

Supplementary Material

Practical synthesis of polysubstituted naphthalene derivatives via HNTf₂-catalyzed benzannulation reaction

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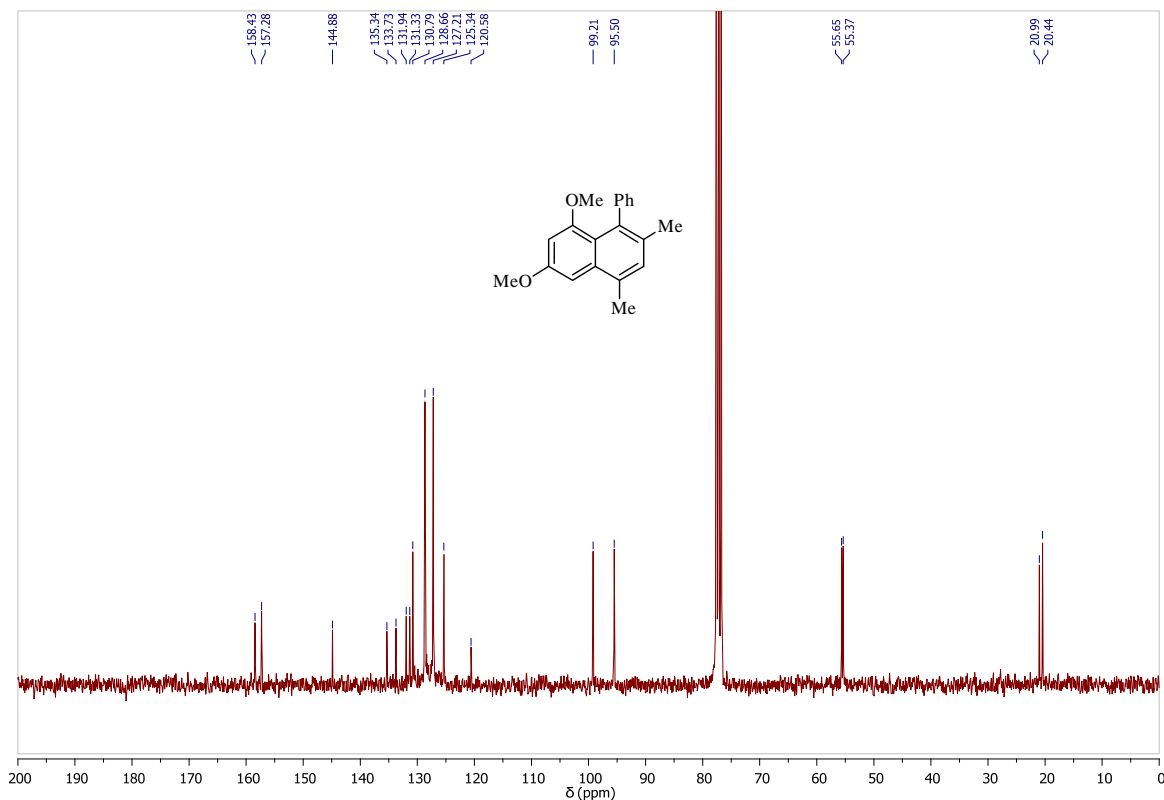
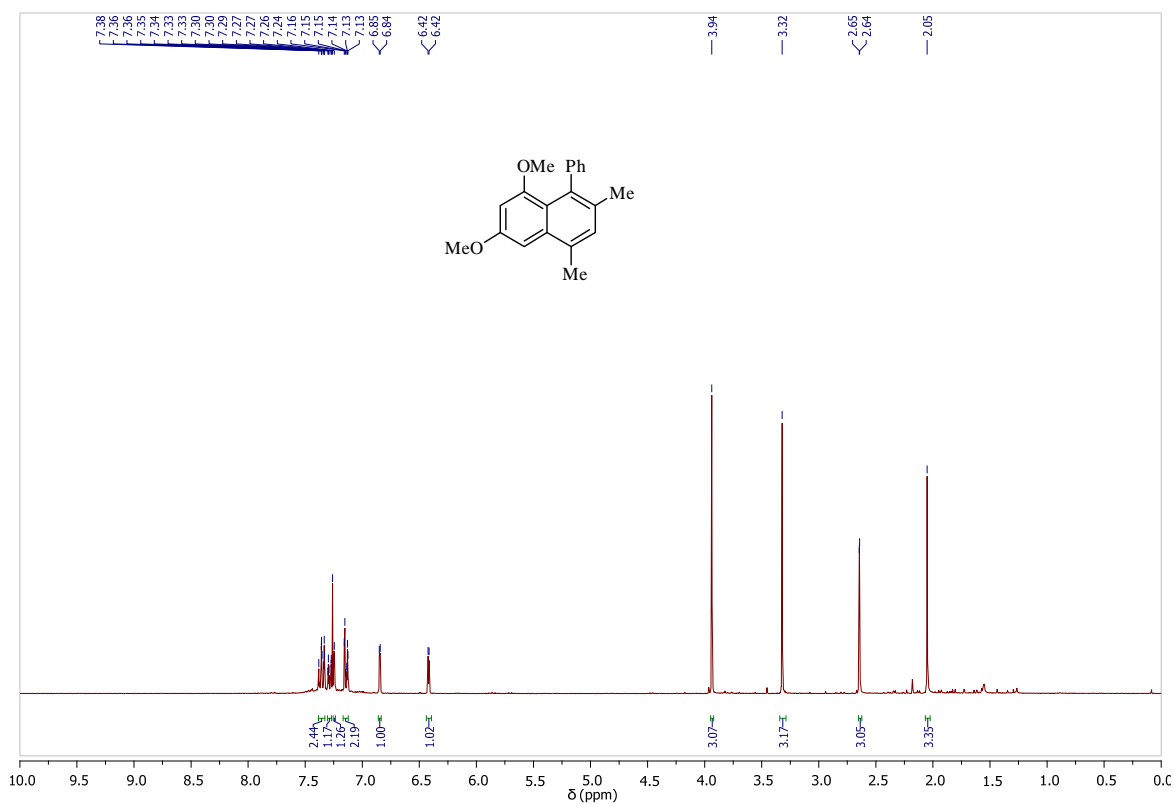
Dedicated to Professor J. S. Yadav on the occasion of his 65th birthday

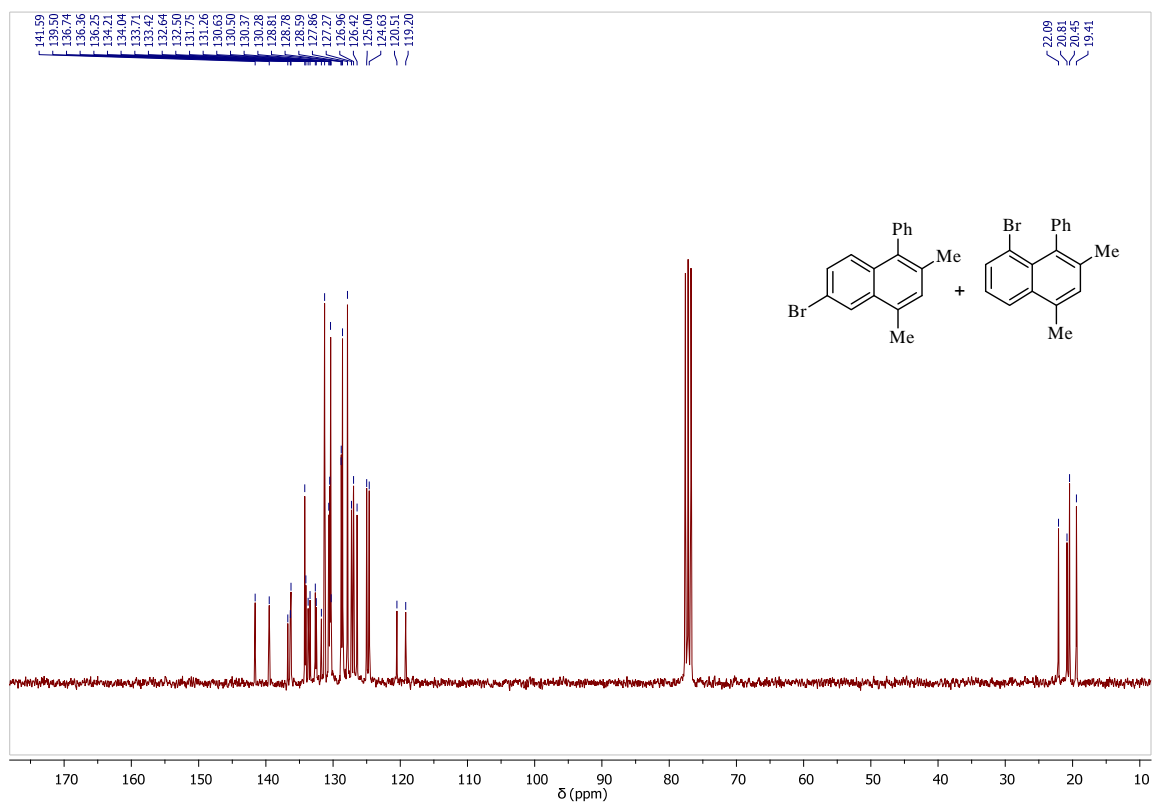
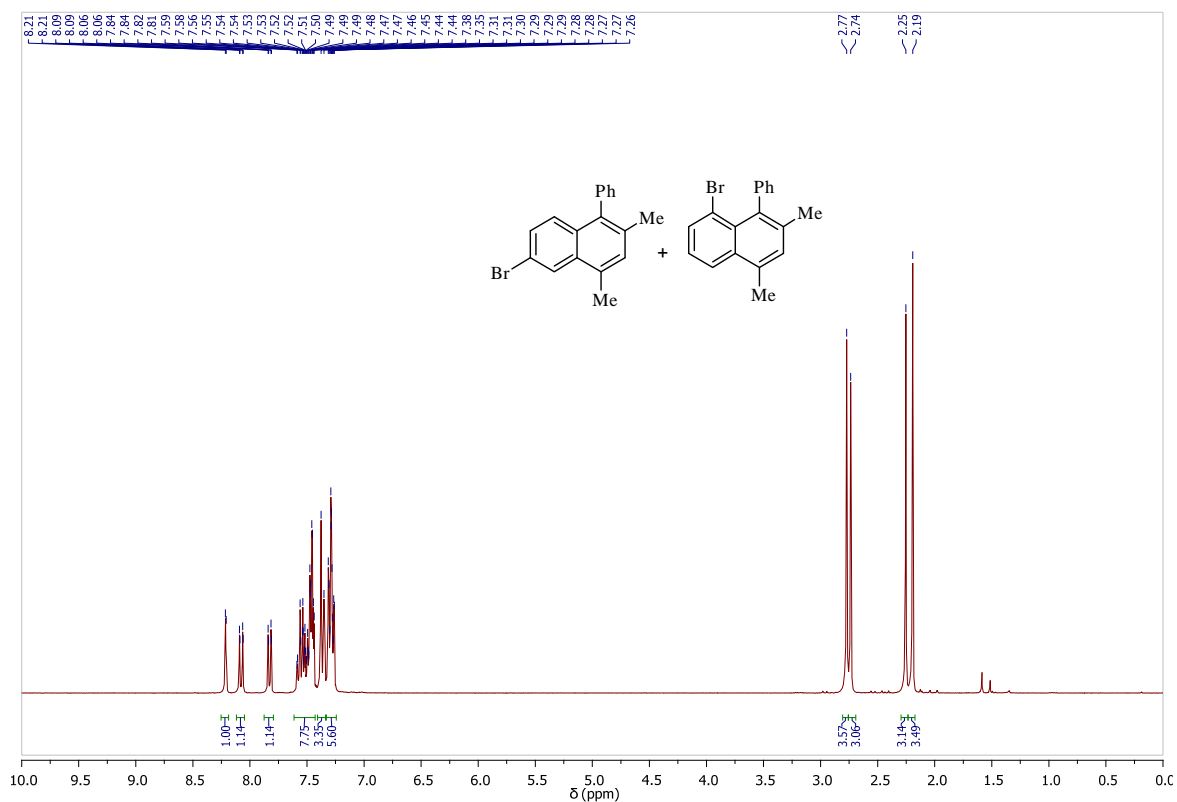
Starting Materials	S1
¹ H NMR and ¹³ C NMR Spectra	S2-S21

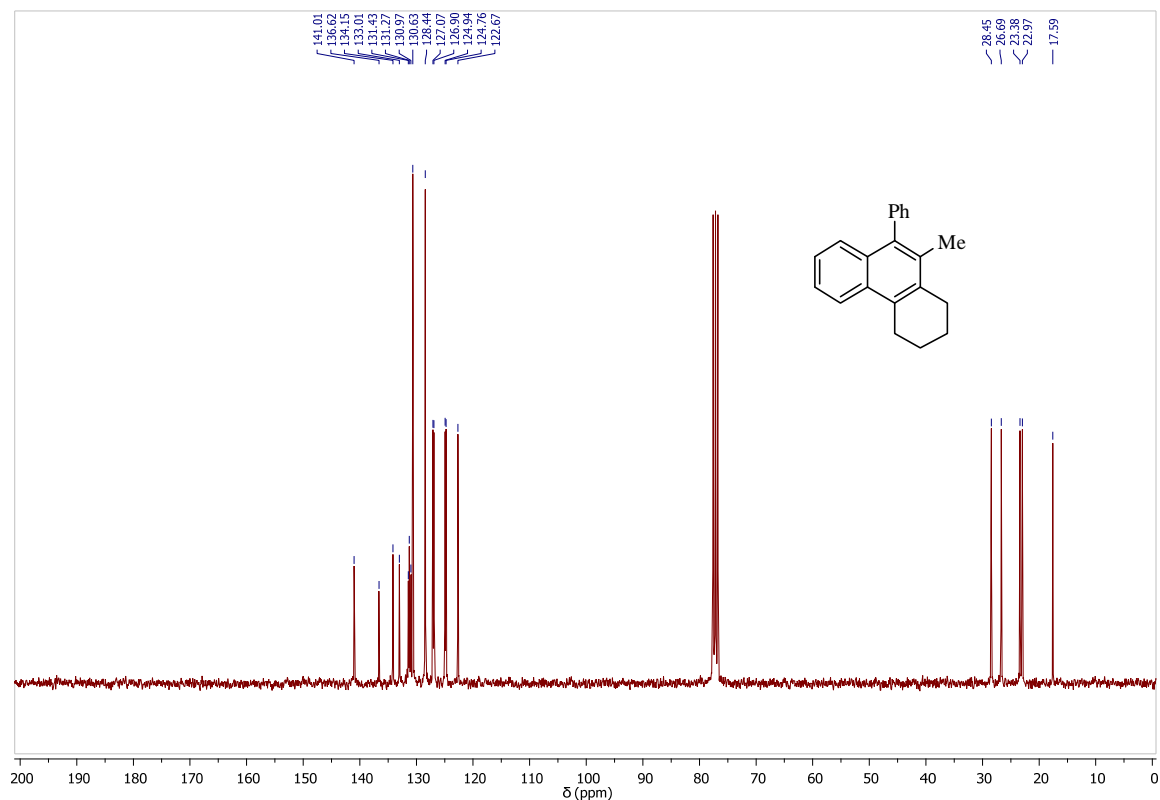
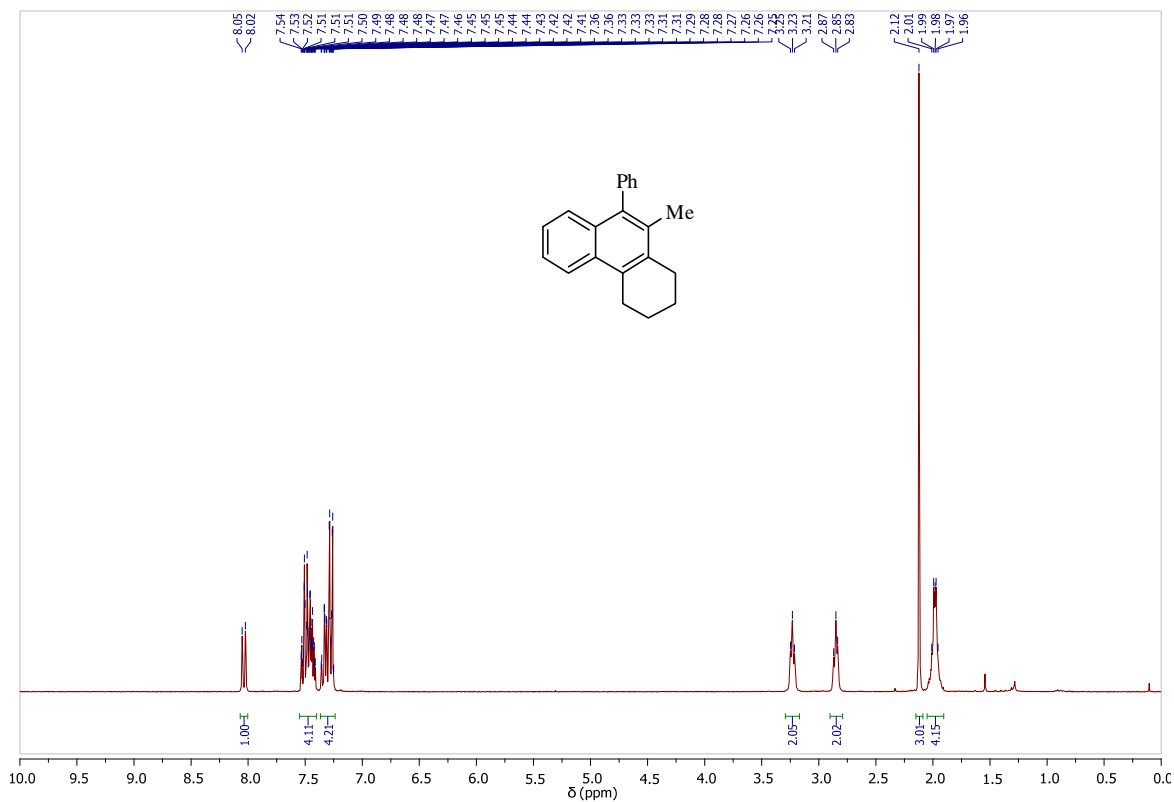
Starting Materials:

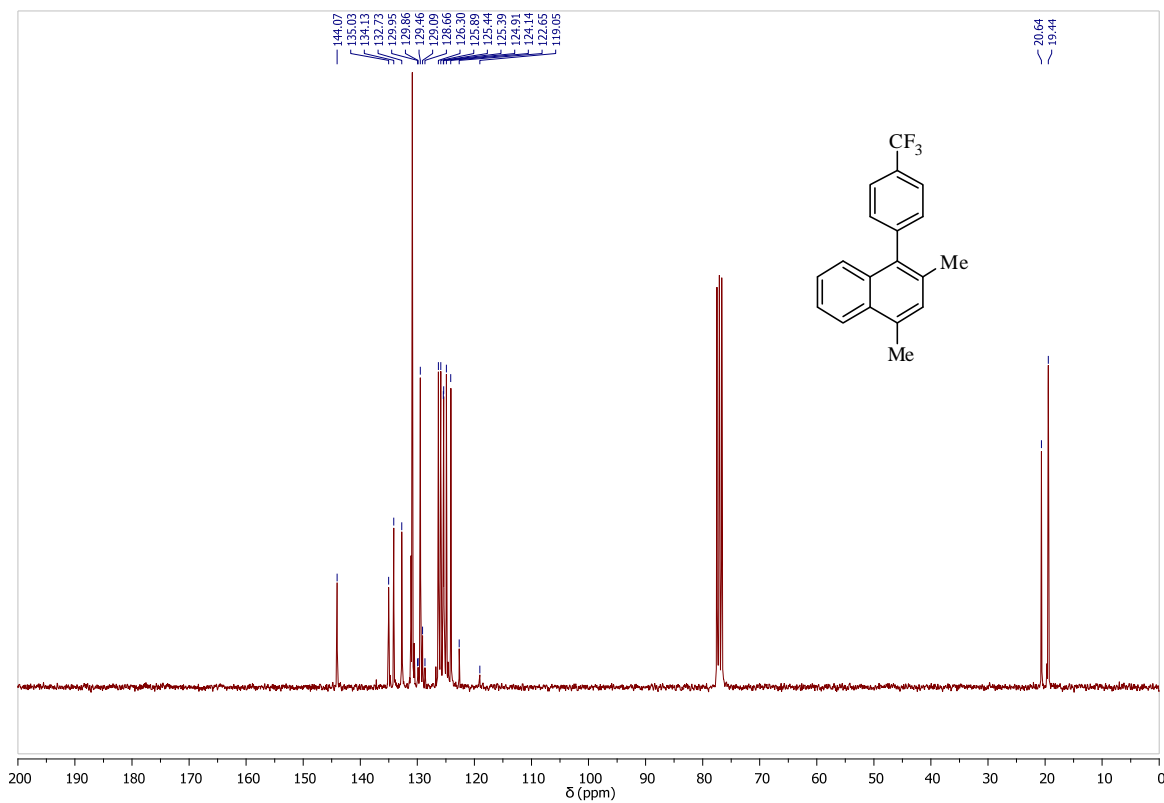
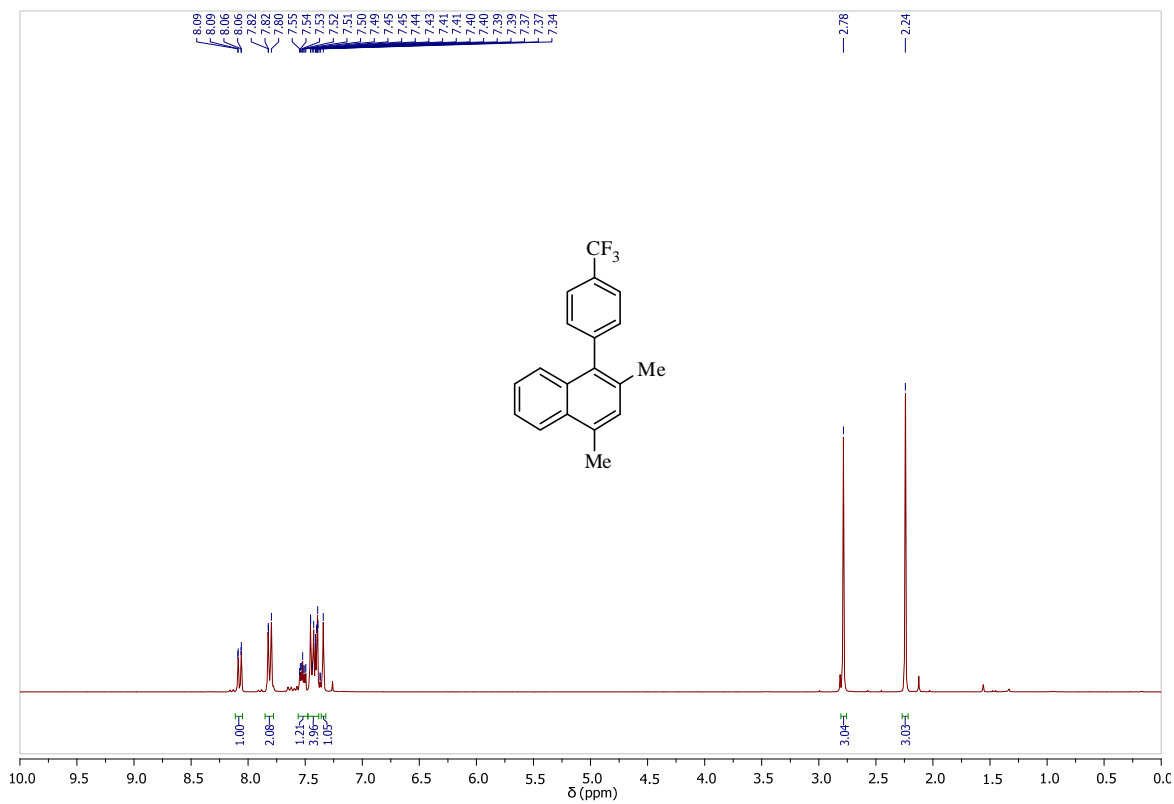
Aldehydes **1b**, **1k** and **1l** were synthesized by using a literature procedure¹ whereas aldehydes **1c-1h** were prepared by following a second literature procedure.² Their NMR analytical data matched those previously reported.²⁻⁶ Alkynes **2**, **4d-h** and **4j-k** were prepared according to literature procedures⁷ and their NMR analytical data matched those previously reported.⁸⁻¹³ Halogenated alkynes **4t-4v** were synthesized according to literature.^{14,15}

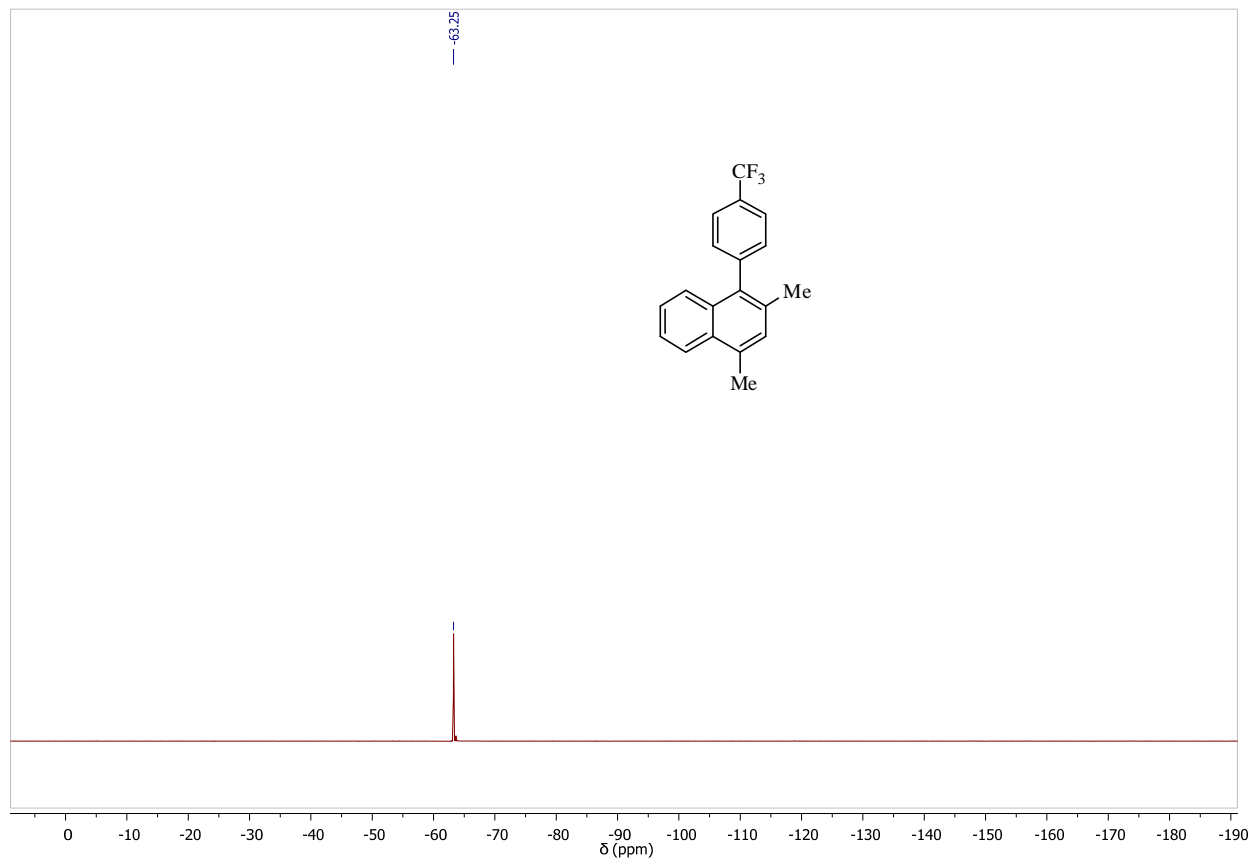
1. Kavadias, G.; Velkof, S. *Can. J. Chem.* **1978**, *56*, 730.
2. Fu, J.-Y.; Xu, X.-Y.; Li, Y.-C.; Huang, Q.-C.; Wang, Li-X. *Org. Biomol. Chem.* **2010**, *8*, 4524.
3. Baumann, T.; Vogt, H.; Bräse, S. *Eur. J. Org. Chem.* **2007**, 266.
4. Humbert, N.; Vyas, D. J.; Besnard, C.; Mazet, C. *Chem. Commun.* **2014**, *50*, 10592.
5. Vyas, D. J.; Larionov, E.; Besnard, C.; Guénée, L.; Mazet, C. *J. Am. Chem. Soc.* **2013**, *135*, 6177.
6. Theodorou, A.; Papadopoulos, G. N.; Kokotos, C. G. *Tetrahedron* **2013**, *69*, 5438.
7. Stuart, D. R.; Bertrand-Laperle, M.; Burgess, K. M. N.; Fagnou, K. *J. Am. Chem. Soc.* **2008**, *130*, 16474.
8. Tsai, W.-T.; Lin, Y.-Y.; Chen, Y.-A.; Lee, C.-F. *Synlett* **2014**, 443.
9. Quan, Y.; Xie, Z. *J. Am. Chem. Soc.* **2014**, *136*, 15513.
10. Okuno, Y.; Yamashita, M.; Nozaki, K. *Eur. J. Org. Chem.* **2011**, 3951.
11. Ikemoto, H.; Yoshino, T.; Sakata, K.; Matsunaga, S.; Kanai, M. *J. Am. Chem. Soc.* **2014**, *136*, 5424.
12. Pschirer, N. G.; Bunz, U. H. F. *Tetrahedron Lett.* **1999**, *40*, 2481.
13. Tai, C.-C.; Yu, M.-S.; Chen, Y.-L.; Chuang, W.-H.; Lin, T.-H.; Yap, G. P. A.; Ong, T.-G. *Chem. Commun.* **2014**, *50*, 4344.
14. Feng, Y. S.; Xu, Z. Q.; Mao, L.; Zhang, F. F.; Xu, H. J. *Org. Lett.* **2013**, *15*, 1472.
15. Russo, M. V.; Lo Sterzo, C.; Franceschini, P.; Biagini, G.; Furlani, A. *J. Organomet. Chem.* **2001**, *619*, 49.

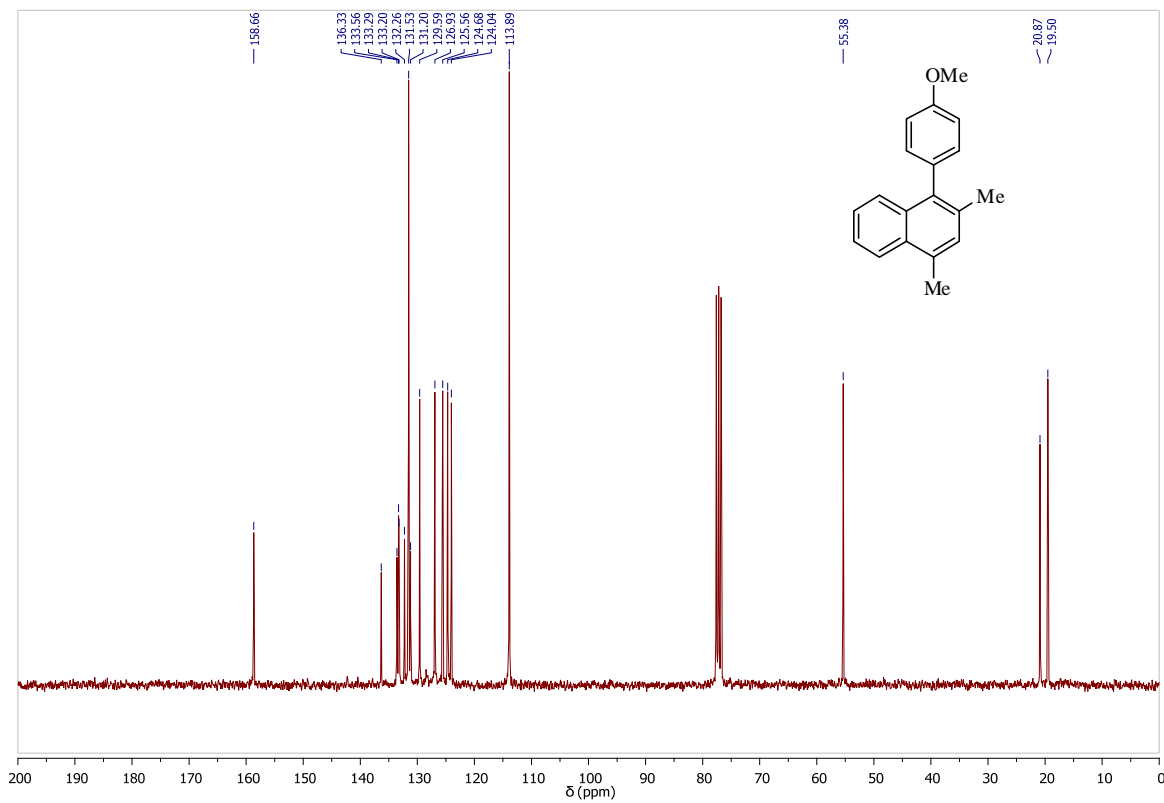
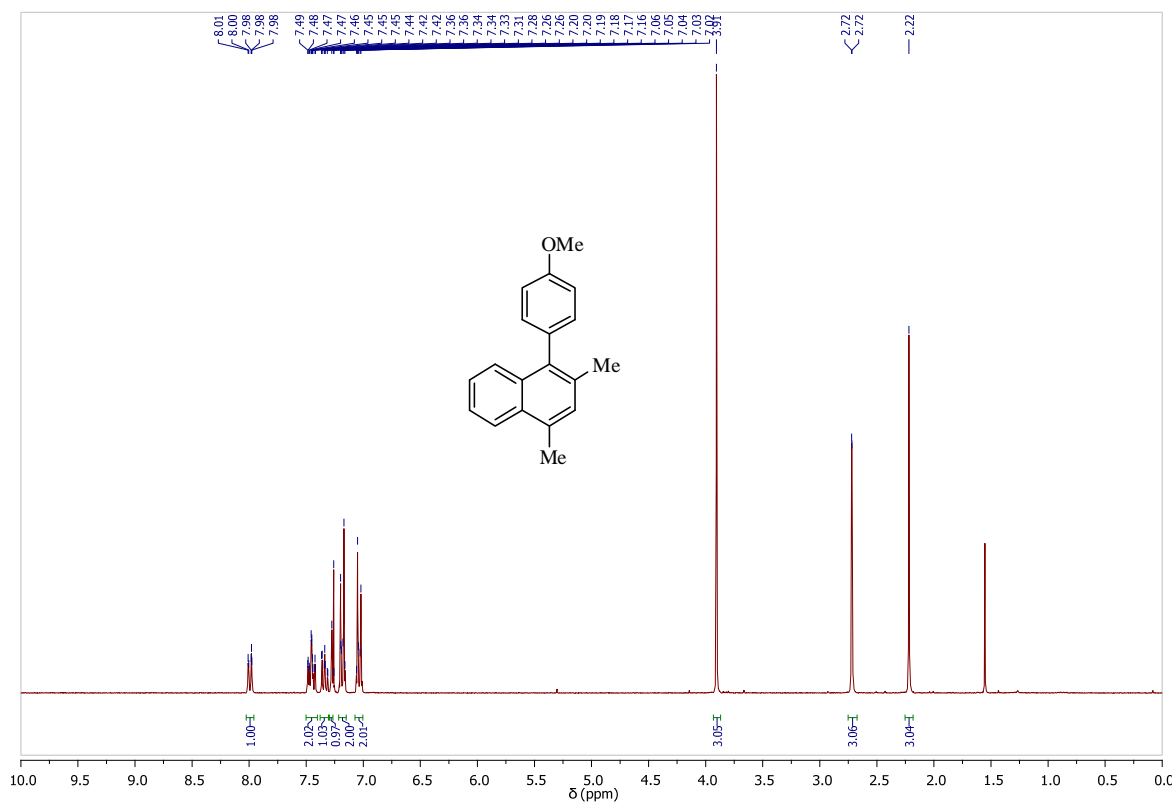
6,8-dimethoxy-2,4-dimethyl-1-phenylnaphthalene (3d):

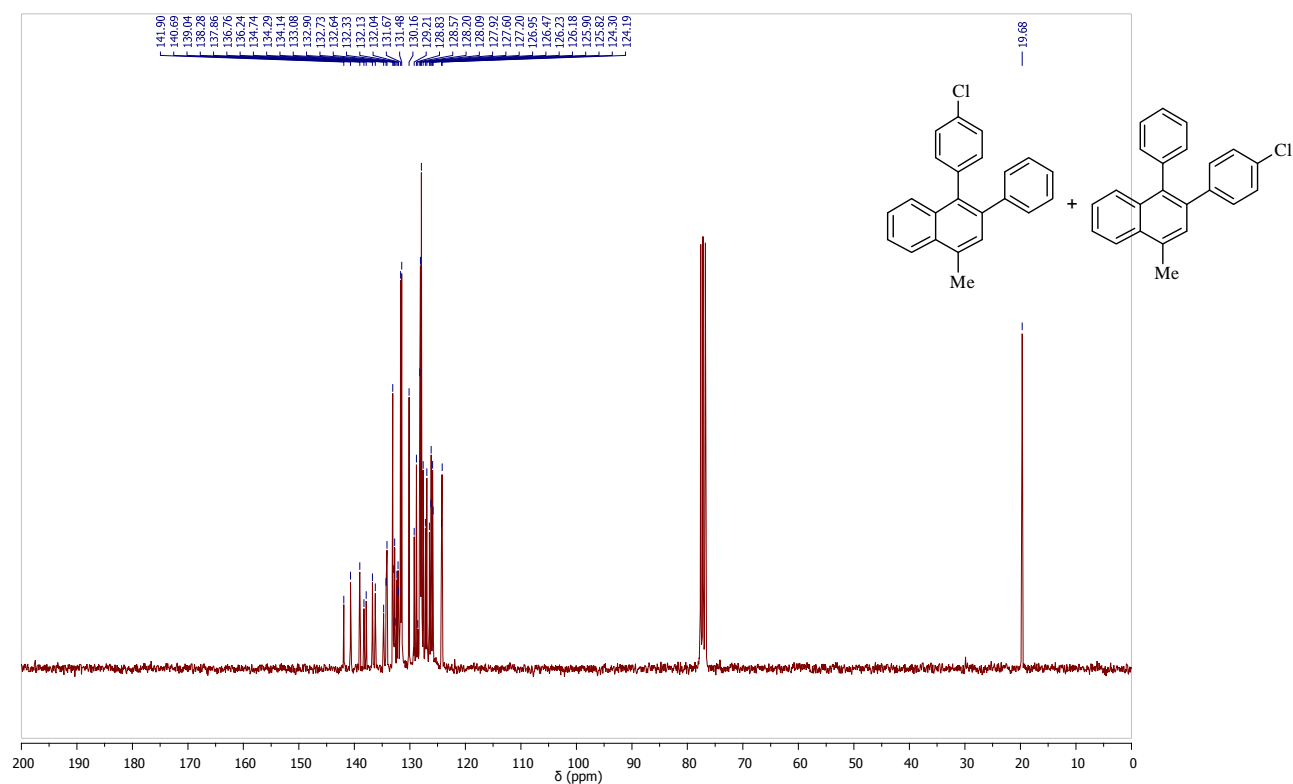
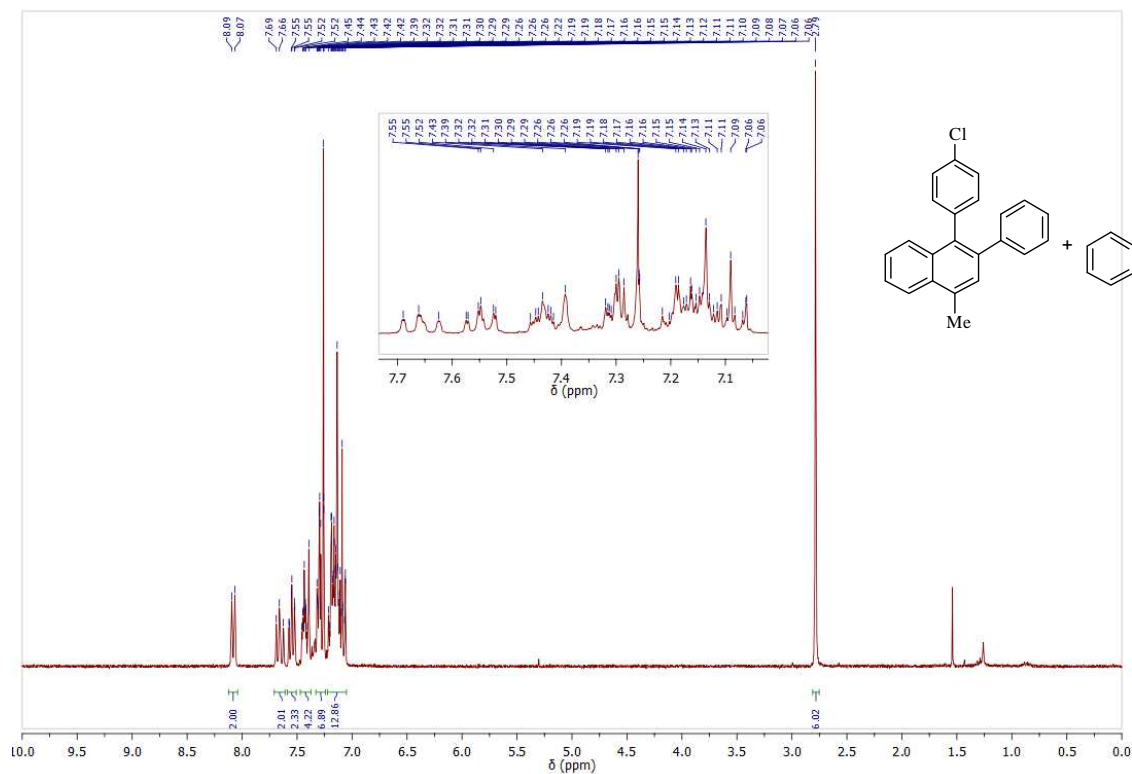
6-bromo-2,4-dimethyl-1-phenylnaphthalene (3g) and 8-bromo-2,4-dimethyl-1-phenylnaphthalene (3g'):

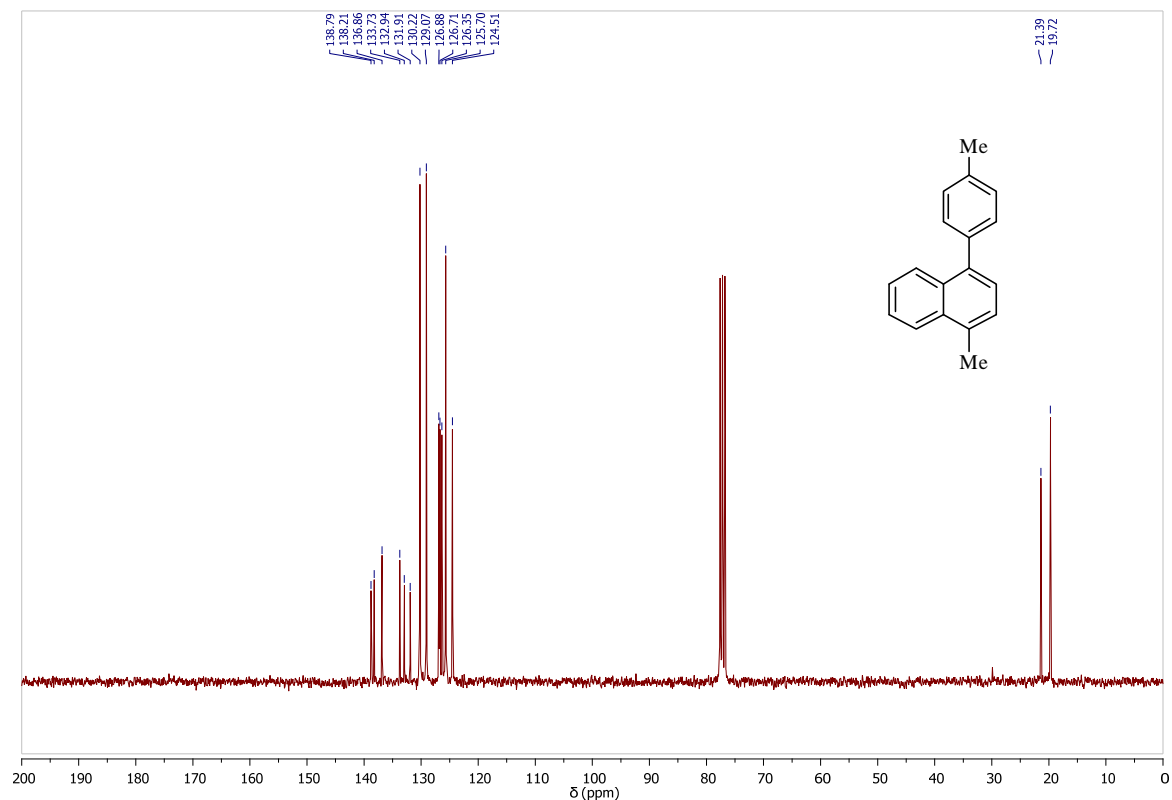
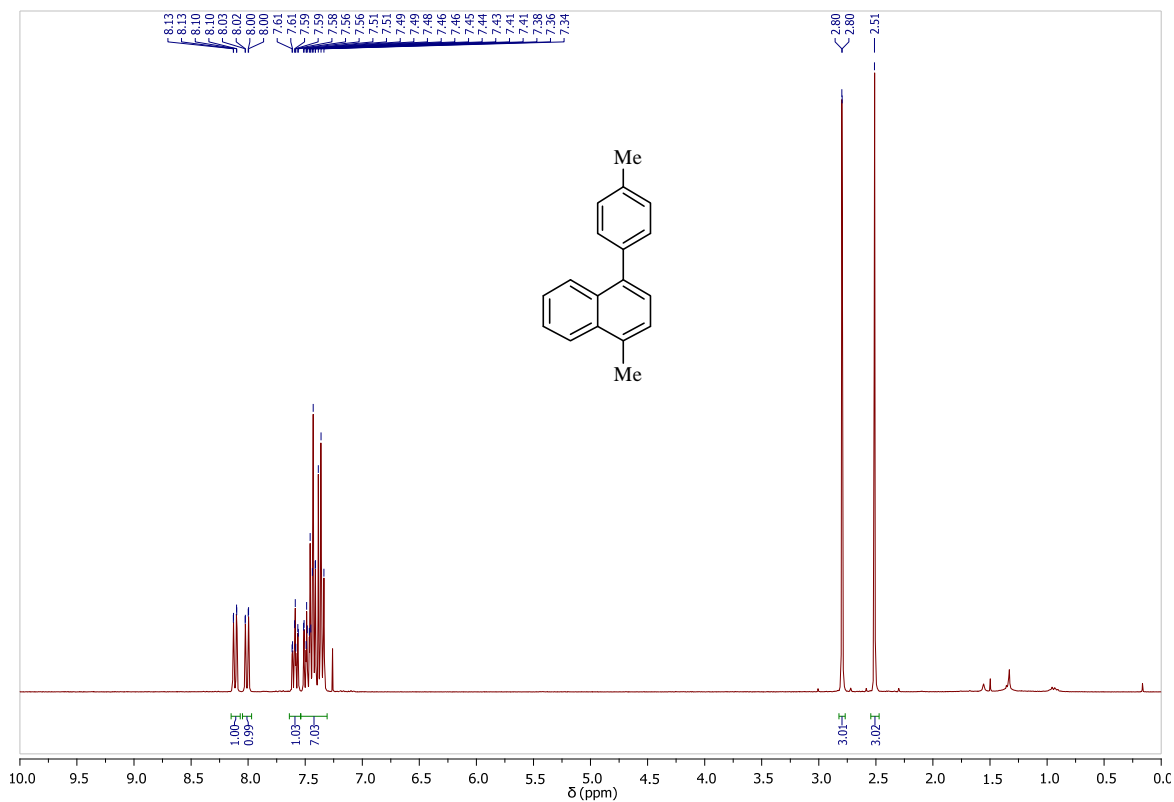
10-methyl-9-phenyl-1,2,3,4-tetrahydrophenanthrene (3o):

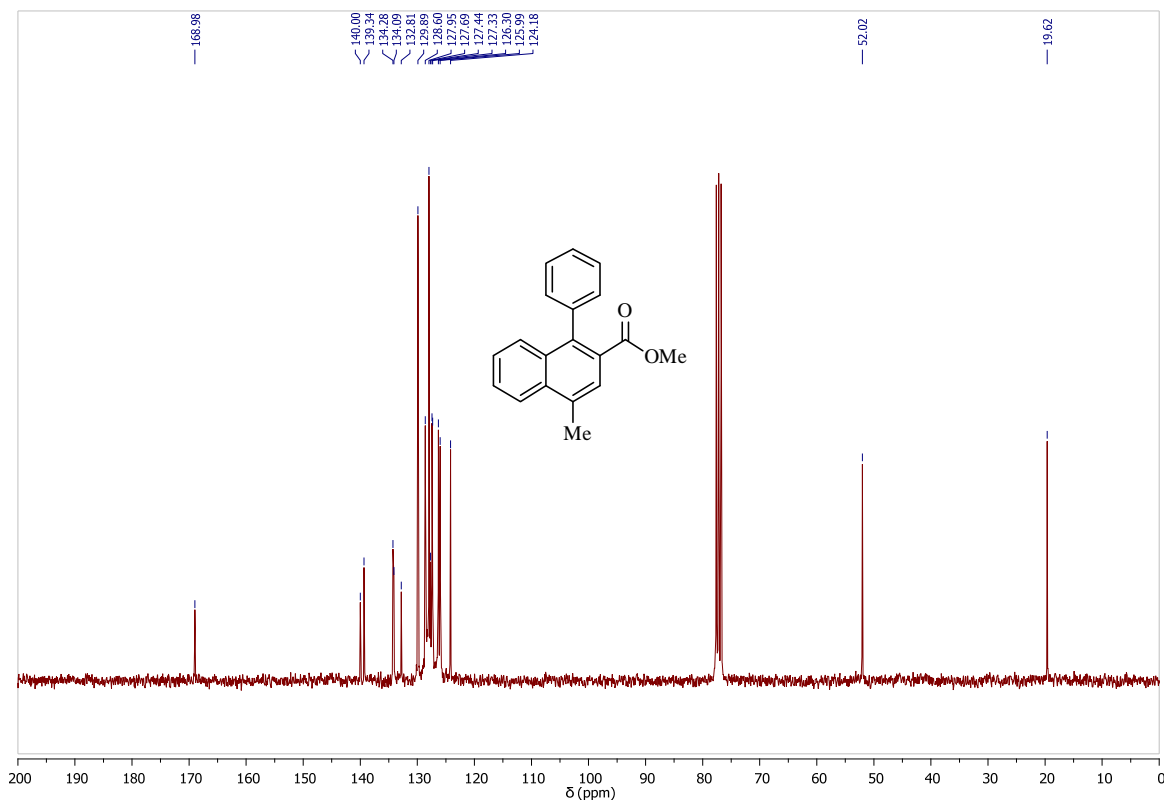
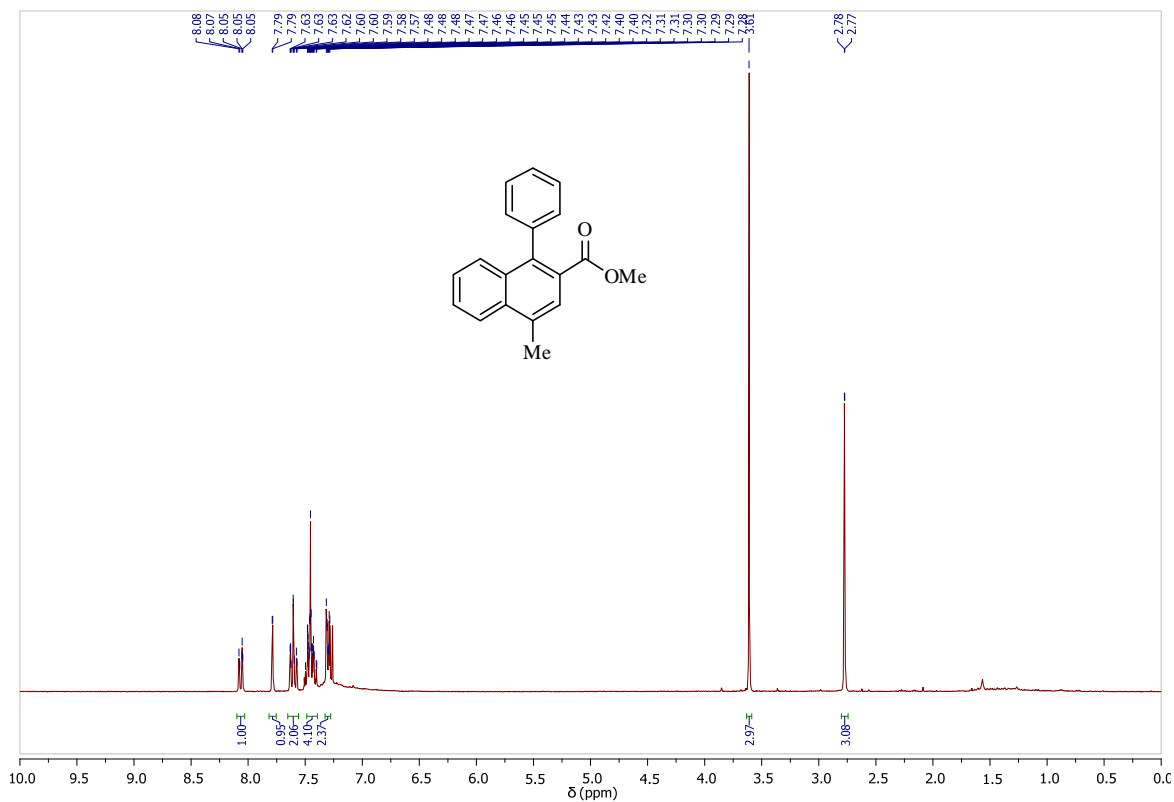
2,4-dimethyl-1-(4-(trifluoromethyl)phenyl)-naphthalene (5g):

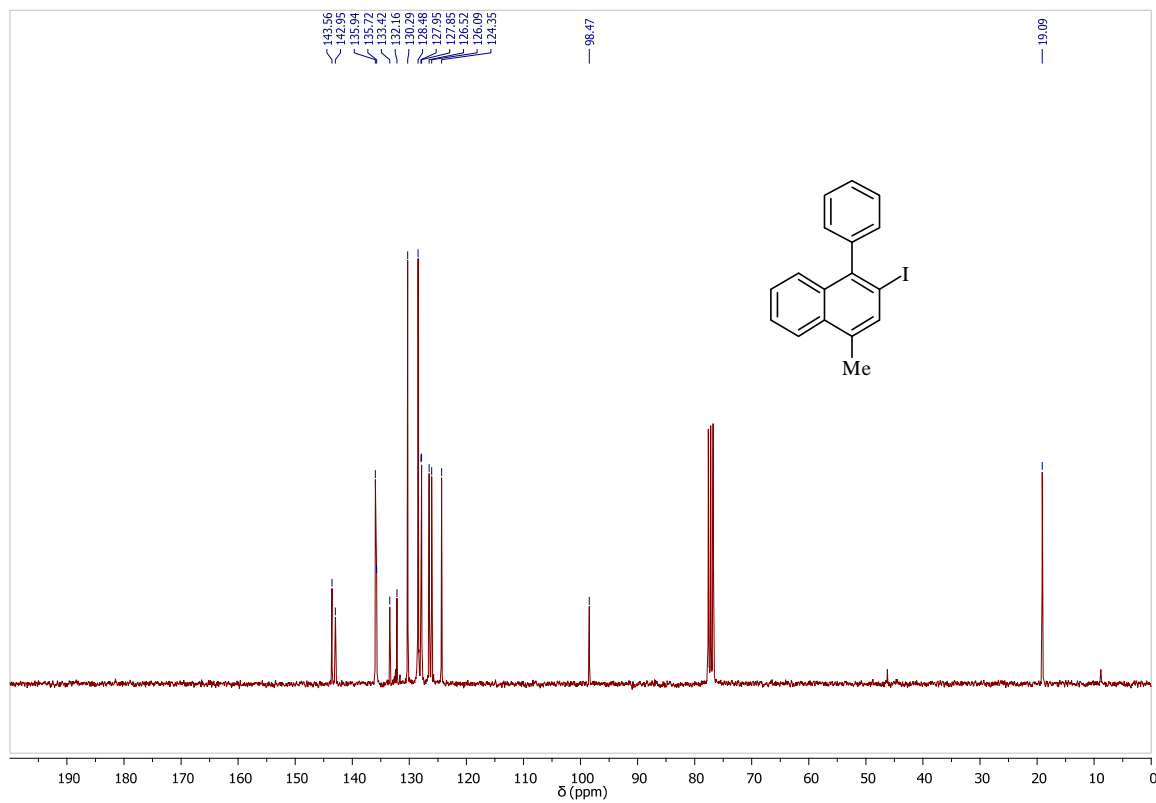
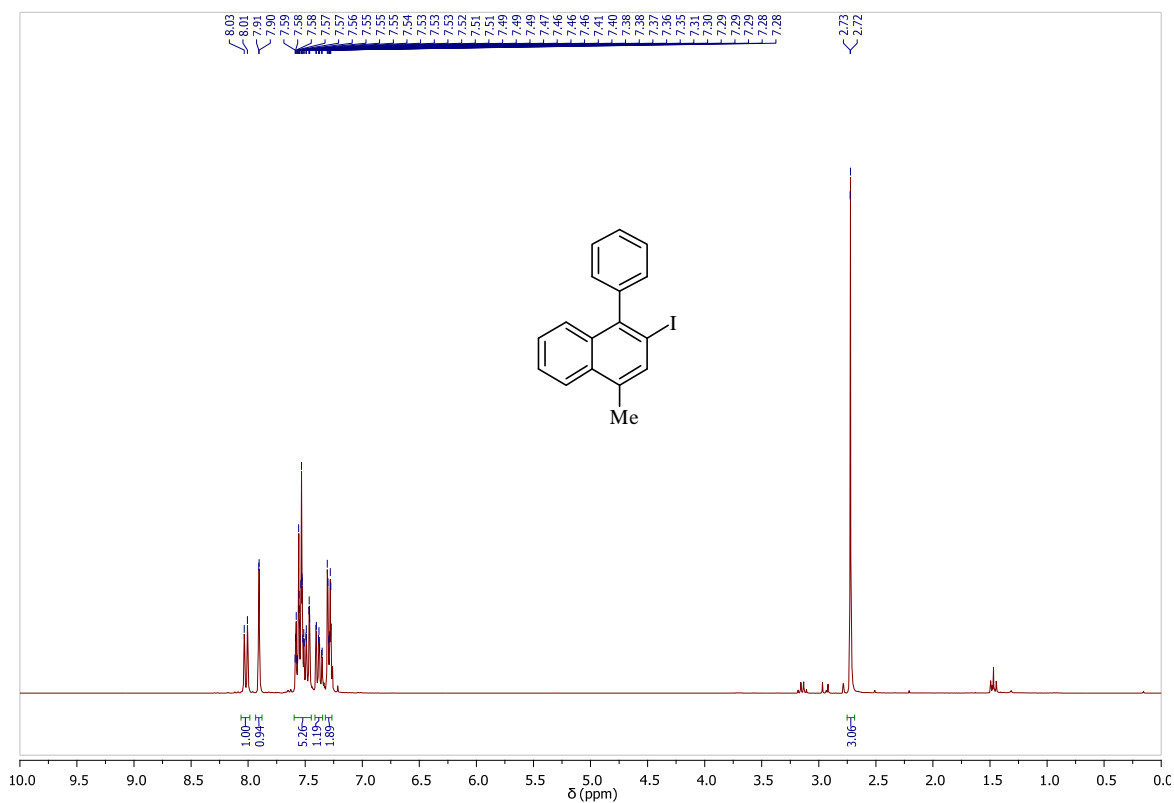


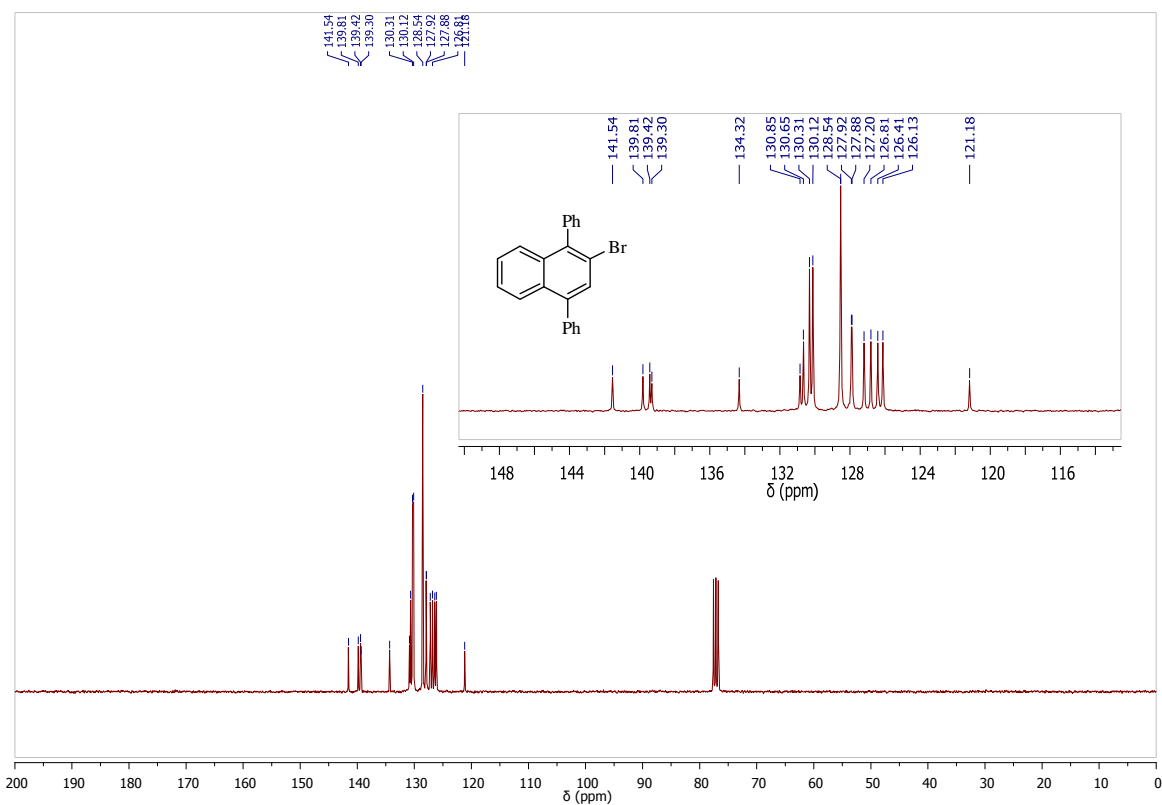
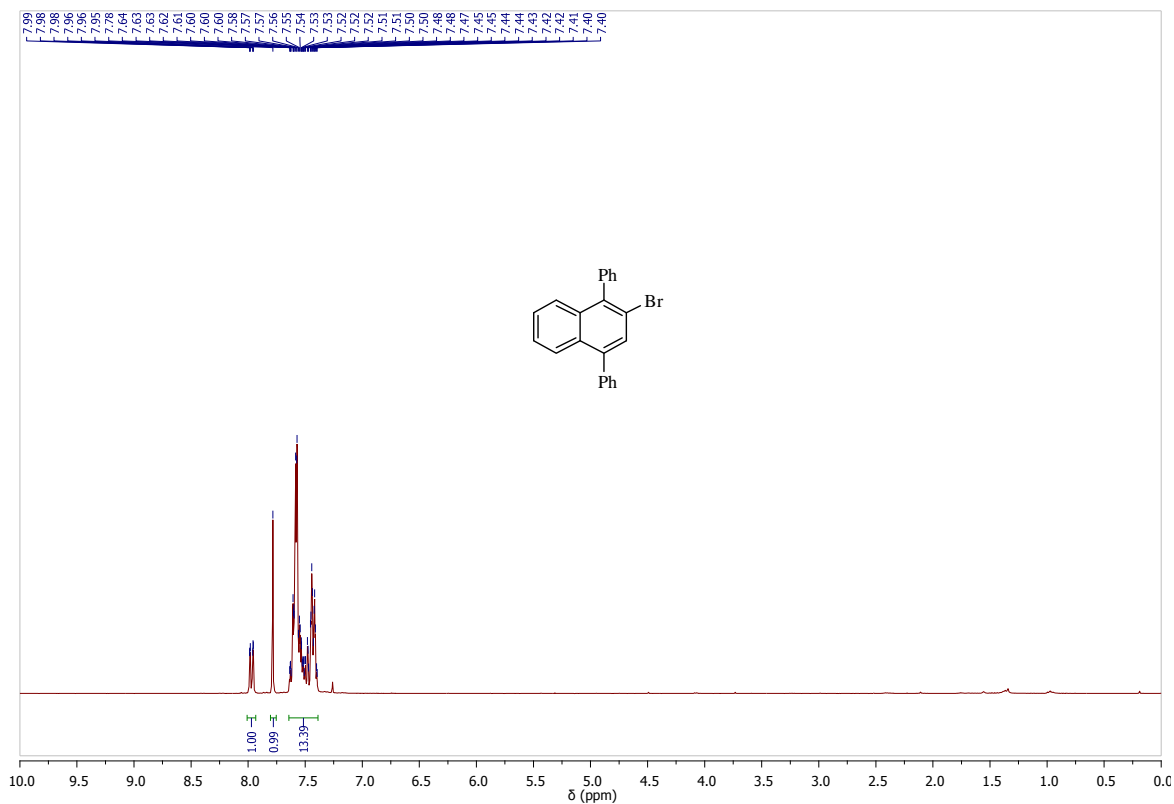
1-(4-methoxyphenyl)-2,4-dimethylnaphthalene (5h)

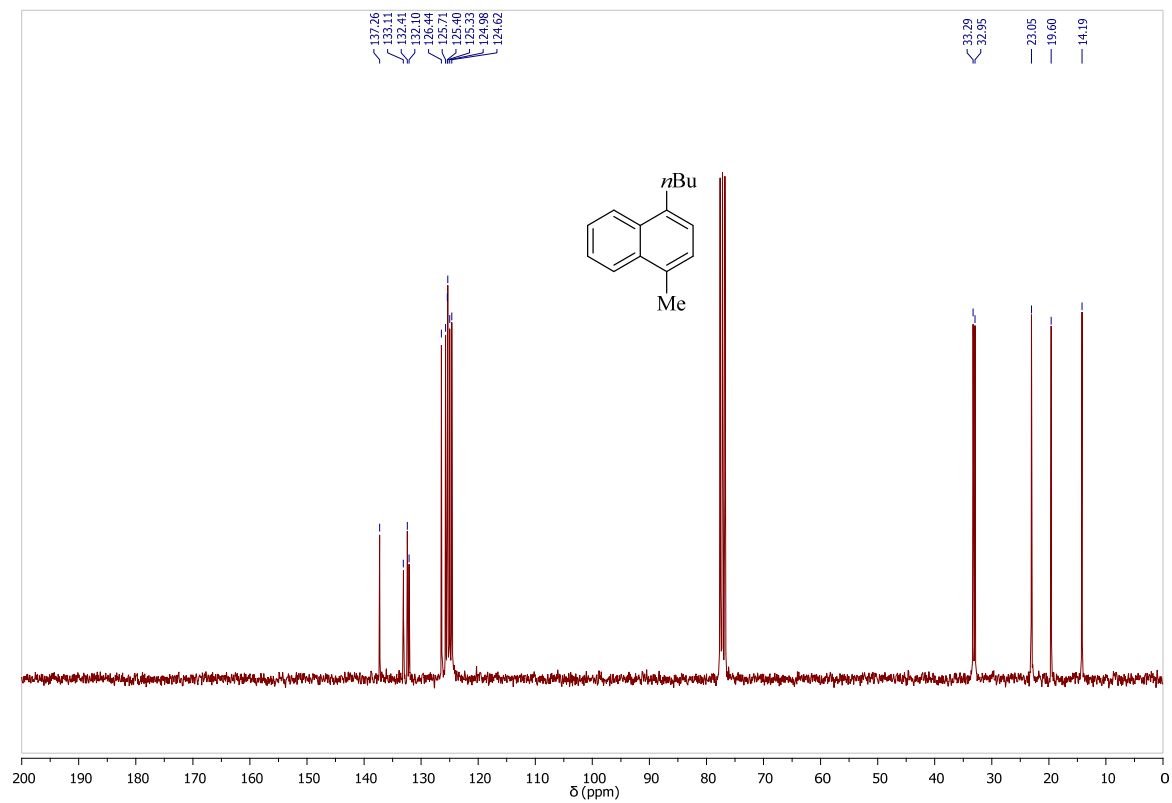
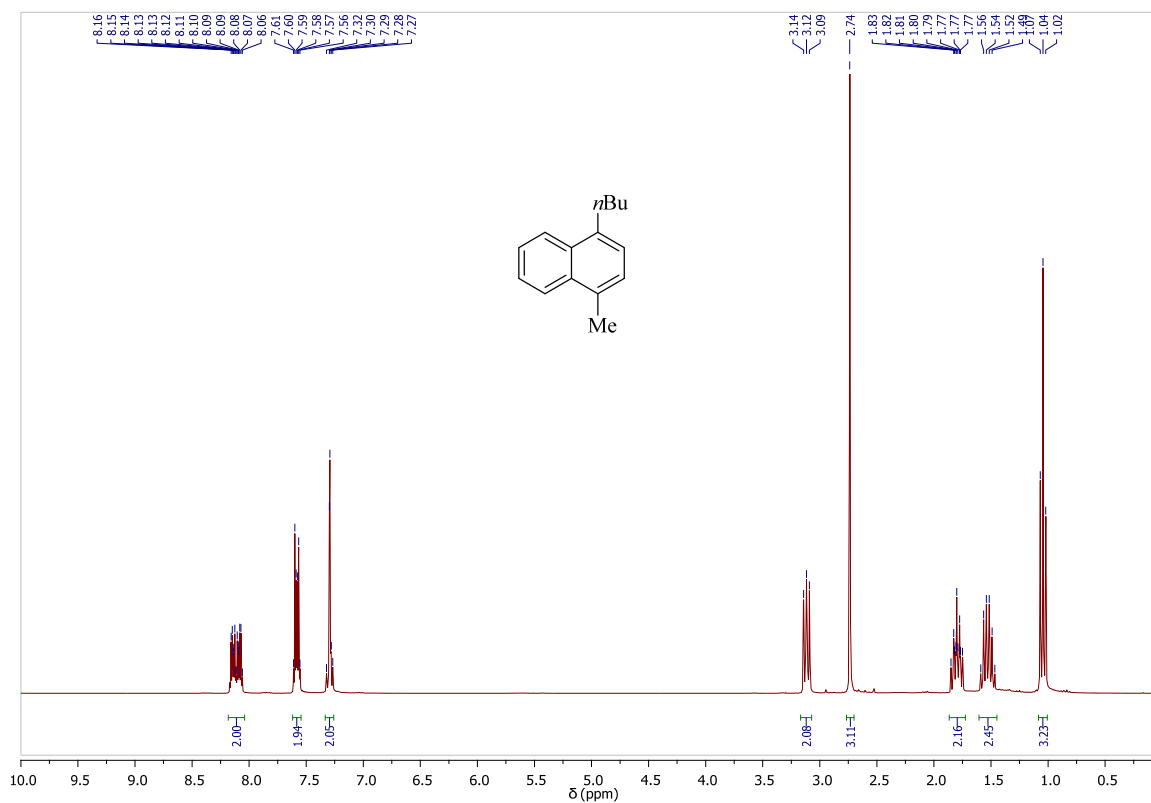
1-(4-chlorophenyl)-4-methyl-2-phenylnaphthalene (5k) and 2-(4-chlorophenyl)-4-methyl-1-phenylnaphthalene (5k')

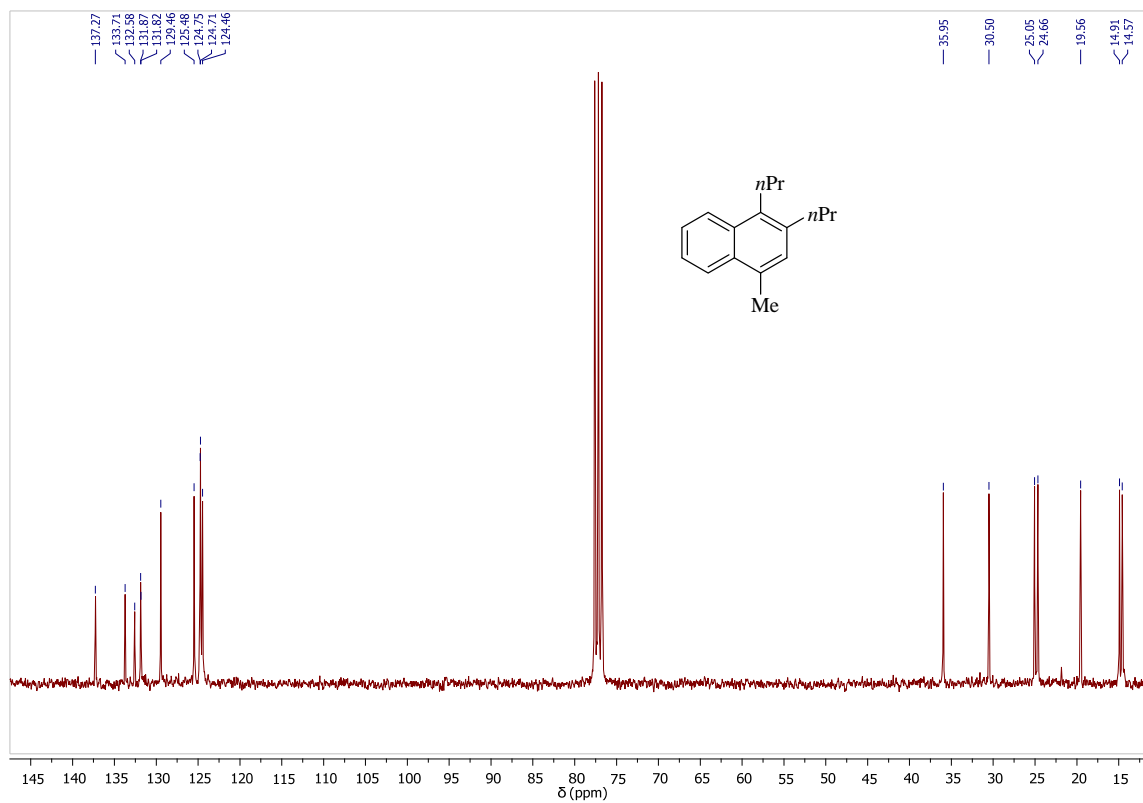
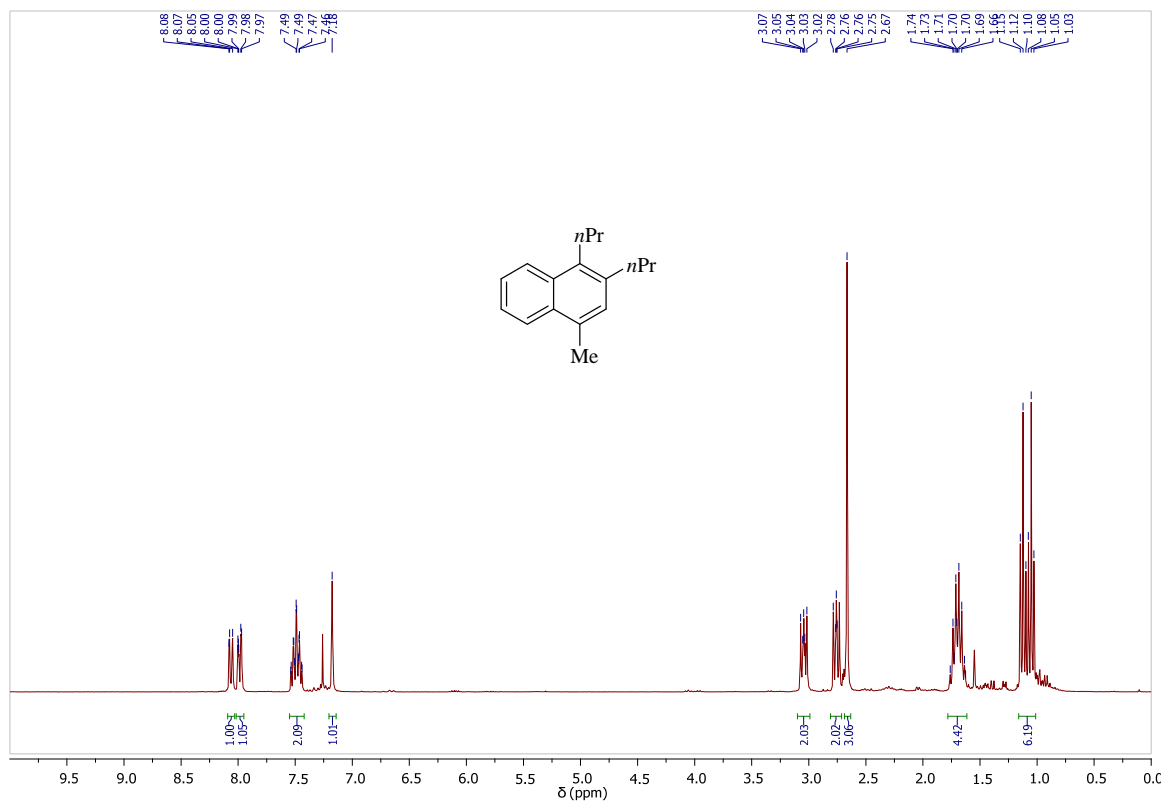
1-methyl-4-p-tolynaphthalene (5p):

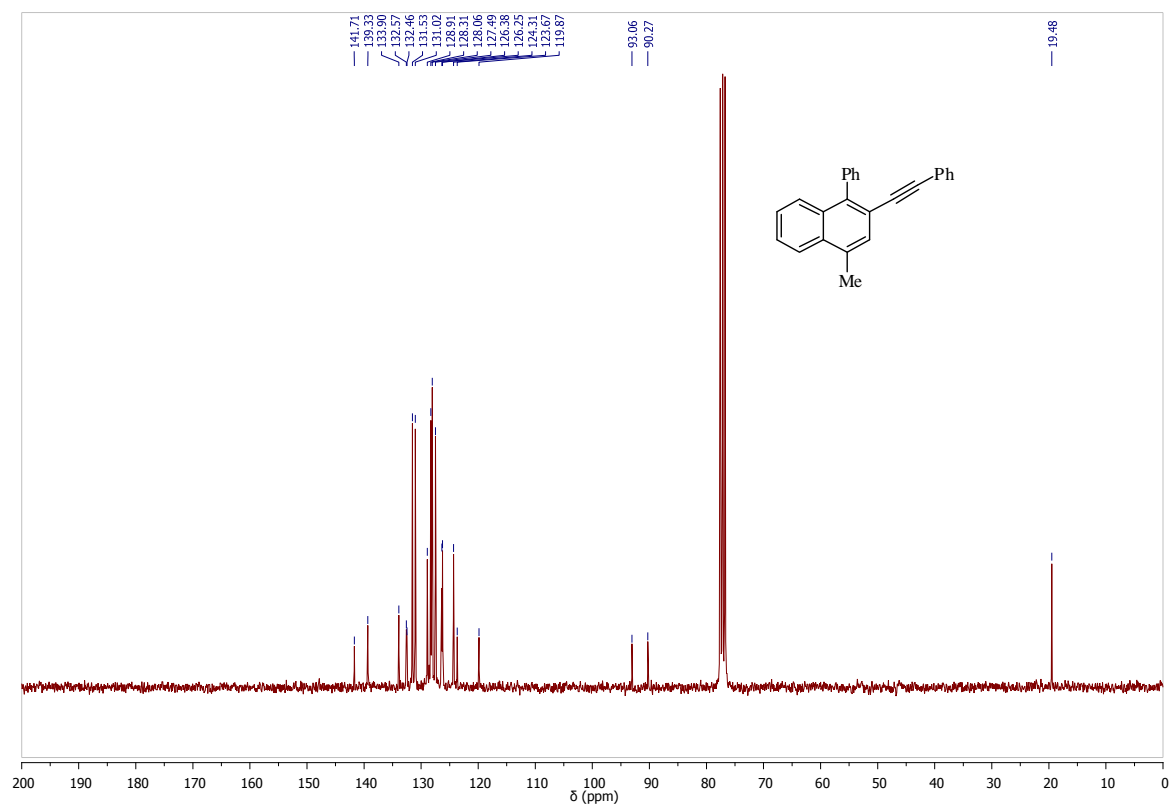
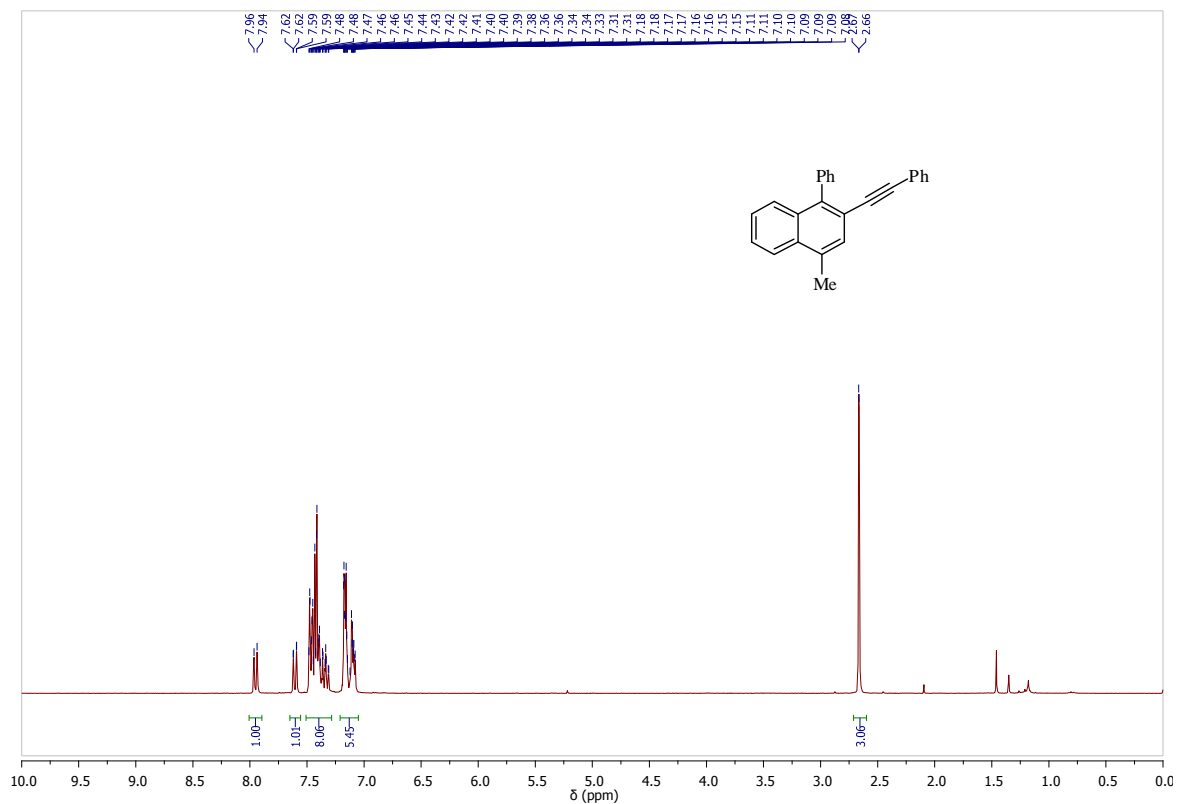
2-carbomethoxy-4-methyl-1-phenylnaphthalene (5s):

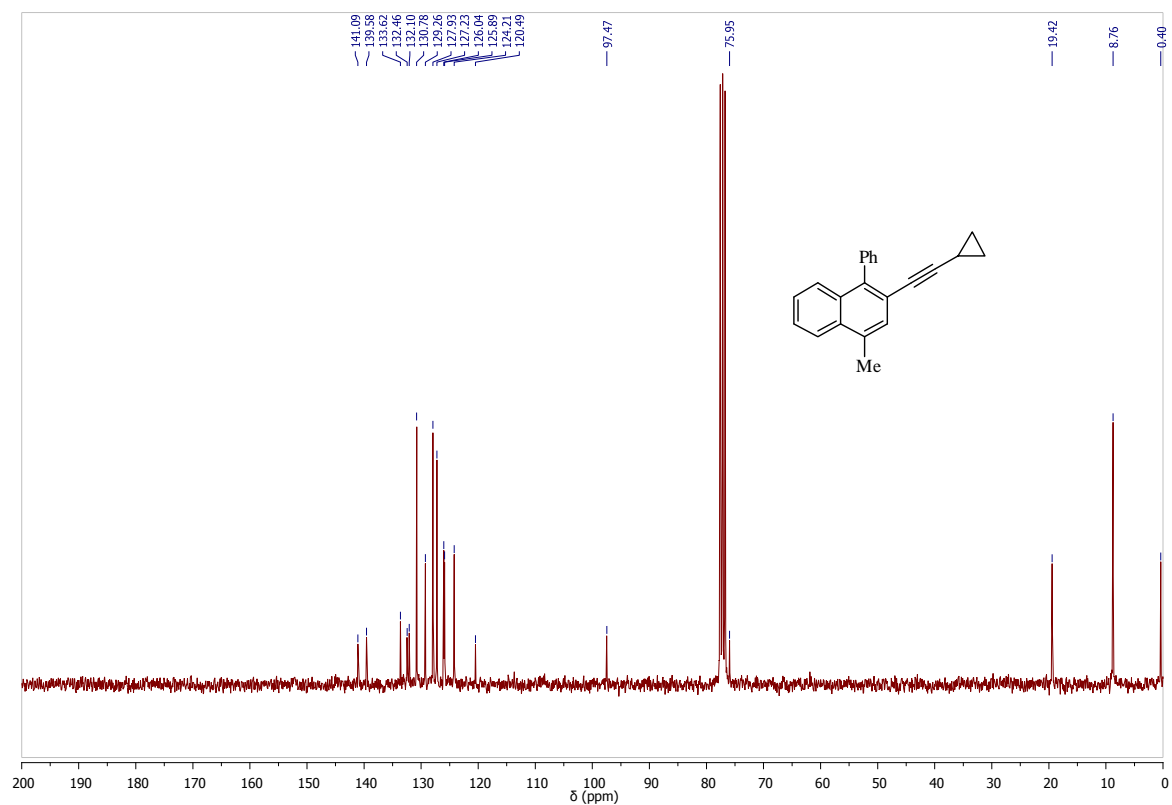
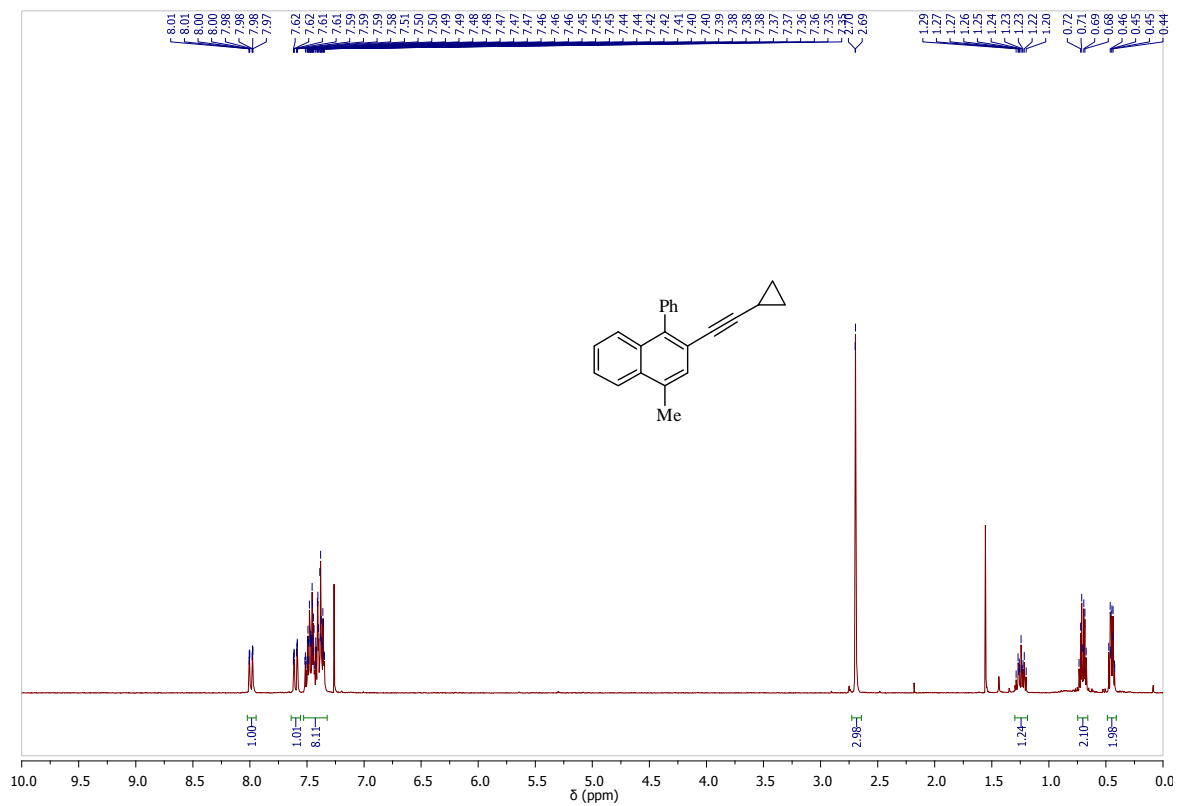
2-iodo-4-methyl-1-phenylnaphthalene (5v):

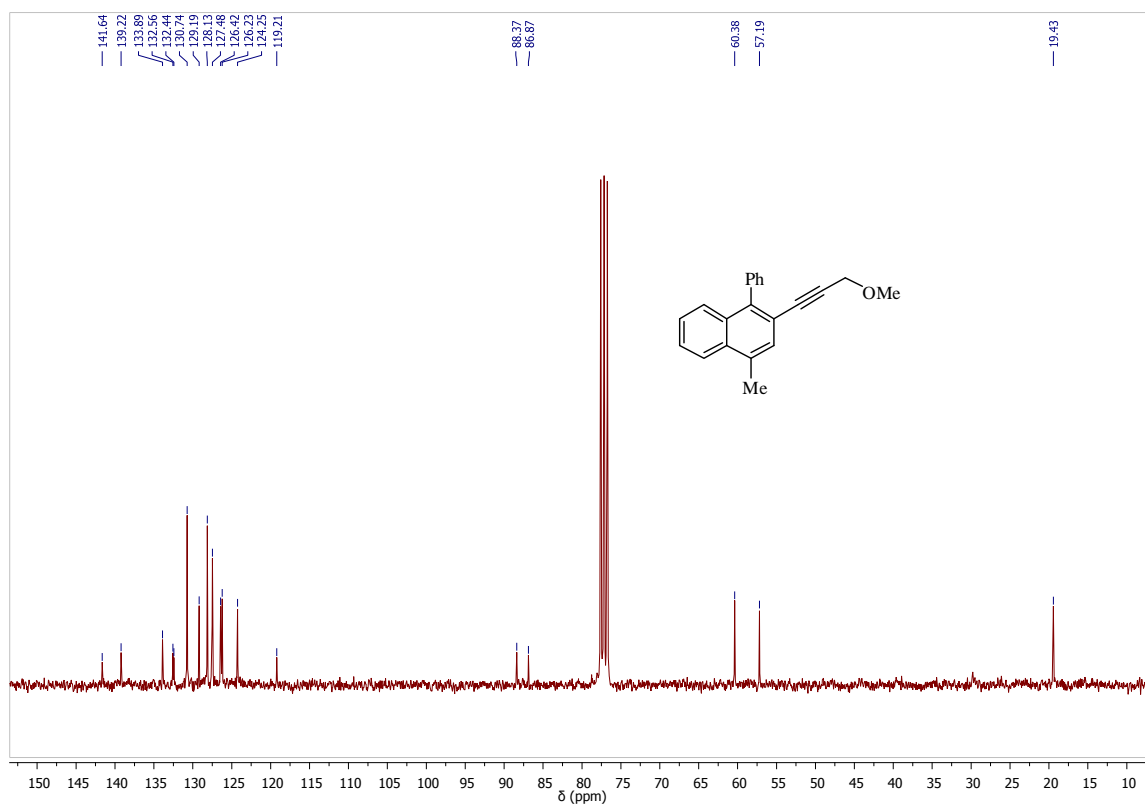
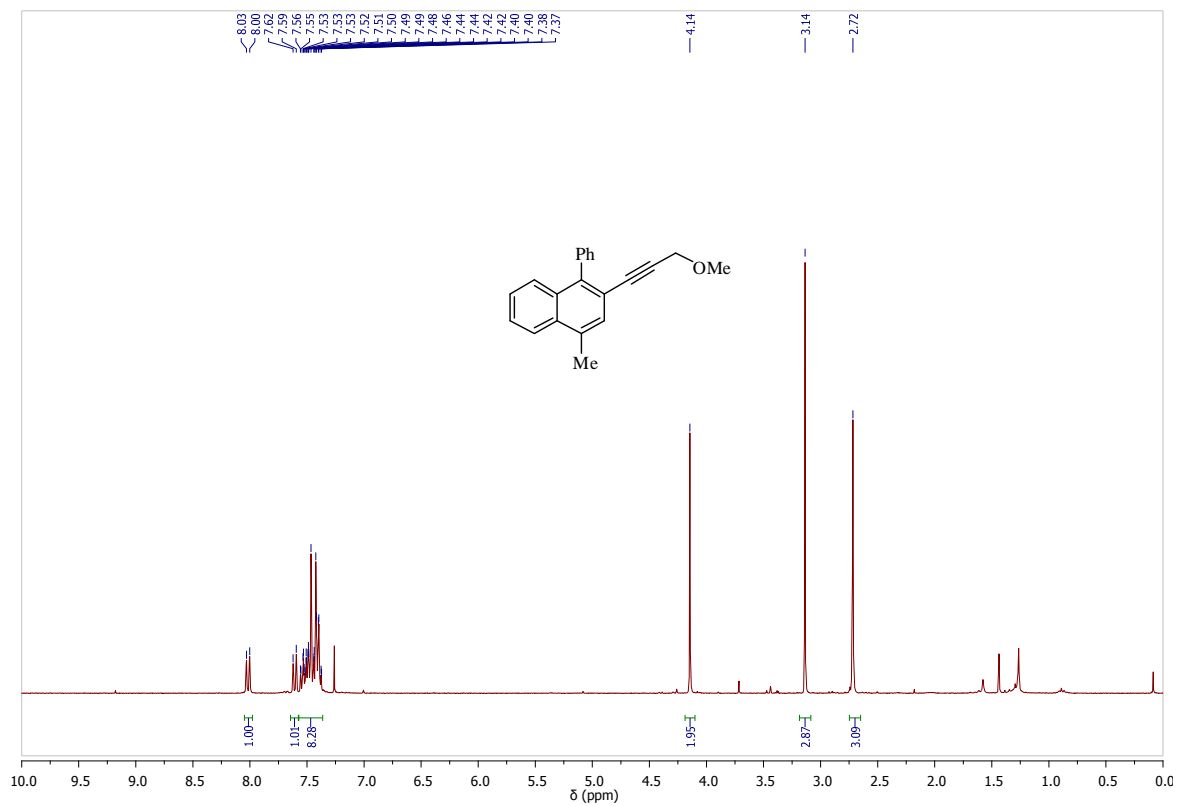
2-bromo-1,4-diphenylnaphthalene (6):

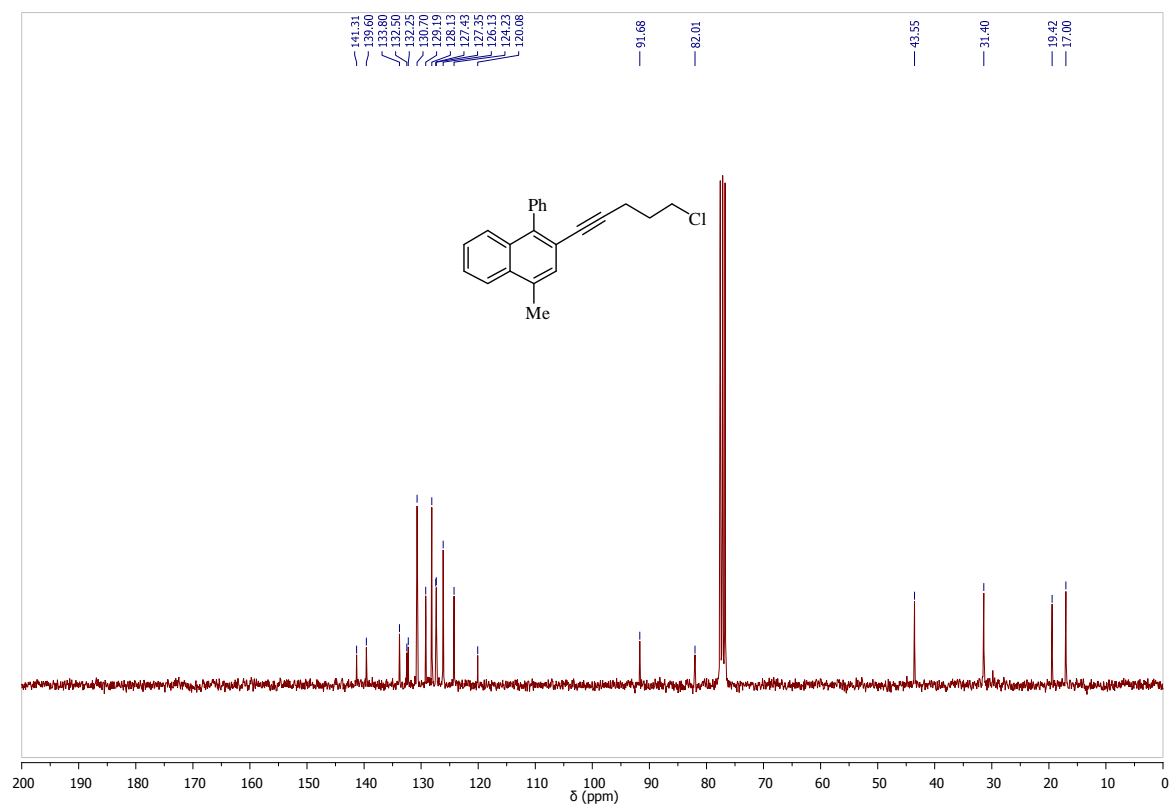
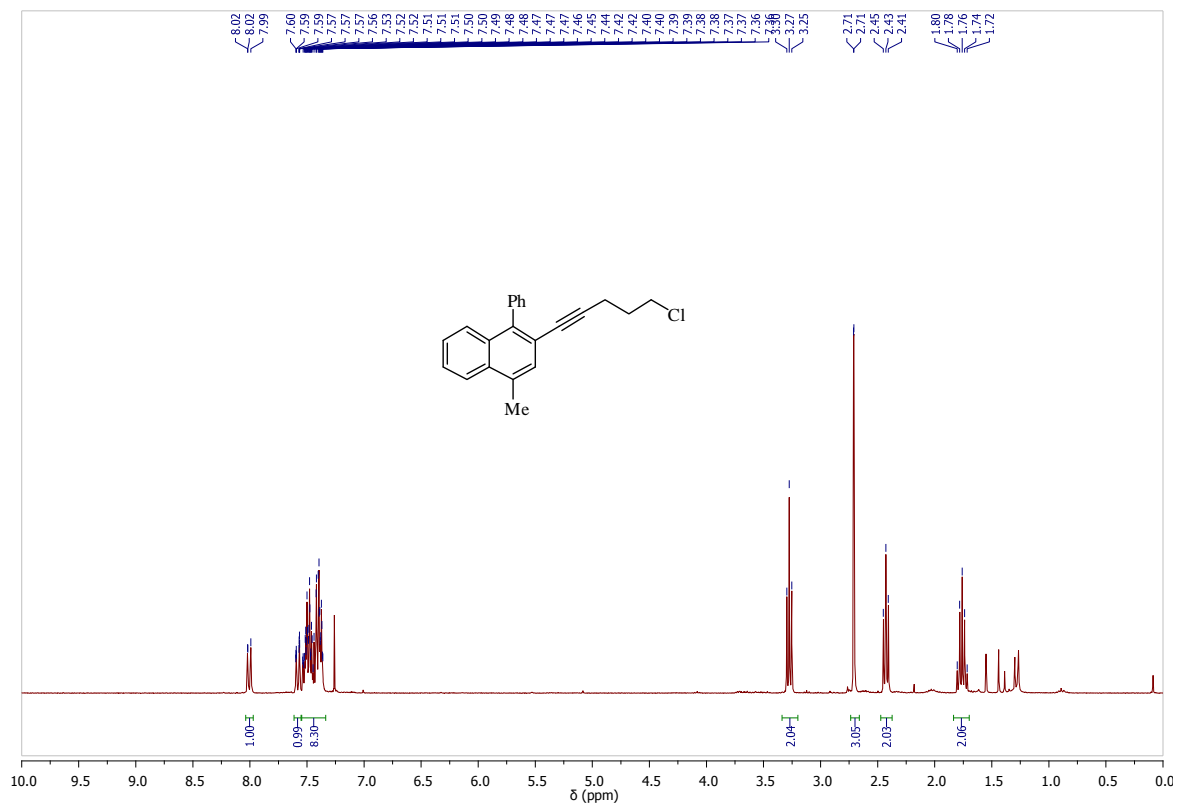
1-butyl-4-methylnaphthalene (5w):

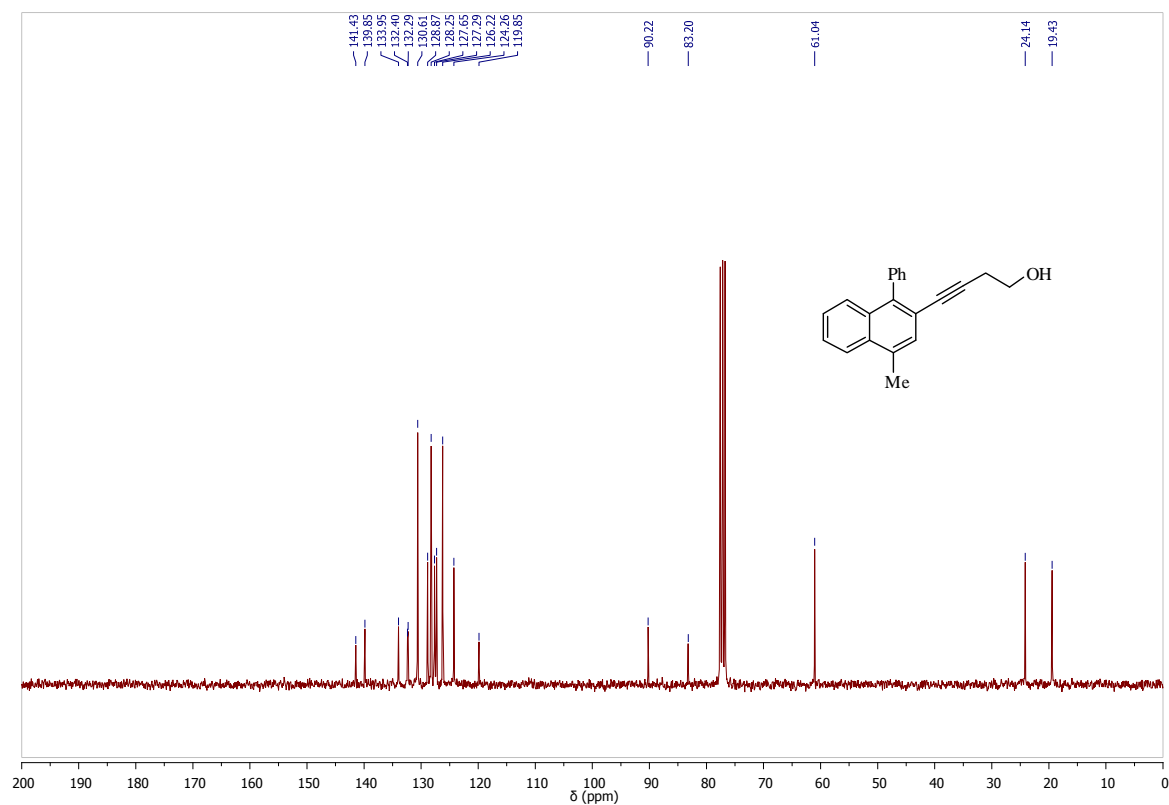
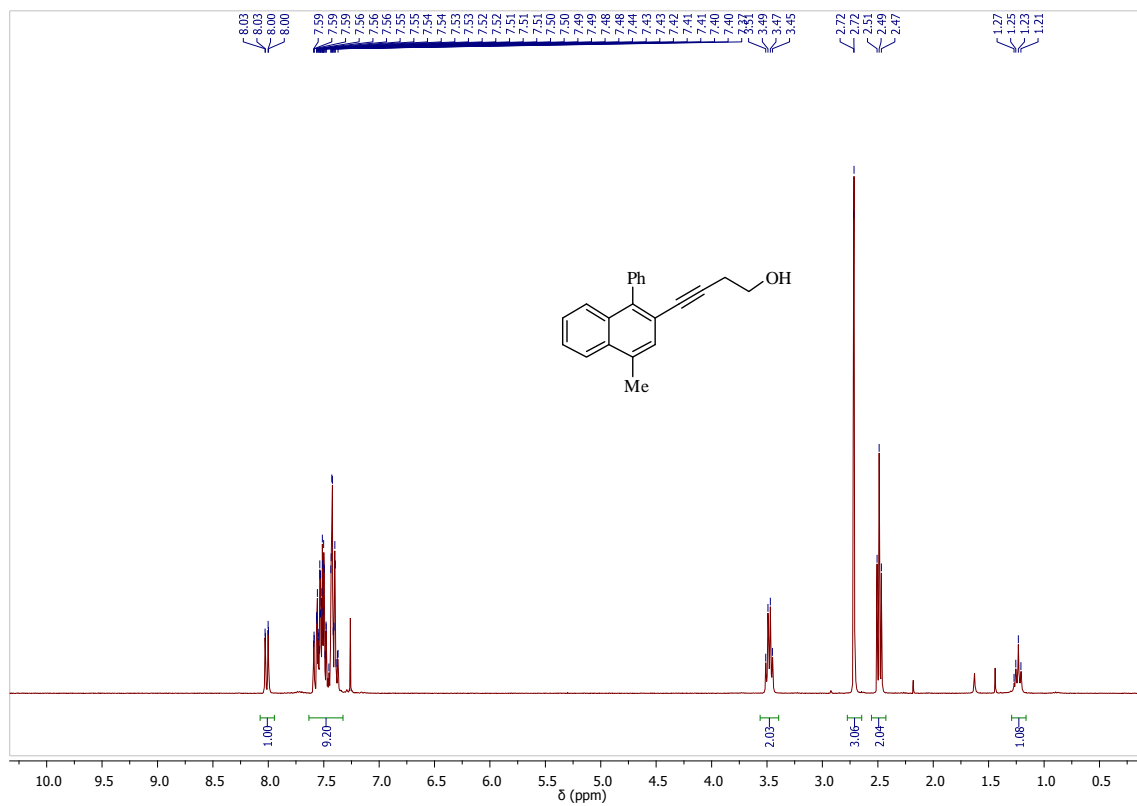
4-methyl-1,2-di(*n*-propyl)-naphthalene (5x):

4-methyl-1-phenyl-2-(phenylethynyl)naphthalene (9a):

2-(cyclopropylethynyl)-4-methyl-1-phenylnaphthalene (9b):

2-(3-methoxyprop-1-ynyl)-4-methyl-1-phenylnaphthalene (9c):

2-(5-chloropent-1-ynyl)-4-methyl-1-phenylnaphthalene (9d):

4-(4-methyl-1-phenylnaphthalen-2-yl)-but-3-yn-1-ol (9e):

4-methyl-1-phenyl-2-(4-(trifluoromethyl)phenyl)-naphthalene (10):