

# **Selenochromanes via Tandem Homolytic Addition/Substitution Chemistry**

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## **Electronic Supplementary Information**

Characterisation data for all new compounds reported.

***O*-Ethyl-*S*-(2-benzylselenobenzyl)dithiocarbonate (6):**  $^1\text{H}$  NMR ( $\text{CDCl}_3$ )  $\delta$  7.51 (dd,  $J = 1.3, 7.7, 1\text{H}$ ), 7.43 (dd,  $J = 1.5, 7.6, 1\text{H}$ ), 7.27 – 7.19 (m, 4 H), 7.16 (ddd,  $J = 3.4, 5.9, 9.0, 3\text{H}$ ), 4.65 (q,  $J = 7.1, 2\text{H}$ ), 4.42 (s, 2 H), 4.09 – 4.06 (m, 2 H), 1.42 (t,  $J = 7.1, 3\text{H}$ );  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ )  $\delta$  213.91, 138.74, 138.20, 135.80, 131.75, 130.21, 128.86, 128.42, 128.34, 128.10, 126.96, 69.98, 41.22, 33.21, 13.81;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  327.75; IR (neat)  $\text{cm}^{-1}$ : 2980.1, 1741.6, 1493.7, 1453.0, 1213.12, 1109.7 ; MS (EI) 382 (1) 291 (28) 201 (17) 119.1 (9) 91.1 (100); HRMS calcd for  $\text{C}_{17}\text{H}_{18}\text{OS}_2\text{Se}$  [ $\text{M} + \text{Ag}$ ] 488.90097, found 488.90130.

**Methyl 3,4-dihydro-2H-1-benzoselenin-2-carboxylate (1,  $\text{R}=\text{CO}_2\text{Me}$ ):**  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.36 – 7.24 (m, 1H), 7.20 – 7.04 (m, 3H), 4.24 – 4.18 (m, 1H), 3.74 (s, 3H), 2.96 – 2.87 (m, 1H), 2.74 – 2.64 (m, 1H), 2.20 – 2.12 (m, 2H);  $\delta$   $^{13}\text{C}$  NMR (500 MHz  $\text{CDCl}_3$ )  $\delta$  173.13, 138.24, 129.26, 128.77, 128.40, 127.06, 125.83, 52.55, 35.43, 31.32, 25.69;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  305.168; IR (neat)  $\text{cm}^{-1}$ : 2949.1, 1731.0, 1433.6, 1307.4, 1234.7, 1157.6; MS (EI)  $m/z$  (relative intensity) 256 (66) 195 (31) 169 (23) 115.1 (100) 89.1 (18); HRMS calcd for  $\text{C}_{11}\text{H}_{12}\text{O}_2\text{Se}$  [ $\text{M}+\text{Ag}$ ] 362.90480, found 362.90491.

**Methyl 3,4-dihydro-2-methyl-2H-1-benzoselenin-2-carboxylate (10):**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.67 (d,  $J = 7.7, 1\text{H}$ ), 7.40 (d,  $J = 7.6, 1\text{H}$ ), 7.32 – 7.22 (m, 5H), 7.21 – 7.13 (m, 3H), 7.12 – 7.06 (m, 3H), 3.75 (s, 3H), 2.98 – 2.88 (m, 1H), 2.81 – 2.71 (m, 1H), 2.46 – 2.37 (m, 1H), 1.86 – 1.81 (m, 3H);  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  425.708; MS (EI)  $m/z$  (relative intensity) 270.1 (100) 211 (64) 195 (27) 183 (25) 169 (34) 130.1 (65) 115.1 (24) 91.1 (22); HRMS calcd for  $\text{C}_{12}\text{H}_{14}\text{O}_2\text{Se}$  [ $\text{M}+\text{Ag}$ ] 376.92045, found 376.92053.

**Compound 11:** mp 193 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.45 – 7.40 (m, 1H), 7.28 – 7.05 (m, 6H), 6.71 (d,  $J = 7.3, 2\text{H}$ ), 4.49 (q,  $J = 14.6, 2\text{H}$ ), 4.27 (d,  $J = 9.5, 1\text{H}$ ), 3.60 (dt,  $J = 4.6, 9.4, 1\text{H}$ ), 3.39 (dd,  $J = 4.2, 13.9, 1\text{H}$ ), 2.93 (dd,  $J = 5.0, 13.9, 1\text{H}$ );  $^{13}\text{C}$  NMR ( $\text{CDCl}_3$ )  $\delta$  176.81, 176.68, 137.00, 134.86, 131.90, 129.65, 128.47, 128.42, 128.38, 128.18, 127.36, 127.25, 43.28, 42.48, 36.91, 35.20;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  320.312; IR (neat)  $\text{cm}^{-1}$ : 1773.9, 1698.8, 1426.6, 1395.3, 1339.8, 1168.2; MS (EI)  $m/z$  (relative

intensity) 357.1 (94) 276.1 (12) 195 (75) 186 (30) 168.9 (30) 115 (100) 106.1 (29) 91.1 (100) 89 (24) 65 (21); Anal. Calc. for C<sub>18</sub>H<sub>15</sub>NO<sub>2</sub>Se: C 60.68, H 4.24; found C 60.79, H 4.01.

**Benzyl 3,4-dihydro-2H-1-benzoselenin-2-carboxylate (13):** <sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>) δ 7.43 – 7.25 (m, 6H), 7.13 – 7.04 (m, 3H), 5.23 – 5.12 (m, 2H), 4.29 – 4.20 (m, 1H), 2.96 – 2.85 (m, 1H), 2.74 – 2.62 (m, 1H), 2.24 – 2.11 (m, 2H); <sup>13</sup>C NMR (CDCl<sub>3</sub>) 172.431, 138.255, 135.515, 129.209, 128.762, 128.528, 128.447, 128.271, 128.088, 127.019, 125.803, 67.031, 35.499, 31.288, 25.604; <sup>77</sup>Se NMR (CDCl<sub>3</sub>) δ 305.785; IR (neat) cm<sup>-1</sup>: 2928.6, 1732.4, 1454.8, 1441.1; MS (EI) *m/z* (relative intensity) 332.1 (30) 241 (18) 195 (54) 169 (12) 116.1 (80) 91.1 (100) 65.1 (13); HRMS calcd for C<sub>17</sub>H<sub>16</sub>O<sub>2</sub>Se [M+Ag] 438.93610, found 438.93622.

**Compound 14:** mp 210-211 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) δ 7.52 (d, J = 7.3, 1H), 7.36 – 7.21 (m, 3H), 4.45 (d, J = 10.5, 1H), 3.89 – 3.82 (m, 1H), 3.37 (dd, J = 4.5, 14.2, 1H), 2.96 (dd, J = 4.9, 14.2, 1H); <sup>13</sup>C NMR (500 MHz, CDCl<sub>3</sub>) δ 171.72, 171.26, 136.10, 131.89, 129.87, 128.89, 128.77, 127.66, 44.08, 35.25, 34.93; IR (neat) cm<sup>-1</sup>: 1849.4, 1787.5, 1693.7, 1464.3, 1443.5, 1423.0.

**O-Ethyl-S-(2-benzylseleno-5-nitrobenzyl)dithiocarbonate (15):** mp 77-78 °C; <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) δ 8.28 (d, J 2.4, 1H), 8.01 (dd, J 2.5, 8.6, 1H), 7.58 (d, J 8.6, 1H), 7.34 – 7.22 (m, 5H), 4.66 (q, J 7.1, 2H), 4.43 (s, 2H), 4.26 – 4.22 (m, 2H), 1.46 – 1.42 (m, 3H); <sup>13</sup>C NMR (CDCl<sub>3</sub>) δ 212.81, 146.84, 143.01, 139.27, 136.79, 133.03, 129.38, 129.17, 128.02, 124.97, 122.98, 70.95, 40.44, 33.18, 14.17; <sup>77</sup>Se NMR (CDCl<sub>3</sub>) δ 342.222; IR (neat) cm<sup>-1</sup>: 3063.0, 2981.2, 1569.9, 1512.3, 1453.8, 1338.2, 1216.3, 1037.4. HRMS calcd for C<sub>17</sub>H<sub>17</sub>NO<sub>3</sub>S<sub>2</sub>Se [M+Ag] 533.88605, found 533.79749.

**O-Ethyl-S-(2-benzylseleno-3-pyridyl)dithiocarbonate (16):** <sup>1</sup>H NMR (CDCl<sub>3</sub>) δ 8.41 (dd, J 1.7, 4.8, 1H), 7.60 (dd, J 1.8, 7.6, 1H), 7.37 (d, J 7.3, 2H), 7.26 (t, J 7.3, 2H), 7.19 (t, J 7.3, 1H), 7.03 (dd, J 4.8, 7.6, 1H), 4.62 (q, J 7.1, 2H), 4.54 (d, J 4.3, 2H), 4.31 (s, 2 H), 1.38 (t, J 7.1, 3H); <sup>13</sup>C NMR (CDCl<sub>3</sub>) δ 213.31, 156.44, 148.66, 138.98, 136.67,

131.72, 129.15, 128.48, 126.89, 120.20, 70.32, 38.41, 30.02, 13.78. ;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  388.103; IR (neat)  $\text{cm}^{-1}$ : 2980.4, 1573.15, 1493.5, 1397.5, 1212.4, 1109.4 ; MS (EI) 383 (1) 291.9 (18) 201.9 (24) 182.1 (18) 91.1 (100); HRMS calcd for  $\text{C}_{16}\text{H}_{17}\text{NOS}_2\text{Se}$  [M+Ag] 489.89622, found 489.89647.

**Compound 17:**  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.32 – 7.25 (m, 1H), 7.24 – 7.20 (m, 1H), 7.18 – 7.13 (m, 2H), 7.10 – 7.06 (m, 2H), 4.42 (dd,  $J = 1.1, 4.5$ , 1H), 3.75 (s, 3H), 3.73 (s, 3H), 3.47 (dd,  $J = 11.2, 16.2$ , 1H), 3.31 (dd,  $J = 2.7, 16.5$ , 1H), 3.06 – 3.00 (m, 1H);  $^{13}\text{C}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  172.06, 135.57, 130.41, 129.00, 128.55, 127.78, 127.21, 125.68, 52.58, 52.44, 41.82, 33.48, 30.64;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  318.029; MS (EI)  $m/z$  (relative intensity) 314.1 (40) 254 (12) 195 (100) 115.1 (46); HRMS calcd for  $\text{C}_{13}\text{H}_{14}\text{O}_4\text{Se}$  [M+Ag] 420.91028, found 420.91040.

**Compound 18:** mp 212-214 °C;  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  7.98 (d,  $J = 2.4$ , 1H), 7.89 (dd,  $J = 2.5, 8.4$ , 1H), 7.51 (d,  $J = 8.4$ , 1H), 7.13 (t,  $J = 7.3$ , 1H), 7.05 (t,  $J = 7.5$ , 2H), 6.88 (d,  $J = 7.3$ , 2H), 4.52 – 4.40 (m, 2H), 4.34 (d,  $J = 9.5$ , 1H), 3.71 – 3.62 (m, 1H), 3.49 (dd,  $J = 4.0, 14.0$ , 1H), 2.92 (dd,  $J = 5.1, 14.0$ , 1H);  $^{13}\text{C}$  NMR (400 MHz)  $\text{CDCl}_3$   $\delta$  175.807, 175.722, 147.508, 138.150, 137.770, 134.975, 132.485, 128.401, 128.105, 127.856, 123.878, 122.750, 42.864, 42.739, 37.539, 35.576;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  344.802; IR (neat)  $\text{cm}^{-1}$ : 1769.1, 1699.4, 1509.4, 1395.5, 1332.9; HRMS calcd for  $\text{C}_{18}\text{H}_{14}\text{N}_2\text{O}_4$  [M+Ag] 508.91642, found 508.91652

**Compound 19:** mp 162 °C;  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  8.35 (dd,  $J = 1.4, 4.8$ , 1H), 7.43 (dd,  $J = 1.4, 7.6$ , 1H), 7.21 – 7.10 (m, 3H), 7.04 (dd,  $J = 4.8, 7.5$ , 1H), 6.92 (dt,  $J = 2.4, 4.0$ , 2H), 4.51 (q,  $J = 14.4$ , 2H), 4.38 (d,  $J = 9.4$ , 1H), 3.58 (dt,  $J = 4.8, 9.5$ , 1H), 3.30 (dd,  $J = 4.7, 14.2$ , 1H), 2.92 (dd,  $J = 4.8, 14.2$ , 1H);  $^{13}\text{C}$  NMR (500 MHz,  $\text{CDCl}_3$ )  $\delta$  176.577, 176.496, 153.925, 149.384, 136.903, 135.240, 133.529, 128.790, 127.948, 127.893, 122.887, 42.956, 42.799, 37.316, 34.448;  $^{77}\text{Se}$  NMR ( $\text{CDCl}_3$ )  $\delta$  372.290; IR (neat)  $\text{cm}^{-1}$ : 2916.8, 1775.6, 1703.6, 1561.8, 1421.3, 1400.1, 1341.6; HRMS calcd for  $\text{C}_{17}\text{H}_{14}\text{N}_2\text{O}_2\text{Se}$  [M+Ag] 464.92659, found 464.92680.

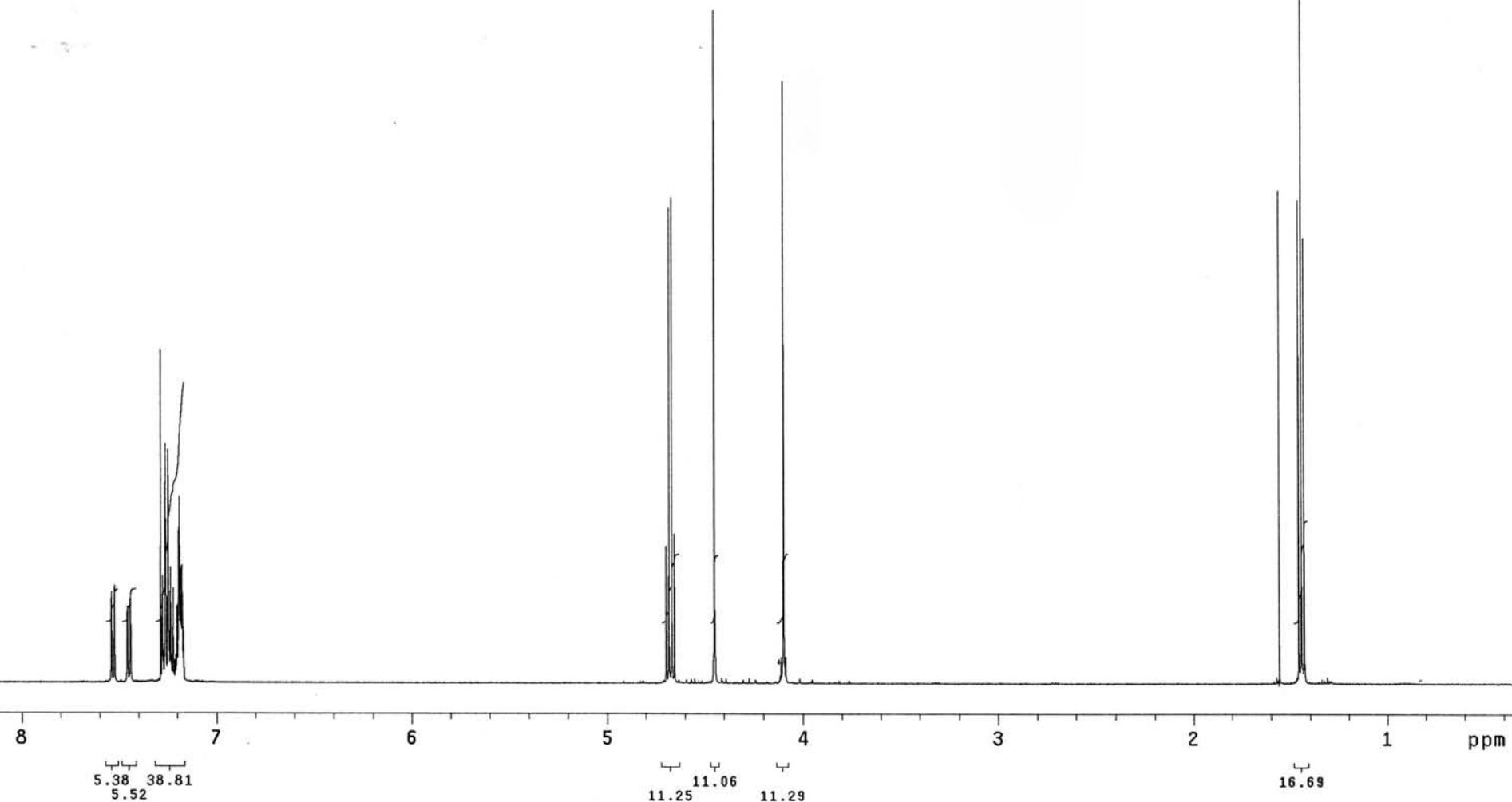
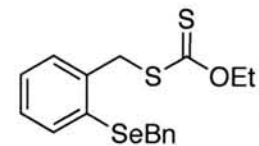
Std proton

File: xp

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Operator: chs  
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4 repetitions  
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DATA PROCESSING  
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Total time 0 min, 16 sec



Std carbon

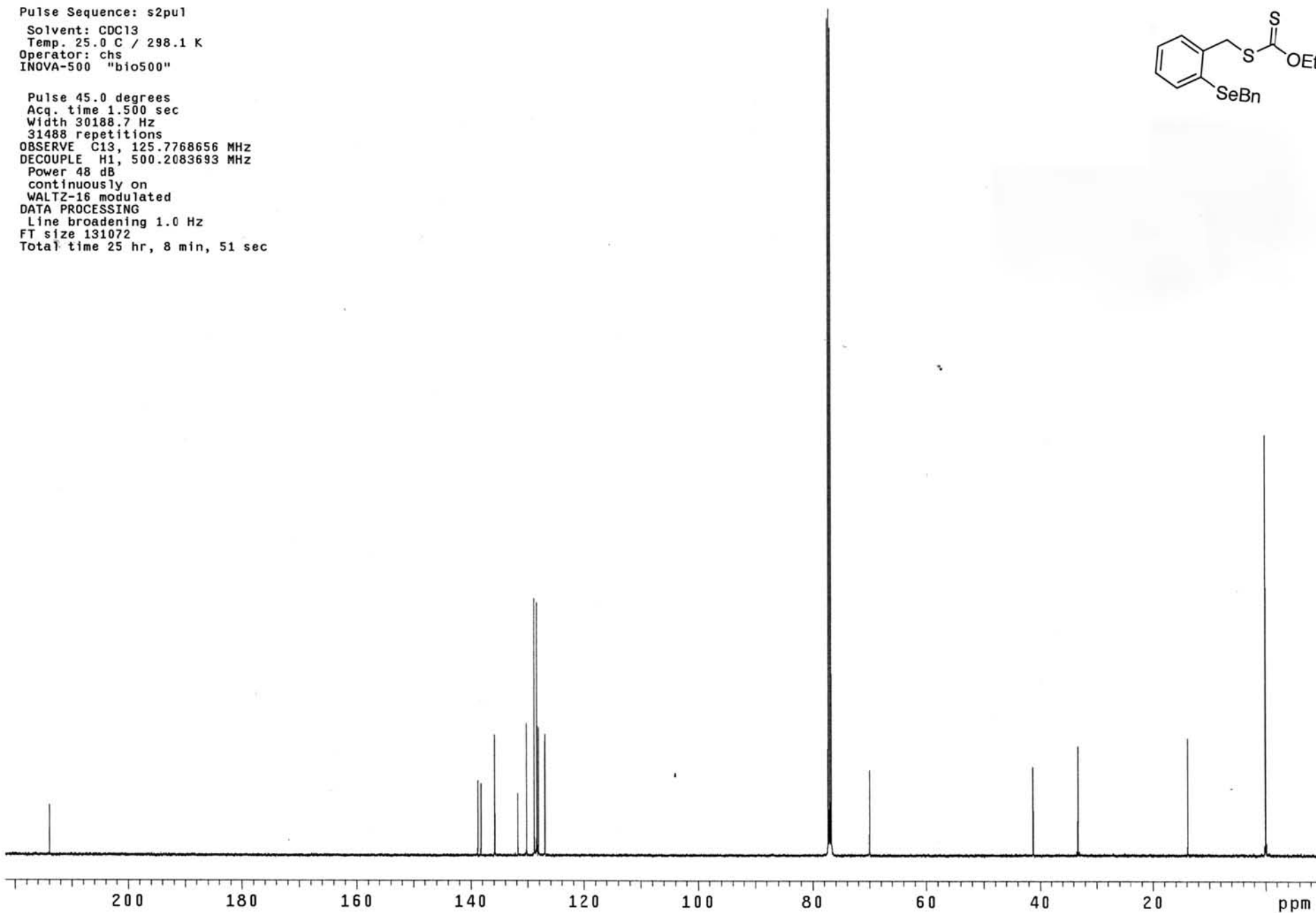
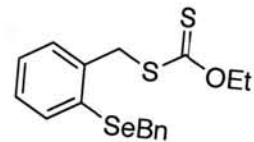
Supplementary Material (ESI) for Chemical Communications  
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File: xp

Pulse Sequence: s2pu1

Solvent: CDCl<sub>3</sub>  
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Operator: chs  
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Pulse 45.0 degrees  
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Width 30188.7 Hz  
31488 repetitions  
OBSERVE C13, 125.7768656 MHz  
DECOUPLE H1, 500.2083693 MHz  
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continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 25 hr, 8 min, 51 sec

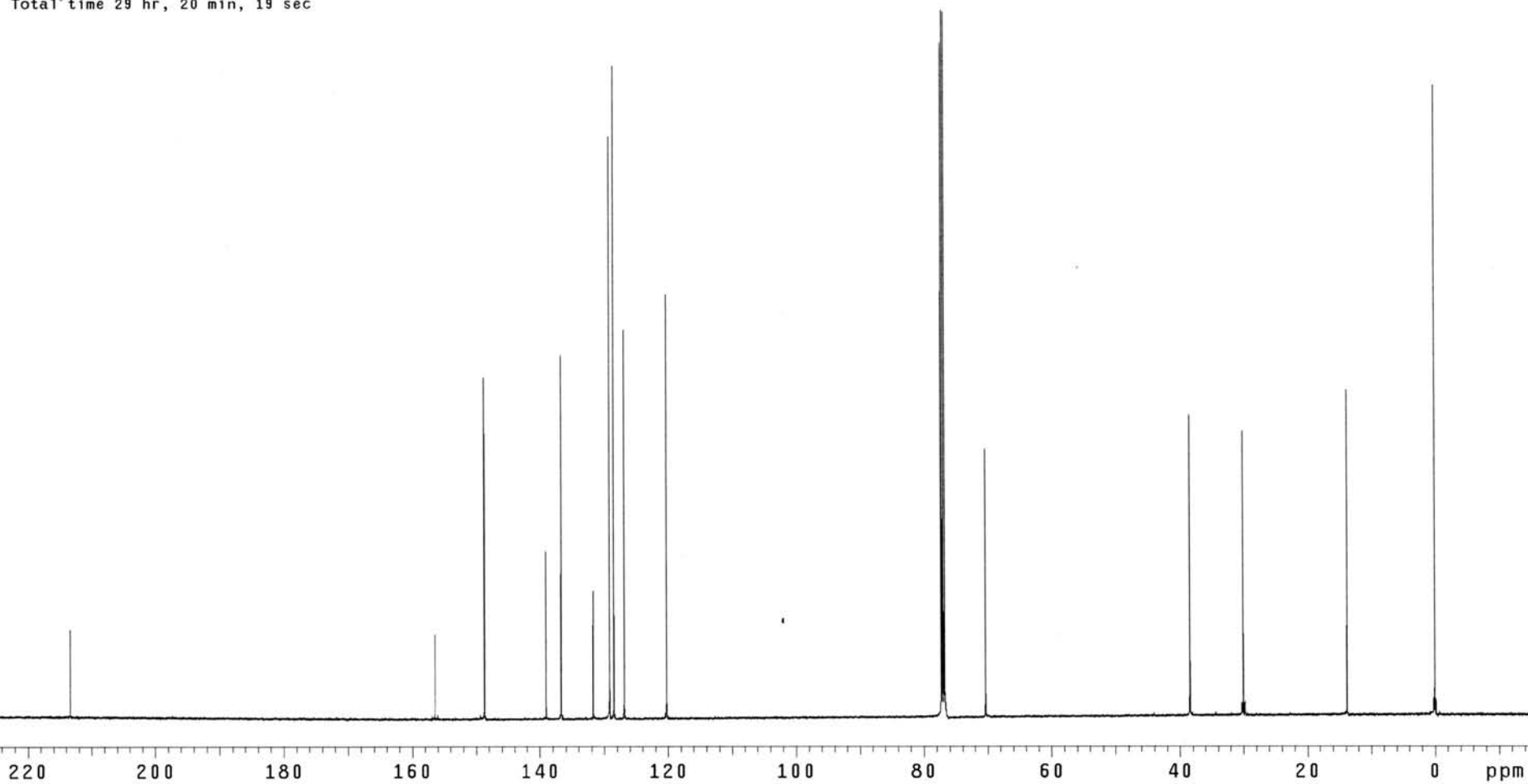
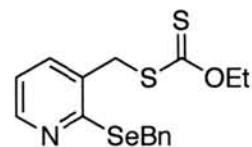




Std carbon

File: xp

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32912 repetitions  
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DECOUPLE H1, 500.2083693 MHz  
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continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
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Total time 29 hr, 20 min, 19 sec



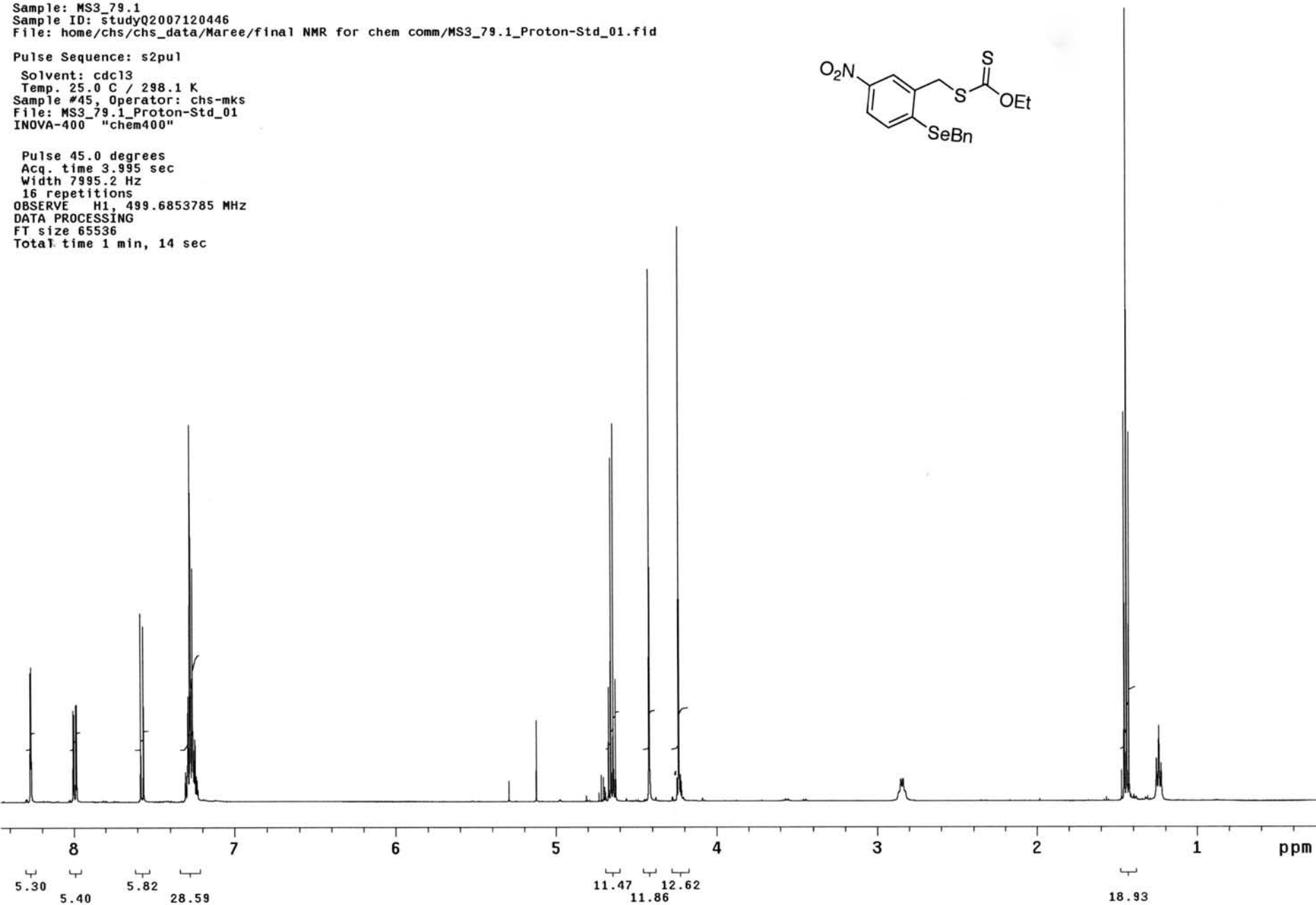
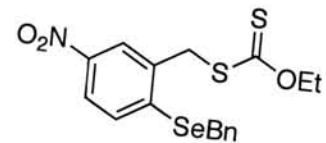
MS3\_79.1  
pad=10 run with findz0 before acquisition  
pad=10 run with gradshim before acquisition

Supplementary Material (ESI) for Chemical Communications  
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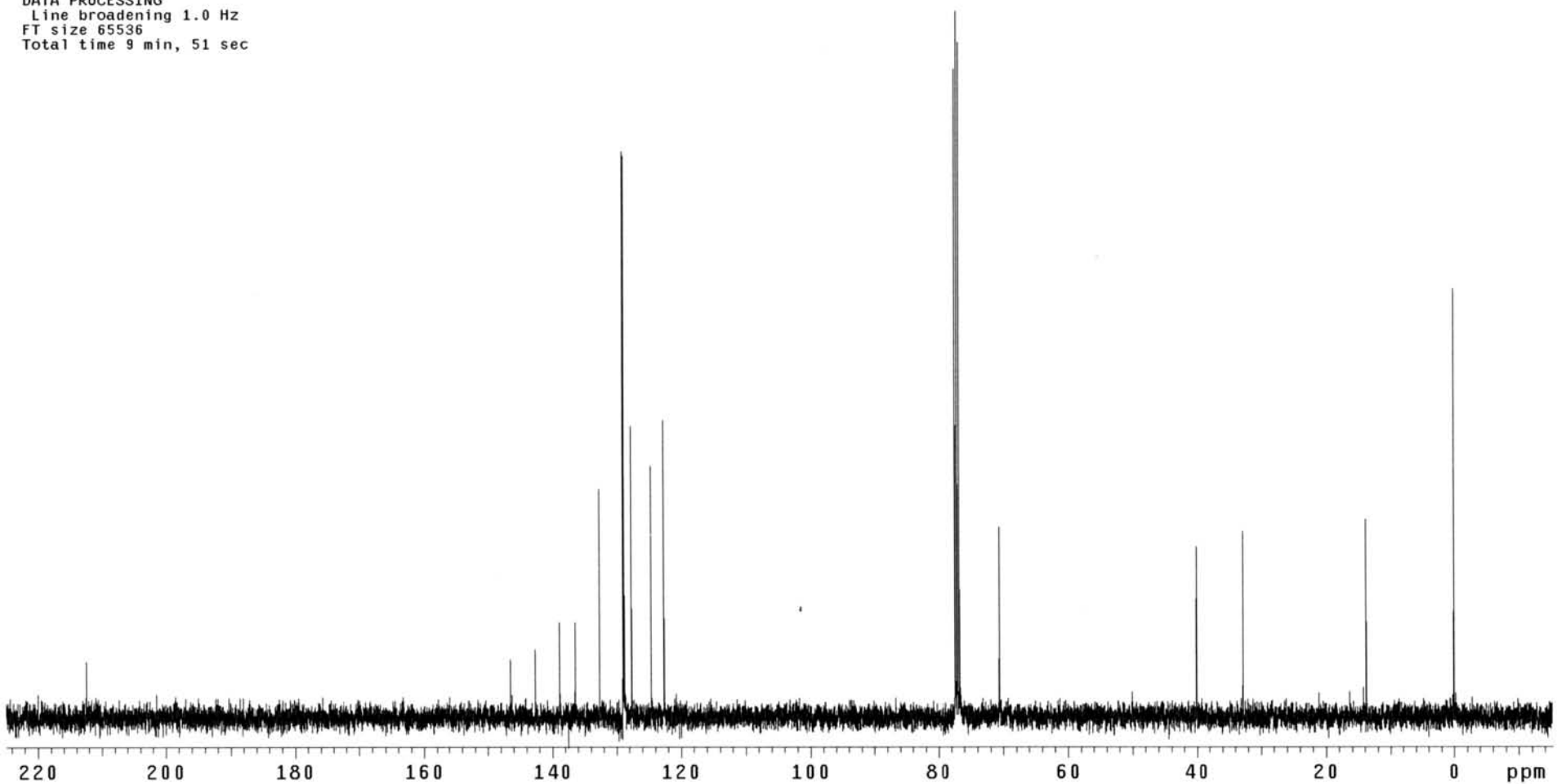
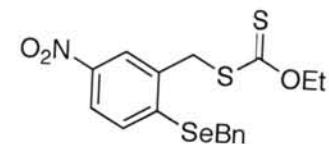


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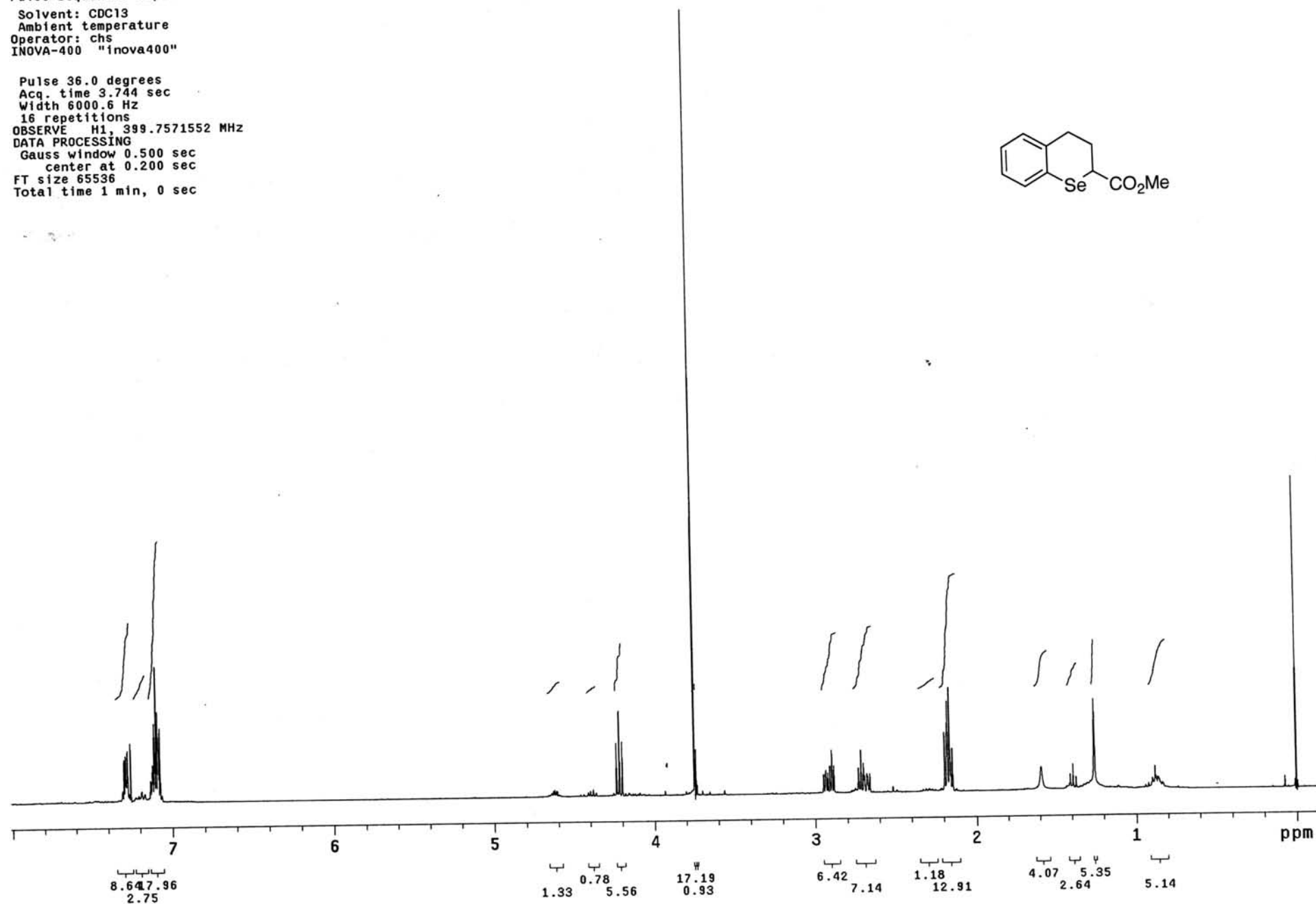
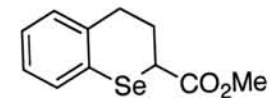
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DECOUPLE H1, 399.7526414 MHz  
Power 44 dB  
continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 65536  
Total time 9 min, 51 sec



Pulse Sequence: s2pu1  
Solvent: CDCl3  
Ambient temperature  
Operator: chs  
INOVA-400 "inova400"

Pulse 36.0 degrees  
Acq. time 3.744 sec  
Width 6000.6 Hz  
16 repetitions  
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center at 0.200 sec  
FT size 65536  
Total time 1 min, 0 sec



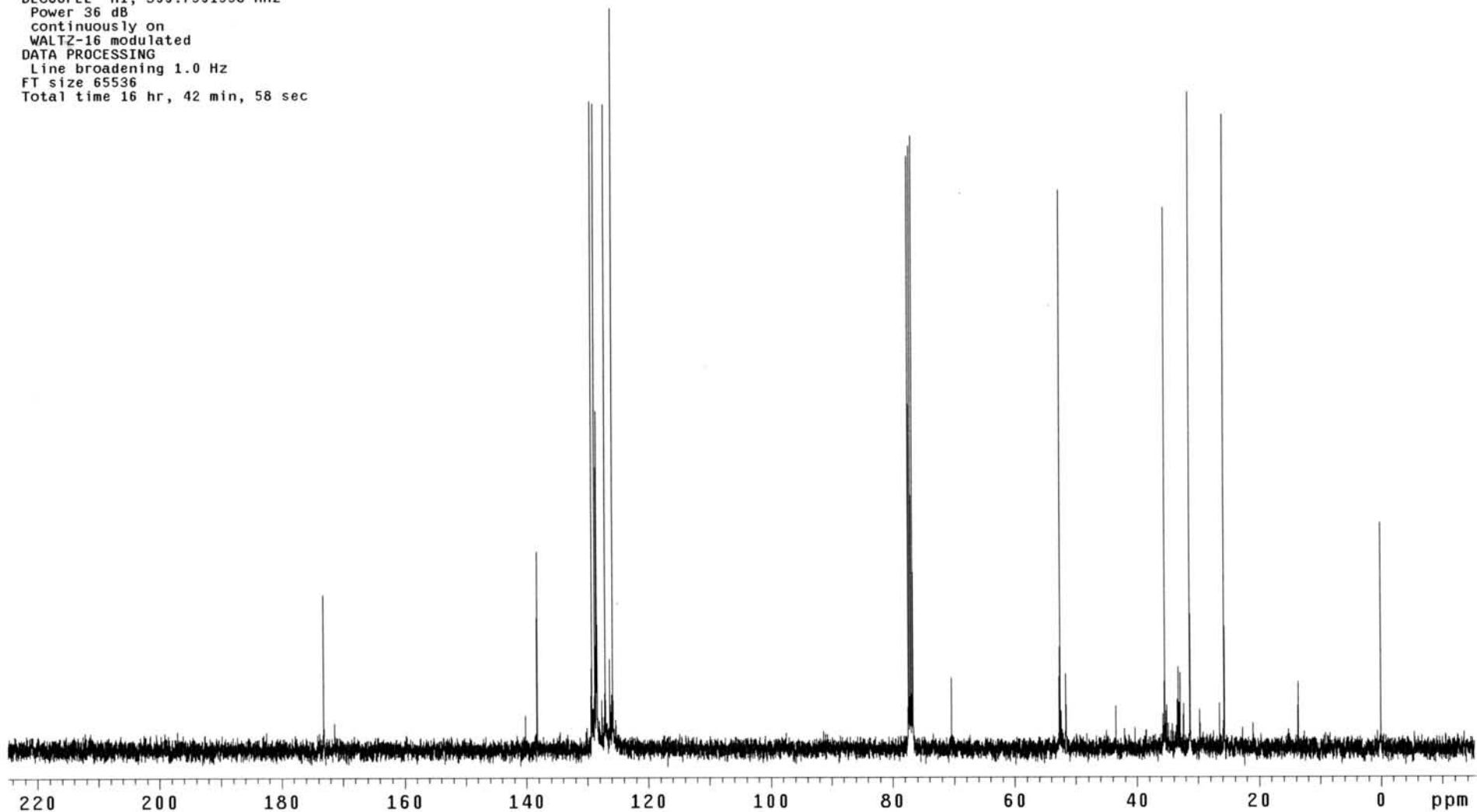
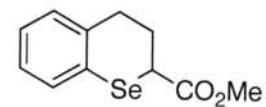
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4/5/06

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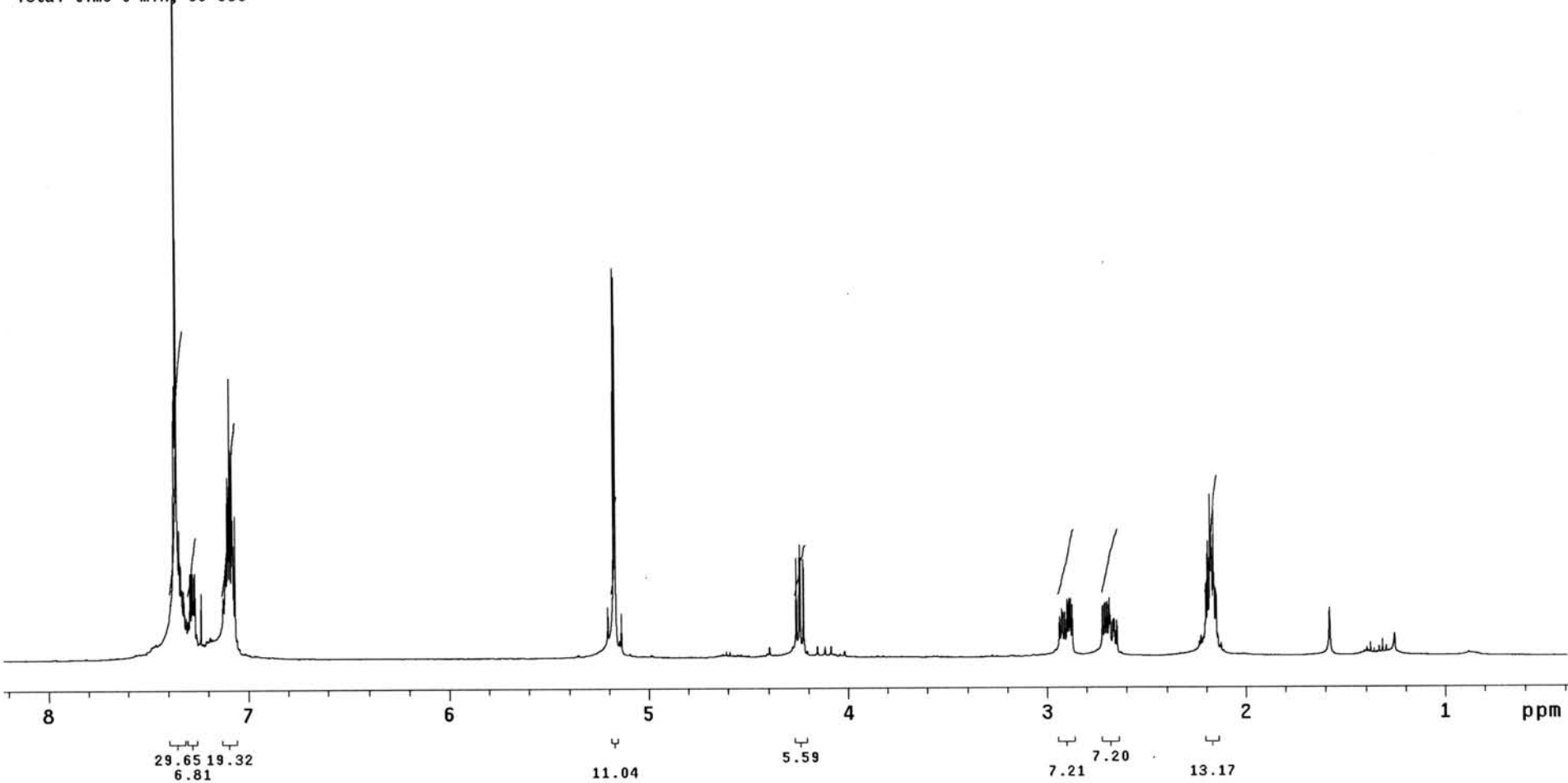
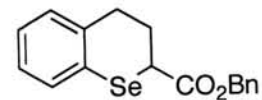
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DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 65536  
Total time 16 hr, 42 min, 58 sec



Sample: MS1\_26.2F29-40  
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Ambient temperature  
Operator: chs  
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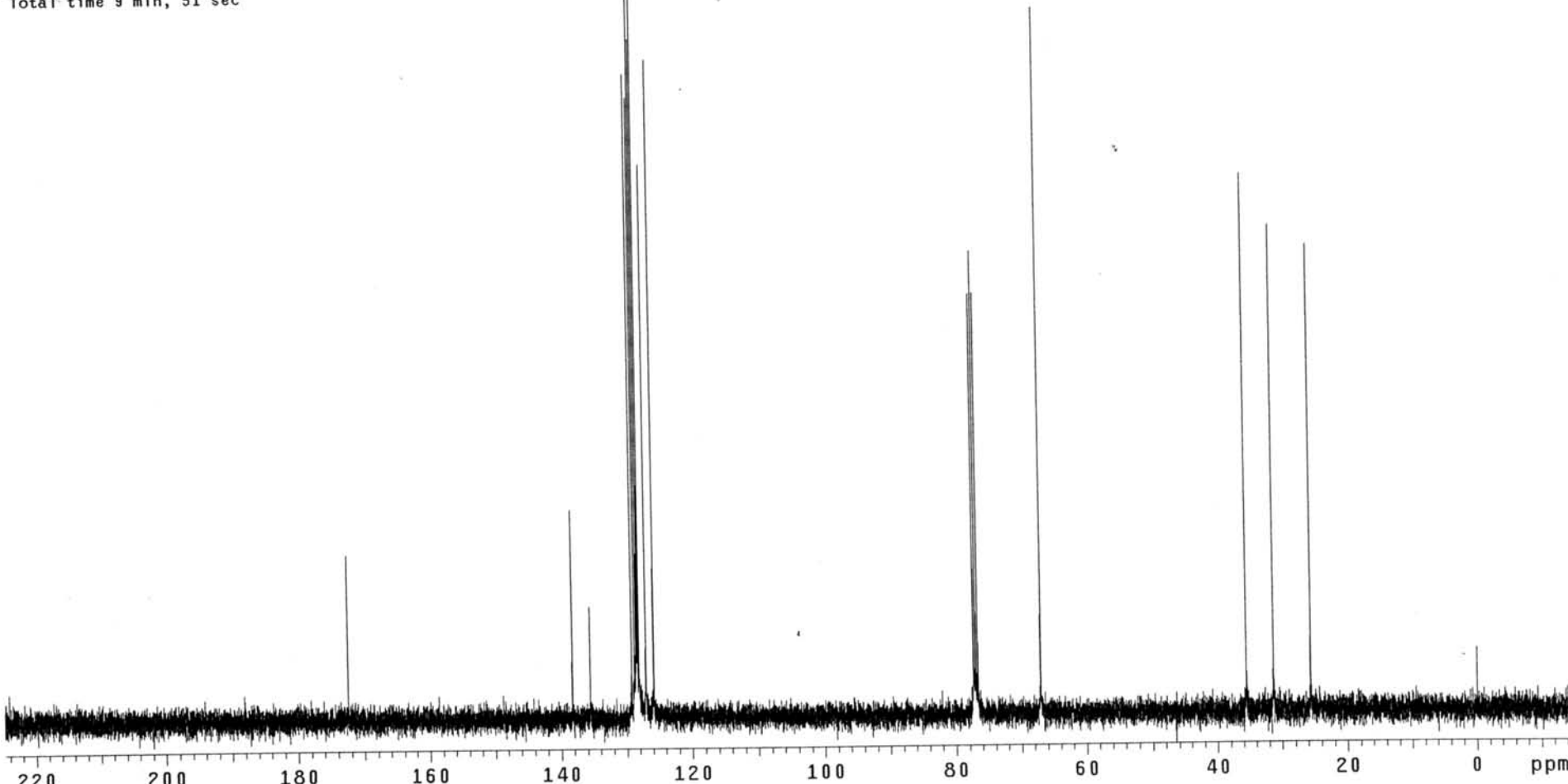
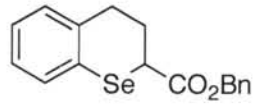
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DATA PROCESSING  
Line broadening 0.2 Hz  
FT size 65536  
Total time 0 min, 55 sec



242

Sample: MS1\_26-29-40C13  
Pulse Sequence: s2pu1  
Solvent: cdc13  
Ambient temperature  
Operator: chs  
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Pulse 45.0 degrees  
Acq. time 1.300 sec  
Width 24125.5 Hz  
192 repetitions  
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DECOUPLE H1, 399.7591558 MHz  
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FT size 65536  
Total time 9 min, 51 sec



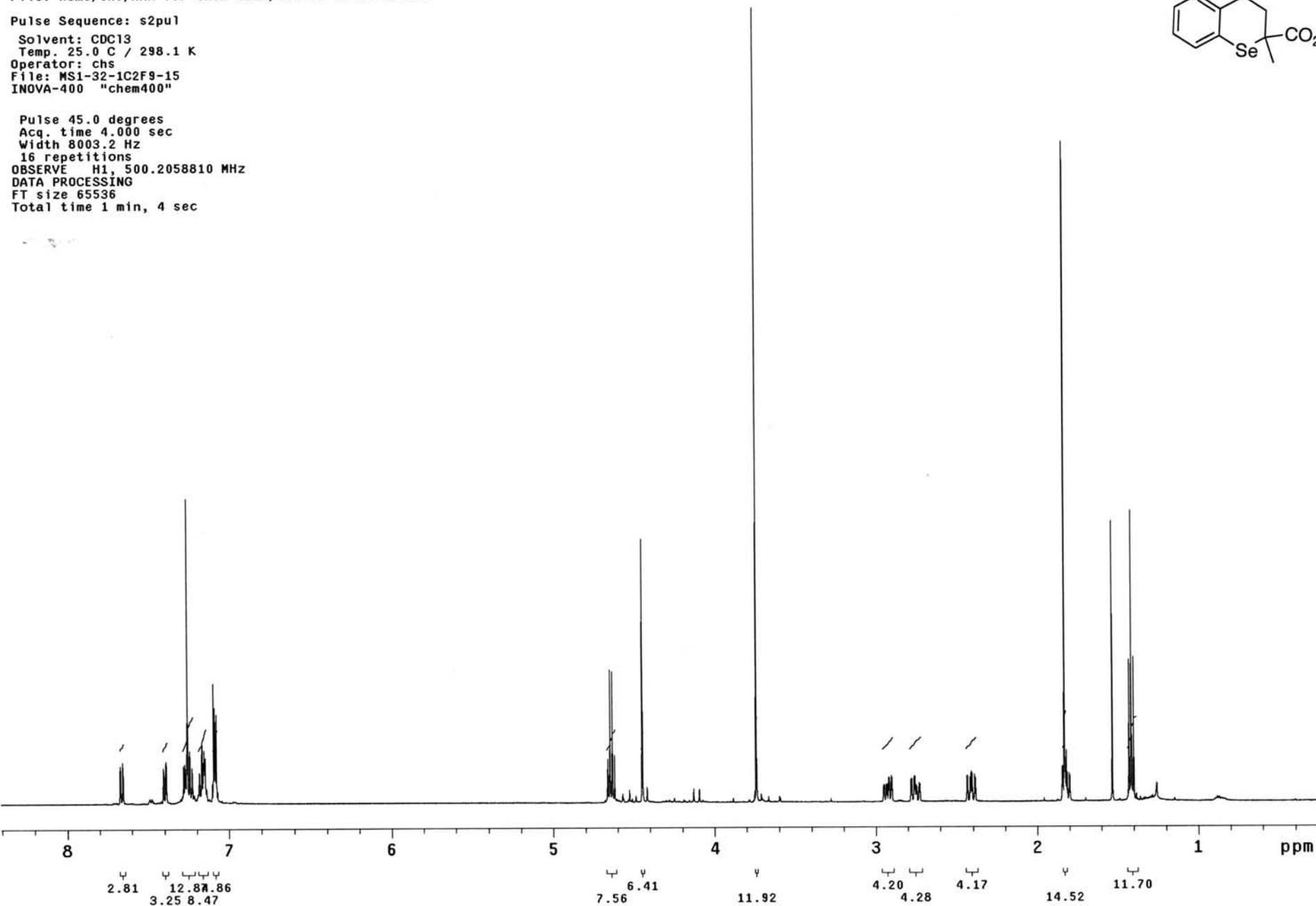
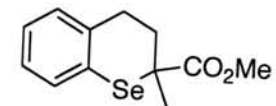
Std proton

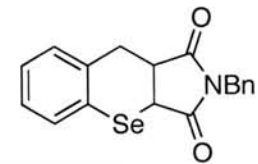
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Operator: chs  
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Pulse 45.0 degrees  
Acq. time 4.000 sec  
Width 8003.2 Hz  
16 repetitions  
OBSERVE H1, 500.2058810 MHz  
DATA PROCESSING  
FT size 65536  
Total time 1 min, 4 sec

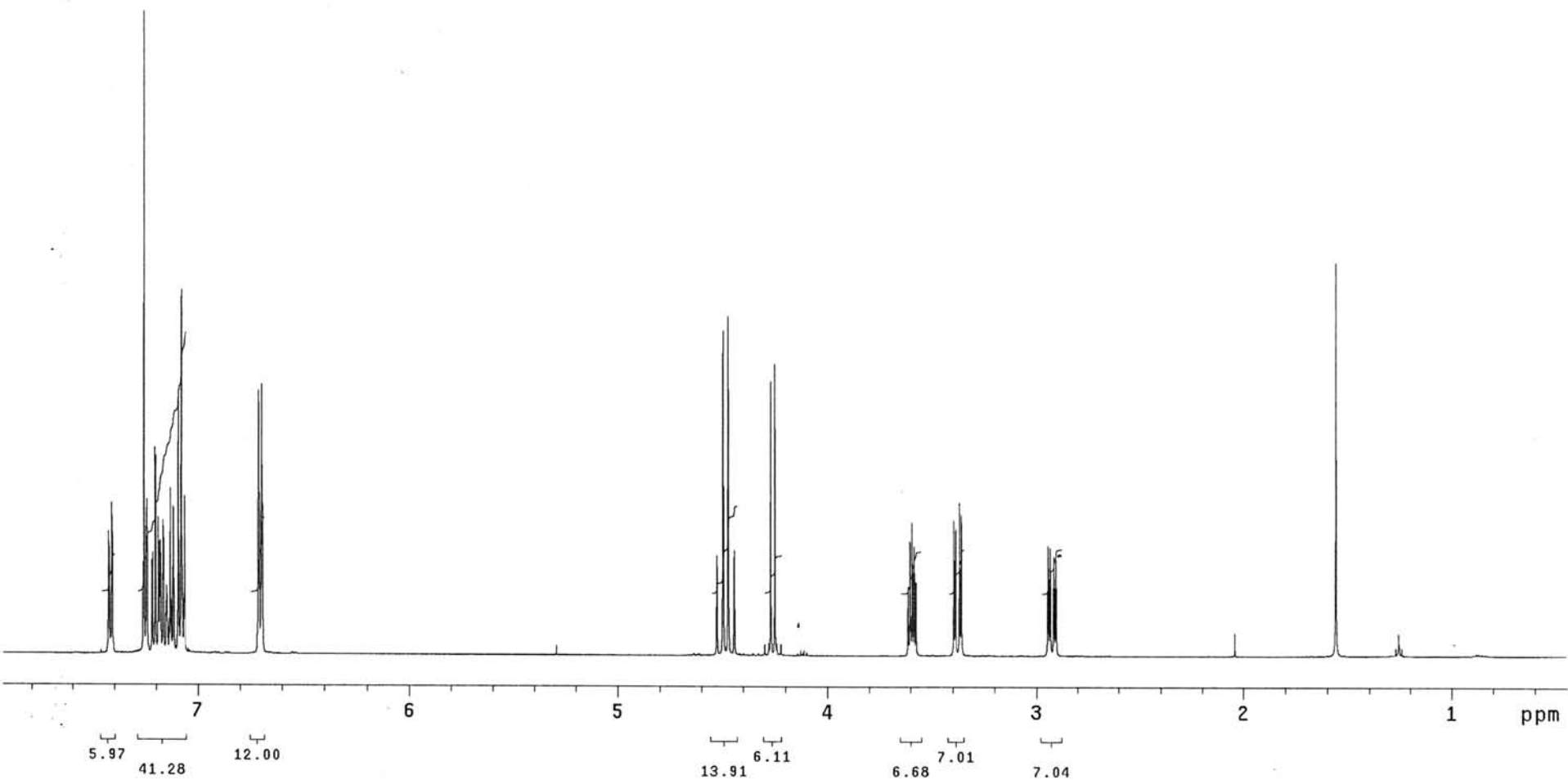




Sample: MS-53  
Sample ID: Aug14\_18\_01  
File: /home/walkup/Chs-mks\_data09/Aug09/MS-53\_Proton-Std-01.fid

Pulse Sequence: s2pu1  
Solvent: cdc13  
Temp. 25.0 C / 298.1 K  
Sample #18, Operator: chs-mks  
File: MS-53\_Proton-Std-01  
INOVA-500 "chem500"

Pulse 45.0 degrees  
Acq. time 4.000 sec  
Width 7995.2 Hz  
32 repetitions  
OBSERVE H1, 499.6853768 MHz  
DATA PROCESSING  
FT size 131072  
Total time 2 min, 8 sec





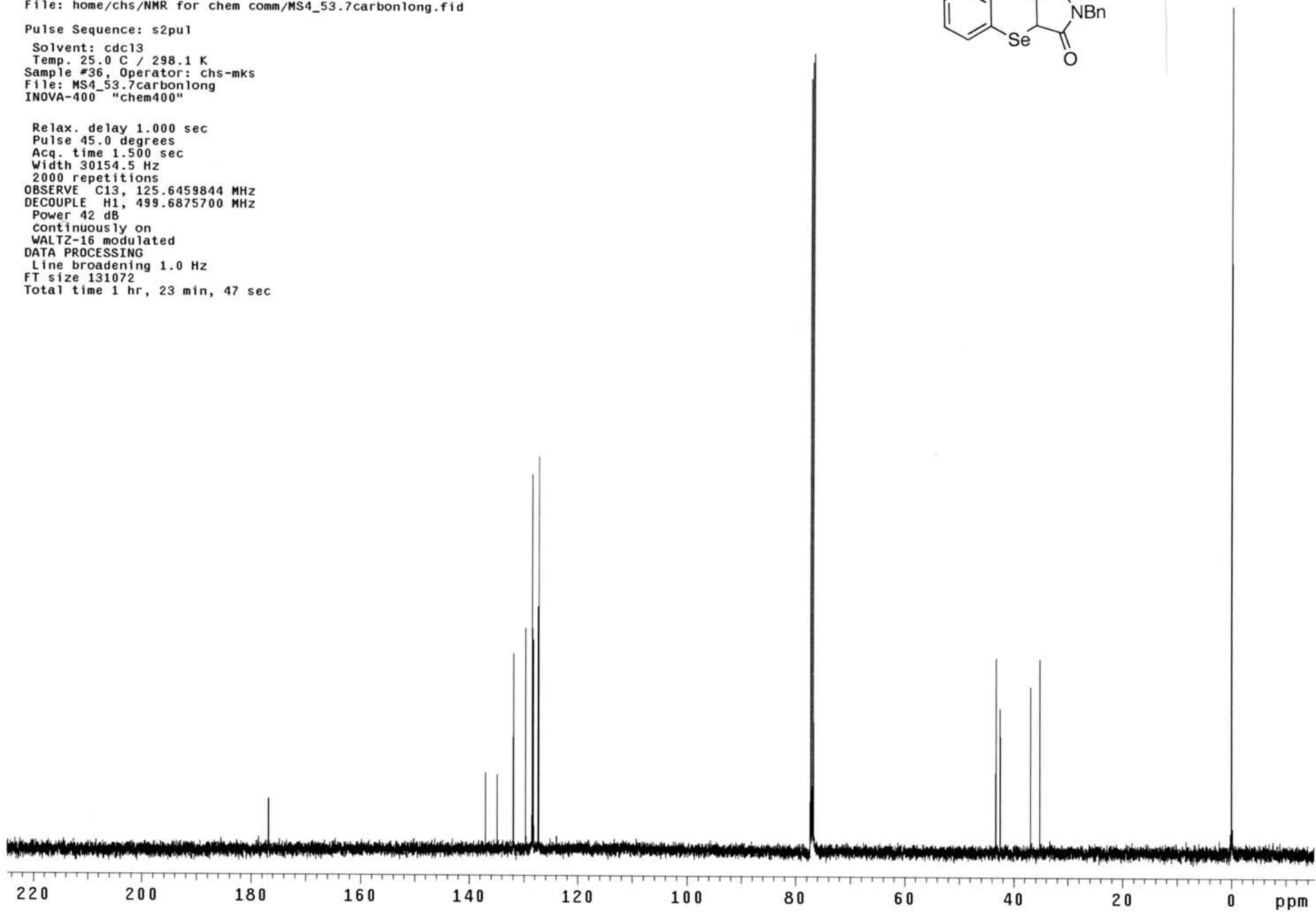
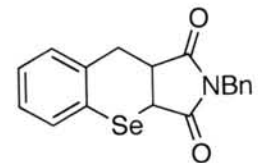
pad=10 run with findz0 before acquisition  
pad=10 run with gradshim before acquisition

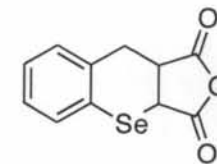
Sample ID: study02008050804  
File: home/chs/NMR for chem comm/MS4\_53.7carbonlong.fid

Pulse Sequence: s2pu1

Solvent: cdc13  
Temp. 25.0 C / 298.1 K  
Sample #36, Operator: chs-mks  
File: MS4\_53.7carbonlong  
INOVA-400 "chem400"

Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 1.500 sec  
Width 30154.5 Hz  
2000 repetitions  
OBSERVE C13, 125.6459844 MHz  
DECOUPLE H1, 499.6875700 MHz  
Power 42 dB  
continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 1 hr, 23 min, 47 sec



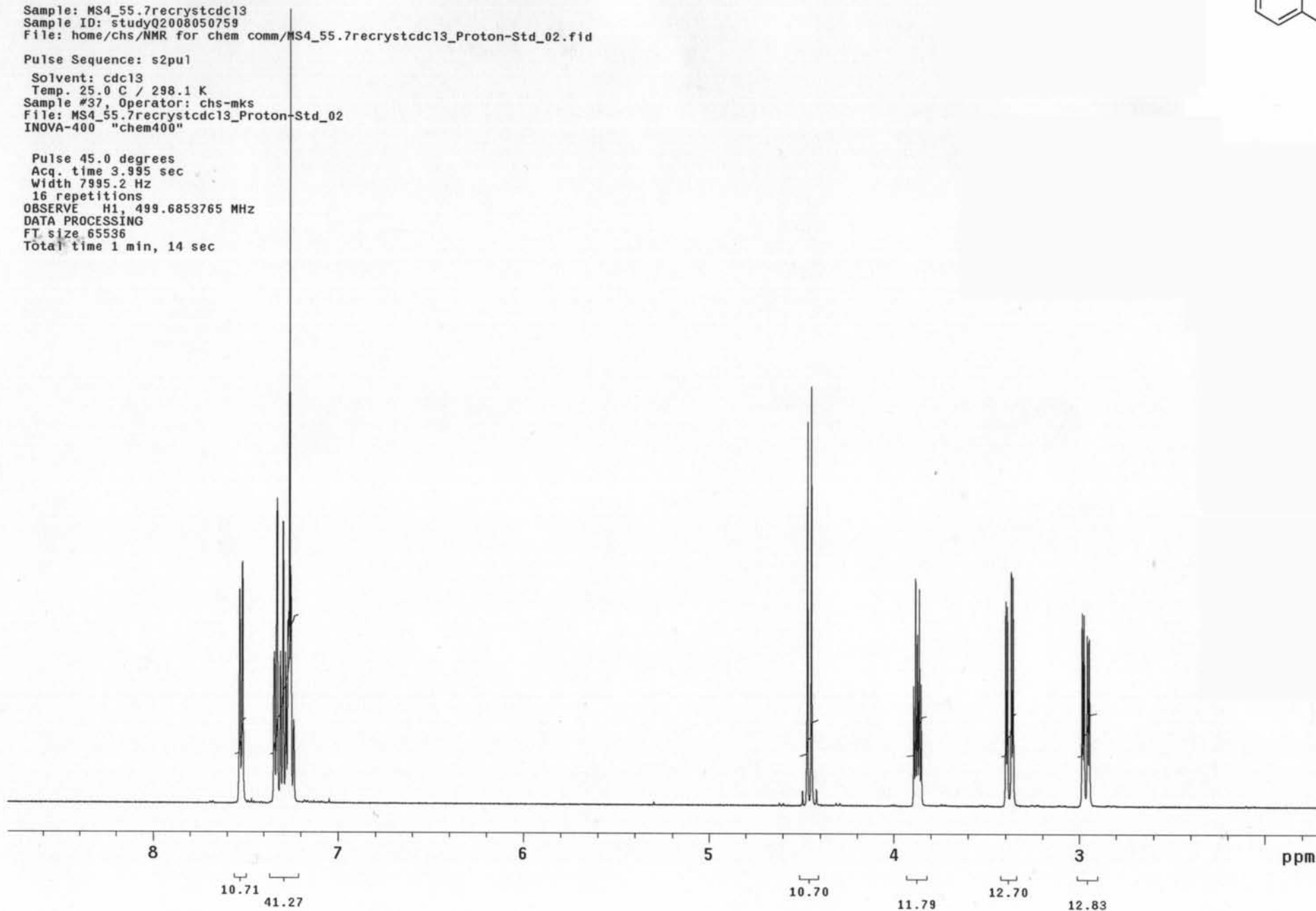


pad=10 run with findz0 before acquisition  
pad=10 run with gradshim before acquisition

Sample: MS4\_55.7recrystcdc13  
Sample ID: studyQ2008050759  
File: home/chs/NMR for chem comm/MS4\_55.7recrystcdc13\_Proton-Std\_02.fid

Pulse Sequence: s2pu1  
Solvent: cdc13  
Temp. 25.0 C / 298.1 K  
Sample #37, Operator: chs-mks  
File: MS4\_55.7recrystcdc13\_Proton-Std\_02  
INOVA-400 "chem400"

Pulse 45.0 degrees  
Acq. time 3.995 sec  
Width 7995.2 Hz  
16 repetitions  
OBSERVE H1, 499.6853765 MHz  
DATA PROCESSING  
FT size 65536  
Total time 1 min, 14 sec



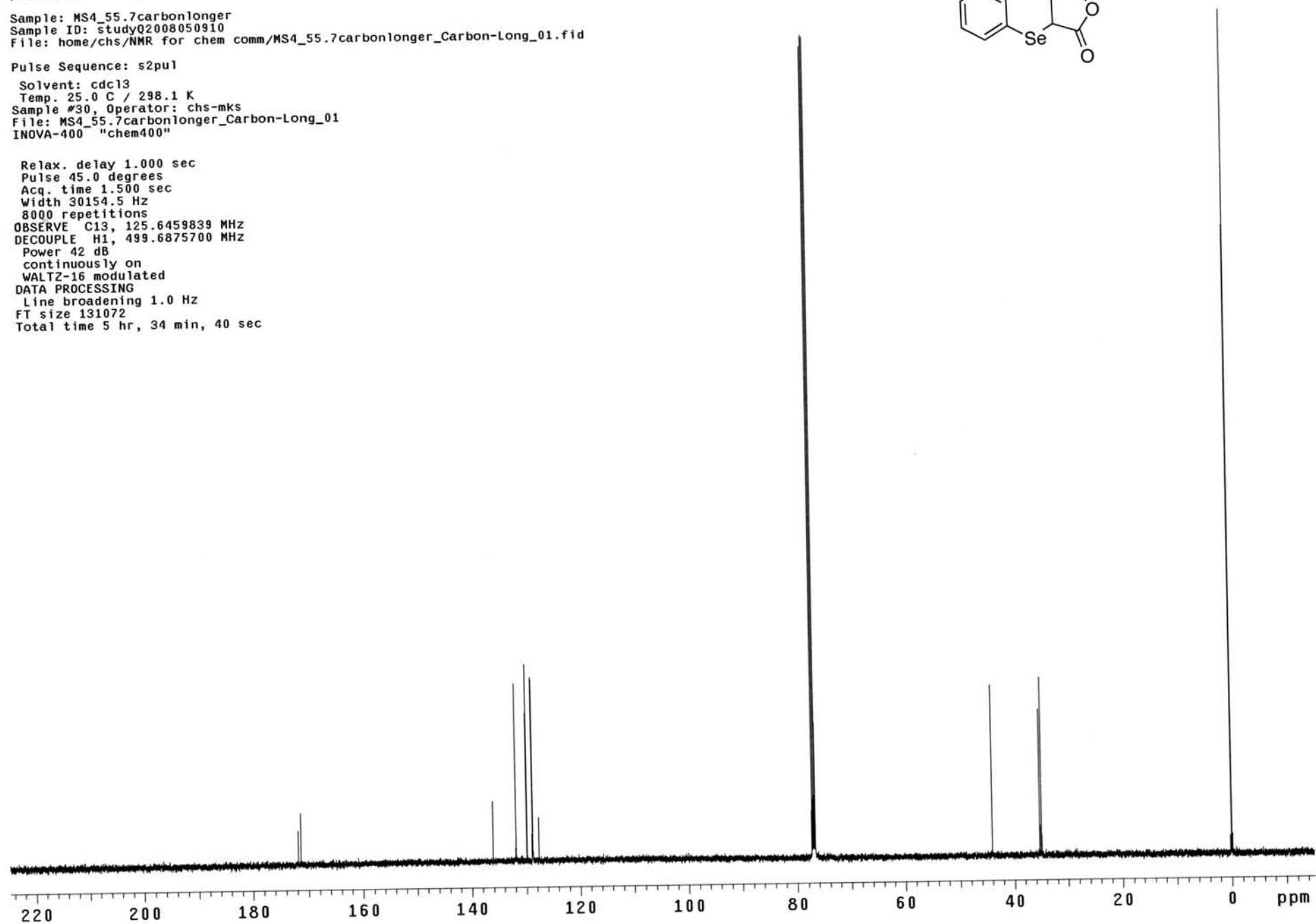
pad=10 run with findz0 before acquisition  
pad=10 run with gradshim before acquisition

Sample: MS4\_55.7carbonlonger  
Sample ID: studyQ2008050910  
File: home/chs/NMR for chem comm/MS4\_55.7carbonlonger\_Carbon-Long\_01.fid

Pulse Sequence: s2pu1

Solvent: cdcl3  
Temp. 25.0 C / 298.1 K  
Sample #30, Operator: chs-mks  
File: MS4\_55.7carbonlonger\_Carbon-Long\_01  
INOVA-400 "chem400"

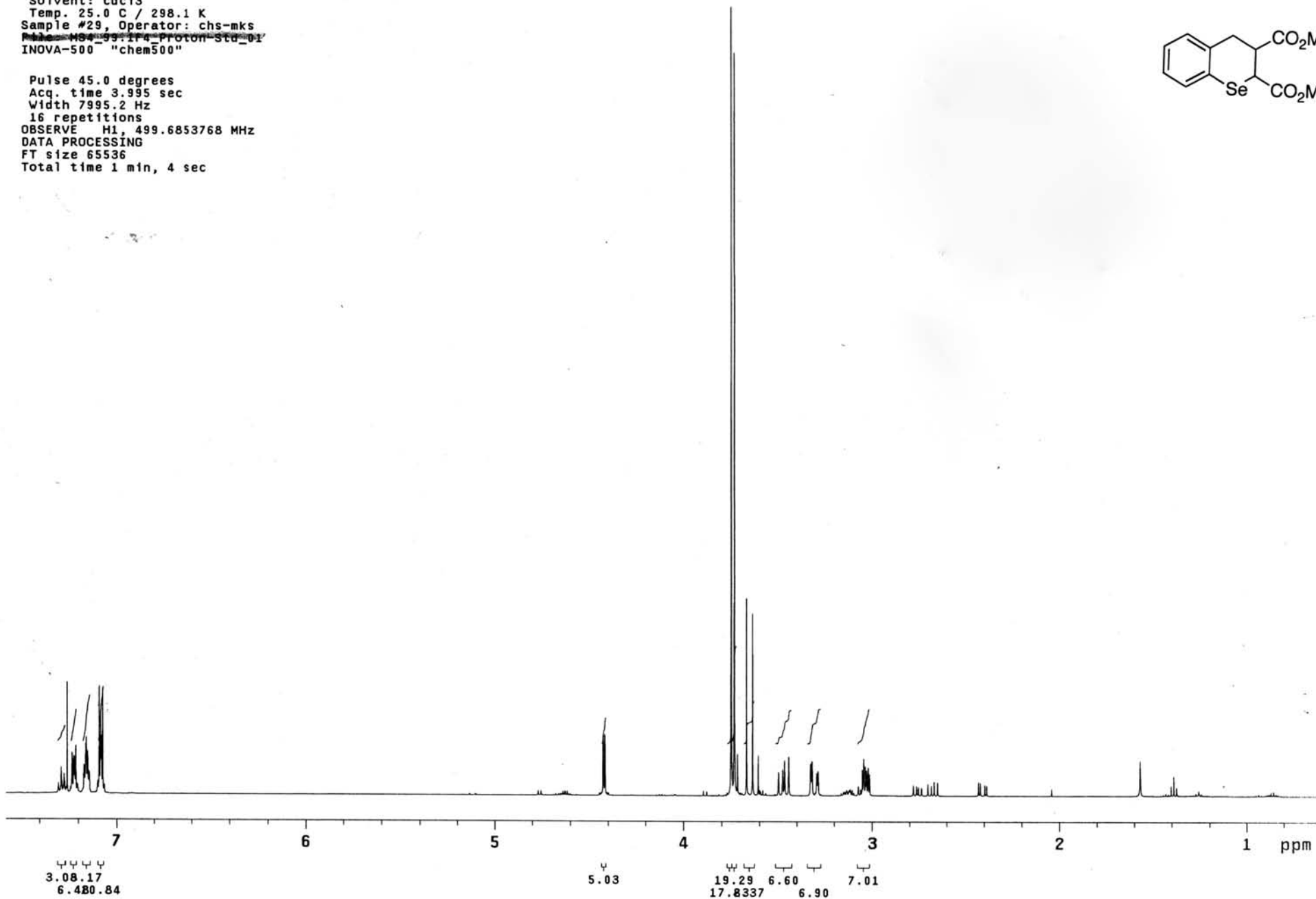
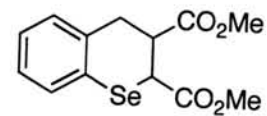
Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 1.500 sec  
Width 30154.5 Hz  
8000 repetitions  
OBSERVE C13, 125.6459839 MHz  
DECOUPLE H1, 499.6875700 MHz  
Power 42 dB  
continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 5 hr, 34 min, 40 sec



pad=10 run with findz0 before acquisition  
pad=10 run with gradshim before acquisition

Solvent: cdc13  
Temp. 25.0 C / 298.1 K  
Sample #29, Operator: chs-mks  
Pulse: HS4-99.1F4-Proton-Std\_01  
INOVA-500 "chem500"

Pulse 45.0 degrees  
Acq. time 3.995 sec  
Width 7995.2 Hz  
16 repetitions  
OBSERVE H1, 499.6853768 MHz  
DATA PROCESSING  
FT size 65536  
Total time 1 min, 4 sec



MS3\_80.1  
F12-15

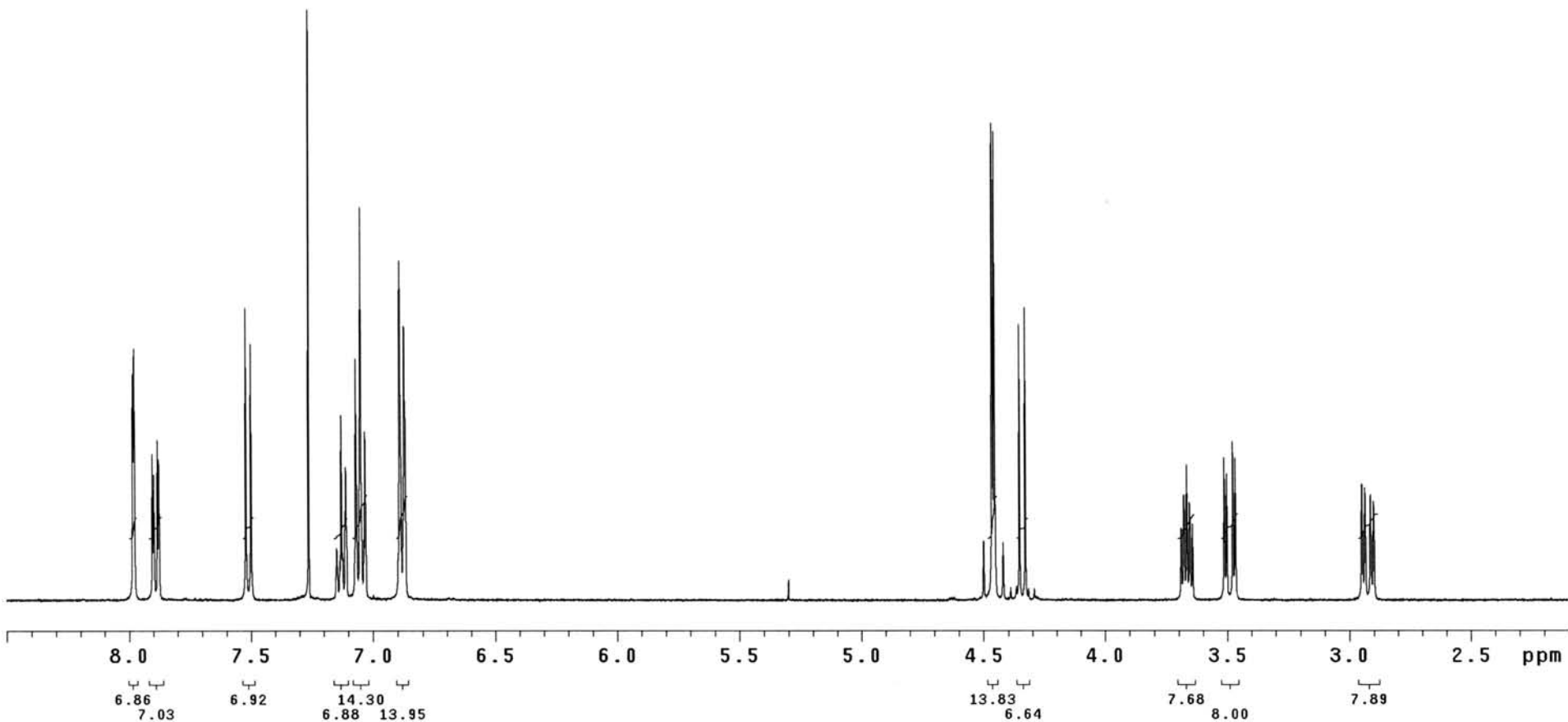
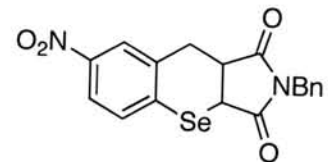
Supplementary Material (ESI) for Chemical Communications  
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File: home/chs/NMR for chem comm/MS3\_80.1F12-15.fid

Pulse Sequence: s2pu1

Solvent: CDC13  
Temp. 25.0 C / 298.1 K  
Operator: chs  
File: MS3\_80.1F12-15  
INOVA-400 "chem400"

Pulse 45.0 degrees  
Acq. time 4.000 sec  
Width 6395.9 Hz  
16 repetitions  
OBSERVE H1, 399.7506296 MHz  
DATA PROCESSING  
FT size 65536  
Total time 1 min, 4 sec

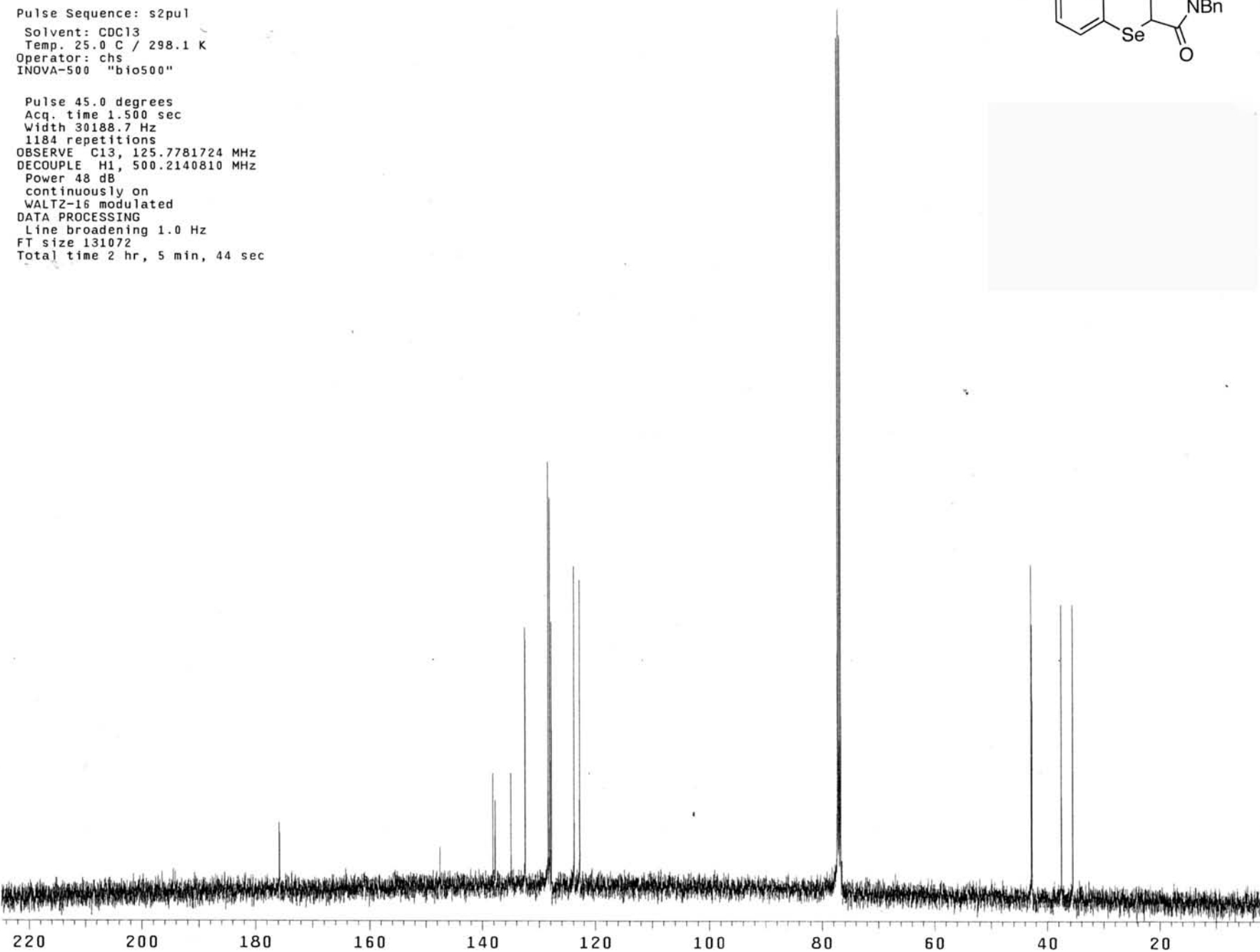
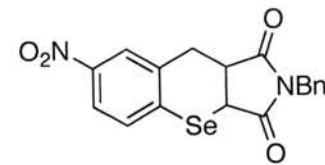


MS3\_80.1  
F12-15

Supplementary Material (ESI) for Chemical Communications  
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File: Carbon  
Pulse Sequence: s2pu1  
Solvent: CDC13  
Temp. 25.0 C / 298.1 K  
Operator: chs  
INOVA-500 "bio500"

Pulse 45.0 degrees  
Acq. time 1.500 sec  
Width 30188.7 Hz  
1184 repetitions  
OBSERVE C13, 125.7781724 MHz  
DECOUPLE H1, 500.2140810 MHz  
Power 48 dB  
continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 2 hr, 5 min, 44 sec

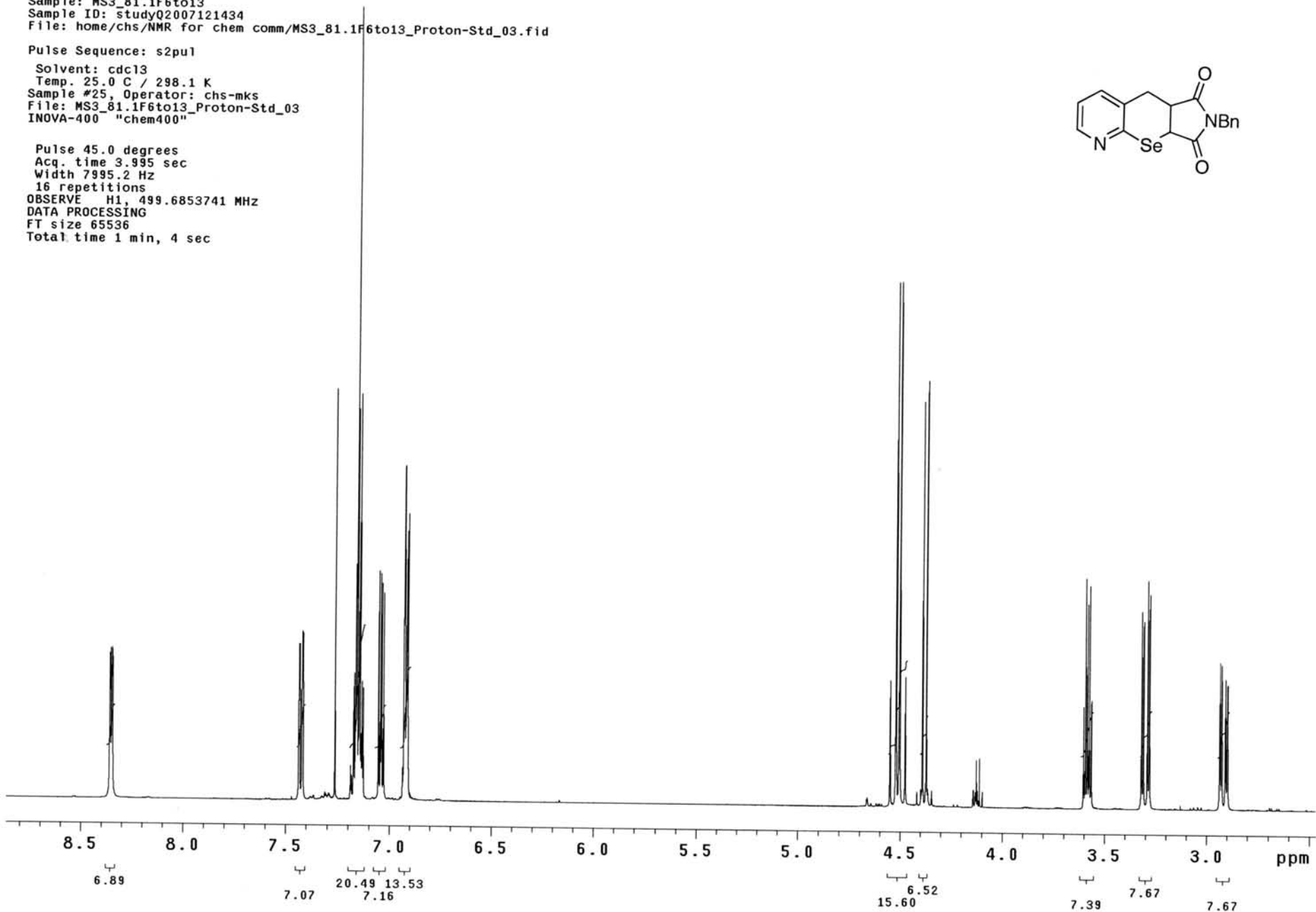
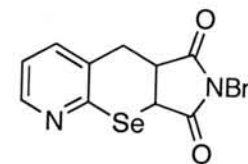


MS3\_81.1  
MS3\_81.1  
F6-13

Sample: MS3\_81.1F6to13  
Sample ID: studyQ2007121434  
File: home/chs/NMR for chem comm/MS3\_81.1F6to13\_Proton-Std\_03.fid

Pulse Sequence: s2pu1  
Solvent: cdc13  
Temp. 25.0 C / 298.1 K  
Sample #25, Operator: chs-mks  
File: MS3\_81.1F6to13\_Proton-Std\_03  
INOVA-400 "chem400"

Pulse 45.0 degrees  
Acq. time 3.995 sec  
Width 7995.2 Hz  
16 repetitions  
OBSERVE H1, 499.6853741 MHz  
DATA PROCESSING  
FT size 65536  
Total time 1 min, 4 sec



File: Carbon  
Pulse Sequence: s2pu1  
Solvent: CDCl3  
Temp. 25.0 C / 298.1 K  
Operator: chs  
INOVA-500 "bio500"

Pulse 45.0 degrees  
Acq. time 1.500 sec  
Width 30188.7 Hz  
352 repetitions  
OBSERVE C13, 125.7781460 MHz  
DECOUPLE H1, 500.2140810 MHz  
Power 48 dB  
continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 12 min, 52 sec

