

Supporting Information

Diastereomerically Pure Rarely Functionalized Alkenoyl Dihydropyrans, 1,6-Diketones, and Cyclopentanes from Acetylene Gas and Ketones

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and Boris A. Trofimov*

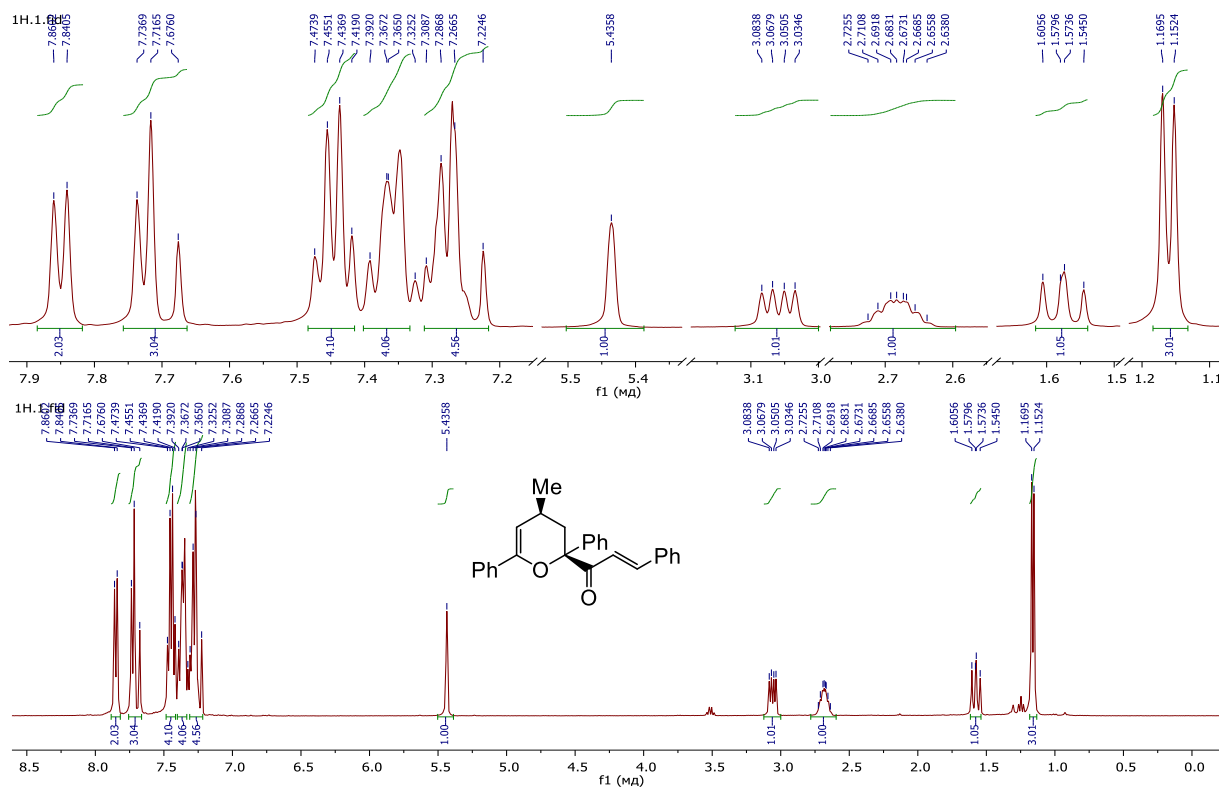
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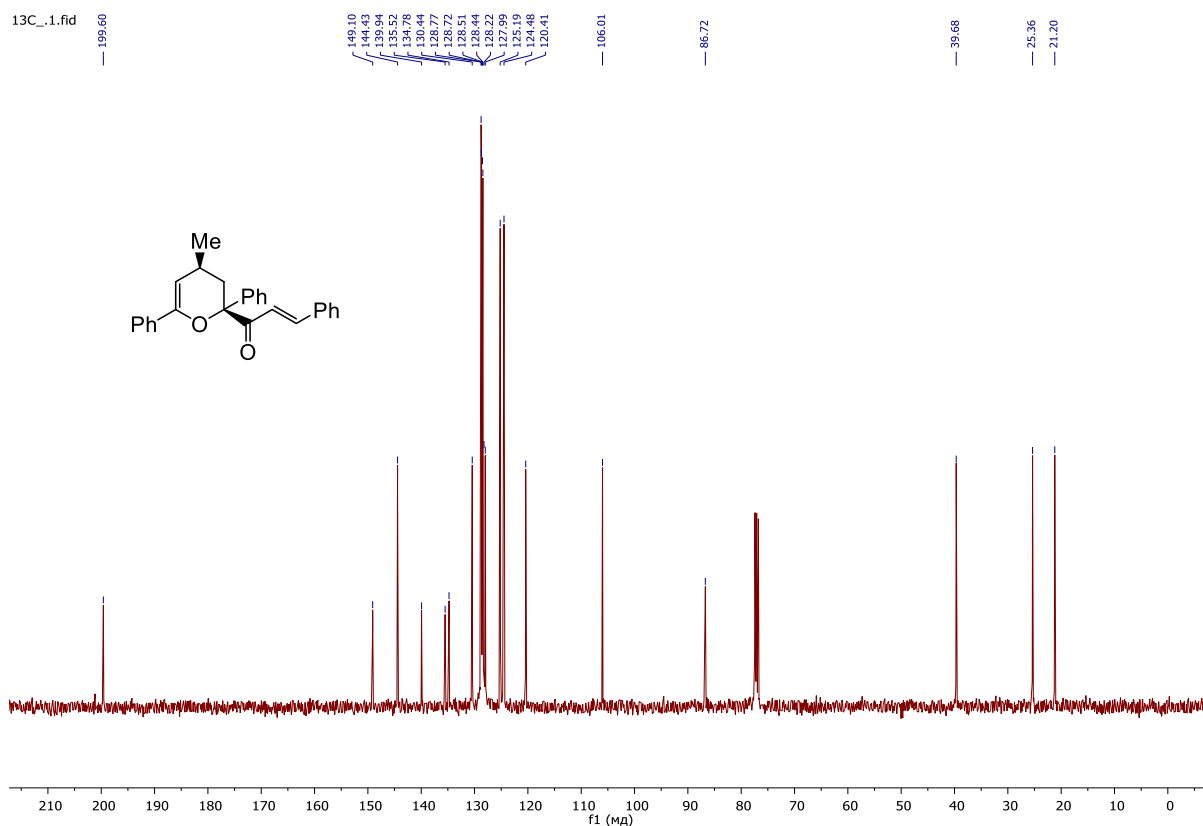
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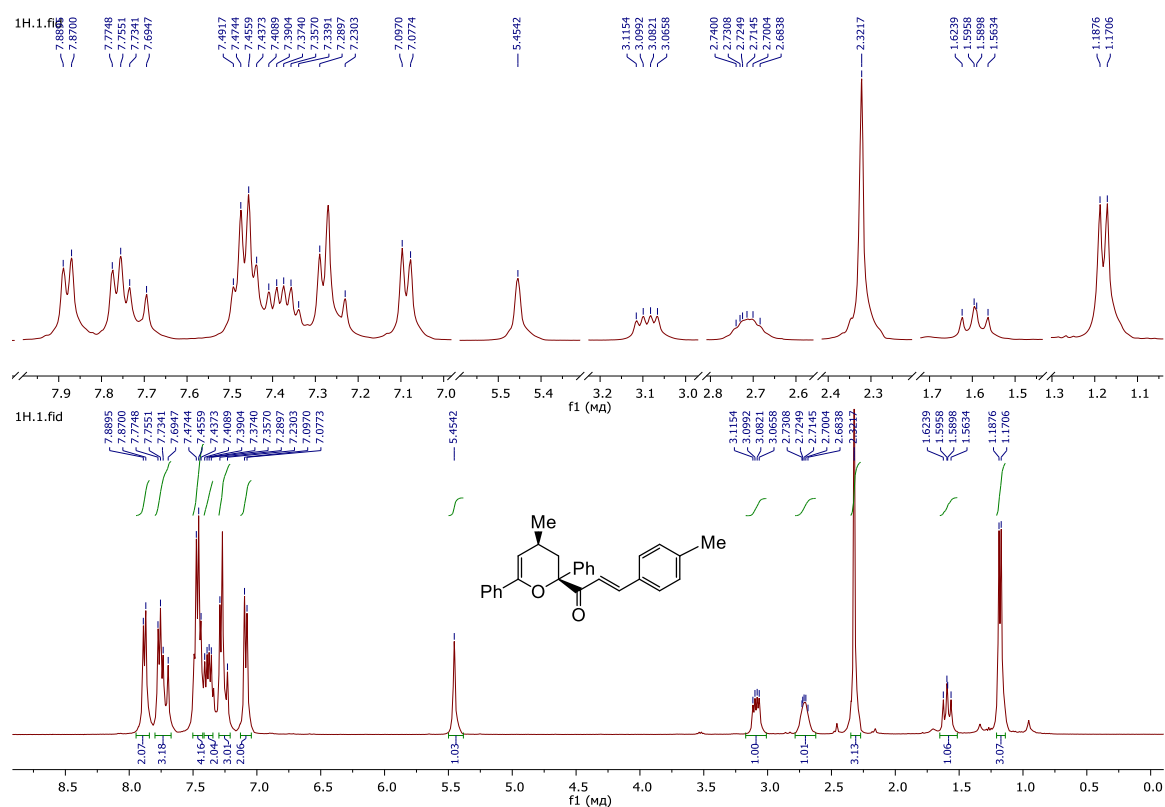
1. ^1H and ^{13}C NMR Spectra of dihydropyrans 3



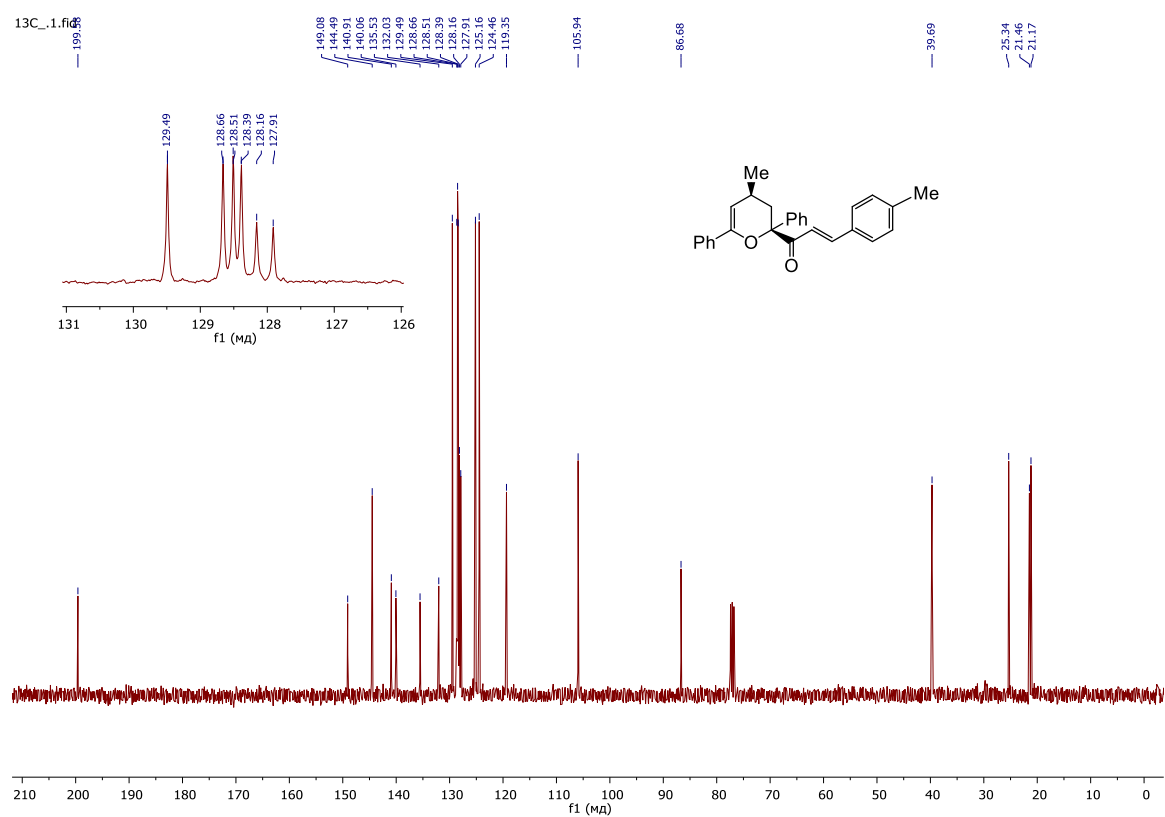
^1H NMR Spectrum of **3aa** (400.1 MHz, CDCl_3)



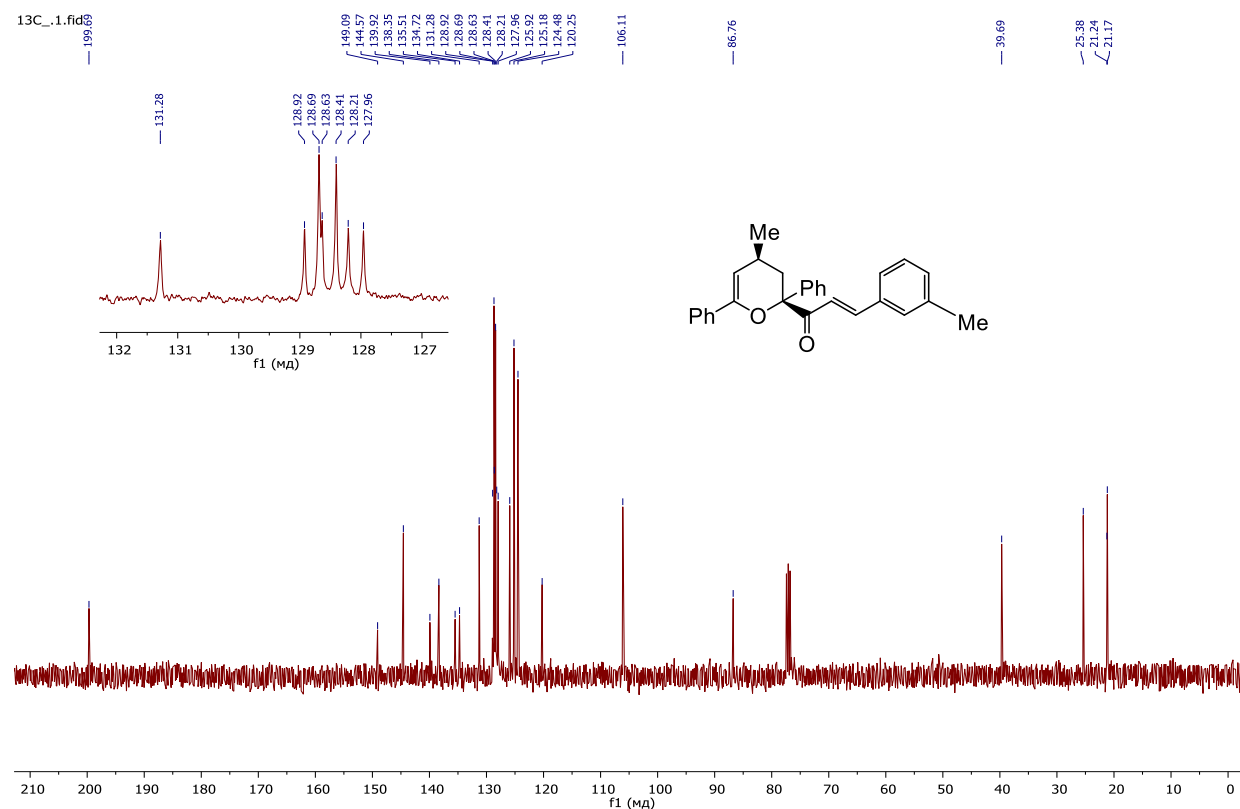
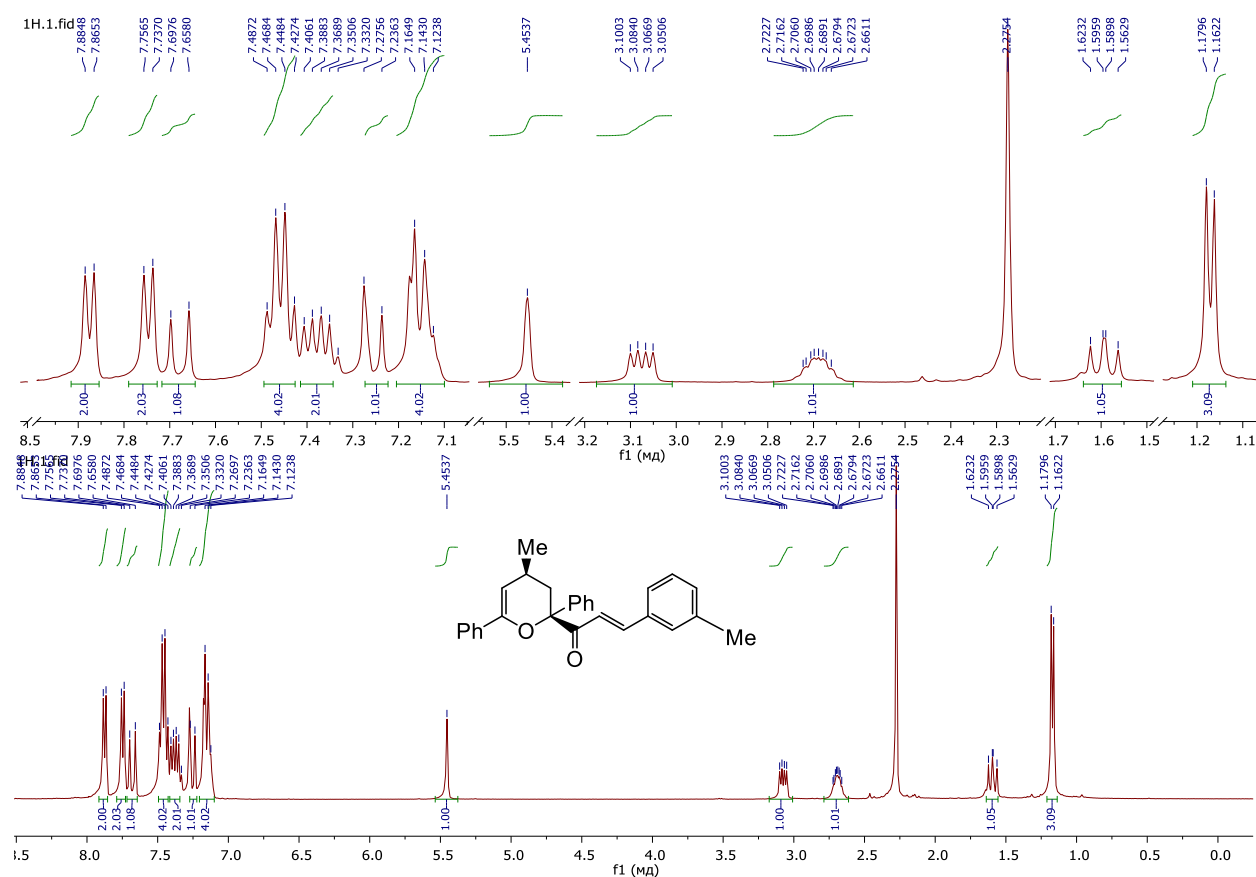
^{13}C NMR Spectrum of **3aa** (100.6 MHz, CDCl_3)



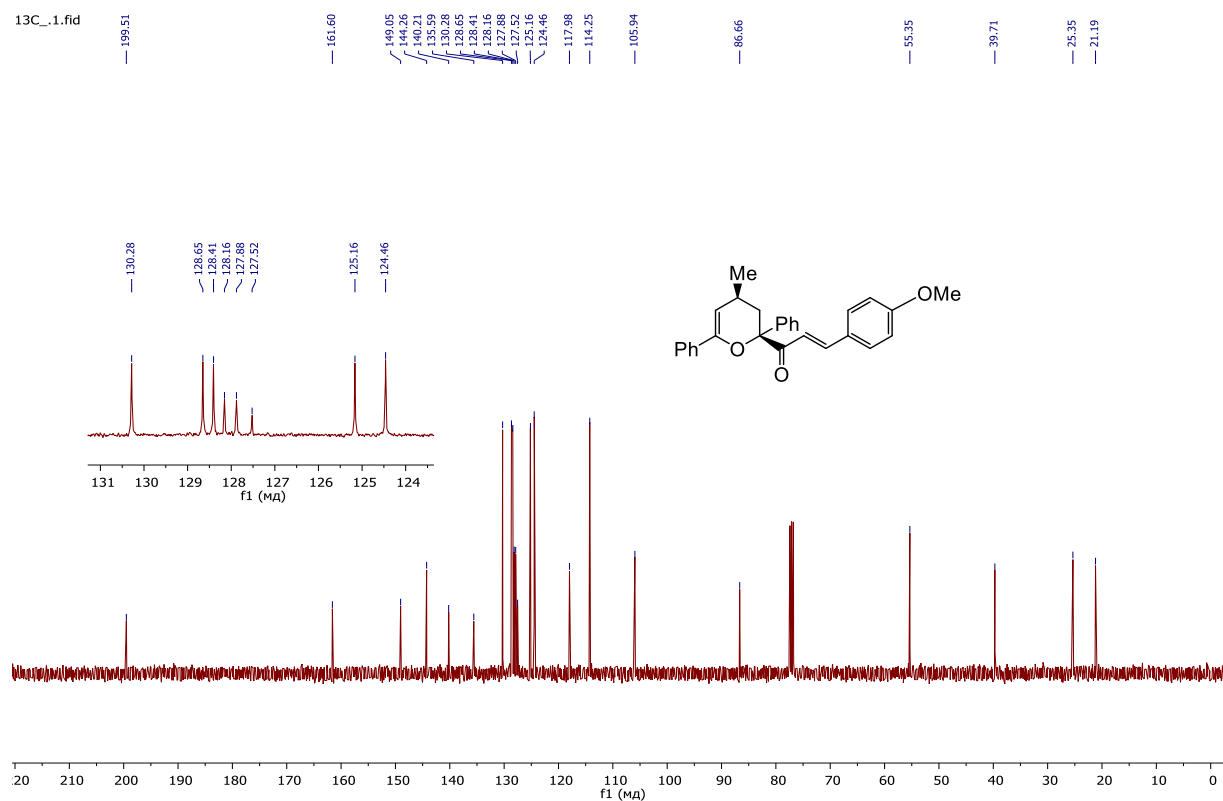
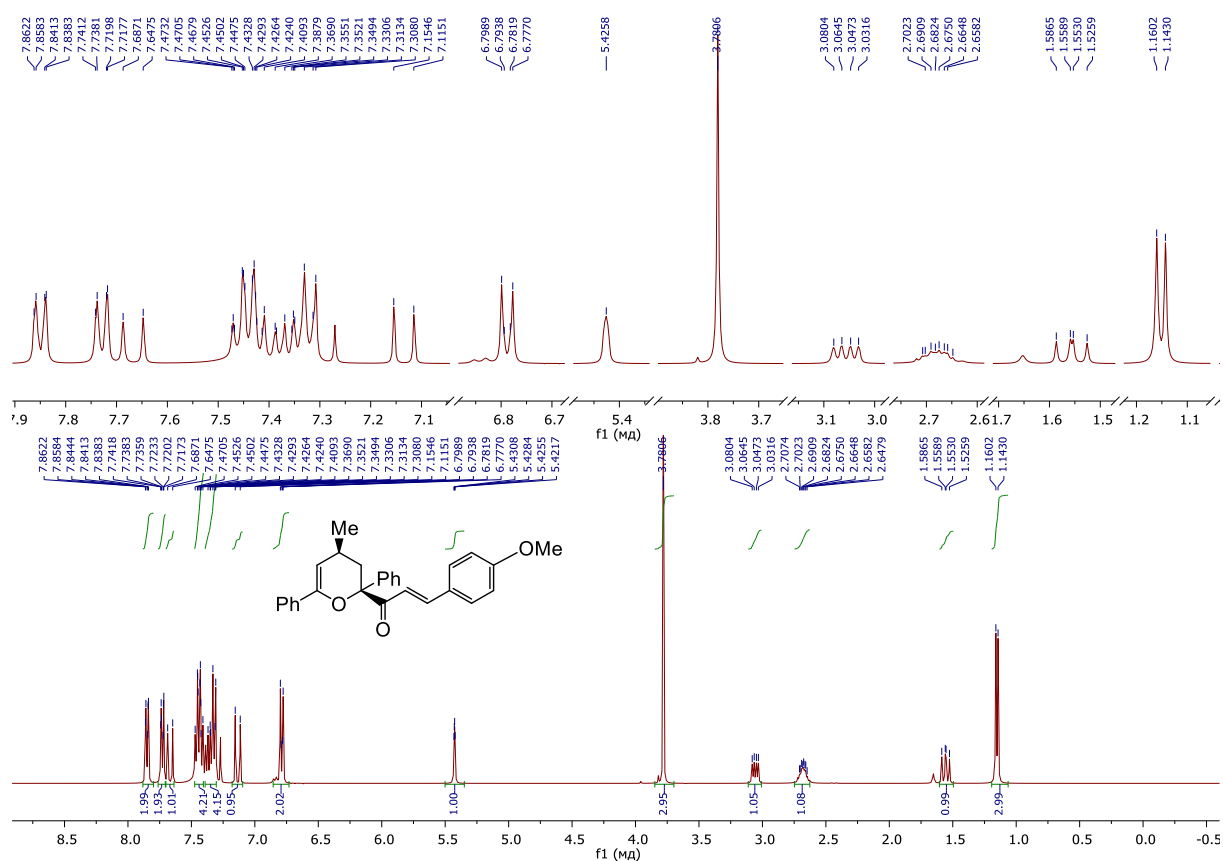
¹H NMR Spectrum of **3ab (400.1 MHz, CDCl₃)**



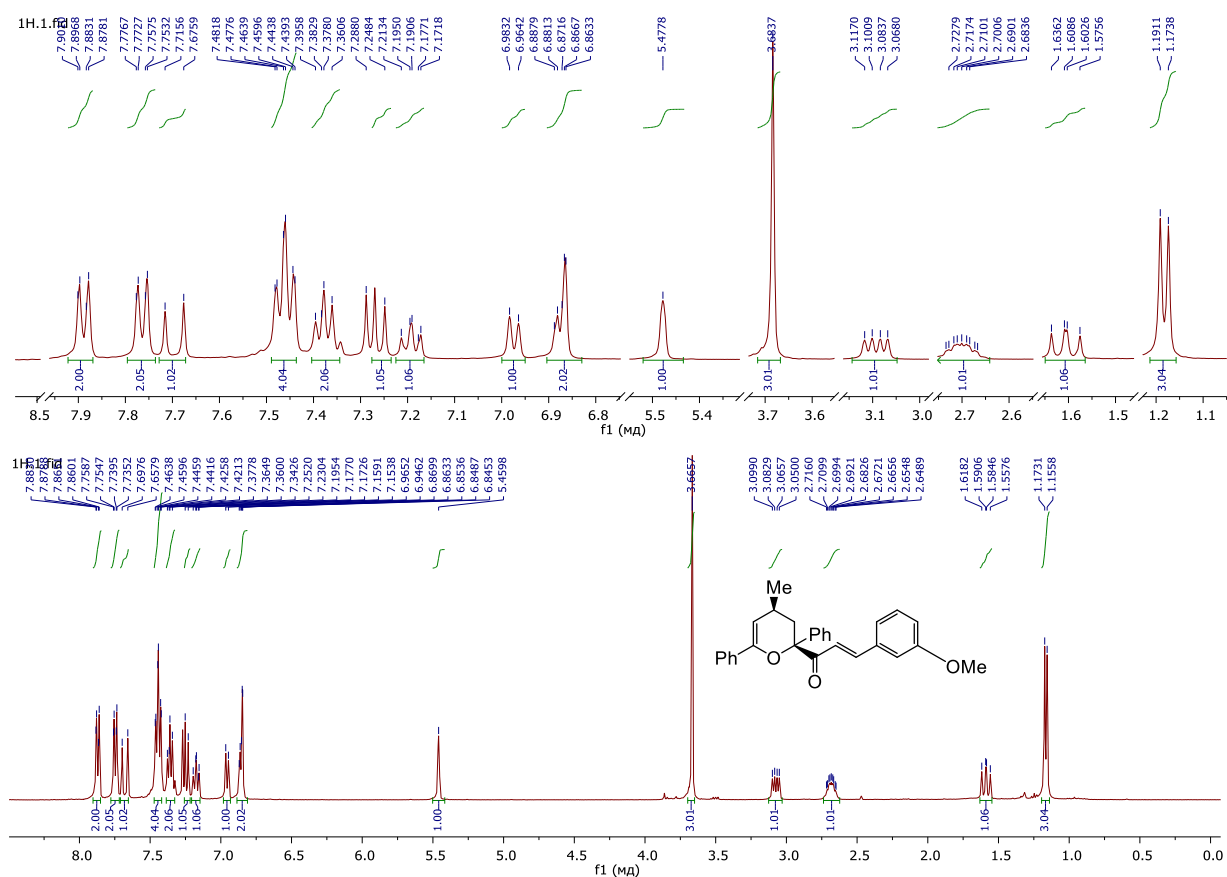
¹³C NMR Spectrum of **3ab (100.6 MHz, CDCl₃)**



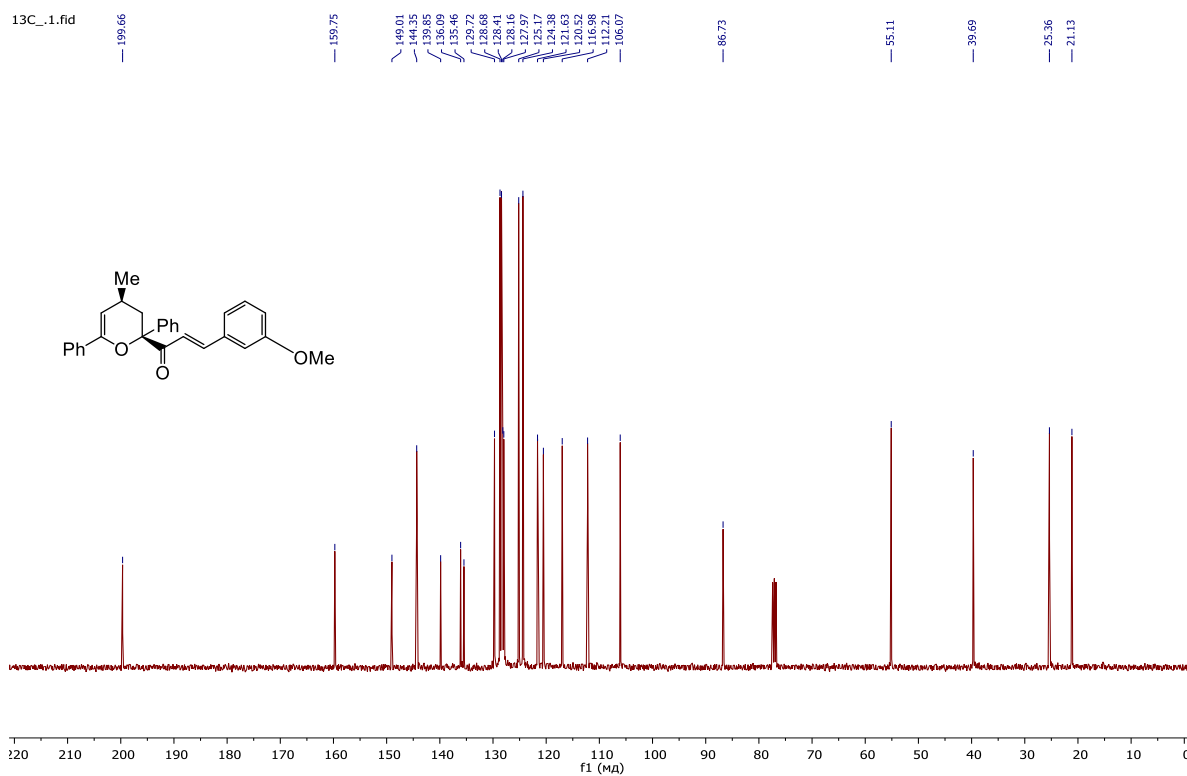
¹³C NMR Spectrum of **3ac** (100.6 MHz, CDCl₃)



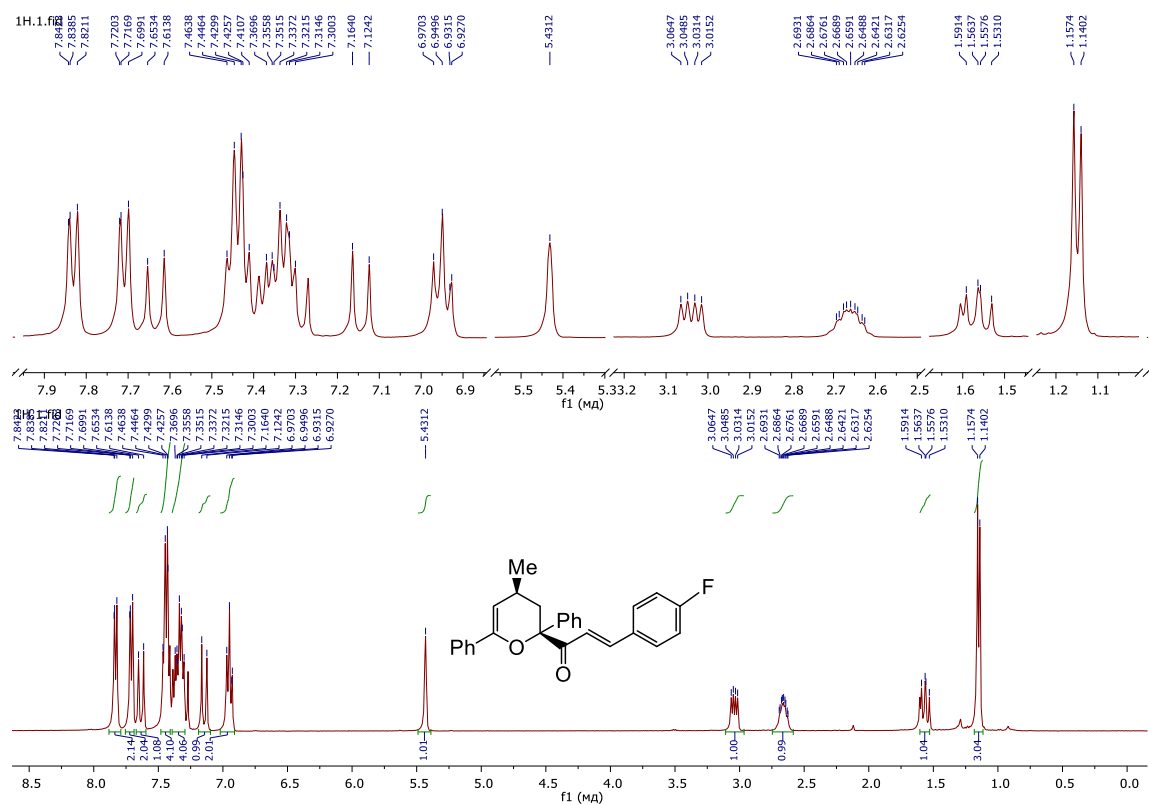
¹³C NMR Spectrum of 3ad (100.6 MHz, CDCl₃)



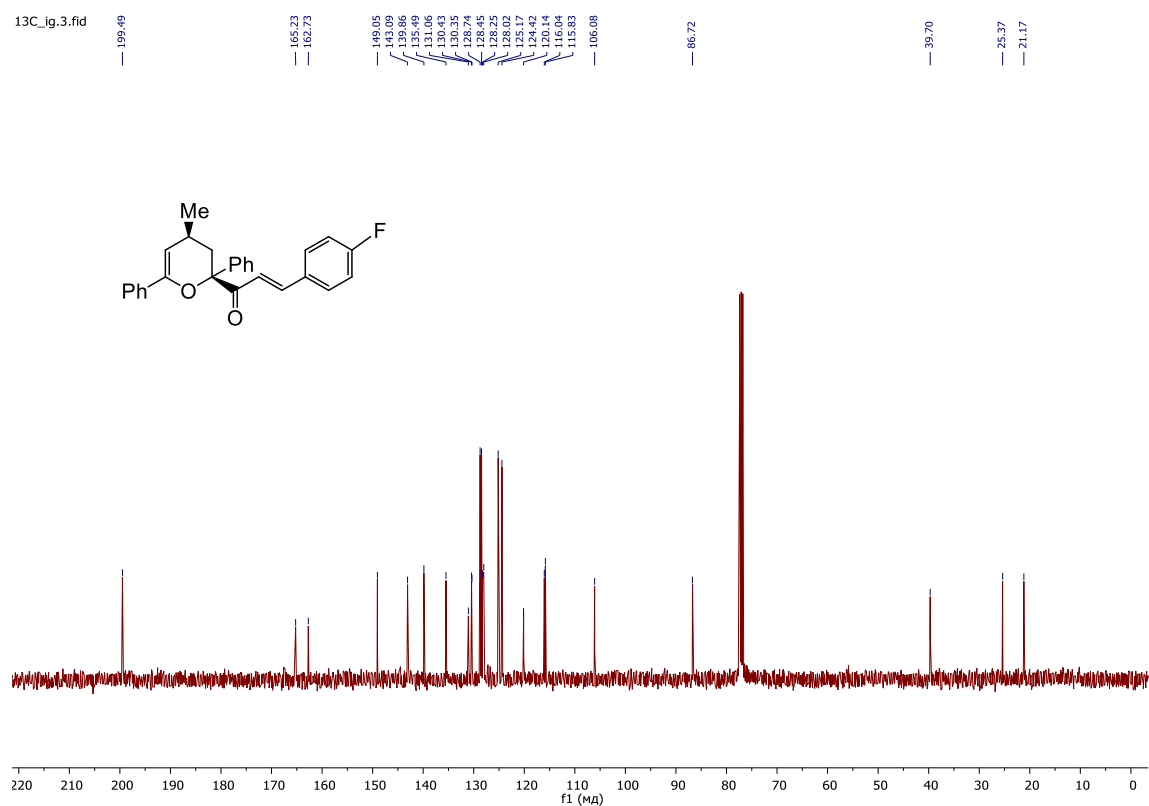
¹H NMR Spectrum of 3ae (400.1 MHz, CDCl₃)



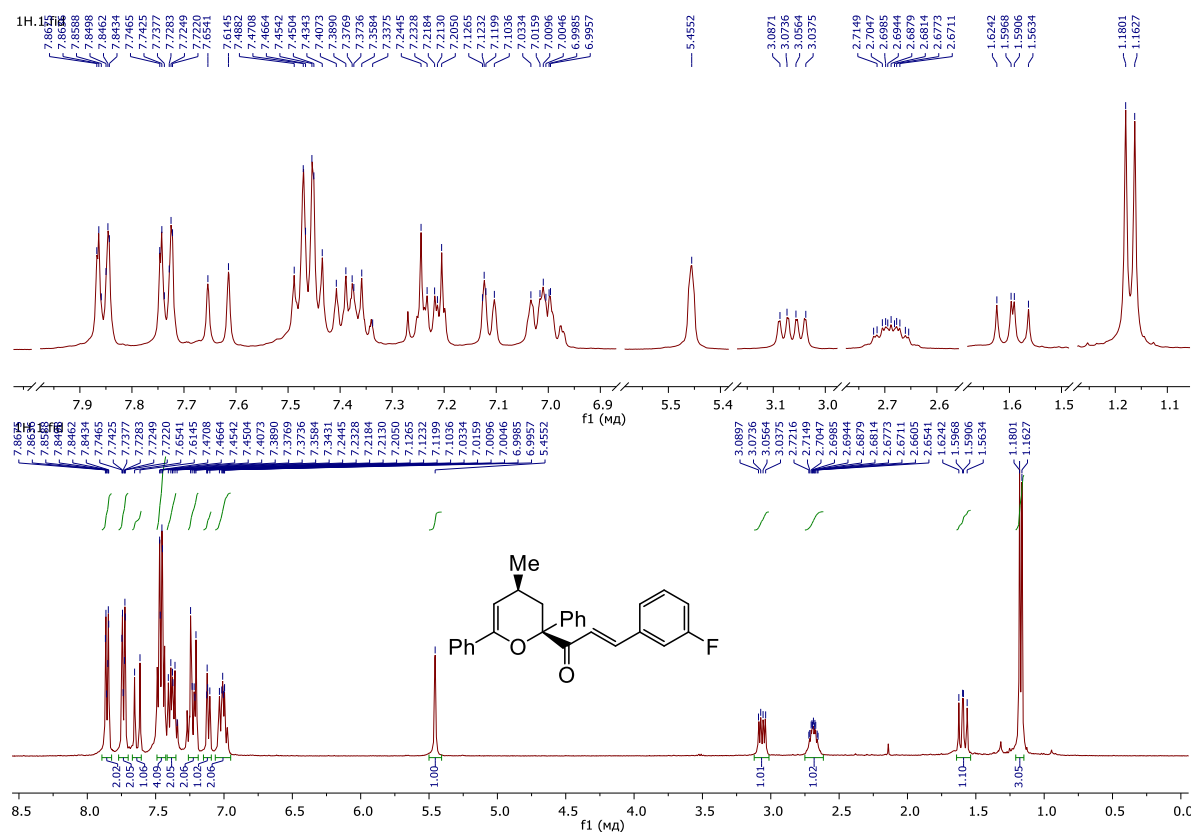
¹³C NMR Spectrum of 3ae (100.6 MHz, CDCl₃)



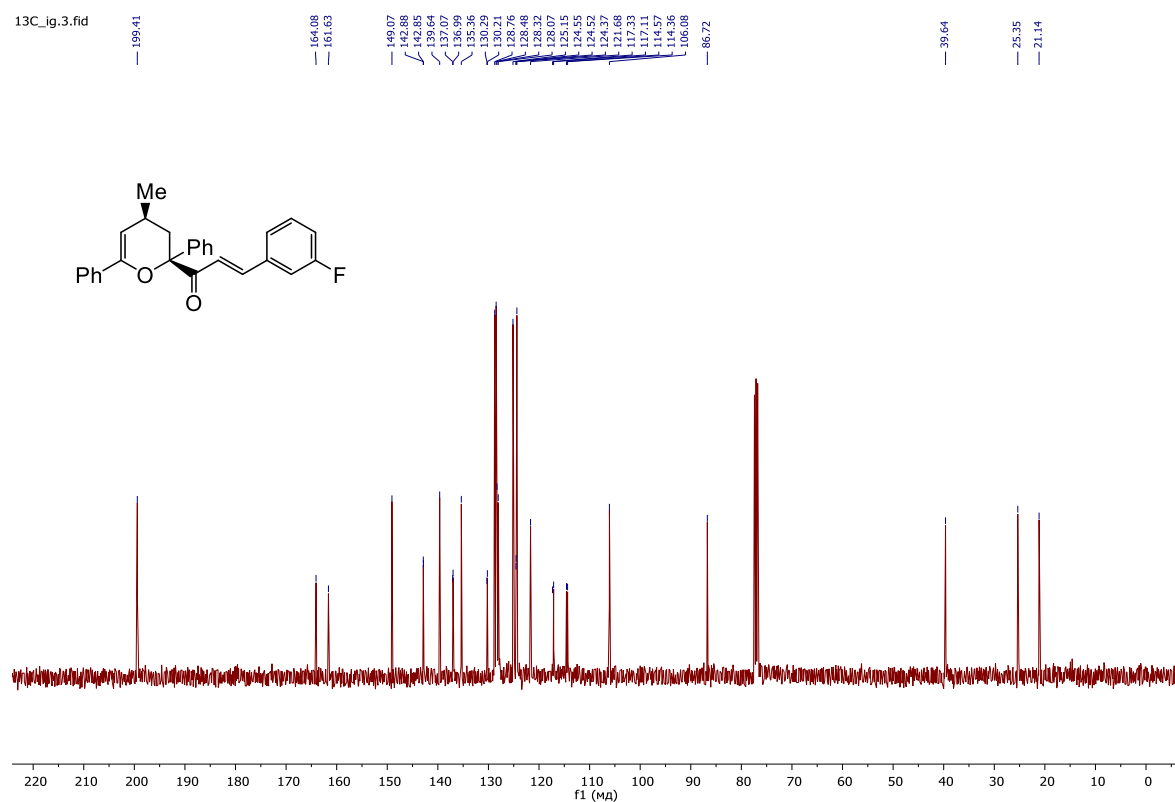
¹H NMR Spectrum of **3af (400.1 MHz, CDCl₃)**



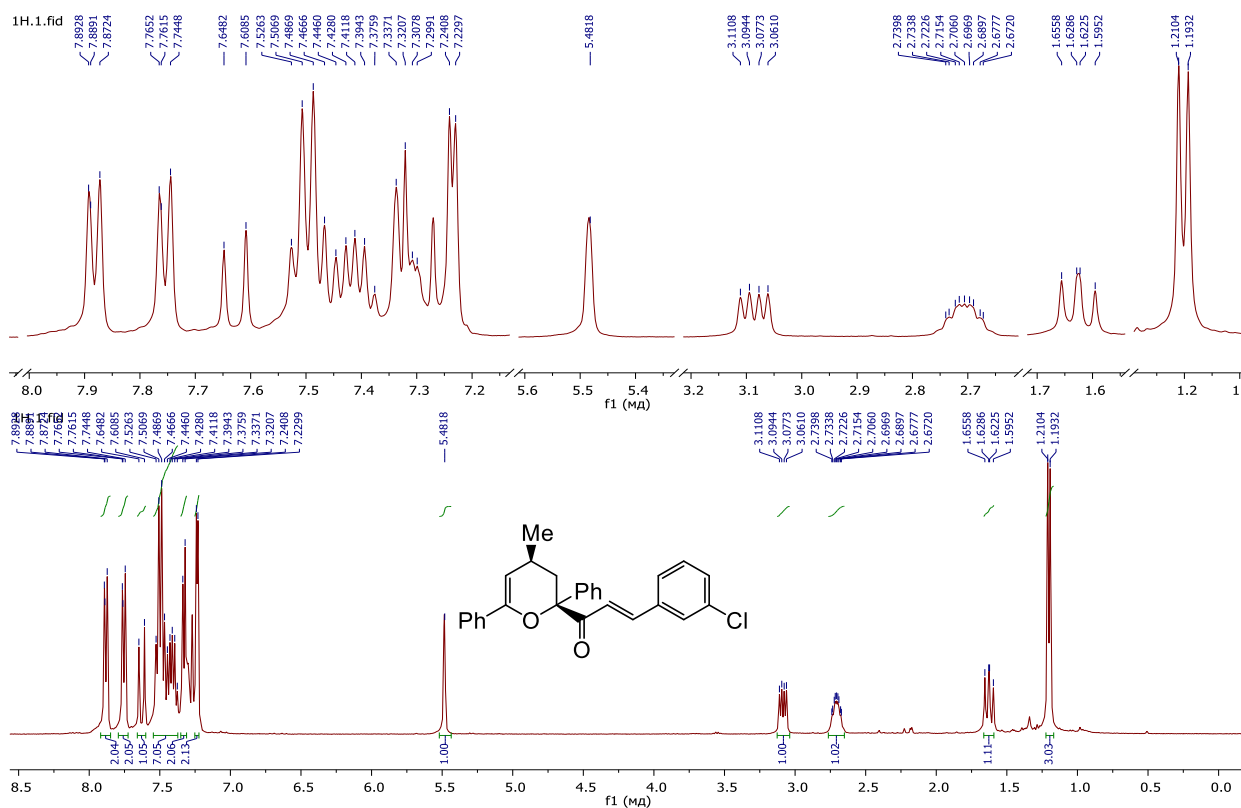
¹³C NMR Spectrum of **3af (100.6 MHz, CDCl₃)**



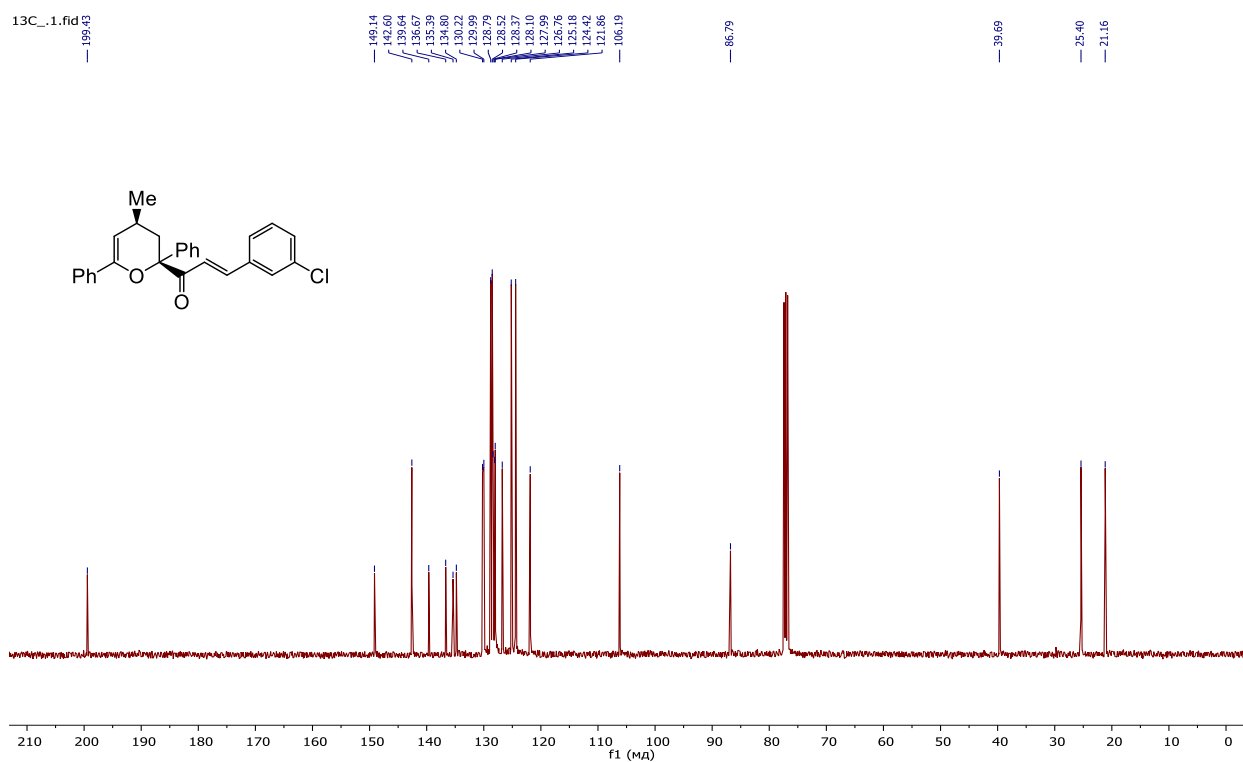
¹H NMR Spectrum of **3ag** (400.1 MHz, CDCl₃)



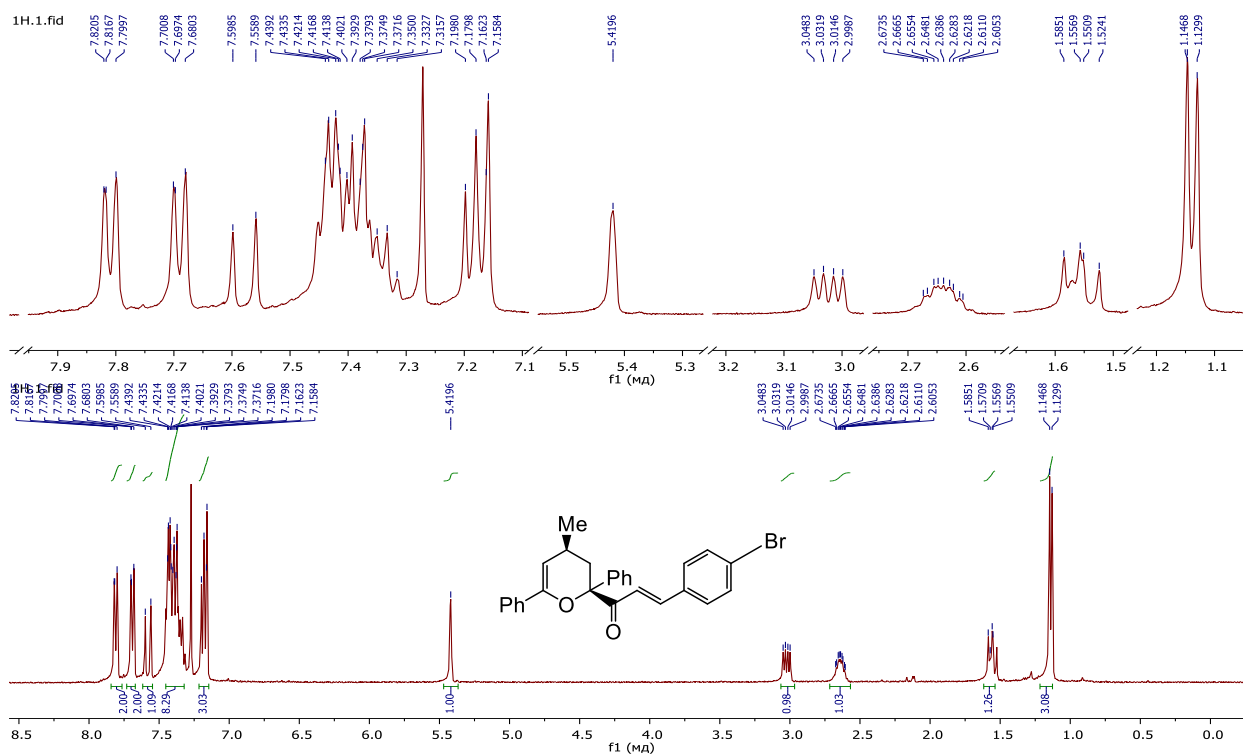
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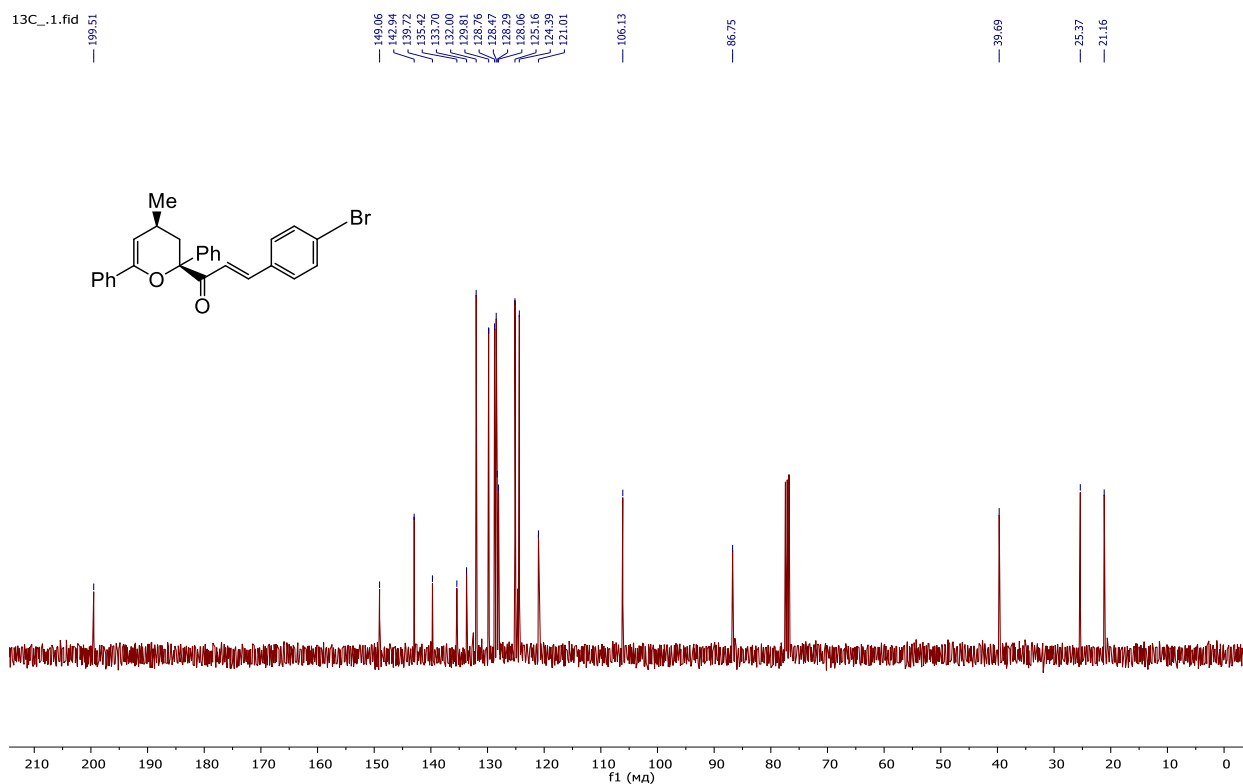
¹H NMR Spectrum of 3ah (400.1 MHz, CDCl₃)



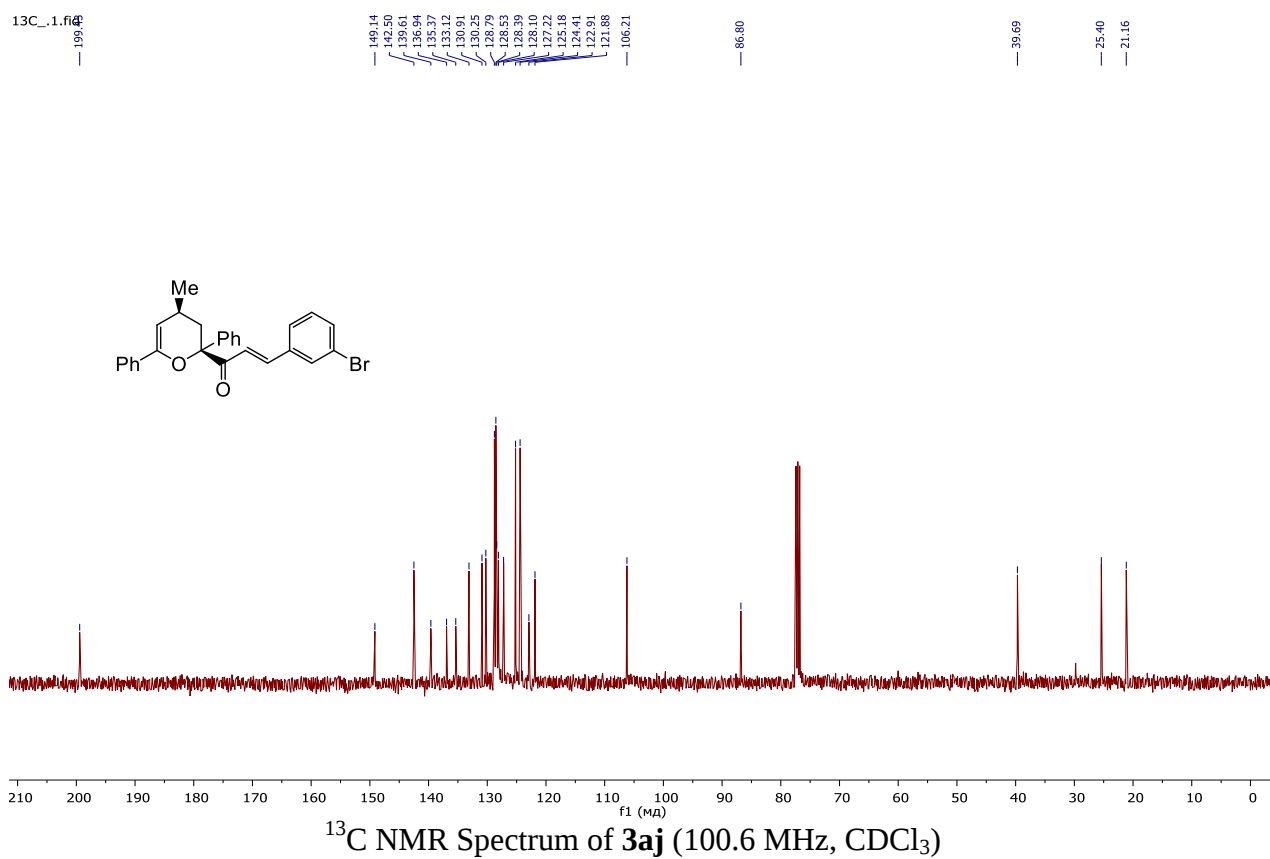
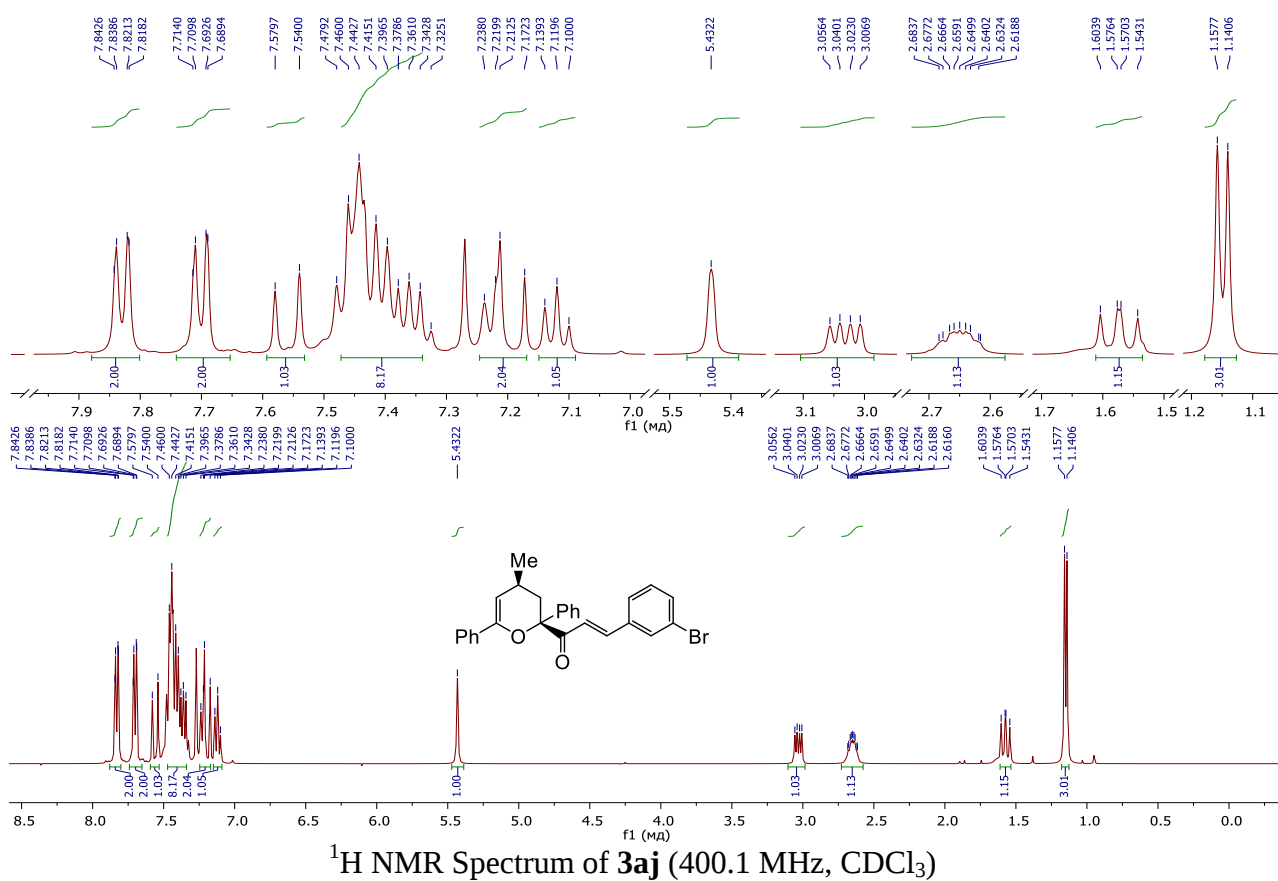
¹³C NMR Spectrum of 3ah (100.6 MHz, CDCl₃)

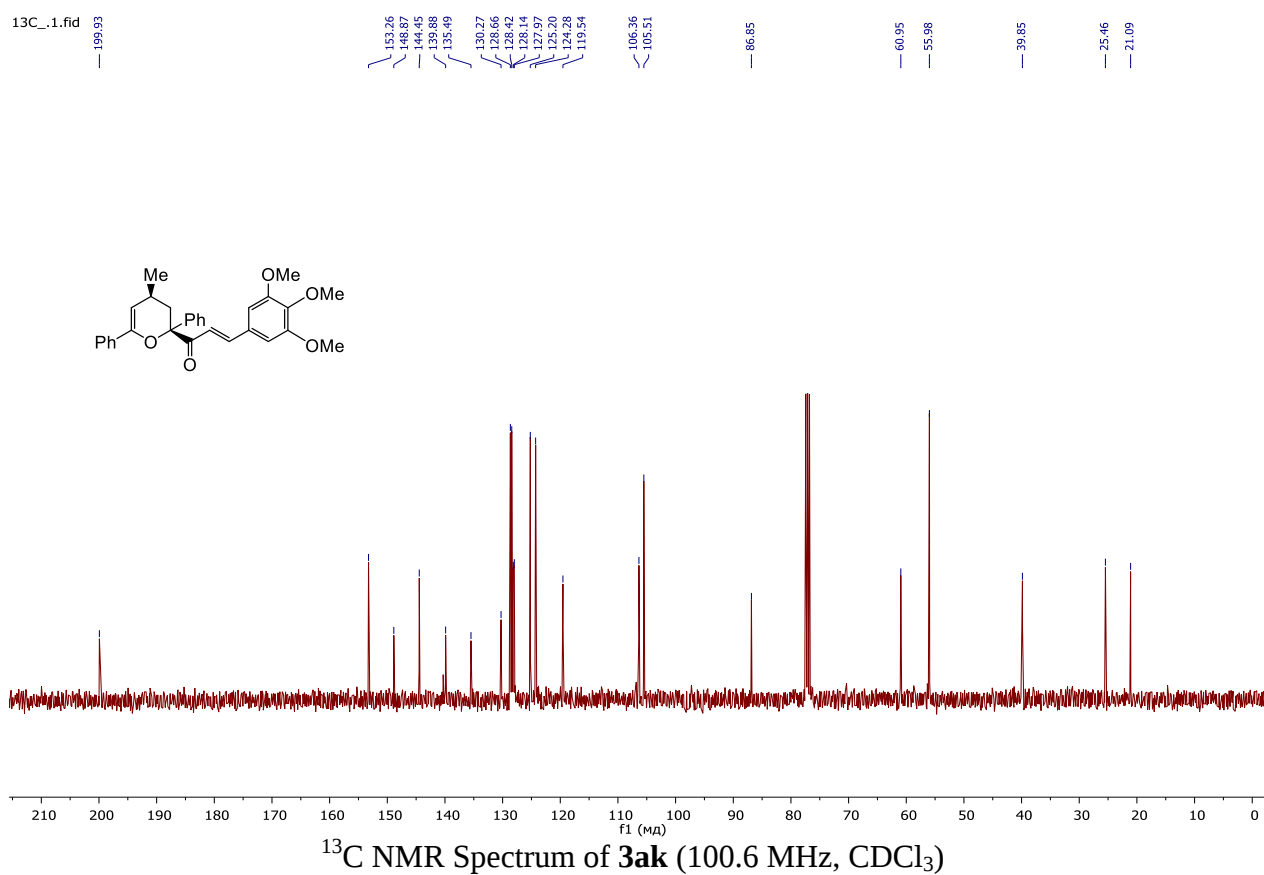
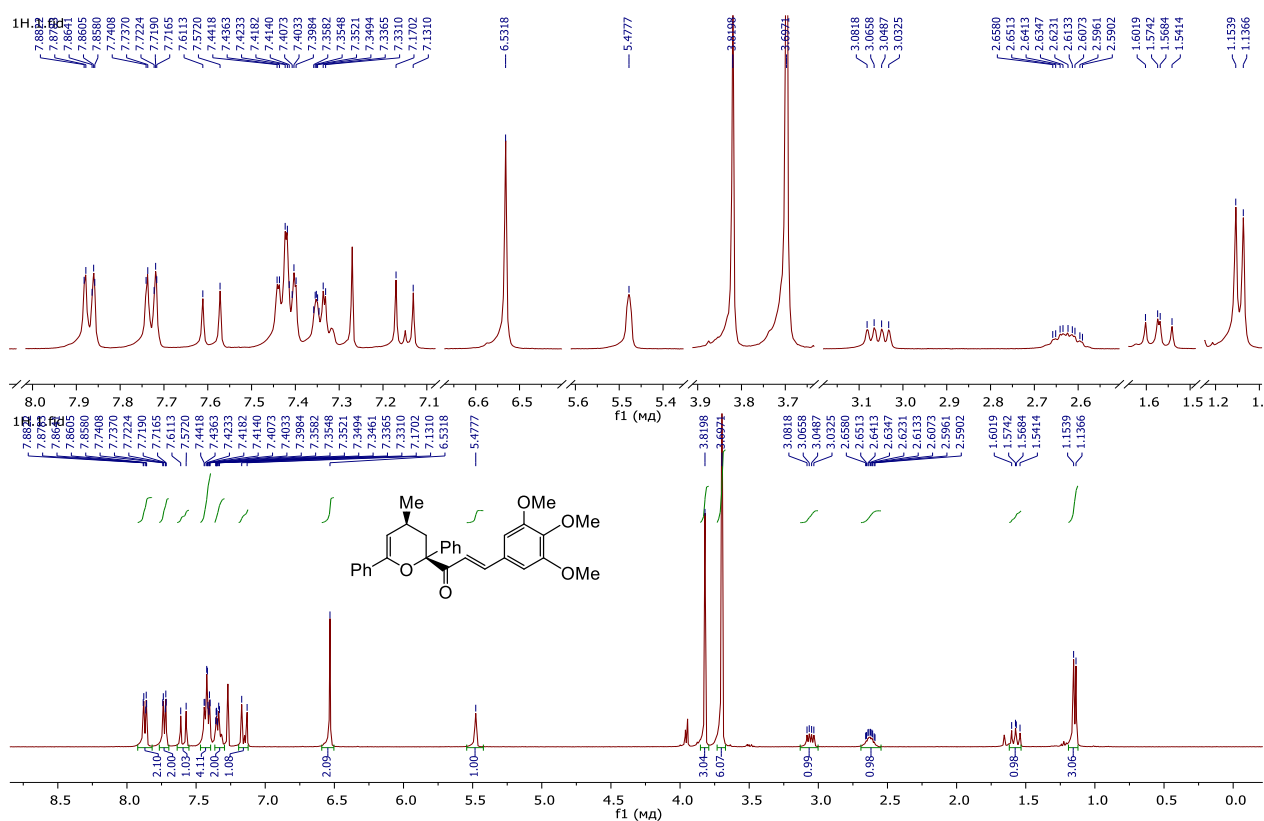


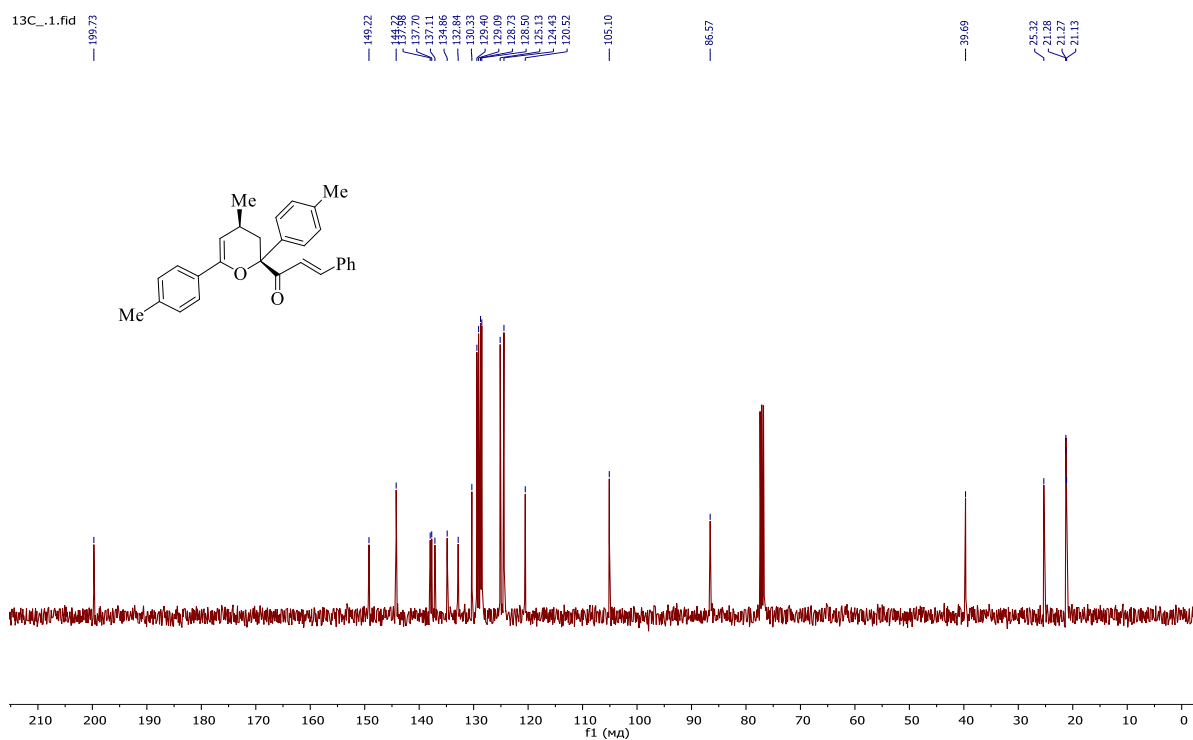
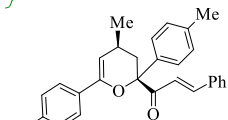
^1H NMR Spectrum of **3ai** (400.1 MHz, CDCl_3)



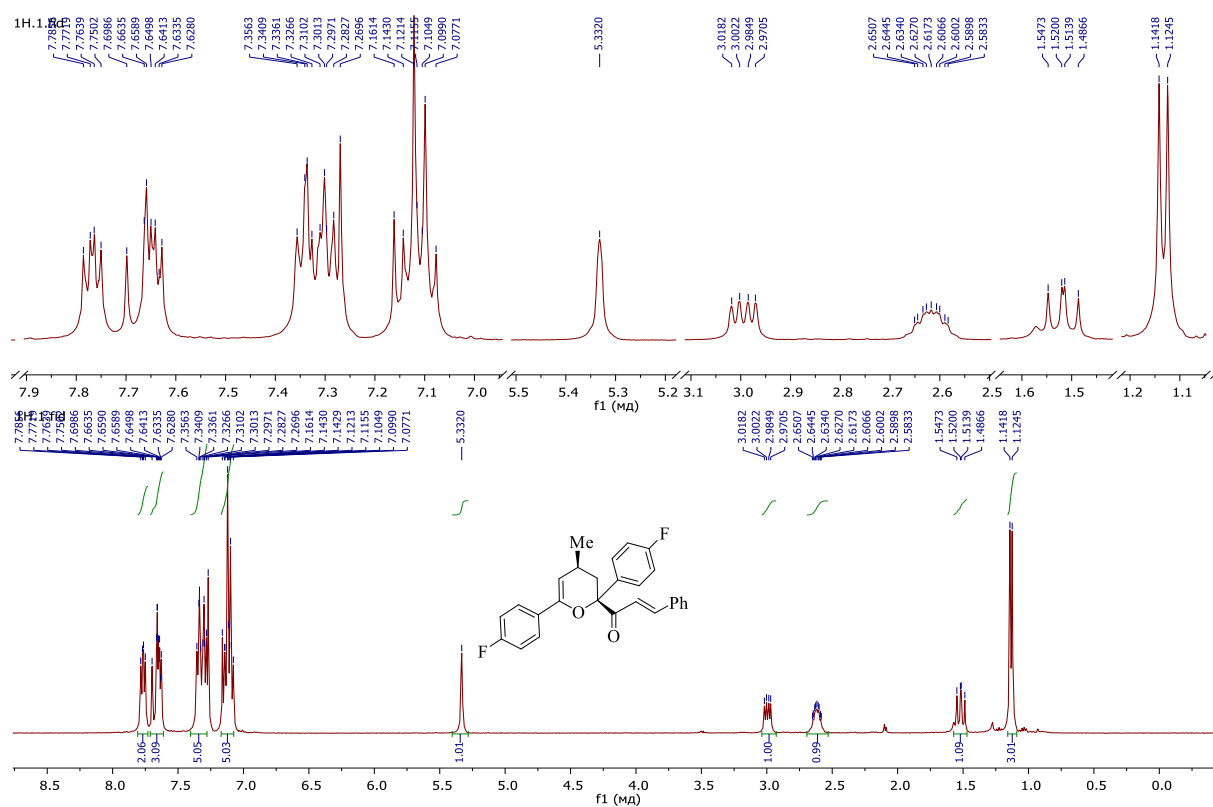
^{13}C NMR Spectrum of **3ai** (100.6 MHz, CDCl_3)



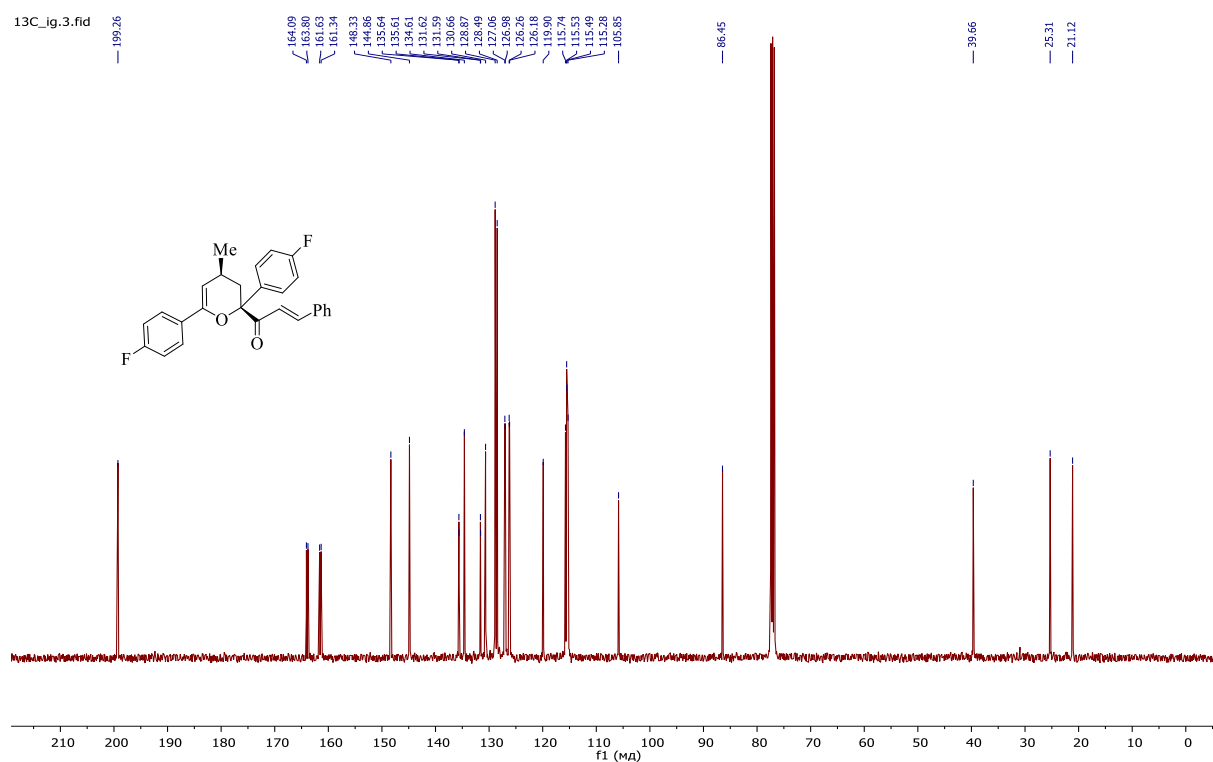




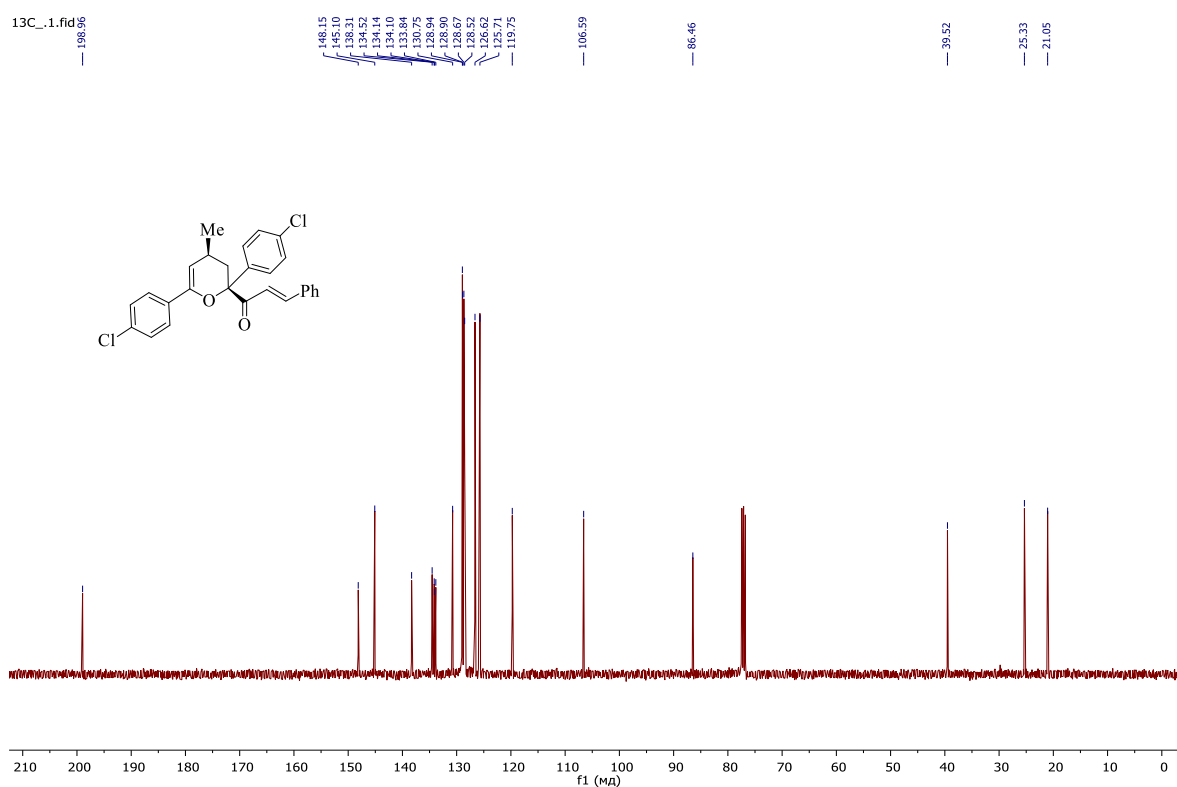
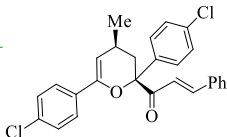
¹³C NMR Spectrum of **3ba** (100.6 MHz, CDCl₃)



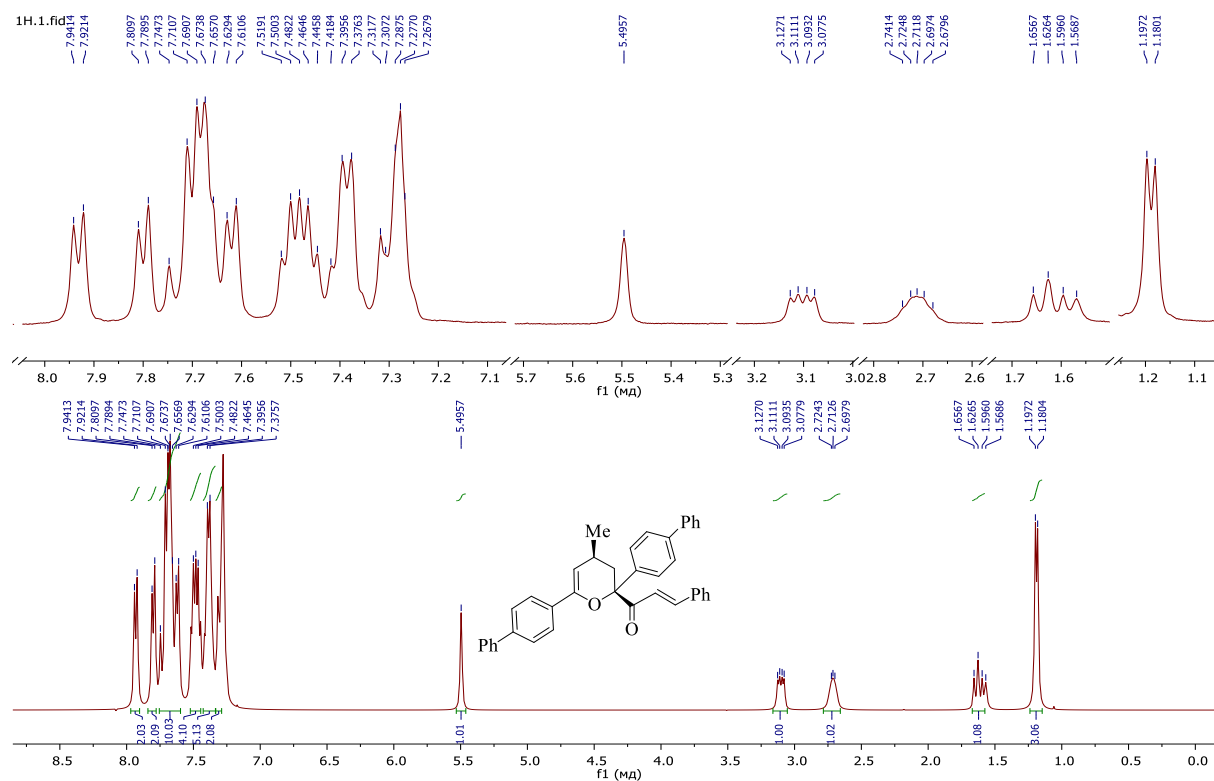
¹H NMR Spectrum of 3ca (400.1 MHz, CDCl₃)



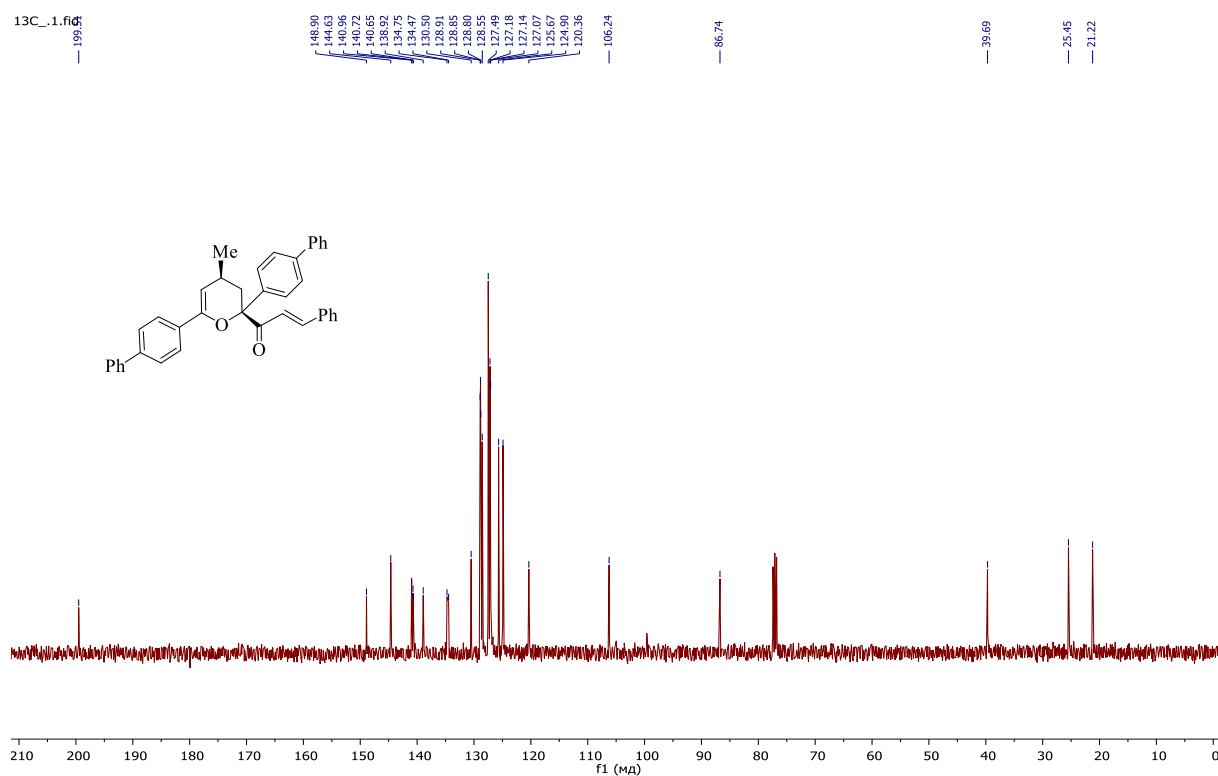
¹³C NMR Spectrum of 3ca (100.6 MHz, CDCl₃)



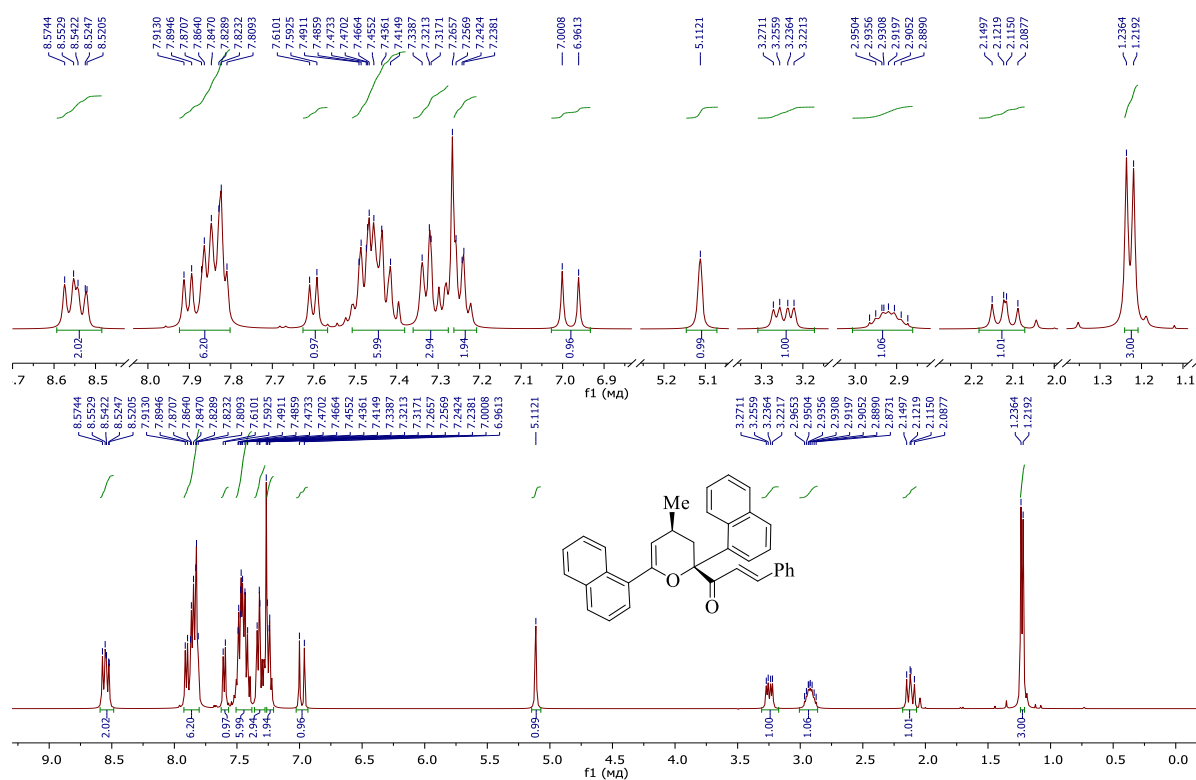
¹³C NMR Spectrum of **3da** (100.6 MHz, CDCl₃)



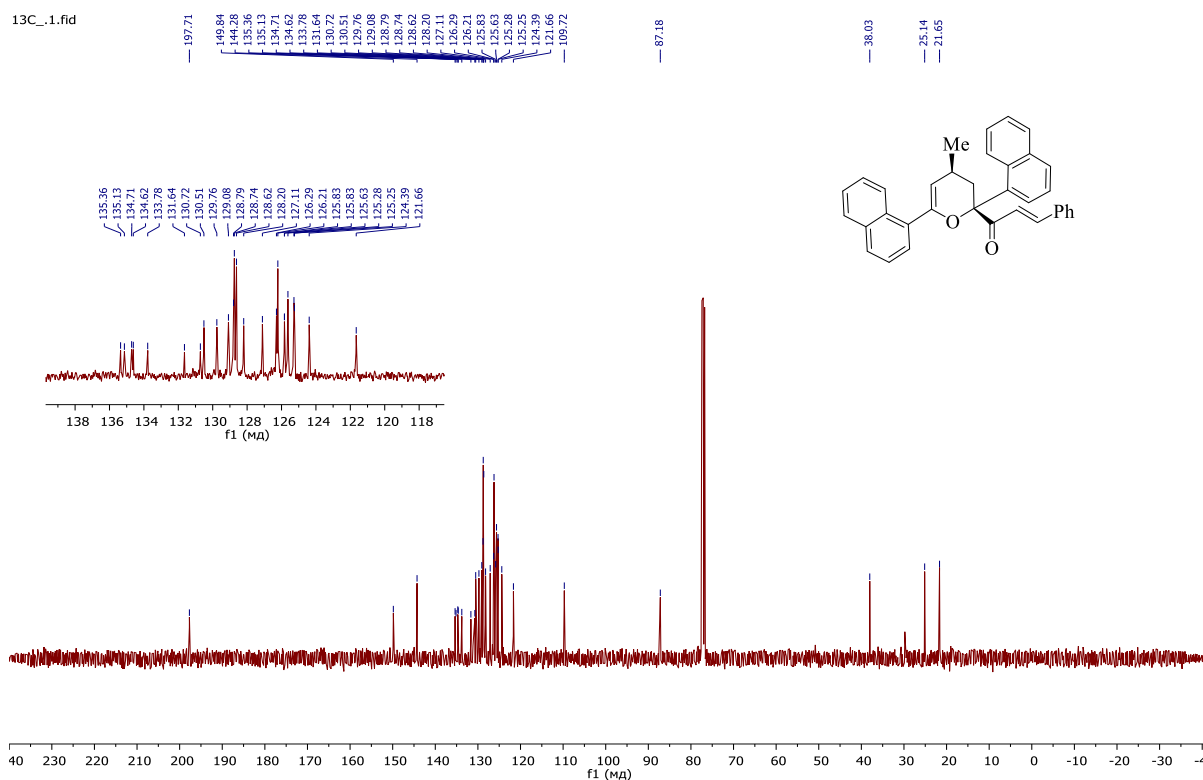
¹H NMR Spectrum of **3ea (400.1 MHz, CDCl₃)**



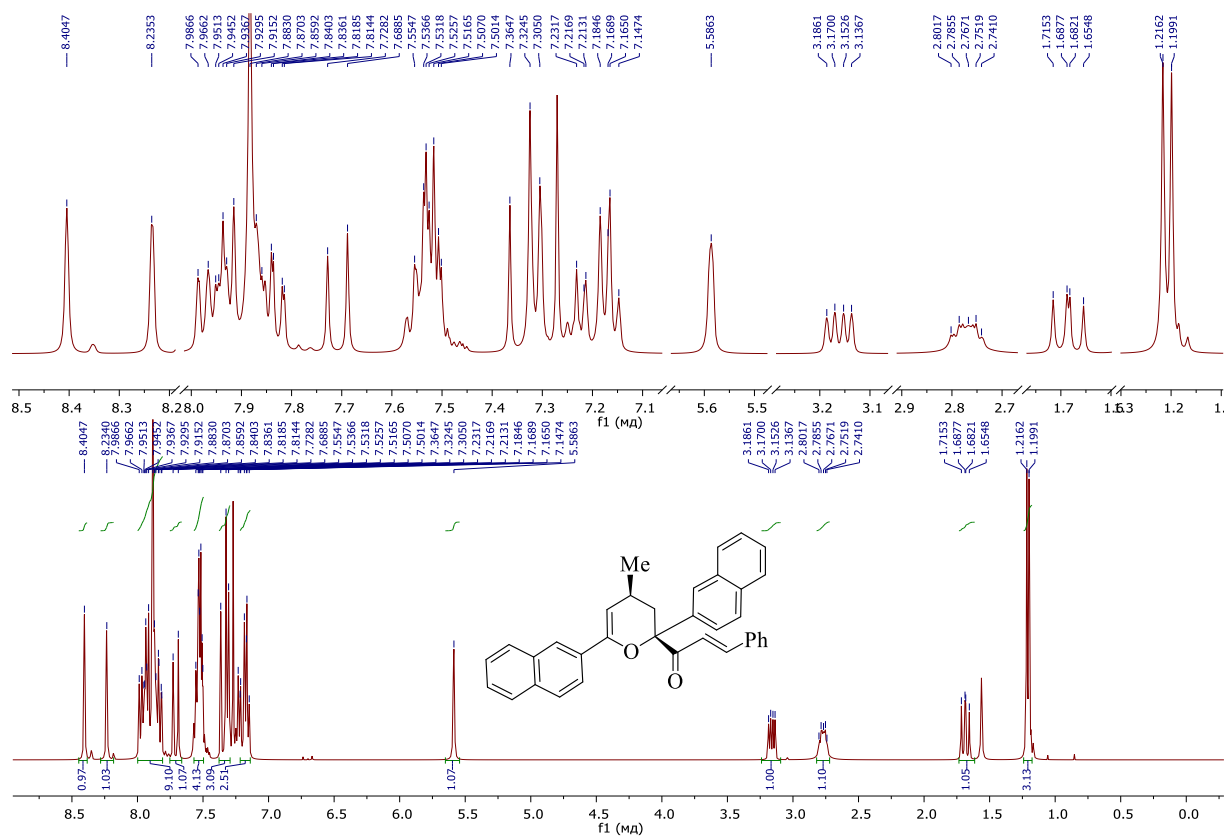
¹³C NMR Spectrum of **3ea (100.6 MHz, CDCl₃)**



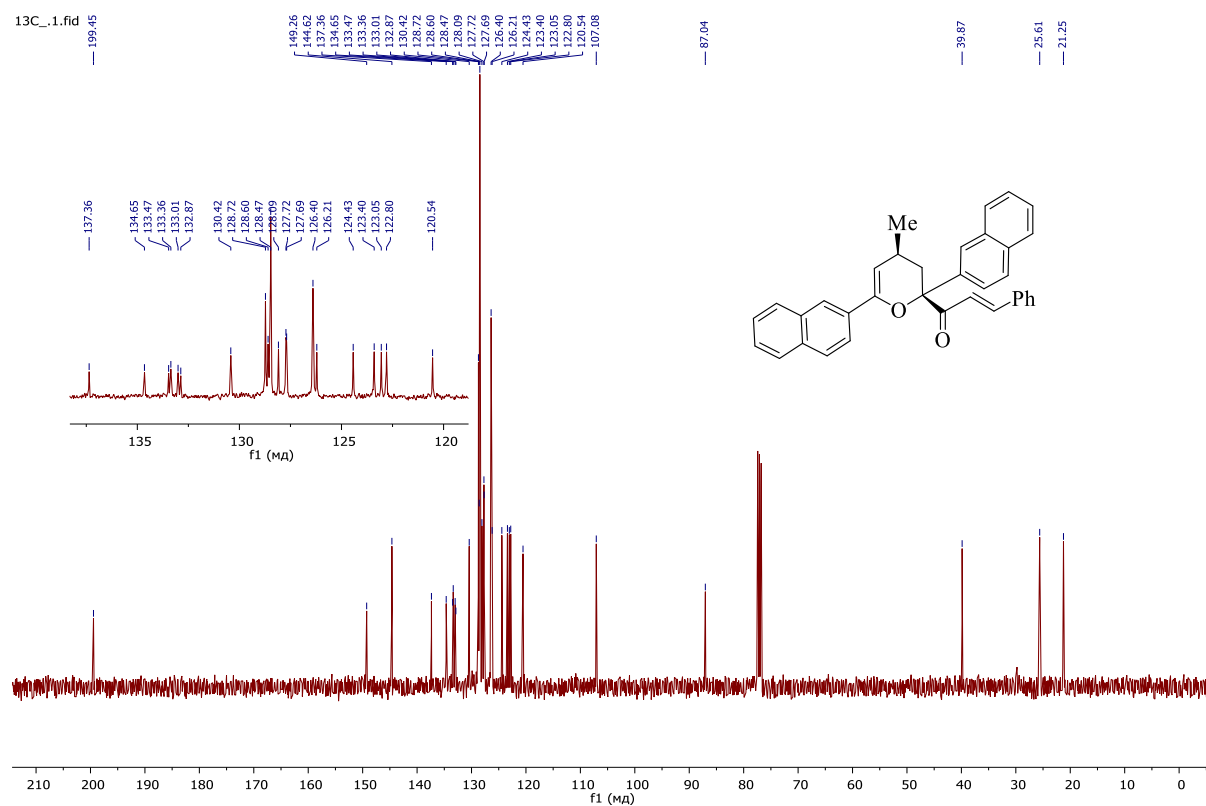
¹H NMR Spectrum of 3fa (400.1 MHz, CDCl₃)



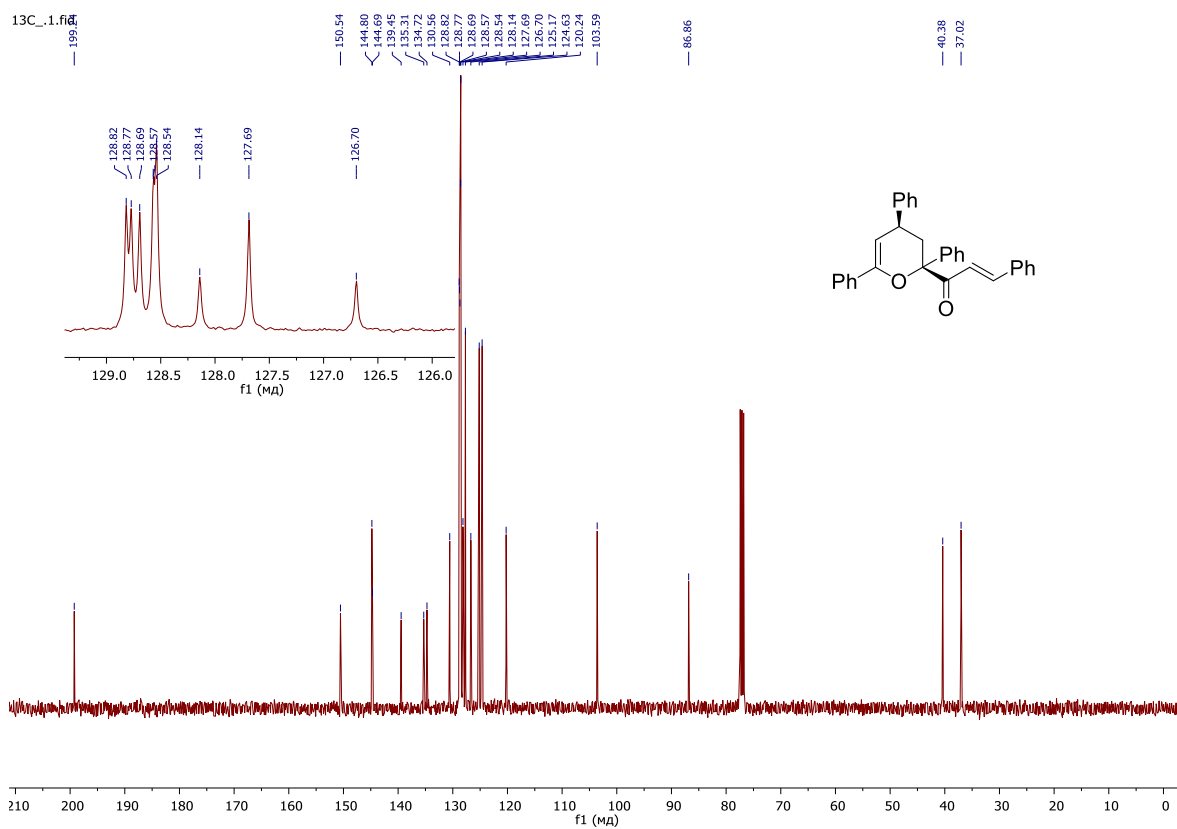
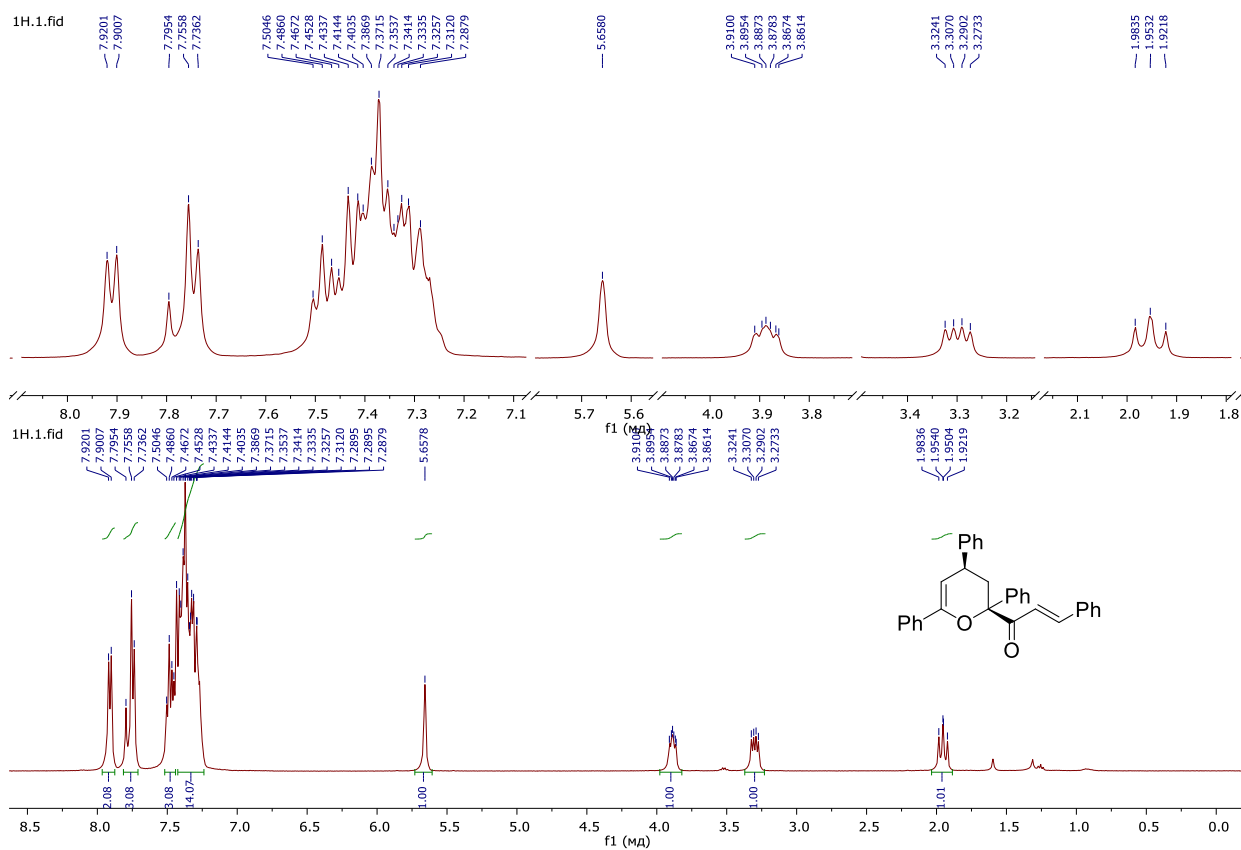
¹³C NMR Spectrum of 3fa (100.6 MHz, CDCl₃)



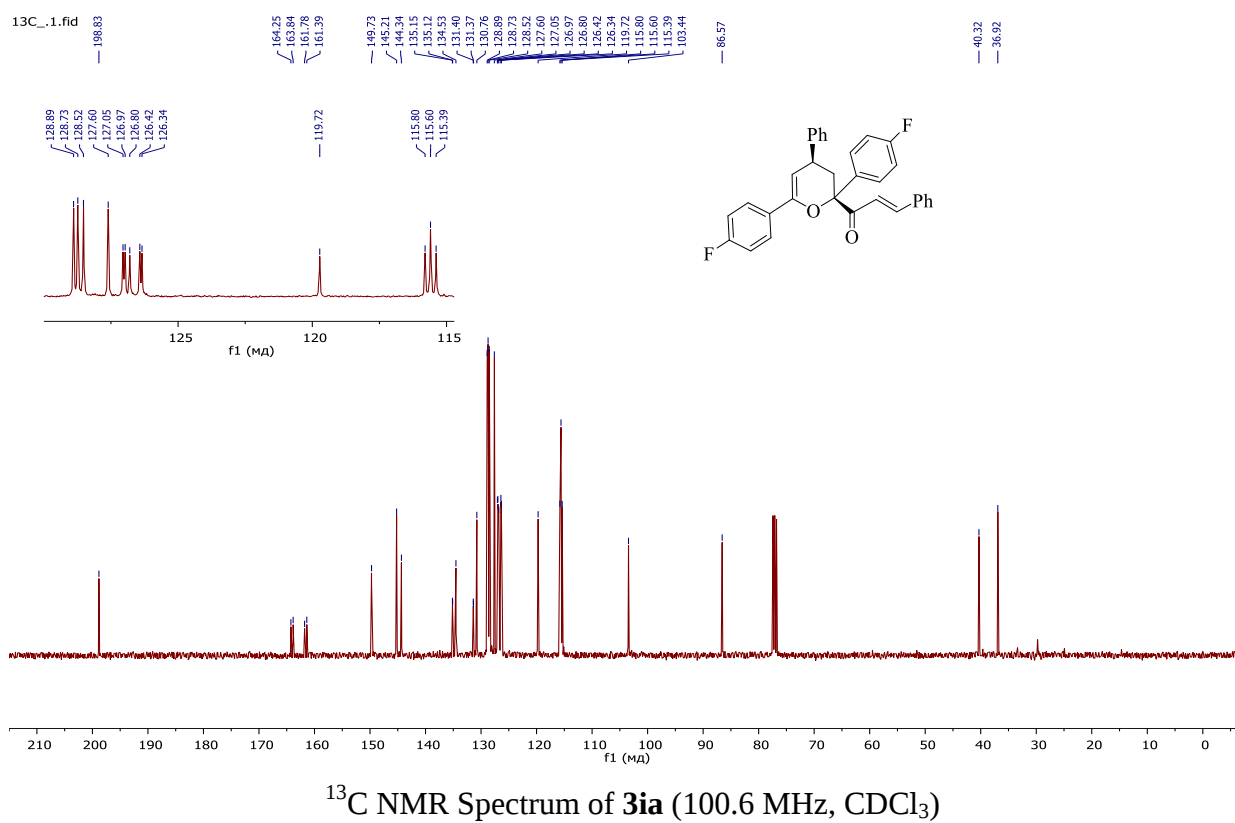
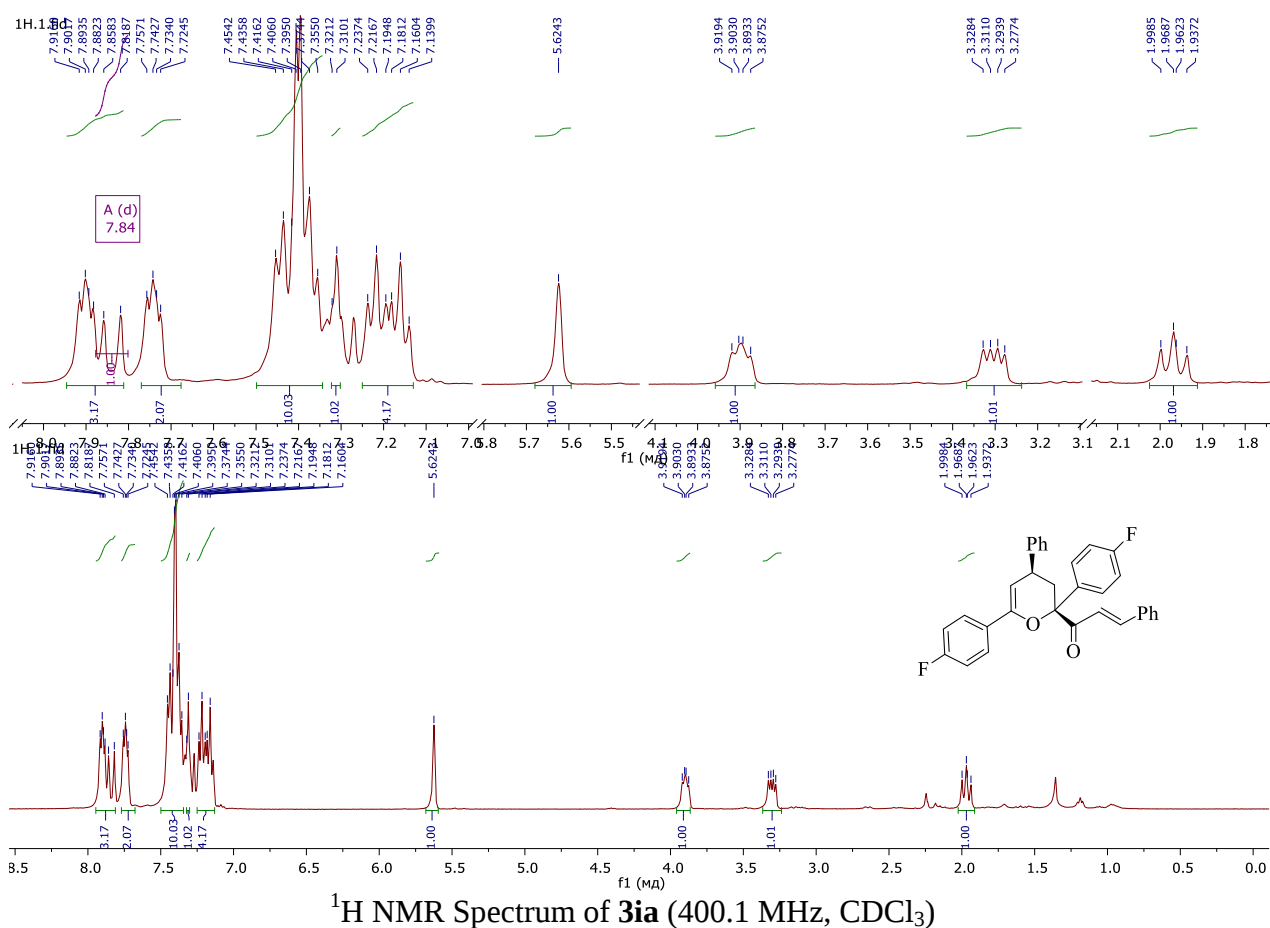
¹H NMR Spectrum of 3ga (400.1 MHz, CDCl₃)

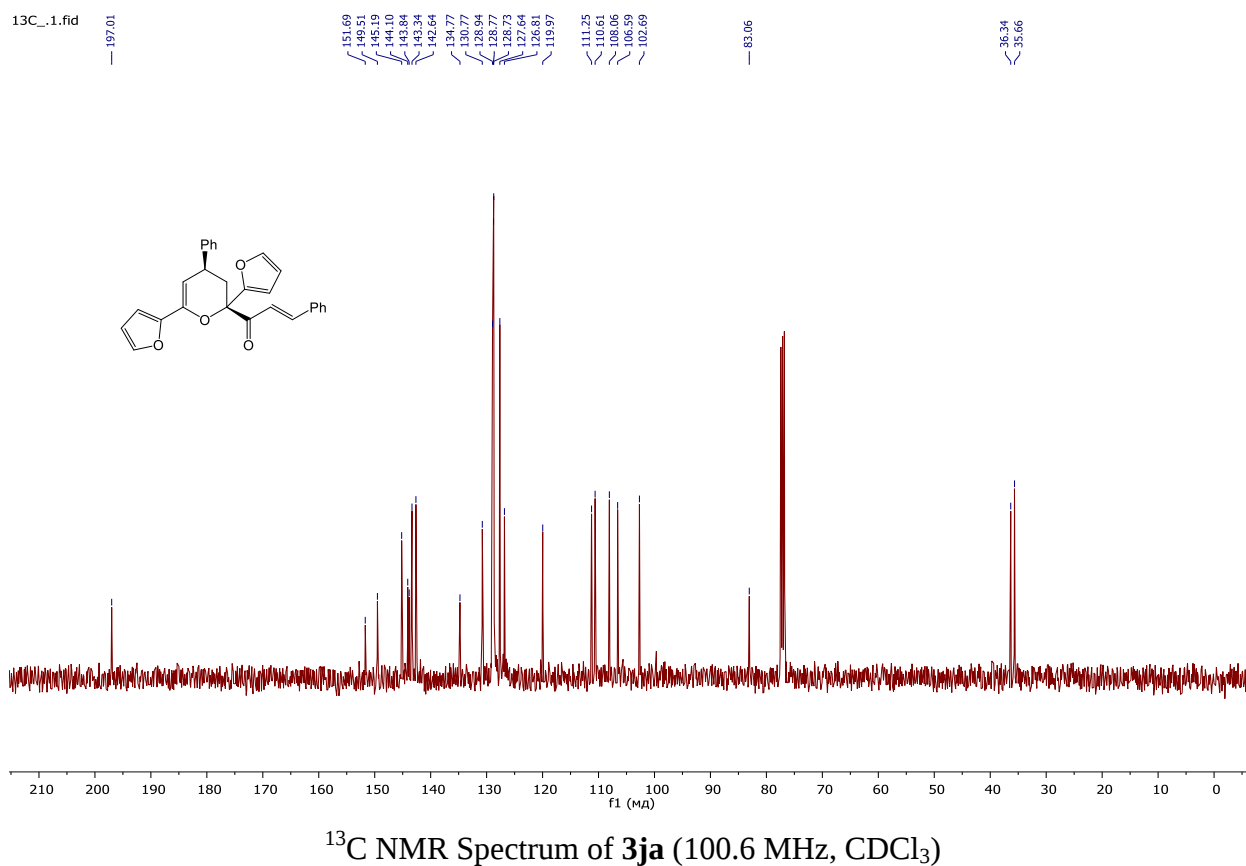
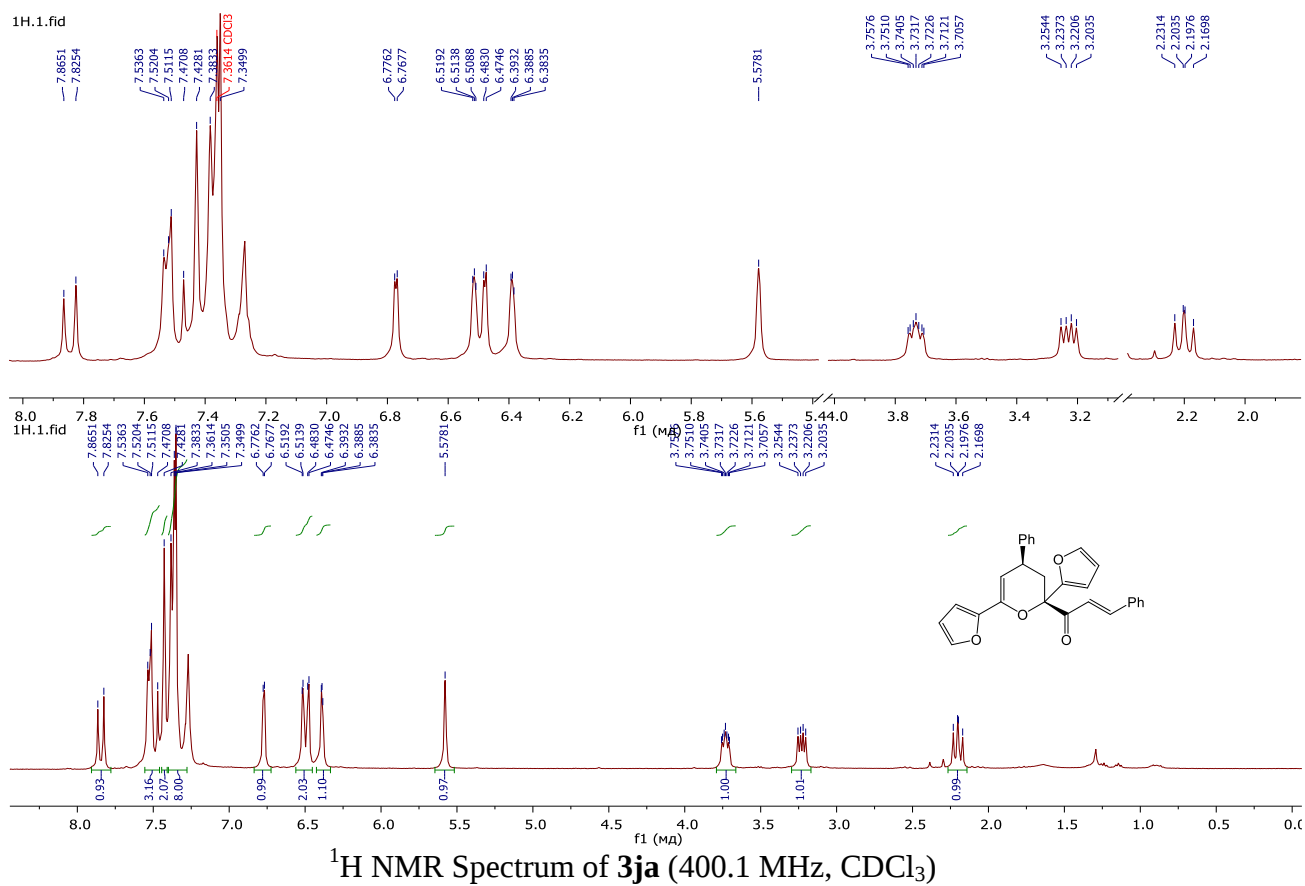


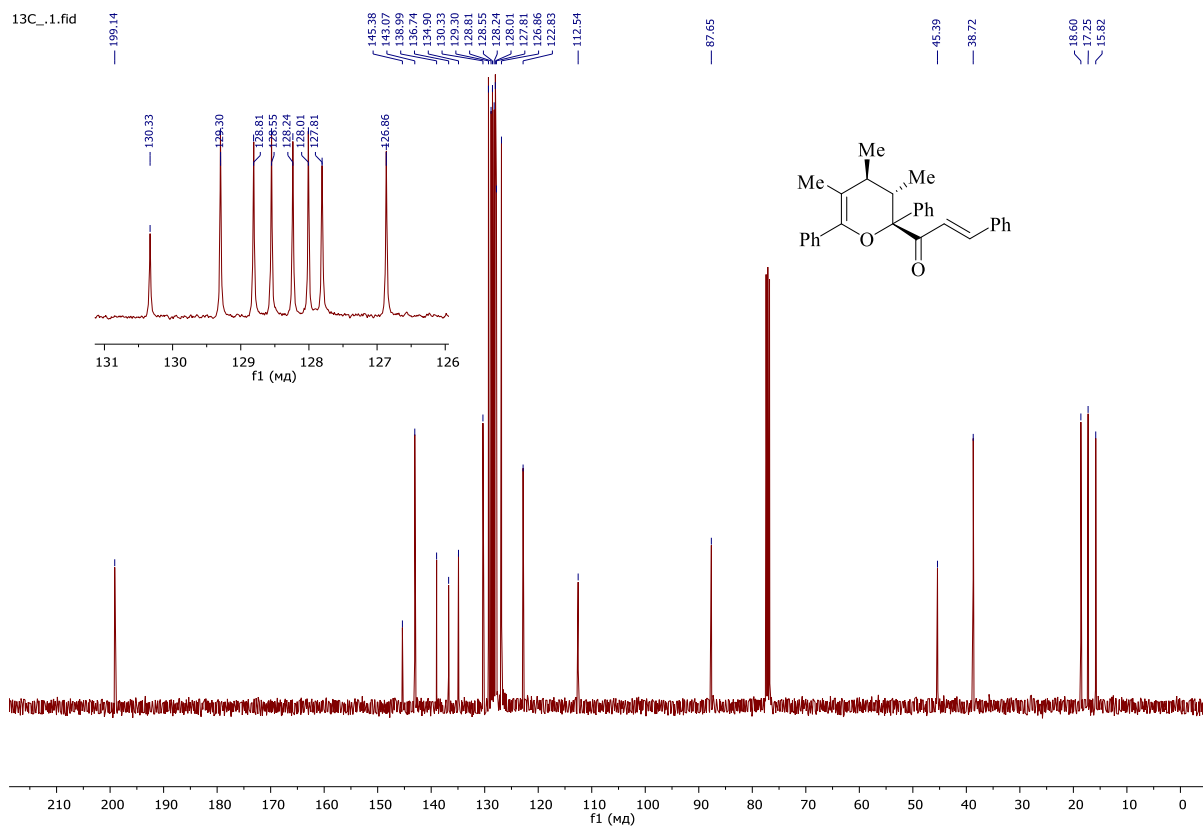
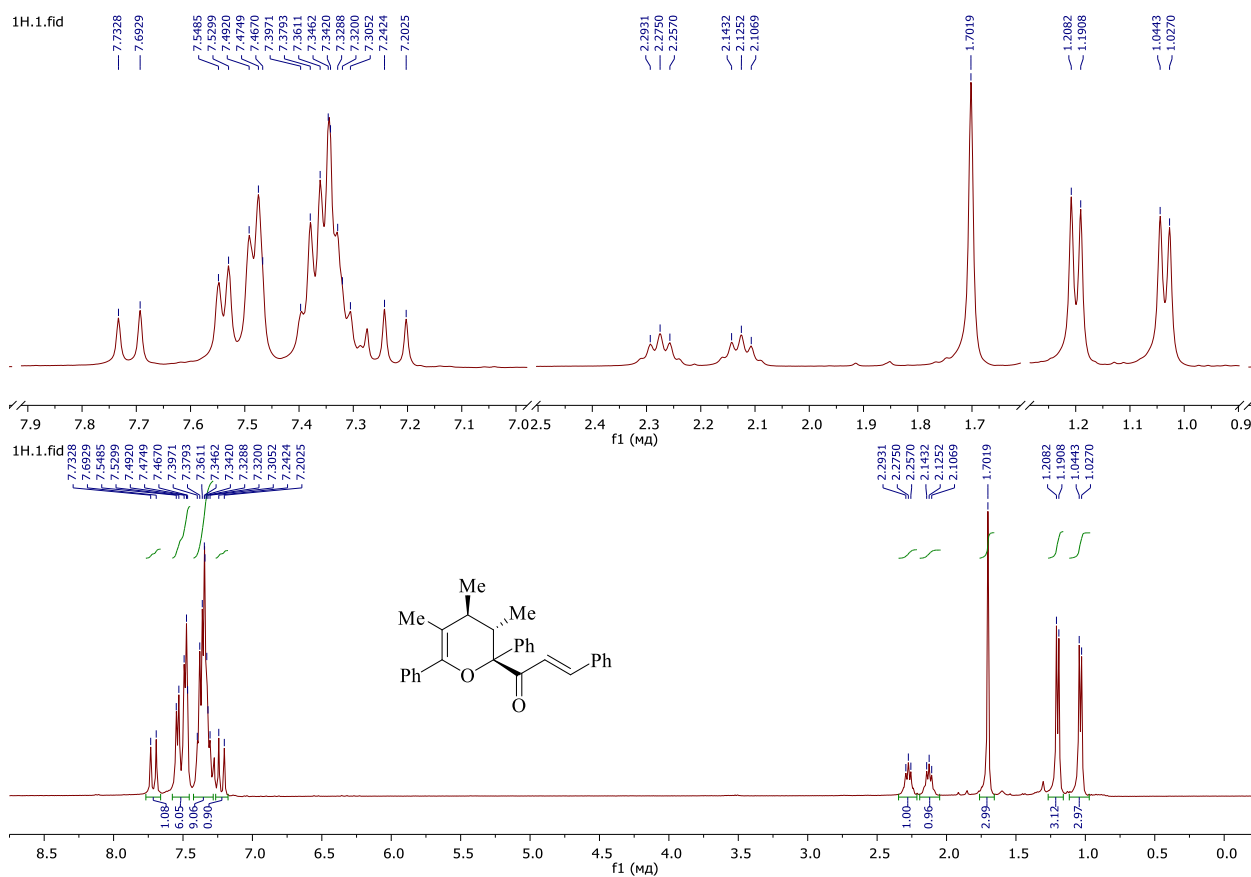
¹³C NMR Spectrum of 3ga (100.6 MHz, CDCl₃)

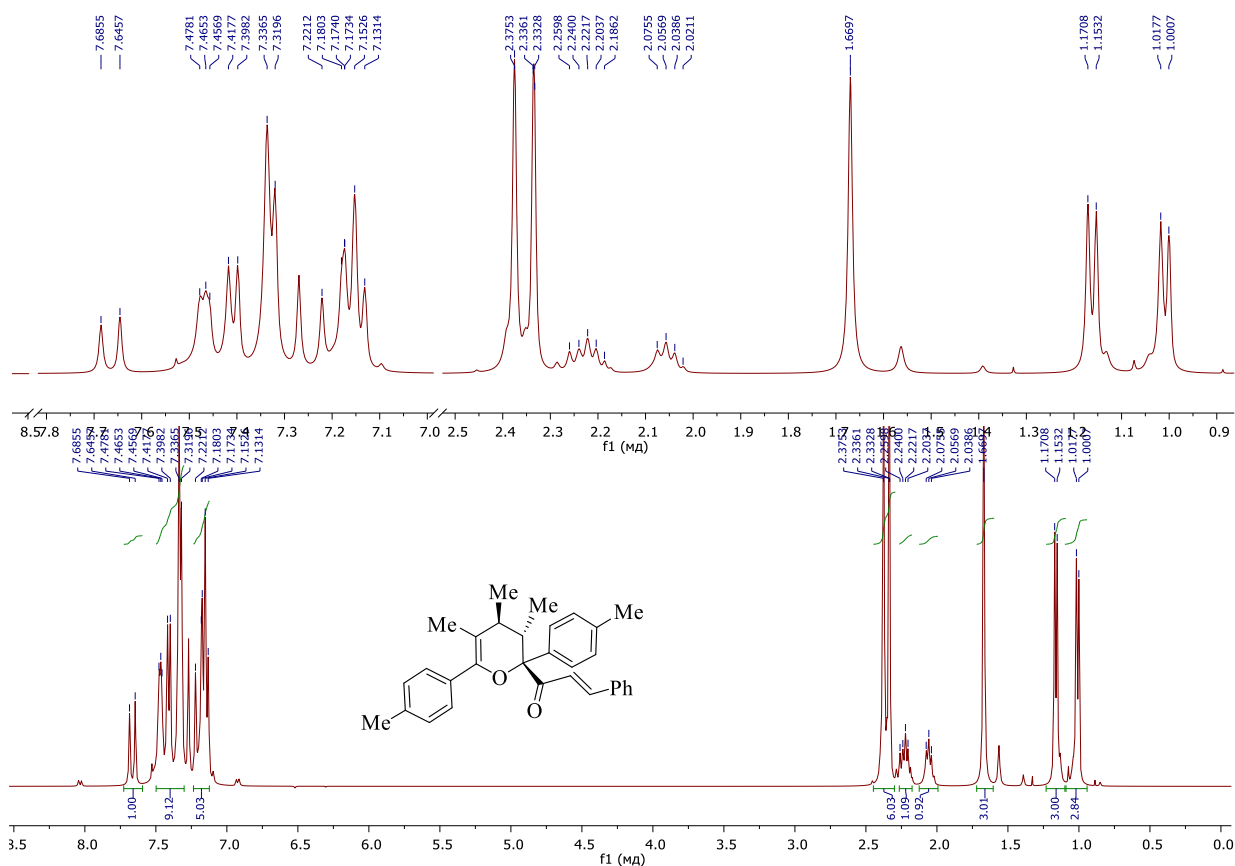


¹³C NMR Spectrum of **3ha** (100.6 MHz, CDCl₃)

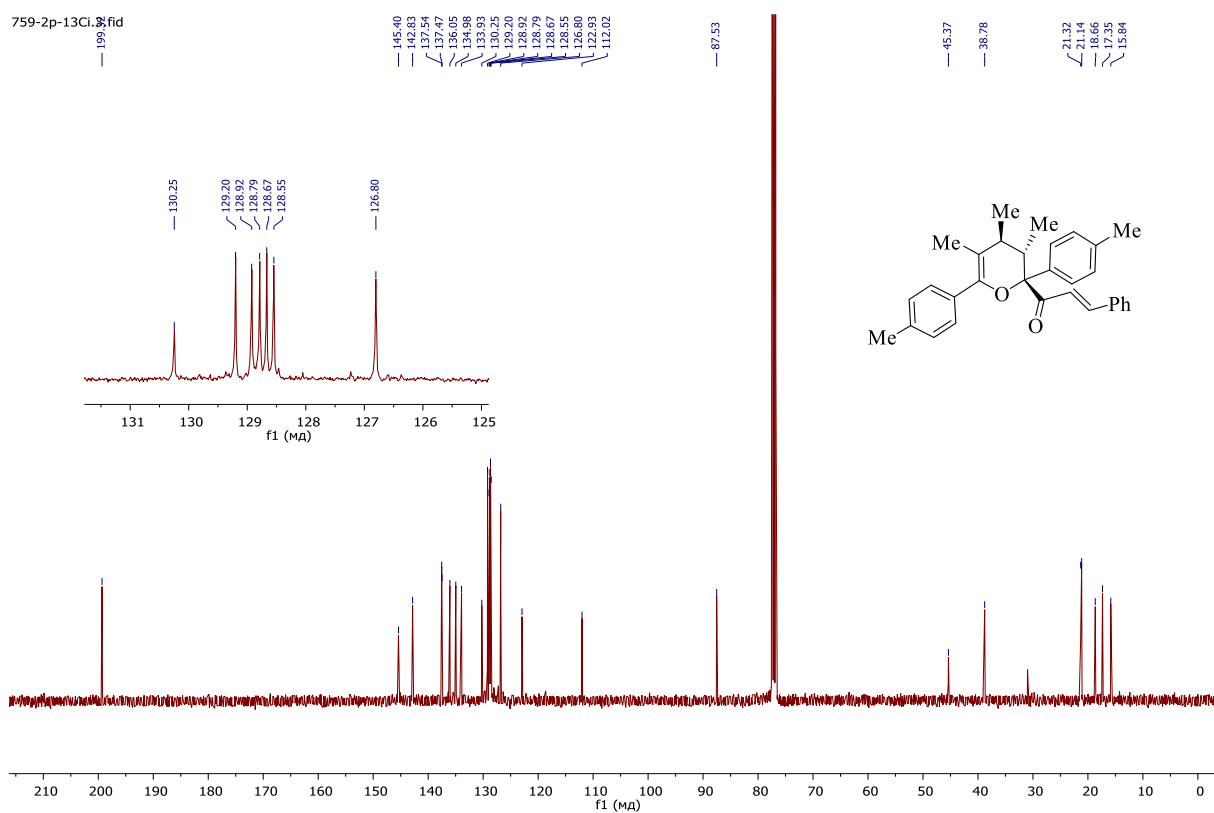




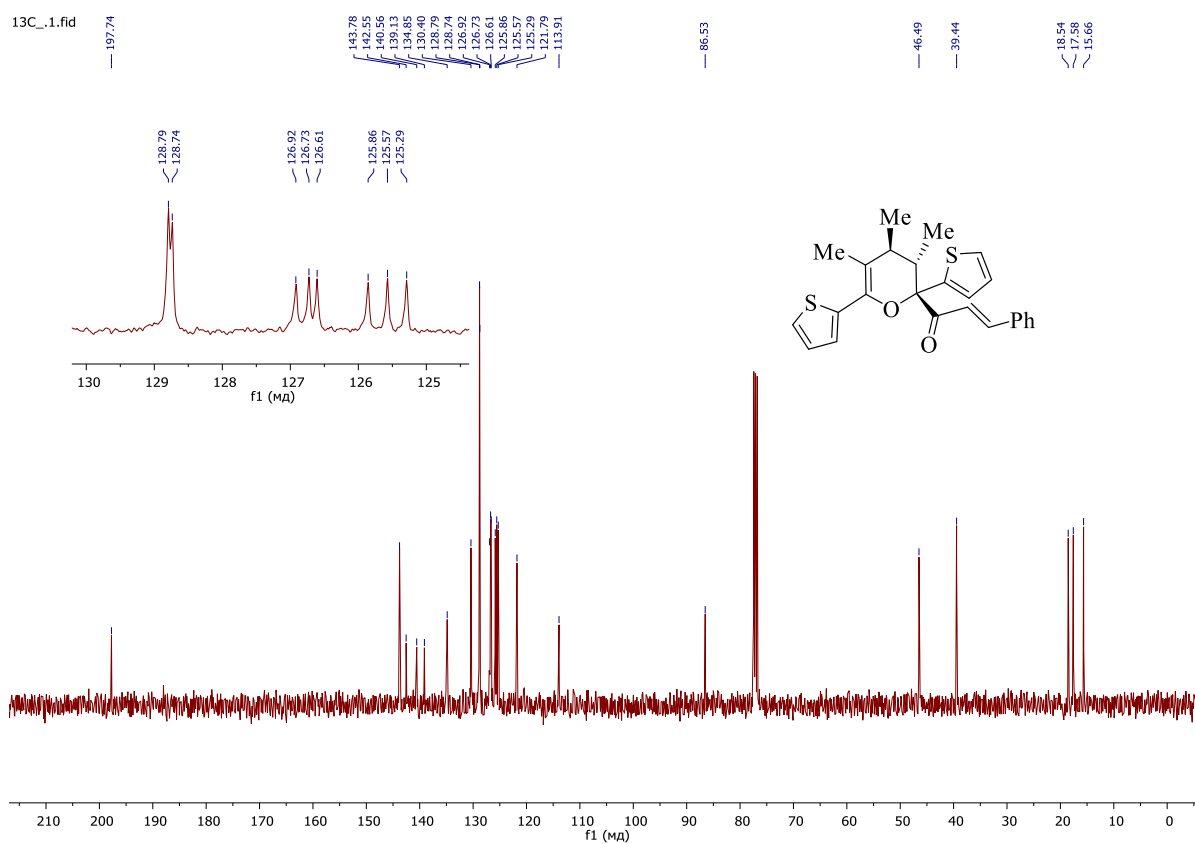
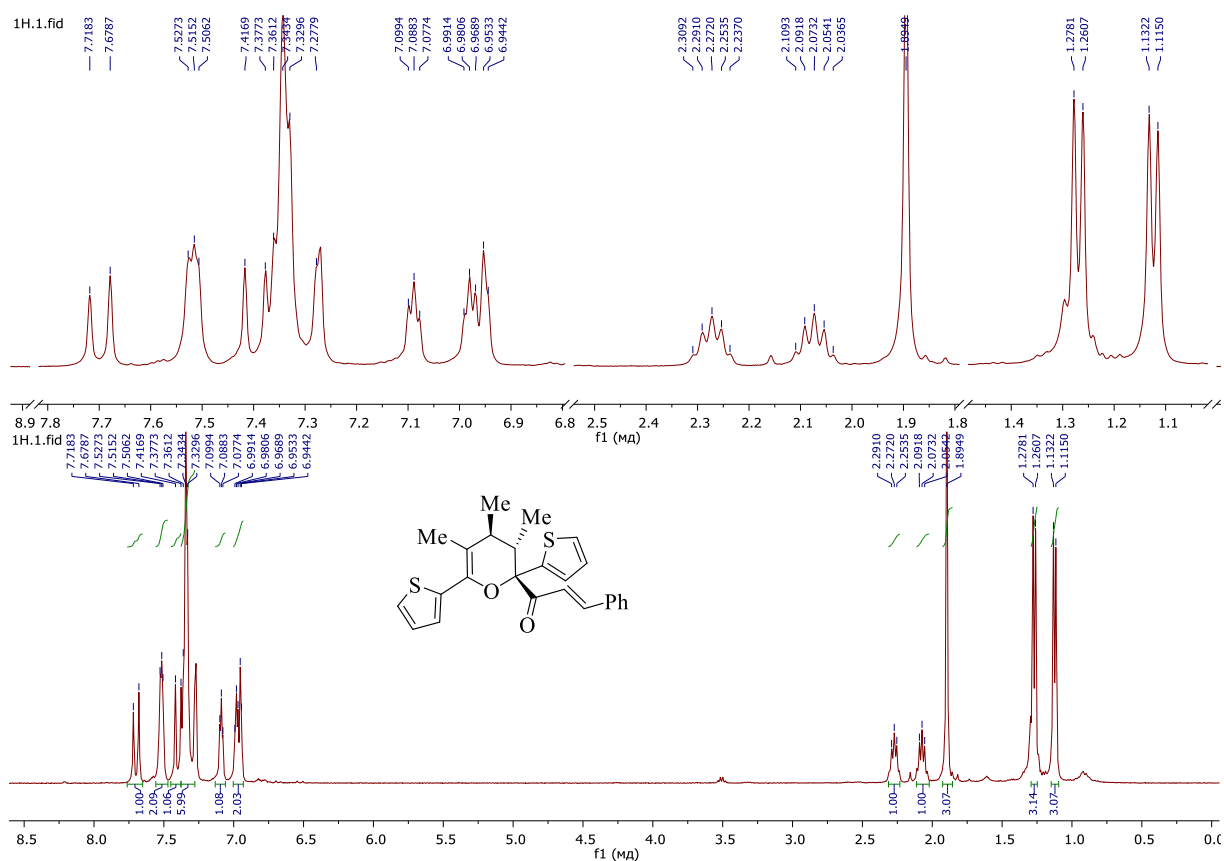




¹H NMR Spectrum of 3la (400.1 MHz, CDCl₃)

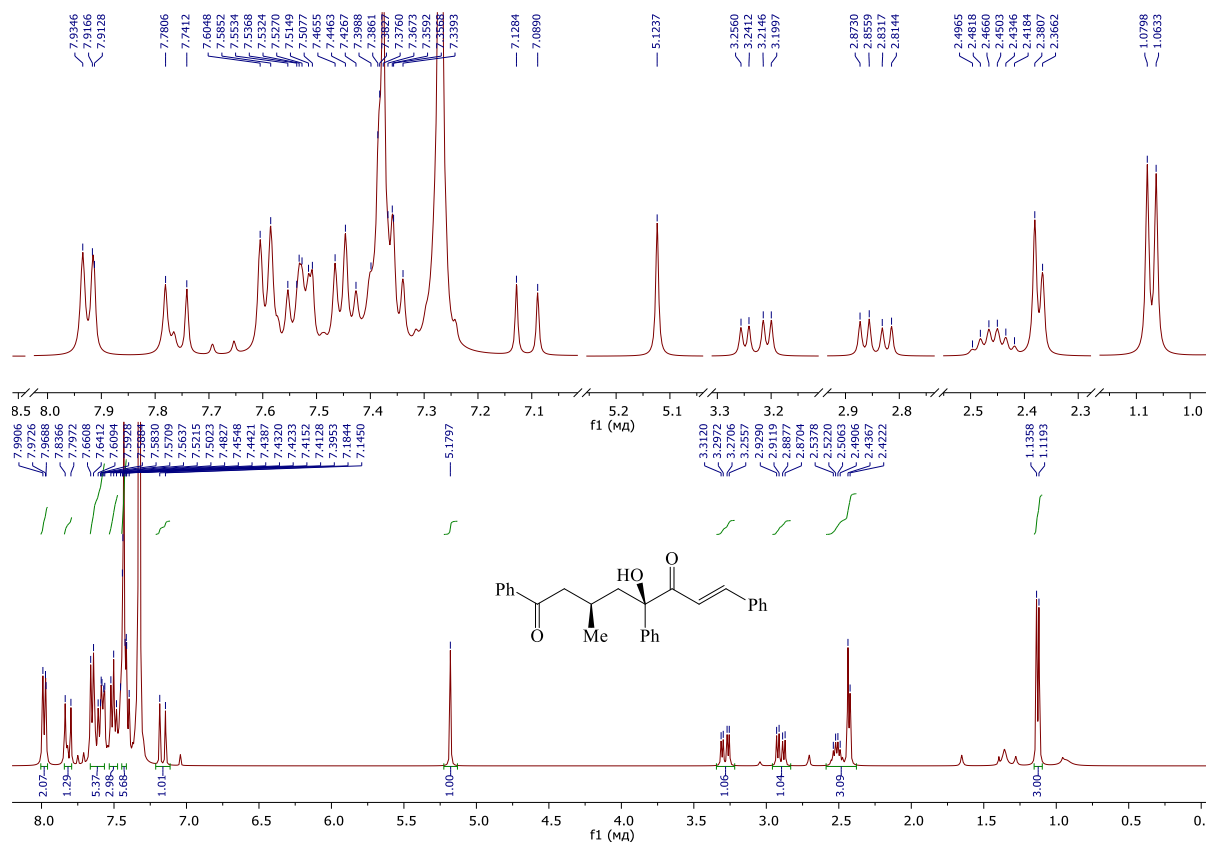


¹³C NMR Spectrum of 3la (100.6 MHz, CDCl₃)

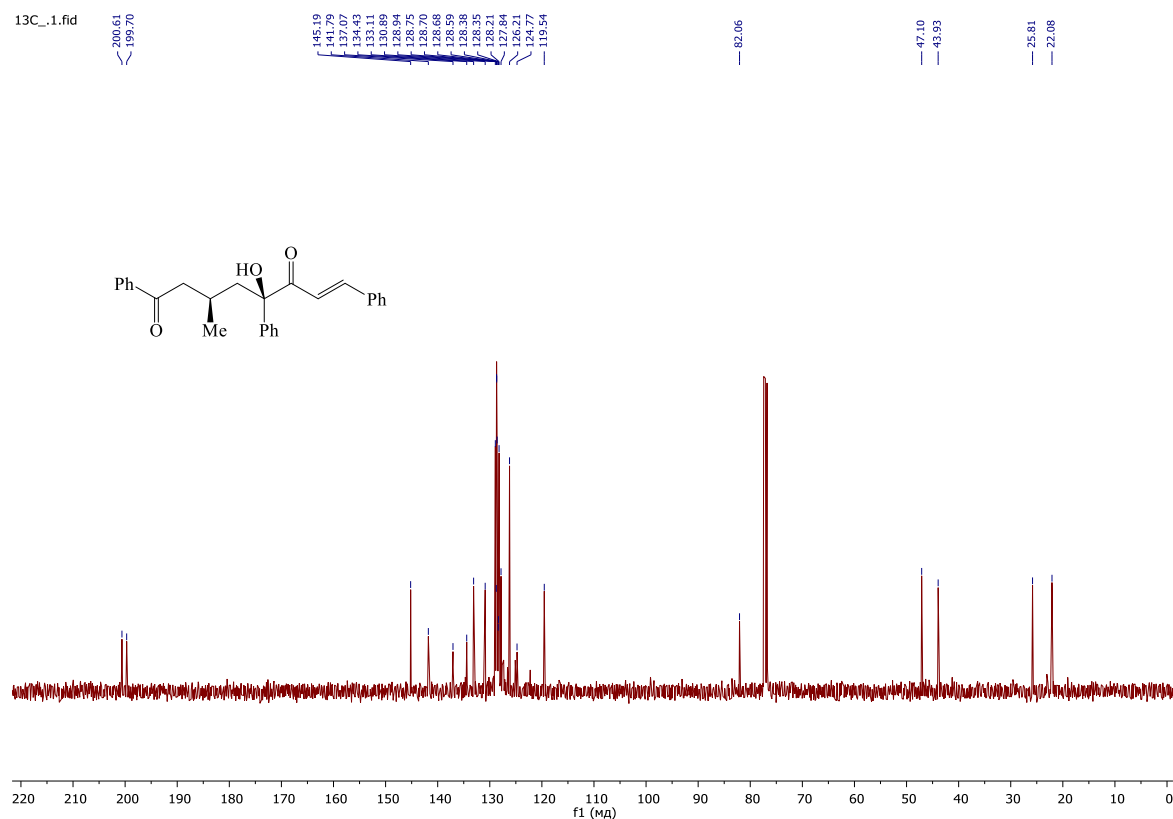


¹³C NMR Spectrum of **3ma** (100.6 MHz, CDCl₃)

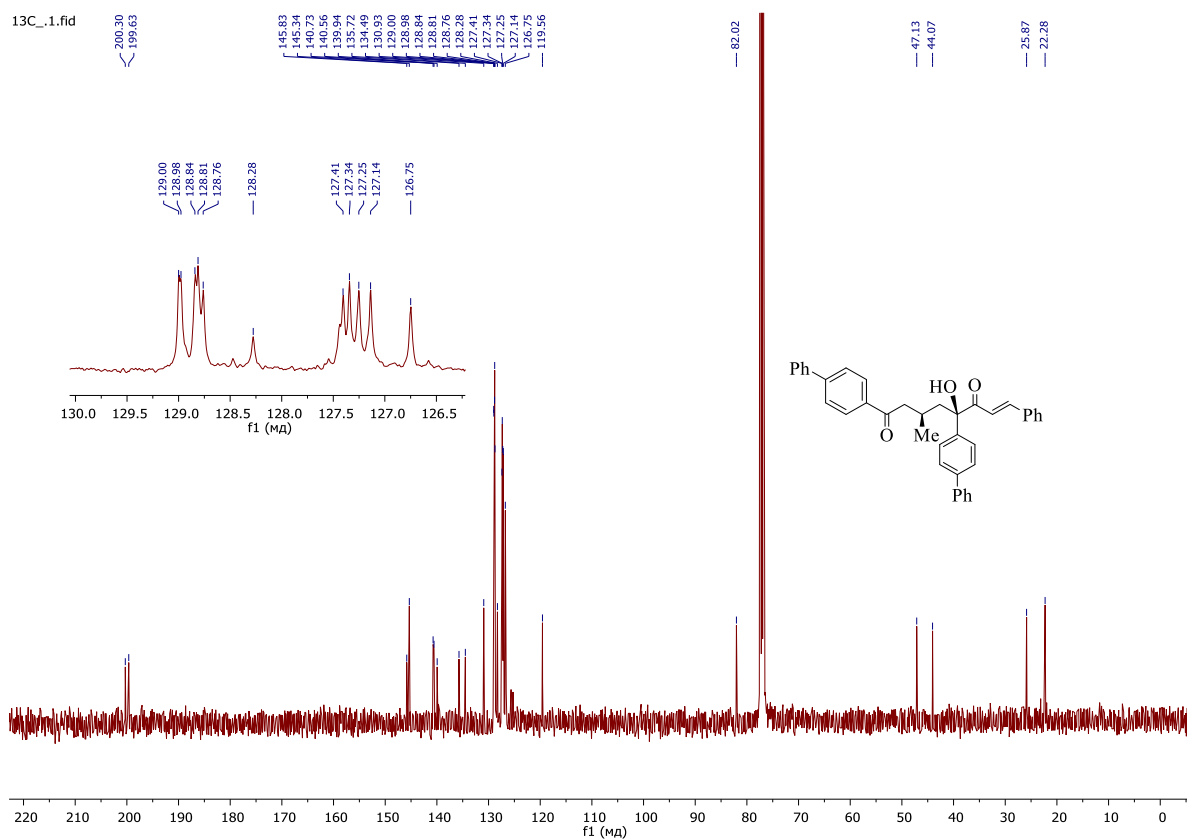
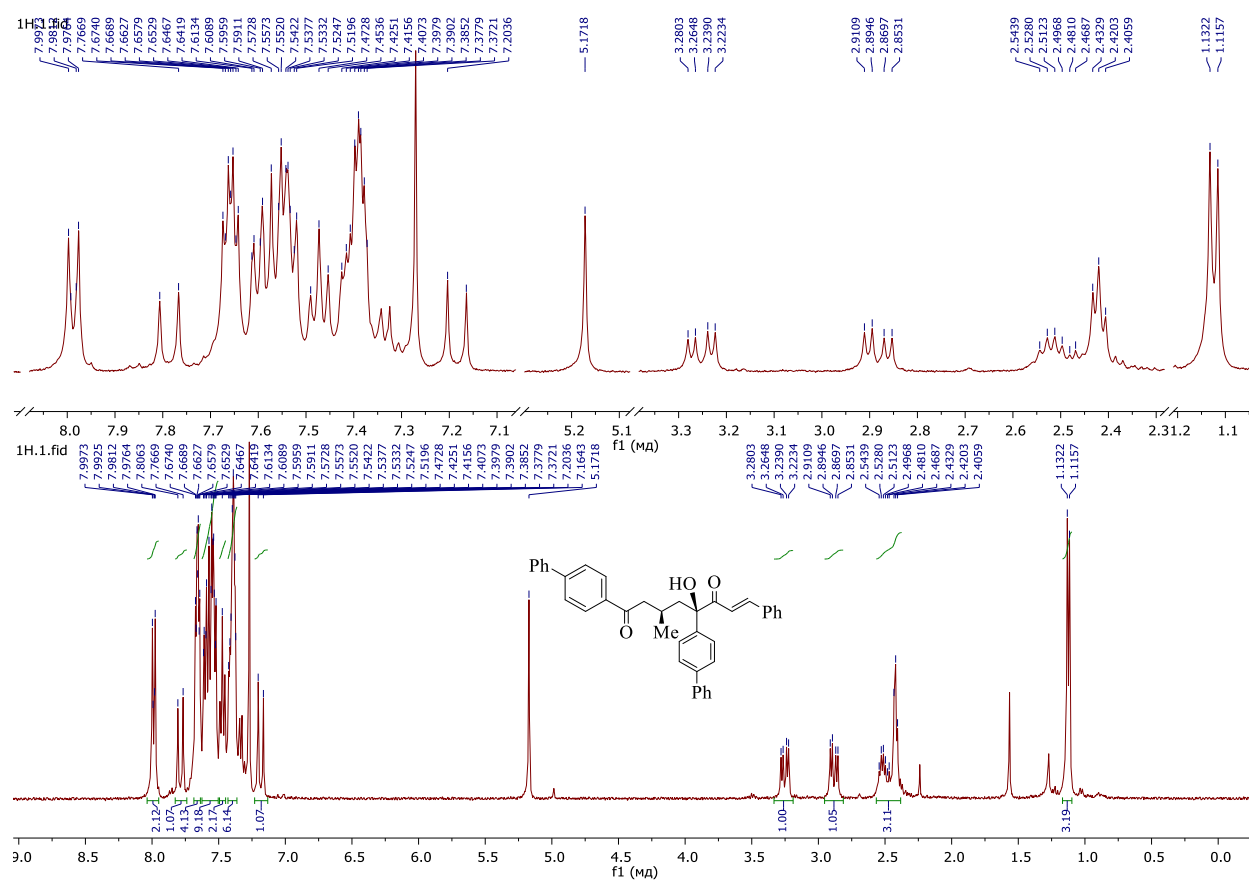
2. ^1H and ^{13}C NMR Spectra of 1,6-diketones 4



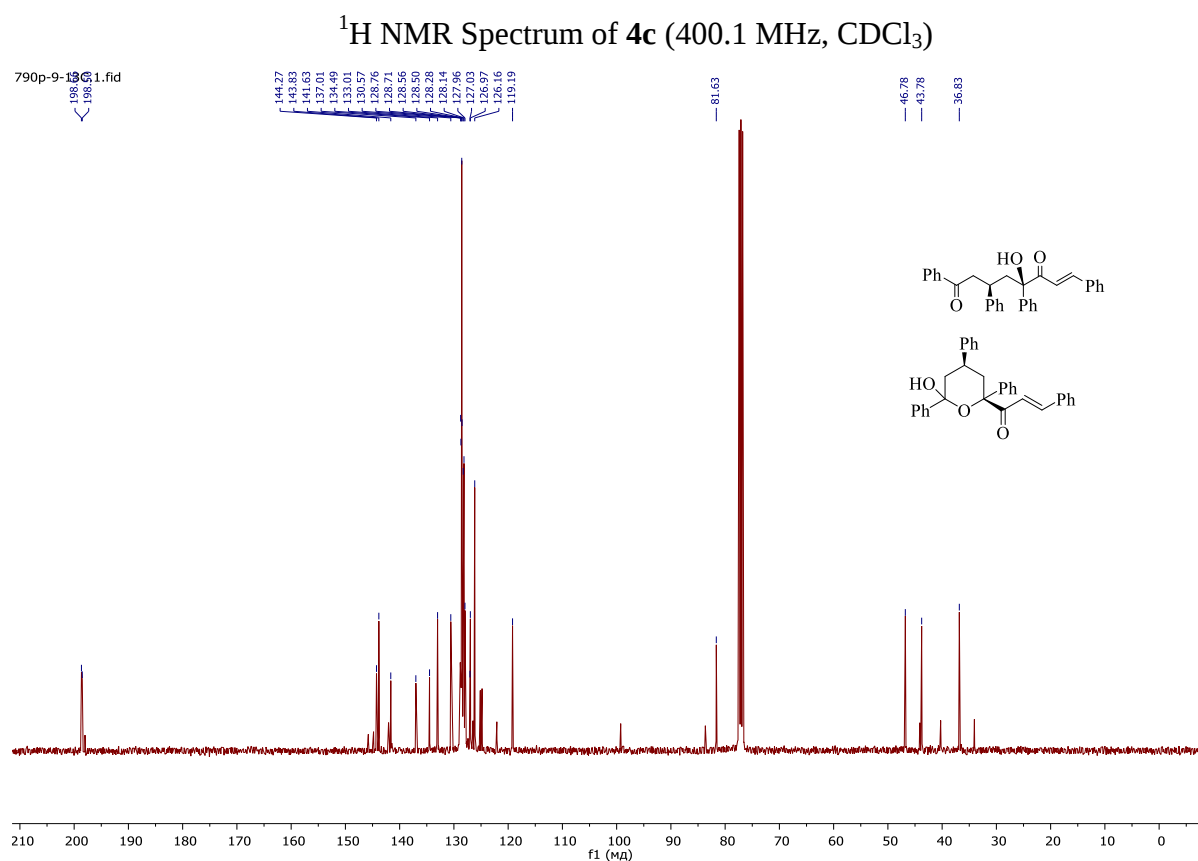
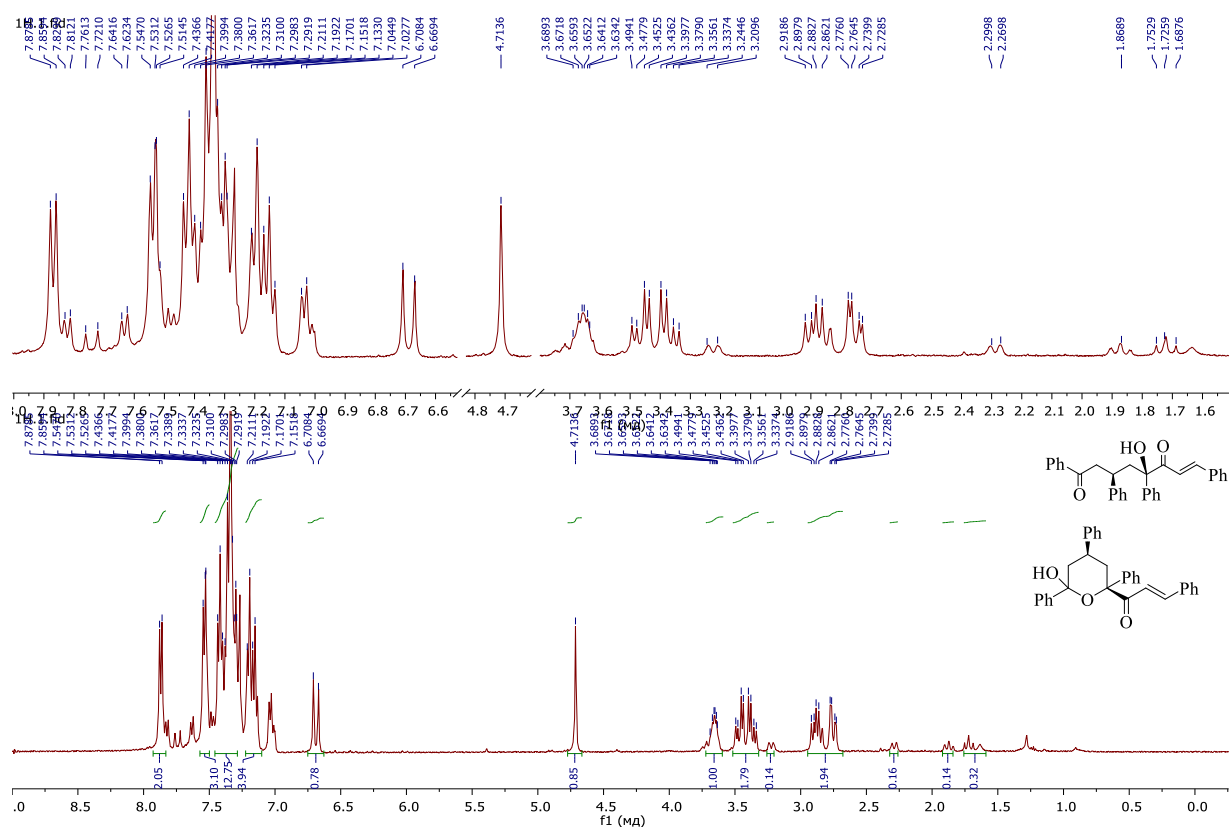
^1H NMR Spectrum of **4a** (400.1 MHz, CDCl_3)



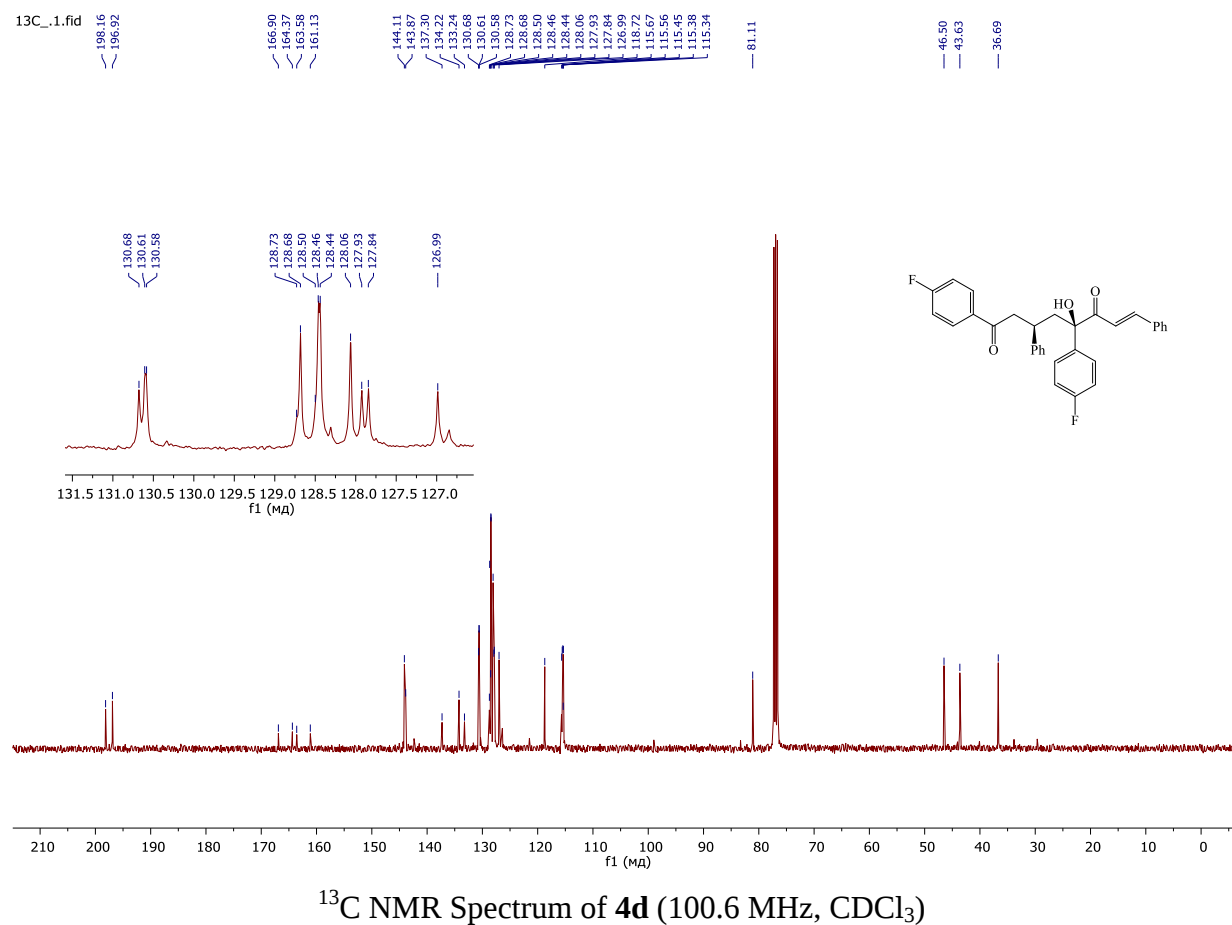
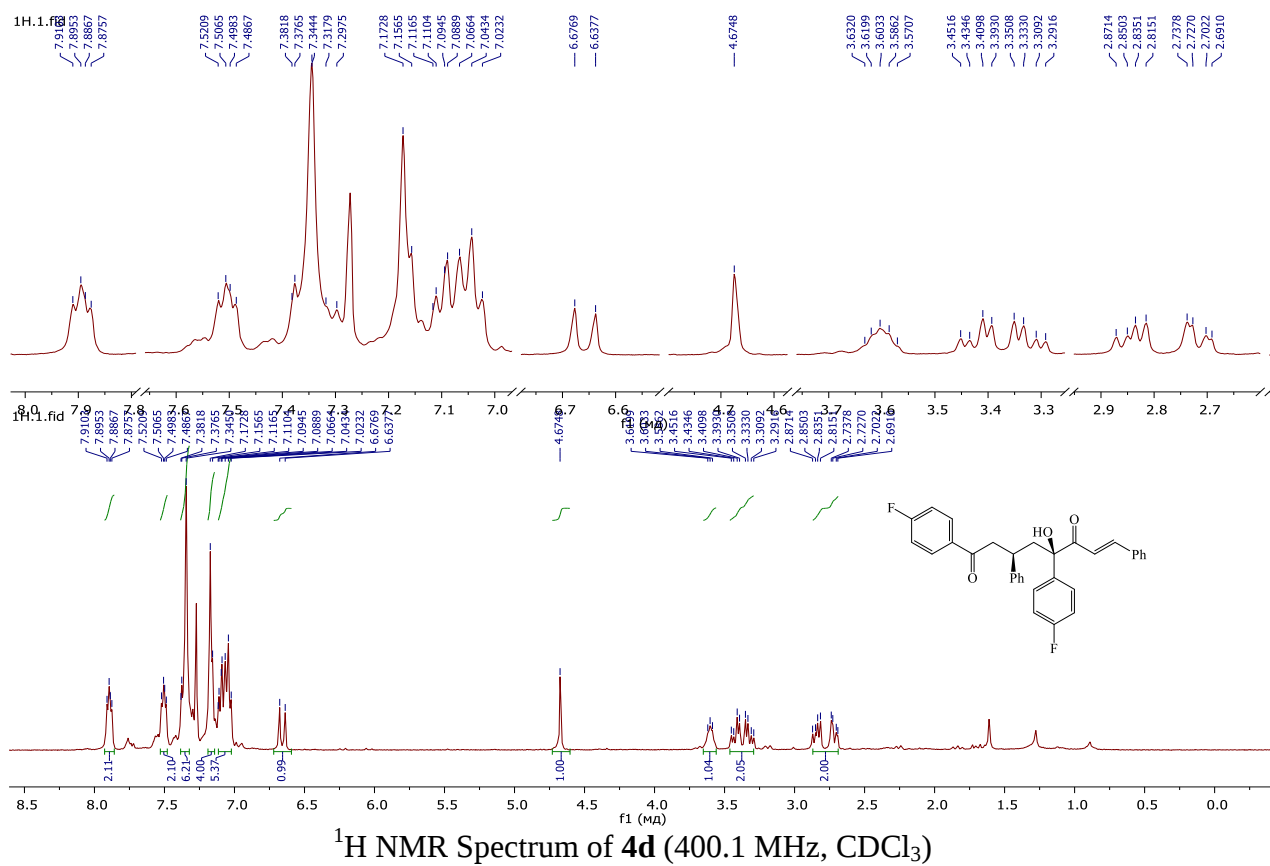
^{13}C NMR Spectrum of **4a** (100.6 MHz, CDCl_3)

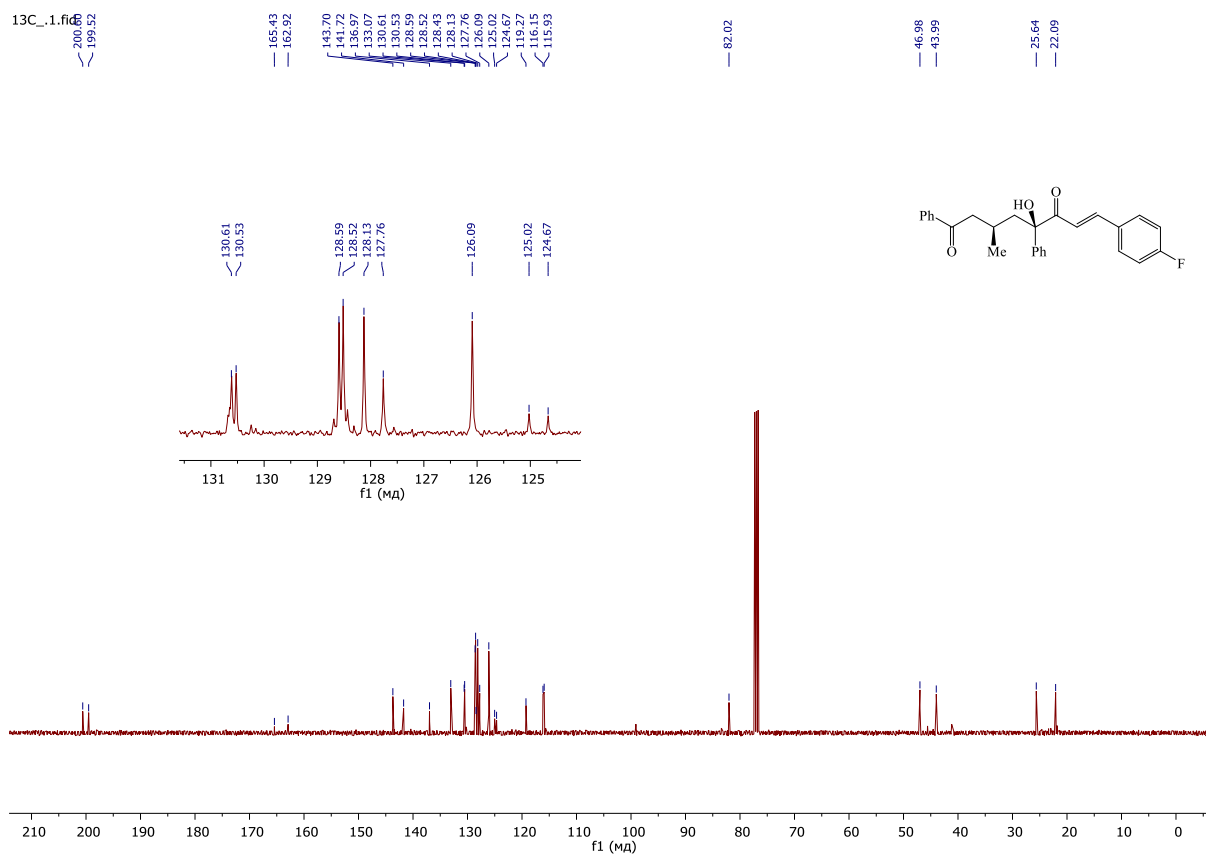
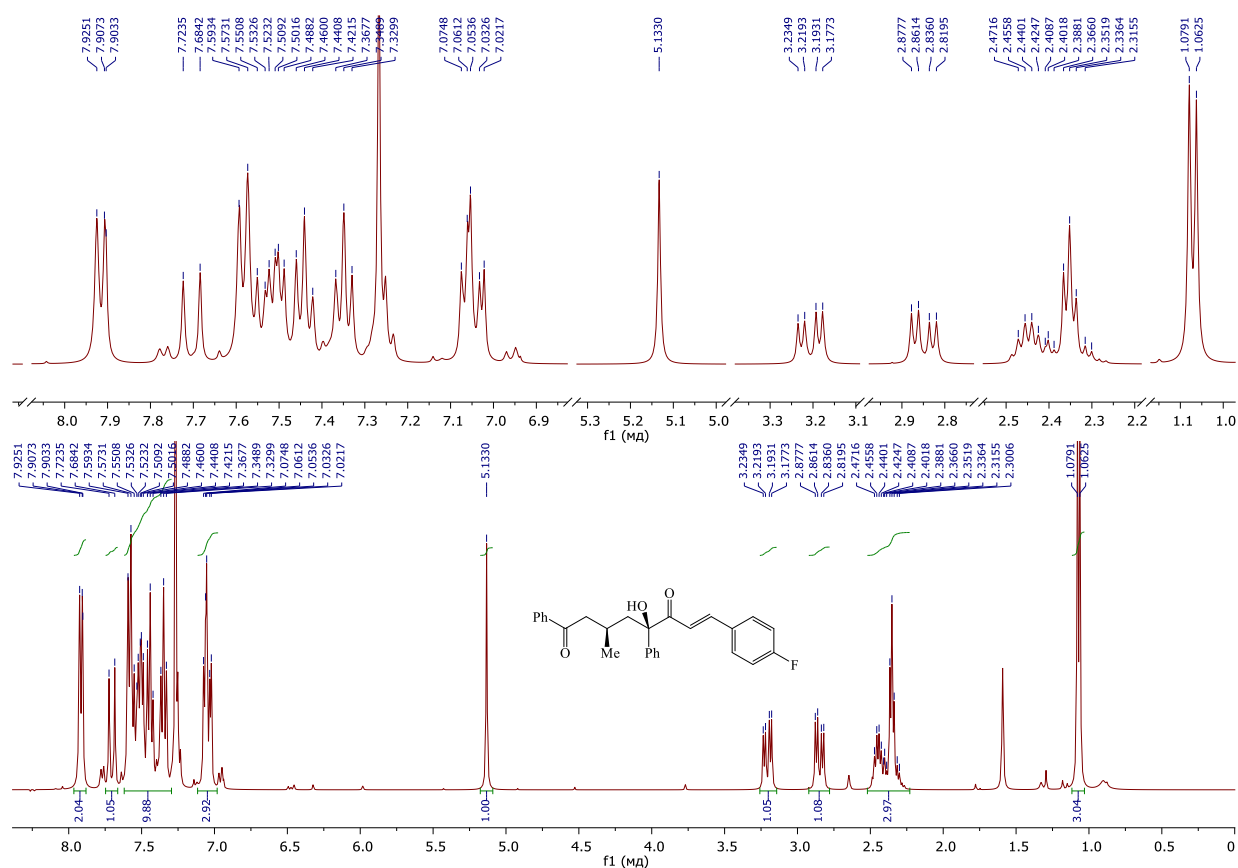


¹³C NMR Spectrum of **4b (100.6 MHz, CDCl₃)**



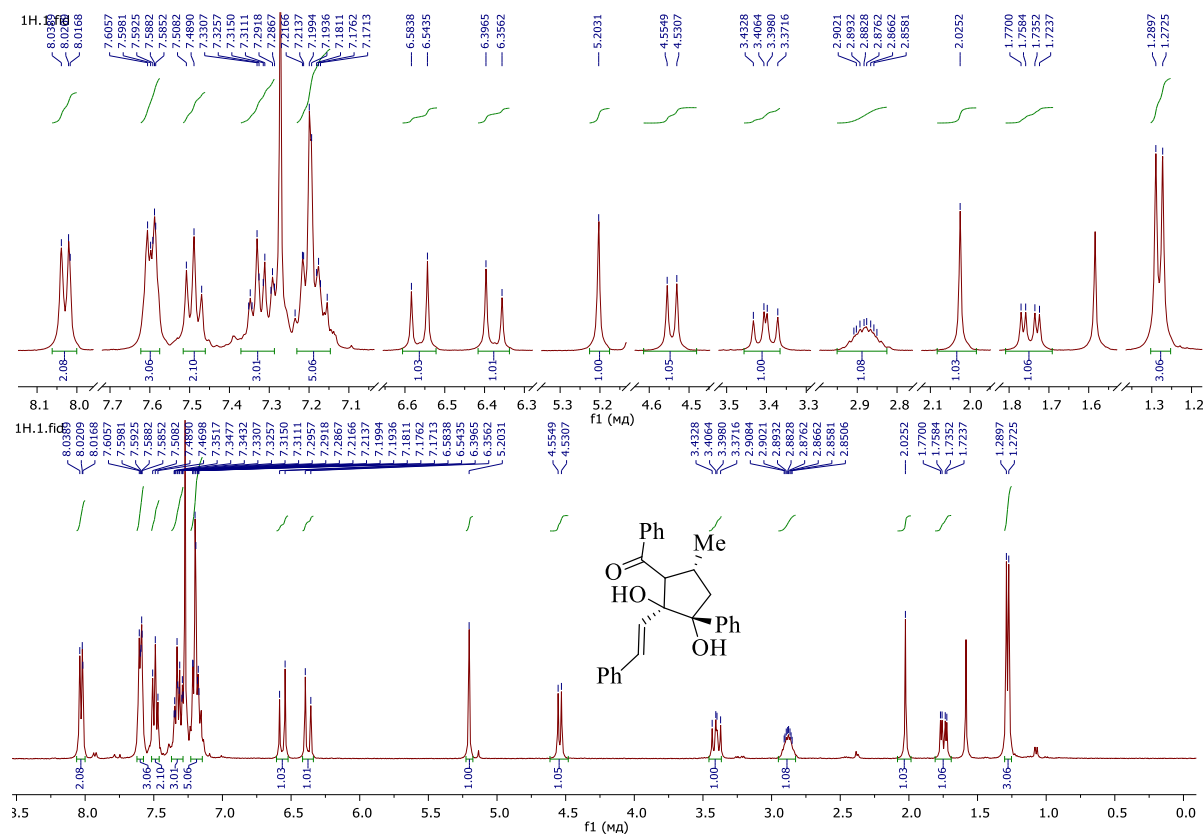
¹³C NMR Spectrum of 4c (100.6 MHz, CDCl₃)



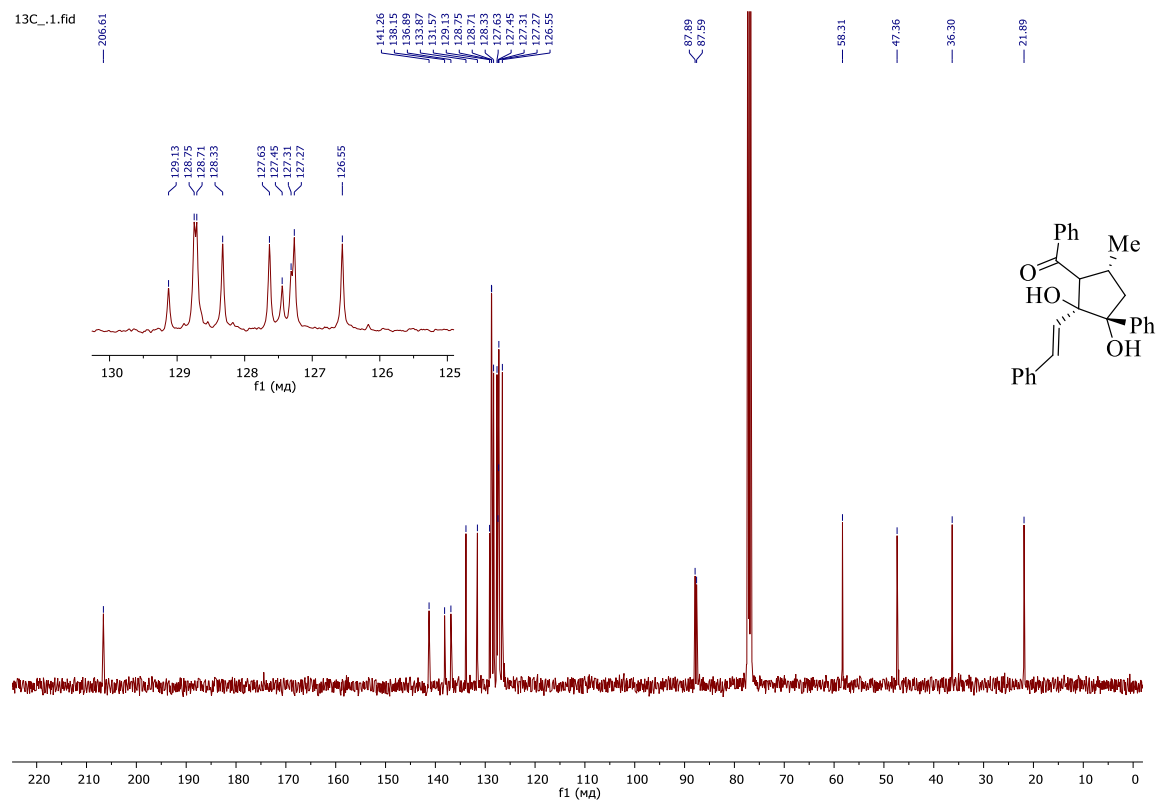


¹³C NMR Spectrum of 4e (100.6 MHz, CDCl₃)

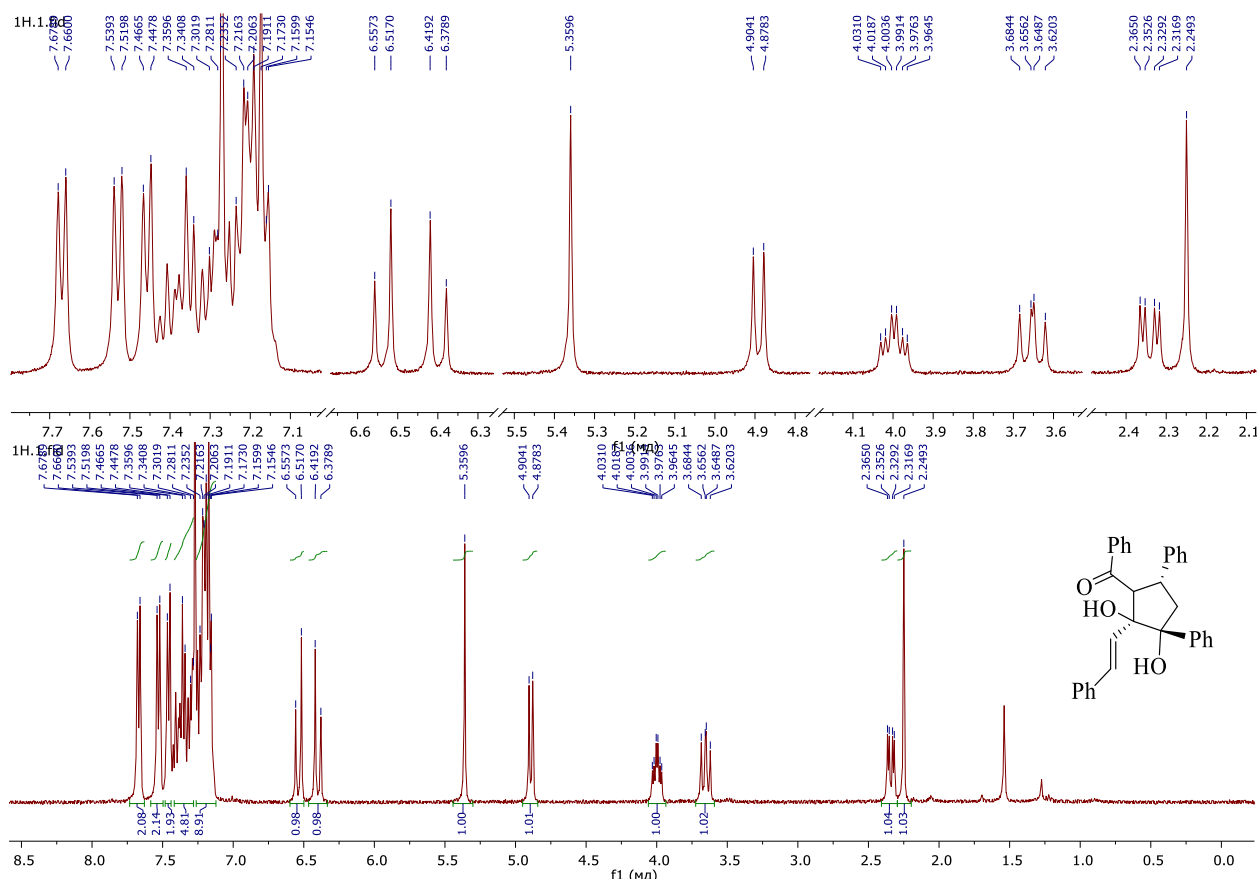
3. ^1H and ^{13}C NMR Spectra of cyclopentanes 5



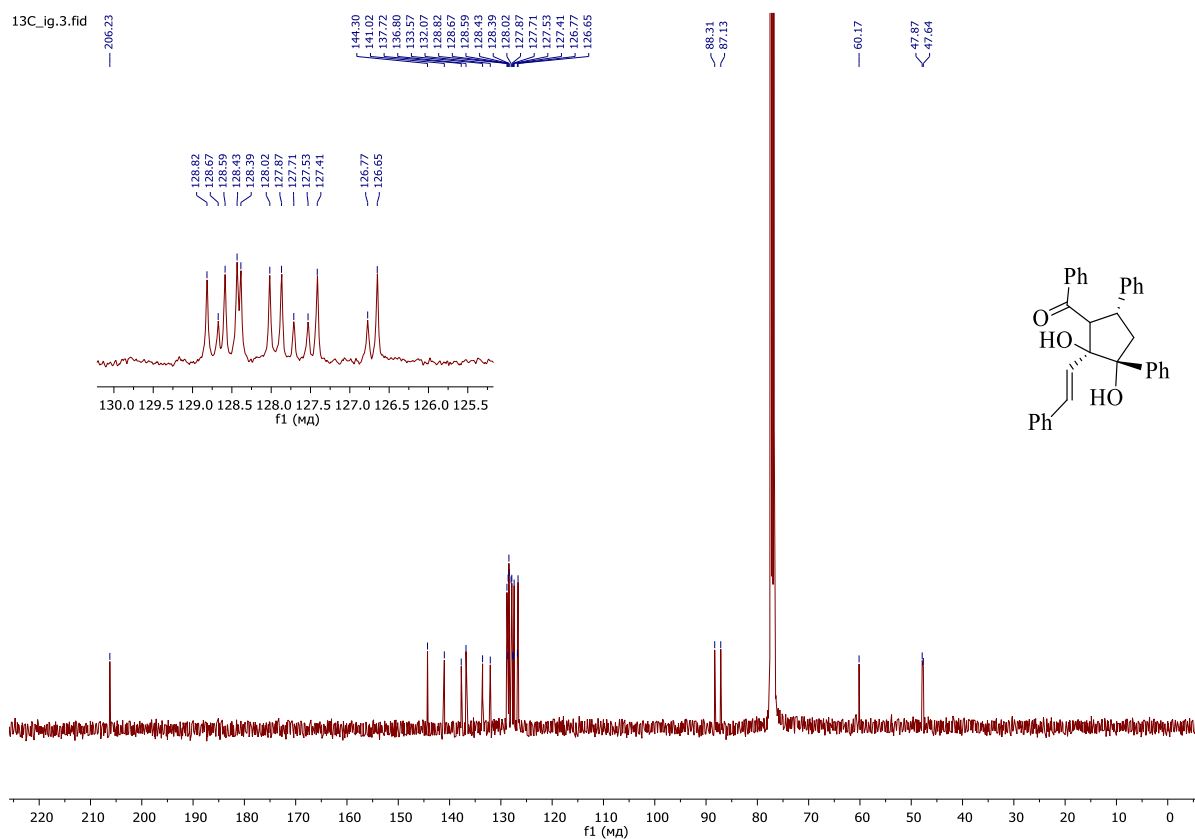
^1H NMR Spectrum of 5a (400.1 MHz, CDCl_3)



^{13}C NMR Spectrum of 5a (100.6 MHz, CDCl_3)

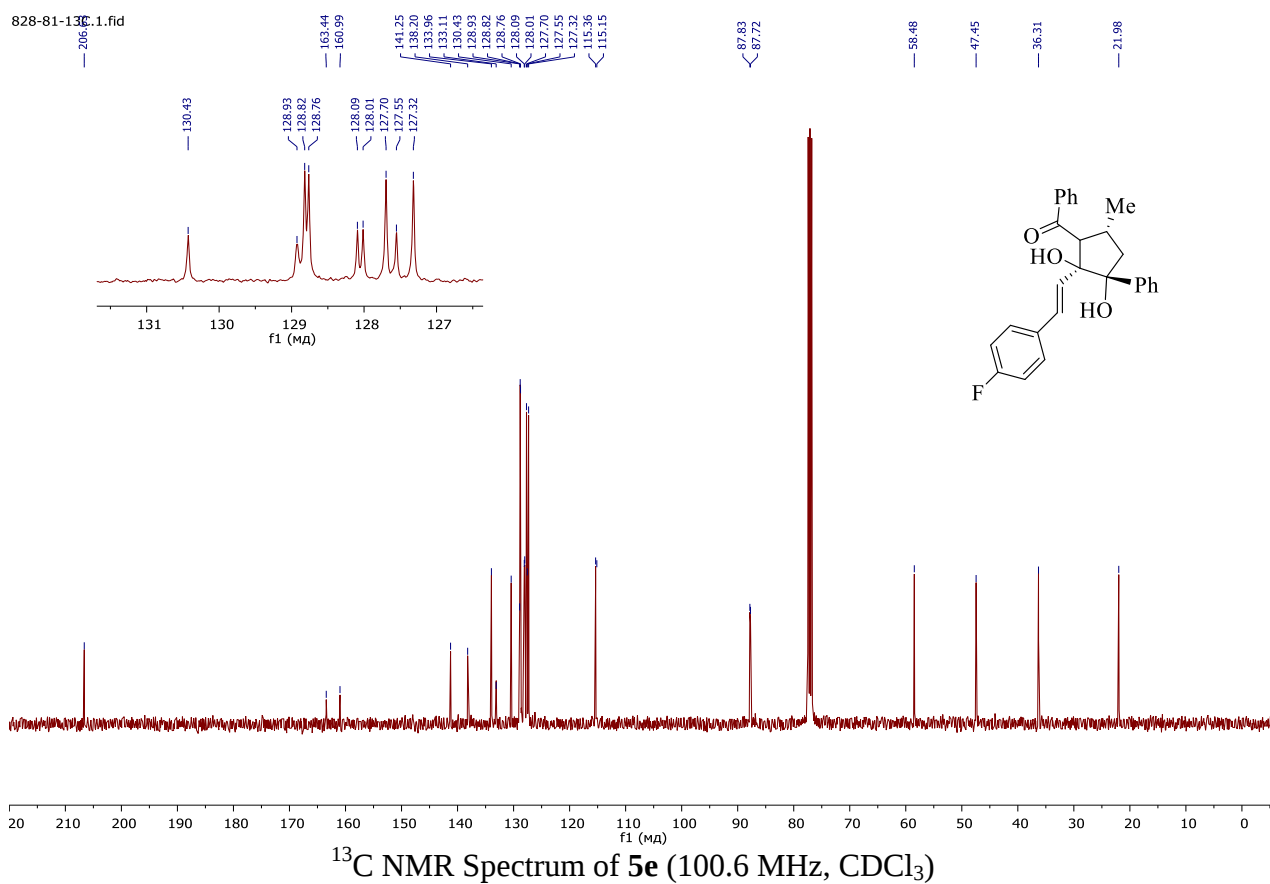
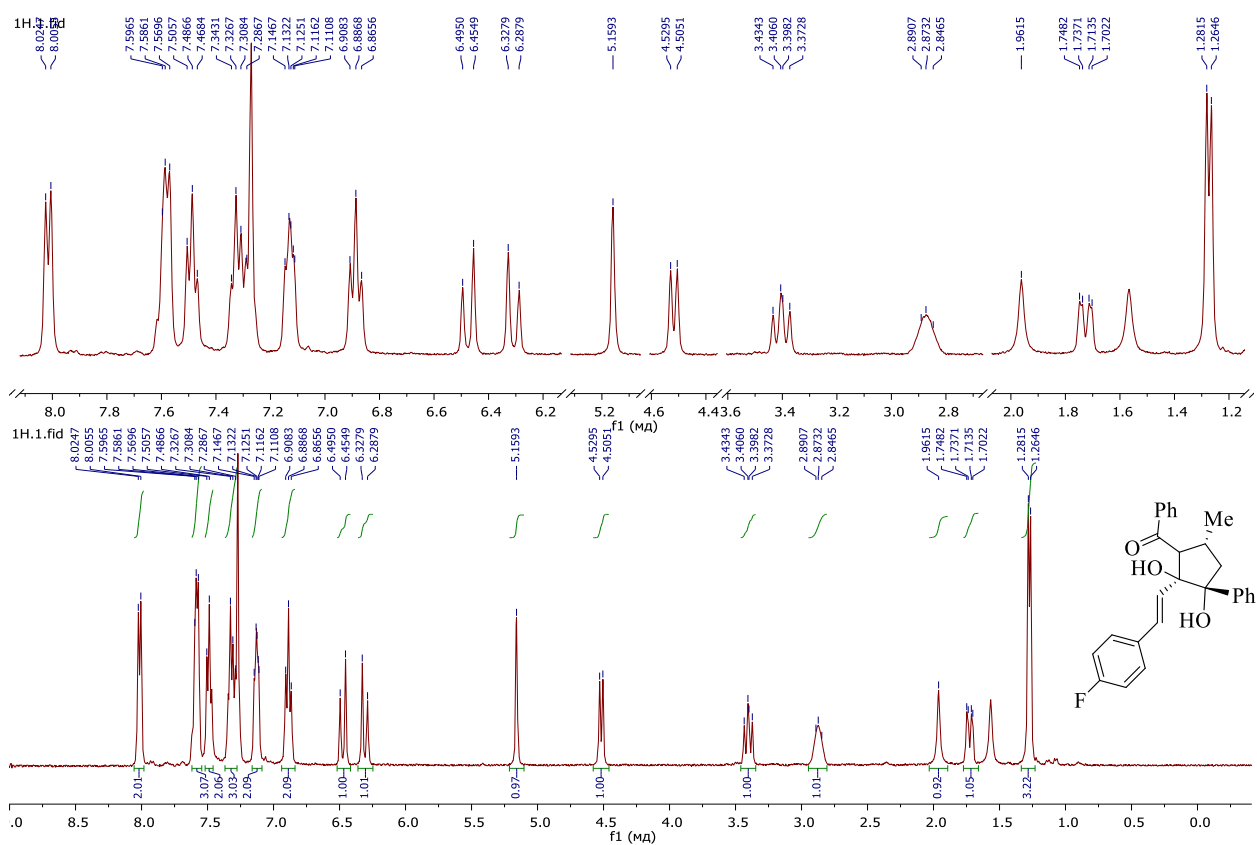


¹H NMR Spectrum of 5c (400.1 MHz, CDCl₃)

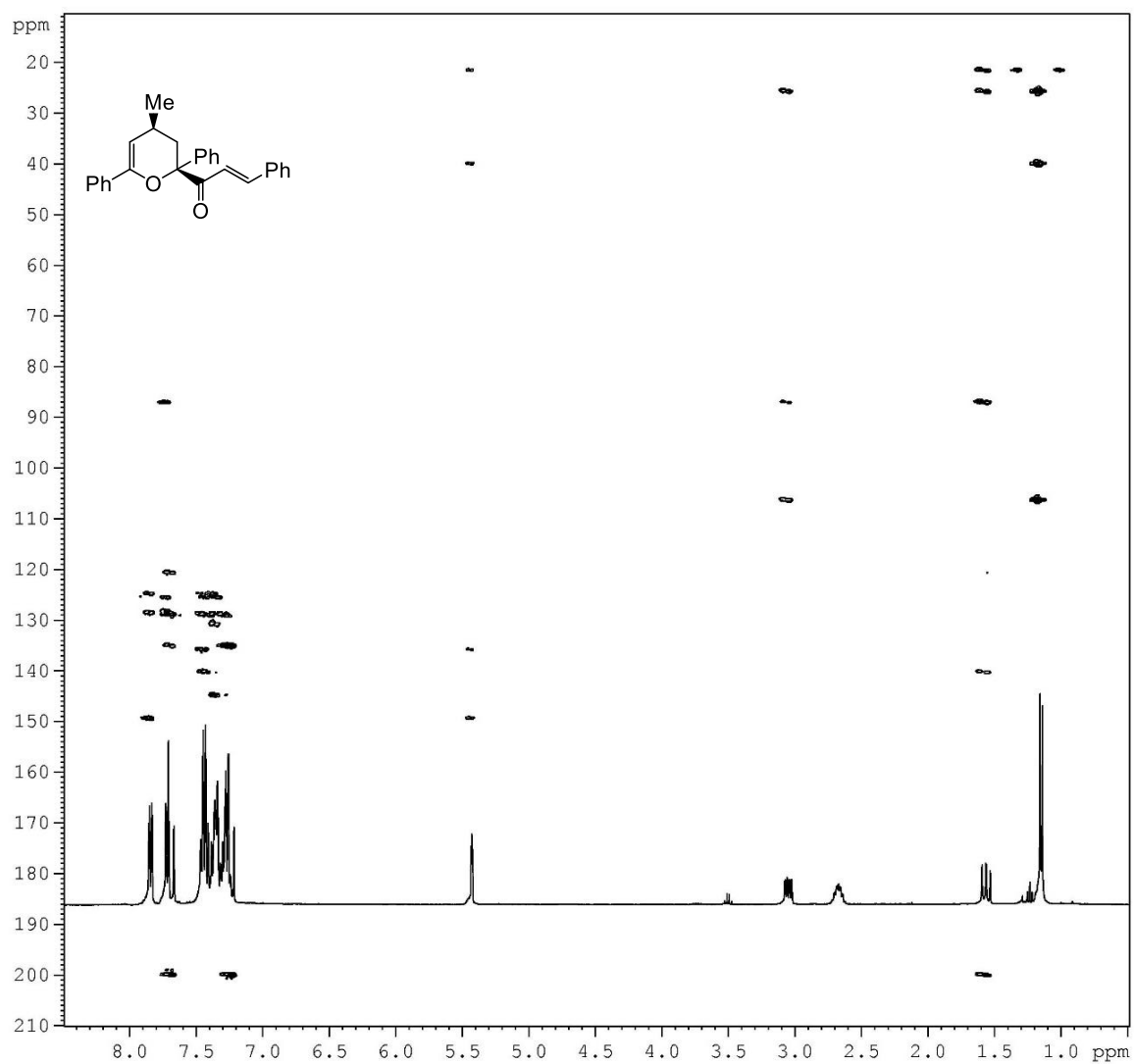


¹³C NMR Spectrum of 5c (100.6 MHz, CDCl₃)

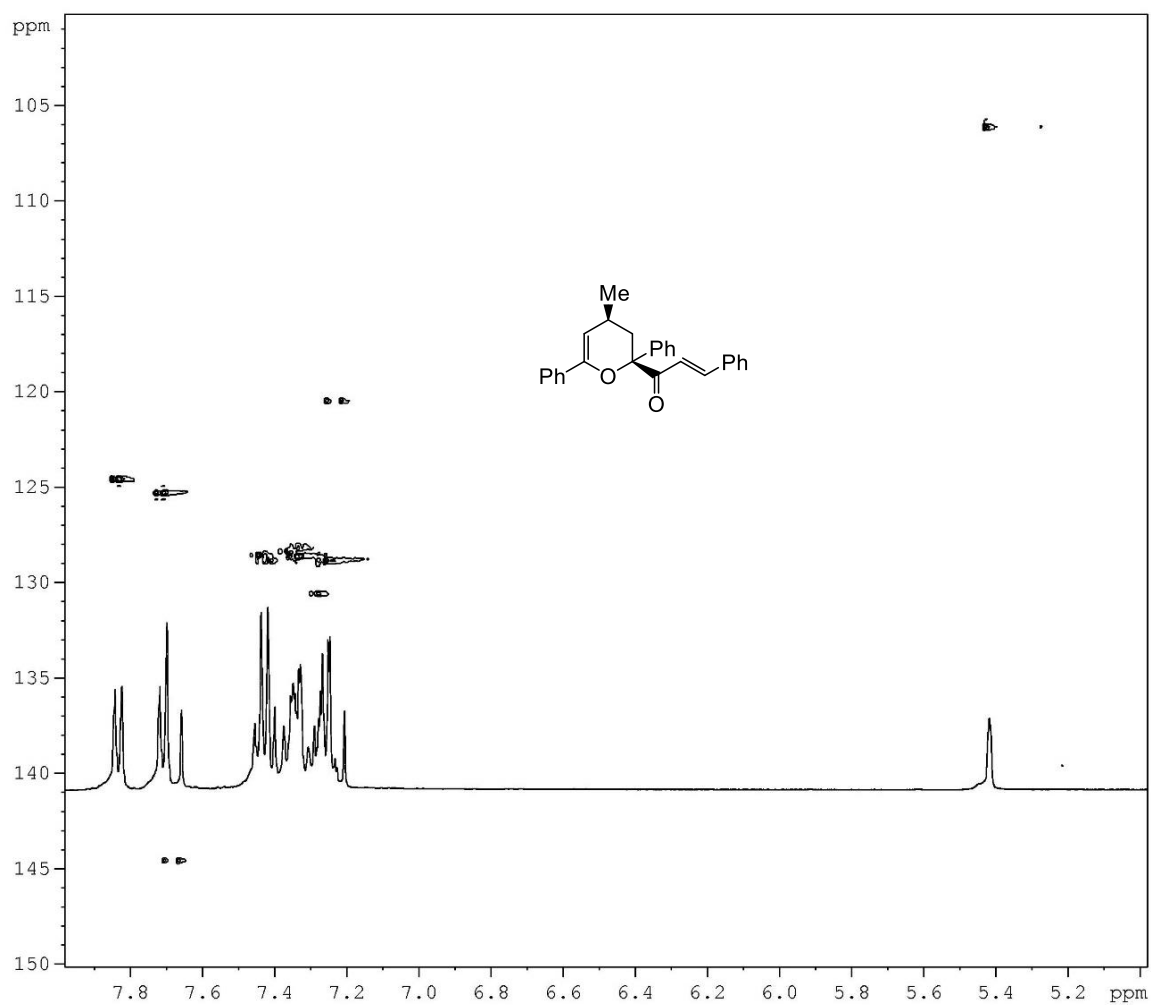
¹³C NMR Spectrum of **5d** (100.6 MHz, CDCl₃)



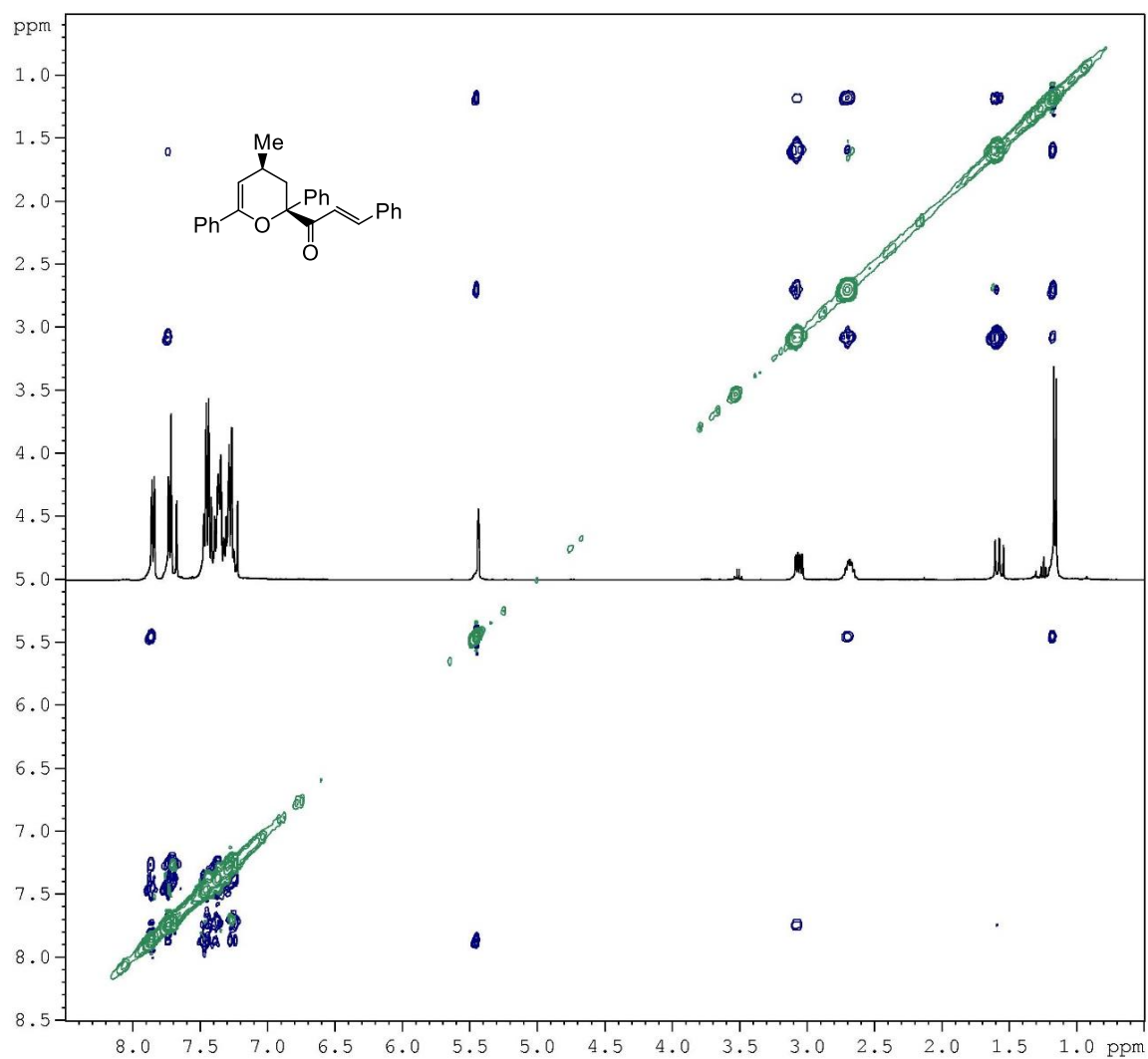
4. Selected 2D NMR spectra



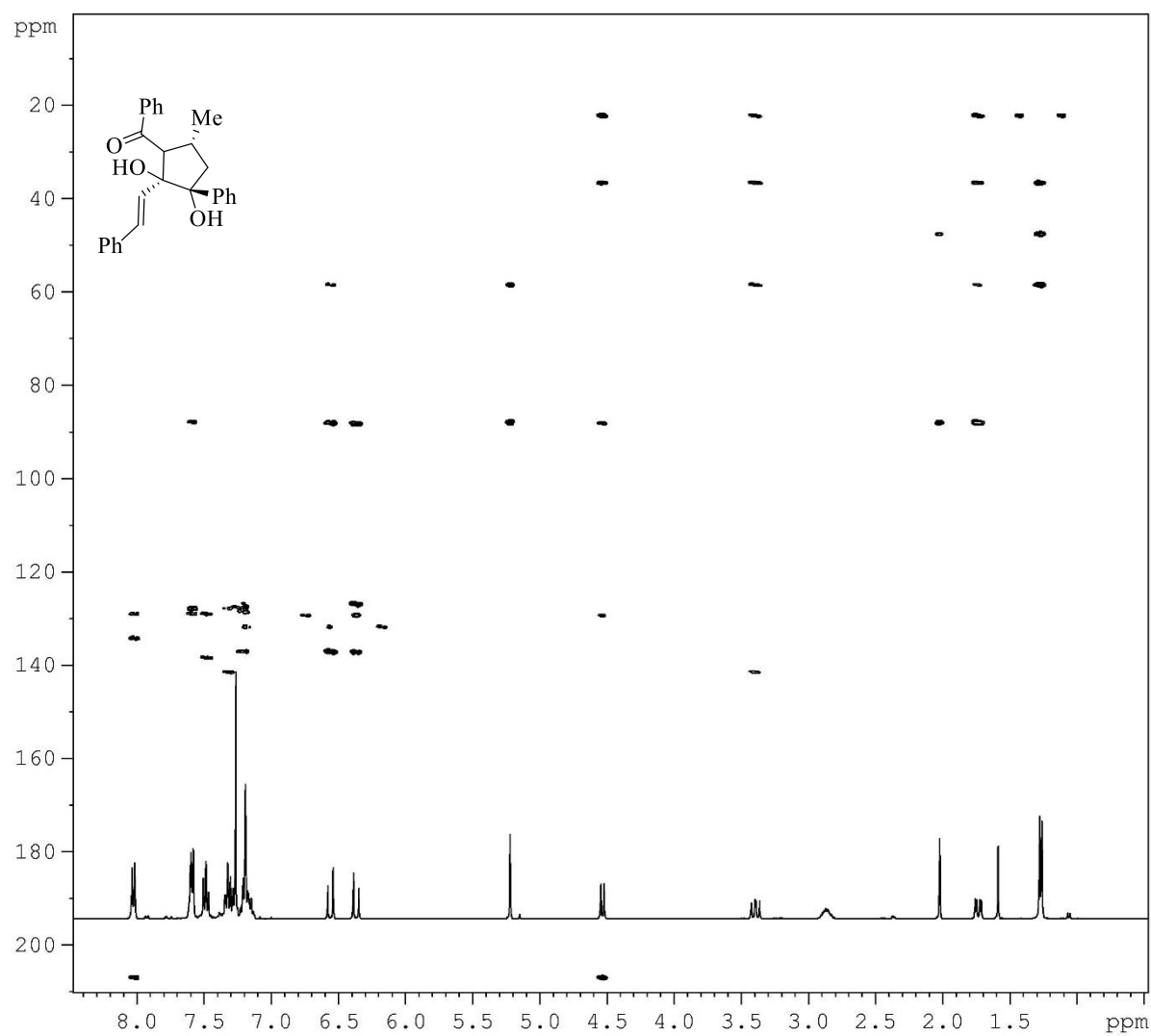
2D ^1H - ^{13}C HMBC spectrum of **3aa**



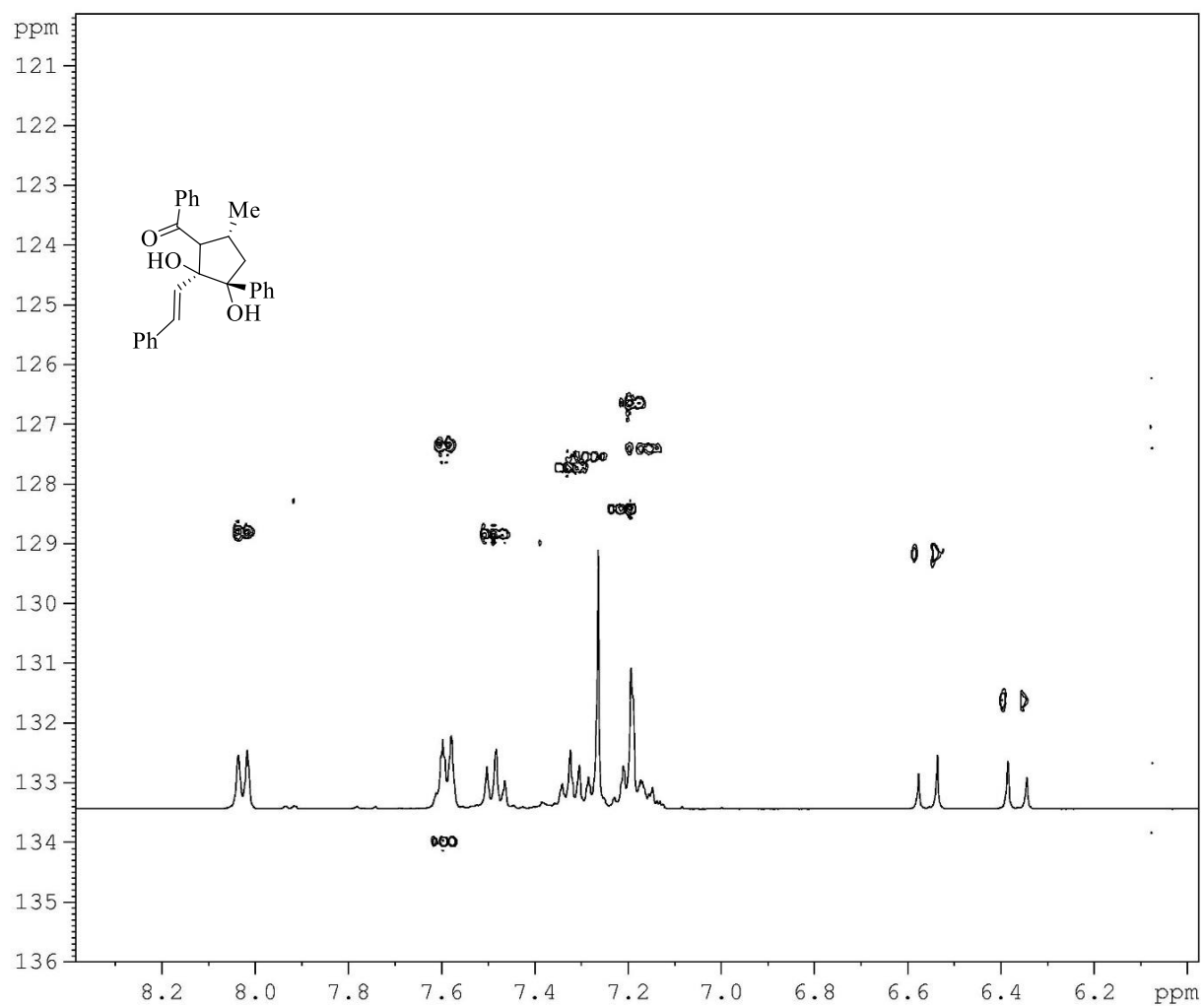
2D ^1H - ^{13}C HSQC spectrum of **3aa**



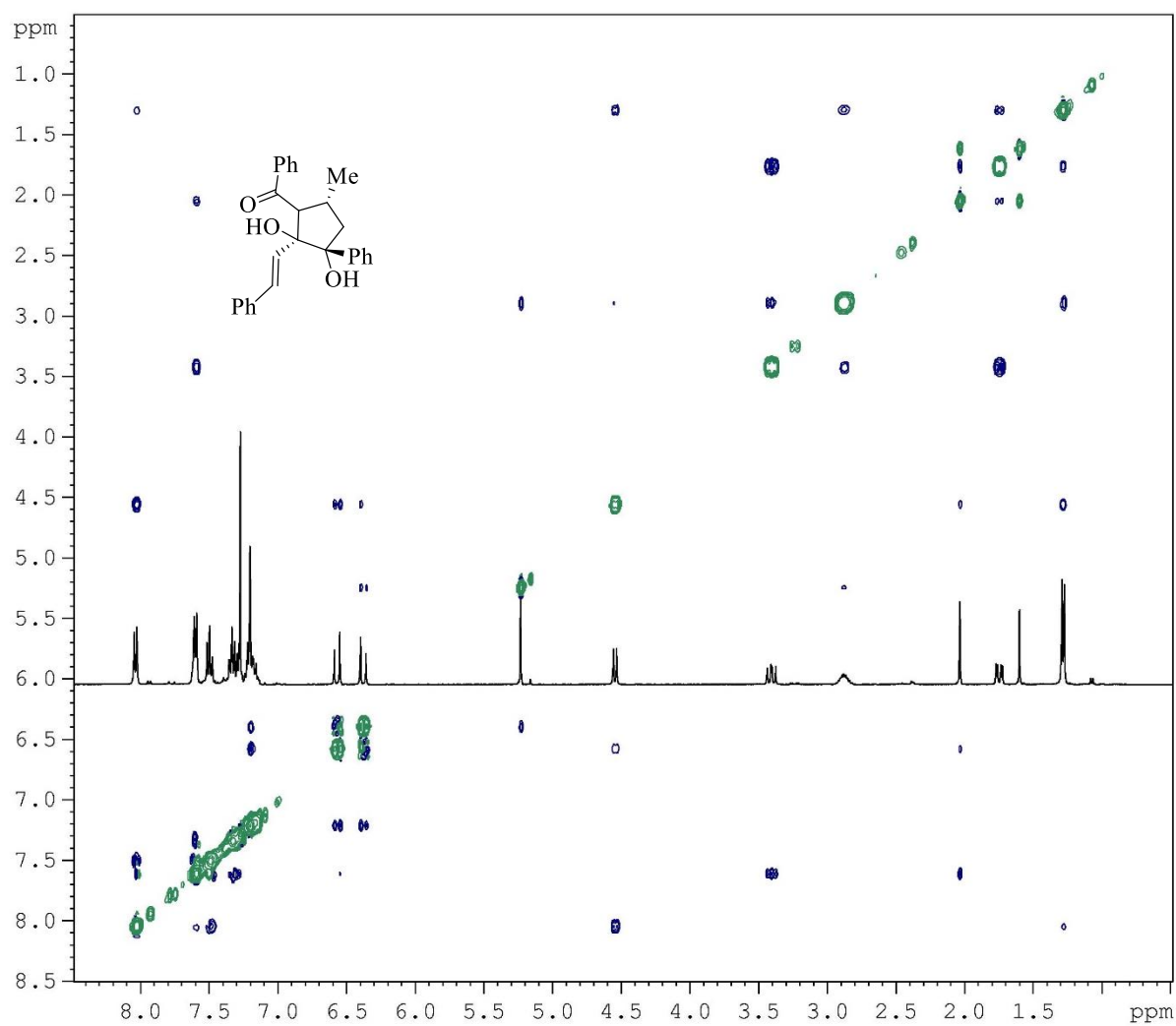
2D NOESY spectrum of **3aa**



2D ^1H - ^{13}C HMBC spectrum of **5a**



2D ^1H - ^{13}C HSQC spectrum of **5a**



2D NOESY spectrum of **5a**