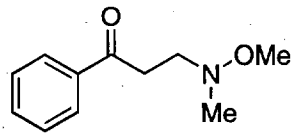
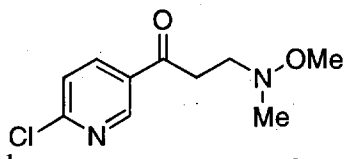
SUPPORTING INFORMATION

General procedures. ^1H and ^{13}C NMR spectra were recorded in $CDCl_3$ at 300 and 75 MHz, respectively, and the chemical shifts are reported in ppm on the δ scale with TMS as reference. MS and HRMS spectra were recorded using electron ionization or by the FAB technique. Organic solvents were dried by standard methods. Commercially obtained reagents were used without further purification. Flash chromatography was performed on 230-400 mesh silica gel. Thin-layer chromatography (TLC) was performed on glass plates coated with 0.02 mm layer of silica gel 60 F-254.

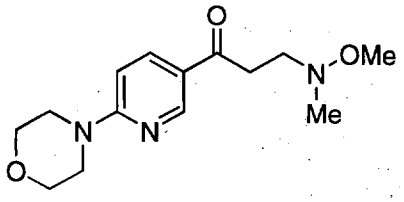
A general procedure for the sequential transformation of amides to β-aminoketones: To a solution of amide **1** (2.18 g, 13.2 mmol) in dry THF (20 mL) at O^0C was added 1M solution of vinylmagnesium bromide (14.5 mL, 14.5 mmol) in THF within 1 min. After 10 min the mixture was allowed to attain ambient temperature and was stirred for 1 h. The mixture was quenched with water (15 mL) and after 15 min diluted with ethyl acetate and washed twice with water. Organic layer was separated, concentrated and chromatographed on SiO_2 (20% EtOAc-hexanes) to afford **2** (2.0g, 77%) as a yellow oil:



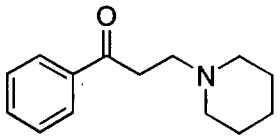
^1H NMR δ 8.00 (m, 2H), 7.58-7.40 (m, 2H), 3.50 (s, 3H), 3.28 (t, 2H, J=4.2 Hz), 3.10 (t, 2H, J=4.2 Hz), 2.65 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 198.6, 136.7, 132.7, 128.2, 127.7, 59.6, 55.2, 44.8, 35.9; MS m/z 194, 162, 105; HRMS calcd. for $C_{11}H_{16}NO_2$ 194.1181 (M+1), found 194.1183.



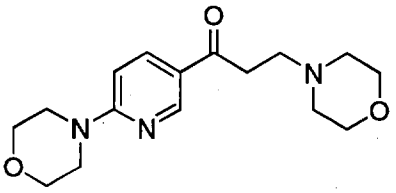
^1H NMR (400 MHz) δ 8.97 (d, J=2.0 Hz, 1H), 8.21 (dd, J=2.0 and 8.3 Hz, 1H), 7.46 (d, J=8.3 Hz, 1H), 3.48 (s, 3H), 3.23 (t, J=4.8 Hz, 2H), 3.10 (t, J=4.8 Hz, 2H), 2.62 (s, 3H); ^{13}C NMR (100 MHz) δ 196.6, 155.5, 149.8, 138.0, 131.1, 124.5, 59.8, 55.11, 44.8, 36.5; MS m/z 229, 154, 136, 74; HRMS calcd. for $C_{10}H_{14}N_2ClO_2$ 229.0744 (M+1), found 229.0738.



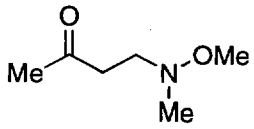
^{1}H NMR δ 8.82 (d, J=2.0 Hz, 1H), 8.08 (dd, J=2.0 and 8.3 Hz, 1H), 6.62 (d, J=8.3 Hz, 1H), 3.80 (t, 4.5 Hz, 4H), 3.68 (t, J=4.5 Hz, 4H), 3.49 (s, 3H), 3.18-3.01 (m, 4H), 2.62 (s, 3H); MS m/z 280, 237, 191; 229, HRMS calcd. for $C_{14}H_{22}N_3O_3$ 280.1661 (M+1), found 280.1659.



^{1}H NMR (400 MHz) δ 7.91 (m, 2H), 7.55-7.36 (m, 3H), 3.15 (t, J=4.8 Hz, 2H), 2.78 (t, J=4.8 Hz, 2H), 2.40 (broad s, 4H), 1.56 (m, 4H), 1.40 (broad s, 2H); ^{13}C NMR (100 MHz) δ 198.7, 136.5, 132.5, 128.1, 127.5, 54.1, 53.5, 35.9, 25.5, 23.8; MS m/z 218, 167, 150; HRMS calcd. for $C_{14}H_{20}NO$ 218.1545 (M+1), found 218.1536.

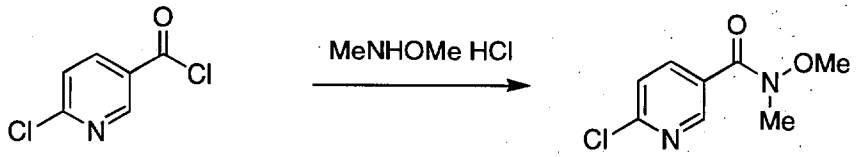


^{1}H NMR (400 MHz) δ 8.78 (d, J=2Hz, 1H), 8.04 (dd, J=2.0 and 8.2 Hz, 1H), 6.61 (δ, ϑ=8.2 Hζ, 1H), 3.80 (t, J=4.8 Hz, 4H), 2.70 (m, 8H), 3.07 (t, J=5.5 Hz, 2H), 2.81 (t, J=5.5 Hz, 2H), 2.50 (t, J=3.8 Hz, 4H); ^{13}C NMR (100 MHz) δ 196.2, 160.5, 150.2, 137.2, 122.7, 105.4,66.9, 66.5, 53.7, 53.6, 44.9, 35.4; MS m/z 306, 219; HRMS calcd. for $C_{16}H_{24}N_3O_3$ 306.1818 (M+1), found 306.1808.

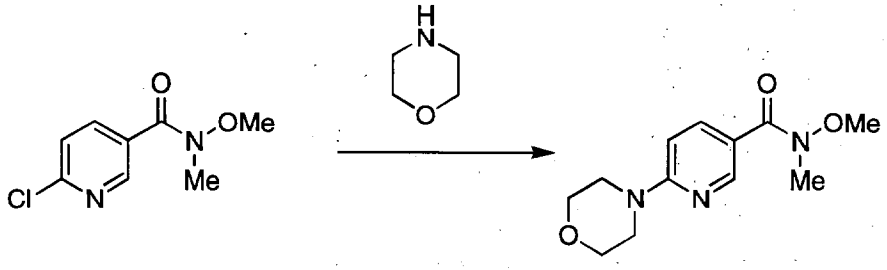


^{1}H NMR δ 3.46 (s, 3H), 2.90 (t, J=6.0 Hz, 2H), 2.69 (t, J=6.0 Hz, 2H), 2.48 (s, 3H), 2.18 (s, 3H); MS m/z 132, 100, 88.

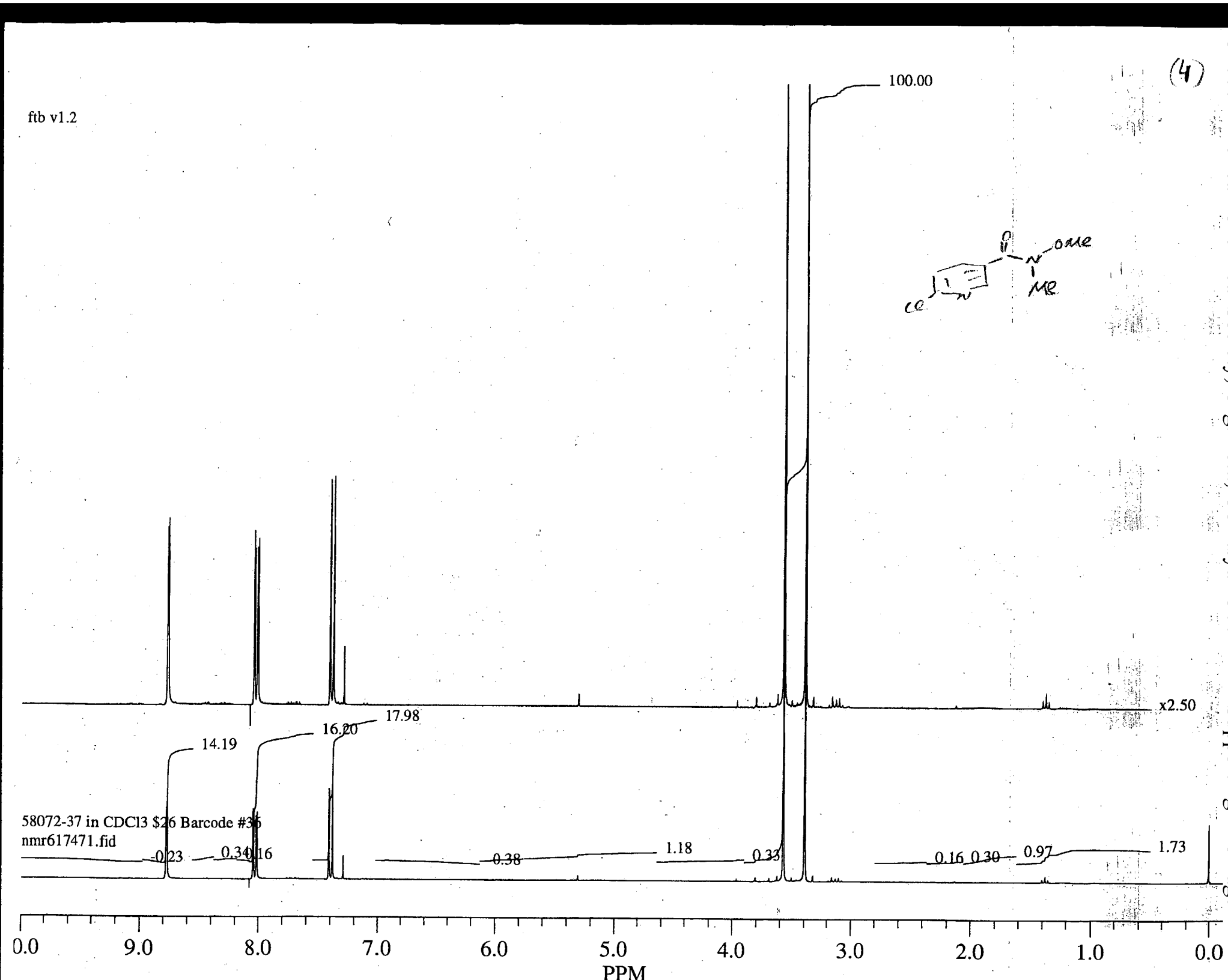
Synthesis of Starting Materials

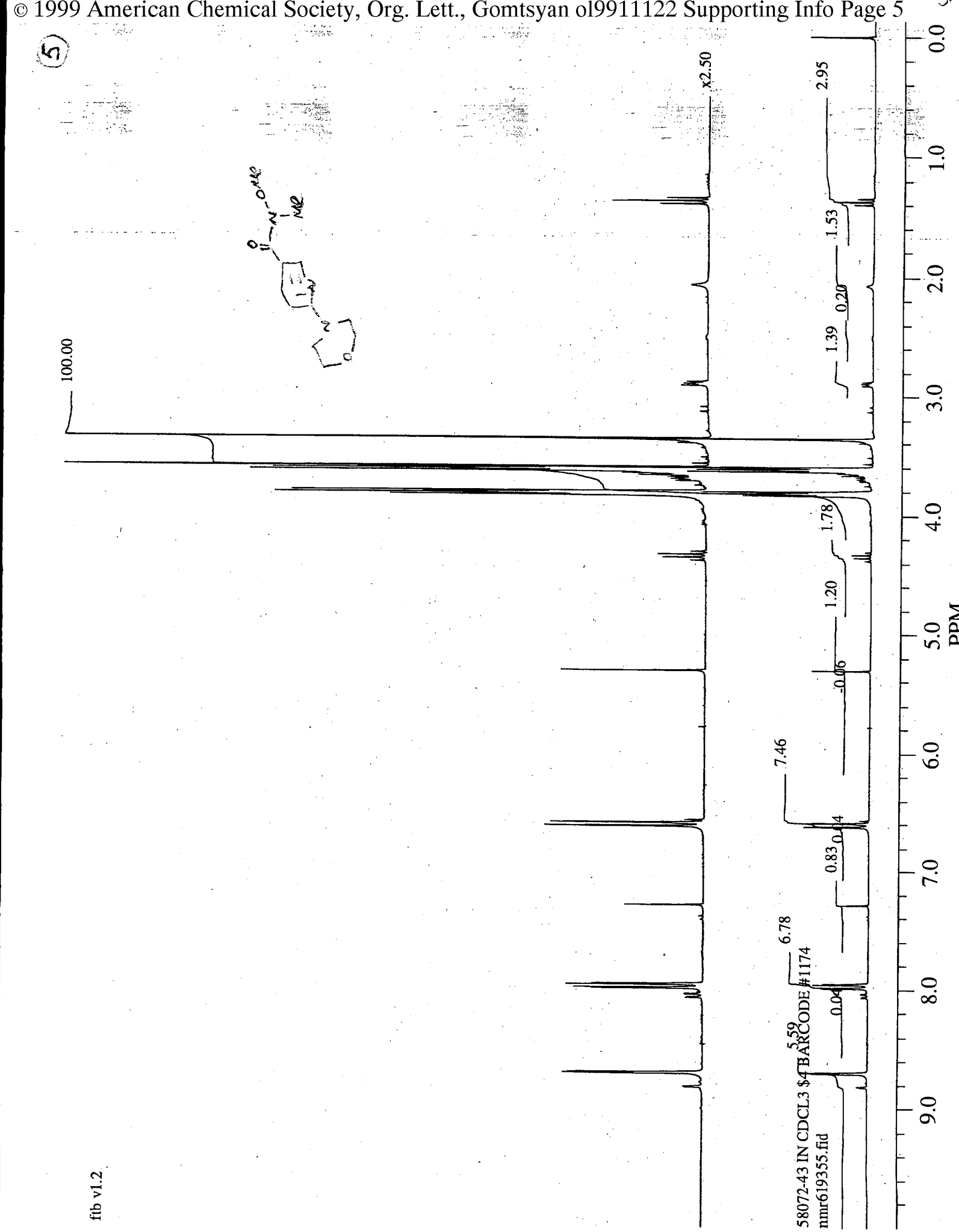


To a 0^0C suspension of N,O-methyl hydroxylamine hydrochloride (18.3 g, 187 mmol) in CH_2Cl_2 (400 mL) and Et_3N (71 mL, 510 mmol) was added 6-chloronicotinoyl chloride (30.0g, 170 mmol) portionwise. The mixture was stirred for 2 h at ambient temperature, diluted with CH_2Cl_2 and washed twice with water. Organic layer was dried ($MgSO_4$) and concentrated to obtain the amide (27.2g, 80%) as an oil of high purity. ^{1}H NMR δ 8.78 (d, J=1.5 Hz, 1H), 8.02 (dd, J=1.5 and 8.3 Hz, 1H), 7.40 (d, J=8.3 Hz, 1H), 3.57 (s, 3H), 3.40 (s, 3H); MS m/z 218, 201, 188, 171.



A solution of starting Weinreb amide (9.6 g, 48 mmol) and morpholine (8.4 mL, 96 mmol) in EtOH (100 mL) was refluxed for 8 h, then more of morpholine (4 mL, 45 mmol) was added and reflux continued for 14 h. The mixture was concentrated under vacuo, diluted with CH_2Cl_2 and washed with water. Aqueous layer was extracted twice with CH2Cl2, combined organic layers were dried ($MgSO_4$) and concentrated to obtain the product (12.0 g, 99%) as a white solid of ~95% purity. This material has been used for sequential transformations without further purification. ^{1}H NMR δ 8.70 (d, J=4.5 Hz, 1H), 7.95 (dd, J=1.5 and 8.3 Hz, 1H), 6.61 (d, J=8.3 Hz, 1H), 3.81 (t, J=4.6 Hz, 4H), 3.61 (m, 7H), 3.37 (s, 3H).

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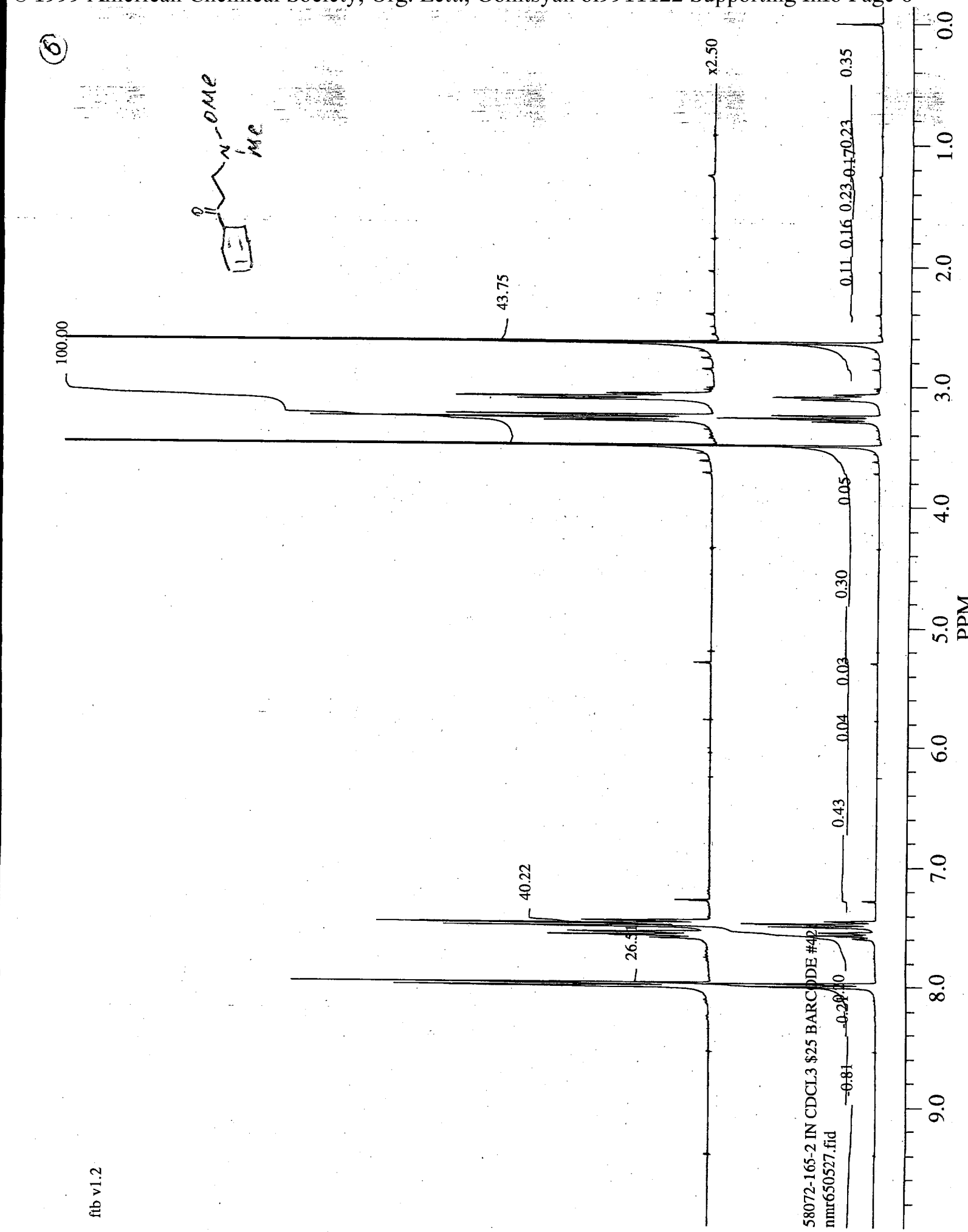
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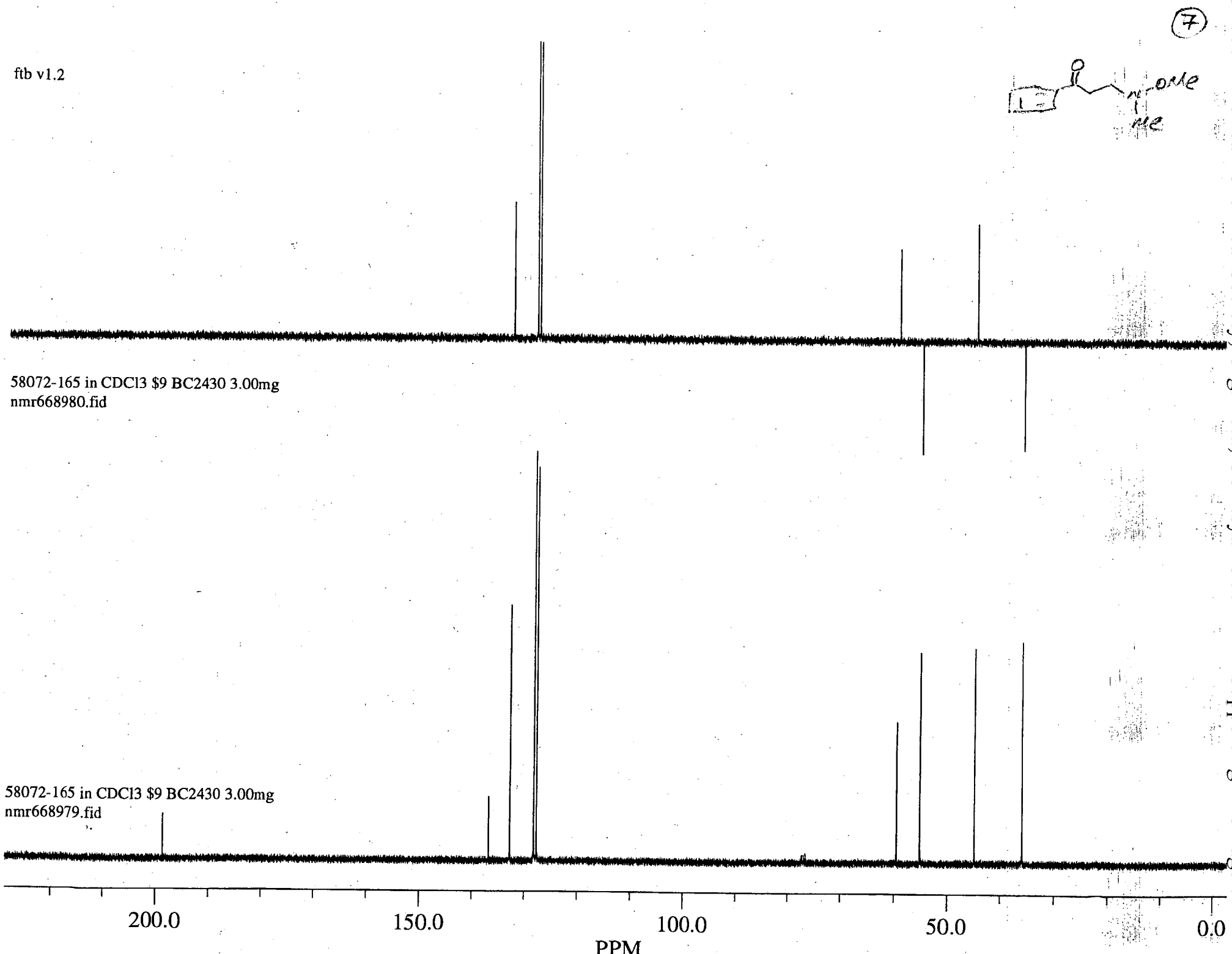

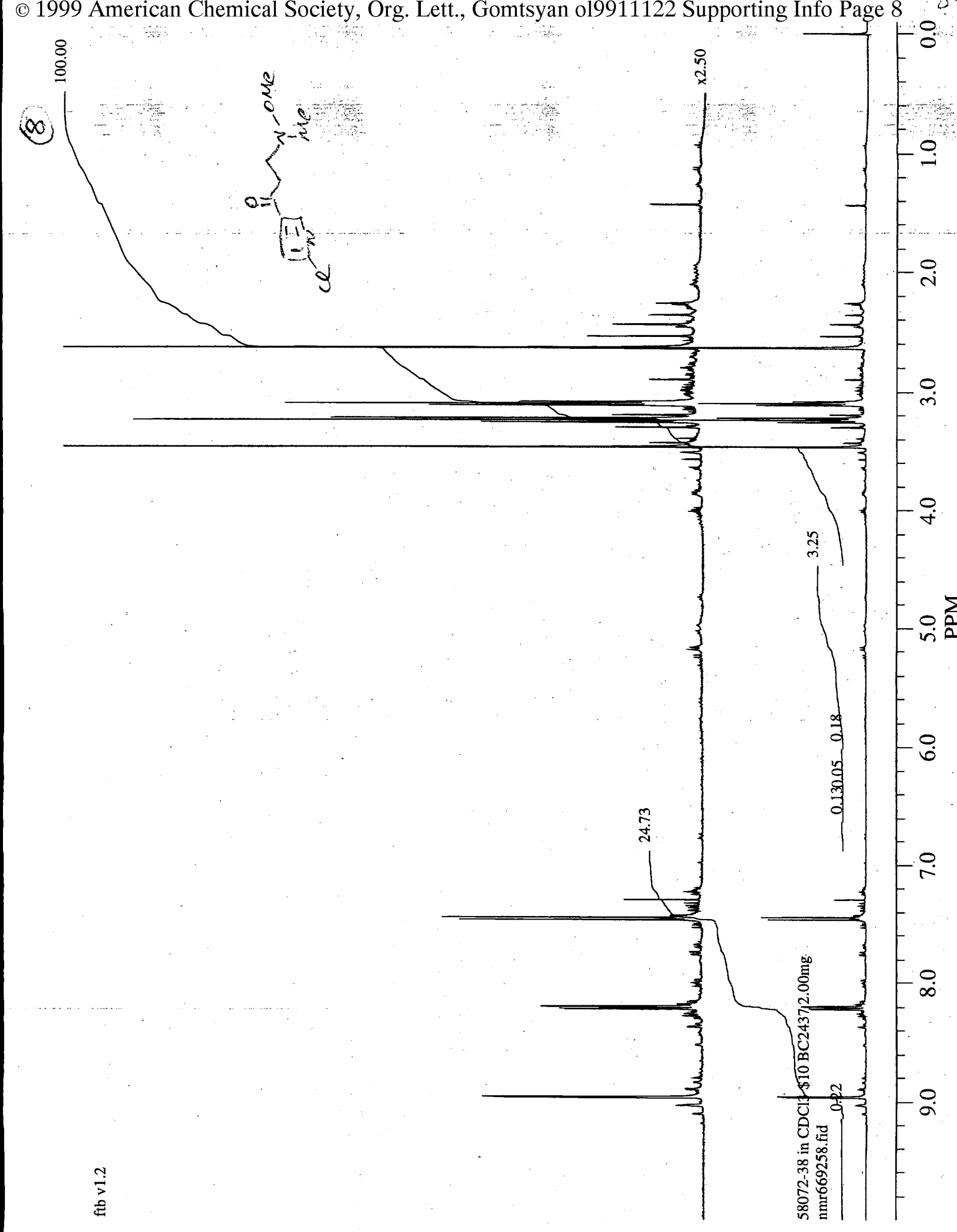

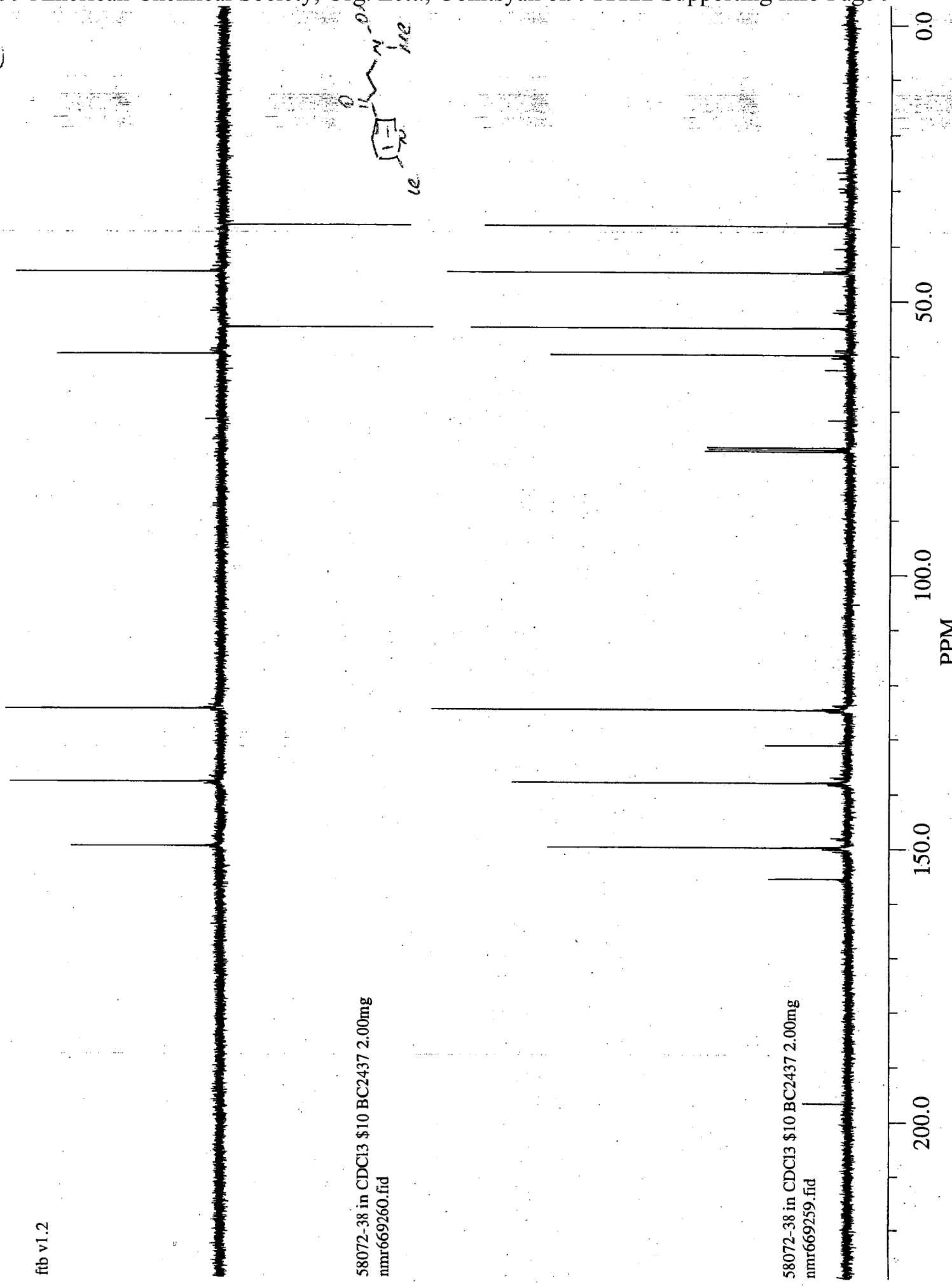
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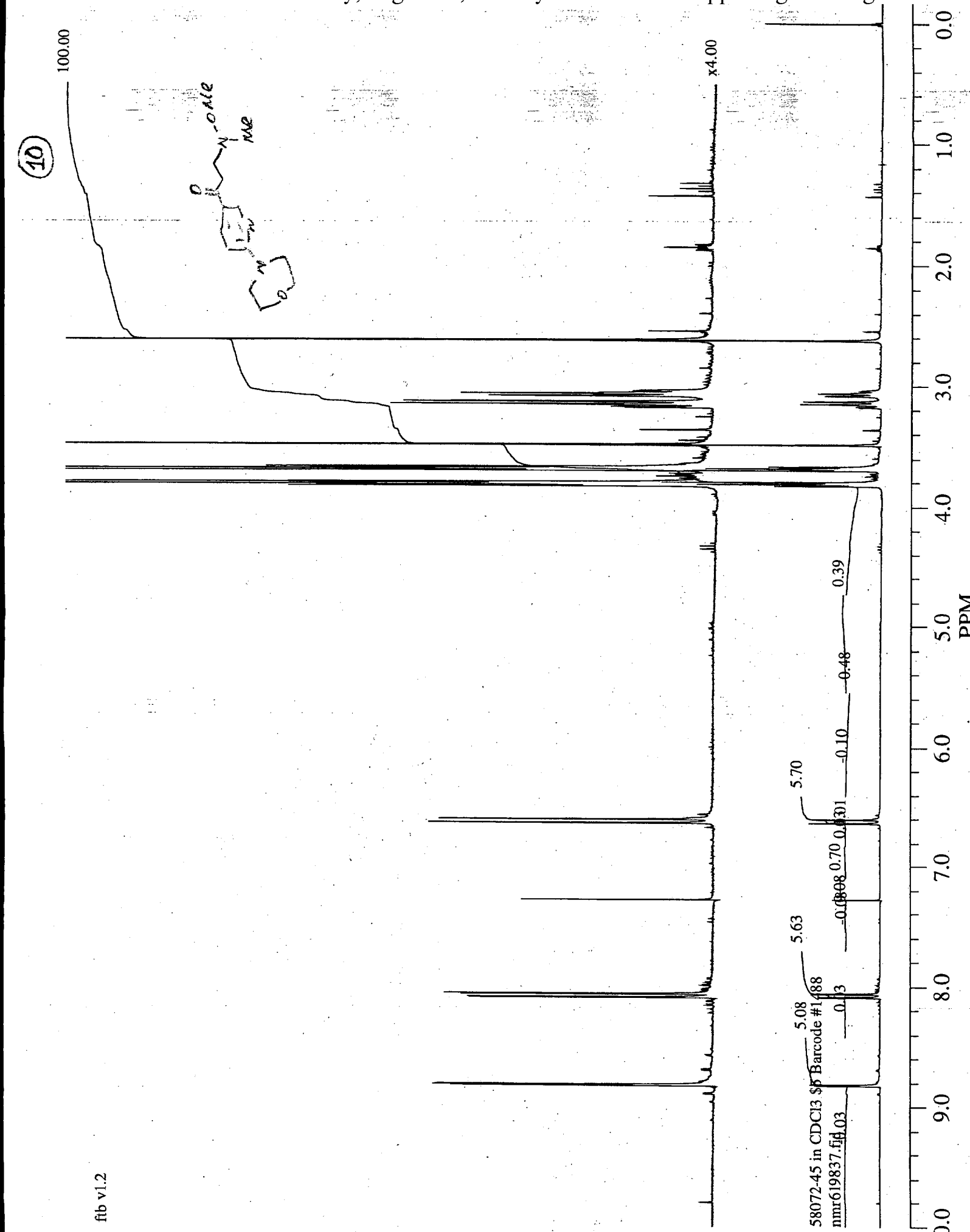
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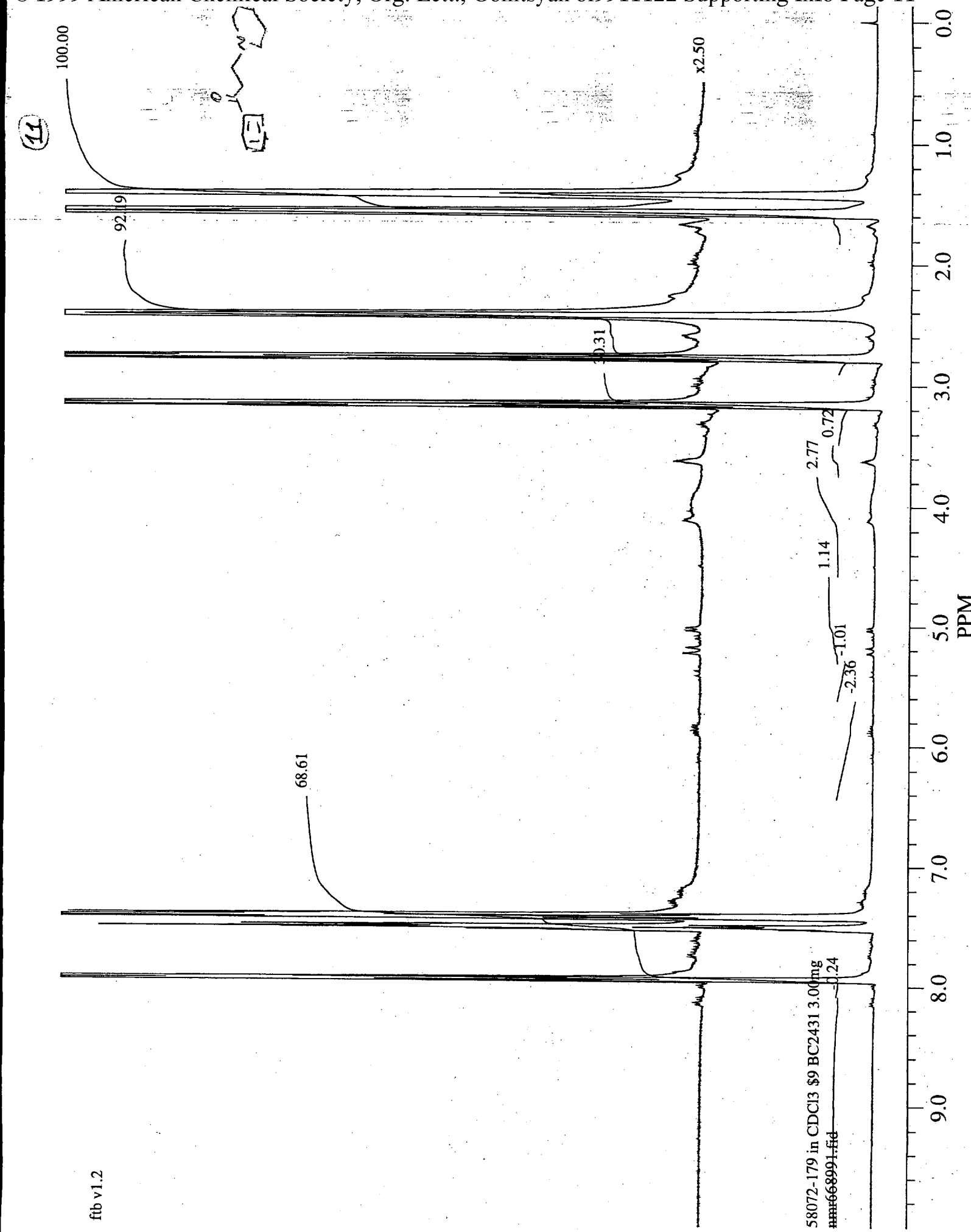

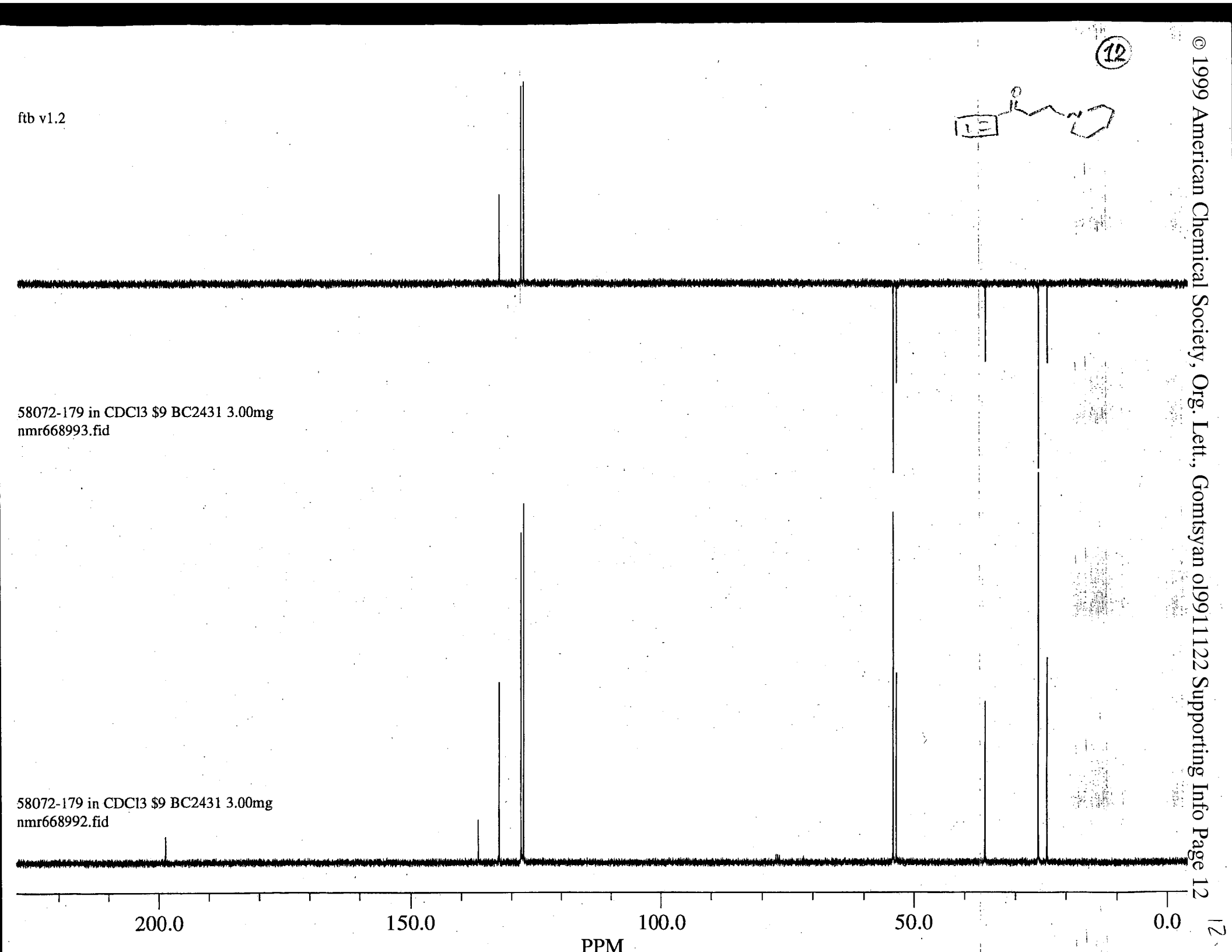

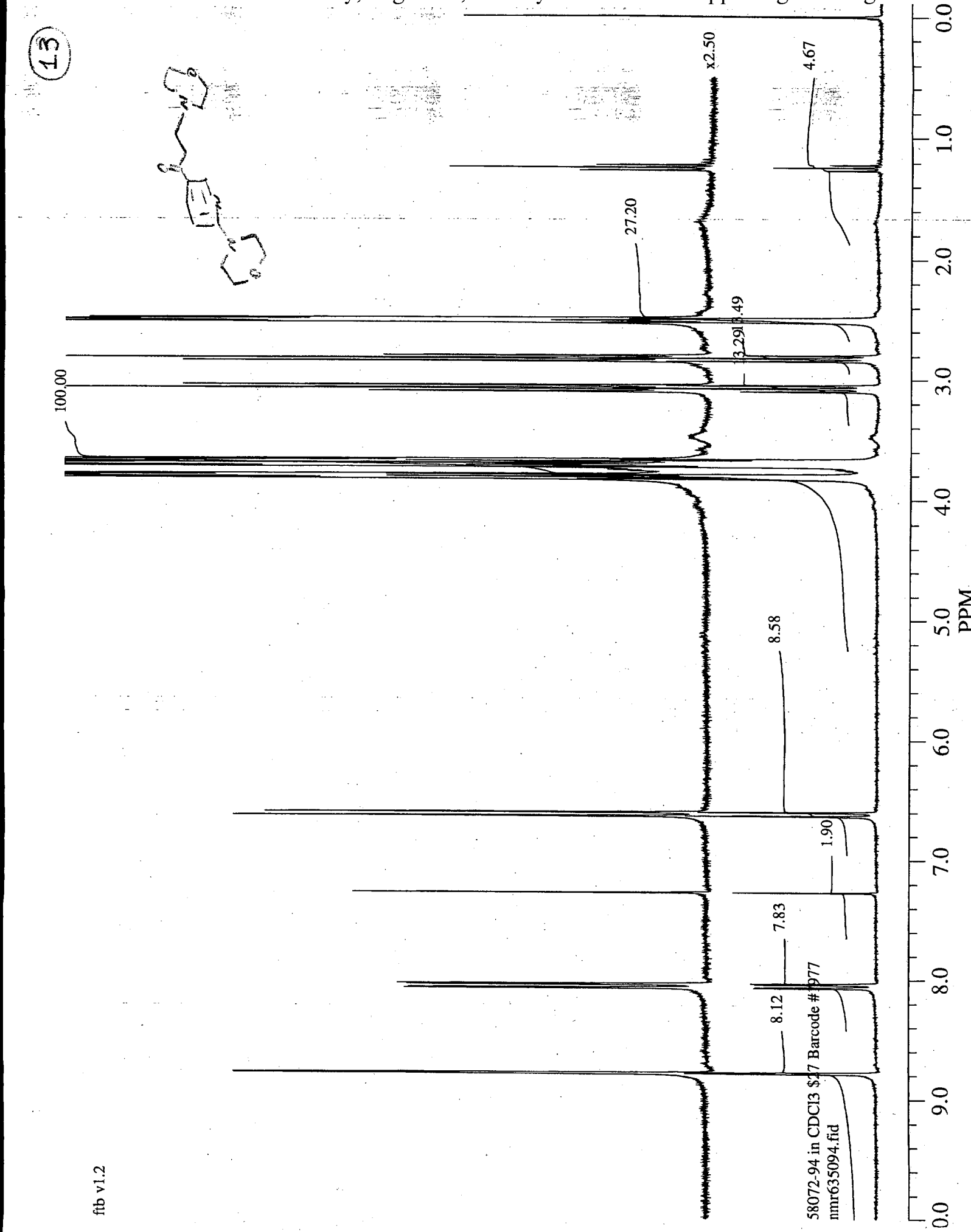
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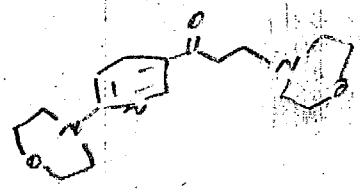

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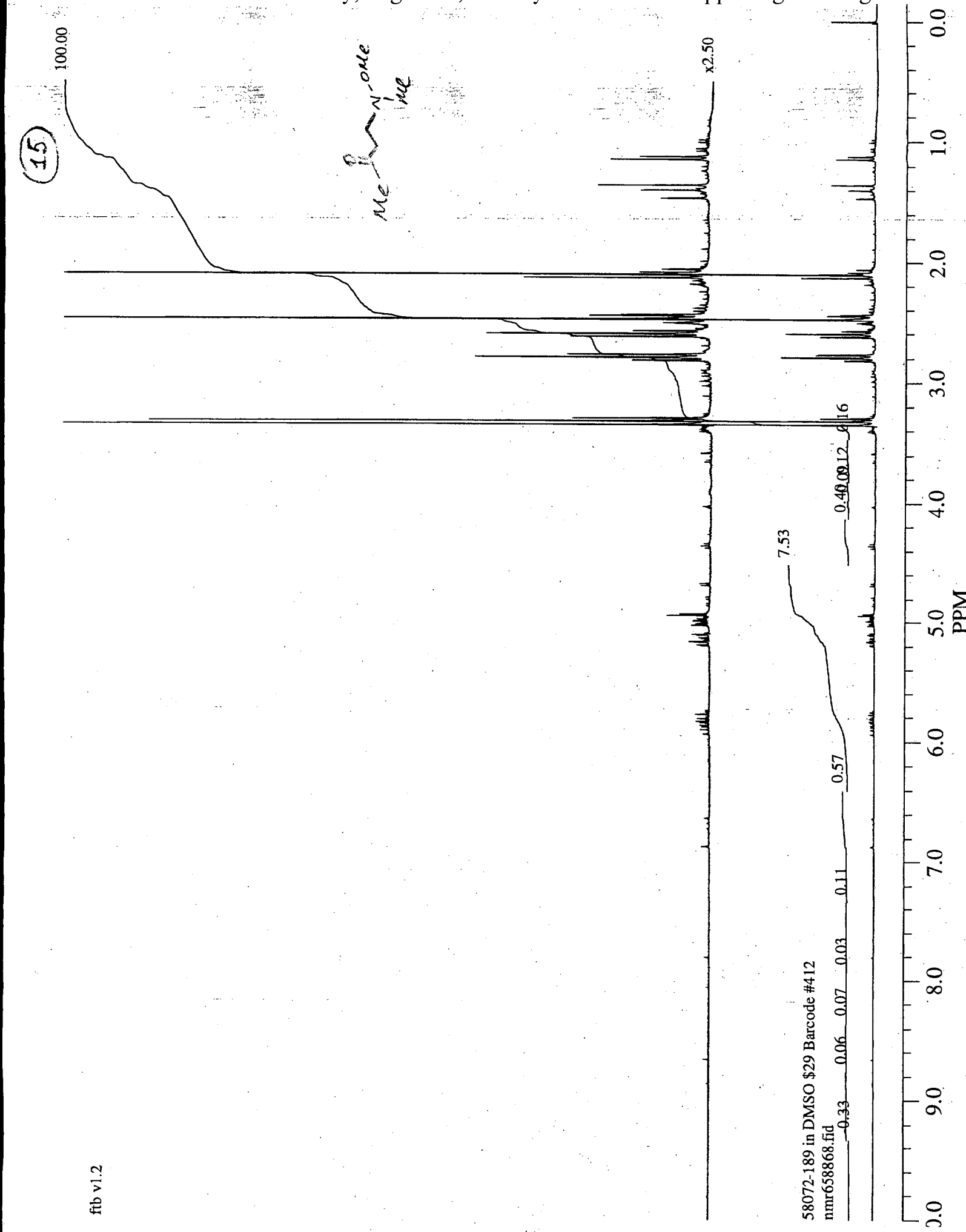
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