Supporting Information

General Procedures. All chemicals were reagent grade and were used as supplied. Technical grade or reagent grade solvents for extraction and chromatography were used without further purification. Silica gel 60 F_{254} plates (E. Merck) were used for analytical and preparative thin-layer chromatography. Silica gel 60N (spherical, neutral, Kanto Chemical Co., Inc, Tokyo) was used for flash column chromatography (40-100 mm) and open column (100-200 mm) chromatography. ^{1}H and ^{13}C NMR spectra were recorded at ambient temperature (23~24 °C) in $CDCl_3$ using JEOL EX 400 MHz spectrometer. ^{13}C-NMR spectra were taken in $CDCl_3$ unless otherwise mentioned, and *C*HCl_3 (δ 77.0 ppm) was used as an internal standard. Chemical shifts are reported in ppm relative to internal tetramethylsilane (δ = 0.00 ppm or $CHCl_3$ as 7.26 ppm) for ^{1}H and internal $CDCl_3$ (δ = 77.00 ppm) for ^{13}C NMR spectra. Optical rotations were measured with a JASCO DIP-310 polarimeter. MALDI-TOF MS spectra were measured by Shimadzu AXIMA-CFR using DHBA and CHCA as matrix.

General procedure for preparation of glycosyl bromide from thioglycoside

To a solution of thioglycoside (1 equiv.) in CH_2Cl_2, Br_2 solution (1 M in CH_2Cl_2, 1.2 equiv.) was dropped at 4 °C. The mixture was stirred at 4 °C-room temperature under N_2 atmosphere (normally 30 min ~ 2 h). After consuming the thioglycoside, the reaction was quenched with 10% $Na_2S_2O_3$ aq. and the aqueous layer was extracted with EtOAc. The combined layers were washed with sat. $NaHCO_3$ and brine. After drying the mixture over Na_2SO_4. The mixture was filtered and concentrated. The residue was purified by silica gel column chromatography.

Yields **1a** (94%), **1b** (93%), **1c** (44%), **6a** (46%), **6b** (95%), **6c** (94%), **9** (94%).

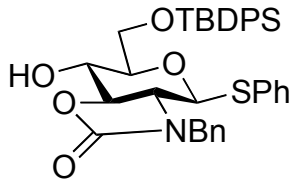
General Procedure for Keck reaction;

A mixture of bromide (1 equiv.), allyl-*n*-tributylstannane (12 equiv.) and AIBN (15.5 mg/substrate mmol) in PhH (0.2 M solution) was refluxed under N_2 atmosphere for 12 h. The mixture was purified by silica gel column chromatography. The α/β ratio is based on integration of ^{1}H-NMR.

General Procedure for chain reaction:

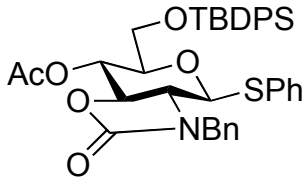
To a solution of bromide (1 equiv.), Bu_3SnH (2 equiv) and olefin (15 equiv) in PhH

(substrate concentration 0.2 M), AIBN (16.8 mg/substrate mmol) was added. The mixture was refluxed under N_2 atmosphere for 12 h. After cooling the mixture to room temperature, the mixture was purified by silica gel column chromatography. The α/β ratio is based on integration of ^{1}H-NMR.



Phenyl *N*-benzyl-2-amino-4,6-*O*-benzylidene-2,3-*N*,*O*-carbonyl-2-deoxy-1-thio-α-D-glucopyranoside[1] (3.00g, 6.31 mmol) in AcOH (16 mL) and H_2O (4 mL) was stirred at 100 °C for 2 h. After concentration, the residue was filtered and washed with ether. The precipitate was dissolved in DMF (10 mL) and imidazole (858 mg, 12.62 mmol) was added. To a solution, TBDPSCl (1.93mL, 7.57 mmol) was dropped. The mixture was stirred at room temperature under N_2 atmosphere overnight. The solution was diluted with EtOAc and washed with sat. NH_4Cl, sat. $NaHCO_3$ and brine. After concentration, the residue was purified by silica gel column chromatography (hexane:EtOAc 7:3-1:1) to give product (3.08 g, 78%).

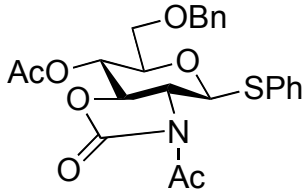
^{1}H-NMR δ 7.67-7.65 (m, 4H), 7.42-7.18 (m, 16H), 4.78-4.68 (m, 3H), 4.11-4.06 (m, 2H), 3.93 (s, 1H), 3.91 (s, 1H), 3.51 (m, 1H), 3.41-3.36 (m, 1H), 1.04 (s, 9H); ^{13}C-NMR δ 150.9, 136.3, 135.6, 135.5, 132.4, 132.0, 129.9, 129.0, 128.6, 128.2, 128.1, 127.8, 127.8, 127.5, 86.8, 82.4, 80.5, 69.0, 64.0, 60.2, 47.7, 26.8, 19.3; [α] -54.5 (*c* 0.73, $CHCl_3$); calcd for $[C_{36}H_{39}NO_5SSi+Na]^+$ 648.2210, found 648.2217.



To a solution of alcohol (2.00 g, 3.20 mmol) in pyridine (5 mL), Ac_2O (3 mL) was added. After 2 h, the reaction was concentrated *in vacuo*. The residue was purified by silica gel column chromatography (hexane:EtOAc 7:3) to give product (2.00 g, 94%).

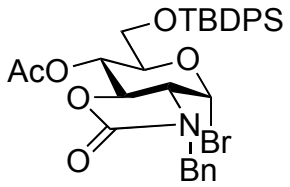
^{1}H-NMR δ 7.66-7.63 (m, 4H), 7.40-7.18 (m, 16H), 5.30 (t, J = 8.8 Hz, 1H), 4.79-4.72 (m,

3H), 4.13 (t, J = 10.4 Hz, 1H), 3.75-3.73 (m, 2H), 3.57 (m, 1H), 3.53 (t, J = 10.0 Hz, 1H), 1.95 (s, 3H), 1.02 (s, 9H); ^{13}C-NMR δ 168.9, 158.6, 136.1, 135.6, 135.5, 132.8, 132.8, 132.3, 132.3, 129.7, 129.1, 128.6, 128.3, 128.1, 127.7, 127.6, 86.8, 80.3, 67.2, 62.6, 60.4, 47.7, 26.7, 20.6, 19.3; [α] -37.1 (*c* 0.56, $CHCl_3$); calcd for $[C_{38}H_{41}NO_6SSi+Na]^+$ 690.2316, found 690.2326.

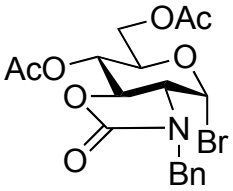


To a solution of phenyl 2-amino-6-*O*-benzyl-2,3-*N*,*O*-carbonyl-2-deoxy-1-thio-α-D-glucopyranoside (1.00 g, 2.60 mmol)[2,3] in pyridine (3 mL), Ac_2O (2 mL) and DMAP (50 mg, 0.41 mmol) was added. After stirring at room temperature overnight, the reaction mixture was concentrated. The residue was purified by silica gel column chromatography (hexane: EtOAc 7:3) to give the product (1.20 g, 95%).

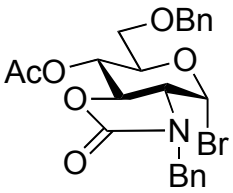
^{1}H-NMR δ 7.52-7.50 (m, 2H), 7.32-7.19 (m, 8H), 5.33 (t, J = 8.4 Hz, 1H), 4.95 (d, J = 7.6 Hz, 1H), 4.53 (d, J = 12.0 Hz, 1H), 4.46 (d, J = 12.0 Hz, 1H), 4.24 (d, J = 10.8 Hz, 1H), 4.22 (d, J = 10.8 Hz, 1H), 3.72 (m, 1H), 3.65 (s, 1H), 3.63 (s, 1H), 2.55 (s, 3H), 2.02 (s, 3H); ^{13}C NMR δ 172.5, 169.1, 153.2, 137.5, 134.1, 132.0, 128.8, 128.3, 127.8, 127.7, 87.4, 79.3, 79.1, 76.7, 73.6, 68.9, 68.4, 59.8, 24.8, 20.7; [α] –55.2 (*c* 1.4, $CHCl_3$); calcd for $[C_{24}H_{25}NO_7SNa]^+$ 494.1244, found 494.1243.



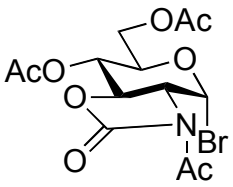
^{1}H-NMR δ 7.56-7.54 (m, 4H), 7.40-7.15 (m, 11H), 6.24 (d, J = 3.2 Hz, 1H) 5.44 (t, J = 10.0 Hz, 1H), 4.78 (d, J = 14.8 Hz, 1H), 4.63 (t, J = 11.6 Hz, 1H), 4.09 (d, J = 14.8 Hz, 1H), 3.80 (m, 1H), 3.70 (m, 2H), 3.27 (dd, J = 11.2, 2.8 Hz, 1H), 1.98 (s, 3H), 1.01 (s, 9H); ^{13}C-NMR δ 168.7, 159.6, 135.5, 133.7, 132.7, 132.6, 129.8, 129.7, 129.1, 129.0, 128.9, 128.7, 128.1, 127.7, 127.6, 83.9, 75.8, 66.8, 61.2, 61.0, 47.8, 26.8, 20.6, 19.3; calcd for $[C_{33}H_{37}NO_7SSi+Na]^+$ 642.1952, found 642.1950.



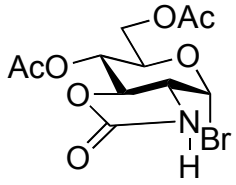
^{1}H-NMR δ 7.38-7.36 (m, 3H), 7.28-7.26 (m, 2H), 6.21 (d, *J* = 3.2 Hz, 1H), 5.30 (t, *J* = 10.0 Hz, 1H), 4.80 (d, *J* = 14.4 Hz, 1H), 4.65 (t, *J* = 10.0 Hz, 1H), 4.27 (dd, *J* = 12.8, 4.4 Hz, 1H), 4.09-4.04 (m, 2H), 4.01 (m, 1H), 3.31 (dd, *J* = 11.2, 2.8 Hz, 1H), 2.10 (s, 3H), 2.03 (s, 3H); ^{13}C-NMR δ 170.1, 168.8, 157.3, 133.5, 129.1, 128.8, 128.7, 83.0, 75.3, 74.1, 66.8, 60.8, 47.8, 20.8; [α] 194.0 (*c* 1.1, $CHCl_3$); calcd for $[C_{18}H_{20}BrNO_7+Na]^+$ 464.0315, found 464.0314.



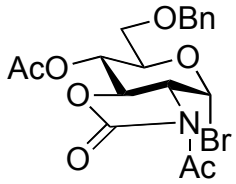
^{1}H-NMR δ 7.36-7.17 (m, 10H), 6.24 (d, *J* = 3.2 Hz, 1H), 5.43 (t, *J* = 9.6 Hz, 1H), 4.80 (d, *J* = 14.8 Hz, 1H), 4.62 (t, *J* = 10.4 Hz, 1H), 4.53 (d, *J* = 12.0 Hz, 1H), 4.39 (d, *J* = 12.0 Hz, 1H), 3.90 (d, *J* = 14.8 Hz, 1H), 3.89 (m, 1H), 3.54-3.47 (m, 2H), 3.33 (d, *J* = 11.6, 3.2 Hz, 1H), 1.97 (t, 3H); ^{13}C-NMR δ 168.7, 157.5, 136.9, 133.7, 129.2, 129.0, 128.8, 128.7, 128.4, 128.1, 128.0, 127.9, 83.7, 75.7, 75.2, 73.6, 67.0, 66.4, 60.7, 47.7, 20.6; [α] 121.2 (*c* 1.85, $CHCl_3$); calcd for $[C_{29}H_{29}NO_5S+Na]^+$ 526.1659, found 526.1653.



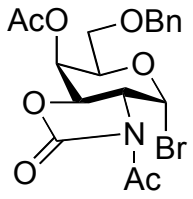
^{1}H-NMR δ 7.06 (d, *J* = 3.2 Hz, 1H), 5.41 (t, *J* = 10.0 Hz, 1H), 4.76 (t, *J* = 11.6 Hz, 1H), 4.31 (dd, *J* = 12.8 Hz, 4.0 Hz, 1H), 4.17 (dd, *J* = 12.8 Hz, 2.0 Hz, 1H), 4.16 (m, 1H), 3.95 (dd, *J* = 11.6 Hz, 3.2 Hz, 1H); ^{13}C-NMR δ 170.8, 170.2, 168.7, 152.5, 83.7, 75.4, 73.8, 66.6, 61.0, 60.7, 23.7, 20.8, 20.7; [α] 159.0 (*c* 2.56, $CHCl_3$); calcd for $[C_{13}H_{16}BrNO_8+Na]^+$ 415.9952, found 415.9953.



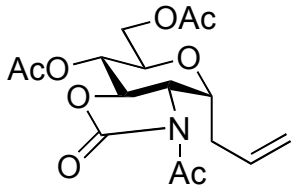
^{1}H-NMR δ 6.52 (d, *J* = 3.2 Hz, 1H), 5.50 (bs, 1H), 5.43 (t, *J* = 10.0 Hz, 1H), 4.75 (t, *J* = 11.2 Hz, 1H), 4.30 (dd, *J* = 12.4 Hz, 4.4 Hz, 1H), 4.16 (dd, *J* = 12.8, 2.0 Hz, 1H), 4.16 (dd, *J* = 12.8 Hz, 2.0 Hz, 1H), 4.06 (m, 1H), 3.76 (m, 1H), 2.12 (s, 3H), 2.08 (s, 3H); ^{13}C-NMR δ 170.2, 168.8, 157.6, 83.6, 77.6, 73.9, 66.9, 60.9, 59.6, 20.8; [α] 149.1 (*c* 1.50, $CHCl_3$).



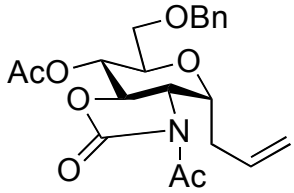
^{1}H-NMR δ 7.33-7.15 (m, 5H), 7.08 (d, *J* = 2.8 Hz, 1H), 5.54 (t, *J* = 10.0 Hz, 1H), 4.74 (t, *J* = 10.8 Hz, 1H), 4.58 (d, *J* = 12.0 Hz, 1H), 4.46 (d, *J* = 12.0 Hz, 1H), 3.97-3.91 (m, 2H), 3.60-3.57 (m, 2H), 2.49 (s, 3H), 2.01 (s, 3H); ^{13}C-NMR δ 170.8, 168.6, 151.9, 137.0, 128.8, 128.4, 128.1, 127.9, 125.2, 84.4, 75.8, 75.1, 73.6, 66.9, 66.5, 60.9, 23.7, 20.9; [α] 242.8 (*c* 2.25, $CHCl_3$); calcd for $[C_{18}H_{20}BrNO_7+Na]^+$ 464.0315, found 464.0307.



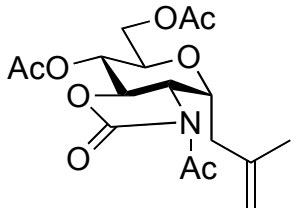
^{1}H-NMR δ 7.34-7.27 (m, 4H), 7.10 (d, *J* = 2.8 Hz, 1H), 5.72 (s, 1H), 4.80 (dd, *J* = 2.4 Hz, 1H), 4.53 (d, *J* = 11.6 Hz, 1H), 4.42 (d, *J* = 11.6 Hz, 1H), 4.25 (dd, *J* = 12.0. 2.8 Hz, 1H), 4.21 (t, *J* = 6.4 Hz, 1H), 3.54 (m, 2H), 2.50 (s, 3H), 2.05 (s, 3H); ^{13}C-NMR δ 171.4, 168.8, 152.0, 137.0, 128.5, 128.0, 127.9, 85.8, 76.1, 74.0, 73.7, 73.3 66.7, 65.1, 56.9, 23.8, 20.6; [α] 162.0 (*c* 0.80, $CHCl_3$); calcd for $[C_{18}H_{20}BrNO_7+Na]^+$ 426.1523, found 426.1527.



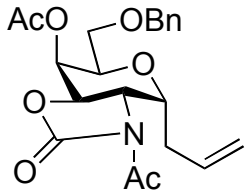
^{1}H-NMR δ 5.74 (m, 1H), 5.19 (t, *J* = 9.6 Hz, 1H), 5.13-5.09 (m, 2H), 4.92 (m, 1H), 4.37 (t, *J* = 12.4 Hz, 1H), 4.20-4.11 (m, 2H), 4.05 (dd, *J* = 12.0, 5.2 Hz, 1H), 3.75 (m, 1H), 2.46 (s, 3H), 2.46 (m, 1H), 2.17 (m, 1H), 2.10 (s, 3H), 2.05 (s, 3H); ^{13}C-NMR δ 171.4, 170.5, 169.0, 152.7, 132.3, 118.0, 75.3, 73.4, 70.7, 68.6, 62.1, 59.5, 29.5, 23.9, 20.7; [α] 89.9 (*c* 1.2, $CHCl_3$); calcd for $[C_{16}H_{21}NO_8+Na]^+$ 378.1159, found 378.1157.



^{1}H-NMR δ 7.29-7.19 (m, 5H), 5.76 (m, 1H), 5.25 (t, *J* = 9.0 Hz, 1H), 5.09-5.03 (m, 2H), 4.87 (m, 1H), 4.52 (d, *J* = 12.0 Hz, 1H), 4.42 (d, *J* = 12.0 Hz, 1H), 4.31 (t, *J* = 12.2 Hz, 1H), 4.03 (dd, *J* = 12.4 Hz, 4.8 Hz, 1H), 3.67 (m, 1H), 3.51-3.47 (m, 2H), 2.41 (s, 3H), 2.13 (m, 1H), 1.92 (s, 3H); ^{13}C-NMR δ 171.3, 168.9, 152.8, 137.4, 132.6, 128.2, 127.8, 127.6, 117.8, 75.6, 73.6, 73.4, 72.4, 69.2, 68.4, 59.3, 29.9, 24.0, 20.8; [α] 126.8 (*c* 1.86, $CHCl_3$); calcd for $[C_{21}H_{25}NO_7+Na]^+$ 426.1523; found 426.1527.

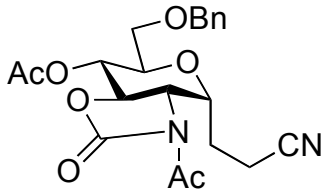


^{1}H-NMR δ 5.22 (t, *J* = 9.6 Hz, 1H), 5.04 (m, 1H), 4.84 (s, 1H), 4.76 (s, 1H), 4.38 (t, *J* = 10.0 Hz, 1H), 4.18 (dd, *J* = 12.0, 5.2 Hz, 1H), 4.09 (dd, *J* = 12.0, 2.4 Hz, 1H), 4.05 (dd, *J* = 12.4, 5.2 Hz, 1H), 3.78 (m, 1H), 2.44 (s, 3H), 2.44-2.42 (m, 1H), 2.11 (s, 3H), 2.05 (s, 3H), 2.05-2.00 (m, 1H); ^{13}C-NMR δ 171.3, 170.5, 169.0, 152.8, 140.4, 113.8, 75.4, 72.4, 70.6, 68.6, 62.2, 59.7, 32.9, 23.9, 21.9, 20.7, 20.7; [α] 105.1 (*c* 0.84, $CHCl_3$); calcd for $[C_{17}H_{23}NO_8+Na]^+$ 392.1316, found 392.1315.

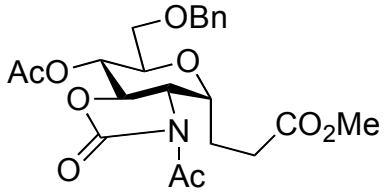


^{1}H-NMR δ 7.34-7.24 (m, 5H), 5.73 (m, 1H), 5.08 (s, 1H), 4.96-4.54 (m, 2H), 4.41 (m,

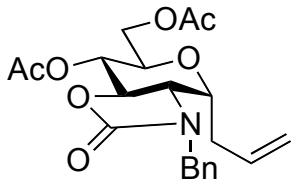
1H), 4.52 (d, *J* = 11.6 Hz, 1H), 4.43-4.34 (m, 3H), 3.91 (t, *J* = 6.0 Hz, 1H), 3.48-3.46 (m, 2H), 2.46 (s, 3H), 2.05 (m, 1H), 205 (s, 3H); ^{13}C-NMR δ 171.6, 169.0, 152.8, 137.3, 132.7, 128.3, 127.8, 127.8, 117.9, 77.2, 74.4, 73.8, 73.6, 69.8, 67.8, 65.9, 55.7, 29.1, 24.2, 20.8; [α] 51.7 (*c* 1.00, $CHCl_3$); calcd for $[C_{21}H_{25}NO_7+Na]^+$ 426.1523, found 426.1520.



^{1}H-NMR δ 7.29-7.19 (m, 5H), 5.26 (t, *J* = 8.4 Hz, 1H), 4.77 (m, 1H), 4.53 (d, *J* = 12.0 Hz, 1H), 4.42 (d, *J* = 12.0 Hz, 1H), 4.22 (t, *J* = 12.4 Hz, 1H), 4.07 (m, 1H), 3.64 (m, 1H), 3.58-3.50 (m, 2H), 2.43 (s, 3H), 2.39-2.29 (m, 2H), 1.97 (m, 1H), 1.94 (s, 3H), 1.67 (m, 1H); ^{13}C-NMR δ 171.4, 168.9, 152.5, 137.2, 128.3, 127.8, 118.7, 75.3, 73.7, 73.3, 73.2, 69.1, 68.2, 58.8, 23.4, 21.8, 20.7, 14.2; [α] 87.7 (*c* 0.90, $CHCl_3$); calcd for $[C_{21}H_{24}N_2O_7+Na]^+$ 439.1476, found 439.1463.

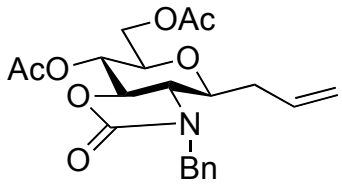


^{1}H-NMR δ 7.28-7.19 (m, 5H), 5.25 (t, *J* = 9.2 Hz, 1H), 4.75 (m, 1H), 4.52 (d, *J* = 12.0 Hz, 1H), 4.40 (d, *J* = 12.0 Hz, 1H), 4.30 (t, *J* = 10.0 Hz, 1H), 4.00 (dd, *J* = 12.4, 5.6 Hz, 1H), 3.63 (m, 1H), 3.59 (s, 3H), 3.45 (m, 2H), 2.45-2.28 (m, 2H), 2.42 (s, 3H), 2.03 (m, 1H), 1.93 (s, 3H), 1.55 (m, 1H); ^{13}C-NMR δ 173.0, 171.3, 168.9, 152.8, 137.3, 128.3, 127.8, 127.7, 75.6, 74.0, 73.6, 72.1, 69.0, 68.2, 59.4, 51.9, 30.5, 25.0, 20.8, 20.3; [α] 88.6 (*c* 1.25, $CHCl_3$); calcd for $[C_{22}H_{27}NO_9+Na]^+$ 472.1578, found 472.1572.

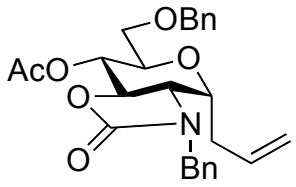


Detectable peak; ^{1}H-NMR δ 7.36 (m, 2H), 7.35 (m, 1H), 7.29 (dd, *J* = 8.0, 1.0 Hz, 2H),

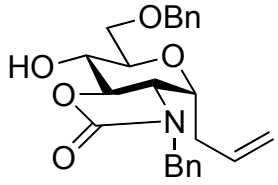
5.60 (dddd, J = 17.1, 10.0, 7.0, 6.6 Hz, 1H), 5.14 (dd, J = 10.1 Hz, 9.6 Hz, 1H), 4.48 (d, J = 14.6 Hz, 1H), 4.28 (d, J = 14.6 Hz, 1H), 4.17 (dd, J = 12.6, 5.0 Hz, 1H), 4.29 (dd, J = 12.1 Hz, 10.1 Hz, 1H), 4.06 (dd, J = 12.6, 2.0 Hz, 1H), 4.06 (ddd, J = 11.1, 5.1, 3.1 Hz, 1H), 3.71 (ddd, J = 9.6, 5.0, 2.0 Hz, 1H), 3.50 (dd, J = 12.1, 5.1 Hz, 1H), 2.10 (s, 3H), 2.04 (s, 3H); ^{13}C-NMR δ 170.6, 169.2, 158.8, 134.8, 132.6, 129.1, 129.0, 128.6, 118.2, 74.8, 73.7, 70.9, 68.9, 62.2, 60.4, 49.2, 29.3, 20.7, 20.7; calcd for $[C_{21}H_{25}NO_7+Na]^+$ 426.1523, found 426.1524.



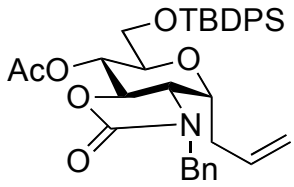
Detectable peak; ^{1}H-NMR δ 7.36-7.29 (m, 5H), 5.71 (dddd, J = 17.1, 10.1, 6.5, 6.5 Hz, 1H), 5.23 (dd, J = 10.6, 9.1 Hz, 1H), 5.01 (br, J = 10.1 Hz, 1H), 4.88 (dddd, J = 17.1, 1.5, 1.5, 1.5 Hz, 1H), 4.67 (d, J = 16.1 Hz, 1H), 4.45 (d, J = 17.1 Hz, 1H), 4.21 (dd, J = 12.1, 5.1 Hz, 1H), 4.17 (dd, J = 11.6, 10.6 Hz, 1H), 4.12 (dd, J = 12.1, 2.5 Hz), 3.50 (m, 1H), 3.29 (ss, J = 11.6, 9.1 Hz, 1H), 2.30 (m, 1H), 2.11 (s, 3H), 2.04 (m, 1H), 2.05 (s, 3H), ^{13}C-NMR δ 159.3, 132.7, 126.9, 118.1, 79.9, 76.7, 67.8, 62.2, 62.1, 48.4, 36.5 20.7, 20.7.



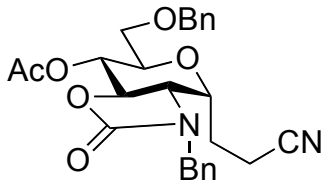
Detectable peak; ^{1}H-NMR δ 7.19-7.41 (m, 10H), 5.56-5.70 (m, 1H), 5.24 (t, J = 9.6 Hz, 1H), 5.07 (d, J = 10.0 Hz, 1H), 5.01 (d, J = 17.2 Hz, 1H), 4.53 (d, J = 12.0 Hz, 1H), 4.48 (d, J = 14.8 Hz, 1H), 4.42 (d, J = 12.0 Hz, 1H), 4.26 (t, J = 11.2 Hz, 1H), 4.25 (d, J = 14.8 Hz, 1H), 4.07 (ddd, J = 11.2, 4.8, 4.0 Hz, 1H), 3.64 (ddd, J = 8.8, 3.6, 2.8 Hz, 1H), 3.41-3.58 (m, 3H), 2.35-2.48 (m, 1H), 1.95 (s, 3H), 1.83-2.03 (m, 1H); ^{13}C-NMR δ 168.8, 158.7, 137.3, 134.6, 132.7, 128.9, 128.8, 128.4, 128.2, 127.8, 127.6, 118.0, 75.2, 73.7, 73.5, 72.0, 69.2, 68.0, 60.2, 49.1, 29.4, 20.8; MALDI-TOFMS: calcd for $C_{26}H_{29}NO_6Na$:474.19 $[M+Na]^+$; found 474.52.



Detectable peak; ^{1}H-NMR δ 7.33 (m, 6H), 7.29 (m, 4H), 5.61 (ddd, *J* = 17.2, 10.3, 6.9 Hz, 1H), 5.05 (br.d. *J* = 10.3 Hz, 1H), 4.98 (br.d, *J* = 17.2 Hz, 1H), 4.44 (d, *J* = 14.9 Hz, 1H), 4.29 (d, *J* = 14.9 Hz, 1H), 4.20 (dd, *J* = 12.0, 9.8 Hz, 1H), 4.00 (ddd, *J* = 10.3, 5.2, 3.5 Hz, 1H), 3.95 (ddd, *J* = 9.8, 8.6, 2.9 Hz, 1H), 3.70 (dd, *J* = 10.3, 4.0 Hz, 1H), 3.62 (dd, *J* = 10.3, 4.6 Hz, 1H), 3.53 (ddd, *J* = 8.6, 4.6, 4.0 Hz, 1H), 3.39 (dd, *J* = 12.0, 5.2 Hz, 1H), 2.97 (d, *J* = 2.9 Hz, 1H), 3.95 (ddd, *J* = 9.8, 8.6, 2.9 Hz, 1H), 2.40 (br.ddd, *J* = 15.4, 10.3, 6.9 Hz, 1H), 1.85 (ddd, *J* = 15.4, 6.9, 3.5 Hz, 1H); ^{13}C-NMR δ 159.4, 137.3, 135.0, 133.0, 128.9, 128.9, 128.4, 128.3, 127.8, 127.7, 117.8, 77.3, 73.7, 73.6, 72.8, 70.6, 69.6, 60.1, 49.0, 29.3; MALDI-TOFMS: calcd for $C_{24}H_{27}NO_5$ 409.1, found 410.24.

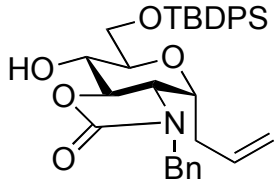


Detectable peak; ^{1}H-NMR δ 7.58-7.63 (m, 4H), 7.25-7.45 (m, 11H), 5.60-5.70 (m, 1H), 5.13 (t, *J* = 10.0 Hz, 1H), 5.05 (dd, *J* = 11.6, 1.2 Hz, 1H), 4.99 (dd, *J* = 17.2, 1.2 Hz, 1H), 4.45 (d, *J* = 14.4 Hz, 1H), 4.31 (d, *J* = 14.4 Hz, 1H), 4.26 (t, *J* = 10.4 Hz, 1H), 4.00-4.08 (m, 1H), 3.63-3.68 (m, 2H), 3.54-3.59 (m, 1H), 3.46 (dd, *J* = 12.0, 5.2 Hz, 1H), 2.35-2.47 (m, 1H), 1.93 (s, 3H), 1.80-1.90 (m, 1H), 1.01 (s, 9H); ^{13}C-NMR δ 168.8, 158.8, 135.5, 135.4, 134.8, 133.0, 132.9, 132.8, 129.6, 129.5, 128.9, 128.8, 128.3, 127.5, 127.4, 117.9, 75.2, 73.7, 73.5, 69.1, 62.9, 60.6, 49.2, 29.4, 26.8, 20.8, 19.3; MALDI-TOFMS: calcd for $C_{35}H_{41}NO_6SiNa$: 622.26 $[M+Na]^+$; found 622.69.

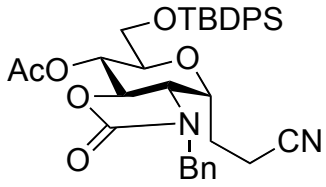


Detectable peak; ^{1}H-NMR δ 7.15-7.45 (m, 10H), 5.25 (t, *J* = 9.6 Hz, 1H), 4.54 (d, *J* = 12.0 Hz, 1H), 4.42 (d, *J* = 12.0 Hz, 1H), 4.40 (d, *J* = 14.4 Hz, 1H), 4.35 (d, *J* = 14.4 Hz, 1H),

4.15 (t, J = 10.8 Hz, 1H), 3.95-4.05 (m, 1H), 3.45-3.63 (m, 3H), 3.45 (dd, J = 10.8, 4.4 Hz, 1H), 2.20-2.32 (m, 1H), 2.06-2.20 (m, 1H), 2.35-2.48 (m, 1H), 1.96 (s, 3H), 1.83-2.03 (m, 1H), 1.22-1.35 (ddd, J = 13.6, 7.6, 5.2 Hz, 1H); ^{13}C-NMR δ 168.8, 158.5, 137.1, 134.6, 128.9, 128.6, 128.3, 128.1, 127.8, 127.7, 118.4, 74.9, 73.6, 72.8, 72.6, 68.9, 67.8, 60.2, 49.5, 21.1, 20.7, 14.1; MALDI-TOFMS: calcd for $C_{26}H_{28}N_2O_6Na$:487.18 $[M+Na]^+$; found 487.40.

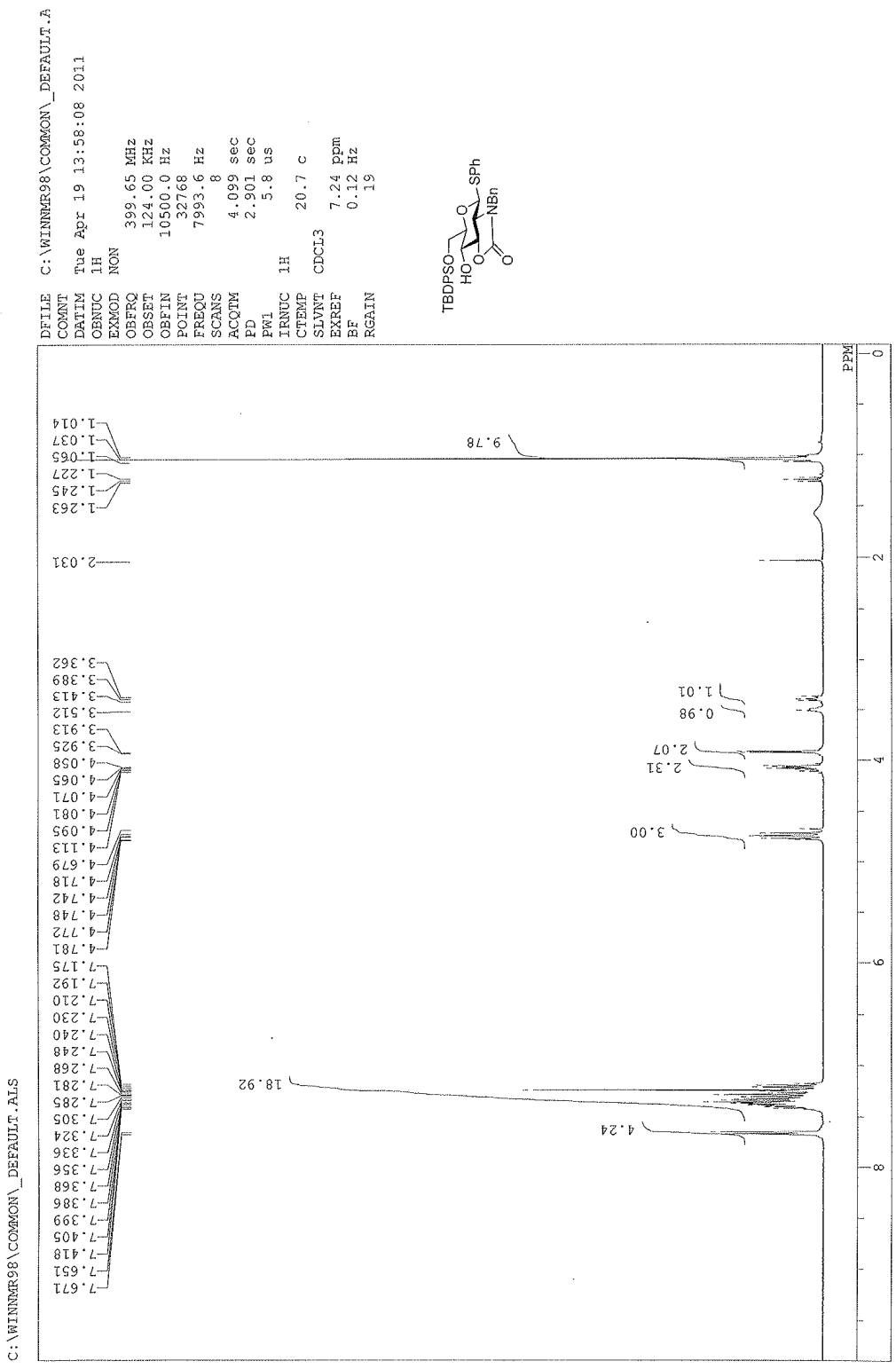


Detectable peak; ^{1}H-NMR δ 7.63 (m, 2H), 7.62 (m, 2H), 7.37 (m, 4H), 7.43 (m, 4H), 7.33 (m, 2H), 7.29 (m, 1H), 7.29 (m, 2H), 5.56 (ddt, J = 17.2, 10.3, 6.9 Hz, 1H), 5.00 (br.d, J = 10.3 Hz, 1H), 4.92 (br.d, J = 17.2 Hz, 1H), 4.41 (d, J = 14.6 Hz, 1H), 4.32 (d, J = 14.6 Hz, 1H), 4.20 (dd, J = 12.1, 9.8 Hz, 1H), 3.94 (m, 1H), 3.94 (m, 1H), 3.85 (dd, J = 10.6, 4.6 Hz, 1H), 3.81 (dd, J = 10.6, 4.8 Hz, 1H), 3.45 (ddd, J = 9.1, 4.8, 4.6 Hz, 1H), 3.33 (dd, J = 12.1, 5.1 Hz, 1H), 3.01 (d, J = 2.9 Hz, 1H), ^{13}C-NMR δ 159.6, 135.2, 132.7, 132.6, 135.6, 135.5, 133.1, 130.0, 129.9, 129.0, 129.0, 128.4, 127.8, 127.8, 117.8, 77.1, 73.7, 73.7, 71.2, 64.7, 60.2, 49.1, 29.4, 26.8, 19.4; calcd for $C_{33}H_{39}NO_5Si$+Na 580.88, found 557.26.



Detectable peak; ^{1}H-NMR δ 7.58-7.63 (m, 4H), 7.25-7.45 (m, 11H), 5.17 (t, J = 9.2 Hz, 1H), 4.45 (d, J = 14.8 Hz, 1H), 4.33 (d, J = 14.8 Hz, 1H), 4.14 (t, J = 10.0 Hz, 1H), 3.92-4.01 (m, 1H), 3.67 (d, J = 3.6 Hz, 2H), 3.50 (dd, J = 12.4, 5.6 Hz, 1H), 3.40-3.47 (m, 1H), 2.24-2.32 (m, 1H), 2.05-2.12 (m, 1H), 1.95 (s, 3H), 1.83-1.92 (m, 1H), 1.22-1.35 (m, 1H), 1.02 (s, 9H); ^{13}C-NMR δ 168.7, 158.5, 135.4, 135.4, 134.8, 132.8, 132.6, 129.7, 129.1, 128.9, 128.6, 127.6, 127.5, 118.2, 75.0, 74.0, 72.3, 68.7, 62.6, 60.5, 49.6, 26.8, 21.2, 20.7, 19.3, 13.8; MALDI-TOFMS: calcd for $C_{35}H_{41}N_2O_6Si$: 613.27 $[M+H]^+$; found 613.81.

1. S. Manabe, K. Ishii, Y. Ito, *J. Am. Chem. Soc.,* 2006, **128**, 10666.
2. K. Benakli, C. Zha, R. J. Kerns, *J. Am. Chem. Soc*., 2001, **123**, 9461.
3. H. Satoh, S. Manabe, Y. Ito, H. P. Lüthi, T. Laino, J., Hutter, *J. Am. Chem. Soc.* **2011***, 133,* 5610-5619.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OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
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ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 20.7 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 19
TBDPSO
HO
SPh
NBn
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3.00
2.31
2.07
1.01
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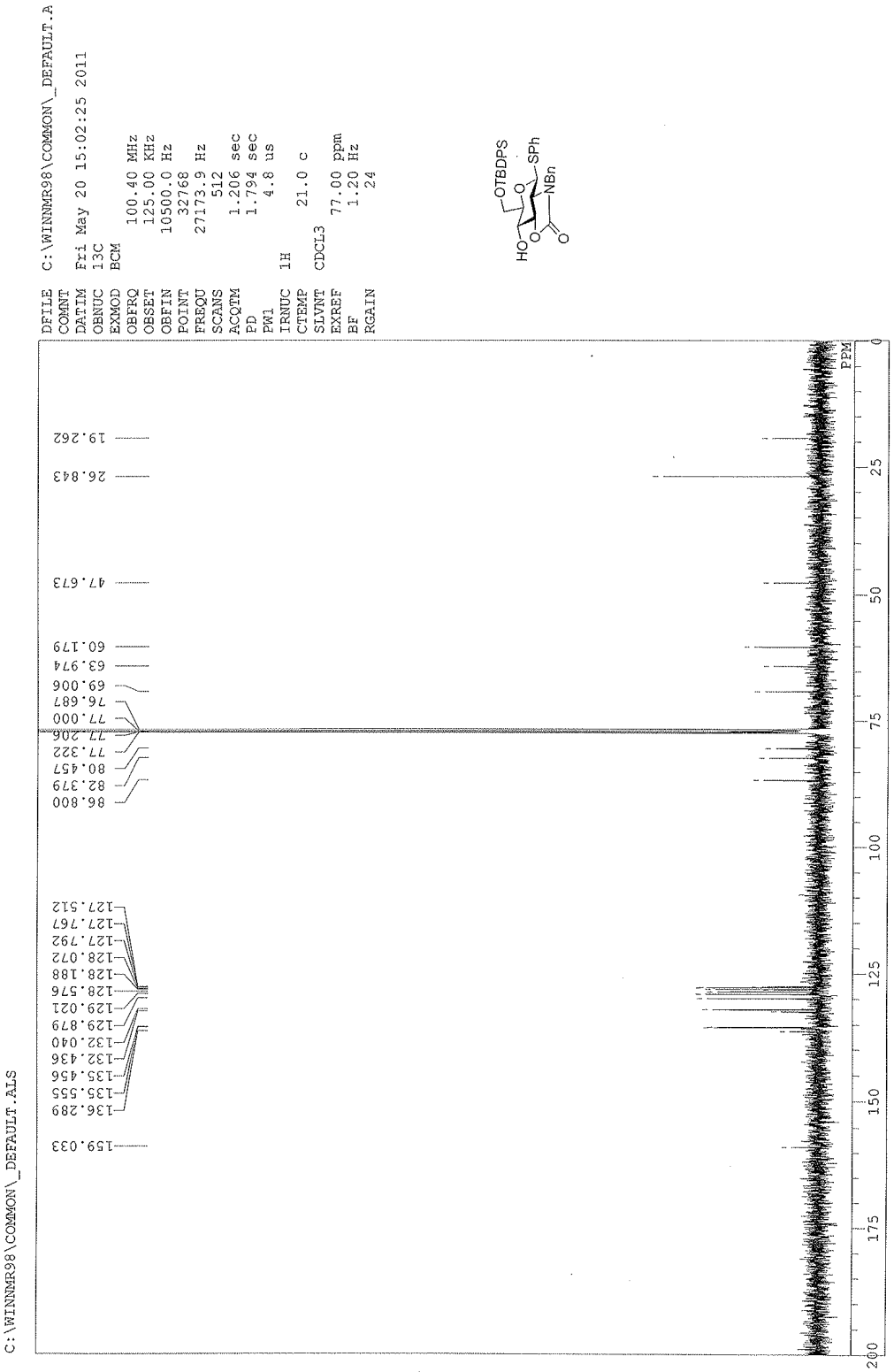
2.031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OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
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ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 21.0 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
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OTBDPS
SPh
NBn
HO
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60.179
63.974
69.006
76.687
77.000
77.206
77.322
80.457
82.379
86.800
127.512
127.767
127.792
128.072
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129.879
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125
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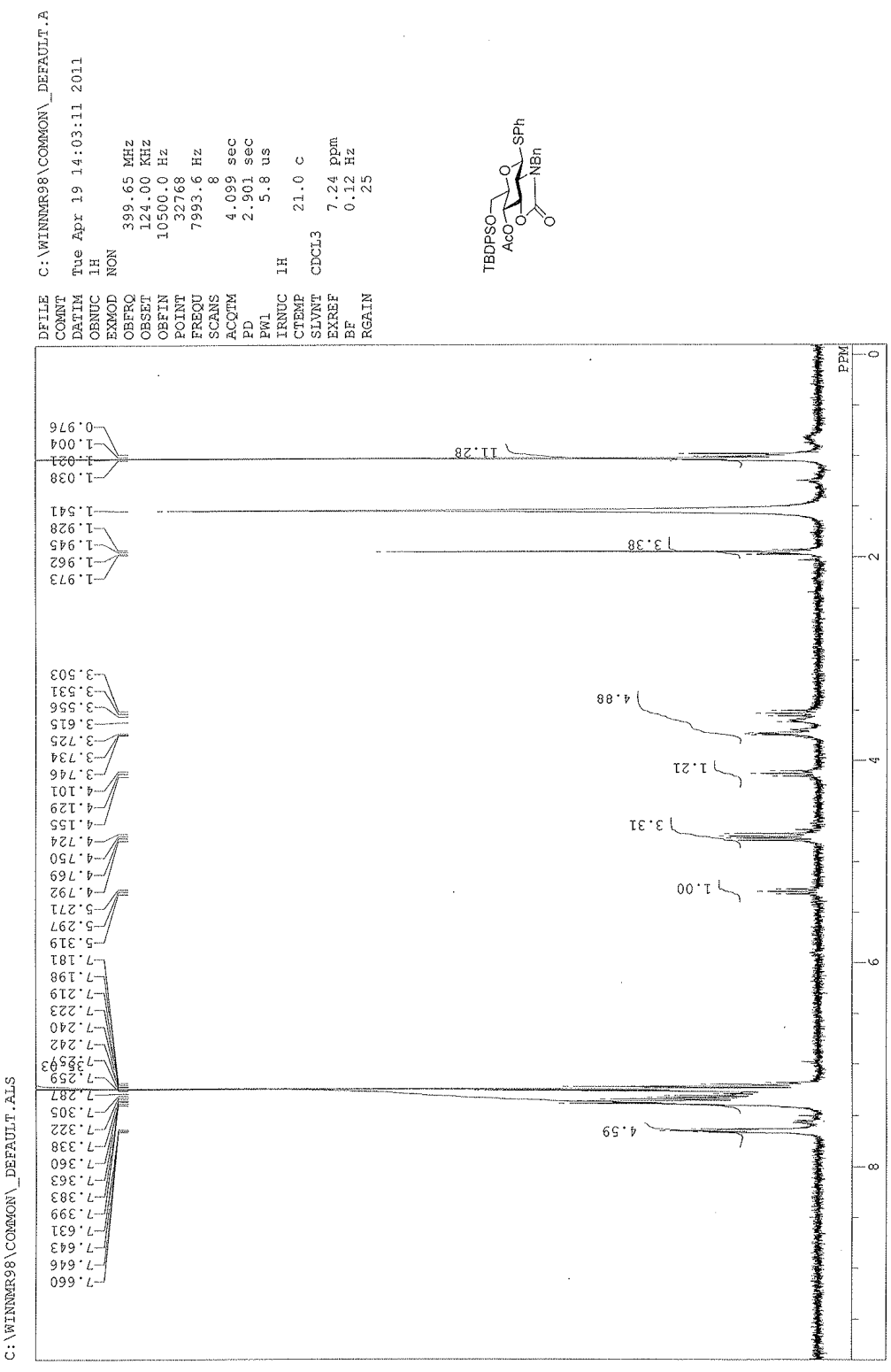
175
200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POINT 32768
FREQU 7993.6 Hz
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ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.0 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 25
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1.00
4.59
PPM
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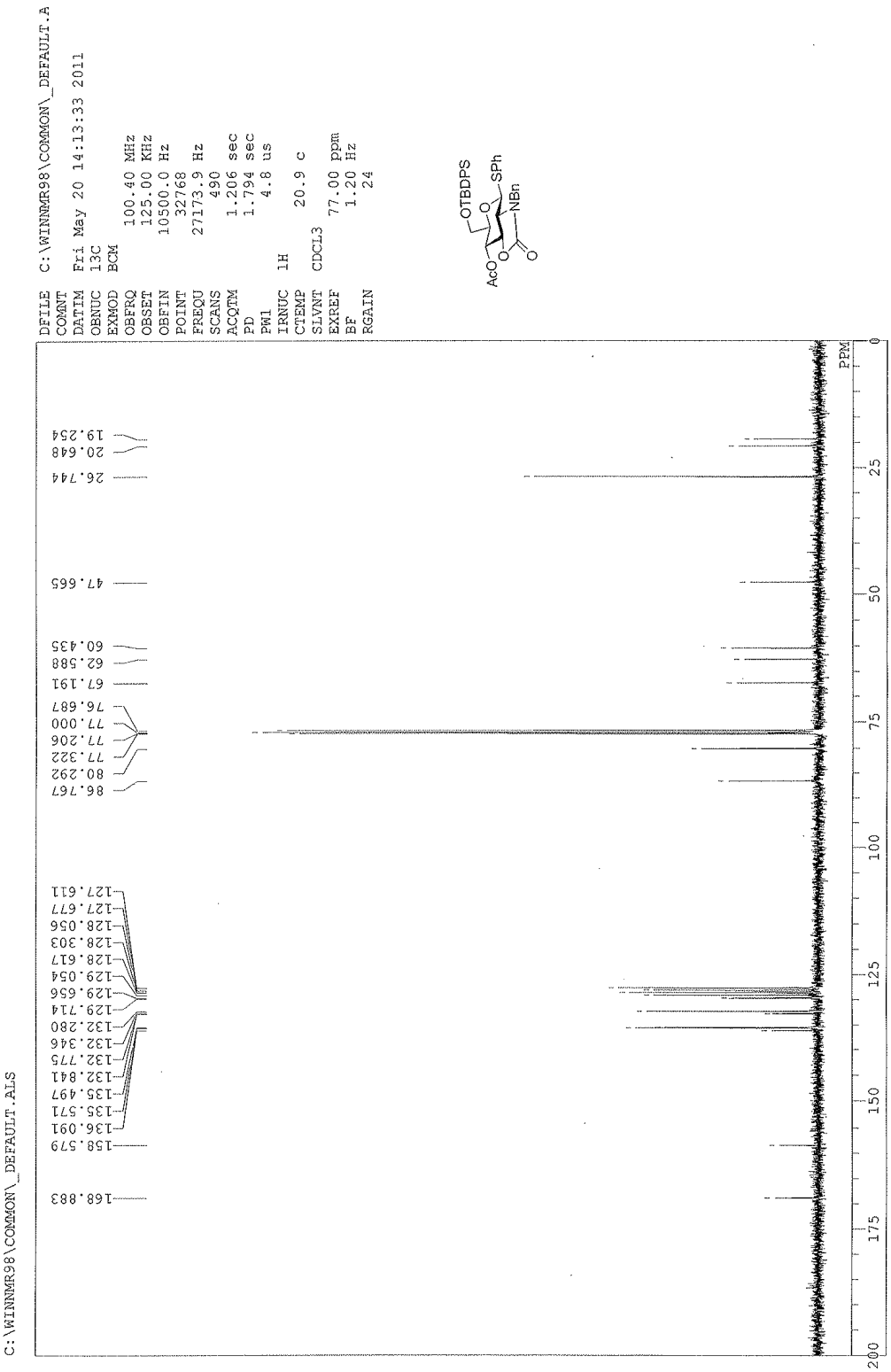
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OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 490
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 20.9 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
OTBDPS
SPh
NBn
AcO
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47.665
60.435
62.588
67.191
76.687
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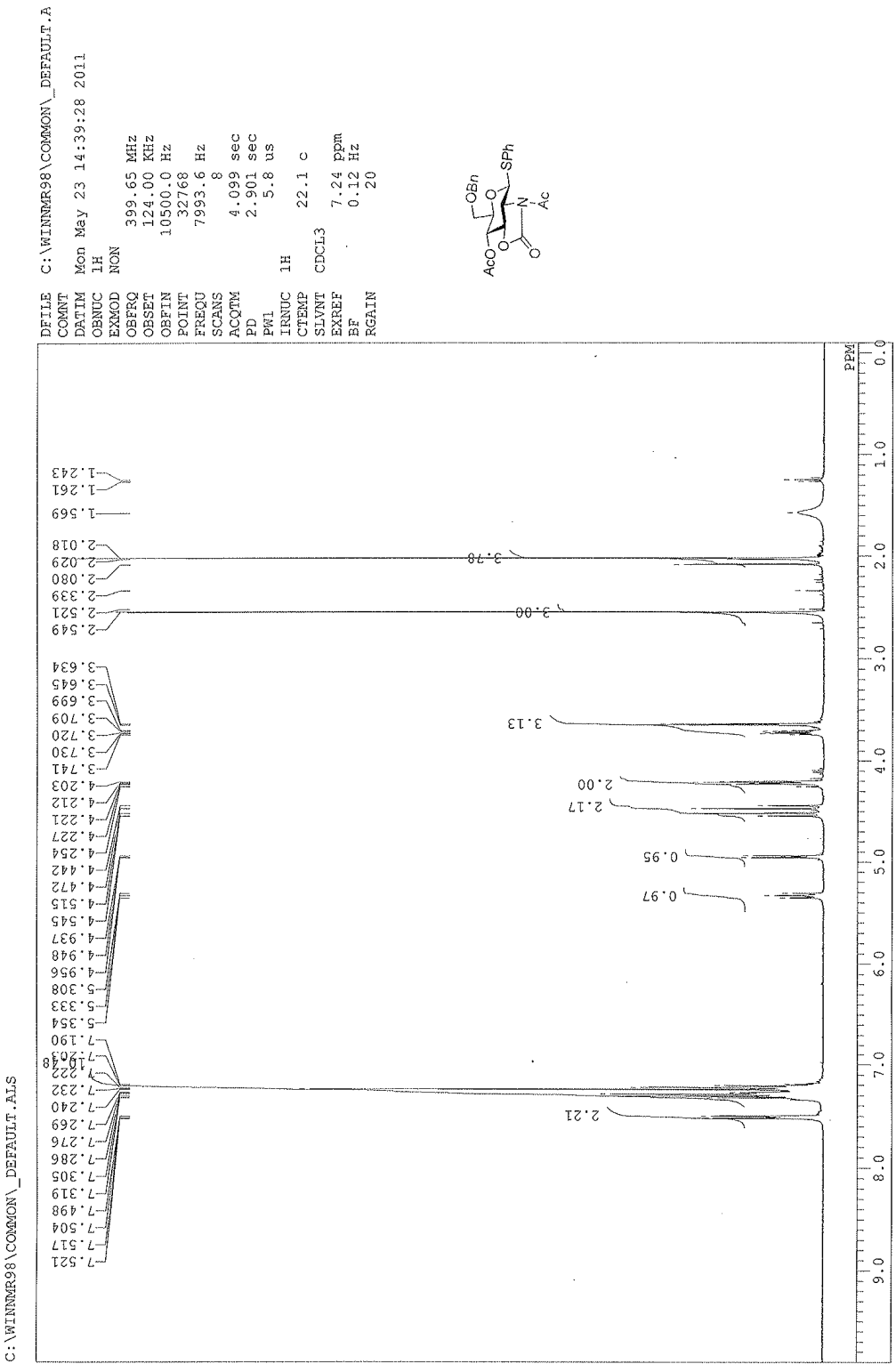
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POINT 32768
FREQU 7993.6 Hz
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PD 2.901 sec
PW1 5.8 us
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CTEMP 22.1 c
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SPh
AcO
Ac
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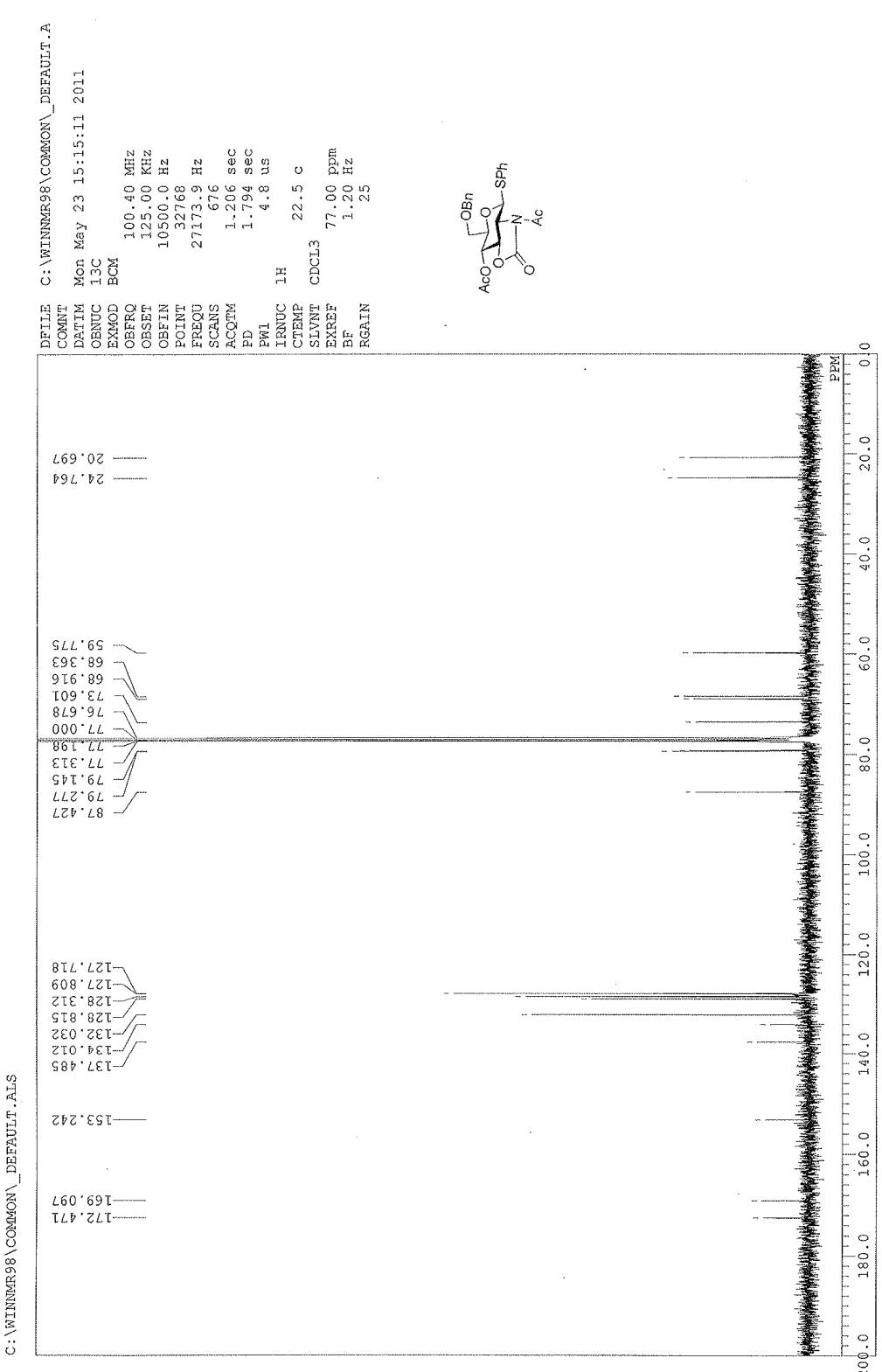
PPM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COMNT
DATIM Mon May 23 15:15:11 2011
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EXMOD BCM
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OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
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PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 22.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
OBn
SPh
AcO
N
Ac
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24.764
59.775
68.363
68.916
73.601
76.678
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172.471
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80.0
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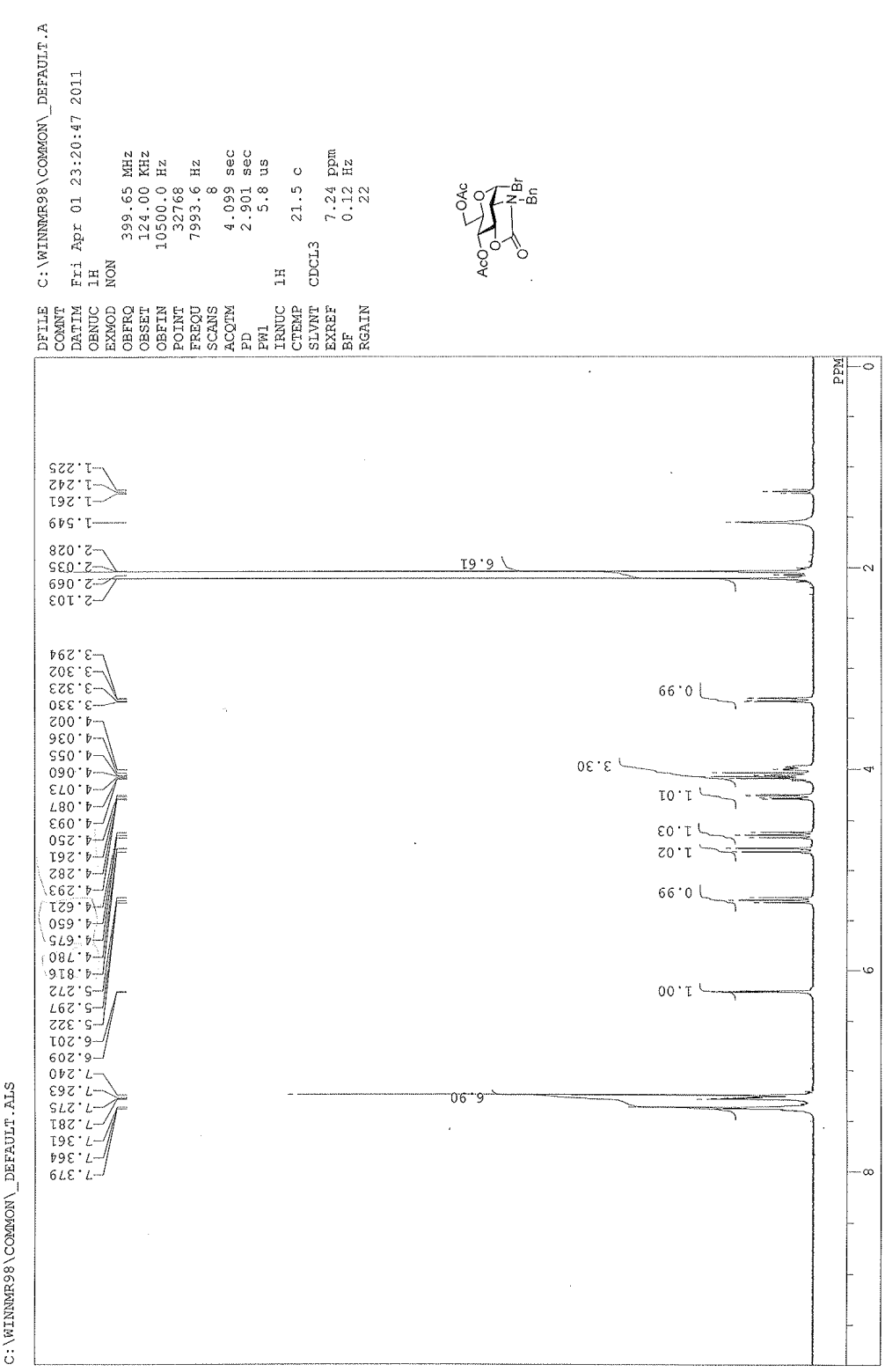
20.0
0.0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EXMOD NON
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OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 8
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 22
OAc
AcO
Br
Bn
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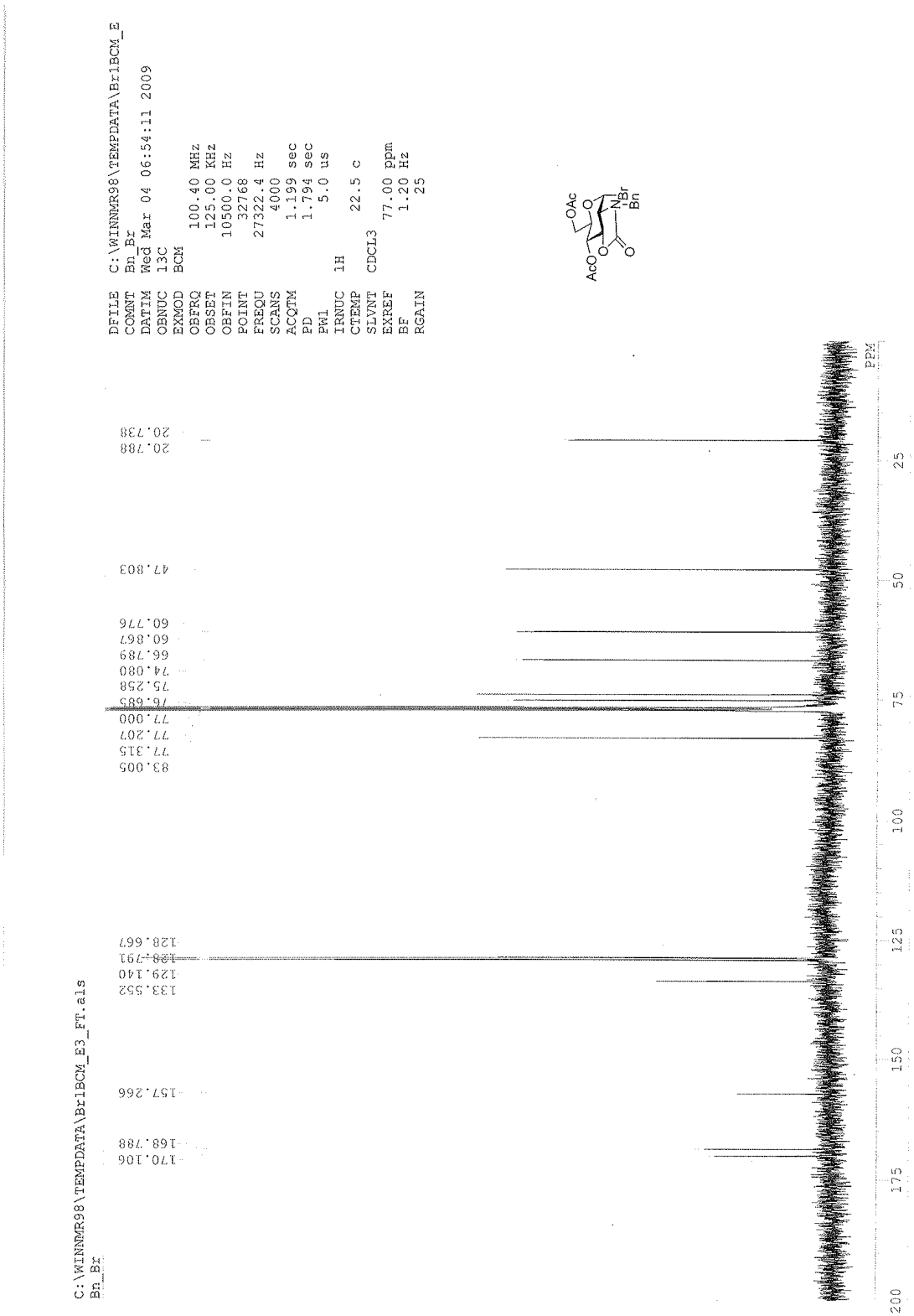
1.03
1.02
0.99
1.00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EXMOD BCM
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PD 1.794 sec
PW1 5.0 us
IRNUC 1H
CTEMP 22.5 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
OAc
AcO
Br
Bn
20.738
20.788
47.803
60.776
60.867
66.789
74.080
75.258
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77.000
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77.315
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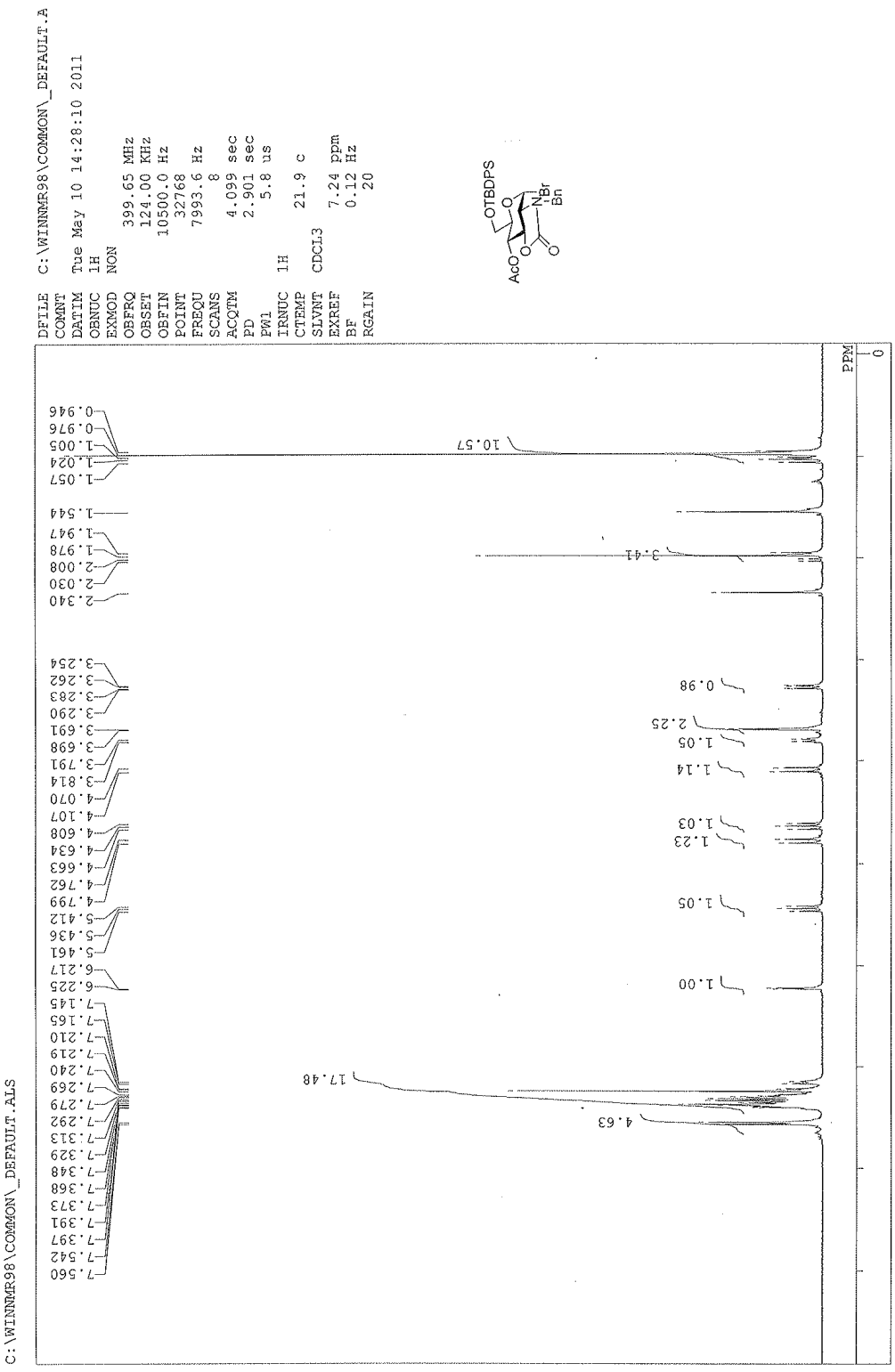
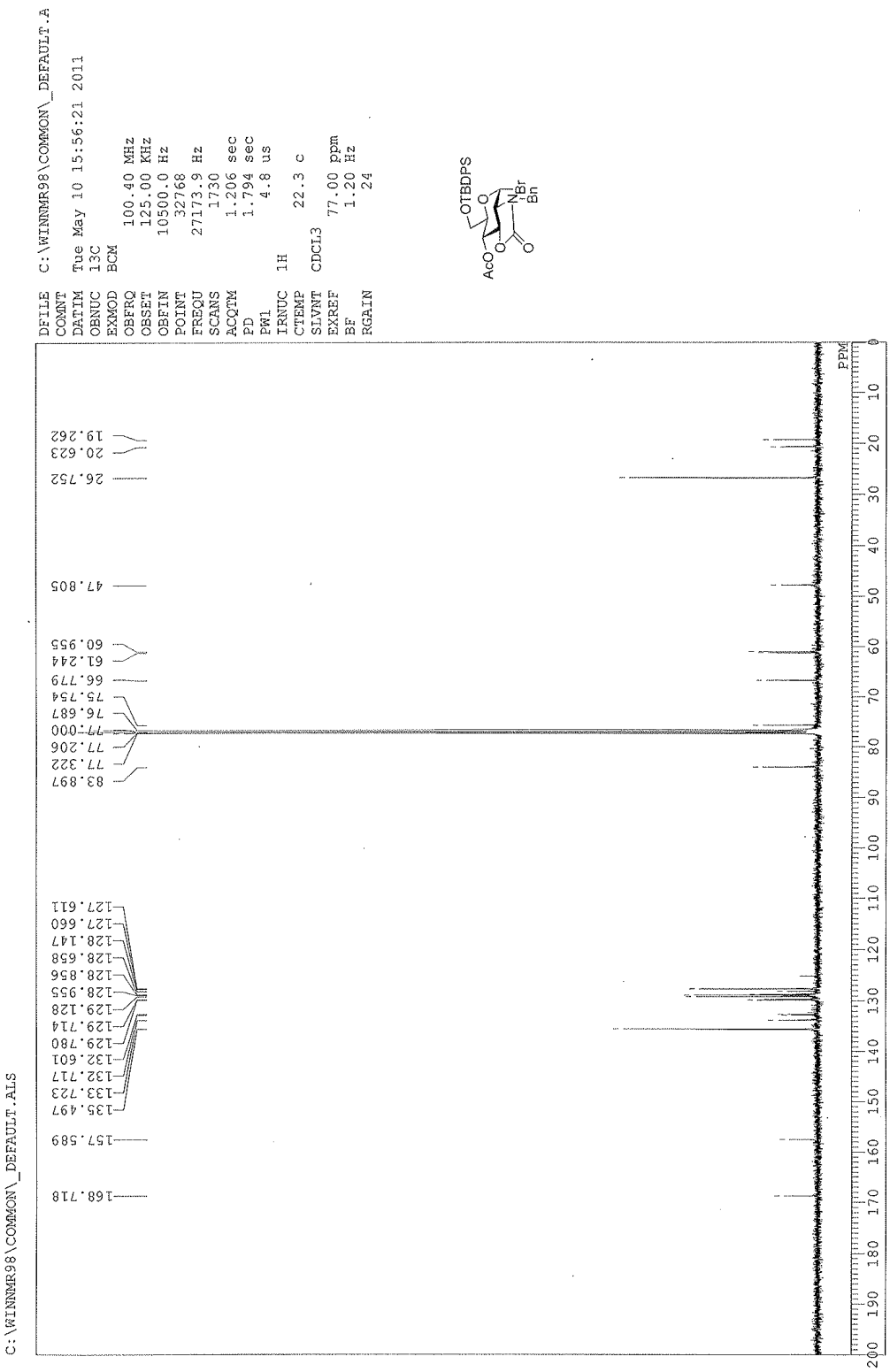
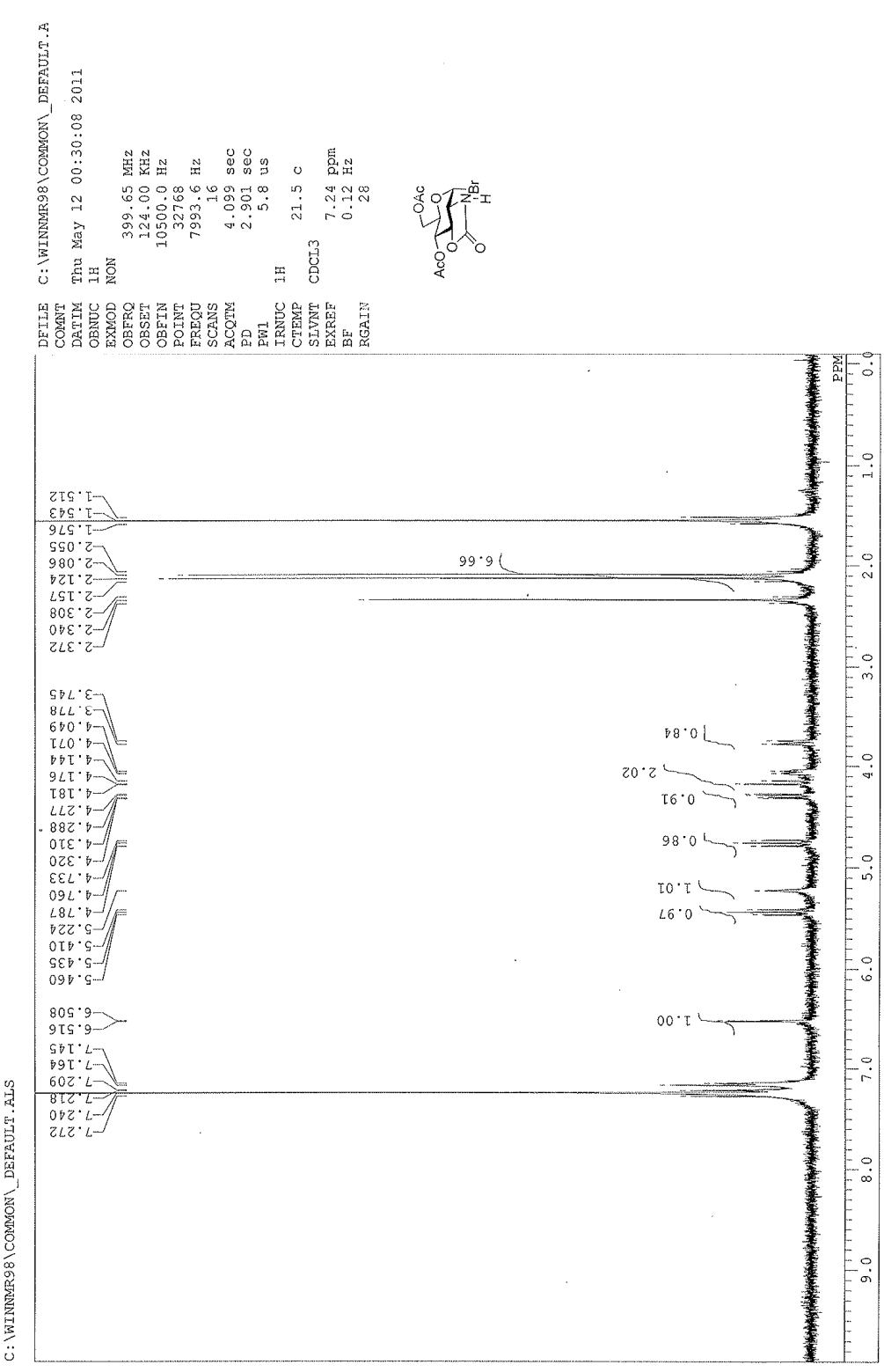
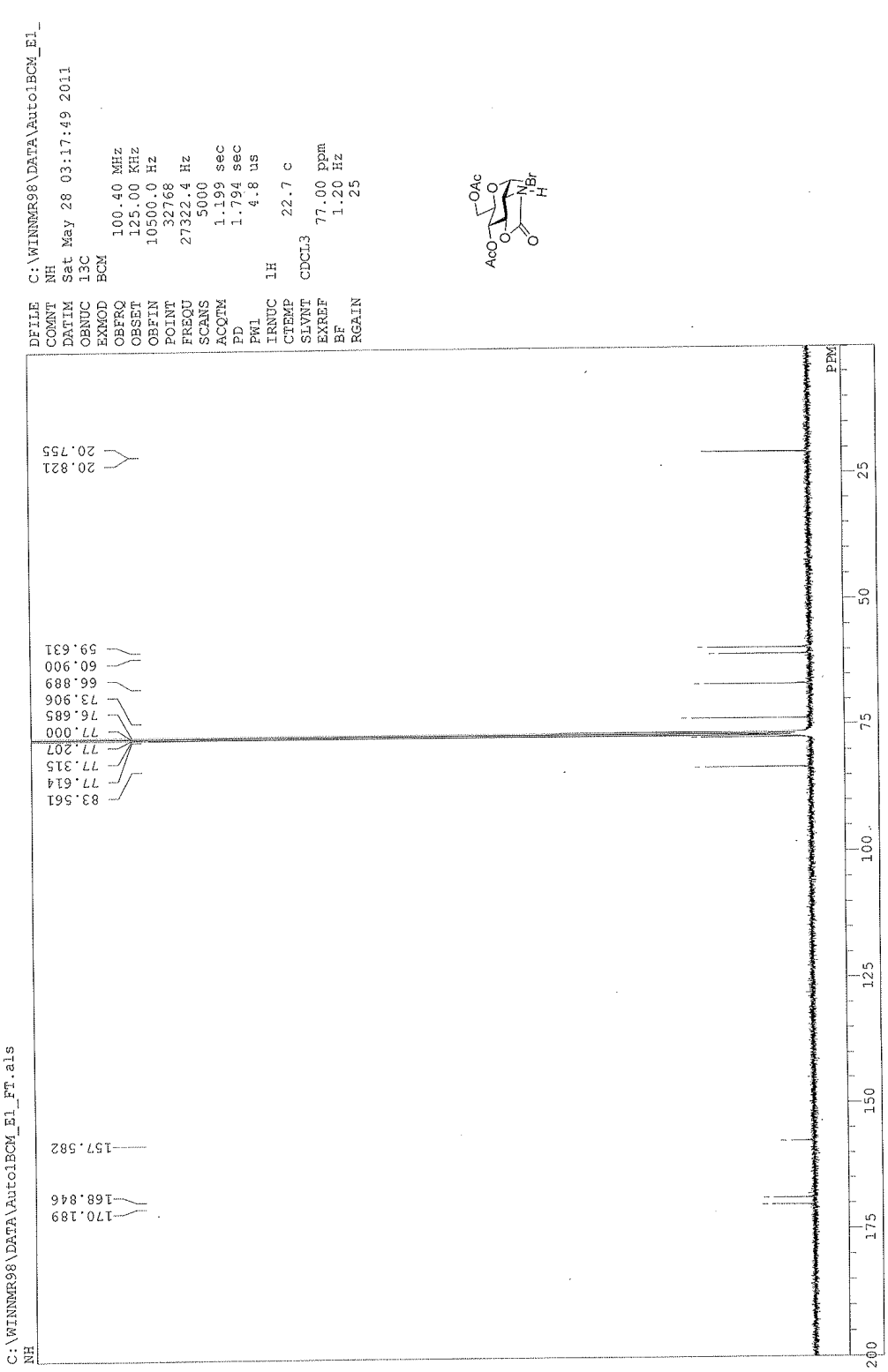
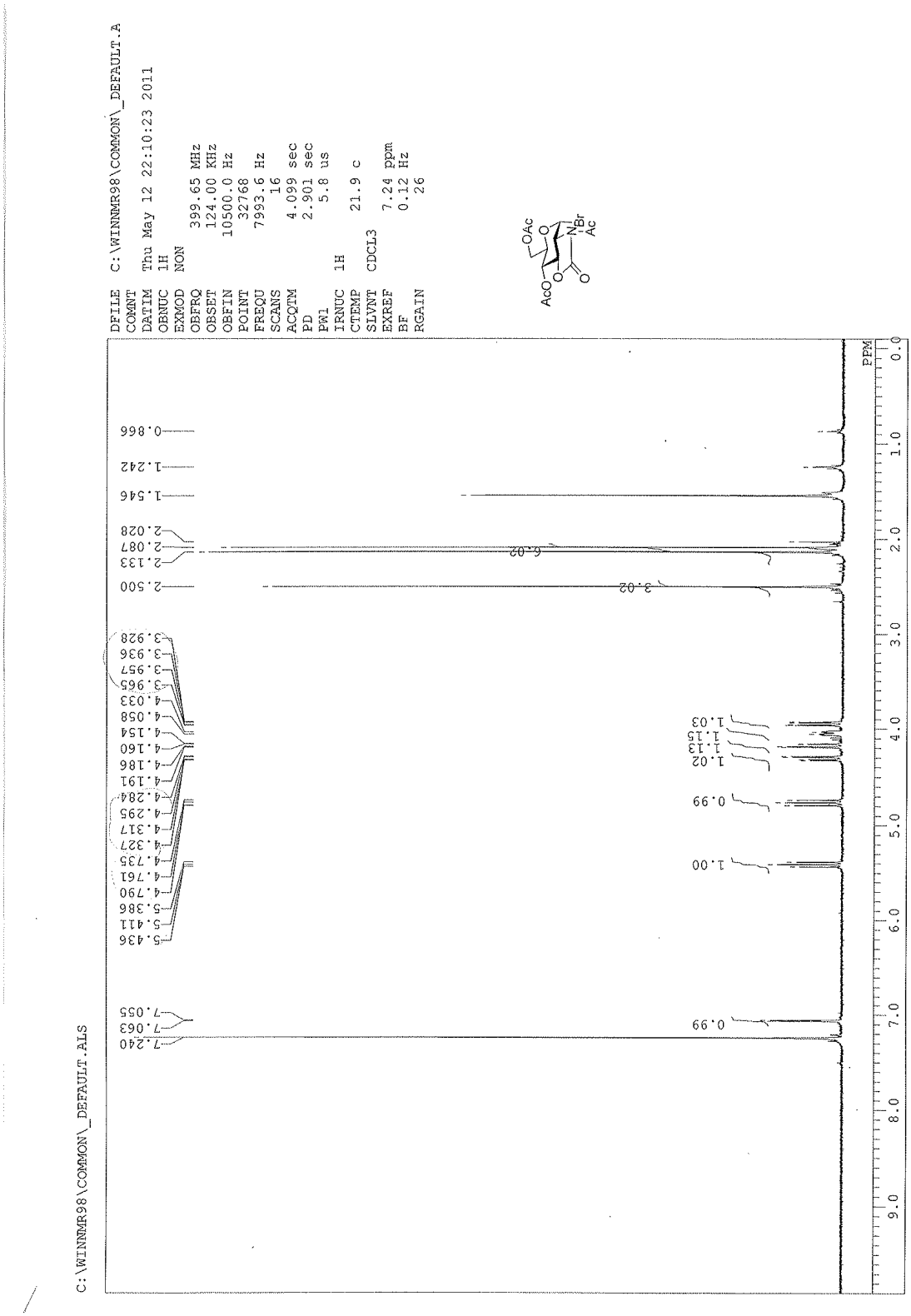
129.140
133.552
157.266
168.788
170.106
PPM
200
175
150
125
100
75
50
25

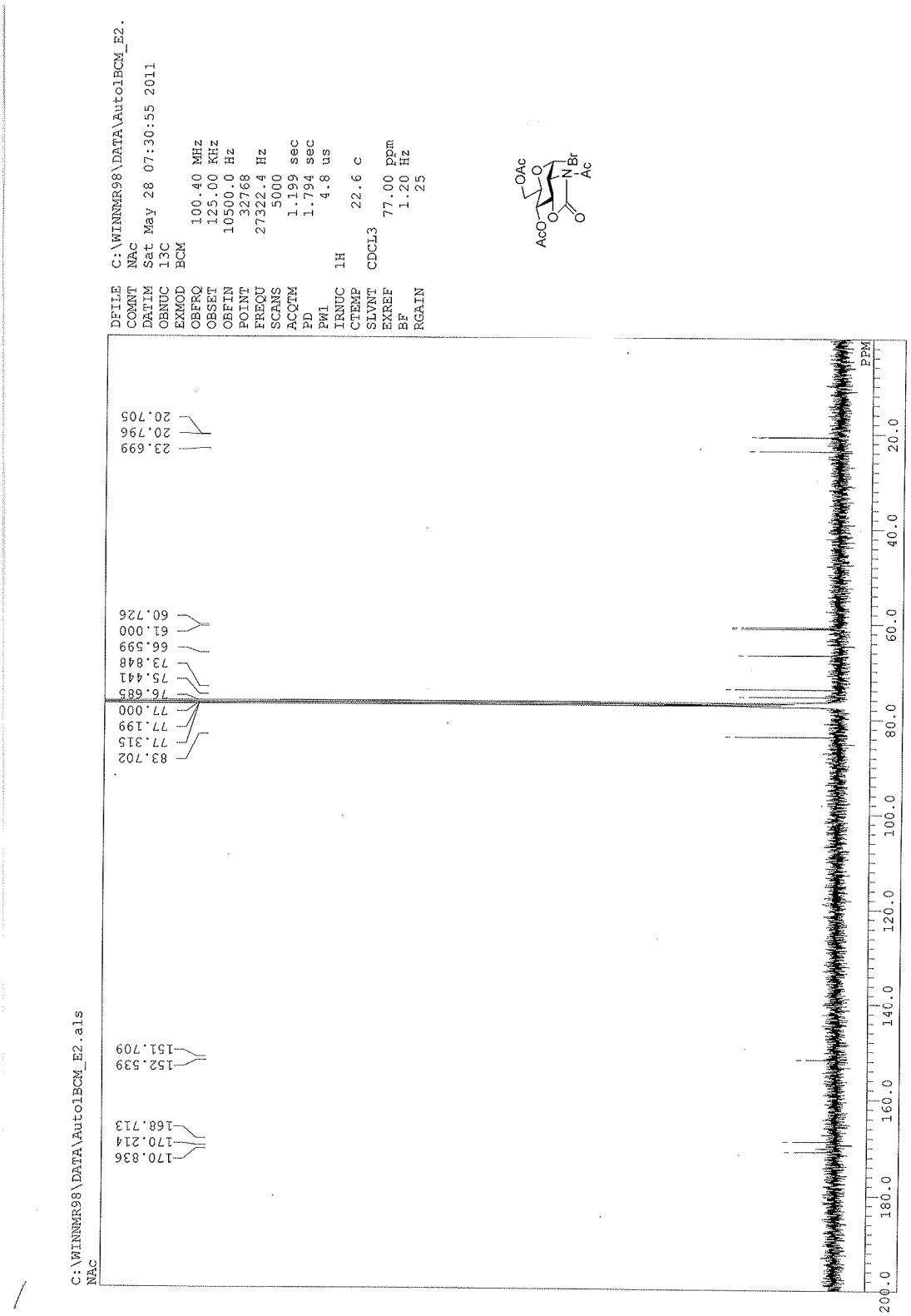

C:\WINNMR98\COMMON_DEFAULT.ALS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Tue May 10 14:28:10 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 8
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.9 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 20
OTBDPS
AcO
Br
Bn
PPM
0
10.57
17.48
4.63
3.41
2.25
1.14
1.05
1.03
1.23
1.05
1.00
0.98

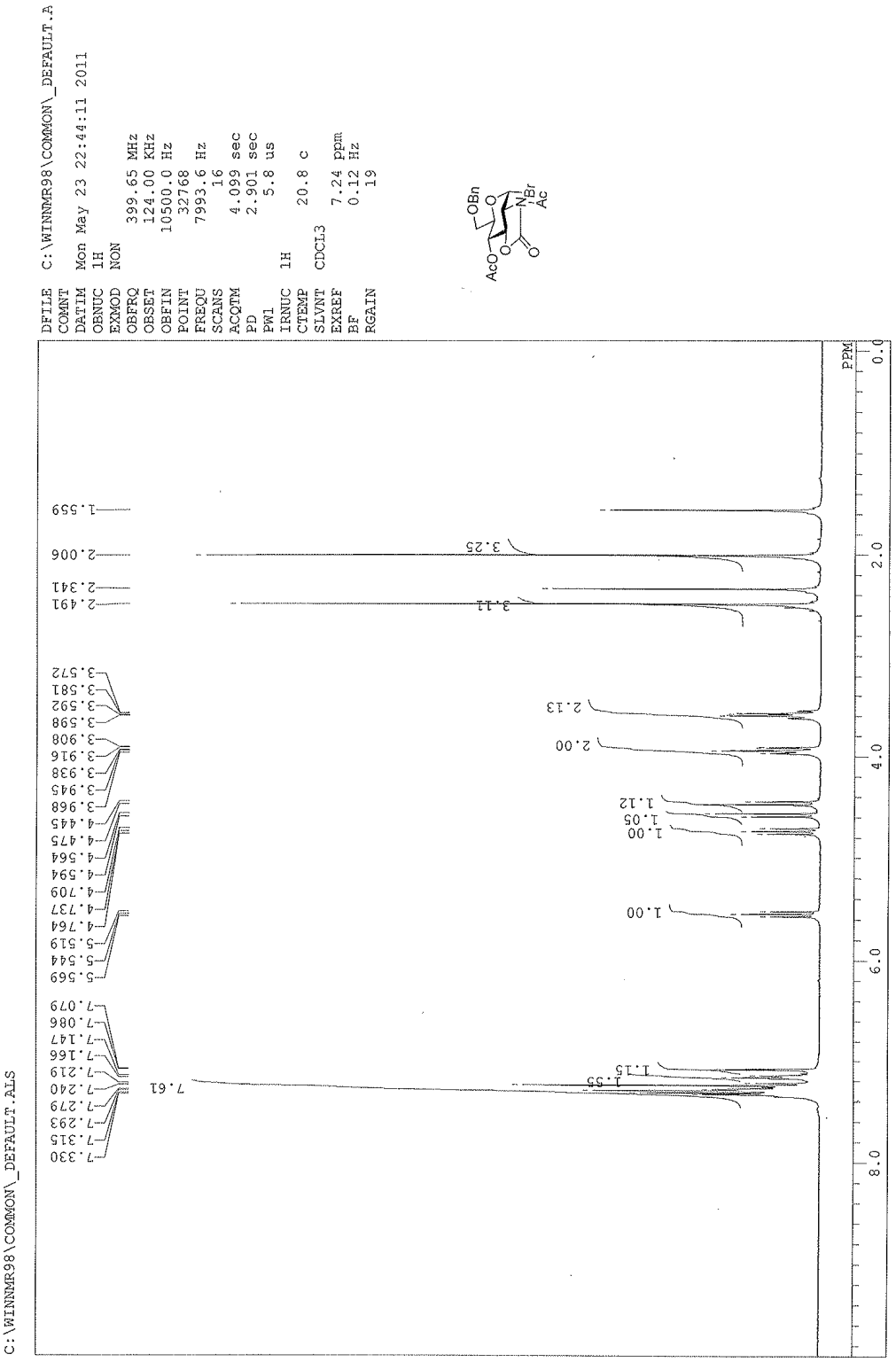

C:\WINNMR98\COMMON_DEFAULT.ALS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Tue May 10 15:56:21 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 1730
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 22.3 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
OTBDPS
AcO
Br
Bn
19.262
20.623
26.752
47.805
60.955
61.244
66.779
75.754
76.687
77.000
77.206
77.322
83.897
127.611
127.660
128.147
128.658
128.856
128.955
129.128
129.714
129.780
132.601
132.717
133.723
135.497
157.589
168.718
PPM

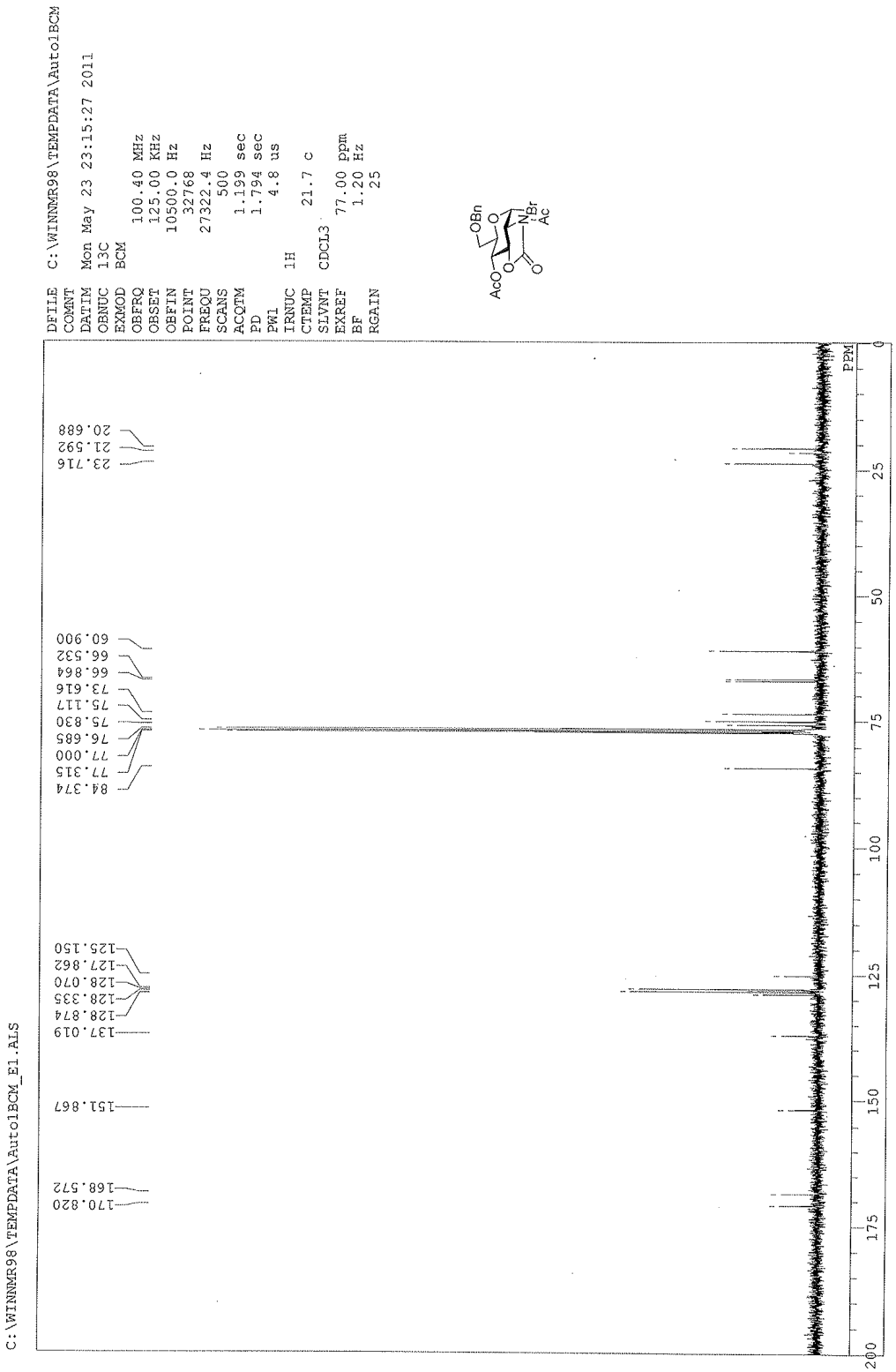

C:\WINNMR98\COMMON_DEFAULT.ALS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Thu May 12 00:30:08 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.5 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 28
OAc
AcO
NBr
H
1.512
1.543
1.576
2.055
2.086
2.124
2.157
2.308
2.340
2.372
3.745
3.778
4.049
4.071
4.144
4.176
4.181
4.277
4.288
4.310
4.320
4.733
4.760
4.787
5.224
5.410
5.435
5.460
6.508
6.516
7.145
7.164
7.209
7.218
7.240
7.272
6.66
0.84
2.02
0.91
0.86
1.01
0.97
1.00
PPM
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0

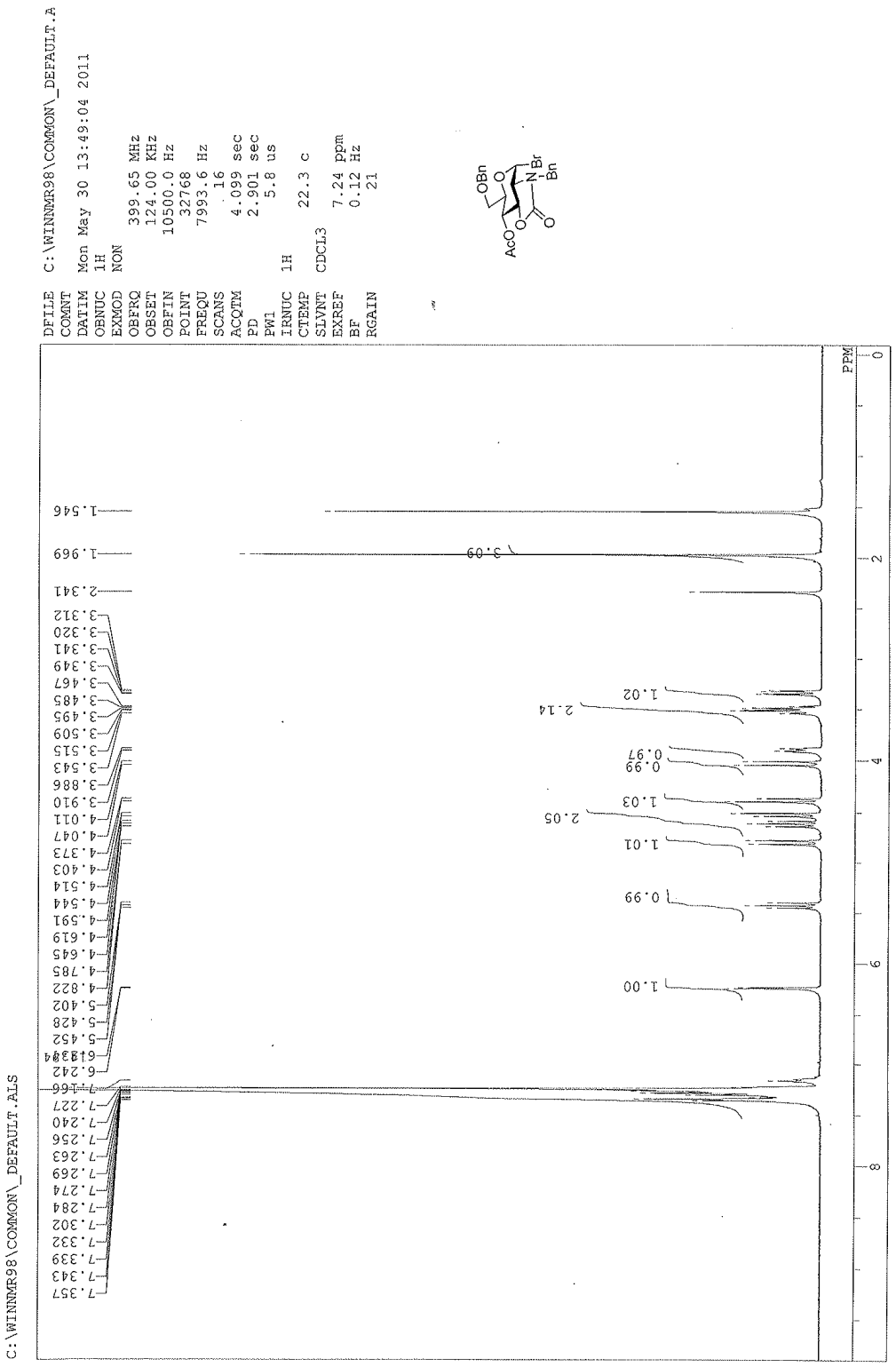

C:\WINNMR98\DATA\Auto1BCM_E1_FT.als
NH
DFILE C:\WINNMR98\DATA\Auto1BCM_E1_
COMNT NH
DATIM Sat May 28 03:17:49 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 5000
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 22.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
20.821
20.755
59.631
60.900
66.889
73.906
76.685
77.000
77.207
77.315
77.614
83.561
157.582
168.846
170.189
OAc
AcO
O
N
Br
H
PPM
200
175
150
125
100
75
50
25

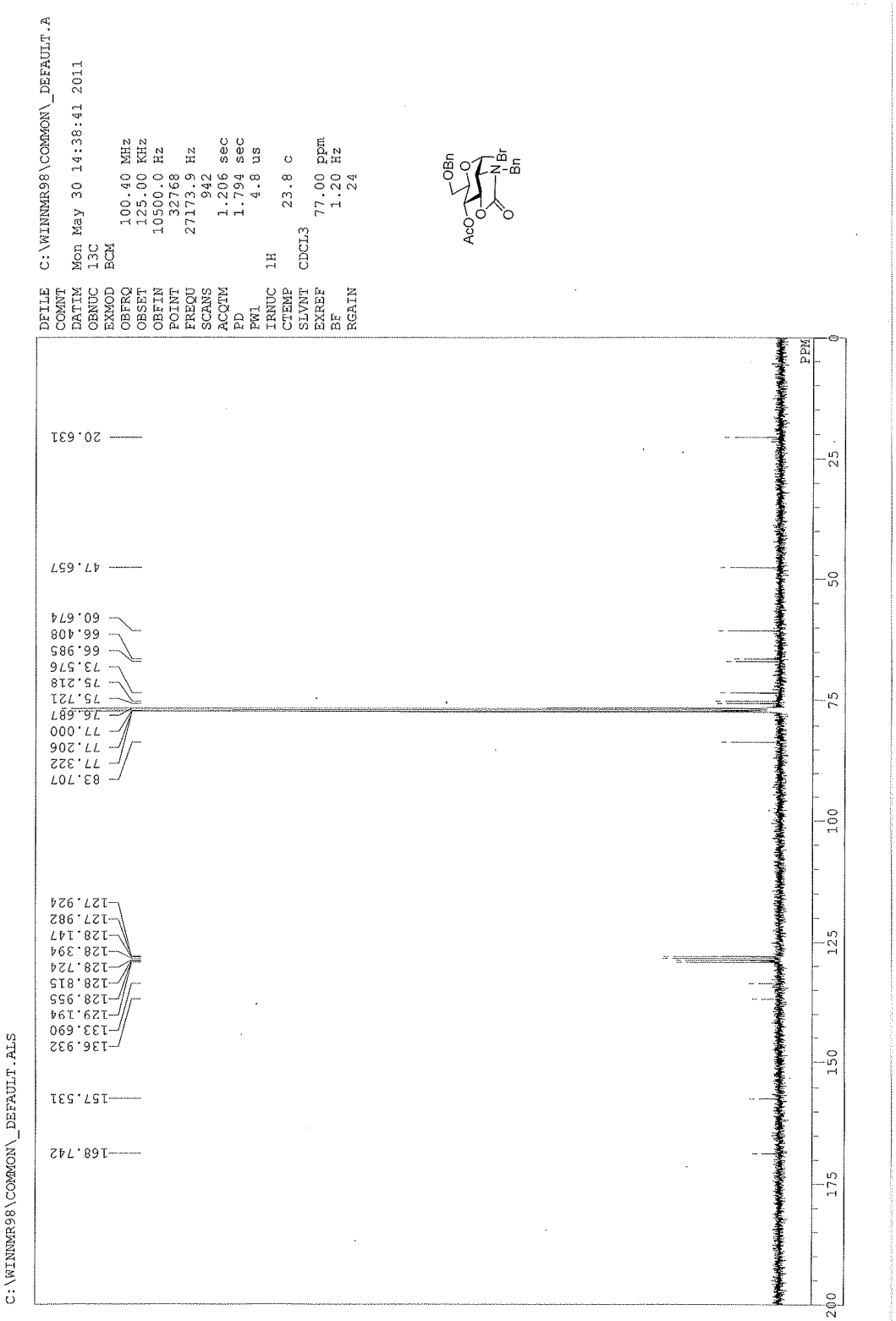

DPFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Thu May 12 22:10:23 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.9 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 26
OAc
AcO
NBr
Ac
C:\WINNMR98\COMMON_DEFAULT.ALS
PPM

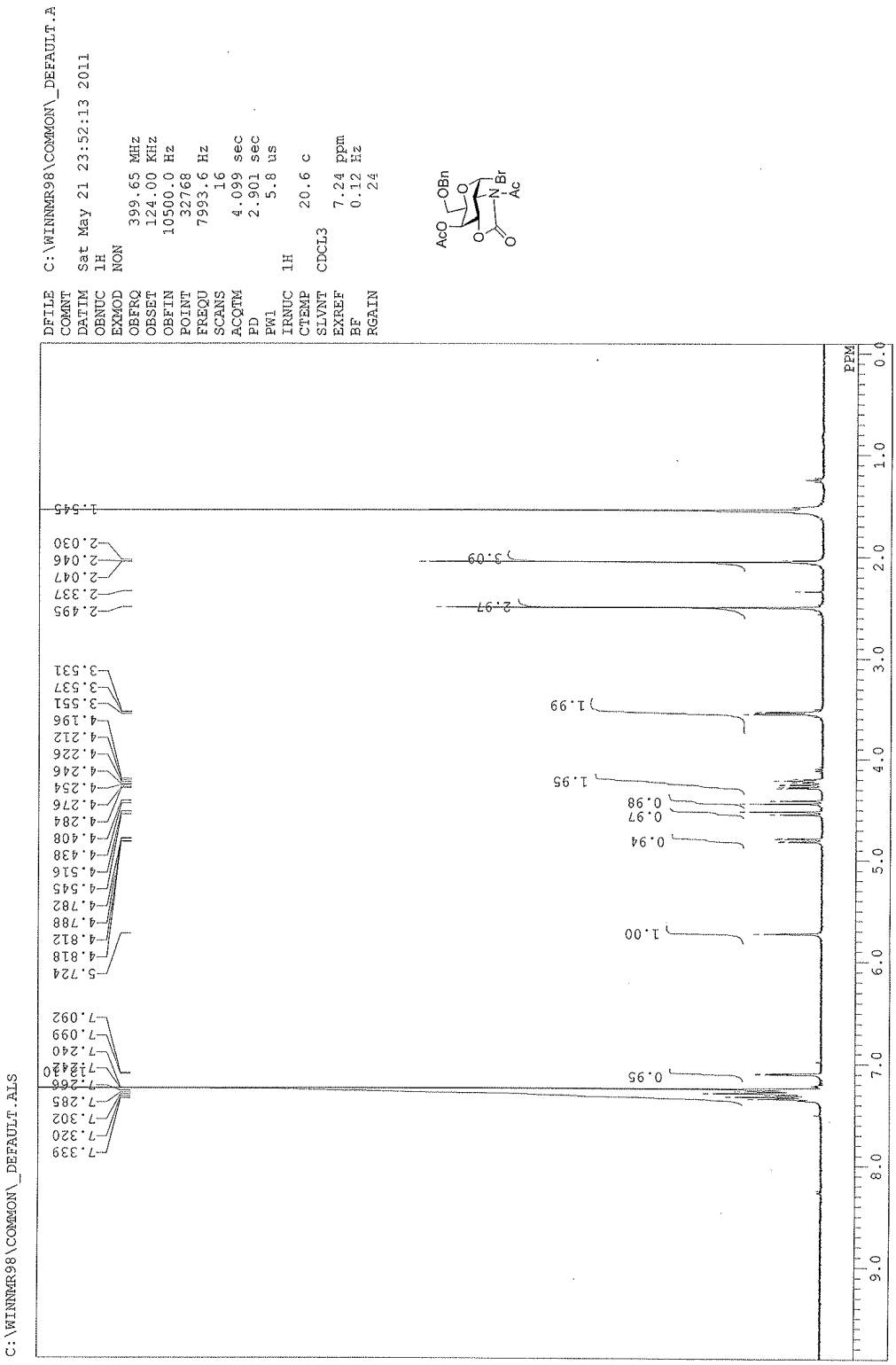

C:\WINNMR98\DATA\Auto1BCM_E2.als
NAc
DFILE C:\WINNMR98\DATA\Auto1BCM_E2.
COMNT NAc
DATIM Sat May 28 07:30:55 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSFT 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 5000
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 22.6 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
OAc
AcO
Br
Ac
20.705
20.796
23.699
60.726
61.000
66.599
73.848
75.441
76.685
77.000
77.199
77.315
83.702
151.709
152.539
168.713
170.214
170.836
PPM
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0

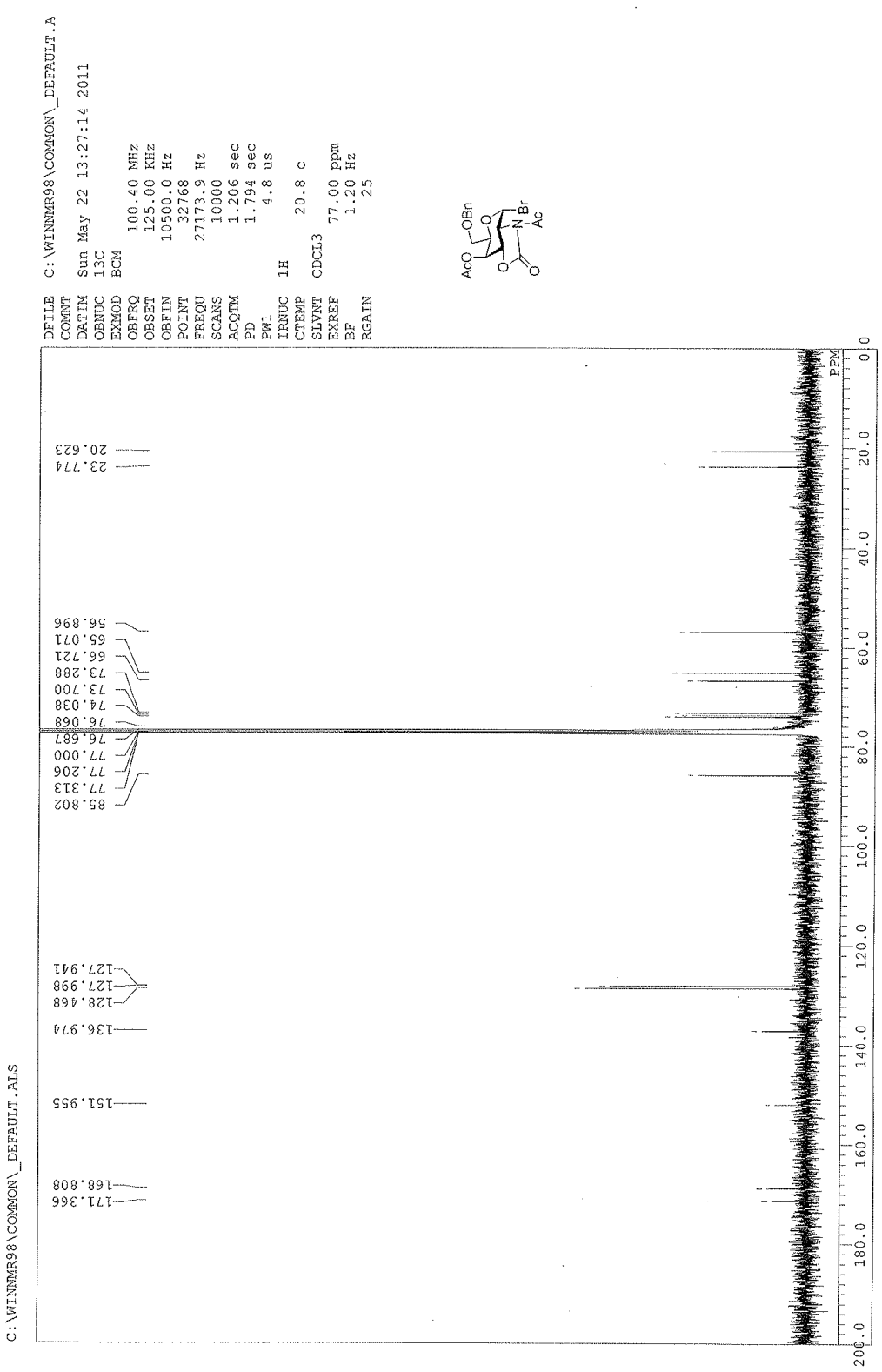

C:\WINNMR98\COMMON_DEFAULT.AJS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Mon May 23 22:44:11 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 20.8 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 19
OBn
AcO
Br
Ac
PPM
1.559
2.006
2.341
2.491
3.572
3.581
3.592
3.598
3.908
3.916
3.938
3.945
3.968
4.445
4.475
4.564
4.594
4.709
4.737
4.764
5.519
5.544
5.569
7.079
7.086
7.147
7.166
7.219
7.240
7.279
7.293
7.315
7.330
7.61
3.25
3.11
2.13
2.00
1.12
1.05
1.00
1.00
1.15
1.55

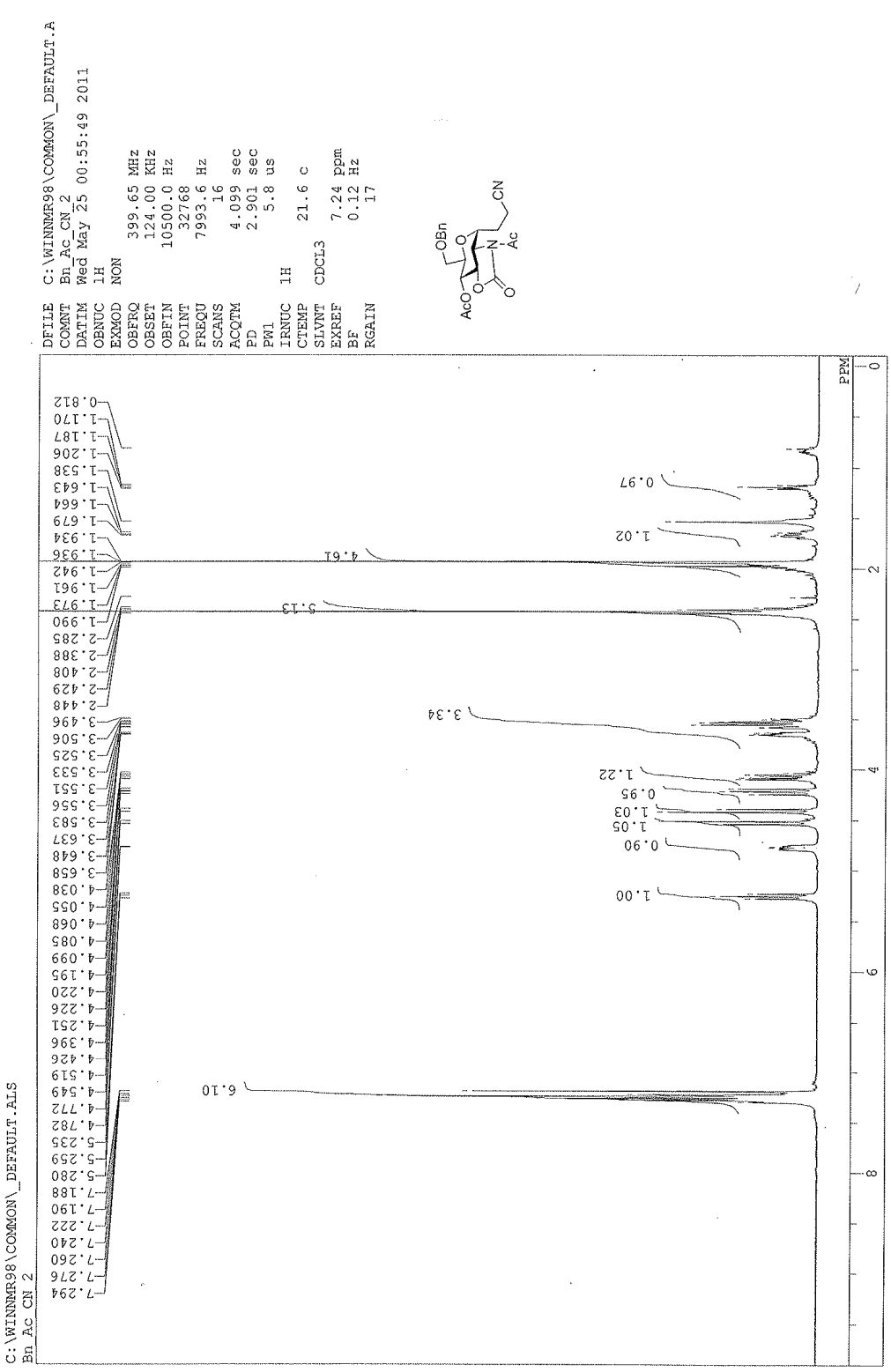

C:\WINNMR98\TEMPDATA\Autol BCM_E1.ALS
DFILE C:\WINNMR98\TEMPDATA\Autol BCM
COMNT
DATIM Mon May 23 23:15:27 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 500
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 21.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
OBn
O
NBr
Ac
AcO
O
O
20.688
21.592
23.716
60.900
66.532
66.864
73.616
75.117
75.830
76.685
77.000
77.315
84.374
125.150
127.862
128.070
128.335
128.874
137.019
151.867
168.572
170.820
PPM
0
25
50
75
100
125
150
175
200

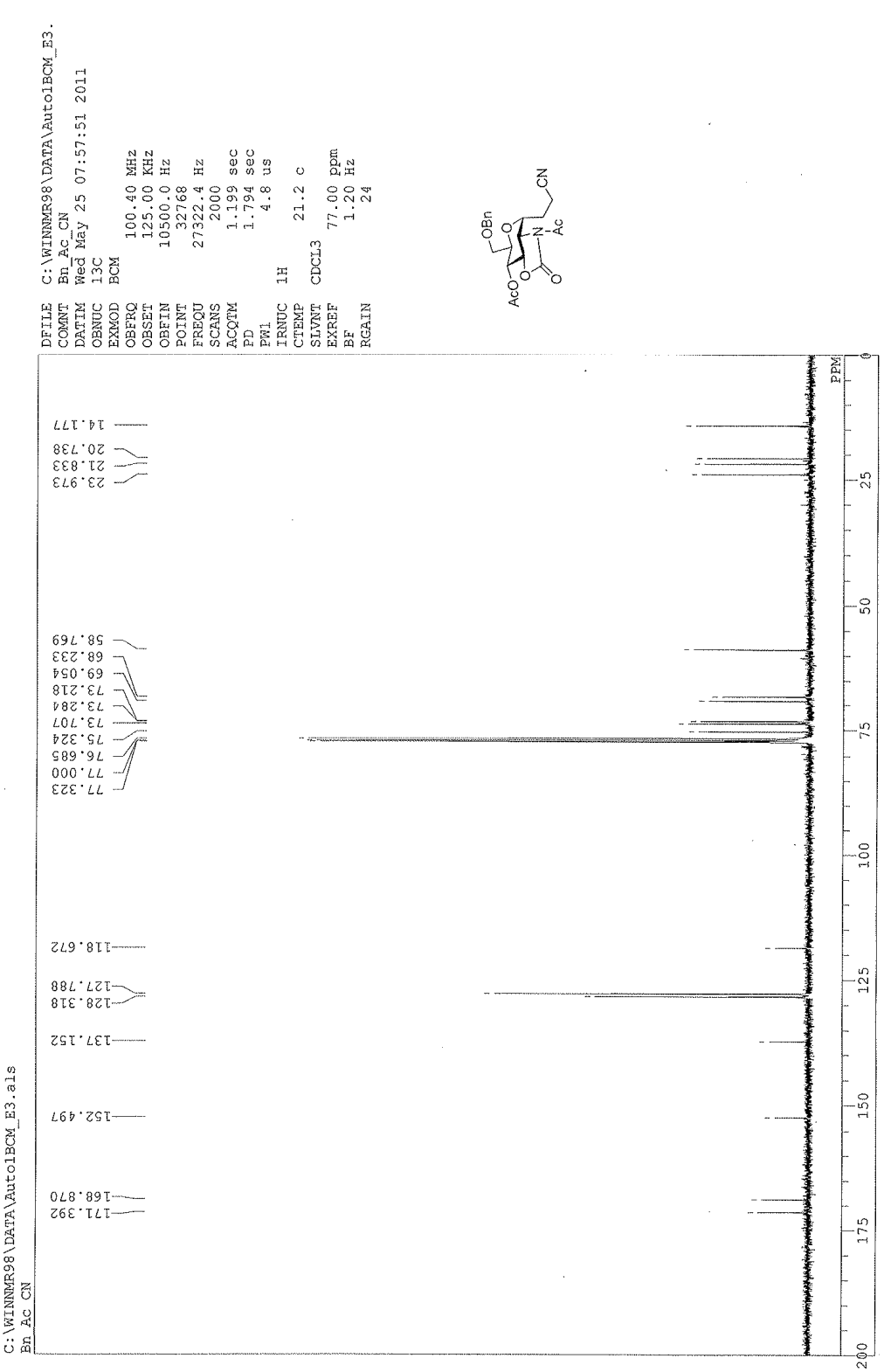

DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Mon May 30 13:49:04 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 22.3 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 21
OBn
Br
Bn
AcO
C:\WINNMR98\COMMON_DEFAULT.ALS
PPM

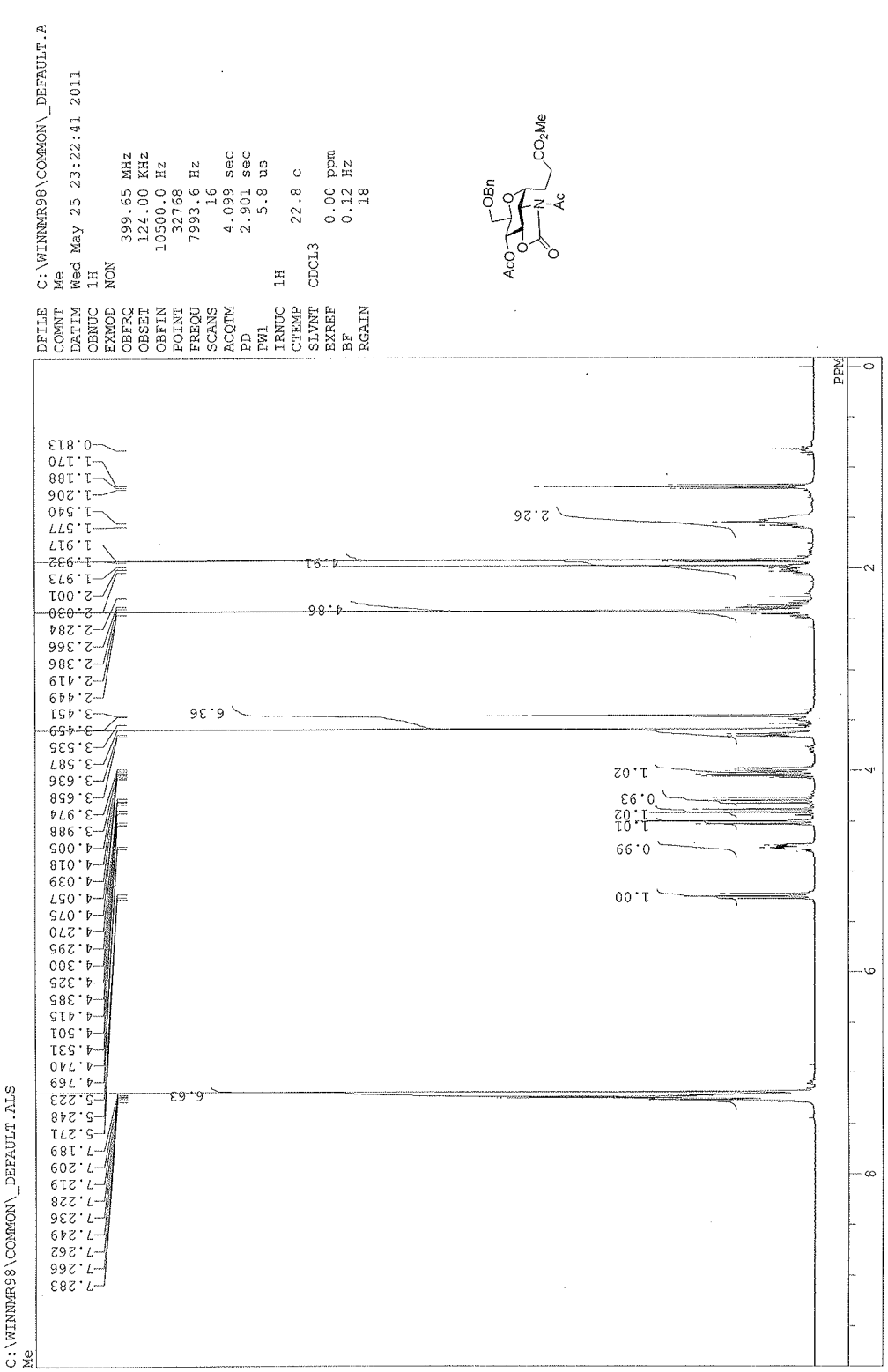

C:\WINNMR98\COMMON_DEFAULT.ALS
C:\WINNMR98\COMMON_DEFAULT.A
DFILE
COMNT
DATIM Mon May 30 14:38:41 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 942
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 23.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
OBn
AcO
N
Br
Bn
20.631
47.657
60.674
66.408
66.985
73.576
75.218
75.721
76.687
77.000
77.206
77.322
83.707
127.924
127.982
128.147
128.394
128.724
128.815
128.955
129.194
133.690
136.932
157.531
168.742
PPM
0
25
50
75
100
125
150
175
200

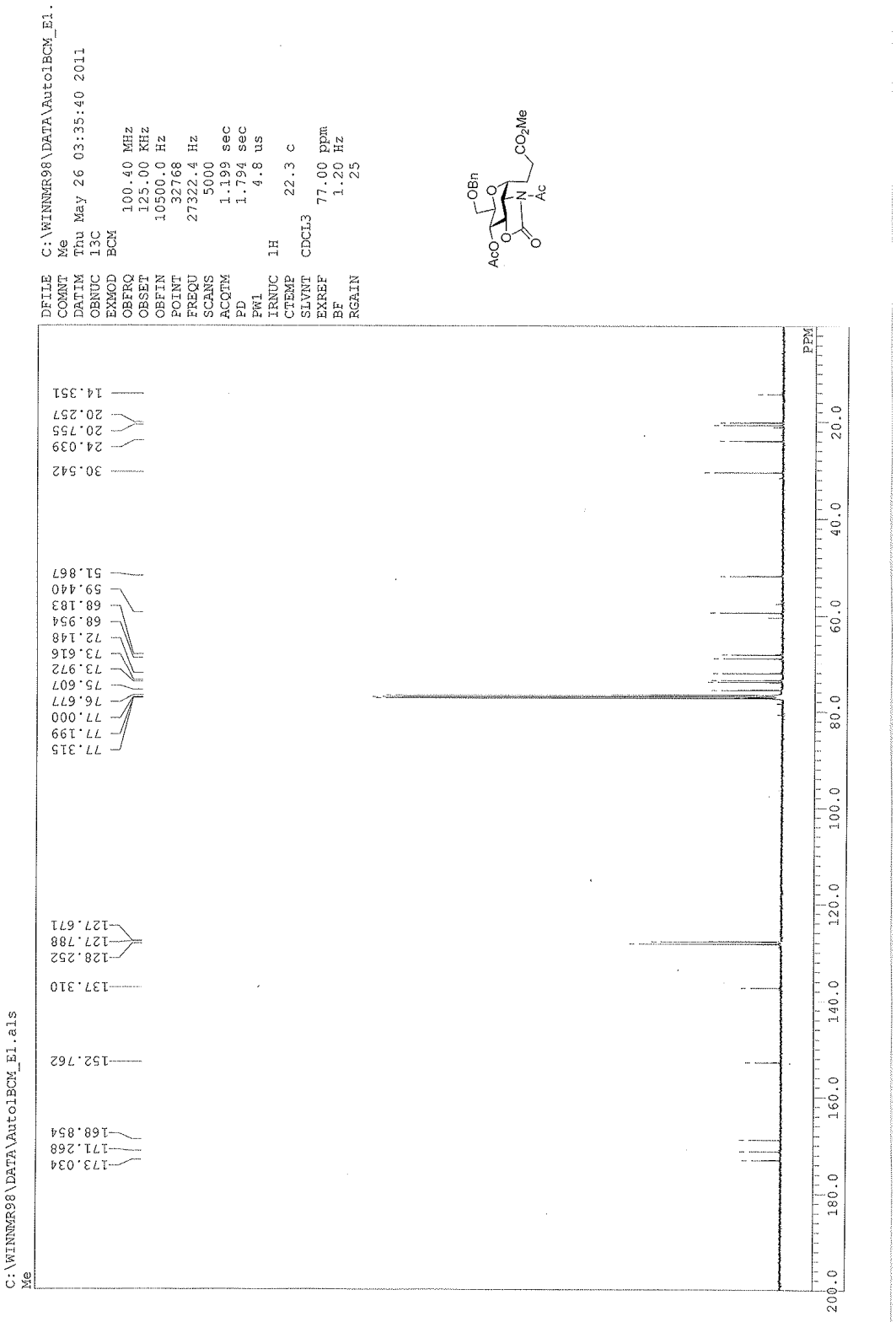

C:\WINNMR98\COMMON_DEFAULT.ALS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Sat May 21 23:52:13 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 20.6 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 24
AcO
OBn
Br
Ac
PPM

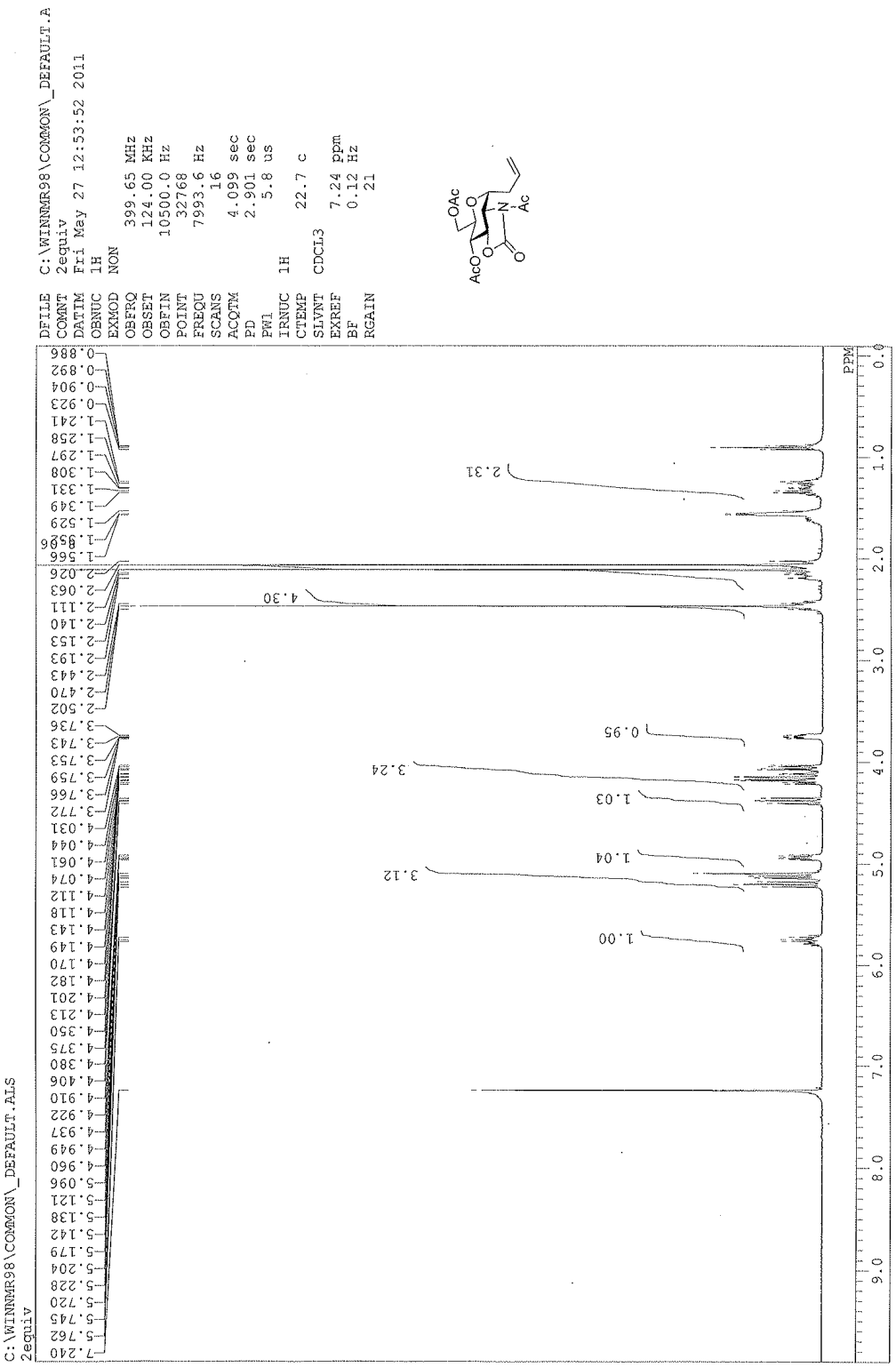

C:\WINNMR98\COMMON_DEFAULT.ALS
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Sun May 22 13:27:14 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSFT 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 10000
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 20.8 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
AcO
OBn
Br
Ac
20.623
23.774
56.896
65.071
66.721
73.288
73.700
74.038
76.068
76.687
77.000
77.206
77.313
85.802
127.941
127.998
128.468
136.974
151.955
168.808
171.366
PPM
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0

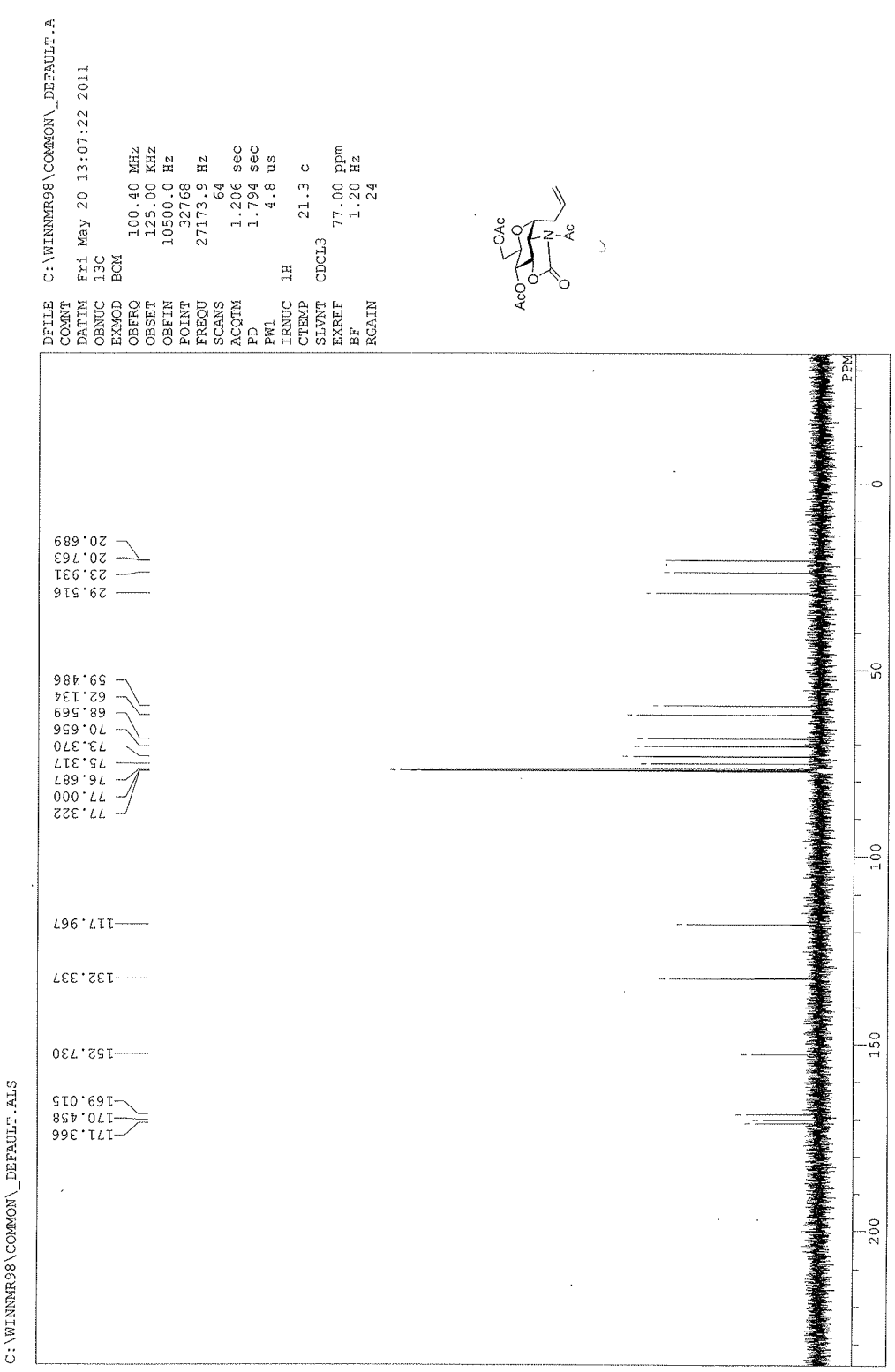

DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT Bn_Ac_CN_2
DATIM Wed May 25 00:55:49 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 21.6 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 17
OBn
CN
AcO
Ac
C:\WINNMR98\COMMON_DEFAULT.ALS
Bn_Ac_CN_2
PPM
0.812
1.170
1.187
1.206
1.538
1.643
1.664
1.679
1.934
1.936
1.942
1.961
1.973
1.990
2.285
2.388
2.408
2.429
2.448
3.496
3.506
3.525
3.533
3.551
3.556
3.583
3.637
3.648
3.658
4.038
4.055
4.068
4.085
4.099
4.195
4.220
4.226
4.251
4.396
4.426
4.519
4.549
4.772
4.782
5.235
5.259
5.280
7.188
7.190
7.222
7.240
7.260
7.276
7.294
0.97
1.02
4.61
5.13
3.34
1.22
0.95
1.03
1.05
0.90
1.00
6.10

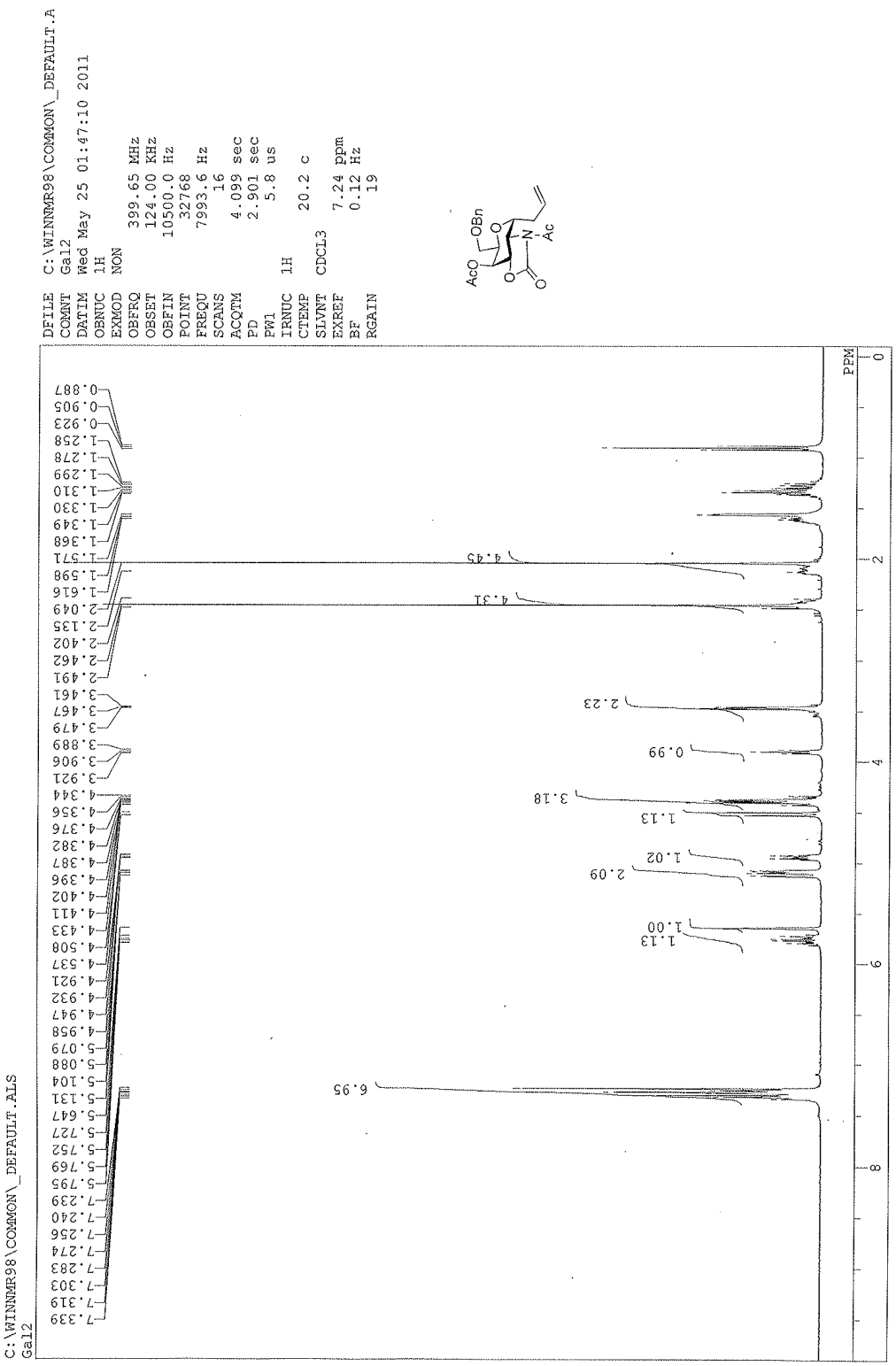

C:\WINNMR98\DATA\Auto1BCM_E3.als
Bn_Ac_CN
DFILE C:\WINNMR98\DATA\Auto1BCM_E3.
COMNT Bn_Ac_CN
DATIM Wed May 25 07:57:51 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 2000
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 21.2 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
OBn
CN
Ac
AcO
14.177
20.738
21.833
23.973
58.769
68.233
69.054
73.218
73.284
73.707
75.324
76.685
77.000
77.323
118.672
127.788
128.318
137.152
152.497
168.870
171.392
PPM
200
175
150
125
100
75
50
25
0

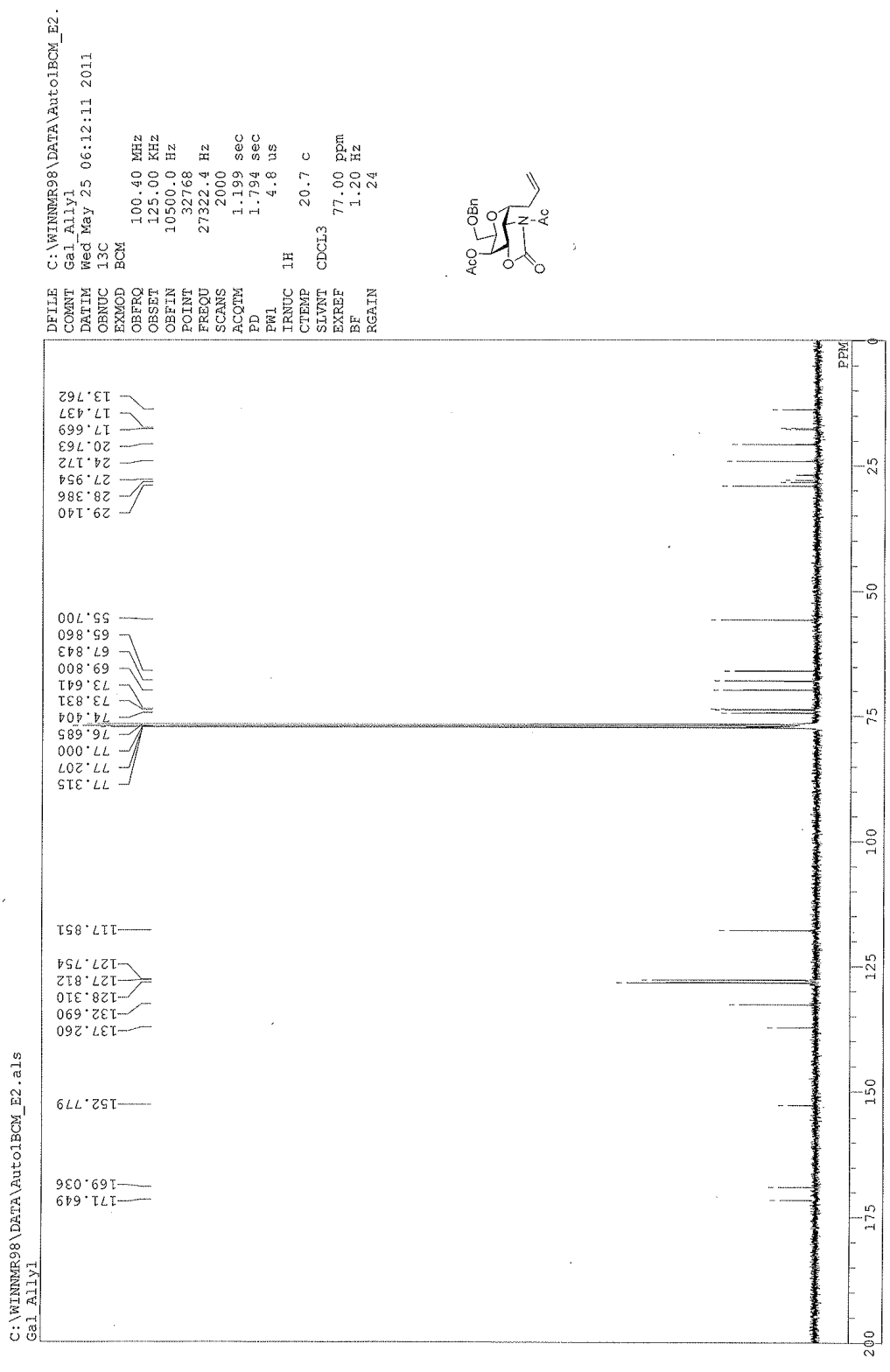

DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT Me
DATIM Wed May 25 23:22:41 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 22.8 c
SLVNT CDCL3
EXREF 0.00 ppm
BF 0.12 Hz
RGAIN 18
OBn
CO2Me
Ac
AcO
C:\WINNMR98\COMMON_DEFAULT.ALS
Me
PPM

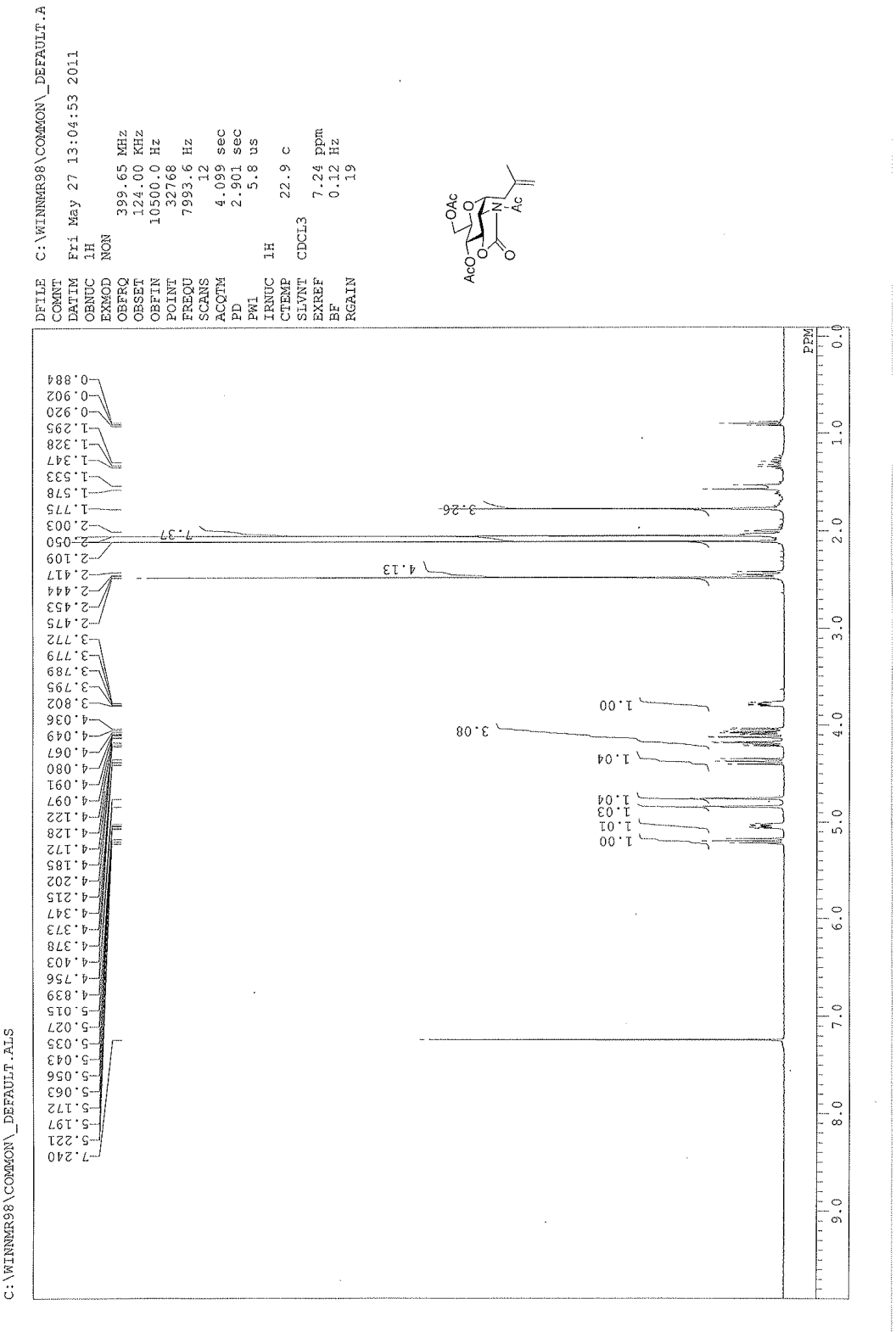

C:\WINNMR98\DATA\Autol8CM_E1.als
Me
C:\WINNMR98\DATA\Autol8CM_E1.
Me
Thu May 26 03:35:40 2011
13C
BCM
100.40 MHz
125.00 KHz
10500.0 Hz
32768
27322.4 Hz
5000
1.199 sec
1.794 sec
4.8 us
1H
22.3 c
CDCL3
77.00 ppm
1.20 Hz
25
OBn
AcO
CO2Me
Ac
14.351
20.257
20.755
24.039
30.542
51.867
59.440
68.183
68.954
72.148
73.616
73.972
75.607
76.677
77.000
77.199
77.315
127.671
127.788
128.252
137.310
152.762
168.854
171.268
173.034
PPM
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0

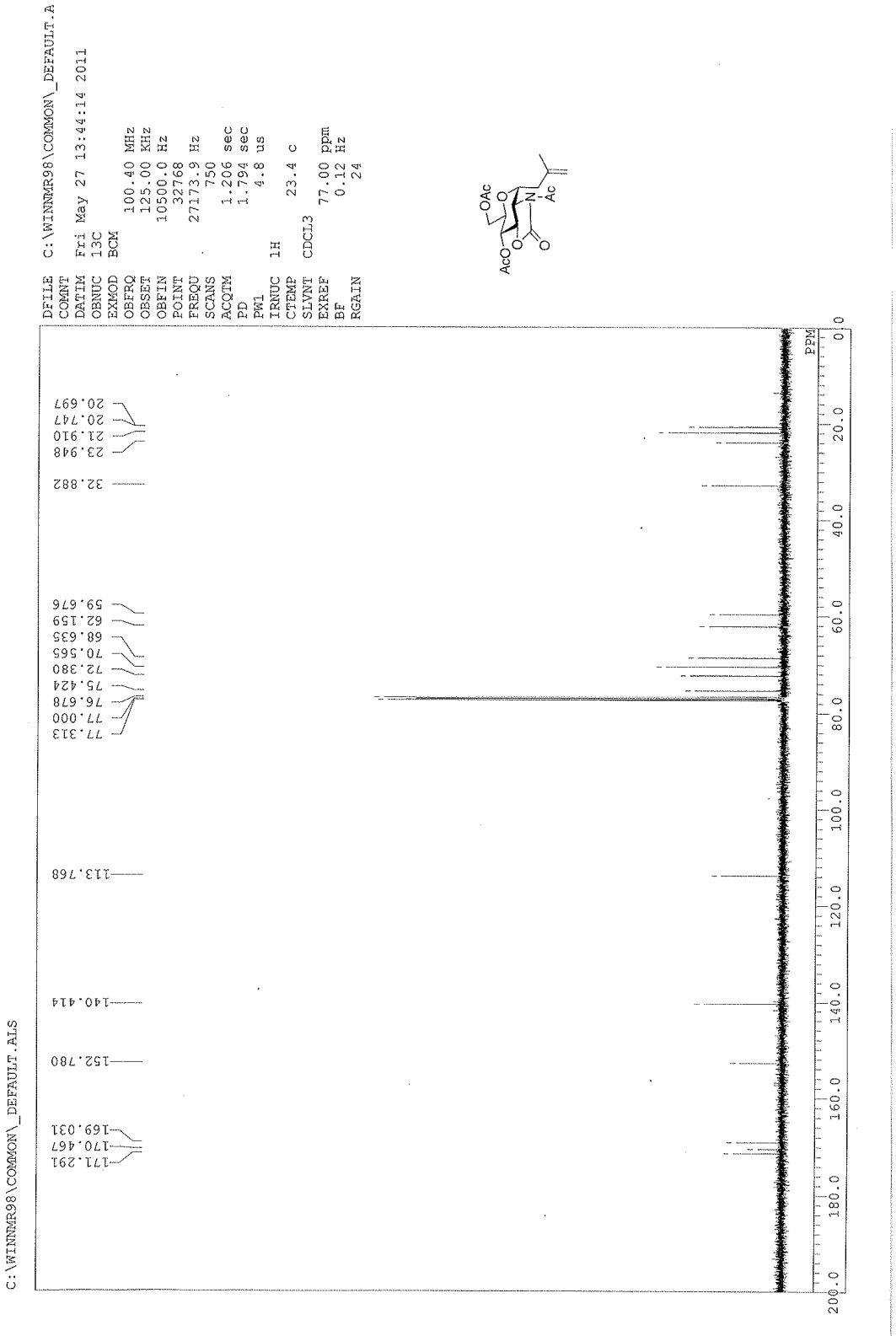

C:\WINNMR98\COMMON_DEFAULT.A
2equiv
Fri May 27 12:53:52 2011
1H
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT 2equiv
DATIM Fri May 27 12:53:52 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 22.7 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 21
OAc
AcO
Ac
2.31
4.30
0.95
3.24
1.03
1.04
3.12
1.00
PPM
C:\WINNMR98\COMMON_DEFAULT.ALS
2equiv

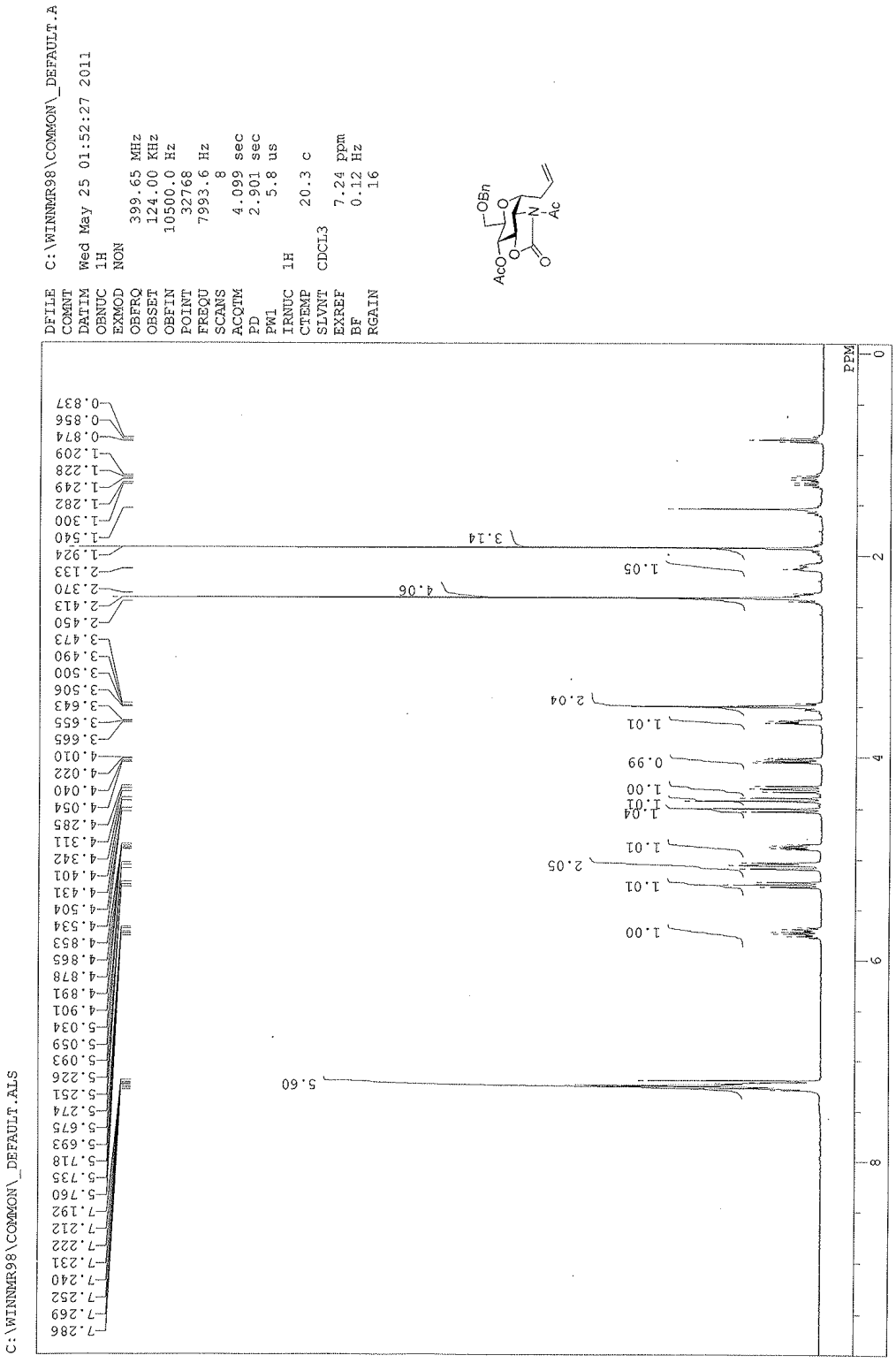

DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Fri May 20 13:07:22 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 64
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 21.3 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
OAc
AcO
N
Ac
20.689
20.763
23.931
29.516
59.486
62.134
68.569
70.656
73.370
75.317
76.687
77.000
77.322
117.967
132.337
152.730
169.015
170.458
171.366
PPM
0
50
100
150
200
C:\WINNMR98\COMMON_DEFAULT.ALS

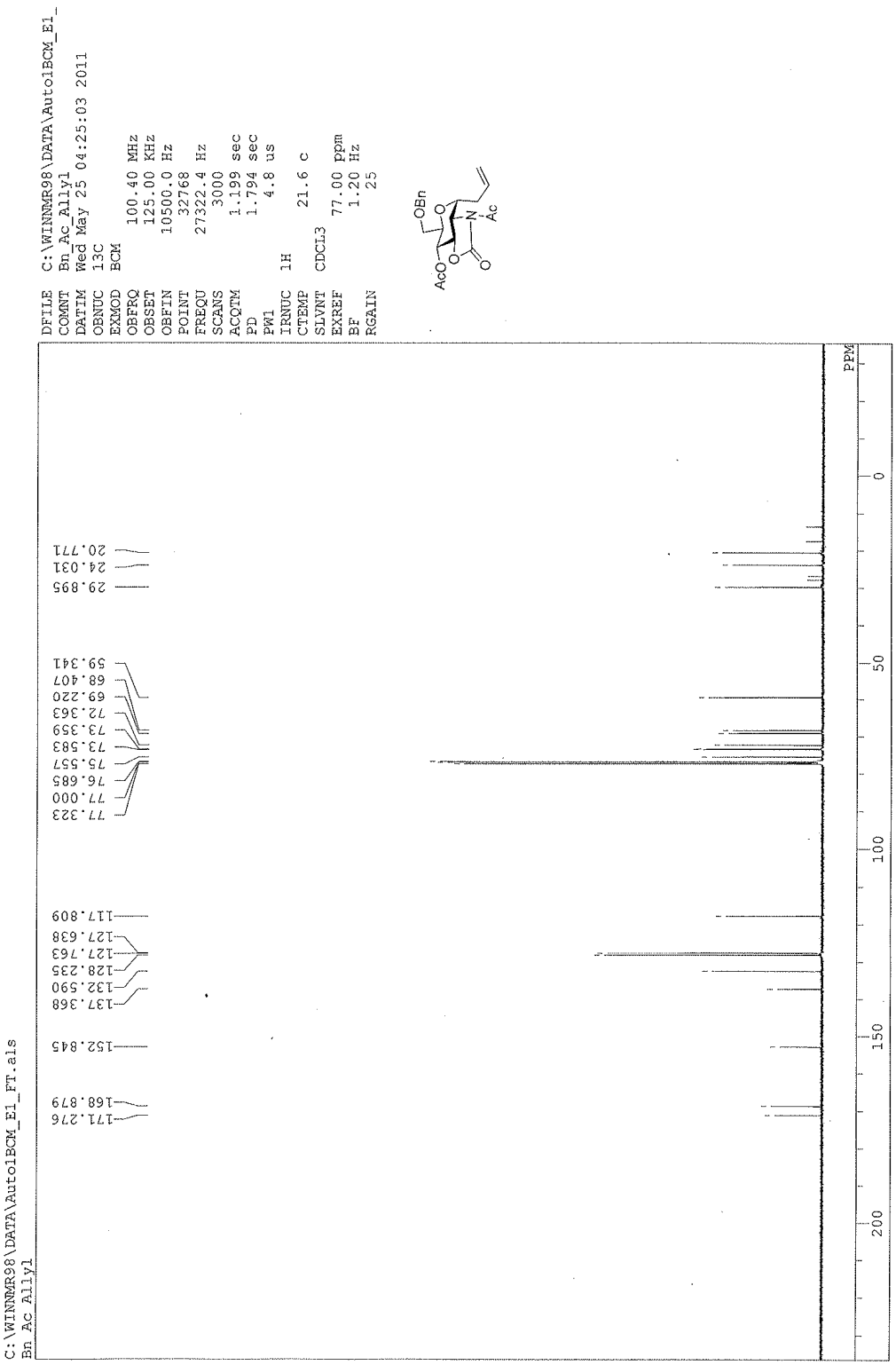

DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT Ga12
DATIM Wed May 25 01:47:10 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 16
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 20.2 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 19
AcO
OBn
Ac
C:\WINNMR98\COMMON_DEFAULT.ALS
Ga12
PPM
0.887
0.905
0.923
1.258
1.278
1.299
1.310
1.330
1.349
1.368
1.571
1.598
1.616
2.049
2.135
2.402
2.462
2.491
3.461
3.467
3.479
3.889
3.906
3.921
4.344
4.356
4.376
4.382
4.387
4.396
4.402
4.411
4.433
4.508
4.537
4.921
4.932
4.947
4.958
5.079
5.088
5.104
5.131
5.647
5.727
5.752
5.769
5.795
7.239
7.240
7.256
7.274
7.283
7.303
7.319
7.339
4.45
4.31
2.23
0.99
3.18
1.13
1.02
2.09
1.00
1.13
6.95


C:\WINNMR98\DATA\Auto1BCM_E2.als
Gal_Allyl
DFILE C:\WINNMR98\DATA\Auto1BCM_E2.
COMNT Gal_Allyl
DATIM Wed May 25 06:12:11 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 2000
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 20.7 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 24
AcO
OBn
N
Ac
13.762
17.437
17.669
20.763
24.172
27.954
28.386
29.140
55.700
65.860
67.843
69.800
73.641
73.831
74.404
76.685
77.000
77.207
77.315
117.851
127.754
127.812
128.310
132.690
137.260
152.779
169.036
171.649
PPM
200
175
150
125
100
75
50
25
0


DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Fri May 27 13:04:53 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 12
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 22.9 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 19
OAc
AcO
Ac
7.37
3.26
4.13
3.08
1.00
1.04
1.04
1.03
1.01
1.00
PPM
C:\WINNMR98\COMMON_DEFAULT.ALS


C:\WINNMR98\COMMON_DEFAULT.A
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Fri May 27 13:44:14 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27173.9 Hz
SCANS 750
ACQTM 1.206 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 23.4 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 0.12 Hz
RGAIN 24
OAc
AcO
Ac
20.697
20.747
21.910
23.948
32.882
59.676
62.159
68.635
70.565
72.380
75.424
76.678
77.000
77.313
113.768
140.414
152.780
169.031
170.467
171.291
PPM
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
C:\WINNMR98\COMMON_DEFAULT.ALS


C:\WINNMR98\COMMON_DEFAULT.A
DFILE C:\WINNMR98\COMMON_DEFAULT.A
COMNT
DATIM Wed May 25 01:52:27 2011
OBNUC 1H
EXMOD NON
OBFRQ 399.65 MHz
OBSET 124.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 7993.6 Hz
SCANS 8
ACQTM 4.099 sec
PD 2.901 sec
PW1 5.8 us
IRNUC 1H
CTEMP 20.3 c
SLVNT CDCL3
EXREF 7.24 ppm
BF 0.12 Hz
RGAIN 16
OBn
AcO
Ac
PPM
0.837
0.856
0.874
1.209
1.228
1.249
1.282
1.300
1.540
1.924
2.133
2.370
2.413
2.450
3.473
3.490
3.500
3.506
3.643
3.655
3.665
4.010
4.022
4.040
4.054
4.285
4.311
4.342
4.401
4.431
4.504
4.534
4.853
4.865
4.878
4.891
4.901
5.034
5.059
5.093
5.226
5.251
5.274
5.675
5.693
5.718
5.735
5.760
7.192
7.212
7.222
7.231
7.240
7.252
7.269
7.286
3.14
1.05
4.06
2.04
1.01
0.99
1.00
1.01
1.04
1.01
2.05
1.01
1.00
5.60
C:\WINNMR98\COMMON_DEFAULT.ALS


C:\WINNMR98\DATA\AutolBCM_E1_FT.als
Bn_Ac_Allyl
DFILE C:\WINNMR98\DATA\AutolBCM_E1_
COMNT Bn_Ac_Allyl
DATIM Wed May 25 04:25:03 2011
OBNUC 13C
EXMOD BCM
OBFRQ 100.40 MHz
OBSET 125.00 KHz
OBFIN 10500.0 Hz
POINT 32768
FREQU 27322.4 Hz
SCANS 3000
ACQTM 1.199 sec
PD 1.794 sec
PW1 4.8 us
IRNUC 1H
CTEMP 21.6 c
SLVNT CDCL3
EXREF 77.00 ppm
BF 1.20 Hz
RGAIN 25
OBn
AcO
N
Ac
20.771
24.031
29.895
59.341
68.407
69.220
72.363
73.359
73.583
75.557
76.685
77.000
77.323
117.809
127.638
127.763
128.235
132.590
137.368
152.845
168.879
171.276
PPM
0
50
100
150
200