

Supplementary material

for

Gold catalysed 1,4-enyne acetate strategy for the

synthesis of 1*H*-indenes and partially

hydrogenated methanonaphtho[1,2-*c*]furan-

1,3(4*H*)-diones

Xiaoyu Chen,^{A,C} Andrew Thomas Holm,^{A,C} Philip Wai Hong Chan^{A,B,D}

^ASchool of Chemistry, Monash University, Clayton, Victoria 3800, Australia

^BDepartment of Chemistry, University of Warwick, Coventry CV4 7AL, United
Kingdom

^CThese authors contributed equally to this work

^DCorresponding author. Email: phil.chan@monash.edu

^1H and ^{13}C NMR spectra

Figure S1. ^1H and ^{13}C NMR spectra of 7-phenyl-3-(phenylethynyl)hept-1-en-6-yn-3-yl acetate (**1a**)

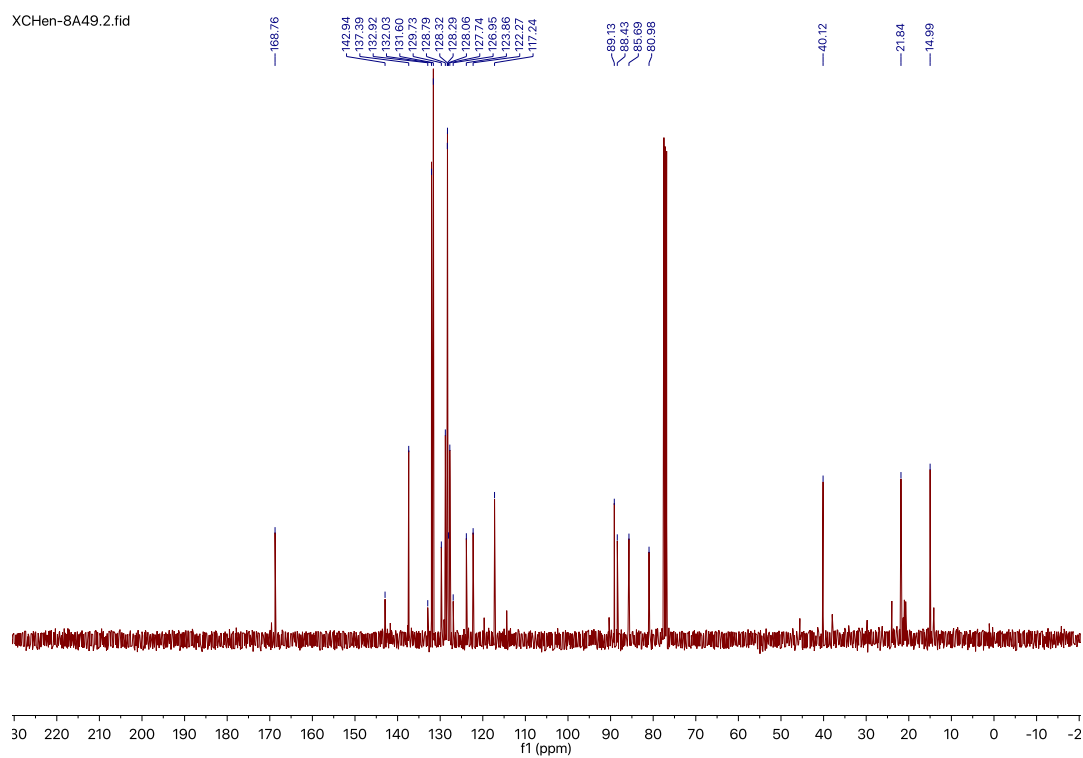
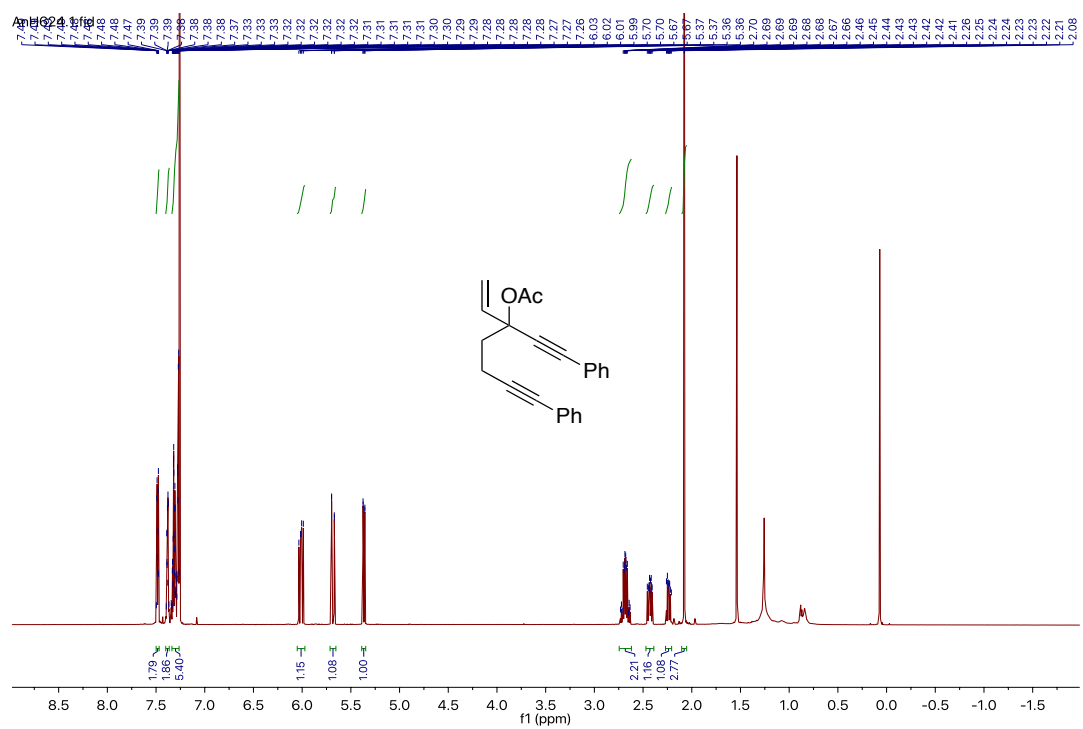


Figure S2. ^1H and ^{13}C NMR spectra of 3-(phenylethynyl)-7-(4-(trifluoromethyl)phenyl)hept-1-en-6-yn-3-yl acetate (**1b**)

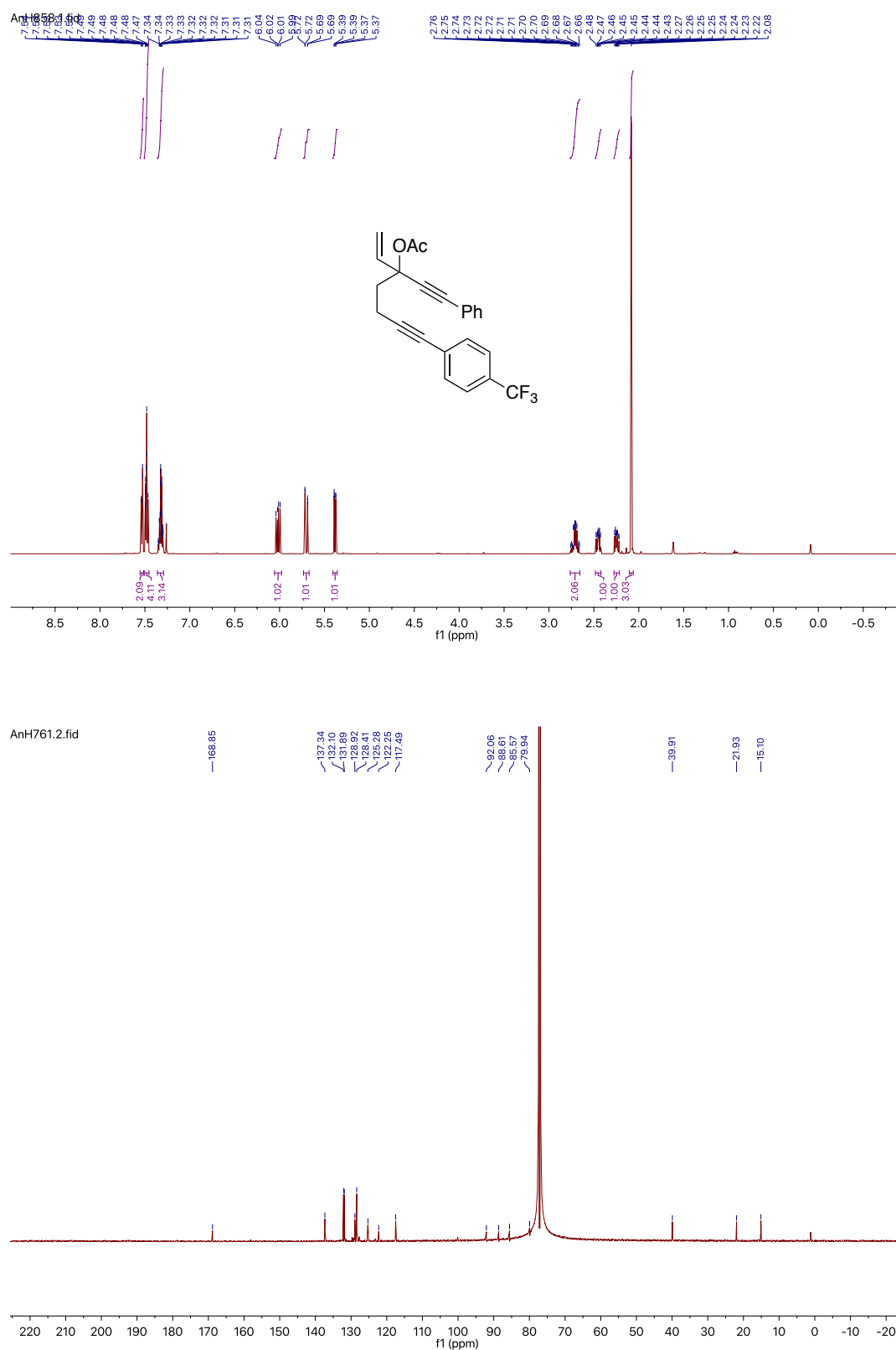


Figure S4. ^1H and ^{13}C NMR spectra of 7-(4-fluorophenyl)-3-(phenylethynyl)hept-1-en-6-yn-3-yl acetate (**1d**)

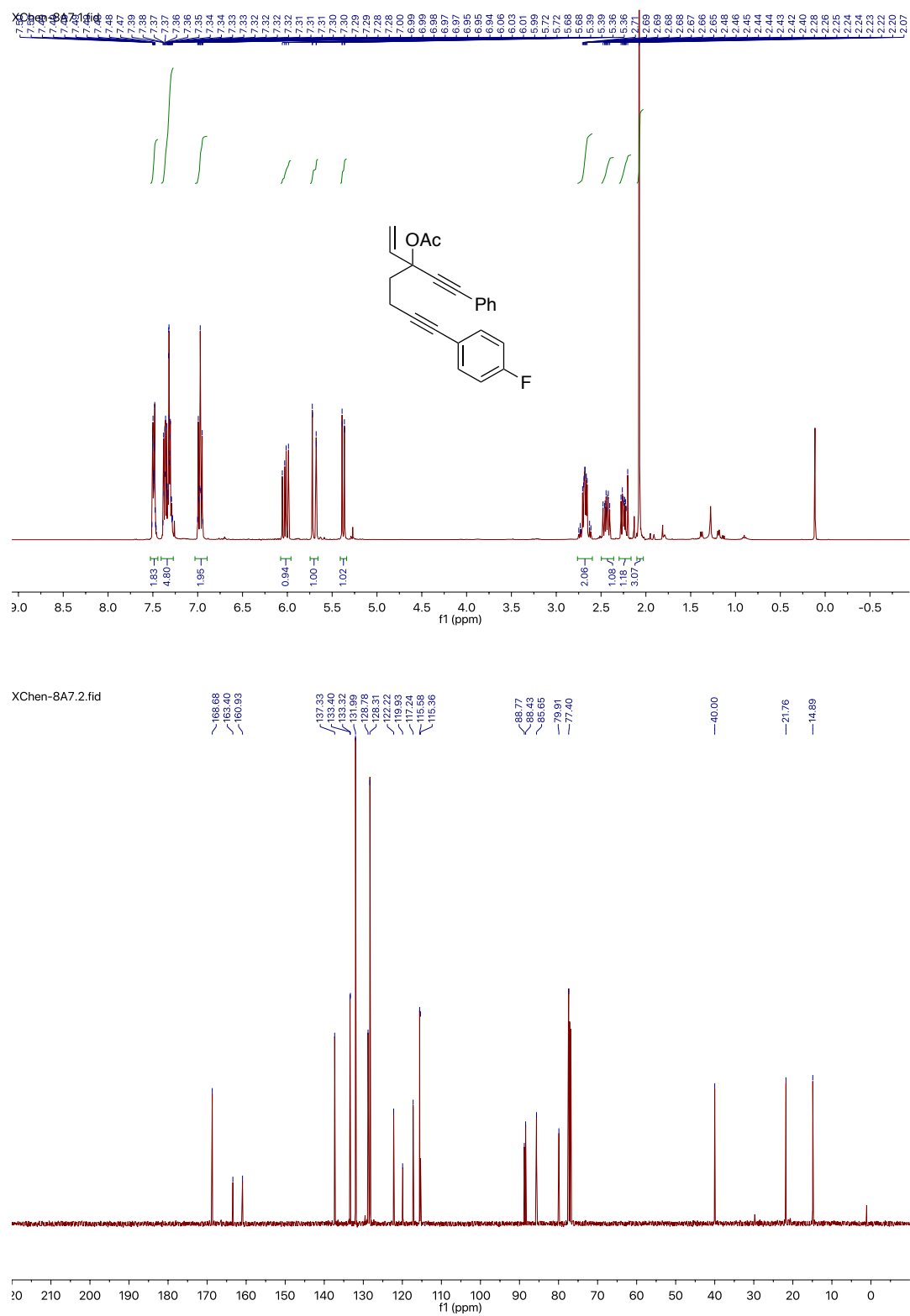


Figure S5. ^1H and ^{13}C NMR spectra of 7-(4-methoxyphenyl)-3-(phenylethynyl)hept-1-en-6-yn-3-yl acetate (**1e**)

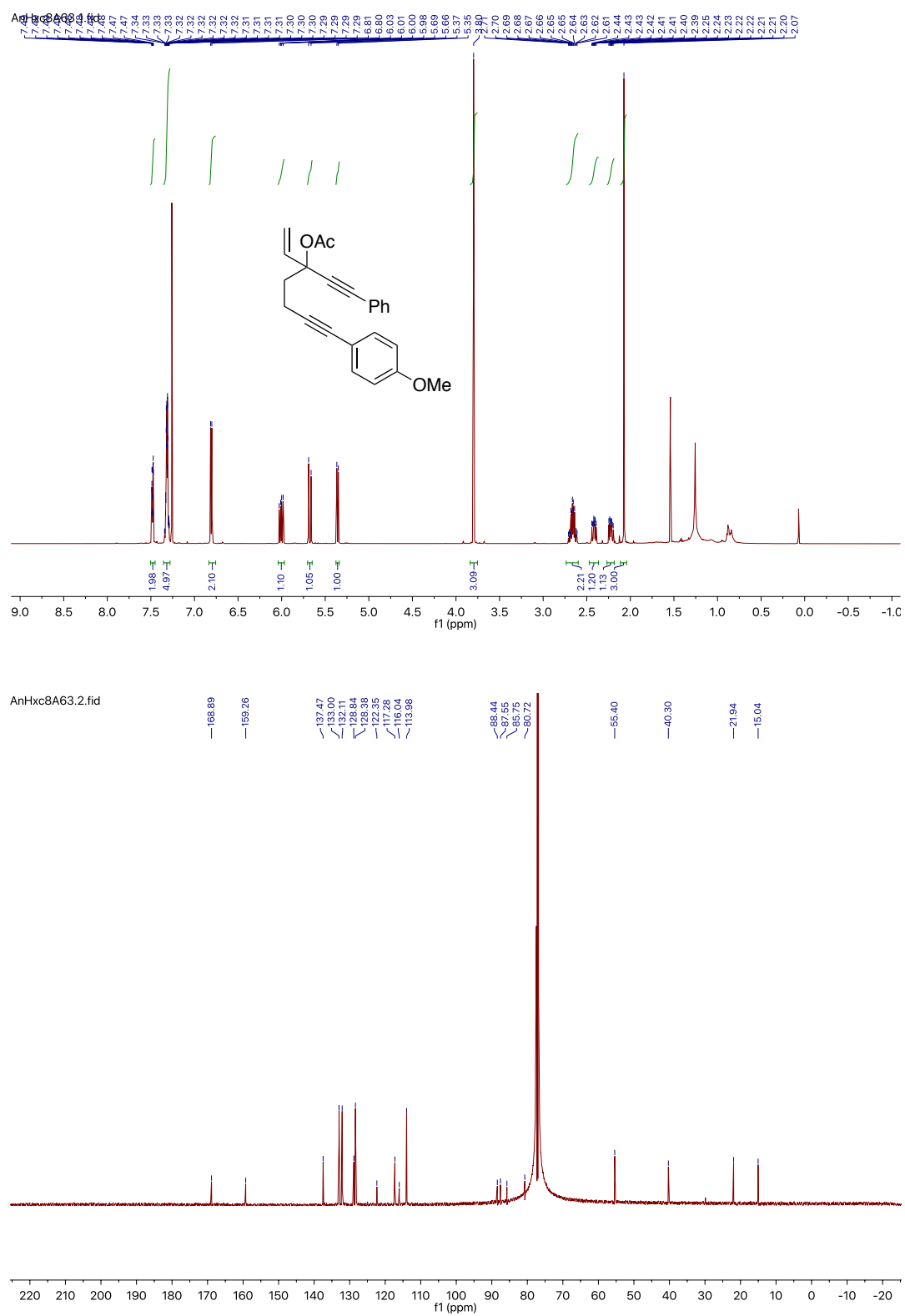


Figure S6. ^1H and ^{13}C NMR spectra of 3-(phenylethynyl)-7-(*m*-tolyl)hept-1-en-6-yn-3-yl acetate (**1f**)

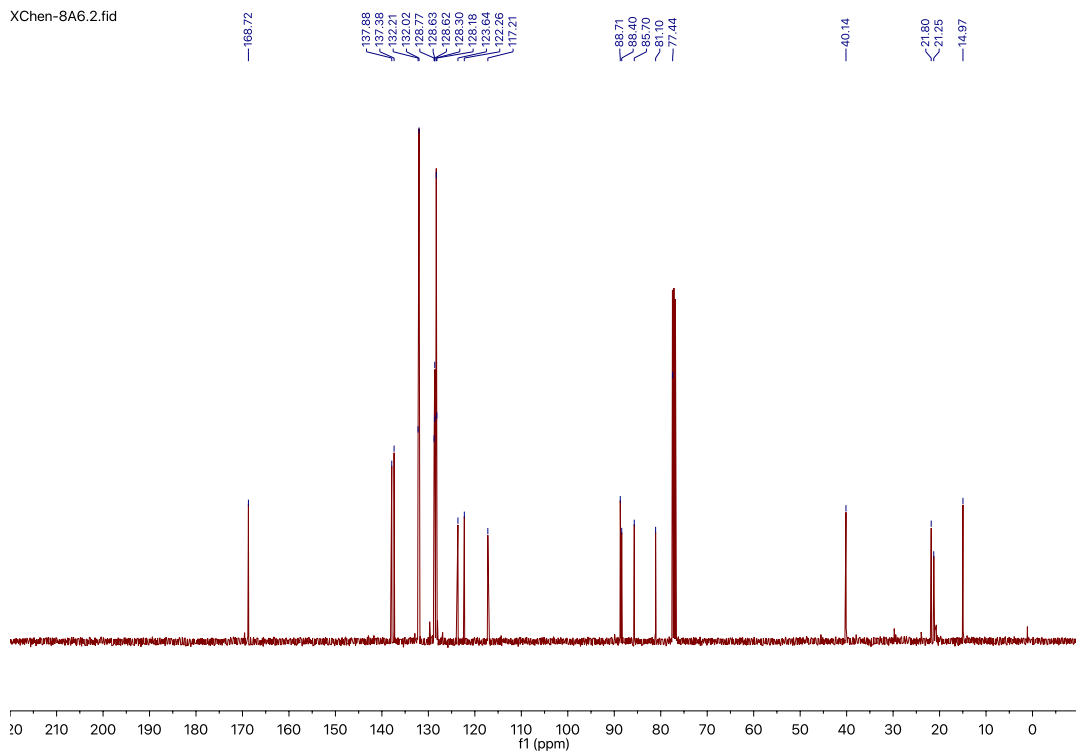
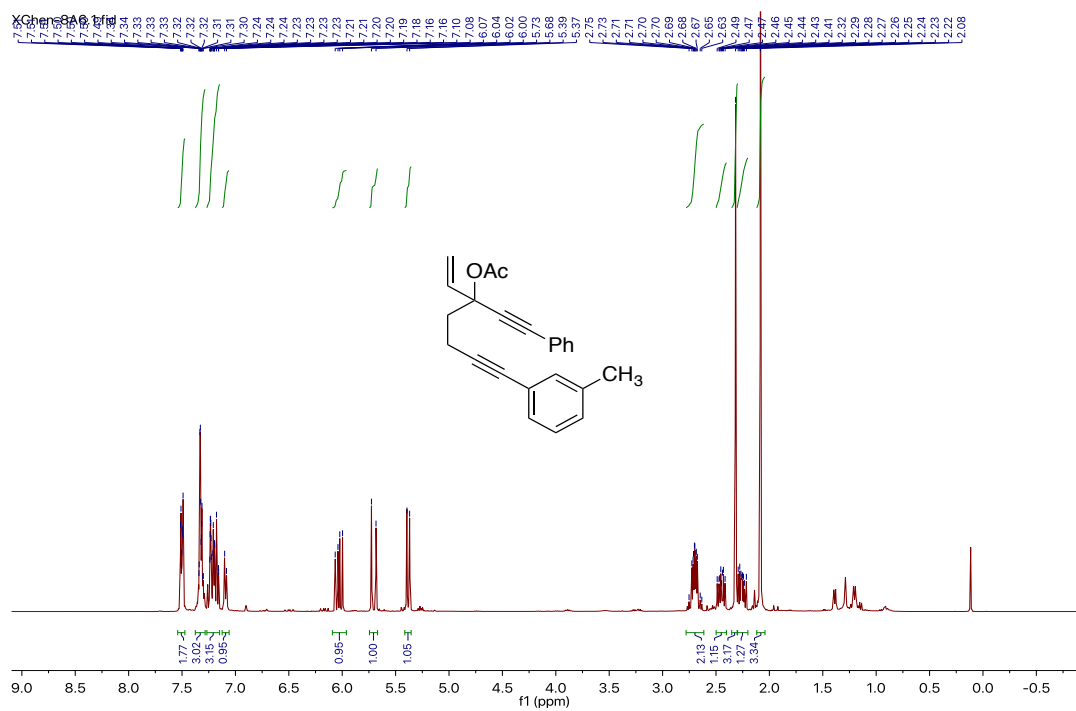


Figure S9. ^1H and ^{13}C NMR spectra of 3-((4-fluorophenyl)ethynyl)-7-phenylhept-1-en-6-yn-3-yl acetate (**1i**)

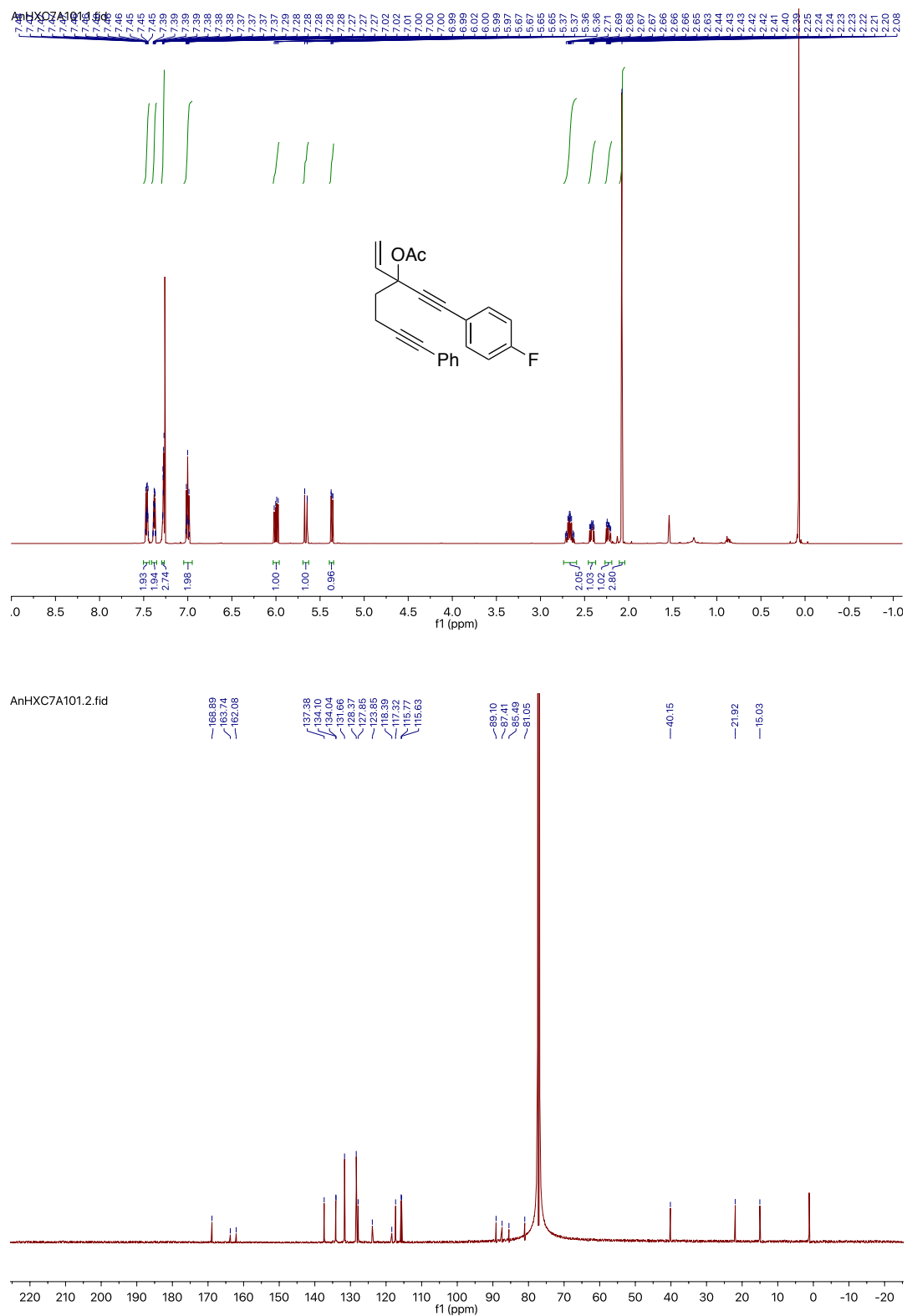


Figure S10. ^1H and ^{13}C NMR spectra of 3-([1,1'-biphenyl]-4-ylethynyl)-7-phenylhept-1-en-6-yn-3-yl acetate (**1j**)

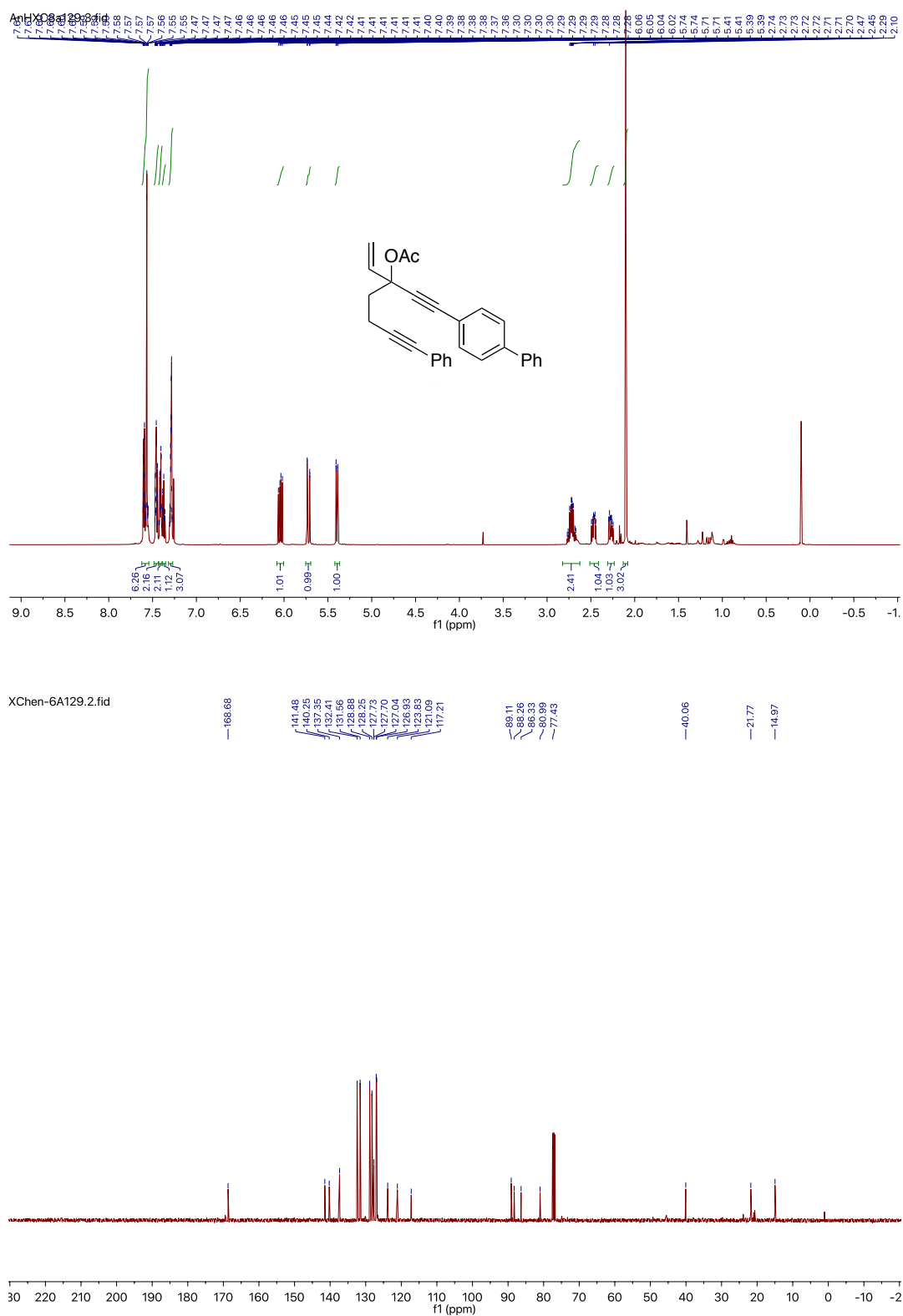


Figure S11. ^1H and ^{13}C NMR spectra of 7-phenyl-3-(*p*-tolylethynyl)hept-1-en-6-yn-3-yl acetate (**1k**)

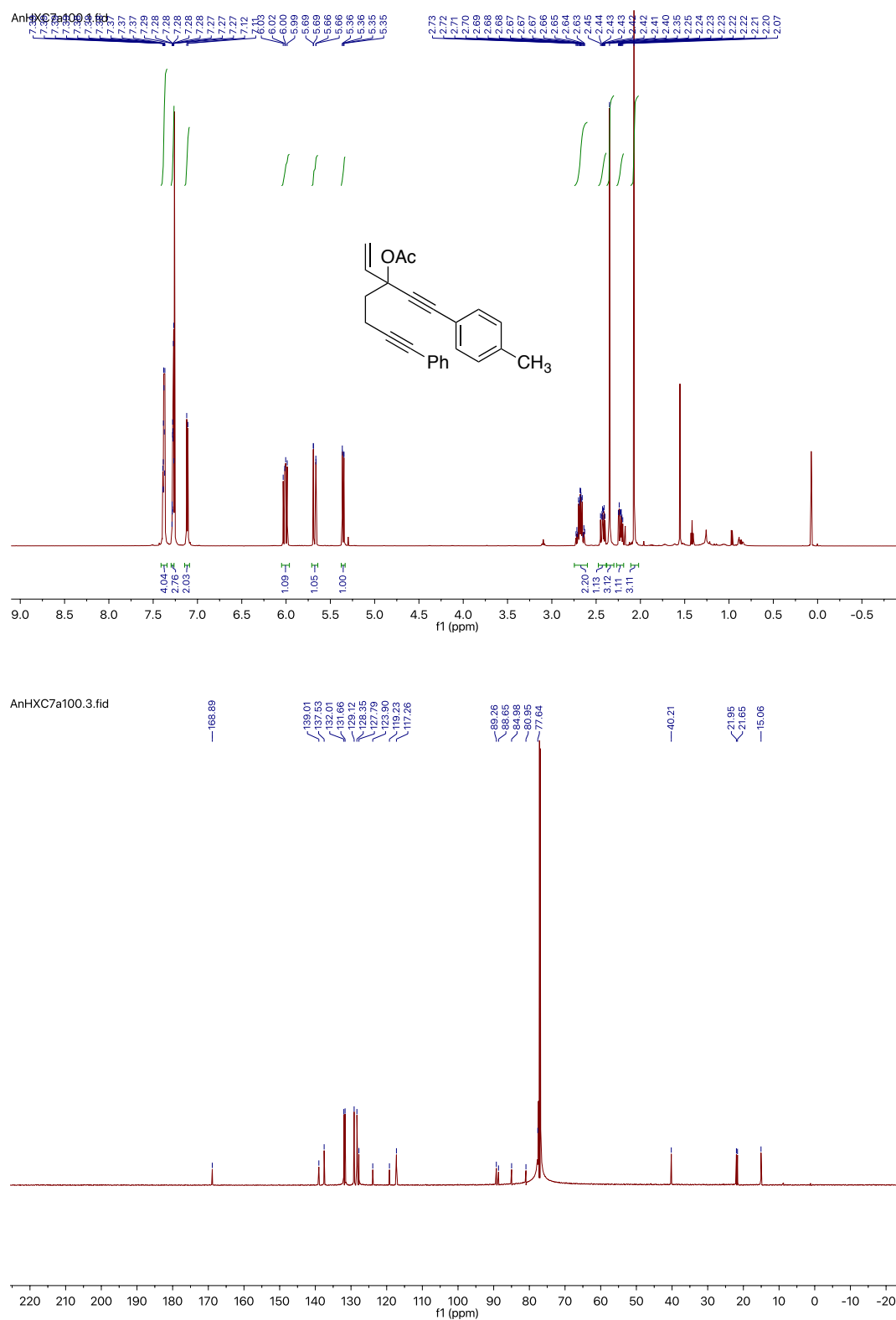


Figure S12. ^1H and ^{13}C NMR spectra of 1-phenyl-3-(phenylethynyl)-7-(4-(trifluoromethyl)phenyl)hept-1-en-6-yn-3-yl acetate (**II**)

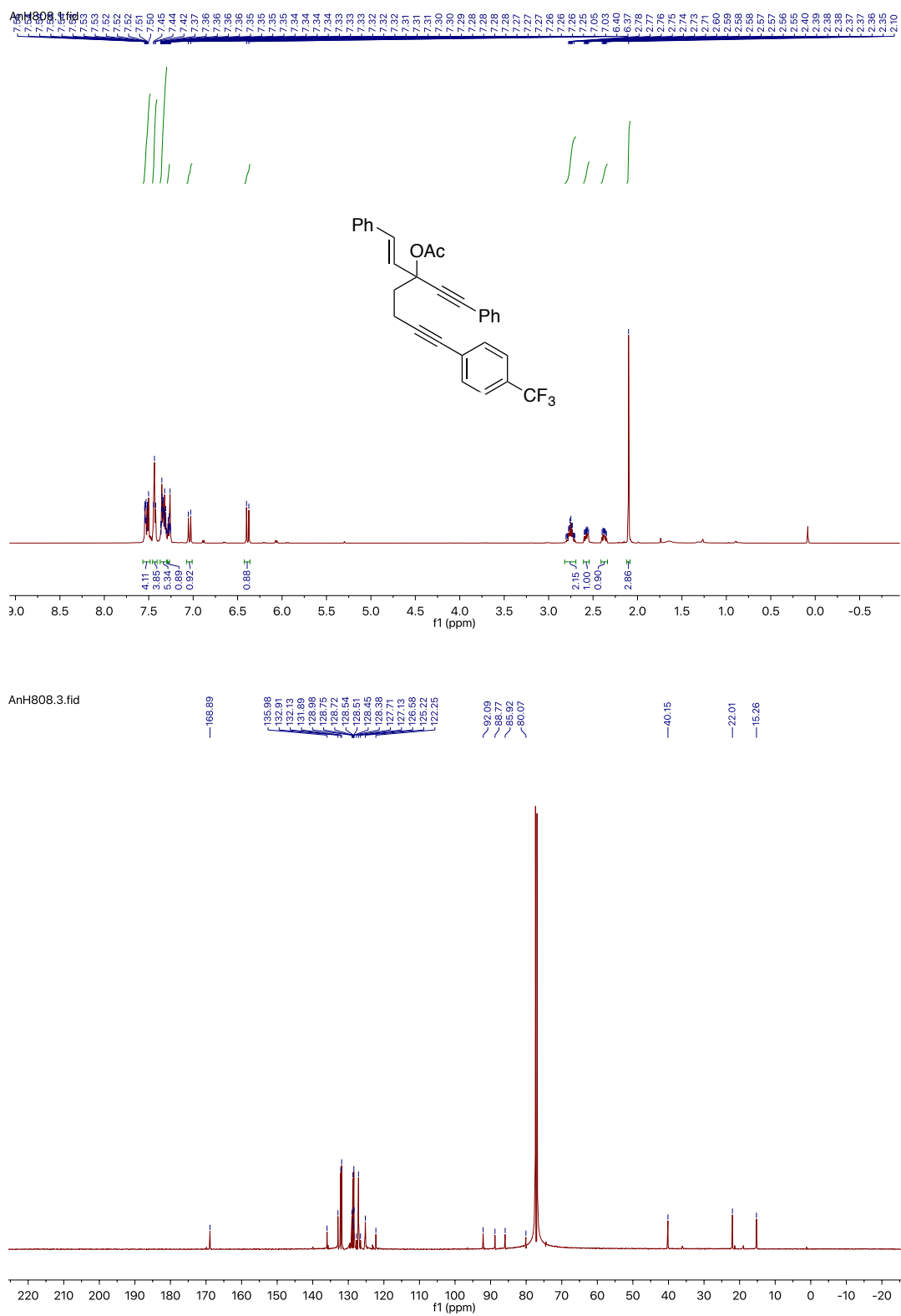


Figure S13. ^1H and ^{13}C NMR spectra of 2-methyl-4-(phenylethynyl)-8-(4-(trifluoromethyl)phenyl)oct-2-en-7-yn-4-yl acetate (**1m**)

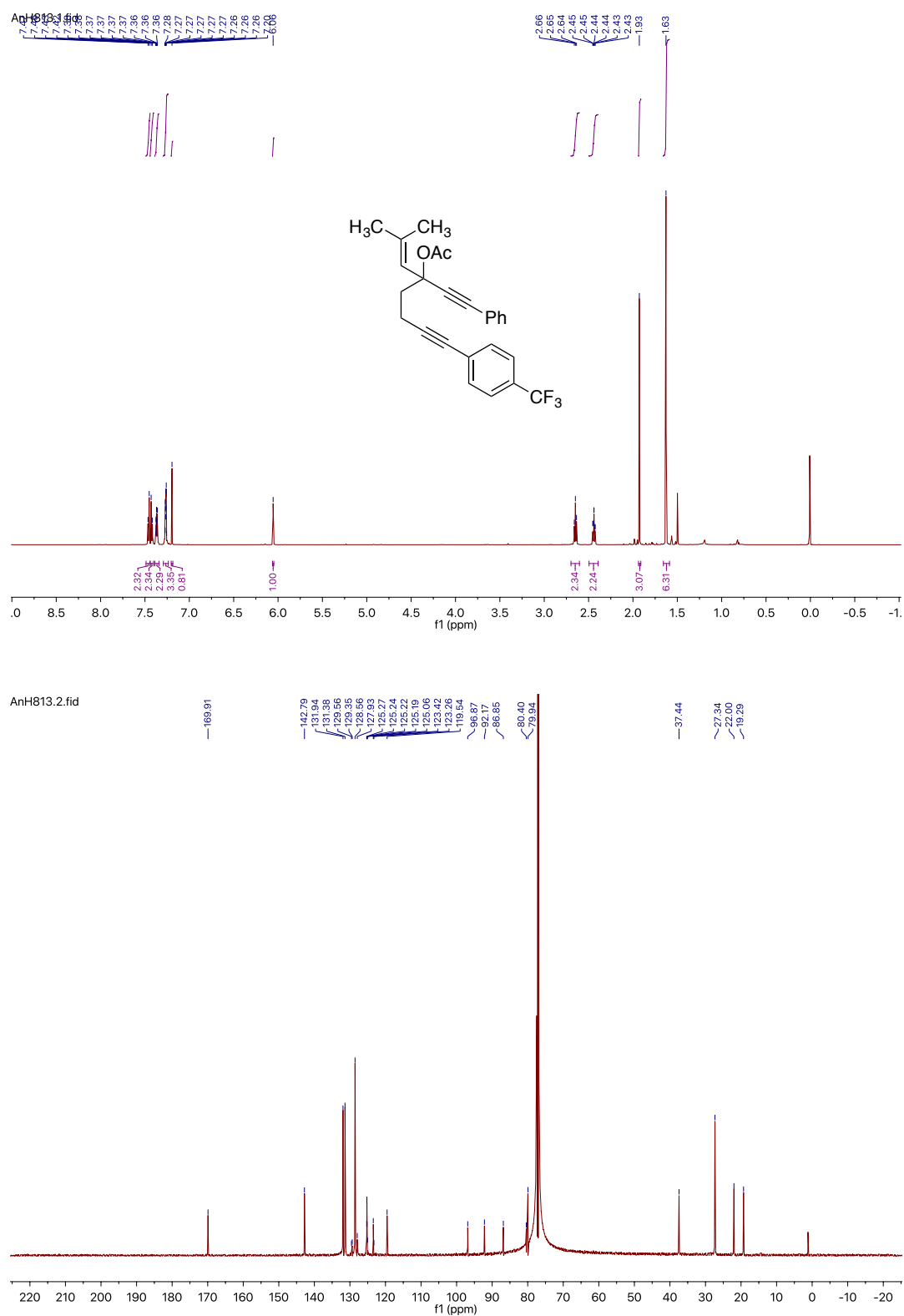


Figure S14. ^1H and ^{13}C NMR spectra of 7-(4-chlorophenyl)-3-(phenylethynyl)hept-1-en-6-yn-3-yl acetate (**1n**)

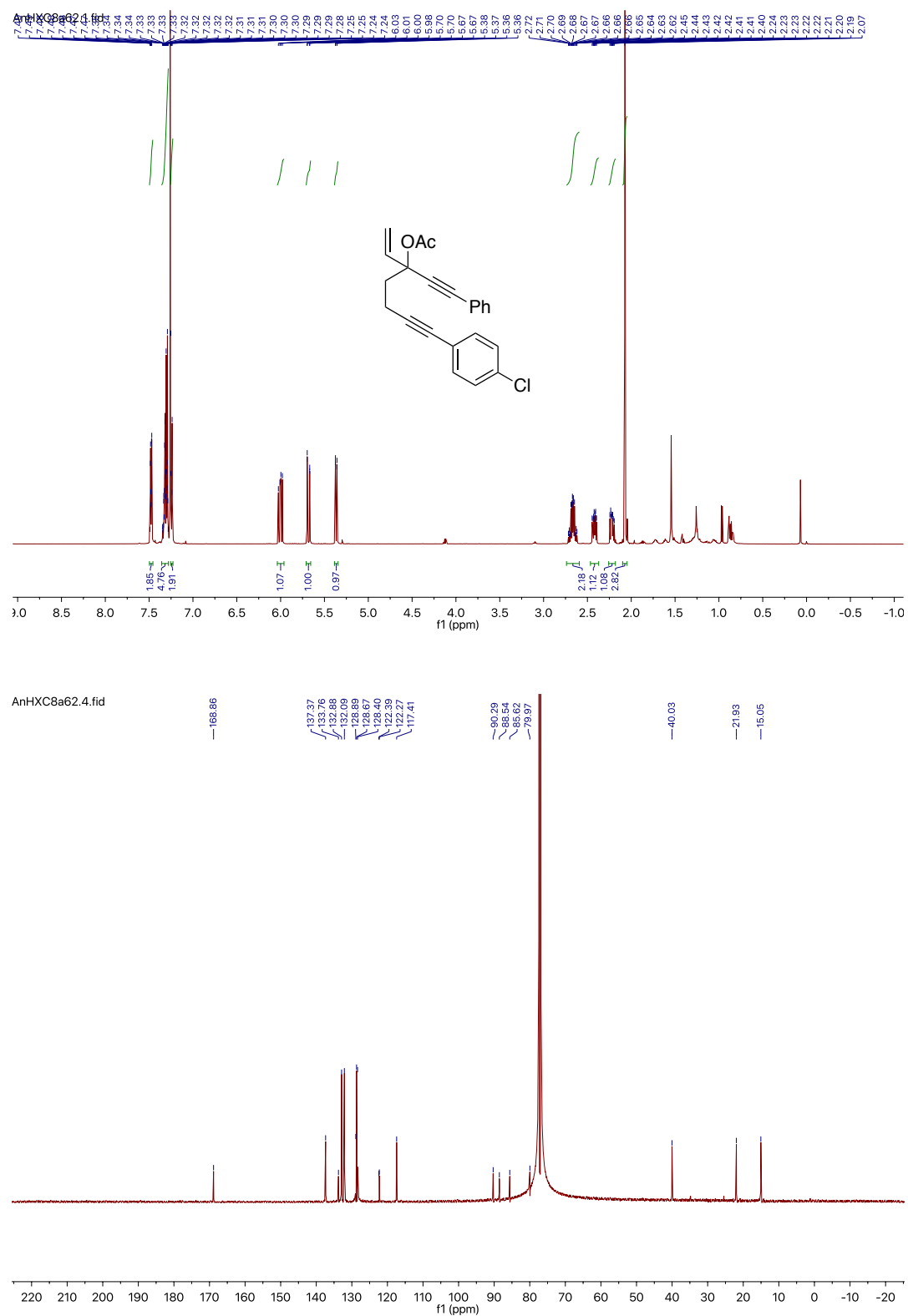


Figure S15. ^1H and ^{13}C NMR spectra of 3-(phenylethynyl)hept-1-en-6-yn-3-yl acetate (**1o**)

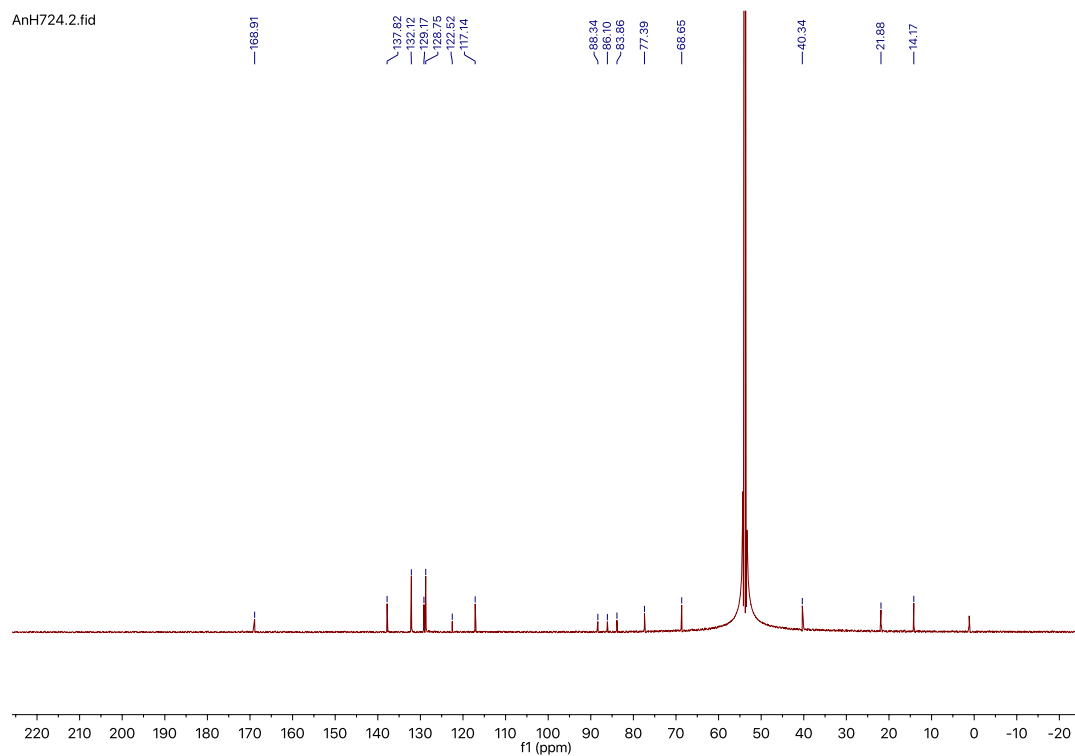
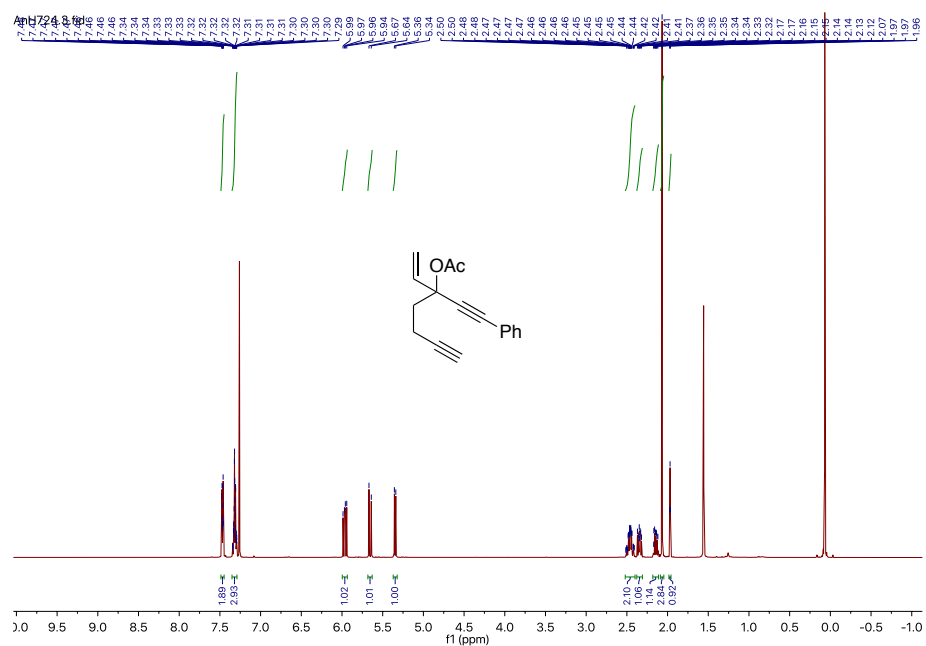


Figure S16. ^1H and ^{13}C NMR spectra of 2,7-diphenyl-1*H*-inden-3-yl acetate (**7a**)

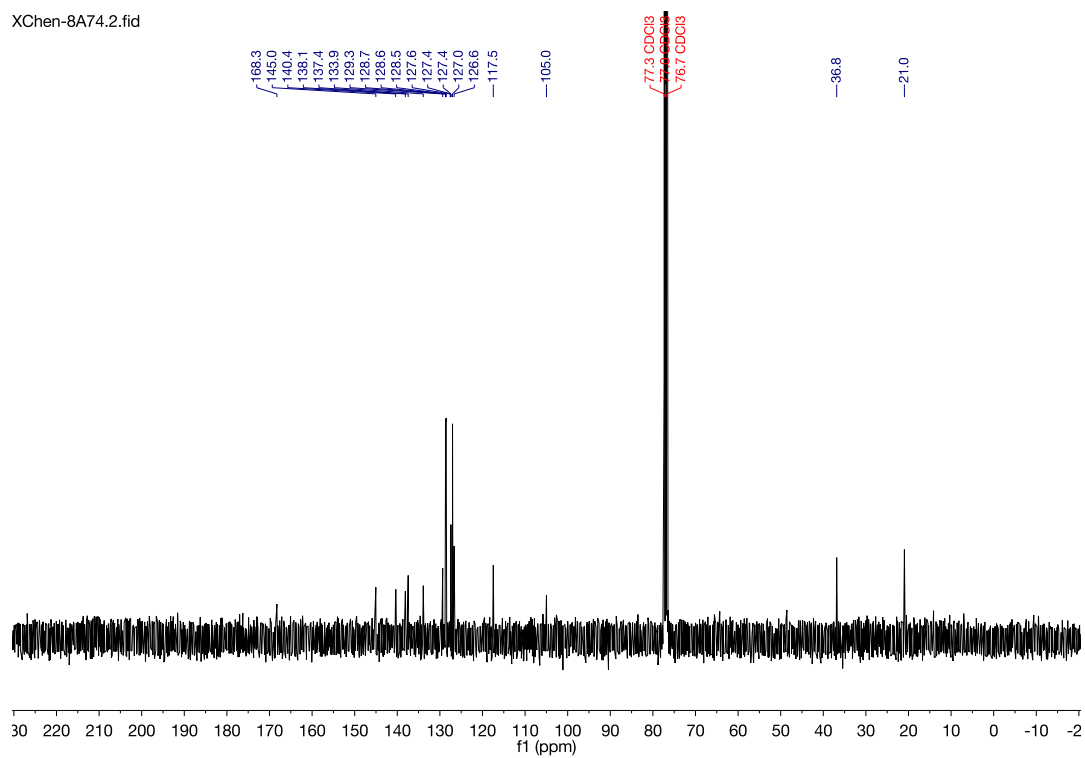
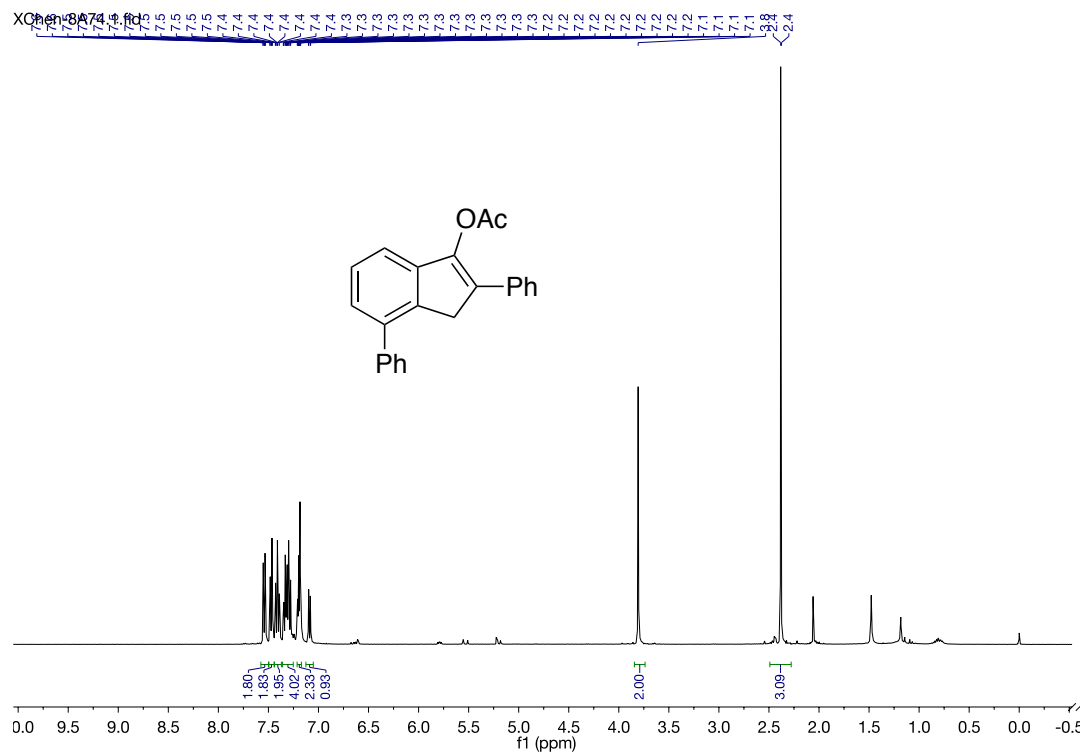


Figure S17. ^1H and ^{13}C NMR spectra of 2-phenyl-7-(4-(trifluoromethyl)phenyl)-1*H*-inden-3-yl acetate (**7b**)

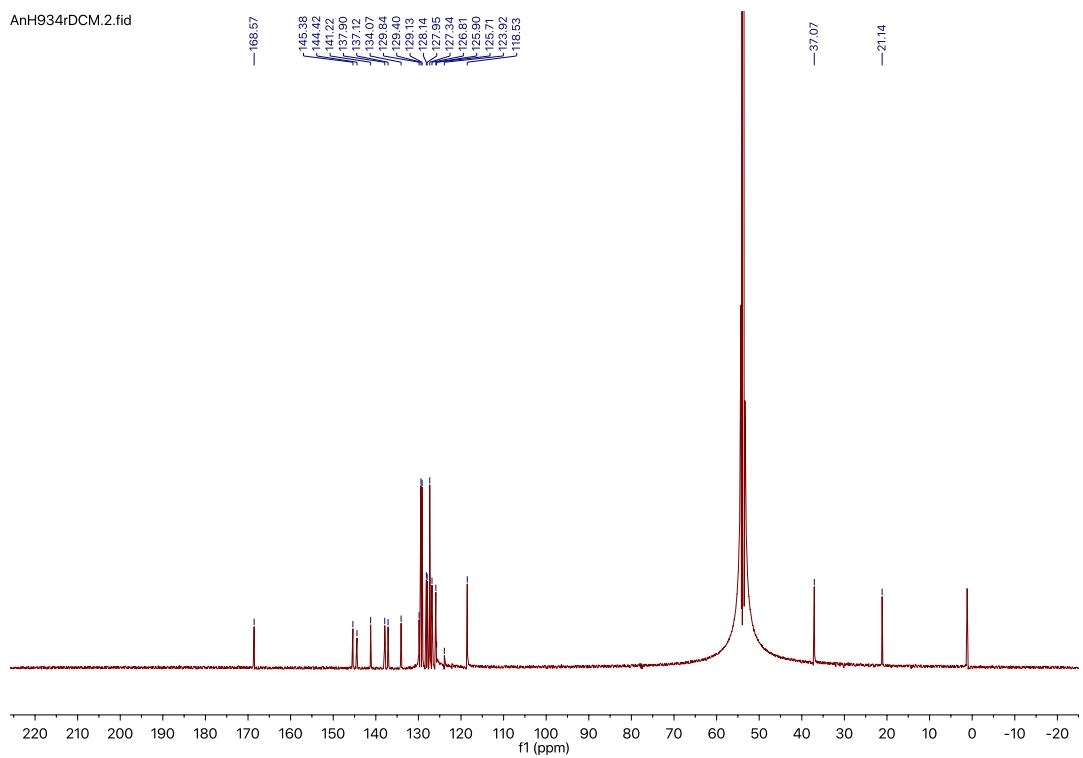
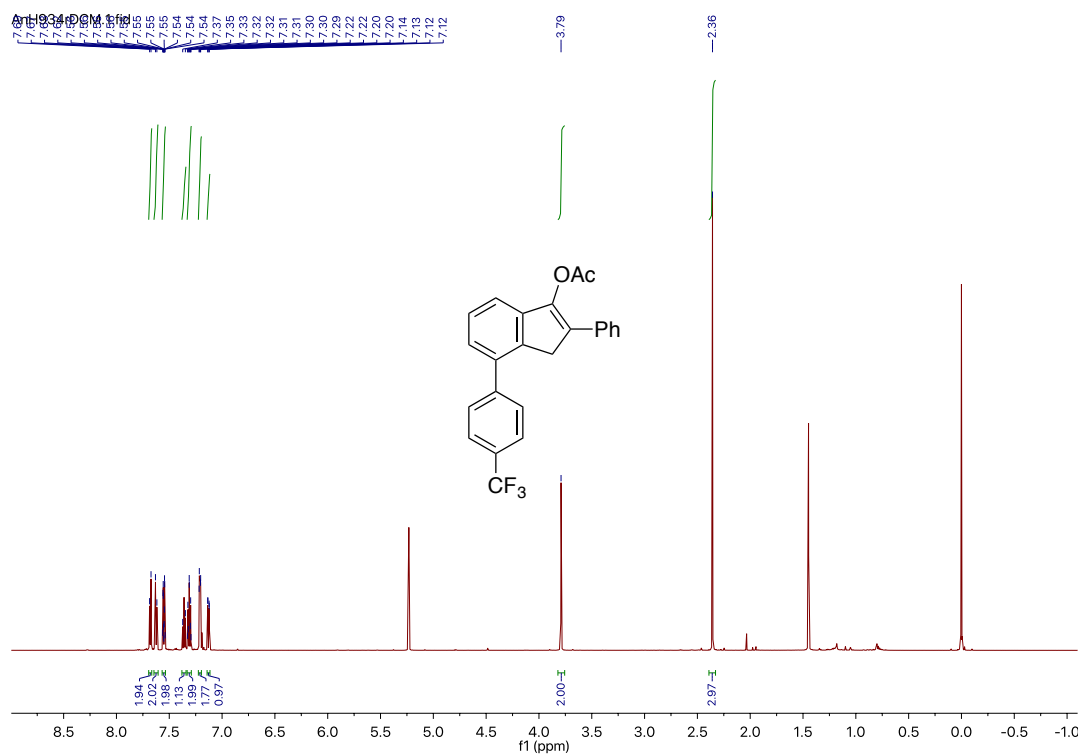


Figure S18. ^1H and ^{13}C NMR spectra of 7-(4-nitrophenyl)-2-phenyl-1*H*-inden-3-yl acetate (**7c**)

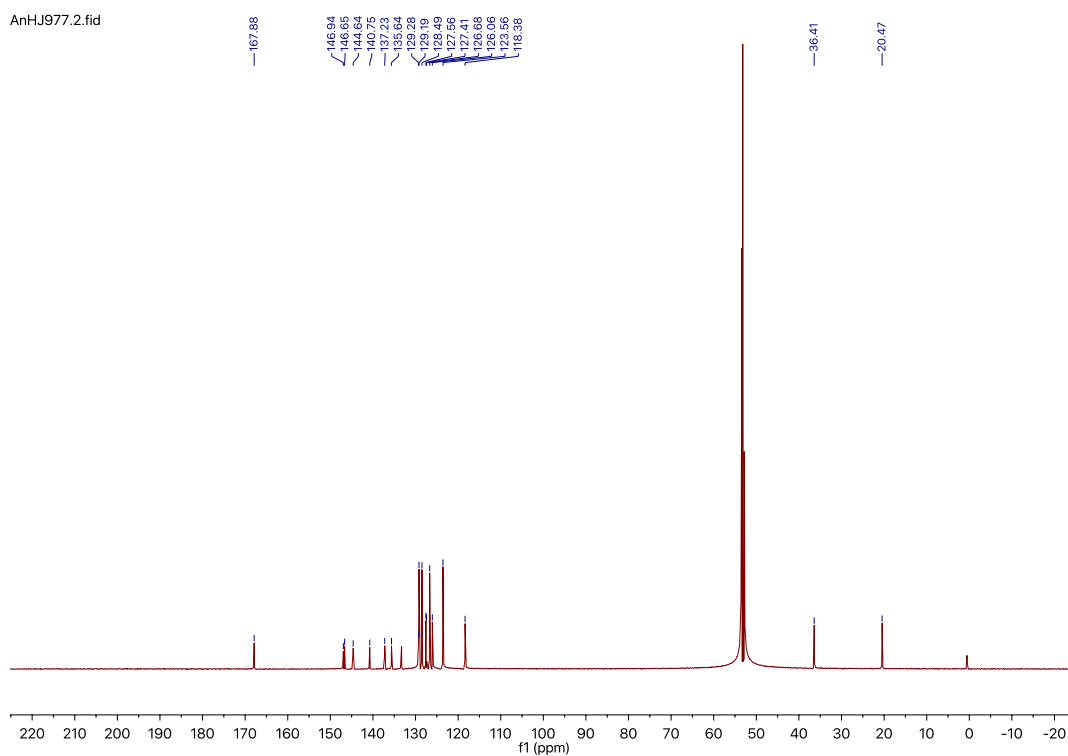
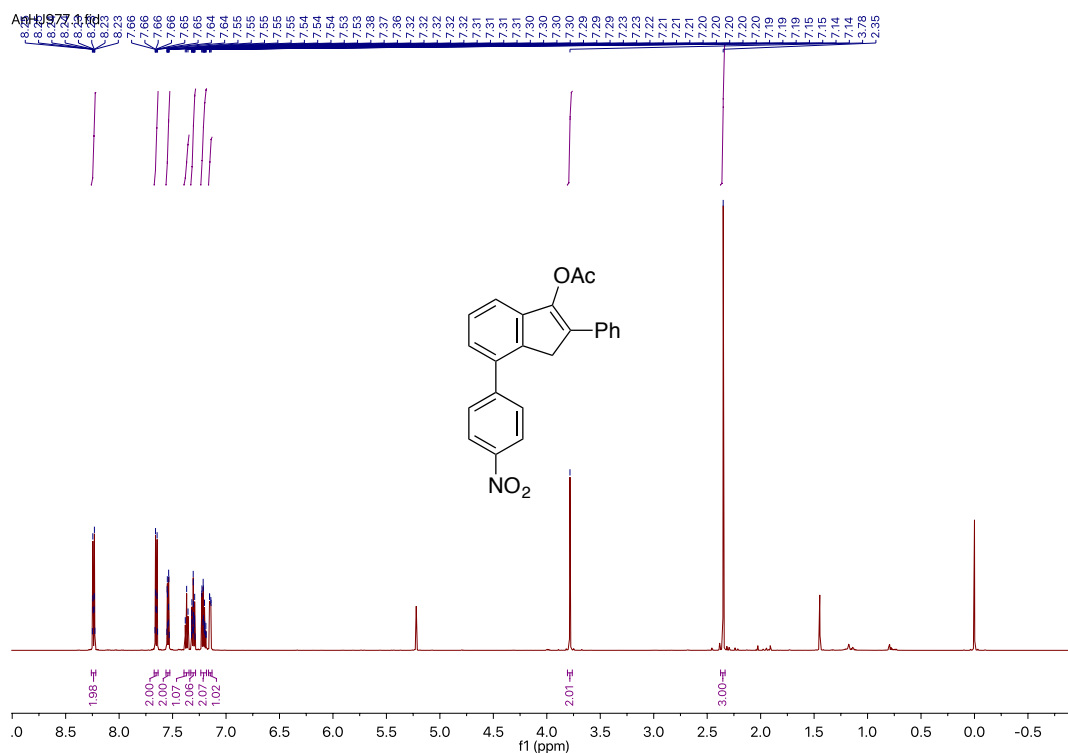


Figure S19. ^1H and ^{13}C NMR spectra of 7-(4-fluorophenyl)-2-phenyl-1*H*-inden-3-yl acetate (**7d**)

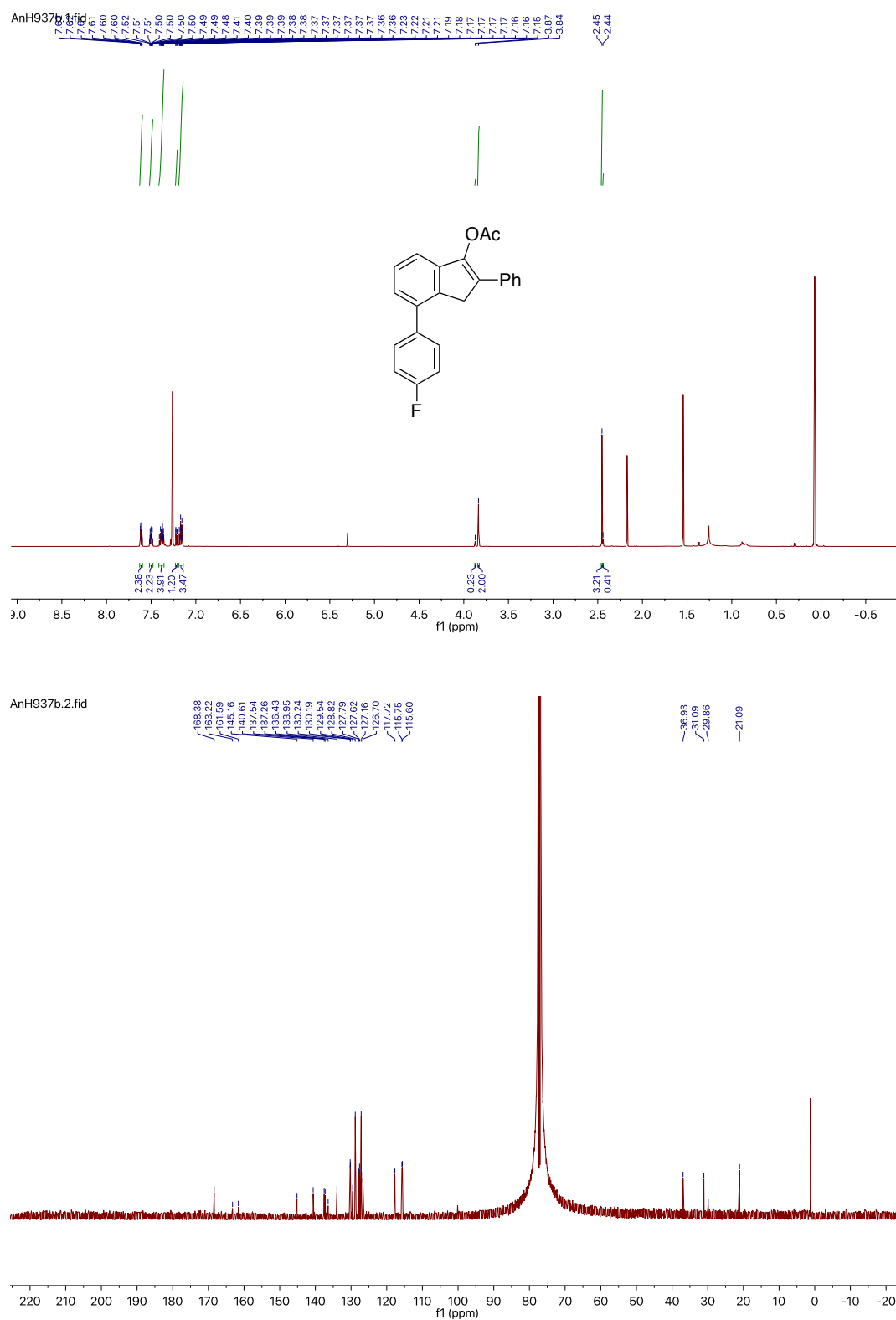


Figure S20. ^1H and ^{13}C NMR spectra of 7-(4-methoxyphenyl)-2-phenyl-1*H*-inden-3-yl acetate (**7e**)

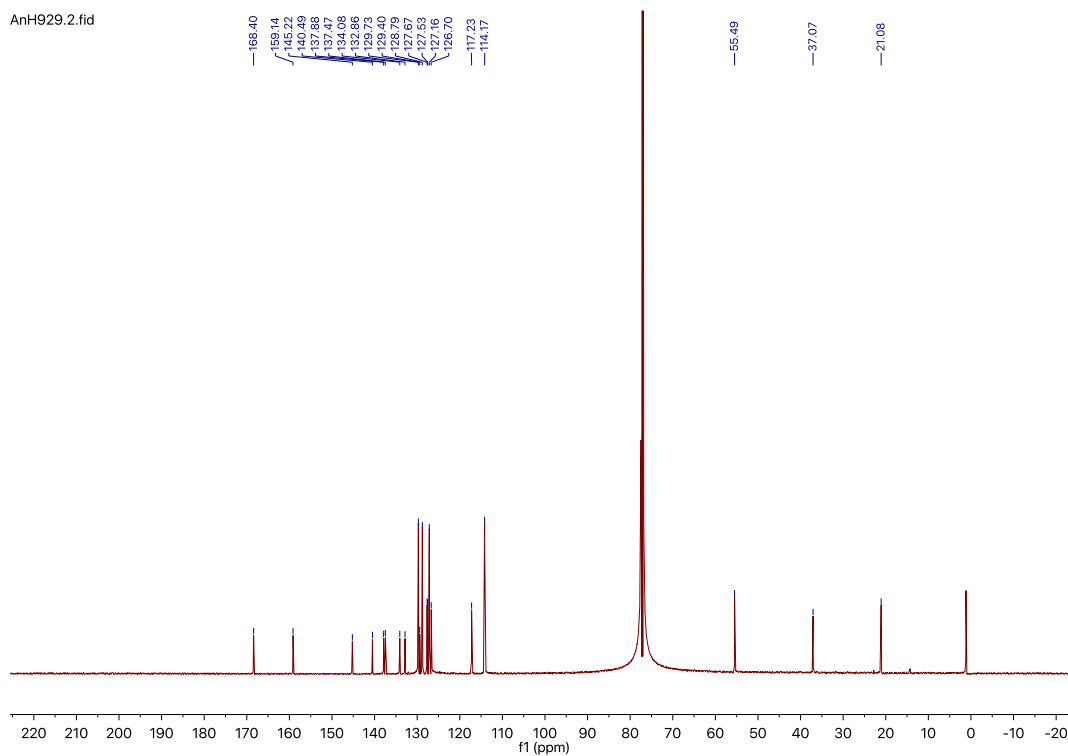
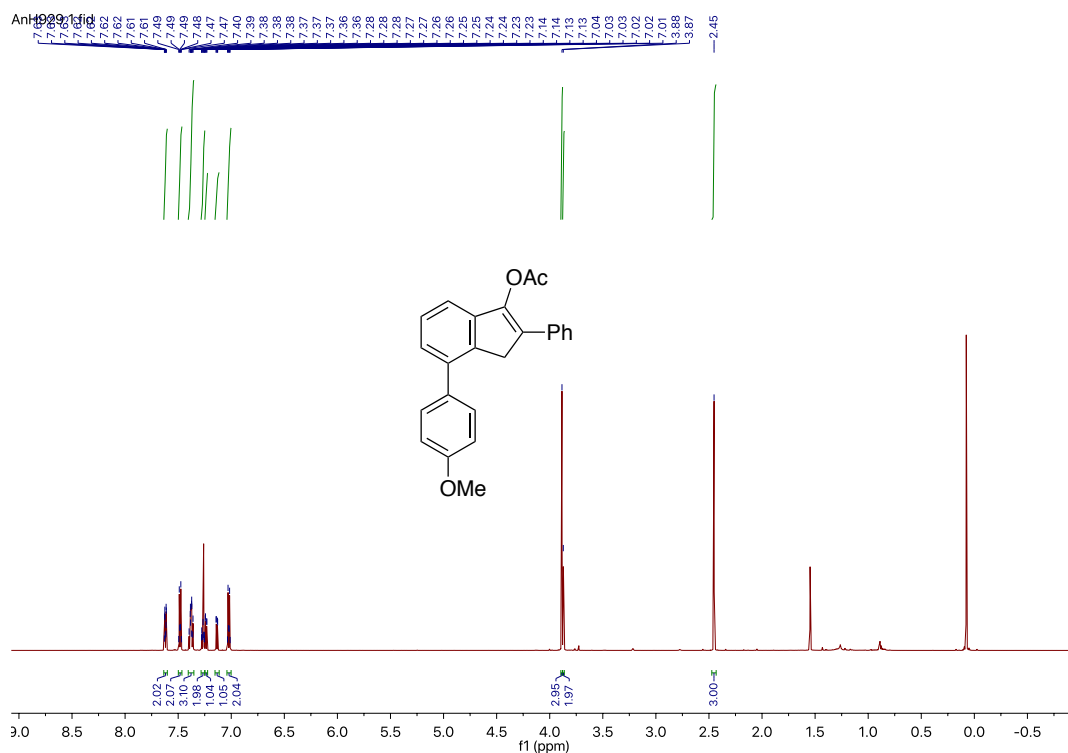


Figure S21. ¹H and ¹³C NMR spectra of 2-phenyl-7-(*m*-tolyl)-1*H*-inden-3-yl acetate

(7f)

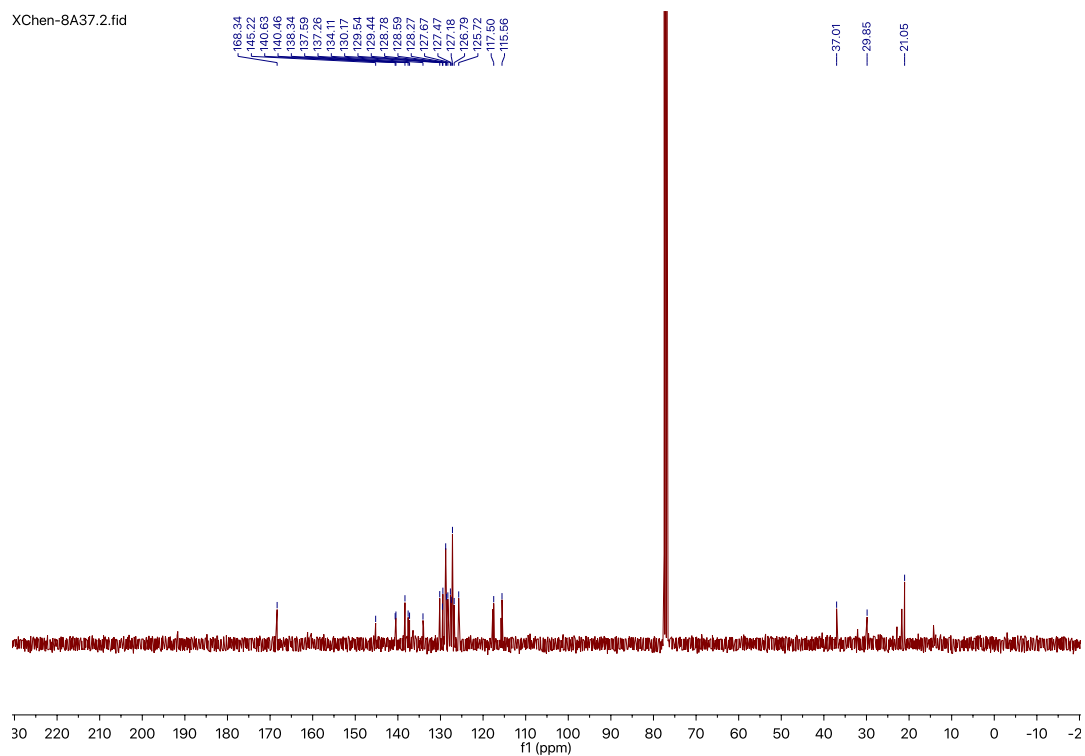
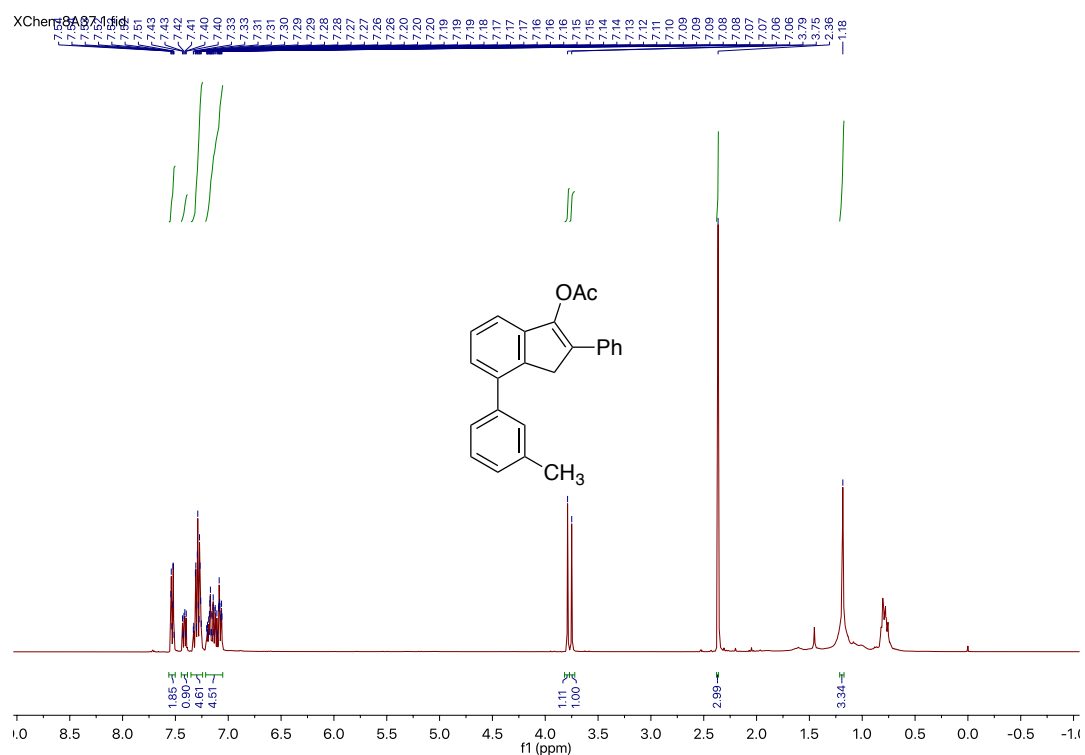


Figure S22. ^1H and ^{13}C NMR spectra of 7-(3,5-difluorophenyl)-2-phenyl-1*H*-inden-3-yl acetate (**7g**)

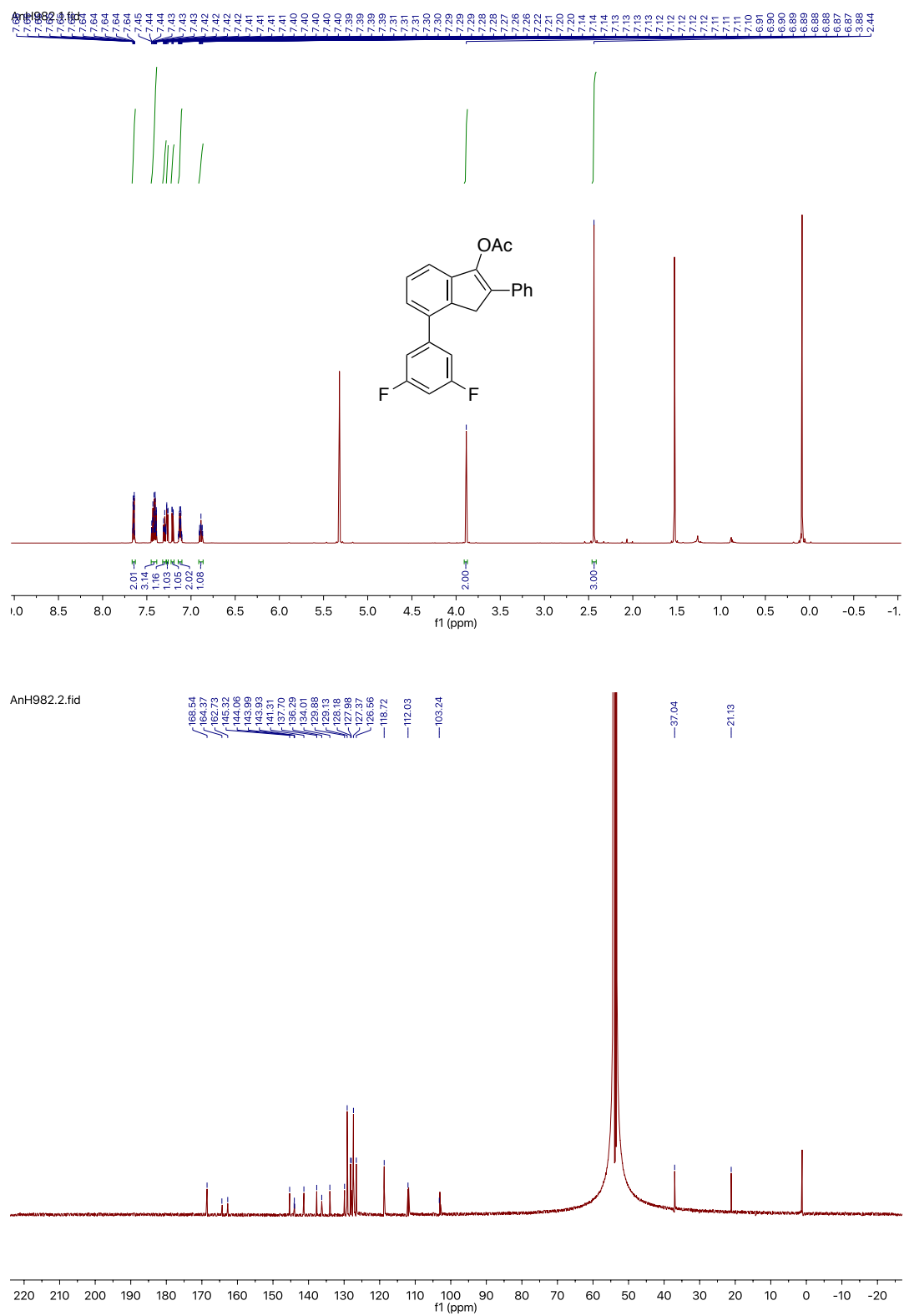


Figure S23. ^1H and ^{13}C NMR spectra of 7-(naphthalen-1-yl)-2-phenyl-1*H*-inden-3-yl acetate (**7h**)

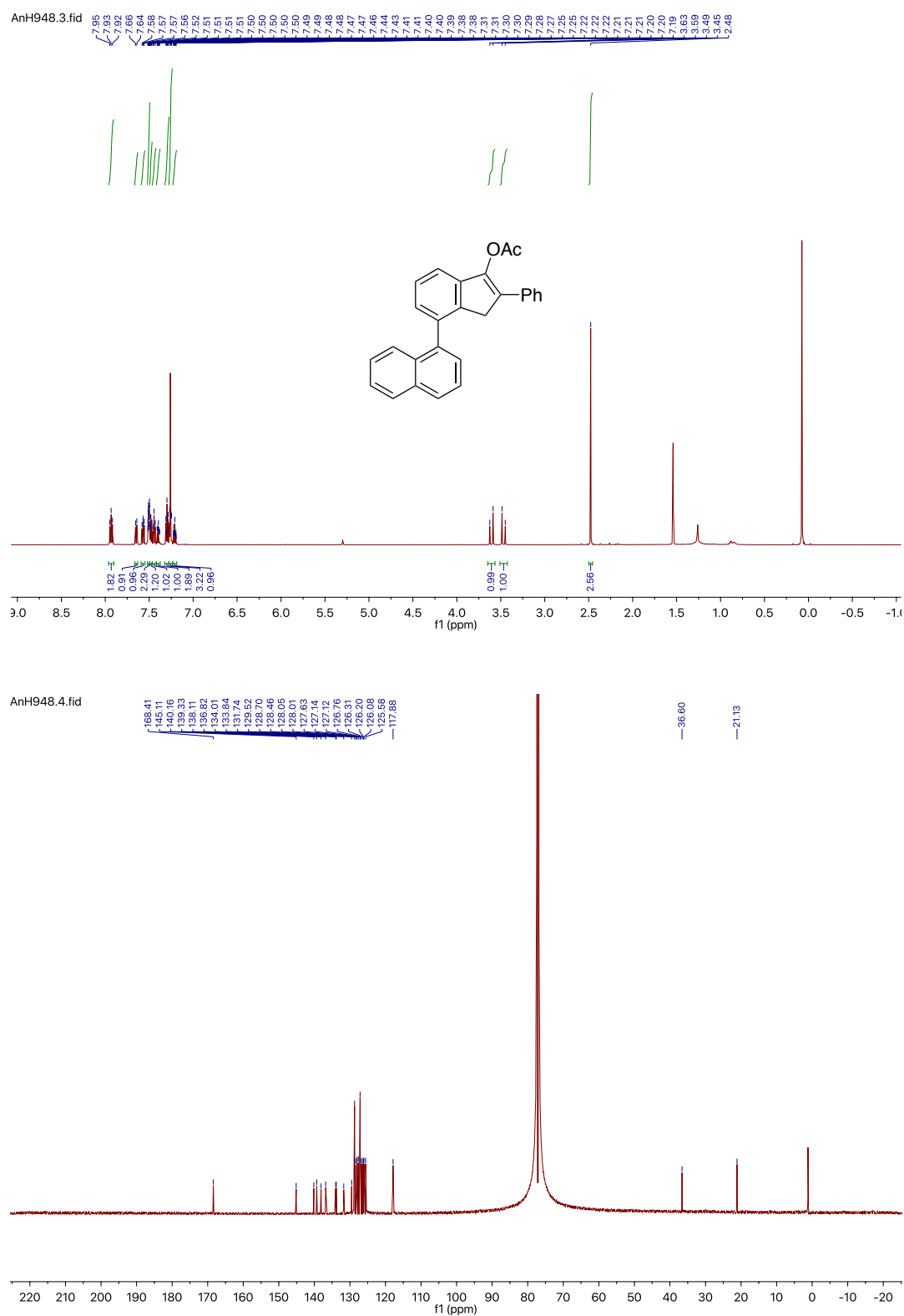


Figure S24. ¹H and ¹³C NMR spectra of 2-(4-fluorophenyl)-7-phenyl-1*H*-inden-3-yl acetate (**7i**)

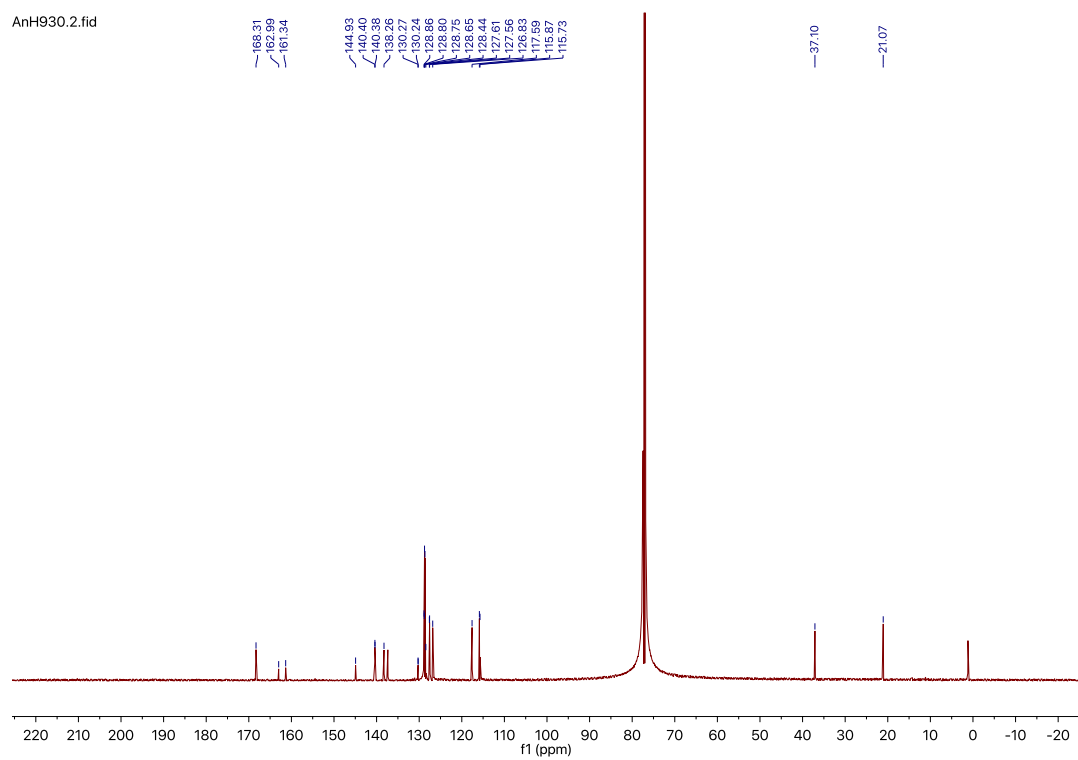
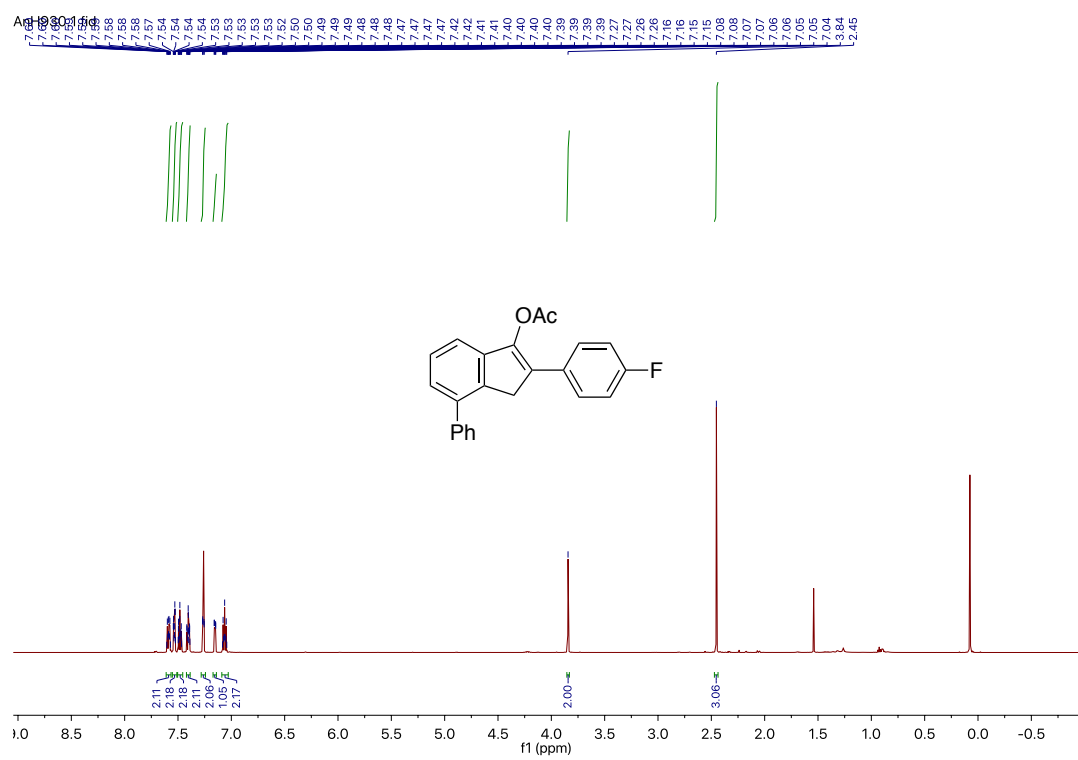


Figure S25. ^1H and ^{13}C NMR spectra of 2-([1,1'-biphenyl]-4-yl)-7-phenyl-1*H*-inden-3-yl acetate (**7j**)

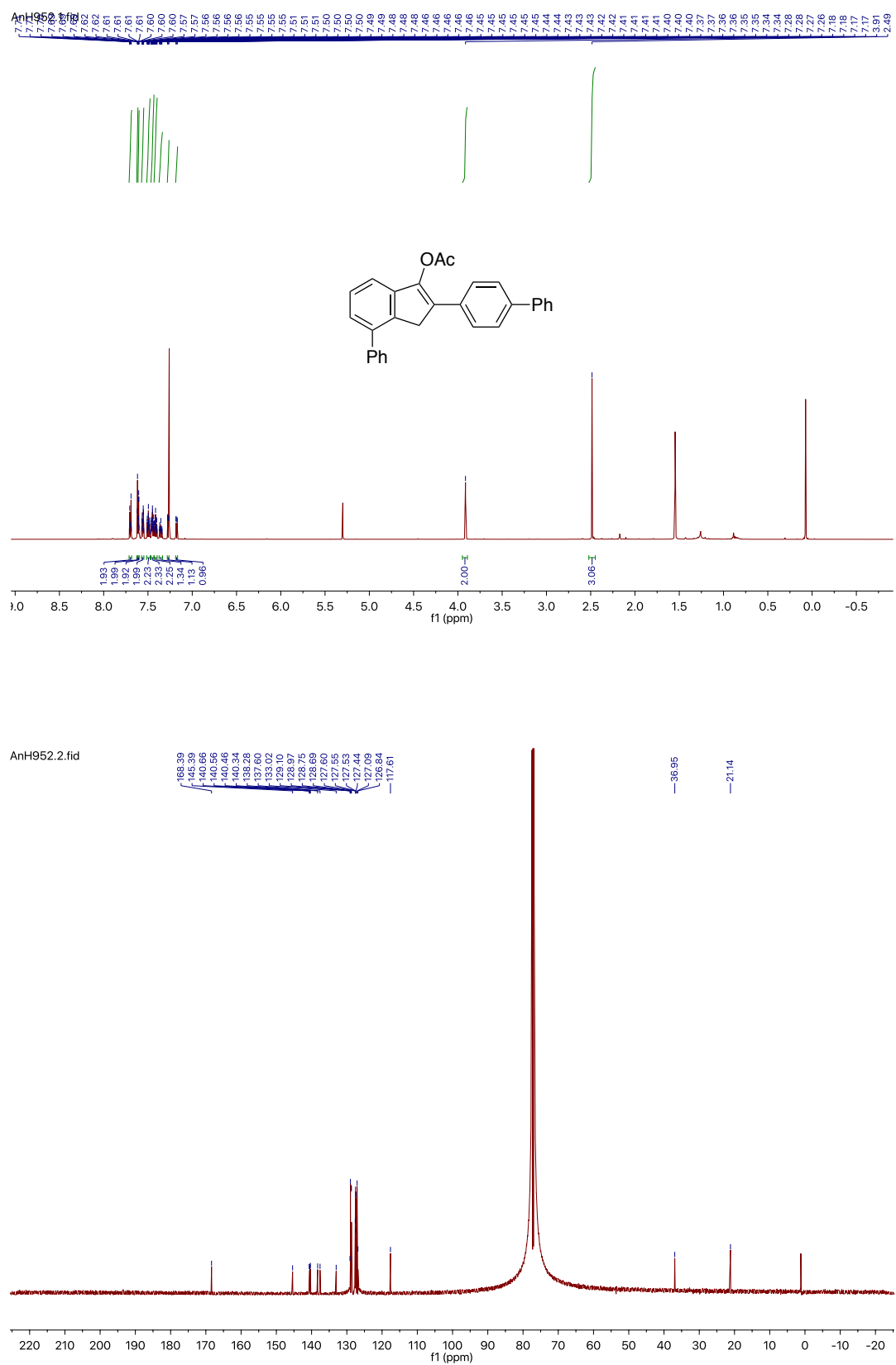


Figure S26. ^1H and ^{13}C NMR spectra of 7-phenyl-2-(*p*-tolyl)-1*H*-inden-3-yl acetate (7k)

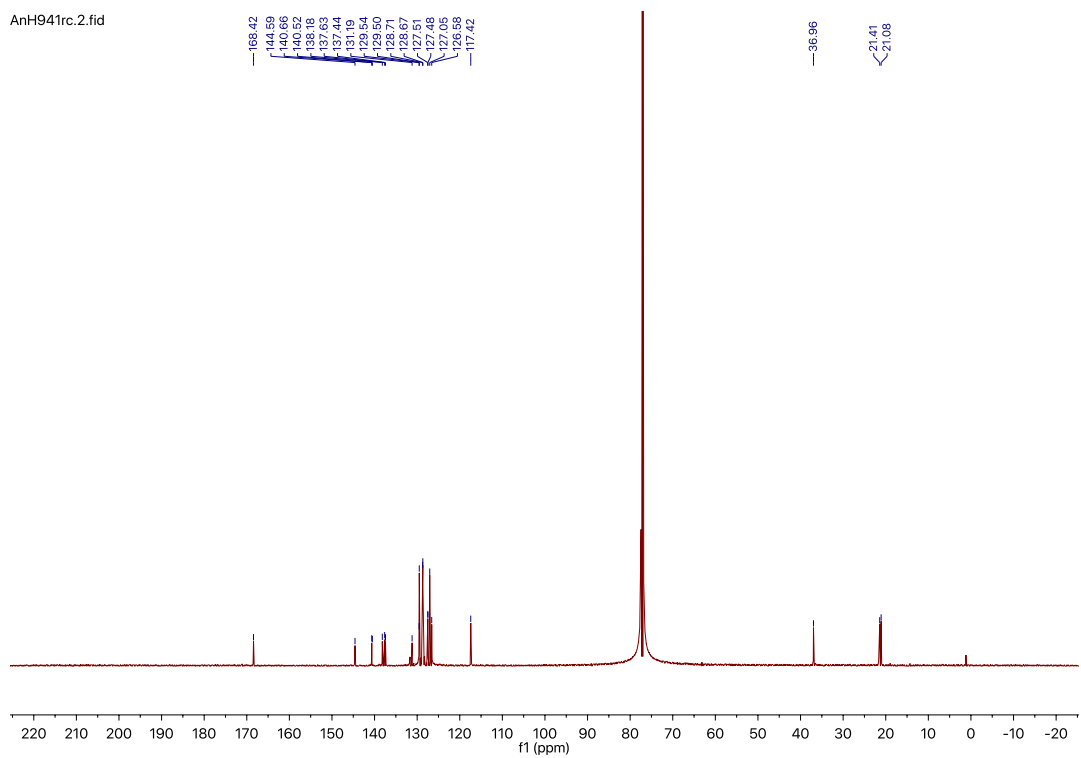
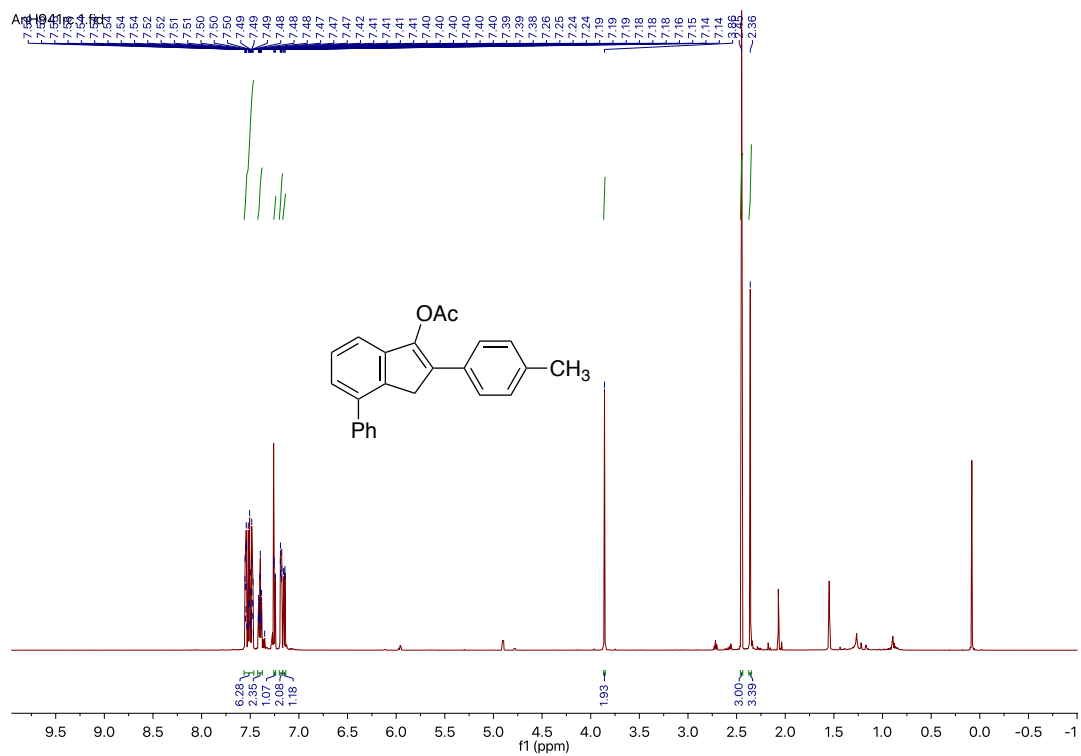


Figure S27. ^1H and ^{13}C NMR spectra of 1,3-dioxo-4,9-diphenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate **8a**

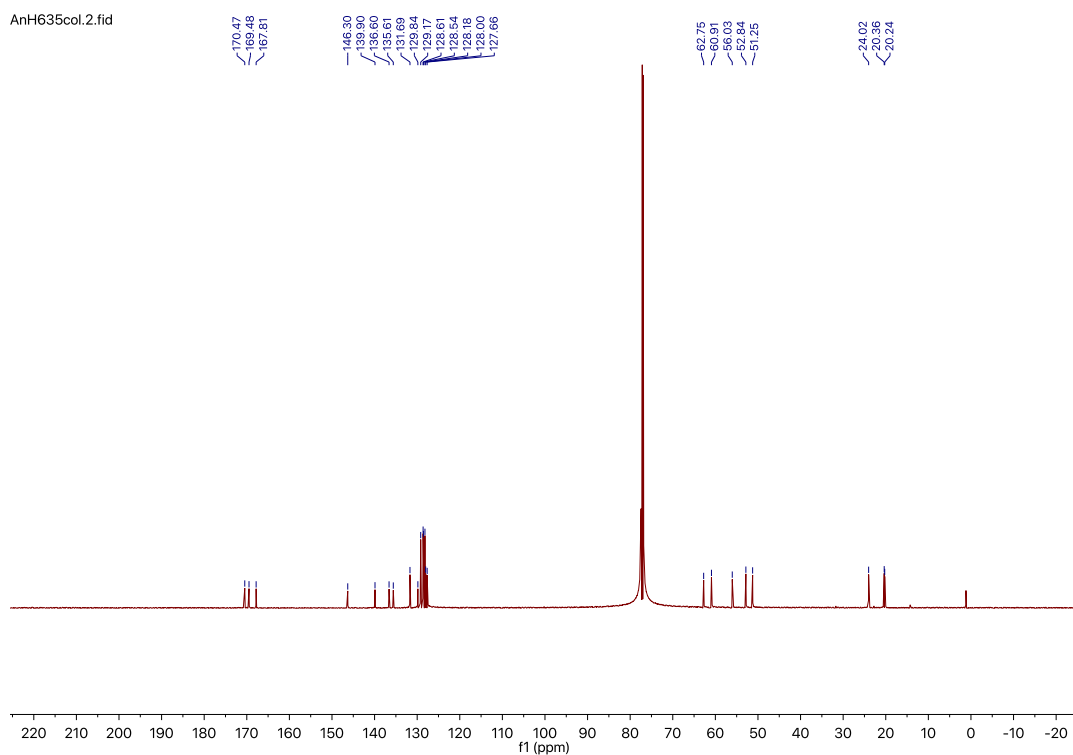
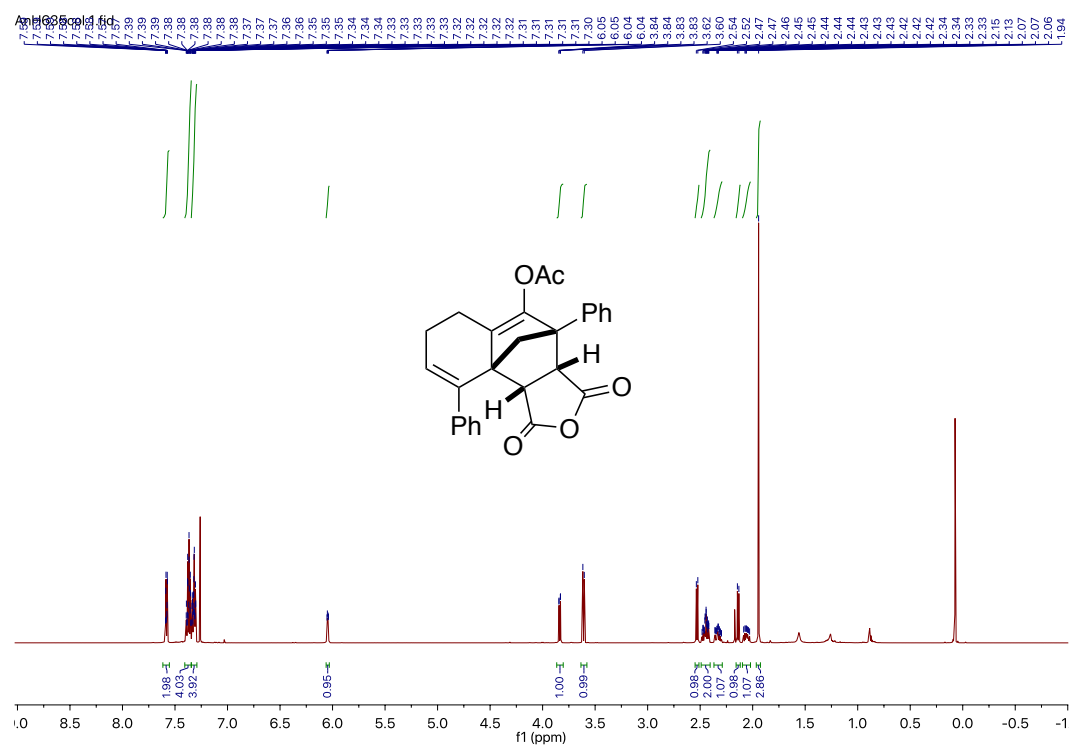


Figure S28 NOSEY spectrum of 1,3-dioxo-4,9-diphenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate **8a**

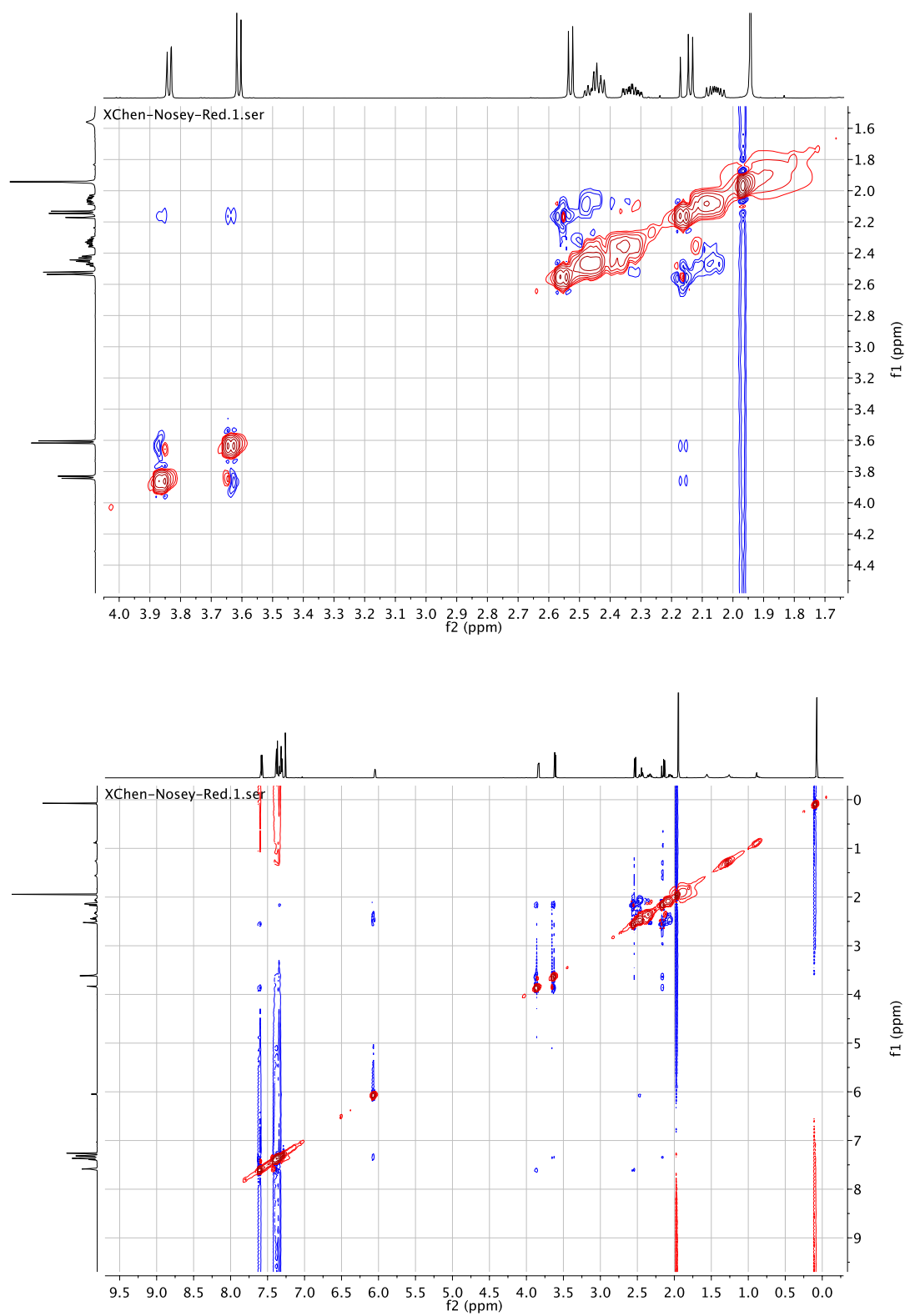


Figure S29. ^1H and ^{13}C NMR spectra of 1,3-dioxo-4-phenyl-9-(4-(trifluoromethyl)phenyl)-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8b**)

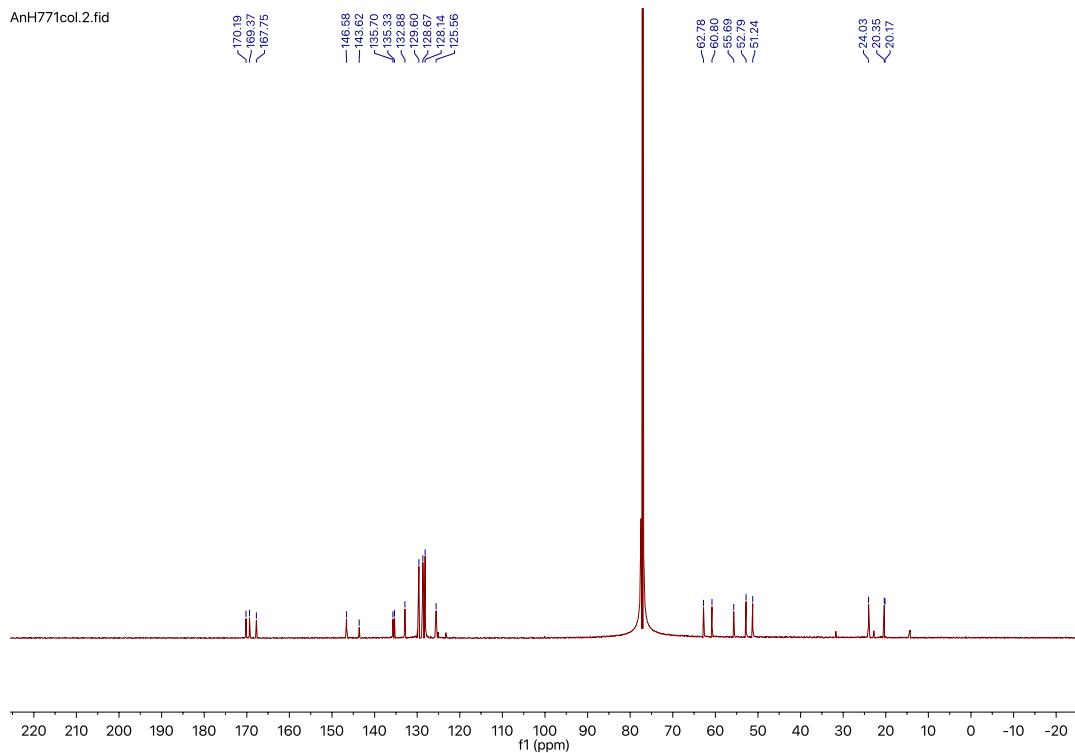
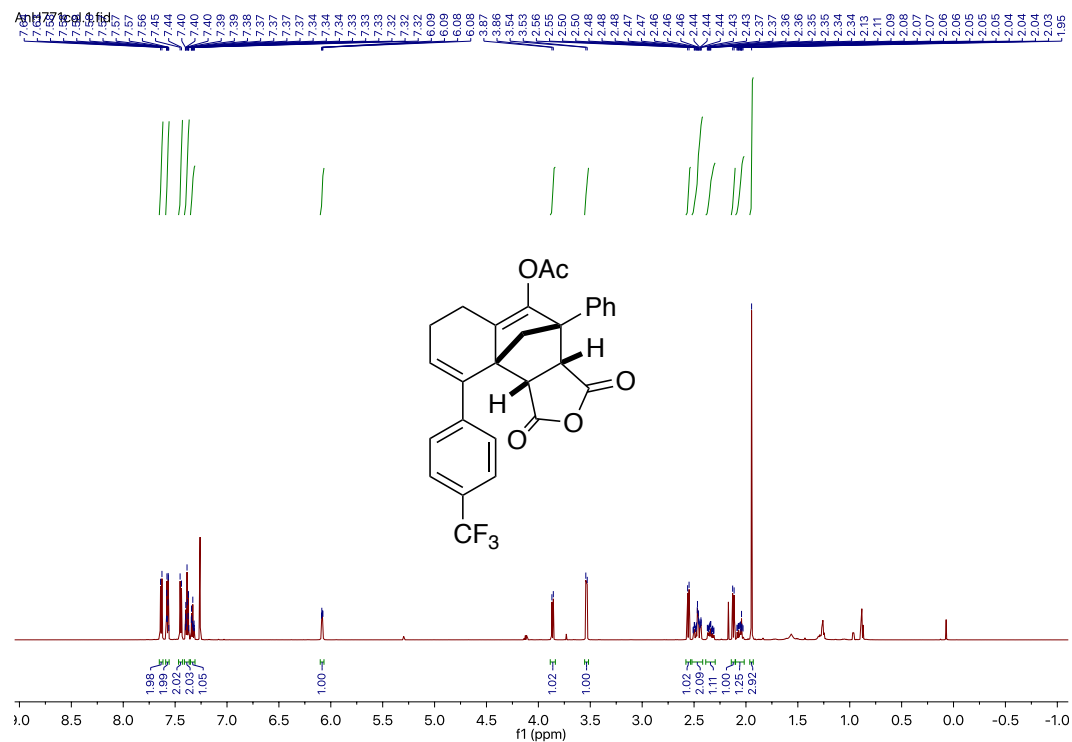


Figure S30. ^1H and ^{13}C NMR spectra of 9-(4-fluorophenyl)-1,3-dioxo-4-phenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8d**)

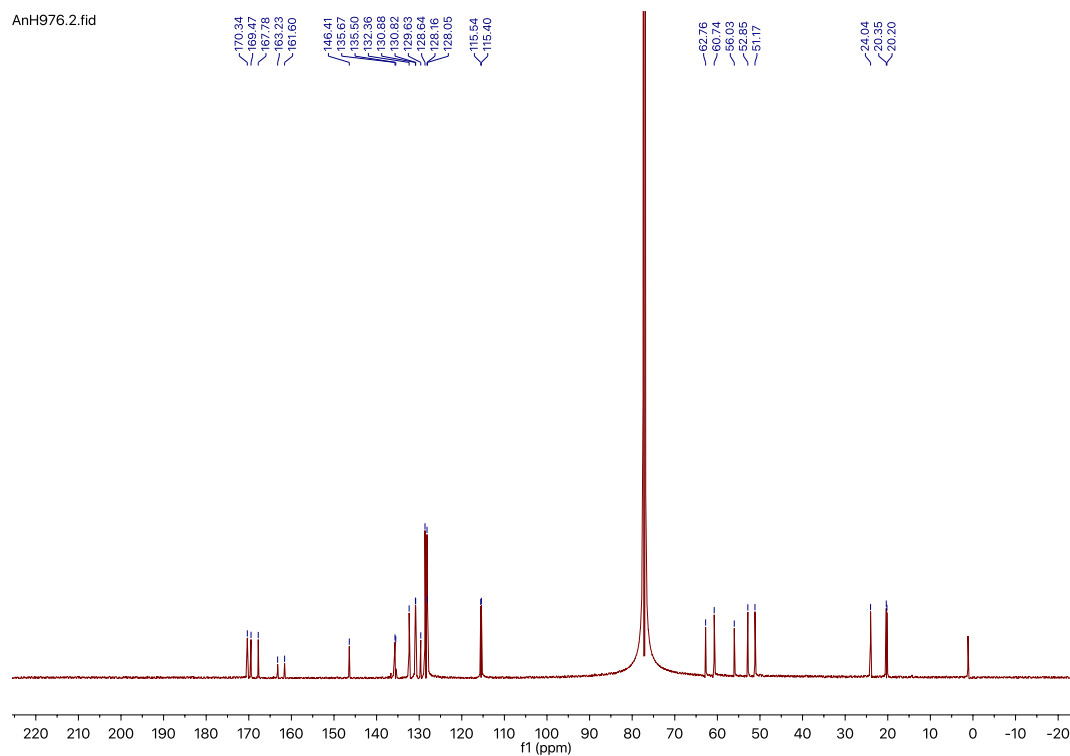
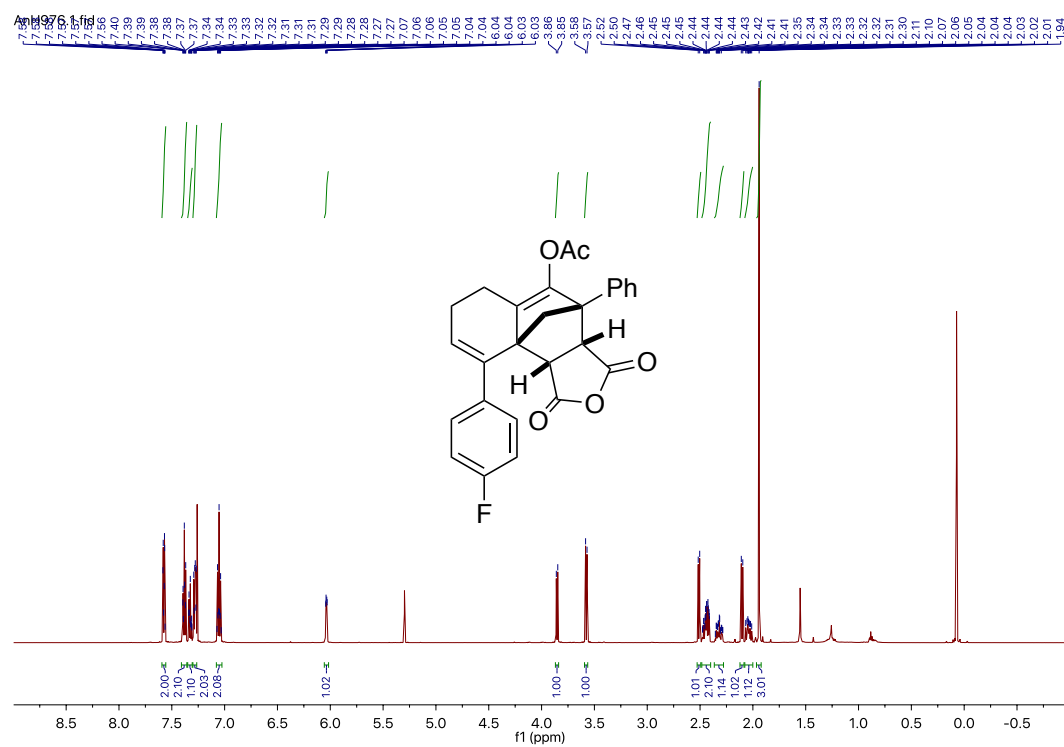


Figure S31. ^1H and ^{13}C NMR spectra of 9-(naphthalen-1-yl)-1,3-dioxo-4-phenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8h**)

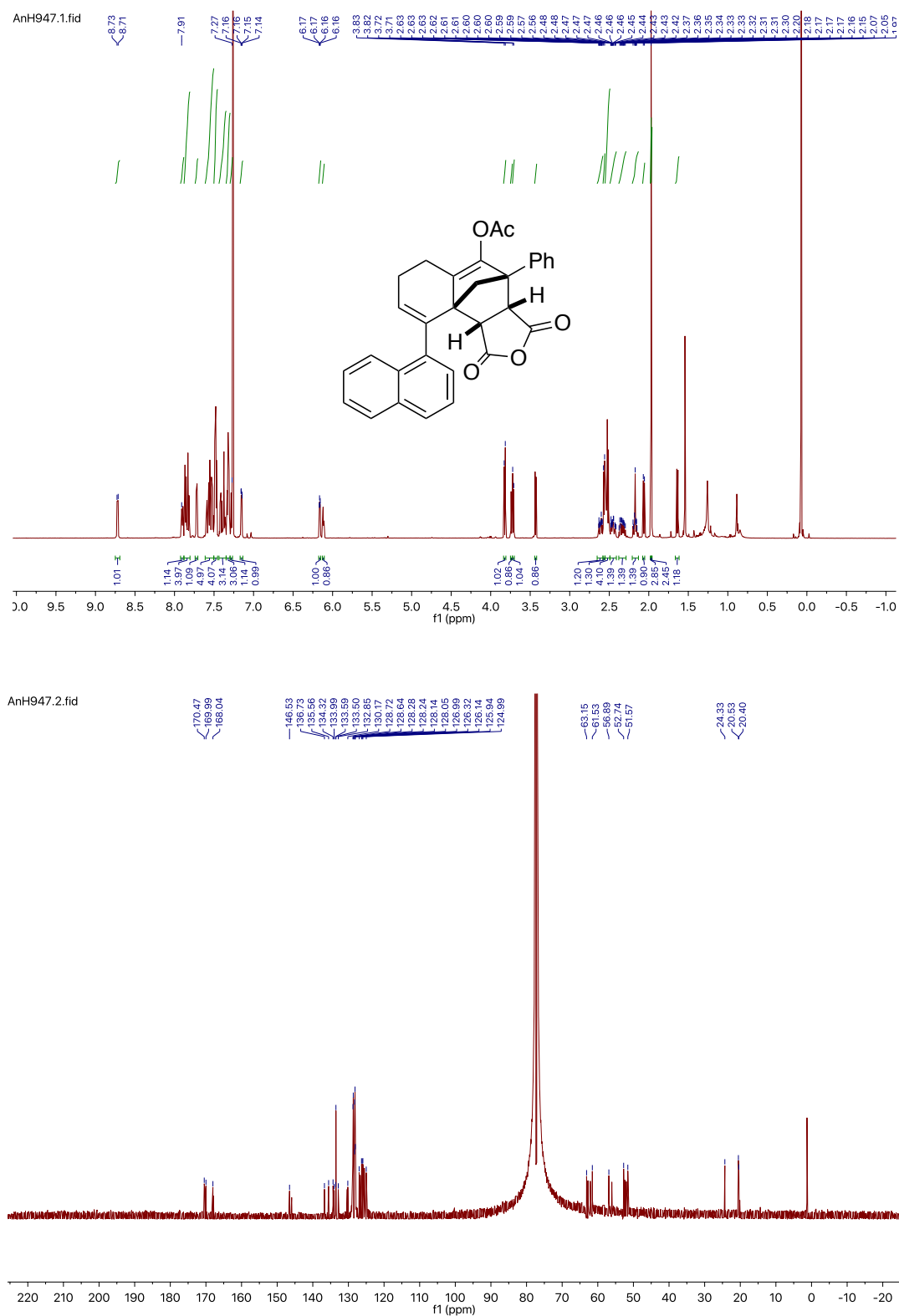


Figure S32. ^1H and ^{13}C NMR spectra of 4-(4-fluorophenyl)-1,3-dioxo-9-phenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8i**)

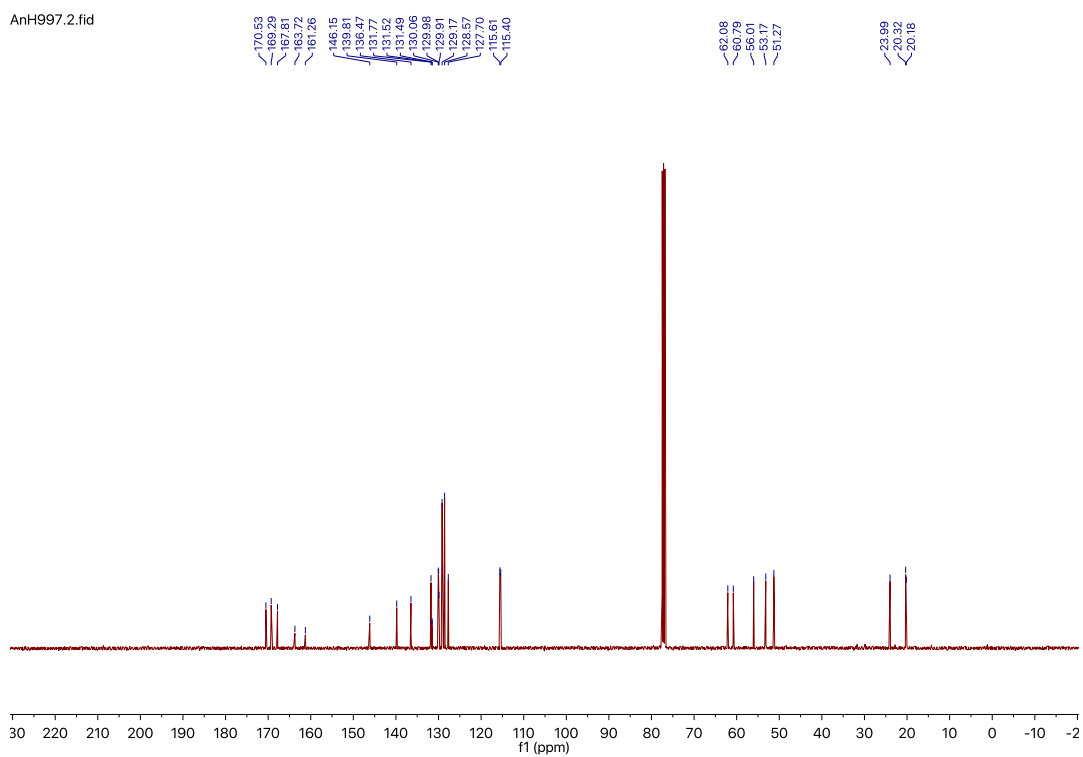
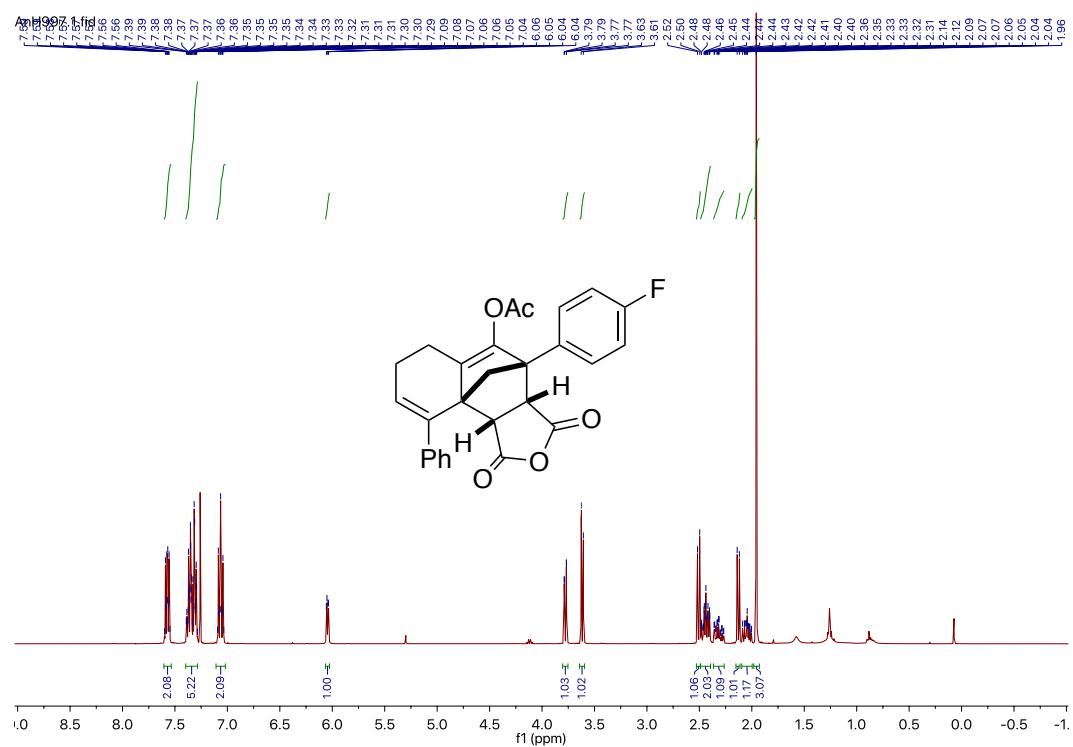


Figure S33. ^1H and ^{13}C NMR spectra of 4-([1,1'-biphenyl]-4-yl)-1,3-dioxo-9-phenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8j**)

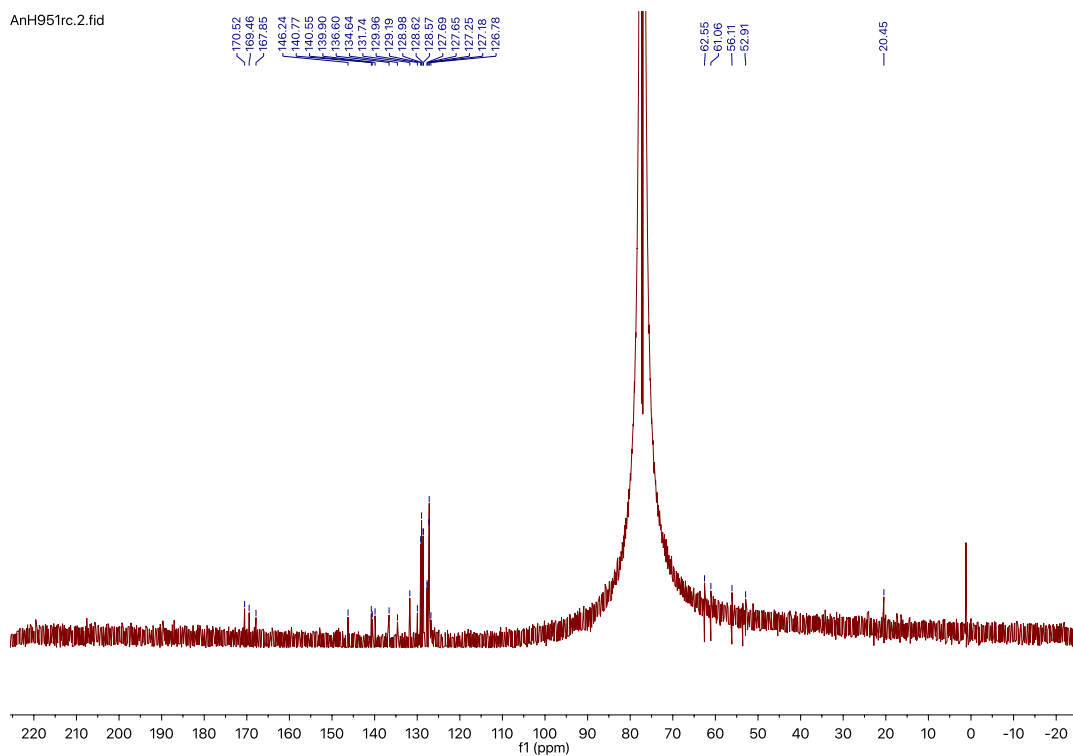
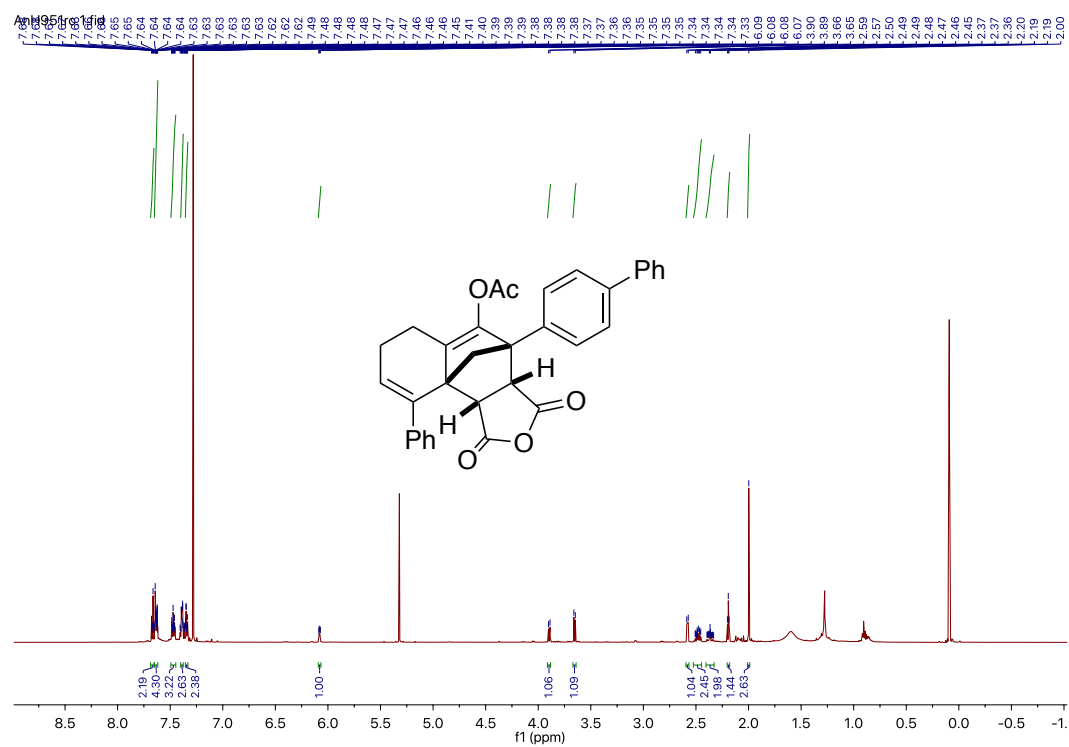


Figure S34. ^1H and ^{13}C NMR spectra of 1,3-dioxo-9-phenyl-4-(*p*-tolyl)-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8k**)

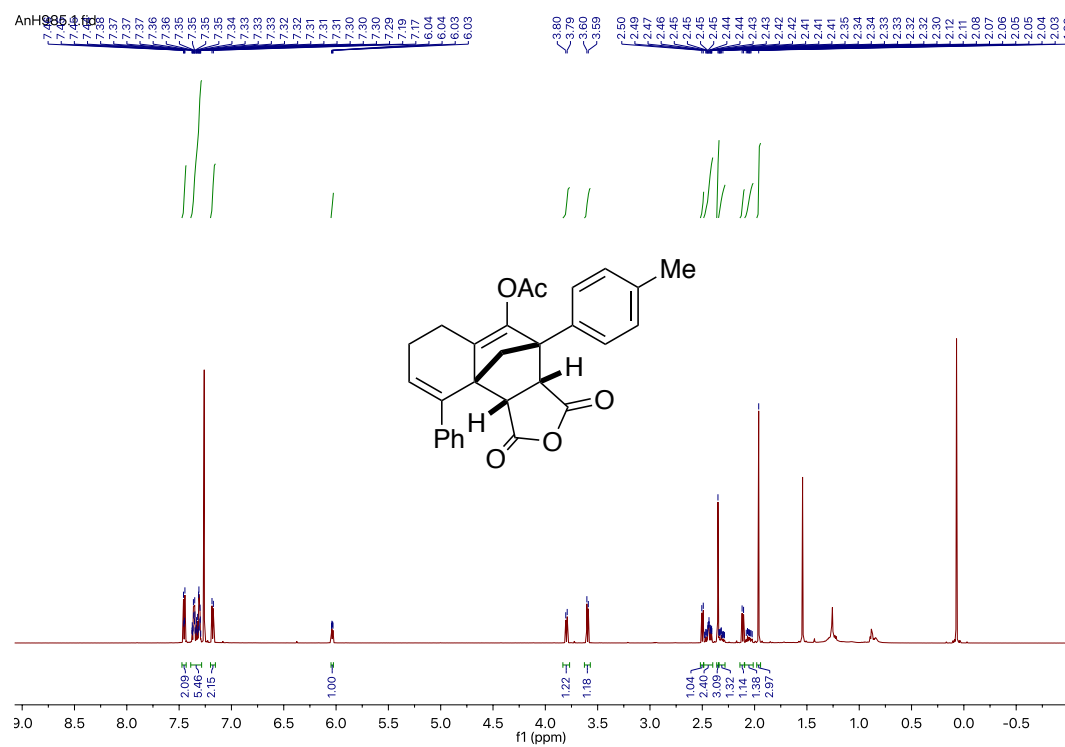


Figure S35. ^1H and ^{13}C NMR spectra of 9-(4-chlorophenyl)-1,3-dioxo-4-phenyl-1,3a,4,6,7,9b-hexahydro-3*H*-4,9a-methanonaphtho[1,2-*c*]furan-5-yl acetate (**8n**)

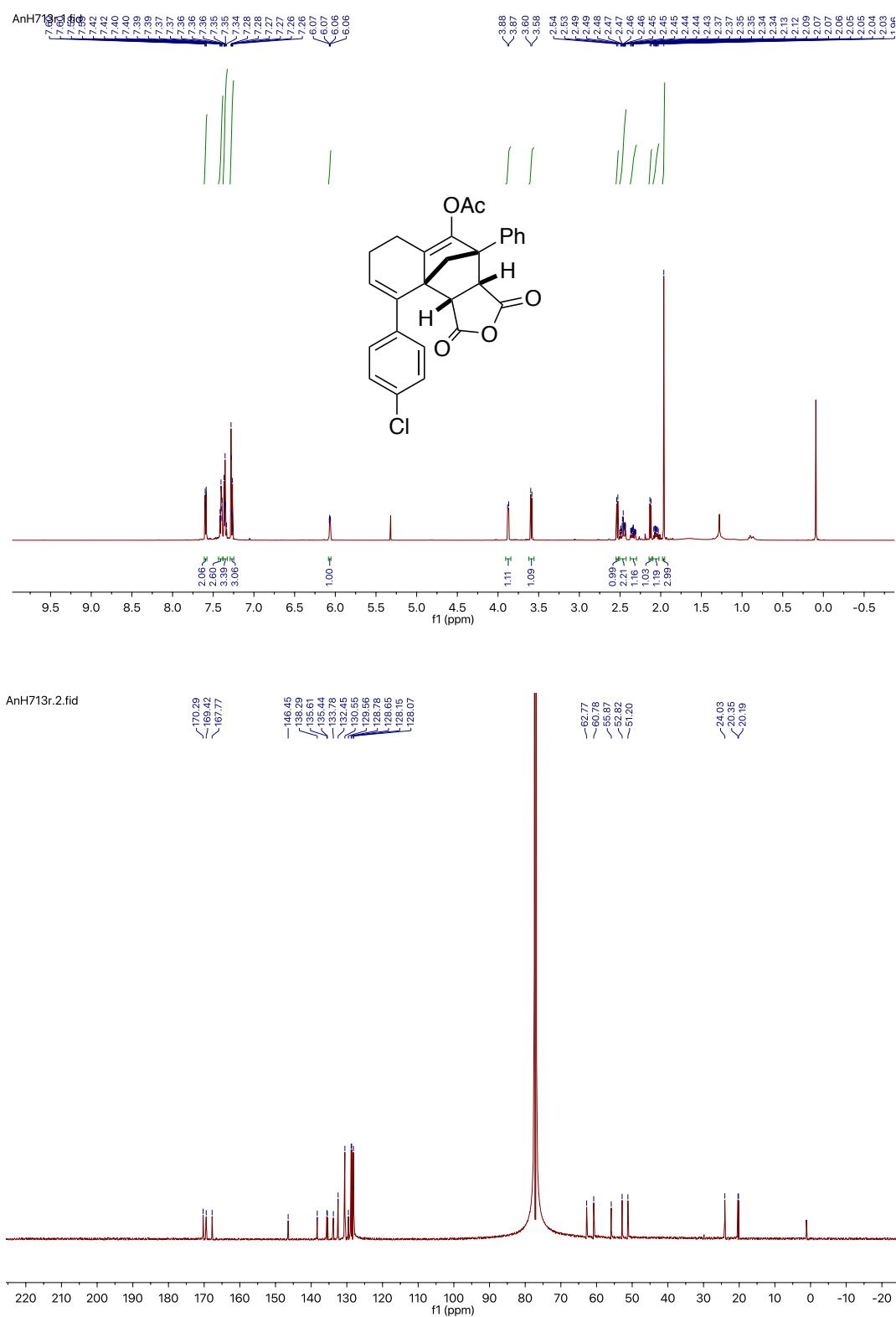


Figure S36. ^1H and ^{13}C NMR spectra of 2,7-diphenyl-4,5-dihydro-1*H*-inden-3-yl acetate (**9a**)

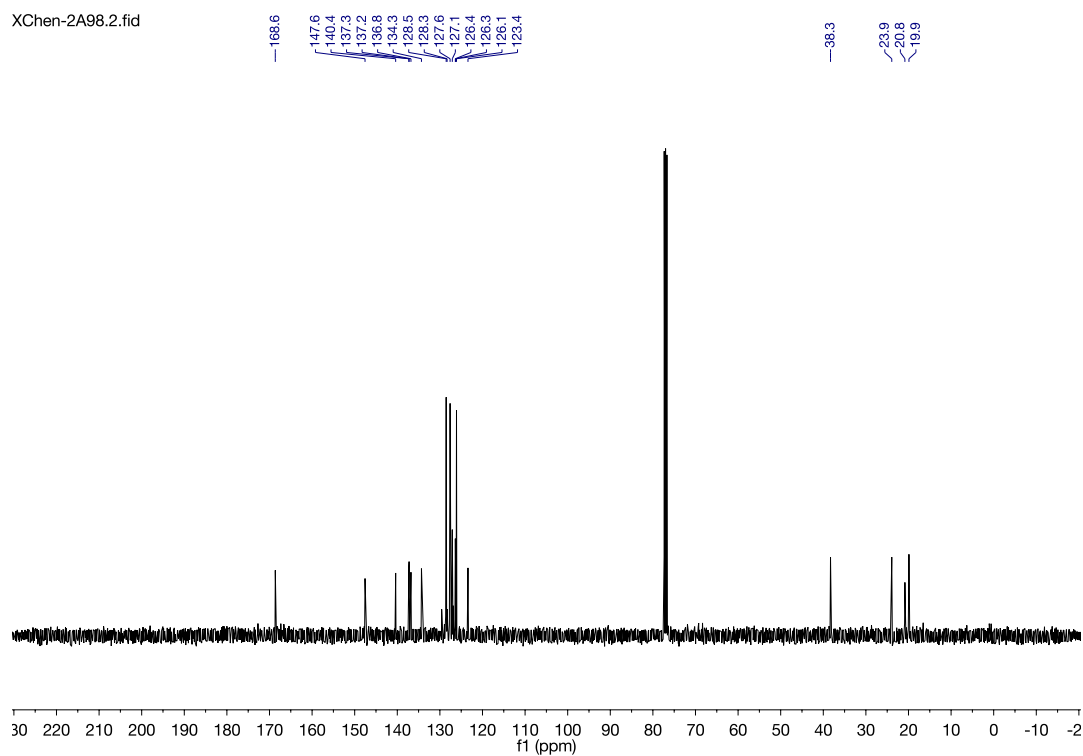
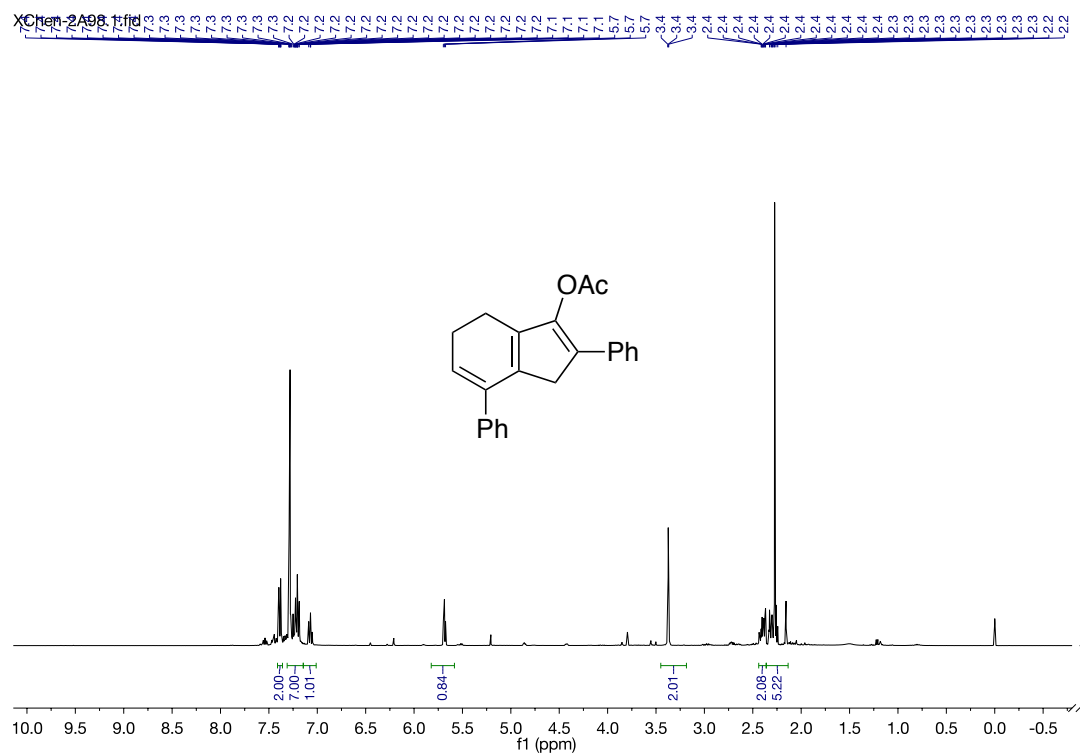


Figure S38. ^1H and ^{13}C NMR spectra of (*E*)-1-(2-benzoyl-3-vinylcyclopent-2-en-1-ylidene)-1-phenylpropan-2-one (**11a**)

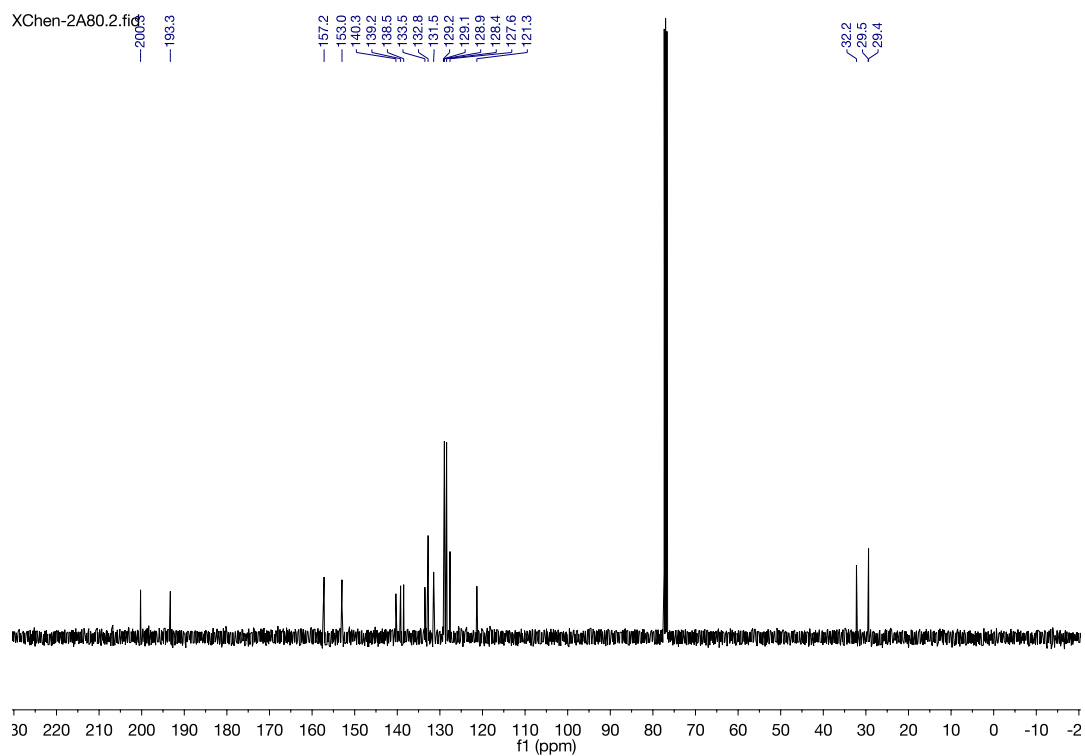
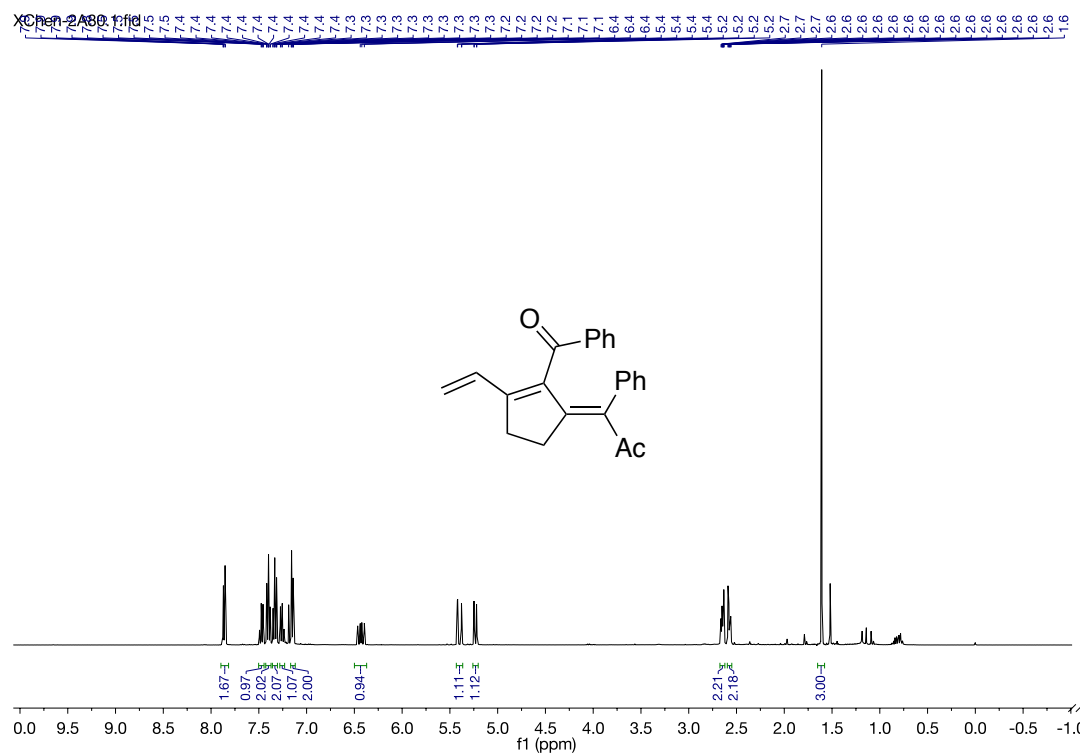


Figure S39. ^1H and ^{13}C NMR spectra of 1-(2-benzoyl-3-vinylcyclopent-2-en-1-ylidene)propan-2-one (**11o**)

