

**SUPPORTING INFORMATION FOR: PLATINUM-CATALYZED TANDEM
DIBORATION/ASYMMETRIC ALLYLBORATION: ACCESS TO NONRACEMIC
FUNCTIONALIZED 1,3-DIOLS.**

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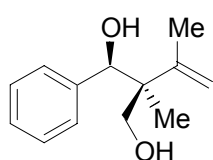
General. ^1H NMR spectra were recorded on Bruker DRX (400 or 300 MHz) spectrometers. Chemical shifts are reported in ppm from tetramethylsilane with the solvent resonance as the internal standard (CDCl_3 : 7.24 ppm). Data are reported as follows: chemical shift, integration, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, br = broad, m = multiplet), coupling constants (Hz) and assignment. ^{13}C NMR were recorded on a Bruker 400 MHz (100 MHz) spectrometer with complete proton decoupling. Chemical shifts are reported in ppm from tetramethylsilane with the solvent as the internal standard (CDCl_3 : 77.0 ppm). Infrared (IR) spectra were obtained using a Nicolet 560 infrared spectrometer.

Liquid chromatography was performed using forced flow (flash chromatography) on silica gel (SiO_2 , 32 to 63 μm) purchased from Scientific Absorbent, Inc. Thin layer chromatography (TLC) was performed on EM science 0.25 mm silica gel 60 plates. Visualization was achieved with phosphomolybdic acid in ethanol or potassium permanganate in water, each followed by heating.

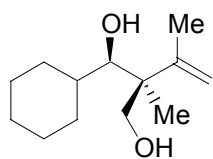
All reactions were conducted in oven and flame dried glassware under an inert atmosphere of dry nitrogen. ^1H NMR samples were prepared in a glovebox under an inert atmosphere of dry nitrogen. Deuterated solvents were used as received. Benzene was distilled over CaH_2 and freeze-pump-thaw degassed. Toluene was passed through activated basic alumina. $\text{Pt}(\text{dba})_2$ was synthesized by literature procedure (Cherwinski, W. J.; Johnson B.; Lewis, J. J. *Chem. Soc., Dalton Trans.* **1974**, 1404-1409). Aldehydes were purchased from Aldrich and used after distillation. (R)-2,2-Dimethyl-1,3-dioxolane-4-carboxaldehyde was synthesized from 1,2:5,6-Di-O-isopropylidene-D-mannitol and (S)-2,2-Dimethyl-1,3-dioxolane-4-carboxaldehyde was synthesized from (R)-3-buten-1,2-diol. All other reagents were purchased from Aldrich Chemical Companies and used directly.

Representative Procedure for the Tandem Diboration/Allylation. Using a dry-box under an inert N_2 atmosphere, 3.3 mg (0.005mmol) of $\text{Pt}(\text{dba})_2$ and 1.4 mg (0.005mmol) of tricyclohexyl phosphine were weighed into a dry 25 ml round bottom flask containing a Teflon-coated magnetic stir bar. 95 mg (0.2mmol) of (L)-Bis(diethyltartrateglycato) diboron (90%) were added to the flask. Upon the addition of 1 mL of benzene, a purple solution was formed. After stirring momentarily, 16.4 mg (0.2mmol) of 2,3-dimethyl-1,3-butadiene was added to the solution dropwise. The flask was sealed with a rubber septum and the solution was stirred for 12 hours under an inert atmosphere. To the resulting light brown solution was added 80 mg of activated 4Å molecular sieves. Upon dilution with 2.75 mL of toluene, the solution was cooled to -78°C in a dry ice/acetone bath. 0.2 mmol of cyclohexane carboxaldehyde (0.8M in

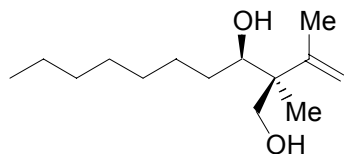
toluene) were added dropwise via syringe over a 45 minute period to ensure that reaction temperature remained at -78°C . The reaction mixture was stirred for 3 hours before warming to room temperature. Volatiles were removed *in vacuo* leaving a brown residue, which was subsequently dissolved in 4 mL of THF. 907 μL (8mmol) of 30% H_2O_2 and 800 μL (2.4mmol) of 3M NaOH were added. The two-phase mixture was heated to 50°C for 2 hours. The reaction was quenched with 5 mL of saturated sodium thiosulfate, and the aqueous layer was extracted with 2 x 20 mL of ethyl acetate. The combined organic layers were dried with Na_2SO_4 , filtered and concentrated. The crude material was purified by column chromatography (silica gel, 3:1 hexane:ethyl acetate). Isolated yield of 30.6 mg (0.14 mmol, 72% yield).



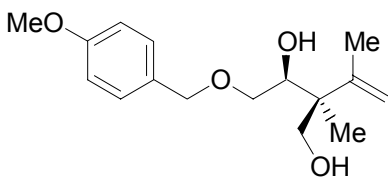
(1R,2S)-2-Isopropenyl-2-methyl-1-phenyl-propane-1,3-diol. ^1H NMR (400 MHz, CDCl_3): 7.22-7.31 (5H, br m, aryl CH), 5.01 (1H, m, $\text{C}=\text{CH}$), 4.93 (1H, s, $\text{C}=\text{CH}$), 4.87 (1H, s, CHOH), 3.75 (1H, d, $^2J_{\text{AB}}=11.2$ Hz, CH_2OH), 3.60 (1H, d, $^2J_{\text{AB}}=11.2$ Hz, CH_2OH), 1.73 (3H, s, $\text{C}=\text{CCH}_3$), 0.85 (3H, s, CCH_3). ^{13}C NMR (100 MHz): 147.1, 140.7, 127.6, 127.5, 127.4, 113.2, 79.4, 67.9, 48.1, 20.6, 17.6. IR: 3460 (br), 3054 (m), 2987 (m), 1639 (m), 1422 (m), 1265 (s). HRMS Calc'd for $\text{C}_{13}\text{H}_{18}\text{O}_2$ $\text{M}+\text{NH}_4^+$: 224.1651; Found: 224.1660.



(1R,2S)-1-Cyclohexyl-2-isopropenyl-2-methyl-propane-1,3-diol. ^1H NMR (400 MHz, CDCl_3): 4.97 (1H, m, $\text{C}=\text{CH}$), 4.89 (1H, s, $\text{C}=\text{CH}$), 3.67 (1H, d, $J=4.0$ Hz, CHOH), 3.66 (1H, d, $^2J_{\text{AB}}=10.8$ Hz, CH_2OH), 3.50 (1H, d, $^2J_{\text{AB}}=10.8$ Hz, CH_2OH), 1.74 (3H, d, $^4J=0.8$ Hz, $\text{C}=\text{CCH}_3$), 1.4-1.9 (5H, m, ring CH), 1.1 (6H, br m, ring CH), 1.06 (3H, s, CCH_3). ^{13}C NMR (100 MHz): 147.7, 113.1, 79.7, 69.8, 48.8, 40.2, 32.9, 28.3, 26.7, 26.3, 26.2, 20.5, 15.6. IR: 3444 (br), 3054 (m), 2987 (m), 1636 (m), 1422 (m), 1265 (s). HRMS Calc'd for $\text{C}_{13}\text{H}_{24}\text{O}_2$ $\text{M}+\text{NH}_4^+$: 230.2120; Found: 230.2124.

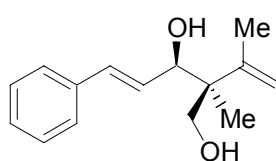


(1R,2S)-2-Isopropenyl-2-methyl-decane-1,3-diol. ^1H NMR (400 MHz, CDCl_3): 4.98 (1H, m, $\text{C}=\text{CH}$), 4.89 (1H, s, $\text{C}=\text{CH}$), 3.80 (1H, dd, $J=9.6$ Hz, $J=2.0$ Hz, CHOH), 3.71 (1H, d, $^3J_{\text{AB}}=10.8$ Hz, CH_2OH), 3.57 (1H, d, $^3J_{\text{AB}}=10.8$ Hz, CH_2OH), 1.72 (3H, d, $^4J=0.8$ Hz, $\text{C}=\text{CCH}_3$), 1.1-1.6 (13H, m, aliphatic CH), 0.99 (3H, s, CCH_3), 0.85 (3H, t, $J=6.8$ Hz, CH_2CH_3). ^{13}C NMR (100 MHz): 147.4, 113.1, 76.0, 69.0, 48.1, 31.9, 31.8, 29.6, 29.3, 26.9, 22.6, 20.2, 15.3, 14.4. IR: 3427 (br), 3054 (m), 2928 (m), 2856 (m), 1635 (m), 1422 (m), 1265 (s). HRMS Calc'd for $\text{C}_{14}\text{H}_{28}\text{O}_2$ $\text{M}+\text{NH}_4^+$: 246.2433; Found: 246.2442.

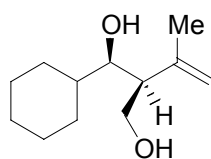


(1S,2S)-2-Isopropenyl-4-(4-methoxy-benzyloxy)-2-methyl-butane-1,3-diol. ^1H NMR (400 MHz, CDCl_3): 7.23 (2H, d, $J=8.4$ Hz, aromatic CH), 6.86 (2H, d, $J=8.4$ Hz, aromatic CH), 4.95 (1H, m, $\text{C}=\text{CH}$), 4.89 (1H, s, $\text{C}=\text{CH}$), 4.44 (2H, s, CCH_2O), 4.08 (1H, dd, $J=8.4$ Hz, $J=2.4$ Hz, CHOH), 3.79 (1H, s, OCH_3), 3.74 (1H, d, $^2J_{\text{AB}}=11.2$ Hz, CH_2OH), 3.50 (1H, d, $^2J_{\text{AB}}=11.2$ Hz, CH_2OH), 3.47 (1H, dd, $J=9.6$ Hz, $J=2.4$ Hz, OCH_2CHOH), 3.37 (1H, dd, $J=8.4$ Hz, $J=9.6$ Hz, OCH_2CHOH), 1.72 (3H, s, $\text{C}=\text{CCH}_3$), 1.04 (3H, s, CCH_3). ^{13}C NMR (100 MHz): 159.3, 146.4,

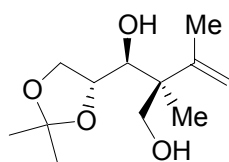
129.8, 129.3, 113.9, 113.4, 74.2, 73.1, 70.9, 69.1, 55.3, 46.3, 20.1, 15.2. IR: 3421 (br), 3055 (m), 2987 (m), 1639 (m), 1422 (m), 1265 (s). HRMS Calc'd for $C_{16}H_{24}O_4$ M+NH₄⁺: 298.2018; Found: 298.2013.



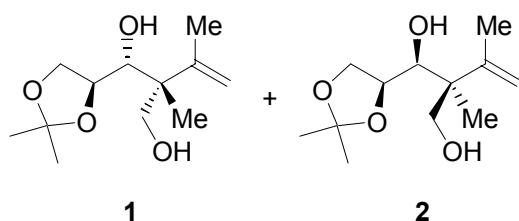
(1R,2S)-2-Isopropenyl-2-methyl-5-phenyl-pent-4-ene-1,3-diol. ¹H NMR (400 MHz, CDCl₃): 7.2-7.4 (5H, m, ring CH), 6.64 (1H, d, J=16.0 Hz, CH=CHCHOH), 6.27 (1H, dd, J=16.0 Hz, J=6.0 Hz, CH=CHCHOH), 5.06 (1H, m, C=CH₂), 5.01 (1H, s, C=CH₂), 4.55 (1H, s, CH=CHCHOH), 3.82 (1H, d, ²J_{AB}=11.2 Hz, CH₂OH), 3.72 (1H, d, ²J_{AB}=11.2 Hz, CH₂OH), 1.83 (3H, d, ⁴J=0.8 Hz, C=CCH₃), 1.03 (3H, s, CCH₃). ¹³C NMR (100 MHz): 146.9, 136.7, 131.7, 128.6, 128.3, 127.7, 126.5, 113.4, 76.7, 68.3, 48.3, 20.3, 16.9. IR: 3448 (br), 3054 (m), 2987 (m), 1639 (m), 1422 (m), 1265 (s). HRMS Calc'd for $C_{15}H_{20}O_2$ M+NH₄⁺: 250.1807; Found: 250.1808.



(1R,2S)-1-Cyclohexyl-2-isopropenyl-propane-1,3-diol. Catalysis of the diboration proceeded with 0.01 mmol of ethylenebis(triphenylphosphine)platinum(0). The reaction required heating to 80 °C for 24 hours to reach completion. The allylation reaction was then carried out as described in the general procedure. ¹H NMR (400 MHz, CDCl₃): 4.90 (1H, m, C=CH), 4.80 (1H, s, C=CH), 3.84 (1H, dd, ²J_{AB}=10.8 Hz, ³J_{AX}=6.8 Hz, CH₂OH), 3.70 (1H, dd, ²J_{AB}=10.8 Hz, ³J_{BX}=5.2 Hz, CH₂OH), 3.59 (1H, dd, J=8.8 Hz, 3.2 Hz, CHOH), 2.43 (1H, ddd, J=8.8 Hz, 6.8 Hz, 5.2 Hz, CHCH₂OH), 1.69 (3H, s, C=CCH₃), 1.6-1.8 (4H, m, aliphatic CH), 1.3-1.55 (2H, m, aliphatic CH), 1.0-1.3 (5H, m, aliphatic CH). ¹³C NMR (100 MHz): 143.7, 113.6, 78.2, 64.9, 51.0, 40.4, 30.4, 26.5, 26.4, 26.1, 25.5, 21.4. IR: 3450 (br), 3054 (m), 2987 (m), 2929 (m), 1644 (m), 1422 (m), 1265 (s). HRMS Calc'd for $C_{12}H_{22}O_2$ M+NH₄⁺: 216.1964; Found: 216.1960.



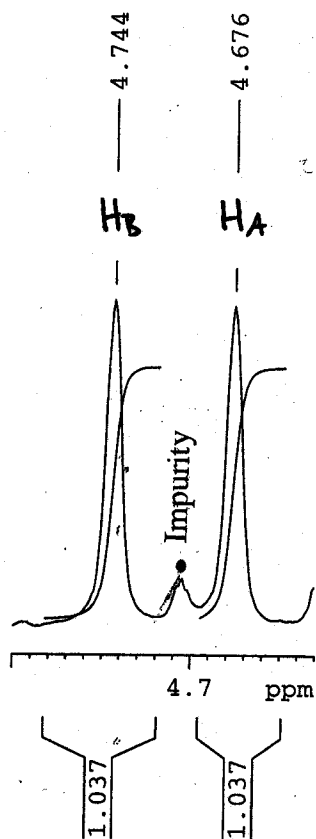
(1S,2S,4'R)-1-(2,2-Dimethyl-[1,3]dioxolan-4-yl)-2-isopropenyl-2-methyl-propane-1,3-diol. ¹H NMR (400 MHz, CDCl₃): 5.01 (1H, m, C=CH), 4.91 (1H, s, C=CH), 4.13 (1H, br d, CHOH), 4.08 (1H, ddd, J=7.2 Hz, 7.2 Hz, 2.8 Hz, CHOC(CH₃)₂), 3.94 (1H, dd, J=8.0 Hz, 7.2 Hz, CH₂OC(CH₃)₂), 3.91 (1H, dd, J=8.0 Hz, 7.2 Hz, CH₂OC(CH₃)₂), 3.77 (1H, d, ²J_{AB}=11.2 Hz, CH₂OH), 3.53 (1H, d, ²J_{AB}=11.2 Hz, CH₂OH), 1.78 (3H, d, ⁴J=0.8 Hz, C=CCH₃), 1.39 (3H, s, C(CH₃)₂), 1.31 (3H, s, C(CH₃)₂), 1.01 (3H, s, CCH₃). ¹³C NMR (100 MHz): 146.5, 113.7, 107.7, 76.5, 75.0, 69.1, 64.5, 46.6, 26.4, 25.1, 20.2, 15.9. IR: 3445 (br), 3055 (m), 2987 (m), 1636 (m), 1422 (m), 1266 (s). HRMS Calc'd for $C_{12}H_{22}O_4$ M+H: 231.1596; Found: 231.1599.



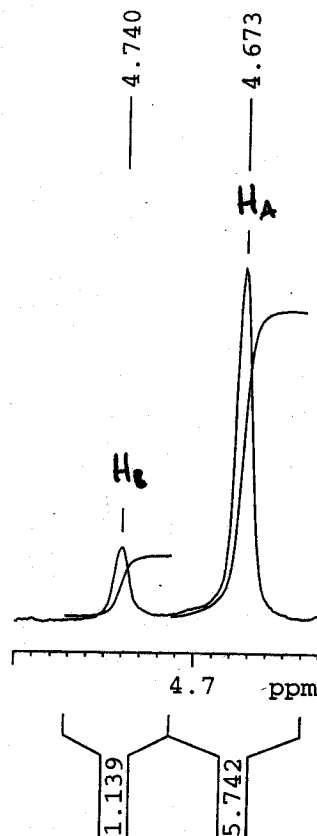
1-(2,2-Dimethyl-[1,3]dioxolan-4-yl)-2-isopropenyl-2-methyl-propane-1,3-diol. ¹H NMR (400 MHz, CDCl₃): An equal mixture of diastereomers was formed one of which was identical to the 1S,2S,4'R isomer described above. The other was characterized by ¹³C NMR (100 MHz) only: 146.7, 113.9, 109.6, 74.6, 73.5, 68.7, 67.5, 47.8, 26.2, 25.8, 20.3, 15.8.

HRMS Calc'd for $C_{12}H_{22}O_4$ M+H: 231.1596; Found: 231.1586.

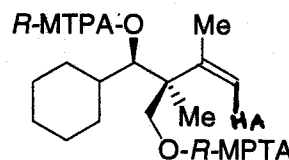
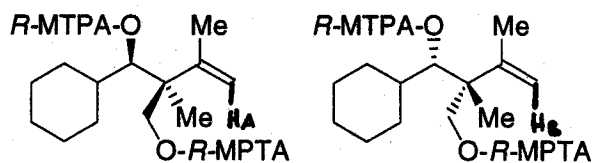
Determination of Enantiopurity. Each diol was converted to the bis-Mosher's Ester via the following procedure: 0.05 mmol of the corresponding diol was transferred to a small vial containing 0.1 mmol of dimethylaminopyridine. 500 μ L of CDCl_3 was added followed by triethylamine (0.25 mmol) and (*R*)-(-)-Mosher's acid chloride (0.11 mmol, Fluka). The yellow solutions were allowed to stand for 1-8 hours, depending on diol structure and then analyzed by ^1H -NMR.



Representative ^1H -NMR peaks for racemic Mosher's ester product



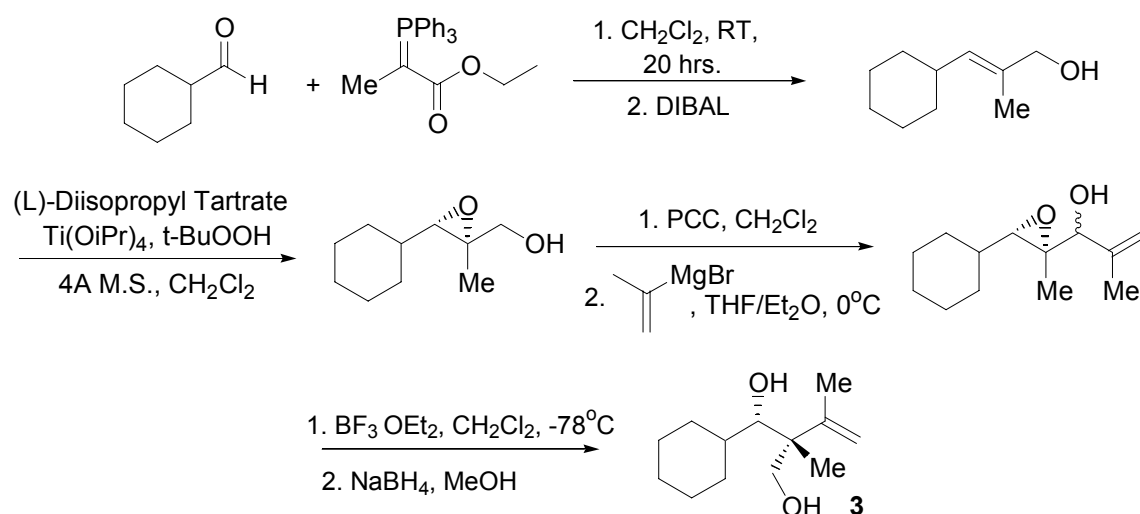
Representative ^1H -NMR peaks for enantioenriched Mosher's ester product



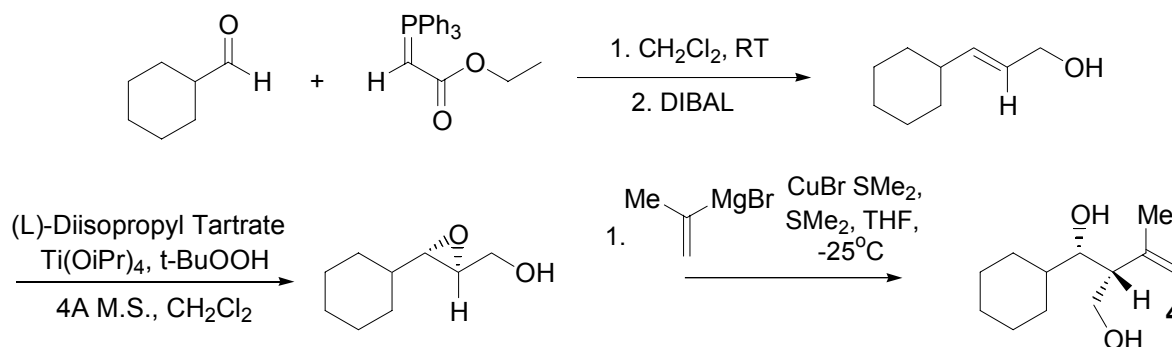
Proof of Absolute Stereochemistry. The absolute configuration of the 1,3-diol products was proven by independent synthesis as shown in the following schemes. In both examples, the absolute

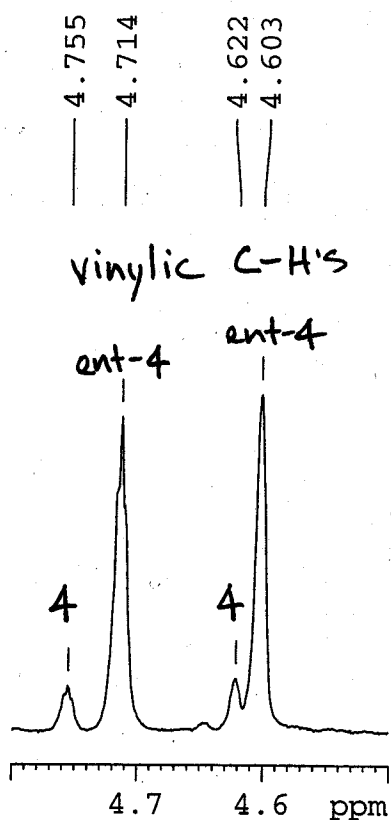
configuration is derived from the Sharpless asymmetric epoxidation using L-diisopropyl tartrate (Gao, Y.; Hanson, R. M.; Klunder, S.; Masamune, H.; Sharpless, K. B. *J. Am. Chem. Soc.* **1987**, *109*, 5765-5780). For compound **3** (Scheme A), the quaternary center is set by a 1,2-isopropenyl shift initiated by Lewis acid induced epoxide opening (Shimazaki, M.; Hara, H.; Suzuki, K.; Tsuchihashi, G. *Tetrahedron Lett.* **1987**, *28*, 5891-5894). For compound **4** (Scheme B), the epoxide is opened with *iso*-propenyl cuprate prepared *in situ* (Roush, W. R.; Ando, K.; Powers, D. B.; Palkowitz, A. D.; Halterman, R. L. *J. Am. Chem. Soc.* **1990**, *112*, 6339-6348). Each diol product was converted to the bis-Mosher's ester as described previously. In both cases, the major resonance corresponded to the minor product formed in the diboration/allylation were present. Based on this observation, the major products formed in the diboration/allylation with L-tartrate-derived bis-boronate are the enantiomer of the independently synthesized diols.

Scheme A

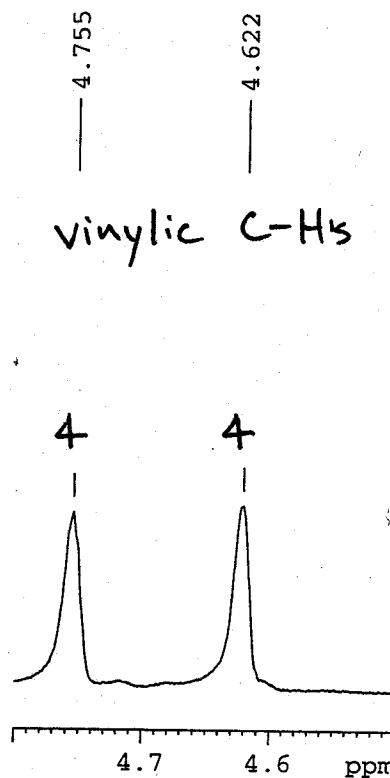


Scheme B



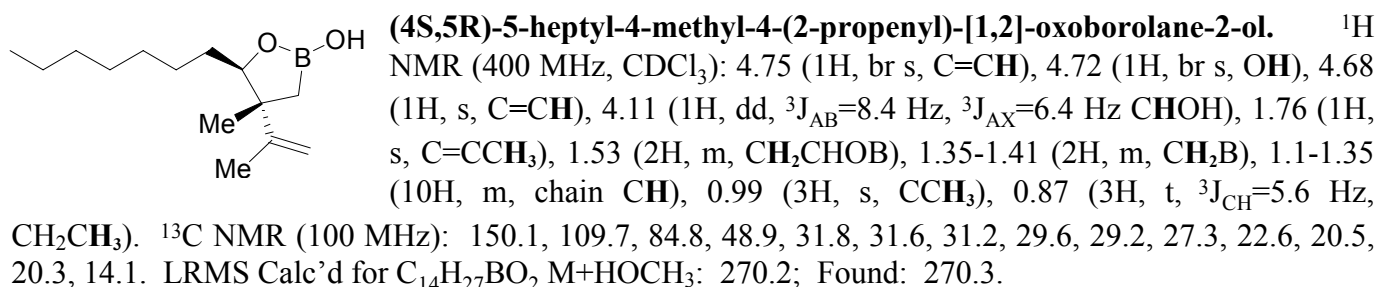


Mosher's ester of diol **4** from
diboration/allylation.

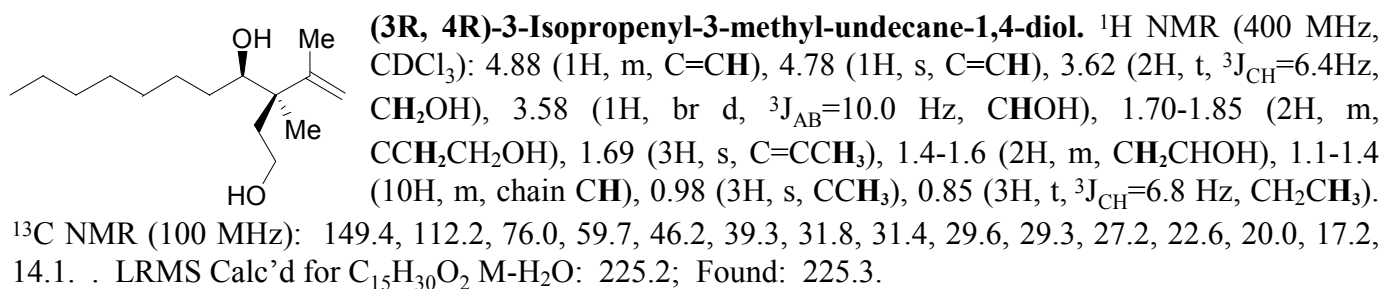


Mosher's ester of diol **4** from
authentic synthesis (Scheme B)

Procedure for Cyclic Boronate Formation. The general procedure was followed for diboration and reaction with aldehyde. Solvent was removed in vacuo, and the crude product was re-dissolved in THF (0.2M). 0.5 mmol of dimethyl zinc (2M in toluene) was added dropwise to the stirred solution at room temperature. After 2 hours of stirring, the solution was cooled to 0°C and quenched with 1 mL of water. 10 mL of ethyl acetate was added. After removal of the organic layer, the aqueous layer was extracted with 2 x 20 mL of ethyl acetate. The combined organic layers were dried with Na₂SO₄, filtered and concentrated. The crude material was purified by column chromatography (silica gel, 10:1 hexane:ethyl acetate). Isolated yield of 28.5 mg(0.12 mmol, 60%).



Procedure for Homologation to 1,4-diol. Boronate (0.05 mmol) was transferred as a solution in THF (0.15 M) to a 10 ml round bottom flask containing a stir bar. 0.10 mmol of bromochloromethane was added and the solution was cooled to -78°C in a dry ice/acetone bath. Butyllithium (1.55 M in hexanes) was added dropwise while the solution was stirred. After 5 minutes, the solution was warmed to room temperature overnight. 250 µL of 30% H₂O₂ and 200 µL of 3M NaOH were added. The two-phase mixture was heated to 50°C for 2 hours. The reaction was quenched with 2 mL of sodium thiosulfate, and 10mL was ethyl acetate was added. After removal of the organic layer, the aqueous layer was extracted with 2 x 20 mL of ethyl acetate. The combined organic layers were dried with Na₂SO₄, filtered and concentrated. The crude material was purified by column chromatography (silica gel, 3:1 hexane:ethyl acetate). Isolated yield of 4.4 mg(0.02 mmol, 36%).



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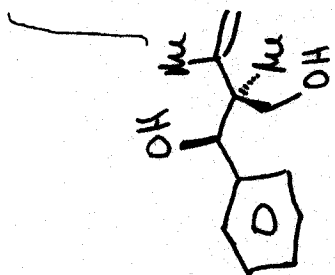
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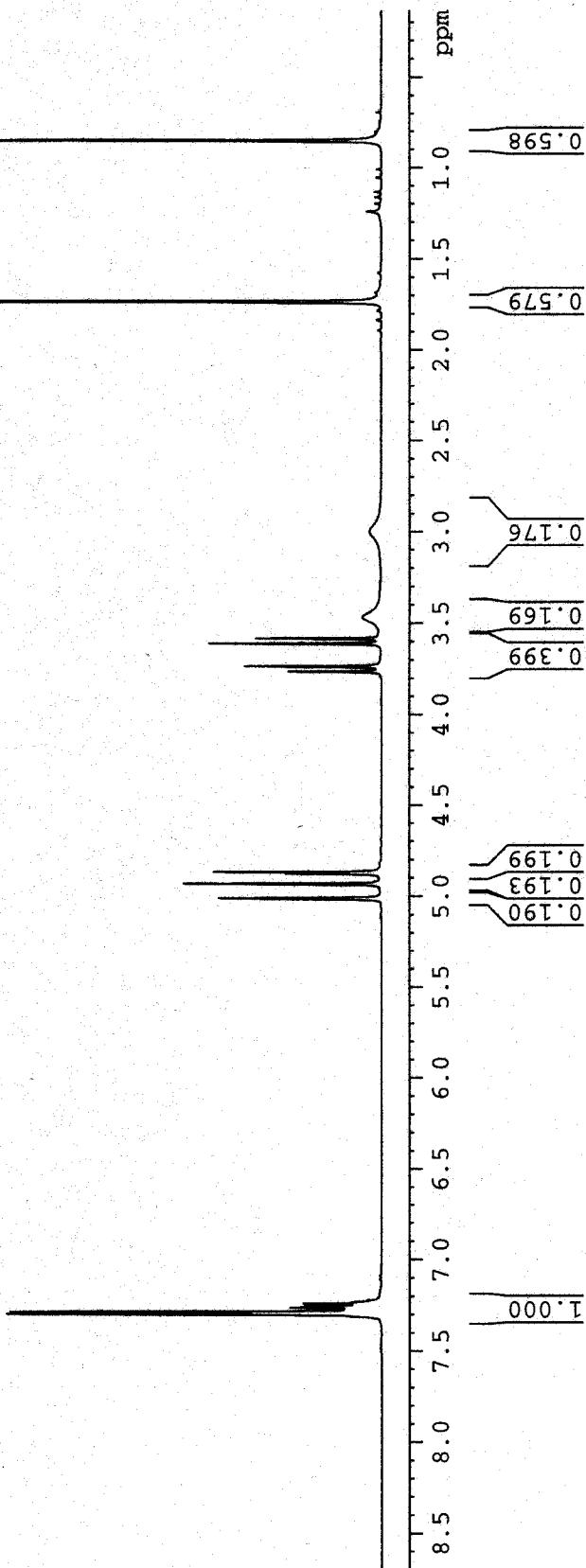
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sss



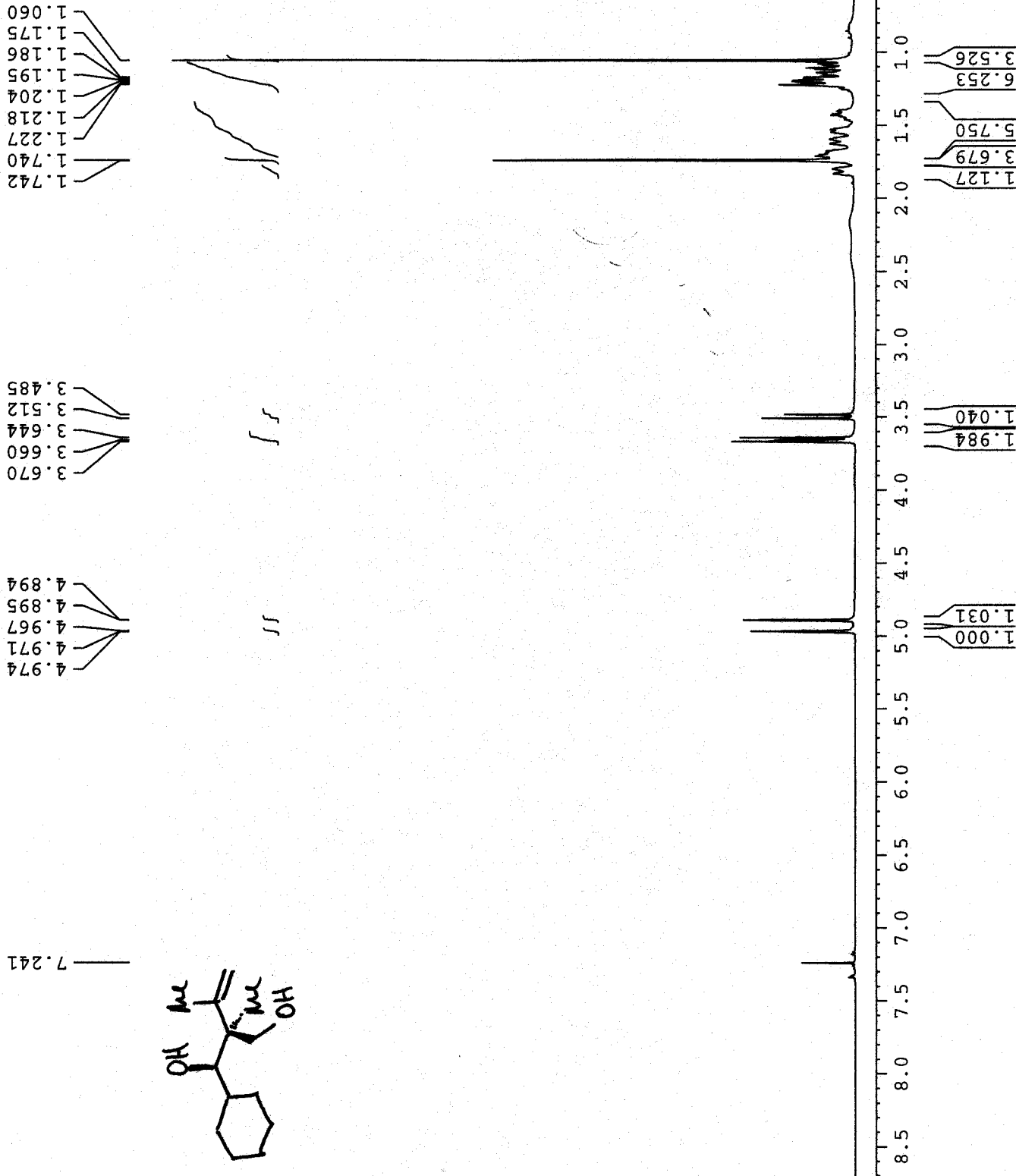
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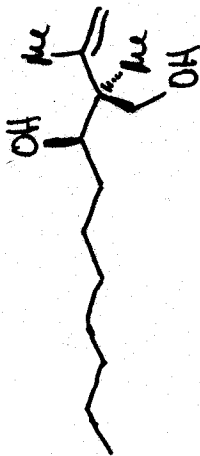
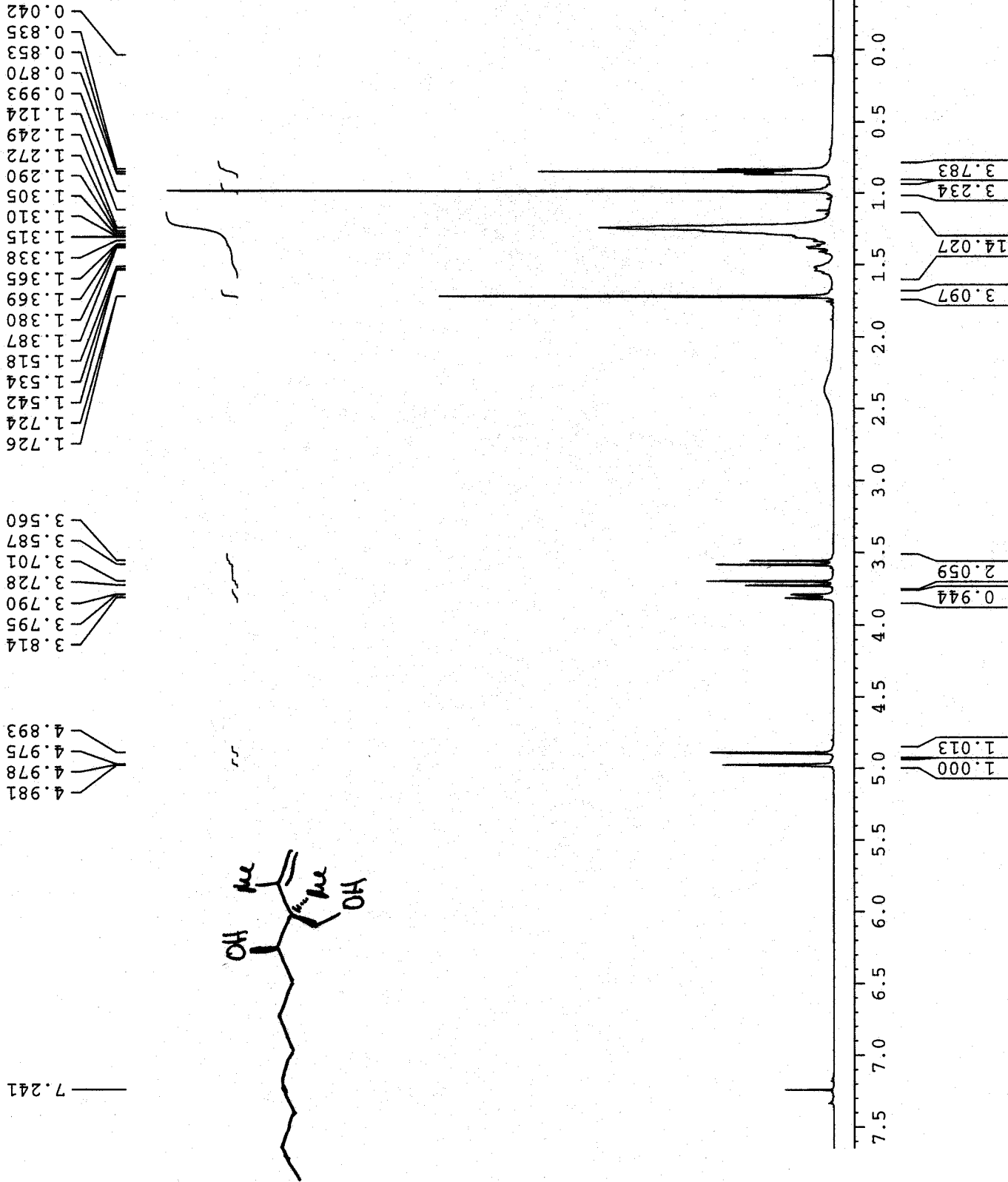
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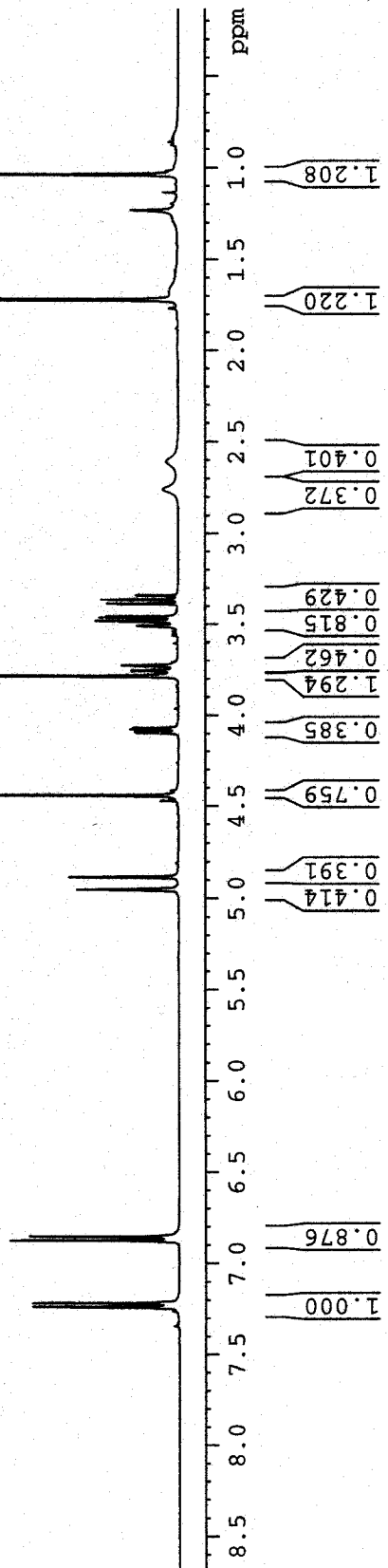
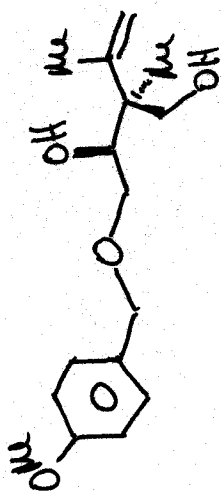
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 TD 32768
 SOLVENT CDCl3
 NS 10
 DS 2
 SWH 6410.256 Hz
 FIDRES 0.195625 Hz
 AQ 2.5560319 sec
 RG 143.7
 DW 78.000 usec
 DE 6.00 usec
 TE 293.0 K
 D1 5.0000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 12.80 usec
 PL1 0.00 dB
 SFO1 400.1326008 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1300172 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0

1.016
 1.038
 1.135
 1.233
 1.722
 2.607
 2.760
 3.343
 3.366
 3.367
 3.389
 3.459
 3.466
 3.484
 3.490
 3.512
 3.728
 3.756
 3.774
 3.788
 4.072
 4.078
 4.093
 4.099
 4.445
 4.474
 4.886
 4.952
 4.955
 4.958

6.846
 6.854
 6.859
 6.870
 6.875
 6.882
 7.210
 7.217
 7.221
 7.234
 7.238
 7.240



Current Data Parameters
 NAME jml-300paperhl
 EXPNO 1
 PROCNO 1

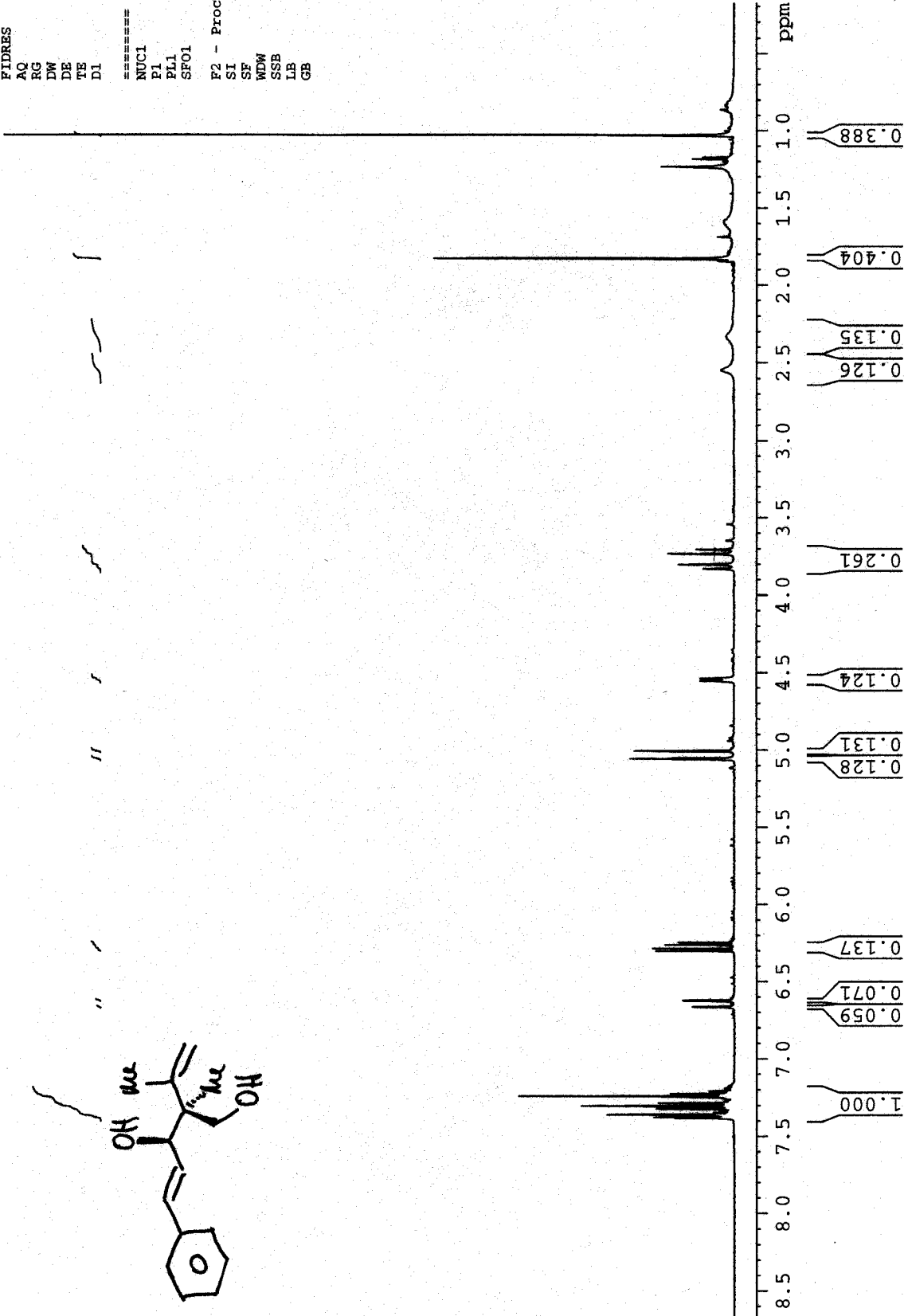
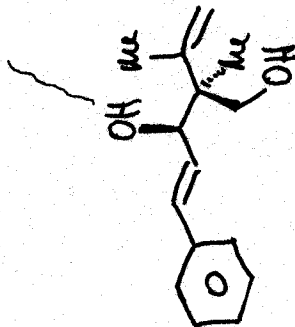
F2 - Acquisition Parameters
 Date_ 20020520
 Time 11:59

INSTRUM spect
 PULPROG 5mm QNP 1H/13C
 TD 2930
 FIDRES 0.195625 Hz
 AQ 2.5560319 sec
 RG 287.4
 DW 78.000 usec
 DE 6.00 usec
 TE 293.0 K
 D1 5.0000000 sec

===== CHANNEL f1 =====
 NUC1 1H
 P1 12.80 usec
 PL1 0.00 dB
 SFO1 400.1326008 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1300172 MHz
 WDW no
 SSB 0
 LB 0.00 Hz
 GB 0

3.707
3.735
3.804
3.832
4.541
4.556
5.011
5.053
5.056
5.060
5.063
5.066
6.246
6.261
6.286
6.301
6.622
6.625
6.662
6.665
7.204
7.208
7.211
7.220
7.226
7.231
7.241
7.244
7.280
7.285
7.288
7.300
7.304
7.317
7.322
7.335
7.346



Data Parameters
 Jm2-30col 1
 EXPNO 1
 PROCNO 1
 F2 - Processing parameters
 SI 16384
 SF 400.1300172 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0

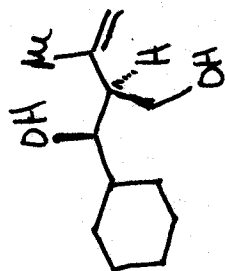
Acquisition Parameters
 Date_ 20020702
 Time 16.30
 INSTRUM spect
 PROBHD 5mm QNP 1H/13C
 PULPROG zg30
 TD 32768
 SOLVENT CDC13
 NS 27
 DS 2
 SWH 6410.256 Hz
 FIDRES 0.195625 Hz
 AQ 2.5560319 sec
 RG 128
 DW 78.000 usec
 DE 6.00 usec
 TE 293.0 K
 D1 1.00000000 sec

===== CHANNEL f1 =====

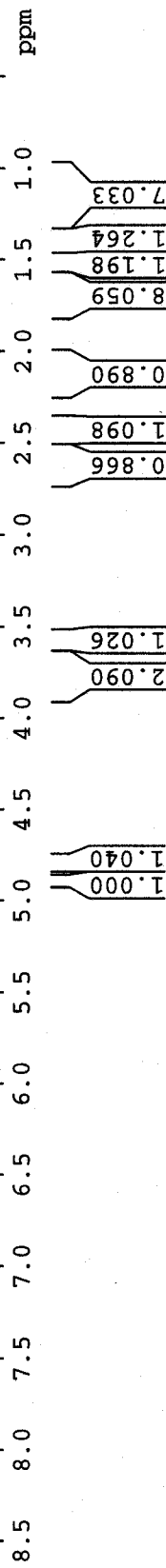
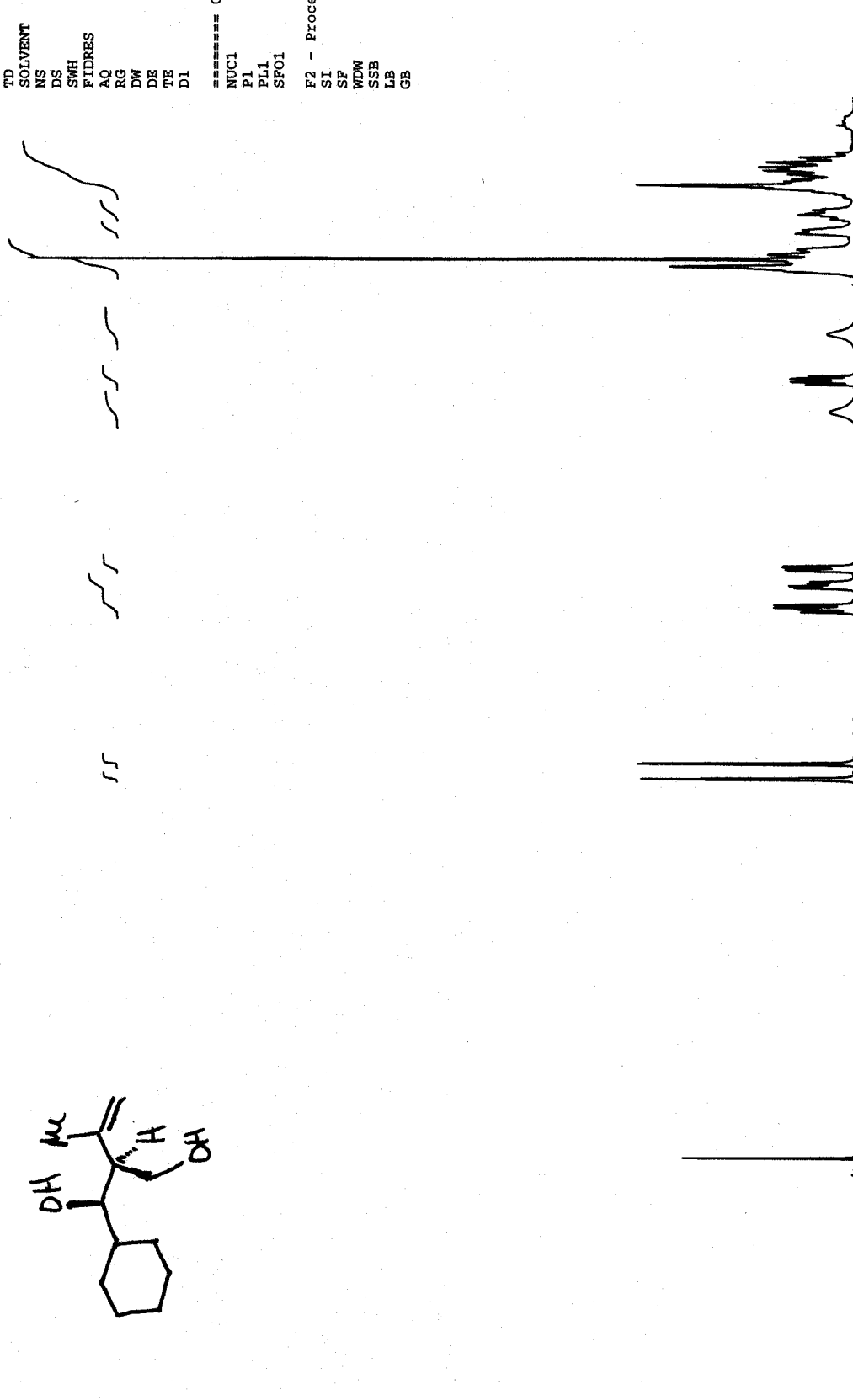
NUC1 1H
 P1 12.80 usec
 PL1 0.00 dB
 SFO1 400.1326008 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1300172 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0

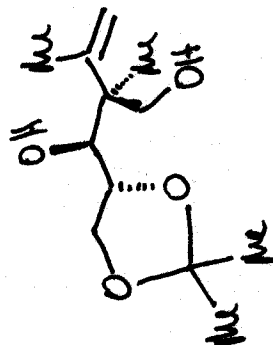
4.903
 4.899
 4.896
 4.804
 3.863
 3.846
 3.836
 3.819
 3.716
 3.703
 3.689
 3.676
 3.609
 3.601
 3.587
 3.579
 2.631
 2.460
 2.446
 2.443
 2.438
 2.429
 2.424
 2.421
 2.407
 2.147
 1.762
 1.737
 1.719
 1.709
 1.689
 1.660
 1.657
 1.637
 1.629
 1.529
 1.512
 1.508
 1.449
 1.441



7.240



7.239



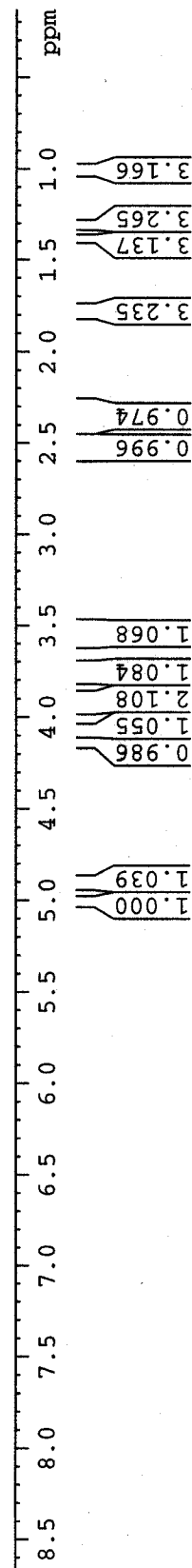
5.008
5.005
5.002
4.911
4.133
4.099
4.082
4.075
4.065
4.057
3.964
3.944
3.927
3.910
3.908
3.890
3.787
3.759
3.547
3.520
2.531
1.780
1.778
1.391
1.314
1.225
1.009

Current Data Parameters
NAME jn2-114coln1
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20020918
Time 17.04
INSTRUM spect
PROBHD 5mm QNP 1H/13C
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 20
DS 2
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5560319 sec
RG 143.7
DW 78.000 usec
DE 6.00 usec
TE 293.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 12.80 usec
PL1 0.00 dB
SFO1 400.1326008 MHz

F2 - Processing parameters
SI 16384
SF 400.1300177 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0



7.24
 5.008
 5.004
 5.000
 4.909
 4.904
 4.137
 4.130
 4.124
 4.120
 4.117
 4.114
 4.104
 4.098
 4.091
 4.081
 4.074
 4.064
 4.056
 3.995
 3.978
 3.974
 3.964
 3.958
 3.944
 3.927
 3.911
 3.908
 3.890
 3.787
 3.760
 3.741
 3.720
 3.712
 3.703
 3.696
 3.576
 3.547
 3.520
 3.520
 3.738
 2.720
 2.720
 2.536
 1.792
 1.780
 1.778
 1.745
 1.743
 1.404
 1.390
 1.354
 1.313

Data Parameters
 NAME jm2-123coll1
 EXPNO 1
 PROCNO 1

Acquisition Parameters
 Date_ 20021114
 Time 17.59

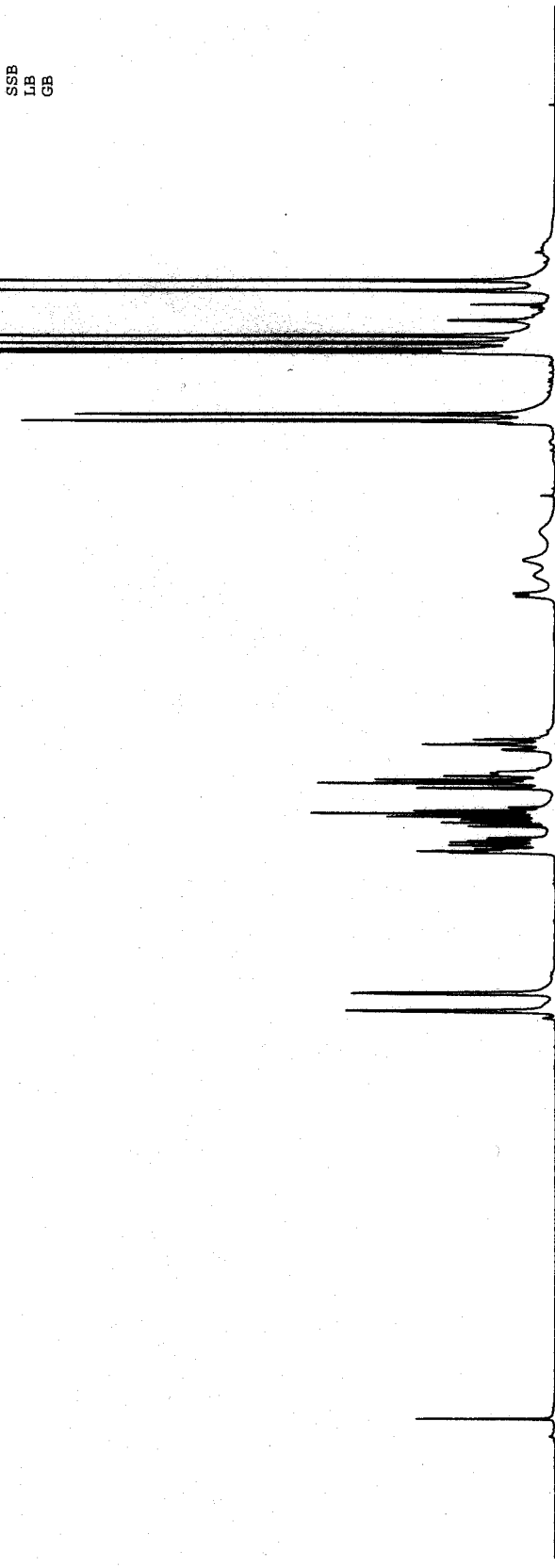
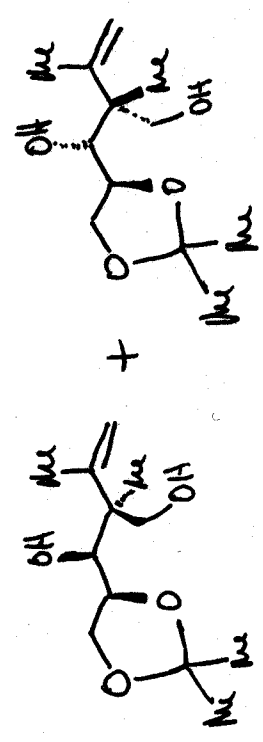
INSTRUM spect
 PROBHD 5mm QNP 1H/13C
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 20
 DS 2

SWH 6410.256 Hz
 FIDRES 0.195625 Hz
 AQ 2.5560319 sec
 RG 181
 DW 78.000 usec
 DE 6.00 usec
 TE 293.0 K
 D1 5.0000000 sec

CHANNEL f1
 NUC1 1H
 P1 22.50 usec
 PL1 0.00 dB
 SFO1 400.1326008 MHz

Processing parameters
 SI 16384
 SF 400.1300172 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0

ss
 ss
 ss



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 ppm