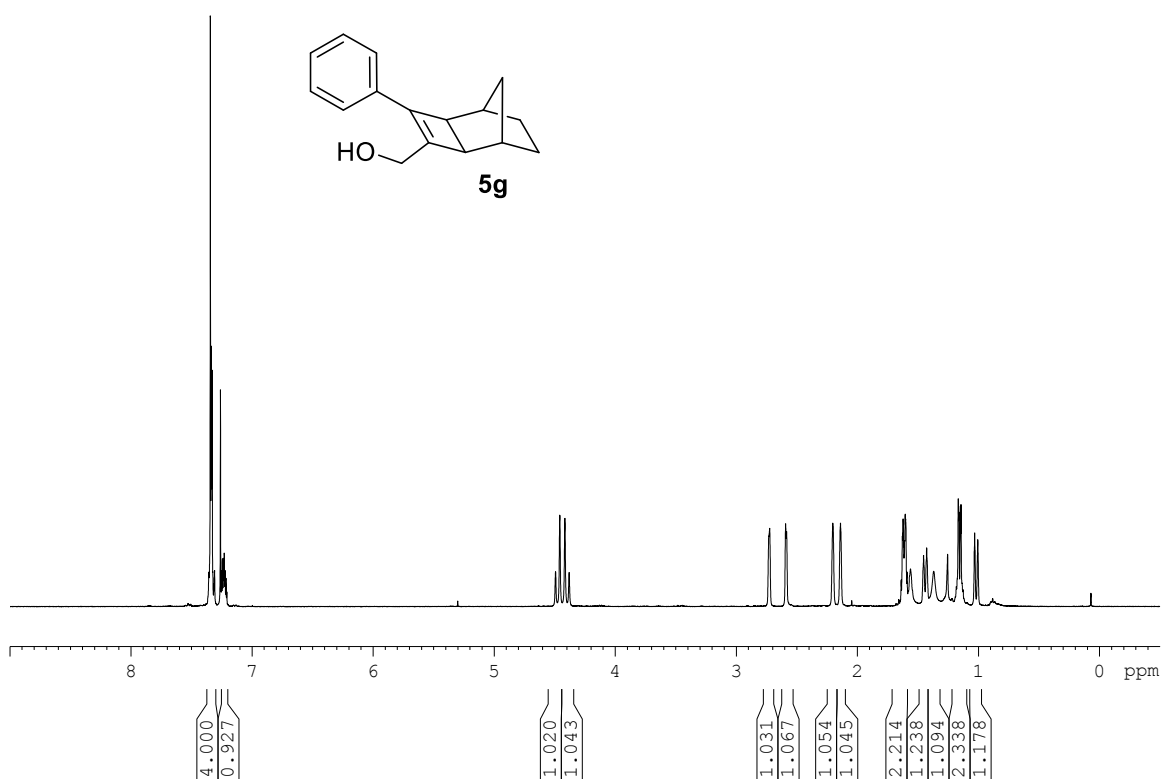
(150 MHz ¹³C NMR Spectrum in CDCl₃)



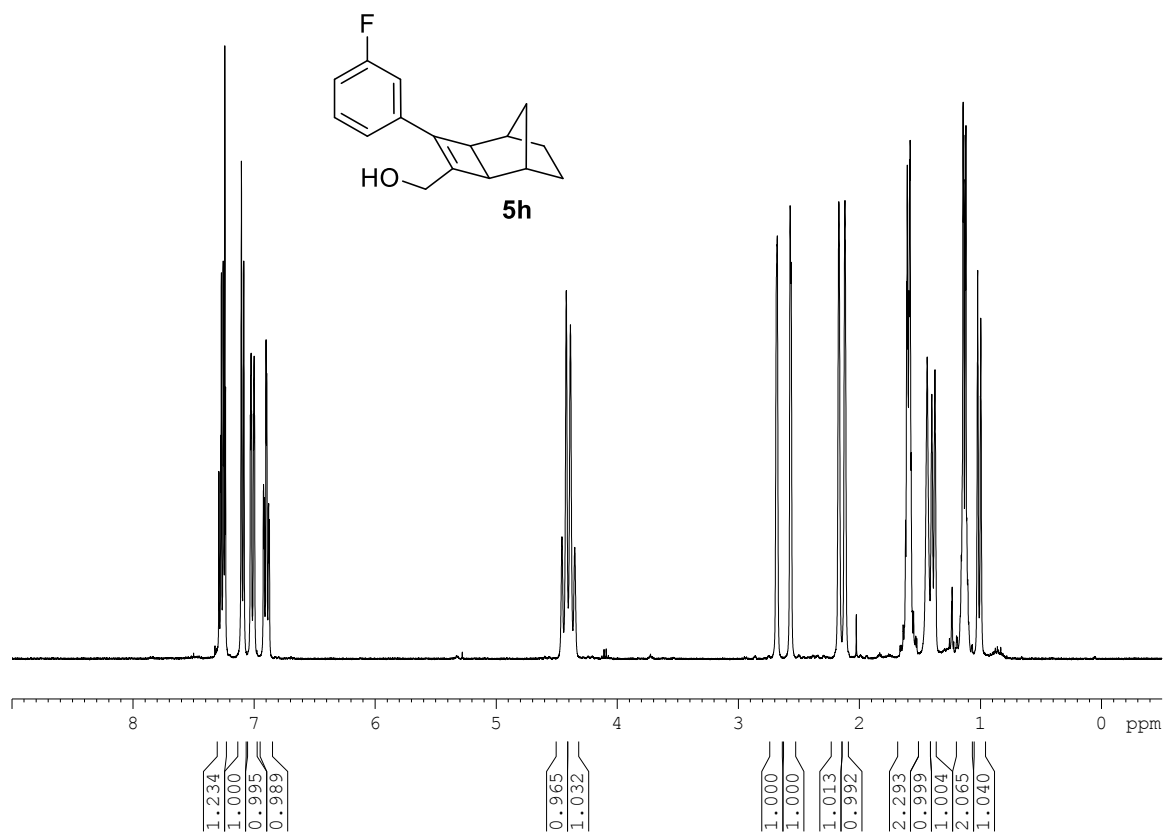
(600 MHz ^1H NMR Spectrum in CDCl_3)



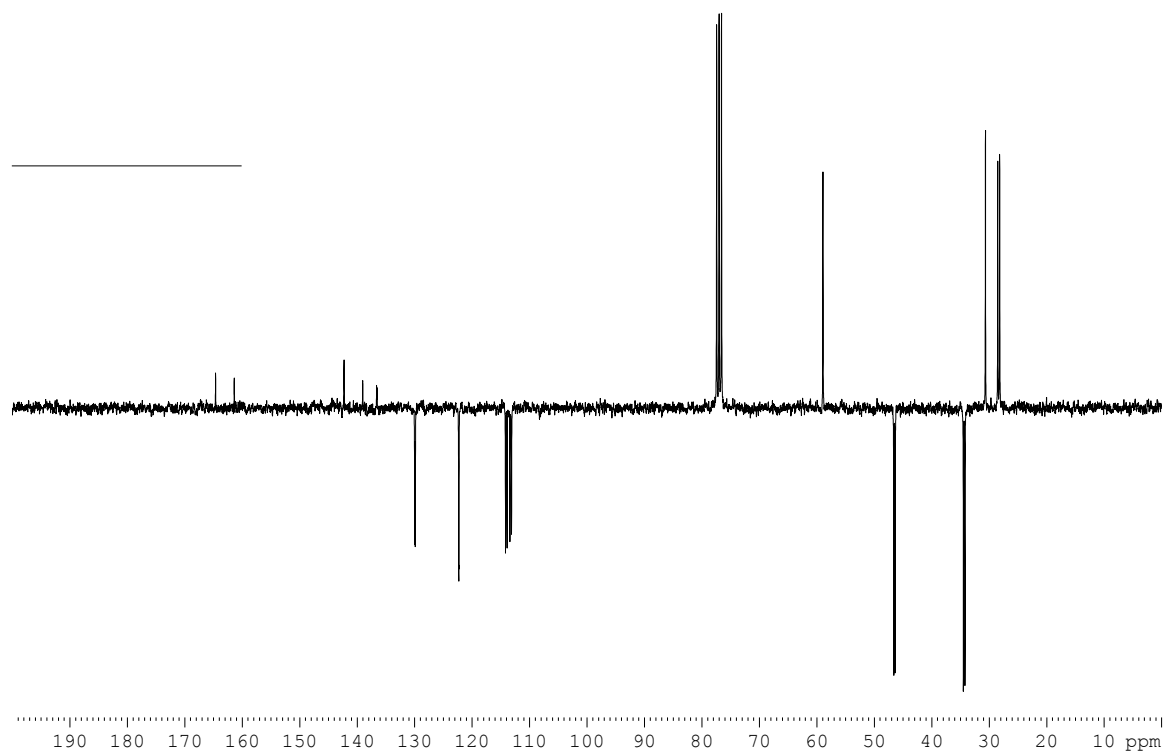
(100 MHz ^{13}C NMR Spectrum in CDCl_3)



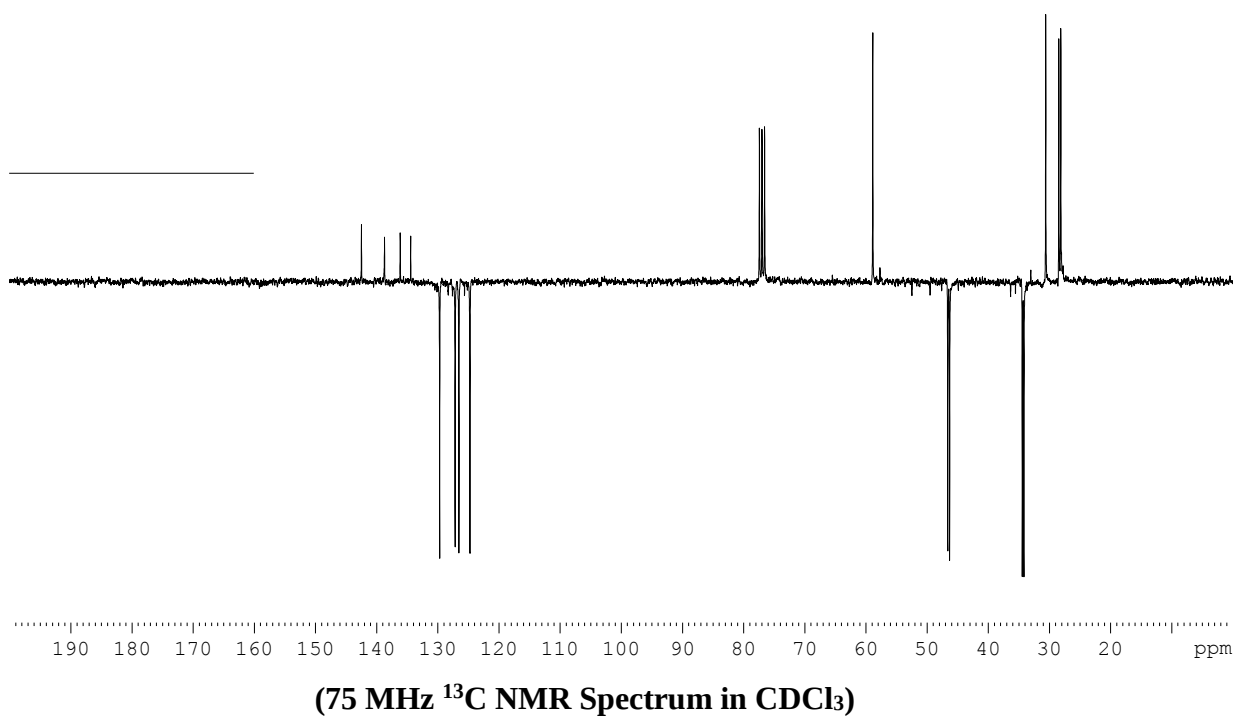
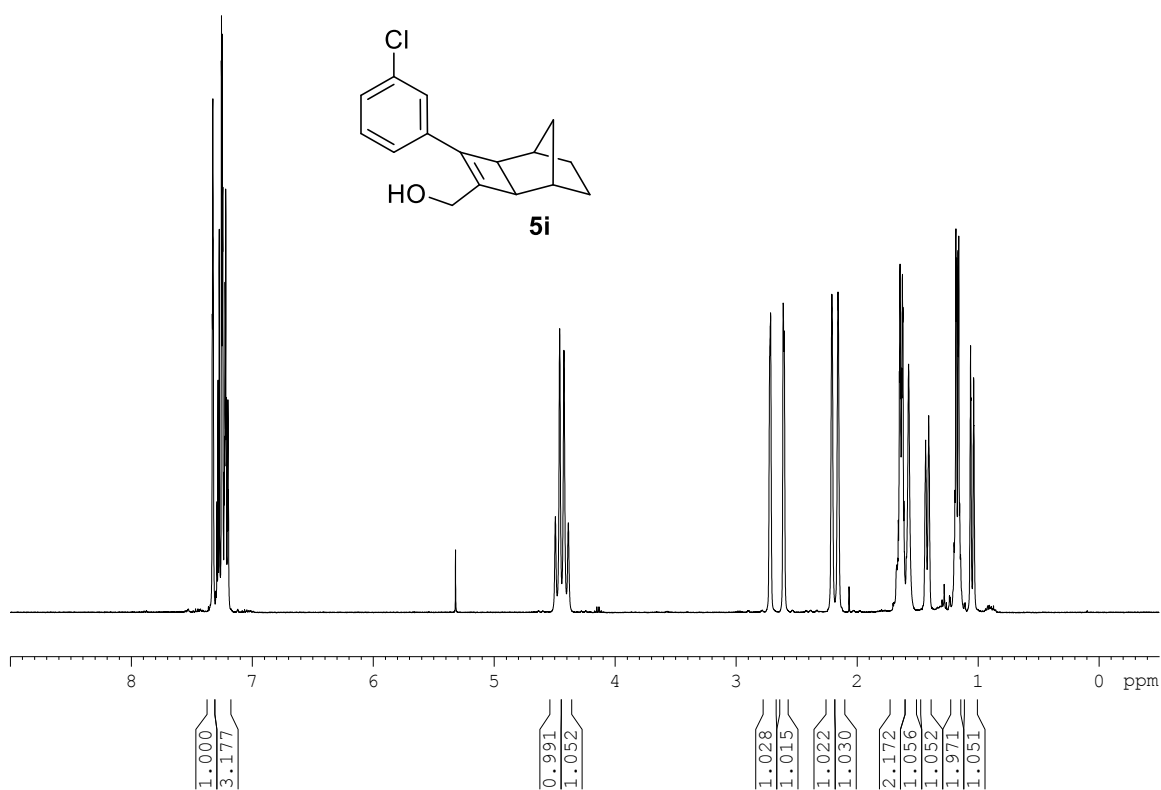
(100 MHz ^{13}C NMR Spectrum in CDCl_3)

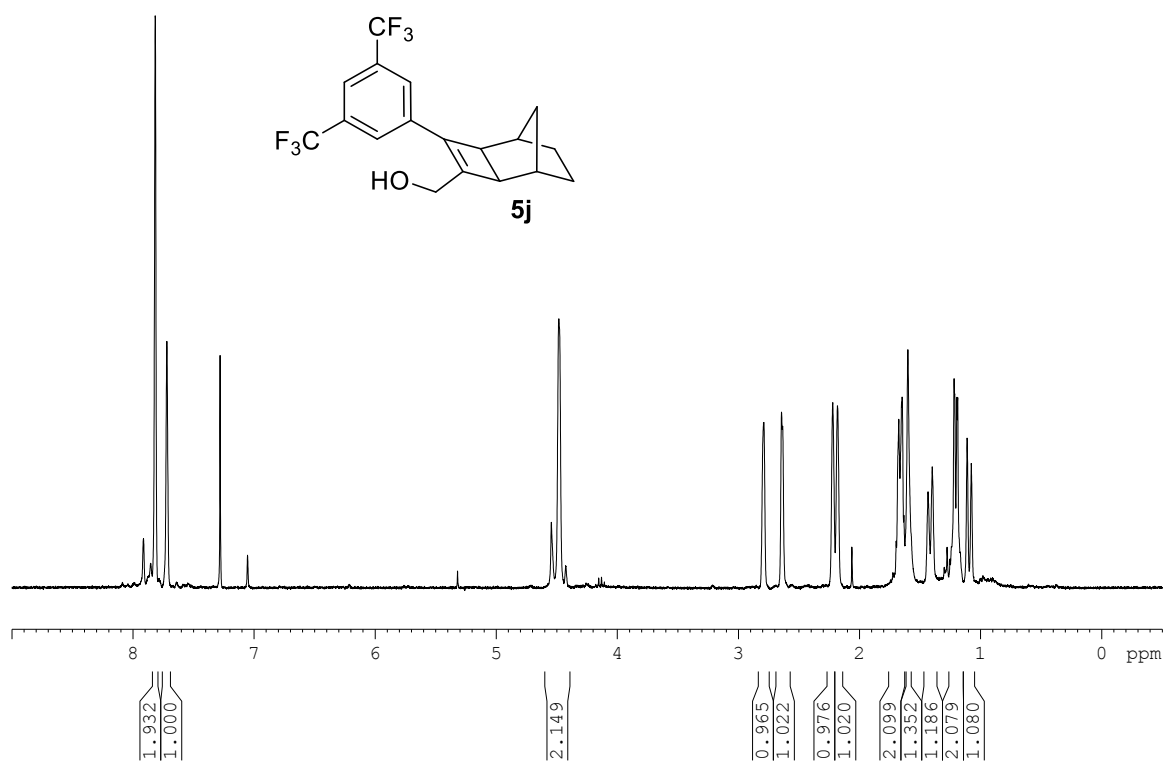


(400 MHz ^1H NMR Spectrum in CDCl_3)

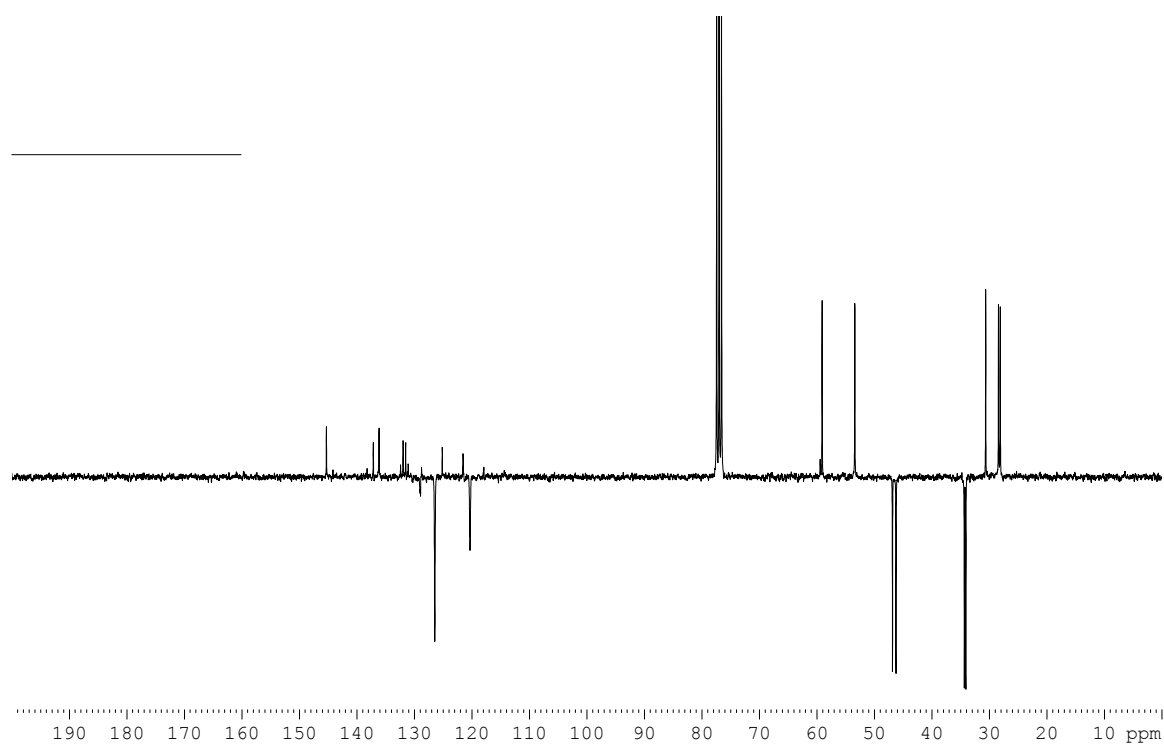


(75 MHz ^{13}C NMR Spectrum in CDCl_3)

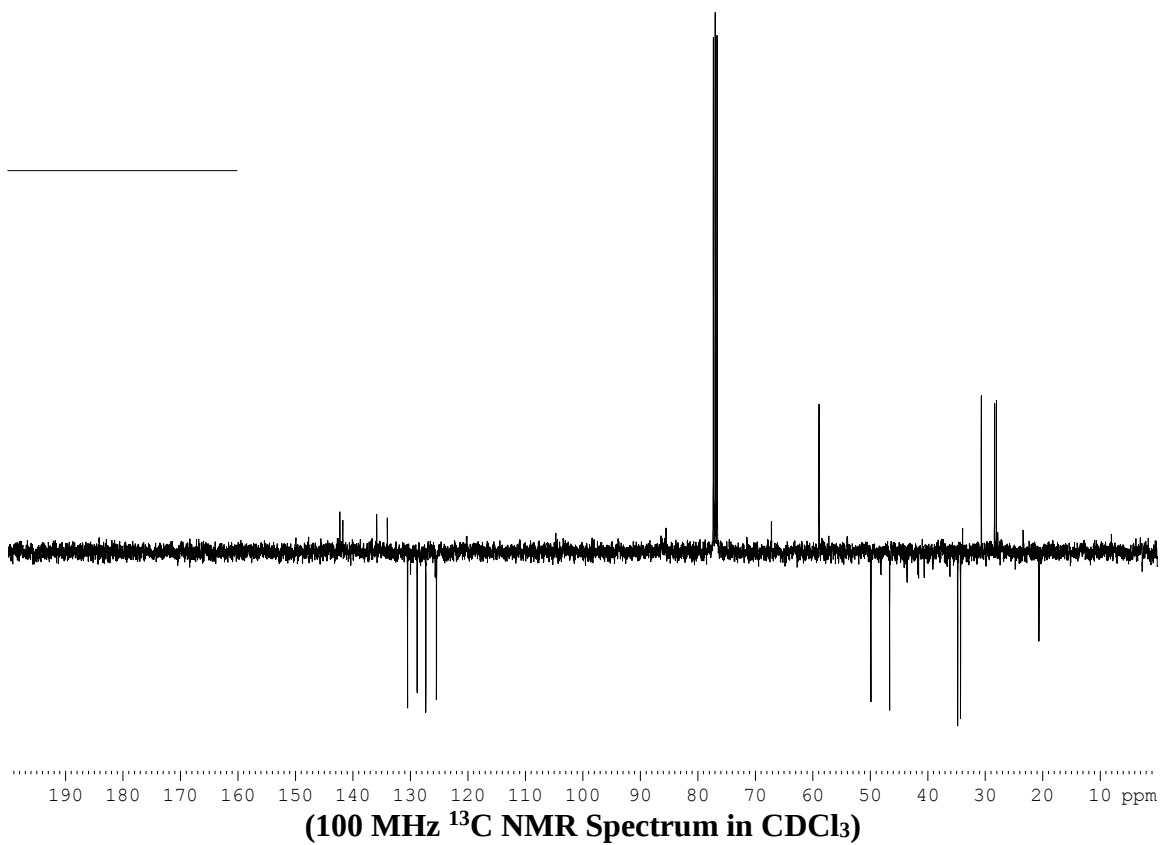
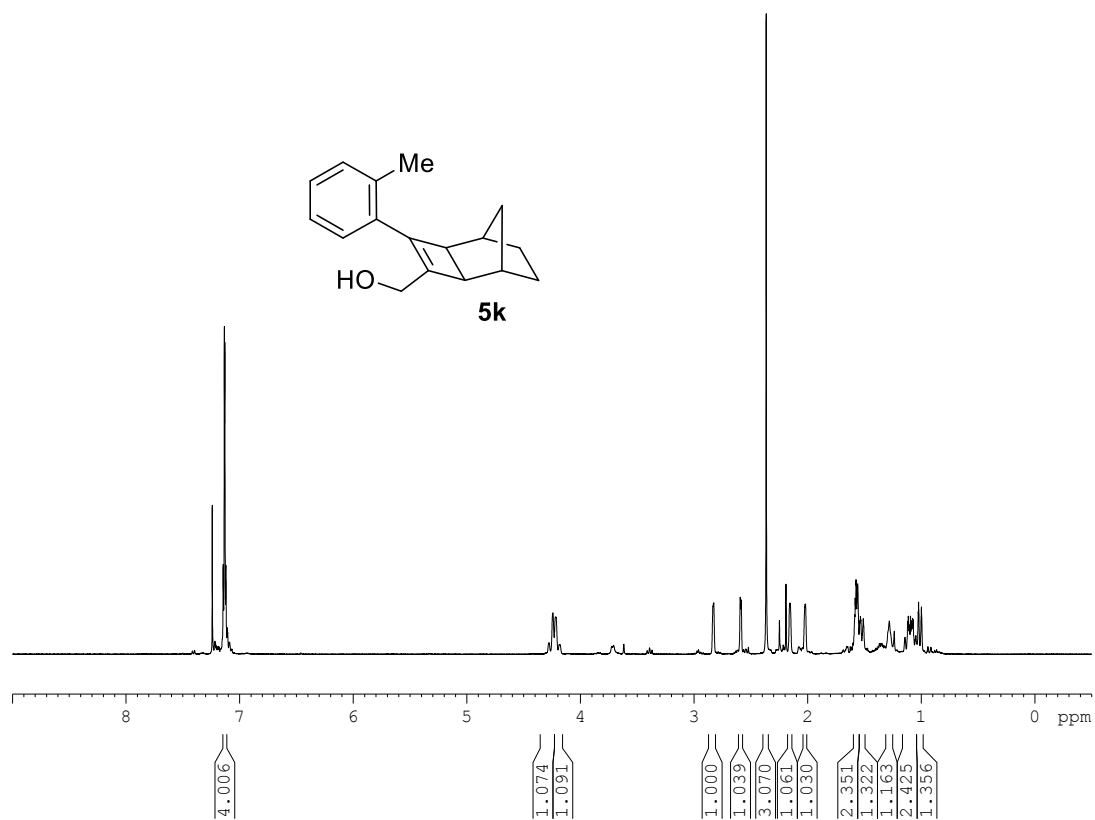


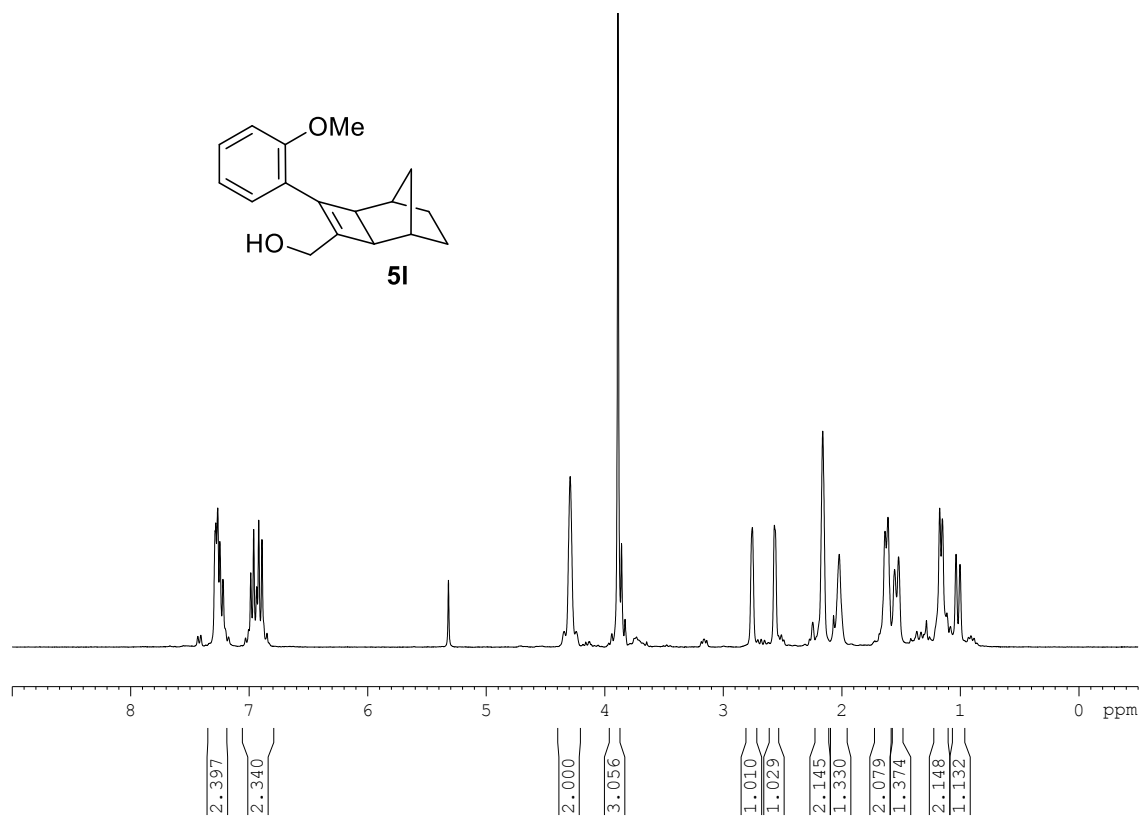


(300 MHz ^1H NMR Spectrum in CDCl_3)

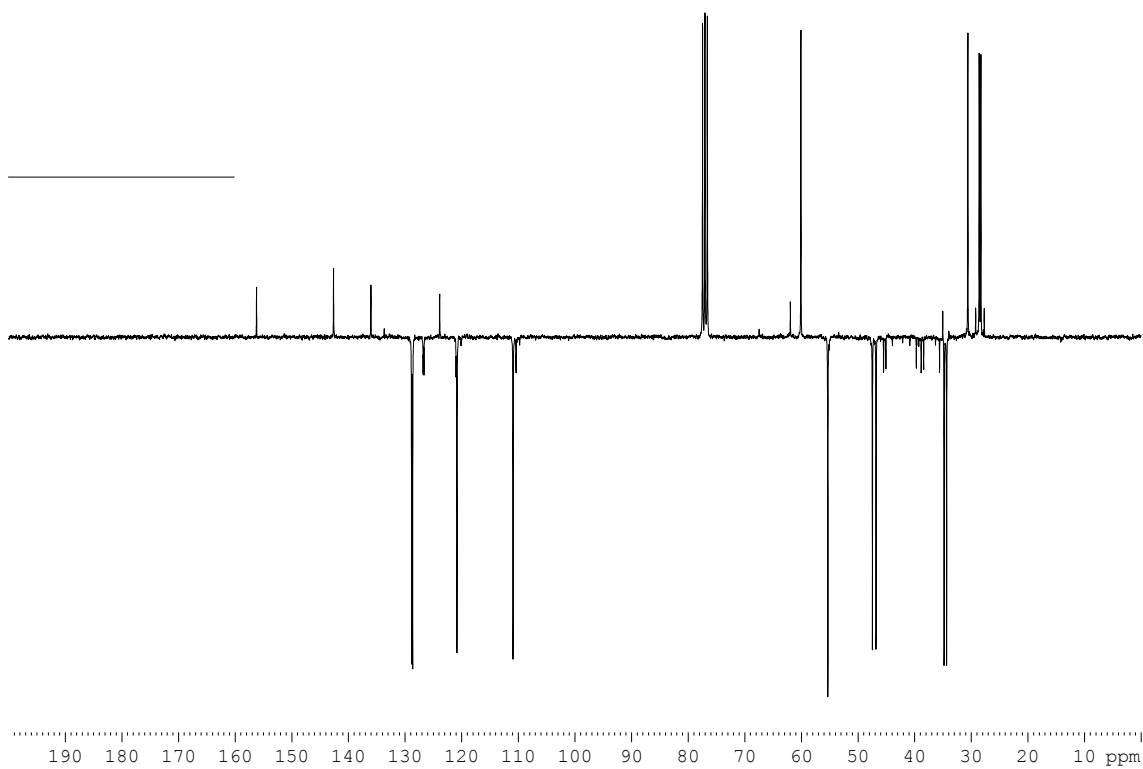


(75 MHz ^1H NMR Spectrum in CDCl_3)

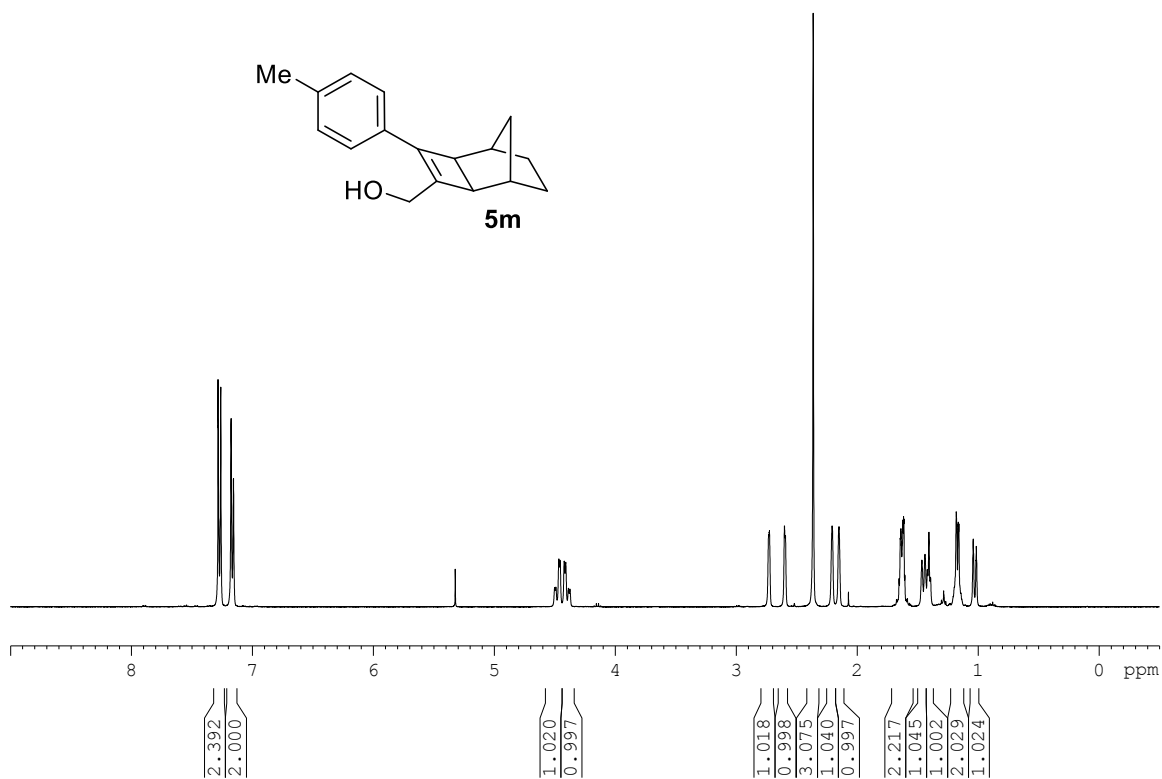
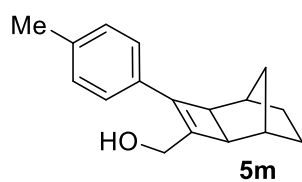




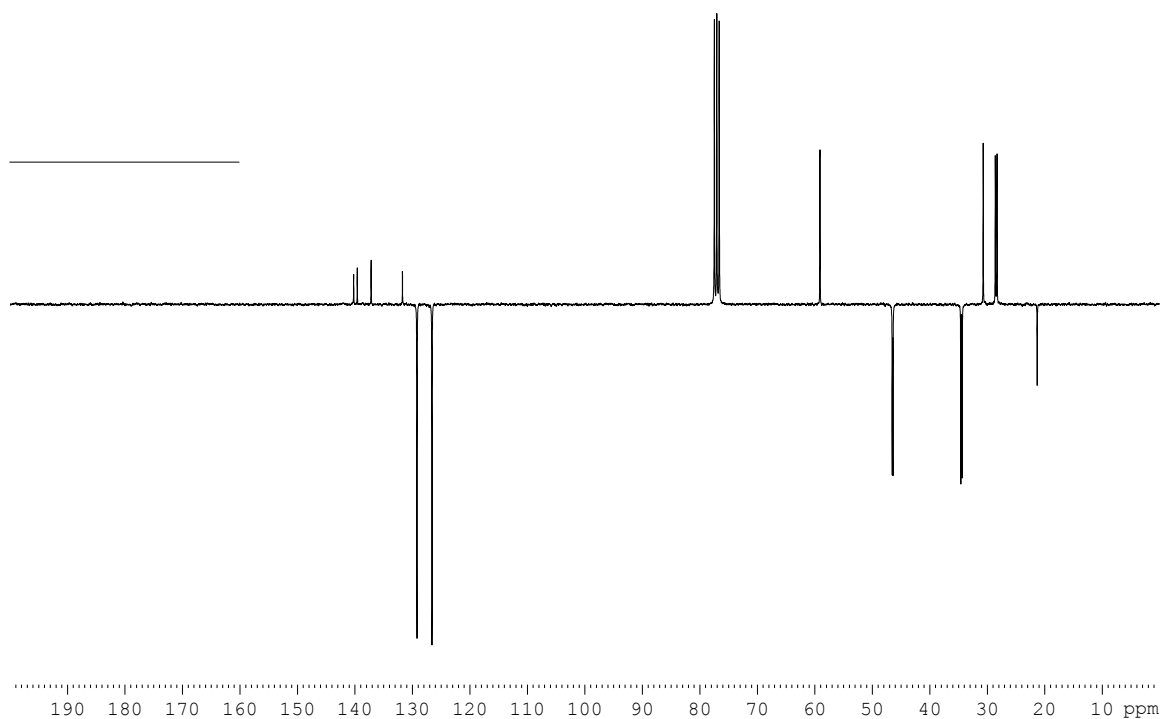
(300 MHz ^1H NMR Spectrum in CDCl_3)



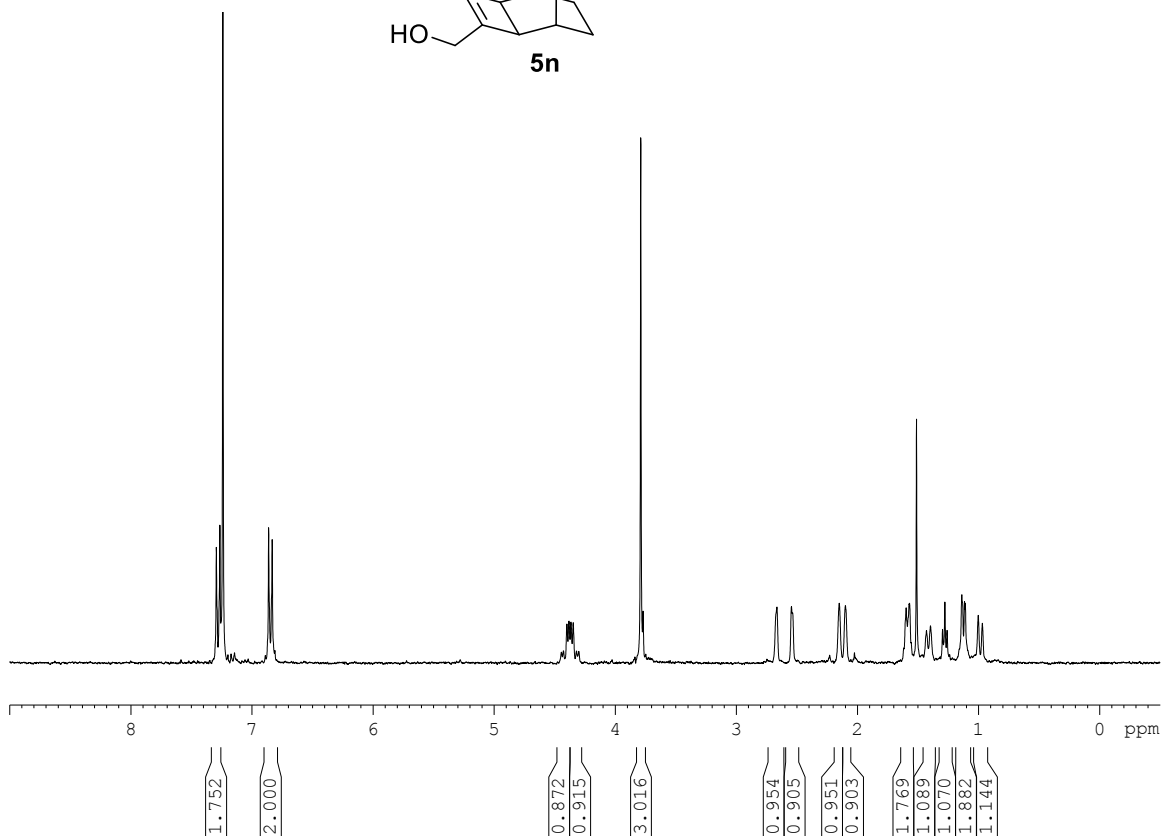
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



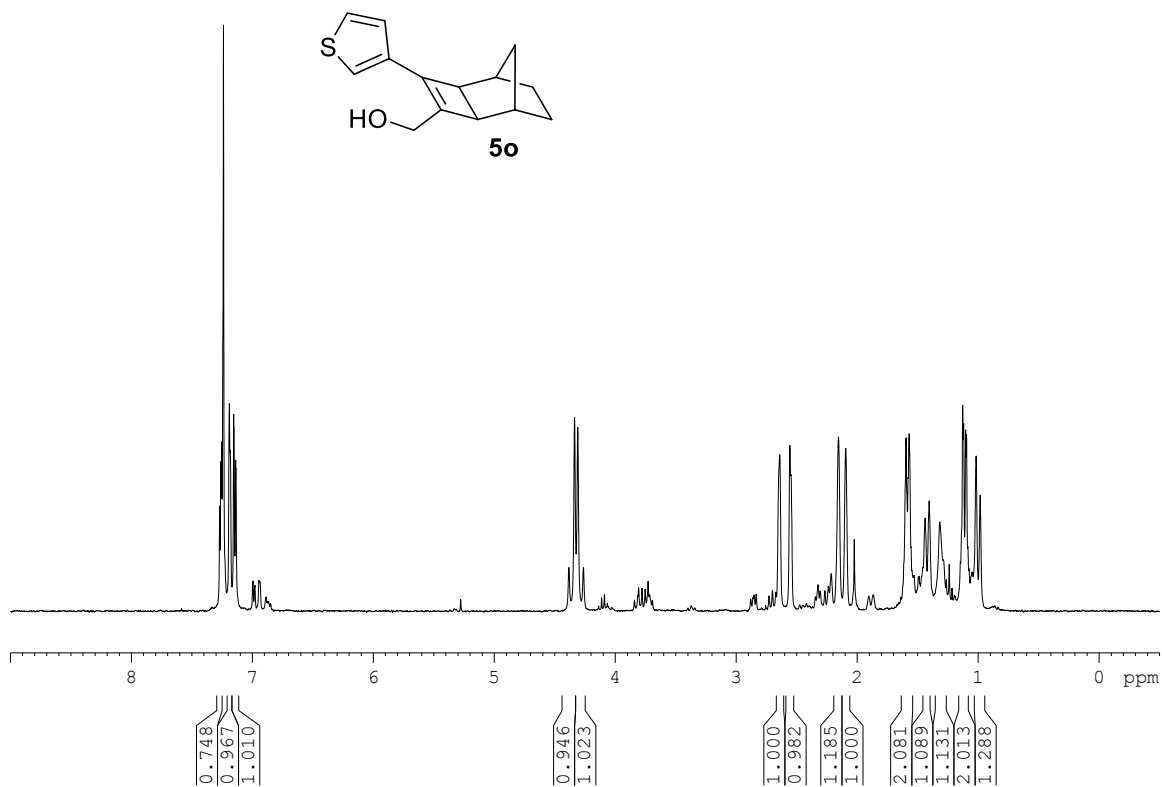
(400 MHz ^1H NMR Spectrum in CDCl_3)



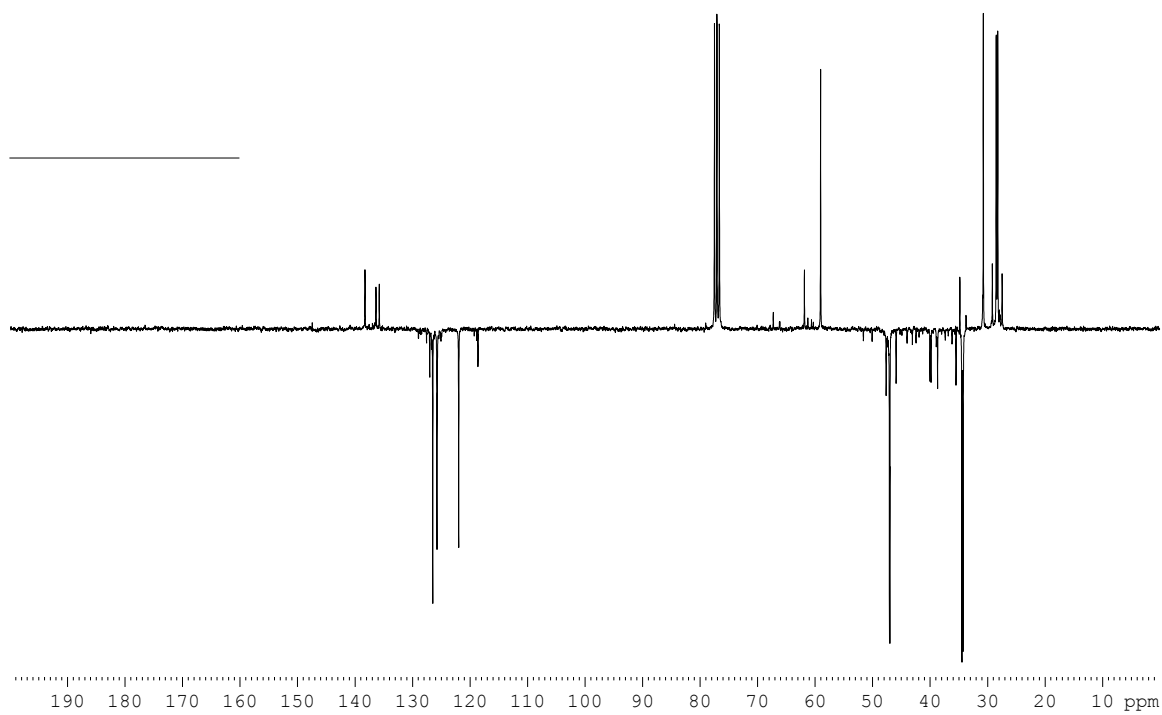
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



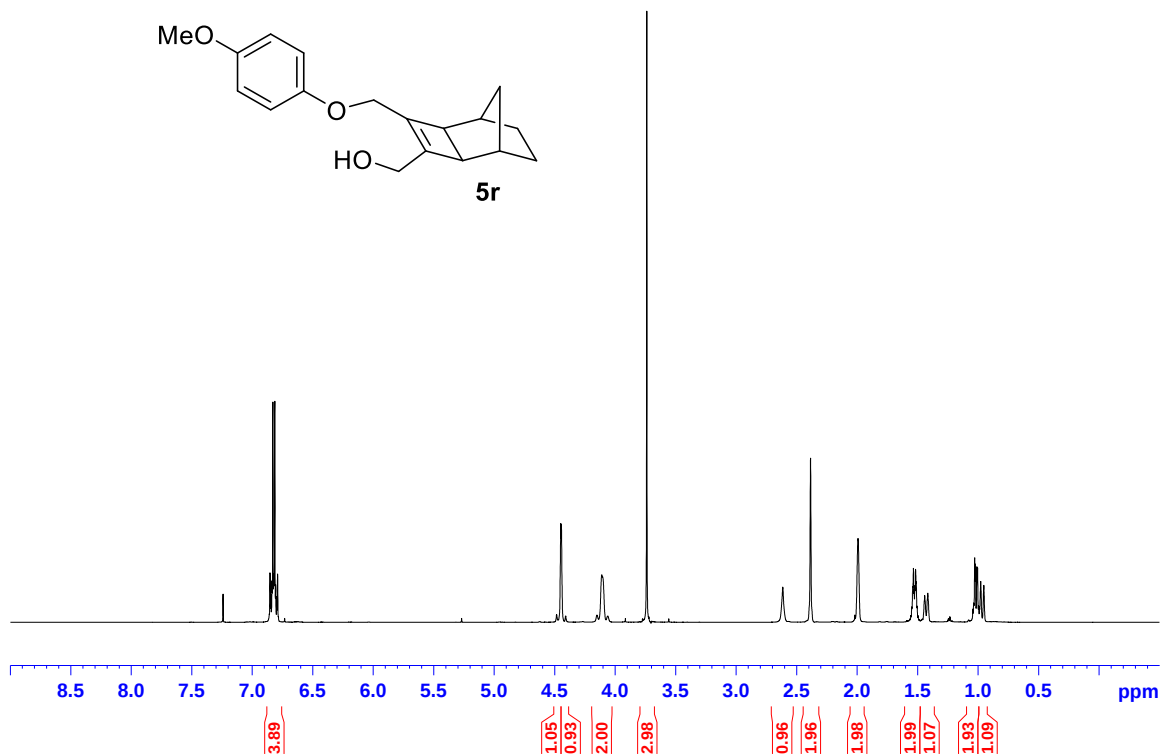
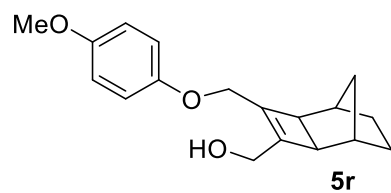
33



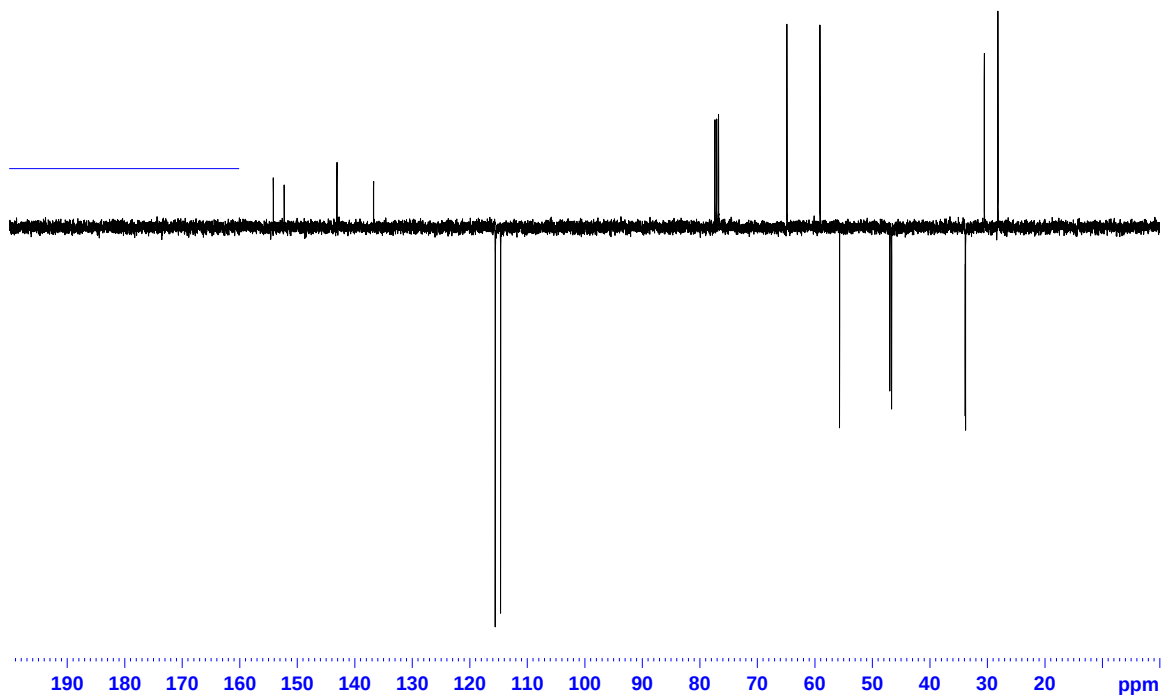
(300 MHz ^1H NMR Spectrum in CDCl_3)



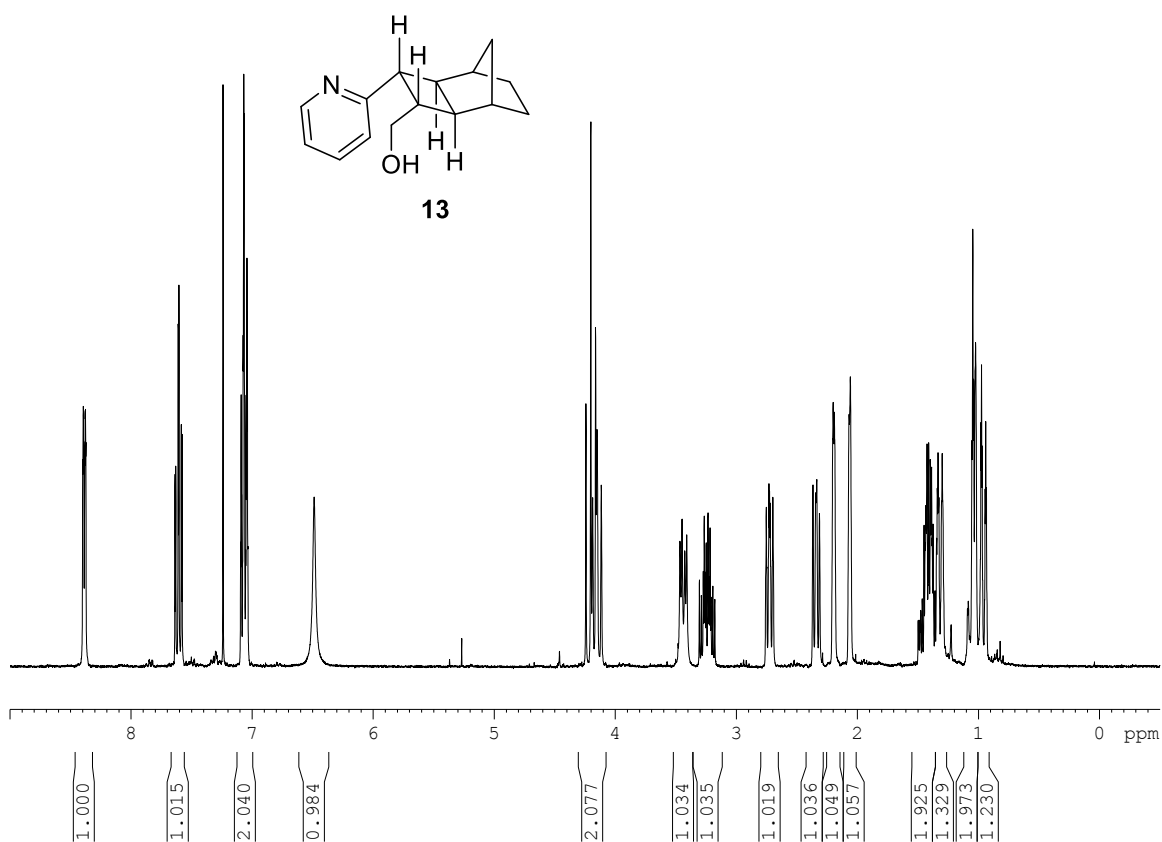
(75 MHz ^{13}C NMR Spectrum in CDCl_3)



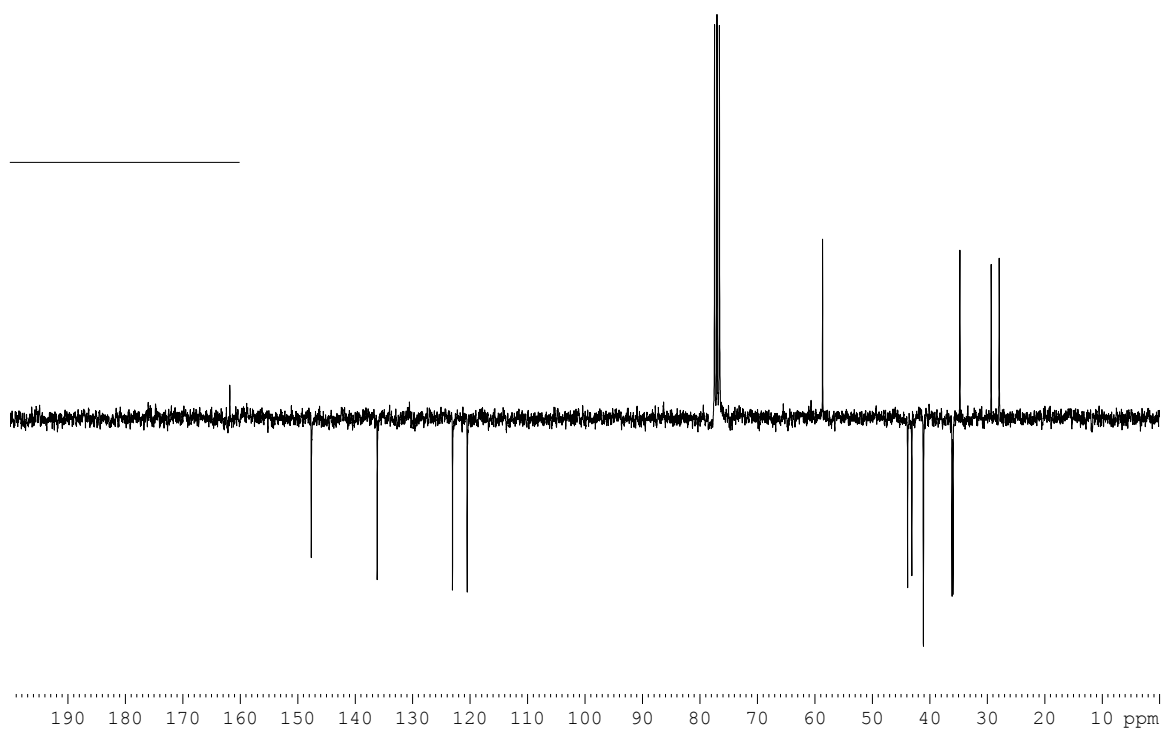
(400 MHz ¹H NMR Spectrum in CDCl₃)



(100 MHz ¹³C NMR Spectrum in CDCl₃)

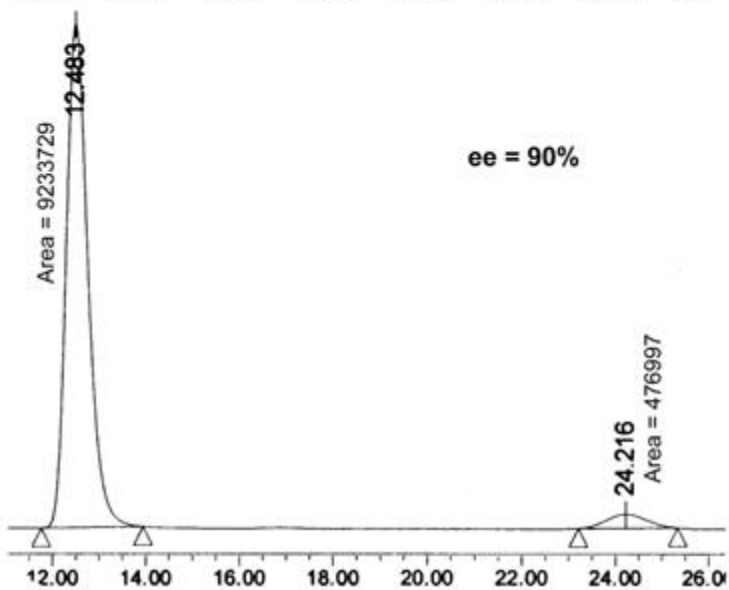
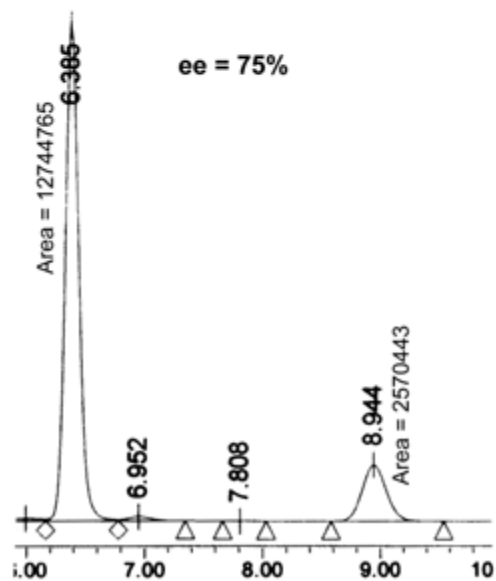
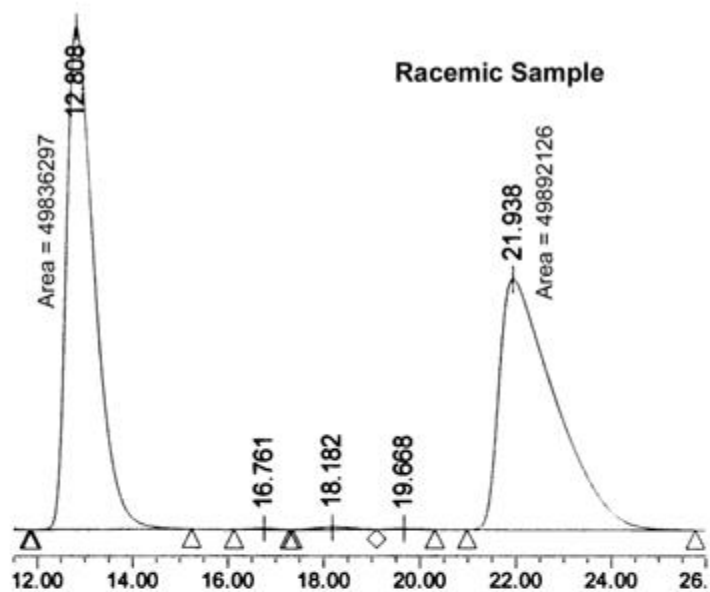
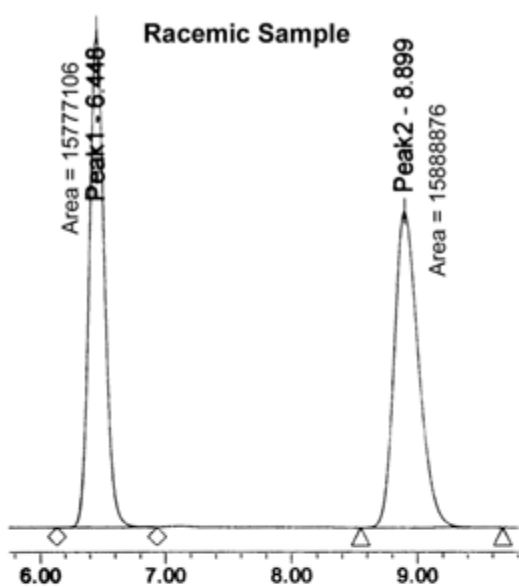
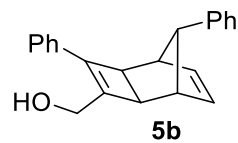
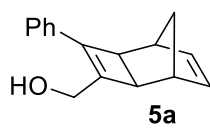


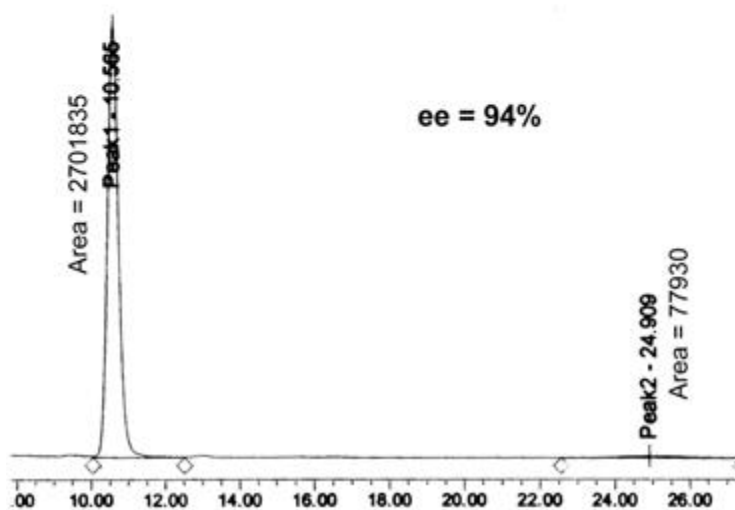
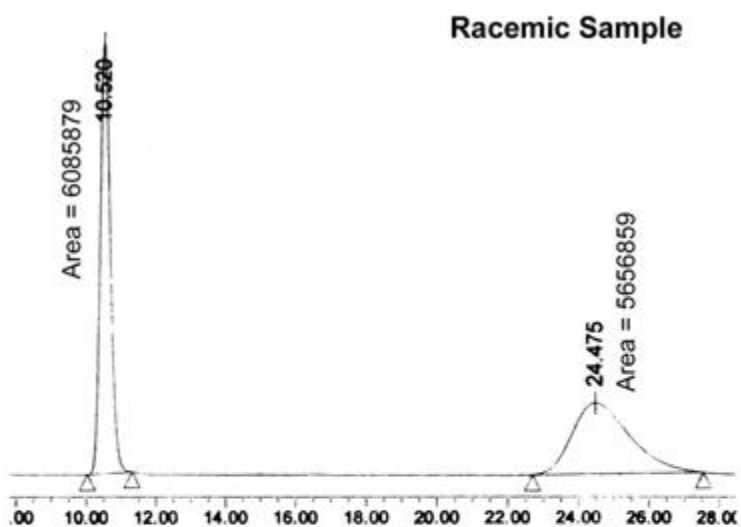
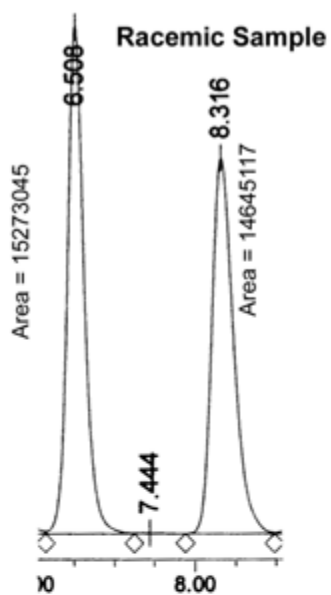
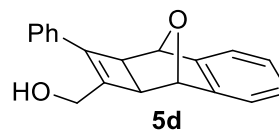
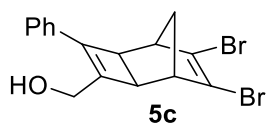
(300 MHz ^1H NMR Spectrum in CDCl_3)

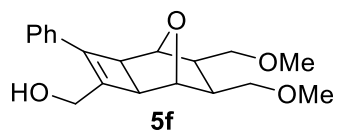
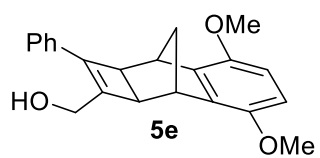


(75 MHz ^{13}C NMR Spectrum in CDCl_3)

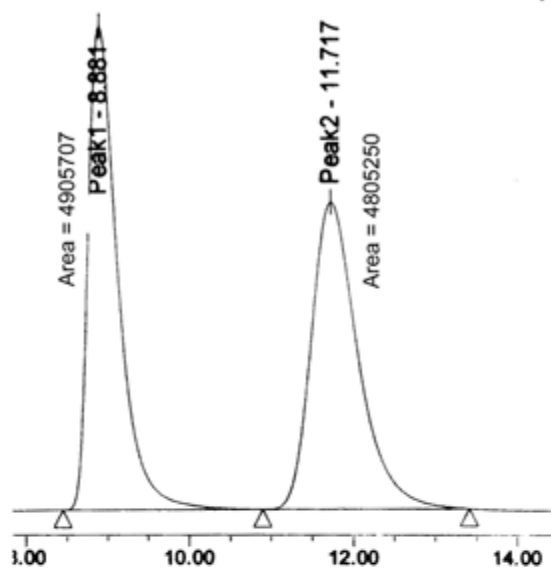
Part II: HPLC Chromatograms



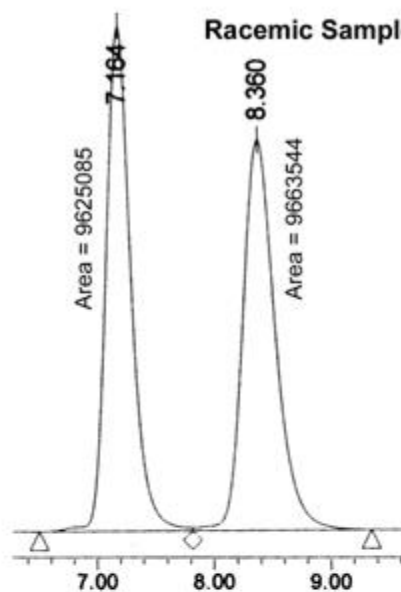




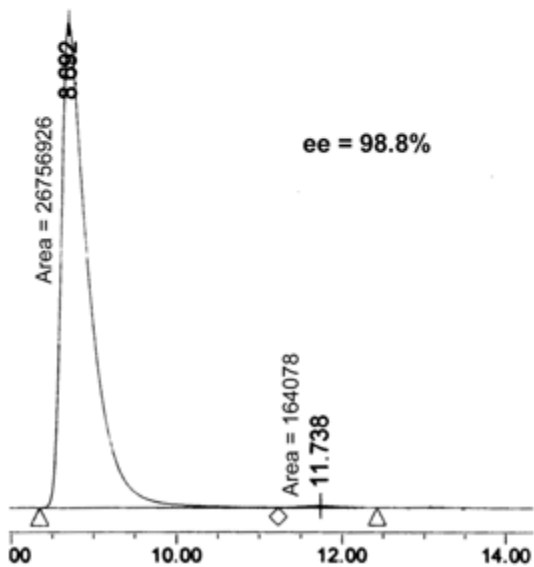
Racemic Sample



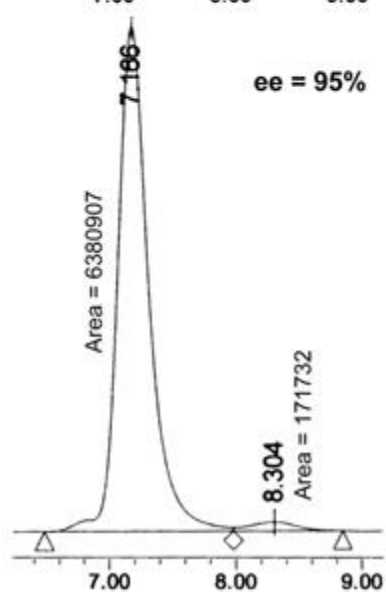
Racemic Sample

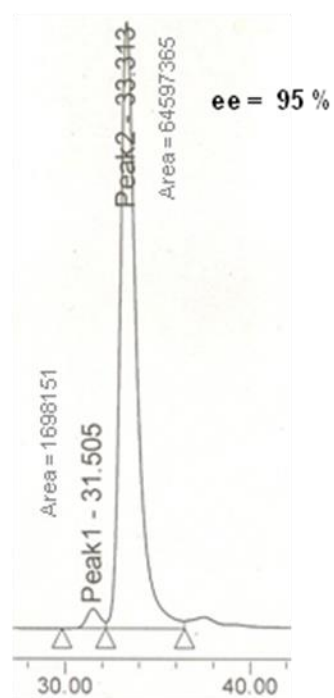
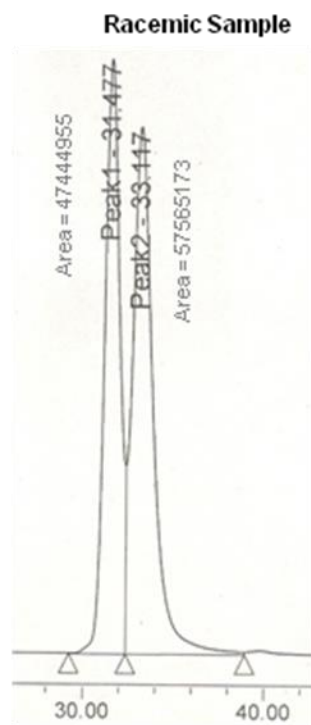
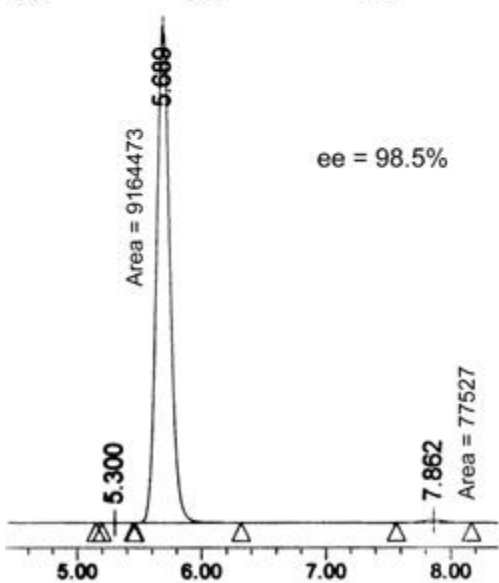
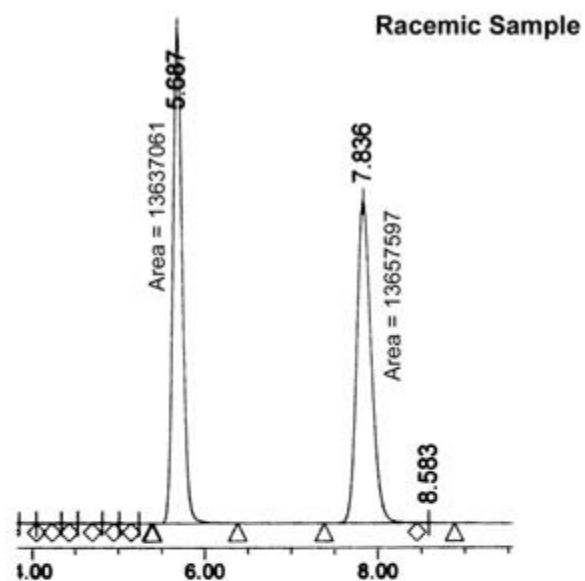
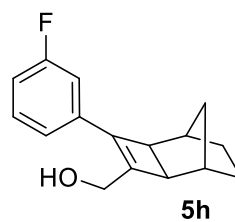
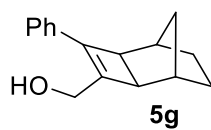


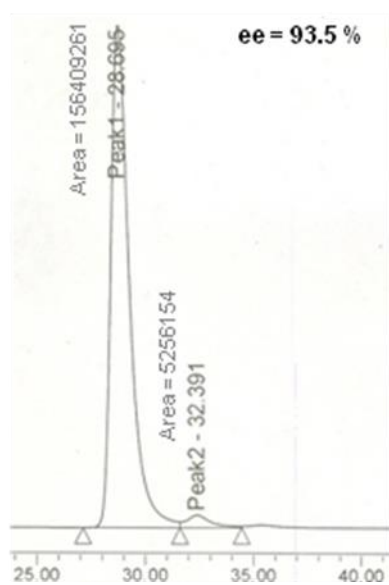
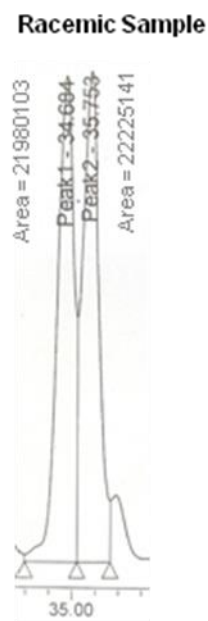
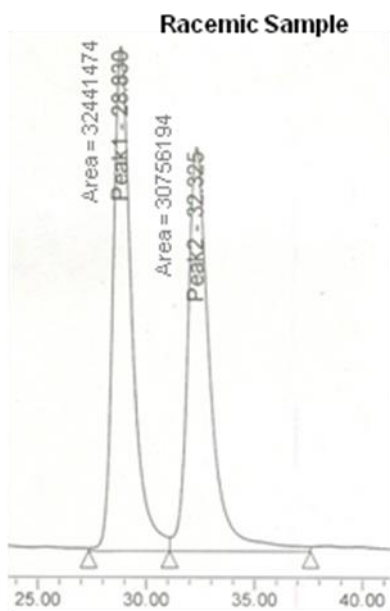
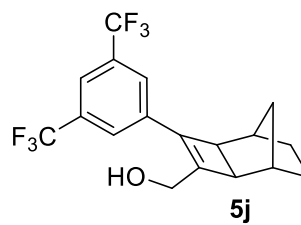
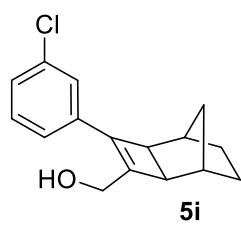
ee = 98.8%

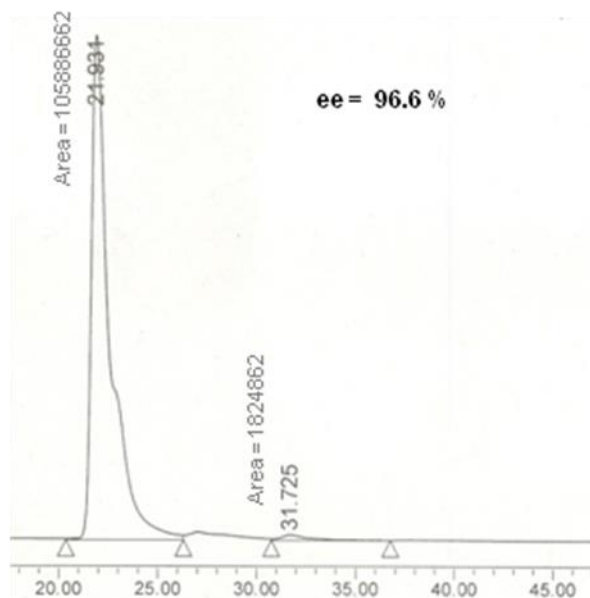
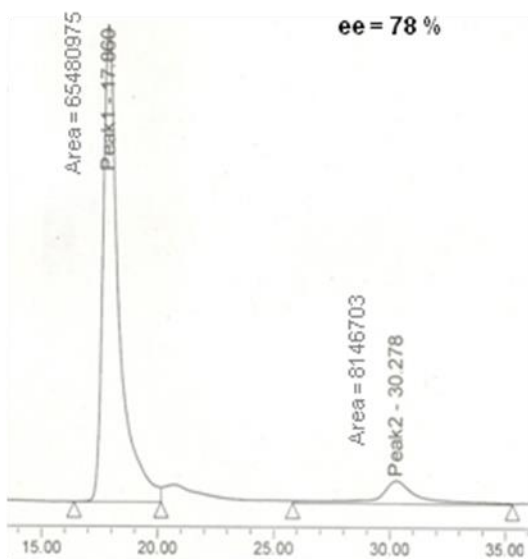
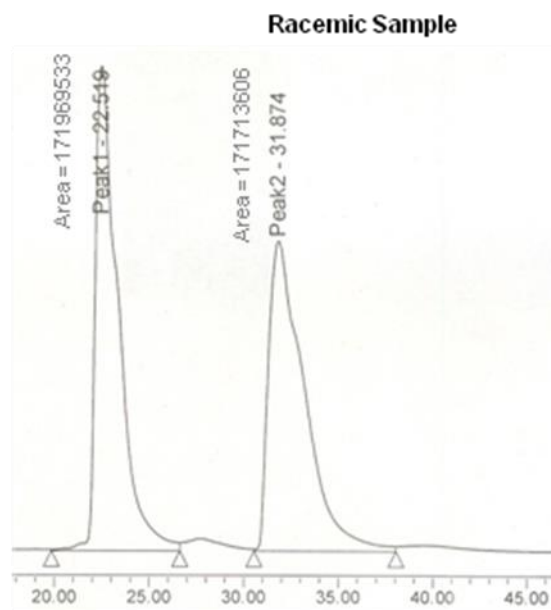
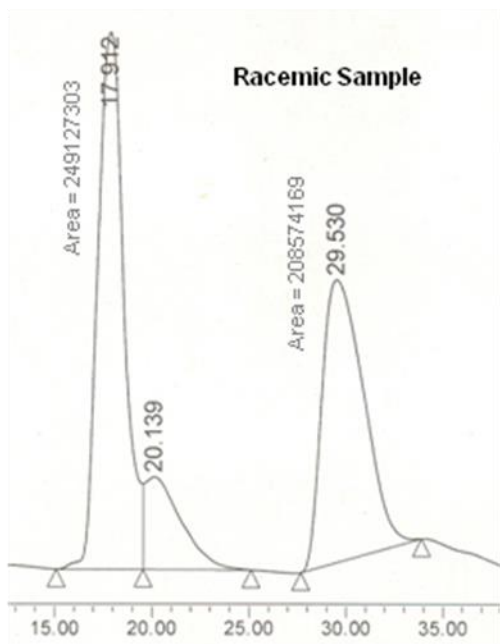
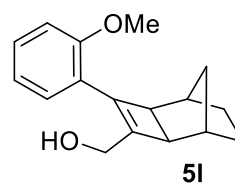
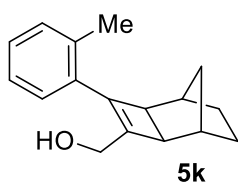


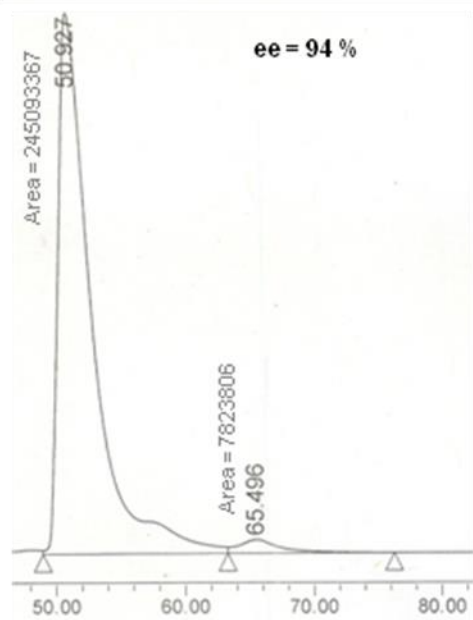
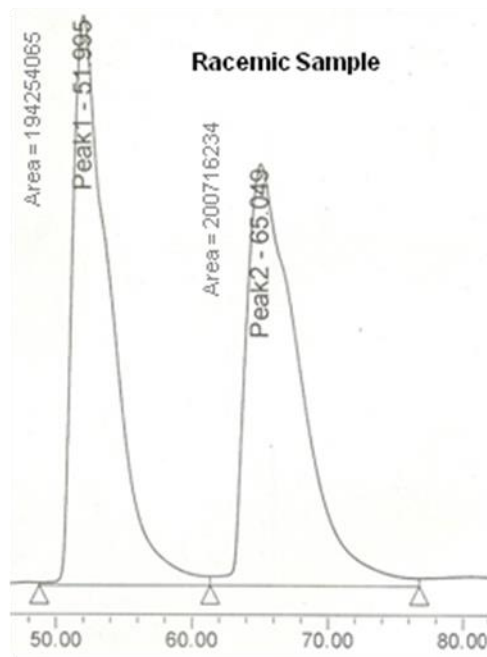
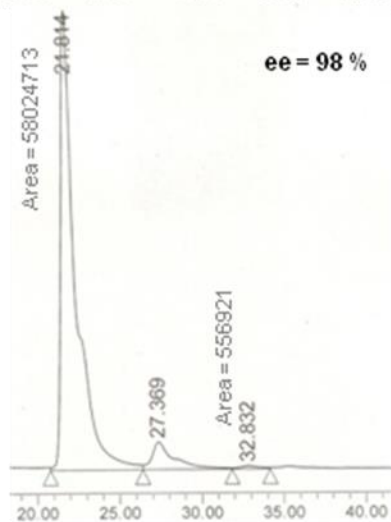
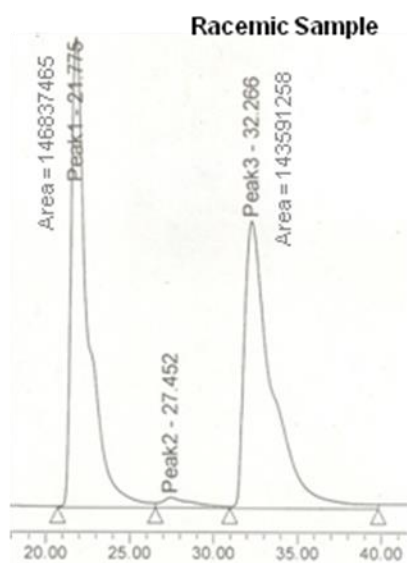
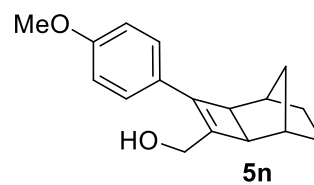
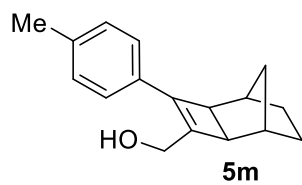
ee = 95%

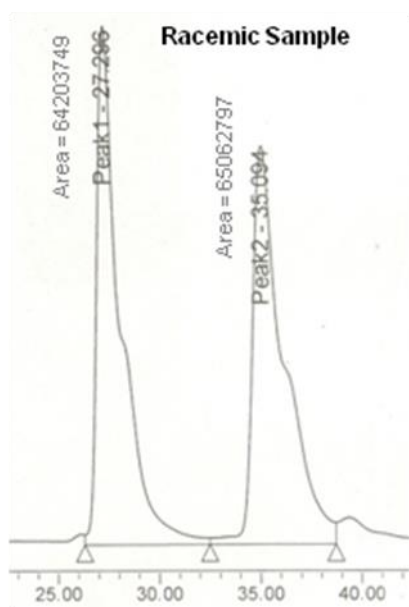
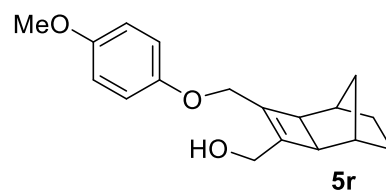
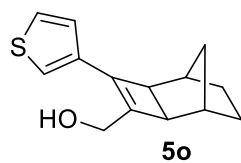




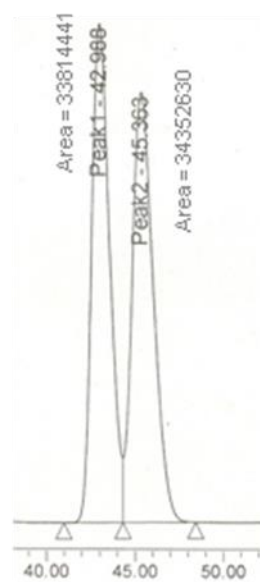




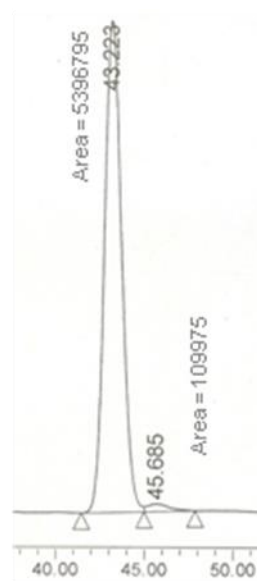
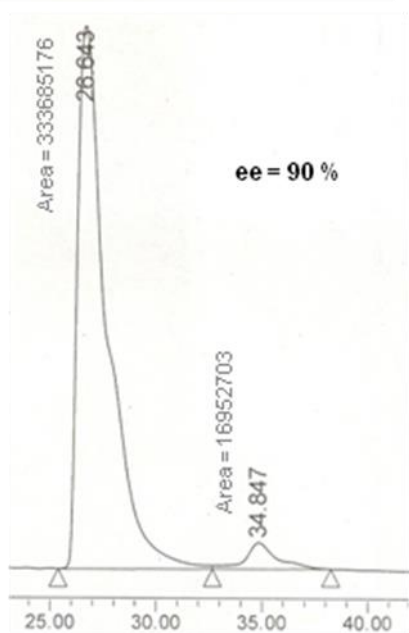


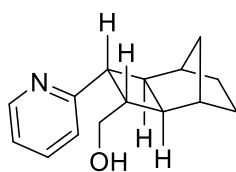


Racemic Sample



ee = 96 %





13

Racemic Sample

