Supplementary Information For

Copper-Catalyzed Enantioselective Stereodivergent Synthesis of Amino Alcohols

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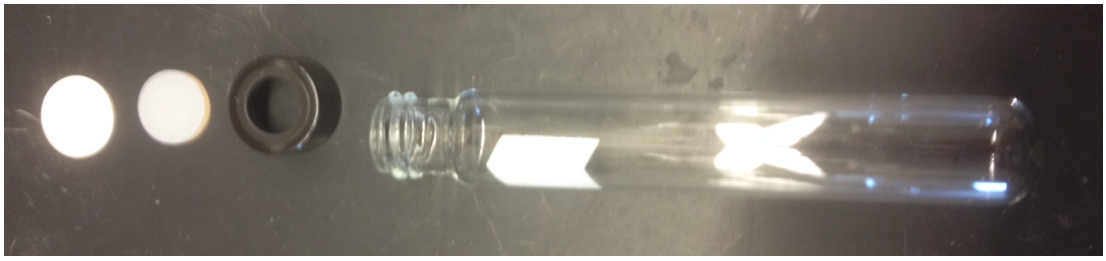
1. General Information

All the reactions were set up on the benchtop and conducted under an argon atmosphere. Flash column chromatography was performed using Silicycle SiliaFlash P60 (230–400 mesh) silica gel. Anhydrous tetrahydrofuran (THF) was purified by passing through two packed columns of neutral alumina and copper (II) oxide under a positive pressure of argon. $Cu(OAc)_2$ was purchased from Sigma-Aldrich Chemical Co. and used as received. DTBM-SEGPHOS was purchased from Takasago International Co. and used as received. $HSiMe(OMe)_2$ (moisture-sensitive) was purchased from TCI and was stored under nitrogen at –20 °C. α-Methyl-*trans*-cinnamaldehyde and (*E*)-4-phenylbut-3-en-2-one were purchased from Sigma-Aldrich Chemical Co. and used as received. *Cis*- and *trans*- α-amylcinnamaldehyde were purchased from TCI and used as received. Other enal and enone substrates were prepared following literature procedures as indicated in each case. Hydroxlyamine esters were prepared following literature procedures.[1] All reported yields of the copper-catalyzed hydrosilylation/hydroamination reactions stated are isolated yields and the average of at least two experiments unless otherwise stated. The screw-cap reaction tubes, caps and septa used in the copper-catalyzed hydroamination reactions are shown as follows:

Fisher 20 x 125 mm tubes (Cat. No. 1495937A, for 0.5 or 1.0 mmol scale reactions)



Caps: CLOSURE OT S/T 18-400TH 14 (Cat. No. 033407G)

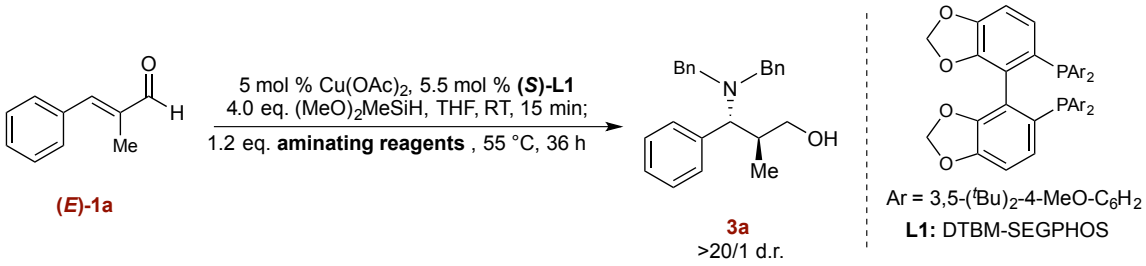
Gray septa: Thermo Scientific SPTA SPTA PTFE/SIL F/18-400 10 (Cat. No. 03394B)

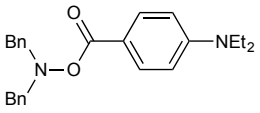
General Analytical Information

All new compounds were characterized by NMR spectroscopy, IR spectroscopy, high-resolution mass spectroscopy (or elemental analysis), and melting point (if solids). NMR spectra were recorded on a Bruker AMX 400 spectrometer and were calibrated using residual solvent as an internal reference ($CDCl_3$: 7.26 ppm for ^1H NMR and 77.16 ppm for ^{13}C NMR). All IR spectra were taken on a Thermo Scientific Nicolet iS5 spectrometer (iD5 ATR, diamond). Elemental analyses were performed by Atlantic Microlabs Inc., Norcross, GA. HRMS spectra were recorded on a Bruker Daltonics APEXIV 4.7 Tesla Fourier transform ion cyclotron resonance mass spectrometer (FT-ICR-MS). Temperatures were controlled for cooling baths using a Neslab CC100 Immersion cooler. Melting points (M.P.) were obtained on a Mel-Temp capillary melting point apparatus. GC analyses were performed on an Agilent 6890 gas chromatograph with an FID detector using a J & W DB-1 column (10 m, 0.1 mm I.D.). The enantiomeric excesses (ee) of the products were determined by high-performance liquid chromatography (HPLC) analysis performed on Agilent 1200 Series chromatographs using a chiral column (25 cm) as noted for each compound. Optical rotations were measured on a Jasco P-1010 polarimeter with $[\alpha]_D$ values reported in degrees; concentration (c) is in g/100 mL.

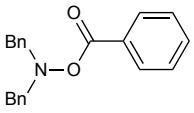
2. Reaction Optimization

Evaluation of Aminating Reagents for Hydrosilylation/Hydroamination Reactions

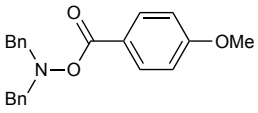




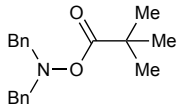
>99% yield, >99% e.e.



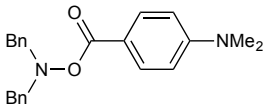
83% yield, >99% e.e.



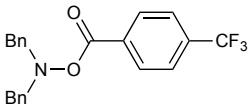
96% yield, >99% e.e.



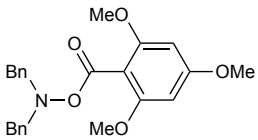
48% yield, e.e.: n.d.



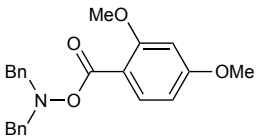
82% yield, >99% e.e.



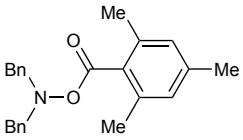
17% yield, e.e.: n.d.



69% yield, e.e.: n.d.

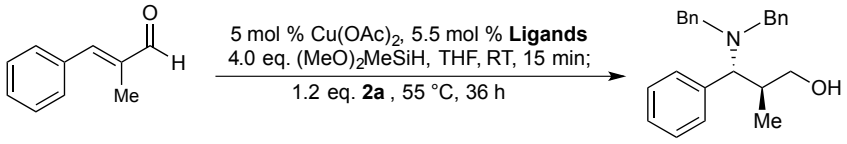


92% yield, >99% e.e.



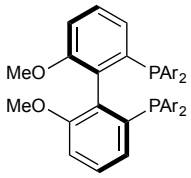
89% yield, >99% e.e.

Evaluation of Ligands for Hydrosilylation/Hydroamination Reactions

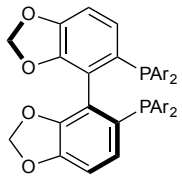


(*E*)-1a

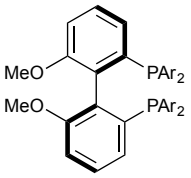
3a
>20/1 d.r.



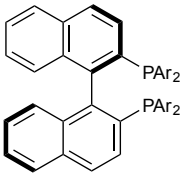
Ar = 3,5-(^{t}Bu)$_2$-C$_6$H$_3$
(S)-DTB-MeO-BIPHEP
76% yield, 98% e.e.



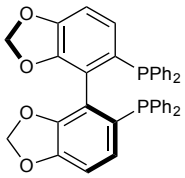
Ar = 3,5-(Me)$_2$-C$_6$H$_3$
L2 = (S)-DM-SEGPHOS
59% yield, 96% e.e.



Ar = 3,5-(Me)$_2$-C$_6$H$_3$
(R)-3,5-Xyl-MeO-BIPHEP
7% yield, e.e.: n.d.

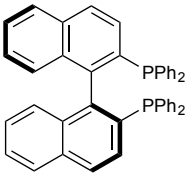


Ar = 3,5-(^{t}Bu)$_2$-4-MeO-C$_6$H$_2$
(R)-DTBM-BINAP
45% yield, 95% e.e.



(S)-SEGPHOS

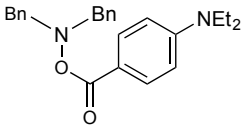
7% yield, e.e.: n.d.



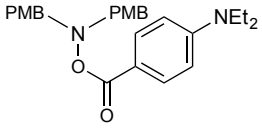
(S)-BINAP

0% yield

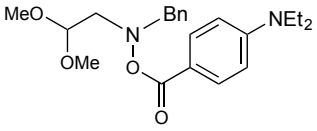
Hydroxylamine Esters 2a-2j[1]



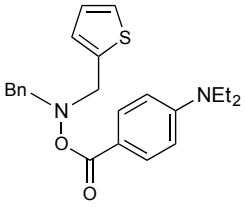
2a



2b



2c



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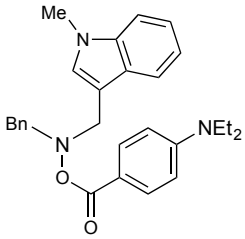

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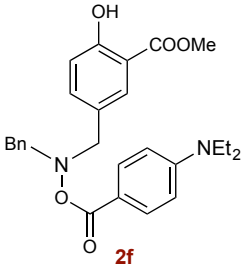

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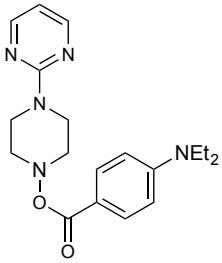
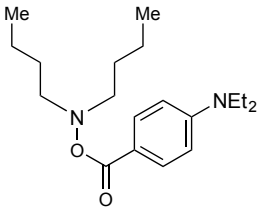
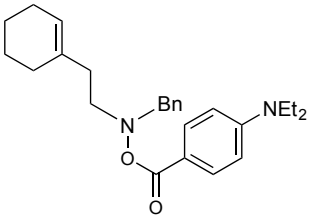


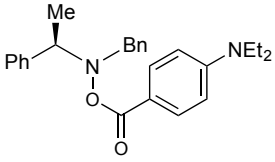
2g



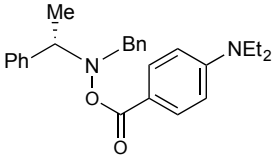
2h



2i

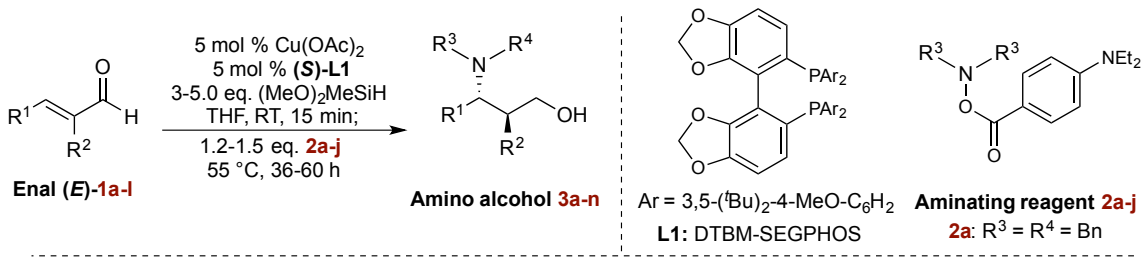


2j

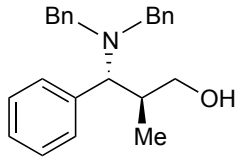


***ent*-2j**

3. Copper-Catalyzed Asymmetric Hydrosilylation/Hydroamination of Enals

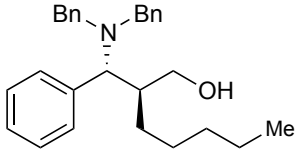


General Procedure A: An oven-dried screw-cap reaction tube equipped with a magnetic stir bar was charged with $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %) and (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %). The reaction tube was sealed with a screw-cap septum, then evacuated and backfilled with argon (this process was repeated a total of two times). Anhydrous THF (0.5 mL) and $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv) were added sequentially via syringe. The resulting mixture was stirred at room temperature (rt) for 15 min until the color changed from blue to orange. A second oven-dried screw-cap reaction tube equipped with a stir bar was charged with enal substrate **1** (0.5 mmol, 1.0 equiv). The reaction tube was sealed with a screw-cap septum, and then evacuated and backfilled with argon (this process was repeated a total of two times). The catalyst solution from the first reaction tube was added slowly at rt via syringe. After stirring at rt for an additional 15 min, hydroxylamine ester **2** (1.0 mmol, 1.0 equiv) was then quickly added to the reaction mixture under a positive pressure of argon. The reaction mixture was stirred at 55 °C for 36 h. After completion, the reaction mixture was allowed to cool to room rt and the solvent was removed *in vacuo* with the aid of a rotary evaporator. A saturated solution of NH_4F in MeOH (3 mL) was added and the mixture was stirred at rt for 10 min, followed by addition of a saturated aqueous solution of Na_2CO_3 (10 mL) and EtOAc (20 mL). The phases were separated and the aqueous layer was extracted with EtOAc (2 x 10 mL). The combined organic phases were washed with a saturated aqueous solution of Na_2CO_3 (2 x 10 mL) and then concentrated in vacuo. The diastereomeric ratio of the crude amino alcohol product, **3** was determined by ^{1}H-NMR analysis to be >20/1 in all cases. The crude products were purified by flash column chromatography. The enantiomeric excesses of the products were determined by HPLC analysis using chiral stationary phases as indicated for each substrate.



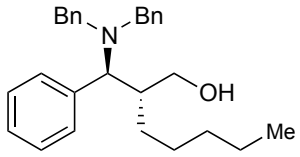
(2*S*,3*R*)-3-(dibenzylamino)-2-methyl-3-phenylpropan-1-ol (3a) was prepared following **General Procedure A**, using (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((dibenzylamino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2a**) (233 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-8% EtOAc in hexanes) to provide the title compound as a pale yellow liquid in 95% yield (164 mg). IR (thin film, cm^{-1}) 3027, 2926, 1452, 908, 729, 697; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.53 – 7.26 (m, 15H), 6.09 – 5.73 (br s, 1H), 4.11 (d, *J* = 13.2 Hz, 2H), 3.91 (dd, *J* = 10.8, 3.9 Hz, 1H), 3.79 – 3.59 (m, 2H), 3.04 (d, *J* = 13.2 Hz, 2H), 2.69 – 2.80 (m, 1H), 0.56 (d, *J* = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.37, 134.15, 129.92, 129.09, 128.53, 127.93, 127.44, 127.21, 69.30, 68.92, 53.95, 33.85, 15.27. $[\alpha]_D^{23}$ = 141.9 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 11.8 min, t_R (major) = 16.5 min. HRMS (DART-TOF) calculated for $C_{24}H_{27}NO$ $[M+H]^+$ *m/z* 346.2165, found 346.2147.

For a 5 mmol-scale reaction: Following **General Procedure A**, using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 1 mol %), (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 1.1 mol %), (*E*)-2-methyl-cinnamaldehyde (731 mg, 5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (1.85 mL, 15.0 mmol, 3.0 equiv), and **2a** (2.33 g, 6.0 mmol, 1.2 equiv) in THF (5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (0-8% EtOAc in hexanes) to provide the title compound as a pale yellow liquid in 96% yield (1.66 g) and >99% ee.

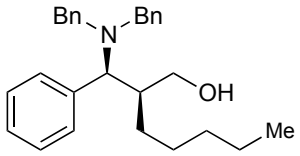


(*S*)-2-((*R*)-(dibenzylamino)(phenyl)methyl)heptan-1-ol ((*S*,*R*)-3b). was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-benzylideneheptanal (101 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2a** (291 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 48 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a colorless liquid in 96% yield (193 mg). IR (thin film, cm^{-1}) 2927, 1494, 1453, 1028, 699; ^1H

NMR (400 MHz, $CDCl_3$) δ: 7.46 – 7.17 (m, 15H), 5.59 (s, 1H), 4.00 (d, *J* = 12.9 Hz, 3H), 3.68 (d, *J* = 11.3 Hz, 1H), 3.48 (dd, *J* = 11.1, 7.7 Hz, 1H), 2.93 (d, *J* = 13.2 Hz, 2H), 2.54 – 2.34 (m, 1H), 1.25 – 0.70 (m, 11H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.59, 134.27, 130.22, 129.32, 128.74, 128.08, 127.61, 127.42, 68.03, 66.57, 54.24, 39.07, 31.87, 28.95, 26.75, 22.43, 13.99. $[\alpha]_D^{23}$ = 121.3 (c = 2.0, $CHCl_3$). HPLC analysis (OD-H, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 7.1 min, t_R (major) = 12.4 min. HRMS (DART-TOF) calculated for $C_{28}H_{35}NO$ $[M+H]^+$ *m/z* 402.2791, found 402.2788.

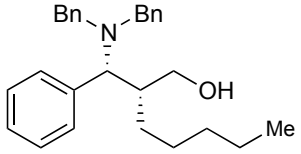


(*R*)-2-((*S*)-(dibenzylamino)(phenyl)methyl)heptan-1-ol ((*R*,*S*)-3b) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-benzylideneheptanal (101 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2a** (291 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 48 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a colorless liquid in 99% yield (200 mg). IR (thin film, cm^{-1}) 2927, 1494, 1452, 1028, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.50 – 7.12 (m, 15H), 5.60 (br s, 1H), 4.16 – 3.85 (m, 3H), 3.69 (d, *J* = 11.3 Hz, 1H), 3.49 (dd, *J* = 11.1, 7.7 Hz, 1H), 2.94 (d, *J* = 13.2 Hz, 2H), 2.54 – 2.33 (m, 1H), 1.23 – 0.67 (m, 11H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.57, 134.25, 130.20, 129.31, 128.72, 128.07, 127.60 127.40, 68.01, 66.55, 54.23, 39.06, 31.85, 28.94, 26.73, 22.42, 13.98. $[\alpha]_D^{23}$ = –121.1 (c = 1.0, $CHCl_3$). HPLC analysis (OD-H, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (major) = 7.1 min, t_R (minor) = 12.6 min. HRMS (DART-TOF) calculated for $C_{28}H_{35}NO$ $[M+H]^+$ *m/z* 495.2791, found 495.2788.

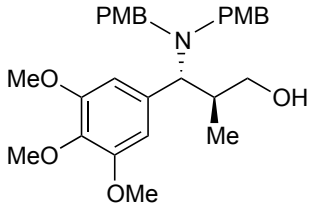


(*S*)-2-((*S*)-(dibenzylamino)(phenyl)methyl)heptan-1-ol ((*S*,*S*)-3b) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-benzylideneheptanal (101 mg, 0.5 mmol, 1.0 equiv),

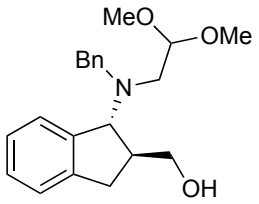
$(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2a** (291 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a colorless liquid in 76% yield (153 mg). IR (thin film, cm^{-1}) 2925, 1494, 1453, 1028, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.43 – 7.35 (m, 6H), 7.31 (t, *J* = 7.5 Hz, 5H), 7.25 – 7.15 (m, 3H), 3.90 (d, *J* = 13.8 Hz, 2H), 3.62 (d, *J* = 10.5 Hz, 1H), 3.42 (dd, *J* = 11.3, 4.1 Hz, 1H), 3.22 (dd, *J* = 11.3, 4.4 Hz, 1H), 3.15 – 2.95 (m, 2H), 2.35 – 2.27 (m, 1H), 2.19 – 1.99 (m, 1H), 1.52 – 1.23 (m, 8H), 1.00 – 0.89 (m, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.80, 136.43, 129.71, 128.97, 128.38, 128.19, 127.40, 126.96, 64.11, 62.82, 53.78, 40.78, 32.68, 27.56, 26.49, 22.93, 14.33. $[\alpha]_D^{23}$ = 65.8 (c = 2.0, $CHCl_3$). HPLC analysis (IC, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (major) = 7.4 min, t_R (minor) = 11.6 min. HRMS (DART-TOF) calculated for $C_{28}H_{35}NO$ $[M+H]^+$ *m/z* 402.2791, found 402.2798.



(*R*)-2-((*R*)-(dibenzylamino)(phenyl)methyl)heptan-1-ol ((*R*,*R*)-3b) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-benzylideneheptanal (101 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2a** (291 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 48 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a colorless liquid in 78% yield (157 mg). IR (thin film, cm^{-1}) 2924, 1493, 1453, 742, 696; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.48 – 7.16 (m, 15H), 3.89 (d, *J* = 13.8 Hz, 2H), 3.62 (d, *J* = 10.5 Hz, 1H), 3.44 (dd, *J* = 11.2, 4.1 Hz, 1H), 3.24 (dd, *J* = 11.3, 4.4 Hz, 1H), 3.06 (d, *J* = 13.8 Hz, 2H), 2.35 – 2.27 (m, 1H), 2.12 – 2.03 (m, 1H), 1.50 – 1.23 (m, 8H), 0.98 – 0.87 (m, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.81, 136.45, 129.74, 129.00, 128.41, 128.24, 127.44, 126.99, 64.21, 62.92, 53.81, 40.82, 32.70, 27.62, 26.55, 22.95, 14.35. $[\alpha]_D^{23}$ = –65.6 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 7.4 min, t_R (major) = 11.6 min. HRMS (DART-TOF) calculated for $C_{28}H_{35}NO$ $[M+H]^+$ *m/z* 402.2791, found 495.2788.

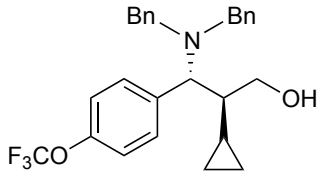


(2*S*,3*R*)-3-(bis(4-methoxybenzyl)amino)-2-methyl-3-(3,4,5-trimethoxyphenyl)propan-1-ol (3c) was prepared following **General Procedure A**, using (*E*)-2-methyl-3-(3,4,5-trimethoxyphenyl)acrylaldehyde (118 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((bis(4-methoxybenzyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2b**) (337 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (33-50% EtOAc in hexanes) to provide the title compound colorless oil in 92% yield (228 mg). IR (thin film, cm^{-1}) 2932, 2835, 1510, 1242, 1126; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.28 (d, *J* = 8.6 Hz, 3H), 6.87 (d, *J* = 8.6 Hz, 3H), 6.37 (s, 2H), 5.98 (br s, 1H), 4.05 – 3.86 (m, 11H), 3.78 (s, 8H), 3.58 – 3.41 (m, 2H), 2.93 (d, *J* = 13.0 Hz, 2H), 2.64 – 2.57 (m, 1H), 0.52 (d, *J* = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 158.89, 152.81, 137.39, 130.37, 130.06, 114.07, 107.30, 69.81, 69.37, 60.94, 56.26, 55.25, 53.44, 33.97, 15.36. $[\alpha]_D^{23}$ = 82.8 (c = 2.0, $CHCl_3$). HPLC analysis (IA, 20% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 17.6 min, t_R (minor) = 18.6 min. HRMS (DART-TOF) calculated for $C_{24}H_{27}NO$ $[M+H]^+$ *m/z* 496.2694, found 496.2680.

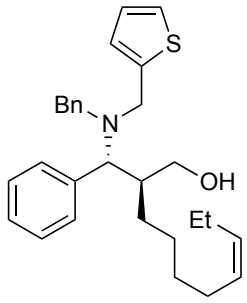


((1*R*,2*S*)-1-(benzyl(2,2-dimethoxyethyl)amino)-2,3-dihydro-1*H*-inden-2-yl)methanol (3d) was prepared following **General Procedure A**, using 1*H*-indene-2-carbaldehyde[2] (72 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((benzyl(2,2-dimethoxyethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2c**) (290 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (25-50% EtOAc in hexanes) to provide the title compound as a yellow liquid in 67% yield (114 mg). IR (thin film, cm^{-1}) 3431, 2928, 1453, 1125, 1062, 748; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.45 – 7.27 (m, 9H), 4.44 (d, *J* = 7.5 Hz, 1H), 4.22 (t, *J* = 5.3 Hz, 1H), 3.91 – 3.57 (m, 5H), 3.26 (d, *J* = 1.1 Hz, 6H), 3.05 – 2.86 (m, 3H), 2.78 – 2.74 (m, 1H), 2.55

(dd, J = 15.7, 8.2 Hz, 1H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 142.65, 142.43, 140.09, 128.96, 128.30, 127.45, 127.10, 126.18, 125.12, 124.79, 104.67, 71.90, 66.81, 56.35, 54.03, 53.92, 53.75, 44.56, 33.20. $[\alpha]_D^{23}$ = 67.0 (c = 2.0, $CHCl_3$). HPLC analysis (OJ-H, 4% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 13.4 min, t_R (major) = 30.0 min. HRMS (DART-TOF) calculated for $C_{21}H_{27}NO_3$ $[M+H]^+$ m/z 342.2064, found 342.2048.

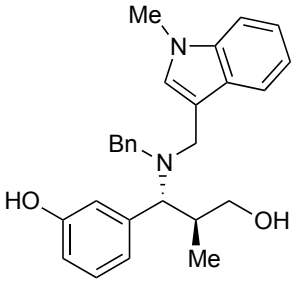


(2*S*,3*R*)-2-cyclopropyl-3-(dibenzylamino)-3-(4-(trifluoromethoxy)phenyl)propan-1-ol (3e) was prepared following **General Procedure A**, using (*E*)-2-cyclopropyl-3-(4-(trifluoromethoxy)phenyl)acrylaldehyde (128 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2a** (290 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (5-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 76% yield (173 mg). IR (thin film, cm^{-1}) 1256, 1221, 1163, 748, 699; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.39 – 7.28 (m, 14H), 5.09 (s, 1H), 4.06 – 3.89 (m, 4H), 3.68 – 3.64 (m, 1H), 3.02 (d, J = 13.1 Hz, 2H), 1.73 (m, 1H), 1.36 (m, 2H), 0.26 – 0.23 (m, 1H), 0.08 – 0.03 (m, 2H), -0.01 – -0.18 (m, 1H), -0.29 (m, 1H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 148.60, 138.39, 133.29, 131.91, 129.23, 128.86, 127.61, 120.64, 120.05 (d, J = 258.6 Hz), 67.91, 67.79, 54.22, 44.32, 32.05, 12.68, 6.85, 2.74. $[\alpha]_D^{23}$ = 79.1 (c = 2.0, $CHCl_3$). HPLC analysis (OD-H, 20% IPA in hexanes, 0.5 mL/min, 220 nm) indicated 95% ee: t_R (minor) = 8.1 min, t_R (major) = 10.5 min. HRMS (DART-TOF) calculated for $C_{27}H_{28}F_3NO_2$ $[M+H]^+$ m/z 456.2145, found 456.2132.



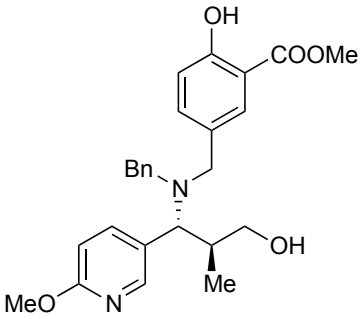
(*S*,*Z*)-2-((*R*)-(benzyl(thiophen-2-ylmethyl)amino)(phenyl)methyl)dec-7-en-1-ol (3f) was prepared following **General Procedure A**, using (2*E*,7*Z*)-2-benzylidenedec-7-enal (121 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((benzyl(thiophen-2-

ylmethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2d**) (296 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (0-20% EtOAc in hexanes) to provide the title compound as a colorless liquid in 78% yield (174 mg). IR (thin film, cm^{-1}) 2929, 1453, 1072, 1039, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.35 – 7.32 (m, 4H), 7.26 (t, *J* = 7.7 Hz, 3H), 7.20 – 7.09 (m, 4H), 6.91 – 6.81 (m, 2H), 5.26 – 5.14 (m, 1H), 5.14 – 4.99 (m, 1H), 4.61 (br s, 1H), 4.09 – 3.86 (m, 3H), 3.63 (d, *J* = 11.3 Hz, 1H), 3.48 (dd, *J* = 11.3, 6.8 Hz, 1H), 3.18 (d, *J* = 13.9 Hz, 1H), 2.89 (d, *J* = 13.5 Hz, 1H), 2.30 (m, 1H), 1.83 (m, 2H), 1.74 (q, *J* = 7.1 Hz, 2H), 1.19 – 0.93 (m, 4H), 0.83 – 0.70 (m, 5H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 142.40, 138.61, 134.35, 131.66, 130.06, 129.02, 128.95, 128.79, 128.19, 127.65, 127.45, 126.83, 126.74, 125.24 , 67.12, 65.50, 53.97, 48.95, 39.42, 29.70, 28.76, 26.85, 26.65, 20.50, 14.44. $[\alpha]_D^{23}$ = 115.9 (c = 2.0, $CHCl_3$). HPLC analysis (OD-H, 2% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (major) = 11.0 min, t_R (minor) = 13.0 min. HRMS (DART-TOF) calculated for $C_{29}H_{37}NOS$ $[M+H]^+$ *m*/*z* 448.2669, found 448.2670.

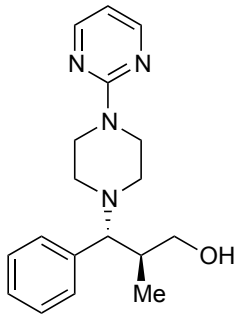


3-((1*R*,2*S*)-1-(benzyl((1-methyl-1*H*-indol-3-yl)methyl)amino)-3-hydroxy-2-methylpropyl)phenol (3g) was prepared following **General Procedure A**, using (*E*)-3-(3-hydroxyphenyl)-2-methylacrylaldehyde (82 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv), and 4-(((benzyl((1-methyl-1*H*-indol-3-yl)methyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2e**) (265 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 48 h. The crude product was purified by flash column chromatography (25-50% EtOAc in hexanes) to provide the title compound as a white foam in 92% yield (191 mg). IR (thin film, cm^{-1}) 3010, 2915, 1587, 1097, 753; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.65 (br s, 1H), 7.49 – 7.14 (m, 11H), 7.07 – 7.00 (m, 1H), 6.98 – 6.84 (m, 2H), 6.78 (d, *J* = 7.5 Hz, 1H), 4.31 – 4.01 (m, 2H), 3.95 – 3.66 (m, 5H), 3.48 (t, *J* = 10.2 Hz, 1H), 3.31 (d, *J* = 13.4 Hz, 1H), 3.11 (d, *J* = 13.3 Hz, 1H), 2.79 (m, 1H), 0.51 (d, *J* = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 156.68, 138.49, 136.85, 135.75, 129.43, 129.27, 128.74, 128.74, 128.71, 127.36, 122.49, 121.68,

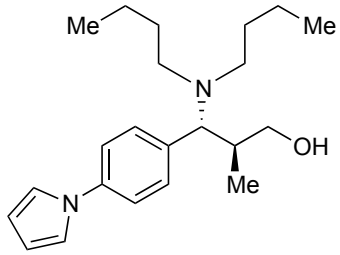
119.26, 118.70, 116.94, 115.02, 110.56, 109.35, 70.13, 69.78, 54.71, 44.58, 33.83, 32.83, 15.21. $[\alpha]_D^{23}$ = 110.1 (c = 1.0, $CHCl_3$). HPLC analysis (IA, 20% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 5.5 min, t_R (major) = 6.5 min. HRMS (DART-TOF) calculated for $C_{27}H_{30}N_2O_2$ $[M+H]^+$ *m/z* 415.2380, found 415.2389.



methyl 5-((benzyl((1*R*,2*S*)-3-hydroxy-1-(6-methoxypyridin-3-yl)-2-methylpropyl) amino)-methyl)-2-hydroxybenzoate (3h) was prepared following **General Procedure A**, using (*E*)-3-(6-methoxypyridin-3-yl)-2-methylacrylaldehyde (89 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv), and methyl 5-((benzyl((4-(diethylamino)benzoyl)oxy)amino)-methyl)-2-hydroxybenzoate (**2f**) (278 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (20-25% EtOAc in hexanes) to provide the title compound as white foam in 66% yield (149 mg). IR (thin film, cm^{-1}) 1676, 1601, 1498, 1204, 751; ^1H NMR (400 MHz, $CDCl_3$) δ: 10.71 (s, 1H), 7.97 (m, 1H), 7.76 (m, 1H), 7.48 (td, *J* = 8.3, 2.4 Hz, 2H), 7.41 – 7.29 (m, 4H), 7.27 – 7.24 (m, 1H), 6.96 (d, *J* = 8.6 Hz, 1H), 6.83 (d, *J* = 8.5 Hz, 1H), 5.47 (br s, 1H), 3.95 (m, 8H), 3.80 – 3.74 (m, 1H), 3.61 – 3.34 (m, 2H), 2.92 – 2.83 (m, *J* , 2H), 2.60 (m, 1H), 0.47 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 170.37, 163.69, 161.05, 148.09, 139.38, 138.00, 136.59, 130.54, 129.20, 128.82, 128.66, 127.58, 122.53, 118.26, 112.19, 110.73, 69.33, 66.00, 53.93, 53.53, 53.16, 52.45, 34.00, 15.40. $[\alpha]_D^{23}$ = 92.0 (c = 2.0, $CHCl_3$). HPLC analysis (OD-H, 20% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 6.3 min, t_R (major) = 8.5 min. HRMS (DART-TOF) calculated for $C_{26}H_{30}N_2O_5$ $[M+H]^+$ *m/z* 451.2227, found 451.2231.

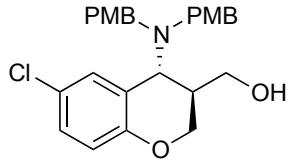


(2*S*,3*R*)-2-methyl-3-phenyl-3-(4-(pyrimidin-2-yl)piperazin-1-yl)propan-1-ol (3i) was prepared following **General Procedure A**, using (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(pyrimidin-2-yl)piperazin-1-yl 4-(diethylamino)benzoate (**2g**) (355 mg, 1.0 mmol, 2.0 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-2% Et_2O in hexanes) to provide the title compound as a pale yellow oil in 76% yield (119 mg). IR (thin film, cm^{-1}) 1585, 1494, 983, 750, 706; ^1H NMR (400 MHz, $CDCl_3$) δ: 8.14 (d, *J* = 4.7 Hz, 2H), 7.34 – 7.13 (m, 3H), 7.12 – 6.93 (m, 2H), 6.32 (t, *J* = 4.7 Hz, 1H), 4.46 – 3.58 (m, 6H), 3.47 (d, *J* = 10.9 Hz, 1H), 2.95 – 2.47 (m, 3H), 2.31 (m, 2H), 0.50 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 161.13, 157.47, 133.79, 129.31, 127.87, 127.47, 109.74, 77.42, 70.56, 49.31, 43.48, 32.80, 14.87. $[\alpha]_D^{23}$ = –16.2 (c = 3.0, $CHCl_3$). HPLC analysis (OD-H, 15% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 8.0 min, t_R (major) = 9.4 min. HRMS (DART-TOF) calculated for $C_{18}H_{24}N_4O$ $[M+H]^+$ *m/z* 313.2023, found 313.2011.

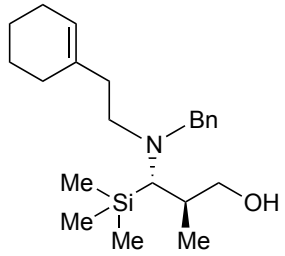


(2*S*,3*R*)-3-(4-(1*H*-pyrrol-1-yl)phenyl)-3-(dibutylamino)-2-methylpropan-1-ol (3j) was prepared following **General Procedure A**, using (*E*)-3-(4-(1*H*-pyrrol-1-yl)phenyl)-2-methylacrylaldehyde (106 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((dibutylamino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2h**) (321 mg, 1.0 mmol, 2.0 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (20-30% EtOAc in hexanes) to provide the title compound as a colorless liquid in 76% yield (130 mg). IR (thin film, cm^{-1}) 2956, 2928, 1519,

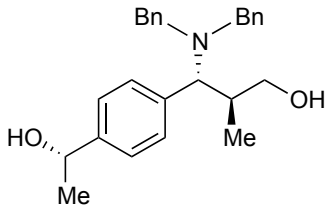
1329, 1070, 726; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.58 (s, 1H), 7.42 – 7.32 (m, 2H), 7.24 – 7.15 (m, 2H), 7.10 (t, *J* = 2.2 Hz, 2H), 6.34 (t, *J* = 2.2 Hz, 2H), 3.80 (dd, *J* = 11.0, 3.5 Hz, 1H), 3.75 – 3.57 (m, 2H), 2.67 (m, 2H), 2.62 – 2.44 (m, 1H), 2.05 – 1.87 (m, 2H), 1.64 – 1.46 (m, 4H), 1.43 – 1.22 (m, 4H), 0.93 (t, *J* = 7.3 Hz, 6H), 0.56 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.94, 132.11, 130.84, 119.79, 119.17, 110.61, 71.42, 70.55, 50.13, 33.31, 30.07, 20.80, 15.24, 14.14. $[\alpha]_D^{23}$ = 14.7 (c = 1.0, $CHCl_3$). HPLC analysis (OD-H, 4% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 13.3 min, t_R (minor) = 14.3 min. HRMS (DART-TOF) calculated for $C_{22}H_{34}N_2O$ $[M+H]^+$ *m/z* 343.2744, found 343.2730.



((3*S*,4*R*)-4-(bis(4-methoxybenzyl)amino)-6-chlorochroman-3-yl)methanol (3k) was prepared following **General Procedure A**, using 6-chloro-2*H*-chromene-3-carbaldehyde (97 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2b** (337 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (25-33% EtOAc in hexanes) to provide the title compound as a pale yellow liquid in 64% yield (145 mg). IR (thin film, cm^{-1}) 1510, 1249, 1216, 1034, 753; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.52 (t, *J* = 2.0 Hz, 1H), 7.27 – 7.25 (m, 4H), 7.08 (dt, *J* = 8.7, 2.3 Hz, 1H), 6.95 – 6.82 (m, 4H), 6.75 (dd, *J* = 8.6, 2.0 Hz, 1H), 4.31 – 4.18 (m, 1H), 4.06 (m, 1H), 3.87 – 3.73 (m, 8H), 3.65 – 3.36 (m, 5H), 2.48 (s, 1H), 1.40 – 1.30 (m, 1H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 158.89, 154.78, 131.50, 130.11, 129.66, 128.24, 125.87, 125.50, 118.39, 113.92, 65.92, 62.52, 55.34, 53.46, 52.23, 36.04. $[\alpha]_D^{23}$ = +129.4 (c = 2.0, $CHCl_3$). HPLC analysis (OD-H, 20% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (major) = 9.6 min, t_R (minor) = 13.5 min. HRMS (DART-TOF) calculated for $C_{26}H_{28}ClNO_4$ $[M+H]^+$ *m/z* 454.1780, found 454. 1787.

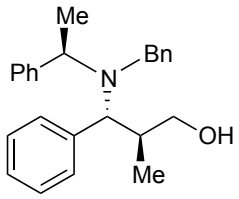


(2*R*,3*S*)-3-(benzyl(2-(cyclohex-1-en-1-yl)ethyl)amino)-2-methyl-3-(trimethylsilyl)propan-1-ol (3l) was prepared following **General Procedure A**, using (*E*)-2-methyl-3-(trimethylsilyl)prop-2-en-1-ol[3] (72 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and 4-(((benzyl(2-(cyclohex-1-en-1-yl)ethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2i**) (305 mg, 0.75 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (0-70% CH_2Cl_2 in hexanes) to provide the title compound as a colorless liquid in 77% yield (138 mg). IR (thin film, cm^{-1}) 2926, 1251, 1103, 752, 699; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.39 – 7.23 (m, 5H), 5.46 – 5.30 (m, 1H), 5.07 (br s, 1H), 3.98 (d, *J* = 12.7 Hz, 1H), 3.75 – 3.50 (m, 2H), 3.36 (dd, *J* = 10.6, 8.1 Hz, 1H), 2.87 – 2.80 (m, 1H), 2.71 – 2.64 (m, 1H), 2.32 (m, 1H), 2.25 – 2.09 (m, 2H), 2.09 – 1.77 (m, 5H), 1.55 (m, 4H), 0.79 (d, *J* = 6.8 Hz, 3H), 0.23 (s, 9H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.14, 135.52, 129.61, 128.54, 127.37, 122.33, 72.25, 60.15, 57.67, 51.51, 37.63, 34.75, 28.59, 25.31, 22.99, 22.46, 16.76, 2.27. $[\alpha]_D^{23}$ = 43.3 (c = 2.0, $CHCl_3$). HPLC analysis (AD-H, 1% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 8.5 min, t_R (major) = 11.6 min. HRMS (DART-TOF) calculated for $C_{22}H_{37}NOSi$ $[M+H]^+$ *m/z* 360.2717, found 360.2724.

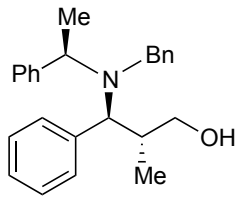


(2*S*,3*R*)-3-(dibenzylamino)-3-(4-((*S*)-1-hydroxyethyl)phenyl)-2-methylpropan-1-ol (3m) was prepared following **General Procedure A**, using (*E*)-3-(4-acetylphenyl)-2-methylacrylaldehyde (94 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv), and **2a** (291 mg, 0.6 mmol, 1.5 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 60 h. The crude product was purified by flash column chromatography (0-33% EtOAc in hexanes) to provide the title compound as a white foam in 76% yield (148 mg). IR (thin film, cm^{-1}) 3340, 2967, 1453, 1028, 733, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.49 – 7.13 (m, 14H), 4.93 (q, *J* = 6.4

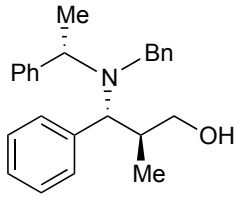
Hz, 1H), 3.99 (d, *J* = 13.2 Hz, 2H), 3.82 – 3.72 (m, 1H), 3.60 (d, *J* = 11.0 Hz, 1H), 3.49 (dd, *J* = 10.9, 8.4 Hz, 1H), 2.93 (d, *J* = 13.2 Hz, 2H), 2.67 – 2.61 (m, 1H), 1.55 (d, *J* = 6.5 Hz, 3H), 0.44 (d, *J* = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 145.29, 138.42, 133.19, 130.11, 129.25, 128.68, 127.36, 125.18, 69.82, 69.59, 68.99, 54.10, 33.86, 25.31, 15.38. $[\alpha]_D^{23}$ = 186.8 (c = 0.25, $CHCl_3$). HPLC analysis (AD-H, 10% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 12.0 min, t_R (major) = 14.4 min. HRMS (DART-TOF) calculated for $C_{26}H_{31}NO_2$ $[M+H]^+$ *m/z* 390.2428, found 390.2433.



(2*S*,3*R*)-3-(benzyl((*R*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*S*,*R*,*R*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and (*R*)-4-(((benzyl(1-phenylethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (**2j**) (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 65% yield (117 mg) and >20/1 dr. IR (thin film, cm^{-1}) 1493, 1451, 1216, 752, 576; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.51 – 7.18 (m, 15H), 4.41 (d, *J* = 15.3 Hz, 1H), 3.90 – 3.64 (m, 5H), 3.36 (d, *J* = 15.4 Hz, 1H), 2.44 – 2.37 (m, 1H), 1.10 (d, *J* = 6.9 Hz, 3H), 0.51 (d, *J* = 6.7 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ: 146.05, 142.40, 136.73, 130.11, 128.86, 128.51, 127.99, 127.62, 127.35, 127.18, 126.63, 68.99, 67.83, 62.45, 52.91, 36.15, 24.03, 15.61. $[\alpha]_D^{23}$ = 59.2 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2304.

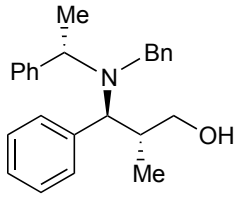


(2*R*,3*S*)-3-(benzyl((*R*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*R*,*S*,*R*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2j** (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 75% yield (135 mg) and >20/1 dr. IR (thin film, cm^{-1}) 1486, 1457, 1209, 752 571; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.48 – 7.18 (m, 12H), 4.35 – 4.01 (m, 3H), 3.68 – 3.60 (m, 3H), 3.25 (dd, *J* = 10.9, 7.1 Hz, 1H), 2.50 – 2.40 (m, 1H), 0.93 (d, *J* = 7.0 Hz, 3H), 0.43 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 143.66, (d, *J* = 1.8 Hz), 129.73, 139.34, 129.43, 128.77, 128.49, 128.33, 128.16, 127.41, 127.34, 127.20, 68.41, 66.65, 55.99, 51.48, 35.81, 15.43, 13.65. $[\alpha]_D^{23}$ = –54.3 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2304.

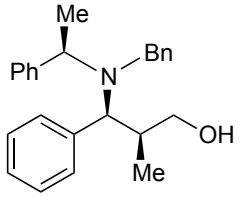


(2*S*,3*R*)-3-(benzyl((*S*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*S*,*R*,*S*)-3n). was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and (*S*)-4-(((benzyl(1-phenylethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline (***ent*-2j**) (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 76% yield (137 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2932, 1494, 1451, 1028, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.52 – 7.20 (m, 15H), 4.30 – 4.15 (m, 2H), 3.70 – 3.55 (m, 3H), 3.30 (dd, *J* = 10.9, 6.9 Hz, 1H), 2.47 – 2.38 (m, 1H), 0.92 (d, *J* = 7.0 Hz, 3H), 0.42 (d, *J* = 6.7 Hz, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ: 143.55, 139.28, 129.26, 129.55, 129.26, 128.59, 128.32, 128.17, 128.02, 127.23, 127.18, 127.02, 68.08, 66.39, 55.81, 51.28, 35.73, 15.28, 13.47. $[\alpha]_D^{23}$ = 51.4 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 495.2307.

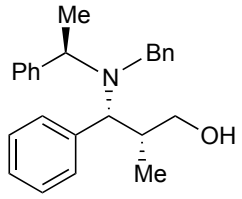


(2*R*,3*S*)-3-(benzyl((*S*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*R*,*S*,*S*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*E*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and ***ent*-2j** (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 75% yield (135 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2968, 1493, 1451, 732, 698 ^1H NMR (400 MHz, $CDCl_3$) δ: 7.50 – 7.14 (m, 15H), 4.38 (d, *J* = 15.4 Hz, 1H), 3.93 – 3.57 (m, 5H), 3.33 (d, *J* = 15.4 Hz, 1H), 2.41 – 2.34 (m, 1H), 1.07 (d, *J* = 6.9 Hz, 3H), 0.48 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 146.03, 142.40, 136.73, 130.09, 128.83, 128.49, 127.97, 127.84, 127.60, 127.32 , 127.15, 126.61 , 68.94, 67.78, 62.41, 52.87, 36.14, 24.01, 15.59. $[\alpha]_D^{23}$ = –56.1 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2325.

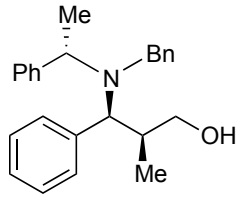


(2*S*,3*S*)-3-(benzyl((*R*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*S*,*S*,*R*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-methyl-cinnamaldehyde[4, 5, 6] (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2j** (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 64% yield (115 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2967, 1493, 1450, 1027, 699; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.51 – 7.14 (m, 15H), 4.34 (d, *J* = 15.8 Hz, 1H), 3.82 (q, *J* = 6.9 Hz, 1H), 3.56 (d, *J* = 9.7 Hz, 1H), 3.43 (d, *J* = 15.8 Hz, 1H), 3.29 (dd, *J* = 10.9, 3.8 Hz, 1H), 2.97 (dd, *J* = 10.9, 6.4 Hz, 1H), 2.33 – 2.23 (m, 1H), 1.23 (d, *J* = 6.6

Hz, 3H), 1.07 (d, J = 6.9 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 145.82, 143.66, 138.04, 129.53, 128.40, 128.21, 128.05, 127.93, 127.51, 127.27, 126.79, 126.23, 67.99, 66.26, 61.63, 51.77, 37.85, 23.35, 15.99. $[\alpha]_D^{23}$ = 25.1 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ m/z 360.2322, found 360.2320.

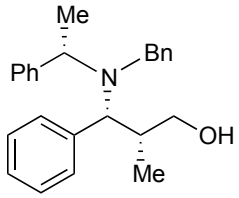


(2*R*,3*R*)-3-(benzyl((*R*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*R*,*R*,*R*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and **2j** (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 72% yield (130 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2967, 1493, 1451, 1027, 698; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.45 – 7.19 (m, 15H), 4.22 (q, J = 6.9 Hz, 1H), 4.06 (d, J = 14.2 Hz, 1H), 3.62 (d, J = 14.2 Hz, 1H), 3.50 (d, J = 9.2 Hz, 1H), 3.31 (dd, J = 10.9, 3.9 Hz, 1H), 2.94 (dd, J = 10.9, 6.5 Hz, 1H), 2.38 – 2.27 (m, 1H), 1.00 (d, J = 6.6 Hz, 3H), 0.97 (d, J = 6.9 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ: 144.39, 140.97, 140.22, 129.22, 128.86, 128.36, 128.30, 128.12, 128.10, 127.22, 126.87, 126.66, 66.13, 65.94, 55.45, 51.34, 37.55, 15.91, 13.49. $[\alpha]_D^{23}$ = –23.6 (c = 1.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{31}H_{30}N_2O_2S$ $[M+H]^+$ m/z 360.2322, found 360.2313.



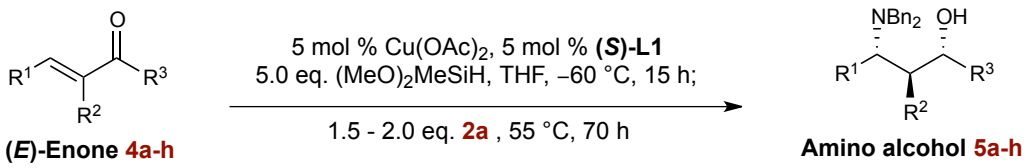
(2*S*,3*S*)-3-(benzyl((*S*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*S*,*S*,*S*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and ***ent*-2j** (242 mg, 0.6

mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 73% yield (131 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2966, 1493, 1451, 1027, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.48 – 7.17 (m, 15H), 4.32 – 4.16 (m, 1H), 4.07 (d, *J* = 14.1 Hz, 1H), 3.63 (d, *J* = 14.2 Hz, 1H), 3.50 (d, *J* = 9.3 Hz, 1H), 3.31 (dd, *J* = 10.8, 3.9 Hz, 1H), 2.94 (dd, *J* = 10.9, 6.5 Hz, 1H), 2.39 – 2.29 (m, 1H), 1.31 (br s, 1H), 1.00 (m, 6H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 144.39, 140.96, 140.21, 129.21, 128.86, 128.35, 128.29, 128.11, 128.09, 127.21, 126.86, 126.65, 66.10, 65.90, 55.44, 51.32, 37.54, 15.90, 13.50. $[\alpha]_D^{23}$ = 24.8 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NOS$ $[M+H]^+$ *m/z* 360.2322, found 360.2306.

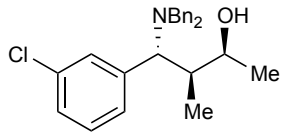


(2*R*,3*R*)-3-(benzyl((*S*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol ((*R*,*R*,*S*)-3n) was prepared following **General Procedure A**, using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (33.2 mg, 0.0275 mmol, 5.5 mol %), (*Z*)-2-methyl-cinnamaldehyde (73 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 4.0 equiv), and ***ent*-2j** (242 mg, 0.6 mmol, 1.2 equiv) in THF (0.5 mL), the reaction mixture was stirred at 55 °C for 36 h. The crude product was purified by flash column chromatography (0-10% EtOAc in hexanes) to provide the title compound as a colorless liquid in 68% yield (122 mg) and >20/1 dr. IR (thin film, cm^{-1}) 2968, 1492, 1450, 1028, 730; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.49 – 7.11 (m, 15H), 4.32 (d, *J* = 15.9 Hz, 1H), 3.80 (q, *J* = 6.9 Hz, 1H), 3.54 (d, *J* = 9.7 Hz, 1H), 3.41 (d, *J* = 15.9 Hz, 1H), 3.26 (dd, *J* = 10.9, 3.8 Hz, 1H), 2.95 (dd, *J* = 10.9, 6.4 Hz, 1H), 2.31 – 2.21 (m, 1H), 1.21 (d, *J* = 6.6 Hz, 3H), 1.05 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 145.82, 143.66, 138.04, 129.52, 128.40 128.21, 128.05, 127.92, 127.50 , 127.27, 126.79, 126.22, 67.98, 66.25, 61.63, 51.77, 37.86, 23.36, 15.99. $[\alpha]_D^{23}$ = –26.9 (c = 2.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2331.

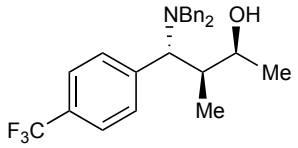
4. Copper-Catalyzed Asymmetric Hydrosilylation/Hydroamination of Enones



General Procedure B (one–pot procedure): An oven-dried screw-cap reaction tube equipped with a magnetic stir bar was charged with $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %) and (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %). The reaction tube was sealed with a screw-cap septum, then evacuated and backfilled with argon (this process was repeated a total of two times). Anhydrous THF (0.3 mL) and $(MeO)_2MeSiH$ (0.25 mL, 2.0 mmol, 2.0 equiv) were added sequentially via syringe. The resulting mixture was stirred at rt for 15 min until the color changed from blue to orange. A second oven-dried screw-cap reaction tube equipped with a stir bar was charged with enone substrate **4** (1.0 mmol, 1.0 equiv). The reaction tube was sealed with a screw-cap septum, and then evacuated and backfilled with argon (this process was repeated a total of two times). Anhydrous THF (0.7 mL) and $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv) were added sequentially via syringe at rt. The reaction tube was cooled in a –60 °C cooling bath and the catalyst solution from the first reaction tube was added slowly to the stirred mixture via syringe. After stirring at –60 °C for an additional 15 h, the reaction mixture was allowed to warm to rt and hydroxylamine ester **2a** (1.5 mmol, 1.5 equiv) was then added. The reaction tube was sealed with a screw-cap septum, then evacuated and backfilled with argon (this process was repeated a total of two times). The reaction mixture was stirred at 55 °C for 70 h. After completion, the reaction was allowed to cool to ambient temperature, then the solvent was removed *in vacuo* with the aid of a rotary evaporator. A saturated solution of NH_4F in MeOH (5 mL) was added and the mixture was stirred at rt for 10 min, followed by addition of a saturated aqueous solution of Na_2CO_3 (10 mL) and EtOAc (20 mL). The phases were separated and the aqueous layer was extracted with EtOAc (2 x 15 mL). The combined organic phases were washed with a saturated aqueous solution of Na_2CO_3 (2 x 15 mL) and then concentrated in vacuo. The diastereomeric ratio of the crude amino alcohol product **5** was determined by ^{1}H-NMR analysis. The crude products were purified by flash column chromatography. The enantiomeric excesses of the products were determined by HPLC analysis using chiral stationary phases as indicated for each substrate.

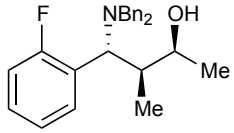


(2*S*,3*S*,4*R*)-4-(3-chlorophenyl)-4-(dibenzylamino)-3-methylbutan-2-ol (5b) was prepared following **General Procedure B**, using (*E*)-4-(3-chlorophenyl)-3-methylbut-3-en-2-one[7] (195 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a yellow liquid in 70% yield (276 mg). IR (thin film, cm^{-1}) 2972, 1453, 907, 733, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.42 – 7.23 (m, 13H), 7.15 (dt, *J* = 7.0, 1.7 Hz, 1H), 4.56 – 4.30 (m, 1H), 3.93 (d, *J* = 13.1 Hz, 2H), 3.78 (d, *J* = 5.8 Hz, 1H), 3.61 (d, *J* = 11.3 Hz, 1H), 2.50 – 2.41 (m, 1H), 0.97 (d, *J* = 6.6 Hz, 3H), 0.48 (d, *J* = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.85, 137.32, 134.30, 130.18, 129.42, 129.40, 128.84, 128.42, 127.76, 127.64, 68.34, 64.49, 53.92, 37.70, 18.68, 12.83. $[\alpha]_D^{23}$ = 144.1 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 7.9 min, t_R (major) = 11.5 min. HRMS (DART-TOF) calculated for $C_{25}H_{28}ClNO$ $[M+H]^+$ *m/z* 394.1932, found 394.1935.

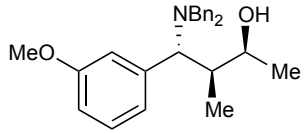


(2*S*,3*R*)-3-(benzyl((*R*)-1-phenylethyl)amino)-2-methyl-3-phenylpropan-1-ol (5c) was prepared following **General Procedure B**, using (*E*)-3-methyl-4-(4-(trifluoromethyl)phenyl)but-3-en-2-one[7] (228 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a white solid liquid in 72% yield (306 mg). M.P. 140 – 141°C; IR (thin film, cm^{-1}) 1325, 1119, 1103, 1067, 750; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.63 (d, *J* = 8.0 Hz, 2H), 7.33 – 7.15 (m, 12H), 4.50 – 4.29 (m, 1H), 3.87 (d, *J* = 13.1 Hz, 2H), 3.69 – 3.51 (m, 2H), 2.84 (d, *J* = 13.1 Hz, 2H), 2.45 – 2.37 (m, 1H), 0.92 (d, *J* = 6.6 Hz, 3H), 0.39 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.28 (d, *J* = 1.5 Hz), 138.80, 130.48, 129.79 (q, *J* = 30.3 Hz), 128.88, 127.70, 125.12 (q, *J* = 3.7 Hz), 124.32 (q, *J* = 272.7 Hz), 68.18, 64.47, 53.94, 37.72, 18.79, 12.66. $[\alpha]_D^{23}$ = 143.3 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 1 mL/min,

220 nm) indicated >99% ee: t_R (minor) = 6.7 min, t_R (minor) = 10.4 min. Anal. Calcd. for $C_{26}H_{28}FNO$: C, 73.05; H, 6.60. Found: C, 73.09; H, 6.62.

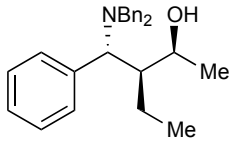


(2*S*,3*S*,4*R*)-4-(dibenzylamino)-4-(2-fluorophenyl)-3-methylbutan-2-ol (5d) was prepared following **General Procedure B**, using (*E*)-4-(2-fluorophenyl)-3-methylbut-3-en-2-one (178 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a yellow liquid in 66% yield (249 mg). IR (thin film, cm^{-1}) 2972, 1486, 1452, 750, 699; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.49 – 7.26 (m, 14H), 4.45 (dt, *J* = 6.5, 3.3 Hz, 1H), 4.19 – 4.04 (m, 4H), 3.08 (dd, *J* = 13.1, 1.7 Hz, 2H), 2.71 (br s, 1H), 1.00 (d, *J* = 6.6 Hz, 3H), 0.60 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 163.22, 160.79, 139.12, 129.65, 129.27 (d, *J* = 8.6 Hz), 128.65, 127.54, 123.72 (d, *J* = 3.3 Hz), 122.53 (d, *J* = 16.0 Hz), 116.14 (d, *J* = 25.3 Hz), 69.10, 54.20, 37.47, 18.32, 13.06. $[\alpha]_D^{23}$ = 145.2 (c = 2.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 12.6 min, t_R (major) = 26.2 min. HRMS (DART-TOF) calculated for $C_{25}H_{28}FNO$ $[M+H]^+$ *m/z* 378.2228, found 378.2218.

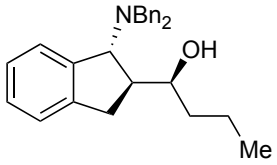


(2*S*,3*S*,4*R*)-4-(dibenzylamino)-4-(3-methoxyphenyl)-3-methylbutan-2-ol (5e) was prepared following **General Procedure B**, using (*E*)-4-(3-methoxyphenyl)-3-methylbut-3-en-2-one[7] (190 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a yellow liquid in 71% yield (276 mg). IR (thin film, cm^{-1}) 2970, 1492, 1258, 910, 576; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.50 – 7.25 (m, 11H), 7.01 – 6.80 (m, 3H), 4.43 (s, 1H), 4.23 (s, 1H), 3.97 (d, *J* = 13.2 Hz, 2H), 3.90 (s, 3H), 3.65 (d, *J* = 11.3 Hz, 1H), 3.06 (d, *J* = 13.2

Hz, 2H), 2.58 – 2.49 (m, 1H), 0.98 (d, J = 6.5 Hz, 3H), 0.53 (d, J = 6.7 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 159.42, 139.11, 136.63, 129.47, 128.97, 128.72, 127.49, 122.76, 116.78, 112.12, 68.79, 64.76, 55.31, 53.96, 37.59, 18.48, 13.10. $[\alpha]_D^{23}$ = 132.8 (c = 2.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 1 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 12.6 min, t_R (major) = 26.2 min. HRMS (DART-TOF) calculated for $C_{26}H_{31}NO_2$ $[M+H]^+$ m/z 390.2428, found 390.2408.

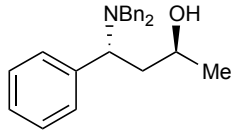


(2*S*,3*S*)-3-((*R*)-(dibenzylamino)(phenyl)methyl)pentan-2-ol (5f) was prepared following **General Procedure B**, using (*E*)-3-benzylidenepentan-2-one[7] (174 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a yellow liquid in 62% yield (232 mg). IR (thin film, cm^{-1}) 2967, 1493, 1453, 733, 698; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 – 7.21 (m, 15H), 6.17 (d, J = 7.6 Hz, 1H), 4.41 – 4.22 (m, 1H), 34.03 – 3.87 (m, 3H), 2.95 (d, J = 13.0 Hz, 2H), 2.55 – 2.48 (m, 1H), 0.98 – 0.67 (m, 8H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.43, 133.93, 130.50, 129.78, 128.59, 128.01, 127.57, 127.46, 68.44, 64.25, 53.80, 42.61, 22.01, 17.24, 12.37. $[\alpha]_D^{23}$ = 120.9 (c = 3.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 20.0 min, t_R (minor) = 24.0 min. HRMS (DART-TOF) calculated for $C_{26}H_{31}NO$ $[M+H]^+$ m/z 374.2478, found 374.2469.



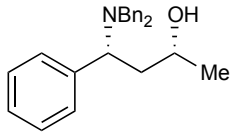
(*S*)-1-((1*R*,2*S*)-1-(dibenzylamino)-2,3-dihydro-1*H*-inden-2-yl)butan-1-ol (5g) was prepared following **General Procedure B**, using 1-(1*H*-inden-2-yl)butan-1-one (186 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% CH_2Cl_2 in hexanes) to provide the title compound as a yellow liquid in 67% yield (258 mg) with 10/1 dr. IR (thin film, cm^{-1}) 2927, 1453, 1126, 909,

732, 697; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.54 – 7.13 (m, 14H), 4.41 (d, *J* = 7.4 Hz, 1H), 3.97 – 3.47 (m, 5H), 2.87 – 2.72 (m, 2H), 2.63 – 2.57 (m, 1H), 1.85 – 1.58 (m, 1H), 1.53 – 1.39 (m, 1H), 1.39 – 1.12 (m, 3H), 0.90 (t, *J* = 6.9 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 143.20, 143.07, 140.17, 129.34, 129.00, 128.40, 127.40, 127.12, 126.18, 125.07, 72.04, 65.18, 54.86, 47.03, 37.09, 30.72, 19.61, 14.14. $[\alpha]_D^{23}$ = –128.2 (c = 3.0, $CHCl_3$). HPLC analysis (IA, 20% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 8.9 min, t_R (minor) = 11.8 min. HRMS (DART-TOF) calculated for $C_{27}H_{31}NO$ $[M+H]^+$ *m/z* 386.2478, found 386.2451.



(2*S*,4*R*)-4-(dibenzylamino)-4-phenylbutan-2-ol ((*S*,*R*)-5h) was prepared following **General Procedure B**, using (*E*)-4-phenylbut-3-en-2-one (219 mg, 1.5 mmol, 1.5 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (388 mg, 1.0 mmol, 1.0 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compounds as yellow liquids in 72% yield for **(*S*,*R*)-5h**,(249 mg) and 10% yield for **(*R*,*R*)-5h** (35 mg).

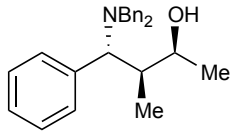
For **(*S*,*R*)-5h**: IR (thin film, cm^{-1}) 1493, 1452, 1073, 747, 697; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.56 – 7.30 (m, 15H), 4.35 – 4.27 (m,1H), 4.12 (dd, *J* = 10.8, 4.7 Hz, 1H), 4.00 (d, *J* = 13.4 Hz, 2H), 3.38 (br s, 1H), 3.16 (d, *J* = 13.4 Hz, 2H), 2.56 – 2.49 (m, 1H), 1.76 – 1.69 (m, 1H), 1.18 (d, *J* = 6.3 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.48, 137.20, 129.32, 129.12, 128.53, 128.09, 127.46, 127.23, 65.36, 57.98, 53.55, 39.38, 22.72. $[\alpha]_D^{23}$ = 125.4 (c = 5.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 29.6 min, t_R (minor) = 31.0 min. HRMS (DART-TOF) calculated for $C_{24}H_{27}NO$ $[M+H]^+$ *m/z* 346.2165, found 346.2147.



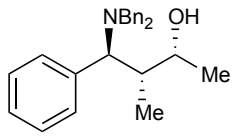
(2*R*,4*R*)-4-(dibenzylamino)-4-phenylbutan-2-ol ((*R*,*R*)-5h).

For **(*R*,*R*)-5h**: IR (thin film, cm^{-1}) 1452, 1215, 1136, 744, 690; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.46 – 7.24 (m, 15H), 6.29 (br s, 1H), 4.10 – 4.04 (m, 3H), 3.93 – 3.75 (m, 1H), 2.97 (d, *J* = 13.2 Hz, 2H), 2.46 – 2.37 (m, 1H), 1.56 (d, *J* = 14.5 Hz, 1H), 1.20 (d, *J* = 6.1 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.45, 136.19, 129.49, 129.38, 128.78, 128.24, 127.81, 127.45, 69.20, 53.91,

39.09, 23.67. $[\alpha]_D^{23}$ = 108.9 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 25.8 min, t_R (minor) = 28.0 min. HRMS (DART-TOF) calculated for $C_{24}H_{27}NO$ $[M+H]^+$ *m/z* 346.2165, found 346.2158.



(2*S*,3*S*,4*R*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*S*,*S*,*R*)-5a) was prepared following **General Procedure B**, using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*E*)-3-methyl-4-phenylbut-3-en-2-one[7] (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as white foam in 76% yield (273 mg). IR (thin film, cm^{-1}) 2972, 1452, 907, 731, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.44 – 7.04 (m, 15H), 4.44 – 4.01 (m, 2H), 3.87 (d, *J* = 13.2 Hz, 2H), 3.59 (d, *J* = 11.3 Hz, 1H), 2.91 (d, *J* = 13.2 Hz, 2H), 2.50 – 2.43 (m, 1H), 0.87 (d, *J* = 6.5 Hz, 3H), 0.40 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.09, 134.95, 130.40, 129.54, 128.75, 128.12, 127.57, 127.53, 69.00, 64.80, 53.94, 37.52, 18.43, 13.31. $[\alpha]_D^{23}$ = 125.0 (c = 3.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 21.0 min, t_R (major) = 30.7 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2321.



(2*R*,3*R*,4*S*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*R*,*R*,*S*)-5a) was prepared following **General Procedure B**, using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*E*)-3-methyl-4-phenylbut-3-en-2-one (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.62 mL, 5.0 mmol, 5.0 equiv), and **2a** (583 mg, 1.5 mmol, 1.5 equiv) in THF (1.0 mL), the reaction mixture was stirred at 55 °C for 70 h. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as a yellow liquid in 75% yield (269 mg). IR (thin film, cm^{-1}) 2972, 1452, 907, 731, 698; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.44 – 7.32 (m, 11H), 7.29 – 7.22 (m, 4H), 4.50 – 4.20

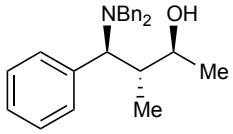
(m, 2H), 3.93 (d, J = 13.1 Hz, 2H), 3.66 (d, J = 11.3 Hz, 1H), 2.97 (d, J = 13.1 Hz, 2H), 2.58 – 2.49 (m, 1H), 0.93 (d, J = 6.4 Hz, 3H), 0.46 (d, J = 6.8 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.04, 134.89, 130.32, 129.47, 128.69, 128.06, 127.51, 127.46, 68.93, 64.72, 53.88, 37.45, 18.40, 13.26. $[\alpha]_D^{23}$ = –123.1 (c = 3.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 21.0 min, t_R (minor) = 30.7 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ m/z 360.2322, found 360.2308.

Two-Step Ligand-Switch Procedure

General Procedure C (for 1,2-reduction): An oven-dried screw-cap reaction tube equipped with a magnetic stir bar was charged with $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %) and (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %). The reaction tube was sealed with a screw-cap septum, then evacuated and backfilled with argon (this process was repeated a total of two times). Anhydrous THF (0.3 mL) and $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv) were added sequentially via syringe. The resulting mixture was stirred at rt for 15 min until the color changed from blue to orange. A second oven-dried screw-cap reaction tube equipped with a stir bar was charged with enone substrate **4** (1.0 mmol, 1.0 equiv). The reaction tube was sealed with a screw-cap septum, and then evacuated and backfilled with argon (this process was repeated a total of two times). Anhydrous THF (0.7 mL) were added via syringe at rt and then immersed into a cooling bath at –60 °C. The catalyst solution from the first reaction tube was then added slowly to the stirred mixture via syringe. After stirring at –60 °C for an additional 15 h, the reaction mixture was quenched at –60 °C by addition of a saturated aqueous solution of Na_2CO_3 (10 mL) then allowed to warm to rt and the solvent was removed *in vacuo* with the aid of a rotary evaporator. A saturated solution of NH_4F in MeOH (3 mL) was added and the mixture was stirred at rt for 10 min followed by addition of a saturated aqueous solution of Na_2CO_3 (10 mL) and EtOAc (20 mL). The phases were separated and the aqueous layer was extracted with EtOAc (2 x 10 mL). The combined organic phases were washed with a saturated aqueous solution of Na_2CO_3 (2 x 10 mL) and then concentrated in vacuo. The crude allylic alcohols were purified by flash column chromatography. The enantiomeric excesses of the products were determined by HPLC analysis using chiral stationary phases as indicated for each substrate.

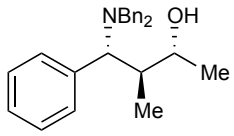
General Procedure D (for hydroamination): An oven-dried screw-cap reaction tube equipped with a magnetic stir bar was charged with $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %) and **(*R*)-DTBM-SEGPHOS** (33.2 mg, 0.0275 mmol, 5.5 mol %). The reaction tube was sealed with a screw-cap septum, then evacuated and backfilled with argon (this process was repeated a total of

two times). Anhydrous THF (0.5 mL) and $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv) were added sequentially via syringe. The resulting mixture was stirred at rt for 15 min until the color changed from blue to orange. A second oven-dried screw-cap reaction tube equipped with a stir bar was charged with allylic alcohol intermediate (0.5 mmol, 1.0 equiv) and hydroxylamine ester **2a** (1.0 mmol, 2.0 equiv). The reaction tube was sealed with a screw-cap septum, and then evacuated and backfilled with argon (this process was repeated a total of two times). The catalyst solution from the first reaction tube was then added slowly to the stirred mixture at rt via syringe. After stirring at rt for 15 min, the reaction mixture was then stirred at 55 °C for 70 h. After cooling to room temperature, the solvent was removed *in vacuo* with the aid of a rotary evaporator. A saturated solution of NH_4F in MeOH (3 mL) was added and the mixture was stirred at rt for 10 min, followed by addition of a saturated aqueous solution of Na_2CO_3 (10 mL) and EtOAc (20 mL). The phases were separated and the aqueous layer was extracted with EtOAc (2 x 10 mL). The combined organic phases were washed with a saturated aqueous solution of Na_2CO_3 (2 x 10 mL) and then concentrated in vacuo. The crude products were purified by flash column chromatography. The enantiomeric excesses of the products were determined by HPLC analysis using chiral stationary phases as indicated for each substrate.



(2*S*,3*R*,4*S*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*S*,*R*,*S*)-5a) was prepared following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (18.0 mg, 0.1 mmol, 5 mol %) and **(*S*)-DTBM-SEGPHOS** (133.0 mg, 0.11 mmol, 5.5 mol %), (*E*)-3-methyl-4-phenylbut-3-en-2-one (320 mg, 2.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.74 mL, 6.0 mmol, 3.0 equiv), the reaction mixture was stirred at –60 °C for 15 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*S*,*E*)-3-methyl-4-phenylbut-3-en-2-ol[8] as a colorless liquid in 99% yield (321 mg). $[\alpha]_D^{23} = -13.5$ (c = 1.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 92% ee: t_R (major) = 7.2 min, t_R (minor) = 8.5 min. Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %) and **(*R*)-DTBM-SEGPHOS** (33.2 mg, 0.0275 mmol, 5.5 mol %), (*R*,*E*)-3-methyl-4-phenylbut-3-en-2-ol (81 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv), the reaction mixture was stirred at 55 °C for 70 h. The diastereomeric ratio was determined to 13/1 via ^1H NMR analysis of the crude sample. The crude product was purified by

flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as white foam in 60% yield (108 mg). IR (thin film, cm^{-1}) 2972, 1736, 1452, 747, 697; ^1H NMR (400 MHz, $CDCl_3$) δ: 8.08 (br s, 1H), 7.56 – 7.10 (m, 15H), 4.29 – 3.88 (m, 2H), 3.73 (d, J = 11.1 Hz, 1H), 3.61 – 3.56 (m, 1H), 2.96 (d, J = 13.2 Hz, 2H), 2.49 – 2.23 (m, 1H), 1.25 (d, J = 6.0 Hz, 3H), 0.45 (d, J = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 137.82, 133.93, 130.35, 129.45, 128.83, 128.21, 127.76, 127.55, 74.19, 70.14, 54.34, 38.99, 21.98, 15.27. $[\alpha]_D^{23}$ = –123.1 (c = 3.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 26.5 min, t_R (major) = 28.3 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ m/z 360.2322, found 360.2306.

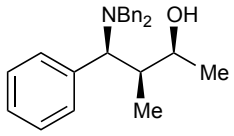


(2*R*,3*S*,4*R*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*R*,*S*,*R*)-5a).

Following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (18.0 mg, 0.1 mmol, 5 mol %) and **(*R*)-DTBM-SEGPHOS** (133.0 mg, 0.11 mmol, 5.5 mol %), (*E*)-3-methyl-4-phenylbut-3-en-2-one (320 mg, 2.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.74 mL, 6.0 mmol, 3.0 equiv), the reaction mixture was stirred at –60 °C for 15 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*R*,*E*)-3-methyl-4-phenylbut-3-en-2-ol[8] as a colorless liquid in 99% yield (321 mg). $[\alpha]_D^{23}$ = 13.5 (c = 2.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 92% ee: t_R (minor) = 7.2 min, t_R (major) = 8.5 min.

Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (4.5 mg, 0.025 mmol, 5 mol %) and **(*S*)-DTBM-SEGPHOS** (33.2 mg, 0.0275 mmol, 5.5 mol %), (*R*,*E*)-3-methyl-4-phenylbut-3-en-2-ol (81 mg, 0.5 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.31 mL, 2.5 mmol, 5.0 equiv), the reaction mixture was stirred at 55 °C for 70 h. The diastereomeric ratio was determined to 13/1 via ^1H NMR analysis of the crude sample. The crude product was purified by flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as white foam in 61% yield (110 mg). IR (thin film, cm^{-1}) 2971, 1494, 1452, 1125, 697; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.93 (br s, 1H), 7.51 – 7.15 (m, 15H), 4.05 (d, J = 13.2 Hz, 2H), 3.69 (d, J = 11.1 Hz, 1H), 3.62 – 3.55 (m, 1H), 2.93 (d, J = 13.2 Hz, 2H), 2.39 – 2.20 (m, 1H), 1.23 (d, J = 6.1 Hz, 3H), 0.43 (d, J = 6.6 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 138.11, 134.12, 130.29, 129.41, 128.75, 128.13, 127.62, 127.43, 74.14, 69.99, 54.32, 39.03, 21.91, 15.22. $[\alpha]_D^{23}$ = 123.6 (c = 3.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R

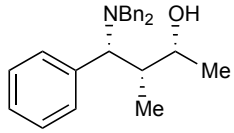
(major) = 26.5 min, t_R (minor) = 28.3 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2323.



(2*S*,3*S*,4*S*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*S*,*S*,*S*)-5a).

Following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*Z*)-3-methyl-4-phenylbut-3-en-2-one[9, 10] (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv), the reaction mixture was stirred at –78 °C for 24 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*S*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol as a white solid in 91% yield (147 mg). M.P. 44 – 45 °C; IR (thin film, cm^{-1}) 2972, 1735, 1453, 748, 695; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.35 (m, 2H), 7.26 – 7.20 (m, 1H), 7.18 – 7.16 (m, 2H), 6.37 (s, 1H), 4.88 (q, *J* = 6.5 Hz, 1H), 1.92 (d, *J* = 1.6 Hz, 3H), 1.64 (s, 1H), 1.34 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 141.21, 137.38, 128.77, 128.26, 126.97, 126.57, 65.64, 21.40, 17.29. $[\alpha]_D^{23}$ = 84.9 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 89% ee: t_R (minor) = 6.2 min, t_R (major) = 8.2 min. HRMS (DART-TOF) calculated for $C_{11}H_{14}O$ $[M+H]^+$ *m/z* 161.0961, found 161.0961.

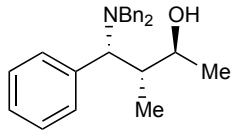
Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (1.8 mg, 0.01 mmol, 10 mol %) and **(*S*)-DM-SEGPHOS** (8.0 mg, 0.011 mmol, 11 mol %), (*R*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol (16 mg, 0.1 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.13 mL, 1.0 mmol, 10.0 equiv), the reaction mixture was stirred at 65 °C for 70 h. The diastereomeric ratio was determined to 7/1 via ^1H NMR analysis of the crude sample. The crude product was purified via preparative TLC (20% EtOAc in hexanes) to provide the title compound as a colorless liquid in 36% yield (13 mg). IR (thin film, cm^{-1}) 2972, 1735, 1453, 748, 695; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.35 – 7.22 (m, 10H), 7.20 – 7.11 (m, 5H), 3.85 (d, *J* = 14.0 Hz, 2H), 3.48 – 3.34 (m, 1H), 3.35 (d, *J* = 9.6 Hz, 1H), 3.05 (d, *J* = 14.0 Hz, 2H), 2.62 – 2.51 (m, 1H), 1.03 (d, *J* = 6.7 Hz, 3H), 0.79 (d, *J* = 6.2 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.11, 135.91, 129.59, 128.91, 128.31, 128.10, 127.35, 126.90, 68.79, 66.57, 53.28, 39.65, 17.76, 11.79. $[\alpha]_D^{23}$ = 100.5 (c = 0.1, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 15.7 min, t_R (minor) = 24.8 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2322.



(2*R*,3*R*,4*R*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*R*,*R*,*R*)-5a).

Following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*Z*)-3-methyl-4-phenylbut-3-en-2-one (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv), the reaction mixture was stirred at –78 °C for 24 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*R*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol as a white solid in 91% yield (147 mg). M.P. 44 – 45 °C; IR (thin film, cm^{-1}) 2972, 1735, 1453, 748, 695; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.33 (dd, *J* = 8.1, 6.7 Hz, 2H), 7.26 – 7.20 (m, 1H), 7.17 (dd, *J* = 7.6, 1.4 Hz, 2H), 6.37 (s, 1H), 4.88 (q, *J* = 6.5 Hz, 1H), 1.92 (d, *J* = 1.6 Hz, 3H), 1.64 (s, 1H), 1.34 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 141.21, 137.38, 128.77, 128.26, 126.97, 126.57, 65.64, 21.40, 17.29. $[\alpha]_D^{23}$ = –84.1 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 89% ee: t_R (major) = 6.2 min, t_R (minor) = 8.2 min. HRMS (DART-TOF) calculated for $C_{11}H_{14}O$ $[M–H]^+$ *m/z* 161.0961, found 161.0961.

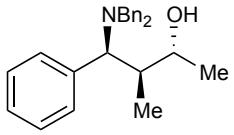
Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (1.8 mg, 0.01 mmol, 10 mol %) and **(*R*)-DM-SEGPHOS** (8.0 mg, 0.011 mmol, 11 mol %), (*R*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol (16 mg, 0.1 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.13 mL, 1.0 mmol, 10.0 equiv), the reaction mixture was stirred at 65 °C for 70 h. The diastereomeric ratio was determined to 7/1 via ^1H NMR analysis of the crude sample. The crude product was purified via preparative TLC (20% EtOAc in hexanes) to provide the title compound as a colorless liquid in 36% yield (13 mg). IR (thin film, cm^{-1}) 2973, 1734, 1452, 748, 696; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.32 – 7.10 (m, 15H), 3.83 (d, *J* = 14.0 Hz, 2H), 3.49 – 3.38 (m, 1H), 3.33 (d, *J* = 9.5 Hz, 1H), 3.03 (d, *J* = 14.0 Hz, 2H), 2.59 – 2.49 (m, 1H), 1.50 (s, 1H), 1.01 (d, *J* = 6.7 Hz, 3H), 0.77 (d, *J* = 6.3 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 139.26, 136.06, 129.74, 129.06, 128.46, 128.24, 127.50, 127.05, 68.95, 66.72, 53.42, 39.80, 17.91, 11.94. $[\alpha]_D^{23}$ = –101.0 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (minor) = 15.7 min, t_R (major) = 24.8 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2318.



(2*S*,3*R*,4*R*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*S*,*R*,*R*)-5a).

Following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*S*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*Z*)-3-methyl-4-phenylbut-3-en-2-one (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv), the reaction mixture was stirred at –78 °C for 24 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*S*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol as a white solid in 91% yield (147 mg). M.P. 44 – 45 °C; IR (thin film, cm^{-1}) 2972, 1735, 1453, 748, 695; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.35 (m, 2H), 7.26 – 7.20 (m, 1H), 7.18 – 7.16 (m, 2H), 6.37 (s, 1H), 4.88 (q, *J* = 6.5 Hz, 1H), 1.92 (d, *J* = 1.6 Hz, 3H), 1.64 (s, 1H), 1.34 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 141.21, 137.38, 128.77, 128.26, 126.97, 126.57, 65.64, 21.40, 17.29. $[\alpha]_D^{23}$ = 84.9 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 89% ee: t_R (minor) = 6.2 min, t_R (major) = 8.2 min. HRMS (DART-TOF) calculated for $C_{11}H_{14}O$ $[M+H]^+$ *m/z* 161.0961, found 161.0961.

Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (1.8 mg, 0.005 mmol, 5 mol %) and **(*R*)-DTBM-SEGPHOS** (13.4 mg, 0.011 mmol, 5.5 mol %), (*R*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol (32 mg, 0.2 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (62 μL, 1.0 mmol, 5.0 equiv), the reaction mixture was stirred at 55 °C for 70 h. The diastereomeric ratio was determined to >20/1 via ^1H NMR analysis of the crude sample. The crude product was purified flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as white foam in 70% yield (50 mg). IR (thin film, cm^{-1}) 2969, 1493, 1453, 909, 748, 697; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.46 – 7.42 (m, 6H), 7.38 – 7.32 (m, 5H), 7.29 – 7.21 (m, 2H), 7.21 – 7.11 (m, 2H), 3.92 (d, *J* = 13.8 Hz, 2H), 3.70 (d, *J* = 11.3 Hz, 1H), 3.54 – 3.41 (m, 1H), 3.02 (d, *J* = 13.8 Hz, 2H), 2.30 – 2.22 (m, 1H), 1.30 (d, *J* = 6.7 Hz, 3H), 1.08 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 140.13, 136.22, 129.78, 128.83, 128.43, 128.21, 127.30, 126.91, 67.48, 65.03, 53.84, 39.95, 21.88, 9.73. $[\alpha]_D^{23}$ = –97.1 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 7.4 min, t_R (minor) = 8.1 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2322.

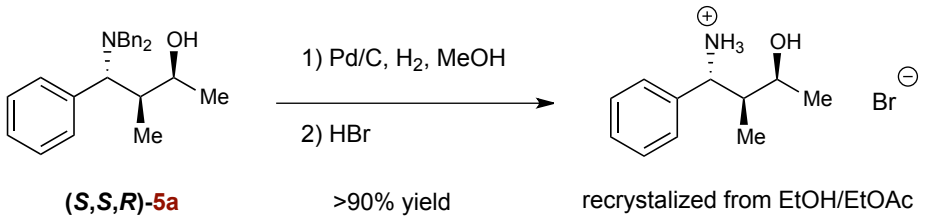


(2*R*,3*S*,4*S*)-4-(dibenzylamino)-3-methyl-4-phenylbutan-2-ol ((*R*,*S*,*S*)-5a).

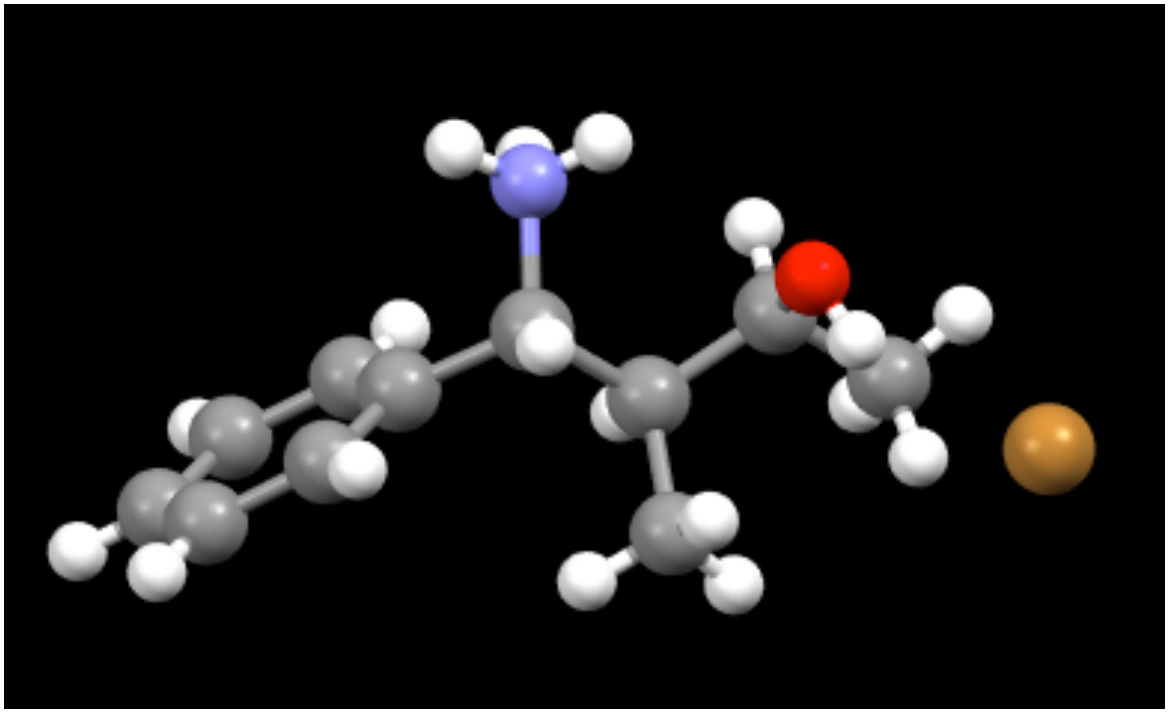
Following **General Procedure C** (for 1,2-reduction), using $Cu(OAc)_2$ (9.0 mg, 0.05 mmol, 5 mol %), (*R*)-DTBM-SEGPHOS (66.4 mg, 0.055 mmol, 5.5 mol %), (*Z*)-3-methyl-4-phenylbut-3-en-2-one (160 mg, 1.0 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (0.37 mL, 3.0 mmol, 3.0 equiv), the reaction mixture was stirred at –78 °C for 24 h. The crude product was purified by flash column chromatography (0-15% EtOAc in hexanes) to provide (*R*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol as a white solid in 91% yield (147 mg). M.P. 44 – 45 °C; IR (thin film, cm^{-1}) 2972, 1735, 1453, 748, 695; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.33 (dd, *J* = 8.1, 6.7 Hz, 2H), 7.26 – 7.20 (m, 1H), 7.17 (dd, *J* = 7.6, 1.4 Hz, 2H), 6.37 (s, 1H), 4.88 (q, *J* = 6.5 Hz, 1H), 1.92 (d, *J* = 1.6 Hz, 3H), 1.64 (s, 1H), 1.34 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 141.21, 137.38, 128.77, 128.26, 126.97, 126.57, 65.64, 21.40, 17.29. $[\alpha]_D^{23}$ = –84.1 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 5% IPA in hexanes, 1 mL/min, 220 nm) indicated 89% ee: t_R (major) = 6.2 min, t_R (minor) = 8.2 min. HRMS (DART-TOF) calculated for $C_{11}H_{14}O$ $[M–H]^+$ *m/z* 161.0961, found 161.0961.

Following **General Procedure D** (for hydroamination), using $Cu(OAc)_2$ (1.8 mg, 0.005 mmol, 5 mol %) and **(*S*)-DTBM-SEGPHOS** (13.4 mg, 0.011 mmol, 5.5 mol %), (*S*,*Z*)-3-methyl-4-phenylbut-3-en-2-ol (32 mg, 0.2 mmol, 1.0 equiv), $(MeO)_2MeSiH$ (62 μL, 1.0 mmol, 5.0 equiv), the reaction mixture was stirred at 55 °C for 70 h. The diastereomeric ratio was determined to >20/1 via ^1H NMR analysis of the crude sample. The crude product was purified flash column chromatography (0-10% Et_2O in hexanes) to provide the title compound as white foam in 68% yield (49 mg). IR (thin film, cm^{-1}) 2972, 1452, 909, 748, 697; ^1H NMR (400 MHz, $CDCl_3$) δ: 7.44 – 7.39 (m, 6H), 7.35 – 7.29 (m, 5H), 7.24 – 7.20 (m, 2H), 7.15 – 7.13 (m, 2H), 3.89 (d, *J* = 13.8 Hz, 2H), 3.67 (d, *J* = 11.3 Hz, 1H), 3.47 – 3.43 (m, 1H), 3.00 (d, *J* = 13.8 Hz, 2H), 2.27 – 2.19 (m, 1H), 1.26 (d, *J* = 6.7 Hz, 3H), 1.06 (d, *J* = 6.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 140.14, 136.23, 129.79, 128.83, 128.44, 128.22, 127.32, 126.92, 67.50, 65.04, 53.85, 39.96, 21.89, 9.74. $[\alpha]_D^{23}$ = 101.1 (c = 1.0, $CHCl_3$). HPLC analysis (IC, 1% IPA in hexanes, 0.5 mL/min, 220 nm) indicated >99% ee: t_R (major) = 7.4 min, t_R (minor) = 8.1 min. HRMS (DART-TOF) calculated for $C_{25}H_{29}NO$ $[M+H]^+$ *m/z* 360.2322, found 360.2325.

5. Determination of the Absolute and Relative Configuration of Products

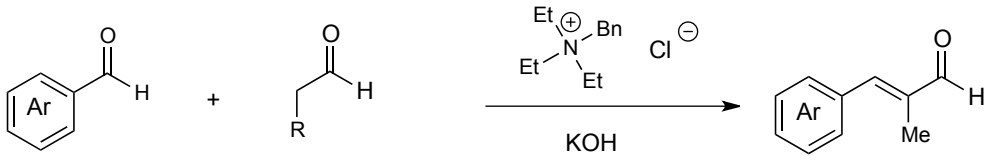


(*S*,*S*,*R*)-5a >90% yield recrystalized from EtOH/EtOAc



The absolute and relative configuration of **5a** (Prepared from (*E*)-3-methyl-4-phenylbut-3-en-2-one using (S)-**L1** using General Procedure B) in **Figure 4** in the manuscript was determined to be (*S*,*S*,*R*) by X-ray diffraction after debenzylation and hydrobromide salt formation. The stereochemistries of the remaining amino alcohols were assigned by analogy.

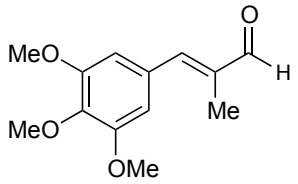
6. Preparation of Substrates



aryl aldehyde aliphatic aldehyde (*E*)-enal

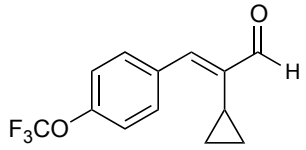
General Procedure E for the Preparation of Enals

To a vigorously stirring suspension of benzyltriethylammonium chloride (1.0 mmol) and potassium hydroxide (1.50 mmol) in toluene (15.0 mL) was added aryl aldehyde (10.0 mmol) and aliphatic aldehyde (12.0 mmol). The mixture was stirred at room temperature and monitored by thin-layer chromatography. The reaction mixture was extracted with EtOAc and the combined organic layers were dried over Na_2SO_4, and filtered. The solvent was removed under reduced pressure and the resulting residue was purified by column chromatography (EtOAc/hexanes) or recrystallization to afford the enal.[11]



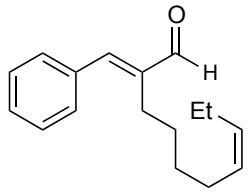
(*E*)-2-methyl-3-(3,4,5-trimethoxyphenyl)acrylaldehyde.

The title compound was prepared by following **General Procedure E** as an off-white solid. M.P. 86 – 87 °C; IR (thin film, cm^{-1}) 1662, 1575, 1330, 1244, 1123; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.55 (s, 1H), 7.18 (d, J = 1.9 Hz, 1H), 6.77 (s, 2H), 3.90 (d, J = 2.6 Hz, 9H), 2.10 (d, J = 1.3 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 195.44, 153.33, 150.04, 139.61, 137.65 , 130.73, 107.70, 61.11, 56.34, 11.13. HRMS (DART-TOF) calculated for $C_{13}H_{16}O_4$ $[M+H]^+$ m/z 237.1121, found 237.1115.



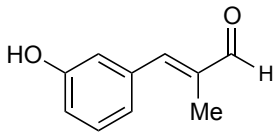
(*E*)-2-cyclopropyl-3-(4-(trifluoromethoxy)phenyl)acrylaldehyde.

The title compound was prepared by following **General Procedure E** as a bright yellow liquid. IR (thin film, cm^{-1}) 1688, 1252, 1217, 1205, 1159; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.65 – 9.42 (m, 1H), 7.69 (d, *J* = 8.7 Hz, 1H), 7.34 – 7.20 (m, 3H), 1.74 – 1.61 (m, 1H), 0.98 – 0.84 (m, 2H), 0.78 – 0.64 (m, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 195.12, 149.88, 149.15, 142.80, 133.36, 131.89, 121.82, 120.72, 119.26, 8.71, 7.57. HRMS (DART-TOF) calculated for $C_{13}H_{11}F_3O_2$ $[M+H]^+$ *m/z* 257.0784, found 257.0778.



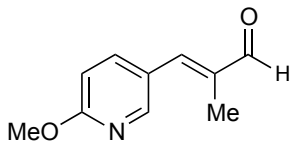
(2*E*,7*Z*)-2-benzylidenedec-7-enal.

The title compound was prepared by following **General Procedure E** as a pale yellow liquid. IR (thin film, cm^{-1}) 2931, 2858, 1660, 1623, 755; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.55 (s, 1H), 7.52 – 7.39 (m, 5H), 7.22 (s, 1H), 5.42 – 5.24 (m, 2H), 2.61 – 2.48 (m, 2H), 2.03 (m, 4H), 1.56 – 1.41 (m, 3H), 0.94 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 195.83, 150.00, 143.34, 135.08, 132.01, 129.73, 128.93, 30.09, 28.04, 26.93, 24.82, 20.66, 14.49. HRMS (DART-TOF) calculated for $C_{17}H_{22}O$ $[M–H]^+$ *m/z* 241.1598, found 259.1700.



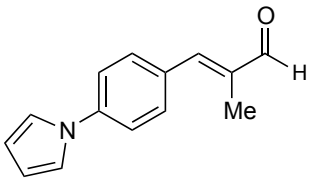
(*E*)-3-(3-hydroxyphenyl)-2-methylacrylaldehyde.

The title compound was prepared by following **General Procedure E** as a white solid. M.P. 119 – 120 °C; IR (thin film, cm^{-1}) 3228, 1650, 1575, 1281, 1194; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.57 (s, 5H), 7.33 (t, *J* = 7.9 Hz, 5H), 7.23 (s, 1H), 7.15 – 7.07 (m, 5H), 7.04 (d, *J* = 2.2 Hz, 4H), 6.91 (ddd, *J* = 8.2, 2.6, 0.9 Hz, 5H), 5.56 (s, 5H), 2.08 (d, *J* = 1.4 Hz, 15H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 196.14, 155.99, 150.12, 138.69, 136.70, 130.09, 122.88, 116.96, 116.74, 11.14. HRMS (DART-TOF) calculated for $C_{10}H_{10}O_2$ $[M+H]^+$ *m/z* 163.0754, found 163.0750.



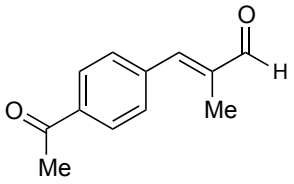
(*E*)-3-(6-methoxypyridin-3-yl)-2-methylacrylaldehyde.

The title compound was prepared by following **General Procedure E** as a light brown solid. M.P. 105 – 106 °C; IR (thin film, cm^{-1}) 1669, 1597, 1493, 1293, 1007; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.56 (s, 1H), 8.37 (d, *J* = 2.4 Hz, 1H), 7.80 (dd, *J* = 8.7, 2.5 Hz, 1H), 7.16 (d, *J* = 1.6 Hz, 1H), 6.82 (d, *J* = 8.7 Hz, 1H), 3.98 (s, 3H), 2.07 (d, *J* = 1.4 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 195.02, 164.65, 149.58, 146.26, 139.46, 137.71, 124.77, 111.31, 53.95, 11.10. HRMS (DART-TOF) calculated for $C_{10}H_{11}NO_2$ $[M+H]^+$ *m/z* 178.0863, found 178.0857.



(*E*)-3-(4-(1*H*-pyrrol-1-yl)phenyl)-2-methylacrylaldehyde.

The title compound was prepared by following **General Procedure E** as a bright yellow solid. M.P. 102 – 104 °C; IR (thin film, cm^{-1}) 1667, 1600, 1518, 1326, 700; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.60 (s, 1H), 7.62 (d, *J* = 8.6 Hz, 2H), 7.48 (d, *J* = 8.7 Hz, 2H), 7.26 – 7.23 (m, 1H), 7.16 (t, *J* = 2.2 Hz, 2H), 6.39 (t, *J* = 2.2 Hz, 2H), 2.12 (d, *J* = 1.3 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 195.42, 148.78, 141.34, 138.11, 132.40, 131.71, 120.11, 119.13, 111.39, 11.16. HRMS (DART-TOF) calculated for $C_{14}H_{13}NO$ $[M+H]^+$ *m/z* 212.1070, found 212.1066.



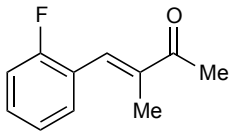
(*E*)-3-(4-acetylphenyl)-2-methylacrylaldehyde.

A solution of 4'-bromoacetophenone (13.2 mmol, 2.63g, 1.0 equiv), acrolein (6.0 mmol, 0.39 mL, 0.45 equiv), palladium acetate (0.66 mmol, 0.148 g, 0.05 equiv), triethylamine (39.6 mmol, 5.5 mL, 3.0 equiv) and benzyltriethylammonium chloride (13.2 mmol, 3.05 g, 1.0 equiv) in dimethylformamide (40 mL) was stirred and heated to 70 °C. After 3 h, additional acrolein (6.0 mmol, 0.393mL, 0.45 equiv) and palladium acetate (0.66 mmol, 0.148g, 0.05 equiv) were added. After 17 h, the reaction mixture was cooled to rt and diluted with EtOAc. The organic layer was washed with H_2O and dried over Na_2SO_4 and filtered. The solvent was removed under reduced pressure and the resulting residue was purified by column chromatography (20% EtOAc in hexanes) to give the title compound as a light orange solid (50% yield, 2.26g).[12] M.P. 73 – 74 °C;

IR (thin film, cm^{-1}) 1674, 1264, 1183, 1010, 591; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.59 (s, 1H), 8.00 (d, J = 8.4 Hz, 2H), 7.58 (d, J = 8.3 Hz, 2H), 7.31 – 7.27 (m, 1H), 2.60 (s, 3H), 2.05 (d, J = 1.5 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 197.39, 195.18, 147.93, 140.18, 139.55, 137.26, 130.05, 128.62, 26.74, 11.11. HRMS (DART-TOF) calculated for $C_{12}H_{12}O_2$ $[M+H]^+$ m/z 189.0910, found 189.0906.

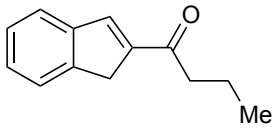
General Procedure F for the Preparation of Enones

To a solution of aliphatic ketone (50 mmol) and aromatic aldehyde (25 mmol) in glacial acetic acid (20 mL) was added sulfuric acid (2.4 g) and the reaction mixture was stirred at rt. After 20 h the mixture was then poured into H_2O (100 mL) and the carefully neutralized with aqueous NaOH. The resulting mixture was then extracted with EtOAc (3 x 30 mL), the combined organic layers were washed with a saturated aqueous $NaHCO_3$ (20 mL) and brine (20 mL) and dried over Na_2SO_4 and filtered. The solvent was removed under reduced pressure and the residue was purified by column chromatography (hexane/EtOAc, 20:1) to afford the enone.



(*E*)-4-(2-fluorophenyl)-3-methylbut-3-en-2-one.

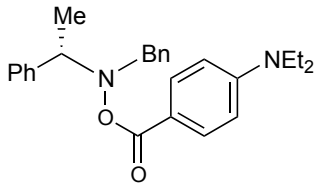
The title compound was prepared by following **General Procedure F** as an orange oil. IR (thin film, cm^{-1}) 1667, 1483, 1365, 1233, 753; ^1H NMR (400 MHz, $CDCl_3$) δ: 9.99 (s, 1H), 7.74 (t, J = 1.9 Hz, 1H), 7.65 – 7.59 (m, 1H), 7.58 – 7.52 (m, 1H), 7.39 (pd, J = 7.4, 1.4 Hz, 2H), 3.67 (d, J = 1.8 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 188.39, 147.93, 147.21, 145.22, 142.38, 129.05, 127.31, 124.98, 124.41, 35.66. HRMS (DART-TOF) calculated for $C_{11}H_{11}FO$ $[M+H]^+$ m/z 179.0867, found 179.0867.



1-(1H-inden-2-yl)butan-1-one[13]**.**

A solution 2-bromobenzaldehyde (3.0 mmol), hex-1-en-3-ol (3.6 mmol), tetrabutylammonium chloride (6.0mmol), sodium acetate (7.5 mmol), lithium chloride (6.0 mmol), and palladium acetate (0.15 mmol) in DMF (30 mL) under an argon atmosphere was heated at 110 °C and stirred for 4 h. The reaction mixture was cooled to rt and extracted with EtOAc. The combined

organic layers were dried over Na_2SO_4, filtered and the solvent was removed under reduced pressure. The resulting residue was purified by column chromatography (hexane/EtOAc, 5:1) to yield the product as a yellow solid (60% yield). M.P. 75 – 76 °C; IR (thin film, cm^{-1}) 2957, 1647, 1556, 1174, 752; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (q, *J* = 1.6 Hz, 1H), 7.48 – 7.35 (m, 2H), 7.27 – 7.18 (m, 2H), 3.67 – 3.45 (m, 2H), 2.71 (t, *J* = 7.4 Hz, 2H), 1.65 (h, *J* = 7.4 Hz, 2H), 0.90 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 198.32, 146.25, 145.02, 143.04, 140.17, 128.10, 127.04, 124.61, 123.83, 40.97, 37.66, 18.44, 14.09. HRMS (DART-TOF) calculated for $C_{13}H_{14}O$ $[M+H]^+$ *m/z* 187.1117, found 187.1107.



(*S*)-4-(((benzyl(1-phenylethyl)amino)oxy)carbonyl)-*N*,*N*-diethylaniline

The title compound was prepared by following the reported procedure as a yellow solid.[1] M.P. 93 – 94 °C; IR (thin film, cm^{-1}) 1722, 1601, 1256, 1179, 696; ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.76 (d, *J* = 8.9 Hz, 2H), 7.58 – 7.46 (m, 2H), 7.44 – 7.14 (m, 7H), 6.57 (d, *J* = 9.0 Hz, 2H), 4.20 (q, *J* = 6.7 Hz, 1H), 4.09 (d, *J* = 14.0 Hz, 1H), 3.92 (d, *J* = 14.0 Hz, 1H), 3.39 (q, *J* = 7.1 Hz, 4H), 1.53 (d, *J* = 6.6 Hz, 3H), 1.18 (t, *J* = 7.1 Hz, 6H); ^{13}C NMR (101 MHz, $CDCl_3$) δ: 165.57, 150.87, 136.71, 131.38, 129.35, 128.49, 127.95, 127.51, 127.17, 114.98, 110.12, 65.76, 59.70, 44.45, 19.85, 12.50. $[\alpha]_D^{23}$ = 19.3 (c = 1.0, $CHCl_3$). HRMS (DART-TOF) calculated for $C_{26}H_{30}N_2O_2$ $[M+H]^+$ *m/z* 403.2380, found 403.2390.

7. References

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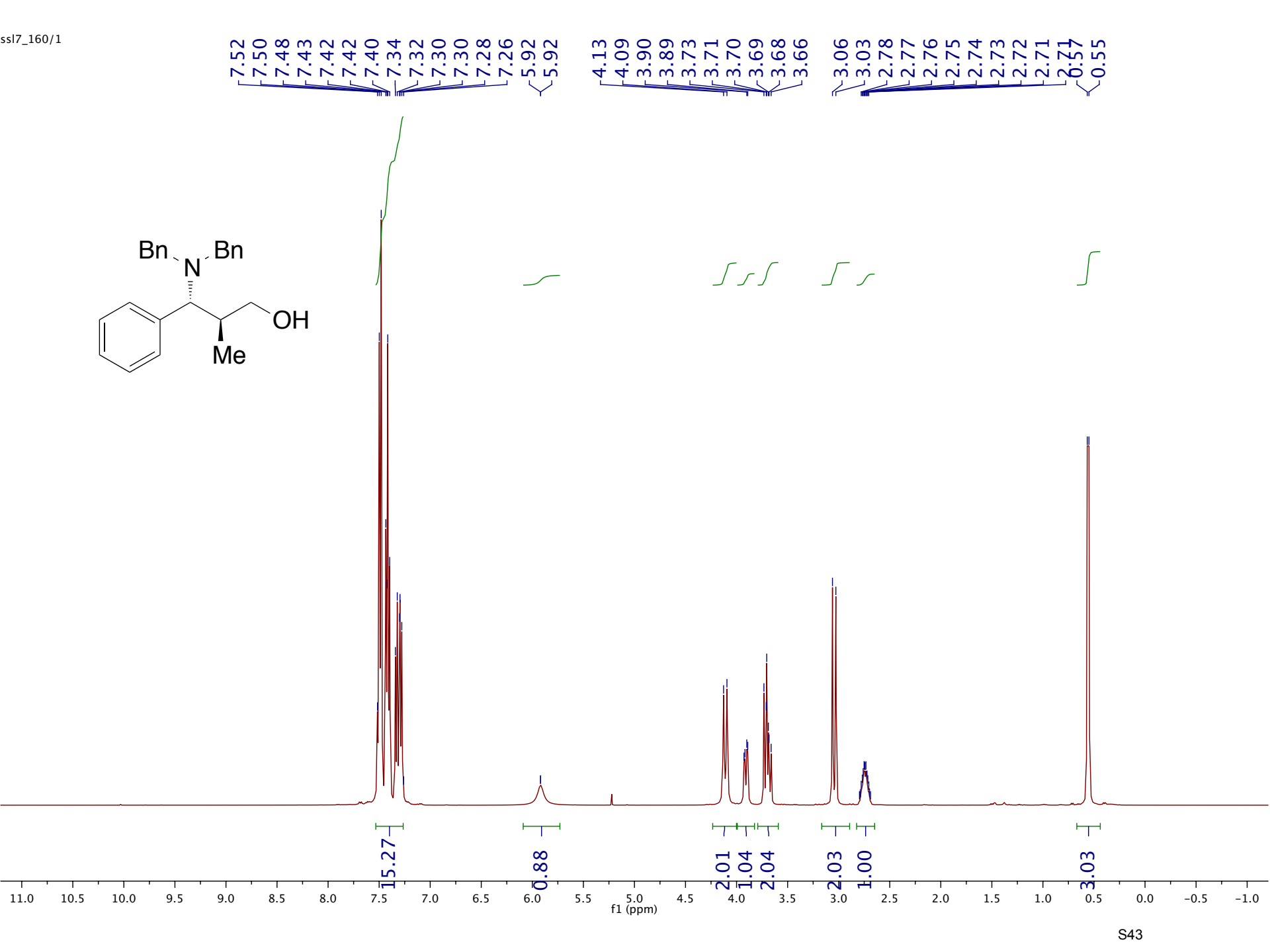
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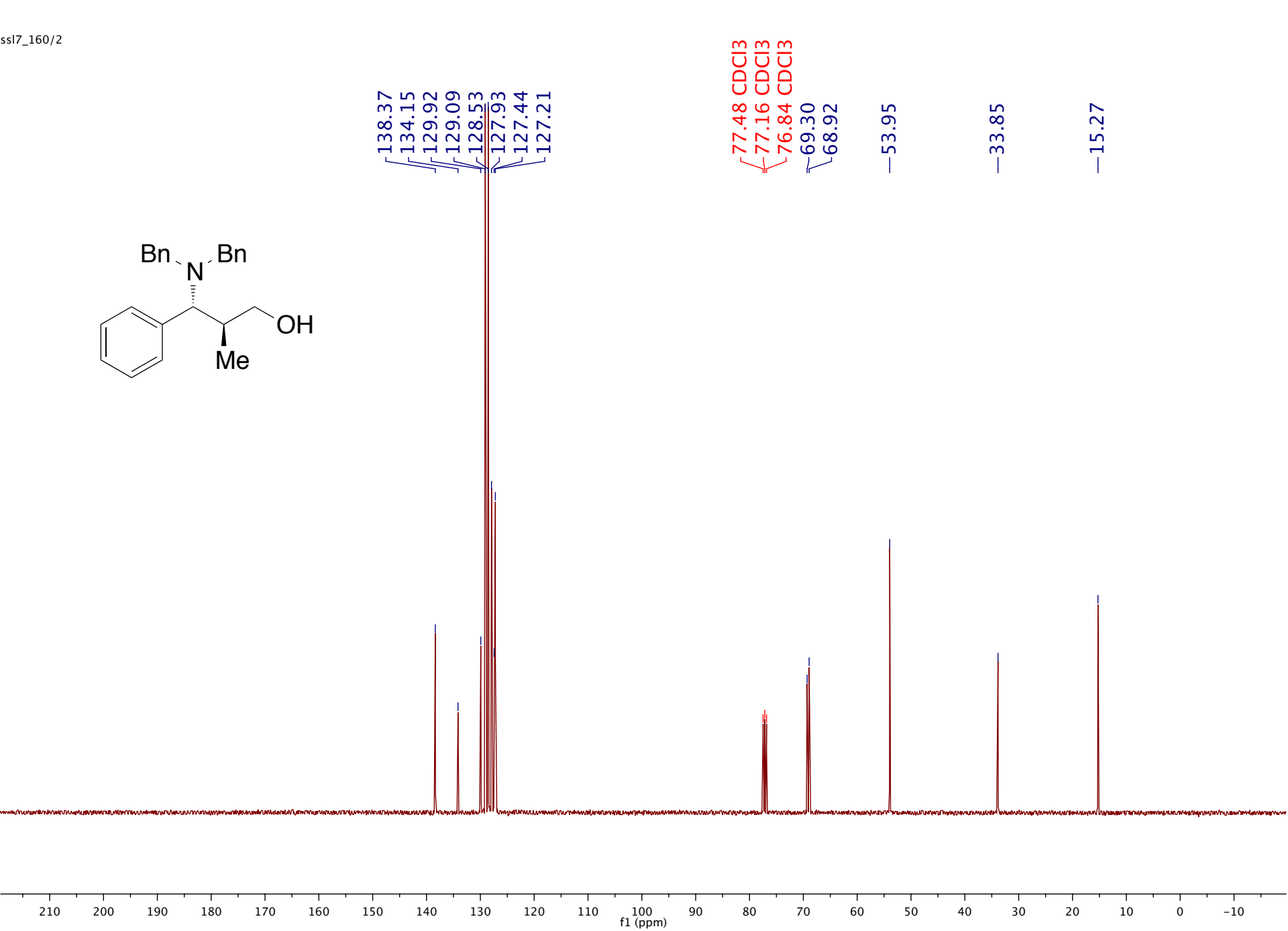
4.09
3.90
3.89
3.73
3.71
3.70
3.69
3.68
3.66
3.06
3.03
2.78
2.77
2.76
2.75
2.74
2.73
2.72
2.71
0.57
0.55
Bn
N
Bn
OH
Me
15.27
0.88
2.01
1.04
2.04
2.03
1.00
3.03
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7_160/2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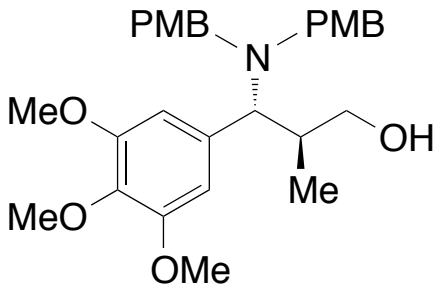
128.53
127.93
127.44
127.21
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.30
68.92
53.95
33.85
15.27
Bn
N
Bn
OH
Me
f1 (ppm)

ssl7-35-H/1



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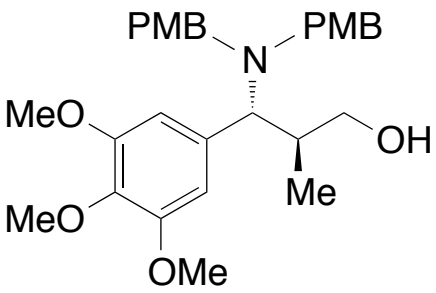
4.06 4.06 2.00 0.94 11.20 7.87 2.07 2.00 0.98 3.00

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0

f1 (ppm)

ssl7-35-C/1



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152.81
137.39
130.37
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114.07
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60.94
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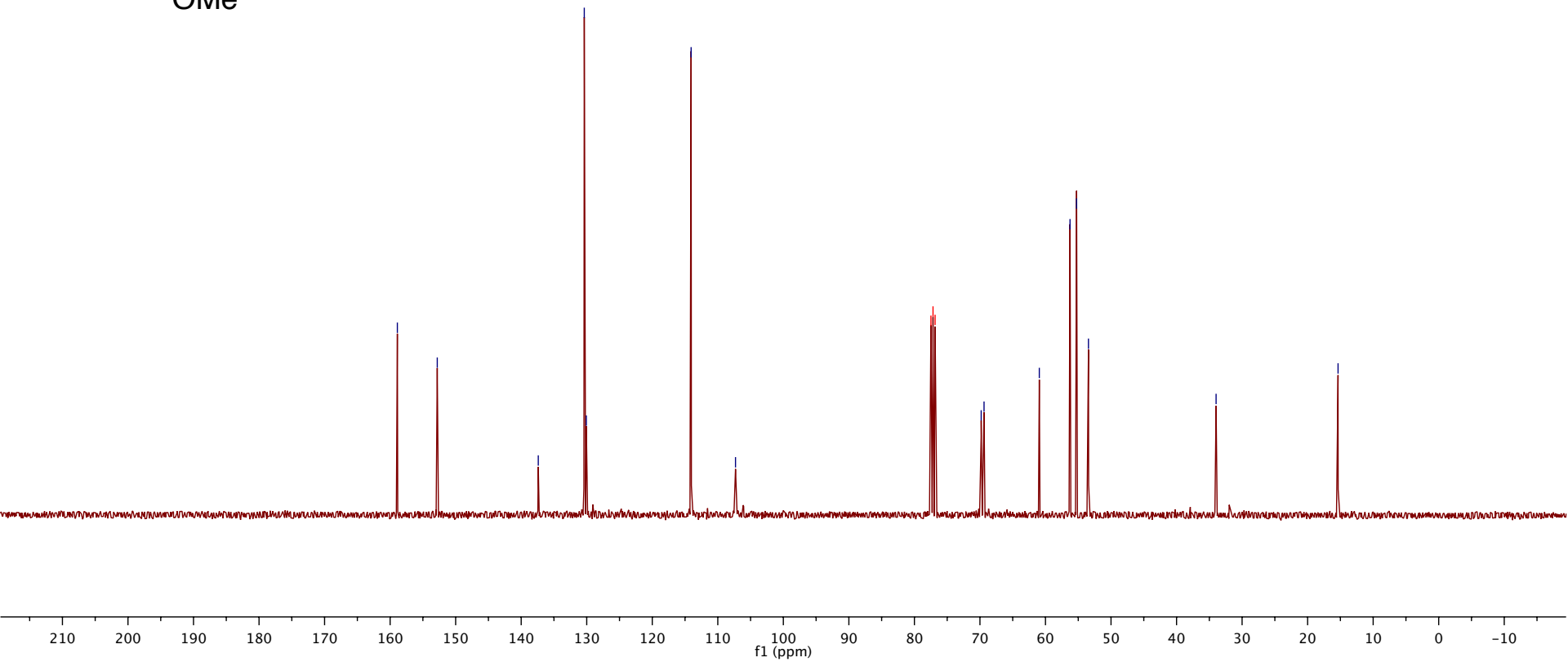
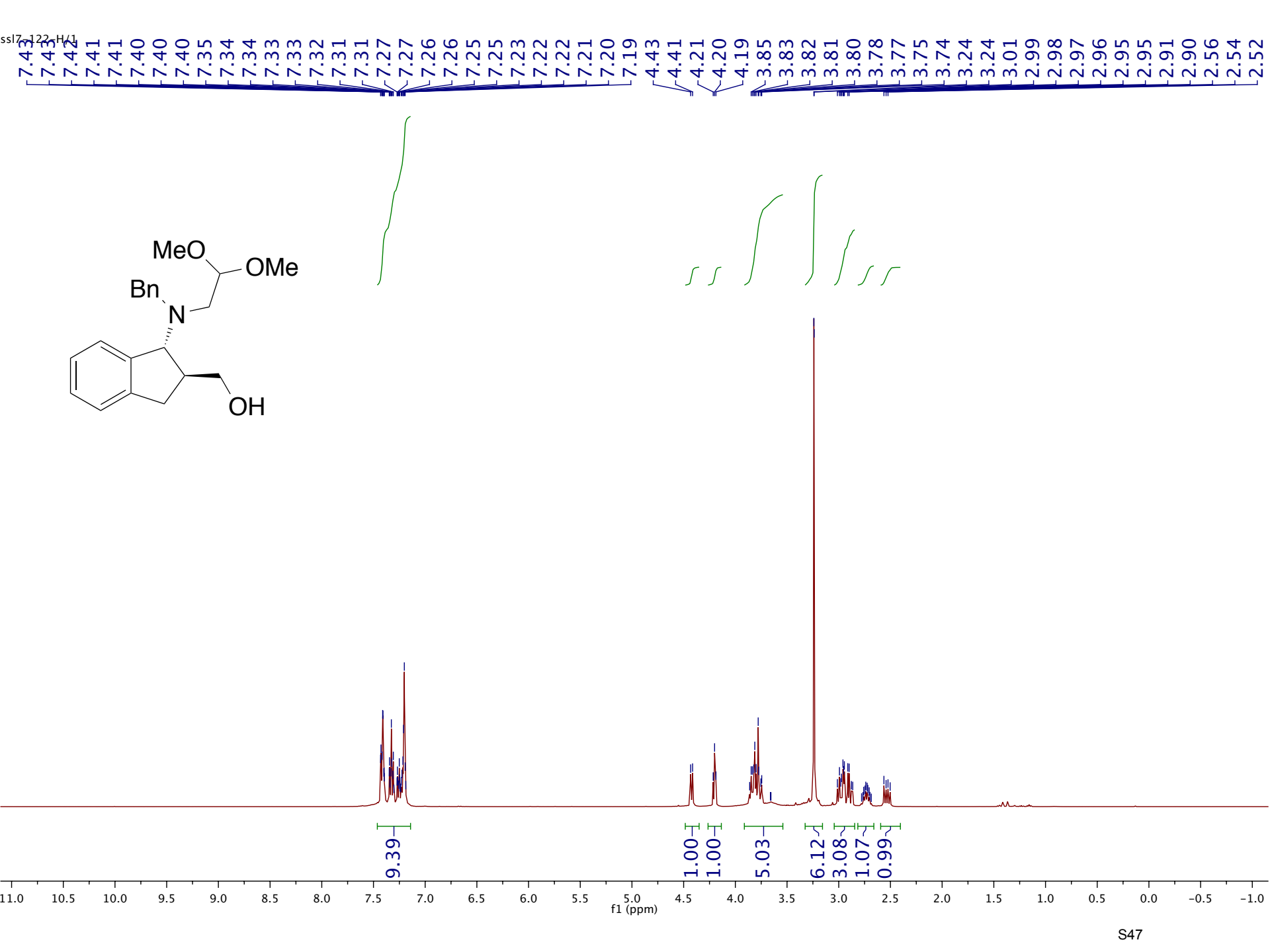
33.97
15.36

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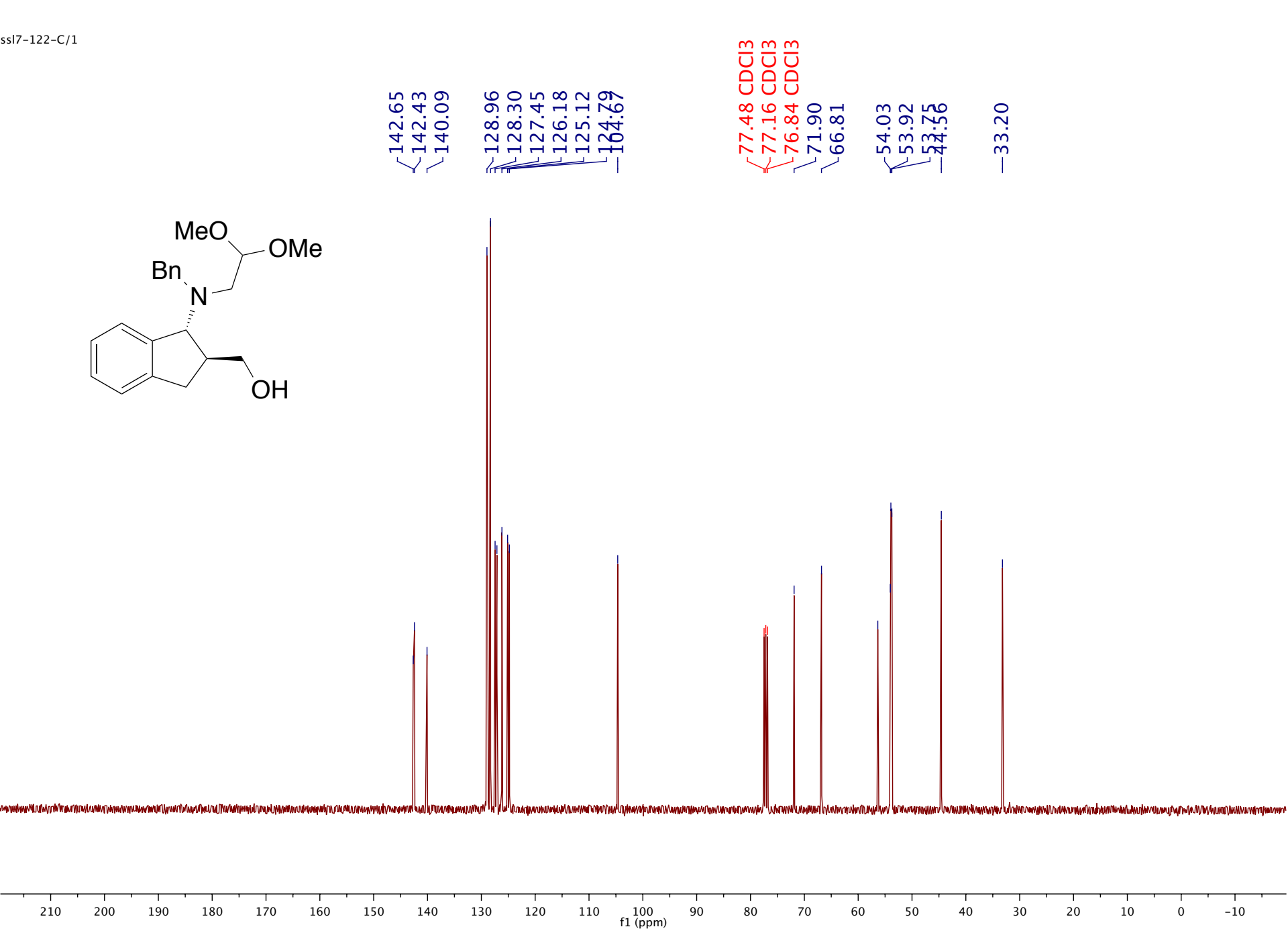
MeO
OMe
Bn
N
OH
9.39
1.00
1.00
5.03
6.12
3.08
1.07
0.99
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-122-C/1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77.16 CDCl3
76.84 CDCl3
71.90
66.81
54.03
53.92
53.75
44.56
33.20
MeO
OMe
Bn
N
OH
210
200
190
180
170
160
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140
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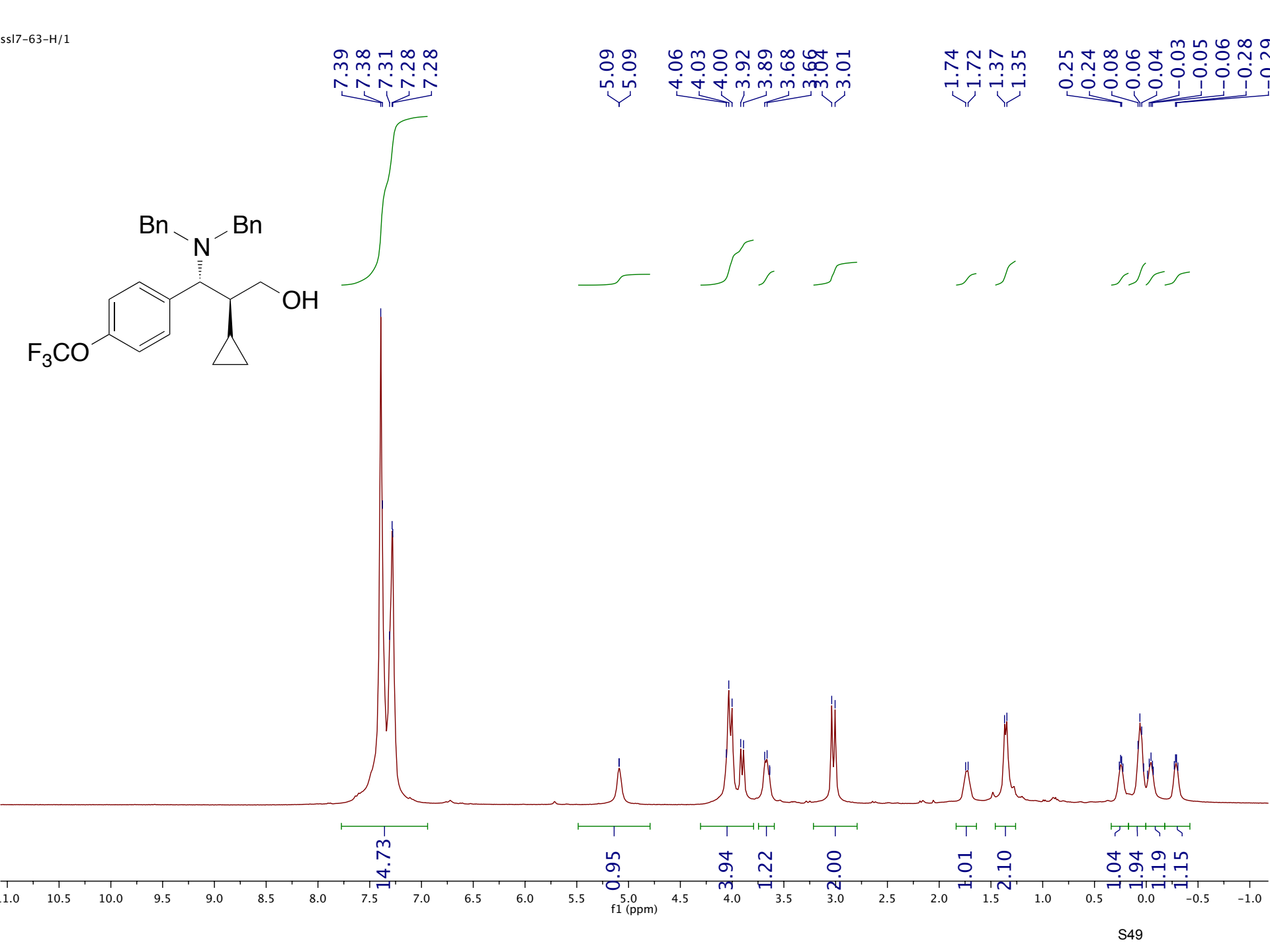
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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4.00
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3.89
3.68
3.66
3.64
3.01
1.74
1.72
1.37
1.35
0.25
0.24
0.08
0.06
0.04
-0.03
-0.05
-0.06
-0.28
Bn
N
Bn
OH
F3CO
14.73
0.95
3.94
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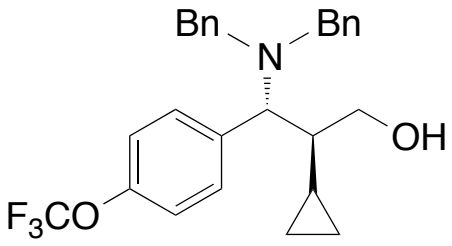
1.01
2.10
1.04
1.94
1.19
1.15
f1 (ppm)

ssl7-63-C/1



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77.16 CDCl3
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54.22
44.32
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210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
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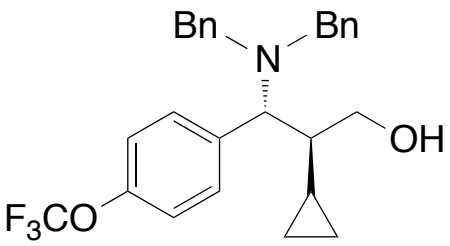

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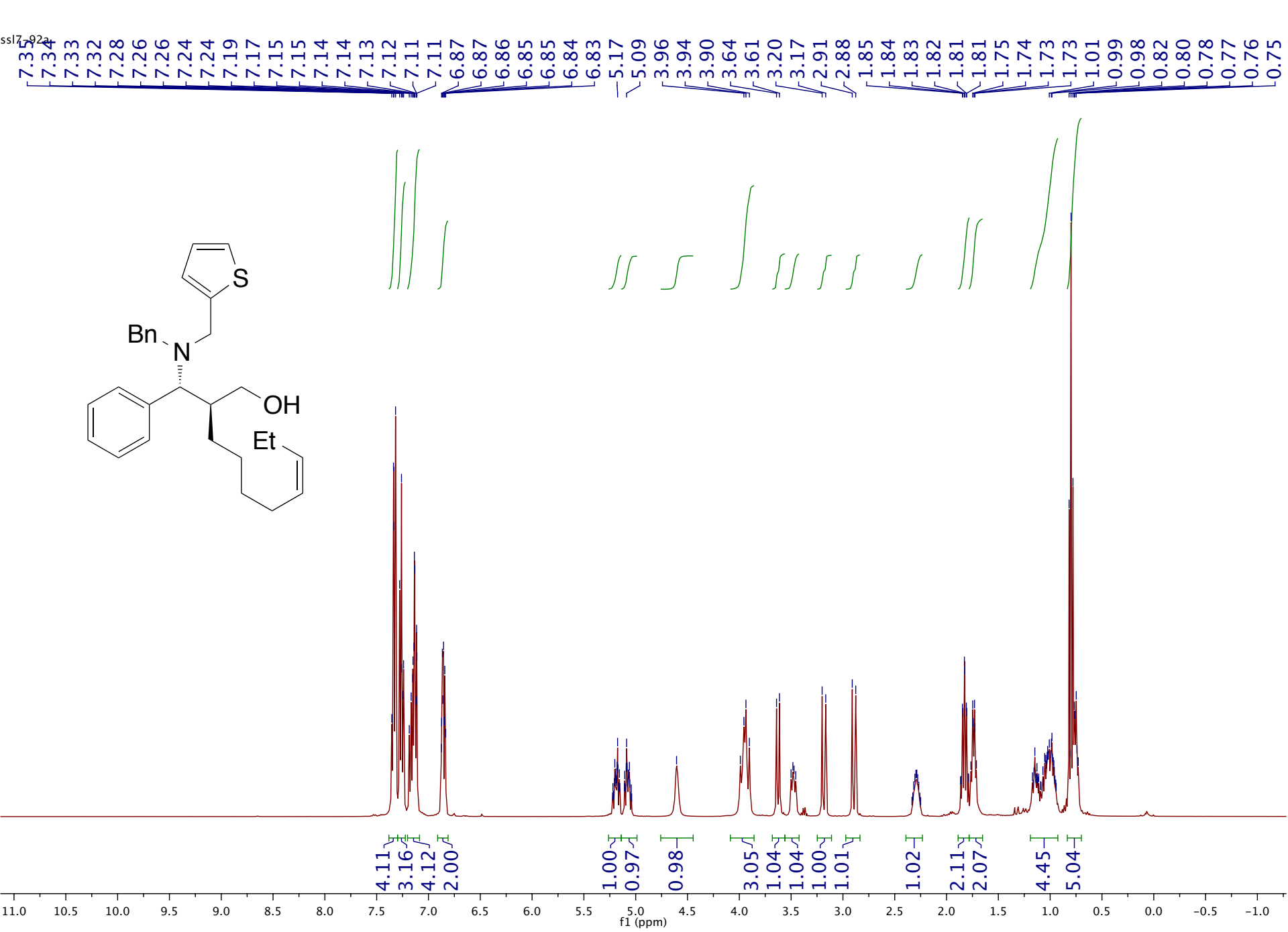
f1 (ppm)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S
Bn
N
OH
Et
4.11 3.16 4.12 2.00 1.00 0.97 0.98 3.05 1.04 1.04 1.00 1.01 1.02 2.11 2.07 4.45 5.04
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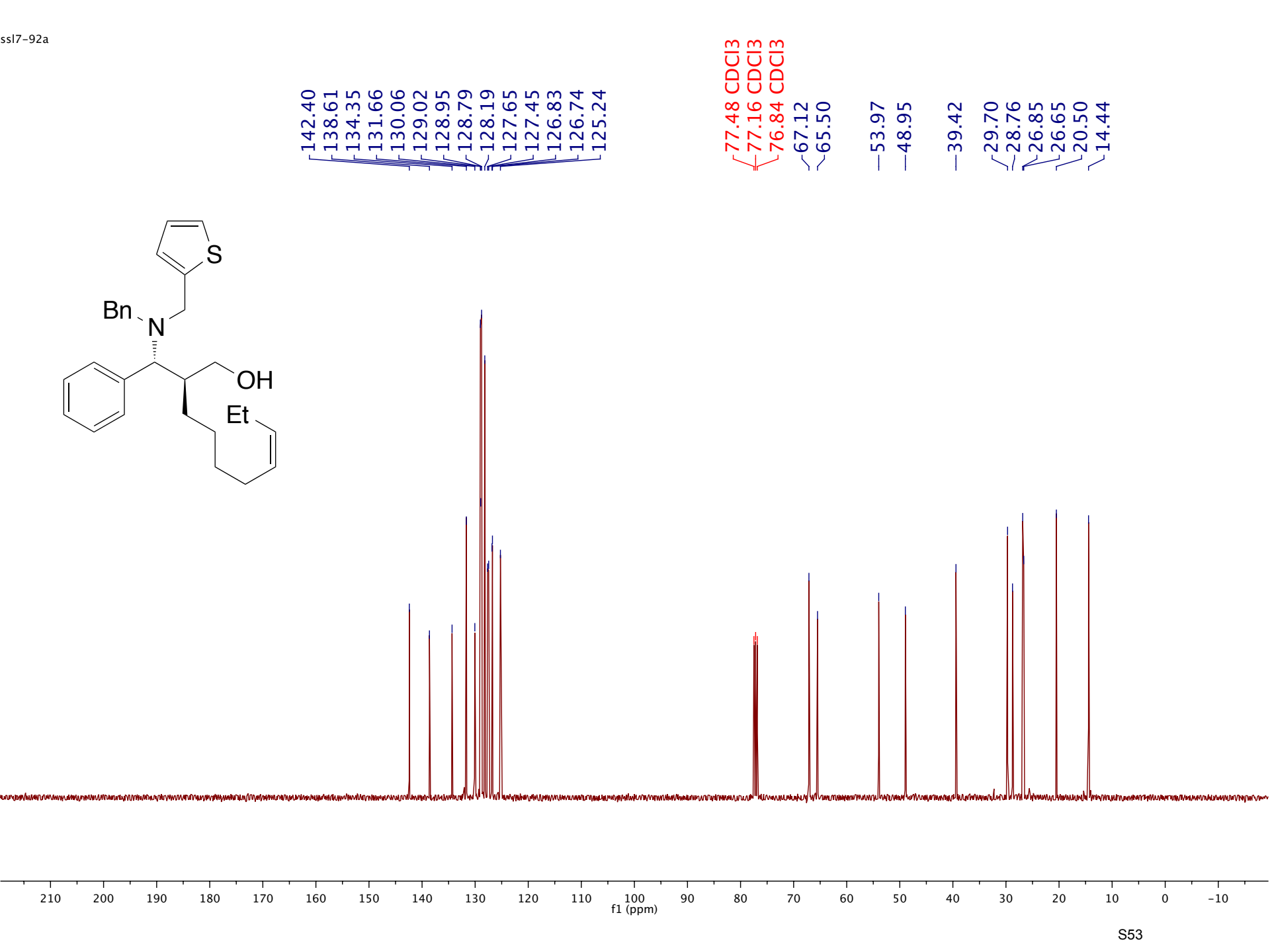
f1 (ppm)

ssl7-92a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77.16 CDCl3
76.84 CDCl3
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65.50
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48.95
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29.70
28.76
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26.65
20.50
14.44
S
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N
OH
Et
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100
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40
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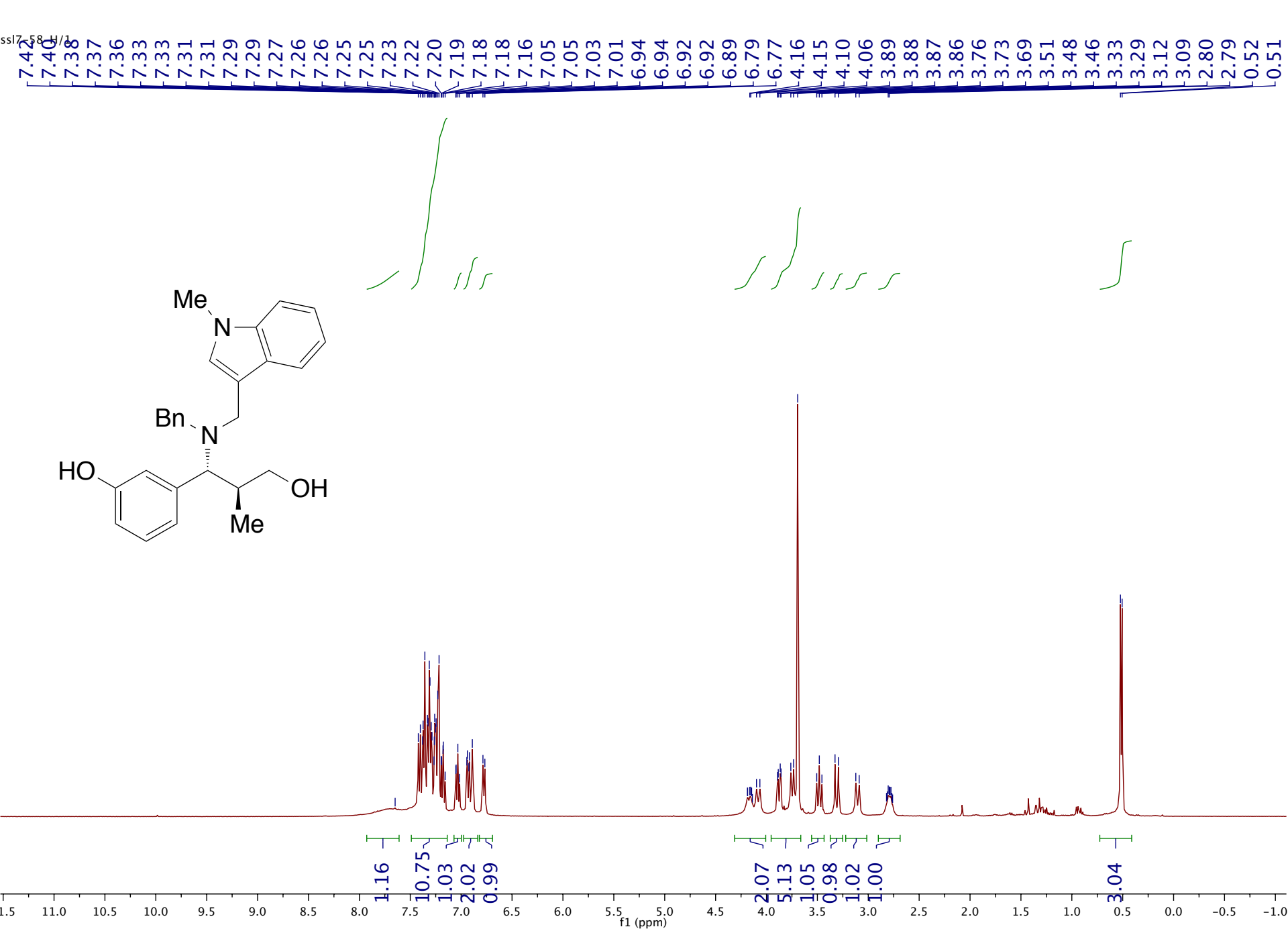
-10
f1 (ppm)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Me
N
Bn
N
HO
OH
Me
1.16 10.75 1.03 2.02 0.99 2.07 5.13 1.05 0.98 1.02 1.00 3.04
11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

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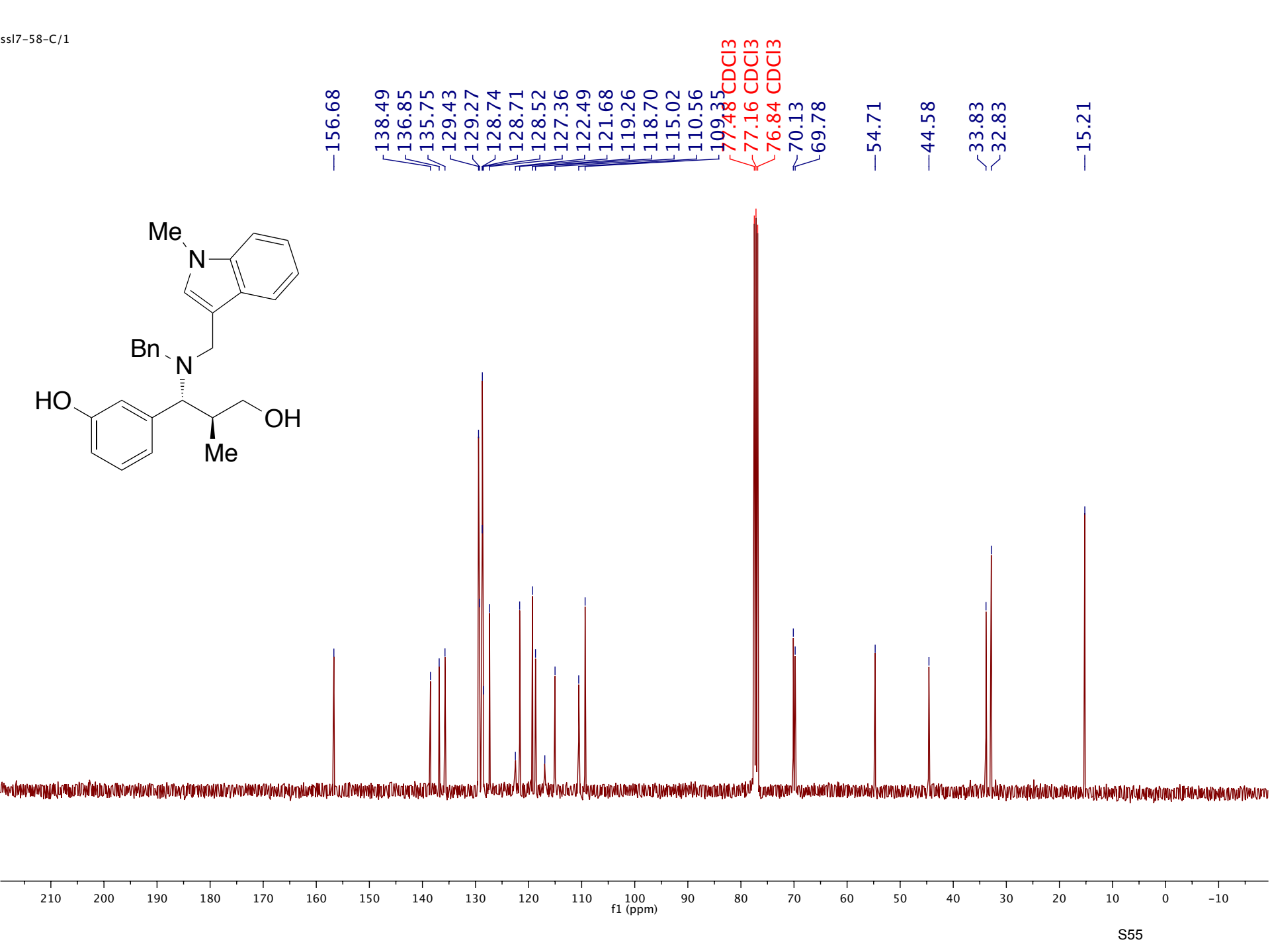
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115.02
110.56
109.35
77.48 CDCl3
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70.13
69.78
54.71
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33.83
32.83
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N
HO
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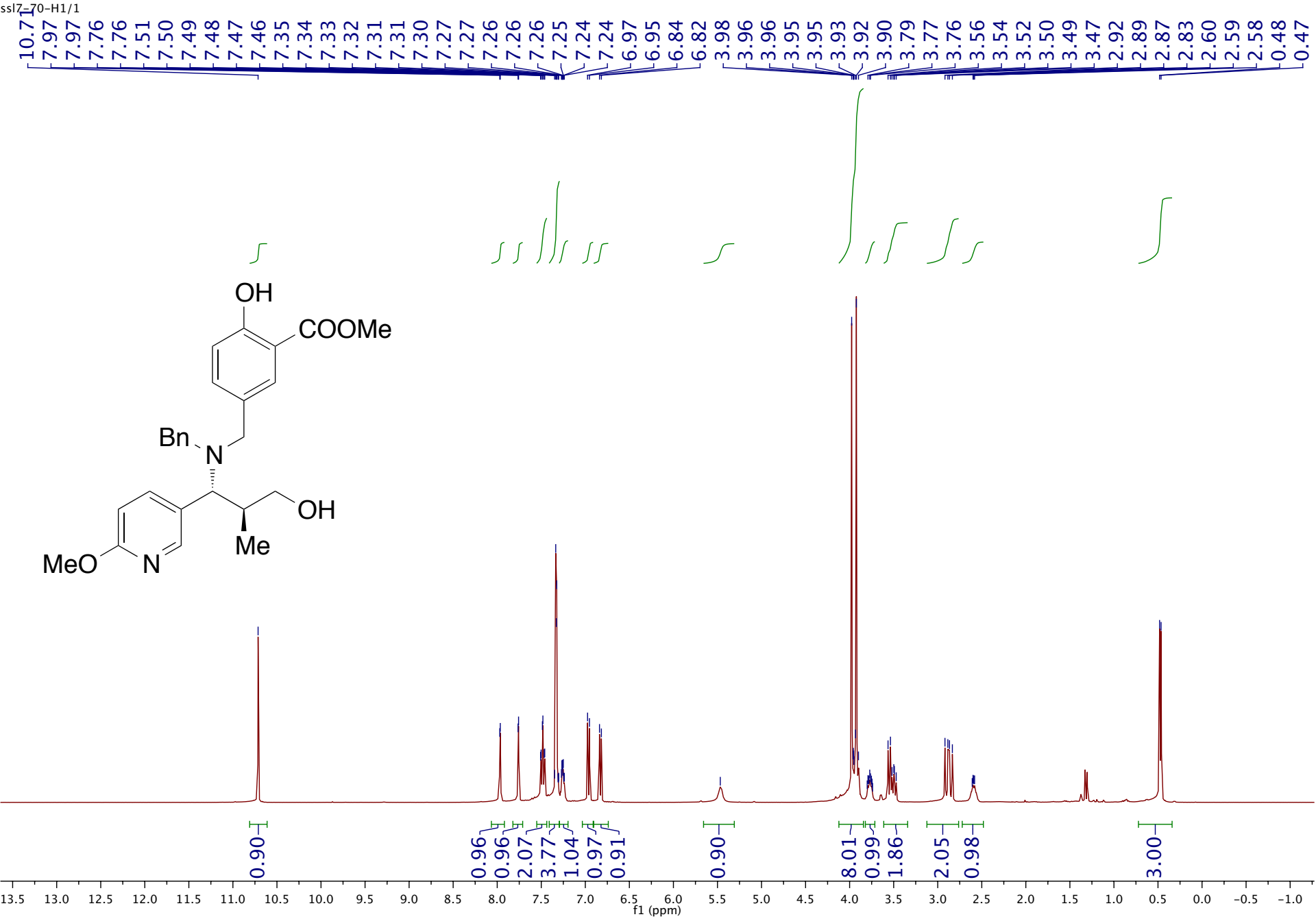
f1 (ppm)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3.98 3.96 3.96 3.95 3.95 3.93 3.92 3.90 3.79 3.77 3.76 3.56 3.54 3.52 3.50 3.49 3.47 2.92 2.89 2.87 2.83 2.60 2.59 2.58 0.48 0.47
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COOMe
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MeO
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2.07
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1.04
0.97
0.91
0.90
8.01
0.99
1.86
2.05
0.98
3.00
13.5 13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

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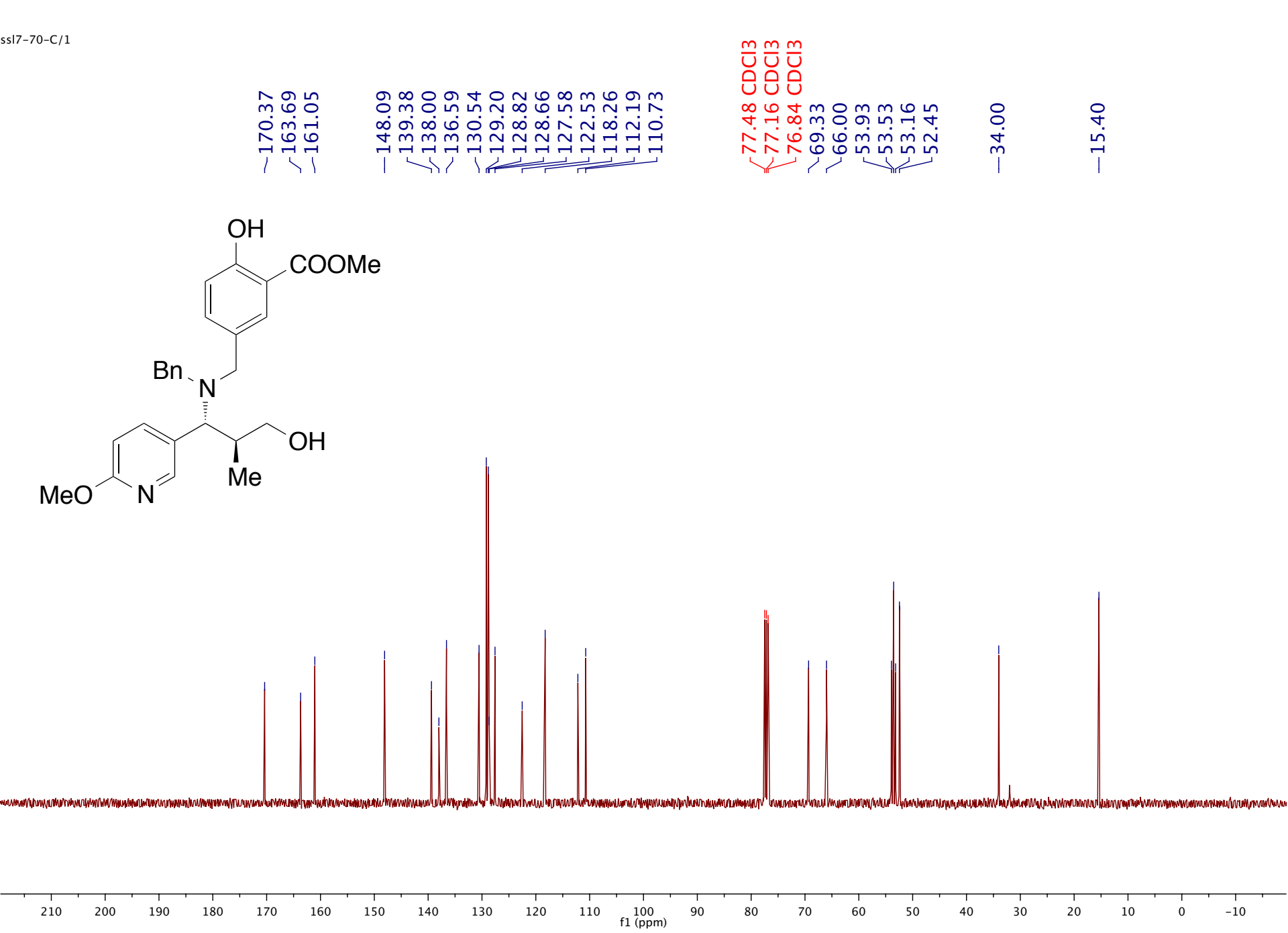
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112.19
110.73
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.33
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200
190
180
170
160
150
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10
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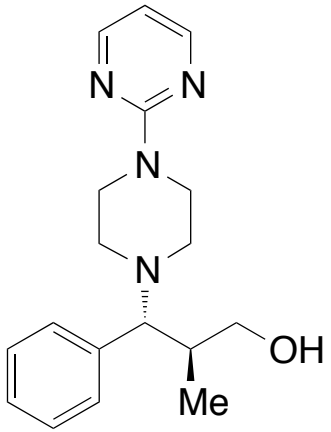
f1 (ppm)

ssl7-98-H/1



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1.94 3.31 1.97 1.25 6.82 1.05 3.34 2.06 3.00

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0

f1 (ppm)

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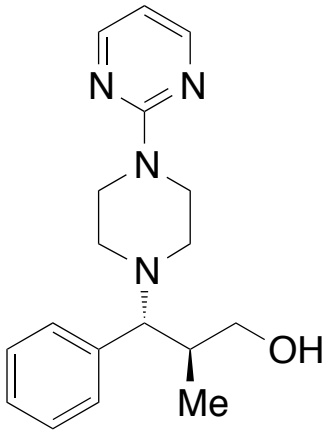

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157.47
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127.47
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70.56
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43.48
32.80
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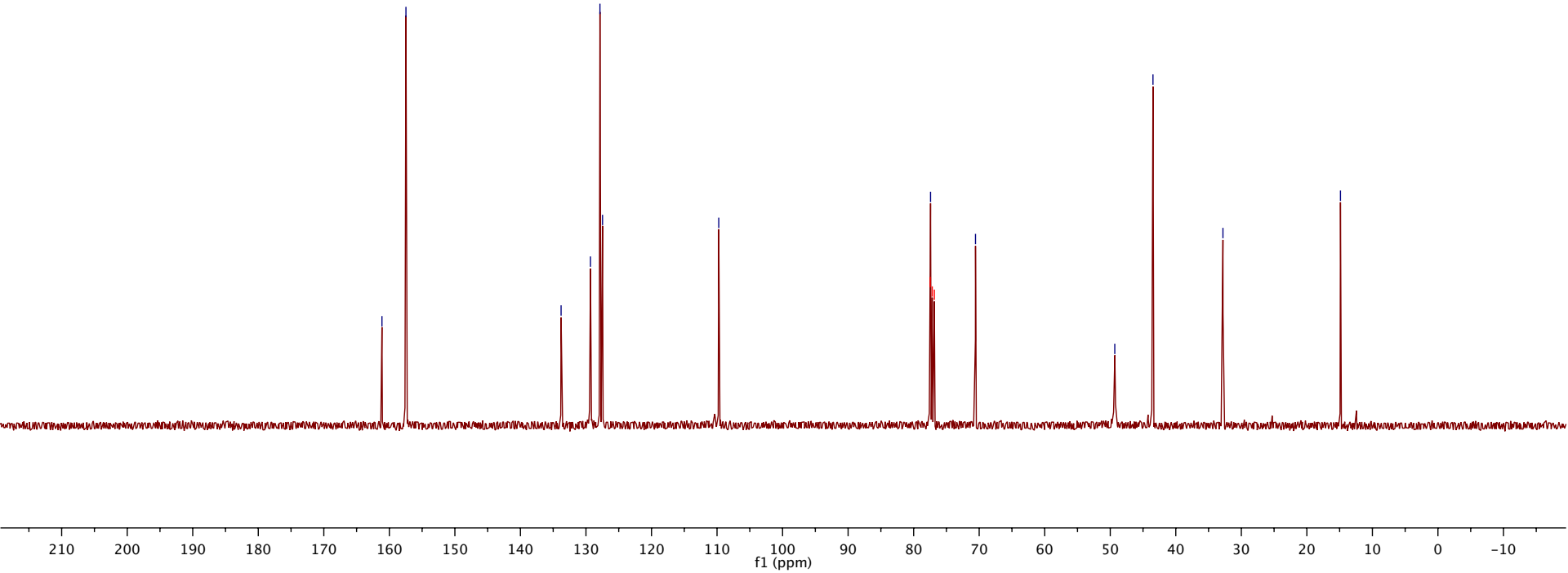

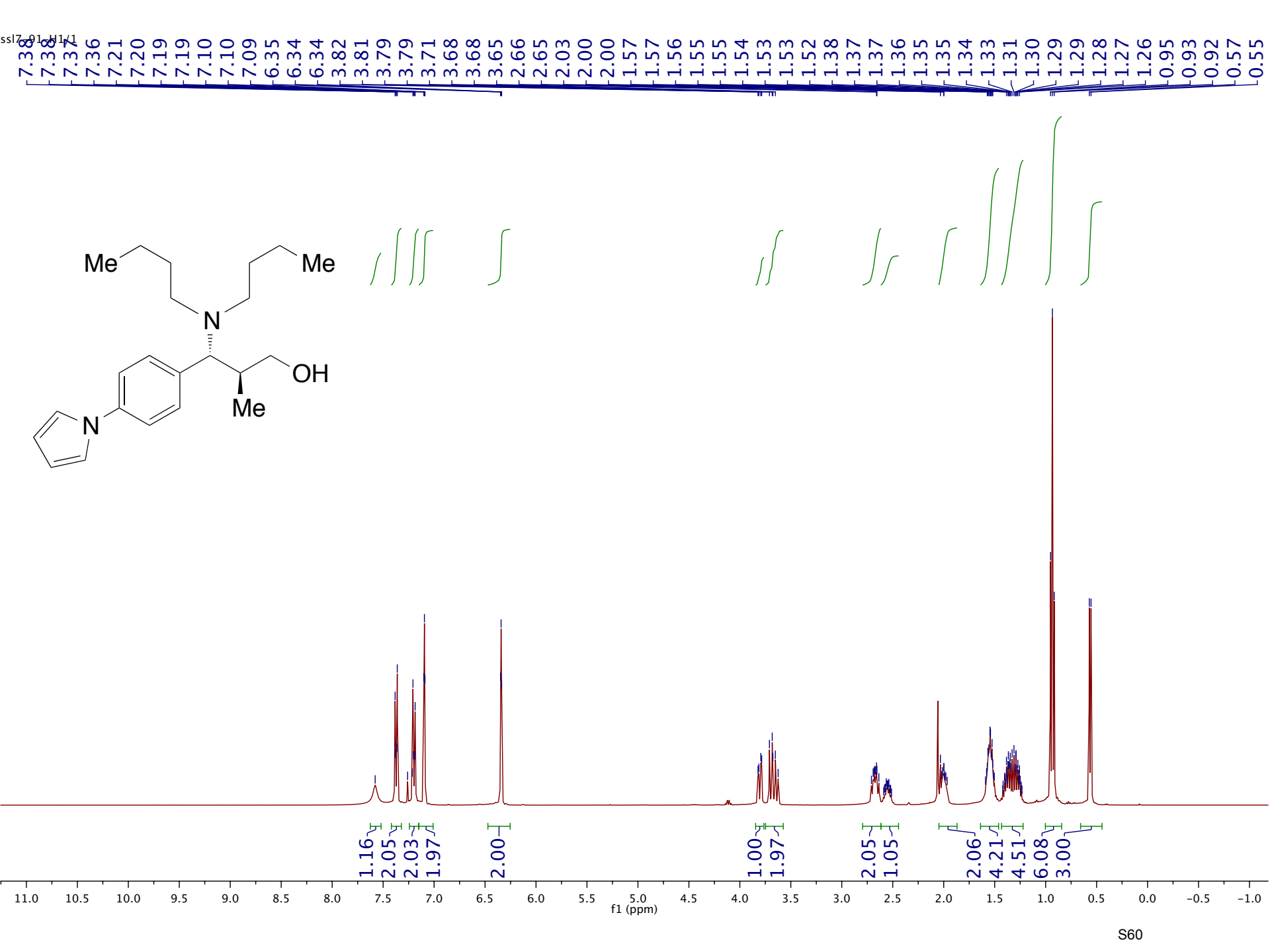
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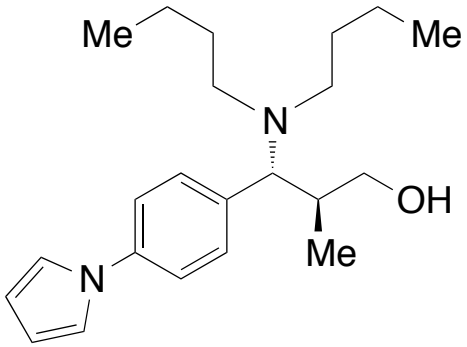
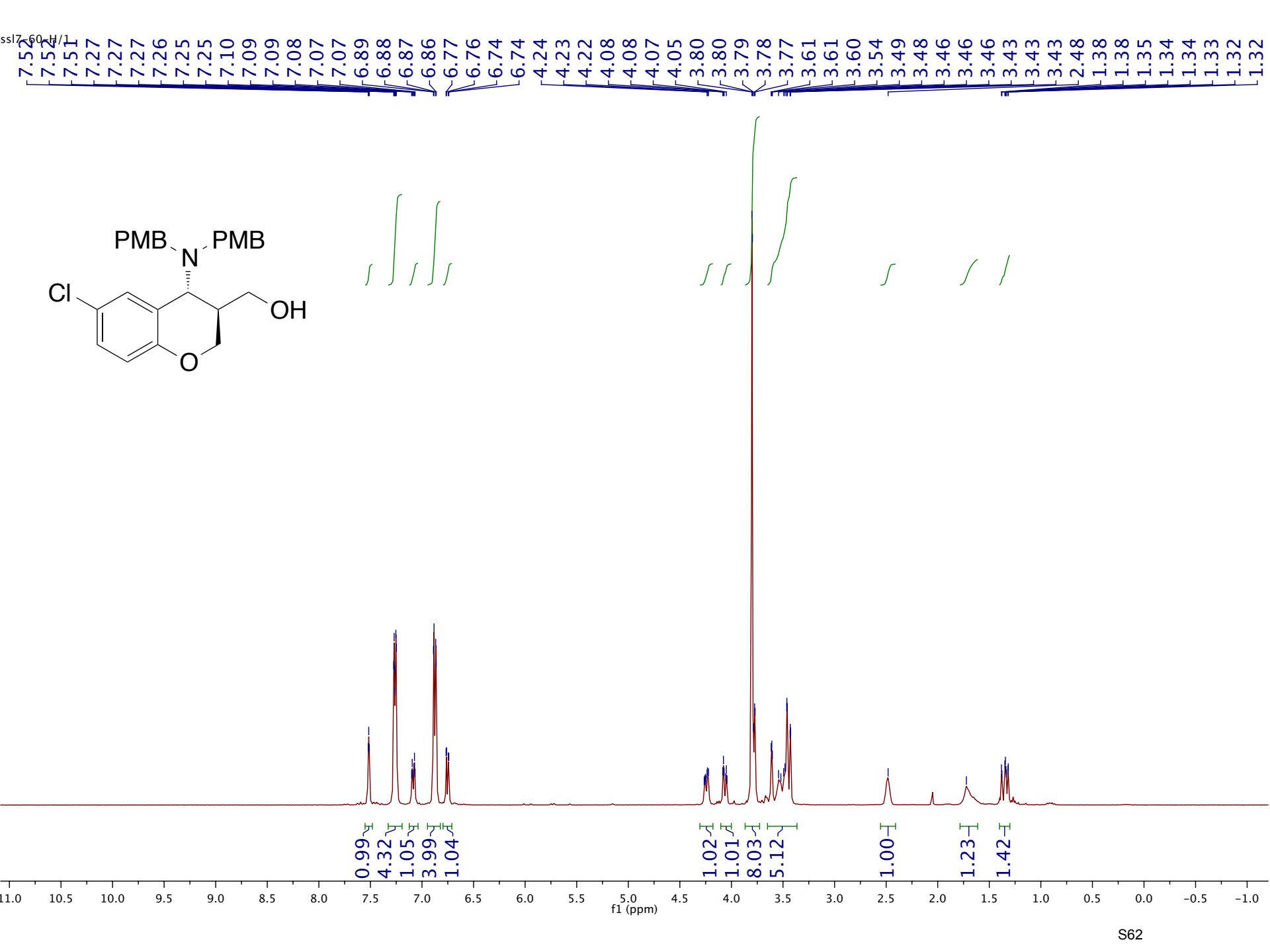
Me
Me
N
OH
Me
N
1.16 2.05 2.03 1.97 2.00 1.00 1.97 2.05 1.05 2.06 4.21 4.51 6.08 3.00
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-91-C/1



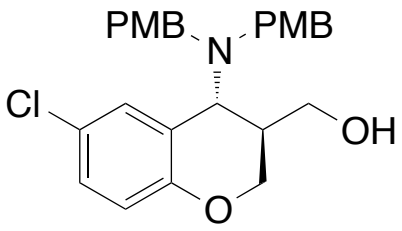
139.94
132.11
130.84
119.79
119.17
110.61
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
71.42
70.55
50.13
33.31
30.07
20.80
15.24
14.14

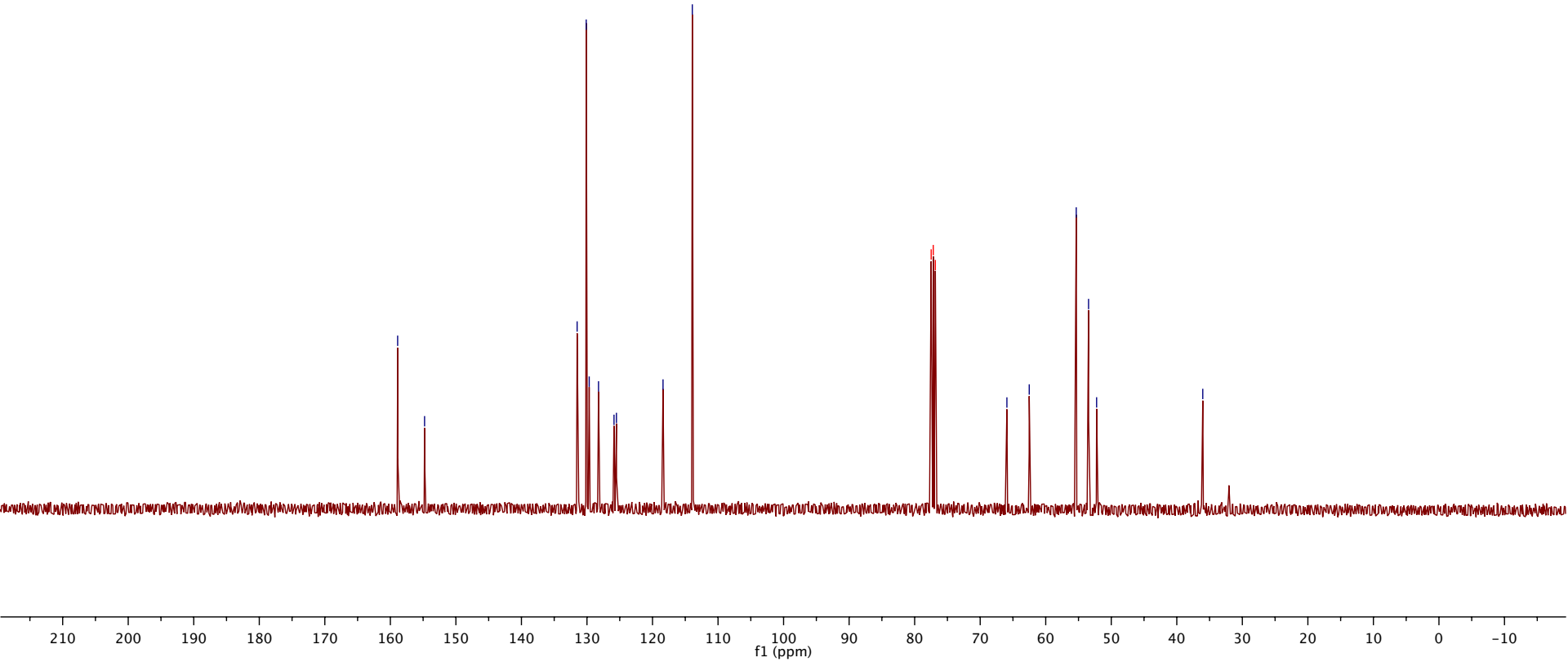
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

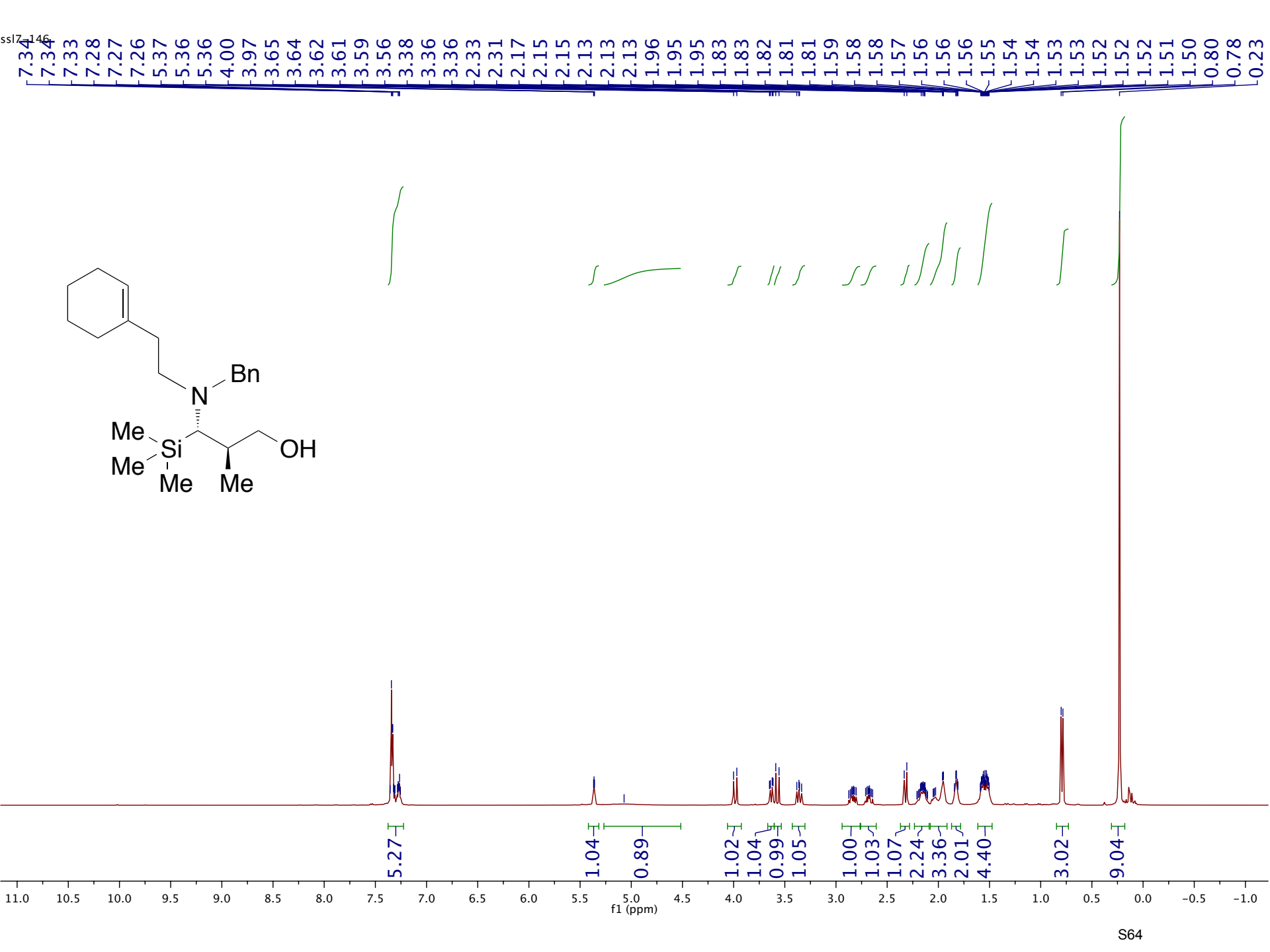

ssl7-60-H/1
7.52
7.51
7.27
7.26
7.25
7.10
7.09
7.08
7.07
6.89
6.88
6.87
6.86
6.77
6.76
6.74
4.24
4.23
4.22
4.08
4.07
4.05
3.80
3.79
3.78
3.77
3.61
3.60
3.54
3.49
3.48
3.46
3.43
2.48
1.38
1.35
1.34
1.33
1.32
PMB
N
PMB
Cl
OH
O
0.99
4.32
1.05
3.99
1.04
1.02
1.01
8.03
5.12
1.00
1.23
1.42
f1 (ppm)

ssl7-60-C/1

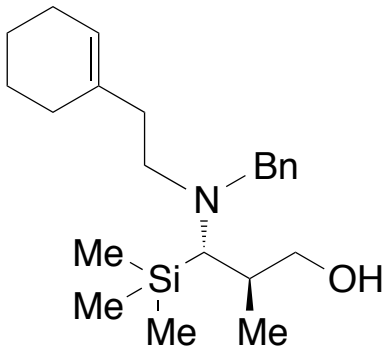
158.89
154.78
131.50
130.11
129.66
128.24
125.87
125.50
118.39
113.92
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
65.92
62.52
55.34
53.46
52.23
36.04






ssl7-146
7.34 7.34 7.33 7.28 7.27 7.26 5.37 5.36 5.36 4.00 3.97 3.65 3.64 3.62 3.61 3.59 3.56 3.38 3.36 3.36 3.33 2.31 2.17 2.15 2.15 2.13 2.13 2.13 1.96 1.95 1.95 1.83 1.83 1.82 1.81 1.81 1.59 1.58 1.58 1.57 1.56 1.56 1.56 1.55 1.54 1.54 1.53 1.53 1.52 1.52 1.52 1.51 1.50 0.80 0.78 0.23
Bn
N
Me
Si
Me
Me
Me
Me
OH
5.27 1.04 0.89 1.02 1.04 0.99 1.05 1.00 1.03 1.07 2.24 3.36 2.01 4.40 3.02 9.04
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

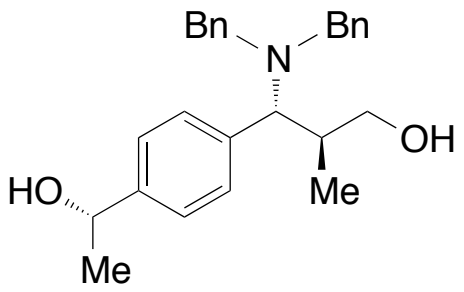
ssl7-146



139.14
135.52
129.61
128.54
127.37
122.33
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
72.25
60.15
57.67
51.51
37.63
34.75
28.59
25.31
22.99
22.46
16.76
2.27

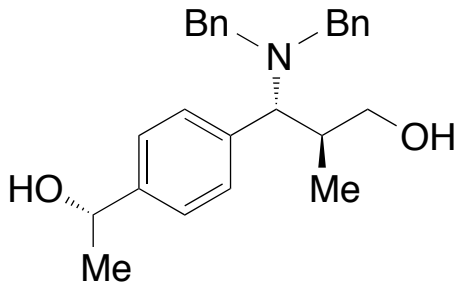
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

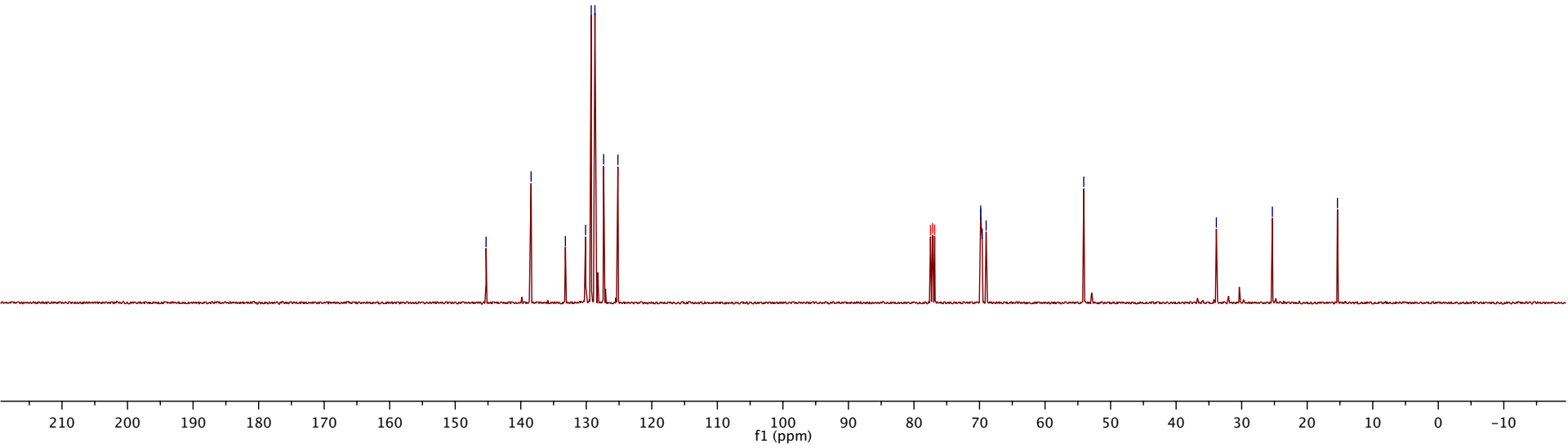
zlw2-37

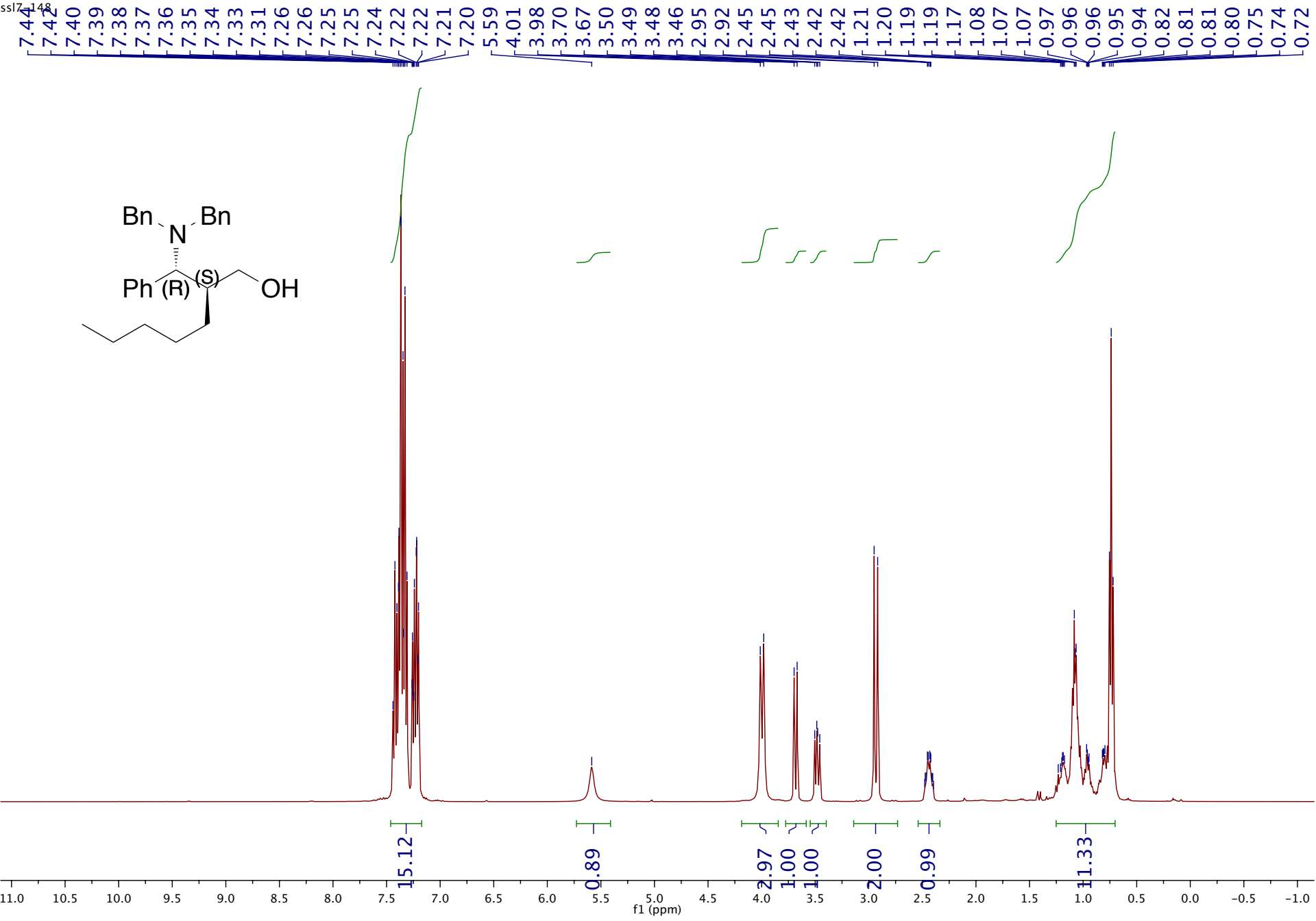


zlw2-37

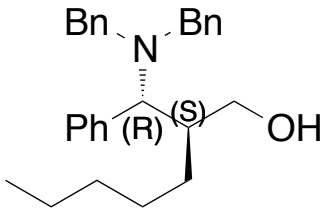
145.29
138.42
133.19
130.11
129.25
128.68
127.36
125.18
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.82
69.82
69.59
68.99
54.10
33.86
25.31
15.38






ssl7_148
7.44 7.42 7.40 7.39 7.38 7.37 7.36 7.35 7.34 7.33 7.31 7.26 7.26 7.25 7.25 7.24 7.22 7.22 7.21 7.20
5.59 4.01 3.98 3.70 3.67 3.50 3.49 3.48 3.46 2.95 2.92 2.45 2.45 2.43 2.42 2.42 1.21 1.20 1.19 1.19 1.17 1.08 1.07 1.07 0.97 0.96 0.96 0.95 0.94 0.82 0.81 0.81 0.80 0.75 0.74 0.72
Bn
N
Bn
Ph
(R)
(S)
OH
15.12
0.89
2.97
1.00
1.00
2.00
0.99
11.33
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

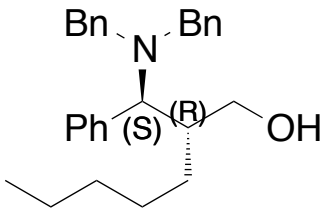
ssl7-148



138.59
134.27
130.22
129.32
128.74
128.08
127.61
127.42
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.03
66.57
54.24
39.07
31.87
28.95
26.75
22.43
13.99

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 −10
f1 (ppm)

ssl7-155



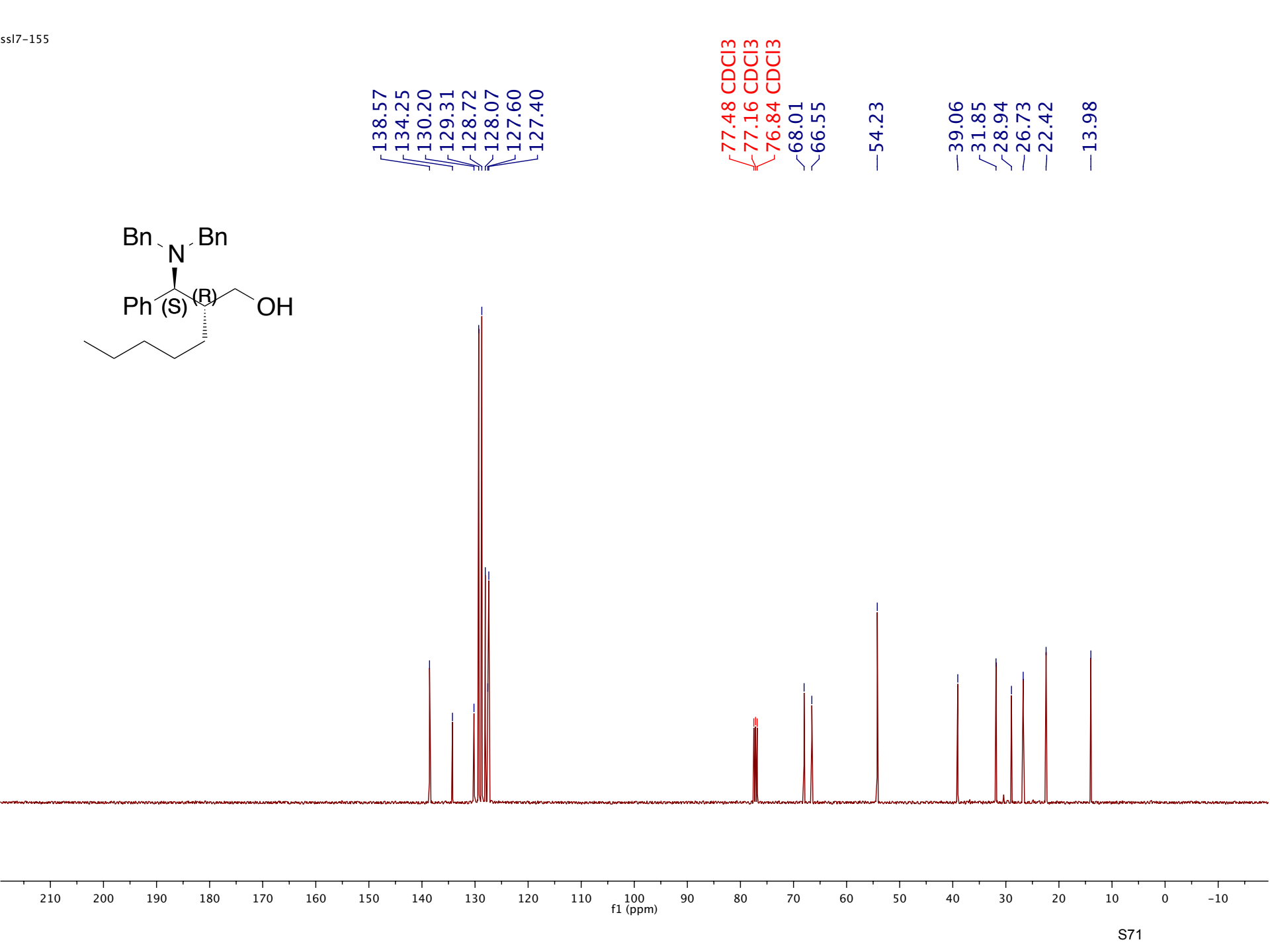
7.45 7.43 7.41 7.40 7.38 7.35 7.33 7.32 7.26 7.25 7.23 7.21 — 5.60 — 4.02 4.02 4.00 3.99 3.71 3.68 3.52 3.50 3.49 3.47 2.96 2.93 2.46 2.46 2.44 2.43 1.11 1.09 1.08 1.07 1.06 0.98 0.82 0.81 0.81 0.78 0.76 0.75 0.73

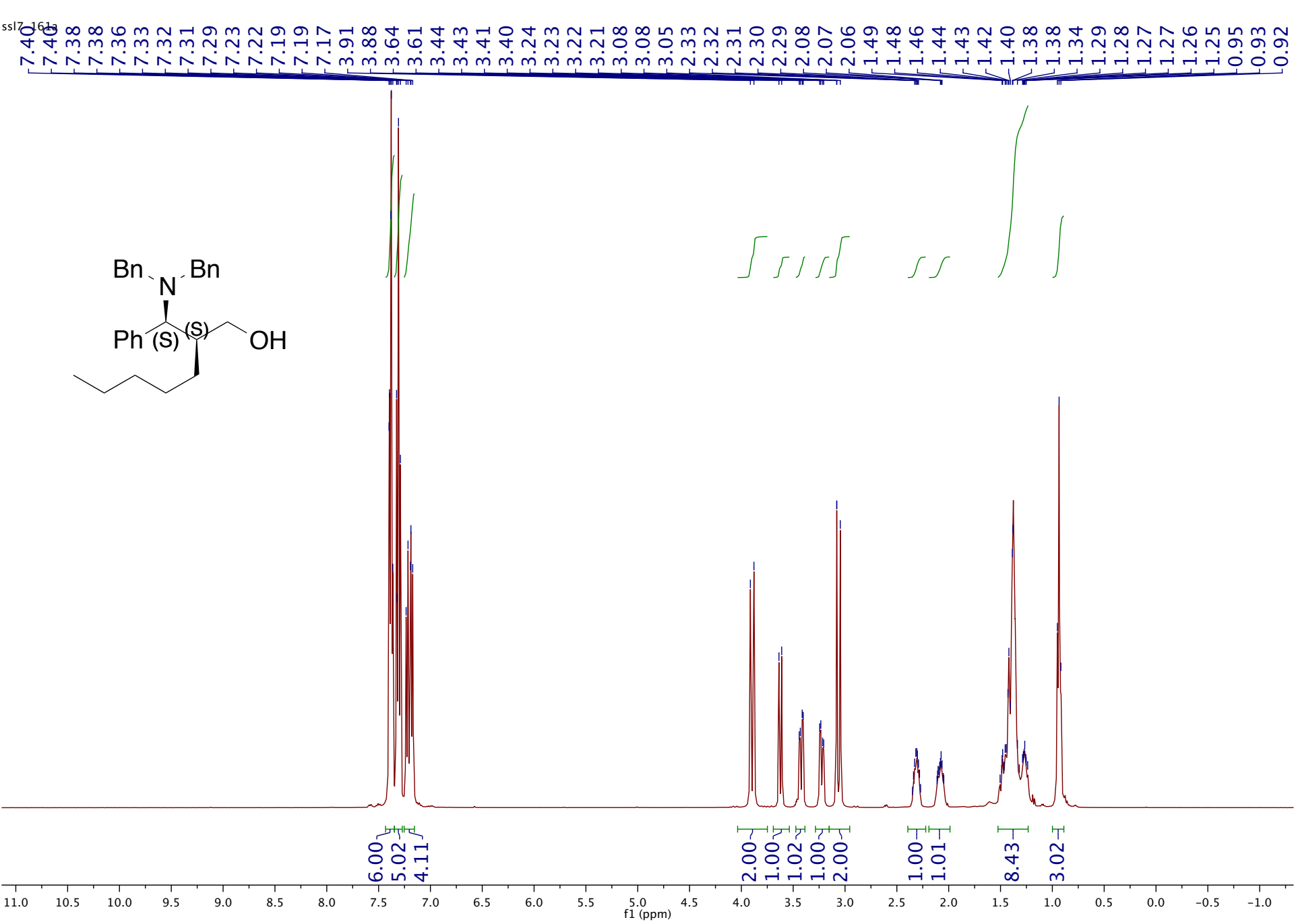
15.45 0.88 3.01 1.02 1.02 2.04 1.01 11.40

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0

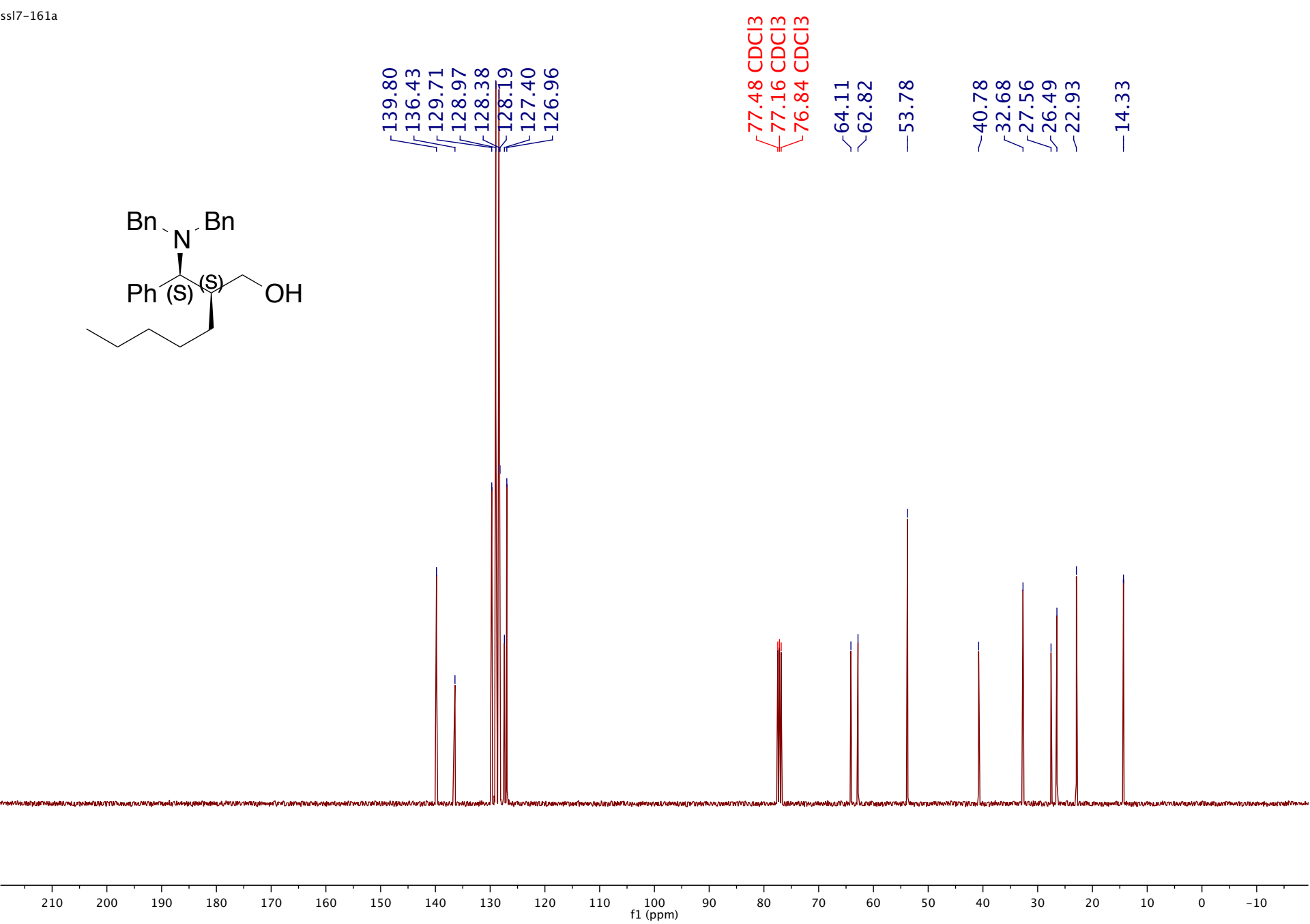
f1 (ppm)

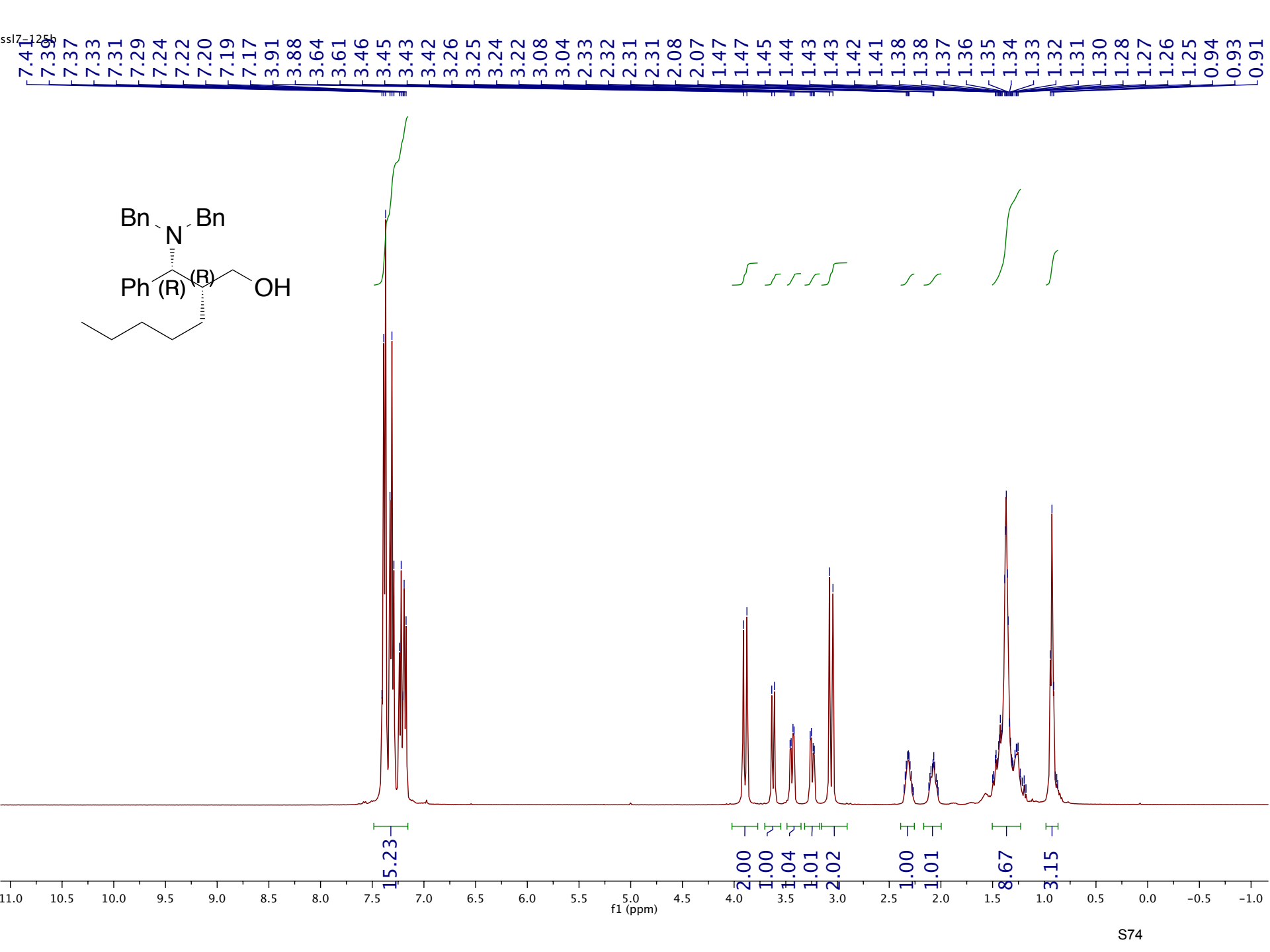
ssl7-155


138.57
134.25
130.20
129.31
128.72
128.07
127.60
127.40
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.01
66.55
54.23
39.06
31.85
28.94
26.73
22.42
13.98
Bn
N
Bn
Ph
(S)
(R)
OH
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

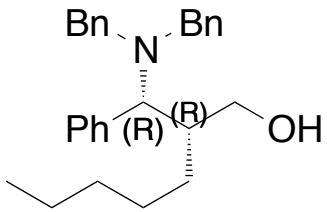

ssl7_161a
7.40 7.40 7.38 7.38 7.36 7.33 7.32 7.31 7.29 7.23 7.22 7.19 7.19 7.17 3.91 3.88 3.64 3.61 3.44 3.43 3.41 3.40 3.24 3.23 3.22 3.21 3.08 3.08 3.05 2.33 2.32 2.31 2.30 2.29 2.08 2.07 2.06 1.49 1.48 1.46 1.44 1.43 1.42 1.40 1.38 1.38 1.34 1.29 1.28 1.27 1.27 1.26 1.25 0.95 0.93 0.92
Bn
N
Bn
Ph
(S)
(S)
OH
6.00
5.02
4.11
2.00
1.00
1.02
1.00
2.00
1.00
1.01
8.43
3.02
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 −0.5 −1.0
f1 (ppm)

ssl7-161a


139.80
136.43
129.71
128.97
128.38
128.19
127.40
126.96
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
64.11
62.82
53.78
40.78
32.68
27.56
26.49
22.93
14.33
Bn
N
Bn
Ph
(S)
(S)
OH
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


ssl7-125h
7.41 7.39 7.37 7.33 7.31 7.29 7.24 7.22 7.20 7.19 7.17 3.91 3.88 3.64 3.61 3.46 3.45 3.43 3.42 3.26 3.25 3.24 3.22 3.08 3.04 2.33 2.32 2.31 2.31 2.08 2.07 1.47 1.47 1.45 1.44 1.43 1.43 1.42 1.41 1.38 1.38 1.37 1.36 1.35 1.34 1.33 1.32 1.31 1.30 1.28 1.27 1.26 1.25 0.94 0.93 0.91
Bn
N
Bn
Ph
(R)
(R)
OH
15.23
2.00
1.00
1.04
1.01
2.02
1.00
1.01
8.67
3.15
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-125b



139.81
136.45
129.74
129.00
128.41
128.24
127.44
126.99

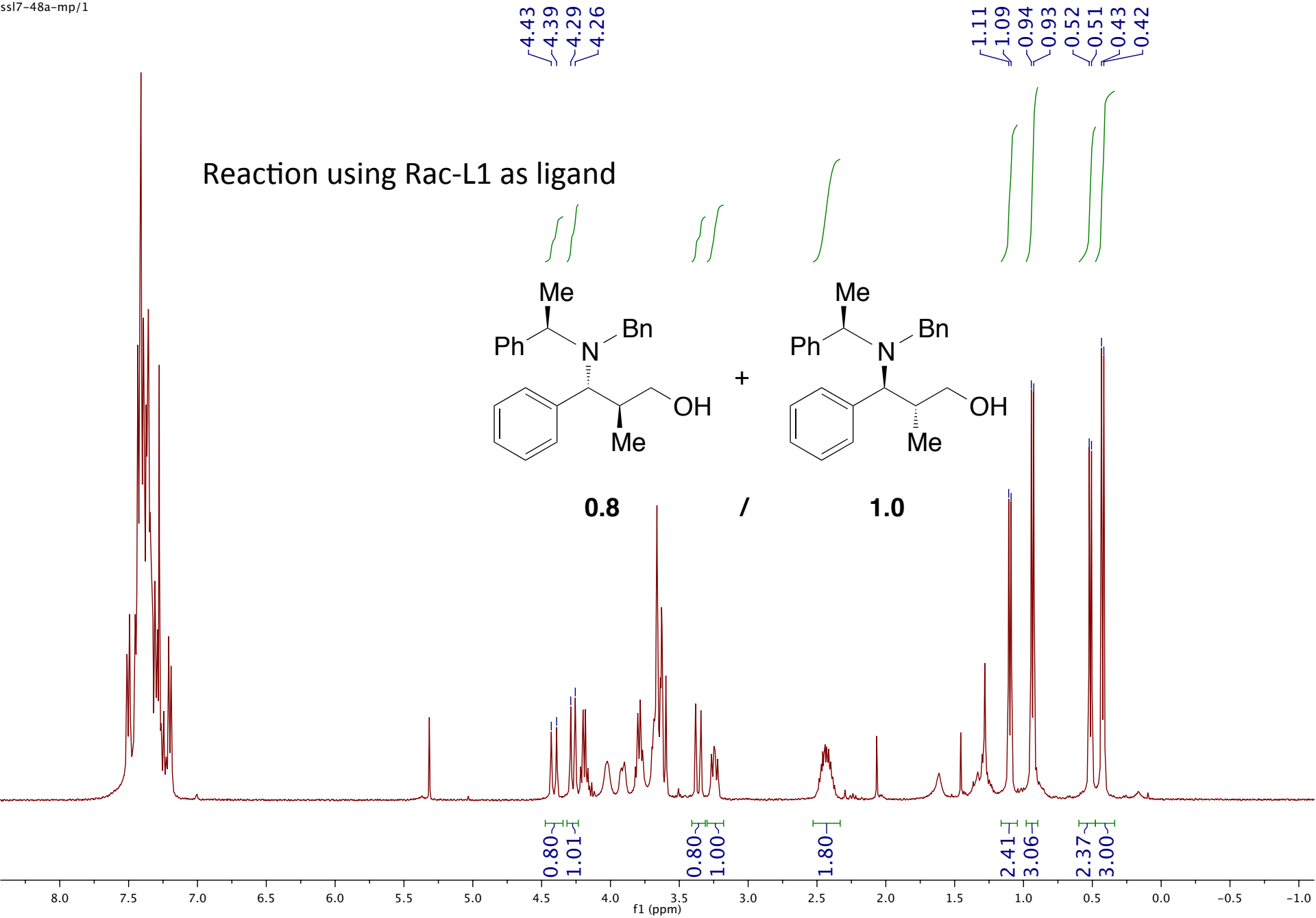
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

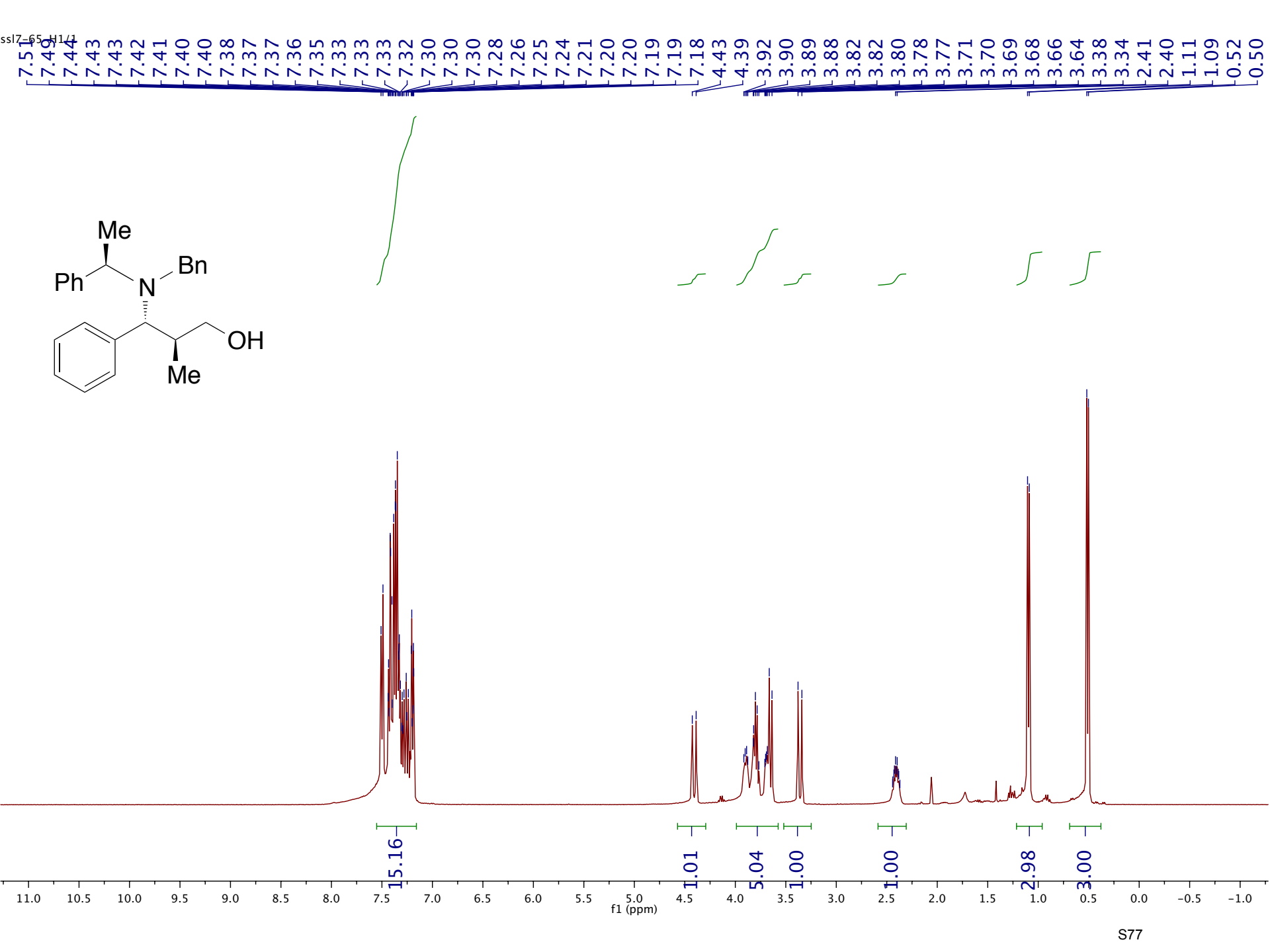
64.21
62.92
53.81
40.82
32.70
27.62
26.55
22.95
14.35

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

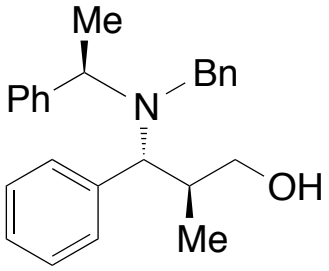
f1 (ppm)

ssl7-48a-mp/1


4.43
4.39
4.29
4.26
1.11
1.09
0.94
0.93
0.52
0.51
0.43
0.42
Reaction using Rac-L1 as ligand
Me
Ph
N
Bn
OH
Me
+
Me
Ph
N
Bn
OH
Me
0.8
/
1.0
0.80
1.01
0.80
1.00
1.80
2.41
3.06
2.37
3.00
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)


ssl7-65_H1/1
7.51 7.49 7.44 7.43 7.43 7.42 7.41 7.40 7.40 7.38 7.37 7.37 7.36 7.35 7.33 7.33 7.33 7.32 7.30 7.30 7.30 7.28 7.26 7.25 7.24 7.21 7.20 7.20 7.19 7.19 7.18 4.43 4.39 3.92 3.90 3.89 3.88 3.82 3.82 3.80 3.78 3.77 3.71 3.70 3.69 3.68 3.66 3.64 3.38 3.34 2.41 2.40 1.11 1.09 0.52 0.50
Me
Ph
N
Bn
OH
Me
15.16
1.01
5.04
1.00
1.00
2.98
3.00
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-65-C/1

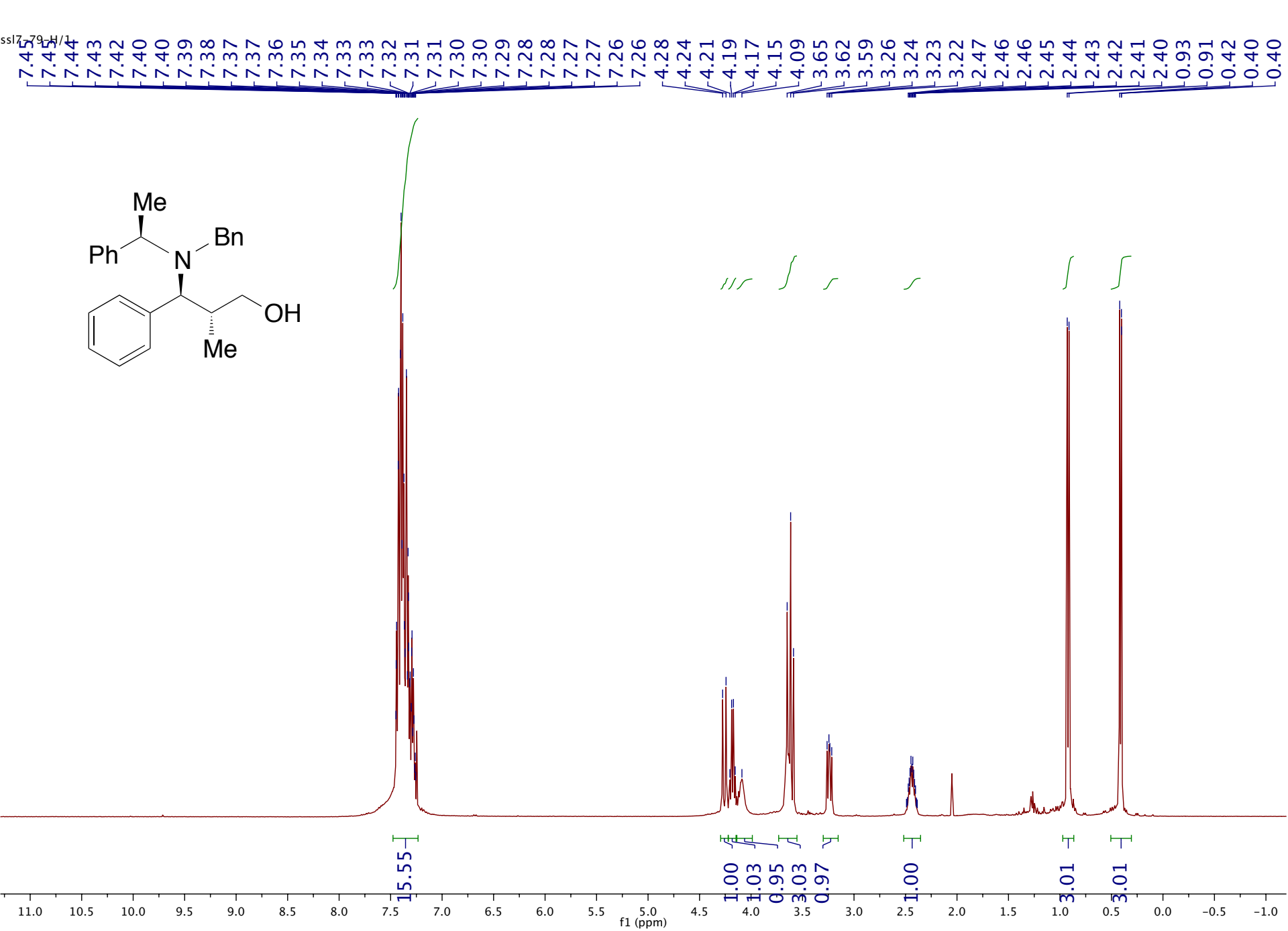


146.05
142.40
136.73
130.11
128.86
128.51
127.99
127.86
127.62
127.35
127.18
126.63

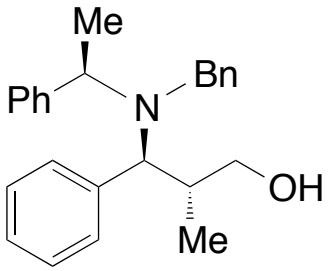
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

68.99
67.83
62.45
52.91
36.15
24.03
15.61

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


ssl7_79_H/1
7.45 7.45 7.44 7.43 7.42 7.40 7.40 7.39 7.38 7.37 7.37 7.36 7.35 7.34 7.33 7.33 7.32 7.31 7.31 7.30 7.30 7.29 7.28 7.28 7.27 7.27 7.26 7.26
4.28 4.24 4.21 4.19 4.17 4.15 4.09 3.65 3.62 3.59 3.26 3.24 3.23 3.22 2.47 2.46 2.46 2.45 2.44 2.43 2.42 2.41 2.40 0.93 0.91 0.42 0.40 0.40
Me
Ph
N
Bn
OH
Me
15.55
1.00
1.03
0.95
3.03
0.97
1.00
3.01
3.01
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

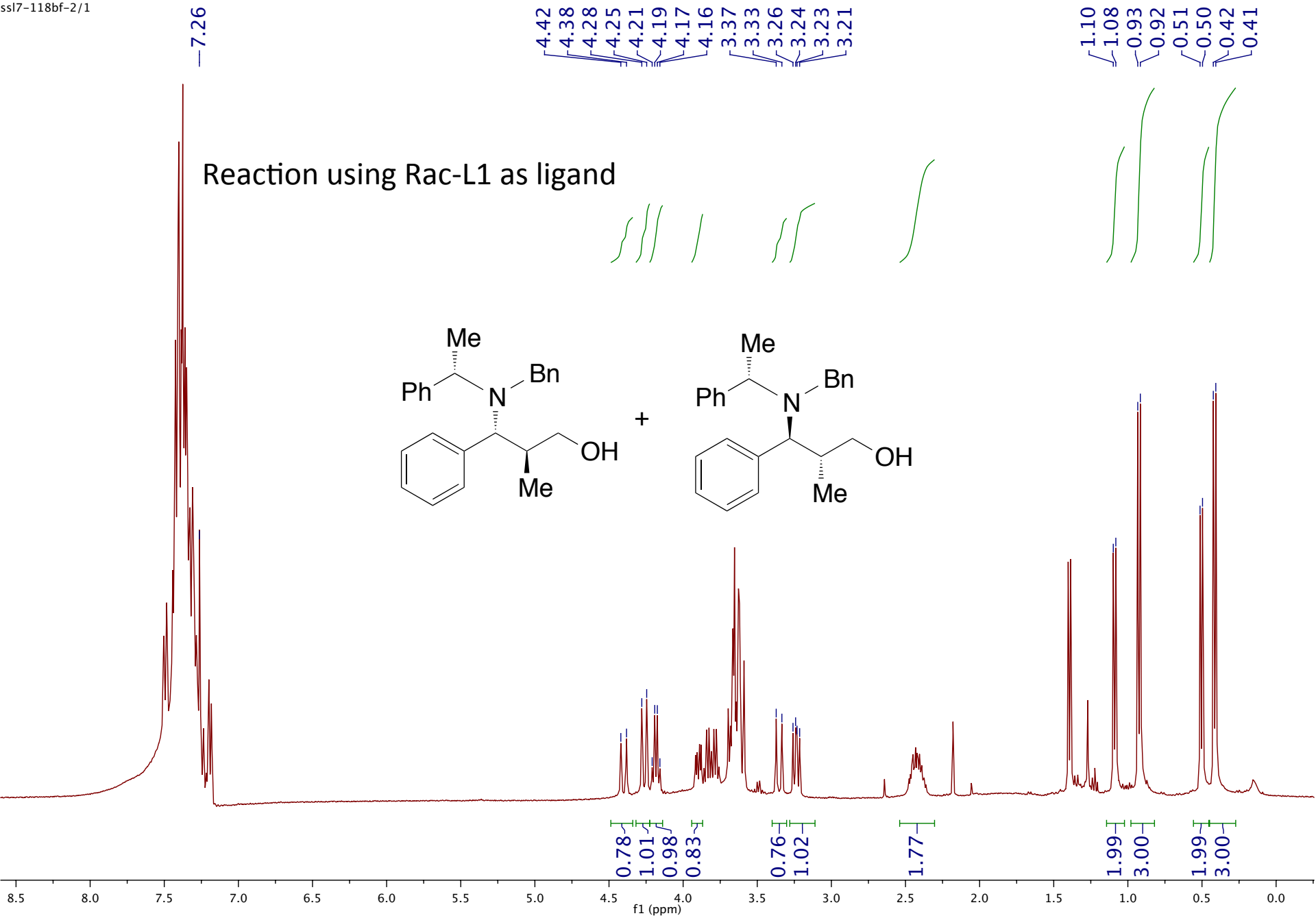
ssl7-79-C/1



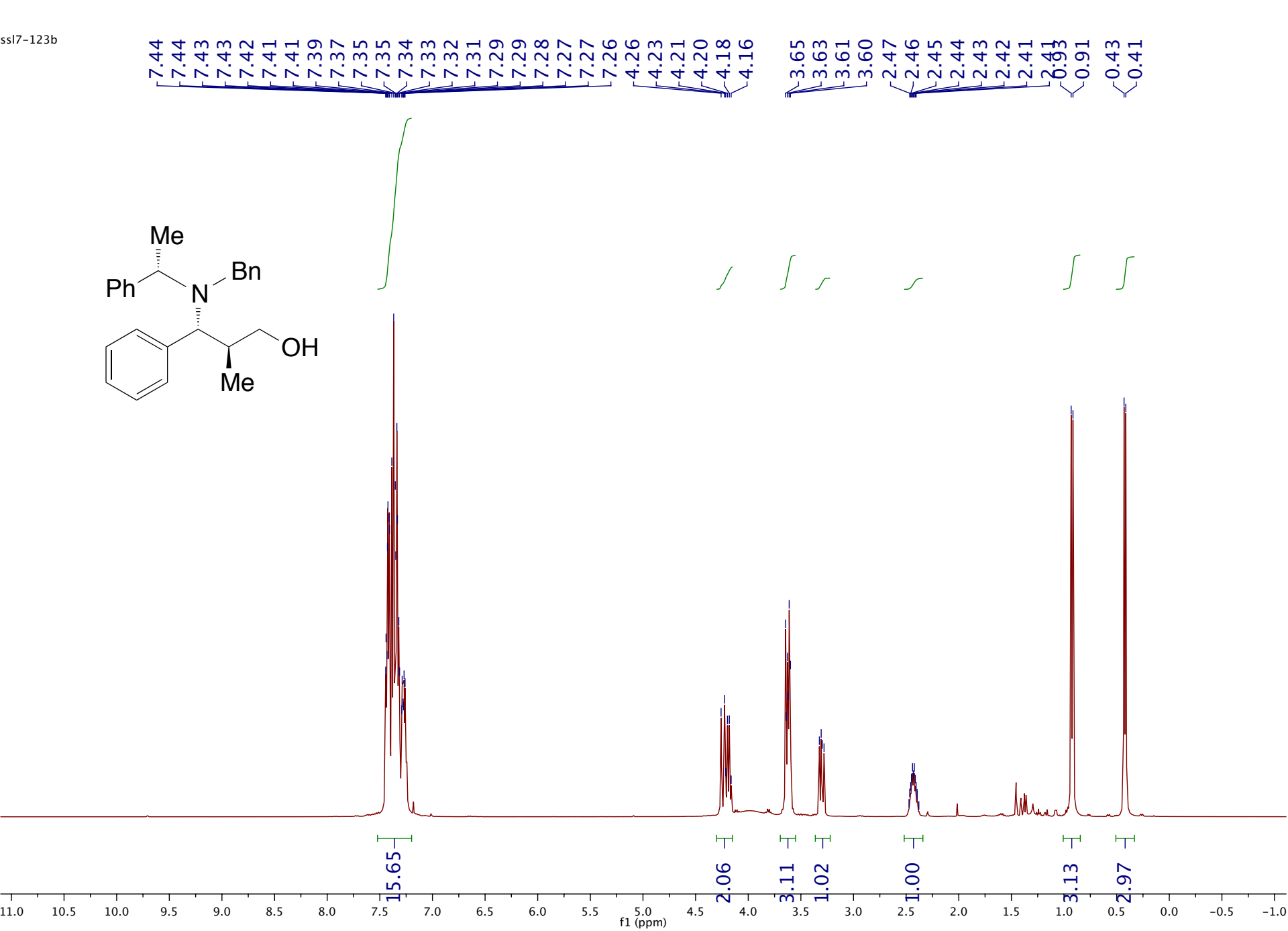
143.66
139.36
139.34
129.73
129.43
128.77
128.49
128.33
128.16
127.41
127.34
127.20
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.41
66.65
55.99
51.48
35.81
15.43
13.65

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

ssl7-118bf-2/1

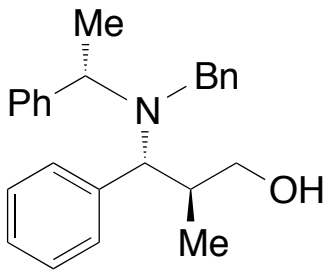


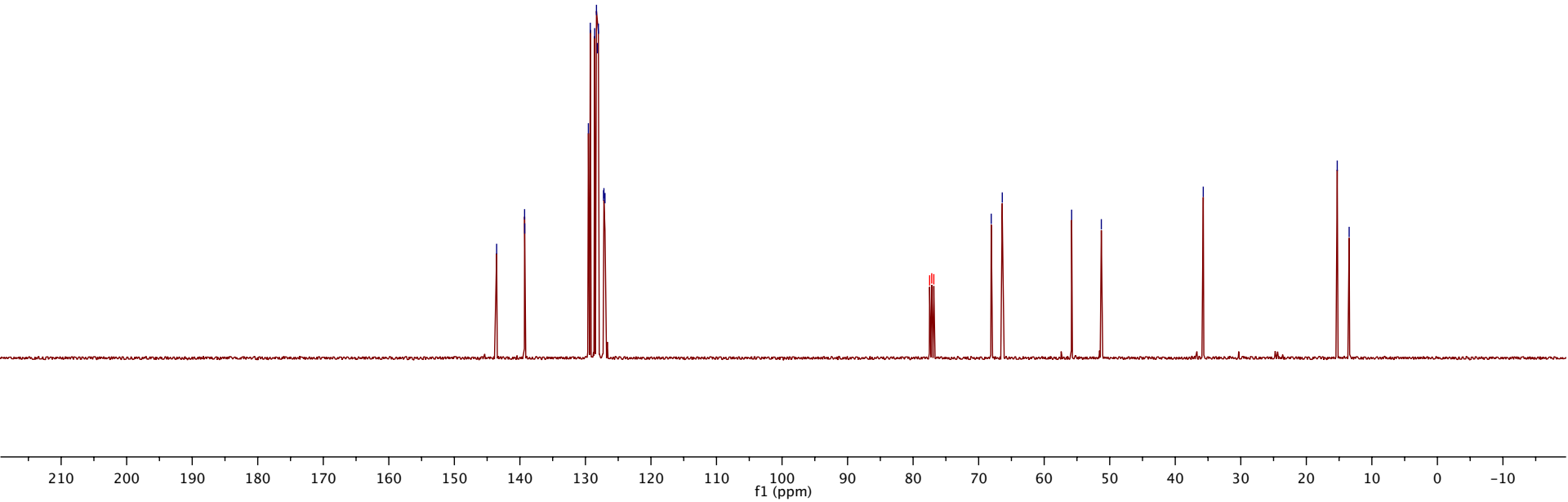
ssl7-123b


7.44
7.44
7.43
7.43
7.42
7.41
7.41
7.39
7.37
7.35
7.35
7.34
7.33
7.32
7.31
7.29
7.29
7.28
7.27
7.27
7.26
4.26
4.23
4.21
4.20
4.18
4.16
3.65
3.63
3.61
3.60
2.47
2.46
2.45
2.44
2.43
2.42
2.41
2.41
0.93
0.91
0.43
0.41
Me
Ph
N
Bn
OH
Me
15.65
2.06
3.11
1.02
1.00
3.13
2.97
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

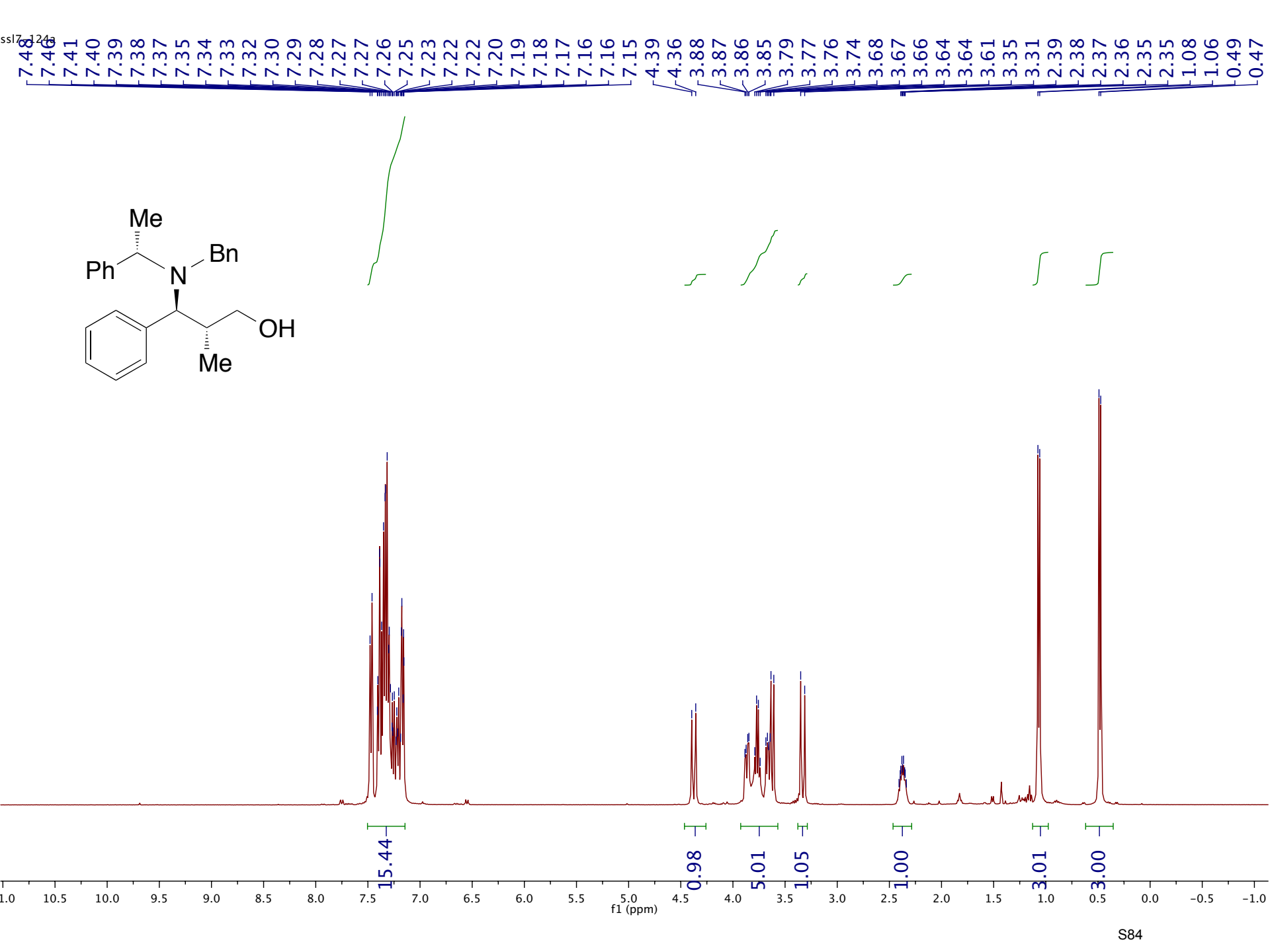
ssl7-123b

143.55
139.28
139.26
129.55
129.26
128.59
128.32
128.17
128.02
127.23
127.18
127.02
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.08
66.39
55.81
51.28
35.73
15.28
13.47





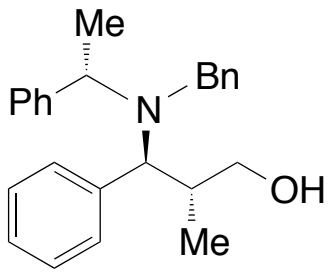
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

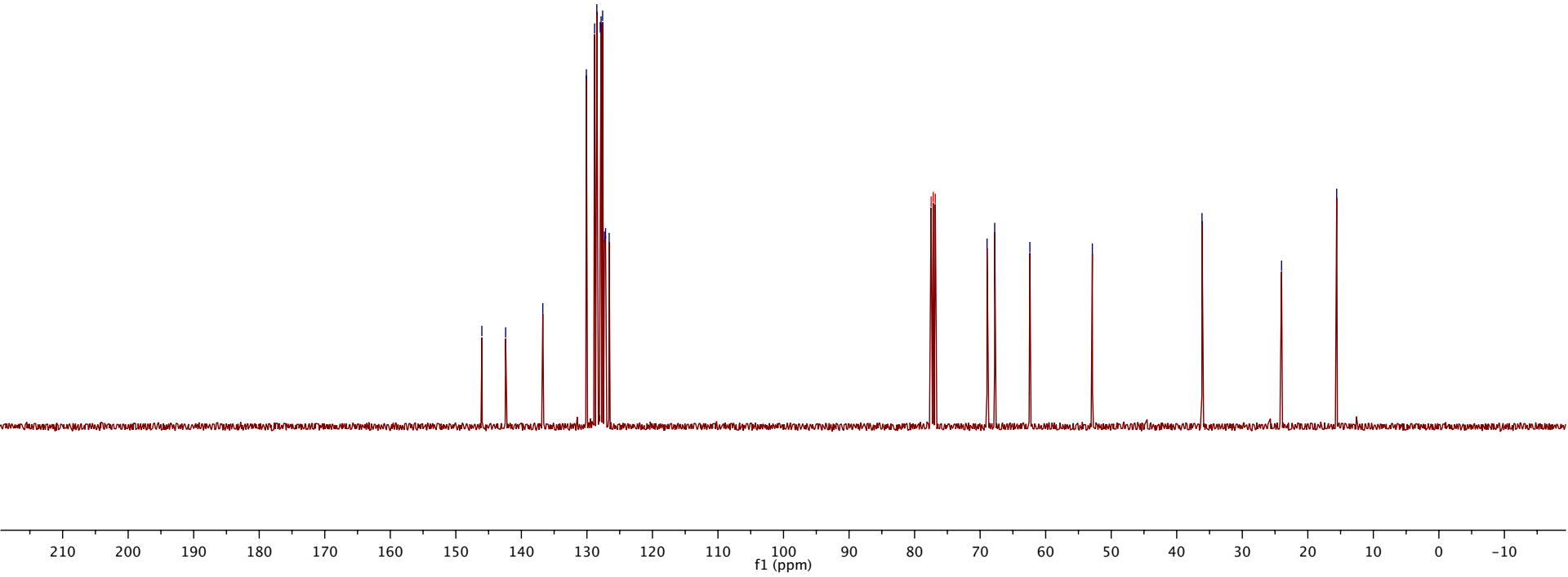

ssl7-124s
7.48 7.46 7.41 7.40 7.39 7.38 7.37 7.35 7.34 7.33 7.32 7.30 7.29 7.28 7.27 7.27 7.26 7.25 7.23 7.22 7.22 7.20 7.19 7.18 7.17 7.16 7.16 7.15 4.39 4.36 3.88 3.87 3.86 3.85 3.79 3.77 3.76 3.74 3.68 3.67 3.66 3.64 3.64 3.61 3.35 3.31 2.39 2.38 2.37 2.36 2.35 2.35 1.08 1.06 0.49 0.47
Me
Ph
N
Bn
OH
Me
15.44
0.98
5.01
1.05
1.00
3.01
3.00
f1 (ppm)

ssl7-124a

146.03
142.40
136.73
130.09
128.83
128.49
127.97
127.84
127.60
127.32
127.15
126.61

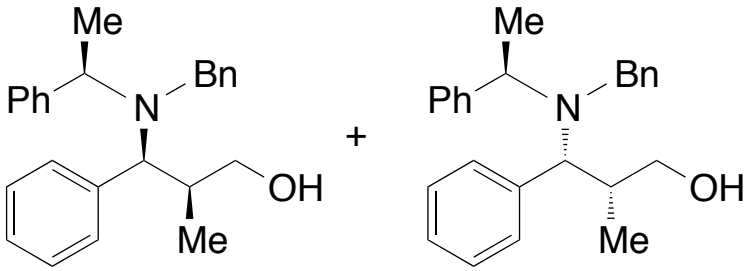
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.94
67.78
62.41
52.87
36.14
24.01
15.59

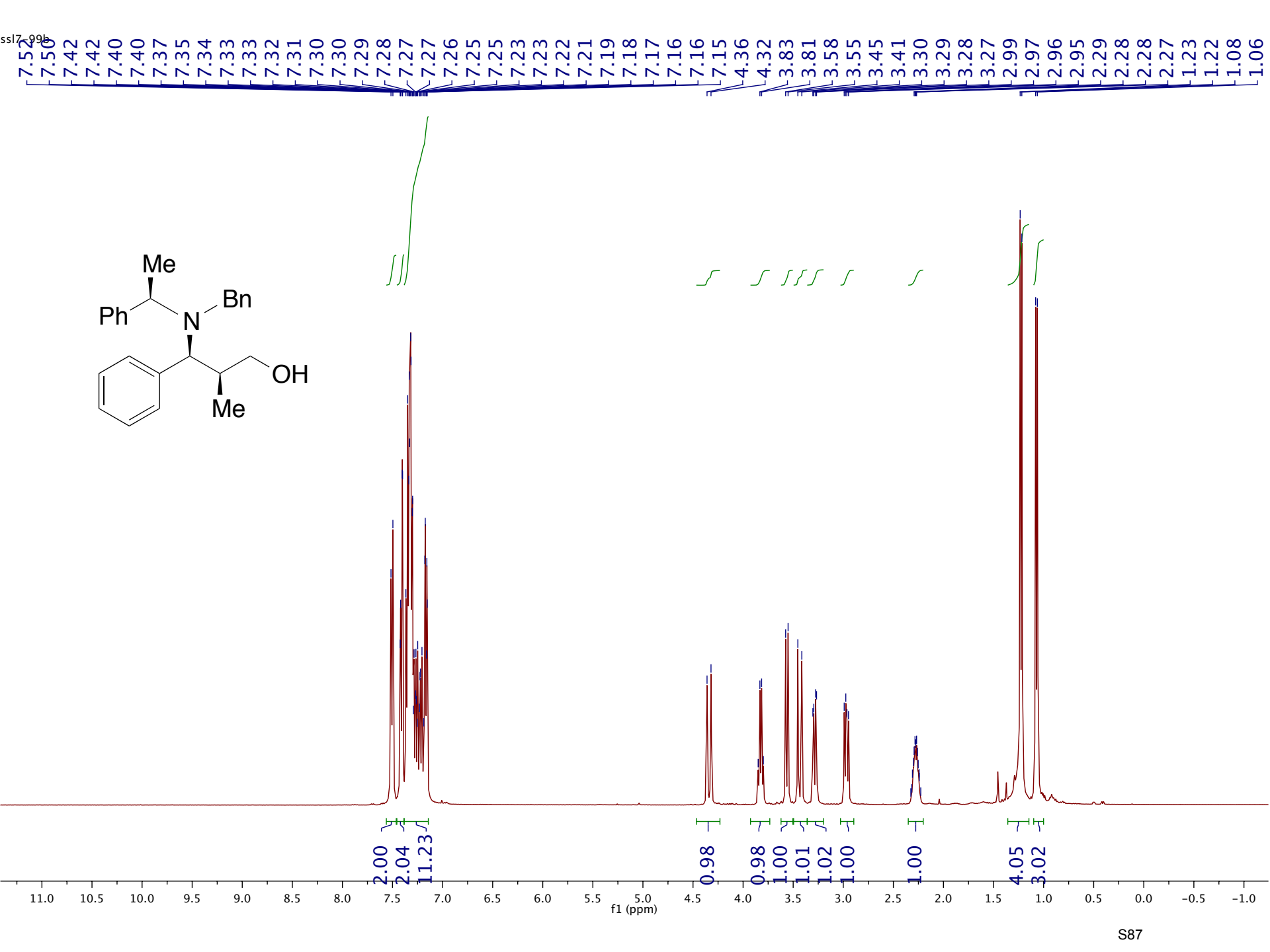




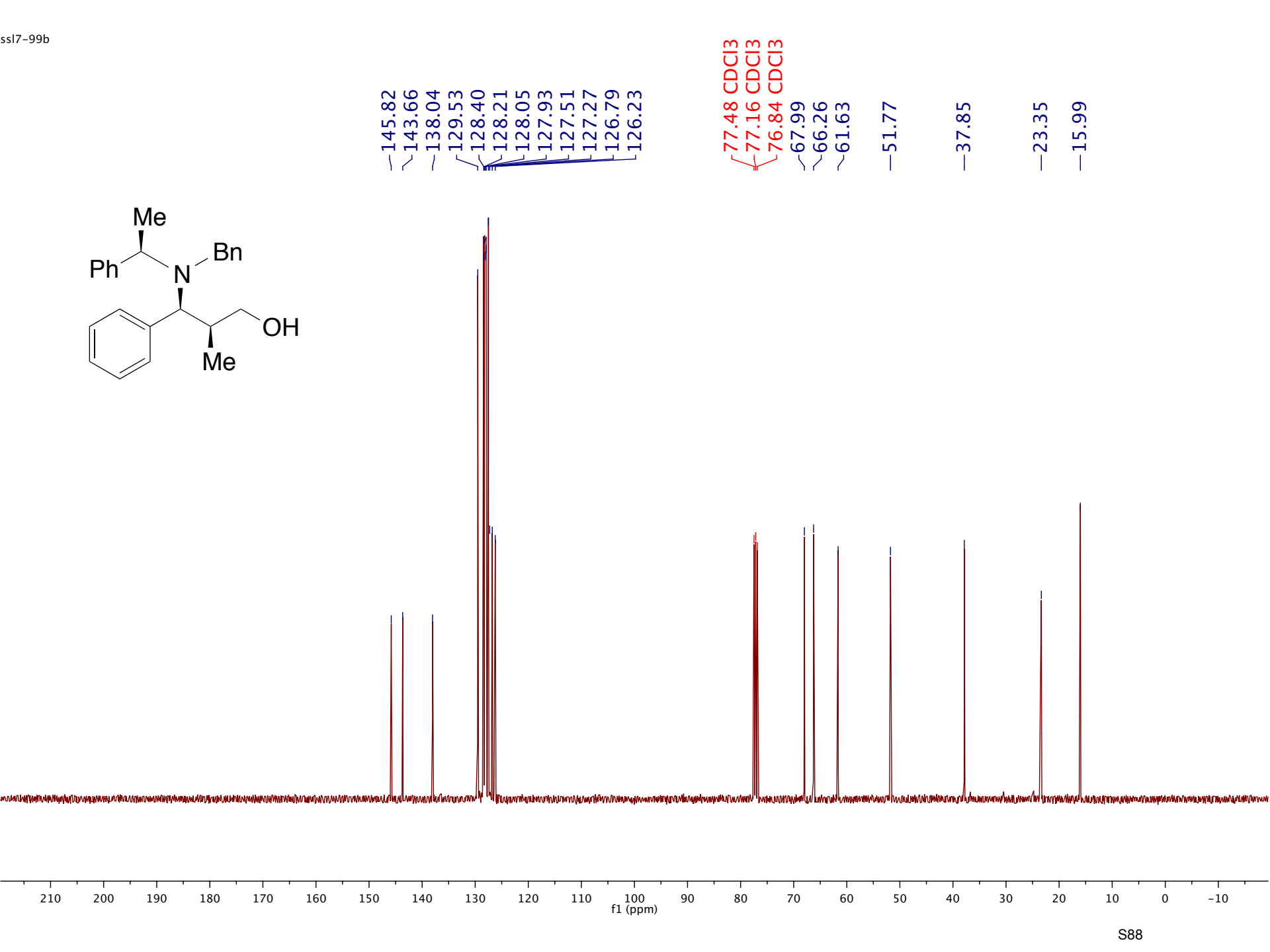
ssl7-119bf-2/1

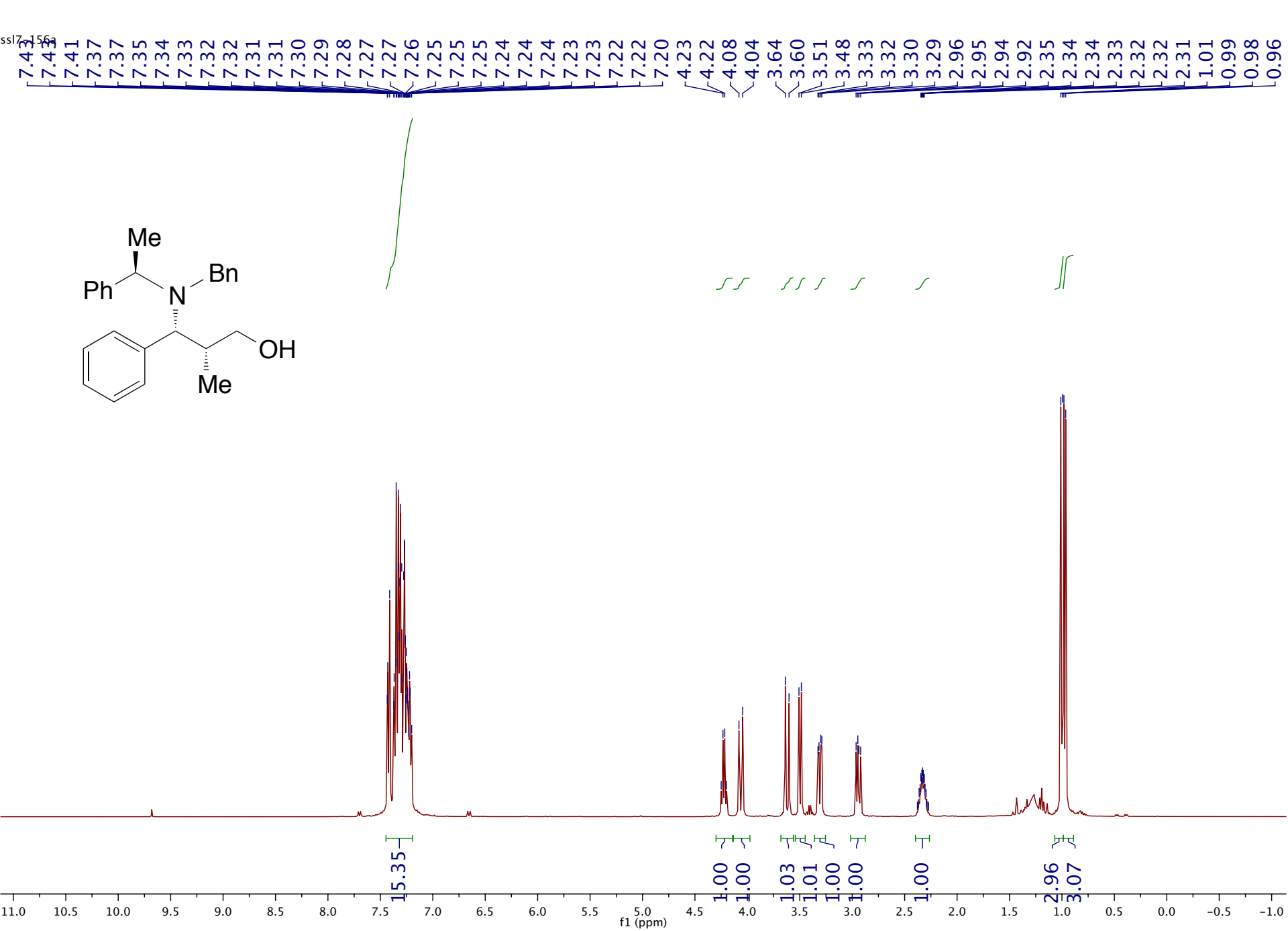
Reaction using Rac-L1 as ligand



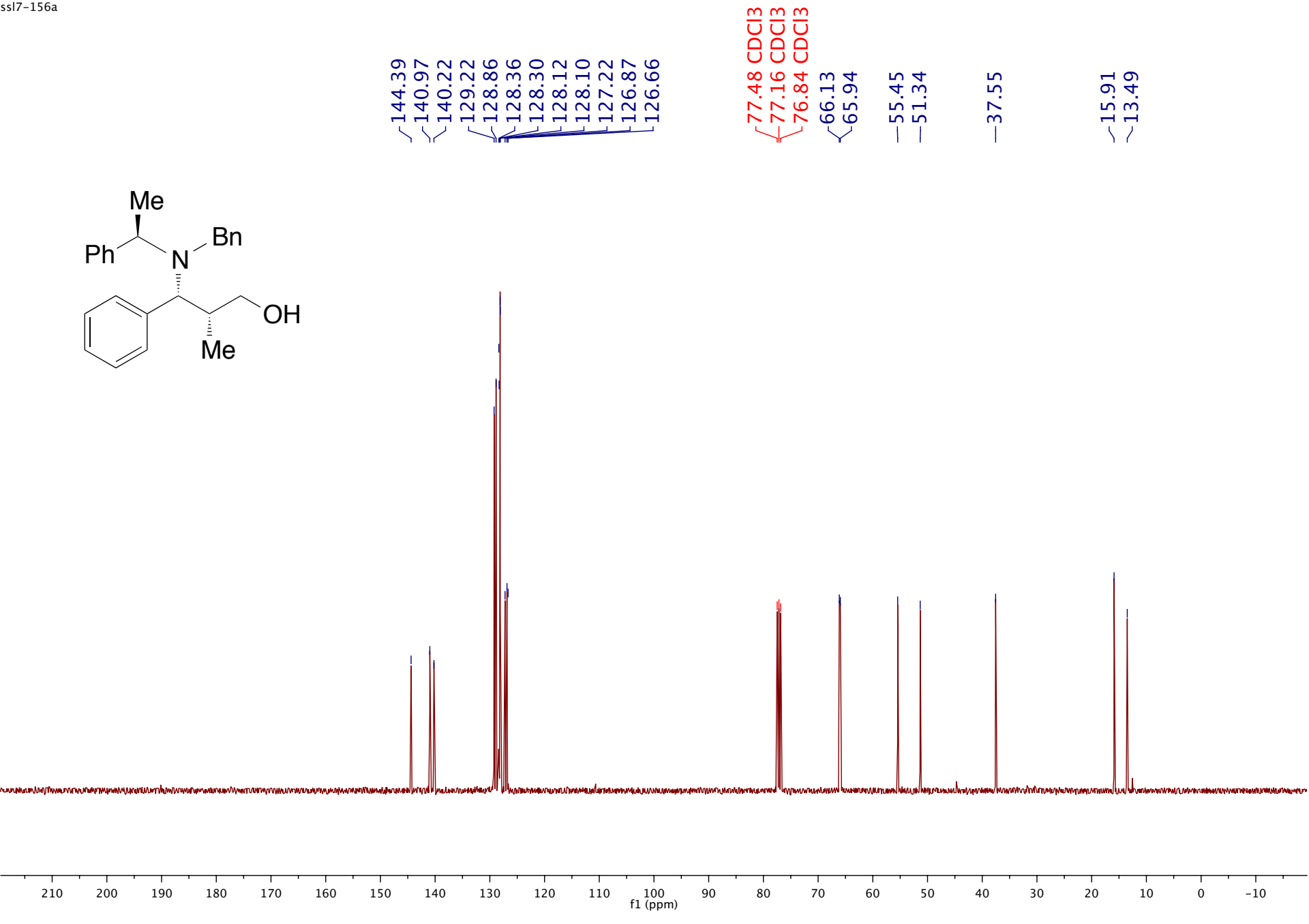

ssl7_99b
7.52 7.50 7.42 7.42 7.40 7.40 7.37 7.35 7.34 7.33 7.33 7.32 7.31 7.30 7.30 7.29 7.28 7.27 7.27 7.26 7.25 7.25 7.23 7.23 7.22 7.21 7.19 7.18 7.17 7.16 7.16 7.15 4.36 4.32 3.83 3.81 3.58 3.55 3.45 3.41 3.30 3.29 3.28 3.27 2.99 2.97 2.96 2.95 2.29 2.28 2.28 2.27 1.23 1.22 1.08 1.06
Me
Ph
N
Bn
OH
Me
2.00 2.04 11.23 0.98 0.98 1.00 1.01 1.02 1.00 1.00 4.05 3.02
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-99b

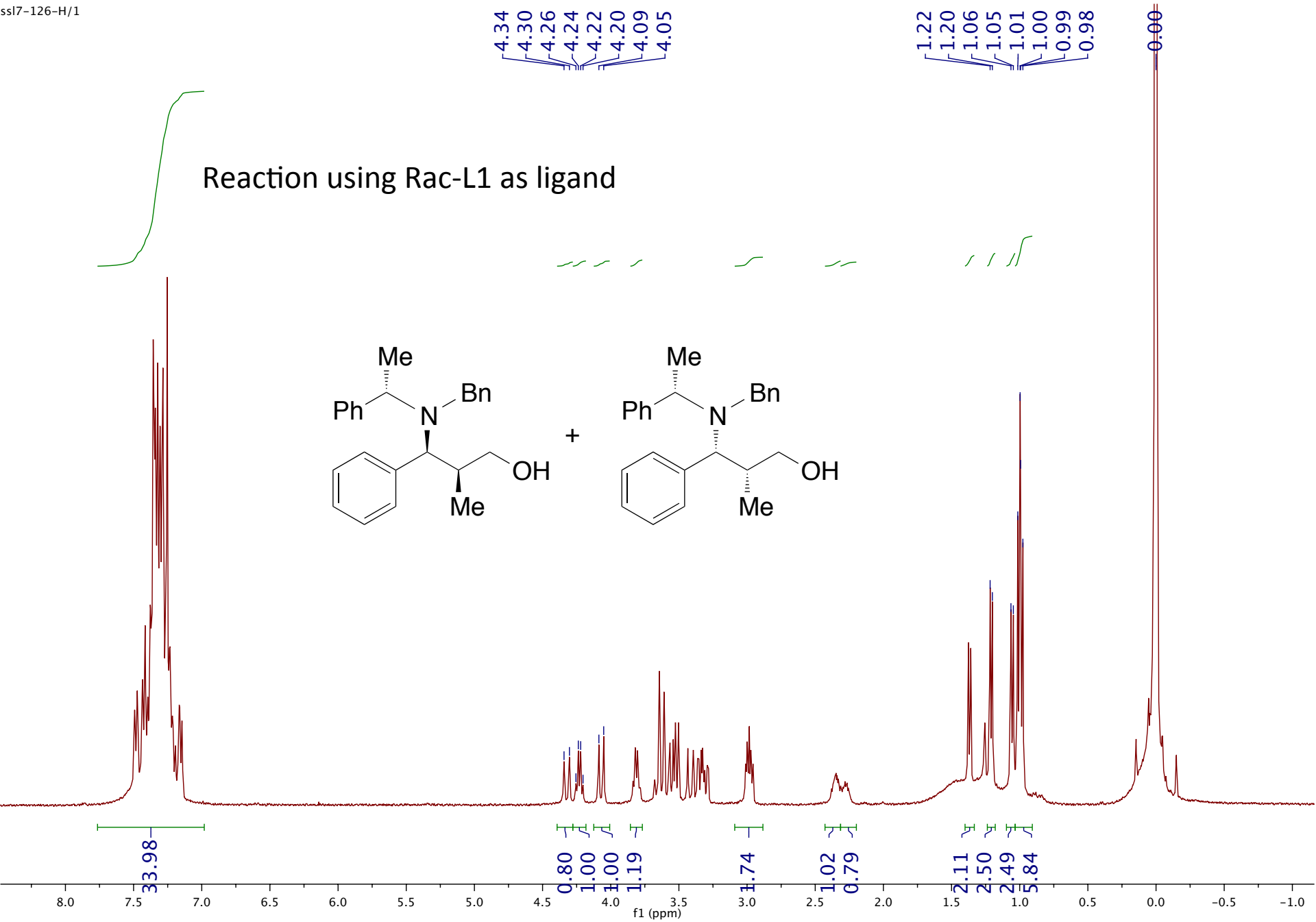

145.82
143.66
138.04
129.53
128.40
128.21
128.05
127.93
127.51
127.27
126.79
126.23
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
67.99
66.26
61.63
51.77
37.85
23.35
15.99
Me
Ph
N
Bn
OH
Me
f1 (ppm)

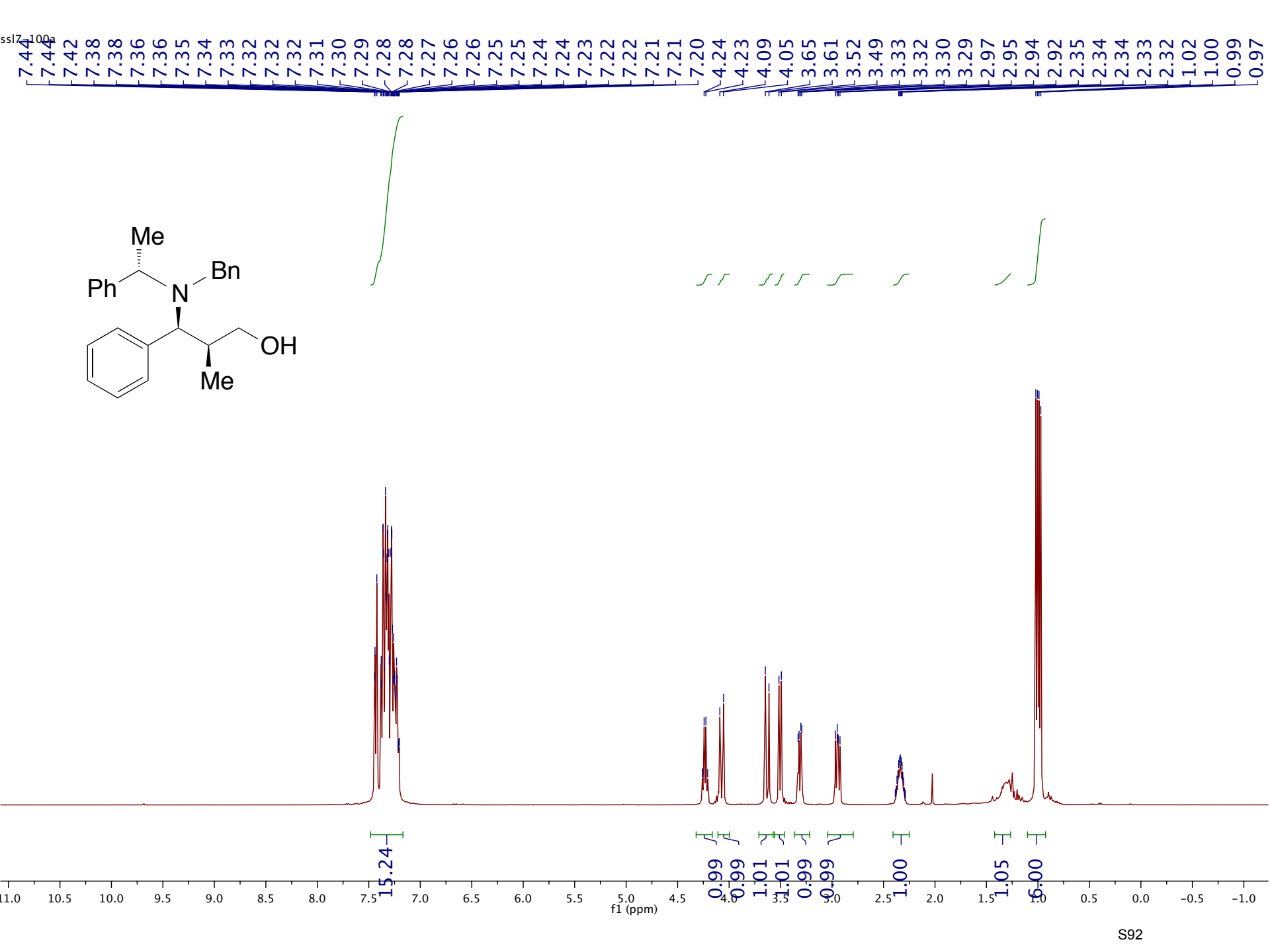

ssl7-156a
7.43 7.41 7.41 7.37 7.37 7.35 7.34 7.33 7.32 7.32 7.31 7.31 7.30 7.29 7.28 7.27 7.27 7.26 7.25 7.25 7.25 7.24 7.24 7.24 7.23 7.23 7.22 7.22 7.20
4.23 4.22 4.08 4.04
3.64 3.60 3.51 3.48 3.33 3.32 3.30 3.29
2.96 2.95 2.94 2.92 2.35 2.34 2.34 2.33 2.32 2.32 2.31
1.01 0.99 0.98 0.96
Me
Ph
N
Bn
OH
Me
15.35
1.00 1.00 1.03 1.01 1.00 1.00 1.00 2.96 3.07
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-156a

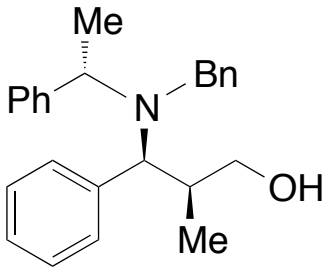

144.39
140.97
140.22
129.22
128.86
128.36
128.30
128.12
128.10
127.22
126.87
126.66
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
66.13
65.94
55.45
51.34
37.55
15.91
13.49
Me
Ph
N
Bn
OH
Me
f1 (ppm)

ssl7-126-H/1


4.34
4.30
4.26
4.24
4.22
4.20
4.09
4.05
1.22
1.20
1.06
1.05
1.01
1.00
0.99
0.98
0.00
Reaction using Rac-L1 as ligand
Me
Ph
N
Bn
OH
Me
+
Me
Ph
N
Bn
OH
Me
33.98
0.80
1.00
1.00
1.19
1.74
1.02
0.79
2.11
2.50
2.49
5.84
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

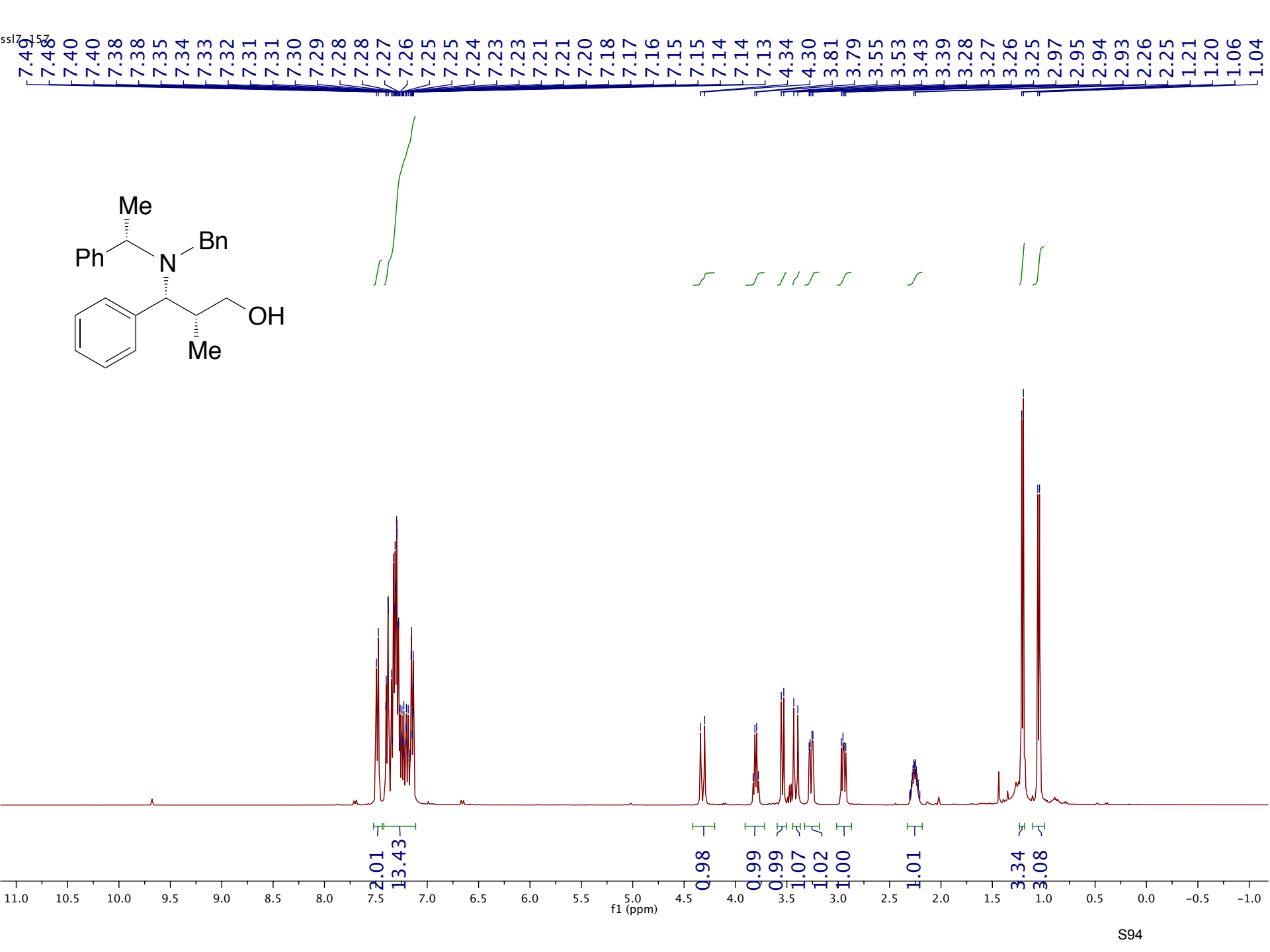

ssl7_100a
7.44 7.43 7.42 7.38 7.38 7.36 7.36 7.35 7.34 7.33 7.32 7.32 7.32 7.31 7.30 7.29 7.28 7.28 7.27 7.26 7.26 7.25 7.25 7.24 7.24 7.23 7.22 7.22 7.21 7.21 7.20
4.24 4.23 4.09 4.05 3.65 3.61 3.52 3.49 3.33 3.32 3.30 3.29 2.97 2.95 2.94 2.92 2.35 2.34 2.34 2.33 2.32 1.02 1.00 0.99 0.97
Me
Ph
N
Bn
OH
Me
15.24
0.99
0.99
1.01
1.01
0.99
0.99
1.00
1.05
6.00
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-100a



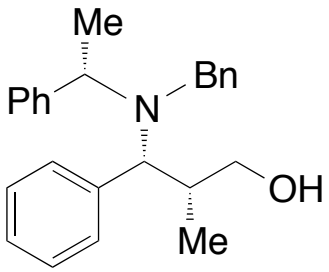
144.39
140.96
140.21
129.21
128.86
128.35
128.29
128.11
128.09
127.21
126.86
126.65
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
66.10
65.90
55.44
51.32
37.54
15.90
13.50

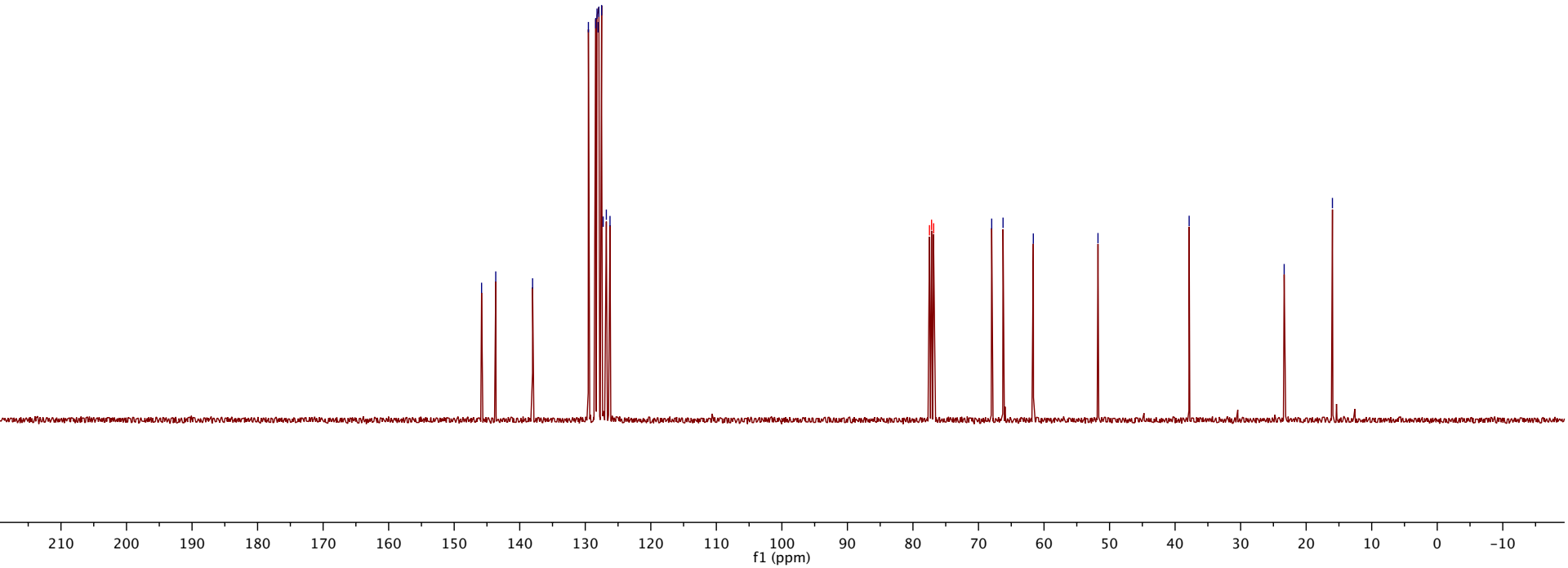
f1 (ppm)


ssl7_157
7.49 7.48 7.40 7.40 7.38 7.38 7.35 7.34 7.33 7.32 7.31 7.31 7.30 7.29 7.28 7.28 7.27 7.26 7.25 7.25 7.24 7.23 7.23 7.21 7.21 7.20 7.18 7.17 7.16 7.15 7.15 7.14 7.14 7.13 4.34 4.30 3.81 3.79 3.55 3.53 3.43 3.39 3.28 3.27 3.26 3.25 2.97 2.95 2.94 2.93 2.26 2.25 1.21 1.20 1.06 1.04
Me
Ph
N
Bn
OH
Me
2.01
13.43
0.98
0.99
0.99
1.07
1.02
1.00
1.01
3.34
3.08
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

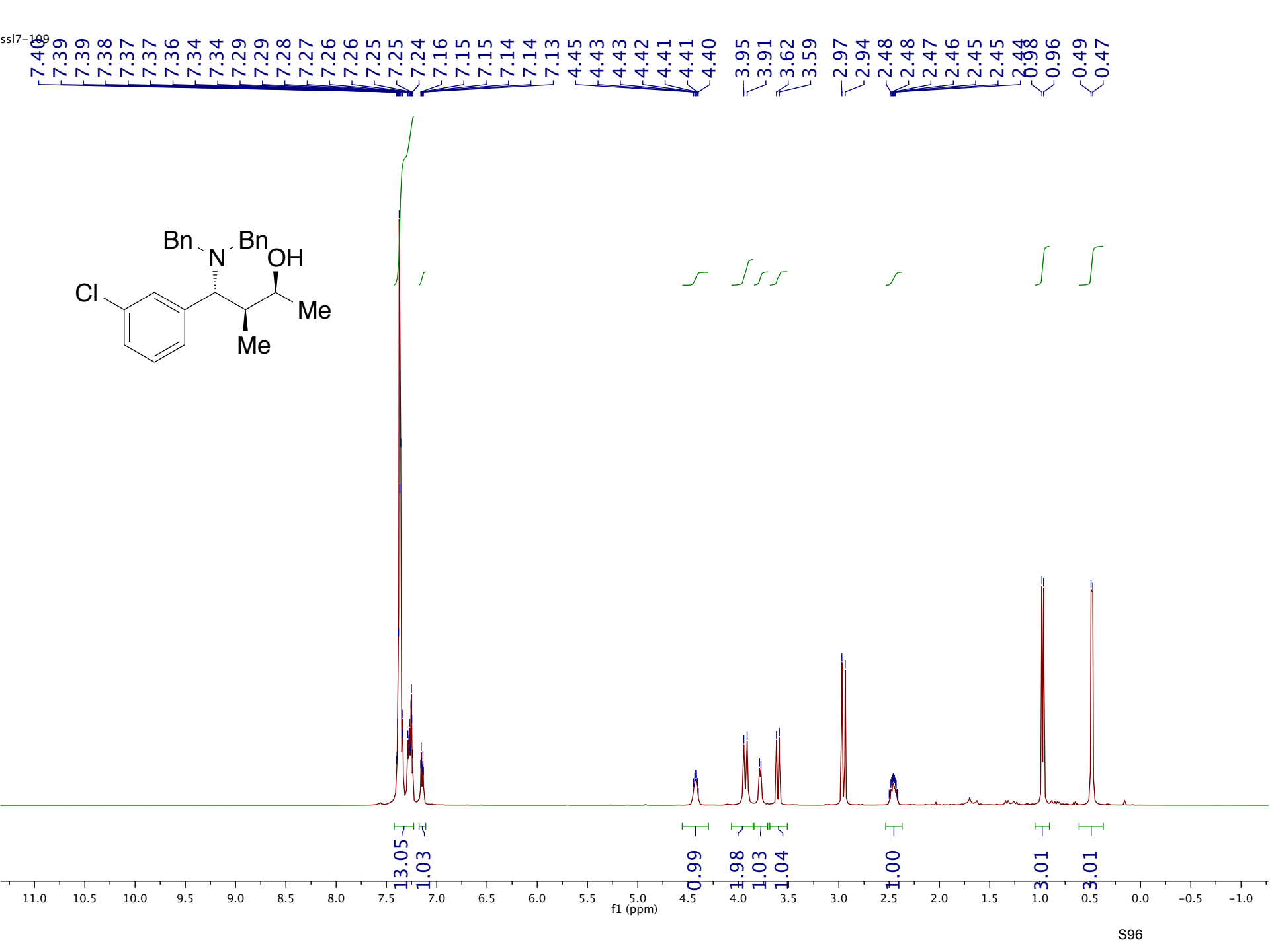
ssl7-157

145.82
143.66
138.04
129.52
128.40
128.21
128.05
127.92
127.50
127.27
126.79
126.22
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
67.98
66.25
61.63
51.77
37.86
23.36
15.99

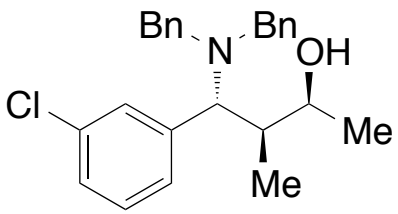




210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


ssl7-109
7.40
7.39
7.39
7.38
7.37
7.37
7.36
7.34
7.34
7.29
7.29
7.28
7.27
7.26
7.26
7.25
7.25
7.24
7.16
7.15
7.15
7.14
7.14
7.13
4.45
4.43
4.43
4.42
4.41
4.41
4.40
3.95
3.91
3.62
3.59
2.97
2.94
2.48
2.48
2.47
2.46
2.45
2.45
2.44
0.98
0.96
0.49
0.47
Bn
N
Bn
OH
Cl
Me
Me
13.05
1.03
0.99
1.98
1.03
1.04
1.00
3.01
3.01
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7-109

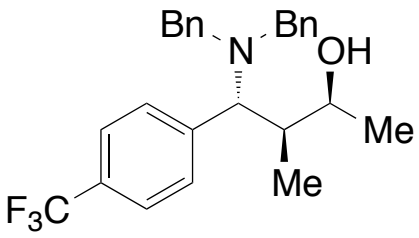


138.85
137.32
134.30
130.18
129.42
129.40
128.84
128.42
127.76
127.64

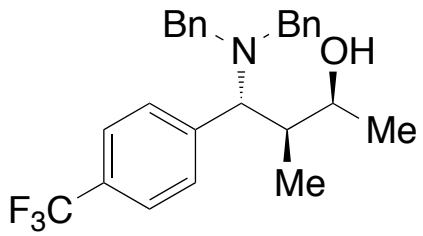
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.34
64.49
53.92
37.70
18.68
12.83

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

SSL7-110



ssl7-110-C



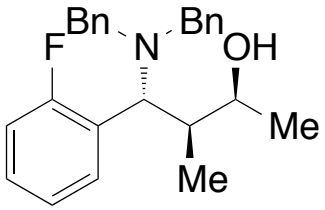
139.29
139.27
138.80
130.48
130.27
129.95
129.63
129.37
129.20
128.38
127.70
125.67
122.97
120.26

77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

68.18
64.47
53.94
37.72
18.79
12.66

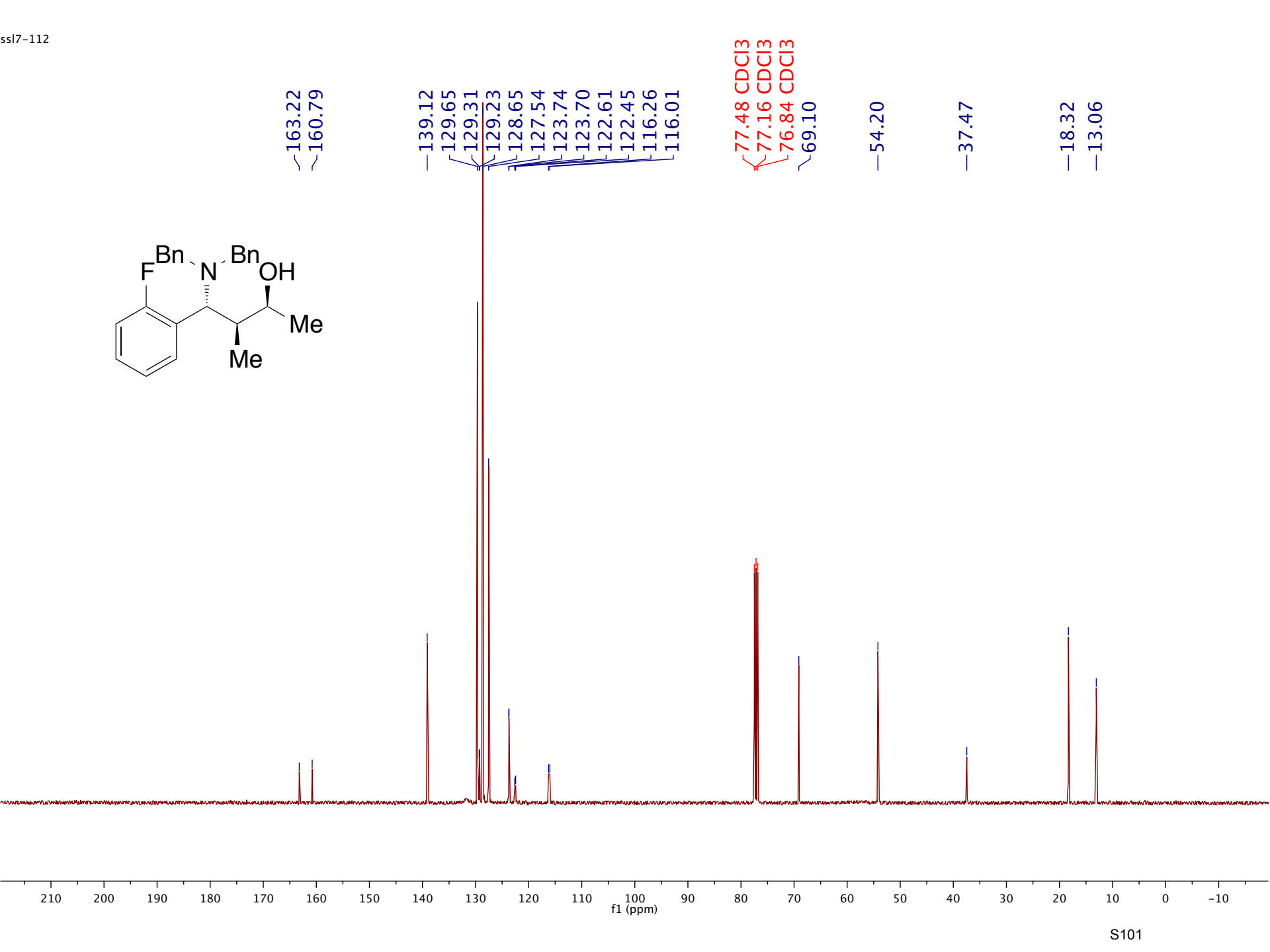
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

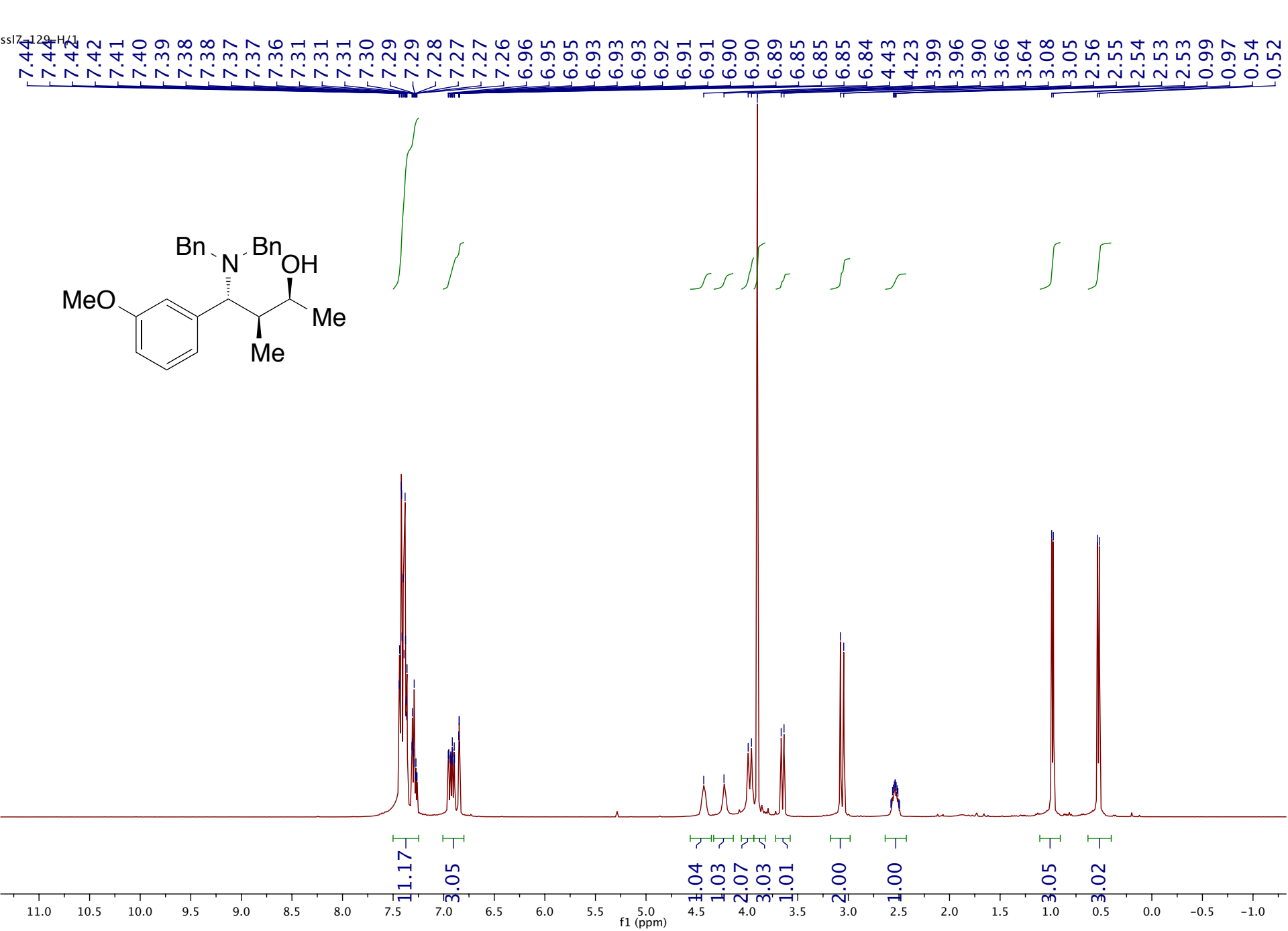
ssl7-112



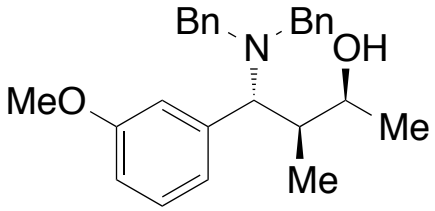
f1 (ppm)

ssl7-112


163.22
160.79
139.12
129.65
129.31
129.23
128.65
127.54
123.74
123.70
122.61
122.45
116.26
116.01
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.10
54.20
37.47
18.32
13.06
F
Bn
N
Bn
OH
Me
Me
f1 (ppm)

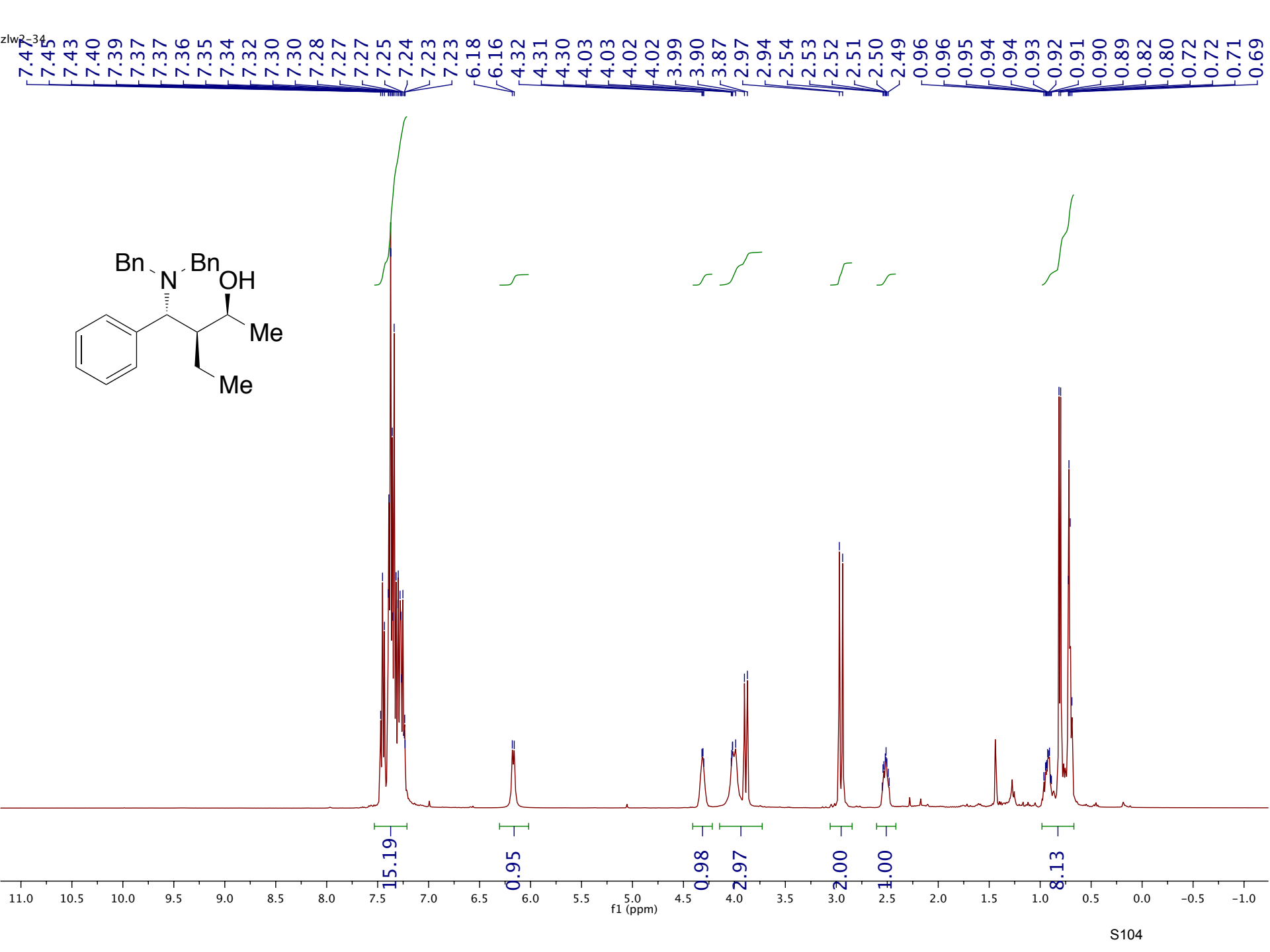

ssl7-129-H/1
7.44 7.44 7.42 7.42 7.41 7.40 7.39 7.38 7.38 7.37 7.37 7.36 7.31 7.31 7.31 7.30 7.29 7.29 7.28 7.27 7.27 7.26 6.96 6.95 6.95 6.93 6.93 6.93 6.92 6.91 6.91 6.90 6.90 6.89 6.85 6.85 6.85 6.84 4.43 4.23 3.99 3.96 3.90 3.66 3.64 3.08 3.05 2.56 2.55 2.54 2.53 2.53 0.99 0.97 0.54 0.52
Bn
N
Bn
OH
MeO
Me
Me
11.17
3.05
1.04
1.03
2.07
3.03
1.01
2.00
1.00
3.05
3.02
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

ssl7-129-C/1

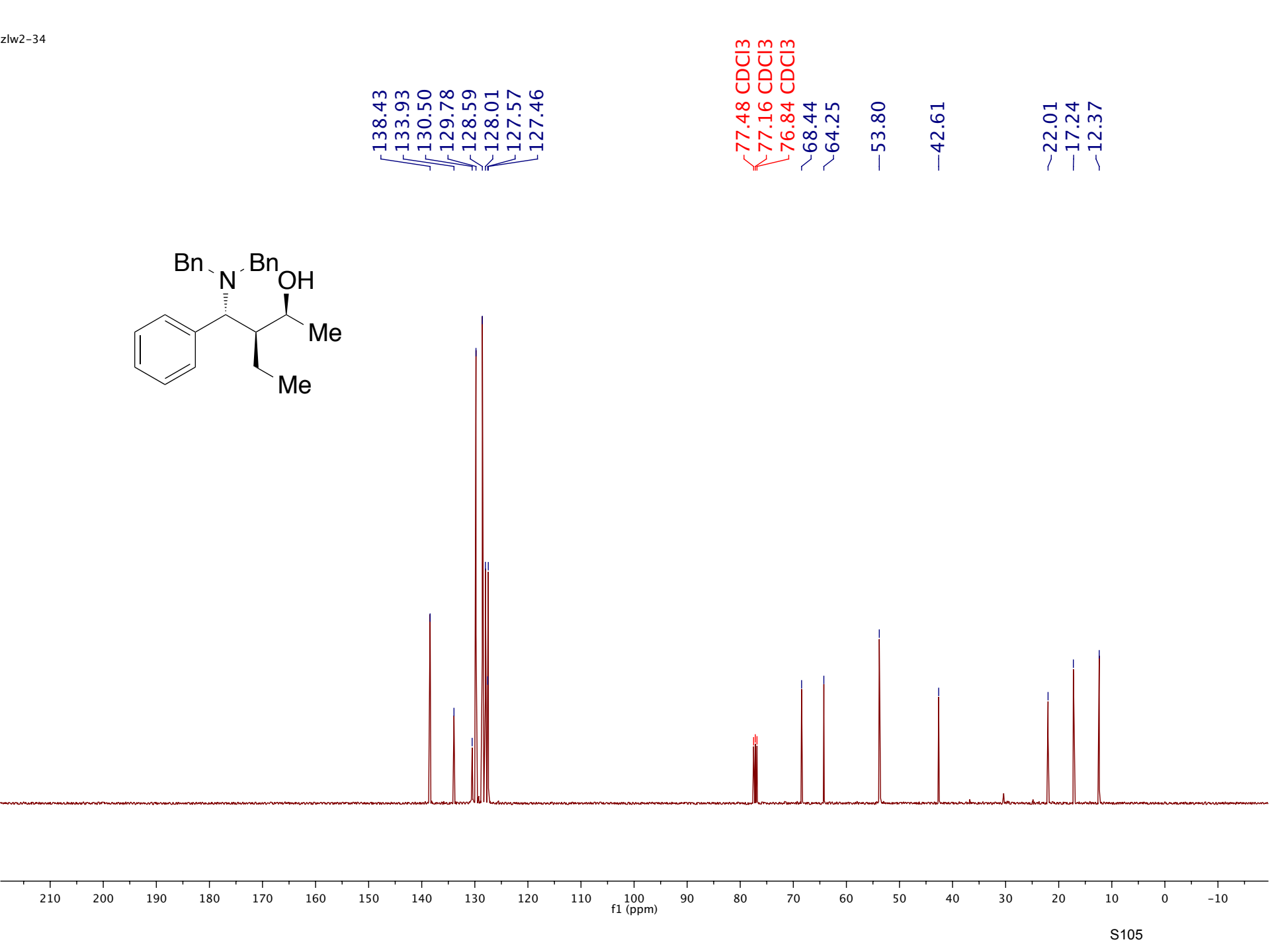


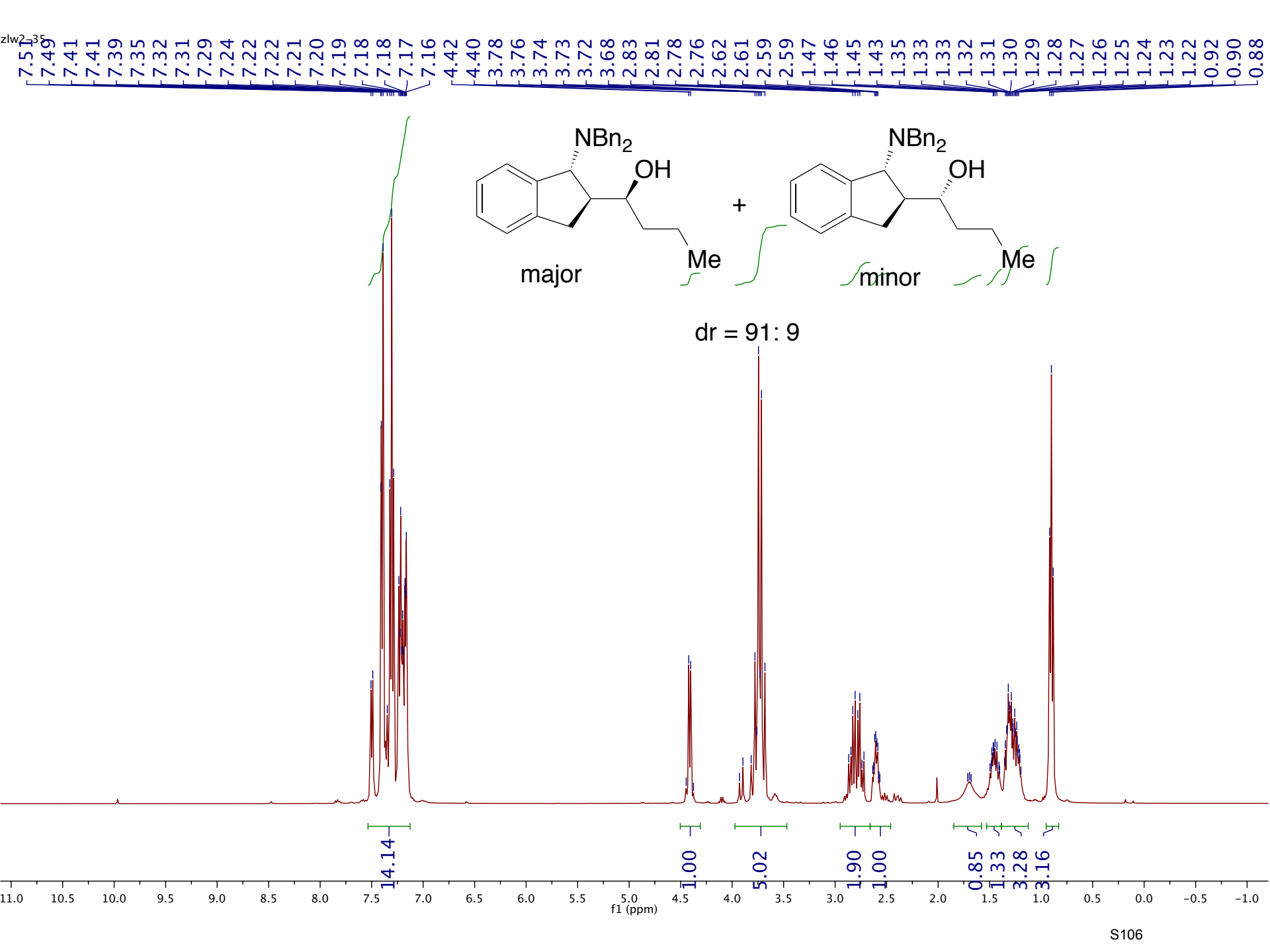
159.42
139.11
136.63
129.47
128.97
128.72
127.49
122.76
116.78
112.12
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.79
64.76
55.31
53.96
37.59
18.48
13.10

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

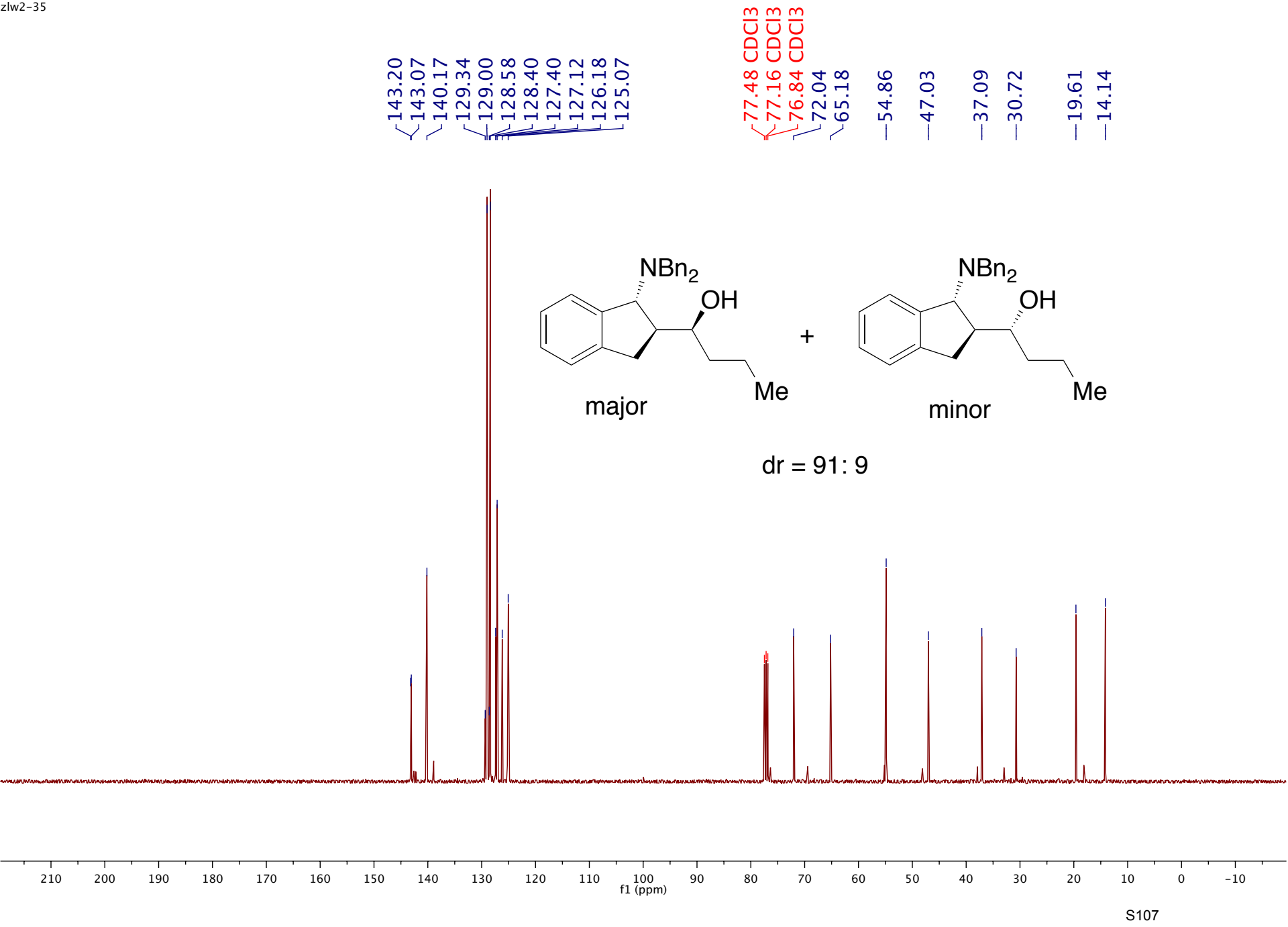

zlw2-34
7.47 7.45 7.43 7.40 7.39 7.37 7.37 7.36 7.35 7.34 7.32 7.30 7.30 7.28 7.27 7.27 7.25 7.24 7.23 7.23
6.18 6.16
4.32 4.31 4.30 4.03 4.03 4.02 4.02 4.02 3.99 3.90 3.87
2.97 2.94 2.54 2.53 2.52 2.51 2.50 2.49
0.96 0.96 0.95 0.94 0.94 0.93 0.92 0.91 0.90 0.89 0.82 0.80 0.72 0.72 0.71 0.69
Bn
N
Bn
OH
Me
Me
15.19
0.95
0.98
2.97
2.00
1.00
8.13
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

zlw2-34

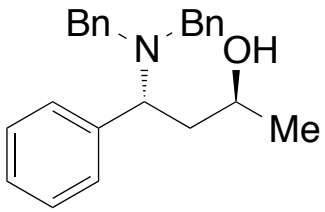

138.43
133.93
130.50
129.78
128.59
128.01
127.57
127.46
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.44
64.25
53.80
42.61
22.01
17.24
12.37
Bn
N
Bn
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


zlw2_35
7.51 7.49 7.41 7.41 7.39 7.35 7.32 7.31 7.29 7.24 7.22 7.22 7.21 7.20 7.19 7.18 7.18 7.17 7.16
4.42 4.40 3.78 3.76 3.74 3.73 3.72 3.68 2.83 2.81 2.78 2.76 2.62 2.61 2.59 2.59 1.47 1.46 1.45 1.43 1.35 1.33 1.33 1.32 1.31 1.30 1.29 1.28 1.27 1.26 1.25 1.24 1.23 1.22 0.92 0.90 0.88
NBn2
OH
Me
major
+
NBn2
OH
Me
minor
dr = 91: 9
14.14
1.00
5.02
1.90
1.00
0.85
1.33
3.28
3.16
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

zlw2-35


143.20
143.07
140.17
129.34
129.00
128.58
128.40
127.40
127.12
126.18
125.07
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
72.04
65.18
54.86
47.03
37.09
30.72
19.61
14.14
NBn2
OH
Me
major
+
NBn2
OH
Me
minor
dr = 91: 9
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

SSL7_245

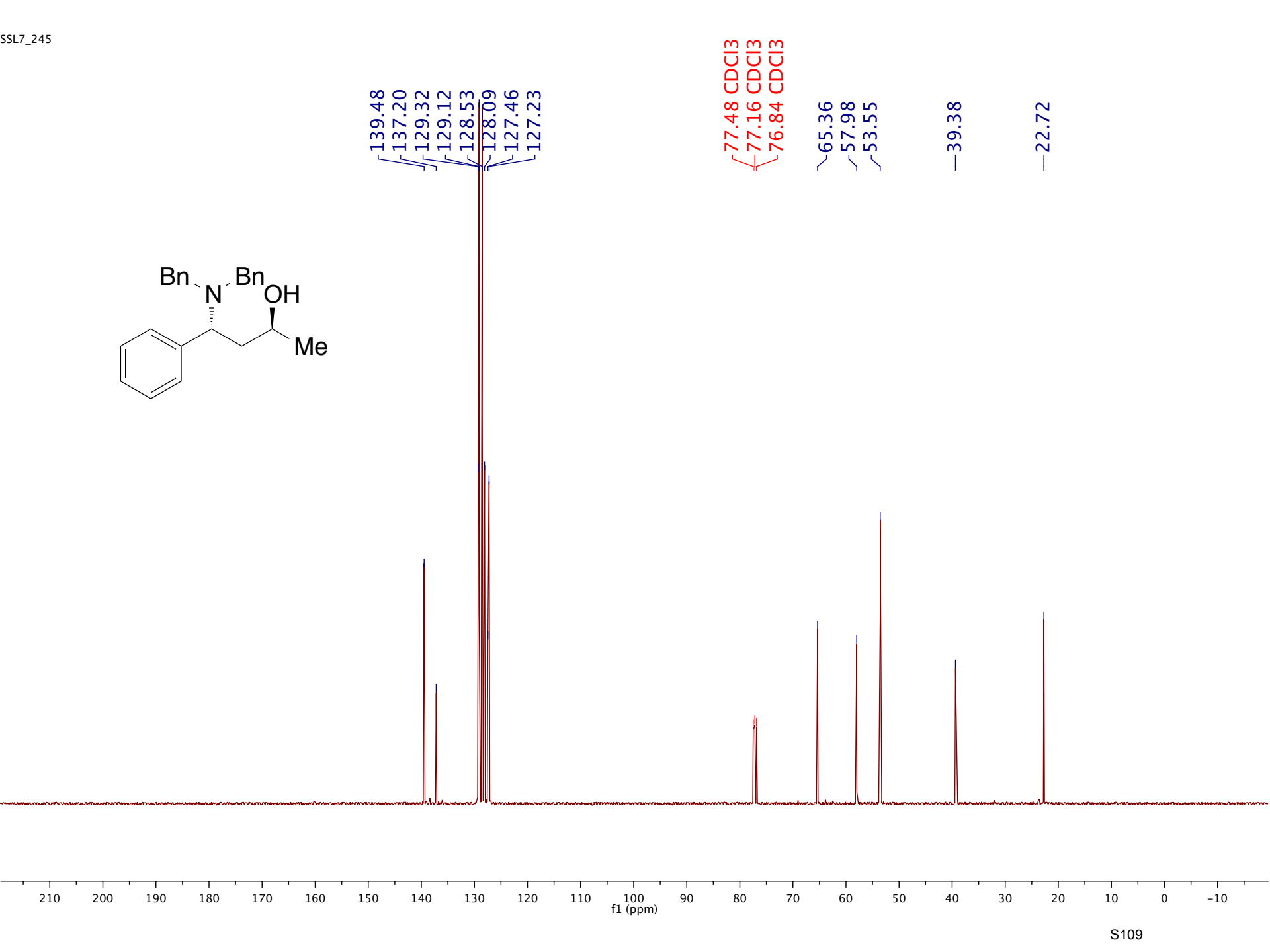


7.52 7.50 7.49 7.46 7.44 7.43 7.42 7.40 7.38 7.36 7.34 7.32 7.32 7.26
4.32 4.31 4.30 4.30 4.14 4.13 4.11 4.10 4.01 3.98 3.98 3.18 3.15
2.54 2.53 2.52
1.74 1.73 1.72 1.18 1.17

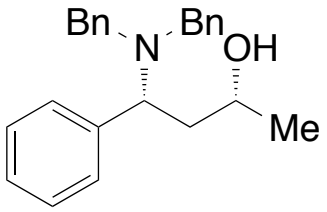
15.09 0.98 1.05 2.00 0.89 2.01 1.00 1.00 2.96

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

SSL7_245


139.48
137.20
129.32
129.12
128.53
128.09
127.46
127.23
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
65.36
57.98
53.55
39.38
22.72
Bn
N
Bn
OH
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

ssl7_245lp

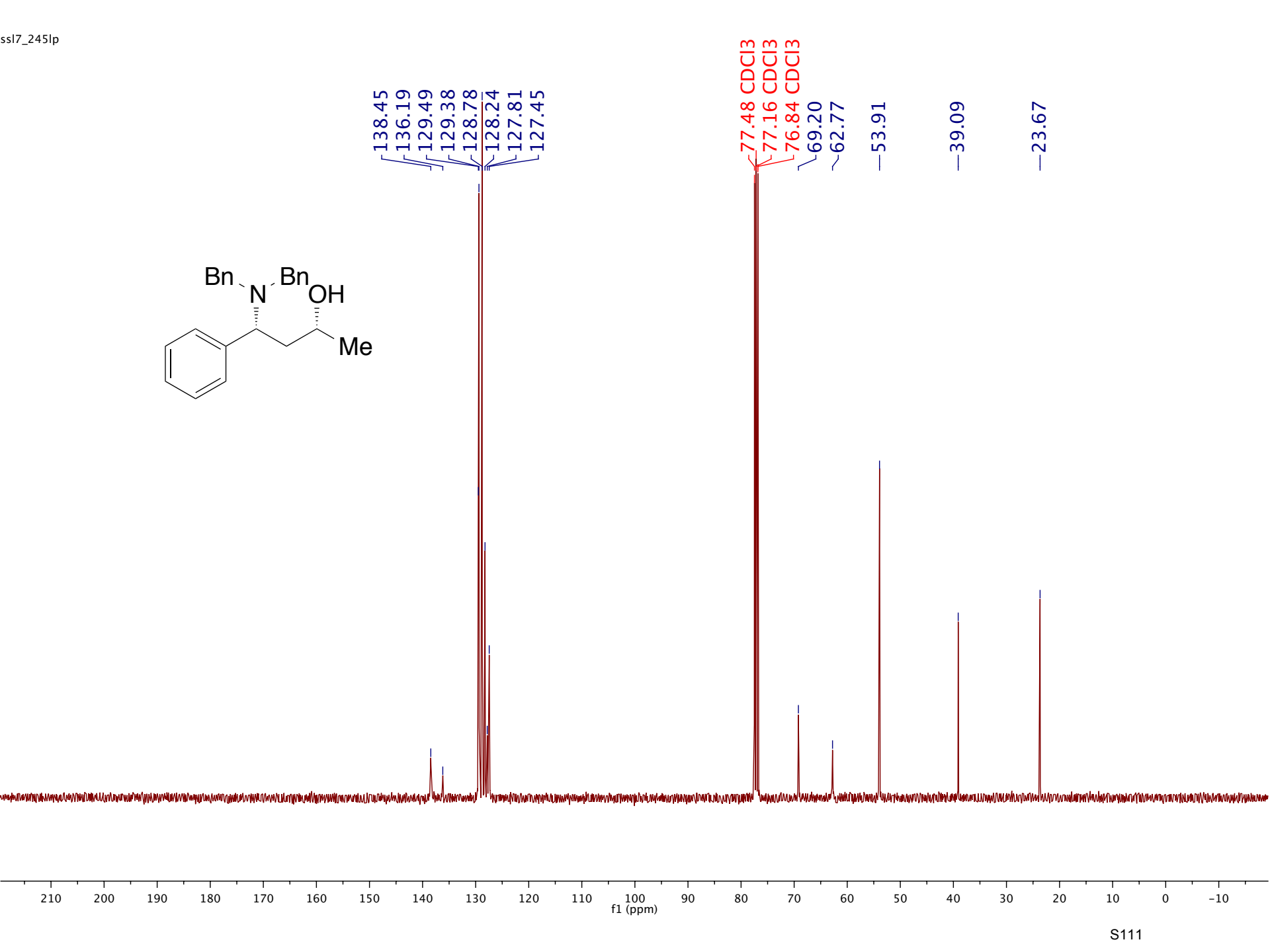


7.45 7.43 7.41 7.39 7.37 7.36 7.34 7.29 7.27 7.26 7.25 6.29
4.10 4.07 4.04 3.88 3.87 3.86 3.85 3.85 3.84 3.84 3.83 3.82 3.81 2.99 2.96
2.43 2.43 2.42 2.40 1.58 1.55 1.21 1.19

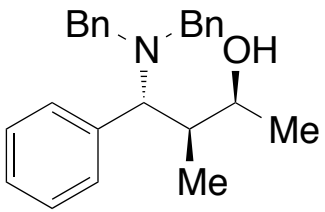
15.26 0.94 3.04 1.06 2.02 1.00 1.05 3.01

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

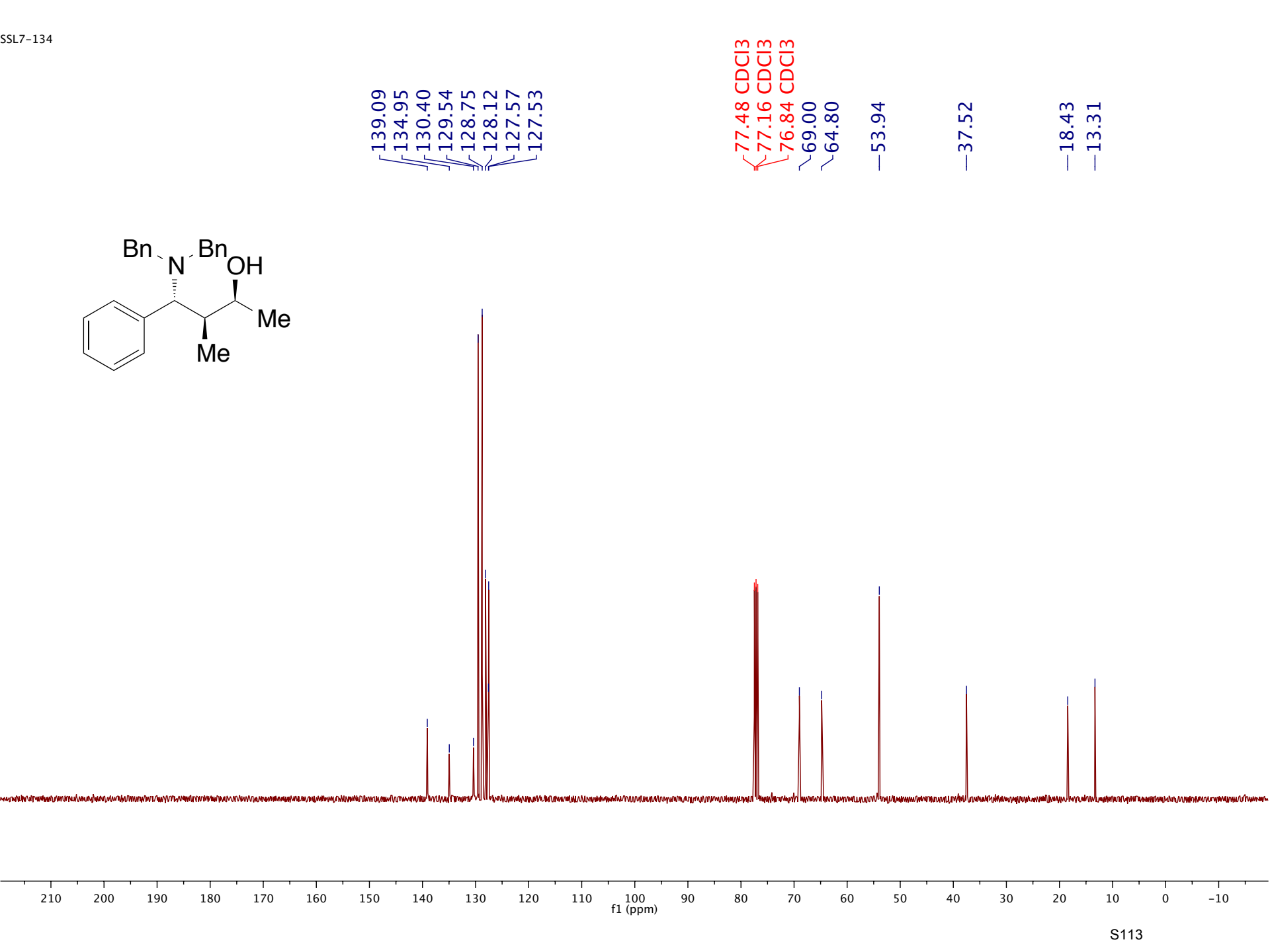
ssl7_245lp


138.45
136.19
129.49
129.38
128.78
128.24
127.81
127.45
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.20
62.77
53.91
39.09
23.67
Bn
N
Bn
OH
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

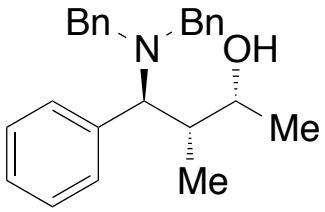
SSL7-134



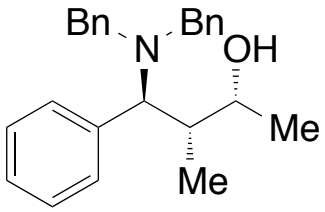
SSL7-134


139.09
134.95
130.40
129.54
128.75
128.12
127.57
127.53
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
69.00
64.80
53.94
37.52
18.43
13.31
Bn
N
Bn
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

ssl7-137



ssl7-137-c



139.04
134.89
130.32
129.47
128.69
128.06
127.51
127.46

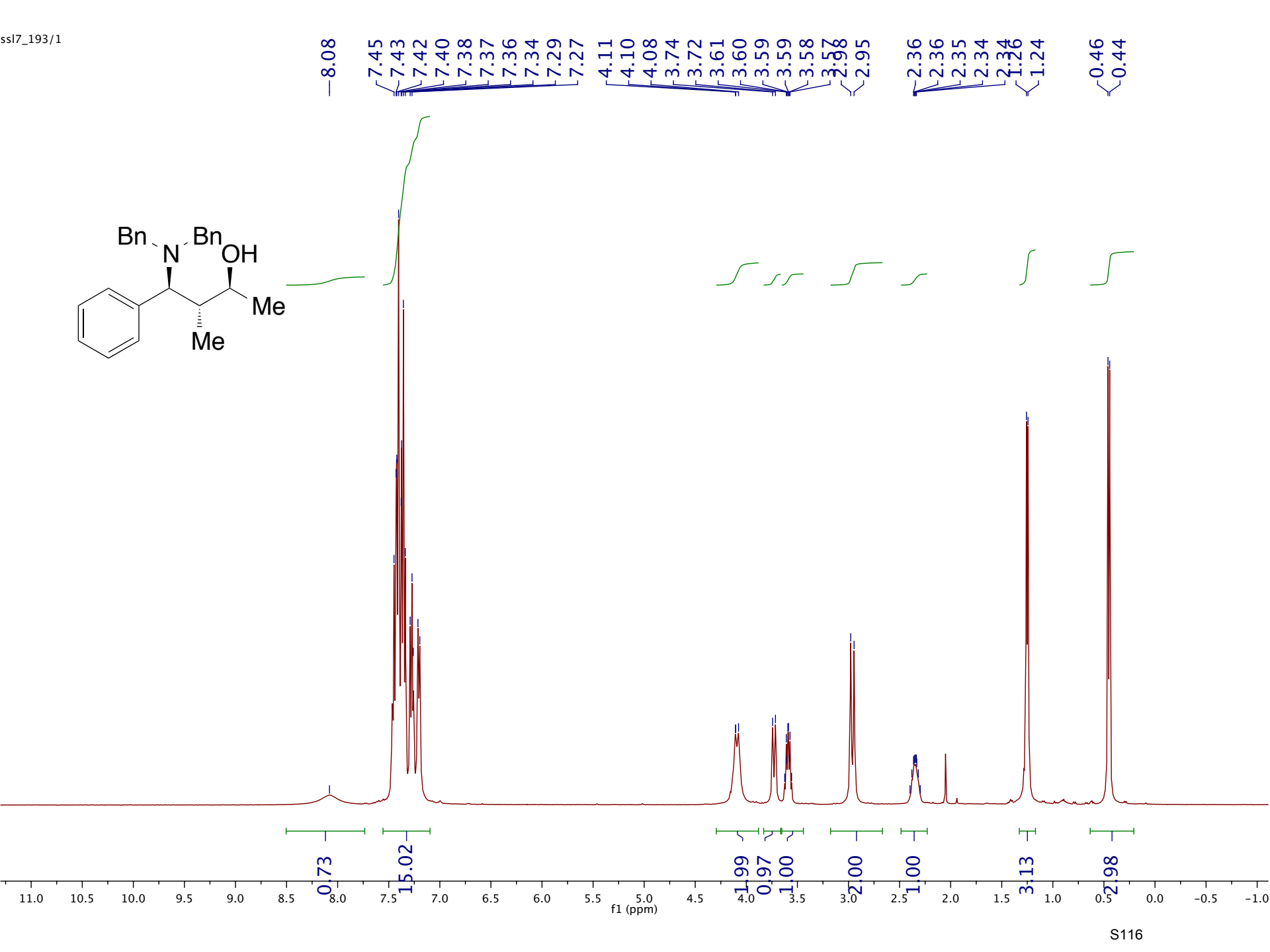
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

68.93
64.72
53.88
37.45
18.40
13.26

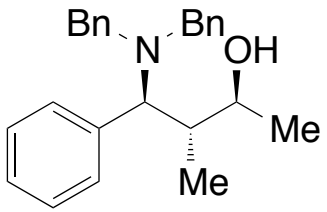
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

ssl7_193/1


8.08
7.45
7.43
7.42
7.40
7.38
7.37
7.36
7.34
7.29
7.27
4.11
4.10
4.08
3.74
3.72
3.61
3.60
3.59
3.59
3.58
3.57
2.98
2.95
2.36
2.36
2.35
2.34
2.34
1.26
1.24
0.46
0.44
Bn
N
Bn
OH
Me
Me
0.73
15.02
1.99
0.97
1.00
2.00
1.00
3.13
2.98
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7_193/2

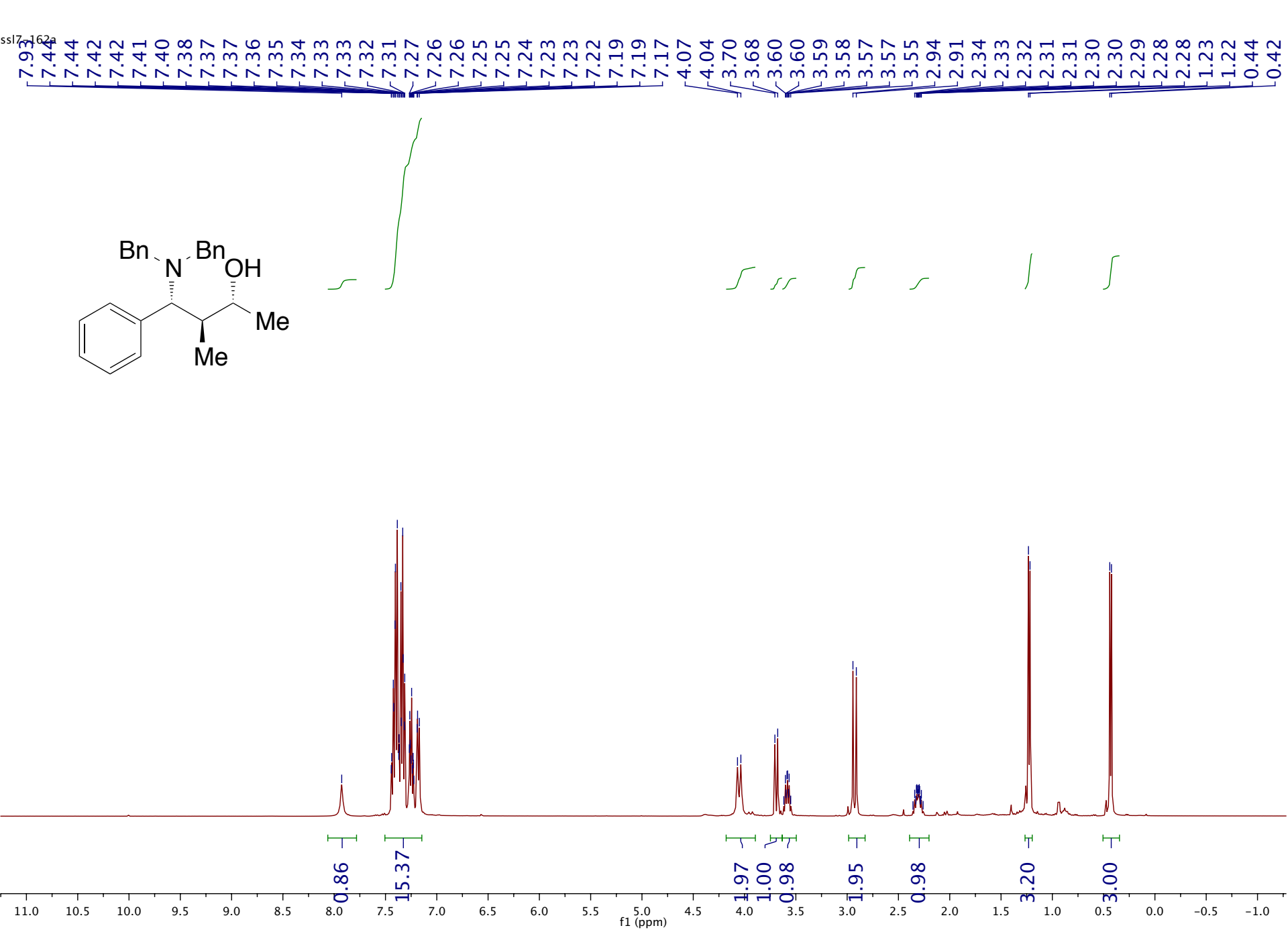


137.82
133.93
130.35
129.45
128.83
128.21
127.76
127.55

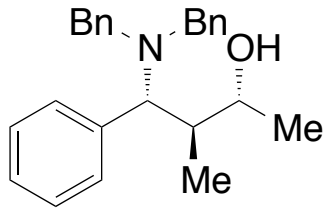
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
74.19
70.14
54.34
38.99
21.98
15.27

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

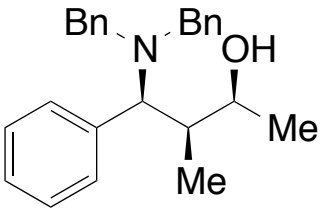

ssl7-162a
7.93
7.44
7.44
7.42
7.42
7.41
7.40
7.38
7.37
7.37
7.36
7.35
7.34
7.33
7.33
7.32
7.31
7.27
7.26
7.26
7.25
7.25
7.24
7.23
7.23
7.22
7.19
7.19
7.17
4.07
4.04
3.70
3.68
3.60
3.60
3.59
3.58
3.57
3.57
3.55
2.94
2.91
2.34
2.33
2.32
2.31
2.31
2.30
2.30
2.29
2.28
2.28
1.23
1.22
0.44
0.42
Bn
N
Bn
OH
Me
Me
0.86
15.37
1.97
1.00
0.98
1.95
0.98
3.20
3.00
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

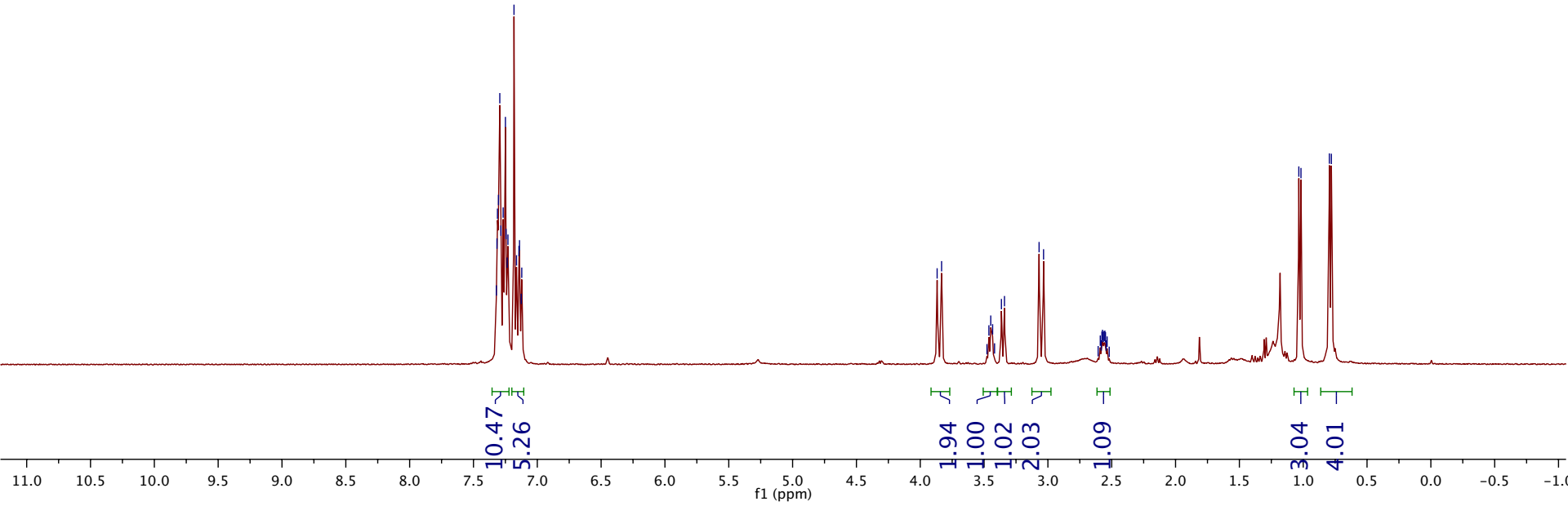
ssl7-162a


Bn
N
Bn
OH
Me
Me

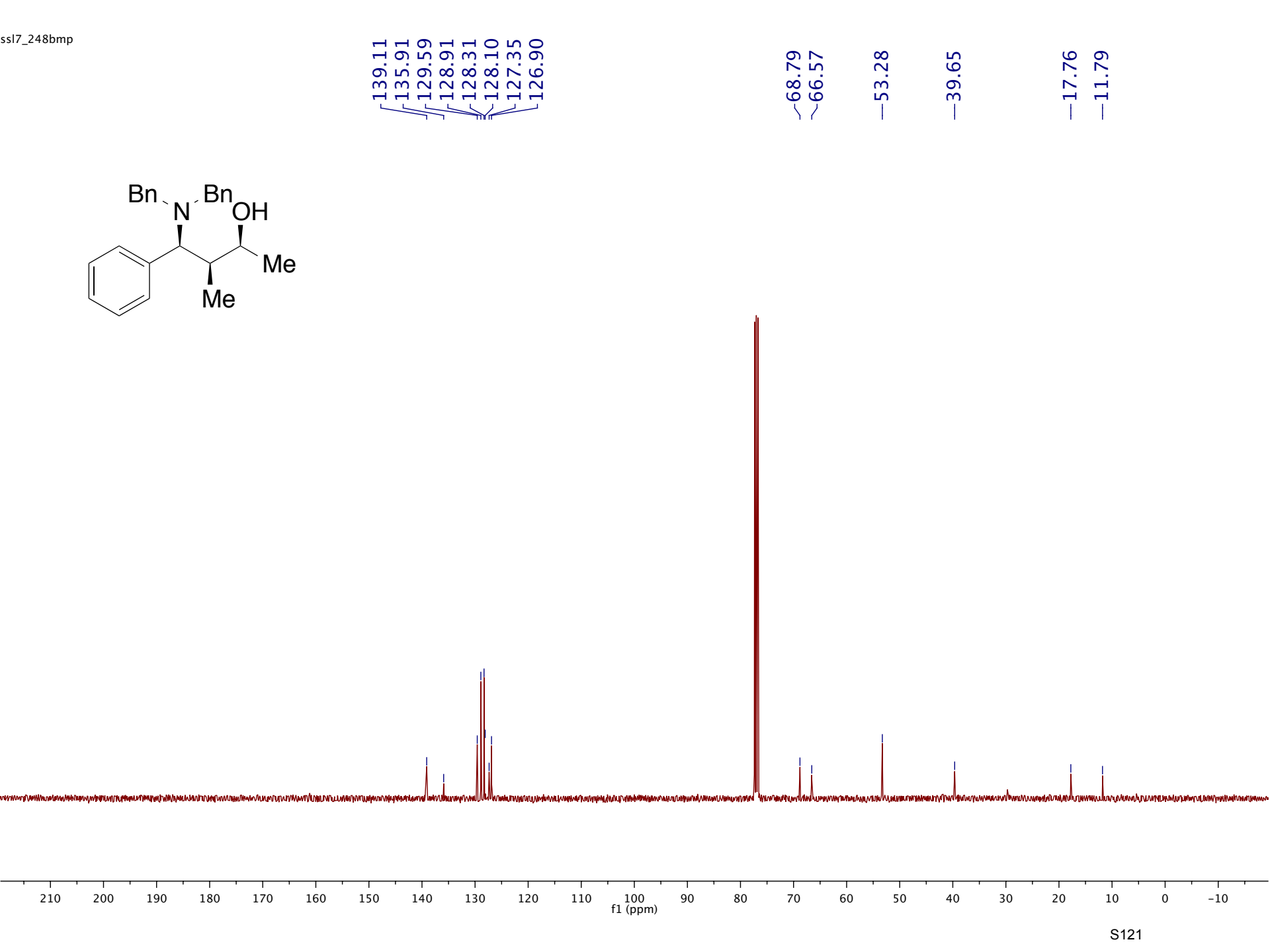
138.11
134.12
130.29
129.41
128.75
128.13
127.62
127.43
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
74.14
69.99
54.32
39.03
21.91
15.22
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

ssl7_248bmp

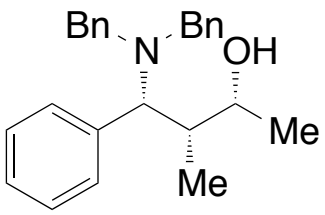

Bn
N
Bn
OH
Me
Me


7.32
7.32
7.31
7.30
7.29
7.29
7.27
7.25
7.24
7.24
7.23
7.18
7.16
7.14
7.14
7.13
7.12
3.87
3.83
3.46
3.45
3.43
3.36
3.34
3.07
3.03
2.59
2.58
2.58
2.57
2.57
2.56
2.55
2.55
2.54
2.54
1.03
1.02
0.80
0.78
10.47
5.26
1.94
1.00
1.02
2.03
1.09
3.04
4.01
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7_248bmp

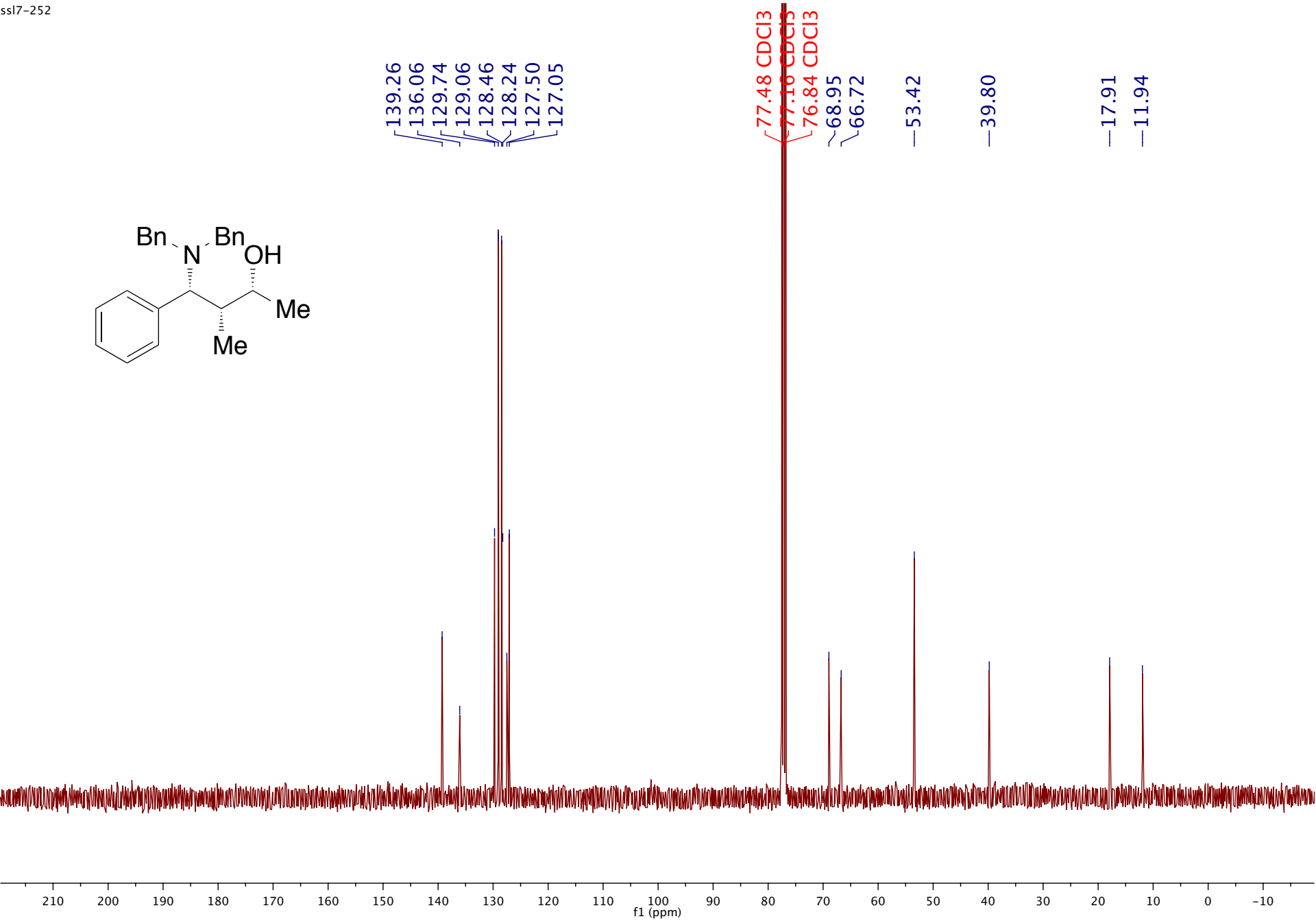

139.11
135.91
129.59
128.91
128.31
128.10
127.35
126.90
68.79
66.57
53.28
39.65
17.76
11.79
Bn
N
Bn
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

ssl7-252

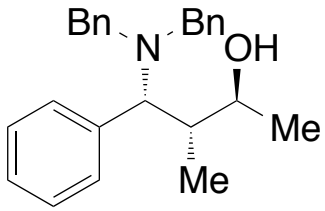


f1 (ppm)

ssl7-252

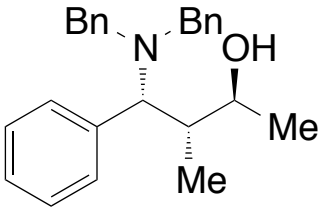

139.26
136.06
129.74
129.06
128.46
128.24
127.50
127.05
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
68.95
66.72
53.42
39.80
17.91
11.94
Bn
N
Bn
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

ssl7_244



f1 (ppm)

ssl7_244



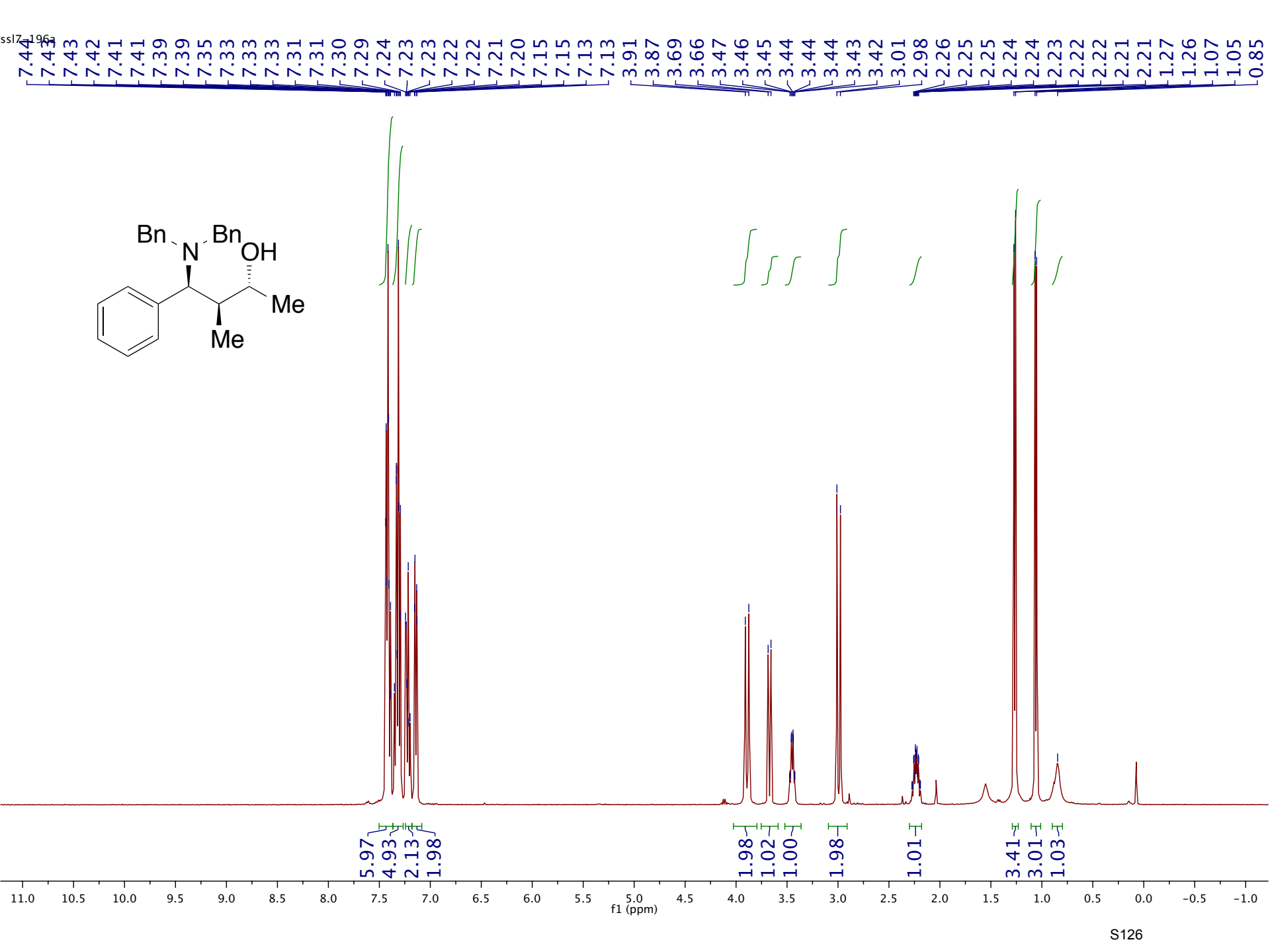
140.13
136.22
129.78
128.83
128.43
128.21
127.30
126.91

77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

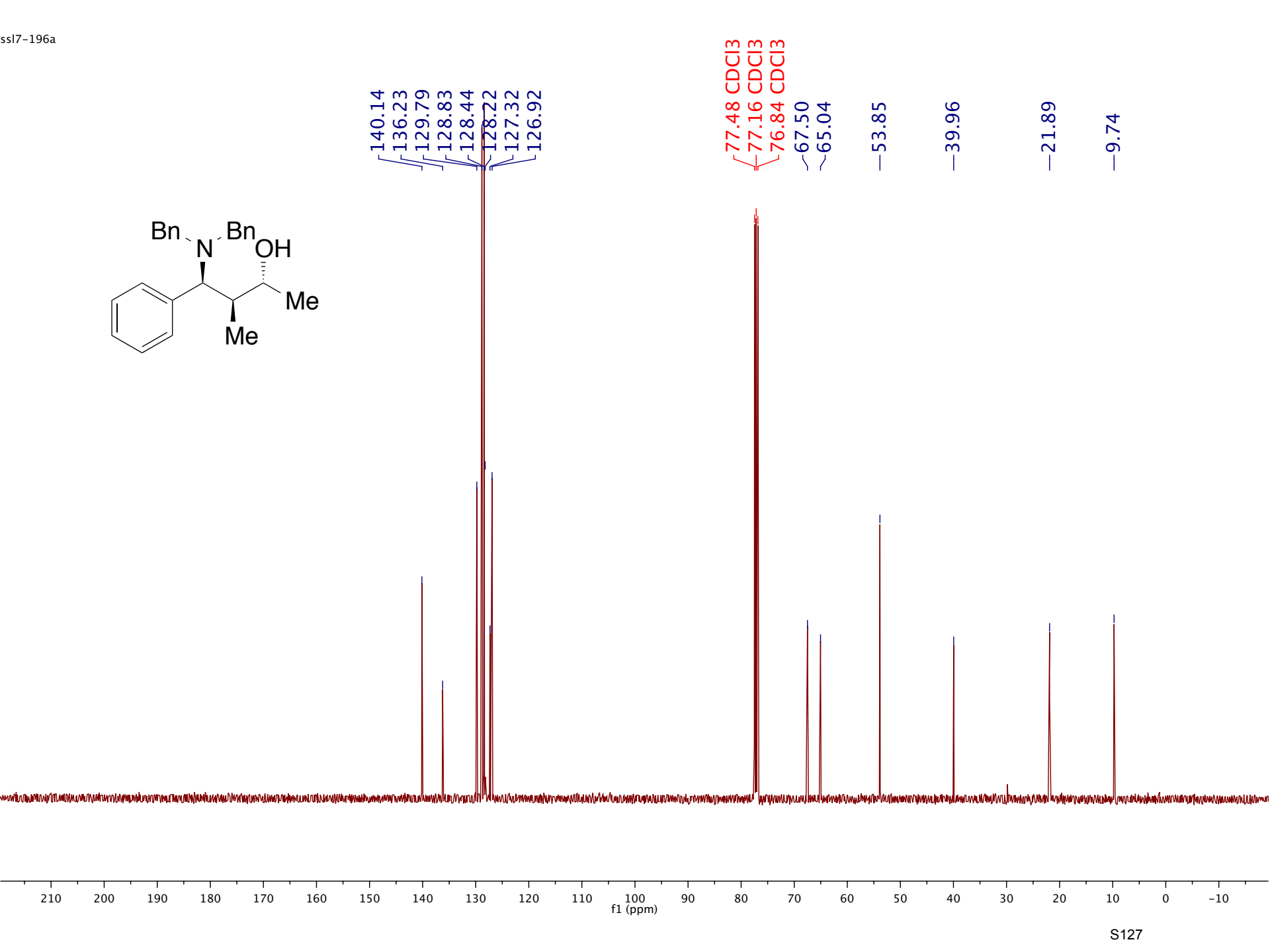
67.48
65.03
53.84
39.95
21.88
9.73

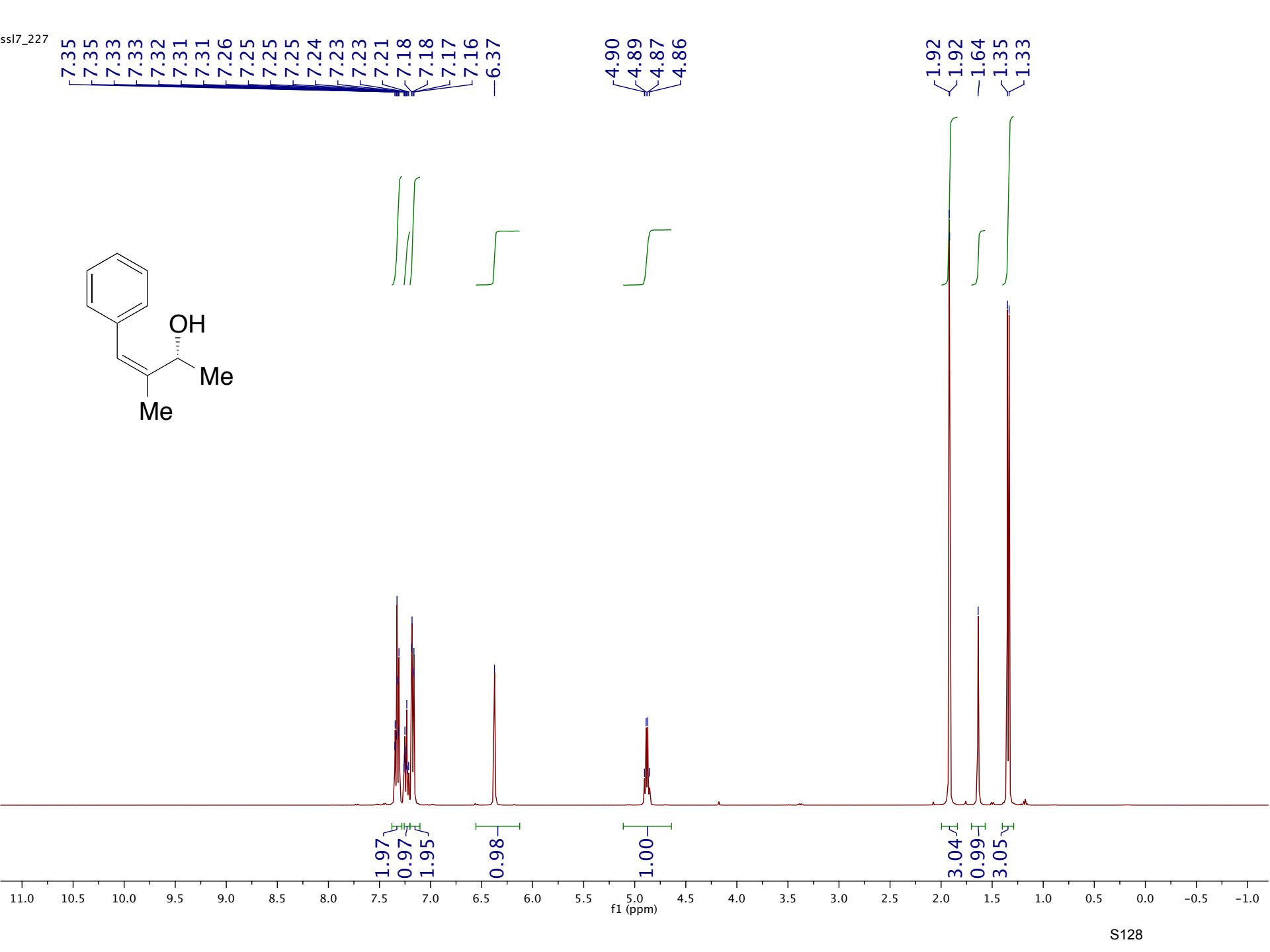
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

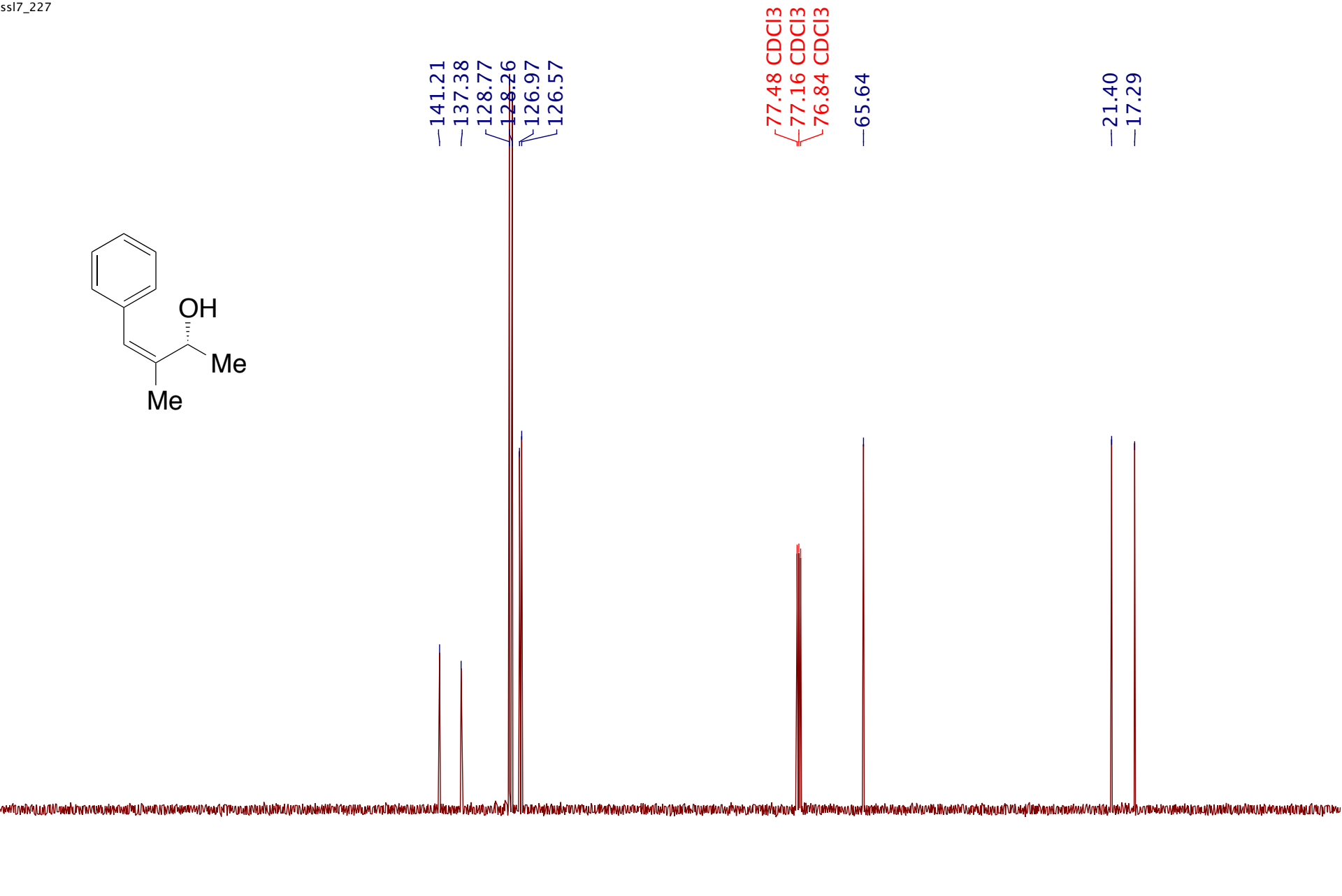

ssl7_196a
7.44 7.43 7.43 7.42 7.41 7.41 7.39 7.39 7.35 7.33 7.33 7.33 7.31 7.31 7.30 7.29 7.24 7.23 7.23 7.22 7.22 7.21 7.20 7.15 7.15 7.13 7.13
3.91 3.87 3.69 3.66 3.47 3.46 3.45 3.44 3.44 3.44 3.43 3.42 3.01 2.98 2.26 2.25 2.25 2.24 2.24 2.23 2.22 2.22 2.21 2.21 1.27 1.26 1.07 1.05 0.85
Bn
N
Bn
OH
Me
Me
5.97
4.93
2.13
1.98
1.98
1.02
1.00
1.98
1.01
3.41
3.01
1.03
11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)

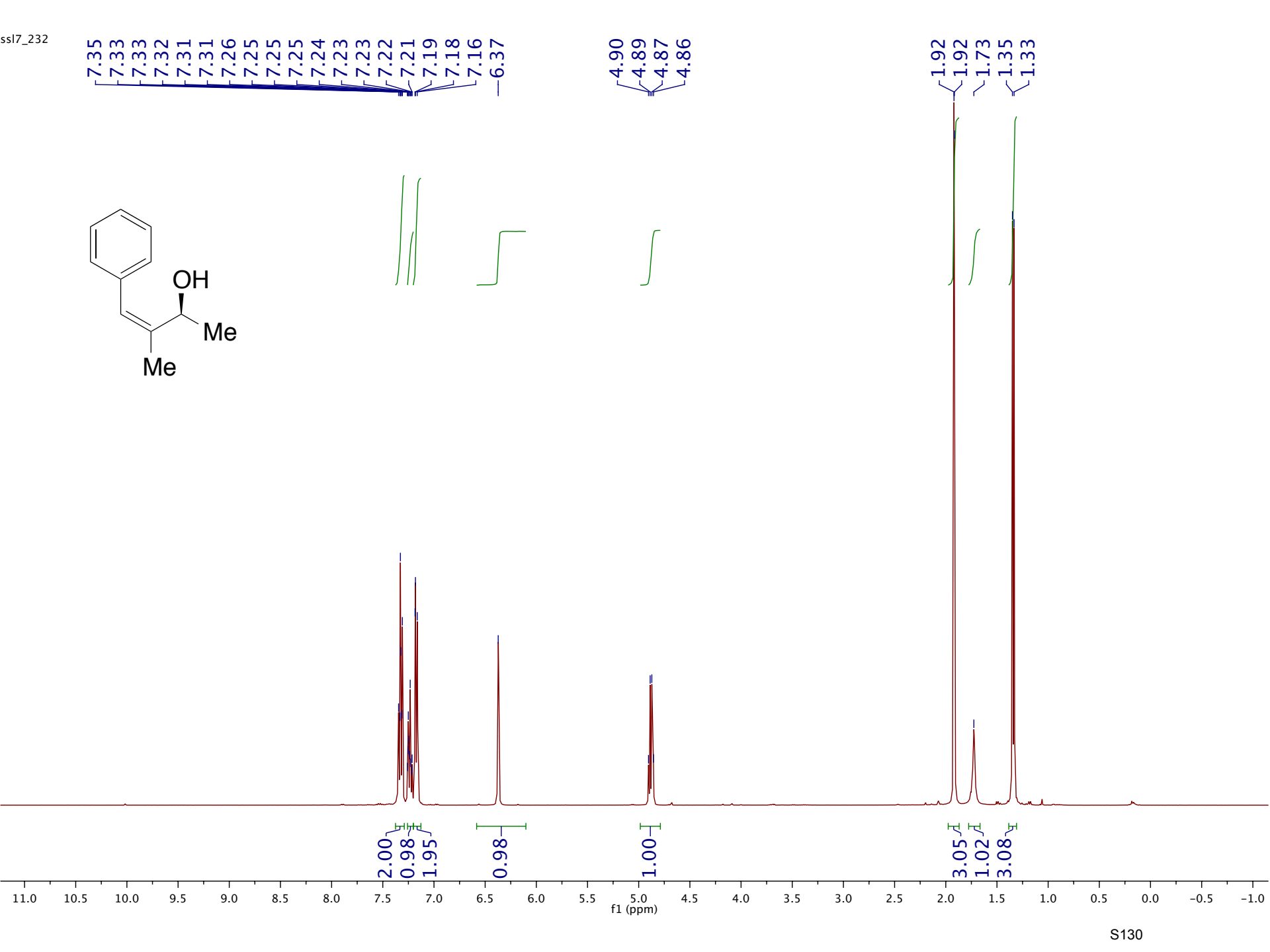
ssl7-196a


140.14
136.23
129.79
128.83
128.44
128.22
127.32
126.92
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
67.50
65.04
53.85
39.96
21.89
9.74
Bn
N
Bn
OH
Me
Me
f1 (ppm)

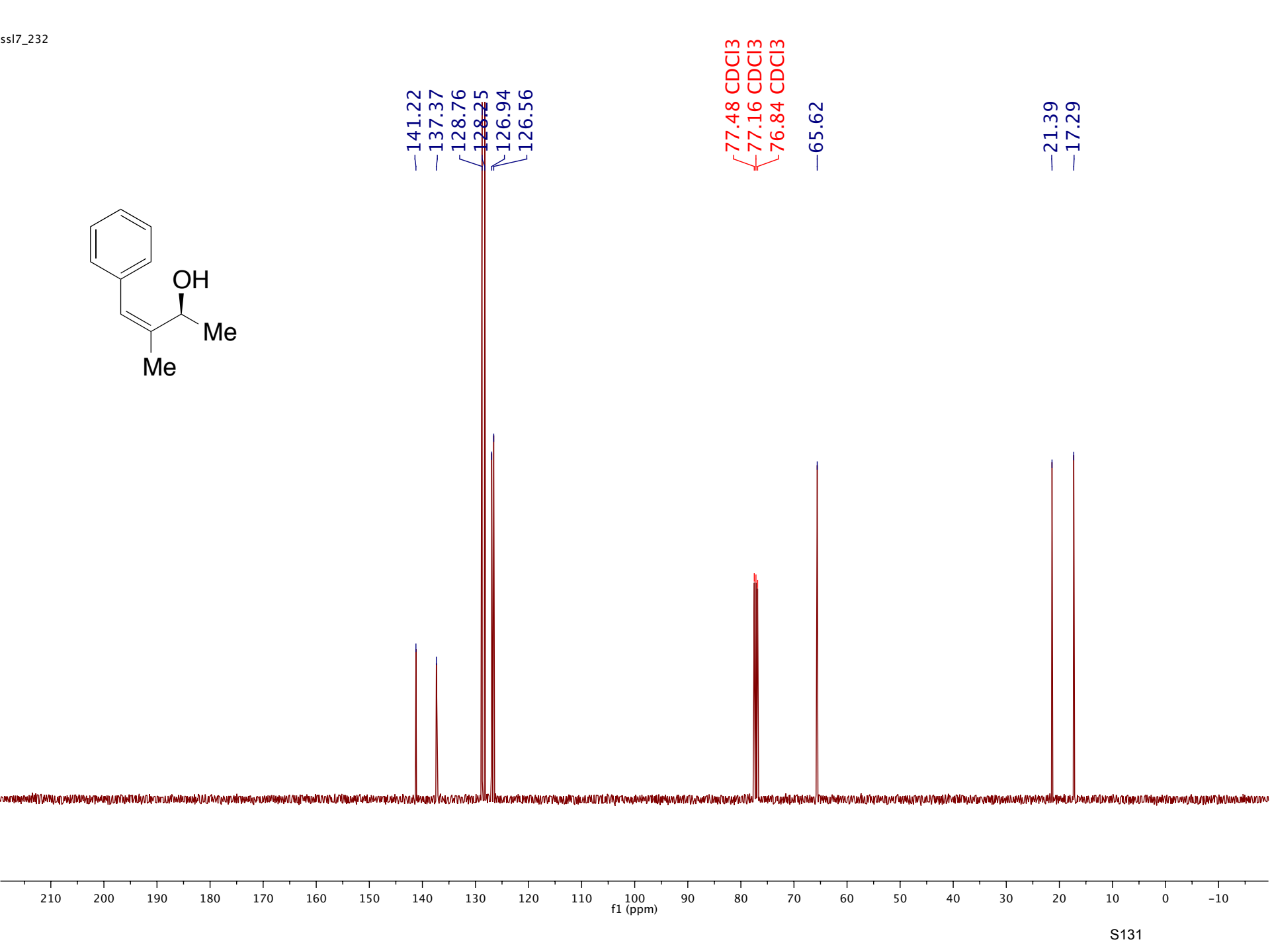

ssl7_227
7.35
7.35
7.33
7.33
7.32
7.31
7.31
7.26
7.25
7.25
7.25
7.24
7.23
7.23
7.21
7.18
7.18
7.17
7.16
6.37
4.90
4.89
4.87
4.86
1.92
1.92
1.64
1.35
1.33
OH
Me
Me
1.97
0.97
1.95
0.98
1.00
3.04
0.99
3.05
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7_227

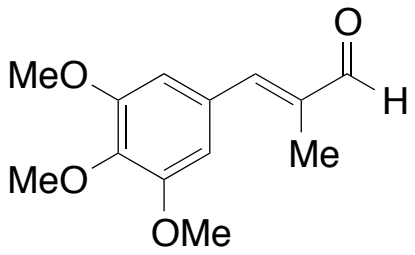

141.21
137.38
128.77
128.26
126.97
126.57
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
65.64
21.40
17.29
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


ssl7_232
7.35
7.33
7.33
7.32
7.31
7.31
7.26
7.25
7.25
7.25
7.24
7.23
7.23
7.22
7.21
7.19
7.18
7.16
6.37
4.90
4.89
4.87
4.86
1.92
1.92
1.73
1.35
1.33
OH
Me
Me
2.00
0.98
1.95
0.98
1.00
3.05
1.02
3.08
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

ssl7_232


141.22
137.37
128.76
128.25
126.94
126.56
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
65.62
21.39
17.29
OH
Me
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

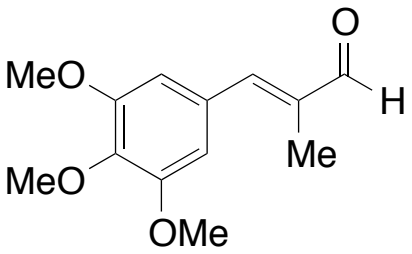
SSL7_76SM

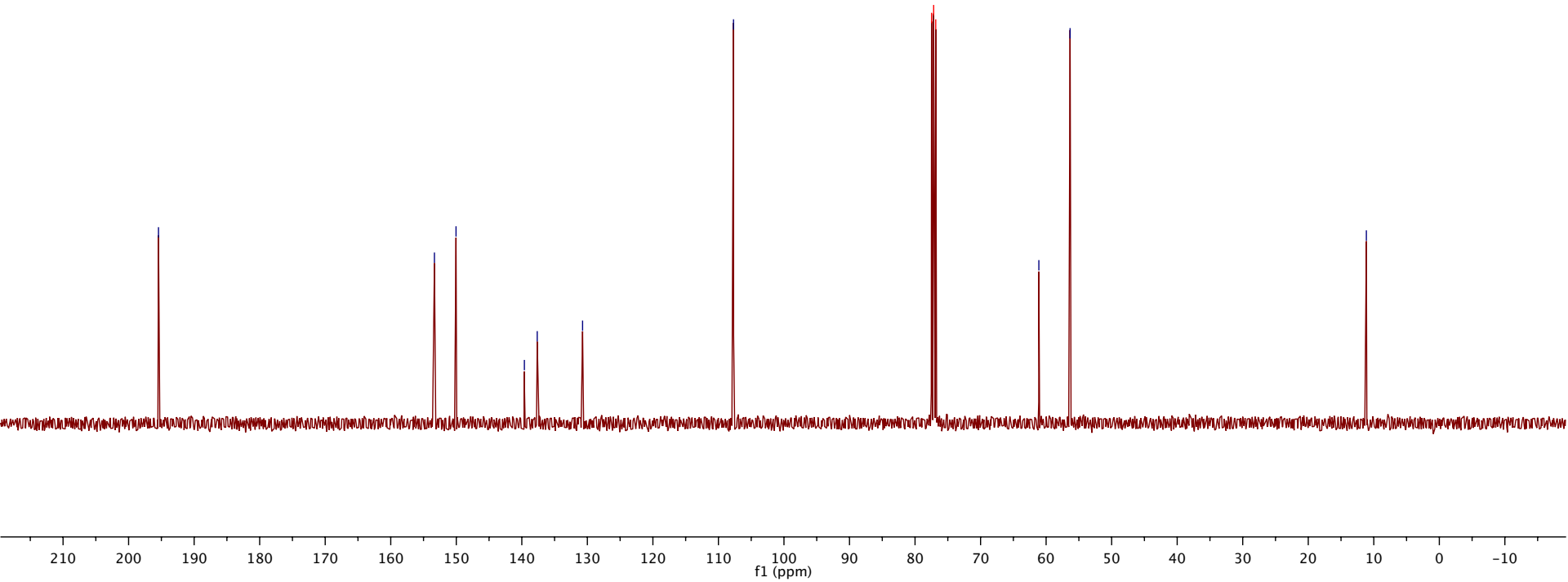

O
MeO
H
Me
MeO
OMe

9.55
7.26
6.77
3.90
3.89
2.10
2.10
0.98
1.00
1.98
9.06
2.98
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

SSL7_76SM

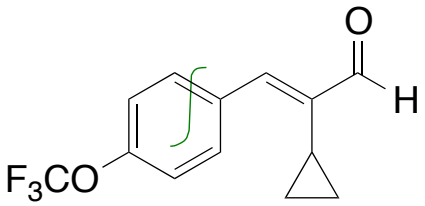
195.44
153.33
150.04
139.61
137.65
130.73
107.70
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
61.11
56.34
11.13



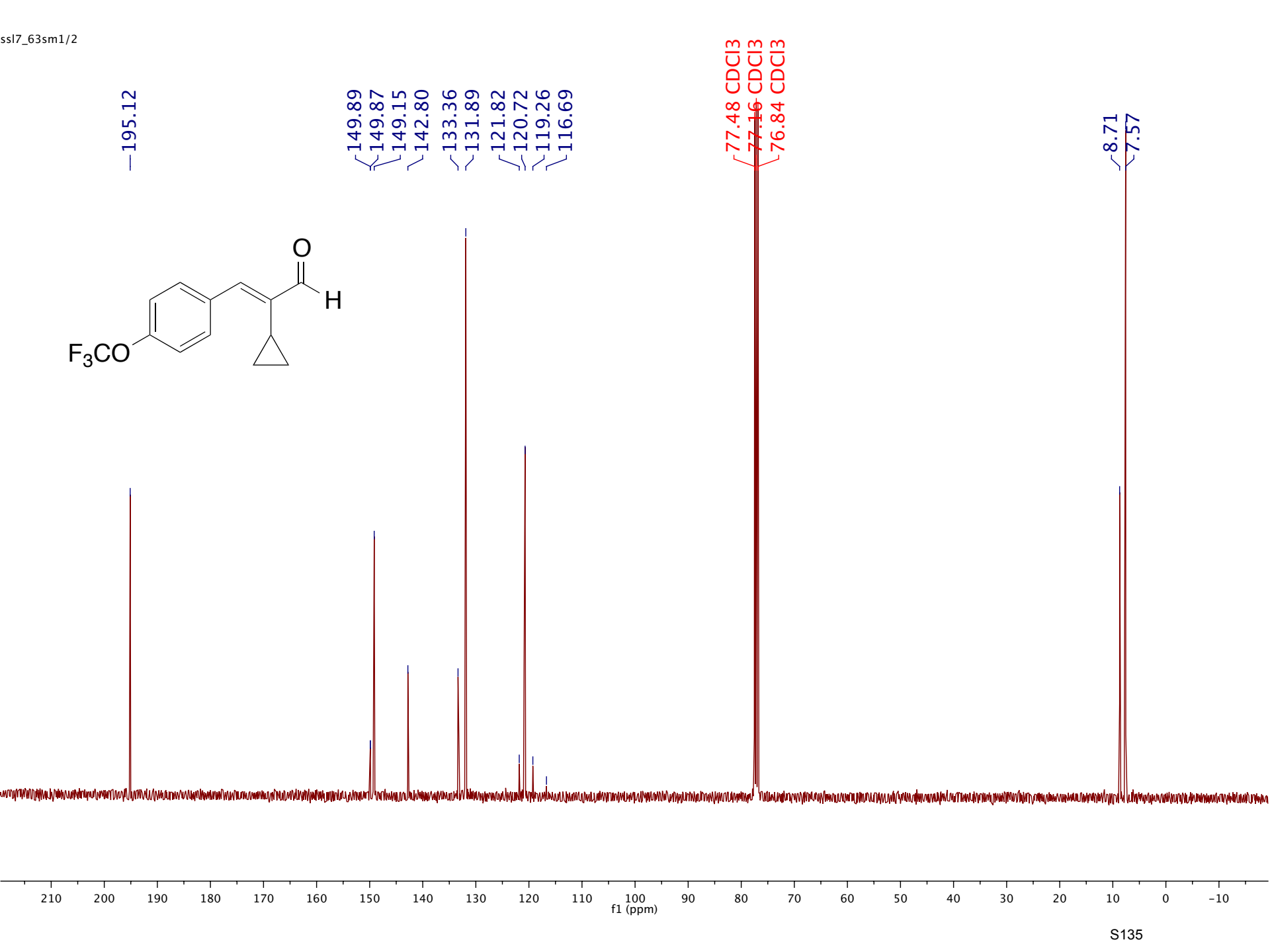


210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

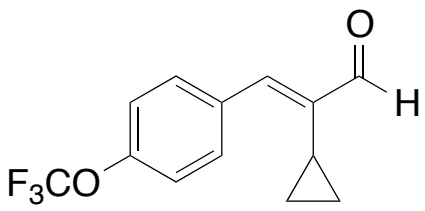
ssl7_63sm1/1



ssl7_63sm1/2


195.12
149.89
149.87
149.15
142.80
133.36
131.89
121.82
120.72
119.26
116.69
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
8.71
7.57
O
H
F3CO
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

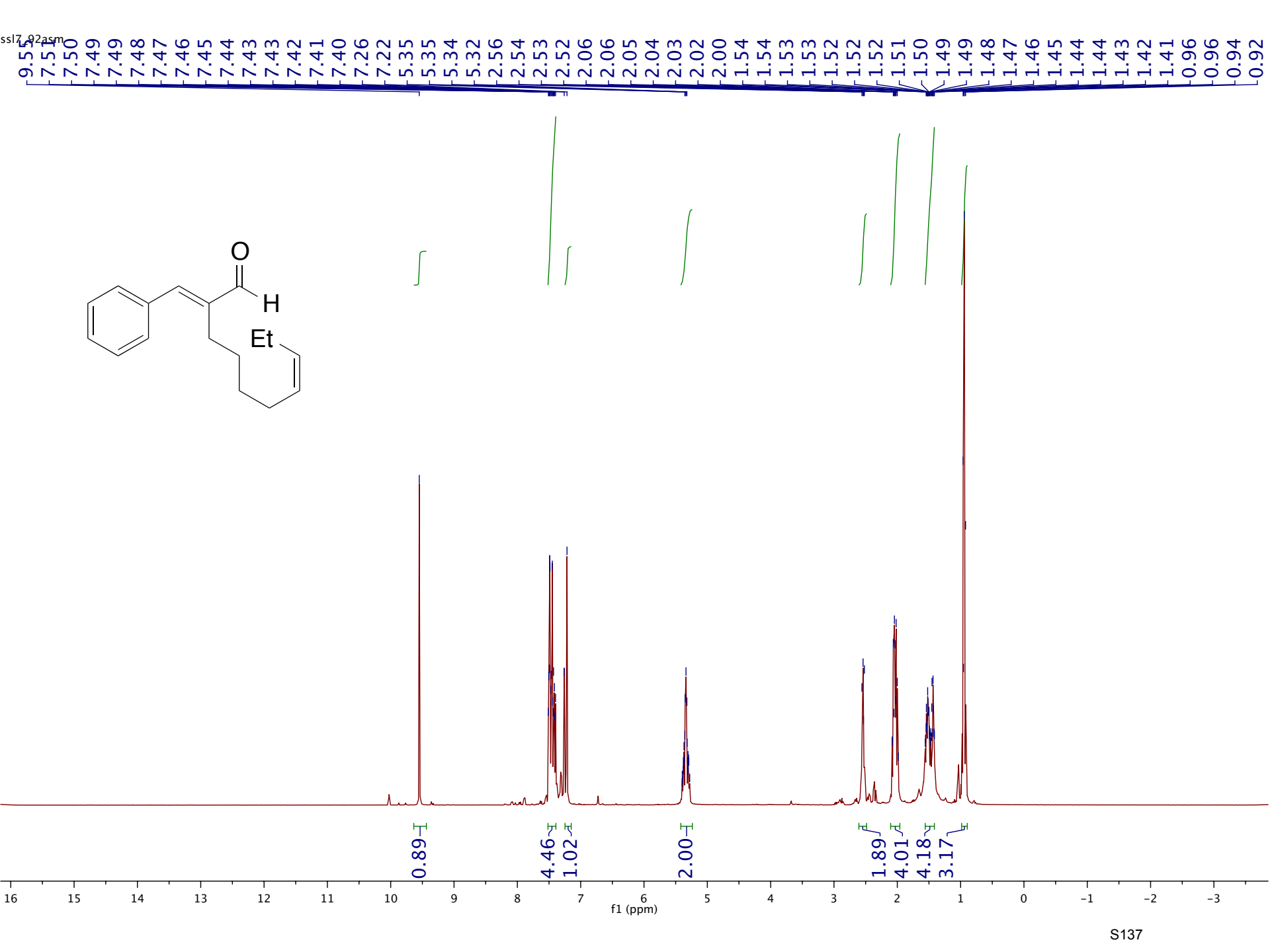
ssl7_63sm1/3



-57.70

10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210

f1 (ppm)


ssl7_92asm
9.51 7.51 7.50 7.49 7.49 7.48 7.47 7.46 7.45 7.44 7.43 7.43 7.42 7.41 7.40 7.26 7.22 5.35 5.35 5.34 5.32 2.56 2.54 2.53 2.52 2.06 2.06 2.05 2.04 2.03 2.02 2.00 1.54 1.54 1.53 1.53 1.52 1.52 1.52 1.51 1.50 1.49 1.49 1.48 1.47 1.46 1.45 1.44 1.44 1.43 1.42 1.41 0.96 0.96 0.94 0.92
O
H
Et
0.89
4.46
1.02
2.00
1.89
4.01
4.18
3.17
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 −1 −2 −3
f1 (ppm)

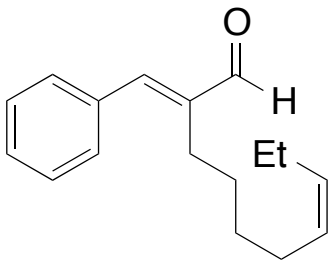
ssl7_92asm

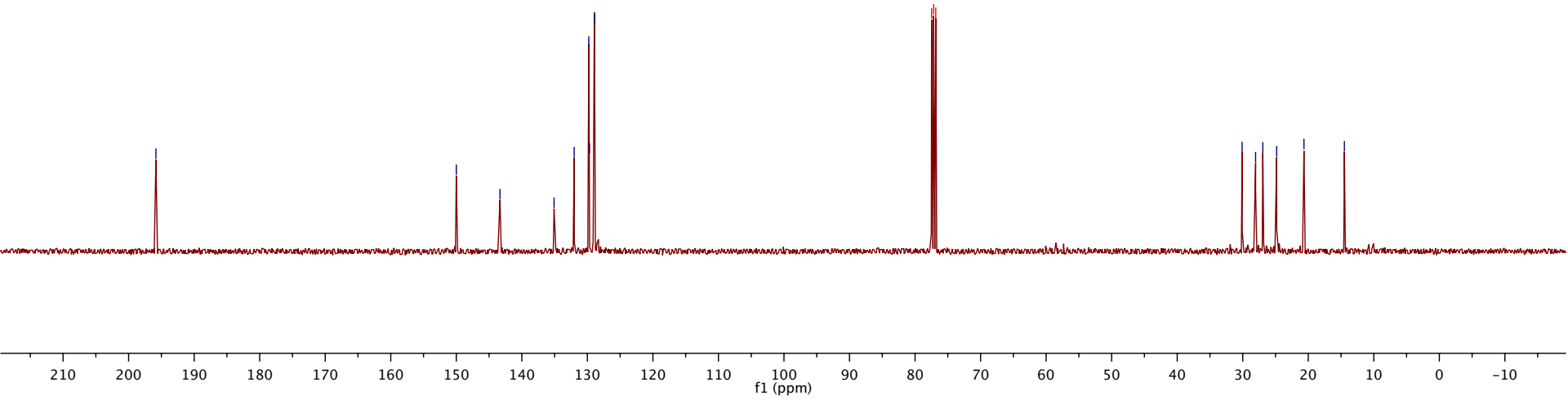
195.83

150.00
143.34
135.08
132.01
129.78
129.68
128.93

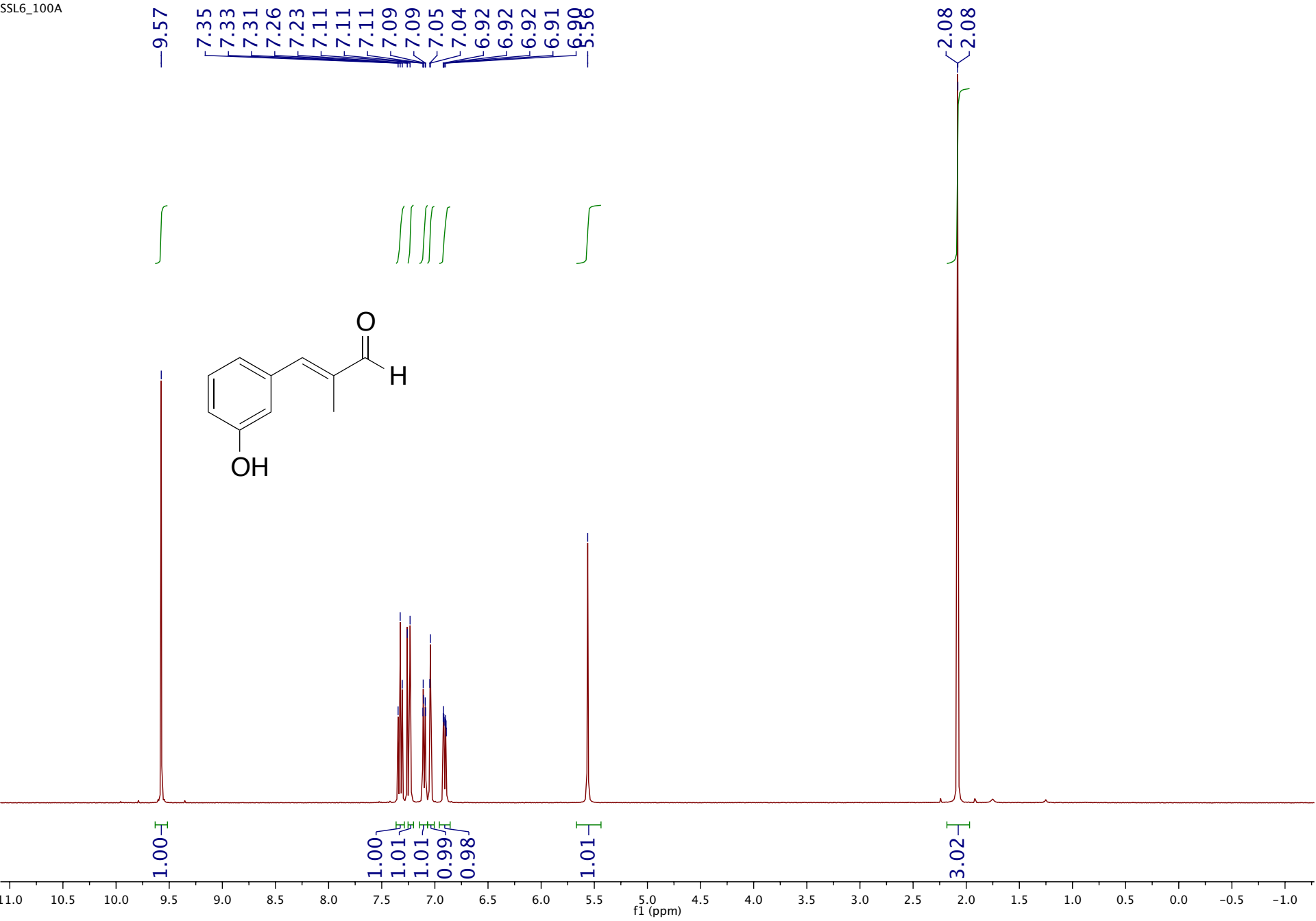
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

30.09
28.04
26.93
24.82
20.66
14.49

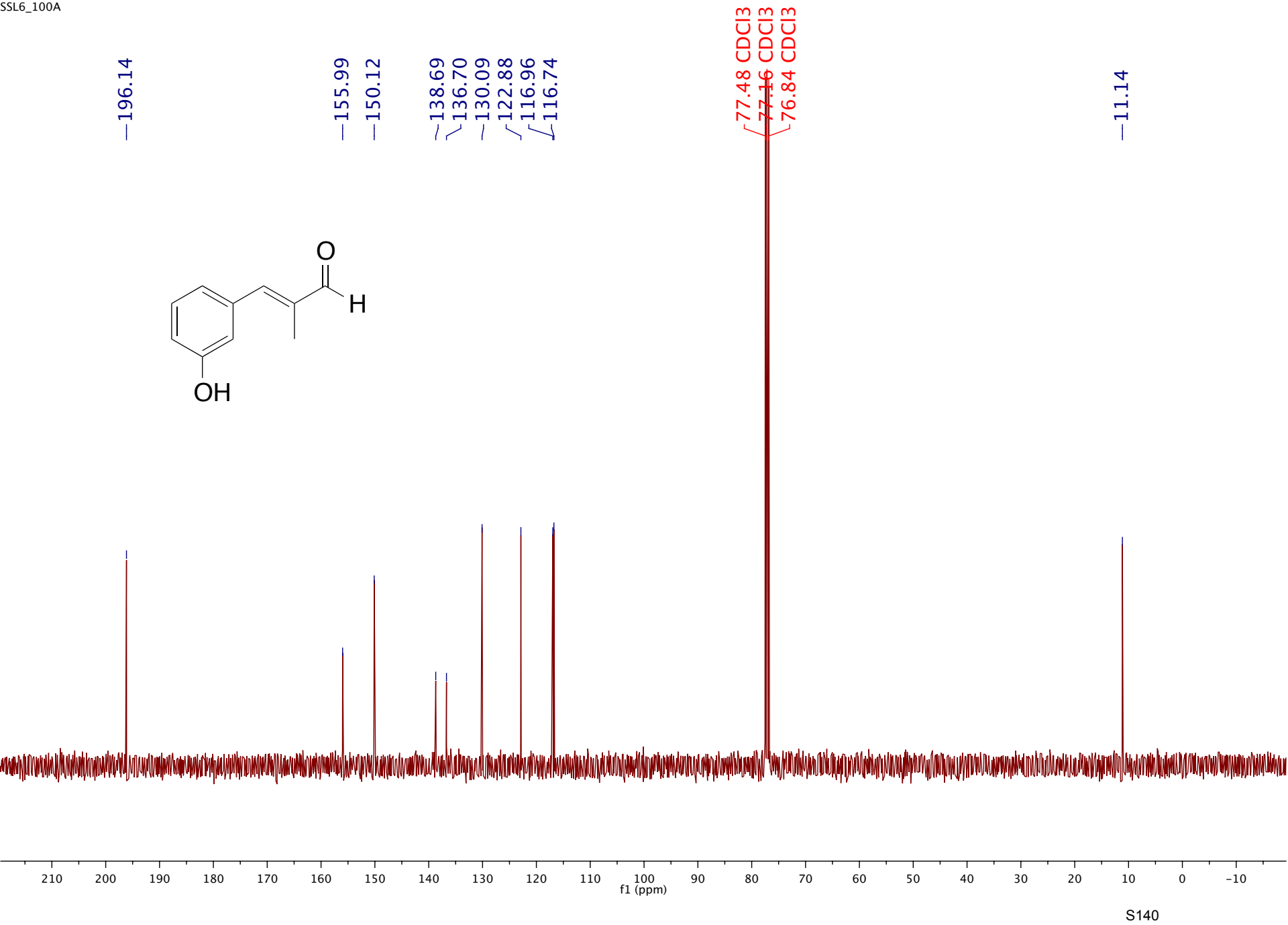


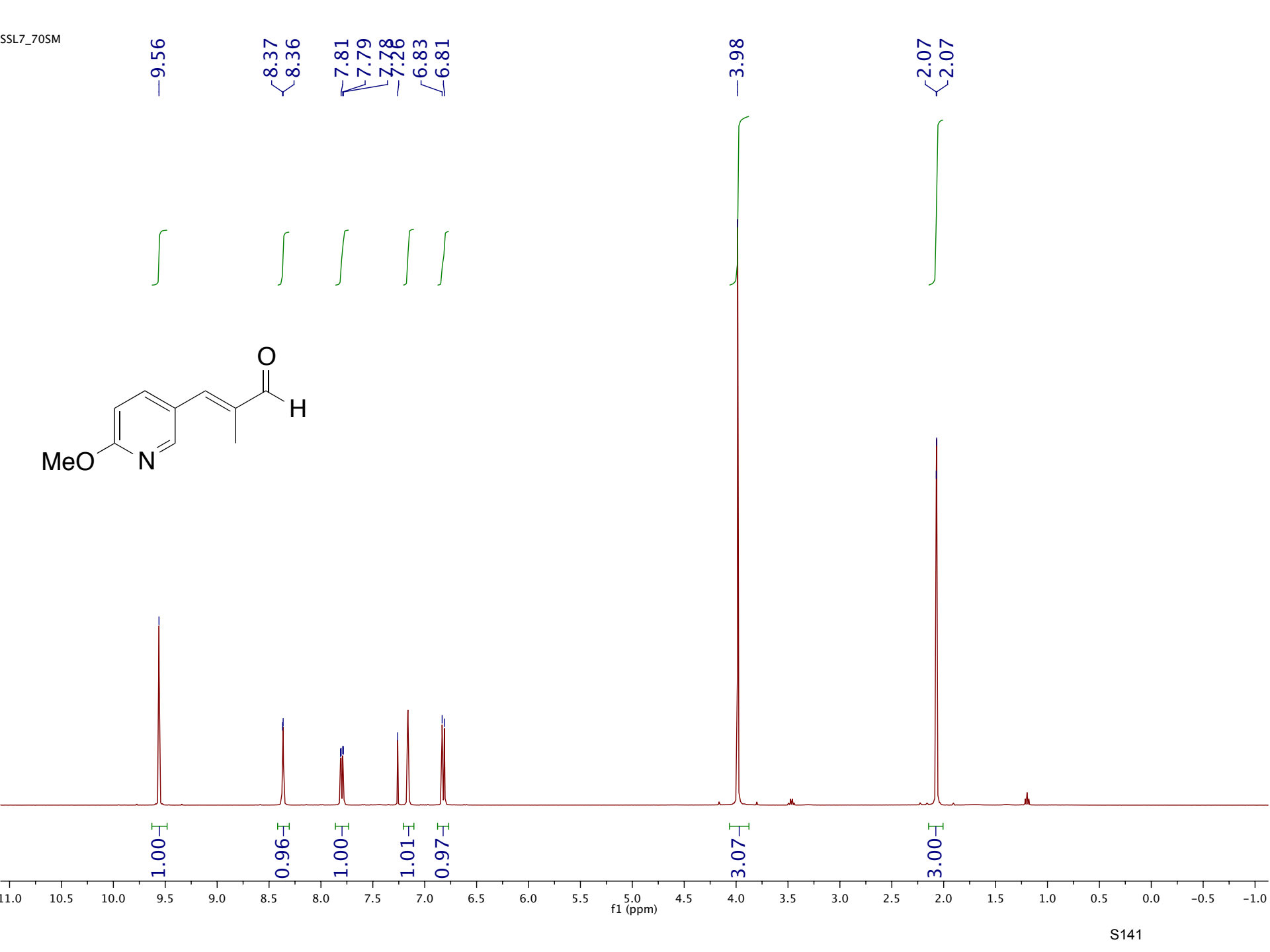


SSL6_100A


9.57
7.35
7.33
7.31
7.26
7.23
7.11
7.11
7.11
7.09
7.09
7.05
7.04
6.92
6.92
6.92
6.91
6.90
5.56
2.08
2.08
O
H
OH
1.00
1.00
1.01
1.01
0.99
0.98
1.01
3.02
f1 (ppm)

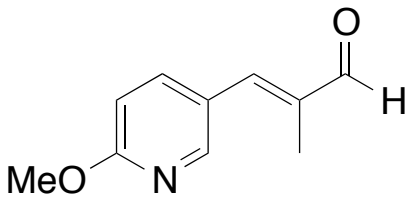
SSL6_100A


196.14
155.99
150.12
138.69
136.70
130.09
122.88
116.96
116.74
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
11.14
O
H
OH
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


SSL7_70SM
9.56
8.37
8.36
7.81
7.79
7.78
7.26
6.83
6.81
3.98
2.07
2.07
O
H
MeO
N
1.00
0.96
1.00
1.01
0.97
3.07
3.00
f1 (ppm)

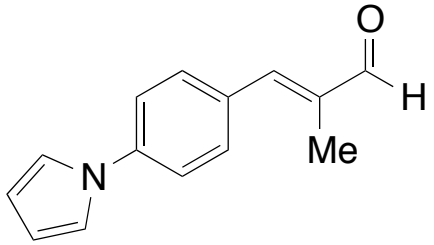
SSL7_70SM

195.02
164.65
149.58
146.26
139.46
137.71
124.77
111.31
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
53.95
11.10

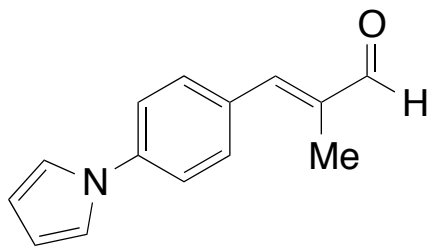


210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

SSL7_91SM

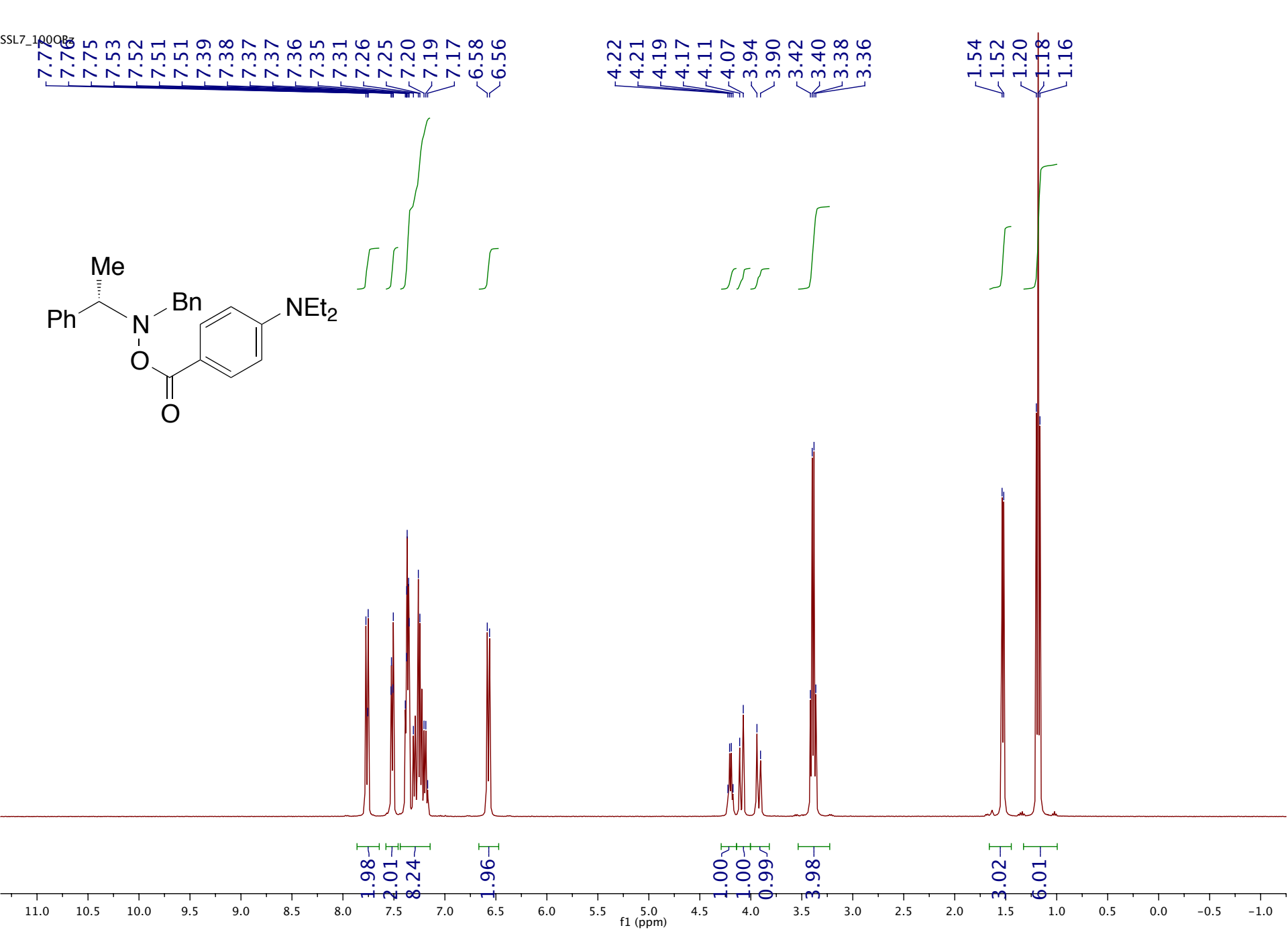


SSL7_91SM

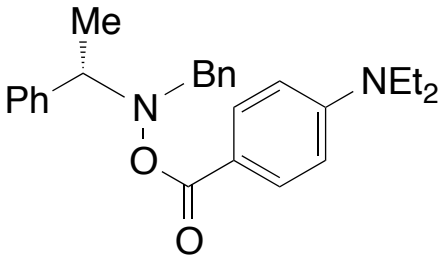


195.42
148.78
141.34
138.11
132.40
131.71
120.11
119.13
111.39
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
11.16

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


SSL7_100QBz
7.77
7.76
7.75
7.53
7.52
7.51
7.51
7.39
7.38
7.37
7.37
7.36
7.35
7.31
7.26
7.25
7.20
7.19
7.17
6.58
6.56
4.22
4.21
4.19
4.17
4.11
4.07
3.94
3.90
3.42
3.40
3.38
3.36
1.54
1.52
1.20
1.18
1.16
Me
Ph
N
Bn
NEt2
O
O
1.98
2.01
8.24
1.96
1.00
1.00
0.99
3.98
3.02
6.01
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

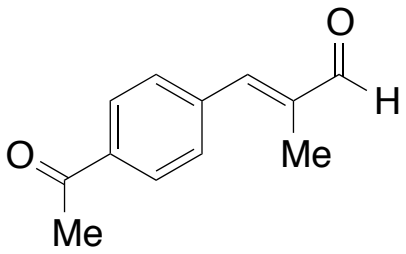
ssl7_100OBz/2



165.65
150.94
131.45
129.42
128.47
128.29
128.12
127.59
115.02
110.19
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
65.87
59.78
44.50
19.93
12.56

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

ssl7_61sm/1



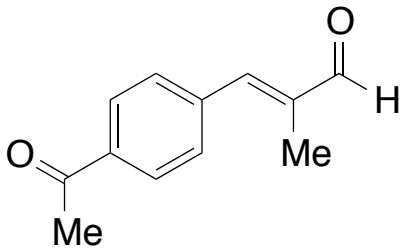
9.59
8.01
7.99
7.59
7.57
7.28
7.28
7.28
2.60
2.05
2.05

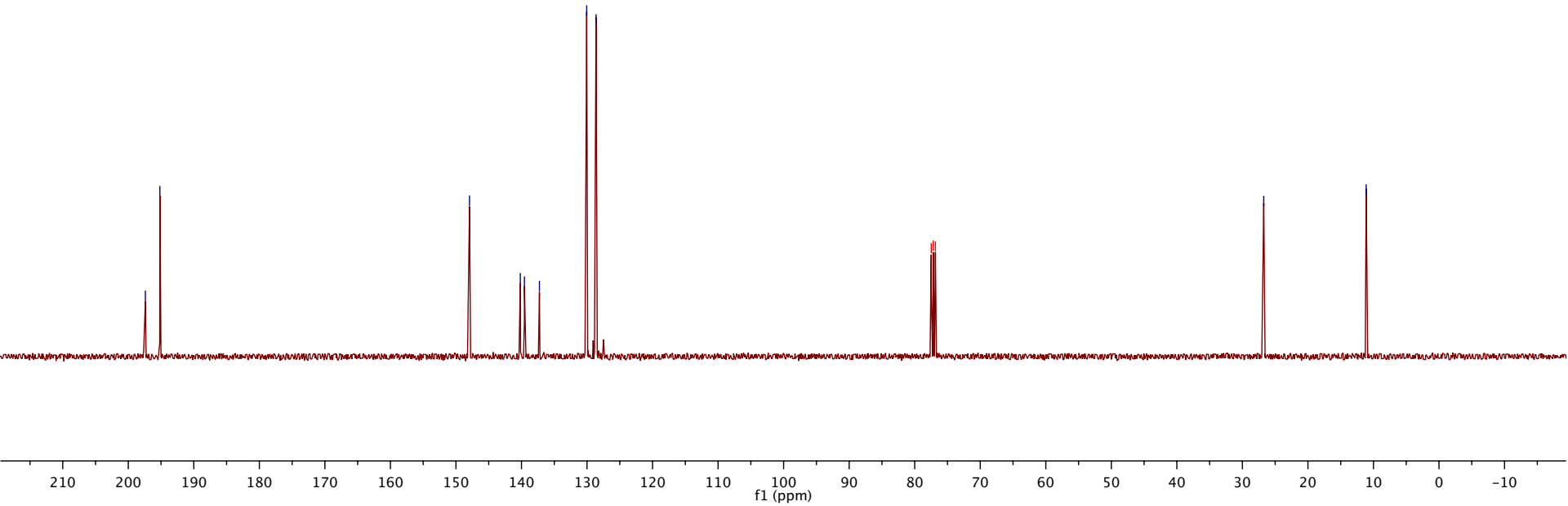
1.00
2.00
2.00
1.00
3.07
3.03

16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 −1 −2 −3
f1 (ppm)

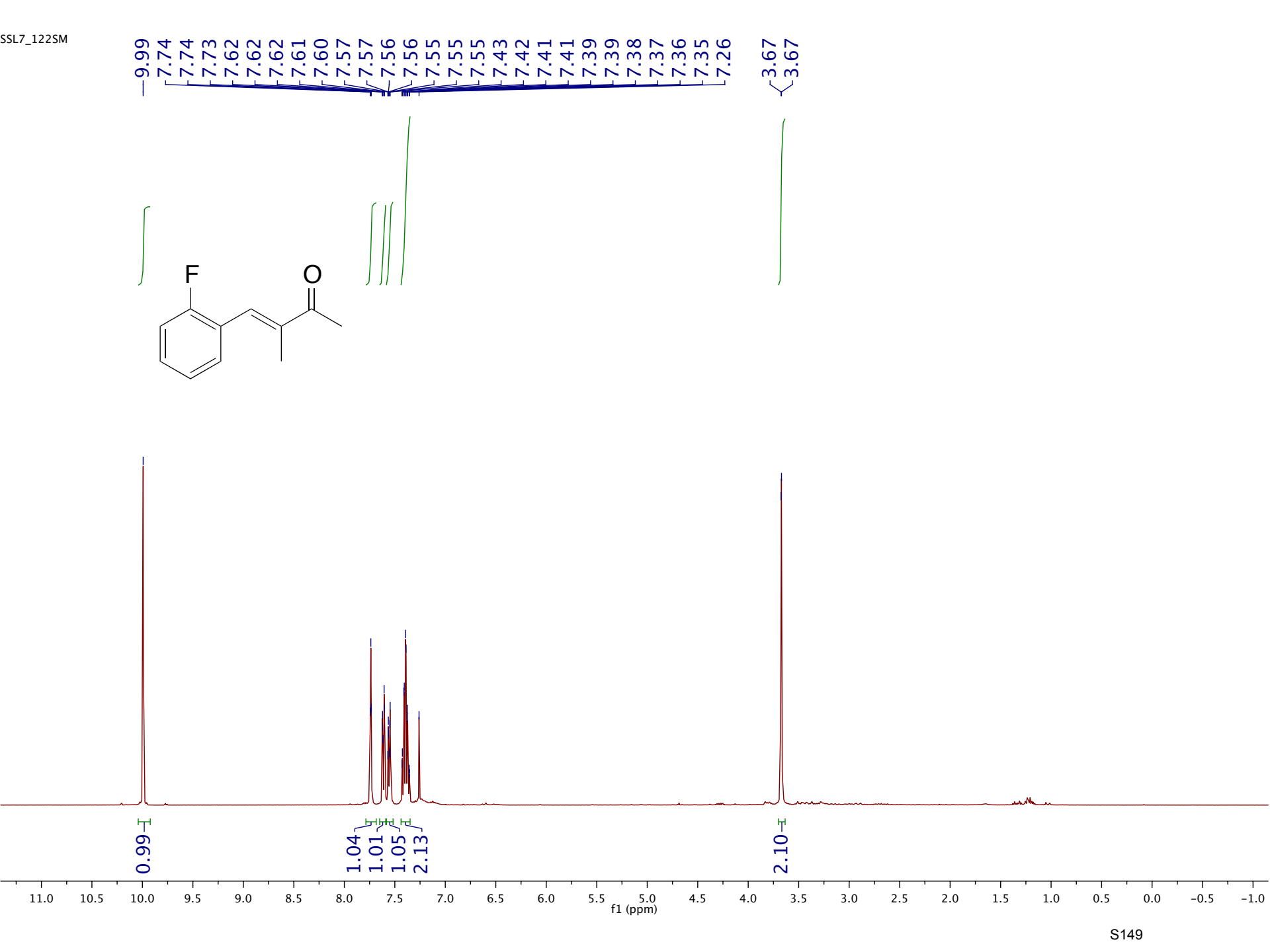
ssl7_61sm/2

197.39
195.18
147.93
140.18
139.55
137.26
130.05
128.62
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
26.74
11.11





SSL7_122SM


9.99
7.74
7.74
7.73
7.62
7.62
7.62
7.61
7.60
7.57
7.57
7.56
7.56
7.55
7.55
7.55
7.43
7.42
7.41
7.41
7.39
7.39
7.38
7.37
7.36
7.35
7.26
3.67
3.67
F
O
0.99
1.04
1.01
1.05
2.13
2.10
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
f1 (ppm)

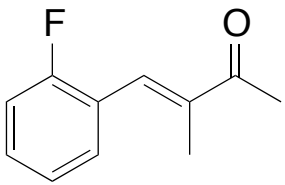
SSL7_122SM

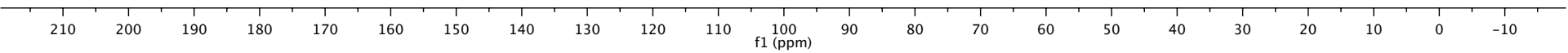
188.39

147.93
147.21
145.22
142.38
129.05
127.31
124.98
124.41

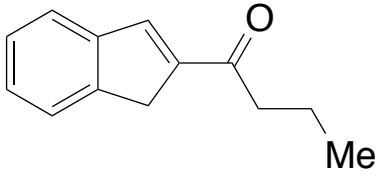
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3

35.66

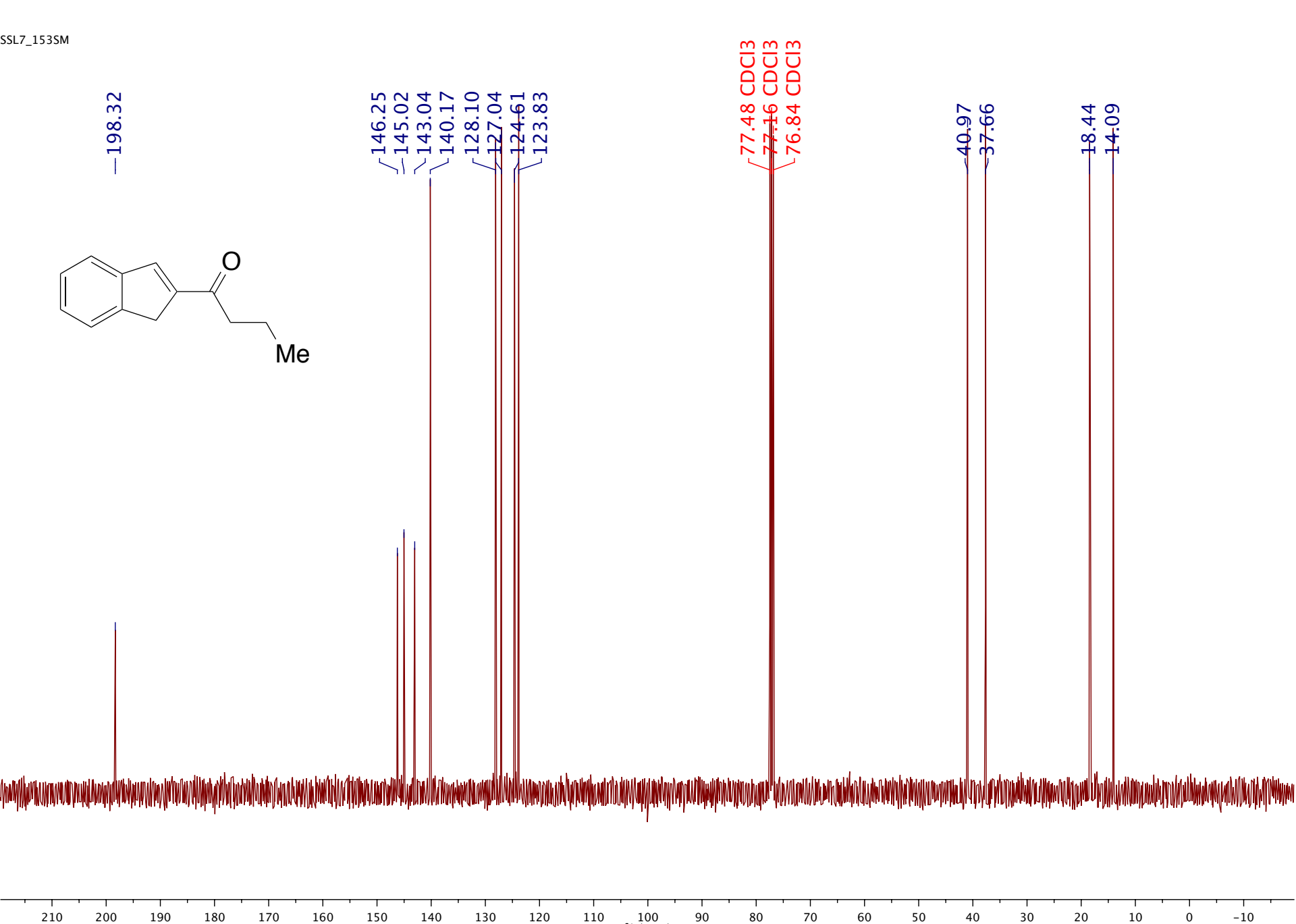




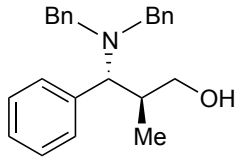
SSL7_153SM



SSL7_153SM


198.32
146.25
145.02
143.04
140.17
128.10
127.04
124.61
123.83
77.48 CDCl3
77.16 CDCl3
76.84 CDCl3
40.97
37.66
18.44
14.09
O
Me
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-13 17-47-32\SSL7-176-IC.D
Sample Name: SSL7-176

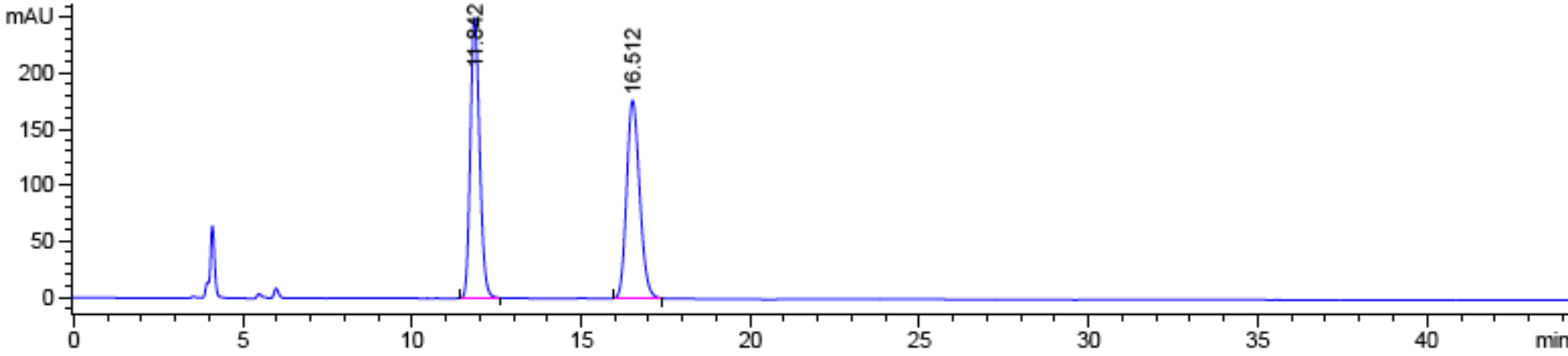


Racemic

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 21
Injection Date : 8/13/2015 5:48:51 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 0.6 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-08-13 17-47-32\02-30.M
Last changed : 8/13/2015 6:32:55 PM by SSL
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\MTP-02IPA-06ML-MIN-30MIN.M

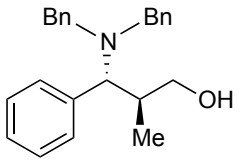
DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-08-13 17-47-32\SSL7-176-IC.D)



Signal 3: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.842	BB	0.2965	1.07895e4	565.74426	50.1928
2	16.512	BB	0.4168	1.07067e4	399.35028	49.8072
Totals :				2.14962e4	965.09454	

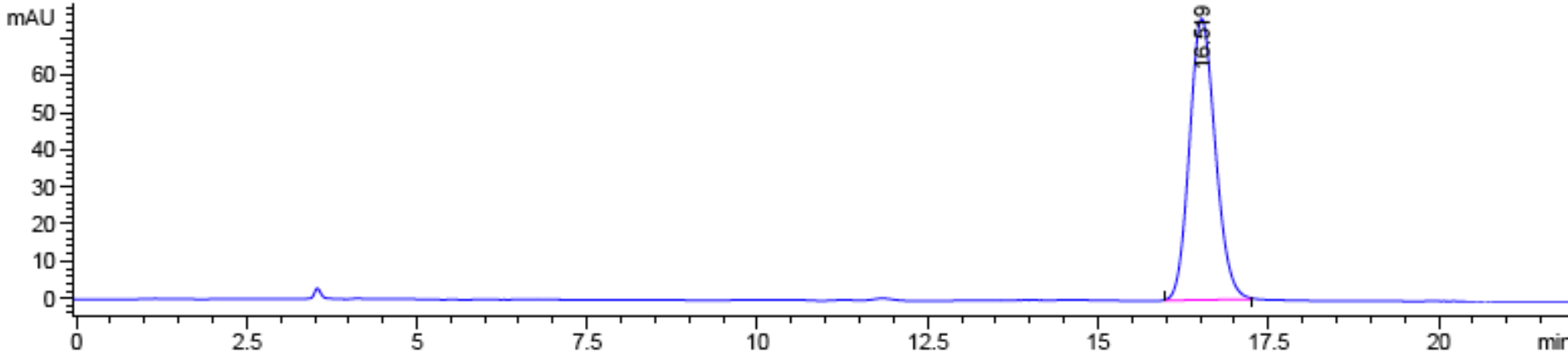
Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-13 19-10-01\SSL7-160-IC.D
Sample Name: SSL7-160



==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 21
Injection Date : 8/13/2015 7:11:21 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-08-13 19-10-01\02-30.M
Last changed : 8/13/2015 7:09:59 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\MTP-02IPA-06ML-MIN-30MIN.M

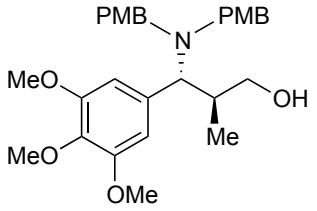
DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-08-13 19-10-01\SSL7-160-IC.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.519	BB	0.4094	2003.53064	75.55466	100.0000
Totals :				2003.53064	75.55466	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-12 23-46-17\SSL7-34C.D
Sample Name: SSL7-34C



Racemic

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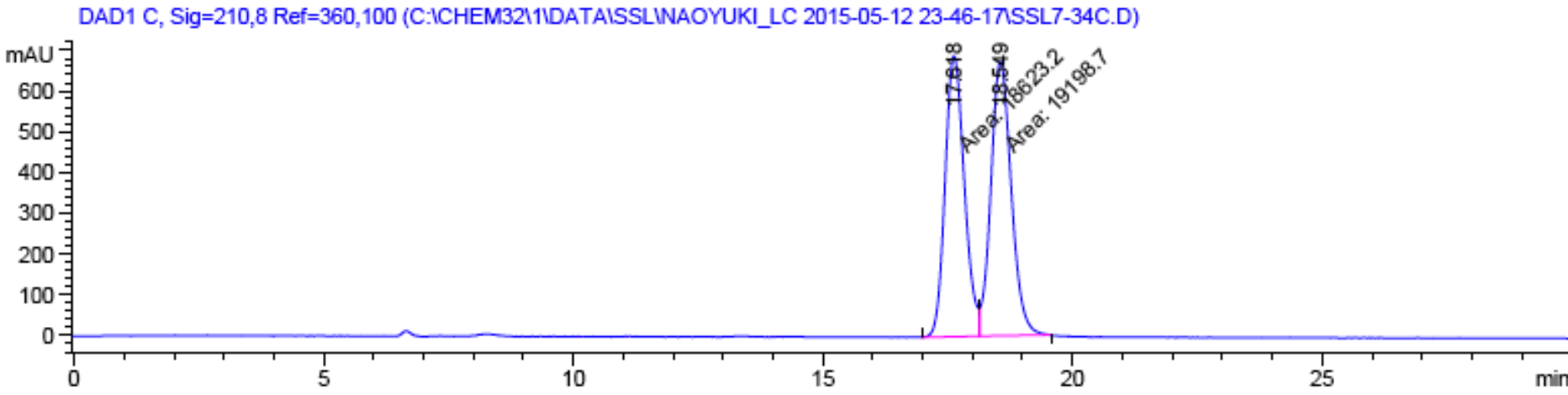
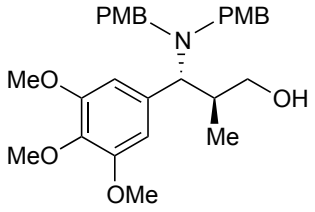
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 21
Injection Date  : 5/12/2015 11:48:41 PM            Inj :   1
                                               Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-12 23-46-17\20-50.M
Last changed    : 5/12/2015 11:46:16 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\03-30.M
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.620	MF	0.4446	1.18444e4	444.01517	49.5189
2	18.551	FM	0.4647	1.20745e4	433.03336	50.4811

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-13 10-00-47\SSL7-35-IA.D
Sample Name: SSL7-35



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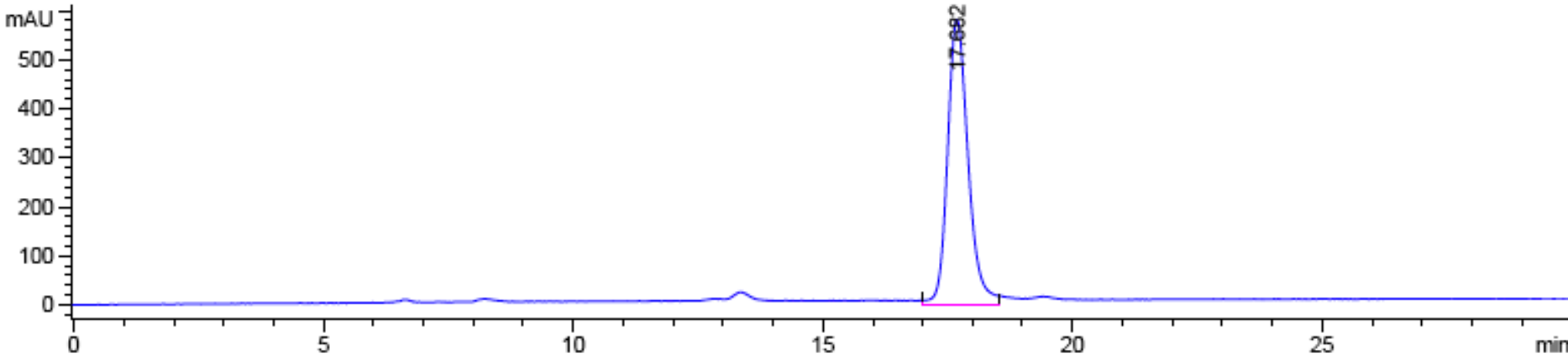
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 21
Injection Date : 5/13/2015 10:03:06 AM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-13 10-00-47\20-50.M
Last changed : 5/12/2015 11:46:16 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\03-30.M

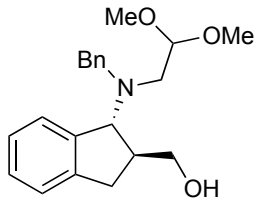
DAD1 C, Sig=210,8 Ref=360,100 (C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-13 10-00-47\SSL7-35-IA.D)



Signal 3: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.682	VV	0.4367	1.66994e4	582.14197	100.0000
Totals :				1.66994e4	582.14197	

Data File C:\CHEM32\1\DATA\SSL\HPLC 2015-07-10 18-24-57\SSL7-93BF2-OJH.D
Sample Name: SSL7-93BF2



Racemic

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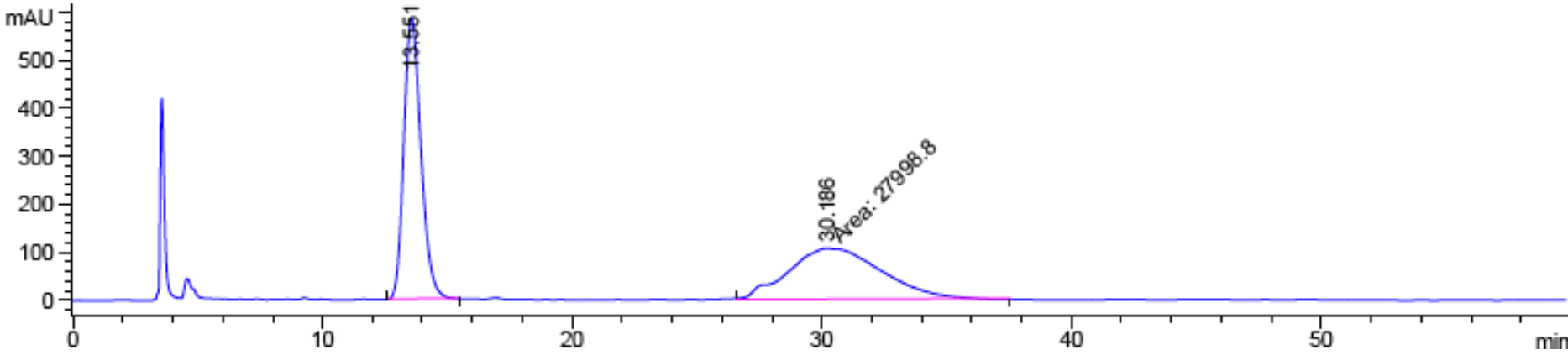
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 61
Injection Date : 7/10/2015 6:26:21 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 3 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\HPLC 2015-07-10 18-24-57\04-30.M
Last changed : 7/10/2015 6:24:55 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M

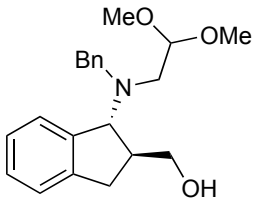
DAD1 C, Sig=210,8 Ref=360,100 (SSL\HPLC 2015-07-10 18-24-57\SSL7-93BF2-OJH.D)



Signal 3: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.551	BB	0.7389	2.80583e4	585.69757	50.0530
2	30.186	MM	4.3487	2.79988e4	107.30796	49.9470
Totals :				5.60571e4	693.00553	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-18 16-56-59\SSL7-122.D
Sample Name: SSL7-122



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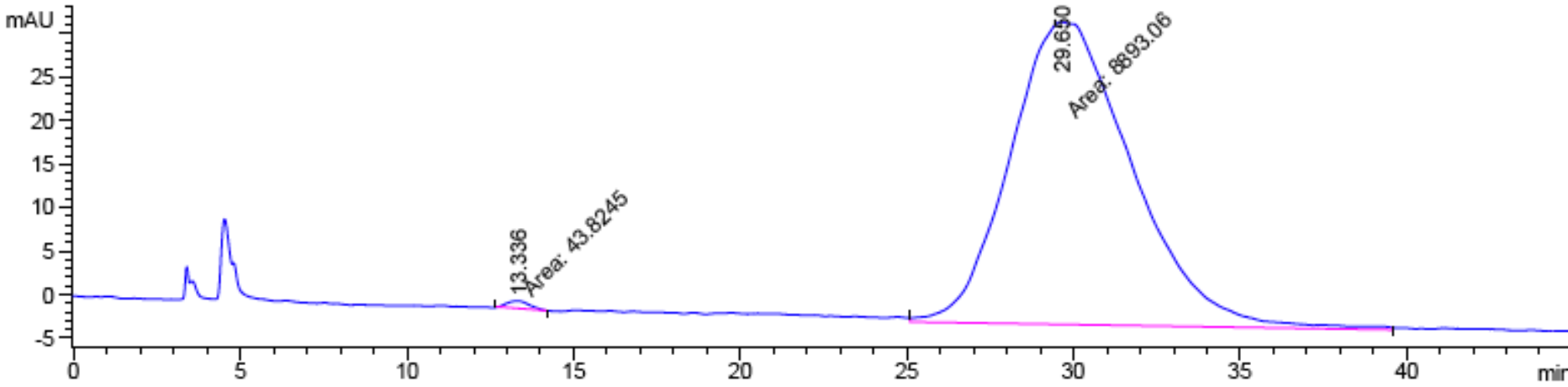
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 7/18/2015 4:59:23 PM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-18 16-56-59\04-30.M
Last changed : 7/16/2015 9:47:24 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M

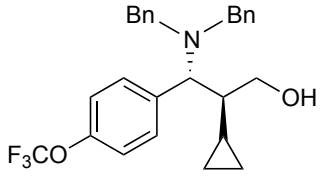
DAD1 D, Sig=220,4 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-18 16-56-59\SSL7-122.D)



Signal 4: DAD1 D, Sig=220,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.336	MM	0.8056	43.82453	9.06692e-1	0.4904
2	29.650	MM	4.2573	8893.06250	34.81514	99.5096
Totals :				8936.88703	35.72184	

Data File C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 19-22-55\SSL7-25C-ODH.D
Sample Name: SSL7-25C



Racemic

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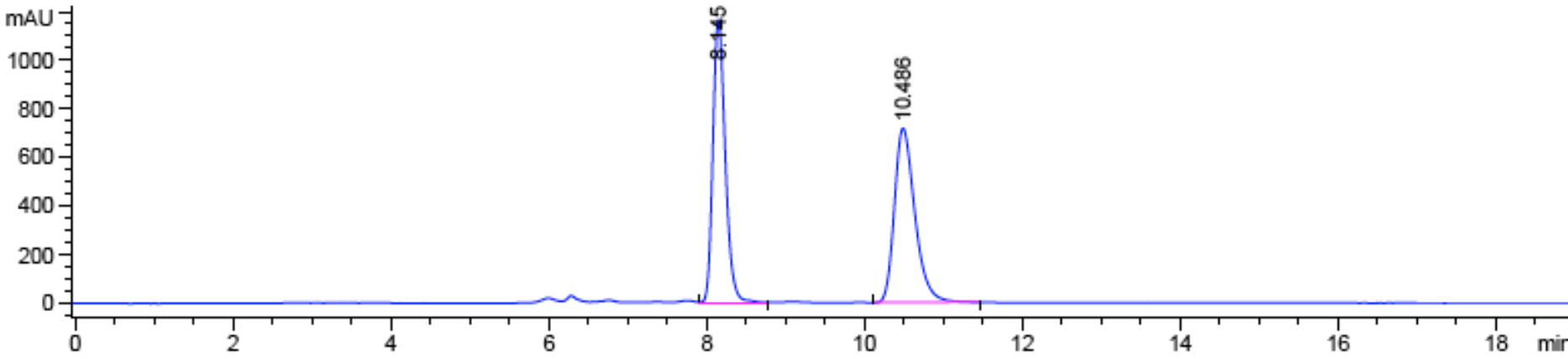
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 2                  Location : Vial 31
Injection Date  : 5/22/2015 7:24:37 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 4 µl
Acq. Method     : C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 19-22-55\20IPA30.M
Last changed    : 5/22/2015 7:43:12 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\2\METHODS\3IPA30_8.M
```

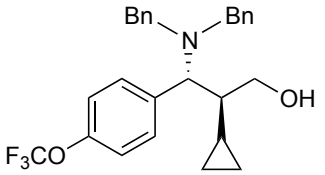
DAD1 B, Sig=230,8 Ref=360,100 (C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 19-22-55\SSL7-25C-ODH.D)



Signal 2: DAD1 B, Sig=230,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.145	VB	0.1697	1.27462e4	1164.87134	49.5817
2	10.486	VB	0.2748	1.29613e4	717.34186	50.4183
Totals :				2.57076e4	1882.21320	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-01 20-35-17\SSL7-63-ODH.D
Sample Name: SSL7-63



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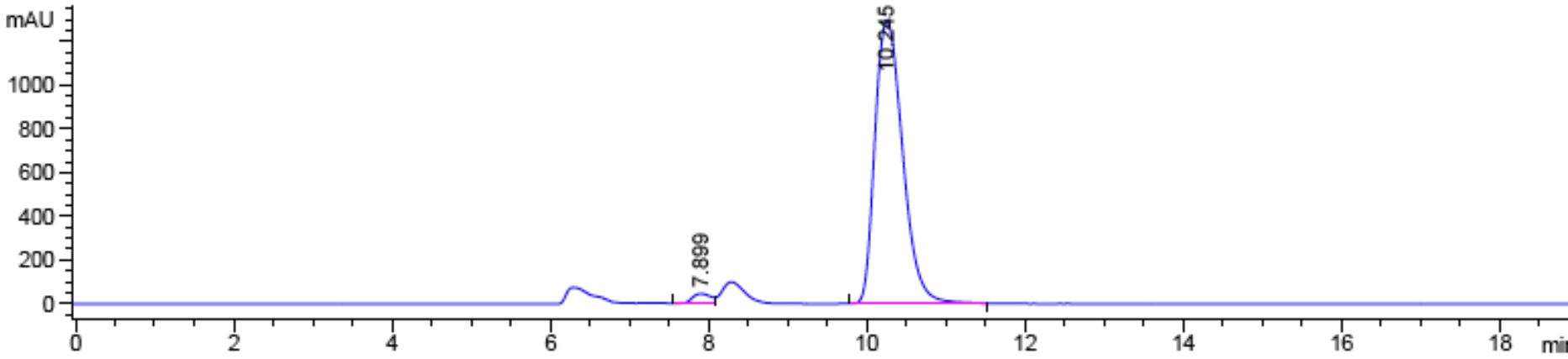
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 21
Injection Date : 6/1/2015 8:38:19 PM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-01 20-35-17\20-30.M
Last changed : 6/1/2015 7:06:36 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\MTP-HEX-1ML-MIN-90MIN.M

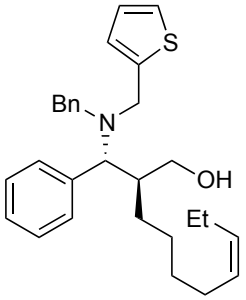
DAD1 C, Sig=210,8 Ref=360,100 (C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-01 20-35-17\SSL7-63-ODH.D)



Signal 3: DAD1 C, Sig=210,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.899	VV	0.2462	815.64081	47.54229	2.4956
2	10.245	VV	0.3763	3.18681e4	1298.72766	97.5044
Totals :				3.26838e4	1346.26995	

Data File C:\CHEM32\1\DATA\ZLW\ATP 2015-08-24 21-27-04\SSL-7-94.D
Sample Name: SSL-7-94



Racemic

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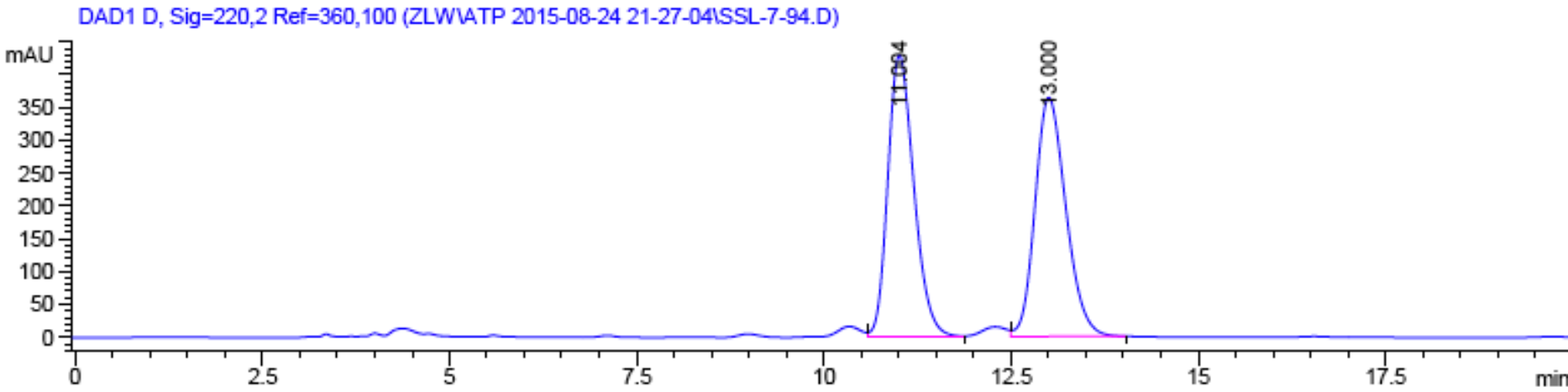
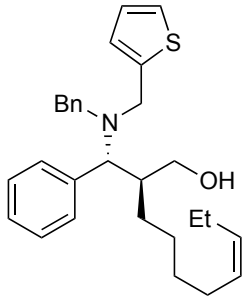
==========================================================================
Acq. Operator   : ZLW                                 Seq. Line :   1
Acq. Instrument : Instrument 1                       Location : Vial 31
Injection Date  : 8/24/2015 9:28:51 PM                   Inj :   1
                                                   Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\ZLW\ATP 2015-08-24 21-27-04\20-30.M
Last changed    : 8/24/2015 8:45:47 PM by ZLW
Analysis Method : C:\CHEM32\1\METHODS\MTP-02IPA-06ML-MIN-15MIN.M
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.004	VB	0.3780	1.04491e4	429.25430	49.9881
2	13.000	VB	0.4428	1.04541e4	364.27774	50.0119

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-17 00-02-31\SSL7-92A.D
Sample Name: SSL7-92A

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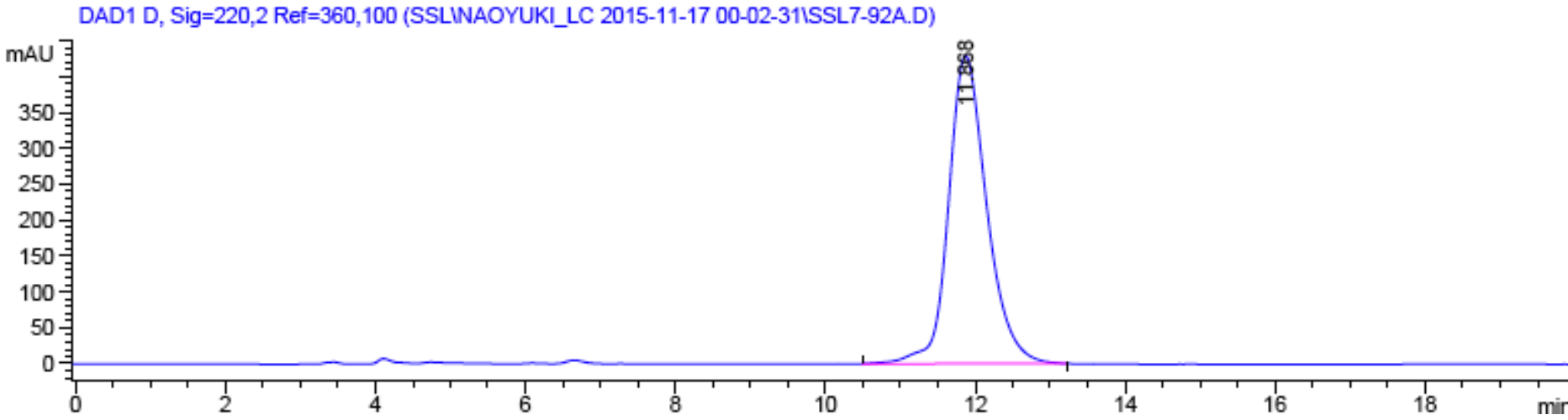
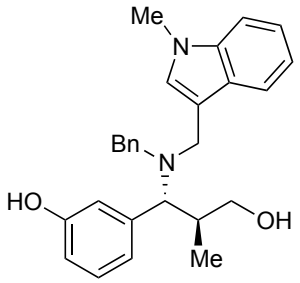
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 61
Injection Date  : 11/17/2015 12:03:52 AM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-17 00-02-31\02-30.M
Last changed    : 11/17/2015 12:02:45 AM by SSL
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.868	BB	0.5414	1.52809e4	429.18539	100.0000
Totals :				1.52809e4	429.18539	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-22 17-27-47\SSL7-45B-IA.D
Sample Name: SSL7-45B



Racemic

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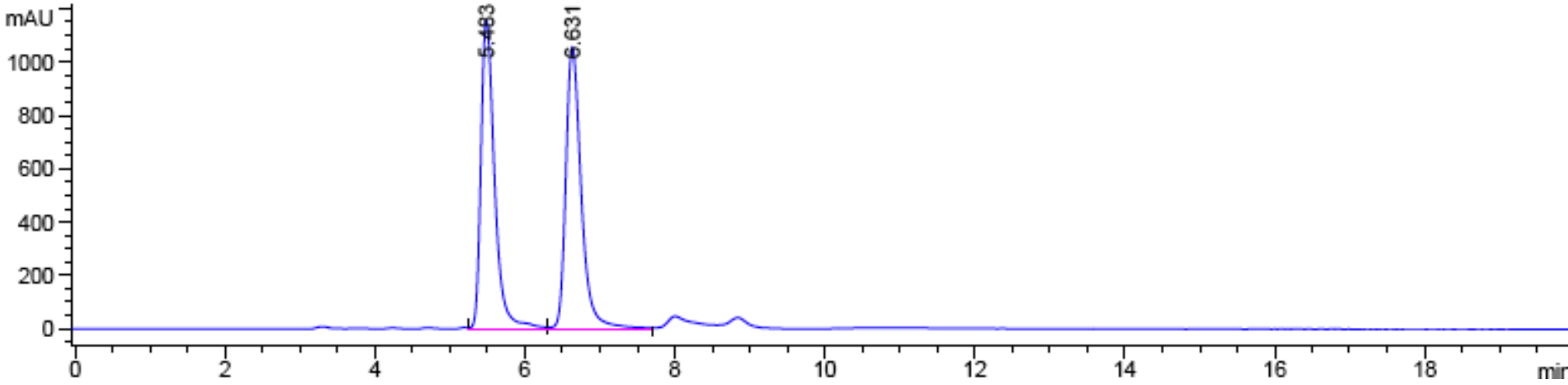
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 21
Injection Date  : 5/22/2015 5:30:00 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-22 17-27-47\20-50.M
Last changed    : 5/22/2015 5:37:09 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\03-30.M
```

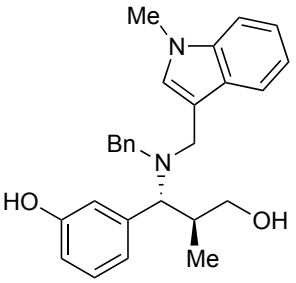
DAD1 D, Sig=220,2 Ref=360,100 (C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-22 17-27-47\SSL7-45B-IA.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.483	VV	0.1942	1.47106e4	1158.29565	49.2134
2	6.631	VB	0.2196	1.51808e4	1056.44556	50.7866
Totals :				2.98914e4	2214.74121	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-27 22-32-53\SSL7-58-S.D
Sample Name: SSL7-58-S



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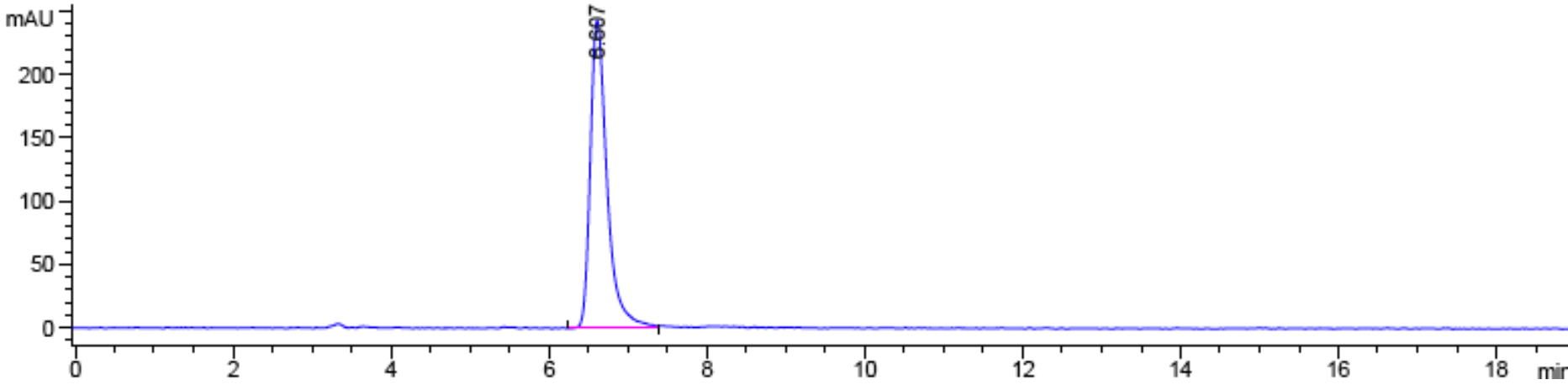
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 31
Injection Date : 5/27/2015 10:35:39 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-27 22-32-53\20-30.M
Last changed : 5/27/2015 10:33:23 PM by SSL
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\03-30.M

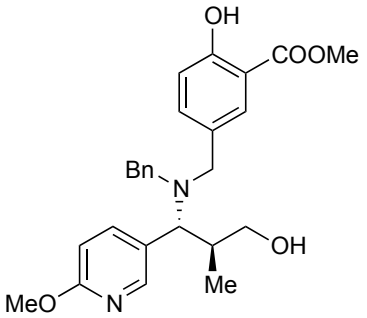
DAD1 D, Sig=220,2 Ref=360,100 (C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-05-27 22-32-53\SSL7-58-S.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.607	VB	0.2255	3621.96558	243.49930	100.0000
Totals :				3621.96558	243.49930	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-02 17-10-11\SSL7-46A.D
Sample Name: SSL7-46A



Racemic

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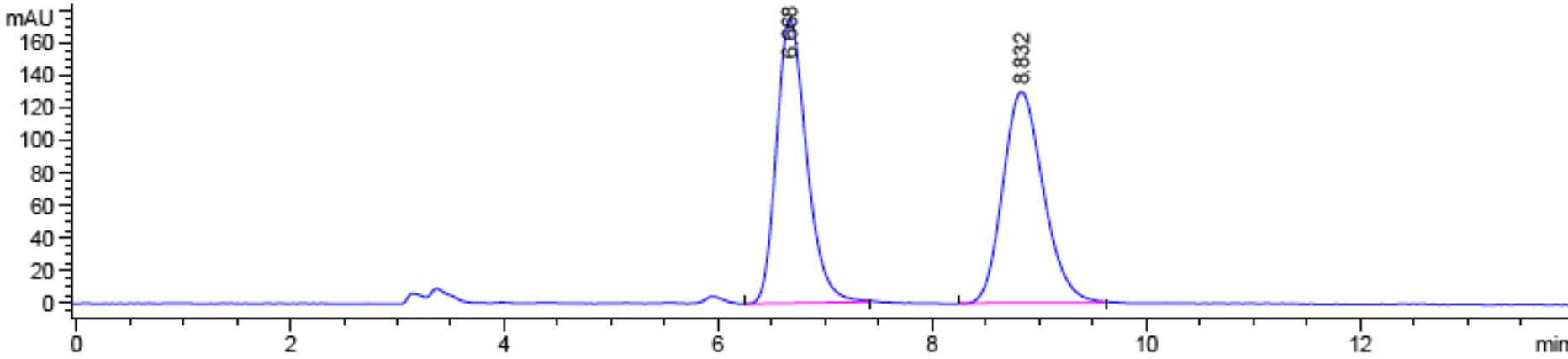
==========================================================================
Acq. Operator   : SSL                                 Seq. Line :   1
Acq. Instrument : Instrument 1                       Location : Vial 22
Injection Date  : 6/2/2015 5:13:06 PM                    Inj :   1
                                                   Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-02 17-10-11\20-30.M
Last changed    : 6/2/2015 5:26:27 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\MTP-HEX-1ML-MIN-90MIN.M
```

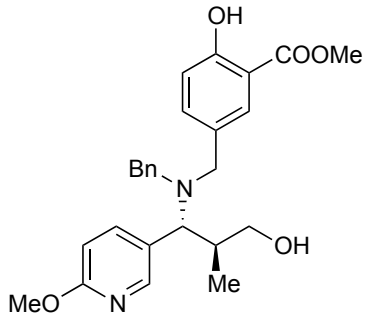
DAD1 A, Sig=230,4 Ref=360,100 (C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-06-02 17-10-11\SSL7-46A.D)



Signal 1: DAD1 A, Sig=230,4 Ref=360,100

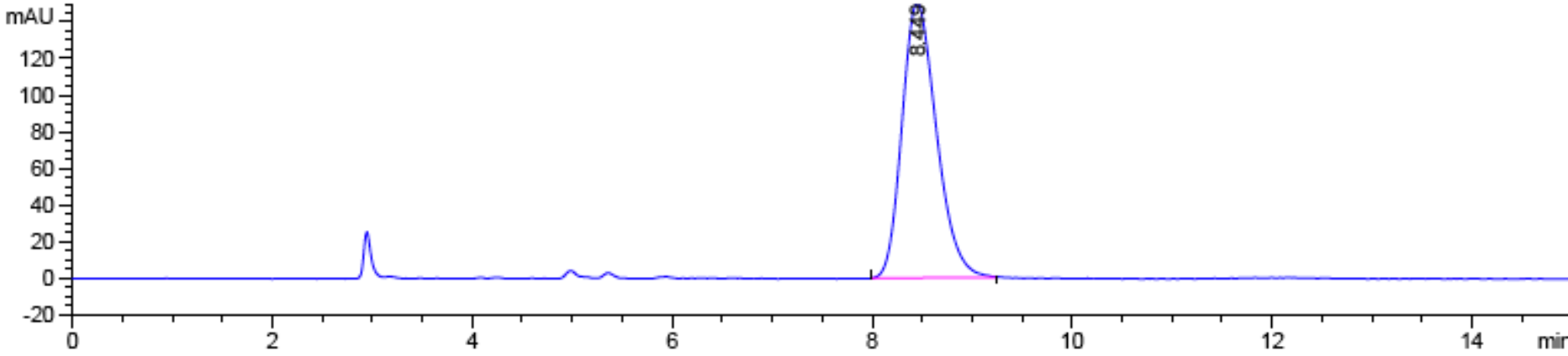
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.668	VB	0.3029	3432.37915	174.91112	50.0005
2	8.832	BB	0.3976	3432.30762	130.17195	49.9995
Totals :				6864.68677	305.08307	

Data File C:\CHEM32\2\DATA\SSL\HPLC 2015-06-03 14-23-53\SSL7-70.D
Sample Name: SSL7-70



Acq. Operator	: SSL	Seq. Line	: 1
Acq. Instrument	: Instrument 2	Location	: Vial 21
Injection Date	: 6/3/2015 2:25:51 PM	Inj	: 1
		Inj Volume	: 5 µl
Acq. Method	: C:\CHEM32\2\DATA\SSL\HPLC 2015-06-03 14-23-53\20IPA30.M		
Last changed	: 6/3/2015 2:24:14 PM by SSL (modified after loading)		
Analysis Method	: C:\CHEM32\2\METHODS\3IPA30_8.M		

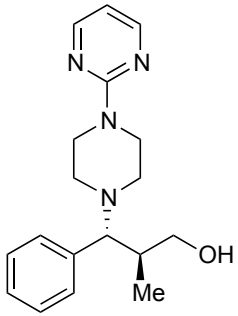
DAD1 A, Sig=254,4 Ref=360,100 (C:\CHEM32\2\DATA\SSL\HPLC 2015-06-03 14-23-53\SSL7-70.D)



Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.449	BB	0.3751	3616.82080	150.08784	100.0000
Totals :				3616.82080	150.08784	

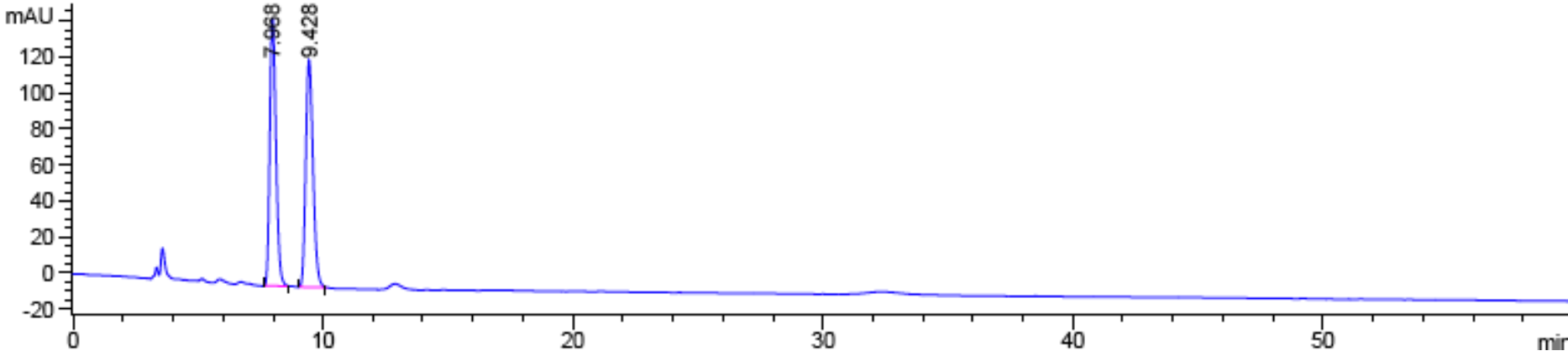
Data File C:\CHEM32\1\DATA\SSL\HPLC 2015-07-09 17-53-39\SSL7-67AF-3-ODH.D
Sample Name: SSL7-67AF-3



Racemic

```
==========================================================================
Acq. Operator   : SSL                                 Seq. Line :   1
Acq. Instrument : Instrument 1                         Location : Vial 61
Injection Date  : 7/9/2015 5:55:01 PM                      Inj :   1
                                                    Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\HPLC 2015-07-09 17-53-39\15-60.M
Last changed    : 7/9/2015 5:53:38 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

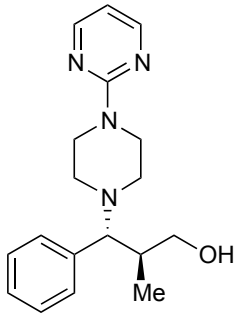
DAD1 D, Sig=220,2 Ref=360,100 (SSL\HPLC 2015-07-09 17-53-39\SSL7-67AF-3-ODH.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.968	BB	0.2675	2565.93481	148.53487	50.0239
2	9.428	BB	0.3149	2563.47925	126.23434	49.9761

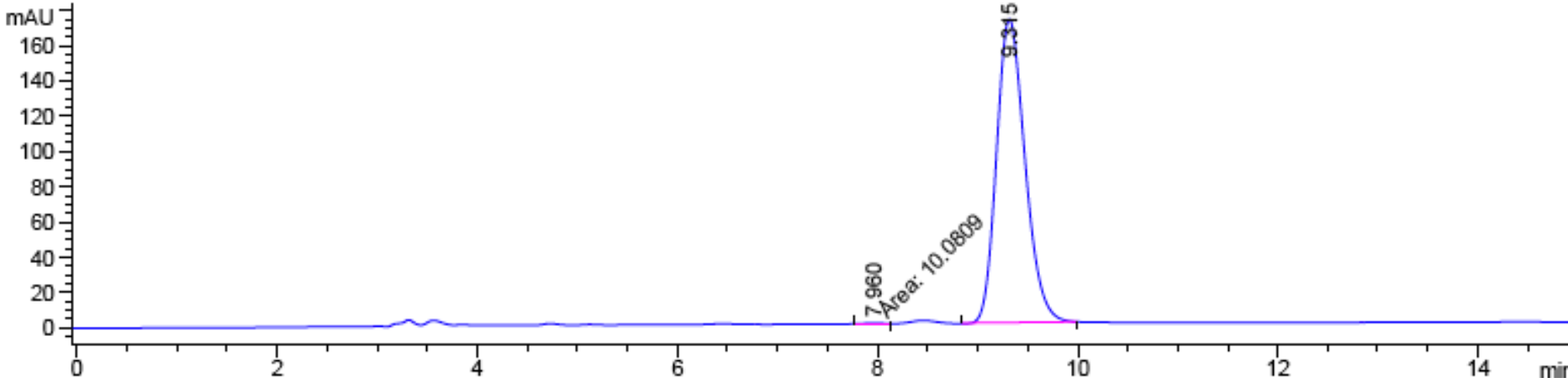
Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-20 21-02-44\SSL7-98.D
Sample Name: SSL7-98



==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 7/20/2015 9:05:10 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 2 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-20 21-02-44\15-30.M
Last changed : 7/20/2015 9:02:42 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M

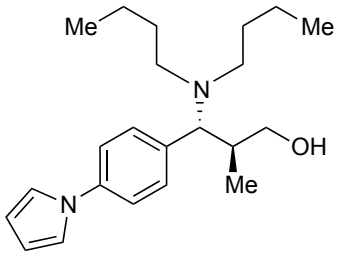
DAD1 D, Sig=220,2 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-20 21-02-44\SSL7-98.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.960	MM	0.2805	10.08085	5.99029e-1	0.2947
2	9.315	VB	0.3075	3410.31519	171.83650	99.7053
Totals :				3420.39604	172.43553	

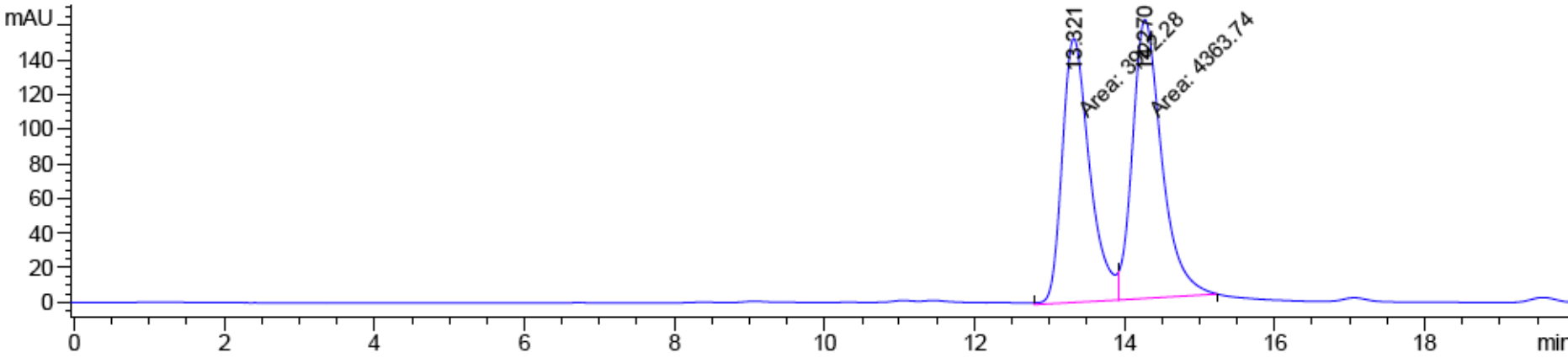
Data File C:\CHEM32\1\DATA\SSL\HPLC 2015-07-11 19-25-51\SSL7-88AF1-IA.D
Sample Name: SSL7-88AF1



Racemic

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 61
Injection Date  : 7/11/2015 7:27:12 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.6 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\HPLC 2015-07-11 19-25-51\04-30.M
Last changed    : 7/11/2015 7:45:21 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

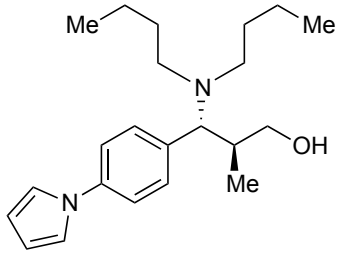
DAD1 B, Sig=254,8 Ref=360,100 (SSL\HPLC 2015-07-11 19-25-51\SSL7-88AF1-IA.D)



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

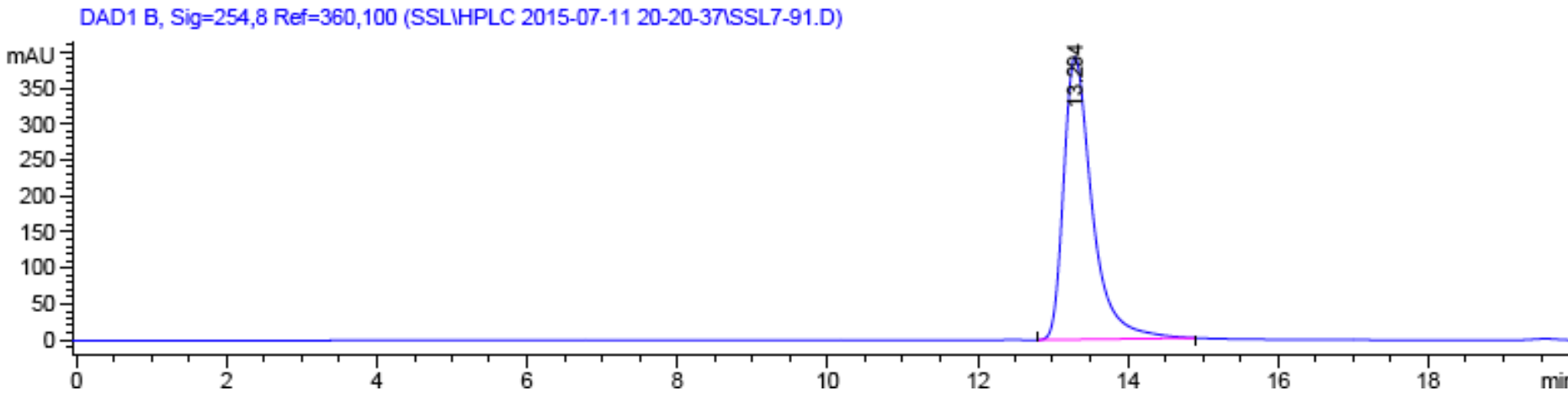
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.321	MF	0.4264	3902.27783	152.51146	47.2087
2	14.270	FM	0.4521	4363.73975	160.86070	52.7913
Totals :				8266.01758	313.37216	

Data File C:\CHEM32\1\DATA\SSL\HPLC 2015-07-11 20-20-37\SSL7-91.D
Sample Name: SSL7-91



==========

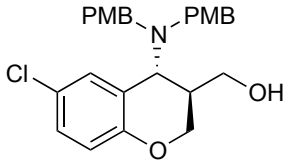
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 71
Injection Date : 7/11/2015 8:21:53 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 2 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\HPLC 2015-07-11 20-20-37\04-30.M
Last changed : 7/11/2015 8:11:44 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.294	BB	0.3994	1.04054e4	392.35010	100.0000
Totals :				1.04054e4	392.35010	

Data File C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 18-25-52\SSL7-47A-ODH.D
Sample Name: SSL7-47A



Racemic

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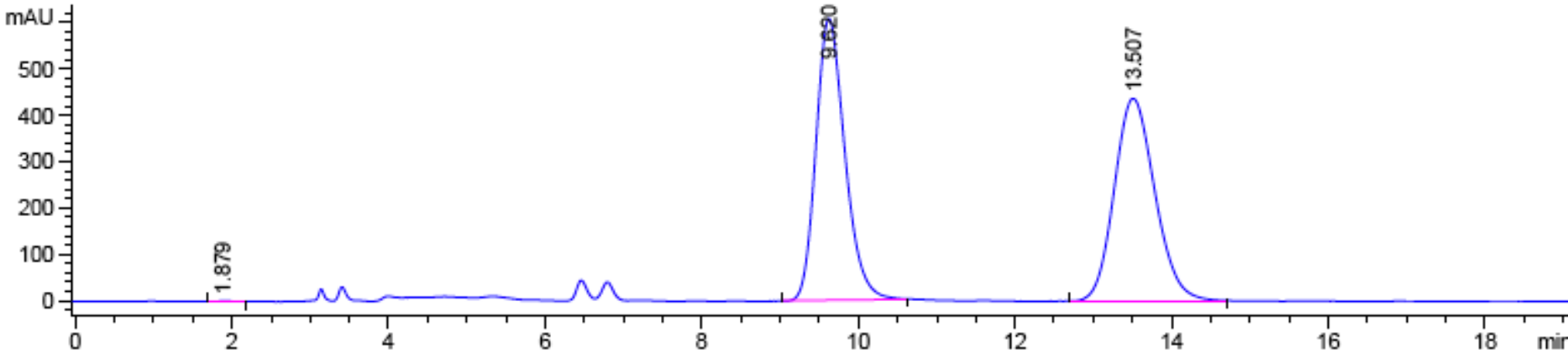
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   2
Acq. Instrument : Instrument 2                  Location : Vial 52
Injection Date  : 5/22/2015 6:59:35 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 4 µl
Acq. Method     : C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 18-25-52\20IPA30.M
Last changed    : 5/22/2015 7:18:45 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\2\METHODS\3IPA30_8.M
```

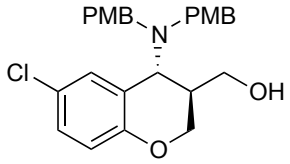
DAD1 B, Sig=230,8 Ref=360,100 (C:\CHEM32\2\DATA\SSL\HPLC 2015-05-22 18-25-52\SSL7-47A-ODH.D)



Signal 2: DAD1 B, Sig=230,8 Ref=360,100

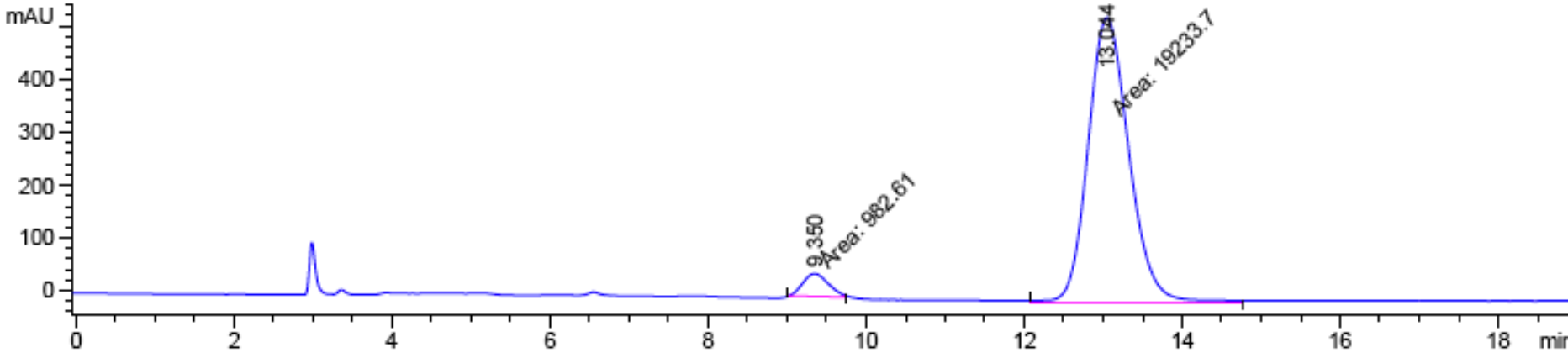
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	1.879	BB	0.1961	17.52534	1.07572	0.0559
2	9.620	BB	0.3981	1.56087e4	606.73492	49.7603
3	13.507	BB	0.5572	1.57415e4	436.00745	50.1838
Totals :				3.13677e4	1043.81810	

Data File C:\CHEM32\2\DATA\SSL\HPLC 2015-05-24 17-49-30\SSL7-60-ODH.D
Sample Name: SSL7-60




```
==========================================================================
Acq. Operator   : SSL                                 Seq. Line :   1
Acq. Instrument : Instrument 2                       Location : Vial 21
Injection Date  : 5/24/2015 5:51:24 PM                    Inj :   1
                                                   Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 4 µl
Acq. Method     : C:\CHEM32\2\DATA\SSL\HPLC 2015-05-24 17-49-30\20IPA30.M
Last changed    : 5/24/2015 5:50:12 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\2\METHODS\3IPA30_8.M
```

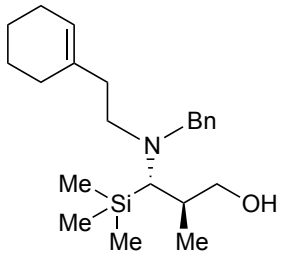
DAD1 B, Sig=230,8 Ref=360,100 (C:\CHEM32\2\DATA\SSL\HPLC 2015-05-24 17-49-30\SSL7-60-ODH.D)



Signal 2: DAD1 B, Sig=230,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.350	MM	0.3776	982.60986	43.37142	4.8605
2	13.044	MM	0.5972	1.92337e4	536.75653	95.1395
Totals :				2.02163e4	580.12795	

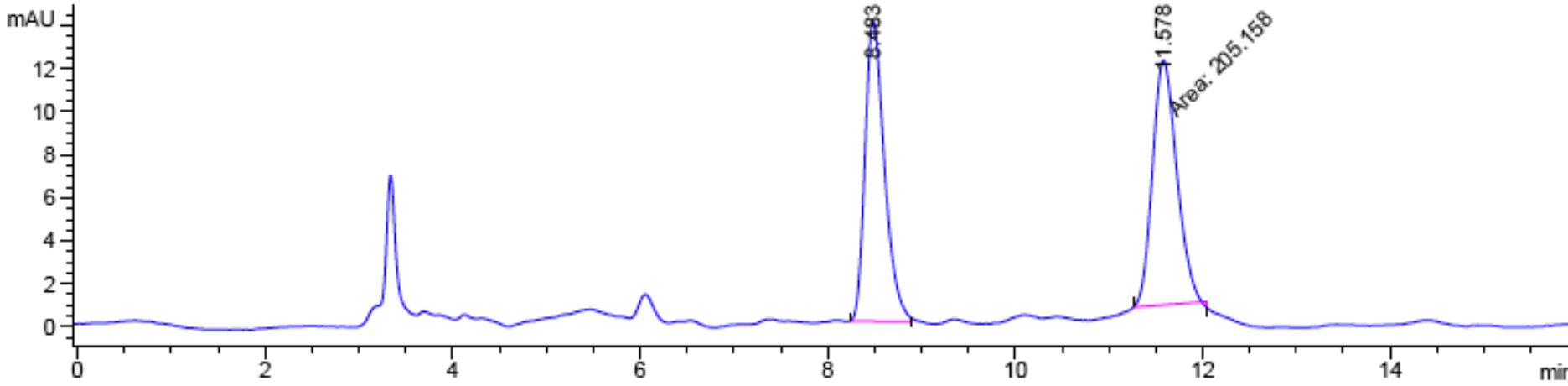
Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-28 15-30-09\SSL7-144.D
Sample Name: SSL7-144



Racemic

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 81
Injection Date  : 7/28/2015 3:32:24 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 10 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-28 15-30-09\01-30.M
Last changed    : 7/28/2015 3:30:07 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

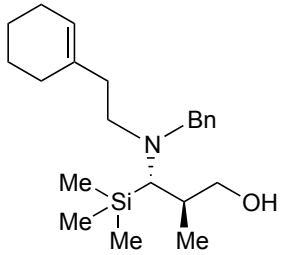
DAD1 D, Sig=220,2 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-28 15-30-09\SSL7-144.D)



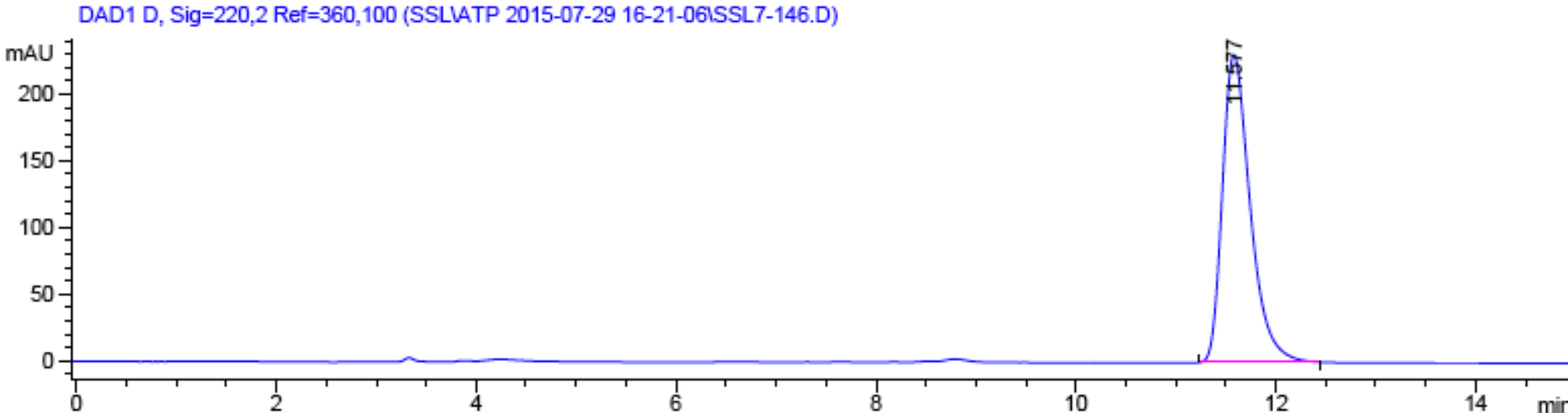
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.483	BB	0.2202	201.46289	13.97519	49.5456
2	11.578	MM	0.3002	205.15820	11.39025	50.4544
Totals :				406.62109	25.36544	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-07-29 16-21-06\SSL7-146.D
Sample Name: SSL7-146



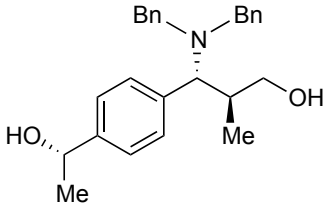

```
==========================================================================
Acq. Operator   : SSL                              Seq. Line :   1
Acq. Instrument : Instrument 1                    Location : Vial 51
Injection Date  : 7/29/2015 4:22:15 PM                Inj :   1
                                                 Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-07-29 16-21-06\01-30.M
Last changed    : 7/29/2015 3:59:49 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.577	BB	0.2960	4468.81299	230.67110	100.0000
Totals :				4468.81299	230.67110	

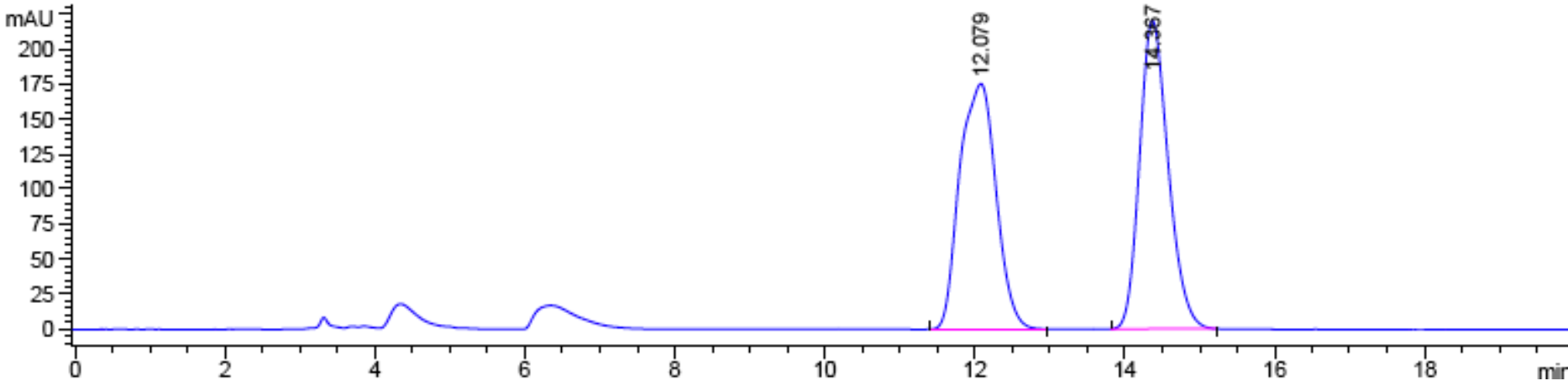
Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-23 19-12-40\SSL7-48B.D
Sample Name: SSL7-48B



Racemic

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 7/23/2015 7:14:47 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-23 19-12-40\10-60.M
Last changed    : 7/23/2015 7:12:38 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
Last changed    : 7/21/2015 11:12:38 AM by SSL
```

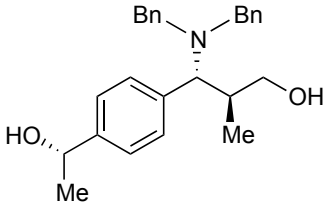
DAD1 D, Sig=220,2 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-23 19-12-40\SSL7-48B.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.079	BB	0.4755	5911.72021	175.27214	50.2372
2	14.367	BB	0.4102	5855.89014	220.21692	49.7628
Totals :				1.17676e4	395.48906	

Data File C:\CHEM32\1\DATA\ZLW\ATP 2015-09-12 16-44-34\ZLW-2-37.D
Sample Name: ZLW-2-37



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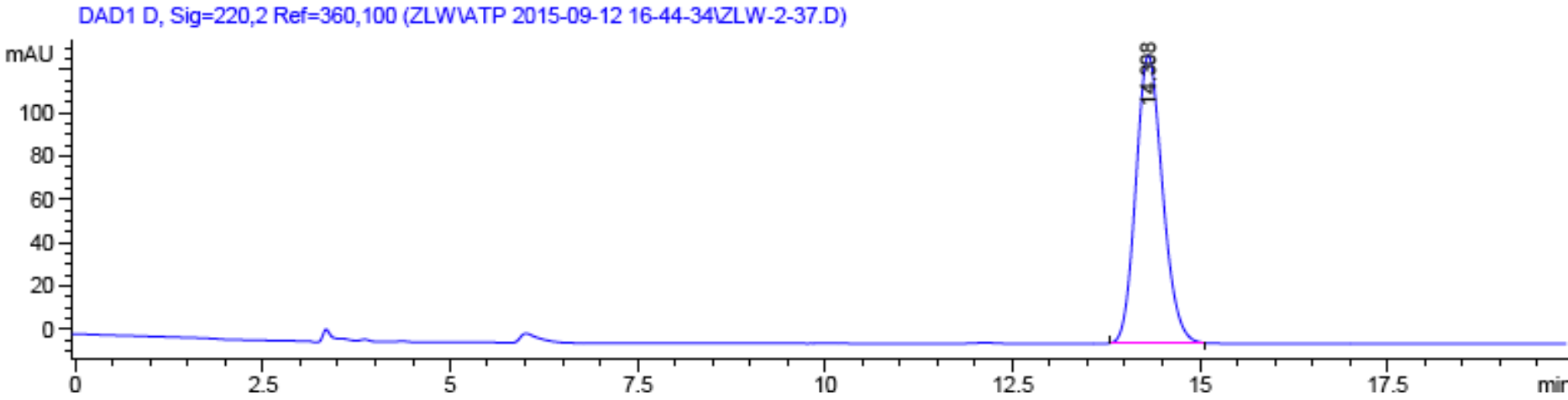
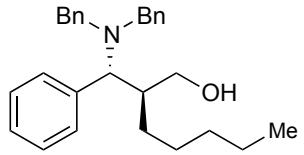
Acq. Operator : ZLW Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 31
Injection Date : 9/12/2015 4:46:41 PM Inj : 1
Inj Volume : 2 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\ZLW\ATP 2015-09-12 16-44-34\10-30.M
Last changed : 9/12/2015 4:44:33 PM by ZLW
Analysis Method : C:\CHEM32\1\DATA\ZLW\ATP 2015-09-12 16-44-34\ZLW-2-37.D\DA.M (10-30.M)



Signal 2: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.308	BB	0.3854	3307.25684	133.34019	100.0000
Totals :				3307.25684	133.34019	

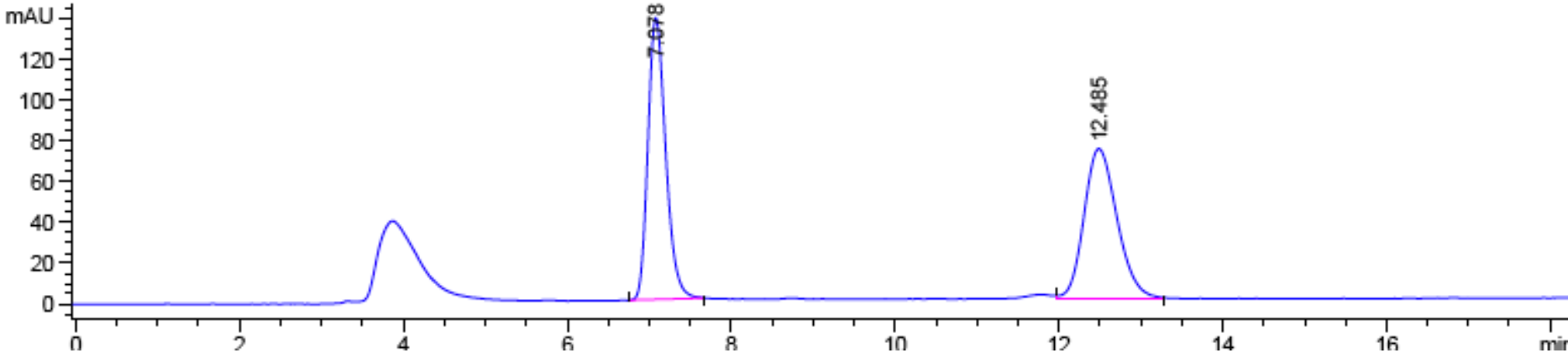
Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-11-21 19-28-56\SSL6-89B-E-RAC.D
Sample Name: SSL6-89B



Racemic

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 61
Injection Date  : 11/21/2014 7:31:05 PM              Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-11-21 19-28-56\02-60.M
Last changed    : 11/21/2014 7:49:28 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

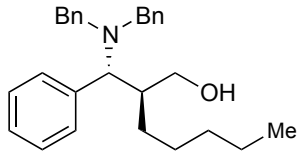
DAD1 A, Sig=230,4 Ref=360,100 (SSL\NAOYUKI_LC 2014-11-21 19-28-56\SSL6-89B-E-RAC.D)



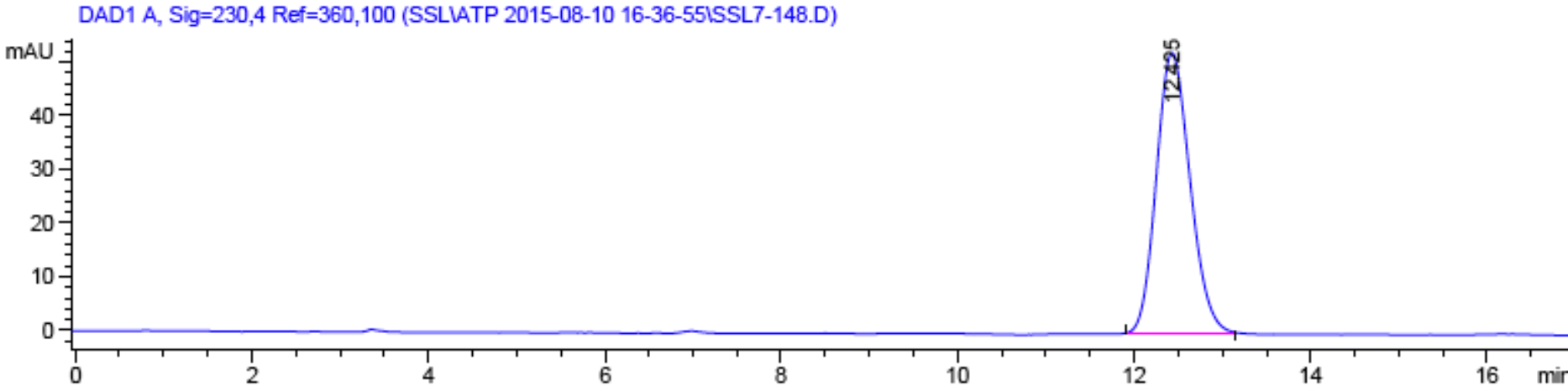
Signal 1: DAD1 A, Sig=230,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.078	BB	0.2324	2093.13989	138.41605	50.4448
2	12.485	VB	0.4357	2056.22437	73.64745	49.5552
Totals :				4149.36426	212.06349	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-10 16-36-55\SSL7-148.D
Sample Name: SSL7-148



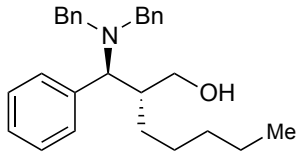

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 21
Injection Date  : 8/10/2015 4:38:07 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-08-10 16-36-55\02-60.M
Last changed    : 8/10/2015 3:53:29 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```



Signal 1: DAD1 A, Sig=230,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.425	BB	0.4126	1394.11951	52.36597	100.0000
Totals :				1394.11951	52.36597	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 15-43-10\SSL7-155-ODH.D
Sample Name: SSL7-155



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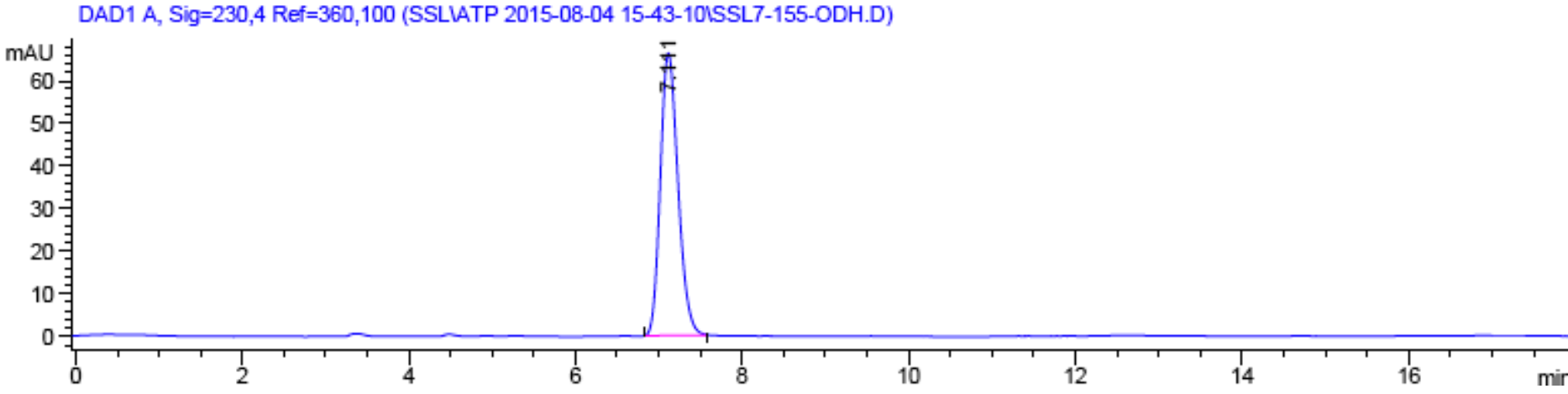
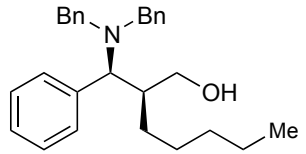
Acq. Operator : SSL Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 41
Injection Date : 8/4/2015 4:03:35 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 15-43-10\02-60.M
Last changed : 8/4/2015 3:43:08 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M



Signal 1: DAD1 A, Sig=230,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.111	BB	0.2303	979.53082	66.31083	99.4179
2	12.661	MM	0.4452	5.73522	2.14708e-1	0.5821
Totals :				985.26604	66.52554	

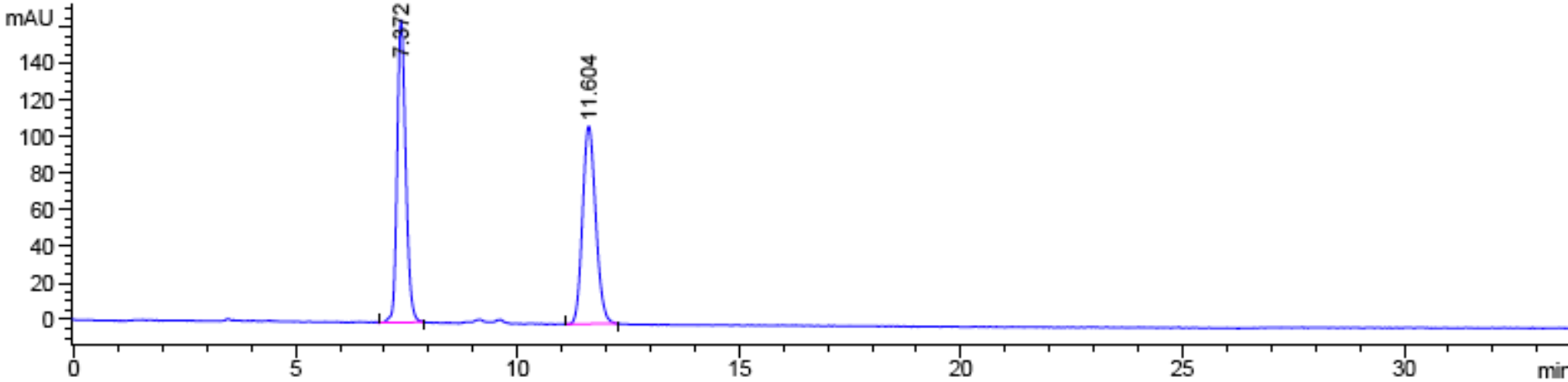
Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-11-21 23-08-02\SSL6-89A-Z-RAC.D
Sample Name: SSL6-89A



Racemic

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 62
Injection Date  : 11/21/2014 11:10:06 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 1 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-11-21 23-08-02\02-60.M
Last changed    : 11/21/2014 11:43:58 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

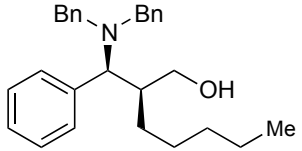
DAD1 D, Sig=220,2 Ref=360,100 (SSL\NAOYUKI_LC 2014-11-21 23-08-02\SSL6-89A-Z-RAC.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.372	BB	0.2081	2244.83618	165.68007	49.9279
2	11.604	BB	0.3265	2251.31909	108.33266	50.0721
Totals :				4496.15527	274.01273	

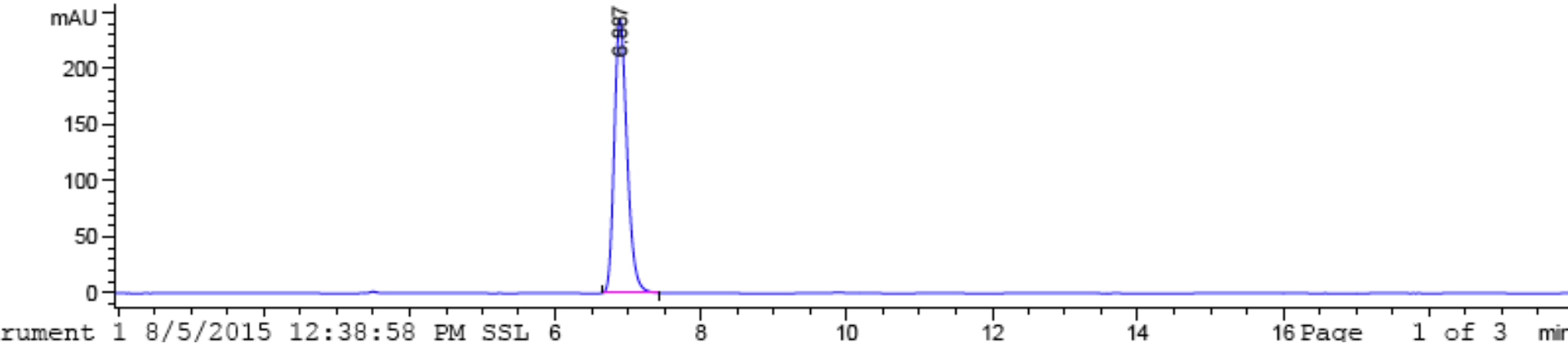
Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 22-09-49\SSL7-161.D
Sample Name: SSL7-161



==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 41
Injection Date : 8/4/2015 10:10:58 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 0.8 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 22-09-49\02-60.M
Last changed : 8/4/2015 10:22:48 PM by SSL
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M

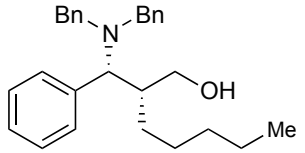
DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-08-04 22-09-49\SSL7-161.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.887	BB	0.1883	2988.11890	244.94547	100.0000
Totals :				2988.11890	244.94547	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-10 15-31-32\SSL7-125.D
Sample Name: SSL7-125

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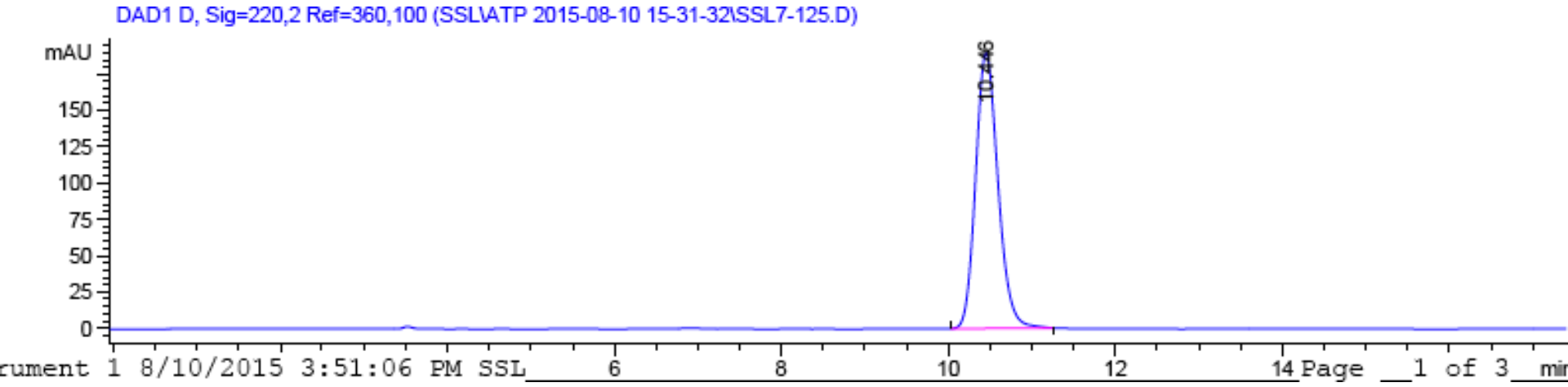
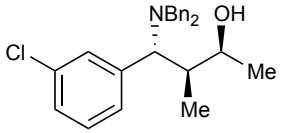
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 21
Injection Date  : 8/10/2015 3:32:45 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.5 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-08-10 15-31-32\02-60.M
Last changed    : 8/10/2015 3:50:07 PM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.446	BB	0.2878	3546.18921	189.93387	100.0000
Totals :				3546.18921	189.93387	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-102LP.D
Sample Name: SSL7-102LP



Racemic

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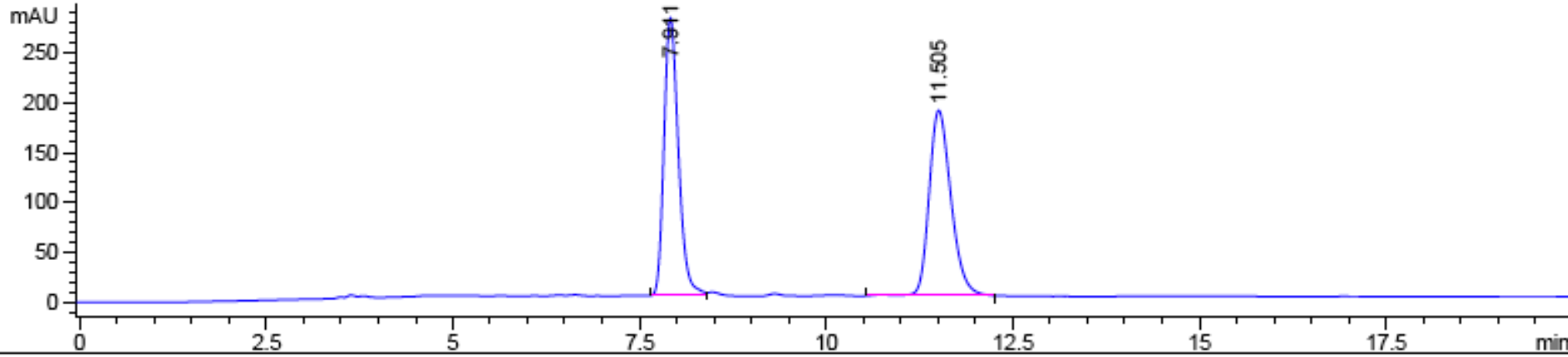
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 81
Injection Date  : 7/21/2015 8:23:04 AM             Inj :   1
                                              Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\01-60.M
Last changed    : 7/21/2015 8:37:06 AM by SSL
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

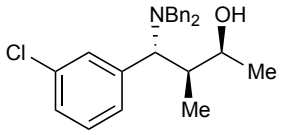
DAD1 A, Sig=230,4 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-102LP.D)



Signal 1: DAD1 A, Sig=230,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.911	BV	0.2073	3755.11646	278.44312	49.6299
2	11.505	BB	0.3174	3811.12036	185.71999	50.3701
Totals :				7566.23682	464.16310	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-27 22-26-58\SSL7-127.D
Sample Name: SSL7-127

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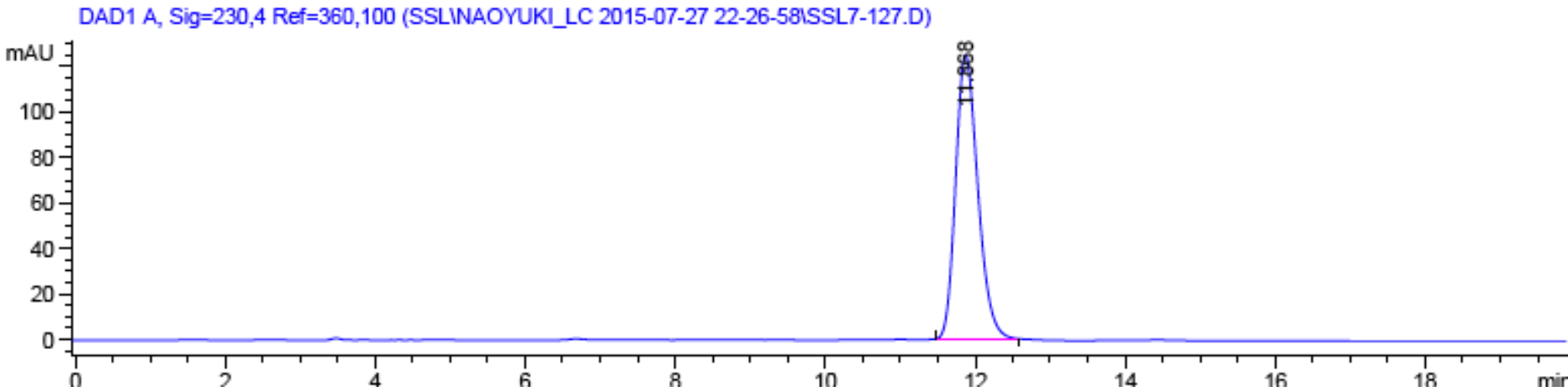
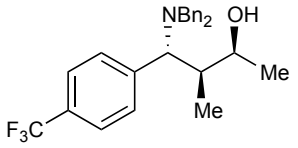
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   2
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 7/27/2015 10:50:08 PM            Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-27 22-26-58\01-30.M
Last changed    : 7/27/2015 10:26:56 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```



Signal 1: DAD1 A, Sig=230,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.868	BB	0.3189	2577.07617	124.80714	100.0000
Totals :				2577.07617	124.80714	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-103LP.D
Sample Name: SSL7-103LP



Racemic

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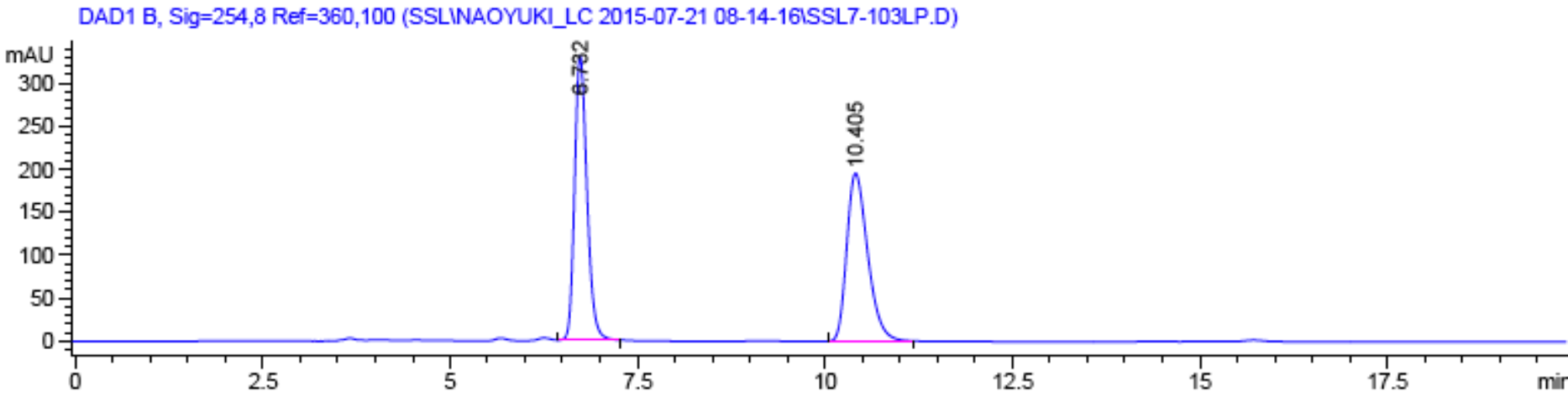
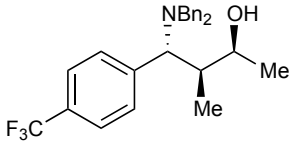
Acq. Operator : SSL Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 81
Injection Date : 7/21/2015 8:44:18 AM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\01-60.M
Last changed : 7/21/2015 8:37:06 AM by SSL
(modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\10-30.M



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.732	VB	0.1764	3822.89648	331.84814	50.0367
2	10.405	BB	0.3015	3817.28784	195.78465	49.9633

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-22 15-28-05\SSL7-128.D
Sample Name: SSL7-128



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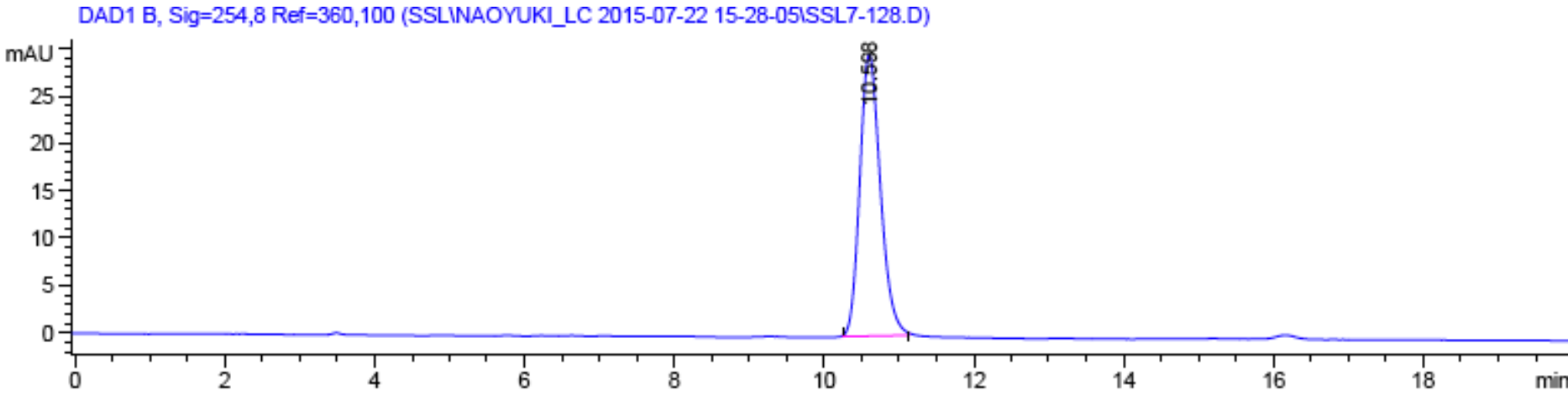
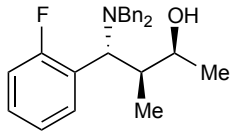
Acq. Operator : SSL Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 7/22/2015 3:51:20 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 8 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-22 15-28-05\01-30.M
Last changed : 7/22/2015 3:28:03 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.598	BB	0.2955	569.41296	29.72390	100.0000
Totals :				569.41296	29.72390	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-105LP.D
Sample Name: SSL7-105LP



Racemic

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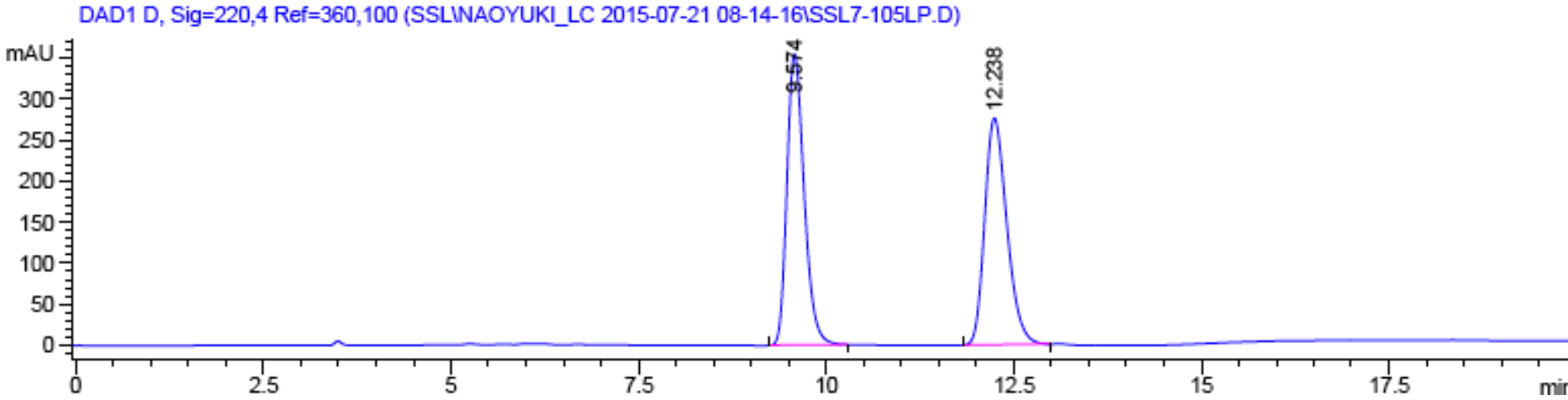
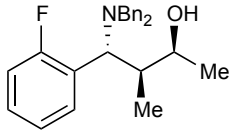
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   3
Acq. Instrument : Instrument 1                  Location : Vial 81
Injection Date  : 7/21/2015 9:05:30 AM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\01-60.M
Last changed    : 7/21/2015 9:18:47 AM by SSL
```



Signal 4: DAD1 D, Sig=220,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.574	BB	0.2463	5678.22266	355.53235	50.0013
2	12.238	BB	0.3153	5677.92529	276.78180	49.9987
Totals :				1.13561e4	632.31415	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-27 16-58-48\SSL7-112.D
Sample Name: SSL7-112

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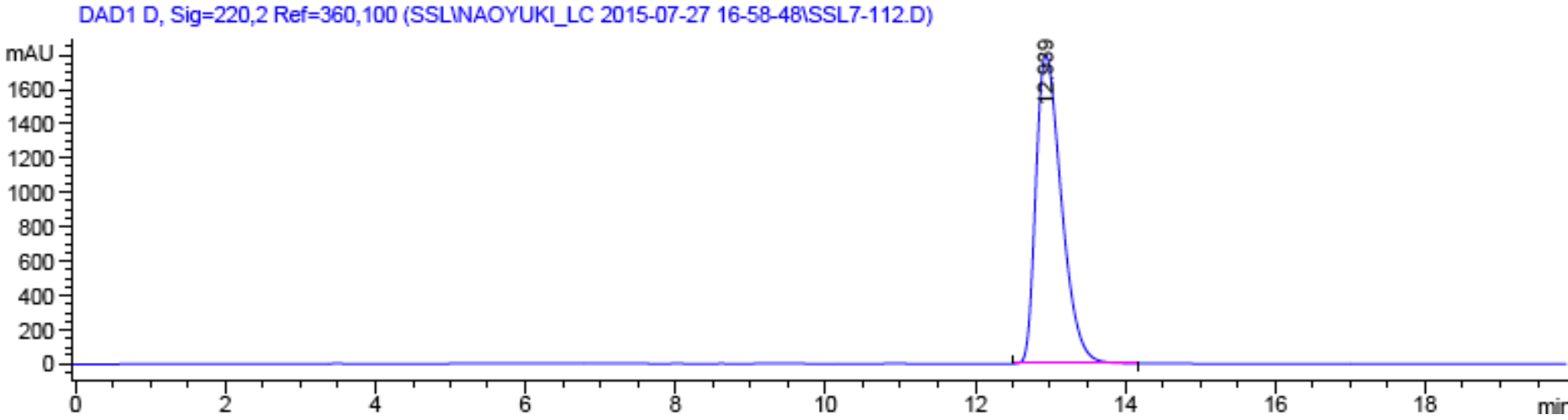
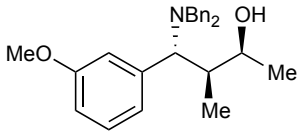
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 7/27/2015 5:00:59 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-27 16-58-48\01-30.M
Last changed    : 7/27/2015 5:00:00 PM by SSL
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.939	BB	0.3687	4.25919e4	1796.04590	100.0000
Totals :				4.25919e4	1796.04590	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-106LP.D
Sample Name: SSL7-106LP



Racemic

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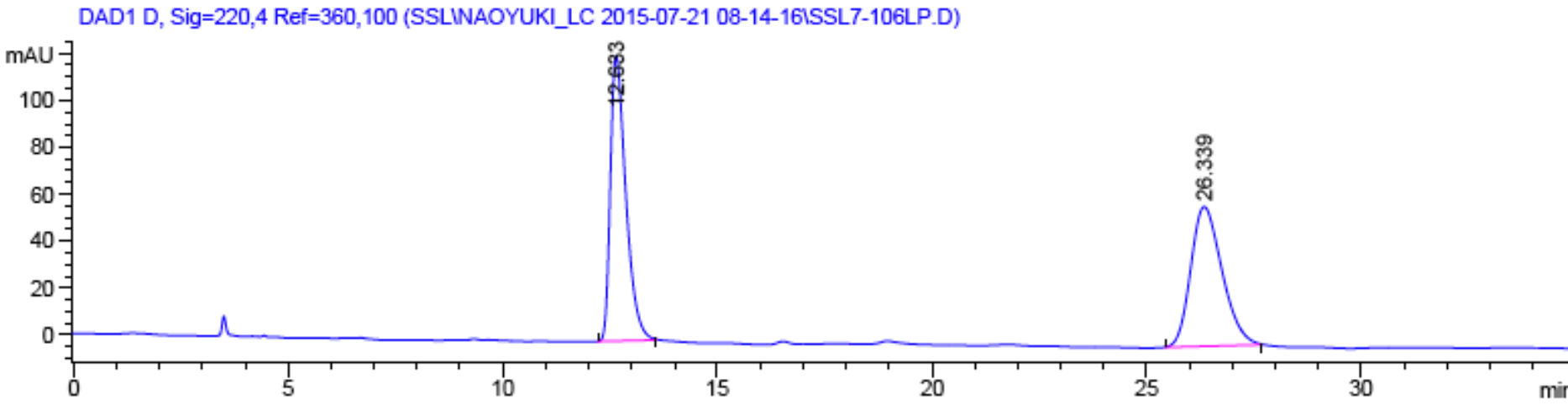
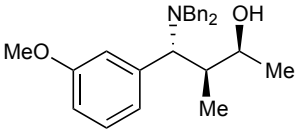
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   4
Acq. Instrument : Instrument 1                  Location : Vial 81
Injection Date  : 7/21/2015 9:26:40 AM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\01-60.M
Last changed    : 7/21/2015 9:57:16 AM by SSL
```



Signal 4: DAD1 D, Sig=220,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.633	BB	0.3810	3048.82324	121.40752	50.1134
2	26.339	BB	0.7782	3035.02637	59.59371	49.8866
Totals :				6083.84961	181.00123	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\SSL7-129.D
Sample Name: SSL7-129

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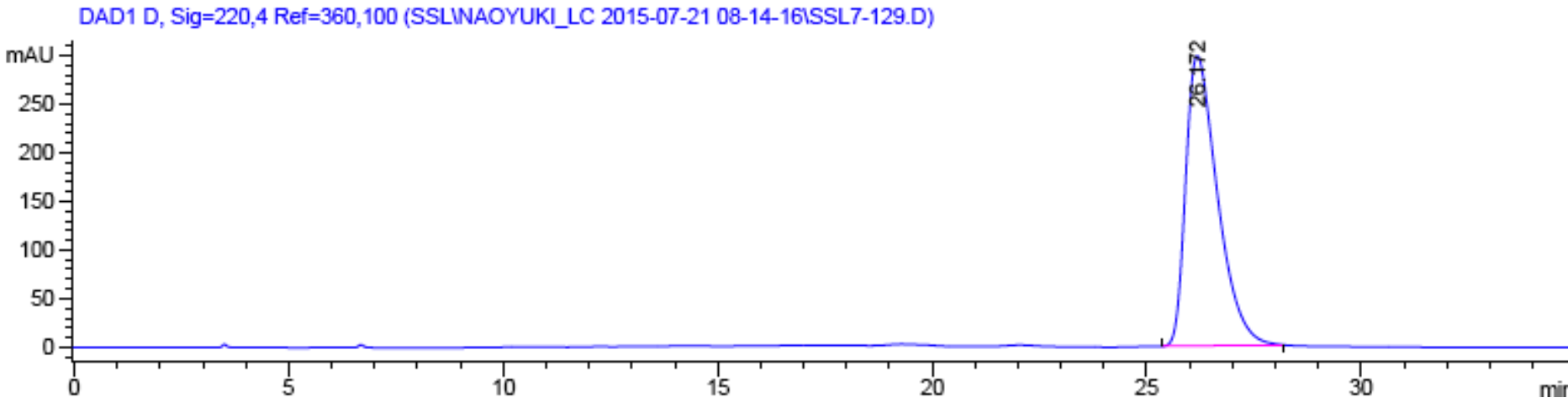
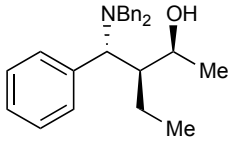
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   5
Acq. Instrument : Instrument 1                  Location : Vial 81
Injection Date  : 7/21/2015 10:02:52 AM            Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-21 08-14-16\01-60.M
Last changed    : 7/21/2015 9:57:16 AM by SSL
```



Signal 4: DAD1 D, Sig=220,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.172	BB	0.7864	1.54151e4	298.52603	100.0000
Totals :				1.54151e4	298.52603	

Data File C:\CHEM32\1\DATA\SSL\HPLC 2015-07-09 14-43-50\SSL7-67BF-1.D
Sample Name: SSL7-67BF-1



Racemic

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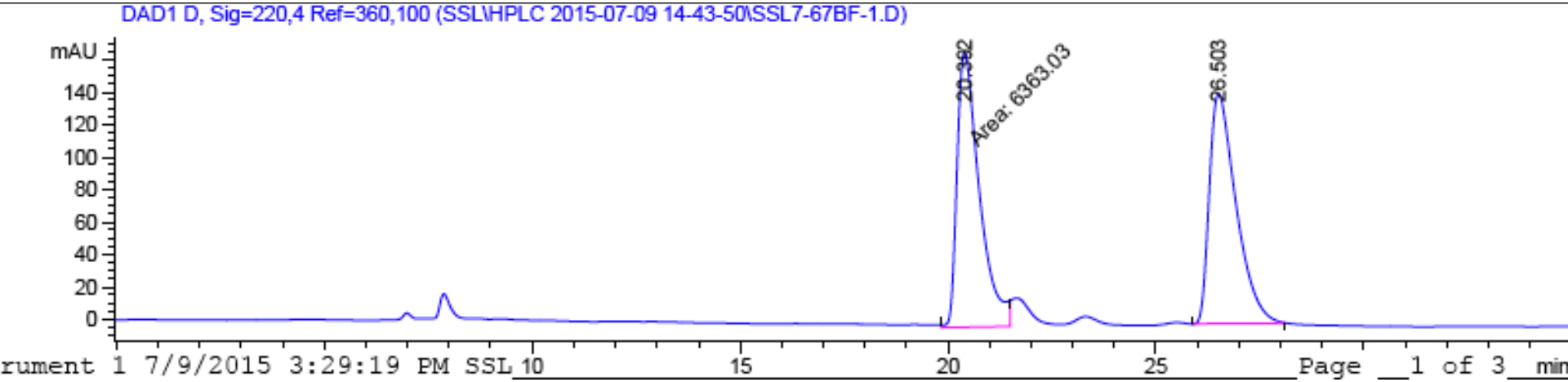
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 61
Injection Date  : 7/9/2015 2:45:14 PM              Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\HPLC 2015-07-09 14-43-50\01-60.M
Last changed    : 7/9/2015 3:16:32 PM by SSL
```

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rument 1 7/9/2015 3:29:19 PM SSL                                Page   1 of 3
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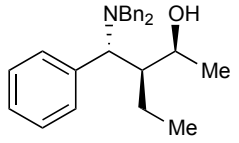
Signal 4: DAD1 D, Sig=220,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	20.392	MF	0.6244	6363.02832	169.83548	50.0014
2	26.503	BB	0.6709	6362.67236	141.96152	49.9986

Data File C:\CHEM32\1\DATA\ZLW\ATP 2015-09-04 19-10-21\ZLW-2-34.D
Sample Name: ZLW-2-34



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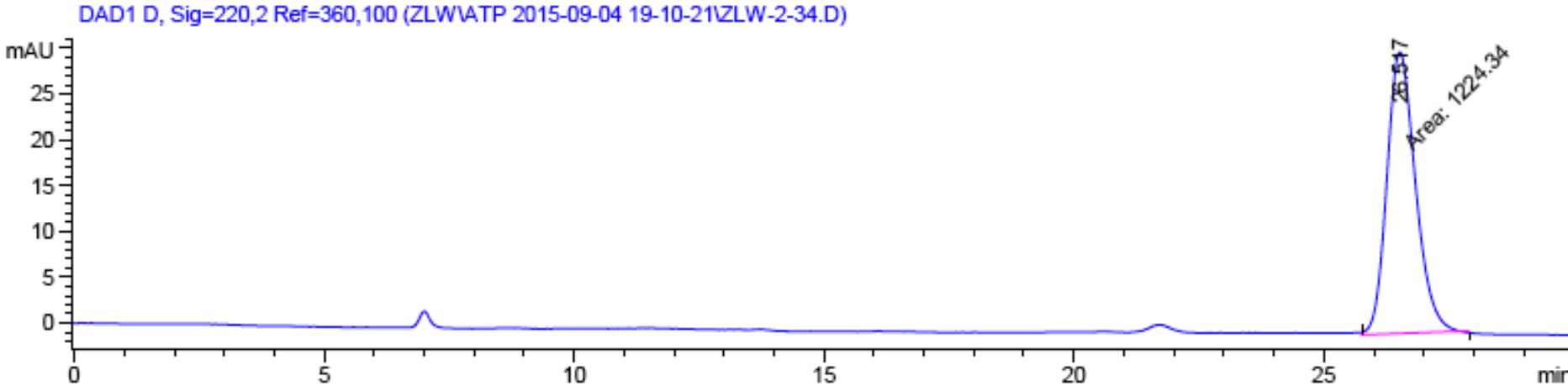
Acq. Operator : ZLW Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 32
Injection Date : 9/4/2015 7:57:54 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\ZLW\ATP 2015-09-04 19-10-21\30-60.M
Last changed : 9/4/2015 7:57:37 PM by ZLW



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

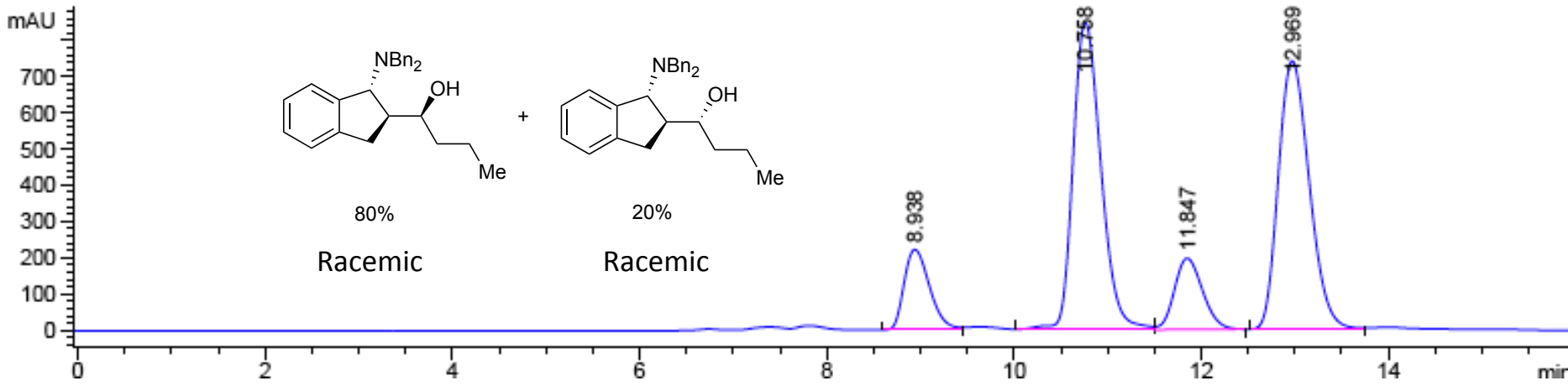
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.517	MM	0.6646	1224.33569	30.70510	100.0000
Totals :				1224.33569	30.70510	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-07-29 22-19-28\SSL7-50-IA.D
Sample Name: SSL7-50

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 52
Injection Date : 7/29/2015 10:21:12 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 2 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-07-29 22-19-28\20-30.M
Last changed : 7/29/2015 10:19:46 PM by SSL

DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-07-29 22-19-28\SSL7-50-IA.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

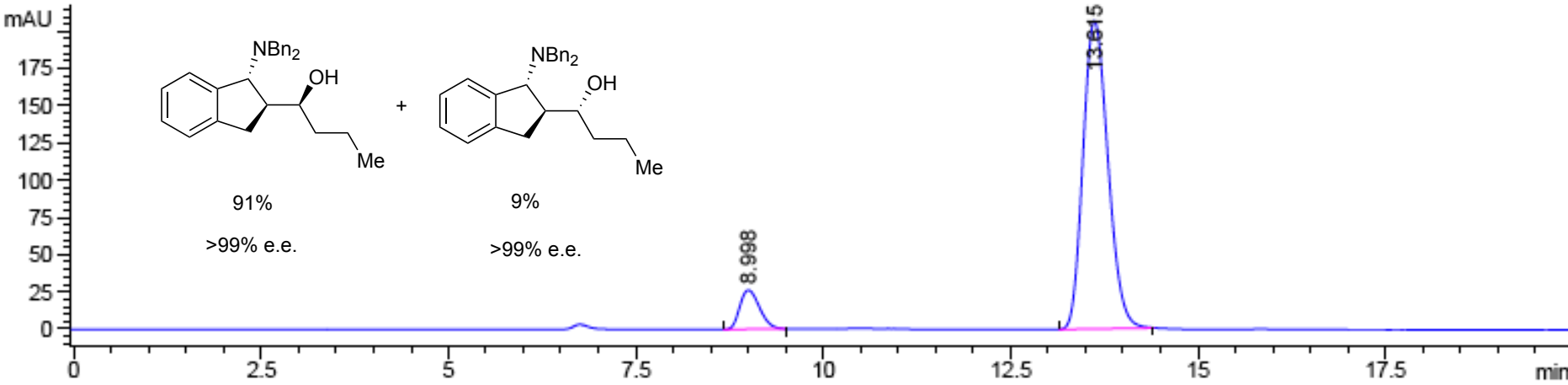
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.938	BV	0.2986	4184.66992	221.32018	9.7328
2	10.758	VV	0.3258	1.75565e4	847.08801	40.8333
3	11.847	VB	0.3297	4147.60791	196.95012	9.6466
4	12.969	BB	0.3634	1.71068e4	740.92169	39.7873

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-07-30 17-24-26\SSL7-153-COMB.D
Sample Name: SSL7-153-COMB

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 7/30/2015 5:26:10 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 0.5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-07-30 17-24-26\20-30.M
Last changed : 7/30/2015 2:39:50 PM by SSL

DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-07-30 17-24-26\SSL7-153-COMB.D)



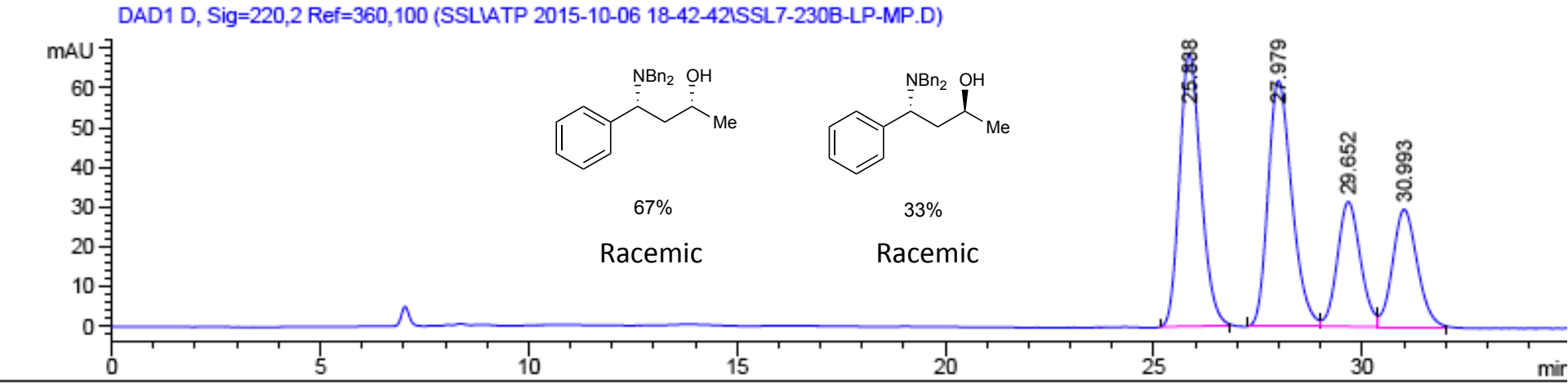
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.998	BB	0.2908	484.66379	26.33016	9.1808
2	13.615	BB	0.3641	4794.41309	207.07204	90.8192
Totals :				5279.07687	233.40219	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 18-42-42\SSL7-230B-LP-MP.D
Sample Name: SSL7-230B-LP-MP

==========

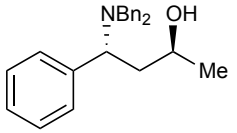
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 10/6/2015 6:44:02 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 2 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 18-42-42\01-30.M
Last changed : 10/6/2015 7:23:14 PM by SSL



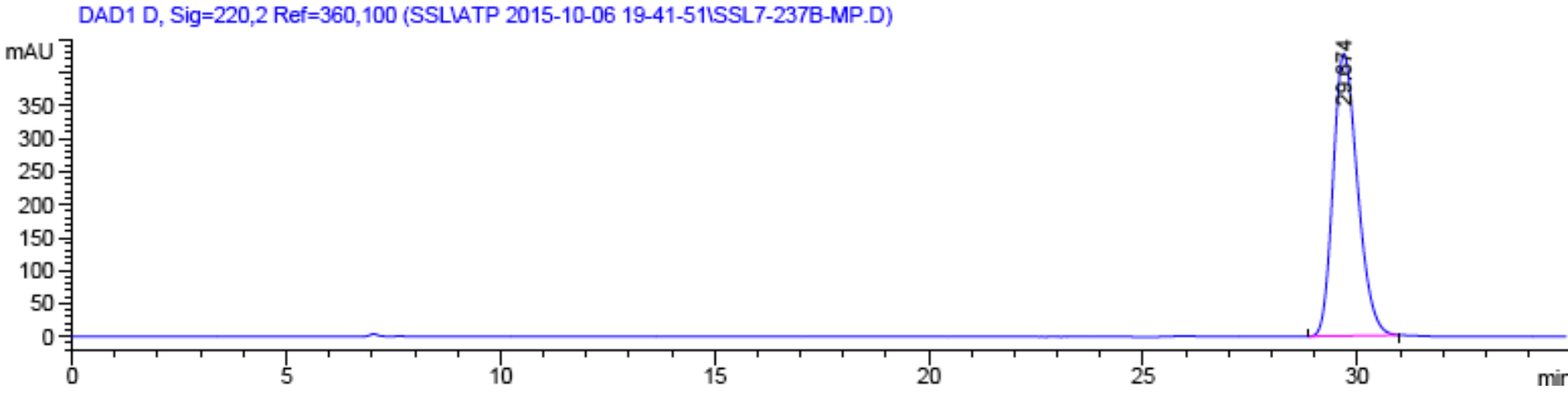
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.838	BB	0.5515	2451.27612	68.82124	33.4120
2	27.979	BV	0.6124	2452.94238	61.88543	33.4347
3	29.652	VV	0.5917	1213.87415	31.48991	16.5456
4	30.993	VB	0.6304	1218.42468	29.58915	16.6077
Totals :				7336.51733	191.78574	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 19-41-51\SSL7-237B-MP.D
Sample Name: SSL7-237B-MP



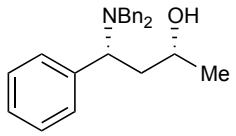

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 10/6/2015 7:43:10 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 19-41-51\01-30.M
Last changed    : 10/6/2015 8:19:12 PM by SSL
```



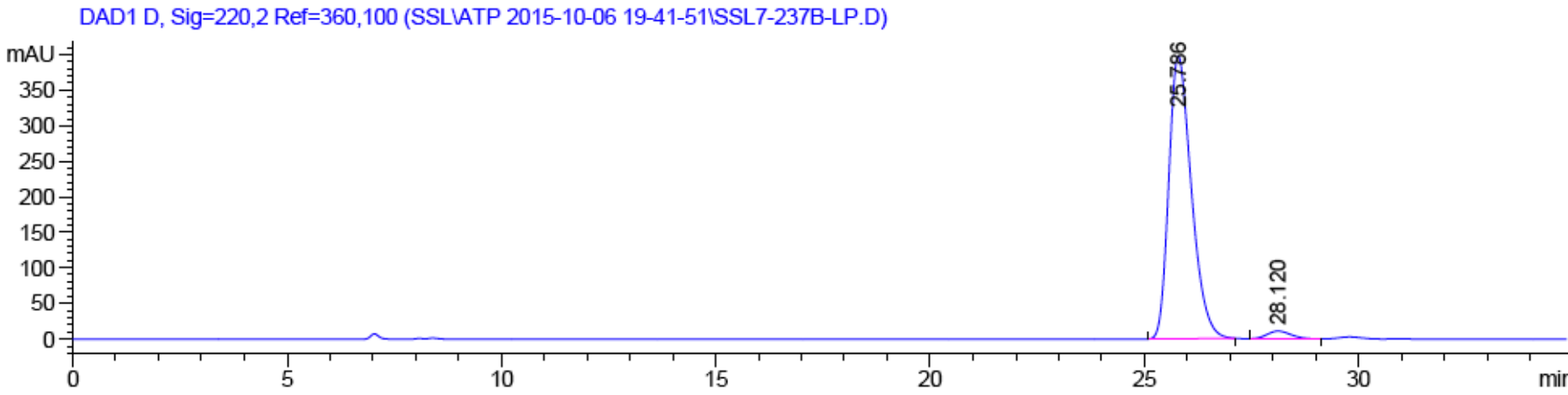
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	29.674	BB	0.6129	1.69683e4	427.70111	100.0000
Totals :				1.69683e4	427.70111	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 19-41-51\SSL7-237B-LP.D
Sample Name: SSL7-237B-LP




```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   2
Acq. Instrument : Instrument 1                  Location : Vial 52
Injection Date  : 10/6/2015 8:20:40 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 19-41-51\01-30.M
Last changed    : 10/6/2015 8:19:12 PM by SSL
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

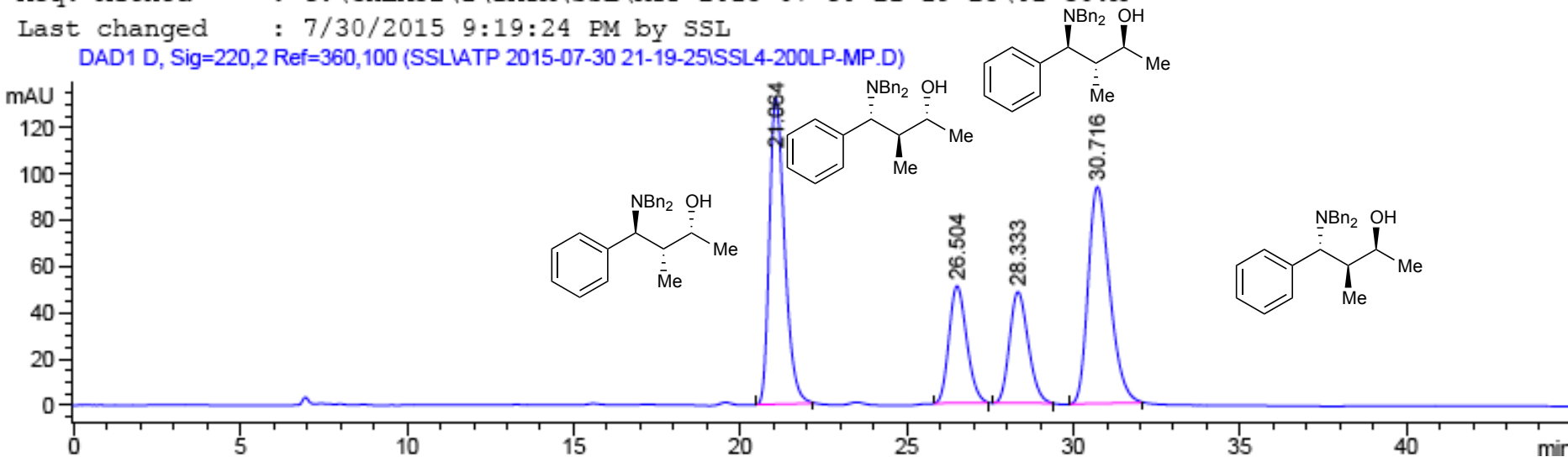
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	25.786	BB	0.5645	1.46271e4	398.20383	97.2233
2	28.120	BB	0.5687	417.75027	10.81348	2.7767

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-07-30 21-19-25\SSL4-200LP-MP.D
Sample Name: SSL4-200LP-MP

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 7/30/2015 9:20:30 PM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-07-30 21-19-25\01-30.M
Last changed : 7/30/2015 9:19:24 PM by SSL

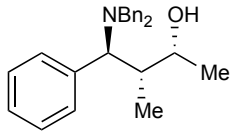
DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-07-30 21-19-25\SSL4-200LP-MP.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.064	BB	0.4857	4199.19971	132.53139	34.3770
2	26.504	BB	0.5731	1887.18909	50.83225	15.4496
3	28.333	BB	0.6068	1897.07507	48.24400	15.5305
4	30.716	BB	0.6961	4231.69434	93.84444	34.6430
Totals :				1.22152e4	325.45207	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-09 14-03-23\SSL7-137.D
Sample Name: SSL7-137

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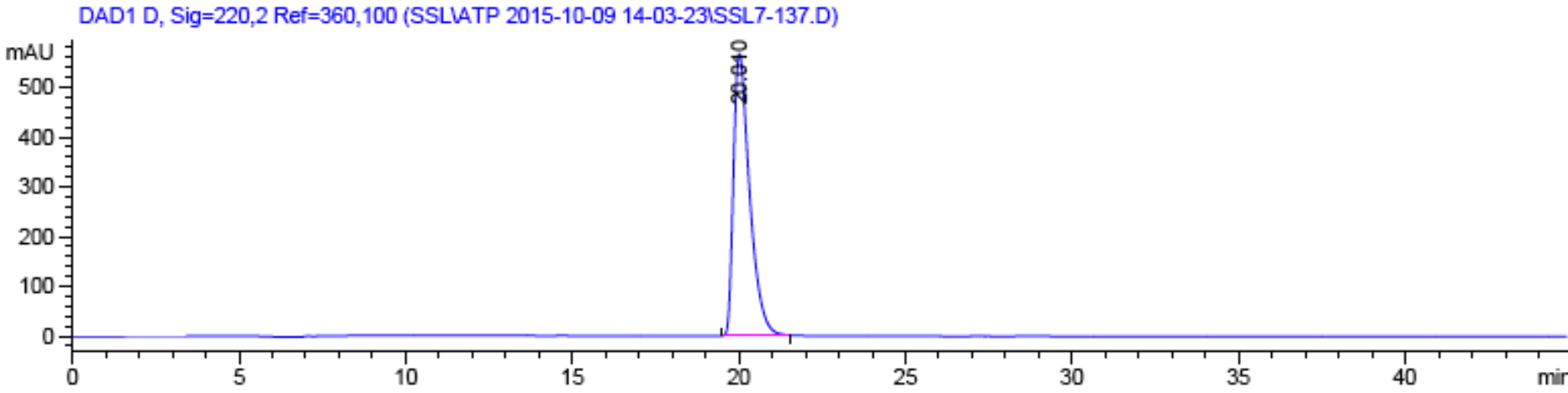
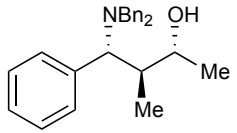
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   5
Acq. Instrument : Instrument 1                  Location : Vial 62
Injection Date  : 10/9/2015 3:49:01 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-10-09 14-03-23\01-30.M
```



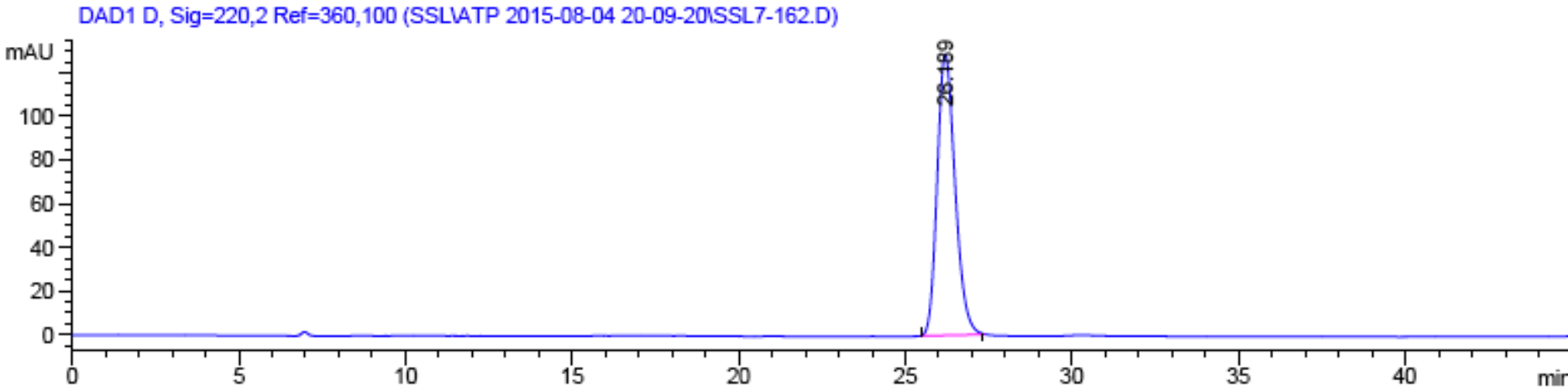
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	20.010	BB	0.5069	1.90614e4	566.07062	100.0000
Totals :				1.90614e4	566.07062	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 20-09-20\SSL7-162.D
Sample Name: SSL7-162



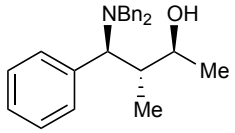

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 41
Injection Date  : 8/4/2015 8:10:30 PM              Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 1 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-08-04 20-09-20\01-30.M
Last changed    : 8/4/2015 8:09:34 PM by SSL
```



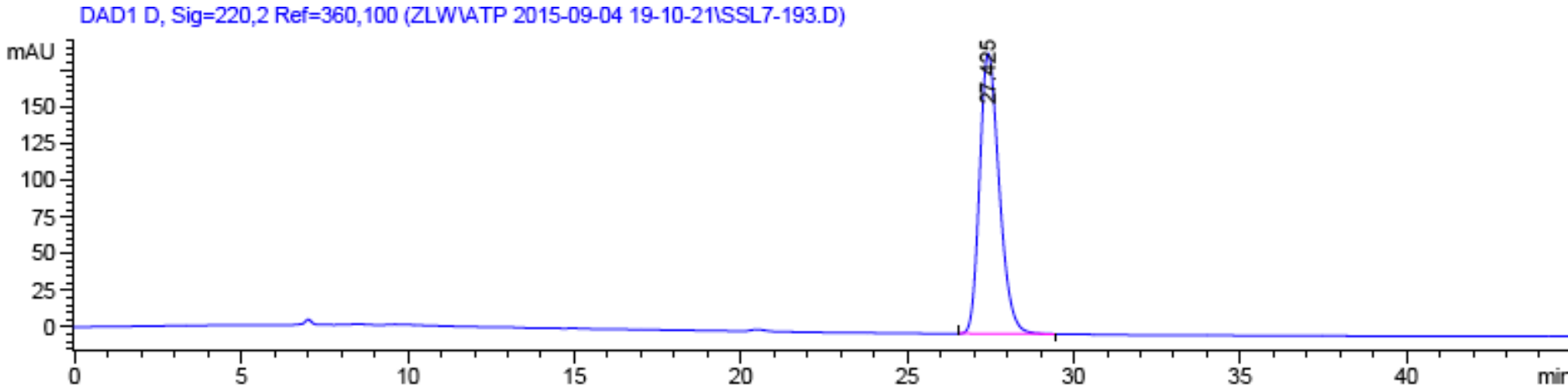
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.189	BB	0.5768	4822.30322	128.80783	100.0000
Totals :				4822.30322	128.80783	

Data File C:\CHEM32\1\DATA\ZLW\ATP 2015-09-04 19-10-21\SSL7-193.D
Sample Name: SSL7-193




```
==========================================================================
Acq. Operator   : ZLW                              Seq. Line :   1
Acq. Instrument : Instrument 1                     Location : Vial 31
Injection Date  : 9/4/2015 7:11:38 PM                 Inj :   1
                                                  Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\ZLW\ATP 2015-09-04 19-10-21\30-60.M
Last changed    : 9/4/2015 7:41:38 PM by ZLW
```



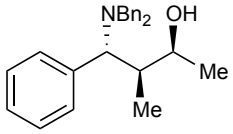
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

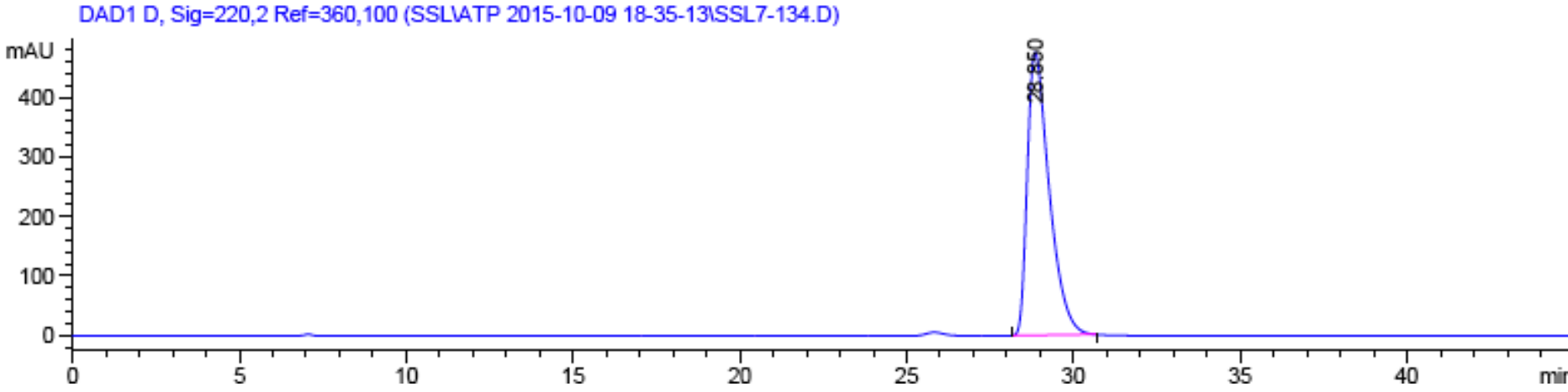
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	27.425	BB	0.6339	7814.40088	190.76607	100.0000
Totals :				7814.40088	190.76607	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-09 18-35-13\SSL7-134.D
Sample Name: SSL7-134

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 61
Injection Date : 10/9/2015 6:36:36 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-10-09 18-35-13\01-30.M
Last changed : 10/9/2015 2:03:21 PM by SSL





Signal 4: DAD1 D, Sig=220,2 Ref=360,100

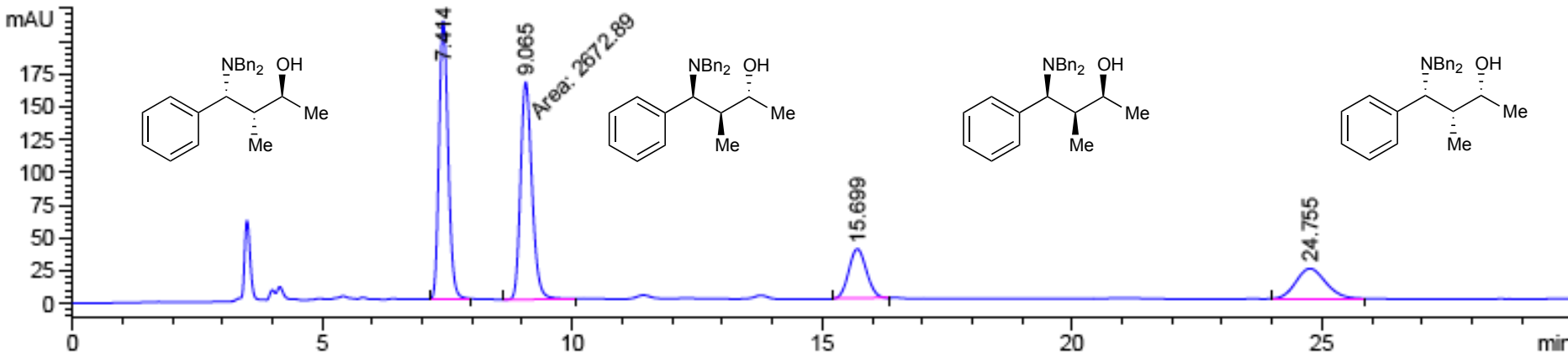
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	28.850	BB	0.6899	2.17376e4	474.96344	100.0000
Totals :				2.17376e4	474.96344	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-09-25 19-59-33\SSL7-223-LP-MP.D
Sample Name: SSL7-223-LP-MP

==========

Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 44
Injection Date : 9/25/2015 8:00:48 PM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-09-25 19-59-33\01-30.M
Last changed : 9/25/2015 8:29:10 PM by SSL

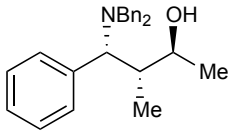
DAD1 D, Sig=220,2 Ref=360,100 (SSL\ATP 2015-09-25 19-59-33\SSL7-223-LP-MP.D)



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.414	BB	0.1982	2694.06079	212.10439	37.0524
2	9.065	MM	0.2686	2672.89282	165.85046	36.7613
3	15.699	BB	0.3875	940.10803	37.88538	12.9296
4	24.755	BB	0.6477	963.88971	23.05795	13.2567
Totals :				7270.95135	438.89818	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 21-00-30\SSL7-241.D
Sample Name: SSL7-241



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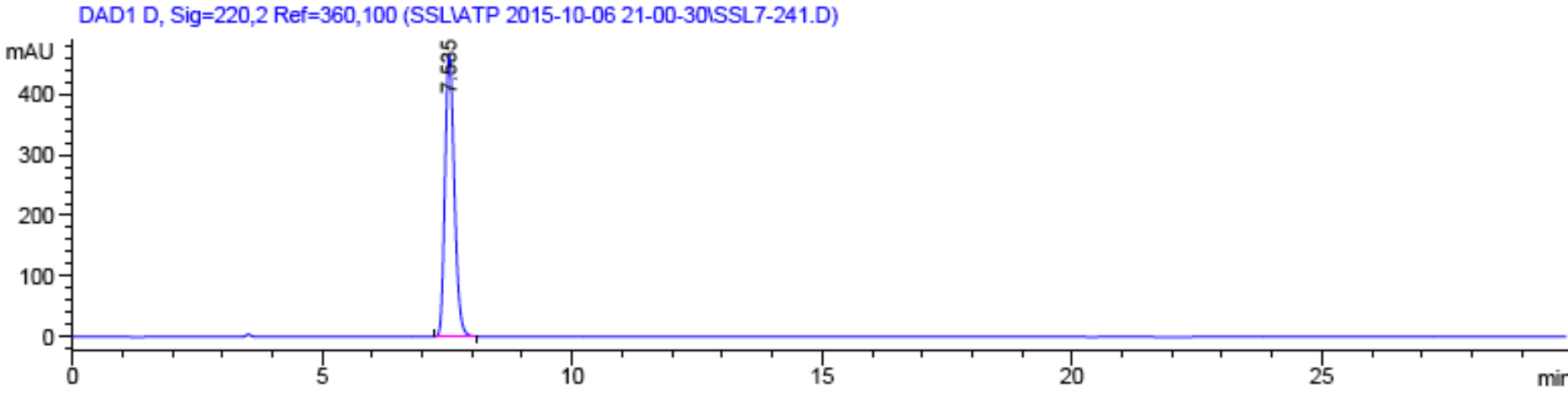
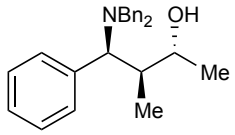
Acq. Operator : SSL Seq. Line : 2
Acq. Instrument : Instrument 1 Location : Vial 51
Injection Date : 10/6/2015 9:27:39 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 0.4 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-10-06 21-00-30\01-30.M
Last changed : 10/6/2015 9:26:27 PM by SSL



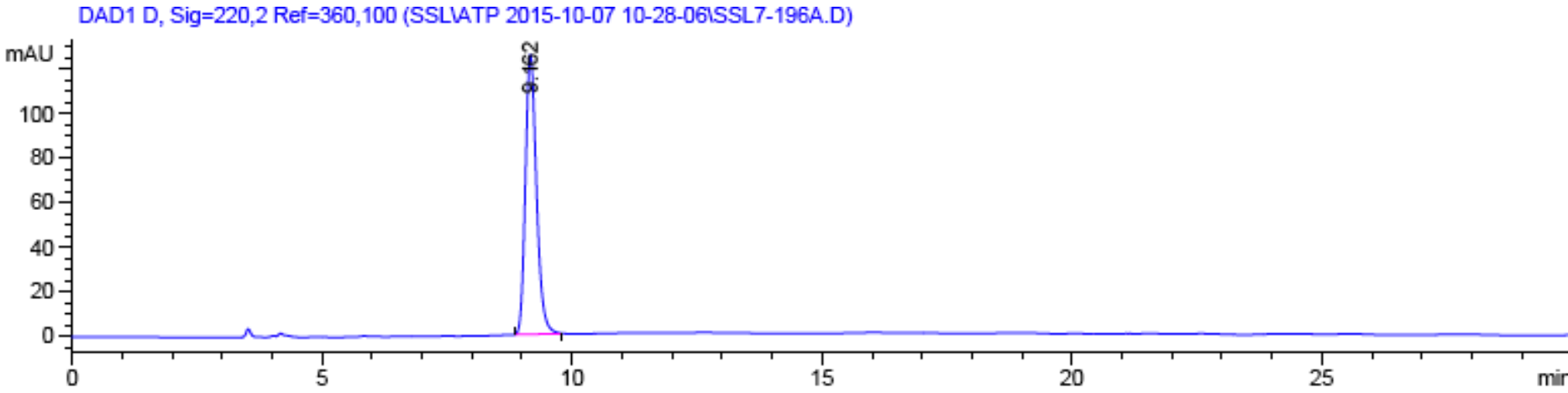
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.535	BB	0.2018	6083.99463	467.47156	100.0000
Totals :				6083.99463	467.47156	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-07 10-28-06\SSL7-196A.D
Sample Name: SSL7-196A



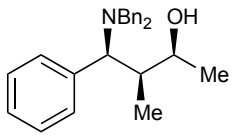

```
==========================================================================
Acq. Operator   : SSL                                 Seq. Line :   1
Acq. Instrument : Instrument 1                       Location : Vial 61
Injection Date  : 10/7/2015 10:29:33 AM                   Inj :   1
                                                   Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\ATP 2015-10-07 10-28-06\01-30.M
Last changed    : 10/7/2015 10:28:04 AM by SSL
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.162	BB	0.2381	1938.92920	125.57664	100.0000
Totals :				1938.92920	125.57664	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-14 02-41-55\SSL7-248B-MP.D
Sample Name: SSL7-248B-MP

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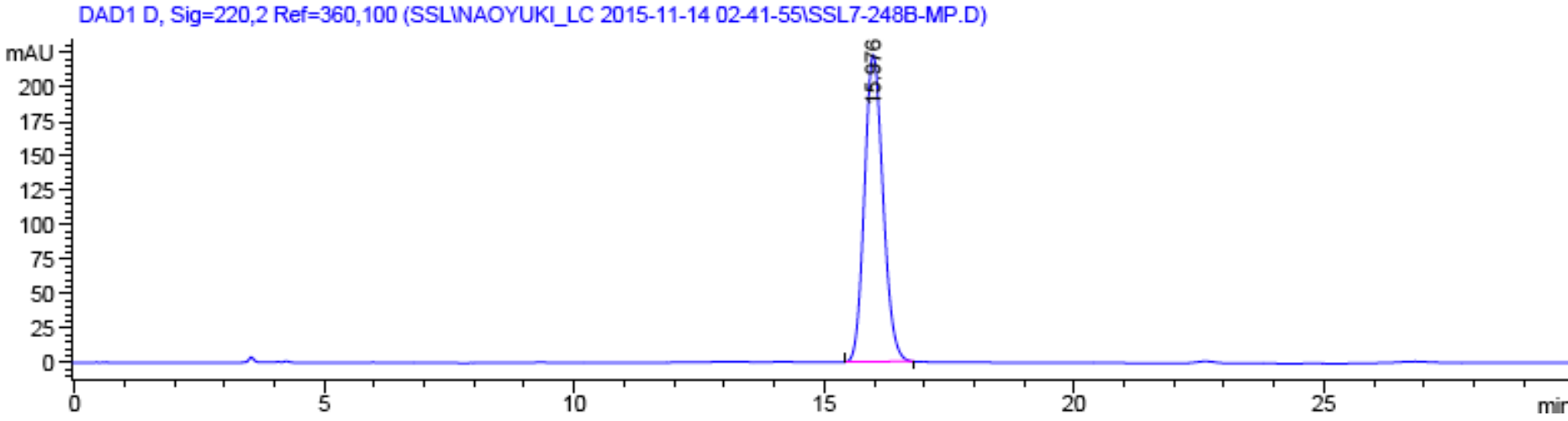
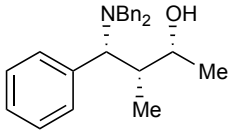
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   3
Acq. Instrument : Instrument 1                  Location : Vial 62
Injection Date  : 11/14/2015 3:45:42 AM            Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-14 02-41-55\01-30.M
Last changed    : 11/14/2015 2:41:53 AM by SSL
```



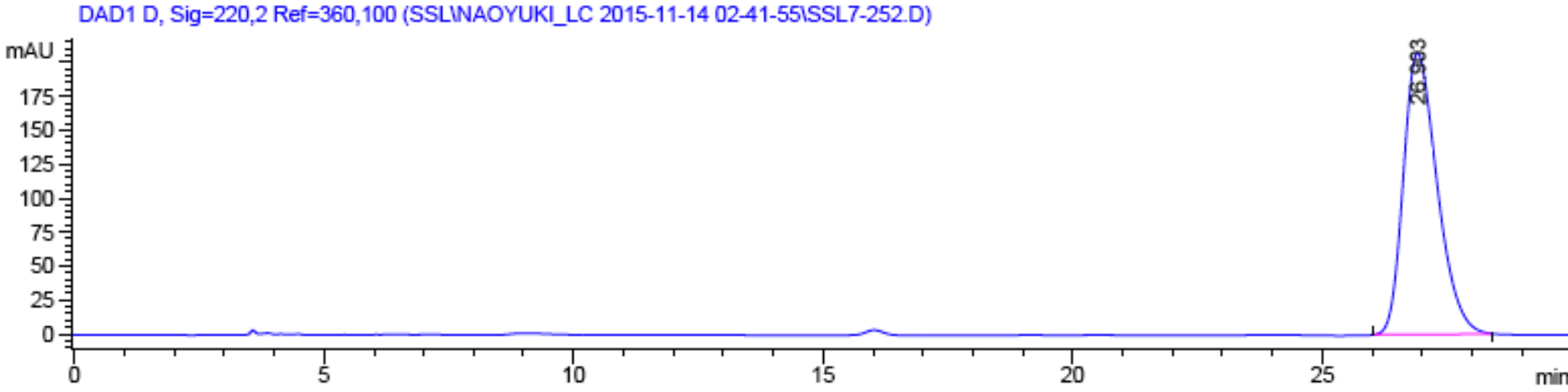
Signal 4: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.976	BB	0.4030	5785.80664	222.80997	100.0000
Totals :				5785.80664	222.80997	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-14 02-41-55\SSL7-252.D
Sample Name: SSL7-252



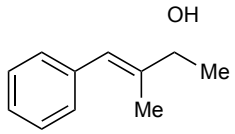

```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 61
Injection Date  : 11/14/2015 2:43:18 AM              Inj :   1
                                               Inj Volume : 5 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-11-14 02-41-55\01-30.M
Last changed    : 11/14/2015 2:41:53 AM by SSL
```



Signal 4: DAD1 D, Sig=220,2 Ref=360,100

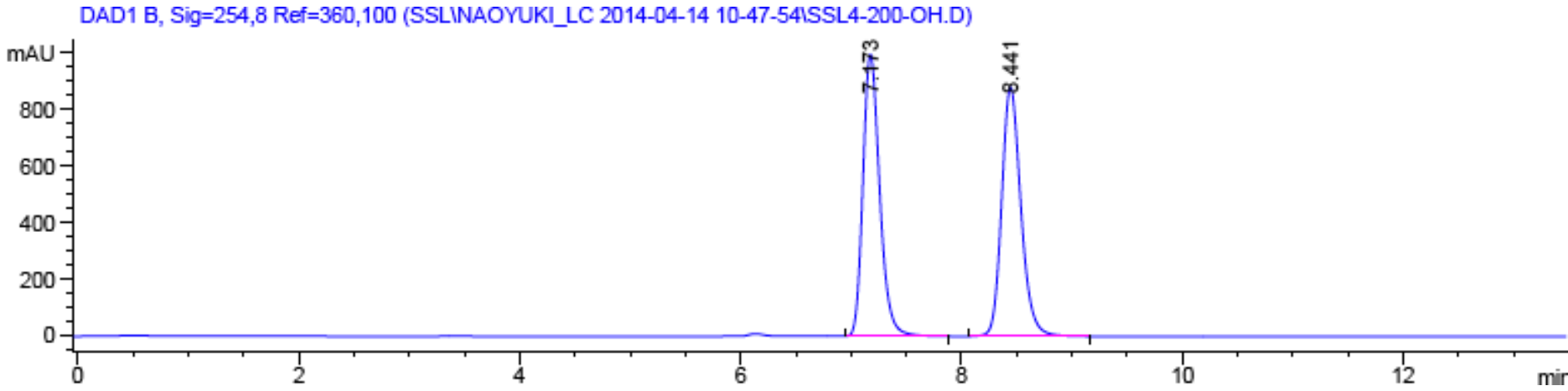
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.903	BB	0.7261	9778.30176	207.38763	100.0000
Totals :				9778.30176	207.38763	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-04-14 10-47-54\SSL4-200-OH.D
Sample Name: SSL4-200-OH



Racemic

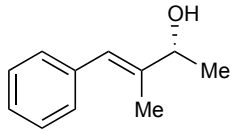
```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 4/14/2014 10:49:19 AM            Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 0.4 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2014-04-14 10-47-54\05-30.M
Last changed    : 4/13/2014 11:02:36 AM by SSL
```



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

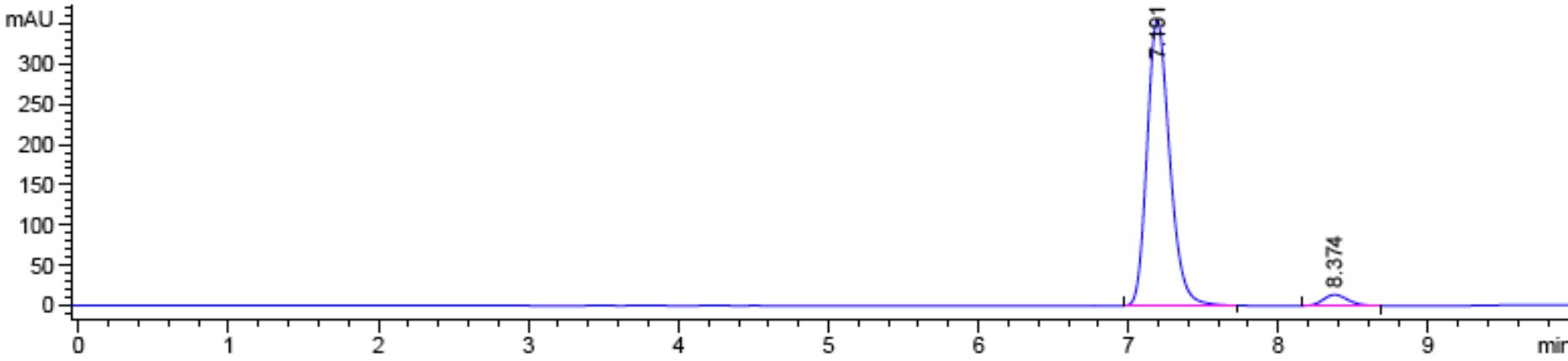
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.173	BB	0.1610	1.05178e4	997.51160	49.6218
2	8.441	BB	0.1855	1.06781e4	880.51263	50.3782
Totals :				2.11959e4	1878.02423	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-20 19-16-45\SSL7-138.D
Sample Name: SSL7-138




```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 7/20/2015 7:19:09 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-20 19-16-45\05-60.M
Last changed    : 7/20/2015 7:16:43 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

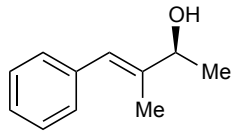
DAD1 B, Sig=254,8 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-20 19-16-45\SSL7-138.D)



Signal 2: DAD1 B, Sig=254,8 Ref=360,100

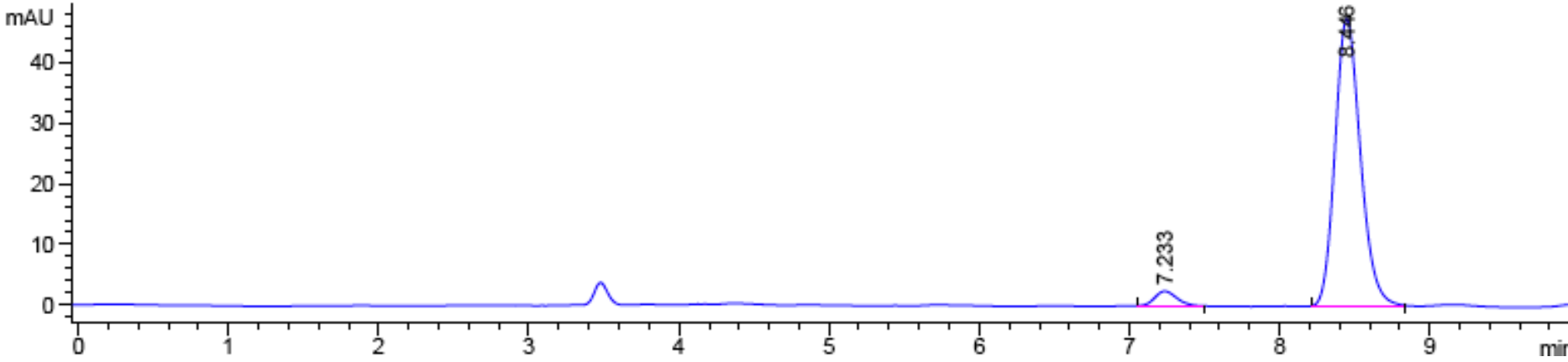
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.191	BB	0.1602	3728.16626	355.93408	95.8873
2	8.374	BB	0.1792	159.90430	13.80166	4.1127
Totals :				3888.07056	369.73574	

Data File C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-17 16-39-22\SSL7-135.D
Sample Name: SSL7-135




```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 1                  Location : Vial 51
Injection Date  : 7/17/2015 4:41:46 PM             Inj :   1
                                               Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 2 µl
Acq. Method     : C:\CHEM32\1\DATA\SSL\NAOYUKI_LC 2015-07-17 16-39-22\05-30.M
Last changed    : 7/17/2015 4:03:41 PM by SSL
Analysis Method : C:\CHEM32\1\METHODS\10-30.M
```

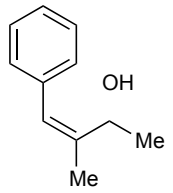
DAD1 D, Sig=220,2 Ref=360,100 (SSL\NAOYUKI_LC 2015-07-17 16-39-22\SSL7-135.D)



Signal 2: DAD1 D, Sig=220,2 Ref=360,100

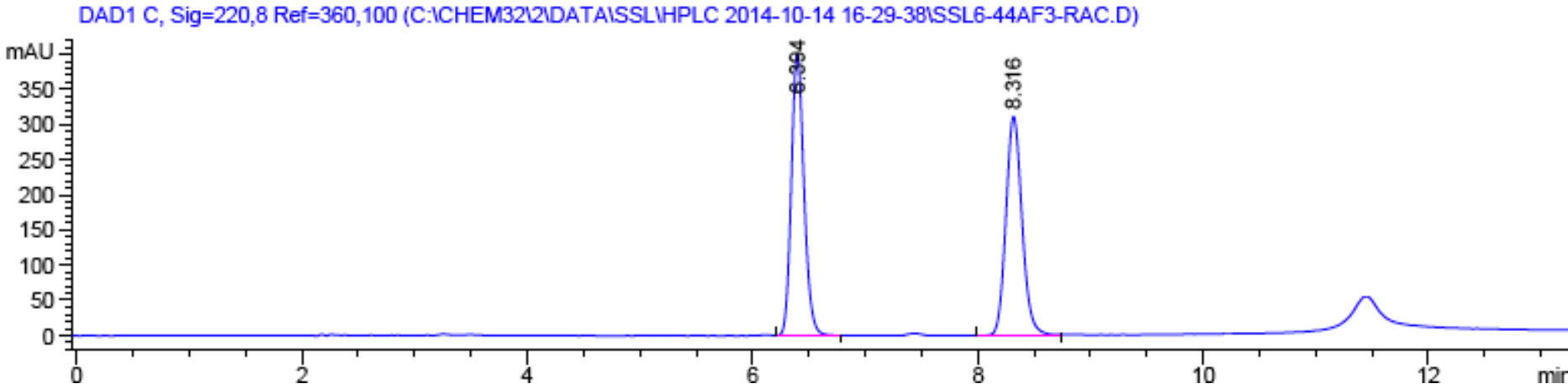
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.233	BB	0.1603	25.90520	2.47071	4.4371
2	8.446	BB	0.1810	557.93237	47.51030	95.5629
Totals :				583.83757	49.98101	

Data File C:\CHEM32\2\DATA\SSL\HPLC 2014-10-14 16-29-38\SSL6-44AF3-RAC.D
Sample Name: SSL6-44AF3-RAC



Racemic

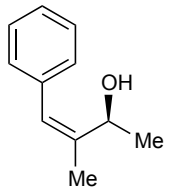
```
==========================================================================
Acq. Operator   : SSL                          Seq. Line :   1
Acq. Instrument : Instrument 2                  Location : Vial 21
Injection Date  : 10/14/2014 4:31:29 PM              Inj :   1
                                              Inj Volume : 5 µl
Different Inj Volume from Sequence !     Actual Inj Volume : 3 µl
Acq. Method     : C:\CHEM32\2\DATA\SSL\HPLC 2014-10-14 16-29-38\5IPA30.M
Last changed    : 10/14/2014 4:44:48 PM by SSL
```



Signal 3: DAD1 C, Sig=220,8 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.394	VB	0.1215	3149.59424	401.46671	50.1508
2	8.316	BB	0.1552	3130.65649	311.76419	49.8492
Totals :				6280.25073	713.23090	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-03 17-23-00\SSL7-232.D
Sample Name: SSL7-232



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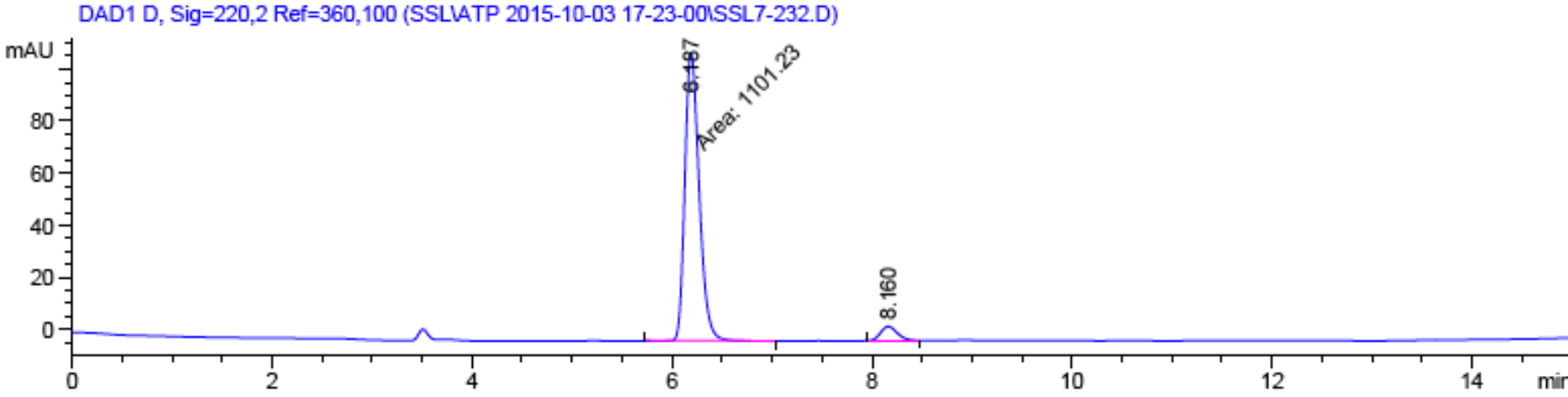
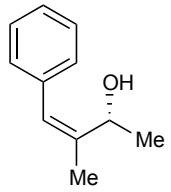
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 44
Injection Date : 10/3/2015 5:24:20 PM Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-10-03 17-23-00\05-30.M
Last changed : 10/3/2015 5:22:58 PM by SSL



Signal 2: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.187	MM	0.1656	1101.23376	110.86546	94.5828
2	8.160	BB	0.1812	63.07291	5.44193	5.4172
Totals :				1164.30668	116.30739	

Data File C:\CHEM32\1\DATA\SSL\ATP 2015-10-01 20-00-35\SSL7-227.D
Sample Name: SSL7-227



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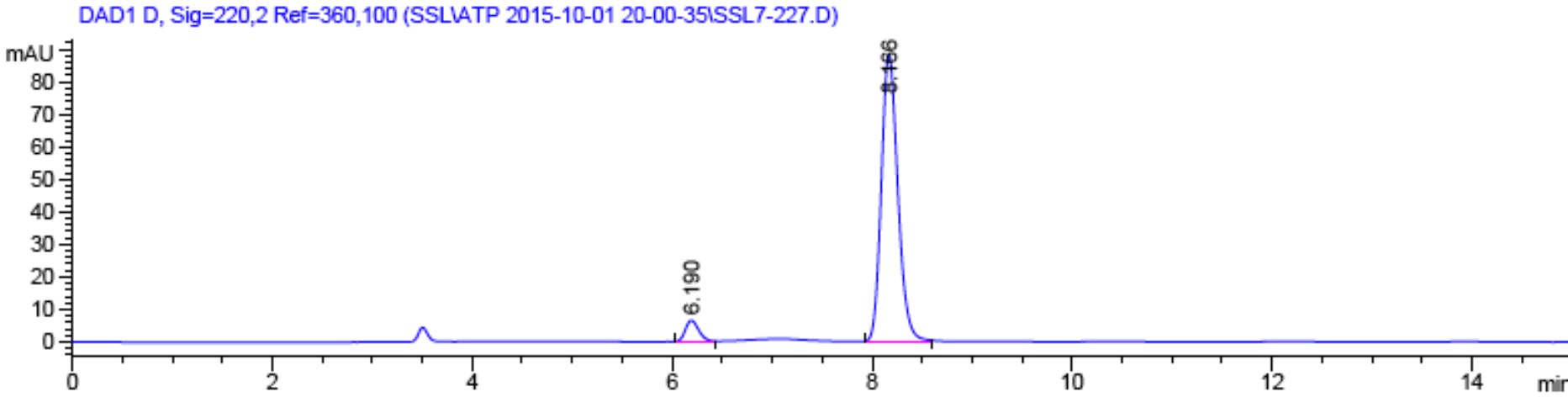
Acq. Operator : SSL Seq. Line : 1
Acq. Instrument : Instrument 1 Location : Vial 44
Injection Date : 10/1/2015 8:01:53 PM Inj : 1
Inj Volume : 5 µl
Different Inj Volume from Sequence ! Actual Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\SSL\ATP 2015-10-01 20-00-35\05-30.M
Last changed : 10/1/2015 8:00:33 PM by SSL



Signal 2: DAD1 D, Sig=220,2 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.190	BB	0.1410	59.11678	6.44685	5.5212
2	8.166	BB	0.1776	1011.60748	88.34971	94.4788
Totals :				1070.72426	94.79656	