Electronic Supporting Information

Guanidine Catalyzed Aerobic Reduction: A Selective Reduction of Olefins using Aqueous Hydrazine

Manjunath Lamani, Ravikumara Siddapa Guralamatta, and Kandikere Ramaiah Prabhu*

General experimental

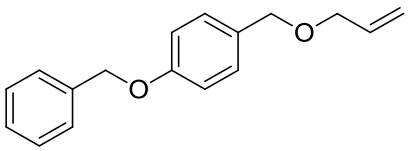
NMR spectra were recorded on a JEOL LA-400, BRUKER-AV400 spectrometer in $CDCl_3$, Tetramethylsilane (TMS; δ = 0.00 ppm) served as internal standards for ^{1}H NMR. The corresponding residual non-deuterated solvent signal ($CDCl_3$: δ = 77.00 ppm) was used as internal standards for ^{13}C NMR. IR spectra were measured using a JASCO FT/IR-410 spectrometer, and Perkin-Elmer FT/IR Spectrum BX, GX. Mass spectra were measured with Micromass Q-Tof (ESI-HRMS). Column chromatography was conducted on Silica gel 230-400 mesh (Merck) and preparative thin-layer chromatography was carried out using SILICA GEL GF-254. Aq hydrazine (hydrazine monohydrate) was purchased from sigma Aldrich composition:N_2H_4 , 64-65 %, reagent grade, assay: 98%, Batch # 24696JK) and guanidine nitrate was is obtained from SD Fine-Chem Ltd, Mumbai, India, (assay: 98%, Batch no: BO8X/0708/0502/13).

Typical experimental procedure

To a stirred solution of guanidine nitrate (12 mg, 0.1 mmol) and olefin (**3a**, 148 mg, 1 mmol) in ethanol (2 mL) was added $NH_2NH_2{\cdot}H_2O$ (100 mg, 2 mmol). The reaction was stirred at room temperature in the presence of oxygen (1atm). Ethanol was removed under reduced pressure and extracted with dichloromethane (20 mL x 3) and dried over Na_2SO_4, solvent was removed under reduced pressure to afford the reduced product **3b** (135 mg, 90%).

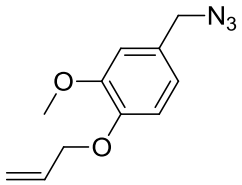
Characterization data for selected olefins

1-((allyloxy)methyl)-4-(benzyloxy)benzene (4a)[1]:



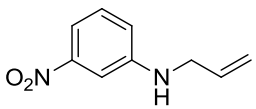
Pale yellow liquid; yield- 80%; **IR** (Neat, cm^{-1}): 3066, 2857,1612, 1512, 1242, 1080, 738; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.42-7.25 (m, 7H), 6.94 (d, J = 8.8 Hz, 2H), 5.97-5.90 (m, 1H), 5.31-5.26 (m, 1H), 5.20-5.17 (m, 1H), 5.04 (s, 2H), 4.44 (s, 2H), 4.0-3.98 (m, 2H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 158.3, 137.0, 134.8, 130.6, 129.3, 128.5, 127.9, 127.4, 117.0, 114.7, 71.7, 70.8, 69.9; **HRESI-MS** *(m/z)*: Calculated for $C_{17}H_{18}O_2$ (M + Na): 277.1204, found (M + Na): 277.1201.

1-(allyloxy)-4-(azidomethyl)-2-methoxybenzene (8a)[2]:



Colorless liquid; Yield – 92%; **IR** (Neat, cm^{-1}): 2099; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 6.81-6.88 (m, 3H), 6.03-6.13 (m, 1H), 5.41 (dd, J_1 = 13.8 Hz, J_2 = 1.2 Hz, 1H), 5.29 (dd, J_1 = 13.8 Hz, J_2 = 1.2 Hz, 1H), 4.62 (d, J = 5.2 Hz, 2H), 4.27 (s, 2H), 3.89 (s, 3H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.6, 148.1, 133.1, 128.2, 120.6, 118.1, 113.3, 111.7, 69.8, 55.9, 54.7; **HRESI-MS** *(m/z)*: Calculated for $C_{11}H_{13}N_3O_2$ (M + Na): 242.0905, found (M + Na): 242.0902.

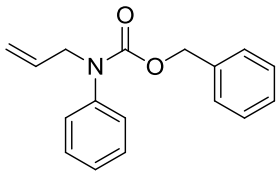
N-allyl-3-nitroaniline (9a)[3]:



Pale yellow liquid; yield - 96%; **IR** (Neat, cm^{-1}): 3408, 2922,1619, 1542, 1340, 733; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.53-7.50 (m, 1H), 7.40 (s, 1H), 7.29-7.24 (m, 1H), 6.87 (dd, J_1 = 8.1Hz, J_2 = 1.8Hz, 1H), 5.97- 5.88 (m, 1H), 5.32-5.20(m, 2H), 4.19(s, br, 1H), 3.84(s, 2H),; **^{13}C NMR** ($CDCl_3$, 100MHz): δ

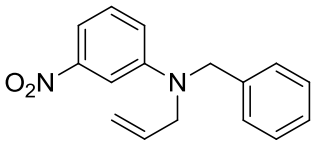
149.4,148.7, 134.04, 118.82, 116.93, 112.01, 106.52, 46.14, 30.89; **HRESI-MS** *(m/z)*: Calculated for $C_9H_{10}N_2O_2$ (M + H): 179.0821, found (M + H): 179.0831.

benzyl allyl(phenyl)carbamate (10a)[4]:



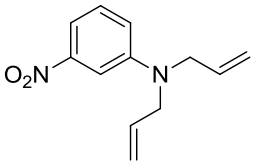
Brown liquid, Yield-96%; **IR** (Neat, cm^{-1}): 1705, 1496,1398, 697; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.51-7.00 (m,10H), 5.94-5.85 (m, 1H), 5.15-5.10 (m, 4H), 4.26 (d, *J* = 5.6Hz, 2H); **^{13}C NMR** ($CDCl_3$, 100 MHz): 155.1, 136.5, 133.6, 128.7, 128.3, 127.8, 127.5, 126.4, 67.1, 53.2; **HRESI-MS** *(m/z)*: Calculated for $C_{17}H_{17}NO_2$(M + Na): 290.1157, found (M + Na): 290.1157.

N-allyl-N-benzyl-3-nitroaniline (25a):



Brown liquid; yield-55%; **IR** (Neat, cm^{-1}): 3086, 2865,1526, 1347, 1237, 733; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.53-7.48 (m, 2H), 7.35-7.31 (m,2H), 7.27-7.20 (m, 4H), 6.93 (d, *J* = 8.4 Hz, 1H), 5.91-5.82 (m, 1H), 5.25-5.18 (m, 2H), 4.60 (s, 2H), 4.07 (d, *J* = 3.6 Hz, 2H); **^{13}C NMR** ($CDCl_3$, 100 M Hz): δ 149.5, 149.4, 137.4, 132.2, 129.6, 128.8, 127.3, 126.4, 117.9, 117.0, 111.0, 106.5, 54.1, 53.3; **HRESI-MS** *(m/z)*: Calculated for $C_{16}H_{16}N_2O_2$ (M + H): 269.1290, found (M + H): 269.1284.

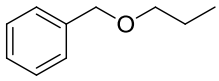
N,N-diallyl-3-nitroaniline (26a)[5]



Pale yellow liquid; yield - 60%; **IR** (Neat, cm^{-1}): 3085, 2982, 2867, 1619, 1526, 1495, 1391, 1347, 1238, 1181, 922, 734, 669; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.49-7.47 (m, 2H), 7.30-7.26 (m, 1H), 6.94-6.91(m, 1H), 5.89-5.80 (m, 2H), 5.22-5.15 (m, 4H), 3.99-3.98 (m, 4H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.42, 149.16, 132.56, 129.54, 117.72, 116.63, 110.79, 106.36, 52.92; **HRESI-MS** *(m/z)*: Calculated for $C_{12}H_{14}N_2O_2$ (M + Na): 241.0953, found (M + Na): 241.0947.

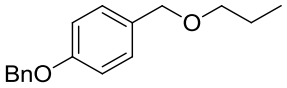
Characterization data for reduced products:

(propoxymethyl)benzene (3b)[6]:



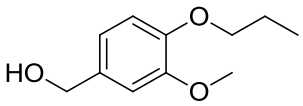
Colorless liquid; Yield - 90%; **IR** (Neat, cm^{-1}): 3065, 2965, 2937, 2877, 1720, 713; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.35- 7.34(m, 4H), 7.32-7.26 (m, 1H), 4.51 (s, 2H), 3.44 (t, *J* = 6.7Hz, 2H),1.69-1.60 (m, 2H), 0.94 (t, *J* = 7.6Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100MHz) δ:138.69, 128.33, 127.61, 127.45, 72.88, 72.11, 22.95, 10.62; **MS** *(m/e)* 150.

1-(benzyloxy)-4-(propoxymethyl)benzene (4b):



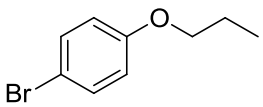
Pale yellow liquid; yield- 92%; **IR** (Neat, cm^{-1}): 3065, 2962, 2859, 1612, 1242, 1096, 820, 696; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.4-7.25 (m, 7H), 6.92(d, *J* = 8.4Hz, 2H), 5.01 (s, 2H), 4.41 (s, 2H), 3.38 (t, *J* = 6.7 Hz, 2H), 1.65-1.56 (m, 2H), 0.91 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 158.2, 137.0, 131.0, 129.1, 128.4, 127.8,127.3, 114.6, 72.4, 71.9, 70.0, 22.9, 10.6; **HRESI-MS** *(m/z)*: Calculated for $C_{17}H_{20}O_2$ (M + Na): 279.1361, found (M + Na): 279.1357.

(3-methoxy-4-propoxyphenyl)methanol (5b):



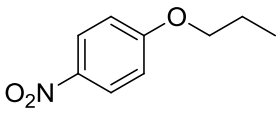
Colorless liquid; yield-85%; **IR** (Neat, cm^{-1}): 2964, 2937, 2877, 1510, 1263, 1234, 1159, 1037, 978, 807; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 6.92(s, 1H), 6.858-6.852 (m, 2H), 4.60(s, 2H), 3.97(t, 2H, J= 7.2Hz), 3.87(s, 3H), 1.88-1.79(m, 2H), 1.03(t, 3H, J= 8Hz). **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.46, 148.06, 133.47, 119.39, 112.75, 110.86, 70.54, 65.29, 55.90, 22.40, 10.36**; HRESI-MS** *(m/z)*: Calculated for $C_{11}H_{16}O_3$ (M + Na): 219.0997, found (M + Na): 219.0995.

1-Bromo-4-propoxybenzene (6b)[7]:



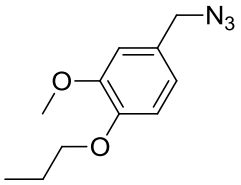
Pale yellow liquid; Yield - 91%; **IR** (Neat, cm^{-1}): 2965, 1489, 1243, 1071, 977, 821; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.34 (d, *J* = 8.9 Hz, 2H), 6.76 (d, *J* = 8.9 Hz, 2H), 3.86 (t, *J* = 6.5Hz, 2H), 1.83-1.74 (m, 2H), 1.02 (t, *J* = 7.3Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 158.21, 132.14, 116.27, 112.52, 69.7, 22.46, 10.43; Anal.Calcd for $C_9H_{12}O$; C, 50.26; H, 5.15; Found: C, 50.61; H, 5.47.

1-Nitro-4-propoxybenzene (7b)[8]:



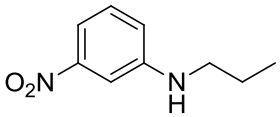
Colorless liquid; Yield - 92%; **IR** (Neat, cm^{-1}): 2970, 1489, 1505, 1338, ; **^{1}H NMR** ($CDCl_3$, 400 MHz) δ: 8.19 (d, *J* = 9.2 Hz, 2H), 6.94 (d, *J* = 9.2 Hz, 2H), 4.01 (t, *J* = 6.5Hz, 2H), 1.90-1.81 (m, 2H), 1.06 (t, *J* = 7.4Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 164.2, 141.2, 125.8, 114.3, 70.3, 22.3, 10.3; **HRESI-MS** *(m/z)*: Calculated for $C_9H_{11}NO_3$ (M + Na): 204.0637, found (M + Na): 204.0632.

4-(azidomethyl)-2-methoxy-1-propoxybenzene (8b):



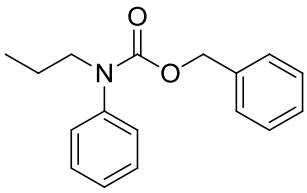
Colorless liquid; Yield – 85%; **IR** (Neat, cm^{-1}):2938, 2100,1515, 1264; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 6.84-6.83 (m, 3H), 4.25 (s, 2H), 3.97(t, *J* = 6.8 Hz, 2H), 3.88 (s, 2H), 1.90-1.81(m, 2H), 1.03(t, *J* = 7.4 Hz, 2H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.54, 148.61, 127.64, 120.75, 112.70, 111.78, 70.44, 55.93, 54.71, 22.37, 10.33; **HRESI-MS** *(m/z)*: Calculated for $C_{11}H_{15}N_3O_2$ (M + Na): 244.1062, found (M + Na): 244.1066.

3-Nitro-*N*-propylaniline (9b)[9]:



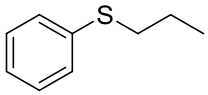
Pale yellow liquid; yield - 92%; **IR** (Neat, cm^{-1}): 3415, 2964, 2876, 1623, 1526, 1350, 1260, 1142, 991, 734; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.7.48-7.46 (m, 1H), 7.36 (t, *J* = 2.4 Hz, 1H), 7.26-7.22 (m, 1H), 6.86-6.83(m, 1H), 4.04 (s, br, 1H), 3.12(t, *J* = 6.8 Hz, 2H), 1.71-1.62(m, 2H), 1.01(t, *J* = 7.2 Hz, 3H),; **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.38,149.17, 129.55, 118.56, 111.43, 105.97, 45.47, 22.34, 11.45; **HRESI-MS** *(m/z)*: Calculated for $C_9H_{12}N_2O_2$ (M + Na): 203.0796, found (M + Na): 203.0795.

Benzyl phenyl(propyl)carbamate (10b)[10]:



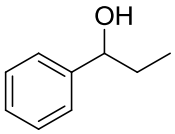
Pale yellow liquid, Yield-99%; **IR** (Neat, cm^{-1}): 2963, 2934, 1704, 1149, 696; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.30-7.11 (m, 10H), 5.06 (s, 2H), 3.56 (t, *J* = 7.5 Hz, 2H), 1.53-1.43 (m, 2H), 0.86 (t, *J* = 7.6Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): 155.4, 141.8, 136.8, 128.9, 128.3, 127.7, 127.4, 127.3, 126.6, 66.9, 52.0, 21.5, 11.1; **HRESI-MS** *(m/z)*: Calculated for $C_{17}H_{19}NO_2$(M + H): 270.1494 found (M + H): 270.1494.

Phenyl 1-propyl sulfide (11b) [11]:



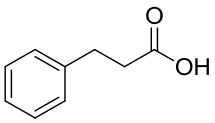
Colorless liquid; Yield - 88%; **IR** (Neat, cm^{-1}): 2962, 1585, 1480, 1091, 737, 690; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.33-7.24 (m, 4H), 7.17-7.13 (m, 1H), 2.89 (t, *J* = 7.3Hz, 2H), 1.71-1.62 (m, 2H), 1.02 (t, *J* = 7.3Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 136.9, 129.0, 128.9, 125,6, 35.6, 22.5, 13.4**; HRESI-MS** *(m/z)*: Calculated for $C_9H_{12}S$ (M + K): 191.0297, found (M + K): 191.0300.

1-Phenyl-1-propanol (12b)[12]:



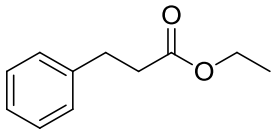
Colorless liquid; Yield - 80%; **IR** (Neat, cm^{-1}): 3453, 3078, 3035, 2978, 2910, 1591, 1455, 917, 753; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.33-7.24 (m, 5H), 4.56 (t, *J* = 6.4Hz, 1H), 2.12 (b, 1H), 1.94-1.67 (m, 2H), 0.89(t, *J* = 7.6Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 144.58, 128.34, 127.42, 125.94, 75.95, 31.82, 10.07; Anal.Calcd for $C_9H_{12}O$; C, 79.37; H, 8.88; Found: C, 79.22; H, 8.90.

3-phenylpropanoic acid (14b) [13]**:**



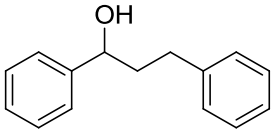
White solid; yield - 97%; mp:44-46 ºC ; **IR** (Neat, cm^{-1}): 3030, 2980, 2938, 1704, 1599, 1498, 1412, 1377, 1286, 1183, 1066, 937, 859, 761; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 9.23(br, 1H), 7.31-7.20(m, 5H), 2.95(t, 2H, J= 7.6Hz), 2.68(t, 2H, J= 8Hz); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 178.91, 140.15, 128.52, 128.23, 126.32, 35.61, 35.6; Anal.Calcd for $C_9H_{10}O_2$; C, 71.98; H, 6.71; Found: C, 71.85; H, 6.75.

Ethyl 3-phenylpropanoate (15b) [14]:



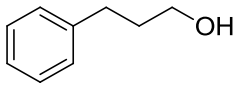
Colorless liquid; Yield – 55%; **IR** (Neat, cm^{-1}): 3086, 2975, 2938, 1739, 1496, 1452, 1373, 1296, 1165, 1041, 748; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.30-7.19 (m, 5H), 4.11 (q, *J* = 7 Hz, 2H), 2.94 (t, *J* = 7.7Hz, 2H), 2.61(t, *J* = 8 Hz, 2H), 1.22 (t, *J* = 7.1 Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 172.9, 140.5, 128.5, 128.3, 126.2, 60.4, 35.9, 30.9, 14.2; MS (EI) m/z 178 (M^+); Anal.Calcd for $C_9H_{12}O$; C, 74.13; H, 7.92; Found: C, 73.74; H, 7.74.

1,3-diphenylpropan-1-ol (16b) [15]:



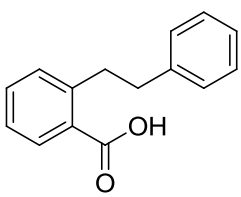
Colorless liquid; Yield- 90**%; IR** (Neat, cm^{-1}): 3367, 3028, 1495, 1455, 1057, 698; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.35-7.18(m, 10H), 4.69-4.66 (m, 1H) 2.77-2.62 (m, 2H), 2.15-1.99 (m, 3H) ,1.87(br, 1H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 144.5, 141.7, 128.5, 128.4, 128.3, 127.6, 125.9, 125.8, 73.8, 40.4, 32.0; **HRESI-MS** *(m/z)*: Calculated for $C_{15}H_{16}O$ (M + Na): 235.1099 found (M + Na): 235.1096.

3-Phenyl-1-propanol (17b)[16]:



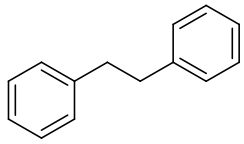
Colorless liquid; Yield - 90%; **IR** (Neat, cm^{-1}): 3338, 2939,1058, 1031; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.29-7.16 (m, 5H), 3.65 (t, *J* = 6.4 Hz, 2H), 2.69 (*t*, *J* = 7.6 Hz, 2H), 1.91-1.84 (m, 2H), 1.78 (s, 1H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 141.8, 128.4, 128.3, 125.8, 62.2, 34.1, 32.0; Anal.Calcd for $C_9H_{12}O$; C, 79.37; H, 8.88; Found: C, 79.47; H, 8.59.

2-phenethylbenzoic acid (**18b**)[17]:



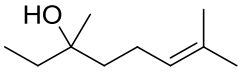
Colorless solid, Yield-95%; mp:130-132 ºC ; **IR** (Neat, cm^{-1}): 2926, 2863, 1690, 1475, 1273, 758, 699; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 8.10 (d, *J* = 7.8 Hz, 1H), 7.47 (t, *J* =7.4 Hz, 1H), 7.33-7.17 (m, 7H), 3.36-3.32 (m, 2H), 2.97-2.93 (m, 2H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 172.9, 144.8, 141.9, 133.0, 131.8, 131.5, 128.5, 128.3, 128.0, 126.2, 125.9; Anal.Calcd for $C_{15}H_{14}O_2$; C, 79.62; H, 6.24; Found: C, 79.59; H, 6.35.

1,2-diphenylethane (19b)[15]:



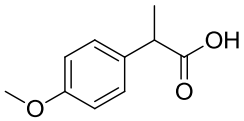
White solid; yield- 98%; mp: 48-51 ºC; **IR** (KBr, cm^{-1}): 3082, 3026, 2943, 2918, 1599, 1490, 1450; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.29-7.16 (m, 10H), 2.91 (s, 4H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 141.8, 128.4, 128.3, 125.9, 37.9; **HRESI-MS** *(m/z)*: Calculated for $C_{14}H_{14}$ (M + K): 221.0733, found (M + K): 221.080.

3,7-dimethyloct-6-en-4-ol (20b) [18]:



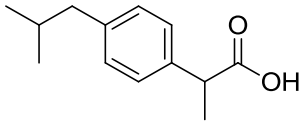
Colorless liquid; Yield- 90%; **IR** (Neat, cm^{-1}): 3754, 3401, 2971, 2928, 1638, 1378, 1116, 836; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 5.15-5.11(m,1H), 2.06-2.00(m, 2H), 1.68(s, 3H), 1.62(s, 3H), 1.52-1.45(m, 4H), 1.15(s,3H),0.90(t, 3H, 8Hz). **^{13}C NMR** ($CDCl_3$, 100MHz): δ 131.49, 124.49, 72.83, 41.00, 34.21, 26.15,25.61, 22.55, 17.53,8.15; **HRESI-MS** *(m/z)*: Calculated for $C_{10}H_{20}O$ (M + K): 195.1151, found (M + K): 195.1300.

2-(4-methoxyphenyl)propanoic acid (23b)[19]:



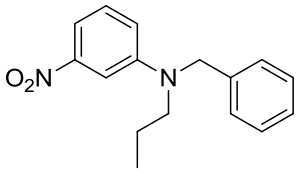
White solid, Yield- 98%; mp:56-58 ºC; **IR** (KBr, cm^{-1}): 1710, 1605, 1515, 1465, 1305, 1185, 950, 795; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 8.7(br, 1H), 7.23(d, 2H, J= 8Hz), 6.85(d, 2H, J= 8Hz), 3.77(s, 3H), 3.67(q, J=7Hz,1H), 1.47(d, 3H, J= 8Hz) **^{13}C NMR** ($CDCl_3$, 100MHz): δ180.29, 158.74,132.11, 128.57, 113.98, 55.21, 44.52, 18.19; **HRESI-MS** *(m/z)*: Calculated for $C_{14}H_{14}$ (M + Na): 203.0684, found (M + Na): 203.0695.

2-(4-isobutylphenyl)propanoic acid (24b) [20]:



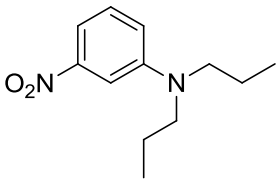
White solid; Yield 80%; mp:74-76 ºC ; **IR** (Neat, cm^{-1}): 3461, 2956, 1716, 1722, 1231,936; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.21(d, *J* = 8Hz, 2H), 7.09 (d, *J* = 8Hz, 2H), 3.69 (q, *J* = 7.1Hz, 1H), 2.43 (d, *J* = 7.1 Hz, 2H), 1.87-1.80 (m, 1H), 1.48 (d, *J* = 7.1Hz, 3H), 0.89 (d, *J* = 6.6Hz, 6H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 181.1, 140.8, 136.9, 129.4, 127.3, 45.0, 45.0, 30.1, 22.4, 18.0; **HRESI-MS** *(m/z)*: Calculated for $C_{13}H_{18}O_2$ (M + Na): 229.1204, found (M + Na): 229.1209.

***N*-benzyl-3-nitro-*N*-propylaniline (25b):**



Brown liquid; yield-94%; **IR** (Neat, cm^{-1}): 2962, 2874, 1621, 1525, 1347, 1239, 733; **^{1}H NMR** ($CDCl_3$, 400 MHz): δ 7.49-7.42 (m, 2H), 7.32-7.28 (m, 2H), 7.21-7.17 (m, 4H), 6.87 (dd, J_1 = 2.24, J_2 = 8.36), 4.58 (s, 2H), 3.43 (t, *J* = 7.7 Hz, 2H), 1.76-1.66 (m, 2H), 0.97 (t, *J* = 7.4 Hz, 3H); **^{13}C NMR** ($CDCl_3$, 100 MHz): δ 149.4, 149.0, 137.5, 129.6, 128.7, 127.0, 126.2, 117.5, 110.3, 105.9, 54.3, 53.2, 20.1, 11.3; **HRESI-MS** *(m/z)*: Calculated for $C_{16}H_{18}N_2O_2$ (M + Na): 293.1266, found (M + Na): 293.1265.

3-nitro-*N*-dipropylaniline (26b)[21]:



Pale yellow liquid; yield - 98%; **IR** (Neat, cm^{-1}): 3834, 3732, 2918, 1697, 1521, 734; **^{1}H NMR** ($CDCl_3$, 400MHz): δ 7.42-7.41 (m, 2H), 7.29-7.25 (m, 1H), 6.88-6.85(m, 1H), 3.29 (t, *J* = 7.5 Hz, 4H), 1.67-1.58 (m, 4H), 0.95 (t, *J* = 7.4 Hz, 6H); **^{13}C NMR** ($CDCl_3$, 100MHz): δ 149.60, 148.72, 129.57, 117.04, 109.58, 105.60, 52.84, 20.16, 11.34; **HRESI-MS** *(m/z)*: Calculated for $C_{12}H_{18}N_2O_2$ (M + Na): 245.1266, found (M + Na): 245.1261.

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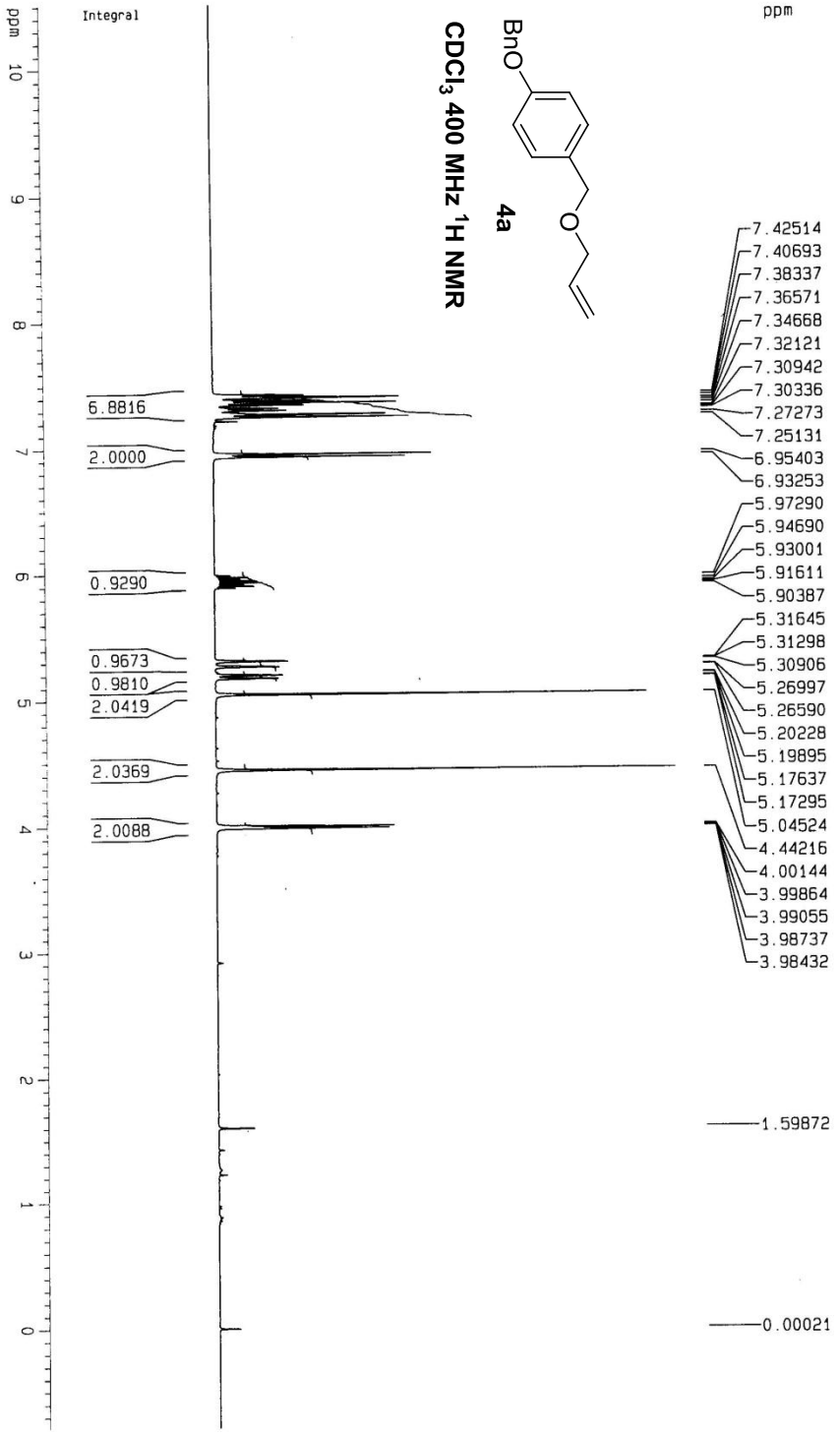
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0.9673
0.9810
2.0419
2.0369
2.0088
7.42514
7.40693
7.38337
7.36571
7.34668
7.32121
7.30942
7.30336
7.27273
7.25131
6.95403
6.93253
5.97290
5.94690
5.93001
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5.90387
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5.26590
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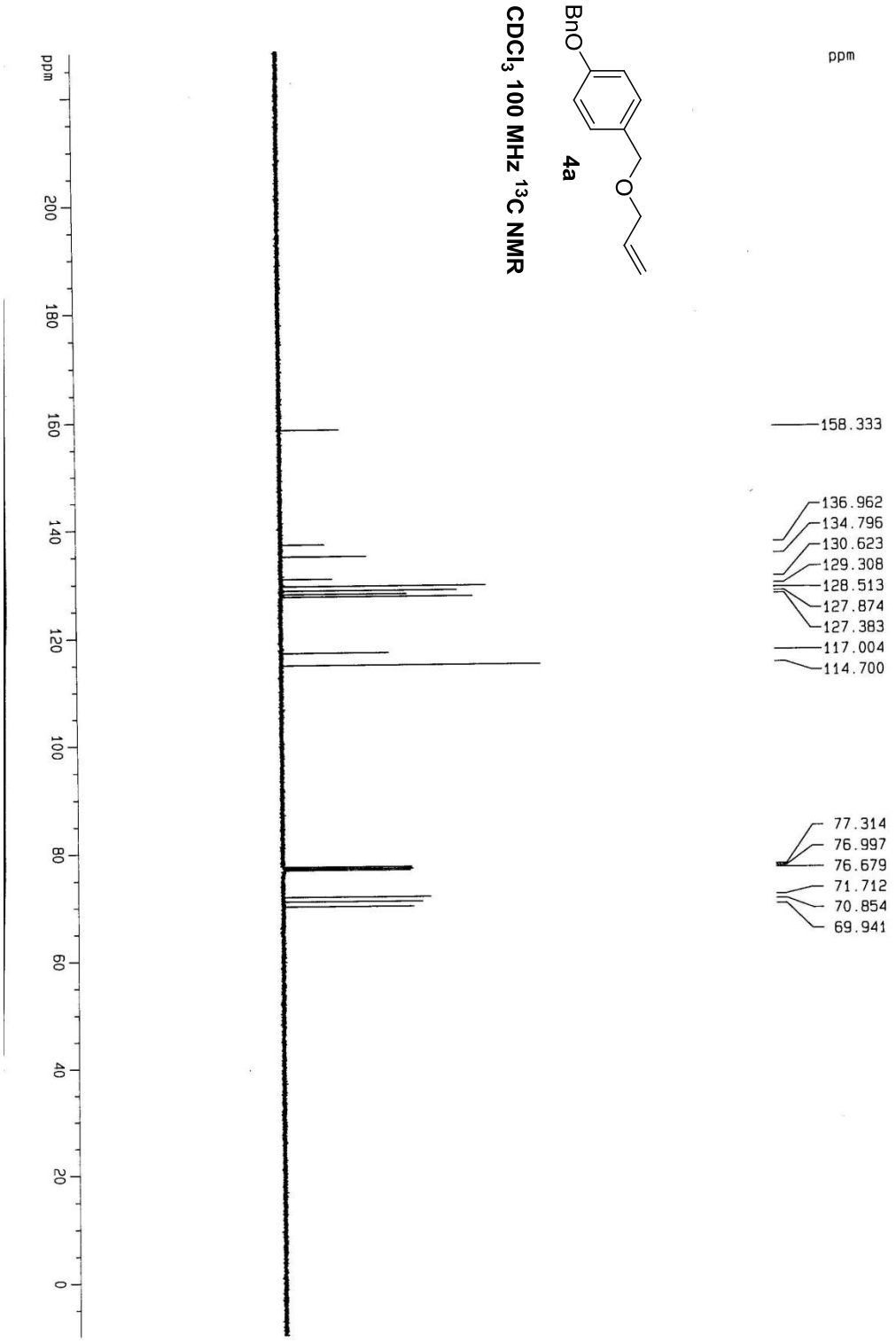
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ppm
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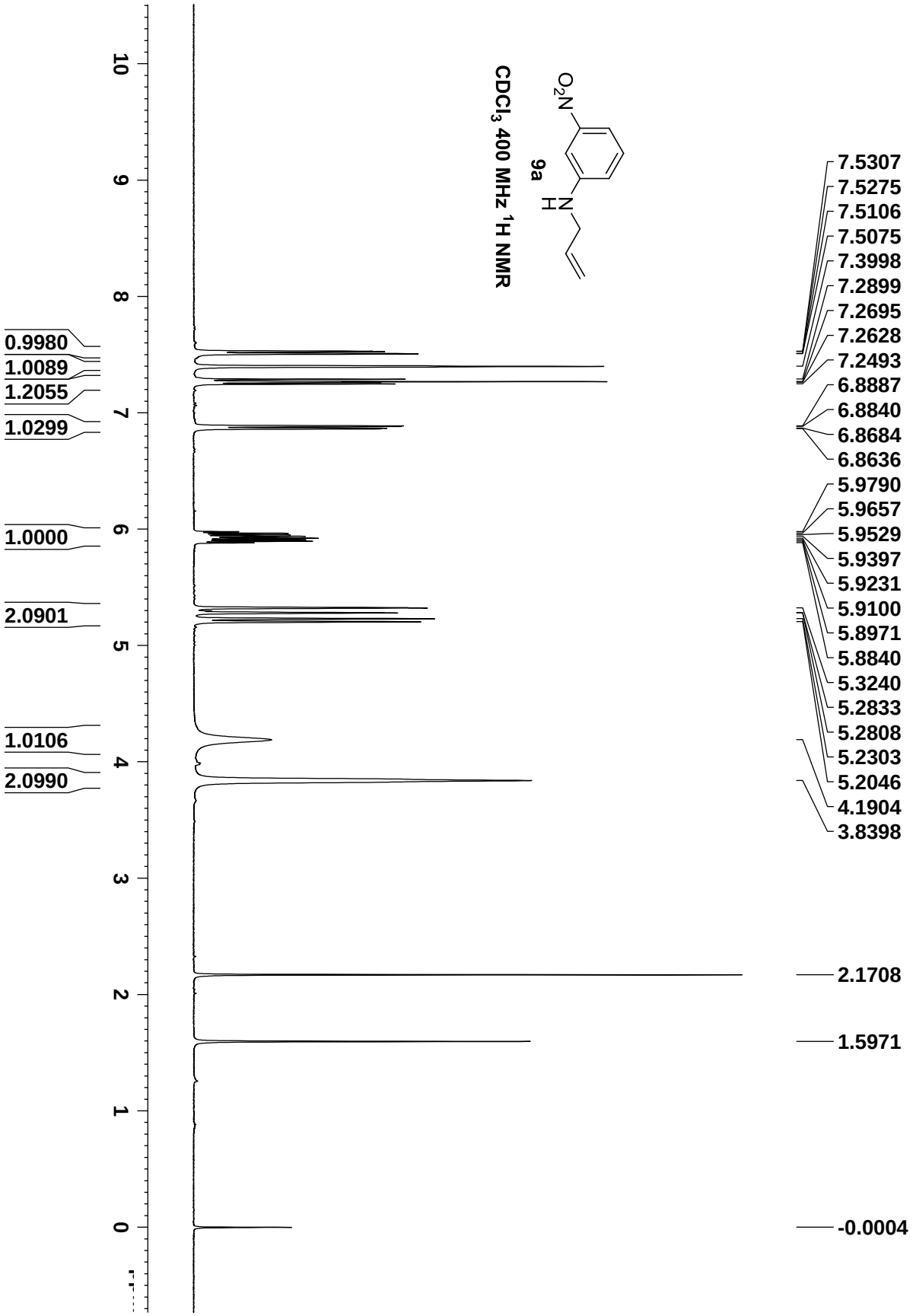

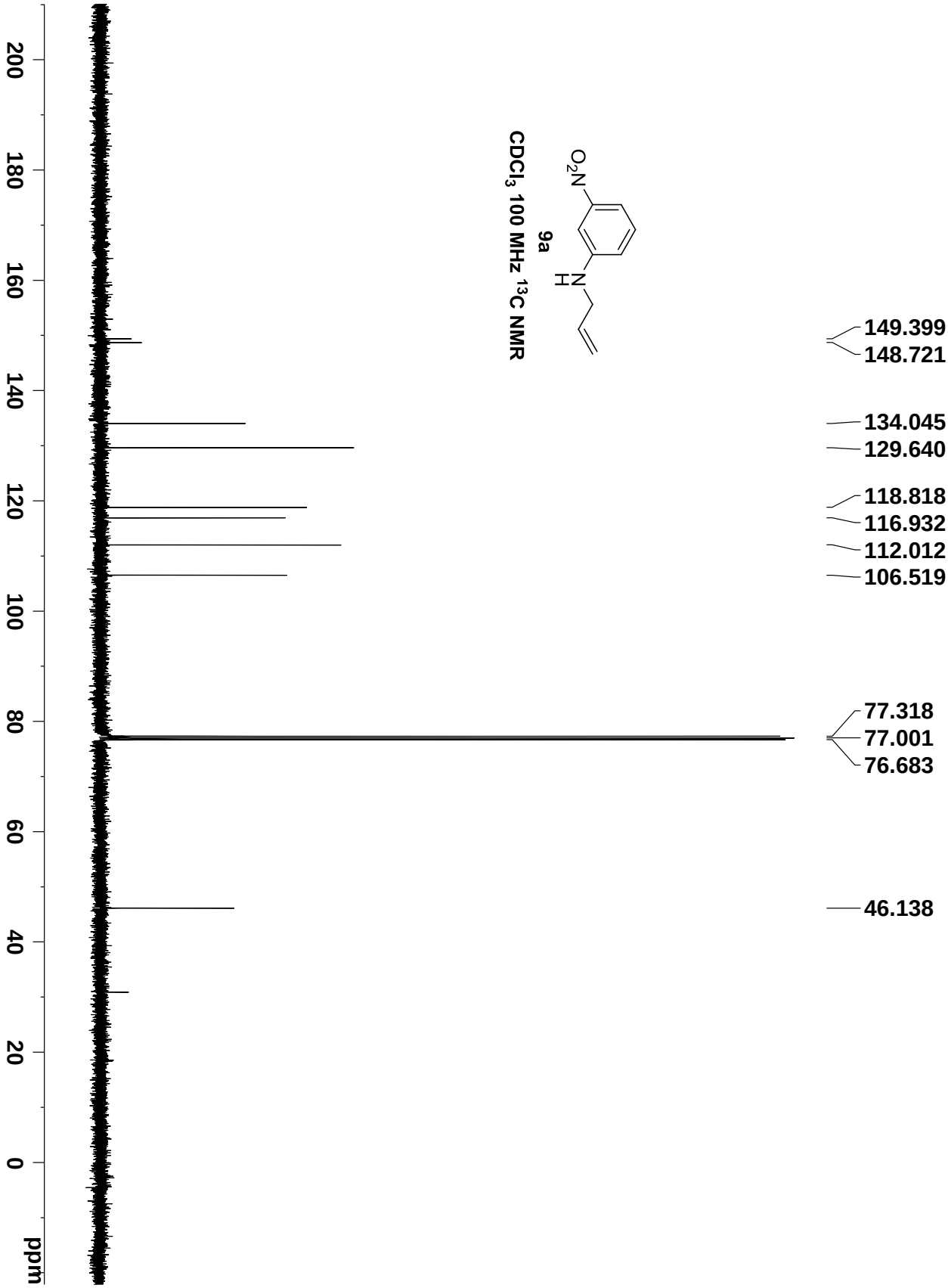

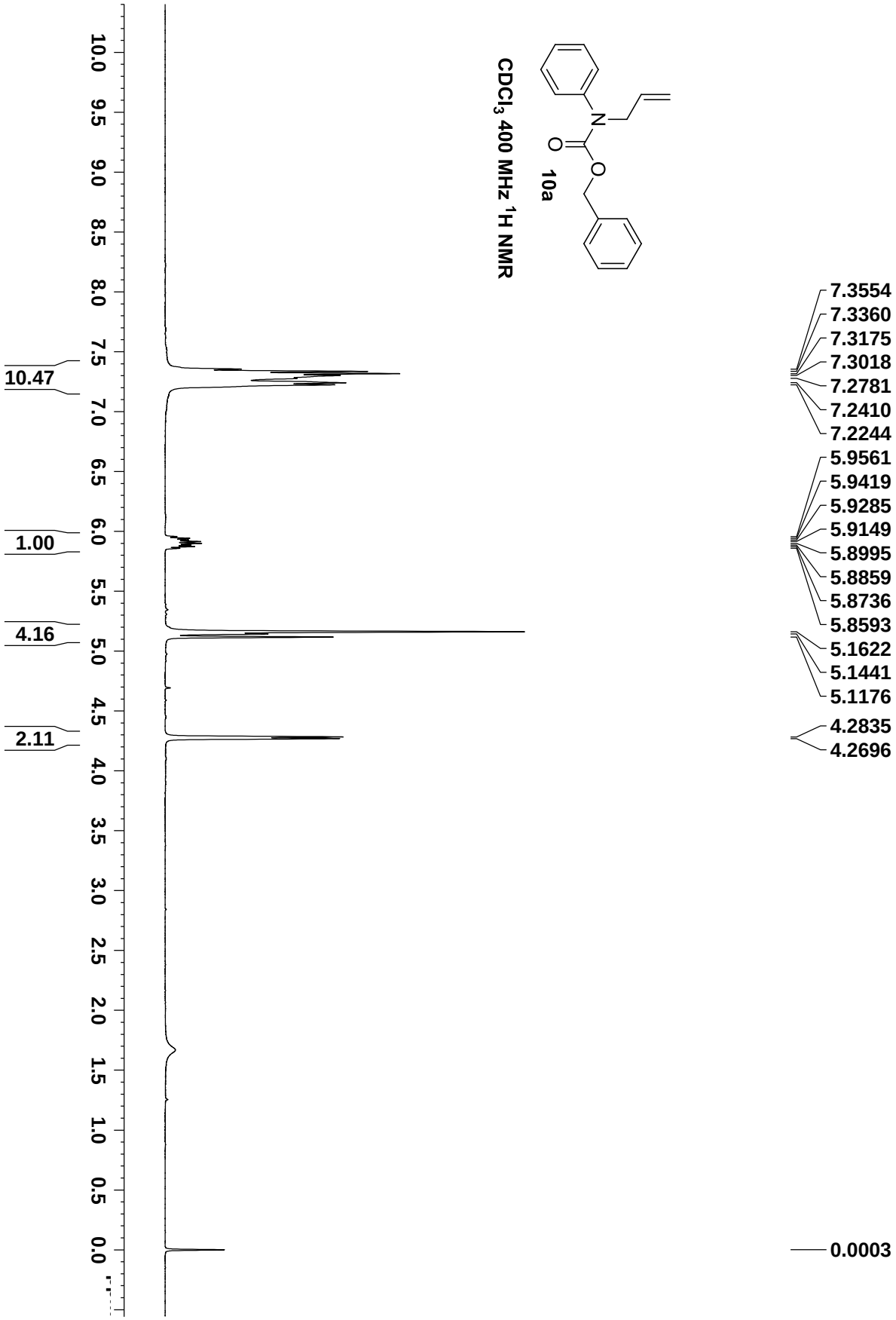

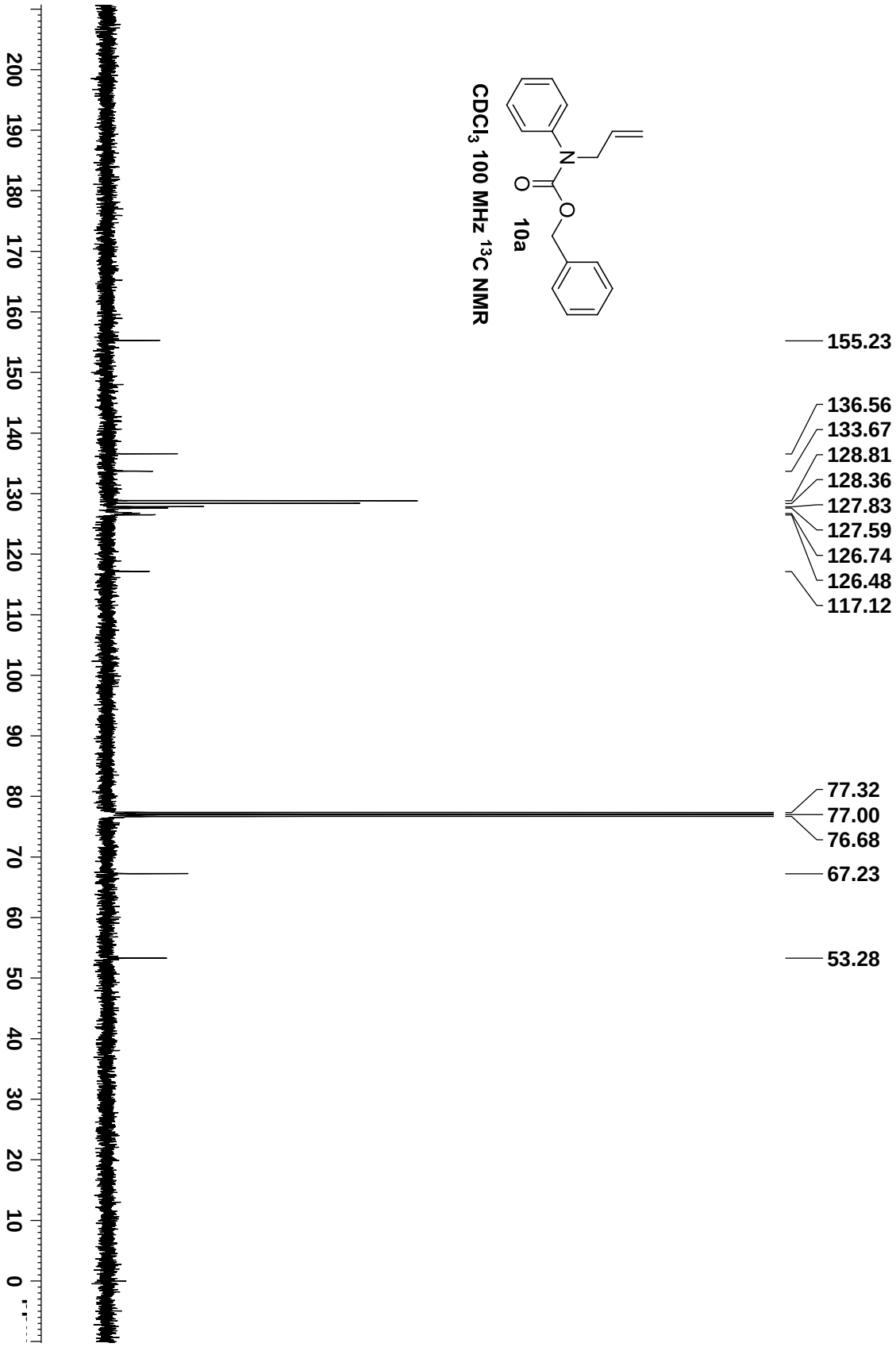

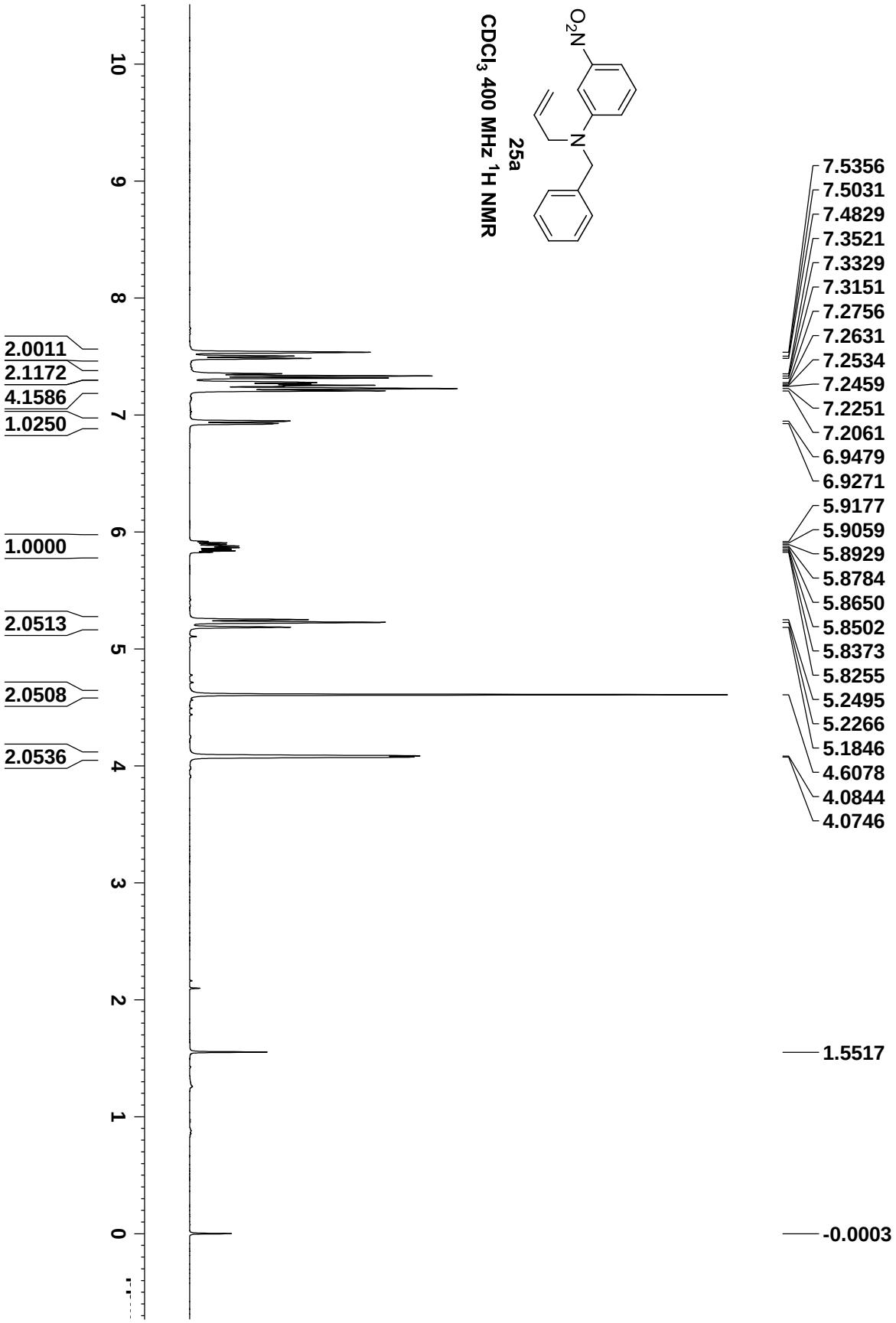

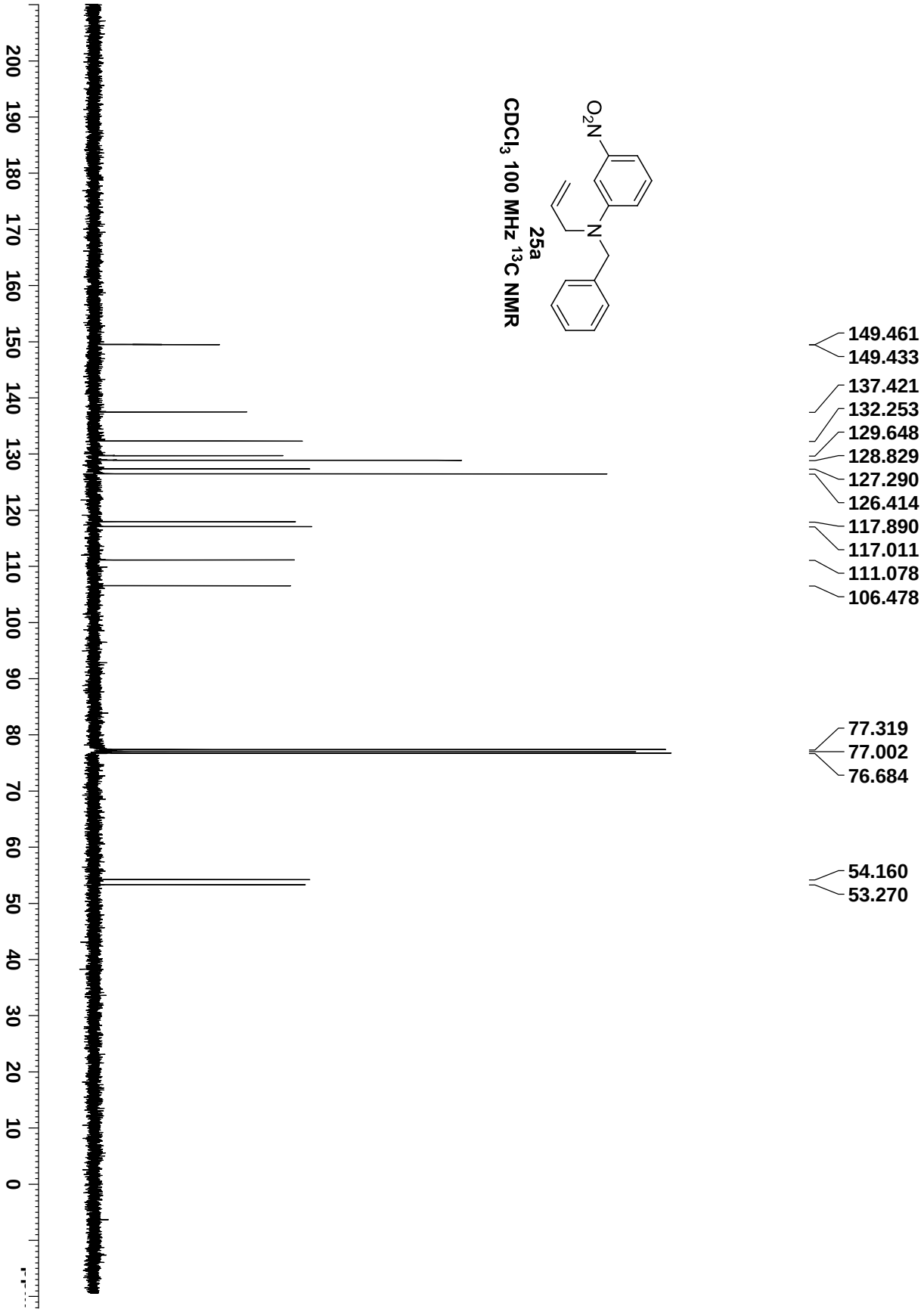

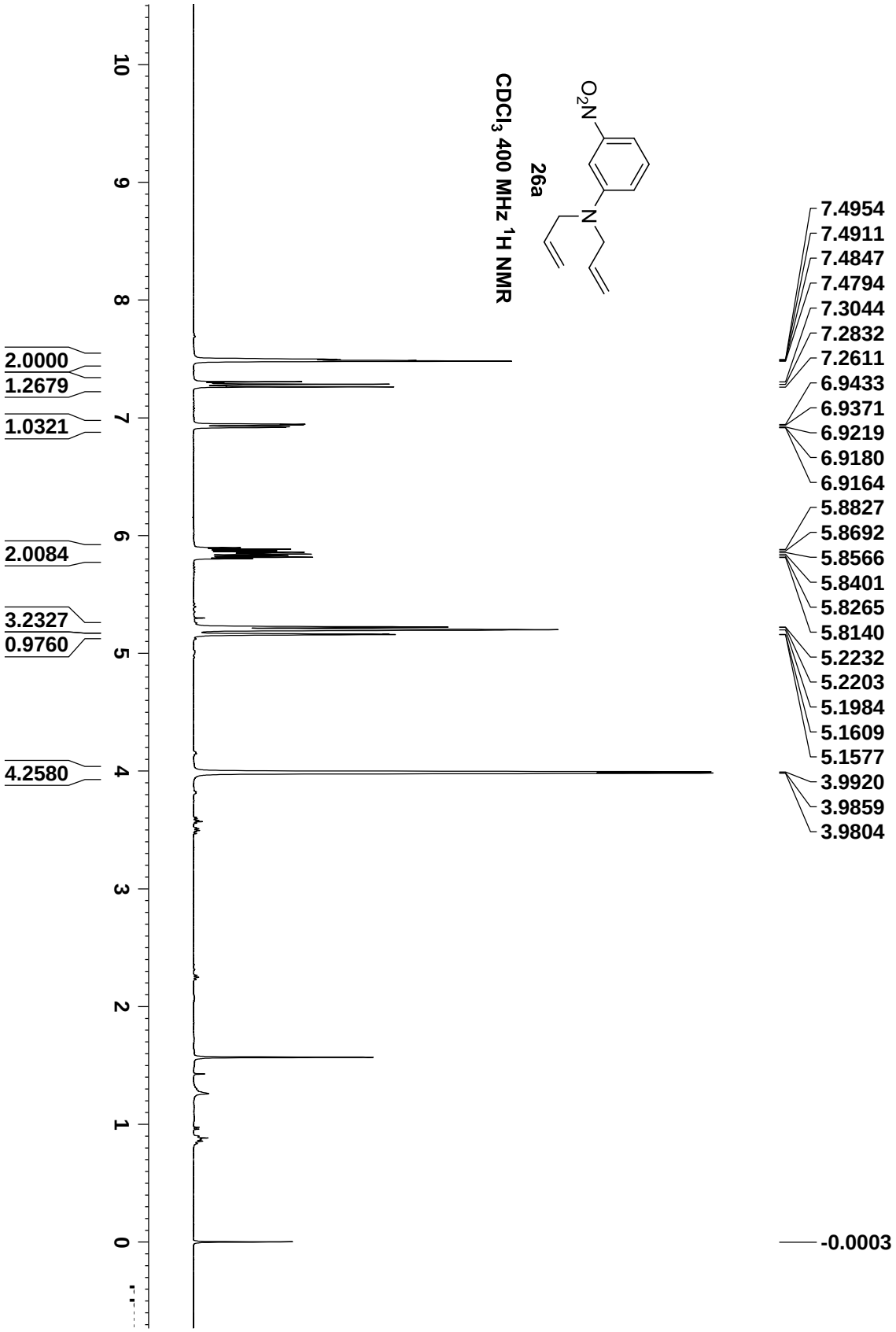

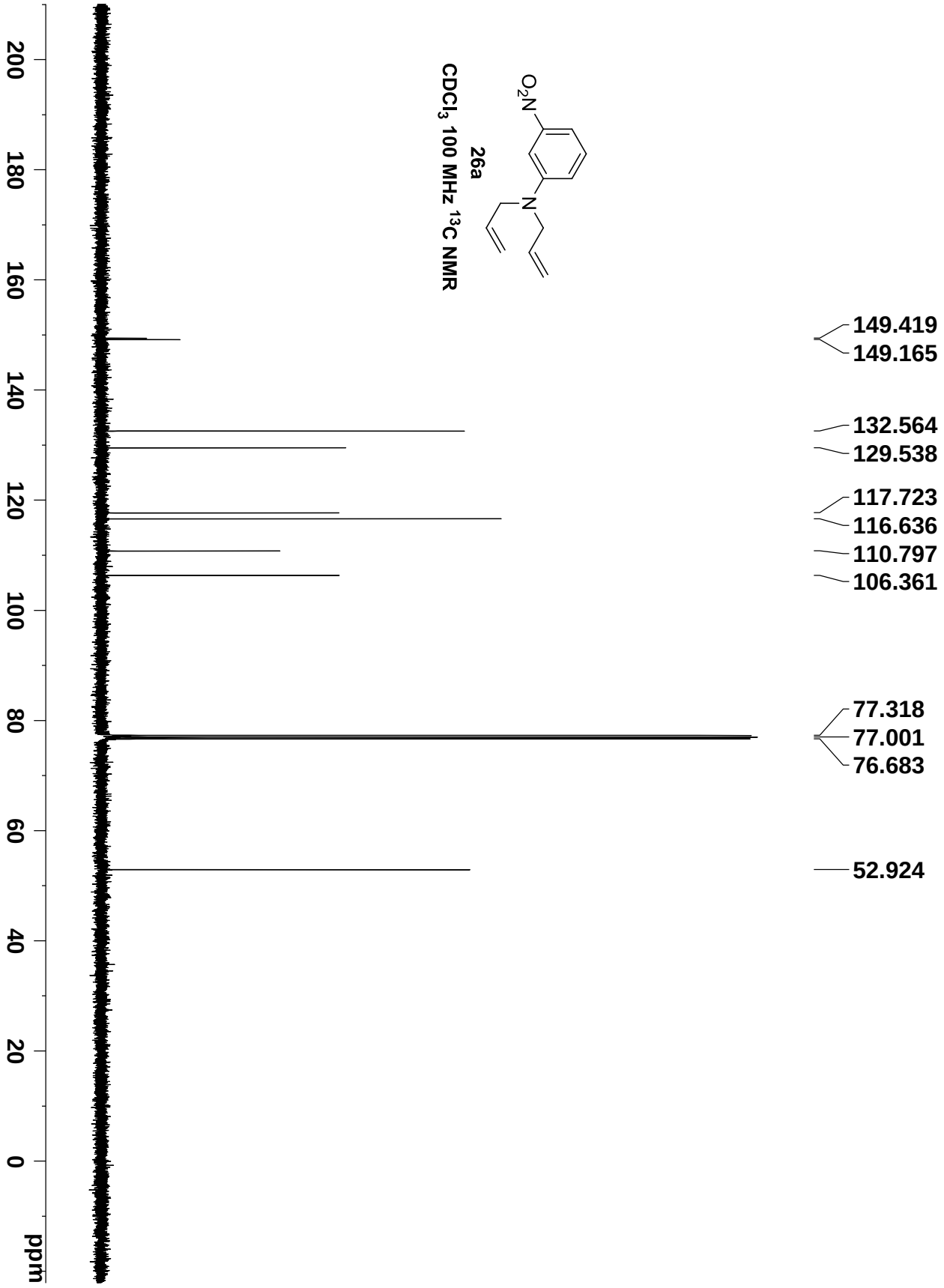

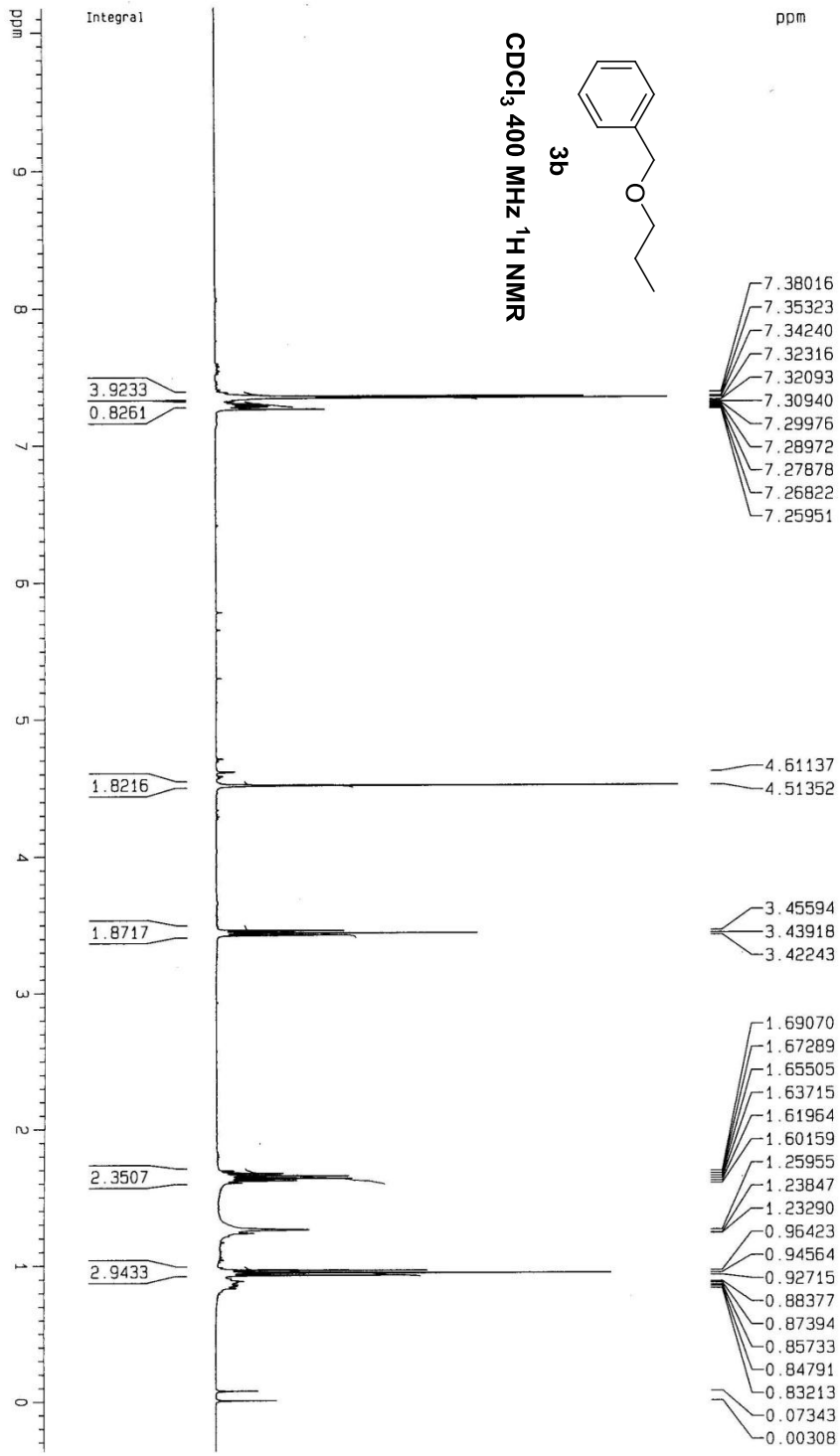

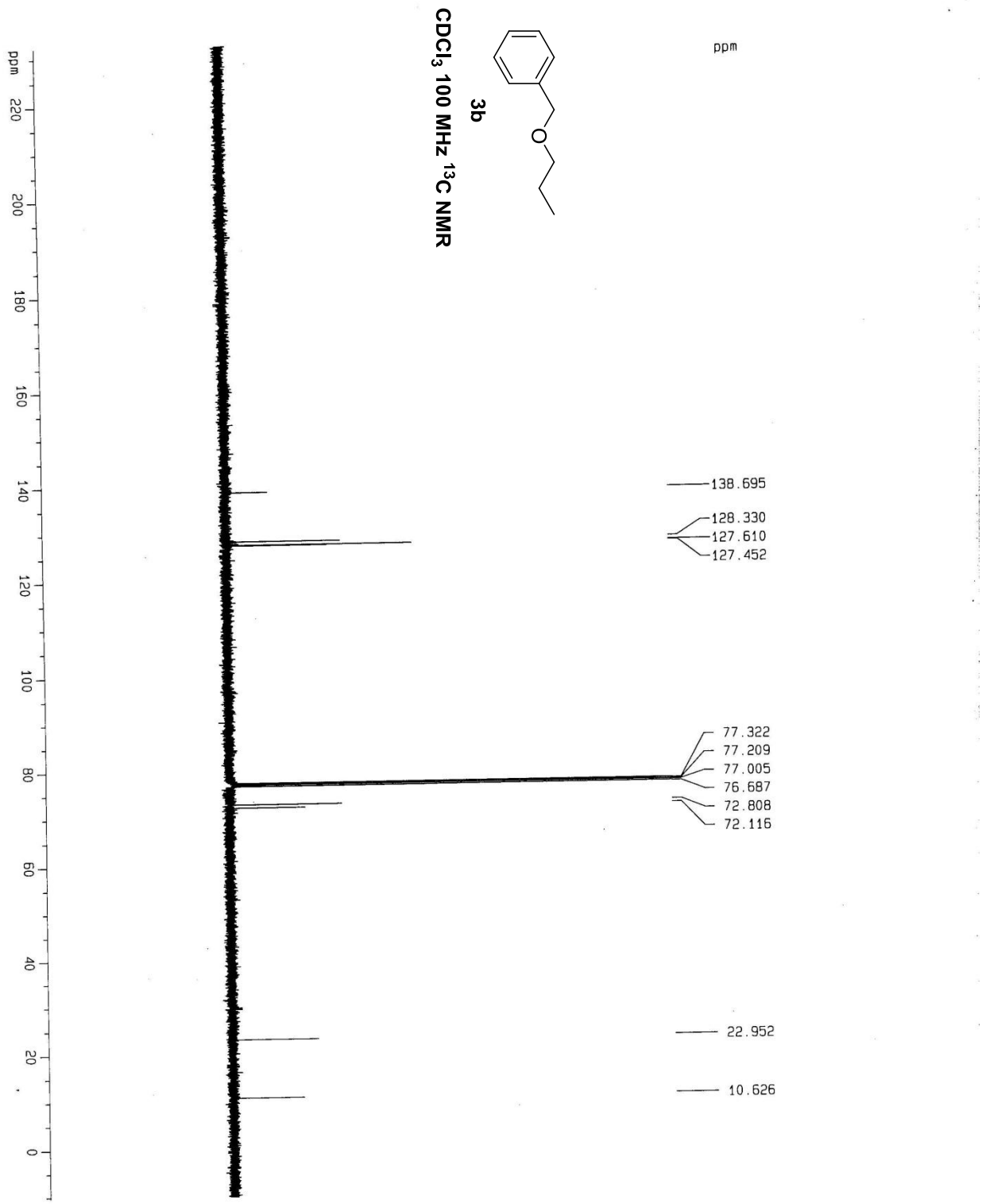

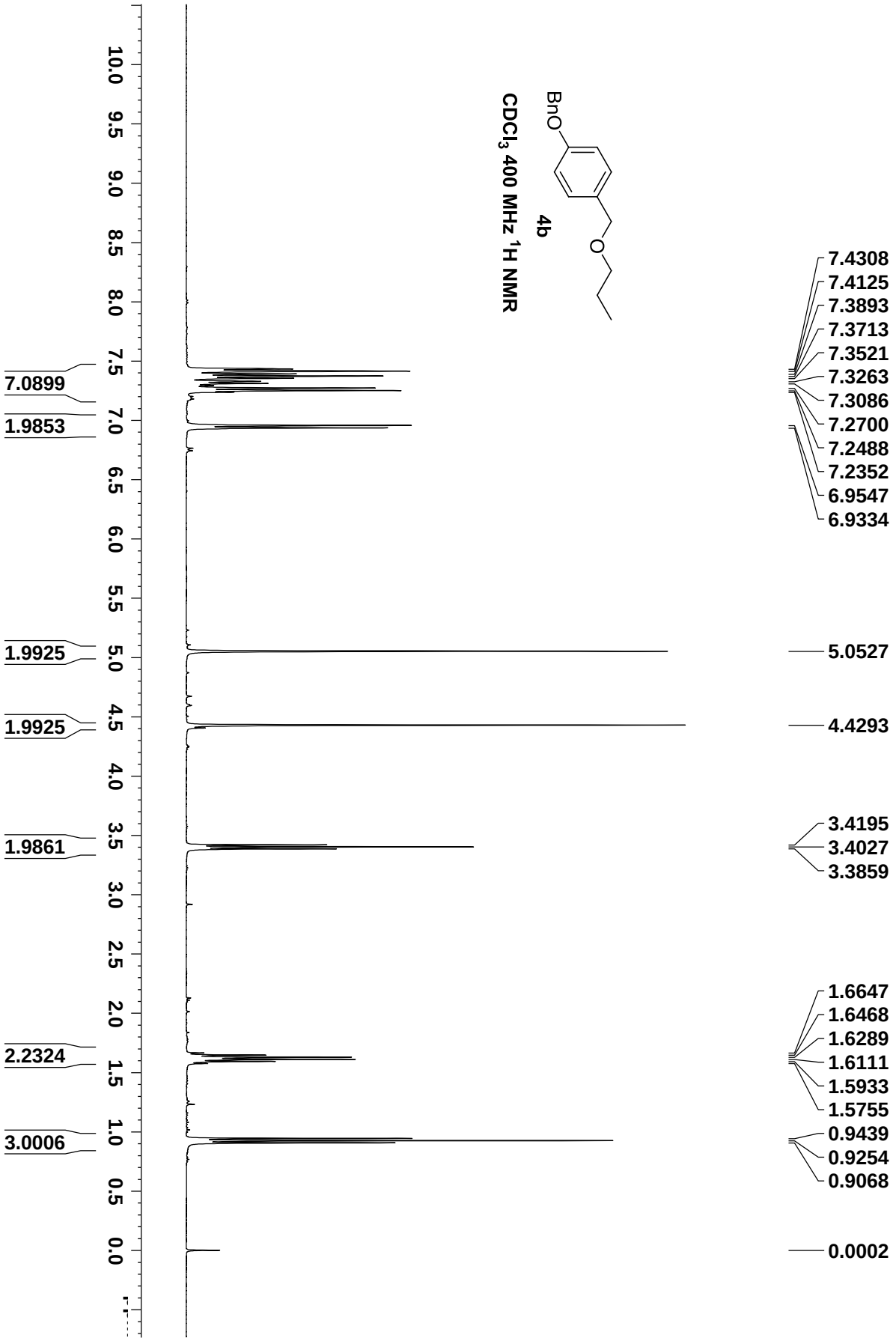

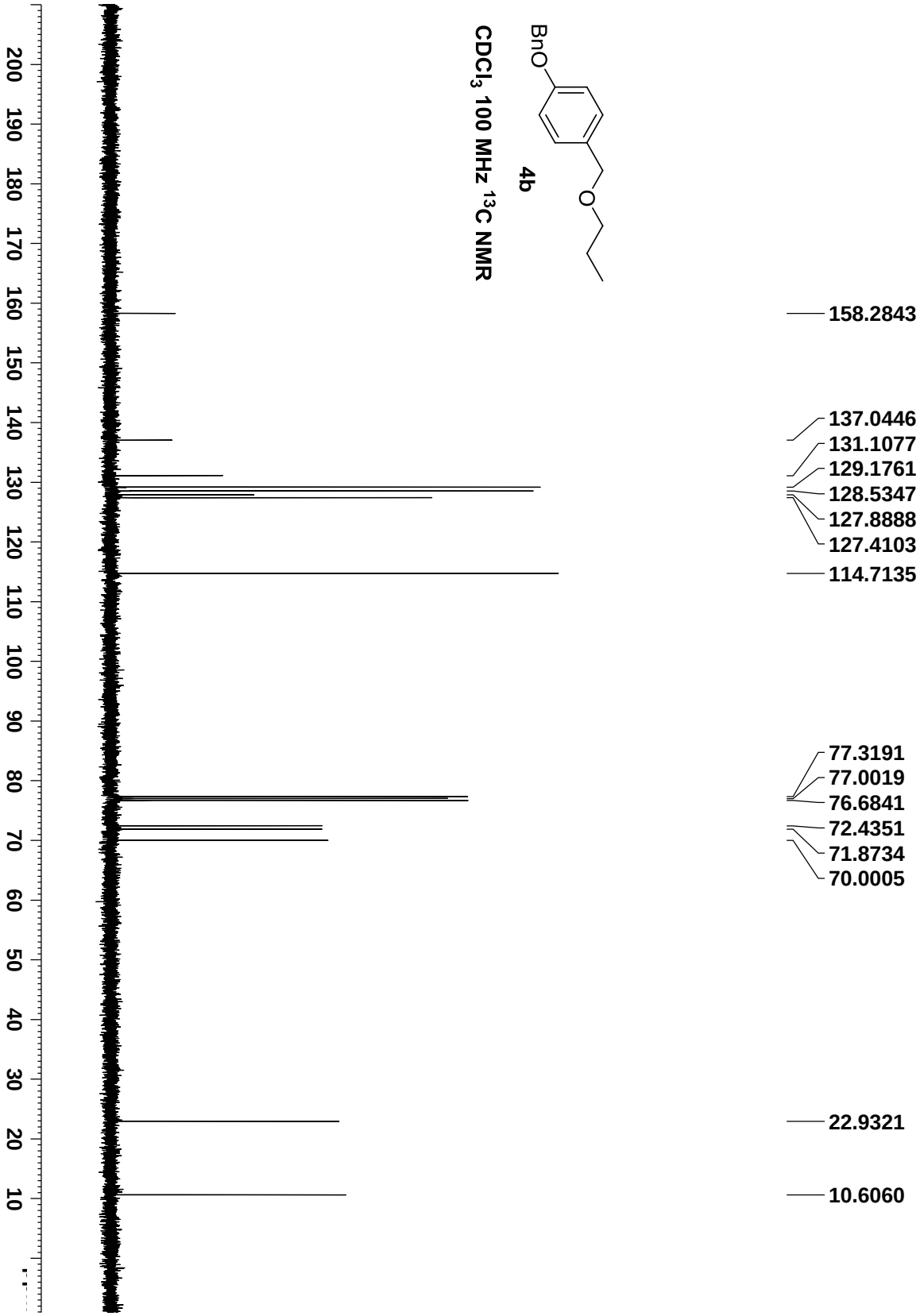

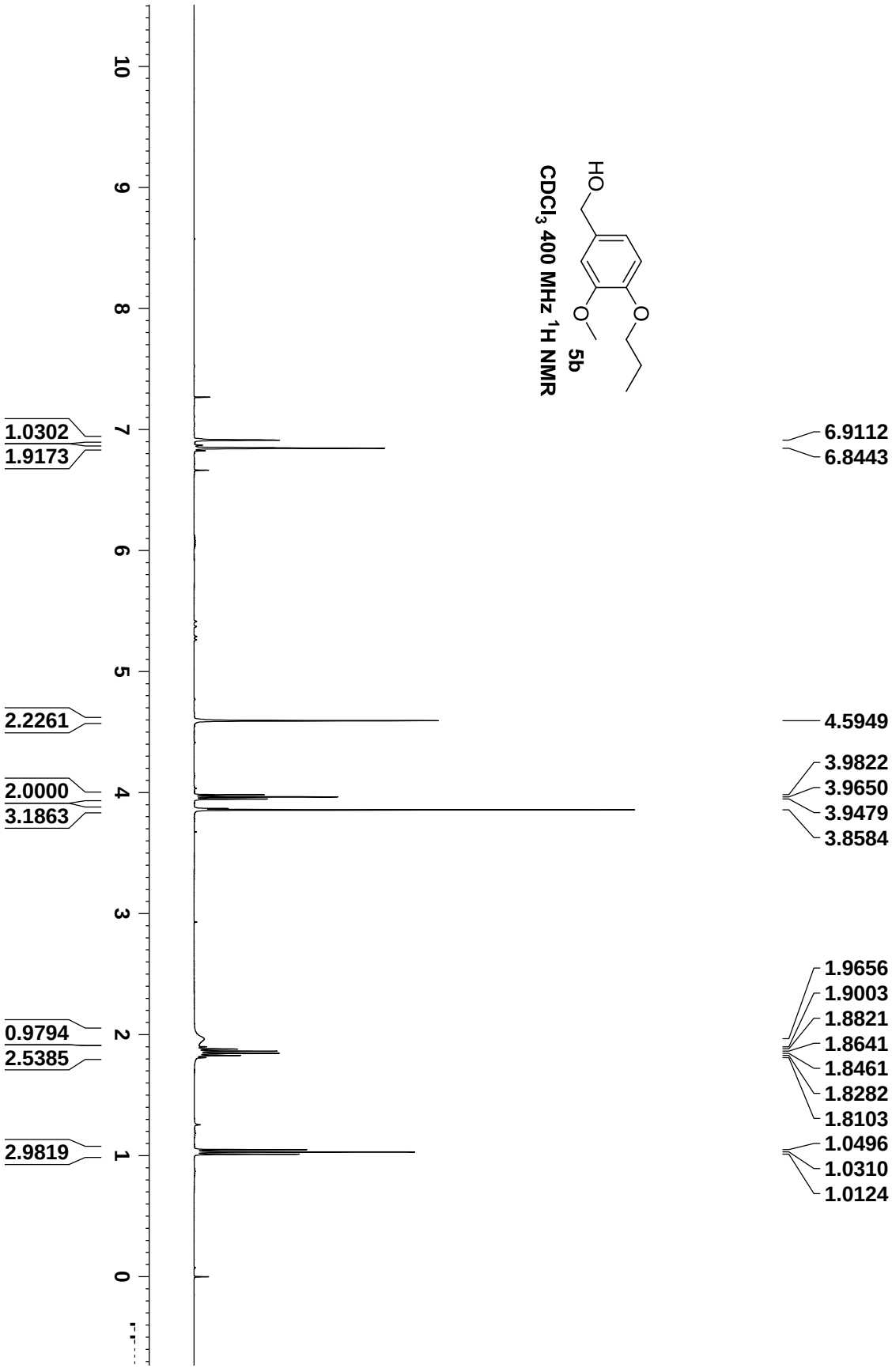

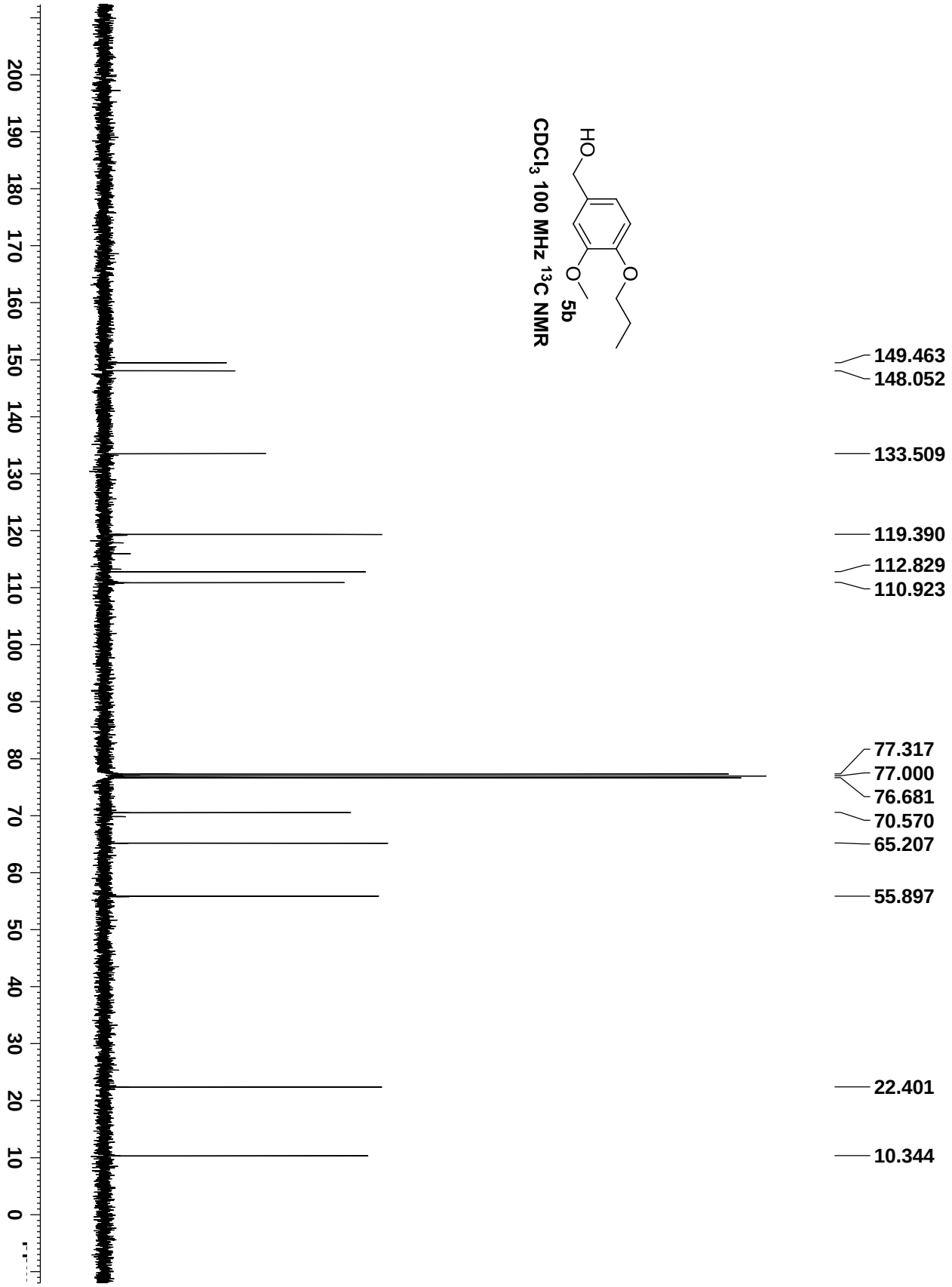

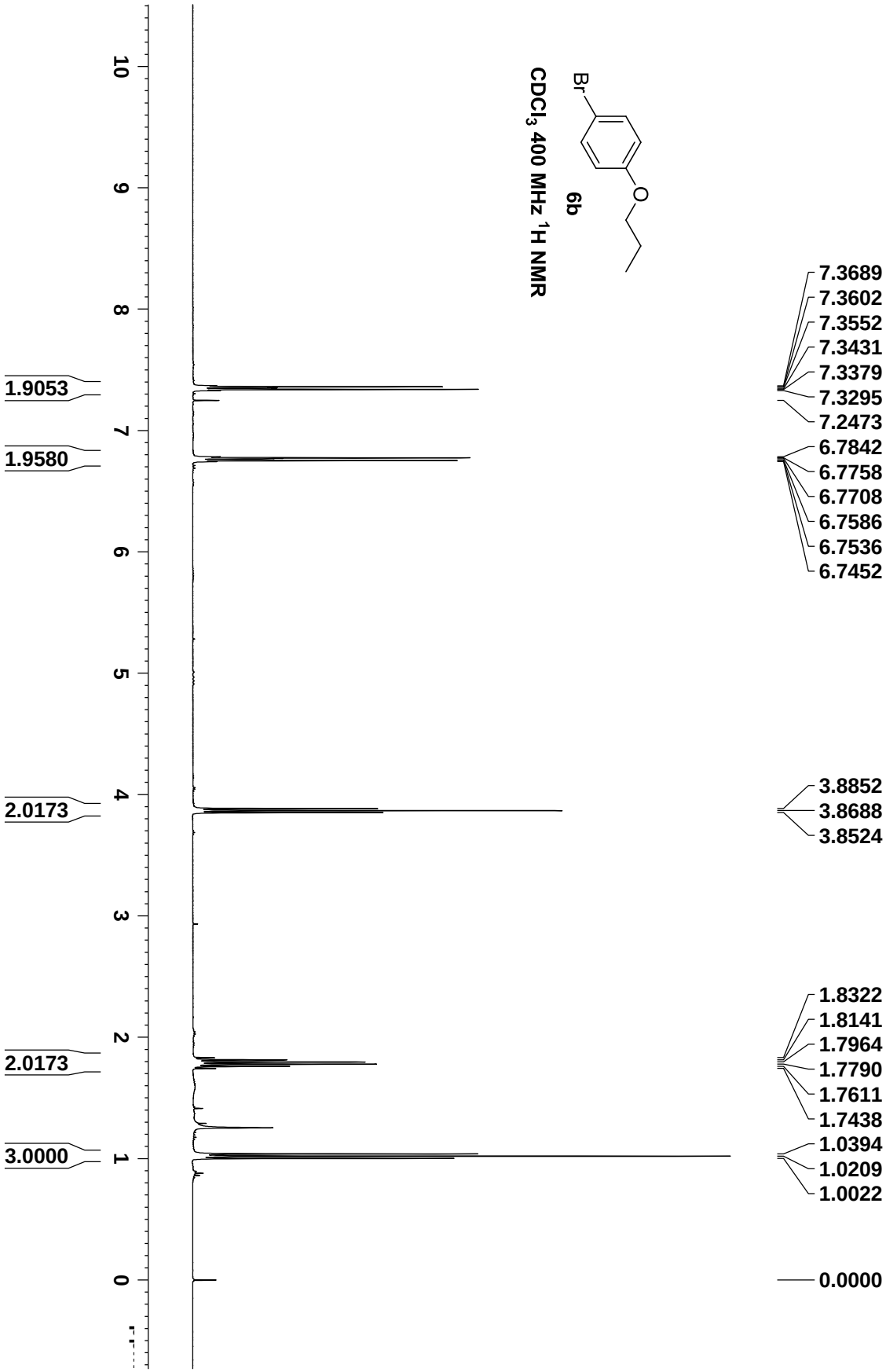

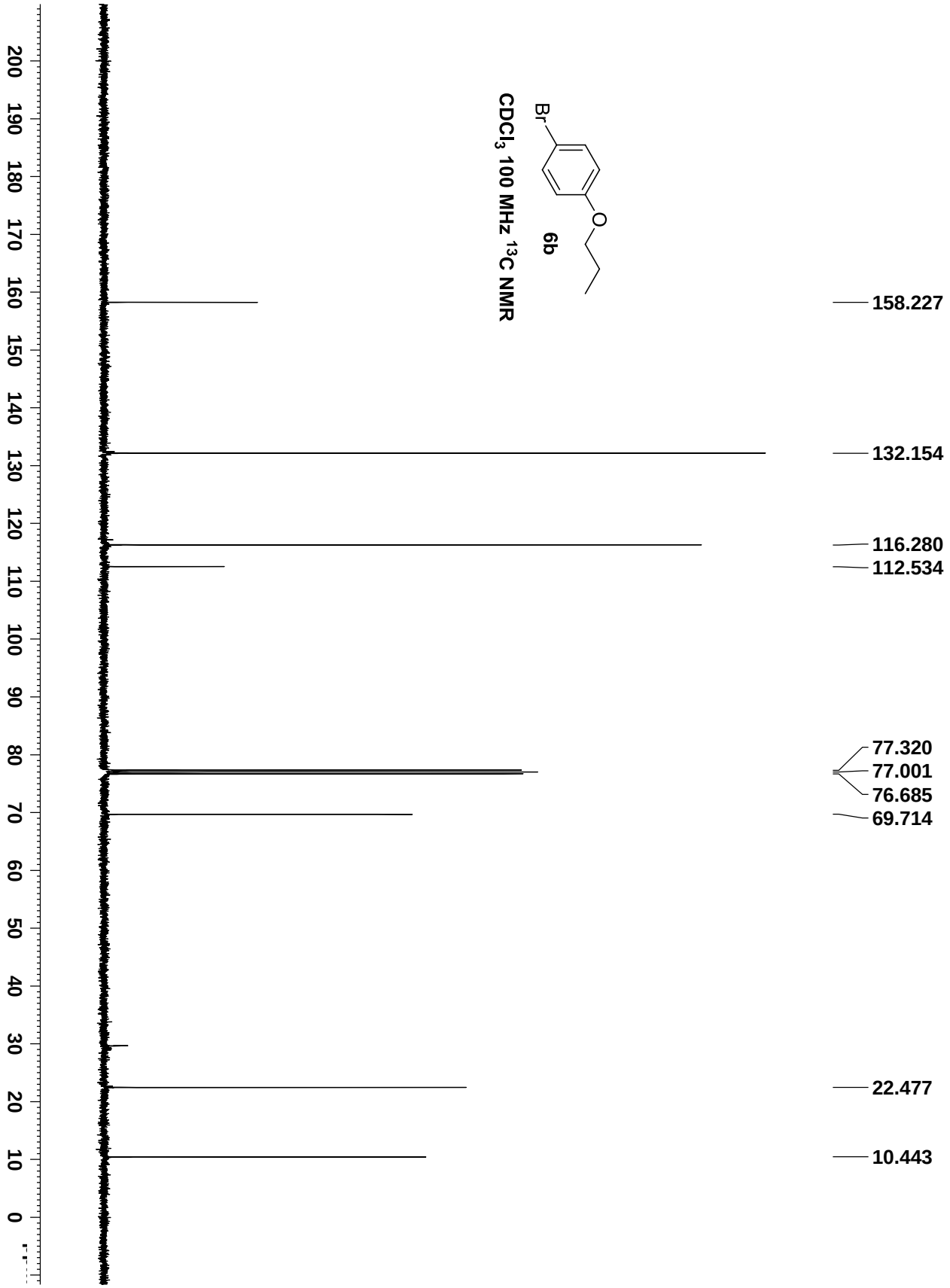

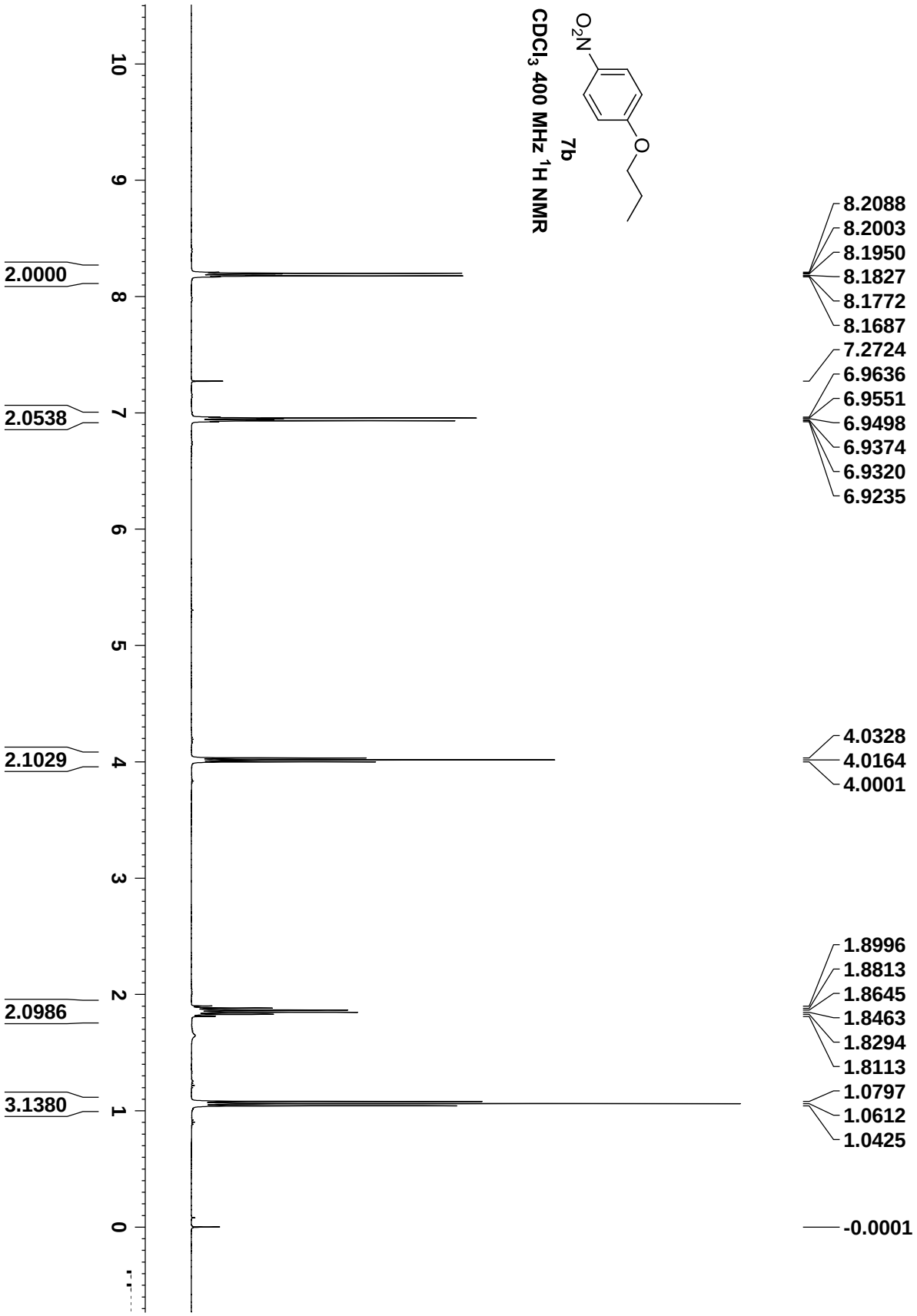

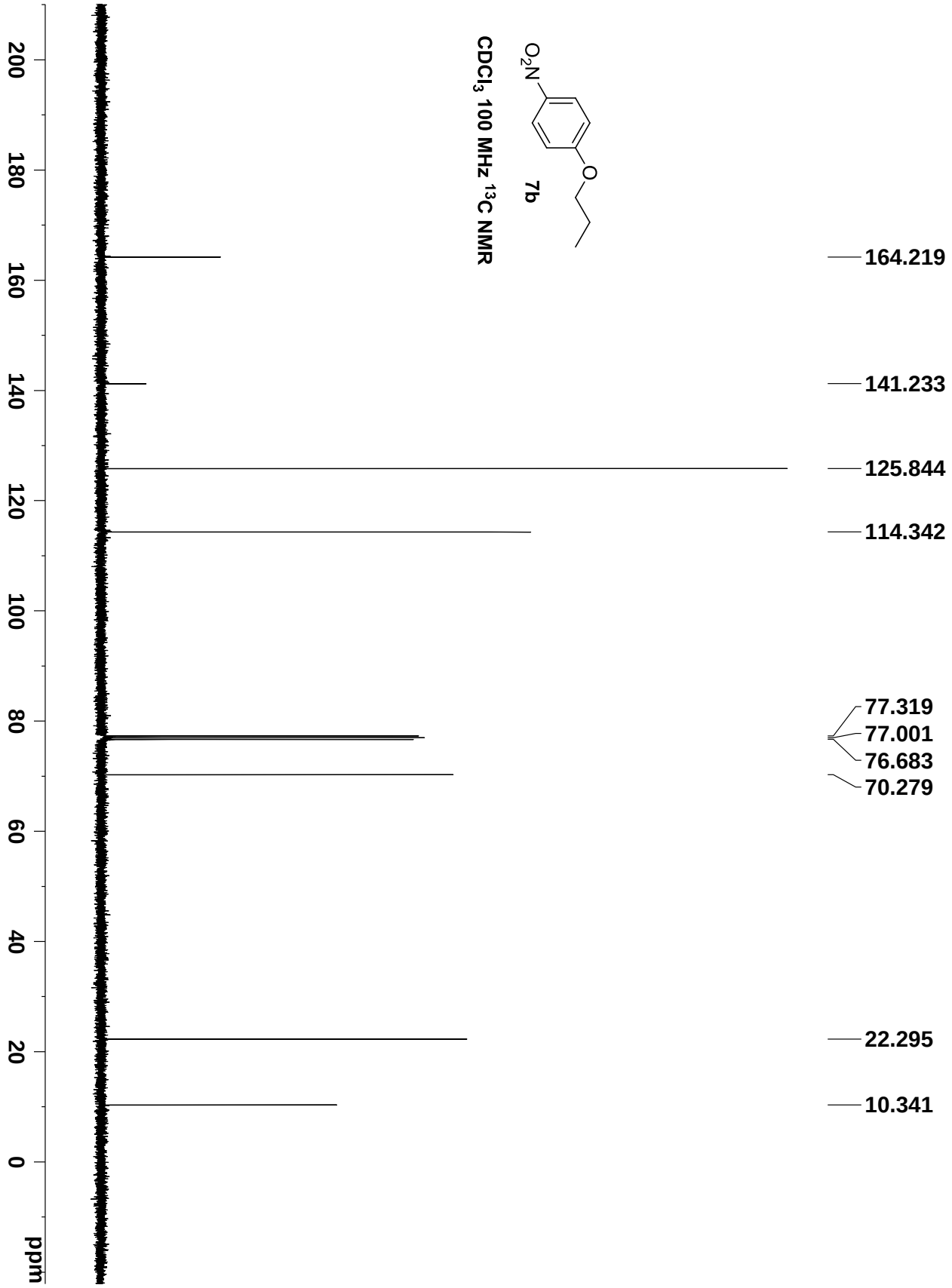

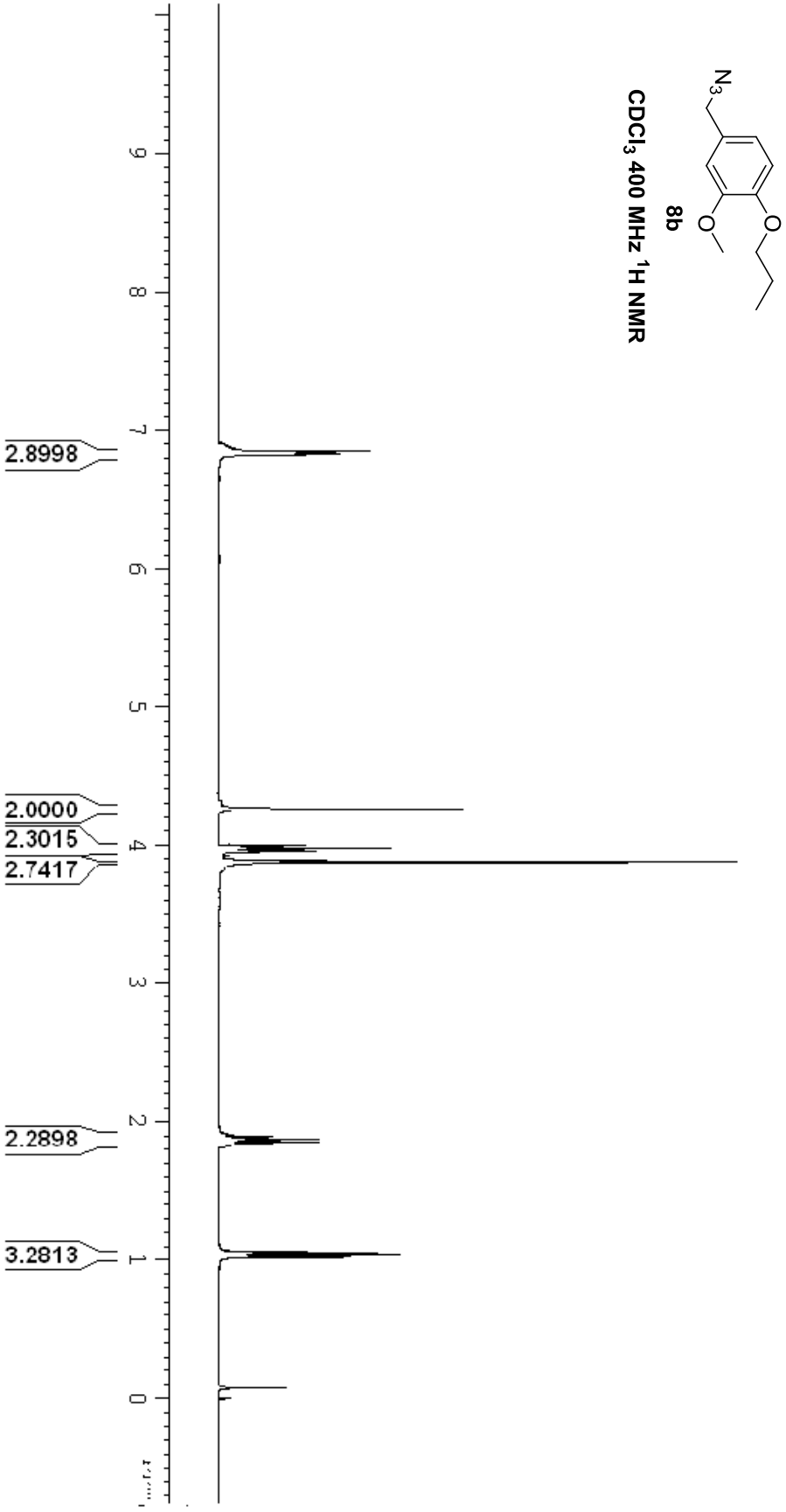
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7
6
5
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3
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1
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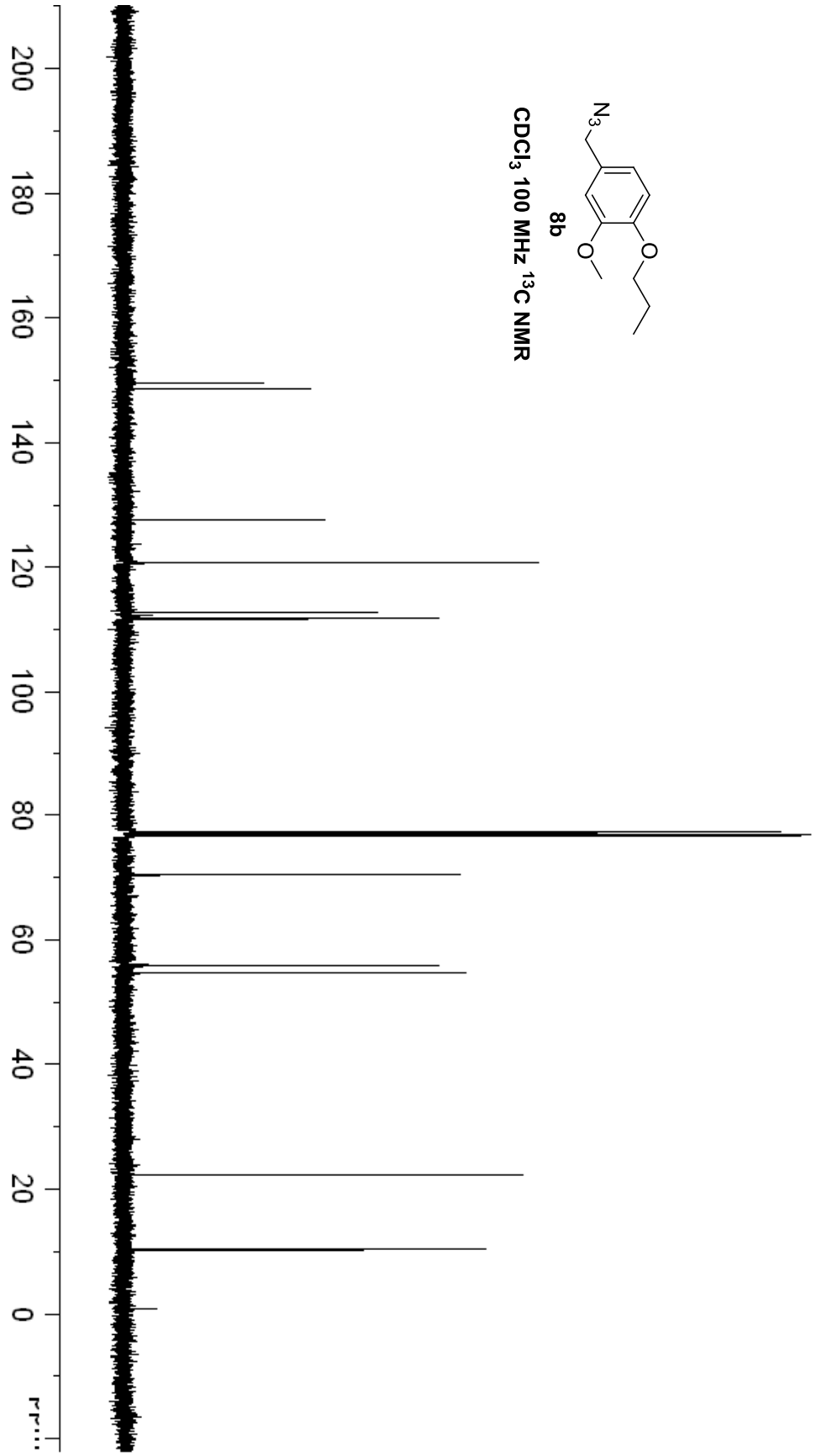
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60
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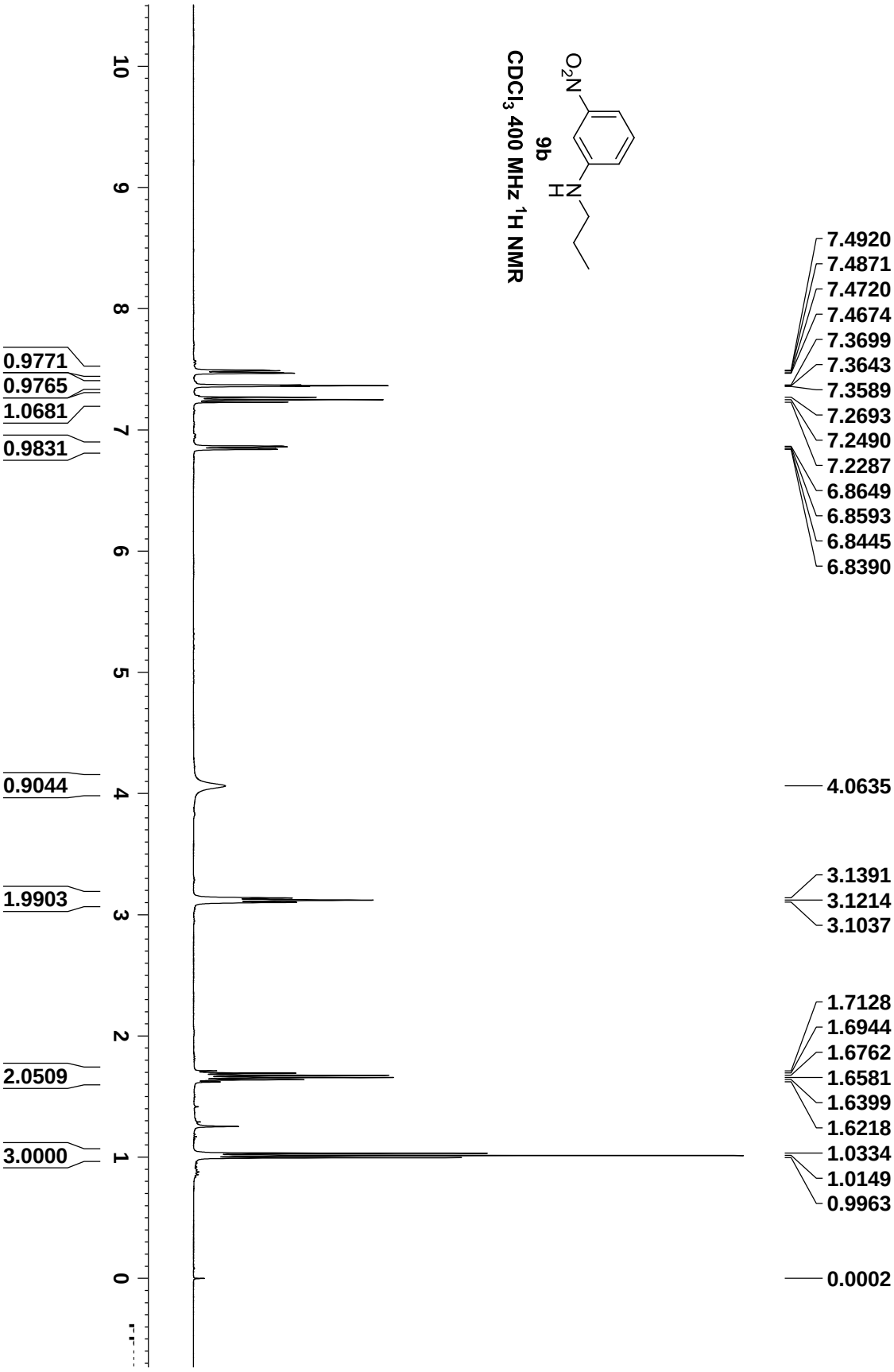
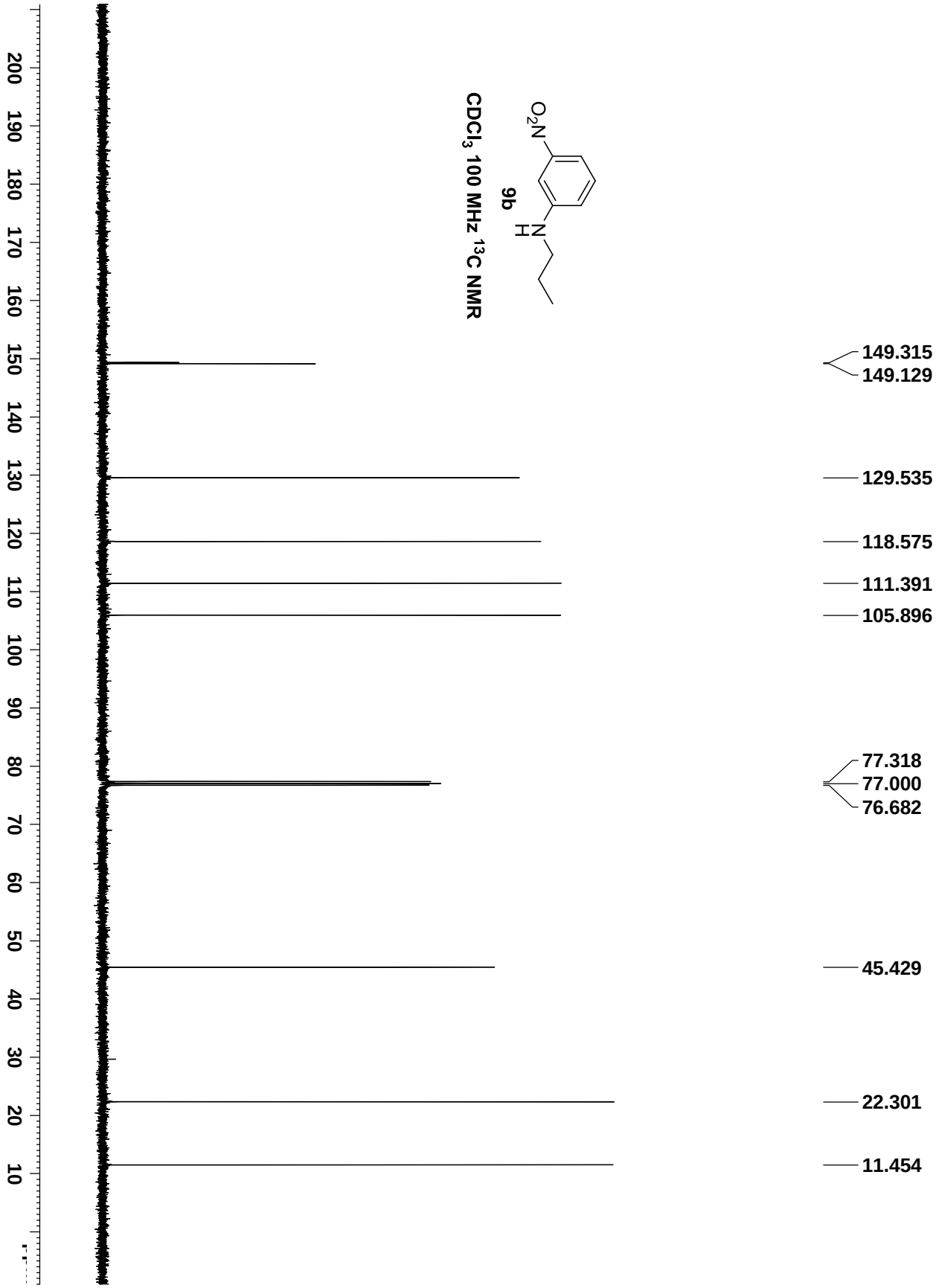
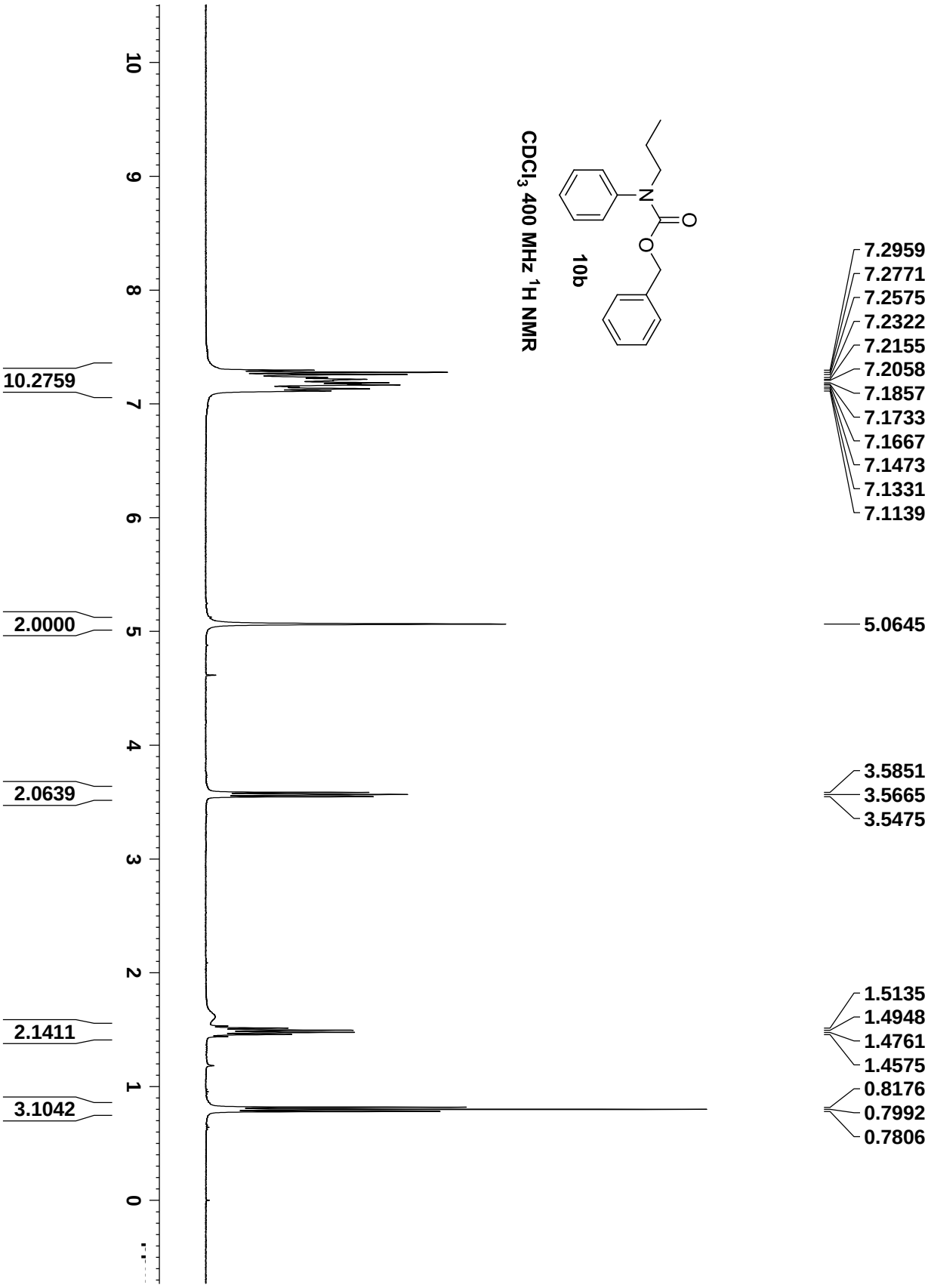
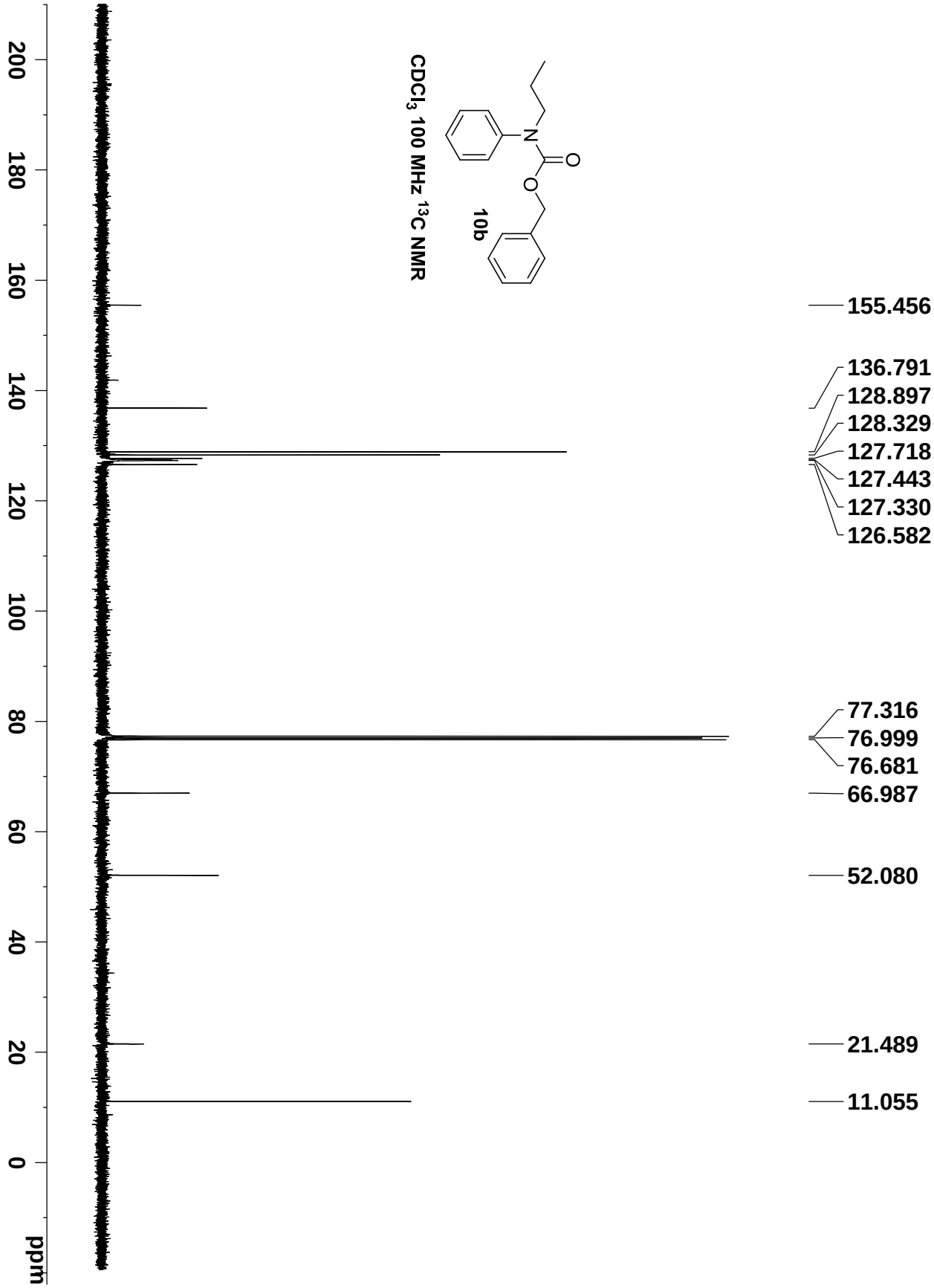
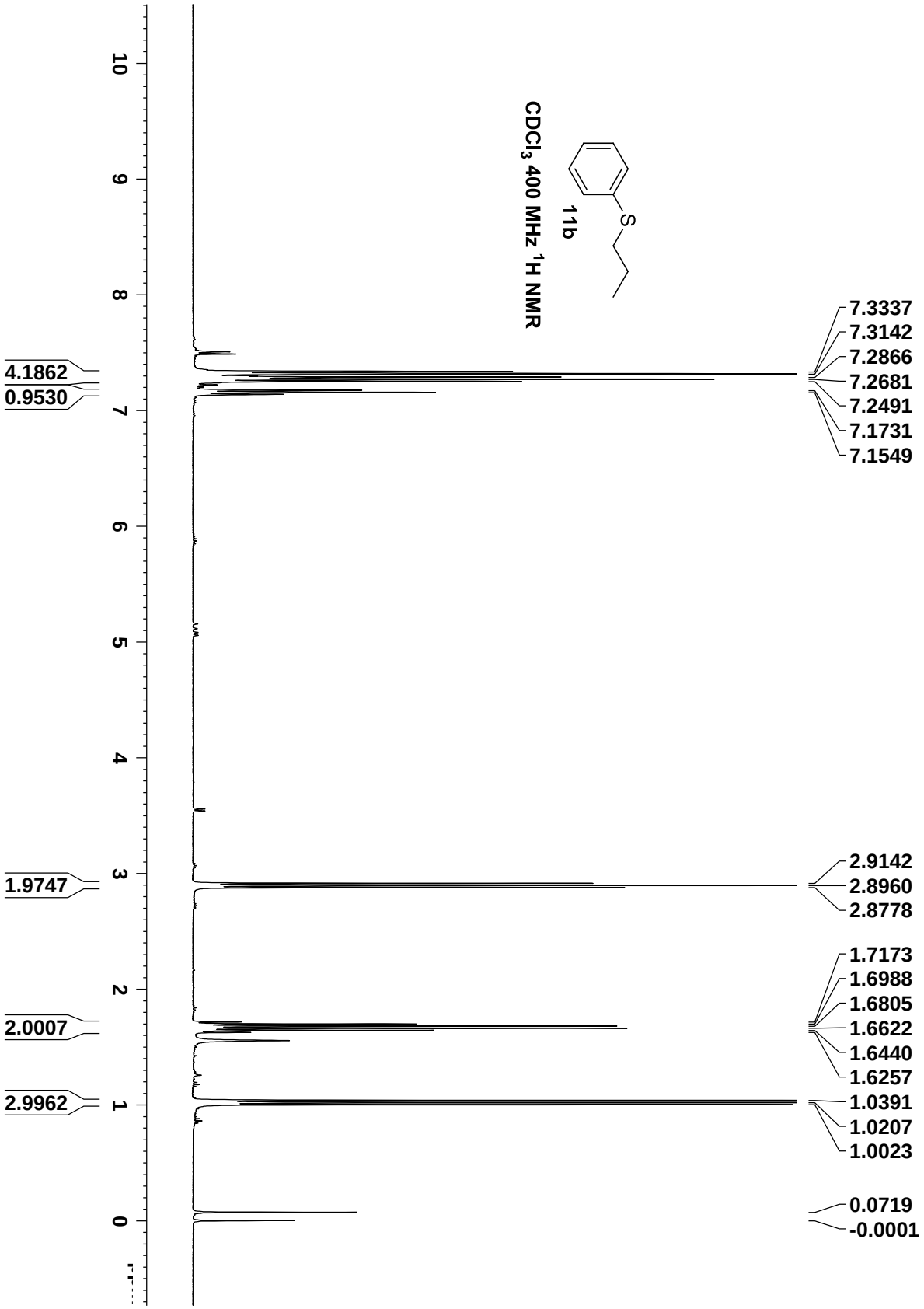
ppm

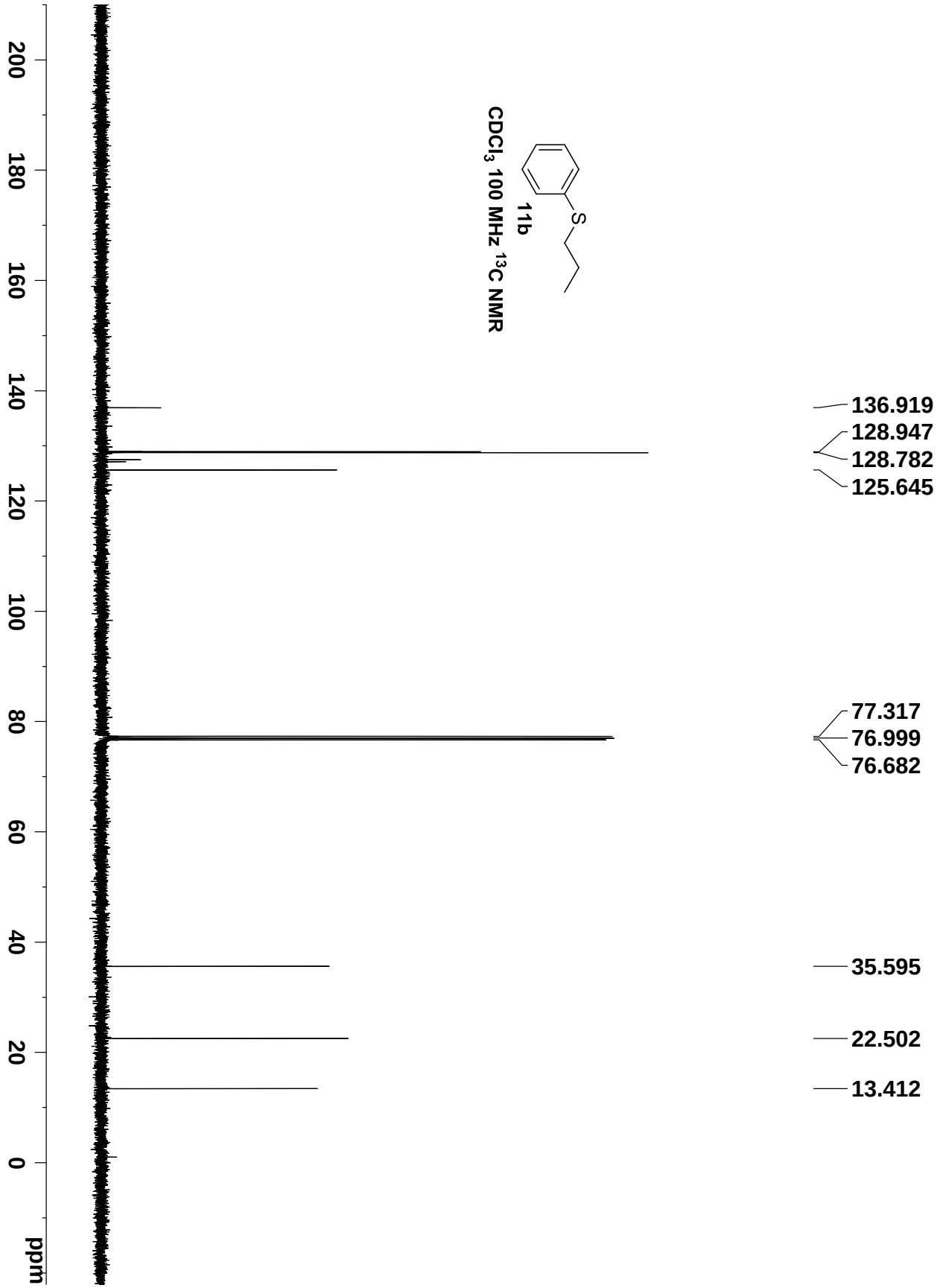


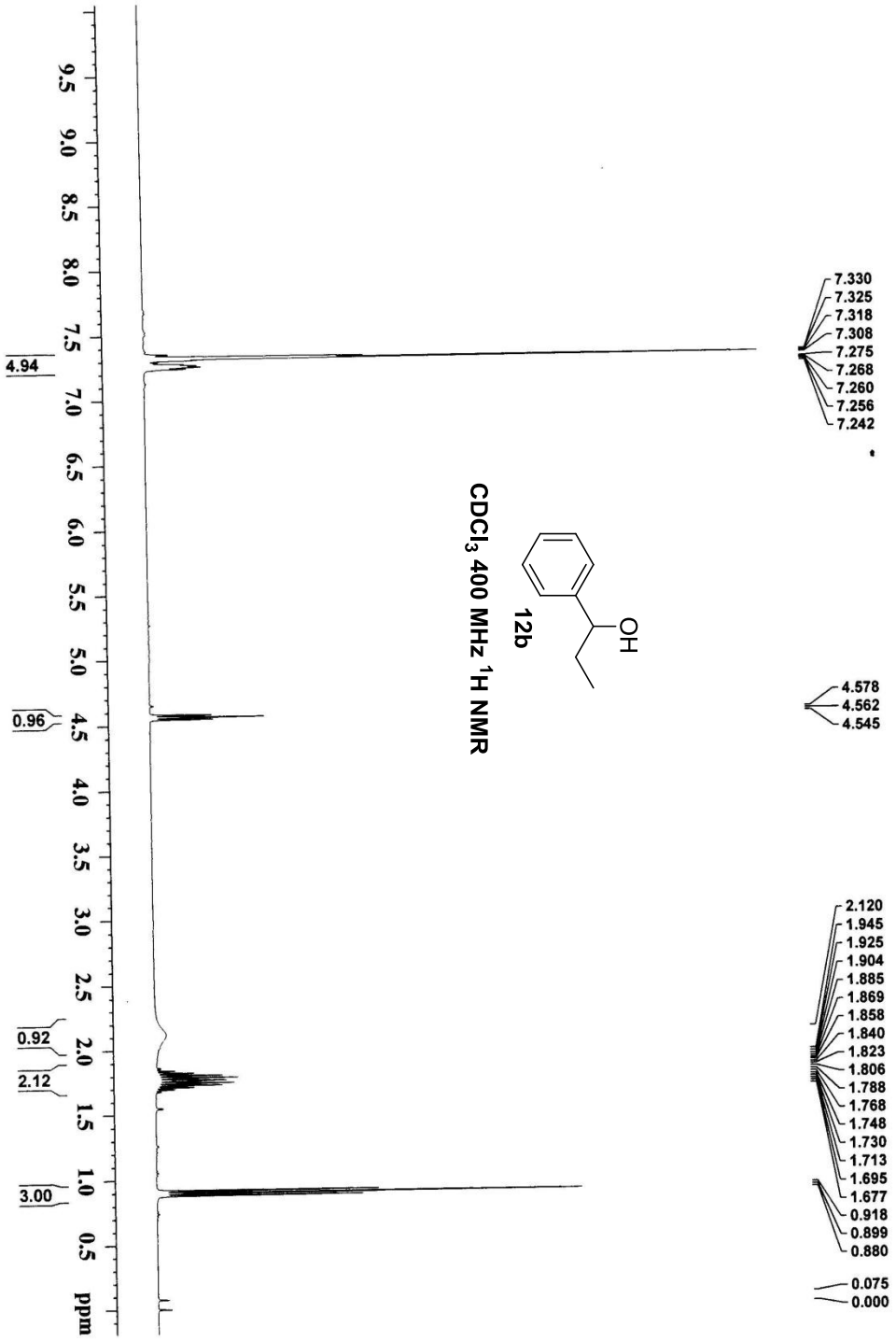


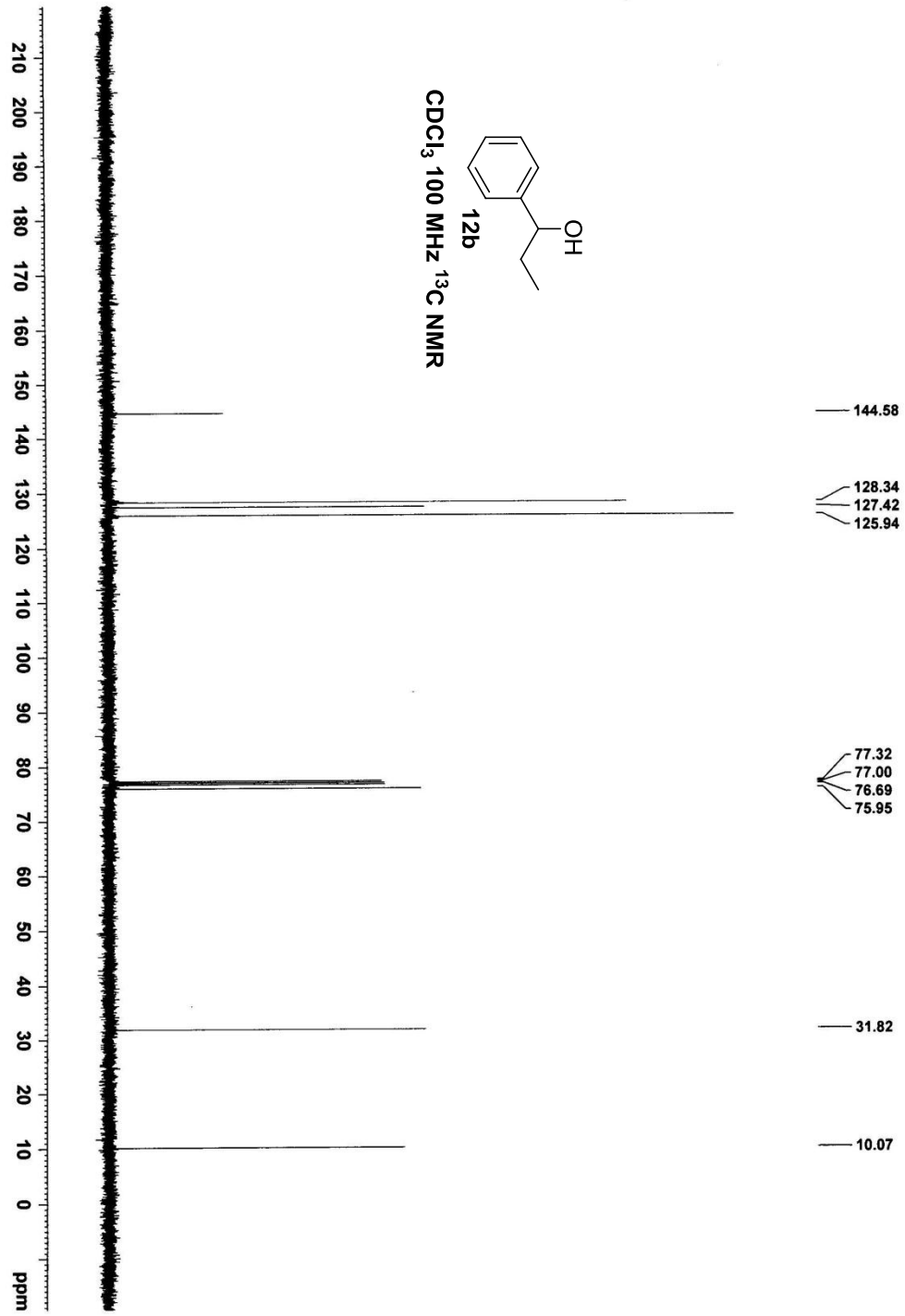


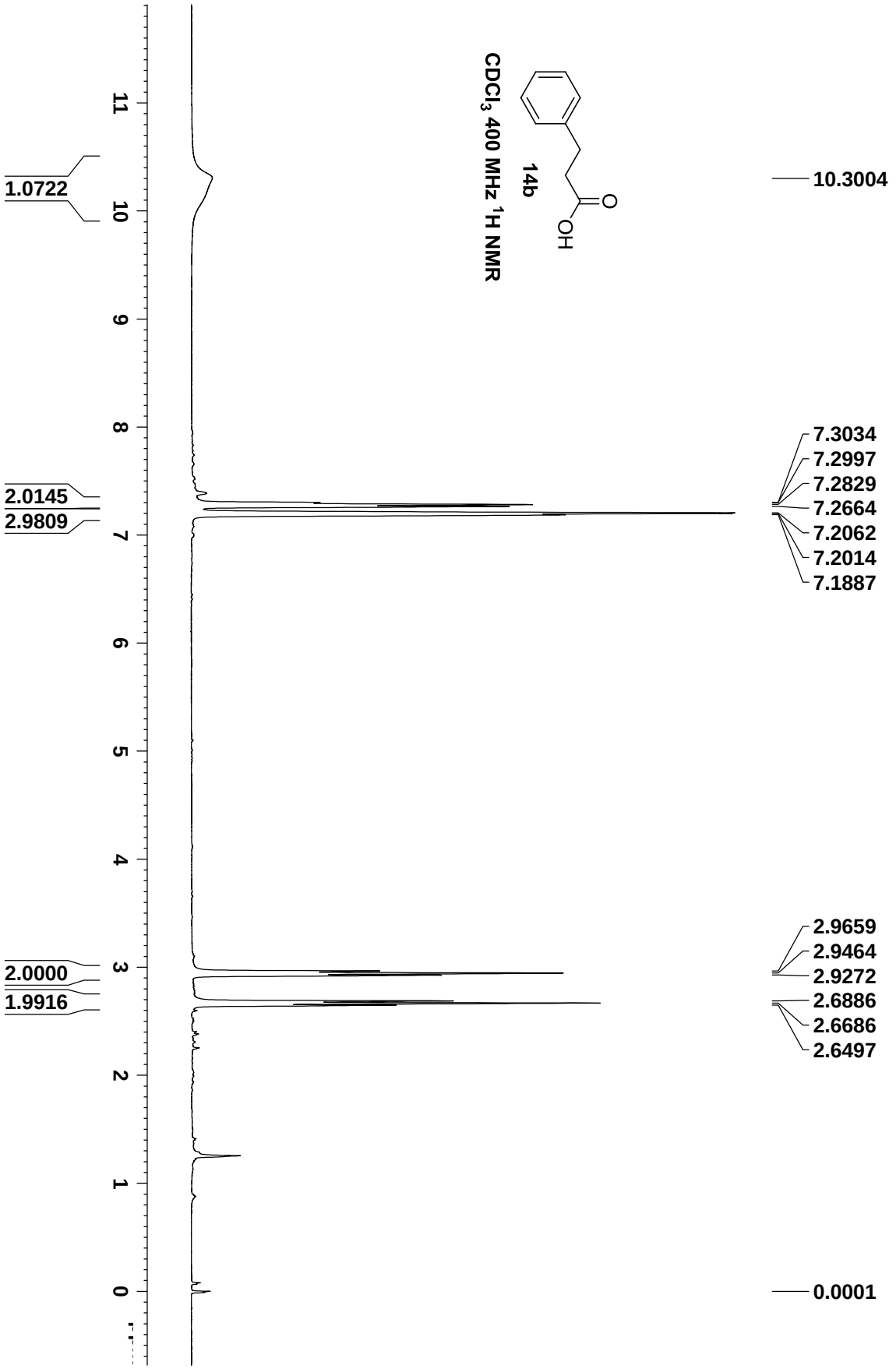

CDCl3 100 MHz 13C NMR
10b
155.456
136.791
128.897
128.329
127.718
127.443
127.330
126.582
77.316
76.999
76.681
66.987
52.080
21.489
11.055
200
180
160
140
120
100
80
60
40
20
0
ppm

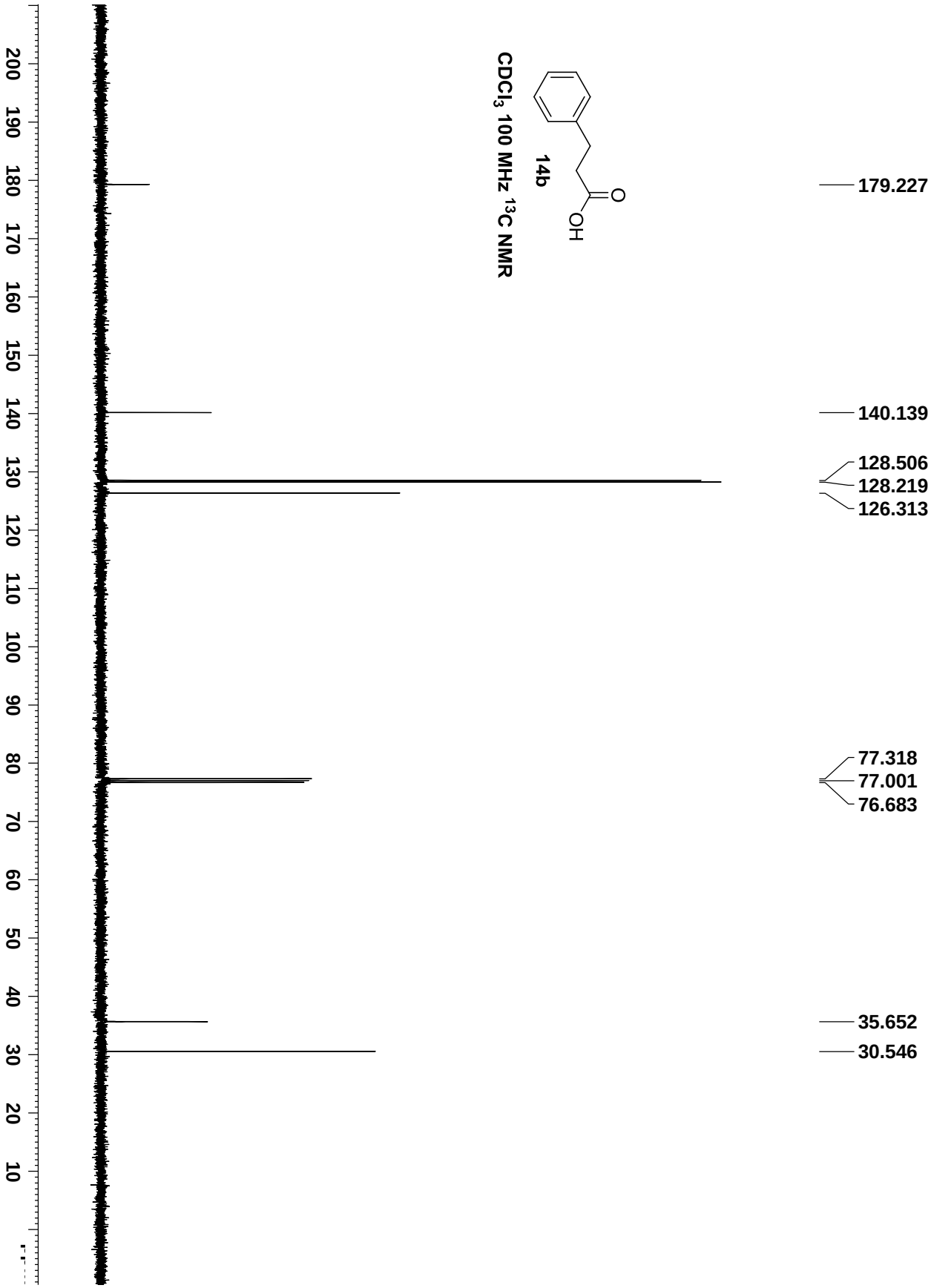


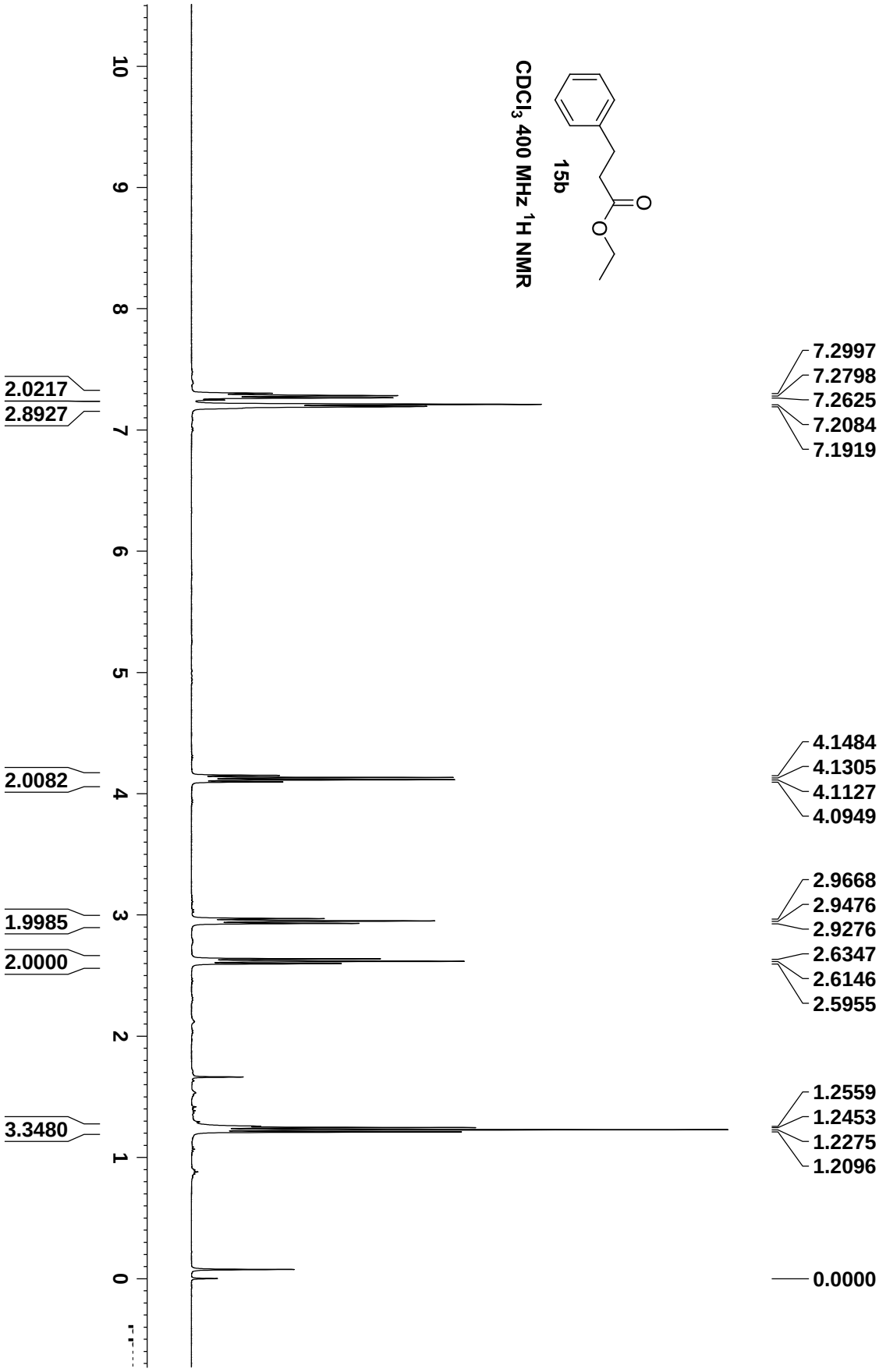


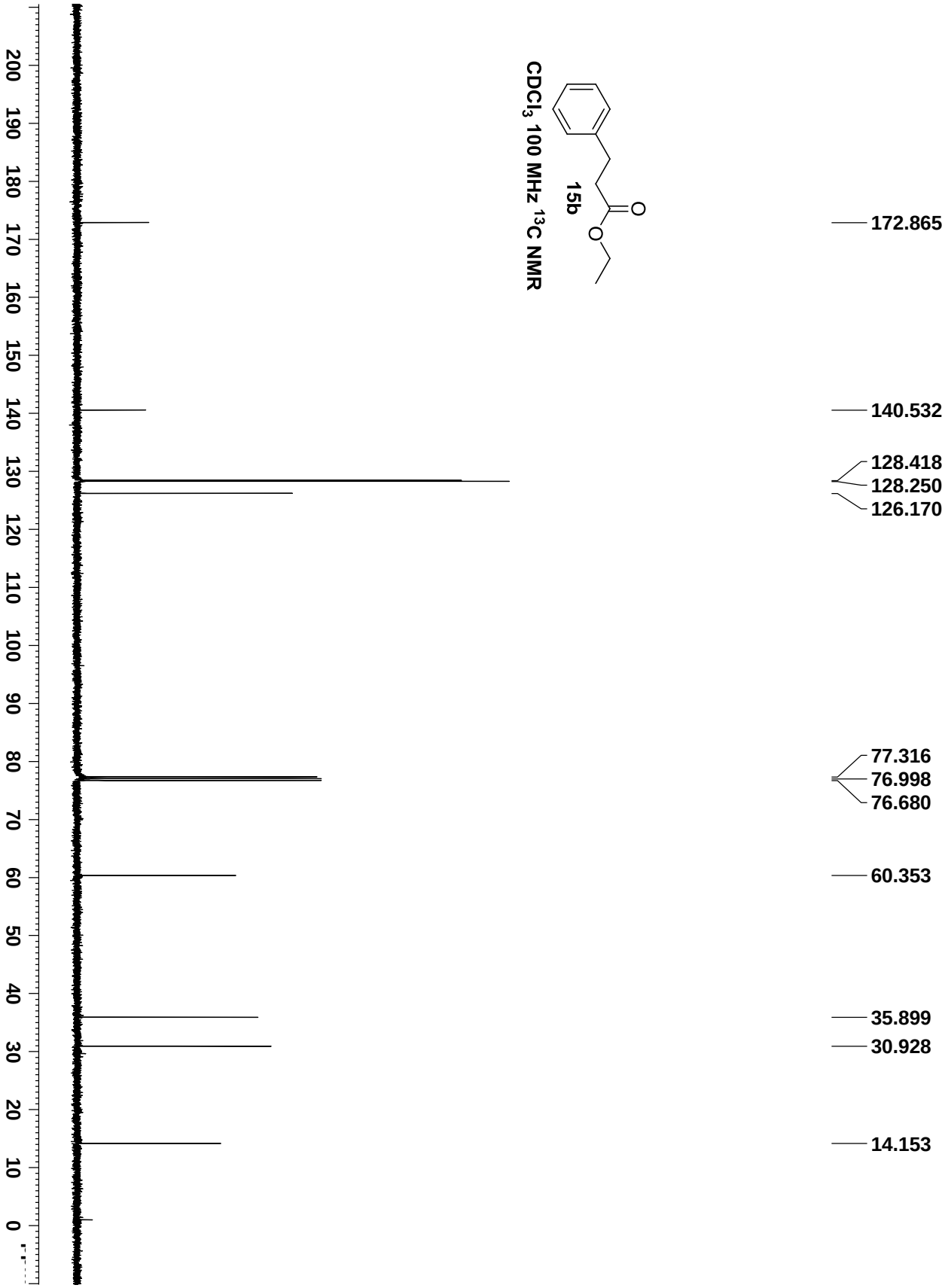


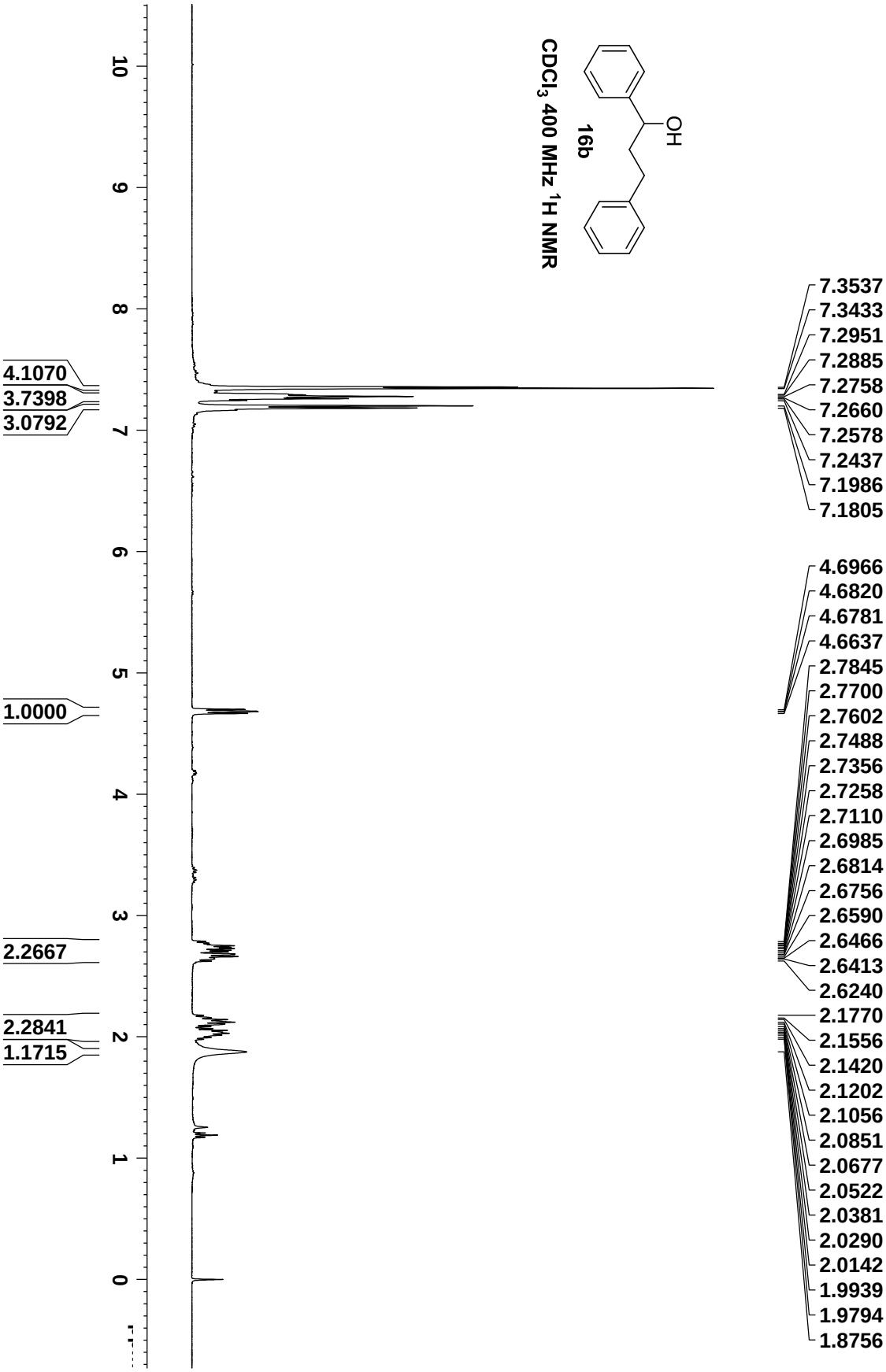


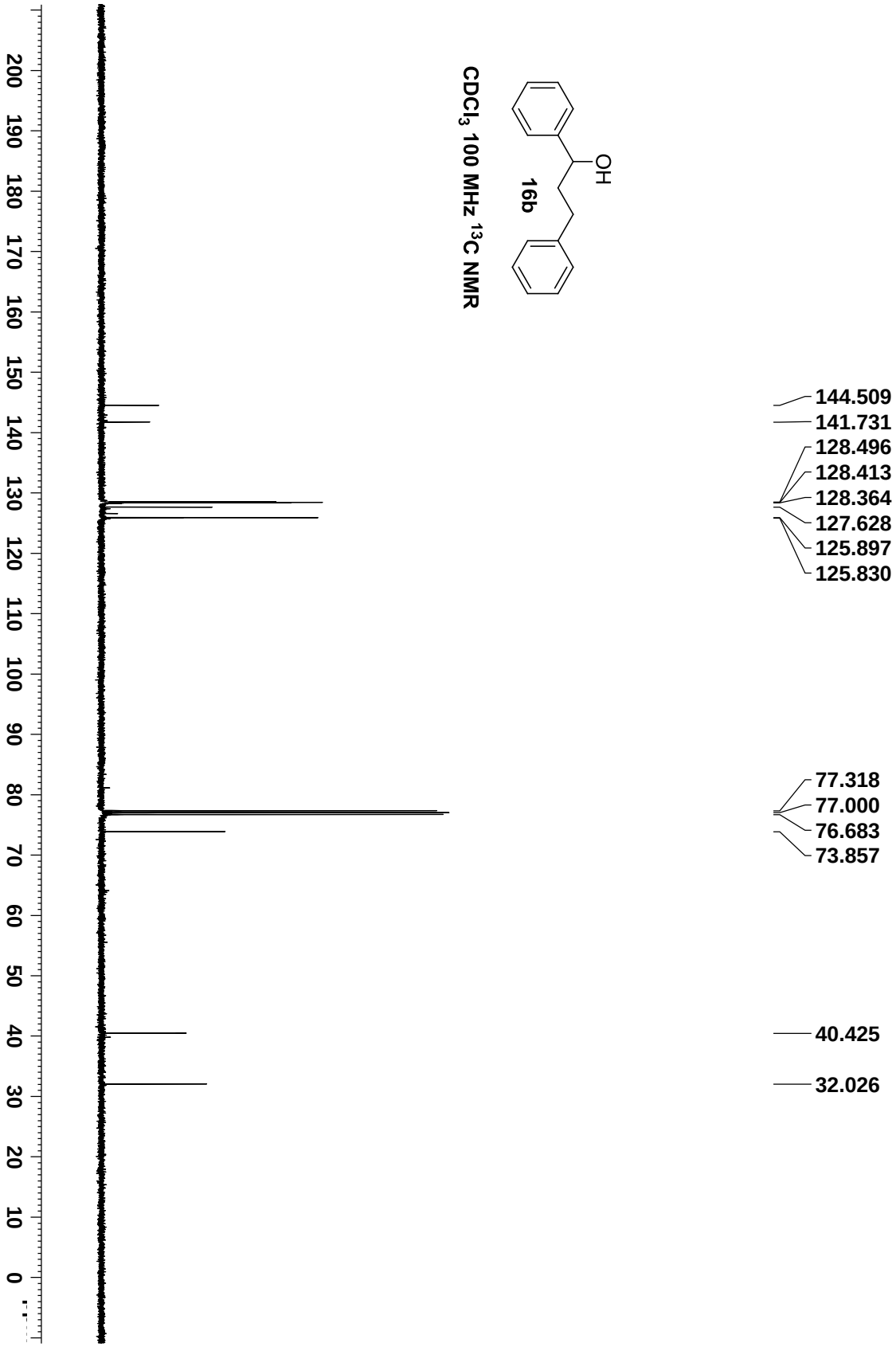


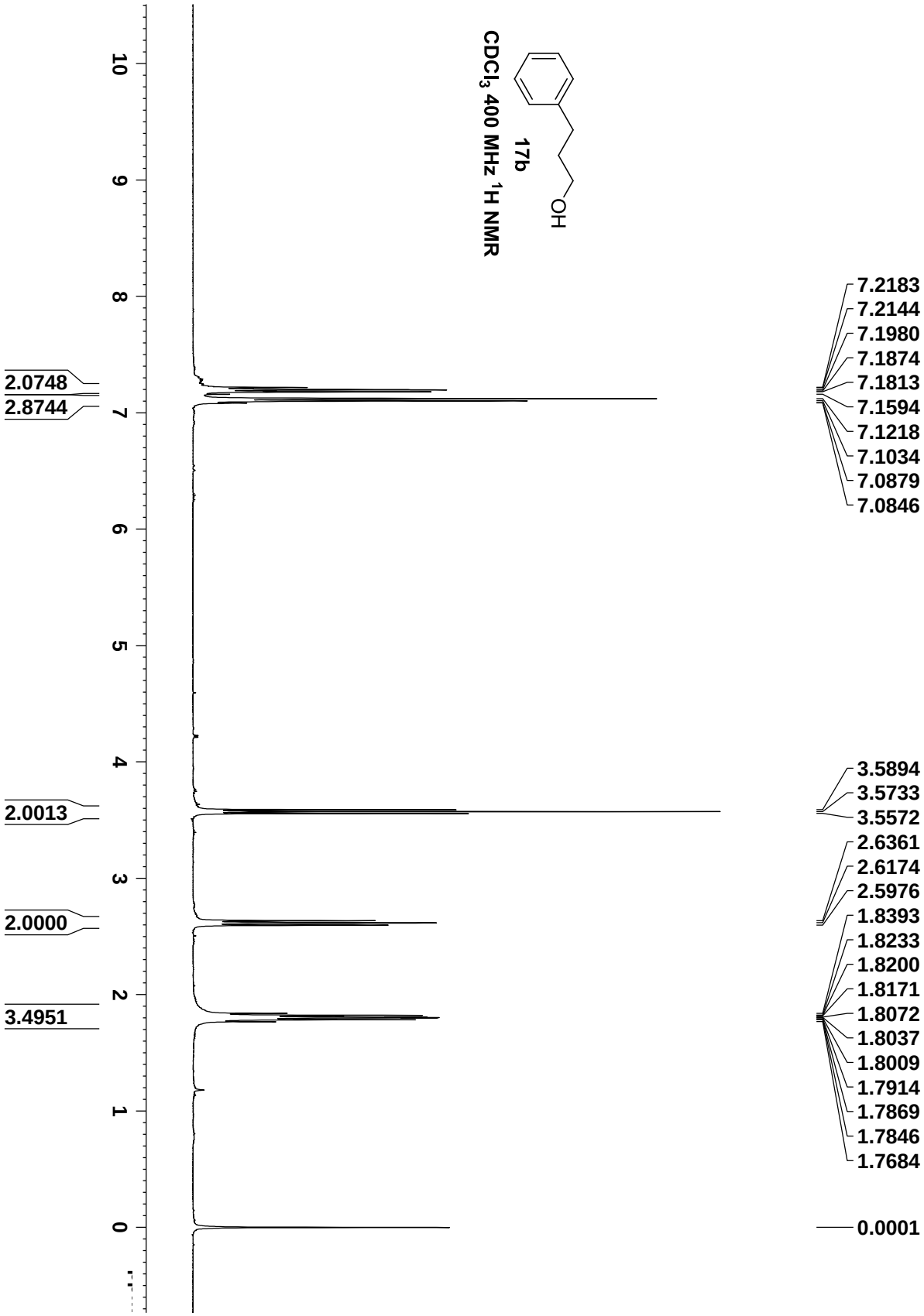


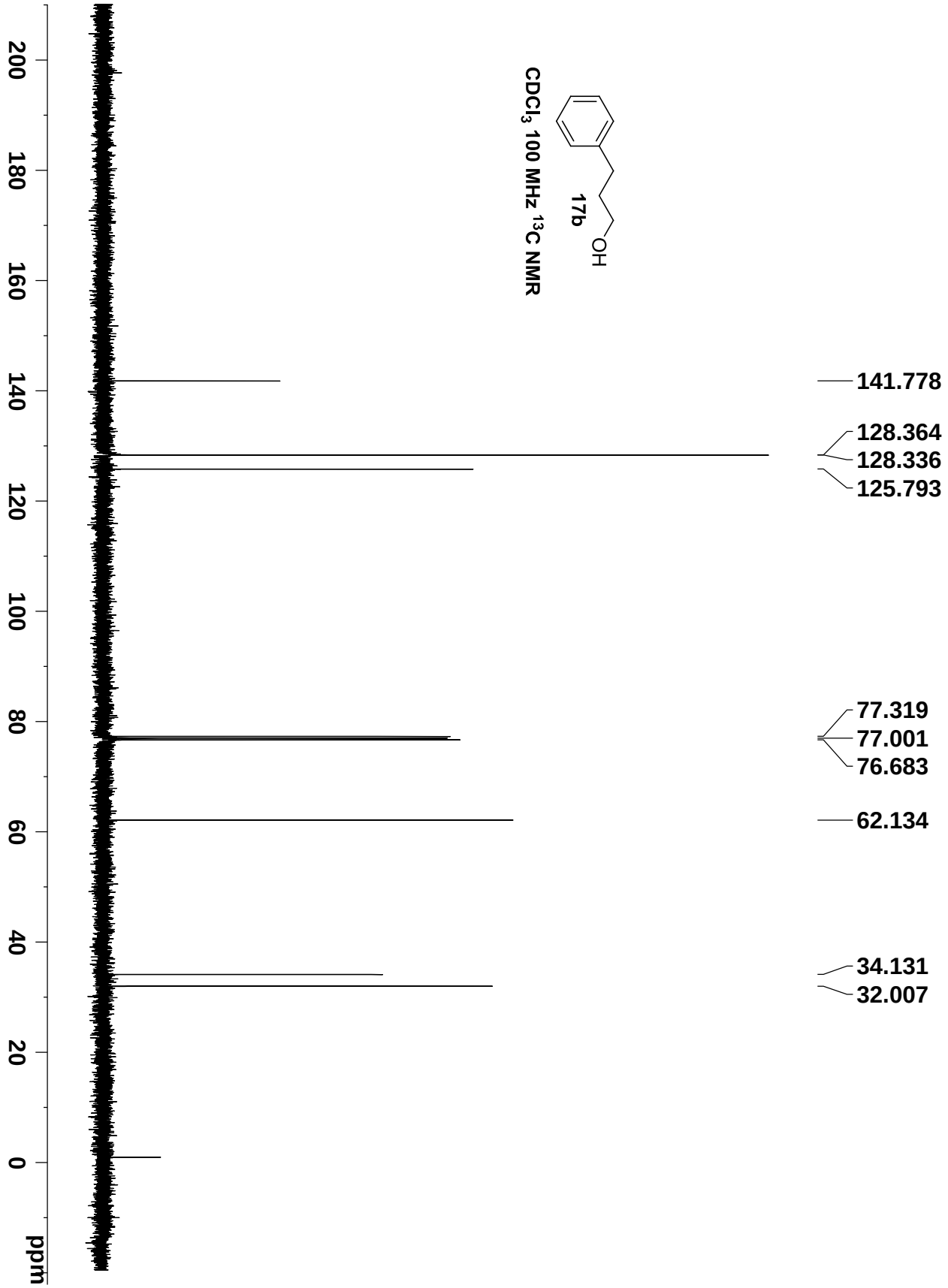


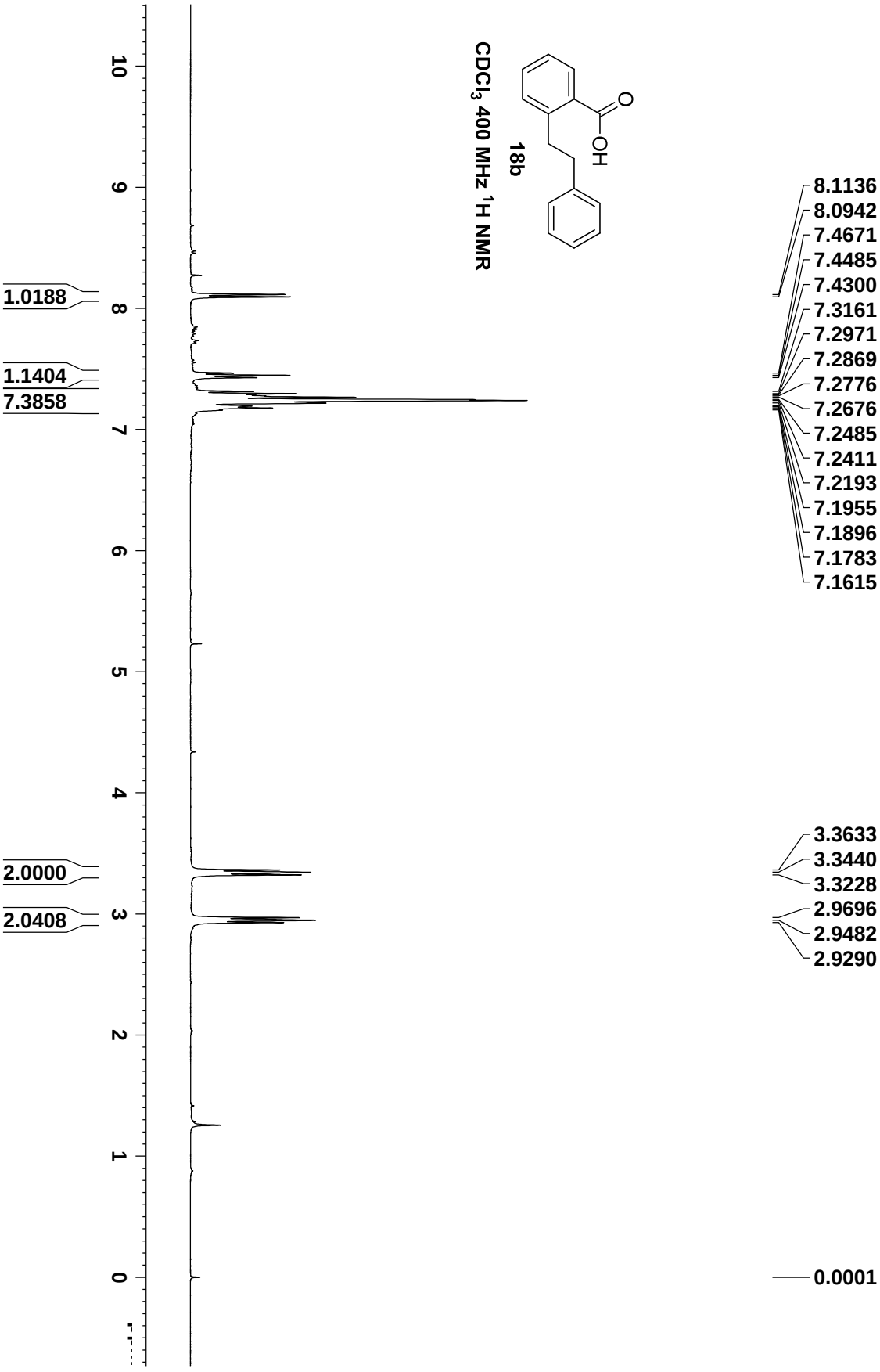


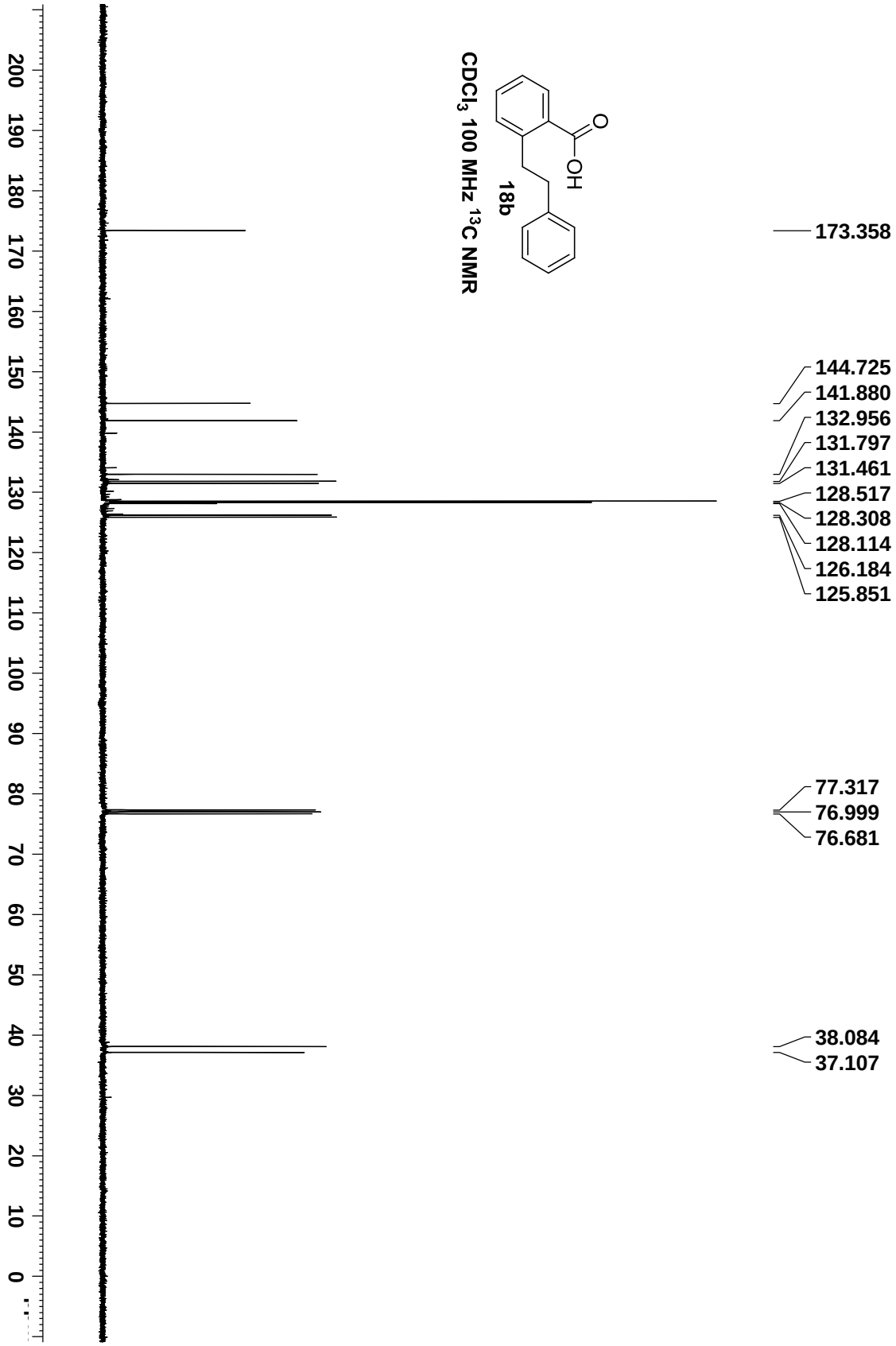


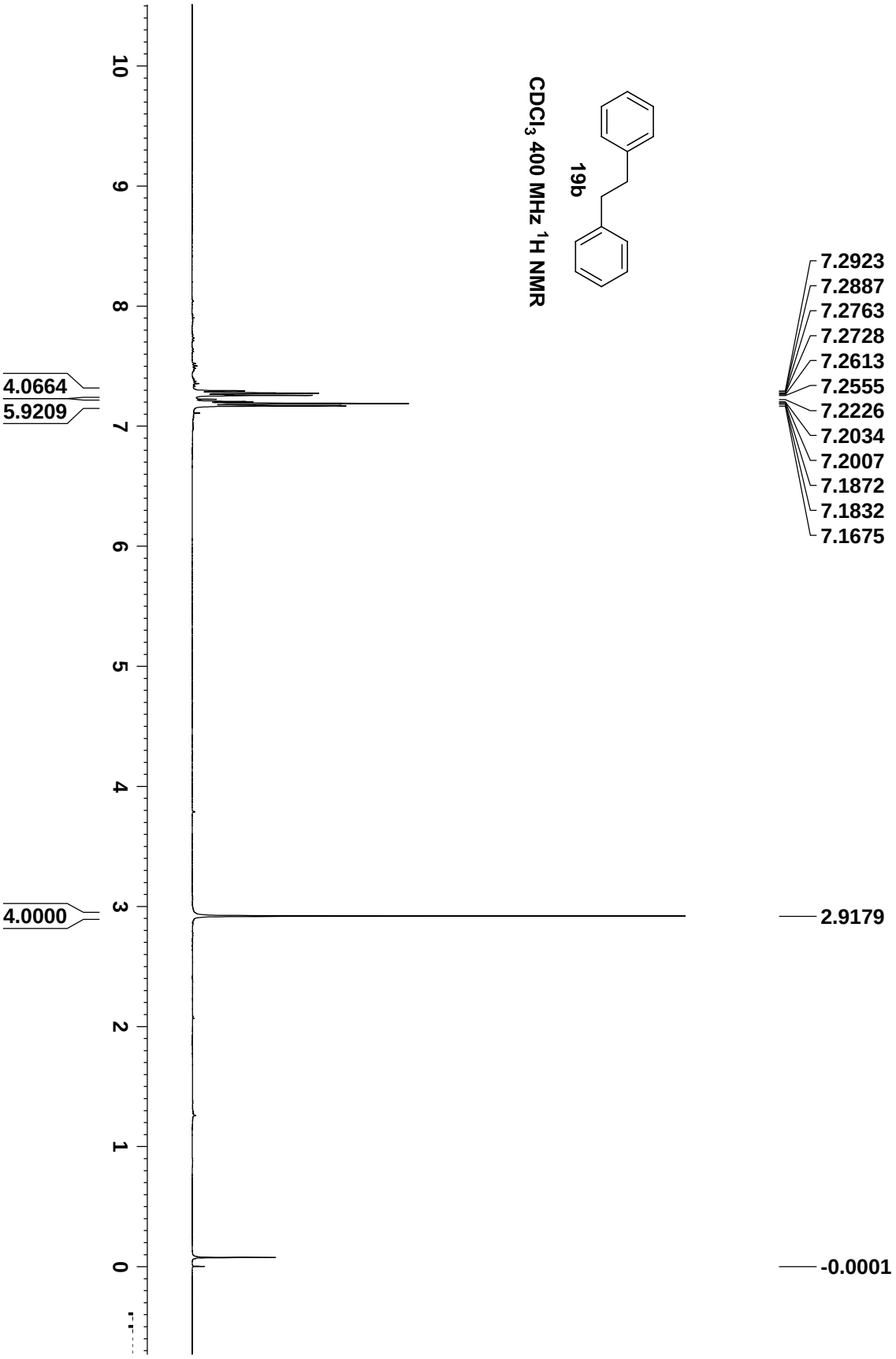


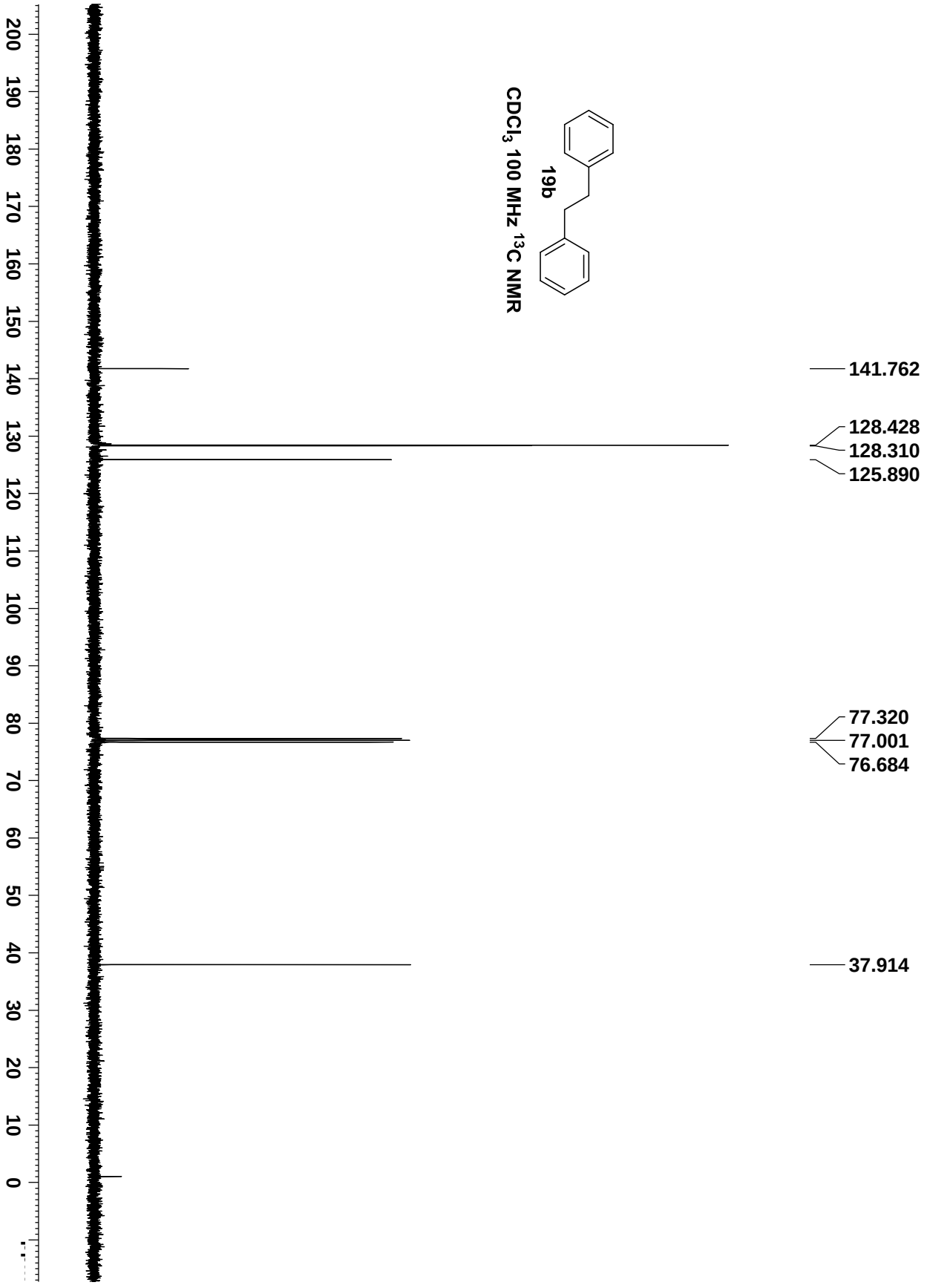


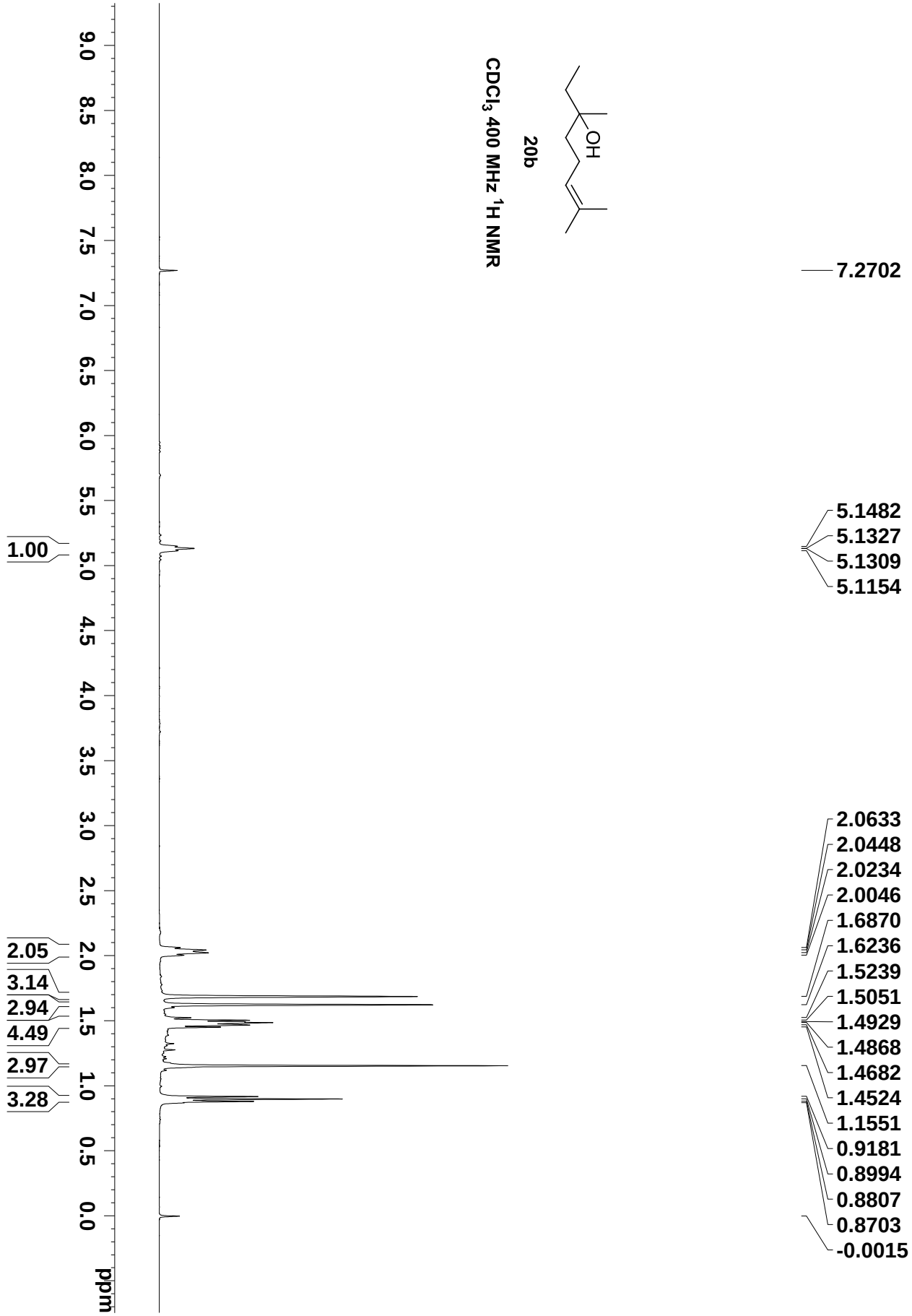


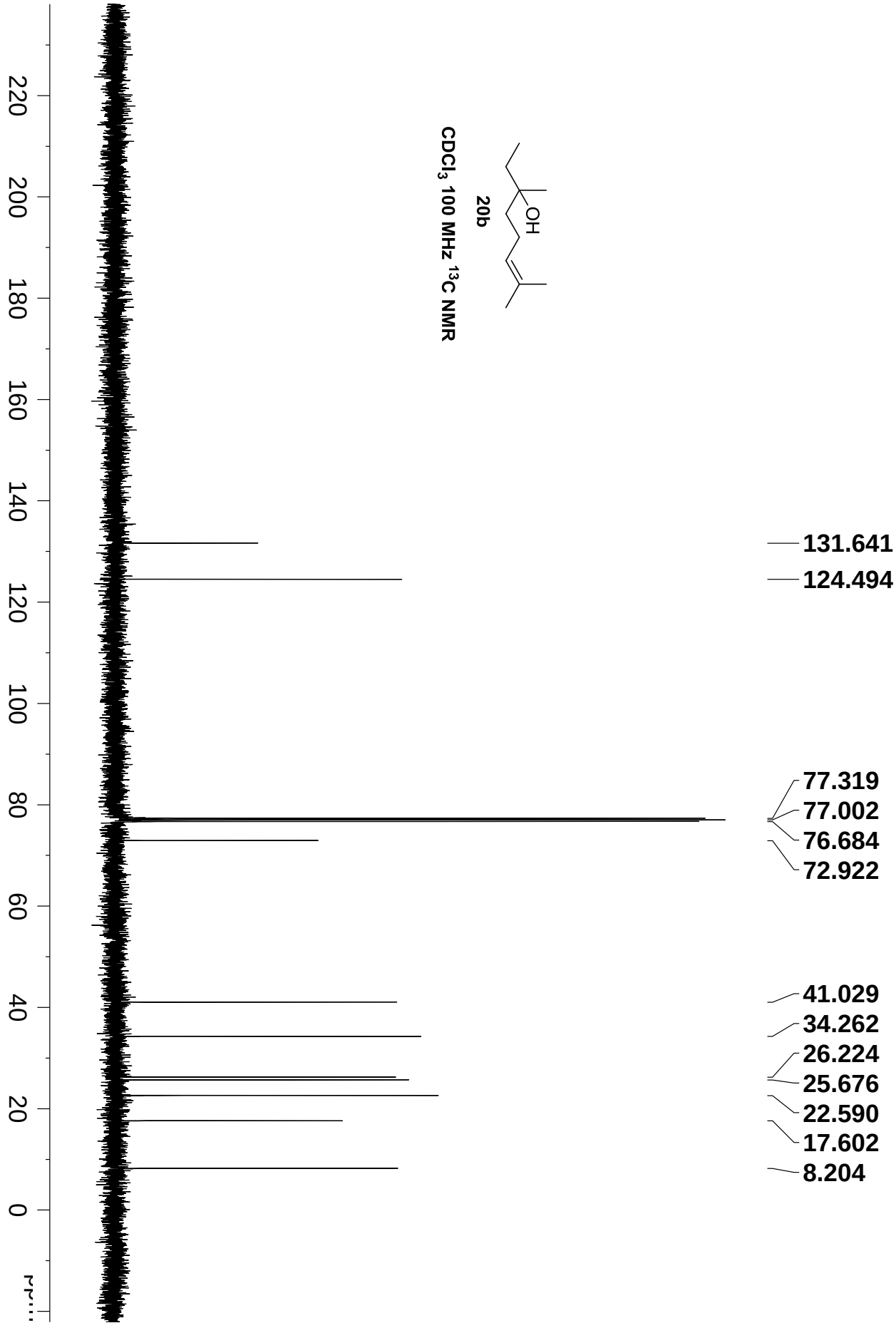


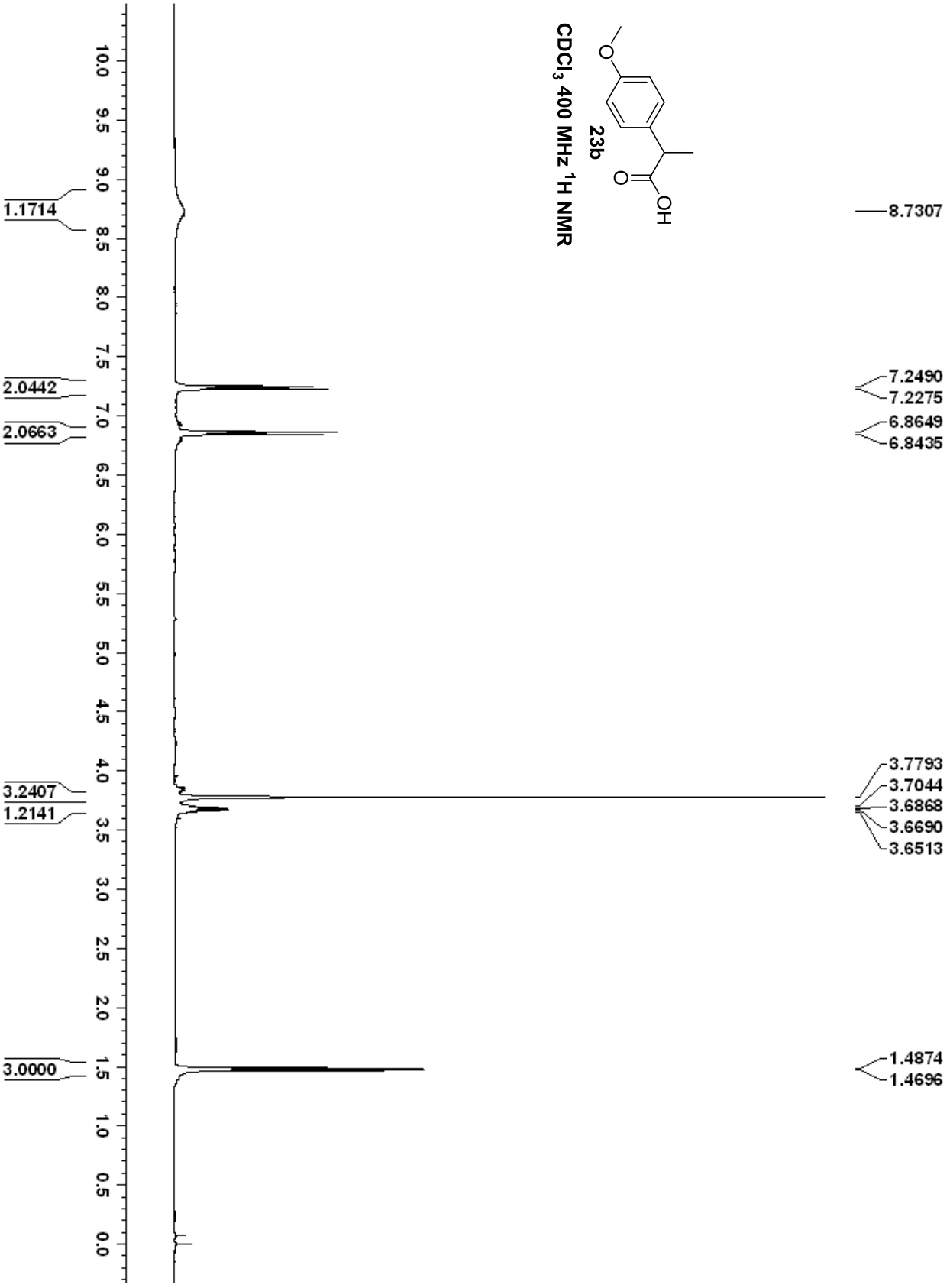


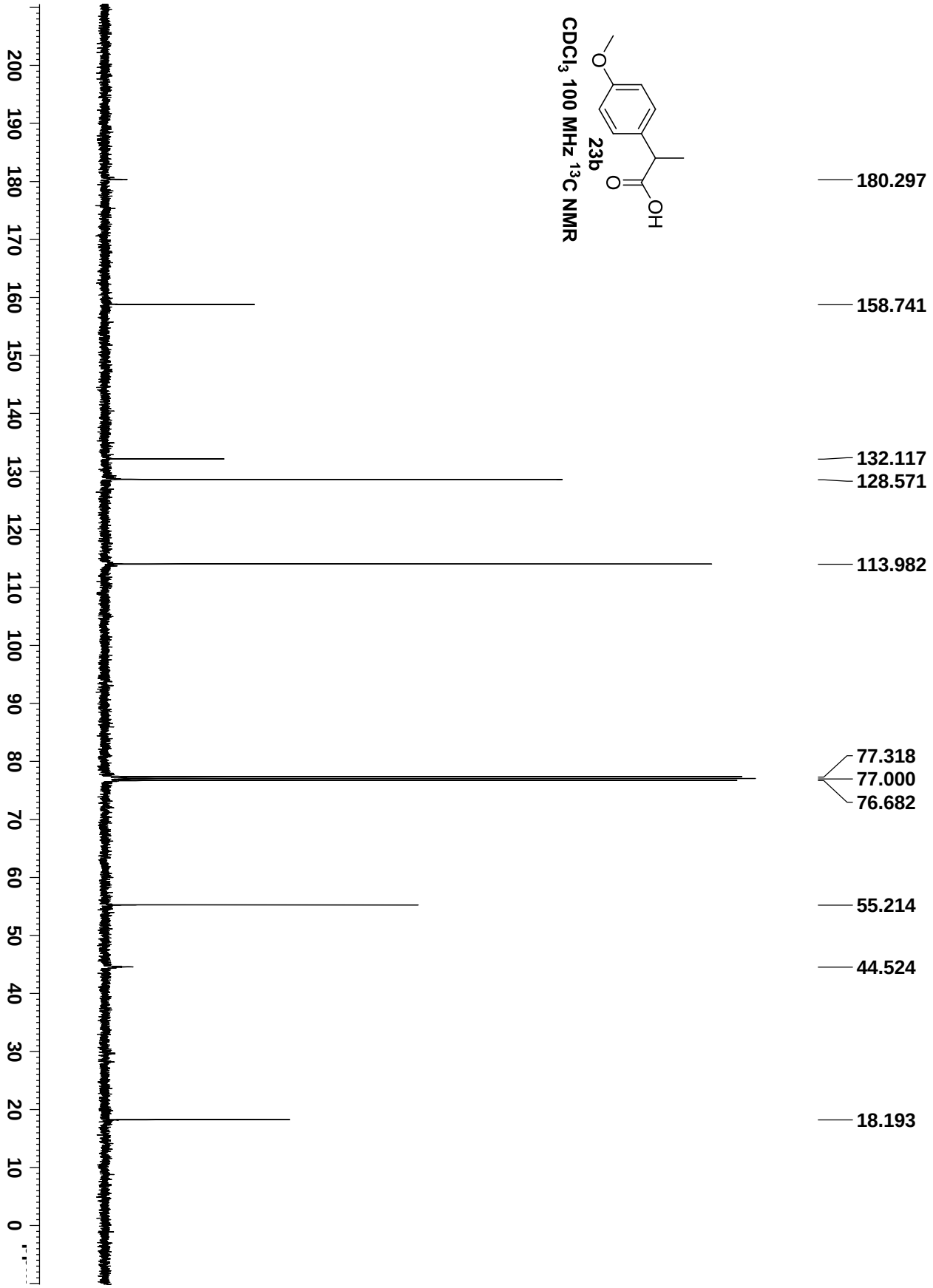

CDCl3 400 MHz 1H NMR
19b
7.2923
7.2887
7.2763
7.2728
7.2613
7.2555
7.2226
7.2034
7.2007
7.1872
7.1832
7.1675
4.0664
5.9209
4.0000
2.9179
-0.0001
10
9
8
7
6
5
4
3
2
1
0

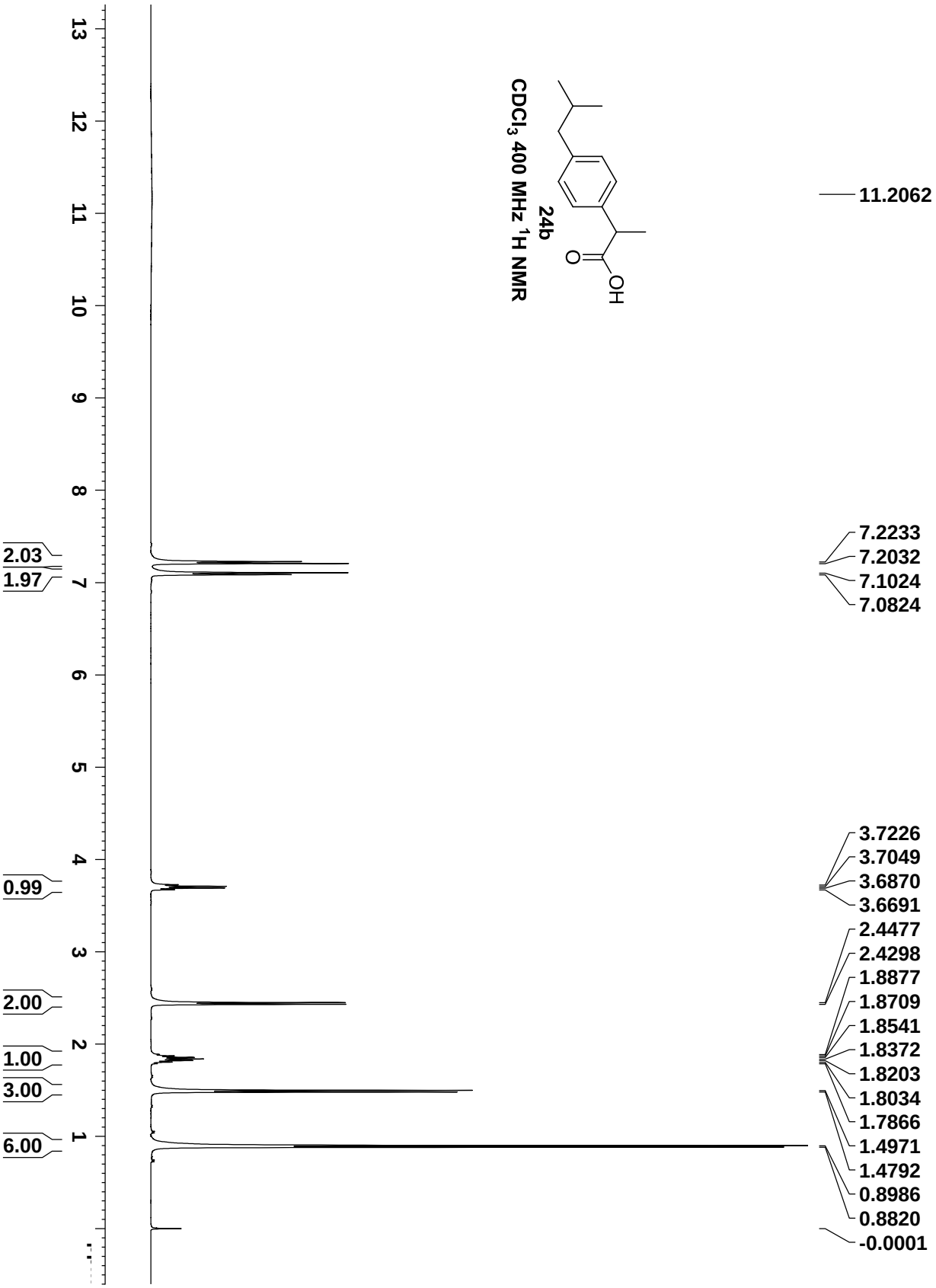


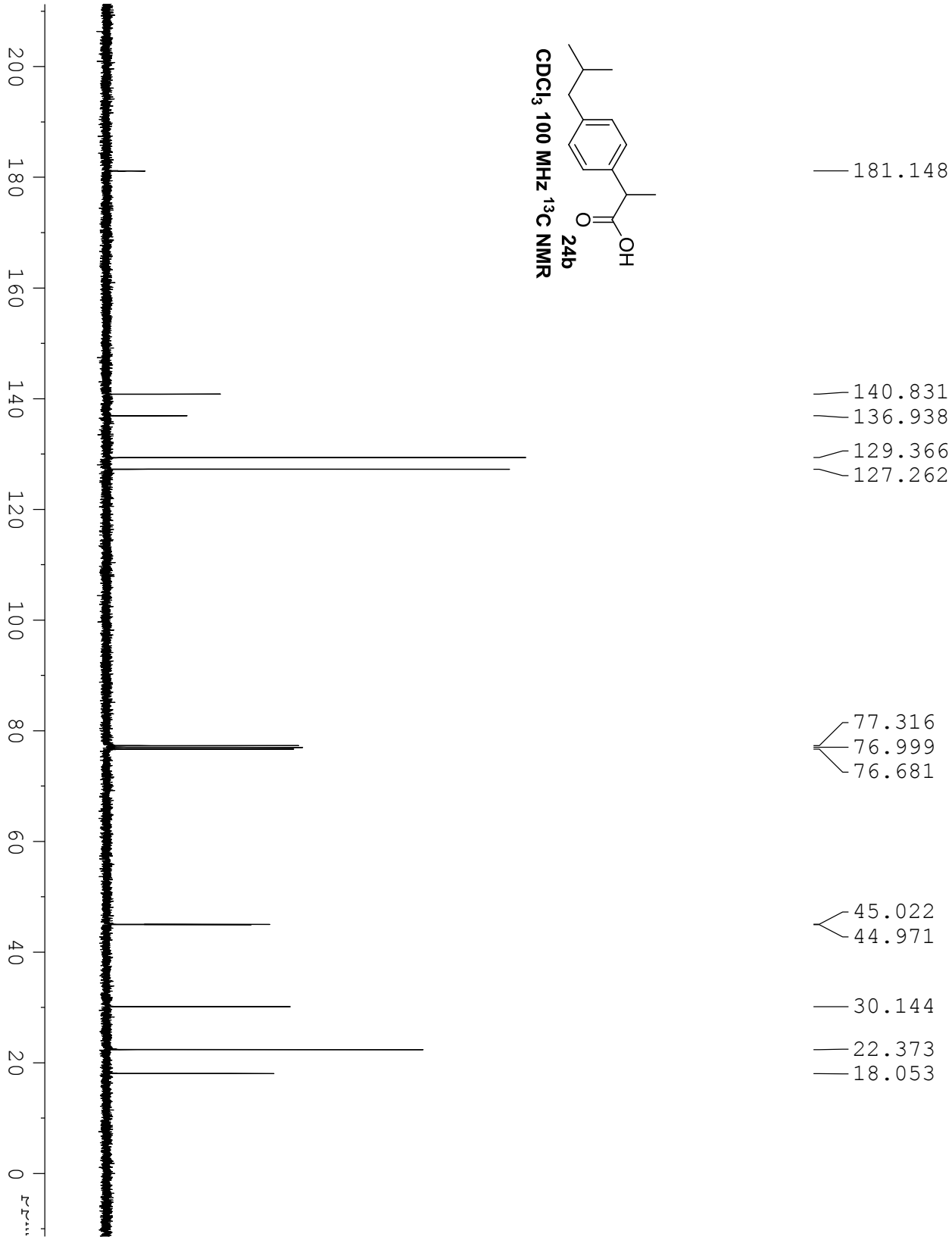


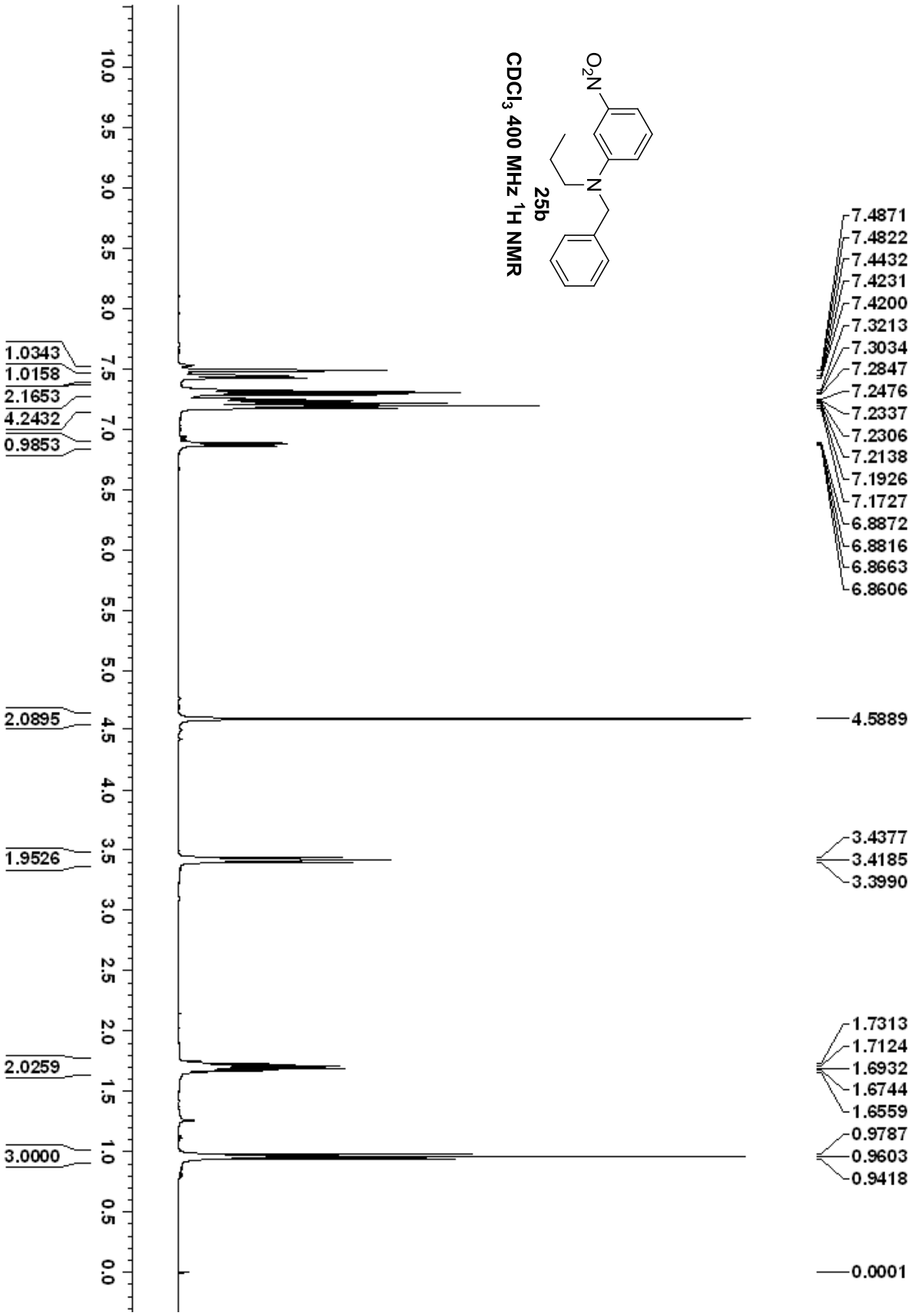


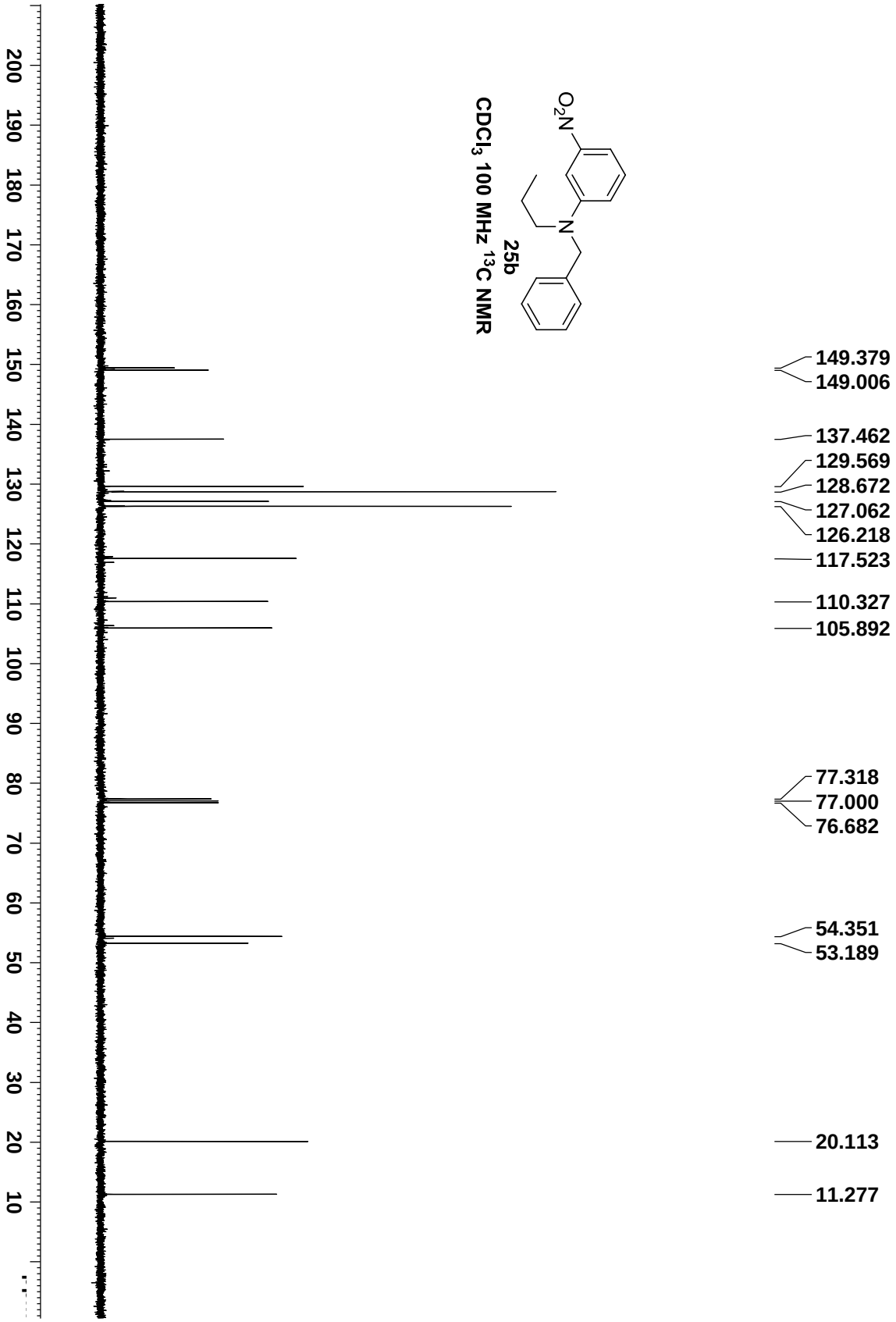











25b
CDCl3 100 MHz 13C NMR
O2N
N
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
149.379
149.006
137.462
129.569
128.672
127.062
126.218
117.523
110.327
105.892
77.318
77.000
76.682
54.351
53.189
20.113
11.277