

Figure SI-1. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

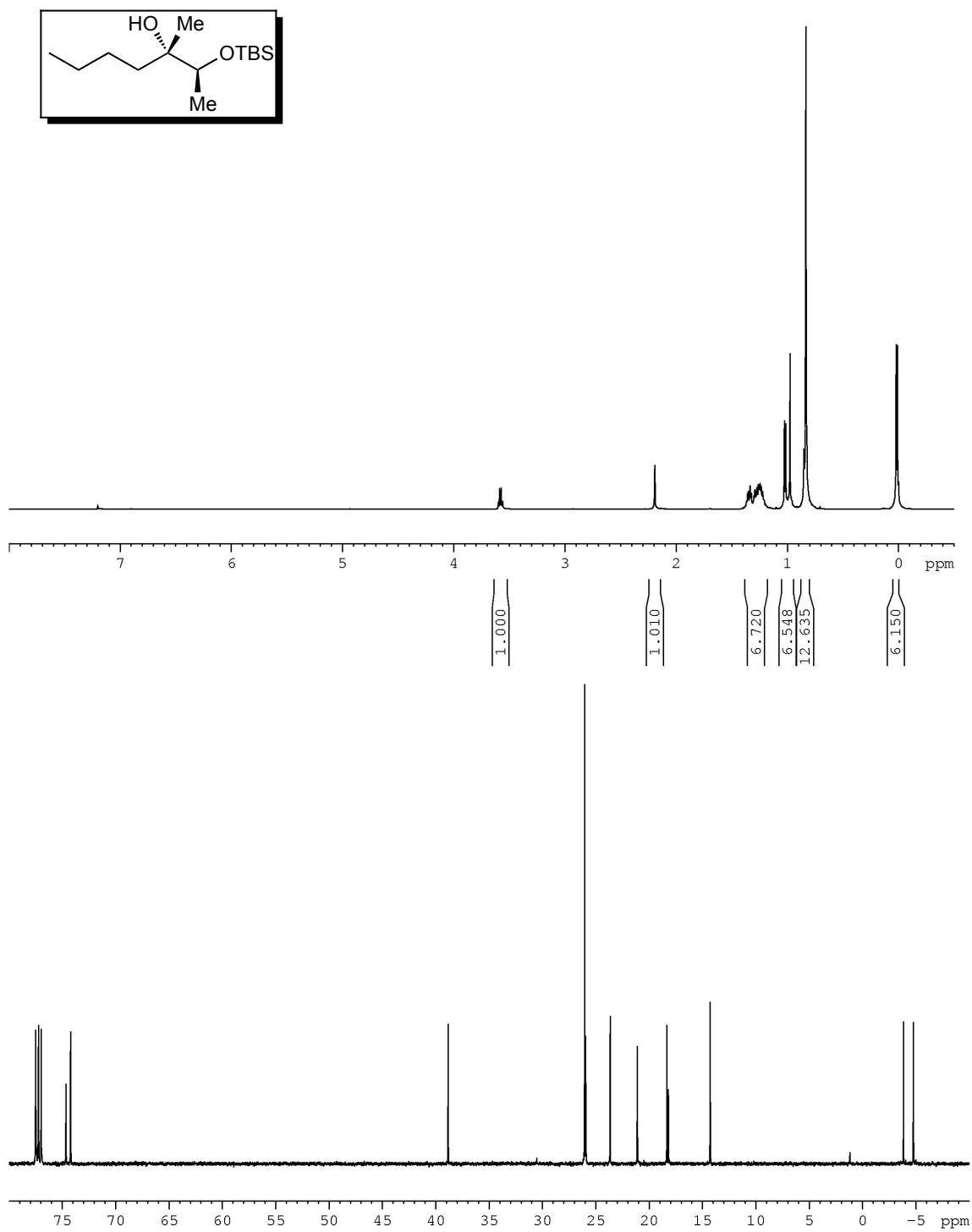


Figure SI-2. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

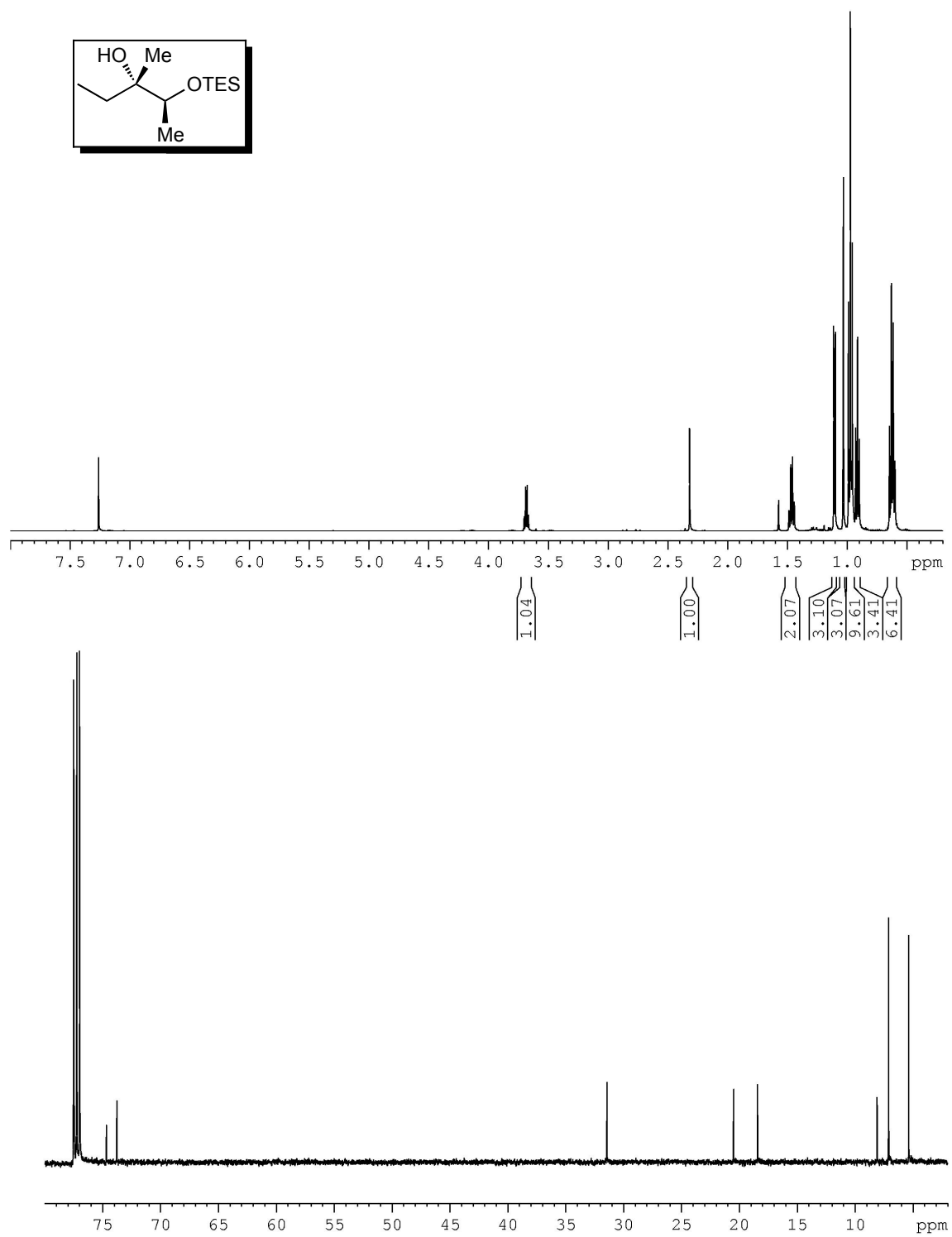


Figure SI-3. 300 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

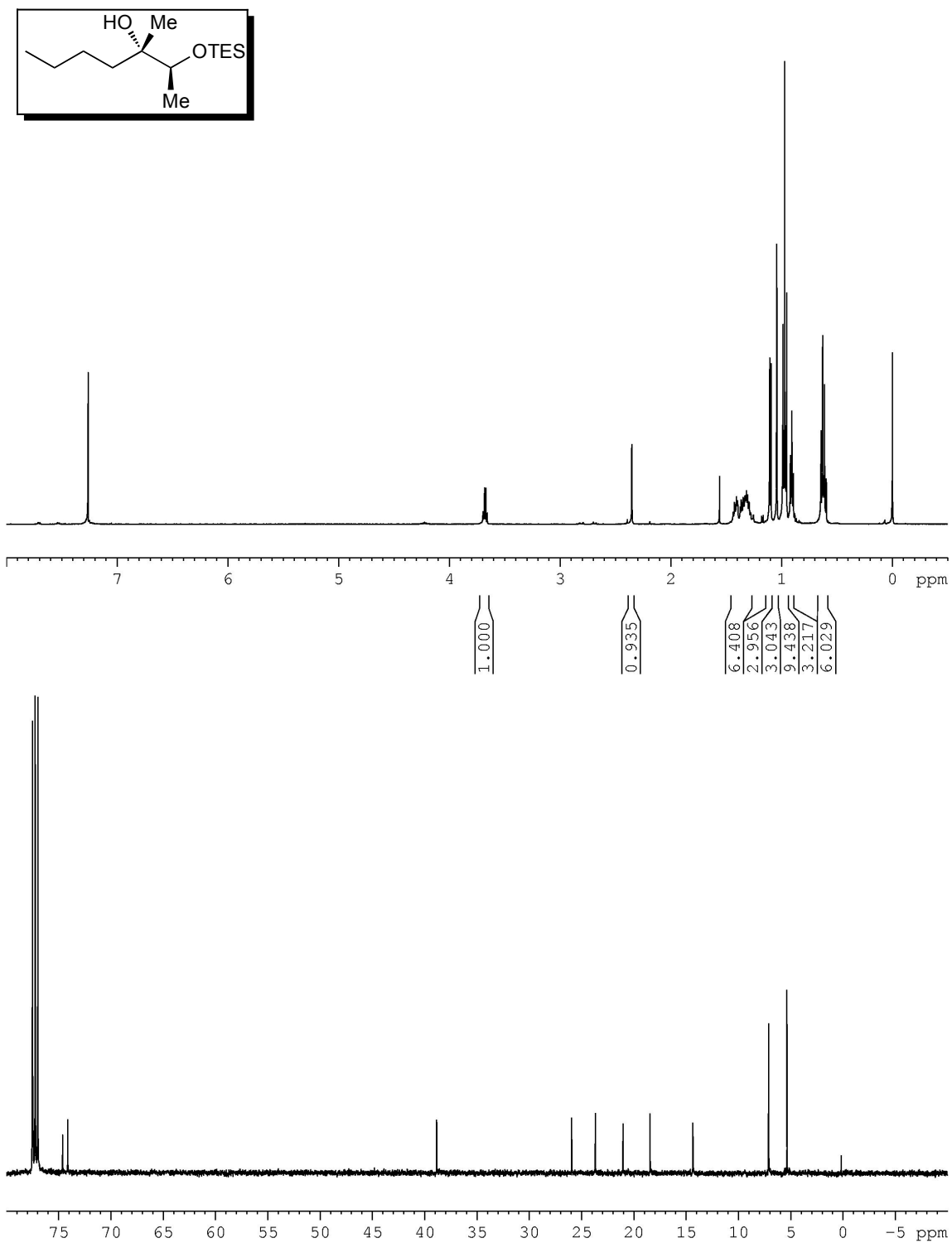


Figure SI-4. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

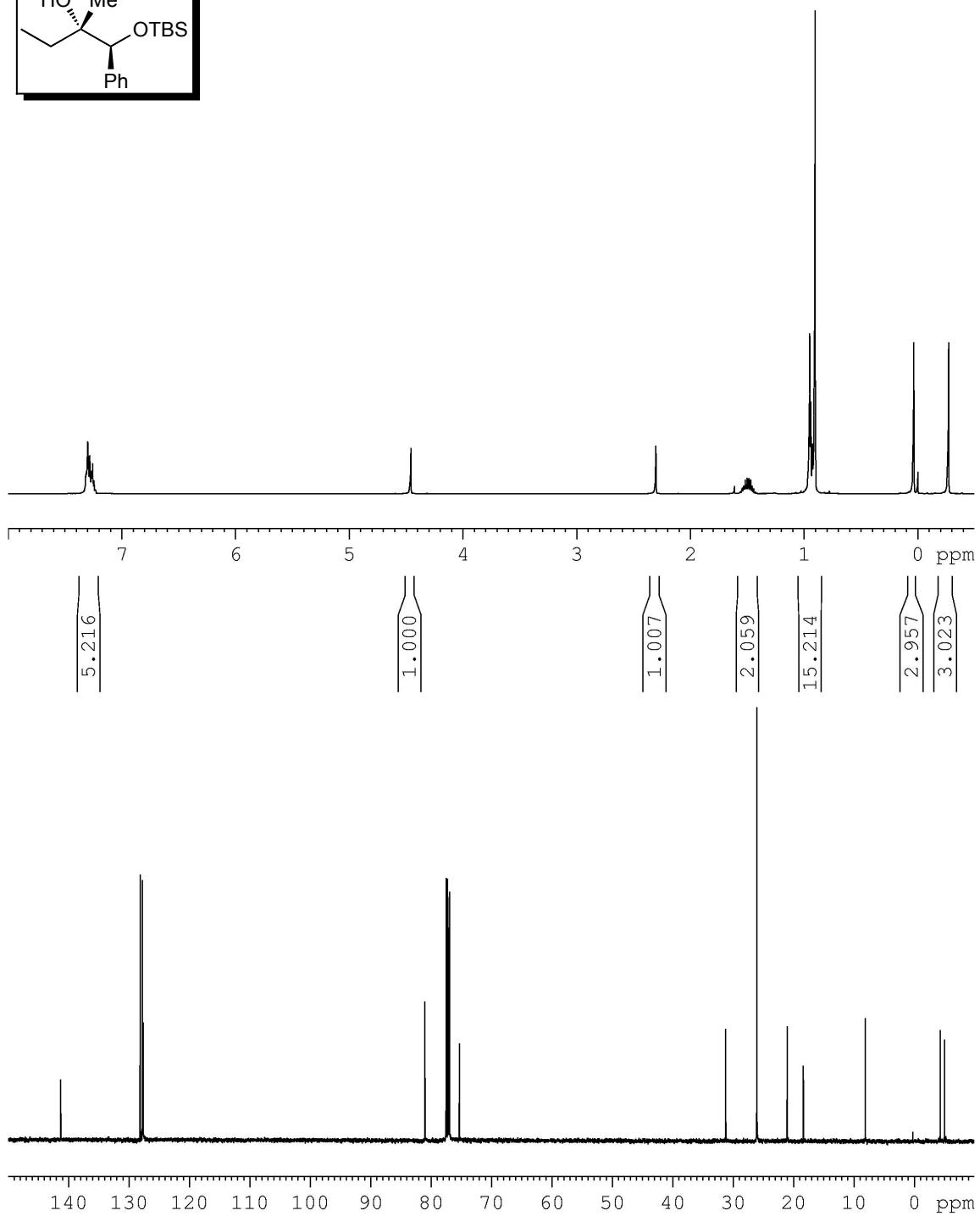
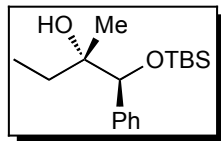


Figure SI-5. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

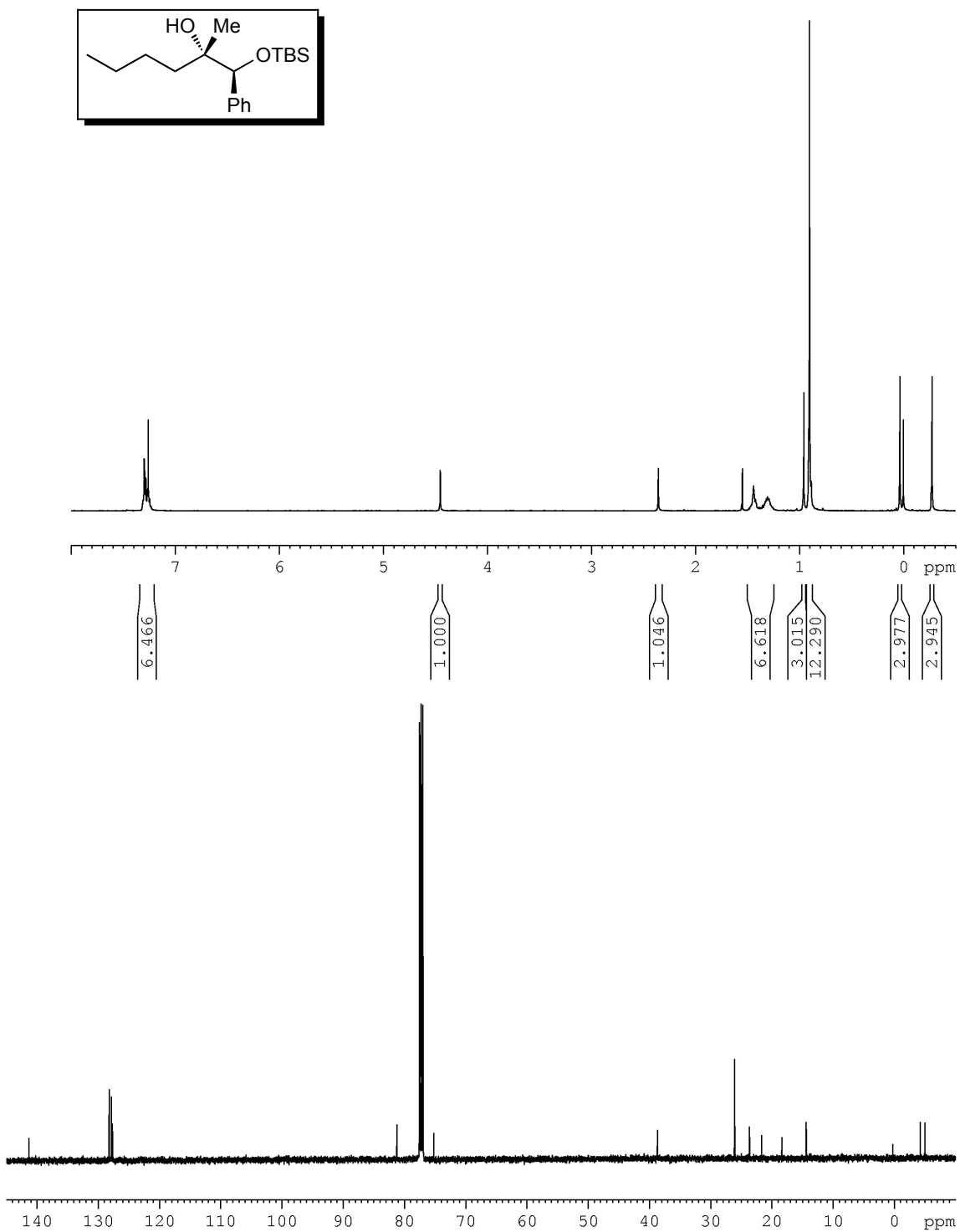


Figure SI-6. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

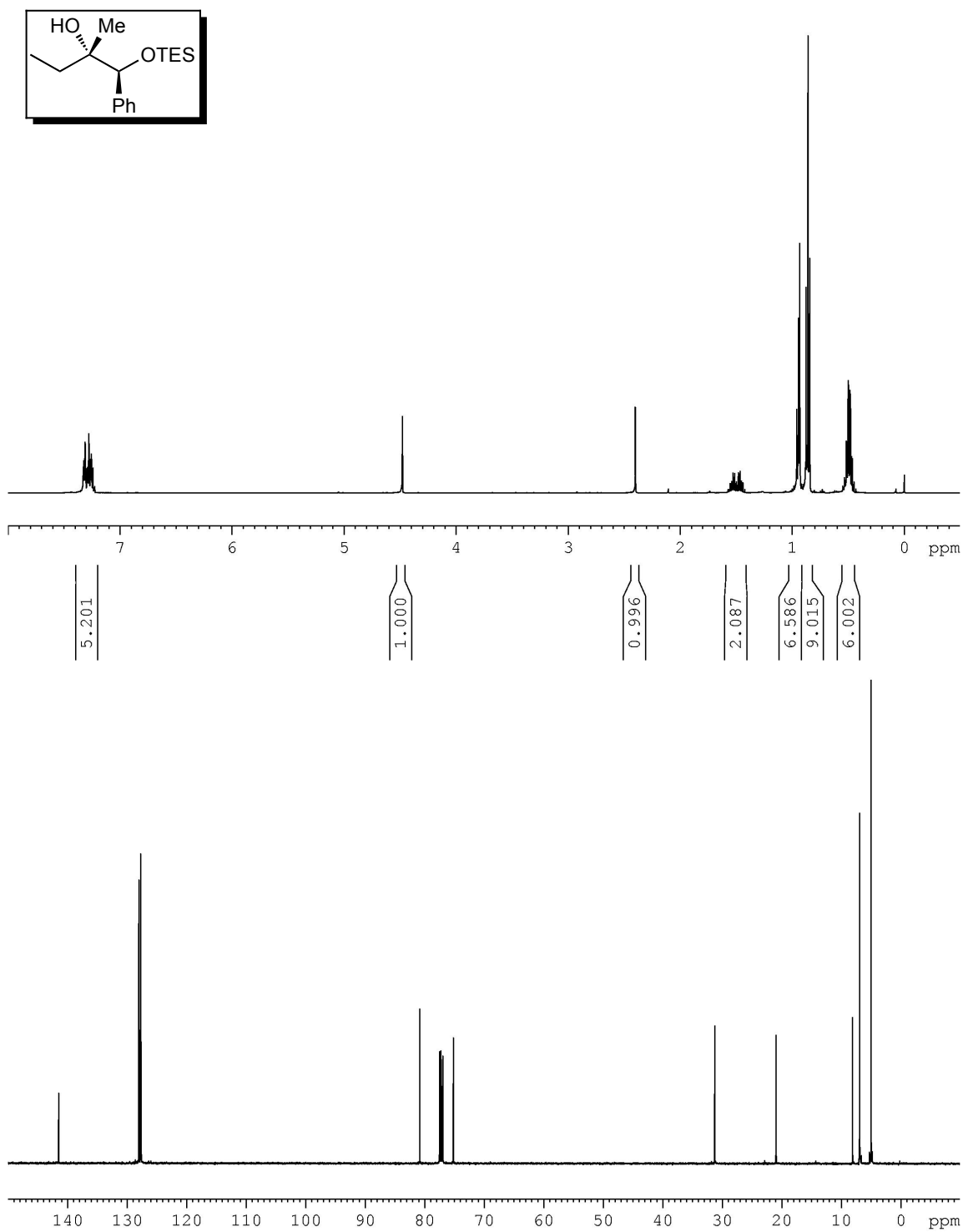


Figure SI-7. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

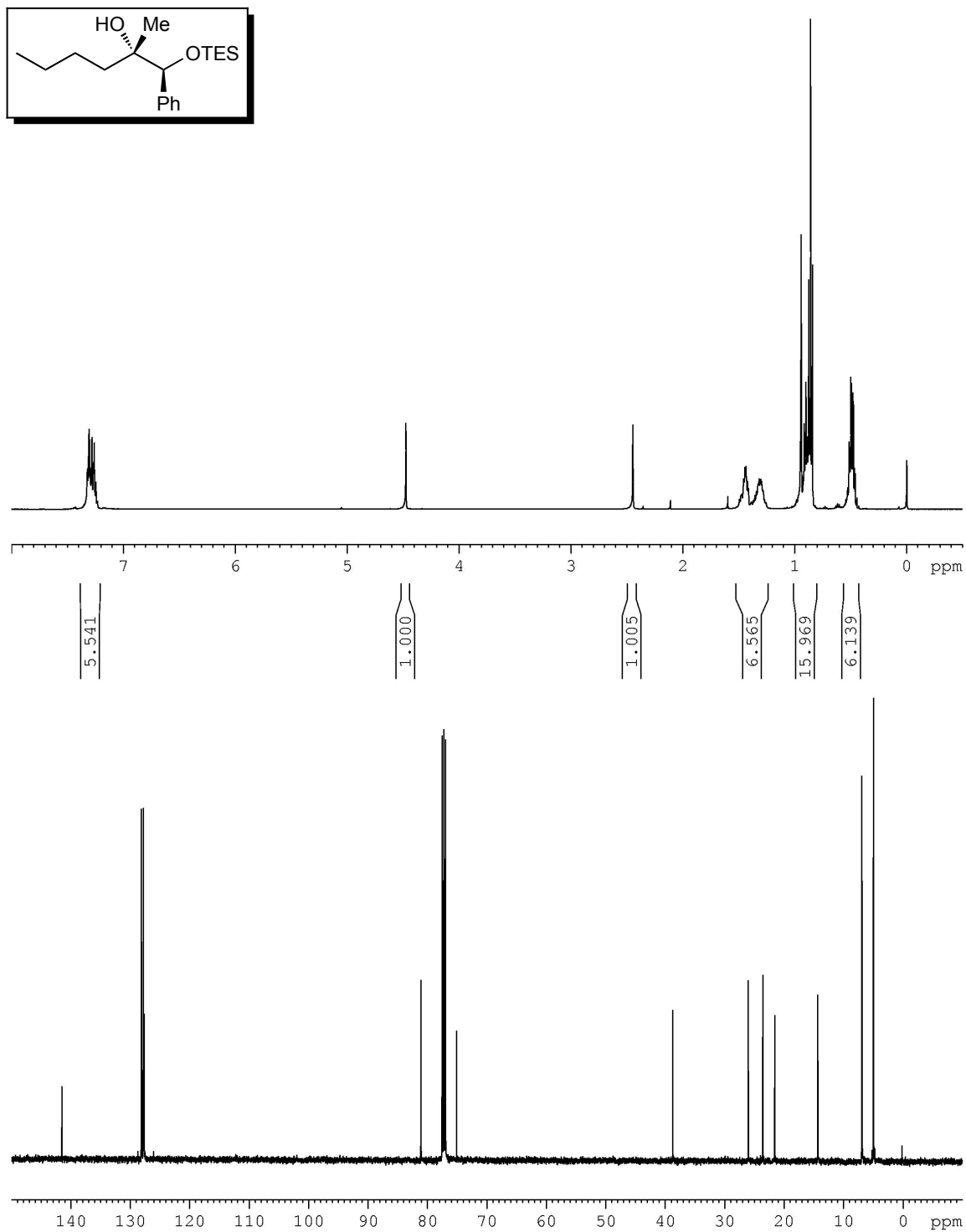


Figure SI-8. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

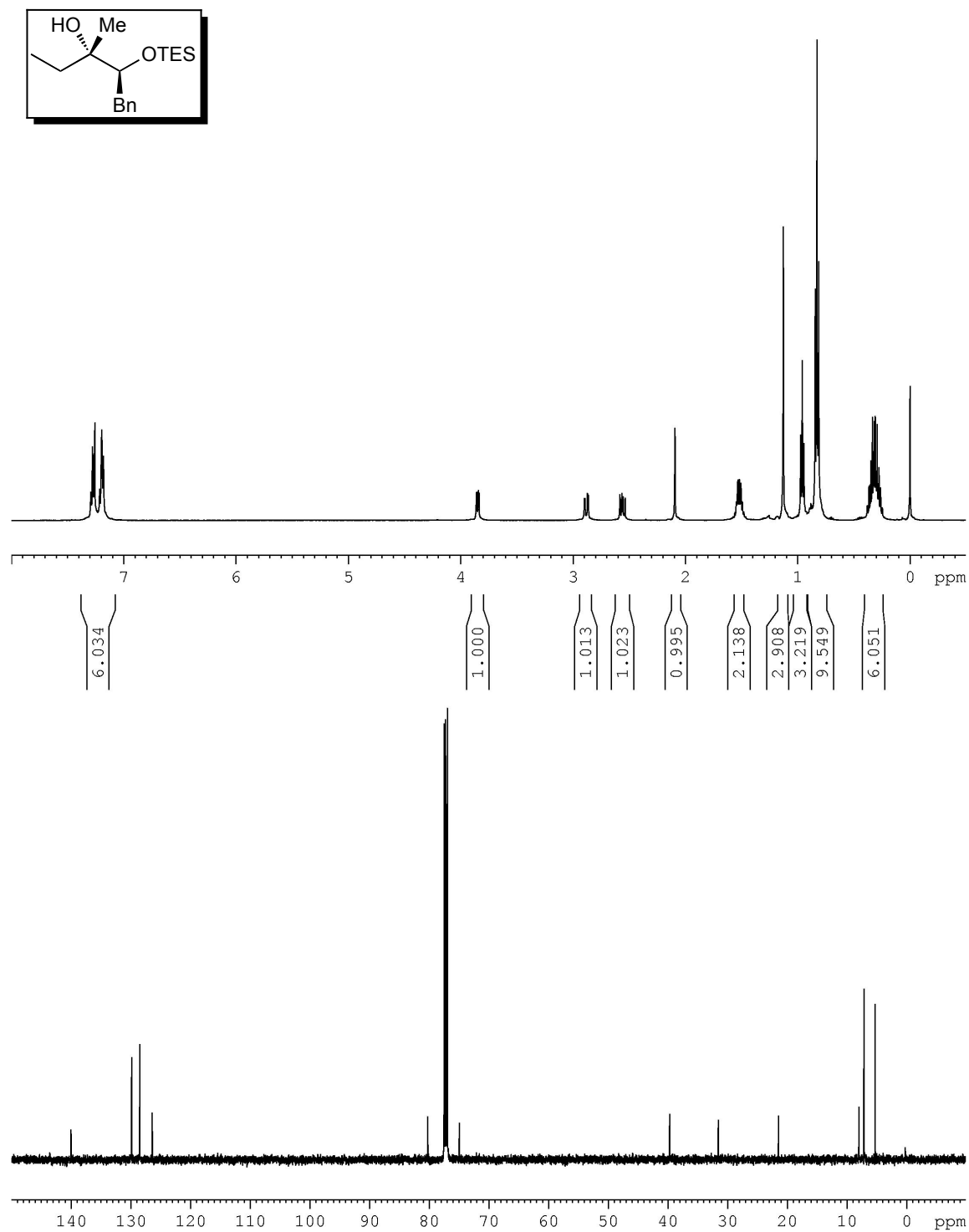


Figure SI-9. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

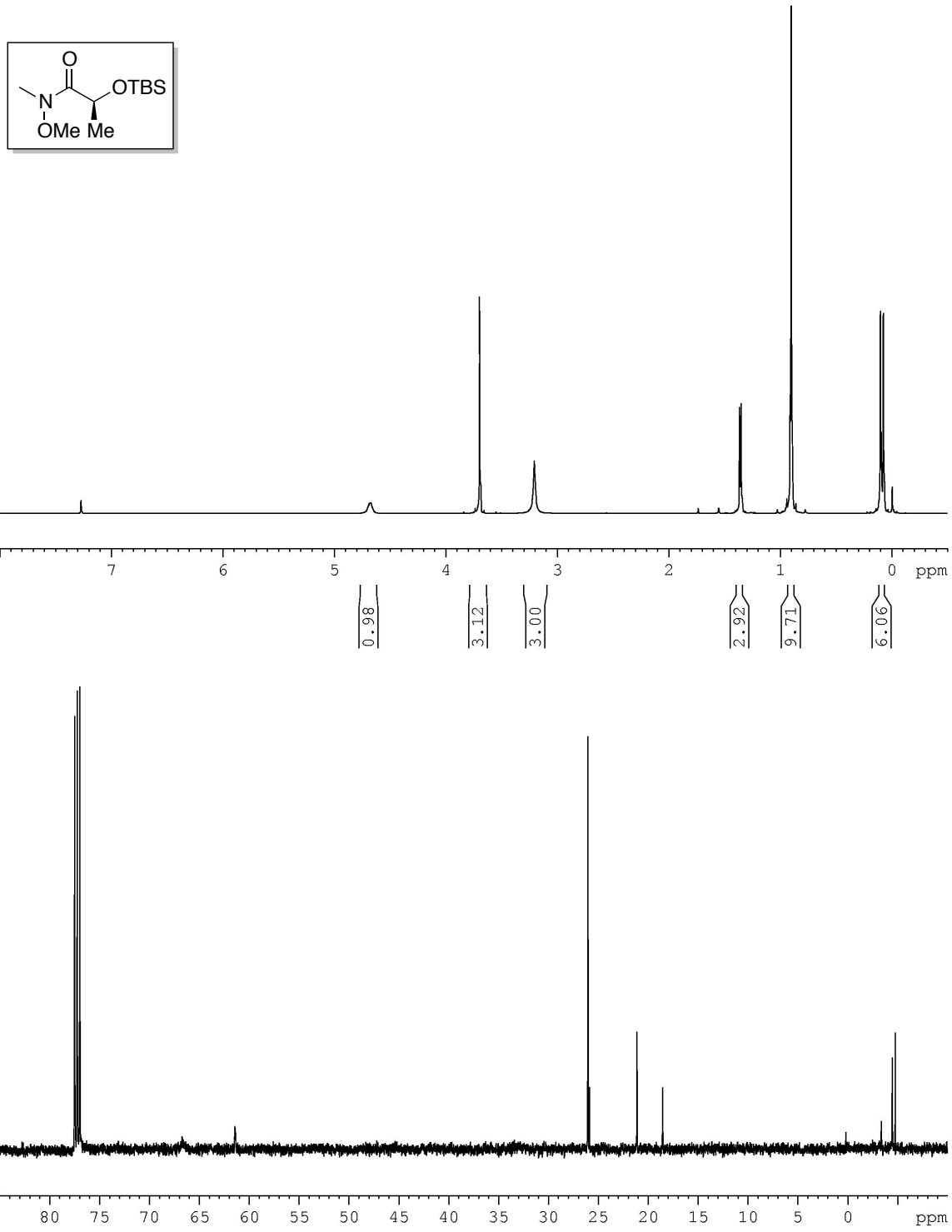


Figure SI-10. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

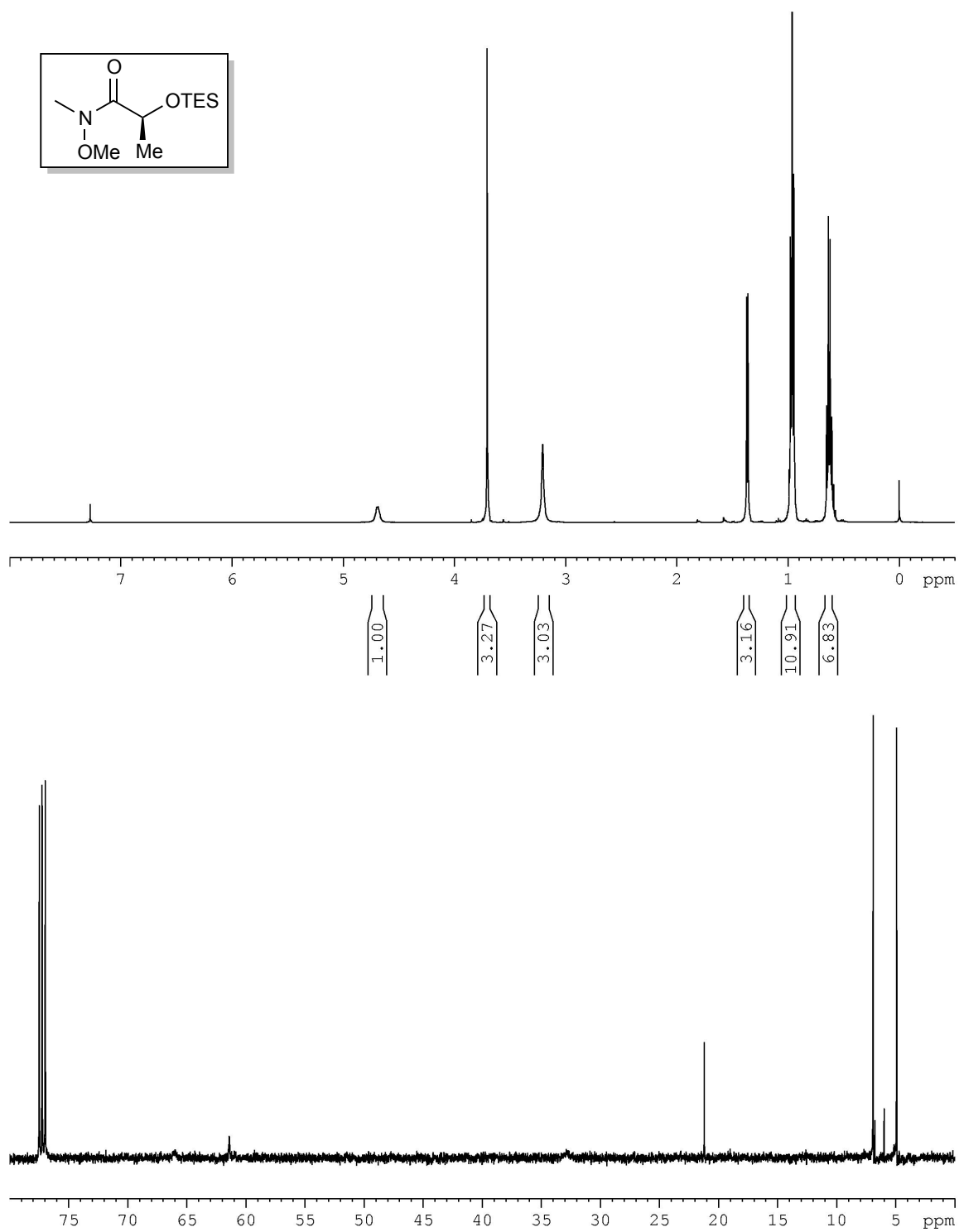


Figure SI-11. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

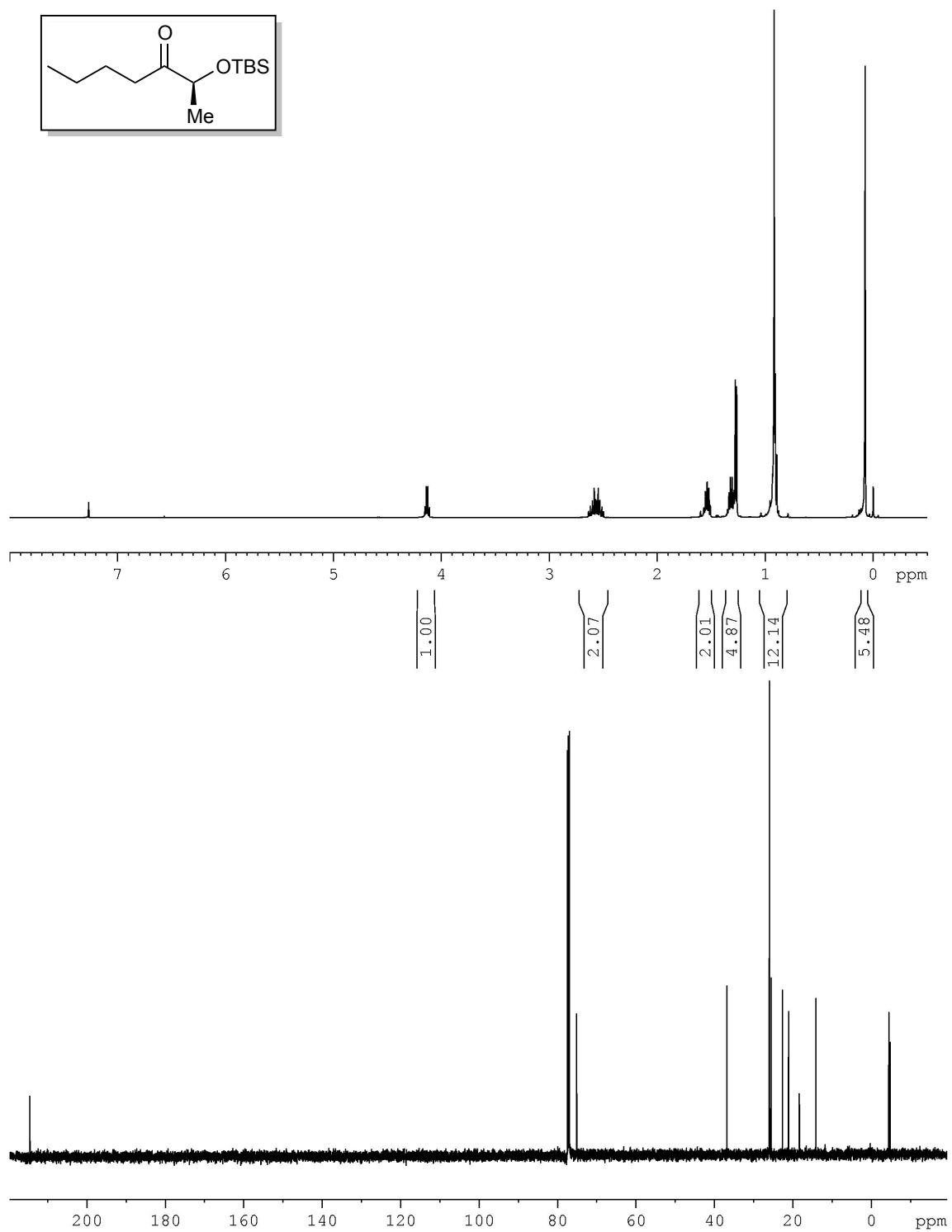


Figure SI-12. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

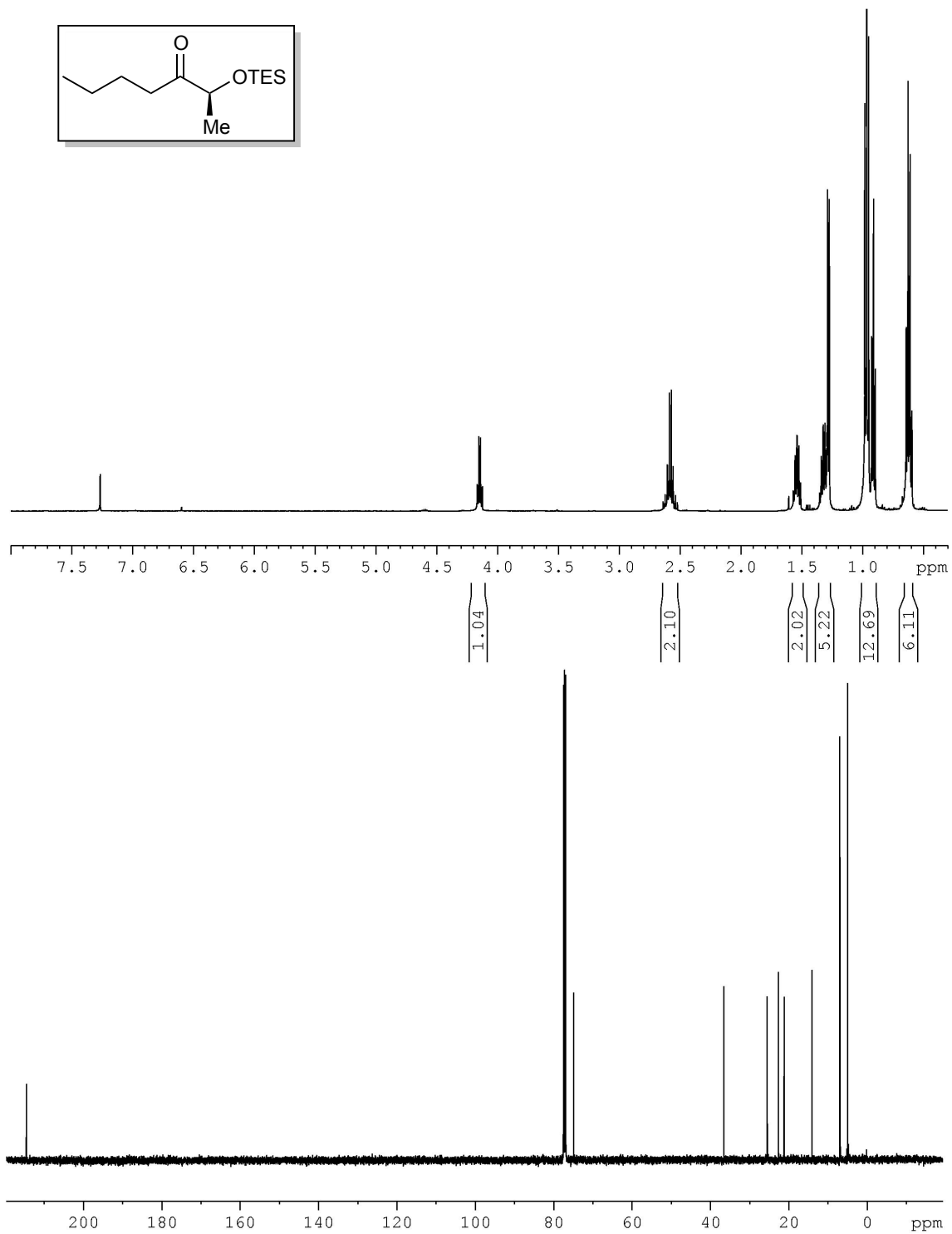


Figure SI-13. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

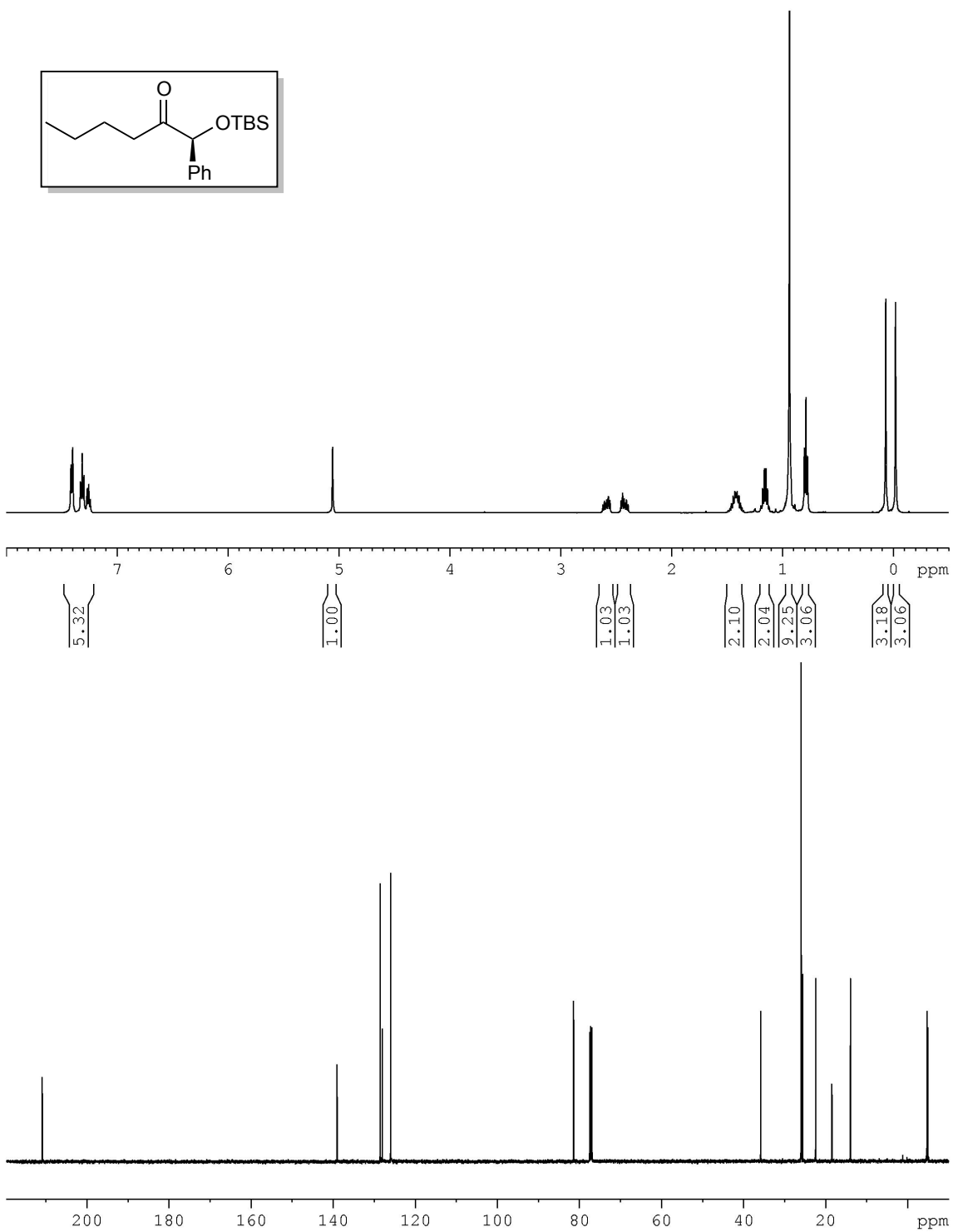


Figure SI-14. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

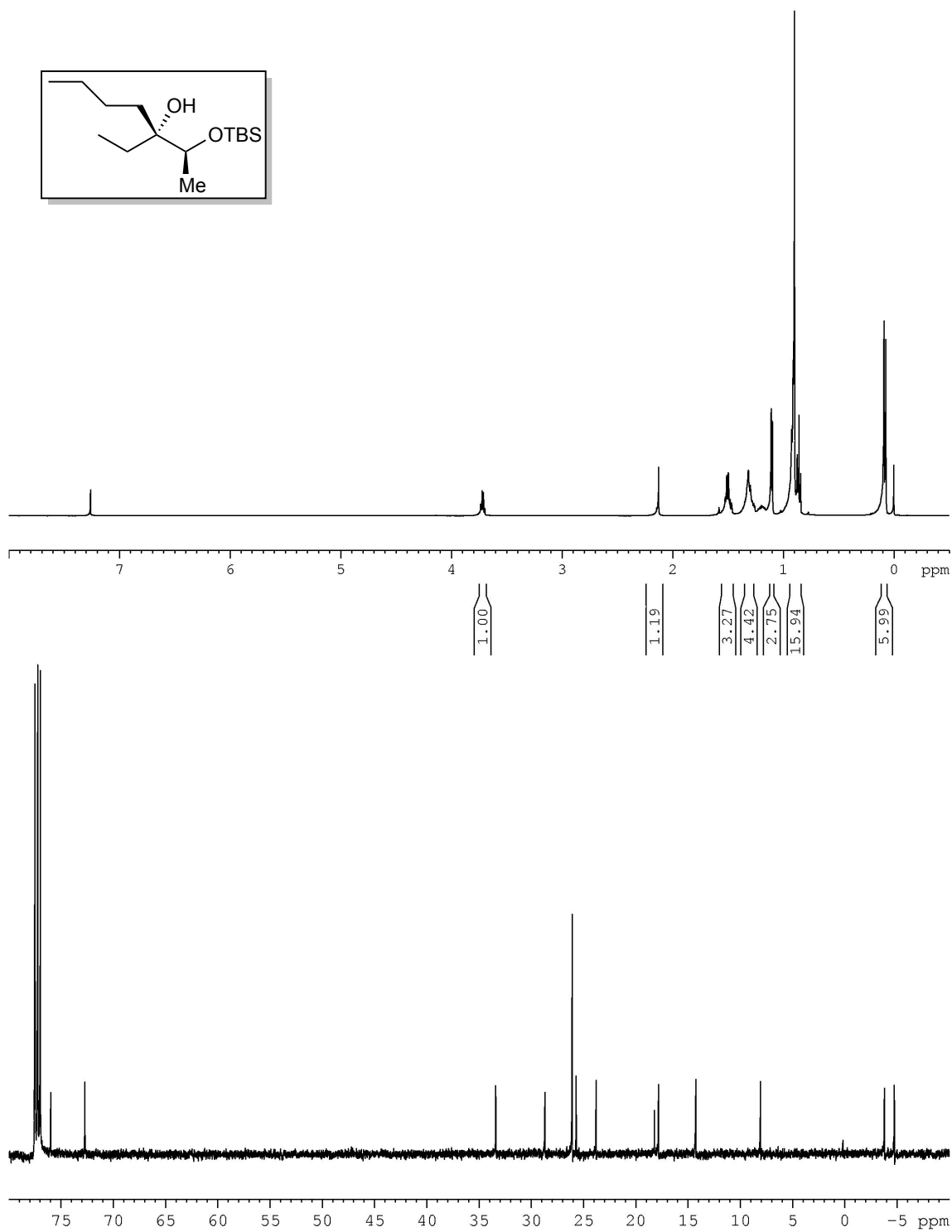


Figure SI-15. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

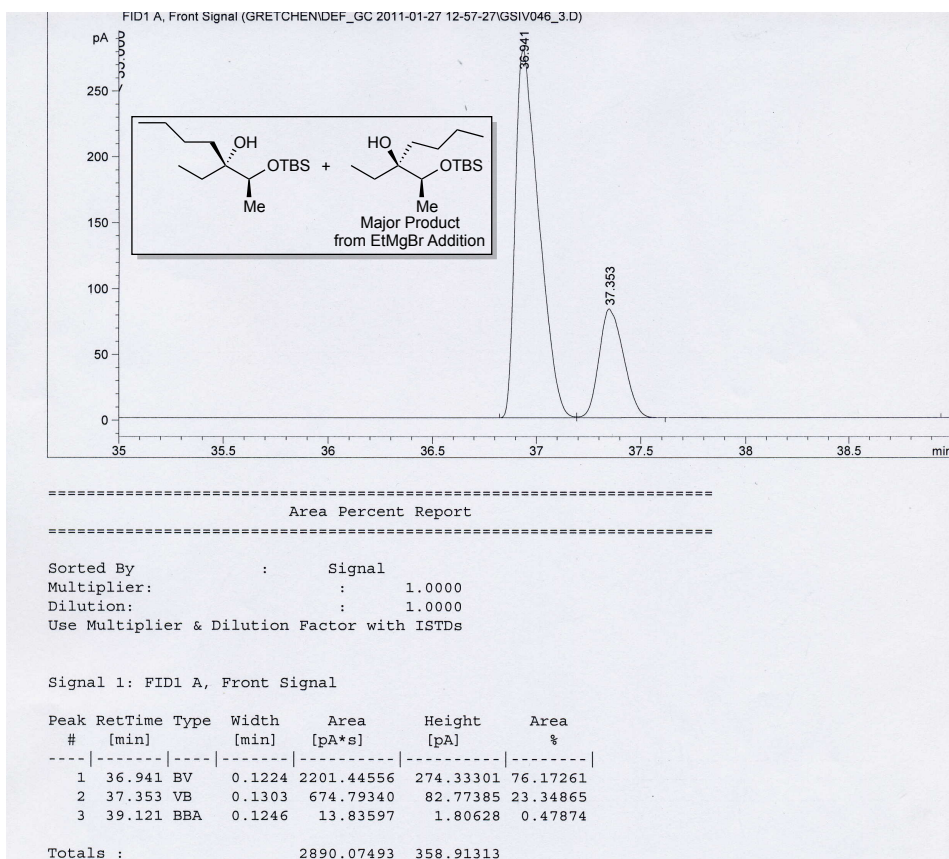
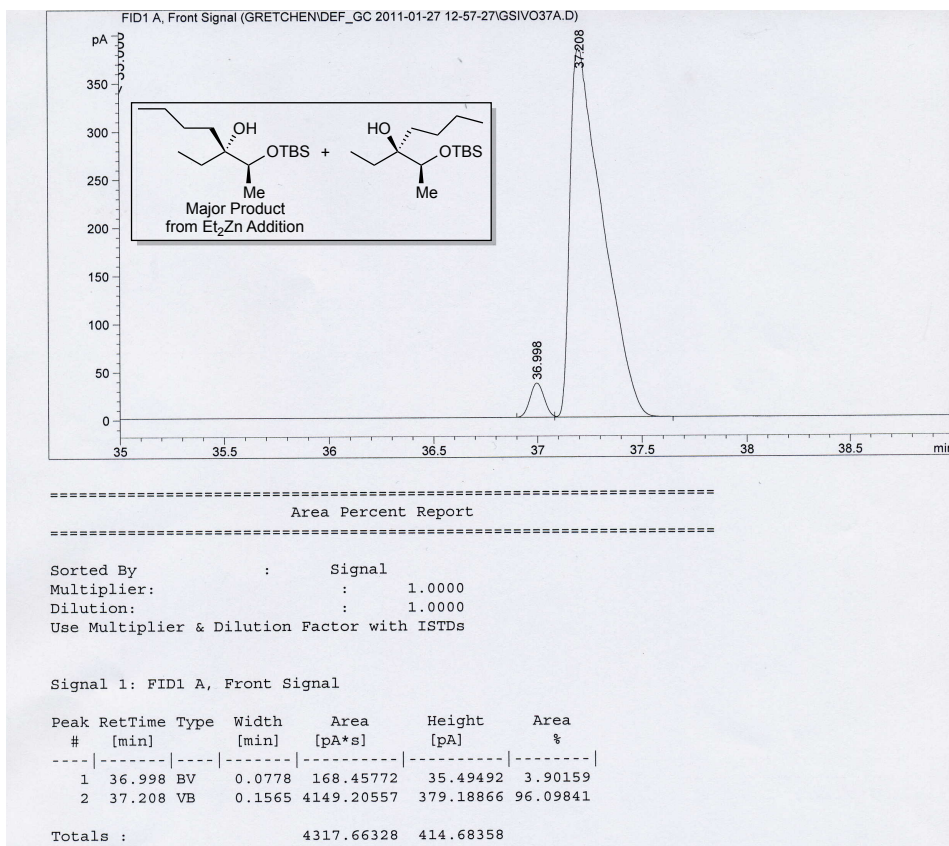


Figure SI-16. GC analysis of ethyl addition to butyl silyloxyketone.

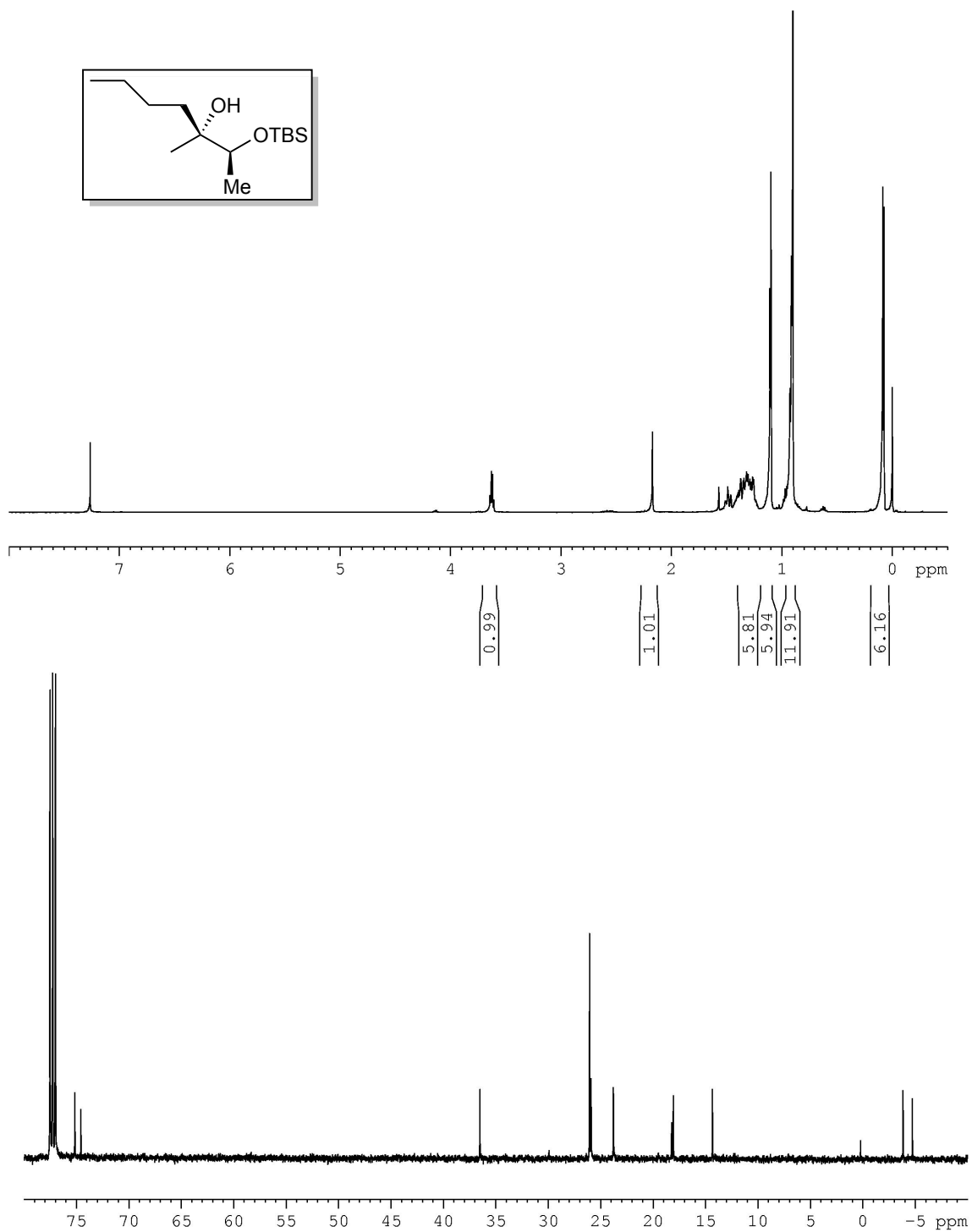


Figure SI-17. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

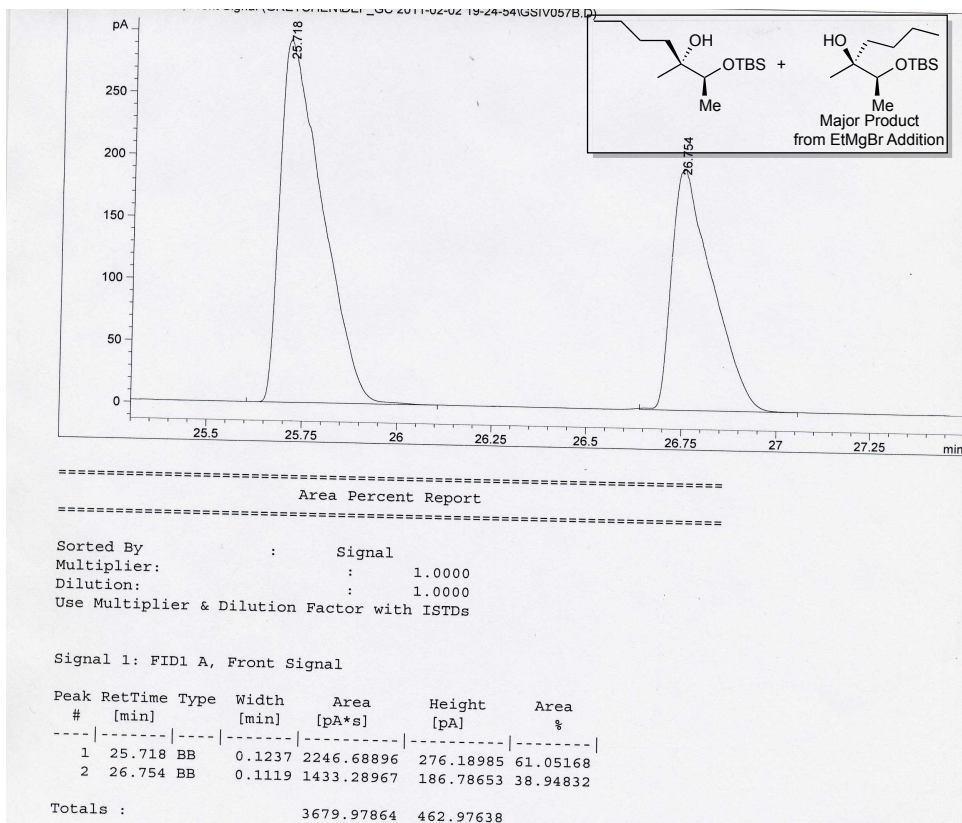
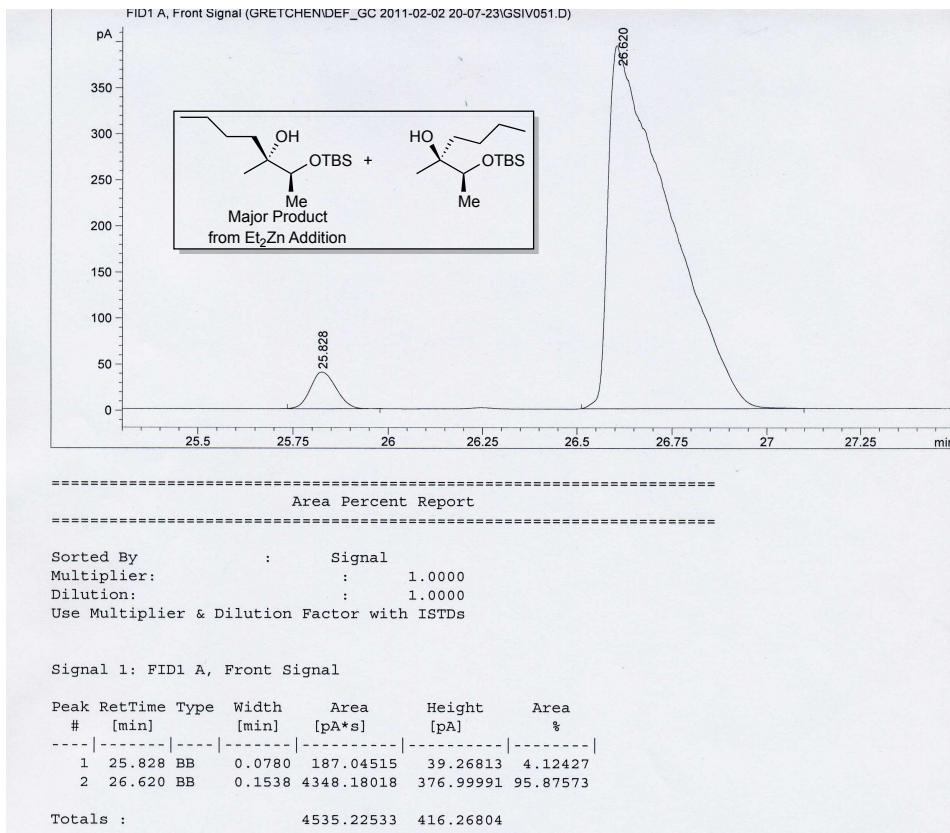


Figure SI-18. GC analysis of methyl addition to butyl silyloxyketone.

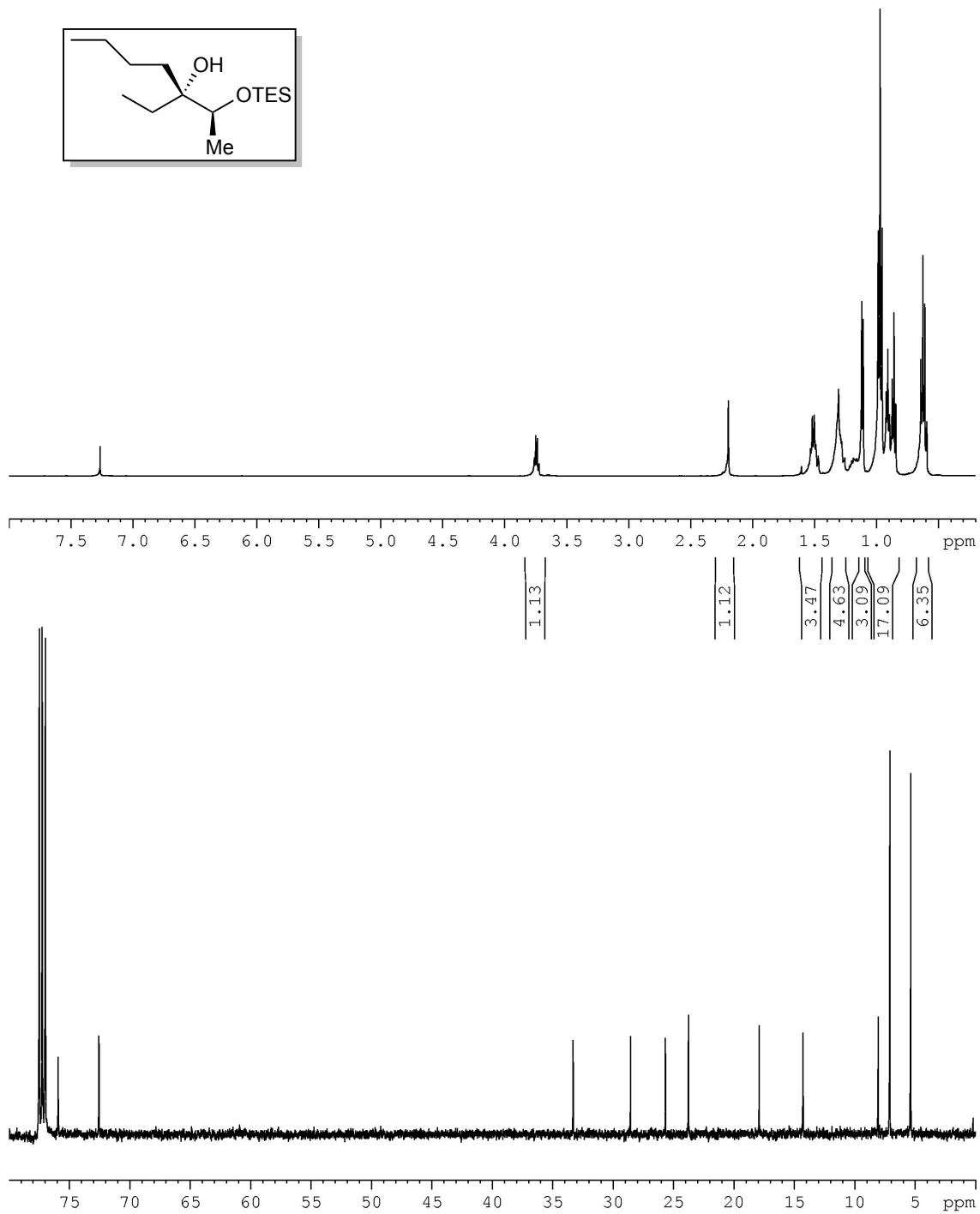


Figure SI-19. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

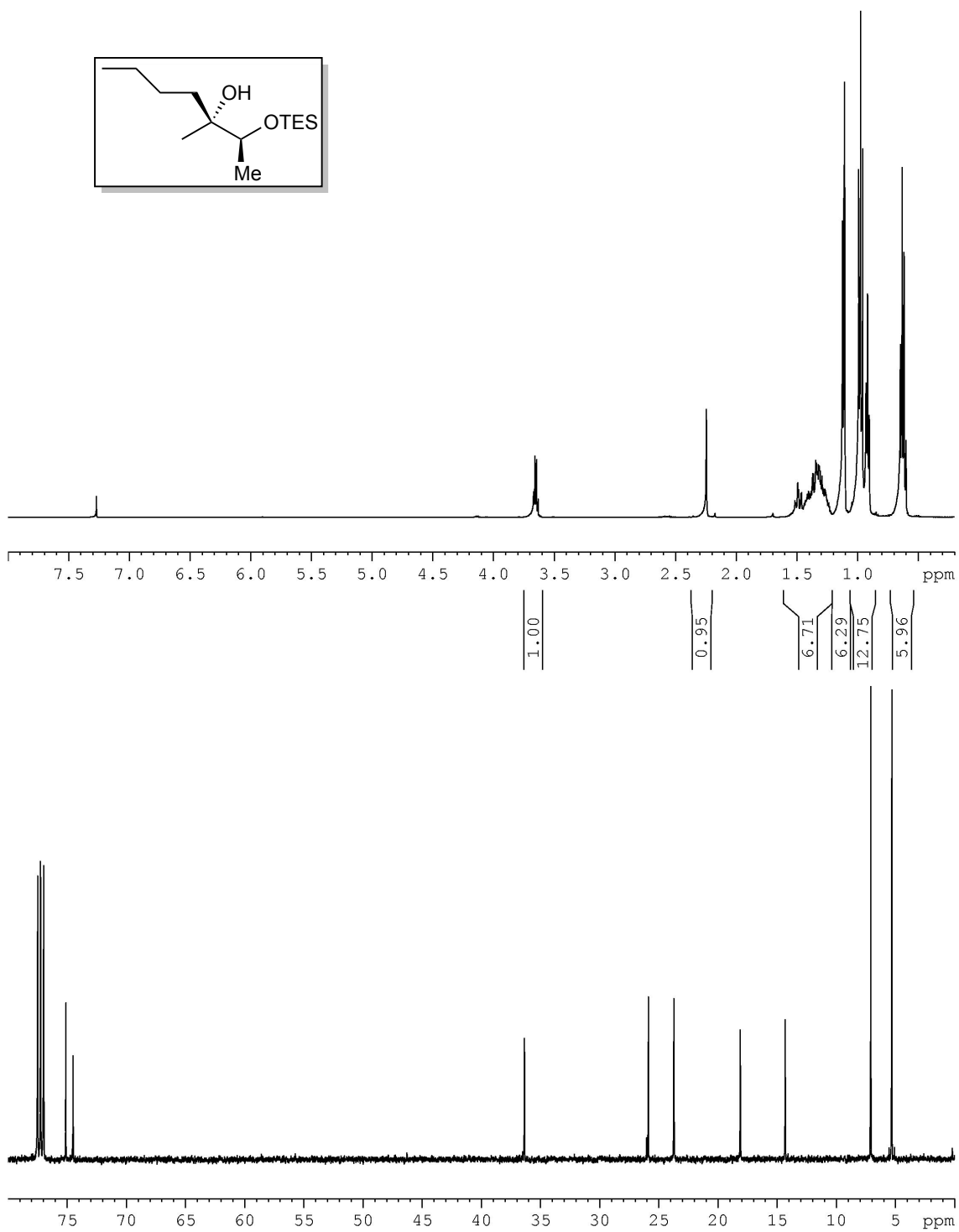


Figure SI-20. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

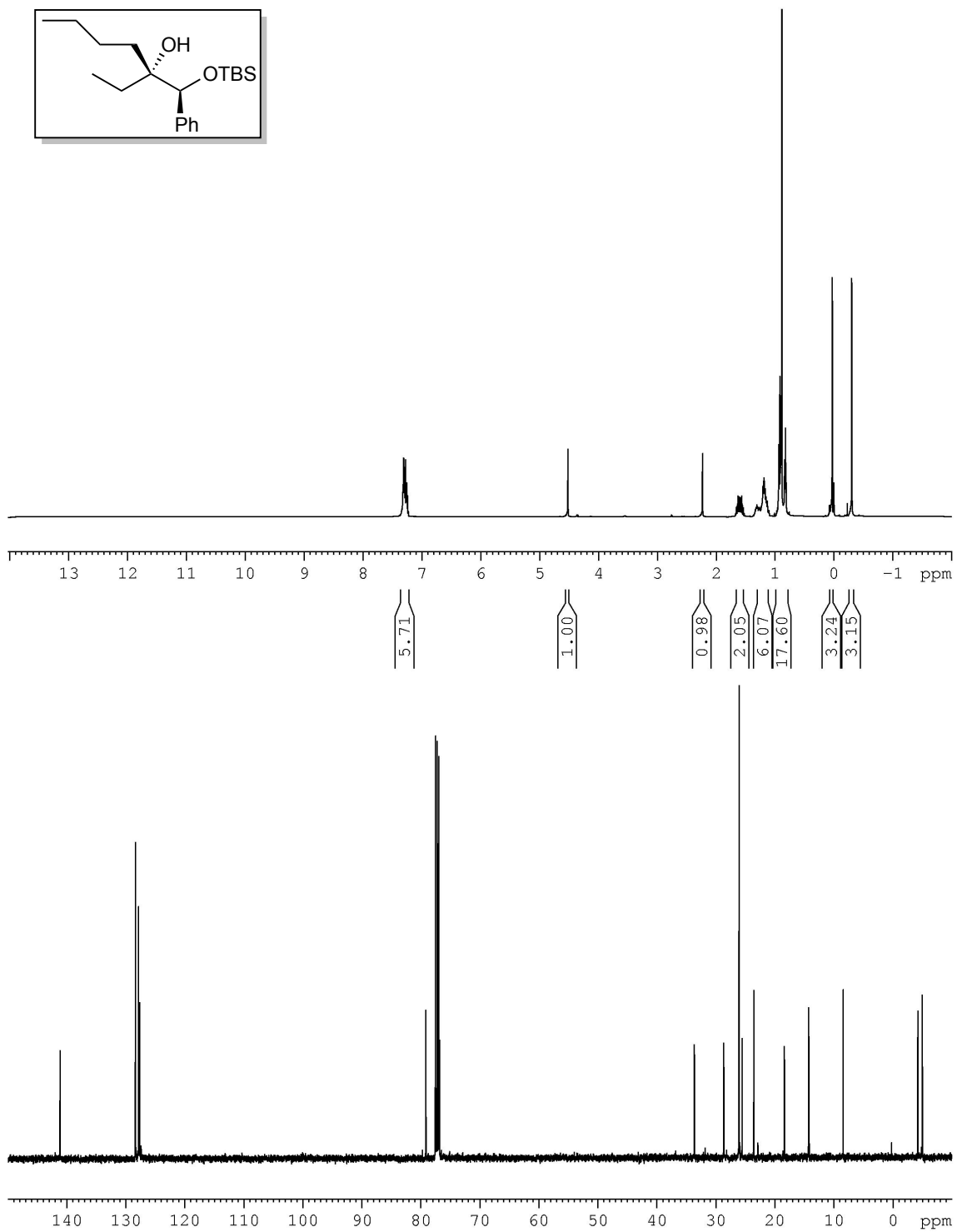


Figure SI-21. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

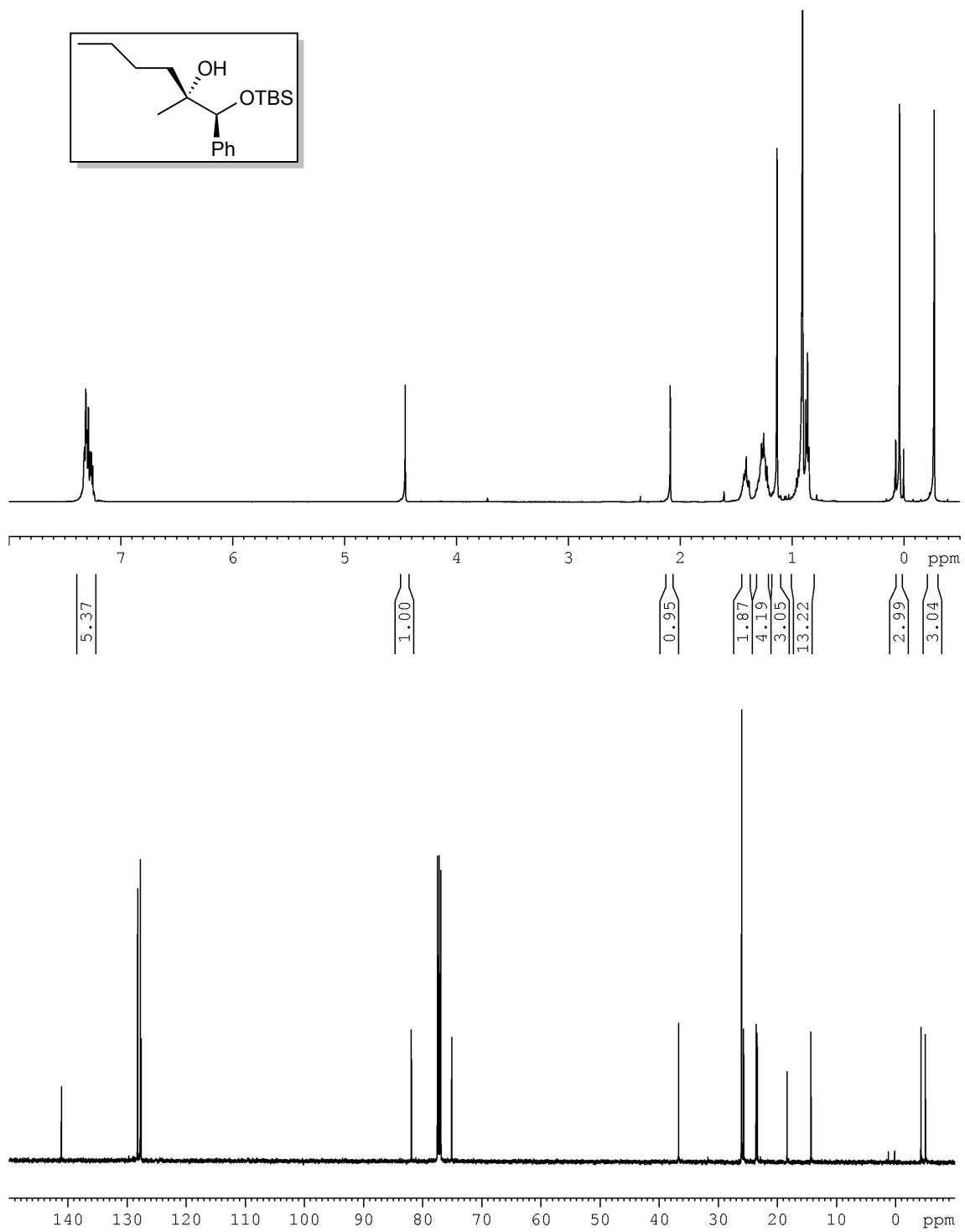


Figure SI-22. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

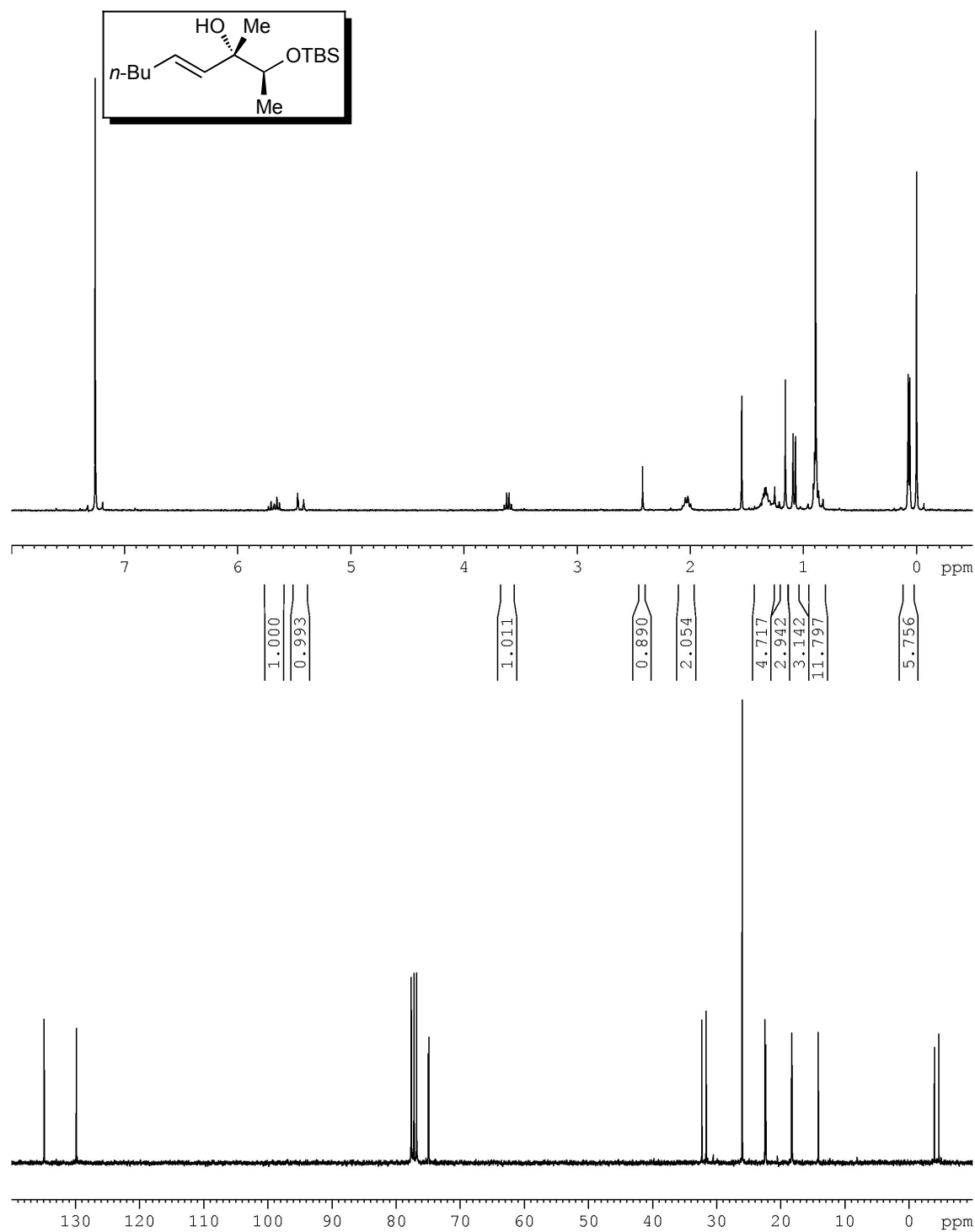


Figure SI-23. 300 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

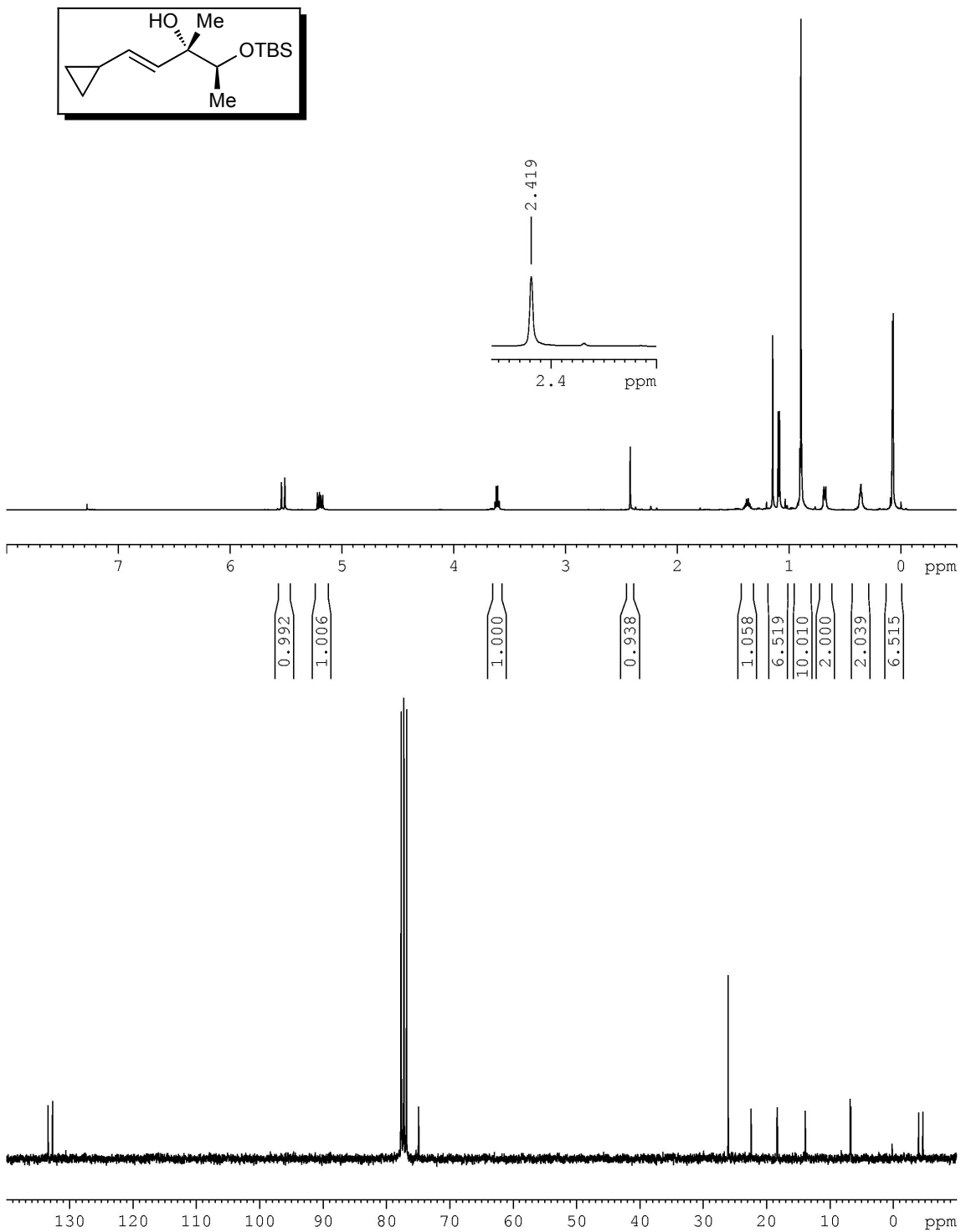


Figure SI-24. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

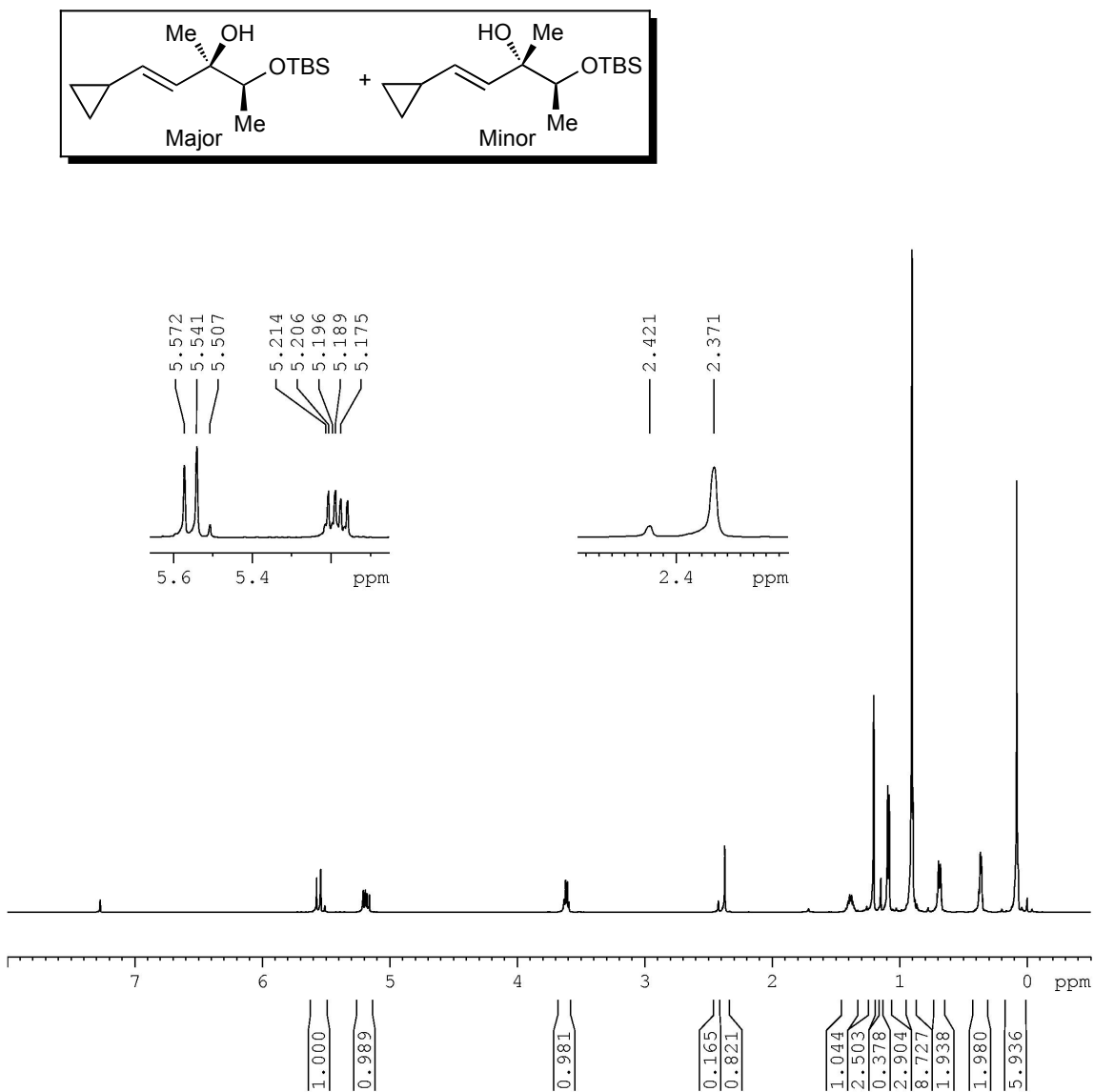


Figure SI-25. 500 MHz ¹H NMR in CDCl₃ (from vinyl lithium addition).

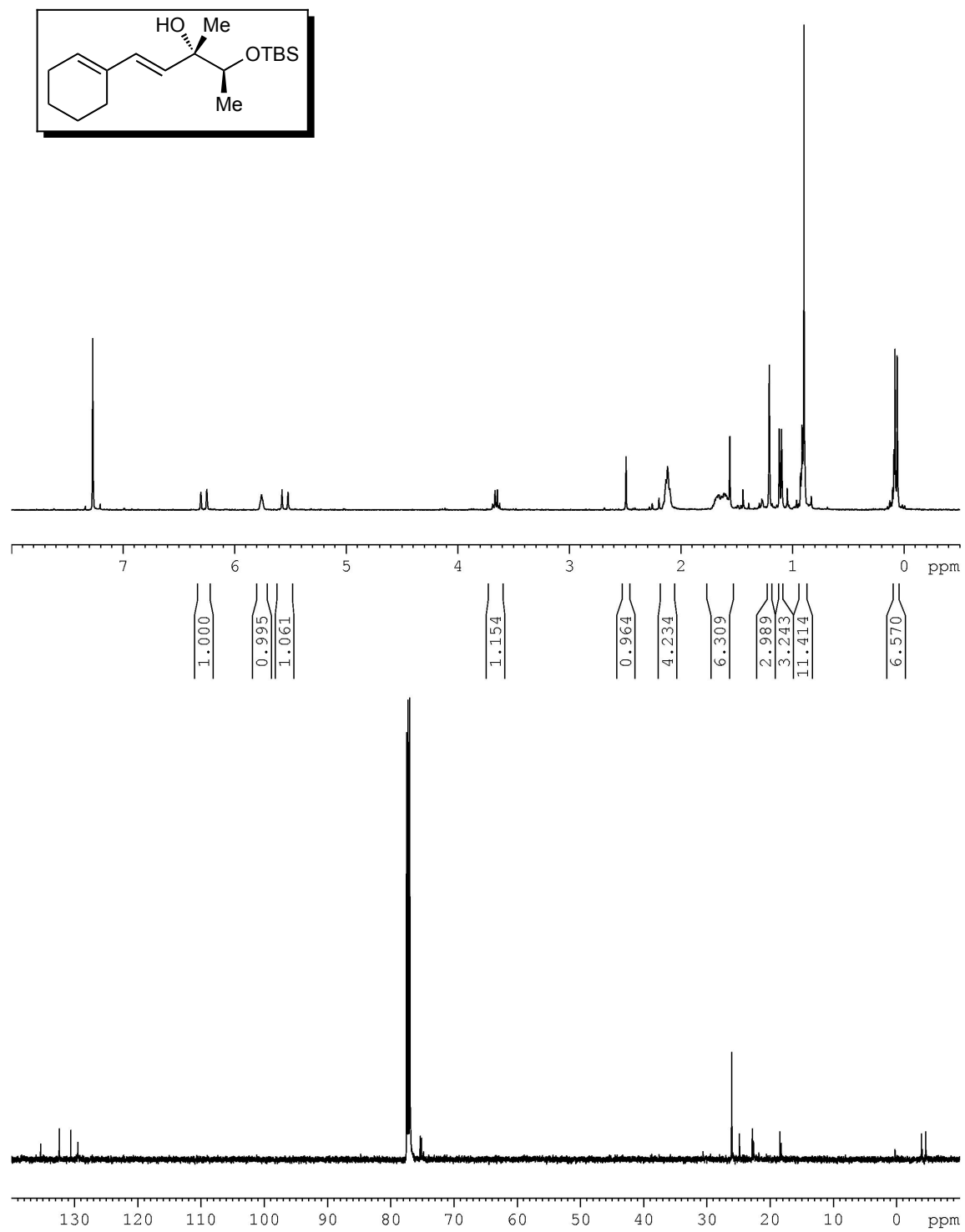


Figure SI-26. 300 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

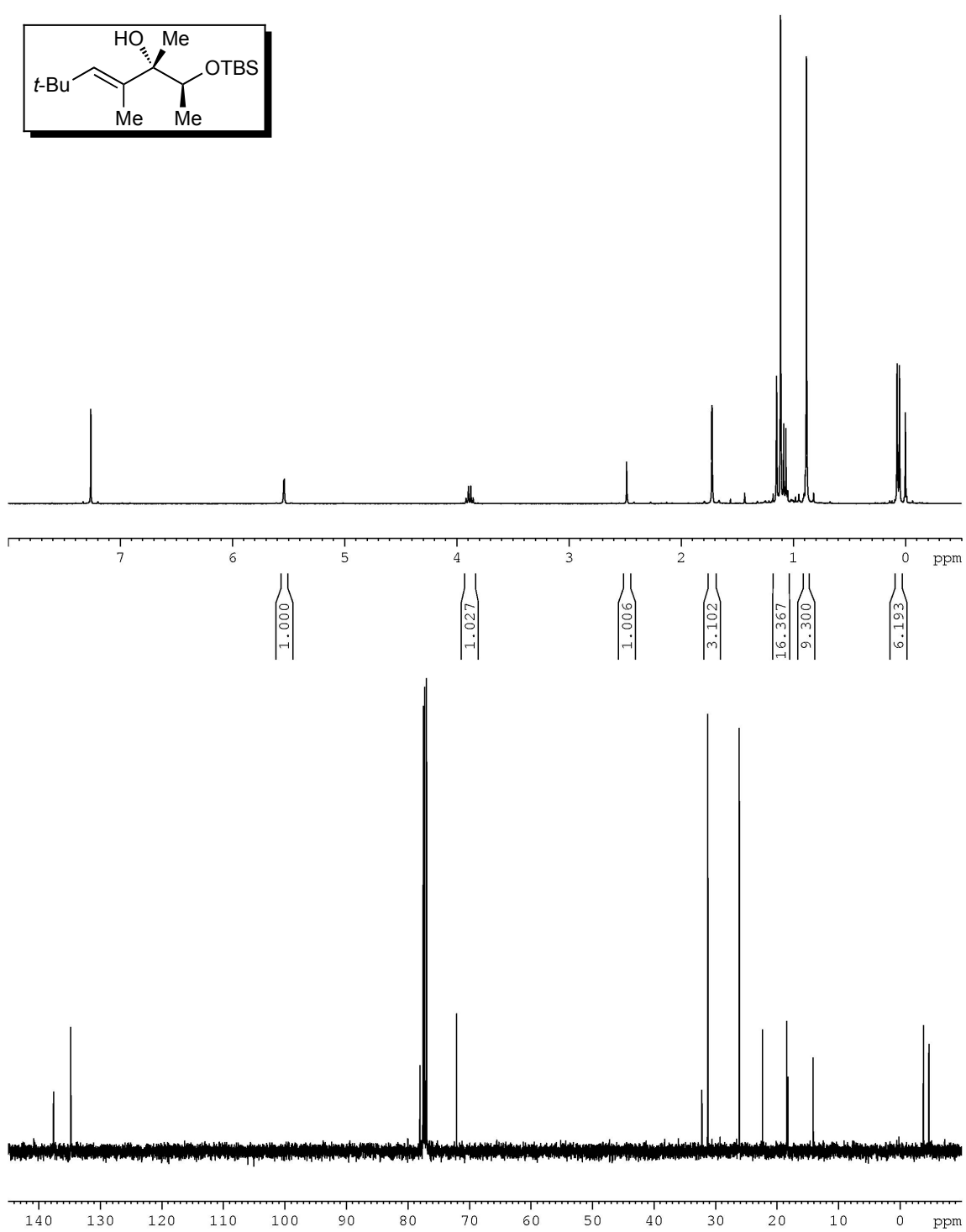


Figure SI-27. 300 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

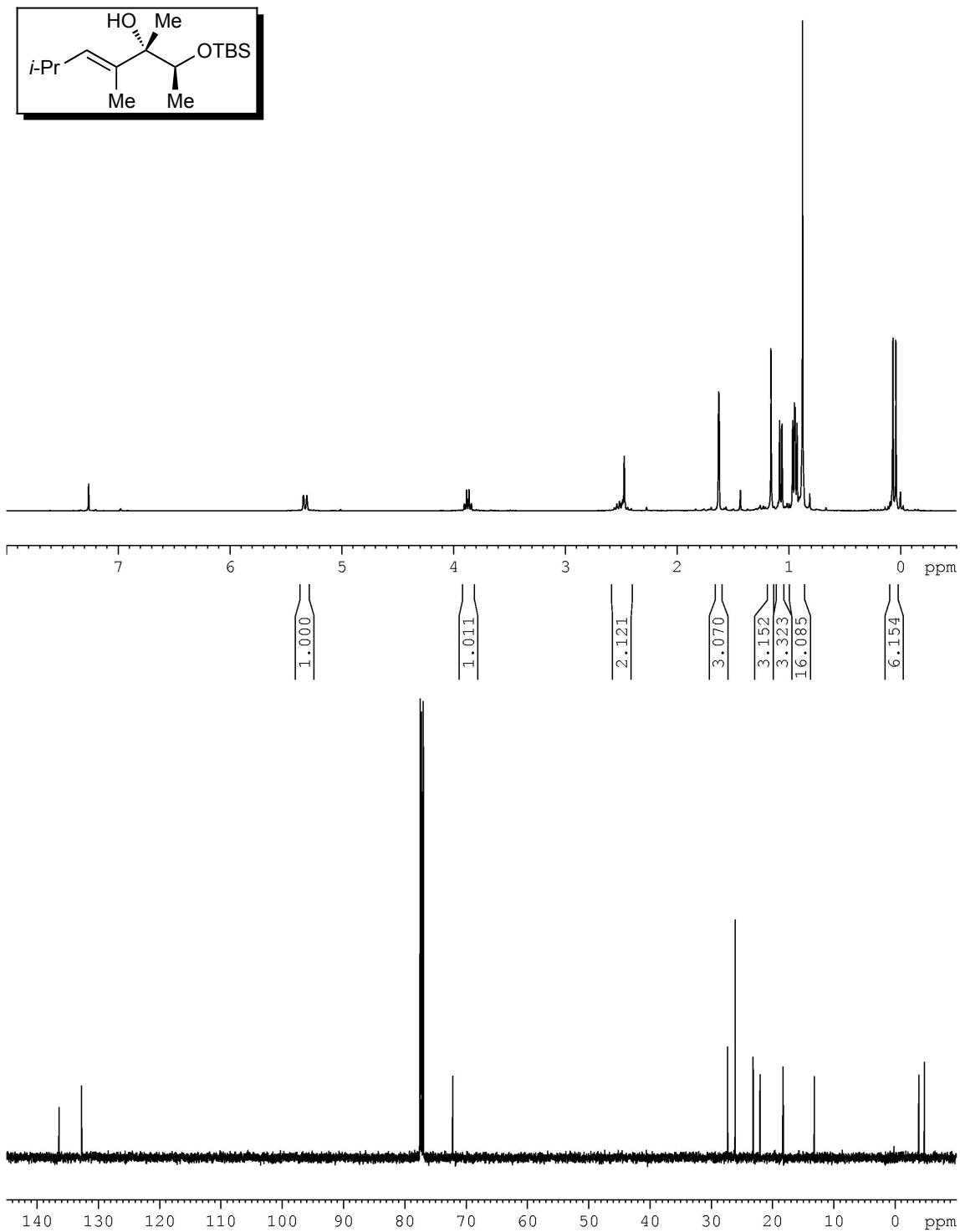


Figure SI-28. 300 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

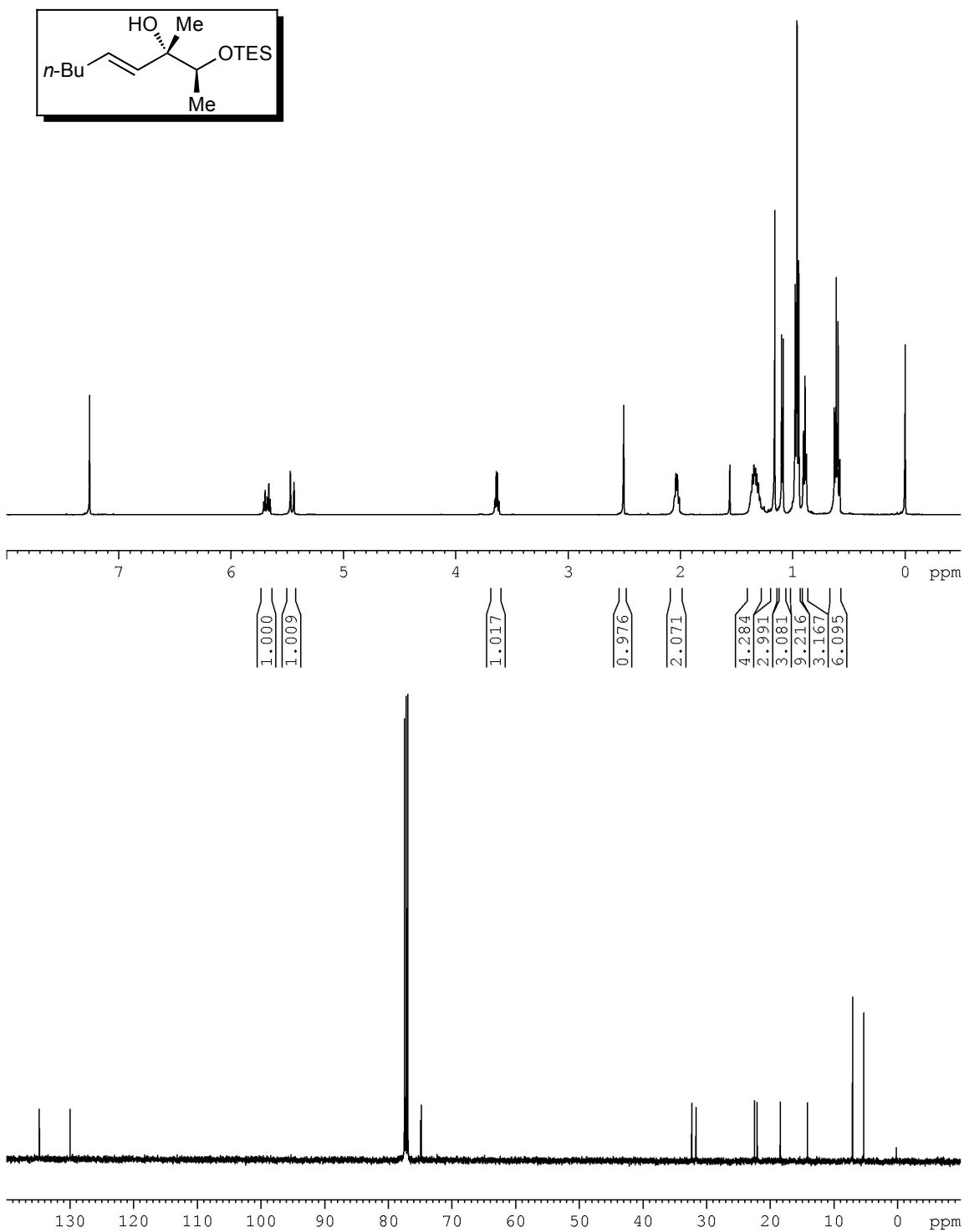


Figure SI-29. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

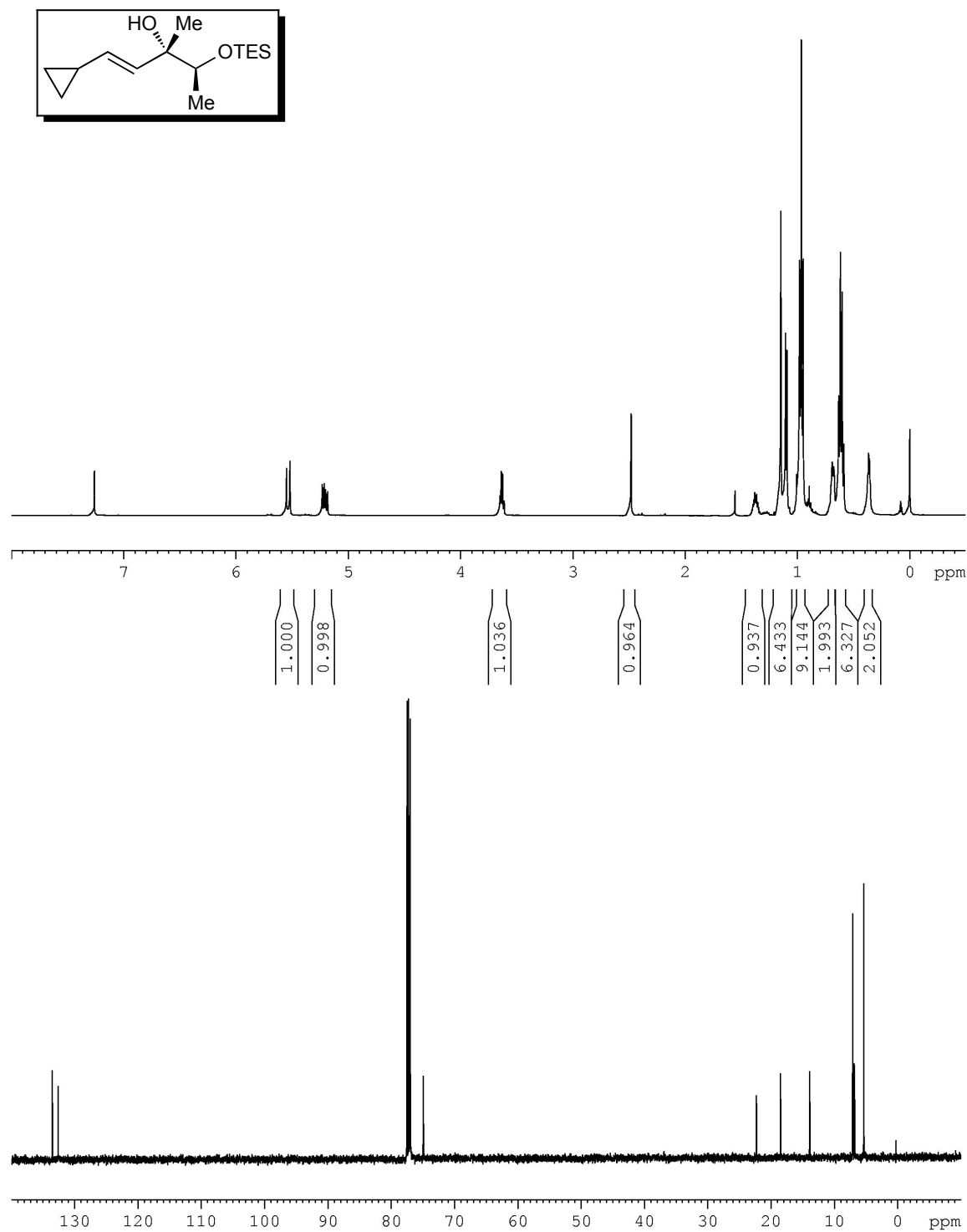


Figure SI-30. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

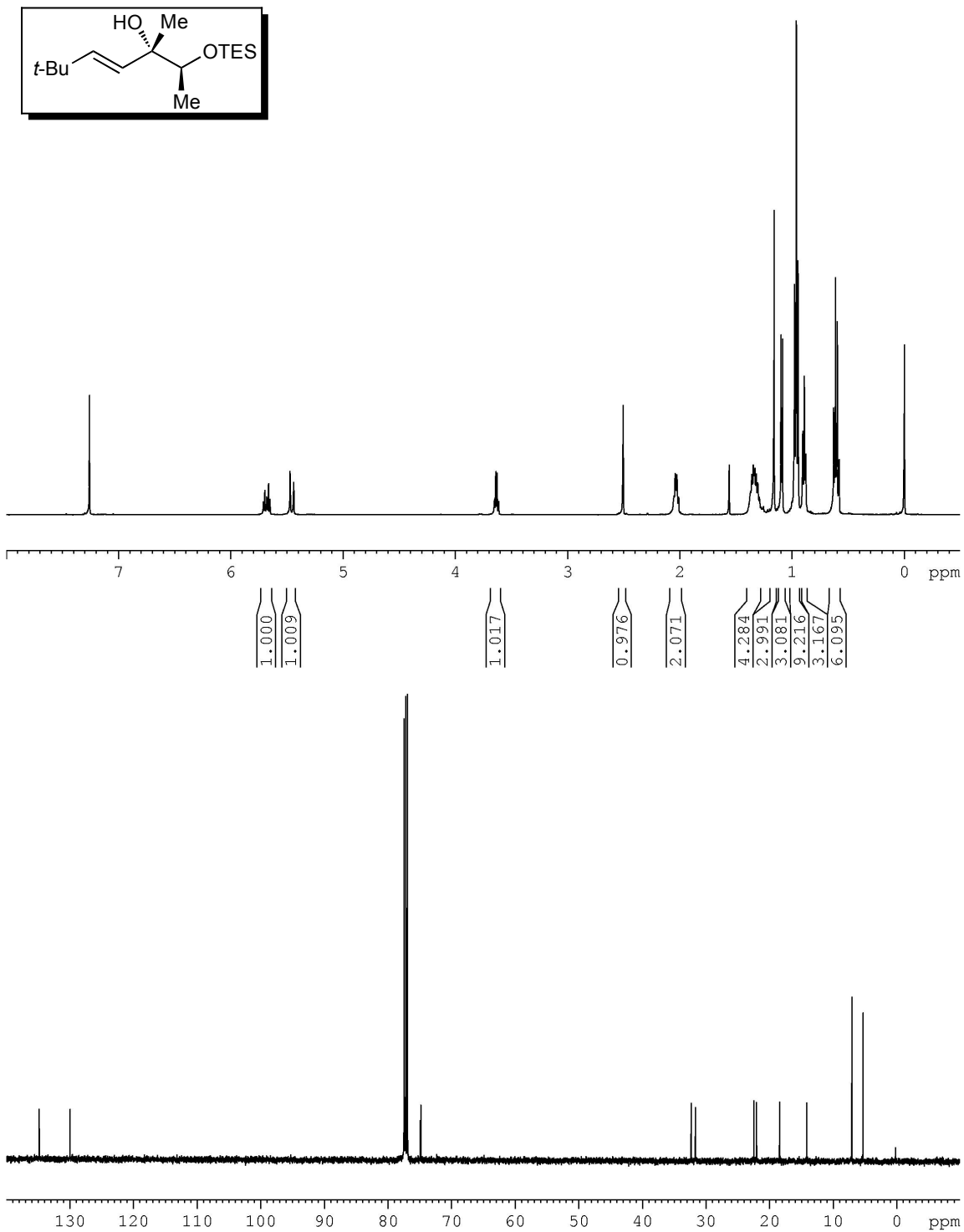


Figure SI-31. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

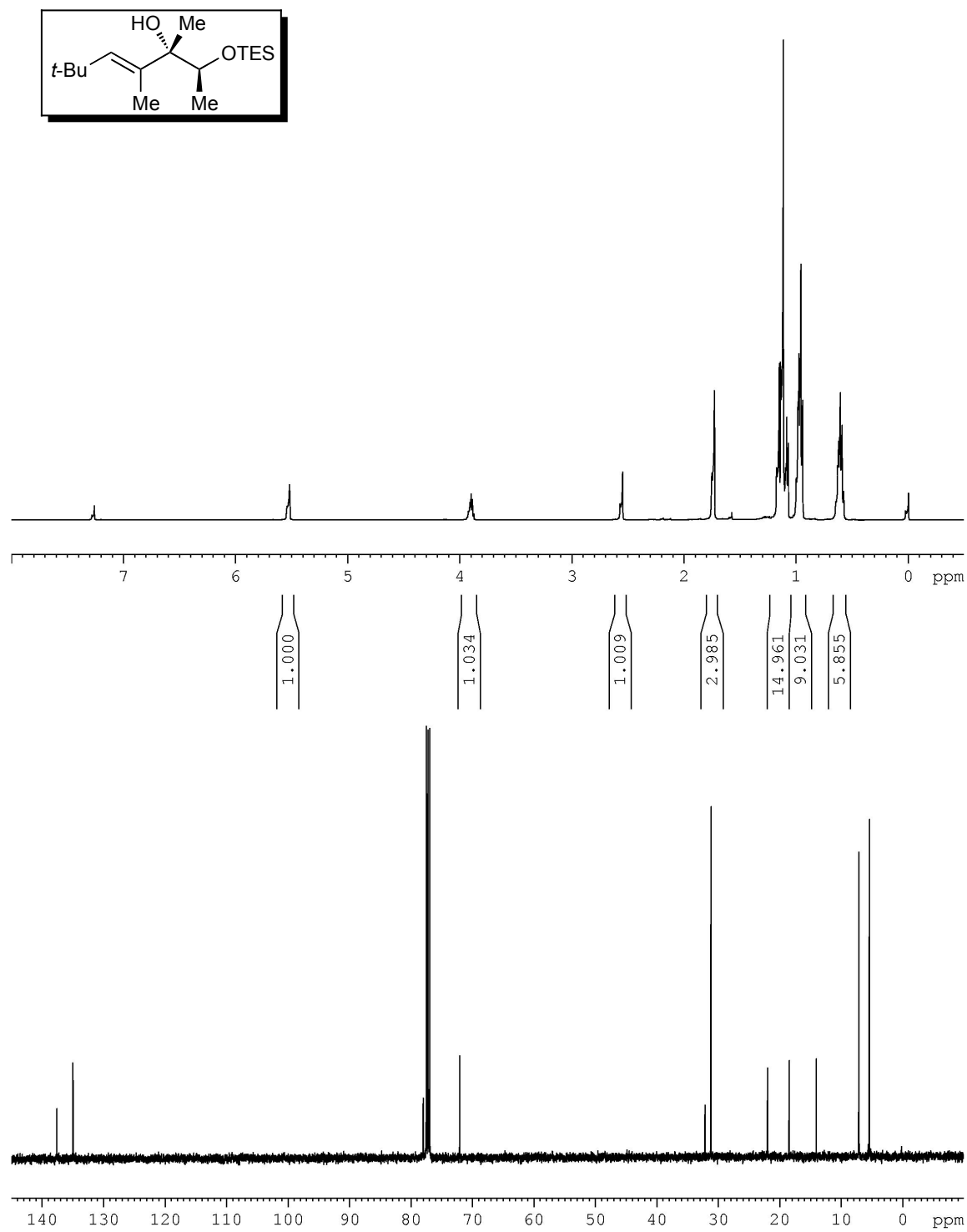


Figure SI-32. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

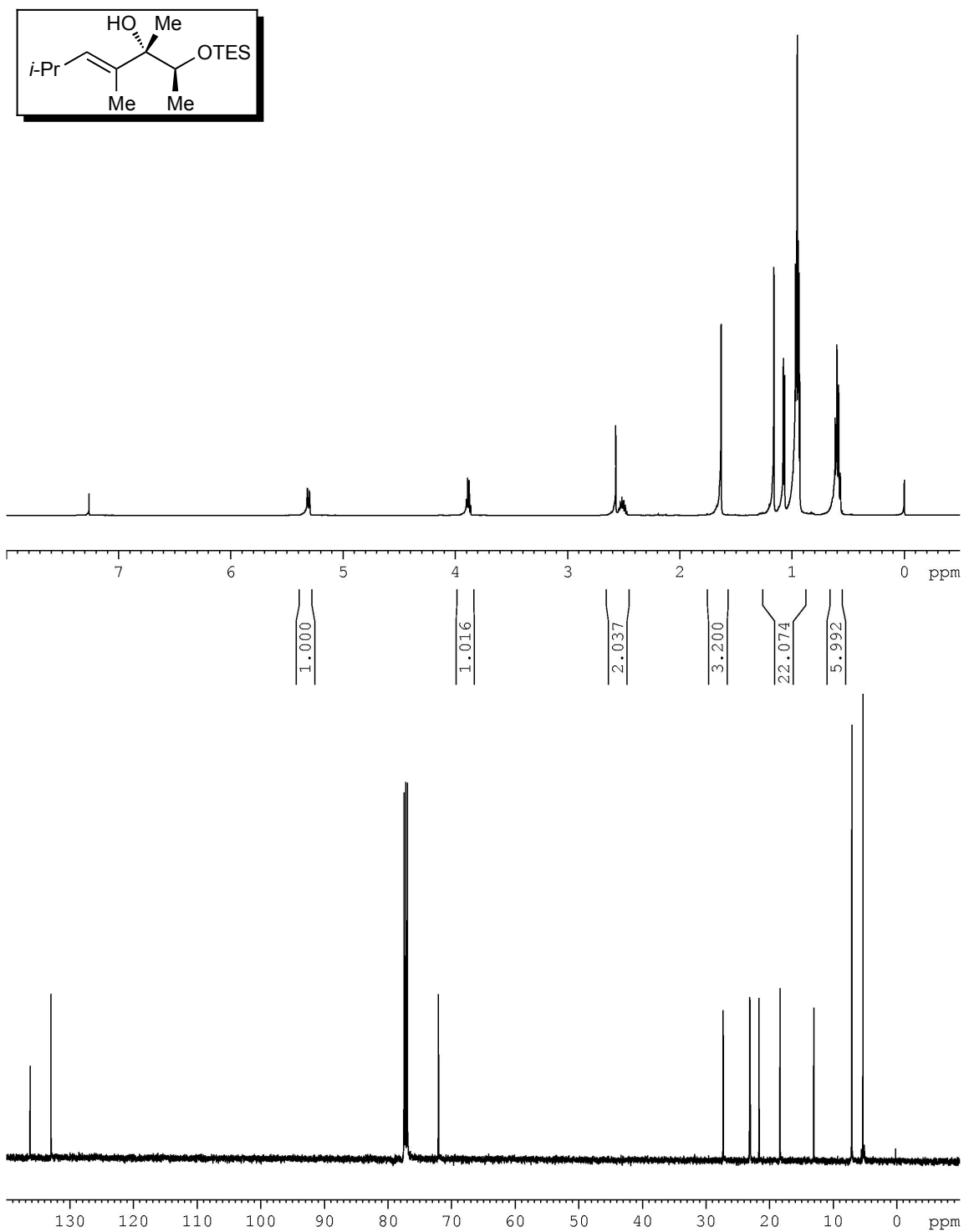


Figure SI-33. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

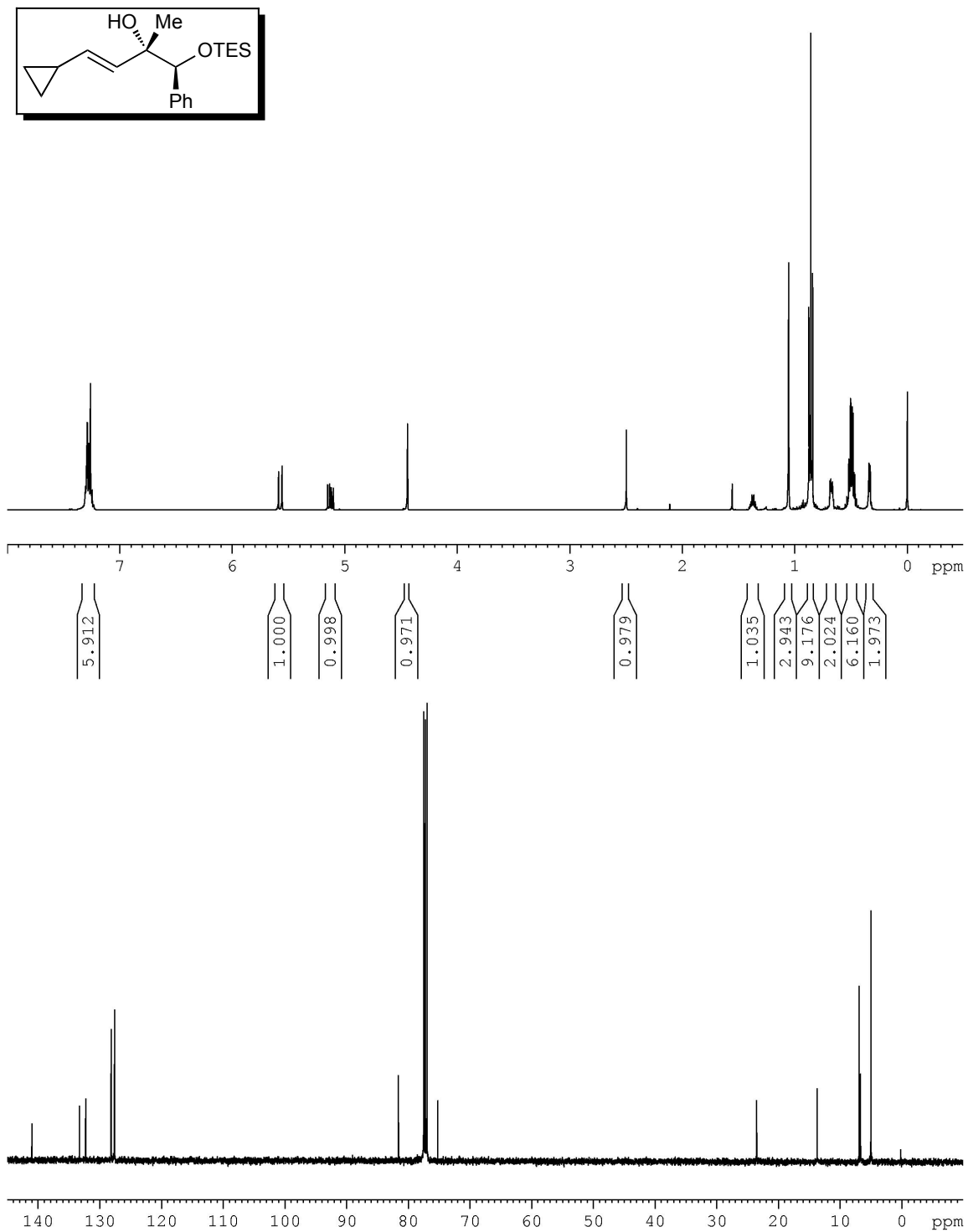


Figure SI-34. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

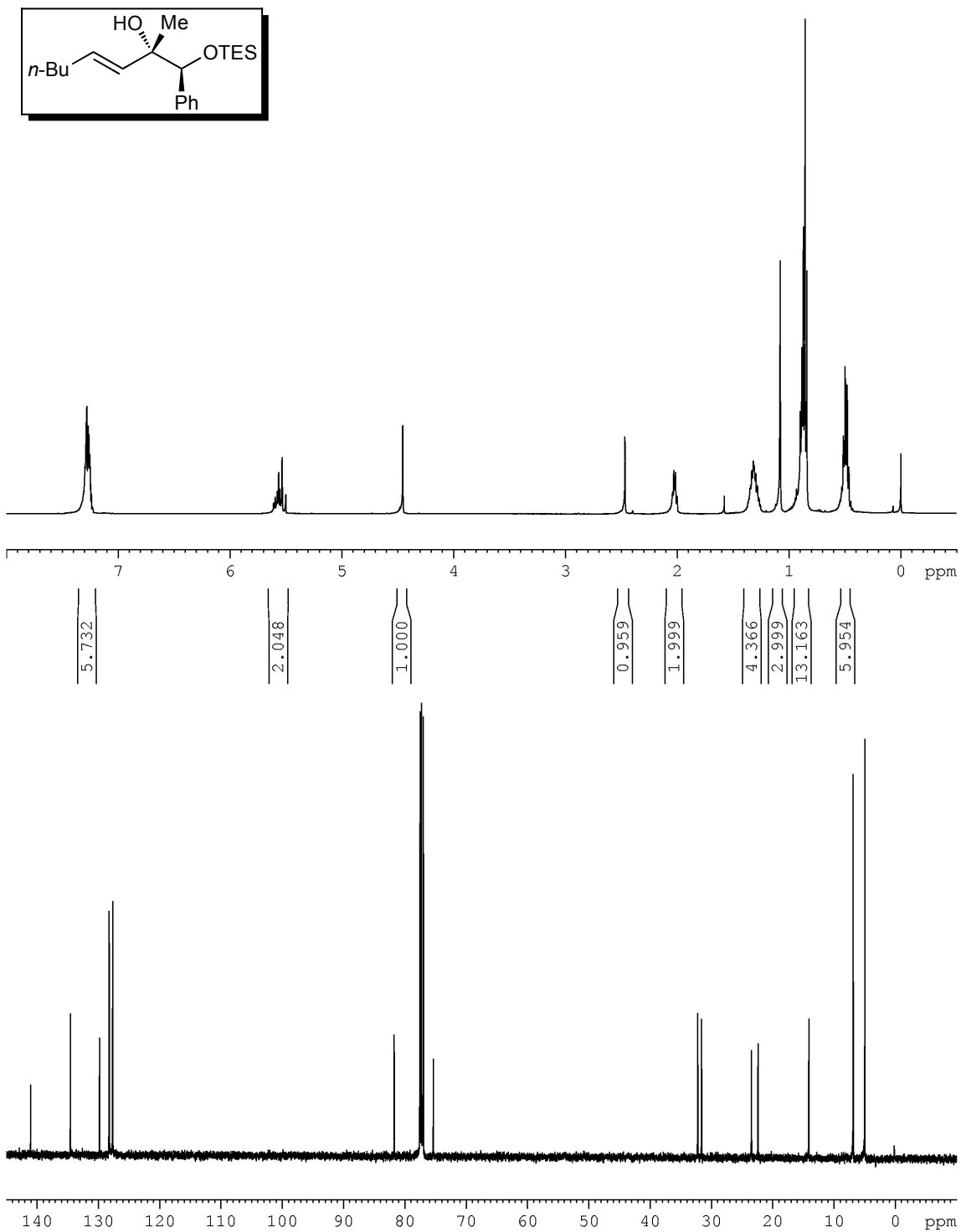


Figure SI-35. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

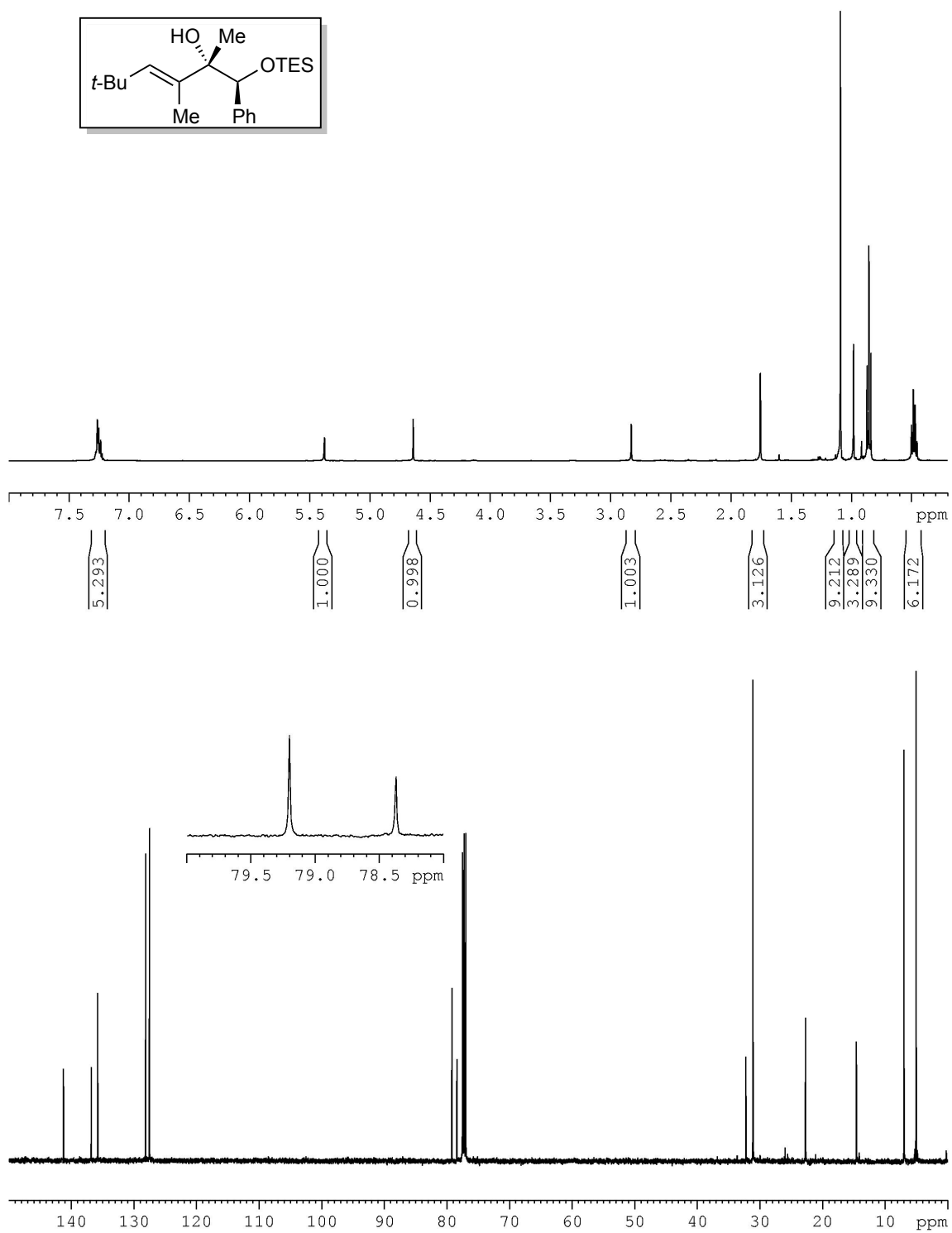


Figure SI-36. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

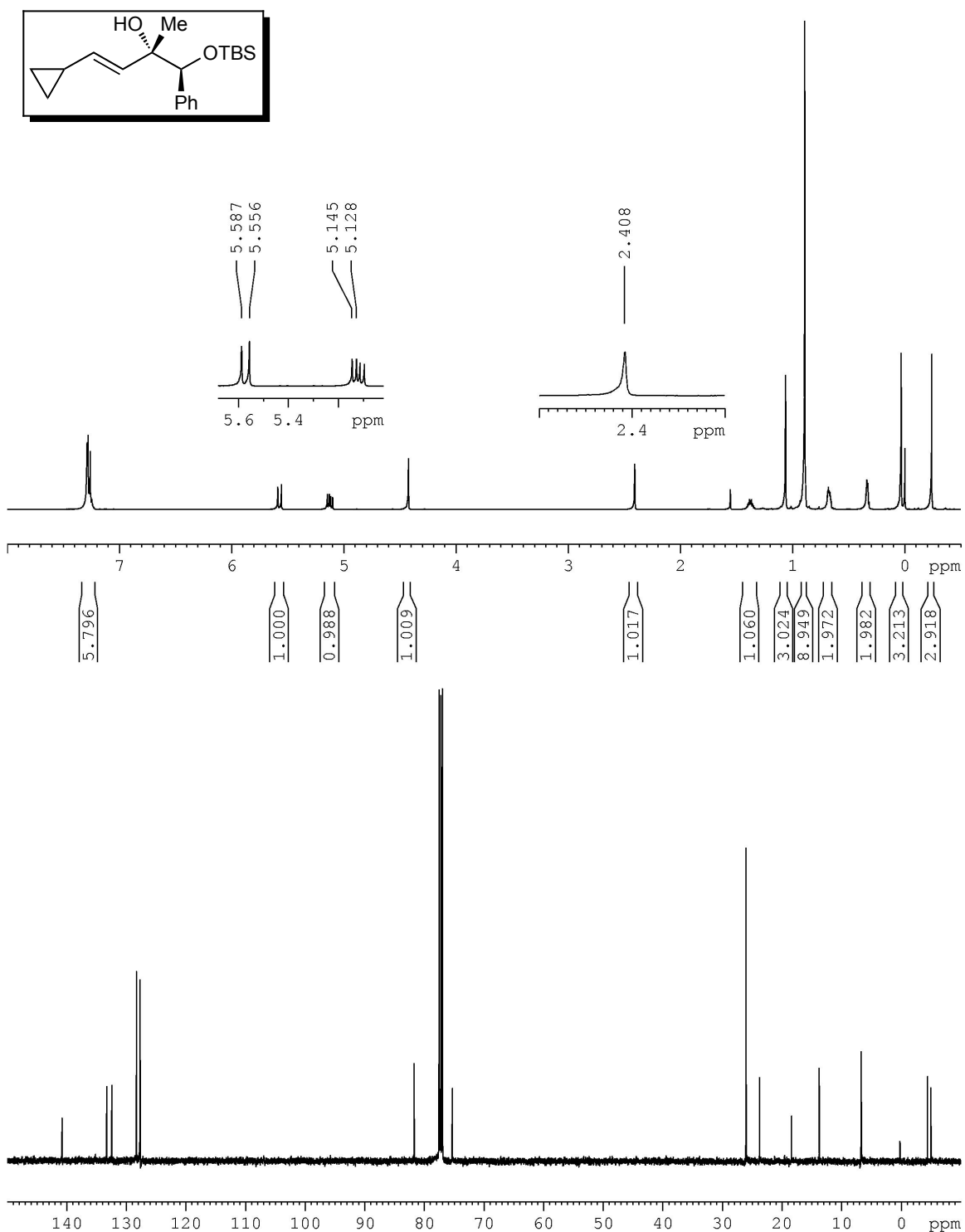
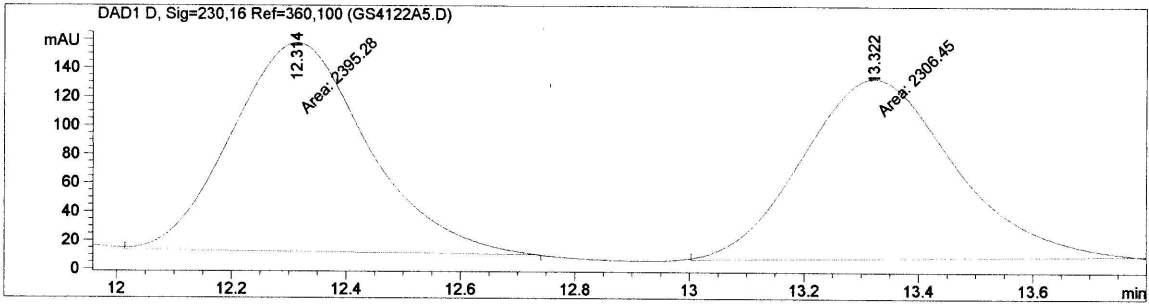
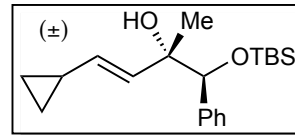


Figure SI-37. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .



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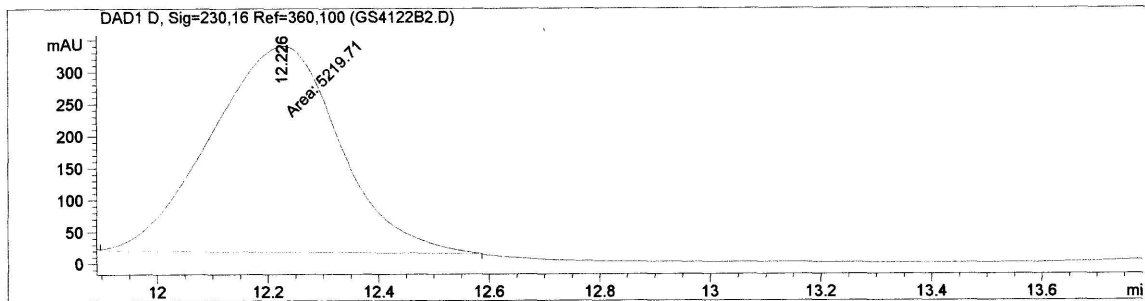
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Use Multiplier & Dilution Factor with ISTDs



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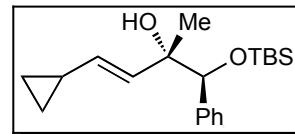
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1	12.314	MM	0.2742	2395.28027	145.61722	50.9446
2	13.322	MM	0.3071	2306.45288	125.16226	49.0554

Totals : 4701.73315 270.77948



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Area Percent Report
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Sorted By : Signal
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Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs



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Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.226	MM	0.2696	5219.71094	322.73309	100.0000

Totals : 5219.71094 322.73309

Figure SI 38. HPLC analysis of chiral purity of vinyl addition product

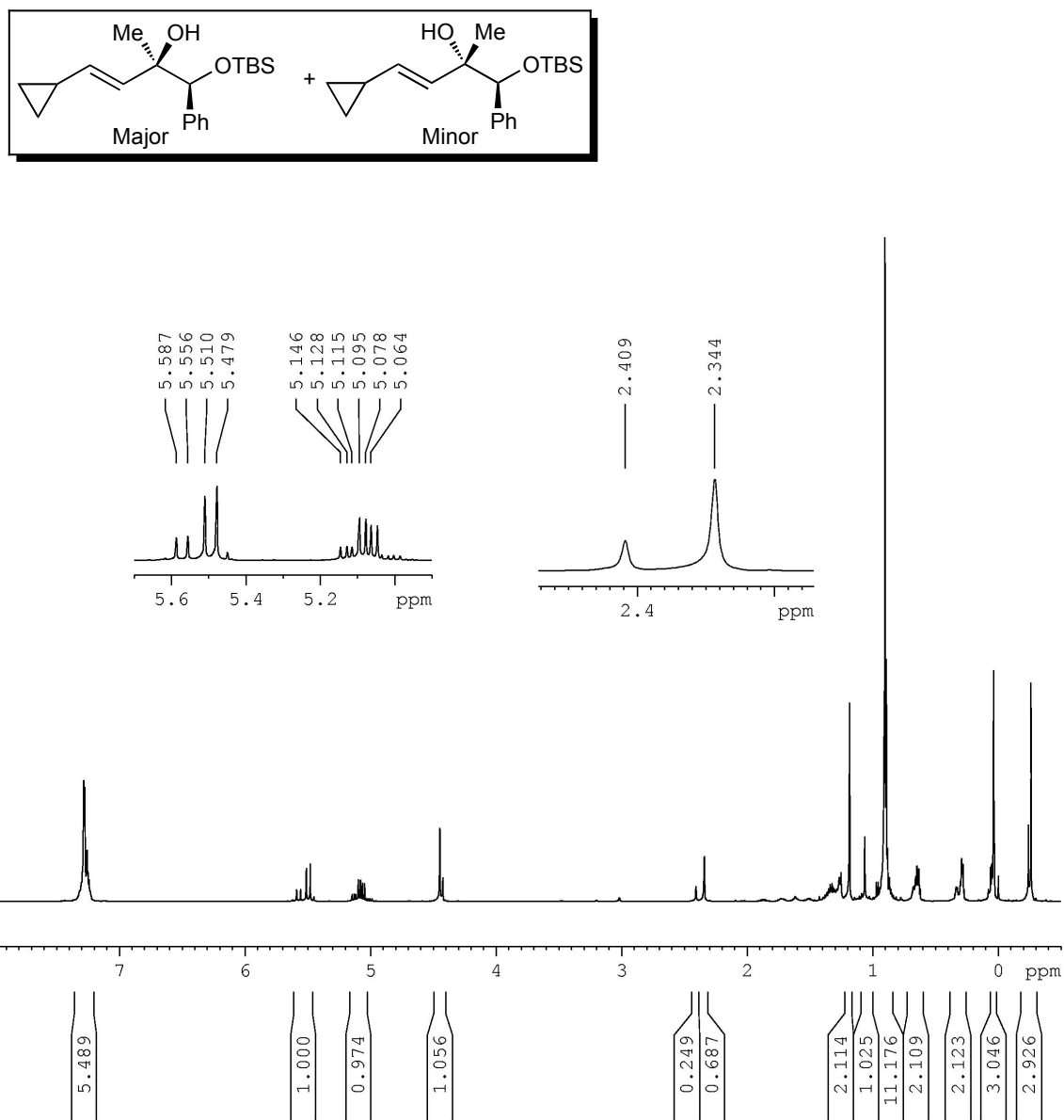


Figure SI-39. 500 MHz ^1H NMR in CDCl_3 (from vinyl lithium addition).

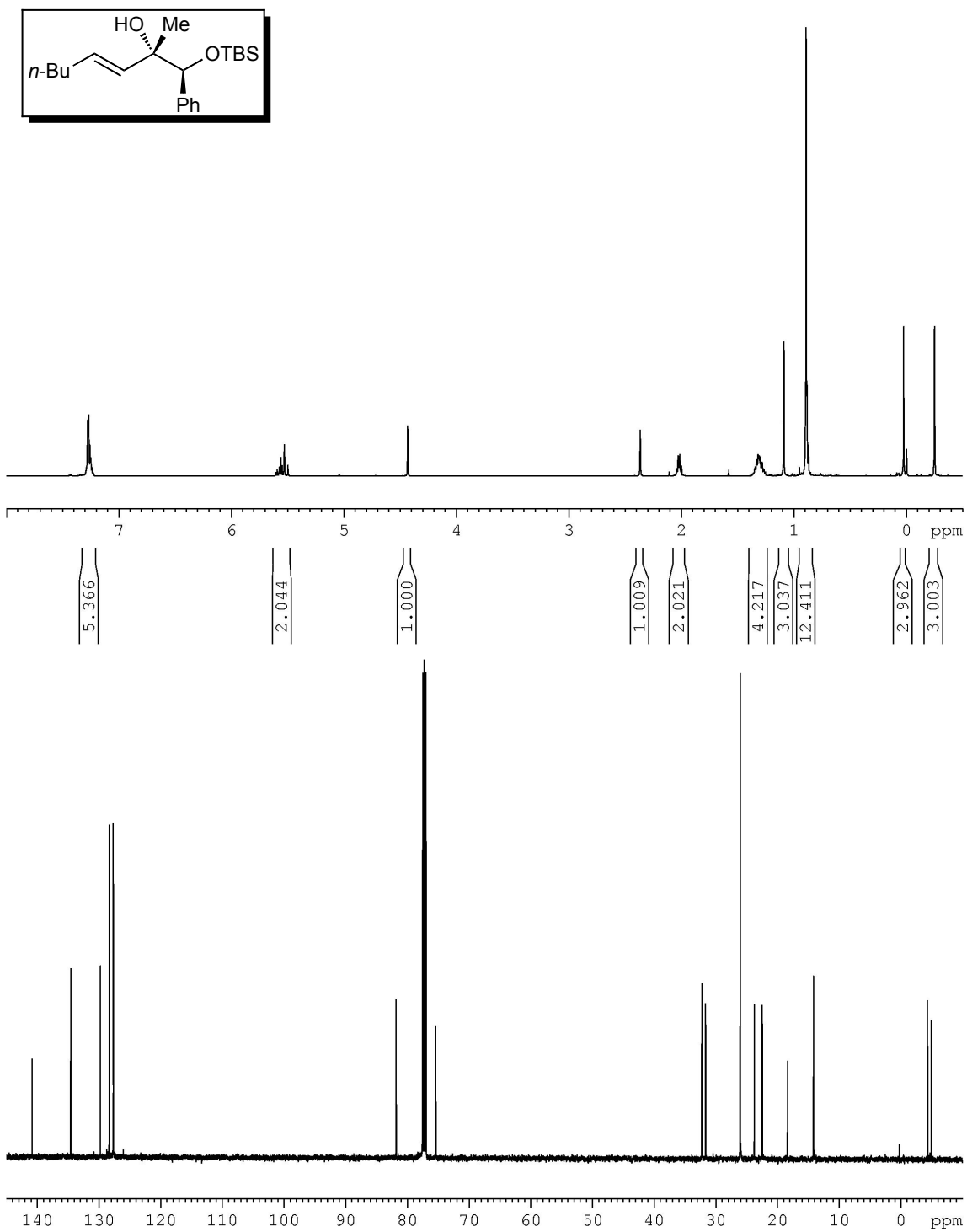


Figure SI-40. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .

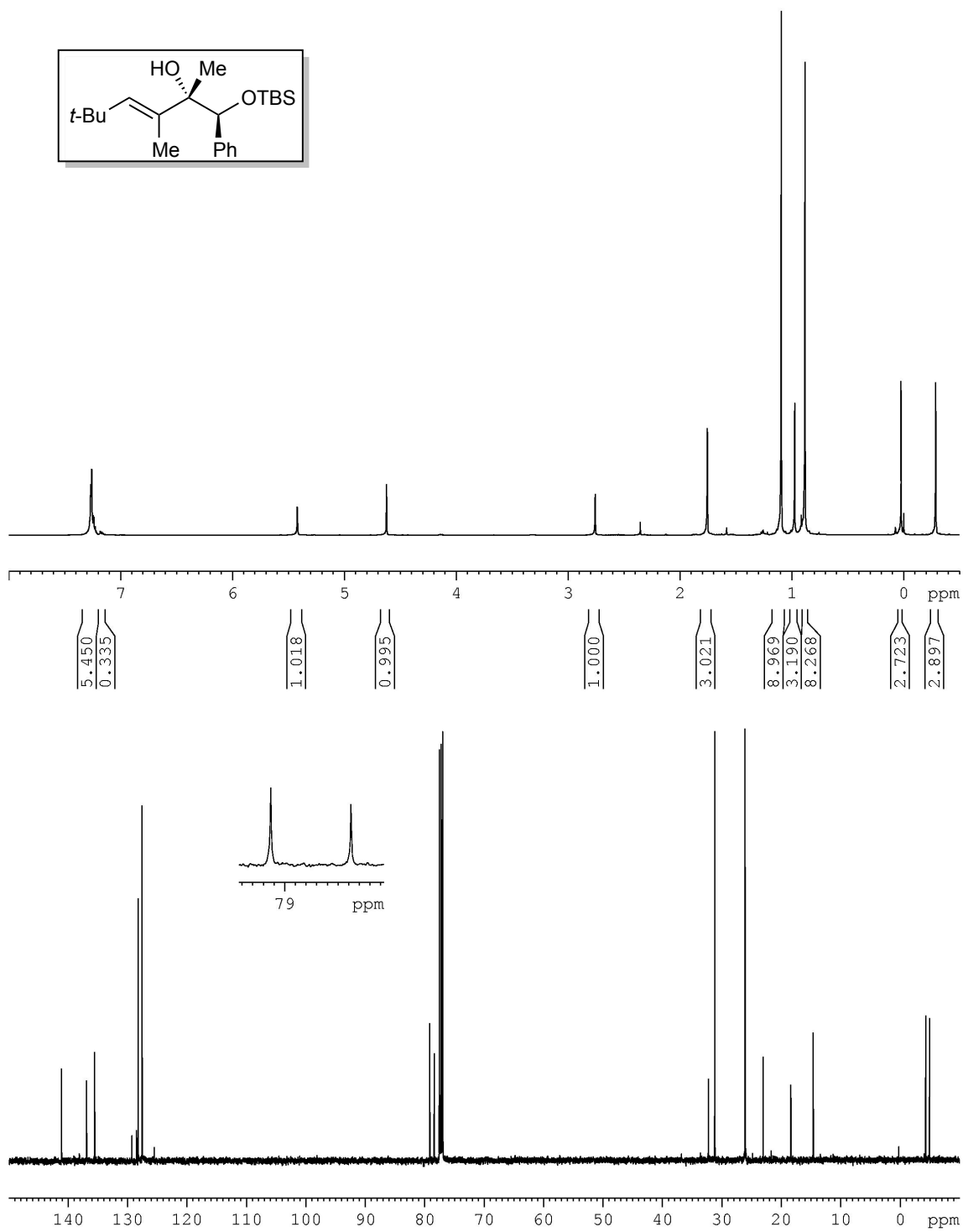


Figure SI-41. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 (small amount residual toluene).

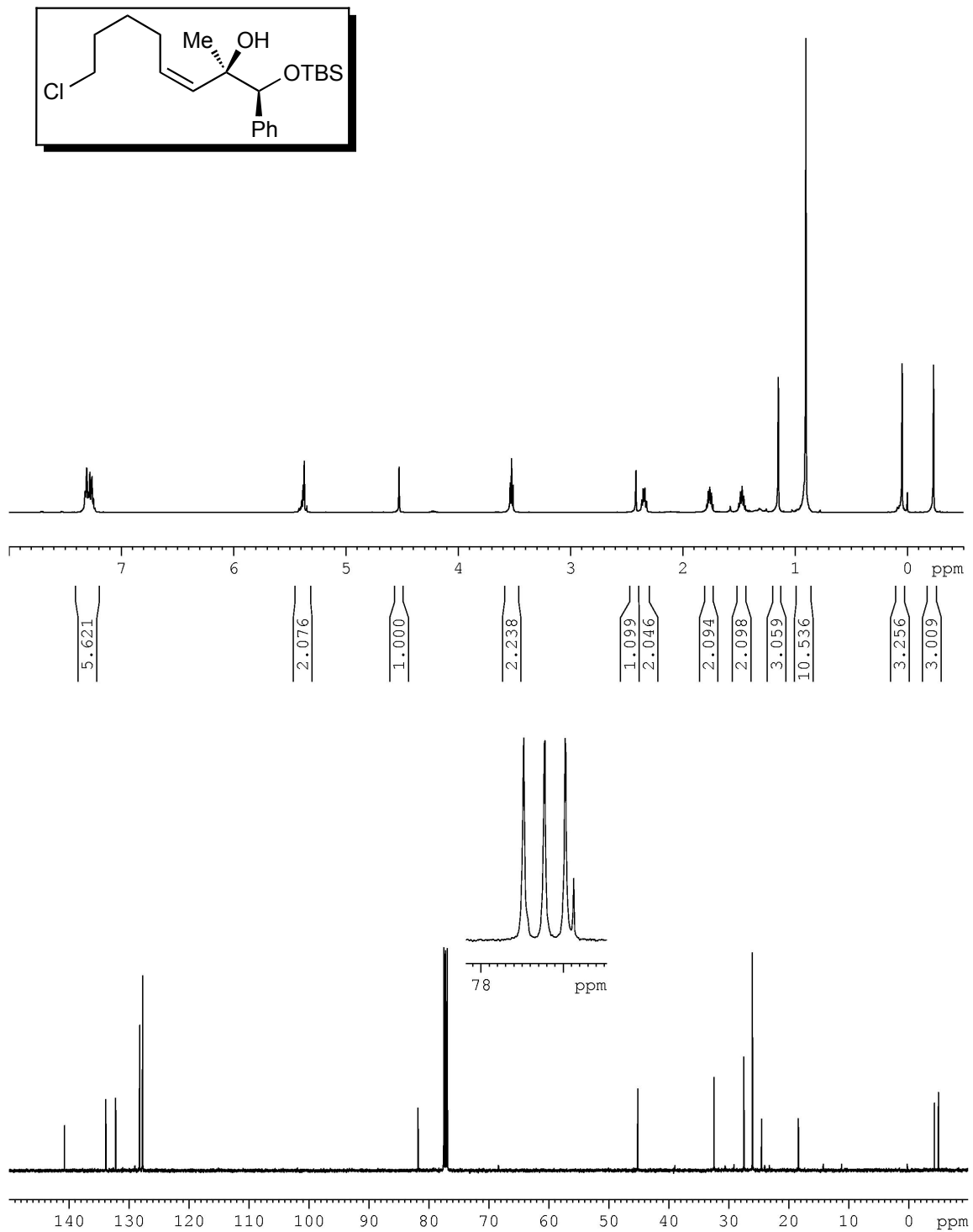


Figure SI-42. 500 MHz ¹H and 125 MHz ¹³C{¹H} NMR in CDCl₃.

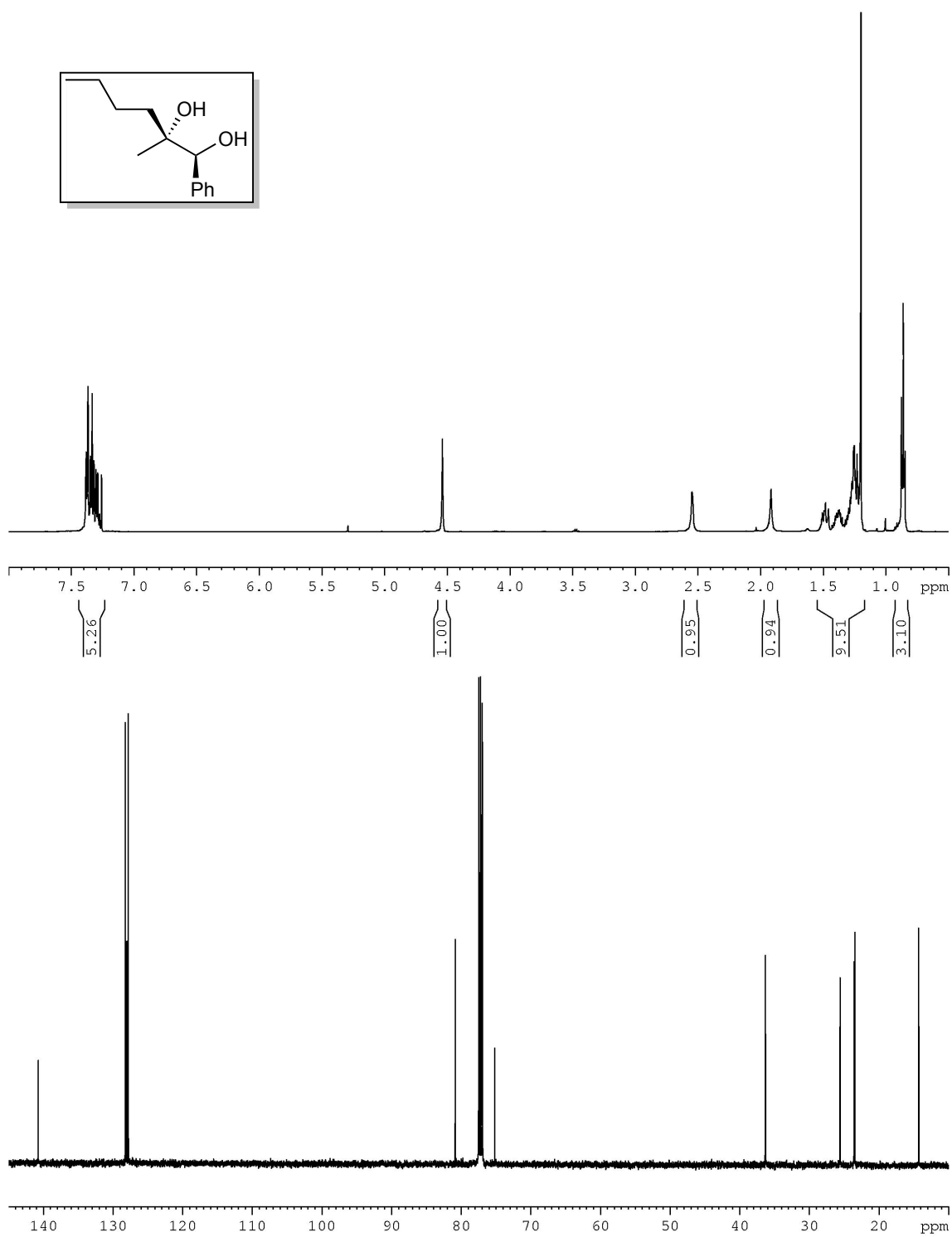
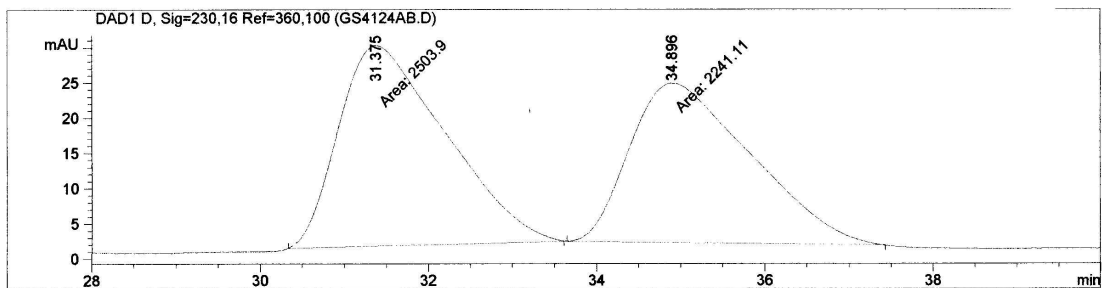


Figure SI-43. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .



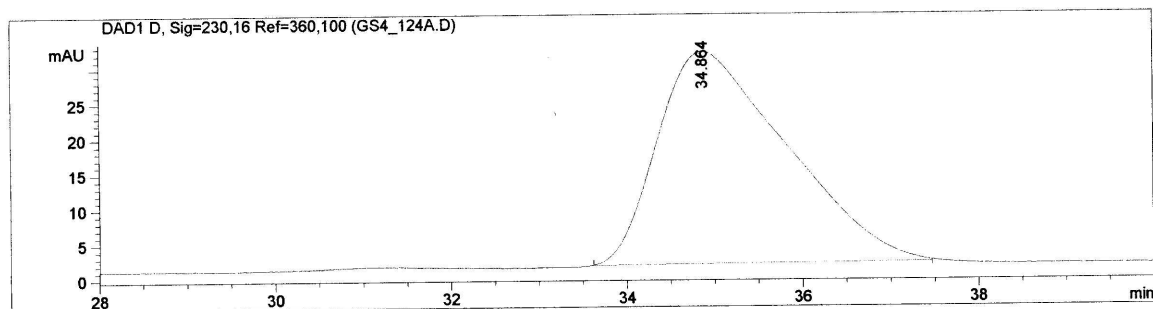
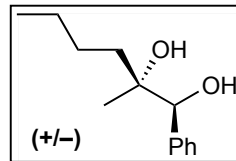
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Sorted By : Signal
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 Dilution : 1.0000
 Use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.269	PB	0.2672	45.73721	2.60085	0.9547
2	31.375	MM	1.4679	2503.90405	28.42905	52.2654
3	34.896	MM	1.6564	2241.10645	22.55004	46.7799

Totals : 4790.74771 53.57994



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 Area Percent Report
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Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
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Totals : 3068.48828 30.21077

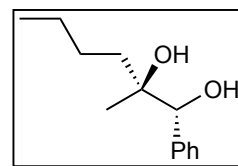
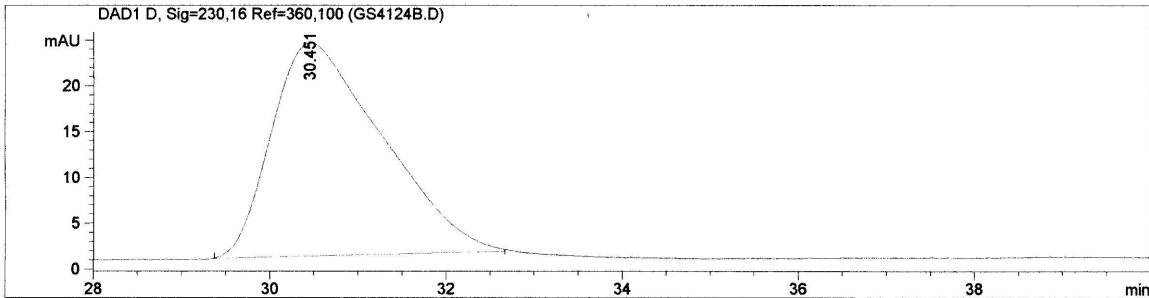
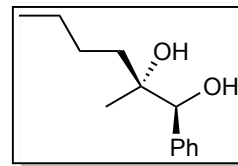


Figure SI-44. HPLC analysis of chiral purity of methyl addition product.



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 Area Percent Report
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 Multiplier : 1.0000
 Dilution : 1.0000
 Use Multiplier & Dilution Factor with ISTDs



Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
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Totals : 2023.77087 23.25989

Figure SI-45 . HPLC analysis of chiral purity of methyl addition product.

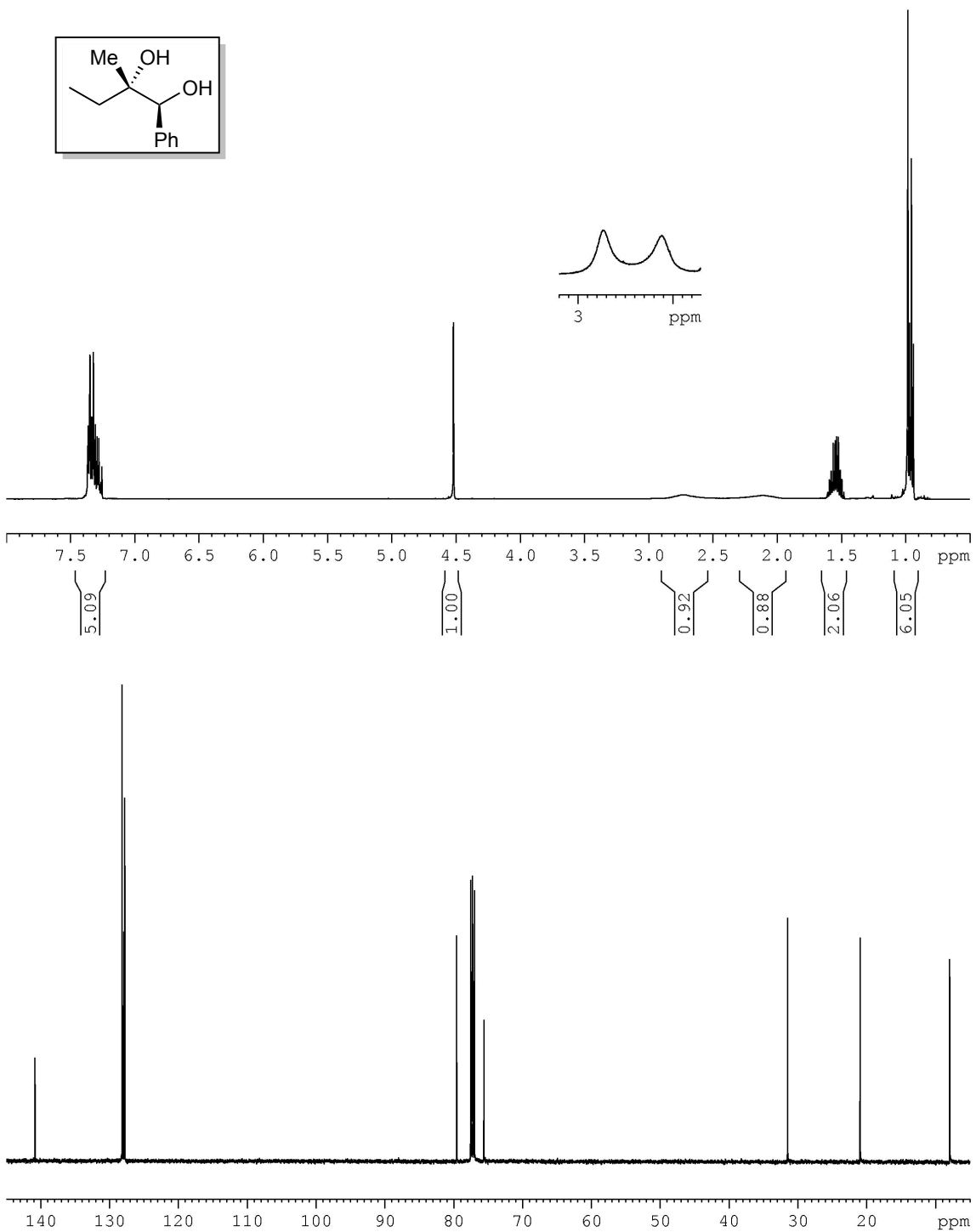
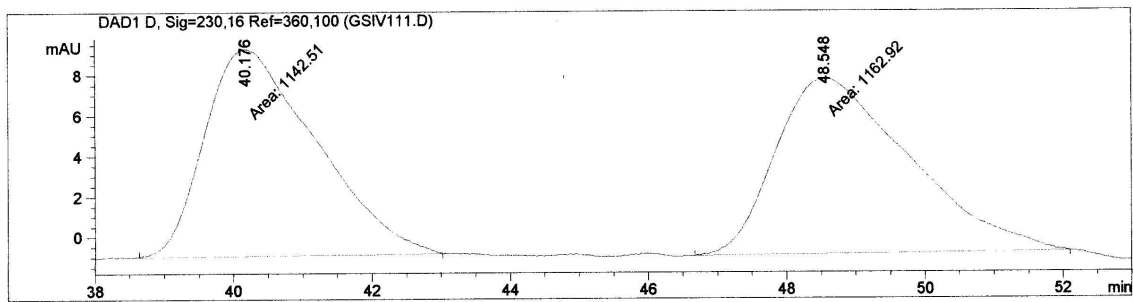
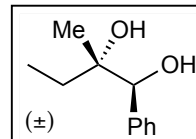


Figure SI-46. 500 MHz ^1H and 125 MHz $^{13}\text{C}\{^1\text{H}\}$ NMR in CDCl_3 .



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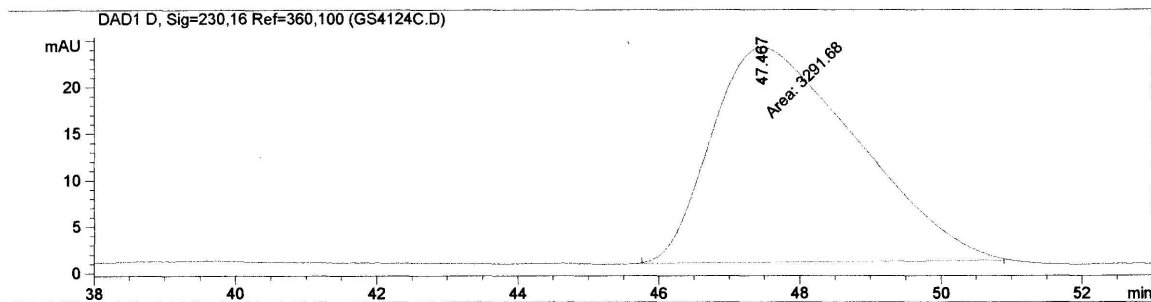
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 Dilution : 1.0000
 Use Multiplier & Dilution Factor with ISTDs



Signal 1: DAD1 D, Sig=230,16 Ref=360,100

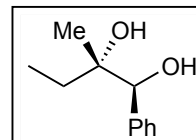
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	40.176	MM	1.8641	1142.50952	10.21519	49.5574
2	48.548	MM	2.2336	1162.91577	8.67759	50.4426

Totals : 2305.42529 18.89278



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 Area Percent Report
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Sorted By : Signal
 Multiplier : 1.0000
 Dilution : 1.0000
 Use Multiplier & Dilution Factor with ISTDs



Signal 1: DAD1 D, Sig=230,16 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	47.467	MM	2.3765	3291.68335	23.08541	100.0000

Totals : 3291.68335 23.08541

Figure SI-47. HPLC analysis of chiral purity of ethyl addition product.