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Supporting Information

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for

Gold- and Silver-Catalyzed Tandem Amination/Ring Expansion of Cyclopropylmethanols with Sulfonamides as an Expedient Route to Pyrrolidines

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Figure S1. ^{1}H and ^{13}C NMR Spectra of 2-Phenyl-1-tosylpyrrolidine **3a**[S1]-[S3]

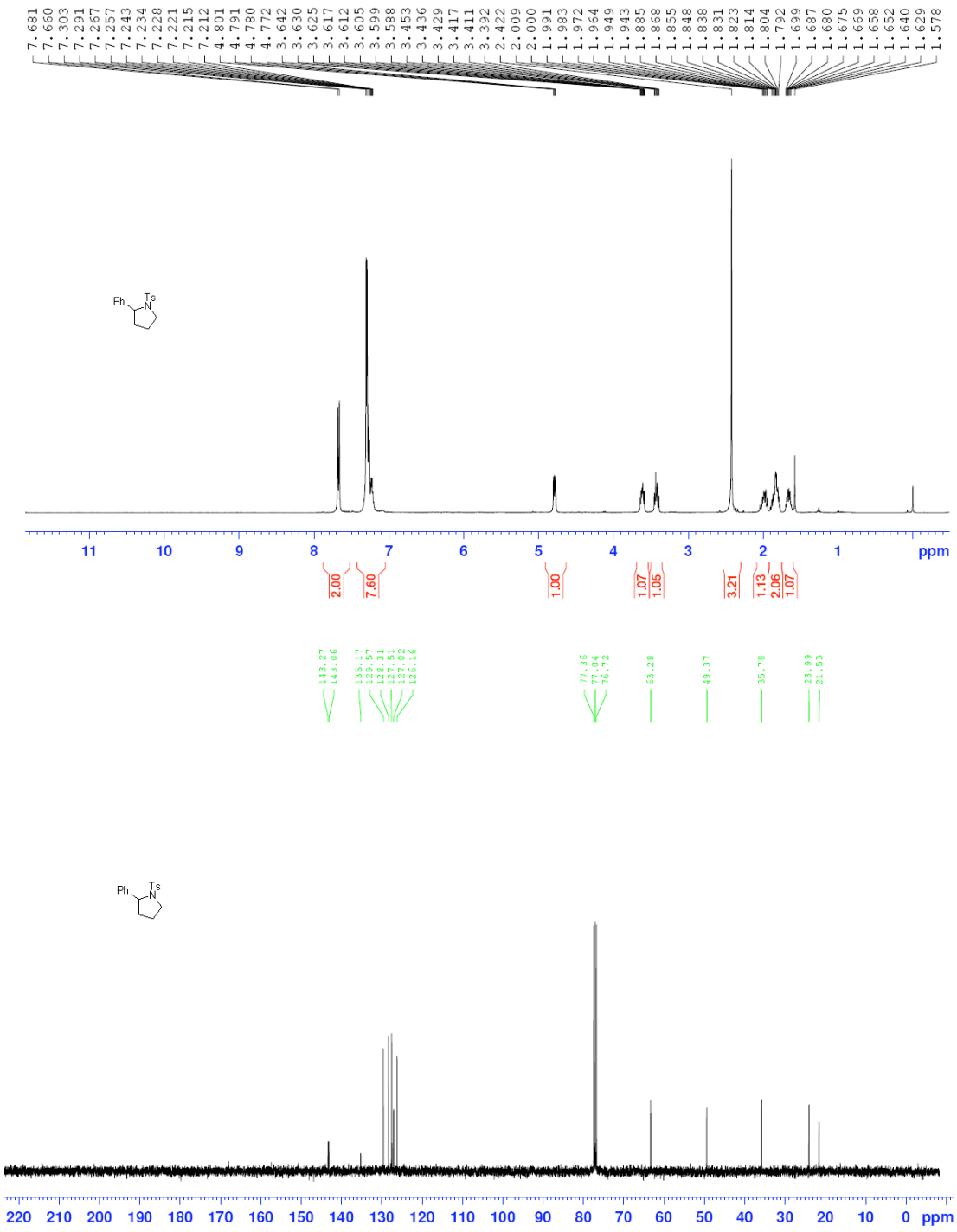


Figure S2. ^{1}H and ^{13}C NMR Spectra of 2-(4-Methylphenyl)-1-tosylpyrrolidine **3b**[S1]-[S3]

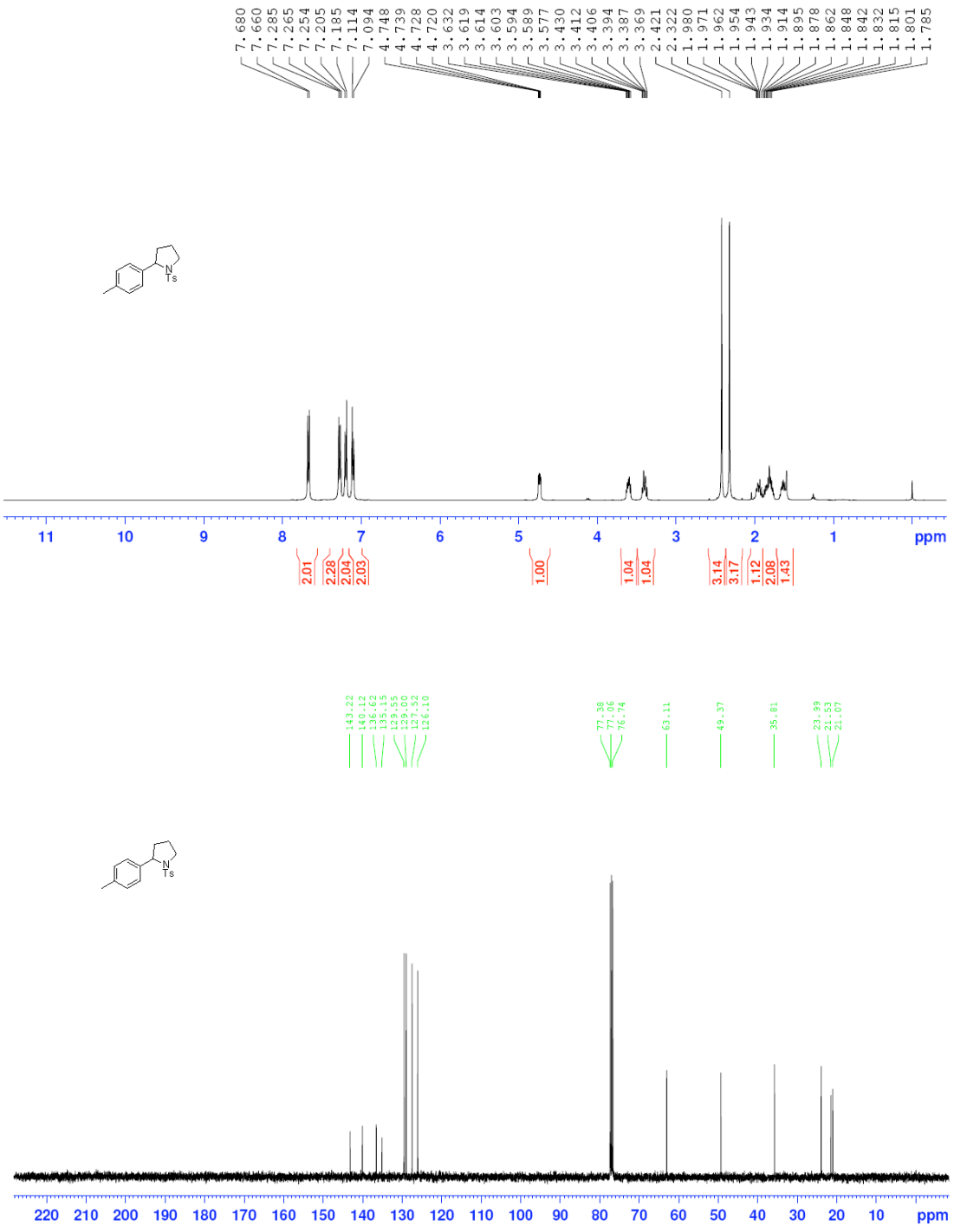


Figure S3. ^{1}H and ^{13}C NMR Spectra of 2-(4-*Tert*-butylphenyl)-1-tosylpyrrolidine **3c**

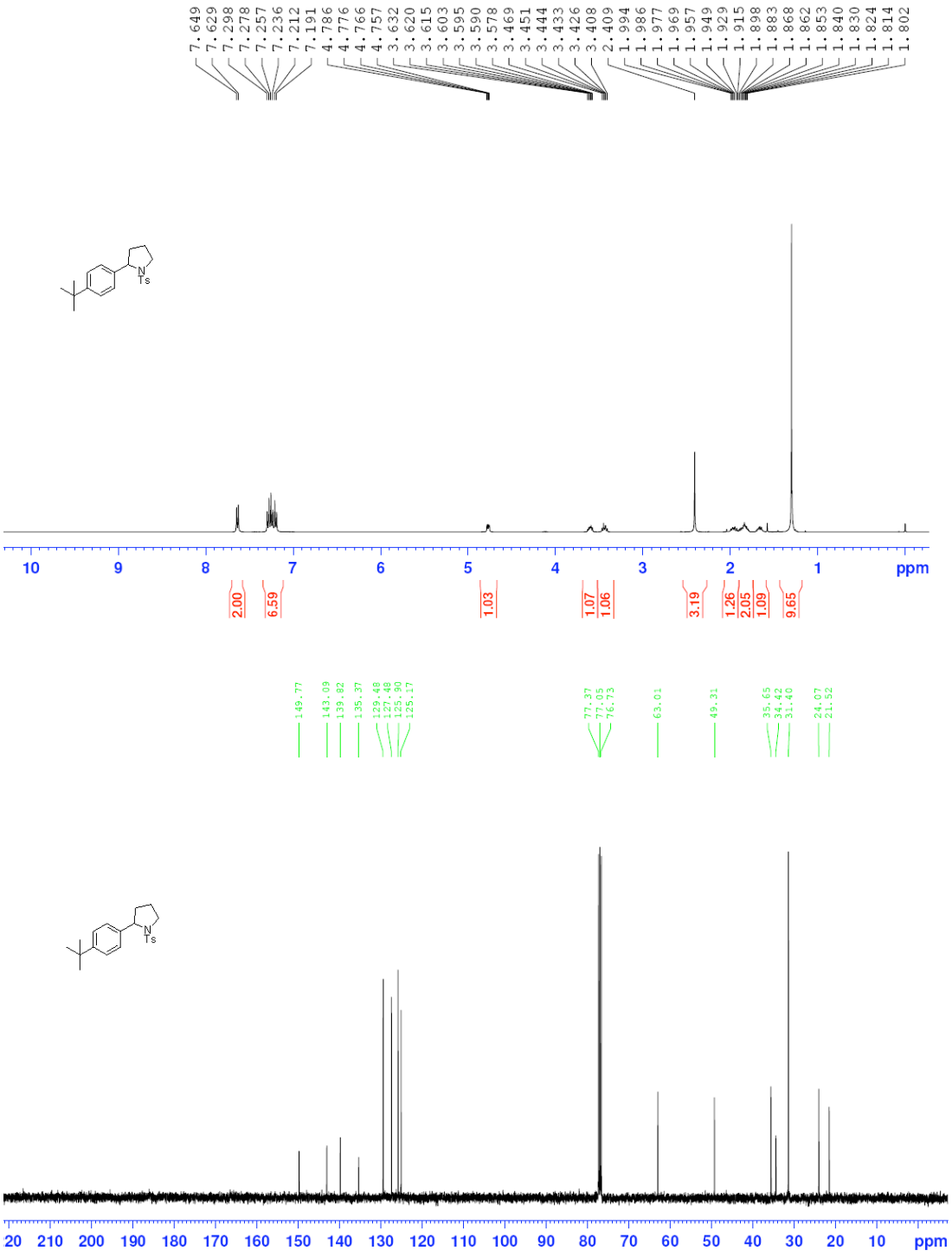


Figure S4. ^{1}H and ^{13}C NMR Spectra of 2-(4-Methoxyphenyl)-1-tosylpyrrolidine **3d**[S2]

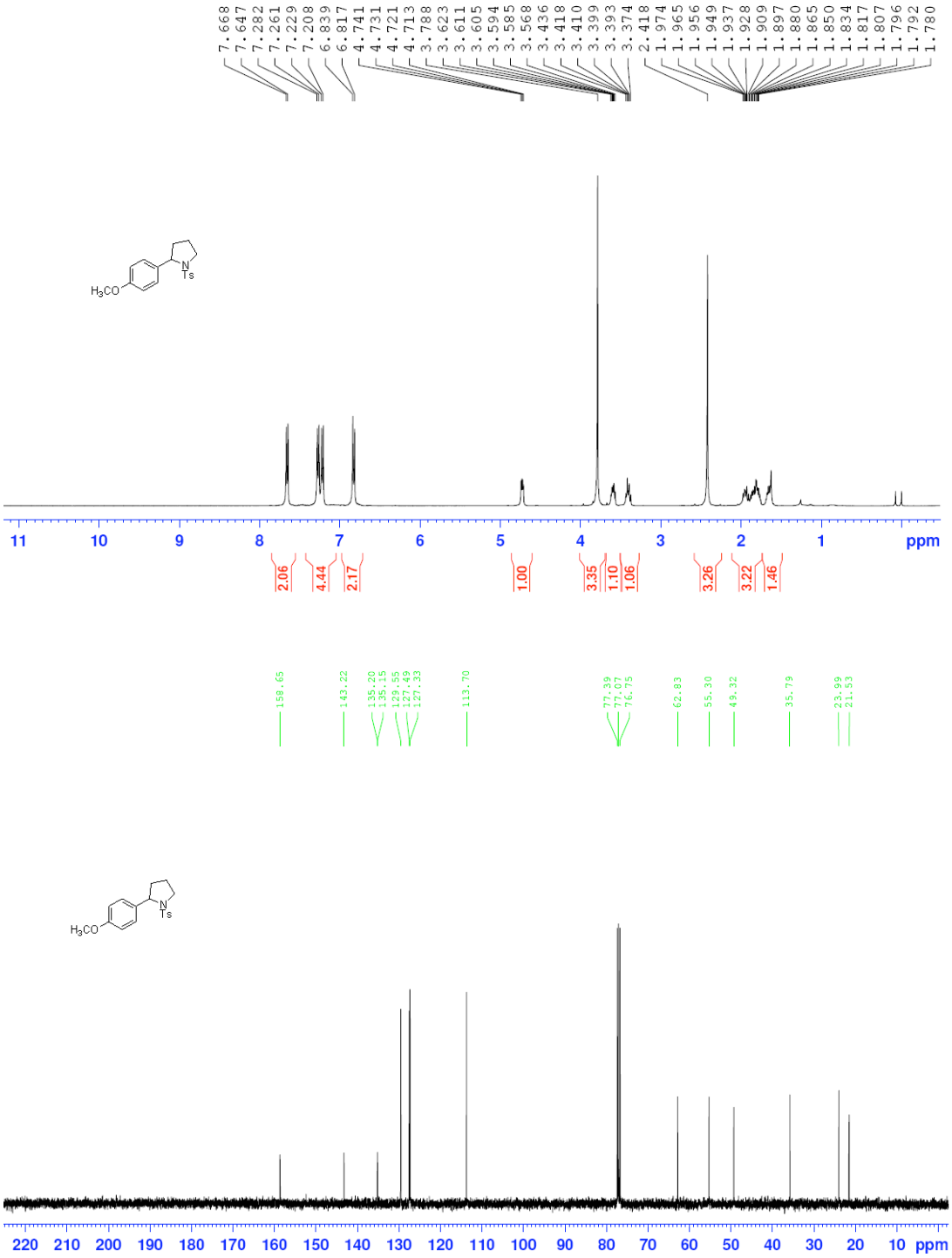


Figure S5. ^{1}H and ^{13}C NMR Spectra of 2-(3,5-Dimethylphenyl)-1-tosylpyrrolidine **3e**

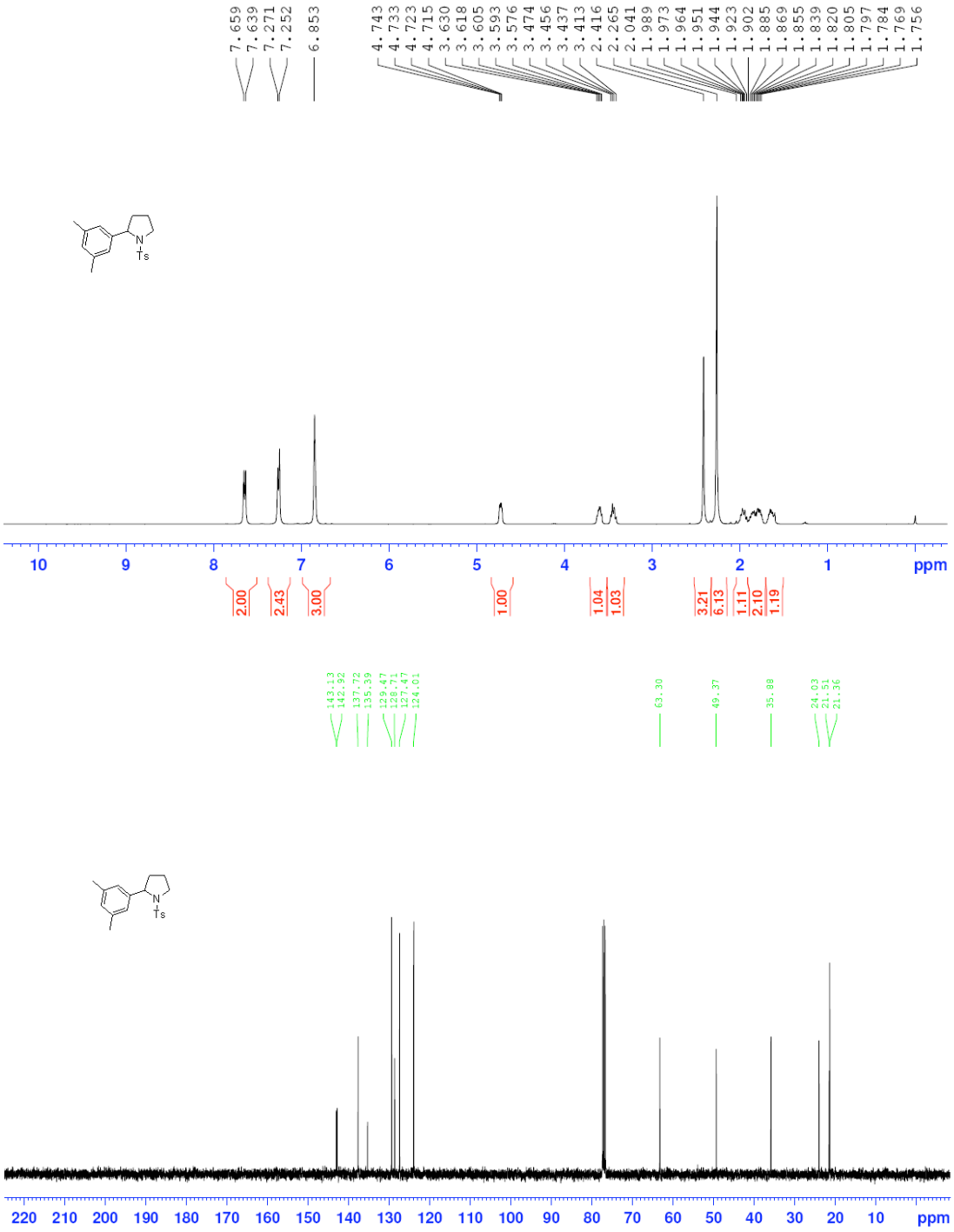


Figure S6. ^{1}H and ^{13}C NMR Spectra of 2-(4-Fluorophenyl)-1-tosylpyrrolidine **3f**[S4]

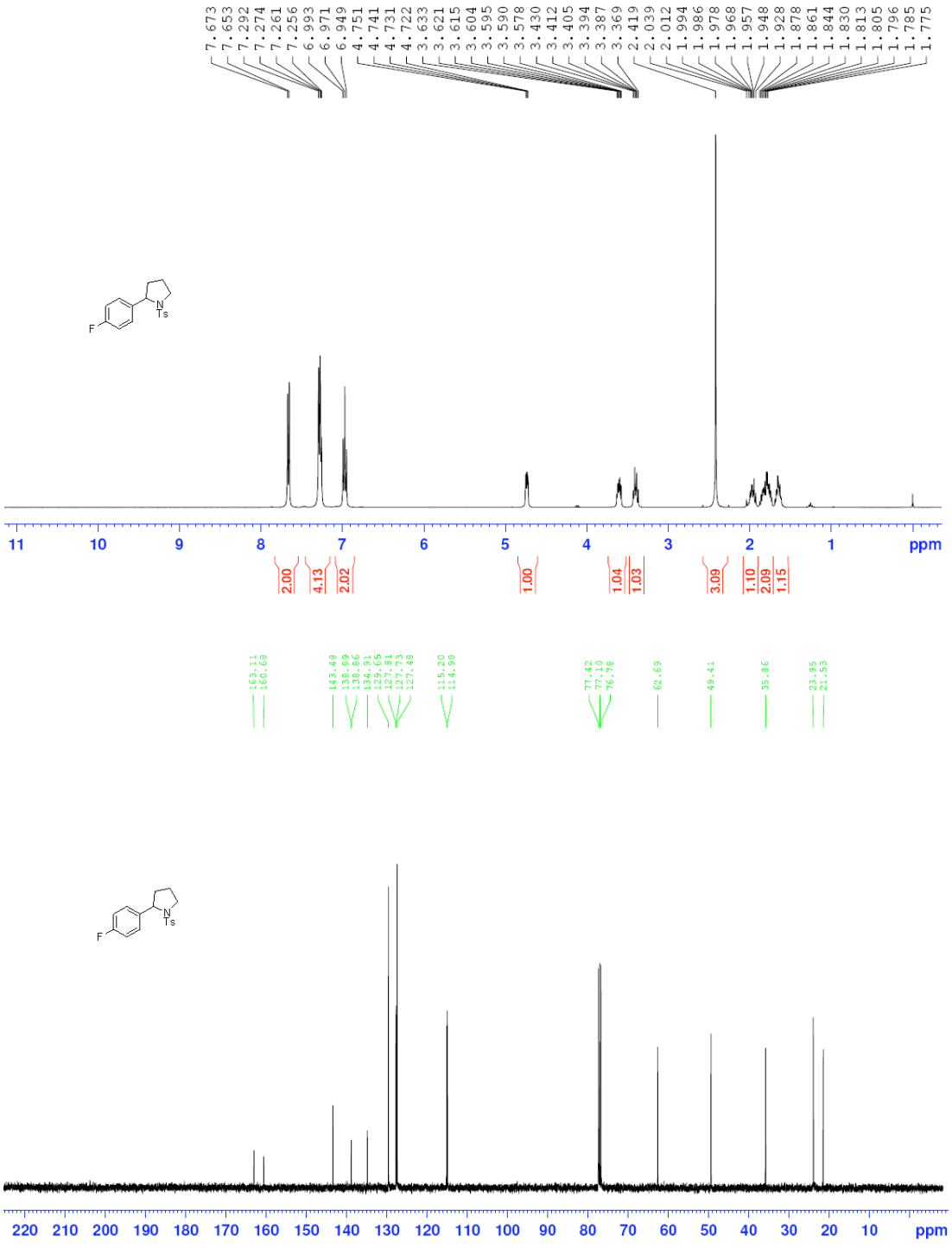


Figure S7. ^{1}H and ^{13}C NMR Spectra of 2-(4-Chlorophenyl)-1-tosylpyrrolidine **3g**[S2], [S4]

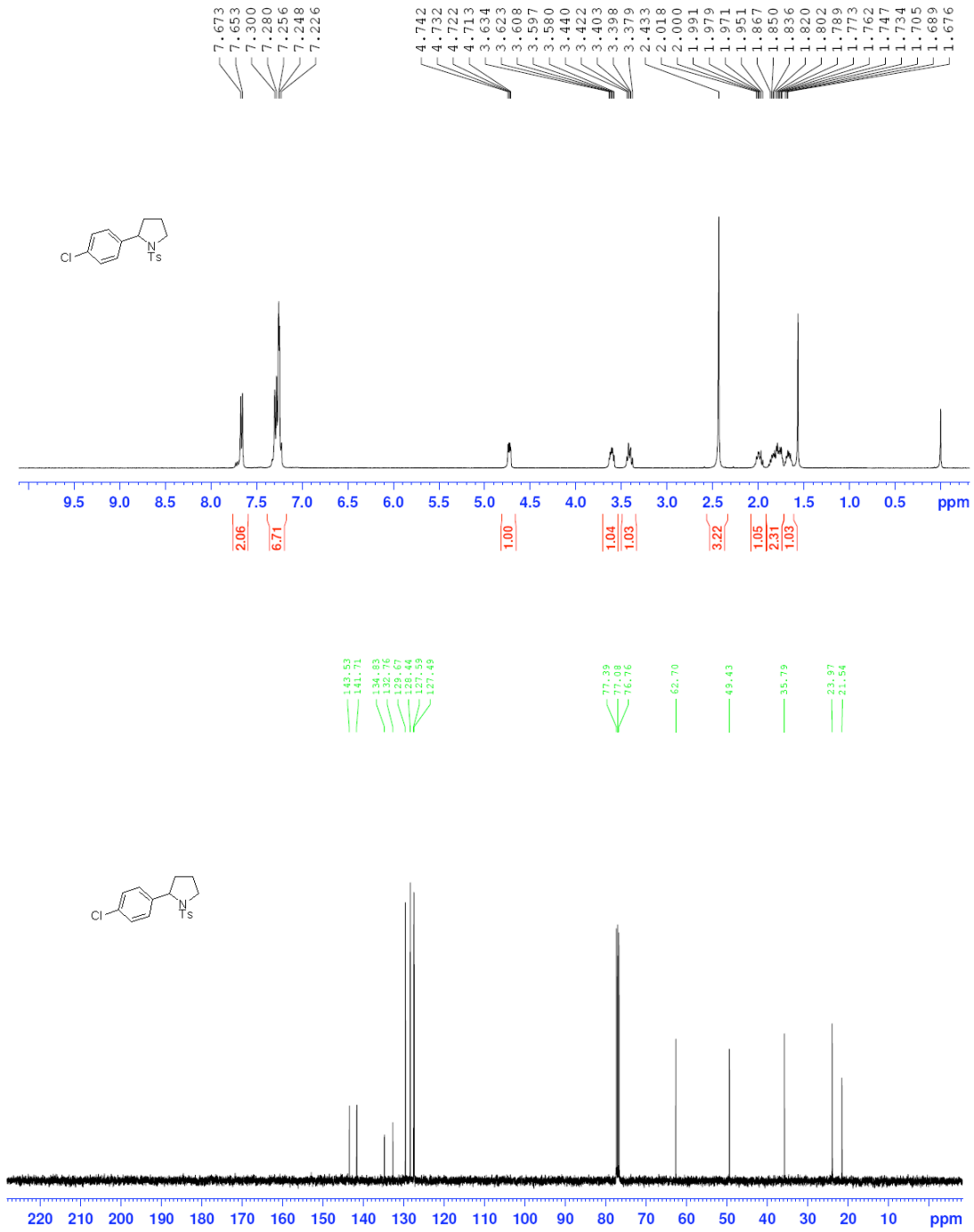


Figure S8. ^{1}H and ^{13}C NMR Spectra of 2-(Naphthalen-1-yl)-1-tosylpyrrolidine **3h**[S1]

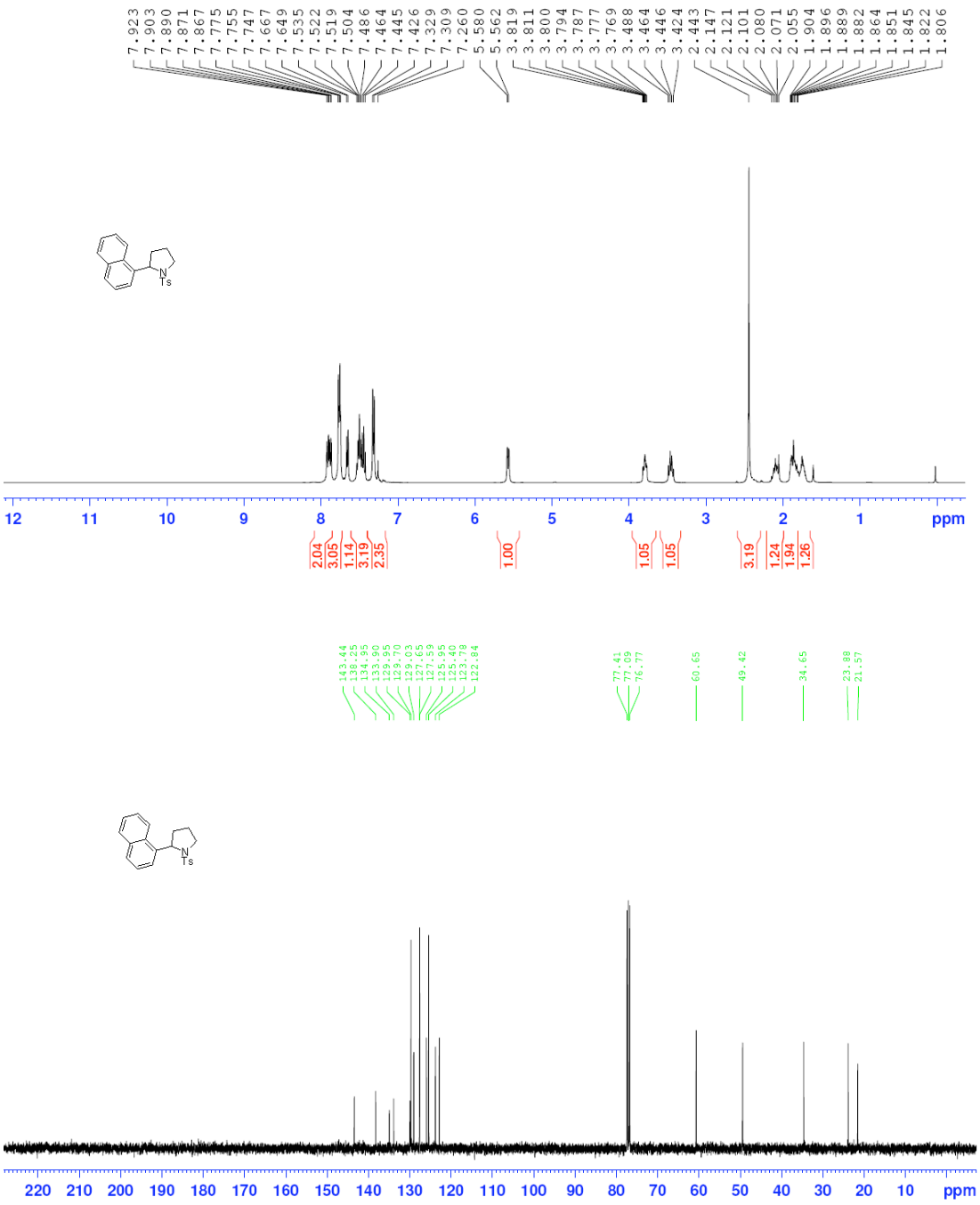


Figure S9. ^{1}H and ^{13}C NMR Spectra of 2-(2,6-Dimethylphenyl)-1-tosylpyrrolidine **3i**

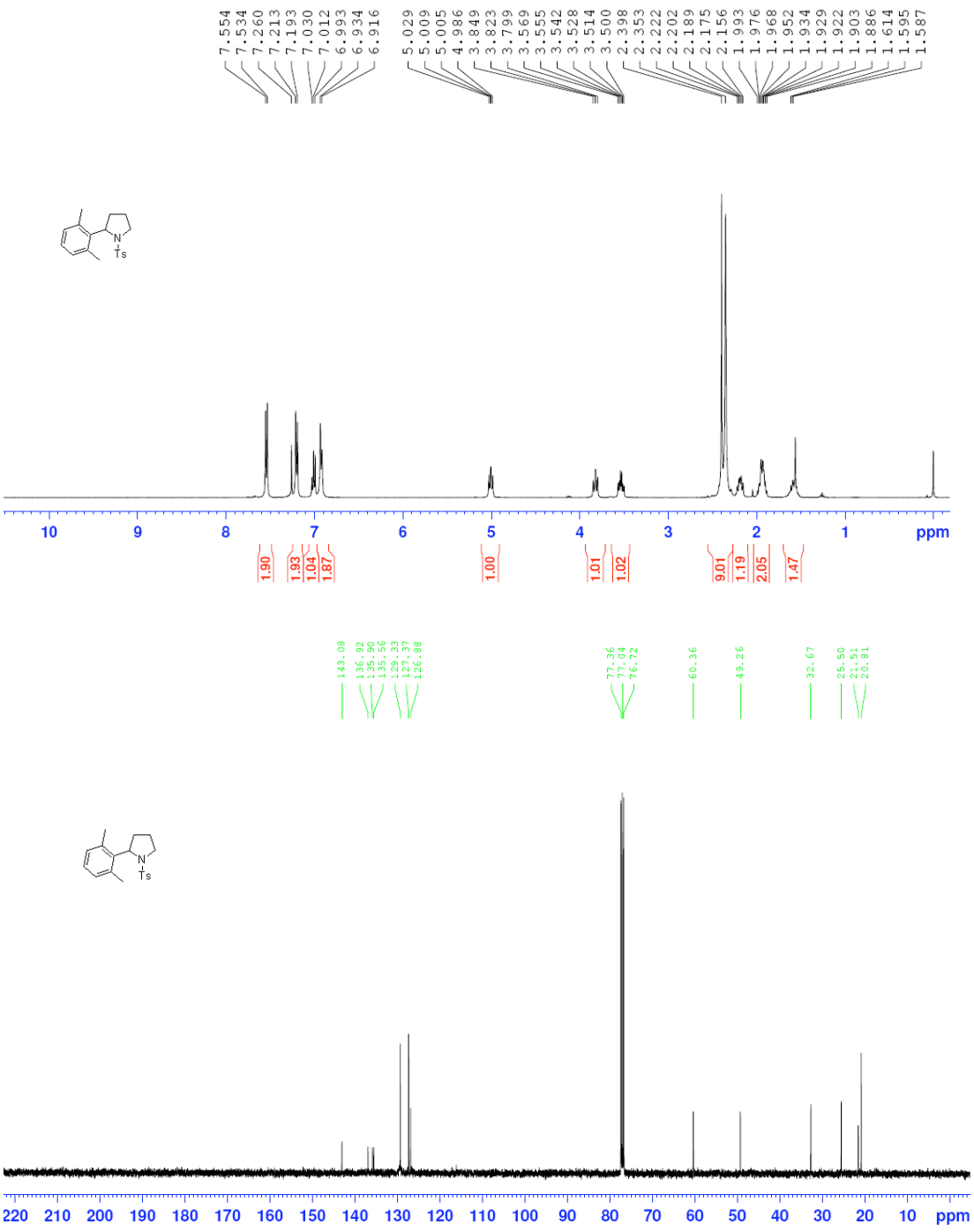


Figure S10. ^{1}H and ^{13}C NMR Spectra of 2-(2-Methoxyphenyl)-1-tosylpyrrolidine **3j**[S1]

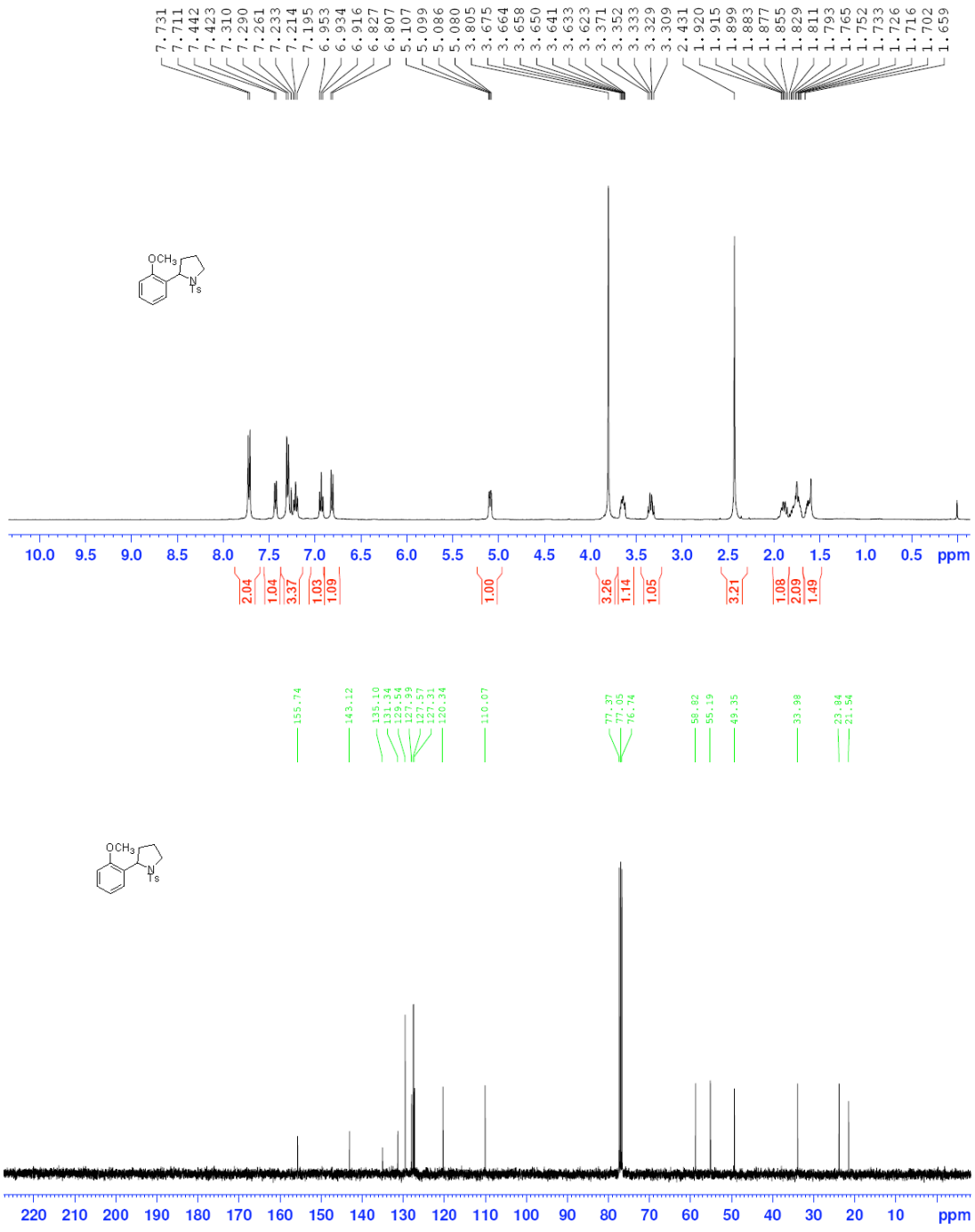


Figure S11. ^{1}H and ^{13}C NMR Spectra of 2-Methyl-2-phenyl-1-tosylpyrrolidine **3k**[S1]

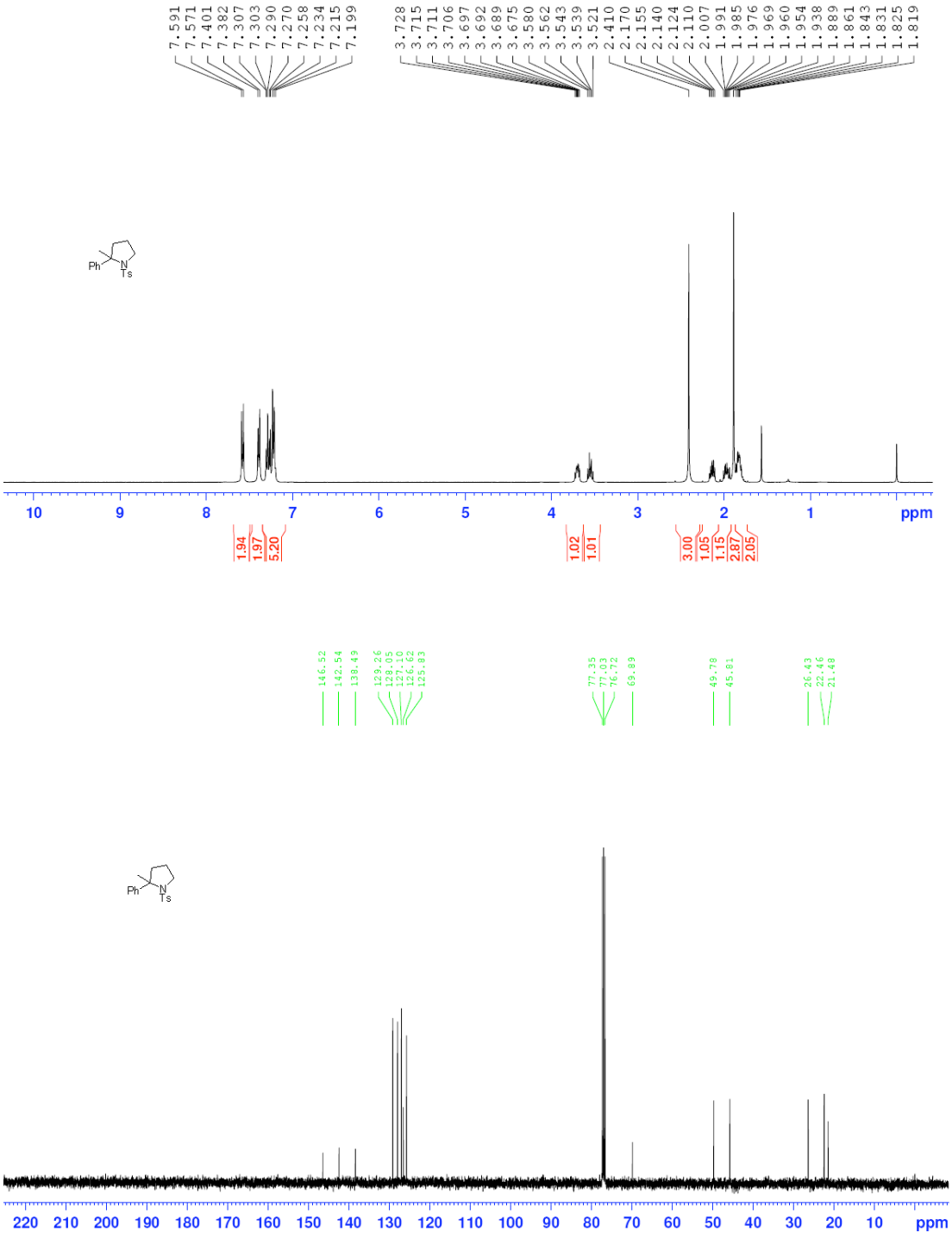


Figure S12. ^{1}H and ^{13}C NMR Spectra of 2-(4-Fluorophenyl)-2-methyl-1-tosyl pyrrolidine **3l**

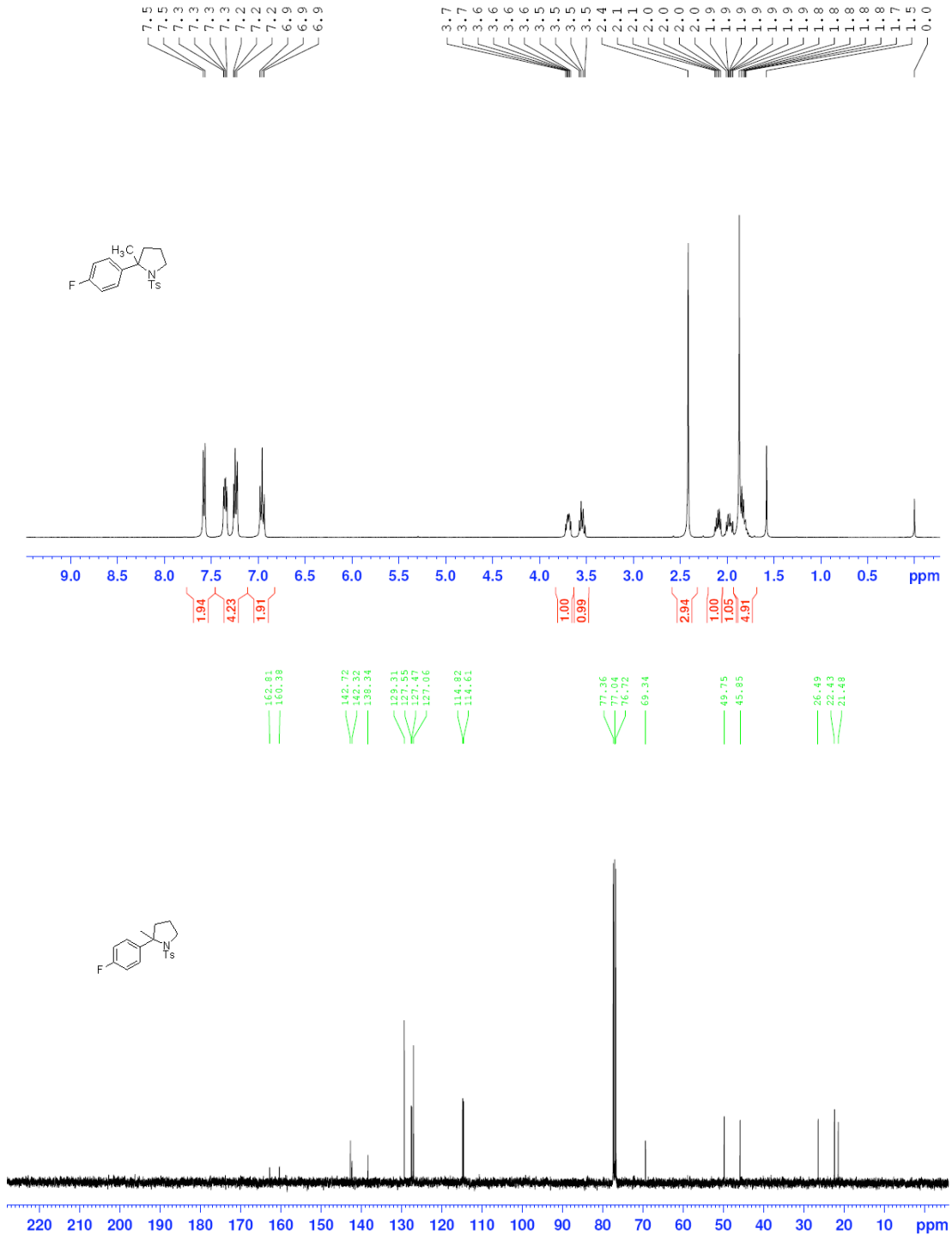


Figure S13. ^{1}H and ^{13}C NMR Spectra of 2-Octyl-1-tosylpyrrolidine **3m**

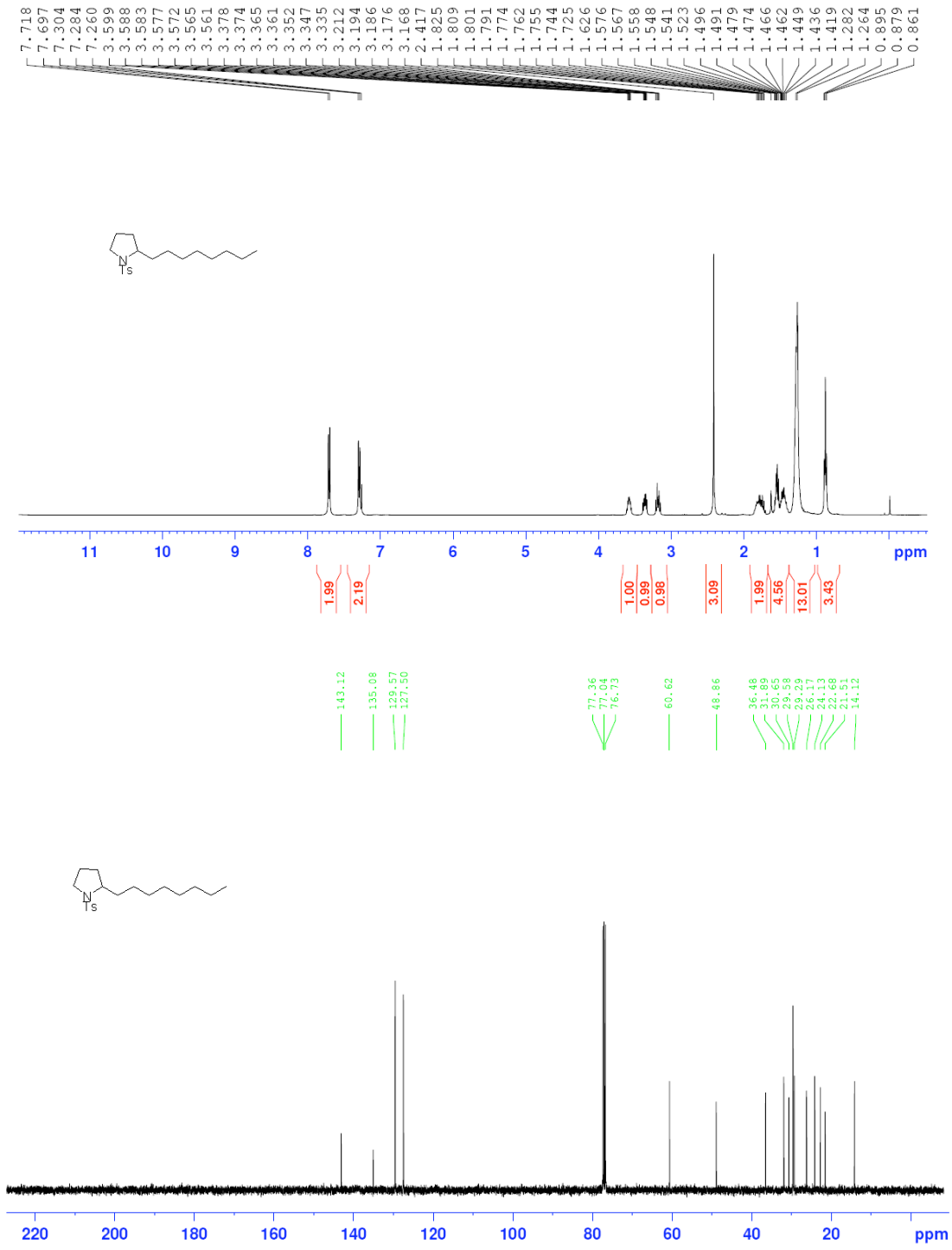


Figure S14. ^{1}H and ^{13}C NMR Spectra of 2-Dodecyl-1-tosylpyrrolidine **3n**

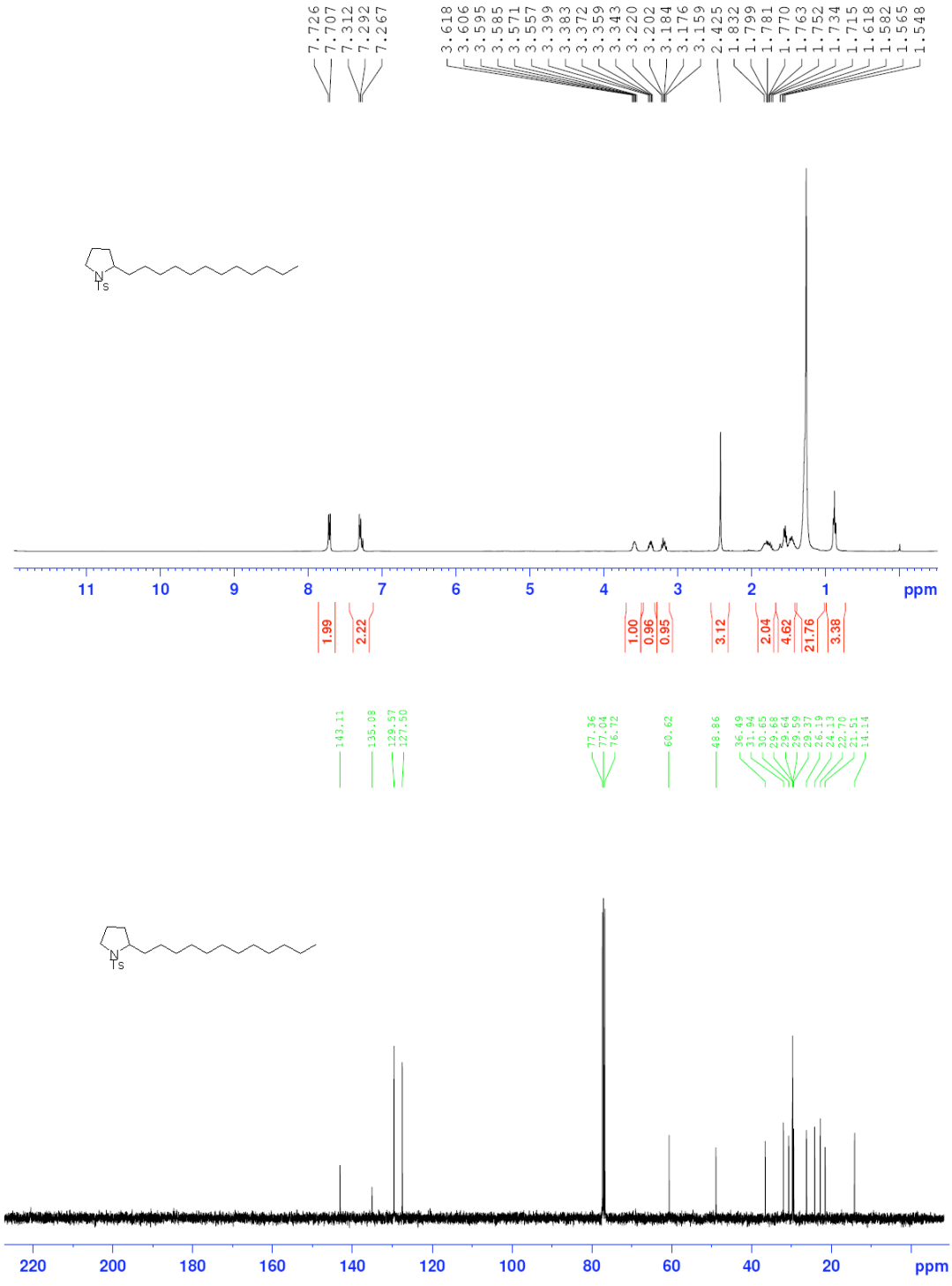


Figure S15. ^{1}H and ^{13}C NMR Spectra of 2-Phenethyl-1-tosylpyrrolidine **3o**[S5]

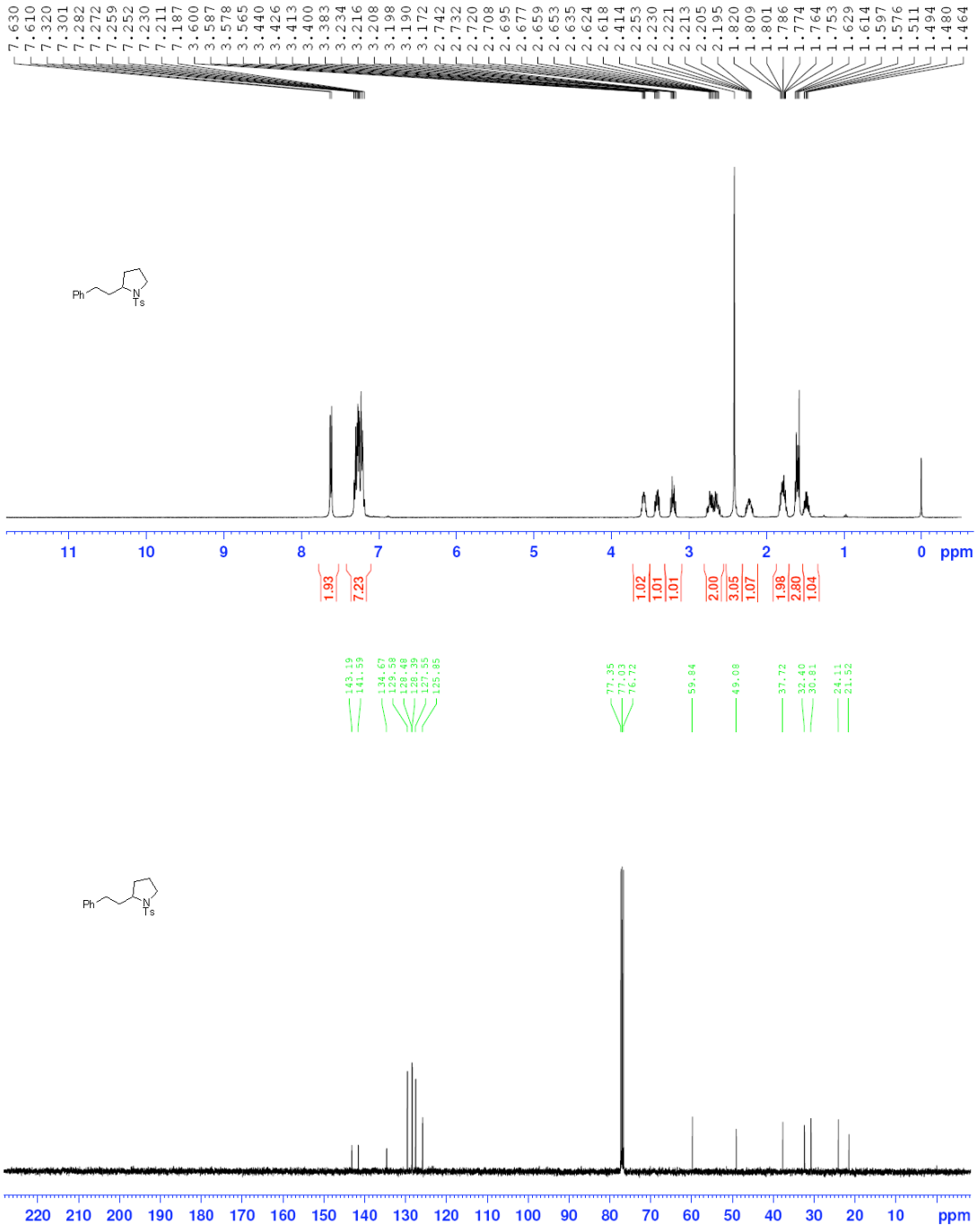


Figure S16. ^{1}H and ^{13}C NMR Spectra of 2-Phenyl-1-(phenylsulfonyl)pyrrolidine **3p**[S1]

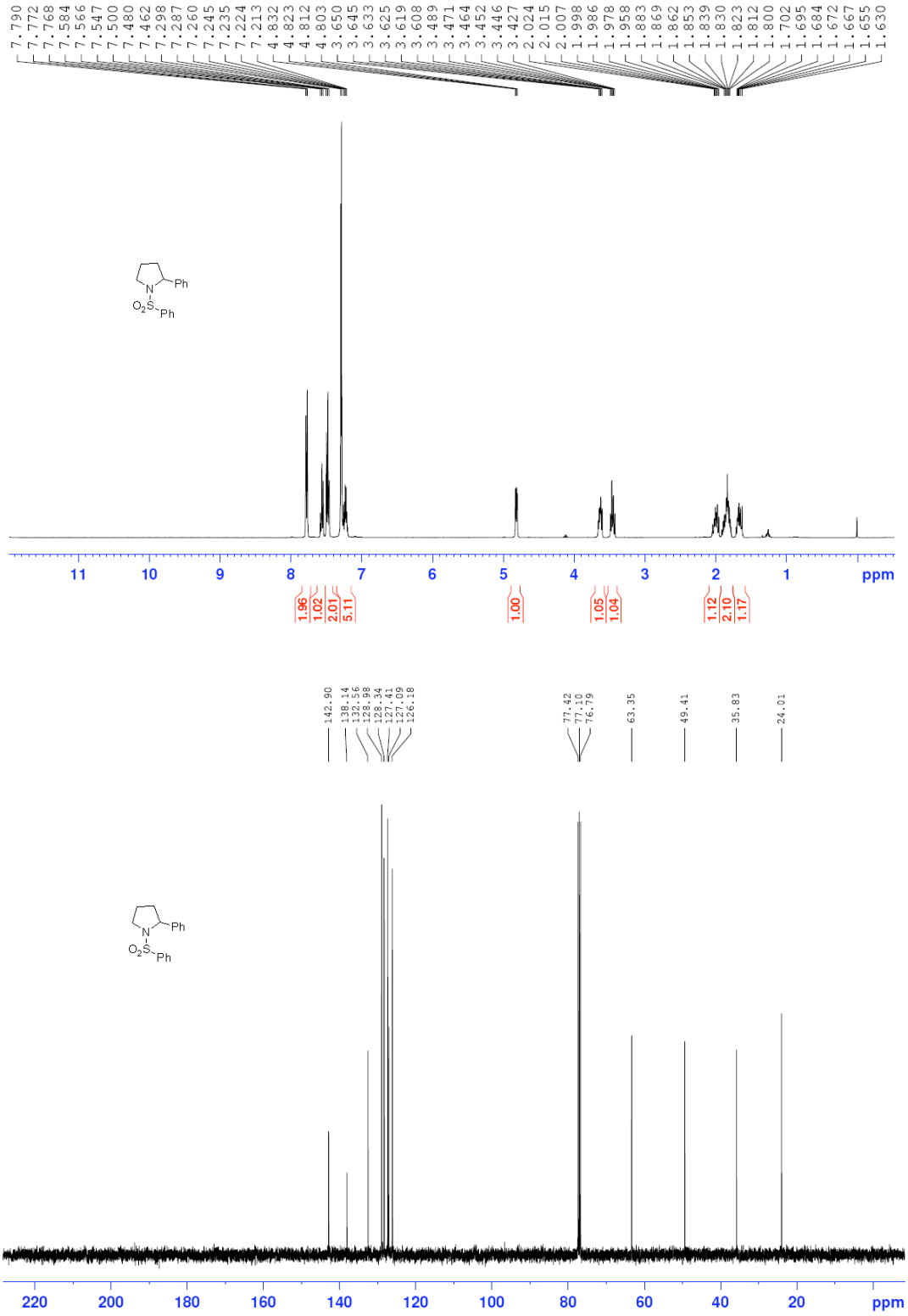


Figure S17. ^{1}H and ^{13}C NMR Spectra of 1-(4-Bromophenylsulfonyl)-2-phenyl pyrrolidine **3q**

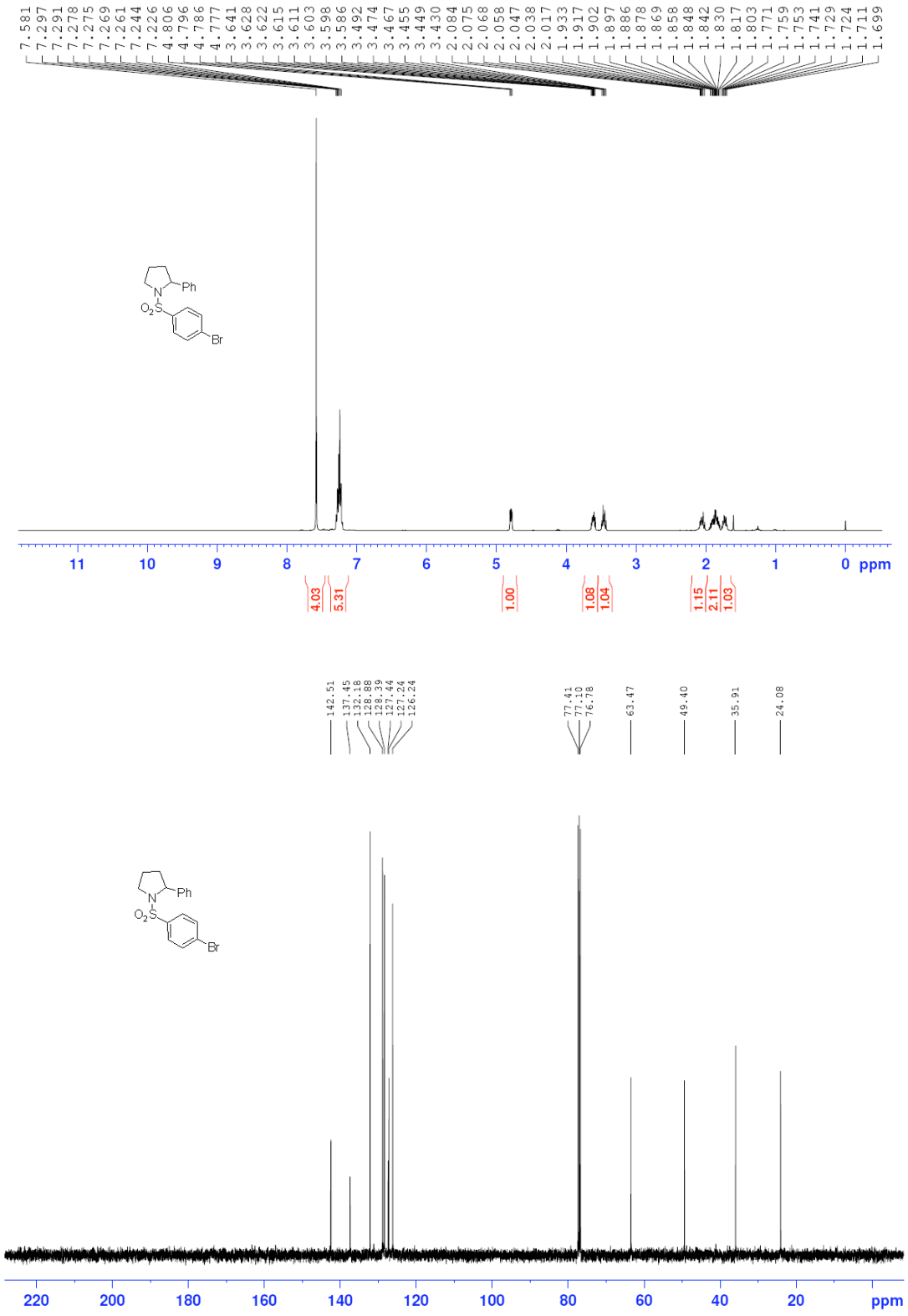


Figure S18. ^{1}H and ^{13}C NMR Spectra of 1-(4-Nitrophenylsulfonyl)-2-phenyl pyrrolidine **3r**[S1], [S2]

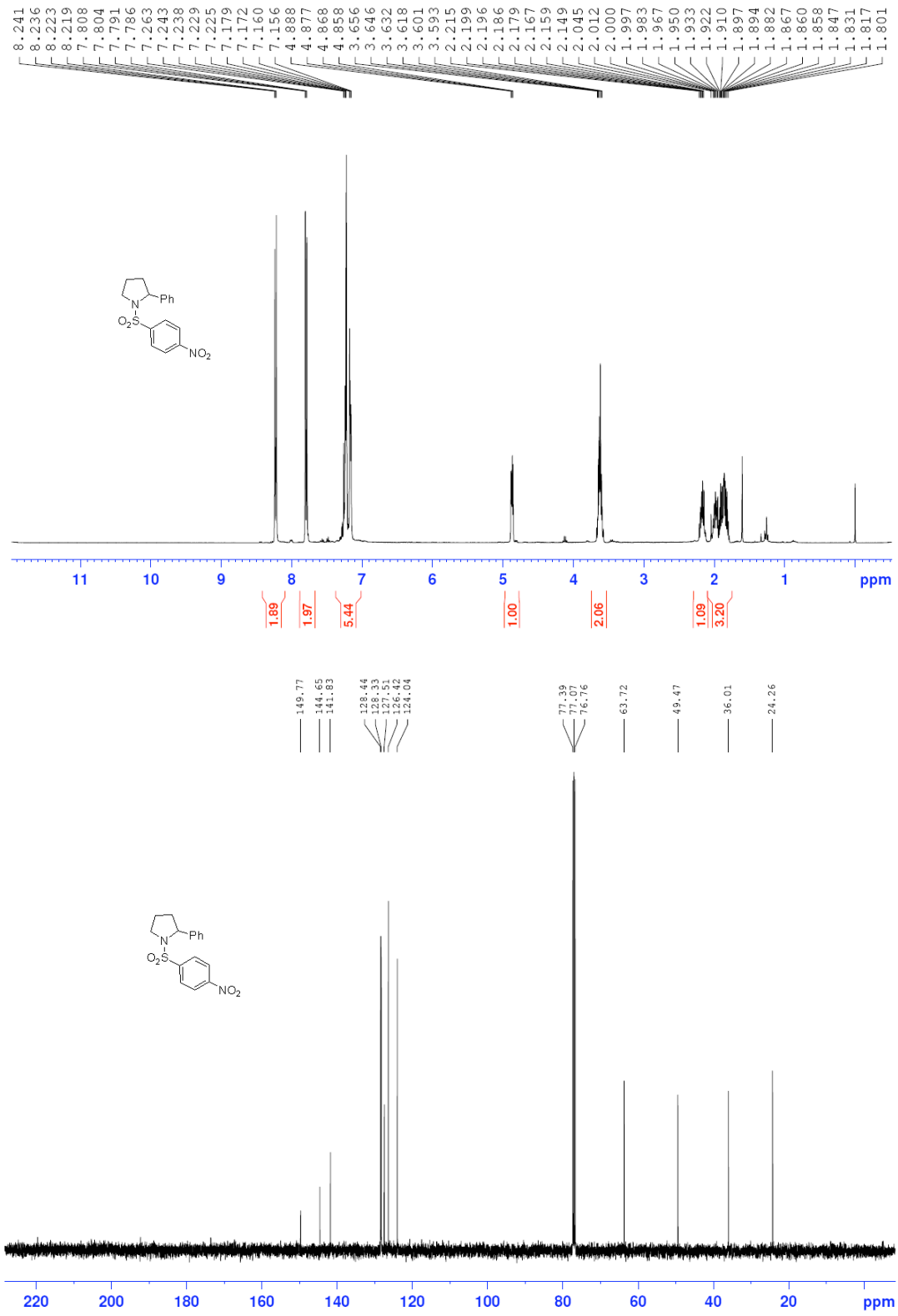


Figure S19. ^{1}H and ^{13}C NMR Spectra of (*E*)-4-Methyl-*N*-(4-phenylbut-3-enyl) benzenesulfonamide **4a**[S1], [S3]

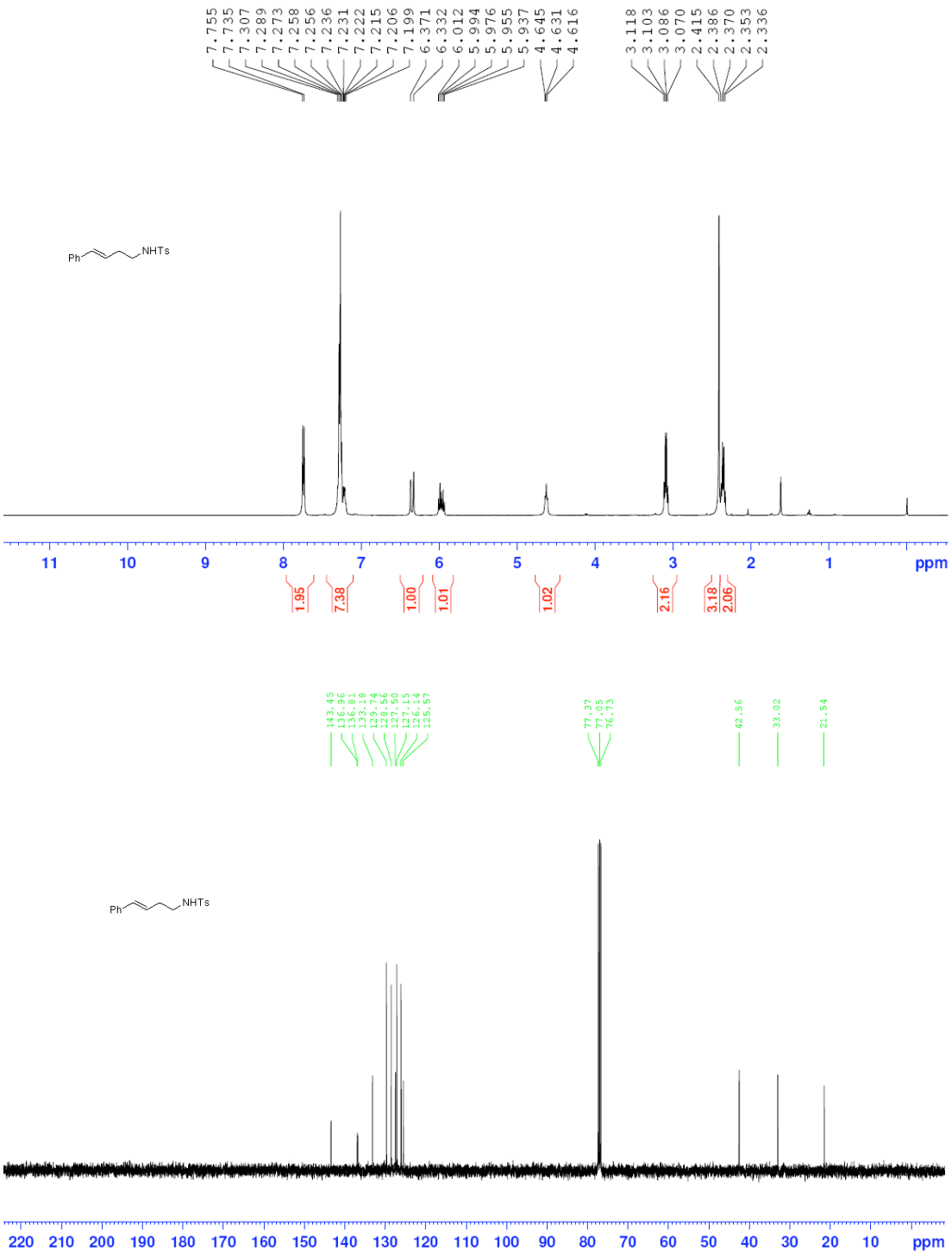


Figure S20. ^{1}H and ^{13}C NMR Spectra of *N*-(4,4-Diphenylbut-3-enyl)-4-methyl benzenesulfonamide **4b**[S6]-[S7]

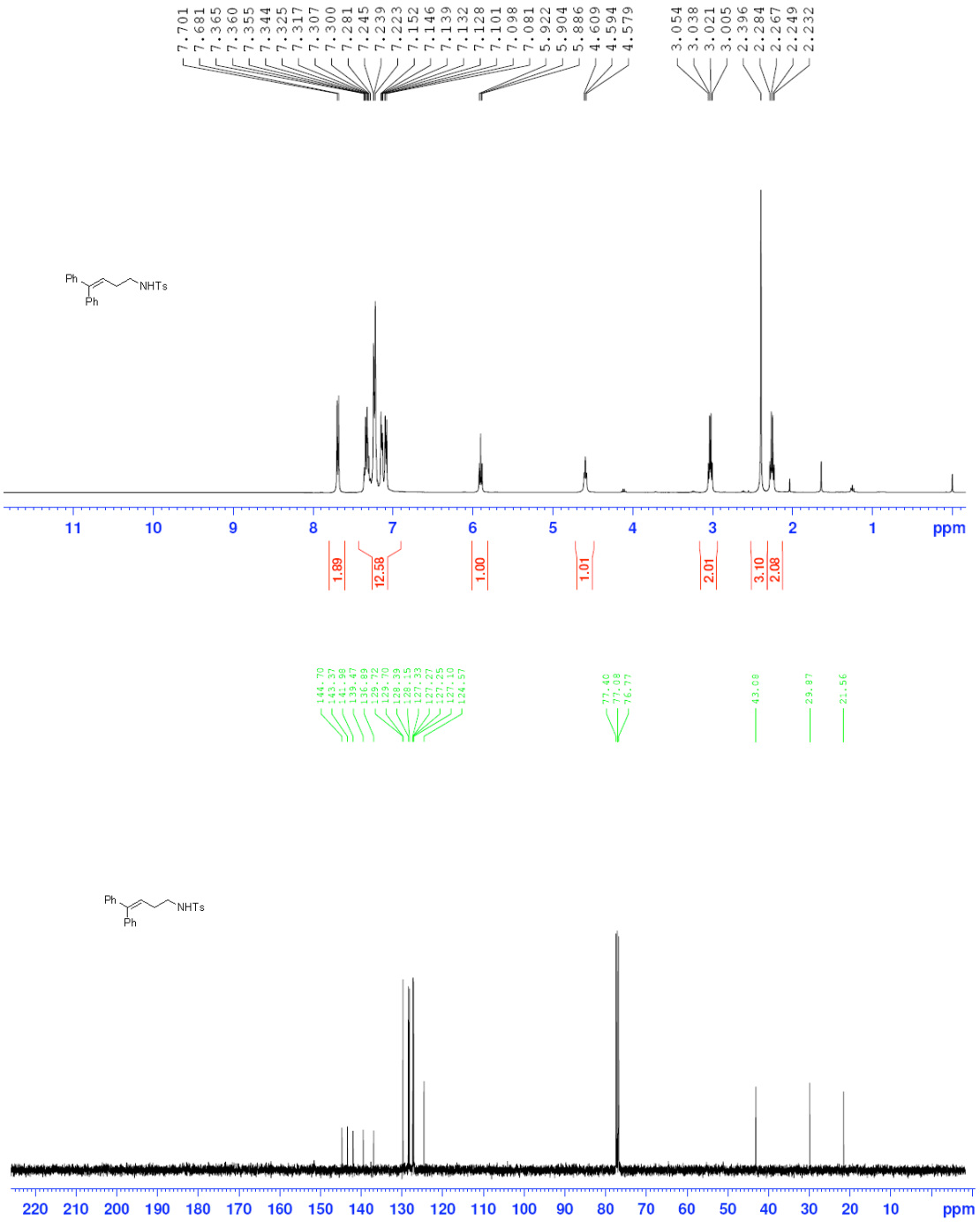


Figure S21. ^{1}H and ^{13}C NMR Spectra of 4-Methyl-*N*-(6-*p*-tolylhex-3-en-5-ynyl) benzenesulfonamide **4c**

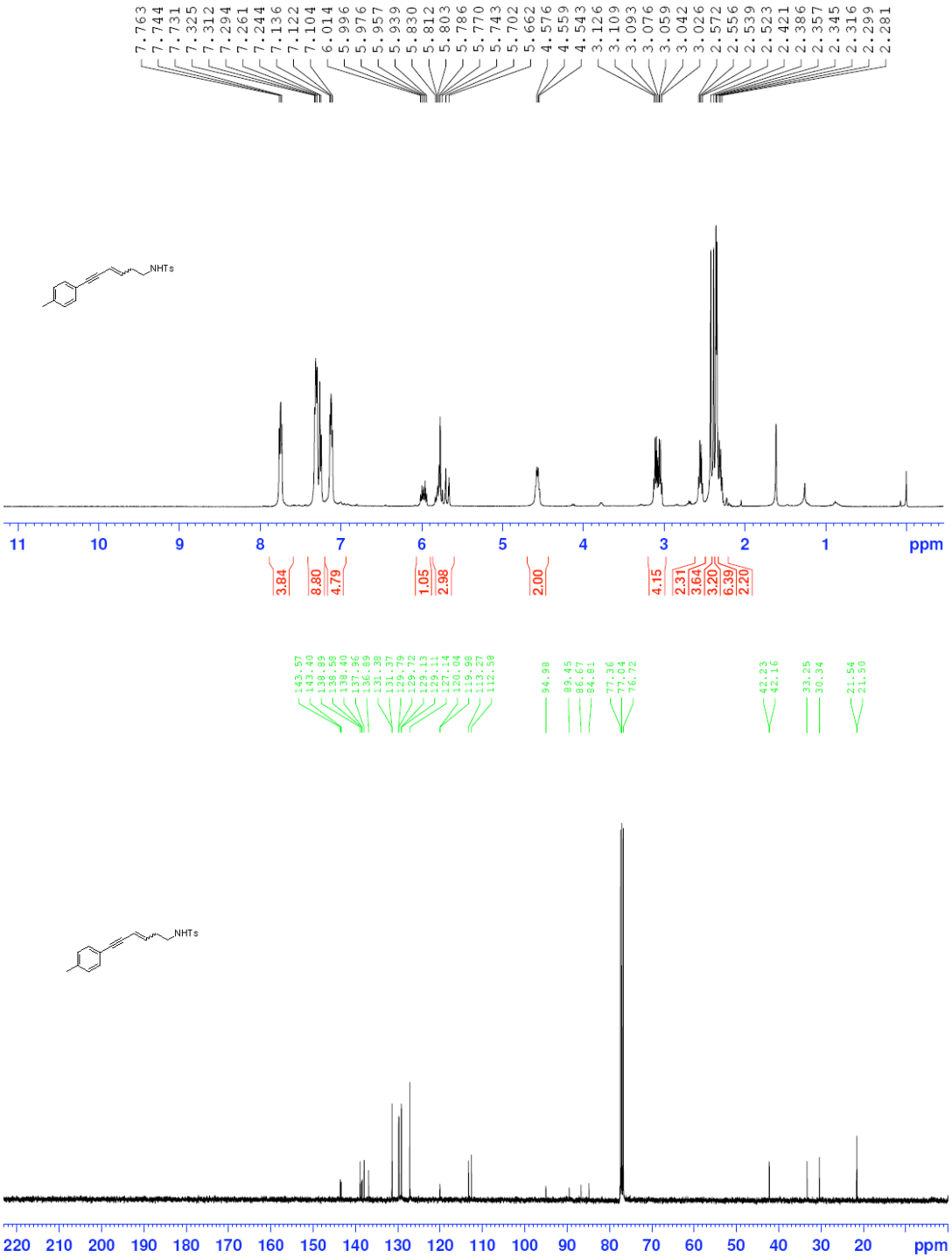


Figure S22. ^{1}H and ^{13}C NMR Spectra of 4-Methyl-*N*,*N*-bis((*E*)-4-phenylbut-3-enyl) benzenesulfonamide **5a**[S1]

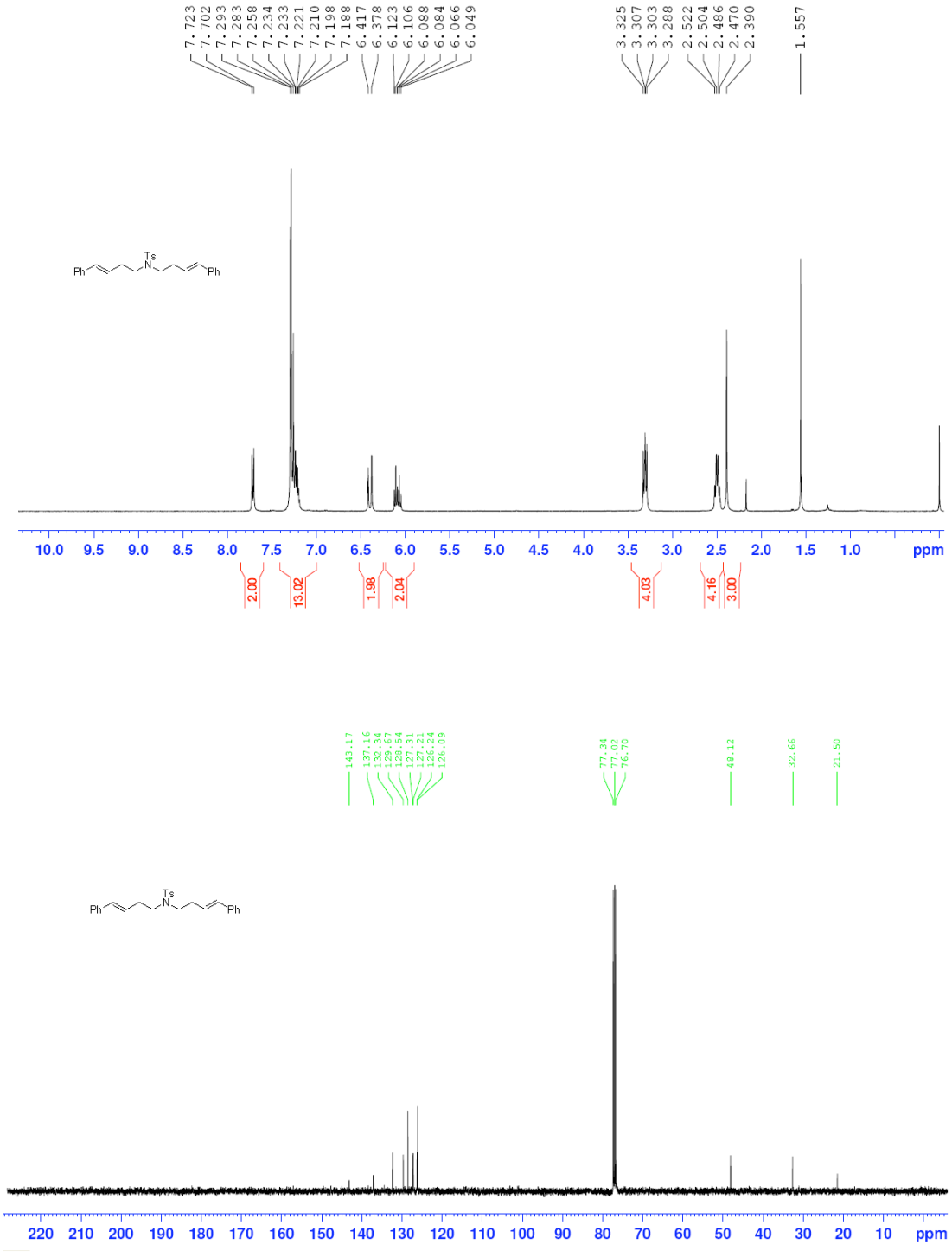


Figure S23. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(phenyl)methyl)-4-methylbenzenesulfonamide **6a**

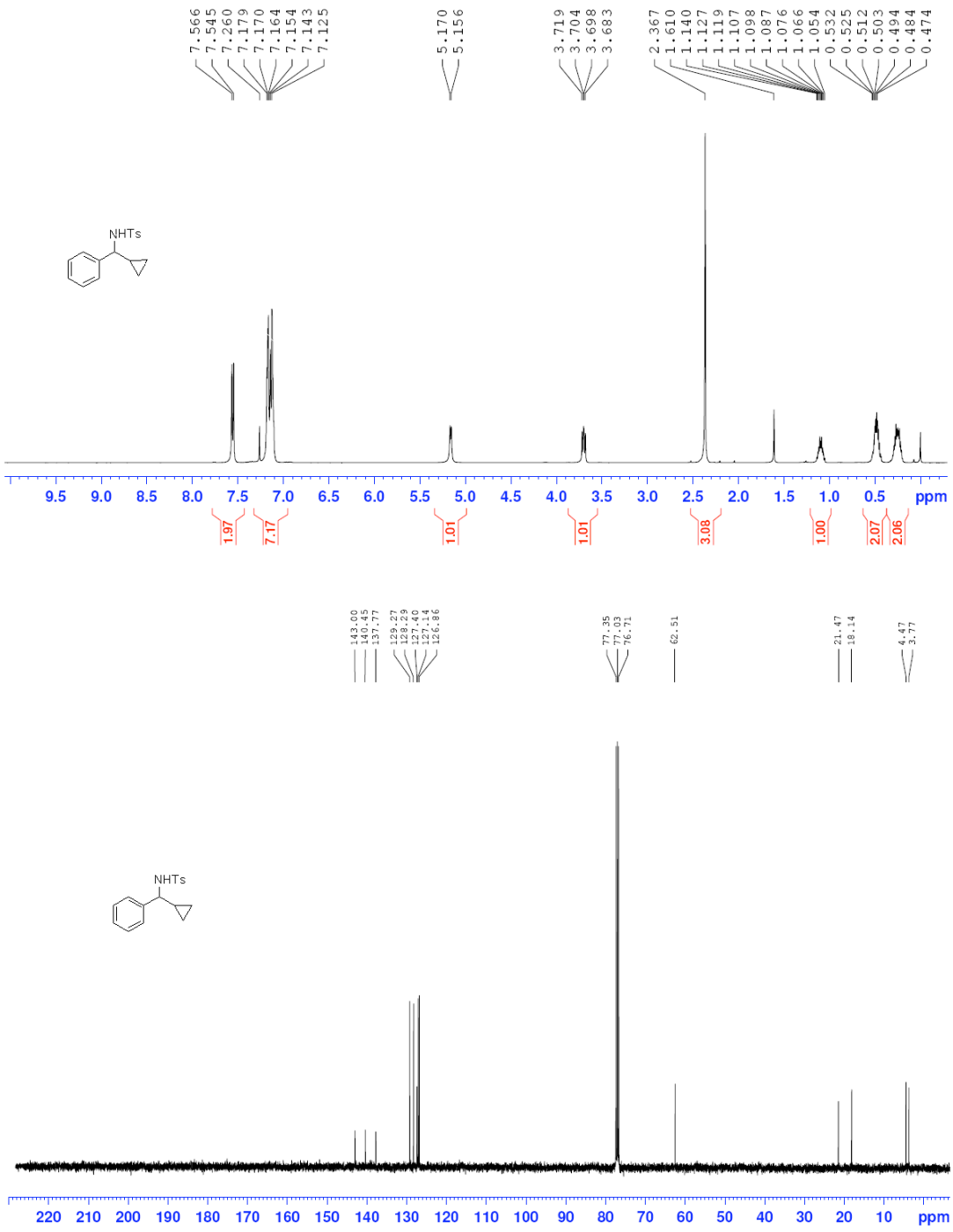


Figure S24. ^{1}H and ^{13}C NMR Spectra of *Tert*-butylcyclopropyl(phenyl)methyl carbamate **6b**

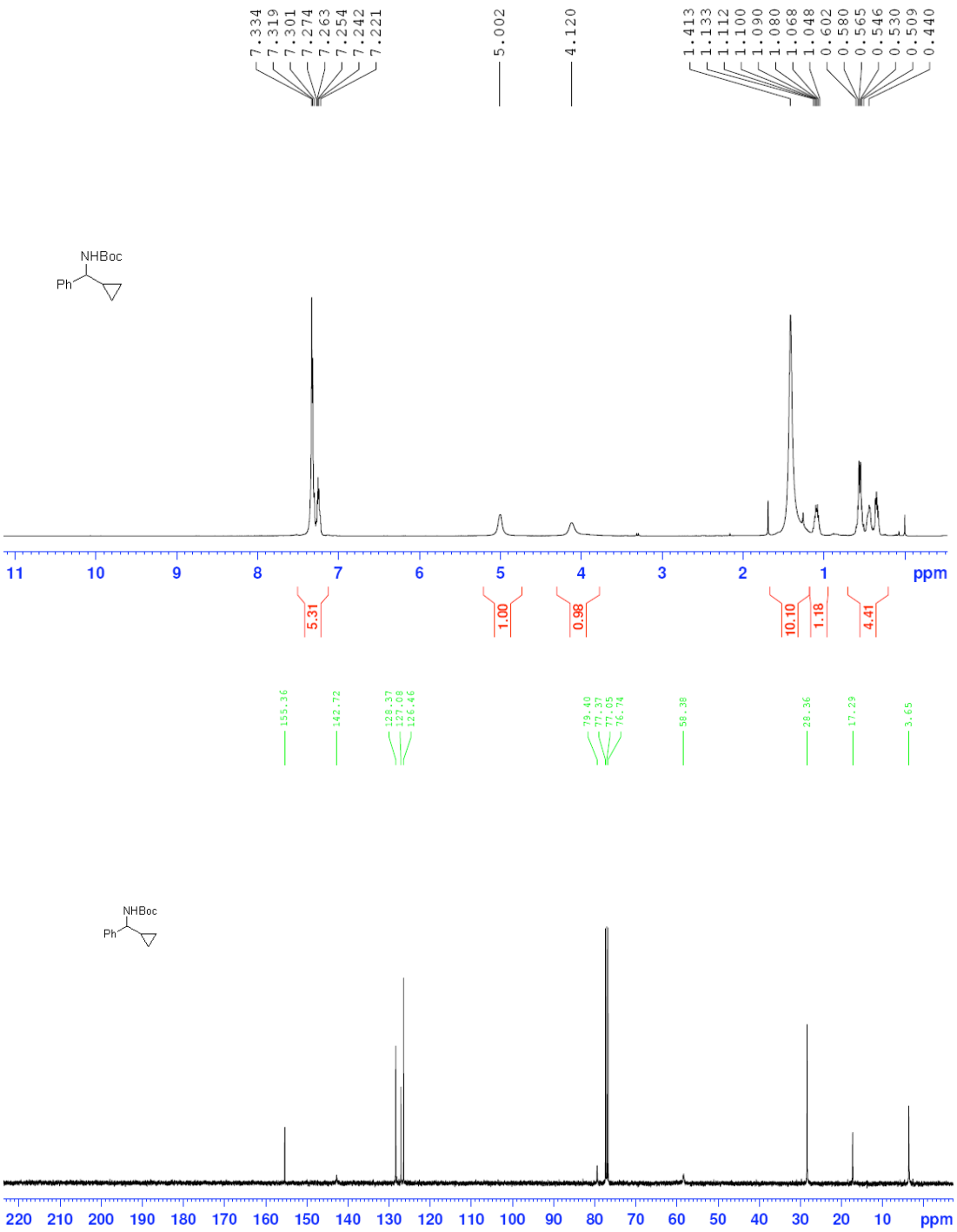


Figure S25. ^{1}H and ^{13}C NMR Spectra of Benzylcyclopropyl(phenyl)methylcarbamate **6c**

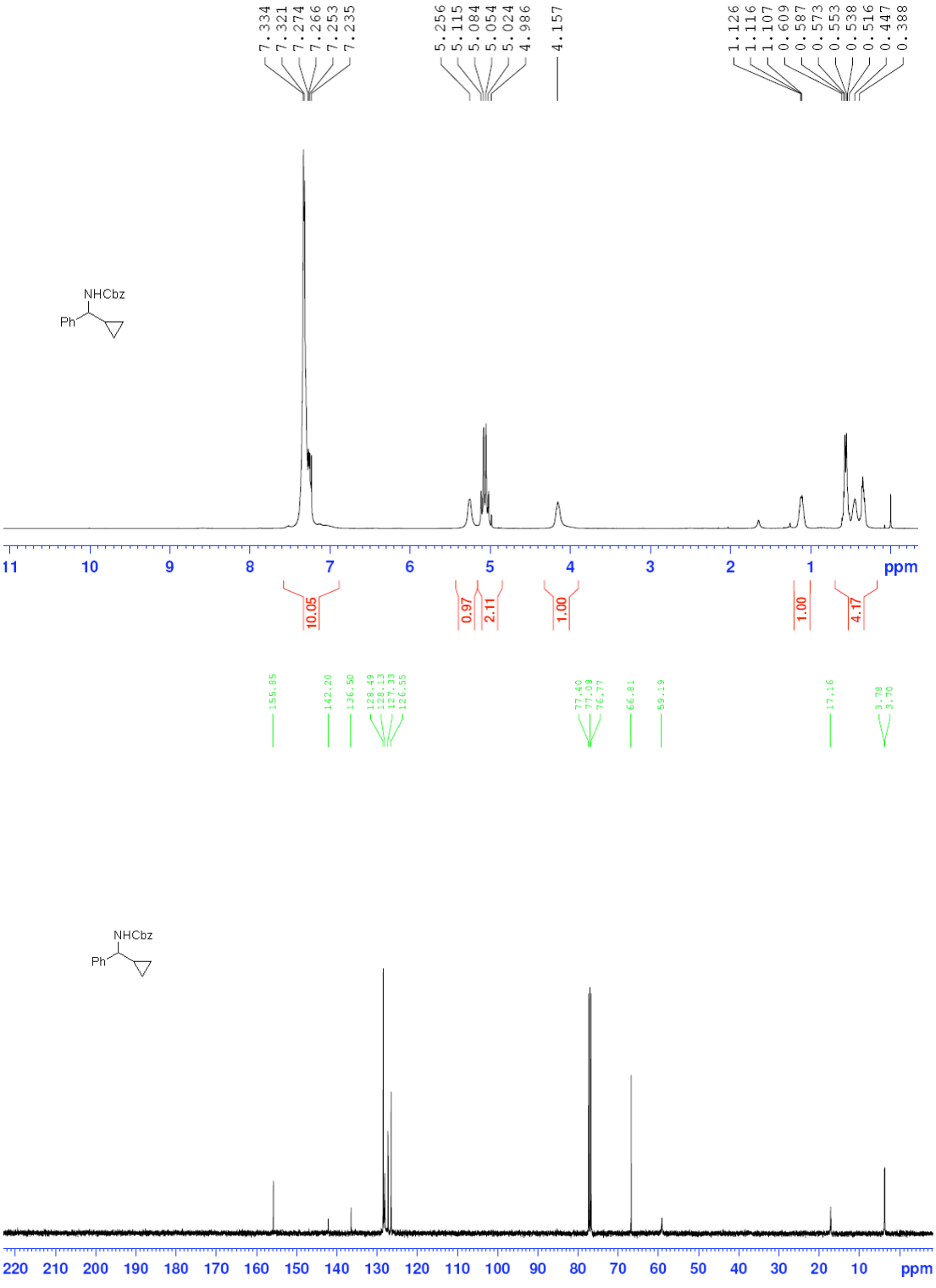


Figure S26. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(4-methoxyphenyl)methyl)- 4-methylbenzenesulfonamide **6d**

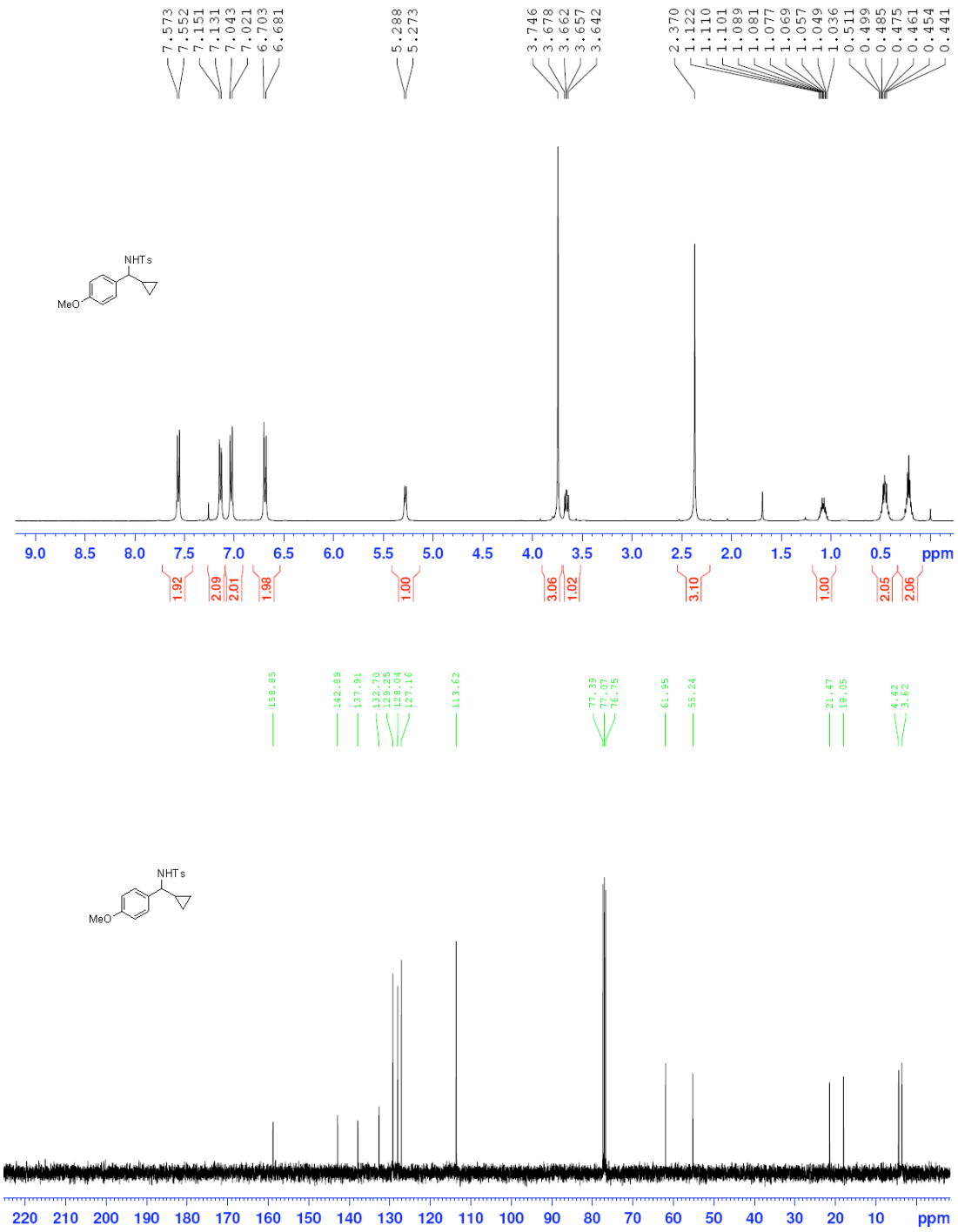


Figure S27. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(4-fluorophenyl)methyl)-4-methylbenzenesulfonamide **6e**

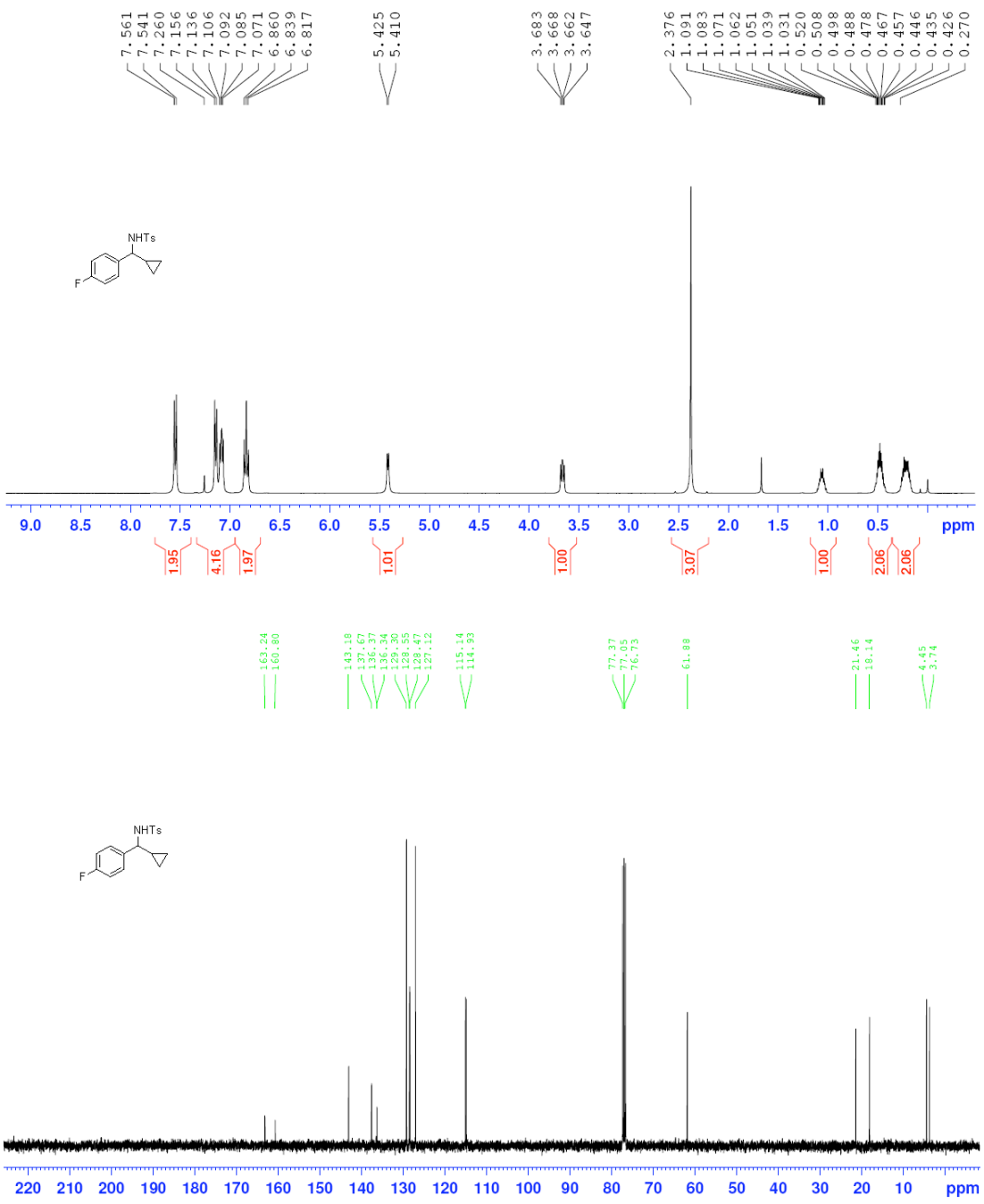


Figure S28. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(naphthalen-1-yl)methyl)-4-methylbenzenesulfonamide **6f**

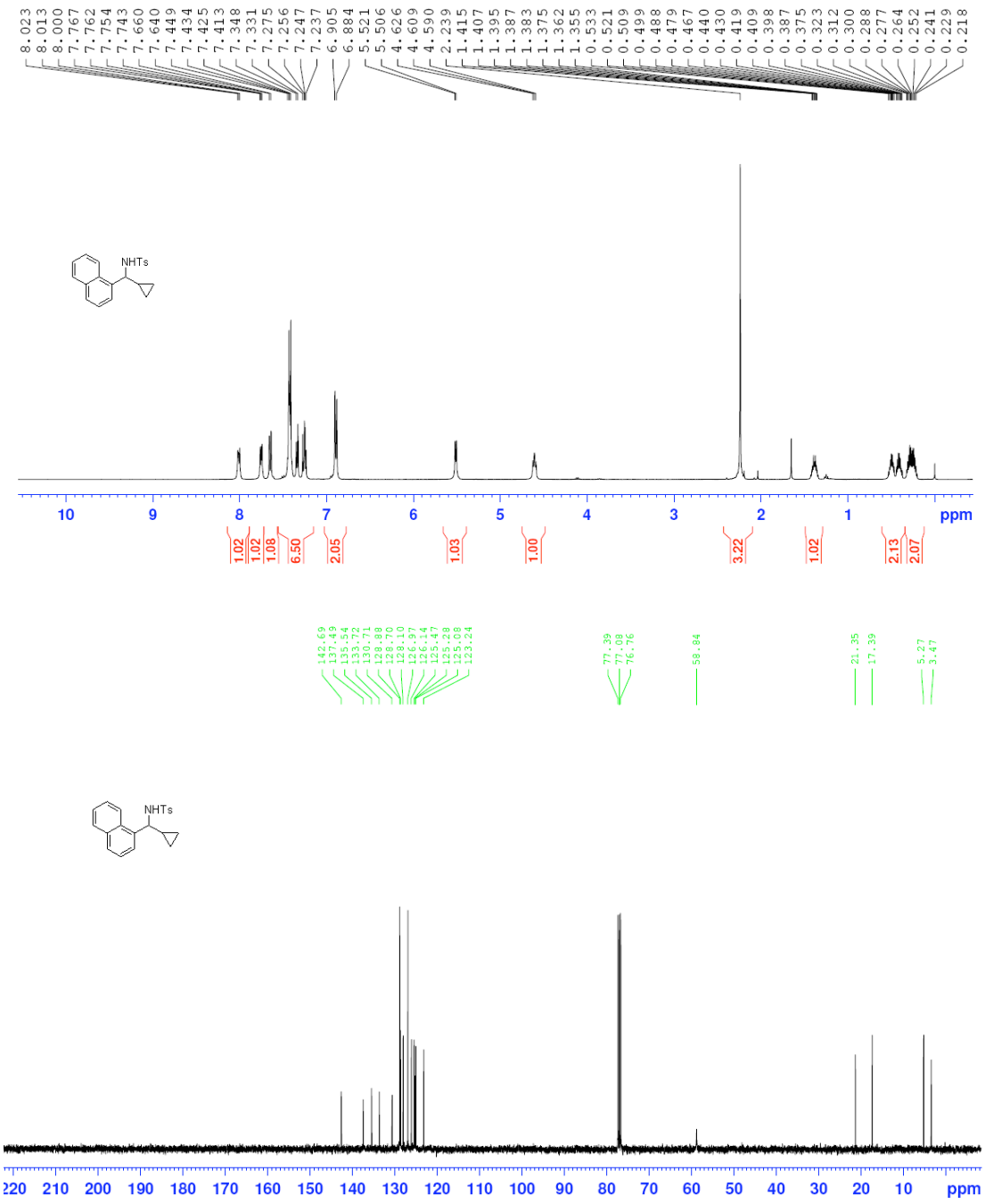


Figure S29. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(3,5-dimethylphenyl)methyl) -4-methylbenzenesulfonamide **6g**

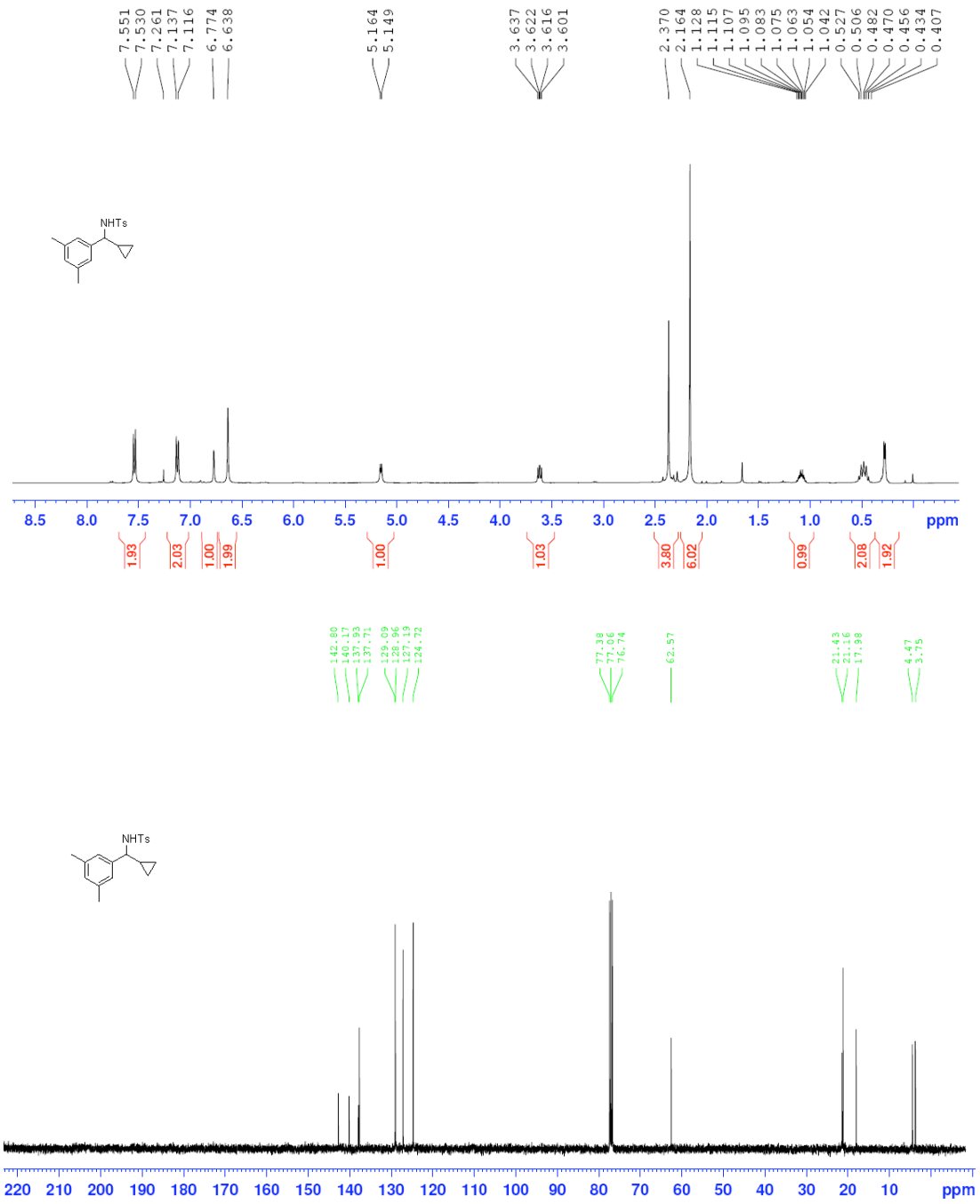


Figure S30. ^{1}H and ^{13}C NMR Spectra of *N*-(Cyclopropyl(2-methoxyphenyl)methyl)- 4-methylbenzenesulfonamide **6h**

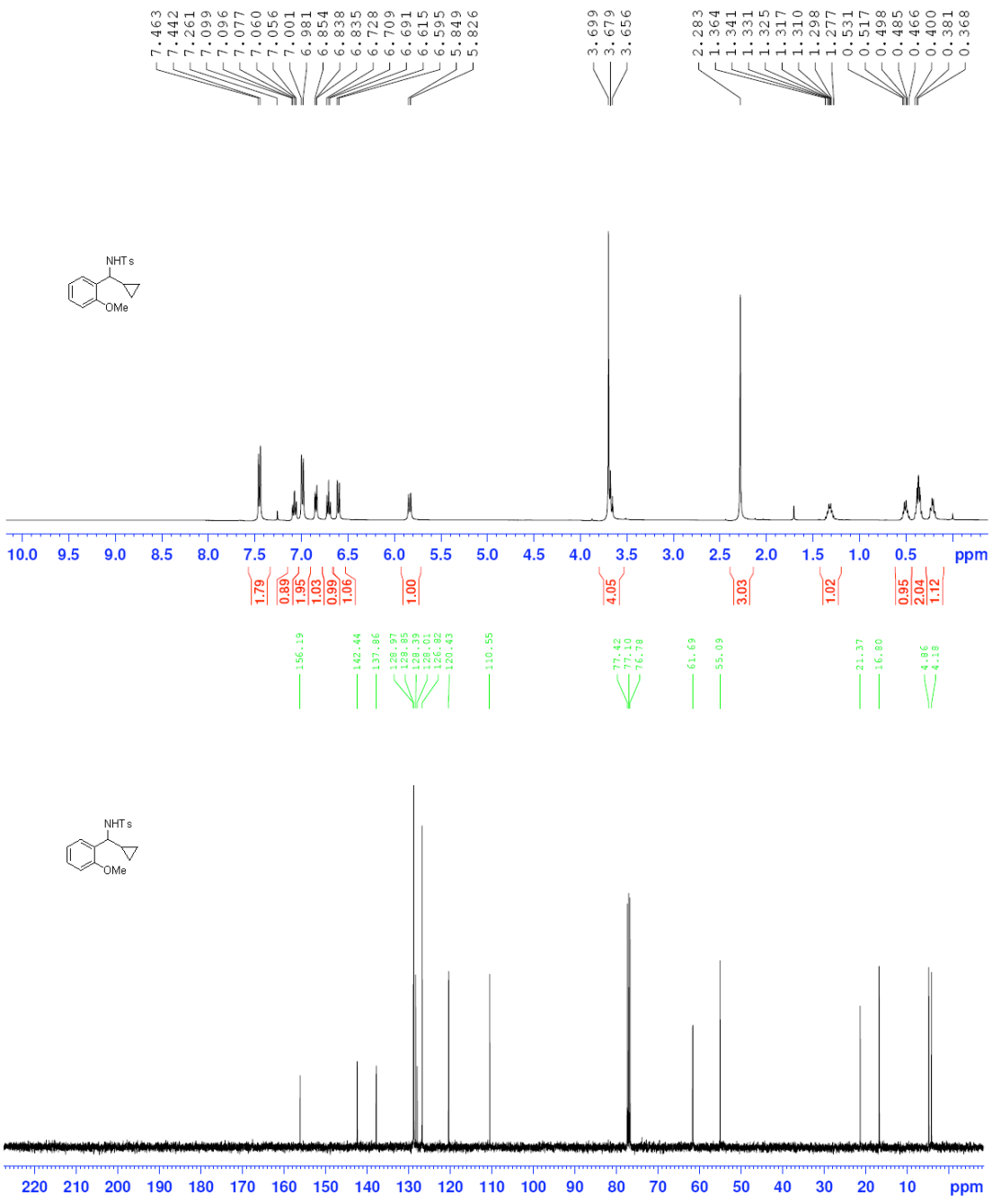


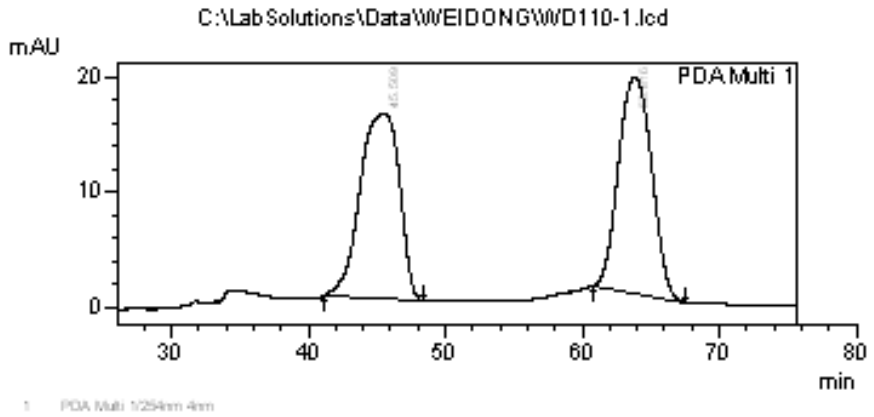
Figure S31. HPLC Spectrum of Racemic **1a**

1/19/2008 14:58:12 1 / 1

==== Shimadzu LCsolution Analysis Report ====

C:\LabSolutions\Data\WEIDONG\WD110-1.lcd
WD002 racemic SM
OD-H ipa-hex 99:1, 0.5 ml/min

<Chromatogram>



PeakTable

PDA Ch1 254nm 4nm

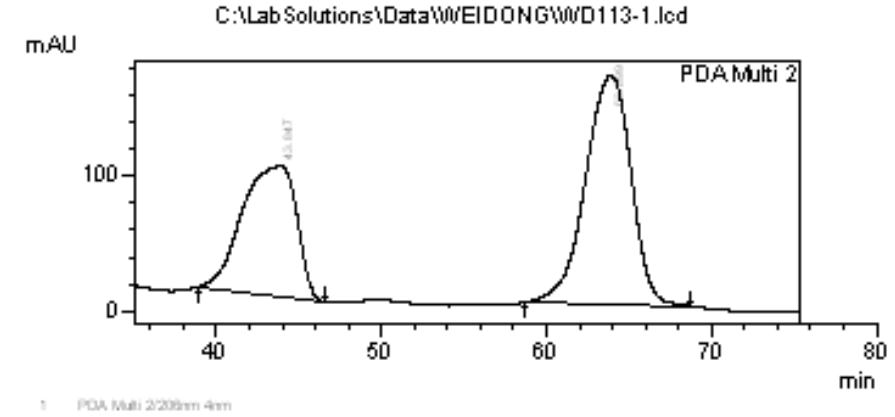
Peak#	Ret. Time	Area	Height	Area %	Height %
1	45.509	3224473	14043	50.329	44.014
2	63.814	3184310	17821	49.671	55.986
Total		6410783	31864	100.000	100.000

Figure S32. HPLC Spectrum of Chiral **1a**

==== Shimadzu LCsolution Analysis Report ====

C:\LabSolutions\Data\WEIDONG\WD113-1.lcd
WD002 Chiral
SM
OD-H ipa-hex 99:1, 0.5 ml/min

<Chromatogram>



1 PDA Multi 2/208nm 4nm

PeakTable

PDA Ch2 208nm 4nm

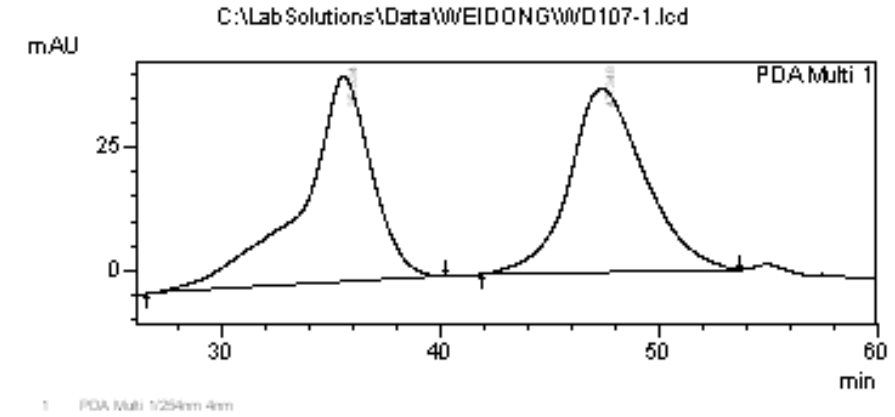
Peak#	Ret. Time	Area	Height	Area %	Height %
1	43.847	21954837	94784	40.260	36.350
2	63.899	32578194	165973	59.740	63.650
Total		54533031	260757	100.000	100.000

Figure S33. HPLC Spectrum of Racemic **3a** obtained from Racemic **1a**

==== Shimadzu LCsolution Analysis Report ====

C:\LabSolutions\Data\WEIDONG\WD107-1.lcd
WD001 racemic product
OD-H ipa-hex 98:2, 1.0 ml/min

<Chromatogram>



1 PDA Multi 1/254nm 4nm

PeakTable

PDA Ch1 254nm 4nm

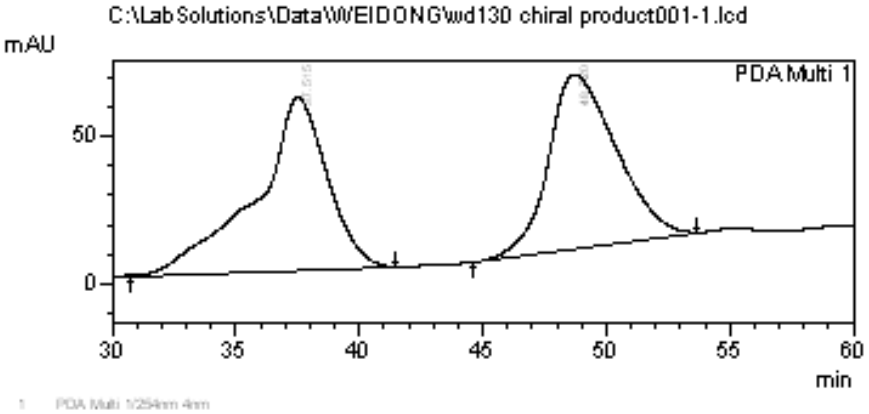
Peak#	Ret. Time	Area	Height	Area %	Height %
1	35.534	9480045	42001	51.320	52.920
2	47.348	8992200	37366	48.680	47.080
Total		18472245	79367	100.000	100.000

Figure S34. HPLC Spectrum of Racemic **3a** obtained from Chiral **1a**

==== Shimadzu LCsolution Analysis Report ====

C:\LabSolutions\Data\WEIDONG\wd130 chiral product001-1.lcd
WD10 Chiral
PD
OD-H ipa-hex 98:2, 0.5 ml/min

<Chromatogram>



1 PDA Multi 1/254nm 4nm

PeakTable

PDA Ch1 254nm 4nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	37.515	11970763	58824	51.362	49.837
2	48.720	11335866	59209	48.638	50.163
Total		23306630	118033	100.000	100.000

Figure S35. ^{1}H NMR Spectrum of AuCl/AgOTf-Catalyzed Reaction of **6a** with **2b**

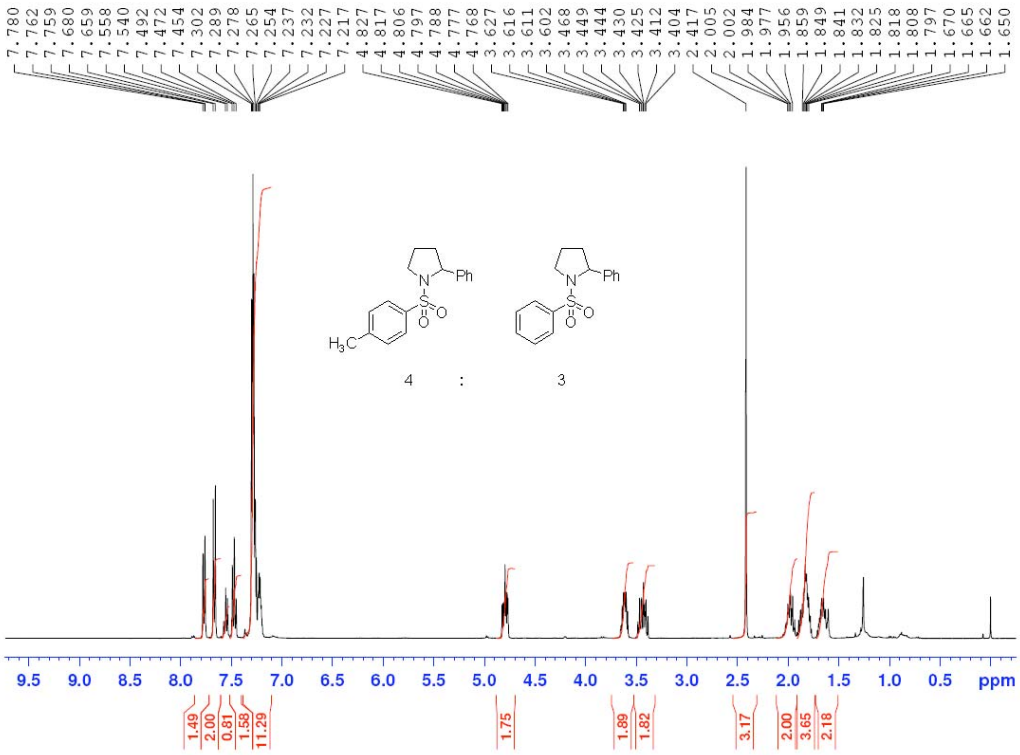


Figure S36. ^{1}H NMR Spectrum of TfOH-Catalyzed Reaction of **6a** with **2b**

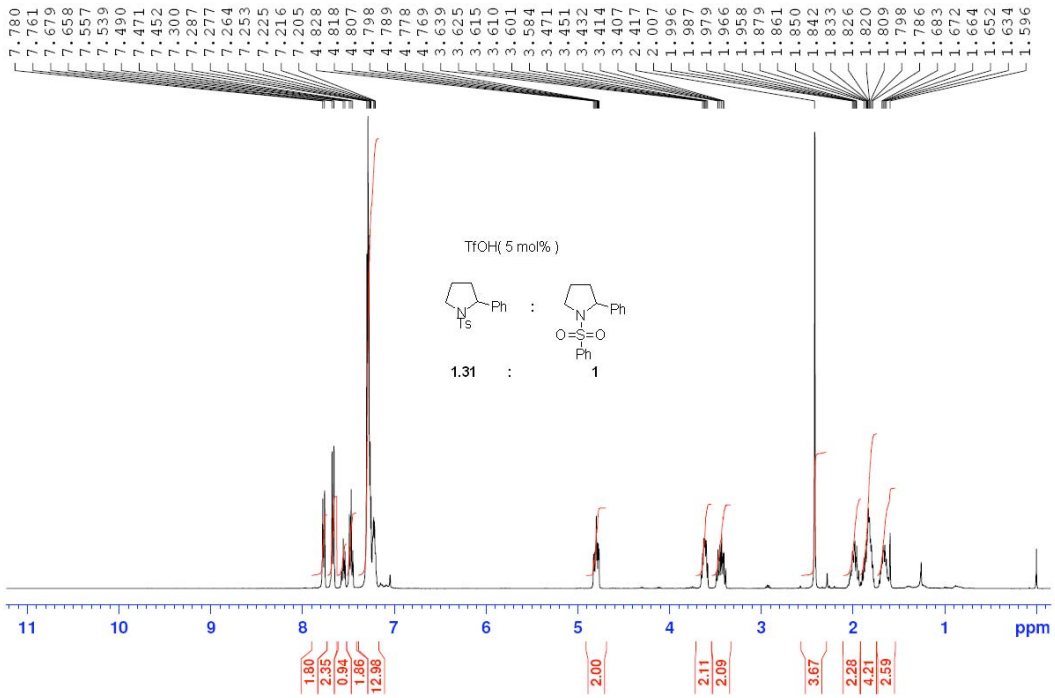
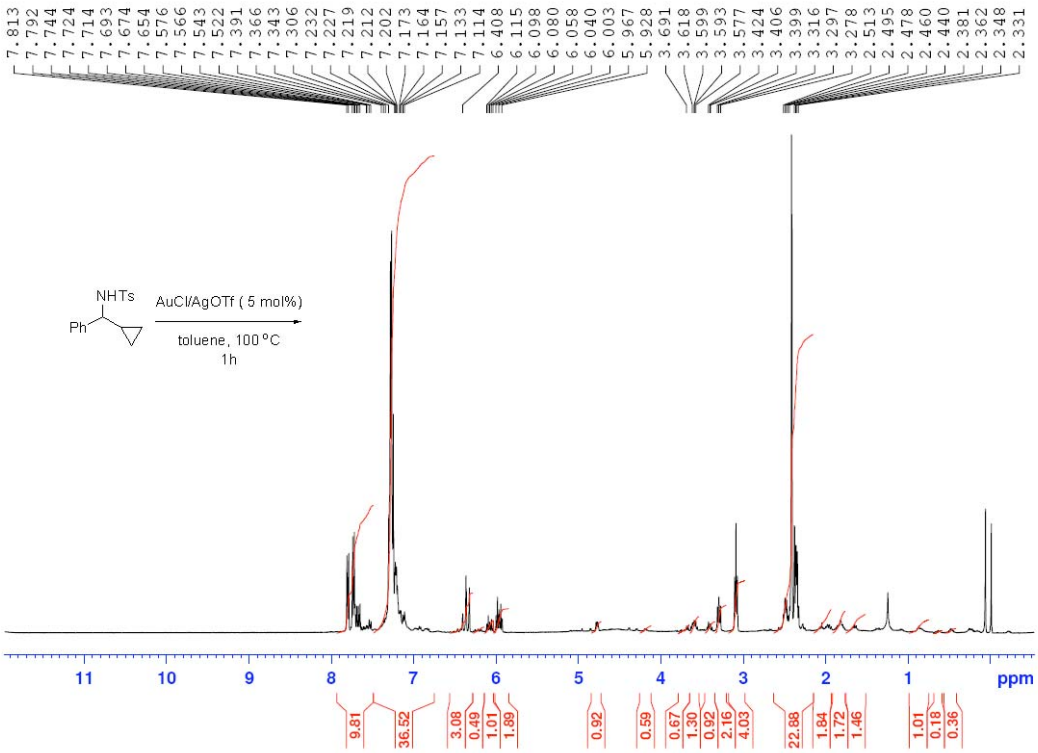


Figure S37. Crude ^{1}H NMR Spectrum of the Products obtained from AuCl/AgOTf-Catalyzed Reaction of **6a** after 1h



References

[S1] M. Shi, L.-P. Liu, J. Tang, *Org. Lett.* **2006**, *8*, 4043-4046.
[S2] B. Schlummer, J. F. Hartwig, *Org. Lett.* **2002**, *4*, 1471-1474.
[S3] Y. Tamaru, M. Hojo, S. Kawamura, Z. Yoshida, J. *Org. Chem.* **1986**, *51*, 4089-4090.
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[S5] J. M. Andrés, I. Herráiz-Sierra, R. Pedrosa, A. Pérez-Encoba, *Eur. J. Org. Chem.* **2000**, *9*, 1719-1726.
[S6] Y. Chen, M. Shi, *J. Org. Chem.* **2004**, *69*, 426-431.
[S7] M. Shi, Y. Chen, B. Xu, J. Tang, *Green Chem.* **2003**, *5*, 85-88.