

Supporting Information

for

Gold-Catalyzed Cycloisomerization of 1,6-Diyne Esters to 1*H*-Cyclopenta[*b*]naphthalenes, *cis*-Cyclopenten-2-yl δ -Diketones and Bicyclo[3.2.0]hepta-1,5-dienes

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1. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra for compounds 1a–λ and 4a–t

Figure S1. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3,7-triphenylhepta-1,6-diyn-3-yl acetate (1a)

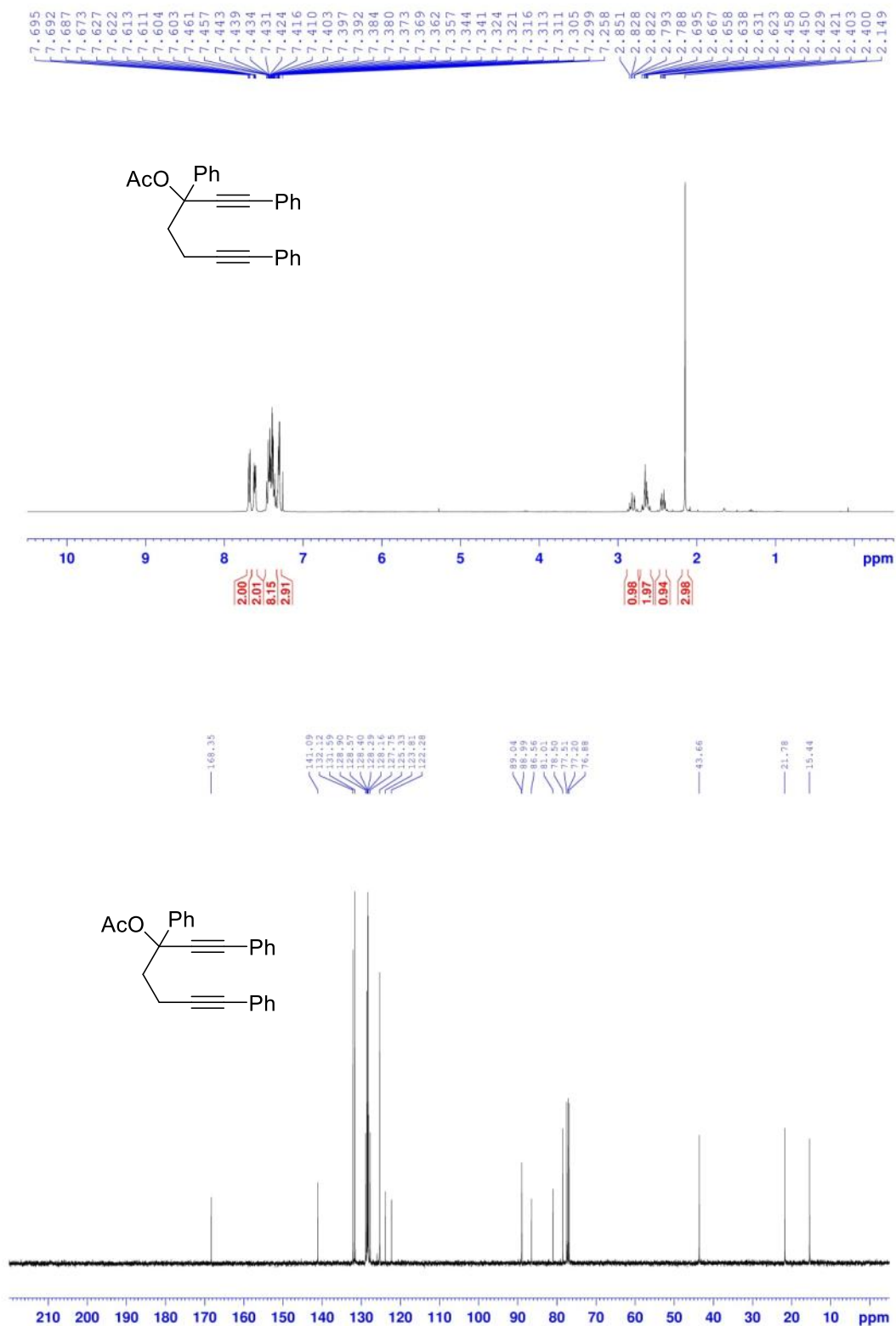


Figure S2. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3,7-triphenylhepta-1,6-diyn-3-yl benzoate (1b)

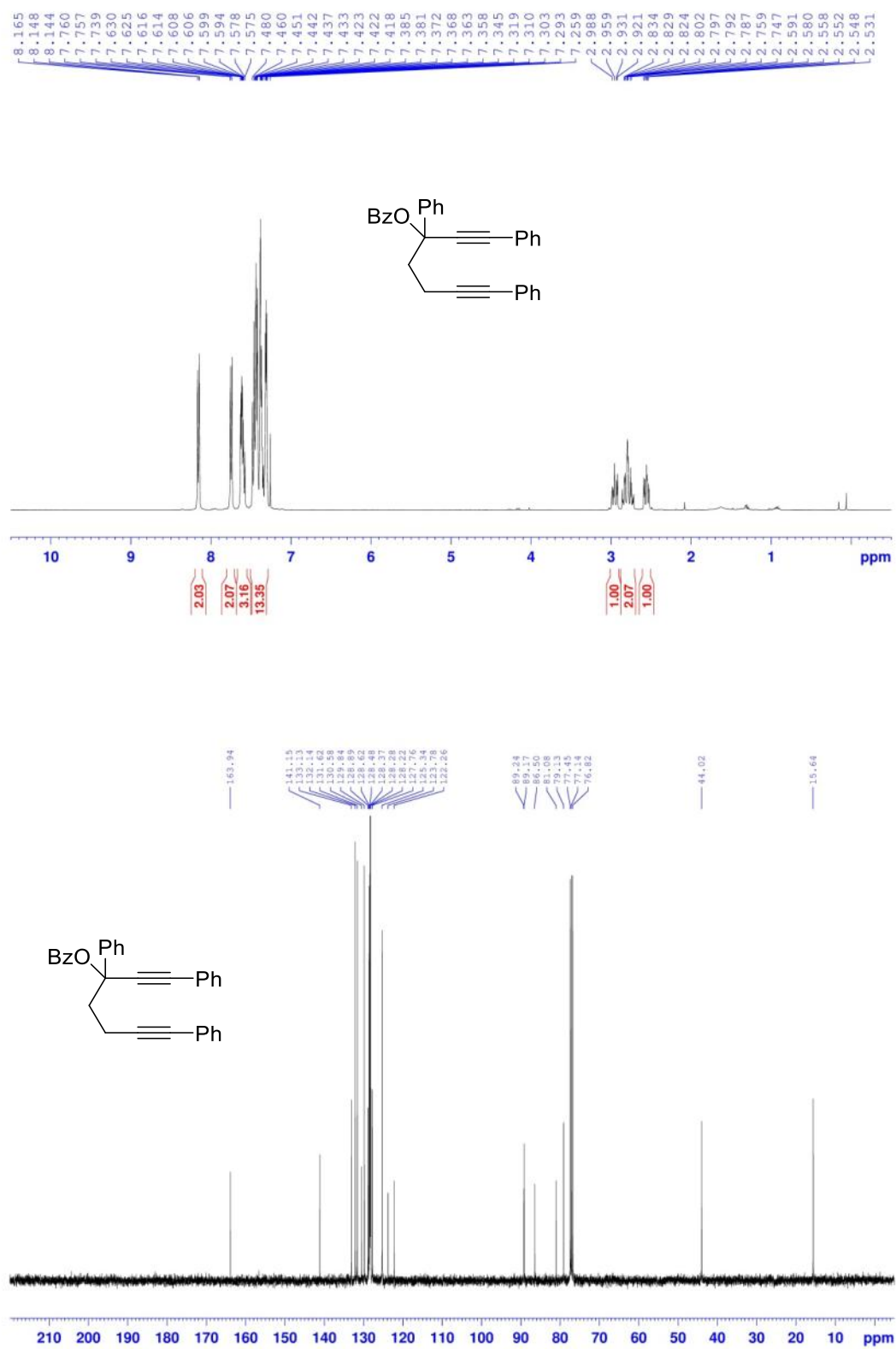


Figure S3. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3,7-triphenylhepta-1,6-diyn-3-yl pivalate (1c)

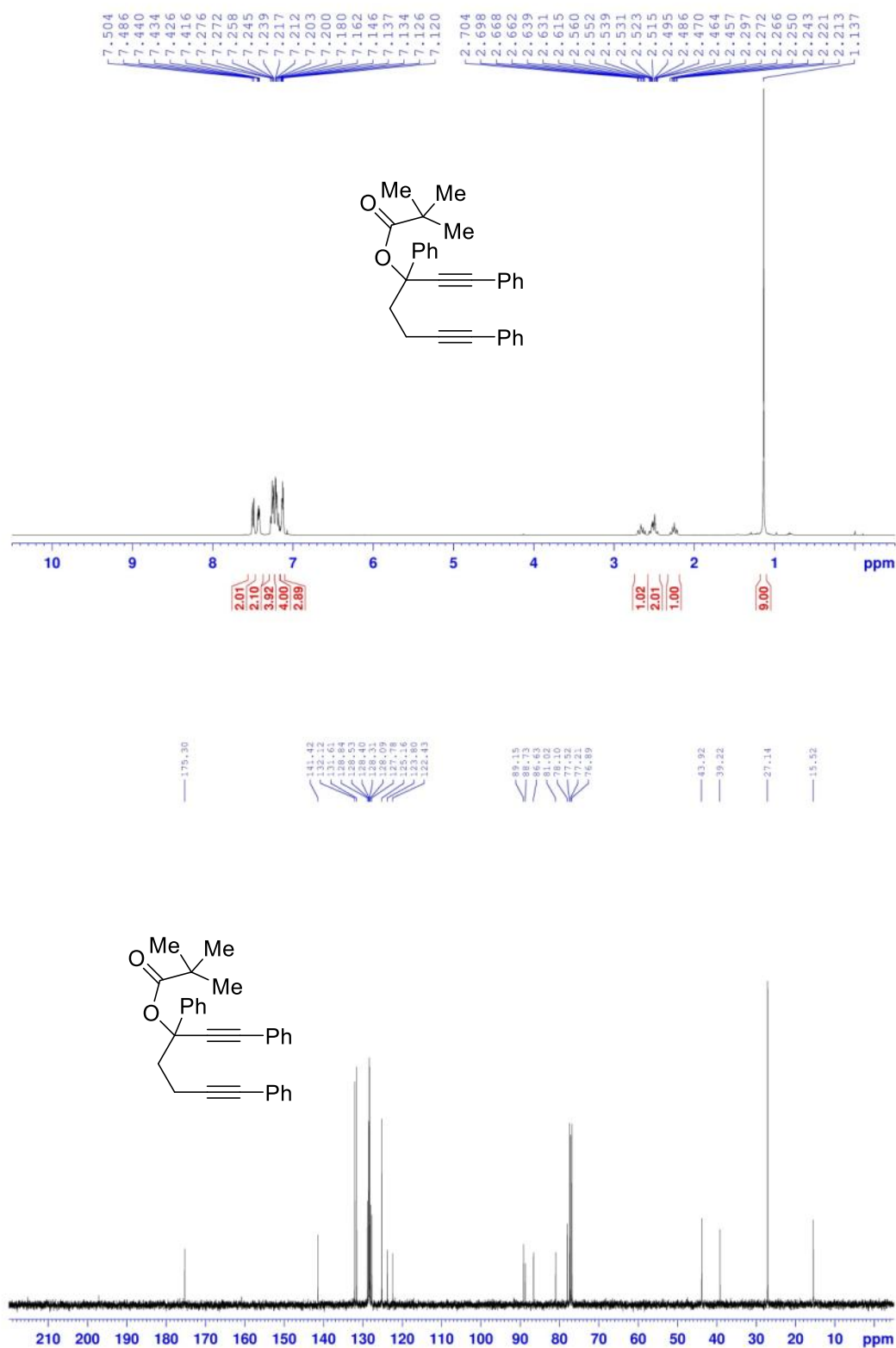


Figure S4. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3,7-triphenylhepta-1,6-diyn-3-yl cyclopropanecarboxylate (1d)

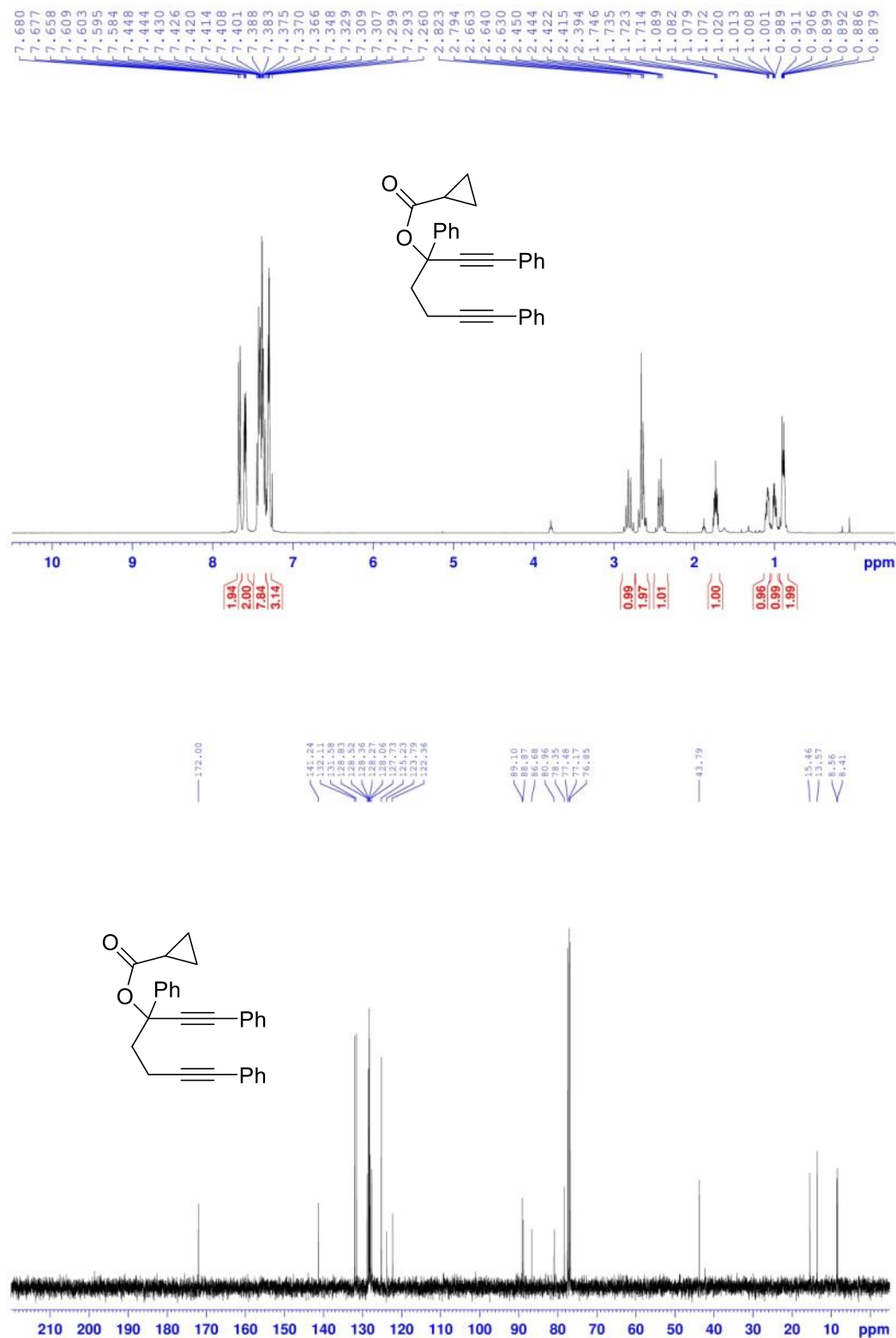
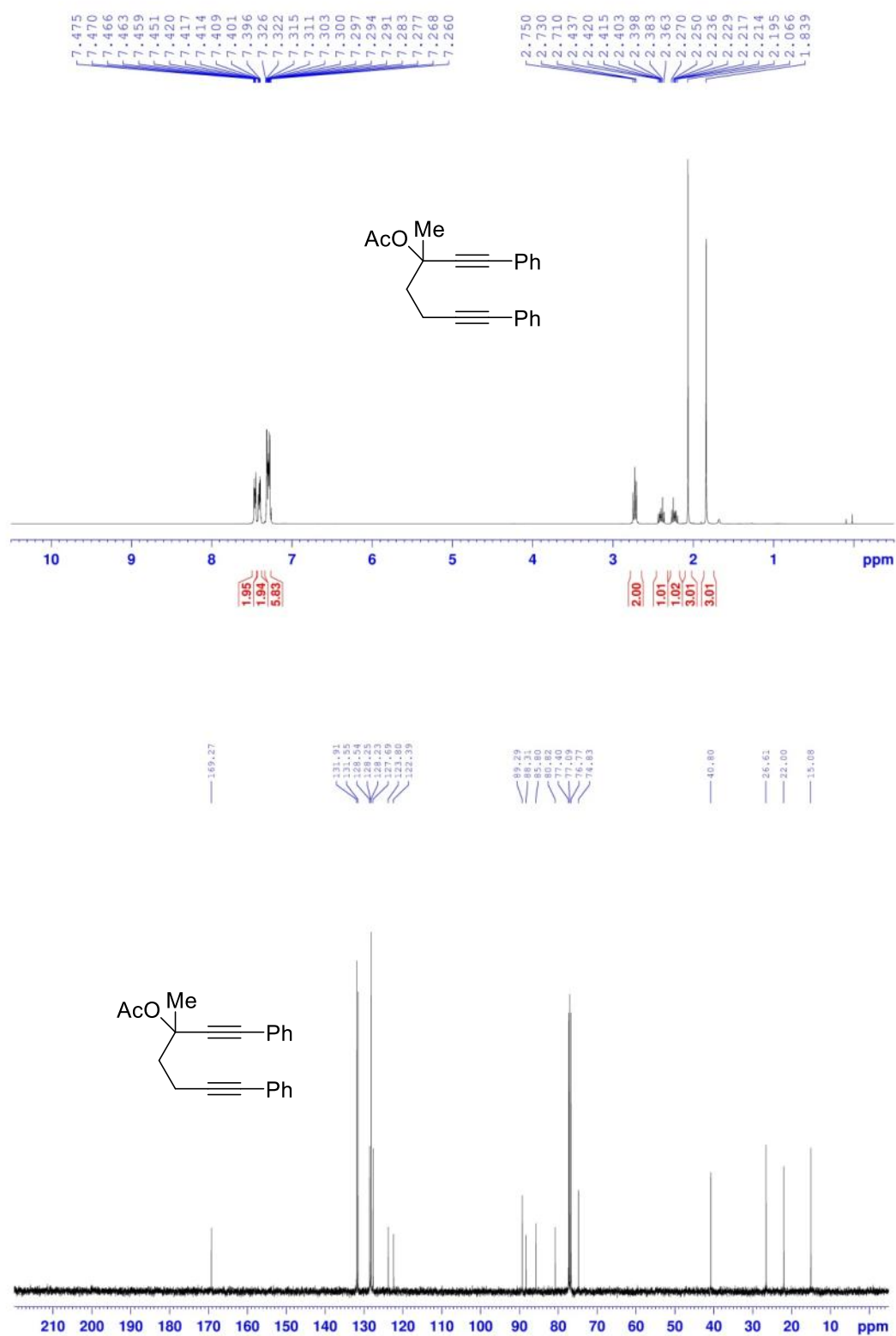


Figure S5. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-methyl-1,7-diphenylhepta-1,6-diyn-3-yl acetate (**1e**)



yl acetate (1f)

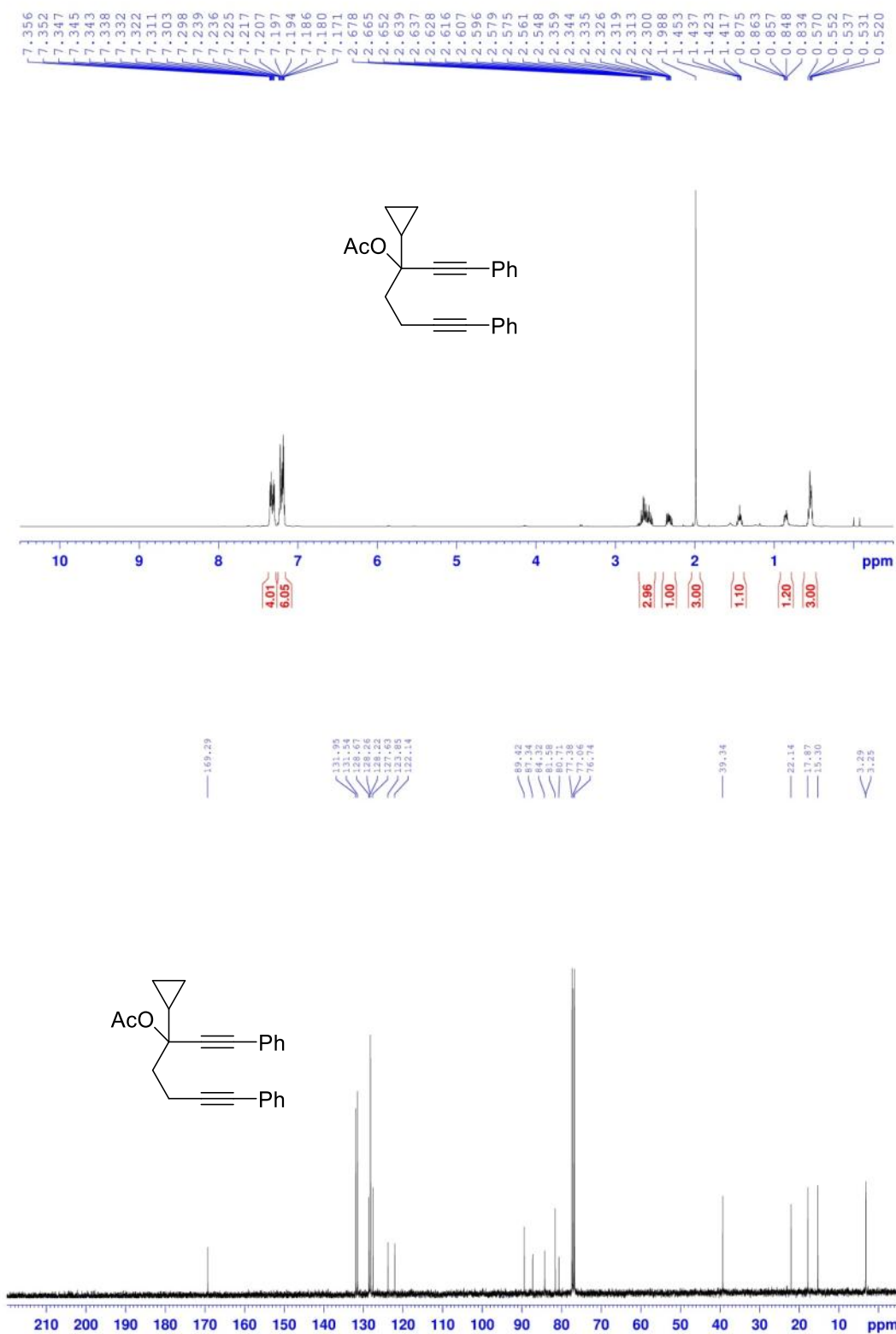


Figure S7. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-(4-chlorophenyl)-1,7-diphenylhepta-1,6-diyn-3-yl acetate (1g)

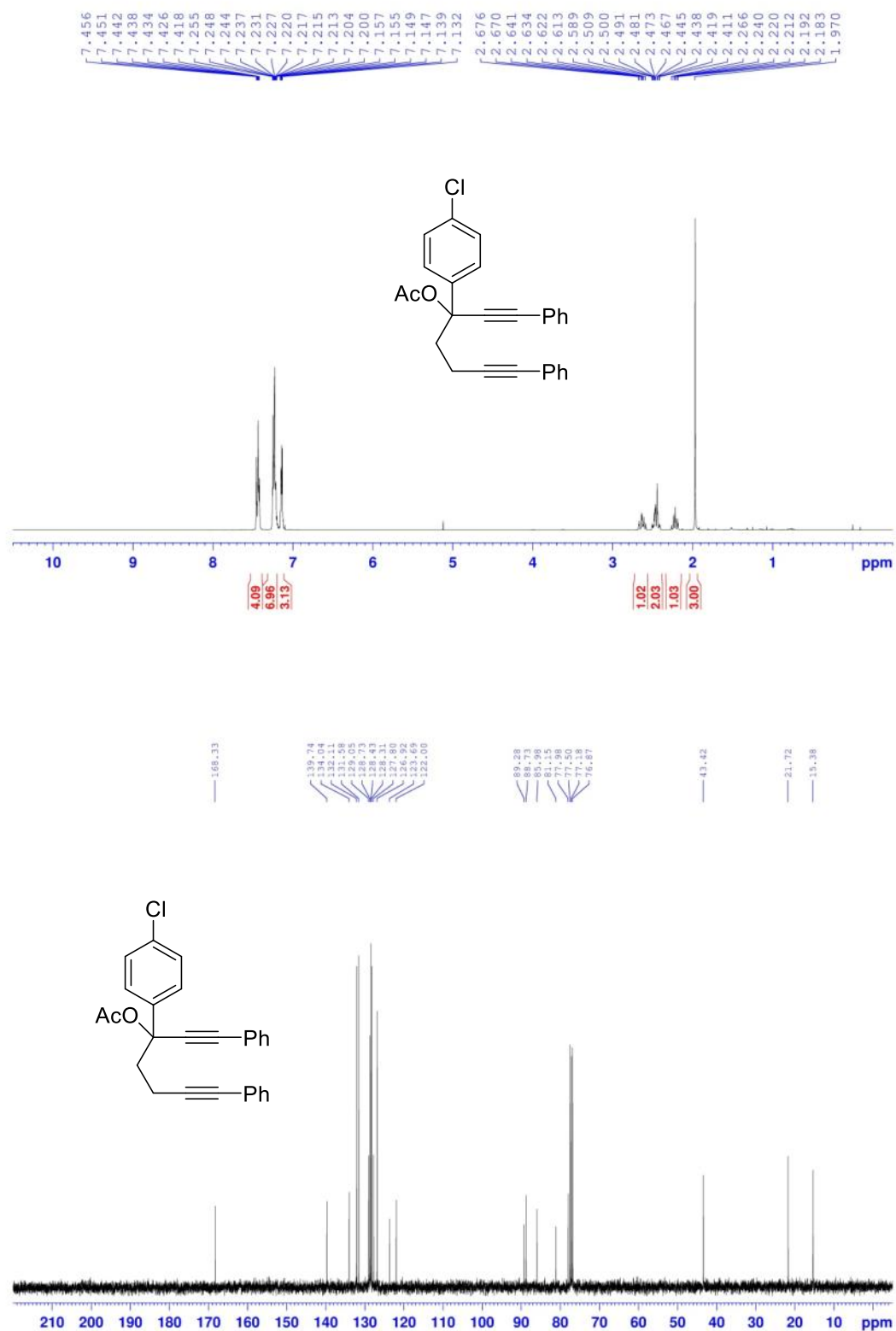


Figure S8. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1-(4-fluorophenyl)-3,7-diphenylhepta-1,6-diyne-3-yl acetate (**1h**)

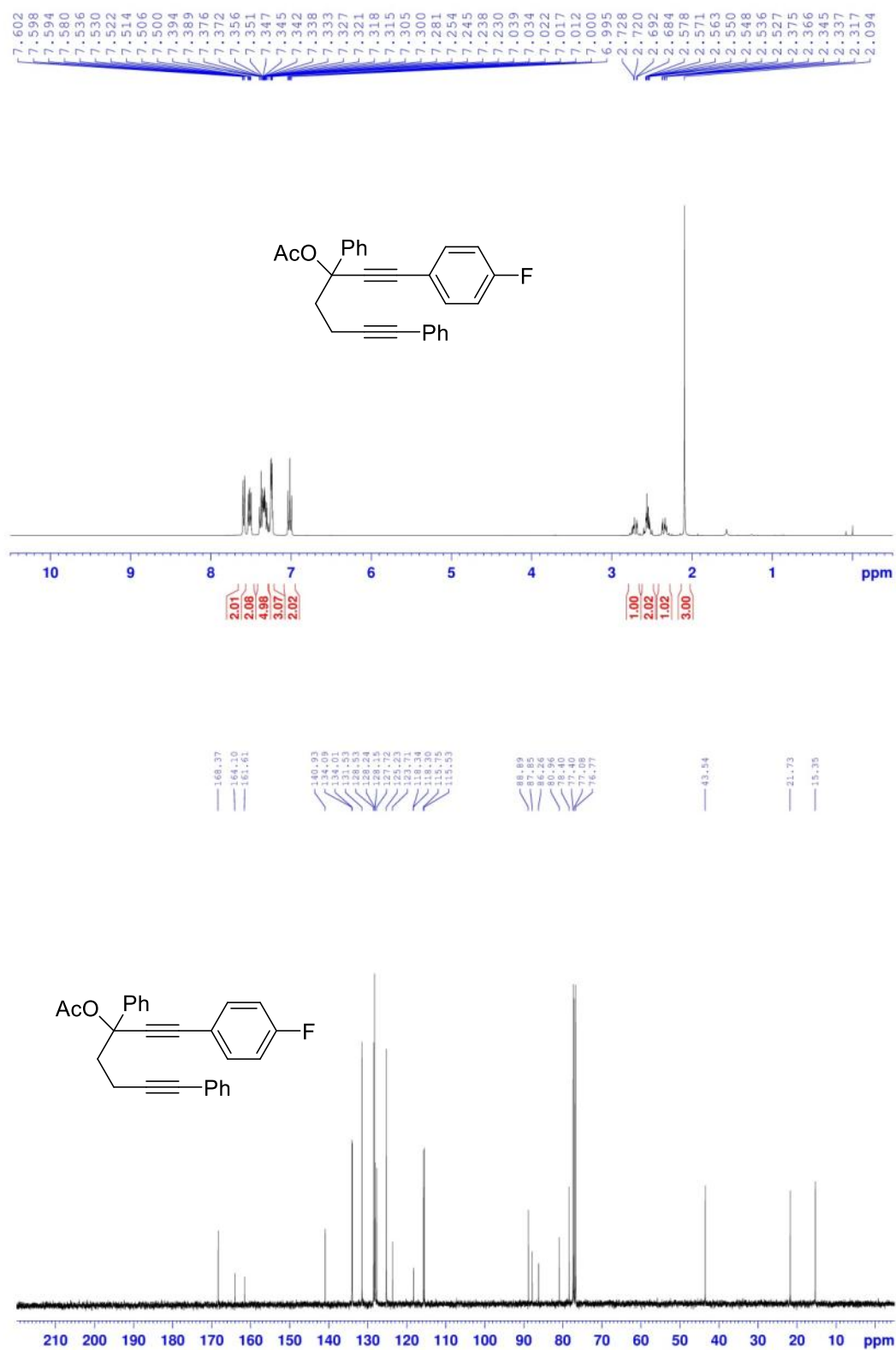


Figure S9. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3,7-diphenyl-1-(p-tolyl)hepta-1,6-diyn-3-yl acetate (**1i**)

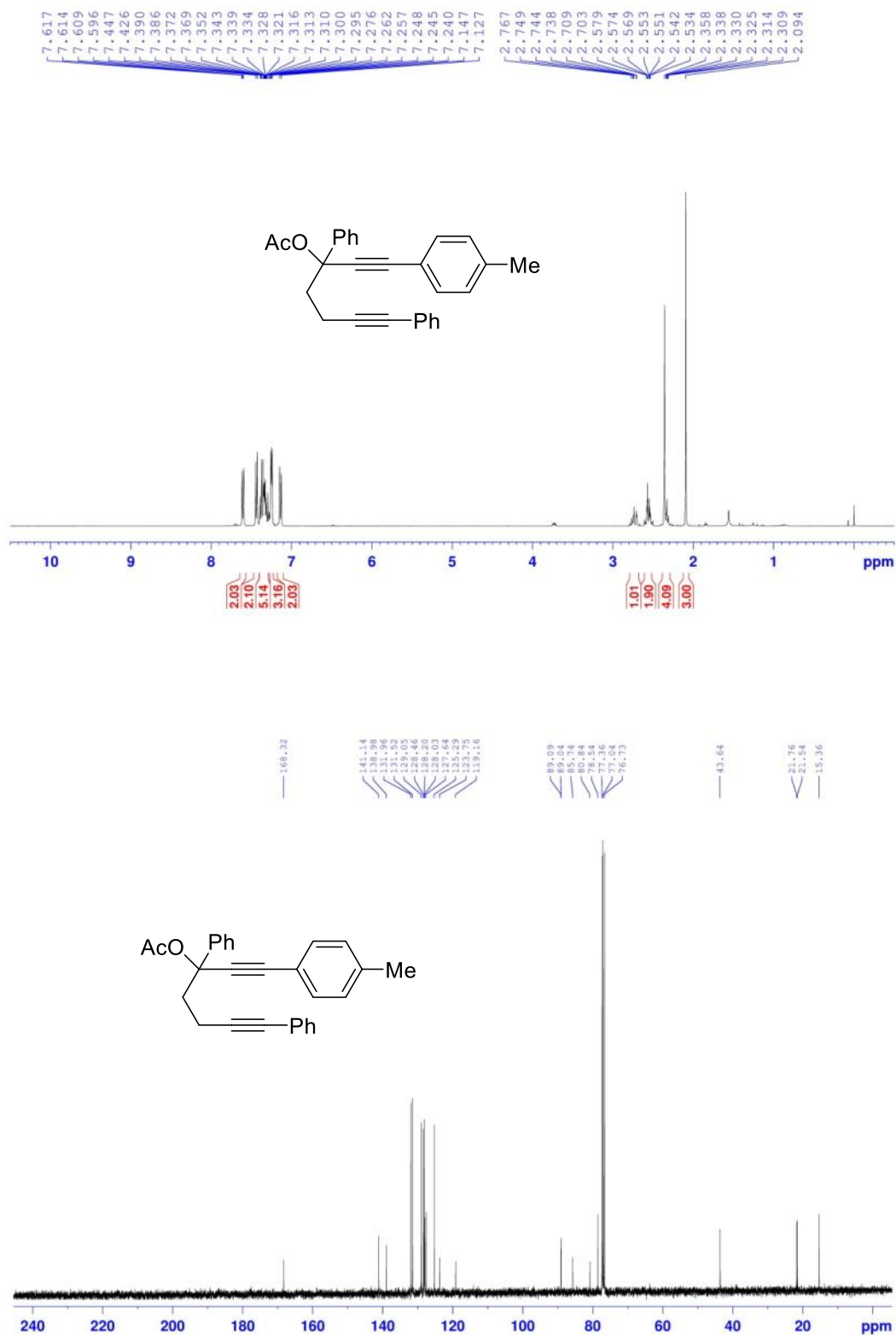


Figure S10. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3,7-diphenyl-1-(thiophen-3-yl)hepta-1,6-diyne-3-yl acetate (**1j**)

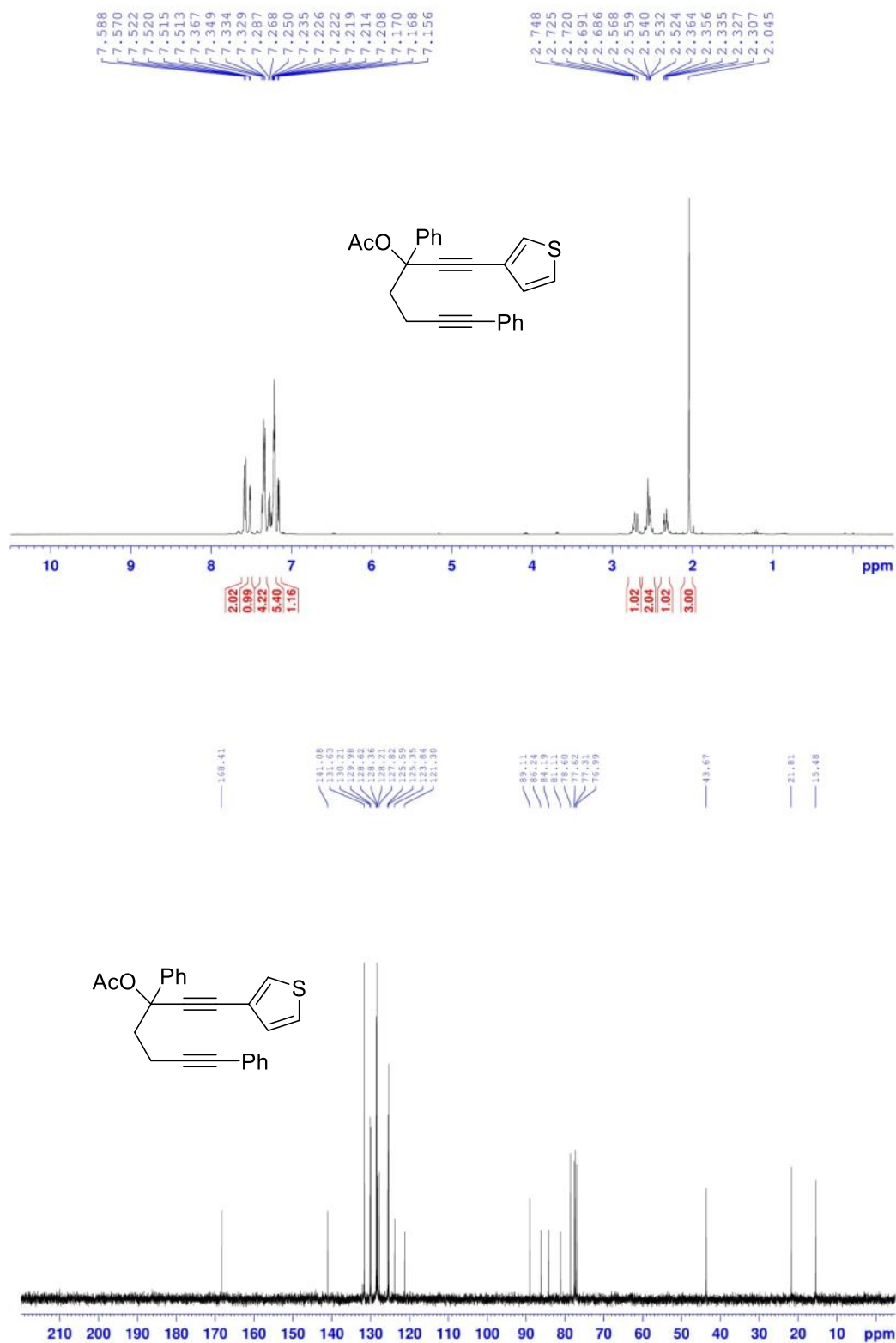


Figure S11. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-(4-fluorophenyl)-1,3-diphenylhepta-1,6-diyne-3-yl acetate (1k)

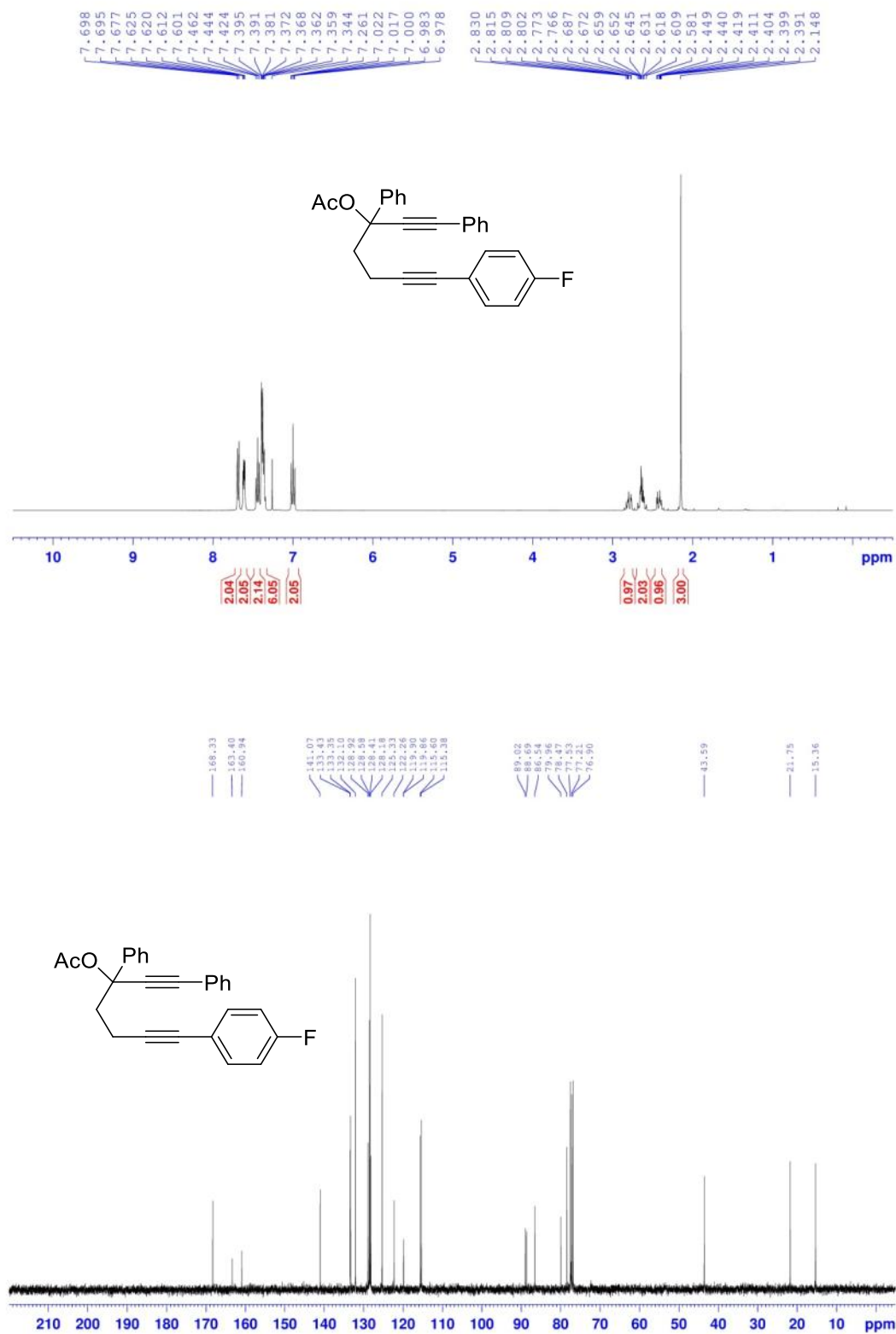


Figure S12. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-(4-bromophenyl)-1,3-diphenylhepta-1,6-diyne-3-yl acetate (II)

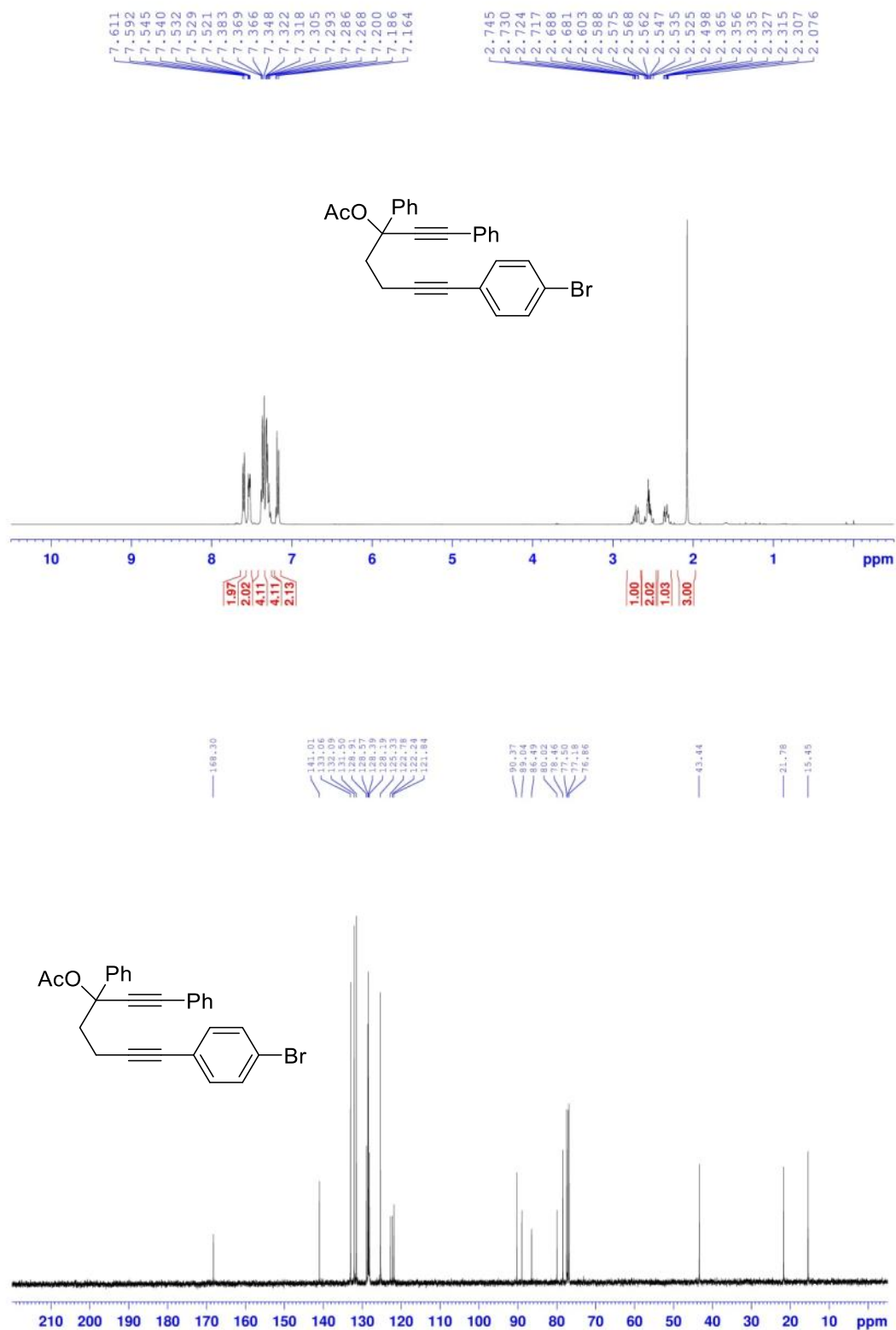


Figure S13. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-(4-pentylphenyl)-1,3-diphenylhepta-1,6-diyne-3-yl acetate(1m)

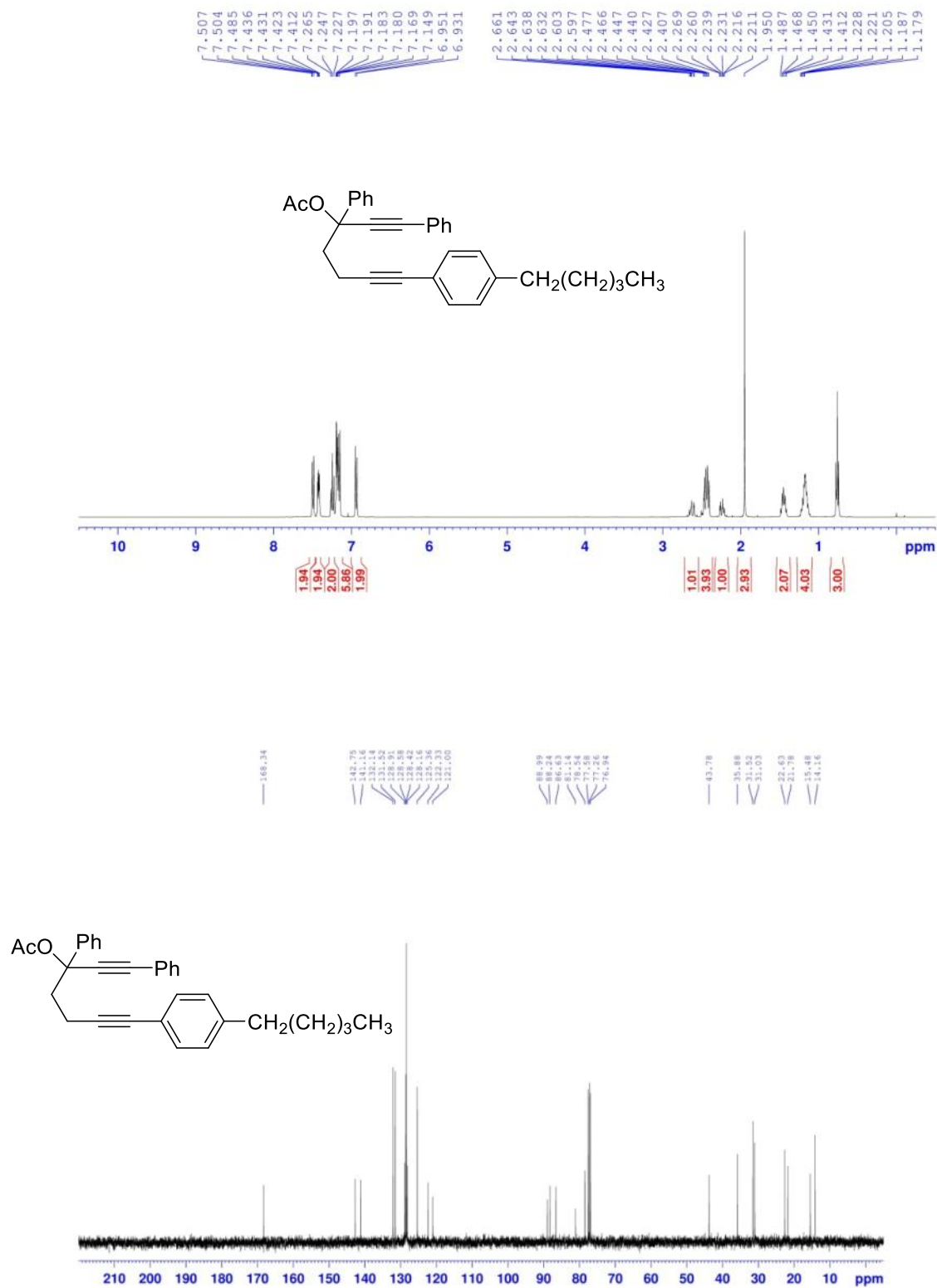


Figure S14. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3-diphenyl-7-(p-tolyl)hepta-1,6-diyn-3-yl acetate (**1n**)

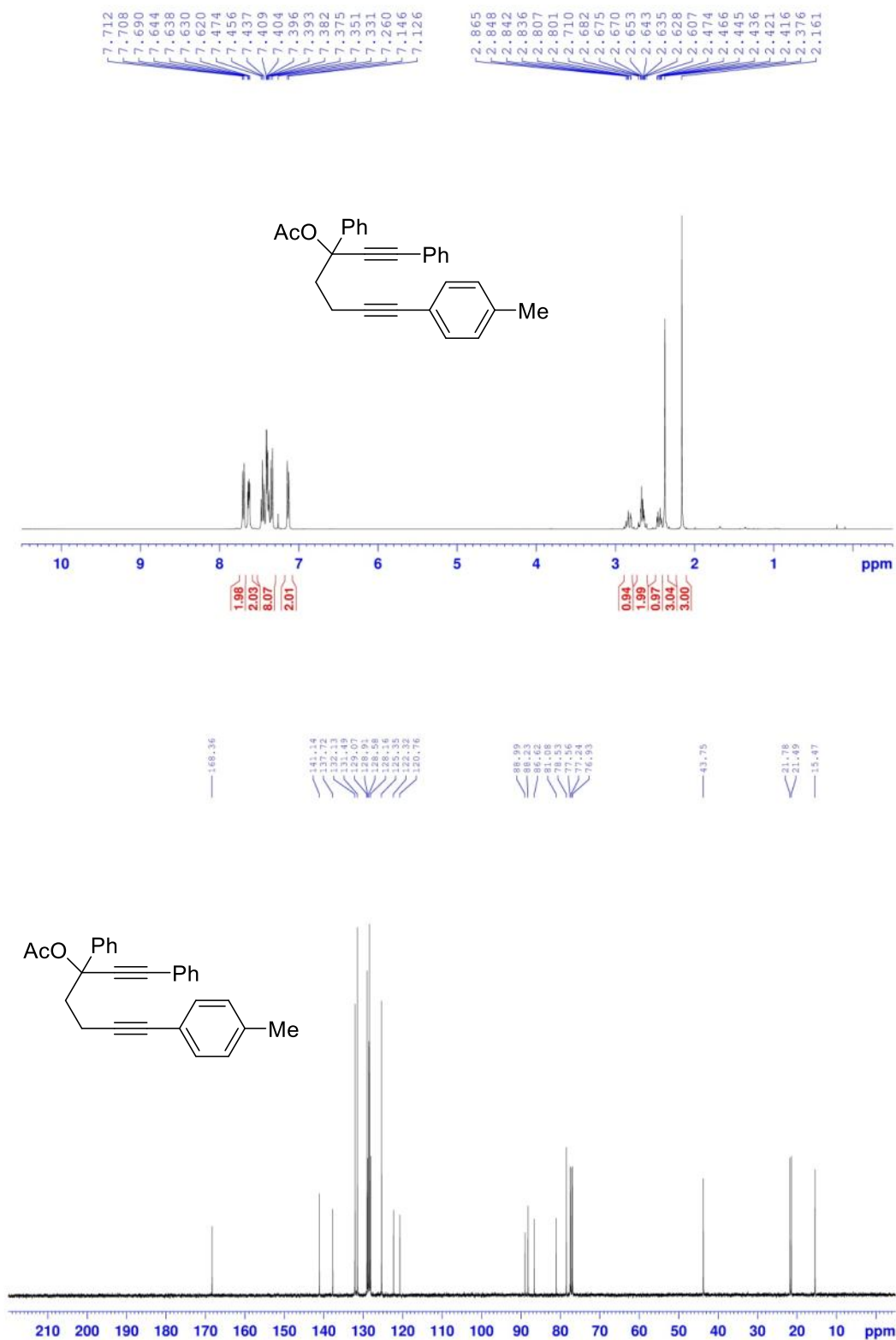


Figure S15. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3-diphenyl-7-o-tolylhepta-1,6-diyn-3-yl acetate (**1o**)

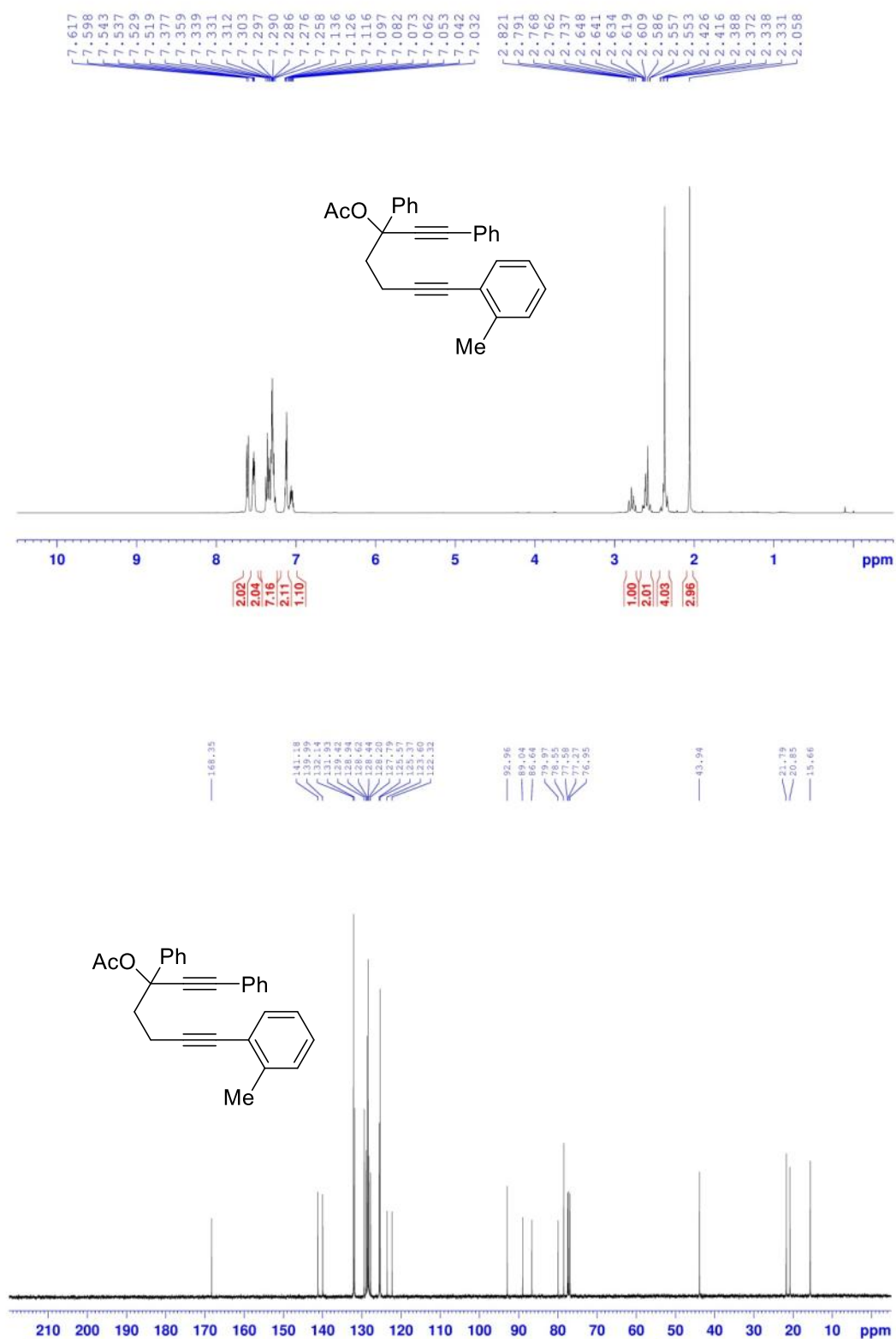


Figure S16. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-(3,5-dimethylphenyl)-1,3-diphenylhepta-1,6-diyn-3-yl acetate (1p)

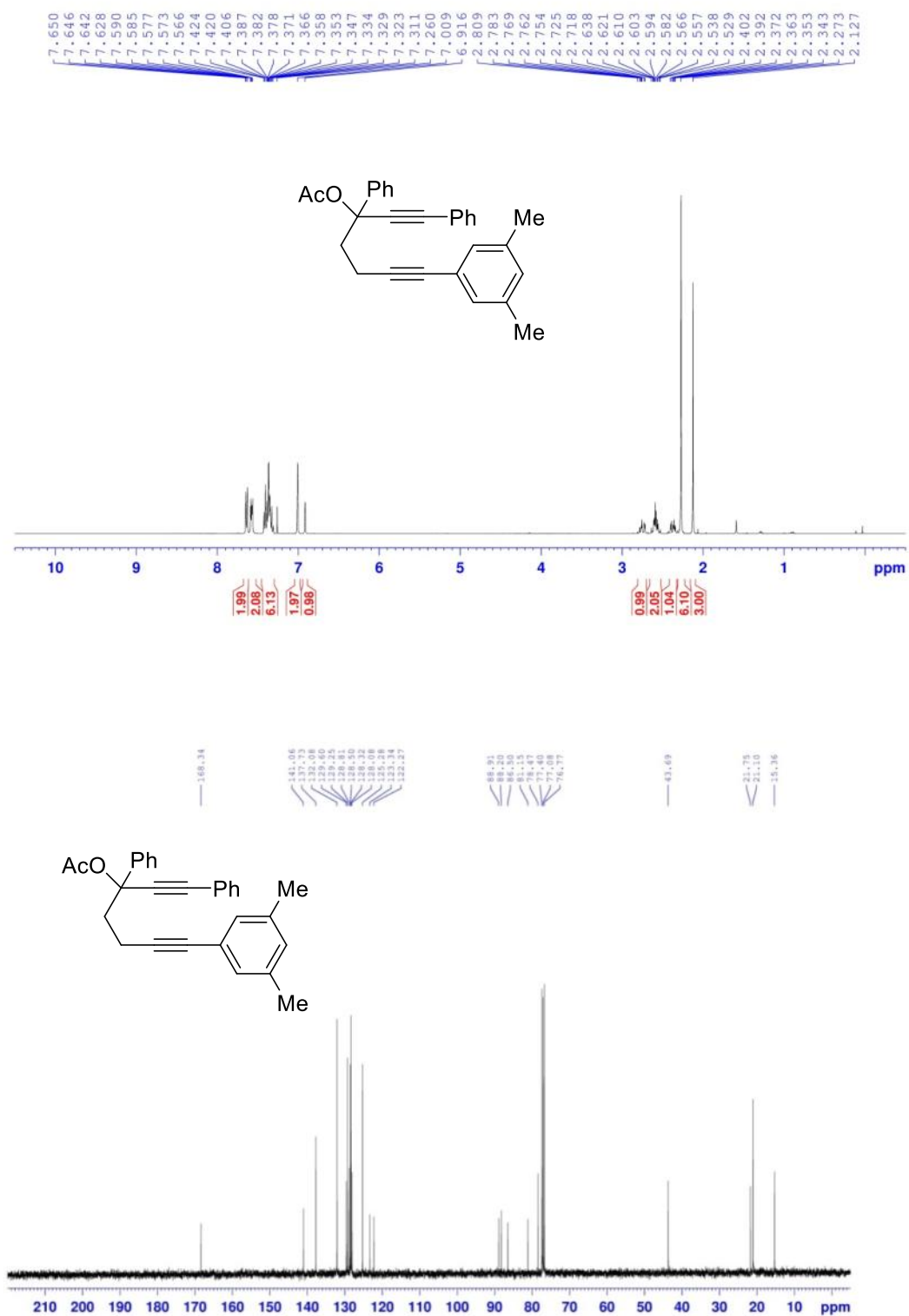


Figure S17. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-mesityl-1,3-diphenylhepta-1,6-diyn-3-yl acetate (**1q**)

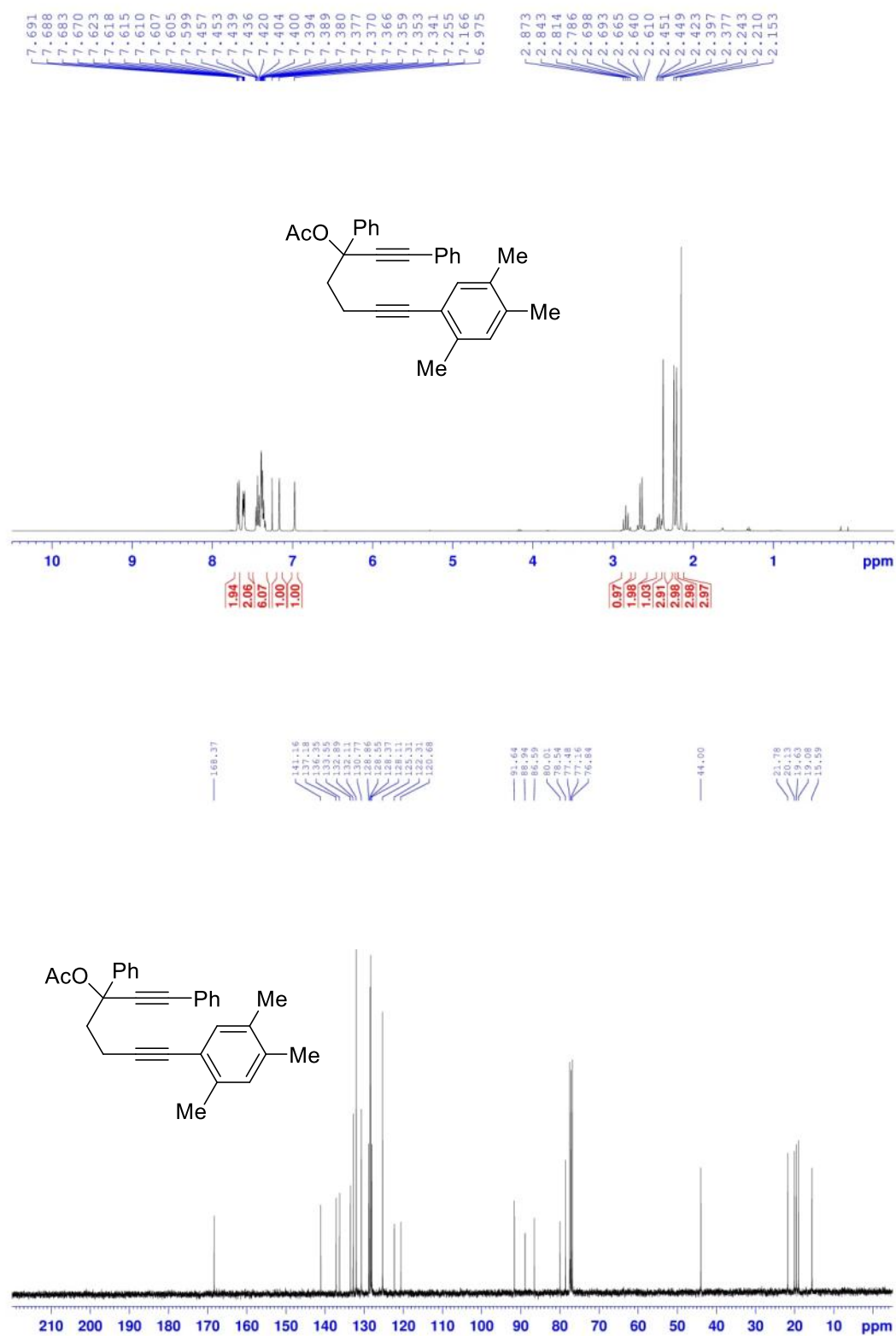


Figure S18. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7-(naphthalen-1-yl)-1,3-diphenylhepta-1,6-diyn-3-yl acetate (1r)

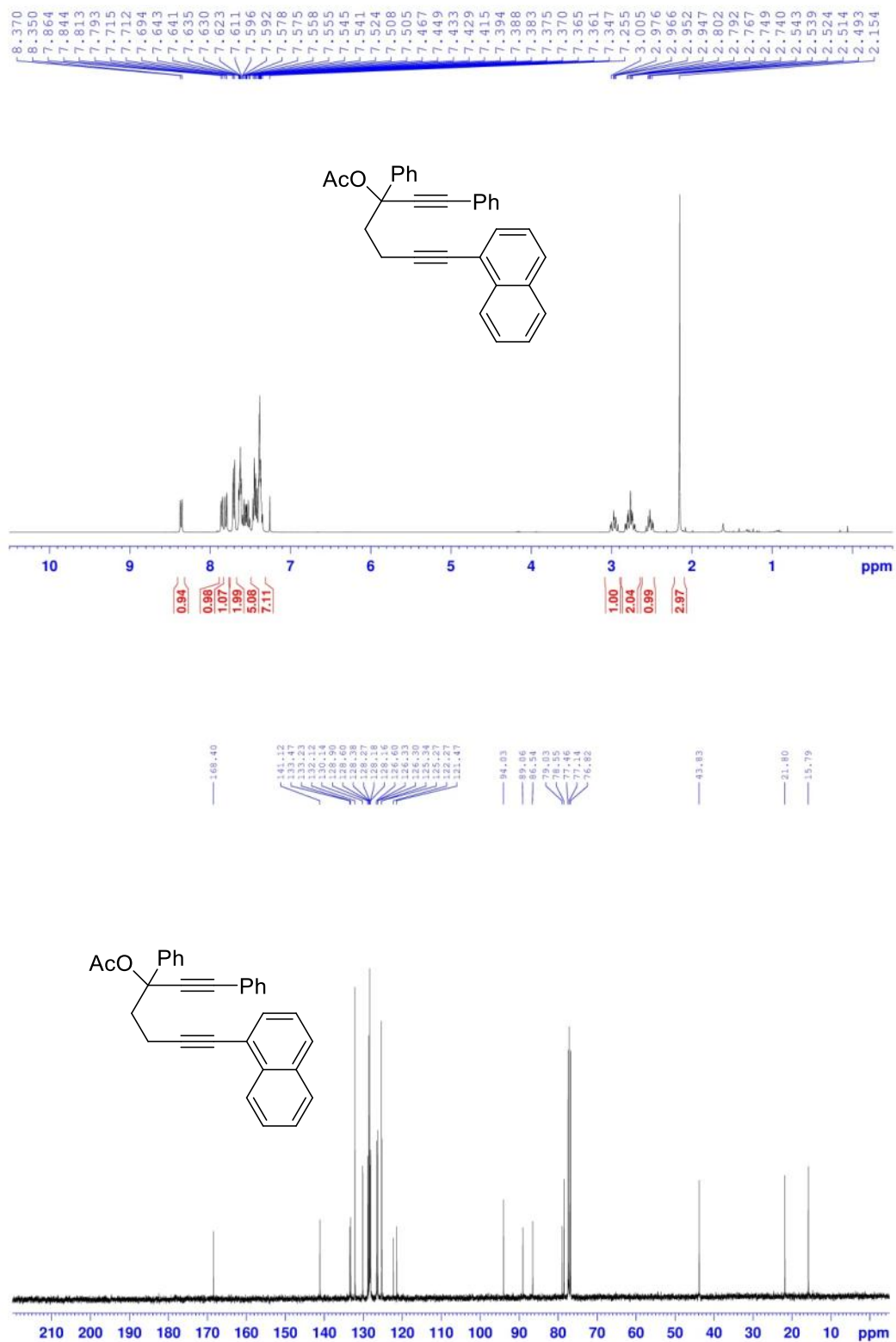


Figure S19. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3-diphenyl-7-(thiophen-3-yl)hepta-1,6-diyn-3-yl acetate (**1s**)

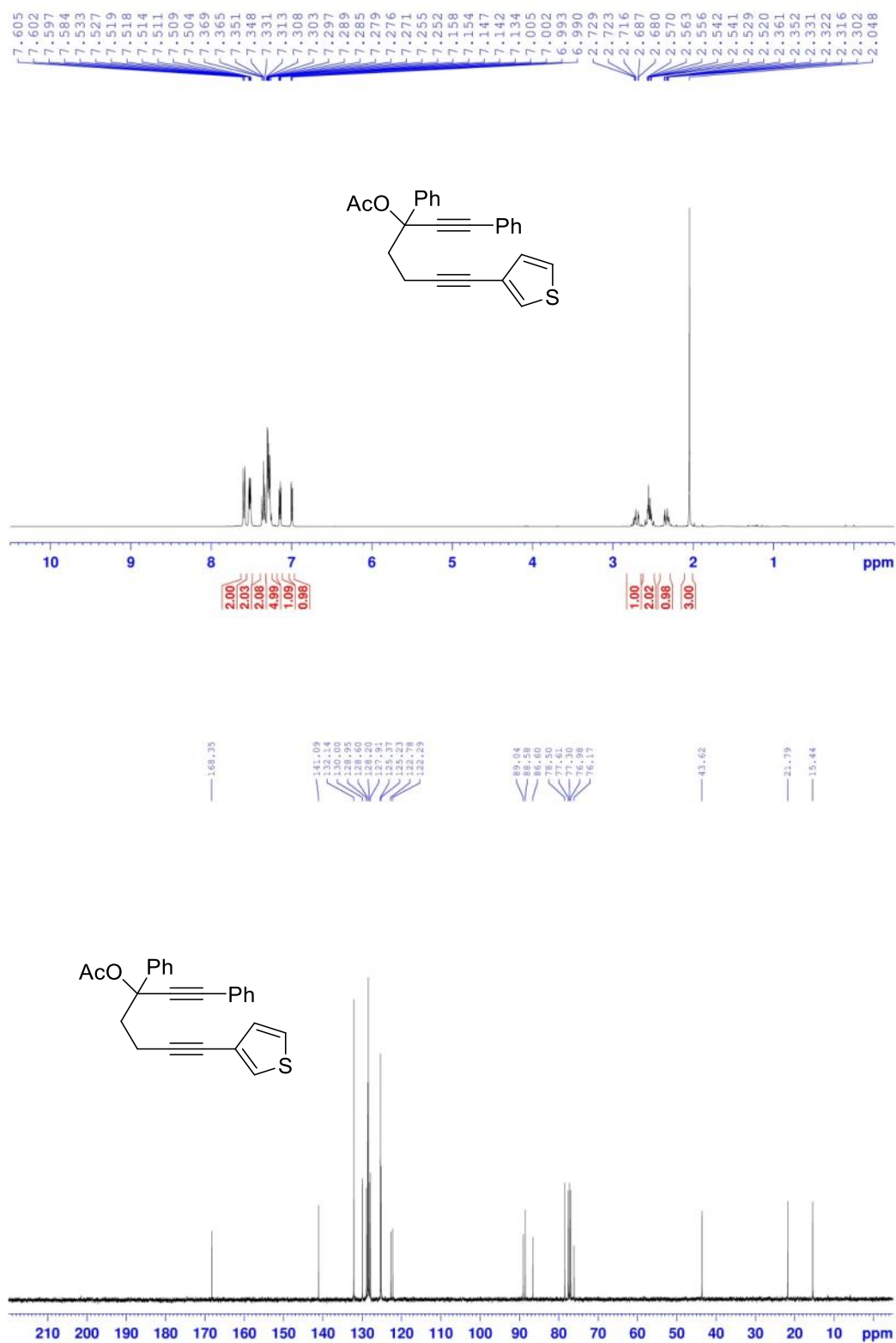


Figure S20. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 1,3-diphenyl-7-(thiophen-2-yl)hepta-1,6-diyn-3-yl acetate (1t)

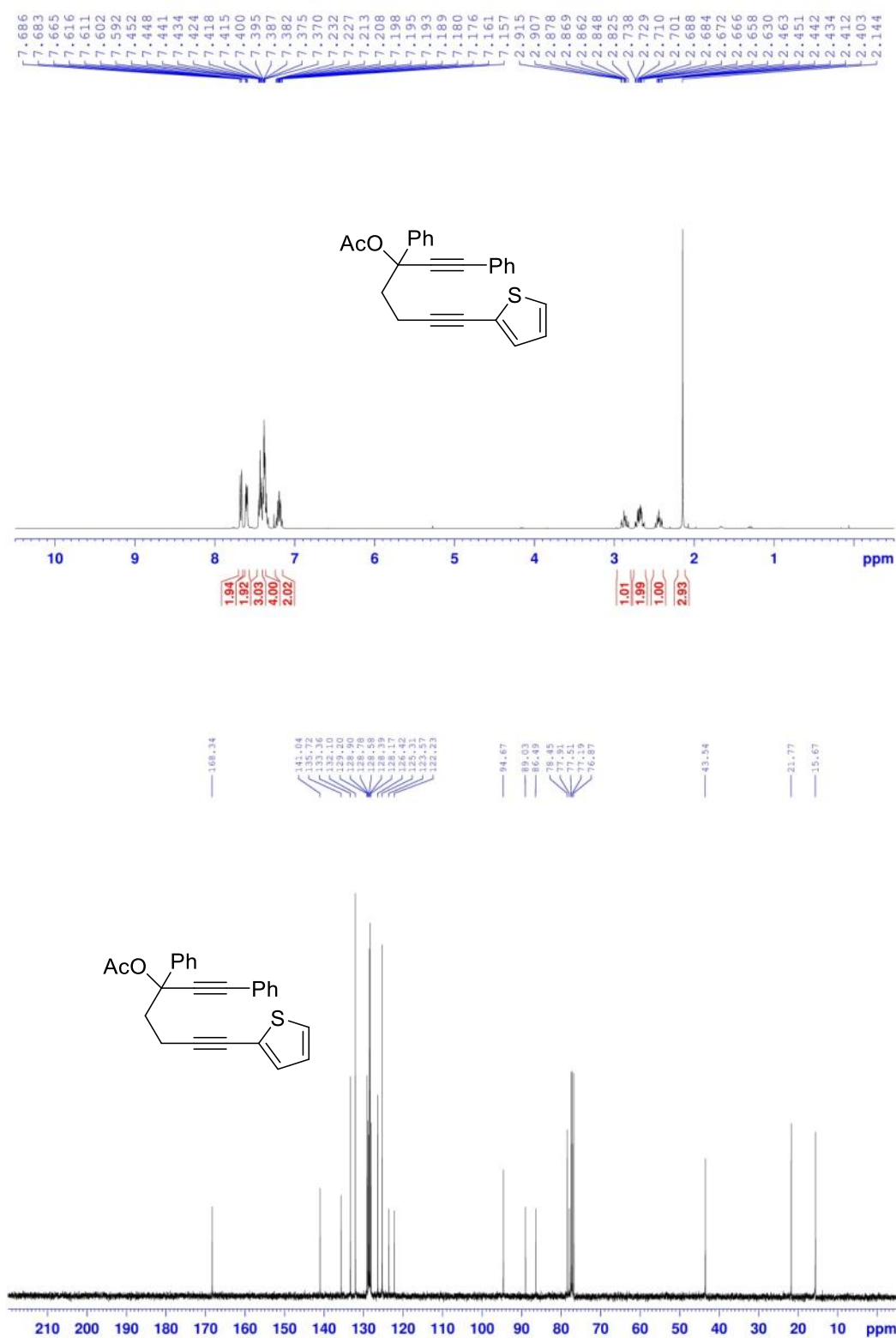


Figure S21. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5,9-diphenylnona-1-en-3,8-diyn-5-yl acetate (1u)

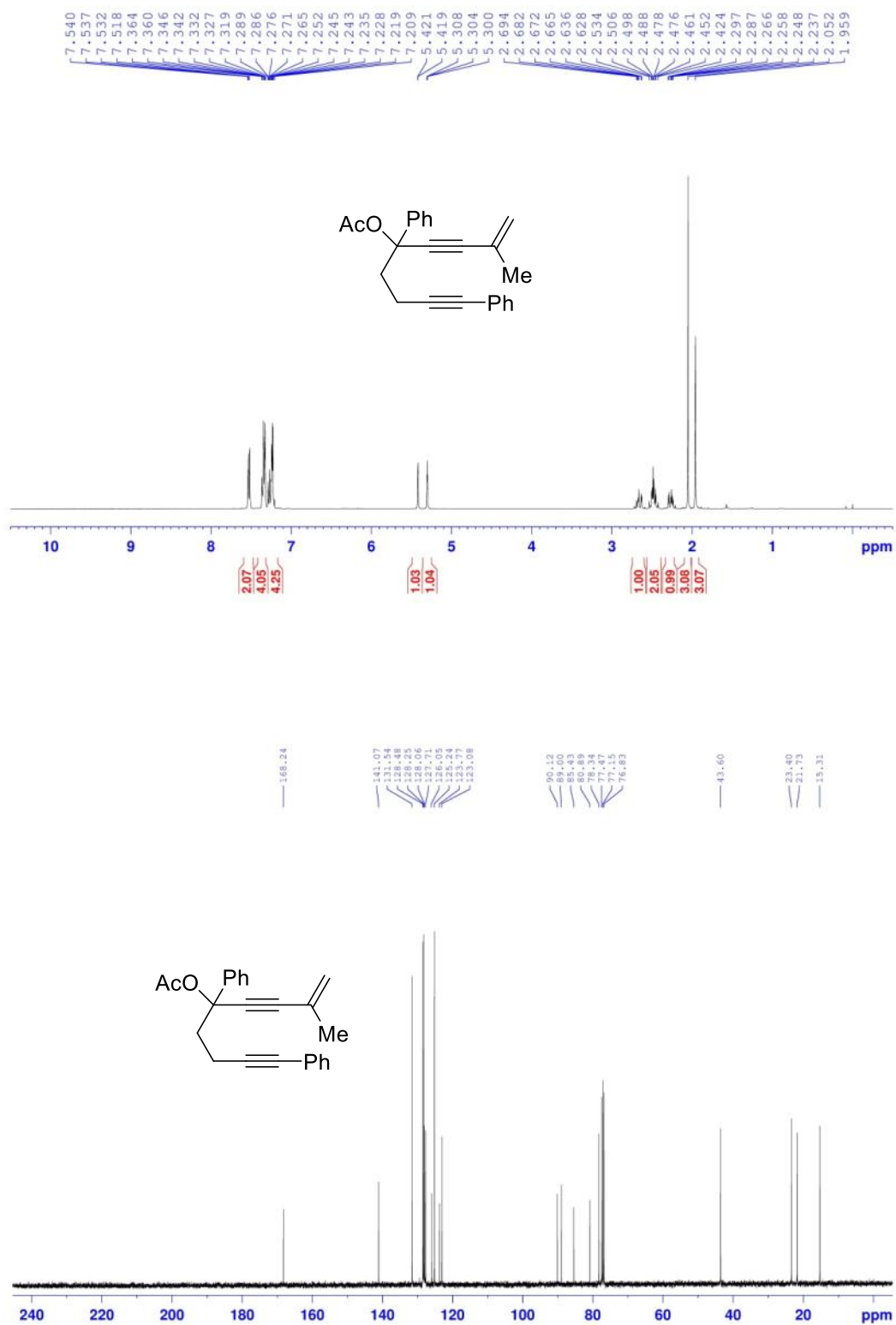


Figure S22. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5,9-diphenylnona-1-en-3,8-diyn-5-yl benzoate (**1v**)

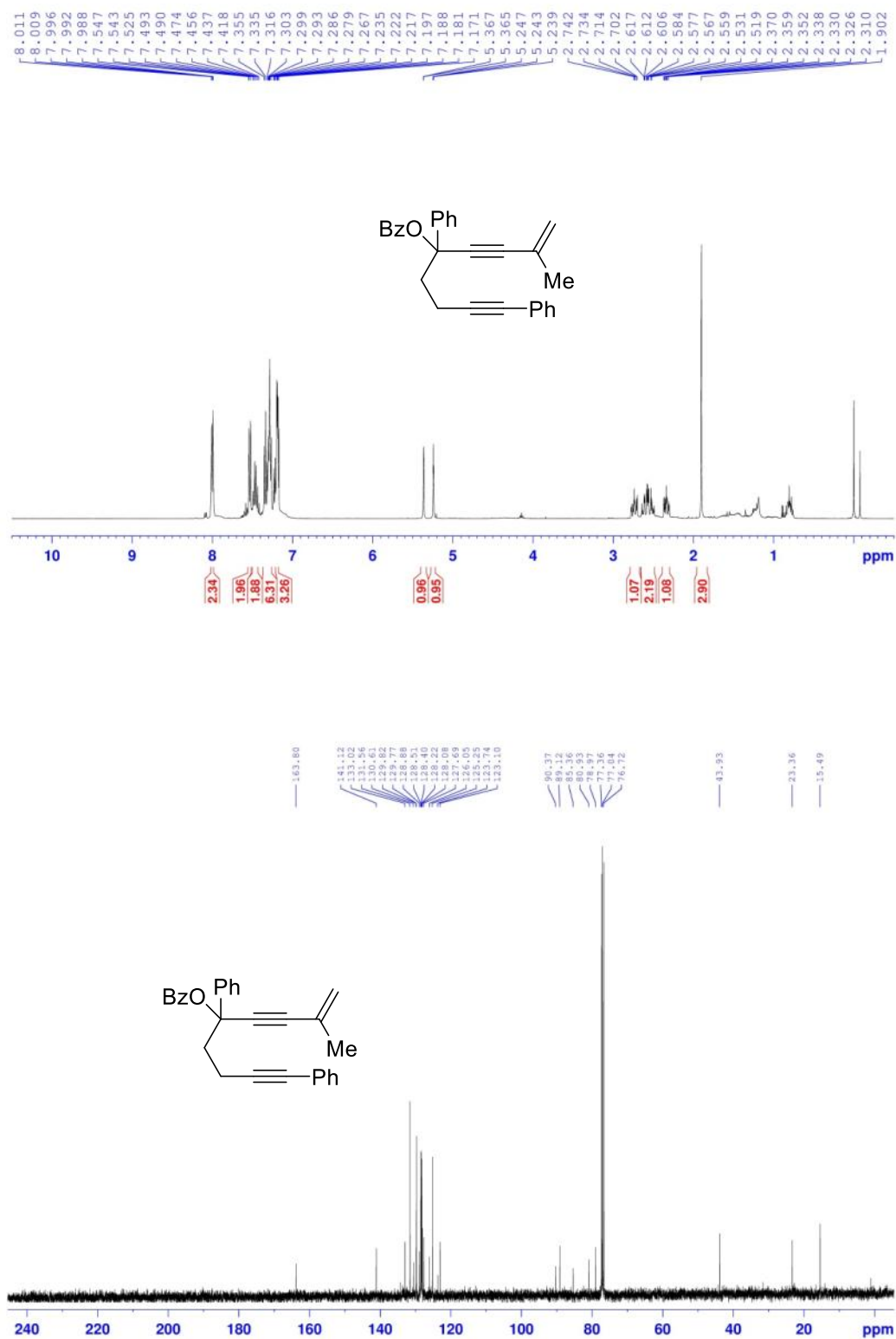


Figure S23. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5,9-diphenylnona-1-en-3,8-diyn-5-yl pivalate (1w)

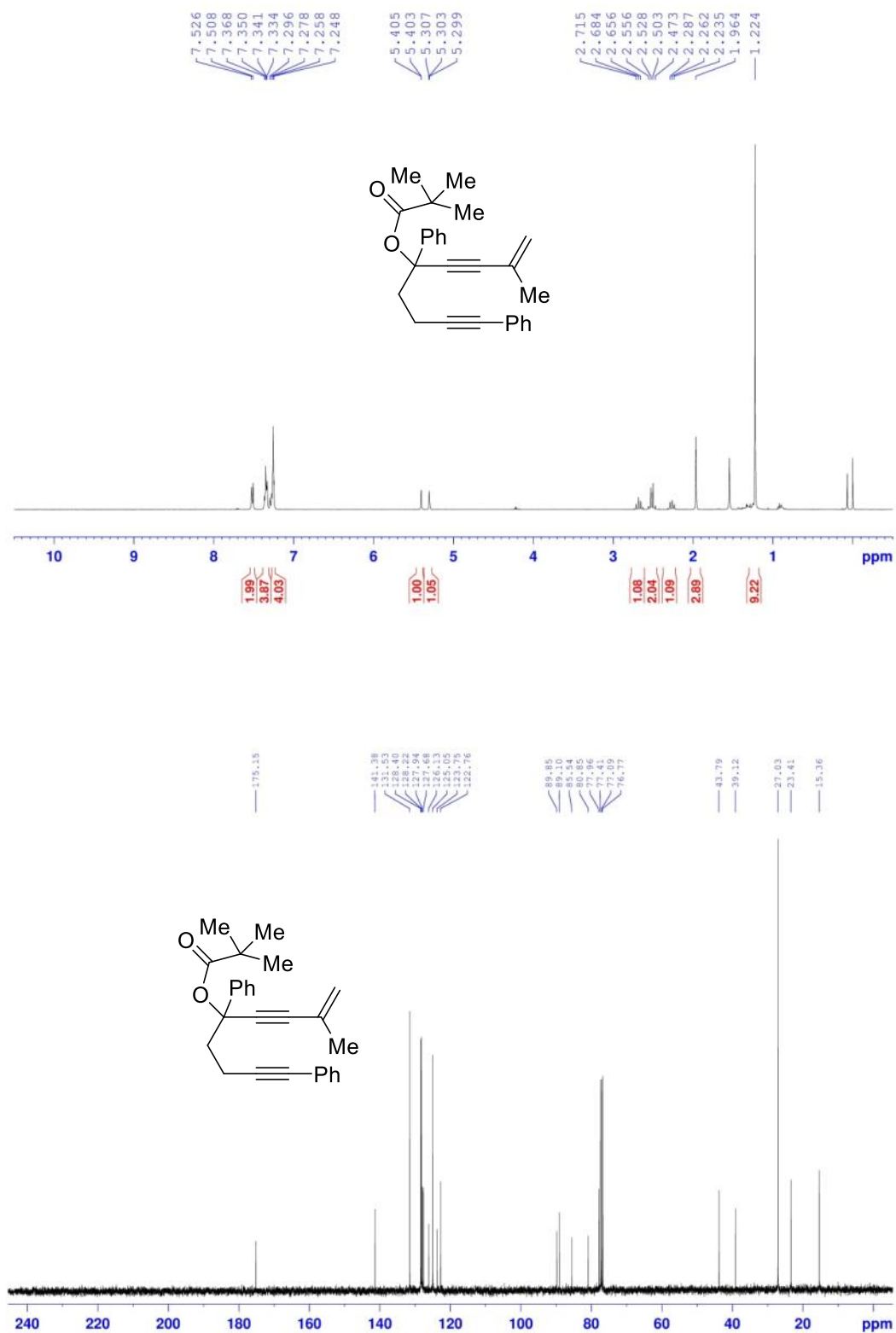


Figure S24. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5,9-diphenylnona-1-en-3,8-diyn-5-yl cyclopropanecarboxylate (1x)

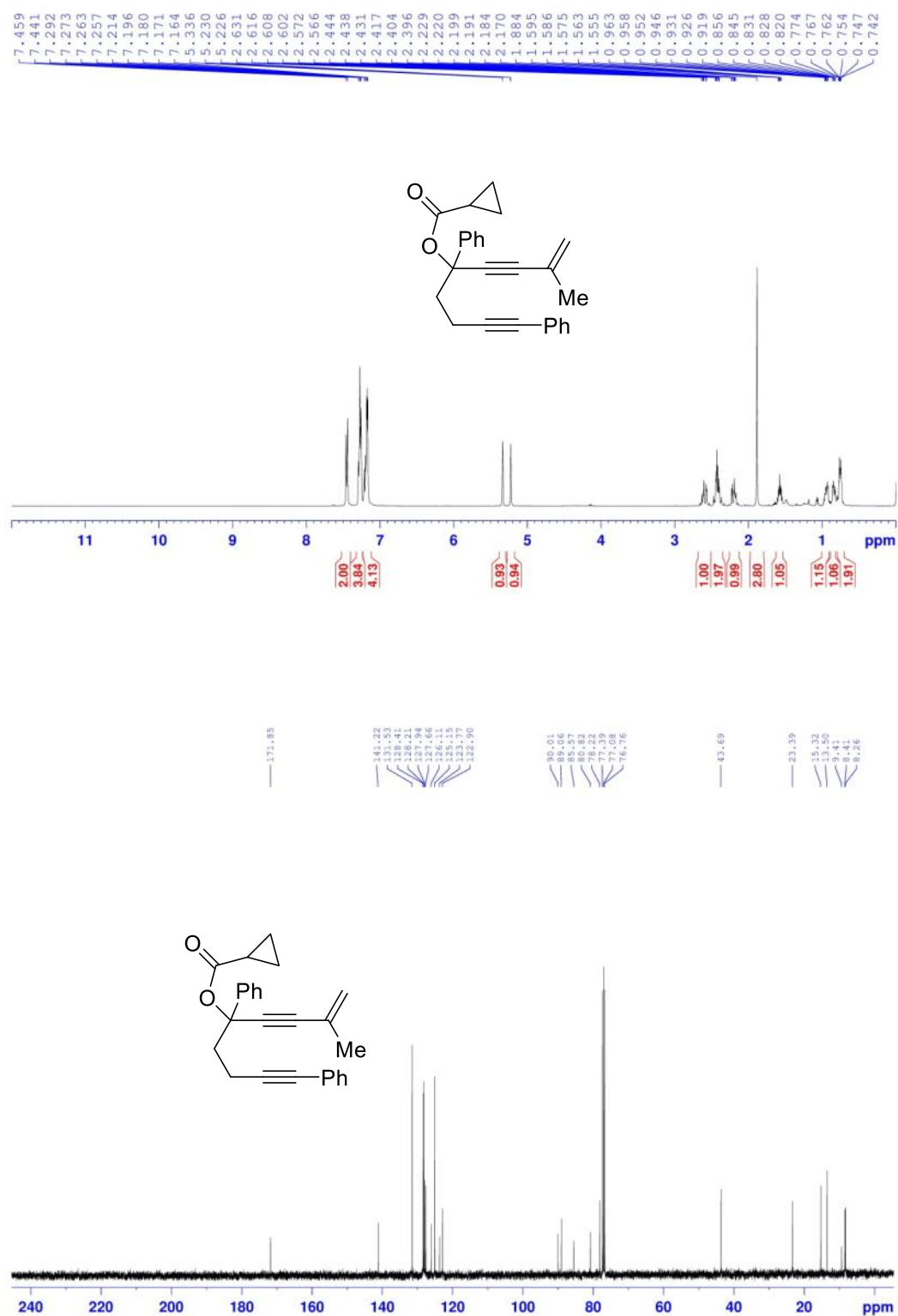


Figure S25. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 5-(4-chlorophenyl)-2-methyl-9-phenylnona-1-en-3,8-diyn-5-yl acetate (1y)

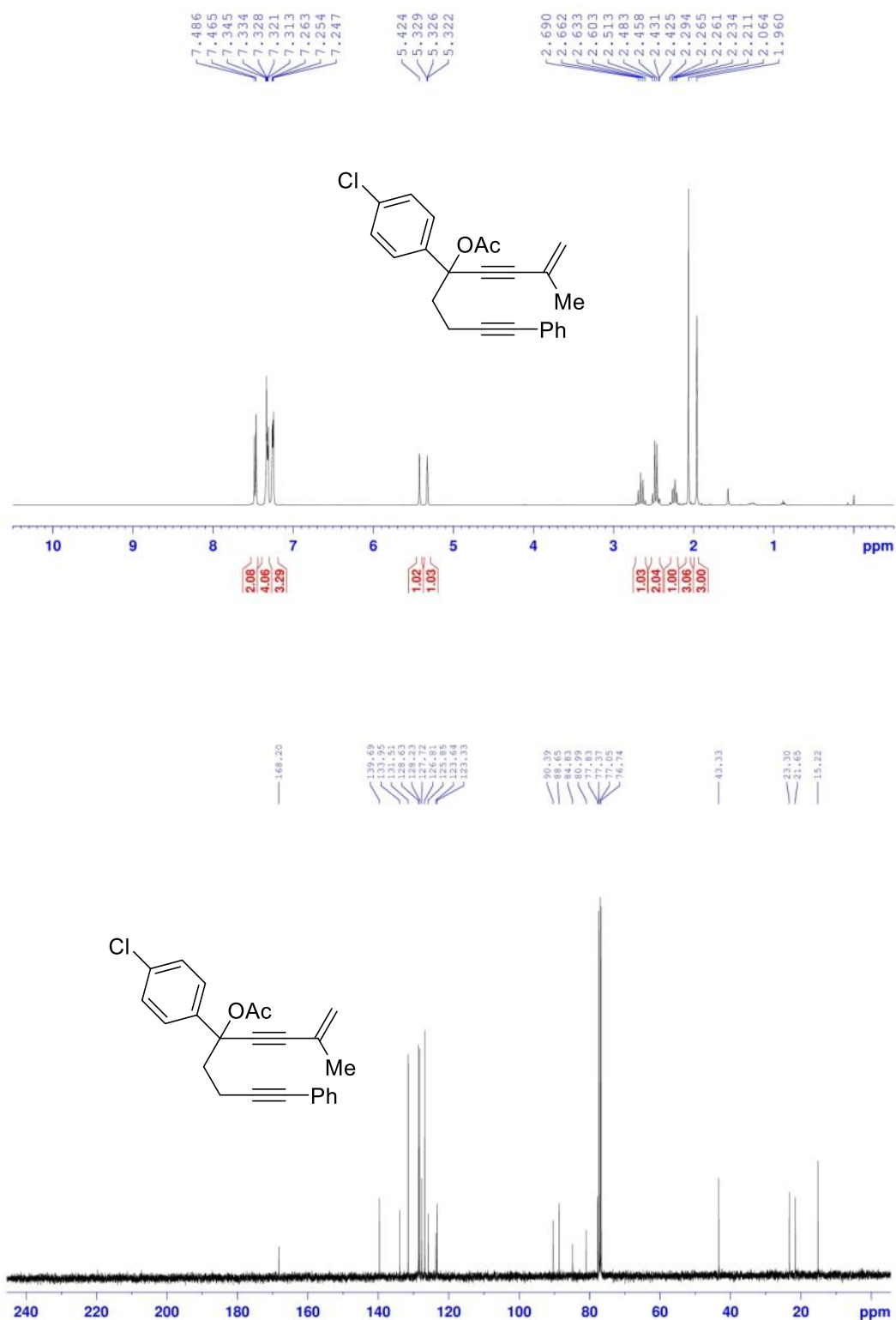


Figure S26. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-9-phenyl-5-p-tolylnona-1-en-3,8-diyn-5-yl acetate (**1z**)

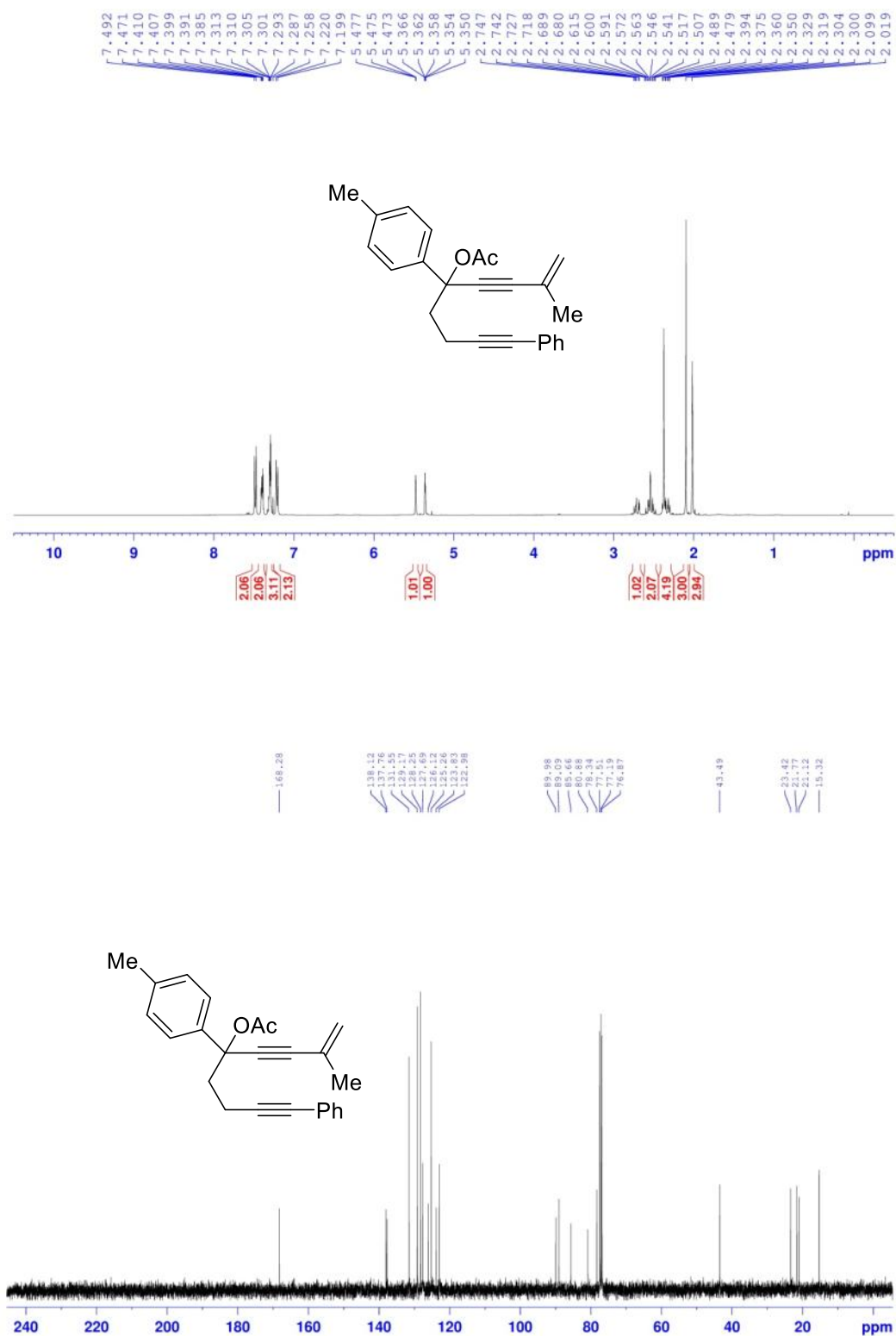


Figure S27. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5-(naphthalen-1-yl)-9-phenylnona-1-en-3,8-diyn-5-yl acetate (**1a**)

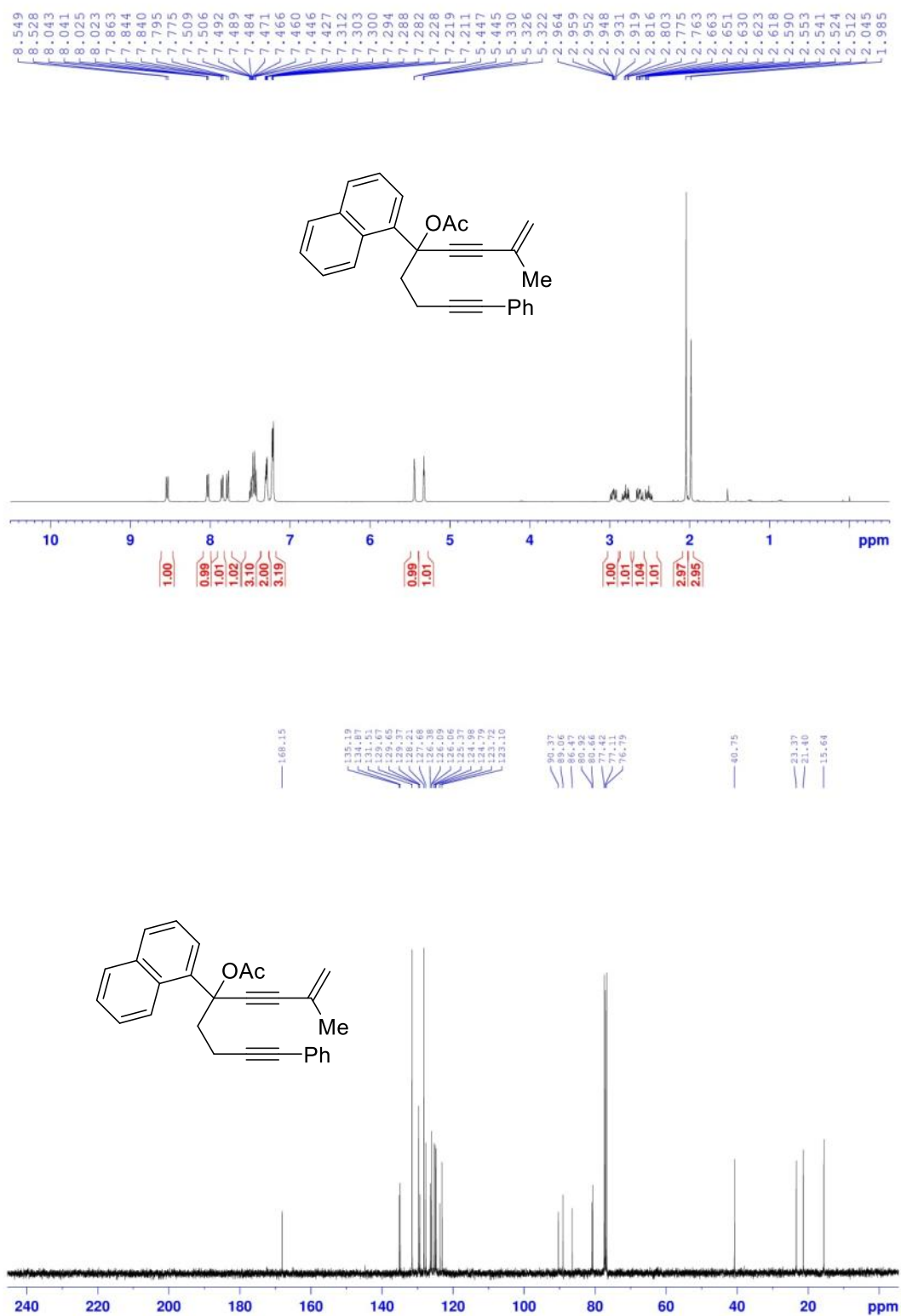


Figure S28. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2,5-dimethyl-9-phenylnona-1-en-3,8-diyn-5-yl acetate (**1 β**)

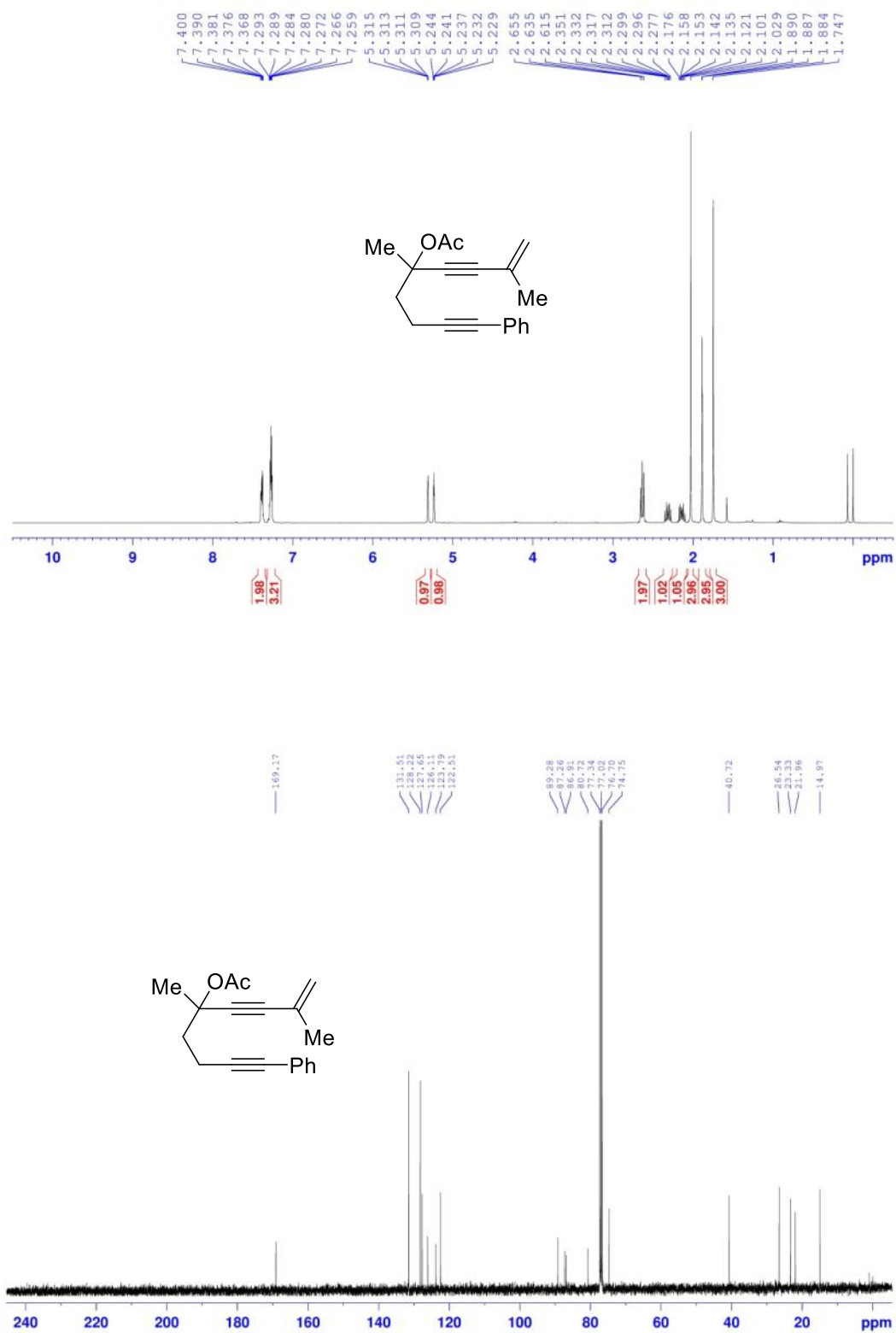
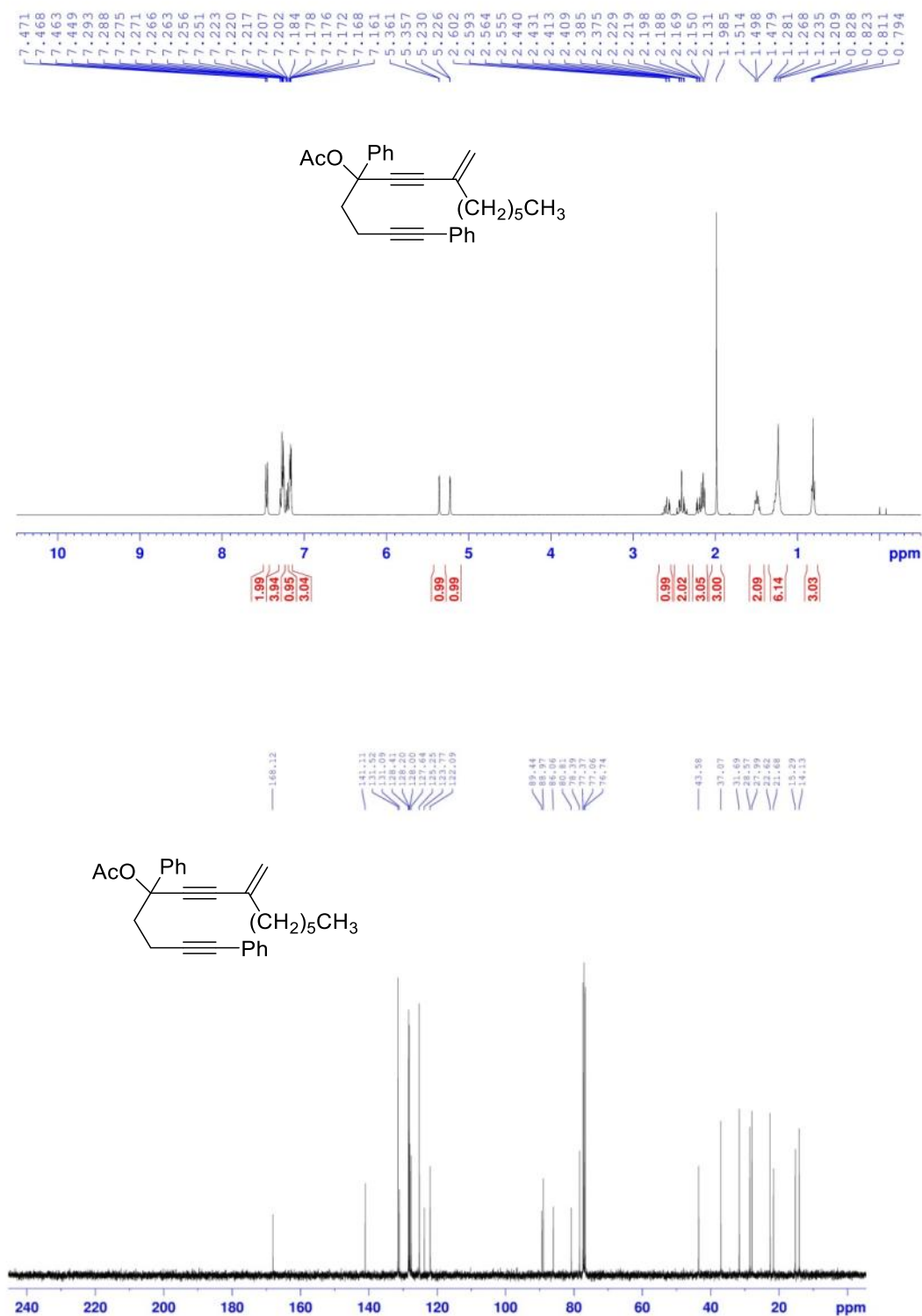


Figure S29. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 8-methylene-1,5-diphenyltetradeca-1,6-diyne-5-yl acetate (**1y**)



acetate (1δ)

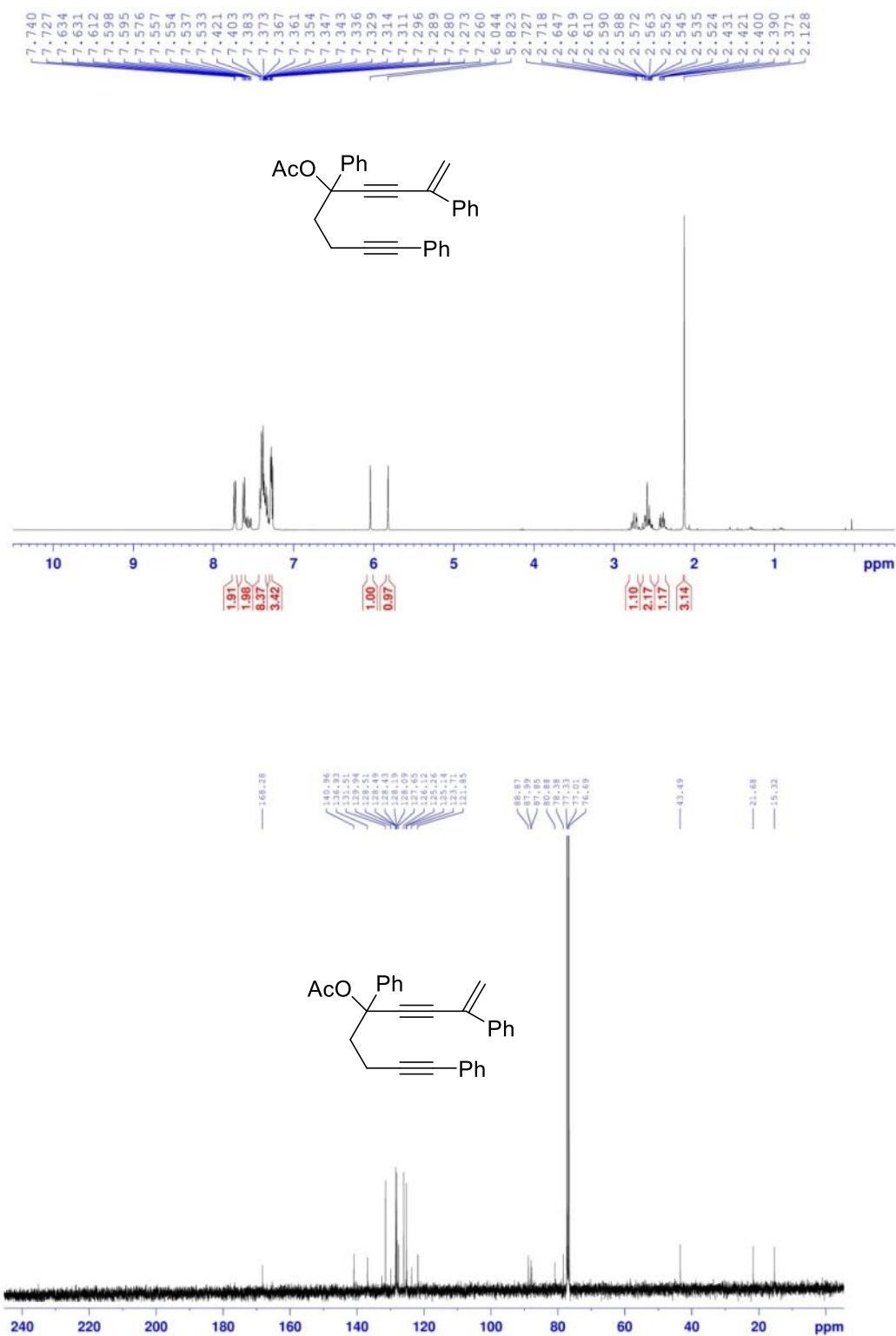


Figure S31. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 9-(4-fluorophenyl)-2-methyl-5-phenylnona-1-en-3,8-diyn-5-yl acetate (**1e**)

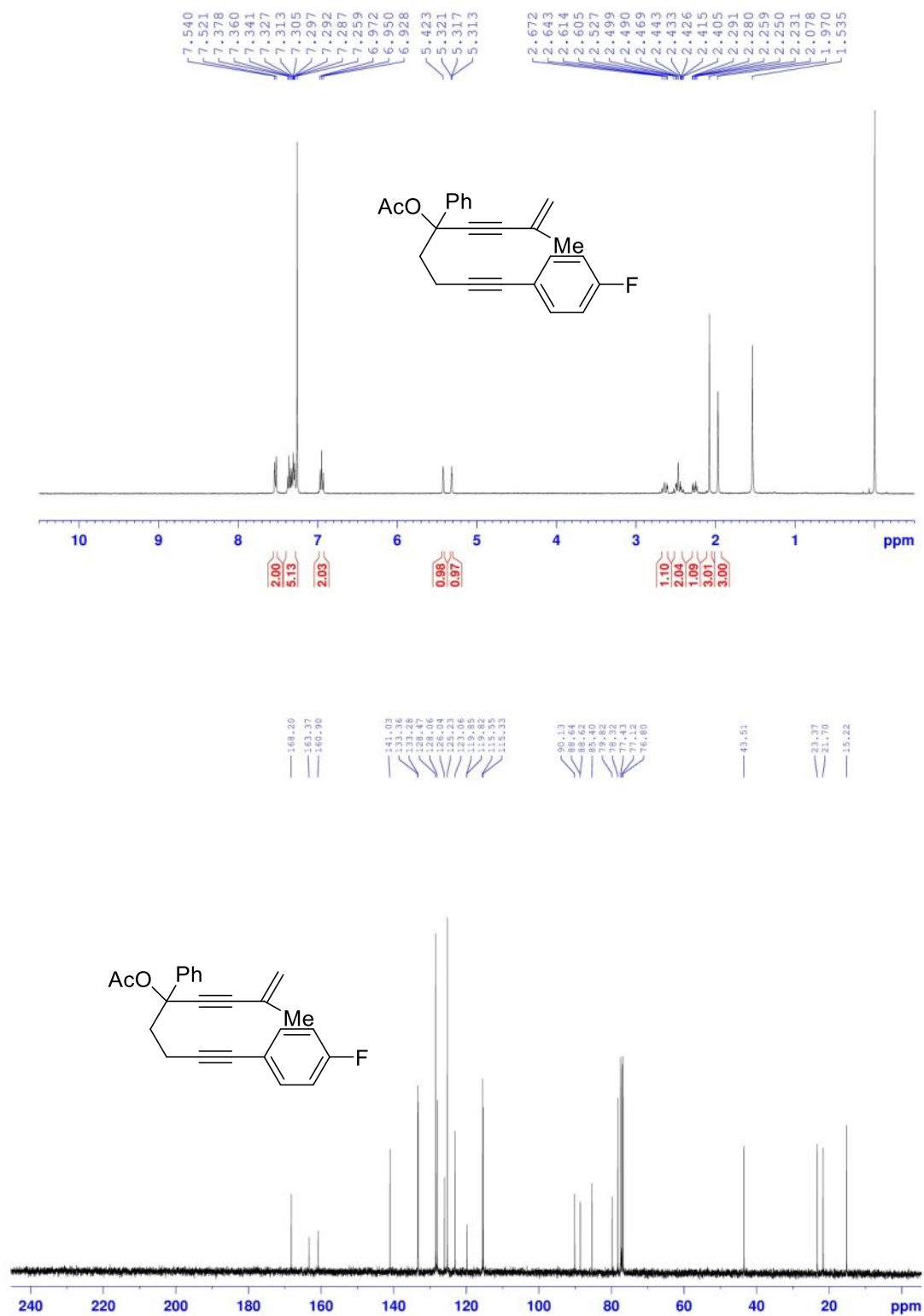


Figure S32. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5-phenyl-9-p-tolynona-1-en-3,8-diyn-5-yl acetate (**1c**)

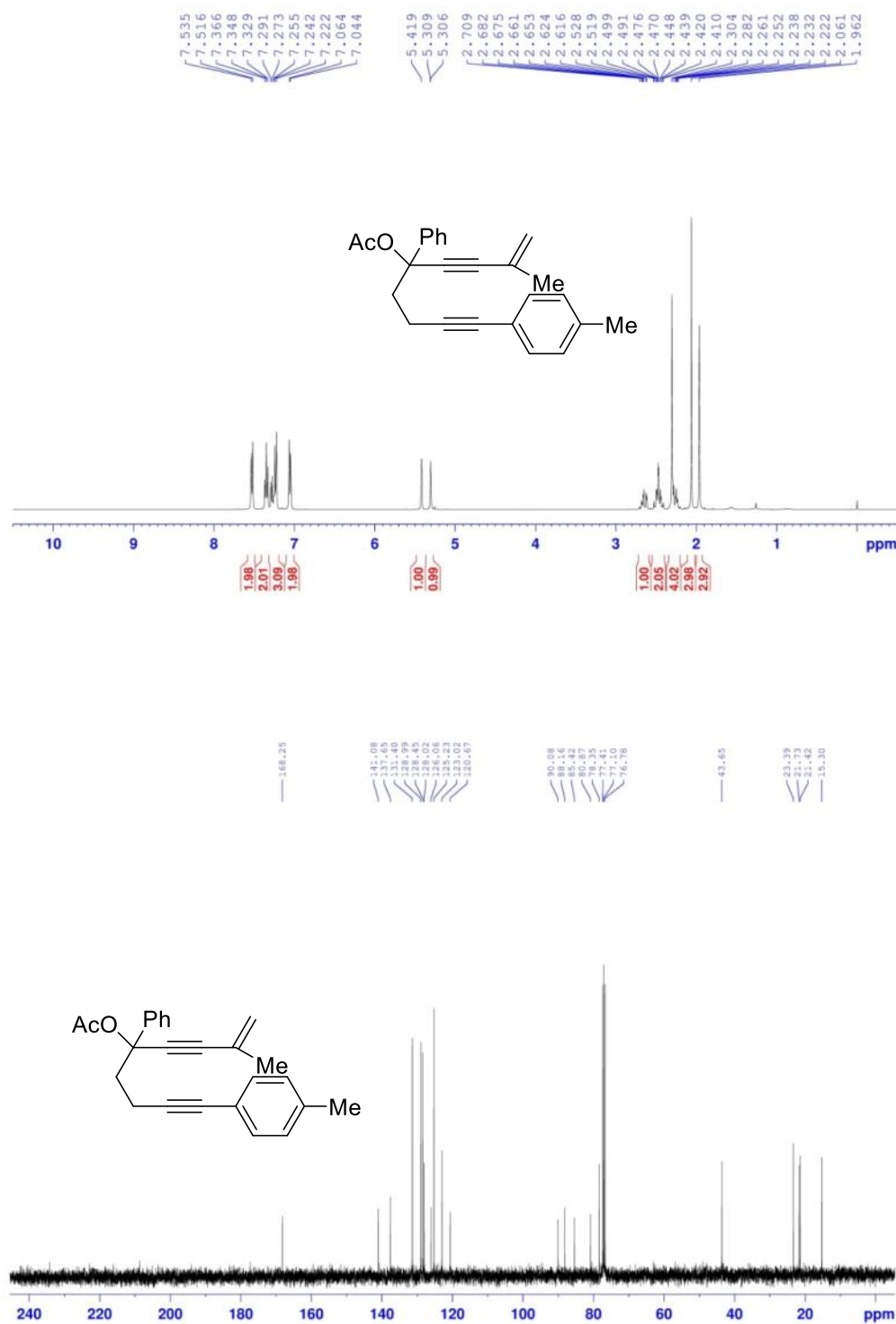
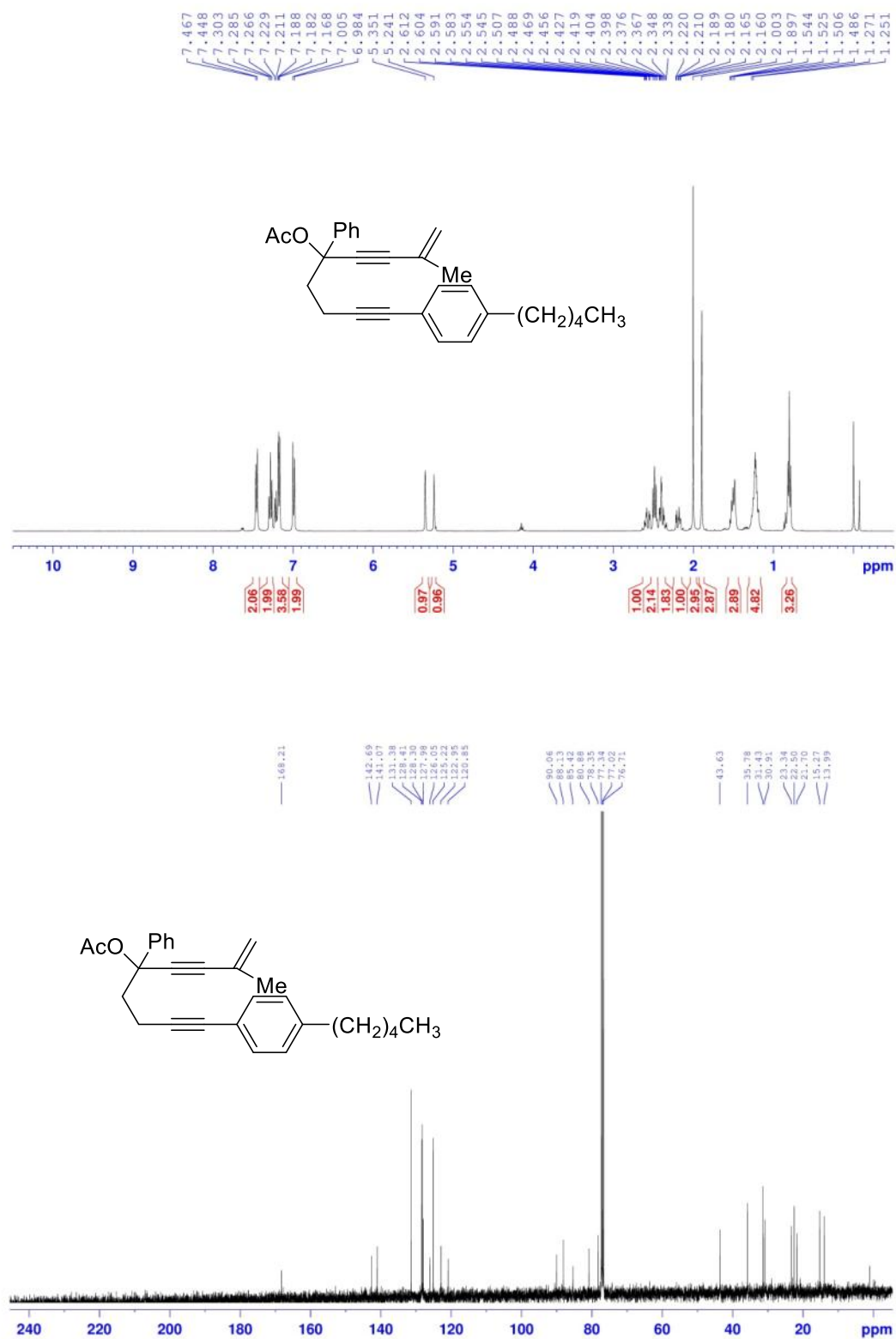


Figure S33. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-9-(4-pentylphenyl)-5-phenylnona-1-en-3,8-diyn-5-yl acetate (**1n**)



5-yl acetate (10)

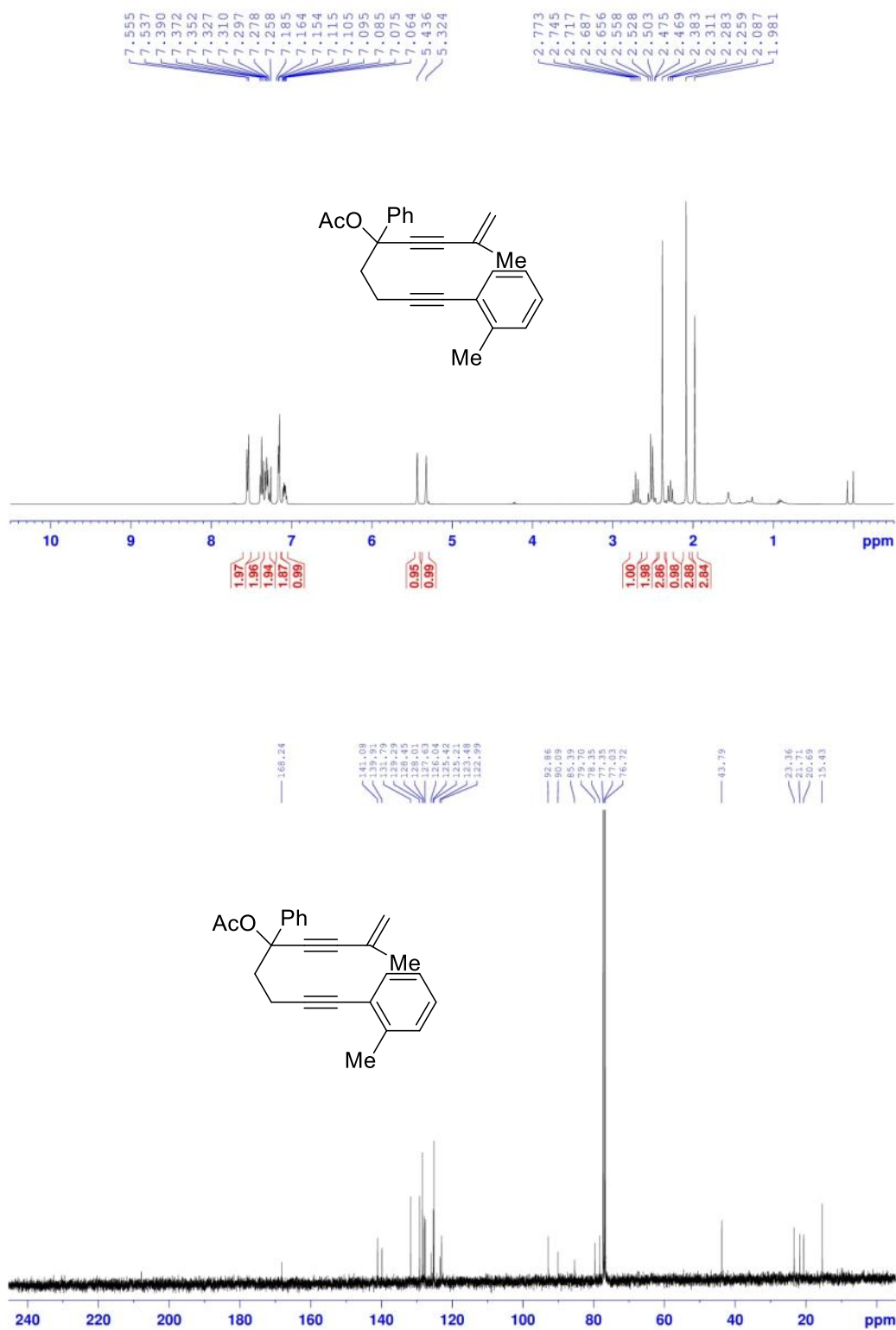


Figure S35. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 9-(3,5-dimethylphenyl)-2-methyl-5-phenylnona-1-en-3,8-diyn-5-yl acetate (1i)

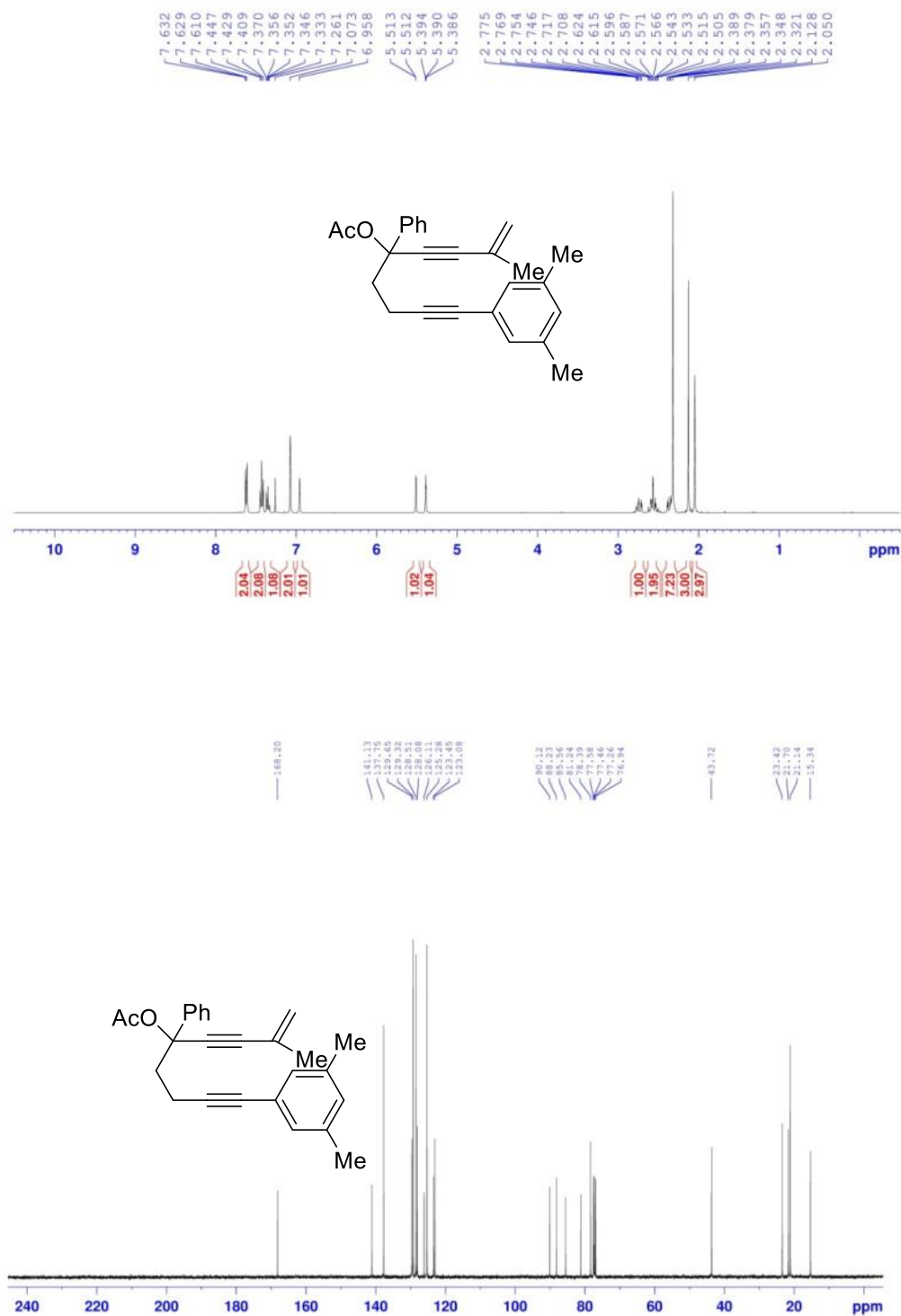
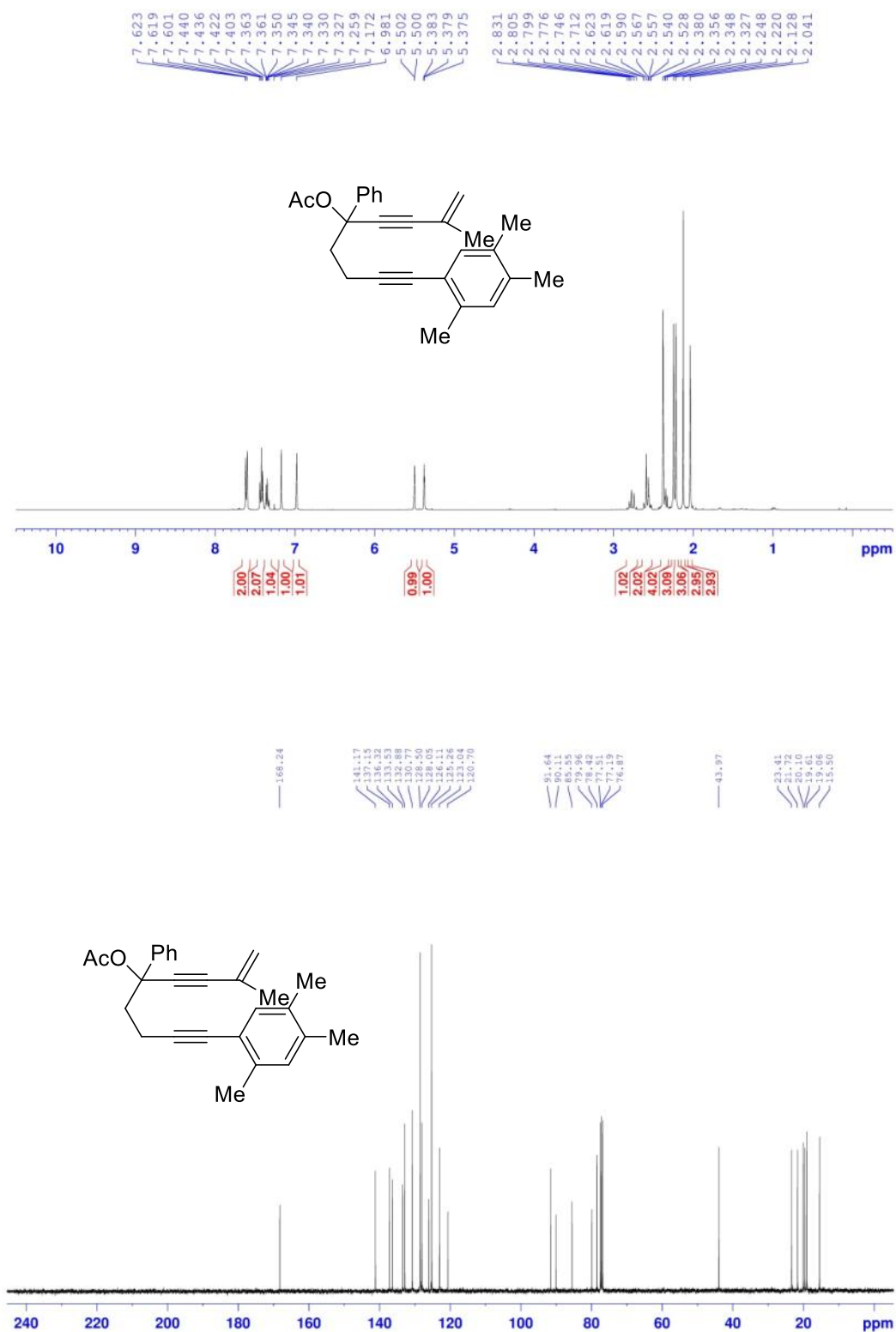


Figure S36. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 2-methyl-5-phenyl-9-(2,4,5-trimethylphenyl)nona-1-en-3,8-diyn-5-yl acetate (1k)



1-en-3,8-diyn-5-yl acetate (1λ)

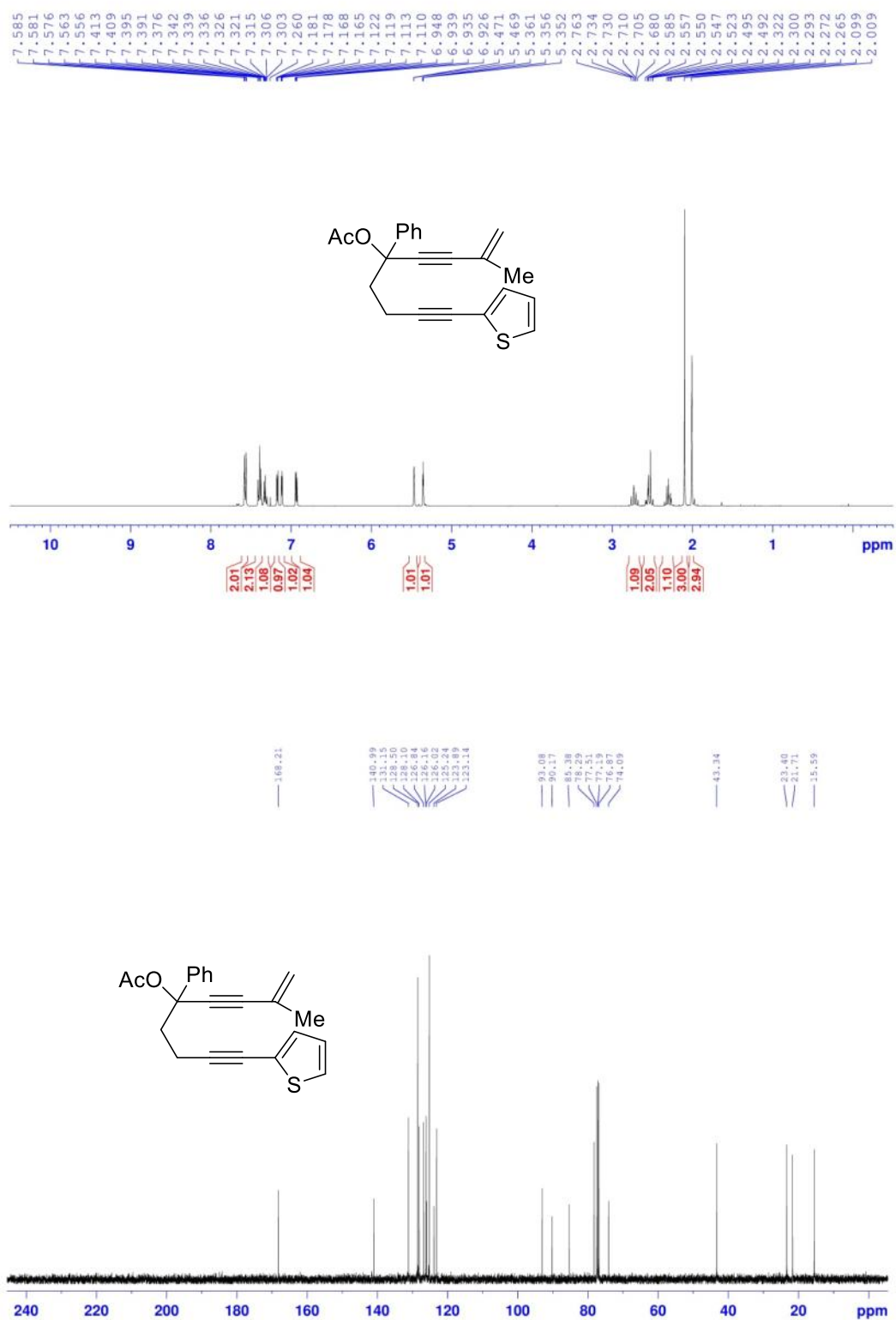


Figure S38. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene
(4a)

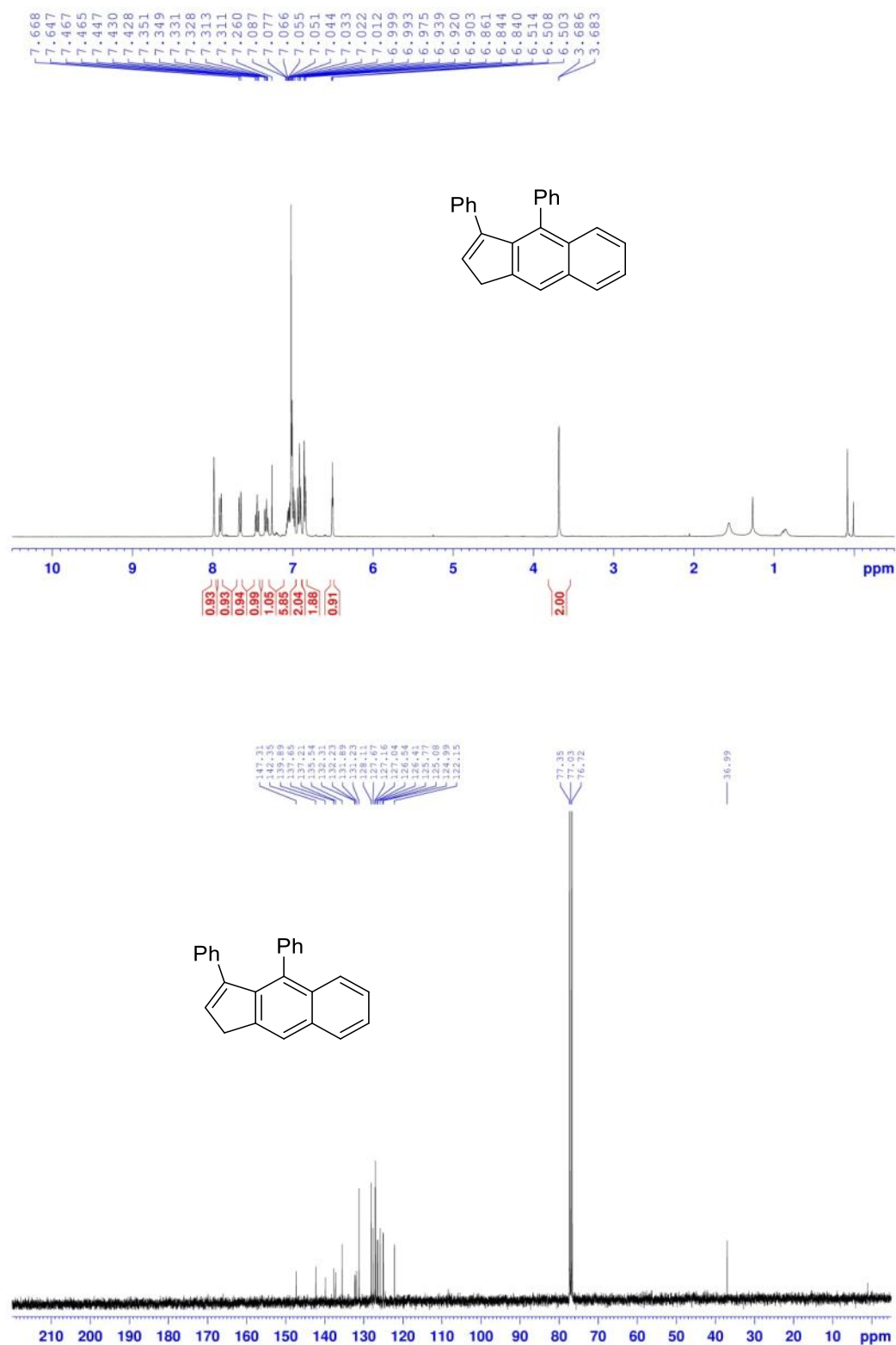


Figure S39. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-methyl-4-phenyl-1*H*-cyclopenta[*b*]naphthalene (4e)

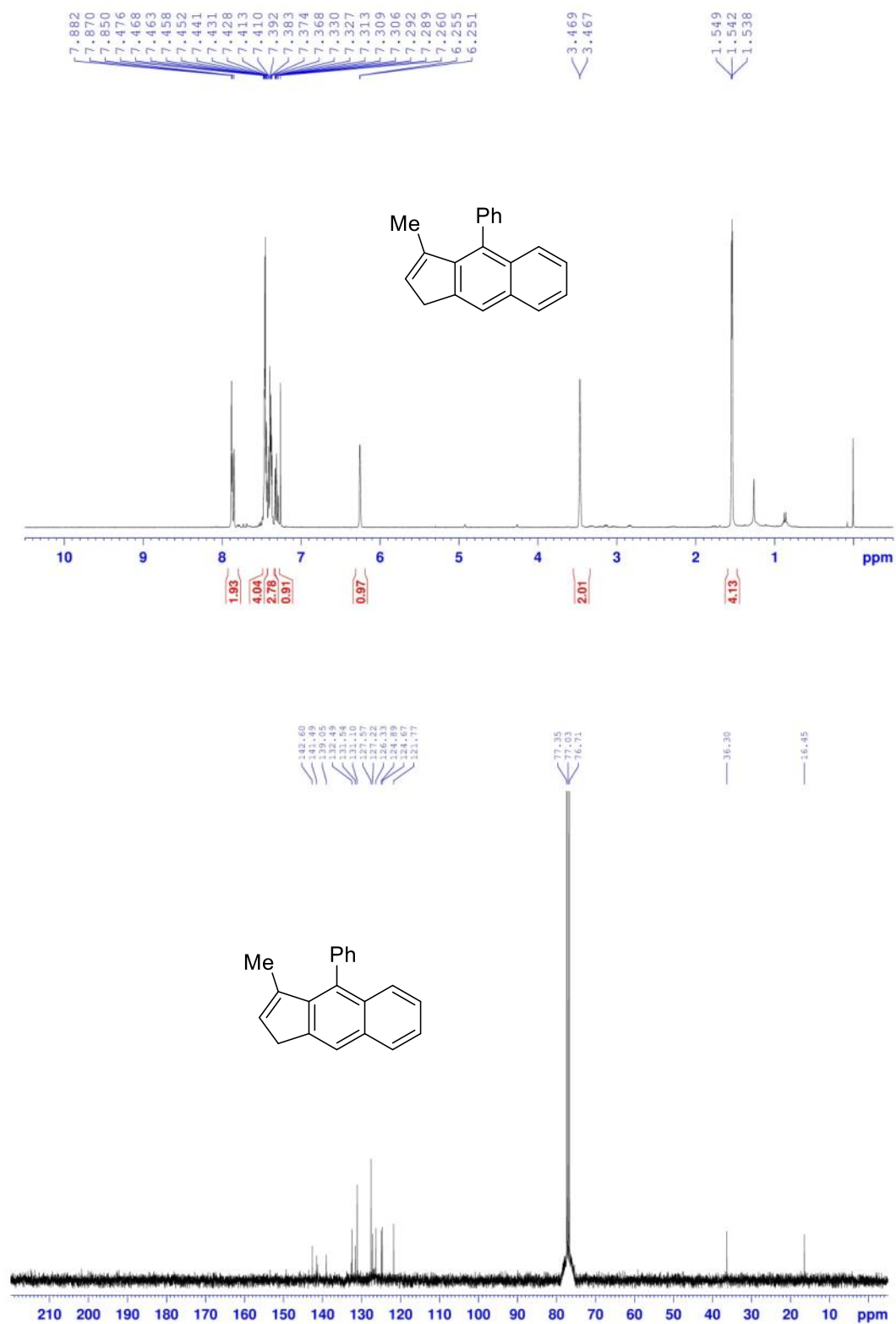


Figure S40. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-cyclopropyl-4-phenyl-1*H*-cyclopenta[*b*]naphthalene (4f)



Figure S41. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-(4-chlorophenyl)-4-phenyl-1*H*-cyclopenta[*b*]naphthalene(4g)

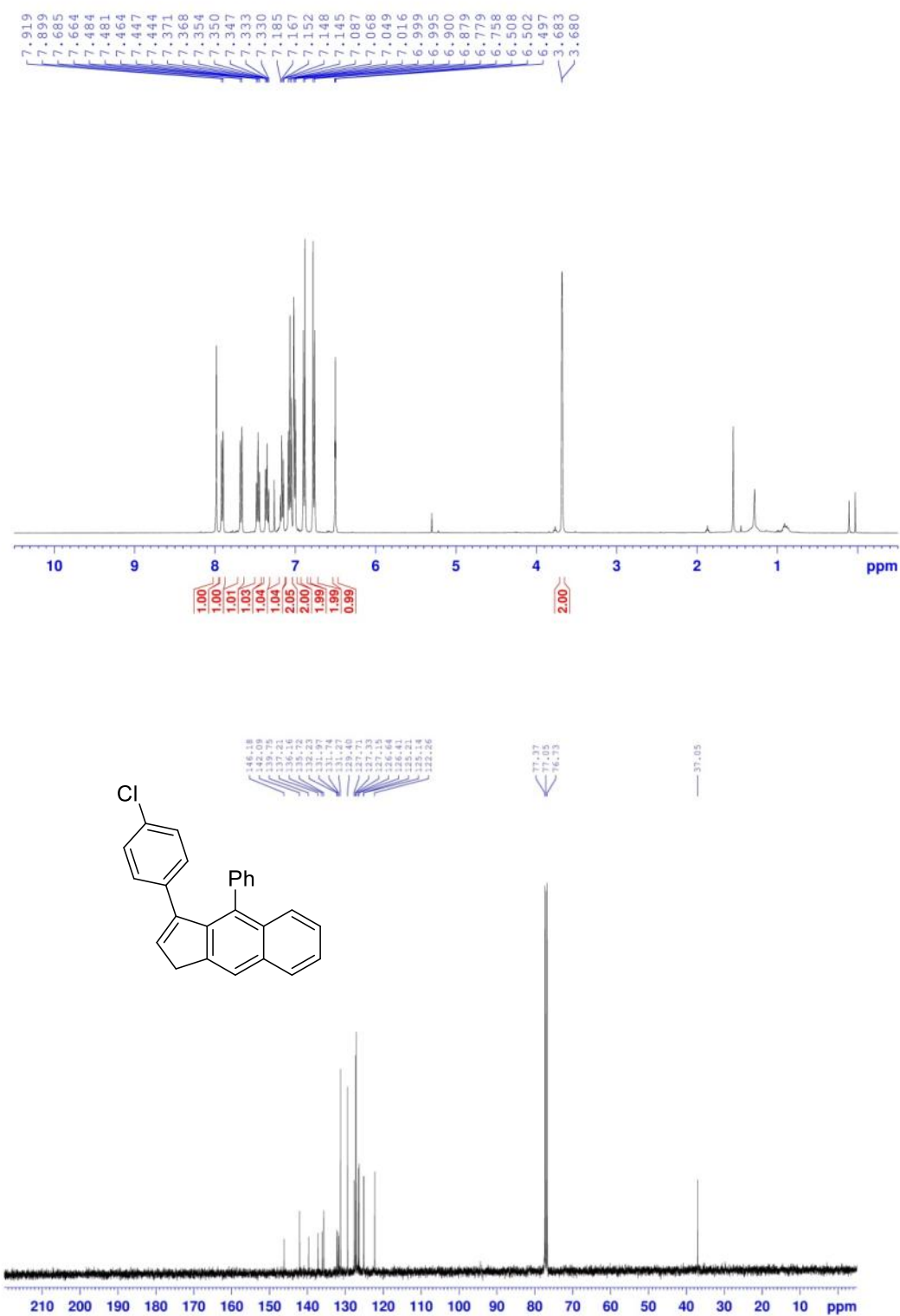


Figure S42. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 4-(4-fluorophenyl)-3-phenyl-1*H*-cyclopenta[*b*]naphthalene(4h)

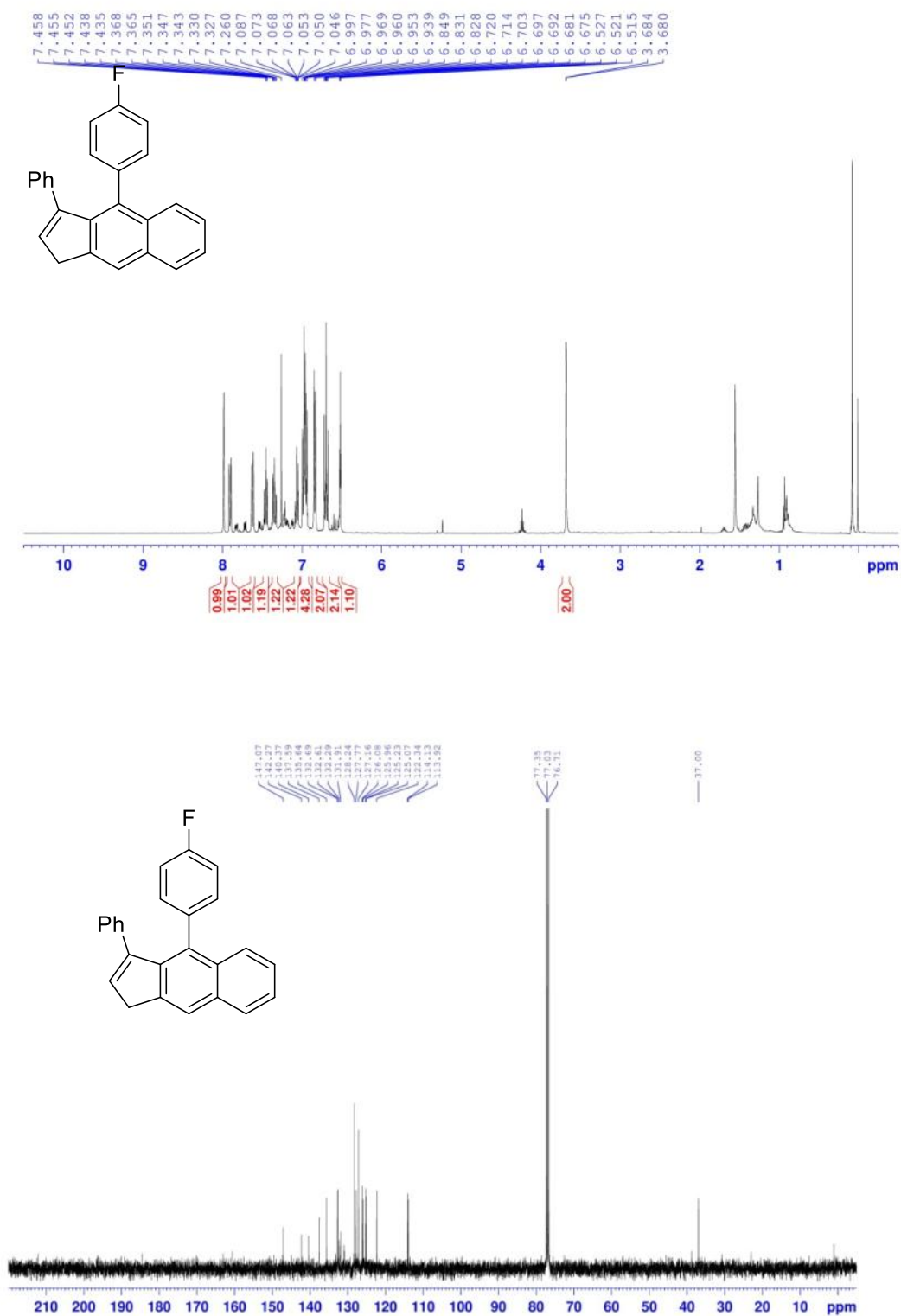


Figure S43. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-phenyl-4-(p-tolyl)-1*H*-cyclopenta[*b*]naphthalene (4i)

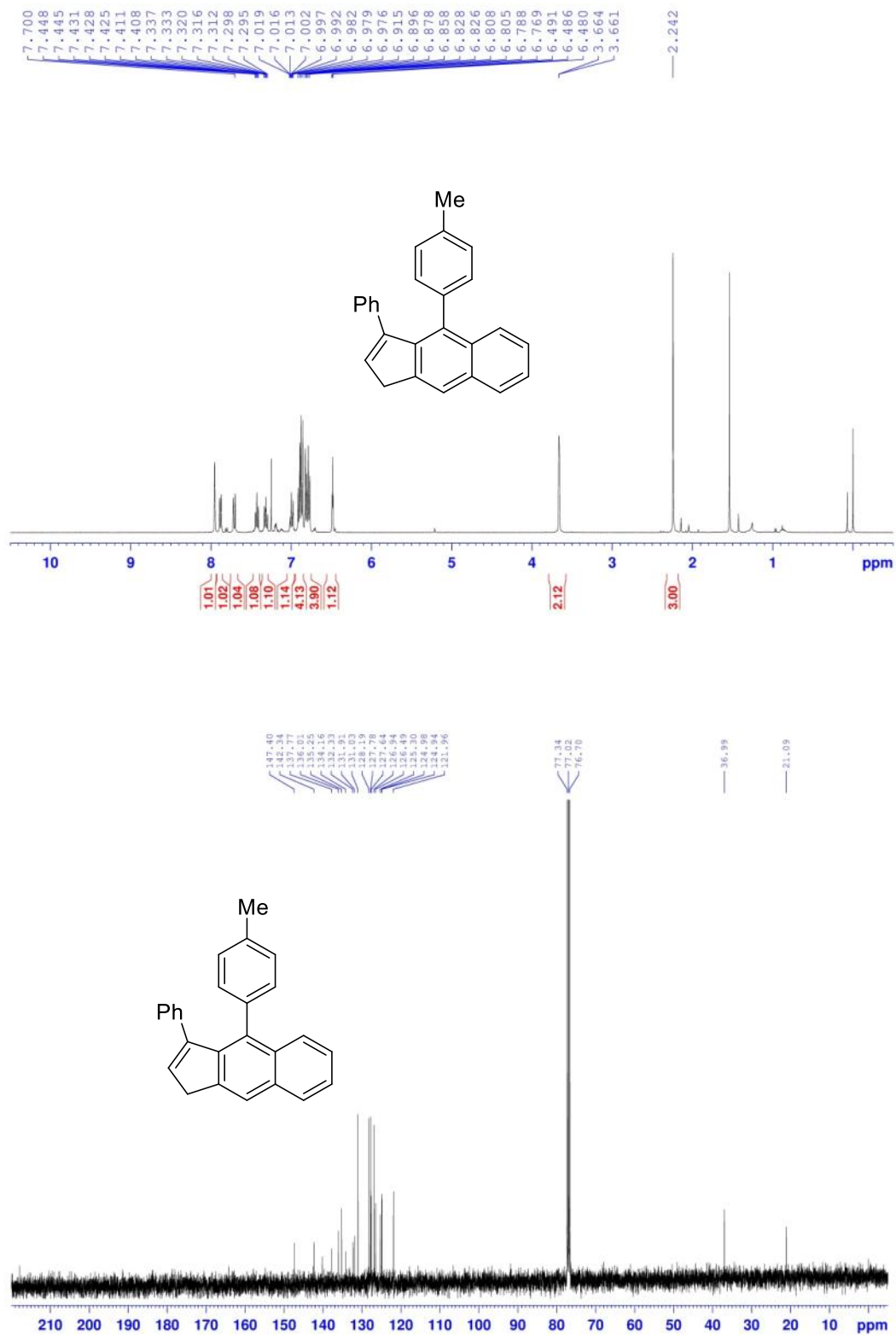


Figure S44. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 3-(3-phenyl-1*H*-cyclopenta[*b*]naphthalen-4-yl)thiophene (4j)

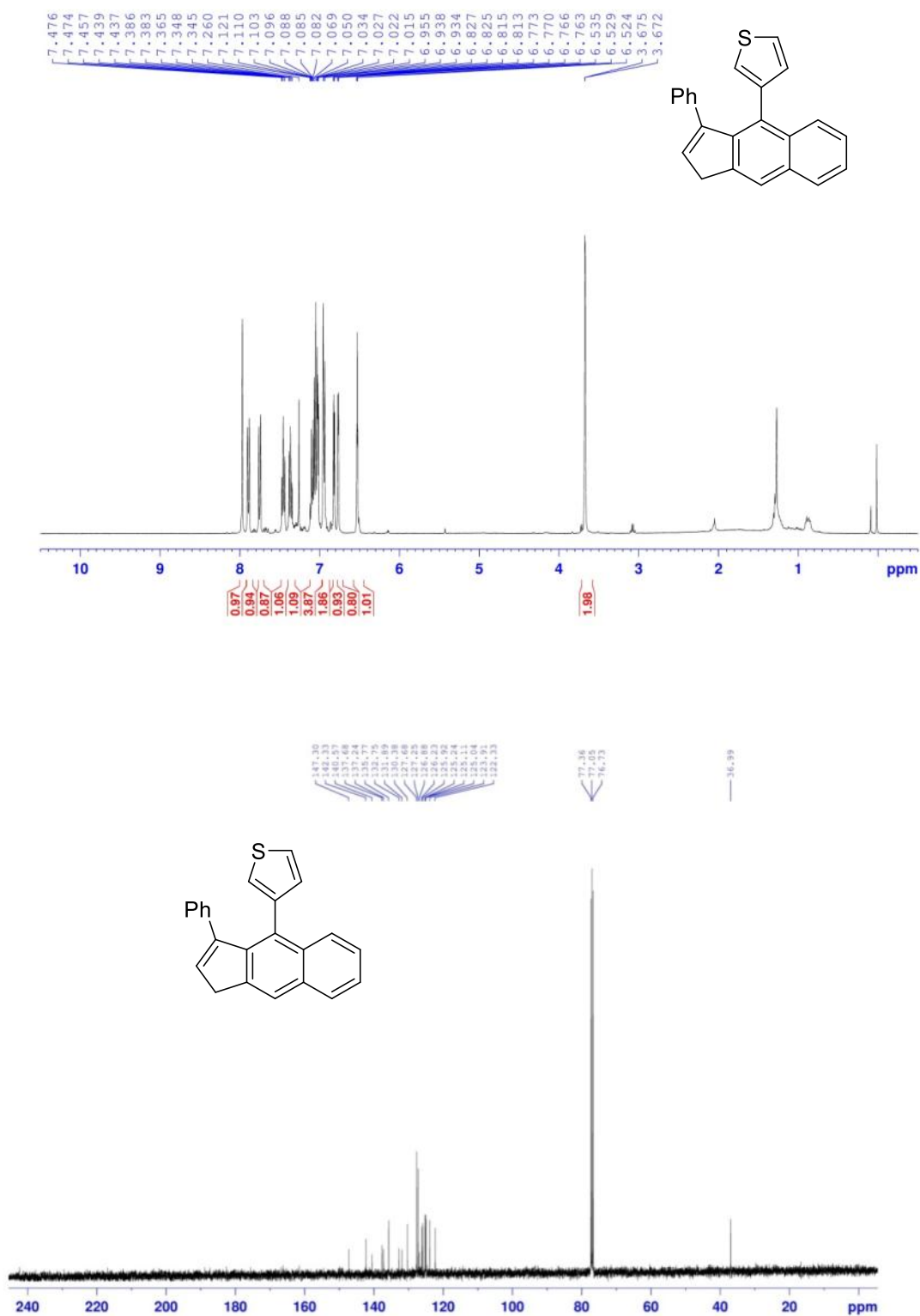


Figure S45. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 6-fluoro-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4k)

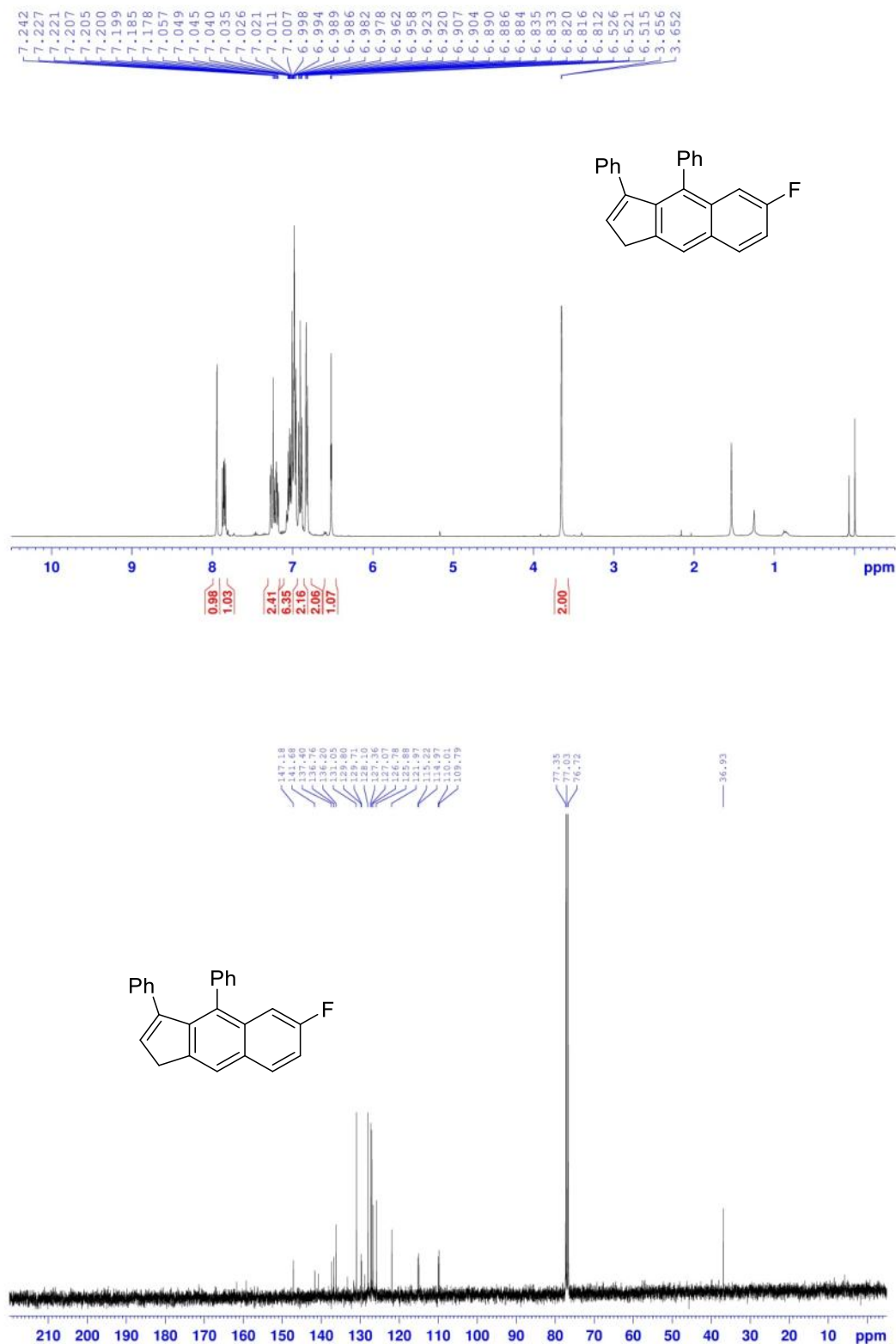


Figure S46. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 6-bromo-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4l)

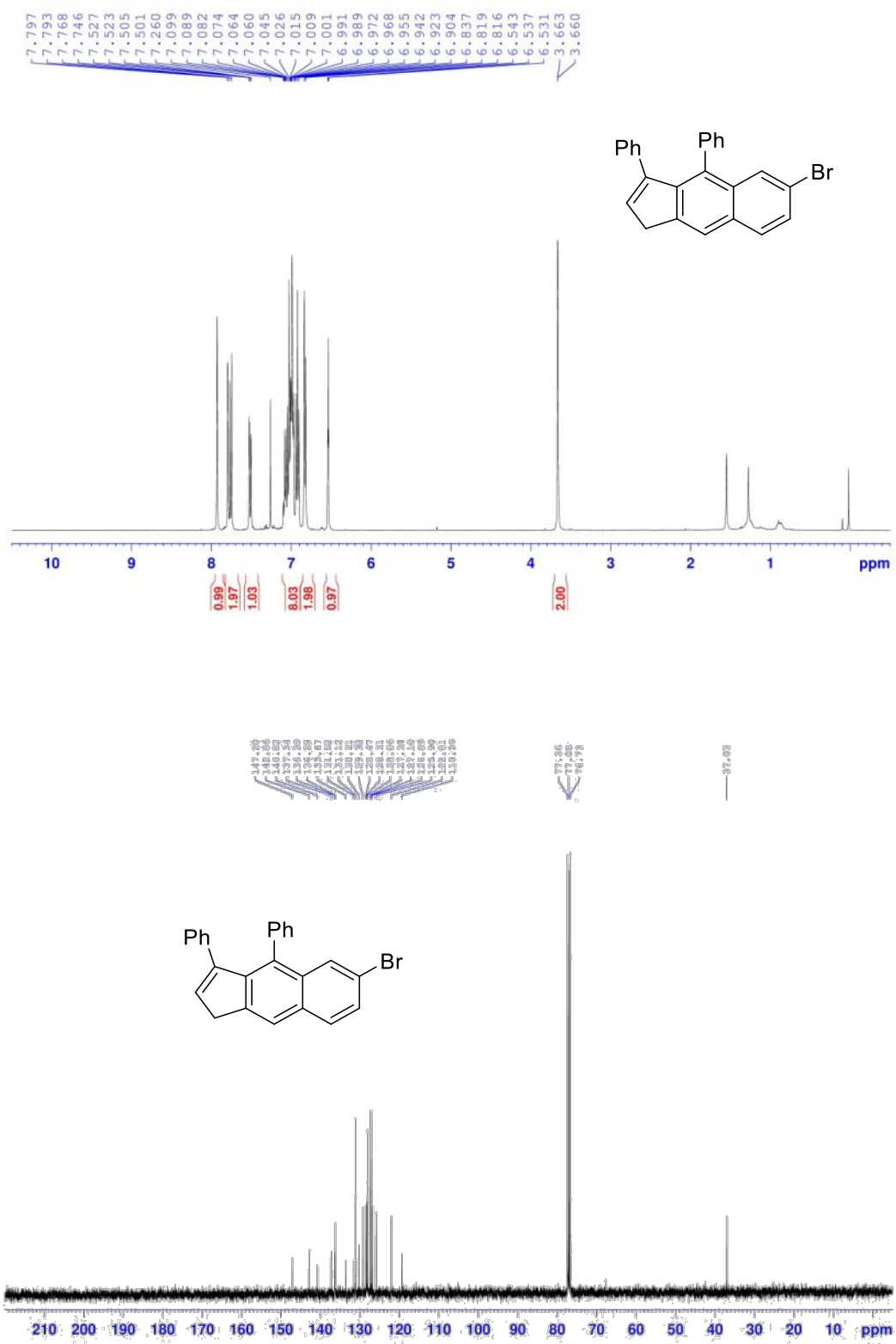


Figure S47. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 6-pentyl-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4m)

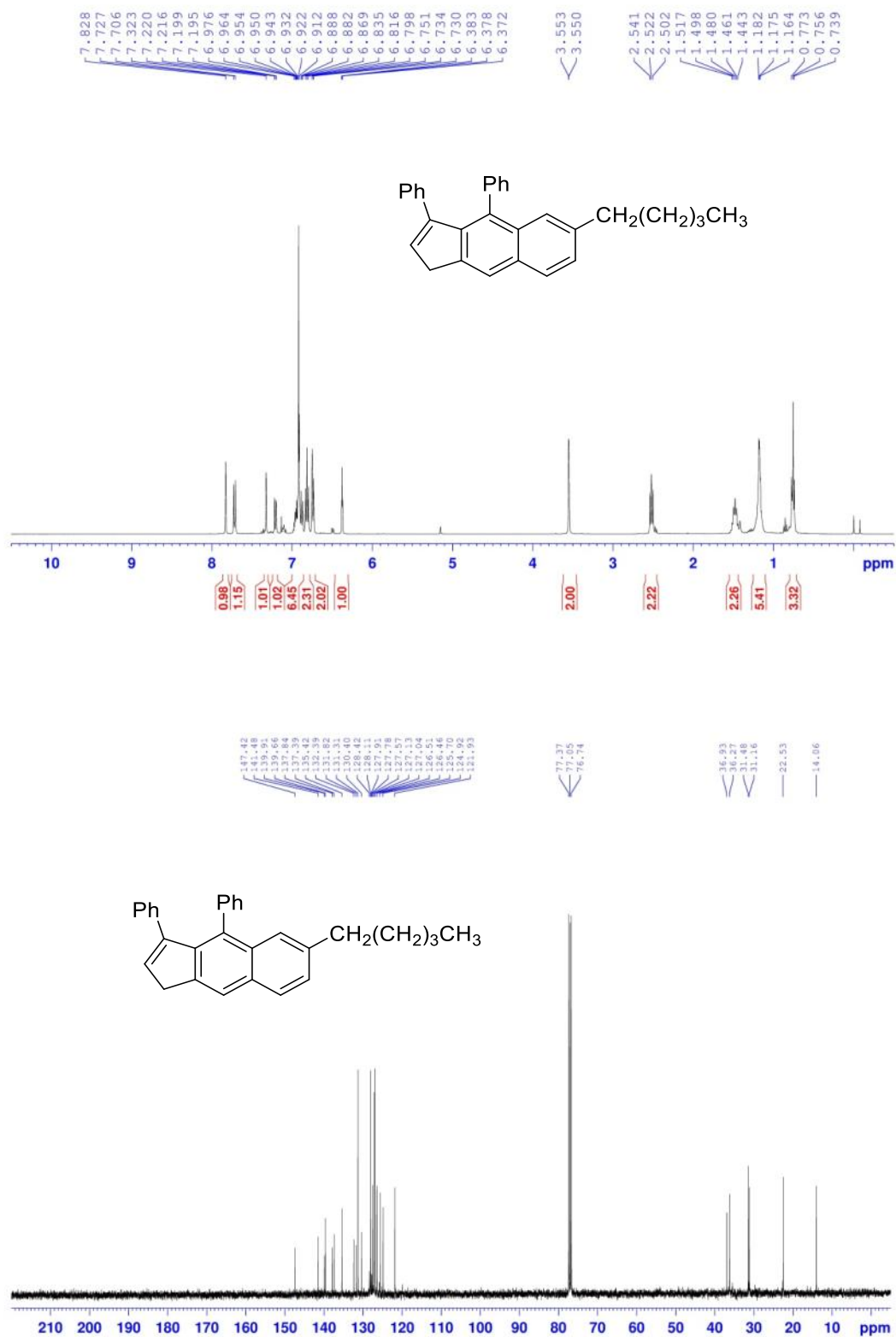


Figure S48. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 6-methyl-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4n)

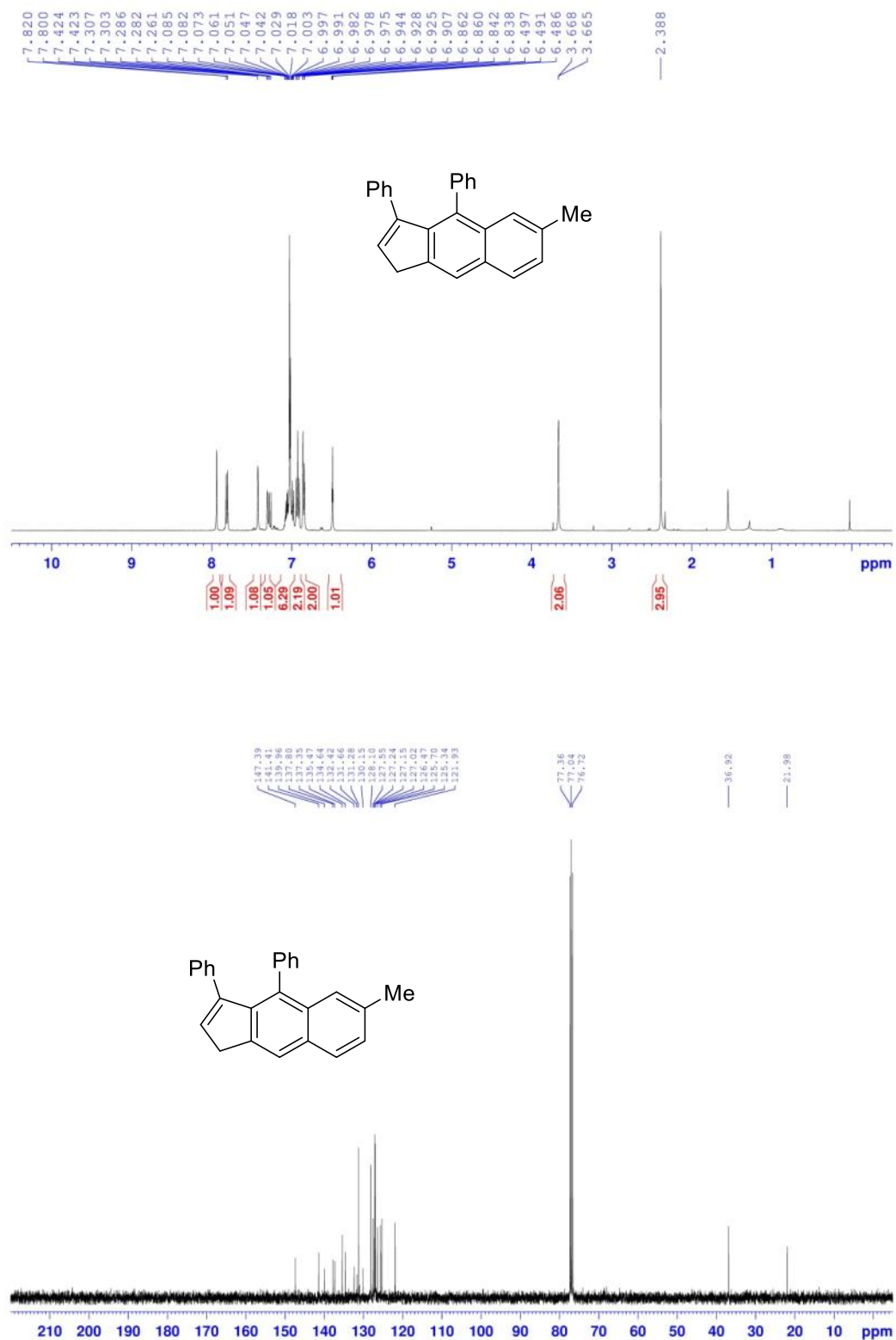


Figure S49. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 8-methyl-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4o)

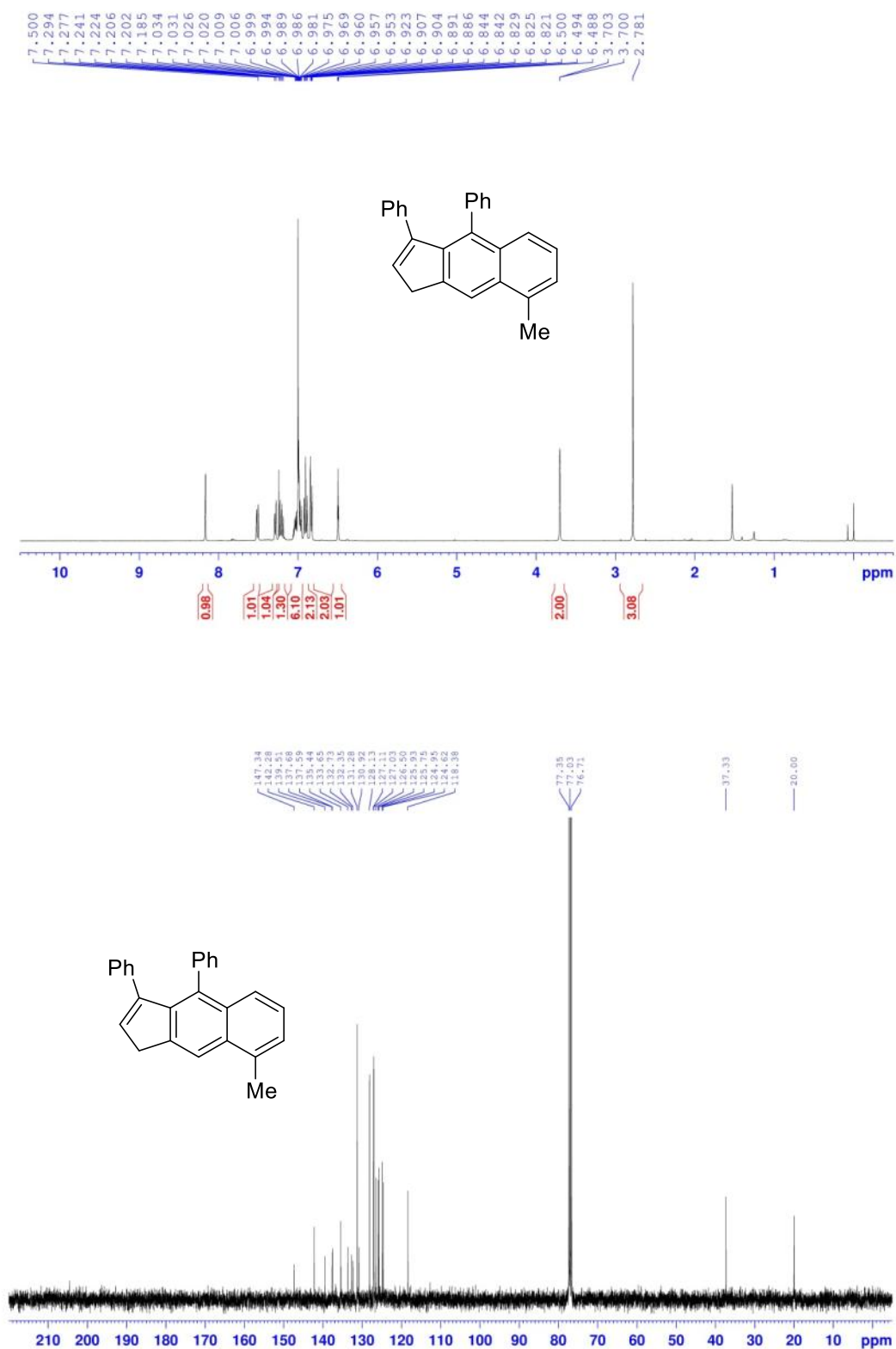


Figure S50. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 5,7-dimethyl-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4p)

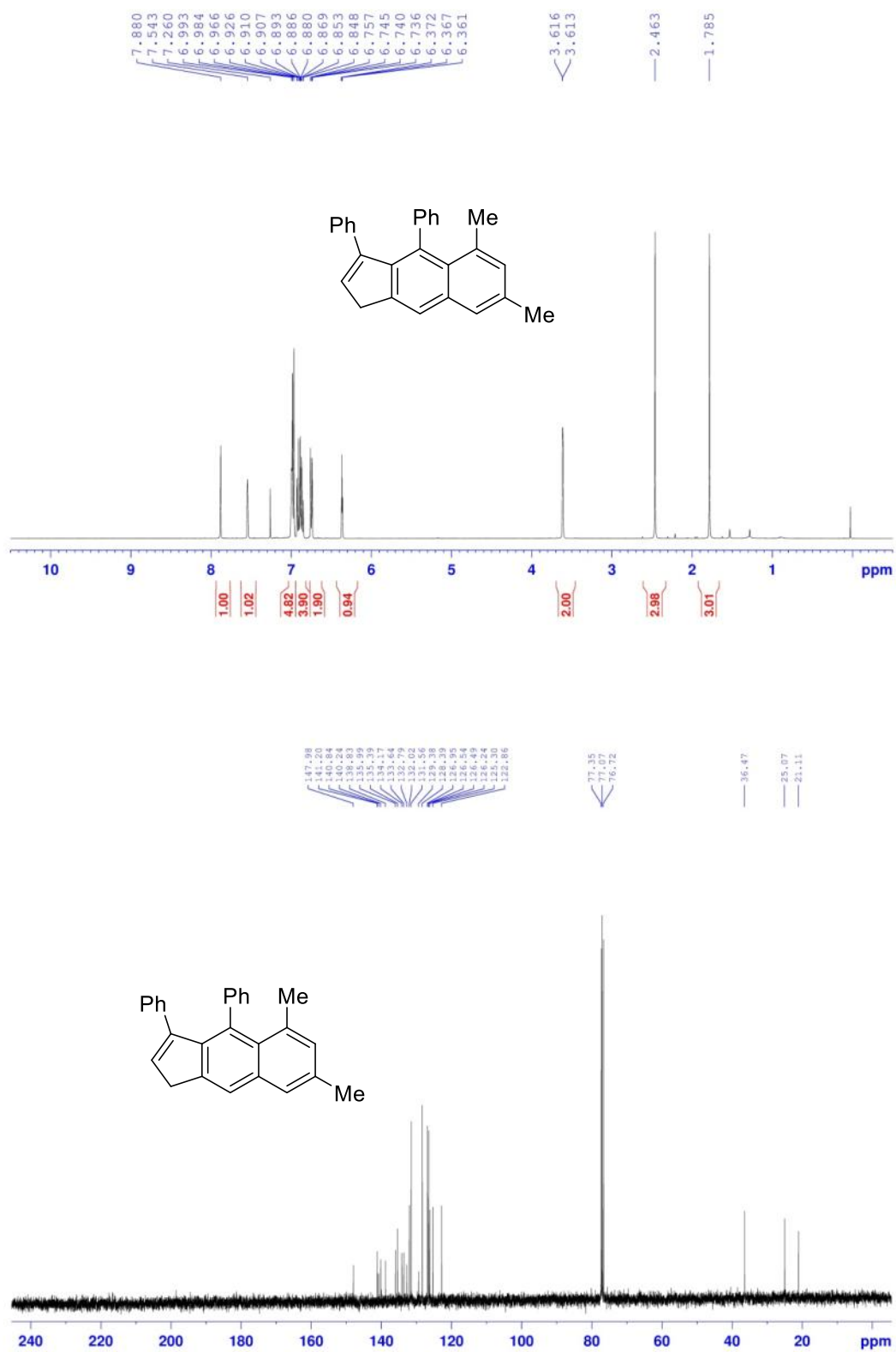


Figure S51. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 5,6,8-trimethyl-3,4-diphenyl-1*H*-cyclopenta[*b*]naphthalene (4q)

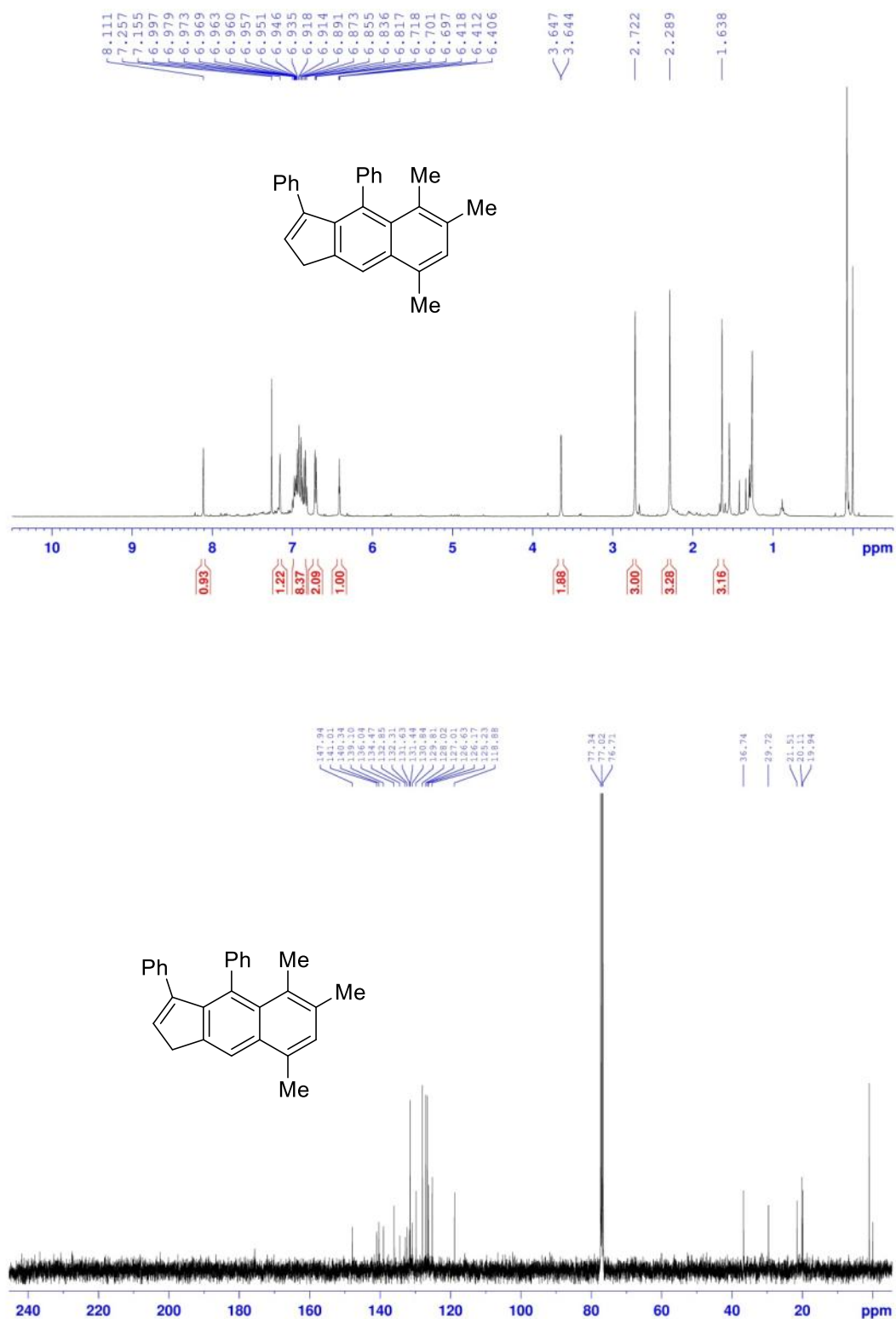


Figure S52. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7,8-diphenyl-10*H*-cyclopenta[*b*]phenanthrene (4r)

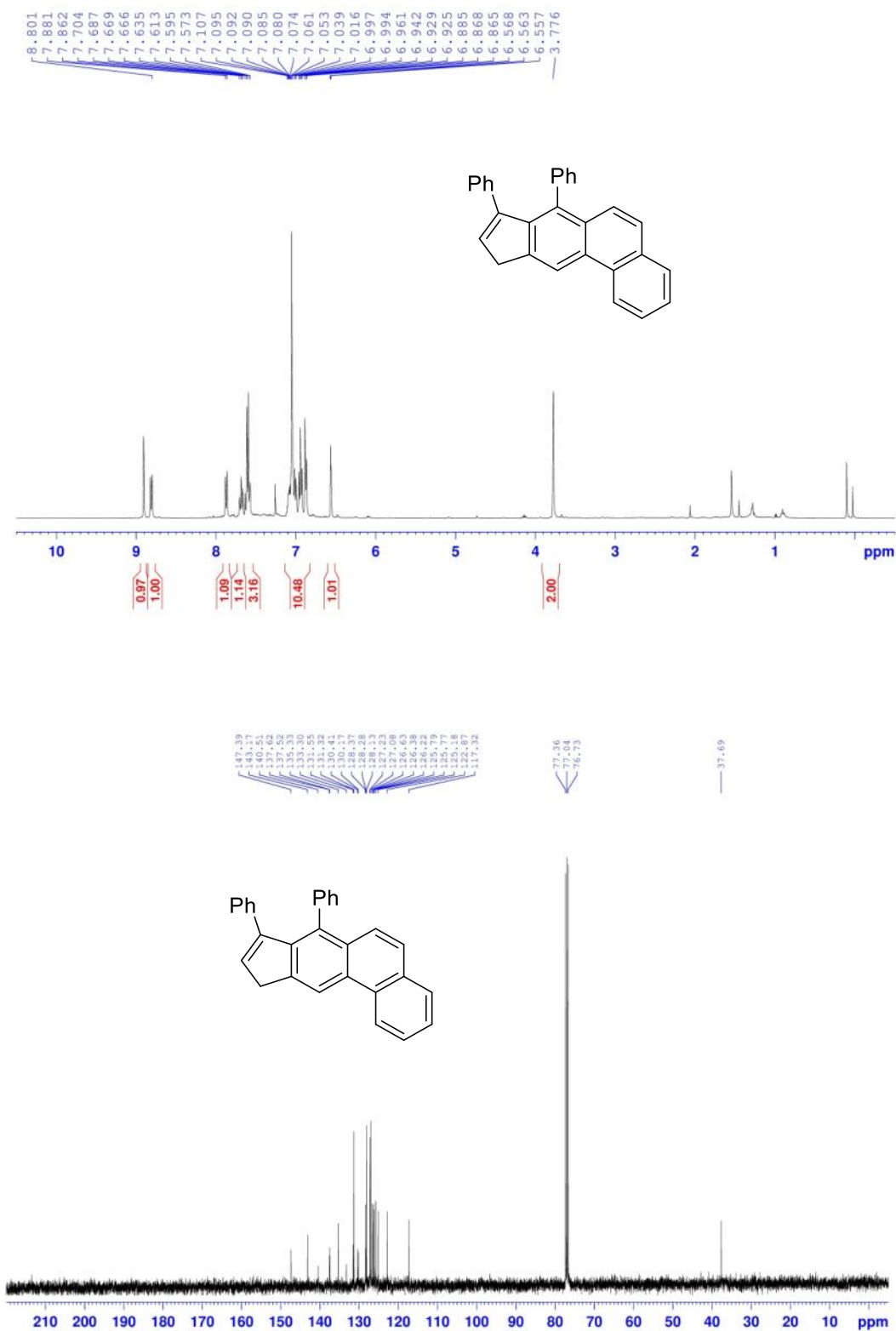


Figure S53. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 7,8-diphenyl-5*H*-indeno[5,6-*b*]thiophene (4s)

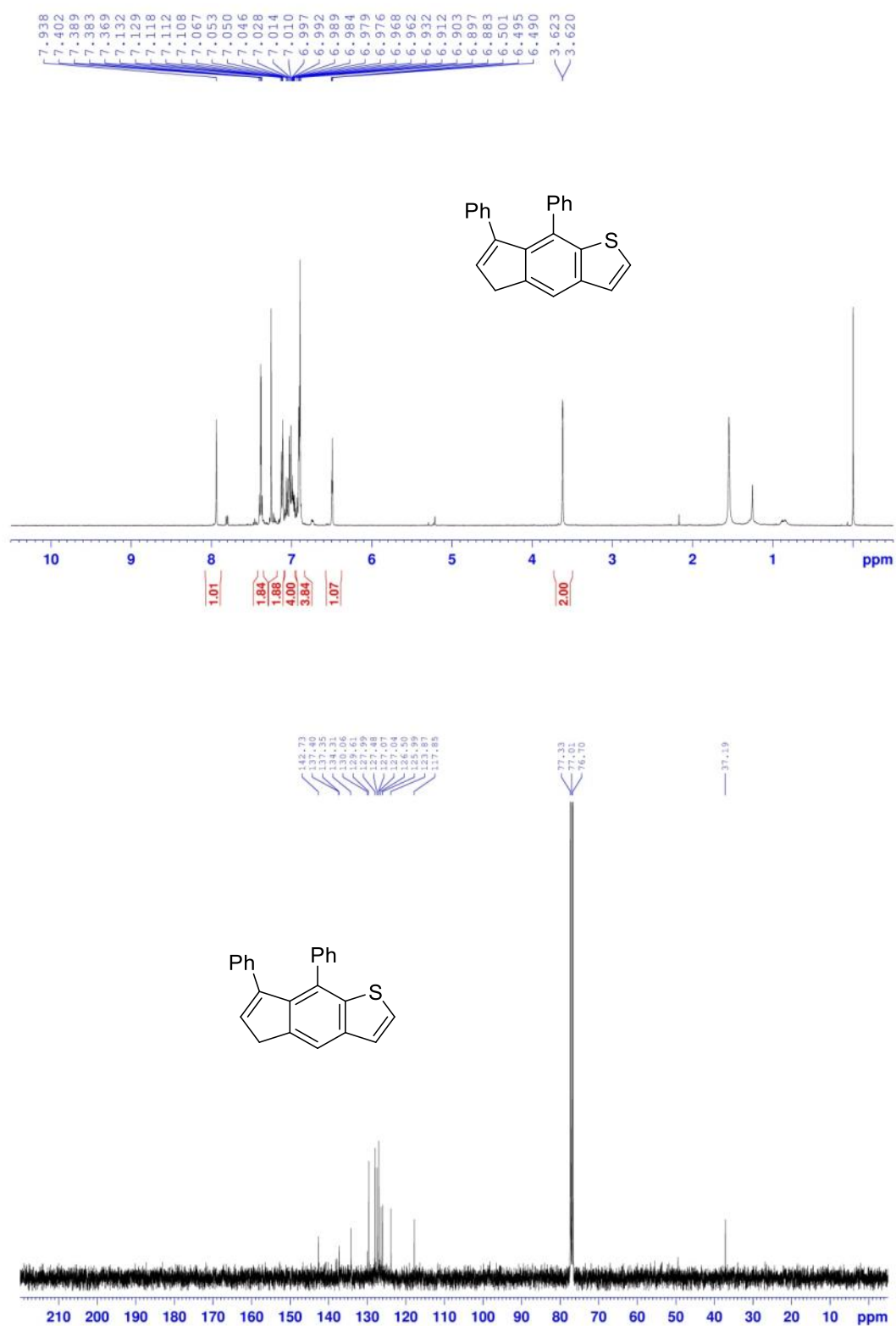


Figure S54. ^1H and $^{13}\text{C}\{^1\text{H}\}$ NMR spectra of 4,5-diphenyl-7*H*-indeno[5,6-*b*]thiophene (4t)

