Electronic Supplementary Material (ESI) for ChemComm.

Highly Regio- and Stereoselective Nitro-Oxoamination of Mono-Substituted Allenes

Can Xue, Chunling Fu* and Shengming Ma*

Laboratory of Molecular Recognition and Synthesis, Department of Chemistry, Zhejiang University, Hangzhou 310027, Zhejiang, People's Republic of China

* Corresponding author. Tel.: 86-21-622-37360; Fax: 86-21-626-09305.

masm@sioc.ac.cn

Supporting Information

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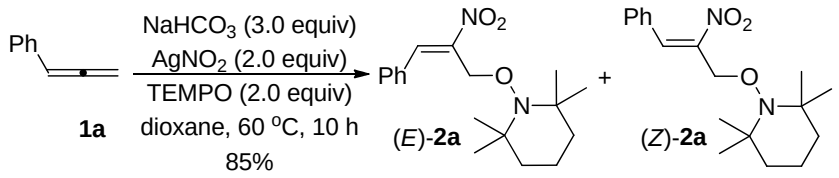
General: Mono-substituted allenes were prepared according to the literature procedure.[1] Dioxane was distilled from Na wire/benzophenone. The other commercially available chemicals were purchased and used without additional purification. The reactions were performed under an atmosphere of nitrogen using standard Schlenk tubes unless otherwise stated. Petroleum ether with a boiling point ranging from 30 to 60 ^{o}C was used. Flash-column chromatography was carried out with silica gel H (10–40 μ). ^{1}H, ^{13}C, and ^{19}F NMR spectra were recorded with a Bruker AN 300 MHz spectrometer. ^{1}H NMR spectra (300 MHz) were recorded using TMS (δ 0 ppm) or $CDCl_3$ (δ 7.26 ppm) as the internal standard. ^{13}C NMR spectra (75 MHz) were recorded using $CDCl_3$ as the internal standard (δ 77.00 ppm). ^{19}F NMR spectra (282 MHz) were recorded using $CFCl_3$ as the internal standard (δ 0 ppm). IR spectra were recorded with a Perkin-Elmer 983G instrument. ESI-Mass spectrometry was performed with an Agilent 1100 LC/MSD SL system. ESI-High-resolution mass spectrometry was determined with a Bruker Daltonics APEXIII^{TM} ESI-FTICRMS instrument. The configuration of the C=C bond in (*E*)-**2a** ~ (*E*)-**2v**, (*Z*)-**2f**, (*Z*)-**2h**, (*Z*)-**2i**, (*Z*)-**2j**, (*Z*)-**2n**, (*Z*)-**2s** and (*Z*)-**2v** were established by the NOE study.

Nitro-oxoamination reactions of mono-allenes without degassing operation

1. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-1-phenylprop-1-ene **(**(*E*)- and (*Z*)-**2a**) (xc-9-176-1)



(*E*)-**2a**/(*Z*)-**2a** = 98/2 (by isolation)

Typical Procedure I: To a dried Schlenk tube were added 2,2,6,6-tetramethyl-1-piperidineoxyl (TEMPO, 98%, 0.3193 g, 2.01 mmol), $AgNO_2$ (99%, 0.3121 g, 2.01 mmol), $NaHCO_3$ (0.2528 g, 3.01 mmol), 1-phenylpropa-1,2-diene **1a** (0.1162 g, 1.00 mmol), and 10 mL of anhydrous 1,4-dioxane at room temperature under N_2 atmosphere. The resulting mixture was then placed in a pre-heated oil bath of 60 ^oC and stirred for 10 h as monitored by TLC. After cooling to room temperature, the crude reaction mixture was filtrated through a short column of silica gel (Et_2O 3 × 15 mL). After concentration, the ratio of (*E*)-**2a**/(*Z*)-**2a** was 97/3 as determined by the ^1H NMR analysis. Column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1 then petroleum ether/ethyl acetate = 100/1) afforded **2a** (0.2702 g, 85%, (*E*)/(*Z*) = 98/2) as an oil.

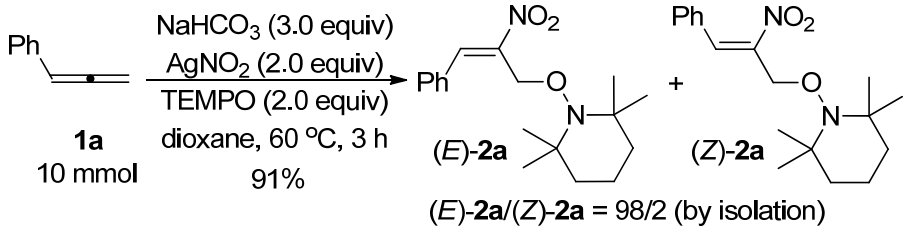
(*E*)-**2a**: ^1H NMR (300 MHz, $CDCl_3$) δ 8.15 (s, 1 H, =CH), 7.65-7.54 (m, 2 H, ArH), 7.49-7.40 (m, 3 H, ArH), 4.95 (s, 2 H, CH_2), 1.58-1.38 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.36-1.27 (m, 1 H, one proton of CH_2), 1.10 (s, 6 H, 2 × CH_3),

1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.3, 137.8, 131.6, 130.4, 129.9, 128.7, 69.1, 60.0, 39.8, 32.8, 20.0, 16.9; IR (neat) ν (cm^{-1}) 3062, 2972, 2932, 2870, 1646, 1601, 1527, 1468, 1451, 1376, 1325, 1261, 1243, 1210, 1184, 1133, 1030; MS (ESI): *m*/*z* = 319 $[M+H]^+$; HRMS (ESI): calcd. for $C_{18}H_{27}N_2O_3$ $[M+H]^+$ 319.2016; found 319.2014. The following signals are discernible for (*Z*)-**2a**: ^1H NMR (300 MHz, $CDCl_3$) δ 6.68 (s, 1 H, =CH), 4.75 (s, 2 H, CH_2).

The following compounds were prepared following Typical Procedure I.

A 10 mmol scale nitro-oxoamination reaction of **1a**.

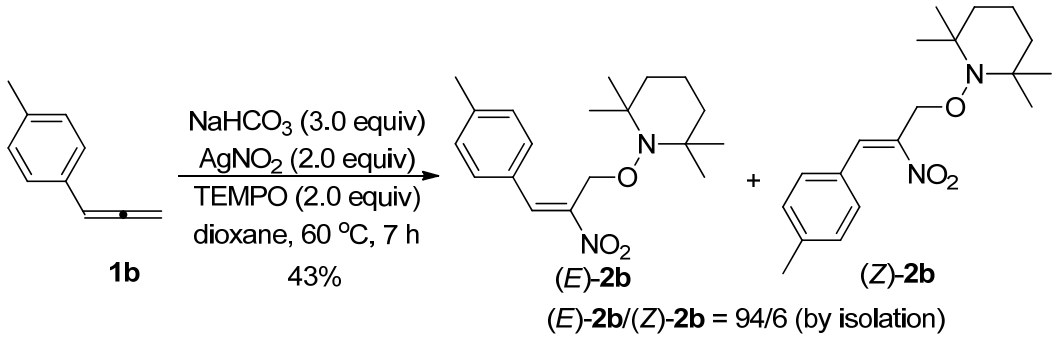
(*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-1-phenylprop-1-ene **(**(*E*)- and (*Z*)-**2a**) (xc-10-159, 9-133)



The reaction of 1-phenylpropa-1,2-diene **1a** (1.1615 g, 10.01 mmol), TEMPO (98%, 3.1845 g, 20.01 mmol), $AgNO_2$ (99%, 3.1112 g, 20.00 mmol), and $NaHCO_3$ (2.5213 g, 30.02 mmol) in dioxane (80 mL) at 60 °C for 3 h afforded a crude product. The ratio of (*E*)-**2a**/(*Z*)-**2a** was 98/2 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 150/1) afforded **2a** (2.8910 g, 91%, (*E*)/(*Z*) > 98/2) as an oil. (*E*)-**2a**: ^1H NMR (300 MHz, $CDCl_3$) δ 8.17 (s, 1 H, =CH), 7.67-7.53 (m, 2 H, ArH), 7.52-7.38 (m, 3 H, ArH), 4.96 (s, 2 H, CH_2), 1.57-1.23 (m, 6 H, 3 × CH_2), 1.11

(s, 6 H, 2 × CH_3), 1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.3, 137.9, 131.6, 130.4, 129.9, 128.7, 69.1, 60.0, 39.8, 32.8, 20.0, 16.9; Elemental analysis calcd for $C_{18}H_{26}N_2O_3$: N, 8.80; C, 67.90; H, 8.23; Found: N, 8.84; C, 67.96; H, 8.03. The following signals are discernible for (*Z*)-**2a**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.68 (s, 1 H, =CH), 4.74 (s, 2 H, CH_2).

2. (*E*)- and (*Z*)-1-(4-Methylphenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **(**(*E*)- and (*Z*)-**2b**) (xc-10-177-1,2)

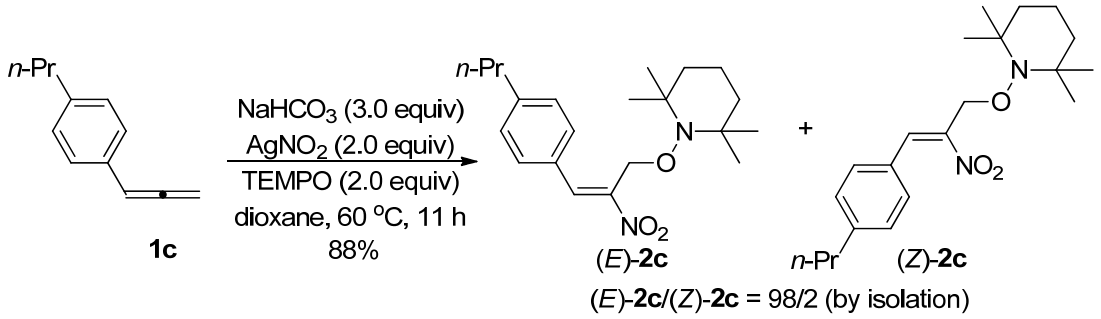


The reaction of 1-(4-methylphenyl)propa-1,2-diene **1b** (0.1302 g, 1.00 mmol), TEMPO (98%, 0.3197 g, 2.01 mmol), $AgNO_2$ (99%, 0.3115 g, 2.00 mmol), and $NaHCO_3$ (0.2522 g, 3.00 mmol) in dioxane (10 mL) at 60 ^{o}C for 7 h afforded a crude product. The ratio of (*E*)-**2b**/(*Z*)-**2b** was 96/4 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1) afforded **2b** (0.1471 g, (*E*)/(*Z*) = 94/6; purity of **2b**: 96% as determined by using mesitylene as the internal standard, 43% yield) as an oil.

(*E*)-**2b**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.15 (s, 1 H, =CH), 7.55 (d, *J* = 8.1 Hz, 2

H, ArH), 7.26 (d, J = 8.1 Hz, 2 H, ArH), 4.98 (s, 2 H, CH_2), 2.41 (s, 3 H, CH_3), 1.54-1.38 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.38-1.27 (m, 1 H, one proton of CH_2), 1.14 (s, 6 H, 2 × CH_3), 1.09 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 147.6, 141.2, 138.2, 130.3, 129.6, 128.8, 69.4, 60.1, 39.9, 33.0, 21.5, 20.1, 17.0; IR (neat) ν (cm^{-1}) 2974, 2933, 2869, 1644, 1608, 1557, 1526, 1468, 1454, 1376, 1361, 1322, 1243, 1186, 1132, 1036; MS (ESI): m/z = 333 $[M+H]^+$; HRMS (ESI): calcd. for $C_{19}H_{29}N_2O_3$ $[M+H]^+$ 333.2173; found 333.2164. The following signals are discernible for (*Z*)-**2b**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.52 (s, 1 H, =CH), 4.73 (s, 2 H, CH_2).

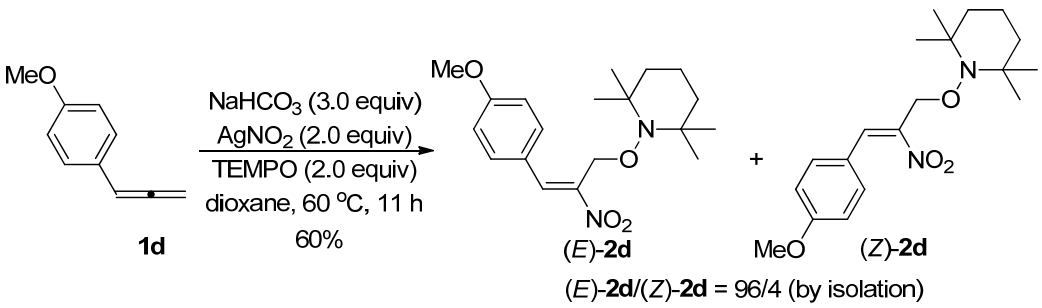
3. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-1-(4-propylphenyl) prop-1-ene **(**(*E*)- and (*Z*)-**2c) (**xc-9-184)



The reaction of 1-(4-propylphenyl)propa-1,2-diene **1c** (0.1585 g, 1.00 mmol), TEMPO (98%, 0.3189 g, 2.00 mmol), $AgNO_2$ (99%, 0.3121 g, 2.01 mmol), and $NaHCO_3$ (0.2532 g, 3.01 mmol) in dioxane (10 mL) at 60 ^{o}C for 11 h afforded a crude product. The ratio of (*E*)-**2c**/(*Z*)-**2c** was 96/4 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether= 100/1) afforded **2c** (0.3175 g, 88%, (*E*)/(*Z*) = 98/2) as an oil.

(*E*)-**2c**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.08 (s, 1 H, =CH), 7.47 (d, *J* = 8.4 Hz, 2 H, ArH), 7.18 (d, *J* = 8.1 Hz, 2 H, ArH), 4.90 (s, 2 H, CH_2), 2.56 (t, *J* = 7.5 Hz, 2 H, CH_2), 1.58 (sext, *J* = 7.4 Hz, 2 H, CH_2), 1.49-1.30 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.29-1.20 (m, 1 H, one proton of CH_2), 1.05 (s, 6 H, 2 × CH_3), 1.01 (s, 6 H, 2 × CH_3), 0.87 (t, *J* = 7.2 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 147.6, 145.9, 138.2, 130.2, 129.0, 128.9, 69.3, 60.0, 39.9, 37.8, 32.9, 24.2, 20.1, 17.0, 13.7; IR (neat) ν (cm^{-1}) 2931, 2871, 1644, 1608, 1527, 1467, 1376, 1360, 1323, 1260, 1243, 1186, 1133, 1034; MS (ESI): *m*/*z* = 361 $[M+H]^+$; HRMS (ESI): calcd. for $C_{21}H_{33}N_2O_3$ $[M+H]^+$ 361.2486; found 361.2476. The following signals are discernible for (*Z*)-**2c**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.55 (s, 1 H, =CH), 4.65 (s, 2 H, CH_2).

4. (*E*)- and (*Z*)-1-(4-Methyloxyphenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitroprop-1-ene **(**(*E*)- and (*Z*)-**2d)** (xc-9-178,185)

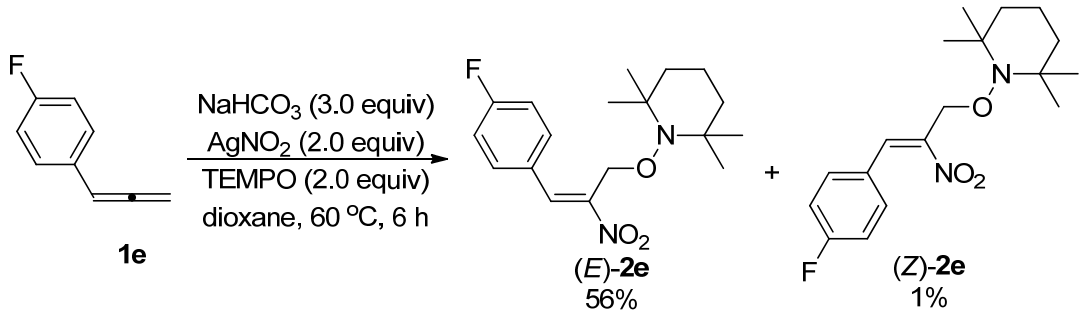


The reaction of 1-(4-methyloxyphenyl)propa-1,2-diene **1d** (0.1458 g, 1.00 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3123 g, 2.01 mmol), and $NaHCO_3$ (0.2533 g, 3.02 mmol) in dioxane (10 mL) at 60 °C for 11 h afforded a crude product. The ratio of (*E*)-**2d**/(*Z*)-**2d** was 97/3 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel

(eluent: petroleum ether/ethyl acetate = 150/1, then petroleum ether/ethyl acetate = 100/1) afforded **2d** (0.2192 g, (*E*)/(*Z*)-**2d** = 96/4; purity of **2d**: 94% as determined by using mesitylene as the internal standard, 60% yield) as an oil.

(*E*)-**2d**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.17 (s, 1 H, =CH), 7.68 (d, *J* = 8.7 Hz, 2 H, ArH), 6.99 (d, *J* = 8.7 Hz, 2 H, ArH), 5.03 (s, 2 H, CH_2), 3.89 (s, 3 H, CH_3), 1.57-1.45 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.40-1.31 (m, 1 H, one proton of CH_2), 1.18 (s, 6 H, 2 × CH_3), 1.13 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 161.4, 146.0, 137.7, 132.0, 123.6, 113.9, 69.2, 59.6, 55.0, 39.5, 32.6, 19.7, 16.6; IR (neat) ν (cm^{-1}) 2972, 2933, 2843, 1641, 1604, 1520, 1466, 1376, 1306, 1260, 1180, 1132, 1030; MS (ESI): *m*/*z* = 349 $[M+H]^+$; HRMS (ESI): calcd. for $C_{19}H_{29}N_2O_4$ $[M+H]^+$ 349.2122; found 349.2109. The following signals are discernible for (*Z*)-**2d**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.62 (s, 1 H, =CH), 4.74 (s, 2 H, CH_2), 3.84 (s, 3 H, CH_3).

5. (*E*)- and (*Z*)-1-(4-Fluorophenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **((***E*)- and (*Z*)-**2e)** (xc-9-183)



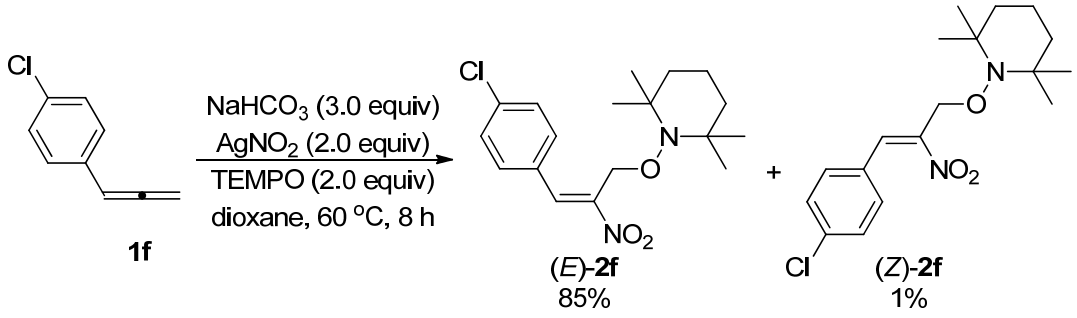
The reaction of 1-(4-fluorophenyl)propa-1,2-diene **1e** (0.1351 g, 1.01 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3121 g, 2.01 mmol), and

$NaHCO_3$ (0.2529 g, 3.01 mmol) in dioxane (10 mL) at 60 ^oC for 6 h afforded a crude product. The ratio of (*E*)-**2e**/(*Z*)-**2e** was 96/4 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1) afforded (*E*)-**2e** (0.1932 g, purity = 98% as determined by using mesitylene as the internal standard, 56% yield) as a liquid and (*Z*)-**2e** (0.0162 g, purity = 27% as determined by using mesitylene as the internal standard, 1% yield) as a solid.

(*E*)-**2e** (less polar): ^1H NMR (300 MHz, $CDCl_3$) δ 8.12 (s, 1 H, =CH), 7.72-7.53 (m, 2 H, ArH), 7.19-7.06 (m, 2 H, ArH), 4.95 (s, 2 H, CH_2), 1.60-1.38 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.37-1.26 (m, 1 H, one proton of CH_2), 1.11 (s, 6 H, 2 × CH_3), 1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 164.0 (d, J = 251.3 Hz), 148.1, 136.8, 132.2 (d, J = 9.0 Hz), 127.8 (d, J = 3.6 Hz), 116.1 (d, J = 22.1 Hz), 69.2, 60.1, 39.9, 32.9, 20.1, 17.0; ^{19}F NMR (282 MHz, $CDCl_3$) δ -108.9 ~ -109.4 (m, 1 F); IR (neat) ν (cm^{-1}) 2970, 2933, 1649, 1602, 1529, 1468, 1377, 1324, 1239, 1163, 1133, 1084, 1016; MS (ESI): *m*/*z* = 337 $[M+H]^+$; HRMS (ESI): calcd. for $C_{18}H_{26}FN_2O_3$ $[M+H]^+$ 337.1922; found 337.1919.

The following signals are discernible for (*Z*)-**2e** (more polar): ^1H NMR (300 MHz, $CDCl_3$) δ 6.57 (s, 1 H, =CH), 4.66 (s, 2 H, CH_2); ^{19}F NMR (282 MHz, $CDCl_3$) δ -108.7 ~ -109.0 (m, 1 F).

6. (*E*)- and (*Z*)-1-(4-Chlorophenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **(**(*E*)- and (*Z*)-**2f)** (xc-10-162-1,2)



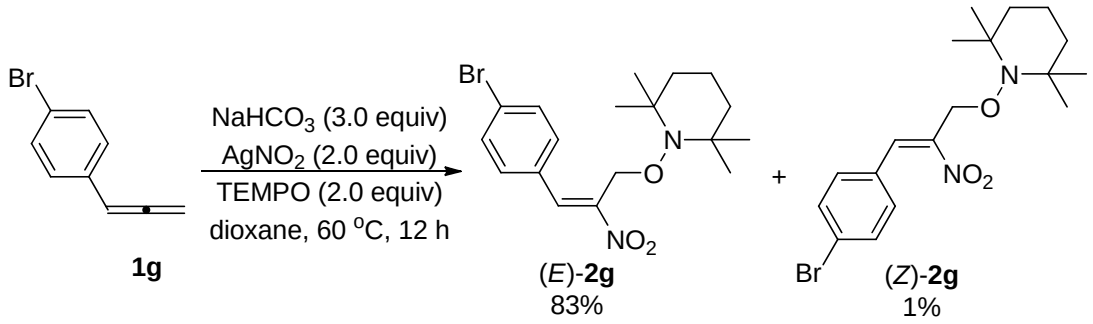
The reaction of 1-(4-chlorophenyl)propa-1,2-diene **1f** (0.1503 g, 1.00 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3117 g, 2.00 mmol), and $NaHCO_3$ (0.2533 g, 3.02 mmol) in dioxane (10 mL) at 60 °C for 8 h afforded a crude product. The ratio of (*E*)-**2f**/(*Z*)-**2f** was 95/5 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1 then petroleum ether/ethyl acetate = 100/1) afforded (*E*)-**2f** (0.2997 g, 85%) as a solid and (*Z*)-**2f** (0.0112 g, purity = 47% as determined by using mesitylene as the internal standard, 1% yield) as an oil.

(*E*)-**2f** (less polar): m.p. 65.3-66.0 °C (*n*-hexane/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.10 (s, 1 H, =CH), 7.59 (d, *J* = 8.4 Hz, 2 H, ArH), 7.43 (d, *J* = 8.4 Hz, 2 H, ArH), 4.94 (s, 2 H, CH_2), 1.63-1.39 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.37-1.26 (m, 1 H, one proton of CH_2), 1.11 (s, 6 H, 2 × CH_3), 1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.6, 136.8, 136.6, 131.3, 130.1, 129.1, 69.2, 60.1, 39.9, 32.9, 20.1, 17.0; IR (KBr) ν (cm^{-1}) 2974, 2935, 2869, 1593, 1557, 1527, 1492, 1467, 1380, 1361, 1244, 1180, 1132, 1092, 1015; MS (ESI): *m*/*z* = 353 $[M(^{35}Cl)+H]^+$, 355 $[M(^{37}Cl)+H]^+$; Elemental analysis calcd for $C_{18}H_{25}ClN_2O_3$: N, 7.94; C, 61.27; H, 7.14; Found: N, 7.66; C, 61.06; H, 7.05.

The following signals are discernible for (*Z*)-**2f** (more polar): ^{1}H NMR (300 MHz,

$CDCl_3$) δ 7.34 (d, *J* = 8.7 Hz, 2 H, ArH), 7.25 (d, *J* = 7.5 Hz, 2 H, ArH), 6.64 (s, 1 H, =CH), 4.73 (s, 2 H, CH_2), 1.20 (s, 6 H, 2 × CH_3), 1.11 (s, 6 H, 2 × CH_3); IR (neat) ν (cm^{-1}) 2974, 2932, 2869, 1646, 1593, 1527, 1491, 1468, 1376, 1339, 1092, 1015; MS (ESI): *m*/*z* = 355 $[M(^{37}Cl)+H]^+$, 353 $[M(^{35}Cl)+H]^+$; HRMS (ESI): calcd. for $C_{18}H_{26}ClN_2O_3$ $[M(^{35}Cl)+H]^+$ 353.1626; found 353.1621.

7. (*E*)- and (*Z*)-1-(4-Bromophenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **(**(*E*)- and (*Z*)-**2g)** (xc-10-005-2,3)



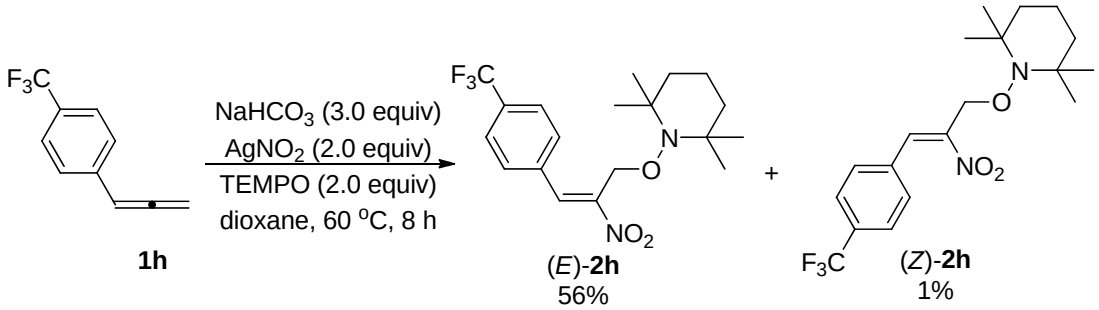
The reaction of 1-(4-bromophenyl)propa-1,2-diene **1g** (0.1959 g, 1.00 mmol), TEMPO (98%, 0.3192 g, 2.01 mmol), $AgNO_2$ (99%, 0.3125 g, 2.01 mmol), and $NaHCO_3$ (0.2515 g, 2.99 mmol) in dioxane (10 mL) at 60 °C for 12 h afforded a crude product. The ratio of (*E*)-**2g**/(*Z*)-**2g** was 97/3 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1 then petroleum ether/ethyl acetate = 100/1) afforded (*E*)-**2g** (0.3295 g, 83%) as a solid and (*Z*)-**2g** (0.0390 g, purity = 10% as determined by using mesitylene as the internal standard, 1% yield) as an oil.

(*E*)-**2g** (less polar): m.p. 95.4-96.1 °C (*n*-hexane/ethyl acetate); ^1H NMR (300 MHz, $CDCl_3$) δ 8.07 (s, 1 H, =CH), 7.59 (d, *J* = 8.4 Hz, 2 H, ArH), 7.51 (d, *J* = 8.4 Hz,

2 H, ArH), 4.93 (s, 2 H, CH_2), 1.55-1.39 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.38-1.27 (m, 1 H, one proton of CH_2), 1.10 (s, 12 H, 4 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.8, 136.6, 132.1, 131.5, 130.6, 125.2, 69.3, 60.2, 39.9, 33.0, 20.1, 17.0; IR (KBr) ν (cm^{-1}) 2973, 2932, 1646, 1588, 1531, 1488, 1468, 1451, 1375, 1361, 1325, 1261, 1243, 1209, 1183, 1133, 1075, 1012; MS (ESI): *m*/*z* = 397 [M(^{79}Br)+H]$^+$, 399 [M(^{81}Br)+H]$^+$; Elemental analysis calcd for $C_{18}H_{25}BrN_2O_3$: N, 7.05; C, 54.41; H, 6.34; Found: N, 6.94; C, 54.55; H, 6.41.

The following signals are discernible for (*Z*)-**2g** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.18 (d, *J* = 8.4 Hz, 2 H, ArH), 6.62 (s, 1 H, =CH), 4.73 (s, 2 H, CH_2).

8. (*E*)- and (*Z*)-1-(4-Trifluoromethylphenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy) -2-nitroprop-1-ene **(**(*E*)- and (*Z*)-**2h)** (xc-10-166-1,2; xc-12-060-1,2)



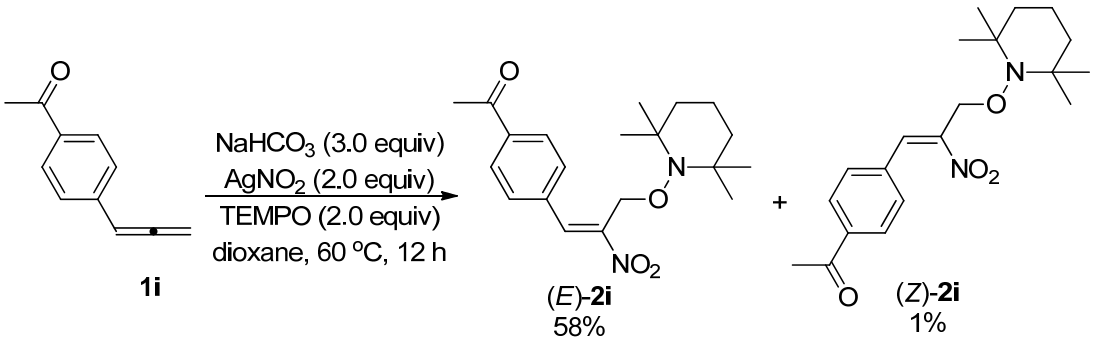
The reaction of 1-(4-trifluoromethylphenyl)propa-1,2-diene **1h** (0.1841 g, 1.00 mmol), TEMPO (98%, 0.3187 g, 2.00 mmol), $AgNO_2$ (99%, 0.3120 g, 2.01 mmol), and $NaHCO_3$ (0.2532 g, 3.01 mmol) in dioxane (10 mL) at 60 ^{o}C for 8 h afforded a crude product. The ratio of (*E*)-**2h**/(*Z*)-**2h** was 96/4 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1; then 100/1; and then 10/1)

afforded (*E*)-**2h** (0.2211 g, purity = 97%, 56%) as an oil and (*Z*)-**2h** (0.0325 g, purity = 15%, 1%) as an oil.

(*E*)-**2h** (less polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.14 (s, 1 H, =CH), 7.78-7.68 (m, 4 H, ArH), 4.93 (s, 2 H, CH_2), 1.56-1.40 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.35-1.27 (m, 1 H, one proton of CH_2), 1.07 (s, 12 H, 4 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 149.8, 135.9, 135.2, 132.0 (q, J = 32.9 Hz), 130.1, 125.7 (q, J = 3.7 Hz), 123.6 (q, J = 270.6 Hz), 69.0, 60.1, 39.8, 32.8, 20.1, 16.9; ^{19}F NMR (282 MHz, $CDCl_3$) δ -63.5 (s, 3 F); IR (neat) ν (cm^{-1}) 2975, 2935, 2869, 1618, 1533, 1469, 1376, 1361, 1324, 1262, 1170, 1131, 1069, 1019; MS (ESI): m/z = 387 $[M+H]^+$; HRMS (ESI): calcd. for $C_{19}H_{26}F_3N_2O_3$ $[M+H]^+$ 387.1890; found 387.1874.

The following signals are discernible for (*Z*)-**2h** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.99 (s, 1 H, =CH), 4.92 (s, 2 H, CH_2).

9. (*E*)- and (*Z*)-1-(4-Acetylphenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **(**(*E*)- and (*Z*)-**2i)** (xc-11-039-1,2)



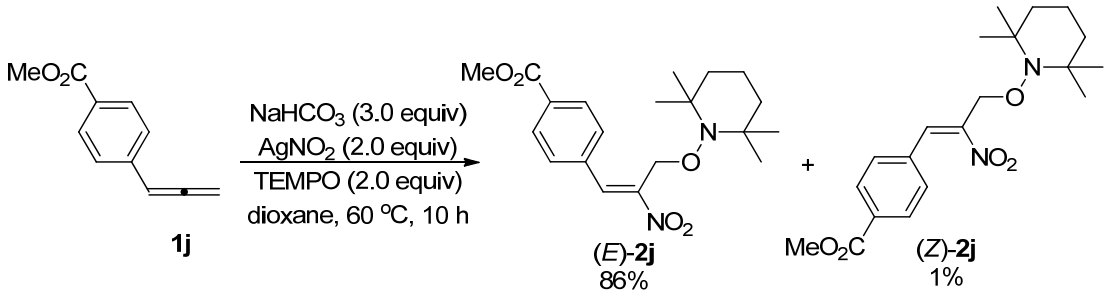
The reaction of 1-(4-acetylphenyl)propa-1,2-diene **1i** (0.1587 g, 1.00 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3115 g, 2.00 mmol), and

$NaHCO_3$ (0.2527 g, 3.01 mmol) in dioxane (10 mL) at 60 ^oC for 12 h afforded a crude product. The ratio of (*E*)-**2i**/(*Z*)-**2i** was 97/3 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 20/1 then petroleum ethyl/ethyl acetate = 15/1) afforded (*E*)-**2i** (0.2101 g, 58%) as a solid and (*Z*)-**2i** (0.0163 g, purity = 13% as determined by using mesitylene as the internal standard, 1% yield) as an oil.

(*E*)-**2i** (less polar): m.p. 71.3-71.8 ^oC (*n*-hexane/ethyl acetate); ^1H NMR (300 MHz, $CDCl_3$) δ 8.15 (s, 1 H, =CH), 8.03 (d, *J* = 8.1 Hz, 2 H, ArH), 7.71 (d, *J* = 8.4 Hz, 2 H, ArH), 4.94 (s, 2 H, CH_2), 2.65 (s, 3 H, CH_3), 1.54-1.39 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.37-1.25 (m, 1 H, one proton of CH_2), 1.09 (s, 6 H, 2 × CH_3), 1.07 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 197.2, 149.6, 138.0, 136.22, 136.17, 130.1, 128.6, 69.1, 60.2, 39.9, 32.9, 26.7, 20.1, 17.0; IR (KBr) ν (cm^{-1}) 2973, 2932, 1687, 1605, 1529, 1468, 1360, 1326, 1265, 1133, 1016; MS (ESI): *m*/*z* = 361 $[M+H]^+$; Elemental analysis calcd for $C_{20}H_{28}N_2O_4$: N, 7.50; C, 66.64; H, 7.90; Found: N, 7.50; C, 66.57; H, 7.90.

The following signals are discernible for (*Z*)-**2i** (more polar): ^1H NMR (300 MHz, $CDCl_3$) δ 7.95 (d, *J* = 8.1 Hz, 2 H, ArH), 7.40 (d, *J* = 7.8 Hz, 2 H, ArH), 6.75 (s, 1 H, =CH), 4.77 (s, 2 H, CH_2), 2.61 (s, 3 H, CH_3), 1.35 (s, 6 H, 2 × CH_3), 1.26 (s, 6 H, 2 × CH_3).

10. (*E*)- and (*Z*)-1-(4-Methoxycarbonylphenyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitroprop-1-ene **((***E*)- and (*Z*)-**2j)** (xc-11-038-1,2)



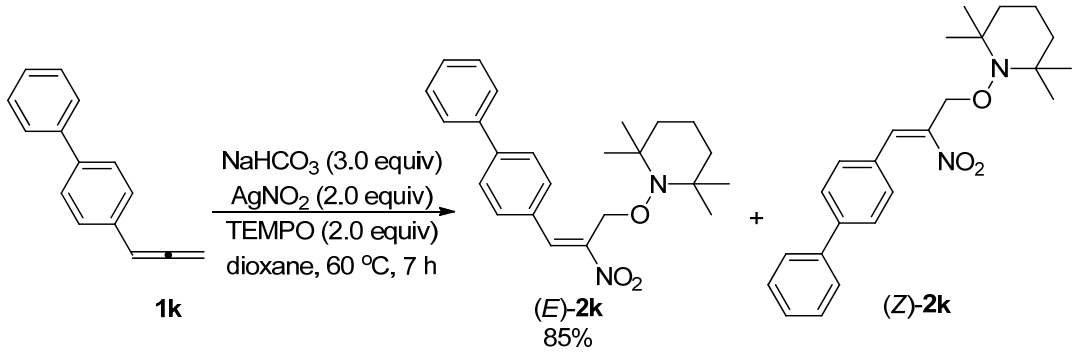
The reaction of 1-(4-methoxycarbonylphenyl)propa-1,2-diene **1j** (0.1745 g, 1.00 mmol), TEMPO (98%, 0.3192 g, 2.01 mmol), $AgNO_2$ (99%, 0.3118 g, 2.00 mmol), and $NaHCO_3$ (0.2527 g, 3.01 mmol) in dioxane (10 mL) at 60 ^oC for 10 h afforded a crude product. The ratio of (*E*)-**2j**/(*Z*)-**2j** was 98/2 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 20/1) afforded (*E*)-**2j** (0.3306 g, purity = 98% as determined by using mesitylene as the internal standard, 86% yield) as a solid and (*Z*)-**2j** (0.0102 g, purity = 41% as determined by using mesitylene as the internal standard, 1% yield) as an oil.

(*E*)-**2j** (less polar): m.p. 99.7-101.0 ^oC (*n*-hexane/ethyl acetate); ^1H NMR (300 MHz, $CDCl_3$) δ 8.15 (s, 1 H, =CH), 8.11 (d, J = 8.4 Hz, 2 H, ArH), 7.68 (d, J = 8.1 Hz, 2 H, ArH), 4.94 (s, 2 H, CH_2), 3.96 (s, 3 H, CH_3), 1.57-1.23 (m, 6 H, 3 × CH_2), 1.09 (s, 6 H, 2 × CH_3), 1.07 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 166.1, 149.3, 136.3, 135.9, 131.4, 129.72, 129.66, 68.9, 60.0, 52.3, 39.7, 32.7, 19.9, 16.8; IR (KBr) ν (cm^{-1}) 2977, 2933, 2869, 2843, 1727, 1648, 1608, 1531, 1436, 1361, 1326, 1280, 1185, 1133, 1110, 1020; MS (ESI): *m*/*z* = 377 $[M+H]^+$; Elemental analysis calcd for $C_{20}H_{28}N_2O_5$: N, 7.44; C, 63.81; H, 7.50; Found: N, 7.27; C, 63.92; H, 7.55.

The following signals are discernible for (*Z*)-**2j** (more polar): ^1H NMR (300 MHz,

$CDCl_3$) δ 8.03 (d, J = 8.4 Hz, 2 H, ArH), 7.37 (d, J = 8.4 Hz, 2 H, ArH), 6.75 (s, 1 H, =CH), 4.76 (s, 2 H, CH_2), 3.93 (s, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 129.9, 128.3, 125.9, 60.3, 39.7; IR (neat) ν (cm^{-1}) 3012, 2927, 2852, 1728, 1608, 1532, 1436, 1376, 1279, 1109, 1016; MS (ESI): m/z = 377 $[M+H]^+$; HRMS (ESI): calcd. for $C_{20}H_{29}N_2O_5$ $[M+H]^+$ 377.2071; found 377.2058.

11. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-1-((1,1'-biphenyl) -4-yl)prop-1-ene **((***E***)- and (*Z*)-2k)** (xc-10-172-1,2)



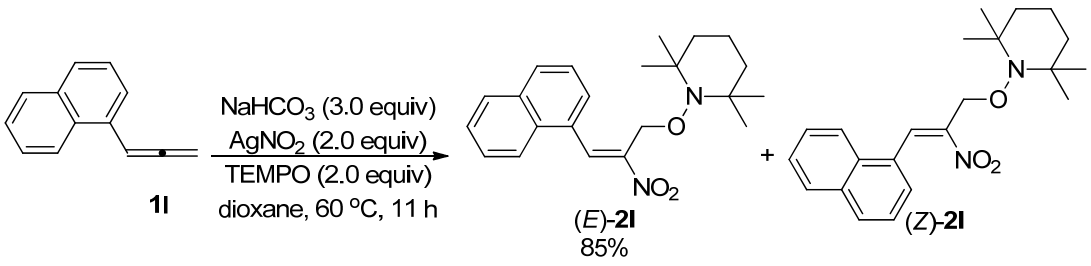
The reaction of 1-((1,1'-diphenyl)-4-yl)propa-1,2-diene **1k** (0.1922 g, 1.00 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3113 g, 2.00 mmol), and $NaHCO_3$ (0.2527 g, 3.01 mmol) in dioxane (10 mL) at 60 °C for 7 h afforded a crude product. The ratio of (*E*)-**2k**/(*Z*)-**2k** was 96/4 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1) afforded pure (*E*)-**2k** (0.3337 g, 85%) as a solid and **2k** (0.0063 g, 1.6%, *E*/*Z* = 77/23) as an oil.

(*E*)-**2k** (less polar): m.p. 105.4-106.7 °C (*n*-hexane/ethyl acetate); ^1H NMR (300 MHz, $CDCl_3$) δ 8.21 (s, 1 H, =CH), 7.78-7.58 (m, 6 H, ArH), 7.53-7.37 (m, 3 H, ArH), 5.02

(s, 2 H, CH_2), 1.54-1.27 (m, 6 H, 3 × CH_2), 1.15 (s, 6 H, 2 × CH_3), 1.10 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.1, 143.4, 139.8, 137.8, 130.8, 130.5, 128.9, 128.1, 127.4, 127.1, 69.4, 60.1, 39.9, 33.0, 20.1, 17.0; IR (KBr) ν (cm^{-1}) 2973, 2932, 1644, 1605, 1526, 1488, 1450, 1375, 1361, 1323, 1262, 1133, 1008; MS (ESI): *m*/*z* = 395 $[M+H]^+$; Elemental analysis calcd for $C_{24}H_{30}N_2O_3$: N, 7.10; C, 73.07; H, 7.66; Found: N, 6.82; C, 72.85; H, 7.74.

The following signals are discernible for (*Z*)-**2k** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.71 (s, 1 H, =CH), 4.76 (s, 2 H, CH_2).

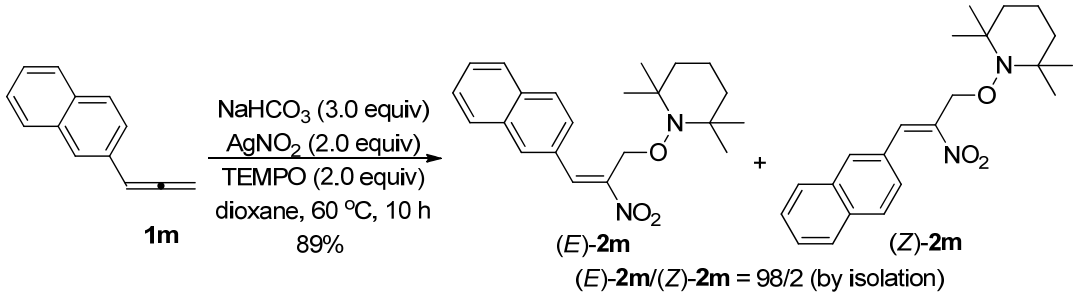
12. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-1-(1-naphthyl)-2-nitroprop-1-ene **(**(*E*)- and (*Z*)-**2l)** (xc-10-078-2)



The reaction of 1-(1-naphthyl)propa-1,2-diene **1l** (0.1665 g, 1.00 mmol), TEMPO (98%, 0.3193 g, 2.01 mmol), $AgNO_2$ (99%, 0.3122 g, 2.01 mmol), and $NaHCO_3$ (0.2533 g, 3.02 mmol) in dioxane (10 mL) at 60 °C for 11 h afforded a crude product. The ratio of (*E*)-**2l**/(*Z*)-**2l** was 99/1 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1 then petroleum ether/ethyl acetate = 100/1) afforded (*E*)-**2l** (0.3138 g, 85%) as a liquid: ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.69 (s, 1

H, =CH), 7.98-7.81 (m, 3 H, ArH), 7.72-7.63 (m, 1 H, ArH), 7.63-7.46 (m, 3 H, ArH), 4.82 (s, 2 H, CH_2), 1.54-1.33 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.30-1.19 (m, 1 H, one proton of CH_2), 1.01 (s, 6 H, 2 × CH_3), 0.97 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 149.2, 136.4, 133.1, 131.1, 130.4, 128.8, 128.5, 127.5, 127.0, 126.4, 124.9, 124.0, 69.0, 59.8, 39.7, 32.4, 19.7, 16.7; IR (neat) ν (cm^{-1}) 3059, 2973, 2932, 2869, 1651, 1531, 1470, 1450, 1375, 1360, 1334, 1244, 1133, 1038; MS (ESI): *m*/*z* = 369 $[M+H]^+$; HRMS (ESI): calcd. for $C_{22}H_{29}N_2O_3$ $[M+H]^+$ 369.2173; found 369.2168.

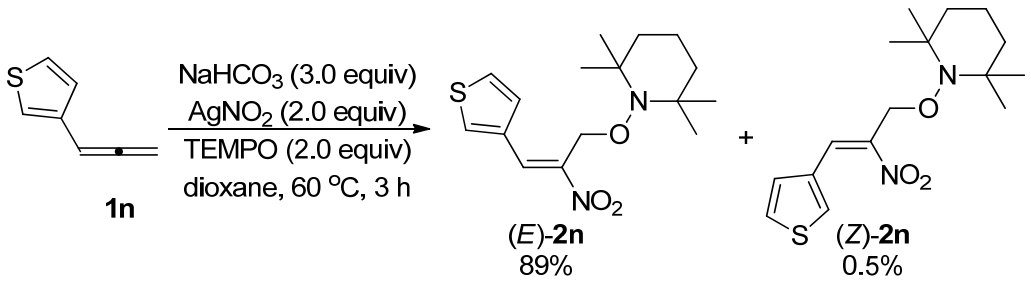
13. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-1-(2-naphthyl)-2-nitroprop-1-ene **((***E***)- and (*Z*)-2m)** (xc-10-161-1,2)



The reaction of 1-(2-naphthyl)propa-1,2-diene **1m** (0.1665 g, 1.00 mmol), TEMPO (98%, 0.3188 g, 2.00 mmol), $AgNO_2$ (99%, 0.3115 g, 2.00 mmol), and $NaHCO_3$ (0.2533 g, 3.02 mmol) in dioxane (10 mL) at 60 °C for 10 h afforded a crude product. The ratio of (*E*)-**2m**/(*Z*)-**2m** was 97/3 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1) afforded **2m** (0.3285 g, (*E*)/(*Z*) = 98/2, 89% yield) as a solid.

(*E*)-**2m**: m.p. 57.7-58.9 °C (*n*-hexane/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.32 (s, 1 H, =CH), 8.21 (s, 1 H, ArH), 7.96-7.84 (m, 3 H, ArH), 7.71-7.63 (m, 1 H, ArH), 7.62-7.51 (m, 2 H, ArH), 5.06 (s, 2 H, CH_2), 1.55-1.40 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.39-1.28 (m, 1 H, one proton of CH_2), 1.15 (s, 12 H, 4 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.3, 138.2, 133.9, 132.9, 130.6, 129.1, 128.6, 127.8, 127.7, 126.9, 126.6, 69.6, 60.2, 39.9, 33.0, 20.2, 17.0; IR (KBr) ν (cm^{-1}) 3057, 2973, 2932, 1645, 1625, 1598, 1525, 1467, 1375, 1361, 1319, 1272, 1242, 1181, 1132, 1018; MS (ESI): *m*/*z* = 369 $[M+H]^+$; Elemental analysis calcd for $C_{22}H_{28}N_2O_3$: N, 7.60; C, 71.71; H, 7.66; Found: N, 7.32; C, 71.68; H, 7.72. The following signals are discernible for (*Z*)-**2m**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.86 (s, 1 H, =CH), 4.80 (s, 2 H, CH_2).

14. (*E*)- and (*Z*)-3-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-1-(3-thienyl)prop-1-ene **(**(*E*)- and (*Z*)-**2n)** (xc-11-026-1,2)



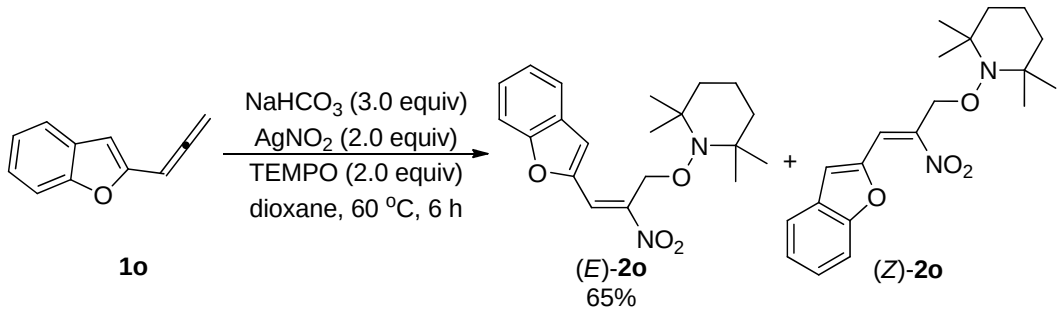
The reaction of 1-(3-thienyl)propa-1,2-diene **1n** (0.1225 g, 1.00 mmol), TEMPO (98%, 0.3191 g, 2.00 mmol), $AgNO_2$ (99%, 0.3118 g, 2.00 mmol), and $NaHCO_3$ (0.2527 g, 3.01 mmol) in dioxane (10 mL) at 60 °C for 3 h afforded a crude product. The ratio of (*E*)-**2n**/(*Z*)-**2n** was 97/3 as determined by the ^{1}H NMR analysis of the

crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1) afforded (*E*)-**2n** (0.2887 g, (*E*)/(*Z*) = 99/1, 89% yield) as a solid and (*Z*)-**2n** (0.0103 g, purity = 16% as determined by using mesitylene as the internal standard, 0.5% yield) as an oil.

(*E*)-**2n** (less polar): m.p. 63.7-64.8 ^{o}C (*n*-hexane/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.14 (s, 1 H, =CH), 7.92 (s, 1 H, ArH), 7.44 (s, 2 H, ArH), 5.07 (s, 2 H, CH_2), 1.59-1.26 (m, 6 H, 3 × CH_2), 1.16 (s, 6 H, 2 × CH_3), 1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 147.1, 132.9, 131.5, 130.9, 128.5, 126.9, 69.6, 60.0, 39.7, 33.0, 20.1, 17.0; IR (KBr) ν (cm^{-1}) 3103, 2973, 2932, 1640, 1525, 1468, 1450, 1375, 1361, 1317, 1258, 1133, 1012; MS (ESI): *m*/*z* = 325 $[M+H]^+$; Elemental analysis calcd for $C_{16}H_{24}N_2O_3S$: N, 8.63; C, 59.23; H, 7.46; Found: N, 8.50; C, 59.38; H, 7.46.

The following signals are discernible for (*Z*)-**2n** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.69-7.62 (m, 1 H, ArH), 7.36-7.29 (m, 1 H, ArH), 7.20-7.14 (m, 1 H, ArH), 6.70 (s, 1 H, =CH), 4.72 (s, 2 H, CH_2); MS (ESI): *m*/*z* = 325 $[M+H]^+$; HRMS (ESI): calcd. for $C_{16}H_{25}N_2O_3S$ $[M+H]^+$ 325.1580; found 325.1569.

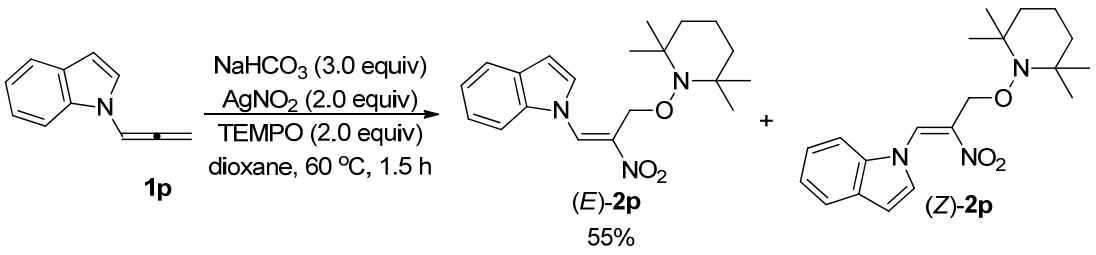
15. (*E*)- and (*Z*)-1-(Benzofuran-2-yl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro prop-1-ene **(**(*E*)- and (*Z*)-**2o)** (xc-11-071-2)



1o (*E*)-**2o** 65% (*Z*)-**2o**

The reaction of 1-(benzofuran-2-yl)propa-1,2-diene **1o** (0.1565 g, 1.00 mmol), TEMPO (98%, 0.3187 g, 2.00 mmol), $AgNO_2$ (99%, 0.3121 g, 2.01 mmol), and $NaHCO_3$ (0.2528 g, 3.01 mmol) in dioxane (10 mL) at 60 °C for 6 h afforded a crude product. The ratio of (*E*)-**2o**/(*Z*)-**2o** was 97/3 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1 then petroleum ether/ethyl acetate = 100/1) afforded (*E*)-**2o** (0.2324 g, 65%) as a solid: m.p. 100.9-102.3 °C (*n*-hexane/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.97 (s, 1 H, =CH), 7.66 (d, *J* = 7.2 Hz, 1 H, ArH), 7.51-7.39 (m, 2 H, ArH), 7.36-7.23 (m, 2 H, ArH), 5.38 (s, 2 H, CH_2), 1.65-1.43 (m, 6 H, 3 × CH_2), 1.37 (s, 6 H, 2 × CH_3), 1.06 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 156.3, 148.2, 145.7, 127.8, 127.5, 123.8, 123.5, 122.2, 117.5, 111.5, 68.8, 60.1, 40.0, 32.9, 20.0, 17.0; IR (KBr) ν (cm^{-1}) 2971, 2931, 2869, 1651, 1612, 1547, 1518, 1469, 1449, 1360, 1315, 1293, 1259, 1134, 1084, 1032; MS (ESI): *m*/*z* = 359 $[M+H]^+$; Elemental analysis calcd for $C_{20}H_{26}N_2O_4$: N, 7.82; C, 67.02; H, 7.31; Found: N, 7.17; C, 67.26; H, 7.46.

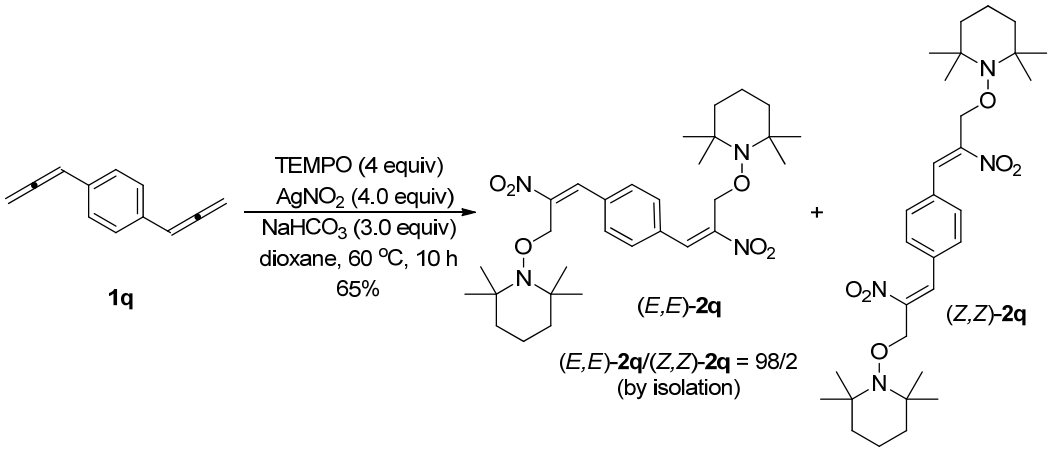
16. (*E*)- and (*Z*)-1-(1-Indolyl)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitroprop-1-ene **((***E*)- and (*Z*)-**2p)** (xc-11-057-1, 059-1)



The reaction of 1-(1-indolyl)propa-1,2-diene **1p** (0.1547 g, 1.00 mmol), TEMPO (98%, 0.3189 g, 2.00 mmol), $AgNO_2$ (99%, 0.3121 g, 2.01 mmol), and $NaHCO_3$ (0.2533 g, 3.02 mmol) in dioxane (10 mL) at 60 °C for 1.5 h afforded a crude product. The ratio of (*E*)-**2p**/(*Z*)-**2p** was 99/1 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1 then petroleum ether/ethyl acetate = 100/1) afforded (*E*)-**2p** (0.1963 g, 55%) as a solid: m.p. 127.5-128.6 °C (*n*-hexane/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 9.02 (s, 1 H, =CH), 8.13 (d, *J* = 3.3 Hz, 1 H, ArH), 7.70-7.52 (m, 2 H, ArH), 7.43-7.27 (m, 2 H, ArH), 6.84 (d, *J* = 3.3 Hz, 1 H, ArH), 5.20 (s, 2 H, CH_2), 1.60-1.42 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.39-1.31 (m, 1 H, one proton of CH_2), 1.23 (s, 6 H, 2 × CH_3), 1.13 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 137.1, 134.9, 134.0, 129.7, 126.8, 124.3, 123.5, 121.5, 110.6, 110.1, 69.3, 60.0, 39.8, 33.1, 20.2, 16.9; IR (KBr) ν (cm^{-1}) 2973, 2932, 2869, 1644, 1588, 1533, 1514, 1463, 1405, 1376, 1362, 1336, 1286, 1250, 1197, 1126, 1098, 1012; MS (ESI): *m*/*z* = 358 $[M+H]^+$; Elemental analysis calcd for $C_{20}H_{27}N_3O_3$: N, 11.76; C, 67.20; H, 7.61; Found: N, 11.50; C, 67.58; H, 7.77.

17. 1,4-Bis((*E*)- and (*Z*)-3-((2,2,6,6-tetramethylpiperidin-1-yl)oxy)-2-nitroprop-1-

en-1-yl)benzene **((***E,E***)-** and (*Z,Z*)-**2q)** (xc-11-033-2)



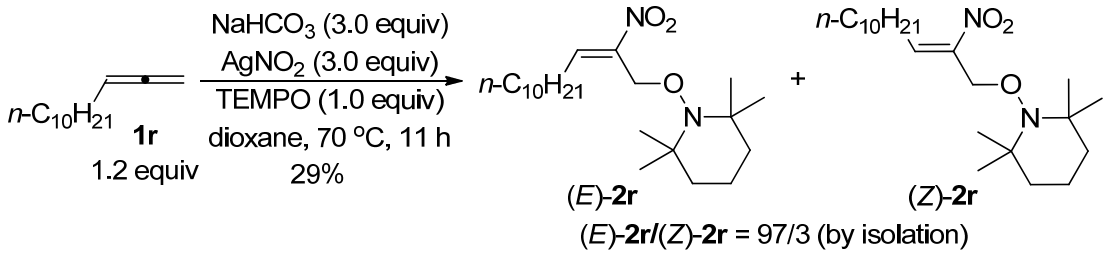
The reaction of 1,4-di(propa-1,2-dien-1-yl)benzene **1q** (0.1542 g, 1.00 mmol), TEMPO (98%, 0.6372 g, 4.00 mmol), $AgNO_2$ (99%, 0.6233 g, 4.01 mmol), and $NaHCO_3$ (0.5051 g, 6.01 mmol) in dioxane (20 mL) at 60 ^oC for 10 h afforded a crude product. The ratio of (*E,E*)-**2q**/(*Z,Z*)-**2q** was 98/2 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 150/1) afforded **2q** (0.3624 g, (*E,E*)/(*Z,Z*) = 98/2, 65% yield) as a solid.

(*E,E*)-**2q**: m.p. 124.7-126.8 ^oC (*n*-hexane/ethyl acetate); ^1H NMR (300 MHz, $CDCl_3$) δ 8.15 (s, 2 H, 2 × =CH), 7.71 (s, 4 H, ArH), 4.97 (s, 4 H, 2 × CH_2), 1.63-1.40 (m, 10 H, 4 × CH_2 and two protons of 2 × CH_2), 1.37-1.26 (m, 2 H, two protons of 2 × CH_2), 1.11 (s, 12 H, 4 × CH_3), 1.08 (s, 12 H, 4 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 149.2, 136.4, 133.6, 130.3, 69.2, 60.1, 39.8, 32.9, 20.1, 16.9; IR (KBr) ν (cm^{-1}) 3006, 2977, 2931, 2869, 1651, 1607, 1537, 1532, 1470, 1376, 1361, 1325, 1261, 1243, 1133, 1036; MS (ESI): *m*/*z* = 559 $[M+H]^+$; Elemental analysis calcd for $C_{30}H_{46}N_4O_6$: N, 10.03; C, 64.49; H, 8.30; Found: N, 9.82; C, 64.60; H, 8.39. The following signals are

discernible for (*Z*,*Z*)-**2q**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.73 (s, 2 H, 2 × =CH), 4.77 (s, 4 H, 2 × CH_2).

Nitro-oxoamination reactions of mono-allenes that need the degassing operation

1. (*E*)- and (*Z*)-1-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitrotridec-2-ene **(**(*E*)- and (*Z*)-**2r)** (xc-11-099-1,2; 11-151-1,2)



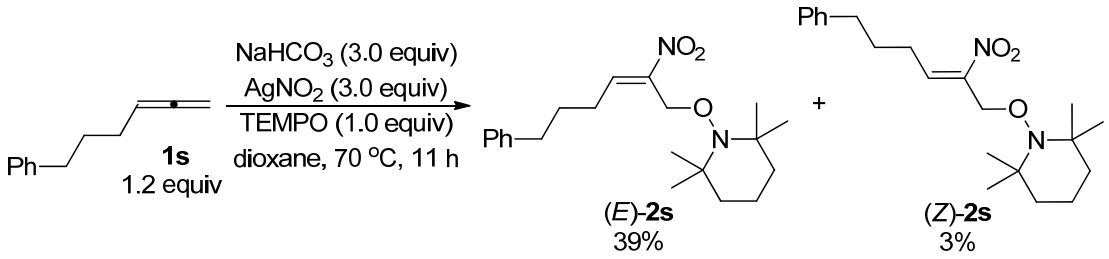
Typical Procedure II: To a dried flask were added $AgNO_2$ (99%, 0.0935 g, 0.60 mmol), $NaHCO_3$ (0.0507 g, 0.60 mmol), TEMPO (98%, 0.0321 g, 0.20 mmol), trideca-1,2-diene **1r** (0.0437 g, 0.24 mmol), and 2 mL of anhydrous 1,4-dioxane at room temperature under N_2 atmosphere. The resulting mixture was then degassed for three times before the reaction flask was placed in a pre-heated oil bath of 70 ^{o}C. The reaction was finished in 11 h as monitored by TLC. After cooling to room temperature, the crude reaction mixture was filtrated through a short column of silica gel (ethyl acetate 3 × 15 mL). After concentration, the ratio of (*E*)-**2r**/(*Z*)-**2r** was 98/2 as determined by the ^{1}H NMR analysis. Column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1) afforded **2r** (0.0225 g, (*E*)/(*Z*) = 97/3, 29% yield) as an oil.

(*E*)-**2r** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.27 (t, *J* = 8.1 Hz, 1 H, =CH),

4.75 (s, 2 H, CH_2), 2.36 (q, J = 7.7 Hz, 2 H, CH_2), 1.59-1.42 (m, 7 H, 3 × CH_2 and one proton of CH_2), 1.38-1.20 (m, 21 H, one proton of CH_2, 7 × CH_2 and 2 × CH_3), 1.06 (s, 6 H, 2 × CH_3), 0.88 (t, J = 6.6 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 147.9, 141.4, 68.2, 60.0, 39.8, 32.9, 31.8, 29.5, 29.4, 29.30, 29.28, 29.2 28.6, 28.3, 22.6, 19.9, 17.0, 14.1; IR (neat) ν (cm^{-1}) 2926, 2855, 1669, 1639, 1558, 1530, 1468, 1375, 1360, 1337, 1261, 1246, 1209, 1183, 1132, 1039; MS (ESI): m/z = 538 $[M+TEMPO]^+$, 326 $[M+H-Bu]^+$; Elemental analysis calcd for $C_{22}H_{42}N_2O_3$: N, 7.32; C, 69.07; H, 11.07; Found: N, 7.29; C, 69.04; H, 11.12.

The following signals are discernible for (*Z*)-**2r** (less polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.09 (t, J = 7.5 Hz, 1 H, =CH), 4.61 (d, J = 0.9 Hz, 2 H, CH_2), 2.49 (d, J = 7.5 Hz, 2 H, CH_2).

2. (*E*)- and (*Z*)-1-(2,2,6,6-Tetramethylpiperidinyl-1-oxy)-2-nitro-6-phenylhex-2-ene **(**(*E*)- and (*Z*)-**2s)** (xc-11-152-1,2)



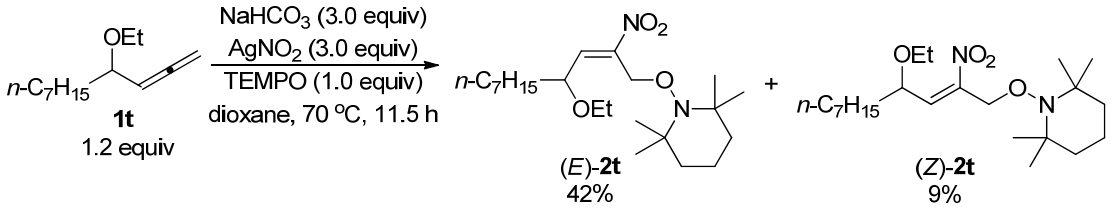
Following Typical Procedure II: The reaction of 6-phenylhexa-1,2-diene **1s** (0.0381 g, 0.24 mmol), $AgNO_2$ (99%, 0.0935 g, 0.60 mmol), $NaHCO_3$ (0.0512 g, 0.61 mmol), and TEMPO (98%, 0.0318 g, 0.20 mmol) in dioxane (2 mL) at 70 ^{o}C for 11 h afforded a crude product. The ratio of (*E*)-**2s**/(*Z*)-**2s** was 95/5 as determined by the ^{1}H

NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 80/1 then 50/1) afforded (*E*)-**2s** (0.0277 g, 39% yield) as an oil and (*Z*)-**2s** (0.0039 g, purity of (*Z*)-**2s**: 55% as determined by using mesitylene as the internal standard, 3% yield) as an oil.

(*E*)-**2s** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.35-7.10 (m, 6 H, ArH and =CH), 4.71 (s, 2 H, CH_2), 2.69 (t, *J* = 7.5 Hz, 2 H, CH_2), 2.38 (q, *J* = 7.7 Hz, 2 H, CH_2), 1.87 (quint, *J* = 7.5 Hz, 2 H, CH_2), 1.60-1.39 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.37-1.27 (m, 1 H, one proton of CH_2), 1.21 (s, 6 H, 2 × CH_3), 1.04 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.1, 140.9, 140.7, 128.5, 128.3, 126.1, 68.3, 60.0, 39.8, 35.4, 32.9, 30.1, 27.8, 20.0, 17.0; IR (neat) ν (cm^{-1}) 2972, 2932, 2867, 1667, 1637, 1526, 1497, 1470, 1453, 1375, 1360, 1335, 1261, 1246, 1132, 1038; MS (ESI): *m*/*z* = 361 $[M+H]^+$; HRMS (ESI): calcd. for $C_{21}H_{33}N_2O_3$ $[M+H]^+$ 361.2486; found 361.2492.

The following signals are discernible for (*Z*)-**2s** (less polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.08 (t, *J* = 7.5 Hz, 1 H, =CH), 4.60 (d, *J* = 0.9 Hz, 2 H, CH_2), 2.67 (t, *J* = 7.7 Hz, 2 H, CH_2), 2.54 (q, *J* = 7.3 Hz, 2 H, CH_2), 1.84 (quint, *J* = 7.7 Hz, 2 H, CH_2), 1.16 (s, 6 H, 2 × CH_3), 1.08 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 147.1, 141.4, 135.7, 128.42, 128.38, 126.0, 74.3, 60.1, 39.7, 35.5, 32.8, 30.5, 27.9, 20.1, 17.0; IR (neat) ν (cm^{-1}) 2971, 2930, 2867, 1640, 1578, 1526, 1453, 1332, 1242, 1132; MS (ESI): *m*/*z* = 361 $[M+H]^+$; HRMS (ESI): calcd. for $C_{21}H_{33}N_2O_3$ $[M+H]^+$ 361.2486; found 361.2496.

3. (*E*)- and (*Z*)-4-Ethoxy-1-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitroundec-2-ene **((***E*)- and (*Z*)-**2t)** (xc-12-025)



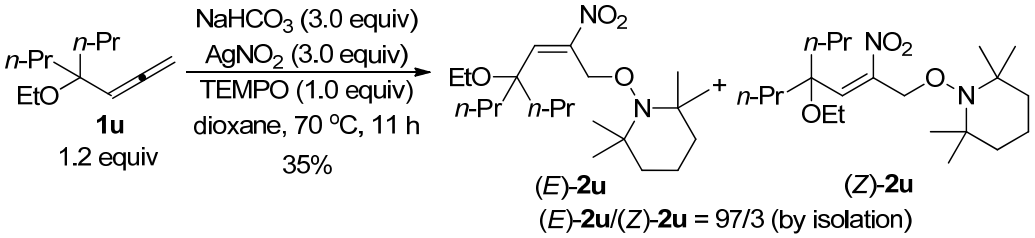
Following Typical Procedure II: The reaction of 4-ethoxyundeca-1,2-diene **1t** (0.0482 g, 0.25 mmol), $AgNO_2$ (99%, 0.0935 g, 0.60 mmol), $NaHCO_3$ (0.0507 g, 0.60 mmol), and TEMPO (98%, 0.0320 g, 0.20 mmol) in dioxane (2 mL) at 70 ^oC for 11.5 h afforded a crude product. The ratio of (*E*)-**2t**/(*Z*)-**2t** was 83/17 as determined by the ^1H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 80/1 then 50/1) afforded (*E*)-**2t** (0.0333 g, 42% yield) as an oil and (*Z*)-**2t** (0.0086 g, purity of (*Z*)-**2t**: 83% as determined by using mesitylene as the internal standard, 9% yield) as an oil.

(*E*)-**2t** (less polar): ^1H NMR (300 MHz, $CDCl_3$) δ 7.06 (d, *J* = 9.3 Hz, 1 H, =CH), 4.80 (AB, *J* = 12.0 Hz, 1 H, one proton of $NOCH_2$), 4.74 (AB, *J* = 11.70 Hz, 1 H, one proton of $NOCH_2$), 4.22-4.11 (m, 1 H, CH), 3.58-3.31 (m, 2 H, OCH_2), 1.82-1.68 (m, 1 H, one proton of CH_2), 1.61-1.40 (m, 7 H, 3 × CH_2 and one proton of CH_2), 1.38-1.18 (m, 19 H, 5 × CH_2 and 3 × CH_3), 1.06 (s, 6 H, 2 × CH_3), 0.88 (t, *J* = 6.9 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 148.3, 141.3, 75.4, 68.6, 65.1, 60.2, 60.1, 39.8, 35.4, 33.0, 32.9, 31.7, 29.5, 29.1, 25.2, 22.6, 20.05, 20.00, 17.0, 15.3, 14.1; IR (neat) ν (cm^{-1}) 2929, 2871, 1537, 1469, 1453, 1375, 1361, 1335, 1261, 1244, 1209,

1184, 1132, 1114, 1093, 1045; MS (ESI): *m*/*z* = 399 $[M+H]^+$; HRMS (ESI): calcd. for $C_{22}H_{43}N_2O_4$ $[M+H]^+$ 399.3217; found 399.3222.

The following signals are discernible for (*Z*)-**2t** (more polar): ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.07 (d, *J* = 8.4 Hz, 1 H, =CH), 4.68 (AB, *J* = 12.9 Hz, 1 H, one proton of $NOCH_2$), 4.59 (AB, *J* = 13.2 Hz, 1 H, one proton of $NOCH_2$), 4.53-4.43 (m, 1 H, CH), 3.57-3.33 (m, 2 H, OCH_2); IR (neat) ν (cm^{-1}) 2928, 2852, 1531, 1467, 1450, 1376, 1361, 1262, 1132, 1089; MS (ESI): *m*/*z* = 399 $[M+H]^+$; HRMS (ESI): calcd. for $C_{22}H_{43}N_2O_4$ $[M+H]^+$ 399.3217; found 399.3224.

4. (*E*)- and (*Z*)-4-Ethoxy-1-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro-4-propyl hept-2-ene **((***E*)- and (*Z*)-**2u)** (xc-12-030-1)



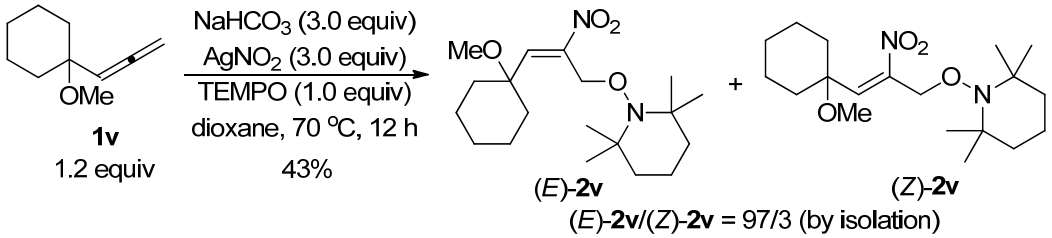
Following Typical Procedure II: The reaction of 4-ethoxy-4-propylhepta-1,2-diene **1u** (0.0439 g, 0.24 mmol), $AgNO_2$ (99%, 0.0938 g, 0.60 mmol), $NaHCO_3$ (0.0512 g, 0.61 mmol), and TEMPO (98%, 0.0322 g, 0.20 mmol) in dioxane (2 mL) at 70 °C for 11 h afforded a crude product. The ratio of (*E*)-**2u**/(*Z*)-**2u** was 96/4 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 100/1 then 50/1) afforded **2u** (0.0273 g, (*E*)/(*Z*) = 97/3, 35% yield) as an oil.

(*E*)-**2u**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.69 (s, 1 H, =CH), 5.08 (s, 2 H, $NOCH_2$),

3.31 (q, J = 6.9 Hz, 2 H, OCH_2), 1.87-1.72 (m, 2 H, CH_2), 1.56-1.41 (m, 7 H, 3 × CH_2 and one proton of CH_2), 1.37-1.18 (m, 11 H, 2 × CH_3, 2 × CH_2 and one proton of CH_2), 1.17 (t, J = 6.9 Hz, 3 H, CH_3), 1.04 (s, 6 H, 2 × CH_3), 0.90 (t, J = 7.2 Hz, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 149.9, 141.1, 79.7, 68.2, 60.0, 56.6, 40.1, 39.2, 33.1, 19.9, 17.0, 16.8, 15.5, 14.3; IR (neat) ν (cm^{-1}) 2959, 2933, 2874, 1532, 1469, 1455, 1376, 1361, 1347, 1326, 1262, 1245, 1166, 1133, 1116, 1074, 1033; MS (ESI): m/z = 385 $[M+H]^+$; HRMS (ESI): calcd. for $C_{21}H_{41}N_2O_4$ $[M+H]^+$ 385.3061; found 385.3063.

The following signals are discernible for (*Z*)-**2u**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.34 (s, 1 H, =CH), 4.51 (s, 2 H, $NOCH_2$), 3.24 (q, J = 7.1 Hz, 2 H, OCH_2).

5. (*E*)- and (*Z*)-3-(1-Methoxycyclohexyl)-1-(2,2,6,6-tetramethylpiperidinyl-1-oxy) -2-nitroprop-2-ene **((***E***)**- and (*Z*)-**2v)** (xc-12-022-1)



Following Typical Procedure II: The reaction of 1-(1-methoxycyclohexyl)propa-1,2-diene **1v** (0.0367 g, 0.24 mmol), $AgNO_2$ (99%, 0.0935 g, 0.60 mmol), $NaHCO_3$ (0.0508 g, 0.60 mmol), and TEMPO (98%, 0.0319 g, 0.20 mmol) in dioxane (2 mL) at 70 °C for 12 h afforded a crude product. The ratio of (*E*)-**2v**/(*Z*)-**2v** was 96/4 as determined by the ^{1}H NMR analysis of the crude product. Further purification via column chromatography on silica gel (eluent: petroleum

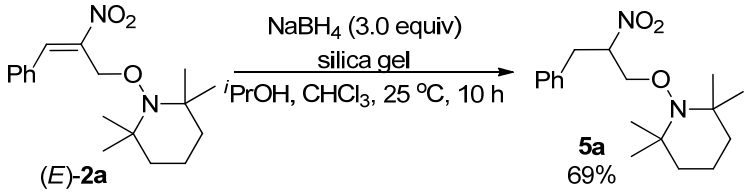
ether/ethyl ether = 80/1 then 50/1) afforded **2v** (0.0306 g, (*E*)/(*Z*) = 97/3, 43% yield) as an oil.

(*E*)-**2v**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.88 (s, 1 H, =CH), 4.99 (s, 2 H, $NOCH_2$), 3.14 (s, 3 H, OCH_3), 1.98-1.88 (m, 2 H, CH_2), 1.68-1.42 (m, 14 H, 7 × CH_2), 1.26 (s, 6 H, 2 × CH_3), 1.05 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 149.4, 141.3, 75.6, 67.9, 60.2, 50.2, 40.2, 35.5, 32.8, 25.0, 21.3, 20.0, 17.0; IR (neat) ν (cm^{-1}) 2934, 2860, 1532, 1470, 1450, 1376, 1361, 1348, 1326, 1262, 1244, 1183, 1147, 1133, 1074, 1046; MS (ESI): *m*/*z* = 355 $[M+H]^+$; HRMS (ESI): calcd. for $C_{19}H_{35}N_2O_4$ $[M+H]^+$ 355.2591; found 355.2600.

The following signals are discernible for (*Z*)-**2v**: ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.46 (s, 1 H, =CH), 4.54 (d, *J* = 1.2 Hz, 2 H, CH_2), 3.10 (s, 3 H, CH_3).

Synthetic applications of nitro-oxoamination product (*E*)-2a.

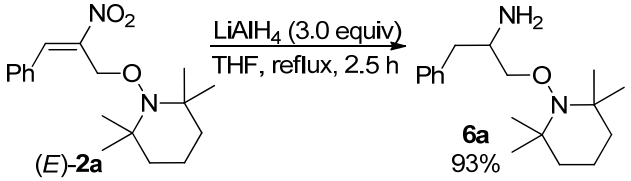
1. 2,2,6,6-Tetramethyl-1-(2-nitro-3-phenylpropoxy)piperidine (**5a**)[2] (xc-12-056)



To a dried Schlenk tube were added (*E*)-3-(2,2,6,6-tetramethylpiperidinyl-1-oxy)-2-nitro-1-phenylprop-1-ene (*E*)-**2a** (0.0957 g, 0.30 mmol), silica gel (100 ~ 200 mesh, 1.0012 g), $CHCl_3$ (1.5 mL), and ^{i}PrOH (7.5 mL) at room temperature under N_2 atmosphere. After stirring for 5 min, $NaBH_4$ (98%, 0.0351 g, 0.91 mmol) was added. The resulting mixture was stirred at

25 ^{o}C for 10 h as monitored by TLC. The crude reaction mixture was filtrated through a short column of silica gel (eluted with ethyl acetate 3 × 10 mL). After evaporation, the crude product was purified through column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 100/1 then 80/1) to afford **5a** (0.0663 g, 69%) as an oil: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.35-7.23 (m, 3 H, ArH), 7.21-7.13 (m, 2 H, ArH), 4.96-4.83 (m, 1 H, CH), 4.31 (dd, J_1 = 10.4 Hz, J_2 = 8.9 Hz, 1 H, one proton of OCH_2), 3.96 (dd, J_1 = 10.2 Hz, J_2 = 3.3 Hz, 1 H, one proton of OCH_2), 3.26 (dd, J_1 = 14.3 Hz, J_2 = 8.6 Hz, 1 H, one proton of CH_2), 3.02 (dd, J_1 = 14.1 Hz, J_2 = 6.3 Hz, 1 H, one proton of CH_2), 1.54-1.36 (m, 5 H, 2 × CH_2 and one proton of CH_2), 1.35-1.26 (m, 1 H, one proton of CH_2), 1.12 (s, 3 H, CH_3), 1.06 (s, 3 H, CH_3), 1.03 (s, 6 H, 2 × CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 135.0, 128.8, 128.7, 127.5, 87.7, 75.7, 60.3, 60.1, 39.6, 39.5, 36.5, 32.7, 20.1, 19.9, 16.9; IR (neat) ν (cm^{-1}) 3065, 3030, 2974, 2932, 1605, 1557, 1497, 1470, 1455, 1376, 1361, 1310, 1262, 1245, 1209, 1184, 1133, 1071, 1047; MS (ESI): *m*/*z* = 321 $[M+H]^+$; HRMS (ESI): calcd. For $C_{18}H_{29}N_2O_3$ $[M+H]^+$ 321.2173; found 321.2164.

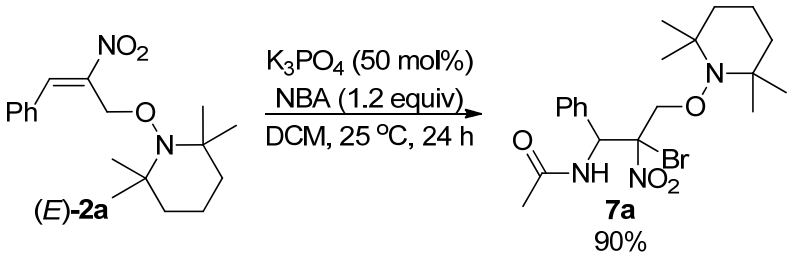
2. 1-Phenyl-3-((2,2,6,6-tetramethylpiperidin-1-yl)oxy)prop-2-yl amine (**6a**)[3] (xc-12-038)



To a dried Schlenk tube were added $LiAlH_4$ (98%, 0.1165 g, 3.0 mmol) and THF

(6 mL) at room temperature under N_2 atmosphere. After stirring for 5 min, (*E*)-**2a** (0.3175 g, 1.0 mmol) and THF (4 mL) were added. Then the Schlenk tube was placed in a pre-heated oil bath of 90 ^oC, the resulting mixture was stirred and refluxed for 2.5 h as monitored by TLC. After cooling to room temperature H_2O (20 mL) and NaOH (1 M, 3 mL) were added to quench the reaction in an ice-water bath. The resulting mixture was extracted with ethyl acetate (20 mL × 3), washed with brine and dried over anhydrous Na_2SO_4. After filtration and concentration, the crude product was purified through column chromatography (6 cm high) on silica gel (eluent: petroleum ether/ethyl acetate = 10/1 then 5/1) to afford **6a** (0.2697 g, 93%) as an oil: ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.34-7.25 (m, 2 H, ArH), 7.24-7.16 (m, 3 H, ArH), 3.82-3.65 (m, 2 H, OCH_2), 3.32-3.20 (m, 1 H, CH), 2.80 (dd, J_1 = 13.4 Hz, J_2 = 4.7 Hz, 1 H, one proton of CH_2), 2.53 (dd, J_1 = 13.5 Hz, J_2 = 9.0 Hz, 1 H, one proton of CH_2), 1.61-1.38 (m, 7 H, NH_2, 2 × CH_2 and one proton of CH_2), 1.37-1.27 (m, 1 H, one proton of CH_2), 1.19 (s, 3 H, CH_3), 1.13 (s, 6 H, 2 × CH_3), 1.11 (s, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 139.0, 129.2, 128.4, 126.2, 81.3, 59.8, 52.2, 40.9, 39.6, 33.2, 33.0, 20.14, 20.06, 17.0; IR (neat) ν (cm^{-1}) 3378, 3062, 3026, 2973, 2931, 2871, 1727, 1603, 1495, 1470, 1454, 1374, 1359, 1262, 1245, 1208, 1184, 1133, 1049; MS (ESI): *m*/*z* = 291 $[M+H]^+$; HRMS (ESI): calcd. For $C_{18}H_{31}N_2O$: $[M+H]^+$ 291.2431; found 291.2439.

3. *N*-(2-Bromo-2-nitro-1-phenyl-3-((2,2,6,6-tetramethylpiperidin-1-yl)oxy)propyl) acetamide (**7a**)[4] (xc-12-037)



To a dried Schlenk tube were added (*E*)-**2a** (0.3178 g, 1.0 mmol), *N*-bromoacetamide (NBA, 97%, 0.1711 g, 1.2 mmol), K_3PO_4 (0.1065 g, 0.5 mmol) and DCM (10 mL). The resulting mixture was stirred at 25 ^oC for 24 h as monitored by TLC. The resulting mixture was transfer to a separation funnel with ethyl acetate (20 mL), washed with 10 mL each of water and brine, and dried over anhydrous Na_2SO_4. After filtration and concentration, the crude product was purified through column chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 50/1 then 5/1) to afford **7a** (0.4121 g, 90%) as a viscous oil: ^1H NMR (300 MHz, $CDCl_3$) δ 7.38-7.28 (m, 5 H, ArH), 6.33 (d, *J* = 9.9 Hz, 1 H, NH), 5.97 (d, *J* = 9.9 Hz, 1 H, CH), 4.77 (d, *J* = 10.8 Hz, 1 H, one proton of CH_2), 4.20 (d, *J* = 10.8 Hz, 1 H, one proton of CH_2), 2.06 (s, 3 H, CH_3), 1.54-1.35 (m, 5 H, 2 ×CH_2 and one proton of CH_2), 1.33-1.24 (m, 1 H, one proton of CH_2), 1.18 (s, 3 H, CH_3), 1.12 (s, 6 H, 2 × CH_3), 1.00 (s, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$) δ 169.0, 133.9, 129.3, 128.6, 128.3, 105.8, 79.7, 60.9, 60.7, 56.9, 39.9, 32.4, 23.3, 20.3, 20.2, 16.8; IR (neat) ν (cm^{-1}) 3296, 2974, 2933, 2872, 1738, 1660, 1568, 1532, 1471, 1453, 1374, 1328, 1245, 1207, 1131, 1101, 1083, 1046; MS (ESI): *m*/*z* = 458 $[M+H]^+$; HRMS (ESI): calcd. For $C_{20}H_{31}BrN_3O_4$: $[M+H]^+$ 456.1492; found 456.1500.

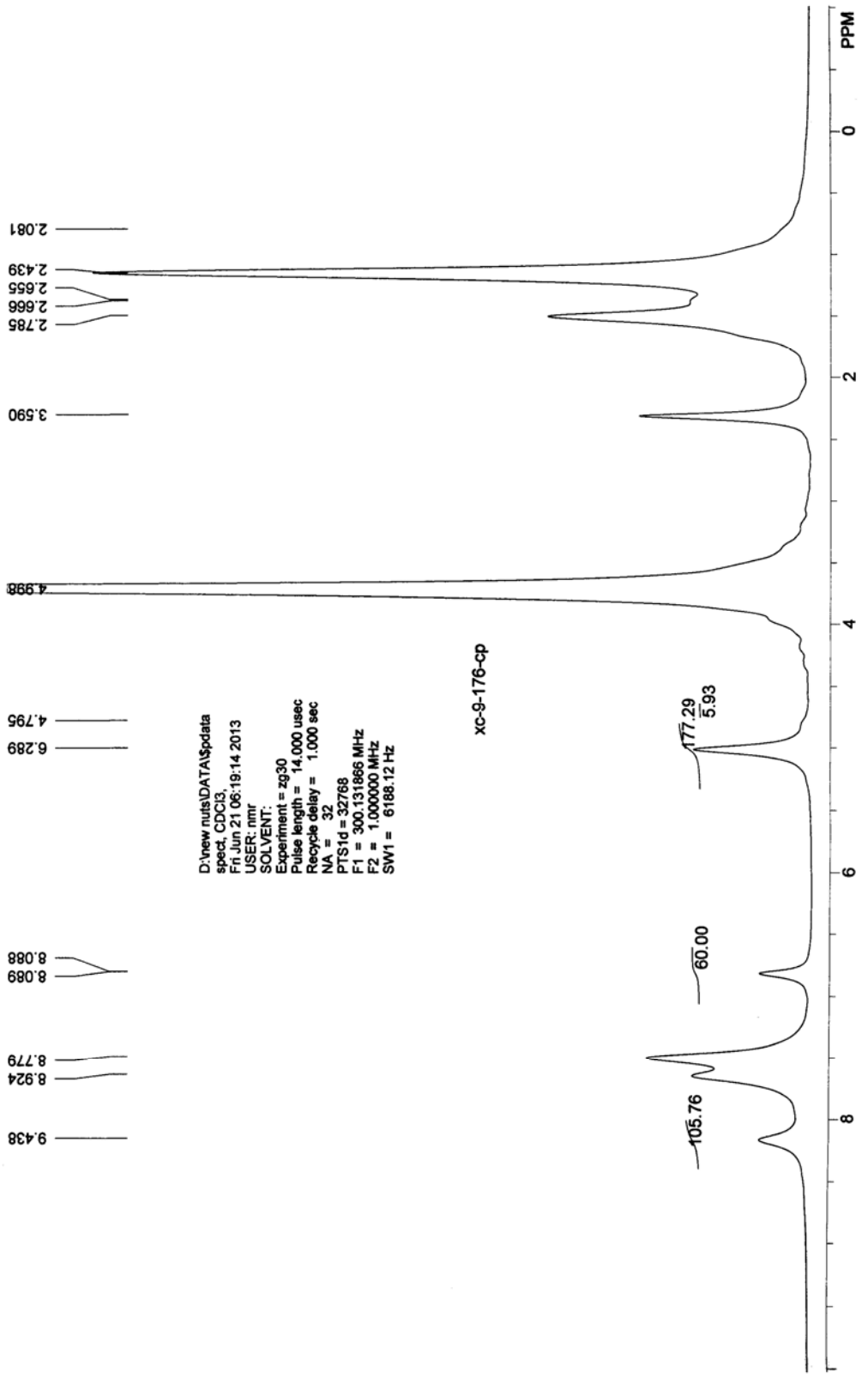
Reference:

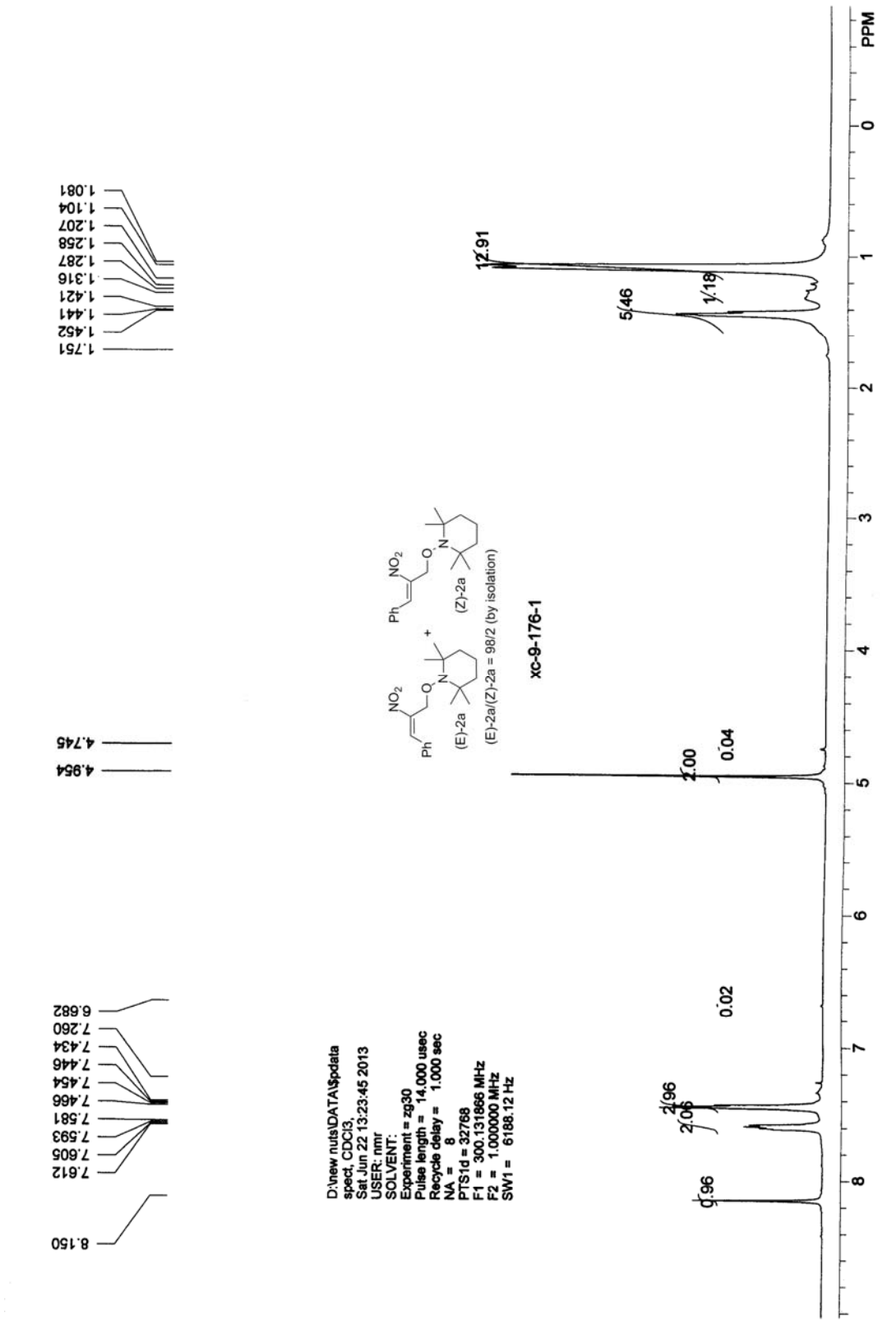
1. Kuang, J.-Q.; Ma, S.-M. *J. Org. Chem.*, 2009, **74**, 1763.

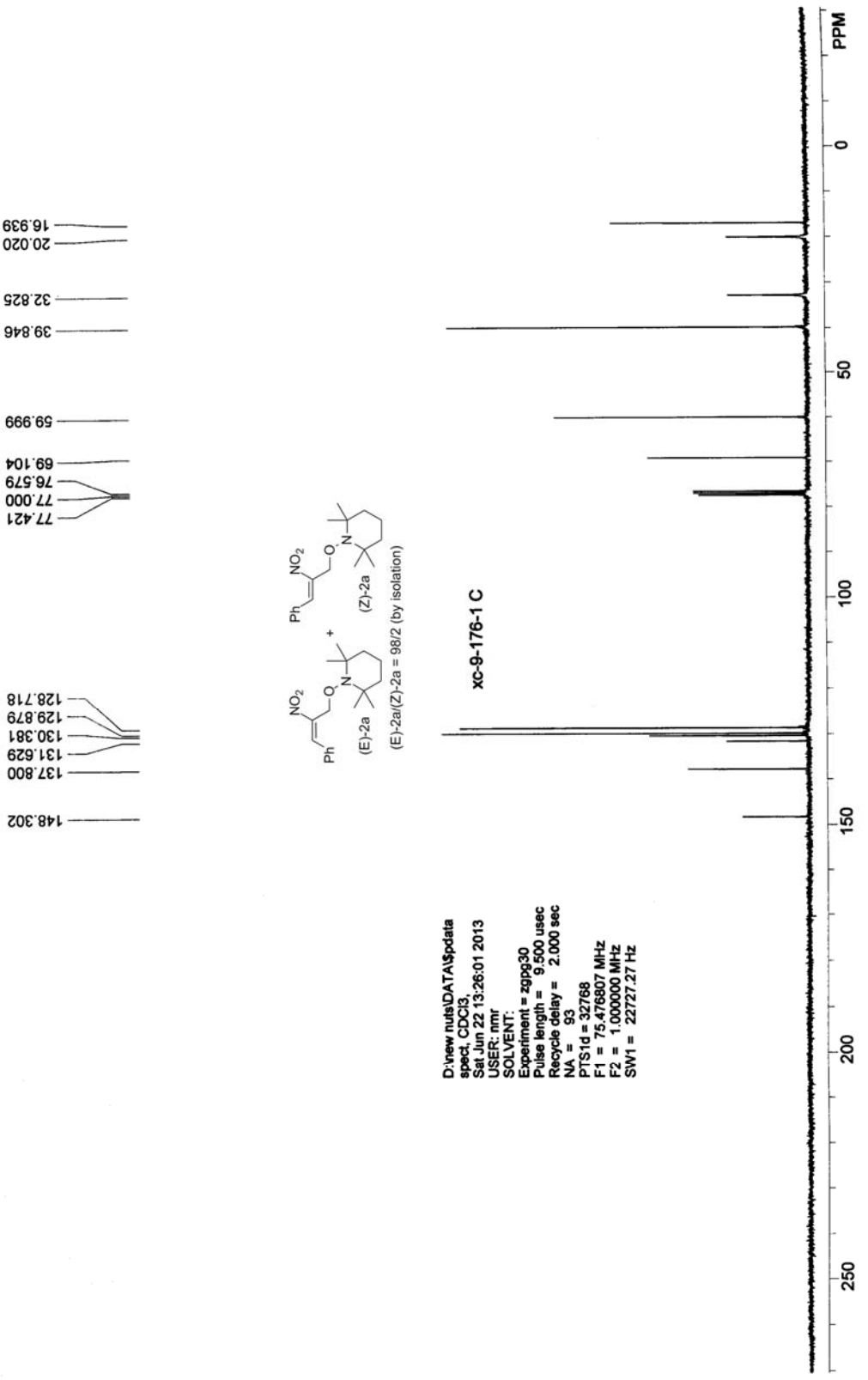
2. S. P. Waters, M. W. Fennie, M. C. Kozlowski, *Org. Lett.*, 2006, **8**, 3243.

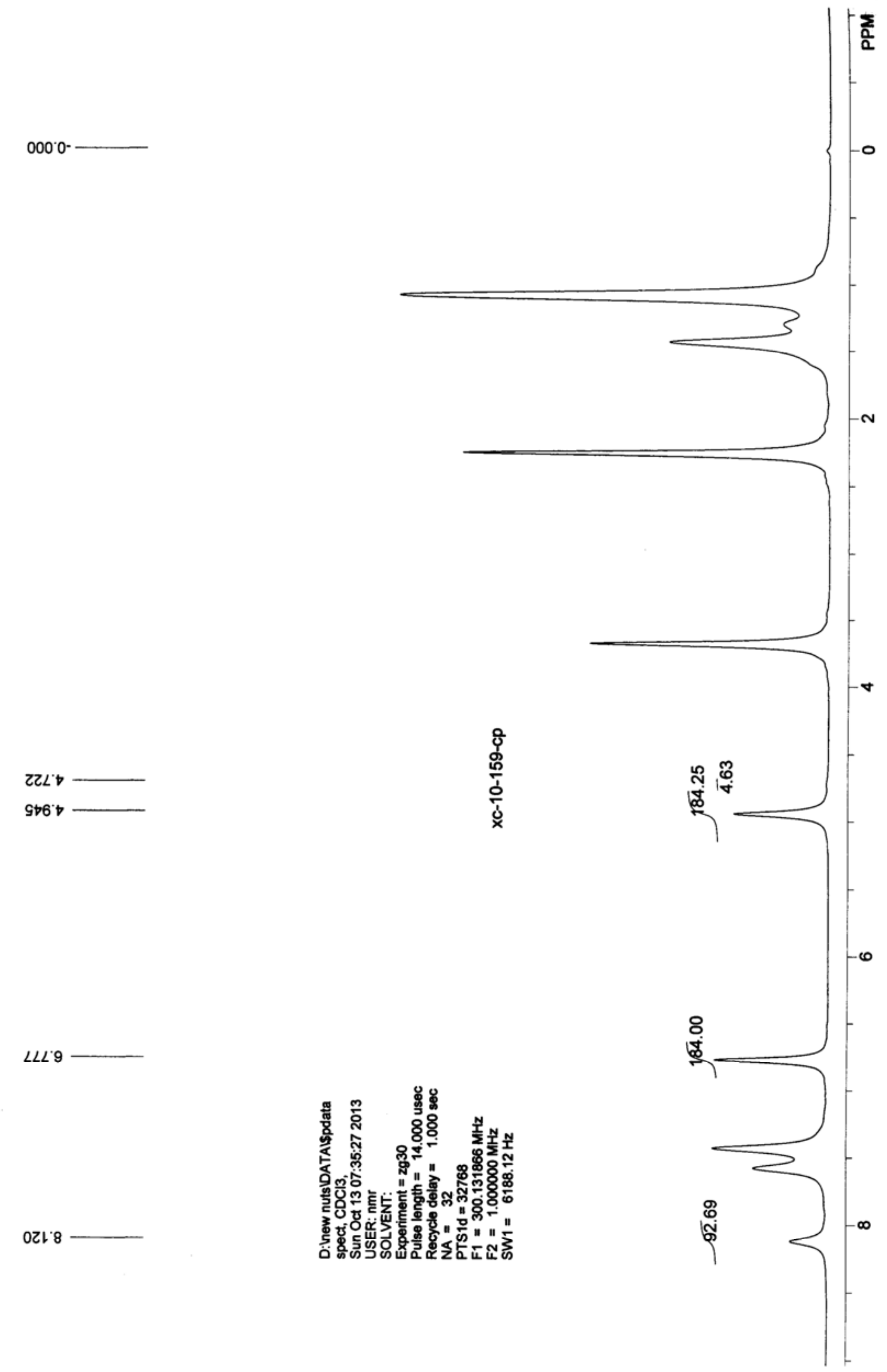
3. N. Kise, S. Isemoto, T. Sakurai, *J. Org. Chem.* 2011, **76**, 9856.

4. Z.-G. Chen, Y. Wang, J.-F. Wei, P.-F. Zhao, X.-Y. Shi, *J. Org. Chem.*, 2010, **75**, 2085.


2.081
2.439
2.655
2.666
2.785
3.590
4.998
4.795
6.289
8.089
8.088
8.779
8.924
9.438
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Jun 21 06:19:14 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-9-176-cp
177.29
5.93
60.00
105.76
PPM
0
2
4
6
8


8.150
7.612
7.605
7.593
7.581
7.466
7.454
7.446
7.434
7.260
6.682
4.954
4.745
1.751
1.452
1.441
1.421
1.316
1.287
1.258
1.207
1.104
1.081
D:\new nuts\DATA\5\pdata
spect, CDCl3,
Sat Jun 22 13:23:45 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2a
(Z)-2a
(E)-2a/(Z)-2a = 98/2 (by isolation)
xc-9-176-1
12.91
5.46
1.18
2.00
0.04
0.02
2.06
2.06
0.96
0.96
PPM


148.302
137.800
131.629
130.381
129.879
128.718
77.421
77.000
76.579
69.104
59.999
39.846
32.825
20.020
16.939
(E)-2a
(Z)-2a
(E)-2a/(Z)-2a = 98/2 (by isolation)
xc-9-176-1 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Jun 22 13:26:01 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 93
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
250
200
150
100
50
0



xc-10-159-cp
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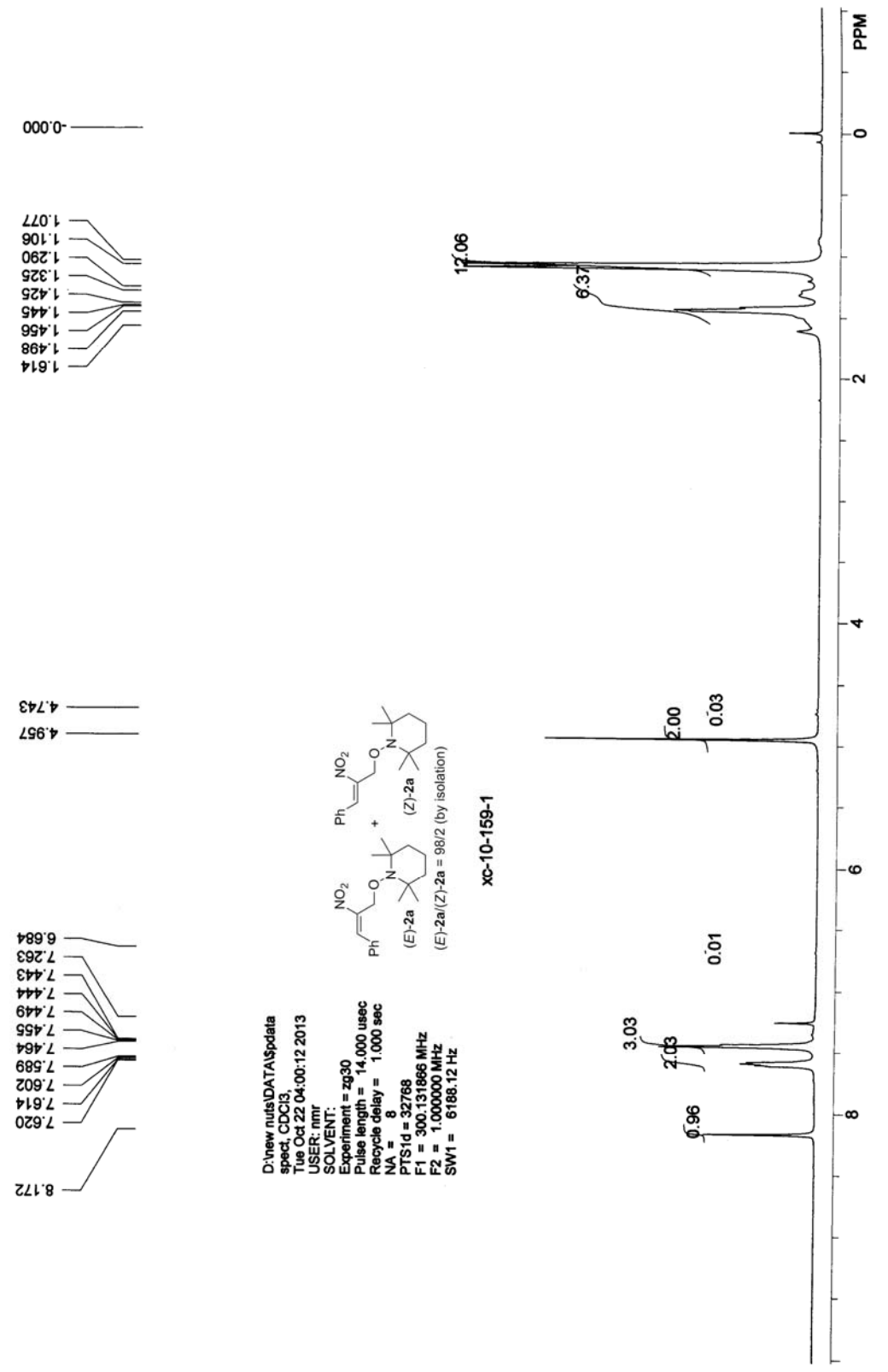
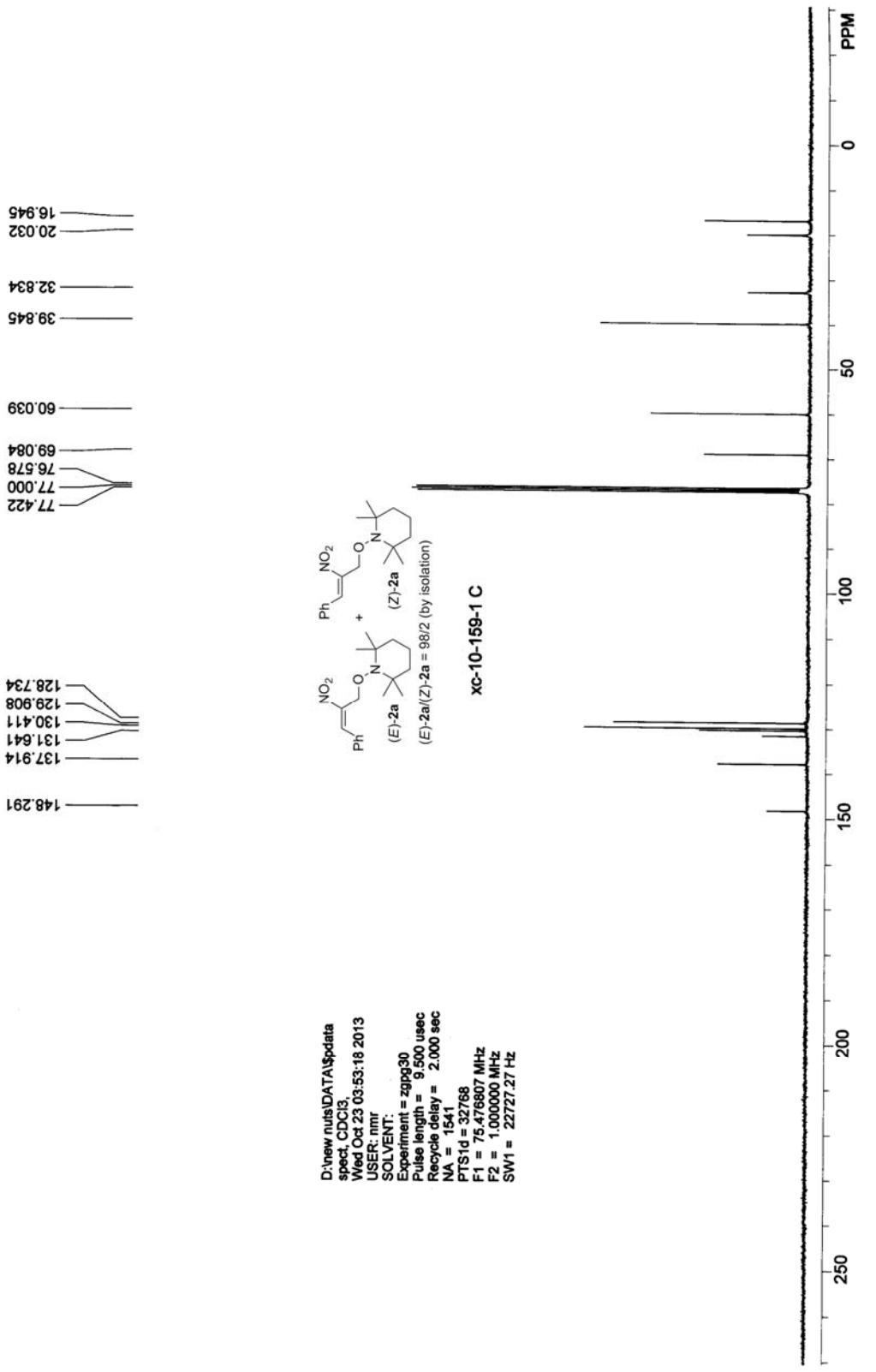
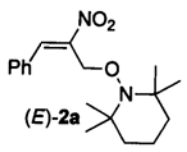
4.722
4.945
6.777
8.120
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sun Oct 13 07:35:27 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
92.69
184.00
184.25
4.63
PPM
0
2
4
6
8

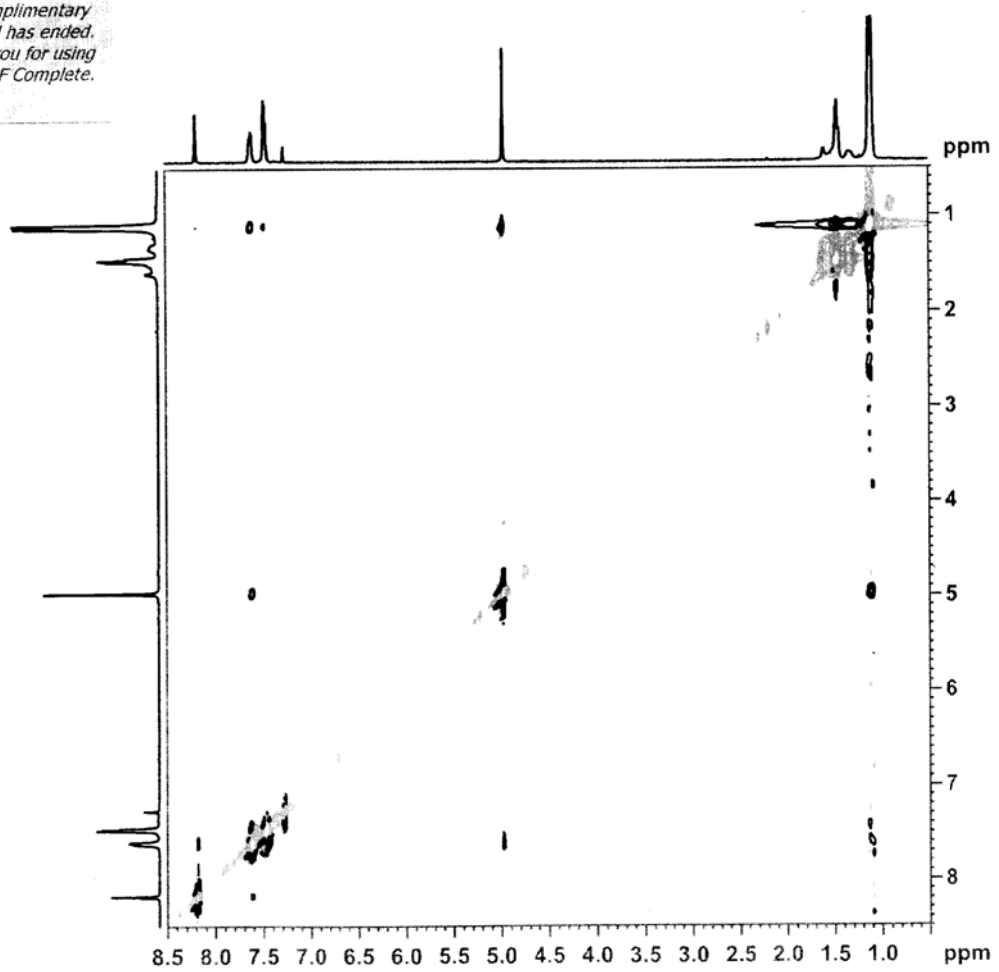

xc-10-159-1
(E)-2a/(Z)-2a = 98/2 (by isolation)
(E)-2a
(Z)-2a
PPM

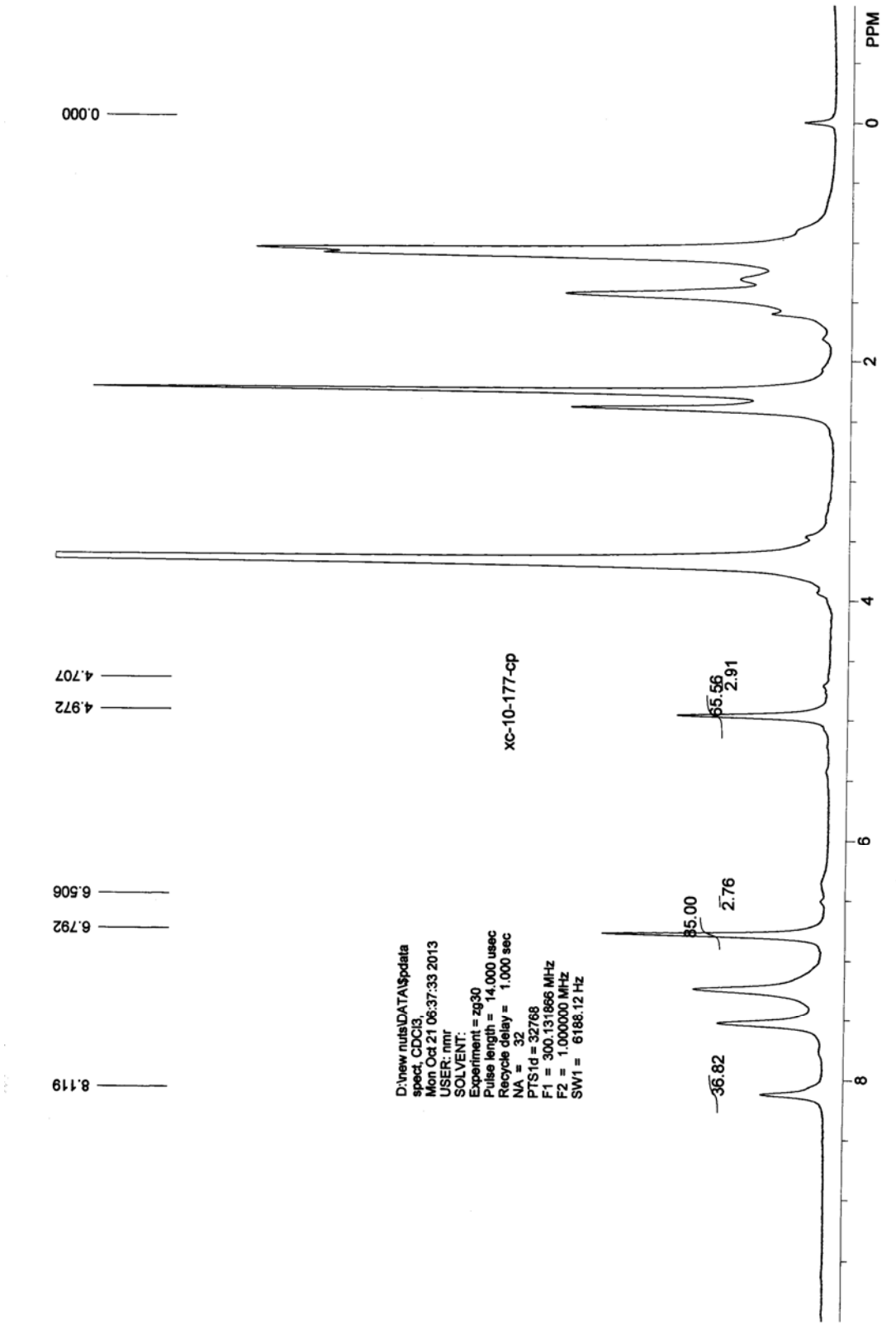

16.945
20.032
32.834
39.845
60.039
69.084
76.578
77.000
77.422
128.734
128.908
130.411
131.641
137.914
148.291
D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed Oct 23 03:53:18 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 1541
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(E)-2a
(Z)-2a
(E)-2a/(Z)-2a = 98/2 (by isolation)
xc-10-159-1 C
250
200
150
100
50
0
PPM

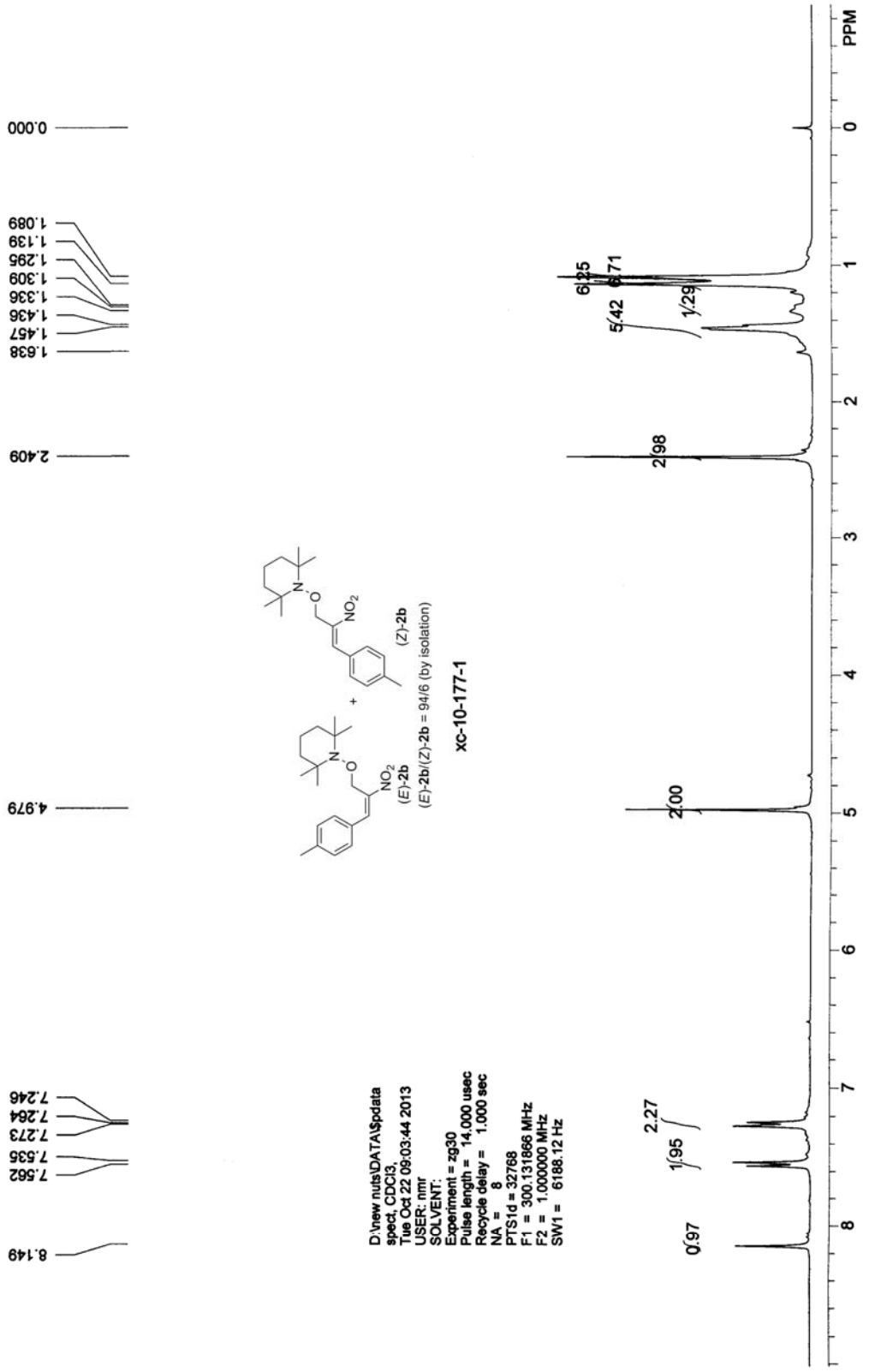


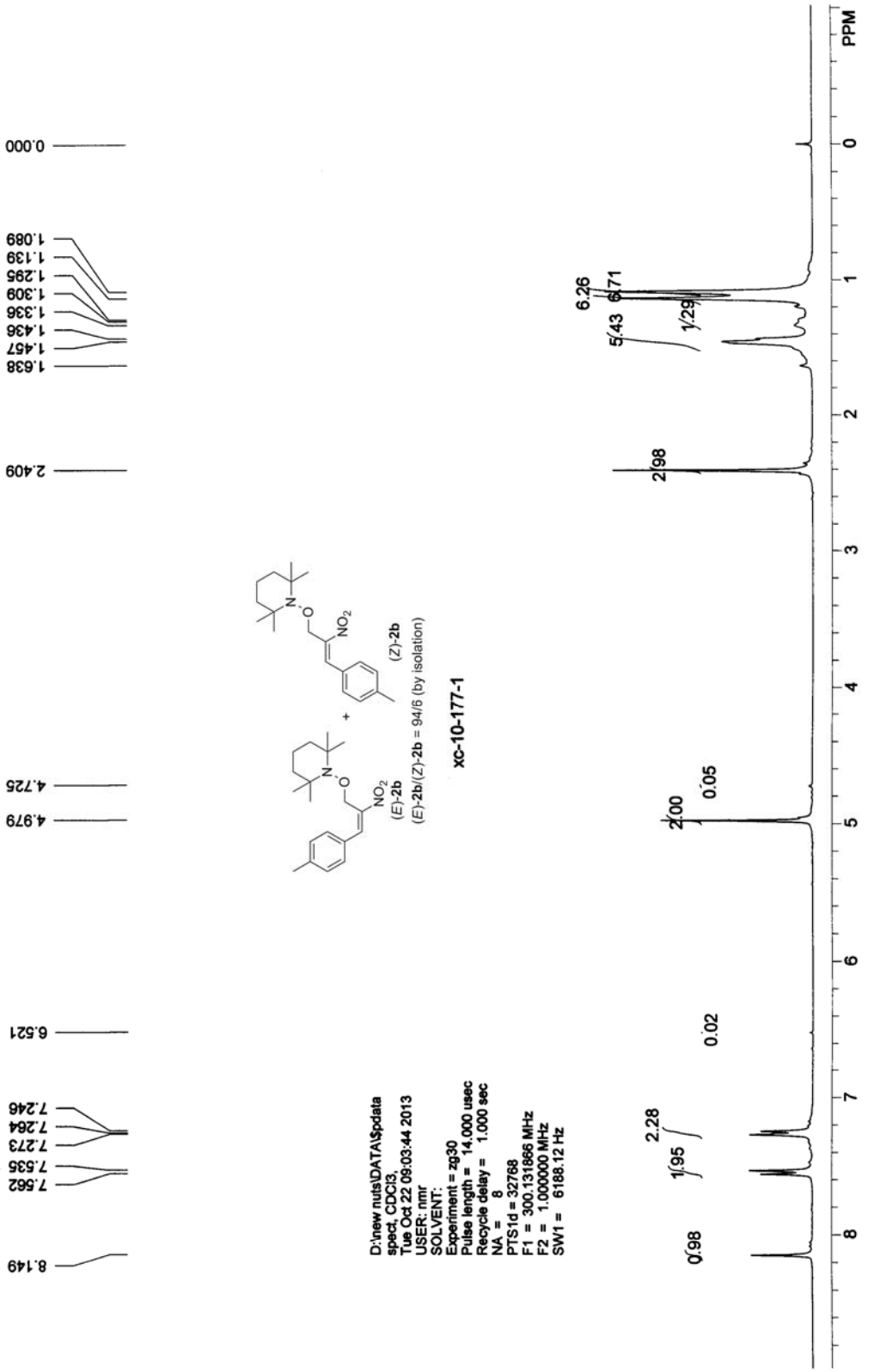
(*E*)-**2a**

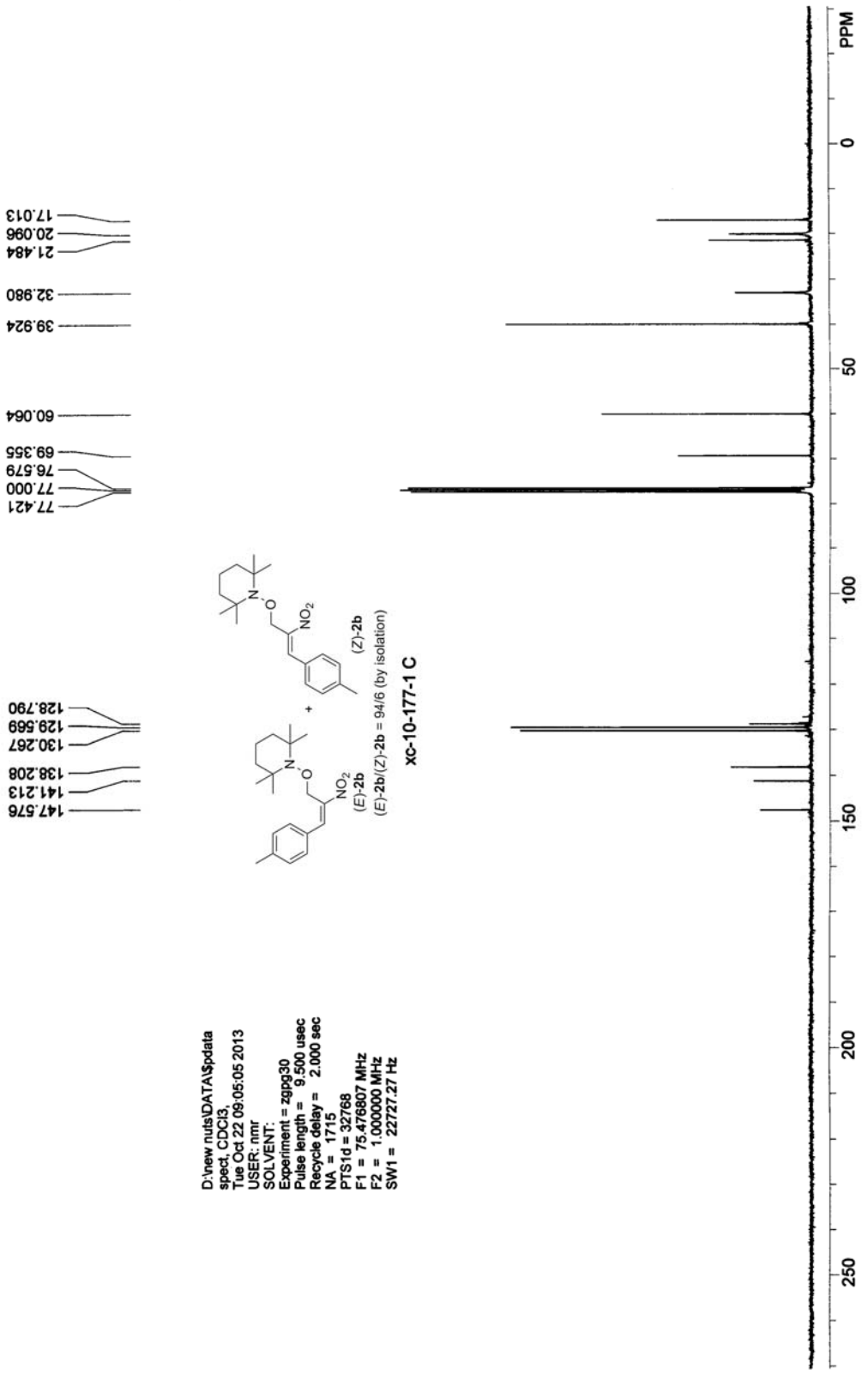
xc-10-159-1-noe




0.000
4.707
4.972
6.506
6.792
8.119
PPM
0
2
4
6
8
xc-10-177-cp
D:\new nuts\DATA\$pdata
spect, CDCl3,
Mon Oct 21 06:37:33 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
36.82
35.00
2.76
5.56
2.91


0.000
1.089
1.139
1.296
1.309
1.336
1.436
1.457
1.638
2.409
4.979
7.246
7.264
7.273
7.536
7.562
8.149
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Oct 22 09:03:44 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(Z)-2b
(E)-2b
(E)-2b/(Z)-2b = 94/6 (by isolation)
xc-10-177-1
2.27
1.95
0.97
2.00
2.98
5.42
1.29
6.25
6.71
PPM


0.000
1.089
1.139
1.295
1.309
1.336
1.436
1.457
1.638
2.409
4.725
4.979
6.521
7.246
7.264
7.273
7.535
7.562
8.149
D:\new nuts\DATA\5pdata
spect, CDCl3,
Tue Oct 22 09:03:44 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(Z)-2b
(E)-2b
(E)-2b/(Z)-2b = 94/6 (by isolation)
xc-10-177-1
0.98
2.28
1.95
0.02
2.00
0.05
2.98
5.43
6.26
6.71
1.29
PPM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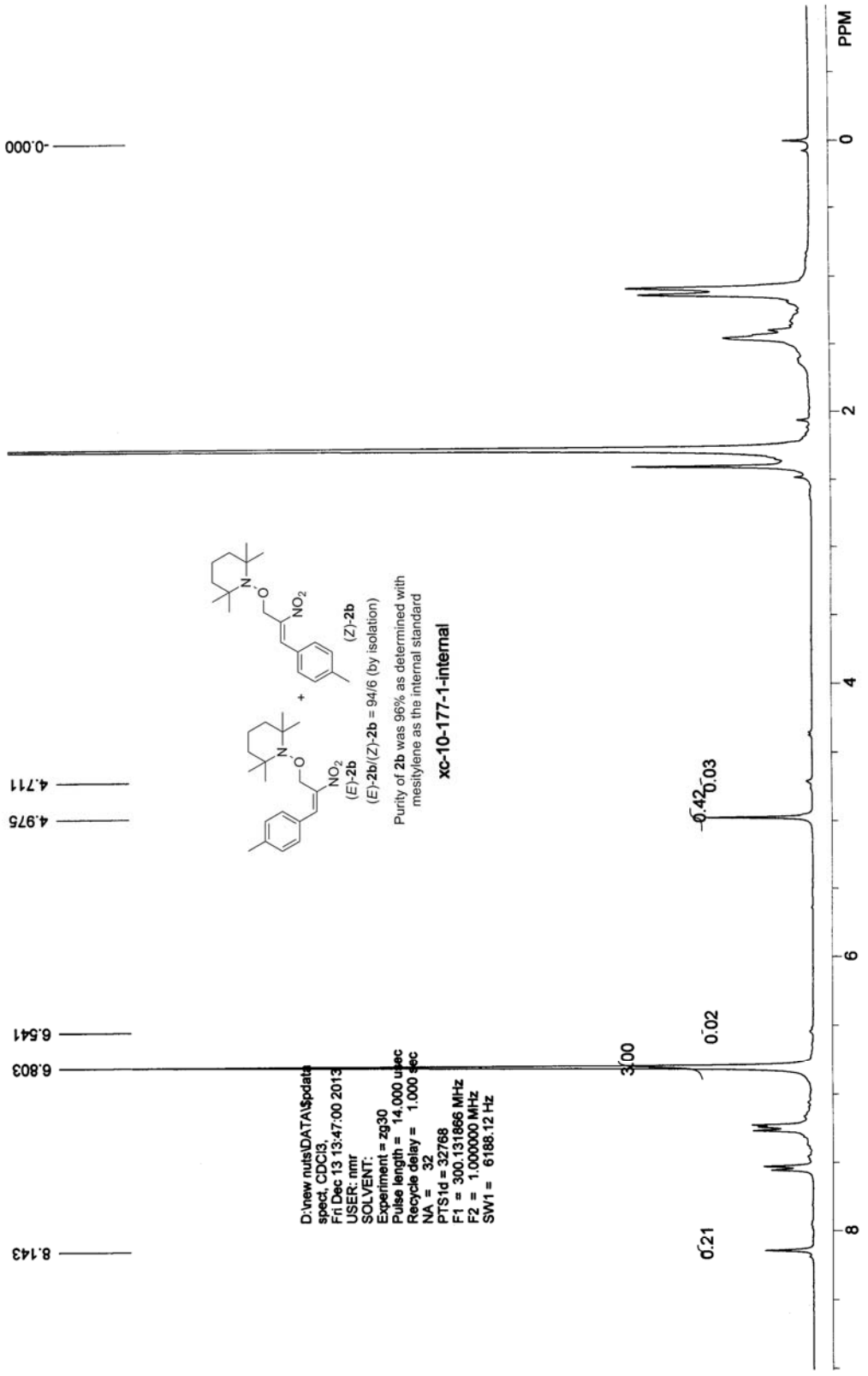
spect, CDCl3,
Tue Oct 22 09:05:05 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 1715
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(Z)-2b
(E)-2b
(E)-2b/(Z)-2b = 94/6 (by isolation)
xc-10-177-1 C
147.576
141.213
138.208
130.267
129.569
128.790
77.421
77.000
76.579
69.355
60.064
39.924
32.980
21.484
20.096
17.013
PPM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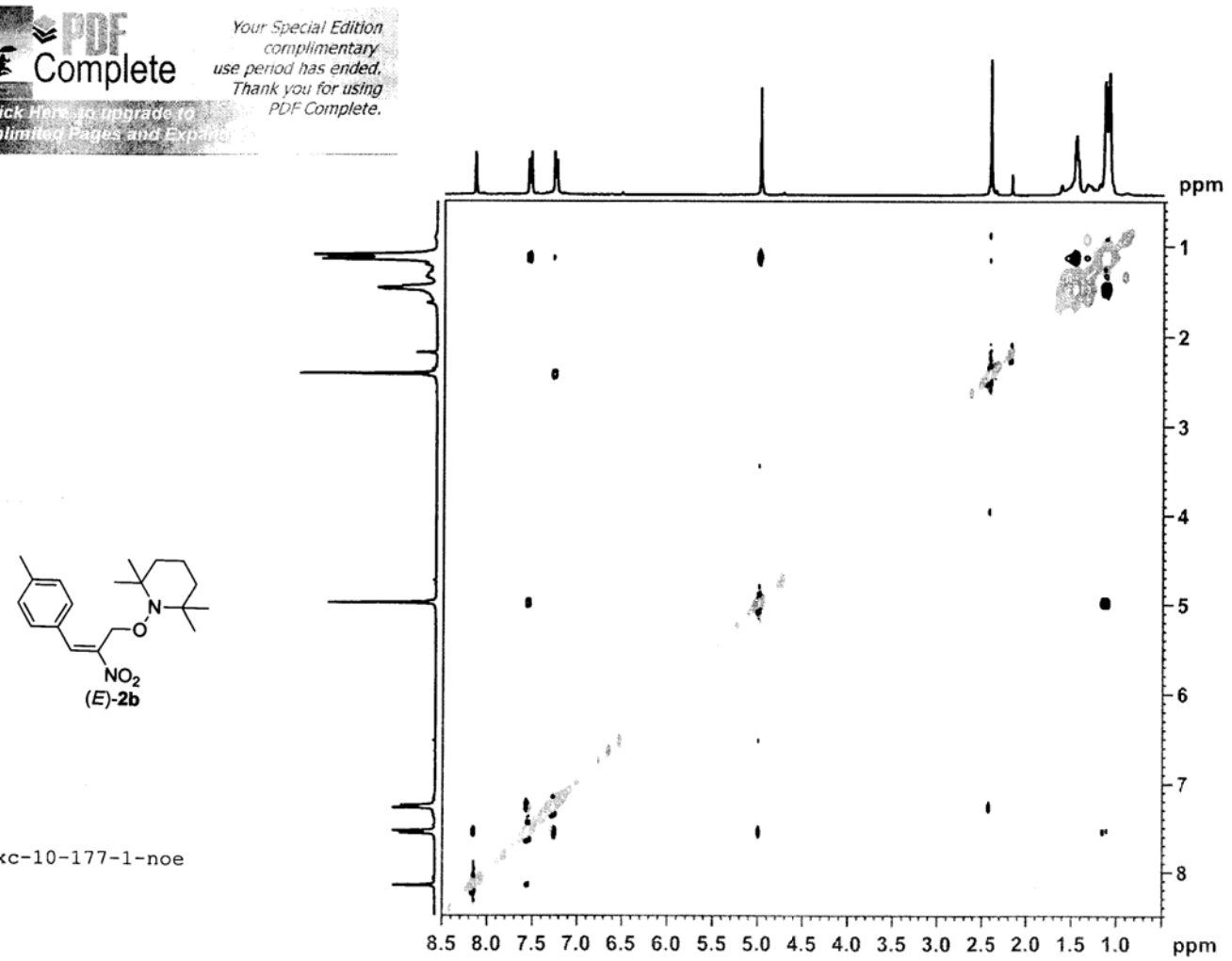
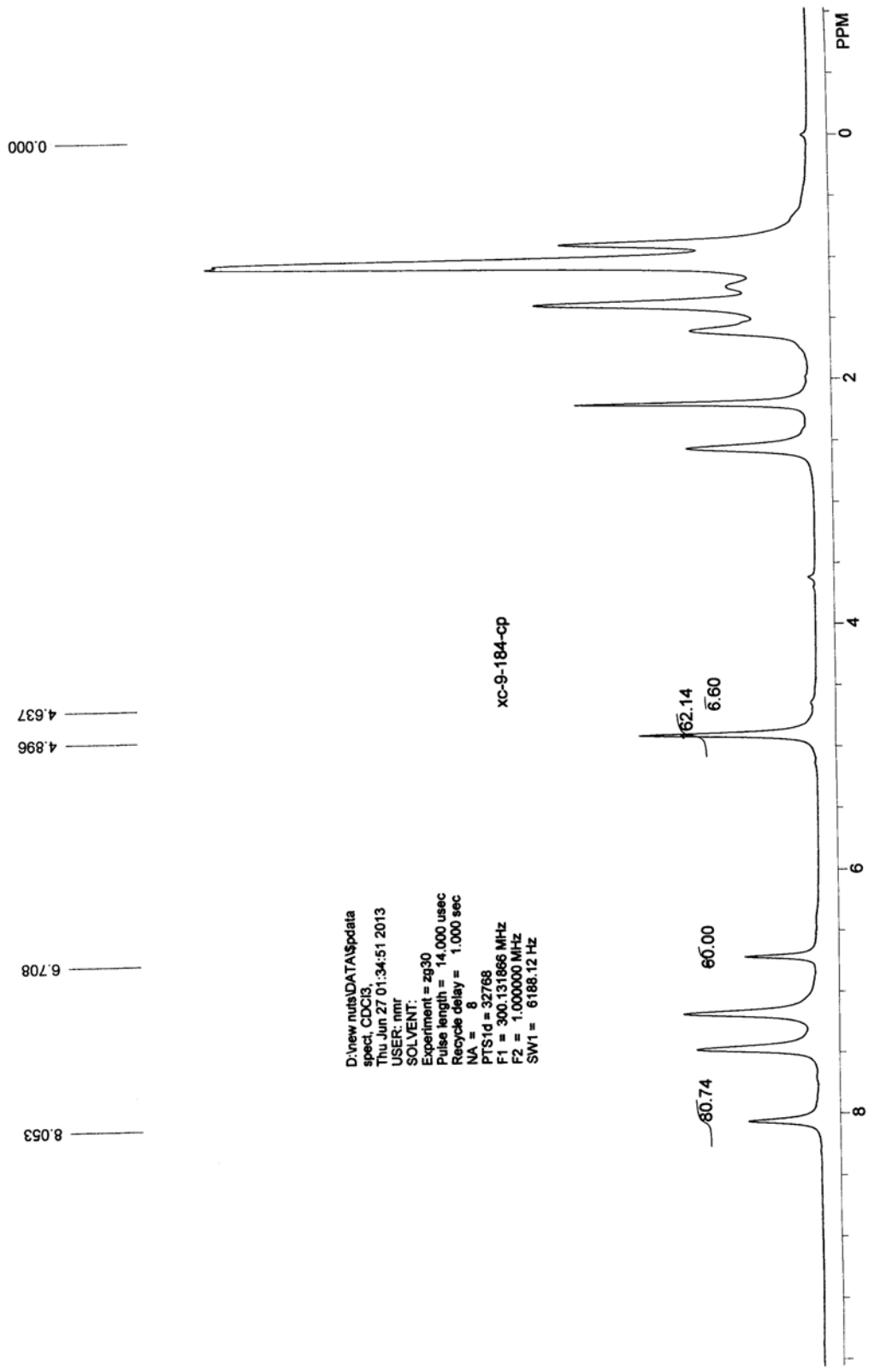
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2b/(Z)-2b = 94/6 (by isolation)
Purity of 2b was 96% as determined with mesitylene as the internal standard
xc-10-177-1-internal
(Z)-2b
(E)-2b
NO2
8.143
6.803
6.541
4.975
4.711
-0.000
3.00
0.21
0.02
0.42
0.03
PPM
0
2
4
6
8

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spect, CDCl3,
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USER: nmr
SOLVENT:
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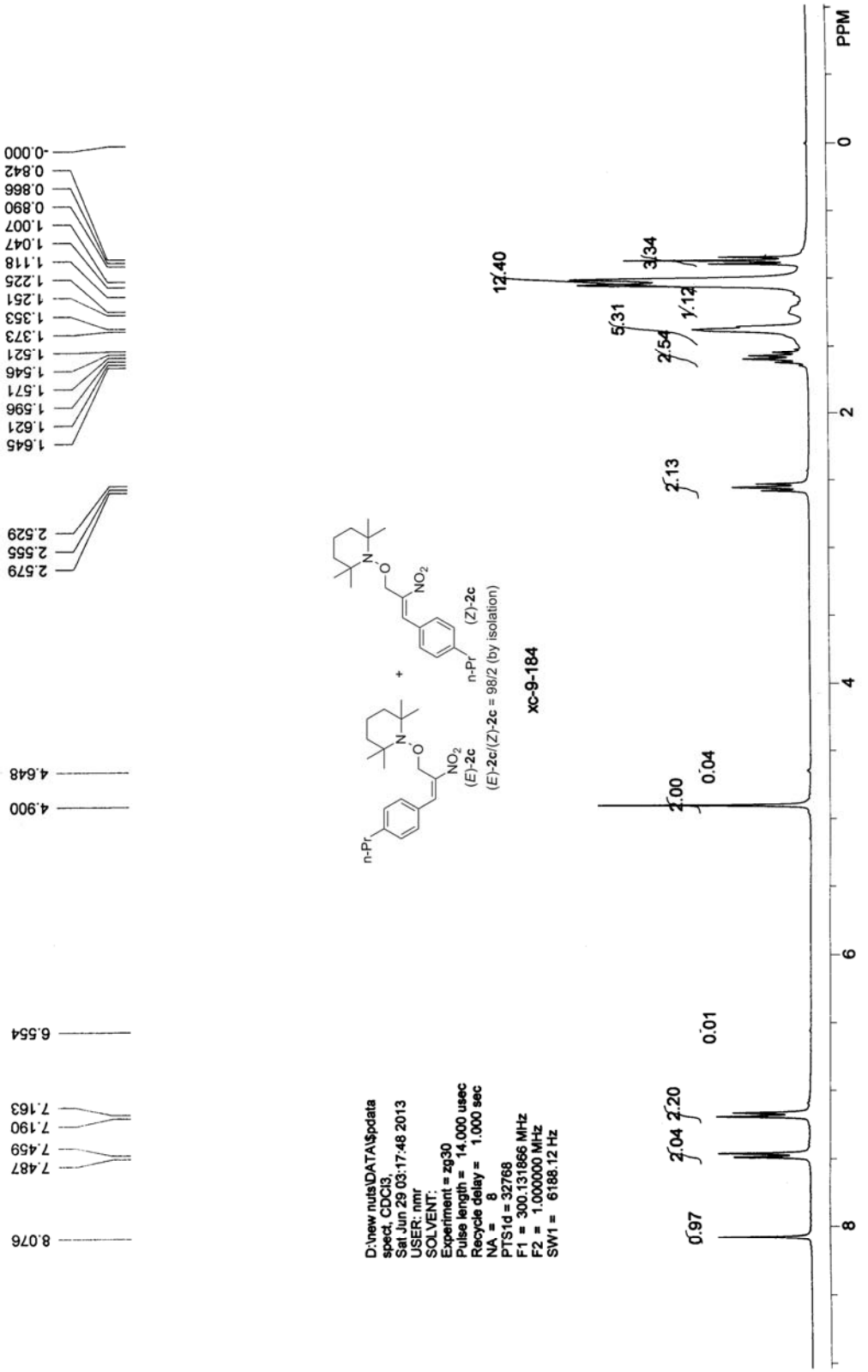
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-9-184-cp
8.053
6.708
4.896
4.637
0.000
0.74
6.00
2.14
6.60
PPM
0
2
4
6
8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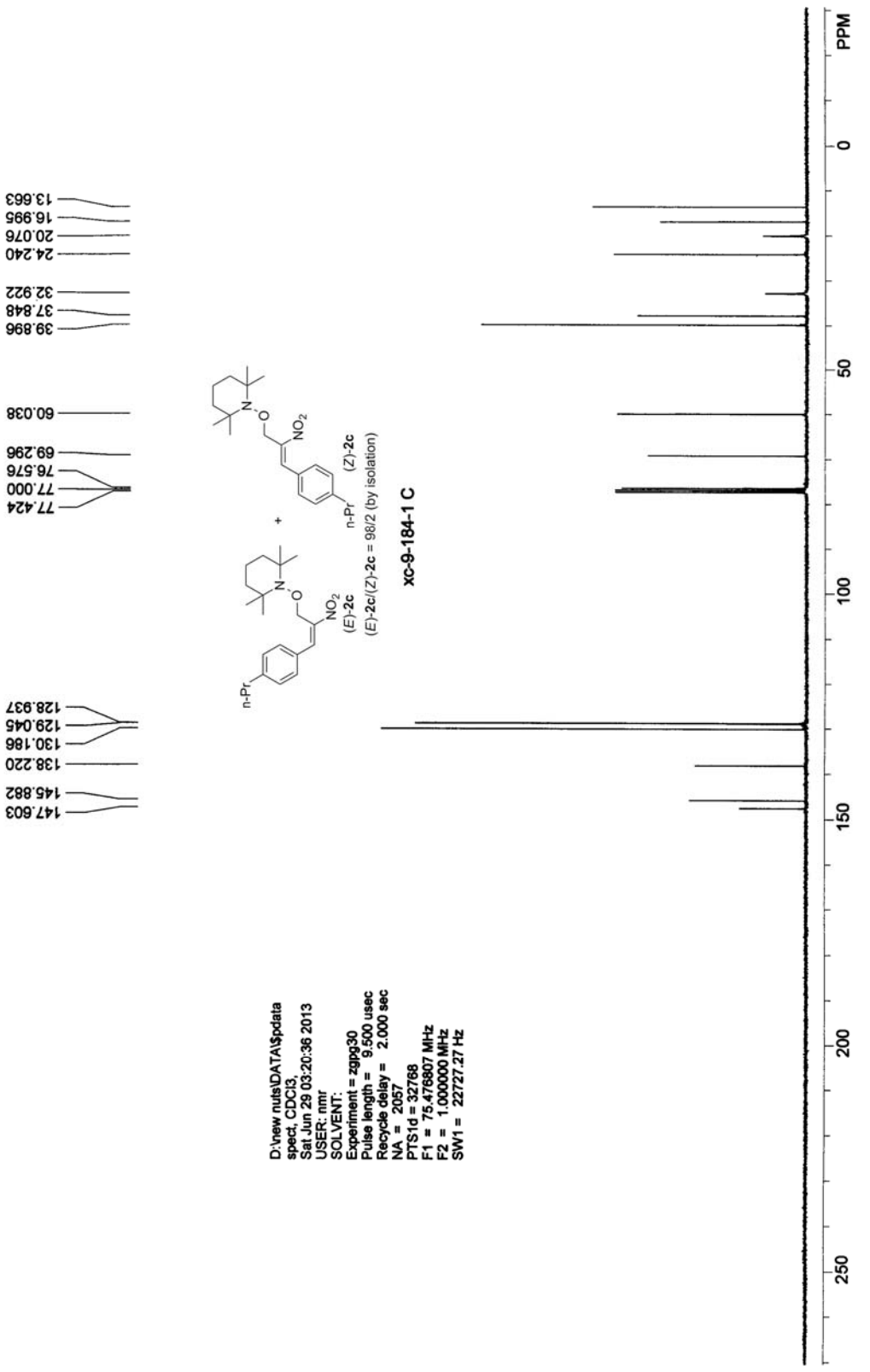
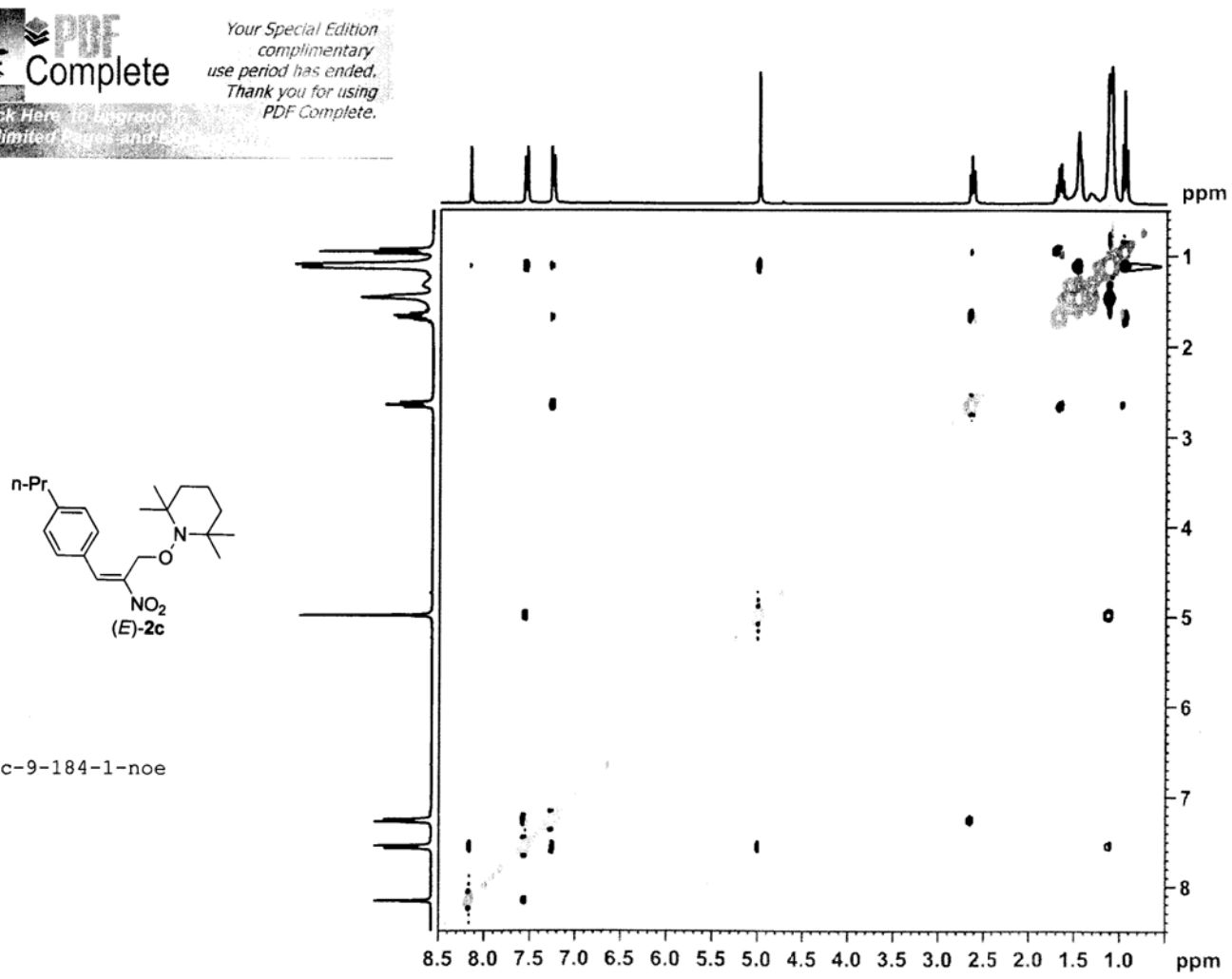
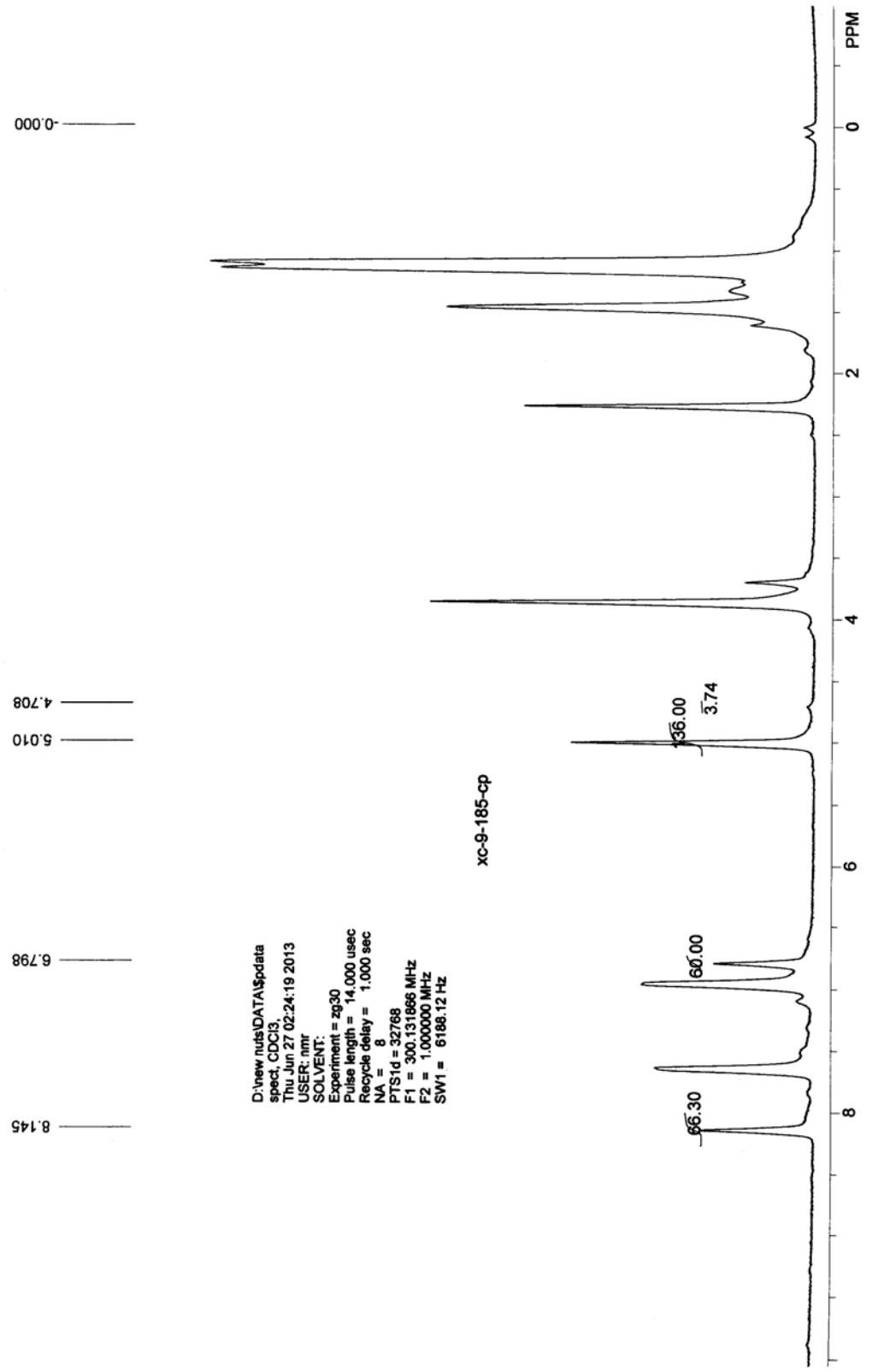
spect, CDCl3,
Sat Jun 29 03:17:48 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-9-184
(E)-2c/(Z)-2c = 98/2 (by isolation)
(E)-2c
(Z)-2c
n-Pr
NO2
PPM


13.663
16.995
20.076
24.240
32.922
37.848
39.896
60.038
69.296
76.576
77.000
77.424
128.937
129.045
130.186
138.220
145.882
147.603
n-Pr
NO2
(E)-2c
+
n-Pr
NO2
(Z)-2c
(E)-2c/(Z)-2c = 98/2 (by isolation)
xc-9-184-1 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Jun 29 03:20:36 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 2057
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
250
200
150
100
50
0

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4.708
5.010
6.798
8.145
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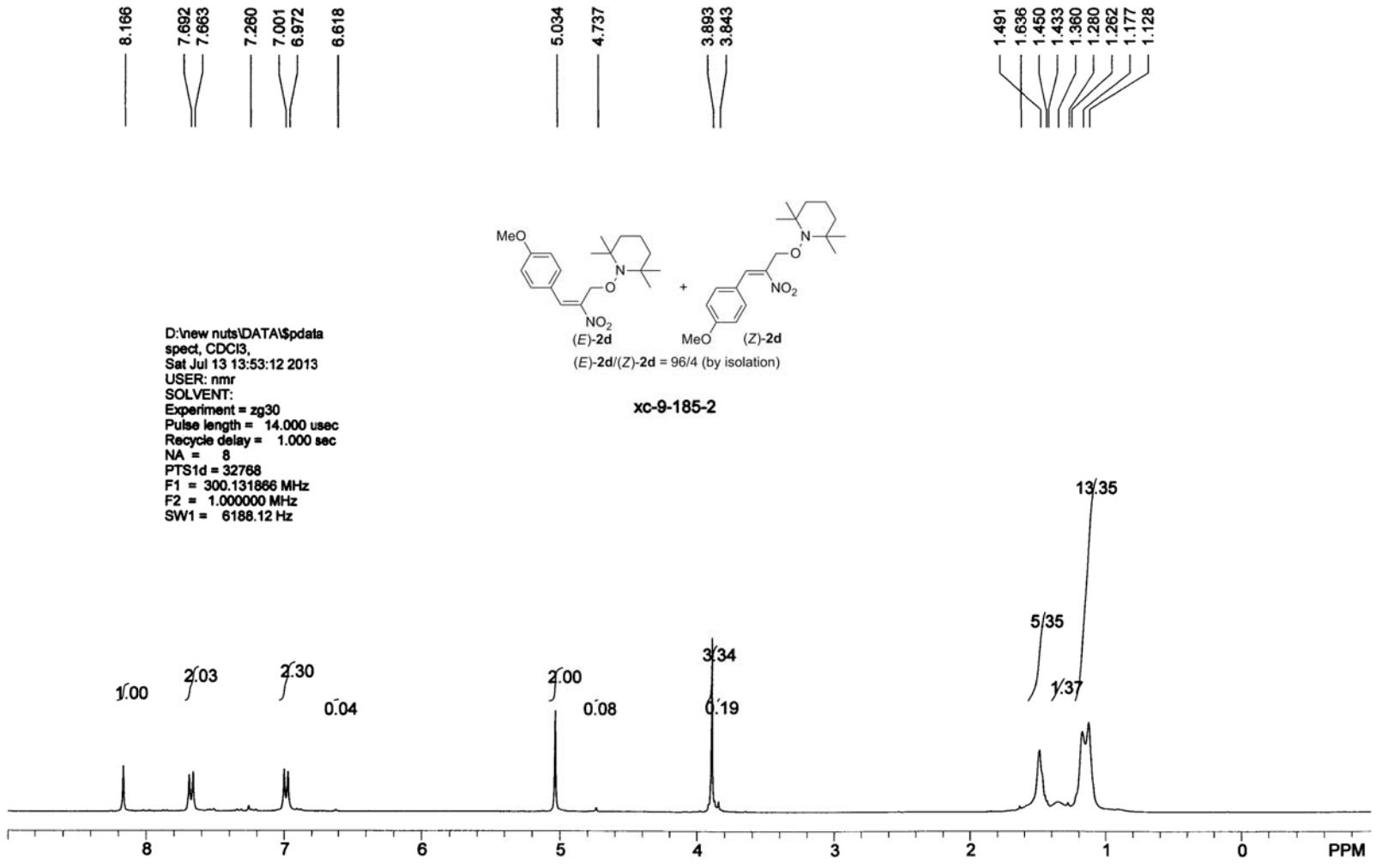
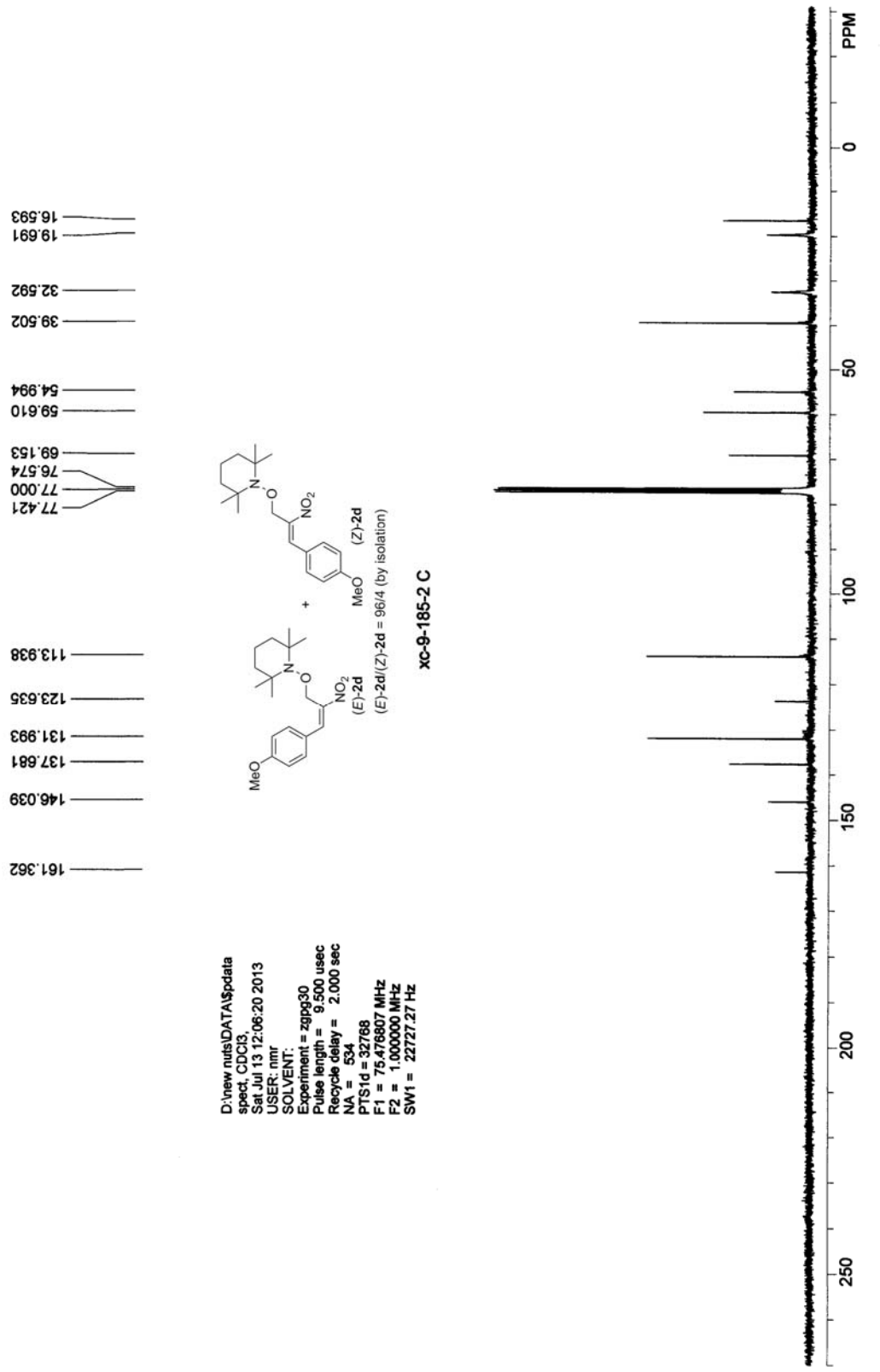
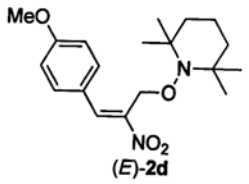
spect, CDCl3,
Thu Jun 27 02:24:19 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-9-185-cp
36.00
3.74
6.00
6.30
PPM
0
2
4
6
8

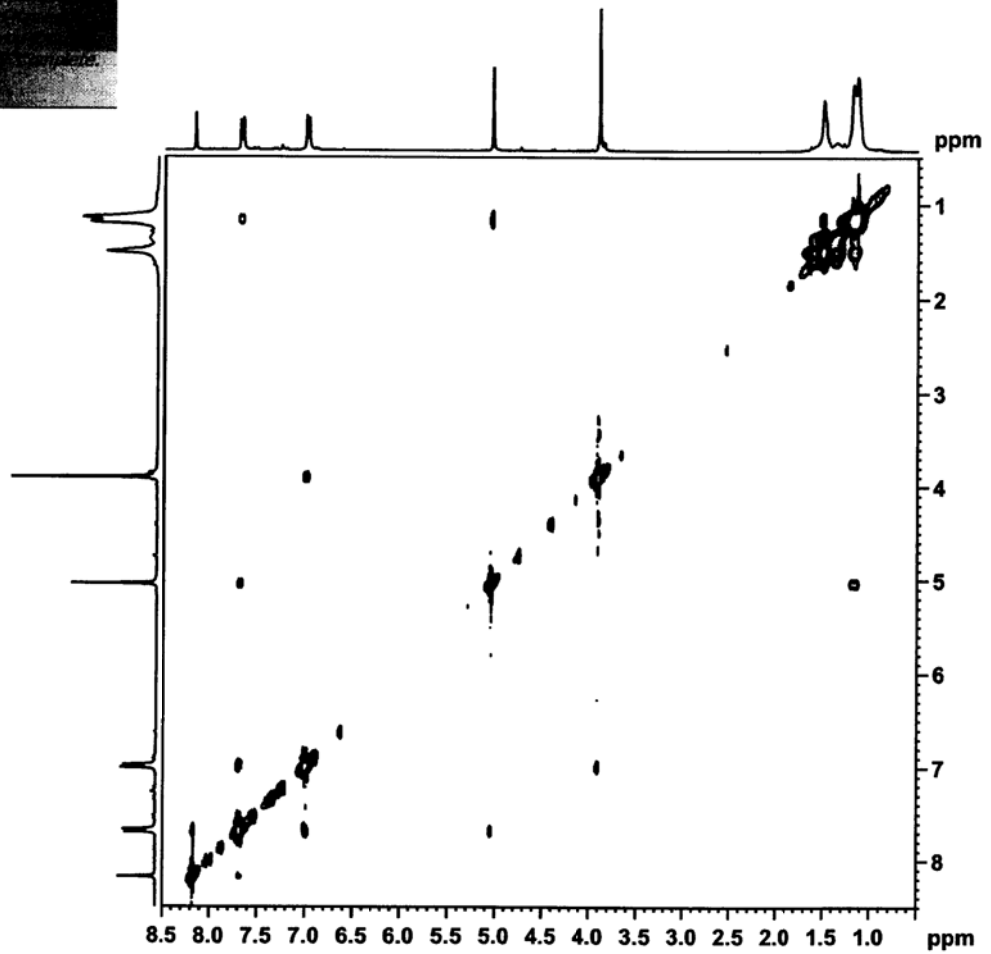

8.166
7.692
7.663
7.260
7.001
6.972
6.618
5.034
4.737
3.893
3.843
1.491
1.636
1.450
1.433
1.360
1.280
1.262
1.177
1.128
MeO
NO2
(E)-2d
MeO
NO2
(Z)-2d
(E)-2d/(Z)-2d = 96/4 (by isolation)
xc-9-185-2
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Jul 13 13:53:12 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
1.00
2.03
2.30
0.04
2.00
0.08
3.34
0.19
5.35
1.37
13.35
8
7
6
5
4
3
2
1
0
PPM

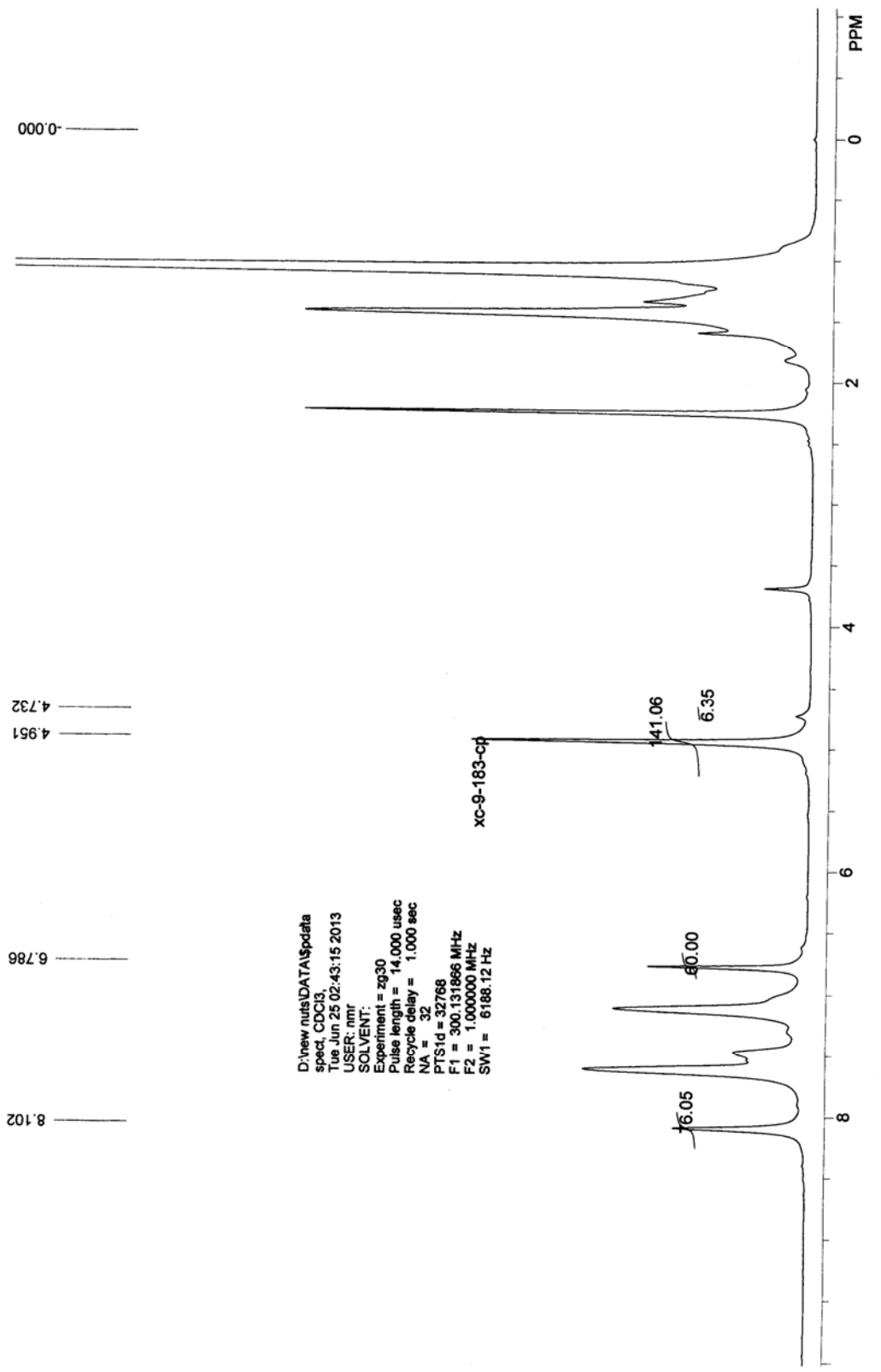

16.593
19.691
32.592
39.502
54.994
59.610
69.153
76.574
77.000
77.421
113.938
123.635
131.993
137.681
146.039
161.362
MeO
NO2
(E)-2d
+
MeO
NO2
(Z)-2d
(E)-2d/(Z)-2d = 96/4 (by isolation)
xc-9-185-2 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Jul 13 12:06:20 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 534
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
250
200
150
100
50
0
PPM

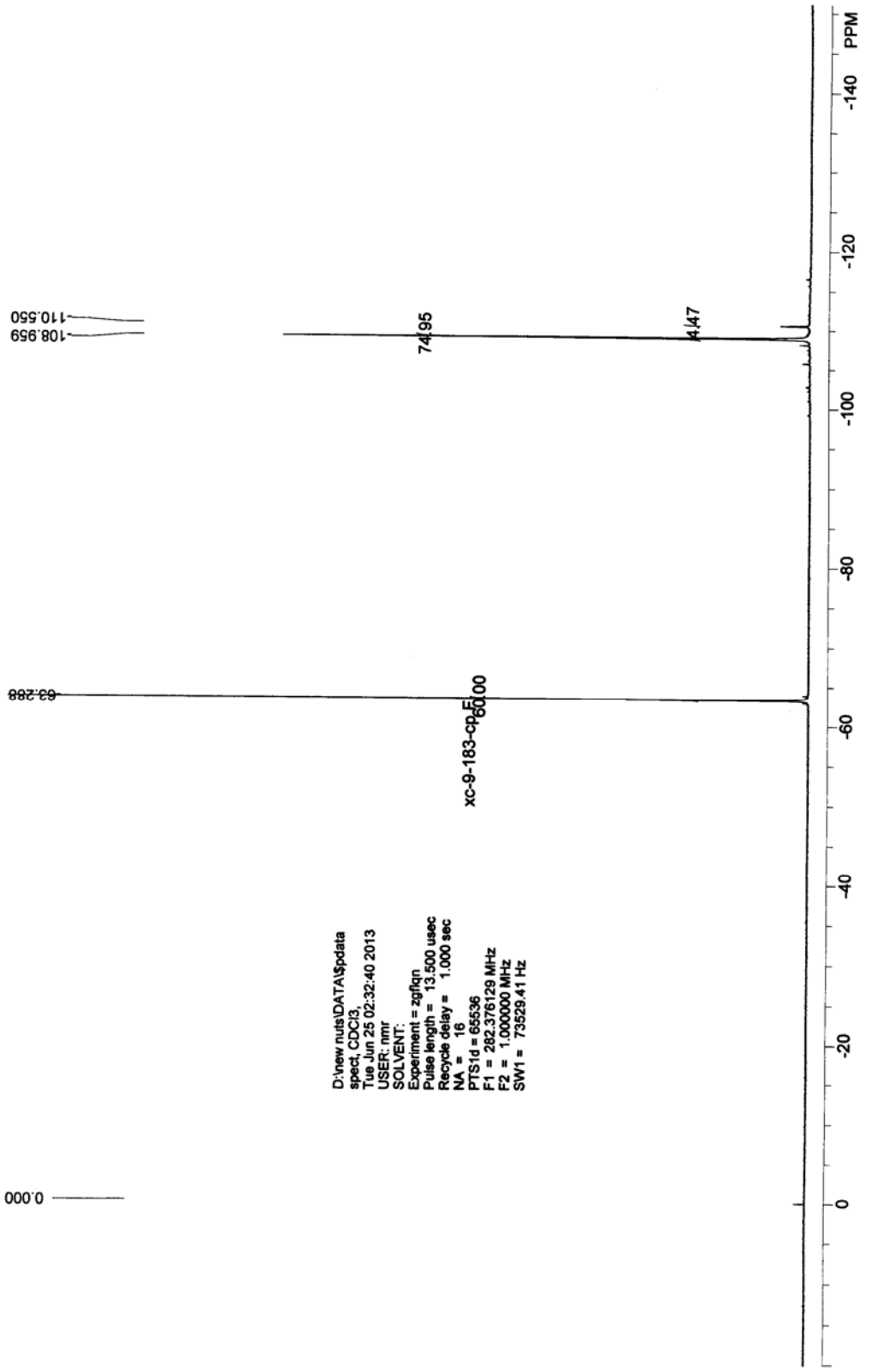


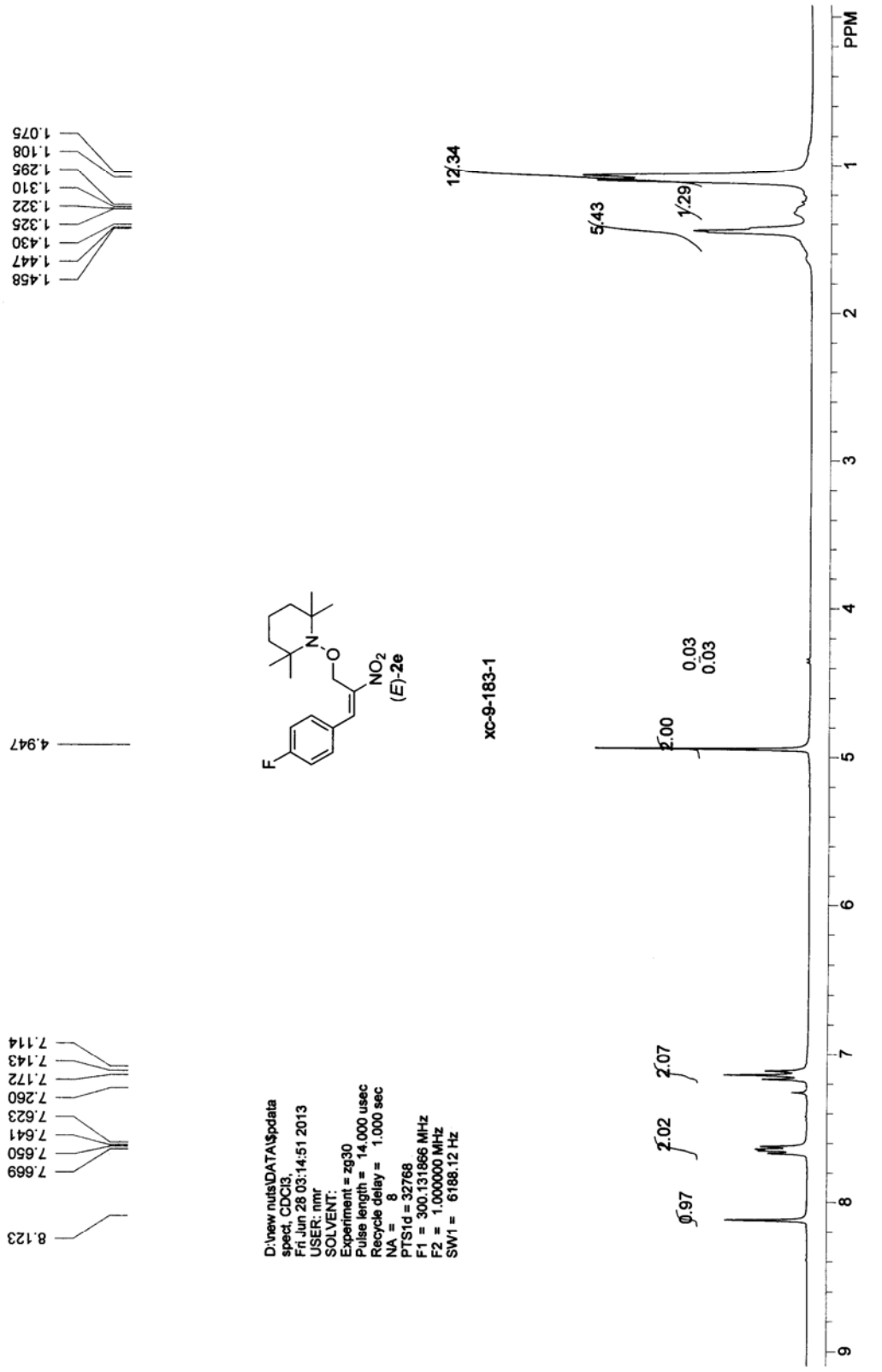
(*E*)-**2d**

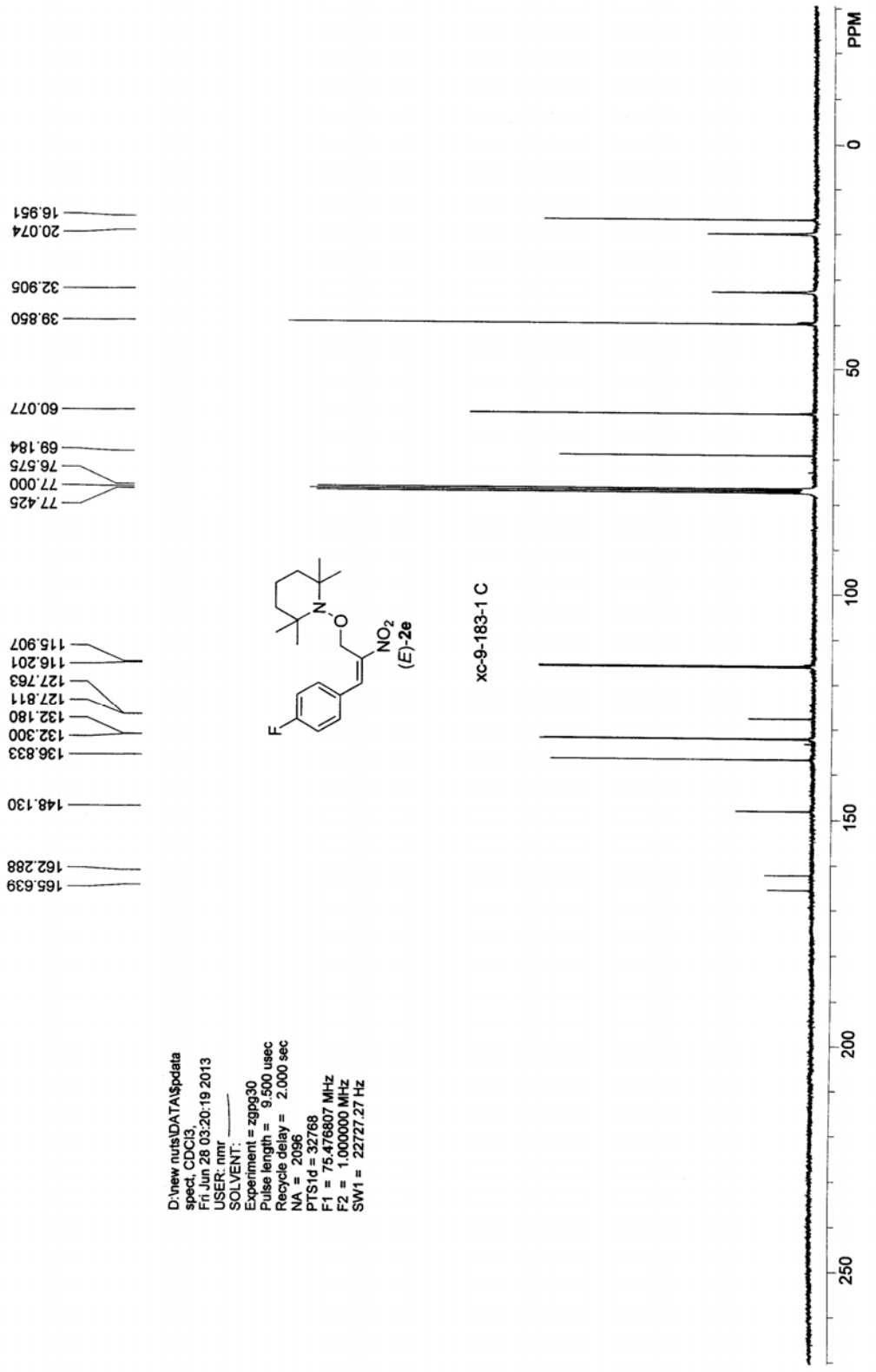
xc-9-185-2-noe

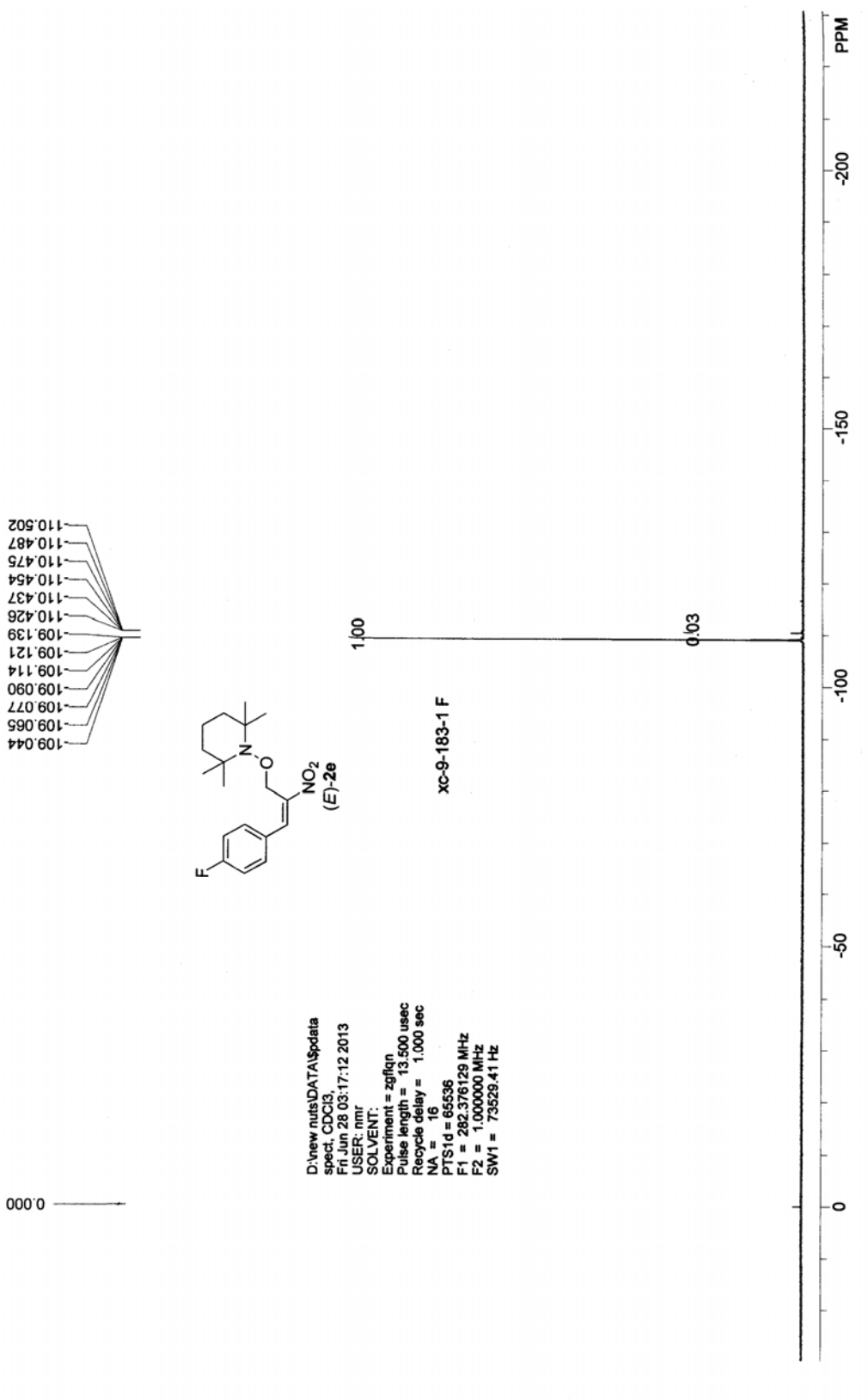


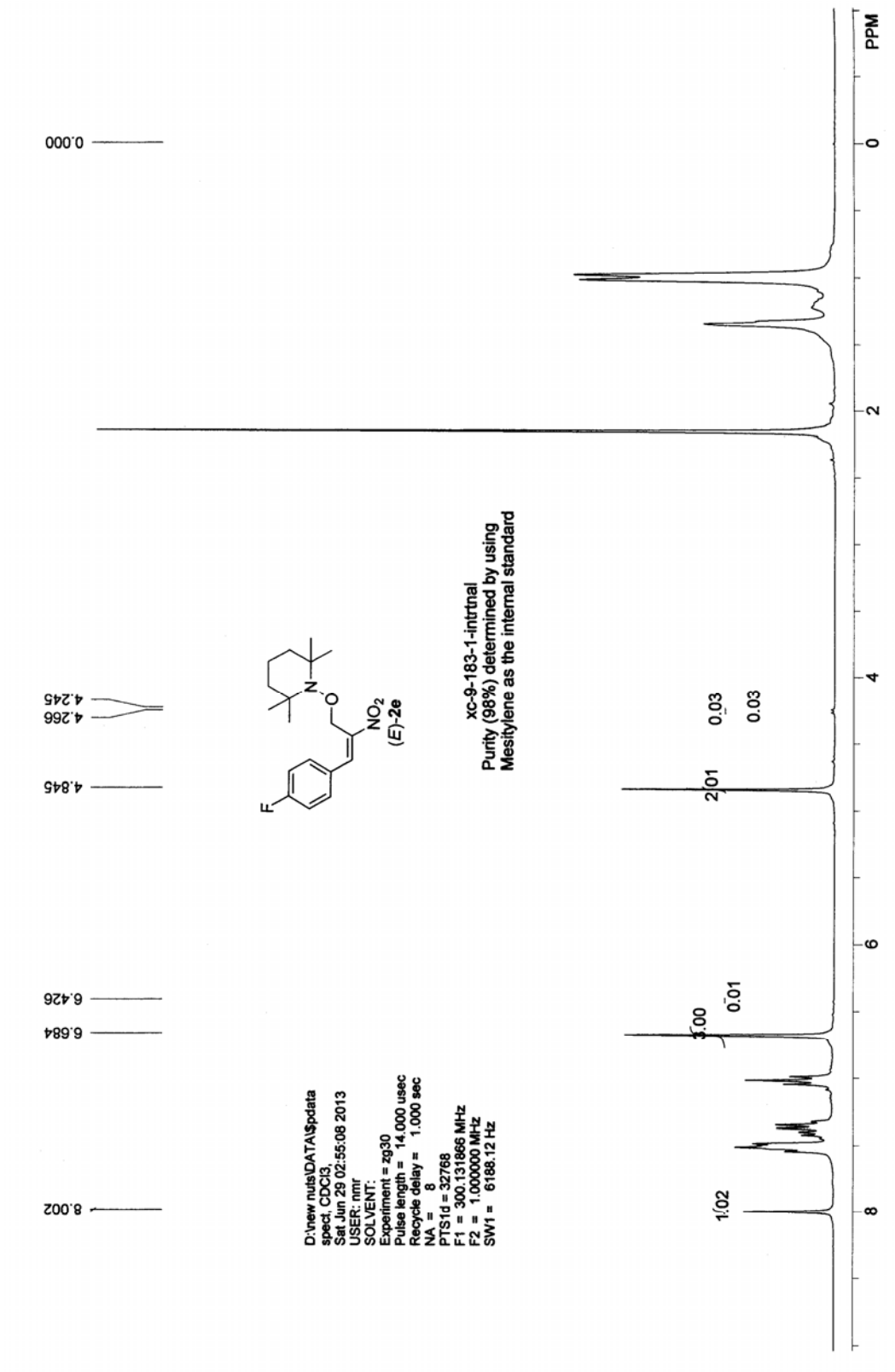

-0.000
8.102
6.786
4.951
4.732
PPM
0
2
4
6
8
6.05
6.00
6.35
1.06
xc-9-183-cp
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Jun 25 02:43:15 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz

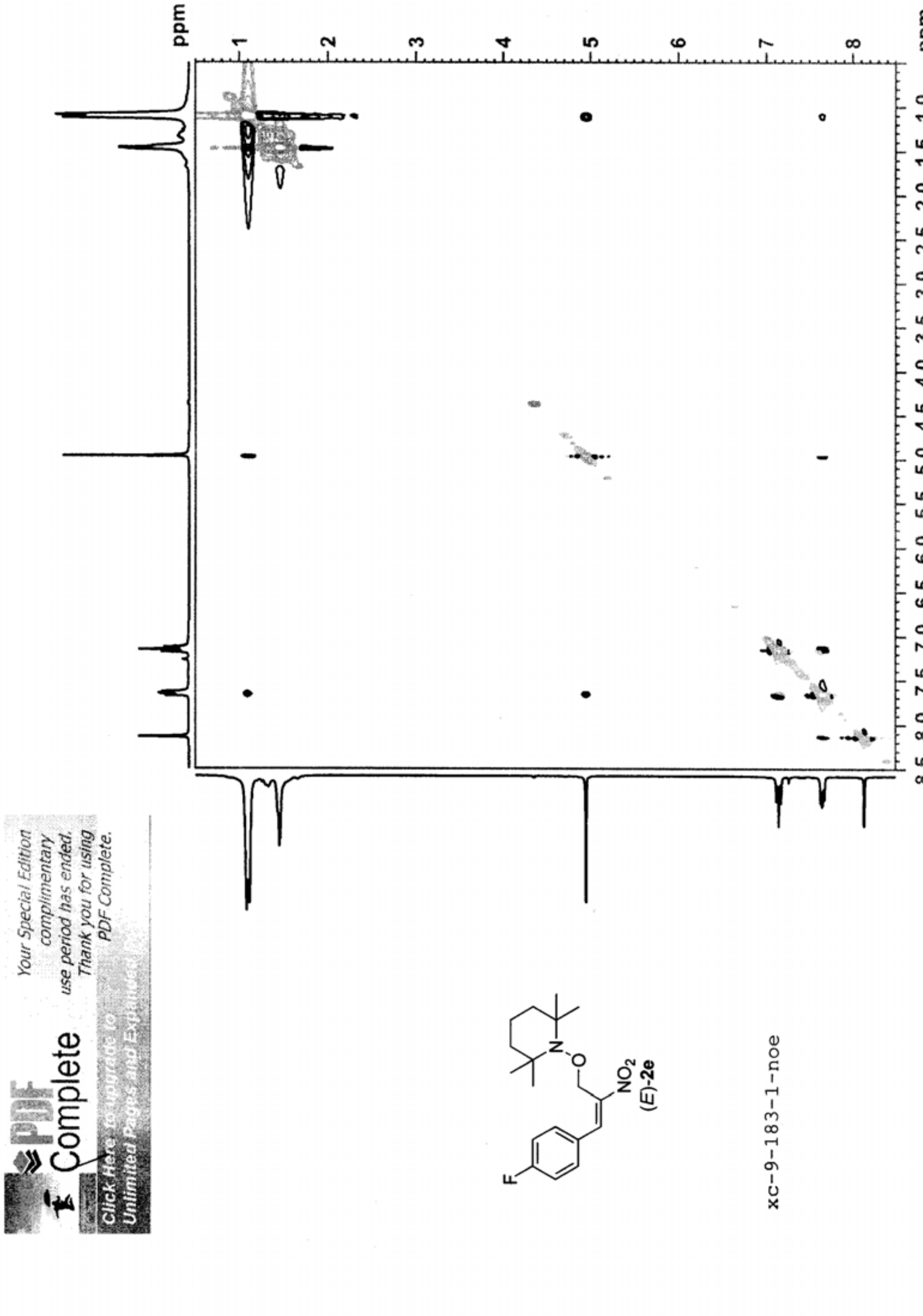

D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Jun 25 02:32:40 2013
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
xc-9-183-cp-F
60.00
74.95
4.47
63.288
108.959
110.550
0.000
PPM
0
-20
-40
-60
-80
-100
-120
-140

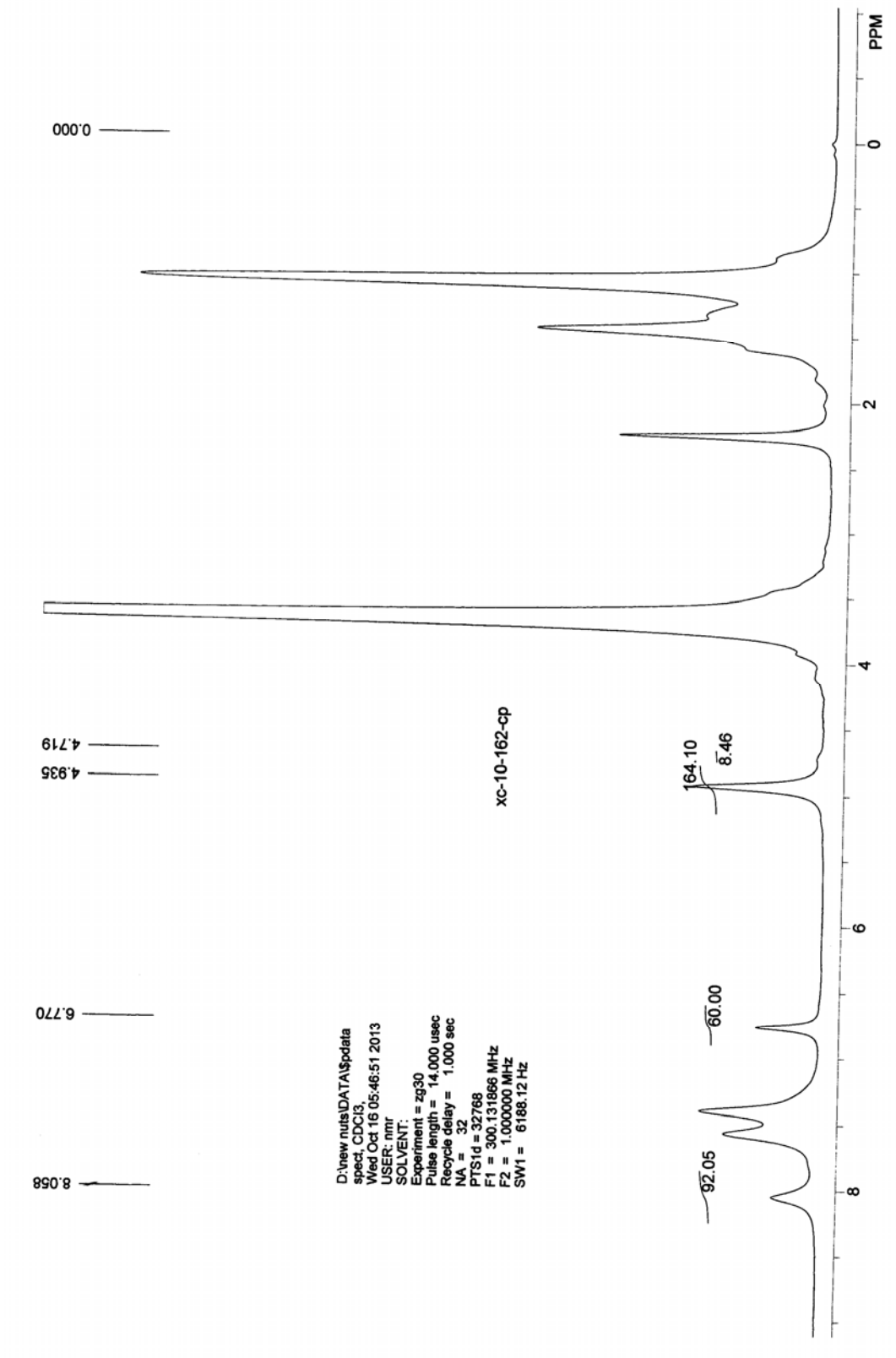

1.075
1.108
1.295
1.310
1.322
1.325
1.430
1.447
1.458
4.947
8.123
7.669
7.650
7.641
7.623
7.260
7.172
7.143
7.114
D:\new nuts\DATA\$pdata
sped, CDCl3,
Fri Jun 28 03:14:51 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
F
NO2
(E)-2e
xc-9-183-1
12.34
5.43
1.29
2.00
0.03
0.03
0.97
2.02
2.07
PPM

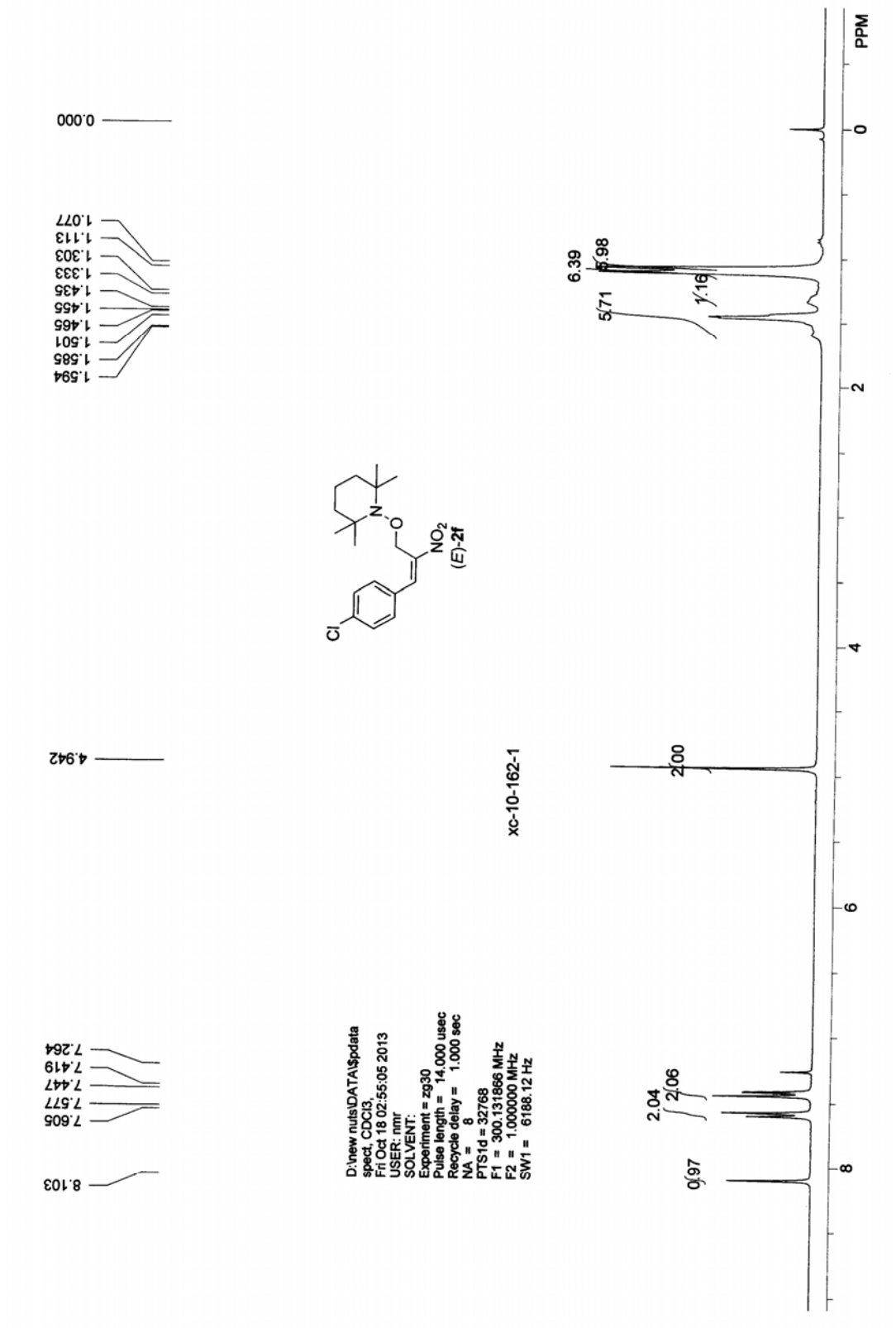

16.951
20.074
32.905
39.850
60.077
69.184
76.575
77.000
77.425
115.907
116.201
127.763
127.811
132.180
132.300
136.833
148.130
162.288
165.639
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Jun 28 03:20:19 2013
USER: nmr
SOLVENT: ——
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 2096
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
xc-9-183-1 C
(E)-2e
PPM
0
50
100
150
200
250

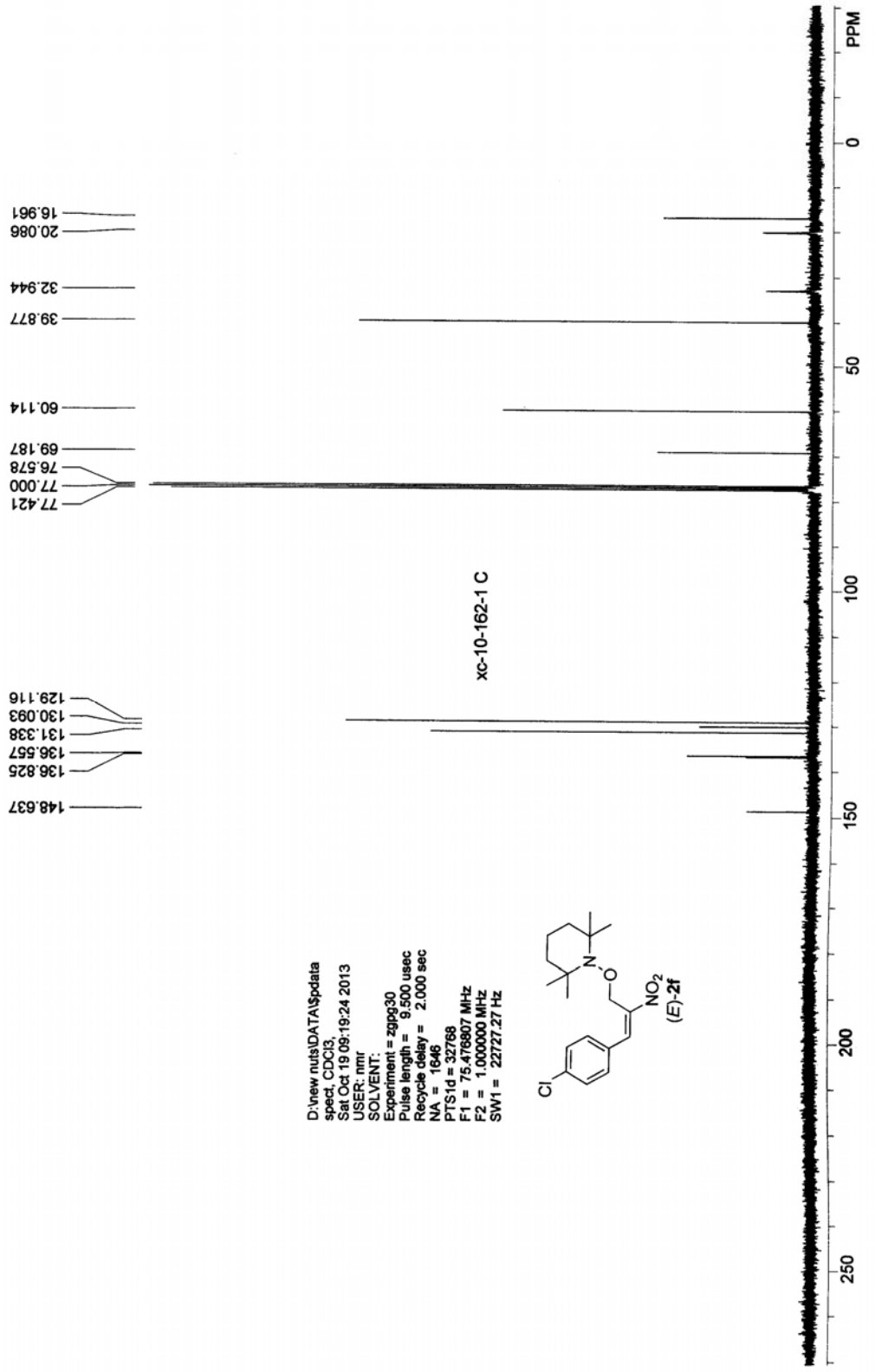

110.502
110.487
110.475
110.454
110.437
110.426
109.139
109.121
109.114
109.090
109.077
109.065
109.044
0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Jun 28 03:17:12 2013
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
xc-9-183-1 F
(E)-2e
NO2
F
1.00
0.03
PPM
0
-50
-100
-150
-200

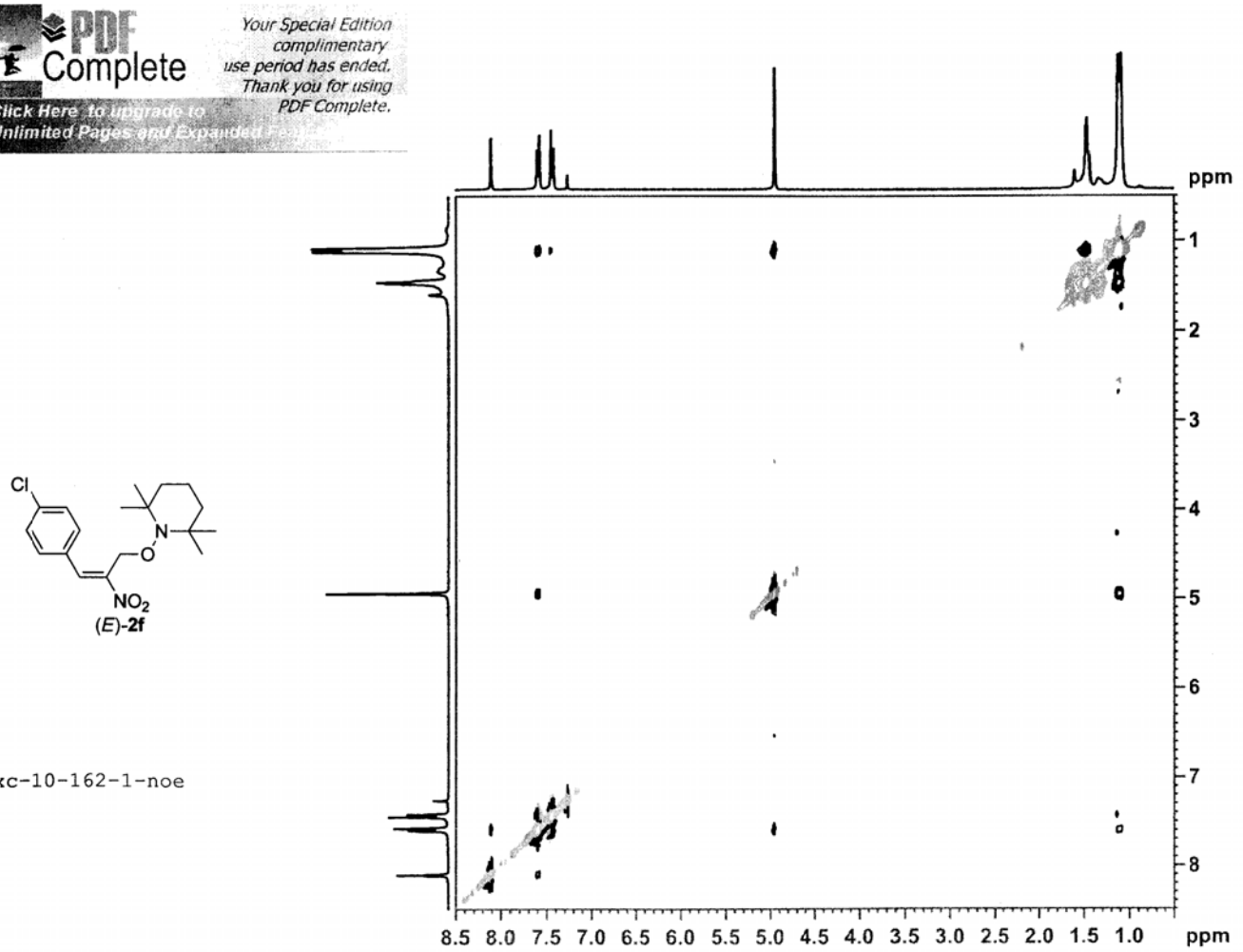

8.002
6.684
6.426
4.845
4.266
4.245
0.000
1.02
1.00
0.01
2.01
0.03
0.03
PPM
0
2
4
6
8
F
N
O
NO2
(E)-2e
xc-9-183-1-intrtnal
Purity (98%) determined by using
Mesitylene as the internal standard
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Jun 29 02:55:08 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz

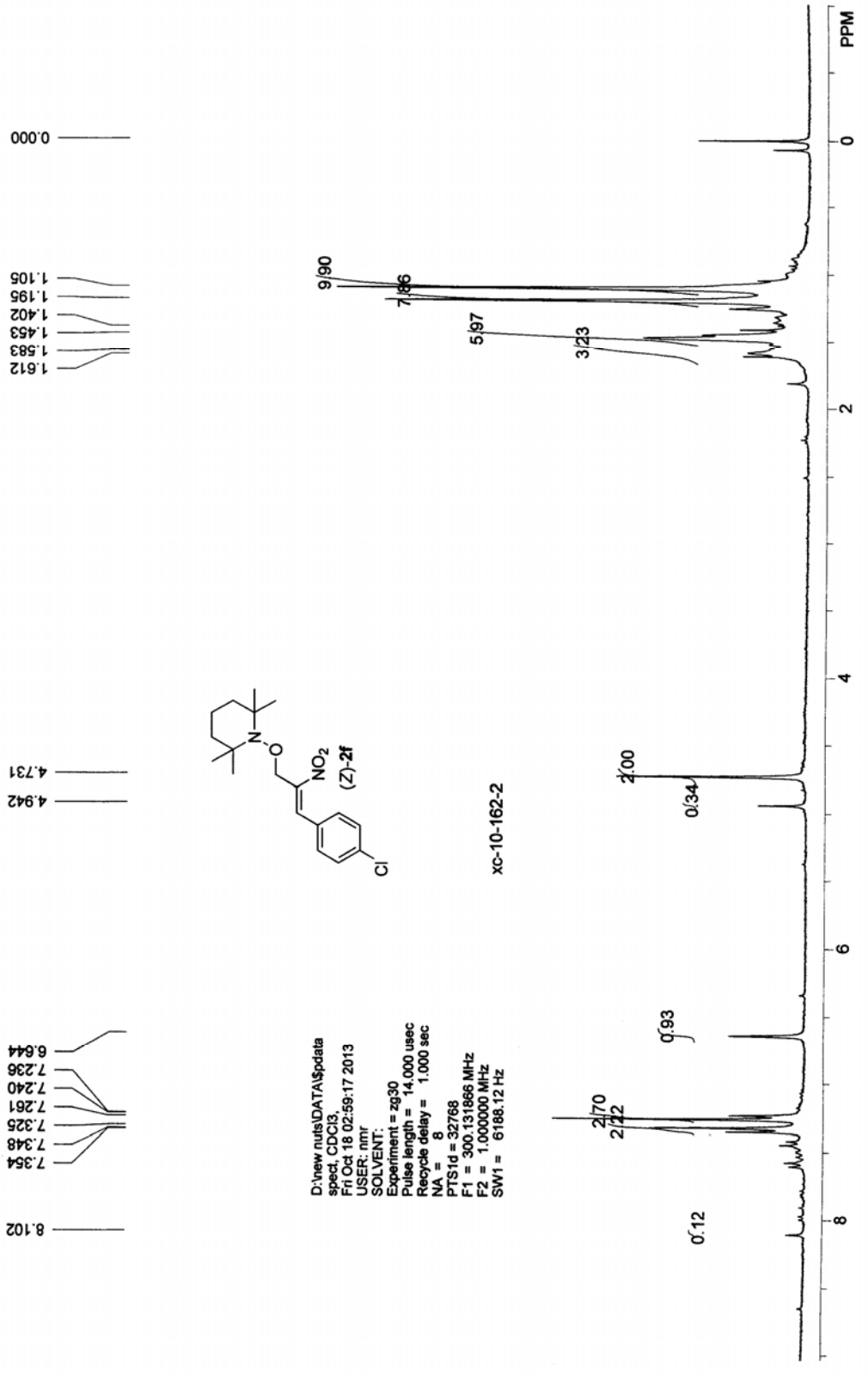


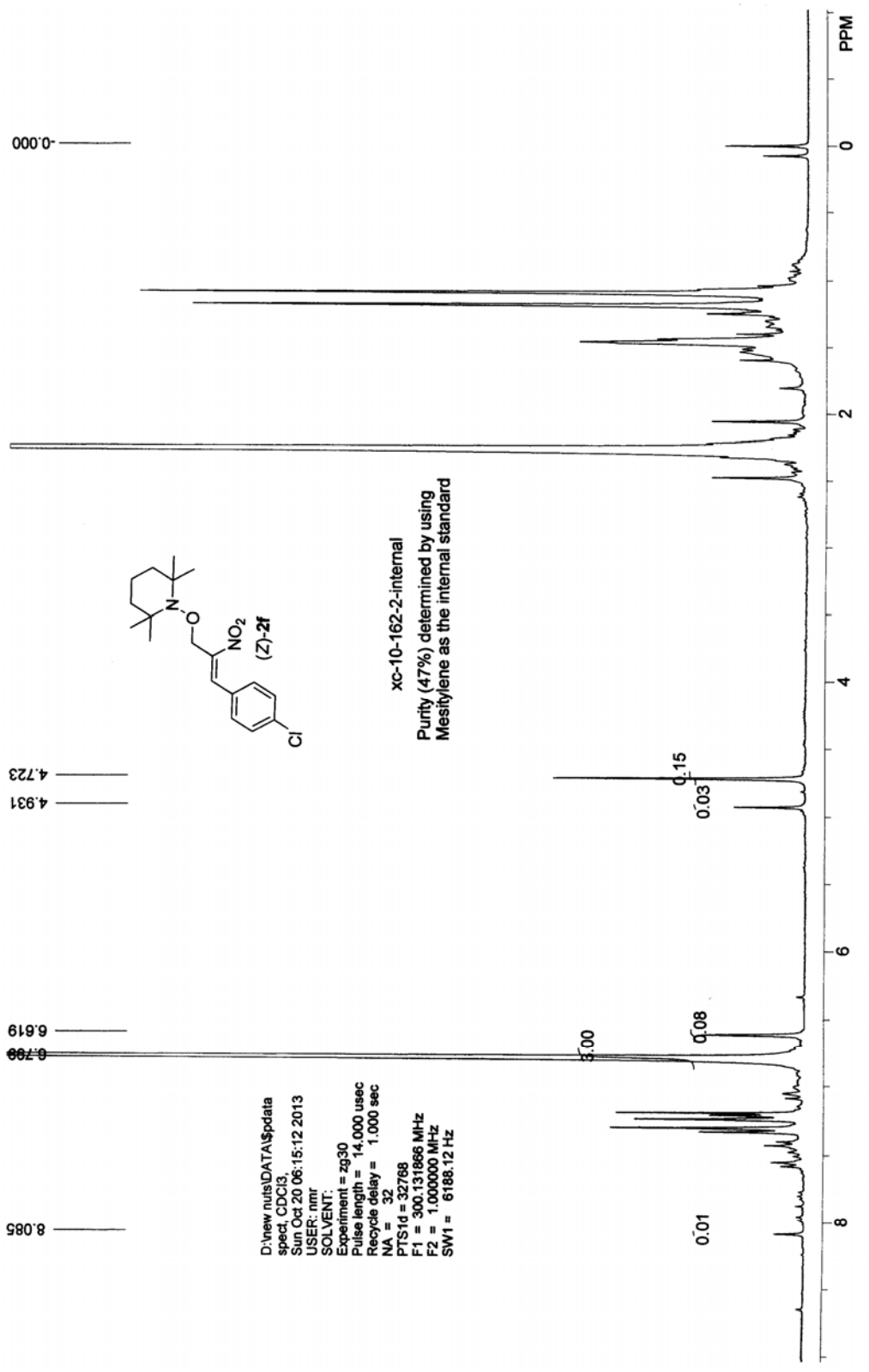

0.000
4.719
4.935
6.770
8.058
D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed Oct 16 05:46:51 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-162-cp
164.10
8.46
60.00
92.05
PPM
0
2
4
6
8

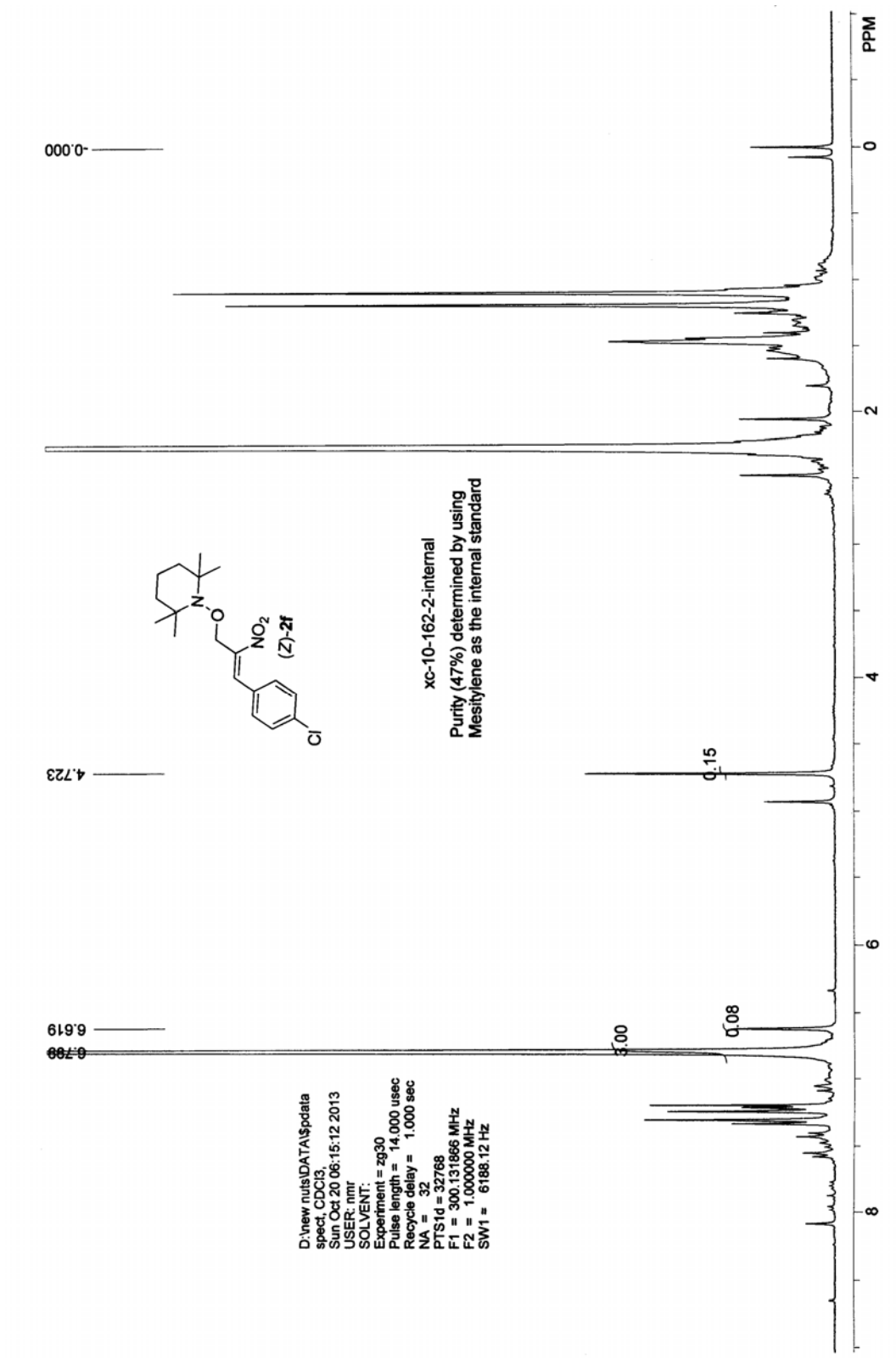

PPM
0
2
4
6
8
6.39
6.98
5.71
1.16
2.00
2.04
2.06
0.97
xc-10-162-1
D:\new nuts\DATA\$pdata
sped, CDCl3,
Fri Oct 18 02:55:05 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
Cl
N
O
NO2
(E)-2f
7.264
7.419
7.447
7.577
7.605
8.103
4.942
1.077
1.113
1.303
1.333
1.435
1.455
1.465
1.501
1.585
1.594
0.000

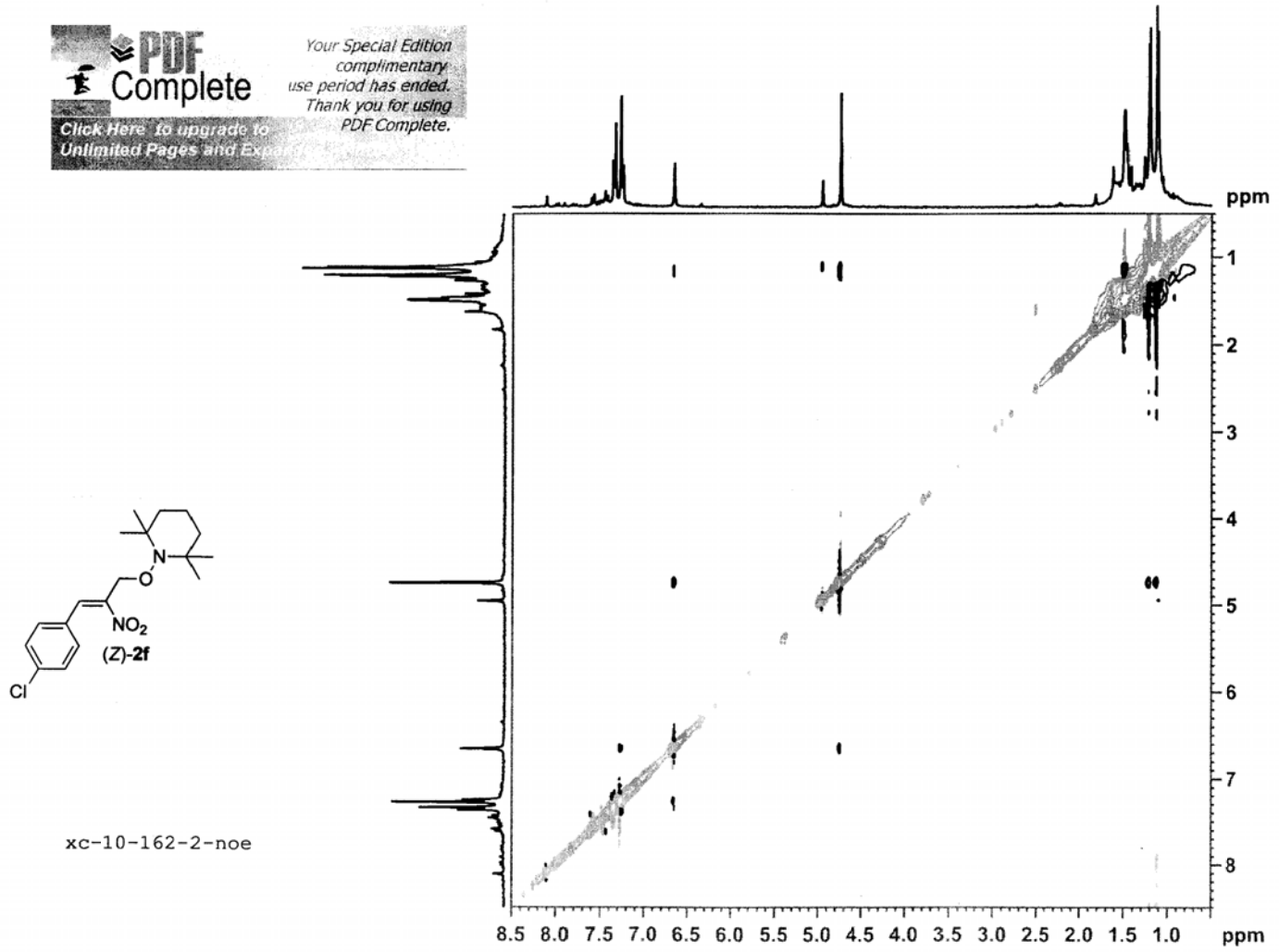

16.961
20.086
32.944
39.877
60.114
69.187
76.578
77.000
77.421
129.116
130.093
131.338
136.557
136.825
148.637
xc-10-162-1 C
PPM
0
50
100
150
200
250
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Oct 19 09:19:24 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 1646
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
Cl
NO2
(E)-2f

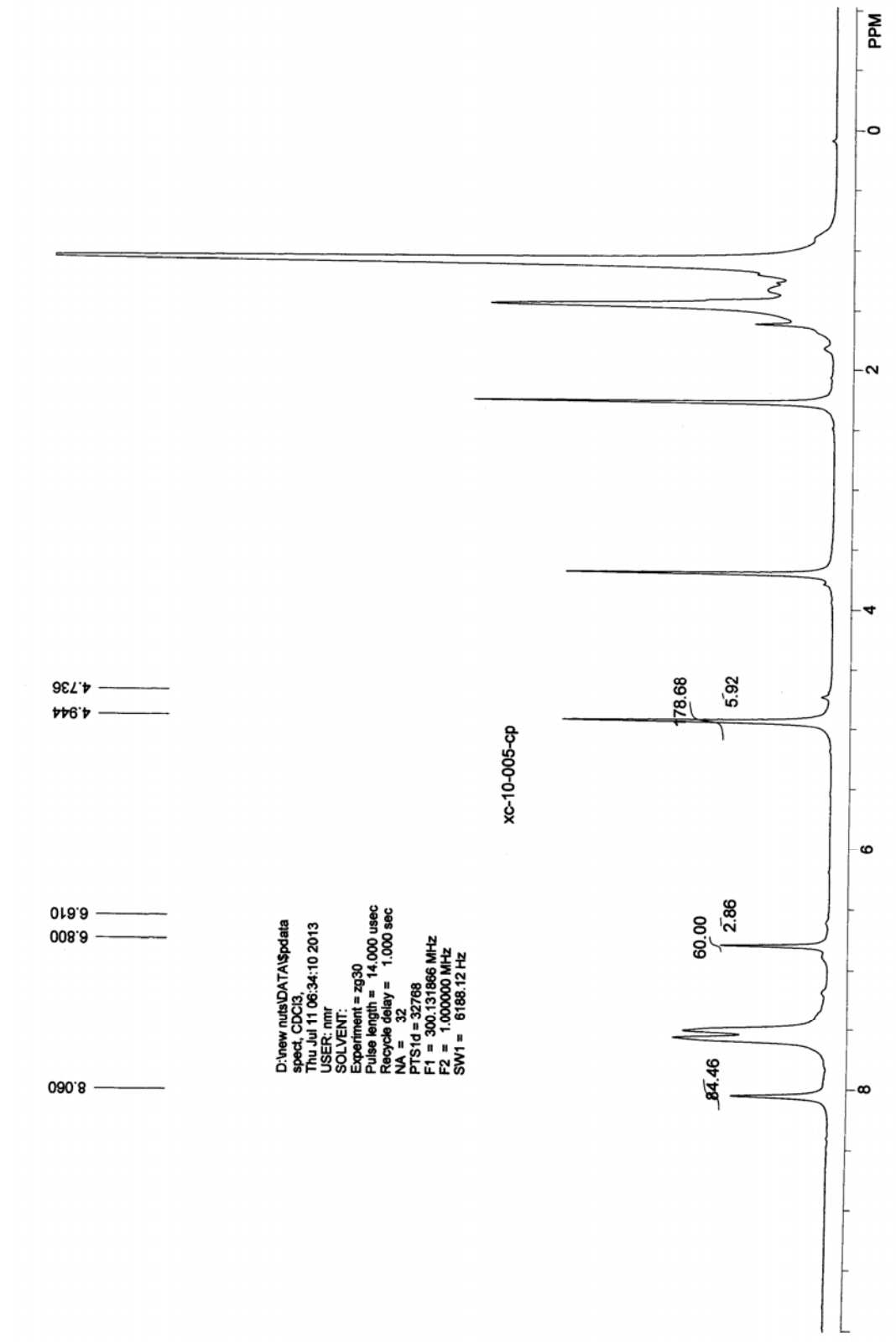


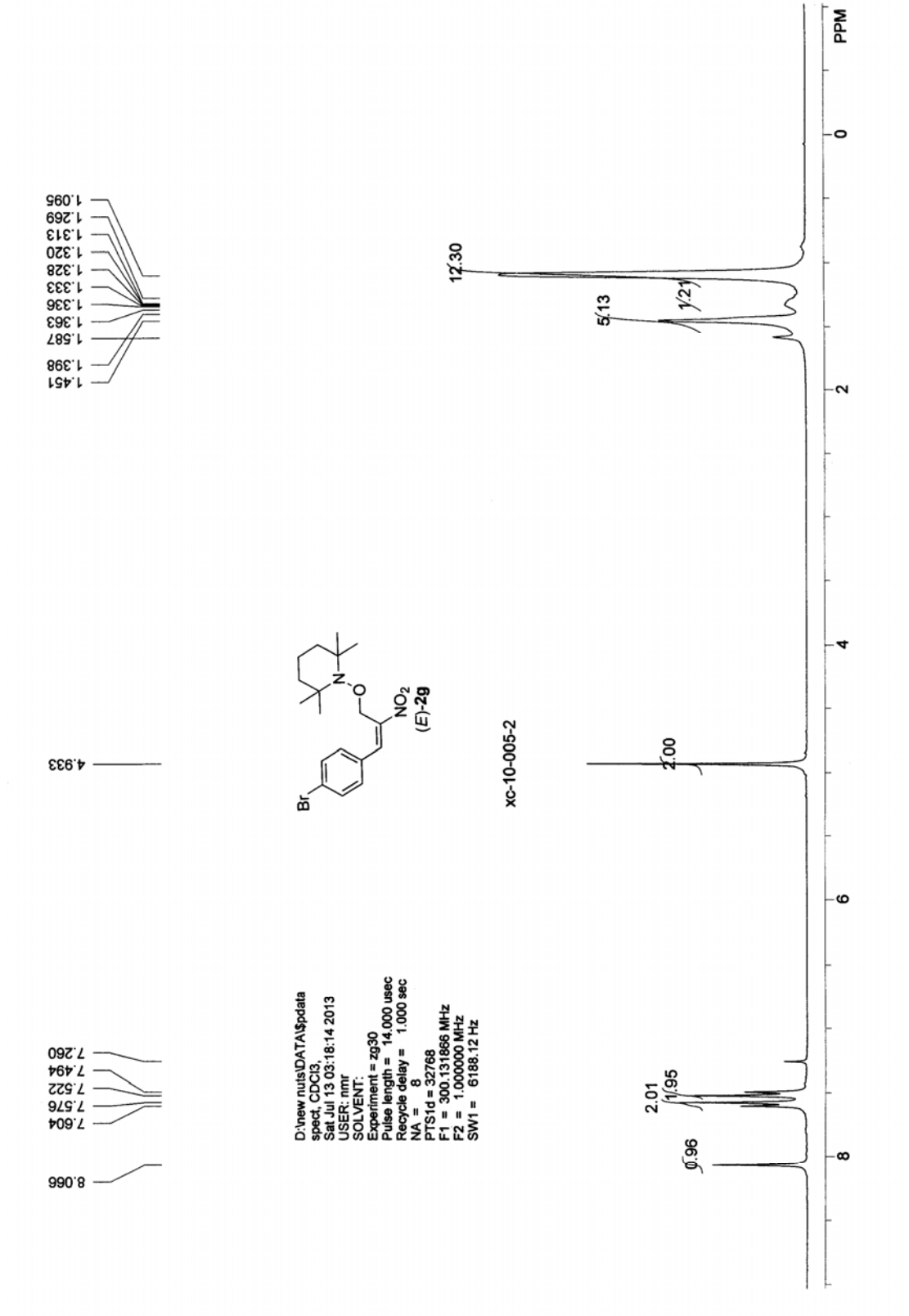

0.000
1.105
1.195
1.402
1.453
1.583
1.612
4.731
4.942
6.644
7.236
7.240
7.261
7.325
7.348
7.354
8.102
9.90
7.86
5.97
3.23
2.00
0.34
0.93
2.70
2.22
0.12
PPM
0
2
4
6
8
NO2
(Z)-2f
Cl
xc-10-162-2
D:\new nuts\DATA\5pdata
spect, CDCl3,
Fri Oct 18 02:59:17 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz

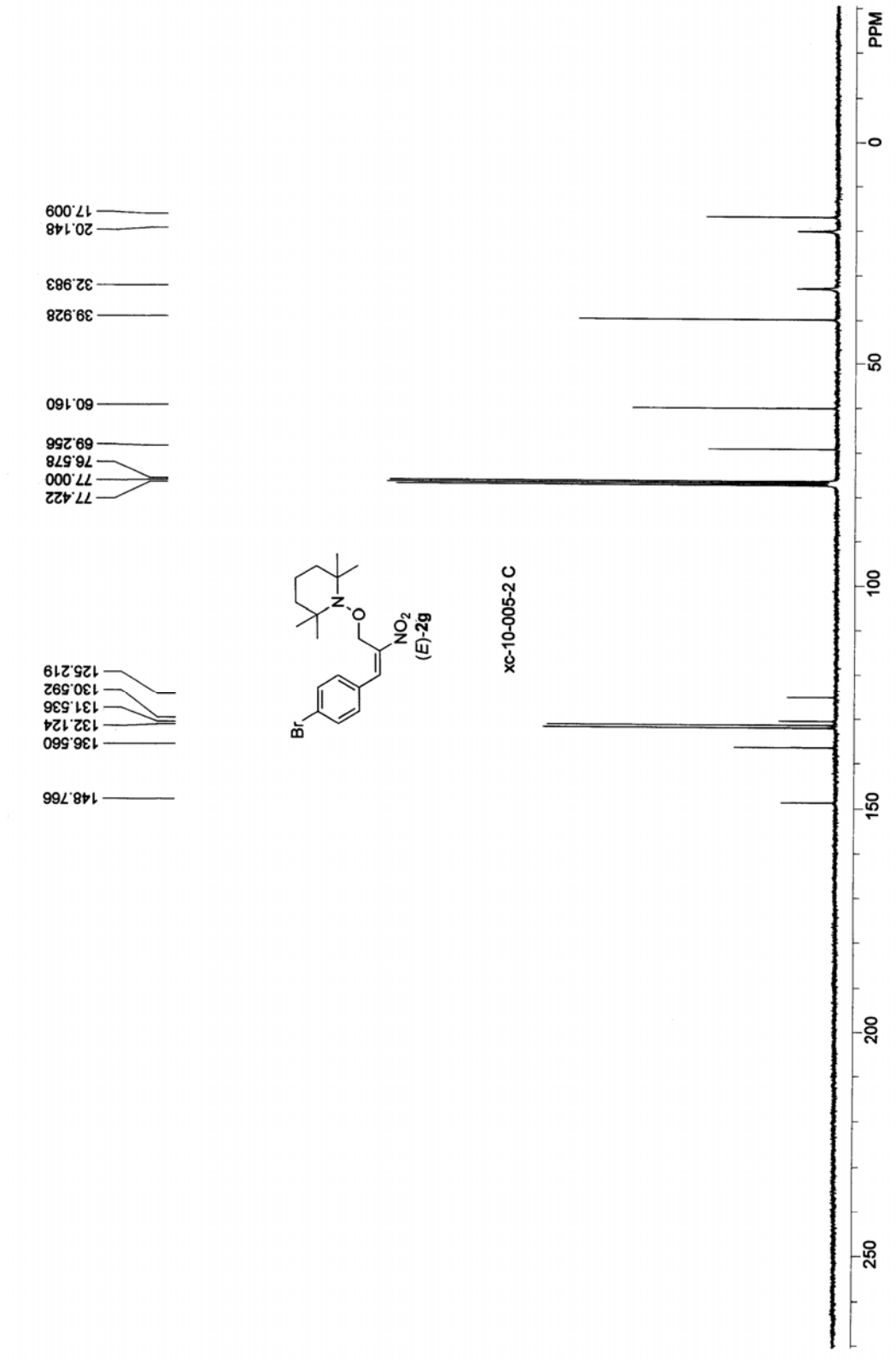

-0.000
8.085
6.799
6.619
4.931
4.723
PPM
0
2
4
6
8
3.00
0.15
0.08
0.03
0.01
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sun Oct 20 06:15:12 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-162-2-internal
Purity (47%) determined by using
Mesitylene as the internal standard
(Z)-2f
NO2
Cl

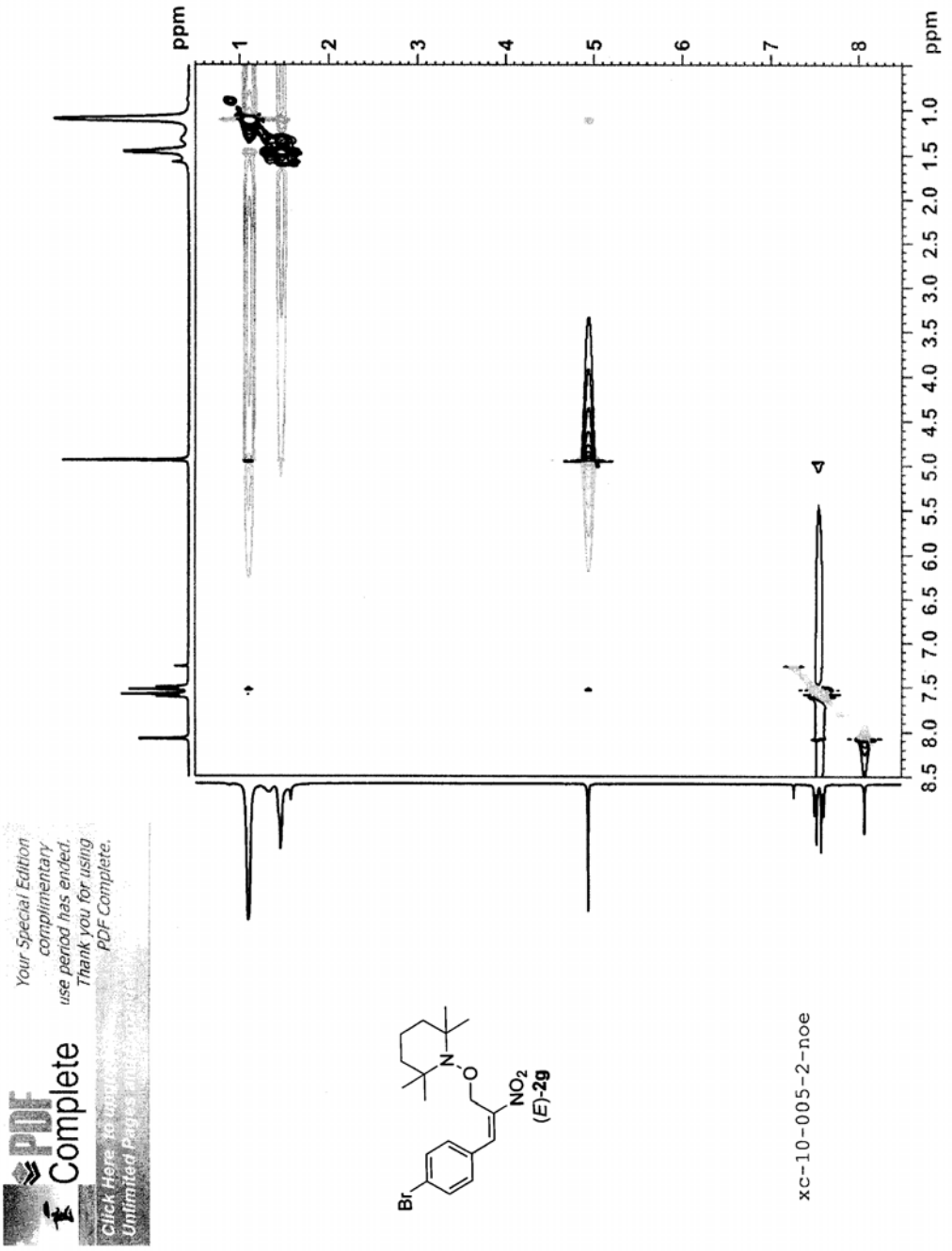

D:\new nuts\DATA\$pdata
spect, CDCl3,
Sun Oct 20 06:15:12 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-162-2-internal
Purity (47%) determined by using
Mesitylene as the internal standard
(Z)-2f
NO2
Cl
6.789
6.619
4.723
-0.000
3.00
0.08
0.15
PPM

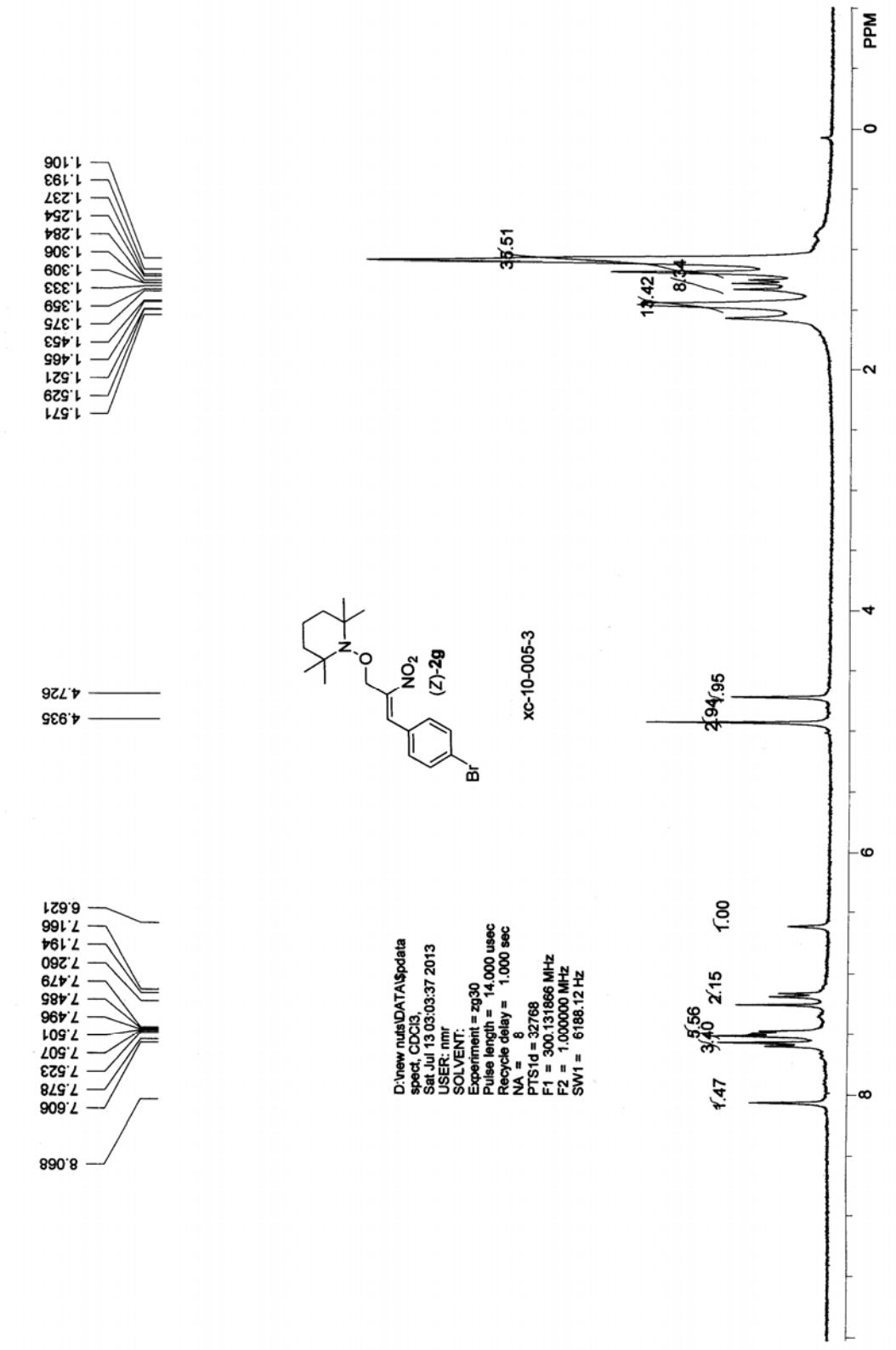


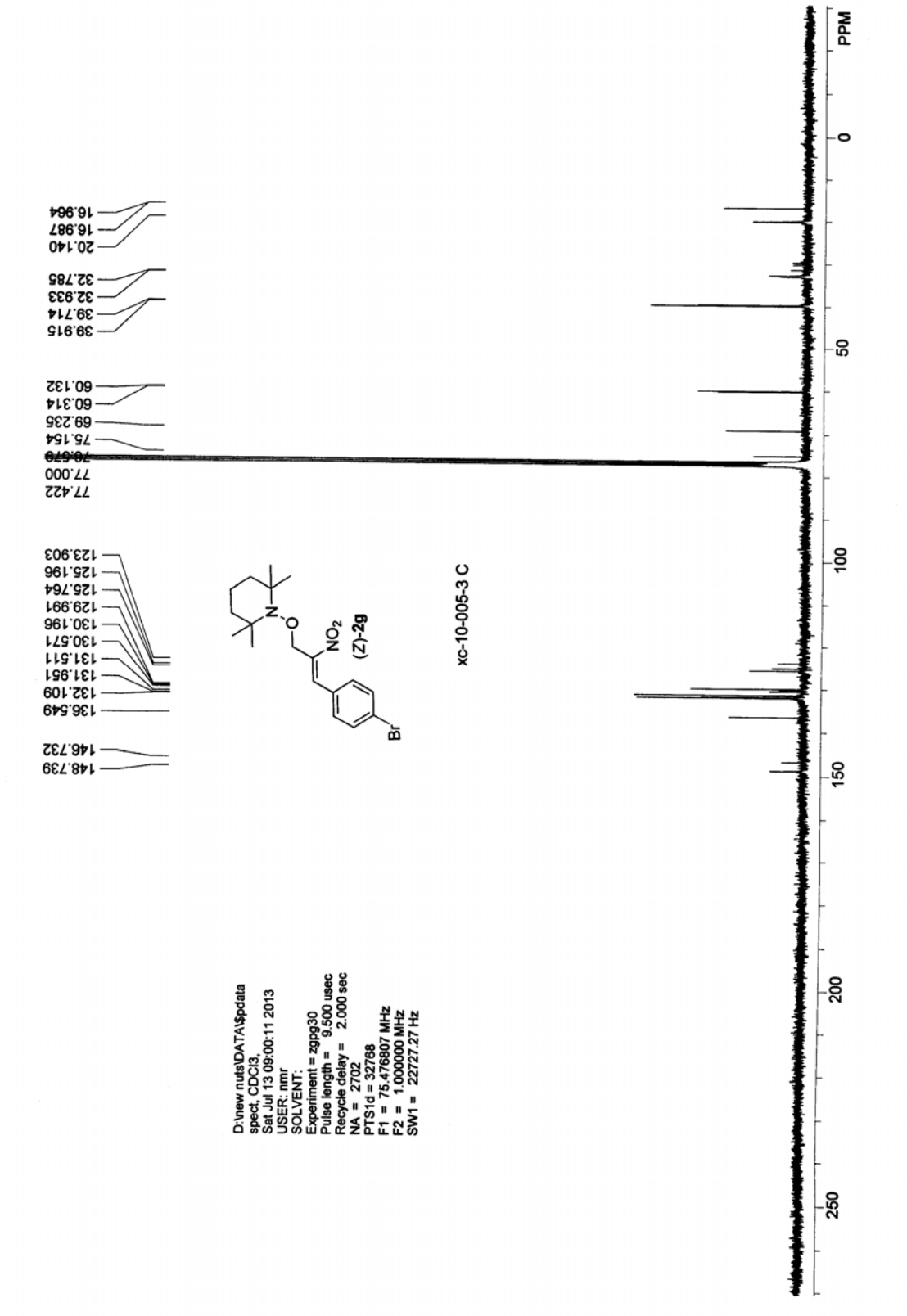

8.060
6.800
6.610
4.944
4.736
D:\new nuts\DATA\5pdata
spect, CDCl3,
Thu Jul 11 06:34:10 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-005-cp
84.46
60.00
2.86
178.68
5.92
8
6
4
2
0
PPM

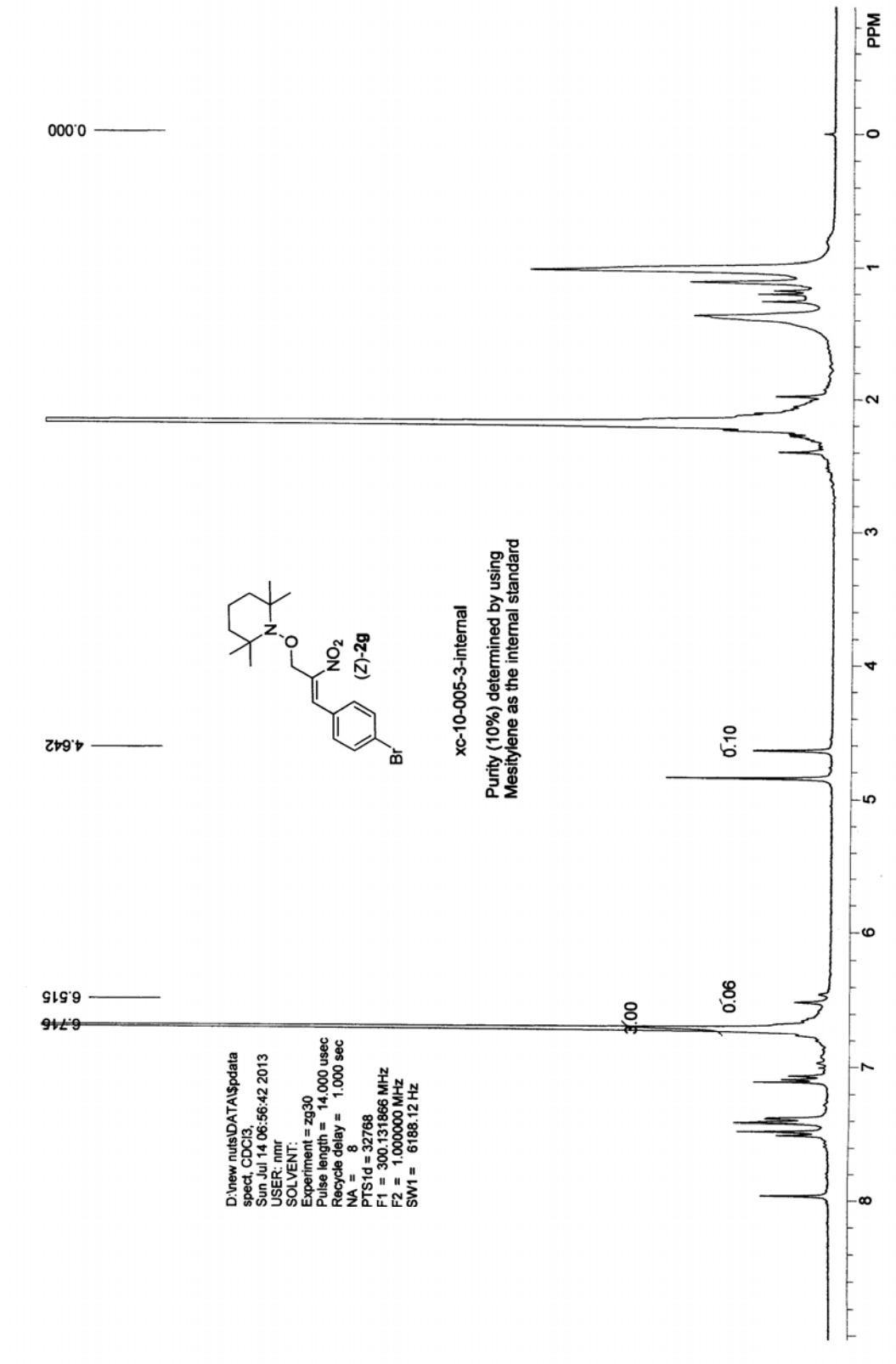

1.095
1.269
1.313
1.320
1.328
1.333
1.336
1.363
1.587
1.398
1.451
4.933
7.260
7.494
7.522
7.576
7.604
8.066
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Jul 13 03:18:14 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
Br
N
O
NO2
(E)-2g
xc-10-005-2
12.30
5.13
1.21
2.00
2.01
1.95
0.96
8
6
4
2
0
PPM

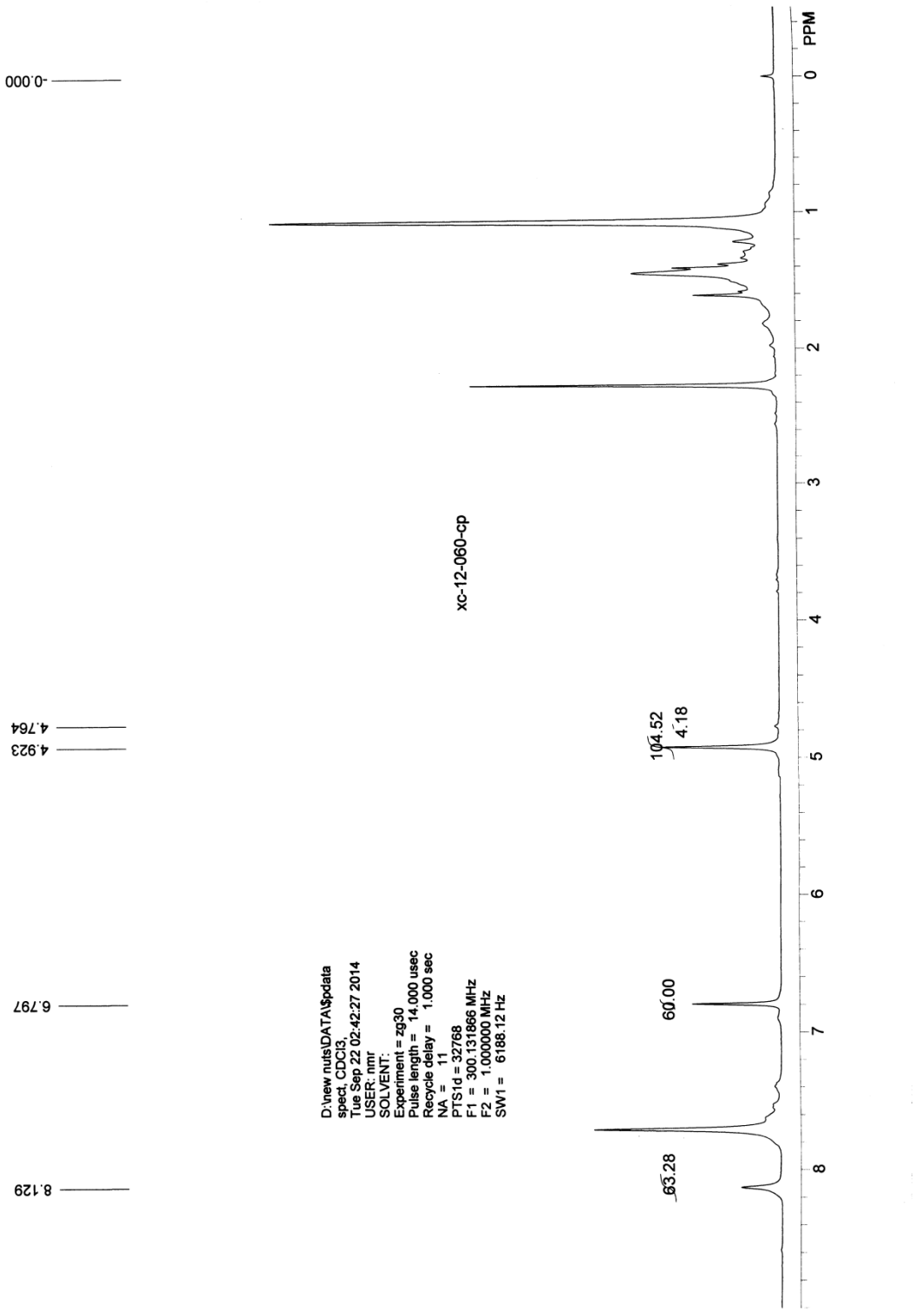

PPM
0
50
100
150
200
250
xc-10-005-2 C
(E)-2g
NO2
Br
17.009
20.148
32.983
39.928
60.160
69.256
76.578
77.000
77.422
125.219
130.592
131.536
132.124
136.560
148.766

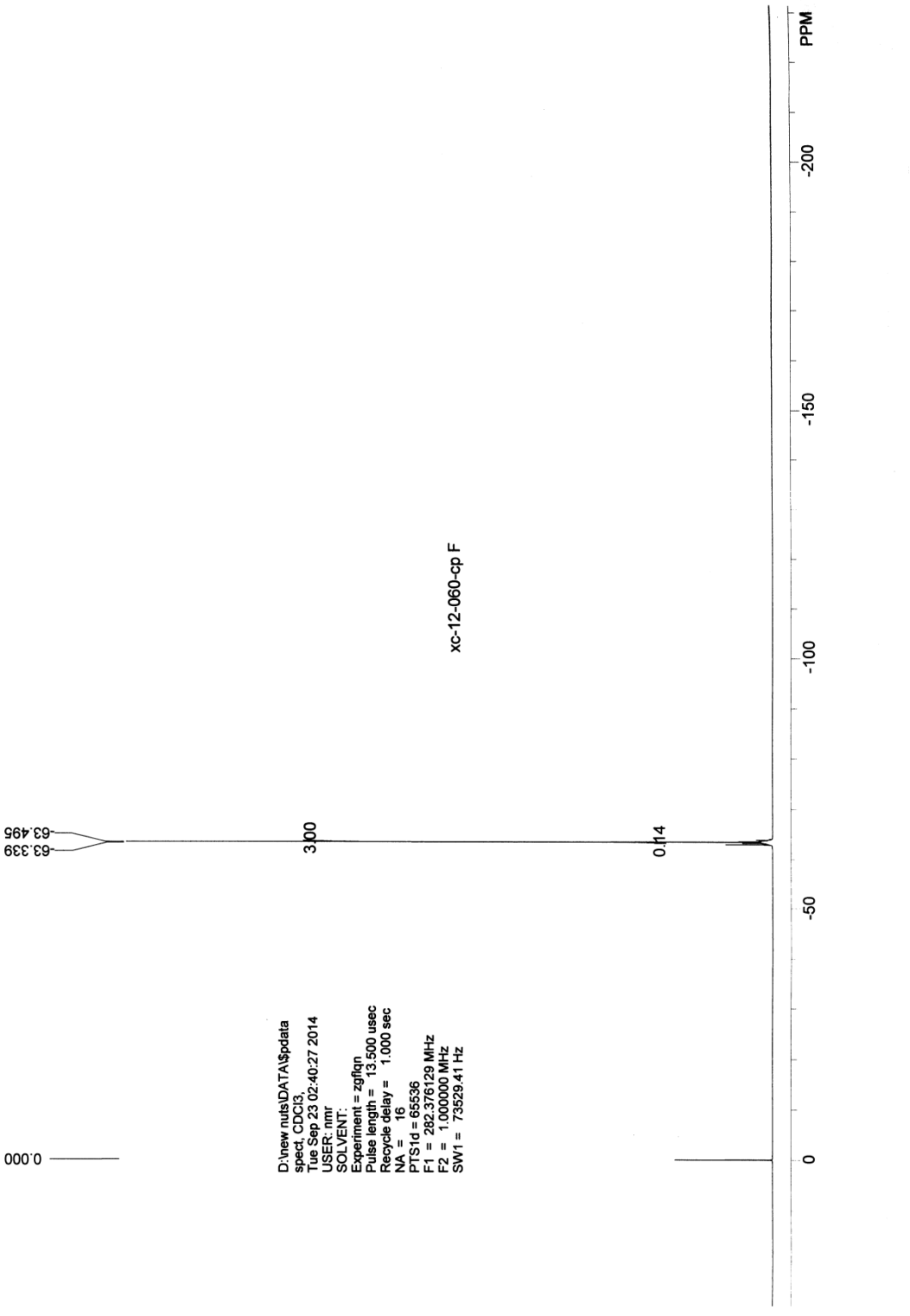


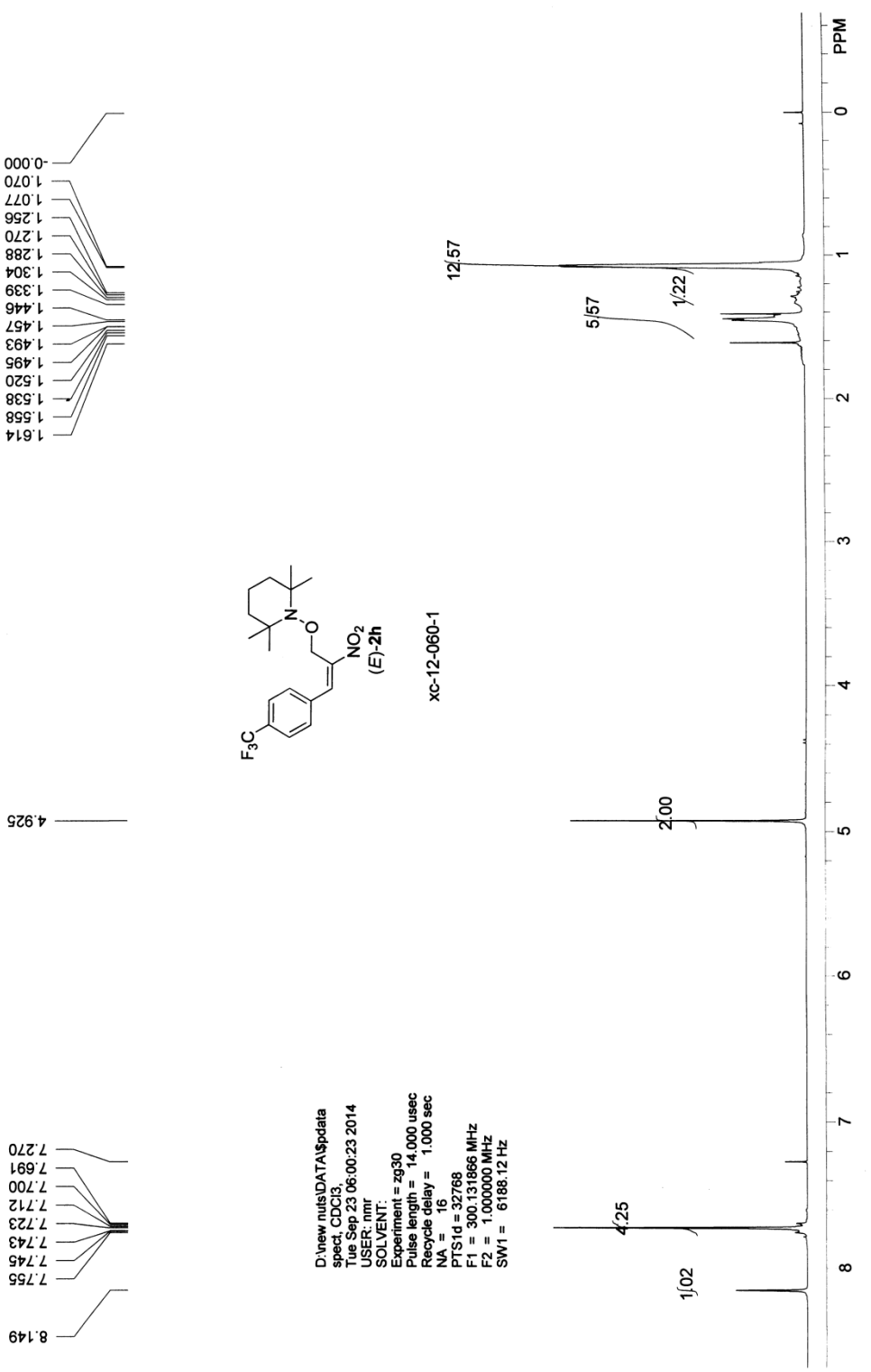

1.106
1.193
1.237
1.254
1.284
1.306
1.309
1.333
1.359
1.375
1.453
1.466
1.521
1.529
1.571
4.726
4.935
6.621
7.166
7.194
7.260
7.479
7.485
7.496
7.501
7.507
7.523
7.578
7.606
8.068
D:\new nuts\DATA\$pdata
sped, CDCl3,
Sat Jul 13 03:03:37 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-005-3
(Z)-2g
NO2
Br
35.51
13.42
8.34
2.94
2.95
1.00
2.15
5.56
3.40
1.47
PPM
0
2
4
6
8

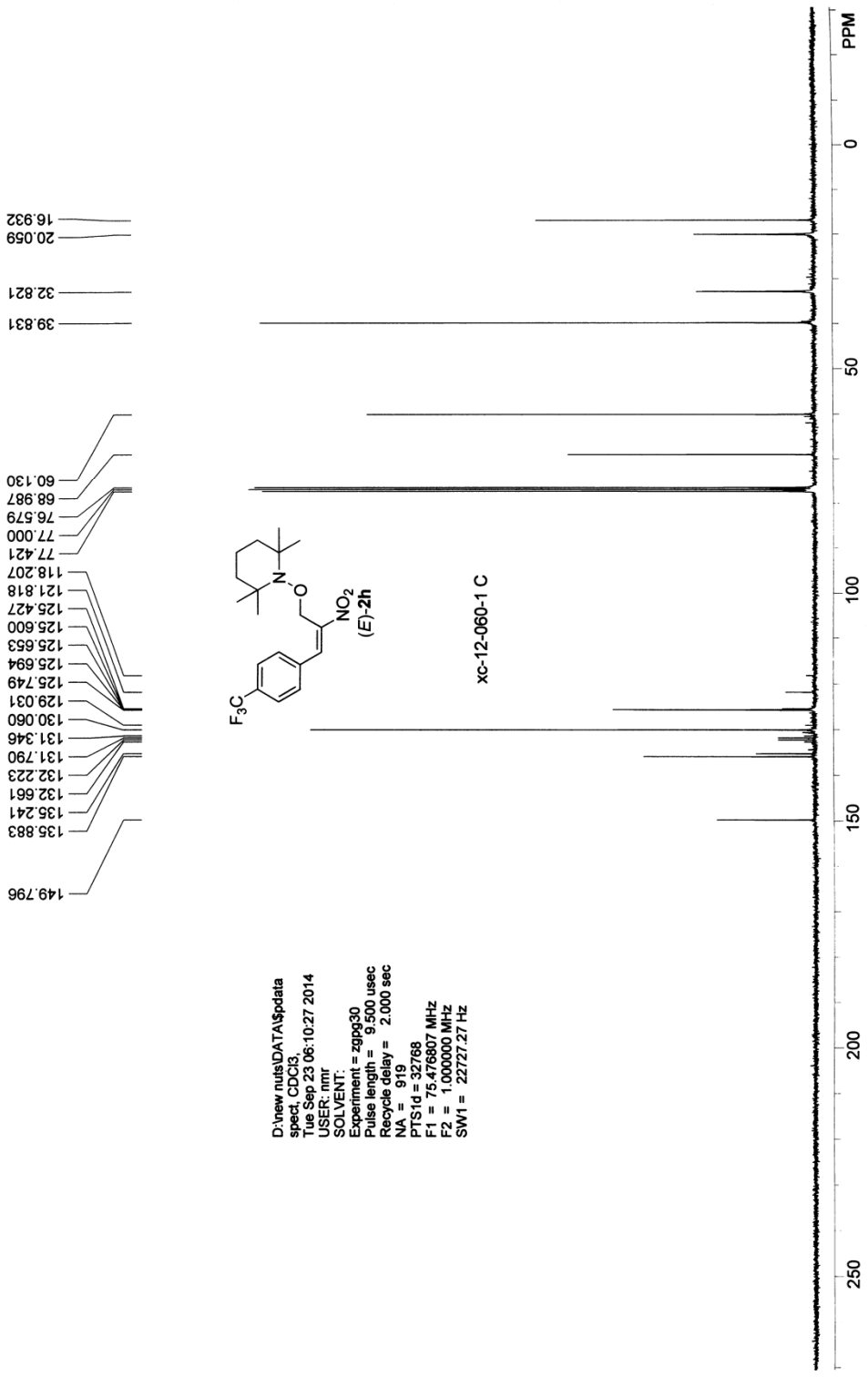

16.964
16.987
20.140
32.785
32.933
39.714
39.915
60.132
60.314
69.235
75.154
77.000
77.422
123.903
125.196
125.764
129.991
130.196
130.571
131.511
131.951
132.109
136.549
146.732
148.739
PPM
0
50
100
150
200
250
xc-10-005-3 C
(Z)-2g
NO2
Br
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Jul 13 09:00:11 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 2702
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

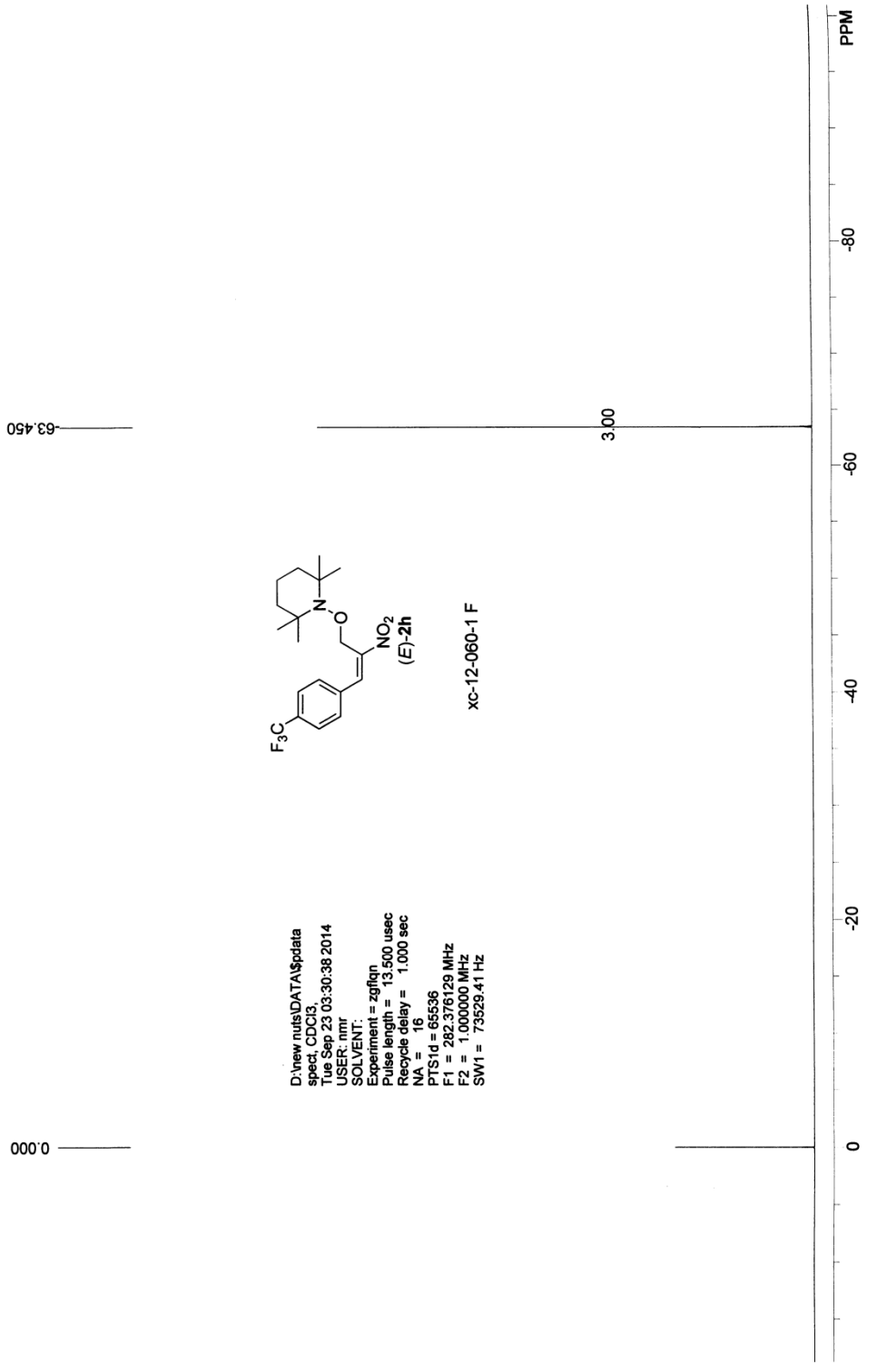

0.000
4.642
6.515
6.746
3.00
0.06
0.10
PPM
0
1
2
3
4
5
6
7
8
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sun Jul 14 06:56:42 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-005-3-internal
Purity (10%) determined by using
Mesitylene as the internal standard
N
O
NO2
(Z)-2g
Br

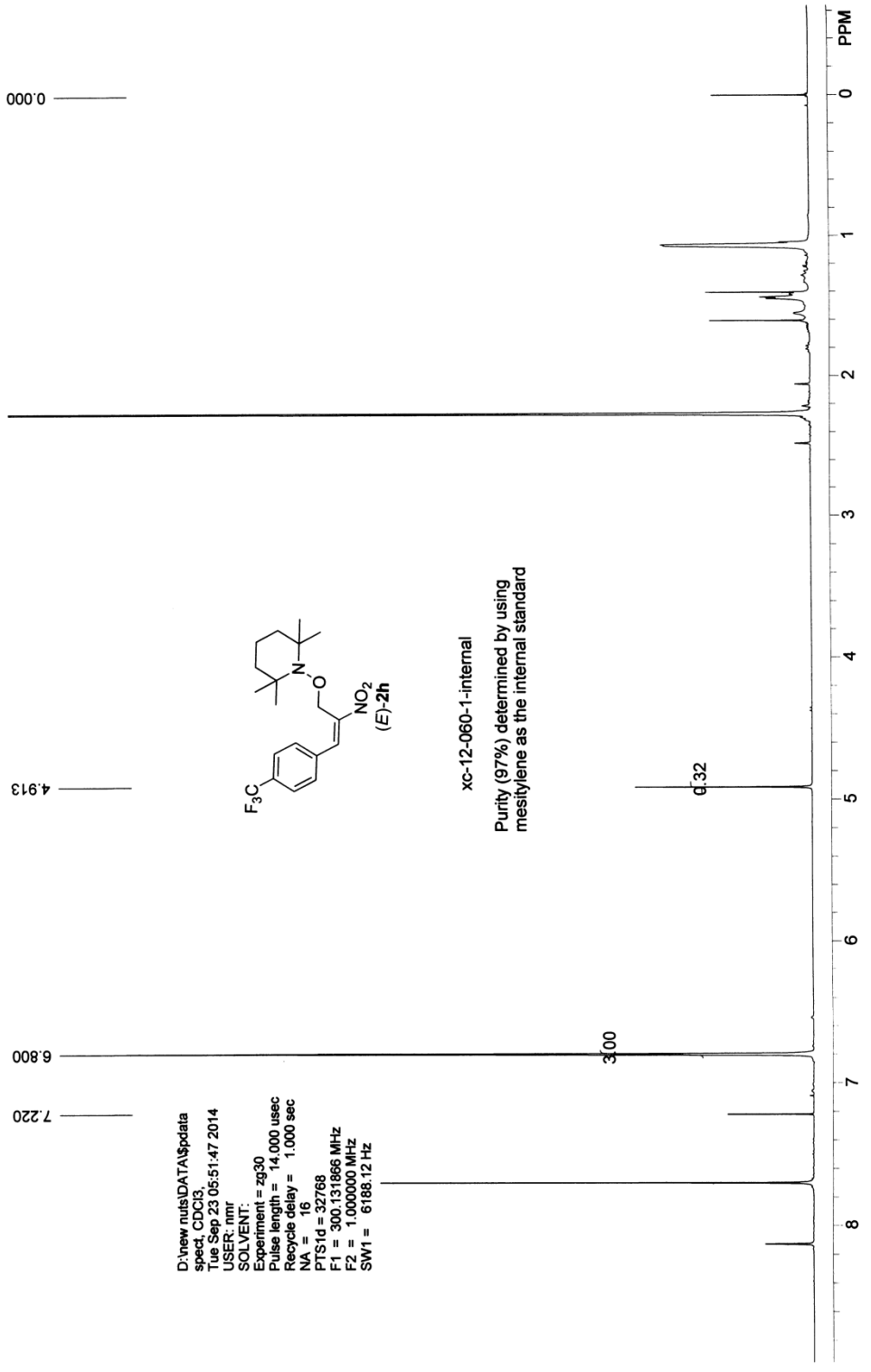

8.129
6.797
4.923
4.764
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 22 02:42:27 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 11
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-060-cp
3.28
60.00
104.52
4.18
8
7
6
5
4
3
2
1
0
PPM

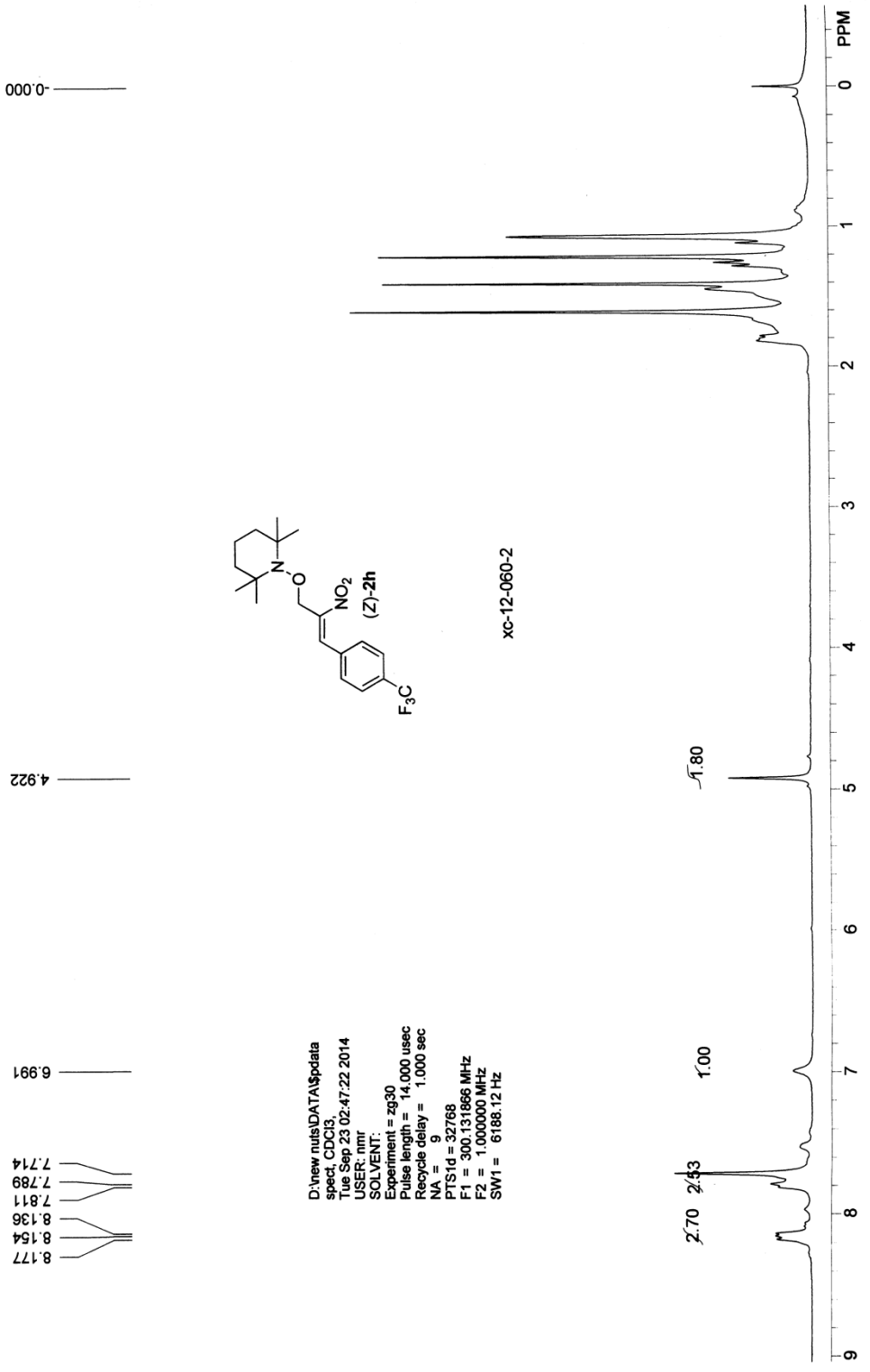

-63.495
-63.339
3.00
0.14
0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 23 02:40:27 2014
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
xc-12-060-cp F
0
-50
-100
-150
-200
PPM

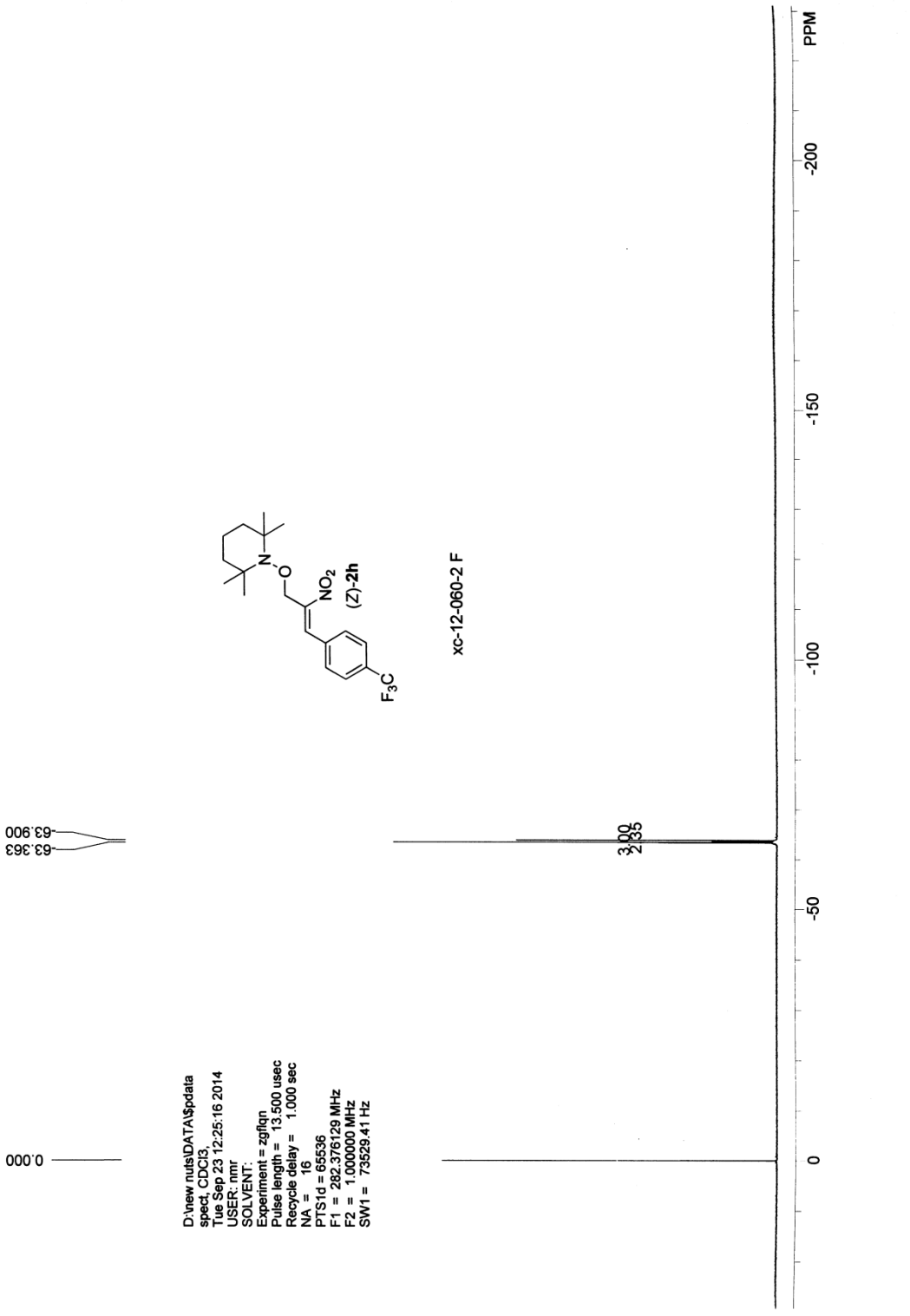

D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 23 06:00:23 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-060-1
(E)-2h
PPM

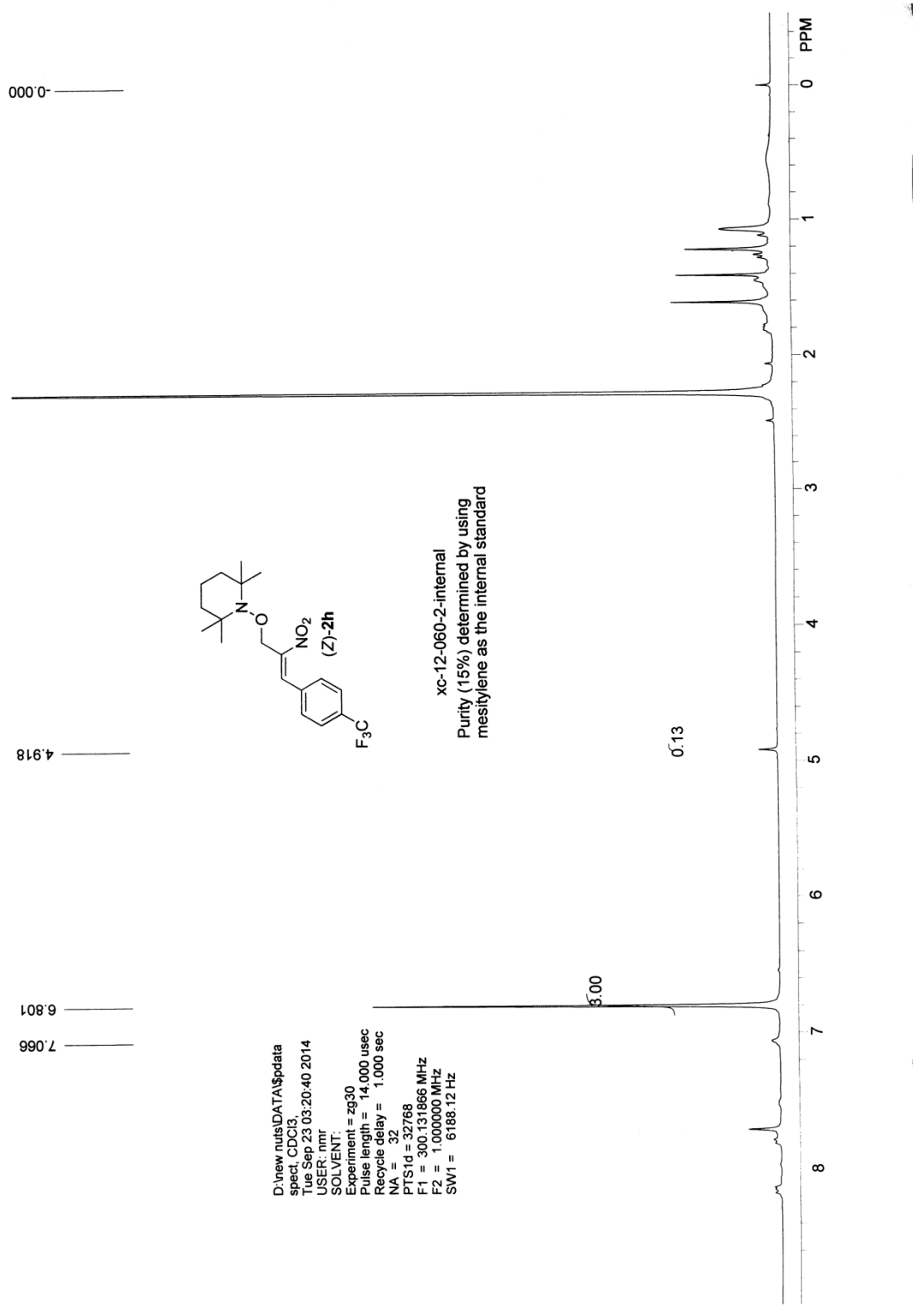

16.932
20.059
32.821
39.831
60.130
68.987
76.579
77.000
77.421
118.207
121.818
125.427
125.600
125.653
125.694
125.749
129.031
130.060
131.346
131.790
132.223
132.661
135.241
135.883
149.796
PPM
0
50
100
150
200
250
xc-12-060-1 C
(E)-2h
D:\new nuts\DATA\$pdata
sped, CDCl3,
Tue Sep 23 06:10:27 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 919
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

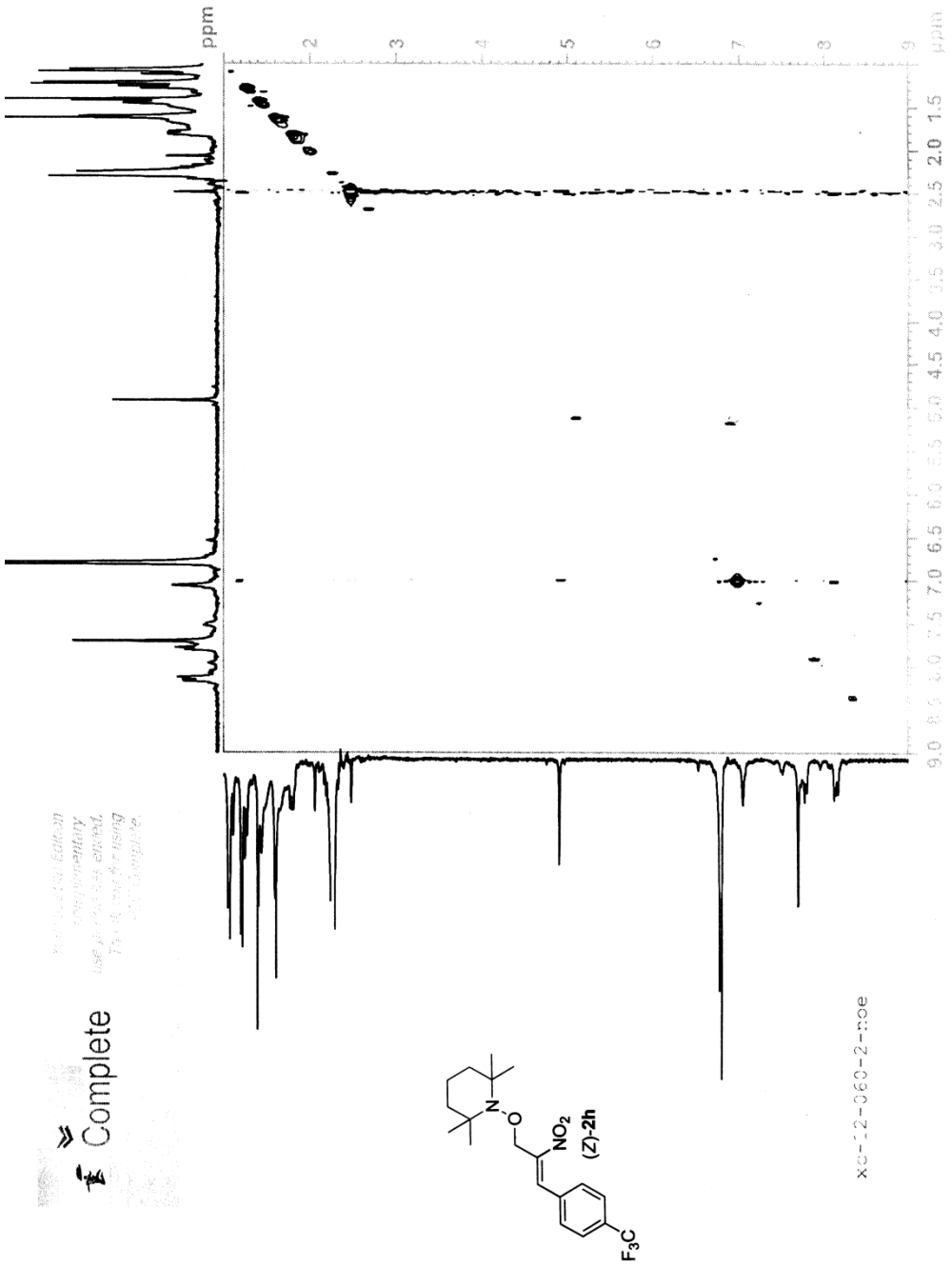

-63.450
0.000
3.00
PPM
0
-20
-40
-60
-80
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 23 03:30:38 2014
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
xc-12-060-1 F
(E)-2h

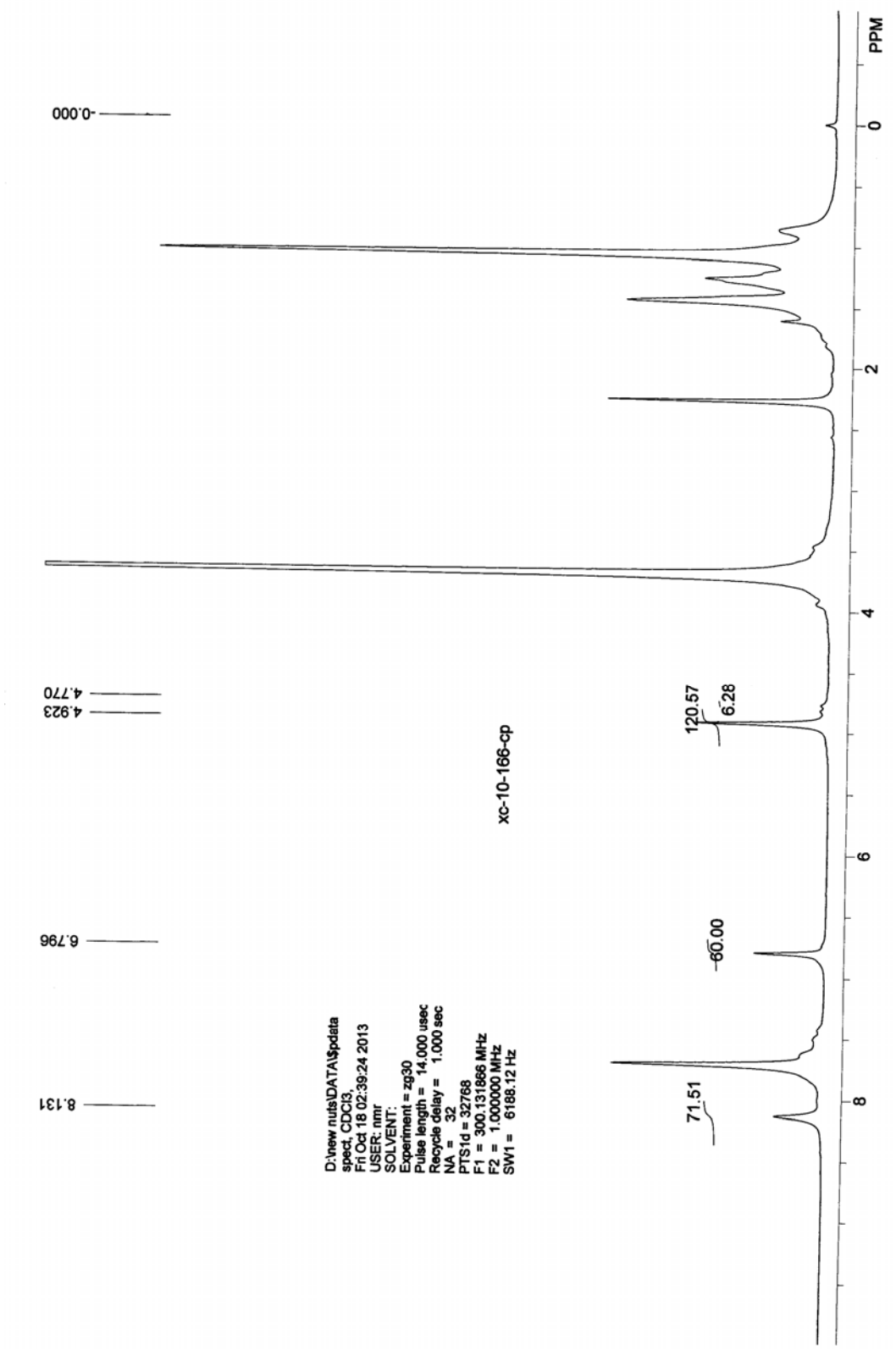

D:\new nuts\DATA\5pdata
spect, CDCl3,
Tue Sep 23 05:51:47 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-060-1-internal
Purity (97%) determined by using
mesitylene as the internal standard
(E)-2h
7.220
6.800
4.913
0.000
3.00
0.32
PPM

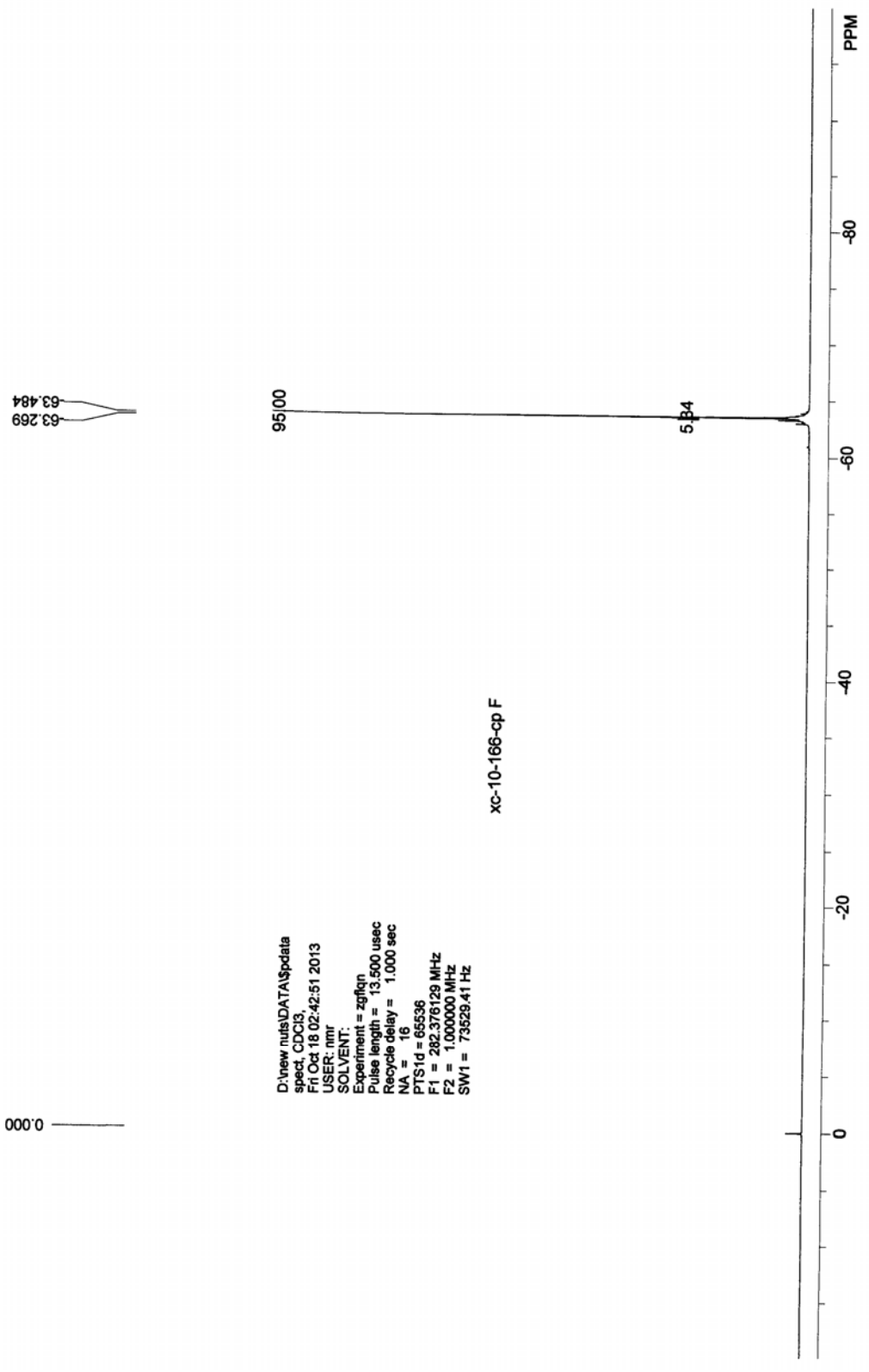

8.177
8.154
8.136
7.811
7.789
7.714
6.991
4.922
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 23 02:47:22 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 9
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-060-2
(Z)-2h
1.80
1.00
2.70
2.53
PPM

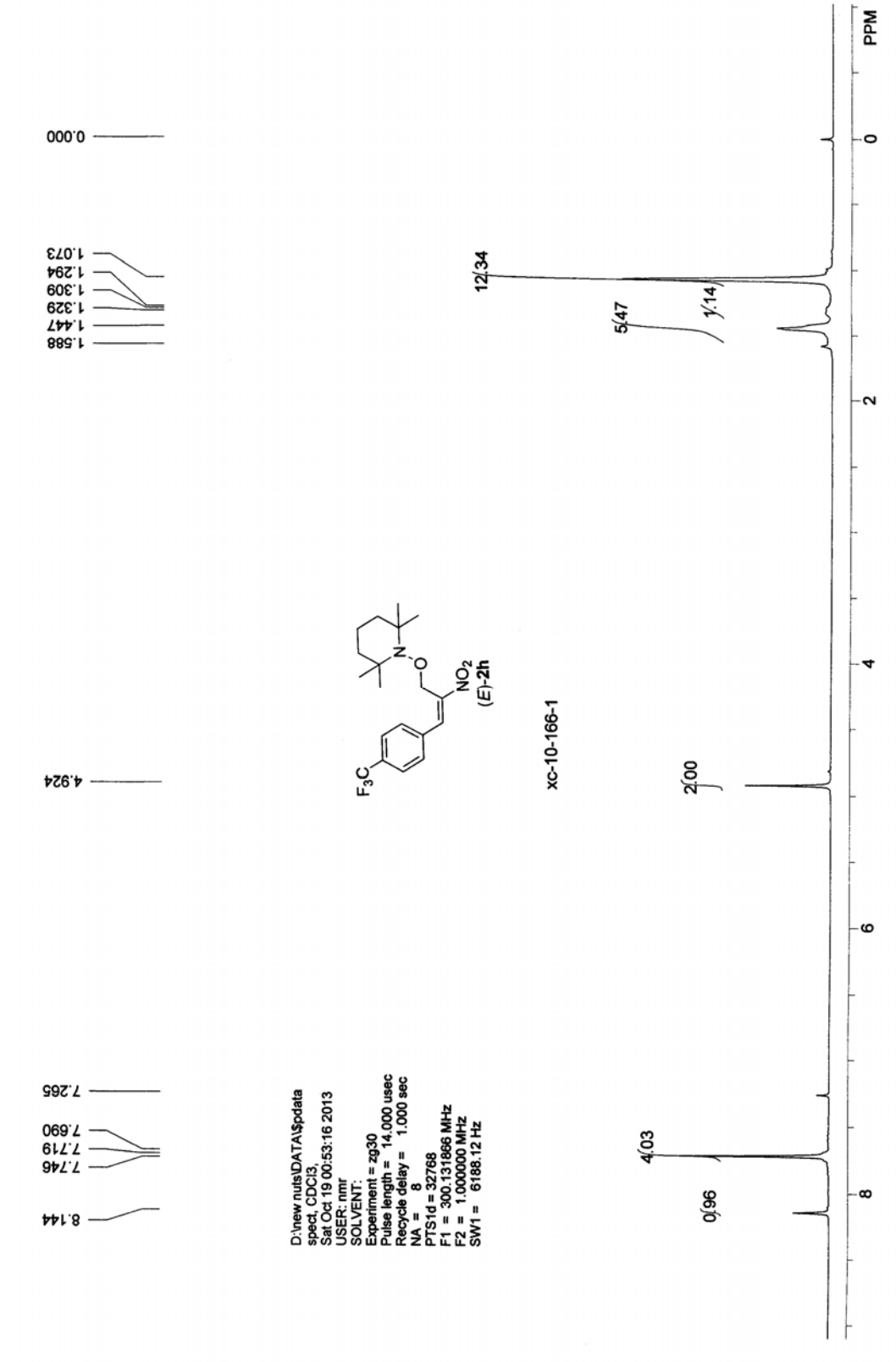

xc-12-060-2 F
(Z)-2h
NO2
F3C
N
O
D:\new nuts\DATA\$pdata
spec4, CDCl3,
Tue Sep 23 12:25:16 2014
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
0.000
63.363
63.900
3.00
2.85
PPM
0
-50
-100
-150
-200

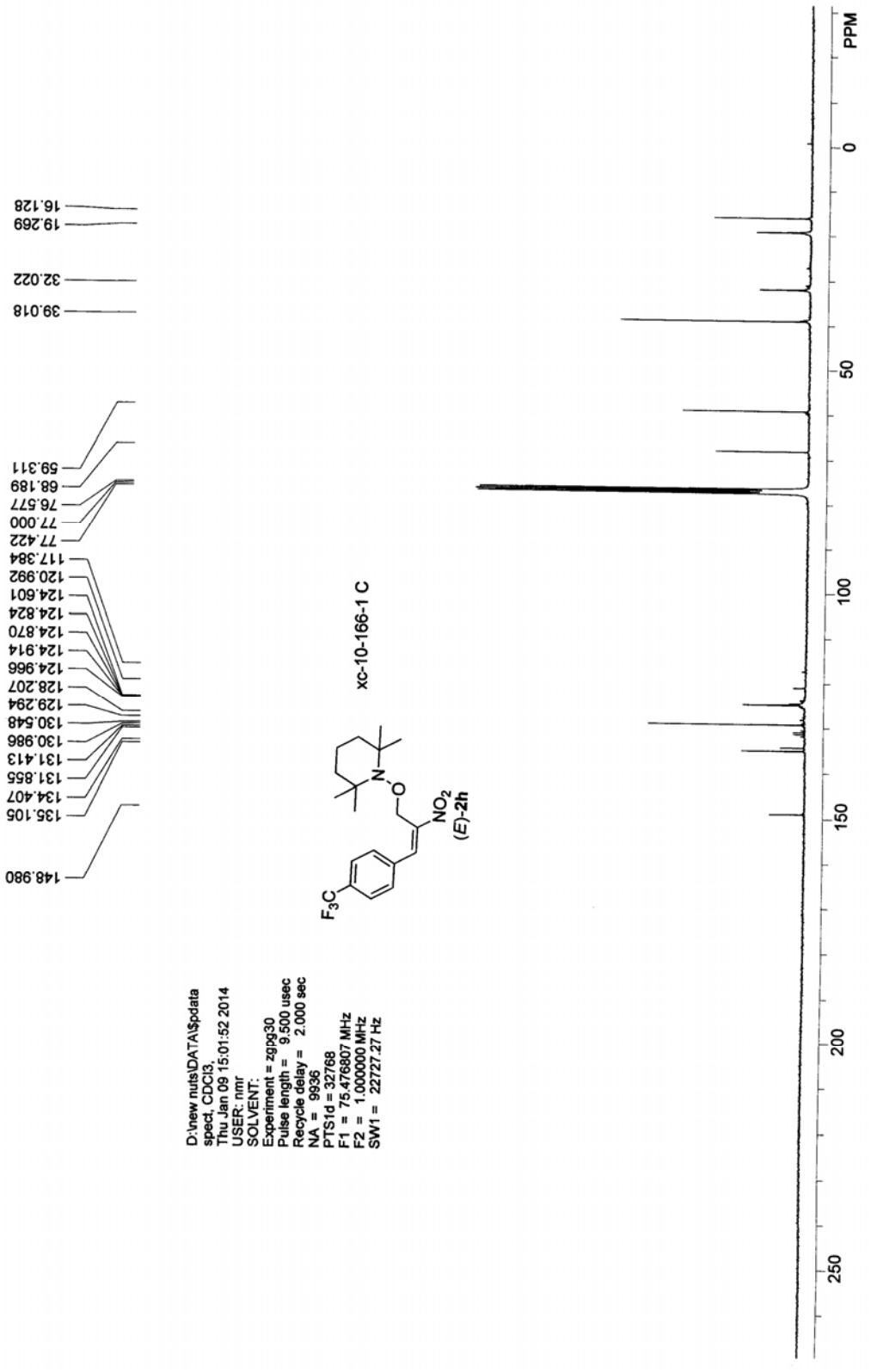

7.066
6.801
4.918
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Sep 23 03:20:40 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
3.00
0.13
xc-12-060-2-internal
Purity (15%) determined by using
mesitylene as the internal standard
(Z)-2h
NO2
F3C
PPM
0
1
2
3
4
5
6
7
8

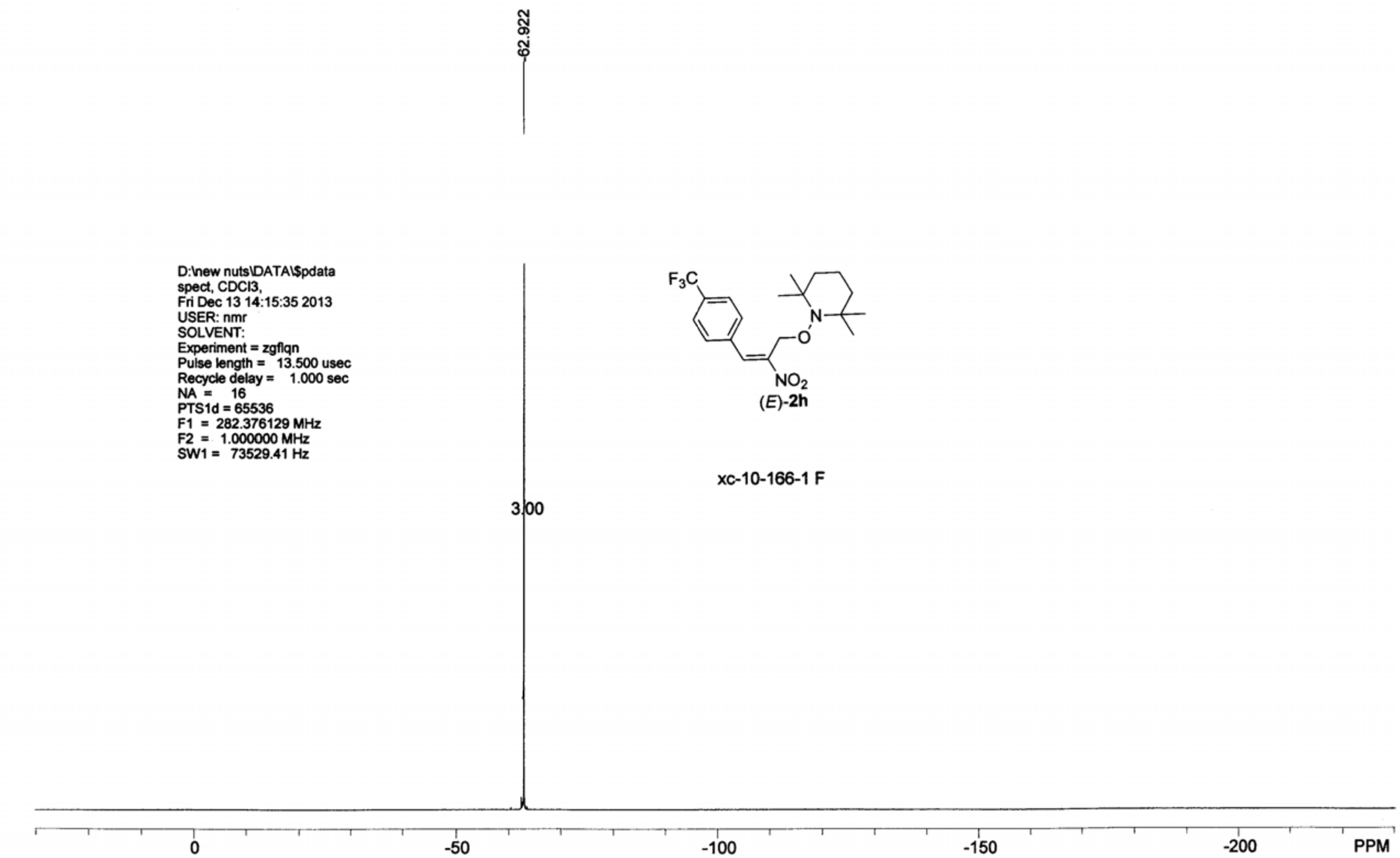

ppm
xc-12-360-2-noe
(Z)-2h
NO2
F3C
Complete

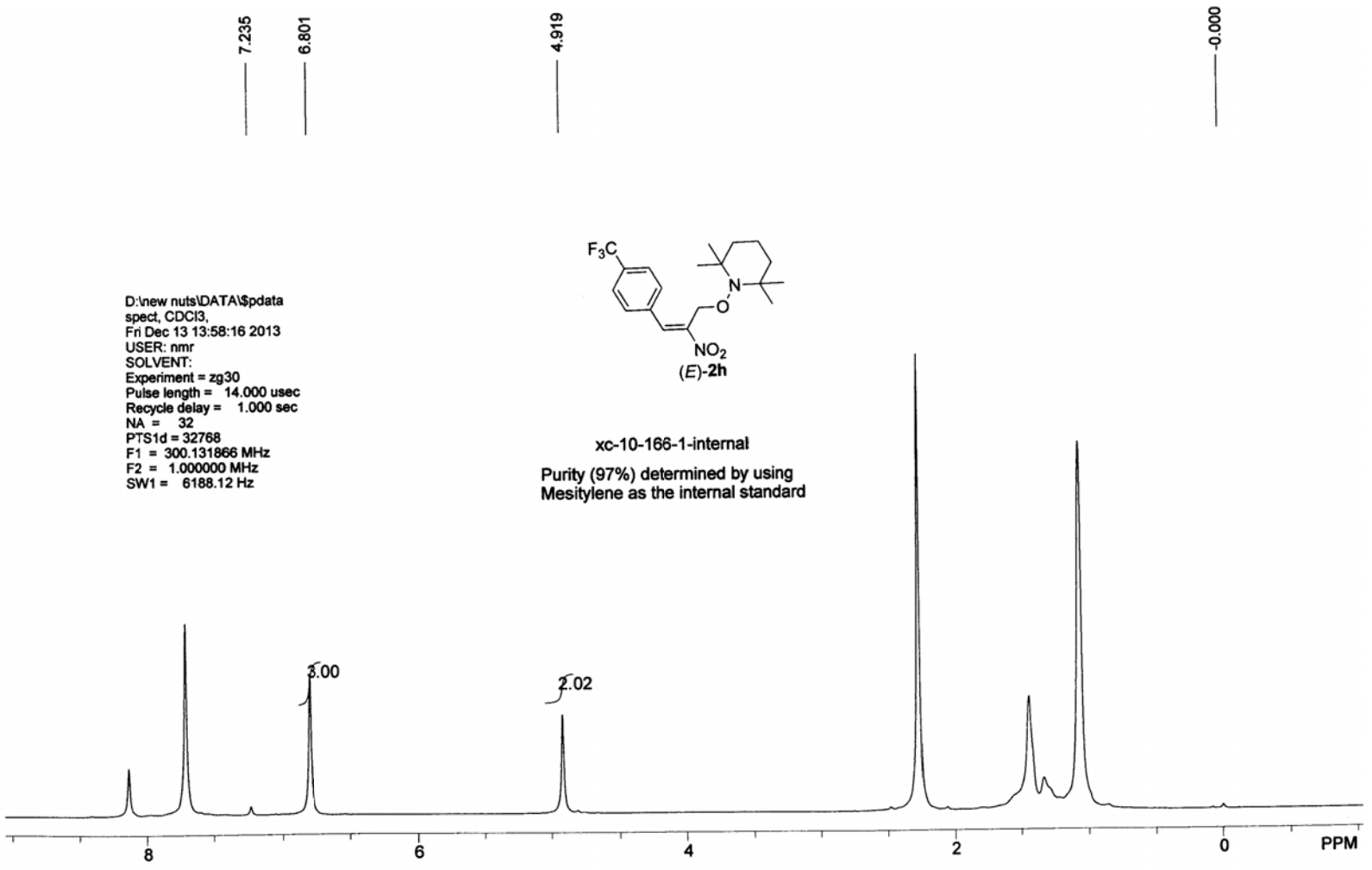

-0.000
8.131
6.796
4.923
4.770
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Oct 18 02:39:24 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-166-cp
71.51
60.00
120.57
6.28
8
6
4
2
0
PPM

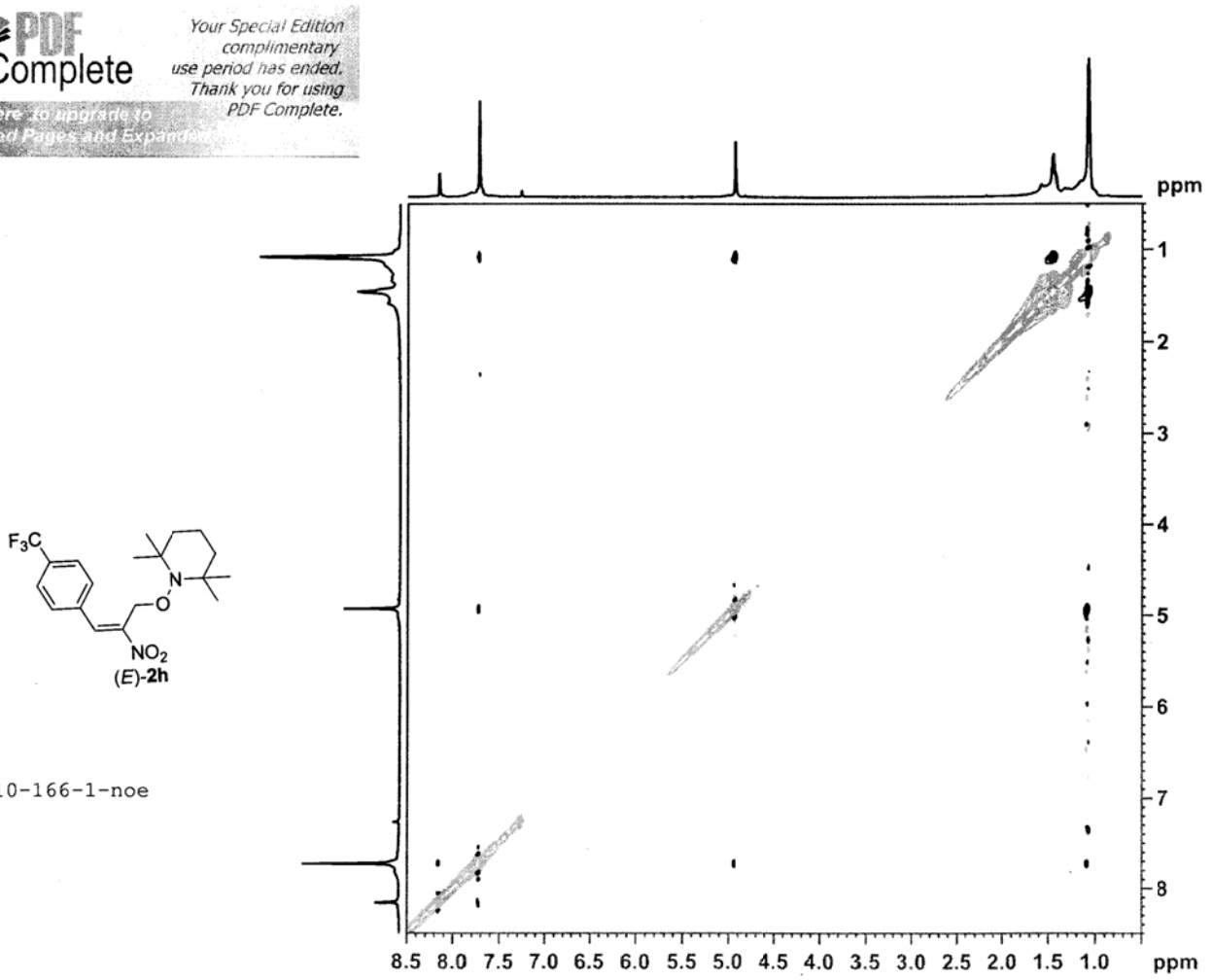

63.484
63.269
95.00
5.34
PPM
-80
-60
-40
-20
0
0.000
D:\new nuts\DATA\$pdata
sped, CDCl3,
Fri Oct 18 02:42:51 2013
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
xc-10-166-cp F


D:\new nuts\DATA\$pdata
sped, CDCl3,
Sat Oct 19 00:53:16 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-166-1
(E)-2h
F3C
NO2
O
N
8.144
7.746
7.719
7.690
7.265
4.924
1.588
1.447
1.329
1.309
1.294
1.073
0.000
0.96
4.03
2.00
5.47
1.14
12.34
PPM
8
6
4
2
0


16.128
19.269
32.022
39.018
59.311
68.189
76.577
77.000
77.422
117.384
120.992
124.601
124.824
124.870
124.914
124.966
128.207
129.294
130.548
130.986
131.413
131.855
134.407
135.105
148.980
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Jan 09 15:01:52 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 9936
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
xc-10-166-1 C
F3C
NO2
(E)-2h
PPM
250
200
150
100
50
0

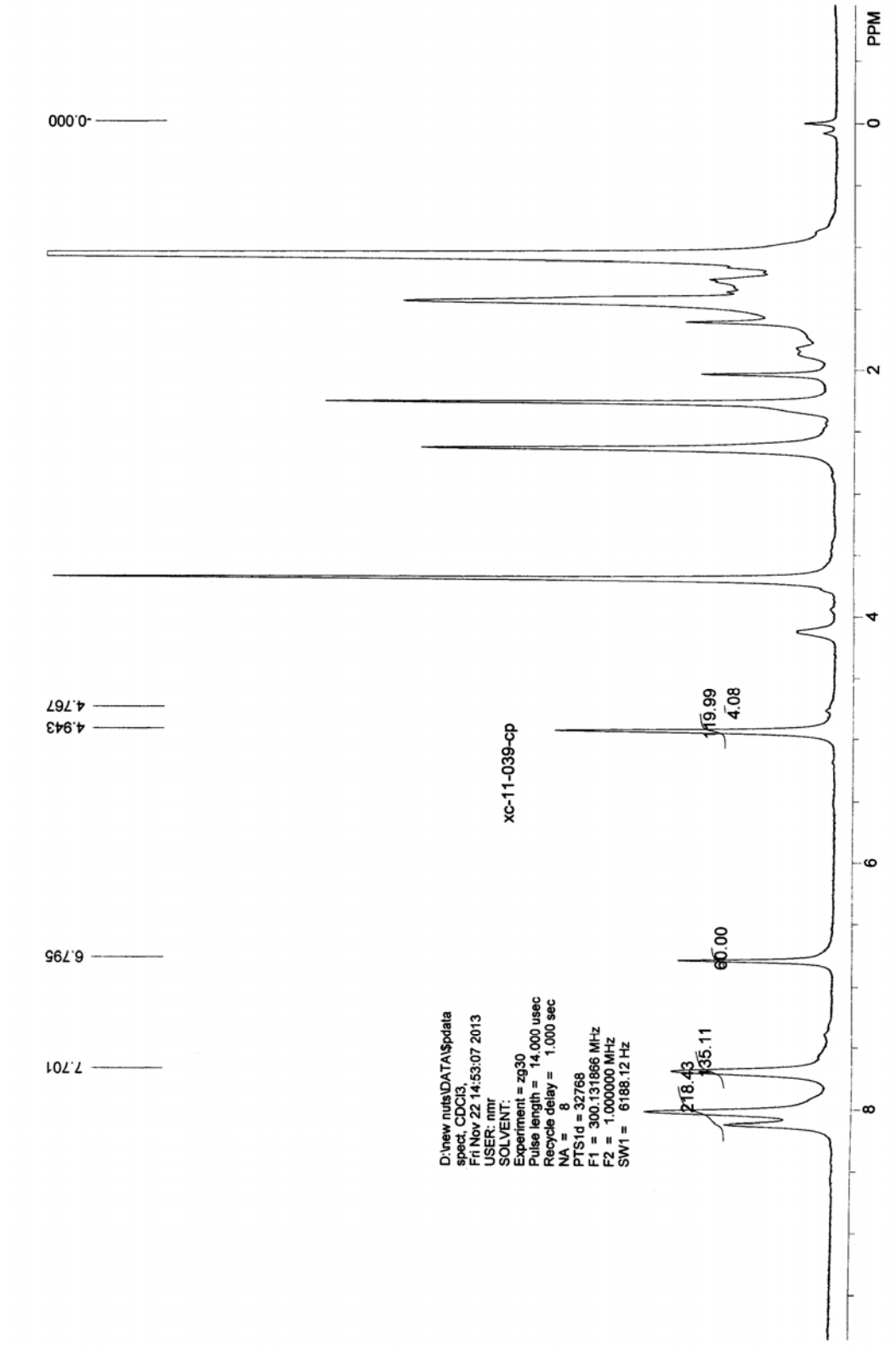

-62.922
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Dec 13 14:15:35 2013
USER: nmr
SOLVENT:
Experiment = zgflqn
Pulse length = 13.500 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 65536
F1 = 282.376129 MHz
F2 = 1.000000 MHz
SW1 = 73529.41 Hz
F3C
N
O
NO2
(E)-2h
xc-10-166-1 F
3.00
0
-50
-100
-150
-200
PPM

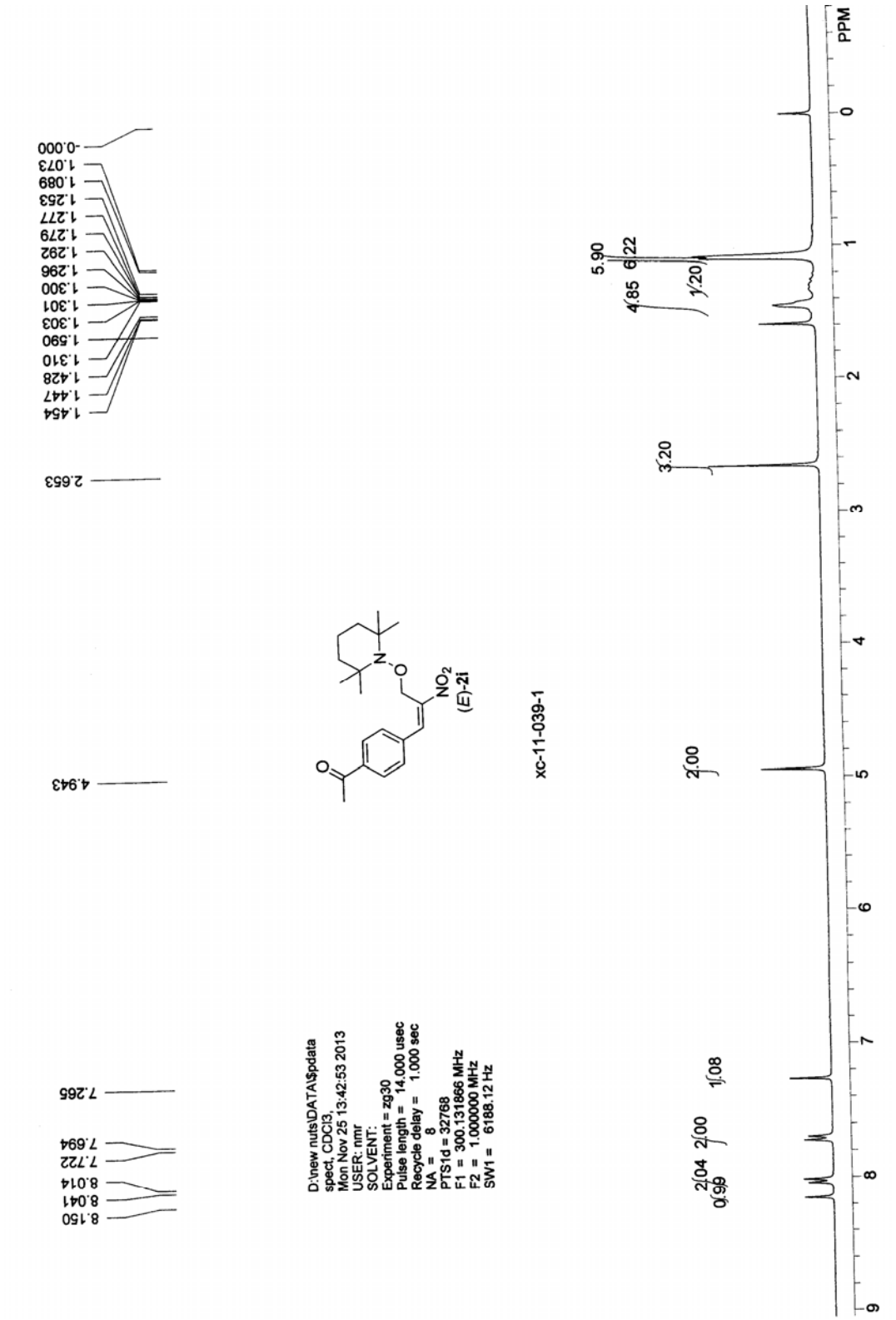

7.235
6.801
4.919
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Dec 13 13:58:16 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
F3C
N
O
NO2
(E)-2h
xc-10-166-1-internal
Purity (97%) determined by using
Mesitylene as the internal standard
3.00
2.02
8
6
4
2
0
PPM

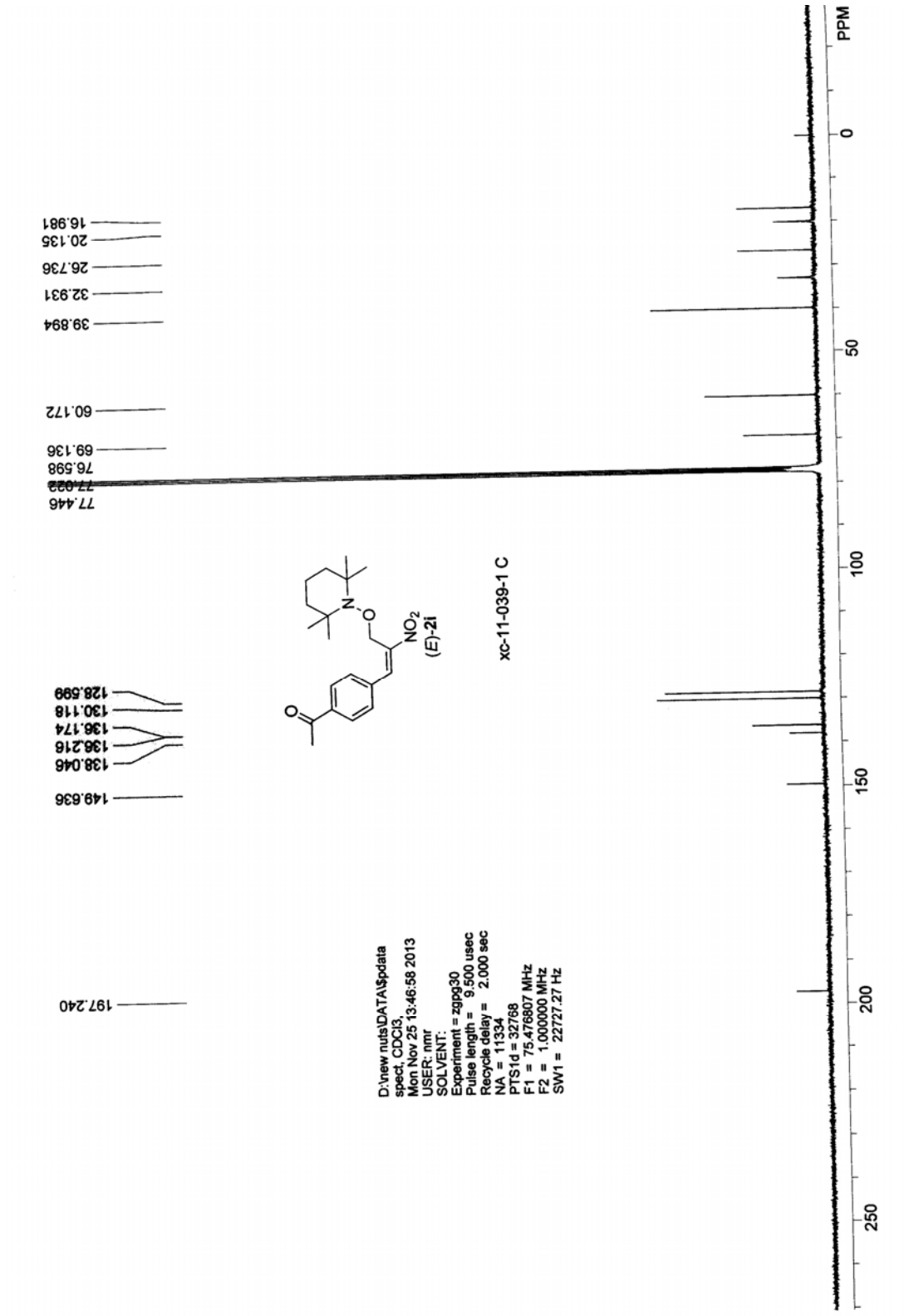


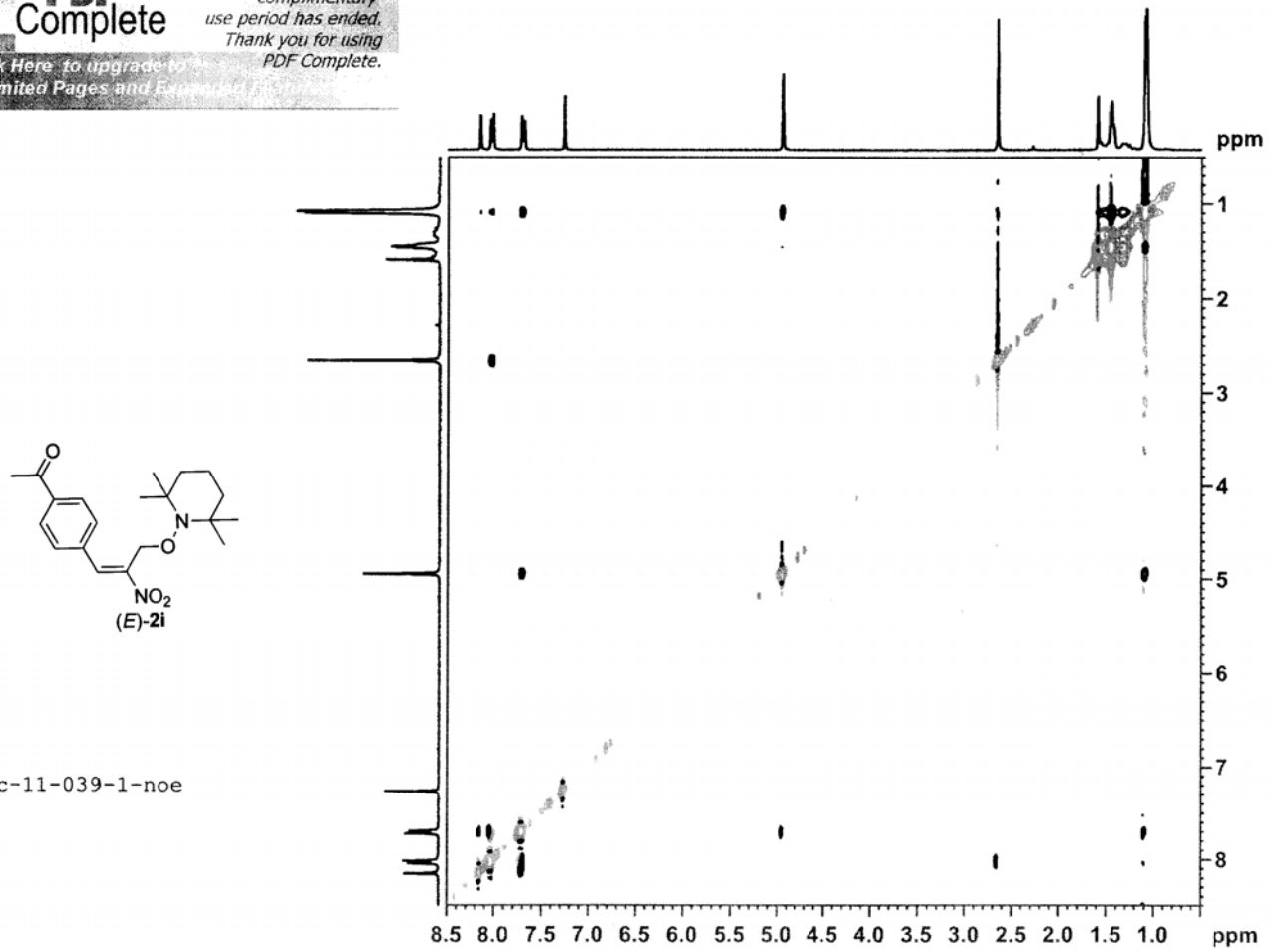
(*E*)-**2h**

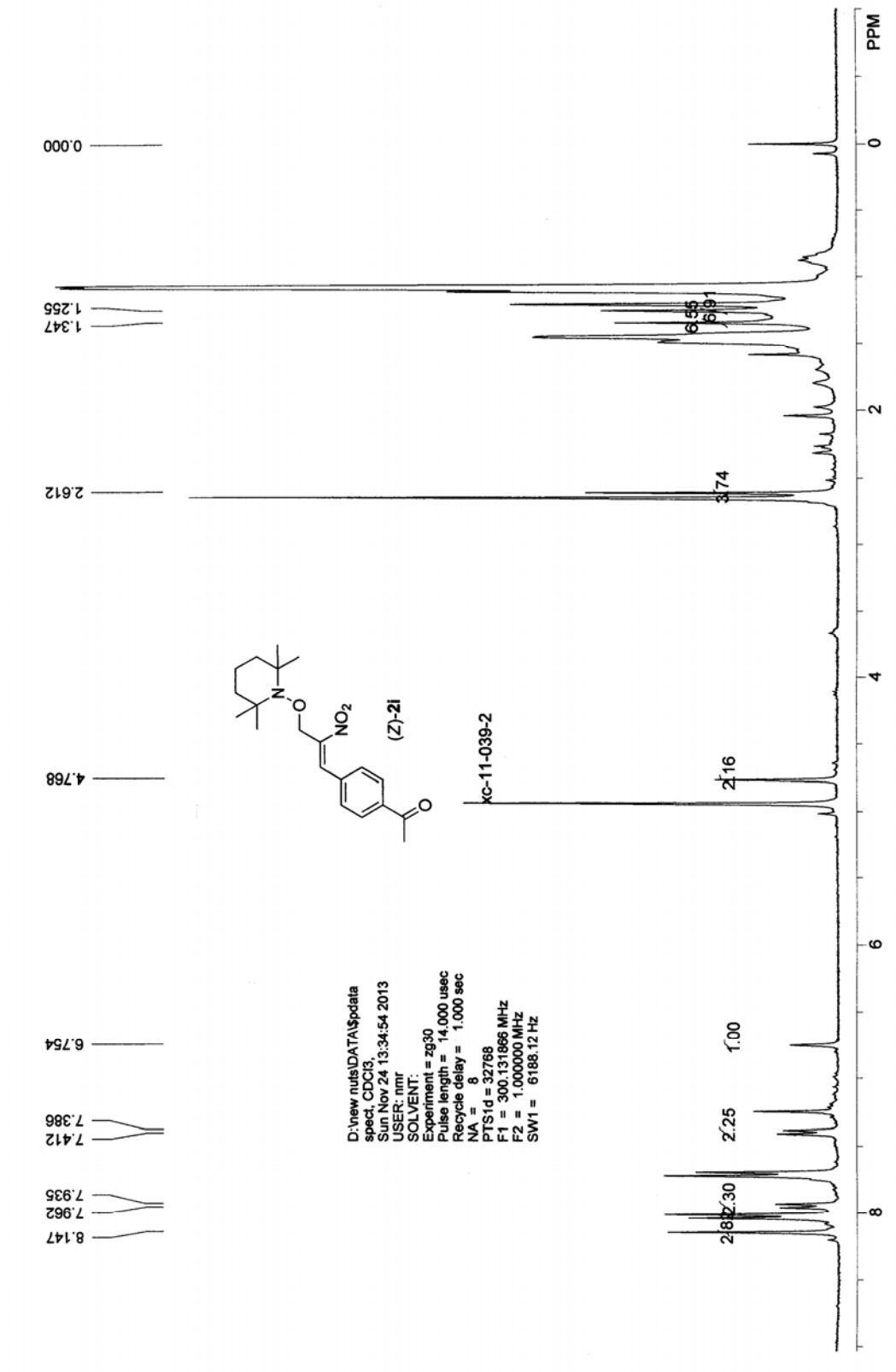
xc-10-166-1-noe

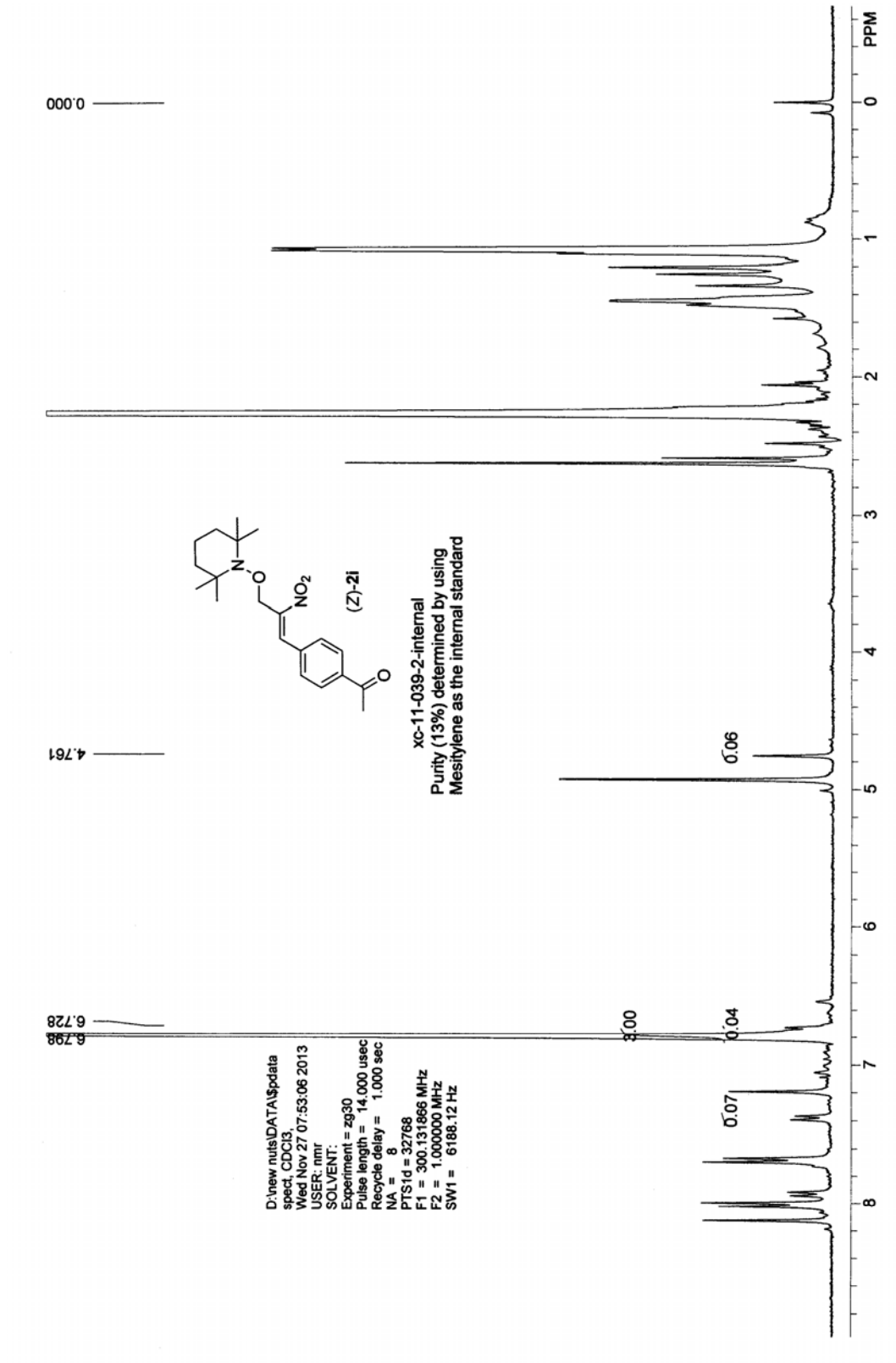

-0.000
4.767
4.943
7.701
6.795
xc-11-039-cp
D:\new nuts\DATA\5pdata
spect, CDCl3,
Fri Nov 22 14:53:07 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
218.43
135.11
60.00
19.99
4.08
PPM
0
2
4
6
8

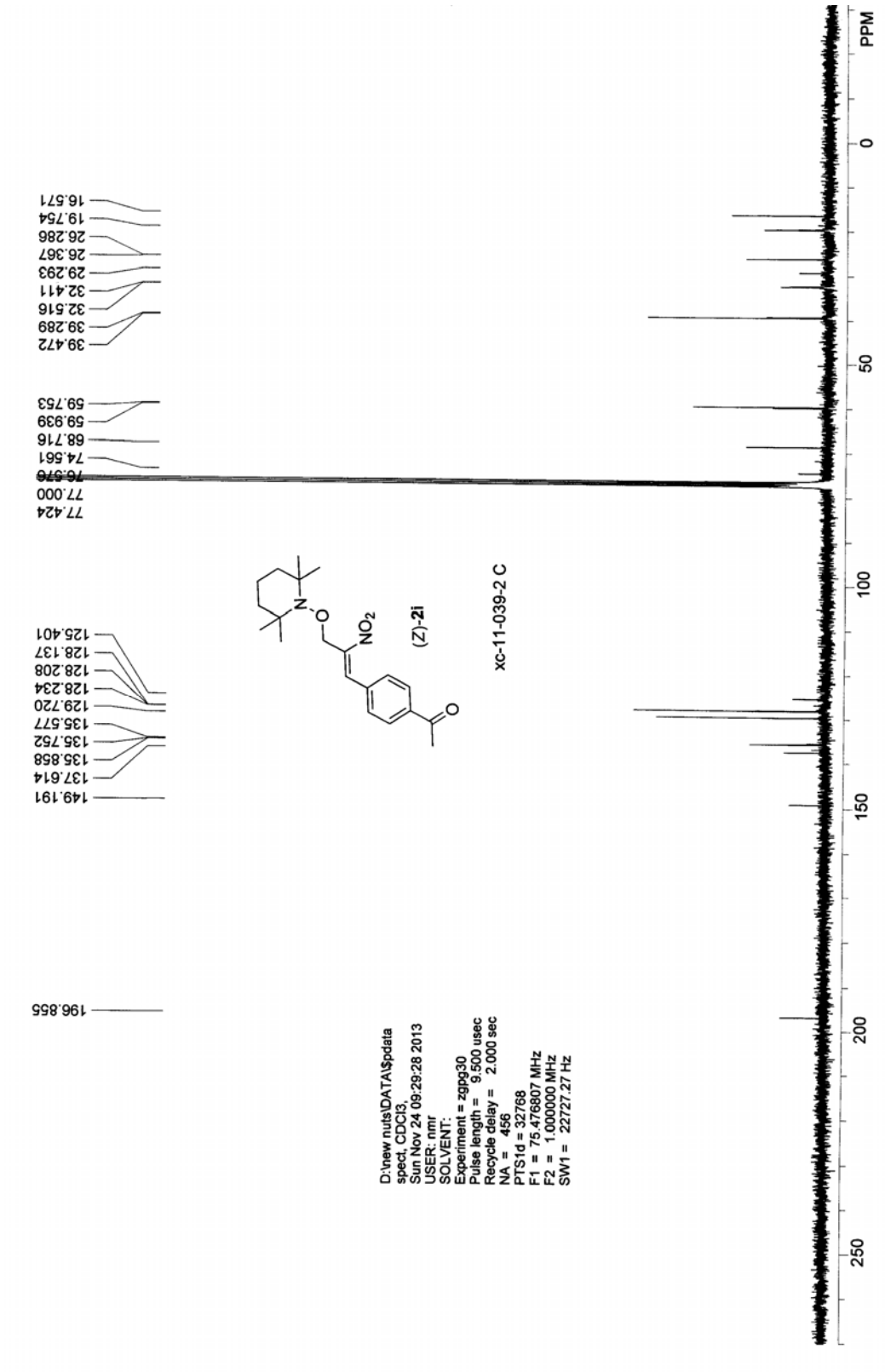

8.150
8.041
8.014
7.722
7.694
7.265
4.943
2.653
1.454
1.447
1.428
1.310
1.590
1.303
1.301
1.300
1.296
1.292
1.279
1.277
1.253
1.089
1.073
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Mon Nov 25 13:42:53 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
O
N
O
NO2
(E)-2i
xc-11-039-1
2.00
3.20
1.20
4.85
6.22
5.90
2.04
2.00
1.08
0.99
PPM

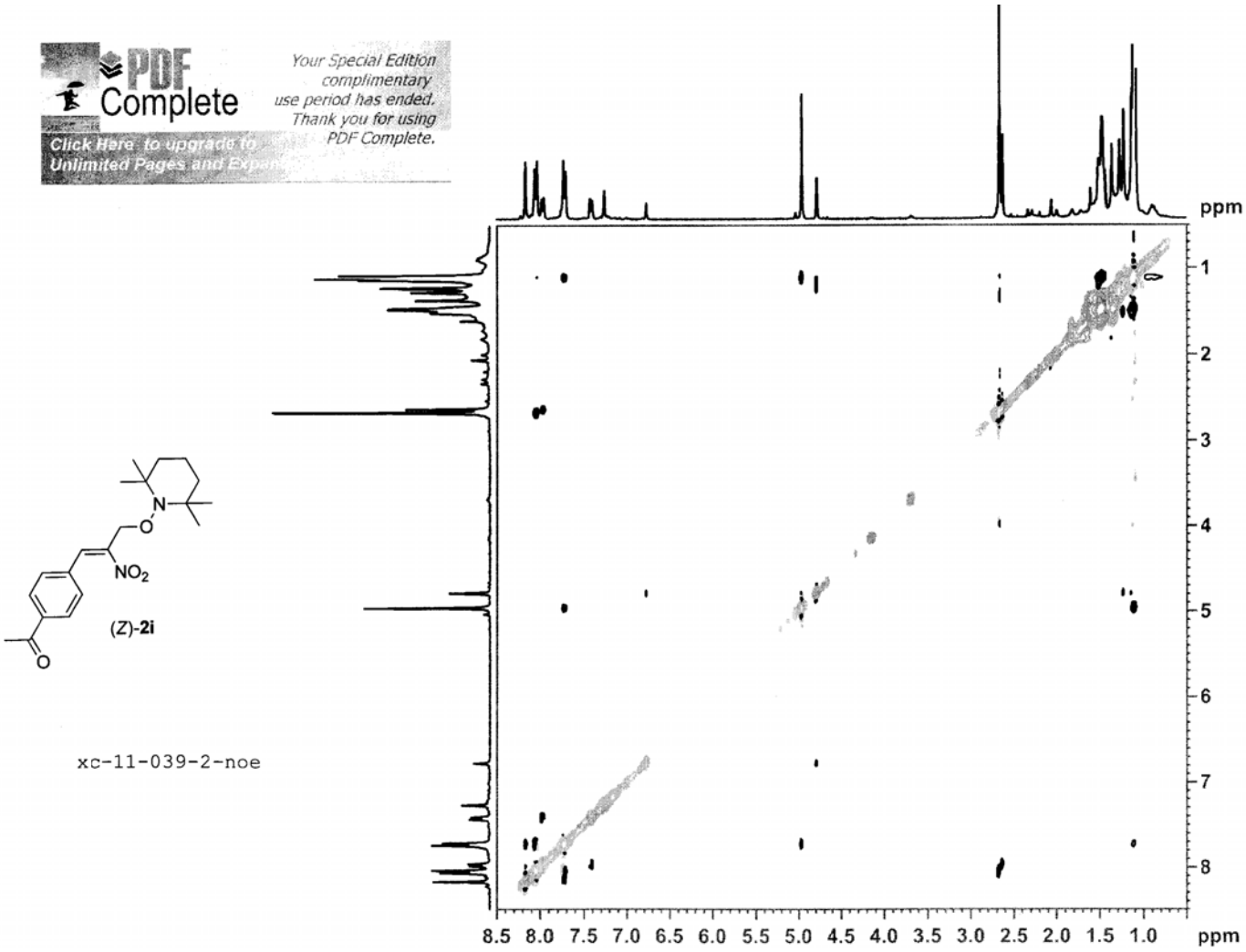

PPM
0
50
100
150
200
250
16.981
20.135
26.736
32.931
39.894
60.172
69.136
76.598
77.022
77.446
128.599
130.118
136.174
136.216
138.046
149.636
197.240
O
N
O
NO2
(E)-2i
xc-11-039-1 C
D:\new nuts\DATA\$pdata
spect, CDCl3,
Mon Nov 25 13:46:58 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 11334
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

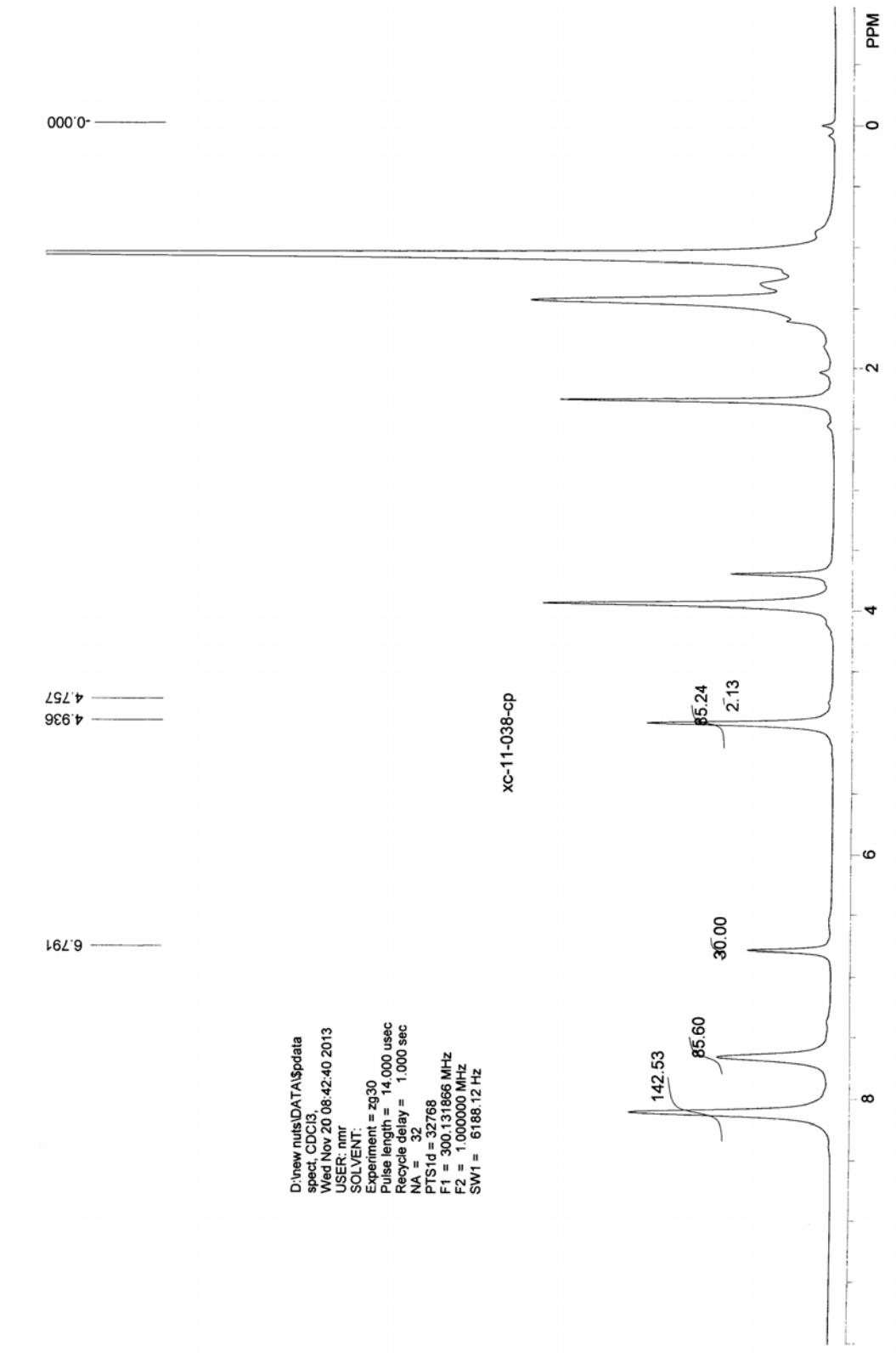


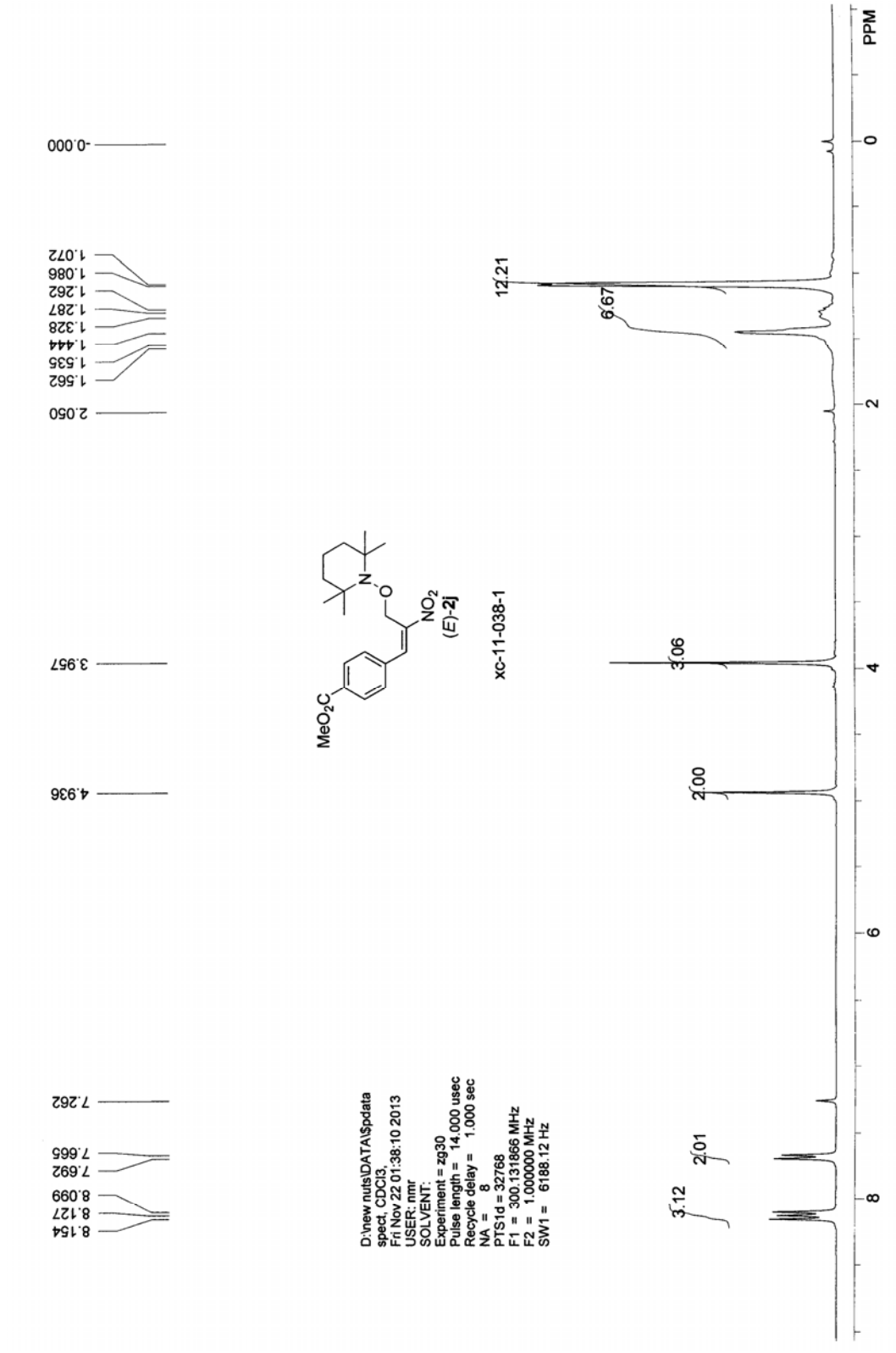

D:\new nuts\DATA\5pdata
spect, CDCl3,
Sun Nov 24 13:34:54 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
kc-11-039-2
(Z)-2l
NO2
O
N
O
0.000
1.255
1.347
2.612
4.768
6.754
7.386
7.412
7.935
7.962
8.147
6.55
6.91
3.74
2.16
2.25
1.00
2.30
2.82
PPM
0
2
4
6
8

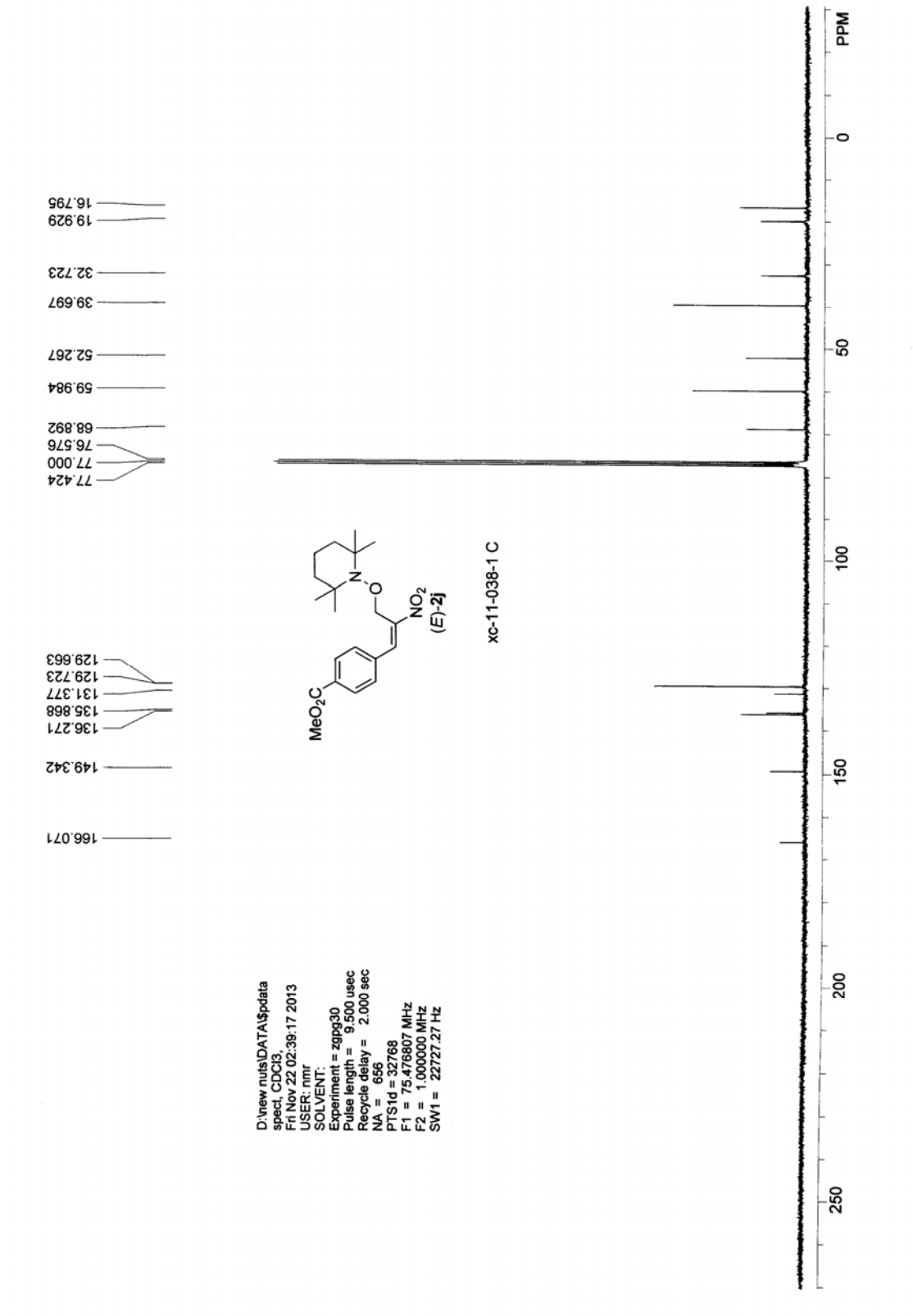

0.000
4.761
6.798
6.728
PPM
0
1
2
3
4
5
6
7
8
3.00
0.04
0.07
0.06
D:\new nuts\DATA\5pdata
spect, CDCl3,
Wed Nov 27 07:53:06 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-039-2-internal
Purity (13%) determined by using
Mesitylene as the internal standard
(Z)-2i
NO2
N
O
O

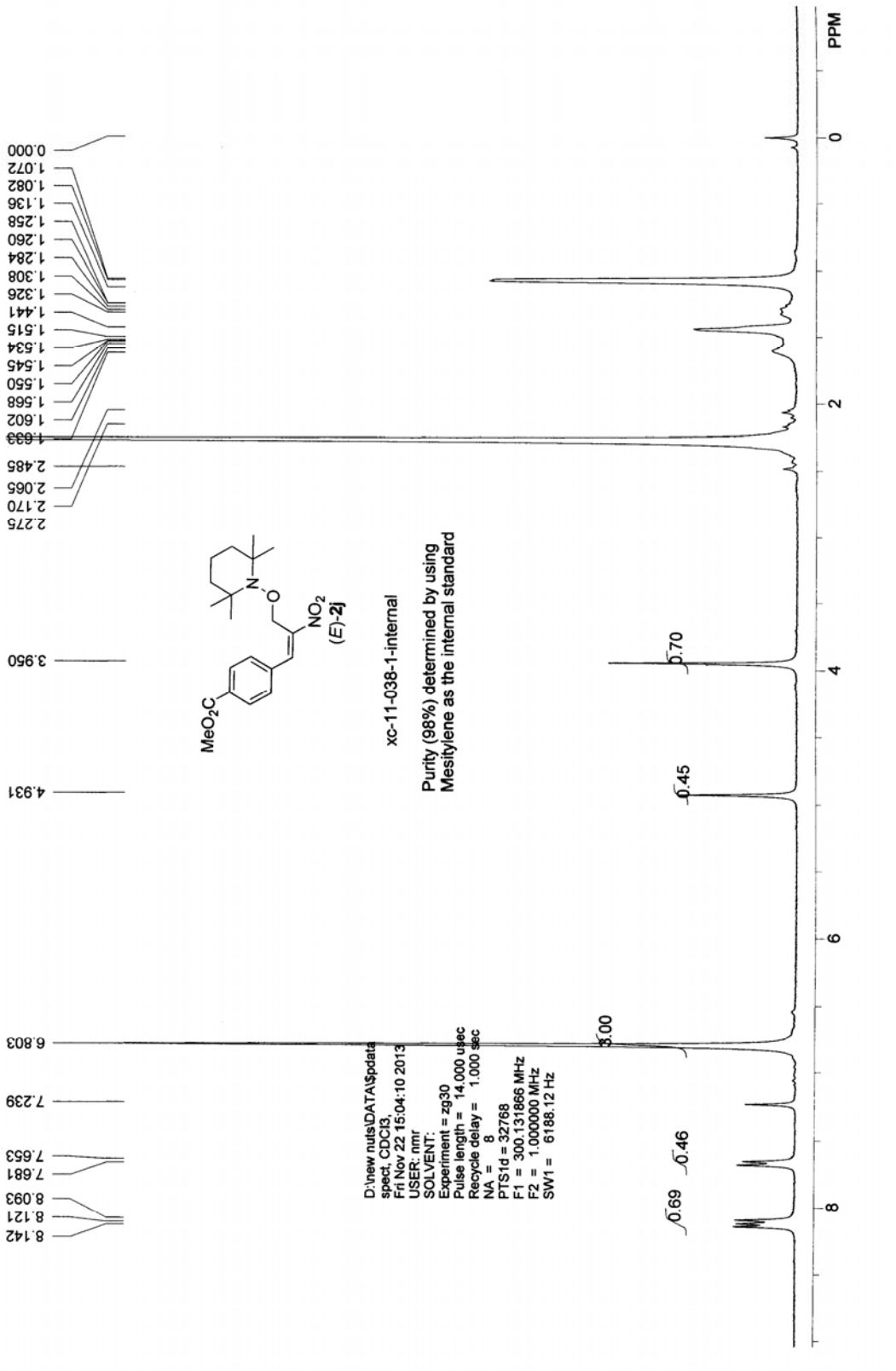

16.571
19.754
26.286
26.367
29.293
32.411
32.516
39.289
39.472
59.753
59.939
68.716
74.561
76.576
77.000
77.424
125.401
128.137
128.208
128.234
129.720
135.577
135.752
135.858
137.614
149.191
196.855
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sun Nov 24 09:29:28 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 456
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(Z)-2i
xc-11-039-2 C
PPM
0
50
100
150
200
250

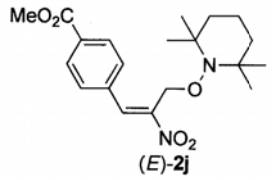



D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed Nov 20 08:42:40 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-038-cp
142.53
85.60
30.00
85.24
2.13
6.791
4.936
4.757
-0.000
PPM
0
2
4
6
8


PPM
0
2
4
6
8
12.21
6.67
3.06
2.00
3.12
2.01
xc-11-038-1
(E)-2j
NO2
MeO2C
D:\new nuts\DATA\Spdata
spect, CDCl3,
Fri Nov 22 01:38:10 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
8.154
8.127
8.099
7.692
7.665
7.262
4.936
3.957
2.050
1.562
1.535
1.444
1.328
1.287
1.262
1.086
1.072
-0.000

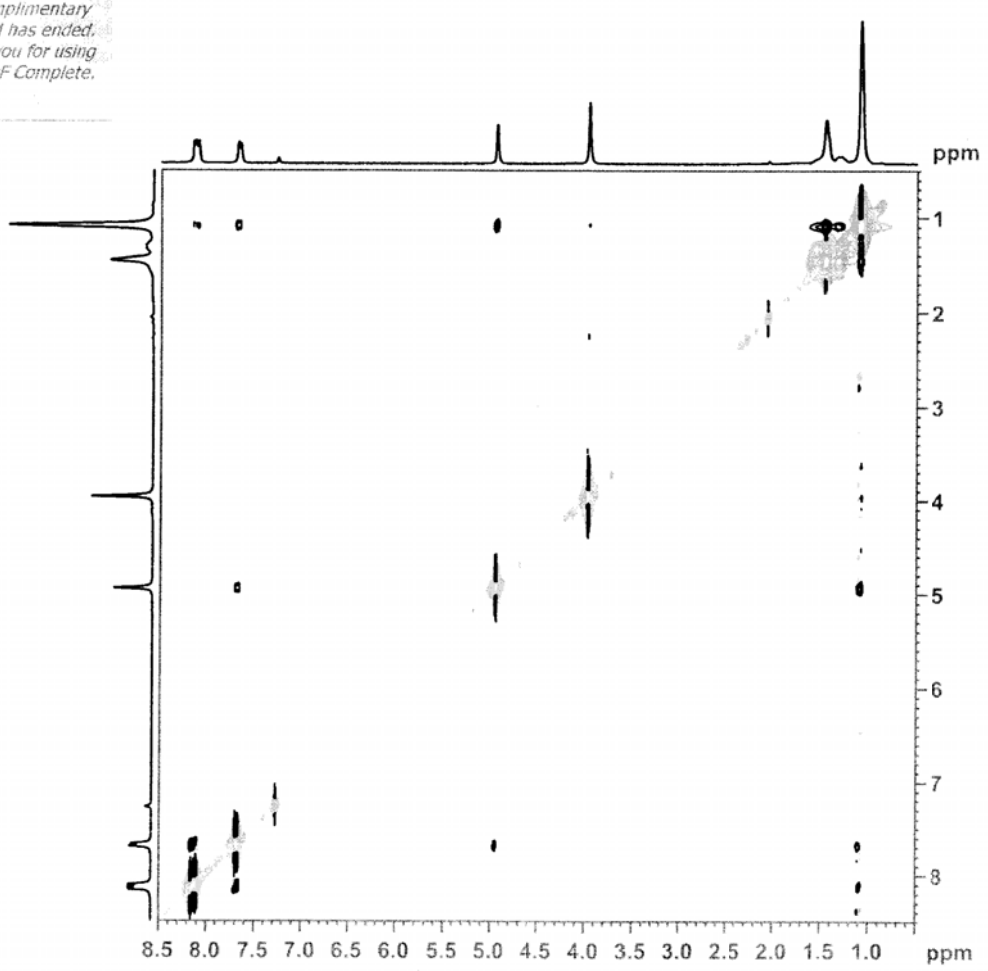

16.795
19.929
32.723
39.697
52.267
59.984
68.892
76.576
77.000
77.424
129.663
129.723
131.377
135.868
136.271
149.342
166.071
MeO2C
NO2
(E)-2j
xc-11-038-1 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Fri Nov 22 02:39:17 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 656
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
0
50
100
150
200
250

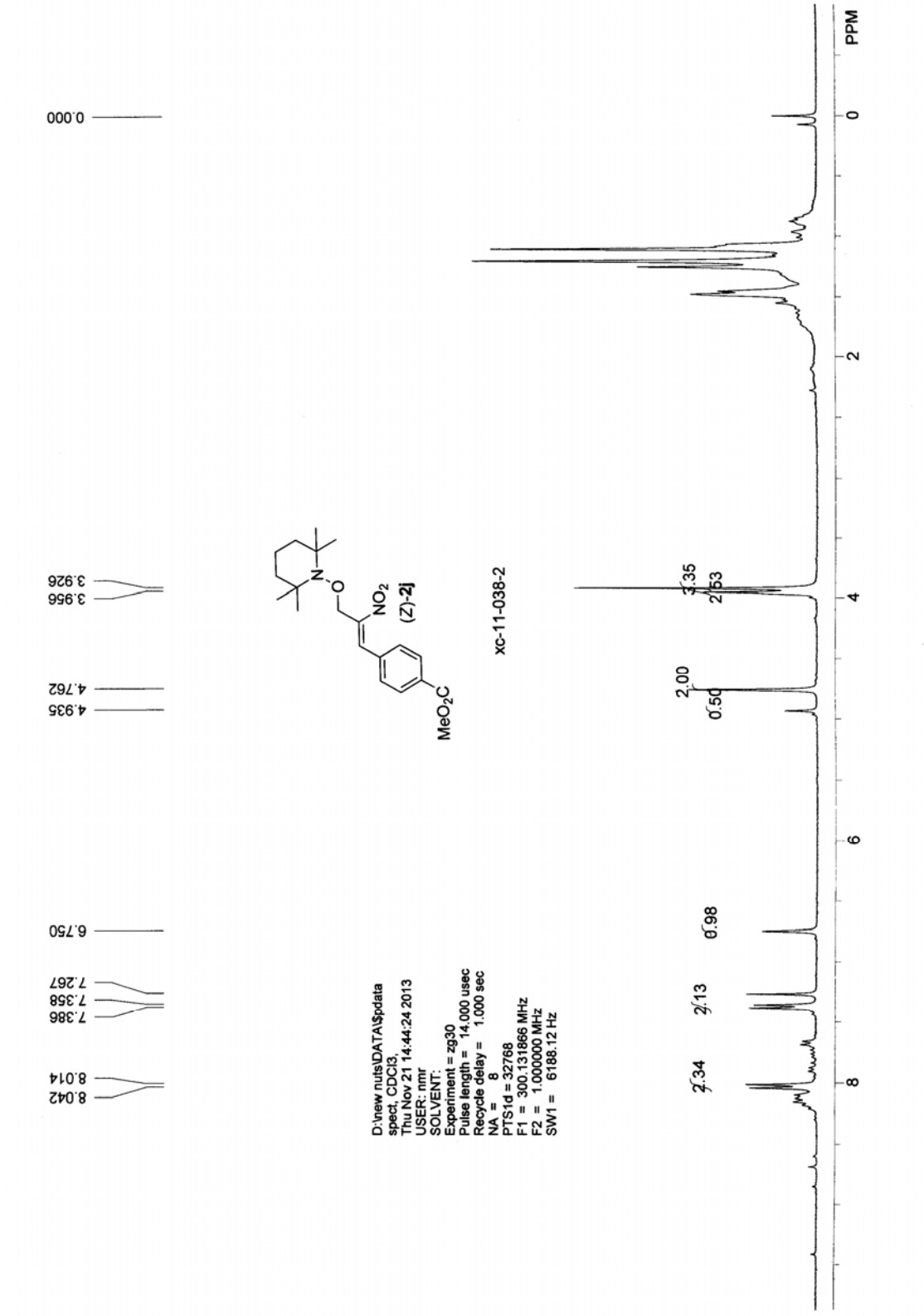

8.142
8.121
8.093
7.681
7.653
7.239
6.803
4.931
3.950
2.275
2.170
2.065
2.485
1.633
1.602
1.568
1.550
1.545
1.534
1.515
1.441
1.326
1.308
1.284
1.260
1.258
1.136
1.082
1.072
0.000
PPM
0
2
4
6
8
3.00
0.70
0.45
0.69
0.46
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Nov 22 15:04:10 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-038-1-internal
Purity (98%) determined by using
Mesitylene as the internal standard
MeO2C
NO2
(E)-2j

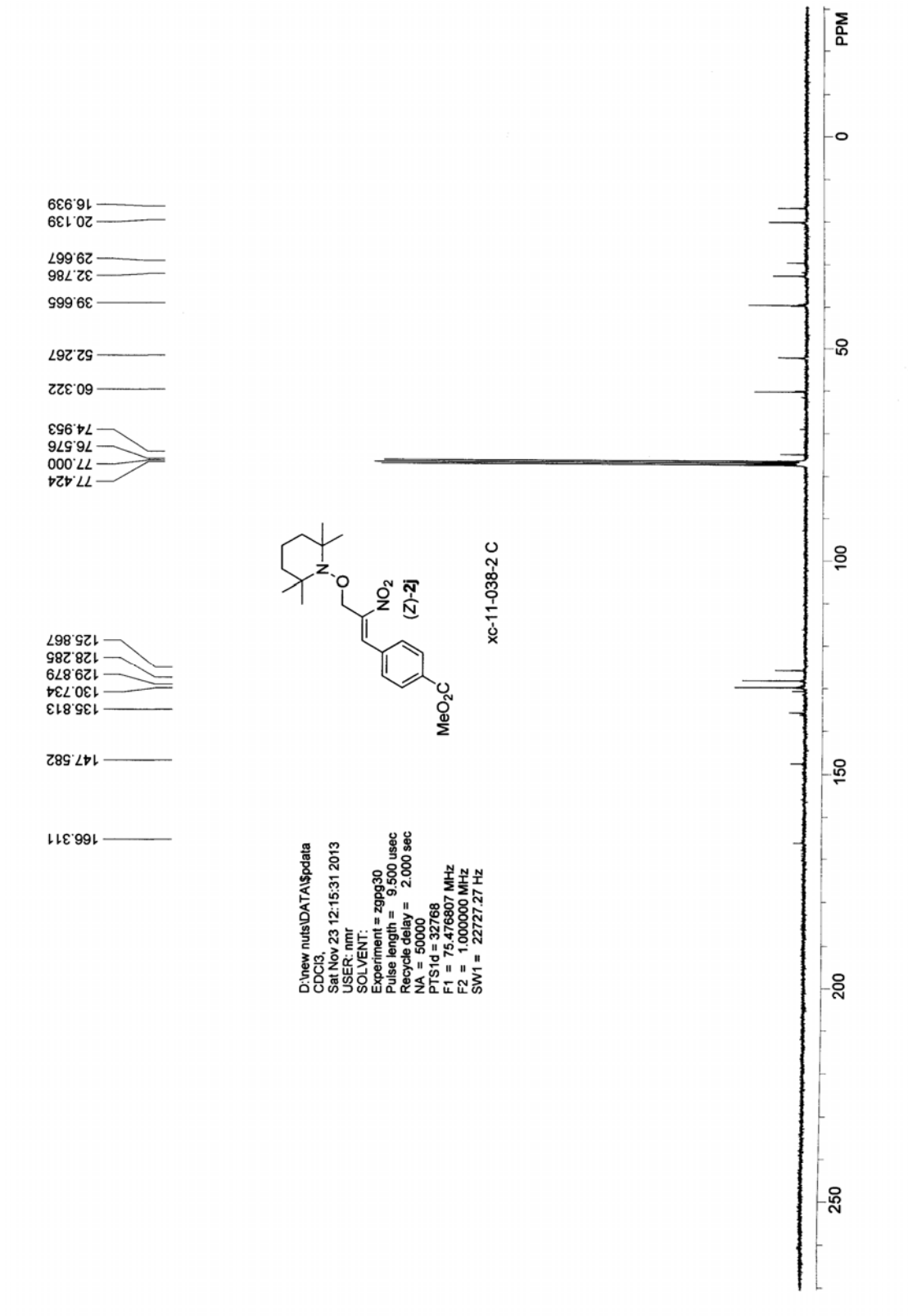


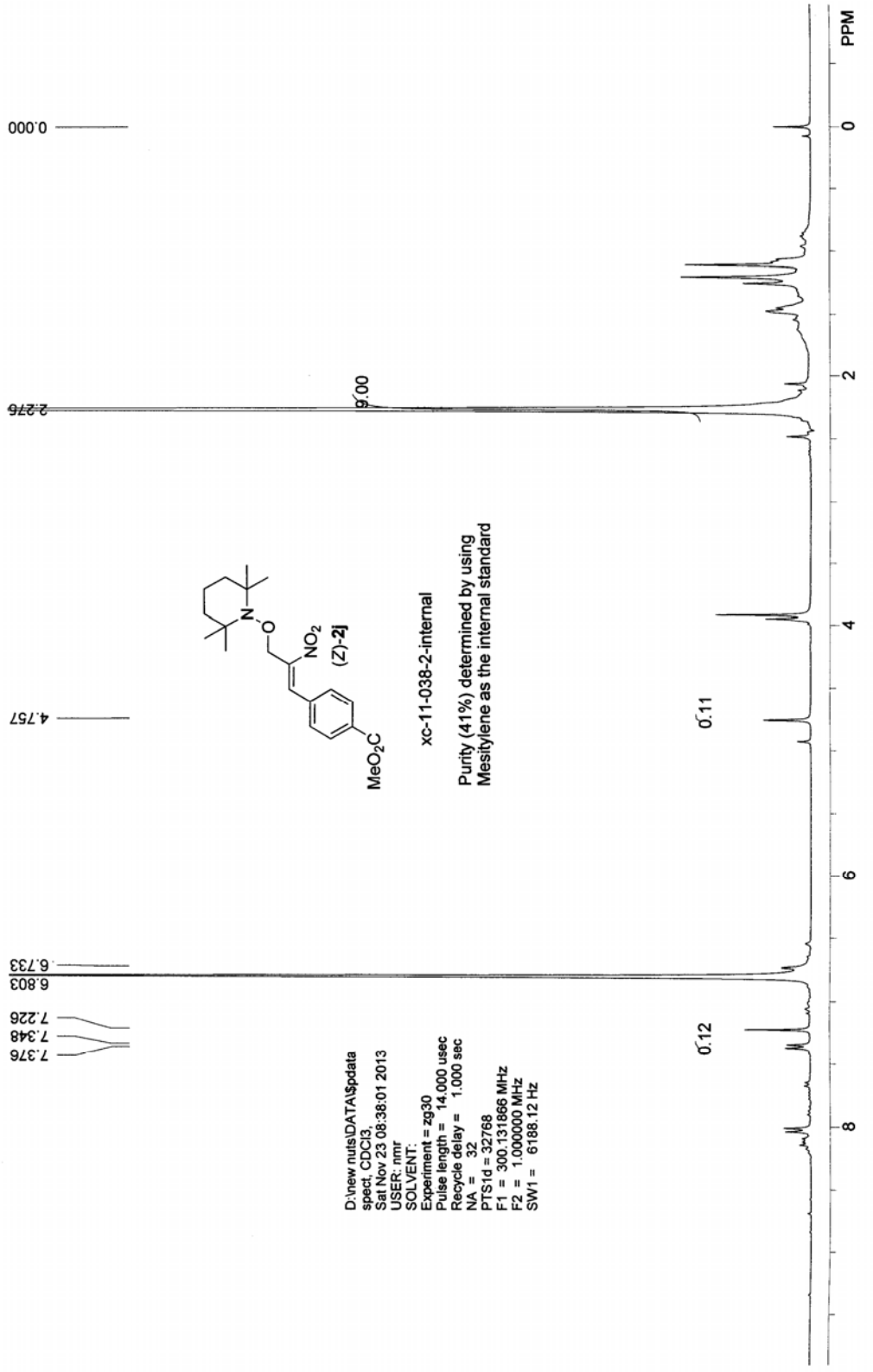
(*E*)-**2j**

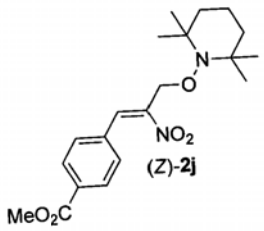
xc-11-038-1-noe



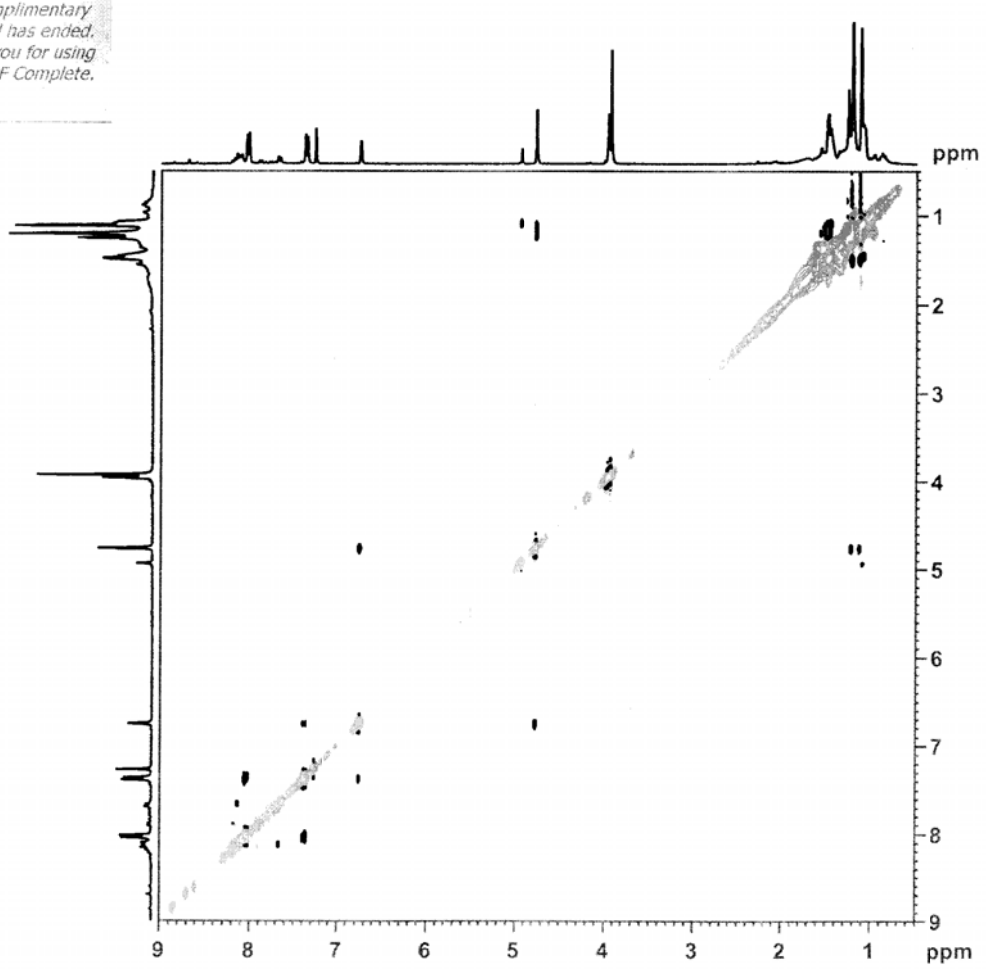

0.000
3.926
3.956
4.762
4.935
6.750
7.267
7.358
7.386
8.014
8.042
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Nov 21 14:44:24 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-038-2
(Z)-2j
2.34
2.13
0.98
2.00
0.50
3.35
2.53
PPM

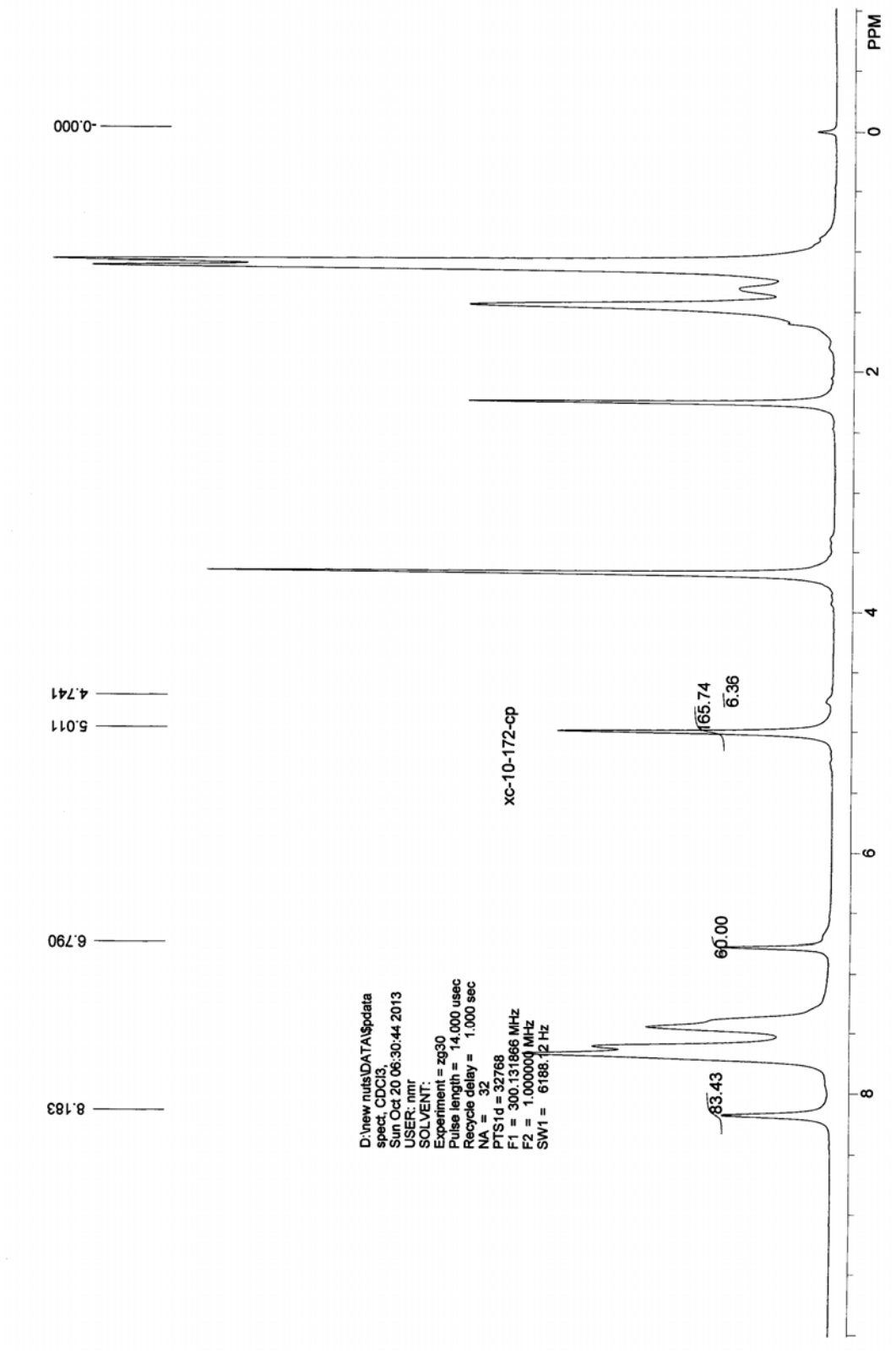

16.939
20.139
29.667
32.786
39.665
52.267
60.322
74.953
76.576
77.000
77.424
125.867
128.285
129.879
130.734
135.813
147.582
166.311
D:\new nuts\DATA\5\pdata
CDCl3,
Sat Nov 23 12:15:31 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 50000
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
NO2
(Z)-2j
MeO2C
xc-11-038-2 C
PPM
0
50
100
150
200
250

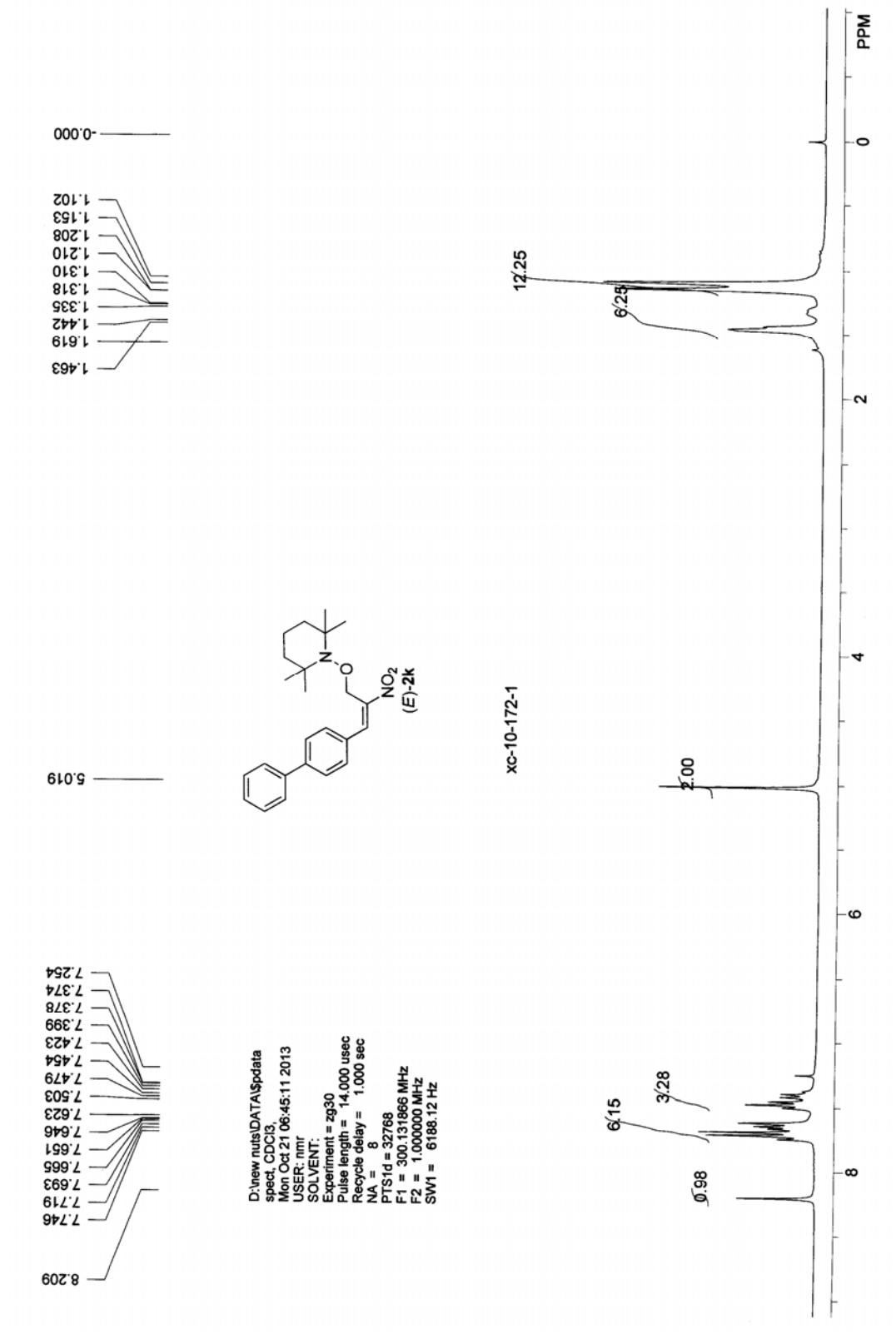

0.000
2.276
9.00
4.757
0.11
6.803
6.733
0.12
7.376
7.348
7.226
PPM
0
2
4
6
8
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Nov 23 08:38:01 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-038-2-internal
Purity (41%) determined by using
Mesitylene as the internal standard
(Z)-2
NO2
MeO2C
N
O

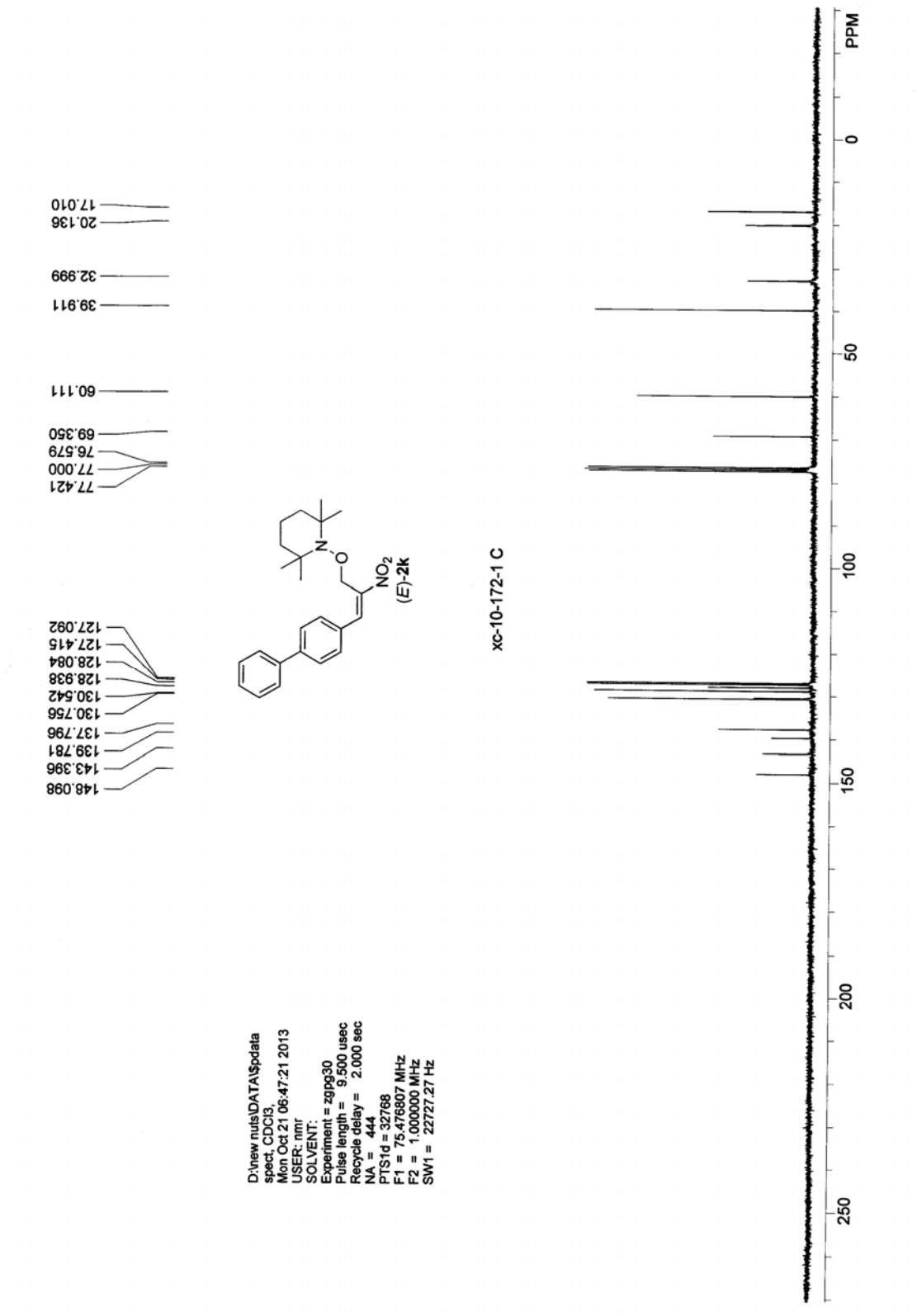


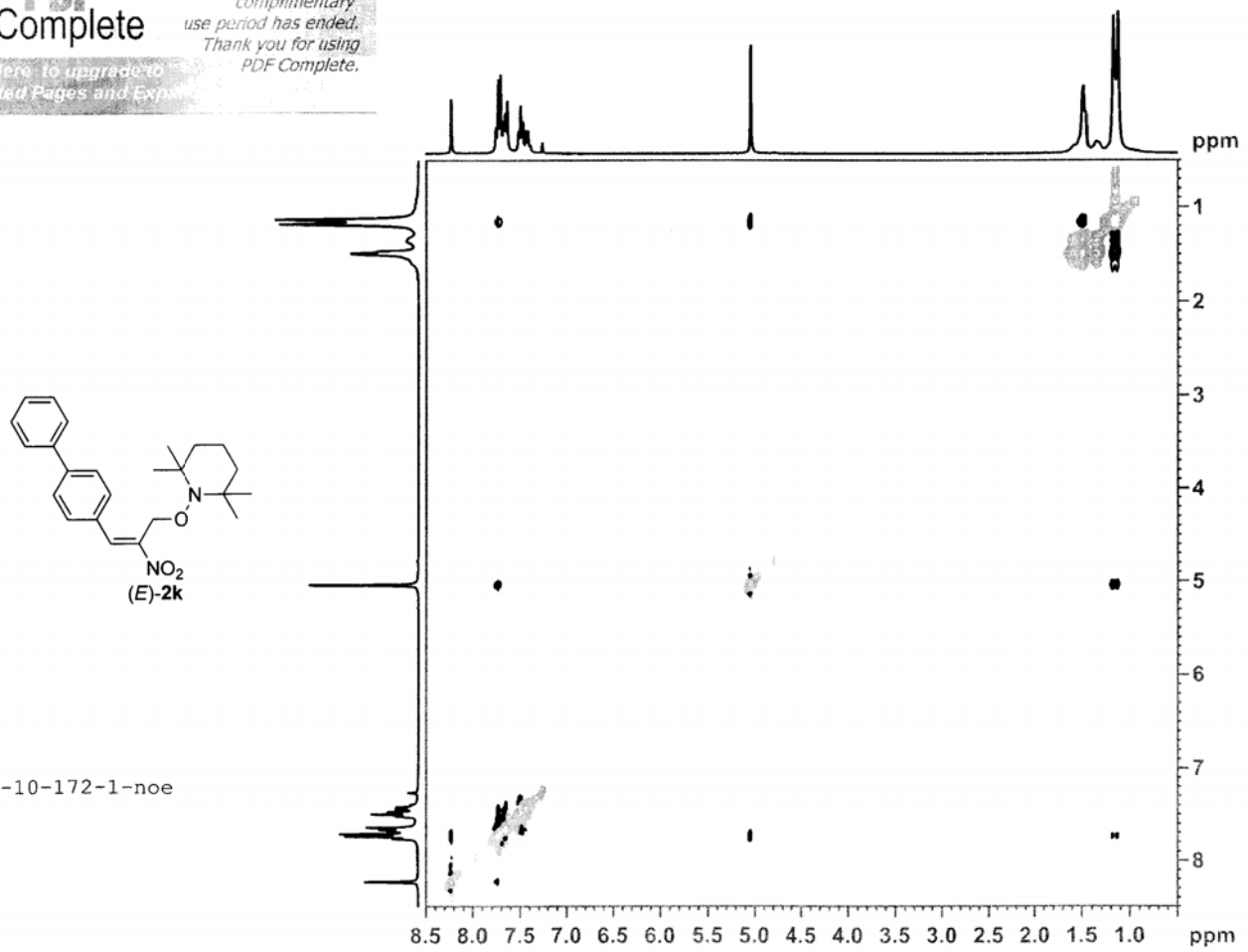
xc-11-038-2-noe

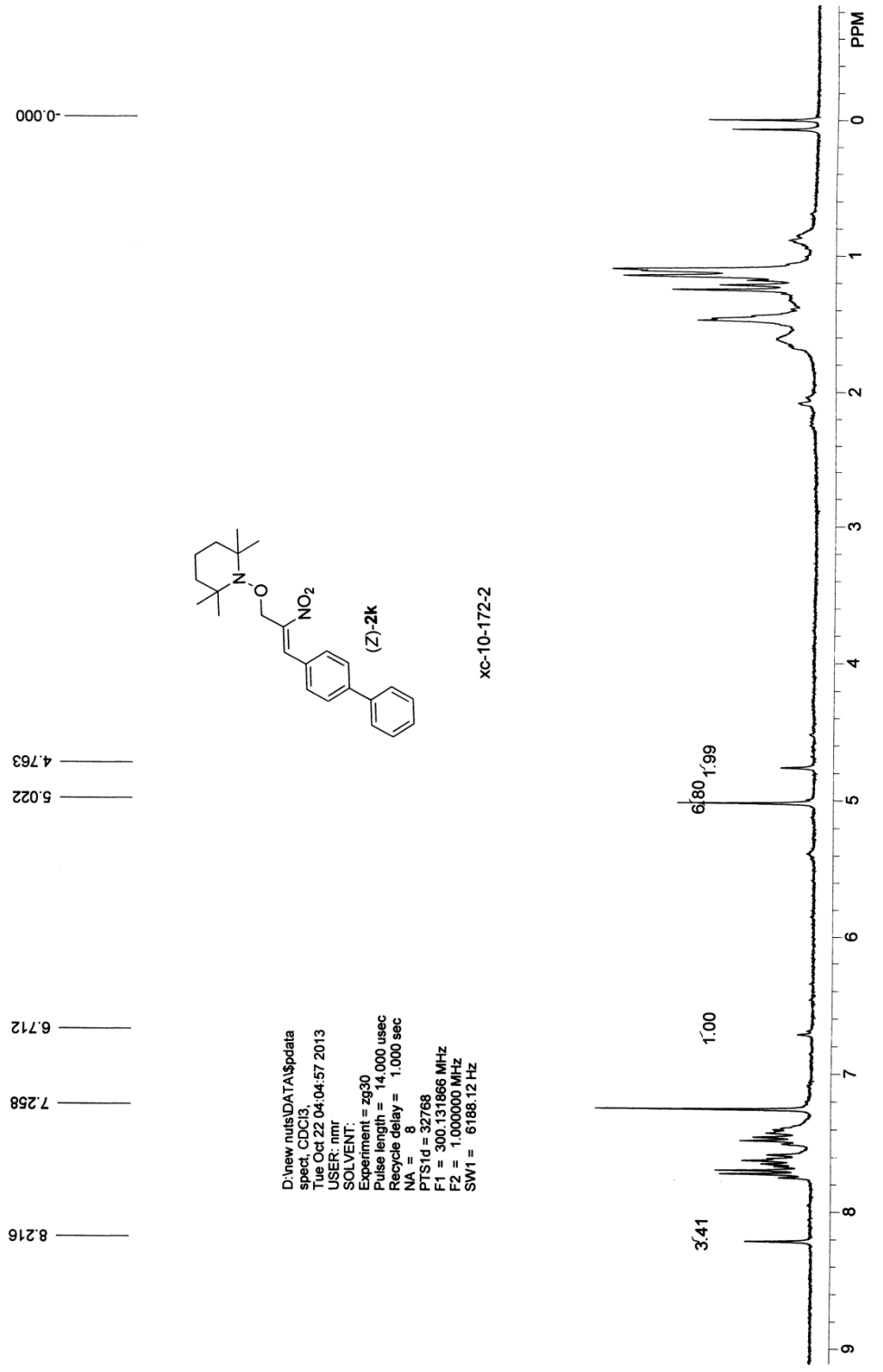


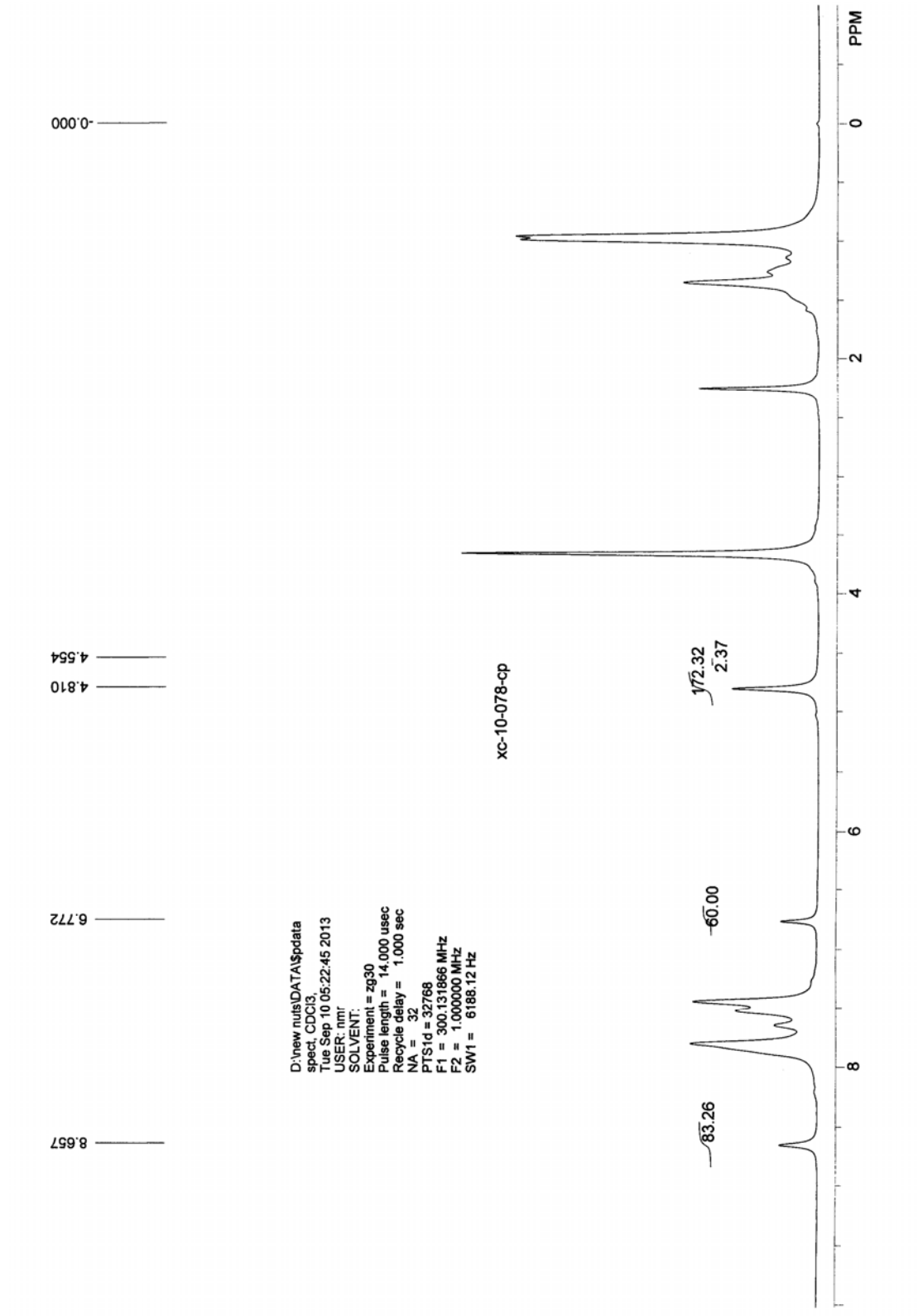

-0.000
8.183
6.790
5.011
4.741
xc-10-172-cp
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sun Oct 20 06:30:44 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
3.43
6.00
6.36
5.74
8
6
4
2
0
PPM

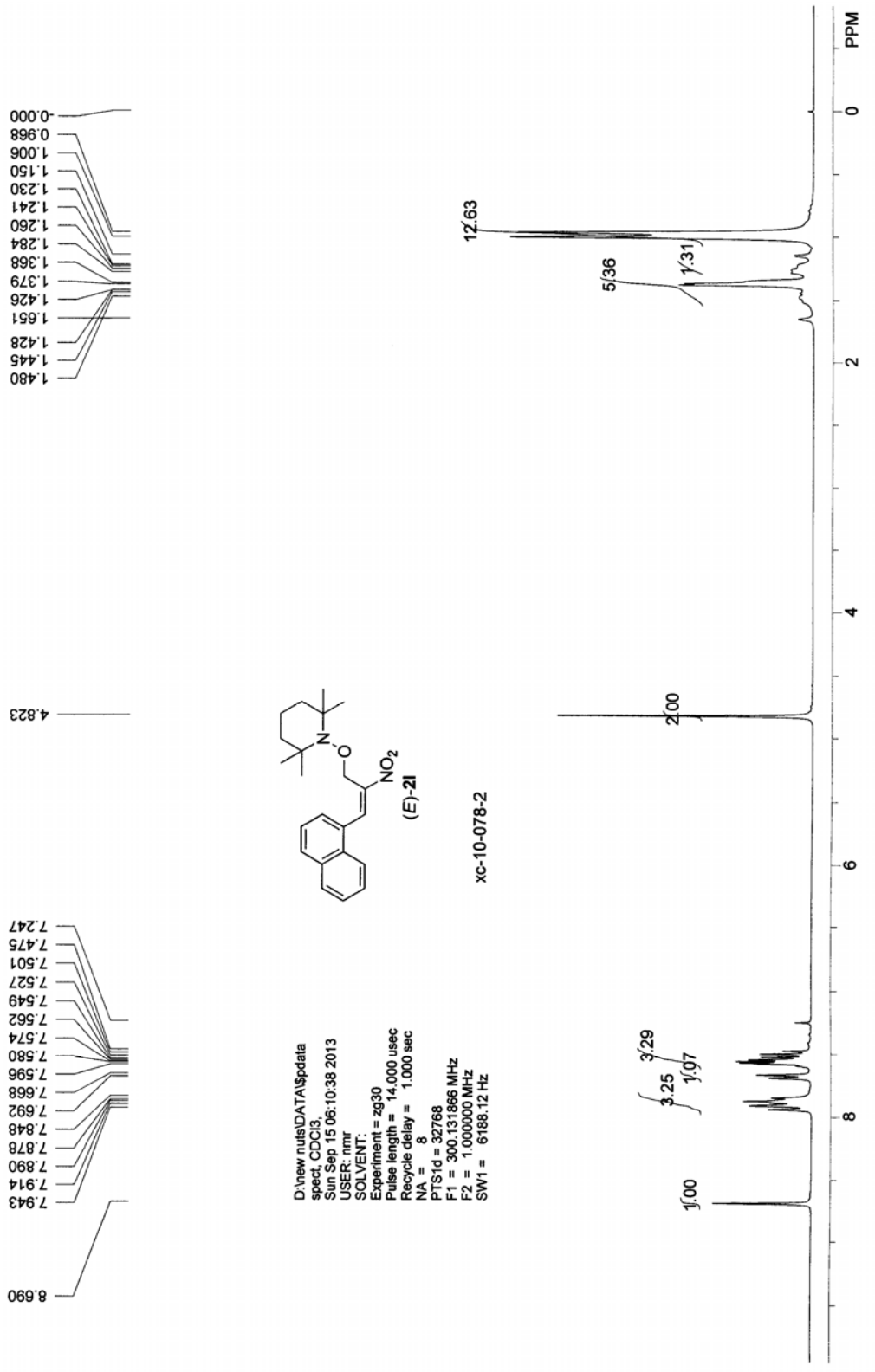

PPM
0
2
4
6
8
12.25
6.25
2.00
6.15
3.28
0.98
xc-10-172-1
(E)-2k
D:\new nuts\DATA\5pdata
spect, CDCl3,
Mon Oct 21 06:45:11 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
-0.000
1.102
1.153
1.208
1.210
1.310
1.318
1.335
1.442
1.619
1.463
5.019
7.254
7.374
7.378
7.399
7.423
7.454
7.479
7.503
7.623
7.646
7.661
7.665
7.693
7.719
7.746
8.209

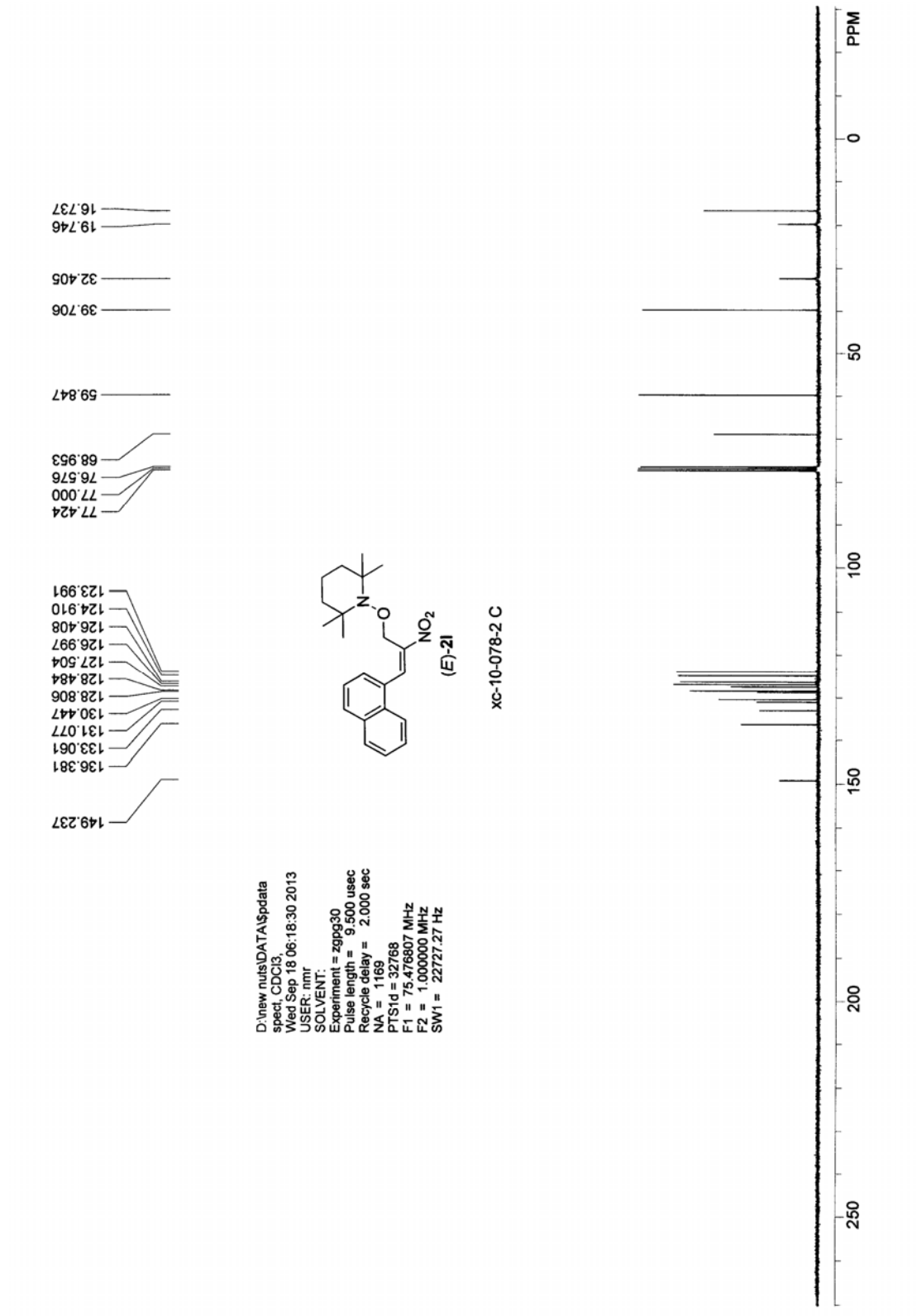

148.098
143.396
139.781
137.796
130.756
130.542
128.938
128.084
127.415
127.092
77.421
77.000
76.579
69.350
60.111
39.911
32.999
20.136
17.010
D:\new nuts\DATA\5pdata
spect, CDCl3,
Mon Oct 21 06:47:21 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 444
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(E)-2k
xc-10-172-1 C
PPM
250
200
150
100
50
0

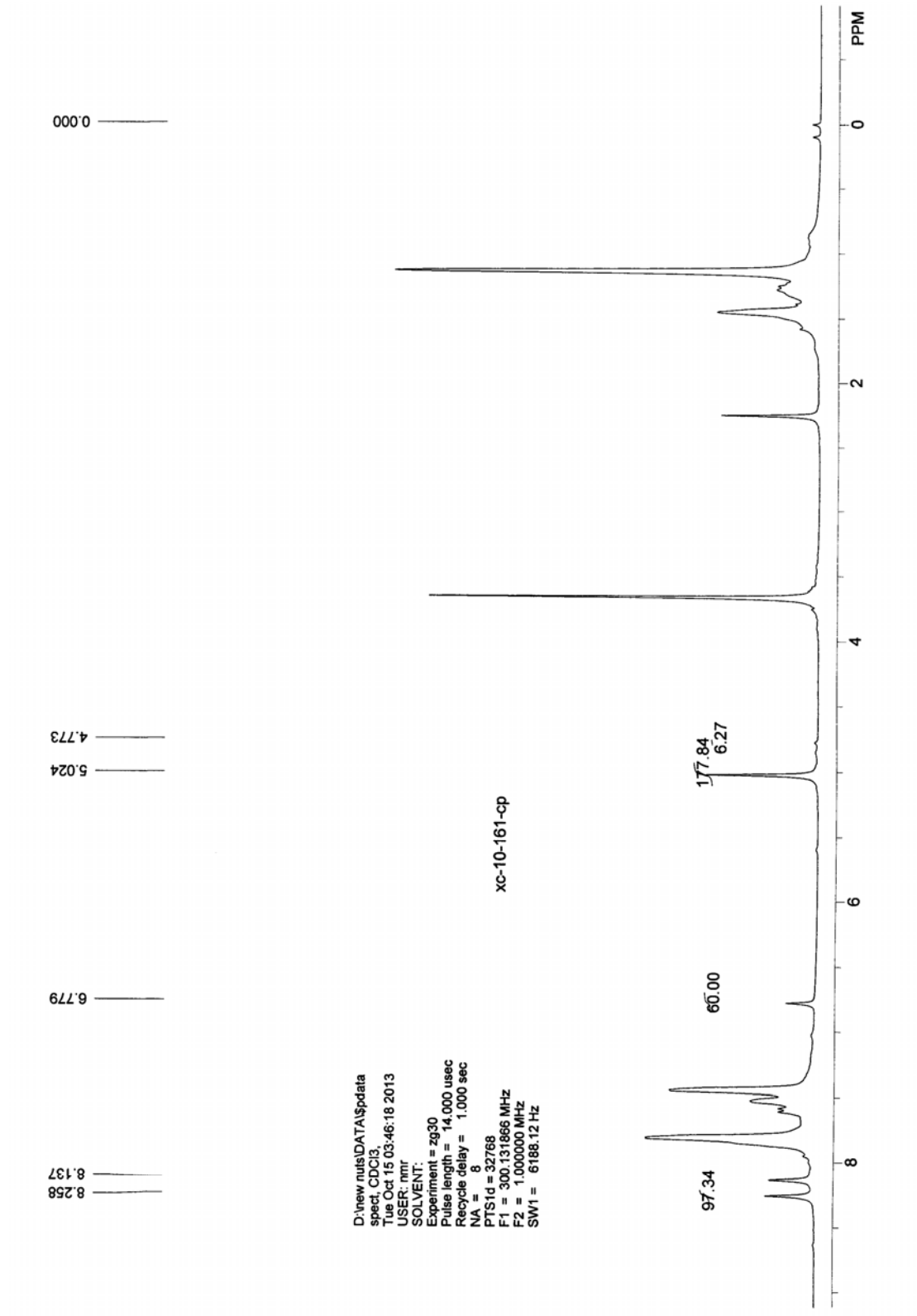


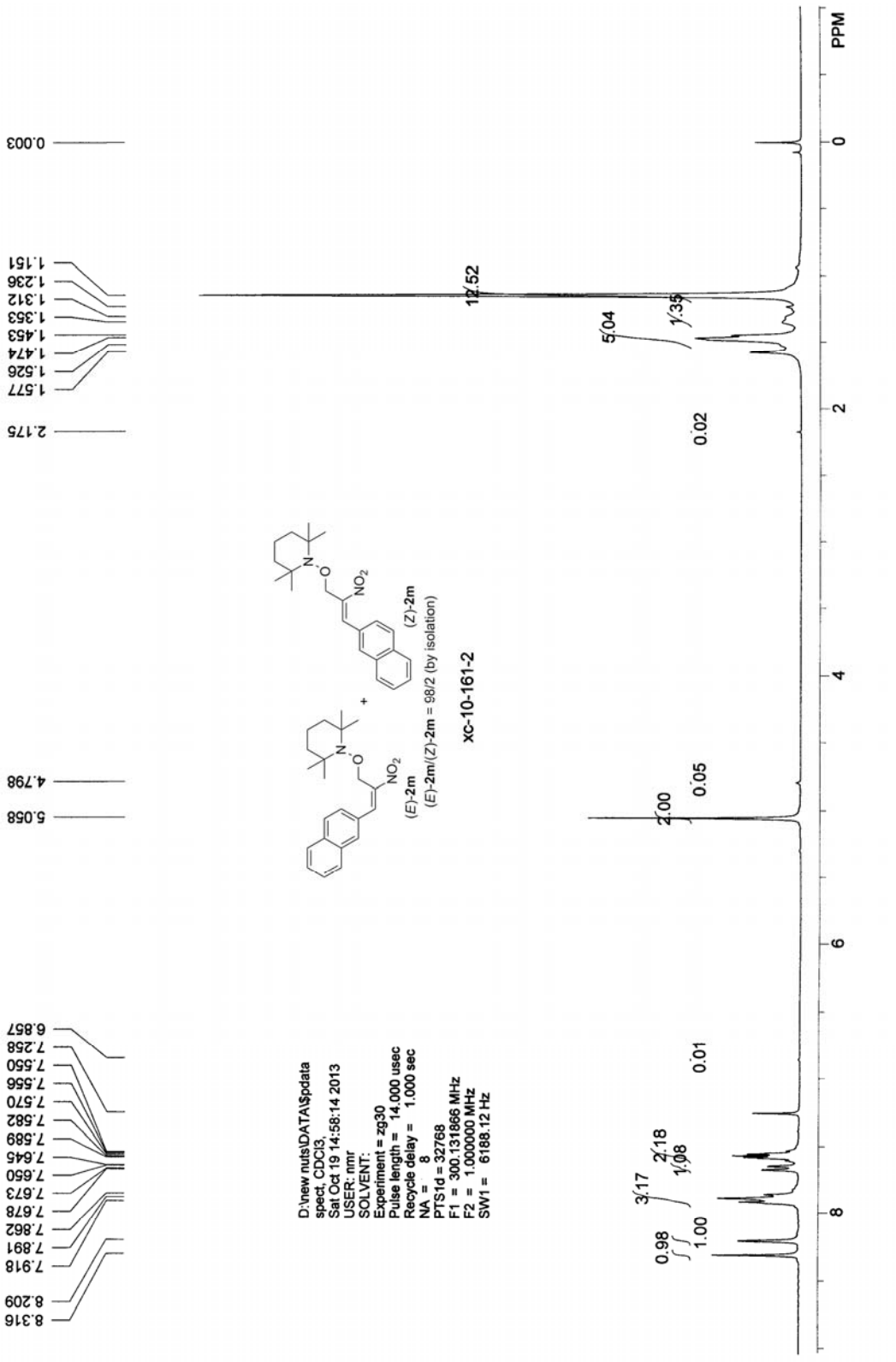

8.216
7.258
6.712
5.022
4.763
-0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Oct 22 04:04:57 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(Z)-2k
xc-10-172-2
3.41
1.00
6.80
1.99
PPM

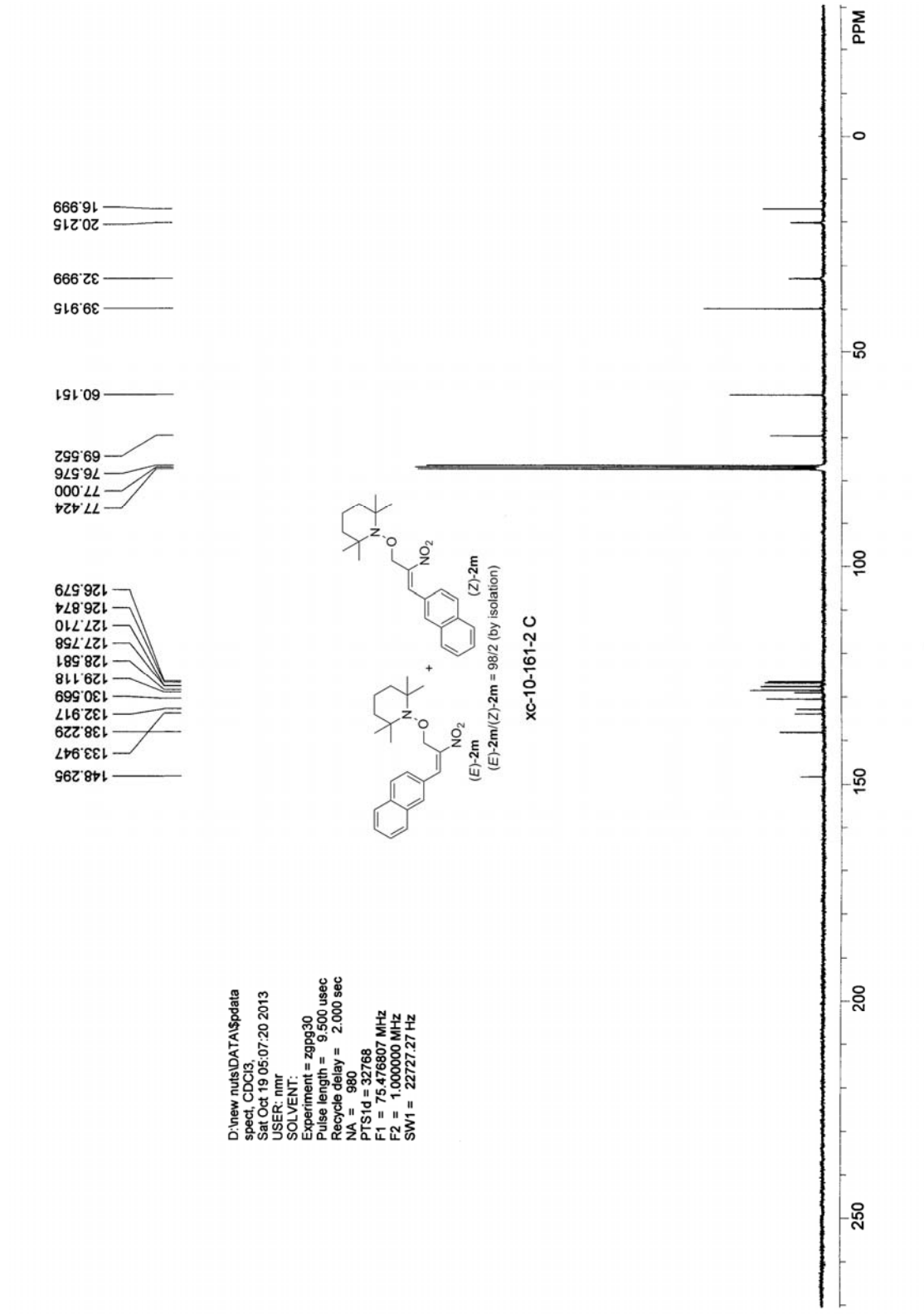

D:\new nuts\DATA\5pdata
spect, CDCl3,
Tue Sep 10 05:22:45 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-078-cp
8.657
6.772
4.810
4.554
-0.000
3.26
0.00
2.32
2.37
PPM
8
6
4
2
0

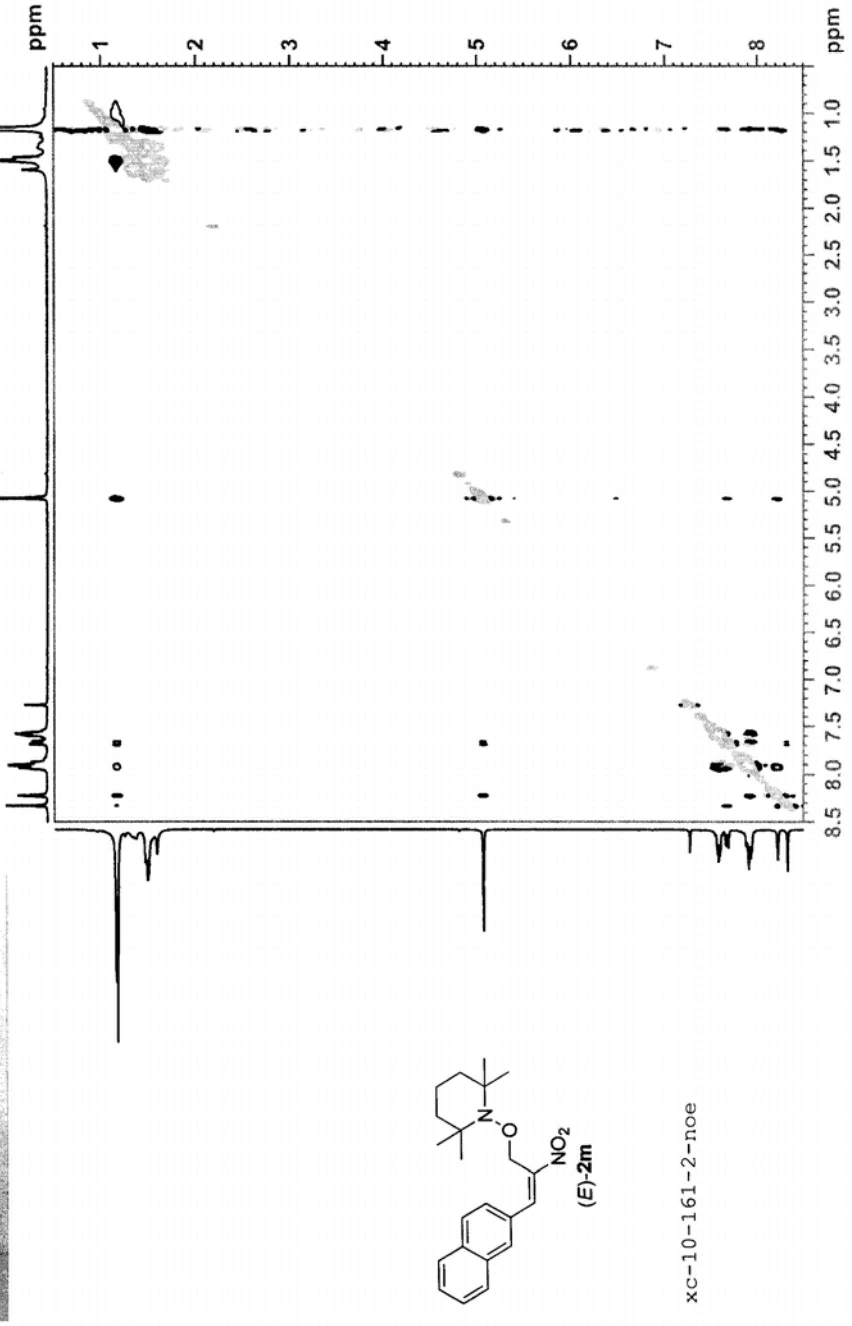

-0.000
0.968
1.006
1.150
1.230
1.241
1.260
1.284
1.368
1.379
1.426
1.651
1.428
1.445
1.480
4.823
7.247
7.475
7.501
7.527
7.549
7.562
7.574
7.580
7.596
7.668
7.692
7.848
7.878
7.890
7.914
7.943
8.690
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sun Sep 15 06:10:38 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2l
xc-10-078-2
1.00
3.25
3.29
1.07
2.00
5.36
1.31
12.63
PPM
8
6
4
2
0


16.737
19.746
32.405
39.706
59.847
68.953
76.576
77.000
77.424
123.991
124.910
126.408
126.997
127.504
128.484
128.806
130.447
131.077
133.061
136.381
149.237
D:\new nuts\DATA\$pdata
spect_CDCl3,
Wed Sep 18 06:18:30 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 1169
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(E)-2l
xc-10-078-2 C
PPM
0
50
100
150
200
250


0.000
4.773
5.024
6.779
8.137
8.258
D:\new nuts\DATA\5pdata
sped, CDCl3,
Tue Oct 15 03:46:18 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-10-161-cp
97.34
60.00
17.84
6.27
8
6
4
2
0
PPM

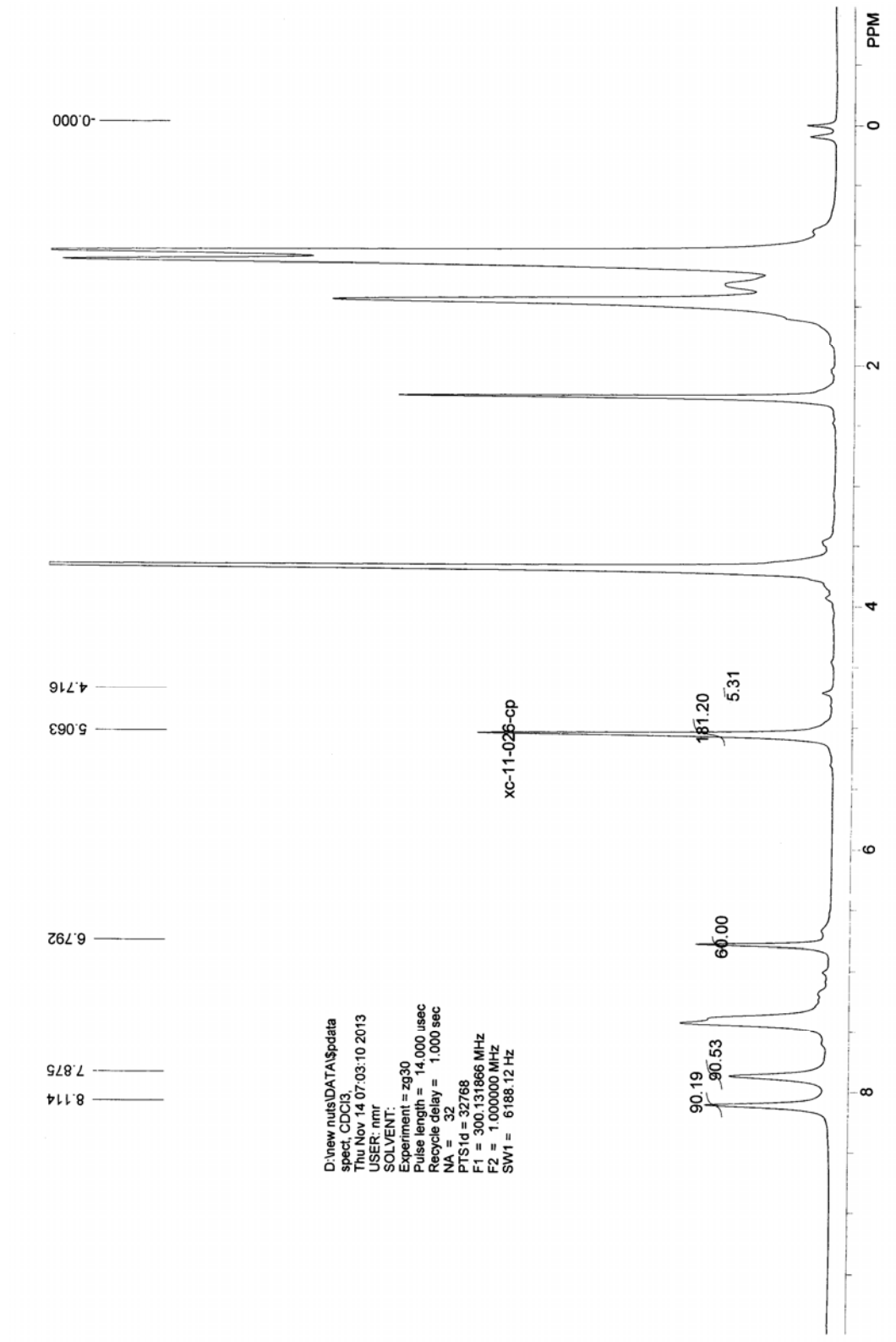

0.003
1.151
1.236
1.312
1.353
1.453
1.474
1.526
1.577
2.175
4.798
5.058
6.857
7.258
7.550
7.556
7.570
7.582
7.589
7.645
7.650
7.673
7.678
7.862
7.891
7.918
8.209
8.316
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Oct 19 14:56:14 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2m
(E)-2m/(Z)-2m = 98/2 (by isolation)
(Z)-2m
xc-10-161-2
0.98
1.00
3.17
2.18
1.08
0.01
2.00
0.05
5.04
12.52
1.35
0.02
PPM

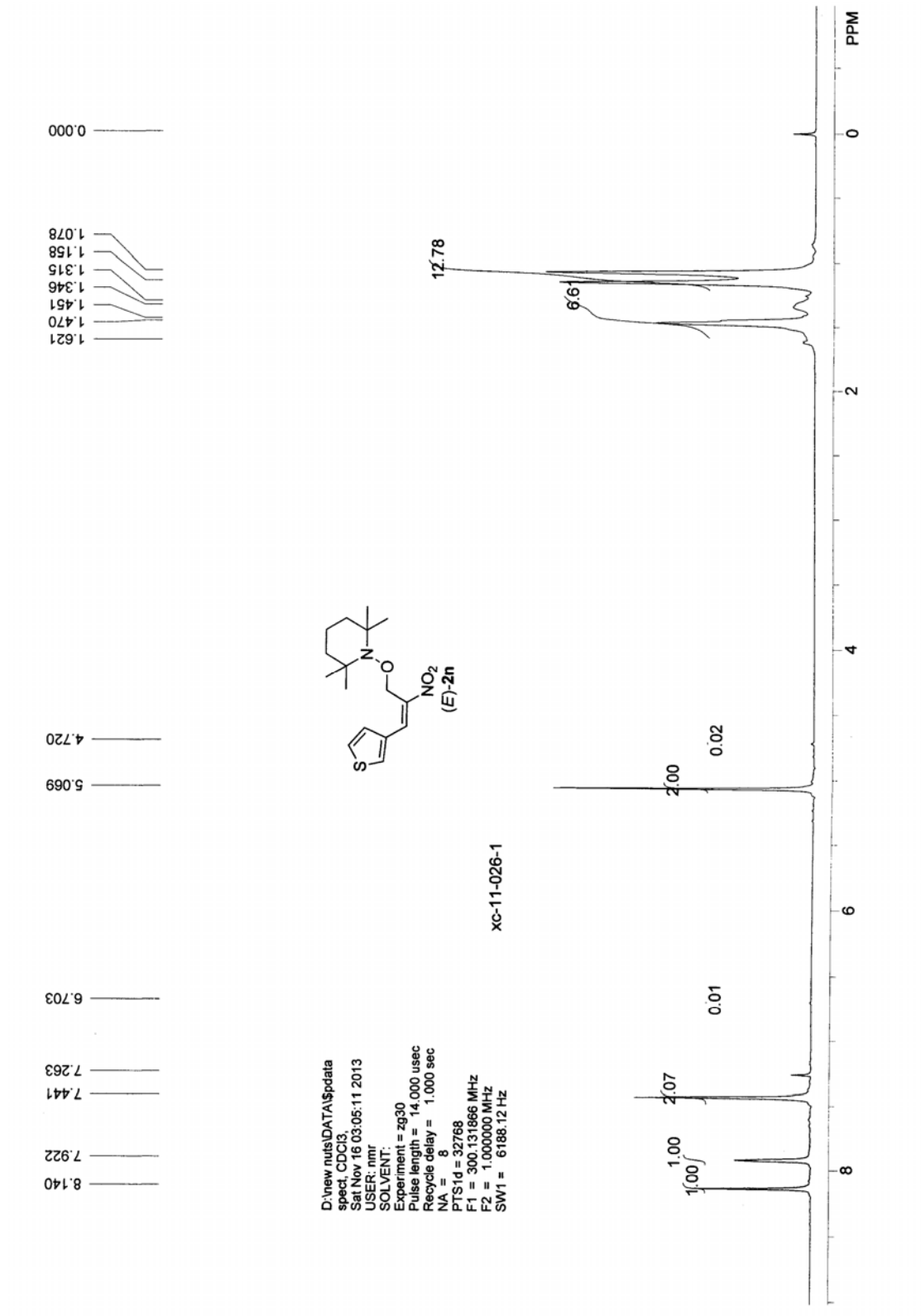

16.999
20.215
32.999
39.915
60.151
69.552
76.576
77.000
77.424
126.579
126.874
127.710
127.758
128.581
129.118
130.569
132.917
138.229
133.947
148.295
PPM
0
50
100
150
200
250
(Z)-2m
(E)-2m
(E)-2m/(Z)-2m = 98/2 (by isolation)
xc-10-161-2 C
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Oct 19 05:07:20 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 980
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

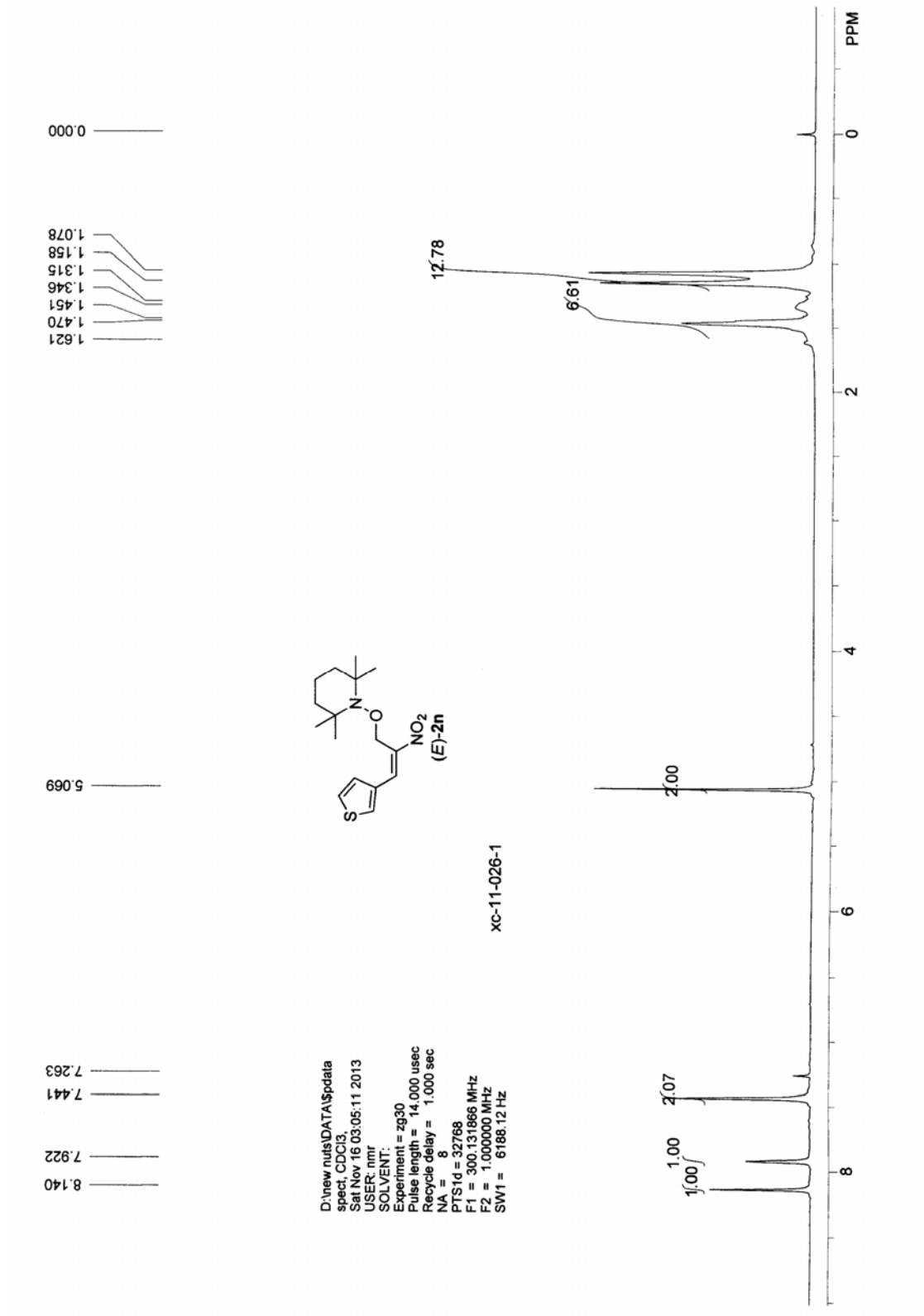


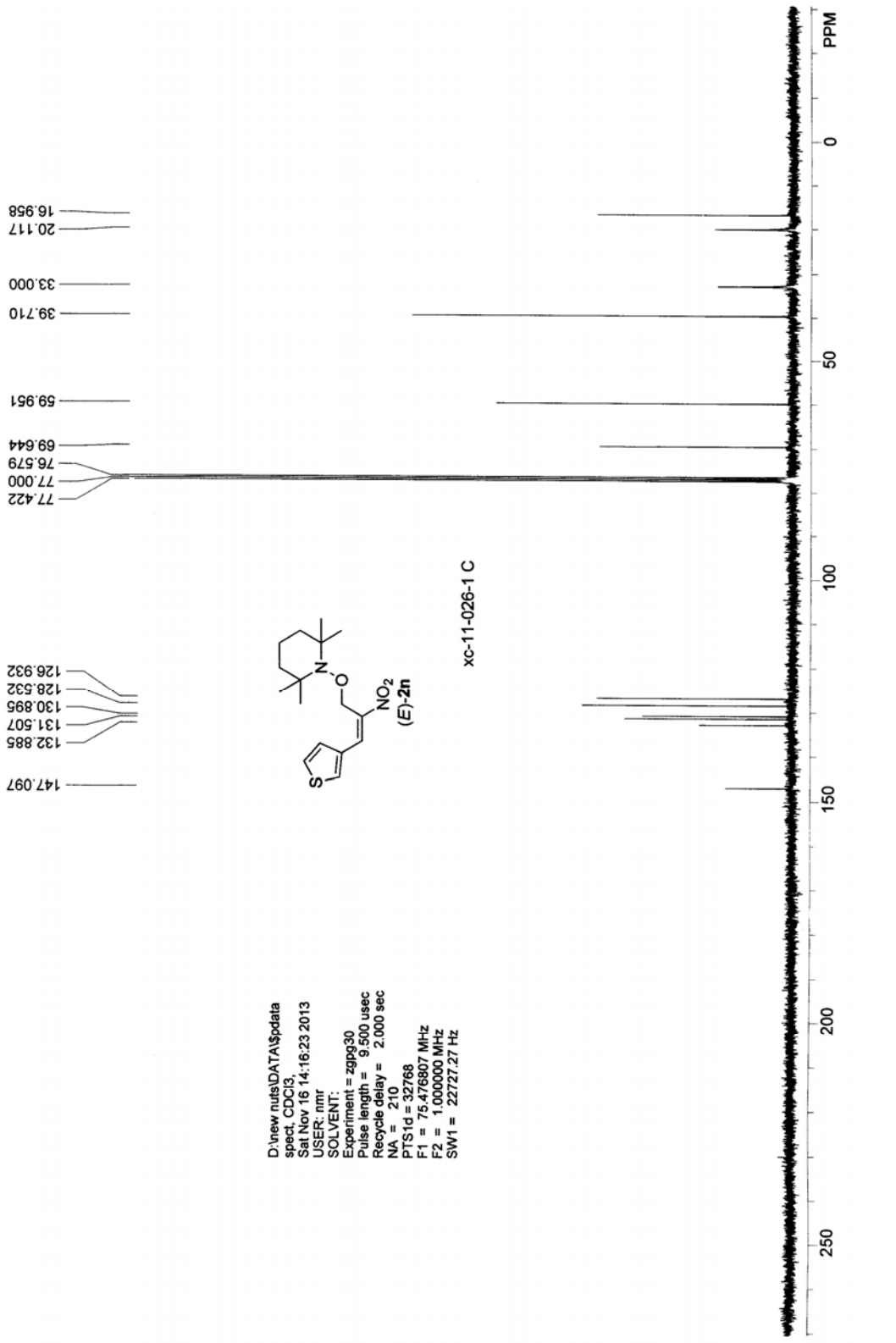
(*E*)-2m

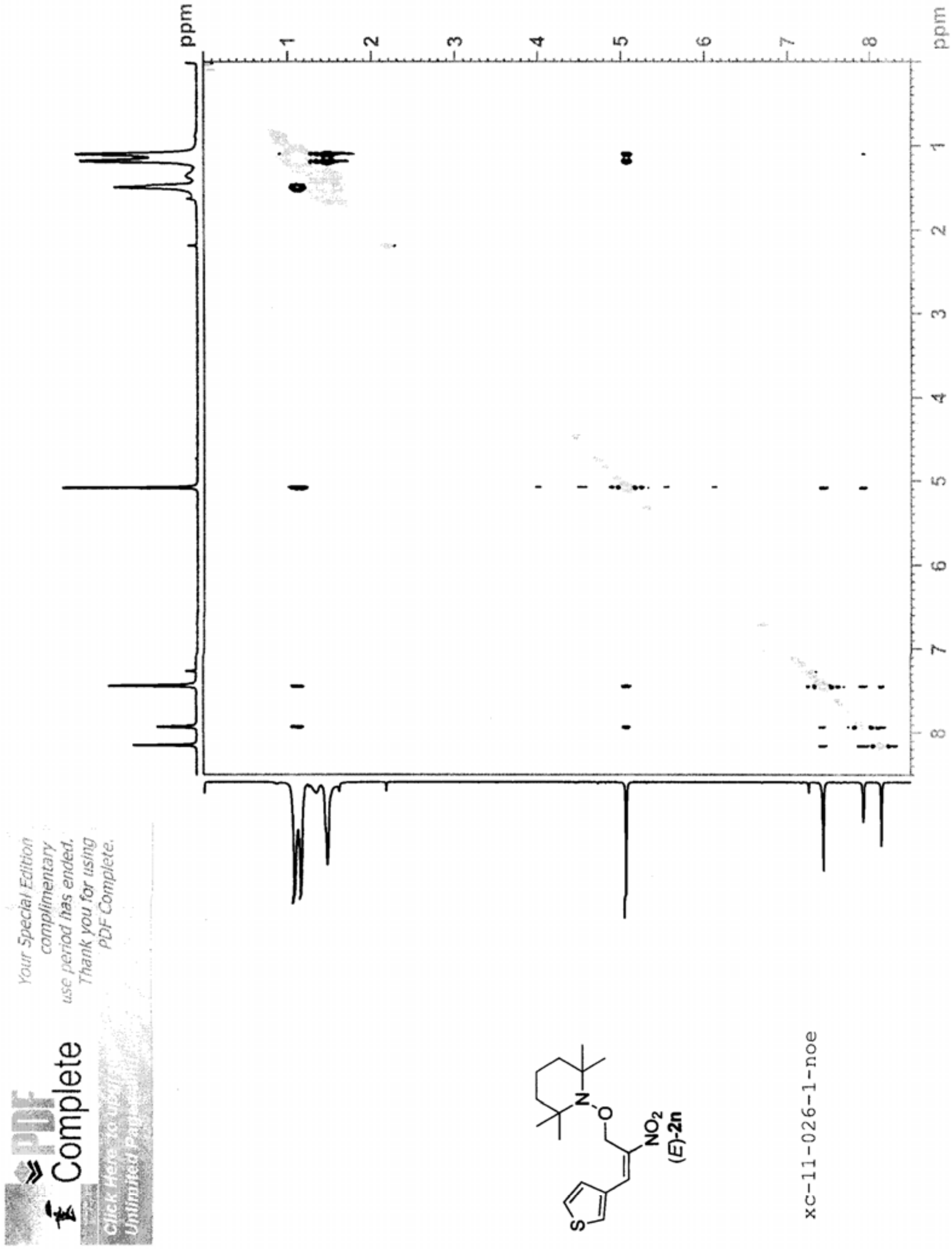
xc-10-161-2-noe

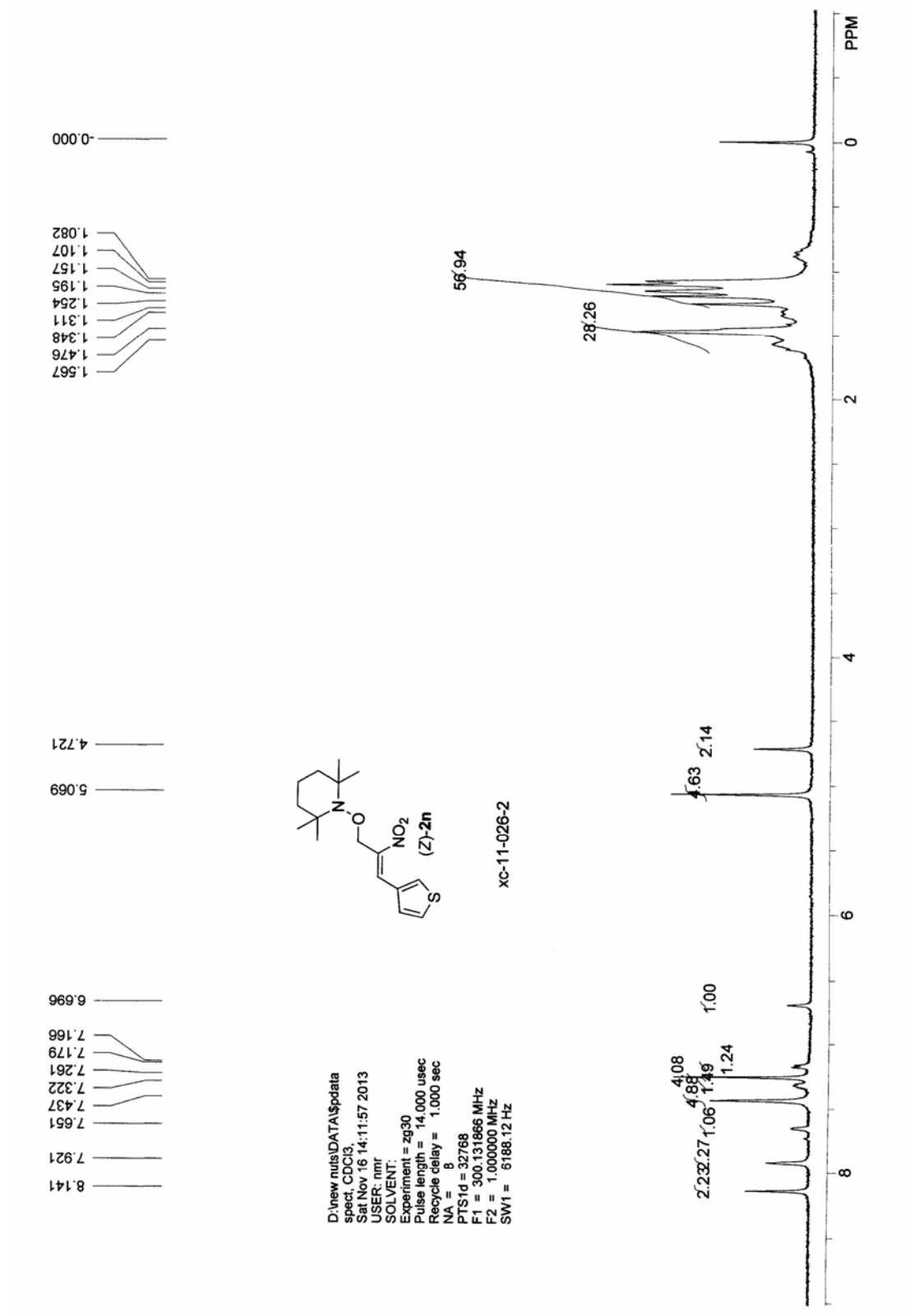

-0.000
4.716
5.063
6.792
7.875
8.114
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Nov 14 07:03:10 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-026-cp
1.20
5.31
6.00
0.19
0.53
PPM
0
2
4
6
8

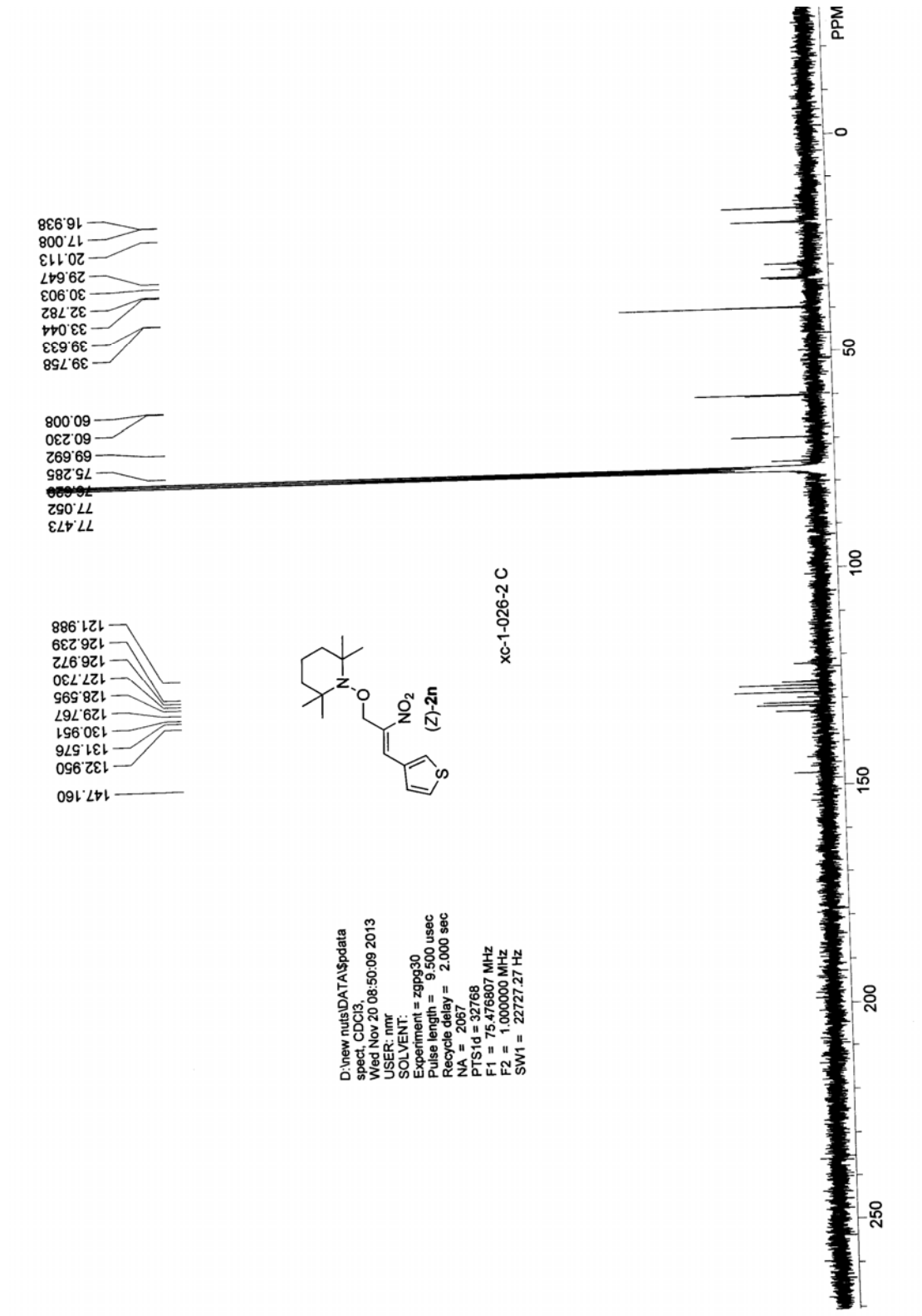

PPM
0
2
4
6
8
12.78
6.61
2.00
0.02
2.07
0.01
1.00
1.00
xc-11-026-1
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Nov 16 03:05:11 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2n
NO2
N
O
S
8.140
7.922
7.441
7.263
6.703
5.069
4.720
1.621
1.470
1.451
1.346
1.315
1.158
1.078
0.000

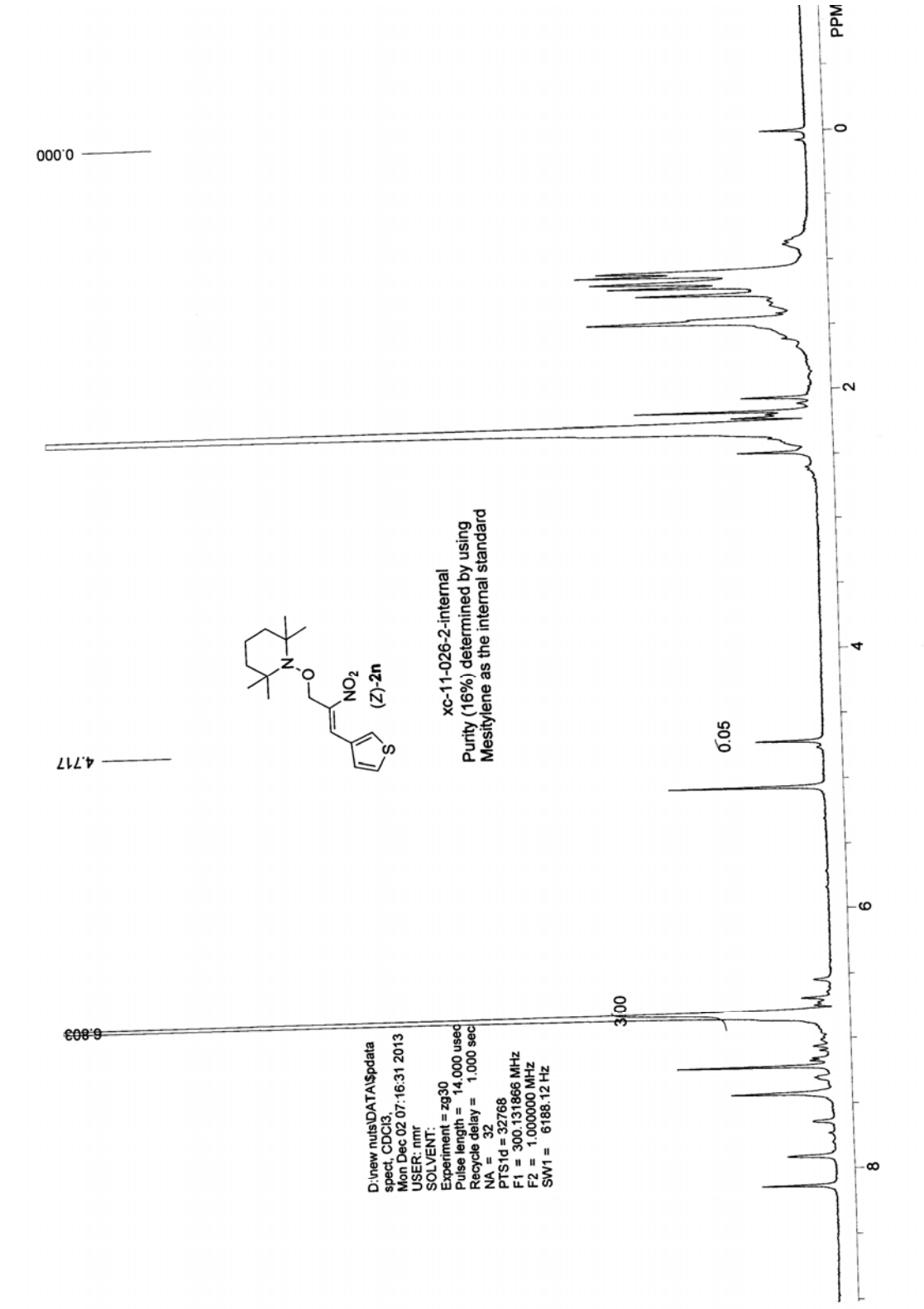

PPM
0
2
4
6
8
12.78
6.61
2.00
2.07
1.00
1.00
xc-11-026-1
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Nov 16 03:05:11 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
NO2
(E)-2n
S
N
O
8.140
7.922
7.441
7.263
5.069
1.621
1.470
1.451
1.346
1.315
1.158
1.078
0.000

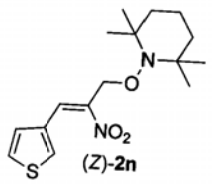

16.958
20.117
33.000
39.710
59.961
69.644
76.579
77.000
77.422
126.932
128.532
130.895
131.507
132.885
147.097
PPM
0
50
100
150
200
250
xc-11-026-1 C
(E)-2n
NO2
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat Nov 16 14:16:23 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 210
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz


ppm
1
2
3
4
5
6
7
8
ppm
(E)-2n
xc-11-026-1-noe
PDF Complete
Your Special Edition complimentary use period has ended. Thank you for using PDF Complete.

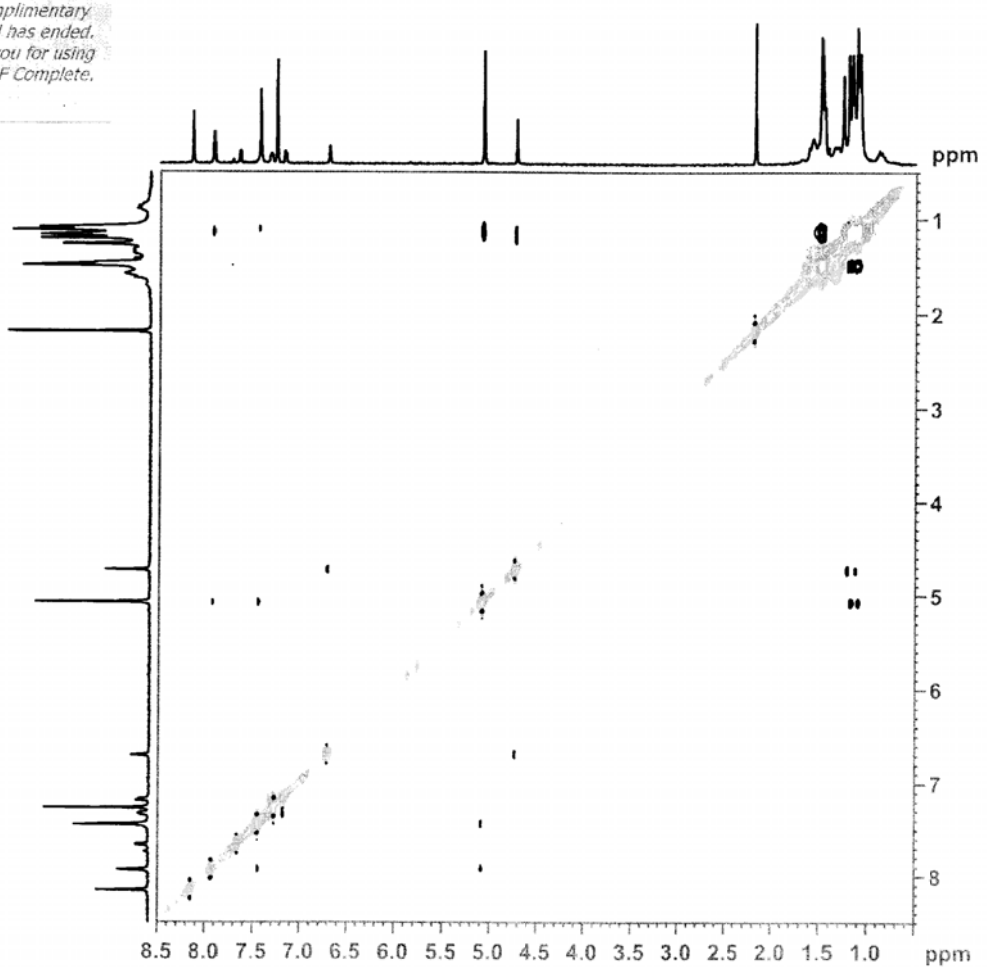

PPM
0
2
4
6
8
56.94
28.26
4.63
2.14
1.00
4.08
4.88
1.49
1.06
2.23
2.27
1.24
-0.000
1.082
1.107
1.157
1.195
1.254
1.311
1.348
1.476
1.567
4.721
5.069
6.696
7.166
7.179
7.261
7.322
7.437
7.661
7.921
8.141
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Nov 16 14:11:57 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-026-2
(Z)-2n
NO2
O
N
S


16.938
17.008
20.113
29.647
30.903
32.782
33.044
39.633
39.758
60.008
60.230
69.692
75.285
77.052
77.473
121.988
126.239
126.972
127.730
128.595
129.767
130.951
131.576
132.950
147.160
NO2
(Z)-2n
S
xc-1-026-2 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Wed Nov 20 08:50:09 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 2067
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
0
50
100
150
200
250

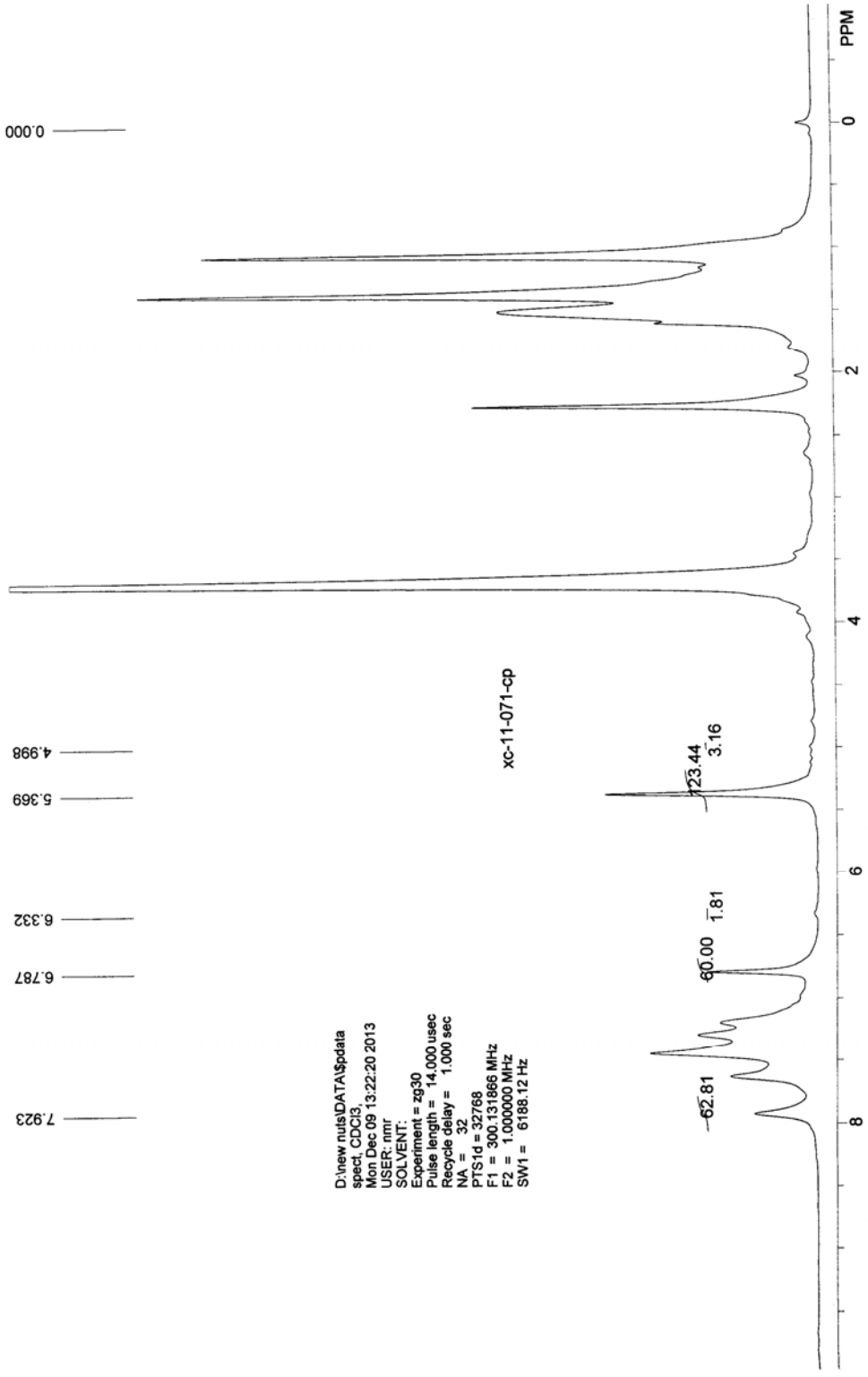

6.803
4.717
0.000
3.00
0.05
D:\new nuts\DATA\$pdata
spect, CDCl3,
Mon Dec 02 07:16:31 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 used
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-026-2-internal
Purity (16%) determined by using
Mesitylene as the internal standard
(Z)-2n
PPM

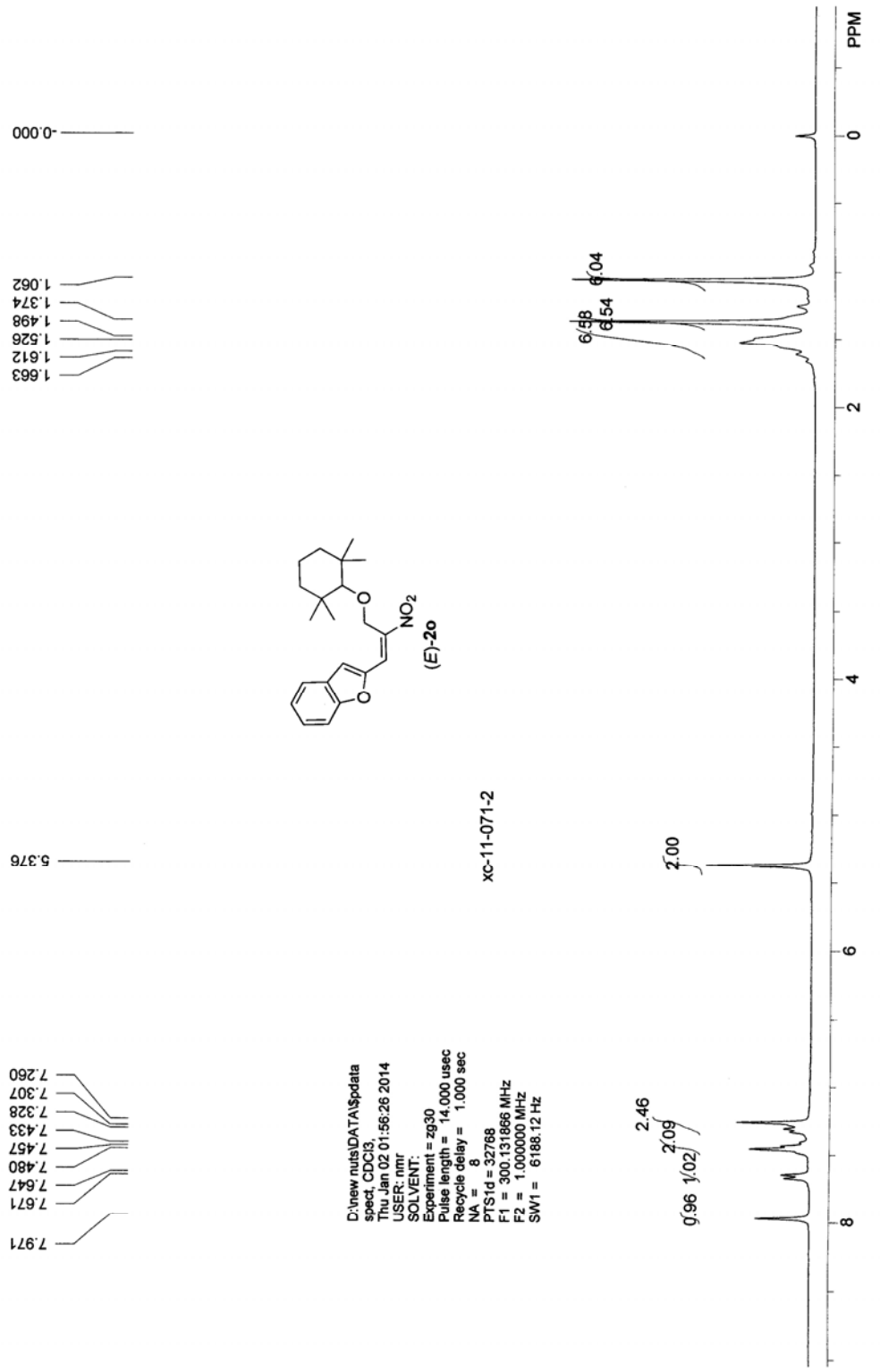


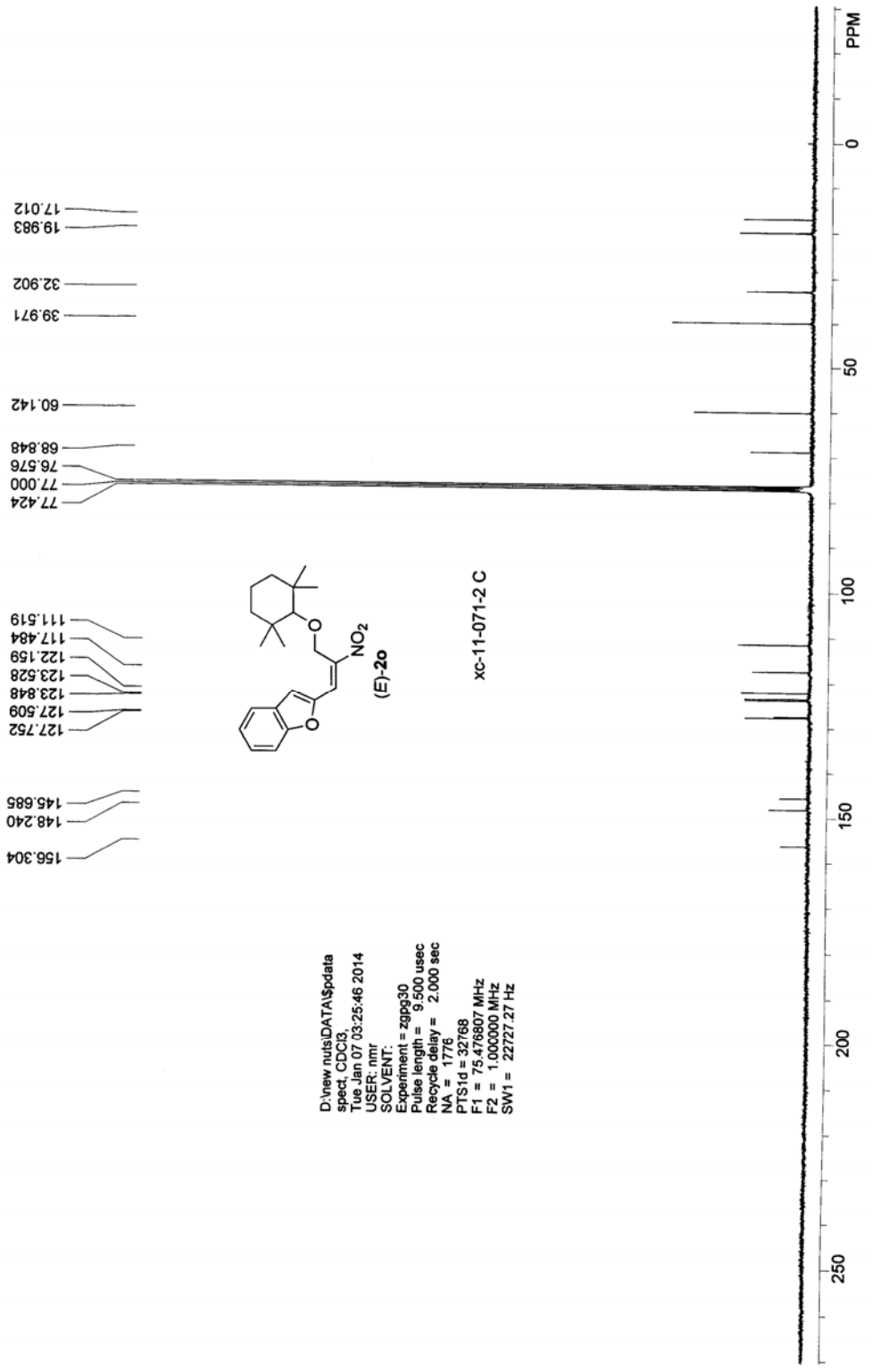
(*Z*)-**2n**

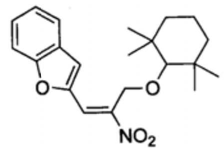


xc-11-026-2-noe

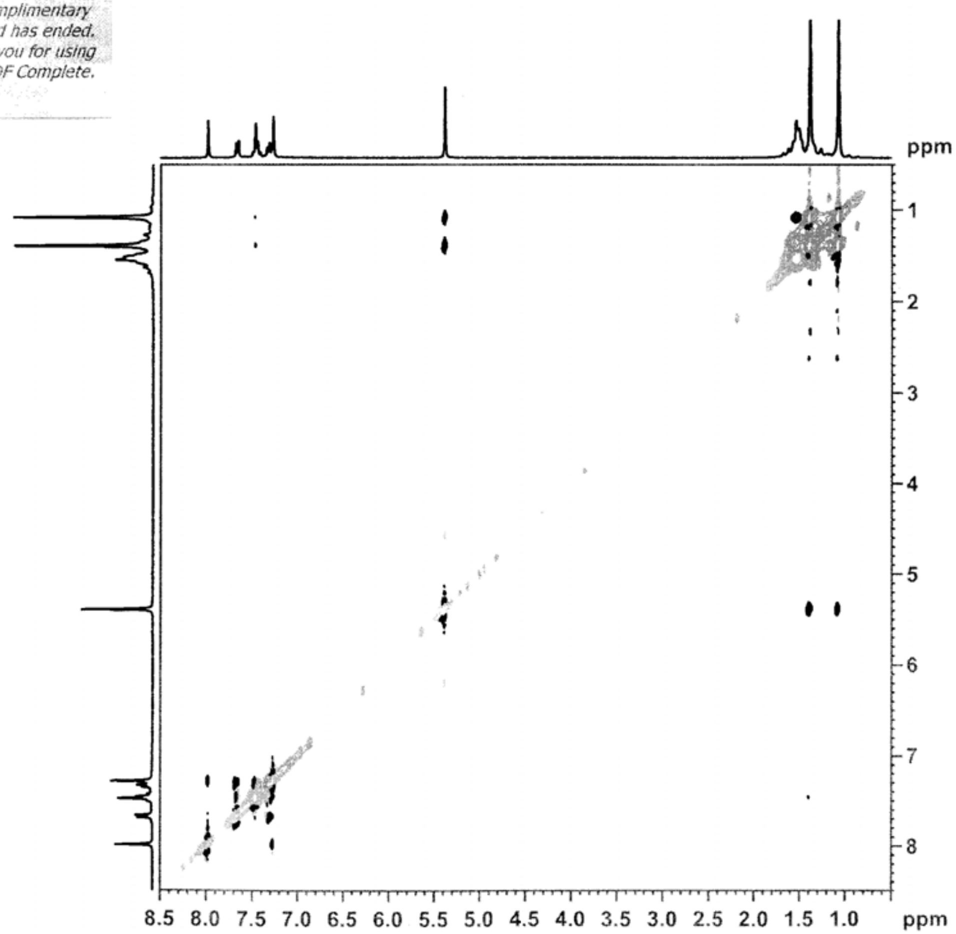

PPM
0
2
4
6
8
0.000
4.998
5.369
6.332
6.787
7.923
xc-11-071-cp
3.16
3.44
1.81
0.00
2.81
D:\new nuts\DATA\$pdata
spect, CDCl3,
Mon Dec 09 13:22:20 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz


-0.000
1.062
1.374
1.498
1.526
1.612
1.663
5.376
7.260
7.307
7.328
7.433
7.457
7.480
7.647
7.671
7.971
D:\new nuts\DATA\$pdata
sped, CDCl3,
Thu Jan 02 01:56:26 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-071-2
(E)-2o
NO2
O
O
2.00
2.46
2.09
0.96
1.02
6.58
6.54
6.04
8
6
4
2
0
PPM

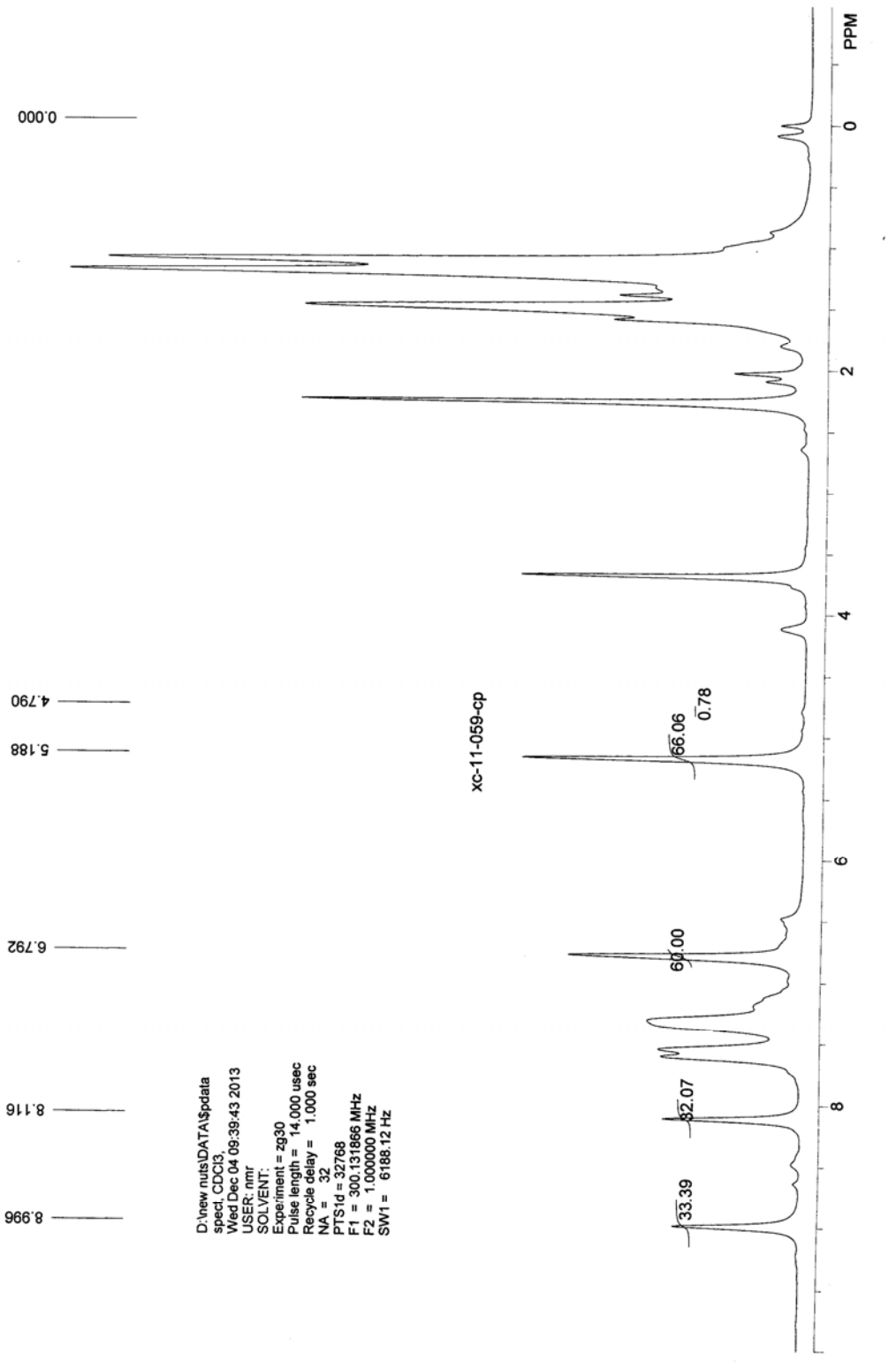

17.012
19.983
32.902
39.971
60.142
68.848
76.576
77.000
77.424
111.519
117.484
122.159
123.528
123.848
127.509
127.752
145.685
148.240
156.304
O
NO2
O
(E)-2o
xc-11-071-2 C
D:\new nuts\DATA\5pdata
spect, CDCl3,
Tue Jan 07 03:25:46 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 1776
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
0
50
100
150
200
250

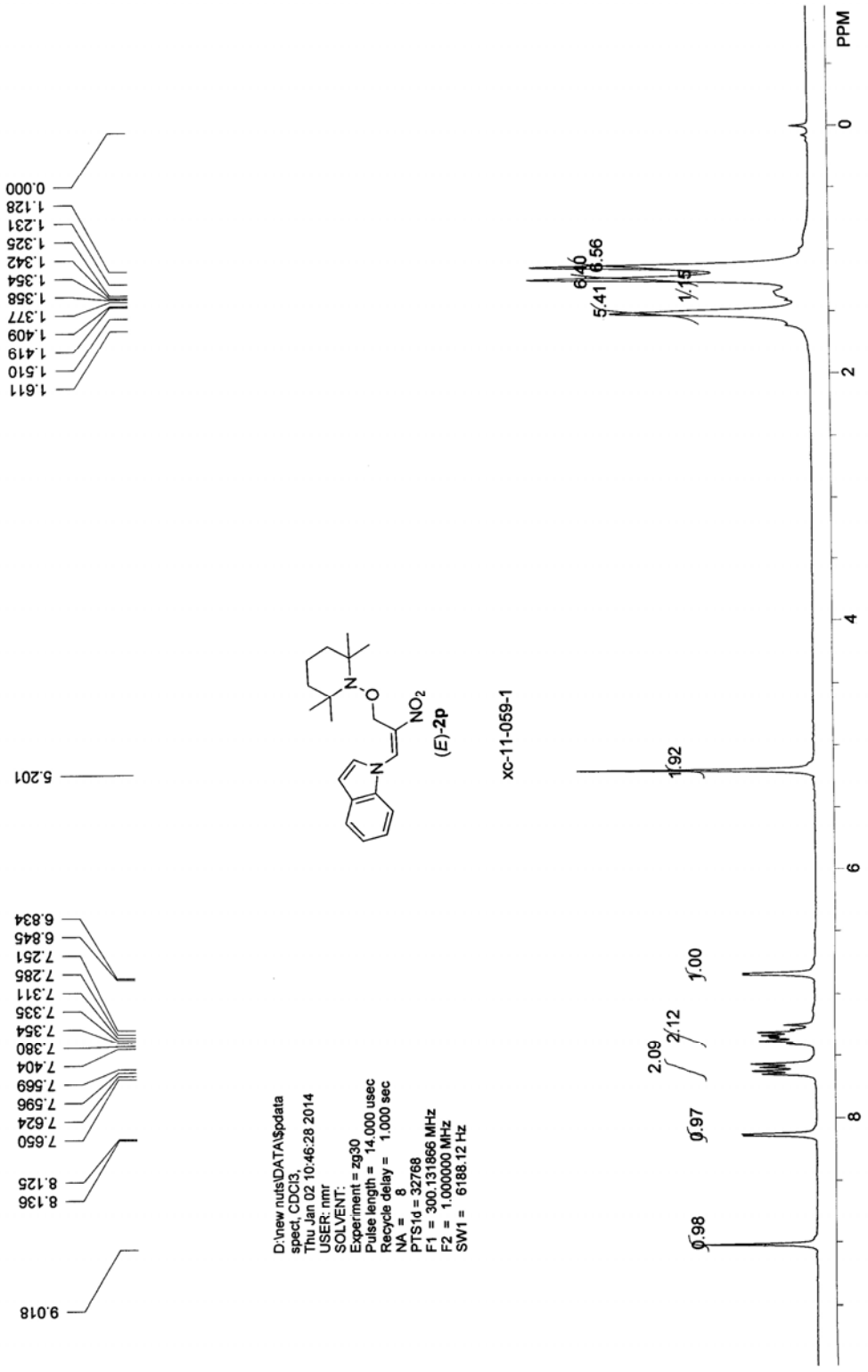


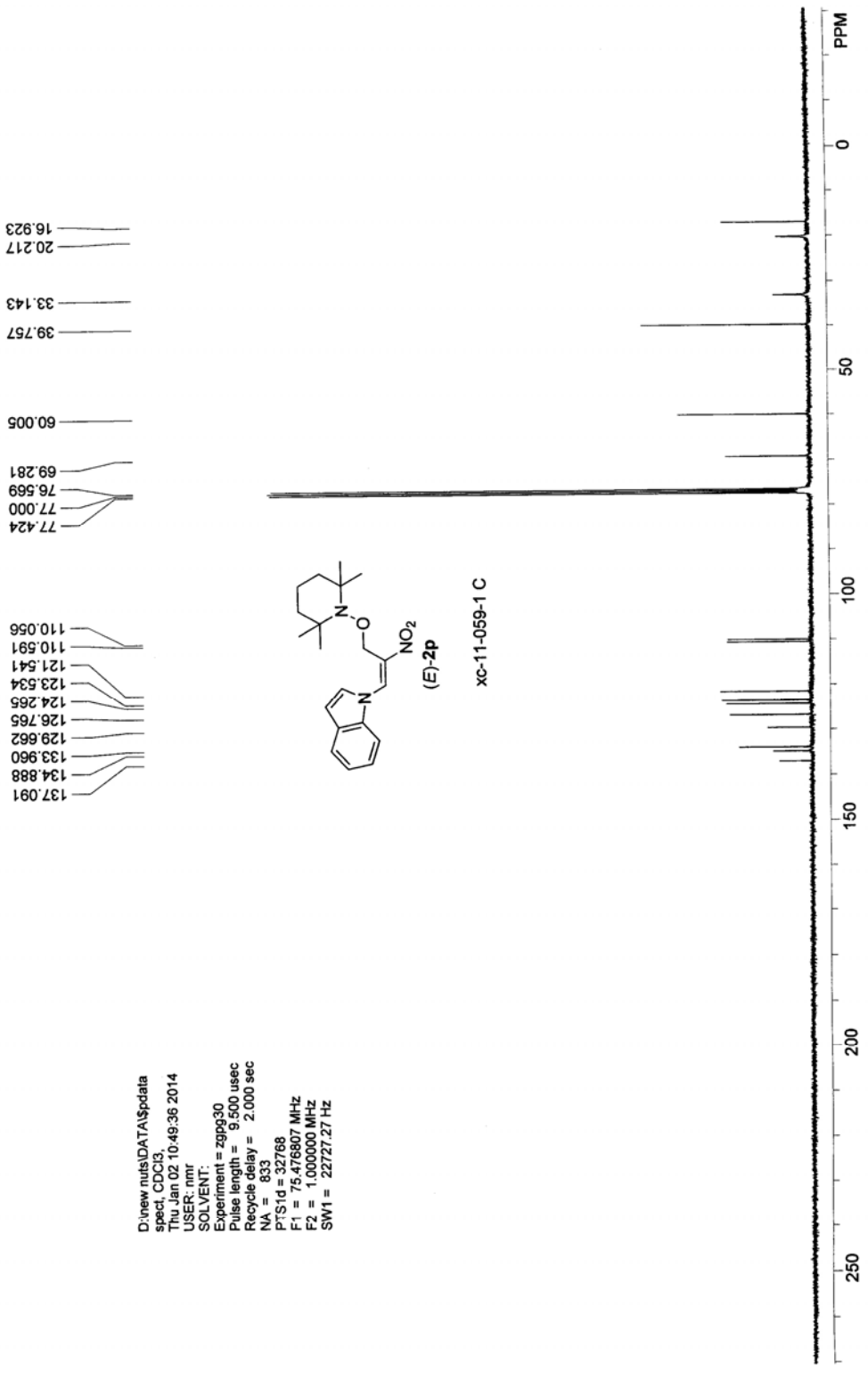
(*E*)-**2o**

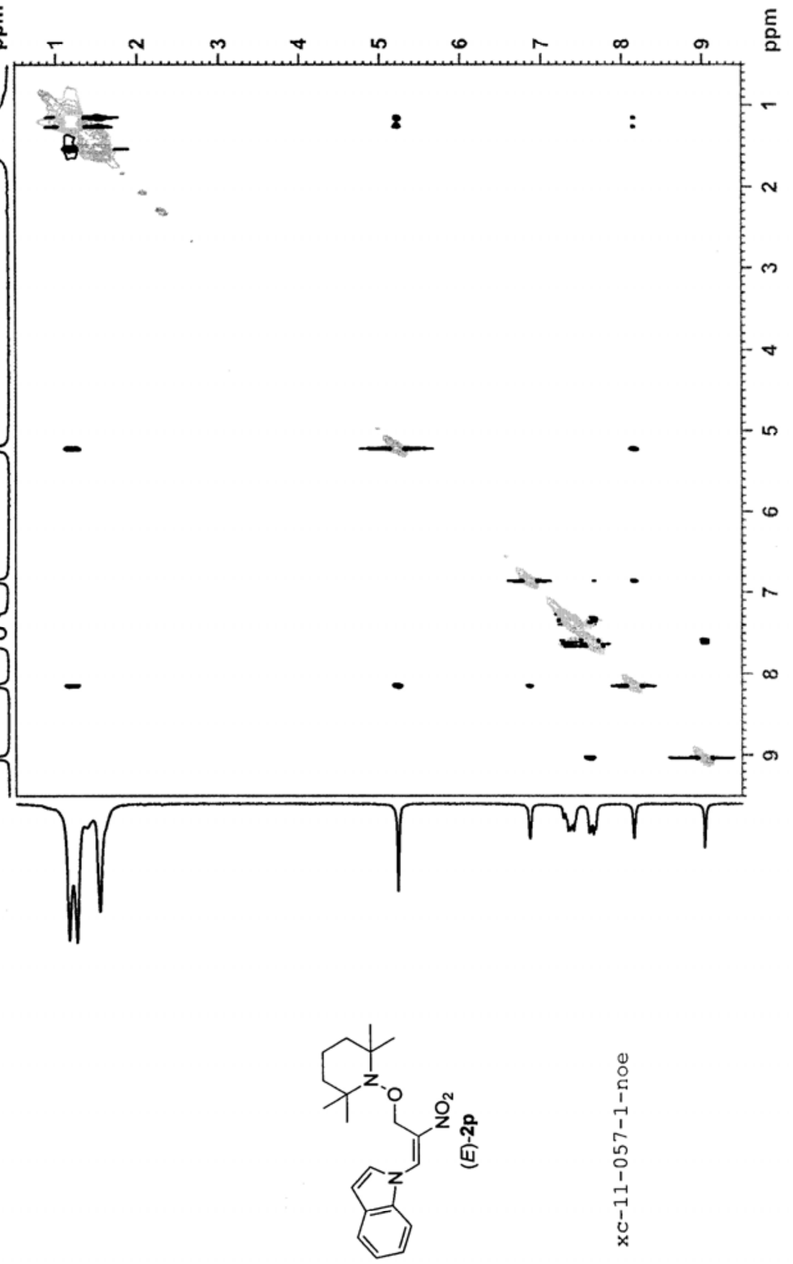


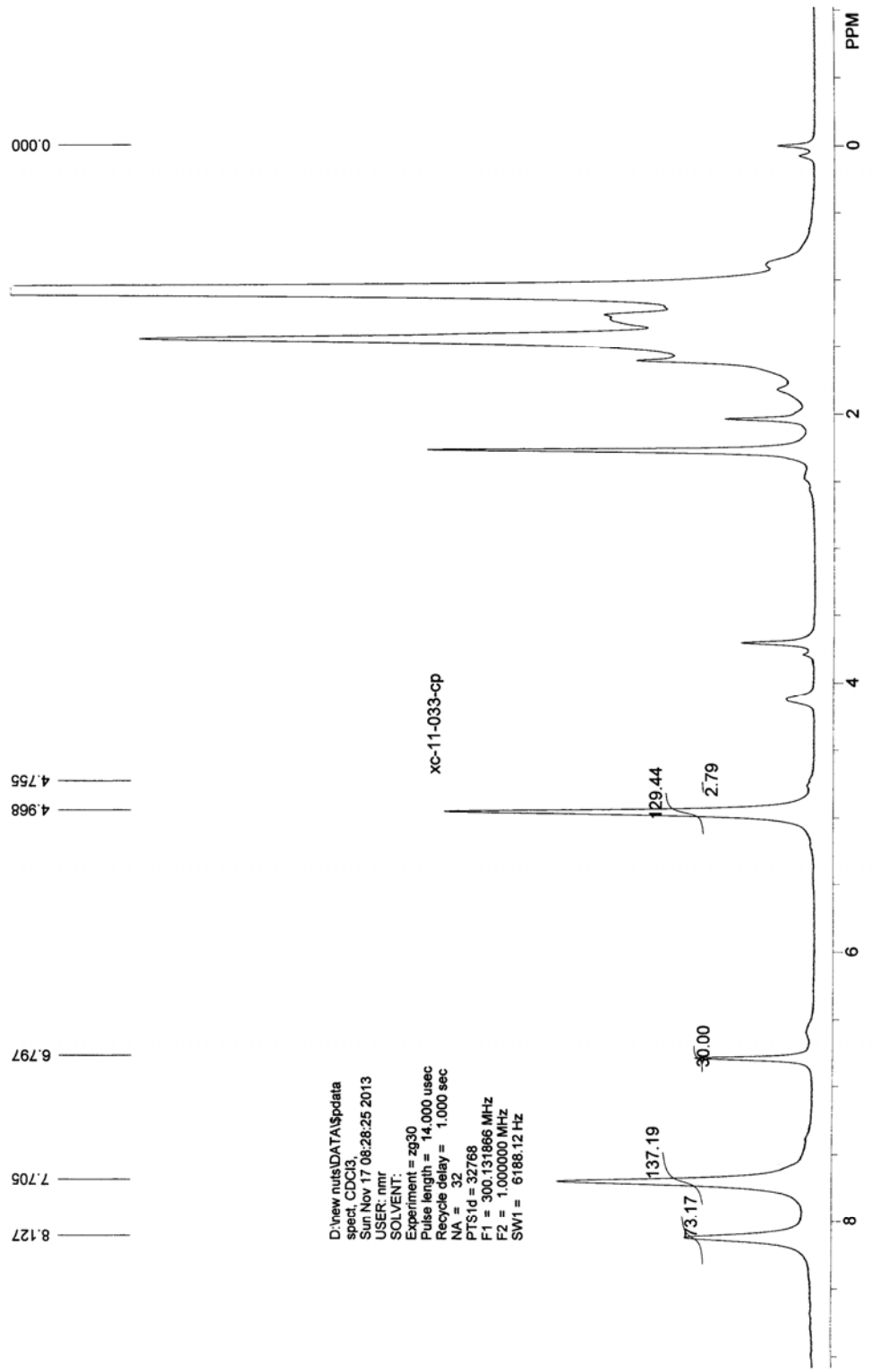
xc-11-071-2-noe

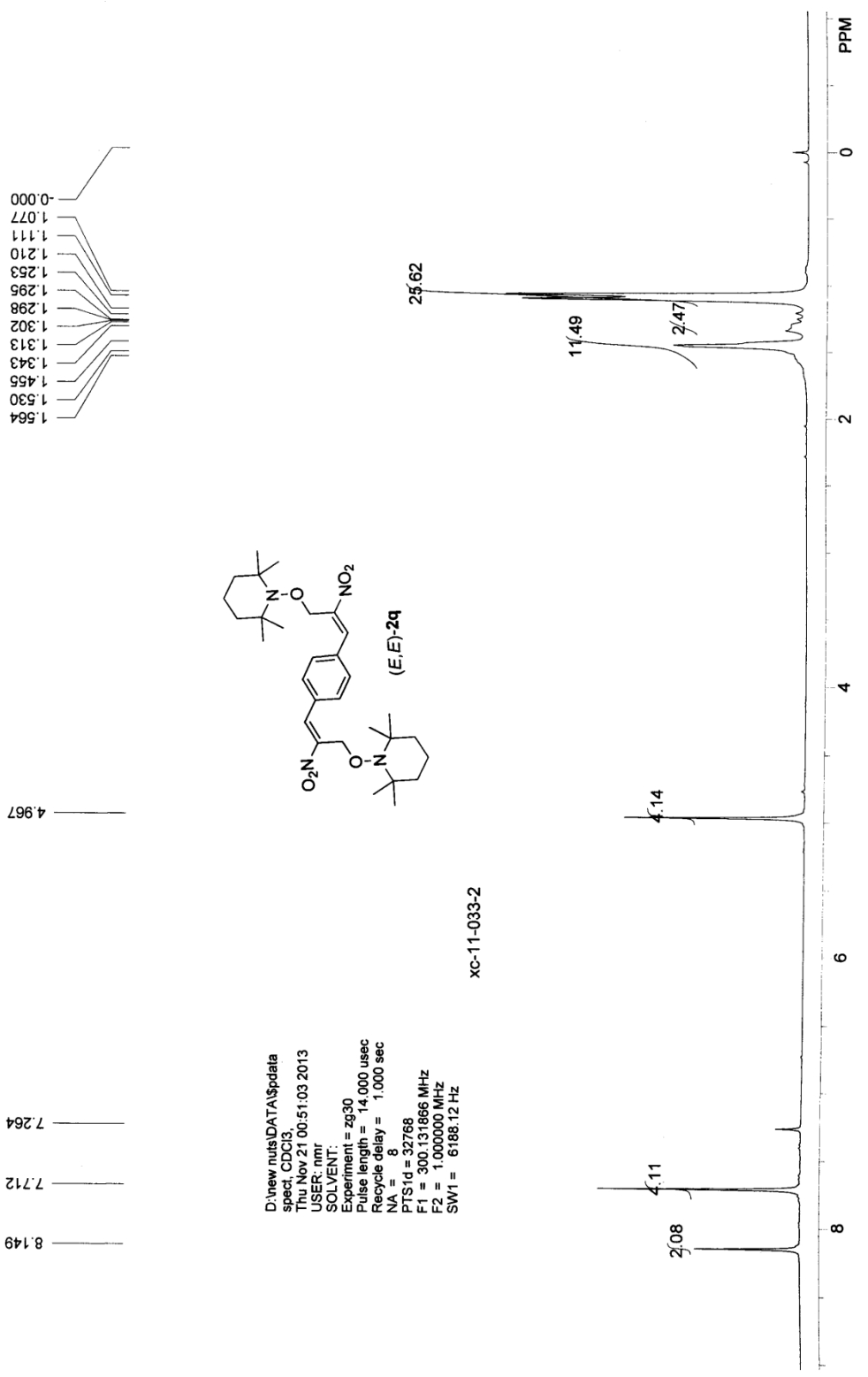

0.000
4.790
5.188
6.792
8.116
8.996
D:\new nuts\DATA\$pdata
sped, CDCl3,
Wed Dec 04 09:39:43 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-059-cp
66.06
0.78
60.00
32.07
33.39
PPM
0
2
4
6
8

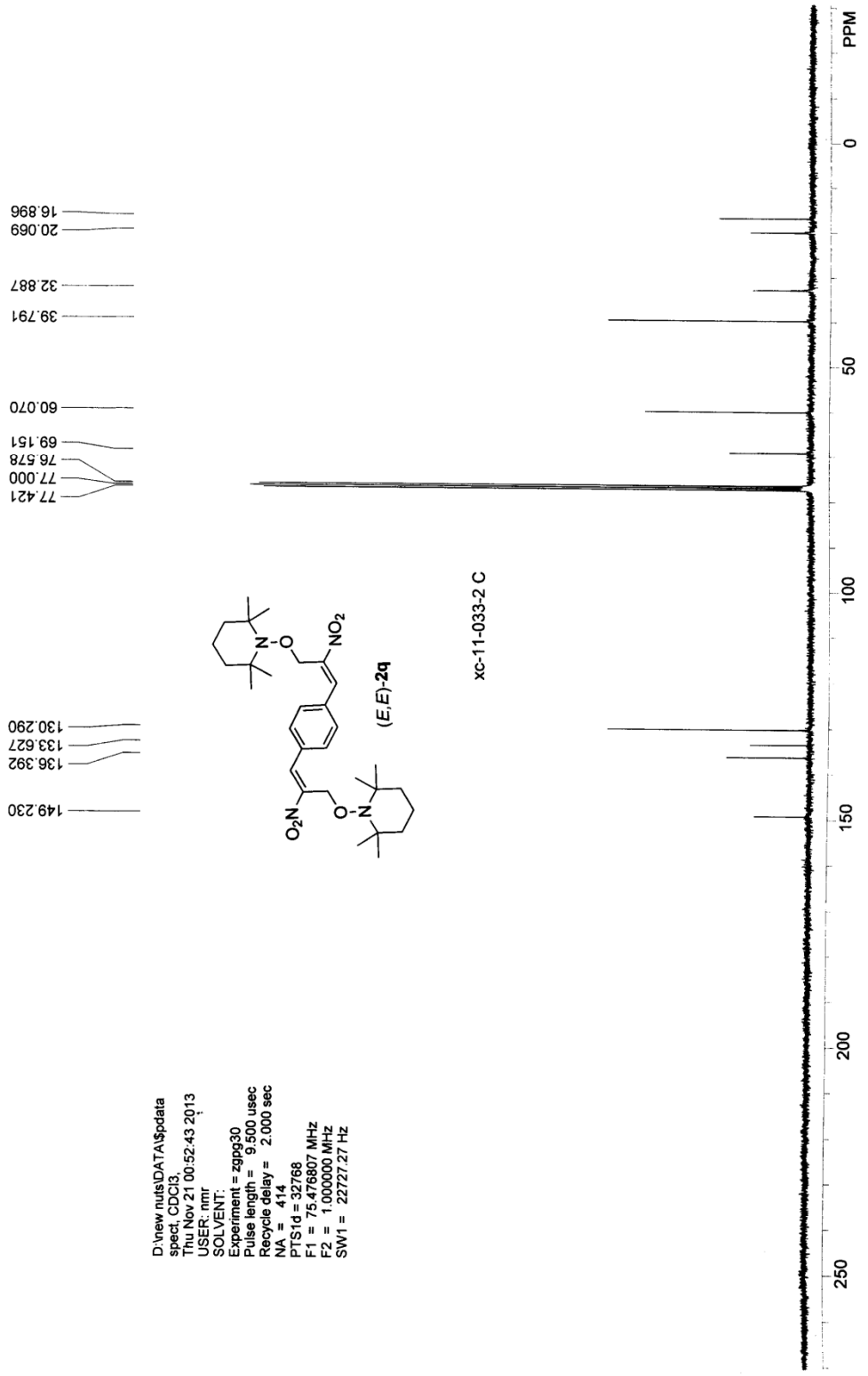

PPM
0
2
4
6
8
1.92
1.00
2.12
2.09
0.97
0.98
6.56
6.40
5.41
1.15
xc-11-059-1
(E)-2p
NO2
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Jan 02 10:46:28 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
9.018
8.136
8.125
7.650
7.624
7.596
7.569
7.404
7.380
7.354
7.335
7.311
7.285
7.261
6.845
6.834
5.201
1.611
1.510
1.419
1.409
1.377
1.358
1.354
1.342
1.325
1.231
1.128
0.000

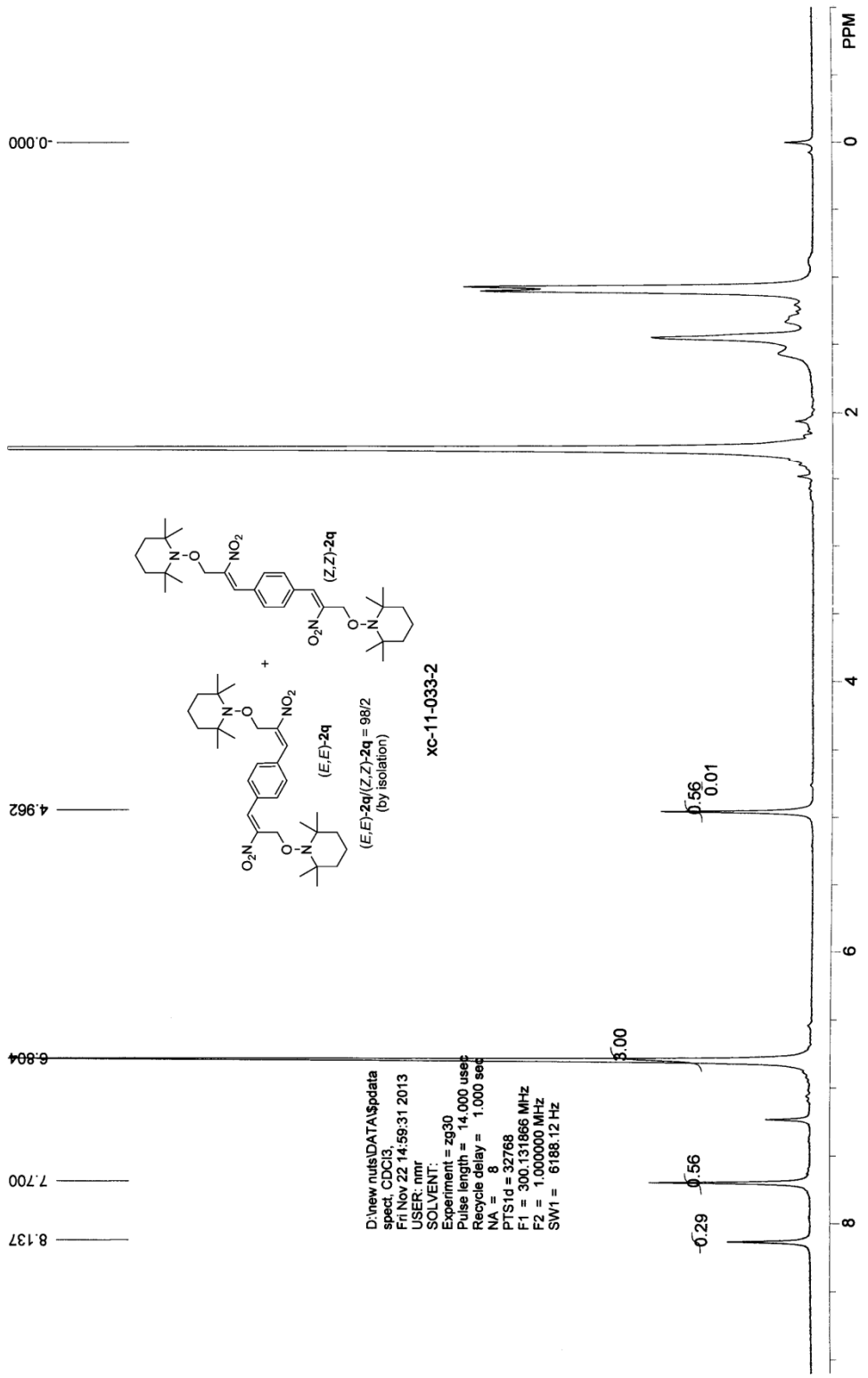

PPM
0
50
100
150
200
250
16.923
20.217
33.143
39.757
60.005
69.281
76.569
77.000
77.424
110.056
110.591
121.541
123.534
124.265
126.765
129.662
133.960
134.888
137.091
NO2
(E)-2p
xc-11-059-1 C
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Jan 02 10:49:36 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 833
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

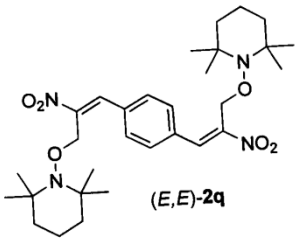



0.000
4.755
4.968
6.797
7.705
8.127
xc-11-033-cp
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sun Nov 17 08:28:25 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
129.44
2.79
30.00
137.19
73.17
PPM
0
2
4
6
8


PPM
0
2
4
6
8
2.08
4.11
4.14
11.49
2.47
25.62
1.564
1.530
1.455
1.343
1.313
1.302
1.298
1.295
1.253
1.210
1.111
1.077
0.000
4.967
7.264
7.712
8.149
(E,E)-2q
xc-11-033-2
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Nov 21 00:51:03 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz

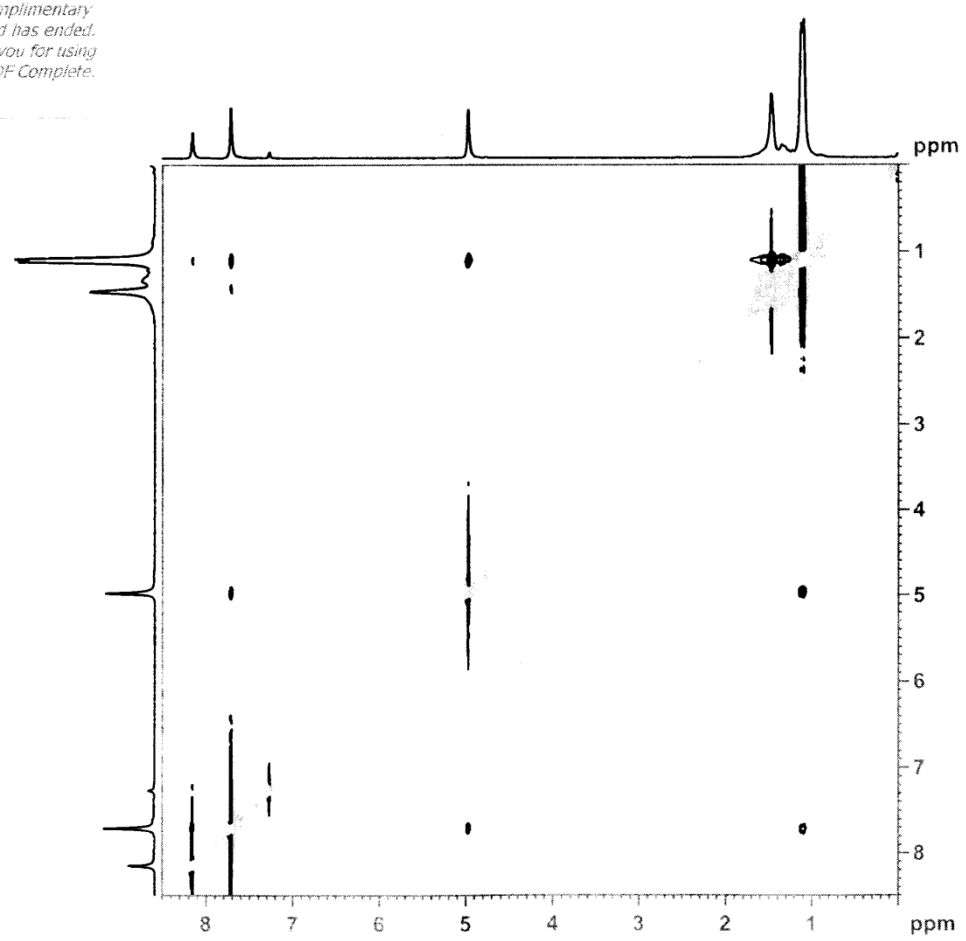

16.896
20.069
32.887
39.791
60.070
69.151
76.578
77.000
77.421
130.290
133.627
136.392
149.230
PPM
0
50
100
150
200
250
xc-11-033-2 C
(E,E)-2q
D:\new nuts\DATA\5pdata
spect, CDCl3,
Thu Nov 21 00:52:43 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 414
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

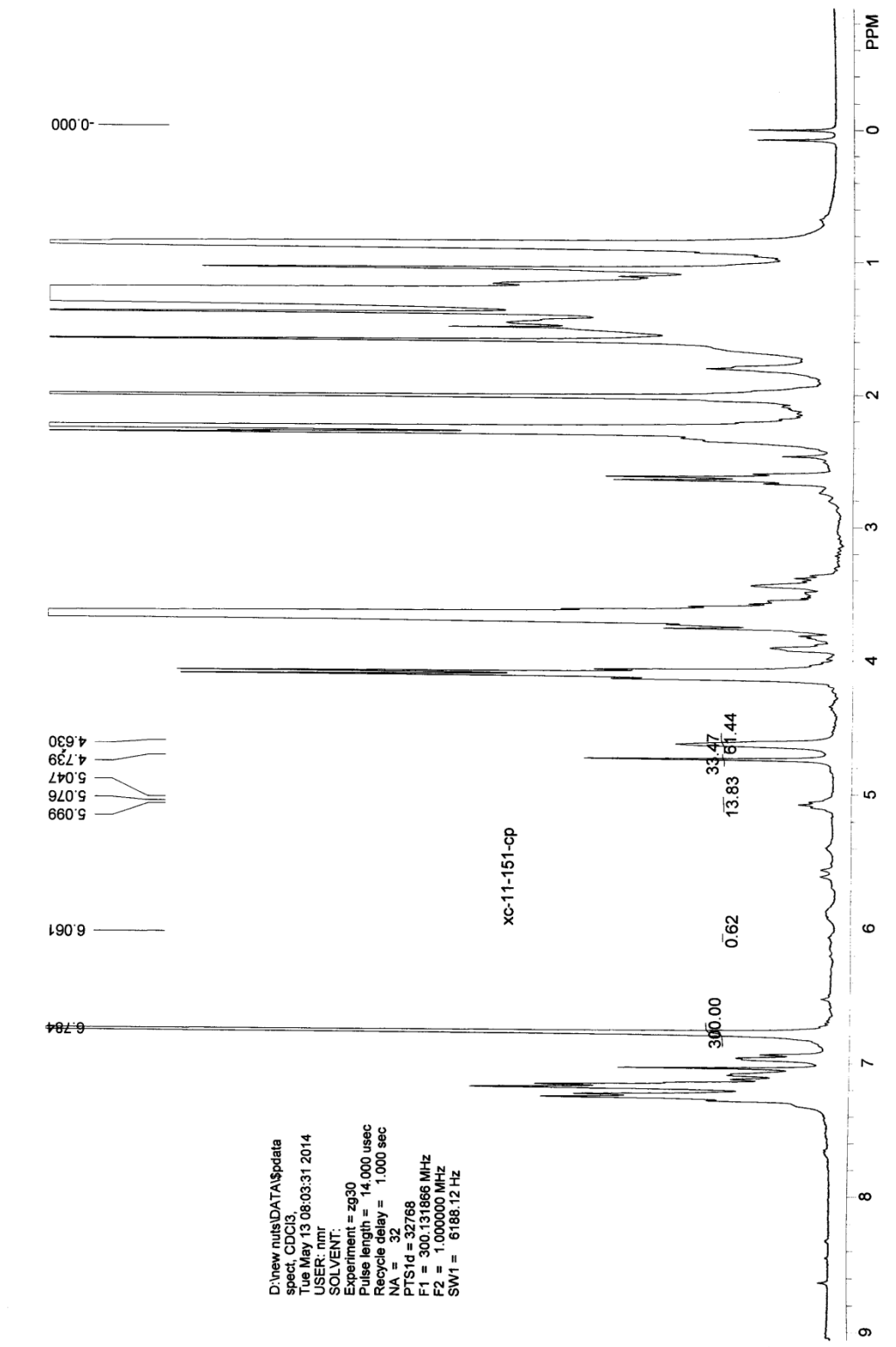

PPM
0
2
4
6
8
-0.000
4.962
6.804
7.700
8.137
3.00
0.56
0.01
0.56
0.29
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Nov 22 14:59:31 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-033-2
(E,E)-2q/(Z,Z)-2q = 98/2
(by isolation)
(E,E)-2q
(Z,Z)-2q

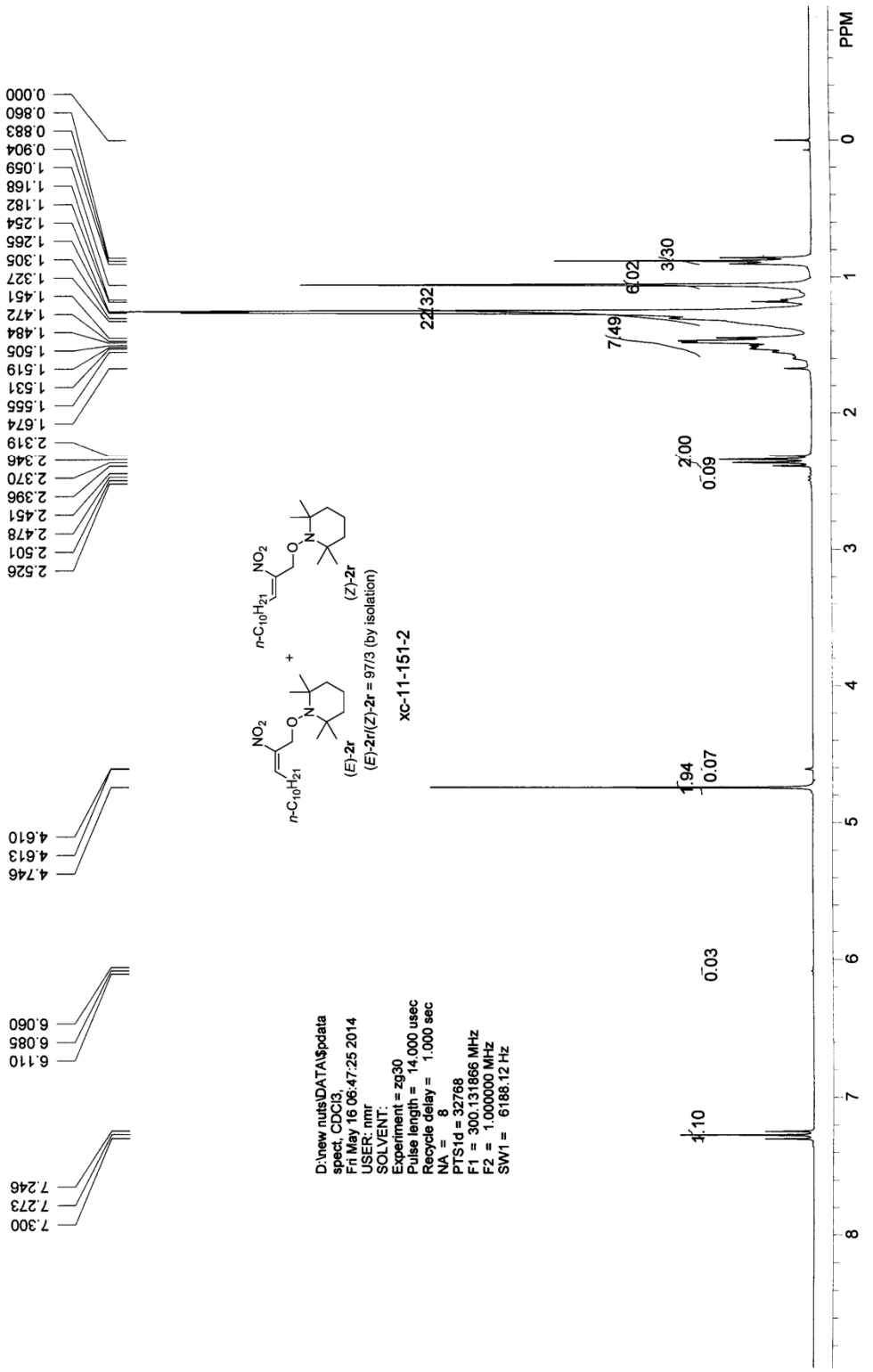


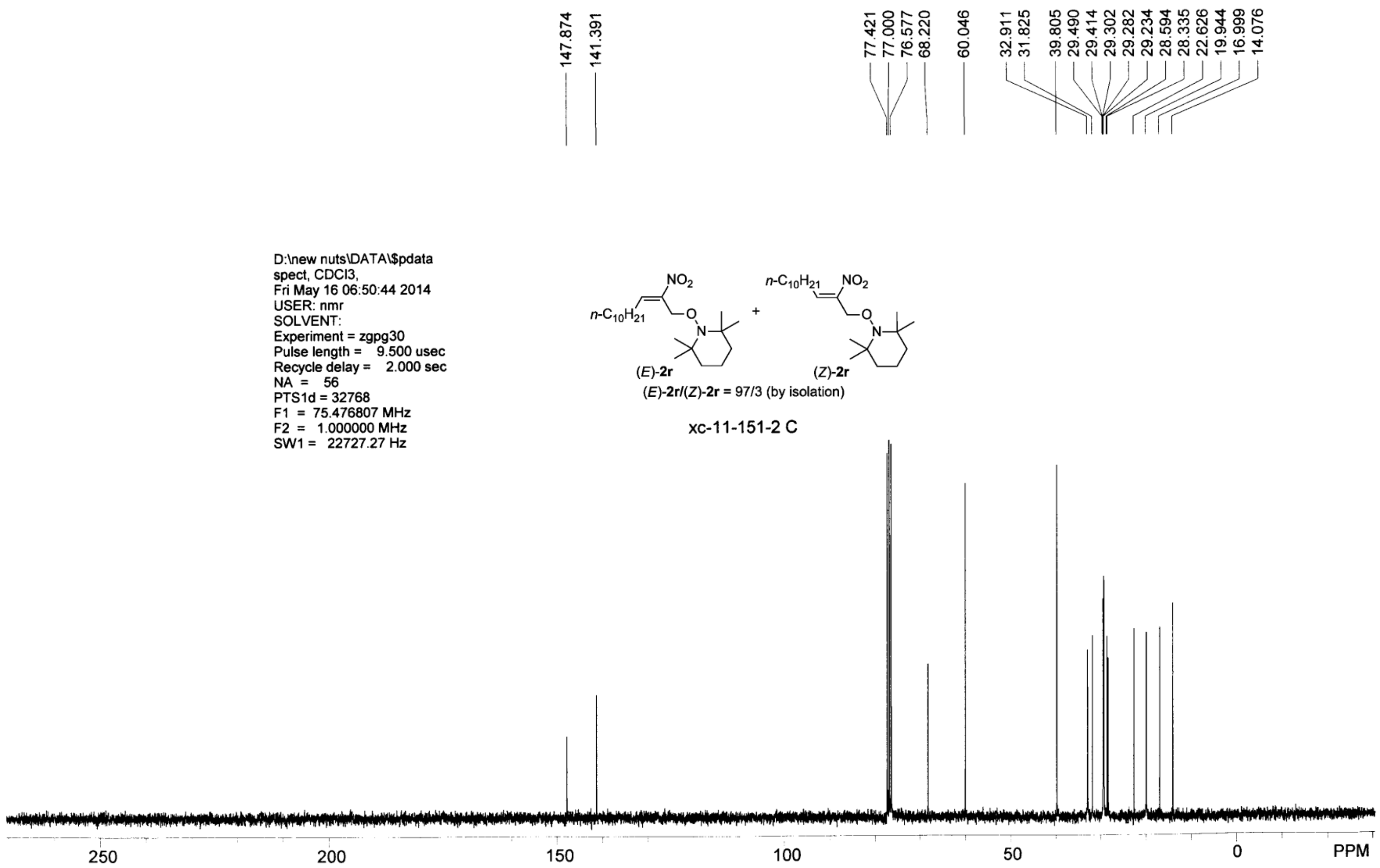
(*E*,*E*)-**2q**

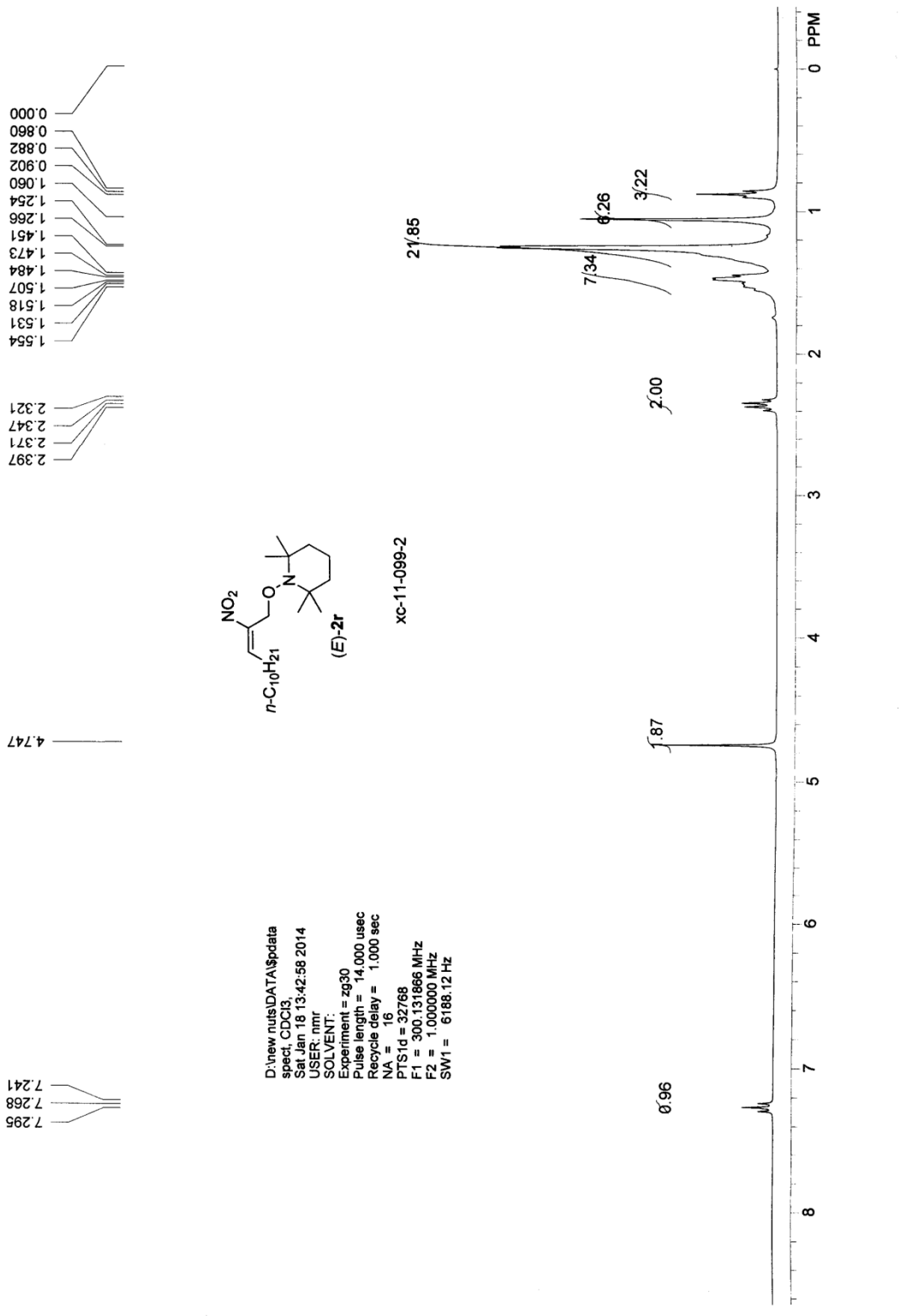
xc-11-033-2-noe

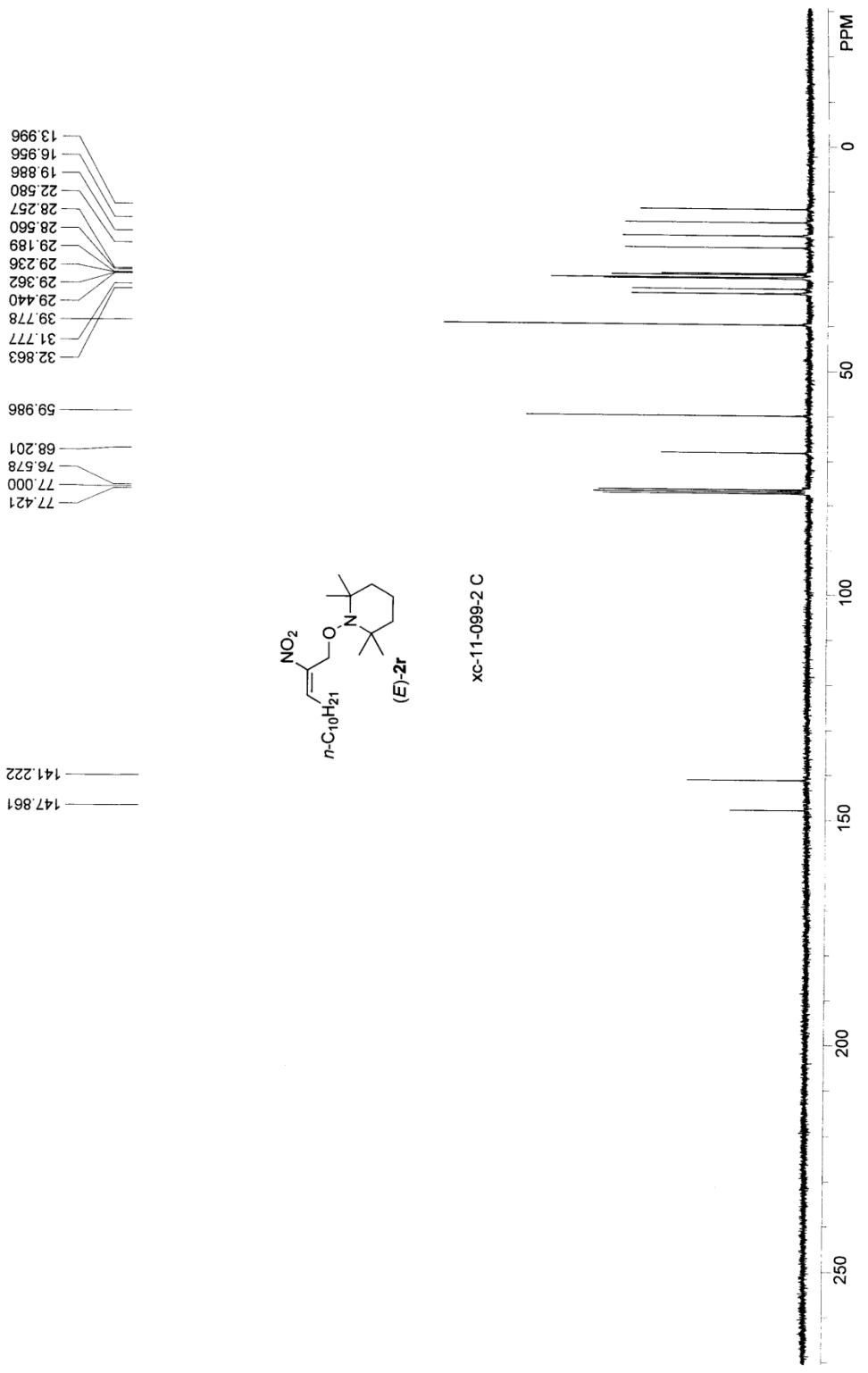


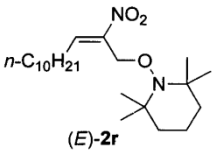

-0.000
6.061
6.784
5.099
5.076
5.047
4.739
4.630
xc-11-151-cp
D:\new nuts\DATA\3\pdata
spect, CDCl3,
Tue May 13 08:03:31 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
300.00
0.62
13.83
33.47
61.44
PPM
0
1
2
3
4
5
6
7
8
9


xc-11-151-2
(E)-2r/(Z)-2r = 97/3 (by isolation)
(E)-2r
(Z)-2r
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri May 16 06:47:25 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
PPM

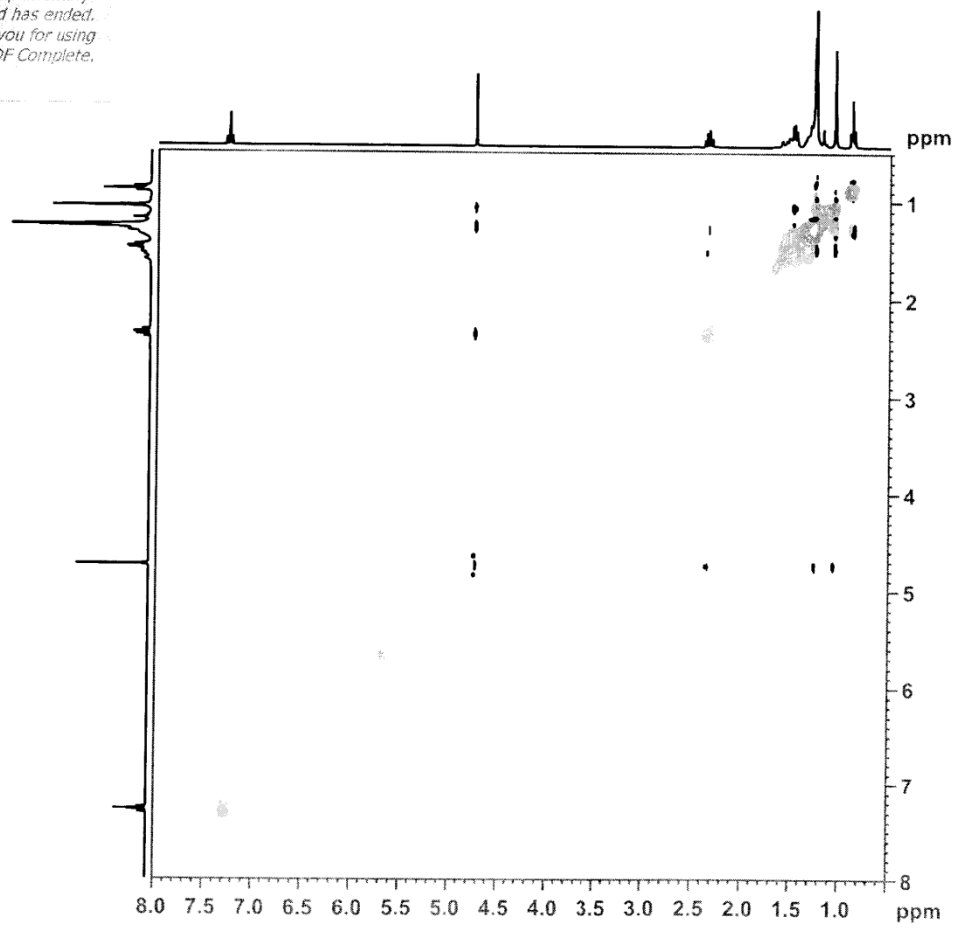

147.874
141.391
77.421
77.000
76.577
68.220
60.046
32.911
31.825
39.805
29.490
29.414
29.302
29.282
29.234
28.594
28.335
22.626
19.944
16.999
14.076
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri May 16 06:50:44 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 56
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
NO2
n-C10H21
(E)-2r
+
(Z)-2r
(E)-2r/(Z)-2r = 97/3 (by isolation)
xc-11-151-2 C
250
200
150
100
50
0
PPM

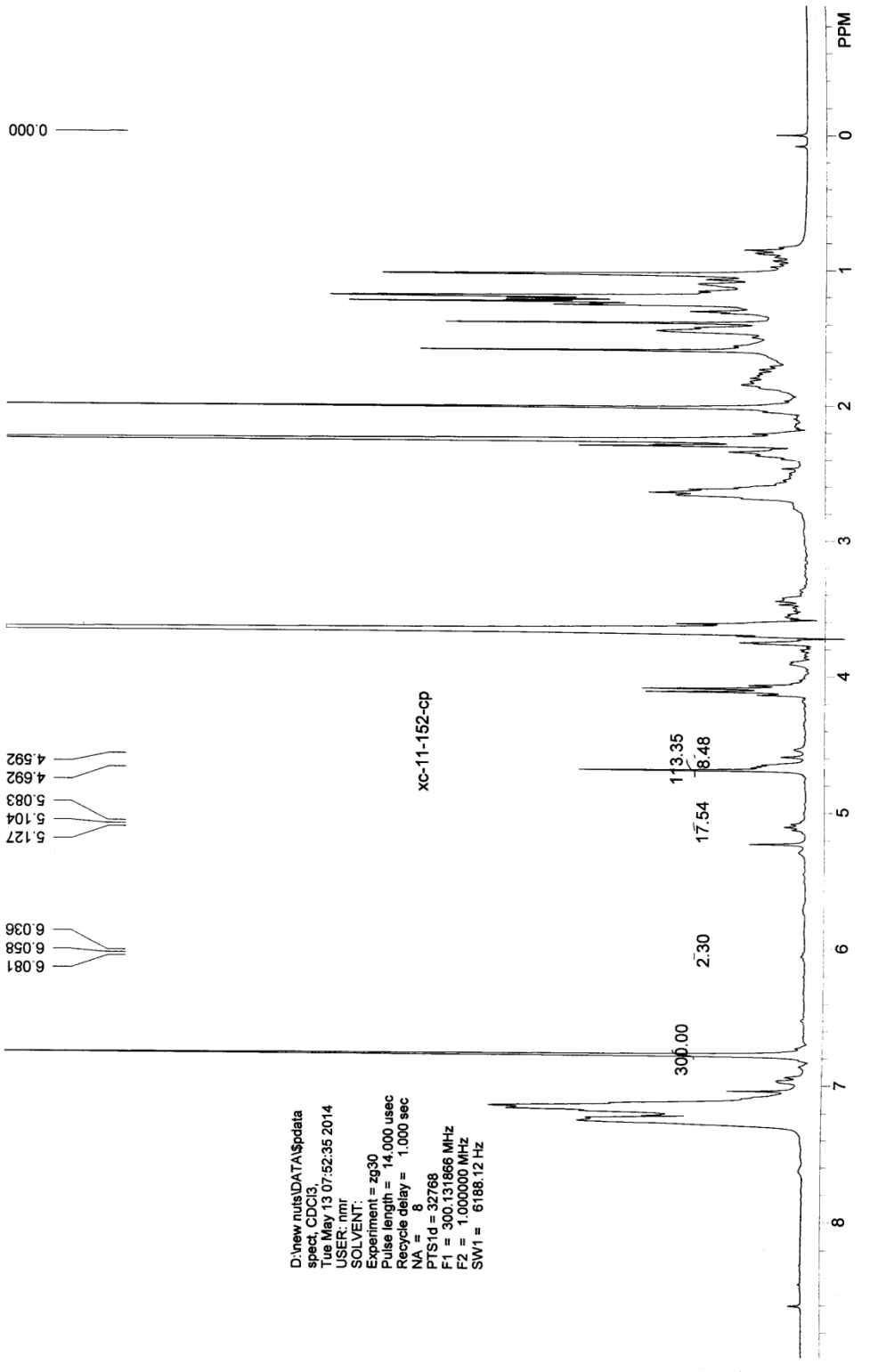

0.000
0.860
0.882
0.902
1.060
1.254
1.266
1.451
1.473
1.484
1.507
1.518
1.531
1.554
2.321
2.347
2.371
2.397
4.747
7.241
7.268
7.295
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Jan 18 13:42:58 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 16
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-099-2
(E)-2r
0.96
1.87
2.00
7.34
6.26
3.22
21.85
PPM

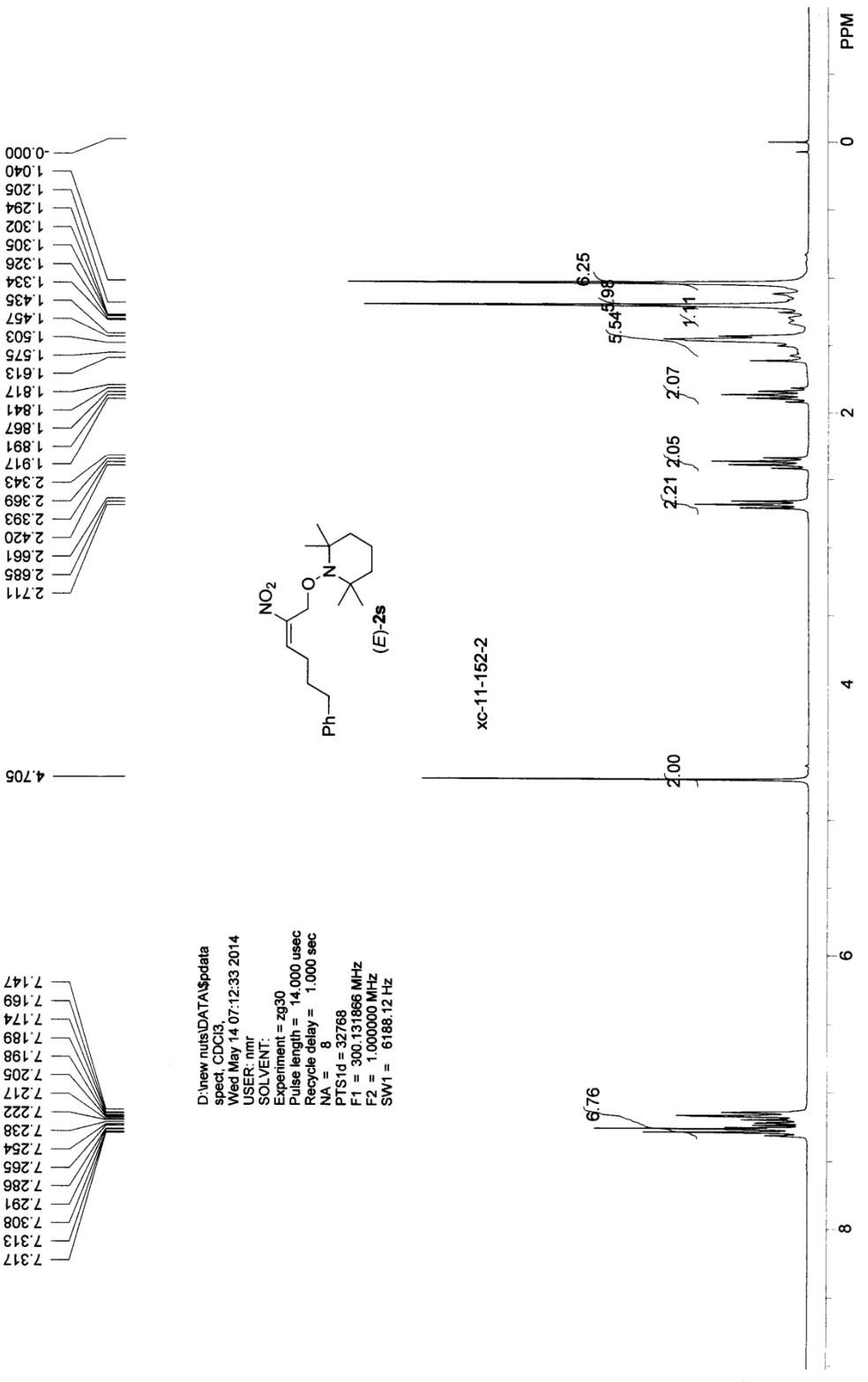

PPM
0
50
100
150
200
250
xc-11-099-2 C
(E)-2r
n-C10H21
NO2
O
N
13.996
16.956
19.886
22.580
28.257
28.560
29.189
29.236
29.362
29.440
39.778
31.777
32.863
59.986
68.201
76.578
77.000
77.421
141.222
147.861

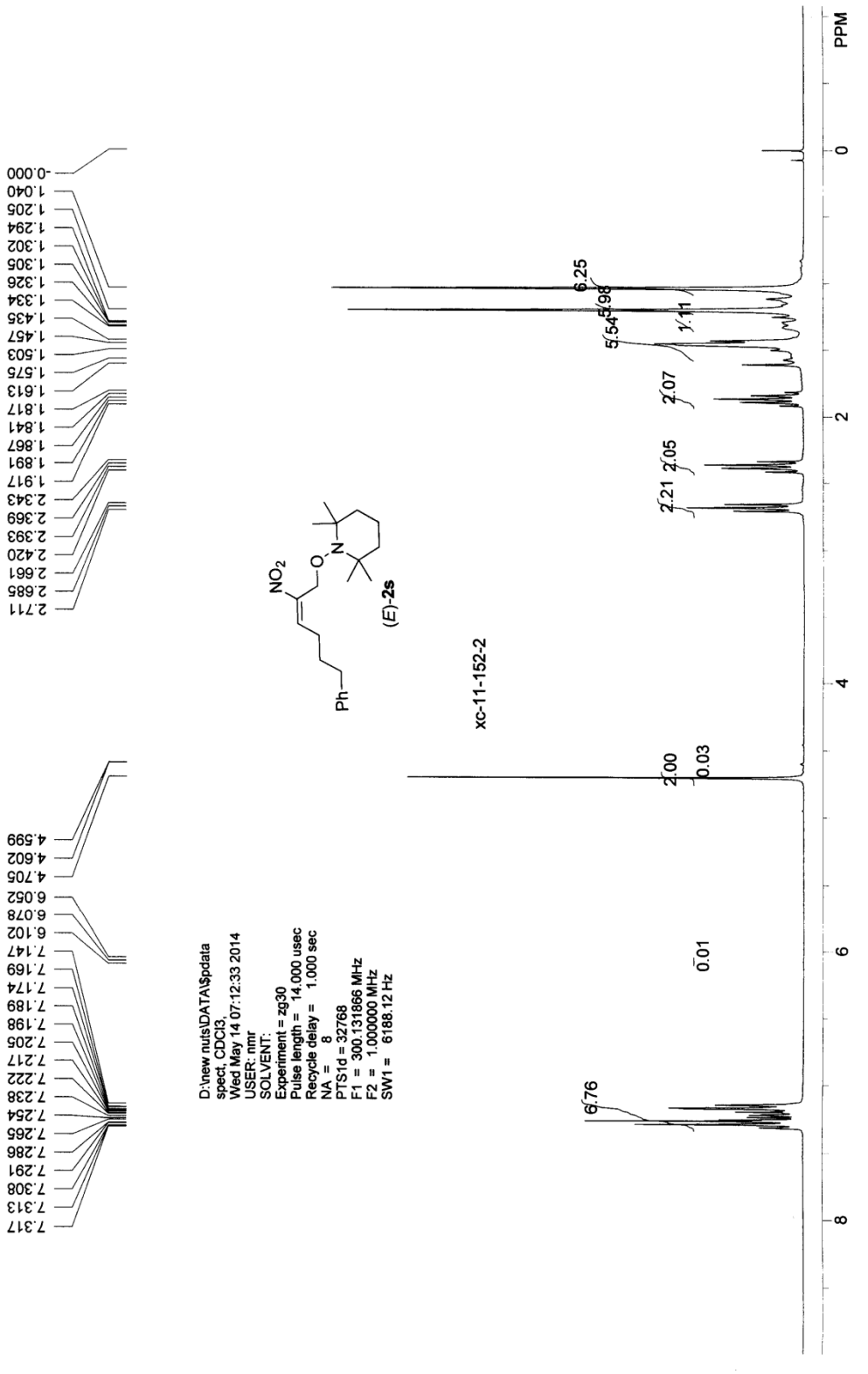


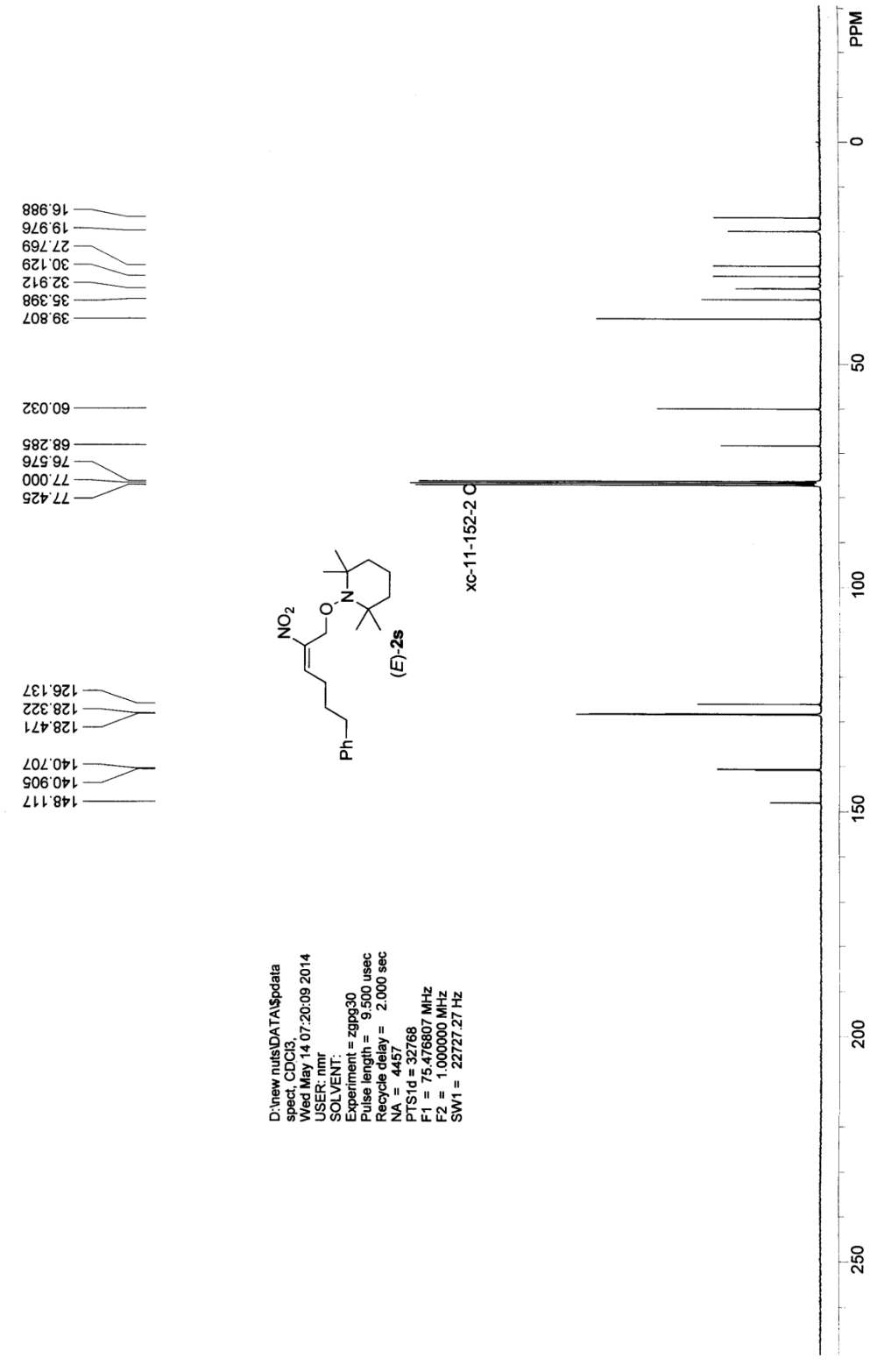
xc-11-099-2-noe

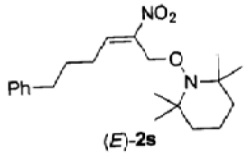



0.000
4.592
4.592
5.083
5.104
5.127
6.036
6.058
6.081
xc-11-152-cp
113.35
8.48
17.54
2.30
300.00
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue May 13 07:52:35 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
PPM
0
1
2
3
4
5
6
7
8


D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed May 14 07:12:33 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-152-2
(E)-2s
NO2
Ph
PPM
6.76
2.00
5.54
5.98
6.25
2.21
2.05
2.07
1.11

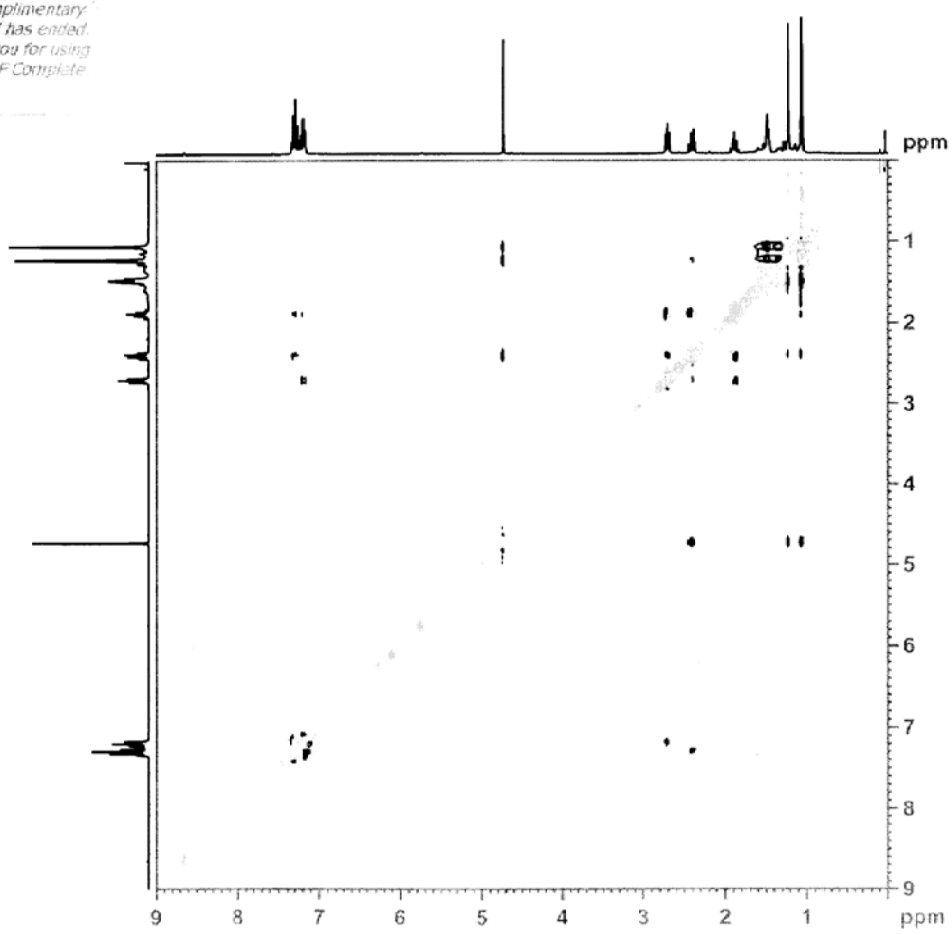

D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed May 14 07:12:33 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-152-2
(E)-2s
NO2
Ph
PPM

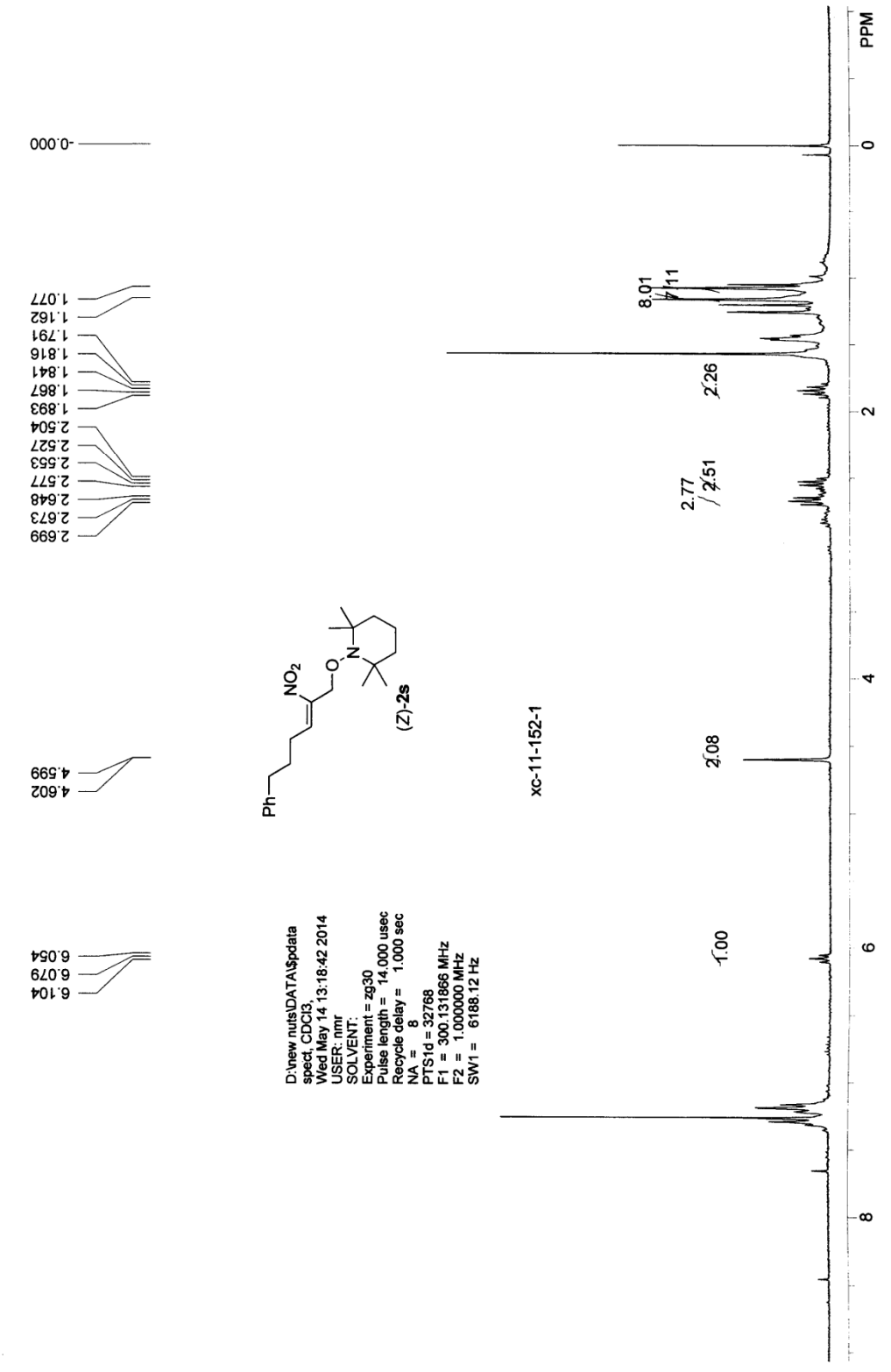

16.988
19.976
27.769
30.129
32.912
35.398
39.807
60.032
68.285
76.576
77.000
77.425
126.137
128.322
128.471
140.707
140.905
148.117
NO2
O
N
Ph
(E)-2s
xc-11-152-2 C
D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed May 14 07:20:09 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 4457
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
250
200
150
100
50
0
PPM

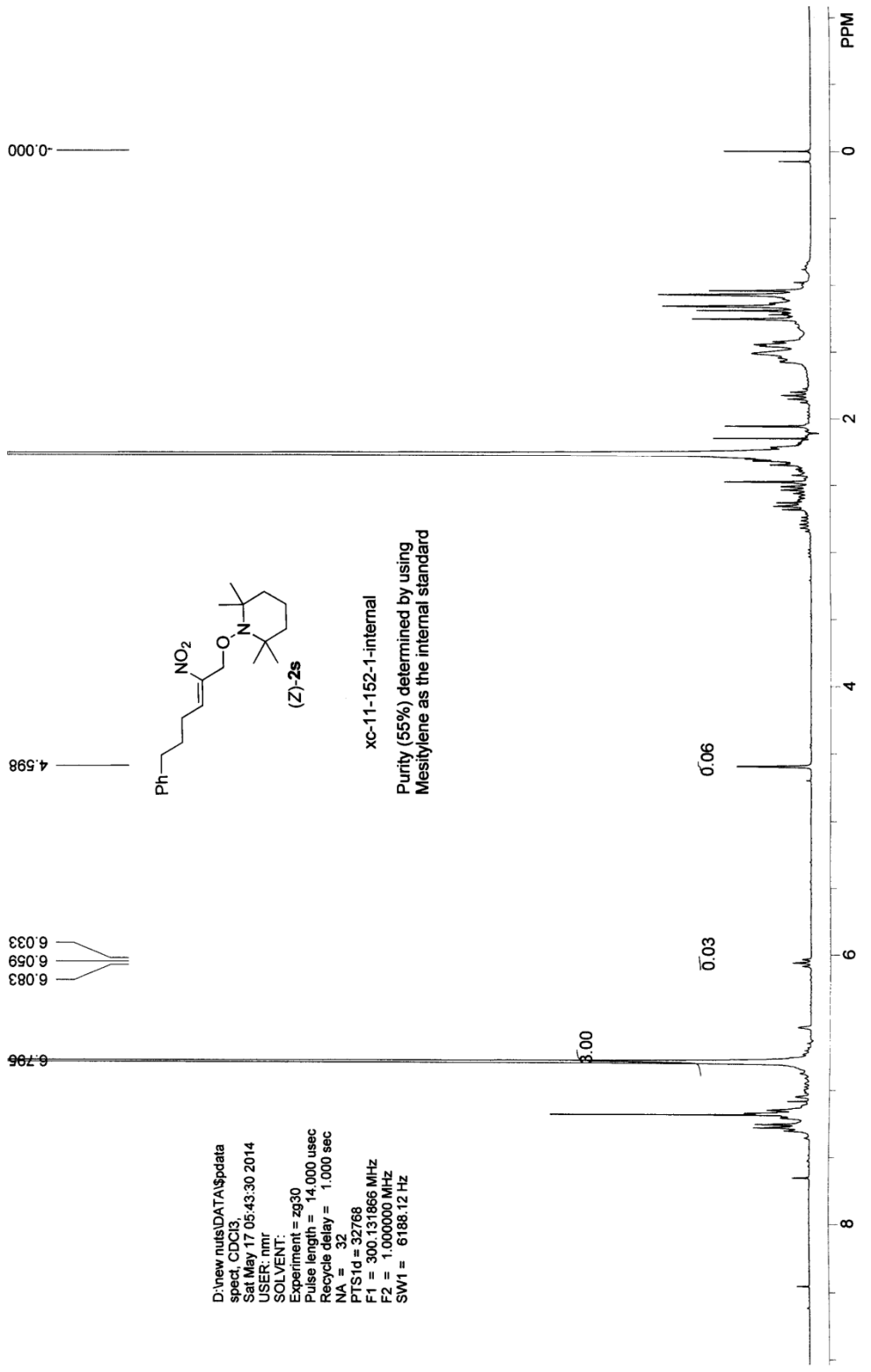


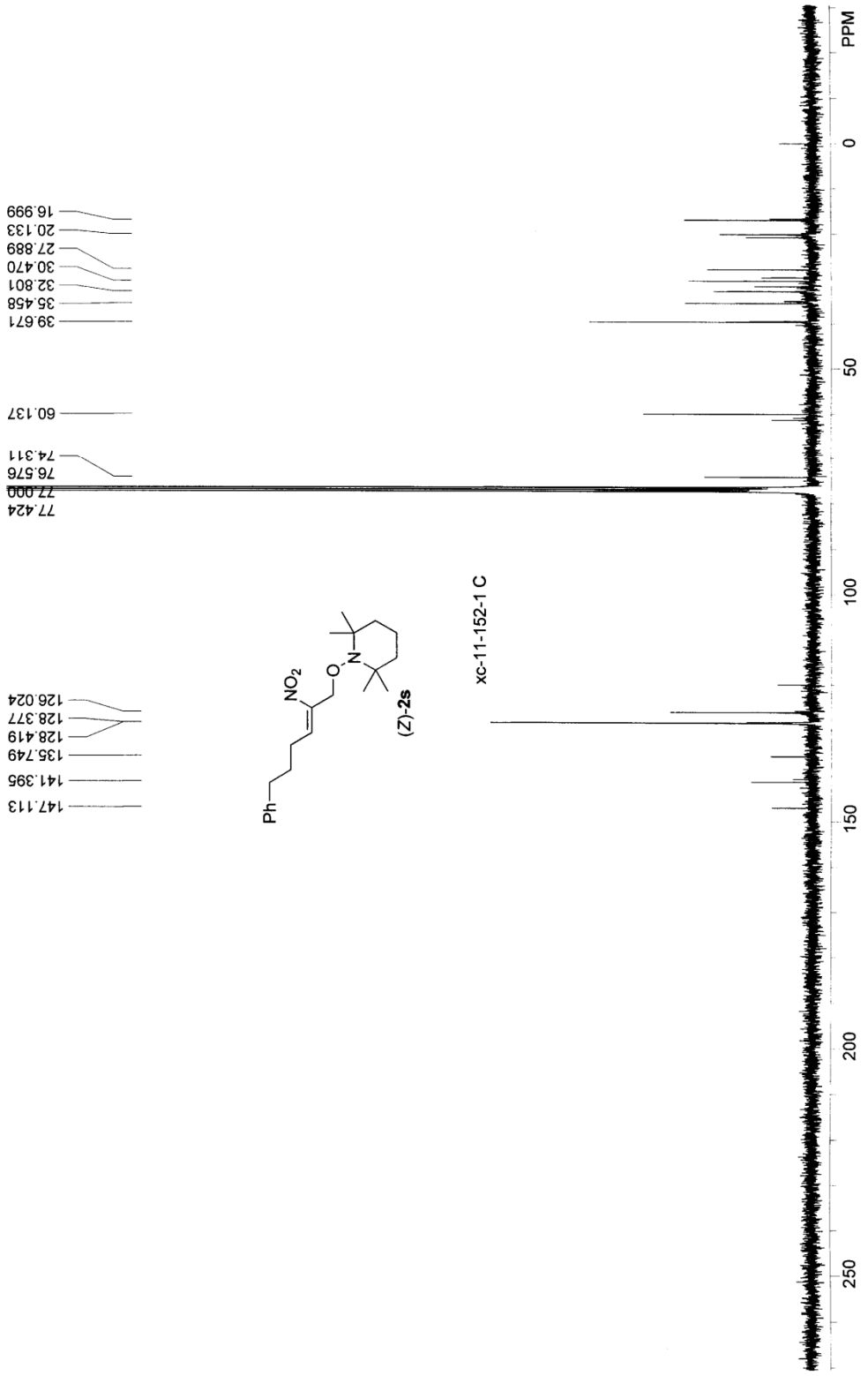
(*E*)-**2s**

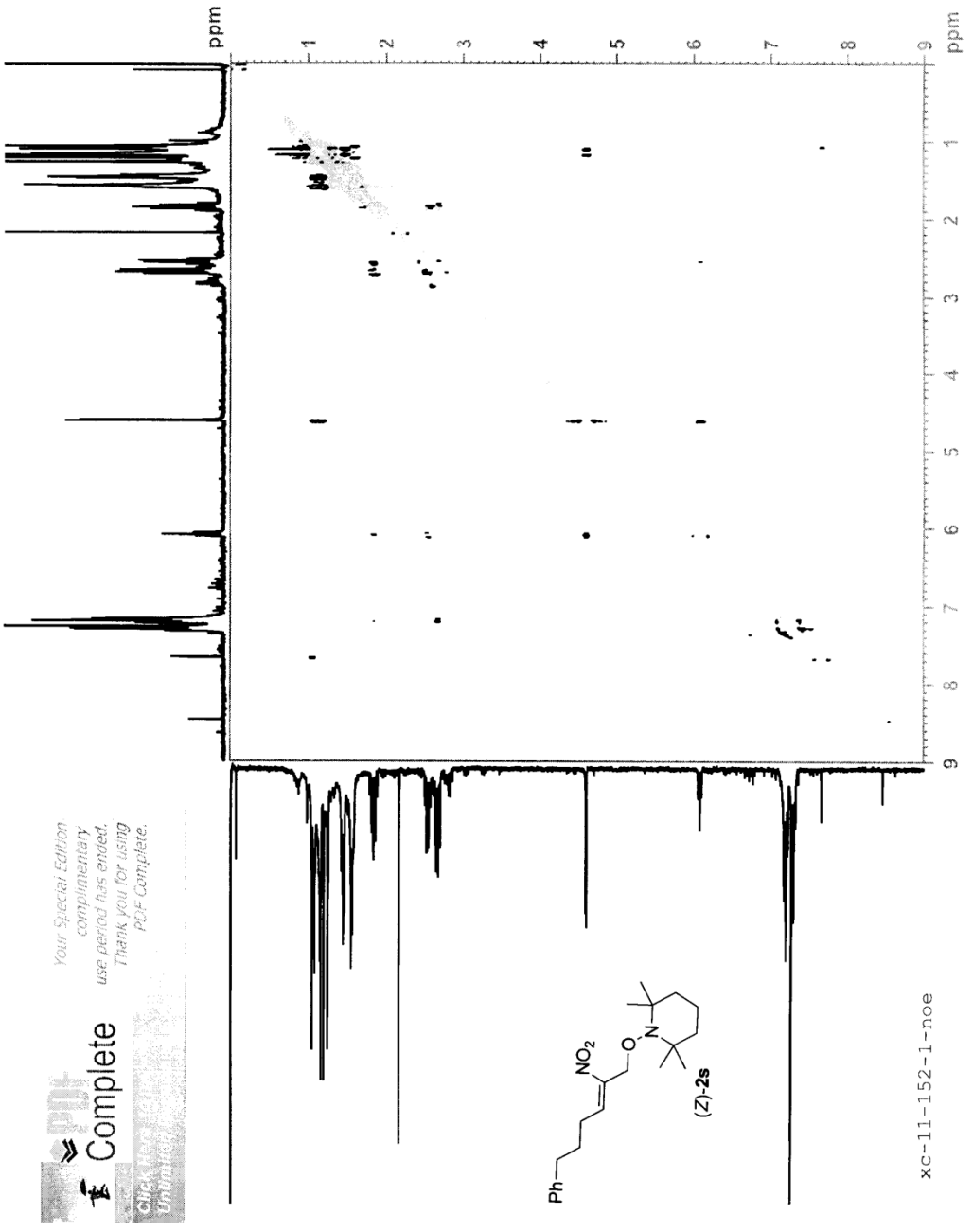
xc-11-152-2-noe

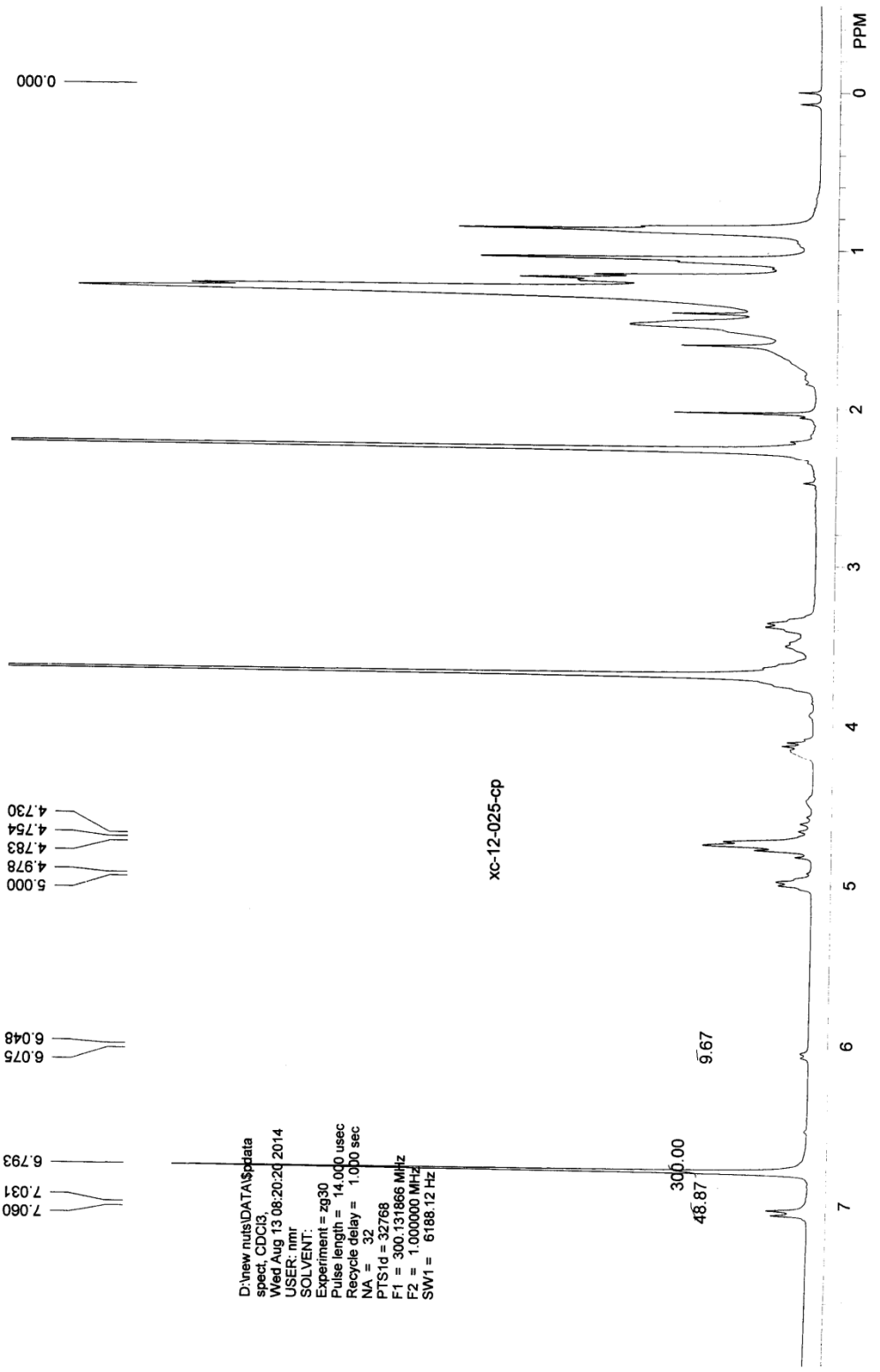


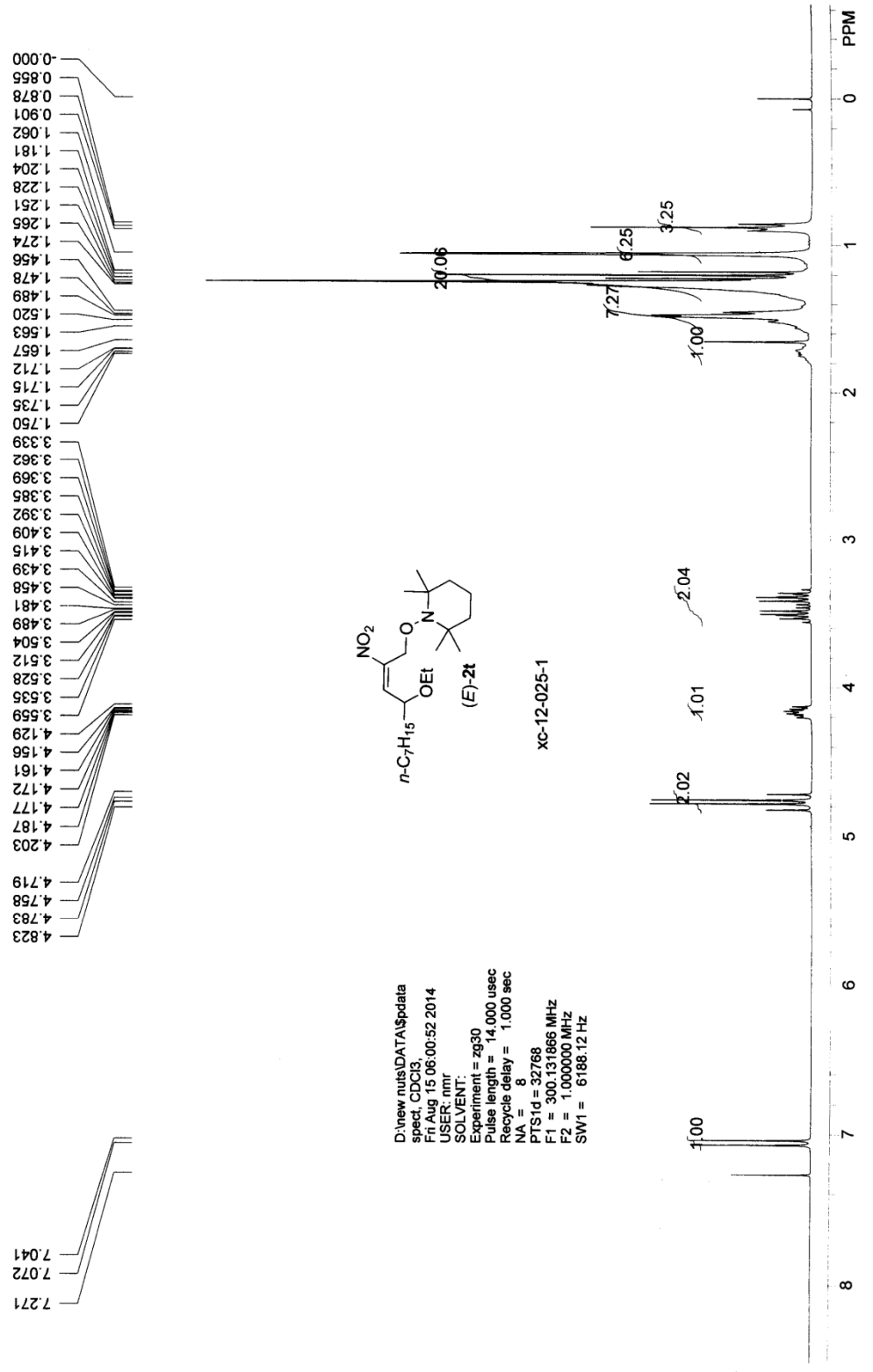

D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed May 14 13:18:42 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-11-152-1
(Z)-2s
Ph
NO2
O
N
1.00
2.08
2.77
2.51
2.26
8.01
2.11
6.104
6.079
6.054
4.602
4.599
2.699
2.673
2.648
2.577
2.553
2.527
2.504
1.893
1.867
1.841
1.816
1.791
1.162
1.077
-0.000
PPM

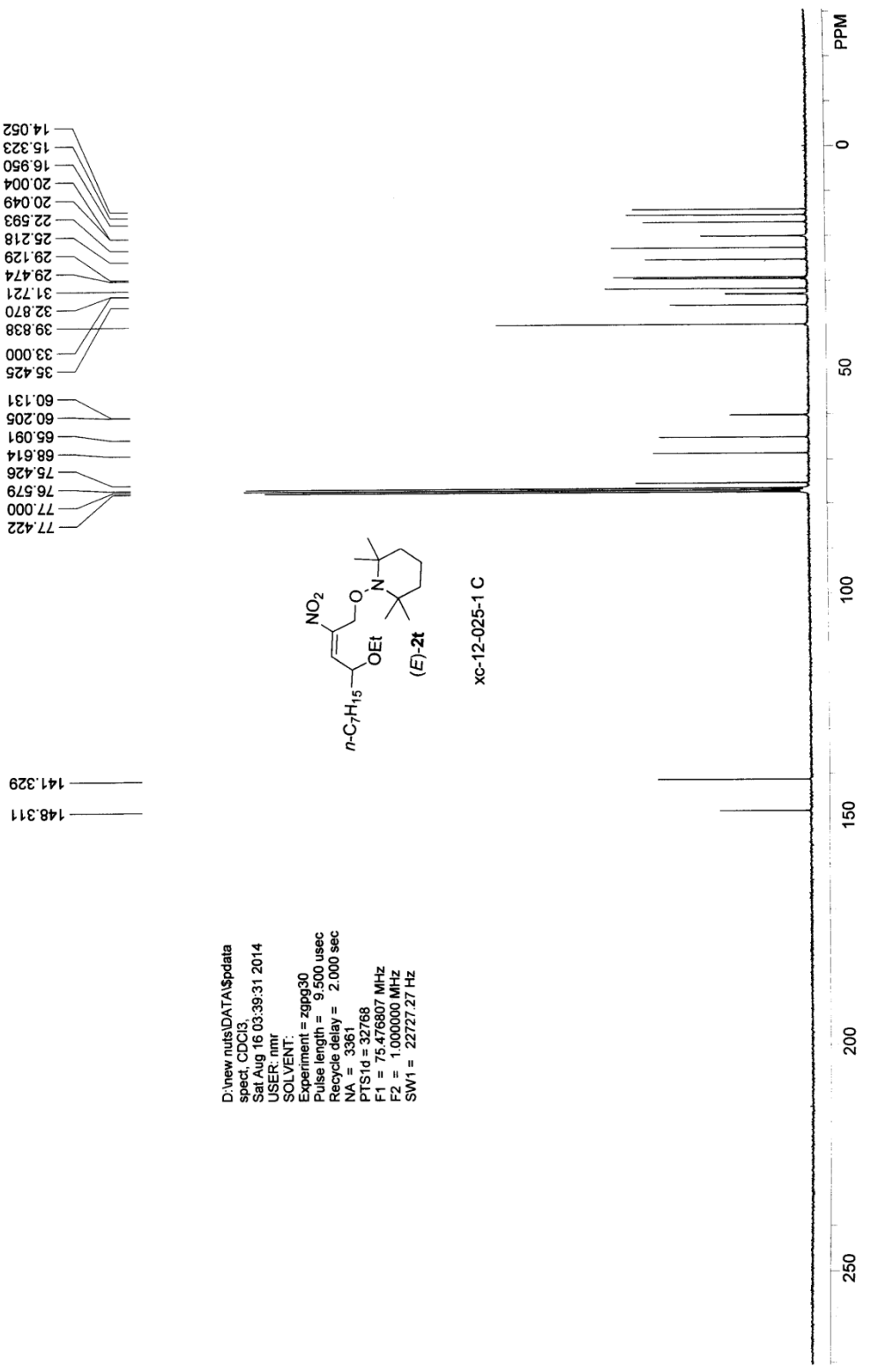

6.796
6.083
6.059
6.033
4.598
-0.000
8.00
0.03
0.06
Ph
NO2
O
N
(Z)-2s
xc-11-152-1-internal
Purity (55%) determined by using
Mesitylene as the internal standard
D:\new nuts\DATA\5pdata
spect, CDCl3,
Sat May 17 05:43:30 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
8
6
4
2
0
PPM

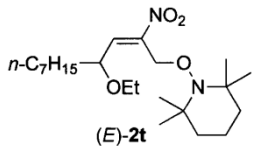

16.999
20.133
27.889
30.470
32.801
35.458
39.671
60.137
74.311
76.576
77.000
77.424
126.024
128.377
128.419
135.749
141.395
147.113
PPM
0
50
100
150
200
250
xc-11-152-1 C
(Z)-2s
NO2
O
N
Ph




0.000
4.730
4.754
4.783
4.978
5.000
6.048
6.075
6.793
7.031
7.060
xc-12-025-cp
D:\new nuts\DATA\$pdata
spect, CDCl3,
Wed Aug 13 08:20:20 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
300.00
48.87
9.67
PPM
0
1
2
3
4
5
6
7

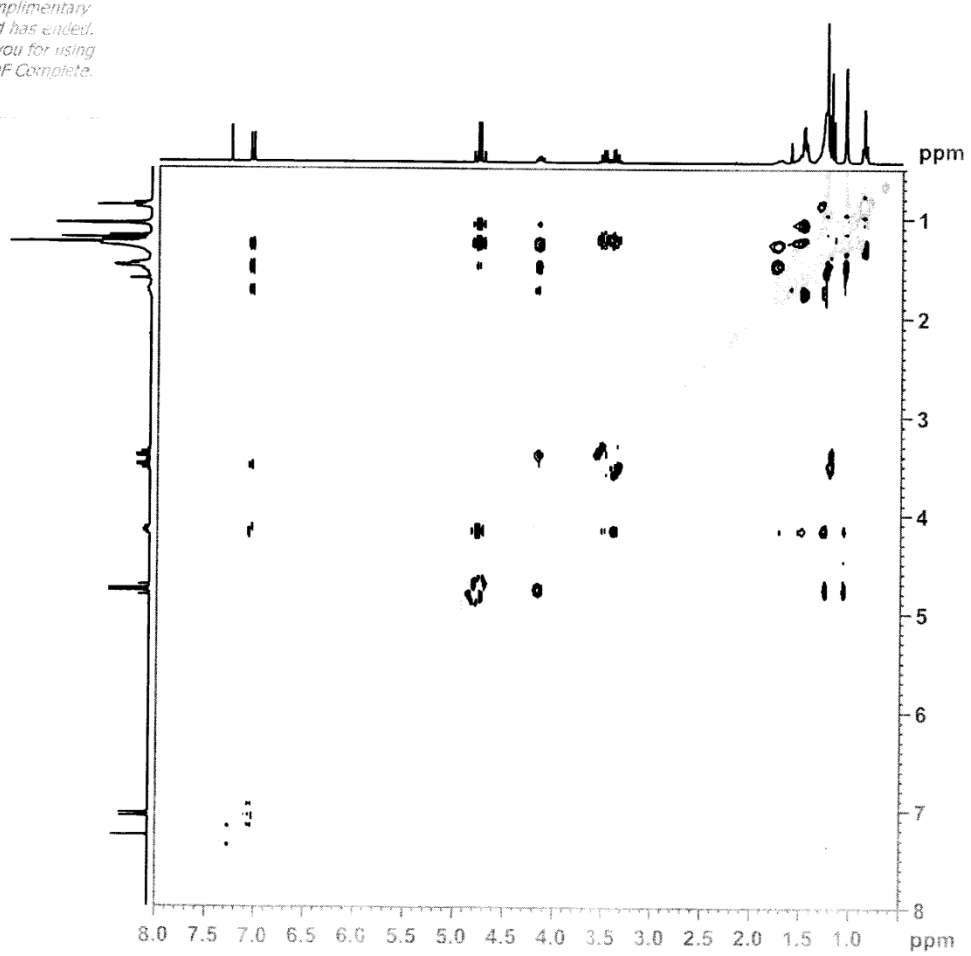

-0.000
0.855
0.878
0.901
1.062
1.181
1.204
1.228
1.251
1.265
1.274
1.456
1.478
1.489
1.520
1.563
1.657
1.712
1.715
1.735
1.750
3.339
3.362
3.369
3.385
3.392
3.409
3.415
3.439
3.458
3.481
3.489
3.504
3.512
3.528
3.535
3.559
4.129
4.156
4.161
4.172
4.177
4.187
4.203
4.719
4.758
4.783
4.823
7.041
7.072
7.271
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 15 06:00:52 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-025-1
(E)-2t
PPM

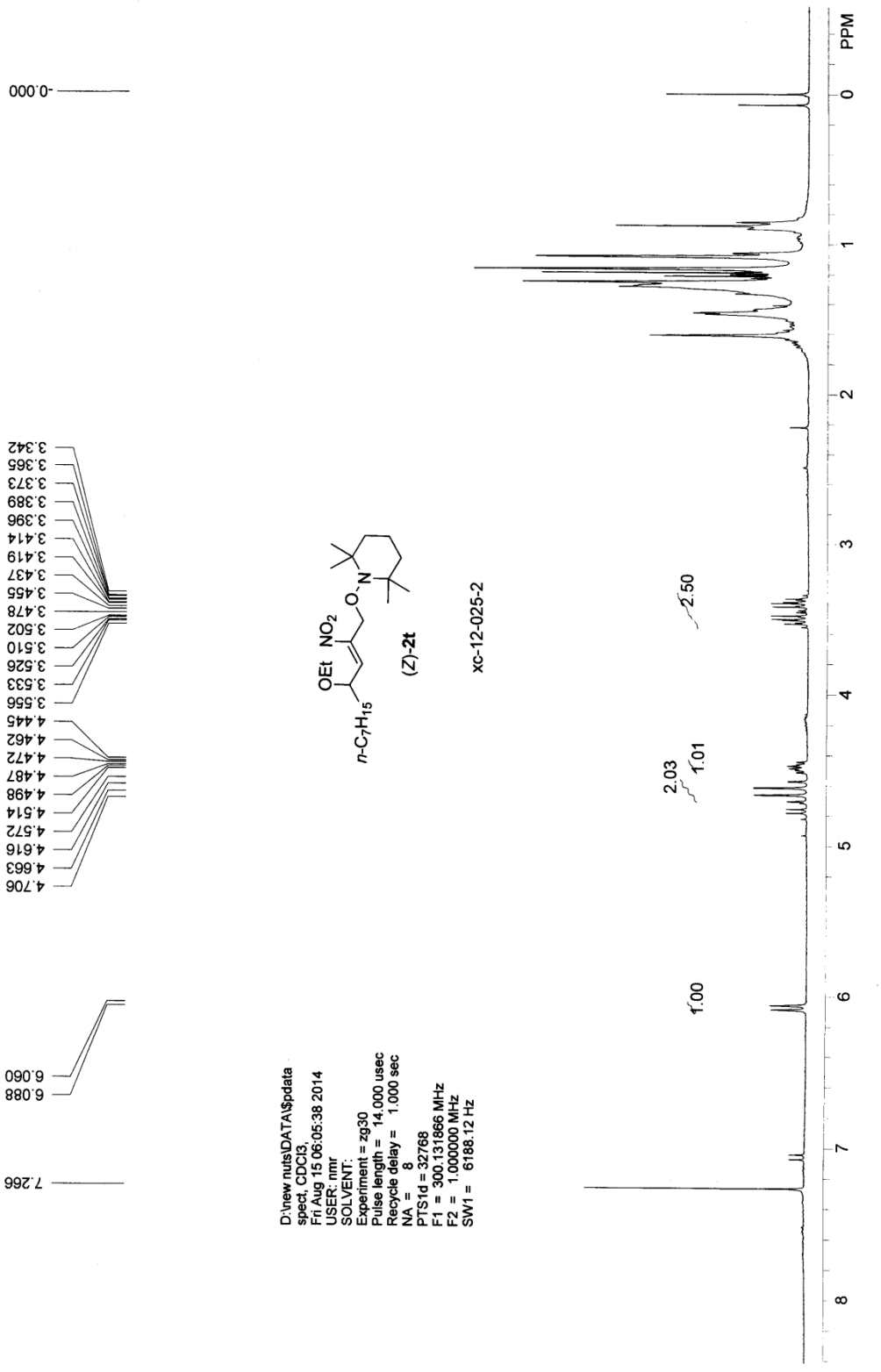

14.052
15.323
16.950
20.004
20.049
22.593
25.218
29.129
29.474
31.721
32.870
39.838
33.000
35.425
60.131
60.205
65.091
68.614
75.426
76.579
77.000
77.422
141.329
148.311
PPM
0
50
100
150
200
250
NO2
O
N
OEt
n-C7H15
(E)-2t
xc-12-025-1 C
D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Aug 16 03:39:31 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 3361
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

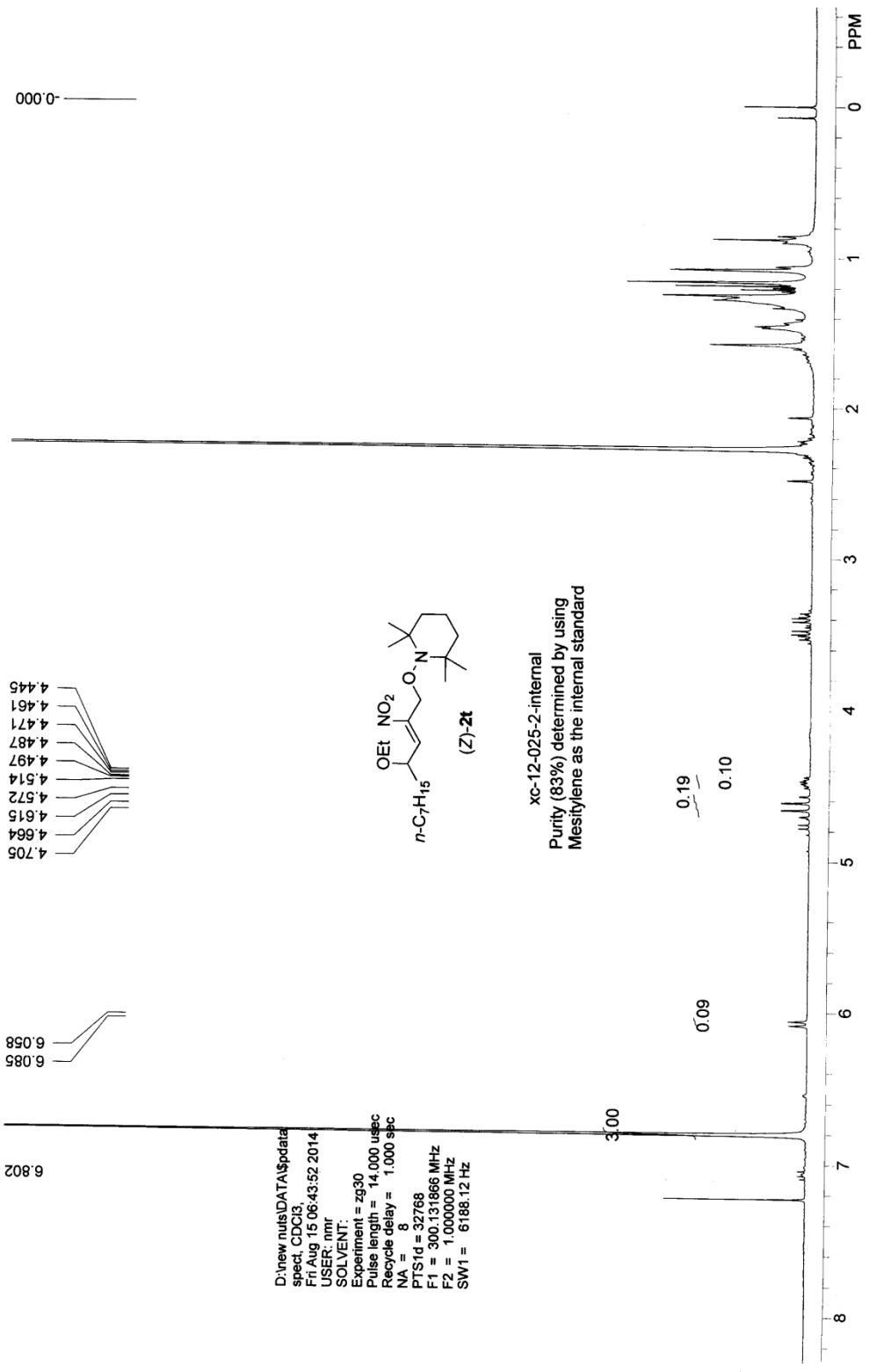


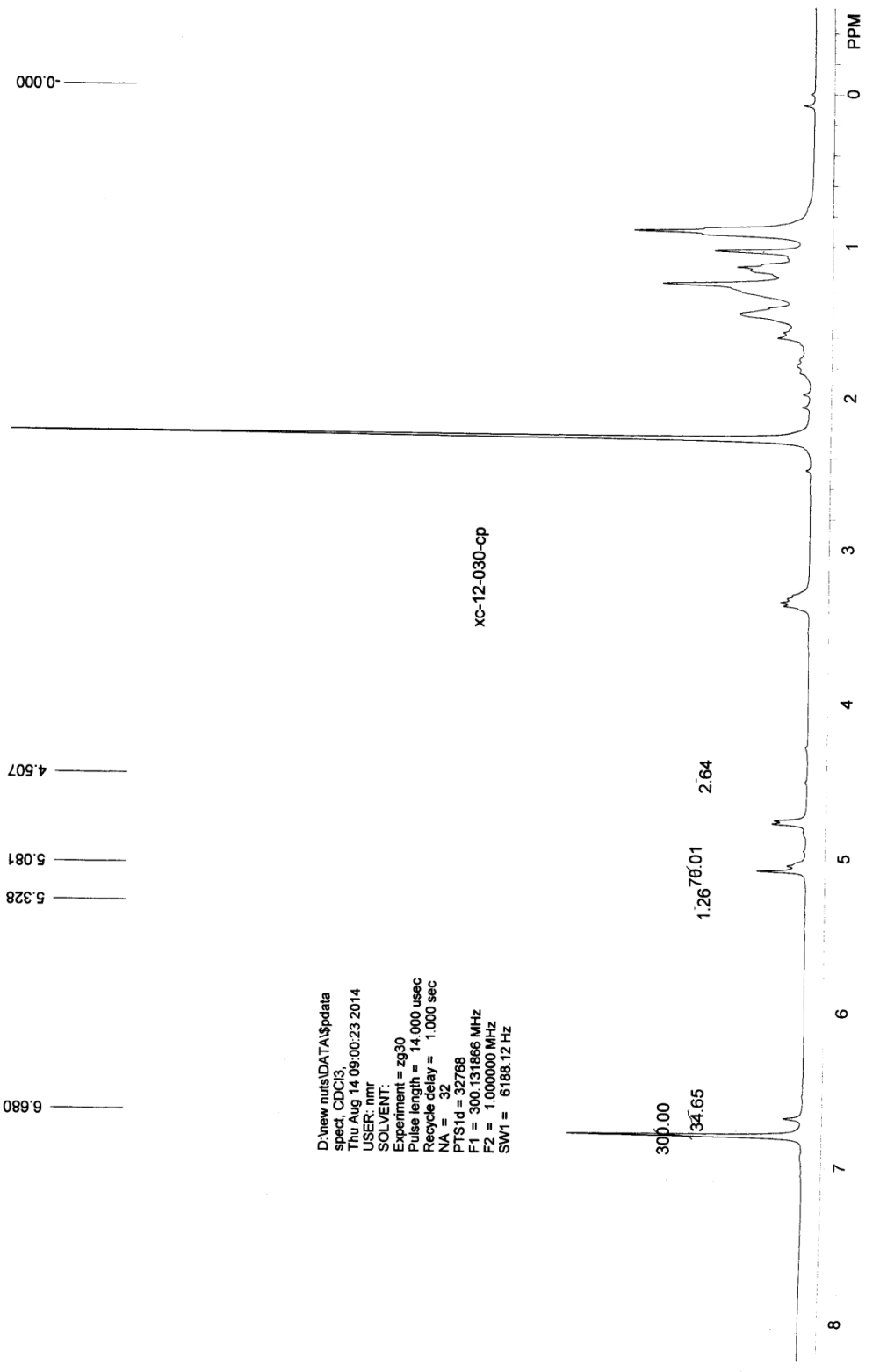
(*E*)-**2t**

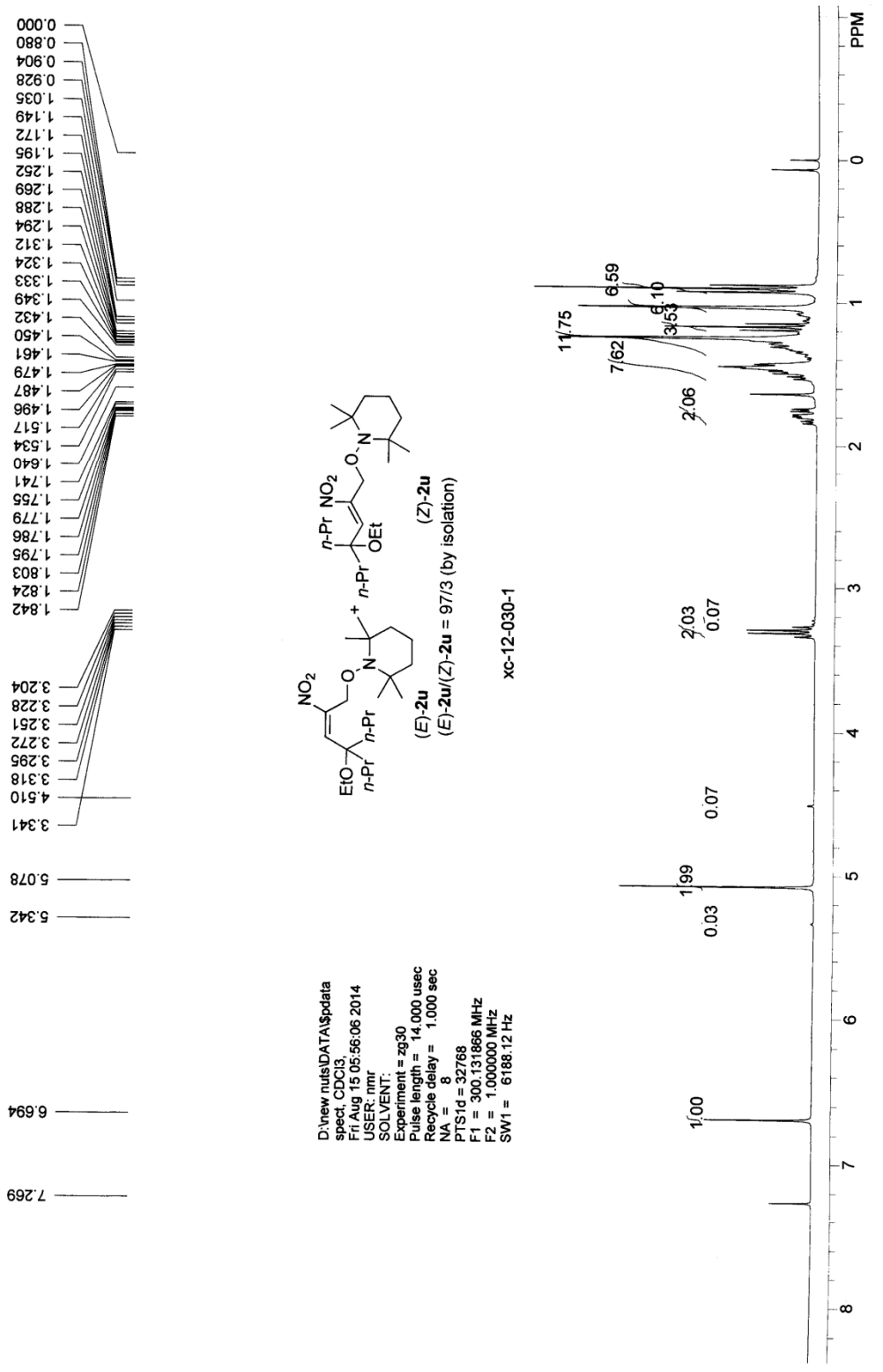
xc-12-025-1-noe

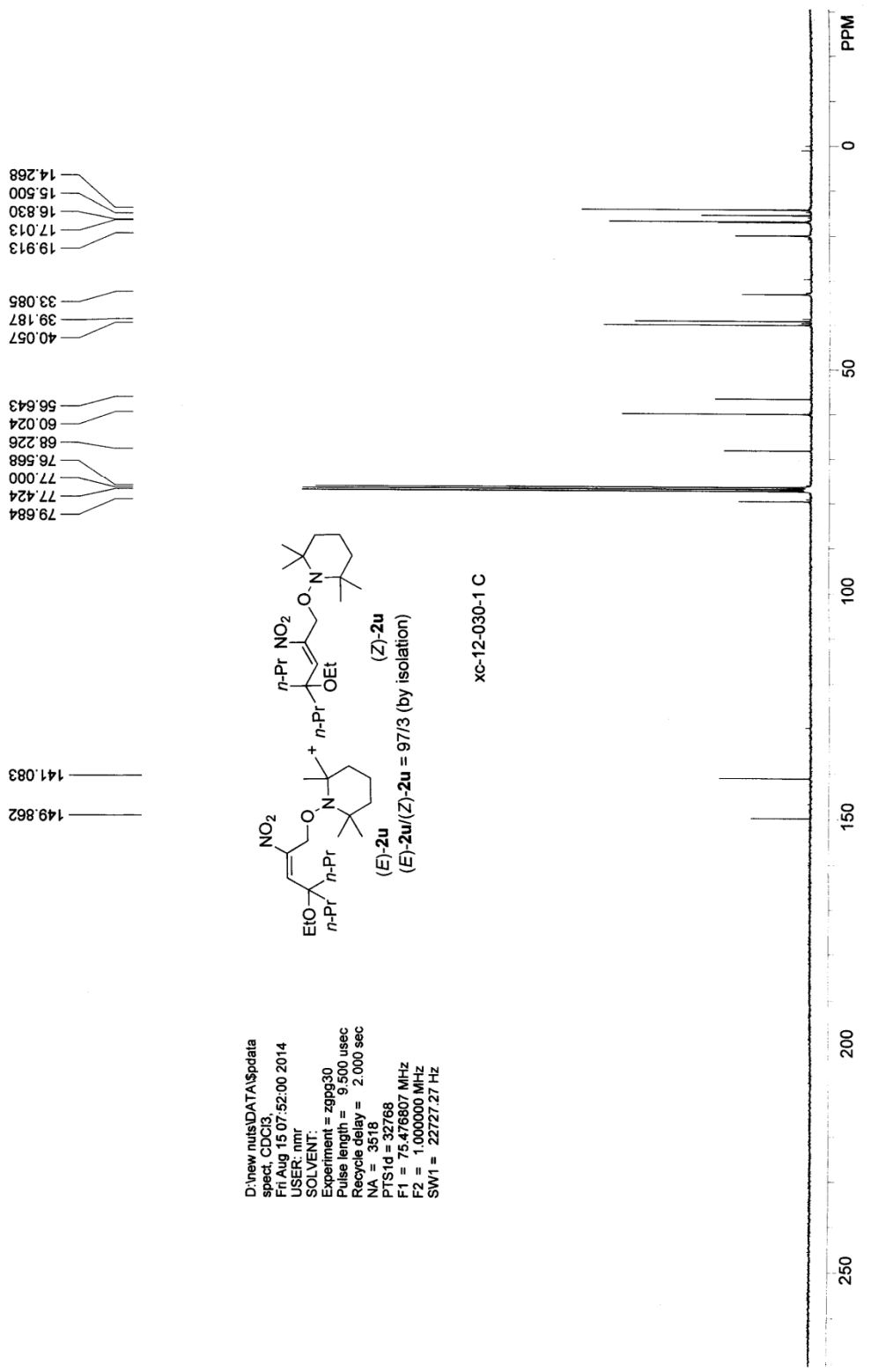


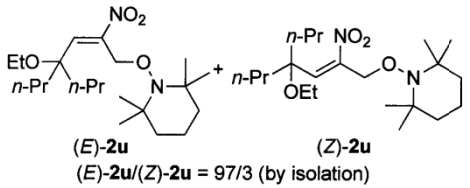

D:\new nuts\DATA\5pdata
spect, CDCl3,
Fri Aug 15 06:05:38 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
OEt NO2
n-C7H15
(Z)-2t
xc-12-025-2
7.266
6.088
6.060
4.706
4.663
4.616
4.572
4.514
4.498
4.487
4.472
4.462
4.445
3.556
3.533
3.526
3.510
3.502
3.478
3.455
3.437
3.419
3.414
3.396
3.389
3.373
3.365
3.342
1.00
2.03
1.01
2.50
PPM


D:\new nuts\DATA\5pdata
spect, CDCl3,
Fri Aug 15 06:43:52 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
6.802
6.085
6.058
4.705
4.664
4.615
4.572
4.514
4.497
4.487
4.471
4.461
4.445
-0.000
OEt NO2
n-C7H15
(Z)-2t
xc-12-025-2-internal
Purity (83%) determined by using
Mesitylene as the internal standard
3.00
0.09
0.19
0.10
PPM


-0.000
6.680
5.328
5.081
4.507
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Aug 14 09:00:23 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-030-cp
300.00
34.65
1.26
76.01
2.64
8
7
6
5
4
3
2
1
0
PPM


0.000
0.880
0.904
0.928
1.035
1.149
1.172
1.195
1.252
1.269
1.288
1.294
1.312
1.324
1.333
1.349
1.432
1.450
1.461
1.479
1.487
1.496
1.517
1.534
1.640
1.741
1.755
1.779
1.786
1.795
1.803
1.824
1.842
3.204
3.228
3.251
3.272
3.295
3.318
4.510
3.341
5.078
5.342
6.694
7.269
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 15 05:56:06 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
(E)-2u
(Z)-2u
(E)-2u/(Z)-2u = 97/3 (by isolation)
xc-12-030-1
1.00
0.03
1.99
0.07
2.03
0.07
2.06
7.62
11.75
3.53
6.10
6.59
PPM

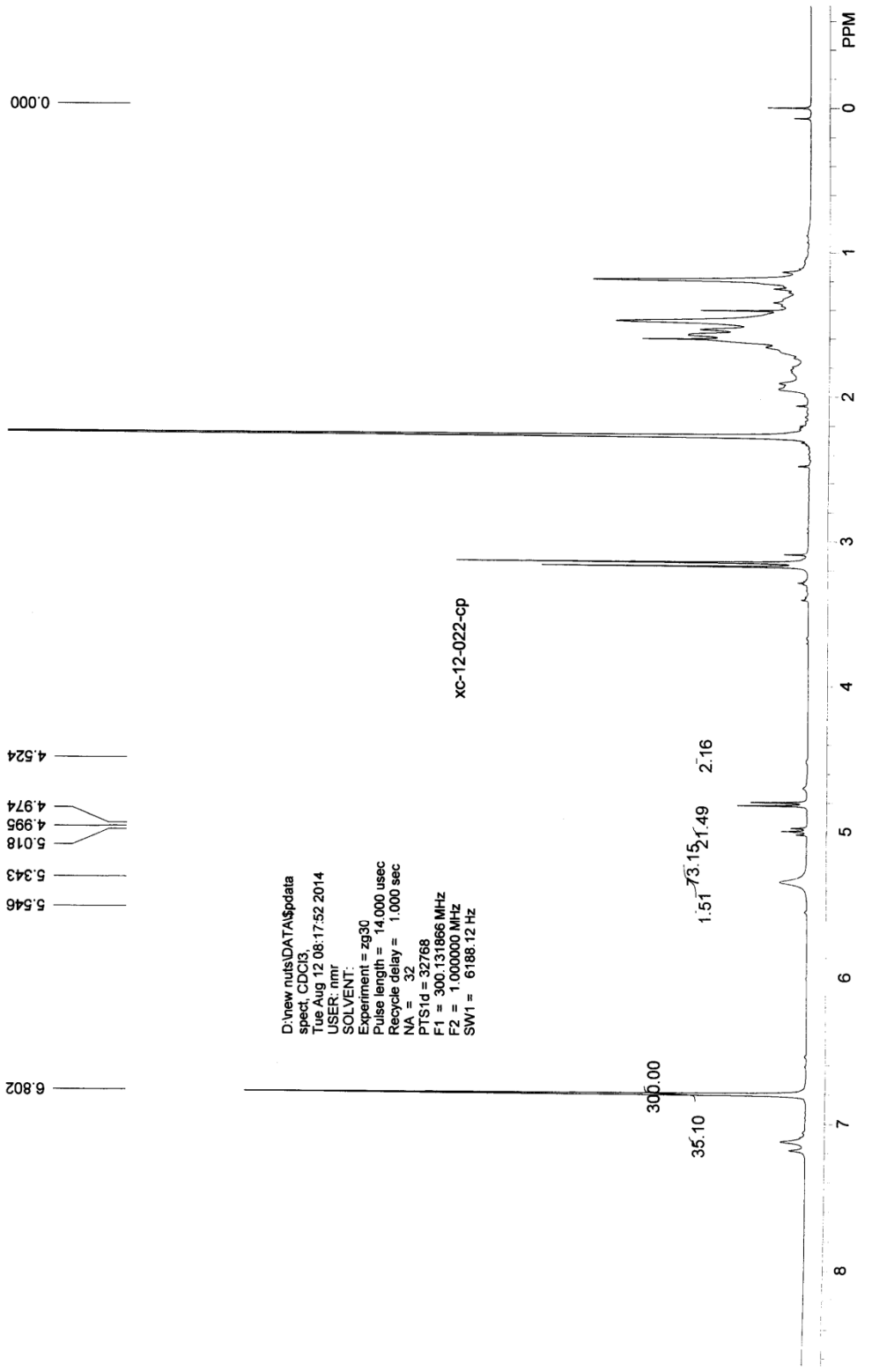

D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 15 07:52:00 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 3518
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
(E)-2u
(E)-2u/(Z)-2u = 97/3 (by isolation)
(Z)-2u
xc-12-030-1 C
PPM
250
200
150
100
50
0
141.083
149.862
79.684
77.424
77.000
76.568
68.226
60.024
56.643
40.057
39.187
33.085
19.913
17.013
16.830
15.500
14.268

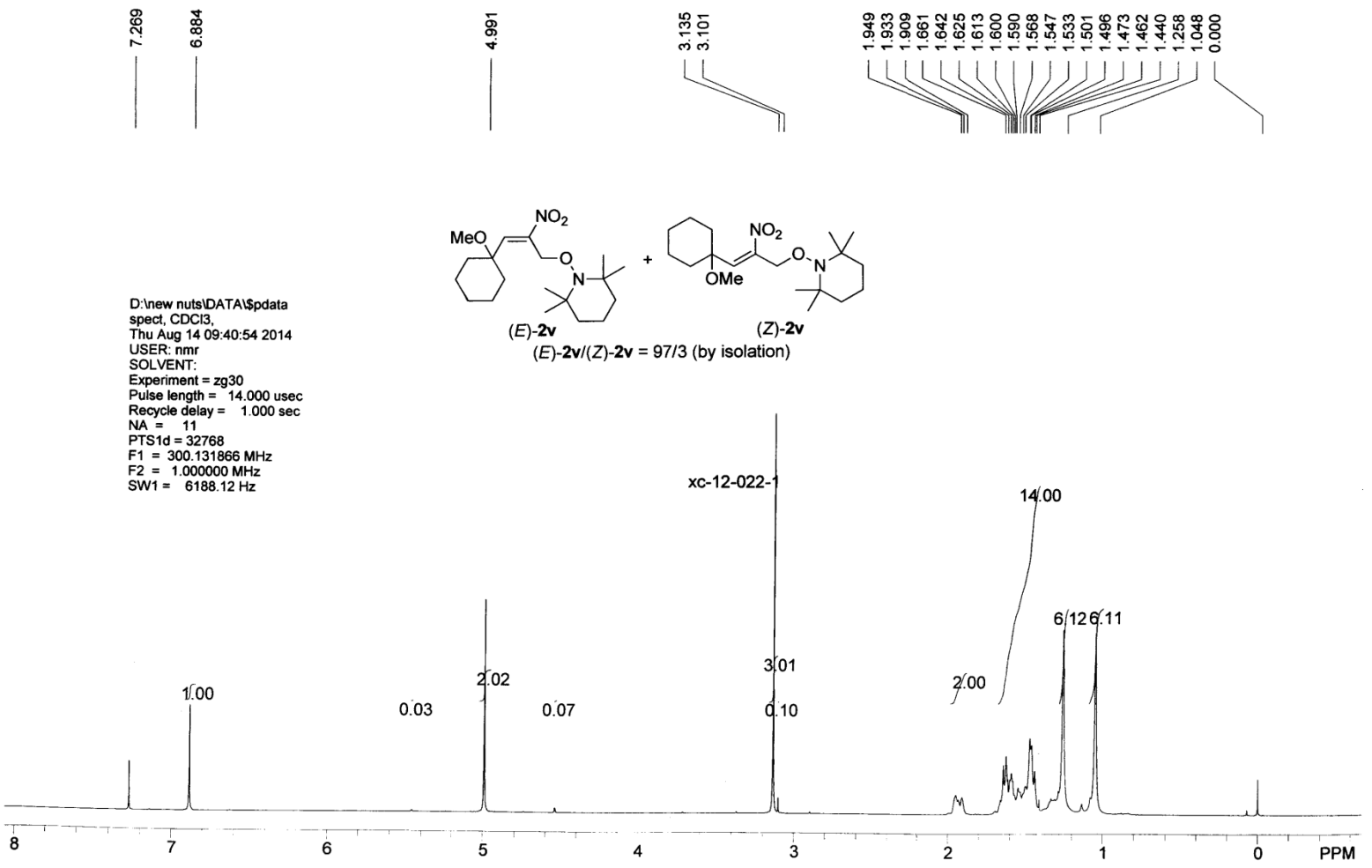


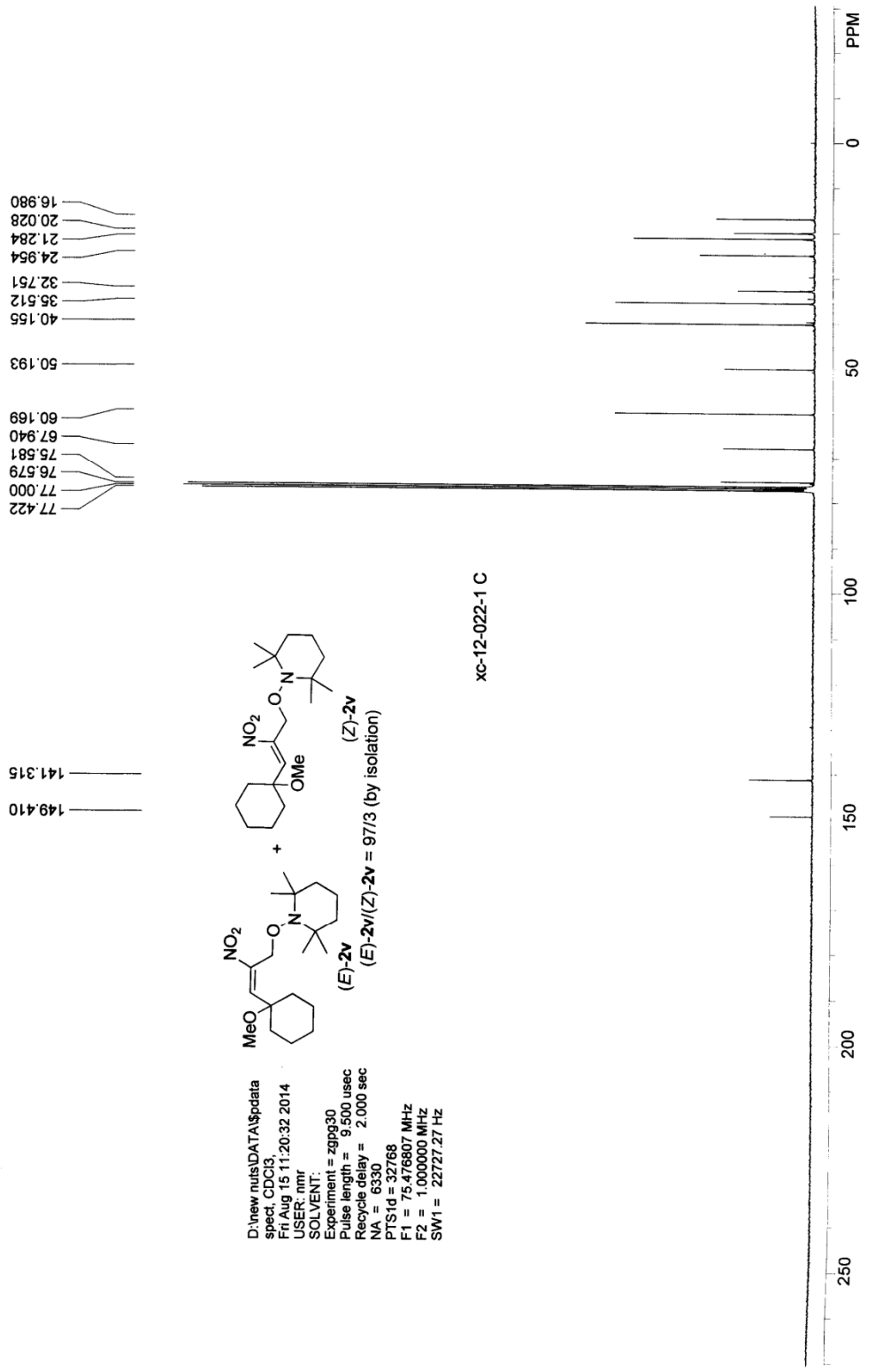
(*E*)-**2u** (*Z*)-**2u**

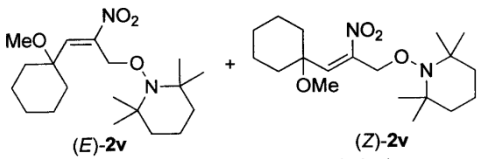
(*E*)-**2u**/(*Z*)-**2u** = 97/3 (by isolation)

xc-12-030-1-noe


0.000
6.802
5.546
5.343
5.018
4.995
4.974
4.524
D:\new nuts\DATA\$pdata
spect, CDCl3,
Tue Aug 12 08:17:52 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-022-cp
300.00
35.10
1.51
73.15
21.49
2.16
PPM
0
1
2
3
4
5
6
7
8


7.269
6.884
4.991
3.135
3.101
1.949
1.933
1.909
1.661
1.642
1.625
1.613
1.600
1.590
1.568
1.547
1.533
1.501
1.496
1.473
1.462
1.440
1.258
1.048
0.000
MeO
NO2
O
N
OMe
(E)-2v
(Z)-2v
(E)-2v/(Z)-2v = 97/3 (by isolation)
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Aug 14 09:40:54 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 11
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-022-1
1.00
0.03
2.02
0.07
3.01
0.10
2.00
14.00
6.12
6.11
8
7
6
5
4
3
2
1
0
PPM

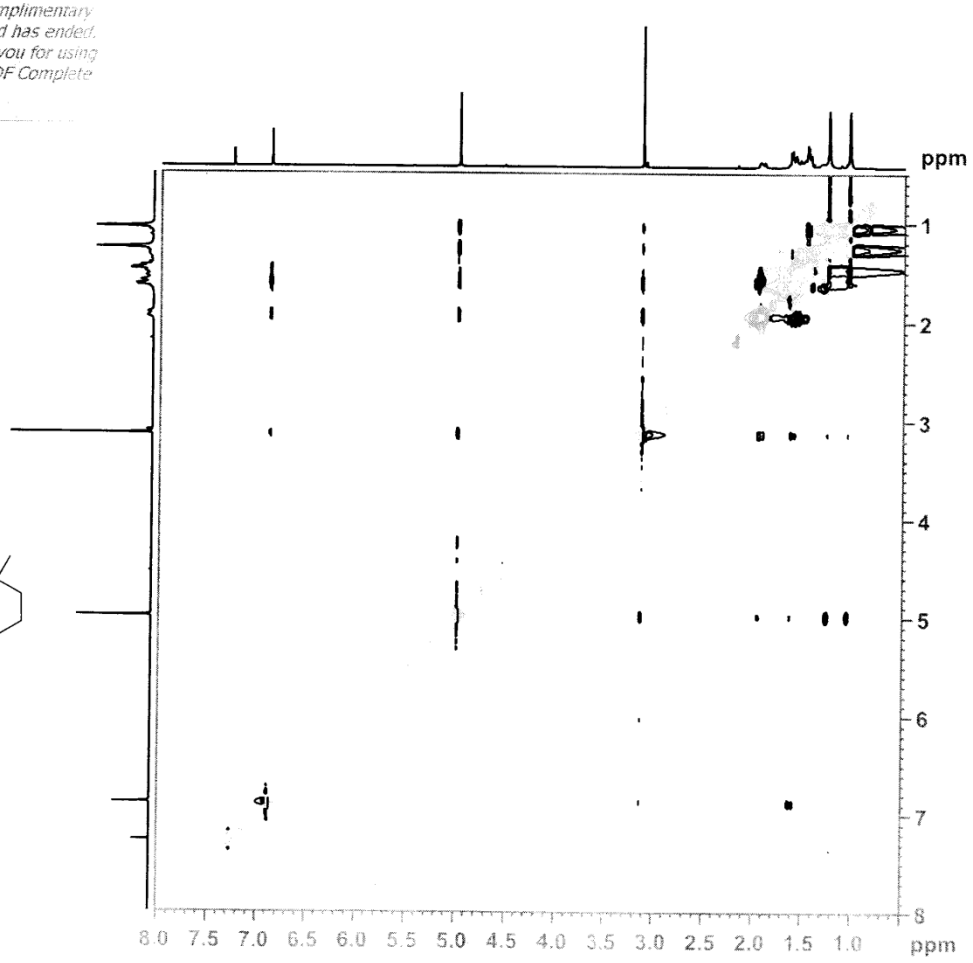

16.980
20.028
21.284
24.954
32.751
35.512
40.155
50.193
60.169
67.940
75.581
76.579
77.000
77.422
141.315
149.410
PPM
0
50
100
150
200
250
xc-12-022-1 C
(E)-2v/(Z)-2v = 97/3 (by isolation)
(E)-2v
(Z)-2v
MeO
OMe
NO2
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 15 11:20:32 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 6330
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz

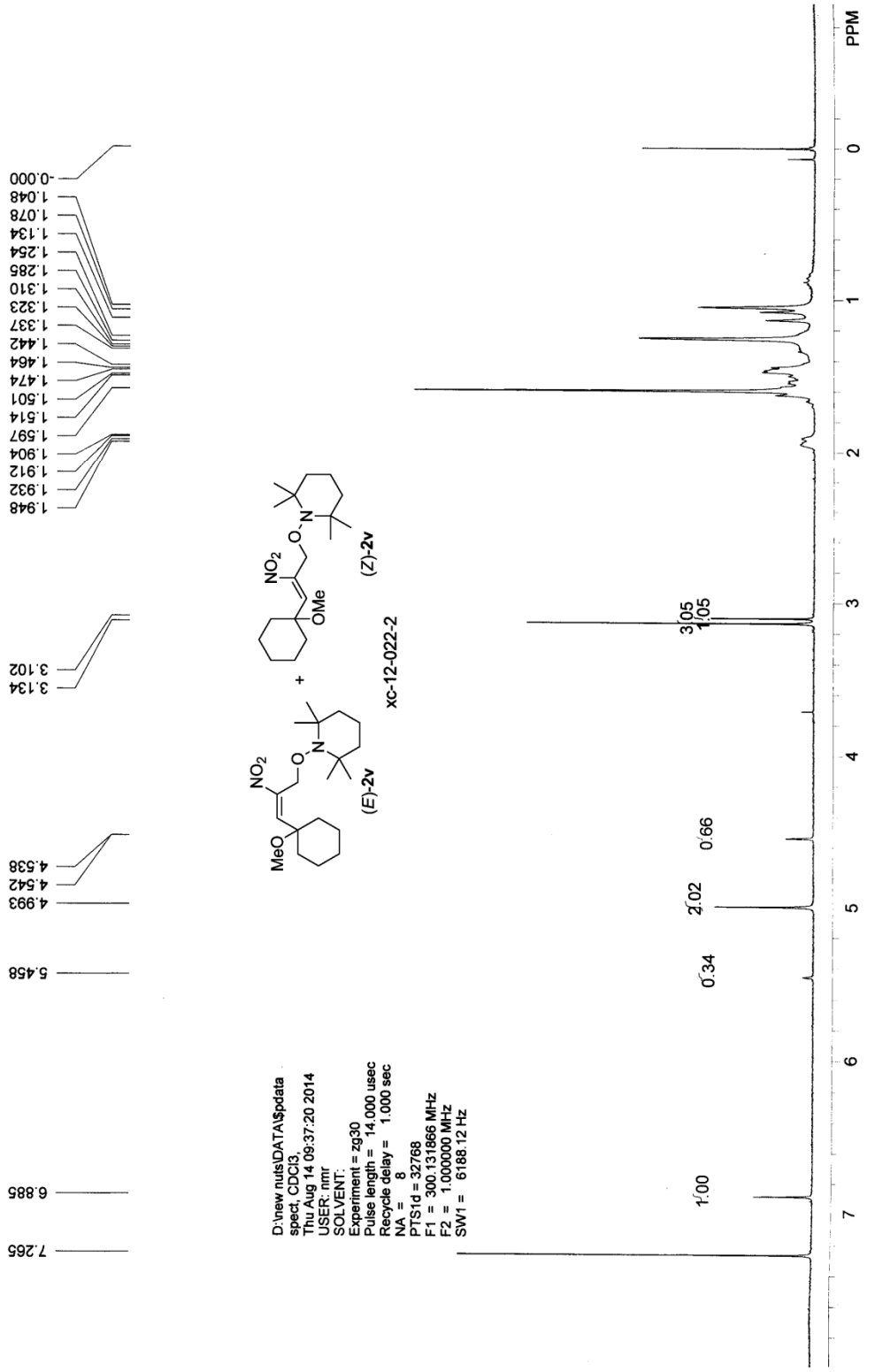


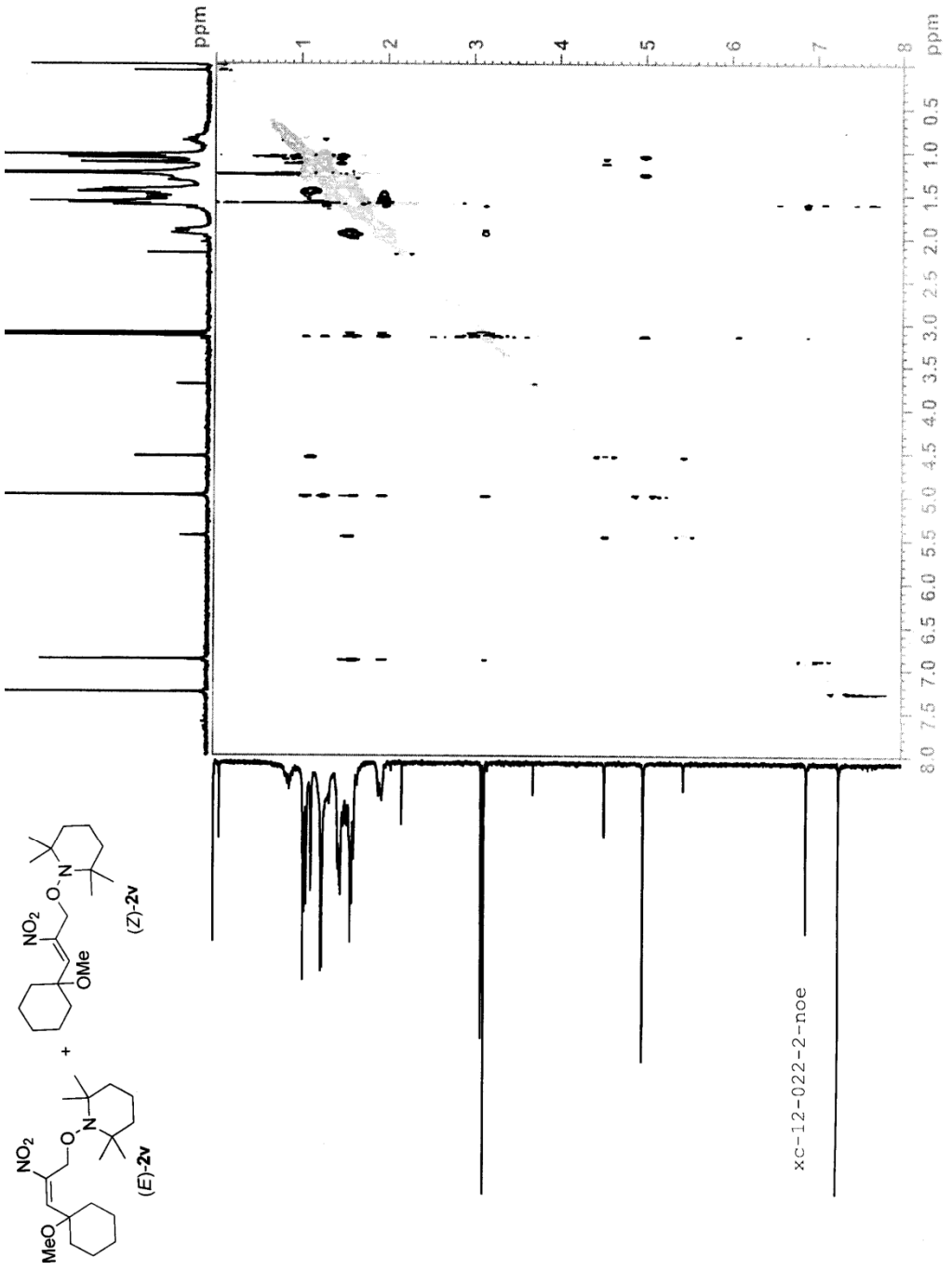
(*E*)-**2v** (*Z*)-**2v**

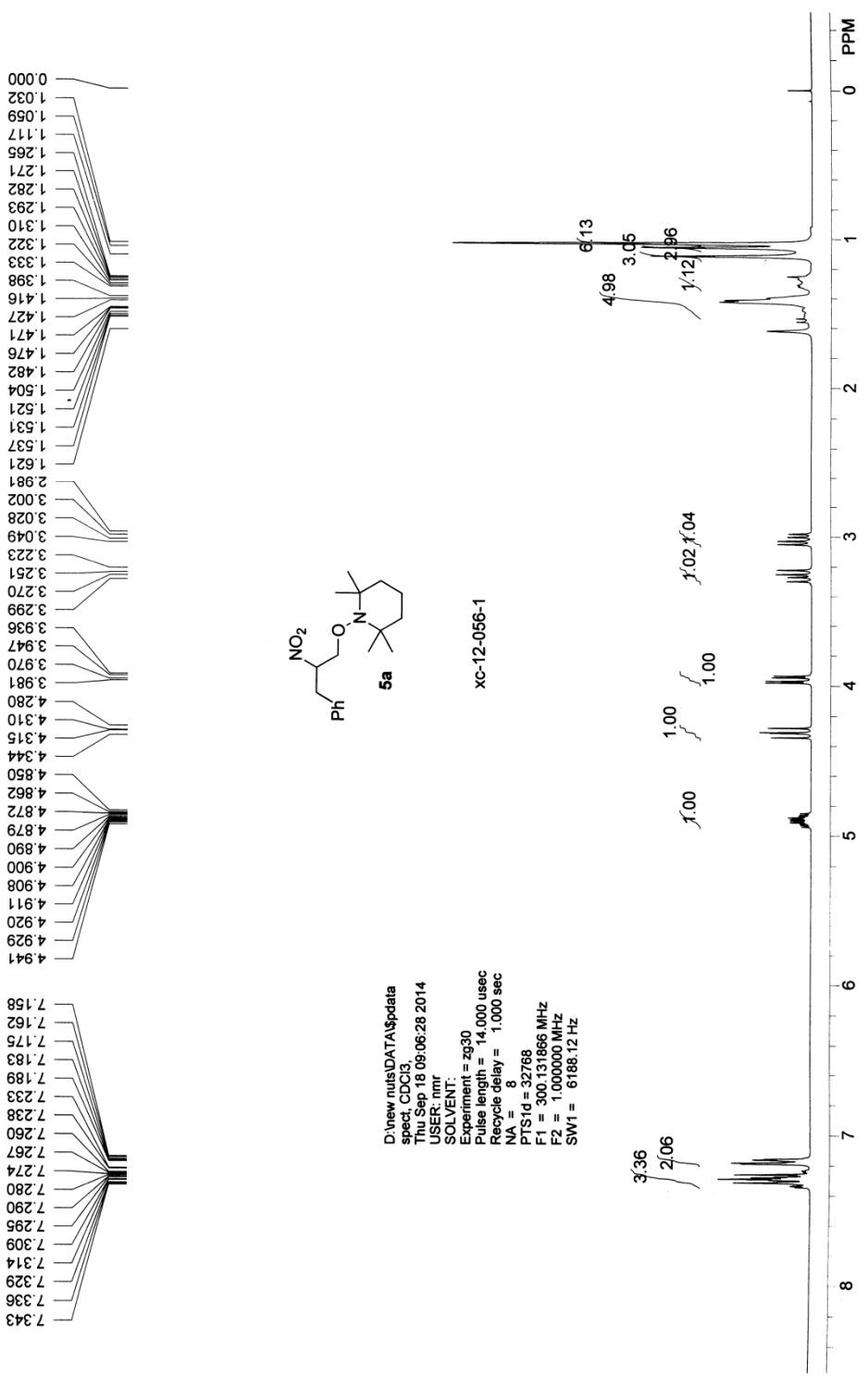
(*E*)-**2v**/(*Z*)-**2v** = 97/3 (by isolation)

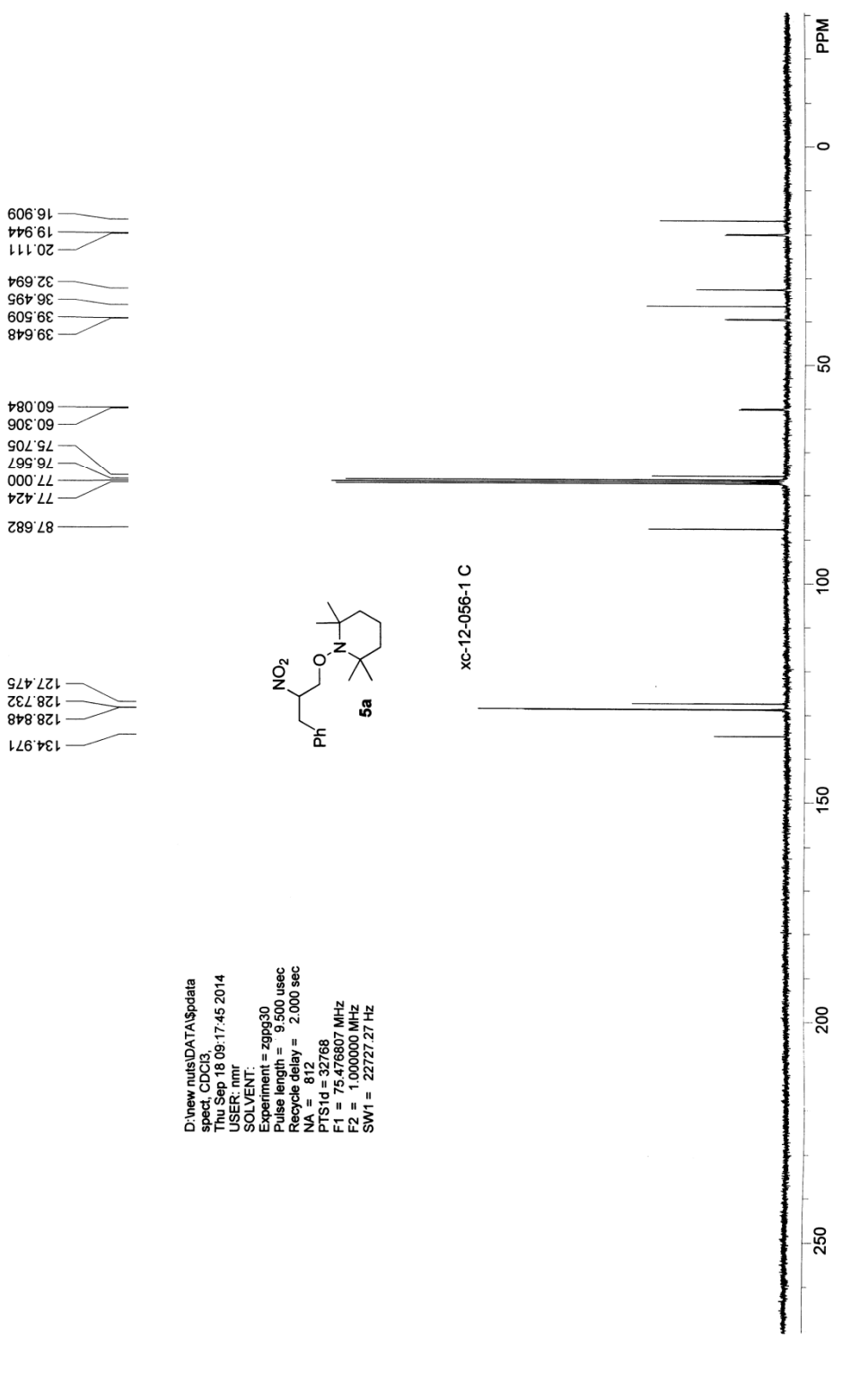
xc-12-022-1-noe

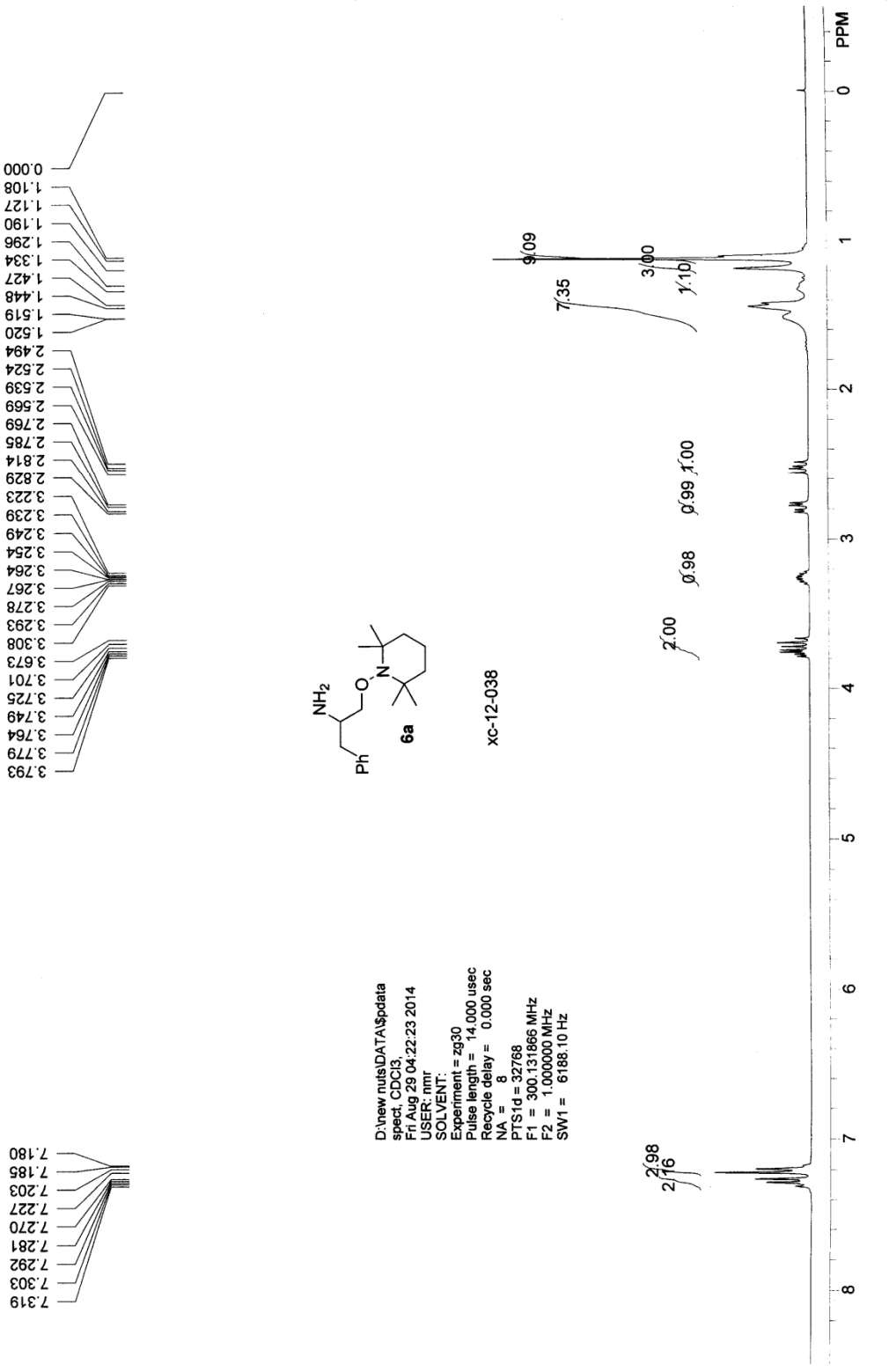


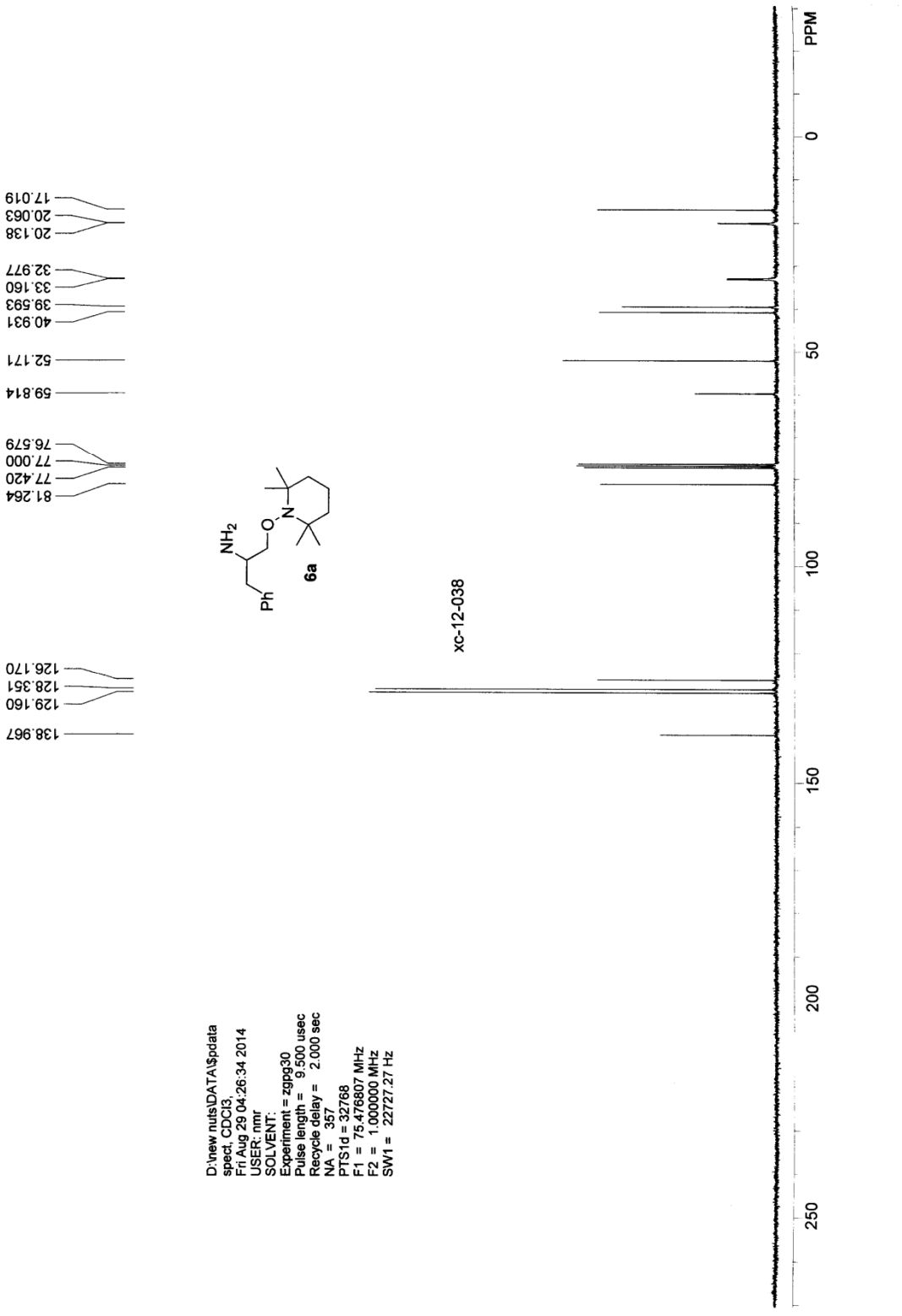

-0.000
1.048
1.078
1.134
1.254
1.285
1.310
1.323
1.337
1.442
1.464
1.474
1.501
1.514
1.597
1.904
1.912
1.932
1.948
3.102
3.134
4.538
4.542
4.993
5.458
6.885
7.265
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Aug 14 09:37:20 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131886 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-022-2
(E)-2v
(Z)-2v
1.00
0.34
2.02
0.66
3.05
1.05
PPM

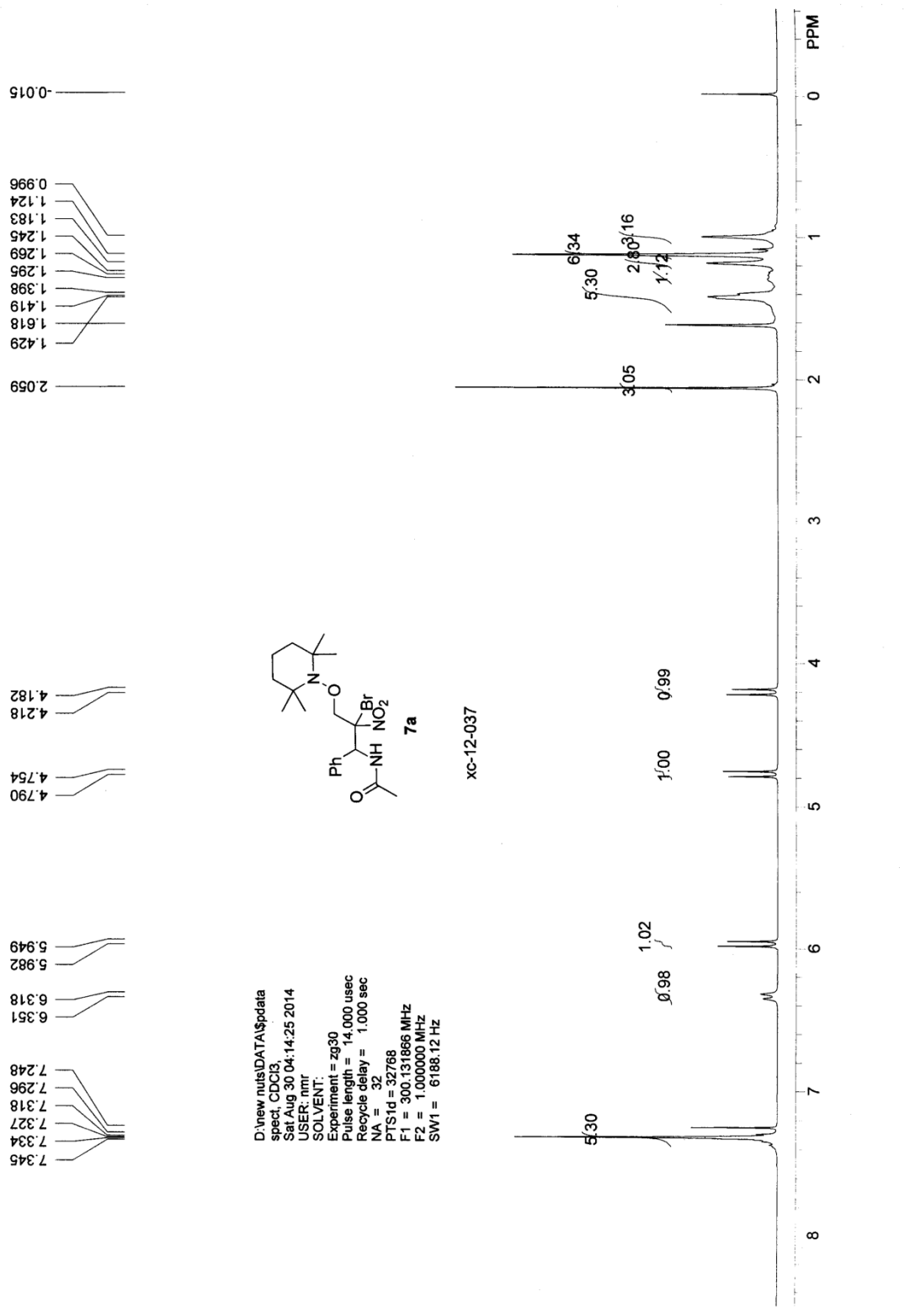

ppm
1
2
3
4
5
6
7
8
ppm
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
xc-12-022-2-noe
NO2
OMe
(Z)-2v
+
NO2
MeO
(E)-2v

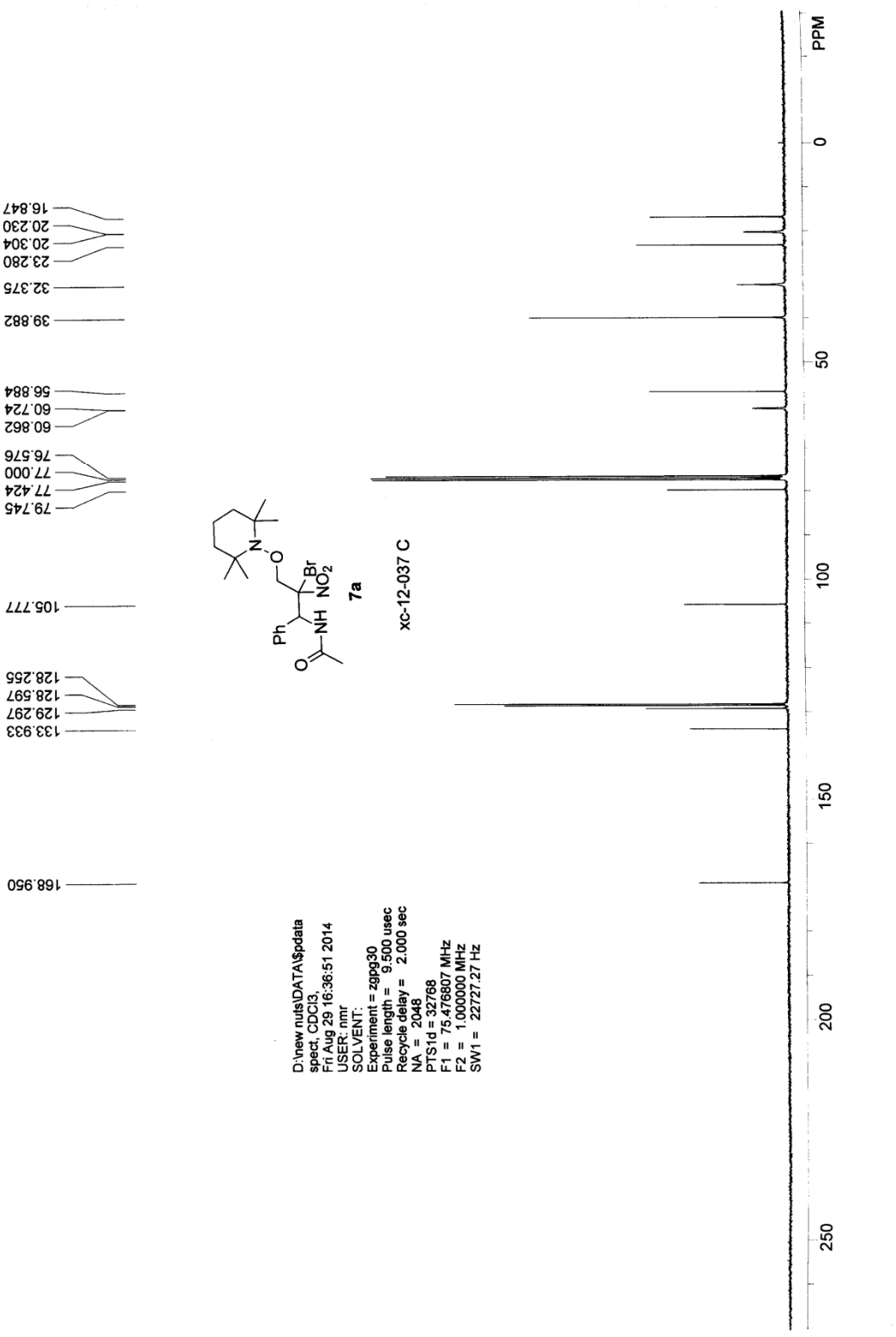

0.000
1.032
1.059
1.117
1.265
1.271
1.282
1.293
1.310
1.322
1.333
1.398
1.416
1.427
1.471
1.476
1.482
1.504
1.521
1.531
1.537
1.621
2.981
3.002
3.028
3.049
3.223
3.251
3.270
3.299
3.936
3.947
3.970
3.981
4.280
4.310
4.315
4.344
4.850
4.862
4.872
4.879
4.890
4.900
4.908
4.911
4.920
4.929
4.941
7.158
7.162
7.175
7.183
7.189
7.233
7.238
7.260
7.267
7.274
7.280
7.290
7.295
7.309
7.314
7.329
7.336
7.343
D:\new nuts\DATA\$pdata
spect, CDCl3,
Thu Sep 18 09:06:28 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-056-1
5a
NO2
Ph
O
N
3.36
2.06
1.00
1.00
1.00
1.02
1.04
4.98
3.05
2.96
1.12
6.13
PPM
0
1
2
3
4
5
6
7
8


16.909
19.944
20.111
32.694
36.495
39.509
39.648
60.084
60.306
75.705
76.567
77.000
77.424
87.682
127.475
128.732
128.848
134.971
D:\new nuts\DATA\5pdata
sped, CDCl3,
Thu Sep 18 09:17:45 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 812
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
NO2
O
N
Ph
5a
xc-12-056-1 C
PPM
0
50
100
150
200
250


7.319
7.303
7.292
7.281
7.270
7.227
7.203
7.185
7.180
3.793
3.779
3.764
3.749
3.725
3.701
3.673
3.308
3.293
3.278
3.267
3.264
3.254
3.249
3.239
3.223
2.829
2.814
2.785
2.769
2.569
2.539
2.524
2.494
1.520
1.519
1.448
1.427
1.334
1.296
1.190
1.127
1.108
0.000
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 29 04:22:23 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 0.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.10 Hz
NH2
Ph
6a
xc-12-038
2.98
2.16
2.00
0.98
0.99
1.00
9.09
7.35
3.00
1.10
PPM


17.019
20.063
20.138
32.977
33.160
39.593
40.931
52.171
59.814
76.579
77.000
77.420
81.264
126.170
128.351
129.160
138.967
NH2
O
N
Ph
6a
xc-12-038
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 29 04:26:34 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 357
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
PPM
250
200
150
100
50
0


D:\new nuts\DATA\$pdata
spect, CDCl3,
Sat Aug 30 04:14:25 2014
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.000 usec
Recycle delay = 1.000 sec
NA = 32
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
xc-12-037
7a
Ph
NH
O
Br
NO2
N
O
7.345
7.334
7.327
7.318
7.296
7.248
6.351
6.318
5.982
5.949
4.790
4.754
4.218
4.182
2.059
1.429
1.618
1.419
1.398
1.295
1.269
1.245
1.183
1.124
0.996
-0.015
5.30
0.98
1.02
1.00
0.99
5.30
3.05
6.34
2.80
2.16
1.12
PPM


16.847
20.230
20.304
23.280
32.375
39.882
56.884
60.724
60.862
76.576
77.000
77.424
79.745
105.777
128.255
128.597
129.297
133.933
168.950
D:\new nuts\DATA\$pdata
spect, CDCl3,
Fri Aug 29 16:36:51 2014
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.500 usec
Recycle delay = 2.000 sec
NA = 2048
PTS1d = 32768
F1 = 75.476807 MHz
F2 = 1.000000 MHz
SW1 = 22727.27 Hz
7a
xc-12-037 C
PPM
250
200
150
100
50
0