

Supporting Information

**Au-Catalyzed Synthesis of 2-Alkylindoles from  
N-Arylhydroxylamines and Terminal Alkynes**

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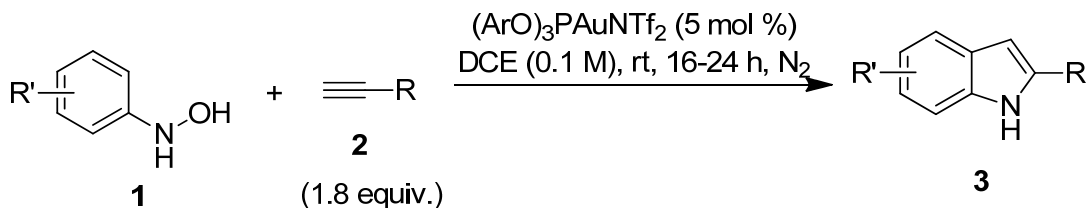
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**General.** Ethyl acetate (ACS grade), hexanes (ACS grade), diethyl ether (ACS grade), NH<sub>4</sub>OH (29.4% in H<sub>2</sub>O, ACS reagent) were purchased from Fisher Scientific and used without further purification. Anhydrous DCE, toluene and commercially available reagents were used without further purification. Reactions were monitored by thin layer chromatography (TLC) using Silicycle precoated silica gel plates. Flash column chromatography was performed over Silicycle silica gel (230-400 mesh). <sup>1</sup>H NMR and <sup>13</sup>C NMR spectra were recorded on a Varian 500 MHz Unity plus spectrometer and a Varian 400 MHz spectrometer using residue solvent peaks as internal standards. Infrared spectra were recorded with a Perkin Elmer FT-IR spectrum 2000 spectrometer and are reported in reciprocal centimeter (cm<sup>-1</sup>). Mass spectra were recorded with Waters micromass ZQ detector using electrospray method.

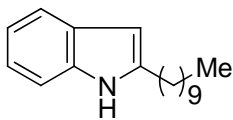
*N*-aryl hydroxylamines were prepared according to the literature procedure (D. A. Evans, H.-J. Song, K. R. Fandrick, *Org. Lett.* **2006**, *8*, 3351-3354).

**General Procedure: Gold-Catalyzed Synthesis of 2-Alkyl indoles**



An oven-dried vial was charged with *N*-arylhydroxylamine **1** (0.3 mmol, 1 equiv), alkyne **2** (0.54 mmol, 1.8 equiv) and anhydrous DCE (3 mL, 0.1 M). The reaction was commenced by the addition of (ArO)<sub>3</sub>PAuNTf<sub>2</sub> (Ar = 2,4-di-*tert*-butylphenyl, 16.8 mg, 5 mol %). After being stirred at room temperature for 16 – 24 h until the alkyne was completely consumed, the reaction mixture was concentrated under *vacuum*. The residue was purified via silica gel flash chromatography (eluent: ethyl acetate: hexanes = 1: 100) to give the desired indole **3**.

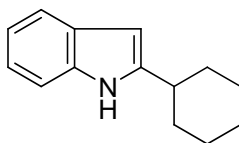
### 2-Decyl-1*H*-indole



**3a**

Compound **3a** was prepared in 84 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.86 (bs, 1H), 7.53 (d, *J* = 7.6 Hz), 7.30 (d, 1H, *J* = 7.6 Hz), 7.12 (td, 1H, *J*<sub>1</sub> = 7.6 Hz, *J*<sub>2</sub> = 1.2 Hz), 7.07 (td, 1H, *J*<sub>1</sub> = 7.2 Hz, *J*<sub>2</sub> = 1.2 Hz), 6.24 (d, 1H, *J* = 0.8 Hz), 2.75 (t, 2H, *J* = 8 Hz), 1.68 – 1.76 (m, 2H), 1.20 – 1.41 (m, 14H), 0.887 (t, 3H, *J* = 6.8 Hz); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>) δ 140.0, 135.8, 128.8, 120.9, 119.7, 119.5, 110.2, 99.4, 31.9, 29.6, 29.5, 29.4, 29.3, 29.2, 28.2, 22.7, 14.1; IR (neat): 3387, 3377, 3052, 2953, 2919, 2849, 1457; MS (ES<sup>+</sup>) Calculated for [C<sub>18</sub>H<sub>28</sub>N]<sup>+</sup>: 258.22; Found: 258.16.

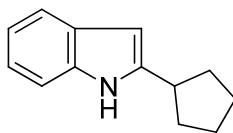
### 2-Cyclohexyl-1*H*-indole



**3b**

Compound **3b** was prepared in 77 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) δ 7.89 (bs, 1H), 7.56 (dd, 1H, *J*<sub>1</sub> = 7.5 Hz, *J*<sub>2</sub> = 1 Hz), 7.31 (d, 1H, *J* = 8.5 Hz), 7.14 (td, 1H, *J*<sub>1</sub> = 7.5 Hz, *J*<sub>2</sub> = 1.5 Hz), 7.09 (td, 1H, *J*<sub>1</sub> = 7.5 Hz, *J*<sub>2</sub> = 1 Hz), 6.25 – 6.26 (m, 1H), 2.72 (tt, 1H, *J*<sub>1</sub> = 11 Hz, *J*<sub>2</sub> = 3.5 Hz), 2.08 – 2.11 (m, 2H), 1.86 – 1.90 (m, 2H), 1.76 – 1.81 (m, 1H), 1.39 – 1.55 (m, 4H), 1.29 – 1.35 (m, 1H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 145.1, 135.5, 28.6, 120.9, 119.8, 119.5, 110.3, 97.4, 37.3, 32.9, 26.2, 26.1; IR (neat): 3392, 2929, 2851, 1597, 1557, 1444, 1414; MS (ES<sup>+</sup>) Calculated for [C<sub>14</sub>H<sub>18</sub>N]<sup>+</sup>: 200.14; Found: 200.16.

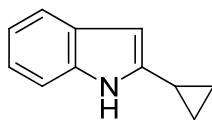
### 2-Cyclopentyl-1*H*-indole



**3c**

Compound **3c** was prepared in 62 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.89 (bs, 1H), 7.53 (dd, 1H,  $J_1=7.6\text{Hz}$ ,  $J_2=0.8\text{Hz}$ ), 7.30 (d, 1H,  $J=7.6\text{Hz}$ ), 7.12 (td, 1H,  $J_1=7.2\text{Hz}$ ,  $J_2=1.2\text{Hz}$ ), 7.04 – 7.09 (m, 1H), 6.24 – 6.2(m, 1H), 3.15 – 3.23 (m, 1H), 2.10 – 2.16 (m, 2H), 1.65 – 1.85 (m, 6H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  143.9, 135.8, 128.6, 120.9, 119.8, 119.5, 110.2, 97.9, 38.8, 32.8, 25.2; IR (neat): 3584, 3054, 2954, 2868, 1547, 1458, 1289; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{13}\text{H}_{16}\text{N}]^+$ : 186.13; Found: 186.15.

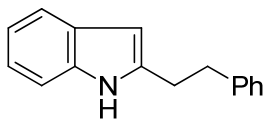
### 2-Cyclopropyl-1*H*-indole



**3d**

Compound **3d** was prepared in 70 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.90 (bs, 1H), 7.53 (d, 1H,  $J=7.5\text{ Hz}$ ), 7.28 (d, 1H,  $J=8\text{ Hz}$ ), 7.14 (td, 1H,  $J_1=7.5\text{ Hz}$ ,  $J_2=1\text{ Hz}$ ), 7.09 (td, 1H,  $J_1=7.5\text{ Hz}$ ,  $J_2=1\text{ Hz}$ ), 6.18 (d, 1H,  $J=1\text{ Hz}$ ), 1.94 – 1.99 (m, 1H), 0.96 – 1.00 (m, 2H), 0.78 – 0.81 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  147.1, 135.7, 128.6, 120.9, 119.67, 119.62, 110.2, 97.6, 8.80, 7.29; IR (neat): 3584, 3396, 3086, 3054, 3008, 2916, 2848, 1556, 1458, 1415; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{11}\text{H}_{11}\text{NNa}]^+$ : 180.08; Found: 180.18

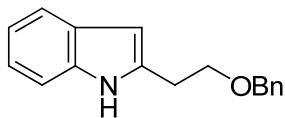
## 2-Phenethyl-1*H*-indole



**3e**

Compound **3e** was prepared in 89 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.74 (bs, 1H), 7.54 (d, 1H, *J* = 8 Hz), 7.32 (tt, 2H, *J*<sub>1</sub> = 6.8 Hz, *J*<sub>2</sub> = 2 Hz), 7.22 – 7.38 (m, 3H), 7.13 (td, 1H, *J*<sub>1</sub> = 8 Hz, *J*<sub>2</sub> = 1.6 Hz), 7.08 (td, 1H, *J*<sub>1</sub> = 7.2 Hz, *J*<sub>2</sub> = 1.2 Hz), 6.29 (m, 1H), 3.03 – 3.12 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 141.2, 140.0, 135.7, 128.6, 128.5, 128.4, 126.8, 121.1, 119.8, 119.6, 110.3, 99.8, 35.6, 30.1; IR (neat): 3584, 3395, 3058, 3021, 2915, 2852, 1553, 1456, 1416; MS (ES<sup>+</sup>) Calculated for [C<sub>16</sub>H<sub>16</sub>N]<sup>+</sup>: 222.13; Found: 222.15.

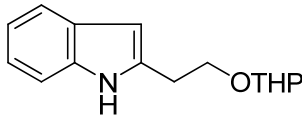
## 2-(2-(Benzyloxy)ethyl)-1*H*-indole



**3f**

Compound **3f** was prepared in 84 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 8.58 (bs, 1H), 7.54 (d, 1H, *J* = 7.6 Hz), 7.26 – 7.41 (m, 5H), 7.13 (t, 1H, *J* = 7.6 Hz), 7.07 (t, 1H, *J* = 7.6 Hz), 6.26 (s, 1H), 4.60 (s, 2H), 3.81 (t, 2H, *J* = 6 Hz), 3.07 (t, 2H, *J* = 6 Hz); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 137.9, 137.7, 135.9, 128.5, 128.3, 127.85, 127.78, 121.0, 119.8, 119.4, 110.5, 99.8, 73.3, 69.9, 28.6; IR (neat): 3584, 3407, 3056, 3029, 2914, 2861, 1553, 1456, 1287, 1096; MS (ES<sup>+</sup>) Calculated for [C<sub>17</sub>H<sub>17</sub>NNaO]<sup>+</sup>: 274.12; Found: 274.15.

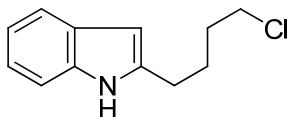
### 2-(2-(Tetrahydro-2H-pyran-2-yloxy)ethyl)-1H-indole



**3g**

Compound **3g** was prepared in 67 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  8.58 (bs, 1H), 7.54 (d, 1H,  $J = 7.5$  Hz), 7.31 (d, 1H,  $J = 8$  Hz), 7.12 (t, 1H,  $J = 7.5$  Hz), 7.07 (t, 1H,  $J = 7$  Hz), 6.27 (s, 1H), 4.66 (t, 1H,  $J = 8.5$  Hz), 4.06 – 4.11 (m, 1H), 3.82 – 3.87 (m, 1H), 3.73 (dt, 1H,  $J_1 = 9.5$  Hz,  $J_2 = 6$  Hz), 3.50 – 3.54 (m, 1H), 3.07 (t, 2H,  $J = 6$  Hz), 1.85 – 1.90 (m, 1H), 1.76 – 1.82 (m, 1H), 1.52 – 1.70 (m, 4H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  137.7, 135.9, 128.4, 120.9, 119.8, 119.4, 110.4, 99.9, 99.3, 67.2, 62.6, 30.8, 28.6, 25.3, 19.8; IR (neat): 3401, 3316, 3055, 2943, 2869, 1553, 1457, 1134, 1030; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{15}\text{H}_{19}\text{NNaO}_2]^+$ : 268.13; Found: 268.15.

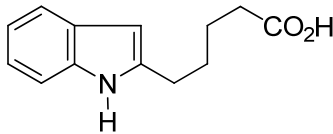
### 2-(4-Chlorobutyl)-1H-indole



**3h**

Compound **3c** was prepared in 62 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.87 (bs, 1H), 7.54 (dd, 1H,  $J_1 = 7.6$  Hz,  $J_2 = 0.8$  Hz), 7.31 (d, 1H,  $J = 8$  Hz), 7.14 (td, 1H,  $J_1 = 7.6$  Hz,  $J_2 = 1.2$  Hz), 7.09 (td, 1H,  $J_1 = 7.6$  Hz,  $J_2 = 1.2$  Hz), 6.27 (d, 1H,  $J = 0.8$  Hz), 3.58 (t, 2H,  $J = 6$  Hz), 2.81 (t, 2H,  $J = 6.8$  Hz), 1.87 – 1.90 (m, 2H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  138.8, 135.8, 128.7, 121.1, 119.8, 119.7, 110.3, 99.8, 44.8, 31.9, 27.4, 26.3; IR (neat): 3402, 3056, 2941, 2864, 1551, 1457, 1415, 1286; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{12}\text{H}_{15}\text{ClN}]^+$ : 208.09; Found: 208.11.

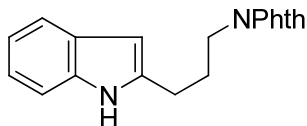
### 5-(1*H*-indol-2-yl)pentanoic acid



**3i**

Compound **3i** was prepared in 73 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.93 (bs, 1H), 7.5 (d, 1H, *J* = 7.6 Hz), 7.30 (d, 1H, *J* = 8 Hz), 7.05 – 7.14 (m, 2H), 6.25 (s, 1H), 2.80 (t, 2H, *J* = 7 Hz), 2.42 (t, 2H, *J* = 6.8 Hz), 1.70 – 1.83 (m, 4H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 178.5, 140.0, 135.8, 128.7, 121.1, 119.8, 119.6, 110.3, 99.7, 33.4, 28.4, 27.8, 24.1; IR (neat): 3584, 3390, 3045, 2939, 2861, 1700, 1457, 1412; MS (ES<sup>+</sup>) Calculated for [C<sub>13</sub>H<sub>15</sub>NNaO<sub>2</sub>]<sup>+</sup>: 240.10; Found: 240.10.

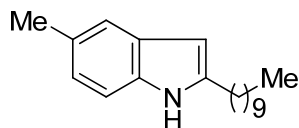
### 2-(3-(1*H*-indol-2-yl)propyl)isoindoline-1,3-dione



**3j**

Compound **3j** was prepared in 72 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) δ 8.76 (bs, 1H), 7.82 – 7.87 (m, 2H), 7.71 – 7.73 (m, 2H), 7.50 (d, 1H, *J* = 7.5 Hz), 7.35 (d, 1H, *J* = 8 Hz), 7.11 (td, 1H, *J*<sub>1</sub> = 7.5 Hz, *J*<sub>2</sub> = 1 Hz), 7.04 (td, 1H, *J*<sub>1</sub> = 7.5 Hz, *J*<sub>2</sub> = 1 Hz), 6.27 (d, 1H, *J* = 1 Hz), 3.81 (t, 2H, *J* = 6.5 Hz), 2.80 (t, 2H, *J* = 7 Hz), 2.07 – 2.13 (m, 2H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>) δ 168.9, 138.5, 135.9, 134.1, 131.9, 128.7, 123.3, 121.0, 119.7, 119.5, 110.6, 99.8, 37.2, 28.8, 25.1; IR (neat): 3584, 3393, 3058, 2922, 2851, 1769, 1703, 1398; MS (ES<sup>+</sup>) Calculated for [C<sub>19</sub>H<sub>16</sub>N<sub>2</sub>NaO<sub>2</sub>]<sup>+</sup>: 327.11; Found: 327.11.

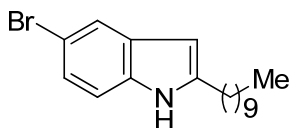
### 2-Decyl-5-methyl-1H-indole



**3k**

Compound **3k** was prepared in 64 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.76 (bs, 1H), 7.32 (d, 1H,  $J = 0.8$  Hz), 7.18 (d, 1H,  $J = 8.4$  Hz), 6.94 (dd, 1H,  $J_1 = 8.4$  Hz,  $J_2 = 0.8$  Hz), 6.14 – 6.16 (m, 1H), 2.73 (t, 2H,  $J = 7.6$  Hz), 2.43 (s, 3H), 1.75 – 1.66 (m, 2H), 1.20 – 1.40 (m, 14H), 0.89 (t, 3H,  $J = 7.2$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  140.1, 134.0, 129.1, 128.7, 122.3, 119.5, 109.9, 98.9, 31.9, 29.59, 29.55, 29.4, 29.3, 29.2, 28.3, 22.7, 21.4, 14.1; IR (neat): 3376, 2953, 2918, 2850, 1470, 1412; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{19}\text{H}_{30}\text{N}]^+$ : 272.24; Found: 272.27.

### 5-Bromo-2-decyl-1H-indole

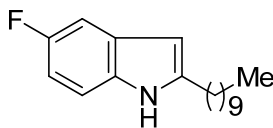


**3l**

Compound **3l** was prepared in 86 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.89 (bs, 1H), 7.63 – 7.64 (m, 1H), 7.14 – 7.20 (m, 2H), 2.73 (t, 2H,  $J = 7.6$  Hz), 1.66 – 1.74 (m, 2H), 1.22-1.40 (m, 14H), 0.89 (t, 3H,  $J = 6.4$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  141.4, 134.4, 130.6, 123.6, 122.2, 112.7, 111.6, 99.1, 31.9, 29.7, 29.6, 29.6, 29.4, 29.30, 29.27, 29.0, 28.2, 22.7, 14.2; IR (neat): 3403, 3315, 3055, 2943, 2870, 1457, 1418, 1134, 1030; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{18}\text{H}_{27}\text{BrN}]^+$ : 336.13; Found: 336.08.



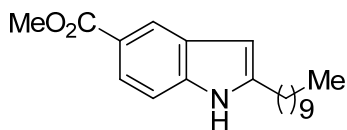
### 2-Decyl-5-fluoro-1H-indole



**3m**

Compound **3m** was prepared in 82 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.85 (bs, 1H), 7.15 – 7.20 (m, 2H), 6.82 – 6.88 (m, 1H), 6.19 – 6.21 (m, 1H), 2.74 (t, 2H,  $J = 7.6$  Hz), 1.67 – 1.75 (m, 2H), 1.22 – 1.40 (m, 14H), 0.89 (t, 3H,  $J = 6.8$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  157.9(d,  $J = 231$  Hz), 142.0, 132.2, 129.2 (d,  $J = 9$  Hz), 110.6 (d,  $J = 10$  Hz), 108.9 (d,  $J = 26$  Hz), 104.6 (d,  $J = 24$  Hz), 99.7 (d,  $J = 4$  Hz), 31.9, 29.6, 29.5, 29.4, 29.3, 29.1, 28.3, 22.7, 14.1; IR (neat): 3465, 3417, 2954, 2926, 2854, 1585, 1486, 1452, 1169, 852; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{18}\text{H}_{26}\text{FNNa}]^+$ : 298.19; Found: 298.16.

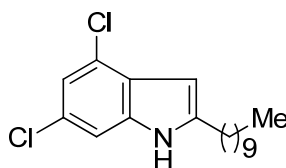
### Methyl 2-decyl-1H-indole-5-carboxylate



**3n**

Compound **3n** was prepared in 76 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  8.30 (s, 1H), 8.27 (bs, 1H), 7.84 (dd, 1H,  $J_1 = 8.4$  Hz,  $J_2 = 1.2$  Hz), 7.29 (d, 1H,  $J = 8.4$  Hz), 6.32 (s, 1H), 3.93 (s, 3H), 2.75 (t, 2H, 8 Hz), 1.68 – 1.76 (m, 2H), 1.20 – 1.40 (m, 14H), 0.89 (t, 3H,  $J = 6.8$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  168.4, 141.6, 138.5, 128.4, 122.6, 112.4, 121.4, 109.9, 100.6, 51.8, 31.9, 29.6, 29.5, 29.4, 29.3, 29.0, 28.2, 22.6, 14.1.

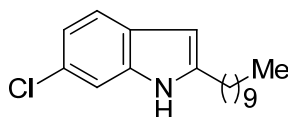
#### 4,6-Dichloro-2-decyl-1H-indole



**3o**

Compound **3o** was prepared in 63 % yield according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100).  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.96 (bs, 1H), 7.17 (dd, 1H,  $J_1 = 1.6$  Hz,  $J_2 = 1.2$  Hz), 7.09 (d, 1H,  $J = 1.2$  Hz), 6.30 – 6.32 (m, 1H), 2.73 (t, 2H,  $J = 7.6$  Hz), 1.68 - 1.75 (m, 2H), 1.22 – 1.40 (m, 14H), 0.89 (t, 3H,  $J = 7.2$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  141.5, 136.2, 126.4, 126.4, 125.2, 119.7, 109.0, 98.2, 31.9, 29.6, 29.5, 29.4, 29.3, 29.2, 28.9, 28.2, 22.7, 14.1; IR (neat): 2953, 2927, 2854, 1614, 1577, 1468, 1328; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{18}\text{H}_{25}\text{Cl}_2\text{NNa}]^+$ : 348.13; Found: 348.16.

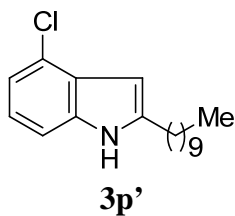
#### 6-Chloro-2-decyl-1H-indole



**3p**

Compound **3p** and **3p'** was prepared in 85 % yield (1.3: 1) according to the general procedure (eluent: ethyl acetate: hexanes = 1: 100). **3p**:  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.84 (bs, 1H), 7.41 (d, 1H,  $J = 9$  Hz), 7.27 (t, 1H,  $J = 0.8$  Hz), 7.02 – 7.05 (m, 1H), 6.20 – 6.21 (m, 1H), 2.73 (t, 2H,  $J = 7.5$  Hz), 1.68 – 1.72 (m, 1H), 1.20 – 1.40 (m, 14H), 0.89 (t, 3H,  $J = 6.8$  Hz);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  140.8, 136.1, 127.4, 126.6, 120.4, 120.2, 110.2, 99.5, 31.9, 29.6, 29.5, 29.4, 29.31, 29.28, 29.0, 28.2, 22.7, 14.1; IR (neat): 3584, 3403, 2954, 2924, 1543, 1467, 1397; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{18}\text{H}_{27}\text{ClN}]^+$ : 292.18; Found: 292.18.

#### 4-Chloro-2-decyl-1H-indole



**3p'**:  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.99 (bs, 1H), 7.19 (dt, 1H,  $J_1=8\text{Hz}$ ,  $J_2=0.8\text{Hz}$ ), 7.02 – 7.08 (m, 2H), 6.34 – 6.35 (m, 1H), 2.76 (t, 2H,  $J = 8 \text{ Hz}$ ), 1.69 – 1.77 (m, 2H), 1.23 – 1.43 (m, 14H), 0.88 (t, 3H,  $J = 6.8 \text{ Hz}$ );  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  140.8, 136.4, 127.6, 125.0, 121.5, 119.3, 108.8, 98.1, 31.9, 29.6, 29.5, 29.4, 29.30, 29.28, 29.1, 28.2, 22.7, 14.1; IR (neat): 3584, 3410, 2922, 2851, 1608, 1433; MS ( $\text{ES}^+$ ) Calculated for  $[\text{C}_{18}\text{H}_{27}\text{ClN}]^+$ : 292.18; Found: 292.19.

USER:

SOLVENT: cddc3

Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 2.000 sec

NA = 16  
Solvent = cddc3

FID P1 S1 D = 20006

PT S1 D = 32768

F1 = 399.950684 MHz

F2 = 100.575279 MHz

SW1 = 8002.40 Hz

AT1 = 2.50 sec

Hz per Pt 1 S1 D = 0.24 Hz

SW2 = 1.00 Hz

Hz per Pt 2 hnd = 1.00 Hz

O1 = 2006.7504 Hz

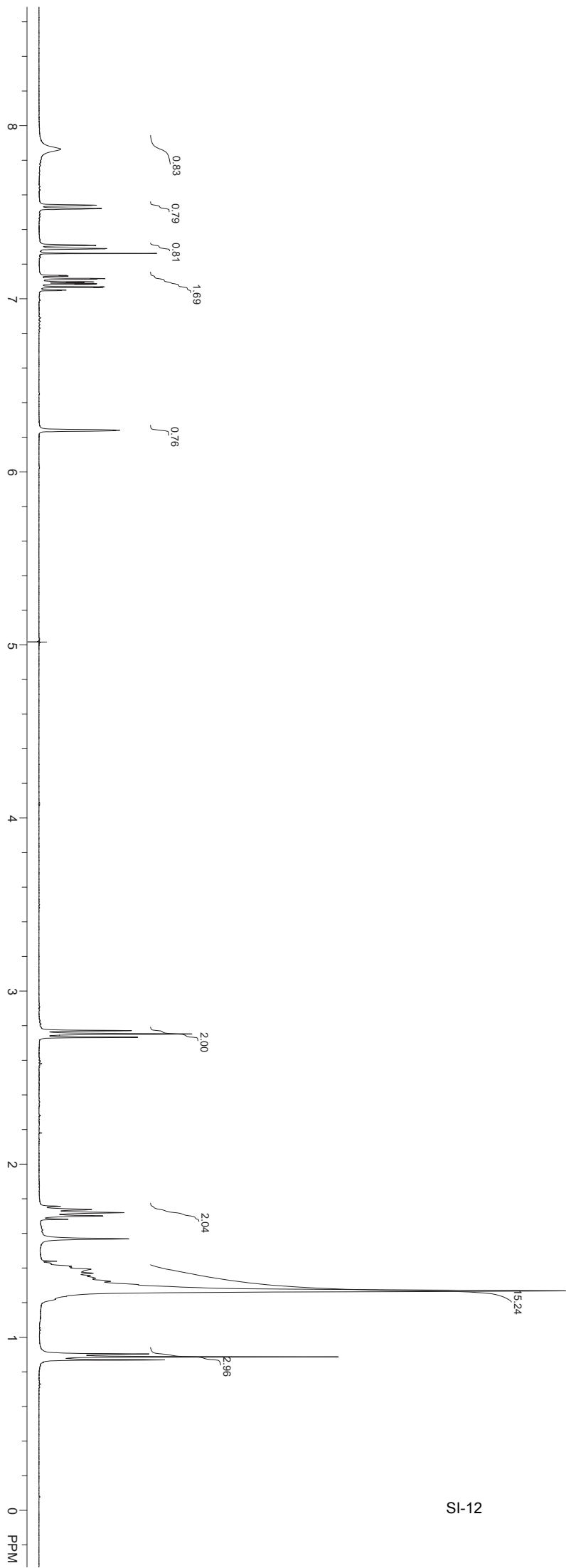
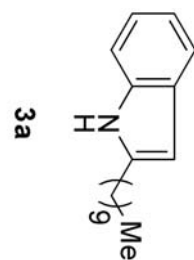
O2 = -0.5000 Hz

LB1 = 0.00 Hz

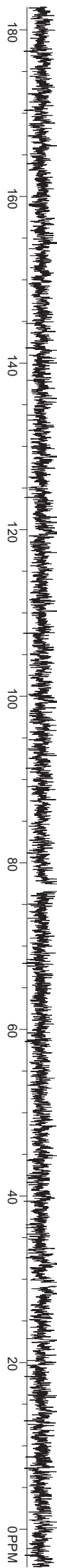
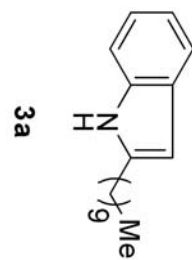
TP A = -46.68

B = -35.68

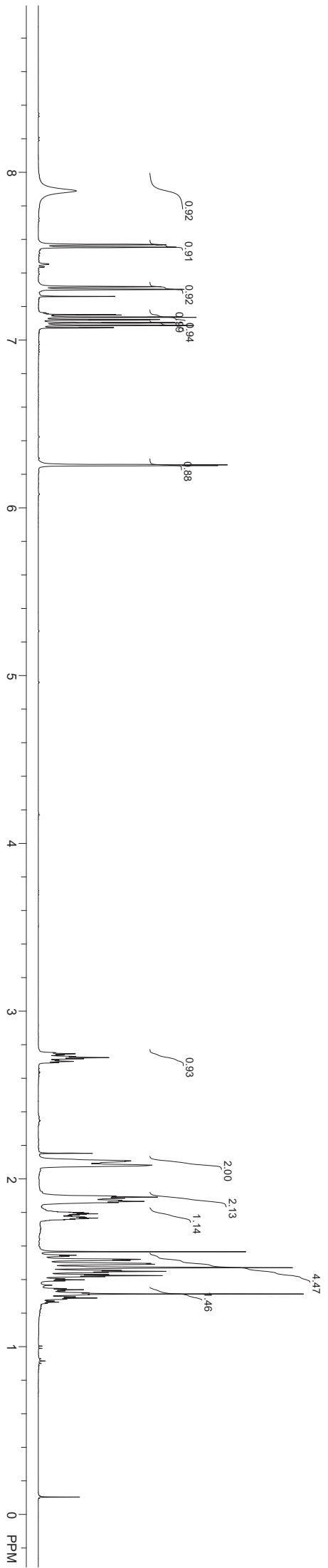
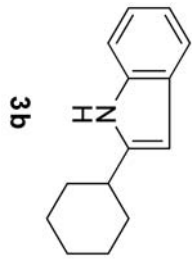
C = 0.00



USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 9.500 usec  
Relaxation delay = 5.000 sec  
NA = 108  
Solvent = cdc13  
FID P1:SID = 16000  
PT:SID = 16384  
F1 = 100.576706 MHz  
F2 = 399.949585 MHz  
SW1 = 25000.00 Hz  
AT1 = 0.64 sec  
Hz per Pt:SID = 1.53 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2nd = 1.00 Hz  
O1 = 9529.8223 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -121.88  
B = 172.97  
C = 0.00

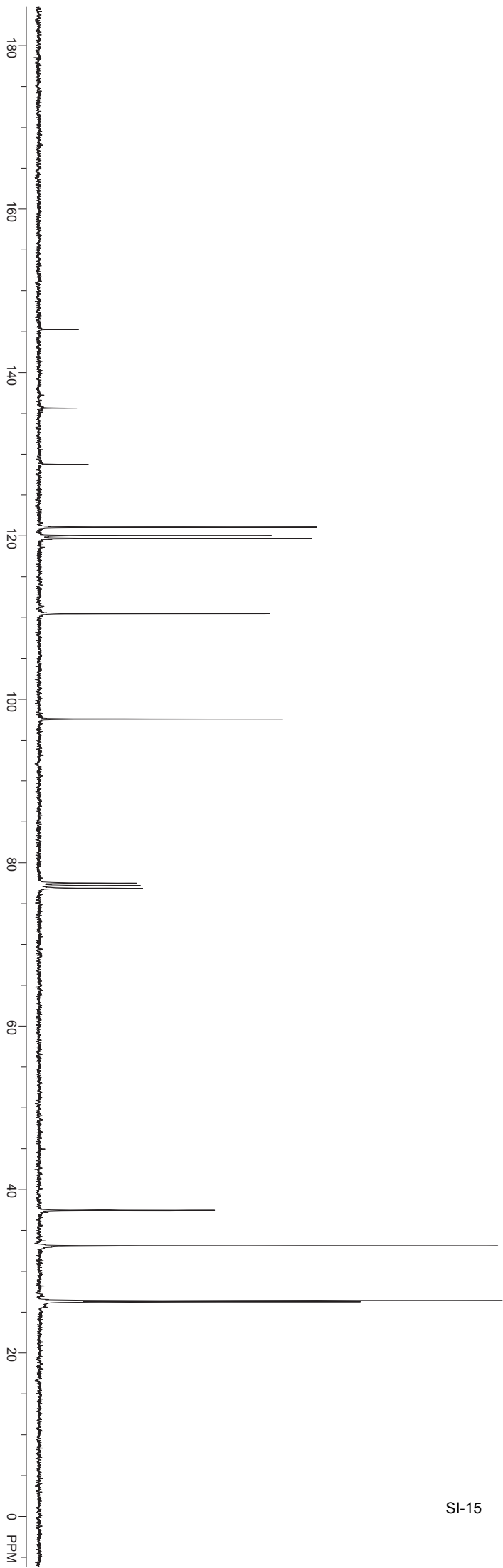
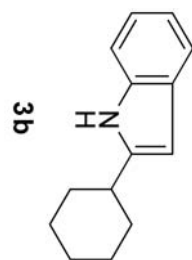


USER:  
SOLVENT: cddcl3  
Experiment = s2pul1  
Pulse length = 7.075 usec  
Relaxation delay = 4.800 sec  
NA = 16  
Solvent = cddcl3  
FID P1:SID = 20006  
PT:SID = 32768  
F1 = 499.858551 MHz  
F2 = 125.700813 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt 1:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2:SID = 1.00 Hz  
O1 = 2496.1272 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -128.44  
B = 2.81  
C = 0.00



D:\Greenware\Nlus 20080731\DATA\Syw-5-17-6ring-cd2.fid  
Standard c13 run using qnp probe  
Jan 29 2011

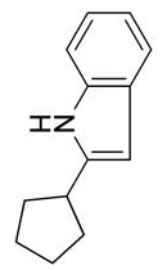
USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 7.775 usec  
Relaxation delay = 1.300 sec  
NA = 934  
Solvent = cdcl3  
FID P1:SID = 28040  
PT:SID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 28040.66 Hz  
AT1 = 1.00 sec  
Hz per Pt:SID = 0.86 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2nid = 1.00 Hz  
O1 = 10071.4883 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -34.81  
B = 2.63  
C = 0.00



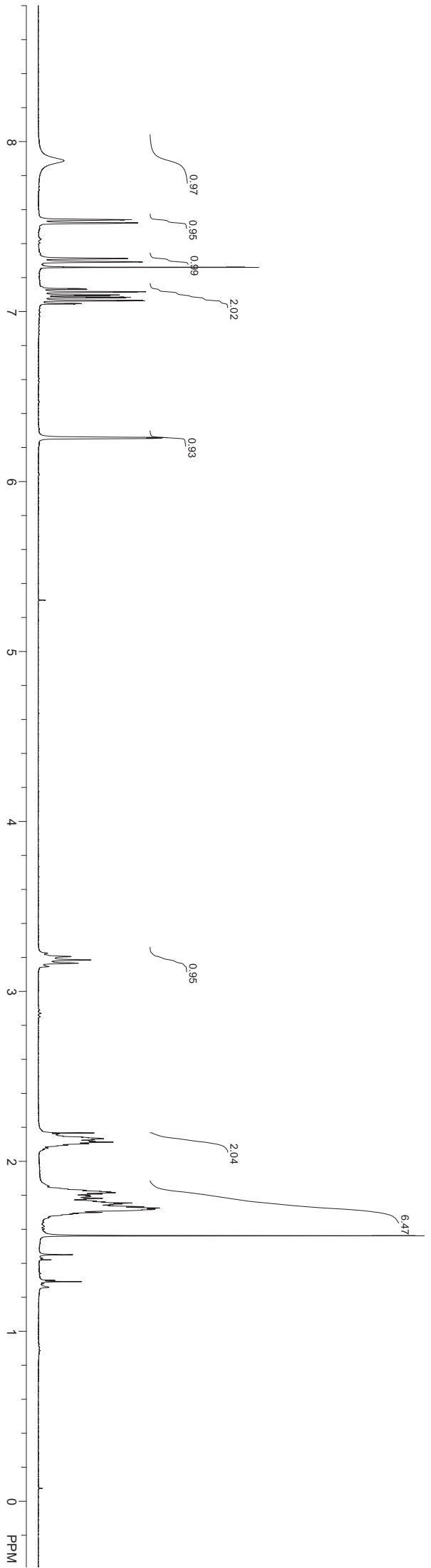
D:\Greenware\Nlus 20080731\DATA\Syw-5-1-9.fid  
new experiment  
Jan 5 2011

USER:  
SOLVENT: cddc3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 16

Solvent = cddc3  
FID P1:SID = 20008  
PT:SID = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2:SID = 1.00 Hz  
O1 = 2006.3970 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -57.50  
B = -3.37  
C = 0.00



**3c**

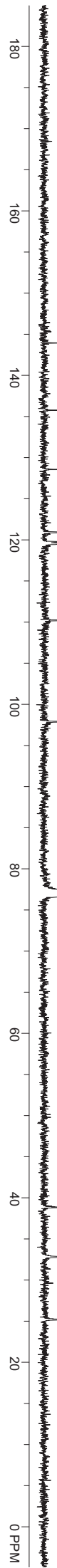




USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.300 sec  
NA = 1888  
Solvent = cdc13  
FID P1 S1 D = 19608  
PT S1 D = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1 S1 D = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 n1 d = 1.00 Hz  
O1 = 10054.9897 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -29.53  
B = 30.94  
C = 0.00

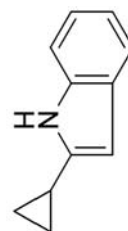


3c

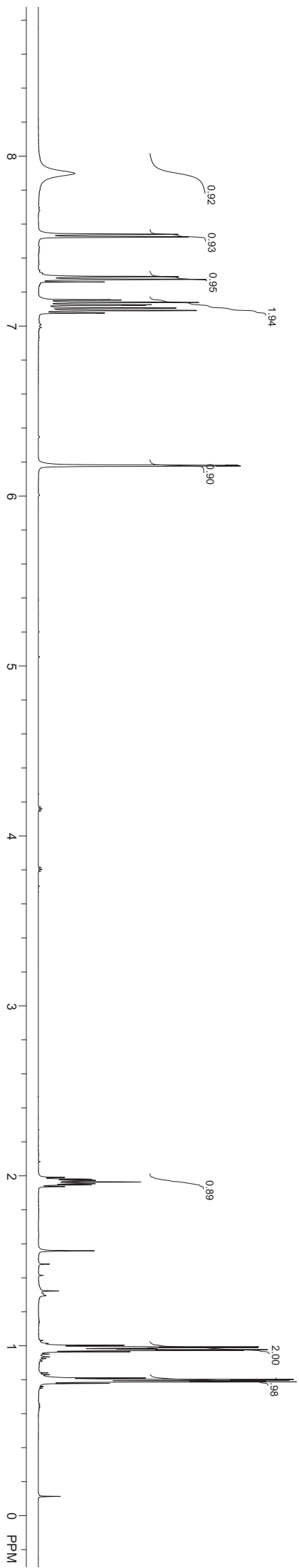


USER:  
SOLVENT: cdc13  
Experiment = s2pul1  
Pulse length = 7.075 usec  
Relaxation delay = 4.800 sec  
NA = 8

Solvent = cdc13  
FID P1:SID = 20006  
PT:SID = 32768  
F1 = 499.858551 MHz  
F2 = 125.700813 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2nd = 1.00 Hz  
O1 = 2495.8831 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -82.97  
B = 1.41  
C = 0.00



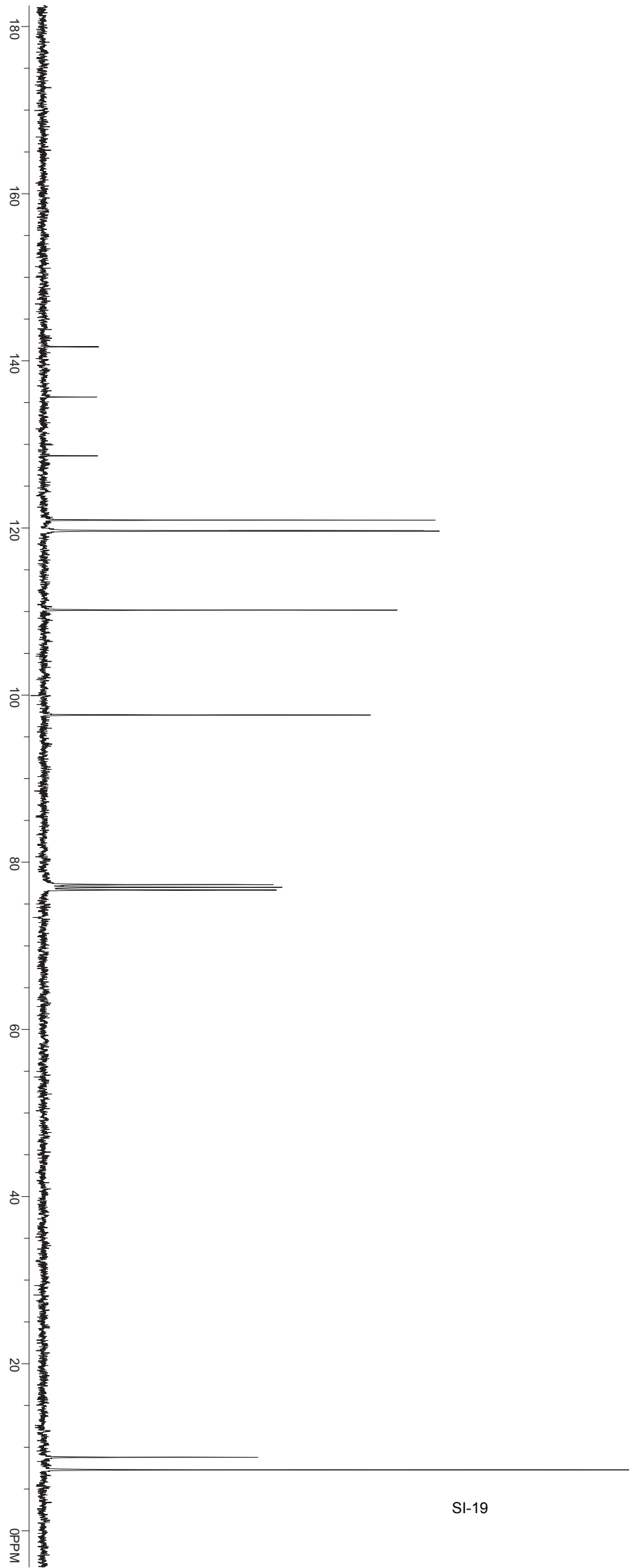
**3d**



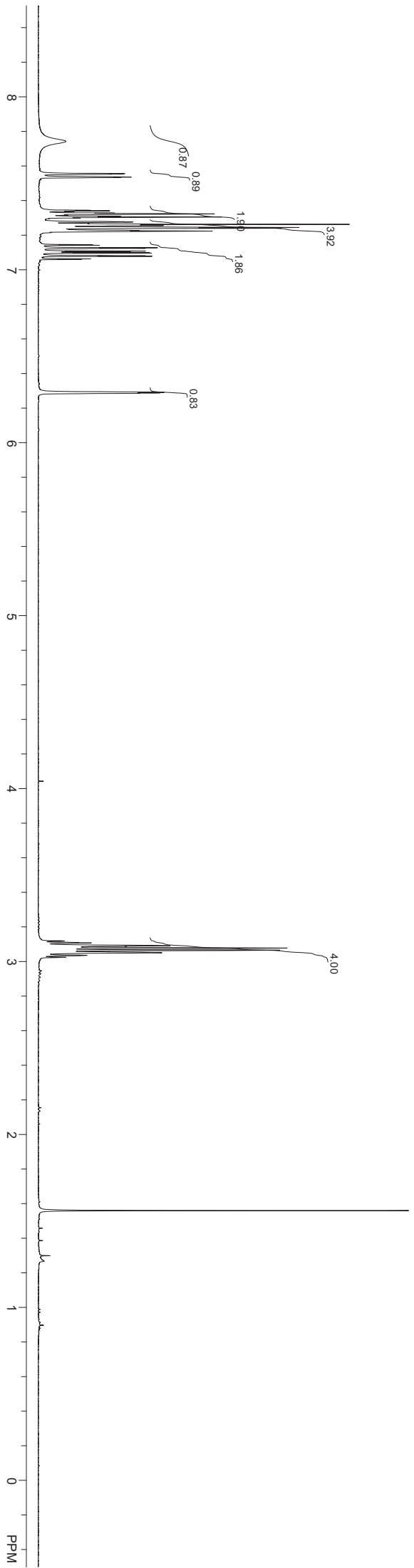
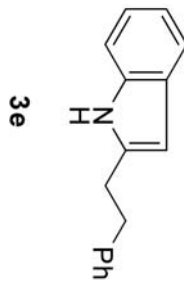
USER:  
SOLVENT: ccdcl3  
Experiment = szpul  
Pulse length = 7.000 usec  
Relaxation delay = 1.300 sec  
NA = 504  
Solvent = ccdcl3  
FID P1:SID = 19608  
PT:SID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt:SID = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2nd = 1.00 Hz  
O1 = 10050.7012 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -17.81  
B = 9.84  
C = 0.00



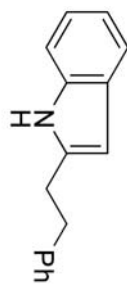
**3d**



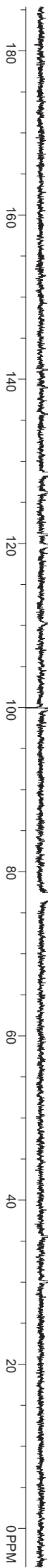
USER:  
SOLVENT: cddc13  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 12  
Solvent = cddc13  
FID P1 S1 D = 20008  
PT S1 D = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 s1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 h1 d = 1.00 Hz  
O1 = 2007.1505 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -70.03  
B = -13.98  
C = 0.00



USER:  
SOLVENT: cdc13  
Experiment = szpul  
Pulse length = 7.000 usec  
Relaxation delay = 1.300 sec  
NA = 2016  
Solvent = cdc13  
FID P1 S1d = 19608  
PT S1d = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1 S1d = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2ndd = 1.00 Hz  
O1 = 10053.2837 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -30.91  
B = -0.75  
C = 0.00



**3e**



D:\Greenware\Nlus 20080731\DATA\Syw-5-14-2.fid  
new experiment  
Jan 12 2011

USER:

SOLVENT: cdcl3

Experiment = szpul

Pulse length = 11.663 usec

Relaxation delay = 4.800 sec

NA = 14

Solvent = cdcl3

FID P1S1D = 20008

P1S1D = 32768

F1 = 399.950684 MHz

F2 = 100.575279 MHz

SW1 = 8003.20 Hz

AT1 = 2.50 sec

Hz per P1 S1D = 0.24 Hz

SW2 = 1.00 Hz

Hz per P1 2hd = 1.00 Hz

O1 = 2007.1505 Hz

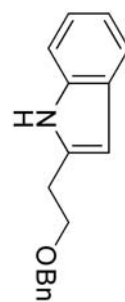
O2 = -0.5000 Hz

LB1 = 0.00 Hz

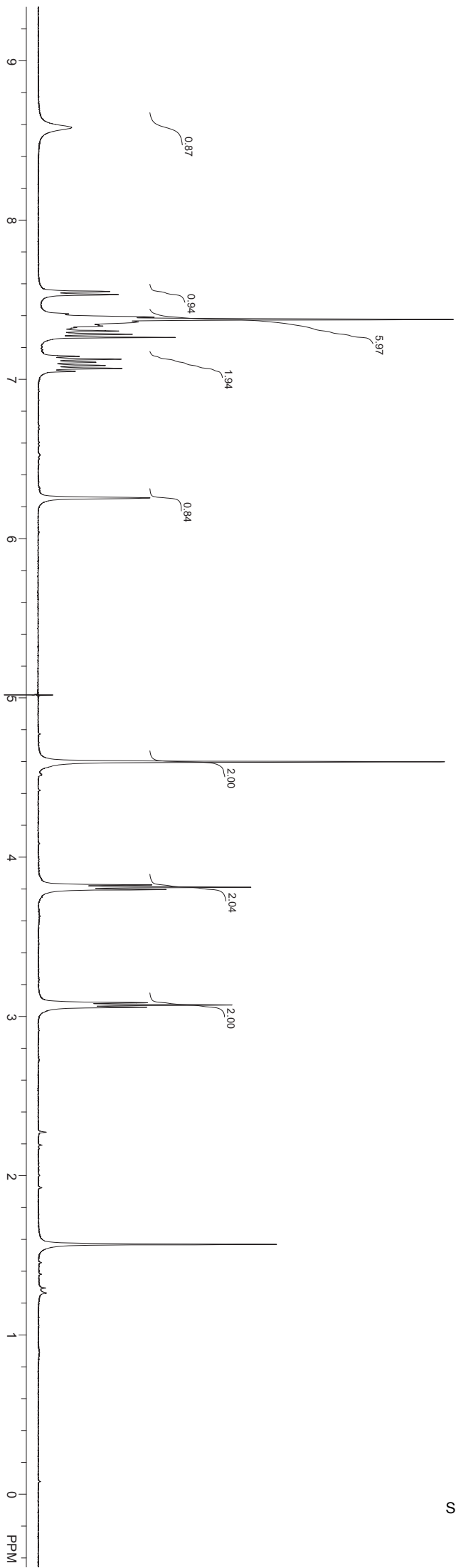
TP A = -74.10

B = -8.96

C = 0.00



**3f**



USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.300 sec  
NA = 372

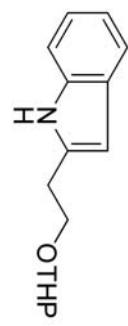
Solvent = cdc13  
FID P1 S1d = 19608  
PT S1d = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1s1d = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2hd = 1.00 Hz  
O1 = 10048.1416 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -30.47  
B = -4.22  
C = 0.00



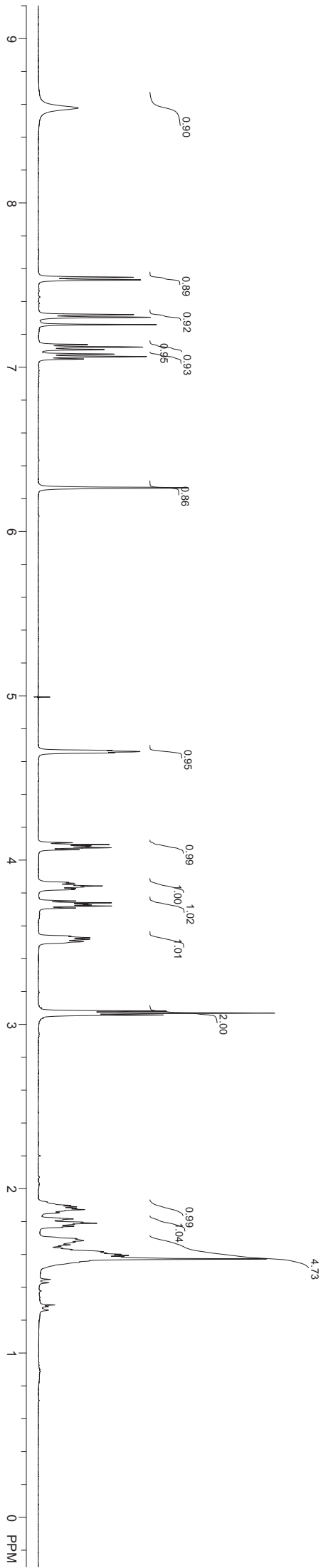
3f



USER:  
SOLVENT: cdcl3  
Experiment = szpul1  
Pulse length = 7.075 usec  
Relaxation delay = 4.800 sec  
NA = 14  
Solvent = cdcl3  
FID P1 S1 D = 20006  
PT S1 D = 32768  
F1 = 499.858551 MHz  
F2 = 125.700813 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 S1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 hnd = 1.00 Hz  
O1 = 2495.7266 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -123.90  
B = -3.40  
C = 0.00



3g





USER:

SOLVENT: cdcl3

Experiment = szpul1

Pulse length = 7.000 usec

Relaxation delay = 1.300 sec

NA = 1562

Solvent = cdcl3

FID P1 S1 D = 19608

PT S1 D = 32768

F1 = 100.577232 MHz

F2 = 399.950684 MHz

SW1 = 27972.03 Hz

AT1 = 0.70 sec

HZ per Pt 1 S1 D = 0.85 Hz

SW2 = 1.00 Hz

HZ per Pt 2 H1 D = 1.00 Hz

O1 = 10051.9111 Hz

O2 = -0.50000 Hz

LB1 = 2.00 Hz

TP A = -11.02 Hz

B = 9.75 Hz

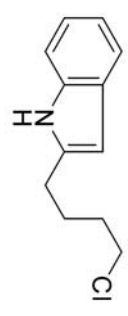
C = 0.00 Hz



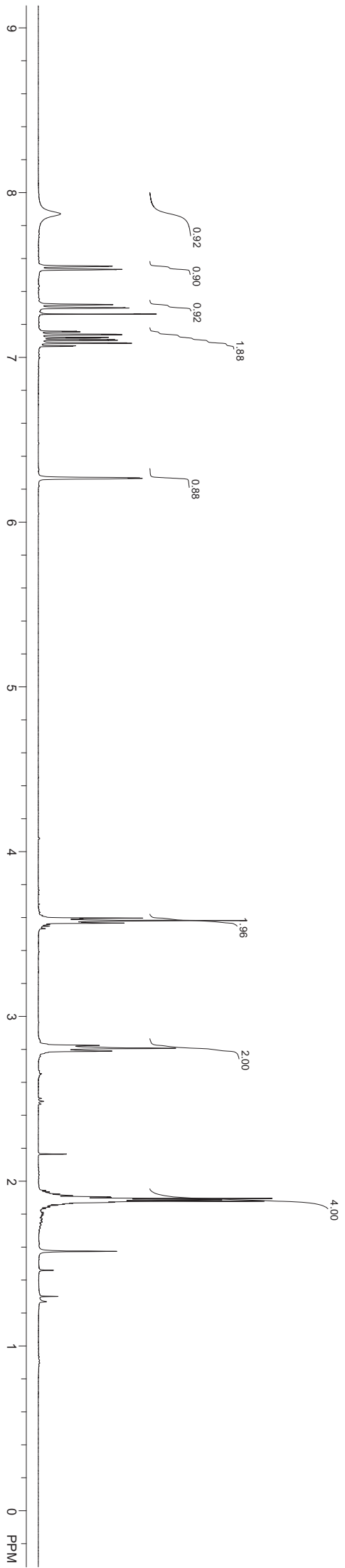
**3g**



USER:  
SOLVENT: cdc13  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 16  
Solvent = cdc13  
FID P1 S1 D = 20008  
PT S1 D = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 S1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 hnd = 1.00 Hz  
O1 = 2007.1505 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -51.23  
B = -10.13  
C = 0.00



3h



USER:

SOLVENT: ccdcl3

Experiment = szpul

Pulse length = 7.000 usec

Relaxation delay = 1.300 sec

NA = 986

Solvent = ccdcl3

FID P1SID = 19608

PTSID = 32768

F1 = 100.577232 MHz

F2 = 399.950684 MHz

SW1 = 27972.03 Hz

AT1 = 0.70 sec

H2 per P1 SID = 0.85 Hz

SW2 = 1.00 Hz

H2 per P2 2nd = 1.00 Hz

O1 = 10054.9897 Hz

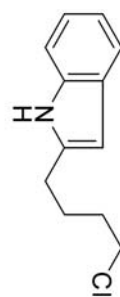
O2 = -0.5000 Hz

LB1 = 2.00 Hz

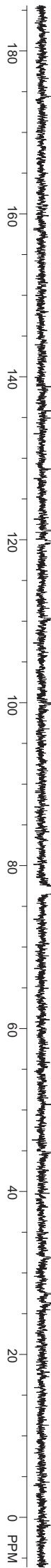
TP A = -4.22

B = -11.25

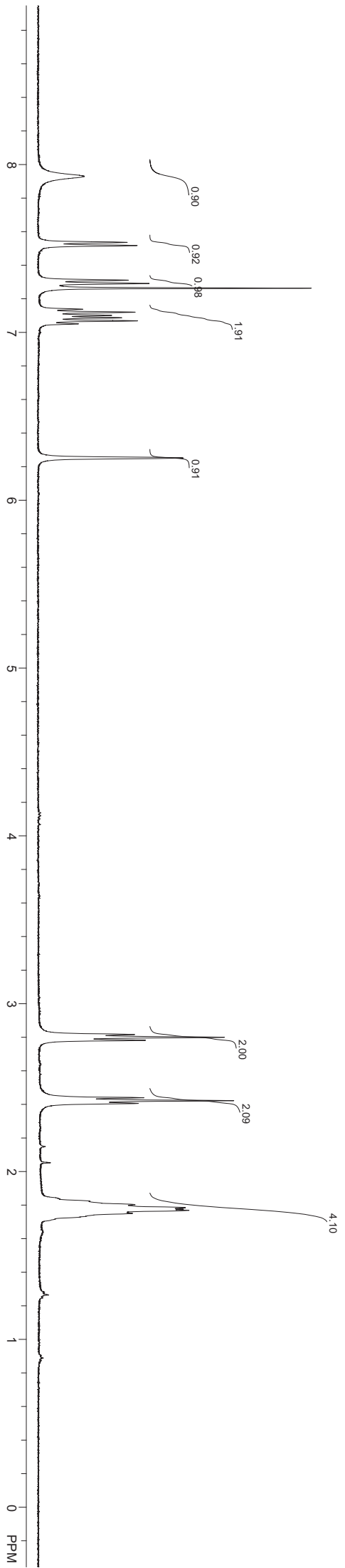
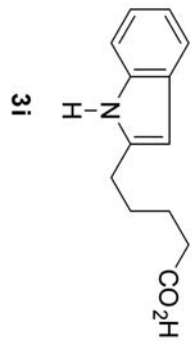
C = 0.00



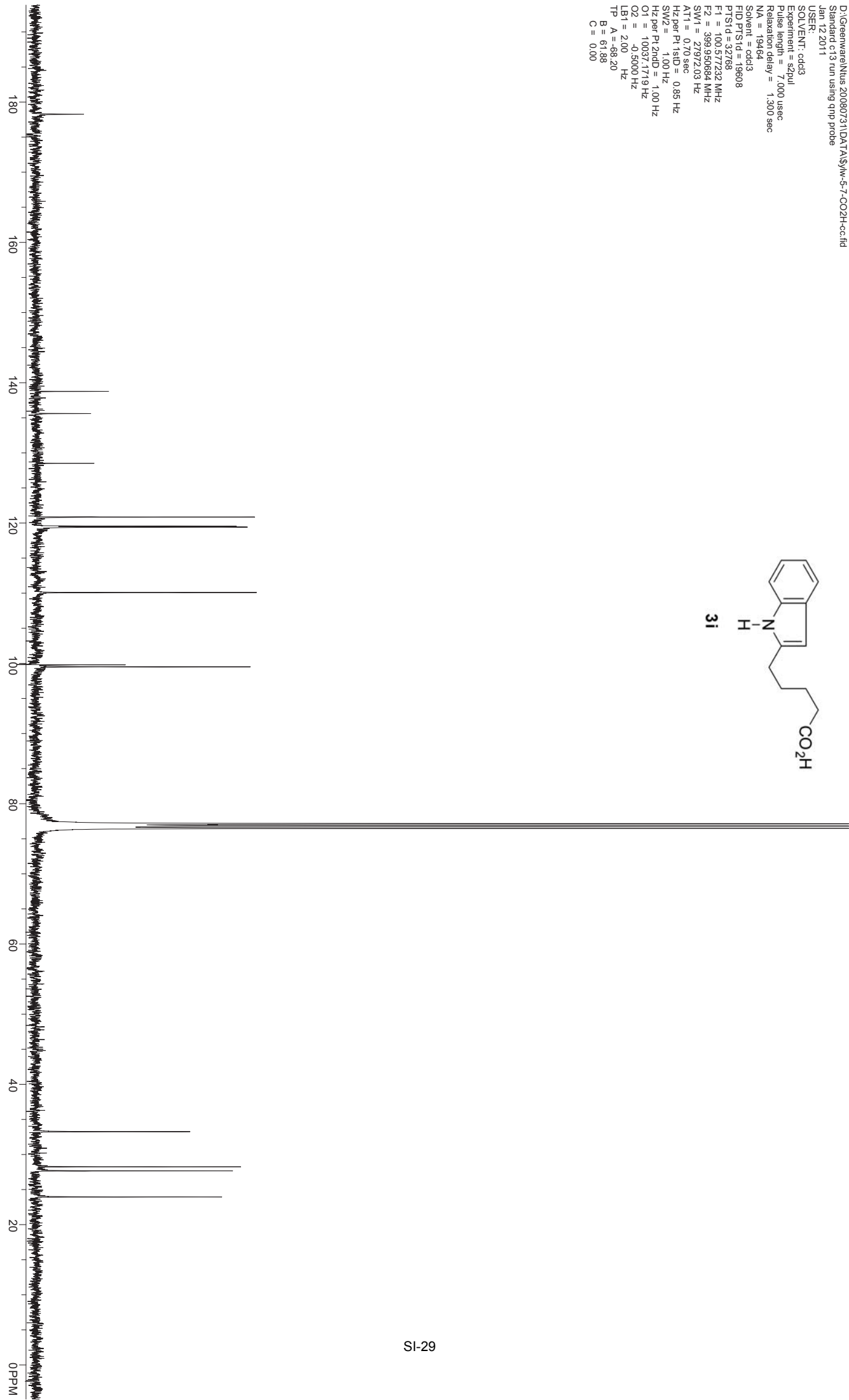
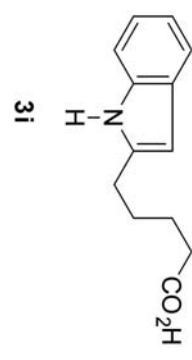
3h



USER:  
SOLVENT: cdcl3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 16  
Solvent = cdcl3  
FID P1 S1 D = 20008  
PT S1 D = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 s1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 h1 d = 1.00 Hz  
O1 = 2007.1505 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -52.51  
B = 2.65  
C = 0.00



USER:  
SOLVENT: ccdcl3  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.300 sec  
NA = 19464  
Solvent = ccdcl3  
FID P1 S1 D = 19608  
PT S1 D = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1 S1 D = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 H1 D = 1.00 Hz  
O1 = 10037.1719 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -68.20  
B = 61.88  
C = 0.00



USER:

SOLVENT: cdcl3

Experiment = szpul1

Pulse length = 7.075 usec

Relaxation delay = 4.800 sec

NA = 12

Solvent = cdcl3

FID P1:SID = 20006

PT:SID = 32768

F1 = 499.858551 MHz

F2 = 125.700813 MHz

SW1 = 8002.40 Hz

AT1 = 2.50 sec

Hz per P1:SID = 0.24 Hz

SW2 = 1.00 Hz

Hz per P1:2hd = 1.00 Hz

O1 = 2496.3713 Hz

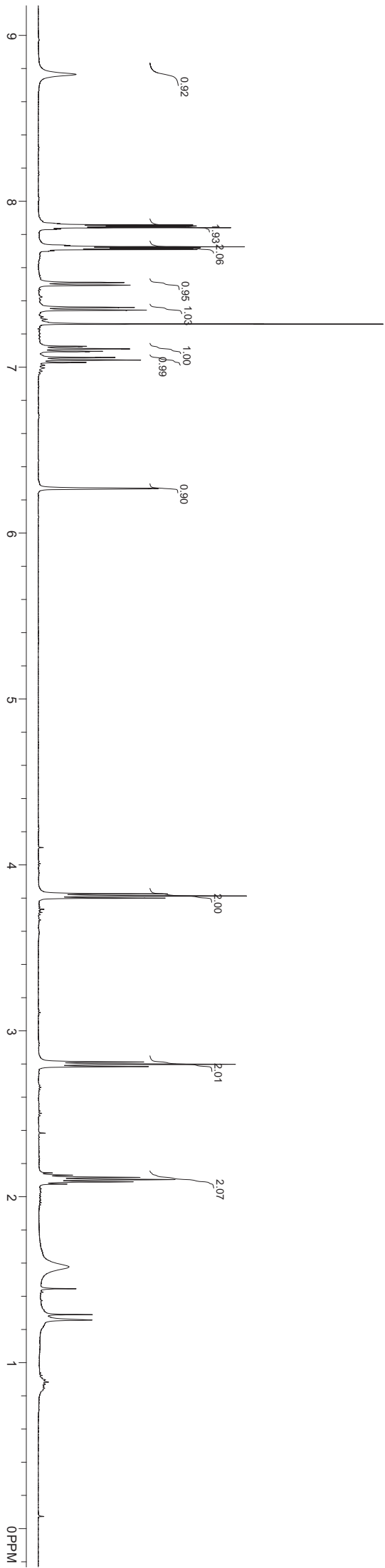
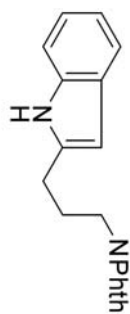
O2 = -0.5000 Hz

LB1 = 0.00 Hz

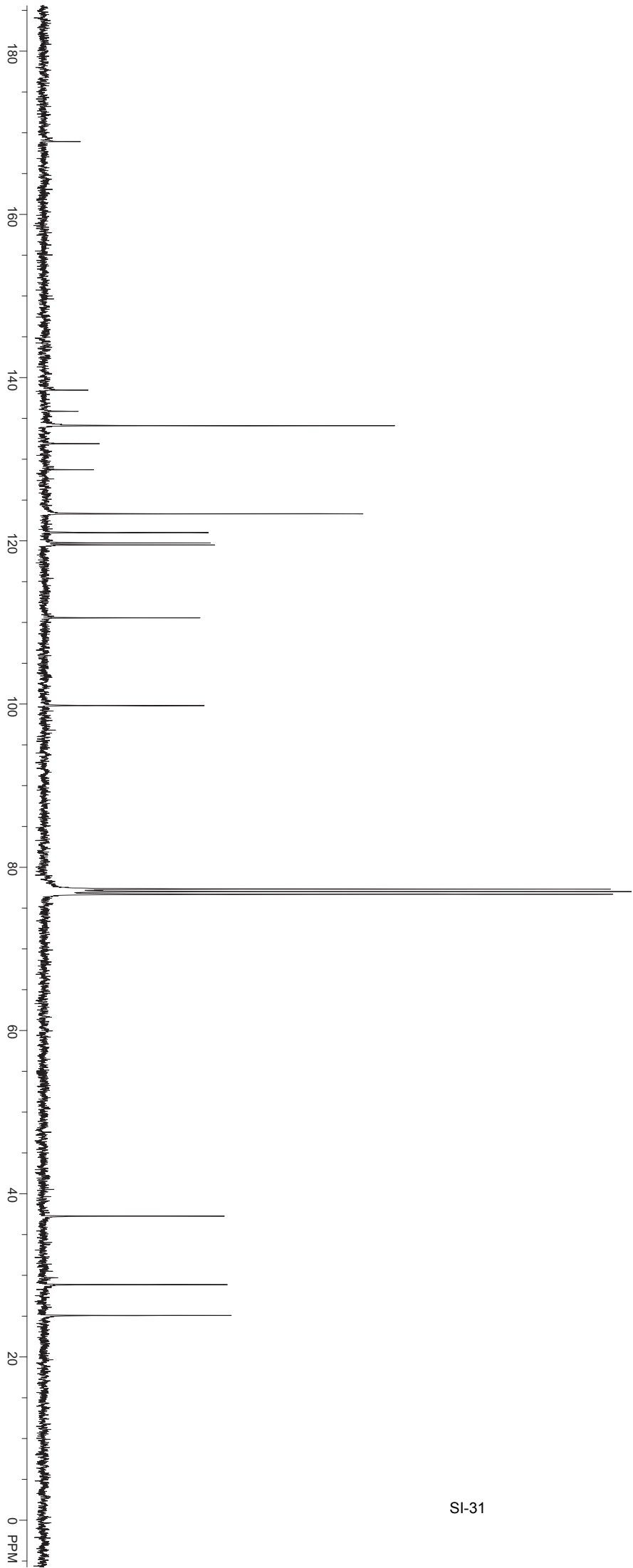
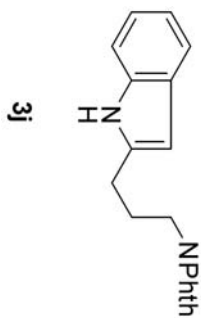
TP A = -121.20

B = 0.55

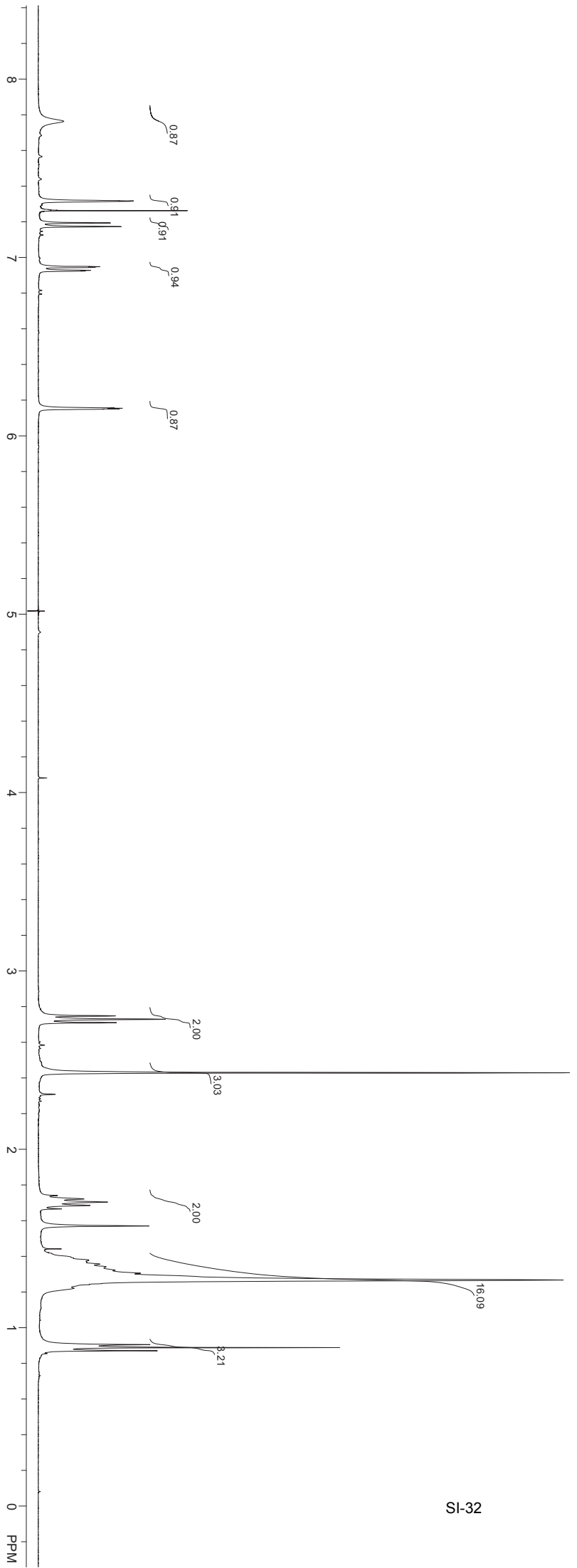
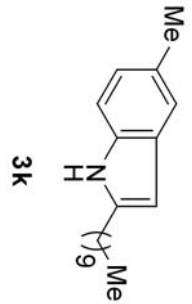
C = 0.00



USER:  
SOLVENT: ccdcl3  
Experiment = s2pul1  
Pulse length = 7.775 usec  
Relaxation delay = 1.300 sec  
NA = 2562  
Solvent = ccdcl3  
FID P1 S1 D = 28040  
PT S1 D = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 28040.66 Hz  
AT1 = 1.00 sec  
Hz per Pt 1 S1 D = 0.86 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 H1 D = 1.00 Hz  
O1 = 10056.3613 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -13.59  
B = -39.39  
C = 0.00



USER:  
SOLVENT: cddc3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 14  
Solvent = cddc3  
FID P1:SID = 20008  
PT:SID = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2:SID = 1.00 Hz  
O1 = 2007.1505 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = 65.43  
B = 0.07  
C = 0.00

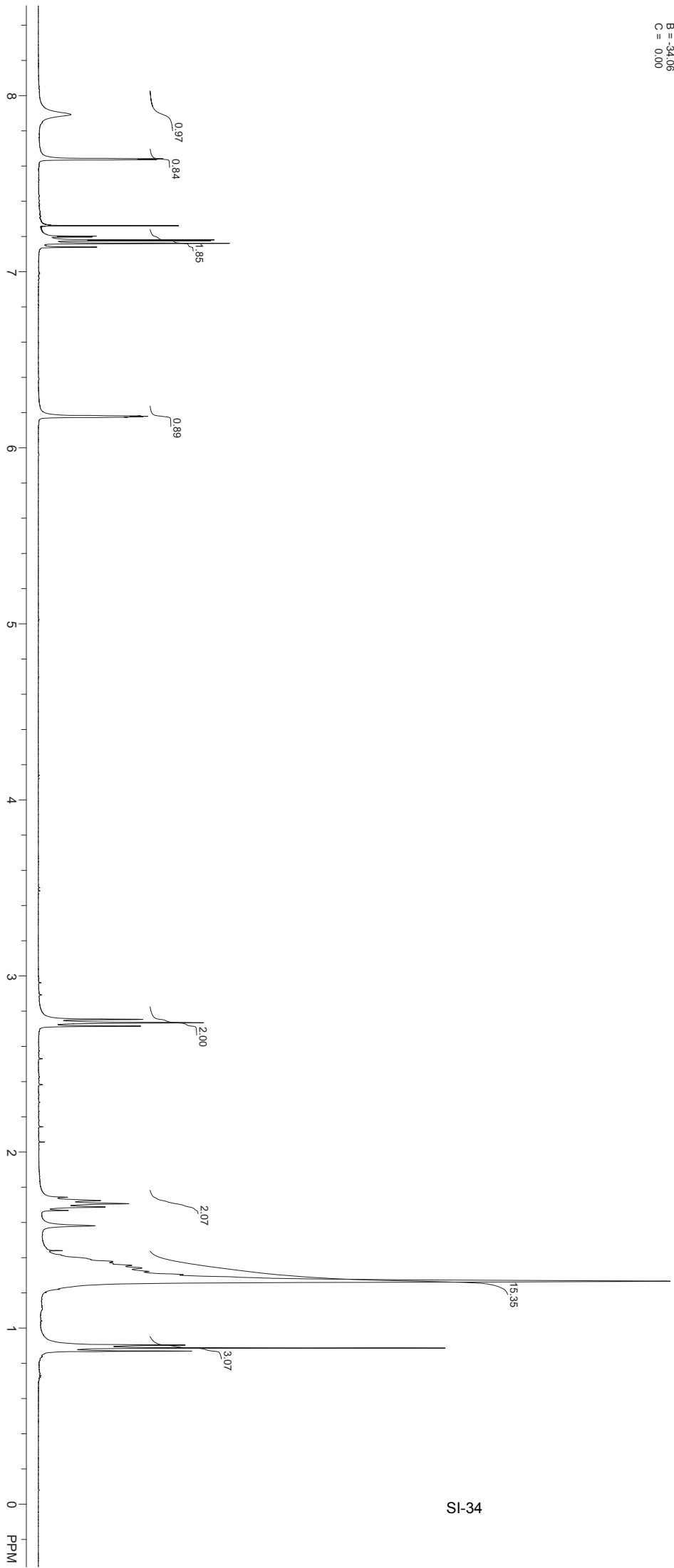
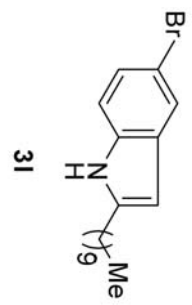






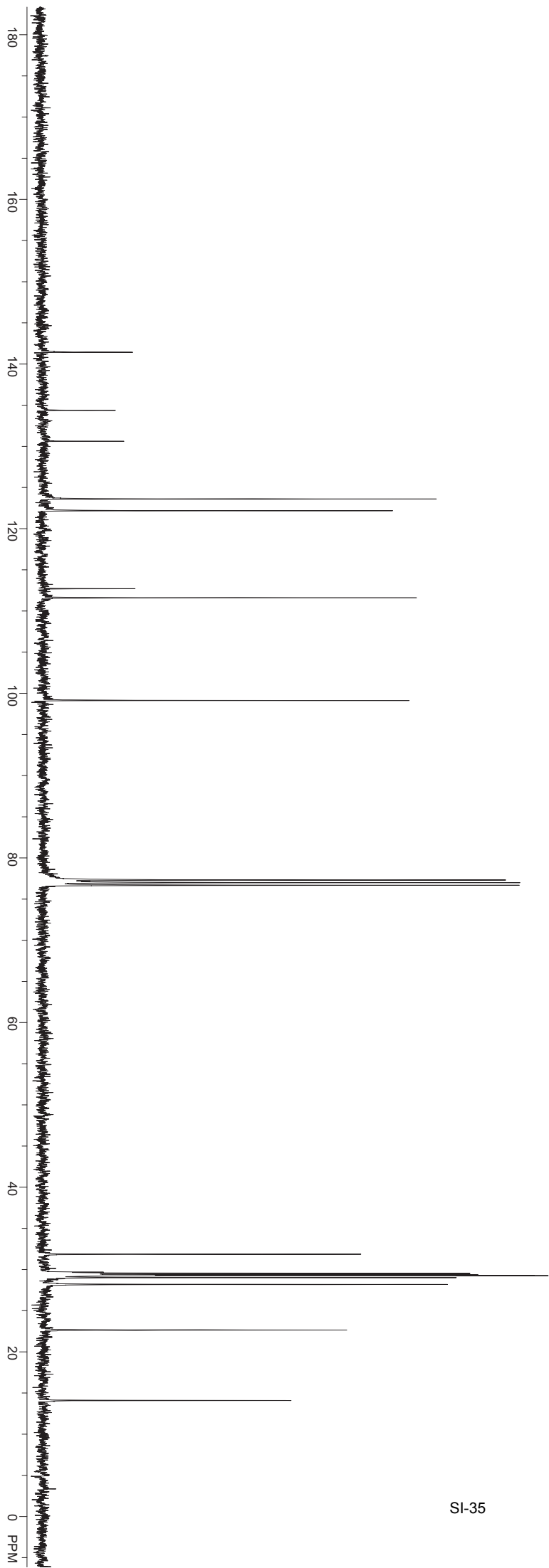
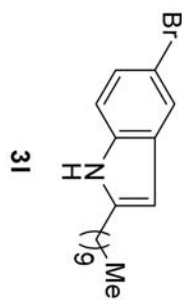
USER:  
SOLVENT: cddc3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 16

Solvent = cddc3  
FID P1 S1 D = 20006  
PT S1 D = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 S1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 hnd = 1.00 Hz  
O1 = 2006.7504 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -40.58  
B = -34.06  
C = 0.00



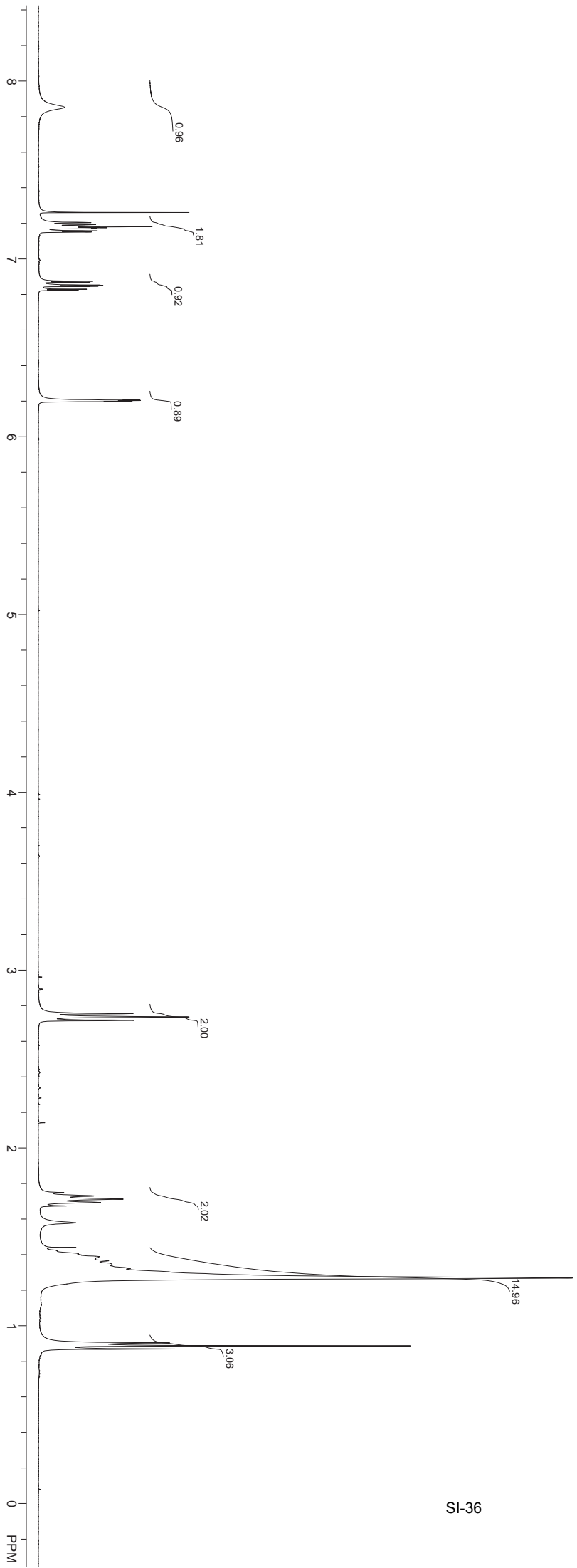
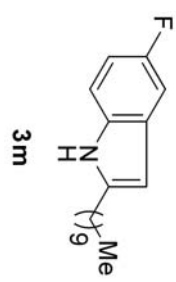
D:\Greenware\NMR\20080731\DATA\5yw-5-36-Br-c.fid  
Standard c13 run using qnp probe  
Jan 27 2011

USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 7.775 usec  
Relaxation delay = 1.300 sec  
NA = 1574  
Solvent = cdc13  
FID P1:SID = 28040  
PT:SID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 28040.66 Hz  
AT1 = 1.00 sec  
Hz per Pt:SID = 0.86 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2nd = 1.00 Hz  
O1 = 10056.3604 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = 20.63  
B = -14.06  
C = 0.00

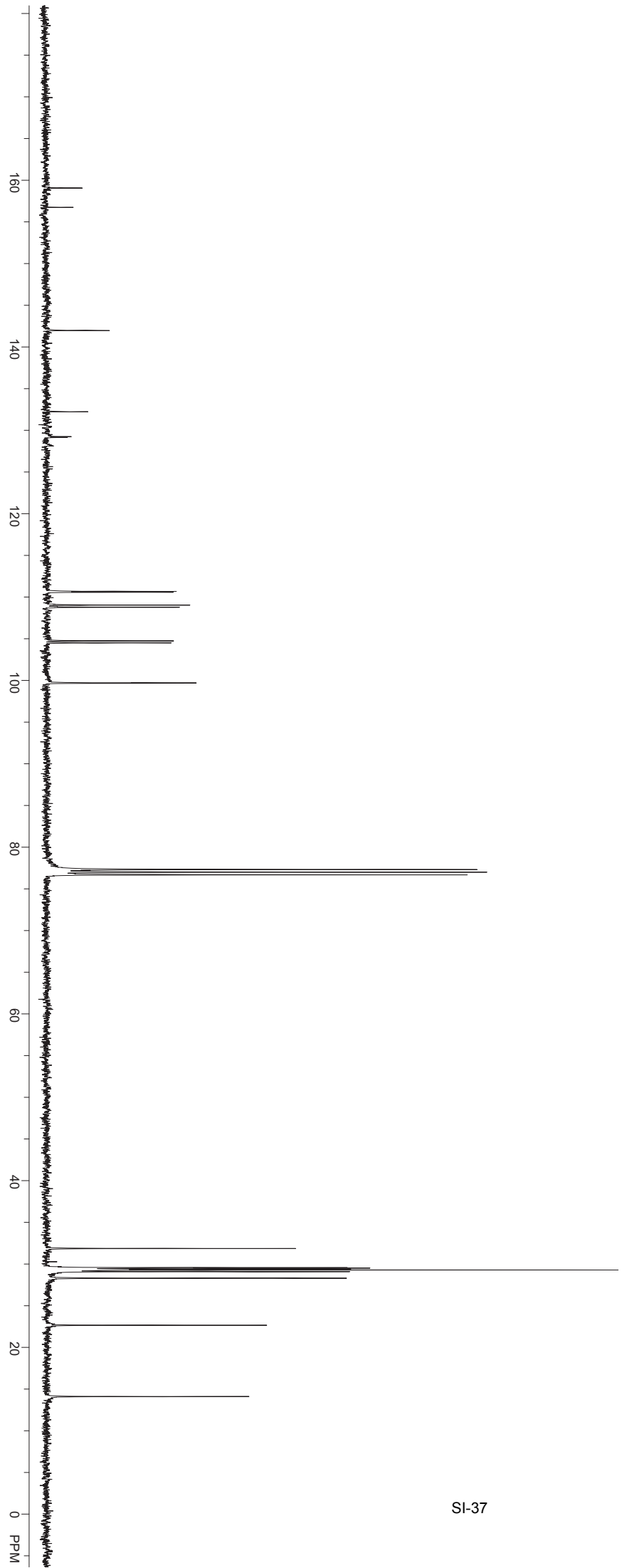
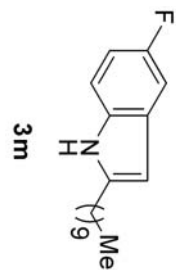


USER:  
SOLVENT: cdcl3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 12

Solvent = cdcl3  
FID P1:SID = 20006  
PT:SID = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2hd = 1.00 Hz  
O1 = 2006.7504 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -38.07  
B = -36.95  
C = 0.00

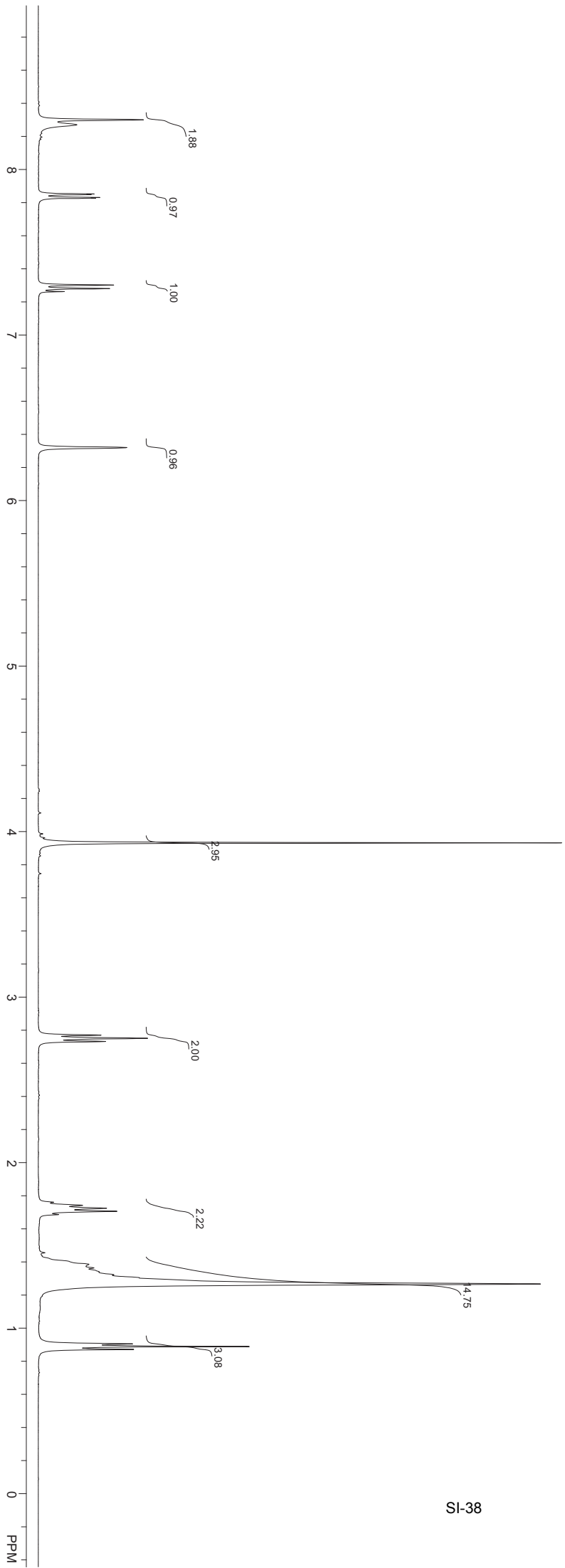
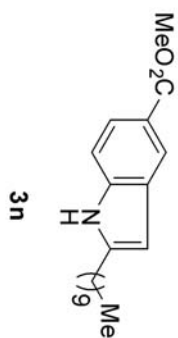


USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 7.775 usec  
Relaxation delay = 1.300 sec  
NA = 2486  
Solvent = cdcl3  
FID P1: 28040  
PT: 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 28040.66 Hz  
AT1 = 1.00 sec  
Hz per Pt: 13ID = 0.86 Hz  
SW2 = 1.00 Hz  
Hz per Pt: 2hd = 1.00 Hz  
O1 = 10056.3604 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -16.88  
B = -9.84  
C = 0.00



D:\Greenware\Nlus 20080731\DATA\%w-5-27-E-hh.fid  
new experiment  
Jan 20 2011

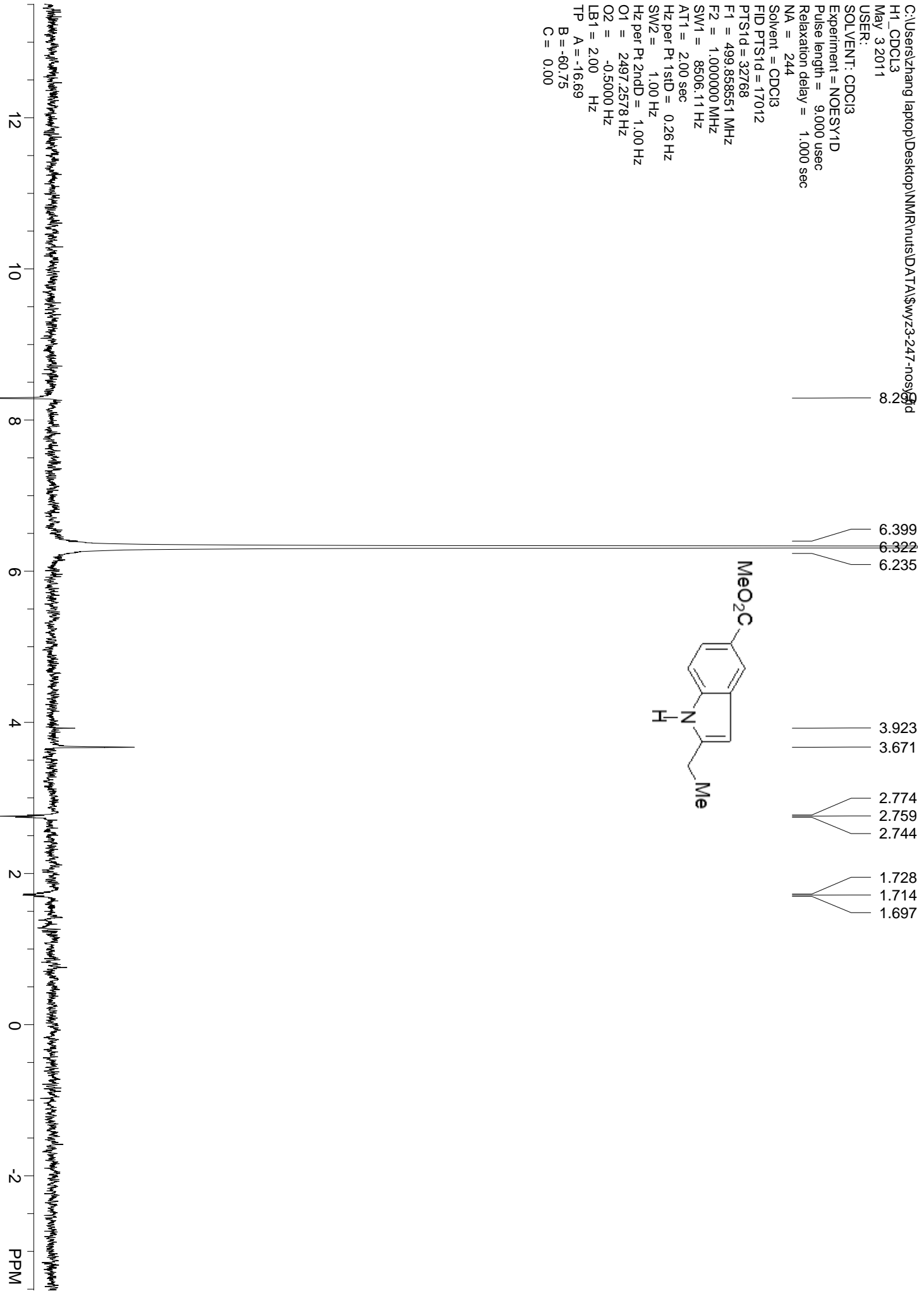
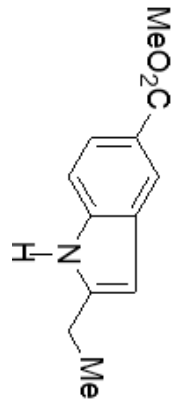
USER:  
SOLVENT: ccd3  
Experiment = s2jul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 12  
Solvent = ccd3  
FIDPTSID = 20008  
PTSID = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
ATT1 = 2.50 sec  
Hz per Pt1SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt2SID = 1.00 Hz  
O1 = 2007150.5 Hz  
O2 = -0.5000 Hz  
LB1 A = 0.00 Hz  
TP A = -63.06  
B = -2.72  
C = 0.00



C:\Users\zhang\laptop\Desktop\NMR\nuts\DATA\$wyz3-247-nosy3d  
H1\_CDCL3  
May 3 2011

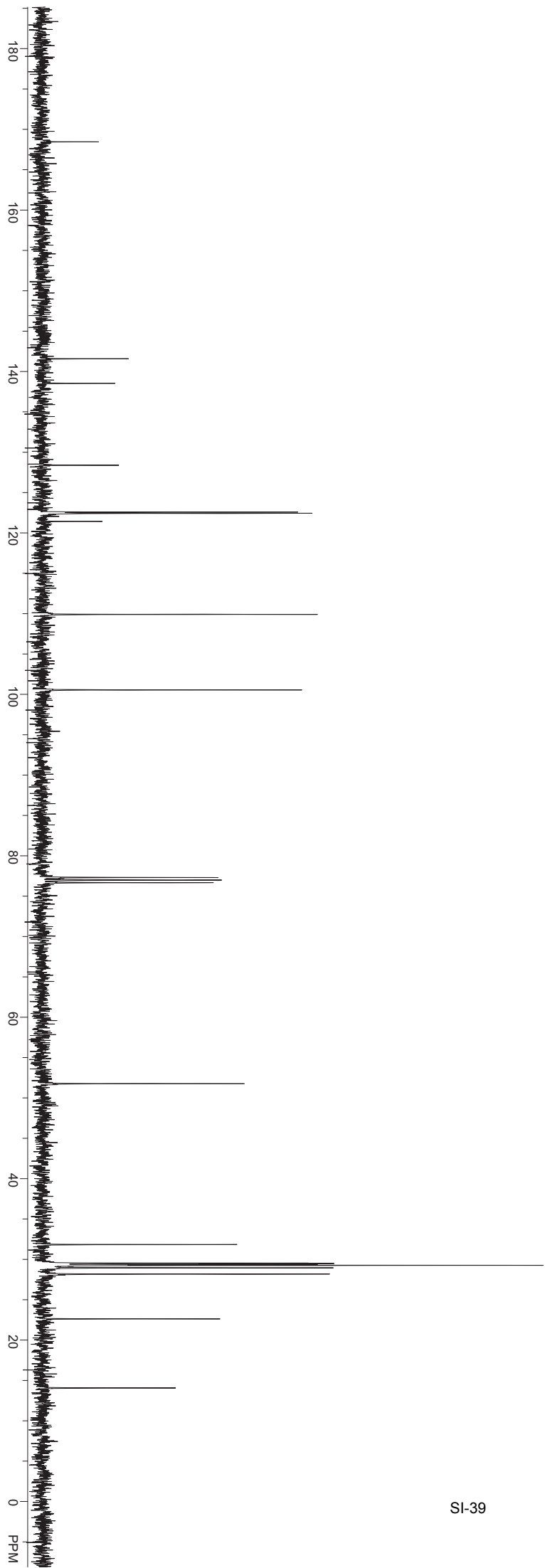
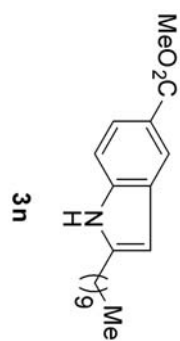
USER:  
SOLVENT: CDCl3  
Experiment = NOESY1D  
Pulse length = 9,000 usec  
Relaxation delay = 1,000 sec  
NA = 244

Solvent = CDCl3  
FID PTS1d = 17012  
PTS1d = 32768  
F1 = 499,858551 MHz  
F2 = 1,000000 MHz  
SW1 = 8506,11 Hz  
AT1 = 2,00 sec  
Hz per Pt 1stD = 0,26 Hz  
SW2 = 1,00 Hz  
Hz per Pt 2ndD = 1,00 Hz  
O1 = 2497,2578 Hz  
O2 = -0,5000 Hz  
LB1 = 2,00 Hz  
TP A = -16,69  
B = -60,75  
C = 0,00



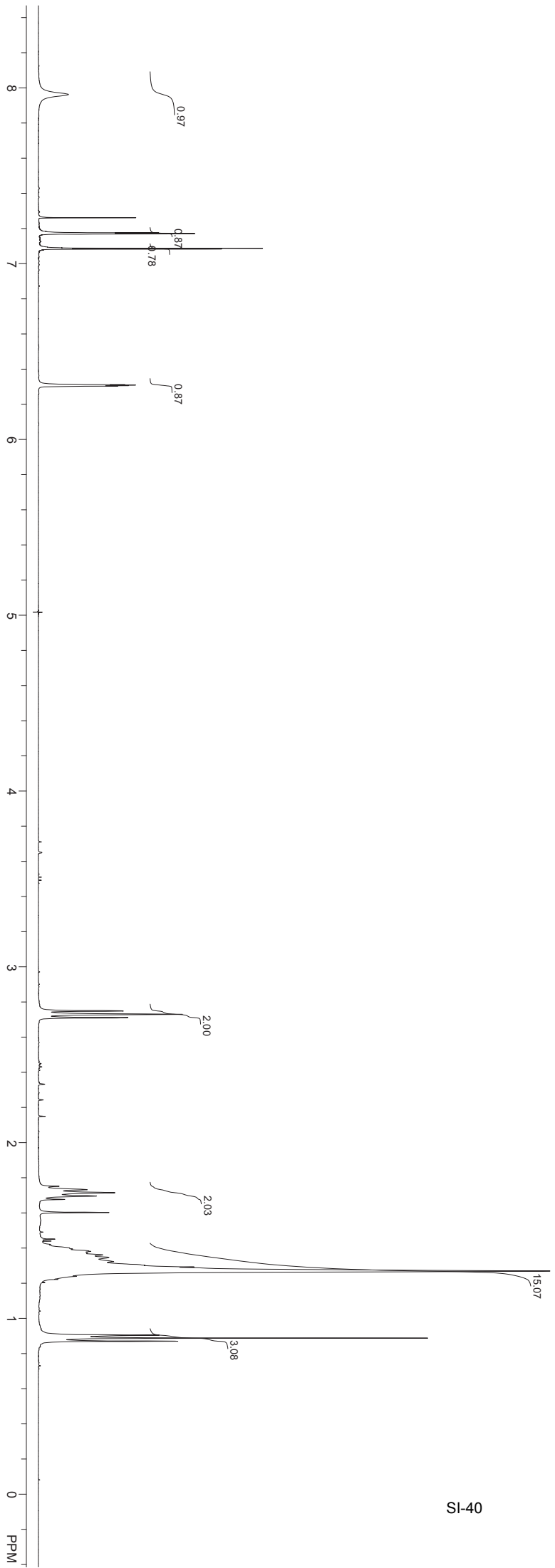
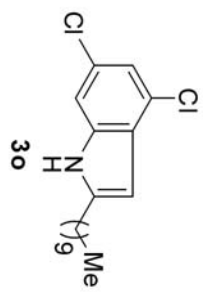
D:\Greenware\Nlus 20080731\DATA\Syw-5-27-E-c-fid  
Standard c13 run using qnp probe  
Jan 20 2011

USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.000 sec  
NA = 84  
Solvent = cdc13  
FID P1SID = 19608  
PTSID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1SID = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2nhd = 1.00 Hz  
O1 = 10054.1162 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -5.63  
B = 14.06  
C = 0.00



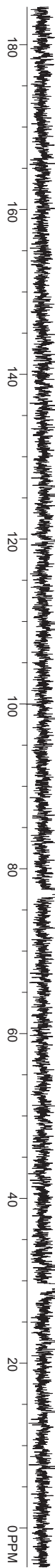
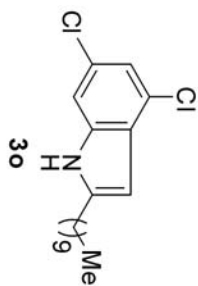


USER:  
SOLVENT: cdcl3  
Experiment = szpul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 10  
Solvent = cdcl3  
FID P1:SID = 20006  
PT:SID = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt 1:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2:SID = 1.00 Hz  
O1 = 2006.7504 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -39.94  
B = -33.79  
C = 0.00



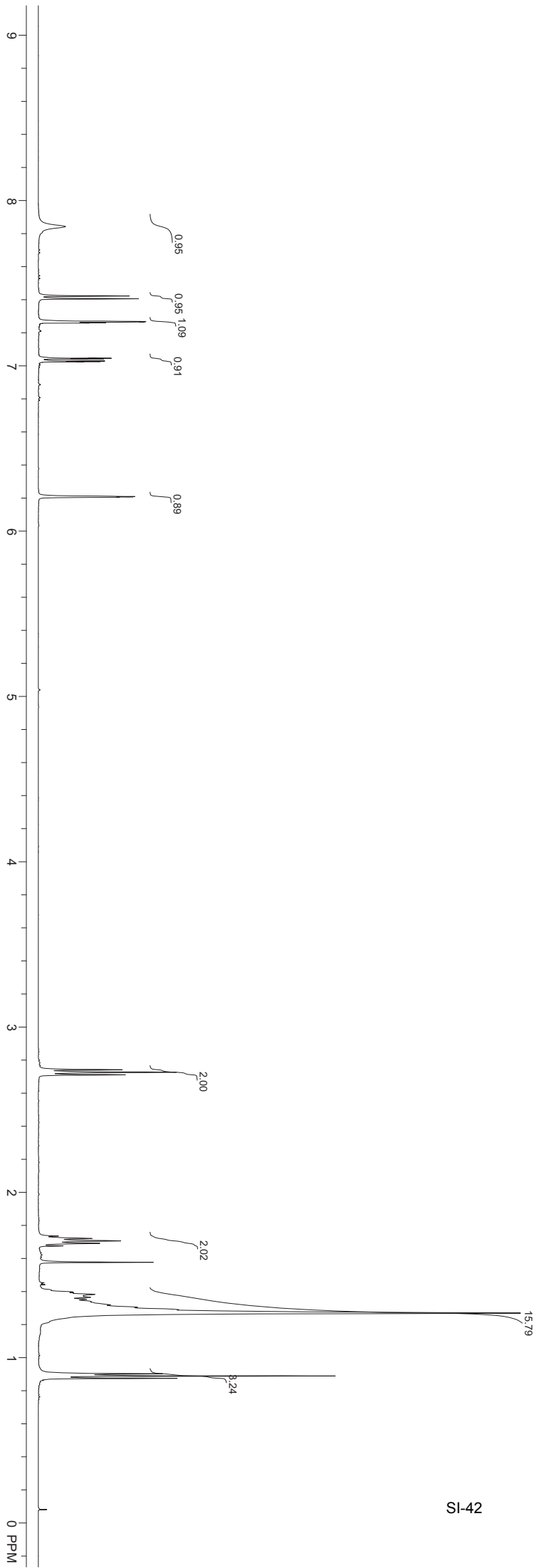
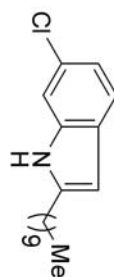
USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 7.775 usec  
Relaxation delay = 1.300 sec  
NA = 226

Solvent = cdcl3  
FID PTStid = 28040  
PTStid = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 28040.66 Hz  
AT1 = 1.00 sec  
Hz per Pt 1sID = 0.86 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2ndD = 1.00 Hz  
O1 = 10055.5137 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -76.41  
B = 9.84  
C = 0.00

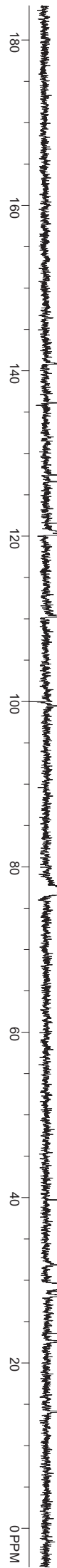
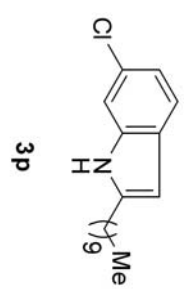


USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 7.075 usec  
Relaxation delay = 4.800 sec  
NA = 16

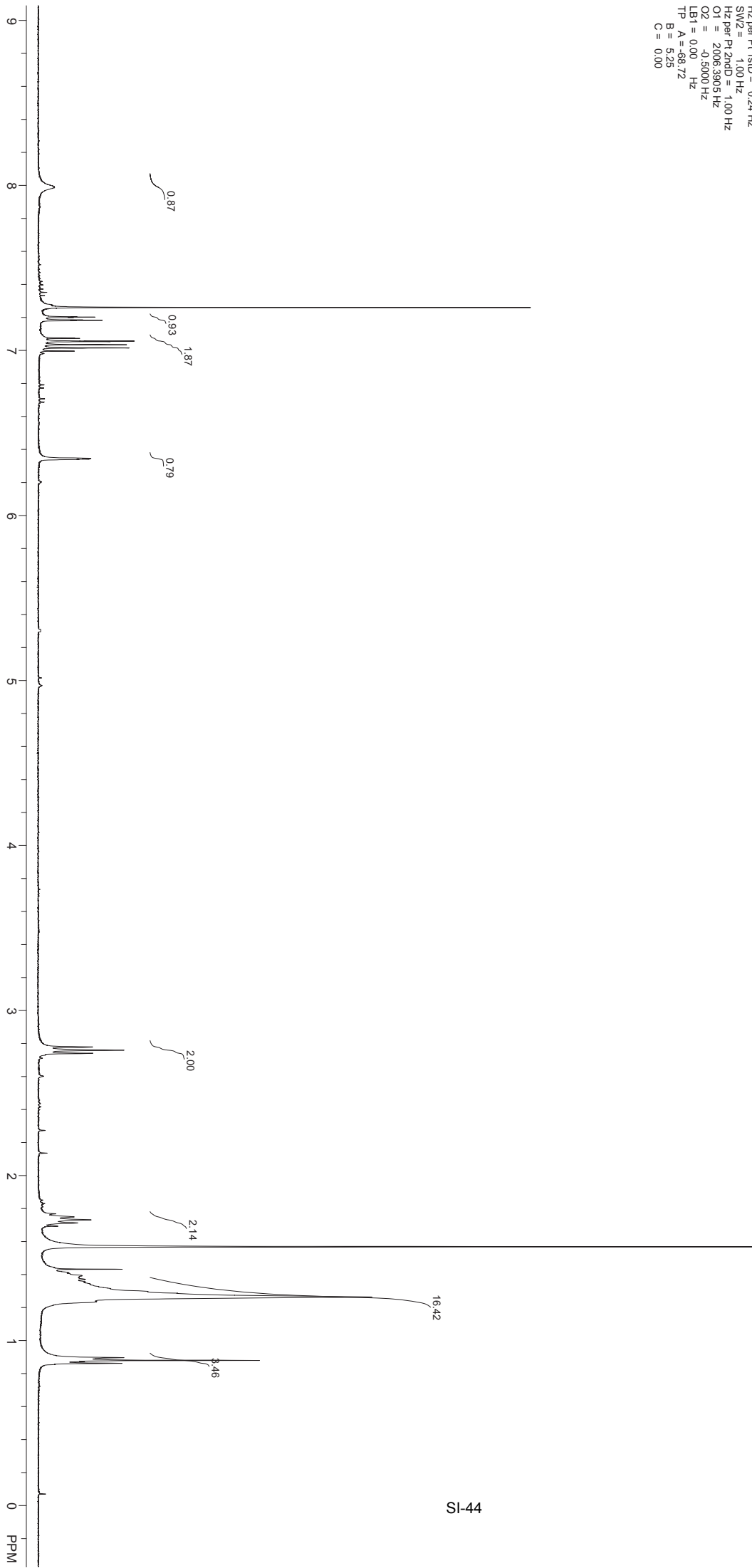
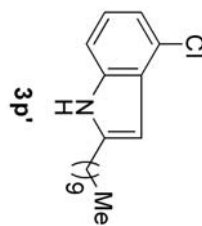
Solvent = cdcl3  
FID P1:SID = 20006  
PT:SID = 32768  
F1 = 499.858551 MHz  
F2 = 125.700813 MHz  
SW1 = 8002.40 Hz  
AT1 = 2.50 sec  
Hz per Pt:SID = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt:2hnd = 1.00 Hz  
O1 = 2496.3250 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -128.46  
B = 5.41  
C = 0.00



USER:  
SOLVENT: cdc13  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.000 sec  
NA = 1432  
Solvent = cdc13  
FID P1:SID = 19608  
PT:SID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1:SID = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2:SID = 1.00 Hz  
O1 = 10055.3262 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -24.84  
B = -26.72  
C = 0.00



USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 11.663 usec  
Relaxation delay = 4.800 sec  
NA = 16  
Solvent = cdcl3  
FID P1 S1 D = 20008  
PT S1 D = 32768  
F1 = 399.950684 MHz  
F2 = 100.575279 MHz  
SW1 = 8003.20 Hz  
AT1 = 2.50 sec  
Hz per Pt 1 S1 D = 0.24 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 hnd = 1.00 Hz  
O1 = 2006.3905 Hz  
O2 = -0.5000 Hz  
LB1 = 0.00 Hz  
TP A = -68.72  
B = 5.25  
C = 0.00



D:\Greenware\Nius 20080731\DATA\Syw-5-25-2-Cl-ec.fid  
Standard C13 Run using qnp probe  
Jan 21 2011

USER:  
SOLVENT: cdcl3  
Experiment = s2pul  
Pulse length = 7.000 usec  
Relaxation delay = 1.000 sec  
NA = 28810  
Solvent = cdcl3  
FID PT SID = 19581  
PT SID = 32768  
F1 = 100.577232 MHz  
F2 = 399.950684 MHz  
SW1 = 27972.03 Hz  
AT1 = 0.70 sec  
Hz per Pt 1 SID = 0.85 Hz  
SW2 = 1.00 Hz  
Hz per Pt 2 SID = 1.00 Hz  
O1 = 10056.1797 Hz  
O2 = -0.5000 Hz  
LB1 = 2.00 Hz  
TP A = -7.29  
B = -39.59  
C = 0.00

