Preparation of Functional Benzofurans and Indoles via Chemoselective Intramolecular Wittig Reactions

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Supporting Information

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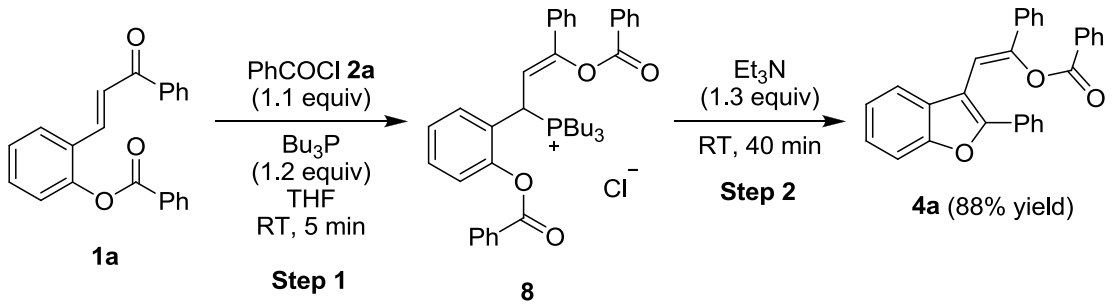
I. General Information:

All reactions were carried out under a nitrogen atmosphere in dried glassware. The starting materials purchased from commercial sources were used without further purification. THF was continuously refluxed and freshly distilled from sodium benzophenone ketyl under nitrogen. Dichloromethane was freshly distilled from calcium hydride under nitrogen and degased under argon. Yields refer to isolated yields of compounds estimated to be > 95 % pure as determined by ^{1}H-NMR. Analytical thin layer chromatography (TLC) was performed using Merck 60 F254 precoated silica gel plate (0.2 mm thickness). Flash chromatography was performed using Merck silica gel 60. The temperature of our RT condition ranges from 28 to 30 ℃.

II. Studies of reaction mechanism:

The following reaction demonstrated that the reaction pathway via 1,4-addition of Bu_3P toward **1a** followed by acylation of benzoyl chloride **2a** can be observed in the crude ^{1}H NMR studies in comparison with pure ^{1}H NMR spectra of **8** (**Step 1, Figure 1**). After the addition of Et_3N, **8** was successfully converted into the desired fuctional benzofuran **4a** (**Step 2, Figure 1**).



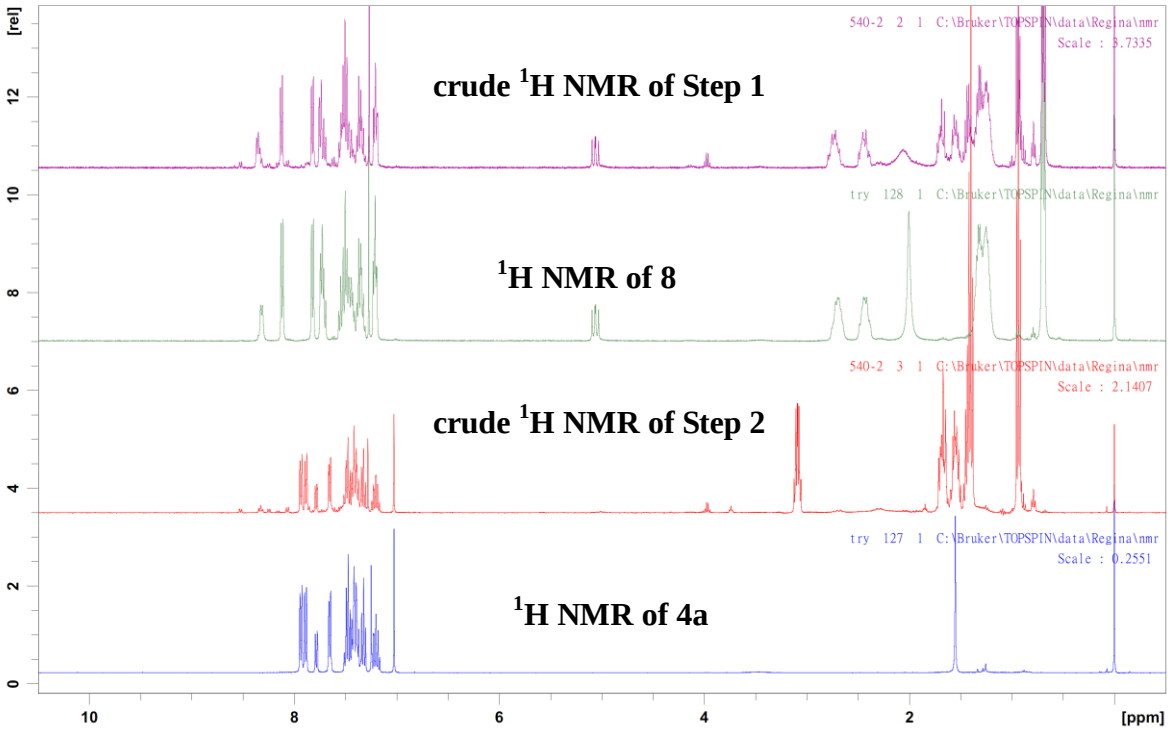


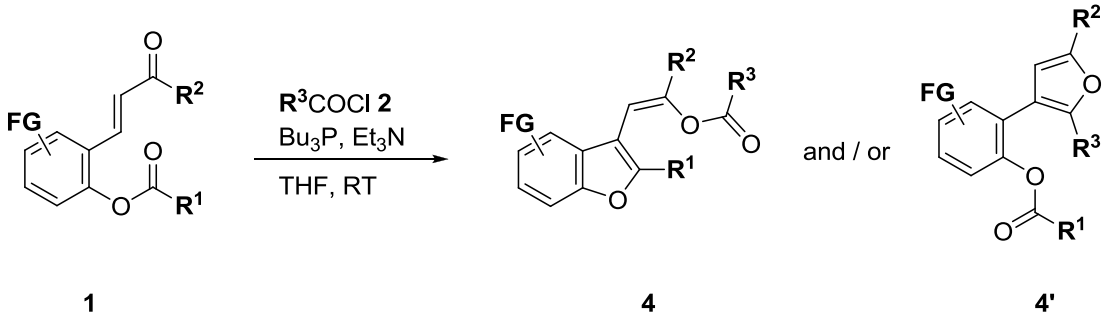
Figure 1

Step 1: A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **1a** (112.0 mg, 0.5 mmol) in dry THF (1 mL). Benzoyl chloride **2a** (64 µL, 1.1 equiv) and Bu_3P (150 µL, 1.2 equiv) was added, and the reaction mixture was stirred for 5 min at room temperature. The formation of **8** was observed in the crude ^{1}H NMR spectrum.

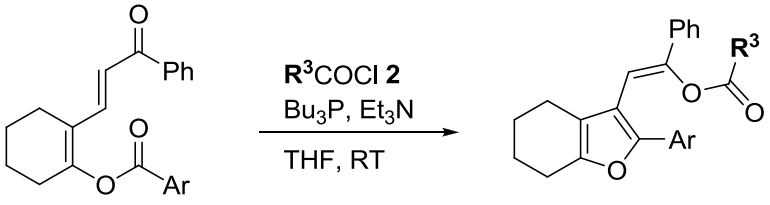
Step 2: followed by step 1, NEt_3 (91 µL, 1.3 equiv) was added to the reaction mixture and the resulting mixture was stirred for 40 min. The formation of expected product **4a** was observed in the crude ^{1}H NMR spectrum. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography furnished **4a** (183.1

mg, 88%).

III. Typical procedure for syntheses of benzofuran 4, 4', 26 (TP 1 for Table 1 and Scheme 5), indole 17, 18, 19, 20 (TP 2 for Table 2) and benzothiophene 22 (TP 3 for Scheme 4)

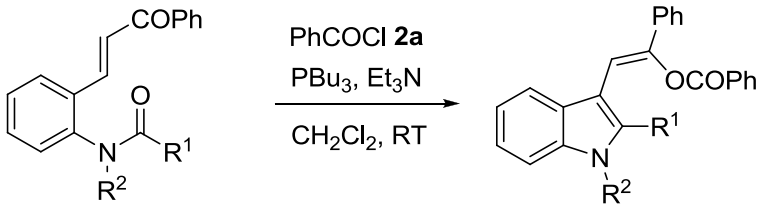


1 **4** **4'**



24 **26**

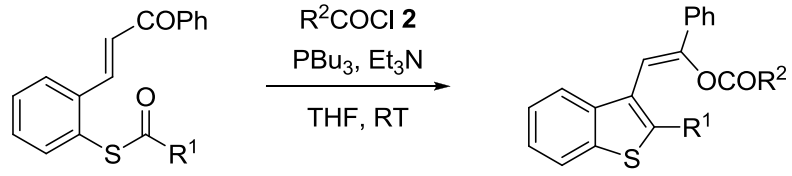
TP 1: A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **1** or **24** (0.5 mmol) in dry THF (1 mL). Acyl chloride **2** (1.1 equiv), Bu_3P (150.0 µL, 1.2 equiv), and NEt_3 (91.0 µL, 1.3 equiv) was added, and the reaction mixture was stirred for the indicated time at room temperature. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography furnished **4**, **4'**, **26.**



9: R^2 = Boc
10: R^2 = Cbz
11: R^2 = Ts
12: R^2 = Bn

17: R^2 = Boc
18: R^2 = Cbz
19: R^2 = Ts
20: R^2 = Bn

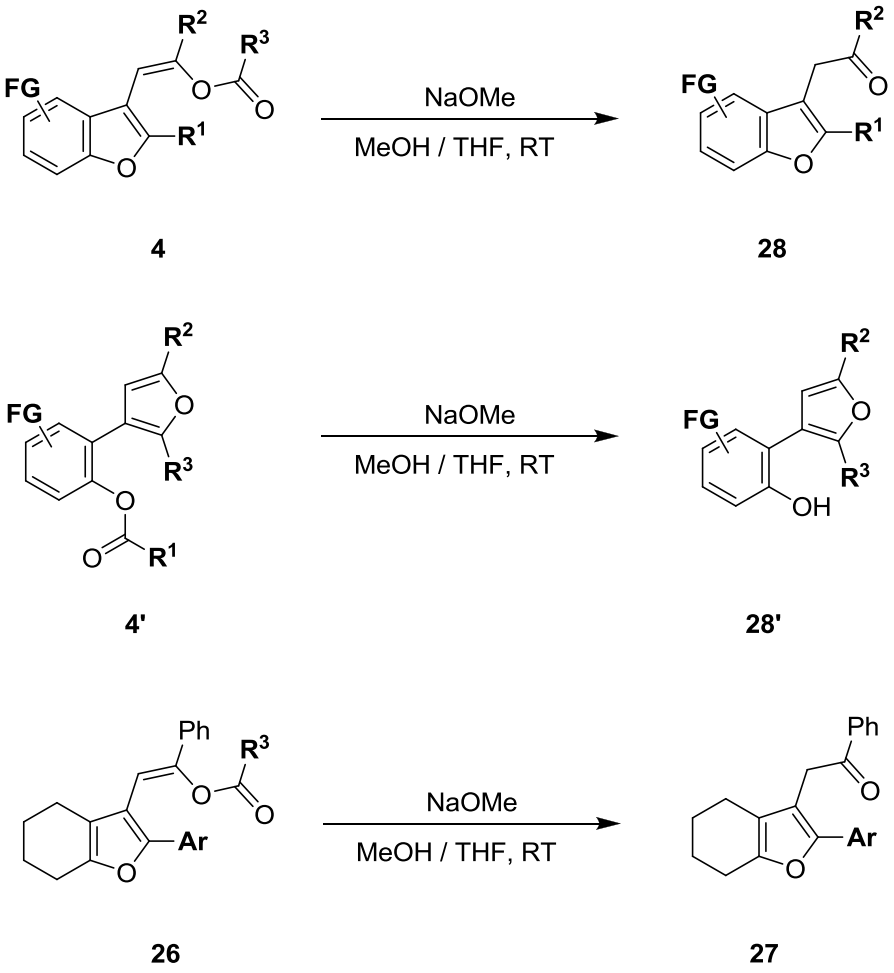
TP 2: A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **9-12** (0.3 mmol) in dry CH_2Cl_2 (0.6 mL). Benzoyl chloride **2a** (38 µL , 1.1 equiv), Bu_3P (1.2 or 1.3 equiv) and NEt_3 (54 µL, 1.3 equiv) was added, and the reaction mixture was stirred for the indicated time at RT. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography furnished **17-20**.



21: R^1 = *p*-ClC_6H_4 **22**

TP 3: A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **21** (0.5 mmol) in dry THF (1 mL). Acyl chloride **2** (1.1 equiv), Bu_3P (150 µL, 1.2 equiv) and NEt_3 (91 µL, 1.3 equiv) was added, and the reaction mixture was stirred for the indicated time at RT. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography furnished **22**.

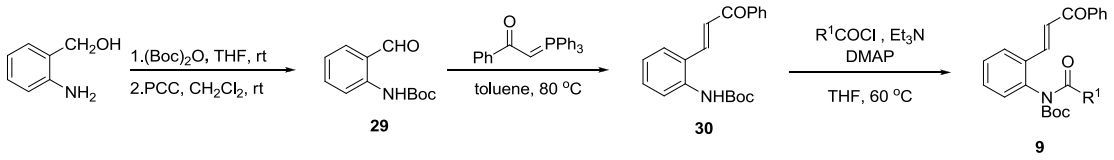
IV. Typical procedure for deacylation of 4, 4', 26 (TP 4 for Table 1 and Scheme 5)



TP4:

A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **4**, **4', 26** (0.2 mmol) in MeOH/THF (0.1/0.1 mL). NaOMe (13 mg, 1.2 equiv) was added, and the reaction mixture was stirred for 5 h at RT. Then the crude product was neutralized by addition of 1M aq. HCl solution and extracted by dichloromethane, and the organic layer was dried by $MgSO_4$ and then evaporated. Purification by flash chromatography furnished **28**, **28'**, **27**.

V. Typical procedure for syntheses of 9, 10, 11, 12 (TP 5 for Table 2), 21 (TP 6 for Scheme 4)

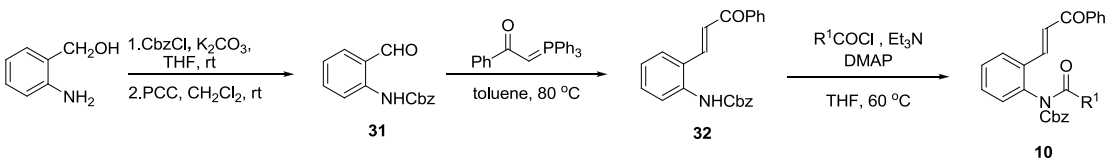


TP 5:

29[1]: A dry and nitrogen-flushed 100-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of 2-aminobenzyl alcohol (2.46 g, 20 mmol) in dry THF (66 mL). $(Boc)_2O$ (4.79 g, 1.1 equiv) was added, and the reaction mixture was stirred for 12 h at room temperature. Thereafter, the solvent was removed by evaporation in vacuo. Without purifcation, the crude product was dissolved in dichloromethane (50 mL) and then PCC (5.173 g, 1.2 equiv) was added. The reaction mixture was stirred for 4 h at room temperature and then filtered through Celite 545 followed by washing with CH_2Cl_2. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/10) furnished **29** (3.54 g, 80%).

30: A dry and nitrogen-flushed 100-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **29** (3.23 g, 10 mmol) in toluene (50 mL). 1-phenyl-2-(triphenylphosphoranylidene)ethanone (4.18 g, 1.1 equiv) was added, and the reaction mixture was stirred for 12 h at 80 ^oC. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/6) furnished **30** (2.58 g, 80%).

9: A dry and nitrogen-flushed 25-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **30** (0.96 g, 3 mmol) and DMAP (36.6 mg, 0.1 equiv) in dry THF (7.5 mL). Acyl chloride or Ac_2O (1.05 equiv) and NEt_3 (0.5 mL, 1.2 equiv) was added, and the reaction mixture was stirred for 12 h at 60 ^oC. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Purification by flash chromatography furnished **9**.

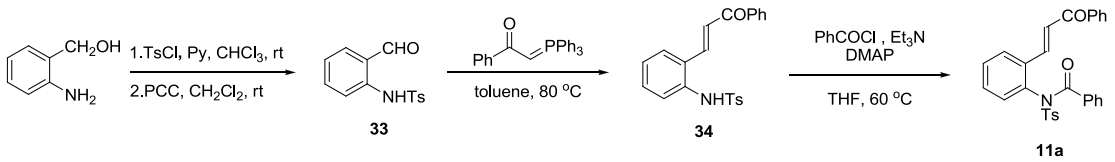


[1] Thielges, S.; Meddah, E.; Bisseret, P.; Eustache, J. *Tetrahedron Lett.* **2004**, *45*, 907.

31[2]: A dry and nitrogen-flushed 100-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of 2-aminobenzyl alcohol (2.46 g, 20 mmol) in dry THF (66 mL). CbzCl (3.74 g, 1.1 equiv) and K_2CO_3 (27.6 g, 10 equiv) was added, and the reaction mixture was stirred for 12 h at room temperature. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Without purifcation, the crude product was dissolved in dichloromethane (50 mL) and then PCC (5.173 g, 1.2 equiv) was added. The reaction mixture was stirred for 4 h at room temperature and then filtered through Celite 545 followed by washing with CH_2Cl_2. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/10) furnished **31** (4.34 g, 85%).

32: A dry and nitrogen-flushed 100-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **31** (2.55 g, 10 mmol) in toluene (50 mL). 1-phenyl-2-(triphenylphosphoranylidene)ethanone (4.18 g, 1.1 equiv) was added, and the reaction mixture was stirred for 12 h at 80 ^oC. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/6) furnished **32** (2.86 g, 80%).

10: A dry and nitrogen-flushed 25-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **32** (1.07 g, 3 mmol) and DMAP (36.6 mg, 0.1 equiv) in dry THF (7.5 mL). Acyl chloride (1.05 equiv) and NEt_3 (0.5 mL, 1.2 equiv) was added, and the reaction mixture was stirred for 12 h at 60 ^oC. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Purification by flash chromatography furnished **10**.



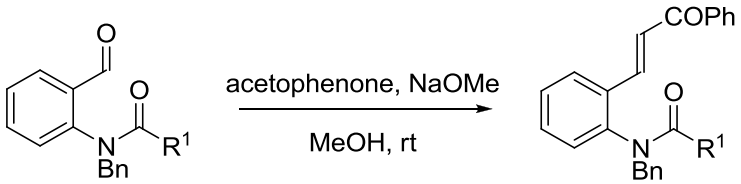
33[3]: A dry and nitrogen-flushed 250-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of 2-aminobenzyl alcohol (2.46 g, 20 mmol) in $CHCl_3$ (100 mL). TsCl (4.18 g, 1.1 equiv) and pyrridine (0.1 mL) was added, and the reaction mixture was stirred for 12 h at room temperature. Thereafter, the solvent was removed by evaporation in vacuo. Without purifcation, the crude

[2] Waibel, M.; Hasserodt, J. *Tetrahedron Lett.* **2009**, *50*, 2767.
[3] LóPez, M. V.; Bermejo, M. R.; Vázquez, M. E.; Taglietti, A.; Zaragoza, G.; Pedrido, R.; Martínez-Calvo, M. *Org. Biomol. Chem.* **2010**, *8*, 357.

product was dissolved in dichloromethane (50 mL) and then PCC (5.173 g, 1.2 equiv) was added. The reaction mixture was stirred for 4 h at room temperature and then filtered through Celite 545 followed by washing with CH_2Cl_2. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (dichloromethane/hexanes: 2/1) furnished **33** (5.34 g, 97%).

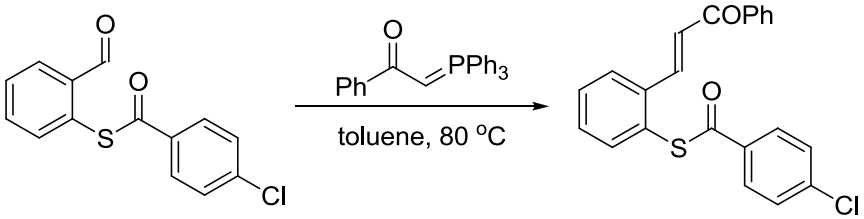
34: A dry and nitrogen-flushed 100-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **33** (2.75 g, 10 mmol) in toluene (50 mL). 1-phenyl-2-(triphenylphosphoranylidene)ethanone (4.18 g, 1.1 equiv) was added, and the reaction mixture was stirred for 12 h at 80 ^oC. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (dichloromethane/hexanes: 6/1) furnished **34** (3.02 g, 80%).

11a: A dry and nitrogen-flushed 25-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **34** (1.07 g, 3 mmol) and DMAP (36.6 mg, 0.1 equiv) in dry THF (7.5 mL). Benzoyl chloride (0.37 mL, 1.05 equiv) and NEt_3 (0.5 mL, 1.2 equiv) was added, and the reaction mixture was stirred for 12 h at 60 ^oC. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3\,(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Washed by *n*-pentane furnished **11a** as yellow solid (1.36 g, 94%).



35 **12**

12: A dry and nitrogen-flushed 25-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **35**[4] (3 mmol) in MeOH (10 mL). Acetophenone (0.39 g, 1.1 equiv) and NaOMe (0.32 g, 2 equiv) was added, and the reaction mixture was stirred for 12 h at room temperature. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3\,(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Purification by flash chromatography furnished **12**.



36 **21**

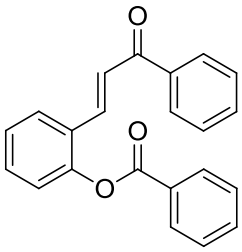
[4] Syu, S.; Lee, Y.-T.; Jang, Y.-J.; Lin, W. *Org. Lett.* **2011**, *13*, 2970.

TP 6:

21: A dry and nitrogen-flushed 25-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was charged with a solution of **36**[4] (0.41 g, 1.5 mmol) in toluene (7.5 mL). 1-phenyl-2-(triphenylphosphoranylidene)ethanone (0.63 g, 1.1 equiv) was added, and the reaction mixture was stirred for 12 h at 80 °C. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography furnished **21**.

VI. Spectra data of compounds

Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl benzoate (1a):



The compound **1a** was obtained as white solid (321.5 g, 98%) according to the reported procedure[4].

R_f 0.2 (ethyl acetate/hexanes: 1/25); mp.: 108.5-109.1 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.26 (*pseudo* d, 2H, J = 7.2 Hz), 7.93 (d, 1H, J = 15.8 Hz), 7.87 (*pseudo* d, 2H, J = 7.2 Hz), 7.81 (*pseudo* d, 1H, J = 7.8 Hz), 7.69 (*pseudo* t, 1H, J = 7.4 Hz), 7.53-7.47 (m, 5H), 7.37 (*pseudo* t, 3H, J = 7.6 Hz), 7.30 (*pseudo* d, 1H, J = 8.1 Hz).

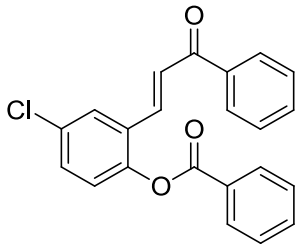
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.4, 164.8, 149.3, 138.4, 137.8, 133.9, 132.7, 131.3, 130.3, 128.9, 128.8, 128.5, 128.4, 127.9, 126.4, 124.3, 123.4.

MS (70eV, EI) *m/z* (%): 328 $[M]^+$ (5), 223 (3), 207 (28), 118 (5), 105 (100), 77 (28).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1727 (s), 1664 (s), 1598 (s), 1211 (m), 1089 (w), 1052 (w).

HRMS (ESI) for **$C_{22}H_{16}O_3Na$**, **$[M+Na]^+$** (351.0997) found: 351.1012.

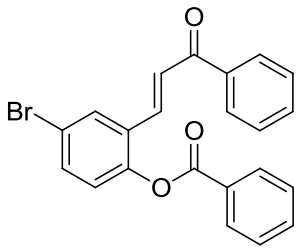
Synthesis of (*E*)-4-chloro-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl benzoate (1b):



The compound **1b** was obtained as white solid (325.8 g, 90%) according to the reported procedure[4].

R_f 0.2 (ethyl acetate/hexanes: 1/25); mp.: 133.1-133.3 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.25 (*pseudo* d, 2H, J = 7.5 Hz), 7.92 (*pseudo* d, 2H, J = 7.3 Hz), 7.84 (d, 1H, J = 15.8 Hz), 7.77 (d, 1H, J = 2.4 Hz), 7.68 (*pseudo* t, 1H, J = 7.5 Hz), 7.54-7.52 (m, 4H), 7.41-7.38 (m, 3H), 7.24 (d, 1H, J = 8.6 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 189.8, 164.6, 148.3, 137.6, 136.8, 134.1, 133.0, 131.9, 130.1, 130.5, 130.3, 129.5, 128.8, 128.6, 128.5, 127.8, 125.2, 124.8.
MS (70eV, EI) *m/z* (%): 364 $[M+2]^+$ (1), 362 $[M]^+$ (3), 240 (5), 179 (1), 152 (5), 105 (100), 77 (35).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1727 (s), 1664 (s), 1598 (s), 1211 (m), 1089 (w), 1052 (w).
HRMS (ESI) for **$C_{22}H_{15}ClO_3Na$**, **$[M+Na]^+$** (385.0607) found: 385.0601.

Synthesis of (*E*)-4-bromo-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl benzoate (1c):

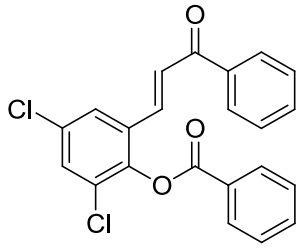


The compound **1c** was obtained as white solid (345.1 g, 85%) according to the reported procedure[4].

R_f 0.2 (ethyl acetate/hexanes: 1/25); mp.: 142.8-143.4 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.23 (*pseudo* d, 2H, J = 7.6 Hz), 7.92-7.89 (m, 3H), 7.82 (d, 1H, J = 15.8 Hz), 7.67 (t, 1H, J = 7.7 Hz), 7.54-7.51 (m,

5H), 7.40 (*pseudo* t, 2H, *J* = 7.7 Hz), 7.17 (d, 1H, *J* = 8.4 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 189.8, 164.5, 148.9, 137.6, 136.6, 134.1, 133.9, 133.0, 130.8, 130.3, 130.0, 128.8, 128.6, 128.5, 128.4, 125.2, 125.1, 119.6.
MS (70eV, EI) *m/z* (%): 408 $[M+2]^+$ (2), 406 $[M]^+$ (2), 285 (8), 196 (2), 105 (100), 77 (32).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3040 (w), 1734 (s), 1660 (w), 1612 (m), 1233 (s), 1048 (m), 680 (m).
HRMS (ESI) for **$C_{22}H_{15}BrO_3Na$**, **$[M+Na]^+$** (406.0205) found: 406.0210.

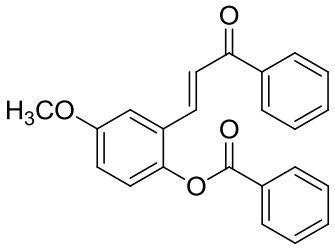
Synthesis of (*E*)-2,4-dichloro-6-(3-oxo-3-phenylprop-1-en-1-yl)phenyl benzoate (1d):



The compound **1d** was obtained as white solid (368.3 g, 93%) according to the reported procedure[4].

R_f 0.2 (ethyl acetate/hexanes: 1/25); mp.: 148.7-149.2 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.25 (*pseudo* d, 2H, *J* = 7.3 Hz), 7.88 (*pseudo* d, 2H, *J* = 7.2 Hz), 7.71-7.67 (m, 3H), 7.54-7.52 (m, 5H), 7.40 (*pseudo* t, 2H, *J* = 7.4 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 189.4, 163.6, 145.1, 137.3, 136.0, 134.3, 133.1, 132.2, 131.5, 131.0, 130.5, 129.5, 128.8, 128.6, 128.5, 127.8, 126.3, 126.1.
MS (70eV, EI) *m/z* (%): 398 $[M+2]^+$ (3), 396 $[M]^+$ (3), 275 (3), 105 (100), 77 (28).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3077 (w), 1734 (s), 1664 (m), 1601 (s), 1211 (m), 1048 (m), 687 (s).
HRMS (ESI) for **$C_{22}H_{14}Cl_2O_3Na$**, **$[M+Na]^+$** (419.0218) found: 419.0219.

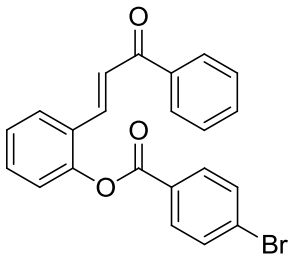
Synthesis of (*E*)-4-methoxy-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl benzoate (1e):



The compound **1e** was obtained as white solid (293.6 g, 82%) according to the reported procedure[4].

R_f 0.2 (ethyl acetate/hexanes: 1/25); mp.: 123.2-123.9 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.24 (*pseudo* d, 2H, J = 7.3 Hz), 7.84-7.79 (m, 3H), 7.68 (*pseudo* t, 1H, J = 7.5 Hz), 7.52-7.47 (m, 4H), 7.38 (t, 2H, J = 7.8 Hz), 7.29 (d, 1H, J = 2.9 Hz), 7.20 (d, 1H, J = 8.8 Hz), 7.04 (dd, 1H, J = 8.9, 3.0 Hz), 3.88 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.4, 165.2, 157.5, 143.6, 138.5, 137.8, 133.9 132.7, 130.3, 130.0, 128.7, 128.5, 128.4, 128.1, 124.5, 124.2, 117.0, 112.7, 55.7.
MS (70eV, EI) *m/z* (%): 358 $[M]^+$ (3), 237 (18), 148 (3), 105 (100), 77 (38).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2841(w), 1734 (s), 1664 (m), 1609 (s), 1262 (s), 1240 (w), 1059 (m), 1037(w).
HRMS (ESI) for **$C_{23}H_{18}O_4Na$**, **$[M+Na]^+$** (381.1103) found: 381.1072.

Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl 4-bromobenzoate (1f):

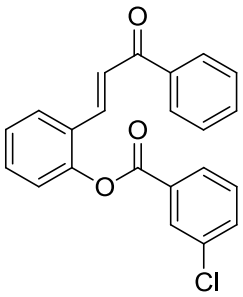


The compound **1f** was obtained as white solid (385.7 g, 95%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 132.5-133.8 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.10 (*pseudo* d, 2H, J = 8.6 Hz), 7.89-7.87 (m, 3H), 7.80 (*pseudo* d, 1H, J = 7.8 Hz), 7.68 (*pseudo* d, 2H, J = 8.8 Hz),

7.52-7.47 (m, 3H), 7.38-7.31 (m, 3H), 7.28 (*pseudo* d, 1H, *J* = 8.1 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.1, 164.0, 149.7, 137.9, 137.8, 132.7, 132.1, 131.6, 131.3, 129.2, 128.4, 128.4, 128.2, 127.8, 126.5, 124.2, 123.2.
MS (70eV, EI) *m/z* (%): 408 $[M+2]^+$ (4), 406 $[M]^+$ (5), 207 (70), 183 (100), 155 (23), 105 (32), 77 (23).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1738 (s), 1660 (s), 1601 (s), 1214 (s), 1070 (m), 680 (m).
HRMS (ESI) for **$C_{22}H_{15}BrO_3Na$**, **$[M+2+Na]^+$** (429.0103) found: 431.0085.

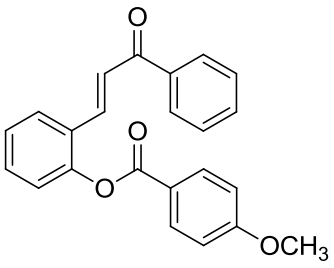
Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl 3-chlorobenzoate (1g):



The compound **1g** was obtained as white solid (325.8 g, 90%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 115.6-115.8 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.23 (*pseudo* s, 1H), 8.14 (*pseudo* d, 1H, *J* = 7.7 Hz), 7.90-7.87 (m, 3H), 7.82 (*pseudo* d, 1H, *J* = 7.7 Hz), 7.67 (*pseudo* d, 1H, *J* = 8.1 Hz), 7.53-7.48 (m, 4H), 7.39-7.36 (m, 3H), 7.28 (*pseudo* d, 1H, *J* = 7.3 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.3, 163.7, 149.7, 138.1, 137.8, 135.0, 134.0, 132.9, 131.4, 130.6, 130.3, 130.1, 128.6, 128.5, 128.4, 128.3, 127.9, 126.7, 124.5, 123.2.
MS (70eV, EI) *m/z* (%): 364 $[M+2]^+$ (2), 362 $[M]^+$ (5), 207 (50), 139 (100), 77 (18).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 1734 (s), 1660 (s), 1572 (s), 1214 (w), 1074 (m), 735 (m).
HRMS (ESI) for **$C_{22}H_{15}ClO_3Na$**, **$[M+Na]^+$** (385.0607) found: 385.0612.

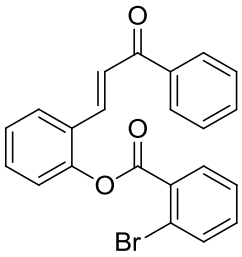
Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl 4-methoxybenzoate (1h):



The compound **1h** was obtained as white solid (311.5 g, 87%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 90.5-91.1 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.20 (*pseudo* d, 2H, J = 8.4 Hz), 7.93 (d, 1H, J = 16.1 Hz), 7.87 (*pseudo* d, 2H, J = 7.7 Hz), 7.80 (*pseudo* d, 1H, J = 7.7 Hz), 7.54-7.46 (m, 3H), 7.38-7.27 (m, 4H), 7.01 (*pseudo* d, 2H, J = 8.4 Hz), 3.89 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.4, 164.5, 164.2, 150.1, 138.6, 137.9, 132.7, 132.5, 131.2, 128.5, 128.4, 127.9, 126.3, 124.2, 123.5, 121.2, 114.1, 55.5.
MS (70eV, EI) *m/z* (%): 358 $[M]^+$ (2), 207 (10), 135 (100), 77 (15).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1723 (s), 1660 (m), 1601 (s), 1211 (m), 1089 (w).
HRMS (ESI) for **$C_{23}H_{18}O_4Na$**, **$[M+Na]^+$** (381.1103) found: 381.1095.

Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl 2-bromobenzoate (1i):



The compound **1i** was obtained as white solid (324.8 g, 80%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 82.5-83.1℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.06 (*pseudo* d, 1H, J = 6.6 Hz), 7.97 (d, 1H, J = 15.8 Hz), 7.92 (*pseudo* d, 2H, J = 7.2 Hz), 7.82 (*pseudo* d, 1H, J = 7.7 Hz), 7.76 (*pseudo* d, 1H, J = 7.2 Hz), 7.49-7.41 (m, 7H), 7.35-7.33 (m, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.4, 164.2, 149.7, 138.2, 137.9, 134.7, 133.4, 132.8, 131.8, 131.3, 128.5, 128.5, 128.2, 128.1, 127.8, 127.5, 126.6, 124.5,

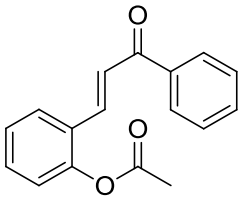
123.6, 122.4.

MS (70eV, EI) *m/z* (%): 408 $[M+2]^+$ (2), 406 $[M]^+$ (2), 302 (2), 223 (1), 207 (10), 183 (100), 118 (23), 105 (35), 77 (15).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 1741 (s), 1660 (m), 1601 (s), 1207 (m), 1015 (w), 683 (m).

HRMS (ESI) for **$C_{22}H_{15}O_3BrNa$**, **$[M+Na]^+$** (429.0094) found: 429.0102.

Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl acetate (1j):



The compound **1j** was obtained as white solid (172.9 g, 65%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 67.9-68.3℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.01 (*pseudo* d, 2H, J = 7.4 Hz), 7.87 (d, 1H, J = 15.8 Hz), 7.78 (*pseudo* d, 1H, J = 6.6 Hz), 7.59 (*pseudo* t, 1H, J = 7.4 Hz), 7.52-7.49 (m, 3H), 7.44 (*pseudo* t, 1H, J = 7.7 Hz), 7.31 (*pseudo* t, 1H, J = 7.6 Hz), 7.16 (*pseudo* d, 1H, J = 8.1 Hz), 2.38 (s, 3H).

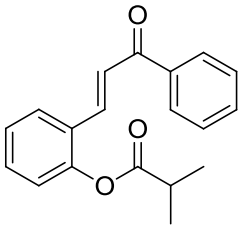
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.3, 169.2, 149.8, 38.0, 133.0, 131.4, 128.7, 128.6, 127.7, 127.6, 126.4, 124.1, 123.2, 21.0.

MS (70eV, EI) *m/z* (%): 266 $[M]^+$ (8), 224 (55), 207 (100), 165 (8), 147 (62), 105 (82), 77 (67).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3040 (w), 1760 (s), 1657 (s), 1605 (s), 1203 (s), 1041 (w).

HRMS (ESI) for **$C_{17}H_{14}O_3Na$**, **$[M+Na]^+$** (289.0841) found: 289.0853.

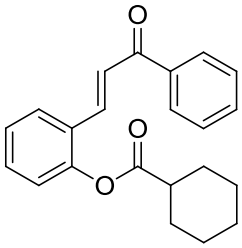
Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl isobutyrate (1k):



The compound **1k** was obtained as white solid (229.3 g, 78%) according to the reported procedure[4].

R_f 0.4 (ethyl acetate/hexanes: 1/20); mp.: 67.9-68.3℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.98 (*pseudo* d, 2H, *J* = 7.4 Hz), 7.87 (d, 1H, *J* = 15.8 Hz), 7.76 (*pseudo* d, 1H, *J* = 7.6 Hz), 7.57 (*pseudo* t, 1H, *J* = 7.4 Hz), 7.49-7.47 (m, 3H), 7.40 (*pseudo* t, 1H, *J* = 7.7 Hz), 7.27 (*pseudo* t, 1H, *J* = 8.0 Hz), 7.11 (*pseudo* d, 1H, *J* = 8.4 Hz), 2.87 (heptet, 1H, *J* = 7.0 Hz), 1.29 (d, 6H, *J* = 7.5 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.4, 175.3, 150.0, 138.0, 138.0, 137.9, 132.8, 131.3, 128.7, 128.5, 127.8, 127.3, 126.2, 124.0, 123.2, 34.3, 19.0.
MS (70eV, EI) *m/z* (%): 294 $[M]^+$ (5), 224 (40), 207 (100), 165 (10), 147 (32), 118 (48), 105 (78), 77 (72).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3070 (w), 2878 (w), 1752 (s), 1657 (m), 1609 (s), 1211 (s), 1041 (w).
HRMS (ESI) for **$C_{19}H_{18}O_3Na$**, **$[M+Na]^+$** (317.1154) found: 317.1160.

Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl cyclohexanecarboxylate (1l):

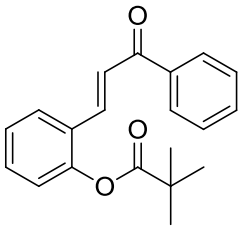


The compound **1l** was obtained as white solid (273.9 g, 82%) according to the reported procedure[4].

R_f 0.4 (ethyl acetate/hexanes: 1/20); mp.: 55.1-56.2 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.98 (*pseudo* d, 2H, *J* = 7.6 Hz), 7.87 (d, 1H, *J* = 15.8 Hz), 7.76 (*pseudo* d, 1H, *J* = 7.7 Hz), 7.57 (*pseudo* t, 1H, *J* = 7.0 Hz), 7.49-7.46 (m, 3H), 7.41 (*pseudo* t, 1H, *J* = 7.6 Hz), 7.28 (*pseudo* t, 1H, *J* = 7.6 Hz), 7.10 (*pseudo* d, 1H, *J* = 8.0 Hz), 2.64 (tt, 1H, *J* = 11.3, 3.6 Hz), 2.08 (*pseudo* d, 2H, *J* = 10.4 Hz) , 1.81 (*pseudo* d, 2H, *J* = 12.8Hz), 1.63-1.55 (m, 3H), 1.33-1.26 (m, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.6, 174.2, 150.0, 138.1, 138.0, 132.7, 131.3, 128.6, 128.5, 127.7, 127.3, 126.1, 124.0, 123.2, 43.2, 28.9, 25.6, 25.3.

MS (70eV, EI) *m/z* (%): 334 $[M]^+$ (5), 229 (2), 224 (35), 207 (70), 147 (17), 118 (28), 105 (50), 83 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055(w), 2922 (m), 2856 (w), 1752 (s), 1660 (s), 1598 (s), 1214 (s), 1089 (m).
HRMS (ESI) for **$C_{22}H_{22}O_3Na$**, **$[M+Na]^+$** (357.1467) found: 357.1468.

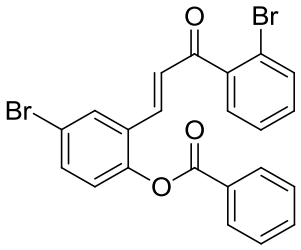
Synthesis of (*E*)-2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl pivalate (1m):



The compound **1m** was obtained as white solid (224.8 g, 73%) according to the reported procedure[4].

R_f 0.4 (ethyl acetate/hexanes: 1/20); mp.: 114.8-115.6 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.98 (*pseudo* d, 2H, J = 7.1 Hz), 7.87 (d, 1H, J = 15.8 Hz), 7.78 (*pseudo* d, 1H, J = 7.9 Hz), 7.59 (*pseudo* t, 1H, J = 7.3 Hz), 7.46-7.41 (m, 4H), 7.28-7.26 (m, 1H), 7.09 (*pseudo* d, 1H, J = 8.0 Hz), 1.38 (s, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.6, 176.8, 150.2, 138.0, 137.9, 132.8, 131.3, 128.6, 127.9, 127.1, 126.2, 124.2, 123.1, 39.3, 27.2.
MS (70eV, EI) *m/z* (%): 308 $[M]^+$ (6), 224 (15), 207 (50), 118 (25), 105 (42), 77 (35), 57 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055(w), 2870 (w), 1745 (s), 1660 (s), 1601 (s), 1214 (s), 1015 (m).
HRMS (ESI) for **$C_{20}H_{20}O_3Na$**, **$[M+Na]^+$** (331.1310) found: 331.1321.

Synthesis of (*E*)-4-bromo-2-(3-(2-bromophenyl)-3-oxoprop-1-en-1-yl)phenyl benzoate (1n):



The compound **1n** was obtained as white solid (425.9 g, 88%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 119.4-119.6 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.09 (*pseudo* d, 2H, J = 7.3 Hz), 7.87 (d, 1H, J = 2.2 Hz), 7.68 (*pseudo* t, 1H, J = 7.5 Hz), 7.59 (dd, 1H, J = 8.6, 2.3 Hz), 7.48-7.44 (m, 4H), 7.29 (dd, 1H, J = 7.3, 1.9 Hz), 7.18-7.15 (m, 3H), 7.06 (d, 1H, J = 16.2 Hz).

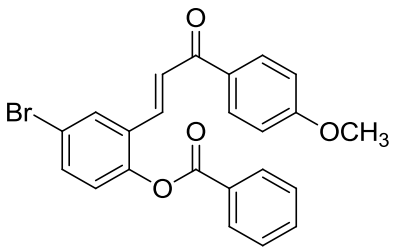
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 194.1, 164.4, 148.8, 140.5, 138.4, 134.3, 134.1, 133.2, 131.3, 130.4, 130.2, 129.3, 129.0, 128.7, 128.4, 127.2, 125.0, 119.6, 119.4.

MS (70eV, EI) *m/z* (%): 488 $[M+4]^+$ (1), 486 $[M+2]^+$ (3), 484 $[M]^+$ (1), 365 (8), 182 (5), 105 (100), 77 (22).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3085 (w), 1738 (s), 1657 (m), 1598 (s), 1214 (m), 1059 (m), 698 (m).

HRMS (ESI) for **$C_{22}H_{14}Br_2O_3N_a$, $[M+Na]^+$** (506.9207) found: 506.9199

Synthesis of (*E*)-4-bromo-2-(3-(4-methoxyphenyl)-3-oxoprop-1-en-1-yl)phenyl benzoate (1o):



The compound **1o** was obtained as white solid (405.5 g, 93%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 151.3-152.0 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.24 (*pseudo* d, 2H, J = 7.3 Hz), 7.93-7.90 (m, 3H), 7.80 (d, 1H, J = 15.8 Hz), 7.68 (*pseudo* t, 1H, J = 7.4 Hz), 7.53-7.51 (m, 4H), 7.17 (d, 1H, J = 8.7 Hz), 6.87 (*pseudo* d, 2H, J = 8.8 Hz), 3.86 (s, 3H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 188.0, 164.6, 163.6, 148.8, 135.8, 134.1, 133.7, 130.9, 130.8, 130.6, 130.4, 130.2, 128.8, 128.6, 125.2, 125.1, 119.6, 113.9,

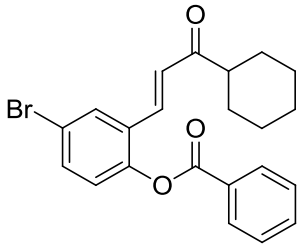
55.5.

MS (70eV, EI) *m/z* (%): 438 $[M+2]^+$ (2), 436 $[M]^+$ (2), 317 (15), 315 (25), 135 (15,)105 (100), 77 (25).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2841 (w), 1741 (s), 1660 (m), 1601 (s), 1218 (s), 1056 (w), 698 (m).

HRMS (ESI) for $\mathbf{C_{23}H_{17}BrO_4N_a}$, $\mathbf{[M+Na]^+}$ (459.0208) found: 459.0210

Synthesis of (*E*)-4-bromo-2-(3-cyclohexyl-3-oxoprop-1-en-1-yl)phenyl benzoate (1p):



The compound **1p** was obtained as white solid (207.9 g, 92%) according to the reported procedure[4].

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 129.5-132.4 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.19 (*pseudo* d, 2H, J = 8.5 Hz), 7.83 (d, 1H, J = 2.3 Hz), 7.66-7.60 (m, 2H), 7.55-7.53 (m, 3H), 7.16 (*pseudo* d, 1H, J = 8.7 Hz), 6.81 (d, 1H, J = 16.0 Hz), 2.50 (*pseudo* tt, 1H, J = 11.2, 6.5 Hz), 1.79-1.75 (m, 4H), 1.63 (*pseudo* s, 1H), 1.25-1.12 (m, 5H).

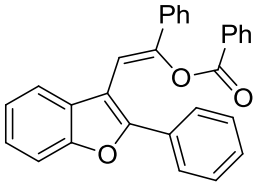
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 202.2, 164.6, 148.8, 134.2, 134.0, 133.7, 130.5, 129.8, 128.8, 128.6, 127.4, 125.0, 119.5, 49.8, 28.4, 25.8, 25.6.

MS (70eV, EI) *m/z* (%): 226 (100), 224 (100), 118 (78), 89 (28), 54 (23).

R (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3070 (w), 2848 (w), 1738 (m), 1686 (w), 1590 (w), 1218 (s), 1082 (w), 650 (m).

HRMS (EI) for $\mathbf{C_{22}H_{21}BrO_3}$, $\mathbf{[M]^+}$ (412.0674) found: 412.0671.

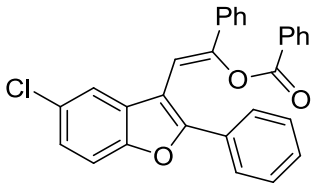
Synthesis of (*Z*)-1-phenyl-2-(2-phenylbenzofuran-3-yl)vinyl benzoate (4a):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl benzoate (**1a**) (164.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 40 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4a** as white solid (185.1 mg, 89%).

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 140.6-141.1 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.93 (*pseudo* d, 2H, J = 8.6 Hz), 7.88 (*pseudo* d, 2H, J = 7.3 Hz), 7.77 (*pseudo* d, 1H, J = 7.3 Hz), 7.65 (*pseudo* d, 2H, J = 6.7 Hz), 7.48-7.46 (m, 3H), 7.40-7.37 (m, 5H), 7.33 (*pseudo* t, 2H, J = 7.8Hz), 7.20-7.17 (m, 2H), 7.02 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.8, 154.2, 152.9, 148.5, 134.9, 133.3, 131.0, 130.1, 128.9, 128.8, 128.7, 128.6, 128.4, 128.3, 127.5, 124.9, 124.5, 122.7, 121.5, 111.0, 110.7, 108.4.
MS (70eV, EI) *m/z* (%): 416 $[M]^+$ (22), 311 (8), 206 (8), 105 (100), 77 (30).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 1730 (m), 1605 (w), 1240 (s), 1082 (m).
HRMS (ESI) for **$C_{29}H_{20}O_3Na$**, **$[M+Na]^+$** (439.1310) found: 439.1326.
CCDC: 865909

Synthesis of (*Z*)-2-(5-chloro-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (4b):

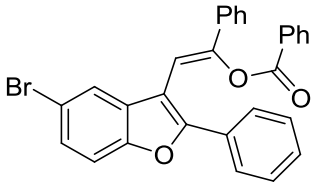


Prepared according to **TP 1** from (*E*)-4-chloro-2-(3-oxo-3-phenylprop-1-enyl)phenyl benzoate (**1b**) (181.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 20 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4b** as white solid (207.0 mg, 92%).

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 145.2-145.9 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.98 (*pseudo* d, 2H, J = 7.1 Hz), 7.91 (*pseudo* d, 2H, J = 8.6 Hz), 7.80 (d, 1H, J = 2.0 Hz), 7.67 (*pseudo* d, 2H, J = 7.9 Hz), 7.51-7.48(m, 3H), 7.41-7.37 (m, 6H), 7.33 (*pseudo* d, 1H, J = 8.6 Hz), 7.16 (*pseudo*

dd, 1H, *J* = 8.7, 2.1 Hz), 7.00 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 163.6, 154.4, 152.5, 148.6, 134.6, 133.5, 130.4, 130.2, 129.4, 129.1, 129.0, 128.8, 128.7, 128.6, 128.4, 128.3, 127.6, 124.9, 124.6, 121.5, 112.0, 110.4, 107.7.
MS (70eV, EI) *m/z* (%): 452 $[M+2]^+$ (6), 450 $[M]^+$ (15), 239 (5), 105 (100), 77 (20).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3040 (w), 1730 (s), 1598 (m), 1229 (s), 1063 (s), 691 (s).
HRMS (ESI) for **$C_{29}H_{19}ClO_3Na$**, **$[M+Na]^+$** (473.0920) found: 473.0924.

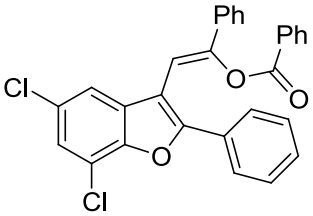
Synthesis of (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (4c):



Prepared according to **TP 1** from (*E*)-4-bromo-2-(3-oxo-3-phenylprop-1-enyl)phenyl benzoate (**1c**) (203.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 μL, 1.1 equiv), PBu_3 (150.0 μL, 1.2 equiv) and NEt_3 (91.0 μL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 20 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4c** as white solid (219.9 mg, 89%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 154.8-155.3 ℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.00 (*pseudo* d, 3H, *J* = 7.0 Hz), 7.91 (*pseudo* d, 2H, *J* = 7.5 Hz), 7.66 (*pseudo* d, 2H, *J* = 6.8 Hz), 7.52-7.48 (m, 3H), 7.41-7.37 (m, 6H), 7.30 (*pseudo* s, 2H), 7.00 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 163.6, 154.2, 152.9, 148.6, 134.5, 133.5, 130.3, 130.2, 130.0, 129.1, 129.0, 128.8, 128.7, 128.5, 128.4, 127.6, 127.2, 124.9, 124.6, 115.8, 112.5, 110.2, 107.7.
MS (70eV, EI) *m/z* (%): 496 $[M+2]^+$ (11), 494 $[M]^+$ (10), 105 (100), 77 (20).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 1734 (s), 1653 (w), 1233 (s), 1063 (s), 683 (s).
HRMS (EI) for **$C_{29}H_{19}BrO_3$**, **$[M]^+$** (494.0518) found: 494.0518.

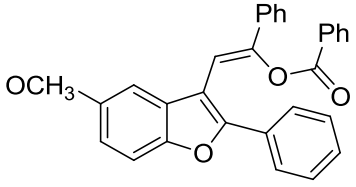
Synthesis of (*Z*)-2-(5,7-dichloro-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (4d):



Prepared according to **TP 1** from (*E*)-2,4-dichloro-6-(3-oxo-3-phenylprop-1-enyl)phenyl benzoate (**1d**) (198.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 10 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4d** as white solid (218.0 mg, 90%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 177.4-178.0 °C.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.94 (*pseudo* d, 4H, J = 6.3 Hz), 7.71 (d, 1H, J = 1.8 Hz), 7.65-7.64 (*pseudo* dd, 2H, J = 8.0, 1.5 Hz), 7.53-7.49 (m, 3H), 7.41-7.39 (m, 6H), 7.20 (d, 1H, J = 1.8 Hz), 7.00 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.5, 155.0, 149.1, 148.6, 134.4, 133.6, 130.5, 130.2, 129.9, 129.5, 129.2, 128.8, 128.5, 127.8, 125.0, 124.5, 120.1, 117.0, 110.8, 107.2.
MS (70eV, EI) *m/z* (%): 486 $[M+2]^+$ (3), 484 $[M]^+$ (5), 105 (100), 77 (20).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1727 (s), 1657 (w), 1233 (s), 1082 (s), 761 (s).
HRMS (EI) for **$C_{29}H_{18}Cl_2O_3$**, **$[M]^+$** (484.0633) found: 484.0637.

Synthesis of (*Z*)-2-(5-methoxy-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (4e):



Prepared according to **TP 1** from (*E*)-4-methoxy-2-(3-oxo-3-phenylprop-1-enyl)phenyl benzoate (**1e**) (179.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 60 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **4e** as white solid (194.0 mg, 87%).

R_f 0.4 (ethyl acetate/hexanes: 1/20); mp.: 152.4-154.4°C.

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.91-7.90 (m, 4H), 7.65 (*pseudo* dd, 2H, J = 8.1, 1.3 Hz), 7.42-7.31 (m, 10H), 7.18 (d, 1H, J = 2.5 Hz), 6.98 (s, 1H), 6.81 (*pseudo* d, 4H, J = 6.3 Hz dd, 1H, J = 8.9, 2.6 Hz), 3.76 (s, 3H).

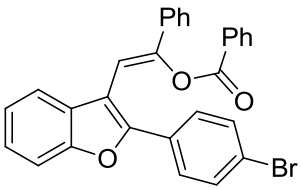
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.9, 155.9, 153.7, 149.1, 148.3, 134.9, 133.4, 131.0, 130.1, 128.9, 128.8, 128.7, 128.6, 128.5, 128.3, 127.4, 124.9, 113.7, 111.5, 110.9, 108.5, 103.6, 55.8.

MS (70eV, EI) *m/z* (%): 446 $[M]^+$ (23), 340 (11), 105 (100), 77 (23).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3040 (w), 2826 (w), 1730 (s), 1657 (w), 1236 (s), 1063 (s).

HRMS (ESI) for **$C_{30}H_{22}O_4$**, **$[M+Na]^+$** (469.1416) found: 469.1425.

Synthesis of (*Z*)-2-(2-(4-bromophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (4f):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl 4-bromobenzoate (**1f**) (203.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 60 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4f** as white solid (224.8 mg, 91%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 133.4-134.1°C.

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.86 (*pseudo* d, 2H, J = 7.1 Hz), 7.77-7.76 (m, 3H), 7.65 (*pseudo* d, 2H, J = 8.2 Hz), 7.58 (*pseudo* d, 2H, J = 8.6 Hz), 7.50 (*pseudo* t, 1H, J = 7.5 Hz), 7.41-7.38 (m, 4H), 7.33 (*pseudo* t, 2H, J = 7.8 Hz), 7.20-7.18 (m, 2H), 7.20 (s, 1H).

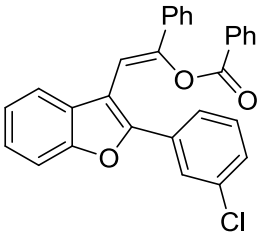
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 154.1, 151.5, 148.8, 134.6, 133.4, 131.8, 130.0, 129.8, 129.0, 128.8, 128.7, 128.3, 128.3, 124.9, 124.8, 122.9, 122.8, 121.3, 111.2, 111.0, 107.8.

MS (70eV, EI) *m/z* (%): 496 $[M+2]^+$ (7), 494 $[M]^+$ (7), 105(100), 77 (18).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1730 (s), 1646 (w), 1240 (s), 1078 (m), 687 (s).

HRMS (ESI) for **$C_{29}H_{19}BrO_3Na$**, **$[M+Na]^+$** (517.0416) found: 517.0433.

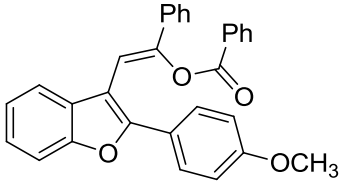
Synthesis of (*Z*)-2-(2-(3-chlorophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (4g):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl 3-chlorobenzoate (**1g**) (181.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 40 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **4g** as white solid (202.5 mg, 90%).

R_f 0.4 (ethyl acetate/hexanes: 1/20); mp.: 129.6-129.9℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.89 (*pseudo* s, 1H), 7.83 (m, 3H), 7.77 (*pseudo* d, 1H, J = 6.6 Hz), 7.66 (*pseudo* d, 2H, J = 6.6 Hz), 7.51 (*pseudo* t, 1H, J = 7.5 Hz), 7.38-7.31 (m, 8H), 7.23 (m, 2H), 6.99 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.7, 154.1, 151.0, 149.0, 134.7, 133.4, 132.7, 130.0 129.9, 129.0, 128.8, 128.7, 128.5, 128.3, 127.0, 125.6, 125.0, 124.9, 122.9, 121.5, 111.6, 111.1, 107.7.
MS (70eV, EI) *m/z* (%): 452 $[M+2]^+$ (3), 450 $[M]^+$ (10), 105(100), 77 (18).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1730 (s), 1638 (w), 1236 (s), 1059 (m), 750 (s)
HRMS (ESI) for **$C_{29}H_{19}ClO_3Na$**, **$[M+Na]^+$** (473.0920) found: 473.0918.

Synthesis of (*Z*)-2-(2-(4-methoxyphenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (4h):

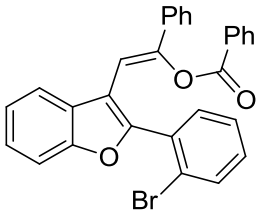


Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl 4-methoxybenzoate (**1h**) (179.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL)

[reaction condition: RT for 70 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **4h** as white solid (165.0 mg, 74%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 142.2-142.9℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.92 (*pseudo* d, 2H, J = 7.6 Hz), 7.84 (*pseudo* d, 2H, J = 8.5 Hz), 7.76-7.74 (m, 1H), 7.63 (*pseudo* d, 2H, J = 7.3 Hz), 7.37-7.28 (m, 7H), 7.16-7.15 (m, 2H), 6.95 (m, 3H), 3.81 (s, 3H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.9, 160.2, 154.1, 153.2, 148.2, 135.0, 133.4, 130.2 129.1, 129.0, 128.8, 128.7, 128.6, 128.4, 124.9, 124.2, 123.7, 122.7, 121.3, 114.3, 110.9, 109.4, 108.7, 55.4.
MS (70eV, EI) *m/z* (%): 446 $[M]^+$ (38), 341 (25), 235 (5), 105 (100), 77 (22).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2833 (w), 1727 (s), 1642 (w), 1240 (s), 1082 (m).
HRMS (ESI) for **$C_{30}H_{22}O_4Na$**, **$[M+Na]^+$** (469.1416) found: 469.1427.

Synthesis of (*Z*)-2-(2-(2-bromophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (4i):

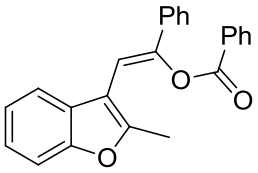


Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl 2-bromobenzoate (**1i**) (203.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 μL, 1.1 equiv), PBu_3 (150.0 μL, 1.2 equiv) and NEt_3 (91.0 μL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 60 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4i** as white solid (197.6 mg, 80%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 82.1-82. 9℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.93 (*pseudo* d, 2H, J = 7.1 Hz), 7.83 (*pseudo* d, 1H, J = 8.0 Hz), 7.63-7.61 (m, 2H), 7.54-7.52 (m, 3H), 7.46 (*pseudo* d, 1H, J = 8.2 Hz), 7.35-7.30 (m, 6H), 7.24-7.22 (m, 2H) ,7.18 (*pseudo* t, 1H, J = 7.4 Hz), 6.83 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.6, 154.5, 152.5, 147.8, 135.1, 133.5, 133.4, 133.1, 131.9, 130.6, 130.2, 128.9, 128.7, 128.7, 128.3, 127.4, 127.2, 124.9, 124.8, 123.2, 122.7, 121.6, 113.2, 111.3, 107.8.
MS (70eV, EI) *m/z* (%): 496 $[M+2]^+$ (2), 494$[M]^+$ (2), 185 (2), 105 (100), 77 (40).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 1730 (s), 1657 (w), 1236 (s), 1059 (m), 691 (m).
HRMS (ESI) for **$C_{29}H_{19Br}O_3Na$**, **$[M+Na]^+$** (517.0415) found: 517.0424.

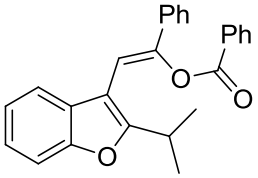
Synthesis of (*Z*)-2-(2-methylbenzofuran-3-yl)-1-phenylvinyl benzoate (4j):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl acetate (**1j**) (133.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 40 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4j** as white solid (141.6 mg, 80%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 129.6-129.9 °C.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.07 (*pseudo* d, 2H, J = 7.9 Hz), 7.62-7.58 (m, 3H), 7.51 (*pseudo* t, 1H, J = 7.2 Hz), 7.34-7.28 (m, 6H), 7.09-7.03 (m, 2H), 6.81 (s, 1H), 2.45 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 164.1, 154.2, 153.7, 147.2, 135.3, 133.7, 130.2, 129.2, 128.8, 128.8, 128.6, 128.1, 124.9, 123.6, 12.6, 120.6, 110.7, 110.6, 107.7, 13.5.
MS (70eV, EI) *m/z* (%): 354 $[M]^+$ (15), 223 (8), 144 (3), 105 (100), 77 (23).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2826 (w), 1734 (s), 1649 (w), 1236 (m), 1063 (m).
HRMS (ESI) for **$C_{24}H_{18}O_3Na$**, **$[M+Na]^+$** (377.1154) found: 377.1163.

Synthesis of (*Z*)-2-(2-isopropylbenzofuran-3-yl)-1-phenylvinyl benzoate (4k):

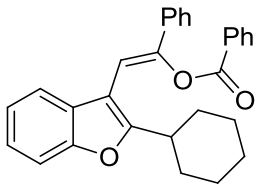


Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl isobutyrate (**1k**) (147.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 90 min]. Purification by flash-chromatography (ethyl

acetate/hexanes: 1/25) yielded **4k** as white solid (149.0 mg, 78%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 122.5-129.9 ℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.01 (*pseudo* d, 2H, J = 8.1 Hz), 7.66 (*pseudo* d, 1H, J = 7.5 Hz), 7.60 (*pseudo* d, 2H, J = 8.3 Hz), 7.47 (*pseudo* t, 1H, J = 7.5 Hz), 7.34-7.28 (m, 6H), 7.09 (*pseudo* quintet, 2H, J = 8.2 Hz), 6.86 (s, 1H), 3.29 (septet, 1H, J = 6.9 Hz), 1.32 (d, 6H, J = 6.6 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.9, 161.5, 153.9, 147.2, 135.1, 133.4, 130.1, 129.1, 128.6, 128.6, 128.3, 127.8, 124.8, 123.3, 122.2, 120.9, 110.6, 108.2, 107.6, 27.3, 21.1.
MS (70eV, EI) *m/z* (%): 382 $[M]^+$ (8), 128 (5), 105 (100), 77 (50).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3040(w), 2870 (w), 1723 (s), 1660 (w), 1240 (m), 1085 (m).
HRMS (ESI) for **$C_{26}H_{22}O_3Na$**, **$[M+Na]^+$** (405.1457) found: 405.1469.

Synthesis of (*Z*)-2-(2-cyclohexylbenzofuran-3-yl)-1-phenylvinyl benzoate (4l):

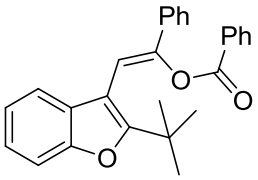


Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl cyclohexanecarboxylate (**1l**) (167.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 90 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4l** as white solid (149.8 mg, 71%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 116.8-117.2 ℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.04 (*pseudo* d, 2H, J = 7.2 Hz), 7.63-7.61 (m, 3H), 7.51 (*pseudo* t, 1H, J = 7.5 Hz), 7.36-7.32 (m, 6H), 7.09-7.00 (m, 2H), 6.84 (s, 1H), 2.92 (t, 1H, J = 11.5 Hz), 1.83 (t, 4H , J = 13.4 Hz), 1.68-1.62 (m, 3H), 1.31-1.24 (m, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.9, 161.1, 153.9, 147.1, 135.1, 133.2, 133.4, 130.2, 129.2, 128.7, 128.6, 128.4, 127.9, 124.9, 123.3, 122.2, 120.9, 110.6, 108.4, 107.7, 37.1, 31.2, 26.2, 25.8.
MS (70eV, EI) *m/z* (%): 422 $[M]^+$ (18) , 423 $[M+1]^+$ (10), 317 (8), 105 (100), 77 (22).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3025 (w), 2922 (m), 2848 (w), 1727 (s), 1660 (w), 1240 (s), 1085 (m).

HRMS (ESI) for **$C_{29}H_{26}O_3Na$**, **$[M+Na]^+$** (445.1780) found: 445.1756.

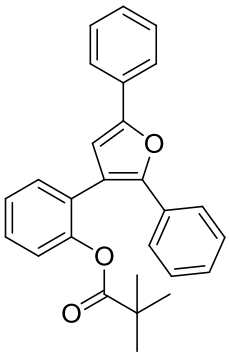
Synthesis of (*Z*)-2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylvinyl benzoate (4m):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl pivalate (**1m**) (154.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 7 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4m** as white solid (106.9 mg, 54%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 147.7-148.2 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.84 (*pseudo* d, 2H, J = 4.2 Hz), 7.61 (*pseudo* d, 3H, J = 4.0 Hz), 7.40-7.33 (m, 4H), 7.27-7.25 (m, 3H), 7.14-7.10 (m, 2H), 6.97 (s, 1H), 1.46 (s, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 162.2, 153.2, 147.9, 135.0, 133.1, 129.9, 129.1, 128.2, 124.9, 124.9, 123.3, 122.1, 120.8, 110.5, 108.9, 107.5, 34.5, 29.4.
MS (70eV, EI) *m/z* (%): 396 $[M]^+$ (38), 133 (1), 105 (100), 77 (15).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2856 (w), 1730 (s), 1657 (w), 1488 (m), 1236 (s), 1085 (m).
HRMS (ESI) for **$C_{27}H_{24}O_3Na$**, **$[M+Na]^+$** (419.1623) found: 419.1612.

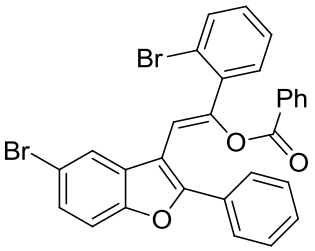
Synthesis of 2-(2,5-diphenylfuran-3-yl)phenyl pivalate (4'm):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl pivalate (**1m**) (154.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 μL, 1.1 equiv), PBu_3 (150.0 μL, 1.2 equiv) and NEt_3 (91.0 μL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 7 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4'm** as white solid (64.0 mg, 29%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 127.5-127.9℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 7.73 (*pseudo* d, 2H, *J* = 7.7 Hz), 7.52 (*pseudo* d, 2H, *J* = 7.5 Hz), 7.40-7.37 (m, 4H), 7.28-7.25 (m, 5H), 7.22 (d, 1H, *J* = 7.4 Hz), 7.15 (*pseudo* d, 1H, *J* = 8.0 Hz), 6.72 (s, 1H), 1.07 (s, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 176.7, 152.0, 149.2, 148.7, 131.4, 130.8, 130.5, 129.0, 128.8, 128.4, 128.0, 127.5, 127.4, 126.2, 125.4, 123.7, 122.9, 110.4, 38.9, 26.9.
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2885 (w), 1727 (w), 1675 (s), 1211 (s), 1082 (w).
HRMS (ESI) for **$C_{27}H_{24}O_3Na$**, **$[M+Na]^+$** (419.1623) found: 419.1613.

Synthesis of (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(2-bromophenyl)vinyl benzoate (4n):

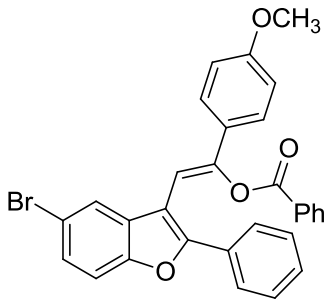


Prepared according to **TP 1** from (*E*)-4-bromo-2-(3-(2-bromophenyl)-3-oxoprop-1-enyl)phenyl benzoate (**1n**) (242.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 μL, 1.1 equiv), PBu_3 (150.0 μL, 1.2 equiv) and NEt_3 (91.0 μL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 10 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4n** as white solid (237.4 mg, 83%).

R_f 0.5 (ethyl acetate/hexanes: 1/25); mp.: 150.4-151.0℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.06 (*pseudo* s, 1H), 7.97 (*pseudo* d, 2H, *J* = 7.3 Hz), 7.88 (*pseudo* d, 2H, *J* = 7.8 Hz), 7.75 (*pseudo* d, 1H, *J* = 7.6 Hz), 7.64 (*pseudo* d, 1H, *J* = 8.1 Hz), 7.49 (*pseudo* t, 3H, *J* = 7.5 Hz), 7.41-7.39 (m, 2H), 7.33-7.30 (m, 4H), 7.27-7.23 (m, 1H), 6.63 (s, 1H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.6, 154.0, 152.8, 148.3, 137.0, 133.5, 133.4, 131.3, 130.4, 130.3, 130.2, 129.1, 128.7, 128.6, 128.3, 127.6, 127.4, 127.3, 124.5, 122.0, 115.9, 112.5,112.4, 109.5.
MS (70eV, EI) *m/z* (%): 574 $[M+2]^+$ (3), 572 $[M]^+$ (1), 183(3), 105 (100), 77 (30).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 1727 (m), 1236 (s), 1063 (s), 680 (s).
HRMS (ESI) for **$C_{29}H_{18}O_3Br_2Na$**, **$[M+Na]^+$** (594.9520) found: 594.9528.

Synthesis of (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(4-methoxyphenyl)vinyl benzoate (4o):

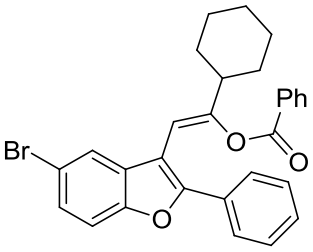


Prepared according to **TP 1** from (*E*)-4-bromo-2-(3-(4-methoxyphenyl)-3-oxoprop-1-enyl)phenyl benzoate (**1o**) (218.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 90 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4o** as white solid (191.3 mg, 73%).

R_f 0.5 (ethyl acetate/hexanes: 1/25); mp.: 138.0-139.6°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.99-7.96 (m, 3H), 7.91 (*pseudo* d, 2H, *J* = 1.4 Hz), 7.58 (*pseudo* d, 2H, *J* = 8.8 Hz), 7.49-7.45 (m, 3H), 7.39-7.36 (m, 3H), 6.93 (*pseudo* d, 2H, *J* = 8.8 Hz), 6.8 (s, 1H), 3.82 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 160.3, 153.9, 152.9, 148.5, 133.5, 130.4, 130.3, 130.1, 129.0, 128.7, 128.6, 128.4, 127.6, 127.2, 126.4, 124.6, 115.7, 114.2, 112.4, 110.4, 105.6,55.4.
MS (70eV, EI) *m/z* (%): 526 $[M+2]^+$ (5), 524 $[M]^+$ (5), 176 (1), 105 (100), 77 (35).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2833 (w), 1730 (s), 1660 (w), 1240 (s), 1082 (m), 687 (m).
HRMS (EI) for **$C_{30}H_{21}BrO_4$**, **$[M]^+$** (524.0623) found: 524.0618.

Synthesis of (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-cyclohexylvinyl

benzoate (4p):



Prepared according to **TP 1** from (*E)*-4-bromo-2-(3-cyclohexyl-3-oxoprop-1-enyl)phenyl benzoate (**1b**) (206.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 2 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4p** as white solid (212.5 mg, 85%).

R_f 0.5 (ethyl acetate/hexanes: 1/25); mp.: 130.2-130.4°C

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.90 (*pseudo* d, 2H, J = 7.6 Hz), 7.80 (*pseudo* t, 3H, J = 7.5 Hz), 7.49 (*pseudo* t, 3H, J = 7.5 Hz), 7.40-7.38 (m, 1H), 7.33 (*pseudo* t, 2H, J = 7.7 Hz), 7.26-7.24 (m, 2H), 6.19 (s, 1H), 2.49 (*pseudo* t, 1H, J =11.1 Hz), 2.17 (m, 2H), 1.87 (*pseudo* d, 2H, J = 12.4 Hz), 1.74 (*pseudo* d, 1H, J = 12.4 Hz), 1.36-1.23 (m,5H).

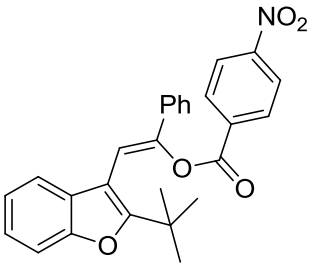
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.6, 156.8, 152.9, 152.7, 133.1, 130.6, 130.5, 129.9, 128.8, 128.6, 128.2, 127.3, 127.0, 124.2, 115.5, 112.3, 110.1, 105.1, 42.6, 31.0, 26.0.

MS (70eV, EI) *m/z* (%): 502 $[M+2]^+$ (8) 500 $[M]^+$ (8), 105(100), 77 (23).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2848(w), 1730 (s), 1671 (w), 1236 (s), 1063 (m), 687 (m).

HRMS (ESI) for **$C_{29}H_{25}BrO_3Na$**, **$[M+Na]^+$** (523.0885) found: 523.0889.

Synthesis of (*Z*)-2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylvinyl 4-nitrobenzoate (4q):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl pivalate (**1m**) (154.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 40 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4q** as white solid (11.0 mg, 5%).

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 140.0-140.6℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.11 (*pseudo* d, 2H, J = 8.9 Hz), 7.96 (*pseudo* d, 3H, J = 8.8 Hz), 7.61-7.59 (m, 2H), 7.28-7.25 (m, 1H), 7.42-7.38 (m, 3H), 7.30-7.29 (m, 1H), 7.18-7.16 (m, 2H), 1.47 (s, 9H)

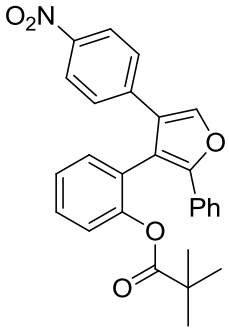
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 162.6, 162.0, 153.2, 150.6, 147.7, 134.4, 134.3, 130.9, 129.0, 128.8, 128.4, 124.8, 123.6, 123.4, 122.2, 120.5, 110.7, 109.2, 107.1, 34.6, 29.3.

MS (70eV, EI) *m/z* (%): 440 $[M]^+$ (57), 291 (20), 234 (2), 150 (3), 105(100), 57 (5).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2870(w), 1738 (s), 1609 (w), 1520 (s), 1343 (m), 1240 (s), 1085 (s).

HRMS (ESI) for **$C_{27}H_{23}NO_5Na$**, **$[M+Na]^+$** (419.1623) found: 419.1612.

Synthesis of 2-(4-(4-nitrophenyl)-2-phenylfuran-3-yl)phenyl pivalate (4'q):

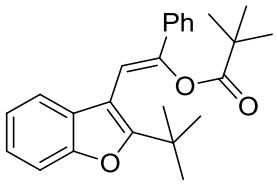


Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl pivalate (**1m**) (154.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT

for 40 min]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4'q** as white solid (167.6 mg, 76%).

R_f 0.3 (ethyl acetate/hexanes: 1/25); mp.: 130.4-130.7°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.12 (*pseudo* d, 2H, J = 9.0 Hz), 7.78 (*pseudo* d, 2H, J = 7.1 Hz), 7.63 (*pseudo* d, 2H, J = 9.0 Hz), 7.47-7.43 (m, 3H), 7.35-7.30 (m, 3H), 6.76-6.73 (*pseudo* d, 1H, J = 8.0 Hz), 6.97 (s, 1H), 1.04 (s, 9H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 176.6, 154.0, 149.0, 146.3, 146.1, 136.5, 131.0, 129.8, 129.7, 128.9, 128.4, 127.1, 126.5, 125.2, 124.1, 123.9, 123.4, 123.2, 111.0, 38.9, 26.8.
MS (70eV, EI) *m/z* (%): 441 $[M]^+$ (100), 357 (70), 205(7), 85 (10), 57(70).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3047 (w), 2878(w), 1738 (s), 1598 (s), 1513 (s), 1336 (s), 1222(w), 1048 (w).
HRMS (ESI) for **$C_{27}H_{23}NO_5Na$**, **$[M+Na]^+$** (464.1474) found: 464.1441.
CCDC: 865911

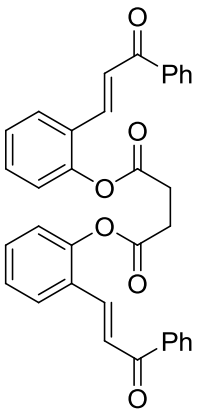
Synthesis of (*Z*)-2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylvinyl pivalate (4r):



Prepared according to **TP 1** from (*E*)-2-(3-oxo-3-phenylprop-1-enyl)phenyl pivalate (**1m**) (154.1 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 30 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **4r** as white solid (133.5 mg, 71%).

R_f 0.4 (ethyl acetate/hexanes: 1/25); mp.: 115.7-118.1°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.54 (*pseudo* d, 2H, J = 8.5 Hz), 7.38-7.31 (m, 5H), 7.14 (*pseudo* quintet, 2H, J = 5.4 Hz), 6.81 (s, 1H), 1.44 (s, 9H), 0.83 (s, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 175.6, 161.9, 153.3, 148.5, 135.1, 129.2, 128.7, 124.8, 123.4, 122.1, 120.8, 110.4, 108.6, 107.3, 38.7, 34.5, 29.3, 26.6.
MS (70eV, EI) *m/z* (%): 376 $[M]^+$ (72), 291 (25), 105(42), 85 (12), 57 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2870(w), 1741 (s), 1646 (w), 1266 (s), 1026 (w).
HRMS (ESI) for **$C_{25}H_{28}O_3Na$**, **$[M+Na]^+$** (399.1936) found: 399.1949.

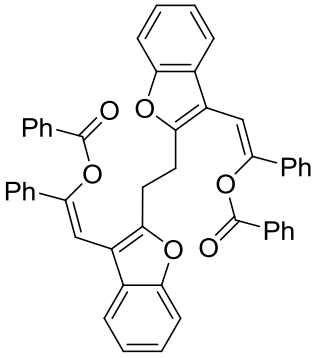
Synthesis of bis(2-((*E*)-3-oxo-3-phenylprop-1-enyl)phenyl) succinate (5):



A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **37a** (224.1 mg, 1.0 mmol) in dry THF (6.6 mL). Succinyl chloride (58.0 μL, 0.525 equiv) and NEt_3 (174.0 μL, 1.25 equiv) was added, and the reaction mixture was stirred for 6 h at room temperature. Thereafter the resulting mixture was extracted with CH_2Cl_2 followed by washed with sat. $NaHCO_{3(aq)}$. The organic layer was dried over anhydrous $MgSO_4$ and then evaporated in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/4) yielded **5** as yellow oil (429.3 mg, 81%).

R_f 0.2 (ethyl acetate/hexanes: 1/4)
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 7.98 (*pseudo* d, 4H, J = 7.2 Hz), 7.86 (d, 2H, J = 16.0 Hz), 7.76 (*pseudo* d, 2H, J = 7.8 Hz), 7.57 (*pseudo* t, 2H, J = 7.2 Hz), 7.54-7.45 (m, 6H), 7.41 (*pseudo* t, 2H, J = 8.0 Hz), 7.29 (*pseudo* t, 2H, J = 7.8 Hz), 7.16 (*pseudo* d, 2H, J = 8.2 Hz), 3.10 (s, 4H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 190.3, 170.4, 149.6, 138.0, 137.9, 132.9, 131.3, 128.6, 128.5, 127.7, 127.6, 126.5, 124.3, 123.2, 29.1.
MS (70eV, EI) *m/z* (%): 207 $[M-323]^+$ (100), 147 (22), 105 (65), 57 (25).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3048 (w), 2915 (w), 1757 (s), 1660 (m), 1602 (s), 1211 (s), 1123 (s).
HRMS (ESI) for **$C_{34}H_{26}O_6Na$,** $[M+Na]^+$ (553.1627) found: 553.1635.

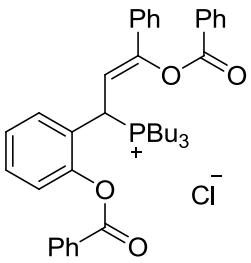
Synthesis of (1*Z*,1'*Z*)-2,2'-(2,2'-(ethane-1,2-diyl)bis(benzofuran-3,2-diyl))bis(1-phenylethene-2,1-diyl) dibenzoate (7):



A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **5** (159.1 mg, 0.3 mmol) in dry THF (1.2 mL). Benzoyl chloride **2a** (77.0 μL, 2.2 equiv), Bu_3P (180.0 μL, 2.4 equiv), and NEt_3 (110.0 μL, 2.6 equiv) was added, and the reaction mixture was stirred for 1h. Thereafter, the solvent was removed by evaporation in vacuo. Purification by flash chromatography (ethyl acetate/hexanes: 1/20) yielded **7** as white solid (165.3 mg, 78%).

R_f 0.2 (ethyl acetate/hexanes: 1/20); mp.: 158.5-159.0℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 8.01 (*pseudo* d, 4H, J = 7.2 Hz), 7.62 (*pseudo* d, 2H, J = 7.6 Hz), 7.51 (*pseudo* t, 2H, J = 7.4 Hz), 7.39-7.22 (m, 16H), 7.16 (*pseudo* t, 2H, J = 7.6 Hz), 7.08 (*pseudo* t, 2H, J = 7.4 Hz), 6.52 (s, 2H), 3.30 (s, 4H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 163.9, 155.1, 154.2, 147.5, 134.9, 133.4, 130.1, 129.1, 128.6, 128.5, 128.4, 127.7, 124.8, 123.8, 122.5, 121.1, 111.3, 110.8, 107.1, 26.0.
MS (70eV, EI) *m/z* (%): 185 $[M-521]^+$ (38), 105 (100), 77 (30).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2922 (w), 1734 (s), 1594 (w), 1450 (m), 1236 (s), 1082 (m), 1060 (m).
HRMS (ESI) for **$C_{48}H_{34}O_6Na$**, **$[M+Na]^+$** (729.2253) found: 729.2229.

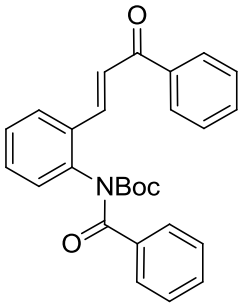
Synthesis of (*Z*)-(3-(benzoyloxy)-1-(2-(benzoyloxy)phenyl)-3-phenylallyl) tributylphosphonium chloride (8):



A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was charged with a solution of **1a** (112.0 mg, 0.5 mmol) in dry THF (1 mL). Benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv) and Bu_3P (150.0 µL, 1.2 equiv) were added, and the reaction mixture was stirred for 5 min at room temperature. Thereafter, the solvent was removed by evaporation in vacuo. The curde product was directly washed by pentane to afford **8**.

mp.: 155.0-155.7℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 8.32 (*pseudo* d, 1H, J = 7.6 Hz), 8.12 (*pseudo* d, 2H, J = 7.6 Hz), 7.82 (*pseudo* d, 2H, J = 7.6 Hz), 7.77-7.67 (m, 3H), 7.58-7.40 (m, 6H), 7.40-7.30 (m, 3H), 7.25-7.15 (m, 3H), 5.06 (dd, 1H, J = 14.0, 11.2 Hz), 2.81-2.58 (m, 3H), 2.54-2.34 (m, 3H), 1.42-1.12 (m, 12H), 0.76-0.61 (m, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 164.7, 164.0, 163.9, 150.4, 147.9, 147.8, 134.3, 134.2, 131.7, 130.1, 129.8, 129.7, 129.6, 129.5, 128.9, 128.7, 127.9, 127.8, 127.7, 127.6, 125.3, 123.2, 123.1, 109.7, 109.6, 30.1 (J = 46.0 Hz), 23.8 (J = 16.0 Hz), 23.7 (J = 5.0 Hz), 18.7 (J = 43.0 Hz), 13.1.
^{31}P (200 MHz, CDCl3, 25 ℃) δ/ppm: 36.89.
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3049 (w), 2959 (m), 2878 (m), 1730 (s), 1598 (w), 1447 (m), 1240 (s), 1207 (s), 1082 (s), 1056 (s).
HRMS (ESI) for **$C_{41}H_{48}O_4P$**, **$[M-Cl]^+$** (635.3290) found: 635.3282.
CCDC: 865910

Synthesis of (*E*)-*tert*-butyl benzoyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (9a):

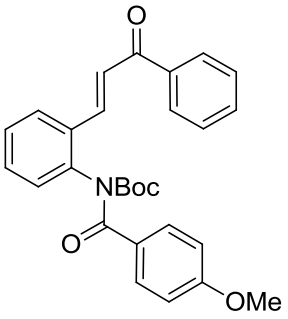


Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), benzoyl chloride (0.37 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2

equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **9a** as white solid (1.09 g, 85%).

R_f 0.2 (ethyl acetate/hexanes: 1/6); mp.: 134.5-135.0°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.98-7.94 (m, 3H), 7.85 (*pseudo* d, 1H, J = 7.4 Hz), 7.73 (*pseudo* d, 2H, J = 7.7 Hz), 7.54-7.48 (m, 9H), 7.31 (*pseudo* d, 1H, J = 7.7 Hz), 1.17 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.4, 172.3, 152.8, 139.5, 138.8, 138.0, 136.6, 133.6, 132.8, 131.7, 131.1, 129.7, 128.9, 128.6, 128.5, 128.3, 128.0, 127.5, 125.1, 84.0, 27.3.
MS (70eV, EI) *m/z* (%): 327 $[M-100]^+$ (8), 249 (8), 207 (27), 105 (100), 77 (40), 57 (56).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (w), 2928 (w), 1738 (s), 1680 (s), 1657 (m), 1604 (m), 1290 (m), 1152 (m).
HRMS (FAB) for **$C_{27}H_{26}NO_4$**, **$[M+H]^+$** (428.1862) found: 428.1860.

Synthesis of (*E*)-*tert*-butyl (4-methoxybenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (9b):



Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), 4-methoxybenzoyl chloride (0.41 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/4) yielded **9b** as yellow solid (1.10 g, 80%).

R_f 0.2 (ethyl acetate/hexanes: 1/4); mp.: 128.5-129.0°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.99-7.95 (m, 3H), 7.83 (*pseudo* d, 1H, J = 7.6 Hz), 7.73 (*pseudo* d, 2H, J = 8.7 Hz), 7.58-7.41 (m, 6H), 7.28 (*pseudo* d, 1H, J = 7.4 Hz), 6.93 (*pseudo* d, 2H, J = 8.7 Hz), 3.86 (s, 3H), 1.23 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.4, 171.6, 162.7, 153.1, 139.7, 139.2,

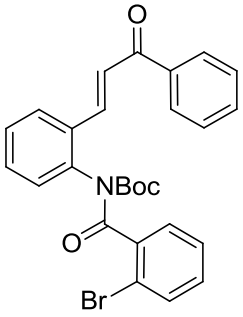
138.0, 133.6, 132.7, 131.0, 130.7, 129,7, 128.6, 128.5, 128.4, 128.3, 127.4, 124.9, 113.6, 83.7, 55.4, 27.5.

MS (70eV, EI) *m/z* (%): 357 $[M-100]^+$ (4), 252 (6), 206 (10), 135 (100), 105 (14), 77 (23), 57 (23).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (m), 2918 (w), 1738 (s), 1676 (s), 1657 (m), 1604 (m), 1242 (m).

HRMS (EI) for $\mathbf{C_{28}H_{27}NO_5}$, $\mathbf{[M]^+}$ (457.1889) found: 457.1886.

Synthesis of (*E*)-*tert*-butyl (2-bromobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (9c):



Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), 2-bromobenzoyl chloride (0.39 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **9c** as white solid (1.26 g, 83%).

R_f 0.2 (ethyl acetate/hexanes: 1/6); mp.: 149.0-149.5°C

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.00-7.93 (m, 3H), 7.87 (*pseudo* d, 1H, *J* = 7.8 Hz), 7.59-7.38 (m, 10H), 7.31-7.28 (m, 1H), 1.16 (s, 9H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.3, 169.8, 151.2, 139.7, 139.4, 138.0, 137.9, 133.4, 132.8, 132.5, 131.1, 130.6, 129.4, 129.0, 128.6, 128.5, 128.0, 127.4, 127.3, 124.9, 118.7, 84.5, 27.3.

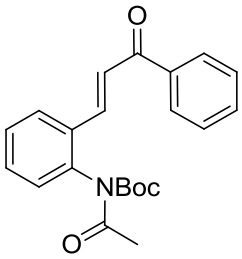
MS (70eV, EI) *m/z* (%): 405 $[M-100]^+$ (6), 300 (14), 207 (35), 183 (100), 155 (34), 105 (68), 77 (52), 57 (88).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2966 (w), 2918 (w), 1742 (s), 1671 (s), 1663 (s), 1600 (m), 1147 (m), 547 (m).

HRMS (FAB) for $\mathbf{C_{27}H_{25}NO_5Br}$, $\mathbf{[M+H]^+}$ (506.0967) found: 506.0965.

Synthesis of (*E*)-*tert*-butyl

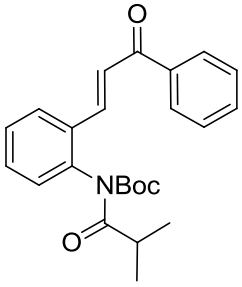
acetyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (9d):



Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), Ac_2O (0.42 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **9d** as yellow oil (0.82 g, 75%).

R_f 0.3 (ethyl acetate/hexanes: 1/6)
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.99 (*pseudo* d, 2H, J = 8.0 Hz), 7.81 (*pseudo* dd, 1H, J = 7.6, 1.3 Hz), 7.68 (d, 1H, J = 15.7 Hz), 7.60 (*pseudo* t, 1H, J = 7.5 Hz), 7.54-7.48 (m, 5H), 7.04 (*pseudo* dd, 1H, J = 7.0, 1.0 Hz), 2.65 (s, 3H), 1.34 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.2, 172.9, 152.2, 139.3, 138.8, 137.9, 132.9, 132.7, 130.9, 129.3, 128.6, 128.5, 128.4, 127.1, 124.5, 83.7, 27.7, 26.4.
MS (70eV, EI) *m/z* (%): 265 $[M-100]^+$ (6), 249 (14), 207 (45), 160 (18), 118 (30), 105 (36), 77 (25), 57 (100).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (m), 2928 (w), 1733 (s), 1700 (s), 1666 (m), 1604 (m), 1271 (m).
HRMS (FAB) for **$C_{22}H_{24}NO_4$**, **$[M+H]^+$** (366.1705) found: 366.1709.

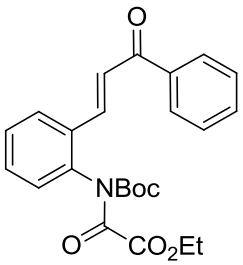
Synthesis of (*E*)-*tert*-butyl isobutyryl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (9e):



Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), isobutyryl chloride (0.48 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **9e** as white solid (0.94 g, 80%).

R_f 0.4 (ethyl acetate/hexanes: 1/6); mp.: 82.5-83.0°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.97 (*pseudo* d, 2H, J = 8.0 Hz), 7.80 (*pseudo* dd, 1H, J = 8.0, 1.0 Hz), 7.72 (d, 1H, J = 15.7 Hz), 7.58 (*pseudo* t, 1H, J = 7.0 Hz), 7.50-7.38 (m, 5H), 7.04 (*pseudo* dd, 1H, J = 8.0, 1.0 Hz), 3.79 (septet, 1H, J = 6.8 Hz), 1.35 (s, 9H), 1.24 (d, 1H, J = 6.8 Hz), 1.23 (d, 1H, J = 6.8 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.3, 180.3, 152.1, 139.4, 139.3, 137.9, 132.8, 130.8, 129.3, 128.6, 128.5, 128.3, 127.0, 124.5, 83.5, 34.8, 27.7, 19.7, 19.4.
MS (70eV, EI) *m/z* (%): 293 $[M\text{-}100]^+$ (4), 249 (16), 207 (76), 105 (42), 77 (21), 71 (23), 57 (100).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2966 (m), 2928 (w), 1728 (s), 1700 (s), 1662 (m), 1600 (s), 1152 (m).
HRMS (EI) for **$C_{24}H_{27}NO_4$**, **$[M]^+$** (393.1940) found: 393.1937.

Synthesis of (*E*)-ethyl 2-((*tert*-butoxycarbonyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)amino)-2-oxoacetate (9f):

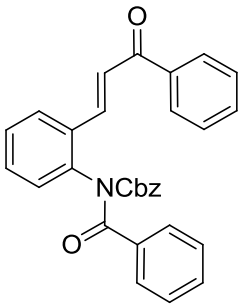


Prepared according to **TP 5** from (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**30**) (0.97 g, 3 mmol), ethyl oxalyl chloride (0.5 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **9f** as yellow solid (0.51 g, 40%).

R_f 0.2 (ethyl acetate/hexanes: 1/6); mp.: 90.0-90.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.97 (*pseudo* d, 2H, J = 7.0 Hz),

7.82-7.80 (m, 1H), 7.74 (d, 1H, *J* = 15.7 Hz), 7.58 (*pseudo* t, 1H, *J* = 8.0 Hz), 7.52-7.47 (m, 5H), 7.26-7.24 (m, 1H), (quartet, 2H, *J* = 7.3 Hz), 1.41-1.38 (m, 12H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 190.1, 163.0, 161.2, 151.0, 138.7, 137.7, 134.9, 133.2, 132.9, 130.9, 129.5, 129.4, 128.6, 128.5, 128.1, 125.4, 85.8, 62.5, 27.6, 13.8.
MS (70eV, EI) *m/z* (%): 323 $[M-100]^+$ (10), 250 (7), 144 (6), 105 (33), 77 (25), 57 (100).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2985 (m), 2937 (w), 1752 (s), 1695 (s), 1662 (s), 1604 (m), 1290 (m), 1152 (m).
HRMS (FAB) for **$C_{24}H_{26}NO_6$**, **$[M+H]^+$** (424.1760) found: 424.1759.

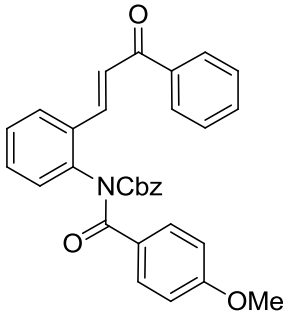
Synthesis of (*E*)-benzyl benzoyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (10a):



Prepared according to **TP 5** from (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**32**) (1.07 g, 3 mmol), benzoyl chloride (0.37 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **10a** as yellow oil (1.18 g, 85%).

R_f 0.1 (ethyl acetate/hexanes: 1/6)
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 8.00-7.95 (m, 3H), 7.88-7.86 (m, 1H), 7.73 (*pseudo* d, 2H, *J* = 8.0 Hz), 7.60-7.40 (m, 9H), 7.33-7.31 (m, 1H), 7.29-7.22 (m, 3H), 7.04 (*pseudo* d, 2H, *J* = 8.0 Hz), 5.10 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 190.2, 171.7, 154.1, 139.0, 138.1, 137.8, 135.3, 134.3, 133.5, 132.7, 131.9, 130.9, 129.7, 129.1, 128.5, 128.3, 128.2, 128.1, 128.0, 127.5, 125.3, 68.9.
MS (70eV, EI) *m/z* (%): 207 $[M-254]^+$ (7), 105 (100), 91 (57), 77 (42).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3035 (w), 1740 (s), 1683 (s), 1601 (m), 1251 (m).
HRMS (MALDI) for **$C_{30}H2_3NO_4Na$**, **$[M+Na]^+$** (484.1525) found: 484.1537.

Synthesis of (*E*)-benzyl (4-methoxybenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (10b):



Prepared according to **TP 5** from (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**32**) (1.07 g, 3 mmol), 4-methoxybenzoyl chloride (0.41 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **10b** as yellow solid (1.18 g, 80%).

R_f 0.1 (ethyl acetate/hexanes: 1/6); mp.: 124.5-125.0°C

^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.95-7.90 (m, 3H), 7.82-7.81 (m, 1H), 7.68 (*pseudo* d, 2H, J = 8.7 Hz), 7.53 (*pseudo* t, 1H, J = 7.4 Hz), 7.46-7.41 (m, 5H), 7.33-7.31 (m, 4H), 7.73 (*pseudo* d, 2H, J = 8.0 Hz), 6.84 (*pseudo* d, 2H, J = 8.7 Hz), 5.08 (s, 2H), 3.82 (s, 3H).

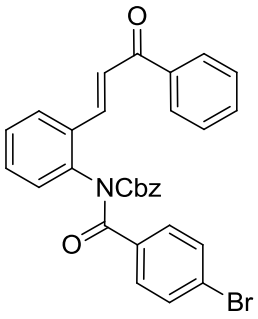
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.3, 171.0, 162.9, 154.4, 139.2, 138.5, 137.8, 134.6, 133.4, 132.7, 130.9, 130.8, 129.8, 128.9, 128.5, 128.3, 128.2, 128.0, 127.5, 127.1, 125.1, 113.6, 68.8, 55.3.

MS (70eV, EI) *m/z* (%): 135 $[M-356]^+$ (100), 107 (16), 91 (70), 77 (28).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3052 (w), 2966 (w), 2928 (w), 1733 (s), 1700 (s), 1685 (s), 1638 (s), 1242 (m).

HRMS (MALDI) for **$C_{31}H_{25}NO_5Na$**, **$[M+Na]^+$** (514.1630) found: 514.1644.

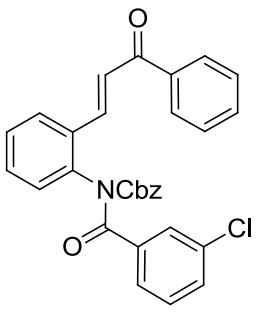
Synthesis of (*E*)-benzyl (4-bromobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (10c):



Prepared according to **TP 5** from (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**32**) (1.07 g, 3 mmol), 4-bormobenzoyl chloride (0.69 g, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **10c** as yellow oil (1.37 g, 85%).

R_f 0.2 (ethyl acetate/hexanes: 1/6)
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.92-7.87 (m, 3H), 7.85-7.83 (m, 1H), 7.56 (*pseudo* t, 1H, J = 7.4 Hz), 7.52-7.43 (m, 9H), 7.27-7.22 (m, 4H), 7.01-7.00 (m, 2H), 5.07 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.2, 170.9, 154.0, 138.8, 137.9, 137.8, 134.2, 133.4, 132.9, 131.6, 131.1, 129.7, 129.6, 129.2, 128.6, 128.5, 128.4, 128.2, 127.5, 126.8, 125.3, 69.2.
MS (70eV, EI) *m/z* (%): 404 $[M-135]^+$ (82), 207 (28), 183 (55), 155 (14), 105 (100), 91 (92), 77 (96).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3037 (w), 1743 (s), 1690 (s), 1608 (m), 1252 (m).
HRMS (MALDI) for **$C_{30}H_{22}BrNO_2Na$**, **$[M+Na]^+$** (562.0630) found: 562.0646.

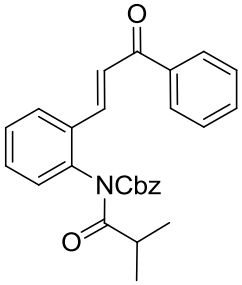
Synthesis of (*E*)-benzyl (3-chlorobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (10d):



Prepared according to **TP 5** from (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**32**) (1.07 g, 3 mmol), 3-chlorobenzoyl chloride (0.58 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **10d** as yellow oil (1.19 g, 80%).

R_f 0.2 (ethyl acetate/hexanes: 1/6)
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.92-7.87 (m, 3H), 7.83-7.81 (m, 1H), 7.65-7.64 (m, 1H), 7.55-7.51 (m, 2H), 7.48-7.41 (m, 6H), 7.28-7.20 (m, 5H), 7.00-6.98 (m, 2H), 5.05 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.0, 170.4, 153.8, 138.6, 137.6, 137.1, 134.4, 134.1, 133.4, 132.8, 131.7, 131.0, 129.5, 129.4, 129.2, 128.5, 128.4, 128.3, 128.0, 127.9, 127.5, 125.8, 125.3, 69.1.
MS (70eV, EI) *m/z* (%): 360 $[M-135]^+$ (3), 207 (15), 139 (38), 105 (44), 91 (100), 77 (12).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3033 (w), 1738 (s), 1690 (s), 1662 (s), 1604 (m), 1252 (m), 738 (s).
HRMS (MALDI) for **$C_{30}H_{22}ClNO_4Na$**, **$[M+Na]^+$** (518.1135) found: 518.1147.

Synthesis of (*E*)-benzyl isobutyryl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (10e):



Prepared according to **TP 5** from (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**32**) (1.07 g, 3 mmol), isobutyryl chloride (0.48 mL, 1.05 equiv), DMAP (36.6 mg, 0.1 equiv) and NEt_3 (0.36 mL, 1.2 equiv) in THF (7.5 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/6) yielded **10e** as yellow solid (0.83 g, 65%).

R_f 0.3 (ethyl acetate/hexanes: 1/6); mp.: 124.5-125.0 °C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.90 (*pseudo* d, 2H, J = 8.2 Hz), 7.82-7.81 (m, 1H), 8.00 (d, 1H, J = 15.6 Hz), 7.57 (*pseudo* t, 1H, J = 7.5 Hz),

7.49-7.44 (m, 4H), , 7.04 (d, 1H, *J* = 15.6 Hz), 7.24-7.22 (m, 3H), 7.12-7.11 (m, 1H), 7.09-7.07 (m, 2H), 5.18-5.11 (m, 2H), 3.85 (septet, 1H, *J* = 6.8 Hz), 1.22 (*pseudo* t, 6H, *J* = 6.8 Hz).

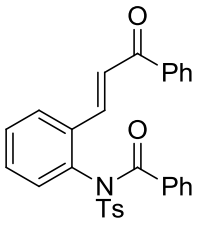
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.1, 180.2, 153.2, 138.8, 138.4, 137.8, 135.0, 133.0, 132.8, 130.9, 129.4, 128.8, 128.6, 128.5, 128.4, 128.3, 127.5, 127.2, 124.8, 68.4, 34.9, 19.7, 19.2.

MS (70eV, EI) *m/z* (%): 207 $[M-200]^+$ (11), 135 (5), 105 (44), 91 (100), 77 (8).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3033 (w), 2995 (w), 2966 (w), 1738 (s), 1704 (s), 1661 (m), 1604 (m), 1247 (m).

HRMS (MALDI) for **$C_{27}H_{25}NO_4Na$**, **$[M+Na]^+$** (450.1682) found: 450.1692.

Synthesis of (*E*)-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)-*N*-tosylbenzamide (11a)



R_f 0.3 (ethyl acetate/hexanes: 1/5); mp.: 177.5-178.2 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.04-7.92 (m, 4H), 7.77-7.67 (m, 2H), 7.63-7.56 (m, 1H), 7.54-7.47 (m, 2H), 7.44-7.18 (m, 9H), 7.15-7.04 (m, 2H), 2.35 (s, 3H)

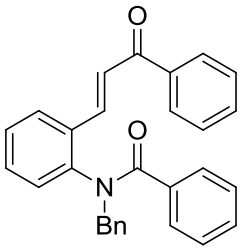
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.3, 169.6, 145.4, 139.0, 137.5, 136.7, 135.2, 134.8, 133.8, 133.0, 132.4, 131.6, 130.7, 130.0, 129.9, 129.4, 128.7, 127.9, 127.8, 125.8, 21.7

MS (70eV, EI) *m/z* (%): 155 $[M-326]^+$ (13), 430 , 105 (100), 77 (48).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2922 (w), 1690 (m), 1631 (s), 1590 (m), 1362 (s), 1166 (s), .

HRMS (ESI) for **$C_{29}H_{23}NO_4SNa$**, **$[M+Na]^+$** (504.1245) found: 504.1223.

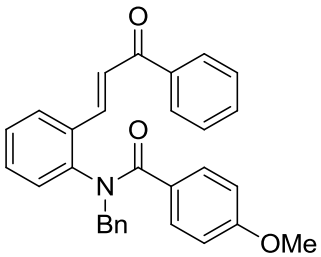
Synthesis of (*E*)-*N*-benzyl-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (12a):



Prepared according to **TP 5** from *N*-benzyl-*N*-(2-formylphenyl)benzamide (**35a**) (94.6 mg, 3 mmol) Acetophenone (0.39 ml, 1.1 equiv) and sodium methoxide (324.0 mg, 2 equiv) in MeOH (10 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/5) yielded **12a** as yellow solid (519.2 mg, 41 %).

R_f 0.1(ethyl acetate/hexanes: 1/10); mp.: 168.3-169.0 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.92 (*pseudo* d, 2H, J = 7.4 Hz), 7.66 (d, 1H, J = 15.7), 7.61-7.44 (m, 4H), 7.34-7.11 (m, 10H), 7.11-6.98 (m, 2H), 6.95-6.85 (m, 1H), 5.38 (d, 1H, J = 13.9 Hz), 4.80 (d, 1H, J = 13.9 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 189.9, 170.4, 142.3, 139.5, 137.7, 136.3, 135.6, 132.8, 132.7, 130.6, 130.3, 129.6, 129.3, 128.6, 128.5, 128.4, 127.9, 127.7, 127.6, 127.5, 124.5, 53.8.
MS (70eV, EI) *m/z* (%): 417 $[M]^+$ (7), 312 (35), 105 (100), 77 (22).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3026 (w), 2900 (w), 1661 (s), 1642 (s), 1598 (s), 1314 (s), 1215 (s).
HRMS (ESI) for **$C_{29}H_{23}NO_2Na$**, **$[M+Na]^+$** (440.1626) found: 440.1613.

Synthesis of (*E*)-*N*-benzyl-4-methoxy-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (12b):

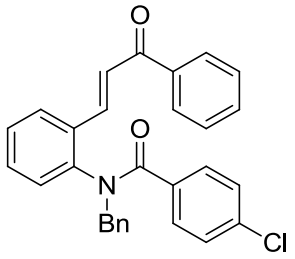


Prepared according to **TP 5** from *N*-benzyl-*N*-(2-formylphenyl)-4-methoxybenzamide (**35b**) (103.5 mg, 3 mmol) Acetophenone (0.39 ml, 1.1 equiv) and sodium methoxide

(324.0 mg, 2 equiv) in MeOH (10 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/5) yielded **12b** as yellow solid (617.1 mg, 46 %).

R_f 0.1 (ethyl acetate/hexanes: 1/10); mp.: 131.3-133.8 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.90 (d, 2H, J = 7.9 Hz), 7.68-7.45 (m, 5H), 7.35-7.08 (m, 10H), 6.94 (s, 1H), 6.69-6.45 (m, 2H), 5.33 (d, 1H, J =14.0 Hz), 4.82 (d, 1H, J =14.0 Hz), 3.64 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 189.7, 169.3, 142.1, 139.2, 137.7, 136.2, 135.8, 134.2, 133.1, 132.9, 131.0, 130.2, 129.9, 129.5, 128.7, 128.5, 128.4, 128.3, 127.9, 124.7, 54.1.
MS (70eV, EI) *m/z* (%): 447 $[M]^+$ (4), 342 (11), 312 (22), 135 (100), 105 (25), 91 (8).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (m), 3011 (m), 2959 (m), 2930 (m), 1661 (s), 1631 (s), 1602 (s), 1248 (s), 1211 (s), 1178 (s).
HRMS (ESI) for **$C_{30}H_{25}NO_3Na$**, **$[M+Na]^+$** (470.1732) found: 470.1717.

Synthesis of (*E*)-*N*-benzyl-4-chloro-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (12c):

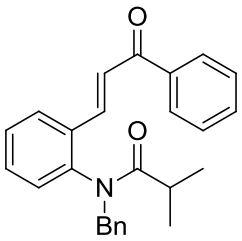


Prepared according to **TP 5** from *N*-benzyl-4-chloro-*N*-(2-formylphenyl)benzamide (**35c**) (104.7 mg, 3 mmol) Acetophenone (0.39 ml, 1.1 equiv) and sodium methoxide (324.0 mg, 2 equiv) in MeOH (10 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/5) yielded **12c** as yellow solid (816.2 mg, 71 %).

R_f 0.1 (ethyl acetate/hexanes: 1/10); mp.: 108.2-110.3 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.92 (d, 2H, J =7.4 Hz), 7.64-7.53 (m,3 H), 7.53-7.46 (m, 2H), 7.31-7.13 (m, 10H), 7.10-6.97 (m, 2H), 6.98-6.89 (m, 1H), 5.32 (d, 1H, J = 14.0), 4.84 (d, 1H, J = 14.0).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 189.6, 169.2, 142.0, 139.0, 137.6, 136.0, 135.7, 134.0, 132.9, 132.8, 130.8, 130.0, 129.8, 129.3, 128.6, 128.4, 128.3, 128.1, 127.7, 124.6, 53.9.

MS (70eV, EI) *m/z* (%): 451 $[M]^+$ (7), 346 (10), 312 (26), 263 (12), 139 (72), 105 (100), 91 (29), 77 (17).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3063 (w), 3026 (w), 2945 (w), 1657 (s), 1639 (s), 1602 (s), 1325 (s), 1274 (s), 1215 (s), 735 (s).
HRMS (ESI) for **$C_{29}H_{22}ClNO_2Na$**, **$[M+Na]^+$** (474.1237) found: 474.1217

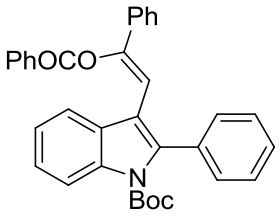
Synthesis of (*E*)-*N*-benzyl-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)isobutyramide (12d):



Prepared according to **TP 5** from *N*-benzyl-*N*-(2-formylphenyl)isobutyramide (**35d**) (84.3 mg, 3 mmol) Acetophenone (0.39 ml, 1.1 equiv) and sodium methoxide (324.0 mg, 2 equiv) in MeOH (10 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/) yielded **12d** as solid (0.34g, 34%).

R_f 0.1 (ethyl acetate/hexanes: 1/10); mp.: 131.1-132.8 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.94 (*pseudo* d, 2H, *J* = 7.5 Hz), 7.78 (*pseudo* d, 1H, *J* = 7.6 Hz), 7.64-7.55 (m, 2H), 7.55-7.46 (m, 2H), 7.44-7.30 (m, 3H), 7.22-7.09 (m, 5H), 6.89 (*pseudo* d, 1H, *J* = 7.8 Hz), 5.21 (d, 1H, *J* =14.0), 4.47 (d, 1H, *J* = 14.0), 2.28 (*pseudo* quintet, 1H, *J* = 6.6 Hz), 1.10-0.97 (m, 6H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 189.8, 177.0, 141.5, 138.9, 137.6, 136.6, 133.3, 132.8, 131.0, 130.1, 129.3, 128.6, 128.4, 128.2, 127.9, 127.4, 124.7, 52.7, 31.7, 19.8, 19.3.
MS (70eV, EI) *m/z* (%): 463 $[M]^+$ (2), 311 (19), 278 (7), 207 (17), 105 (100), 91 (52), 77 (13), 71 (14).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3026 (w), 2959 (w), 2923 (w), 2871 (w), 1642 (s), 1602 (s), 1576 (m), 1247 (m), 1215 (s).
HRMS (EI) for **$C_{26}H_{25}NO_2$**, **$[M+H]^+$** (384.1964) found: 384.1983.

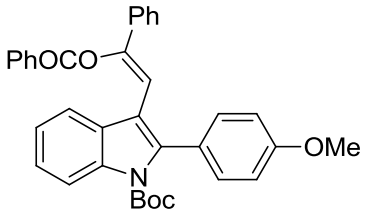
Synthesis of *(Z)-tert*-butyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-phenyl-*1H*-indole-1-carboxylate (17a):



Prepared according to **TP 2** from (*E*)-*tert*-butyl benzoyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**9a**) (132.6 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17a** as white solid (123.6 mg, 80%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 186.0-187.0°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.18 (*pseudo* d, 1H, *J* = 8.0 Hz), 8.05 (*pseudo* d, 2H, *J* = 7.3 Hz), 7.87 (*pseudo* d, 1H, *J* = 7.5 Hz), 7.53 (*pseudo* t, 1H, *J* = 7.5 Hz), 7.50-7.47 (m, 4H), 7.45-7.37 (m, 5H), 7.34-7.26 (m, 4H), 7.21 (*pseudo* t, 1H, *J* = 7.5 Hz), 6.58 (s, 1H), 1.24 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.8, 150.0, 147.3, 138.2, 136.9, 135.1, 133.8, 133.3, 130.2, 130.1, 129.2, 128.6, 128.4, 128.3, 127.8, 127.7, 127.6, 124.7, 124.5, 122.7, 121.3, 115.5, 115.0, 109.9, 83.5, 27.4.
MS (70eV, EI) *m/z* (%): 515 $[M]^+$ (5), 459 (12), 415 (6), 354 (4), 310 (14), 282 (7), 204 (14), 105 (100), 77 (21), 57 (38).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (m), 2926 (w), 1738 (s), 1233 (m), 1147 (m).
HRMS (MALDI) for **$C_{34}H_{29}NO_4Na$**, **$[M+Na]^+$** (538.1995) found: 538.2004.

Synthesis of (*Z*)-*tert*-butyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-(4-methoxyphenyl)-*1H*-indole-1-carboxylate (17b):

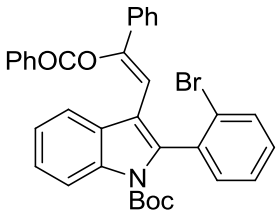


Prepared according to **TP 2** from (*E*)-*tert*-butyl (4-methoxybenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**9b**) (137.2 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2

equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17b** as yellow solid (125.9 mg, 77%).

R_f 0.2 (ethyl acetate/hexanes: 1/10); mp.: 147.5-148.0°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.15 (*pseudo* d, 1H, J = 8.0 Hz), 8.05 (*pseudo* d, 2H, J = 7.8 Hz), 7.85 (*pseudo* d, 1H, J = 7.6 Hz), 7.54-7.49 (m, 3H), 7.42-7.18 (m, 9H), 6.97 (*pseudo* d, 2H, J = 8.5 Hz), 6.58 (s, 1H), 1.30 (s, 9H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.8, 159.4, 150.1, 147.1, 138.3, 136.8, 135.2, 133.3, 131.4, 130.2, 129.3, 128.6, 128.3, 127.7, 126.1, 124.7, 124.3, 122.6, 121.2, 115.2, 115.0, 113.3, 110.1, 83.4, 55.3, 27.6.
MS (70eV, EI) *m/z* (%): 545 $[M]^+$ (2), 489 (7), 445 (16), 340 (32), 312 (12), 234 (8), 105 (100), 77 (35), 57 (22).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3067 (w), 2966 (m), 2932 (w), 1737 (s), 1728 (s), 1235 (m).
HRMS (MALDI) for **$C_{35}H_{31}NO_5Na$**, **$[M+Na]^+$** (568.2100) found: 568.2114.

Synthesis of (*Z*)-*tert*-butyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-(2-bromophenyl)-*1H*-indole-1-carboxylate (17c):

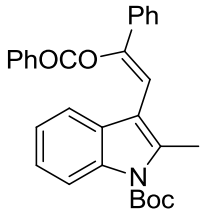


Prepared according to **TP 2** from (*E*)-*tert*-butyl (2-bromobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**9c**) (151.5 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 3.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17c** as yellow solid (119.2 mg, 67%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 77.0-77.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.25 (*pseudo* d, 1H, J = 8.3 Hz), 8.02 (*pseudo* d, 2H, J = 7.3 Hz), 7.86 (*pseudo* d, 1H, J = 7.8 Hz), 7.63 (*pseudo* d, 1H, J = 7.6 Hz), 7.55-7.51 (m, 2H), 7.46-7.44 (m, 2H), 7.41-7.37 (m, 3H), 7.33-7.27 (m, 5H), 7.20 (*pseudo* t, 1H, J = 7.5 Hz), 6.47 (s, 1H), 1.26 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 149.6, 147.5, 136.4, 136.2, 135.6,

135.1, 133.3, 132.9, 132.2, 130.2, 129.6, 129.2, 128.6, 128.5, 128.3, 127.3, 127.2, 124.9, 124.8, 124.5, 122.6, 121.5, 116.0, 115.4, 109.1, 83.3, 27.5.
MS (70eV, EI) *m/z* (%): 595 $[M+2]^+$ (4), 593 $[M]^+$ (4), 537 (7), 493 (6), 388 (22), 360 (2), 282 (8), 105 (100), 77 (22), 57 (38).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3052 (w), 2976 (m), 2928 (w), 1733 (s), 1233 (m), 571 (w).
HRMS (MALDI) for **$C_{34}H_{28}BrNO_4Na$**, **$[M+Na]^+$** (616.1100) found: 616.1116.

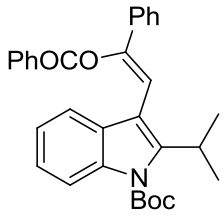
Synthesis of (*Z*)-*tert*-butyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-methyl-*1H*-indole-1-carboxylate (17d):



Prepared according to **TP 2** from (*E*)-*tert*-butyl acetyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**9d**) (109.5 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 3.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17d** as colorless oil (102.0 mg, 75%).

R_f 0.3 (ethyl acetate/hexanes: 1/10)
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.05-8.01 (m, 3H), 7.63-7.62 (m, 3H), 7.53 (*pseudo* t, 1H, J = 7.5 Hz), 7.41-7.33 (m, 5H), 7.21-7.16 (m, 2H), 6.89 (s, 1H), 1.63 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 164.0, 150.5, 147.8, 135.8, 135.6, 135.2, 133.3, 130.1, 129.2, 128.6, 128.5, 128.4, 128.3, 124.9, 123.5, 122.6, 119.5, 115.1, 113.6, 109.0, 83.8, 28.2, 15.5.
MS (70eV, EI) *m/z* (%): 453 $[M]^+$ (20), 397 (54), 292 (24), 248 (48), 220 (22), 105 (100), 77 (23), 57 (44).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3052 (w), 2976 (m), 2918 (w), 1733 (s), 1238 (m).
HRMS (MALDI) for **$C_{29}H_{27}NO_4Na$**, **$[M+Na]^+$** (476.1838) found: 476.1854.

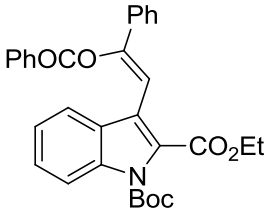
Synthesis of (*Z*)-*tert*-butyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-isopropyl-*1H*-indole-1-carboxylate (17e):



Prepared according to **TP 2** from (*E*)-*tert*-butyl isobutyryl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**9e**) (118.0 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 5.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17e** as yellow solid (115.5 mg, 80%).

R_f 0.4 (ethyl acetate/hexanes: 1/10); mp.: 139.0-139.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.91 (*pseudo* d, 1H, J = 7.8 Hz), 7.87 (*pseudo* d, 2H, J = 7.3 Hz), 7.65-7.62 (m, 3H), 7.46 (*pseudo* t, 1H, J = 7.5 Hz), 7.41-7.38 (m, 2H), 7.50-7.47 (m, 1H), 7.30 (*pseudo* t, 2H, J = 7.8 Hz), 7.22-7.15 (m, 2H), 6.98 (s, 1H), 3.93 (septet, 1H, J = 7.1 Hz), 1.67 (s, 9H), 1.48 (d, 6H, J = 7.1 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.8, 150.5, 147.6, 144.5, 135.6, 135.2, 133.1, 130.0, 129.3, 128.7, 128.6, 128.2, 124.9, 123.4, 122.2, 120.1, 114.9, 112.4, 110.1, 84.0, 28.2, 27.7, 22.0.
MS (70eV, EI) *m/z* (%): 481 $[M]^+$ (7), 425 (12), 381 (3), 320 (7), 276 (18), 248 (4), 170 (5), 105 (100), 77 (21), 57 (38).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (m), 2937 (w), 1734 (s), 1720 (s), 1237 (m).
HRMS (MALDI) for **$C_{31}H_{31}NO_4Na$**, **$[M+Na]^+$** (504.2151) found: 504.2165.
CCDC: 876493

Synthesis of (*Z*)-1-*tert*-butyl 2-ethyl 3-(2-(benzoyloxy)-2-phenylvinyl)-*1H*-indole-1,2-dicarboxylate (17f):

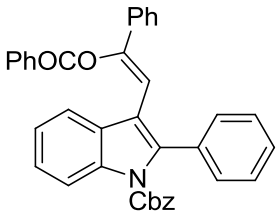


Prepared according to **TP 2** from (*E*)-ethyl 2-((*tert*-butoxycarbonyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)amino)-2-oxoaceta

te (**9f**) (127.0 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 2.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **17f** as yellow solid (107.4 mg, 70%).

R_f 0.1 (ethyl acetate/hexanes: 1/10); mp.: 134.0-134.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.00 (*pseudo* d, 1H, J = 8.4 Hz), 7.97 (*pseudo* d, 2H, J = 7.2 Hz), 7.80 (*pseudo* d, 1H, J = 7.9 Hz), 7.62-7.61 (m, 2H), 7.51 (*pseudo* t, 1H, J = 7.4 Hz), 7.41-7.34 (m, 4H), 7.33-7.30 (m, 1H), 7.18 (*pseudo* t, 1H, J = 7.7 Hz), 7.08 (s, 1H), 4.41 (quartet, 2H, J = 7.2 Hz), 1.61 (s, 9H), 1.36 (t, 3H, J = 7.1 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.8, 162.2, 149.2, 149.0, 136.5, 135.0, 133.4, 130.1, 129.0, 128.9, 128.7, 128.3, 128.0, 127.0, 126.6, 125.1, 123.0, 122.3, 120.0, 114.7, 107.7, 84.7, 61.5, 27.9, 14.2.
MS (70eV, EI) *m/z* (%): 481 $[M-31]^+$ (7), 425 (9), 381 (2), 320 (12), 276 (18), 248 (6), 207 (12), 135 (10), 105 (100), 91 (29), 77 (26), 57 (24).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2976 (m), 2928 (w), 1733 (s), 1238 (m).
HRMS (MALDI) for **$C_{31}H_{29}NO_6Na$**, **$[M+Na]^+$** (534.1893) found: 534.1905.

Synthesis of (*Z*)-benzyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-phenyl-*1H*-indole-1-carboxylate (18a):

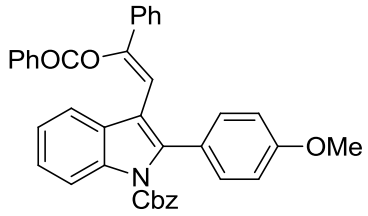


Prepared according to **TP 2** from (*E*)-benzyl benzoyl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**10a**) (138.3 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 2.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **18a** as yellow solid (135.1 mg, 82%).

R_f 0.2 (ethyl acetate/hexanes: 1/10); mp.: 66.5-67.0°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.15 (*pseudo* d, 1H, J = 7.6 Hz), 8.02 (*pseudo* d, 2H, J = 7.4 Hz), 7.85 (*pseudo* d, 1H, J = 8.2 Hz), 7.53-7.46 (m, 5H),

7.39-7.21 (m, 13H), 7.00 (*pseudo* d, 2H, *J* = 6.7 Hz), 6.56 (s, 1H), 5.16 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 163.7, 151.4, 147.7, 138.1, 136.8, 135.0, 134.4, 133.3, 133.0, 130.2, 129.1, 128.6, 128.5, 128.4, 128.3, 128.2, 128.1, 128.0, 127.9, 127.8, 124.8, 123.1, 121.4, 116.5, 115.3, 109.6, 68.7.
MS (70eV, EI) *m/z* (%): 549 $[M]^+$ (18), 414 (4), 400 (14), 204 (6), 105 (100), 91 (94), 77 (20).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3052 (w), 3033 (w), 2947 (w), 1733 (s), 1238 (m).
HRMS (MALDI) for **$C_{37}H_{27}NO_4Na$**, **$[M+Na]^+$** (572.1838) found: 572.1852.

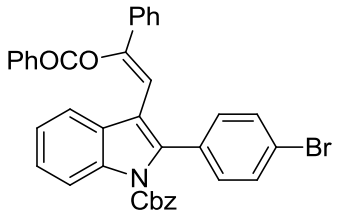
Synthesis of (*Z*)-benzyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-(4-methoxyphenyl)-*1H*-indole-1-carboxylate (18b):



Prepared according to **TP 2** from (*E*)-benzyl (4-methoxybenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**10b**) (147.4 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 2.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **18b** as white solid (126.8 mg, 73%).

R_f 0.2 (ethyl acetate/hexanes: 1/10); mp.: 78.0-78.5℃
^{1}H-NMR (500 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.13 (*pseudo* d, 1H, *J* = 7.5 Hz), 8.03 (*pseudo* d, 2H, *J* = 7.6 Hz), 7.84 (*pseudo* d, 1H, *J* = 7.0 Hz), 7.53-7.49 (m, 3H), 7.50-7.47 (m, 12H), 7.06 (*pseudo* d, 2H, *J* = 7.0 Hz), 6.86 (*pseudo* d, 2H, *J* = 8.6 Hz), 6.57 (s, 1H), 5.18 (s, 2H), 3.83 (s, 3H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 163.8, 159.4, 151.5, 147.4, 138.2, 136.7, 135.0, 134.4, 133.3, 131.5, 130.2, 129.1, 128.6, 128.4, 128.3, 128.2, 128.1, 127.9, 125.2, 124.7, 124.5, 123.0, 121.3, 116.1, 115.3, 113.2, 109.8, 68.7, 55.2.
MS (70eV, EI) *m/z* (%): 579 $[M]^+$ (6), 430 (8)105 (85), 91 (100), 77 (23).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3024 (w), 3004 (w), 2947 (w), 1733 (s), 1723 (s), 1238 (m), 1176 (m).
HRMS (MALDI) for **$C_{28}H_{29}NO_5Na$**, **$[M+Na]^+$** (602.1944) found: 602.1958.

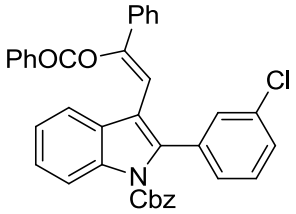
Synthesis of (*Z*)-benzyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-(4-bromophenyl)-*1H*-indole-1-carboxylate (18c):



Prepared according to **TP 2** from (*E*)-benzyl (4-bromobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**10c**) (161.7 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **18c** as yellow solid (150.5 mg, 80%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 133.0-133.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.16 (*pseudo* d, 1H, J = 8.0 Hz), 8.00 (*pseudo* d, 2H, J = 7.8 Hz), 7.83 (*pseudo* d, 1H, J = 7.8 Hz), 7.54-7.48 (m, 3H), 7.41-7.22 (m, 14H), 7.04 (*pseudo* d, 2H, J = 6.8 Hz), 6.52 (s, 1H), 5.17 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 151.3, 148.1, 136.8, 136.6, 134.8, 134.0, 133.4, 131.9, 131.7, 130.9, 130.2, 129.0, 128.7, 128.6, 128.5, 128.4, 128.3, 128.2, 127.8, 125.0, 124.8, 123.2, 122.4, 121.4, 116.9, 115.4, 109.1, 69.0.
MS (70eV, EI) *m/z* (%): 478 $[M-149]^+$ (4), 203 (4), 105 (100), 91 (84), 77 (18).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3043 (w), 1738 (s), 1219 (m), 1057 (m), 581 (w).
HRMS (MALDI) for **$C_{37}H_{26}NO_5Na$**, **$[M+Na]^+$** (650.0943) found: 650.0958.

Synthesis of (*Z*)-benzyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-(3-chlorophenyl)-*1H*-indole-1-carboxylate (18d):

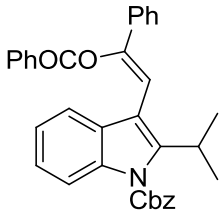


Prepared according to **TP 2** from (*E*)-benzyl (3-chlorobenzoyl)(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**10d**)

(148.5 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **18d** as yellow solid (138.2 mg, 79%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 154.0-154.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.16 (*pseudo* d, 1H, J = 8.1 Hz), 8.00 (*pseudo* d, 2H, J = 7.8 Hz), 7.83 (*pseudo* d, 1H, J = 7.9 Hz), 7.54-7.49 (m, 3H), 7.41-7.22 (m, 14H), 7.08-7.07 (m, 2H), 6.53 (s, 1H), 5.16 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.6, 151.2, 148.2, 136.7, 136.1, 134.8, 134.7, 134.1, 133.6, 133.3, 130.1, 130.0, 129.0, 128.9, 128.7, 128.6, 128.5, 128.4, 128.3, 128.2, 127.8, 125.1, 124.8, 123.2, 121.4, 117.1, 115.4, 108.9, 68.9.
MS (70eV, EI) *m/z* (%): 585 $[M+2]^+$ (2), 583 $[M]^+$ (6), 433 (65), 105 (100), 91 (71), 77 (24).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3033 (w), 2937 (w), 1733 (s), 1233 (m), 752 (m).
HRMS (MALDI) for **$C_{37}H_{26}ClNO_4$**, **$[M+Na]^+$** (606.1448) found: 606.1463.
CCDC: 876492

Synthesis of (*Z*)-benzyl 3-(2-(benzoyloxy)-2-phenylvinyl)-2-isopropyl-*1H*-indole-1-carboxylate (18e):



Prepared according to **TP 2** from (*E*)-benzyl isobutyryl(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (**10e**) (128.2 mg, 0.3 mmol), benzoyl chloride (**3a**) (38.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **18e** as yellow solid (115.9 mg, 75%) and **18'e** as yellow oil (4.6 mg, 3%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 63.0-63.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.89 (*pseudo* d, 1H, J = 8.3 Hz), 7.84 (*pseudo* d, 2H, J = 7.6 Hz), 7.62 (*pseudo* d, 3H, J = 7.3 Hz), 7.49-7.44 (m, 3H), 7.41-7.35 (m, 6H), 7.28 (*pseudo* t, 2H, J = 7.8 Hz), 7.20 (*pseudo* t, 1H, J = 7.4 Hz),

7.14 (*pseudo* t, 1H, *J* = 7.4 Hz), 6.96 (s, 1H), 5.44 (s, 2H), 3.95 (septet, 2H, *J* = 7.1 Hz), 1.43 (d, 6H, *J* = 7.1 Hz).

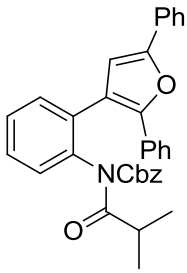
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 163.8, 151.8, 148.0, 144.5, 135.5, 135.1, 134.9, 133.1, 130.0, 129.2, 128.8, 128.7, 128.6, 128.5, 128.4, 128.2, 124.9, 123.8, 122.6, 120.2, 115.3, 113.3, 109.8, 68.9, 27.7, 21.9.

MS (70eV, EI) *m/z* (%): 514 $[M-1]^+$ (6), 366 (4), 260 (2), 105 (100), 91 (76), 77 (28).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 3033 (w), 2956 (m), 2928 (w), 1733 (s), 1233 (m).

HRMS (MALDI) for **$C_{34}H_{29}NO_4Na$**, **$[M+Na]^+$** (538.1995) found: 538.2005.

benzyl (2-(2,5-diphenylfuran-3-yl)phenyl)(isobutyryl)carbamate (18'e):



R_f 0.2 (ethyl acetate/hexanes: 1/10)

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 7.63-7.57 (m, 3H), 7.52 (*pseudo* t, 1H, *J* = 7.6 Hz), 7.44-7.42 (m, 2H), 7.31-7.25 (m, 6H), 7.15 (*pseudo* dt, 1H, *J* = 7.6, 1.0 Hz), 7.09-6.99 (m, 4H), 6.75 (*pseudo* d, 2H, *J* = 7.4 Hz), 6.22 (s, 1H), 3.54-3.47 (m, 2H), 3.37 (d, 1H, *J* = 12.5 Hz), 0.95 (d, 2H, *J* = 6.6 Hz), 0.91 (d, 2H, *J* = 6.6 Hz).

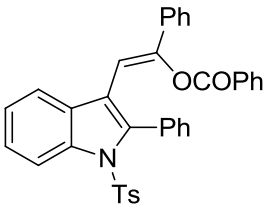
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) *δ*/ppm: 177.8, 177.7, 162.5, 149.4, 140.2, 134.2, 133.8, 133.7, 130.7, 129.9, 129.6, 129.1, 128.6, 128.3, 128.1, 127.8, 127.2, 125.0, 124.9, 123.8, 117.9, 116.4, 54.0, 46.3, 34.5, 18.9, 18.5.

MS (70eV, EI) *m/z* (%): 515 $[M]^+$ (1), 424 (2), 220 (1), 105 (100), 77 (23).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2966 (w), 2922 (w), 1749 (s), 1708 (m), 1251 (s).

HRMS (ESI) for **$C_{34}H_{29}NO_4Na$**, **$[M+Na]^+$** (538.1994) found: 538.1992.

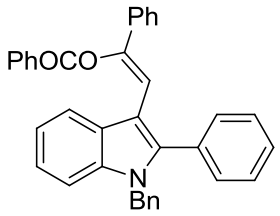
Synthesis of (*Z*)-1-phenyl-2-(2-phenyl-1-tosyl-*1H*-indol-3-yl)vinyl benzoate (19a)



Prepared according to **TP 2** from (*E*)-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)-*N*-tosylbenzamide (**11a**) (144.3 mg, 0.3 mmol), benzoyl chloride (**2a**) (39.0 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.0 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 8 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/30) yielded **19a** as white solid (123.6 mg, 80%).

R_f 0.3 (ethyl acetate/hexanes: 1/25) ; mp.: 189.4-190.1°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 8.23 (d, 1H, J = 7.7 Hz), 7.78-7.61 (m, 5H), 7.55-7.40 (m, 6H), 7.37-7.21 (m, 7H), 7.12 (d, 2H, J = 8.3 Hz), 6.81 (d, 2H, J = 8.2 Hz), 6.50 (s, 1H), 2.14 (s, 3H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.4, 148.5, 144.1, 139.5, 138.0, 134.6, 134.3, 133.2, 131.8, 131.4, 129.8, 129.5, 129.2, 129.0, 128.9, 128.8, 128.7, 128.6, 128.2, 127.4, 126.5, 125.1, 124.8, 124.2, 121.6, 119.6, 116.8, 109.2, 21.5
MS (70eV, EI) *m/z* (%): 769 $[M]^+$ (17), 105 (100), 77 (19).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2922 (w), 1730 (s), 1598 (w), 1443 (m), 1380 (m), 1174 (s).
HRMS (ESI) for **$C_{36}H_{27}NO_4SNa$**, **$[M+Na]^+$** (592.1558) found: 592.1555.
CCDC: 869630

Synthesis of (*Z*)-2-(1-benzyl-2-phenyl-*1H*-indol-3-yl)-1-phenylvinyl benzoate (20a):



Prepared according to **TP 2** from (*E*)-*N*-benzyl-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (**12a**) (125.2 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.3 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.2 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 3.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/30) yielded **20a** as yellow solid (133.4 mg, 88%).

R_f 0.4 (ethyl acetate/hexanes: 1/10); mp.: 203.4-204.3 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.07 (*pseudo* d, 2H, J = 7.1 Hz),

7.99-7.93 (m, 1H), 7.57-7.45 (m, 5H), 7.43-7.17 (m, 11H), 7.11-7.02 (m, 3H), 6.97-6.90 (m, 2H), 6.88 (s, 1H), 5.28 (s, 2H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.9, 144.8, 140.5, 137.9, 137.3, 135.7, 133.1, 131.3, 130.8, 130.2, 129.5, 128.6, 128.5, 128.4, 128.3, 128.2, 127.8, 127.1, 126.2, 125.8, 124.4, 122.2, 121.7, 120.2, 111.2, 110.4, 109.3, 47.9.

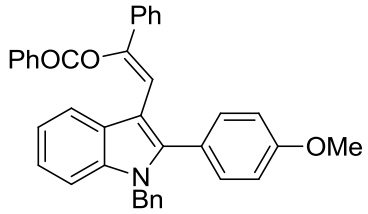
MS (70eV, EI) *m/z* (%): 505 $[M]^+$ (48), 105 (100), 91 (42), 77 (33)

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3026 (w), 2923 (w), 1727 (s), 1598 (w), 1241 (s), 1089 (s).

HRMS (ESI) for **$C_{36}H_{27}NO_2Na$**, **$[M+Na]^+$** (528.1939) found: 528.1935.

CCDC: 866846

Synthesis of (*Z*)-2-(1-benzyl-2-(4-methoxyphenyl)-1*H*-indol-3-yl)-1-phenylvinyl benzoate (20b):



Prepared according to **TP 2** from (*E*)-*N*-benzyl-4-methoxy-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (**12b**) (134.2 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.3 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.2 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 4.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/30) yielded **20b** as yellow solid (131.7 mg, 82%).

R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 212.2-214.1 °C

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.07 (*pseudo* d, 2H, J = 7.8 Hz), 8.00-7.90 (m, 1H), 7.58-7.46 (m, 3H), 7.45-7.15 (m, 10H), 7.09-6.99 (m, 3H), 6.97-6.84 (m, 5H), 5.25 (s, 2H), 3.80 (s, 3H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 164.0, 159.8, 144.6, 140.6, 138.1, 137.2, 135.8, 133.1, 132.1, 130.2, 129.6, 128.7, 128.6, 128.2, 127.8, 127.1, 126.3, 125.8, 124.4, 123.5, 122.1, 121.6, 120.2, 114.0, 111.4, 110.4, 109.0, 55.3, 47.8.

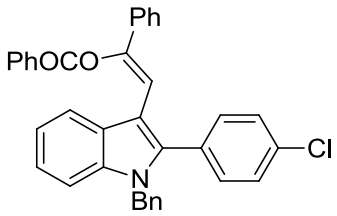
MS (70eV, EI) *m/z* (%): 535 $[M]^+$ (26), 430 (60), 105 (100), 91 (57), 77 (38).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3018 (w), 2996(w), 2930 (w), 1727 (s), 1609 (m), 1637 (s), 1086 (s).

HRMS (ESI) for **$C_{37}H_{29}NO_3Na$**, **$[M+Na]^+$** (558.2045) found: 558.2046.

CCDC: 866847

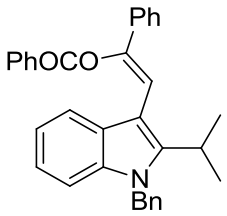
Synthesis of (*Z*)-2-(1-benzyl-2-(4-chlorophenyl)-1*H*-indol-3-yl)-1-phenylvinyl benzoate (20c):



Prepared according to **TP 2** from (*E*)-*N*-benzyl-4-chloro-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)benzamide (**12c**) (135.3 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.3 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.2 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 2.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/30) yielded **20c** as yellow solid (144.0 mg, 89%).

R_f 0.5 (ethyl acetate/hexanes: 1/10); mp.: 139.3-139.9 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.03 (*pseudo* d, 2H. J = 7.4 Hz), 7.98-7.89 (m, 1H), 7.62-7.47 (m, 3H), 7.46-7.25 (m, 9H), 7.25-7.16 (m, 3H), 7.14-7.03 (m, 3H), 6.96-6.86 (m, 2H), 6.85 (s, 1H), 5.24 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 164.0, 145.5, 139.0, 137.9, 137.6, 135.7, 134.7, 133.3, 132.1, 130.3, 129.9, 129.5, 128.9, 128.8, 128.4, 128.2, 127.4, 126.4, 125.9, 124.6, 122.7, 121.8, 120.6, 110.8, 110.6, 109.9, 48.0.
MS (70eV, EI) *m/z* (%): 539 $[M]^+$ (42), 434 (88), 105 (68), 91 (100), 77 (18).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3026 (w), 2923 (w), 1727 (s), 1598 (w), 1237 (s), 1082 (s), 1064 (m), 706 (m).
HRMS (ESI) for **$C_{36}H_{26}ClNO_2Na$**, **$[M+Na]^+$** (562.1550) found: 562.1529.
CCDC: 866849

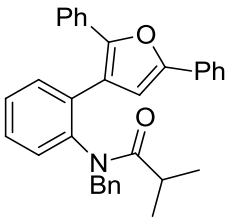
Synthesis of (*Z*)-2-(1-benzyl-2-isopropyl-1*H*-indol-3-yl)-1-phenylvinyl benzoate (20d):



Prepared according to **TP 2** from (*E*)-*N*-benzyl-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)isobutyramide (**12d**) (115.0 mg, 0.3 mmol), benzoyl chloride (**2a**) (38.3 µL, 1.1 equiv), PBu_3 (90.0 µL, 1.2 equiv) and NEt_3 (54.2 µL, 1.3 equiv) in CH_2Cl_2 (0.6 mL) [reaction condition: RT for 24.0 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/40) yielded **20d** as yellow liquid (17.0 mg, 12%) and **20d'** as white powder (70.7 mg, 50%).

R_f 0.4 (ethyl acetate/hexanes: 1/10)
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.92 (*pseudo* d, 2H, *J* = 7.8 Hz), 7.77 (*pseudo* d, 1H, *J* = 7.6 Hz), 7.64 (*pseudo* d, 2H, *J* = 7.6 Hz), 7.46 (*pseudo* t, 1H, *J* = 7.4 Hz), 7.39 (*pseudo* t, 2H, *J* = 7.5 Hz), 7.35-7.26 (m, 3H), 7.25-7.10 (m, 4H), 7.10-6.98 (m, 3H), 6.82-6.74 (m, 2H), 5.34 (s, 2H), 3.22 (septet, 1H, *J* = 6.9 Hz), 1.36 (d, 6H, *J* = 7.1 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 164.0, 145.8, 144.0, 137.9, 136.4, 135.6, 132.9, 130.0, 129.5, 128.6, 128.1, 128.0, 127.1, 126.9, 125.6, 124.6, 121.2, 120.6, 119.7, 110.9, 109.3, 106.0, 46.7, 29.7, 26.6, 22.0.
MS (70eV, EI) *m/z* (%): 471 $[M]^+$ (66), 366 (86), 105 (63), 91 (100), 77 (26).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2959 (m), 2923 (m), 1731 (m), 1642 (s), 1237 (m), 1086 (m).
HRMS (ESI) for **$C_{33}H_{29}NO_2Na$**, **$[M+Na]^+$** (494.2096) found: 494.2107.

***N*-benzyl-*N*-(2-(2,5-diphenylfuran-3-yl)phenyl)isobutyramide (20d'):**



R_f 0.3 (ethyl acetate/hexanes: 1/10) mp.: 160.9-161.4 °C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.71 (*pseudo* d, 2H, *J* =7.7 Hz), 7.59-7.45 (m, 3H), 7.41 (*pseudo* t, 2H, *J* = 7.6 Hz), 7.36-7.15 (m, 9H), 7.15-7.05 (m, 2H), 6.87 (*pseudo* d, 1H, *J* = 7.8 Hz), 6.55 (s, 1H), 5.45 (*pseudo* d, 1H, *J* = 14.4 Hz), 3.72 (d,

1H, *J* = 14.4 Hz), 2.52 (septet, 1H, *J* = 6.6 Hz), 1.08 (d, 3H, *J* = 6.7 Hz), 1.01 (d, 3H, *J* = 6.5 Hz).

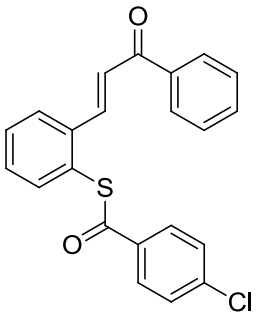
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 177.2, 152.8, 148.4, 140.6, 137.8, 132.7, 132.5, 130.6, 130.2, 130.1, 128.8, 128.7, 128.6, 128.5, 128.3, 128.2, 127.8, 127.6, 127.1, 125.3, 123.9, 120.7, 108.9, 51.7, 31.6, 20.6, 19.1.

MS (70eV, EI) *m/z* (%): 471 $[M]^+$ (68), 400 (22), 105 (70), 91 (100), 77 (24).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3063 (w), 3026 (w), 2967 (m), 2930 (m), 1650 (s), 1594 (m), 1403 (m), 1248 (m), 1215 (m).

HRMS (ESI) for **$C_{33}H_{29}NO_2Na$**, **$[M+Na]^+$** (494.2096) found: 494.2097.

Synthesis of (*E*)-S-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl) 4-chlorobenzothioate (21):



R_f 0.3 (EA /hexanes: 1/20); mp.: 81.1-81.3 ℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 8.13 (d, 1H, *J* = 16.0 Hz), 7.97-7.94 (m, 4H), 7.90 (*pseudo* d, 1H, *J* = 8.0 Hz), 7.58 (*pseudo* d, 1H, *J* = 8.0 Hz), 7.55-7.45 (m, 6H), 7.42-7.38 (m, 2H).

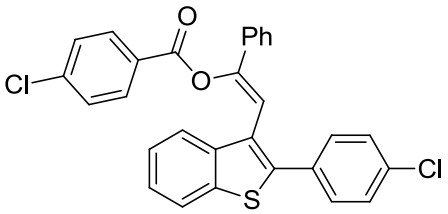
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.5, 187.8, 141.9, 140.3, 139.1, 137.8, 137.2, 134.6, 132.8, 130.6, 130.5, 129.1. 128.9, 128.6, 128.5, 128.4, 127.4, 124.9.

MS (70eV, EI) *m/z* (%): 239 $[M-139]^+$ (7.7), 138 (100), 105 (80), 77 (23).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (m), 1793 (m), 1672 (s), 1203 (m), 894 (m), 753 (w).

HRMS (ESI) for **$C_{29}H_{18}ClO_2SNa$**, **$[M+Na]^+$** (401.0379) found: 401.0377.

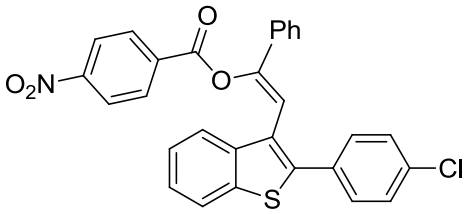
Synthesis of 2-(2-(4-chlorophenyl)benzo[b]thiophen-3-yl)-1-phenylvinyl 4-chlorobenzoate (22a):



Prepared according to **TP 3** from (*Z*)-S-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl) 4-chlorobenzothioate (**21**) (378.0 mg, 0.3 mmol), 4-chlorophenyl chloride (**2a**) (42 µL, 1.1 equiv), PBu_3 (91.5 µL, 1.2 equiv) and NEt_3 (54 µL, 1.3 equiv) in THF (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (Dichloromethane /hexanes: 1/2) yielded **22a** as white solid (141.2 mg, 94%).

R_f 0.3 (Dichloromethane /hexanes: 1/2); mp.: 179.0-180.0 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.92 (*pseudo* d, 1H, J = 8.0 Hz), 7.75 (*pseudo* d, 1H, J = 8.0 Hz), 7.71-7.69 (m, 4H), 7.60-7.57 (m, 2H), 7.42-7.38 (m, 6H), 7.33-7.28(m, 2H) 6.91 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 162.8, 148.7, 140.1, 139.9, 138.9, 138.7, 134.5, 134.4, 133.1, 131.3, 130.6, 129.1, 128.9. 128.8, 128.6, 127.1, 125.8, 124.9, 124.7, 124.4, 123.9, 122.1, 110.9.
MS (70eV, EI) *m/z* (%): 499 $[M-1]^+$ (17),139 (73), 221 (17), 105 (100), 77 (9).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1730 (s), 1240 (s), 1085 (s), 750 (s).
HRMS (ESI) for **$C_{29}H_{18}ClO_2SNa$**, **$[M+Na]^+$** (523.0302) found: 523.0316.

Synthesis of 2-(2-(4-chlorophenyl)benzo[b]thiophen-3-yl)-1-phenylvinyl 4-chlorobenzoate (22b):



Prepared according to **TP 3** from (*Z*)-S-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl) 4-nitrobenzothioate (**21**) (378.0 mg, 0.3 mmol), 4-nitrophenyl chloride (**2a**) (61.3mg, 1.1 equiv), PBu_3 (91.5 µL, 1.2 equiv) and NEt_3 (54 µL, 1.3 equiv) in THF (0.6 mL) [reaction condition: RT for 1.5 h]. Purification by flash-chromatography (EA /hexanes: 1/20) yielded **22b** as white solid (104.3 mg, 68%).

R_f 0.3 (Dichloromethane /hexanes: 1/2); mp.: 190.3-191.3 °C

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.09 (*pseudo* d, 2H, J = 8.6 Hz), 7.91-7.88 (m, 2H), 7.70 (*pseudo* d, 1H, J = 8.0 Hz), 7.67 (*pseudo* d, 2H, J = 8.4 Hz), 7.59-7.58 (m, 2H), 7.41-7.27 (m, 7H), 6.93 (s, 1H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 161.9, 150.6, 148.6, 140.4, 138.7, 138.7, 134.5, 134.0, 133.9, 132.9, 131.0, 130.5, 129.3, 128.9, 128.8, 125.4, 124.8, 124.7, 124.4, 123.7, 123.3, 122.2, 111.1.

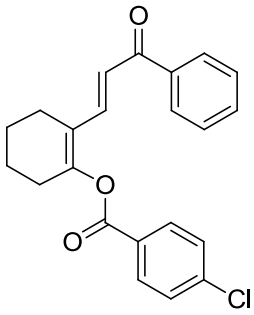
MS (70eV, EI) *m/z* (%): 511[M-1]$^+$ (100), 361 (19), 255 (26), 150 (12).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (m), 1734 (s), 1528 (s), 1244 (m), 1028 (s), 750 (s).

HRMS (ESI) for **$C_{29}H_{18}ClO_2SNa$**, **[M+Na]$^+$** (534.0543) found:534.0538.

CCDC: 876151

Synthesis of (E)-2-(3-oxo-3-phenylprop-1-en-1-yl)cyclohex-1-en-1-yl 4-chlorobenzoate (24):



Prepared according to **TP 5** from 2-formylcyclohex-1-en-1-yl 4-chlorobenzoate (**38**) (2.6 g, 10 mmol), benzoyl chloride (1.2 mL, 1.05 equiv) and NEt_3 (1.7 mL, 1.2 equiv) in THF (20 mL). Purification by flash-chromatography (ethyl acetate/hexanes: 1/20) yielded **24** as yellow oil (0.73 g, 20%).

R_f 0.4 (ethyl acetate/hexanes: 1/20)

^{1}H-NMR (400 MHz,$CDCl_3$, 25 °C) δ/ppm: 8.04 (d, 2H, J = 8.4 Hz), 7.89 (d, 2H, J = 7.1 Hz), 7.77 (d, 2H, J = 15.5 Hz), 7.54-7.38 (m, 5H), 6.92 (d, 1H, J = 15.5 Hz), 2.50-2.42 (m, 4H), 1.88-1.78 (m, 4H).

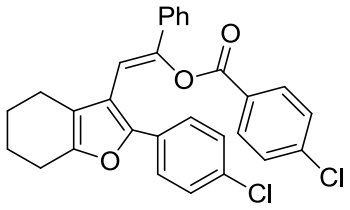
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 190.8, 163.6, 153.7, 140.2, 138.8, 138.2, 132.5, 131.4, 129.0, 128.4, 128.3, 127.5, 122.2, 121.1, 28.6, 24.3, 22.3, 21.7.

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}):3049 (w), 1730 (s), 1664 (m), 1590 (s), 1089 (s), 753(w).

HRMS (ESI) for **$C_{22}H_{19}ClO_3Na$**, **[M+Na]$^+$** (389.0920) found: 389.0929.

Synthesis of

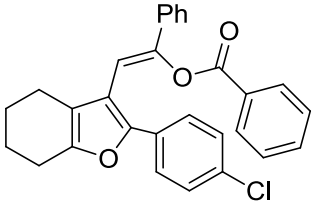
(Z)-2-(2-(4-chlorophenyl)-4,5,6,7-tetrahydrobenzofuran-3-yl)-1-phenylvinyl 4-chlorobenzoate (26a):



Prepared according to **TP 1** from (E)-2-(3-oxo-3-phenylprop-1-en-1-yl)cyclohex-1-en-1-yl 4-chlorobenzoate (**24**) (132.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 4 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **26a** as yellow oil (199.8 mg, 88%).

R_f 0.3 (ethyl acetate/hexanes: 1/25)
^{1}H-NMR (400 MHz,$CDCl_3$, 25 °C) δ/ppm: 7.77 (d, 2H, J = 8.4 Hz), 7.59 (d, 2H, J = 7.1 Hz), 7.53 (d, 2H, J = 15.5 Hz), 7.42-7.33 (m, 5H), 7.34-7.28 (m, 2H), 6.72 (s, 1H), 2.62-2.54 (m, 2H), 2.50-2.42 (m, 2H), 1.84-1.74 (m, 2H), 1.74-1.65 (m, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 162.8, 150.8, 147.4, 147.3, 140.0, 134.8, 132.6, 131.3, 130.4, 128.8, 128.5, 127.5, 127.0, 124.7, 119.4, 115.4, 109.1, 23.2, 22.9, 22.8, 21.7.
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 1738 (s), 1675 (s), 1598 (w), 1236 (s), 1085 (s), 757 (w).
HRMS (ESI) for **$C_{29}H_{23}ClO_3Na$**, **$[M+Na]^+$** (477.1233) found: 477.1243.

Synthesis of (Z)-2-(2-(4-chlorophenyl)-4,5,6,7-tetrahydrobenzofuran-3-yl)-1-phenylvinyl benzoate (26b):

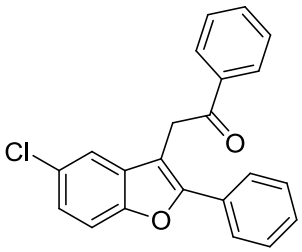


Prepared according to **TP 1** from (E)-2-(3-oxo-3-phenylprop-1-en-1-yl)cyclohex-1-en-1-yl 4-chlorobenzoate (**24**)

(132.0 mg, 0.5 mmol), benzoyl chloride (**2a**) (64.0 µL, 1.1 equiv), PBu_3 (150.0 µL, 1.2 equiv) and NEt_3 (91.0 µL, 1.3 equiv) in THF (1.0 mL) [reaction condition: RT for 4 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **26b** as yellow oil (186.2 mg, 82%).

R_f 0.3 (ethyl acetate/hexanes: 1/25)
^{1}H-NMR (400 MHz,$CDCl_3$, 25 °C) δ/ppm: 7.87 (d, 2H, J = 8.4 Hz), 7.63-7.52 (m, 5H), 7.44-7.32 (m, 5H), 7.54-7.38 (m, 5H), 7.32-7.27 (m, 2H), 6.71 (s, 1H), 2.60-2.52 (m, 2H), 2.52-2.43 (m,2H), 1.82-1.72 (m, 2H), 1.72- 1.63 (m, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 163.7, 150.7, 147.6, 147.3, 135.0, 133.4, 132.5, 130.4, 130.0, 129.1, 128.7, 128.6, 128.5, 128.4, 127.0, 124.7, 119.5, 115.5, 109.0, 23.2, 23.0, 22.8, 21.8.
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3070 (w), 1738 (s), 1590 (m), 1244 (s), 1074 (s), 753 (m).
HRMS (ESI) for **$C_{29}H_{23}ClO_3Na$**, **$[M+Na]^+$** (477.1233) found: 477.1243.

Synthesis of 2-(5-chloro-2-phenylbenzofuran-3-yl)-1-phenylethanone (28b):

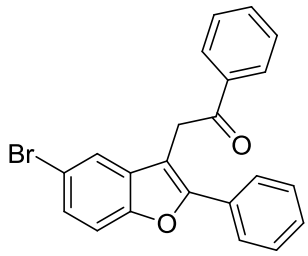


Prepared according to **TP 4** from (*Z*)-2-(5-chloro-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4b**) (90.0 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28b** as white solid (60.9 mg, 88%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 133.1-133.3°C.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.98 (*pseudo* d, 2H, J = 8.6 Hz), 7.65 (*pseudo* d, 2H, J = 7.1 Hz), 7.59 (*pseudo* t, 1H, J = 7.4 Hz), 7.42-7.37 (m, 7H), 7.21 (*pseudo* dd, 1H, J = 8.7, 1.9 Hz), 4.48 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 195.8, 154.4, 152.5, 136.2, 133.6, 131.5, 130.1, 129.0, 128.8, 128.7, 127.3, 124.6, 119.3, 112.2, 108.9, 34.6.
MS (70eV, EI) *m/z* (%): 348 $[M+2]^+$ (12), 346 $[M]^+$ (35), 241 (18), 205(10), 105 (100), 77 (36).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2892 (w), 1686 (s), 1587 (w), 1207 (m), 1067 (w), 687 (s).
HRMS (ESI) for **$C_{22}H_{15}ClO_2Na$**, **$[M+Na]^+$** (369.0658) found: 369.0667.

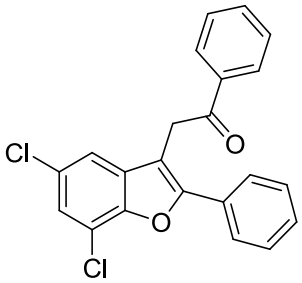
Synthesis of 2-(5-bromo-2-phenylbenzofuran-3-yl)-1-phenylethanone (28c):



Prepared according to **TP 4** from (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4c**) (98.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28c** as white solid (60.9 mg, 88%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 142.8- 143.4℃.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.03 (*pseudo* d, 2H, J = 8.5 Hz), 7.66 (*pseudo* d, 2H, J = 8.4 Hz), 7.60 (*pseudo* t, 1H, J = 7.4 Hz), 7.53 (*pseudo* s, 1H), 7.45-7.39 (m, 5H), 7.36 (s, 2H), 4.50 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 195.8, 154.3, 152.8, 136.2, 133.6, 132.2, 130.1, 130.1, 129.0, 128.8, 128.7, 128.3, 127.4, 122.4, 115.8, 112.7, 108.7, 34.7.
MS (70eV, EI) m/z (%): 392 $[M+2]^+$ (20) , 390 $[M]^+$ (20) , 287 (15), 205(15), 105 (100), 77 (36).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2892 (w), 1682 (s), 1590 (m), 1211 (s), 1063 (m), 750(s).
HRMS (ESI) for **$C_{22}H_{15}BrO_2Na$**, **$[M+Na]^+$** (413.0153) found: 413.0142.

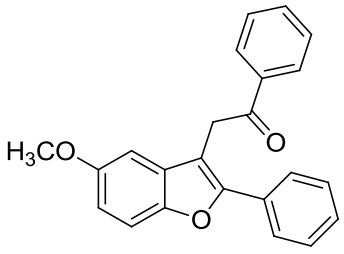
Synthesis of 2-(5,7-dichloro-2-phenylbenzofuran-3-yl)-1-phenylethanone (28d):



Prepared according to **TP 4** from (*Z*)-2-(5,7-dichloro-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4d**) (96.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28d** as white solid (64.6 mg, 85%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 177.0-177.6°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.00 (*pseudo* d, 2H, *J* = 7.2 Hz), 7.68 (*pseudo* d, 2H, *J* = 7.2 Hz), 7.61 (*pseudo* t, 1H, *J* = 7.4 Hz), 7.45-7.39 (m, 5H), 7.28 (*pseudo* s, 1H), 4.47 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 195.4, 155.3, 148.6, 136.1, 133.7, 132.5, 129.5, 129.4, 128.9, 128.3, 127.5, 124.5, 118.1, 117.3, 109.5, 34.7.
MS (70eV, EI) *m/z* (%): 384 $[M+4]^+$ (1), 382 $[M+2]^+$ (5), 380 $[M]^+$ (8), 275 (3), 105 (100), 77 (36).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2892 (w), 1671 (s), 1576 (m), 1211 (s), 1067 (m), 683 (s).
HRMS (EI) for **$C_{22}H_{14}Cl_2O_2Na$**, **$[M+Na]^+$** (380.0371) found: 380.0371.

Synthesis of 2-(5-methoxy-2-phenylbenzofuran-3-yl)-1-phenylethanone (28e):

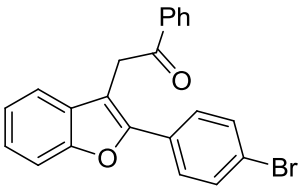


Prepared according to **TP 4** from (*Z*)-2-(5-methoxy-2-phenylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4e**) (89.2 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction

condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28e** as white solid (60.9 mg, 89%).

R_f 0.2 (ethyl acetate/hexanes: 1/15); mp.: 153.1-154.1℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.02 (*pseudo* d, 2H, J = 7.2 Hz), 7.68 (*pseudo* d, 2H, J = 7.1 Hz), 7.57 (*pseudo* t, 1H, J = 7.5 Hz), 7.45 (~~*pseudo* q~~, 4H, J = 7.7 Hz), 7.37-7.36 (m, 2H), 6.88-6.86 (m, 2H), 4.50 (s, 2H), 3.03 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.3, 156.0, 153.8, 149.1, 136.4, 133.4, 130.7, 128.8, 128.7, 128.6, 128.4, 127.3, 113.3, 111.6, 109.3, 102.2, 55.9, 35.0.
MS (70eV, EI) *m/z* (%): 342 $[M]^+$ (88), 237(100), 105 (100), 77 (62).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2826 (w), 1679 (s), 1598 (m), 1211 (s), 1059 (m).
HRMS (ESI) for **$C_{23}H_{18}O_3Na$**, **$[M+Na]^+$** (365.1154) found: 365.1162.

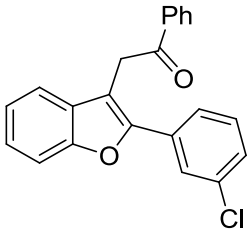
Synthesis of 2-(2-(4-bromophenyl)benzofuran-3-yl)-1-phenylethanone (28f):



Prepared according to **TP 4** from (*Z*)-2-(2-(4-bromophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (**4f**) (98.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28f** as white solid (71.8 mg, 92%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 130.7-131.4℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.01 (*pseudo* d, 2H, J = 7.6 Hz), 7.58-7.55 (m, 5H), 7.42-7.39 (m, 4H), 7.28 (*pseudo* t, 1H, J = 7.5 Hz), 7.19 (*pseudo* t, 1H, J = 7.5 Hz), 4.49 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.0, 154.0, 151.3, 136.3, 133.5, 131.9, 130.0, 129.5, 128.7, 128.6, 128.3, 124.8, 122.8, 122.7, 119.6, 111.2, 109.8, 34.6.
MS (70eV, EI) *m/z* (%): 392 $[M+2]^+$ (22), 390 $[M]^+$ (22), 284(10), 206 (26), 176 (18), 105 (100), 77 (50).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2900 (w), 1675 (s), 1590 (m), 1207 (s), 1070 (m), 735(s).
HRMS (EI) for **$C_{22}H_{15}BrO_2$**, **$[M]^+$** (390.0255) found: 390.0249.

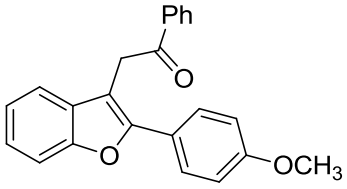
Synthesis of 2-(2-(3-chlorophenyl)benzofuran-3-yl)-1-phenylethanone (28g):



Prepared according to **TP 4** from (*Z*)-2-(2-(3-chlorophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (**4g**) (90.0 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28g** as white solid (65.7 mg, 95%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 126.2-126.8°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.04 (*pseudo* d, 2H, J = 7.8 Hz), 7.72 (*pseudo* s, 1H), 7.61 (*pseudo* t, 1H, J = 7.46 Hz), 7.55-7.54 (m, 1H), 7.47-7.42 (m, 4H), 7.33-7.29 (m, 3H), 7.22-7.20 (m, 1H), 4.54 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 196.0, 154.1, 151.4, 136.4, 134.8, 133.5, 132.4, 130.0, 129.9, 128.8, 128.7, 128.6, 128.4, 127.3, 127.2, 125.2, 125.0, 122.9, 119.8, 111.3, 110.3, 34.7.
MS (70eV, EI) *m/z* (%): 348 $[M+2]^+$ (7), 346 $[M]^+$ (18), 241(8), 206 (12), 105 (100), 77 (28).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2892 (w), 1679 (s), 1587 (m), 1211 (s), 1056 (m), 683 (s).
HRMS (ESI) for **$C_{22}H_{15}ClO_2Na$**, **$[M+Na]^+$** (369.0658) found: 369.0668.

Synthesis of 2-(2-(4-methoxyphenyl)benzofuran-3-yl)-1-phenylethanone (28h):

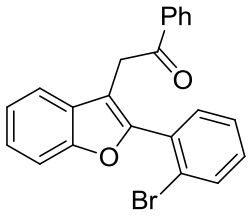


Prepared according to **TP 4** from (*Z*)-2-(2-(4-methoxyphenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (**4h**) (89.2 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction

condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **278h** as white solid (56.7 mg, 83%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 121.3-122.0℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.02 (*pseudo* d, 2H, J = 7.8 Hz), 7.66 (*pseudo* d, 2H, J = 7.8 Hz), 7.57 (*pseudo* t, 1H, J = 7.46 Hz), 7.44-7.40 (m, 4H), 7.26-7.25 (m, 1H), 7.17-7.11 (m, 1H), 7.22-7.20 (m, 1H), 6.91 (*pseudo* d, 2H, J = 7.8 Hz), 4.52 (s, 2H), 3.88 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.5, 160.0, 153.9, 153.1, 136.5, 133.4, 130.2, 128.8, 128.7, 128.4, 124.1, 123.3, 122.6, 119.4, 114.3, 111.0, 107.9, 55.3, 35.0.
MS (70eV, EI) *m/z* (%): 342 $[M]^+$ (63), 265 (3), 249 (18), 237 (100), 105 (23), 77 (21).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3084 (w), 2922 (w), 1682 (s), 1590 (m), 1214 (m), 1089 (m).
HRMS (ESI) for $C_{23}H_{18}O_3$, $[M]^+$ (343.1334) found: 343.1329.

Synthesis of 2-(2-(2-bromophenyl)benzofuran-3-yl)-1-phenylethanone (28i):

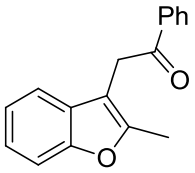


Prepared according to **TP 4** from (*Z*)-2-(2-(2-bromophenyl)benzofuran-3-yl)-1-phenylvinyl benzoate (**4i**) (98.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28i** as white solid (67.9 mg, 87%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 110.8-112.3℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 7.90 (*pseudo* d, 2H, J = 7.2 Hz), 7.72 (*pseudo* d, 1H, J = 8.0 Hz), 7.51-7.48 (m, 4H), 7.40 (*pseudo* t, 3H, J = 7.8 Hz), 7.33 (*pseudo* t, 2H, J = 7.6 Hz), 7.25 (*pseudo* t, 1H, J = 7.4 Hz), 4.30 (s, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.1, 154.5, 152.0, 136.3, 133.4, 132.7, 131.6, 131.0, 128.9, 128.6, 127.4, 124.7, 124.2, 122.8, 120.4, 111.8, 111.4, 35.0.
MS (70eV, EI) *m/z* (%): 392 $[M+2]^+$ (16), 390 $[M]^+$ (18), 311(2), 206 (24), 105 (100), 77 (18).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2915 (s), 2848 (m), 1690 (m), 1211 (w), 1026 (m),

739 (s).
HRMS (ESI) for $C_{22}H_{15}BrO_2Na$, $[M+Na]^+$ (413.0153) found: 413.0128.

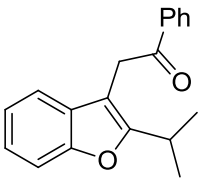
Synthesis of 2-(2-methylbenzofuran-3-yl)-1-phenylethanone (28j):



Prepared according to **TP 4** from (*Z*)-2-(2-methylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4j**) (70.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28j** as white solid (40.5 mg, 81%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 120.1.5-120.3℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.04 (*pseudo* d, 2H, J = 7.2 Hz), 7.57 (*pseudo* t, 1H, J = 7.4 Hz), 7.47 (*pseudo* t, 2H, J = 7.6 Hz), 7.38-7.37 (m, 2H), 7.18 (*pseudo* quint, 2H, J = 6.9 Hz), 4.25 (s, 2H), 2.41 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.3, 154.0, 152.4, 136.6, 133.2, 129.3, 128.7, 128.3, 128.3, 122.4, 118.8, 110.7, 108.0, 34.1, 12.3.
MS (70eV, EI) *m/z* (%): 250 $[M]^+$ (18), 145 (62), 105 (100), 77 (68).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2900 (w), 1675 (s), 1590 (w), 1211 (m), 1078 (w).
HRMS (ESI) for **$C_{17}H_{14}O_2Na$**, **$[M+Na]^+$** (273.0891) found: 273.0866.

Synthesis of 2-(2-isopropylbenzofuran-3-yl)-1-phenylethanone (28k):

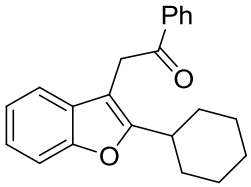


Prepared according to **TP 4** from (*Z*)-2-(2-isopropylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4k**) (76.4 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28k** as white solid (48.9 mg, 88%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 100.8-101.3℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.07 (*pseudo* d, 2H, J = 7.6 Hz), 7.59 (*pseudo* t, 1H, J = 7.4 Hz), 7.50 (*pseudo* t, 2H, J = 7.6 Hz), 7.43-7.40 (m, 2H), 7.21 (*pseudo* quint, 2H, J = 7.7 Hz), 4.29 (s, 2H), 3.19 (heptet, 1H, J = 6.9 Hz), 1.32 (d, 6H, J = 7.0 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 196.6, 160.4, 153.9, 136.6, 133.3, 129.4, 128.68, 128.4, 123.3, 122.3, 119.0, 110.8, 105.8, 34.0, 26.7, 21.1.
MS (70eV, EI) *m/z* (%): 278 $[M]^+$ (22), 173 (57), 158 (15), 105 (100),77 (55).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2870 (w), 1679 (s), 1594 (w), 1214 (m), 1041 (w).
HRMS (ESI) for **$C_{19}H_{18}O_2Na$**, **$[M+Na]^+$** (301.1204) found: 301.1224.

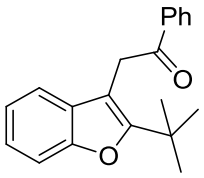
Synthesis of 2-(2-cyclohexylbenzofuran-3-yl)-1-phenylethanone (28l):



Prepared according to **TP 4** from (*Z*)-2-(2-cyclohexylbenzofuran-3-yl)-1-phenylvinyl benzoate (**4l**) (84.4 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28l** as white solid (54.7 mg, 86%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 133.4-134.5°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.03 (*pseudo* d, 2H, J = 7.8 Hz), 7.57 (*pseudo* t, 1H, J = 7.1 Hz), 7.47 (*pseudo* t, 2H, J = 7.4 Hz), 7.36 (*pseudo* d, 2H, J = 7.6 Hz), 7.17 (*pseudo* quint, 2H, J = 7.6 Hz), 4.27 (s, 2H), 2.75 (*pseudo* t, 1H, J = 11.5 Hz), 1.78-1.68 (m, 7H), 1.31-1.25 (m, 3H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 196.6, 159.9, 153.8, 136.6, 133.2, 129.3, 128.6, 128.3, 123.2, 122.2, 119.0, 110.8, 106.0, 36.6, 34.0, 31.2, 26.4, 25.8.
MS (70eV, EI) *m/z* (%): 318 $[M]^+$ (30), 213 (30), 131 (30), 105(100), 77 (55).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2915 (s), 2856 (m), 1679 (s), 1594 (w), 1211 (m), 1085 (w).
HRMS (ESI) for **$C_{22}H_{22}O_2Na$**, **$[M+Na]^+$** (341.1517) found: 341.1482.

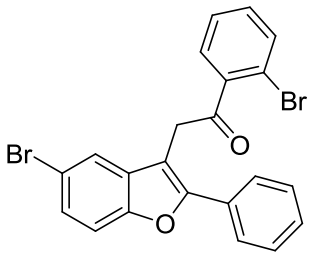
Synthesis of 2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylethanone (28m):



Prepared according to **TP 4** from (*Z*)-2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylvinyl benzoate (**4m**) (79.2 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28m** as white solid (50.2 mg, 86%).

R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 120.3-120.5℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.08 (*pseudo* d, 2H, *J* = 7.6 Hz), 7.61 (*pseudo* t, 1H, *J* = 7.4 Hz), 7.51 (*pseudo* t, 2H, *J* = 7.6 Hz), 7.41 (*pseudo* d, 1H, *J* = 8.1 Hz), 7.25-7.24 (m, 1H), 7.20 (*pseudo* t, 1H, *J* = 7.6 Hz), 7.12 (*pseudo* t, 1H, *J* = 7.4 Hz), 4.51 (s, 2H), 1.4 (s, 9H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.5, 161.8, 153.0, 136.8, 133.3, 130.7, 128.7, 128.2, 123.3, 122.0, 118.4, 110.7, 105.6, 34.4, 29.5.
MS (70eV, EI) *m/z* (%): 292 $[M]^+$ (100), 187 (92), 145 (18), 105 (100), 77 (34).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2959 (m), 2878 (w), 1690 (s), 1598 (w), 1207 (s), 1096 (m).
HRMS (ESI) for **$C_{20}H_{20}O_2Na$**, **$[M+Na]^+$** (315.1361) found: 315.1367.

Synthesis of 2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(2-bromophenyl)ethanone (28n):



Prepared according to **TP 4** from (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(2-bromophenyl)vinyl benzoate (**4n**) (114.4 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28n** as white solid (75.8 mg, 81%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 91.1-92.0°C

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7,67 (*pseudo* d, 2H, J = 8.4 Hz), 7.59 (*pseudo* d, 1H, J = 6.6 Hz), 7.53 (*pseudo* s, 1H), 7.40-7.34 (m, 5H), 7.29-7.25 (m, 3H,), 4.44 (s, 2H).

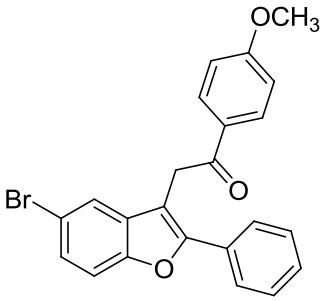
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 200.0, 154.6, 152.7, 141.1, 133.6, 131.8, 131.8, 129.8, 129.1,128.5, 127.5, 127.4, 127.3, 122.4, 118.5, 115.8, 112.6, 107.8, 38.7.

MS (70eV, EI) *m/z* (%): 472 $[M+4]^+$ (16), 470 $[M+2]^+$ (38), 468 $[M]^+$ (18), 285(43), 183 (100), 155 (30), 105 (12), 77 (21).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2892 (w), 1694 (s), 1583 (w), 1258 (m), 1056 (w), 680 (m).

HRMS (ESI) for **$C_{22}H_{14}Br_2O_2Na$**, **$[M+Na]^+$** (490.9258) found: 490.9238.

Synthesis of 2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(4-methoxyphenyl)ethanone (28o):



Prepared according to **TP 4** from (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-(4-methoxyphenyl)vinyl benzoate (**4o**) (104.8.g, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28o** as white solid (69.7 mg, 83%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 136.9-137.4°C

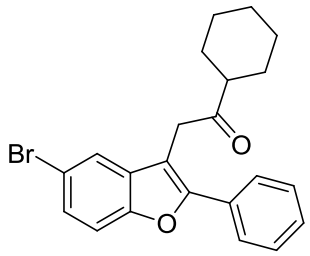
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.02 (*pseudo* d, 2H, J = 8.6 Hz), 7.68 (*pseudo* d, 2H, J = 7.5 Hz), 7.56 (*pseudo* s, 1H), 7.41-7.37 (m, 5H), 6.93 (*pseudo* d, 2H, J = 8.7 Hz), 4.45 (s, 2H), 3.88 (s, 3H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.4, 163.9, 154.2, 152.9, 132.2, 130.7, 130.2, 129.3, 129.0, 128.8, 127.4, 127.3, 122.5, 115.8, 114.0, 112.6, 109.1, 55.5, 34.3.

MS (70eV, EI) *m/z* (%): 422 $[M+2]^+$ (5), 420 $[M]^+$ (5), 285(3), 208 (3), 135 (100), 77 (8).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2907 (w), 2856 (w), 1671 (m), 1598 (s), 1218 (m), 1026 (w).
HRMS (ESI) for **$C_{23}H_{17}BrO_3Na$**, **$[M+Na]^+$** (443.0259) found: 443.0257.

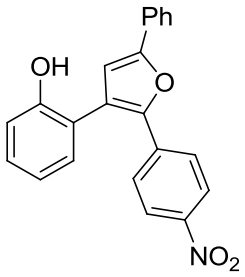
Synthesis of 2-(5-bromo-2-phenylbenzofuran-3-yl)-1-cyclohexylethanone (28p):



Prepared according to **TP 4** from (*Z*)-2-(5-bromo-2-phenylbenzofuran-3-yl)-1-cyclohexylvinyl benzoate (**4p**) (100.0 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28p** as white solid (71.3 mg, 90%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 144.7-145.1°C
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7,66 (*pseudo* d, 2H, *J* = 7.5 Hz), 7.52 (s, 1H), 7.47 (*pseudo* t, 2H, *J* = 7.5 Hz), 7.39-7.36 (m, 3H), 3.90 (s, 2H), 2.56 (*pseudo* t, 1H, *J* = 11.5 Hz), 1.90 (*pseudo* d, 2H, *J* = 13.4 Hz), 1.81 (*pseudo* d, 2H, *J* = 9.6 Hz), 1.68 (*pseudo* s, 1H), 1.45 (*pseudo* quartet, 2H, *J* = 11.7 Hz), 1.27-1.20 (m, 3H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 209.8, 154.2, 152.8, 132.1, 130.1, 129.0, 128.8, 127.4, 127.3, 122.1, 115.9, 112.7, 108.7, 50.3, 36.7, 28.7, 25.7, 25.6.
MS (70eV, EI) *m/z* (%): 398 $[M+2]^+$ (40), 396 $[M]^+$ (38), 285(36), 205 (25), 176 (22),111 (42), 83 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2915 (m), 2848 (w), 1701 (s), 1587 (w), 1258 (w), 1063 (w), 683 (m).
HRMS (ESI) for **$C_{22}H_{21}BrO_2Na$**, **$[M+2+Na]^+$** (419.0623) found: 421.0624.

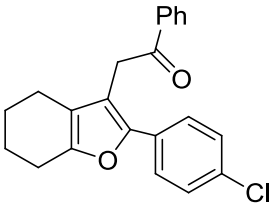
Synthesis of 2-(2-(4-nitrophenyl)-5-phenylfuran-3-yl)phenol (28'q):



Prepared according to **TP 4** from (*Z*)-2-(2-(tert-butyl)benzofuran-3-yl)-1-phenylvinyl 4-nitrobenzoate (**4'q**) (88.0 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/15) yielded **28'q** as white solid (68.1 mg, 86%).

R_f 0.3 (ethyl acetate/hexanes: 1/15); mp.: 174.8-175.8℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 8.12 (*pseudo* d, 2H, *J* = 8.8 Hz) 7,78 (*pseudo* d, 2H, *J* = 7.4 Hz), 7.67 (*pseudo* d, 2H, *J* = 8.8 Hz), 7.47 (*pseudo* t, 2H, *J* = 7.5 Hz), 7.37 (*pseudo* t, 2H, *J* = 7.5 Hz), 7.30-7.28 (m, 1H), 7.03 (*pseudo* d, 2H, *J* = 5.6 Hz), 6.83 (s, 1H), 5.00 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 155.2, 152.9, 146.5, 146.3, 136.2, 130.5, 130.4, 129.4, 129.0, 124.9, 124.3, 124.0, 122.4, 121.3, 119.5, 116.1, 110.7
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3675 (m), 1502 (m), 1325 (s), 1225 (w), 1107 (m).
HRMS (ESI) for **$C_{22}H_{15}NO_4Na$**, **$[M+H]^+$** (358.1079) found: 358.1062.

Synthesis of
2-(2-(4-chlorophenyl)-4,5,6,7-tetrahydrobenzofuran-3-yl)-1-phenylethanone (27):



Prepared according to **TP 6** from (Z)-2-(2-(4-chlorophenyl)-4,5,6,7-tetrahydrobenzofuran-3-yl)-1-phenylvinyl 4-chlorobenzoate (**26a**) (90.8 mg, 0.2 mmol) and NaOMe (13.0 mg, 1.2 equiv) in MeOH/THF (0.1/0.1 mL) [reaction condition: RT for 5 h]. Purification by flash-chromatography (ethyl acetate/hexanes: 1/25) yielded **27** as yellow oil (60.9 mg, 87%).

R_f 0.3 (ethyl acetate/hexanes: 1/25)

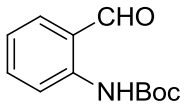
^{1}H-NMR (400 MHz,$CDCl_3$, 25 ℃) δ/ppm: 8.00 (d, 2H, J = 8.4 Hz), 7.59 (t, 1H, J = 8.4 Hz), 7.48 (t, 2H, J = 8.4 Hz), 7.41 (d, 2H, J = 8.4 Hz), 7.31 (d, 2H, J = 8.4 Hz), 7.42 (s, 2H), 2.68-2.62 (m, 2H), 2.32-2.25 (m,2H), 1.90-1.81 (m, 2H), 1.79- 1.69 (m, 2H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 196.7, 150.6, 147.6, 136.6, 133.3, 132.6, 130.1, 128.8, 128.7, 128.3, 126.9, 120.0, 114.2, 34.9, 23.2, 22.9, 22.8, 20.8.

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 1664 (m), 1587 (s), 1255 (w), 1096 (m), 757(w).

HRMS (ESI) for **$C_{22}H_{19}ClO_2Na$**, **$[M+Na]^+$** (373.0971) found: 373.0970.

Synthesis of *tert*-butyl (2-formylphenyl)carbamate (29):



R_f 0.5 (ethyl acetate/hexanes: 1/10); mp.: 85.0-85.5℃

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 10.39 (brs, 1H), 9.90 (s, 1H), 8.46 (d, 1H, J = 8.5 Hz), 7.62 (dd, 1H, J = 7.7, 1.6 Hz), 7.87 (dt, 1H, J = 8.0, 1.3 Hz), 7.53 (dt, 1H, J = 7.7, 1.3 Hz), 1.54 (s, 9H).

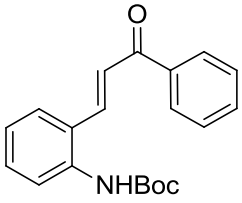
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 195.0, 152.9, 141.8, 136.1, 135.9, 121.5, 121.2, 118.3, 81.0, 28.3.

MS (70eV, EI) *m/z* (%): 221 $[M]^+$ (10), 121 (28), 93 (54), 57 (100).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3291 (s), 2976 (m), 2822 (m), 2746 (m), 1723 (s), 1666 (s), 1147 (m).

HRMS (EI) for **$C_{12}H_{15}NO_3$**, **$[M]^+$** (221.1052) found: 221.1052.

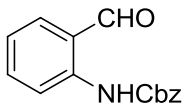
Synthesis of (*E*)-*tert*-butyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (30):



R_f 0.4 (ethyl acetate/hexanes: 1/6); mp.: 98.0-98.5℃

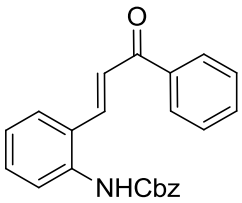
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.06-7.98 (m, 3H), 7.86 (d, 1H, J = 8.1 Hz), 7.66 (d, 1H, J = 8.0 Hz), 7.62-7.59 (m, 1H), 7.55-7.50 (m, 3H), 7.87 (t, 1H, J = 7.8 Hz), 7.15 (t, 1H, J = 7.5 Hz), 6.60 (s, 1H), 1.53 (s, 9H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 189.8, 152.9, 139.2, 137.9, 137.2, 133.0, 131.0, 128.6, 128.5, 127.2, 126.4, 124.3, 123.9, 122.9, 81.0, 28.2.
MS (70eV, EI) *m/z* (%): 223 $[M-100]^+$ (6), 206 (31), 117 (12), 105 (18), 77 (24), 57 (100).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3253 (s), 3062 (w), 2976 (m), 1723 (s), 1652 (m), 1600 (m), 1152 (m).
HRMS (MALDI) for **$C_{20}H_{21}NO_3Na$**, **$[M+Na]^+$** (346.1420) found: 346.1431.

Synthesis of benzyl (2-formylphenyl)carbamate (31):



R_f 0.3 (ethyl acetate/hexanes: 1/10); mp.: 66.0-66.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 10.67 (brs, 1H), 9.86 (s, 1H), 8.46 (d, 1H, J = 8.5 Hz), 7.60 (dd, 1H, J = 7.7, 1.5 Hz), 7.56 (dt, 1H, J = 8.5, 1.5 Hz), 7.43-7.41 (m, 2H), 7.39-7.35 (m, 2H), 7.34-7.31 (m, 1H), 7.14 (t, 1H, J = 7.5 Hz), 5.22 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.9, 153.4, 141.0, 135.9, 135.8, 135.7, 128.5, 128.2, 128.1, 121.9, 121.3, 118.2, 67.0.
MS (70eV, EI) *m/z* (%): 255 $[M]^+$ (6), 164 (3), 120 (7), 91 (100).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3272 (w), 3033 (w), 2956 (w), 2870 (w), 2765 (w), 1723 (s), 1666 (s), 12909 (m).

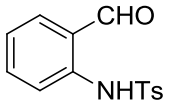
Synthesis of (*E*)-benzyl (2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl)carbamate (32):



R_f 0.3 (ethyl acetate/hexanes: 1/6); mp.: 142.0-142.5°C
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.01 (d, 2H, J = 8.0 Hz), 7.97 (d, 1H, J = 15.5 Hz), 7.86 (brs, 1H), 7.65 (d, 1H, J = 7.8 Hz), 7.60-7.57 (m, 1H), 7.51-7.48 (m,

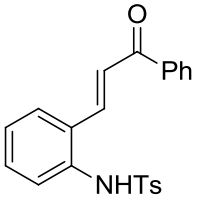
3H), 7.43-7.32 (m, 6H), 7.19 (t, 1H, *J* = 7.6 Hz), 6.87 (brs, 1H), 5.22 (s, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 189.8, 153.7, 138.9, 137.9, 136.6, 135.8, 133.0, 132.1, 132.0, 131.1, 128.7, 128.6, 128.5, 128.4, 127.4, 124.9, 124.5, 123.1, 67.4.
MS (70eV, EI) *m/z* (%): 222 $[M-135]^+$ (6), 207 (12), 105 (34), 91 (100), 77 (22).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3291 (s), 3062 (s), 2985 (w), 3033 (w), 2947 (w), 1700 (s), 1661 (s), 1600 (m), 1238 (m).
HRMS (MALDI) for **$C_{23}H_{19}NO_3Na$**, **$[M+Na]^+$** (380.1263) found: 380.1271.

Synthesis of N-(2-formylphenyl)-4-methylbenzenesulfonamide (33)



R_f 0.3 (ethyl acetate/hexanes: 1/8) ; mp.: 134.8-135.7℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) *δ*/ppm: 10.80 (s, 1H), 9.82 (s, 1H), 7.76(d, 2H, *J* = 8.2 Hz), 7.67 (d, 1H, *J* = 8.4 Hz), 7.59 (*pseudo* d, 1H, *J* = 9.1, 0.7Hz), 7.54-7.46 (m, 1H), 7.23 (d, 2H, *J* = 8.2), 7.16 (t, 1H, *J* = 7.5 Hz), 2.35 (s, 3H)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 195.0, 144.1, 139.7, 136.2, 136.1, 135.7, 129.7, 127.1, 122.9, 121.7, 117.5, 21.4
S (70eV, EI) *m/z* (%): 275 $[M]^+$ (18), 120 (100), 90 (58).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3129(m), 3062 (w), 2915 (w), 2856 (w), 2752 (w), 1668 (s), 1336 (s), 1155 (m).
HRMS (ESI) for **$C_{14}H_{13}NO_3SNa$**, **$[M+Na]^+$** (298.0514) found: 298.0508.

Synthesis of (*E*)-4-methyl-*N*-(2-(3-oxo-3-phenylprop-1-en-1-yl)phenyl) Benzenesulfonamide (34)



R_f 0.3 (ethyl acetate/hexanes: 1/5) ; mp.: 176.7-177.1℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) *δ*/ppm: 7.95 (d, 2H, *J* = 7.2 Hz), 7.71 (d, 1H, *J* =

15.5 Hz), 7.63-7.45 (m, 7H), 7.39 (t, 1H, *J* = 7.1 Hz), 7.34-7.24 (m, 2H), 7.20 (d, 1H, *J* = 15.5 Hz), 7.11 (d, 2H, *J* = 8.1 Hz), 2.14 (s, 3H)

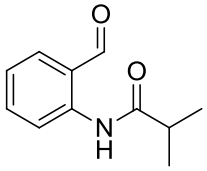
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.0, 143.9, 139.1, 137.6, 135.9, 135.3, 133.1, 131.1, 131.0, 129.7, 128.7, 128.6, 127.7, 127.3, 127.2, 124.3, 21.3

MS (70eV, EI) *m/z* (%): 222 $[M-155]^+$ (13), 117 (13), 105 (100), 77 (30).

IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3180(s), 3047 (w), 2915 (s), 1653 (m), 1590 (s), 1340 (s), 1152 (s)

HRMS (ESI) for **$C_{22}H_{19}NO_3SNa$**, **$[M+Na]^+$** (400.0983) found: 400.0964.

Synthesis of *N*-(2-formylphenyl)isobutyramide :



A 25-mL Schlenk flask, equipped with a magnetic stirring bar, was charged with a solution of 2-amino benzyl alcohol (1231.5 mg, 10 mmol) in THF (33 mL). Benzoyl chloride (1.2 mL, 1.1 equiv) and triethylamine (1.7 mL, 1.2 equiv) was added, and the reaction mixture was stirred for 12 h at room temperature. Then the crude product was dissolved in ethyl acetate and washed with sat. $NaHCO_{3\,(aq)}$, and the organic layer was dried by $MgSO_4$ and then evaporated. Without purification, the crude product was dissolved in CH_2Cl_2 (25 mL) and then PCC (2587.0 mg, 1.2 equiv)was added. The reaction mixture was stirred for 4 h under room temperature and then filtered through Celite 545 and silica gel followed by washing with CH_2Cl_2. The solvent was removed by evaporation and purification by flash chromatography (ethyl acetate/hexanes: 1/10) yielded *N*-(2-formylphenyl)isobutyramide as yellow liquid (1158 mg, 58%).

R_f 0.4 (ethyl acetate/hexanes:1/10)

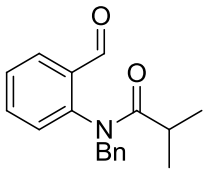
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 11.20 (s, 1H), 9.92 (s, 1H), 8.77 (*pseudo* d, 1H, *J* = 8.4 Hz), 7.67 (*pseudo* dd, 1H, *J* = 7.6 Hz, *J* = 1.4 Hz), 7.60 (*pseudo* t, 1H, *J* = 8.1 Hz), 7.21(*pseudo* t, 1H, *J* = 7.5 Hz), 2.64 (septet, 1H, *J* = 7.0 Hz), 1.30 (d, 6H, *J* = 7.0).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 195.4, 176.6, 141.1, 136.0, 135.9, 122.6, 121.6, 119.7, 37.2, 19.3.

MS (70eV, EI) *m/z* (%): 192 $[M+1]^+$ (65), 121 (22), 93 (38), 71 (100).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2959 (m), 2915 (m), 1650 (s), 1609 (m), 1285 (m), 1189 (m).

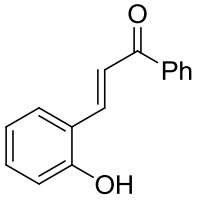
Synthesis of *N*-benzyl-*N*-(2-formylphenyl)isobutyramide (35d):



A 25-mL Schlenk flask, equipped with a magnetic stirring bar, was charged with a solution of *N*-(2-formylphenyl)isobutyramide (955.0 mg, 5 mmol) and sodium hydride (240.0 mg, 1.2 equiv) in DMF (10 mL). After stirred for 30 minutes at 0 ℃, benzyl bromide (374.0 μL, 1.2 equiv) was added, and the reaction mixture was stirred for 12 h under room temperature. Then the crude product was dissolved in ethyl acetate and washed with water. The organic layer was dried by $MgSO_4$ and then evaporated. Purification by flash chromatography (ethyl acetate/hexanes: 1/8) yielded **31d** as yellow liquid (431.9 mg, 31%).

R_f 0.2 (ethyl acetate/hexanes: 1/10)
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ℃) δ/ppm: 9.72 (s, 1H), 7.92 (*pseudo* dd, 1H, J = 7.7 Hz, J = 1.5 Hz), 7.61 (*peseudo* td, 1H, J =7.6 Hz, J =1.6 Hz), 7.50 (*pseudo* t, 1H, J = 7.5 Hz), 7.28-7.19 (m, 3H), 7.18-7.10 (m, 2H), 7.06 (*pseudo* d, 1H, J = 7.9 Hz), 4.99 (d, 1H, J = 14.0 Hz), 4.84 (d, 1H, J = 14.0 Hz), 2.29 (septet, 1H, J = 6.7 Hz), 1.10-0.97 (m, 6H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 189.0, 176.8, 143.9, 136.0, 135.2, 133.1, 130.0, 129.6, 129.3, 128.7, 128.4, 127.8, 53.5, 31.8, 19.8, 19.0.
MS (70eV, EI) *m/z* (%): 282 $[M]^+$ (3), 210 (100), 91 (28), 71 (4)
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3026 (w), 2967 (m) 2841 (m), 1690 (s), 1653 (s), 1392 (s), 1244 (s).

Synthesis of (*E*)-3-(2-hydroxyphenyl)-1-phenylprop-2-en-1-one (37a):

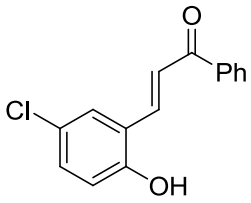


The compound **37a** was obtained as yellow solid according to the reported

procedure[5].

mp.: 154.0-154.3 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 8.19 (*pseudo* d, 1H, J = 15.8 Hz), 8.05 (*pseudo* d, 2H, J = 7.8 Hz), 7.72 (d, 1H, J = 15.8 Hz), 7.60 (*pseudo* t, 2H, J = 7.8 Hz), 7.51 (*pseudo* t, 2H, J = 7.4 Hz), 7.32-7.24 (m, 1H), 7.00-6.90 (m, 2H), 6.63 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 191.8, 155.6, 140.8, 138.3, 132.7, 131.8, 129.5, 128.6, 128.6, 122.9, 122.3, 121.0, 116.6.
MS (70eV, EI) *m/z* (%): 224 $[M]^+$ (75), 207 (100), 147 (60), 105 (46).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3188 (brs), 2944 (w), 1639 (s), 1561 (s), 1230 (s).
HRMS (EI) for **$C_{15}H_{13}O_2$**, **$[M+H]^+$** (225.0916) found: 225.0921.

Synthesis of (*E*)-3-(5-chloro-2-hydroxyphenyl)-1-phenylprop-2-en-1-one (37b):

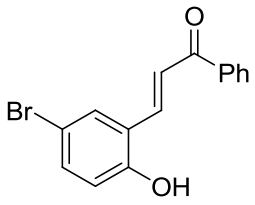


The compound **37b** was obtained as yellow solid according to the reported procedure[5].

mp.: 174.2-174.4 ℃
^{1}H-NMR (400 MHz, d^6-DMSO, 25 C) δ/ppm: 10.55 (s, 1H), 8.15 (*pseudo* d, 2H, J = 7.2 Hz), 8.06-7.90 (m, 3H), 7.66 (*pseudo* t, 1H, J = 7.2 Hz), 7.57 (*pseudo* t, 2H, J = 7.6 Hz), 7.30 (dd, 1H, J = 8.8, 2.4 Hz), 6.95 (*pseudo* d, 1H, J = 8.8 Hz).
^{13}C-NMR (100 MHz, d^6-DMSO, 25 ℃) δ/ppm: 189.2, 155.9, 137.7, 137.6, 133.0, 131.3, 128.7, 128.5, 127.5, 123.2, 123.1, 122.1, 117.8.
MS (70eV, EI) *m/z* (%): 260 $[M+2]^+$ (29), 258 $[M]^+$ (83), 243 (30), 241 (95), 183 (17), 181 (55), 154 (8), 152 (24), 105 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3143 (brs), 2937 (w), 1635 (s), 1565 (s), 1270 (s).
HRMS (EI) for **$C_{15}H_{12}O_2Cl$**, **$[M+H]^+$** (259.0526) found: 259.0528.

Synthesis of (*E*)-3-(5-bromo-2-hydroxyphenyl)-1-phenylprop-2-en-1-one (37c):

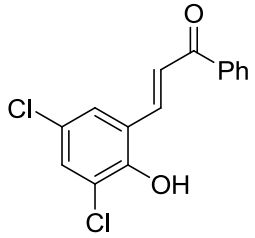
[5] Liao, Q.; Fu, H.; Wang, C.; Yao, J. *Angew. Chem. Int. Ed.* **2011**, *50*, 4942.



The compound **37c** was obtained as yellow solid according to the reported procedure[5].

mp.: 163.7-164.2 ℃
^{1}H-NMR (400 MHz, *d*^{6}-DMSO, 25 C) *δ*/ppm: 10.57 (s, 1H), 8.20-8.09 (m, 3H), 8.05-7.90 (m, 2H), 7.65 (*pseudo* t, 1H, *J* = 7.2 Hz), 7.55 (*pseudo* t, 2H, *J* = 7.2 Hz), 7.40 (dd, 1H, *J* = 8.8, 2.4 Hz), 6.90 (*pseudo* d, 1H, *J* = 8.8 Hz).
^{13}C-NMR (100 MHz, *d*^{6}-DMSO, 25 ℃) *δ*/ppm:.189.2, 156.4, 137.7, 137.6, 134.2, 133.0, 130.4, 128.7, 128.5, 123.7, 122.0, 118.3, 110.9.
MS (70eV, EI) *m/z* (%): 304 $[M+2]^+$ (85), 302 $[M]^+$ (85), 287 (82), 285 (95), 227 (50), 225 (53), 198 (20), 196 (20), 118 (43), 105 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3099 (brs), 2944 (w), 1639 (s), 1561 (s), 1270 (s).
HRMS (EI) for **$C_{15}H_{12}O_2Br$**, **$[M+H]^+$** (303.0021) found: 303.0023.

Synthesis of (*E*)-3-(3,5-dichloro-2-hydroxyphenyl)-1-phenylprop-2-en-1-one (37d):

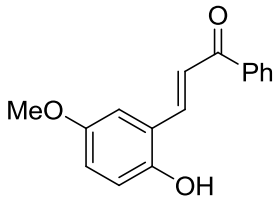


The compound **37d** was obtained as yellow solid according to the reported procedure[5].

mp.: 182.2-182.4 ℃
^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) *δ*/ppm: 8.03 (*pseudo* d, 2H, *J* = 7.6 Hz), 7.97 (d, 1H, *J* = 15.8 Hz), 7.70 (d, 1H, *J* = 15.8 Hz), 7.60 (*pseudo* t, 1H, *J* = 7.6 Hz), 7.55-7.48 (m, 3H), 7.38 (*pseudo* d, 1H, *J* = 2.4 Hz), 6.18 (s, 1H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) *δ*/ppm: 190.3, 149.5, 137.9, 137.7, 133.0, 129.7, 128.7, 128.6, 127.8, 125.7, 125.1, 124.4, 121.5.
MS (70eV, EI) *m/z* (%):296 $[M+4]^+$ (6), 294 $[M+2]^+$ (38), 292 $[M]^+$ (58), 279 (5), 277

(30), 275 (45), 219 (4), 217 (23), 215 (35), 188 (6), 186 (9), 105 (100).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3276 (brs), 2900 (w), 1657 (s), 1564 (s), 1211 (s).
HRMS (EI) for **$C_{15}H_{10}O_2Cl_2$**, **$[M]^+$** (292.0058) found: 292.0054.

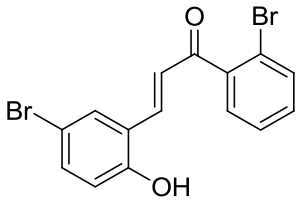
Synthesis of (*E*)-3-(2-hydroxy-5-methoxyphenyl)-1-phenylprop-2-en-1-one (37e):



The compound **37e** was obtained as yellow solid according to the reported procedure[5].

^{1}H-NMR (400 MHz, $CDCl_3$, 25 C) δ/ppm: 8.17 (d, 1H, J = 12.6 Hz), 8.02 (*pseudo* d, 2H, J = 6.8 Hz), 7.66 (d, 1H, J = 12.6 Hz), 7.58 (*pseudo* d, 1H, J = 6.0 Hz), 7.49 (*pseudo* d, 2H, J = 6.0 Hz),7.08 (*pseudo* d, 1H, J = 2.0 Hz), 6.90-6.82 (m, 2H), 3.79 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 192.1, 153.4, 150.5, 141.2, 138.2, 132.8, 128.7, 128.6, 122.7, 122.5, 118.4, 117.7, 113.0, 55.9.
MS (70eV, EI) *m/z* (%): 254 $[M]^+$ (100), 237 (88), 177 (27), 149 (29), 105 (68).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3254 (brs), 2930 (w), 1650 (m), 1583 (s), 1207 (s).
HRMS (EI) for **$C_{16}H_{14}O_3$**, **$[M]^+$** (254.0943) found: 254.0943.

Synthesis of
(E)-3-(5-bromo-2-hydroxyphenyl)-1-(2-bromophenyl)prop-2-en-1-one (37n):

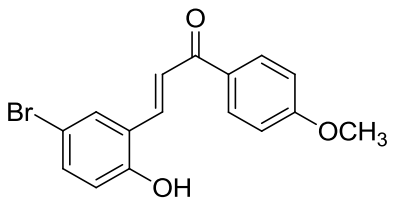


The compound **37n** was obtained as yellow solid according to the reported procedure[5].

mp.: 156.8-157.3 ℃
^{1}H-NMR (400 MHz,MeOD, 25 ℃) δ/ppm: 7.64-7.61 (m, 3H), 7.41-7.33 (m, 4H),

7.17 (d, 1H, *J* = 16.2 Hz), 6.78 (*pseudo* d, 1H, *J* = 8.7 Hz).
^{13}C-NMR (100 MHz, MeOD, 25 ℃) *δ*/ppm: 197.3, 157.5, 143.0, 141.9, 135.4, 134.0, 132.2, 131.8, 129.7, 128.2, 127.3, 124.2, 119.7, 118.6, 112.1.
MS (70eV, EI) *m/z* (%): 384 $[M+2]^+$ (20), 382 $[M]^+$ (30), 301 (10), 227 (35), 183 (100), 155 (55), 118 (100), 89 (83), 76 (32).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3276 (m), 2922 (m), 1646 (s), 1568 (s), 1115 (s), 676(w).
HRMS (ESI) for **$C_{15}H_{10}Br_2O_2Na$**, **$[M+Na]^+$** (380.9126) found: 380.9128.

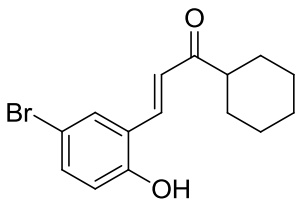
Synthesis of
(E)-3-(5-bromo-2-hydroxyphenyl)-1-(4-methoxyphenyl)prop-2-en-1-one (37o):



The compound **37o** was obtained as yellow solid according to the reported procedure[5].

mp.: 177.0-177.3 ℃
^{1}H-NMR (400 MHz,$CDCl_3$, 25 ℃) *δ*/ppm: 8.08-8.05 (m, 3H), 7.73 (*pseudo* s, 1H), 7.63 (*pseudo* d, 1H, *J* = 15.8 Hz), 7.37 (*pseudo* d, 1H, *J* = 8.5 Hz), 6.99 (*pseudo* d, 2H, *J* = 8.8 Hz), 6.83 (*pseudo* d, 1H, *J* = 8.5 Hz), 6.55 (s, 1H), 3.90 (s, 3H).
^{13}C-NMR (100 MHz, MeOD, 25 ℃) *δ*/ppm: 192.1, 166.2, 158.7, 140.7, 136.0, 133.2, 133.0, 126.3, 124.5, 119.8, 115.9, 113.4, 56.9.
MS (70eV, EI) *m/z* (%): 334 $[M+2]^+$ (20), 332 $[M]^+$ (5), 315 (18), 135 (100), 108 (30), 77 (20).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3217 (w), 2952 (w), 1624 (s), 1587 (s), 1126 (w).
HRMS (ESI) for **$C_{16}H_{13}BrO_3Na$**, **$[M+Na]^+$** (354.9941) found: 354.9941.

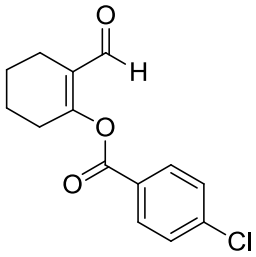
Synthesis of (E)-3-(5-bromo-2-hydroxyphenyl)-1-cyclohexylprop-2-en-1-one (37p):



The compound **37p** was obtained as yellow solid according to the reported procedure[5].

mp.: 175.0-175.7 ℃
^{1}H-NMR (400 MHz,$CDCl_3$, 25 ℃) δ/ppm: 8.03 (*pseudo* s, 1H), 7.93 (d, 1H, J = 16.2 Hz), 7.62 (d, 1H, J = 2.3 Hz), 7.34 (*pseudo* dd, 1H, J = 8.6, 2.3 Hz), 6.99 (d, 1H, J = 16.2 Hz), 6.84 (*pseudo* d, 1H, J = 8.7 Hz), 2.72 (*pseudo* t, 1H, J = 11.1 Hz), 1.91-1.71 (m, 6H), 1.35-1.14 (m, 5H).
^{13}C-NMR (100 MHz, MeOD, 25 ℃) δ/ppm: 207.ma1, 158.5, 139.2, 135.9, 132.8, 127.2, 125.8, 119.7, 113.3, 51.1, 30.8, 27.8, 27.6.
MS (70eV, EI) *m/z* (%): 310 $[M+2]^+$ (8), 308 $[M]^+$ (8), 227 (100), 224 (62), 118 (70), 55 (23).
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3276 (m), 2929 (s), 1646 (w), 1568 (m), 1111 (w).
HRMS (EI) for **$C_{15}H_{17}BrO_2$**, **$[M]^+$** (308.0412) found: 308.0409.

Synthesis of 2-formylcyclohex-1-en-1-yl 4-chlorobenzoate (38):

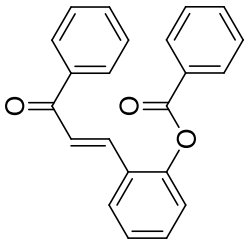


The compound **38** was obtained as white solid (224.5 g, 85%) according to the reported procedure[4].

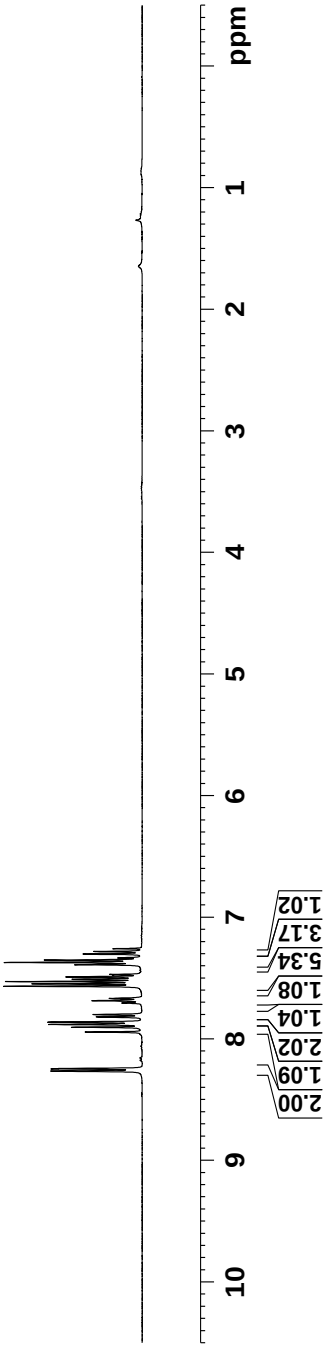
R_f 0.3 (ethyl acetate/hexanes: 1/20); mp.: 132.5-133.1℃
^{1}H-NMR (400 MHz,$CDCl_3$, 25 ℃) δ/ppm: 8.21 (s, 1H), 7.98 (d, 2H, J = 8.2 Hz), 7.37 (d, 2H, J = 8.1 Hz), 2.70-2.62 (m, 2H), 2.43-2.37 (m, 2H), 1.87-1.78 (m, 2H), 1.78-1.69 (m, 2H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ℃) δ/ppm: 200.3, 161.9, 141.5, 140.8, 131.5, 129.1, 126. 8, 122.3, 40.3, 24.5, 23.1, 22.7.
IR (CH_2Cl_2) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 1741 (m), 1620 (s), 1251 (m), 1089 (m),753(w).
HRMS (ESI) for **$C_{14}H_{13}ClO_3Na$**, **$[M+Na]^+$** (287.0451) found: 287.0475.

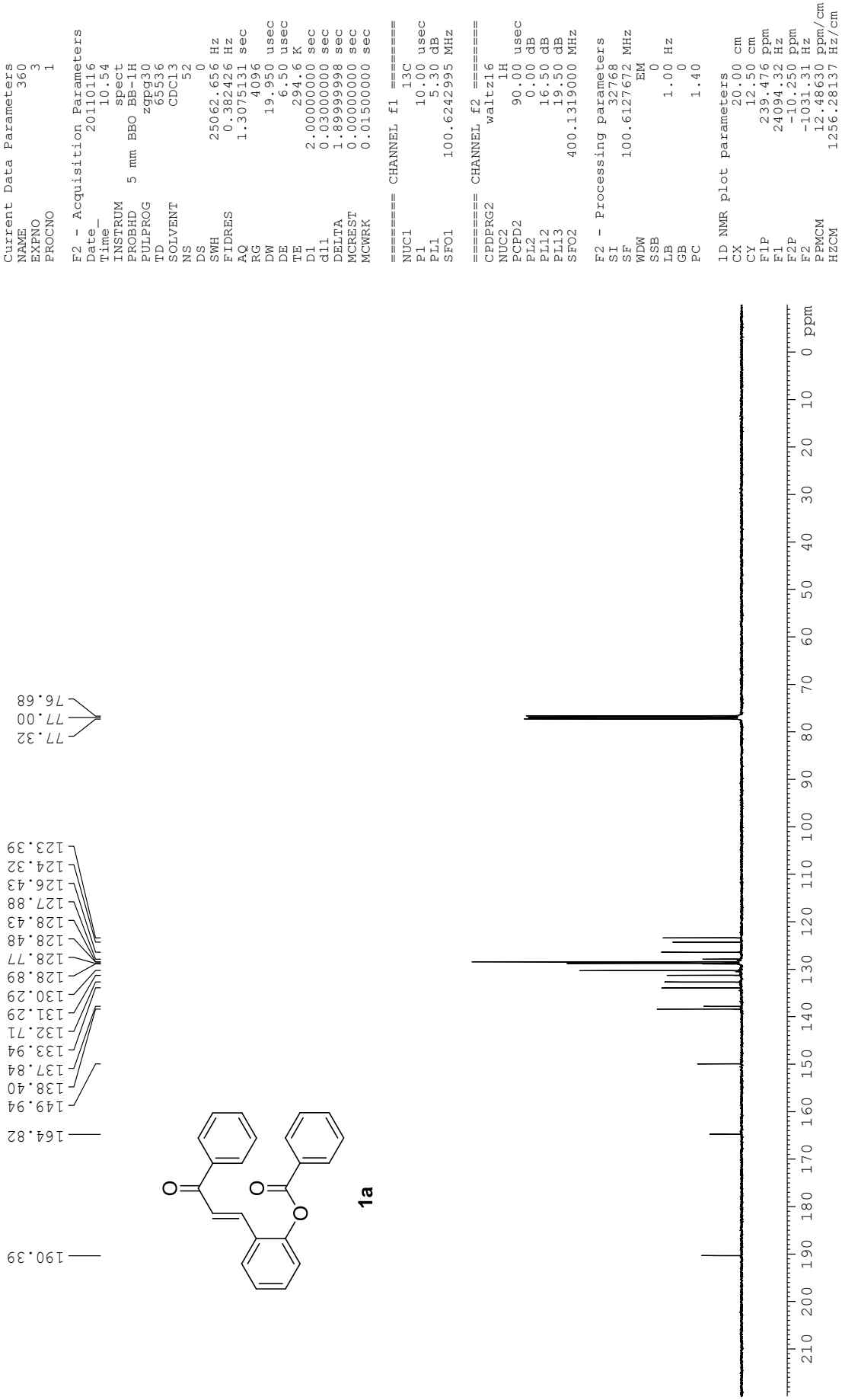
VII. Spectra of ^{1}H, ^{13}C, and ^{31}P NMR

```
Current Data Parameters
NAME                  362
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20110114
Time                15.10
INSTRUM             spect
PROBHD   5 mm BBO BB-1H
PULPROG              zg30
TD                  16384
SOLVENT             CDCl3
NS                     16
DS                      0
SWH              6009.615 Hz
FIDRES           0.366798 Hz
AQ               1.3632820 sec
RG                    128
DW                 83.200 usec
DE                  6.50 usec
TE                 297.3 K
D1               1.50000000 sec
MCREST           0.00000000 sec
MCWRK            0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                 11.20 usec
PL1                 0.00 dB
SFO1         400.1326008 MHz

F2 - Processing parameters
SI                  16384
SF           400.1300088 MHz
WDW                    EM
SSB                     0
LB                 0.10 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                 20.00 cm
CY                  3.97 cm
F1P               10.500 ppm
F1              4201.37 Hz
F2P               -0.500 ppm
F2              -200.06 Hz
PPMCM             0.55000 ppm/cm
HZCM            220.07150 Hz/cm
```



1a

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NAME 360
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
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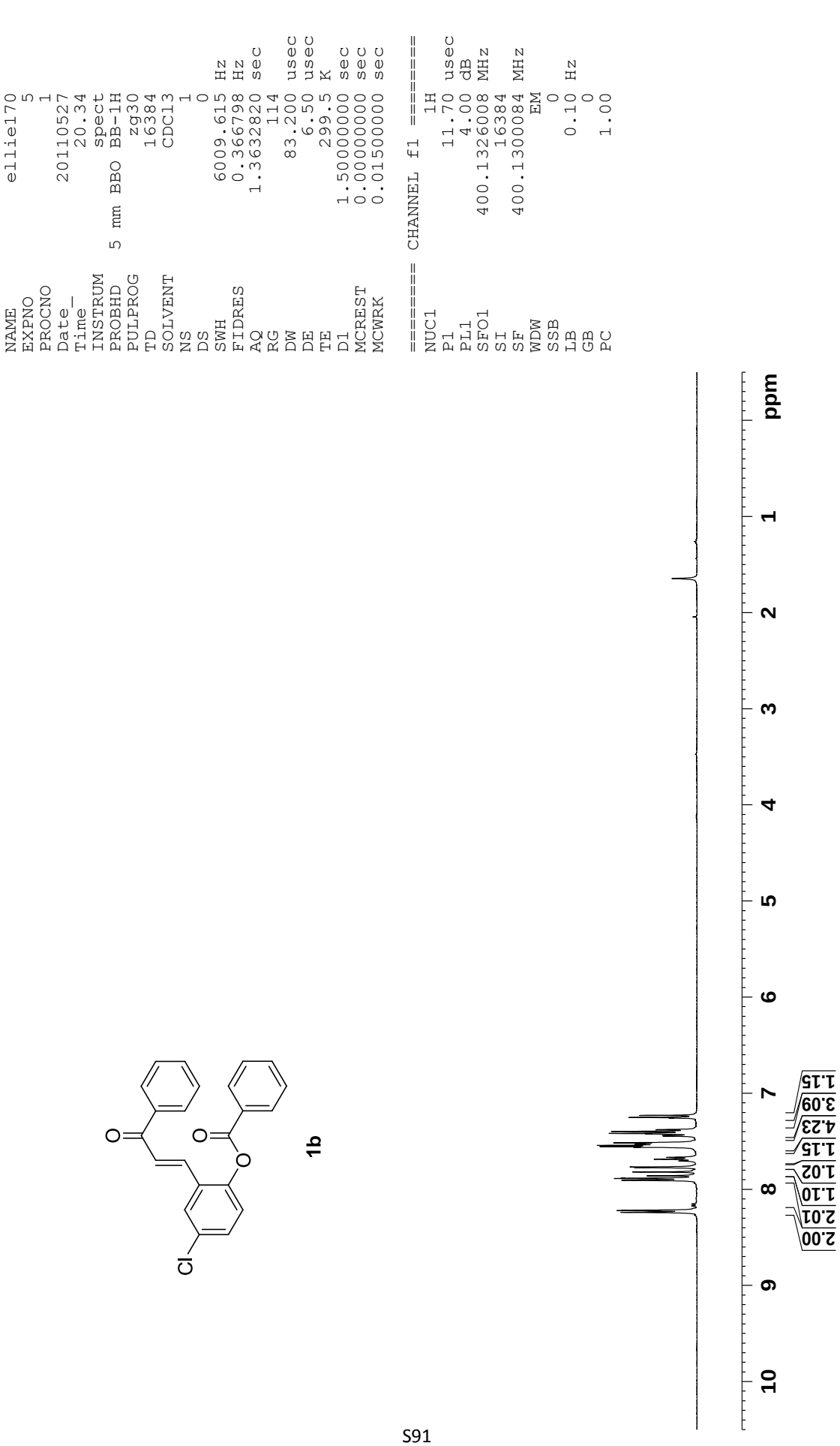
Time_ 10.54
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 52
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 294.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0.00 dB
PL12 16.50 dB
PL13 19.50 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 12.50 cm
F1P 239.476 ppm
F1 24094.32 Hz
F2P -10.250 ppm
F2 -1031.31 Hz
PPMCM 12.48630 ppm/cm
HZCM 1256.28137 Hz/cm
190.39
164.82
149.94
138.40
137.84
133.94
132.71
131.29
130.29
128.89
128.77
128.48
128.43
127.88
126.43
124.32
123.39
77.32
77.00
76.68
1a
0 ppm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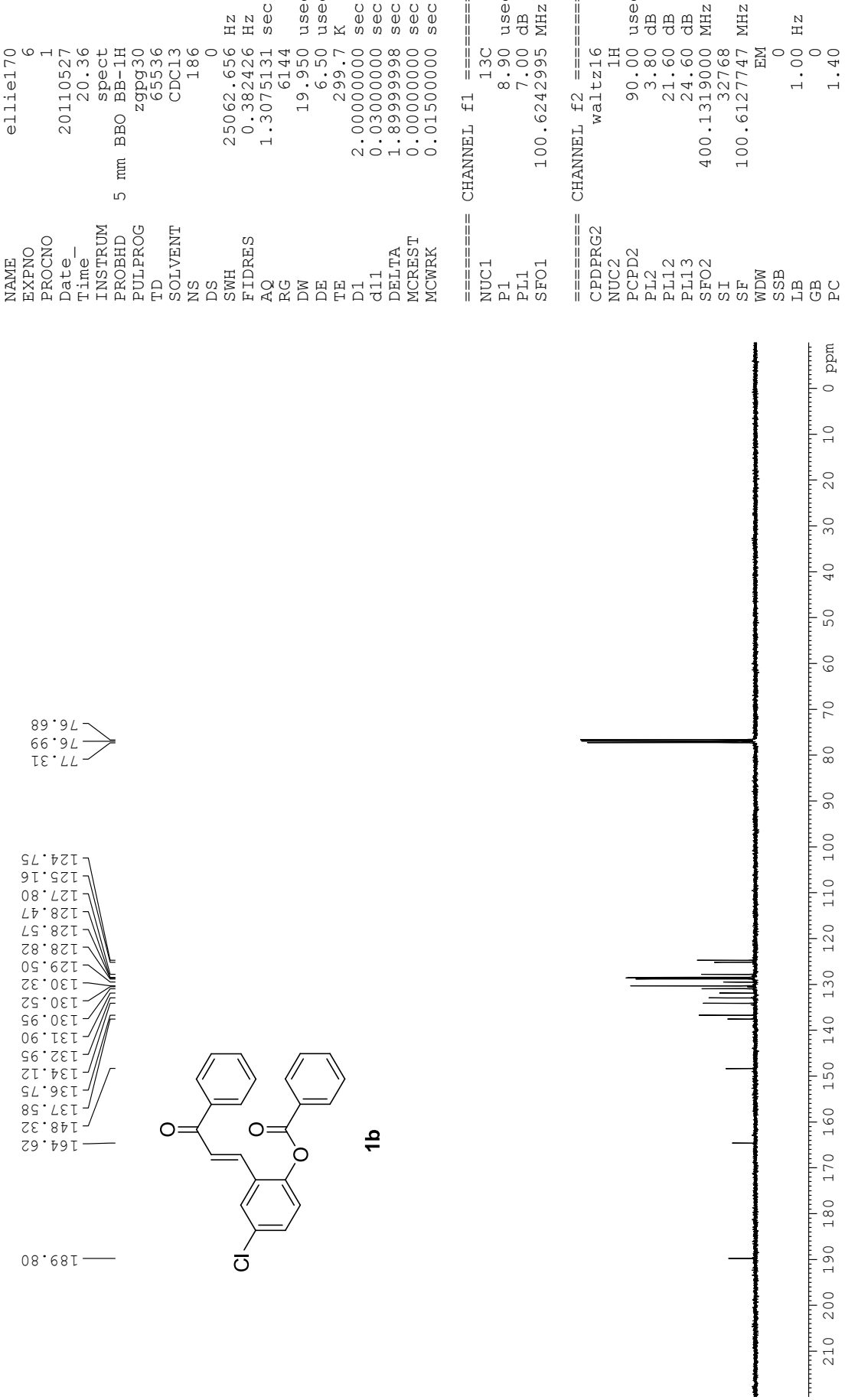
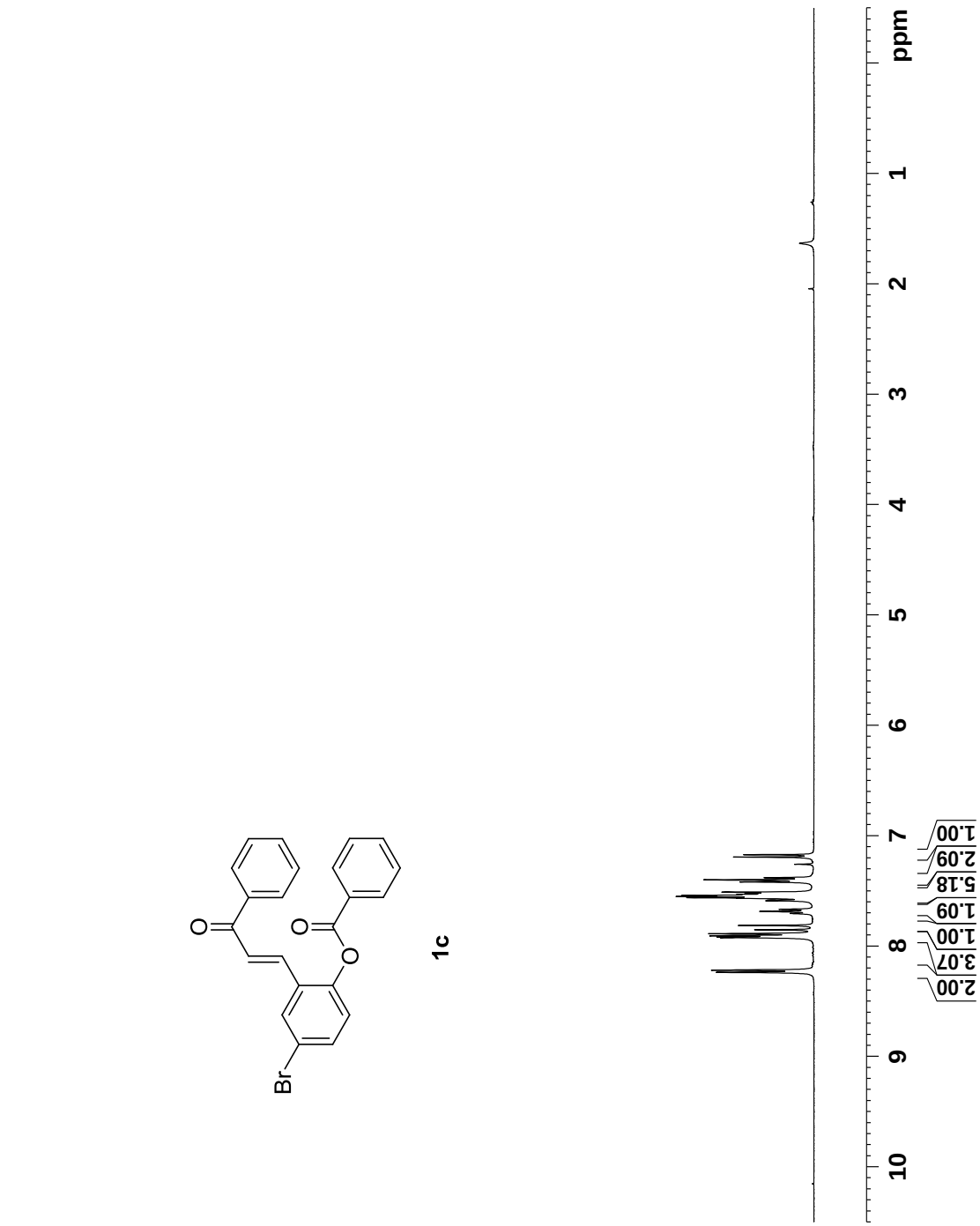
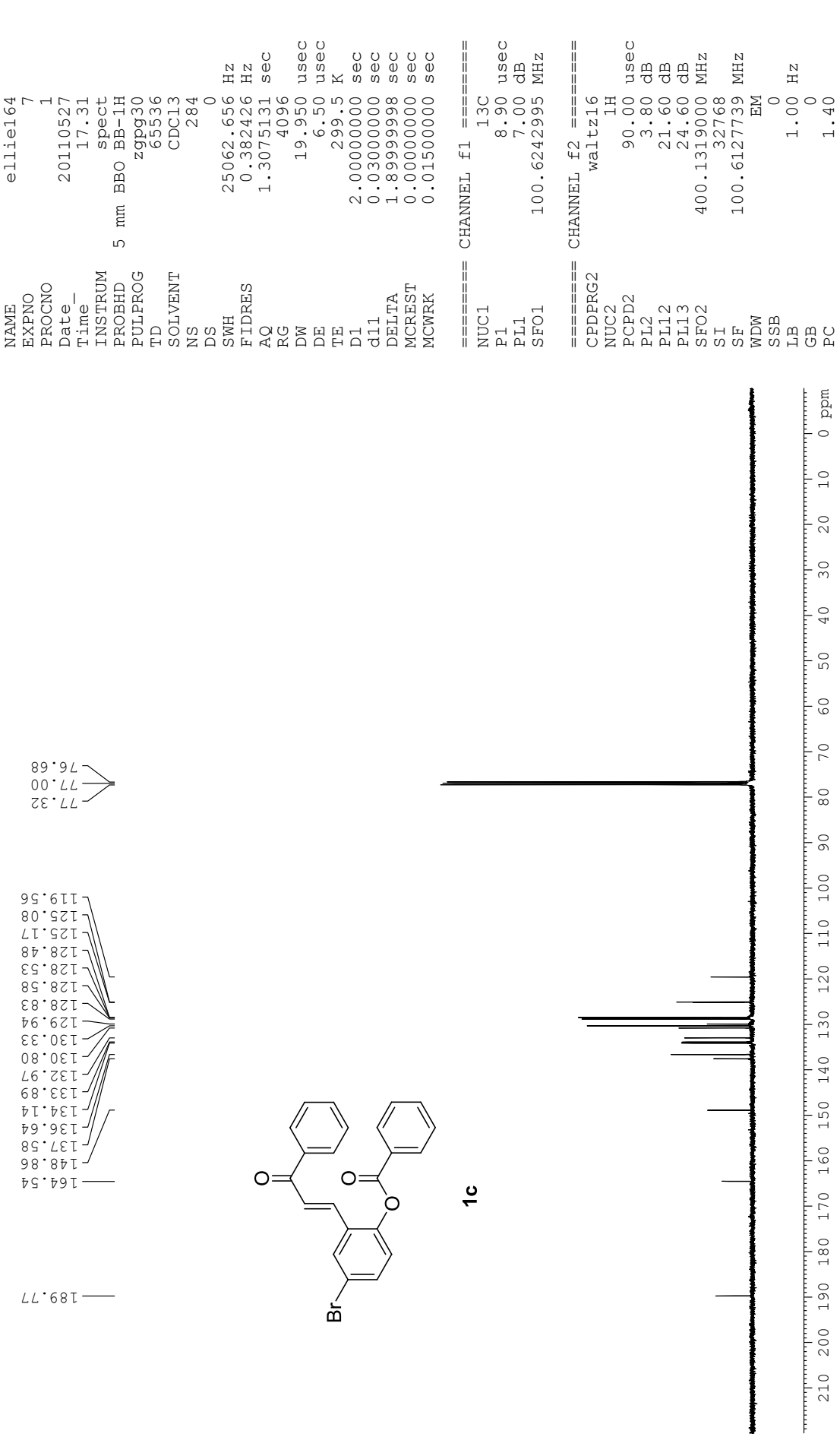
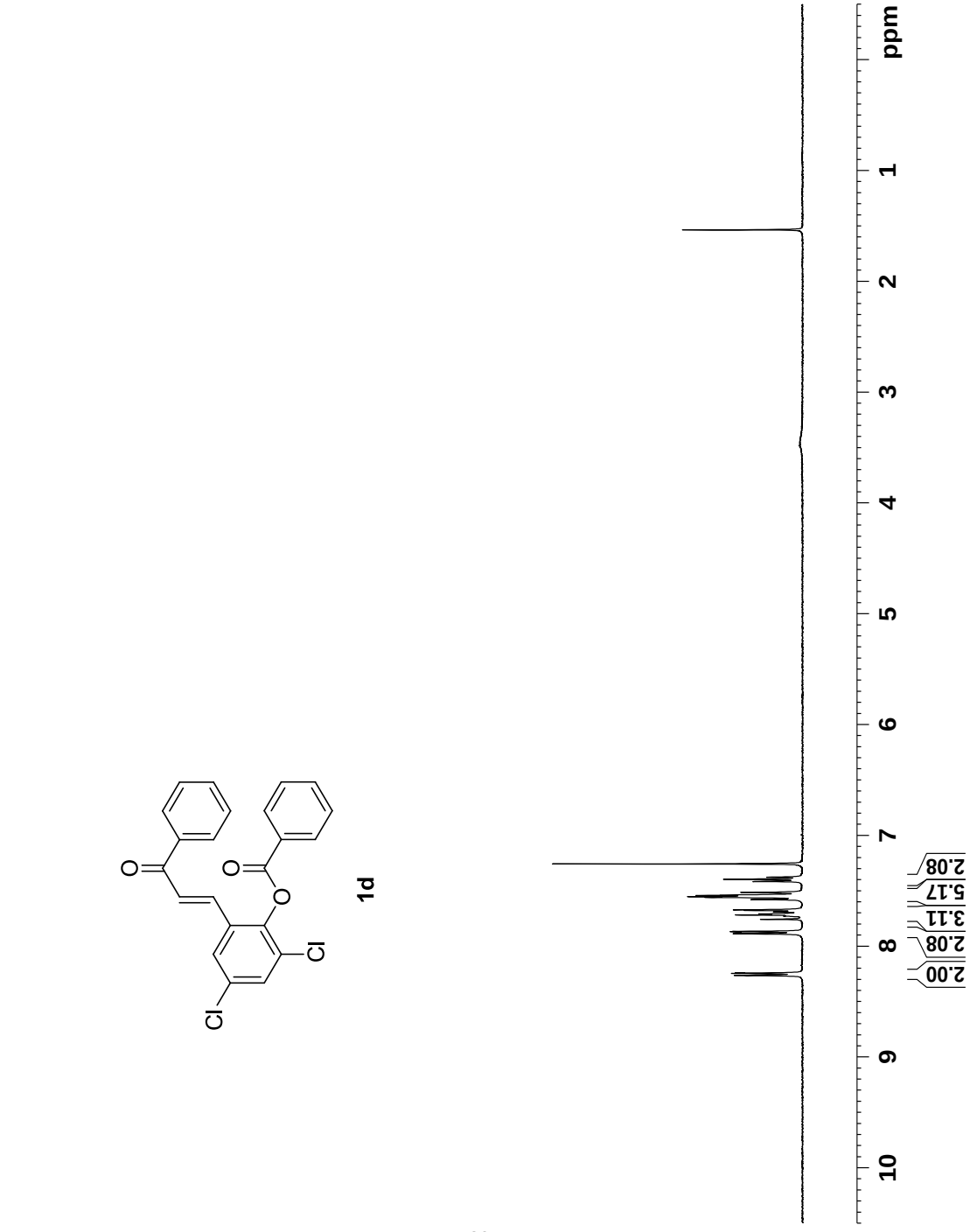
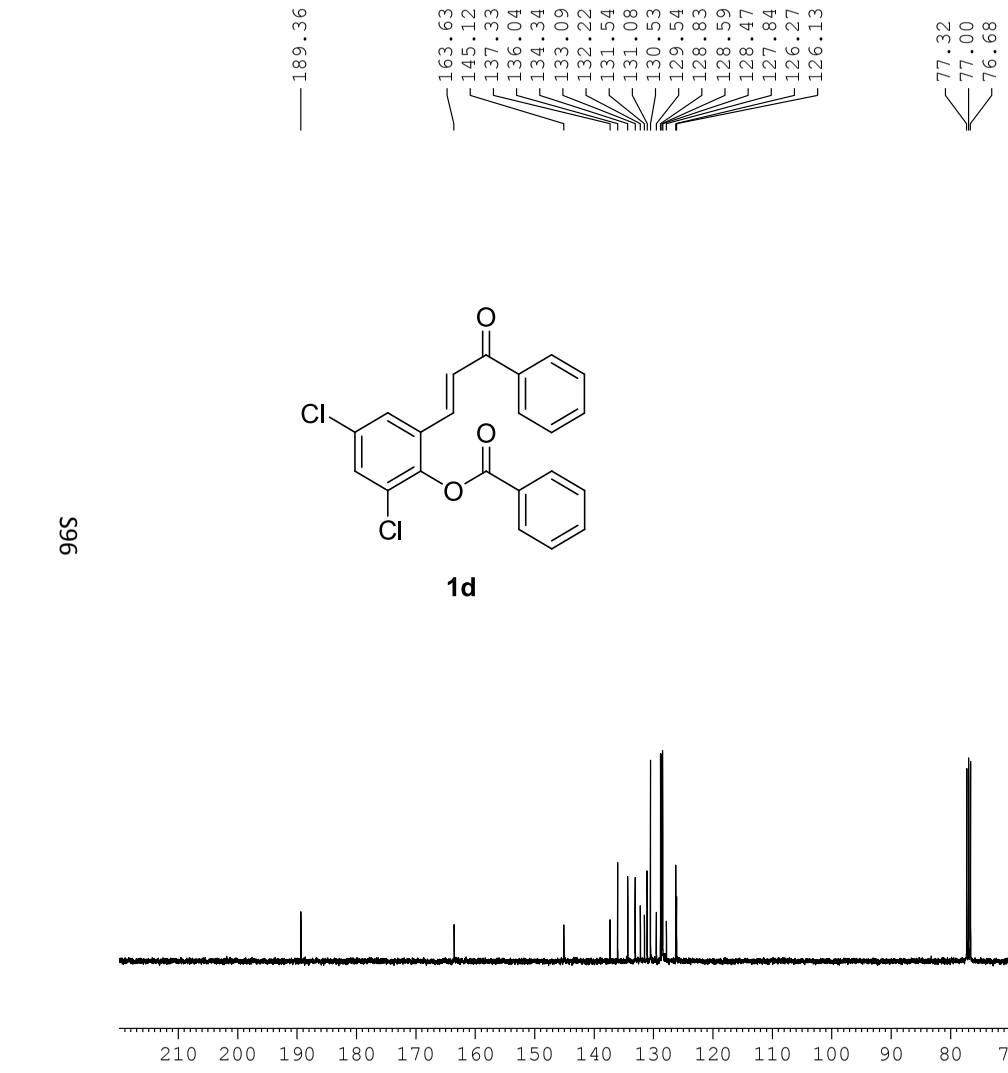
EXPNO 5
PROCNO 1
Date_ 20110527
Time 20.34
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 1
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.363820 sec
RG 114
DW 83.200 usec
DE 6.50 usec
TE 299.5 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
CHANNEL f1
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300084 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
O
O
O
Cl
1b
2.00
2.01
1.10
1.02
1.15
4.23
3.09
1.15
ppm


NAME ellie170
EXPNO 6
PROCNO 1
Date_ 20110527
Time_ 20.36
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 186
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127747 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
77.31
76.99
76.68
124.75
125.16
127.80
128.47
128.57
128.82
129.50
130.32
130.52
130.95
131.90
132.95
134.12
136.75
137.58
148.32
164.62
189.80
O
O
O
Cl
1b
ppm


NAME ellie164
EXPNO 6
PROCNO 1
Date_ 20110527
Time 17.53
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 114
DW 83.200 usec
DE 6.50 usec
TE 299.4 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.80 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300082 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
O
O
O
Br
1c
10
9
8
7
6
5
4
3
2
1
ppm
2.00
3.07
1.00
1.09
5.18
2.09
1.00

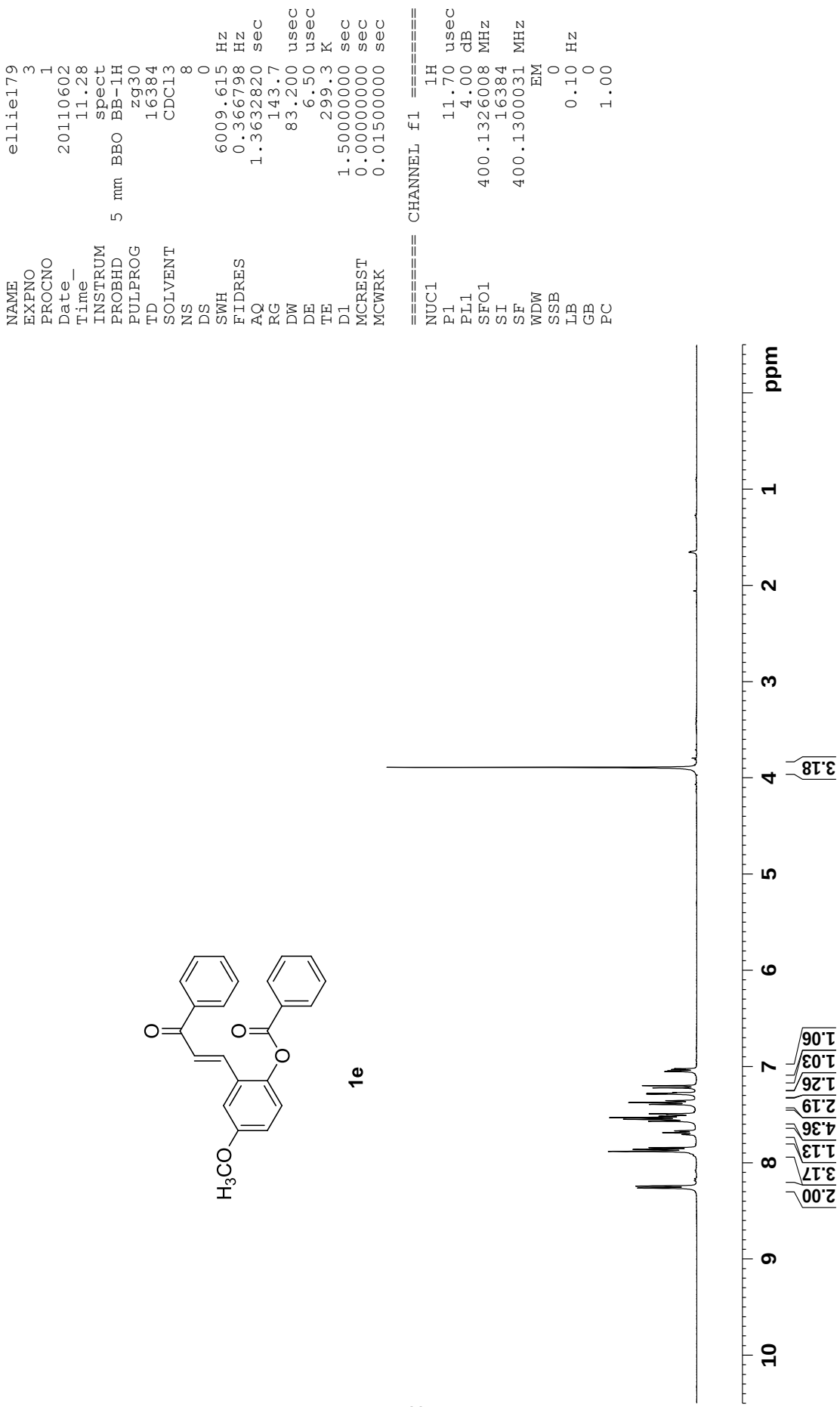

NAME ellie164
EXPNO 7
PROCNO 1
Date_ 20110527
Time_ 17.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 284
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127739 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
77.32
77.00
76.68
189.77
164.54
148.86
137.58
136.64
134.14
133.89
132.97
130.80
130.33
129.94
128.83
128.58
128.53
128.48
125.17
125.08
119.56
Br
O
O
O
1c
ppm

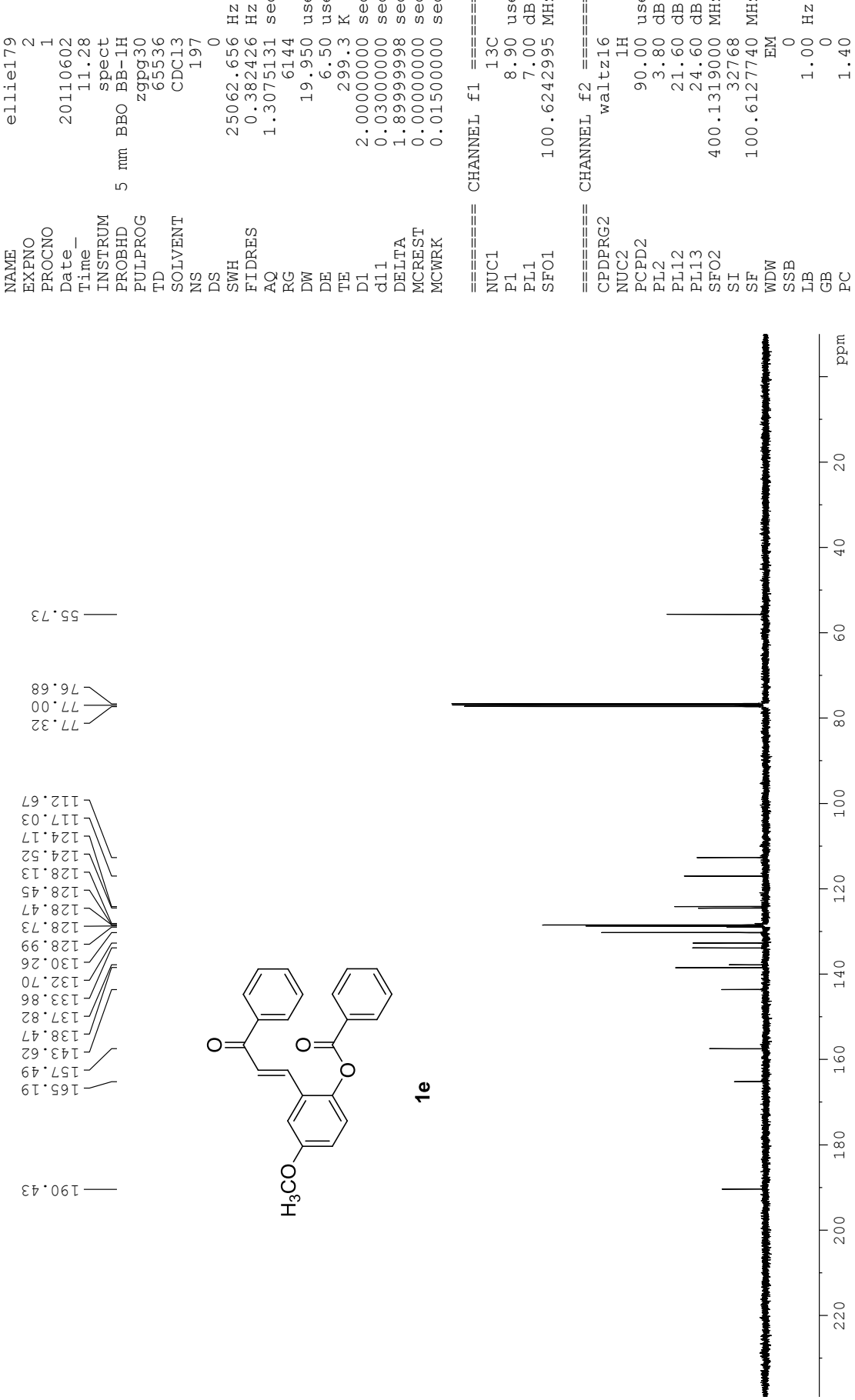


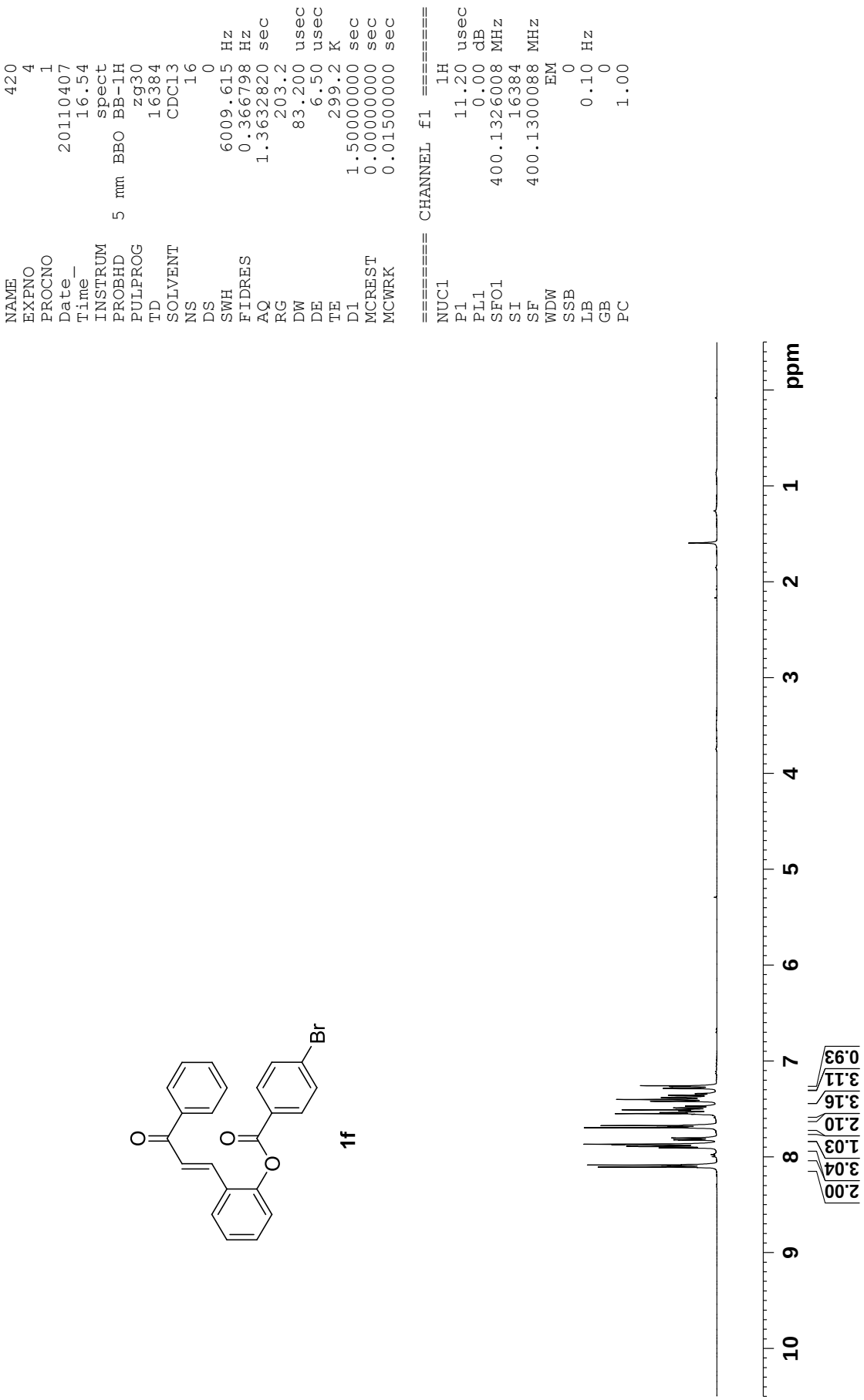


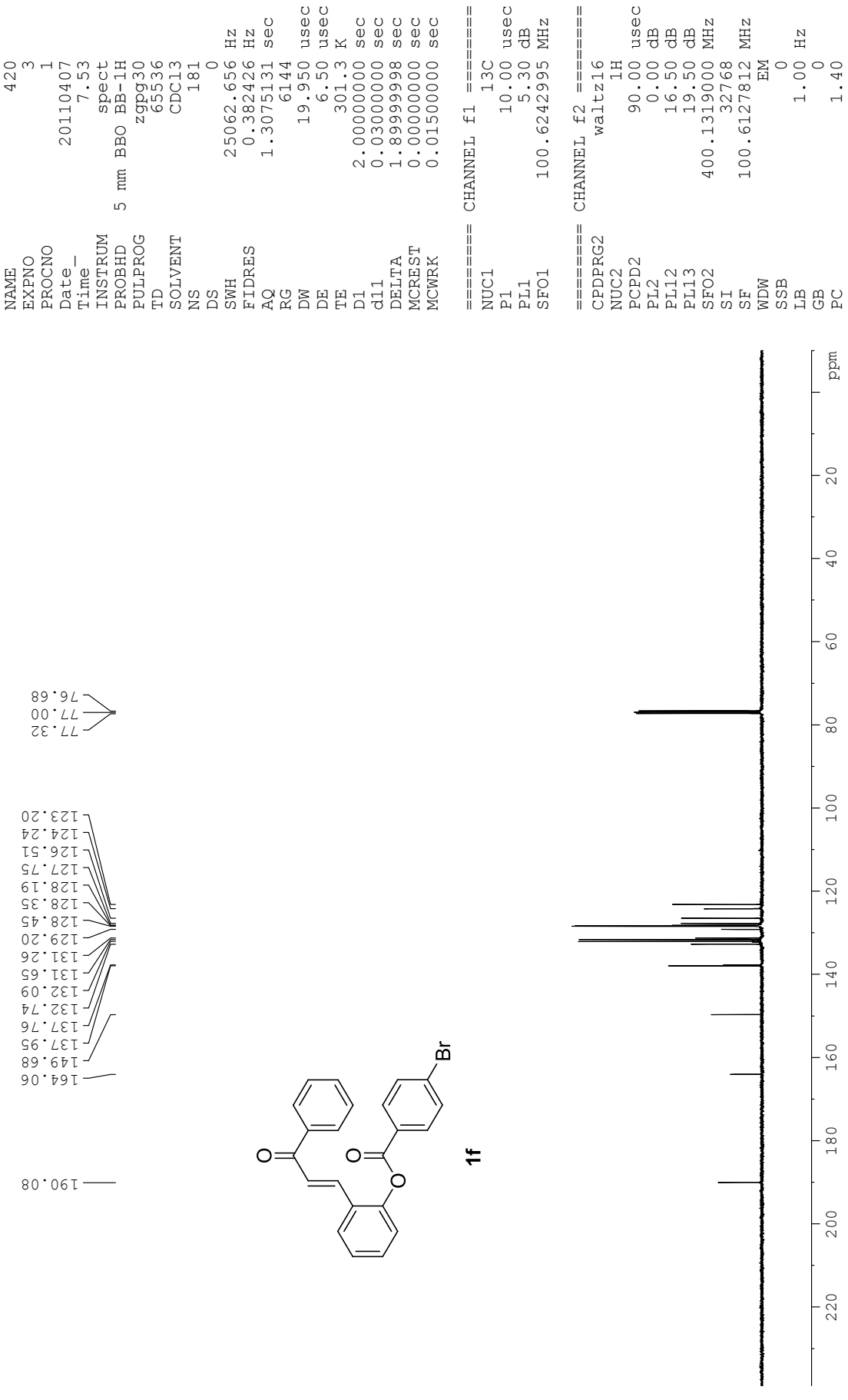
1d

NAME	ellie172
EXPNO	4
PROCNO	1
Date_	20110527
Time	21.19
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	125
DS	0
SWH	25062.656 Hz
FIDRES	0.382426 Hz
AQ	1.3075131 sec
RG	6144
DW	19.950 usec
DE	6.50 usec
TE	299.7 K
D1	2.00000000 sec
d11	0.03000000 sec
DELTA	1.89999998 sec
MCREST	0.00000000 sec
MCWRK	0.01500000 sec
======== CHANNEL f1 ========	
NUC1	13C
P1	8.90 usec
PL1	7.00 dB
SFO1	100.6242995 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	3.80 dB
PL12	21.60 dB
PL13	24.60 dB
SFO2	400.1319000 MHz
SI	32768
SF	100.6127765 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40




NAME ellie179
EXPNO 2
PROCNO 1
Date_ 20110602
Time_ 11.28
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 197
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127740 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
55.73
77.32
77.00
76.68
112.67
117.03
124.17
124.52
128.13
128.45
128.47
128.73
128.99
130.26
132.70
133.86
137.82
138.47
143.62
157.49
165.19
190.43
H3CO
O
O
O
1e
ppm
220
200
180
160
140
120
100
80
60
40
20


NAME 420
EXPNO 4
PROCNO 1
Date_ 20110407
Time 16.54
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 16
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.363820 sec
RG 203.2
DW 83.200 usec
DE 6.50 usec
TE 299.2 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.20 usec
PL1 0.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300088 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
Br
O
O
O
1f
ppm
10
9
8
7
6
5
4
3
2
1
2.00
3.04
1.03
2.10
3.16
3.11
0.93


NAME 420
EXPNO 3
PROCNO 1
Date_ 20110407
Time_ 7.53
INSTRUM spect
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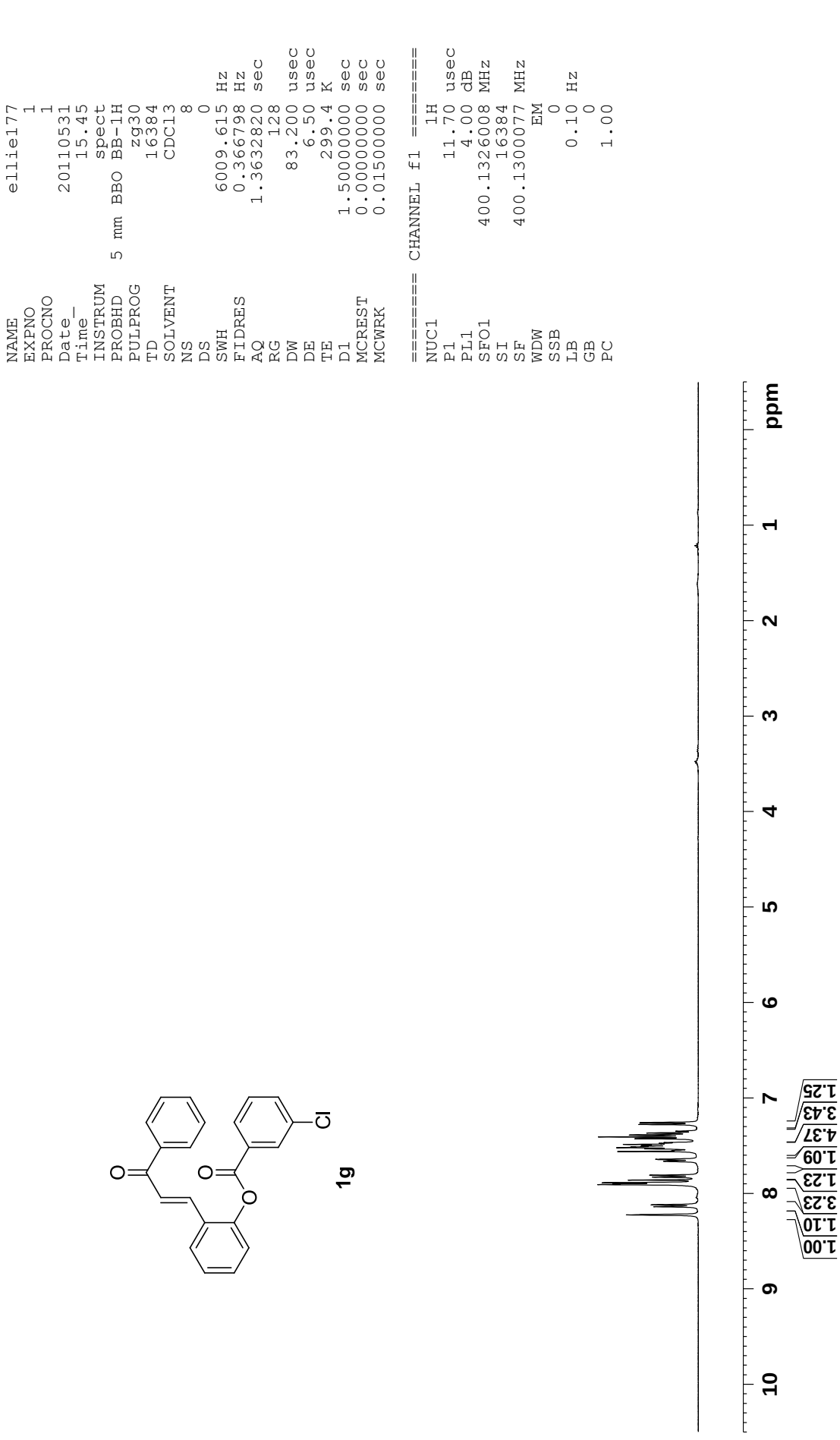
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 181
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0.00 dB
PL12 16.50 dB
PL13 19.50 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127812 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
77.32
77.00
76.68
123.20
124.24
126.51
127.75
128.19
128.35
128.45
129.20
131.26
131.65
132.09
132.74
137.76
137.95
149.68
164.06
190.08
Br
O
O
O
1f
ppm
220
200
180
160
140
120
100
80
60
40
20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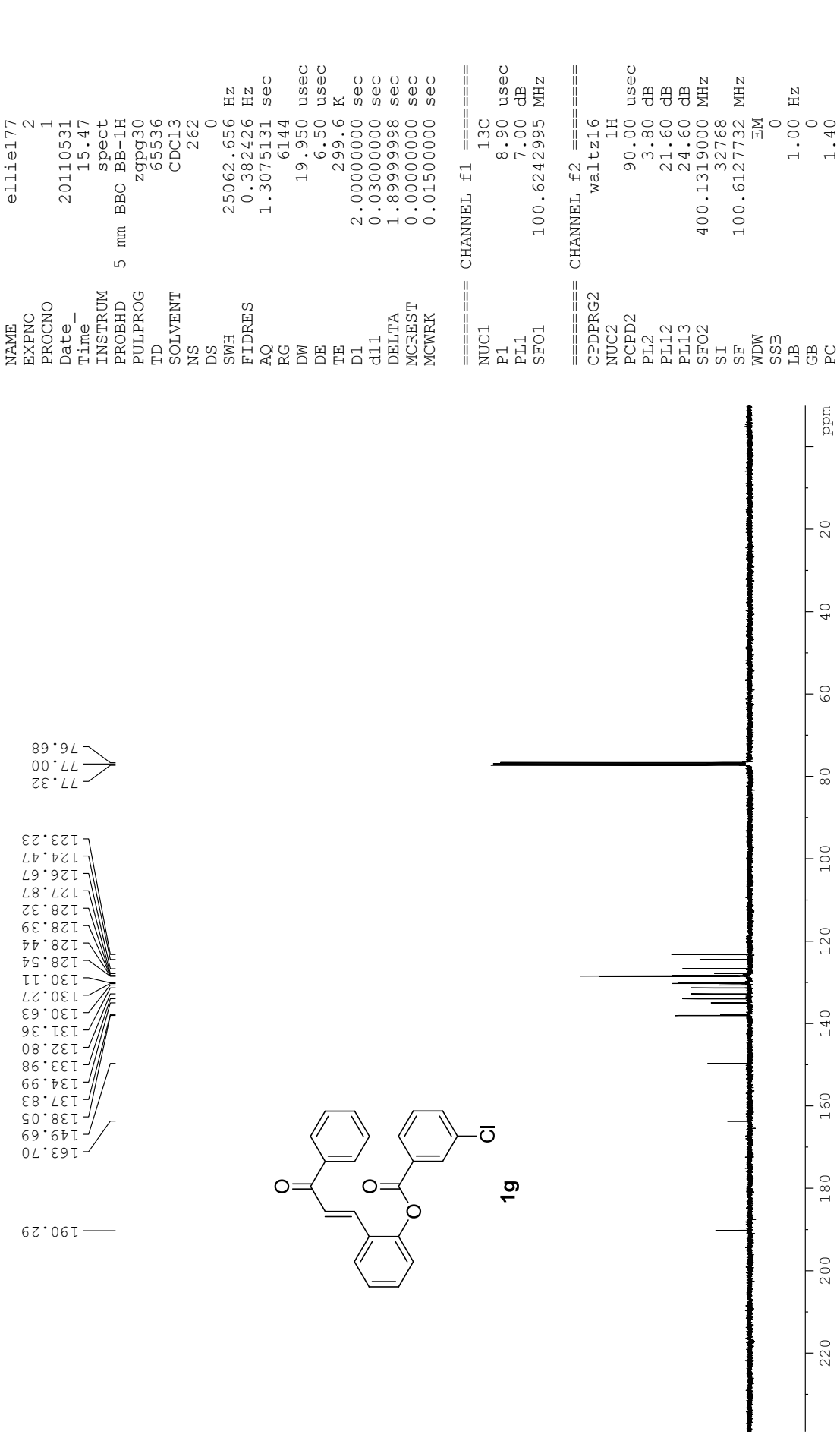
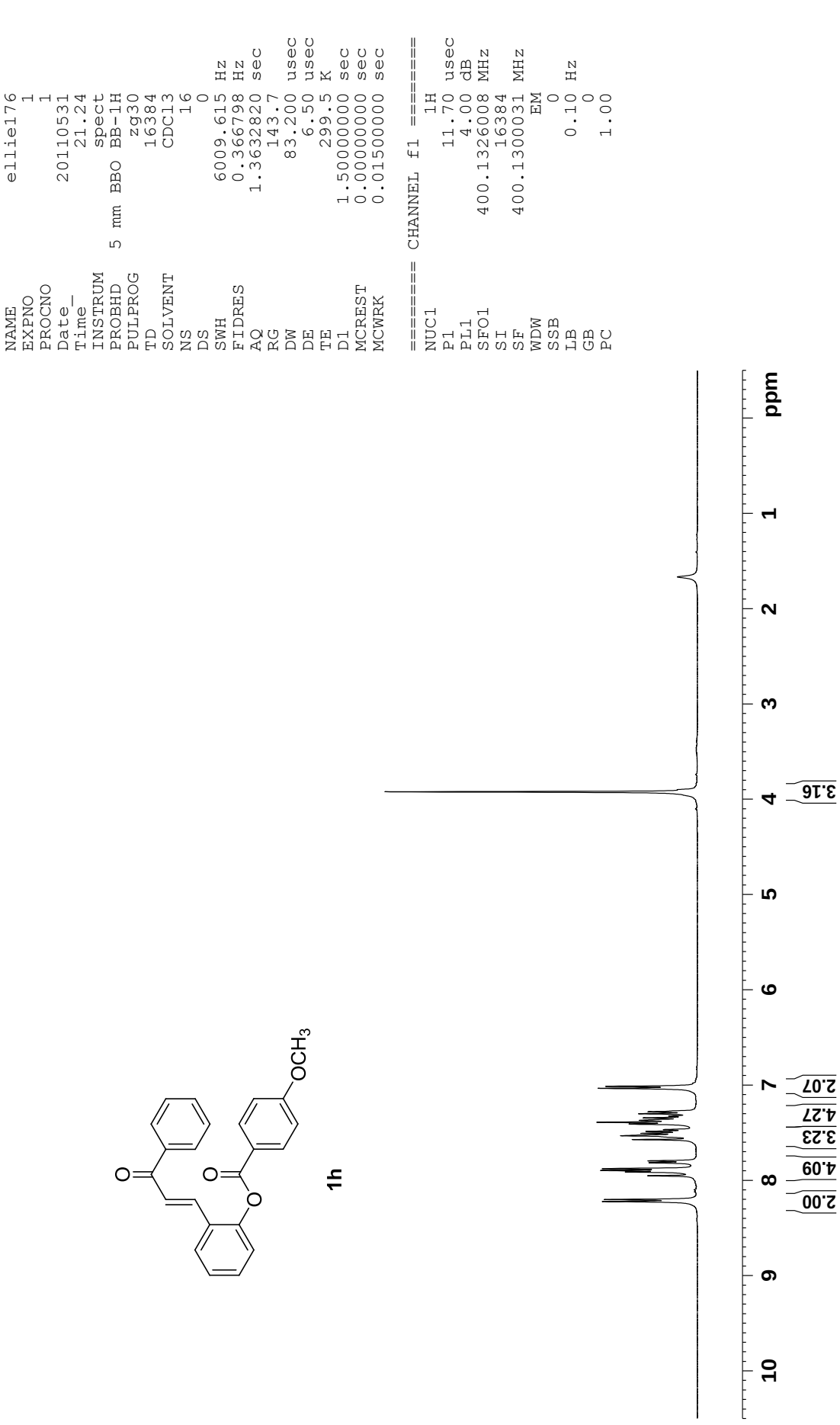
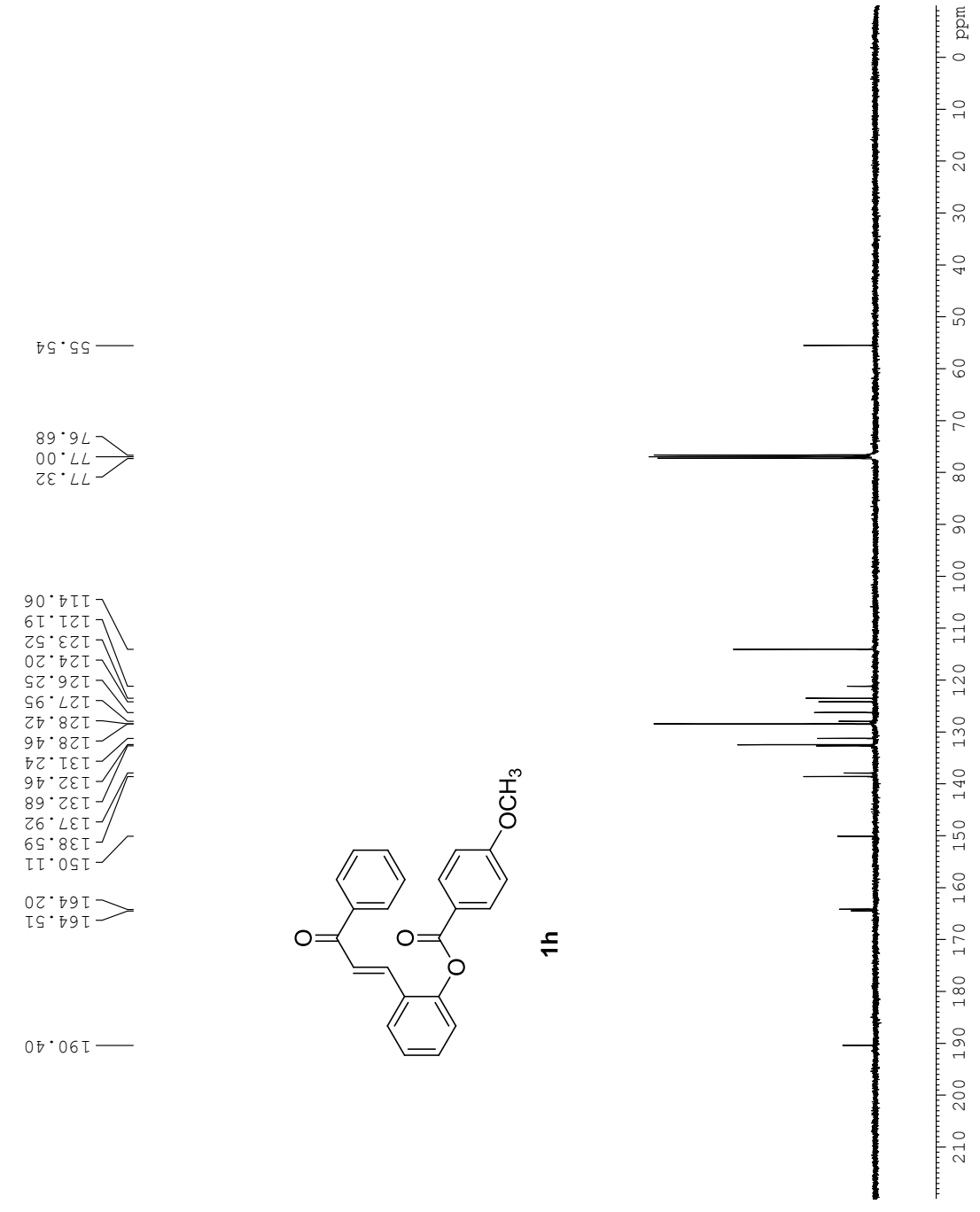
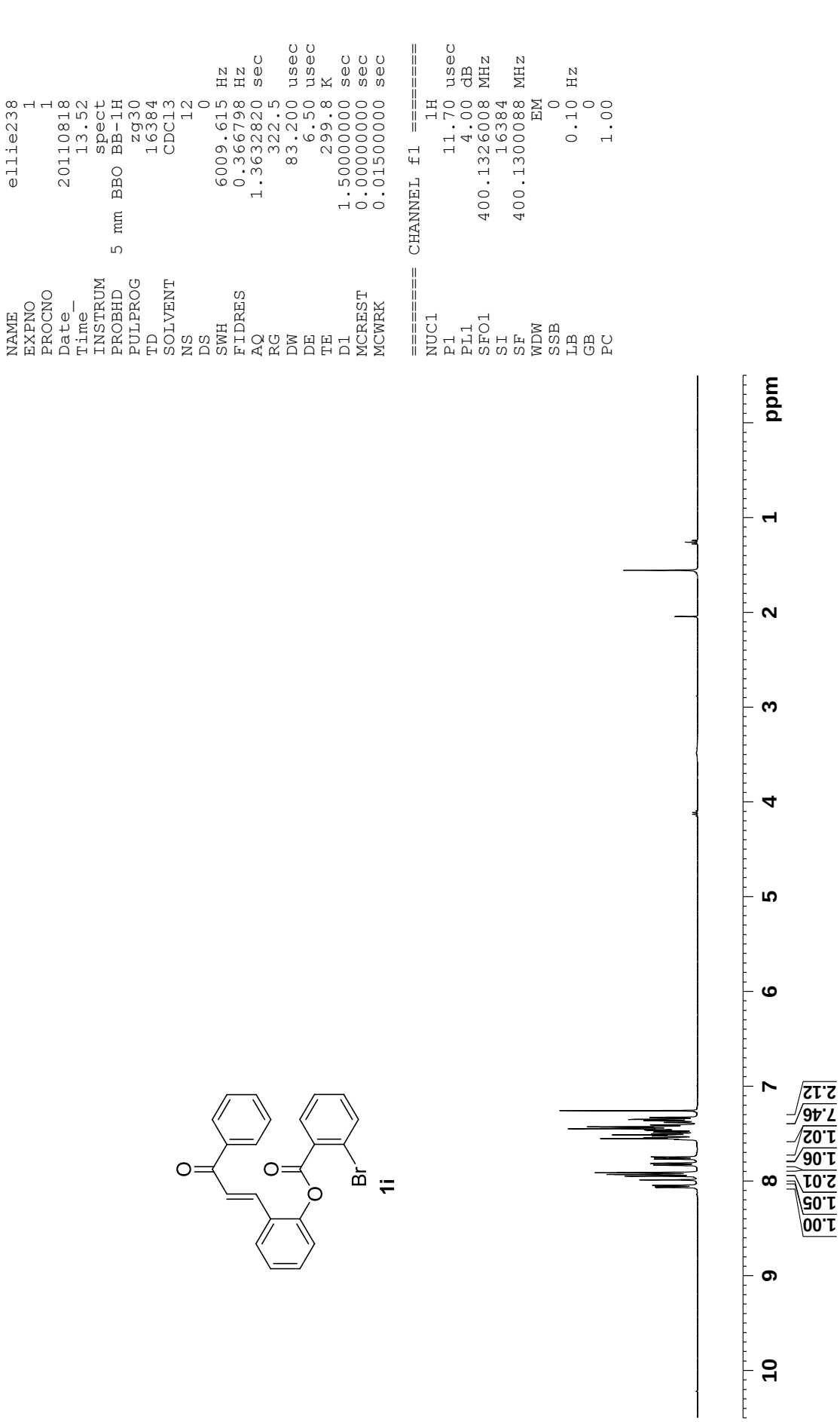
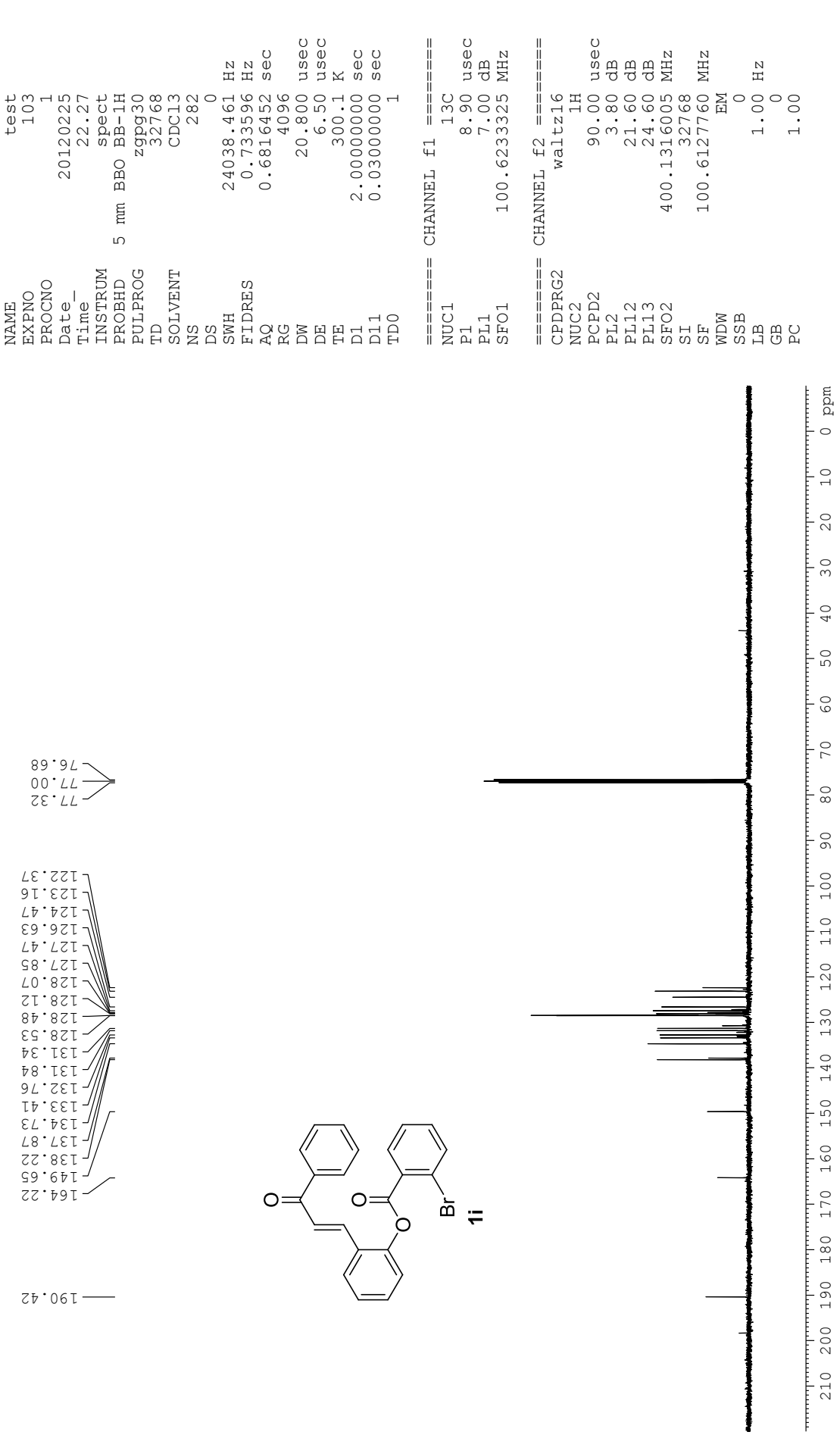
EXPNO 1
PROCNO 1
Date_ 20110531
Time_ 15.45
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 128
DW 83.200 usec
DE 6.50 usec
TE 299.4 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300077 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
O
O
O
Cl
1g
1.00
1.10
3.23
1.23
1.09
4.37
3.43
1.25
10
9
8
7
6
5
4
3
2
1
ppm

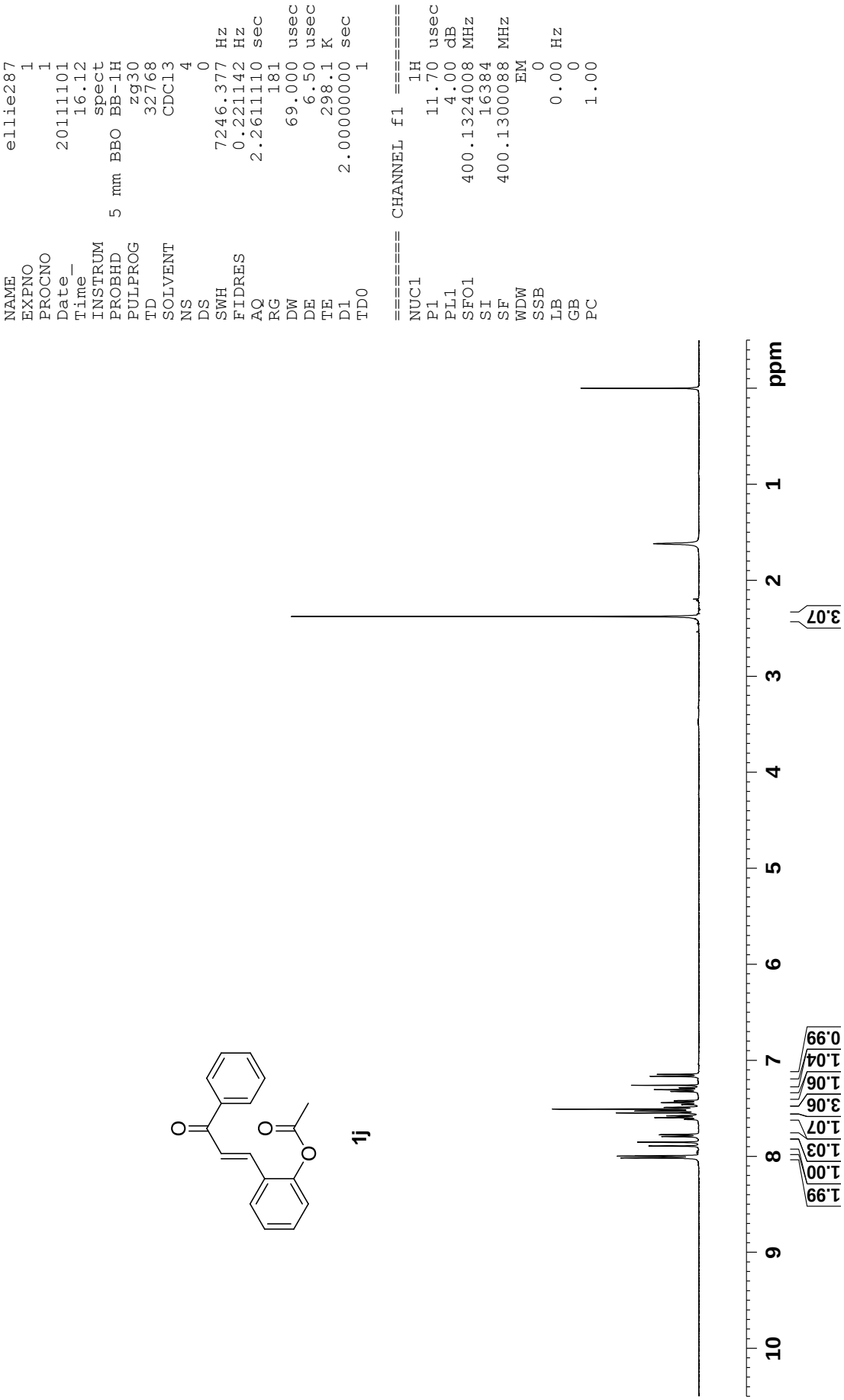

NAME ellie177
EXPNO 2
PROCNO 1
Date_ 20110531
Time_ 15.47
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 262
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127732 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
77.32
77.00
76.68
123.23
124.47
126.67
127.87
128.32
128.39
128.44
128.54
130.11
130.27
130.63
131.36
132.80
133.98
134.99
137.83
138.05
149.69
163.70
190.29
O
O
O
Cl
1g
ppm

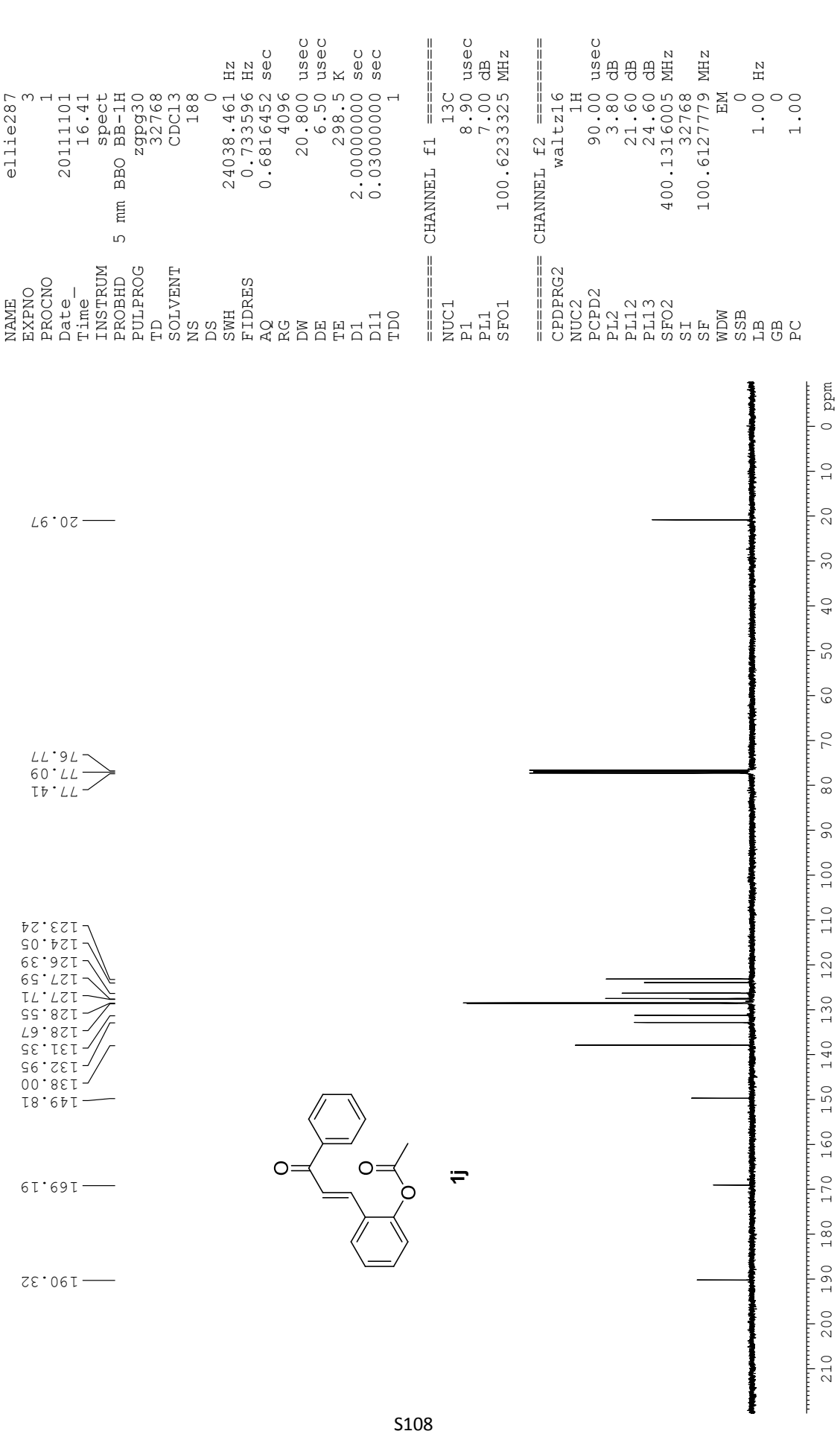

NAME ellie176
EXPNO 1
PROCNO 1
Date_ 20110531
Time 21.24
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 16
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 143.7
DW 83.200 usec
DE 6.50 usec
TE 299.5 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300031 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
OCH3
1h
ppm
1
2
3
4
5
6
7
8
9
10
3.16
2.07
4.27
3.23
4.09
2.00

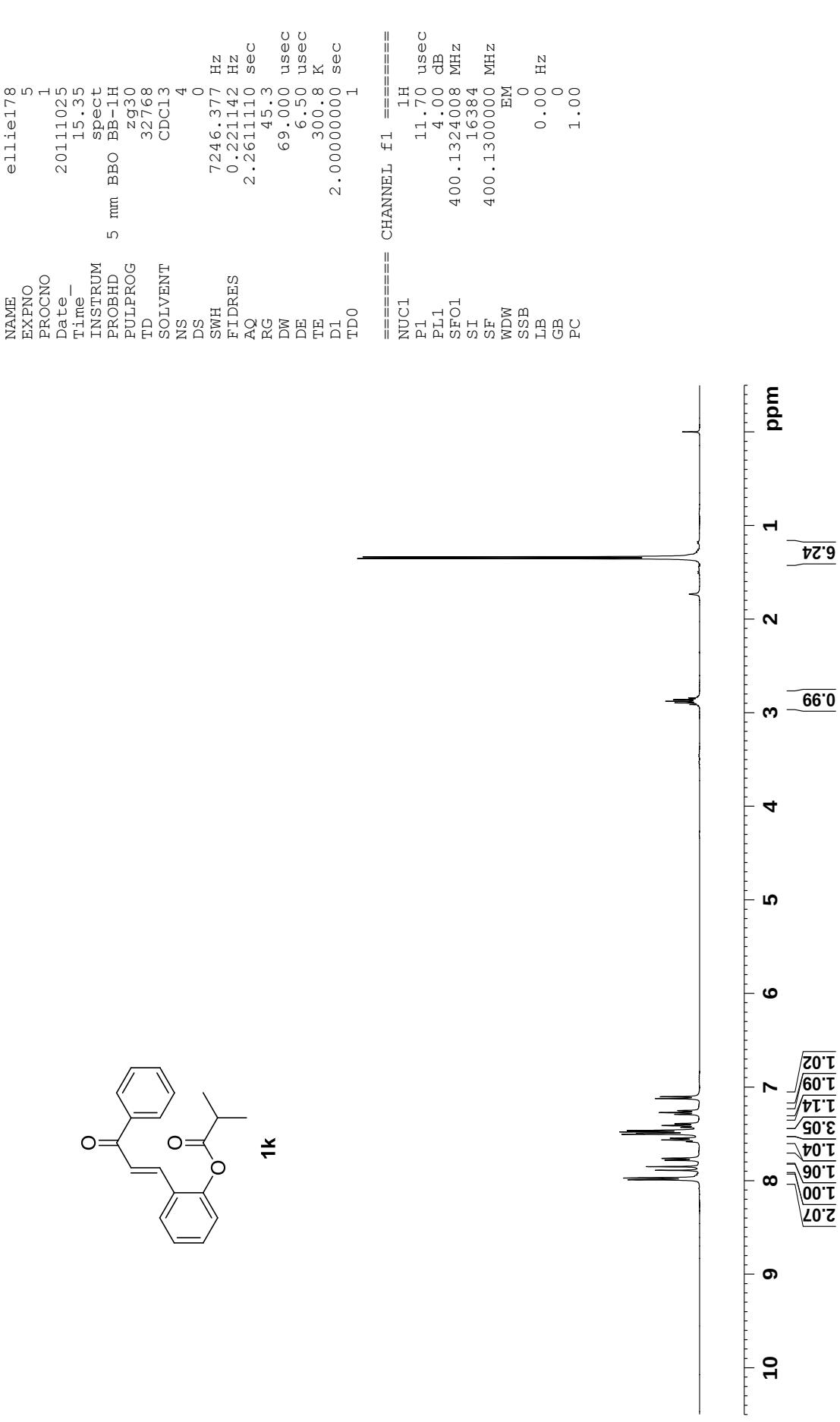

NAME ellie176
EXPNO 2
PROCNO 1
Date_ 20110531
Time_ 21.27
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 270
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127736 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190.40
164.51
164.20
150.11
138.59
137.92
132.68
132.46
131.24
128.46
128.42
127.95
126.25
124.20
123.52
121.19
114.06
77.32
77.00
76.68
55.54
O
O
O
OCH3
1h
0 ppm

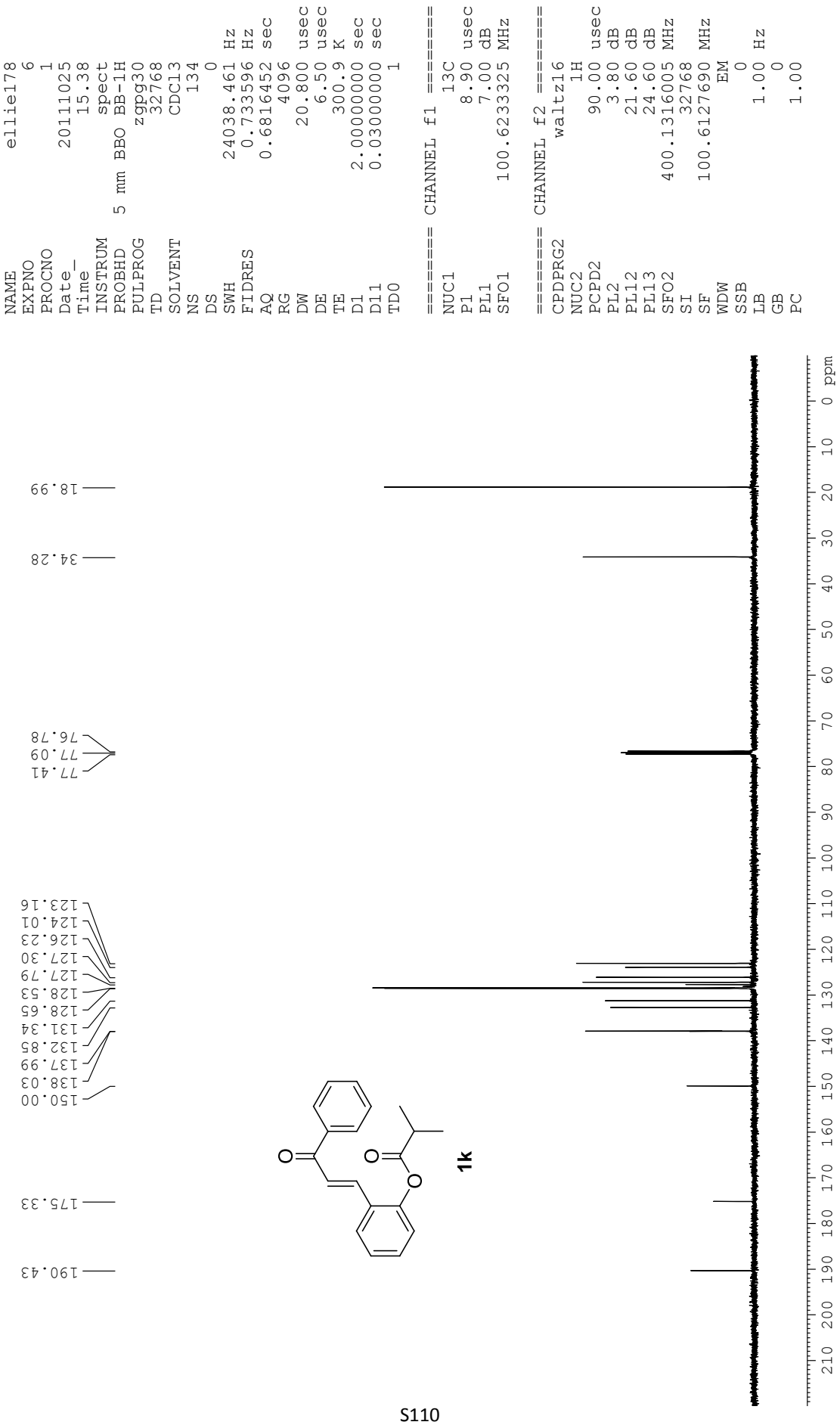


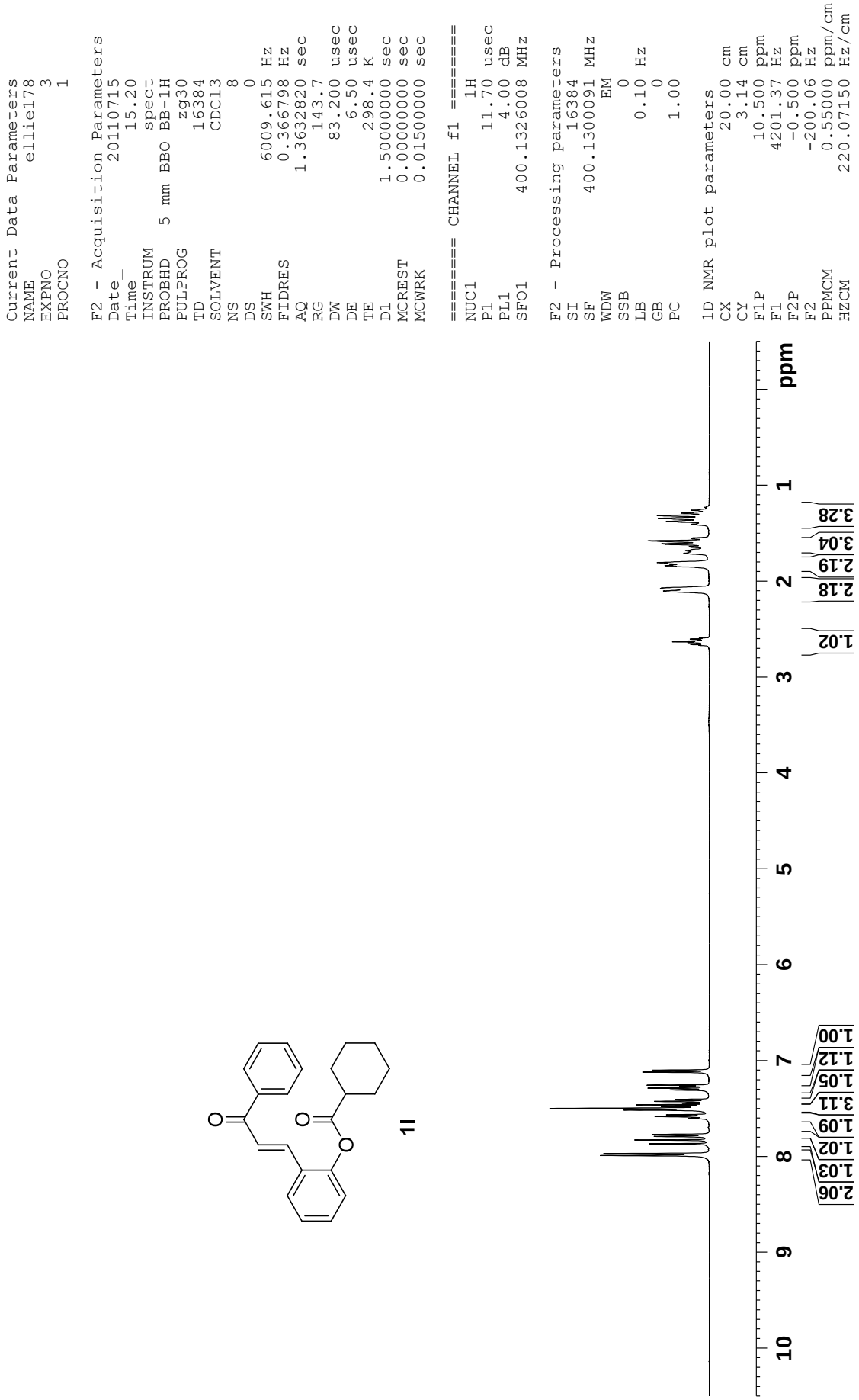

test
103
1
20120225
22.27
spect
5 mm BBO BB-1H
zgpg30
32768
CDC13
282
0
24038.461 Hz
0.733596 Hz
0.6816452 sec
4096
20.800 usec
6.50 usec
300.1 K
2.00000000 sec
0.03000000 sec
1
======== CHANNEL f1 ========
13C
8.90 usec
7.00 dB
100.6233325 MHz
======== CHANNEL f2 ========
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1316005 MHz
32768
100.6127760 MHz
EM
0
1.00 Hz
0
1.00
NAME
EXPNO
PROCNO
Date_
Time_
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
D11
TD0
NUC1
P1
PL1
SFO1
CPDPRG2
NUC2
PCPD2
PL2
PL12
PL13
SFO2
SI
SF
WDW
SSB
LB
GB
PC
77.32
77.00
76.68
122.37
123.16
124.47
126.63
127.47
127.85
128.07
128.12
128.48
128.53
131.34
131.84
132.76
133.41
134.73
137.87
138.22
149.65
164.22
190.42
O
O
O
Br
1i
0 ppm

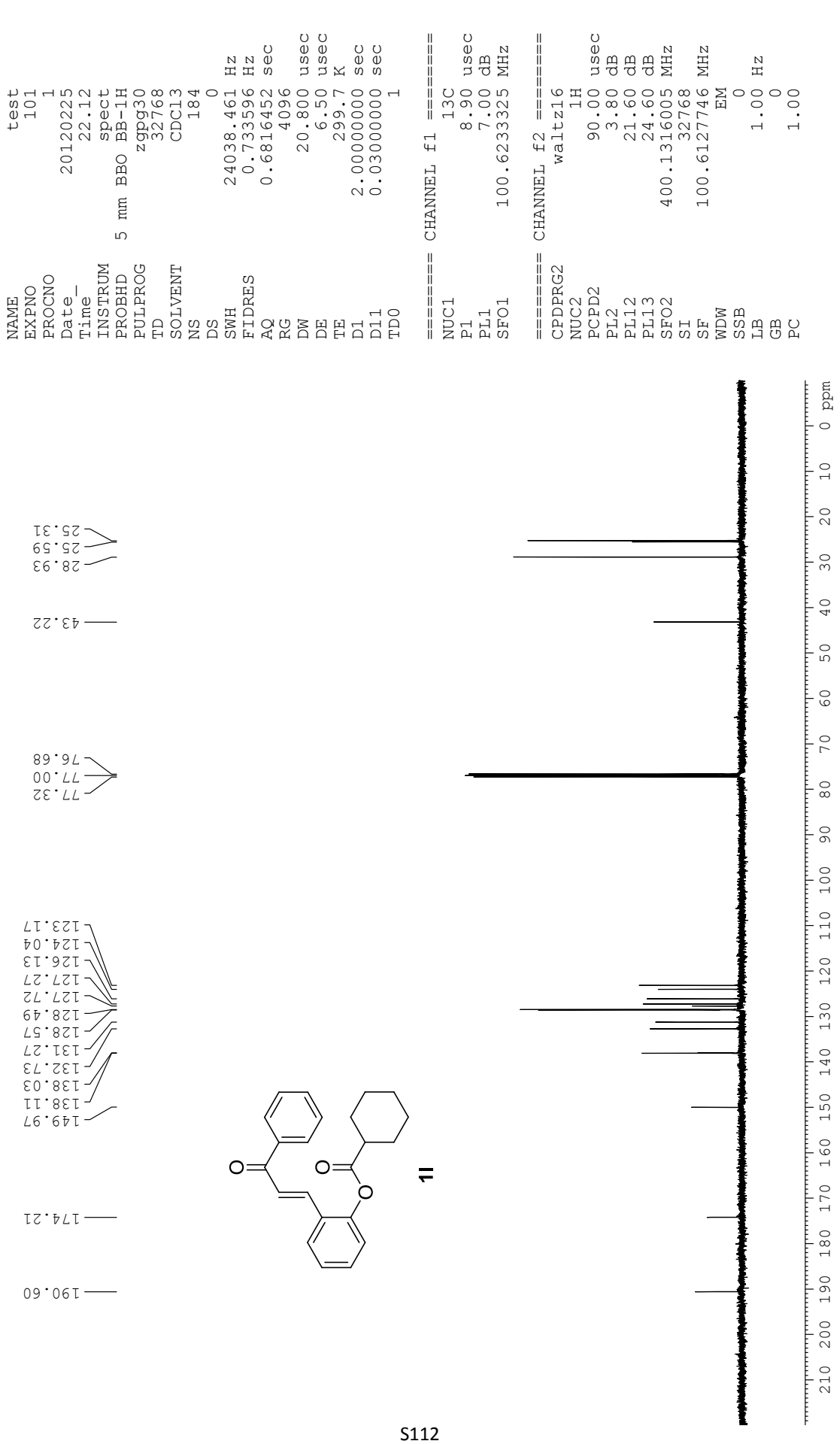

NAME ellie287
EXPNO 1
PROCNO 1
Date_ 20111101
Time 16.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 298.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300088 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1j
ppm
1
2
3
4
5
6
7
8
9
10
3.07
1.99
1.00
1.03
1.07
3.06
1.06
1.04
0.99

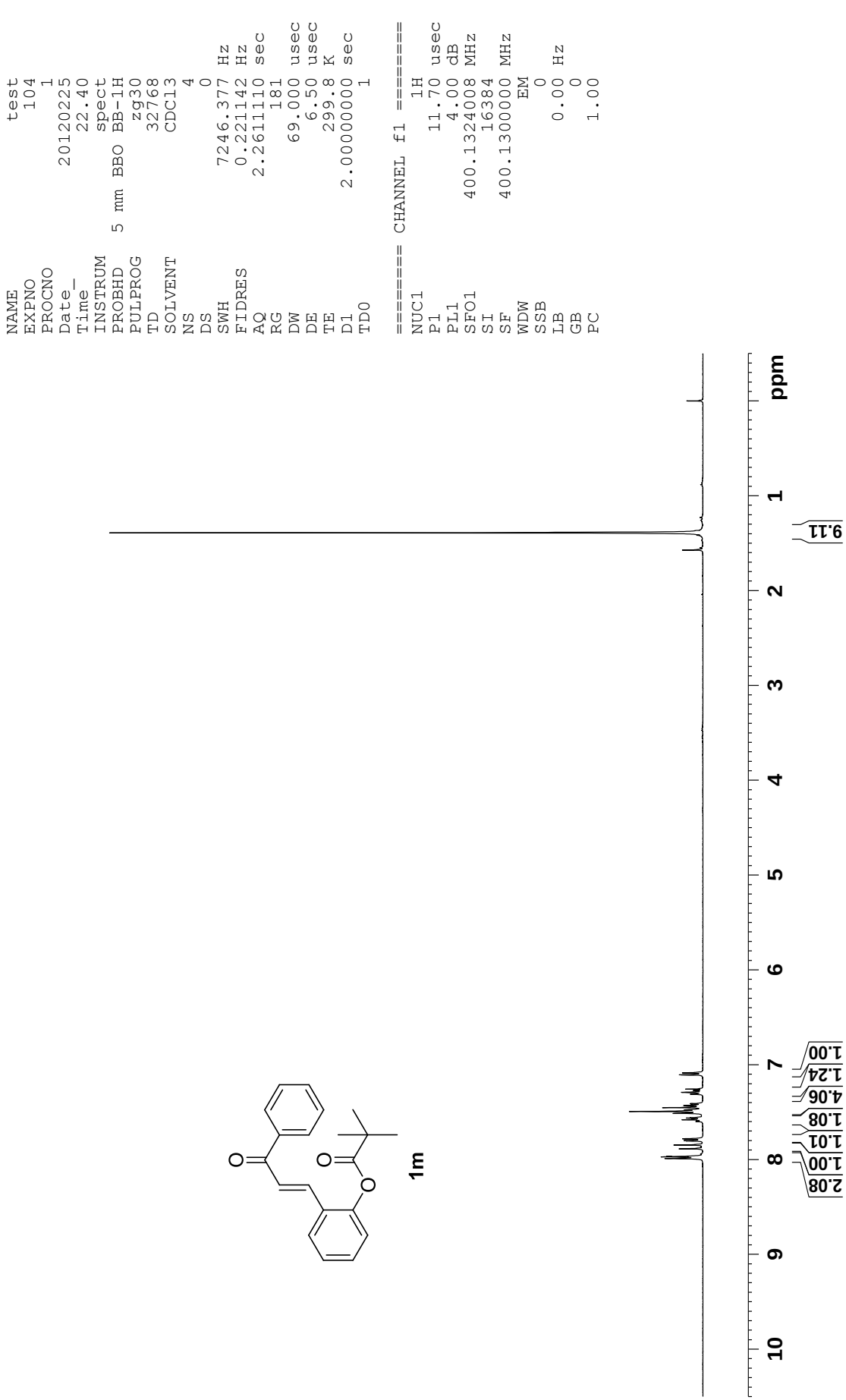

NAME ellie287
EXPNO 3
PROCNO 1
Date_ 20111101
Time_ 16.41
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 188
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127779 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.32
169.19
149.81
138.00
132.95
131.35
128.67
128.55
127.71
127.59
126.39
124.05
123.24
77.41
77.09
76.77
20.97
1j
0 ppm

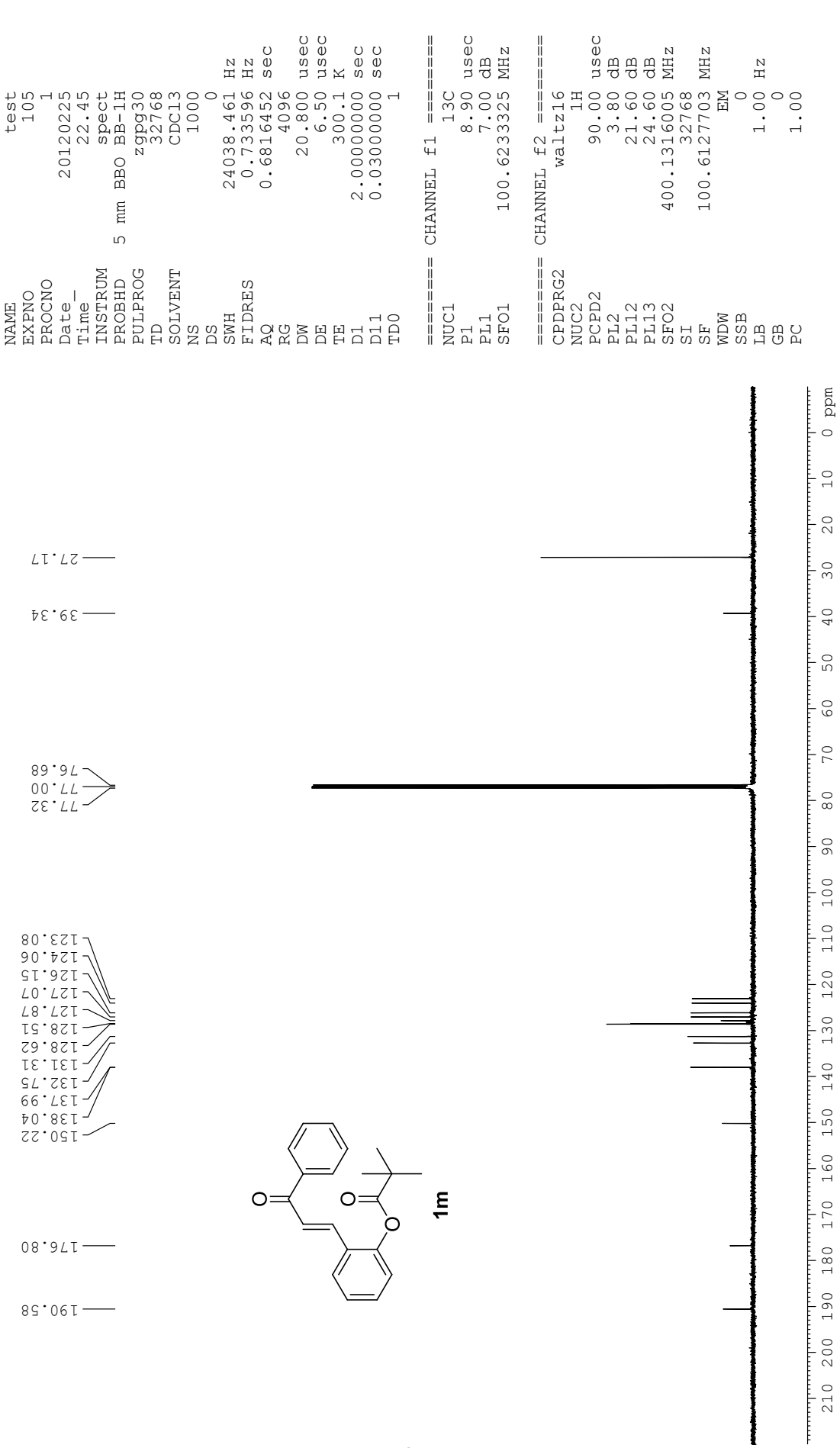

NAME ellie178
EXPNO 5
PROCNO 1
Date_ 20111025
Time_ 15.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 45.3
DW 69.000 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1k
ppm
1
2
3
4
5
6
7
8
9
10
6.24
0.99
2.07
1.00
1.06
1.04
3.05
1.14
1.09
1.02

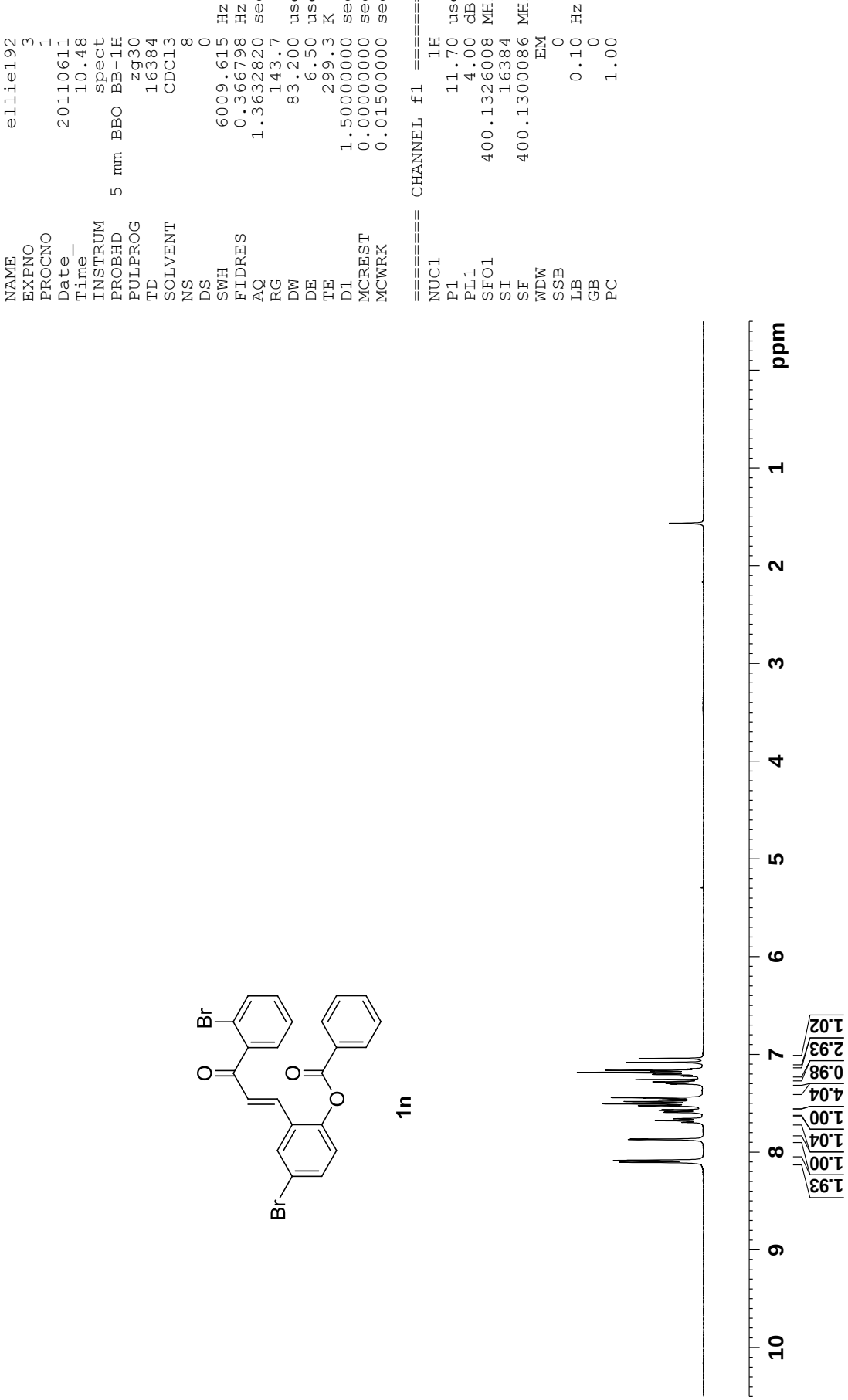

NAME ellie178
EXPNO 6
PROCNO 1
Date_ 20111025
Time 15.38
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 134
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
18.99
34.28
76.78
77.09
77.41
123.16
124.01
126.23
127.30
127.79
128.53
128.65
131.34
132.85
137.99
138.03
150.00
175.33
190.43
1k
ppm

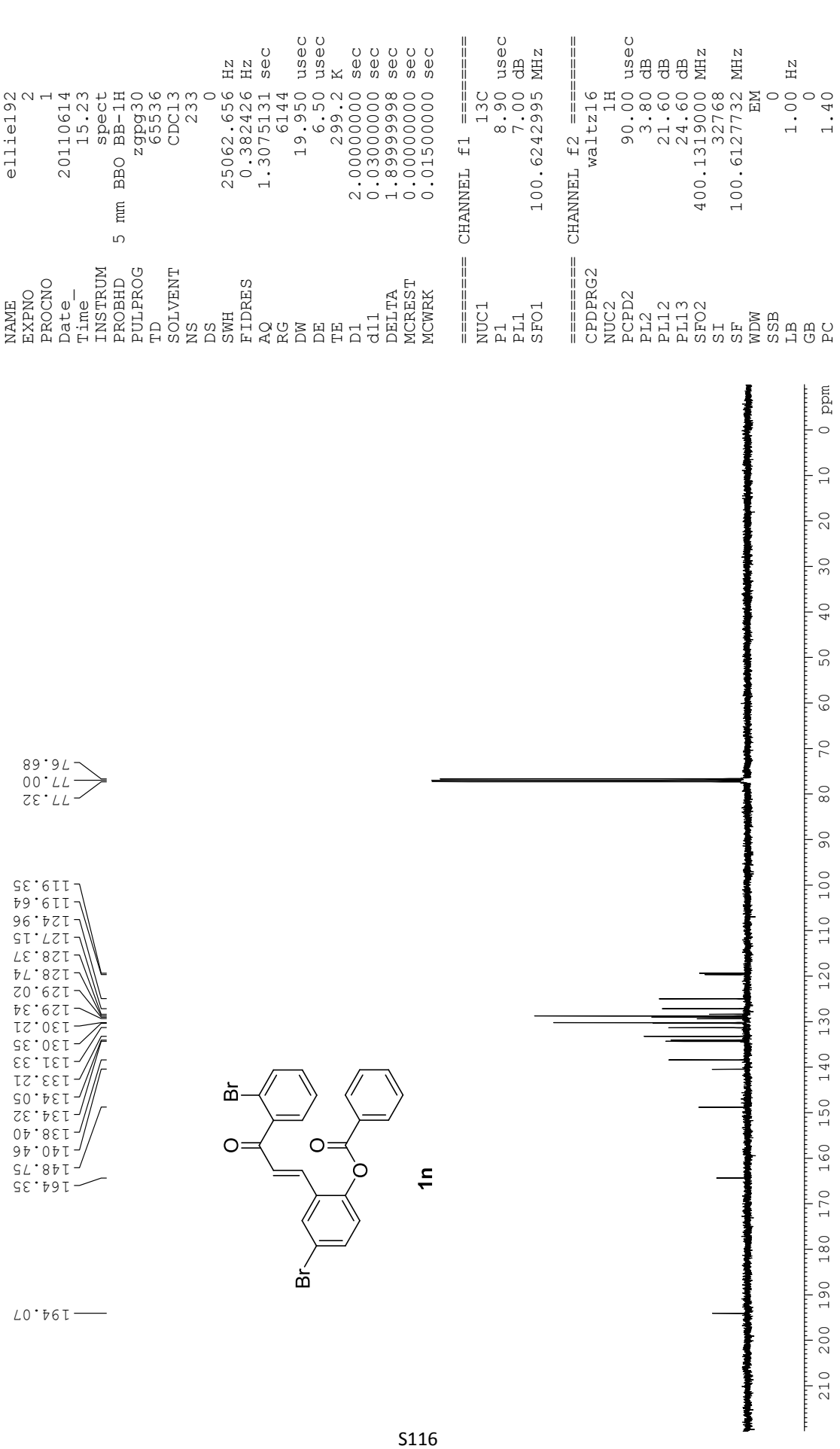

Current Data Parameters
NAME ellie178
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110715
Time 15.20
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 143.7
DW 83.200 usec
DE 6.50 usec
TE 298.4 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300091 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 3.14 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
1.02
2.18
2.19
3.04
3.28
2.06
1.03
1.02
1.09
3.11
1.05
1.12
1.00
ppm
1
2
3
4
5
6
7
8
9
10
11

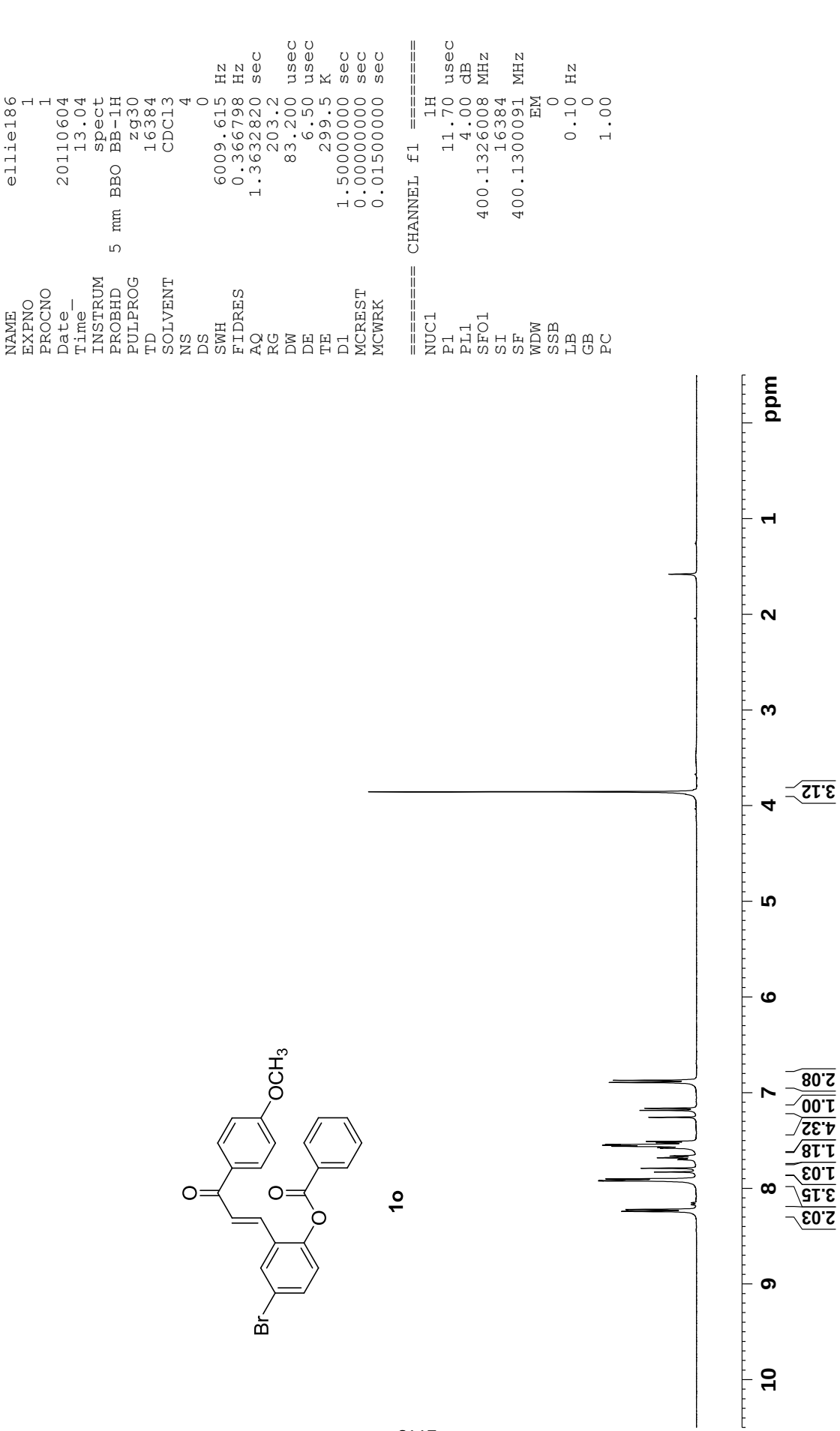

test
101
1
20120225
22.12
spect
5 mm BBO BB-1H
zgpg30
32768
CDCl3
184
0
24038.461 Hz
0.733596 Hz
0.6816452 sec
4096
20.800 usec
6.50 usec
299.7 K
2.00000000 sec
0.03000000 sec
1
======== CHANNEL f1 ========
13C
8.90 usec
7.00 dB
100.6233325 MHz
======== CHANNEL f2 ========
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1316005 MHz
32768
100.6127746 MHz
EM
0
1.00 Hz
0
1.00
NAME
EXPNO
PROCNO
Date_
Time
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
D11
TD0
NUC1
P1
PL1
SFO1
CPDPRG2
NUC2
PCPD2
PL2
PL12
PL13
SFO2
SI
SF
WDW
SSB
LB
GB
PC
25.31
25.59
28.93
43.22
76.68
77.00
77.32
123.17
124.04
126.13
127.27
127.72
128.49
128.57
131.27
132.73
138.03
138.11
149.97
174.21
190.60
O
O
O
1l
0 ppm

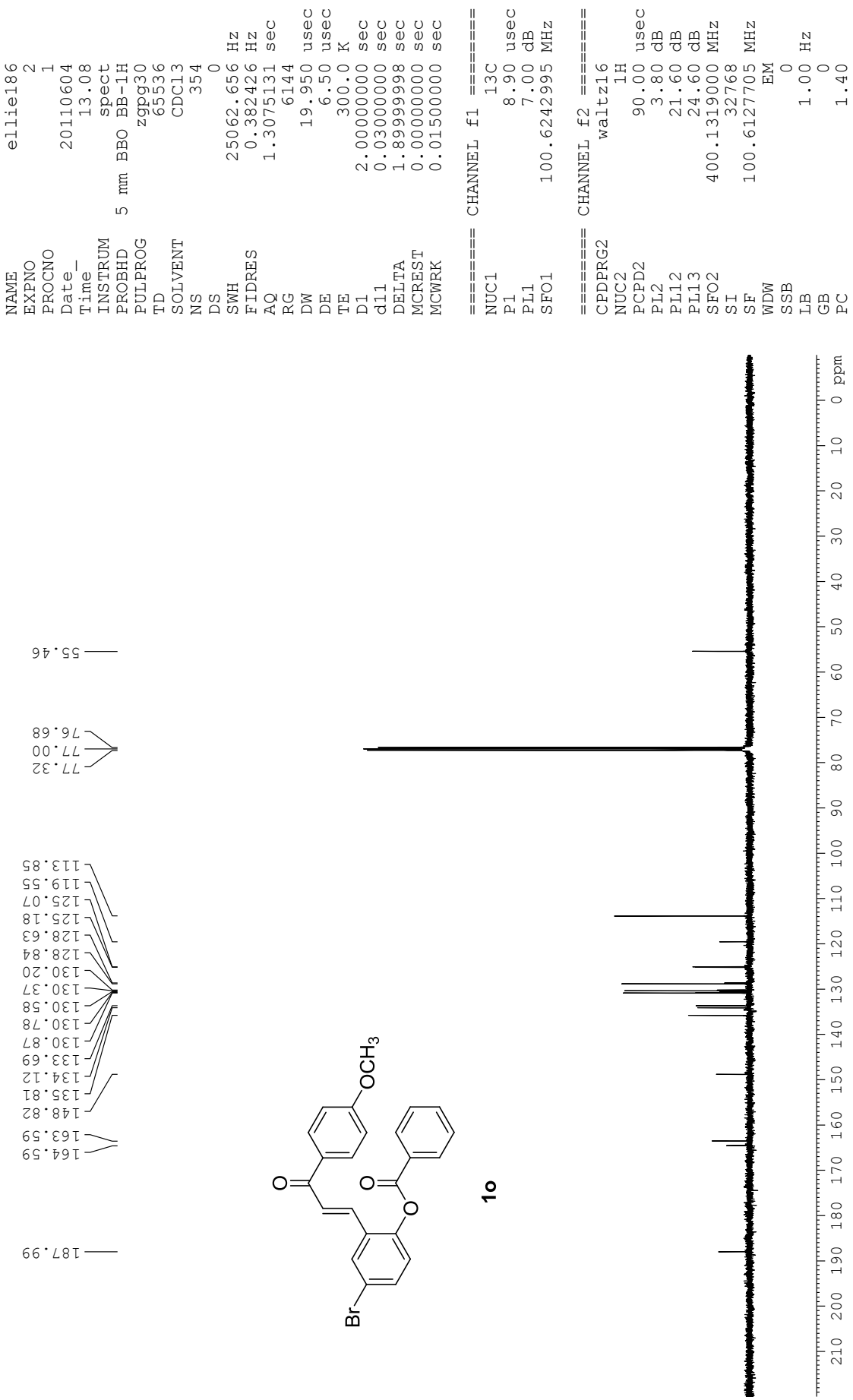

NAME test
EXPNO 104
PROCNO 1
Date_ 20120225
Time_ 22.40
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
ppm
9.11
2.08
1.00
1.01
1.08
4.06
1.24
1.00
1m

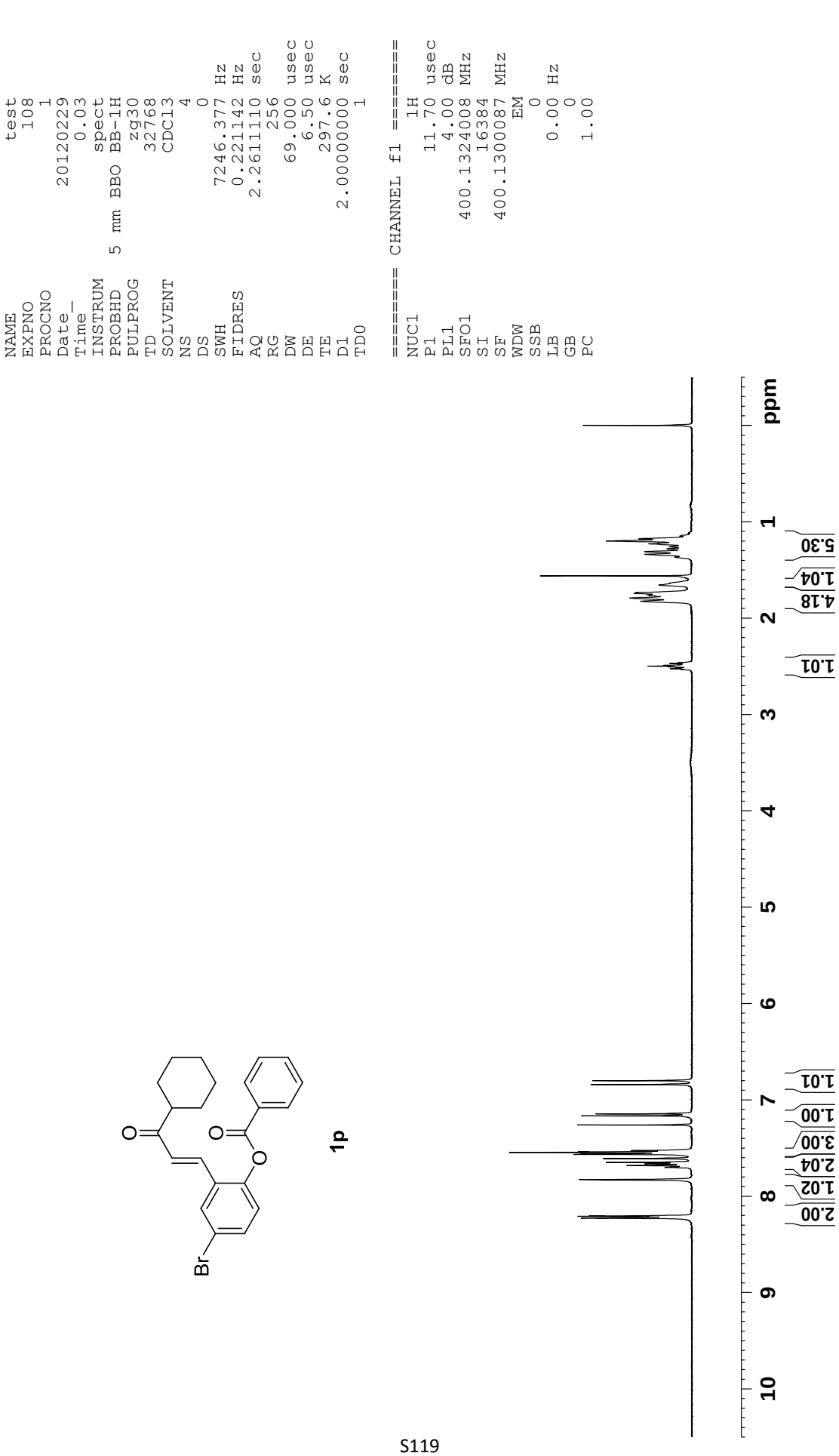

test
105
1
20120225
22.45
spect
5 mm BBO BB-1H
zgpg30
32768
CDC13
1000
0
24038.461 Hz
0.733596 Hz
0.68164452 sec
4096
20.800 usec
6.50 usec
300.1 K
2.00000000 sec
0.03000000 sec
1
======== CHANNEL f1 ========
13C
8.90 usec
7.00 dB
100.6233325 MHz
======== CHANNEL f2 ========
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1316005 MHz
32768
100.6127703 MHz
EM
0
1.00 Hz
0
1.00
NAME
EXPNO
PROCNO
Date_
Time_
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
D11
TD0
NUC1
P1
PL1
SFO1
CPDPRG2
NUC2
PCPD2
PL2
PL12
PL13
SFO2
SI
SF
WDW
SSB
LB
GB
PC
27.17
39.34
76.68
77.00
77.32
123.08
124.06
126.15
127.07
127.87
128.51
128.62
131.31
132.75
137.99
138.04
150.22
176.80
190.58
O
O
O
1m
ppm

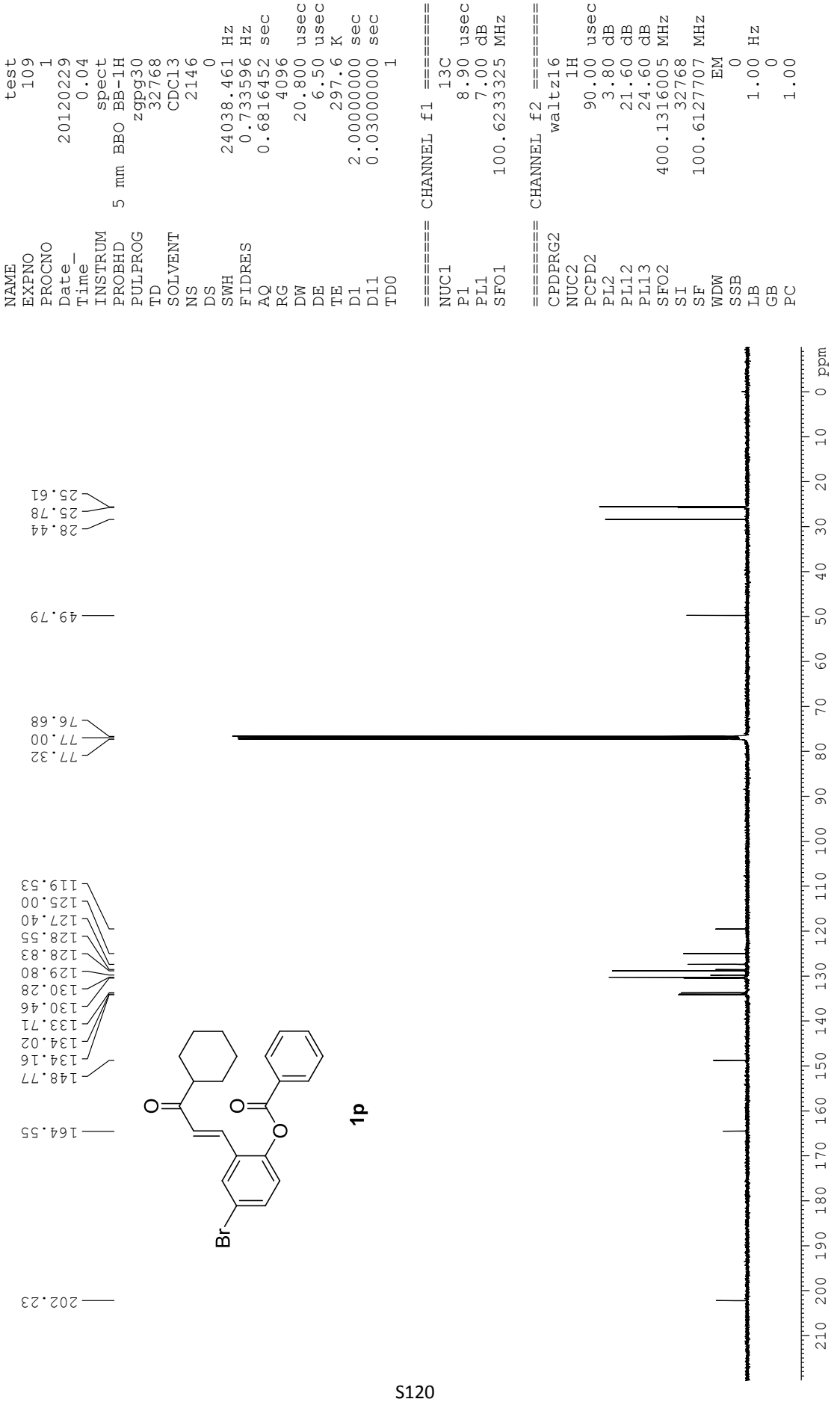

NAME ellie192
EXPNO 3
PROCNO 1
Date_ 20110611
Time_ 10.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 143.7
DW 83.200 usec
DE 6.50 usec
TE 299.3 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300086 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
Br
O
O
O
Br
1n
1.93
1.00
1.04
1.00
4.04
0.98
2.93
1.02
ppm
10
9
8
7
6
5
4
3
2
1

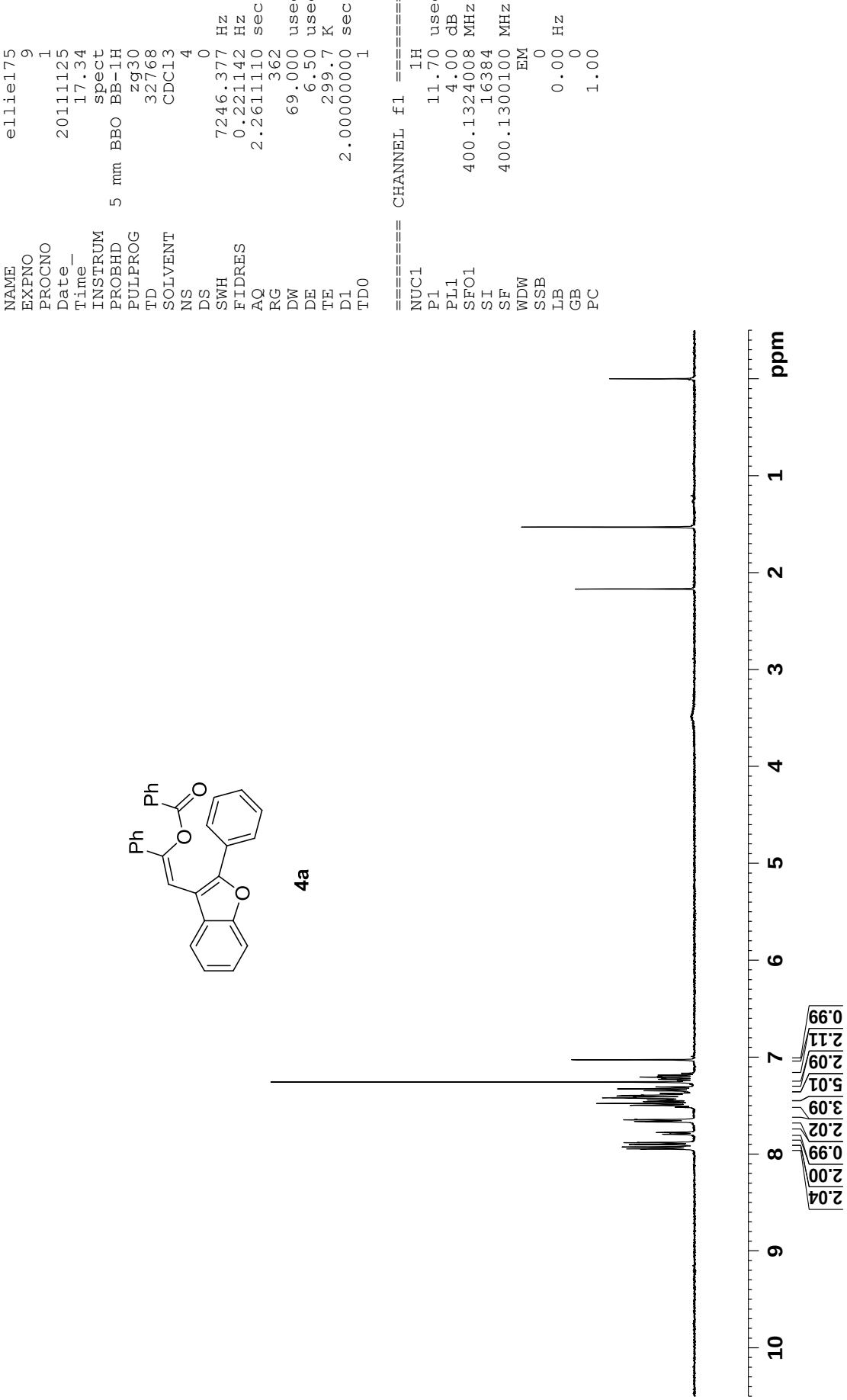

ellie192
2
1
20110614
15.23
spect
5 mm BBO BB-1H
zgpg30
65536
CDC13
233
0
25062.656 Hz
0.382426 Hz
1.3075131 sec
6144
19.950 usec
6.50 usec
299.2 K
2.00000000 sec
0.03000000 sec
1.89999998 sec
0.00000000 sec
0.01500000 sec
CHANNEL f1
13C
8.90 usec
7.00 dB
100.6242995 MHz
CHANNEL f2
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1319000 MHz
32768
100.6127732 MHz
EM
0
1.00 Hz
0
1.40
77.32
77.00
76.68
194.07
164.35
148.75
140.46
138.40
134.32
134.05
133.21
131.33
130.35
130.21
129.34
129.02
128.74
128.37
127.15
124.96
119.64
119.35
Br
O
O
O
Br
1n
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

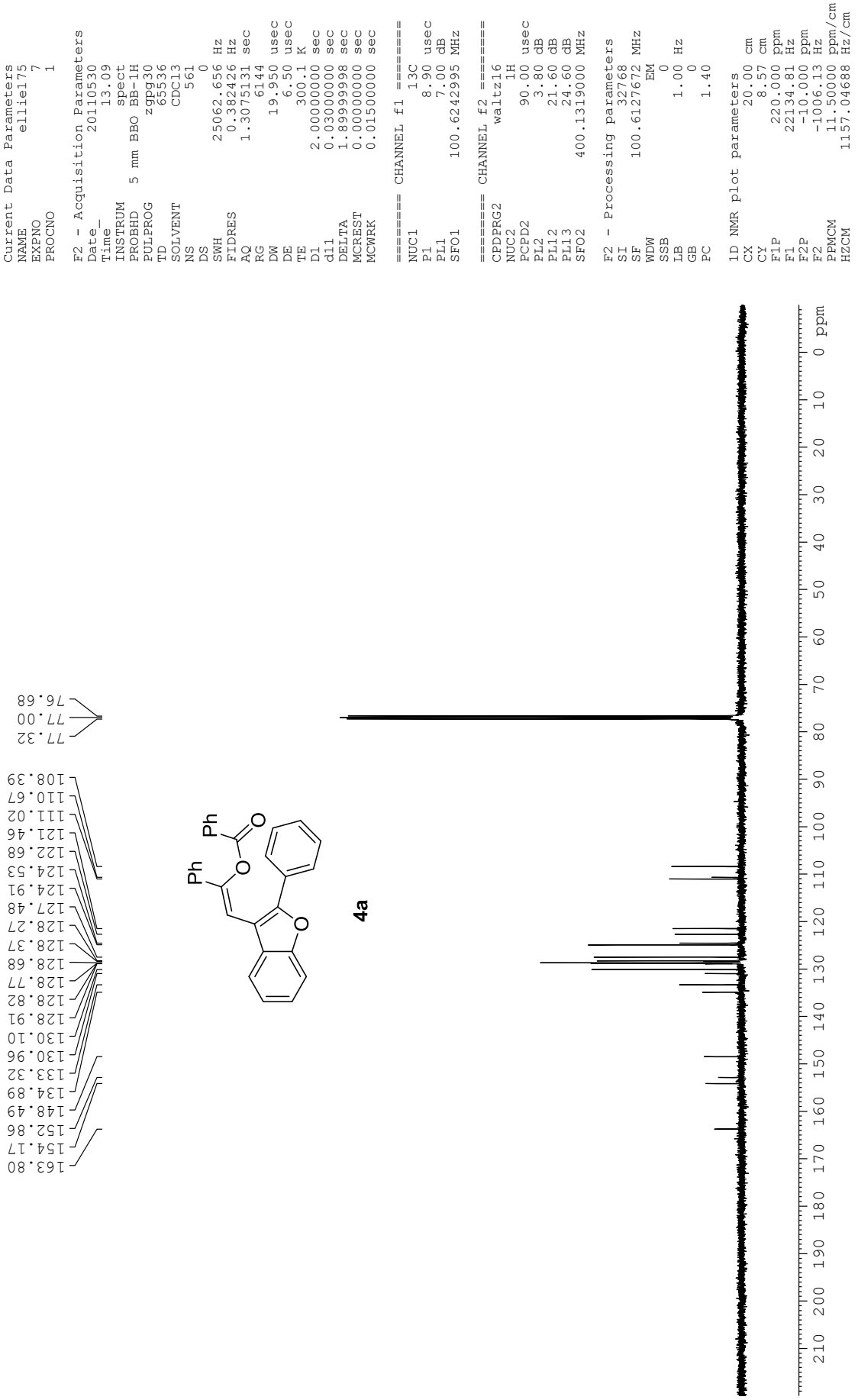

NAME ellie186
EXPNO 1
PROCNO 1
Date_ 20110604
Time 13.04
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 4
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 203.2
DW 83.200 usec
DE 6.50 usec
TE 299.5 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
SI 16384
SF 400.1300091 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
OCH3
O
O
O
Br
1o
ppm
1
2
3
4
5
6
7
8
9
10
3.12
2.03
3.15
1.03
1.18
4.32
1.00
2.08

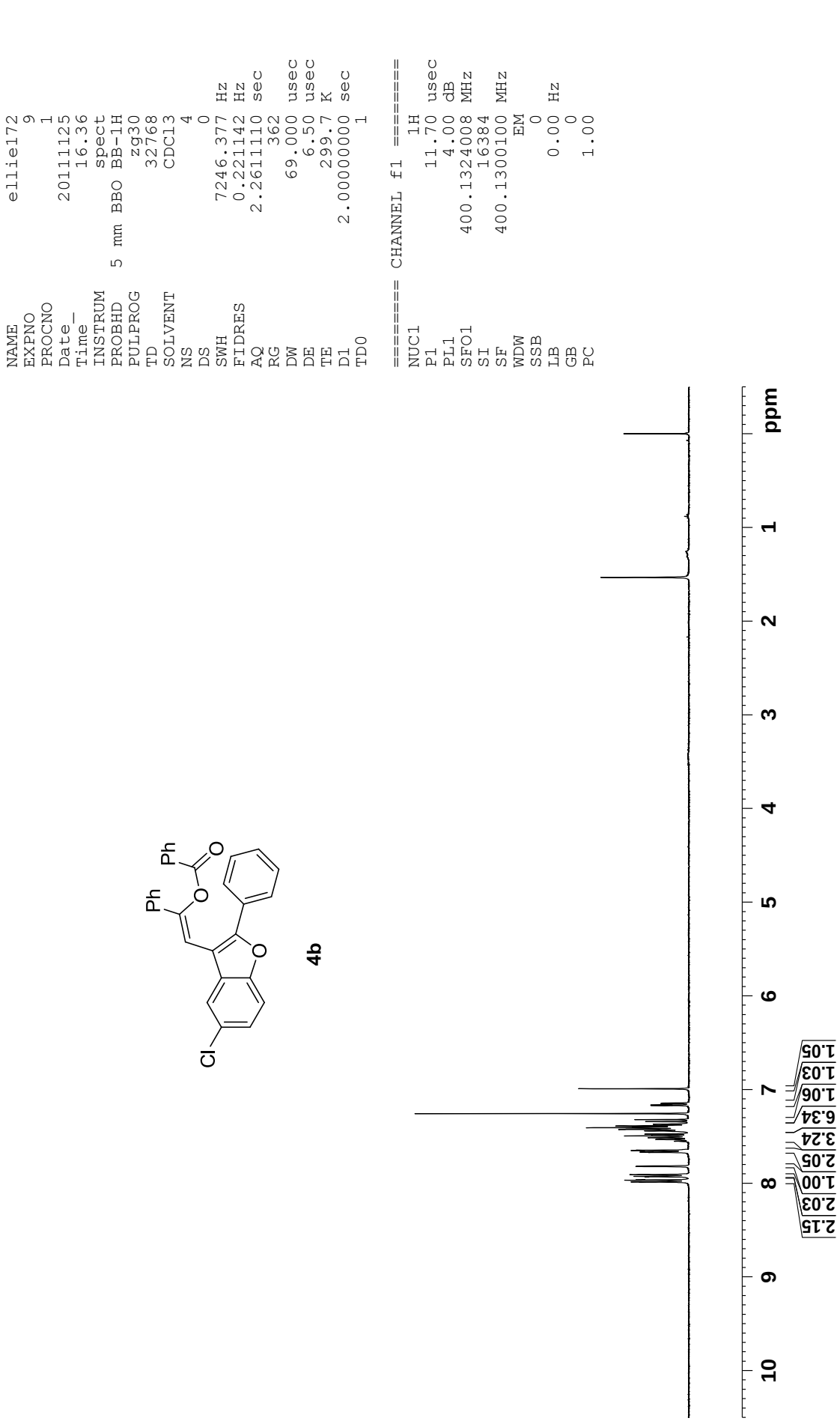

NAME ellie186
EXPNO 2
PROCNO 1
Date_ 20110604
Time_ 13.08
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 354
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127705 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
187.99
164.59
163.59
148.82
135.81
134.12
133.69
130.87
130.78
130.58
130.37
130.20
128.84
128.63
125.18
125.07
119.55
113.85
77.32
77.00
76.68
55.46
OCH3
O
O
O
Br
1o
ppm

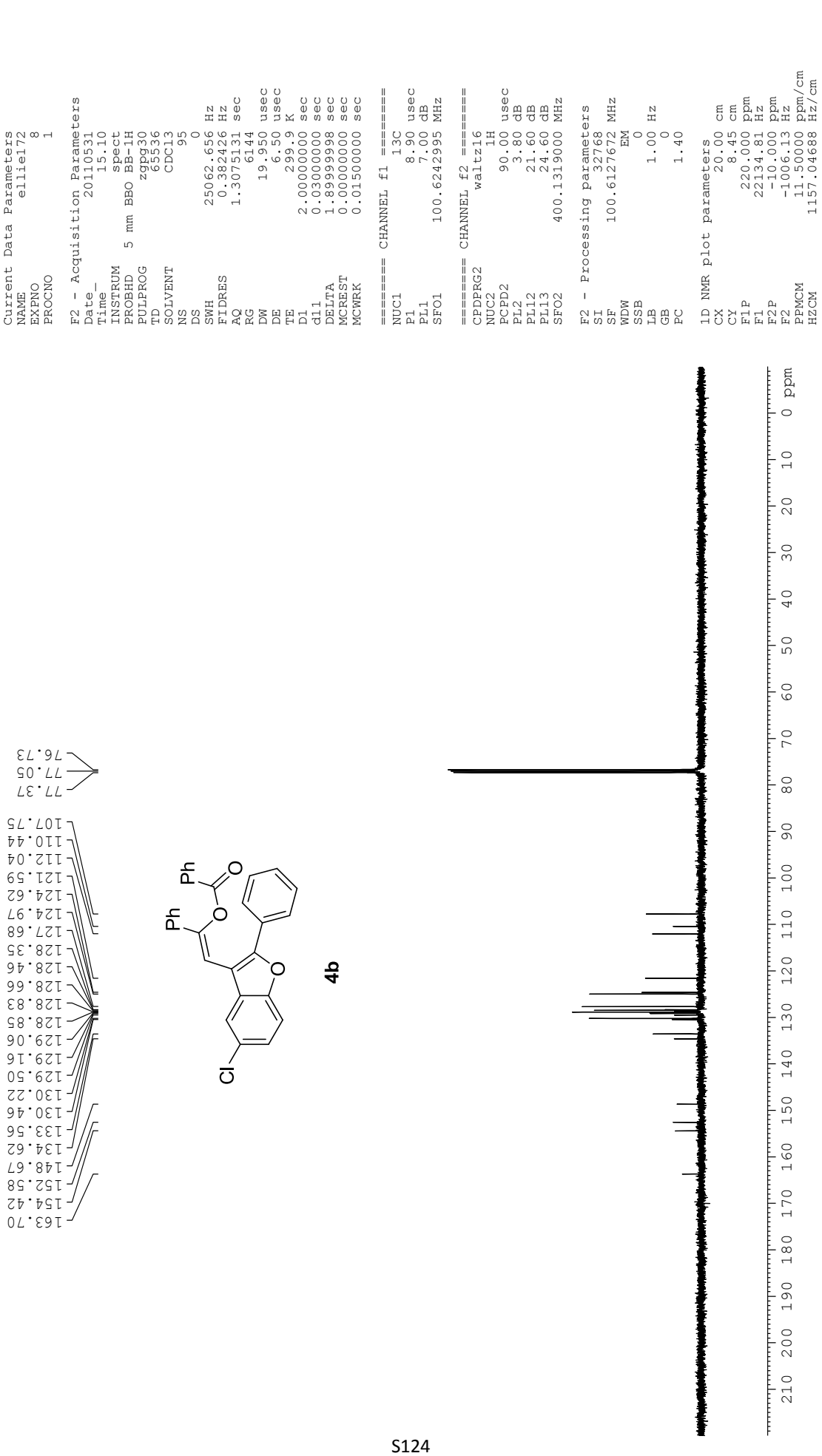

test
108
1
20120229
0.03
spect
5 mm BBO BB-1H
zg30
32768
CDC13
4
0
7246.377 Hz
0.221142 Hz
2.2611110 sec
256
69.000 usec
6.50 usec
297.6 K
2.00000000 sec
1
CHANNEL f1
1H
11.70 usec
4.00 dB
400.1324008 MHz
16384
400.1300087 MHz
EM
0
0.00 Hz
0
1.00
ppm
1.01
4.18
1.04
5.30
2.00
1.02
2.04
3.00
1.00
1.01
Br
1p

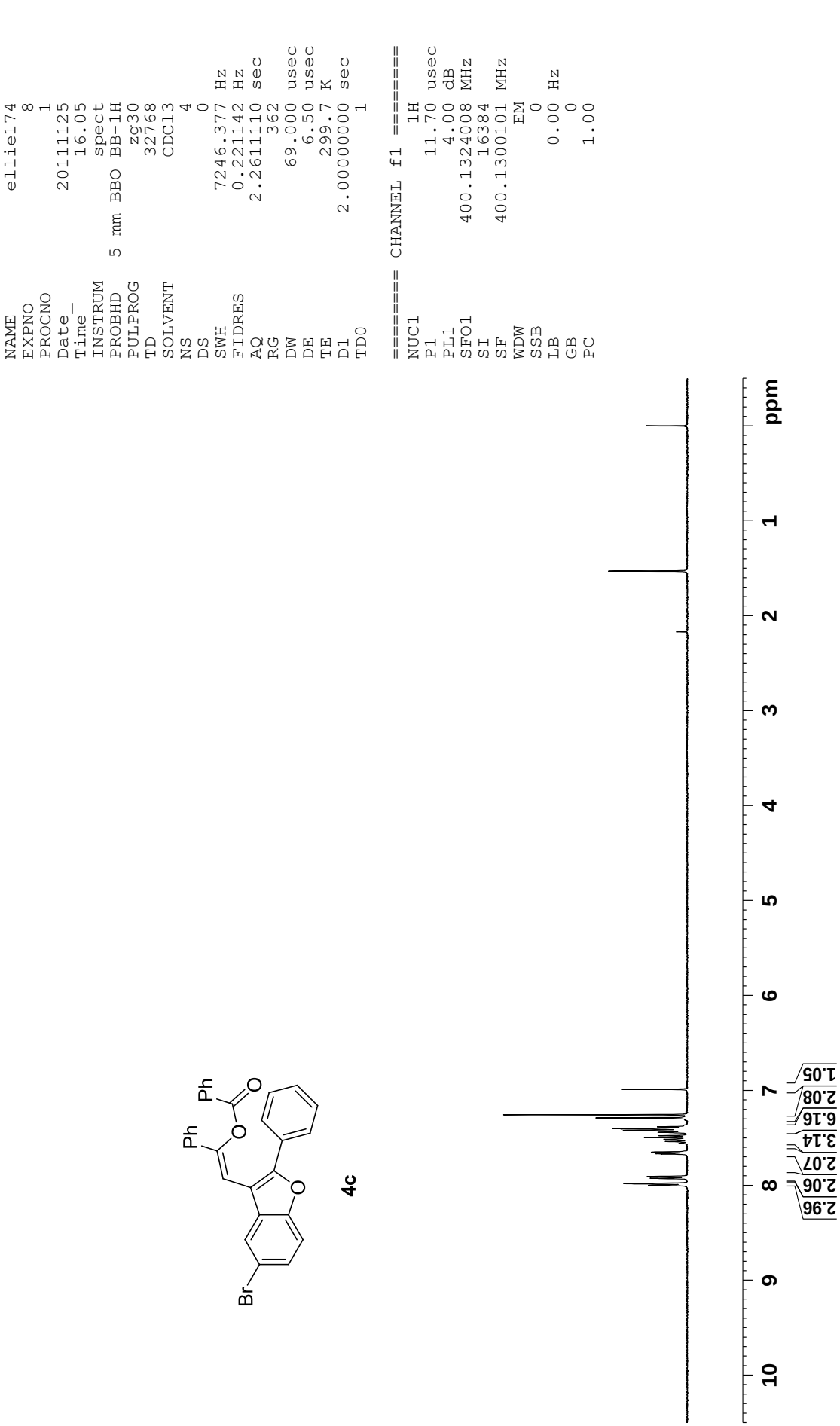

test
109
1
20120229
0.04
spect
5 mm BBO BB-1H
zgpg30
32768
CDC13
2146
0
24038.461 Hz
0.733596 Hz
0.6816452 sec
4096
20.800 usec
6.50 usec
297.6 K
2.00000000 sec
0.03000000 sec
1
NAME
EXPNO
PROCNO
Date_
Time_
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
D11
TD0
======== CHANNEL f1 ========
13C
8.90 usec
7.00 dB
100.6233325 MHz
======== CHANNEL f2 ========
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1316005 MHz
32768
100.6127707 MHz
EM
0
1.00 Hz
0
1.00
NUC1
P1
PL1
SFO1
CPDPRG2
NUC2
PCPD2
PL2
PL12
PL13
SFO2
SI
SF
WDW
SSB
LB
GB
PC
202.23
164.55
148.77
134.16
134.02
133.71
130.46
130.28
129.80
128.83
128.55
127.40
125.00
119.53
77.32
77.00
76.68
49.79
28.44
25.78
25.61
O
O
O
Br
1p
ppm

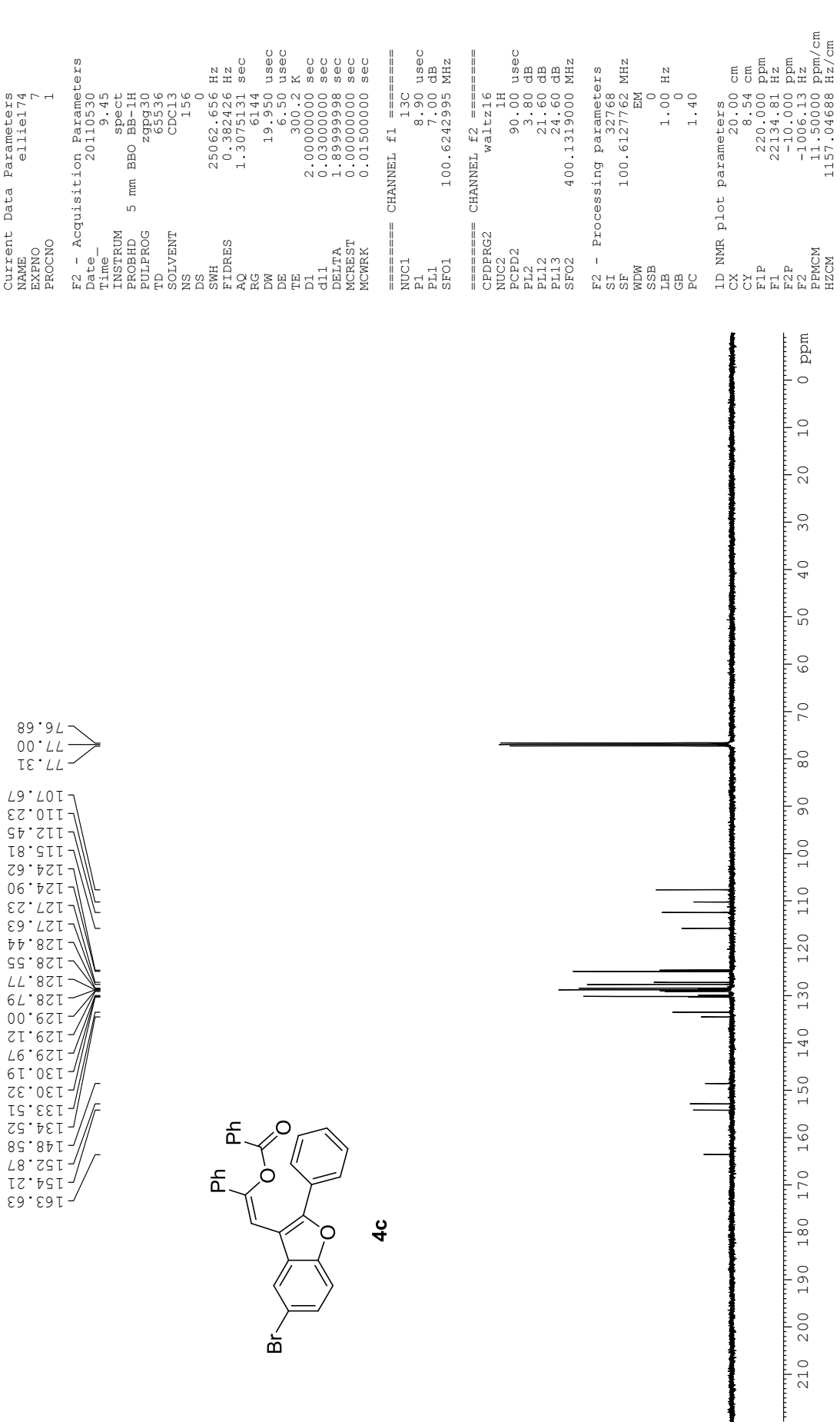

NAME ellie175
EXPNO 9
PROCNO 1
Date_ 20111125
Time_ 17.34
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
4a
ppm
1
2
3
4
5
6
7
8
9
10
2.04
2.00
0.99
2.02
3.09
5.01
2.09
2.11
0.99

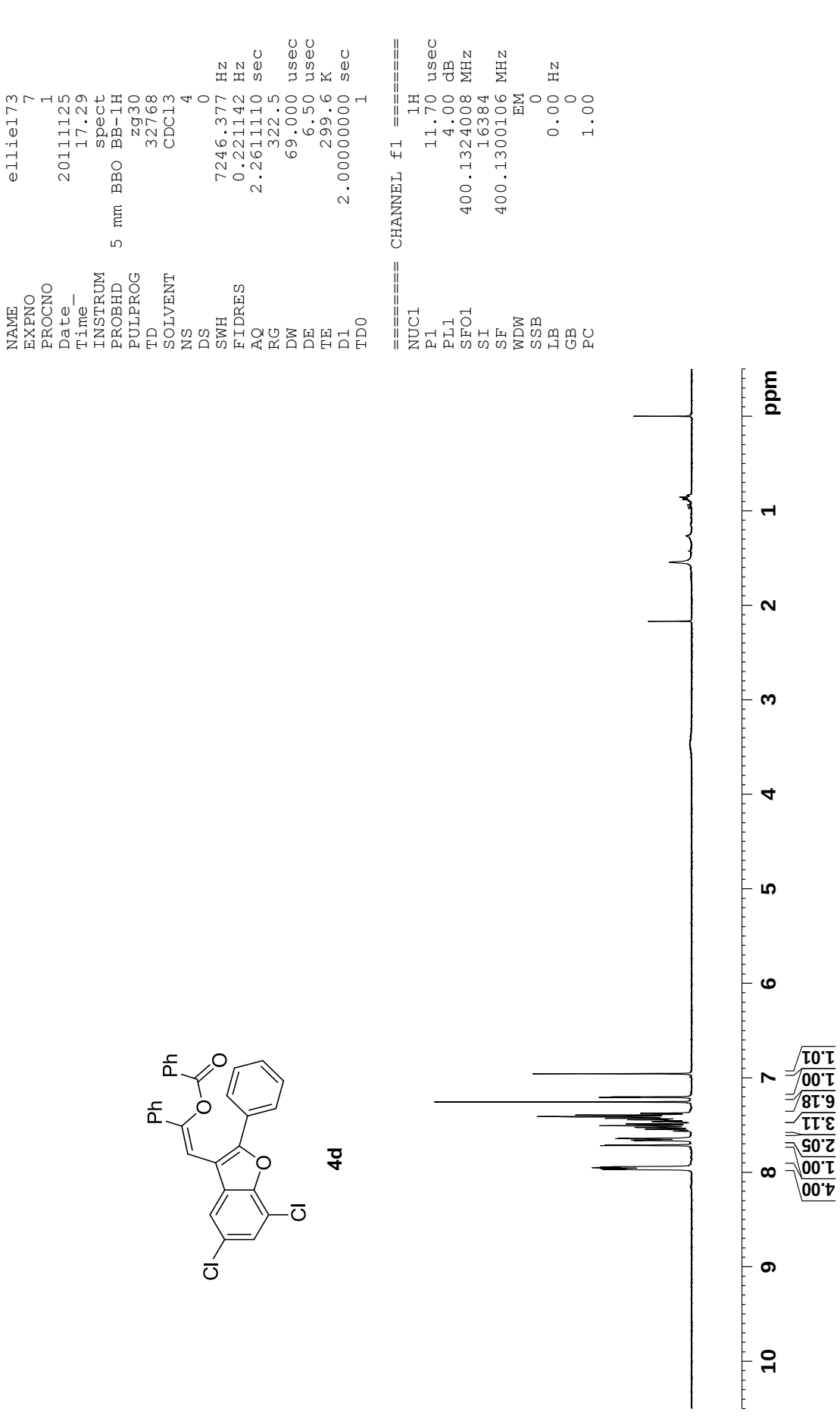

Current Data Parameters
NAME elli1e175
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110530
Time_ 13.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 561
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.57 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
Ph
Ph
O
O
O
4a
77.32
77.00
76.68
108.39
110.67
111.02
121.46
122.68
124.53
124.91
127.48
128.27
128.37
128.68
128.77
128.82
128.91
130.10
130.96
133.32
134.89
148.49
152.86
154.17
163.80
ppm

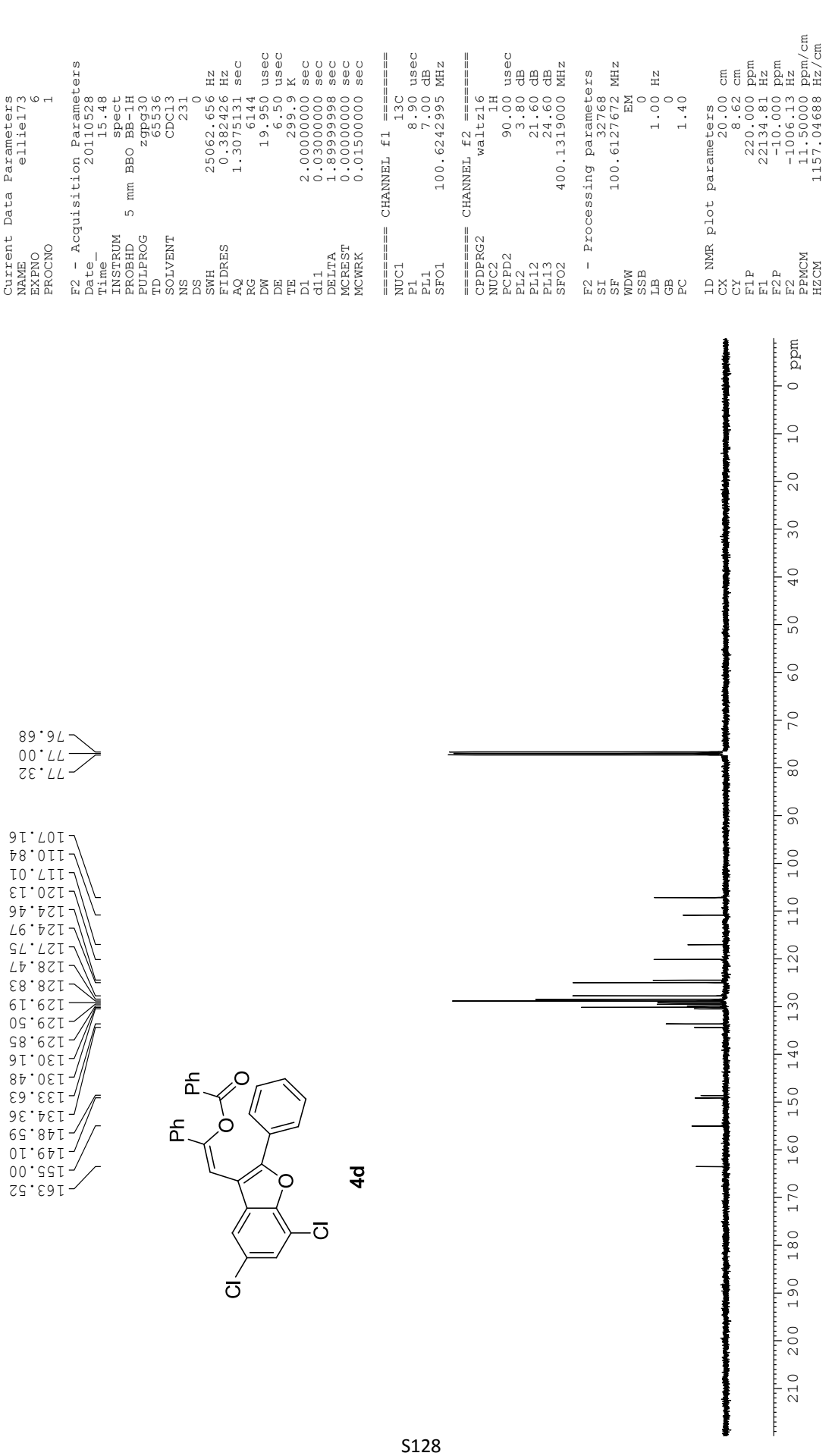

NAME ellie172
EXPNO 9
PROCNO 1
Date_ 20111125
Time_ 16.36
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
Cl
4b
ppm
1
2
3
4
5
6
7
8
9
10
2.15
2.03
1.00
2.05
3.24
6.34
1.06
1.03
1.05

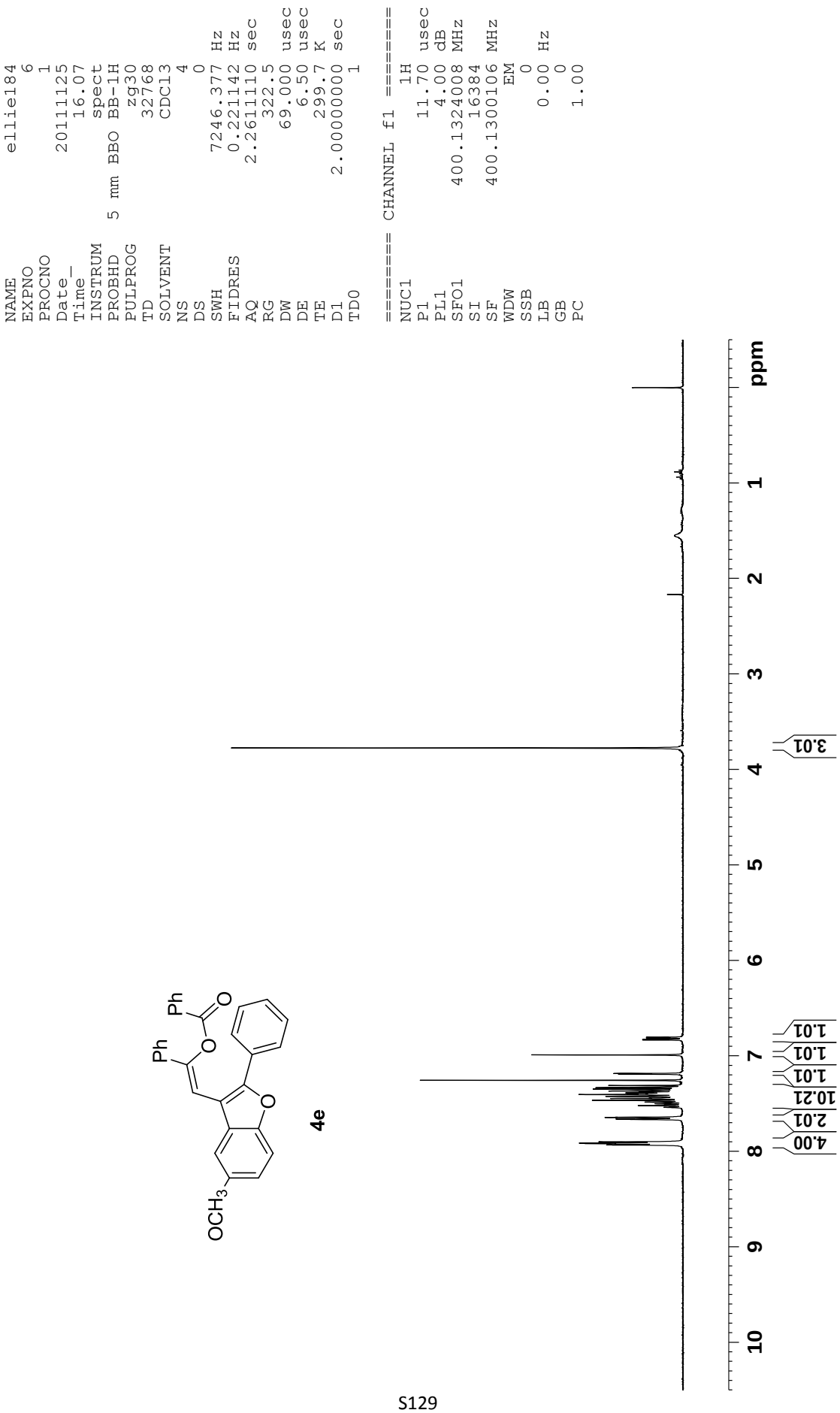

Current Data Parameters
NAME ellie172
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110531
Time_ 15.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 95
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.45 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
77.37
77.05
76.73
107.75
110.44
112.04
121.59
124.62
124.97
127.68
128.35
128.46
128.66
128.83
128.85
129.06
129.16
129.50
130.22
130.46
133.56
134.62
148.67
152.58
154.42
163.70
Ph
Ph
O
O
O
Cl
4b
0 ppm

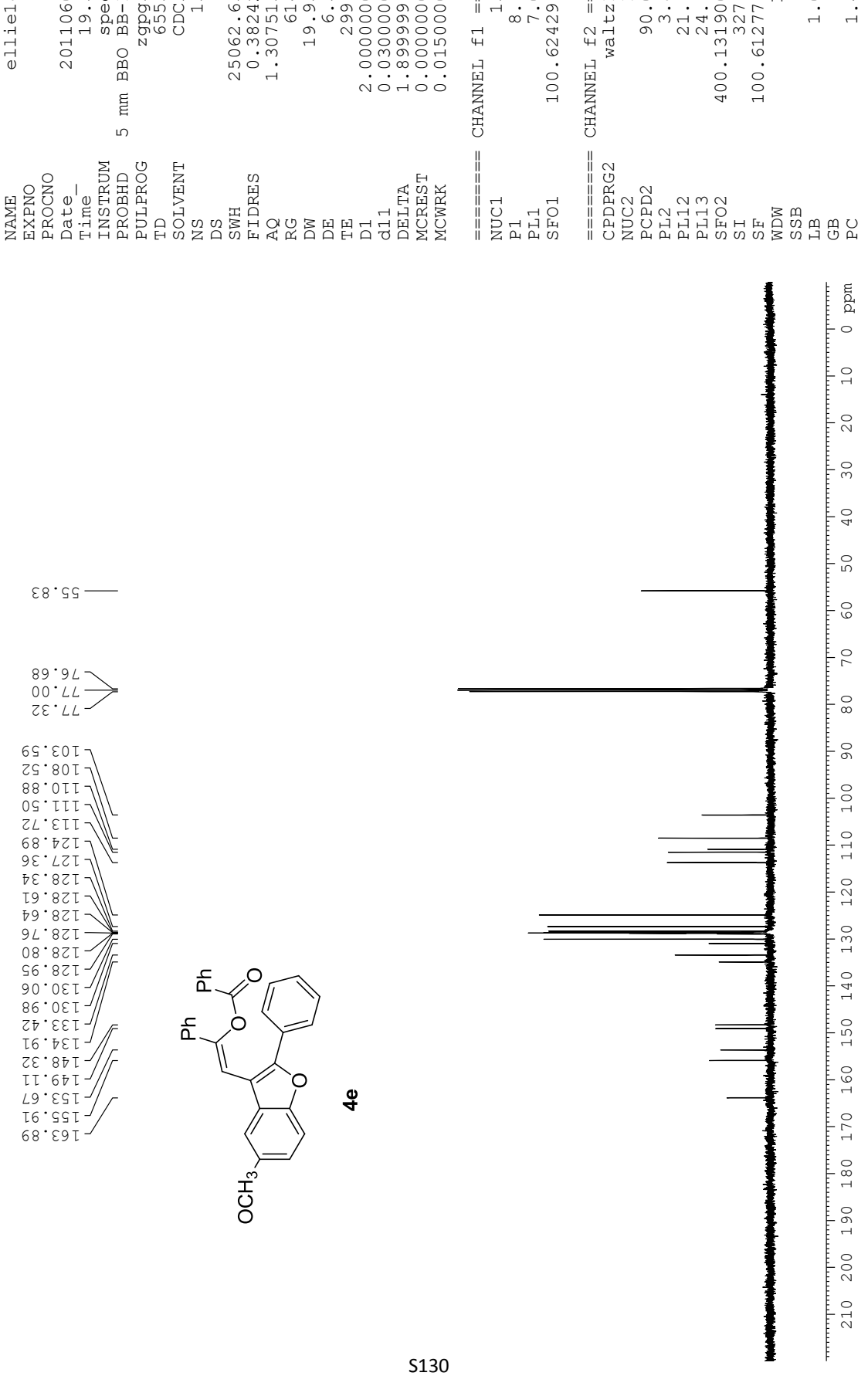

NAME ellie174
EXPNO 8
PROCNO 1
Date_ 20111125
Time 16.05
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300101 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
Br
4c
ppm
1
2
3
4
5
6
7
8
9
10
1.05
2.08
6.16
3.14
2.07
2.06
2.96

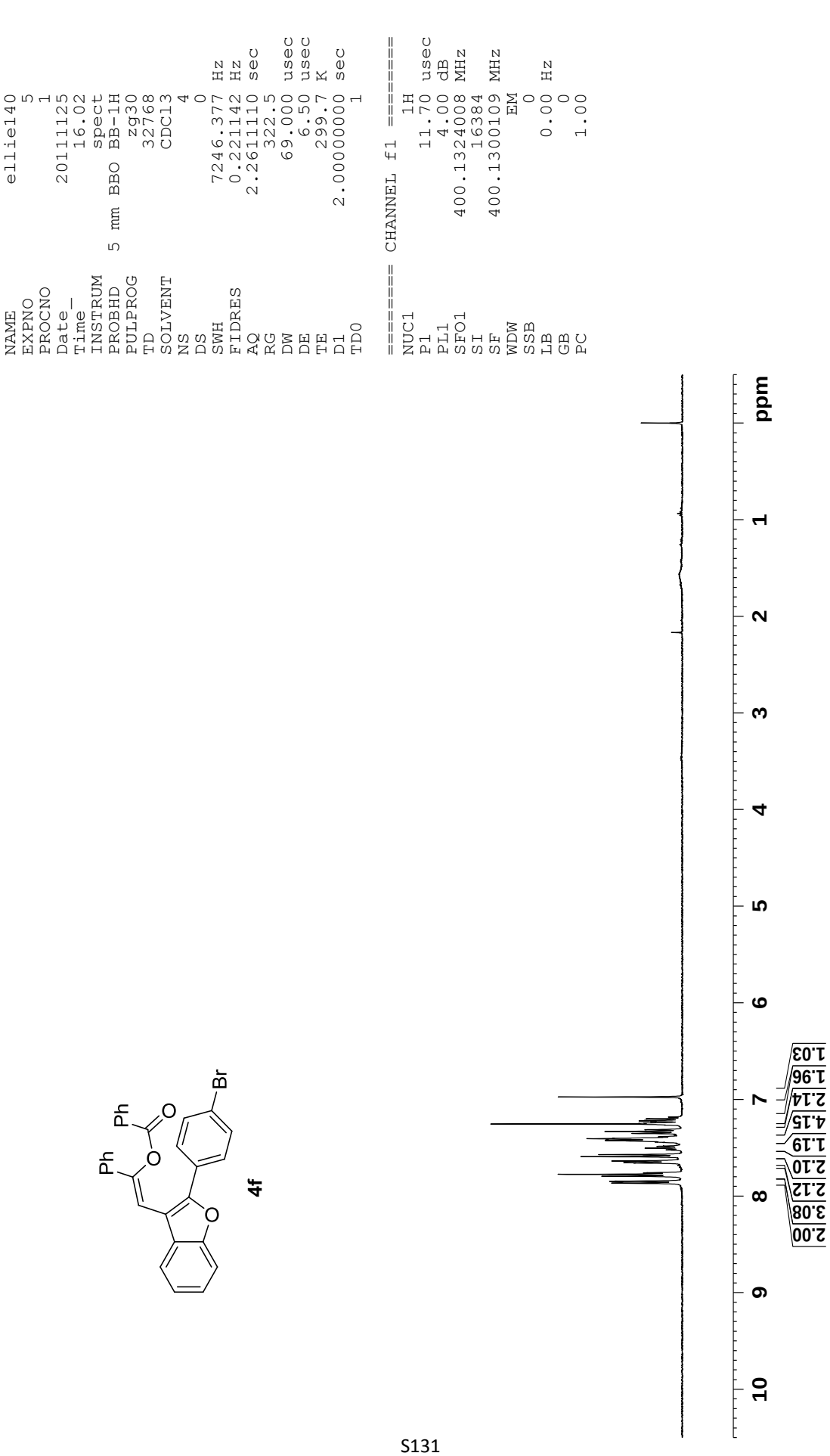

Current Data Parameters
NAME ellie174
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110530
Time_ 9.45
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 156
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 300.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127762 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.54 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
77.31
77.00
76.68
107.67
110.23
112.45
115.81
124.62
124.90
127.23
127.63
128.44
128.55
128.77
128.79
129.00
129.12
129.97
130.19
130.32
133.51
134.52
148.58
152.87
154.21
163.63
Ph
Ph
O
O
O
Br
4c
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

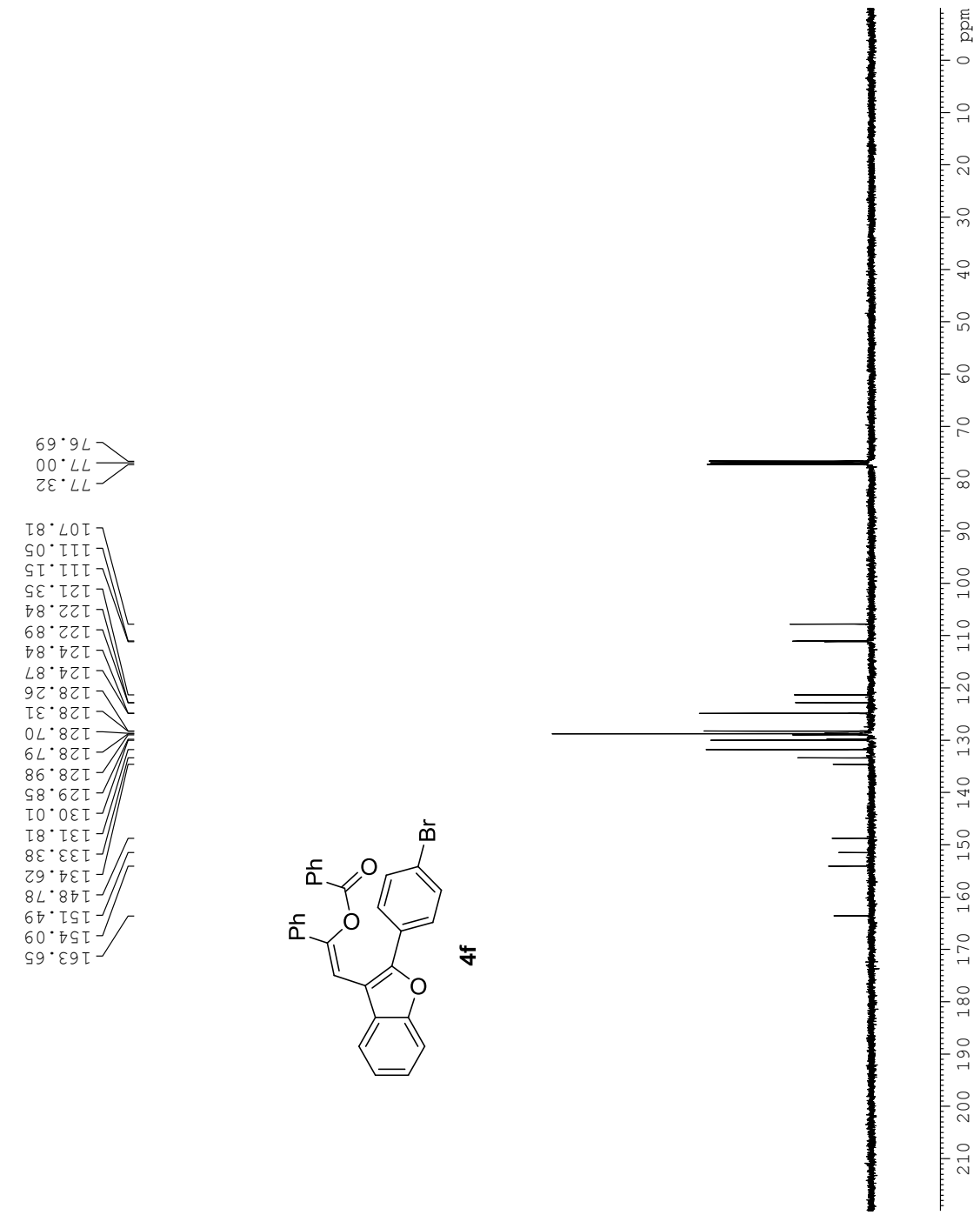

NAME ellie173
EXPNO 7
PROCNO 1
Date_ 20111125
Time_ 17.29
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300106 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
Cl
Cl
4d
ppm
1
2
3
4
5
6
7
8
9
10
4.00
1.00
2.05
3.11
6.18
1.00
1.01

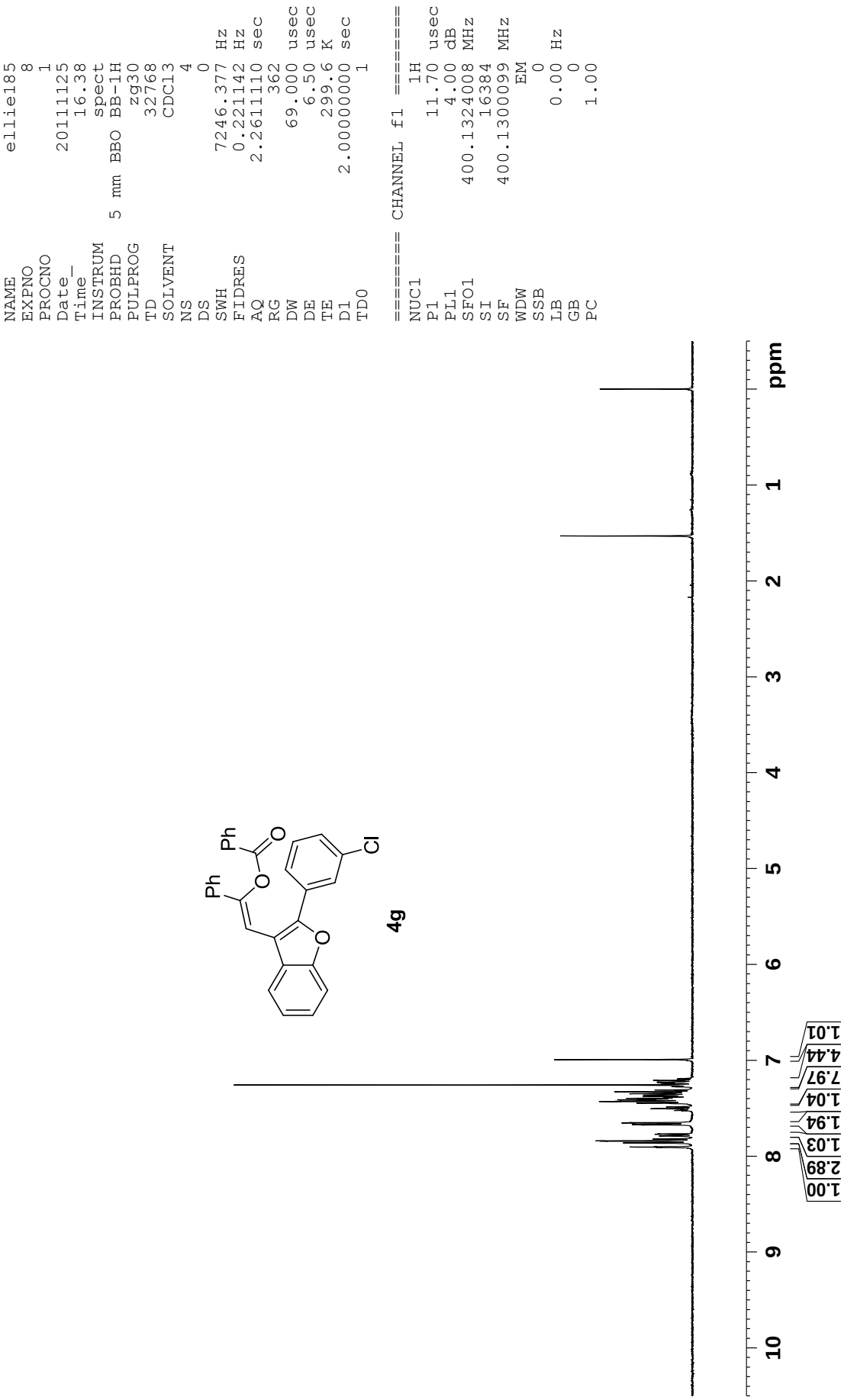

Current Data Parameters
NAME ellie173
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110528
Time_ 15.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 231
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.62 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
163.52
155.00
149.10
148.59
134.36
133.63
130.48
130.16
129.85
129.50
129.19
128.83
128.47
127.75
124.97
124.46
120.13
117.01
110.84
107.16
77.32
77.00
76.68
Ph
O
Ph
O
O
Cl
Cl
4d
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

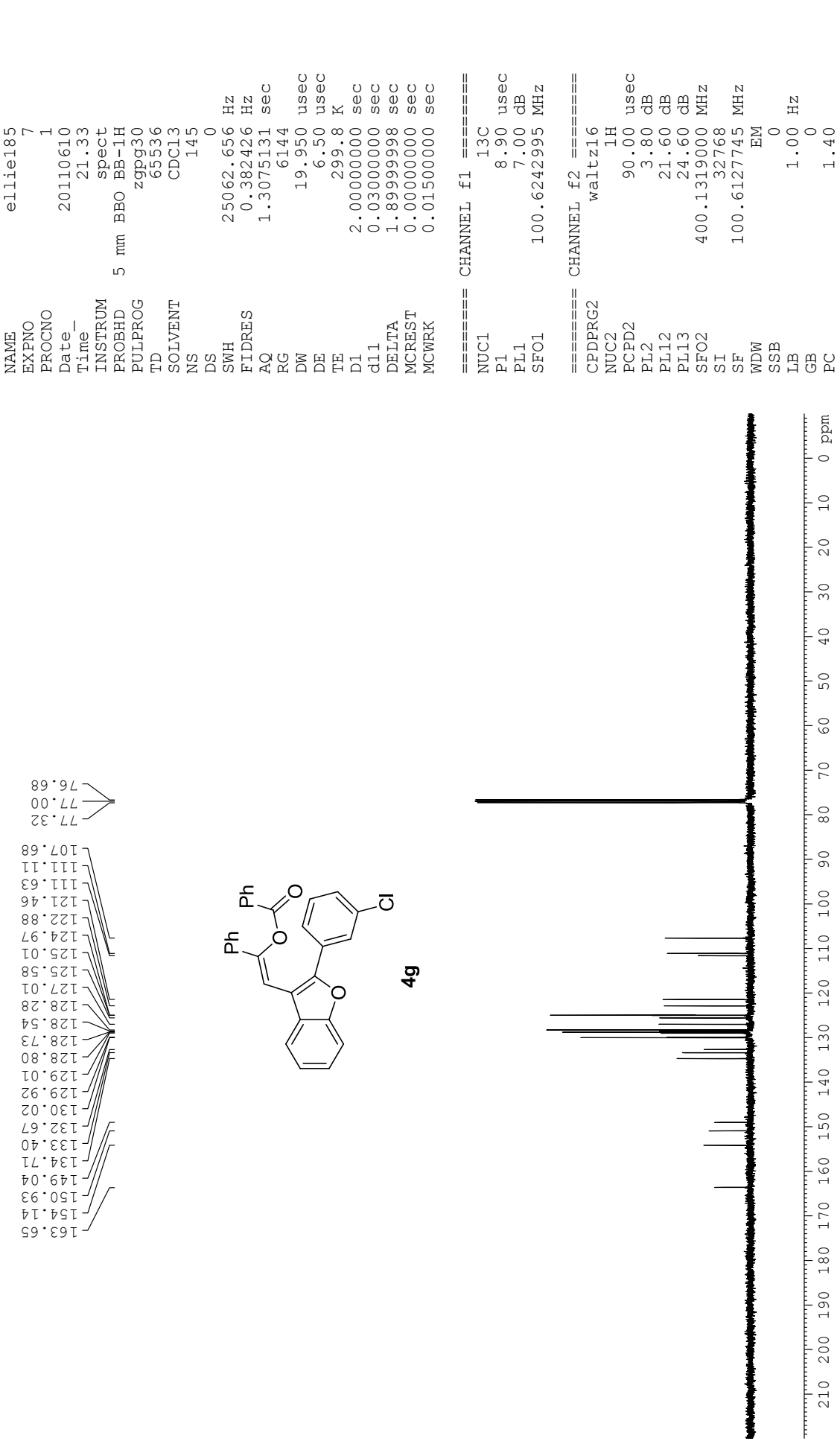

NAME ellie184
EXPNO 6
PROCNO 1
Date_ 20111125
Time_ 16.07
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300106 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
OCH3
4e
ppm
1
2
3
4
5
6
7
8
9
10
3.01
1.01
1.01
1.01
10.21
2.01
4.00

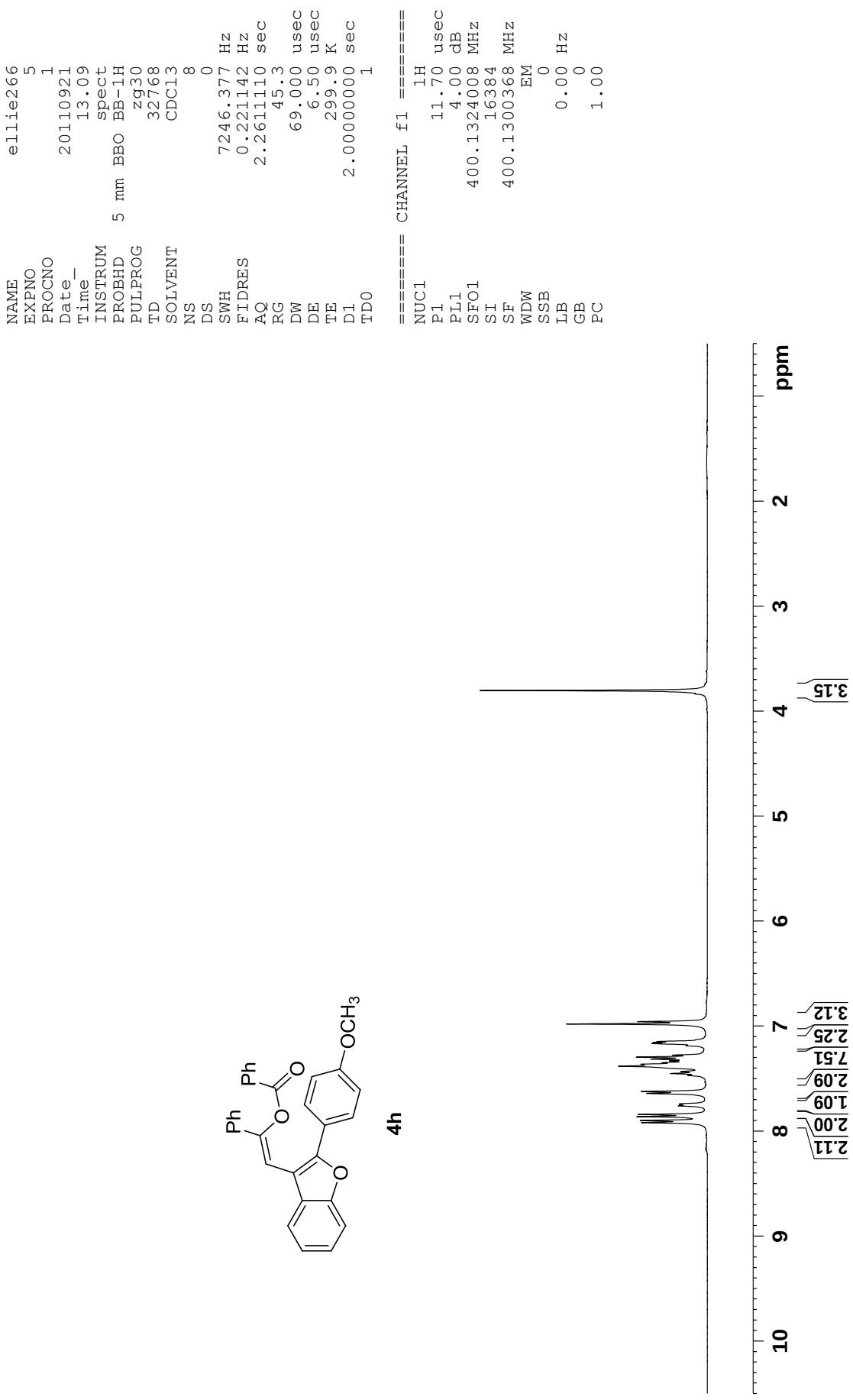

NAME elie184
EXPNO 5
PROCNO 1
Date_ 20110603
Time_ 19.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 135
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
D11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127767 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
55.83
76.68
77.00
77.32
103.59
108.52
110.88
111.50
113.72
124.89
127.36
128.34
128.61
128.64
128.76
128.80
128.95
130.06
130.98
133.42
134.91
148.32
149.11
153.67
155.91
163.89
Ph
Ph
O
O
O
O
OCH3
4e
0 ppm

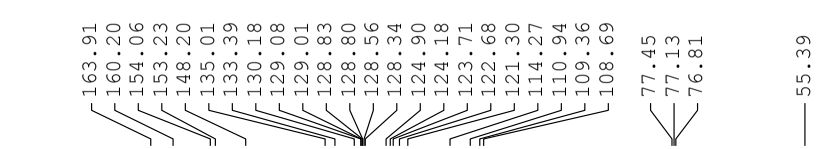

NAME ellie140
EXPNO 5
PROCNO 1
Date_ 20111125
Time 16.02
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300109 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
Ph
O
Br
O
4f
ppm
1
2
3
4
5
6
7
8
9
10
2.00
3.08
2.12
2.10
1.19
4.15
2.14
1.96
1.03

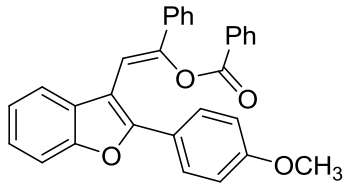

NAME ellie144
EXPNO 8
PROCNO 1
Date_ 20111130
Time_ 20.29
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 83
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127784 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.32
77.00
76.69
107.81
111.05
111.15
121.35
122.84
122.89
124.84
124.87
128.26
128.31
128.70
128.79
128.98
129.85
130.01
131.81
133.38
134.62
148.78
151.49
154.09
163.65
Ph
Ph
O
O
O
Br
4f
ppm


NAME ellie185
EXPNO 8
PROCNO 1
Date_ 20111125
Time 16.38
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300099 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
Ph
O
Cl
O
4g
ppm
1
2
3
4
5
6
7
8
9
10
1.00
2.89
1.03
1.94
1.04
7.97
4.44
1.01

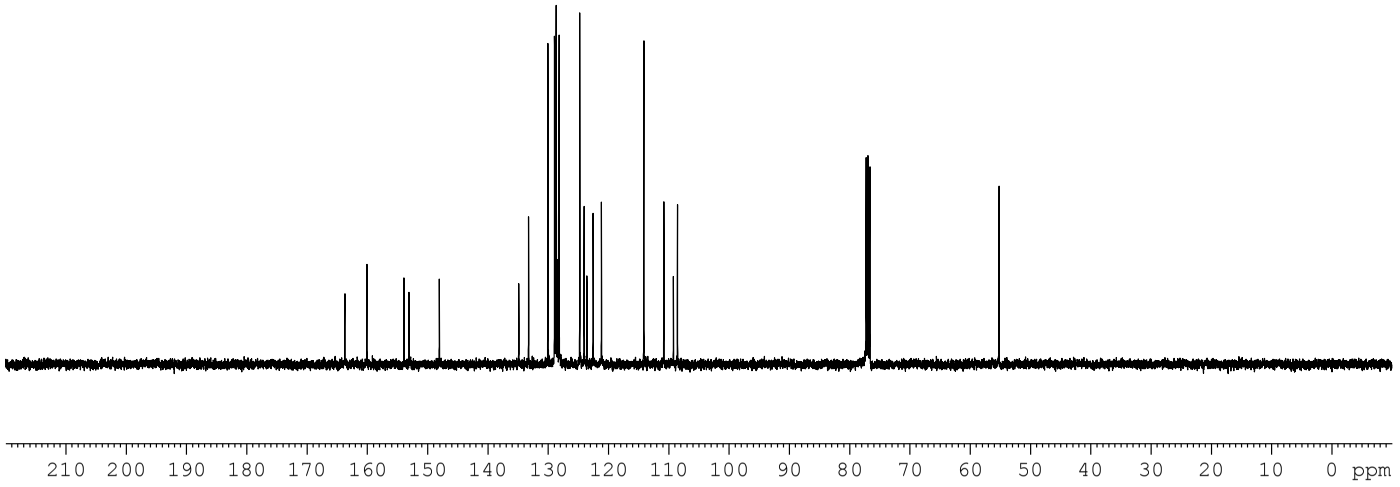

NAME ellie185
EXPNO 7
PROCNO 1
Date_ 20110610
Time_ 21.33
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 145
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127745 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
Ph
Ph
O
O
O
Cl
4g
77.32
77.00
76.68
107.68
111.11
111.63
121.46
122.88
124.97
125.01
125.58
127.01
128.28
128.54
128.73
128.80
129.01
129.92
130.02
132.67
133.40
134.71
149.04
150.93
154.14
163.65
0 ppm


NAME ellie266
EXPNO 5
PROCNO 1
Date_ 20110921
Time_ 13.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 45.3
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300368 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
OCH3
4h
ppm
10
9
8
7
6
5
4
3
2
3.15
2.11
2.00
1.09
2.09
7.51
2.25
3.12

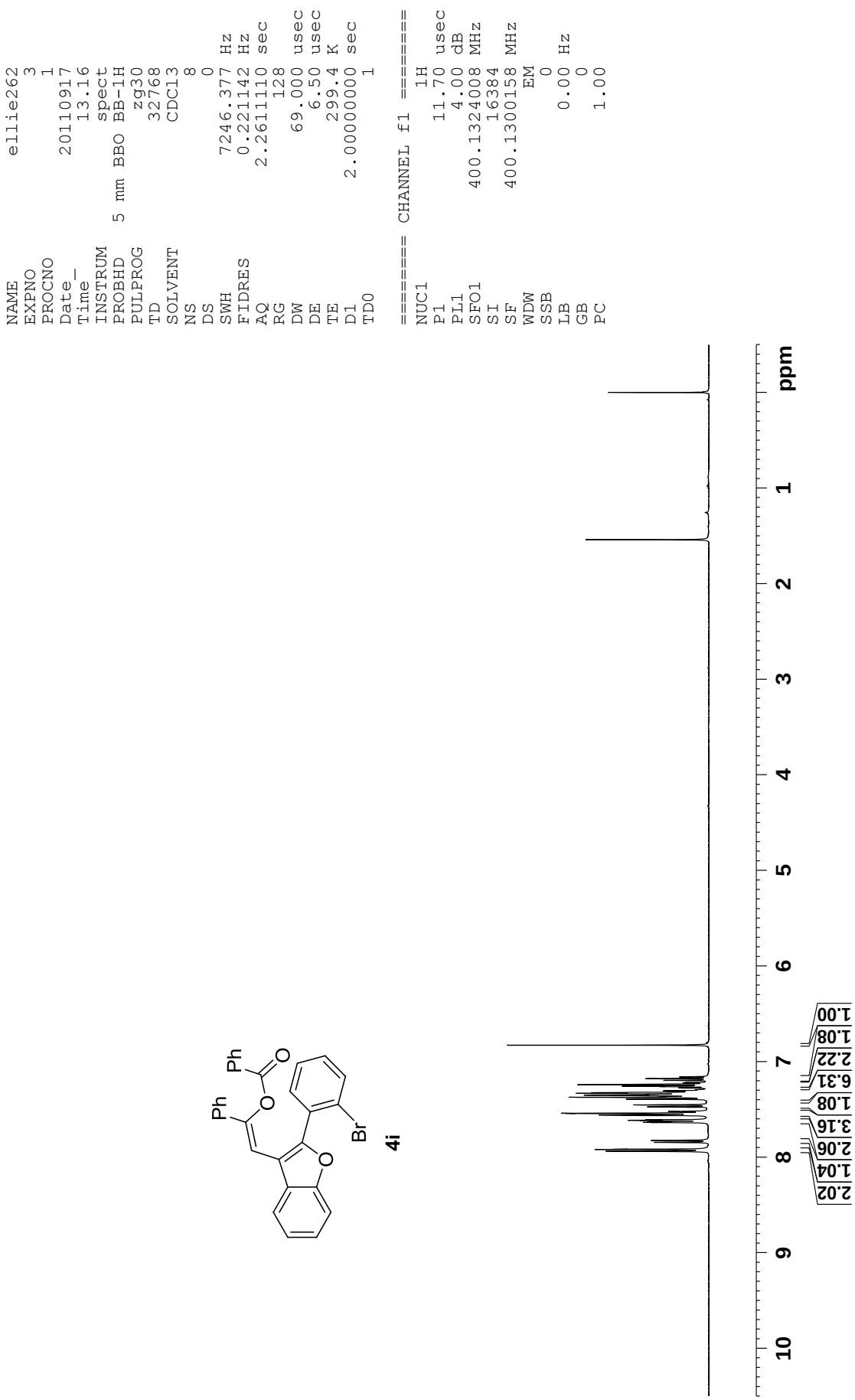


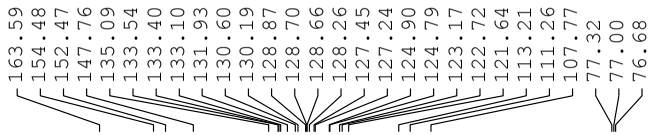


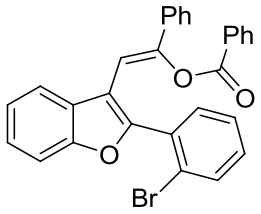
4h



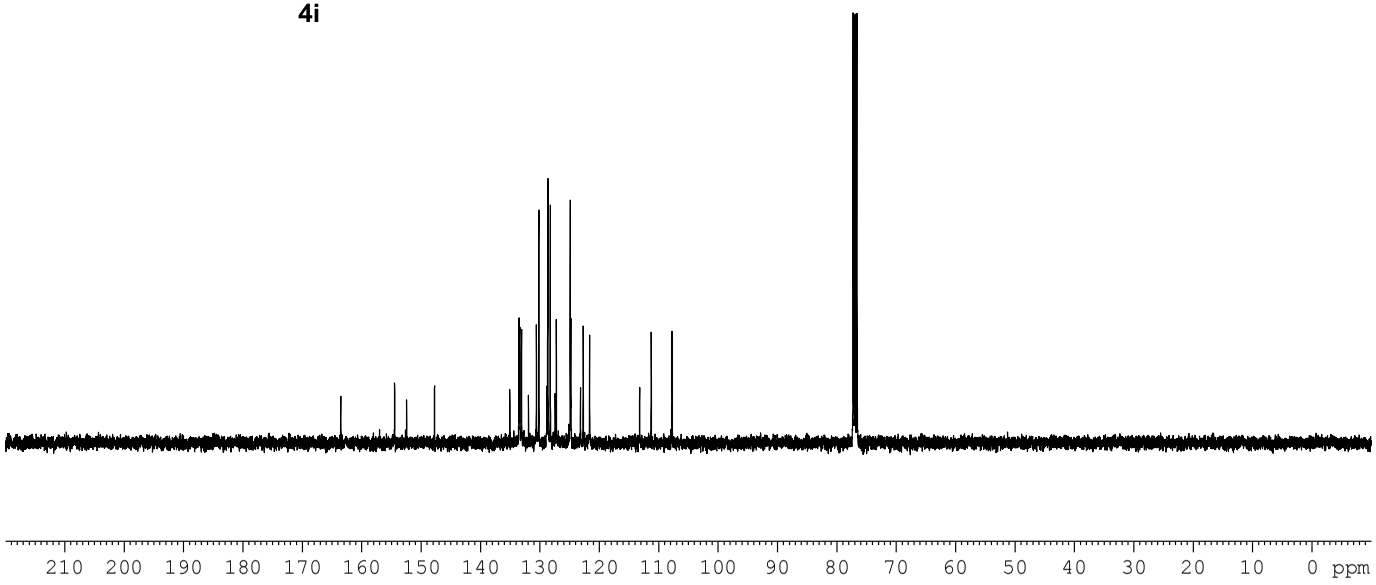
NAME	ellie266	
EXPNO	4	
PROCNO	1	
Date_	20110921	
Time	13.10	
INSTRUM	spect	
PROBHD	5 mm BBO BB-1H	
PULPROG	zgpg30	
TD	32768	
SOLVENT	CDC13	
NS	126	
DS	0	
SWH	24038.461	Hz
FIDRES	0.733596	Hz
AQ	0.6816452	sec
RG	4096	
DW	20.800	usec
DE	6.50	usec
TE	299.9	K
D1	2.00000000	sec
D11	0.03000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	13C	
P1	8.90	usec
PL1	7.00	dB
SFO1	100.6233325	MHz
======== CHANNEL f2 ========		
CPDPRG2	waltz16	
NUC2	1H	
PCPD2	90.00	usec
PL2	3.80	dB
PL12	21.60	dB
PL13	24.60	dB
SFO2	400.1316005	MHz
SI	32768	
SF	100.6127818	MHz
WDW	EM	
SSB	0	
LB	1.00	Hz
GB	0	
PC	1.00	


NAME ellie262
EXPNO 3
PROCNO 1
Date_ 20110917
Time_ 13.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300158 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
Br
4i
ppm
1
2
3
4
5
6
7
8
9
10
2.02
1.04
2.06
3.16
1.08
6.31
2.22
1.08
1.00

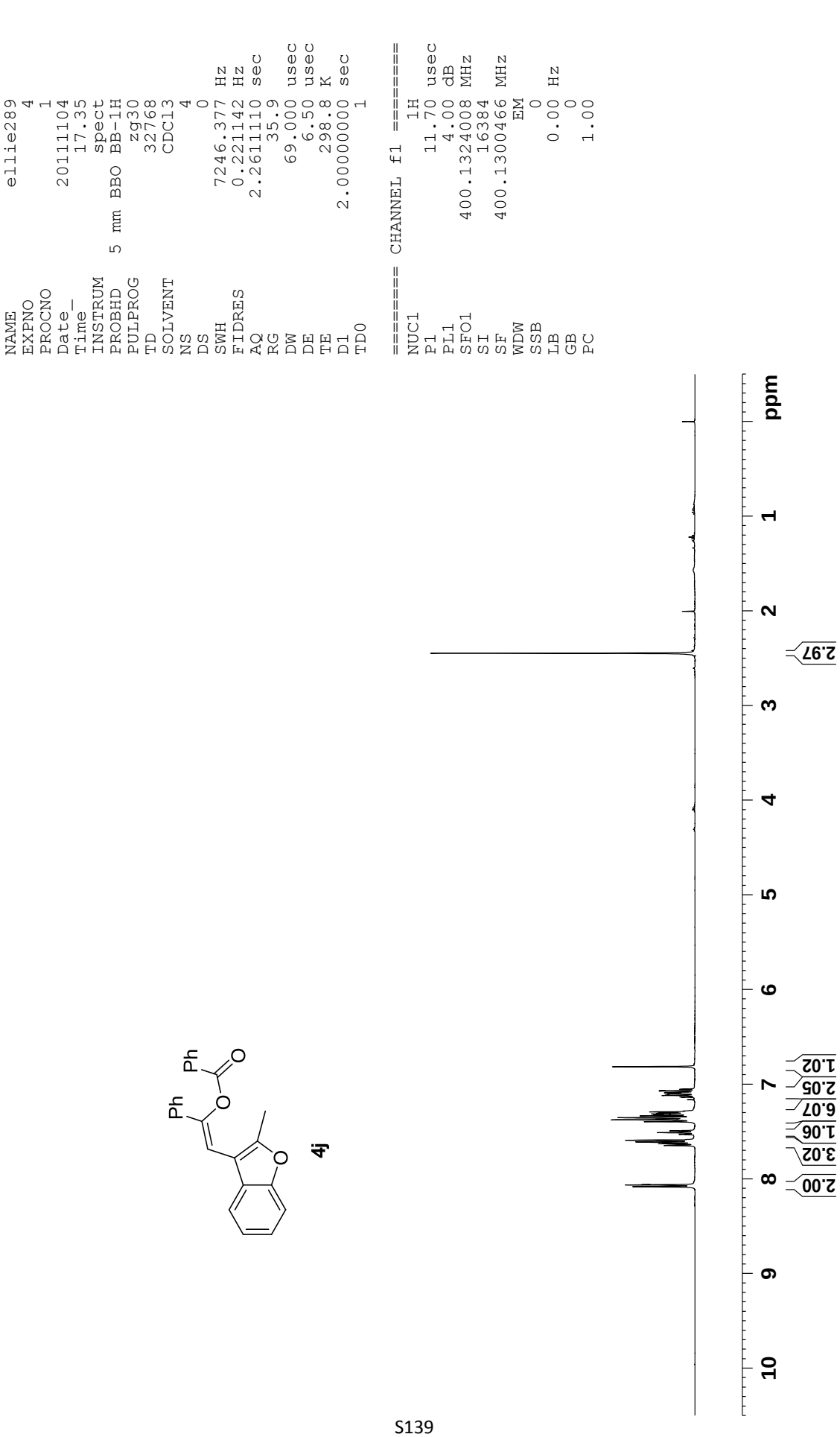


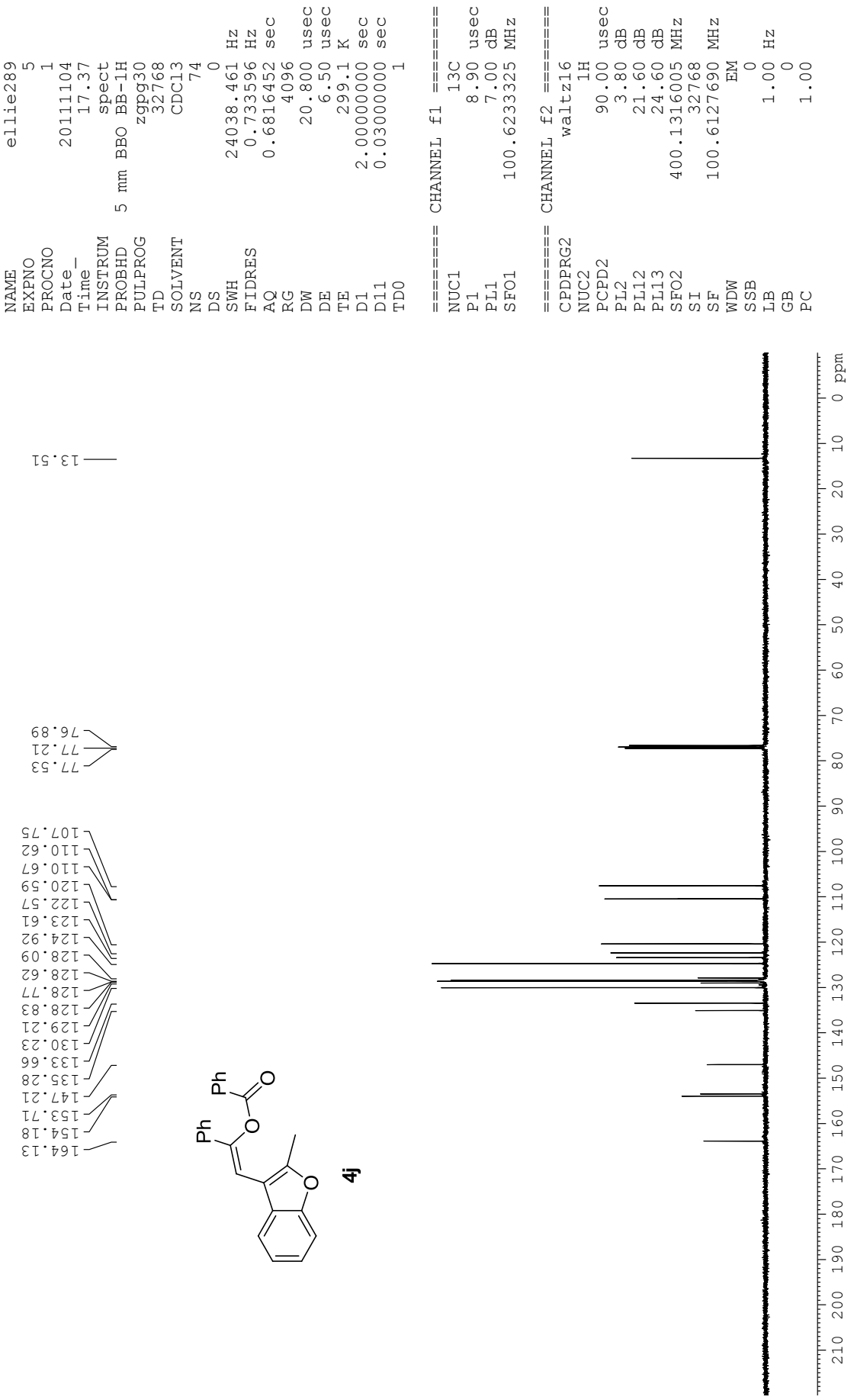


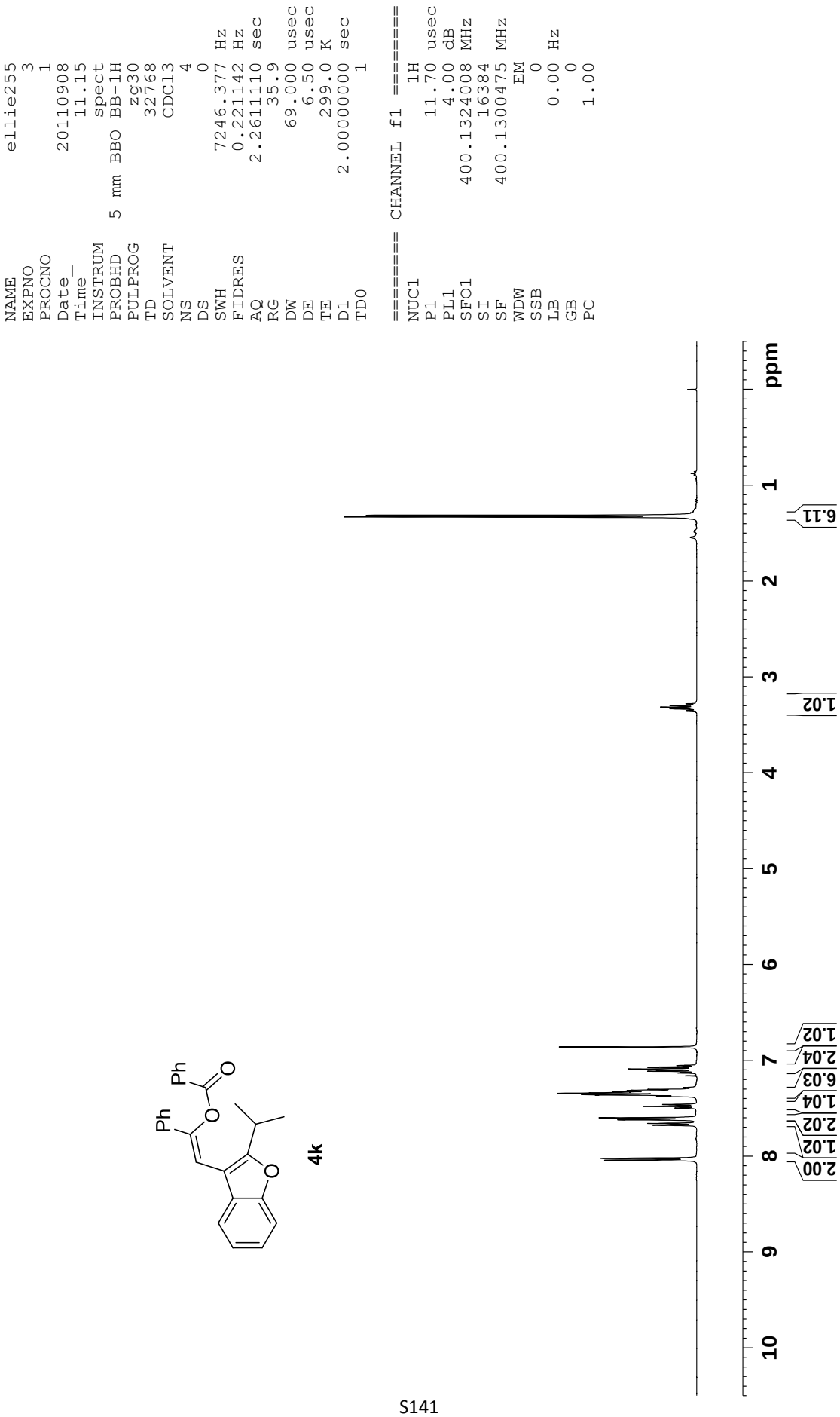
4i

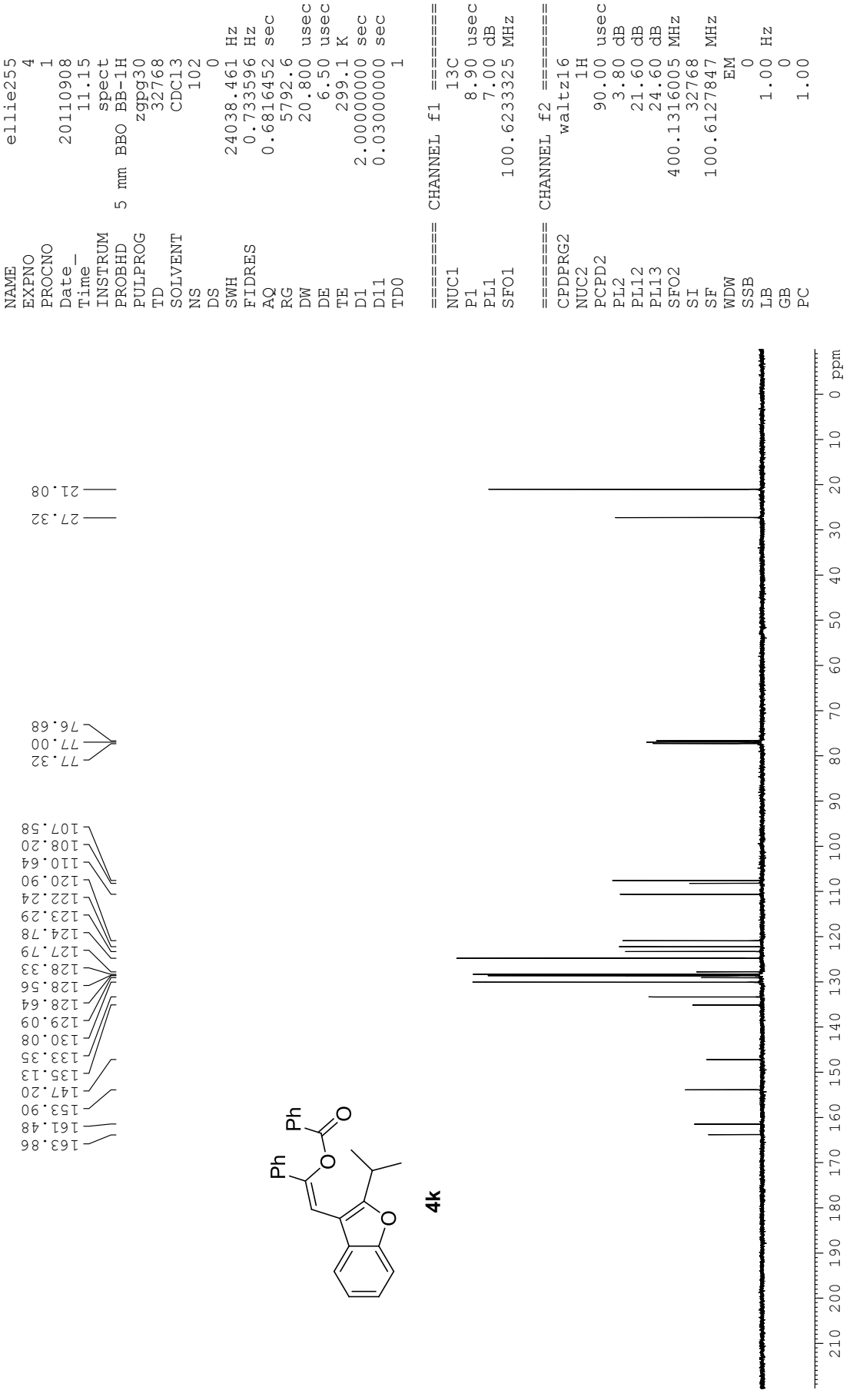


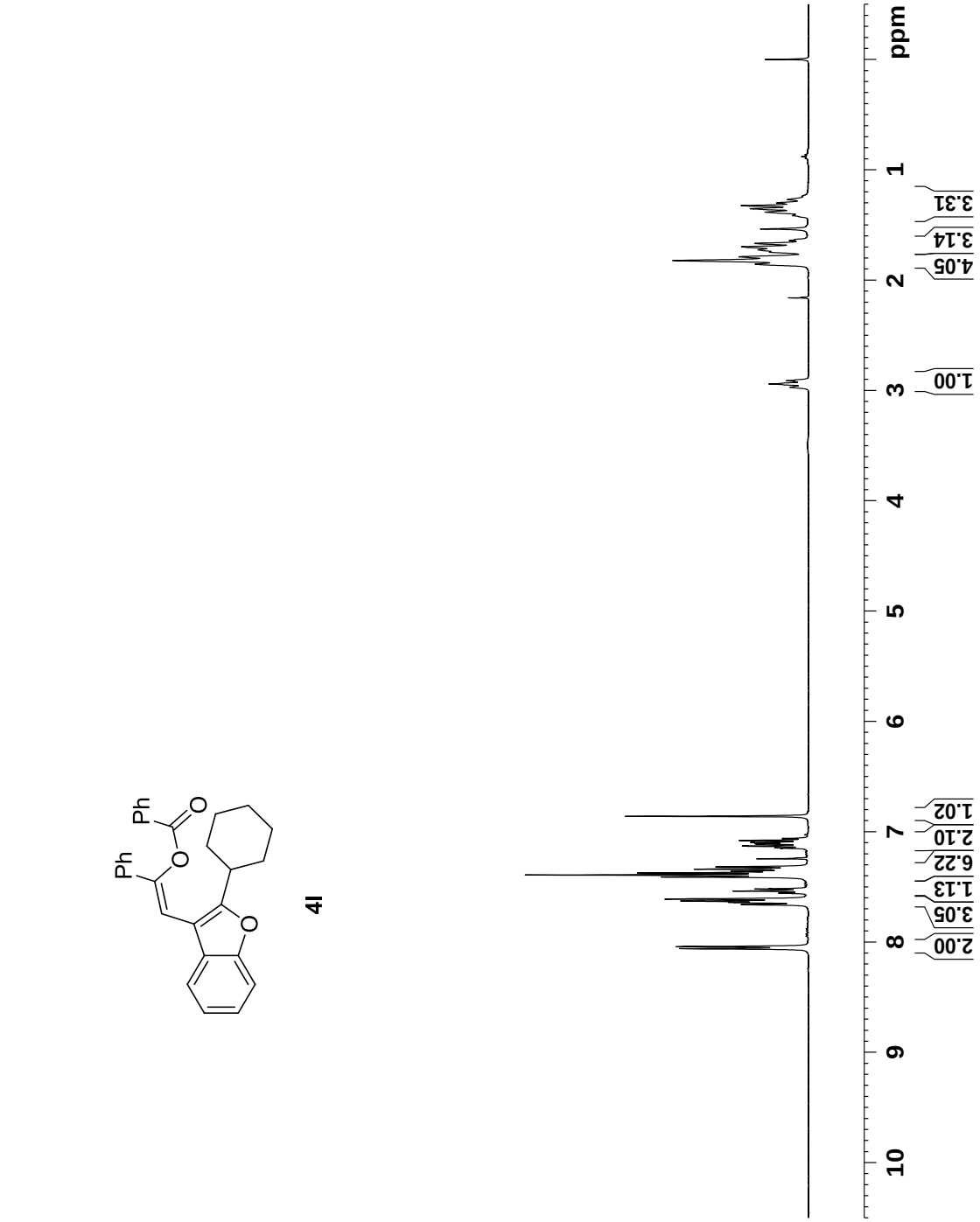
NAME	ellie296	
EXPNO	3	
PROCNO	1	
Date_	20111130	
Time	17.13	
INSTRUM	spect	
PROBHD	5 mm BBO BB-1H	
PULPROG	zgpg30	
TD	32768	
SOLVENT	CDCl3	
NS	233	
DS	0	
SWH	24038.461	Hz
FIDRES	0.733596	Hz
AQ	0.6816452	sec
RG	4096	
DW	20.800	usec
DE	6.50	usec
TE	299.3	K
D1	2.00000000	sec
D11	0.03000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	13C	
P1	8.90	usec
PL1	7.00	dB
SFO1	100.6233325	MHz
======== CHANNEL f2 ========		
CPDPRG2	waltz16	
NUC2	1H	
PCPD2	90.00	usec
PL2	3.80	dB
PL12	21.60	dB
PL13	24.60	dB
SFO2	400.1316005	MHz
SI	32768	
SF	100.6127751	MHz
WDW	EM	
SSB	0	
LB	1.00	Hz
GB	0	
PC	1.00	

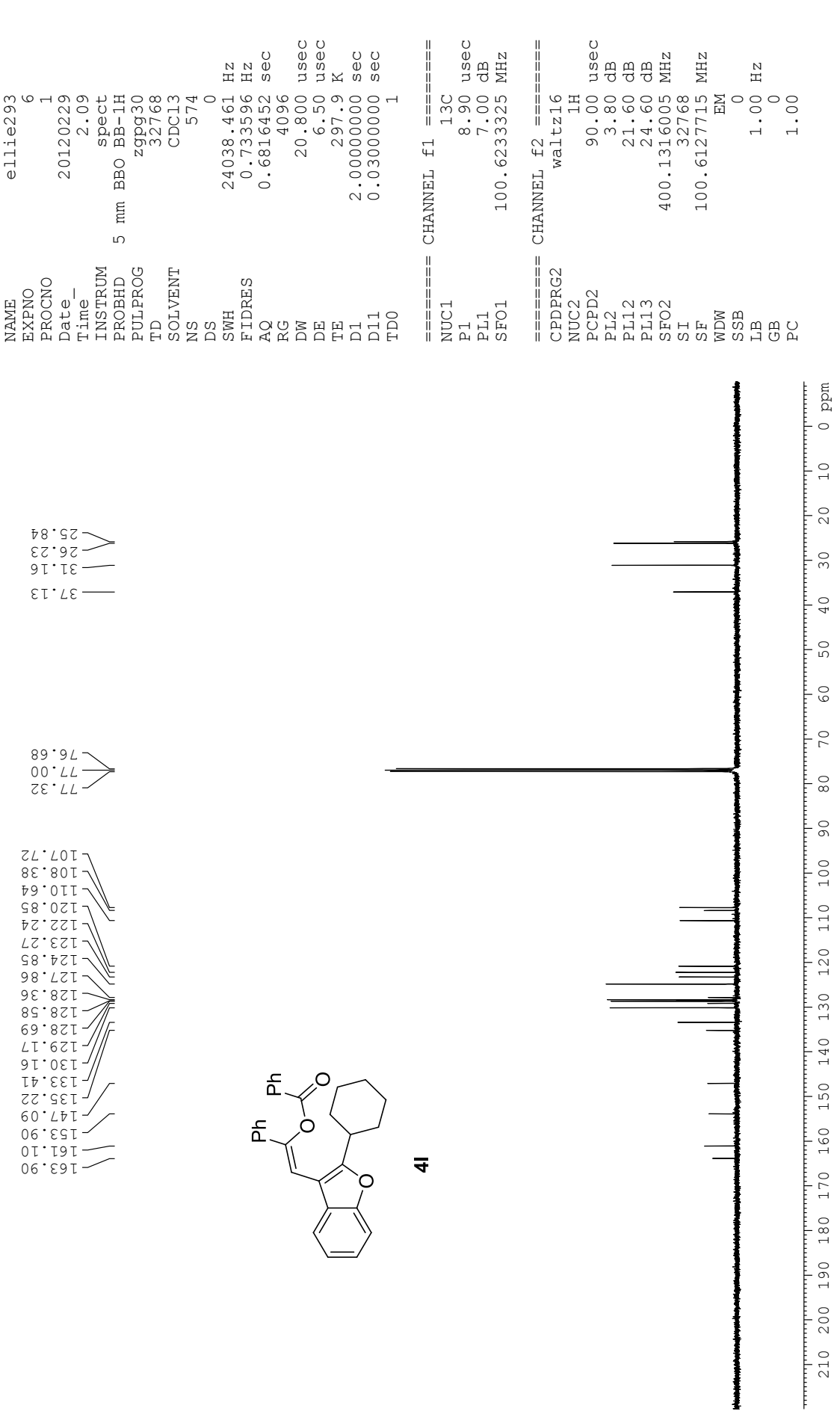

NAME ellie289
EXPNO 4
PROCNO 1
Date_ 20111104
Time_ 17.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 35.9
DW 69.000 usec
DE 6.50 usec
TE 298.8 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300466 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
4j
ppm
1
2
3
4
5
6
7
8
9
10
2.97
1.02
2.05
6.07
1.06
3.02
2.00

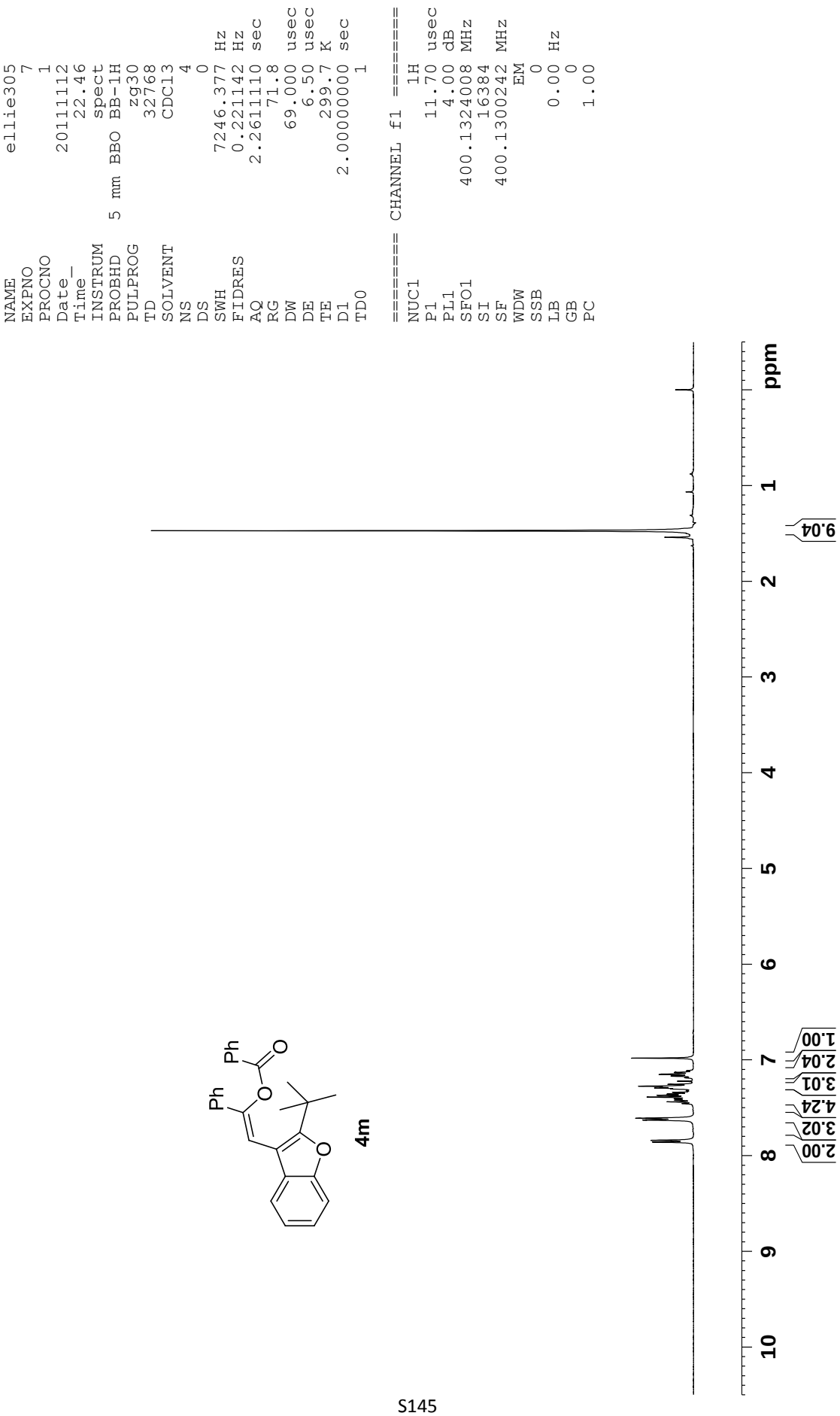

NAME ellie289
EXPNO 5
PROCNO 1
Date_ 20111104
Time_ 17.37
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 74
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
13.51
76.89
77.21
77.53
107.75
110.62
110.67
120.59
122.57
123.61
124.92
128.09
128.62
128.77
128.83
129.21
130.23
133.66
135.28
147.21
153.71
154.18
164.13
Ph
Ph
O
O
O
4j
0 ppm

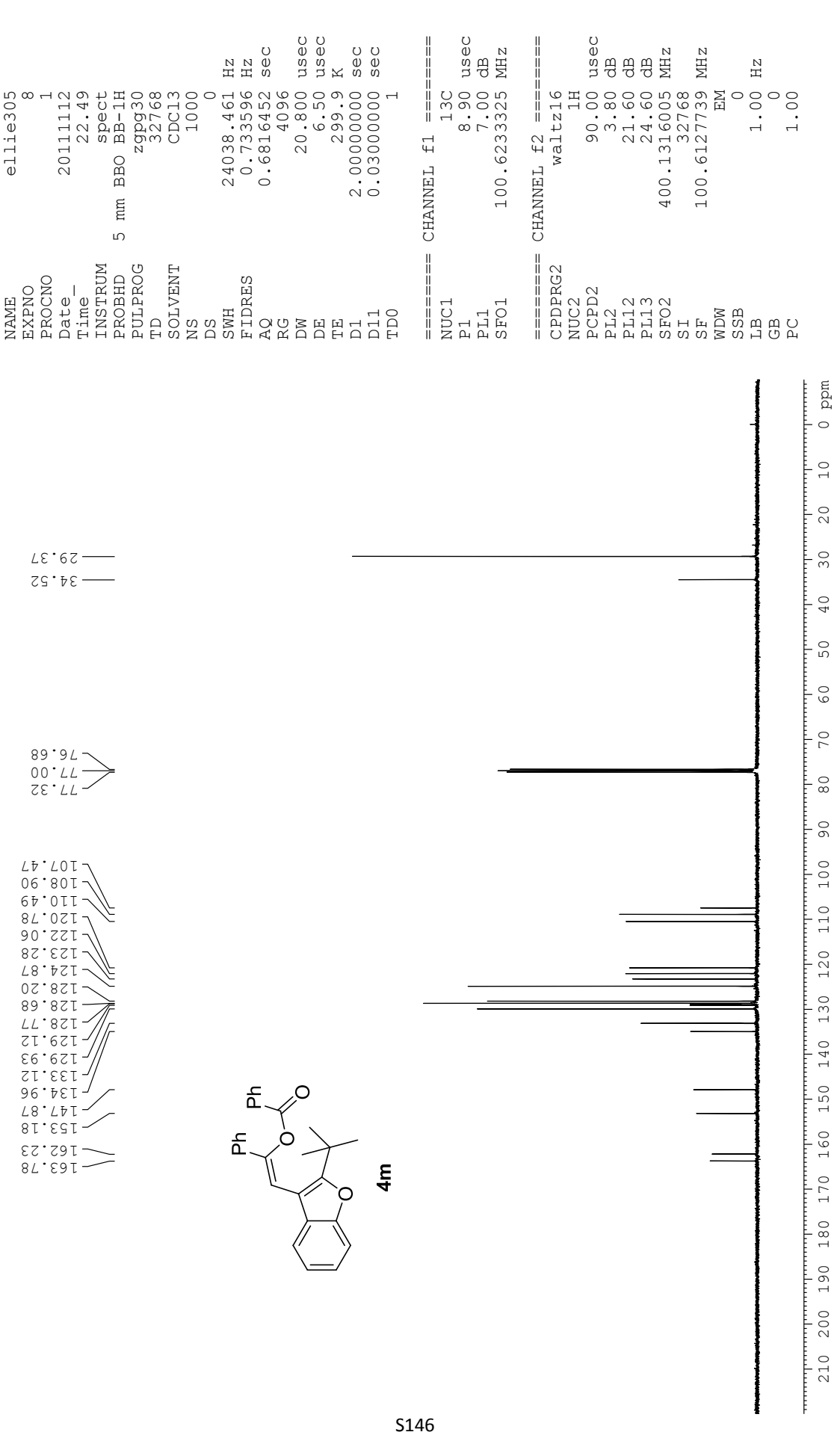

NAME ellie255
EXPNO 3
PROCNO 1
Date_ 20110908
Time_ 11.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 35.9
DW 69.000 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300475 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
4k
ppm
1
2
3
4
5
6
7
8
9
10
6.11
1.02
2.00
1.02
2.02
1.04
6.03
2.04
1.02

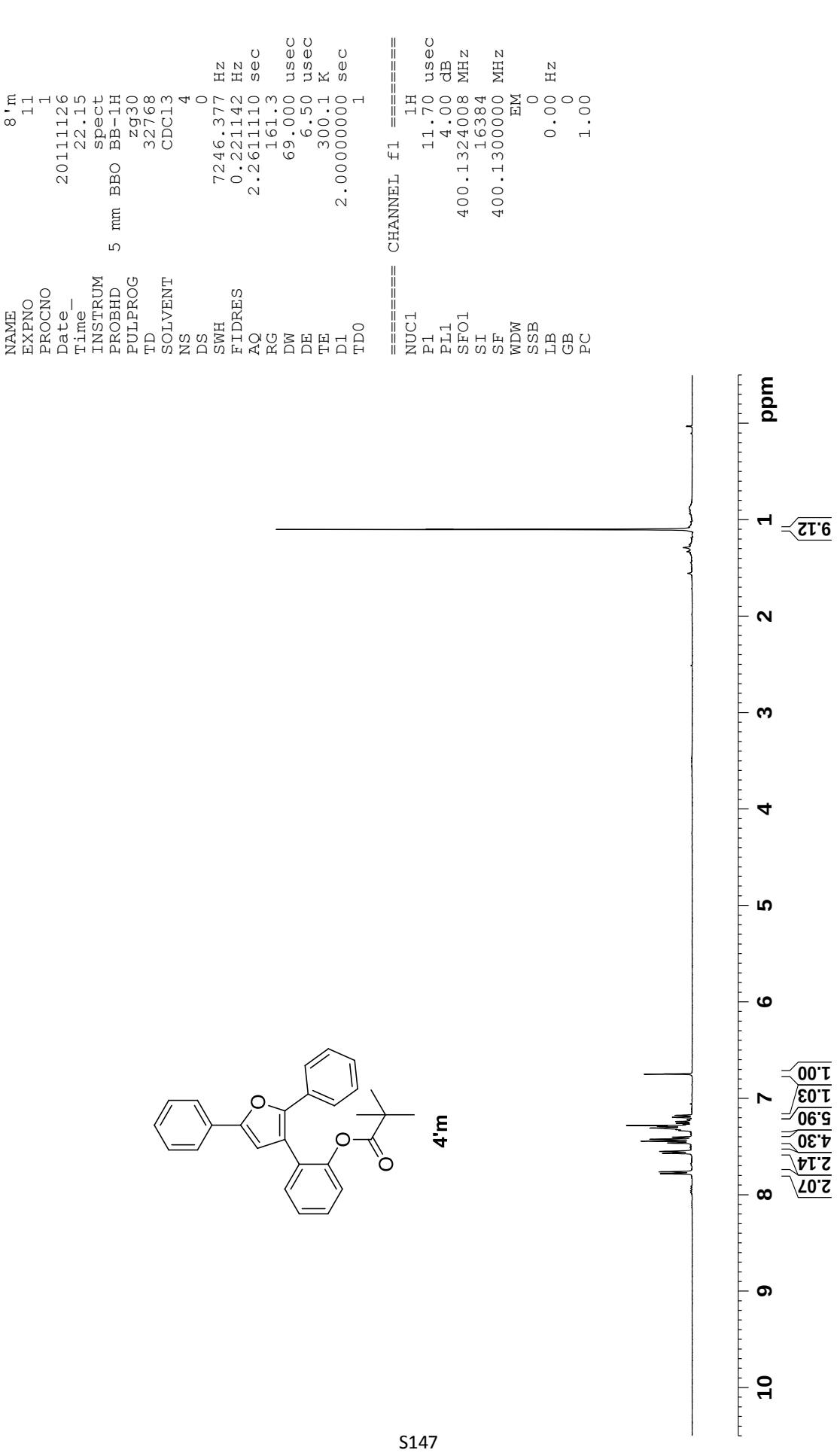

NAME ellie255
EXPNO 4
PROCNO 1
Date_ 20110908
Time_ 11.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 102
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 5792.6
DW 20.800 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127847 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.08
27.32
76.68
77.00
77.32
107.58
108.20
110.64
120.90
122.24
123.29
124.78
127.79
128.33
128.56
128.64
129.09
130.08
133.35
135.13
147.20
153.90
161.48
163.86
Ph
Ph
O
O
O
4k
0 ppm

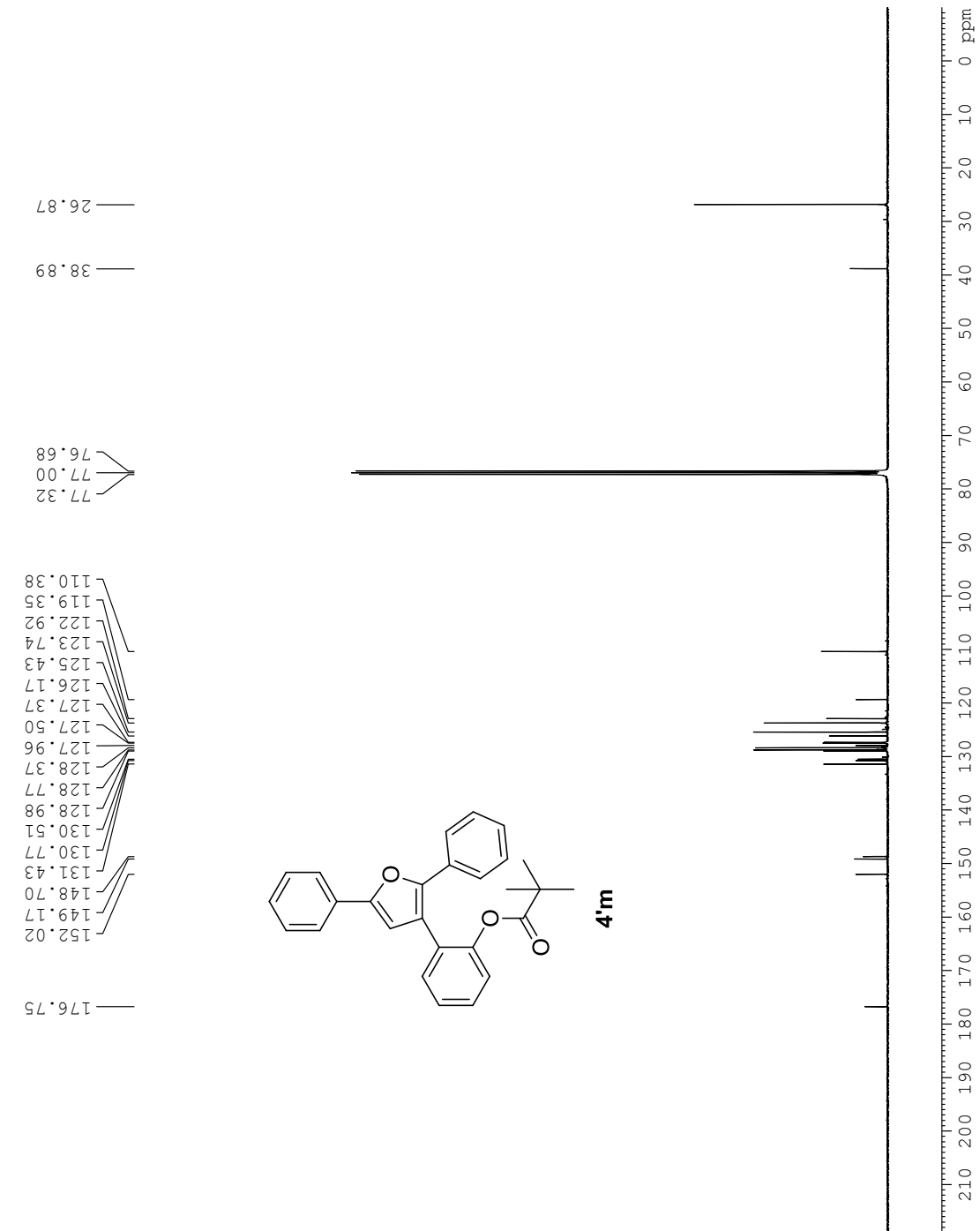

NAME ellie293
EXPNO 5
PROCNO 1
Date_ 20120229
Time_ 2.05
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 297.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300149 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
4l
ppm
1
2
3
4
5
6
7
8
9
10
3.31
3.14
4.05
1.00
2.00
3.05
1.13
6.22
2.10
1.02

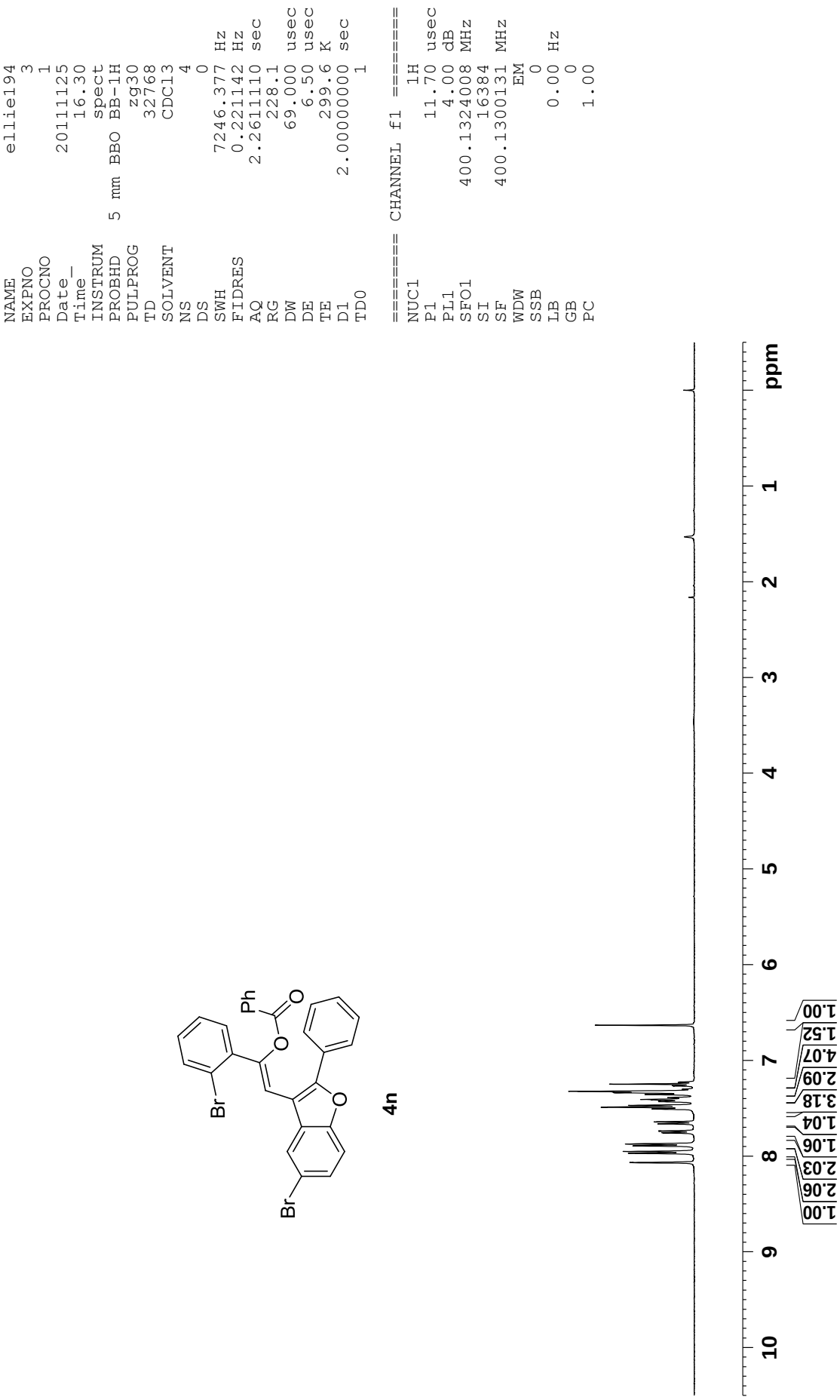

NAME ellie293
EXPNO 6
PROCNO 1
Date_ 20120229
Time_ 2.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 574
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127715 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
25.84
26.23
31.16
37.13
77.32
77.00
76.68
107.72
108.38
110.64
120.85
122.24
123.27
124.85
127.86
128.36
128.58
128.69
129.17
130.16
133.41
135.22
147.09
153.90
161.10
163.90
Ph
Ph
O
O
O
4l
ppm

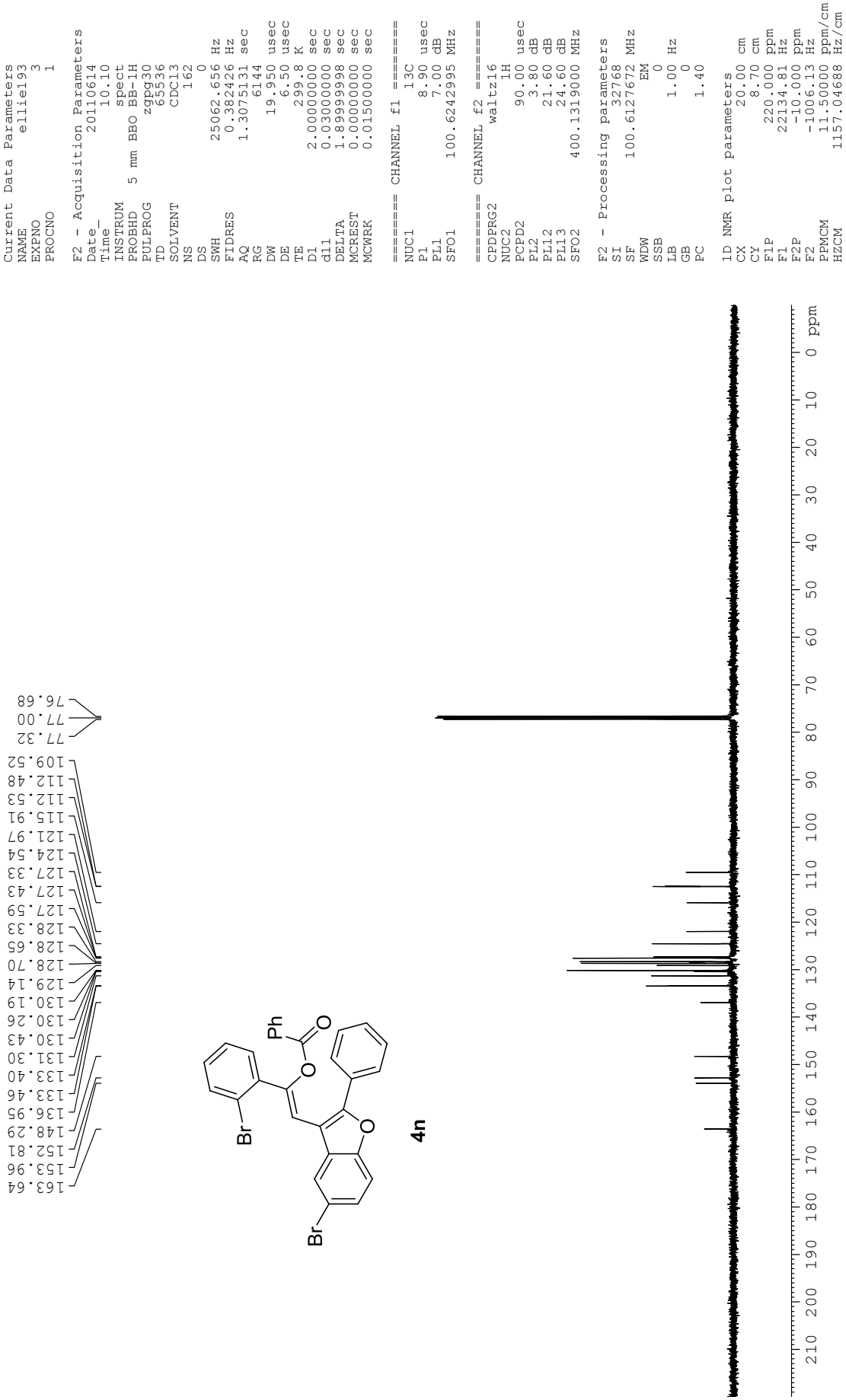

NAME ellie305
EXPNO 7
PROCNO 1
Date_ 20111112
Time_ 22.46
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.261110 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300242 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
Ph
O
O
O
4m
ppm
1
2
3
4
5
6
7
8
9
10
9.04
2.00
3.02
4.24
3.01
2.04
1.00

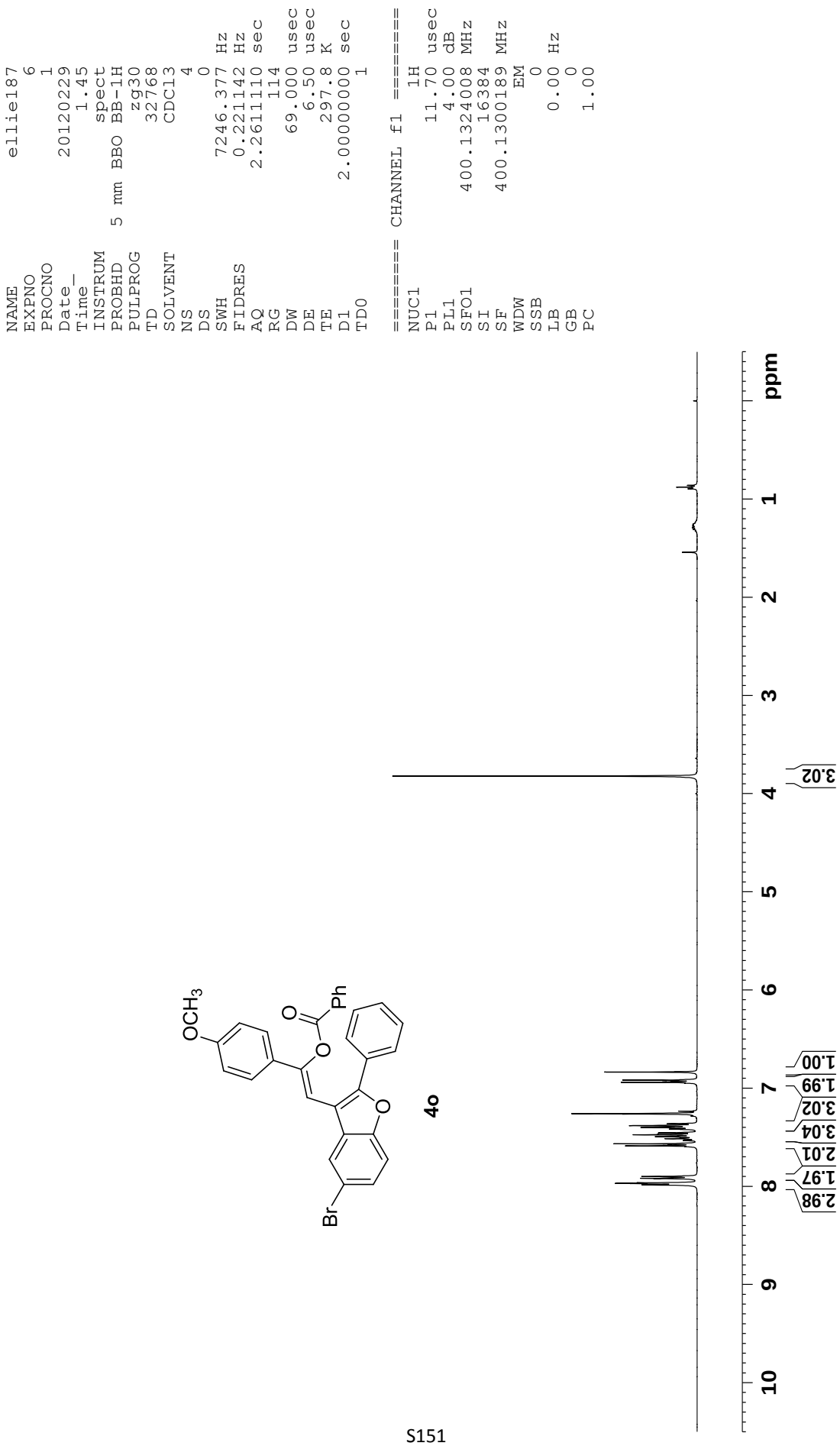

NAME ellie305
EXPNO 8
PROCNO 1
Date_ 20111112
Time_ 22.49
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 1000
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.681645 2 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127739 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
29.37
34.52
77.32
77.00
76.68
107.47
108.90
110.49
120.78
122.06
123.28
124.87
128.20
128.68
128.77
129.12
129.93
133.12
134.96
147.87
153.18
162.23
163.78
Ph
Ph
O
O
O
4m
0 ppm

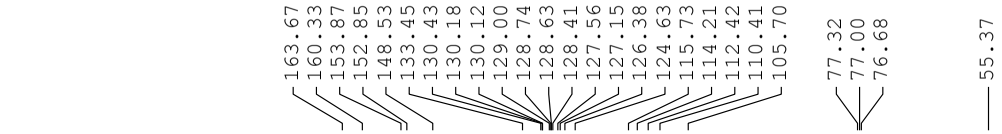

8'm
11
1
20111126
22.15
spect
5 mm BBO BB-1H
zg30
32768
CDCl3
4
0
7246.377 Hz
0.221142 Hz
2.2611110 sec
161.3
69.000 usec
6.50 usec
300.1 K
2.0000000 sec
1
CHANNEL f1
1H
11.70 usec
4.00 dB
400.1324008 MHz
16384
400.1300000 MHz
EM
0
0.00 Hz
0
1.00
4'm
9.12
2.07
2.14
4.30
5.90
1.03
1.00
ppm

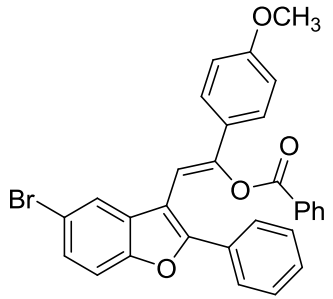

NAME ellie305
EXPNO 12
PROCNO 1
Date_ 20111126
Time 22.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 18038
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
26.87
38.89
76.68
77.00
77.32
110.38
119.35
122.92
123.74
125.43
126.17
127.37
127.50
127.96
128.37
128.77
128.98
130.51
130.77
131.43
148.70
149.17
152.02
176.75
4'm
0 ppm


NAME ellie194
EXPNO 3
PROCNO 1
Date_ 20111125
Time 16.30
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300131 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
Br
O
Br
4n
ppm
1 2 3 4 5 6 7 8 9 10
1.00
2.06
2.03
1.06
1.04
3.18
2.09
4.07
1.52
1.00

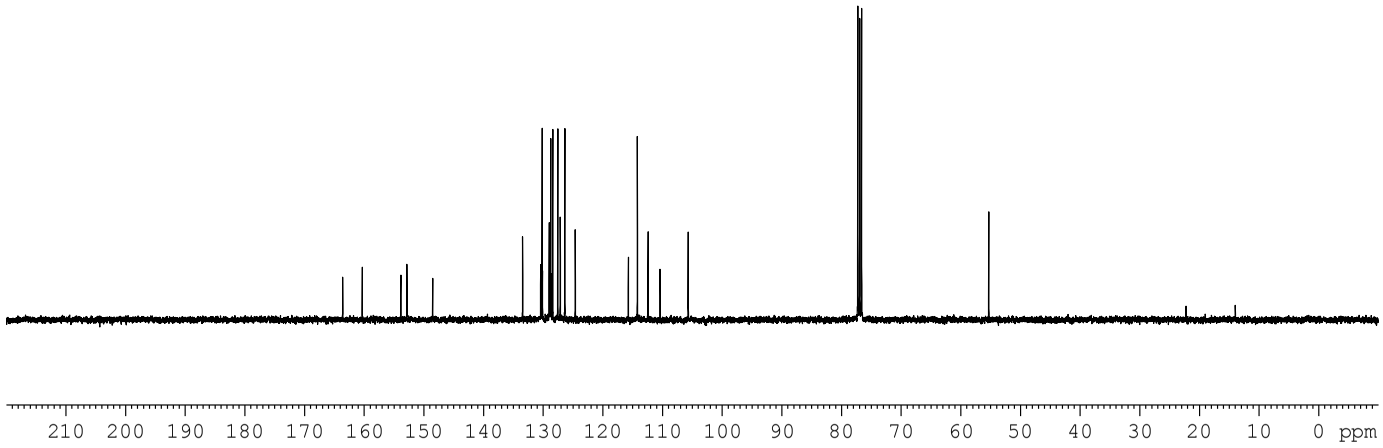

Current Data Parameters
NAME elliei93
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110614
Time_ 10.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 162
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 6144
DW 19.950 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.70 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
163.64
153.96
152.81
148.29
136.95
133.46
133.40
131.30
130.43
130.26
130.19
129.14
128.70
128.65
128.33
127.59
127.43
127.33
124.54
121.97
115.91
112.53
112.48
109.52
77.32
77.00
76.68
Br
O
Ph
O
O
Br
4n
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm


NAME ellie187
EXPNO 6
PROCNO 1
Date_ 20120229
Time_ 1.45
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 297.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300189 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
OCH3
O
O
Ph
Br
4o
ppm
1
2
3
4
5
6
7
8
9
10
3.02
1.00
1.99
3.02
3.04
2.01
1.97
2.98

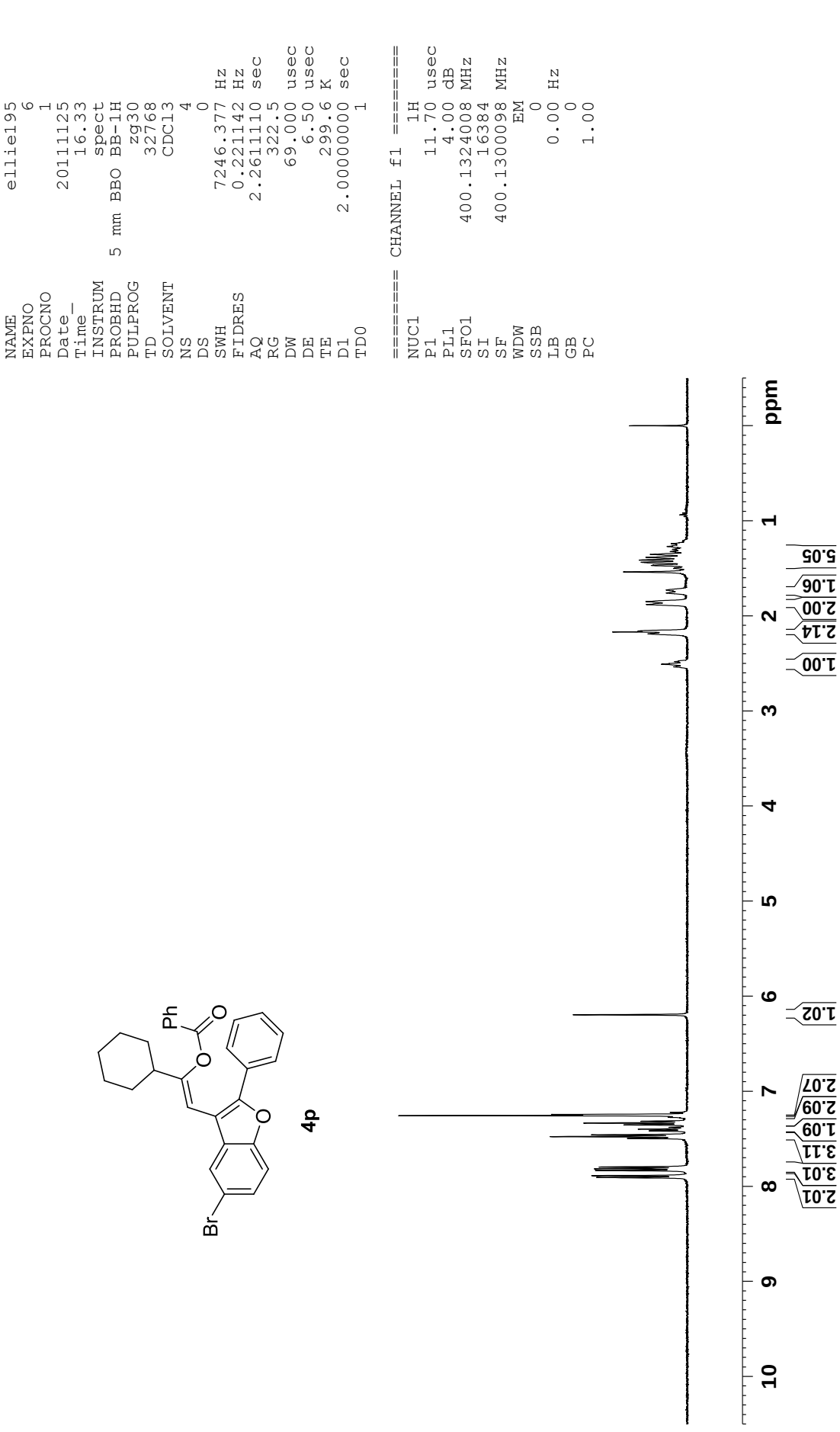


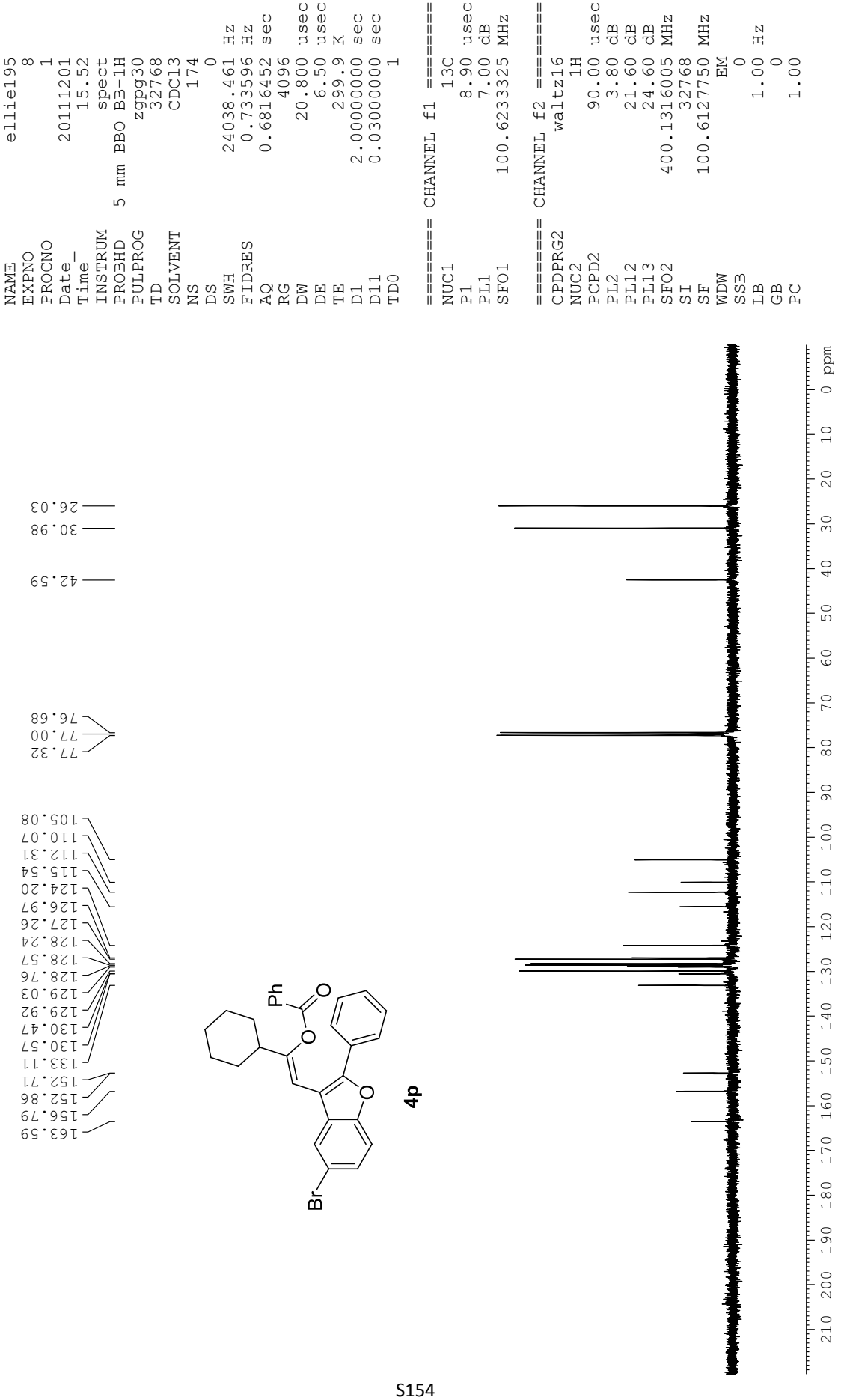


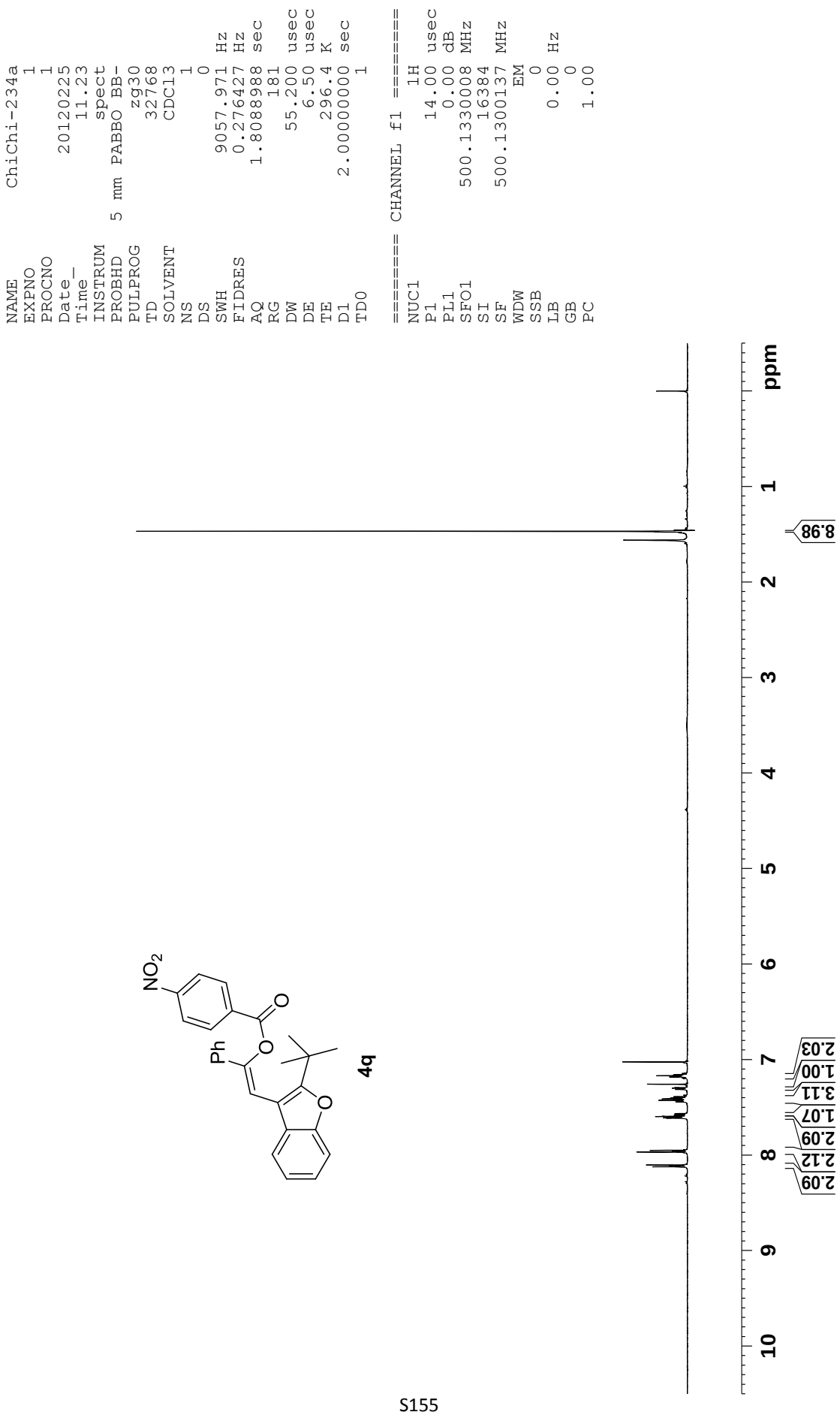
4o

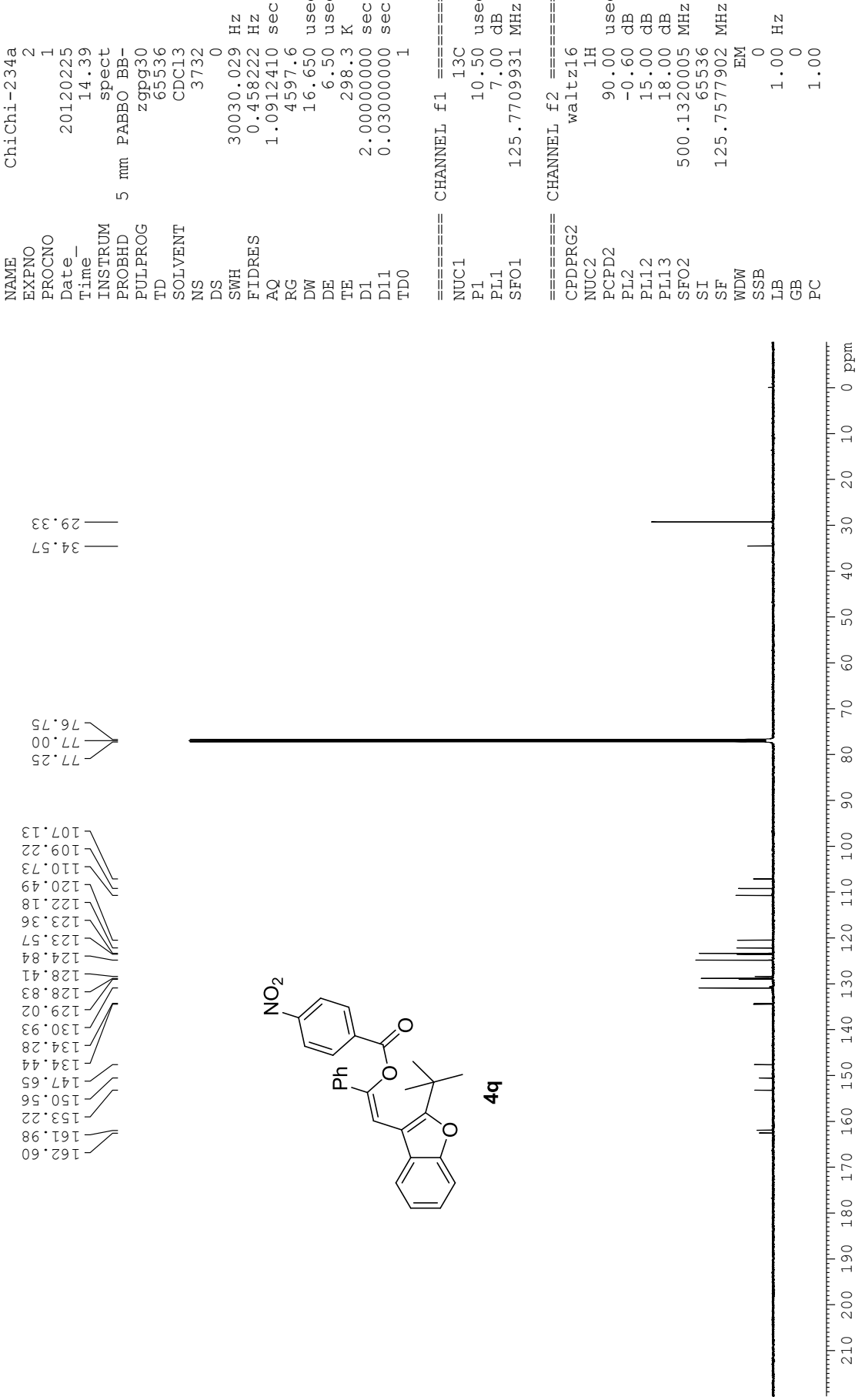


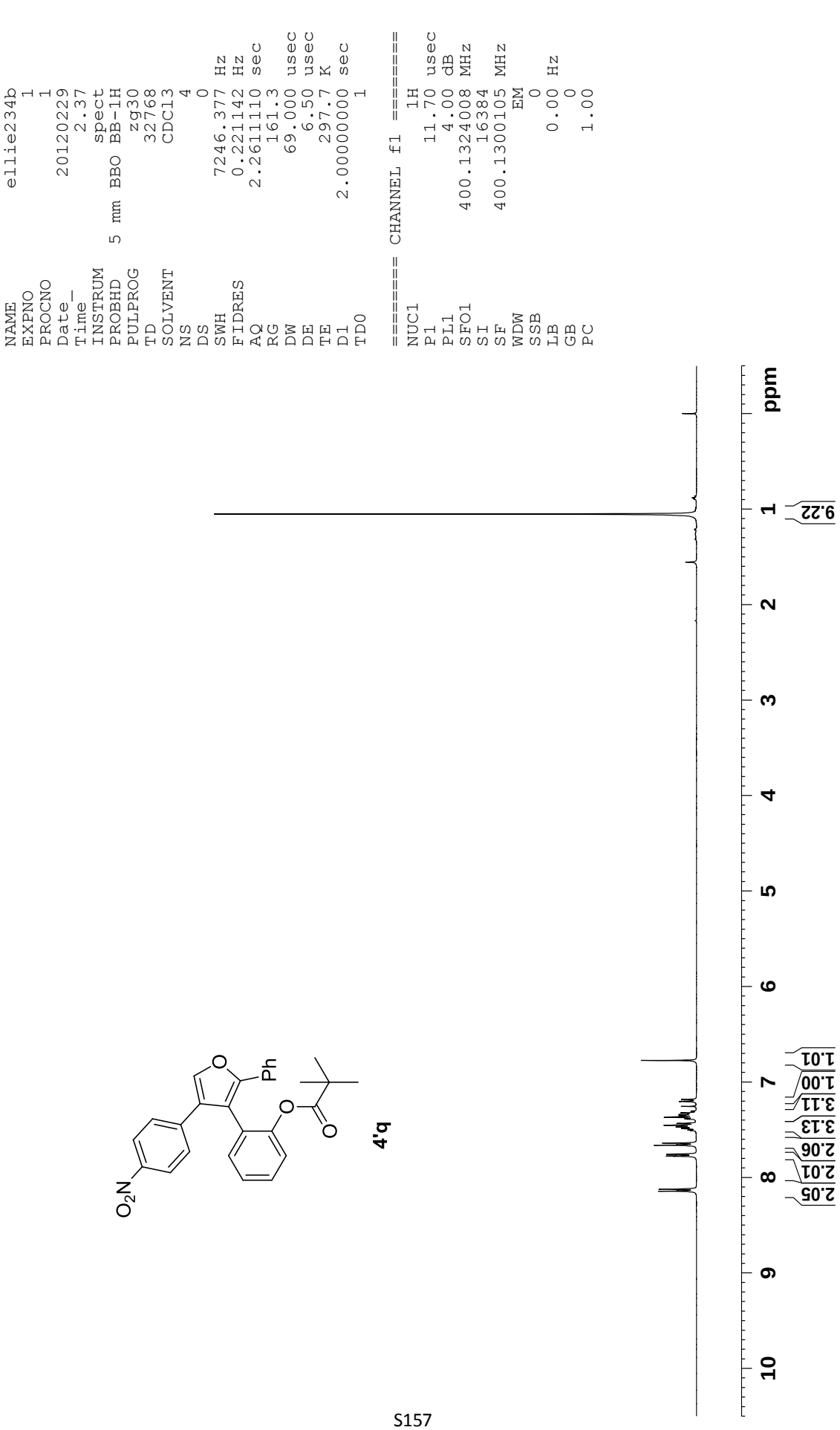
NAME	ellie187
EXPNO	7
PROCNO	1
Date_	20120229
Time	1.48
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zgpg30
TD	32768
SOLVENT	CDCl3
NS	327
DS	0
SWH	24038.461 Hz
FIDRES	0.733596 Hz
AQ	0.6816452 sec
RG	4096
DW	20.800 usec
DE	6.50 usec
TE	297.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.90 usec
PL1	7.00 dB
SFO1	100.6233325 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	90.00 usec
PL2	3.80 dB
PL12	21.60 dB
PL13	24.60 dB
SFO2	400.1316005 MHz
SI	32768
SF	100.6127743 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.00

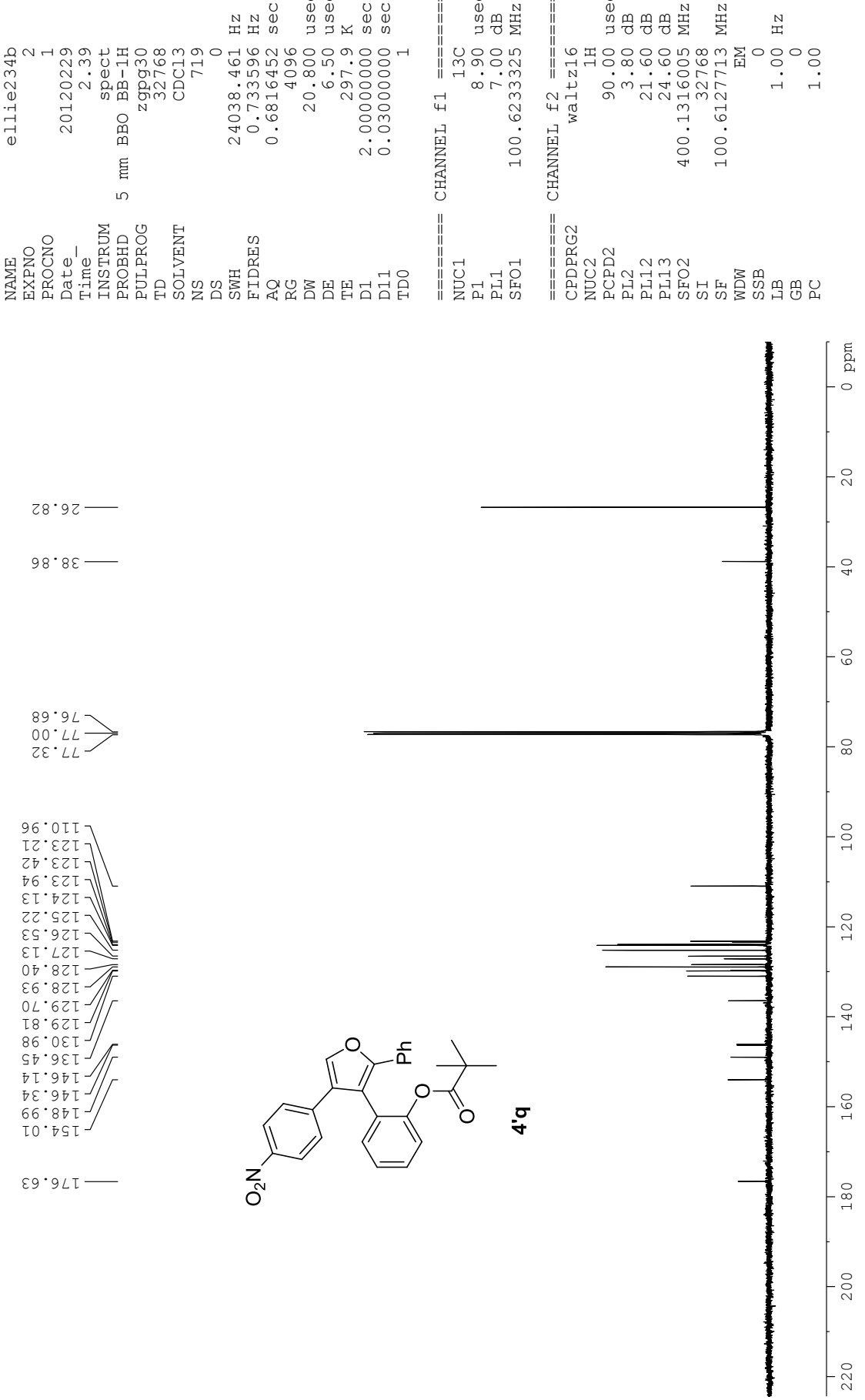

NAME ellie195
EXPNO 6
PROCNO 1
Date_ 20111125
Time 16.33
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300098 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
O
Br
4p
ppm
1
2
3
4
5
6
7
8
9
10
5.05
1.06
2.00
2.14
1.00
1.02
2.07
2.09
1.09
3.11
3.01
2.01

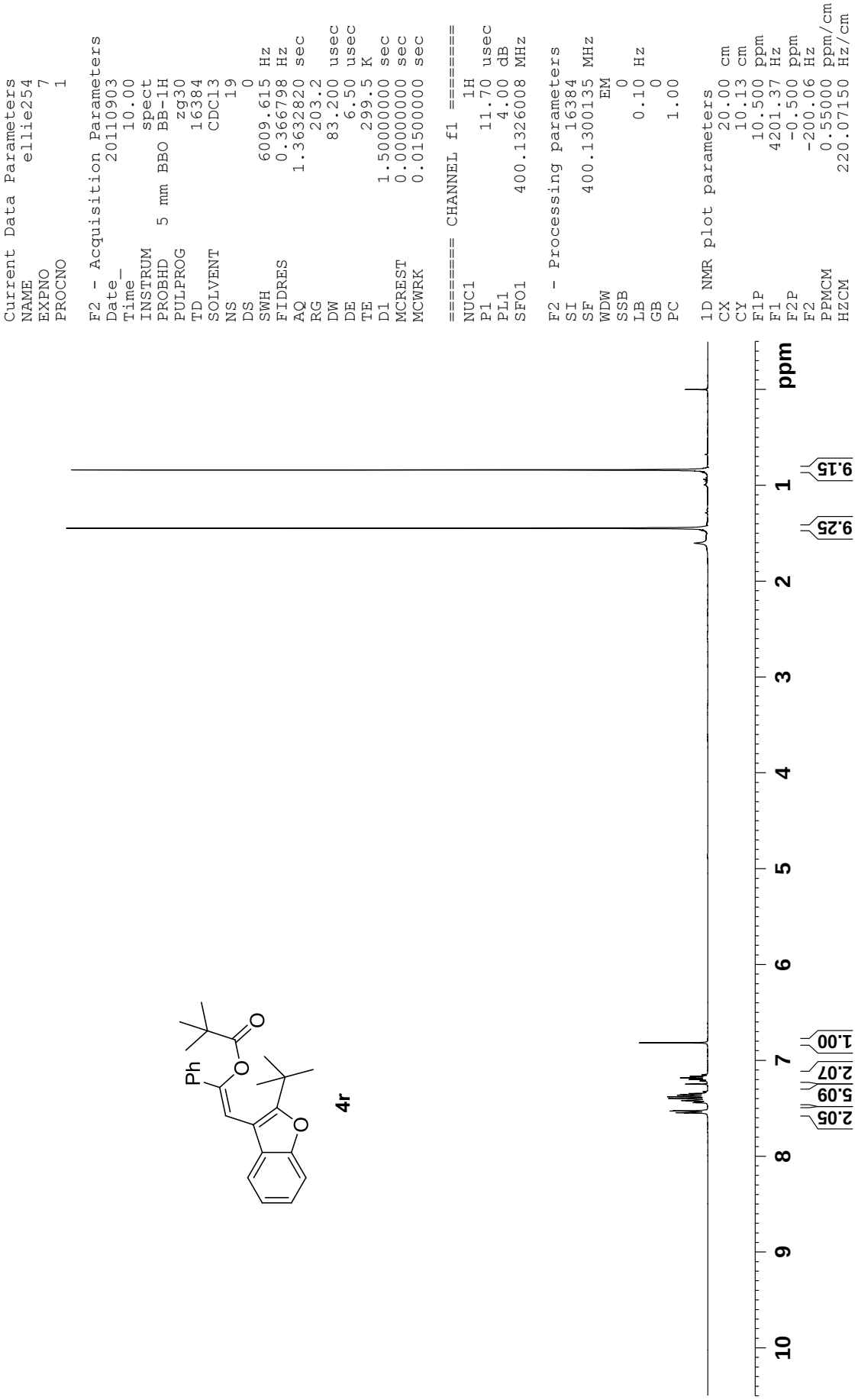

NAME ellie195
EXPNO 8
PROCNO 1
Date_ 20111201
Time_ 15.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 174
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127750 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
26.03
30.98
42.59
77.32
77.00
76.68
105.08
110.07
112.31
115.54
124.20
126.97
127.26
128.24
128.57
128.76
129.03
129.92
130.47
130.57
133.11
152.71
152.86
156.79
163.59
Ph
O
O
O
Br
4p
0 ppm
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210

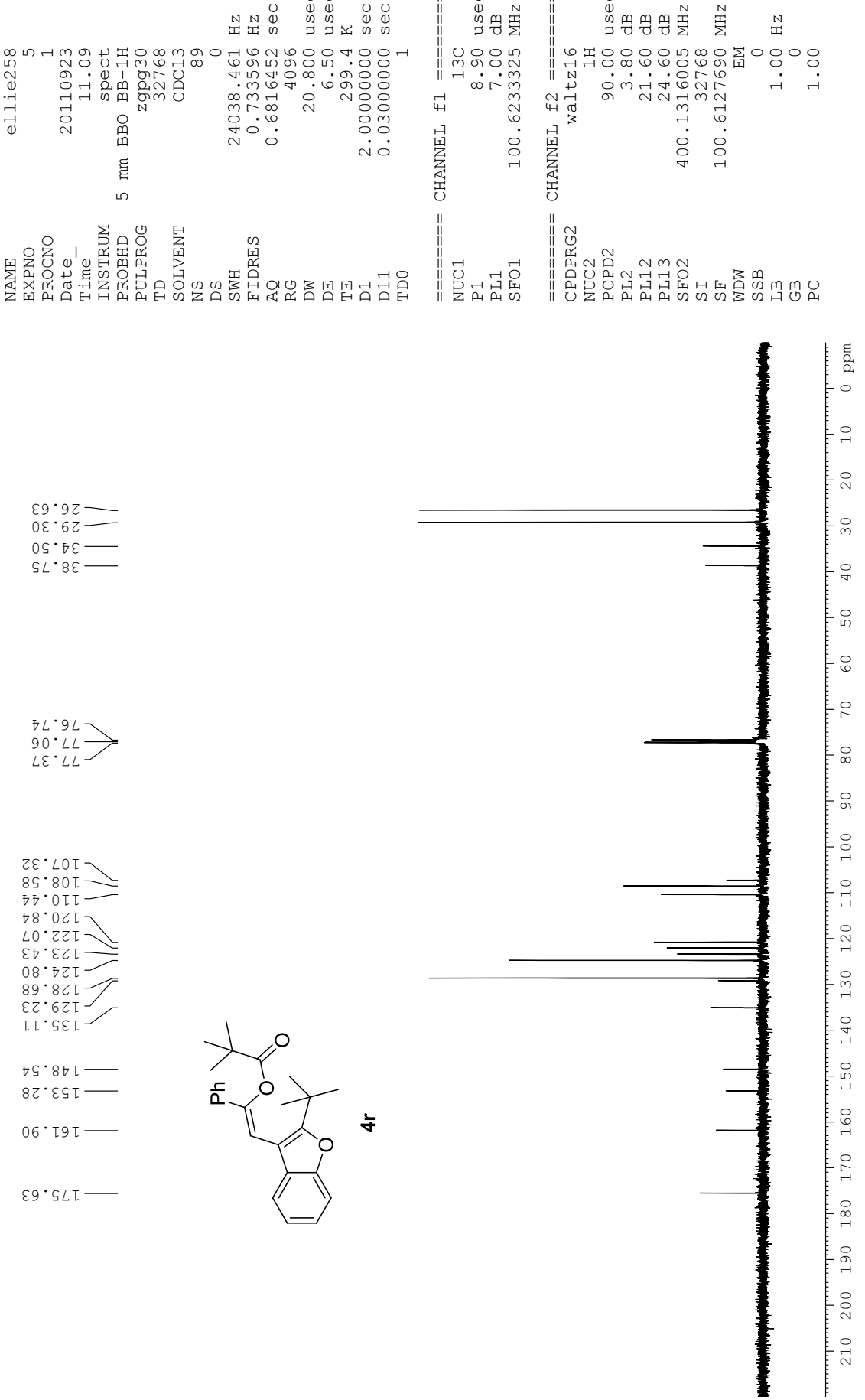

NAME ChiChi-234a
EXPNO 1
PROCNO 1
Date_ 20120225
Time_ 11.23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088988 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 296.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0.00 dB
SFO1 500.1330008 MHz
SI 16384
SF 500.1300137 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
NO2
O
O
Ph
O
4q
ppm
1
2
3
4
5
6
7
8
9
10
8.98
2.09
2.12
2.09
1.07
3.11
1.00
2.03

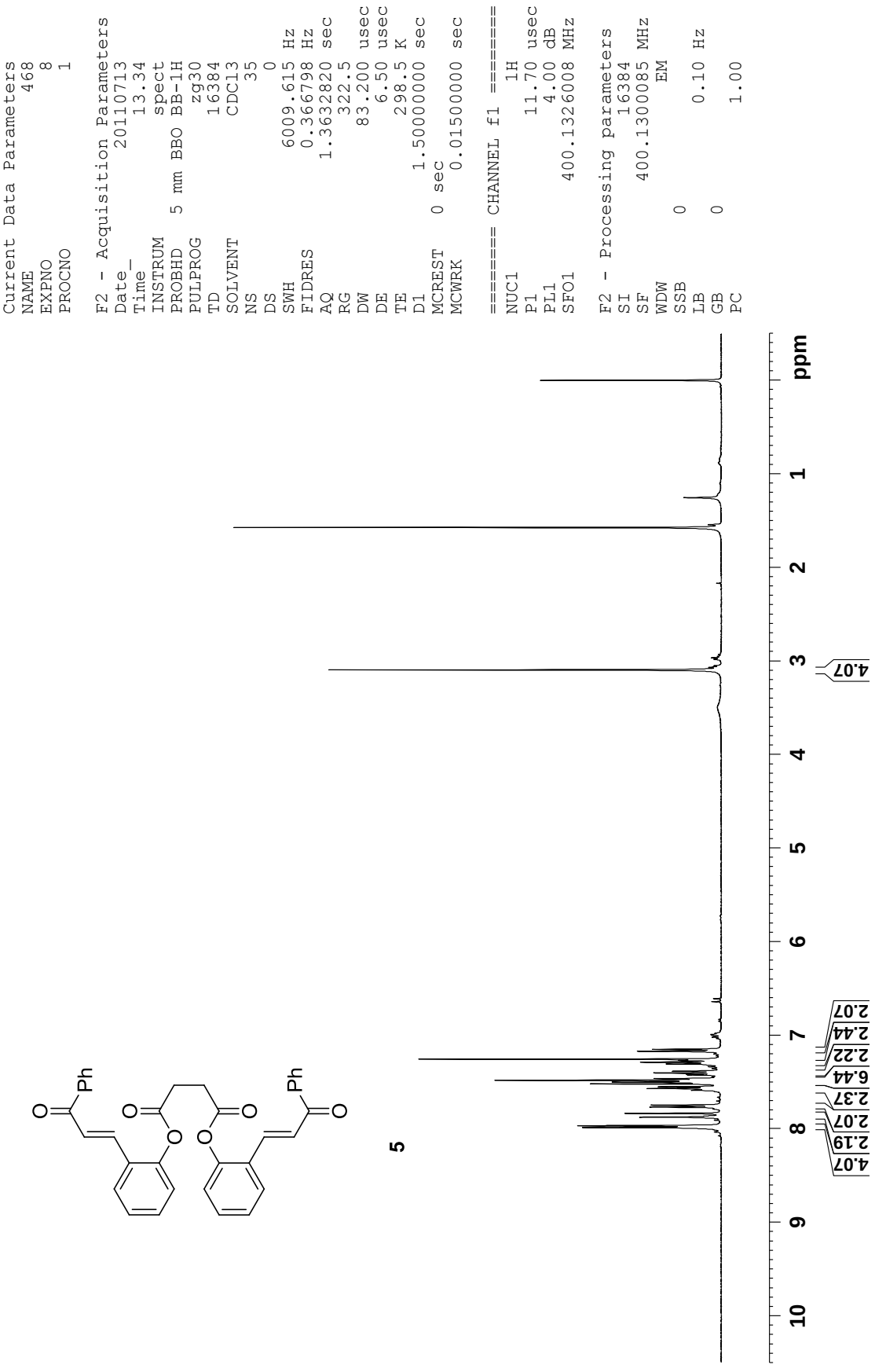

NAME ChiChi-234a
EXPNO 2
PROCNO 1
Date_ 20120225
Time 14.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3732
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912410 sec
RG 4597.6
DW 16.650 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
SI 65536
SF 125.7577902 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
29.33
34.57
76.75
77.00
77.25
107.13
109.22
110.73
120.49
122.18
123.36
123.57
124.84
128.41
128.83
129.02
130.93
134.28
134.44
147.65
150.56
153.22
161.98
162.60
NO2
Ph
O
O
O
4q
0 ppm

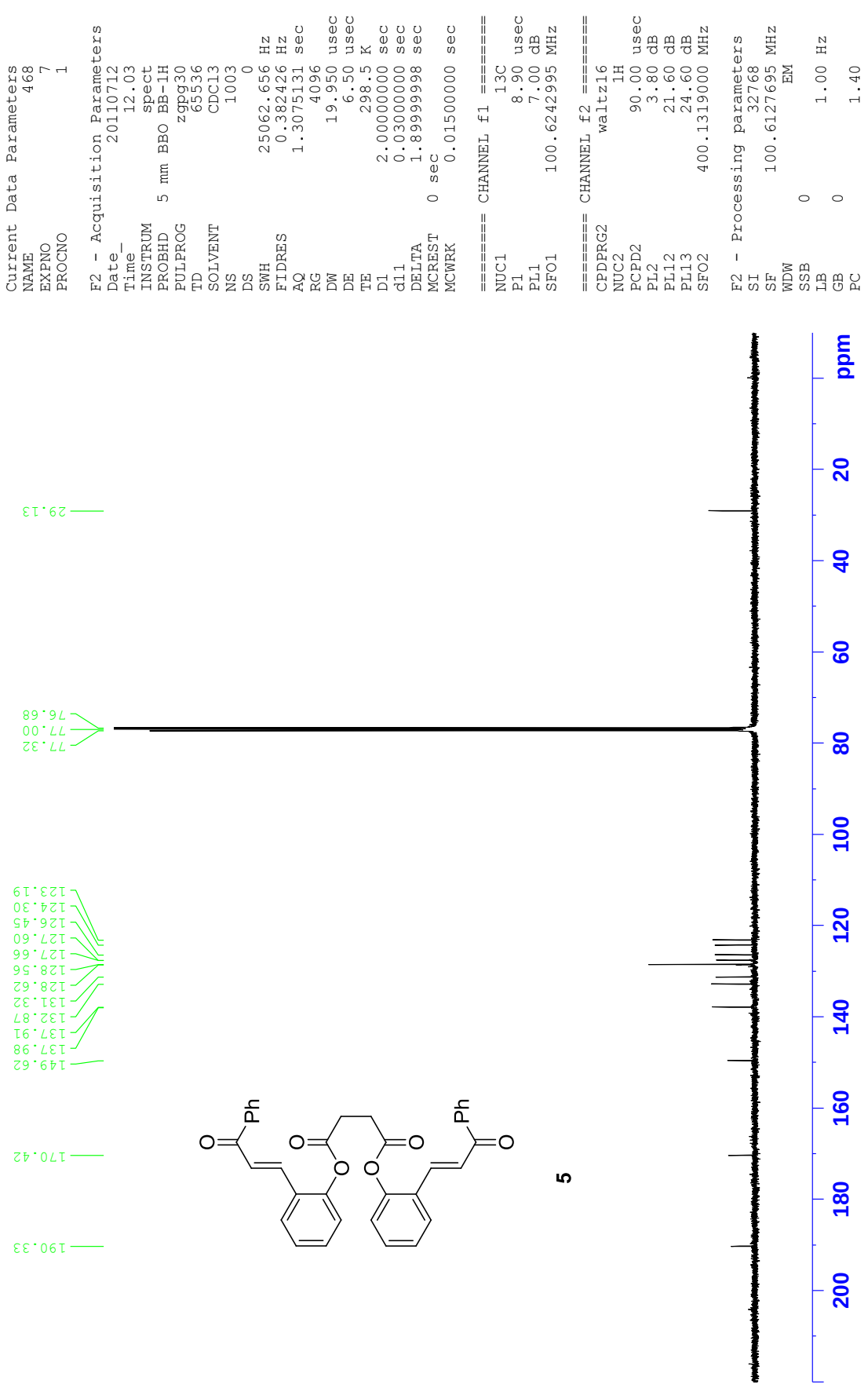

NAME ellie234b
EXPNO 1
PROCNO 1
Date_ 20120229
Time_ 2.37
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 161.3
DW 69.000 usec
DE 6.50 usec
TE 297.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300105 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
Ph
O
O
O2N
4'q
ppm
10
9
8
7
6
5
4
3
2
1
9.22
2.05
2.01
2.06
3.13
3.11
1.00
1.01

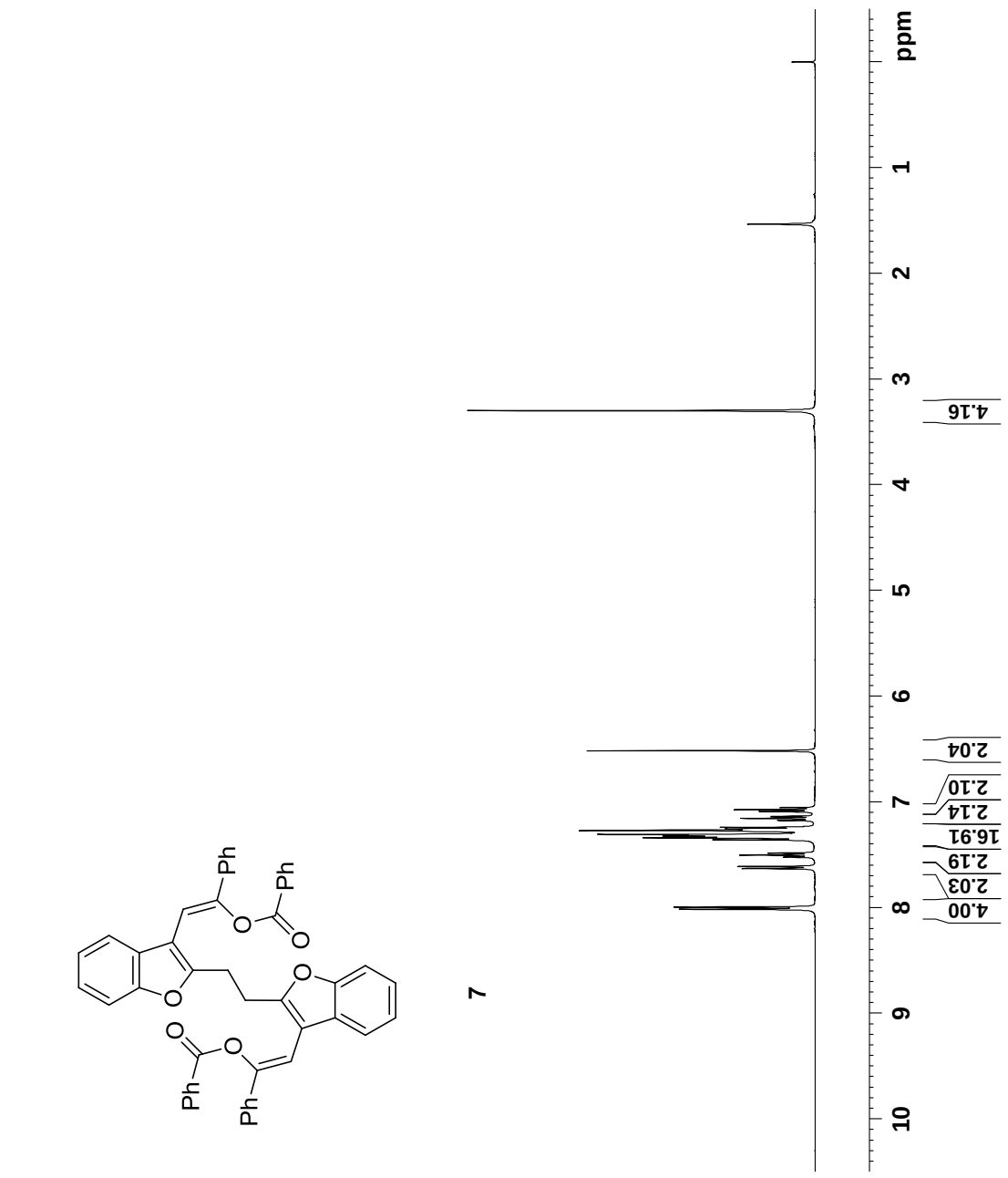

NAME ellie234b
EXPNO 2
PROCNO 1
Date_ 20120229
Time_ 2.39
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 719
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127713 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
26.82
38.86
76.68
77.00
77.32
110.96
123.21
123.42
123.94
124.13
125.22
126.53
127.13
128.40
128.93
129.70
129.81
130.98
136.45
146.14
146.34
148.99
154.01
176.63
O2N
O
Ph
O
O
4'q
0 ppm
20
40
60
80
100
120
140
160
180
200
220

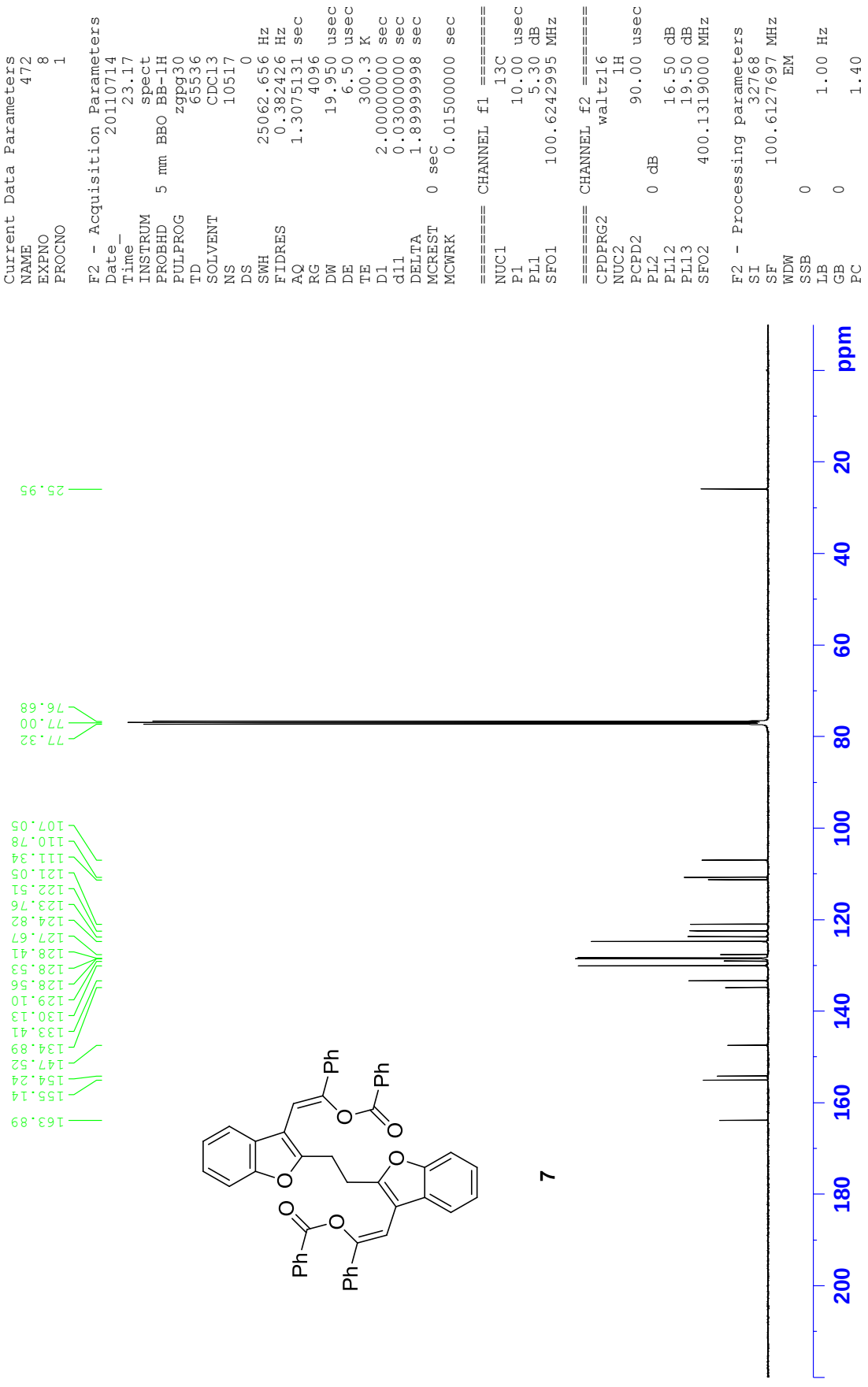

Current Data Parameters
NAME elle254
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110903
Time_ 10.00
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 19
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 203.2
DW 83.200 usec
DE 6.50 usec
TE 299.5 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300135 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.13 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
9.15
9.25
1.00
2.07
5.09
2.05
ppm
Ph
O
O
O
4r

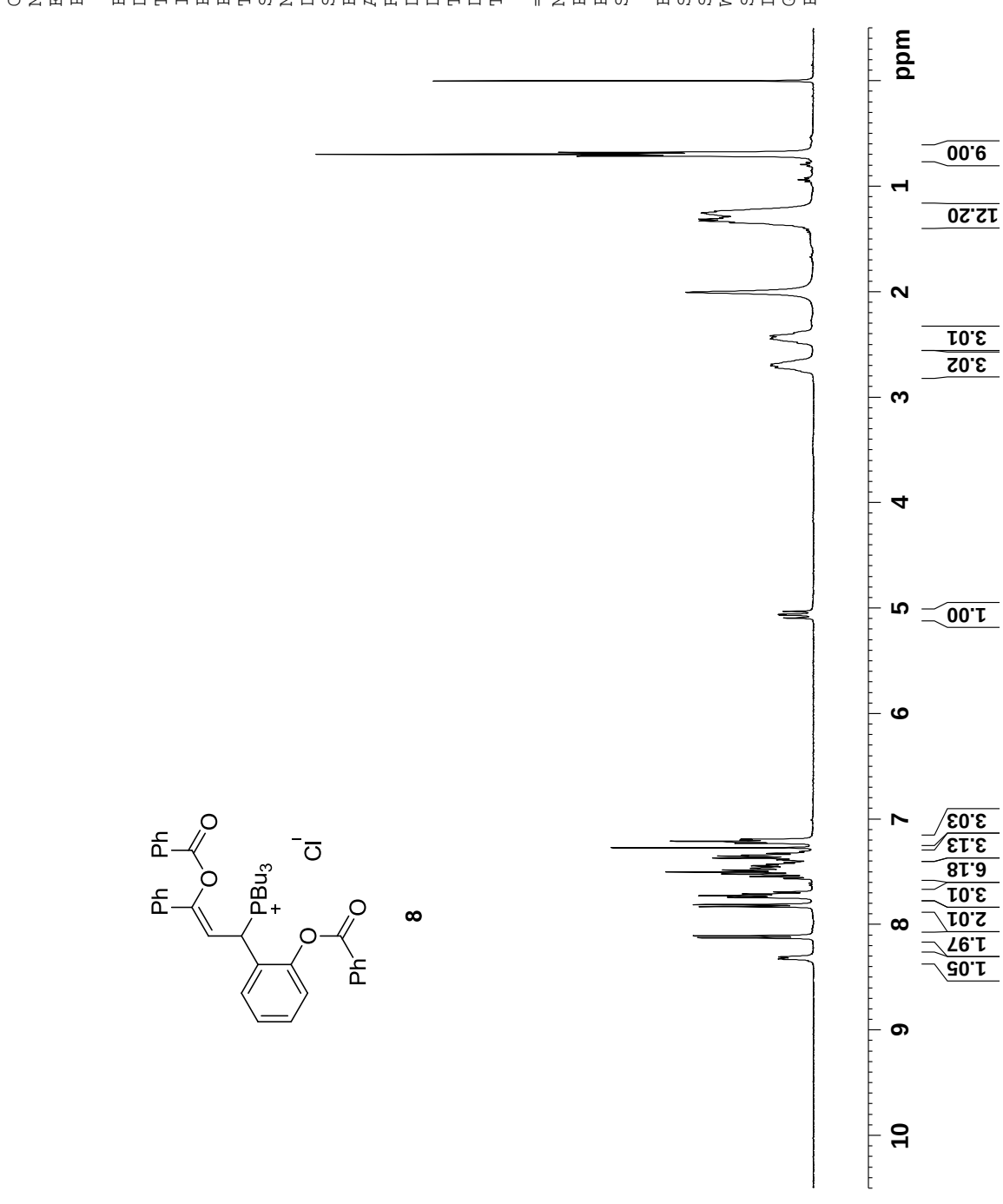

NAME ellie258
EXPNO 5
PROCNO 1
Date_ 20110923
Time_ 11.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 89
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
26.63
29.30
34.50
38.75
77.37
77.06
76.74
107.32
108.58
110.44
120.84
122.07
123.43
124.80
128.68
129.23
135.11
148.54
153.28
161.90
175.63
Ph
O
O
O
4r
0 ppm

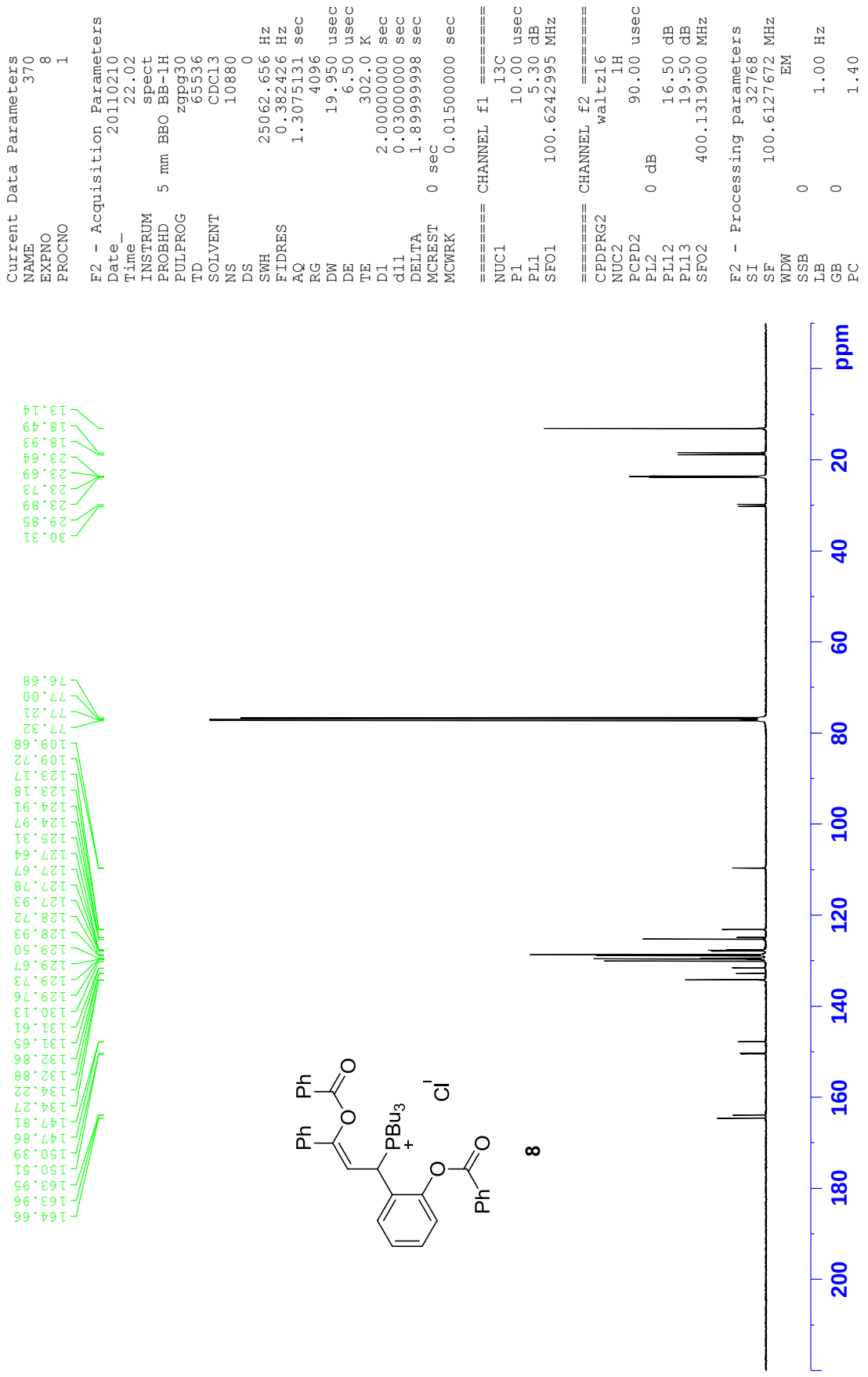

Current Data Parameters
NAME 468
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110713
Time 13.34
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 35
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 322.5
DW 83.200 usec
DE 6.50 usec
TE 298.5 K
D1 1.50000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300085 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
Ph
Ph
5
ppm
1
2
3
4
5
6
7
8
9
10
4.07
2.19
2.07
2.37
6.44
2.22
2.44
2.07

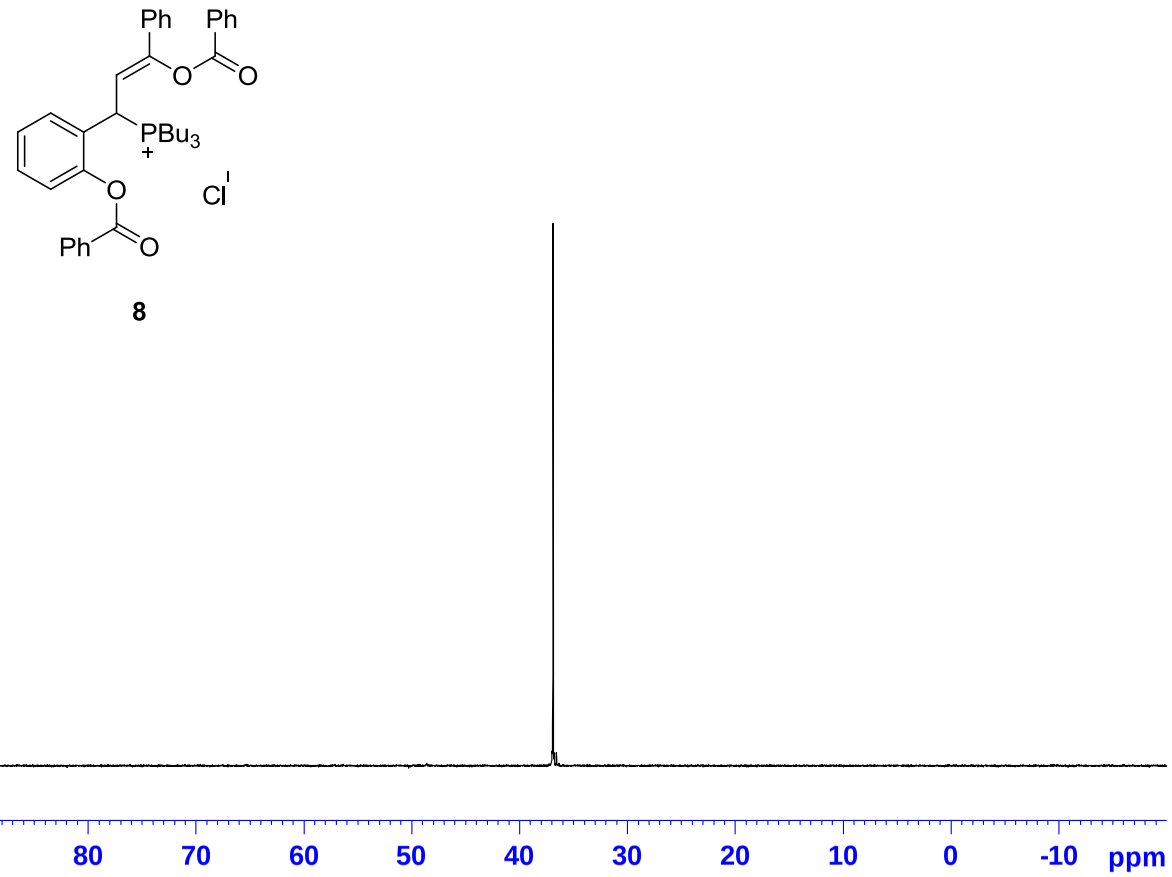

Current Data Parameters
NAME 468
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110712
Time_ 12.03
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1003
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127695 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
29.13
76.68
77.00
77.32
123.19
124.30
126.45
127.60
127.66
128.56
128.62
131.32
132.87
137.91
137.98
149.62
170.42
190.33
Ph
Ph
5
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME 472
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110714
Time_ 23.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 203.2
DW 83.200 usec
DE 6.50 usec
TE 300.2 K
D1 1.50000000 sec
MCREST 0 sec 0.01500000 sec
MCWRK
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300147 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
Ph
O
O
O
O
O
O
Ph
Ph
Ph
7
ppm
1
2
3
4
5
6
7
8
9
10
4.16
4.00
2.03
2.19
16.91
2.14
2.10
2.04


Current Data Parameters
NAME 472
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110714
Time_ 23.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 10517
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 300.3 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0 dB
PL12 16.50 dB
PL13 19.50 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127697 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
25.95
77.32
77.00
76.68
107.05
110.78
111.34
121.05
122.51
123.76
124.82
127.67
128.41
128.53
128.56
129.10
130.13
133.41
134.89
147.52
154.24
155.14
163.89
ppm
20
40
60
80
100
120
140
160
180
200
Ph
O
O
Ph
O
O
O
Ph
O
Ph
7

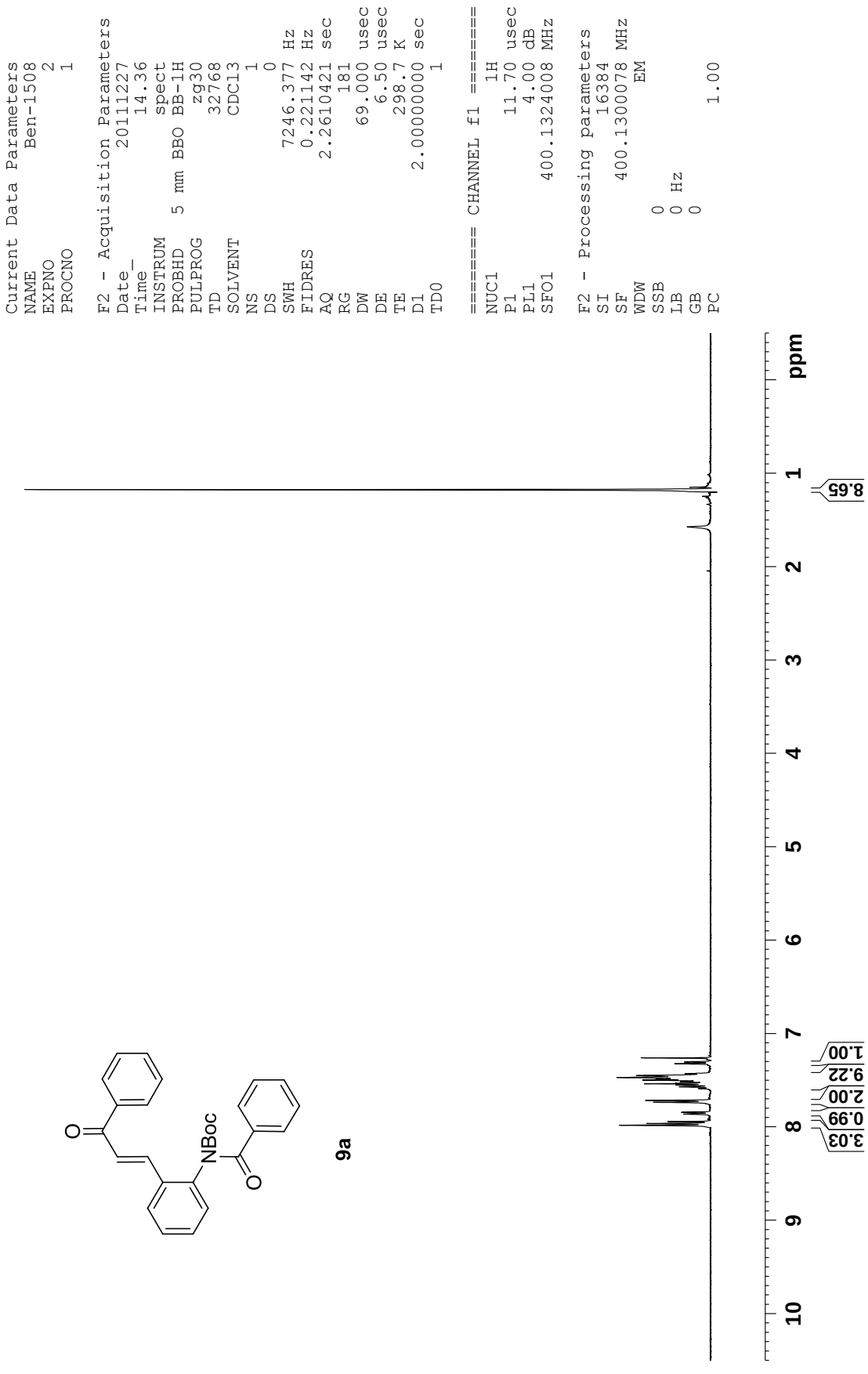

Current Data Parameters
NAME try
EXPNO 128
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110921
Time_ 18.01
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300034 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
9.00
12.20
3.01
3.02
1.00
3.03
3.13
6.18
3.01
2.01
1.97
1.05
Ph
Ph
O
O
PBu3
+
Cl
-
O
O
Ph
8

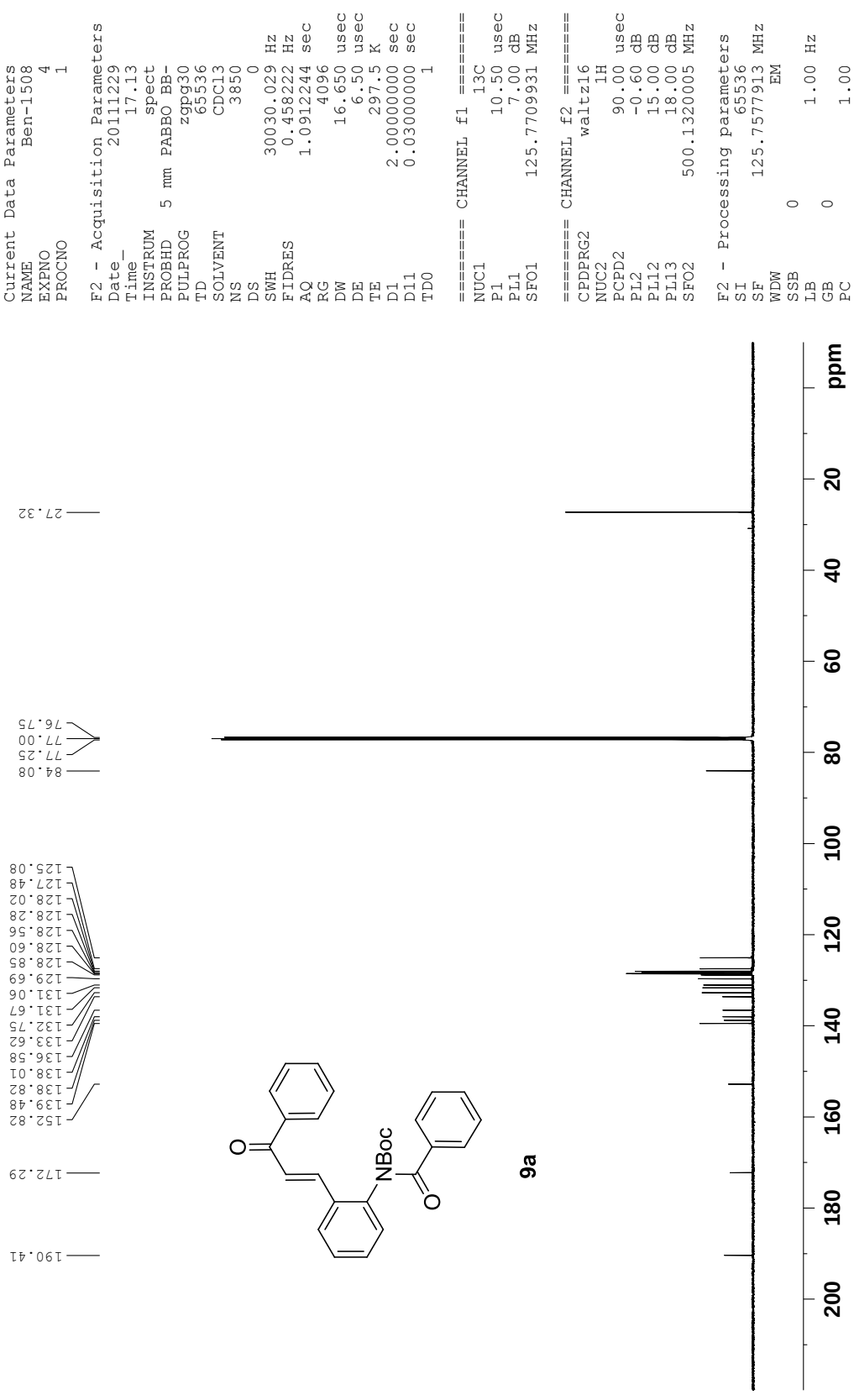

Current Data Parameters
NAME 370
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110210
Time_ 22.02
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1088
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 302.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0 dB
PL12 16.50 dB
PL13 19.50 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
13.14
18.49
18.93
23.64
23.69
23.73
23.89
29.85
30.31
76.68
77.00
77.21
77.32
109.68
109.72
123.17
123.18
124.91
124.97
125.31
127.64
127.67
127.78
127.93
128.72
128.93
129.50
129.67
129.73
129.76
130.13
131.61
131.65
132.86
132.88
134.22
134.27
147.81
147.86
150.39
150.51
163.95
163.96
164.66
Ph
Ph
O
O
PBu3
+
Cl
-
O
O
Ph
8
ppm
200
180
160
140
120
100
80
60
40
20

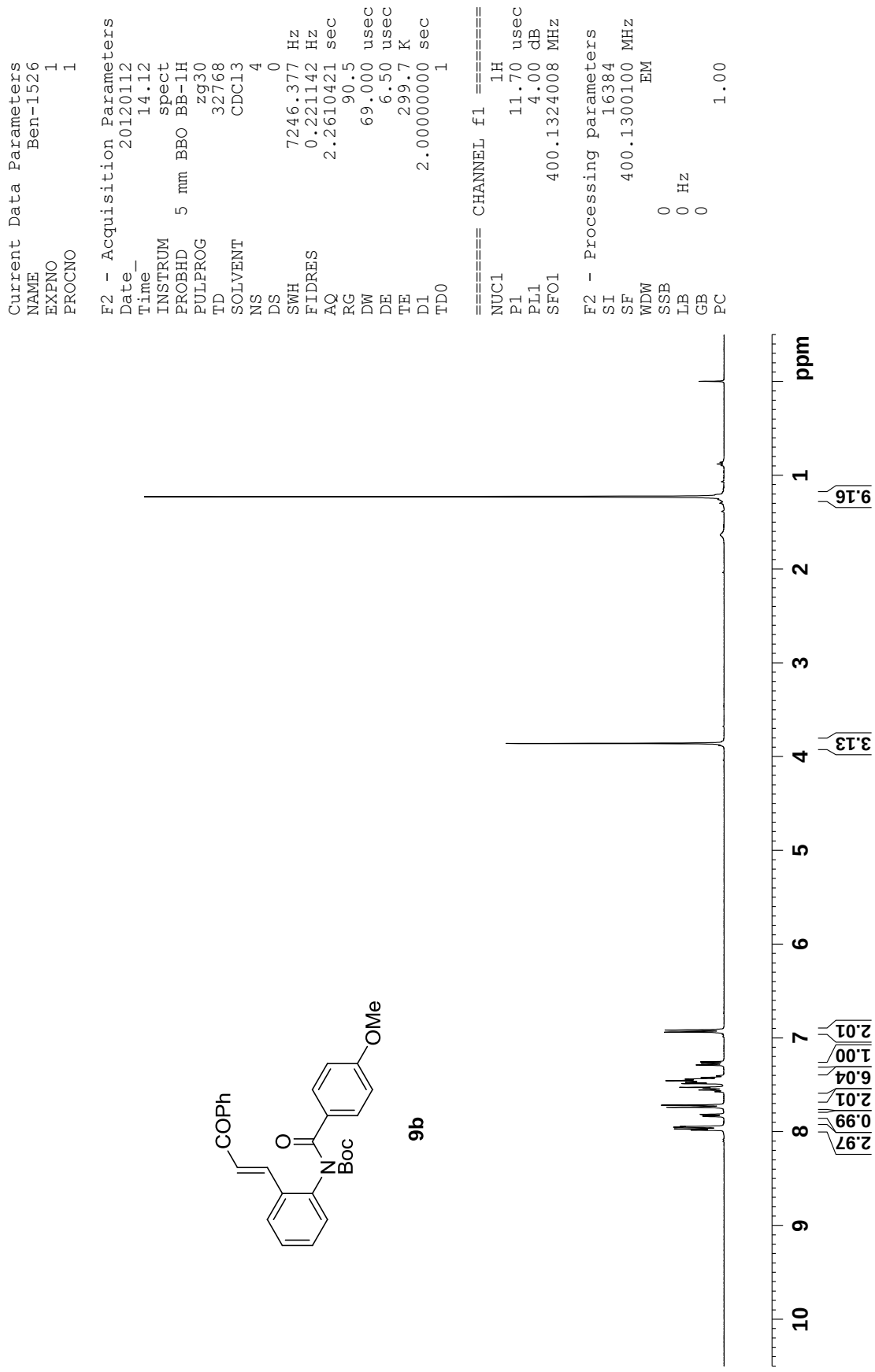


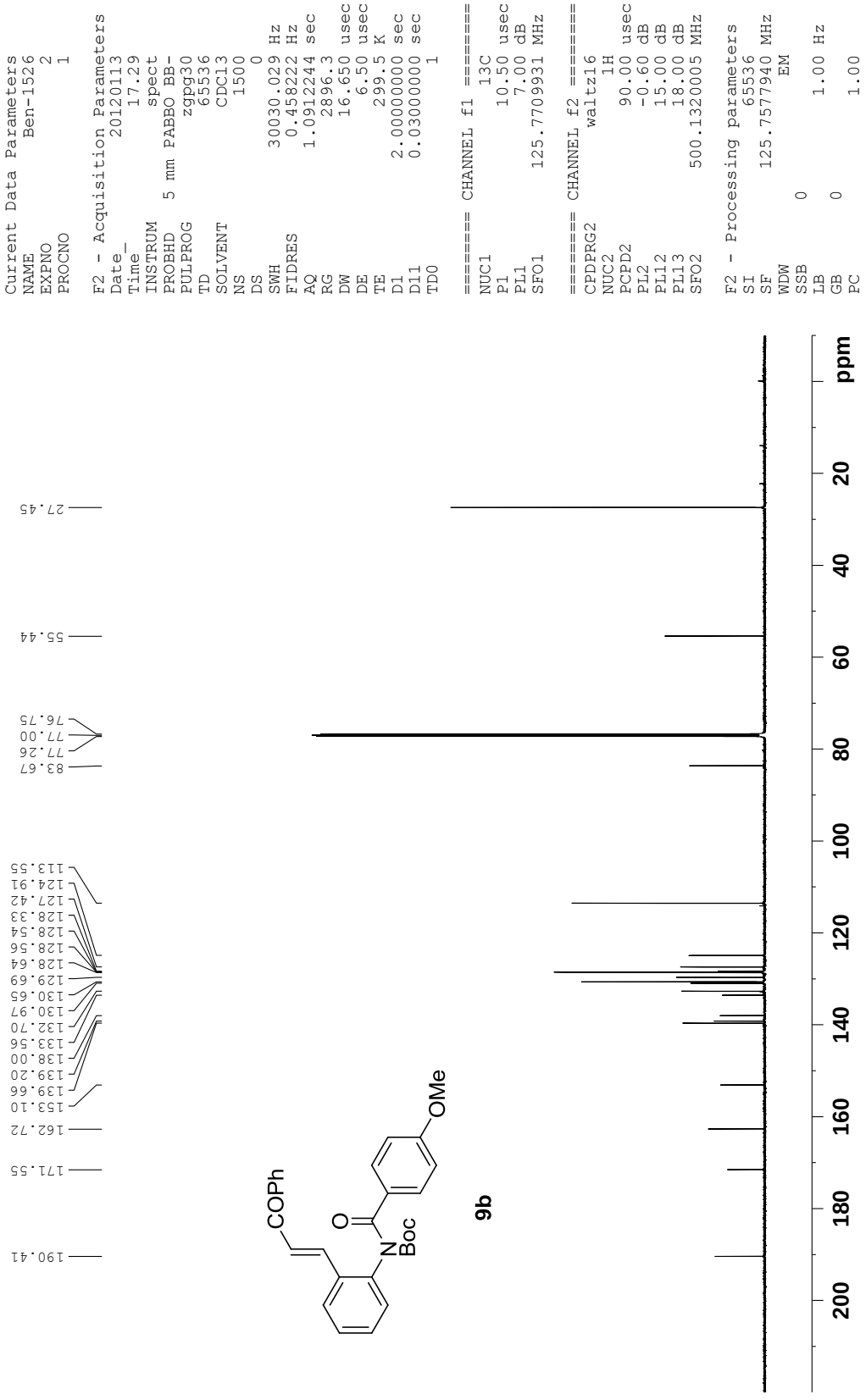
8

```
Current Data Parameters
NAME            Regina-P
EXPNO                  3
PROCNO                 1

F2 - Acquisition Parameters
Date_           20120203
Time                20.15
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    80
DS                     0
SWH            80645.164 Hz
FIDRES          1.230548 Hz
AQ             0.4063794 sec
RG               20642.5
DW                6.200 usec
DE                6.50 usec
TE                293.9 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 31P
P1                12.00 usec
PL1                6.00 dB
SFO1         202.4462122 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PL2               -0.60 dB
PL12              15.00 dB
PL13              18.00 dB
SFO2         500.1320005 MHz

F2 - Processing parameters
SI                 32768
SF           202.4564874 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.00
```


Current Data Parameters
NAME Ben-1508
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111227
Time_ 14.36
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300078 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
NBoc
O
O
9a
ppm
1
2
3
4
5
6
7
8
9
10
8.65
3.03
0.99
2.00
9.22
1.00


Current Data Parameters
NAME Ben-1508
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111229
Time_ 17.13
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3850
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 297.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577913 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.32
76.75
77.00
77.25
84.08
125.08
127.48
128.02
128.28
128.56
128.60
128.85
129.69
131.06
131.67
132.75
133.62
136.58
138.01
138.82
139.48
152.82
172.29
190.41
O
NBoc
O
9a
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME Ben-1526
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120112
Time_ 14.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Boc
OMe
9b
9.16
3.13
2.97
0.99
2.01
6.04
1.00
2.01
ppm


Current Data Parameters
NAME Ben-1526
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120113
Time_ 17.29
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2896.3
DW 16.650 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577940 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.45
55.44
76.75
77.00
77.26
83.67
113.55
124.91
127.42
128.33
128.54
128.56
128.64
129.69
130.65
130.97
132.70
133.56
138.00
139.20
139.66
153.10
162.72
171.55
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COPh
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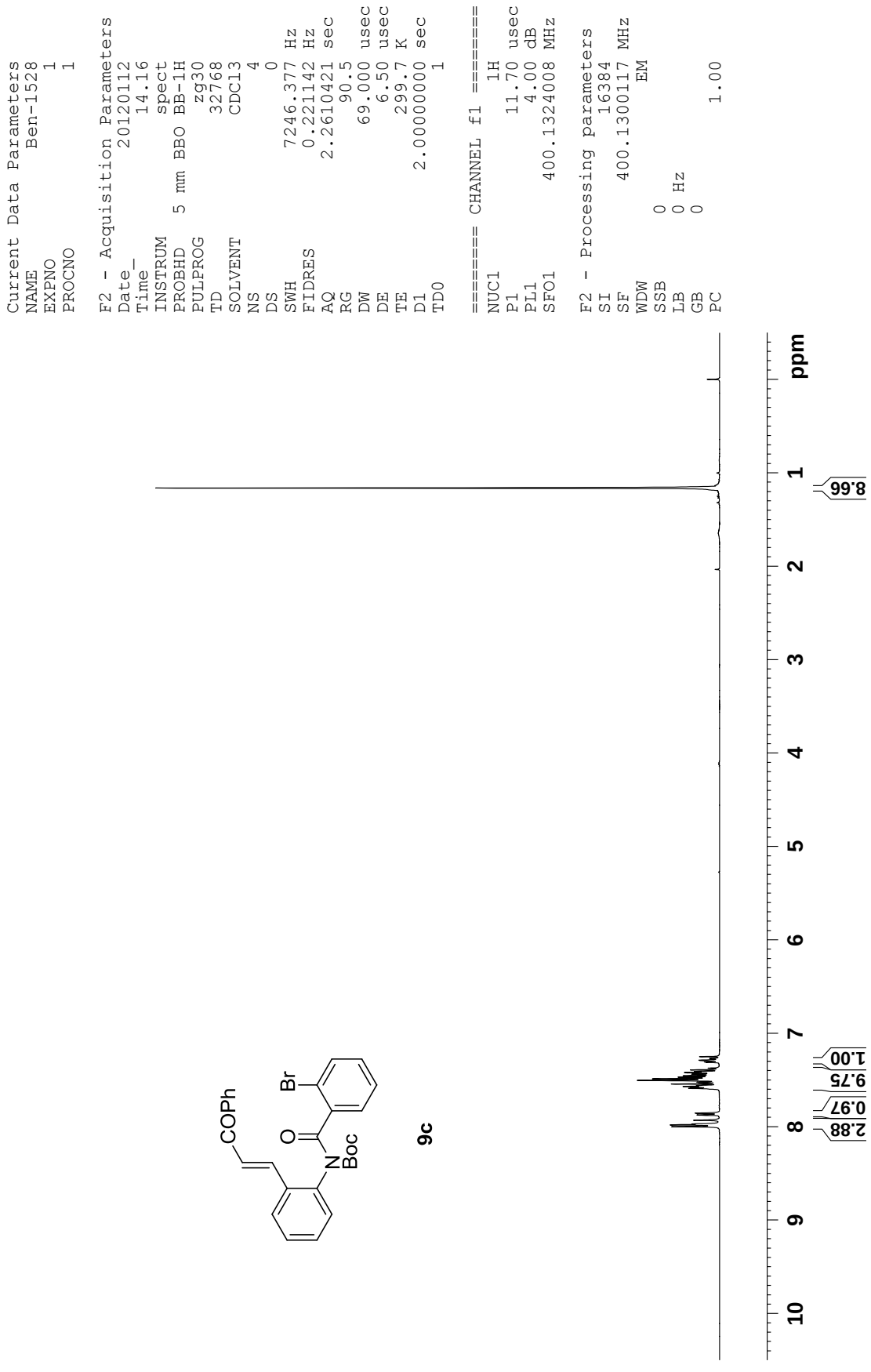
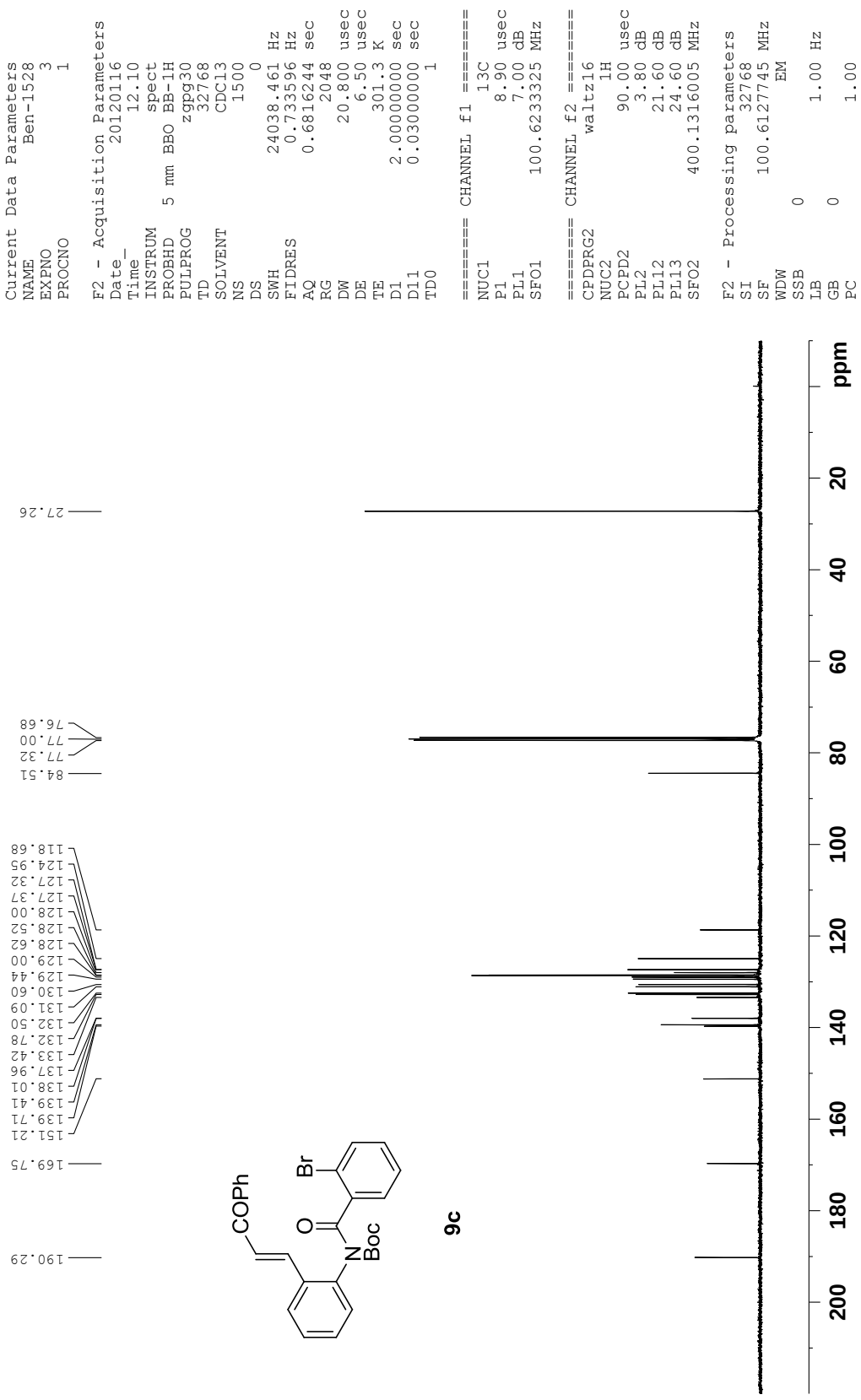
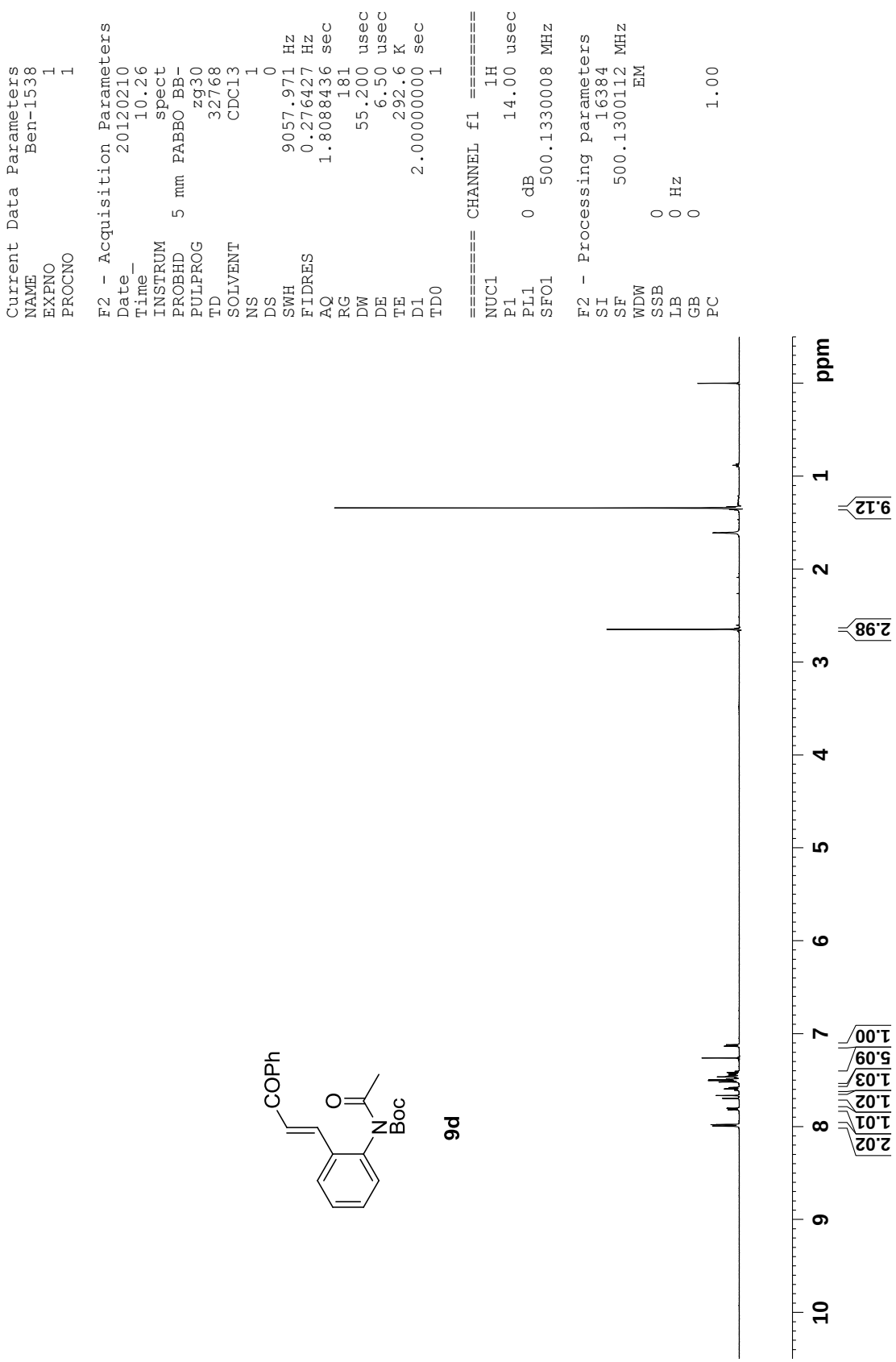
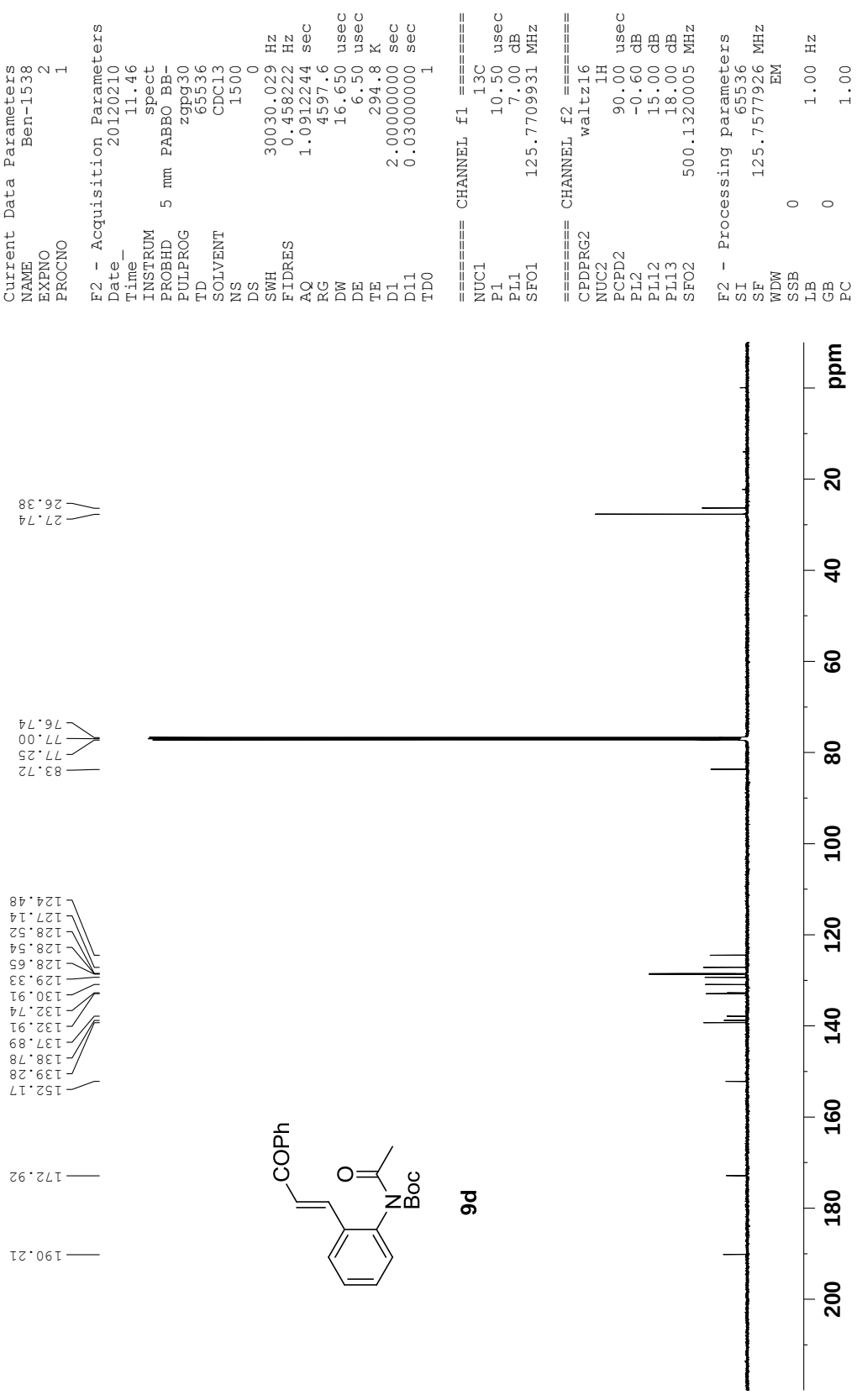
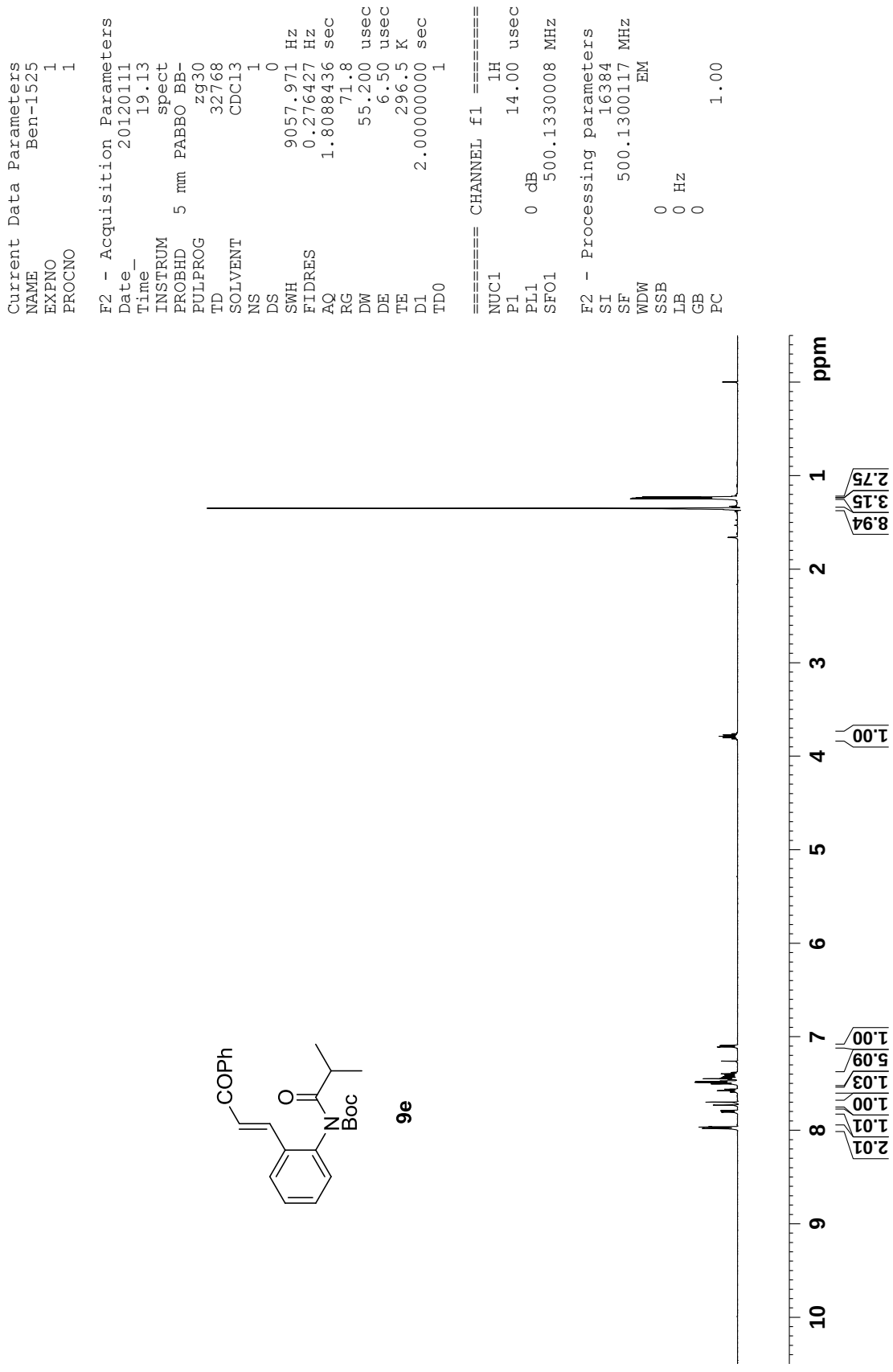
N
Boc
OMe
9b
ppm
200
180
160
140
120
100
80
60
40
20

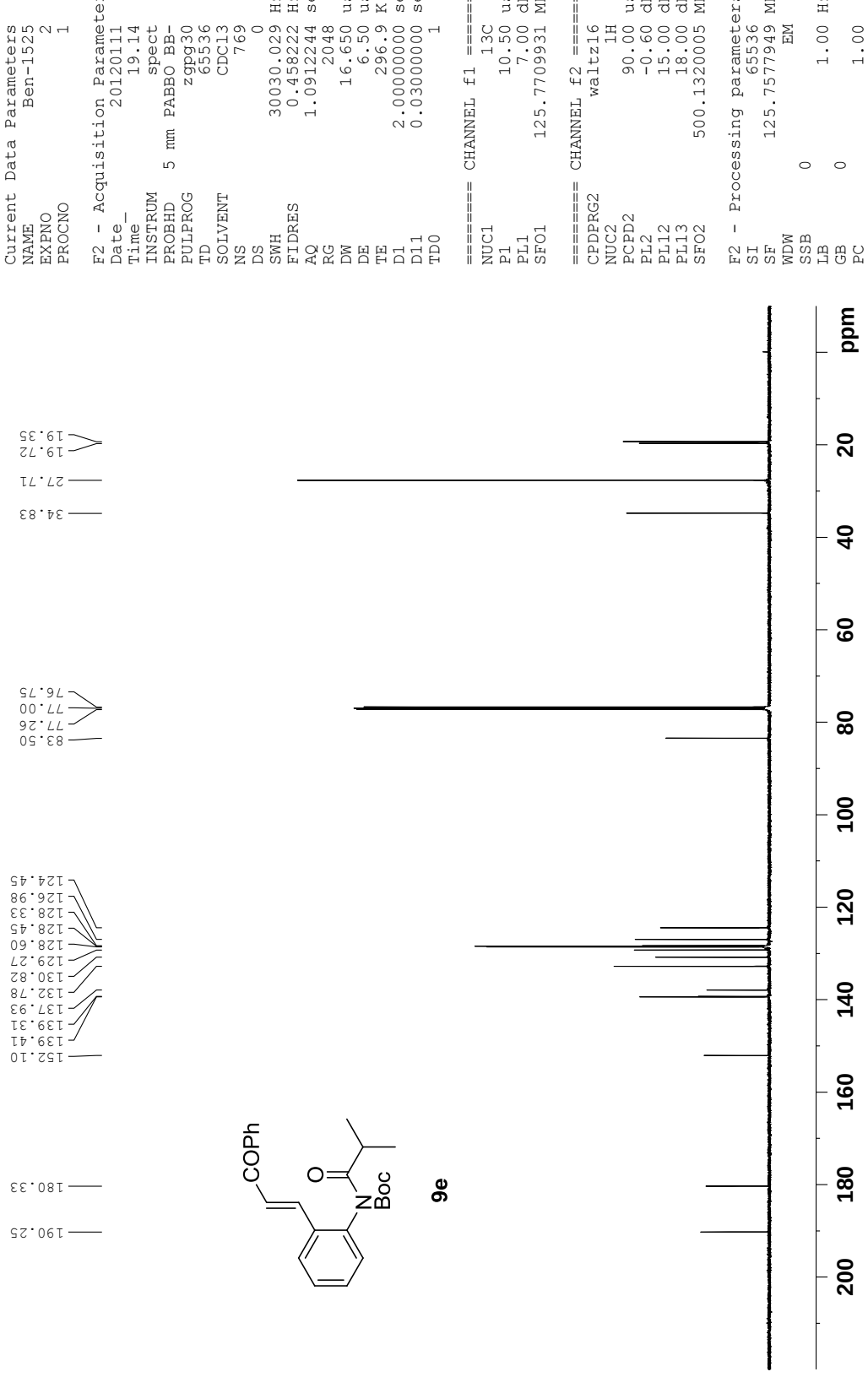

Current Data Parameters
NAME Ben-1528
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120112
Time_ 14.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300117 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
Br
O
N
Boc
9c
ppm
1
2
3
4
5
6
7
8
9
10
8.66
2.88
0.97
9.75
1.00

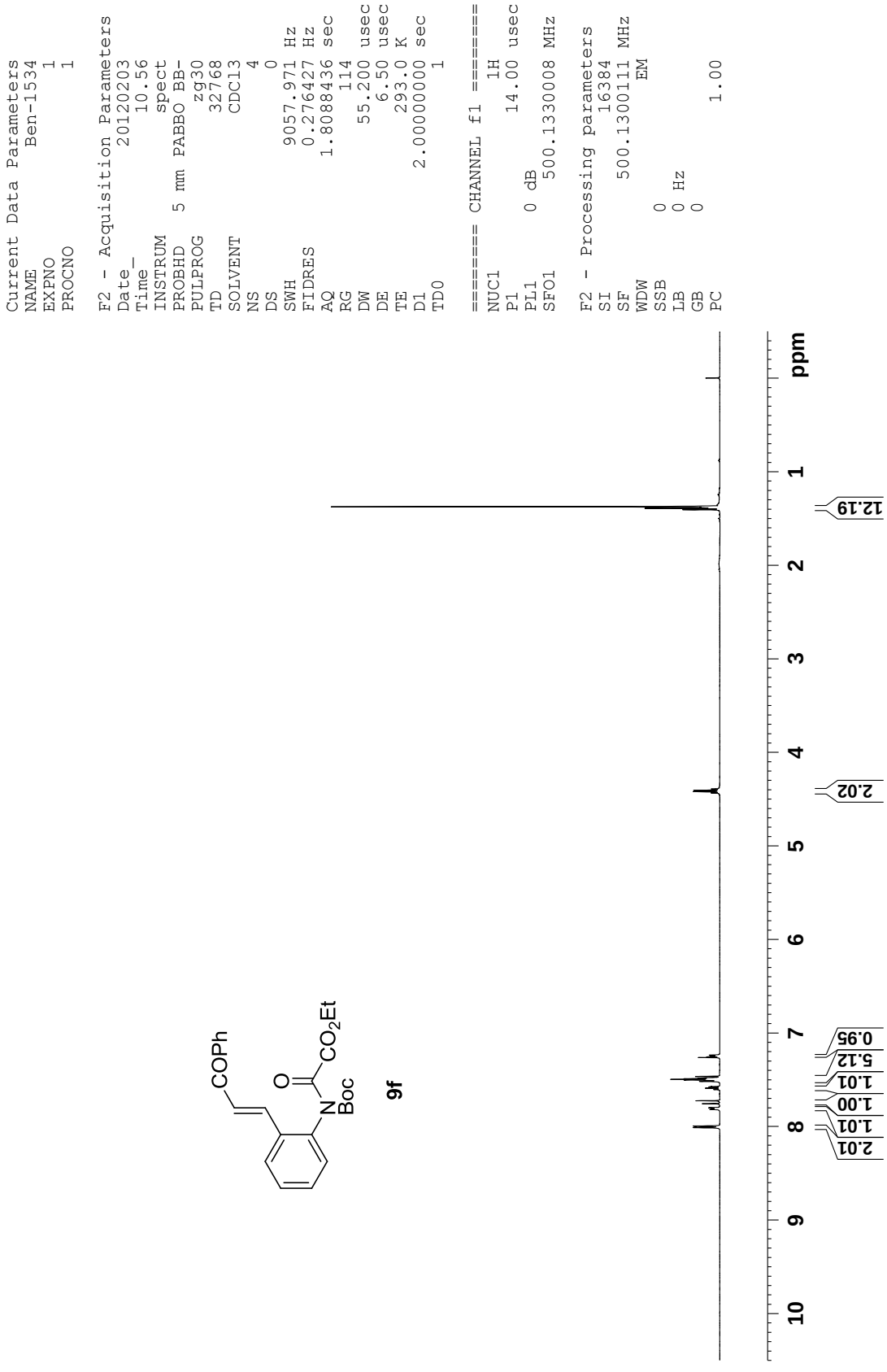

Current Data Parameters
NAME Ben-1528
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120116
Time_ 12.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1500
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 2048
DW 20.800 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127745 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.26
76.68
77.00
77.32
84.51
118.68
124.95
127.32
127.37
128.00
128.52
128.62
129.00
129.44
130.60
131.09
132.50
132.78
133.42
137.96
138.01
139.41
139.71
151.21
169.75
190.29
COPh
Br
O
N
Boc
9c
ppm
200
180
160
140
120
100
80
60
40
20

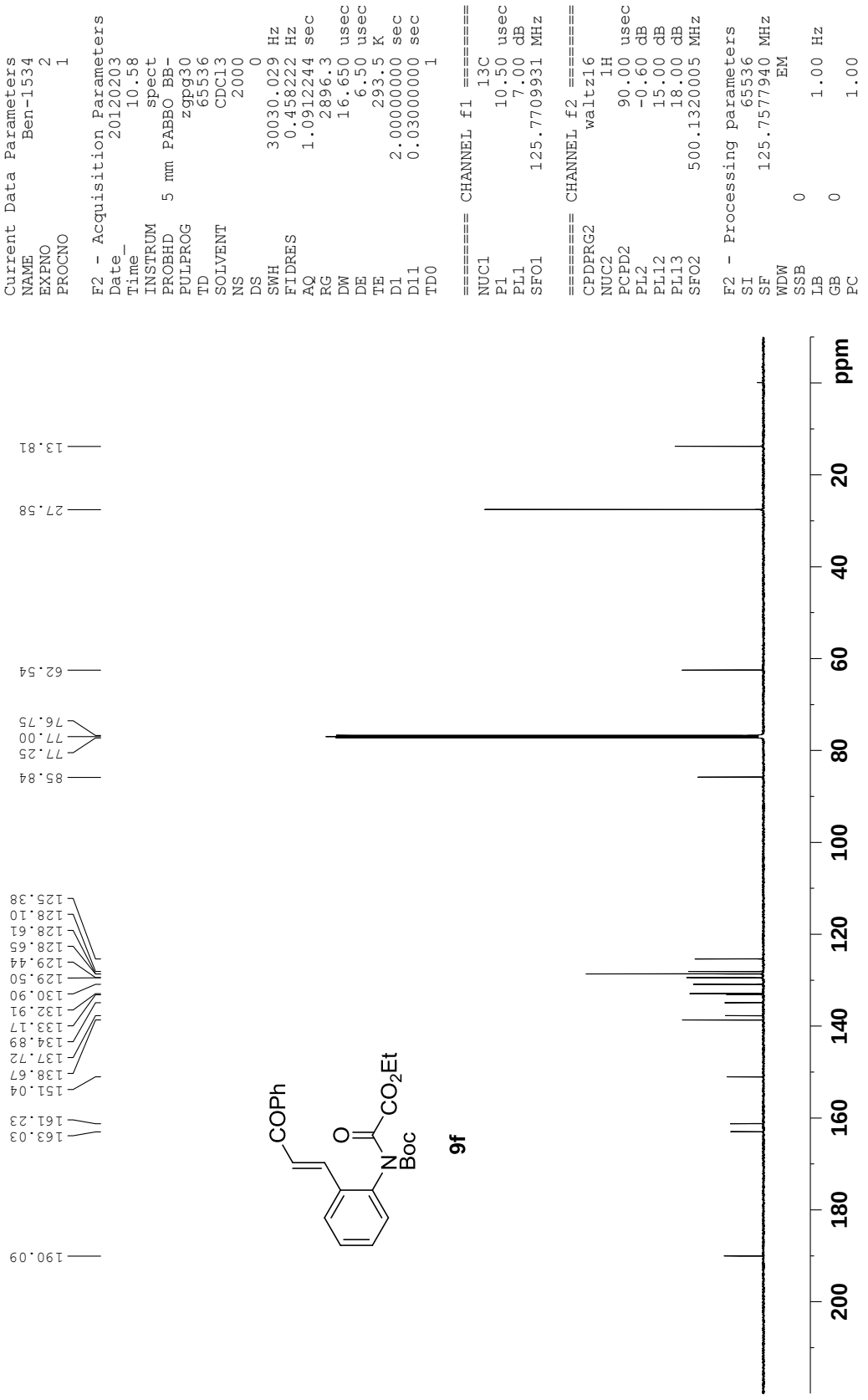

Current Data Parameters
NAME Ben-1538
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 10.26
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 292.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300112 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Boc
9d
ppm
9.12
2.98
2.02
1.01
1.02
1.03
5.09
1.00

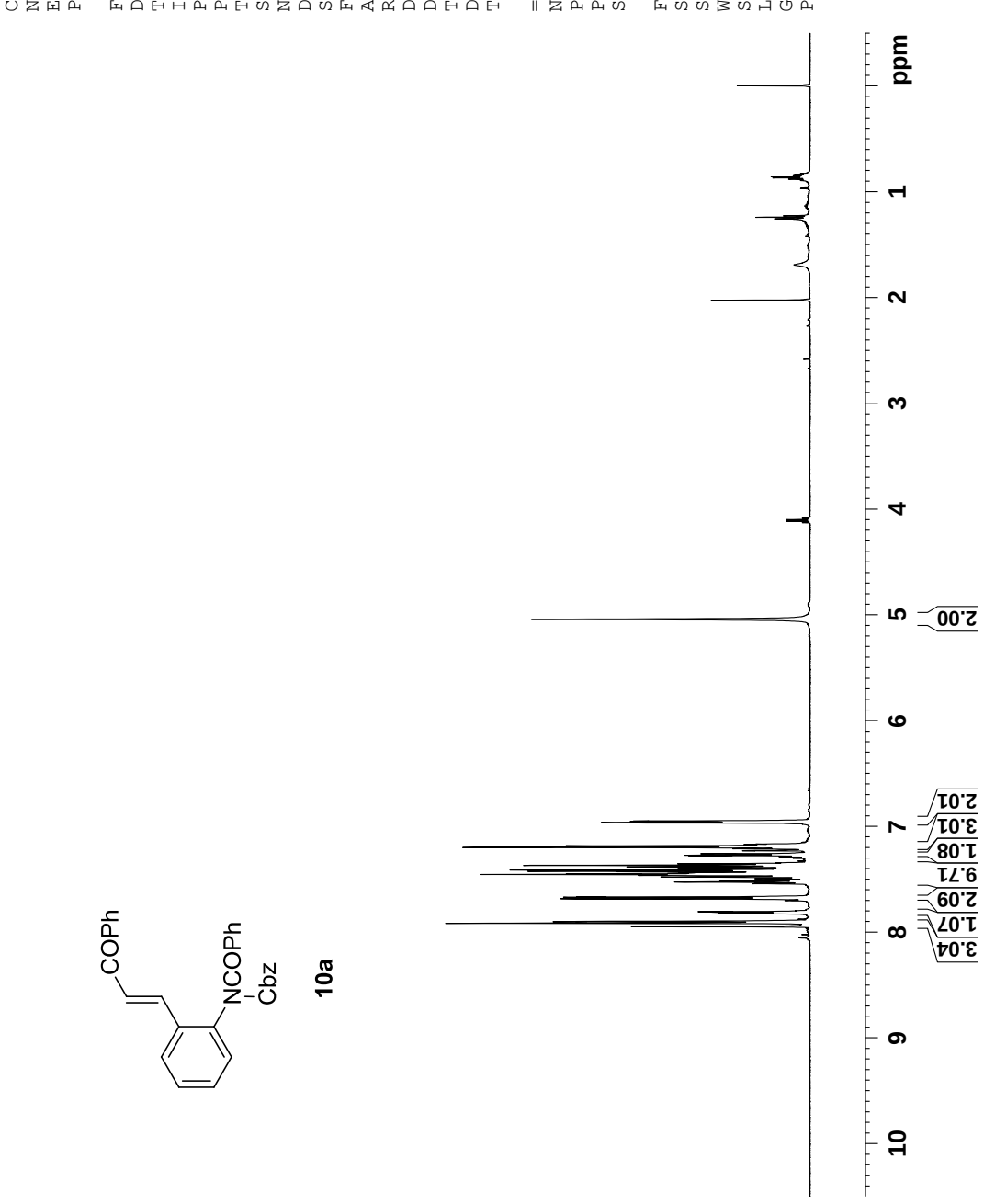

Current Data Parameters
NAME Ben-1538
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 11.46
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4597.6
DW 16.650 usec
DE 6.50 usec
TE 294.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577926 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
26.38
27.74
76.74
77.00
77.25
83.72
124.48
127.14
128.52
128.54
128.65
129.33
130.91
132.74
132.91
137.89
138.78
139.28
152.17
172.92
190.21
COPh
O
N
Boc
9d
ppm
200
180
160
140
120
100
80
60
40
20

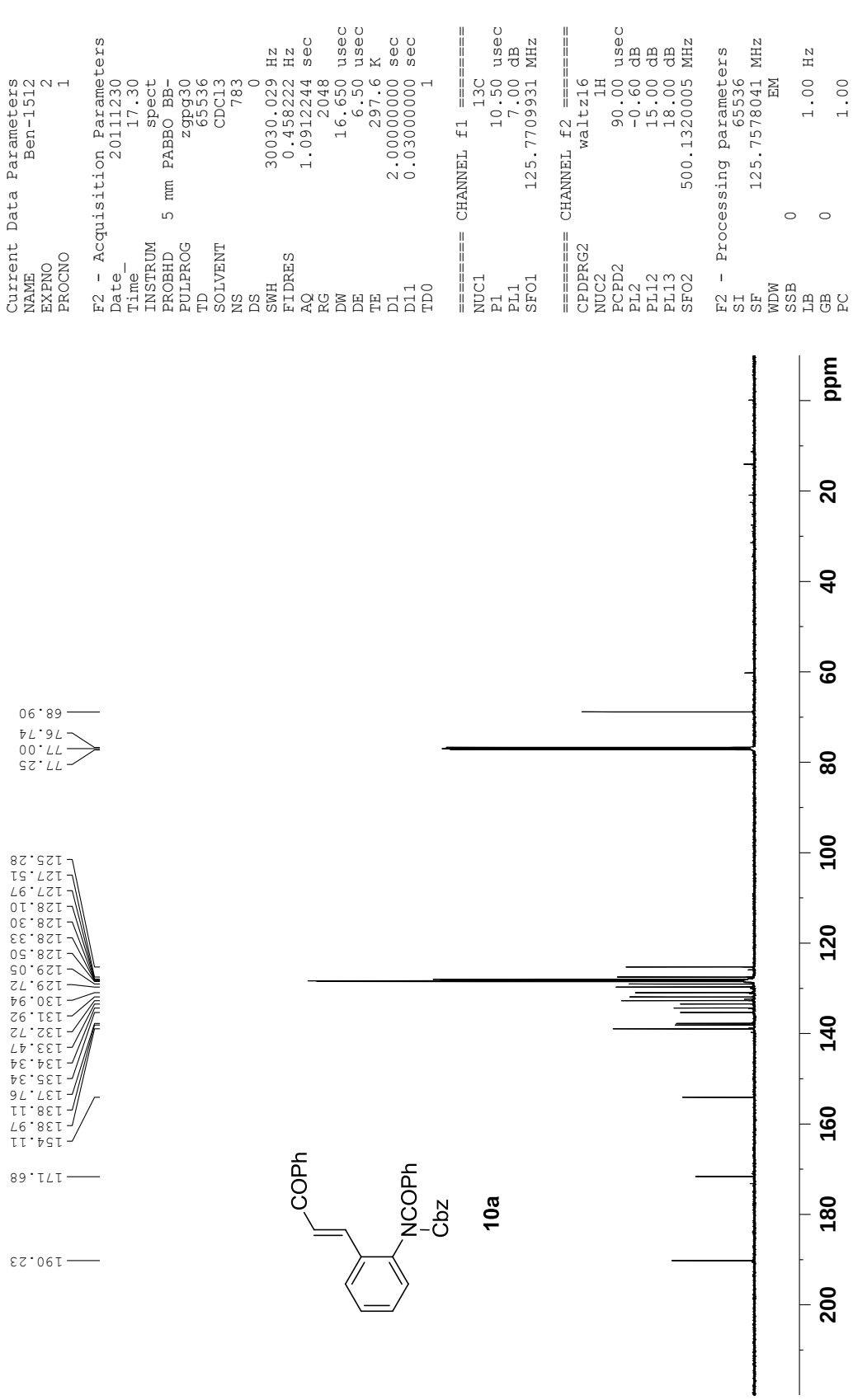

Current Data Parameters
NAME Ben-1525
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120111
Time_ 19.13
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 71.8
DW 55.200 usec
DE 6.50 usec
TE 296.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300117 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Boc
9e
ppm
1
2
3
4
5
6
7
8
9
10
2.75
3.15
8.94
1.00
1.00
5.09
1.03
1.00
1.01
2.01


Current Data Parameters
NAME Ben-1525
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120111
Time 19.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 769
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 296.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577949 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
19.35
19.72
27.71
34.83
76.75
77.00
77.26
83.50
124.45
126.98
128.33
128.45
128.60
129.27
130.82
132.78
137.93
139.31
139.41
152.10
180.33
190.25
COPh
O
N
Boc
9e
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME Ben-1534
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120203
Time_ 10.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 114
DW 55.200 usec
DE 6.50 usec
TE 293.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300111 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
CO2Et
O
N
Boc
9f
ppm
12.19
2.02
2.01
1.01
1.00
1.01
5.12
0.95


Current Data Parameters
NAME Ben-1534
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120203
Time_ 10.58
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2896.3
DW 16.650 usec
DE 6.50 usec
TE 293.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577940 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
13.81
27.58
62.54
76.75
77.00
77.25
85.84
125.38
128.10
128.61
128.65
129.44
129.50
130.90
132.91
133.17
134.89
137.72
138.67
151.04
161.23
163.03
190.09
COPh
O
CO2Et
N
Boc
9f
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME Ben-1512
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111230
Time_ 17.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 57
DW 55.200 usec
DE 6.50 usec
TE 297.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300274 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
NCOPh
Cbz
10a
ppm
1
2
3
4
5
6
7
8
9
10
2.00
2.01
3.01
1.08
9.71
2.09
1.07
3.04


Current Data Parameters
NAME Ben-1512
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111230
Time_ 17.30
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 783
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578041 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.23
171.68
154.11
138.97
138.11
137.76
135.34
134.34
133.47
132.72
131.92
130.94
129.72
129.05
128.50
128.33
128.30
128.10
127.97
127.51
125.28
77.25
77.00
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COPh
NCOPh
Cbz
10a
ppm
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160
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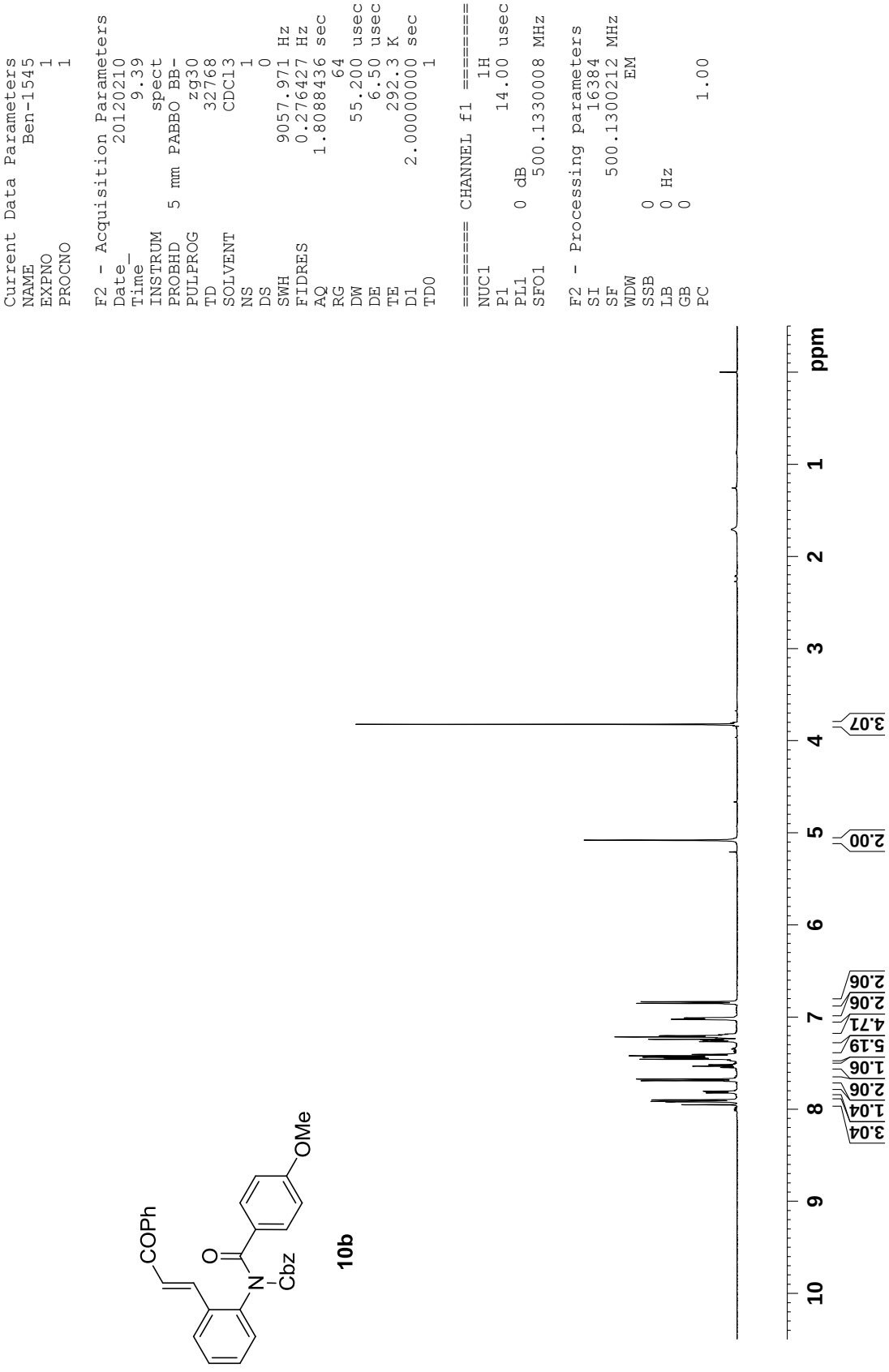
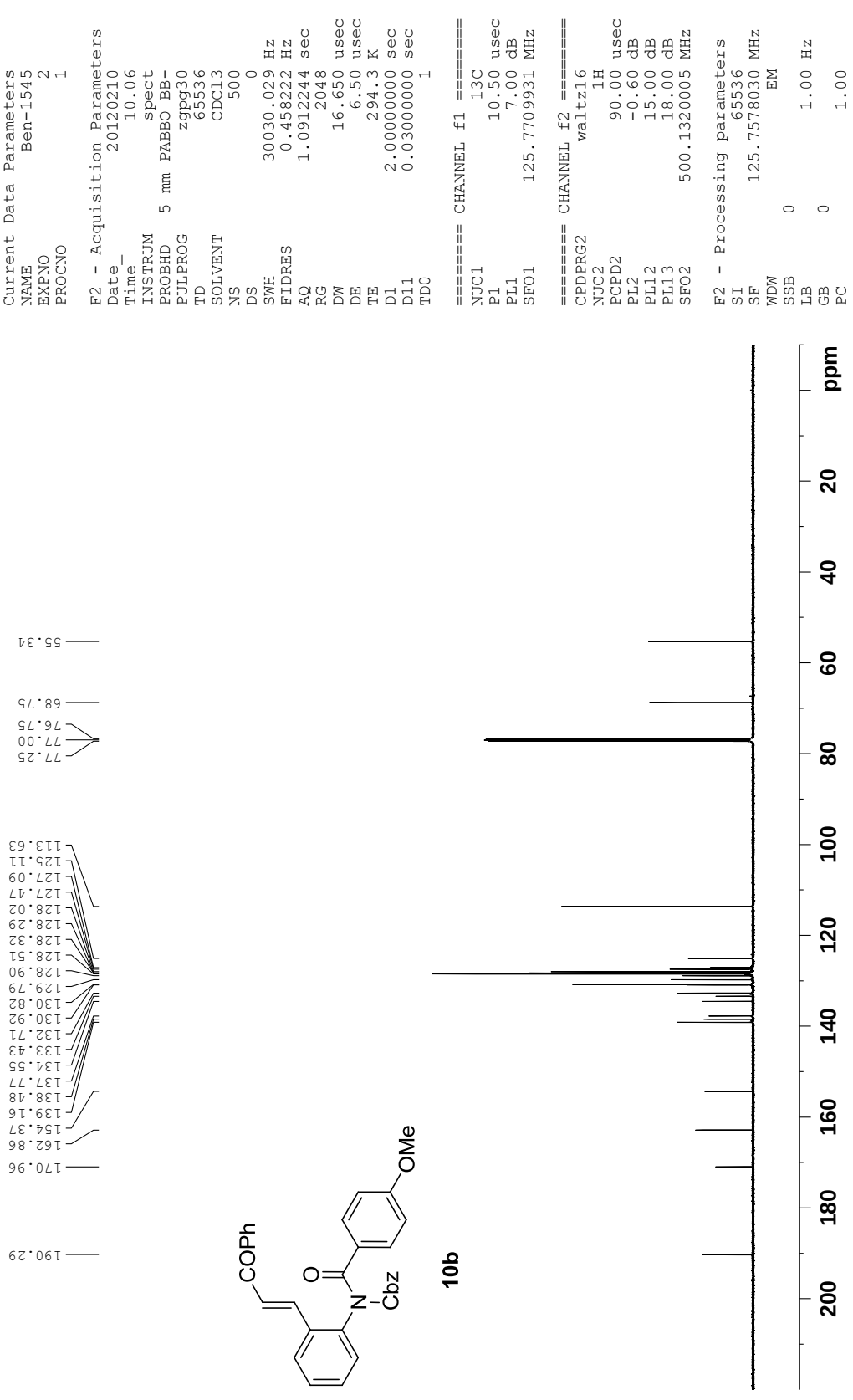
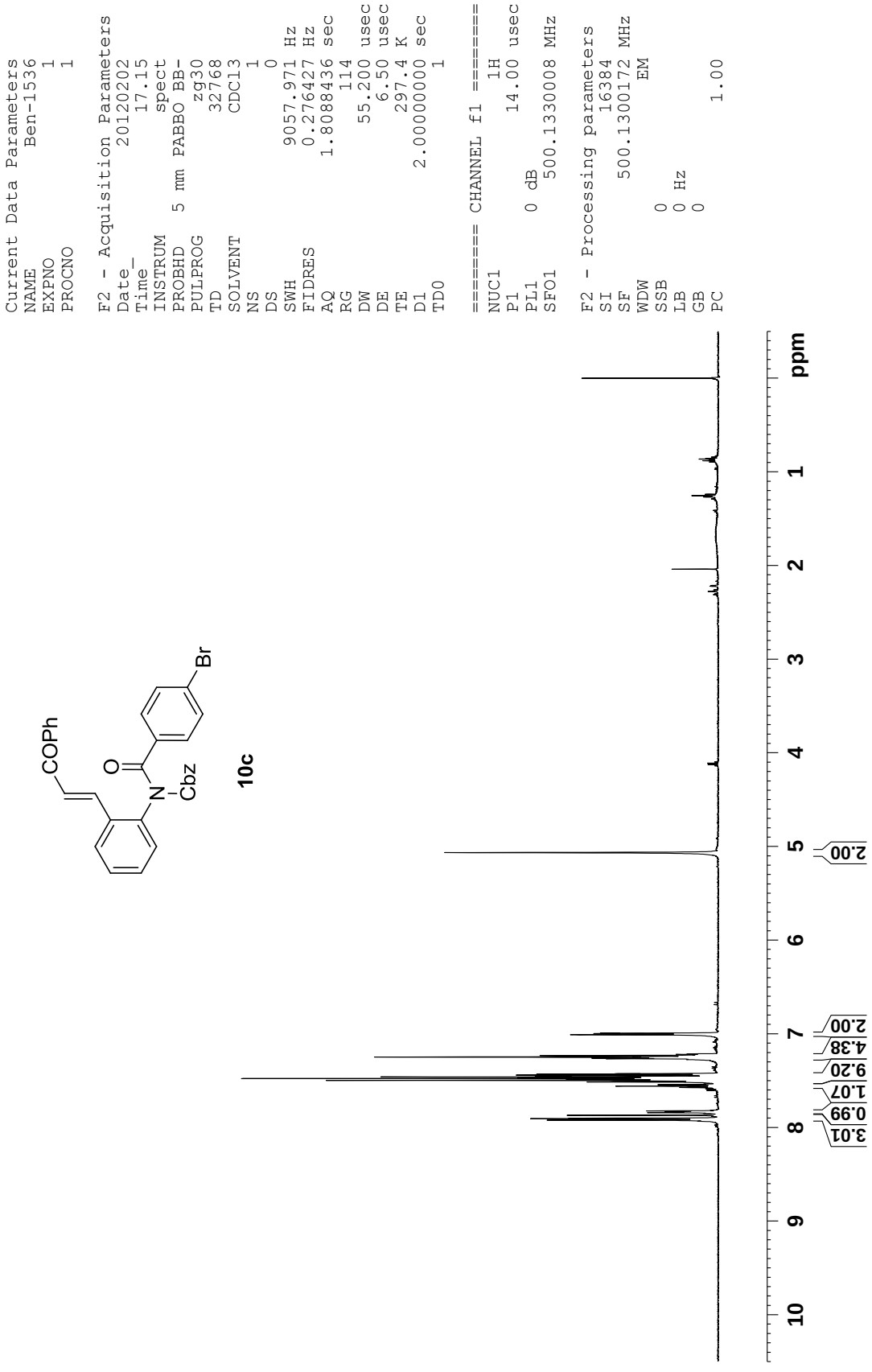

Current Data Parameters
NAME Ben-1545
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 9.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 64
DW 55.200 usec
DE 6.50 usec
TE 292.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300212 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Cbz
OMe
10b
ppm
1
2
3
4
5
6
7
8
9
10
3.07
2.00
3.04
1.04
2.06
1.06
5.19
4.71
2.06
2.06


Current Data Parameters
NAME Ben-1545
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time 10.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 294.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578030 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.29
170.96
162.86
154.37
139.16
138.48
137.77
134.55
133.43
132.71
130.92
130.82
129.79
128.90
128.51
128.32
128.29
128.02
127.47
127.09
125.11
113.63
77.25
77.00
76.75
68.75
55.34
COPh
O
N
Cbz
OMe
10b
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME Ben-1536
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120202
Time 17.15
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 114
DW 55.200 usec
DE 6.50 usec
TE 297.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300172 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Cbz
Br
10c
ppm
10
9
8
7
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4
3
2
1
3.01
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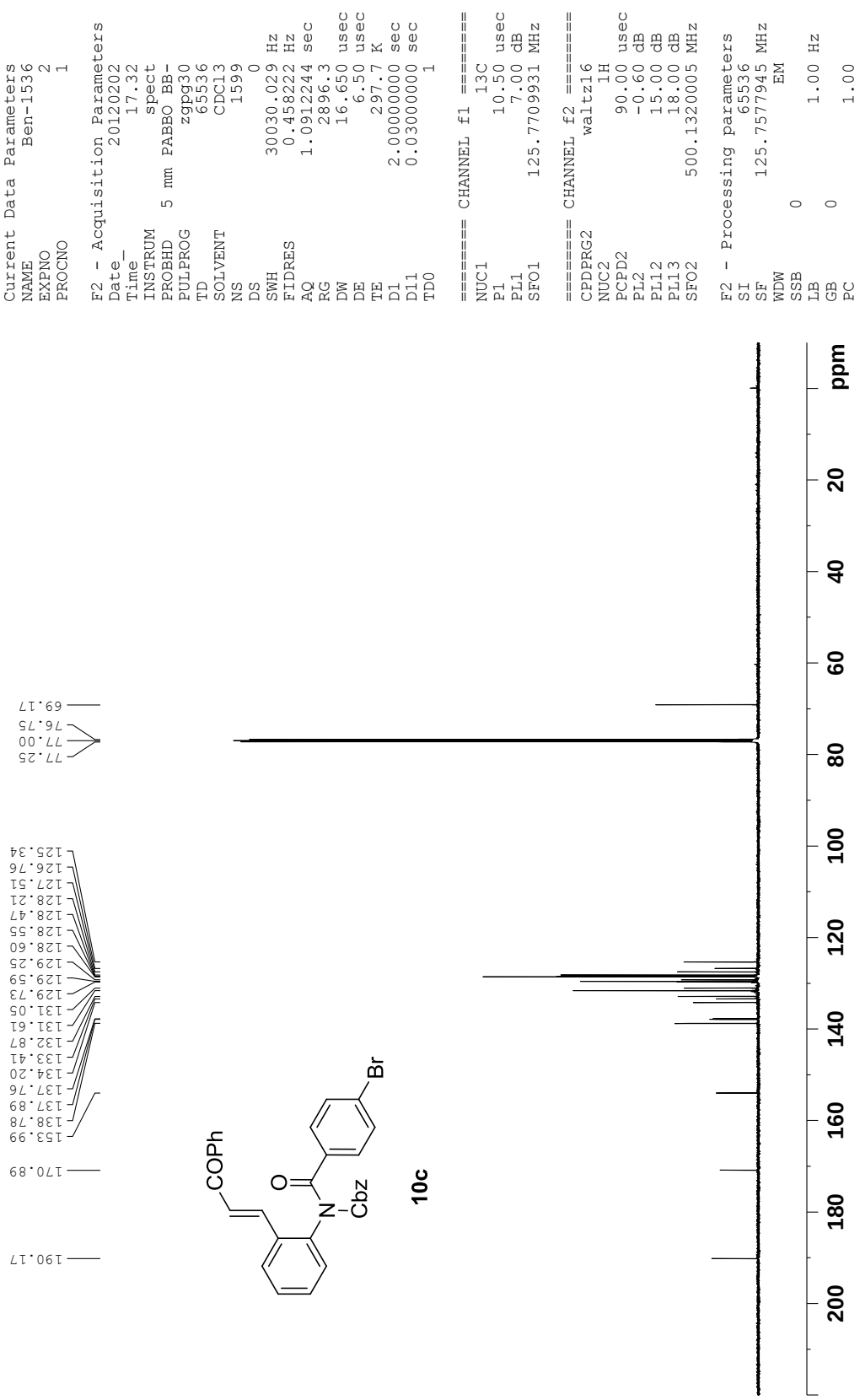
1.07
9.20
4.38
2.00
2.00


Current Data Parameters
NAME Ben-1536
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120202
Time_ 17.32
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1599
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2896.3
DW 16.650 usec
DE 6.50 usec
TE 297.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577945 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.25
77.00
76.75
69.17
190.17
170.89
153.99
138.78
137.89
137.76
134.20
133.41
132.87
131.61
131.05
129.73
129.59
129.25
128.60
128.55
128.47
128.21
127.51
126.76
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COPh
O
N
Cbz
Br
10c
200
180
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140
120
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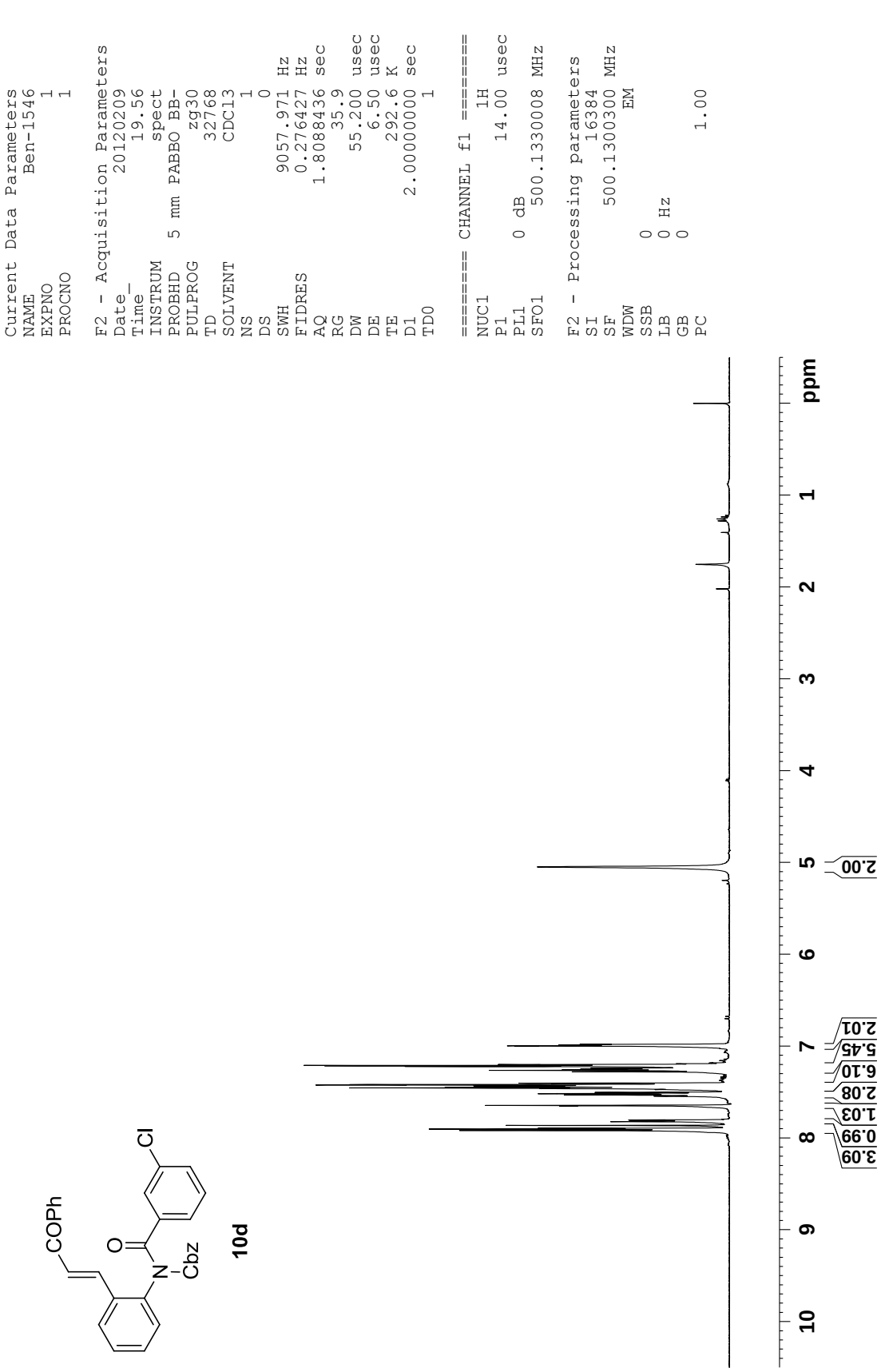
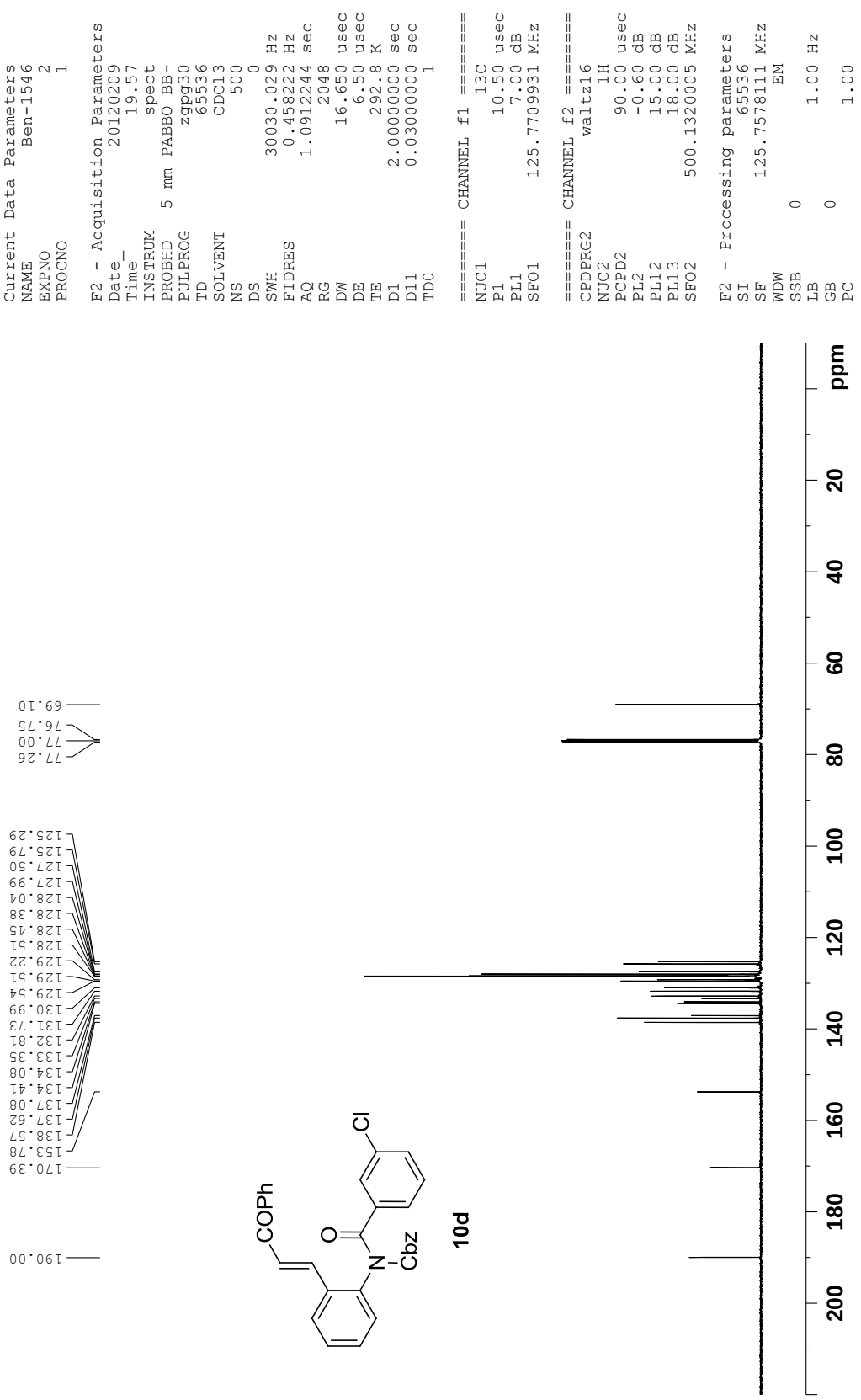
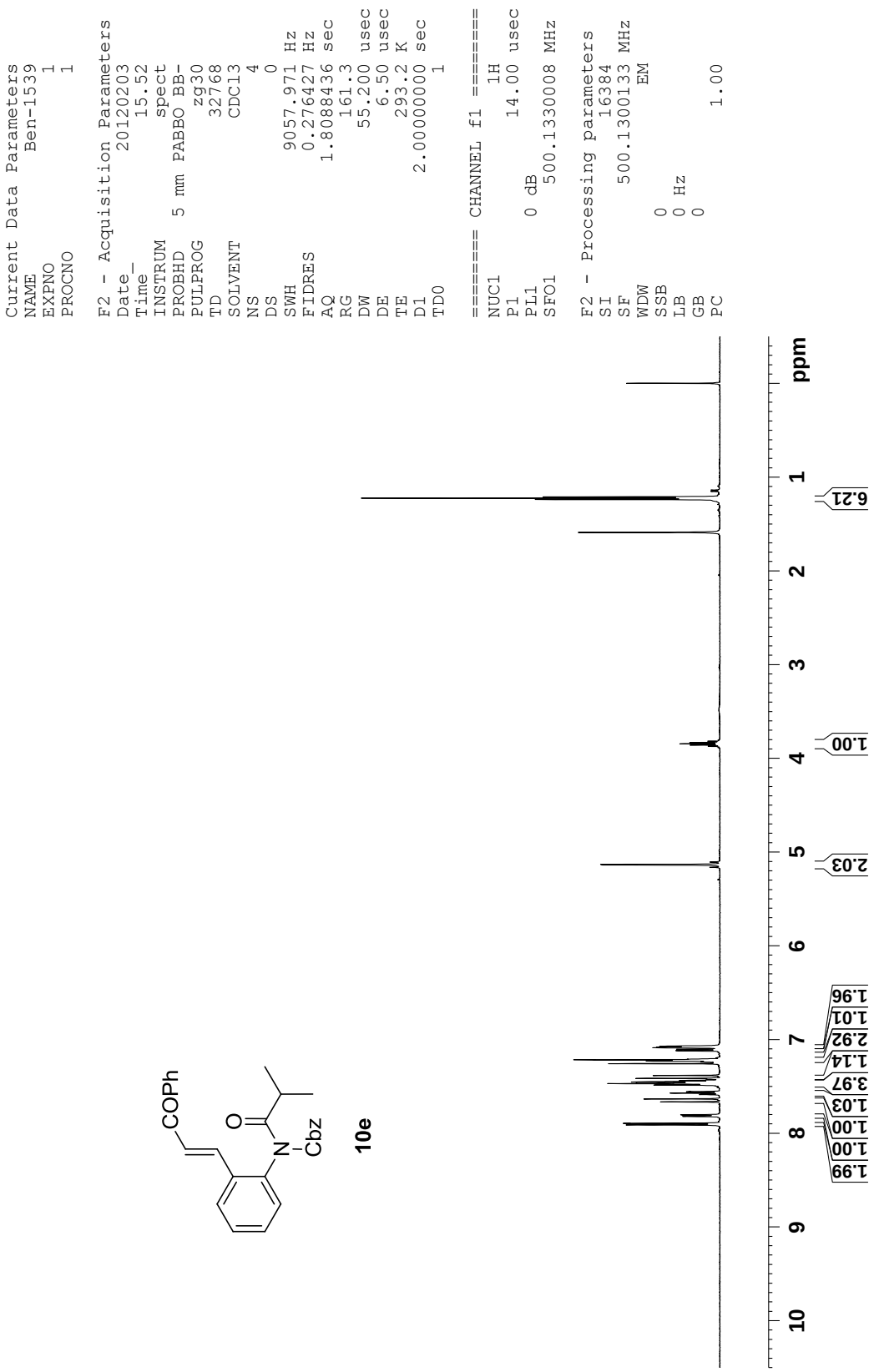
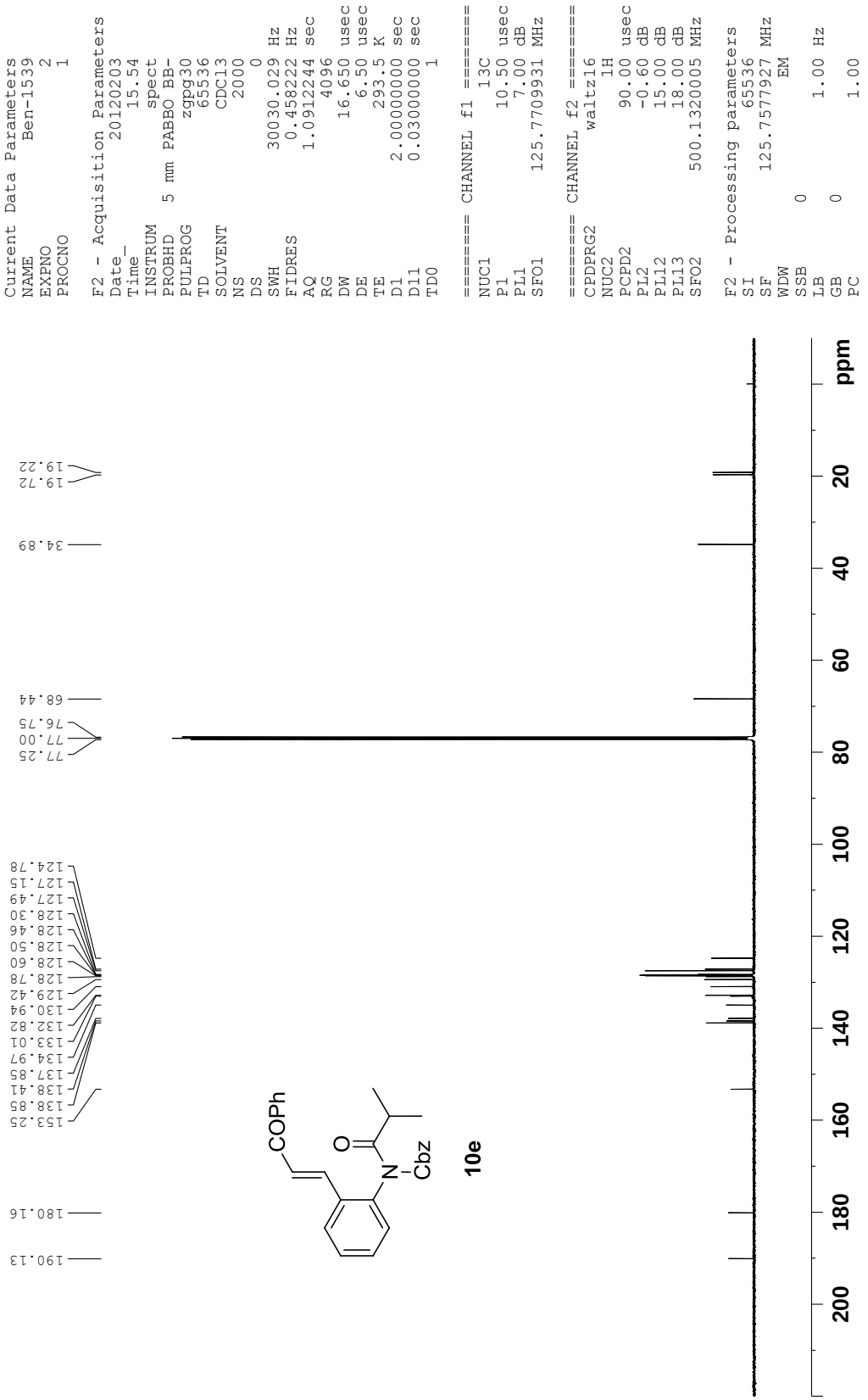
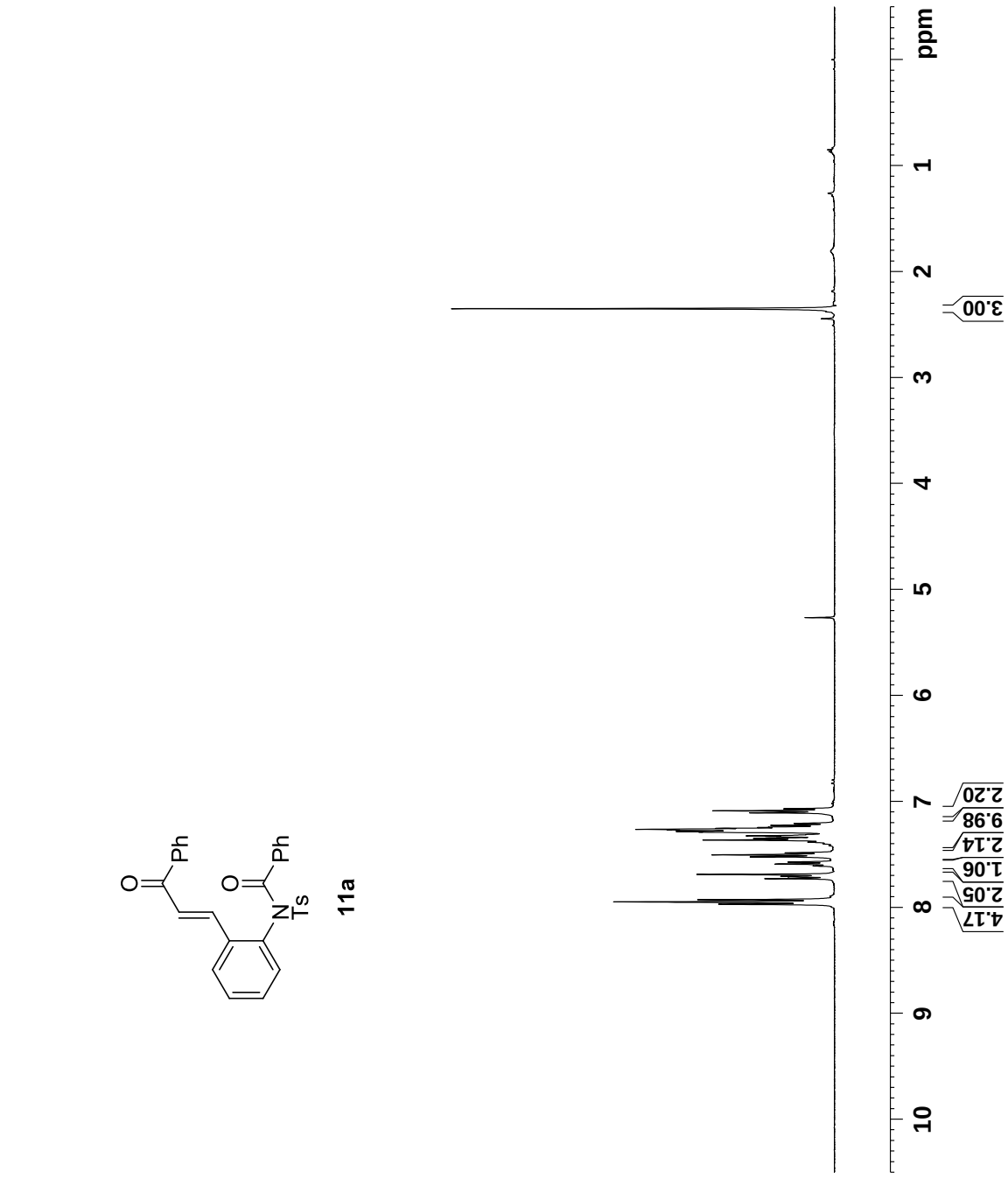
80
60
40
20
ppm

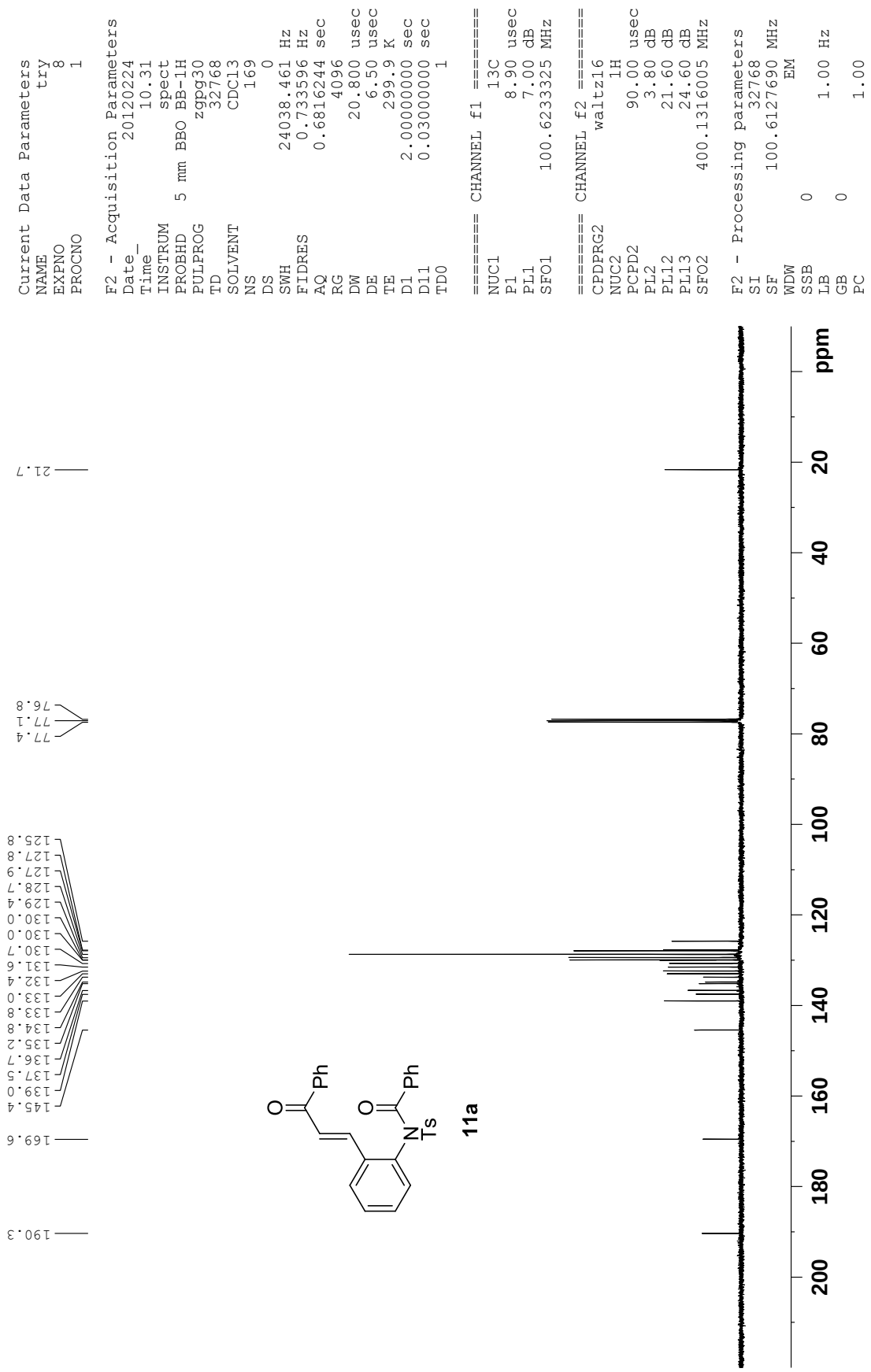

Current Data Parameters
NAME Ben-1546
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120209
Time_ 19.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 35.9
DW 55.200 usec
DE 6.50 usec
TE 292.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300300 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
2.00
3.09
0.99
1.03
2.08
6.10
5.45
2.01
ppm
10d
COPh
O
N
Cbz
Cl

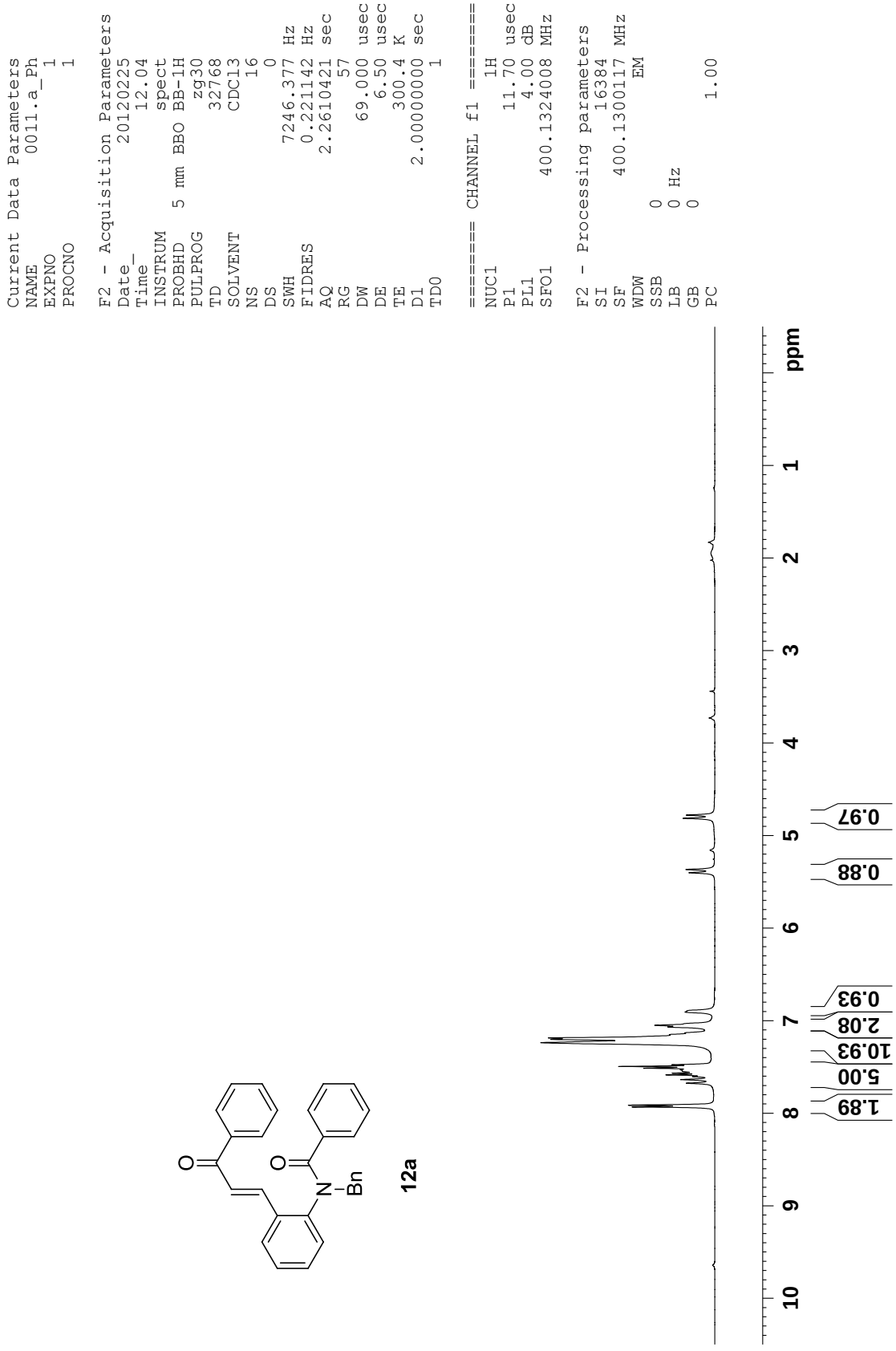

Current Data Parameters
NAME Ben-1546
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120209
Time_ 19.57
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 292.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578111 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.00
170.39
153.78
138.57
137.62
137.08
134.41
134.08
133.35
132.81
131.73
130.99
129.54
129.51
129.22
128.51
128.45
128.38
128.04
127.99
127.50
125.79
125.29
77.26
77.00
76.75
69.10
COPh
O
N
Cbz
Cl
10d
ppm
200
180
160
140
120
100
80
60
40
20

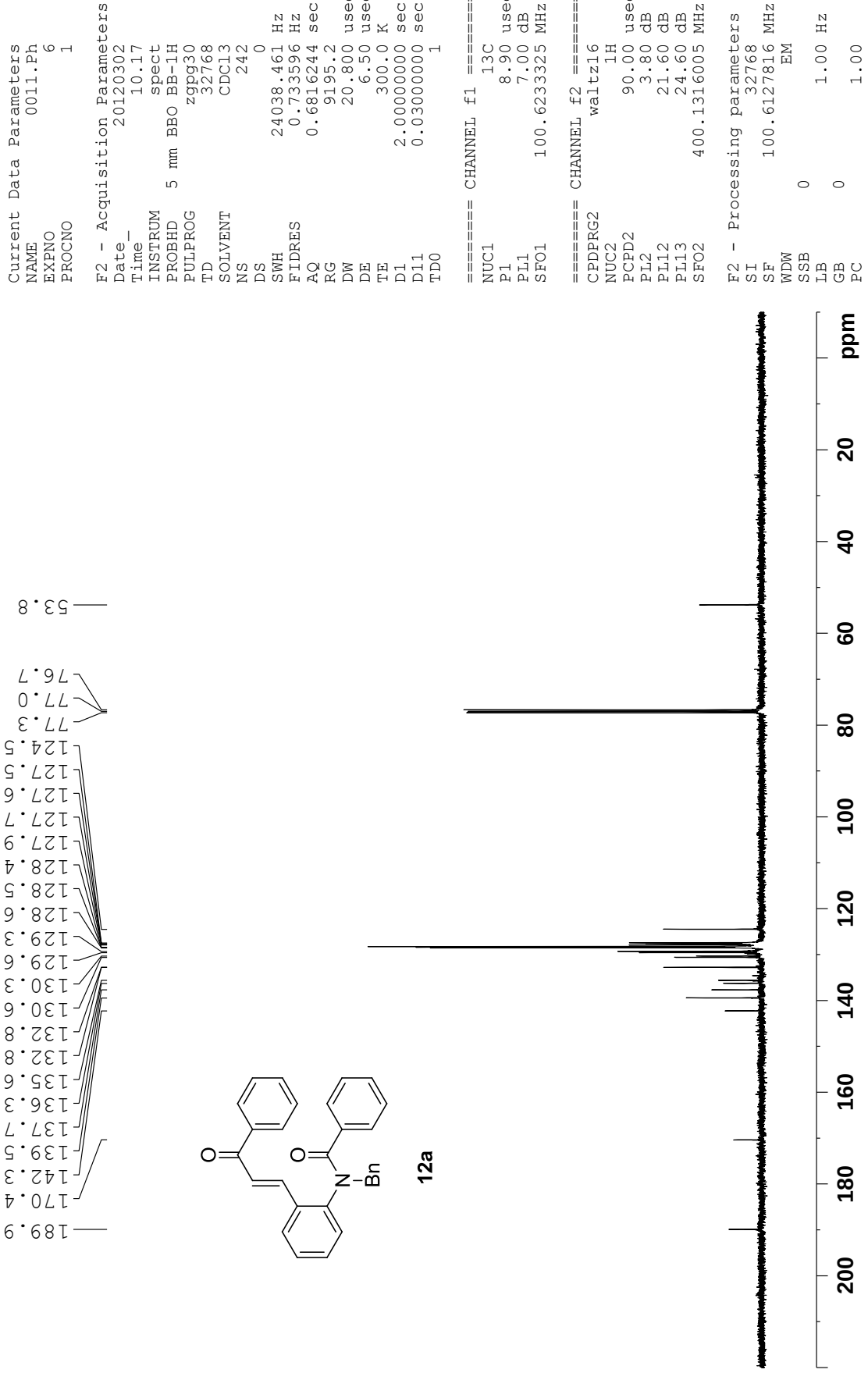

Current Data Parameters
NAME Ben-1539
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120203
Time_ 15.52
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 161.3
DW 55.200 usec
DE 6.50 usec
TE 293.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300133 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
N
Cbz
10e
ppm
1 2 3 4 5 6 7 8 9 10
6.21
1.00
2.03
1.99
1.00
1.00
1.03
3.97
1.14
2.92
1.01
1.96

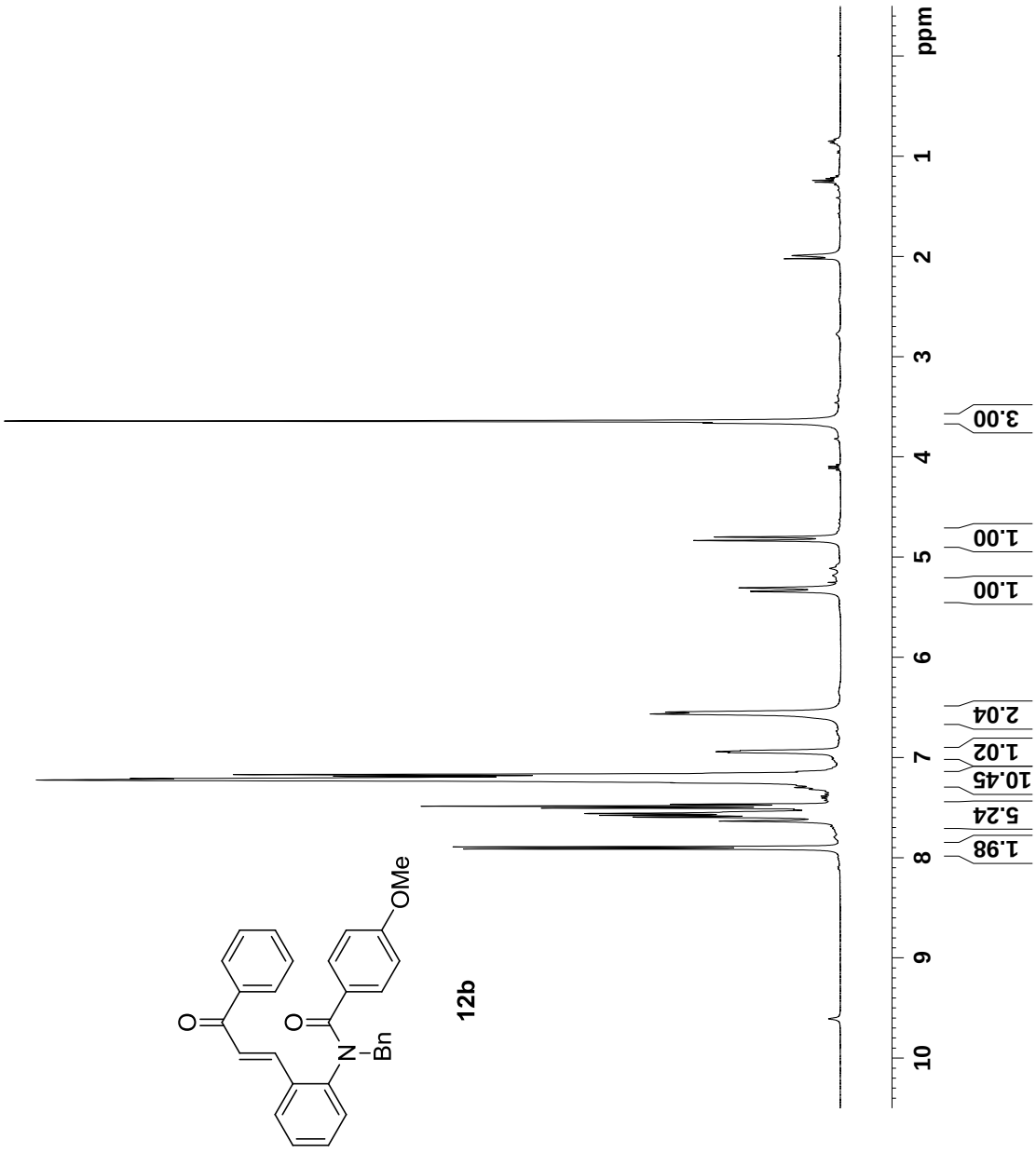

Current Data Parameters
NAME Ben-1539
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120203
Time_ 15.54
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 2000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 293.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577927 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
19.72
19.22
34.89
68.44
76.75
77.00
77.25
124.78
127.15
127.49
128.30
128.46
128.50
128.60
128.78
129.42
130.94
132.82
133.01
134.97
137.85
138.41
138.85
153.25
180.16
190.13
COPh
O
N
Cbz
10e
200
180
160
140
120
100
80
60
40
20
ppm

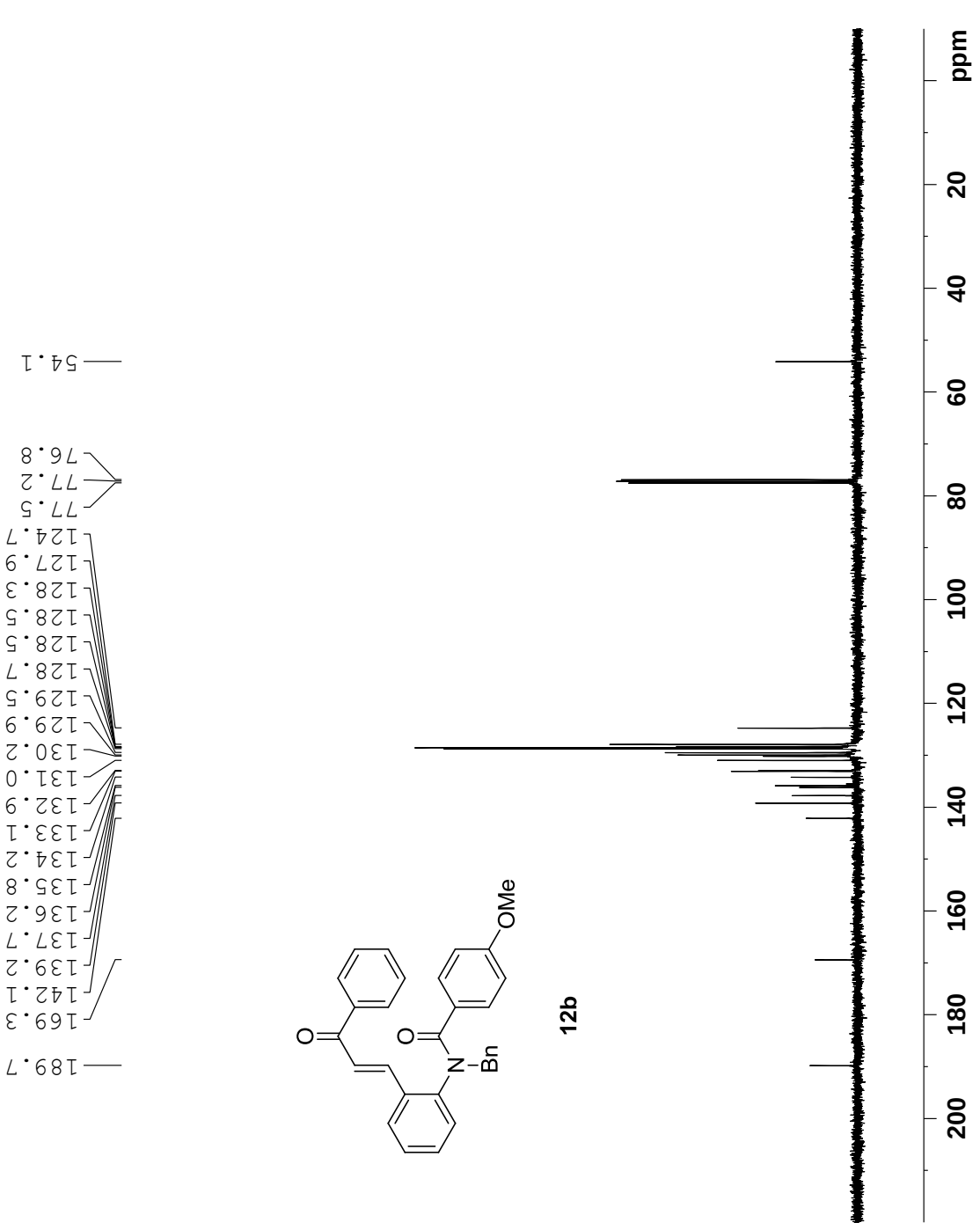

Current Data Parameters
NAME try
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120217
Time_ 11.53
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 57
DW 69.000 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300104 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
O
O
Ph
N
Ts
11a
ppm
10
9
8
7
6
5
4
3
2
1
3.00
4.17
2.05
1.06
2.14
9.98
2.20

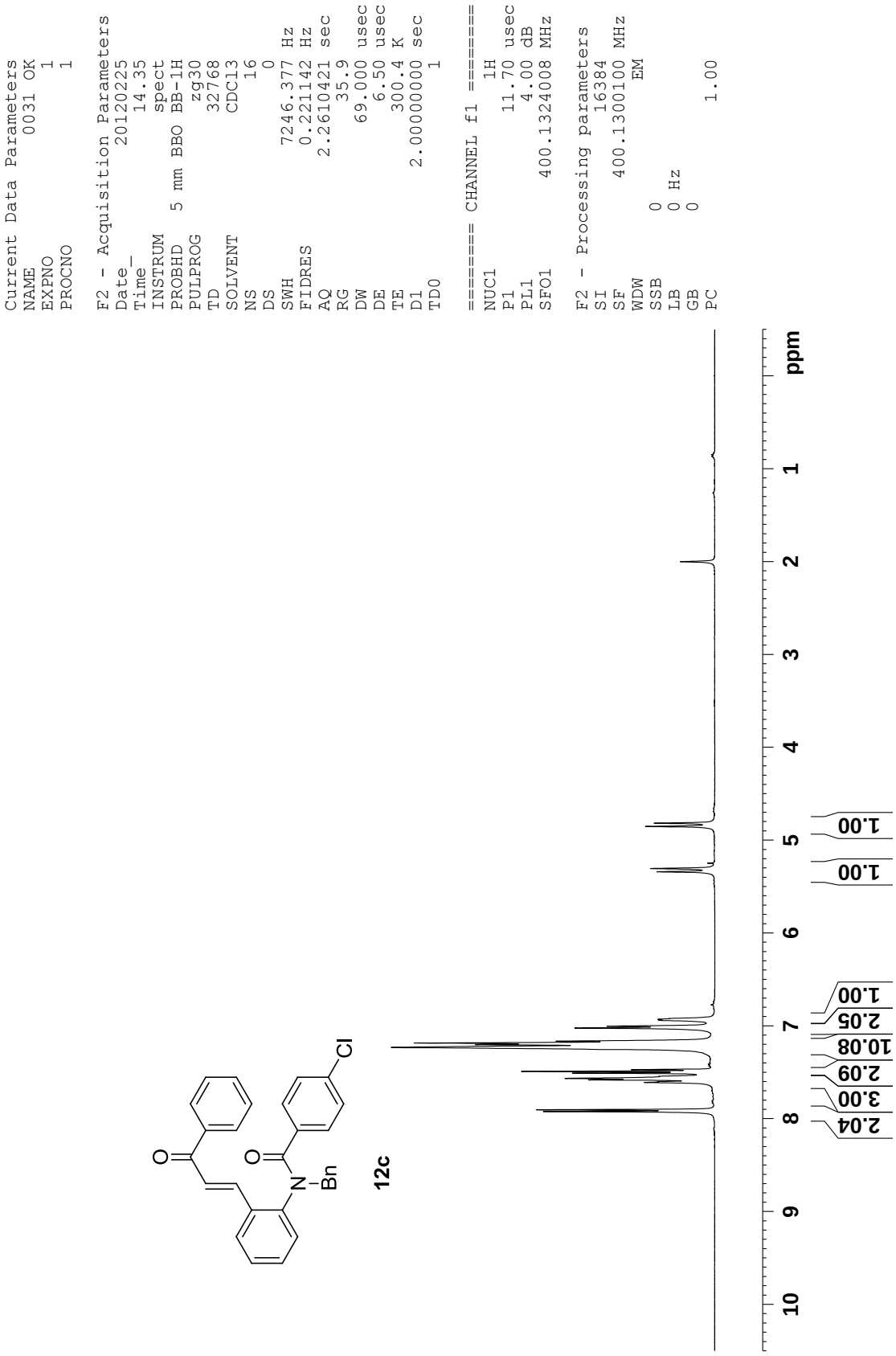

Current Data Parameters
NAME try
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120224
Time 10.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 169
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.7
76.8
77.1
77.4
125.8
127.8
127.9
128.7
129.4
130.0
130.0
130.7
131.6
132.4
133.0
133.8
134.8
135.2
136.7
137.5
139.0
145.4
169.6
190.3
O
Ph
O
N
Ts
Ph
11a
ppm
200
180
160
140
120
100
80
60
40
20

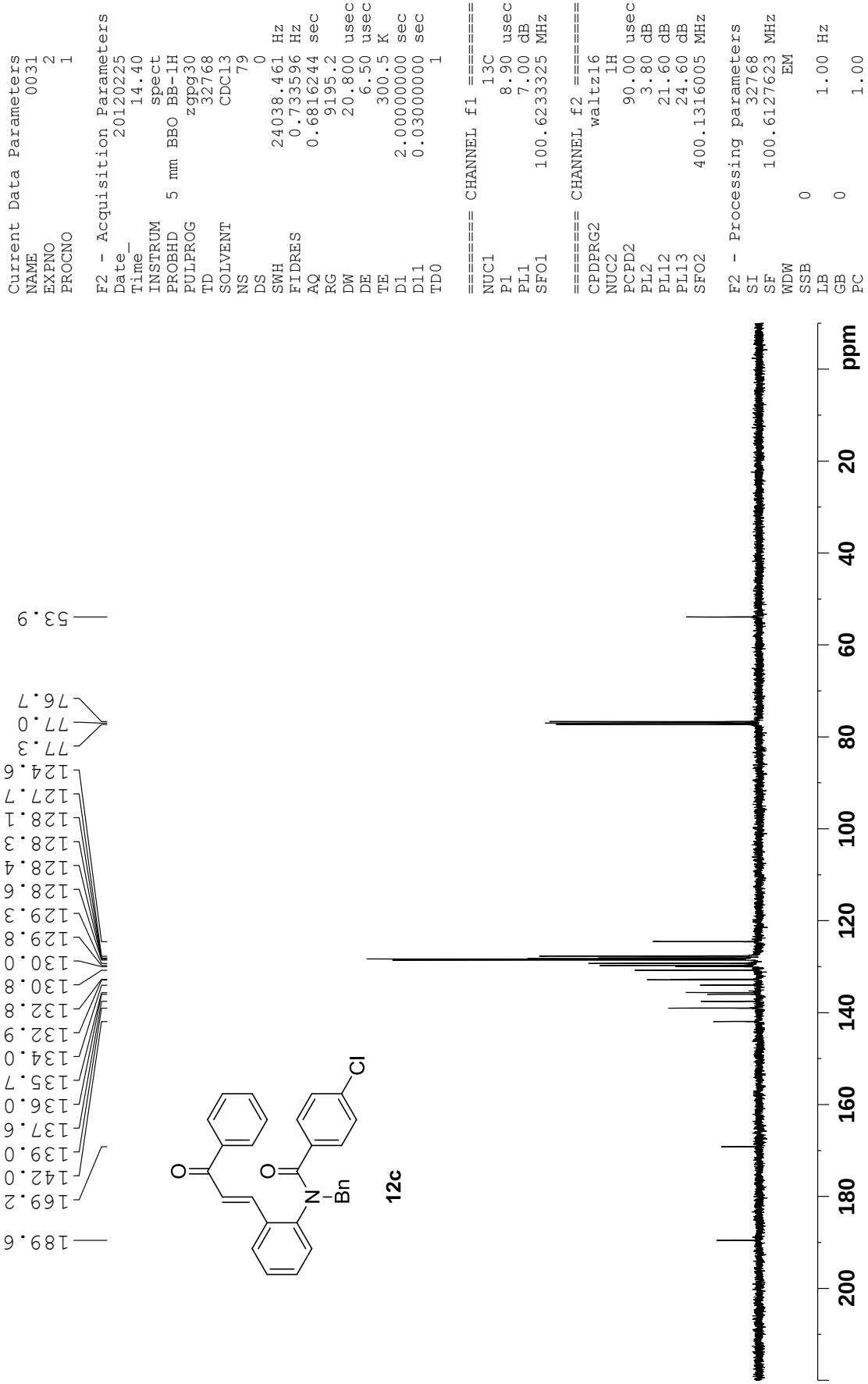

Current Data Parameters
NAME 0011.a_Ph
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120225
Time_ 12.04
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 57
DW 69.000 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300117 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
0.97
0.88
0.93
2.08
10.93
5.00
1.89
ppm
12a

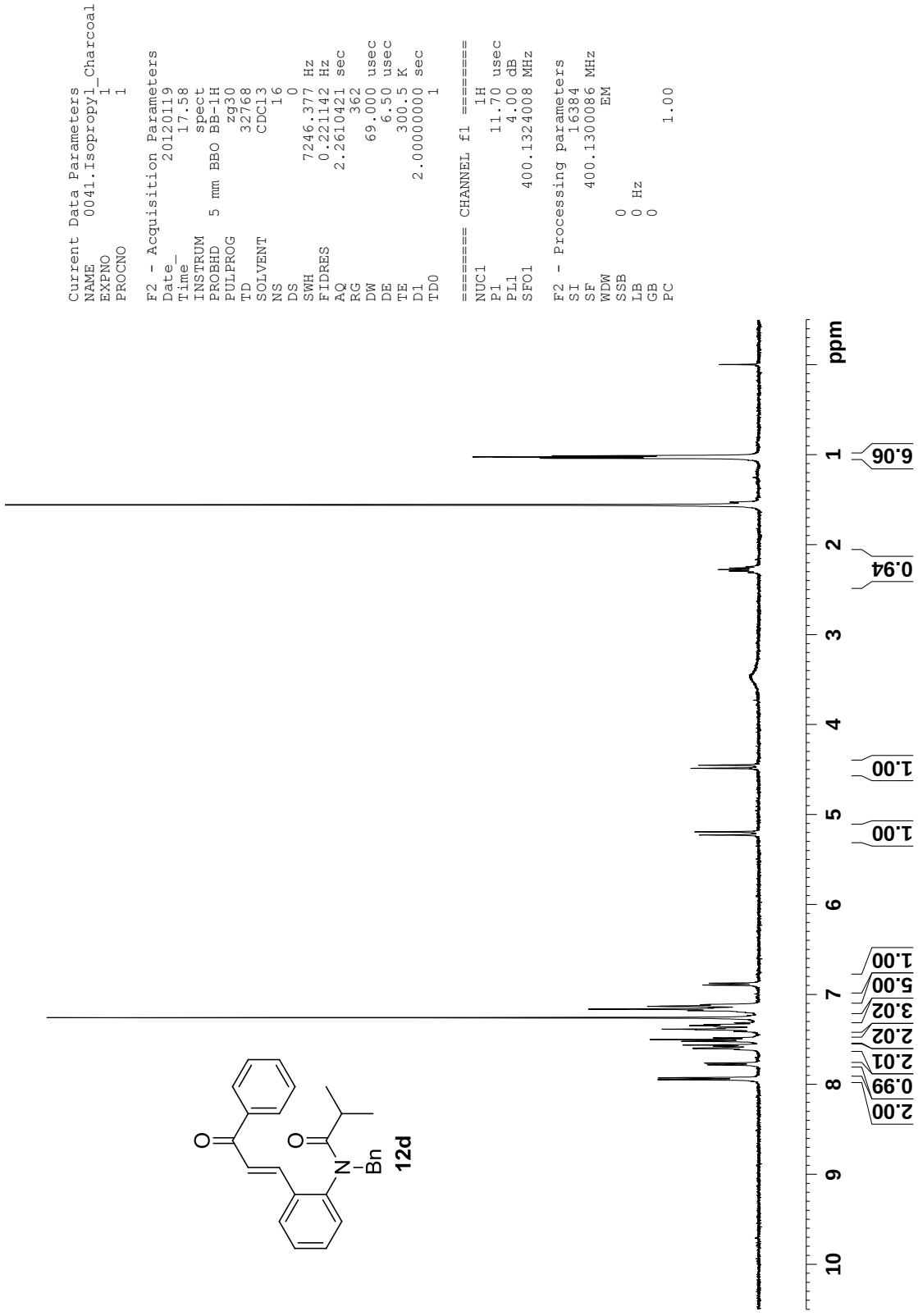

Current Data Parameters
NAME 0011.Ph
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120302
Time 10.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 242
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127816 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.9
170.4
142.3
139.5
137.7
136.3
135.6
132.8
132.8
130.6
130.3
129.6
129.3
128.6
128.5
128.4
127.9
127.7
127.6
127.5
124.5
77.3
77.0
76.7
53.8
O
O
N
Bn
12a
ppm
200
180
160
140
120
100
80
60
40
20

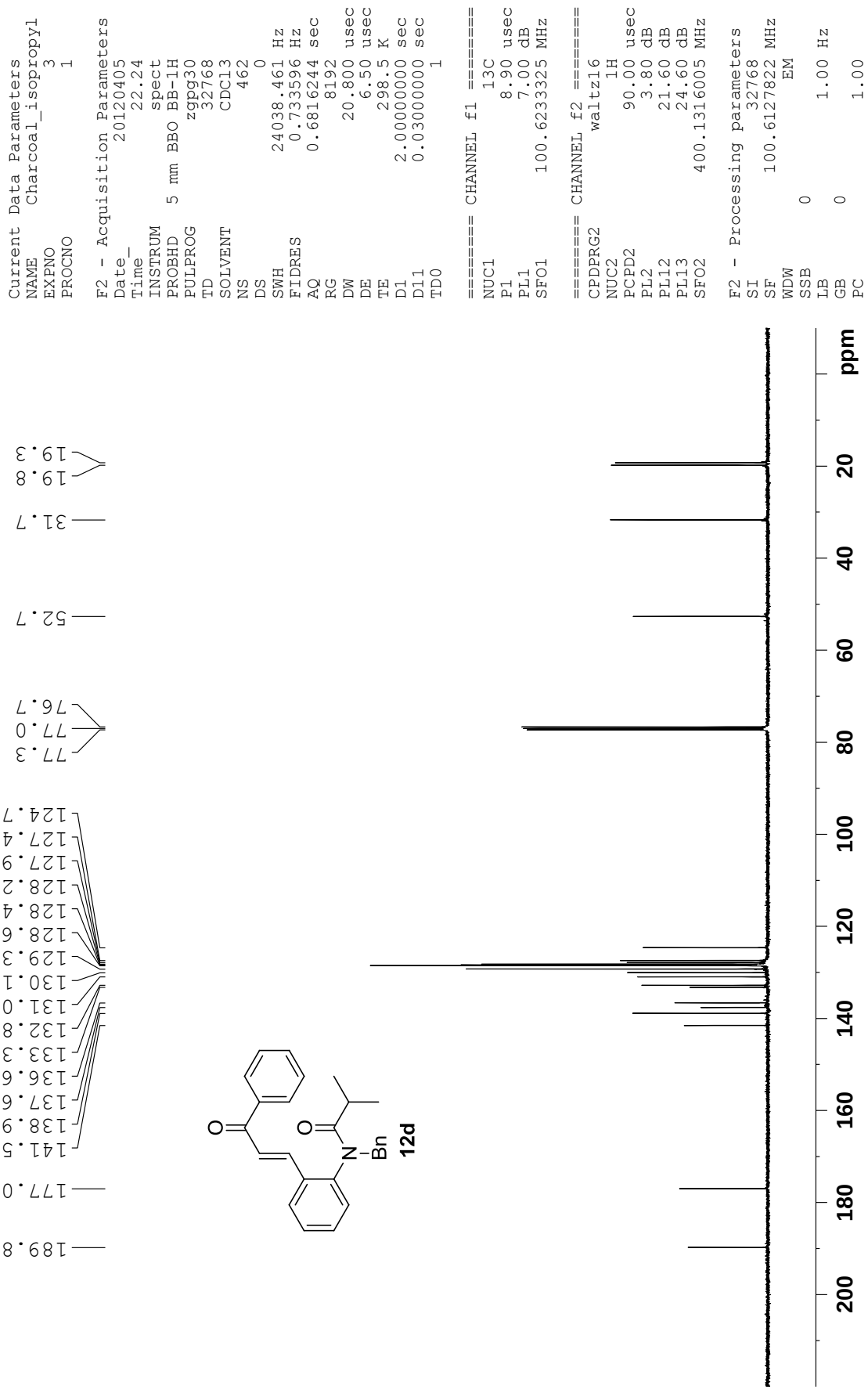

Current Data Parameters
NAME 0021.OMe_Charcoal
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120215
Time_ 7.43
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 40.3
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1 2 3 4 5 6 7 8 9 10
3.00
1.00
1.00
2.04
1.02
10.45
5.24
1.98
12b
O
O
N
Bn
OMe


Current Data Parameters
NAME 0021
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120225
Time 14.40
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 79
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127623 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.7
169.3
142.1
139.2
137.7
136.2
135.8
134.2
133.1
132.9
131.0
130.2
129.9
129.5
128.7
128.5
128.5
128.3
127.9
124.7
77.5
77.2
76.8
54.1
OMe
O
O
N
Bn
12b
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME 0031 OK
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120225
Time_ 14.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 35.9
DW 69.000 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
O
N
Bn
Cl
12c
1.00
1.00
1.00
2.05
10.08
2.09
3.00
2.04
ppm


Current Data Parameters
NAME 0031
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120225
Time 14.40
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 79
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127623 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.6
169.2
142.0
139.0
137.6
136.0
135.7
134.0
132.9
132.8
130.8
130.0
129.8
129.3
128.6
128.4
128.3
128.1
127.7
124.6
77.3
77.0
76.7
53.9
O
O
N
Bn
Cl
12c
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME 0041.Isopropyl_Charcoal
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120119
Time_ 17.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 300.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300086 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
6.06
0.94
1.00
1.00
1.00
5.00
3.02
2.02
2.01
0.99
2.00
O
O
N
Bn
12d


Current Data Parameters
NAME Charcoal_isopropyl
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120405
Time_ 22.24
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 462
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127822 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.8
177.0
141.5
138.9
137.6
136.6
133.3
132.8
131.0
130.1
129.3
128.6
128.4
128.2
127.9
127.4
124.7
77.3
77.0
76.7
52.7
31.7
19.8
19.3
O
O
N
Bn
12d
ppm
200
180
160
140
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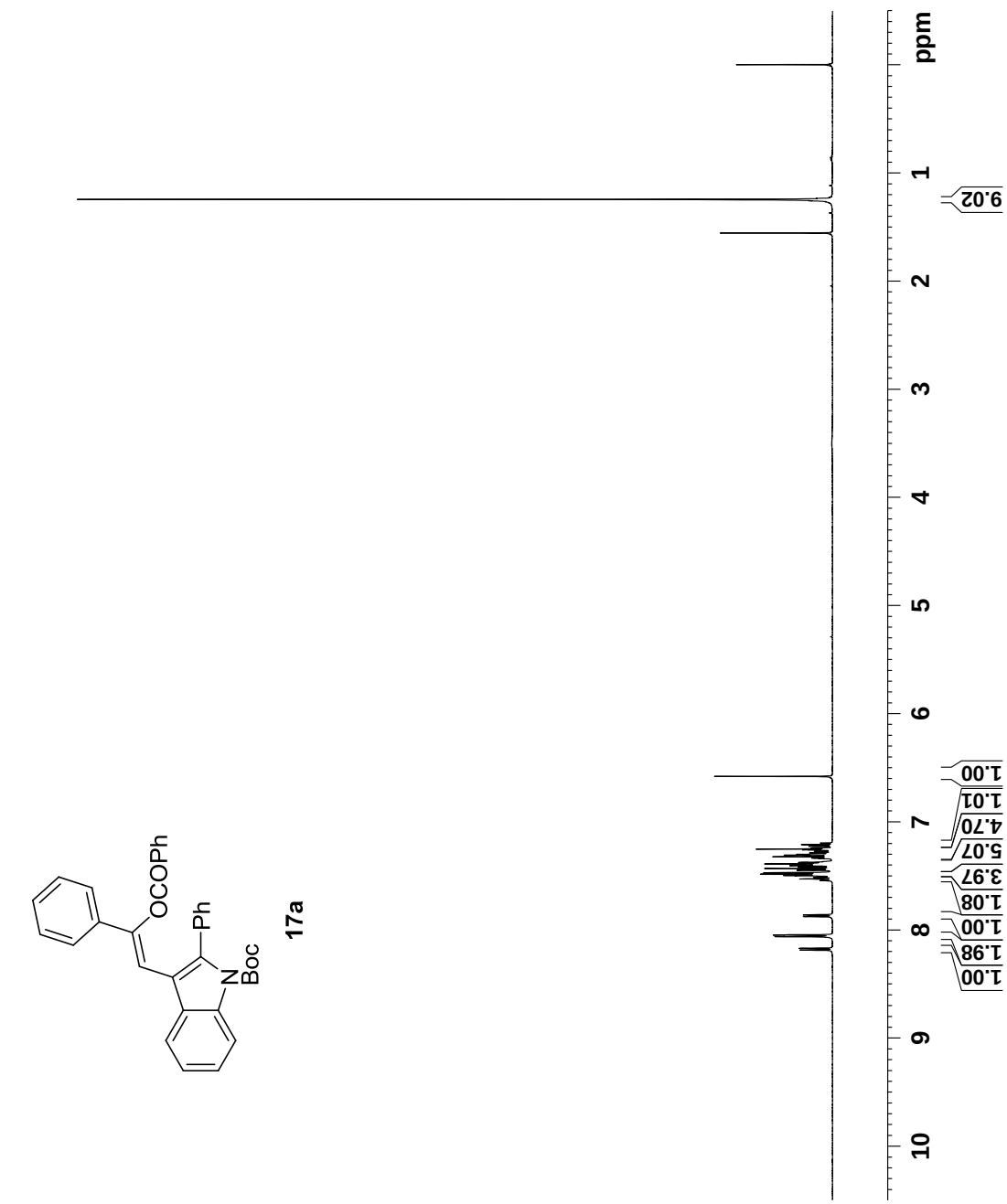
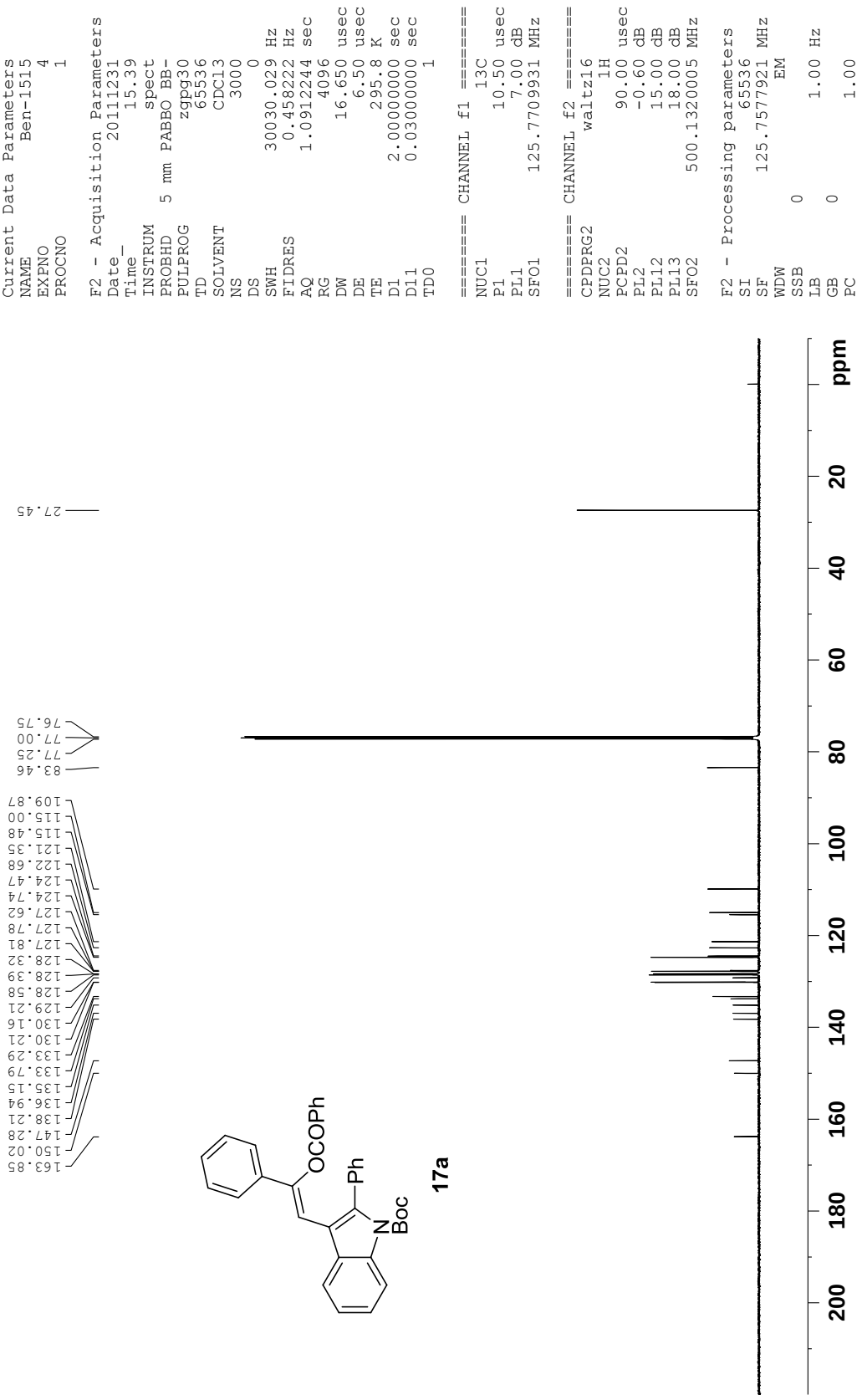
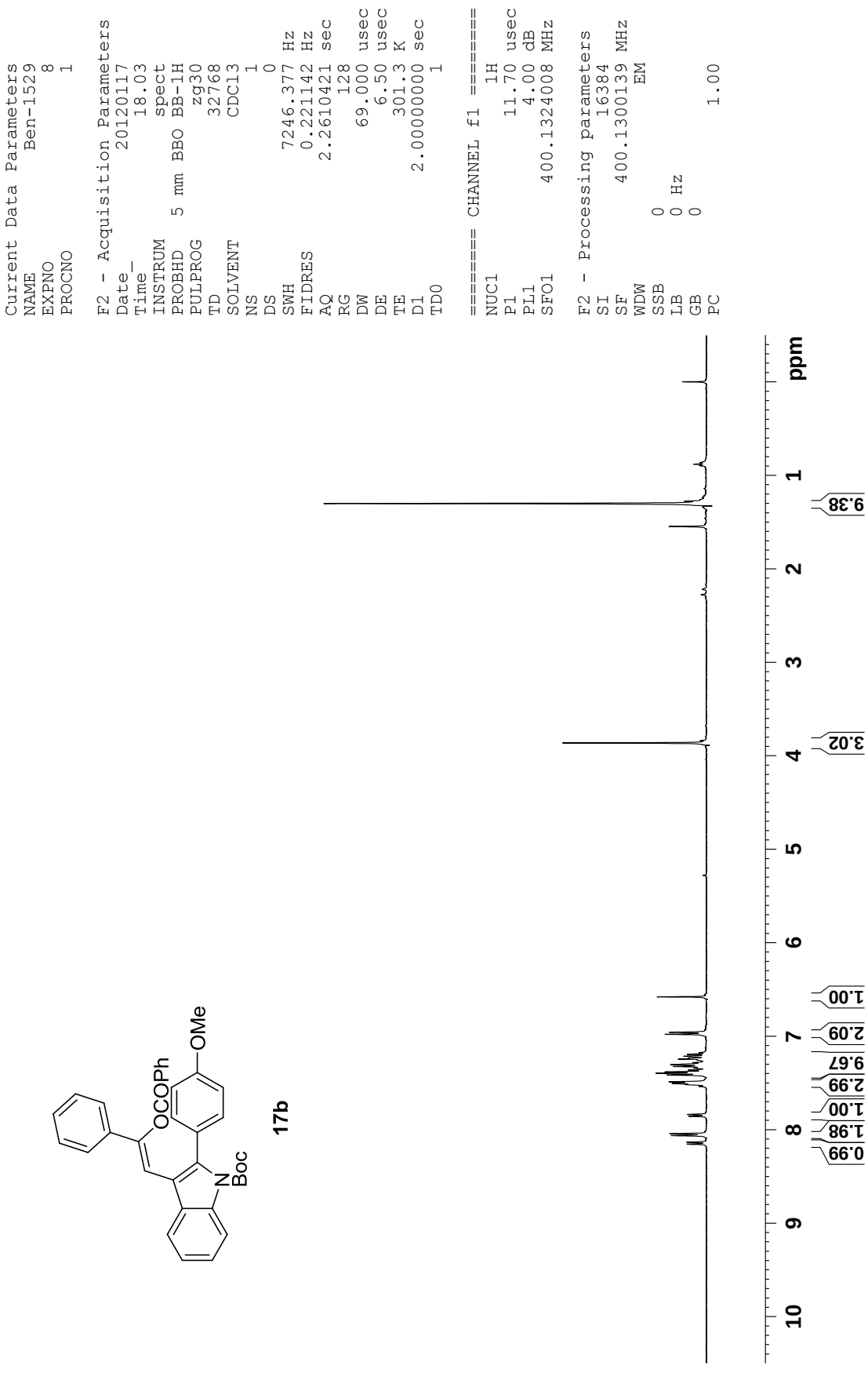
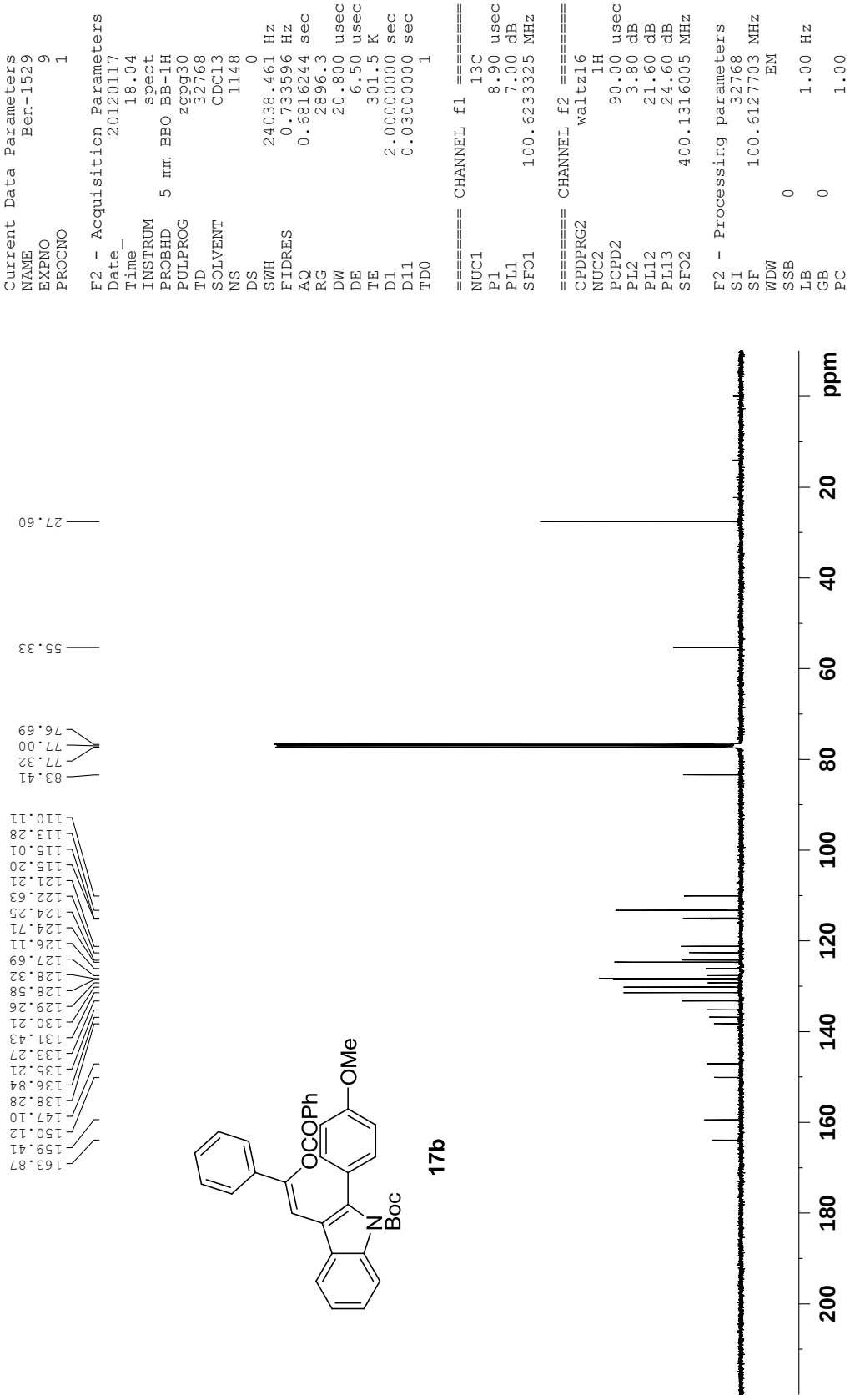
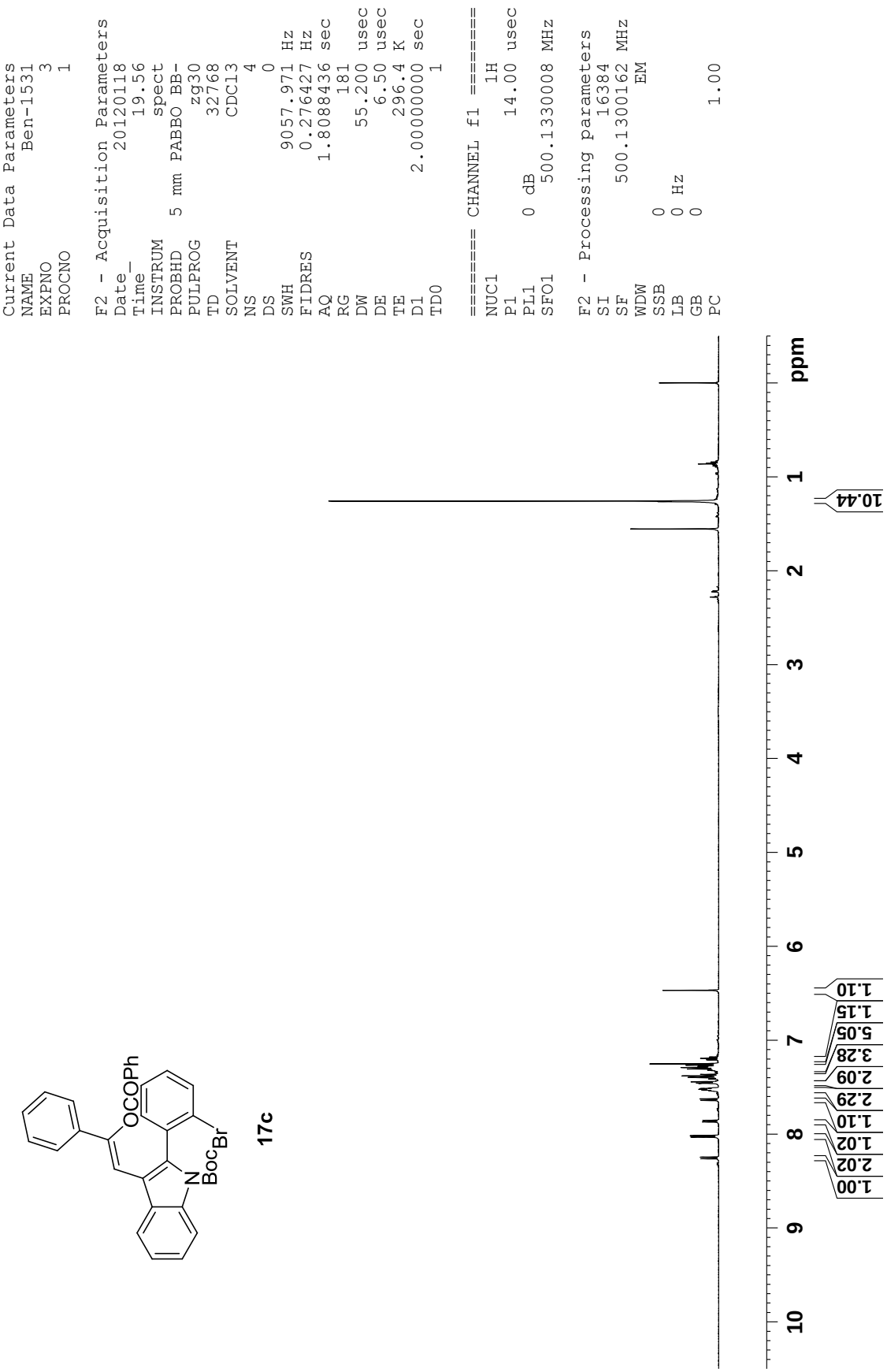
100
80
60
40
20

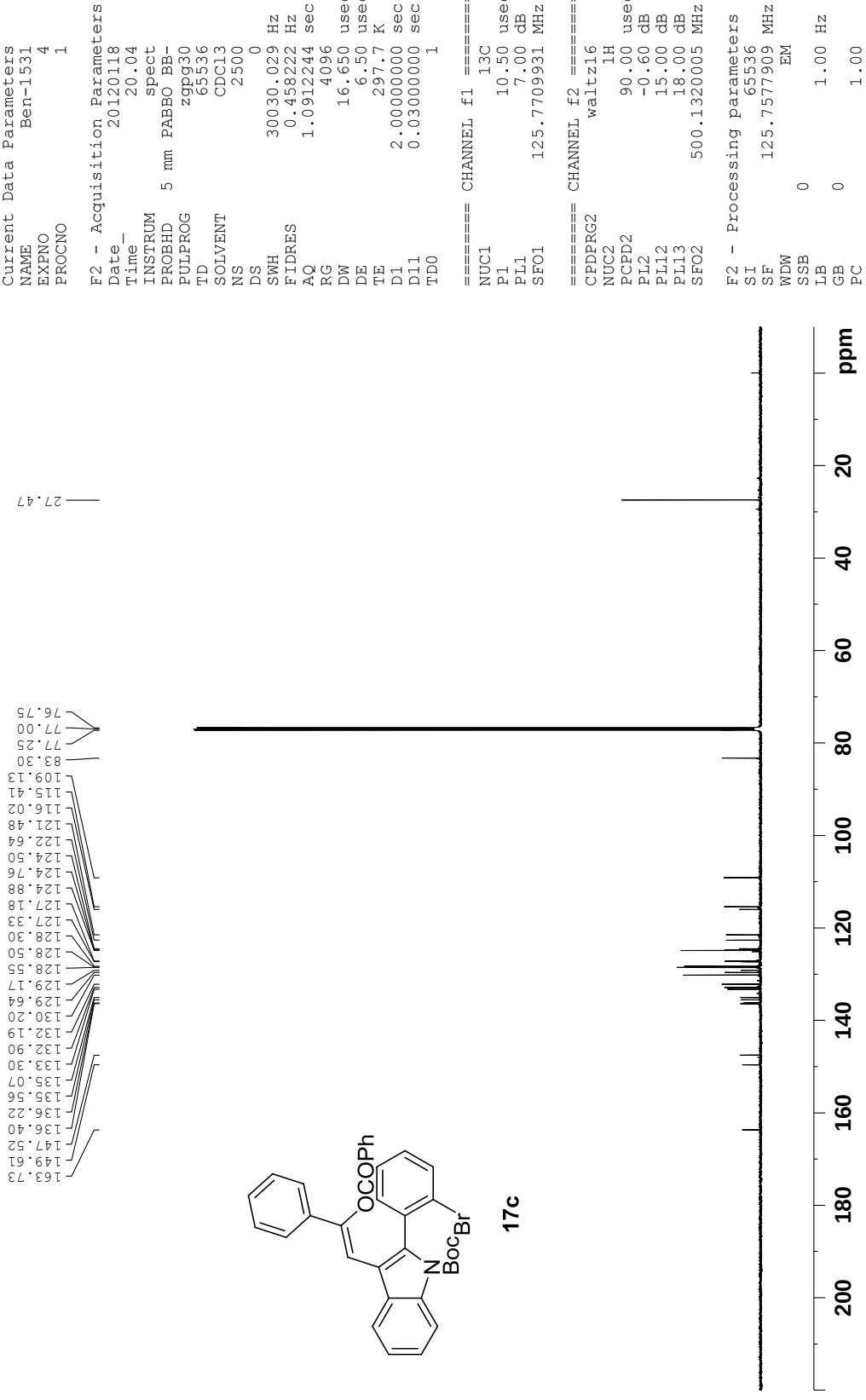

Current Data Parameters
NAME Ben-1515
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111231
Time 15.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 128
DW 55.200 usec
DE 6.50 usec
TE 295.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300173 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OCOPh
Ph
N
Boc
17a
ppm
1
2
3
4
5
6
7
8
9
10
9.02
1.00
1.01
4.70
5.07
3.97
1.08
1.00
1.98
1.00

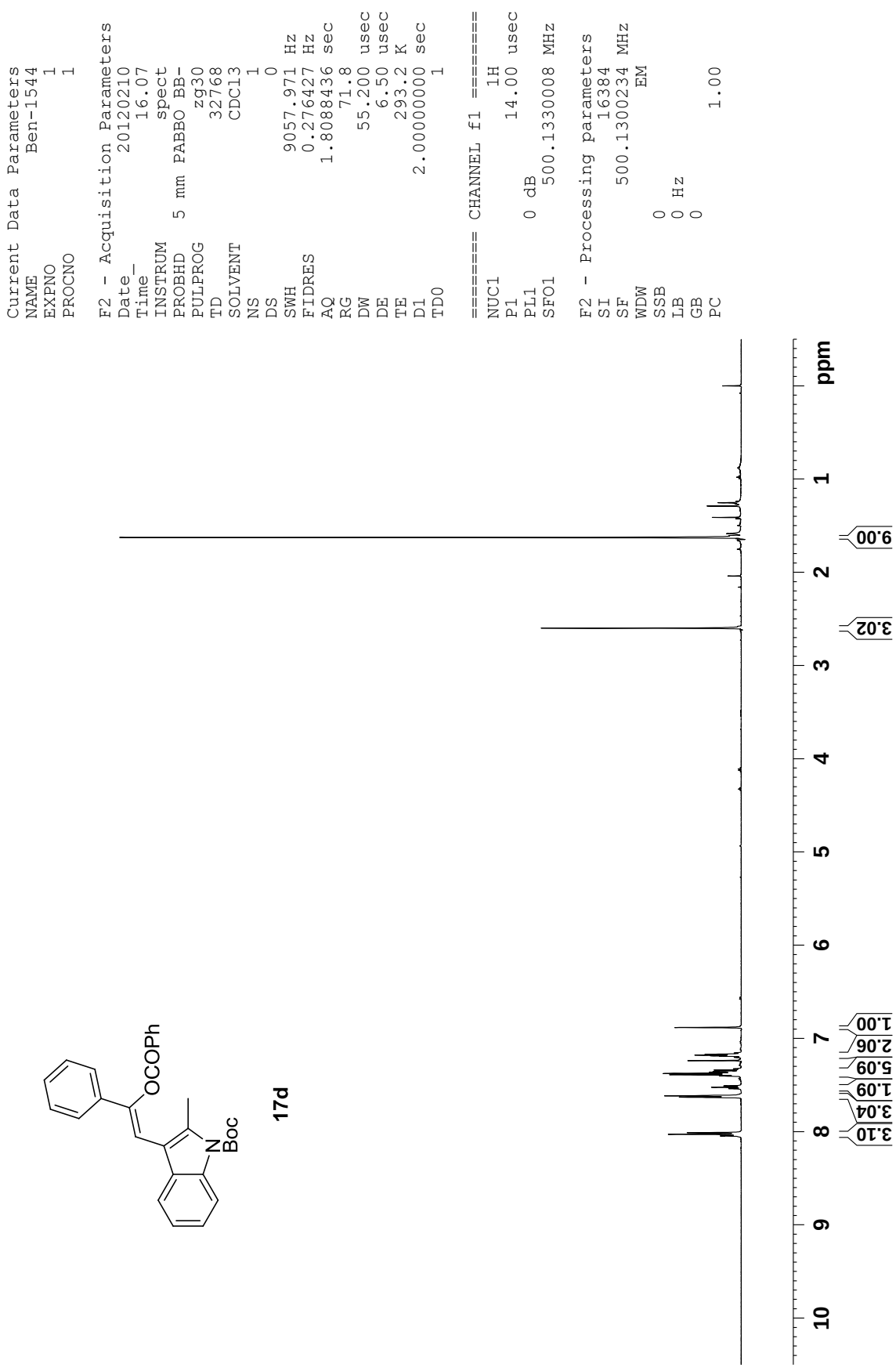

Current Data Parameters
NAME Ben-1515
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111231
Time_ 15.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 295.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577921 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.45
76.75
77.00
77.25
83.46
109.87
115.00
115.48
121.35
122.68
124.47
124.74
127.62
127.78
127.81
128.32
128.39
128.58
129.21
130.16
130.21
133.29
133.79
135.15
136.94
138.21
147.28
150.02
163.85
OCOPh
Ph
N
Boc
17a
200
180
160
140
120
100
80
60
40
20
ppm

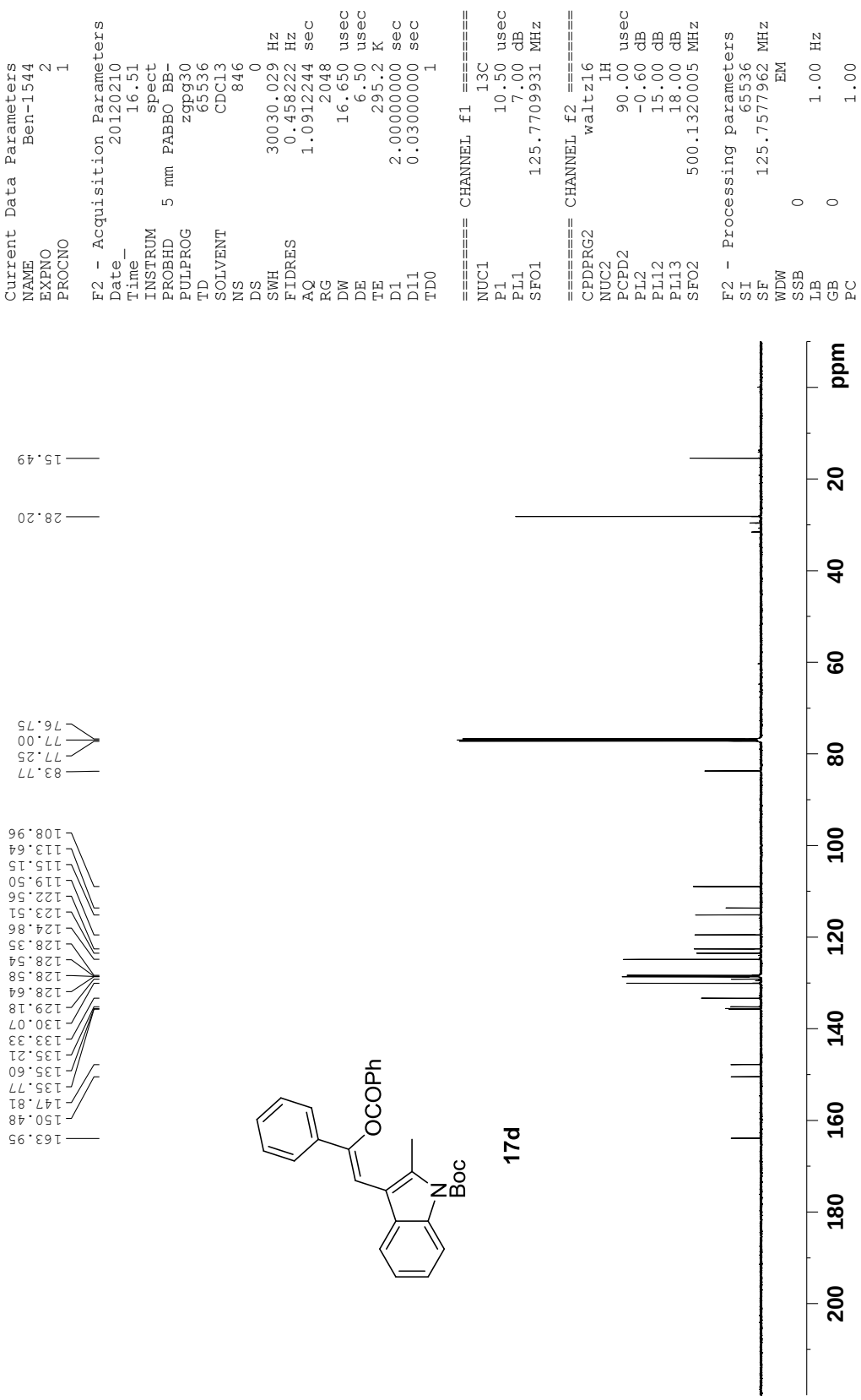

Current Data Parameters
NAME Ben-1529
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120117
Time_ 18.03
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300139 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OMe
OCOPh
N
Boc
17b
ppm
9.38
3.02
1.00
2.09
9.67
2.99
1.00
1.98
0.99

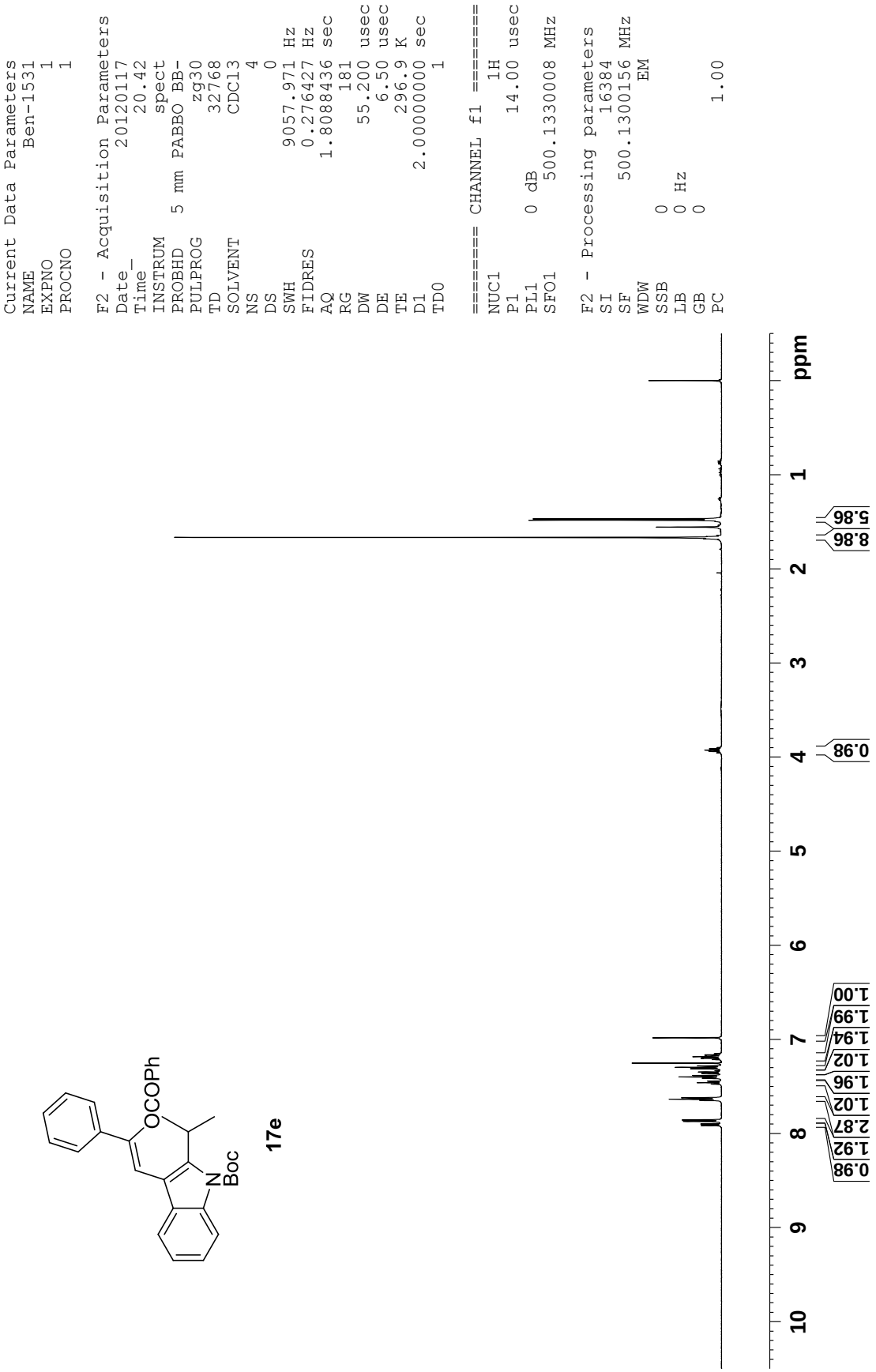

Current Data Parameters
NAME Ben-1529
EXPNO 9
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120117
Time_ 18.04
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1148
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 2896.3
DW 20.800 usec
DE 6.50 usec
TE 301.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127703 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.60
55.33
76.69
77.00
77.32
83.41
110.11
113.28
115.01
115.20
121.21
122.63
124.25
124.71
126.11
127.69
128.32
128.58
129.26
130.21
131.43
133.27
135.21
136.84
138.28
147.10
150.12
159.41
163.87
OCOPh
OMe
N
Boc
17b
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Ben-1531
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120118
Time_ 19.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 296.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300162 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OCOPh
Boc
N
Br
17c
10.44
1.00
2.02
1.02
1.10
2.29
2.09
3.28
5.05
1.15
1.10
ppm
10
9
8
7
6
5
4
3
2
1


Current Data Parameters
NAME Ben-1531
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120118
Time_ 20.04
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 297.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577909 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
27.47
76.75
77.00
77.25
83.30
109.13
115.41
116.02
121.48
122.64
124.50
124.76
124.88
127.18
127.33
128.30
128.50
128.55
129.17
129.64
130.20
132.19
132.90
133.30
135.07
135.56
136.22
136.40
147.52
149.61
163.73
OCOPh
Boc
N
Br
17c
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME Ben-1544
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 16.07
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 71.8
DW 55.200 usec
DE 6.50 usec
TE 293.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300234 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OCOPh
N
Boc
17d
ppm
9.00
3.02
1.00
2.06
5.09
1.09
3.04
3.10


Current Data Parameters
NAME Ben-1544
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time 16.51
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 846
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577962 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
15.49
28.20
76.75
77.00
77.25
83.77
108.96
113.64
115.15
119.50
122.56
123.51
124.86
128.35
128.54
128.58
128.64
129.18
130.07
133.33
135.21
135.60
135.77
147.81
150.48
163.95
OCOPh
N
Boc
17d
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Ben-1531
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120117
Time_ 20.42
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 296.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300156 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OCOPh
N
Boc
17e
ppm
1
2
3
4
5
6
7
8
9
10
5.86
8.86
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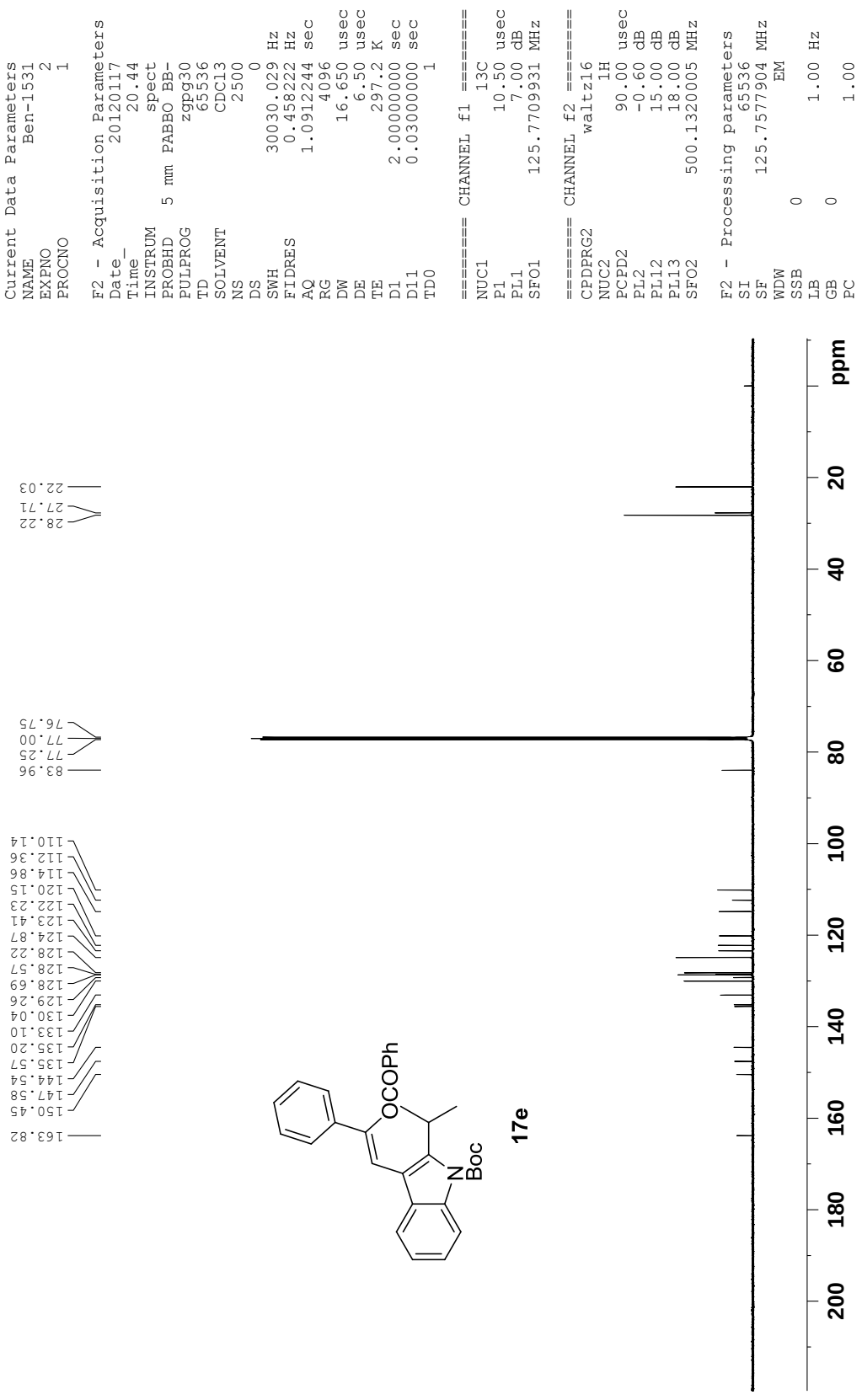
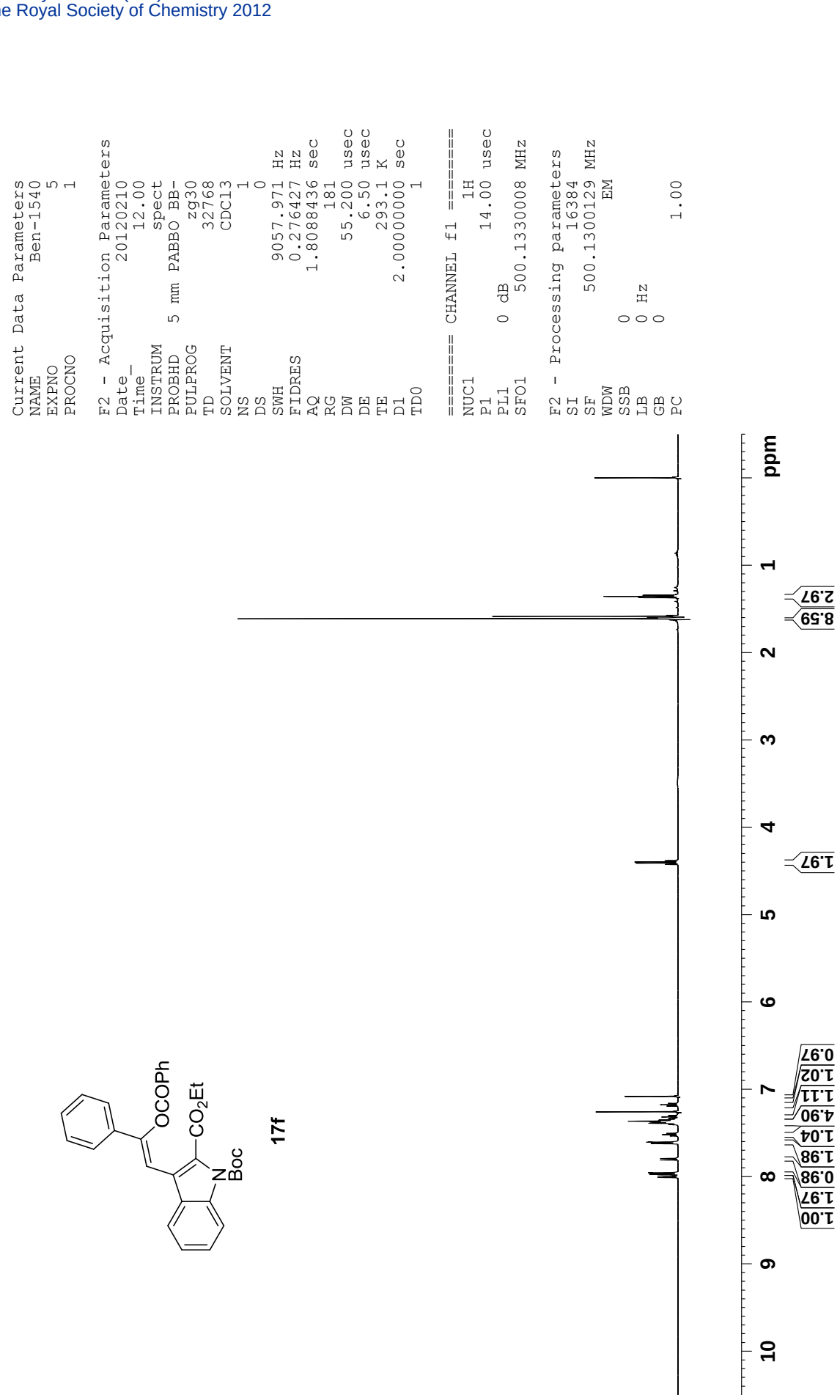
1.00
1.99
1.94
1.02
1.96
1.02
2.87
1.92
0.98


Current Data Parameters
NAME Ben-1531
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120117
Time 20.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 2500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 297.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577904 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
22.03
27.71
28.22
76.75
77.00
77.25
83.96
110.14
112.36
114.86
120.15
122.23
123.41
124.87
128.22
128.57
128.69
129.26
130.04
133.10
135.20
135.57
144.54
147.58
150.45
163.82
OCOPh
N
Boc
17e
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Ben-1540
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time 12.00
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 293.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300129 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OCOPh
CO2Et
N
Boc
17f
ppm
1
2
3
4
5
6
7
8
9
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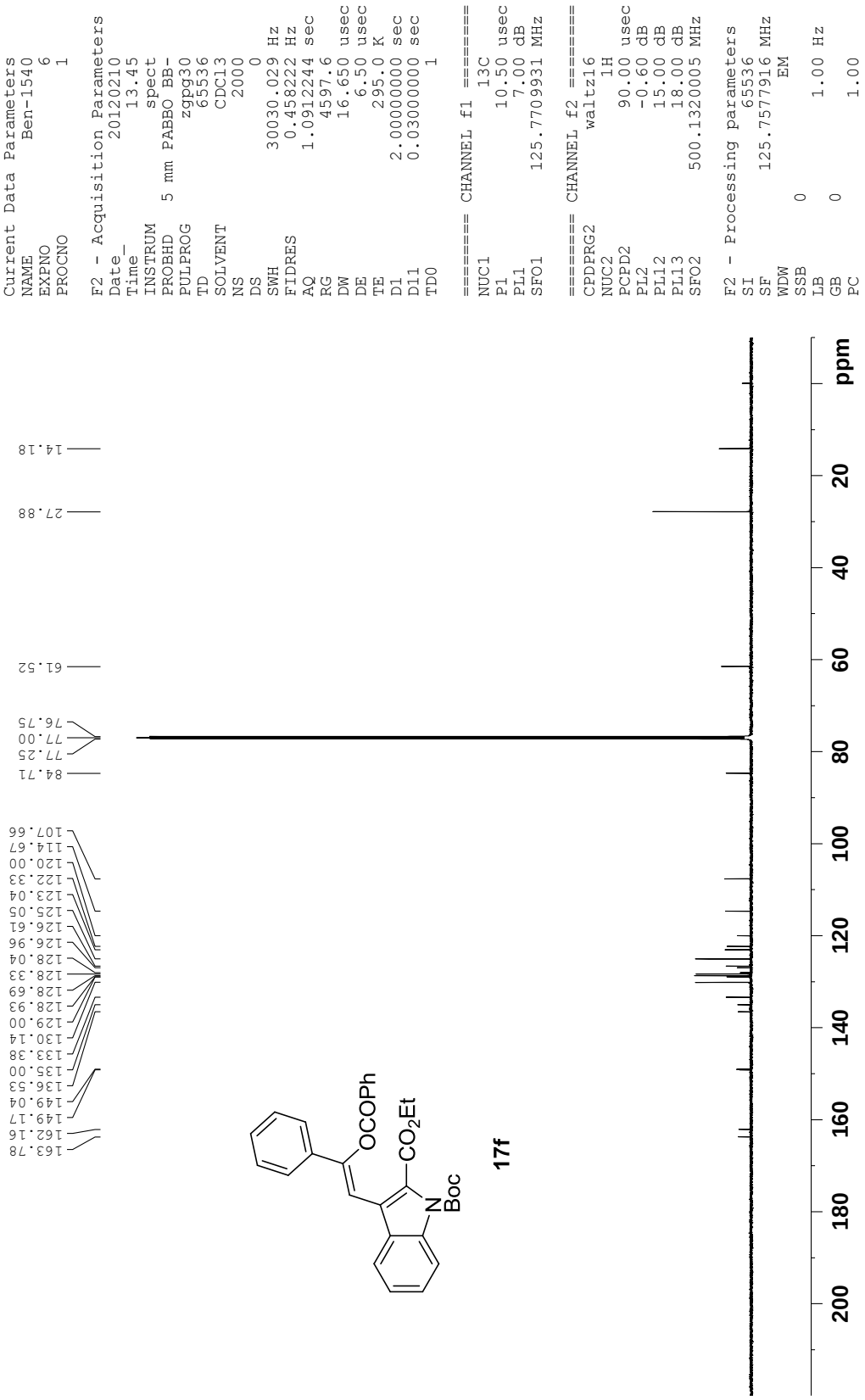
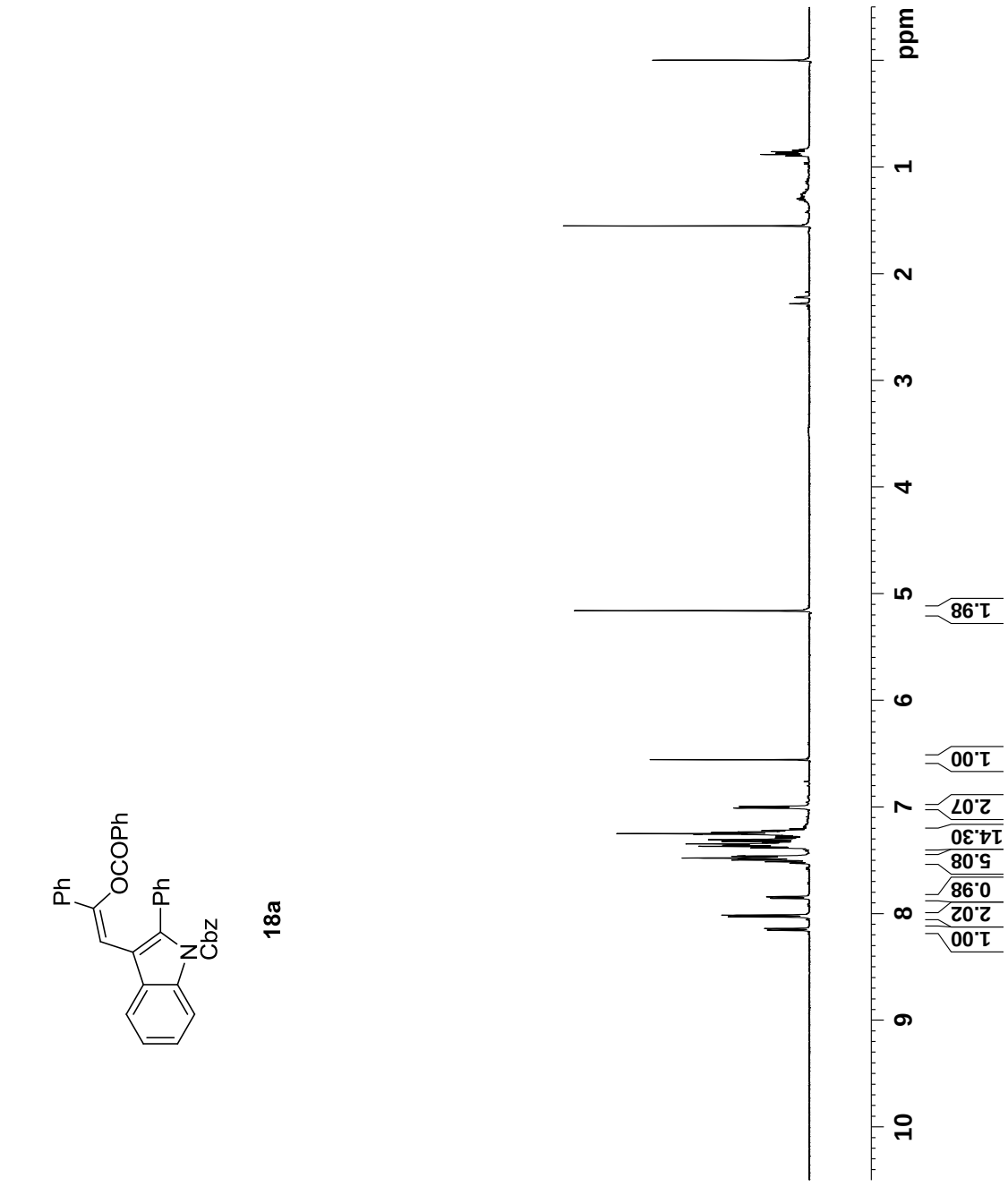
1.00


Current Data Parameters
NAME Ben-1540
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 13.45
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4597.6
DW 16.650 usec
DE 6.50 usec
TE 295.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577916 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
14.18
27.88
61.52
76.75
77.00
77.25
84.71
107.66
114.67
120.00
122.33
123.04
125.05
126.61
126.96
128.04
128.33
128.69
128.93
129.00
130.14
133.38
135.00
136.53
149.04
149.17
162.16
163.78
OCOPh
CO2Et
N
Boc
17f
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Ben-1519
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120109
Time_ 20.30
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 161.3
DW 55.200 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300178 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
OCOPh
Ph
N
Cbz
18a
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5.08
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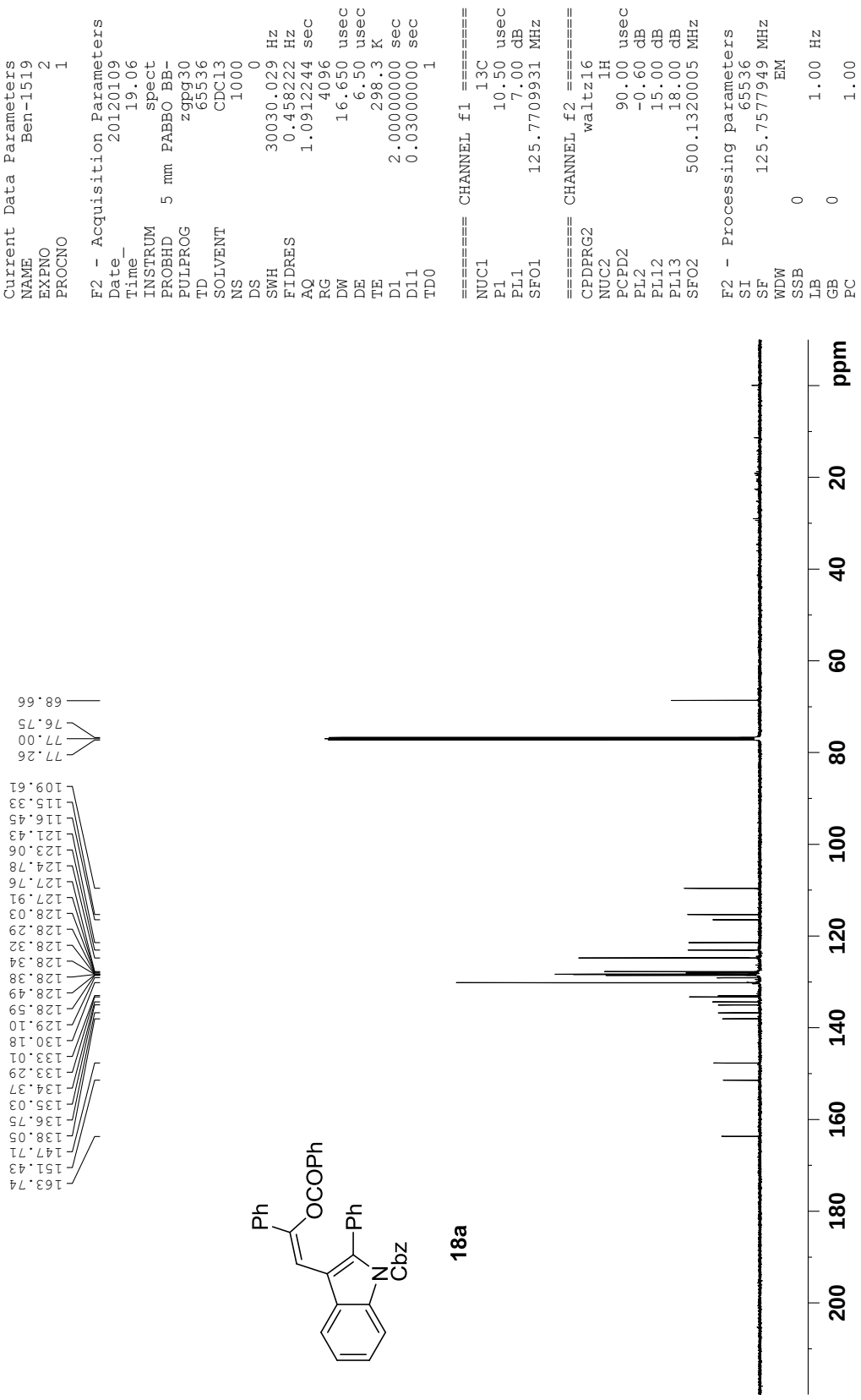
2.02
1.00
ppm


Current Data Parameters
NAME Ben-1519
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120109
Time_ 19.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577949 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
68.66
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77.26
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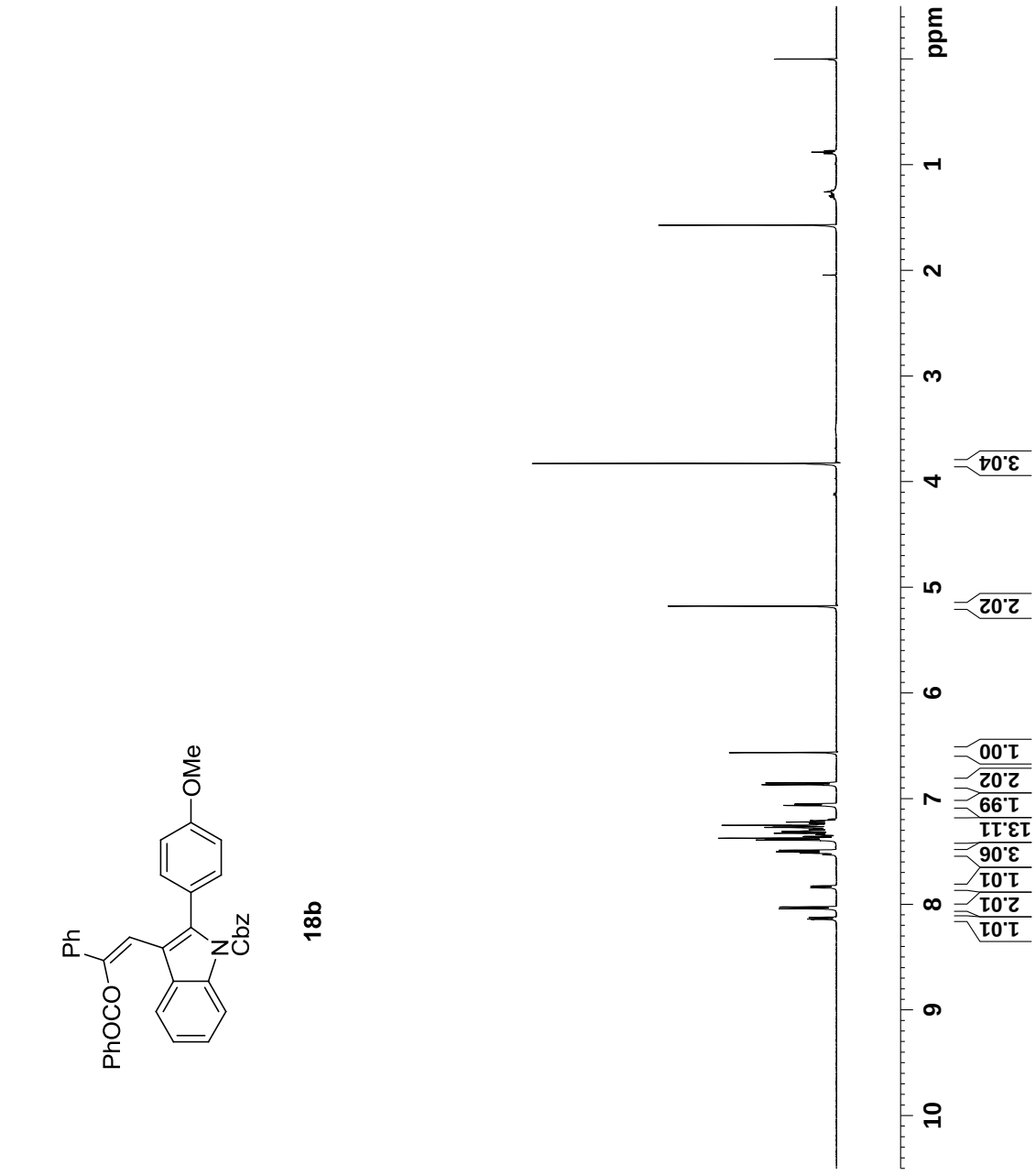
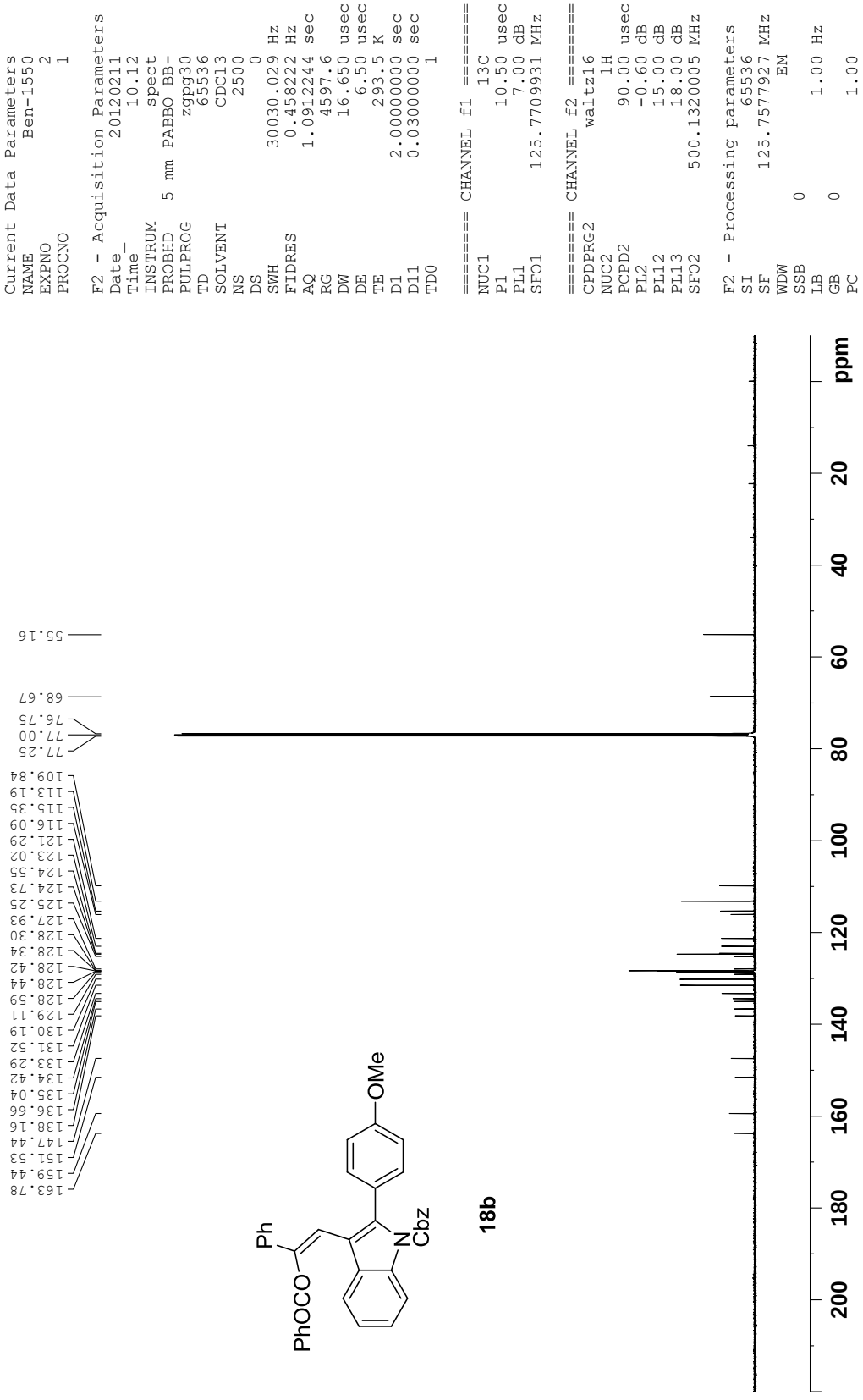
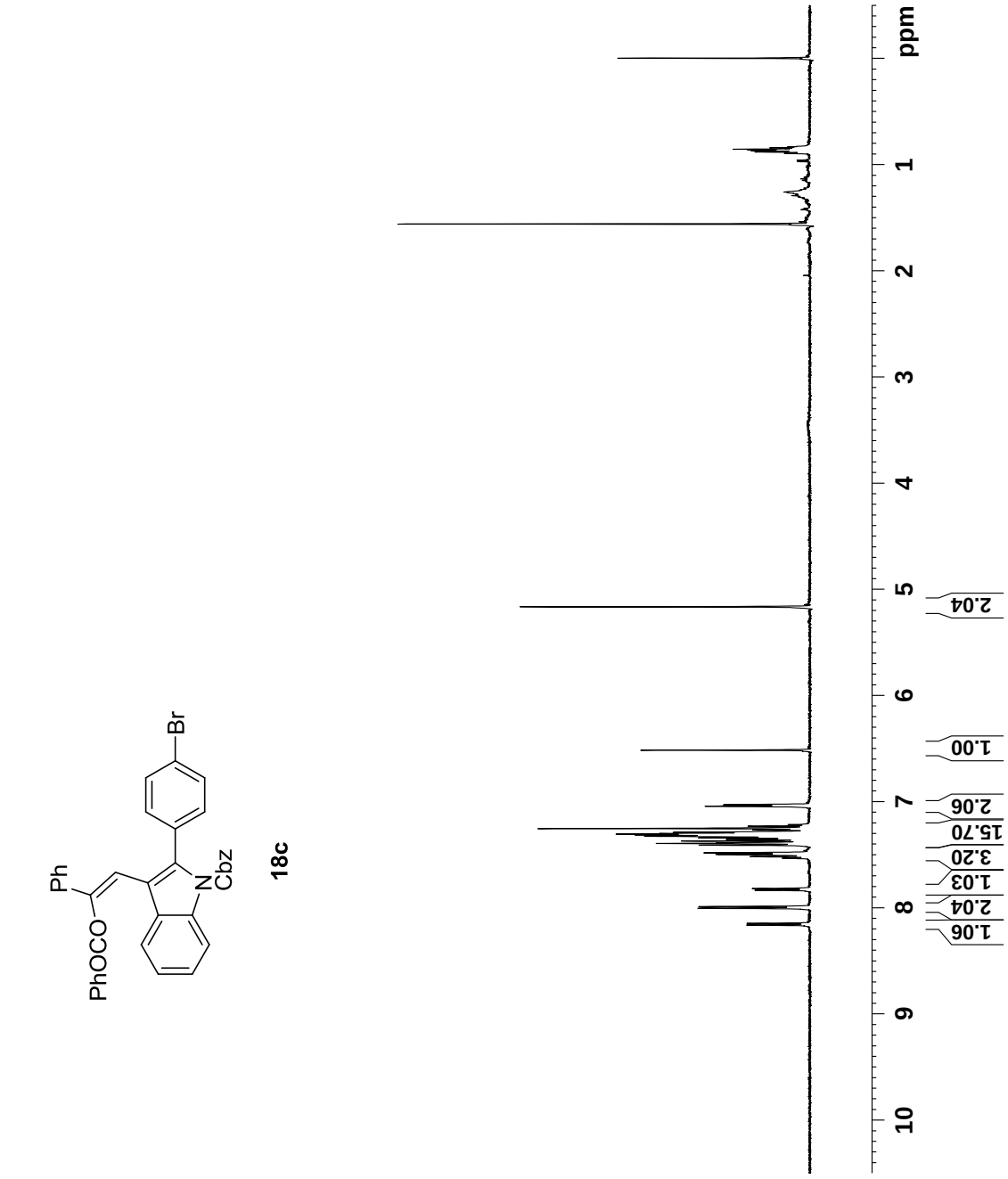
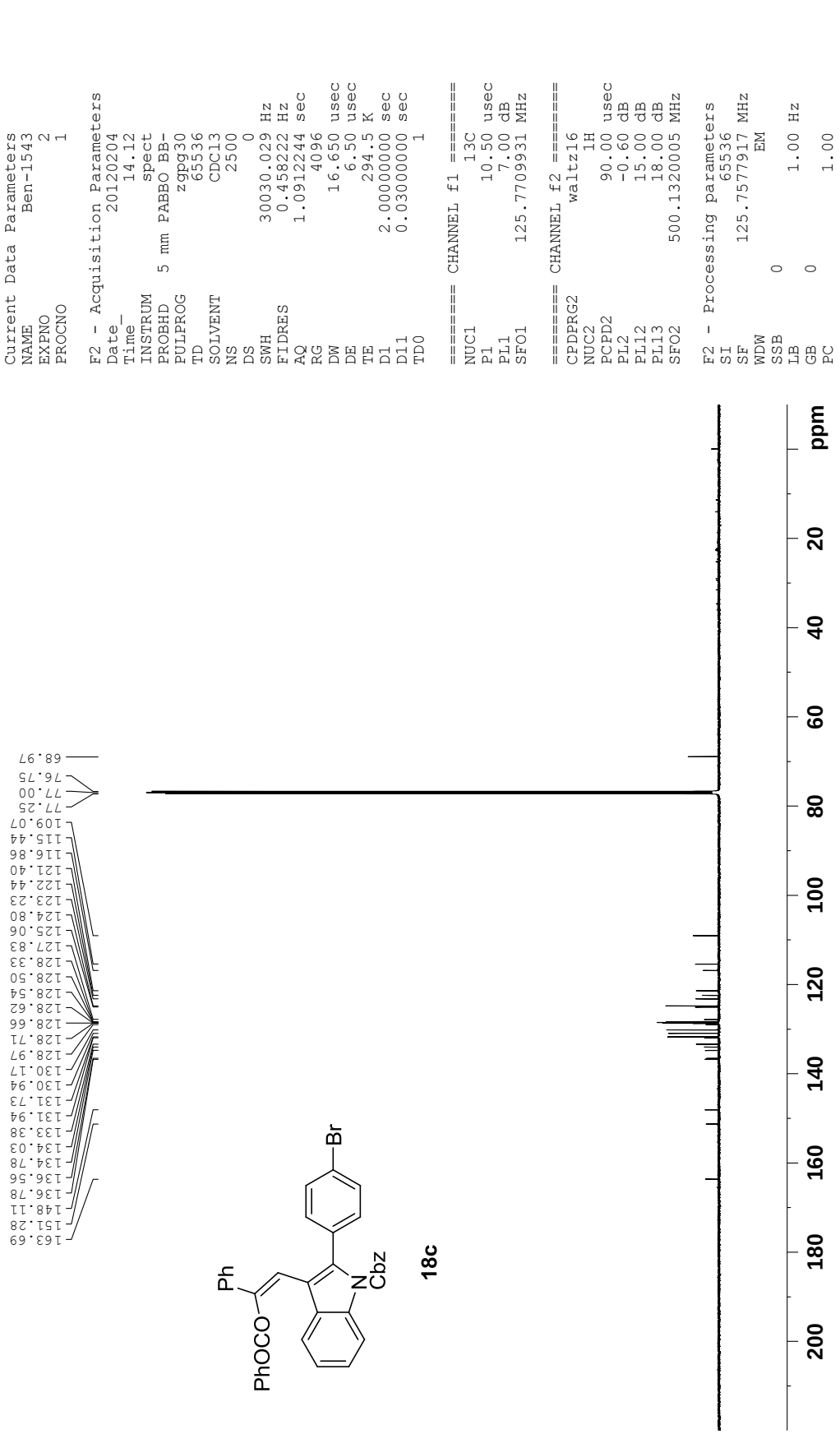
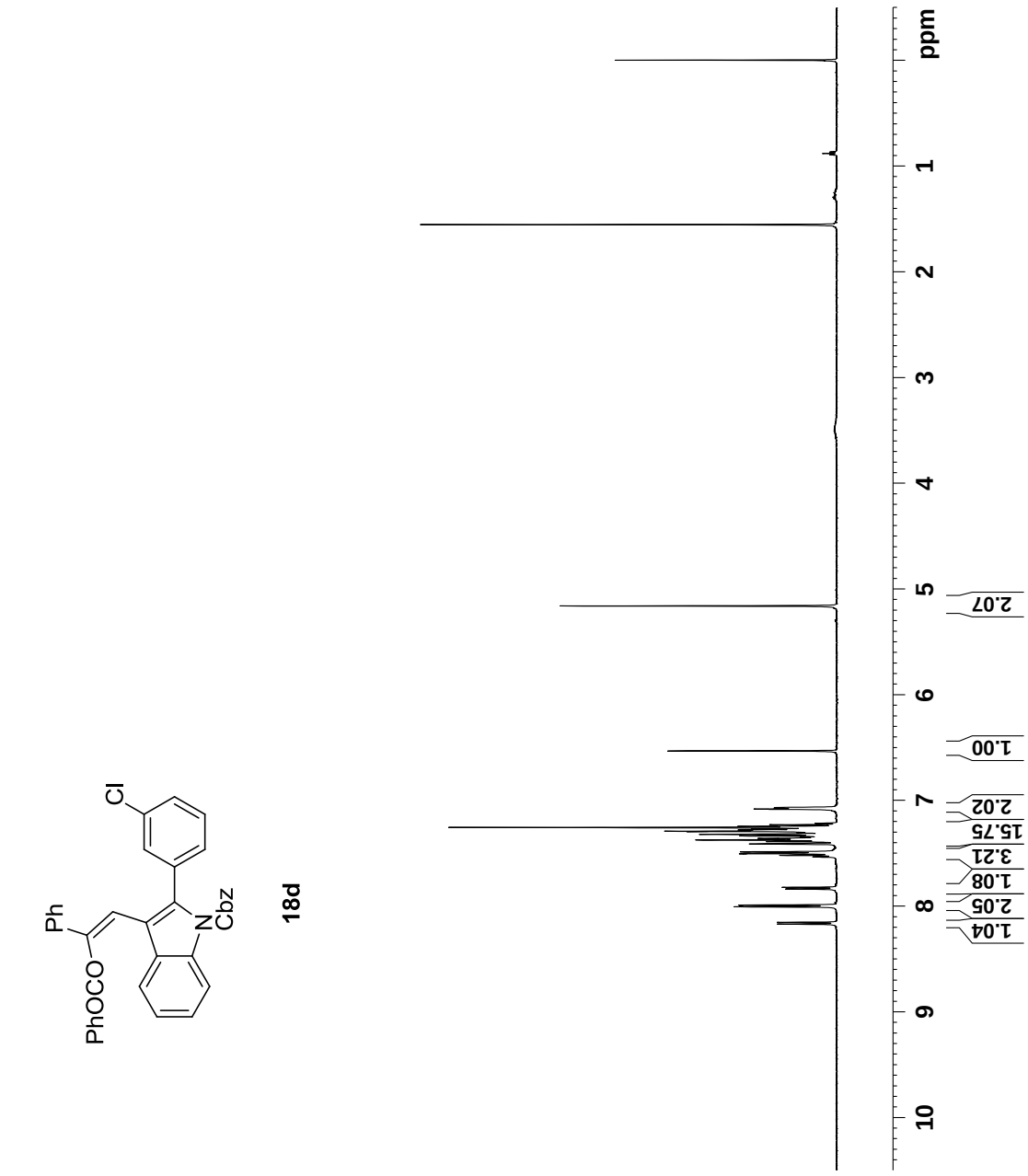
116.45
121.43
123.06
124.78
127.76
127.91
128.03
128.29
128.32
128.34
128.38
128.49
128.59
129.10
130.18
133.01
133.29
134.37
135.03
136.75
138.05
147.71
151.43
163.74
Ph
OCOPh
Ph
N
Cbz
18a
200
180
160
140
120
100
80
60
40
20
ppm

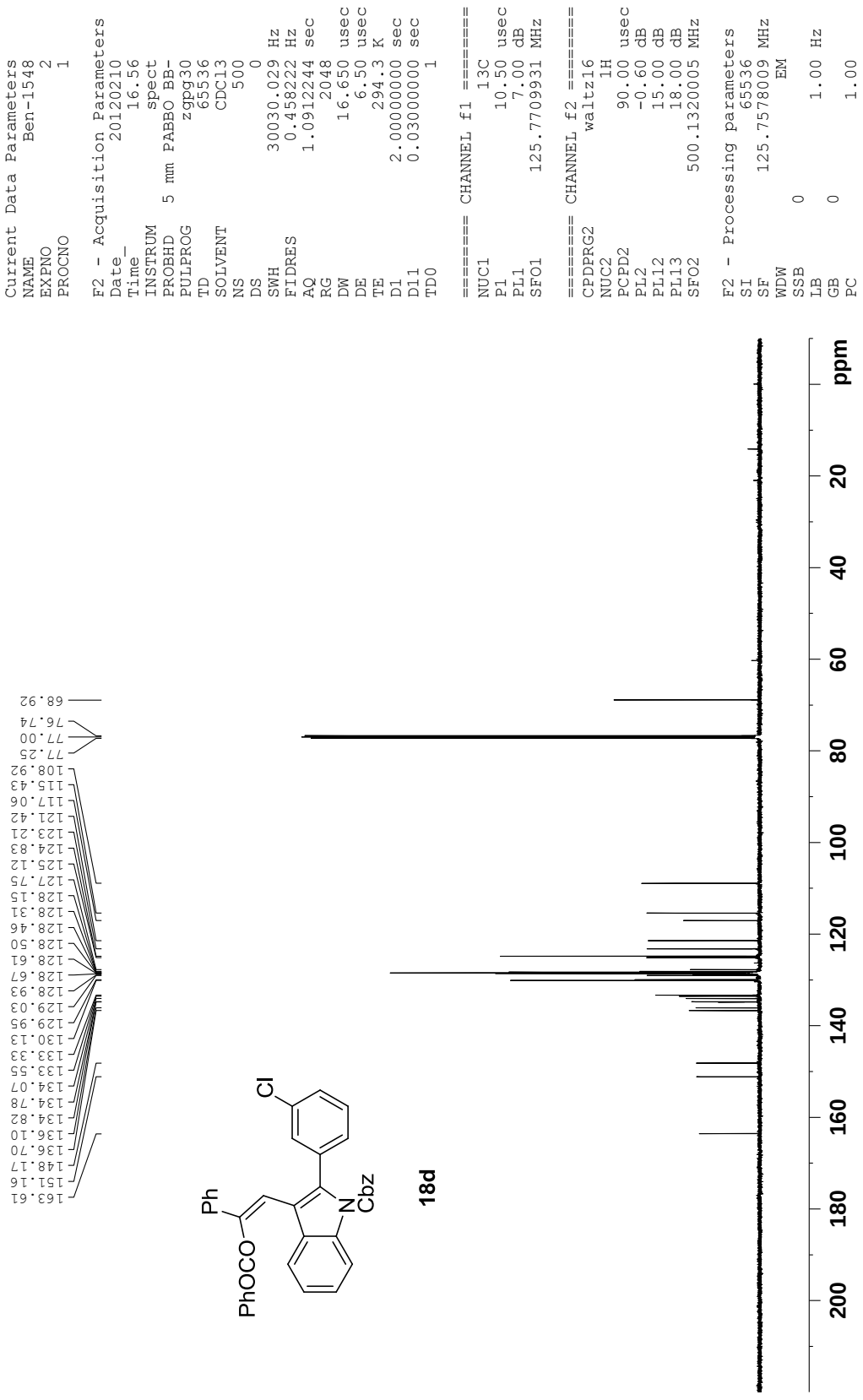

Current Data Parameters
NAME Ben-1550
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 10.11
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 161.3
DW 55.200 usec
DE 6.50 usec
TE 293.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300166 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OMe
Ph
PhOCO
N
Cbz
18b
3.04
2.02
1.00
1.99
2.02
13.11
3.06
1.01
2.01
1.01
ppm

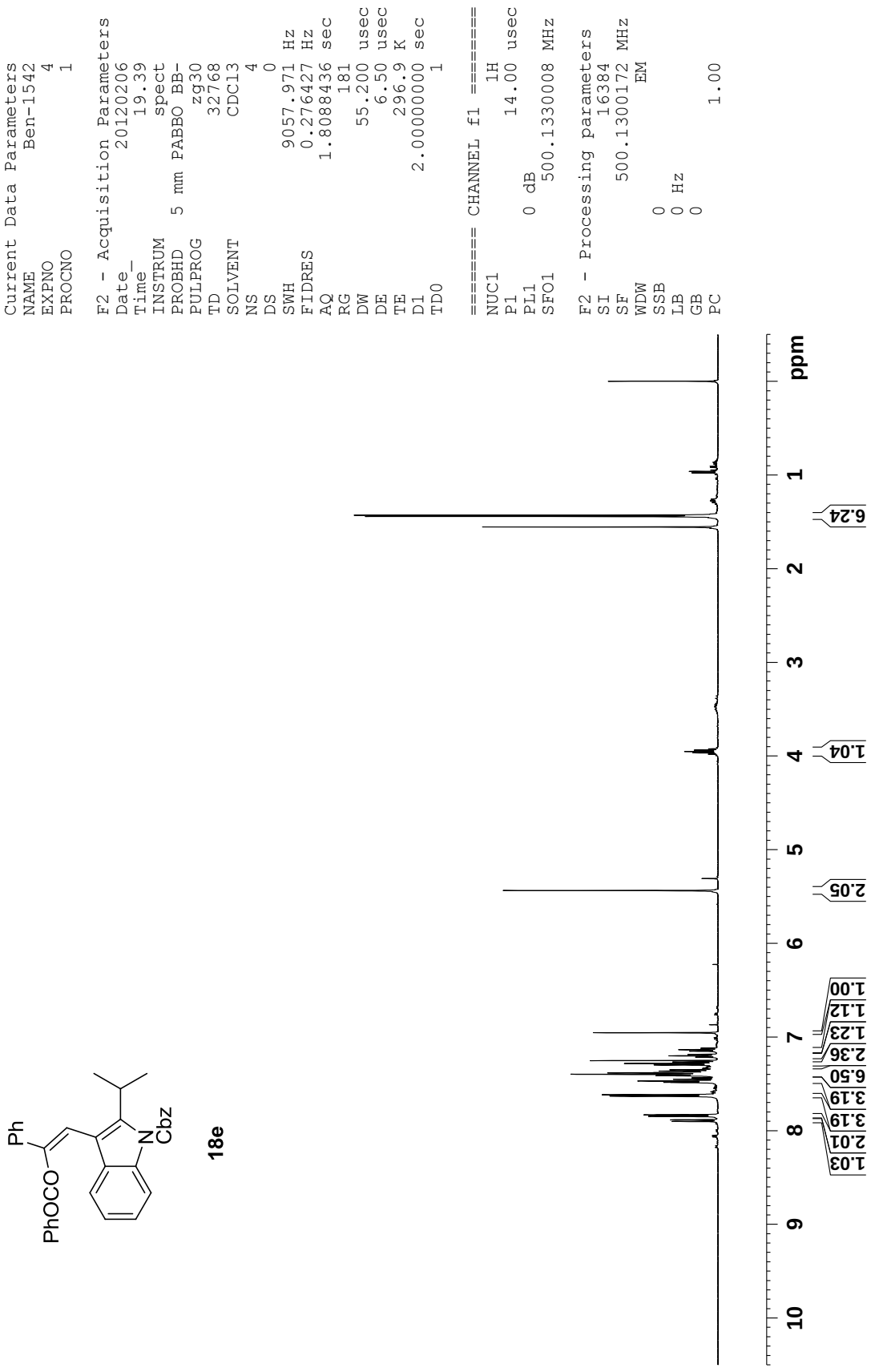

Current Data Parameters
NAME Ben-1550
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 10.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4597.6
DW 16.650 usec
DE 6.50 usec
TE 293.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577927 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
55.16
68.67
76.75
77.00
77.25
109.84
113.19
115.35
116.09
121.29
123.02
124.55
124.73
125.25
127.93
128.30
128.34
128.42
128.44
128.59
129.11
130.19
131.52
133.29
134.42
135.04
136.66
138.16
147.44
151.53
159.44
163.78
Ph
PhOCO
N
Cbz
OMe
18b
200
180
160
140
120
100
80
60
40
20
ppm

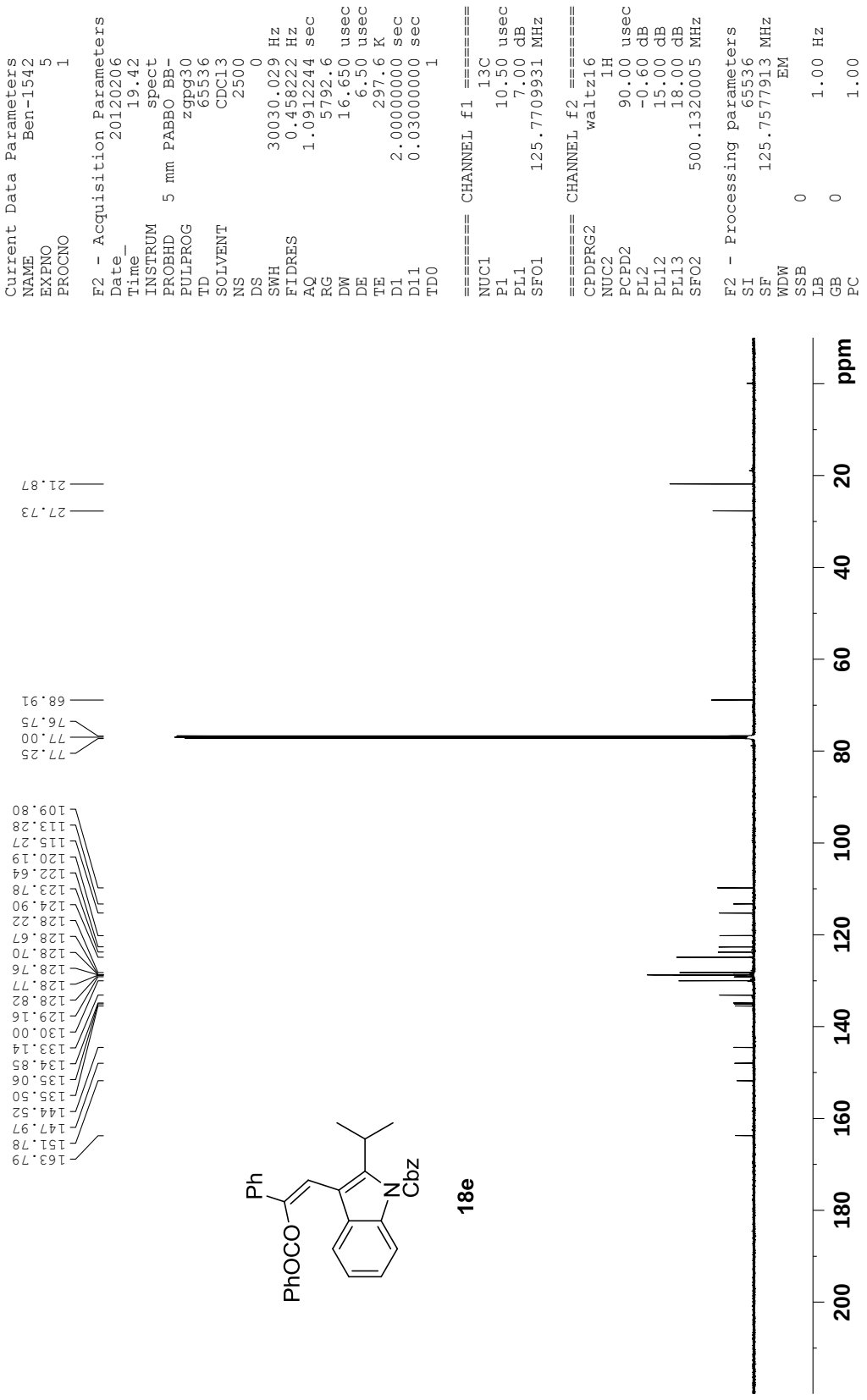

Current Data Parameters
NAME Ben-1543
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120204
Time_ 14.10
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300151 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Br
Ph
PhOCO
N
Cbz
18c
2.04
1.00
2.06
15.70
3.20
1.03
2.04
1.06
ppm

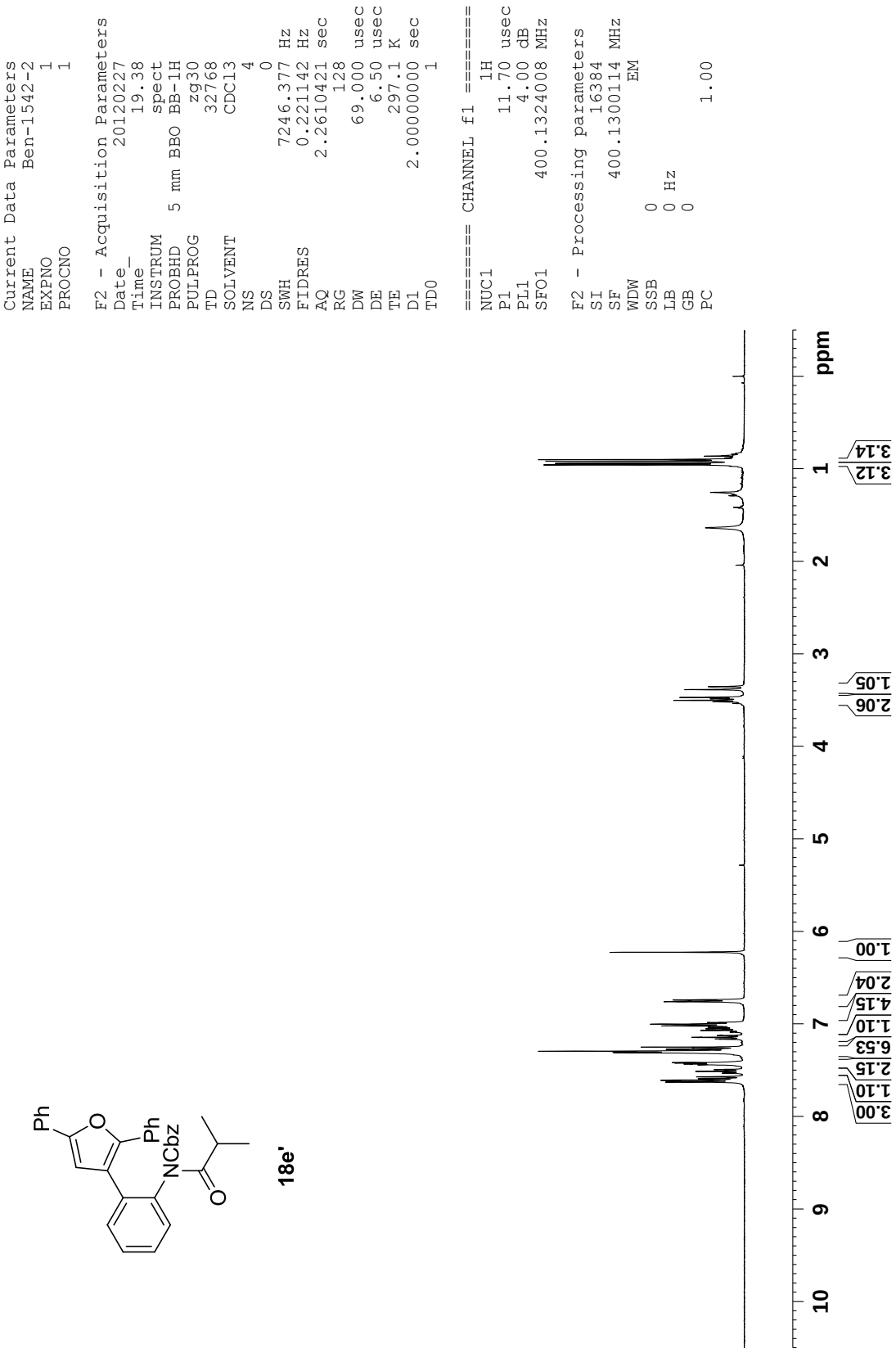

Current Data Parameters
NAME Ben-1543
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120204
Time_ 14.12
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 2500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 294.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577917 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
163.69
151.28
148.11
136.78
136.56
134.78
134.03
133.38
131.94
131.73
130.94
130.17
128.97
128.71
128.66
128.62
128.54
128.50
128.33
127.83
125.06
124.80
123.23
122.44
121.40
116.86
115.44
109.07
77.25
77.00
76.75
68.97
Br
N
Cbz
Ph
PhOCO
18c
ppm
200
180
160
140
120
100
80
60
40
20

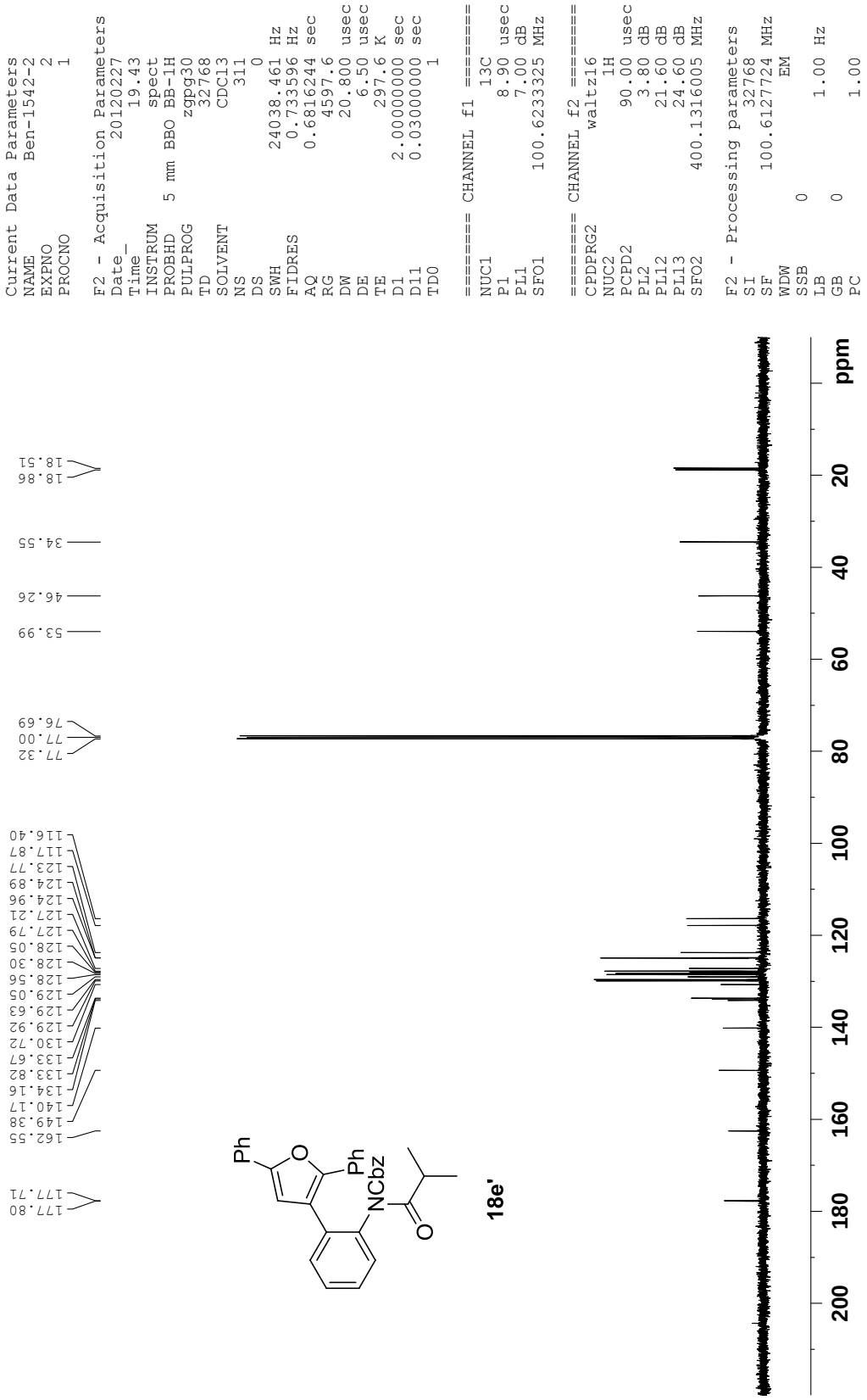

Current Data Parameters
NAME Ben-1548
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time 18.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 294.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300151 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
Ph
PhOCO
N
Cbz
18d
ppm
1
2
3
4
5
6
7
8
9
10
2.07
1.00
2.02
15.75
3.21
1.08
2.05
1.04

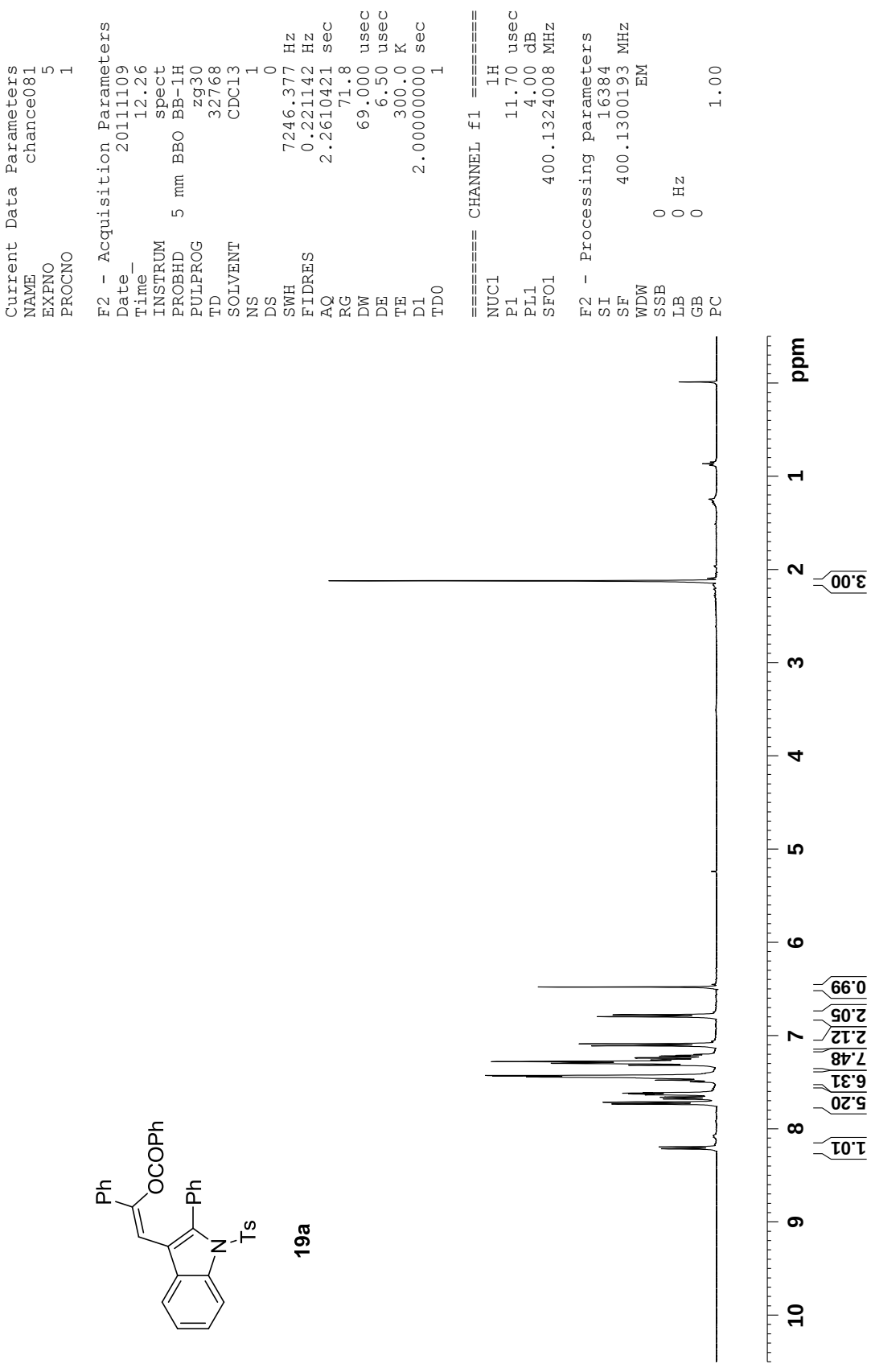

Current Data Parameters
NAME Ben-1548
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time_ 16.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 294.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578009 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
163.61
151.16
148.17
136.70
136.10
134.82
134.78
134.07
133.55
133.33
130.13
129.95
129.03
128.93
128.67
128.61
128.50
128.46
128.31
128.15
127.75
125.12
124.83
123.21
121.42
117.06
115.43
108.92
77.25
77.00
76.74
68.92
Cl
Ph
PhOCO
N
Cbz
18d
ppm
200
180
160
140
120
100
80
60
40
20

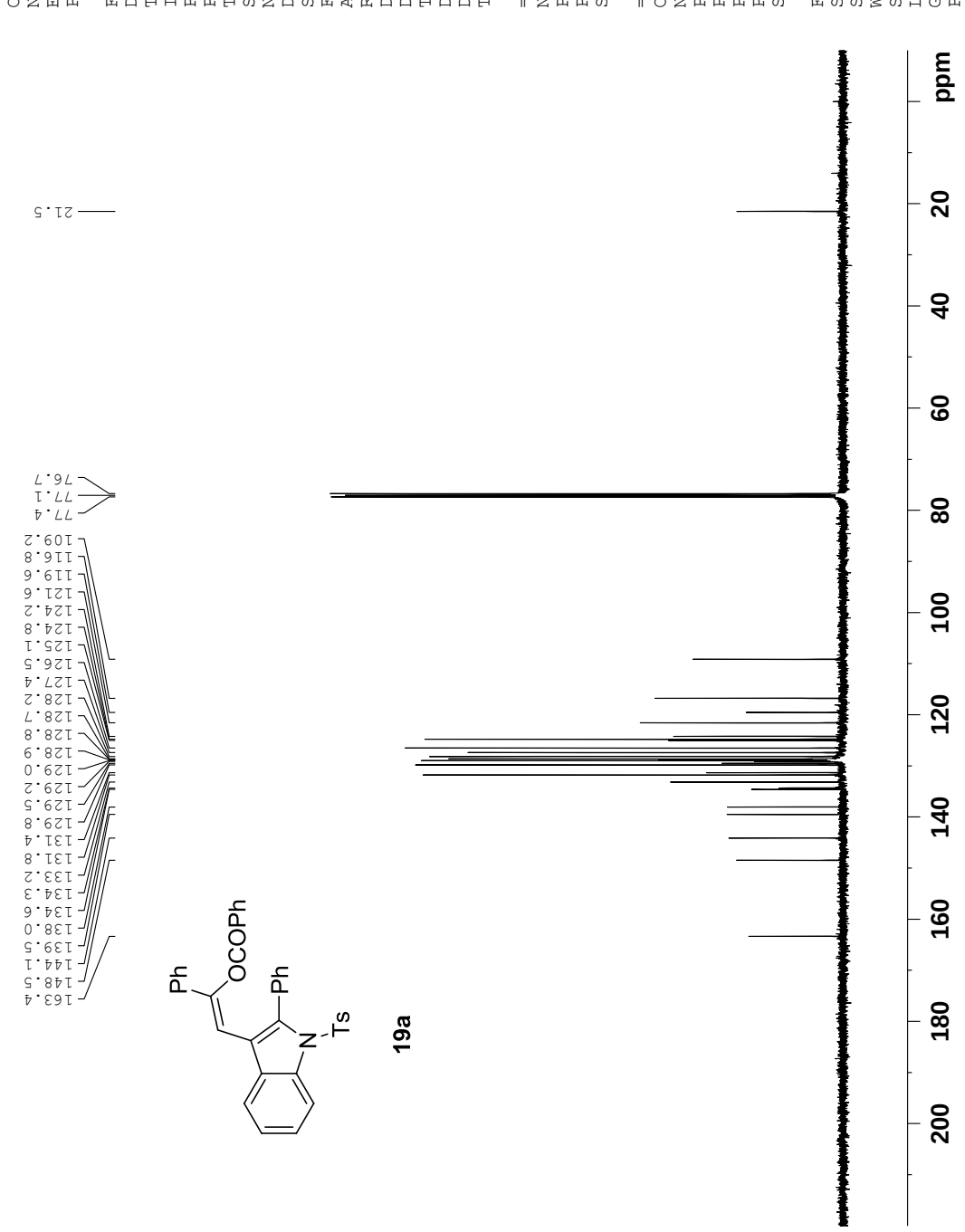

Current Data Parameters
NAME Ben-1542
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120206
Time 19.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 181
DW 55.200 usec
DE 6.50 usec
TE 296.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300172 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
PhOCO
N
Cbz
18e
ppm
1
2
3
4
5
6
7
8
9
10
6.24
1.04
2.05
1.00
1.12
1.23
2.36
6.50
3.19
3.19
2.01
1.03

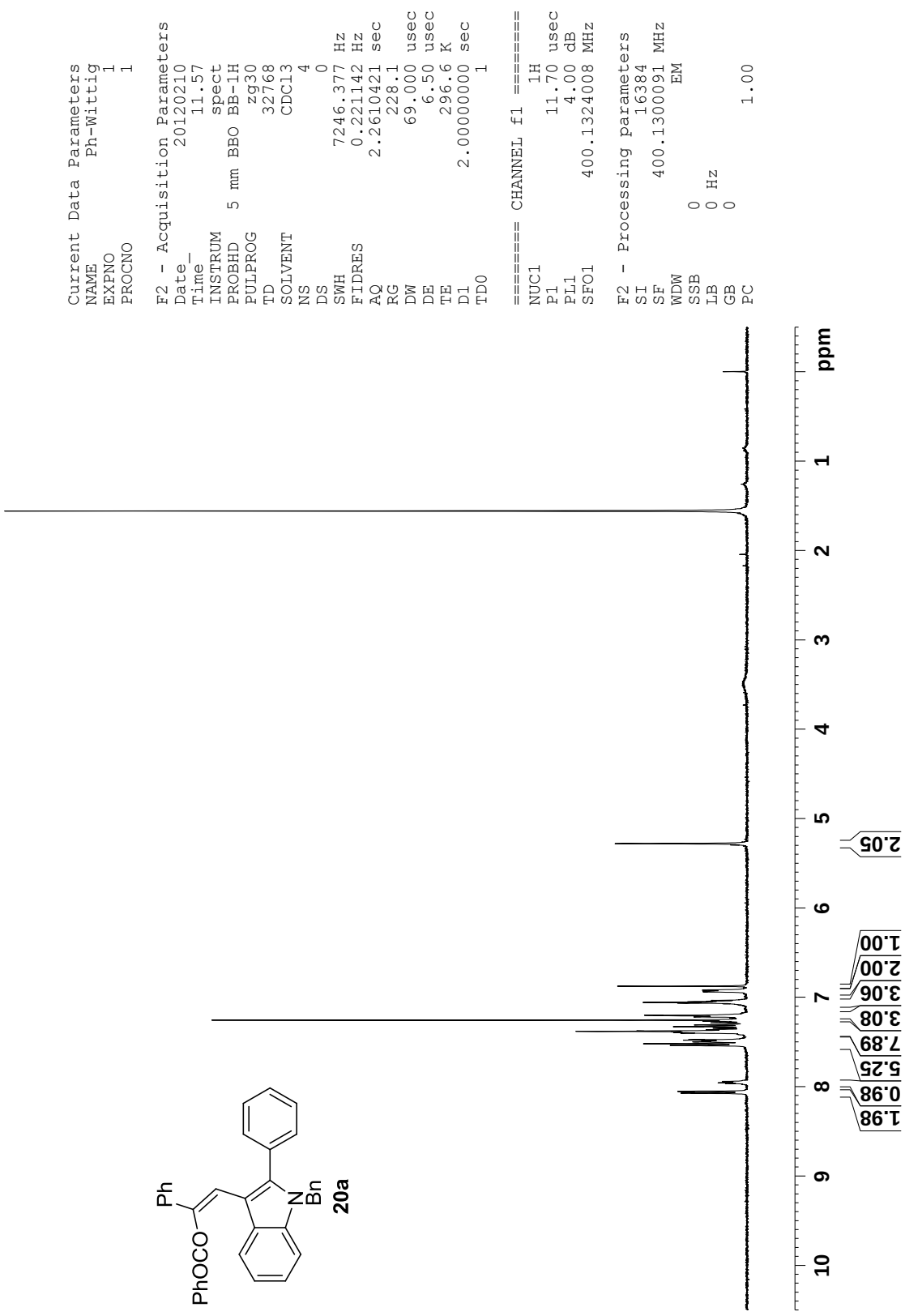

Current Data Parameters
NAME Ben-1542
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120206
Time 19.42
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 5792.6
DW 16.650 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577913 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.87
27.73
68.91
76.75
77.00
77.25
109.80
113.28
115.27
120.19
122.64
123.78
124.90
128.22
128.67
128.70
128.76
128.77
128.82
129.16
130.00
133.14
134.85
135.06
135.50
144.52
147.97
151.78
163.79
Ph
PhOCO
N
Cbz
18e
ppm
20
40
60
80
100
120
140
160
180
200

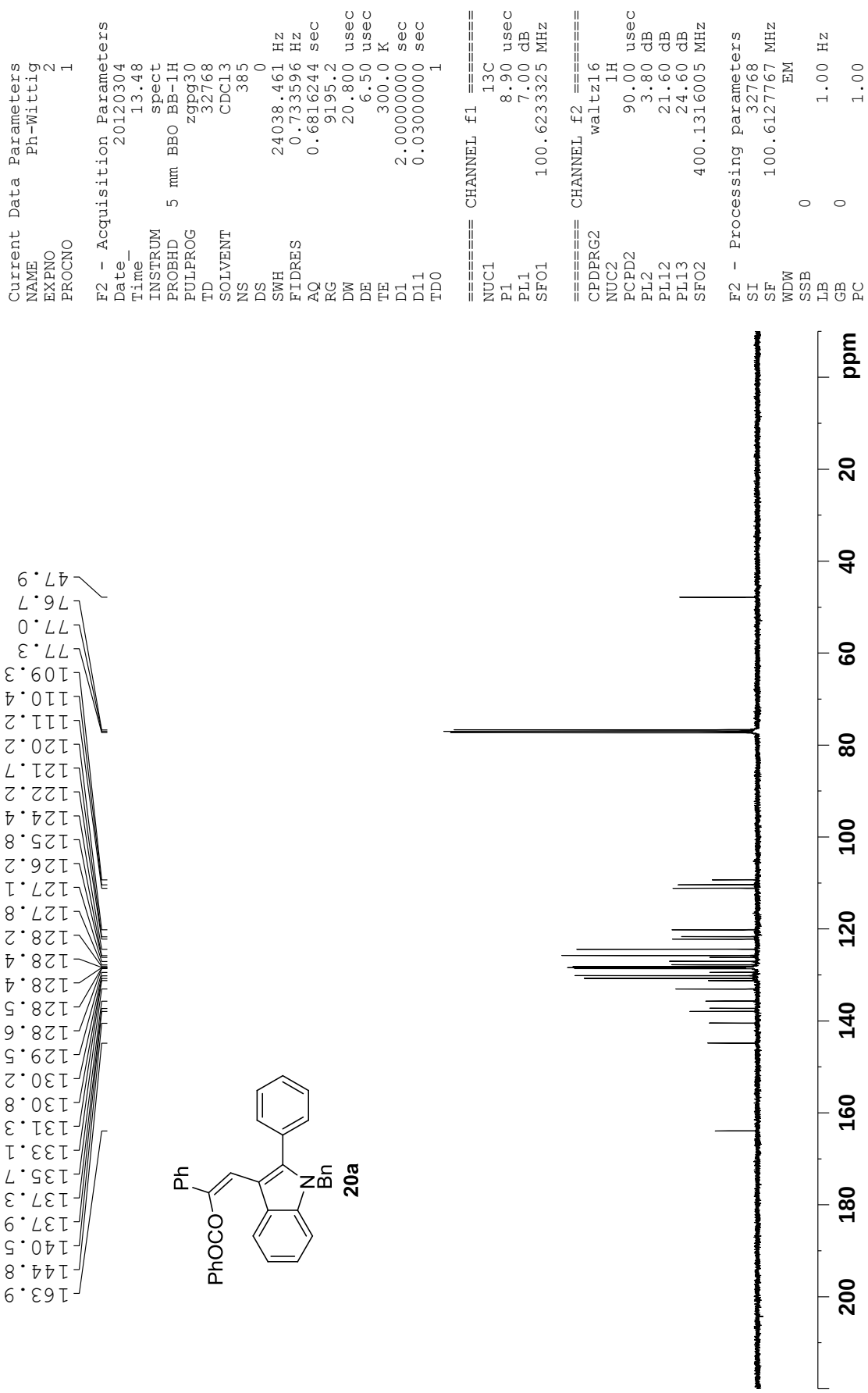

Current Data Parameters
NAME Ben-1542-2
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120227
Time_ 19.38
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 297.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300114 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
O
Ph
NCbz
O
18e'
ppm
1 2 3 4 5 6 7 8 9 10
3.14
3.12
2.06
1.05
1.00
2.04
4.15
1.10
6.53
2.15
1.10
3.00

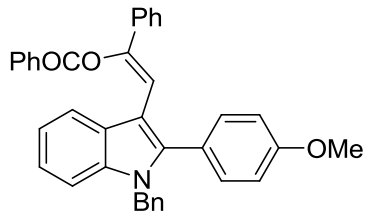

Current Data Parameters
NAME Ben-1542-2
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120227
Time 19.43
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 311
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 4597.6
DW 20.800 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127724 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
177.80
177.71
162.55
149.38
140.17
134.16
133.82
133.67
130.72
129.92
129.63
129.05
128.56
128.30
128.05
127.79
127.21
124.96
124.89
123.77
117.87
116.40
77.32
77.00
76.69
53.99
46.26
34.55
18.86
18.51
Ph
O
Ph
NCbz
O
18e'
ppm
200
180
160
140
120
100
80
60
40
20


Current Data Parameters
NAME chance081
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111109
Time_ 12.26
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300193 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
OCOPh
Ph
N
Ts
19a
ppm
1
2
3
4
5
6
7
8
9
10
3.00
1.01
5.20
6.31
7.48
2.12
2.05
0.99

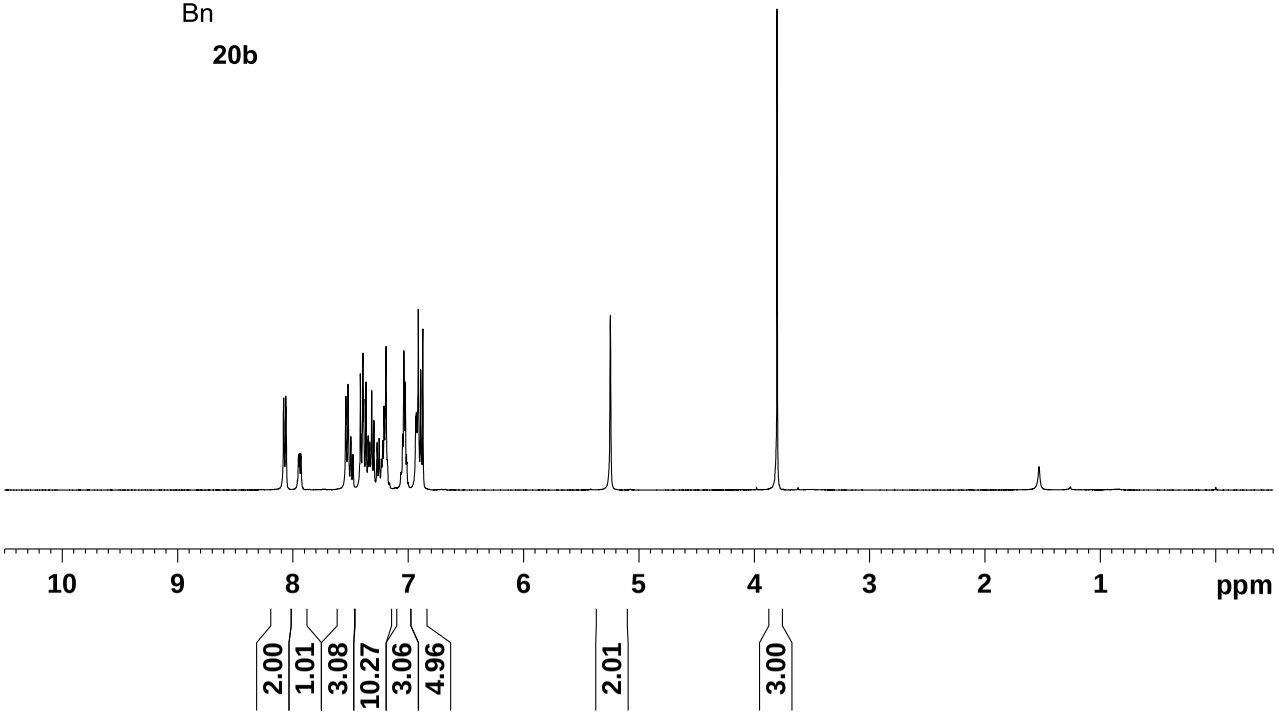

Current Data Parameters
NAME chance081
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111109
Time 12.32
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 446
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 301.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.5
76.7
77.1
77.4
109.2
116.8
119.6
121.6
124.2
124.8
125.1
126.5
127.4
128.2
128.7
128.8
128.9
129.0
129.2
129.5
129.8
131.4
131.8
133.2
134.3
134.6
138.0
139.5
144.1
148.5
163.4
Ph
OCOPh
Ph
N
Ts
19a
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Ph-Wittig
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120210
Time 11.57
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 296.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300091 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1 2 3 4 5 6 7 8 9 10
2.05
1.00
2.00
3.06
3.08
7.89
5.25
0.98
1.98
Ph
PhOCO
N
Bn
20a


Current Data Parameters
NAME Ph-Wittig
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120304
Time_ 13.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 385
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127767 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
47.9
76.7
77.0
77.3
109.3
110.4
111.2
120.2
121.7
122.2
124.4
125.8
126.2
127.1
127.8
128.2
128.4
128.4
128.5
128.6
129.5
130.2
130.8
131.3
133.1
135.7
137.3
137.9
140.5
144.8
163.9
Ph
PhOCO
N
Bn
20a
200
180
160
140
120
100
80
60
40
20
ppm



20b

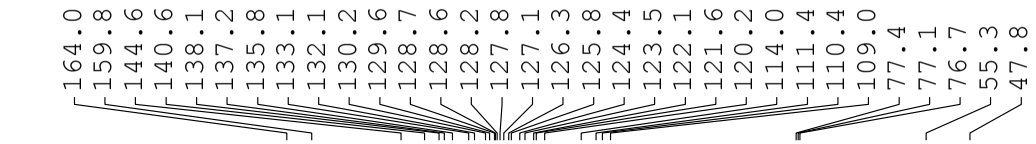


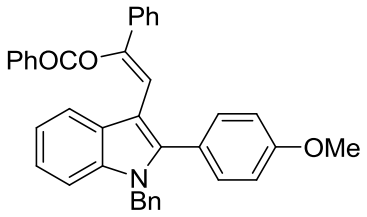

```
Current Data Parameters
NAME                 0022
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20120304
Time               15.09
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             7246.377 Hz
FIDRES          0.221142 Hz
AQ              2.2610421 sec
RG                  90.5
DW                 69.000 usec
DE                  6.50 usec
TE                 299.6 K
D1            2.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 11.70 usec
PL1                 4.00 dB
SFO1         400.1324008 MHz

F2 - Processing parameters
SI                 16384
SF           400.1300242 MHz
WDW                   EM
SSB       0
LB        0 Hz
GB        0
PC                  1.00
```





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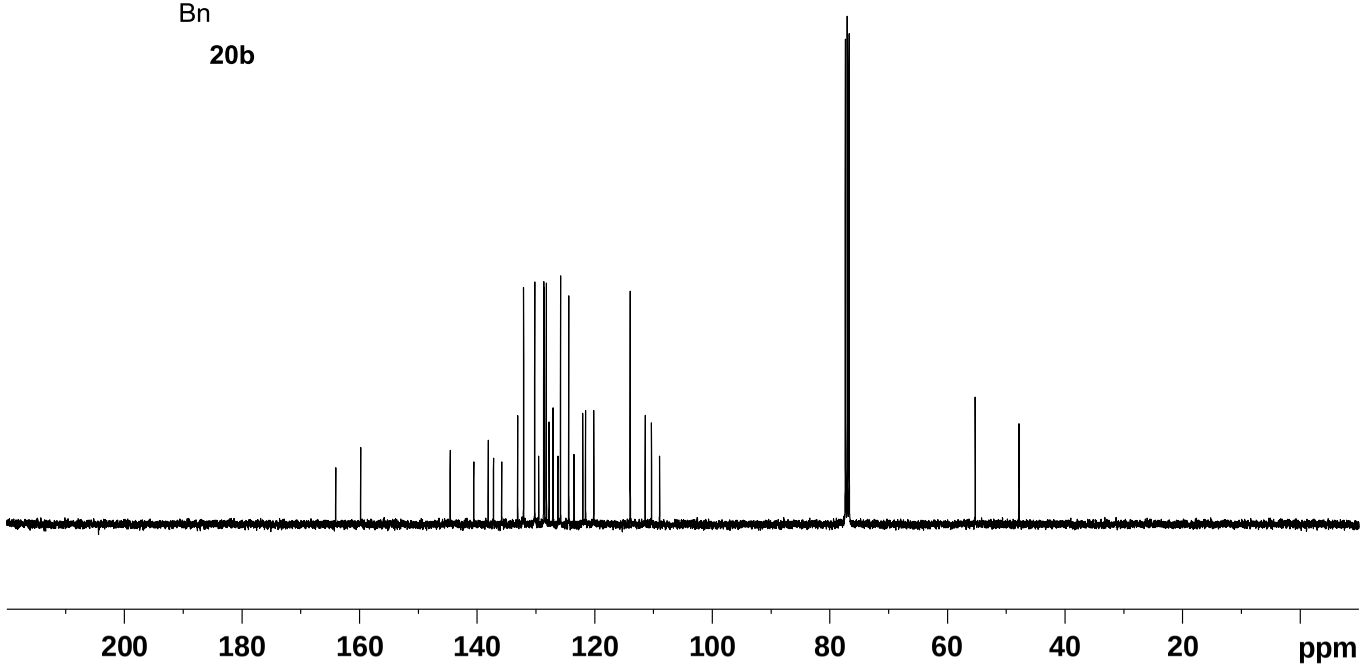
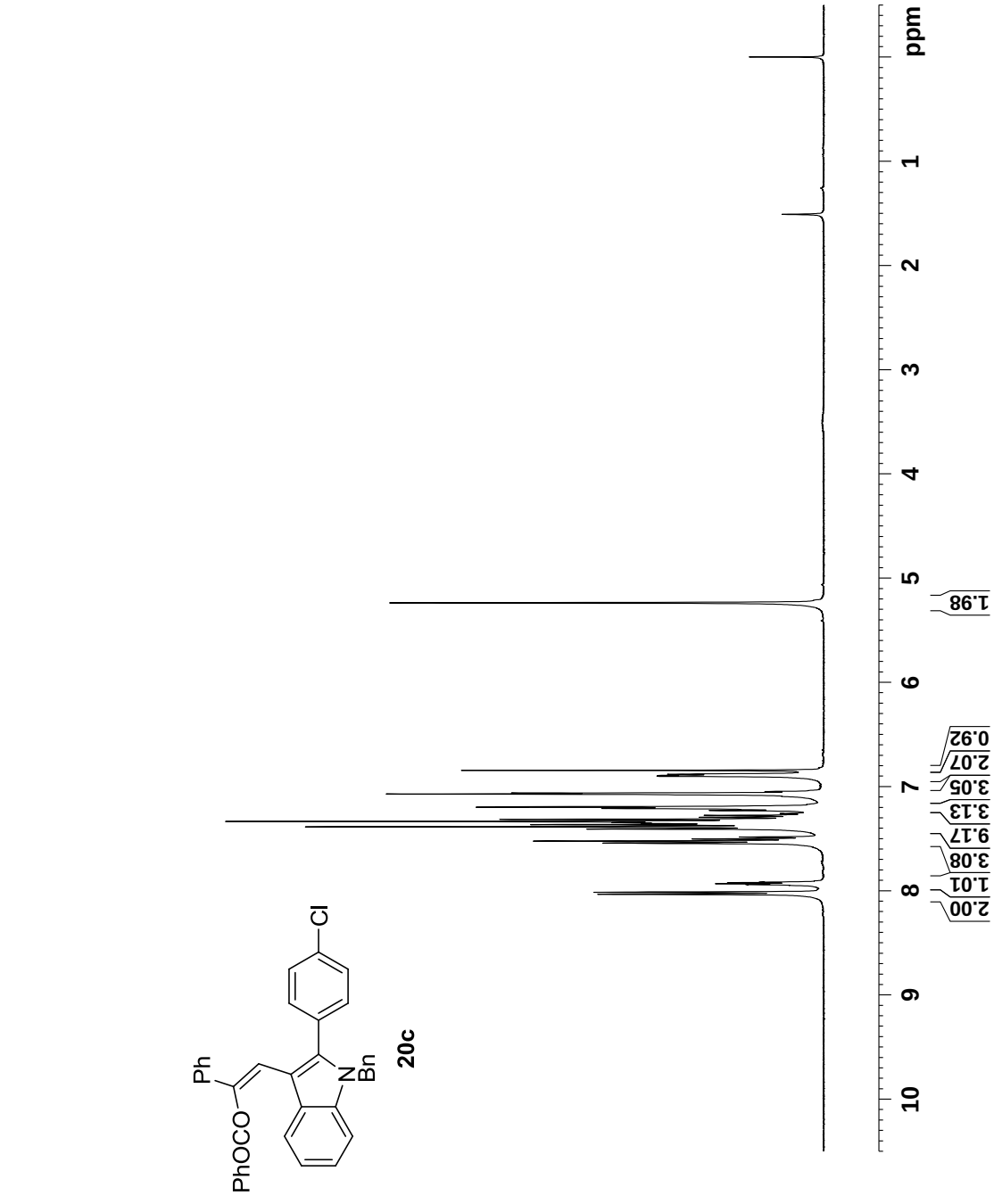
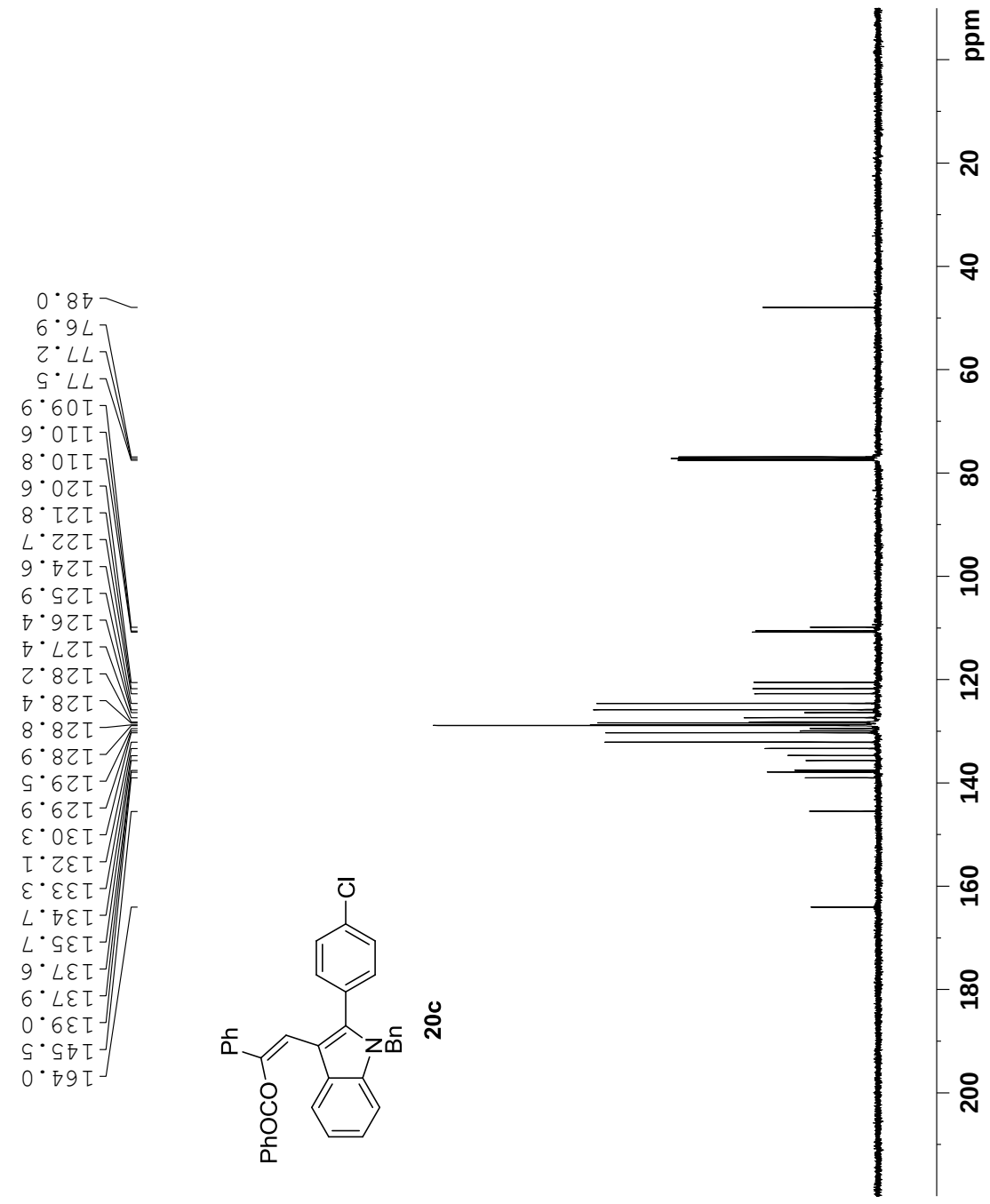
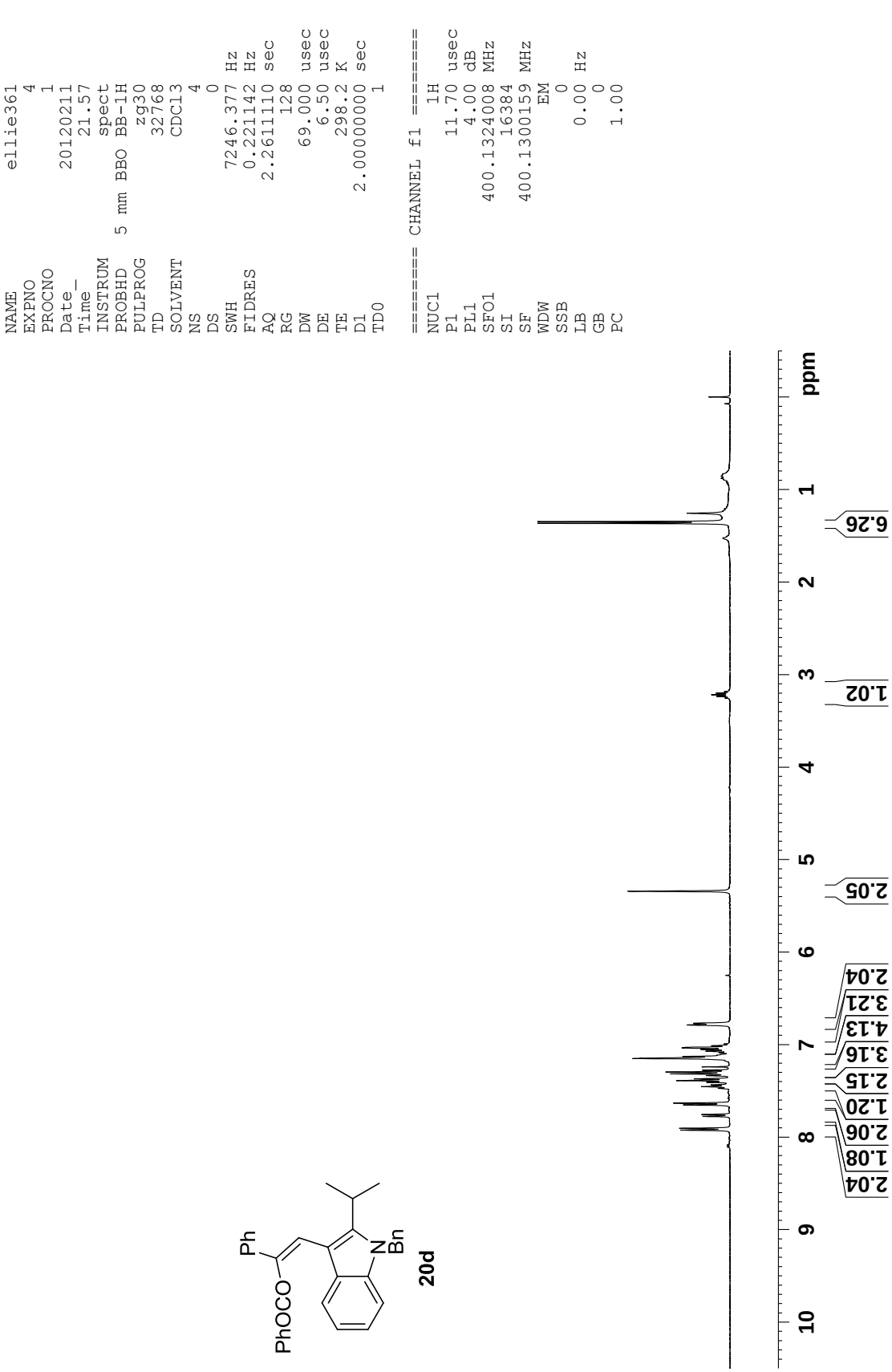
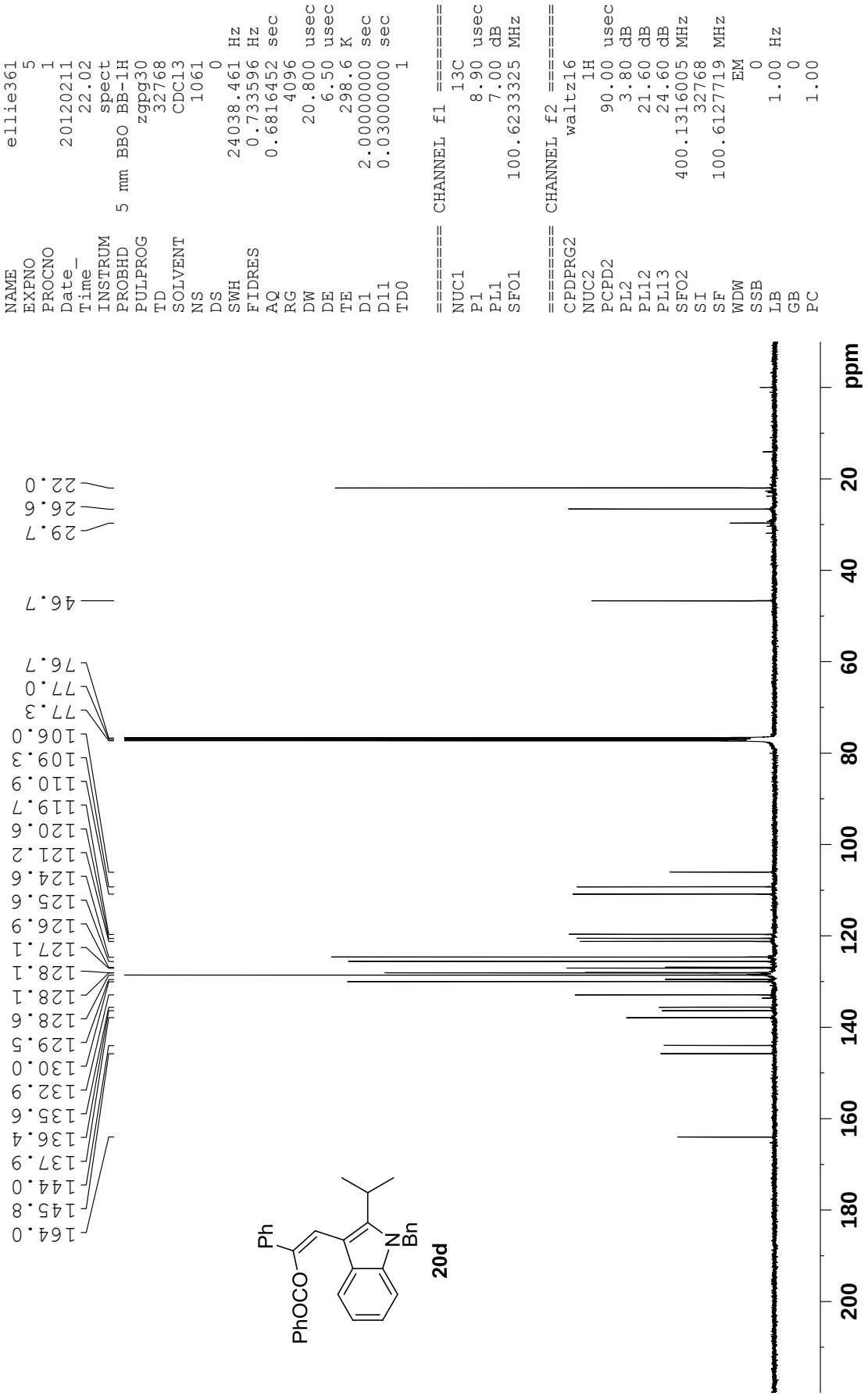


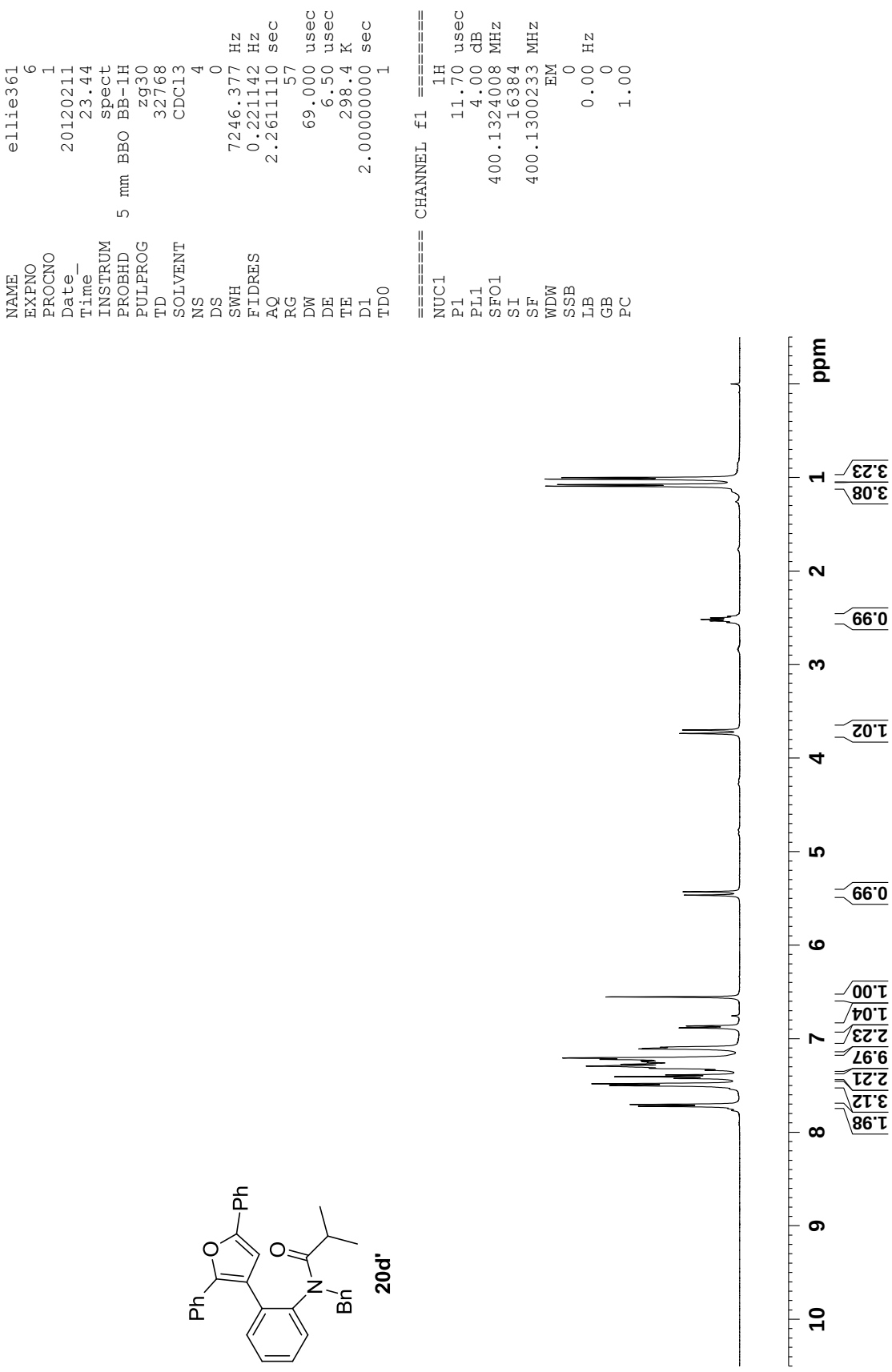

```
Current Data Parameters
NAME                  0022
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_              20120304
Time                 15.16
INSTRUM              spect
PROBHD    5 mm BBO BB-1H
PULPROG             zgpg30
TD                   32768
SOLVENT              CDCl3
NS                     449
DS                       0
SWH              24038.461 Hz
FIDRES            0.733596 Hz
AQ                0.6816244 sec
RG                   9195.2
DW                  20.800 usec
DE                   6.50 usec
TE                  299.9 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.90 usec
PL1                   7.00 dB
SFO1          100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                90.00 usec
PL2                   3.80 dB
PL12                 21.60 dB
PL13                 24.60 dB
SFO2          400.1316005 MHz

F2 - Processing parameters
SI                   32768
SF            100.6127690 MHz
WDW                    EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.00
```

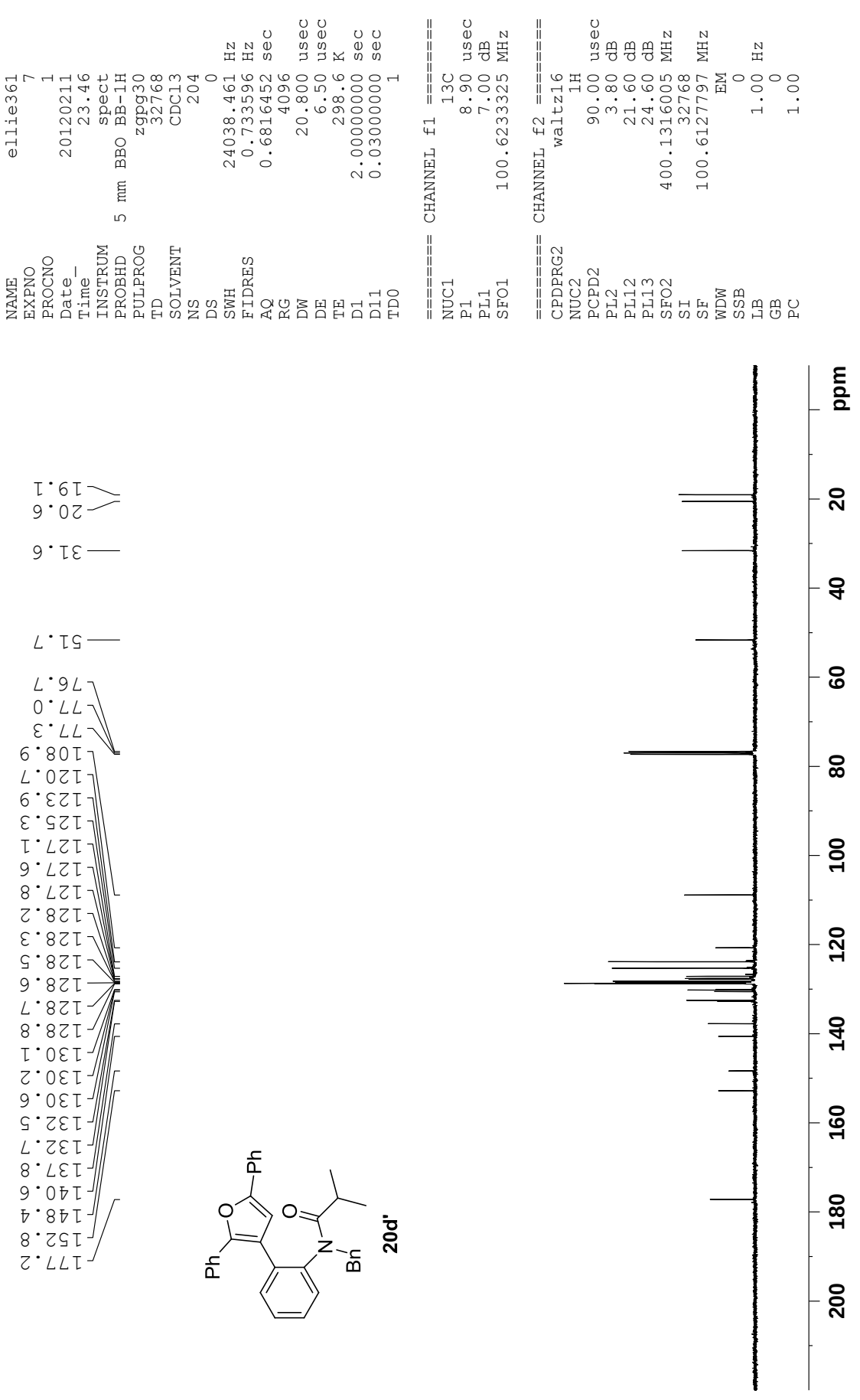

NAME ellie365
EXPNO 2
PROCNO 1
Date_ 20120211
Time 23.40
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300198 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1.98
0.92
2.07
3.05
3.13
9.17
3.08
1.01
2.00
ppm
Cl
Ph
PhOCO
N
Bn
20c

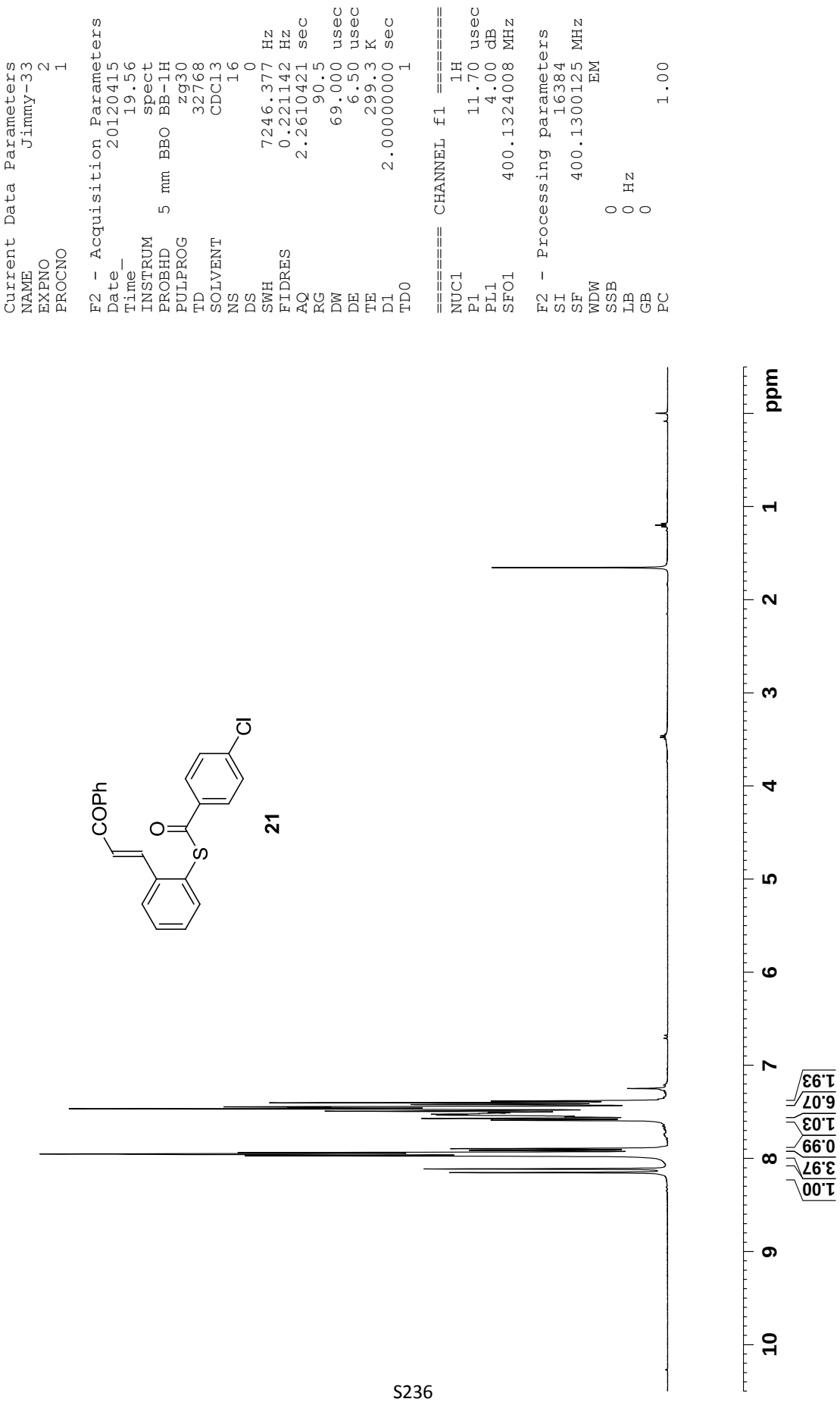

NAME ellie365
EXPNO 3
PROCNO 1
Date_ 20120211
Time_ 23.13
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 148
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127878 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
48.0
76.9
77.2
77.5
109.9
110.6
110.8
120.6
121.8
122.7
124.6
125.9
126.4
127.4
128.2
128.4
128.8
128.9
129.5
129.9
130.3
132.1
133.3
134.7
135.7
137.6
137.9
139.0
145.5
164.0
Ph
PhOCO
N
Bn
Cl
20c
200
180
160
140
120
100
80
60
40
20
ppm

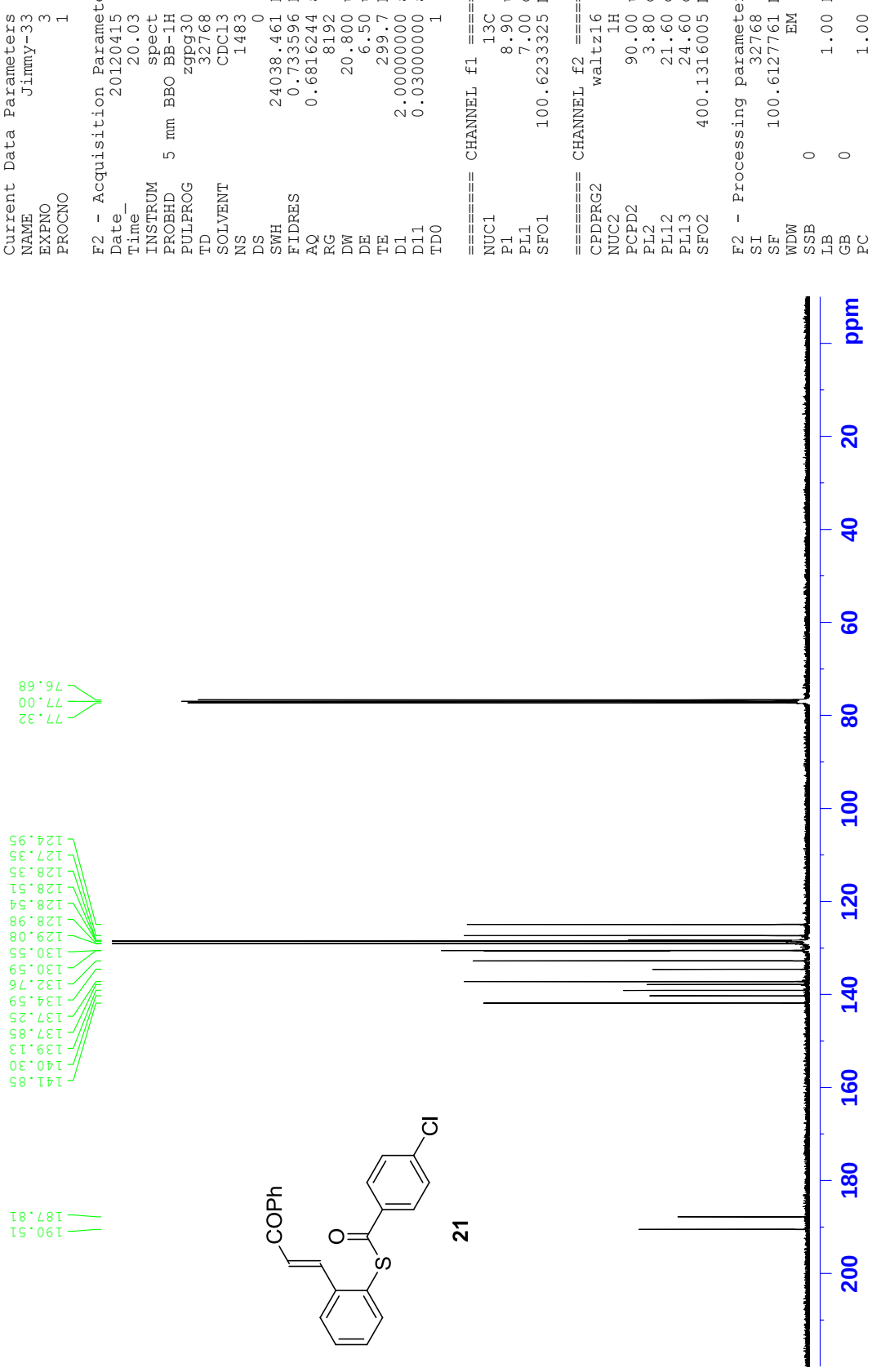

NAME ellie361
EXPNO 4
PROCNO 1
Date_ 20120211
Time 21.57
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300159 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
PhOCO
N
Bn
20d
ppm
1
2
3
4
5
6
7
8
9
10
6.26
1.02
2.05
2.04
3.21
4.13
3.16
2.15
1.20
2.06
1.08
2.04

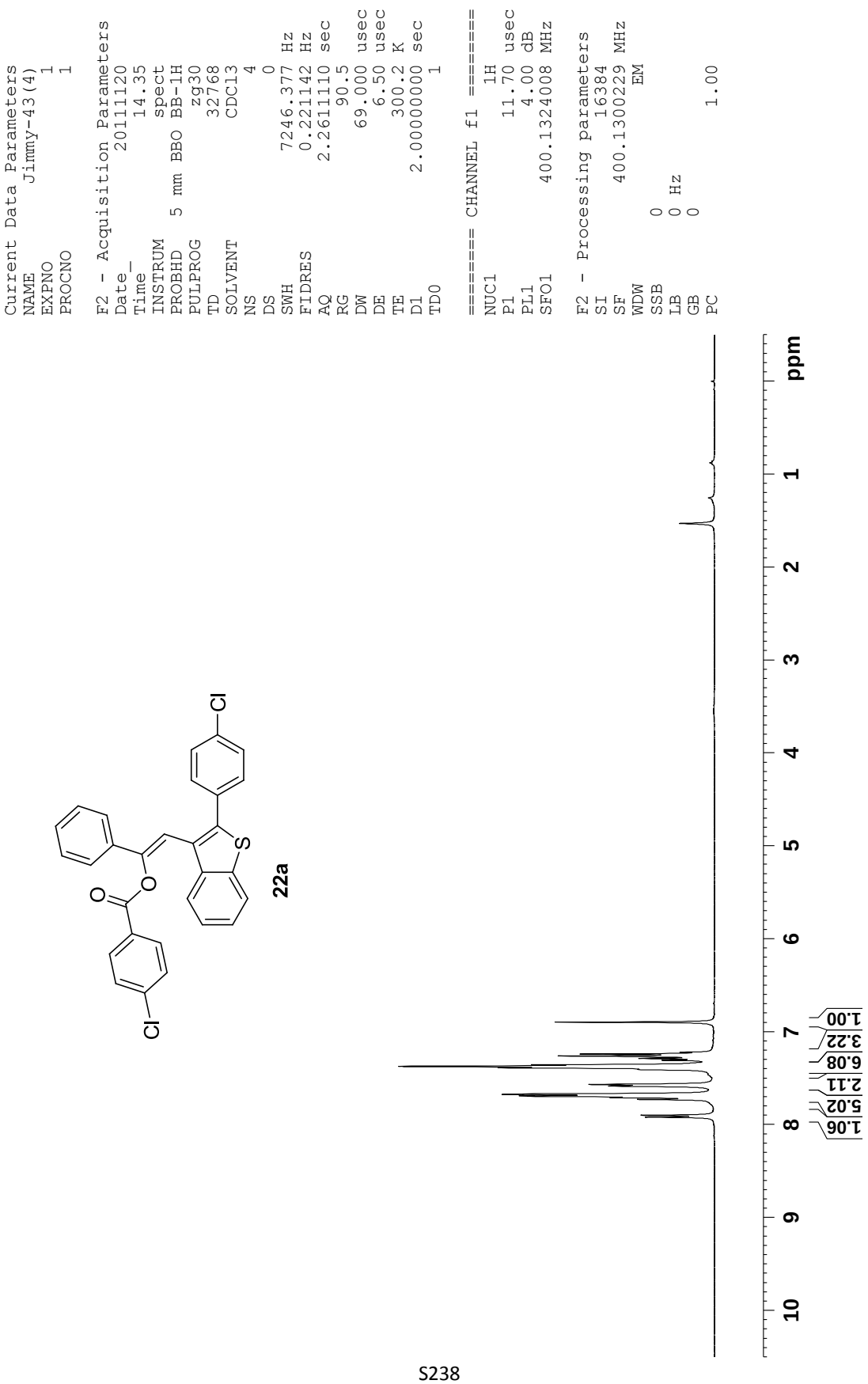

NAME ellie361
EXPNO 5
PROCNO 1
Date_ 20120211
Time_ 22.02
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1061
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127719 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
22.0
26.6
29.7
46.7
76.7
77.0
77.3
106.0
109.3
110.9
119.7
120.6
121.2
124.6
125.6
126.9
127.1
128.1
128.1
128.6
129.5
130.0
132.9
135.6
136.4
137.9
144.0
145.8
164.0
Ph
PhOCO
N
Bn
20d
ppm
200
180
160
140
120
100
80
60
40
20

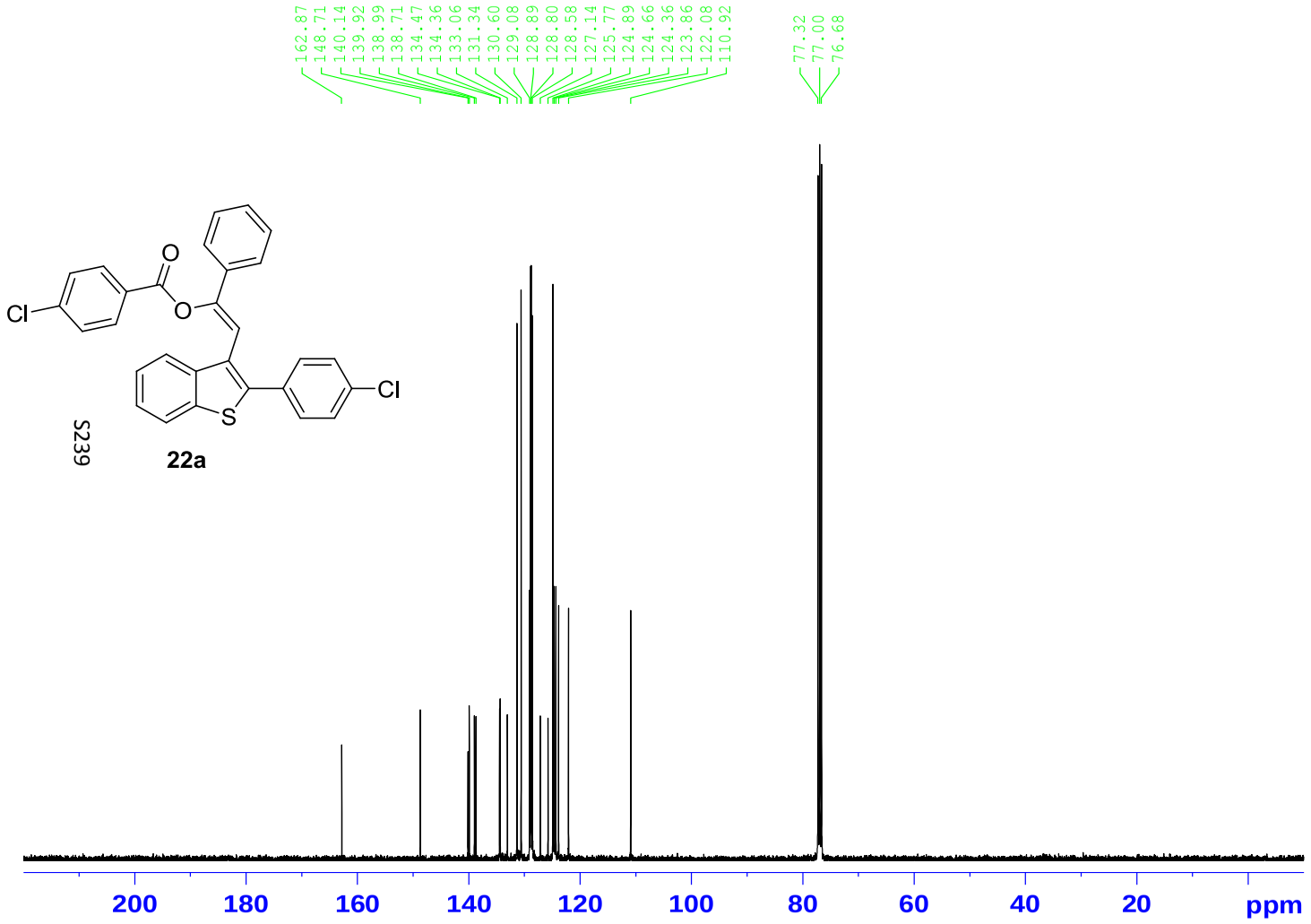

NAME ellie361
EXPNO 6
PROCNO 1
Date_ 20120211
Time_ 23.44
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 57
DW 69.000 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300233 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
Ph
O
N
Bn
20d'
ppm
1
2
3
4
5
6
7
8
9
10
3.23
3.08
0.99
1.02
0.99
1.00
1.04
2.23
9.97
2.21
3.12
1.98


NAME ellie361
EXPNO 7
PROCNO 1
Date_ 20120211
Time_ 23.46
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 204
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127797 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
177.2
152.8
148.4
140.6
137.8
132.7
132.5
130.6
130.2
130.1
128.8
128.7
128.6
128.5
128.3
128.2
127.8
127.6
127.1
125.3
123.9
120.7
108.9
77.3
77.0
76.7
51.7
31.6
20.6
19.1
Ph
O
O
N
Bn
Ph
20d'
ppm
200
180
160
140
120
100
80
60
40
20

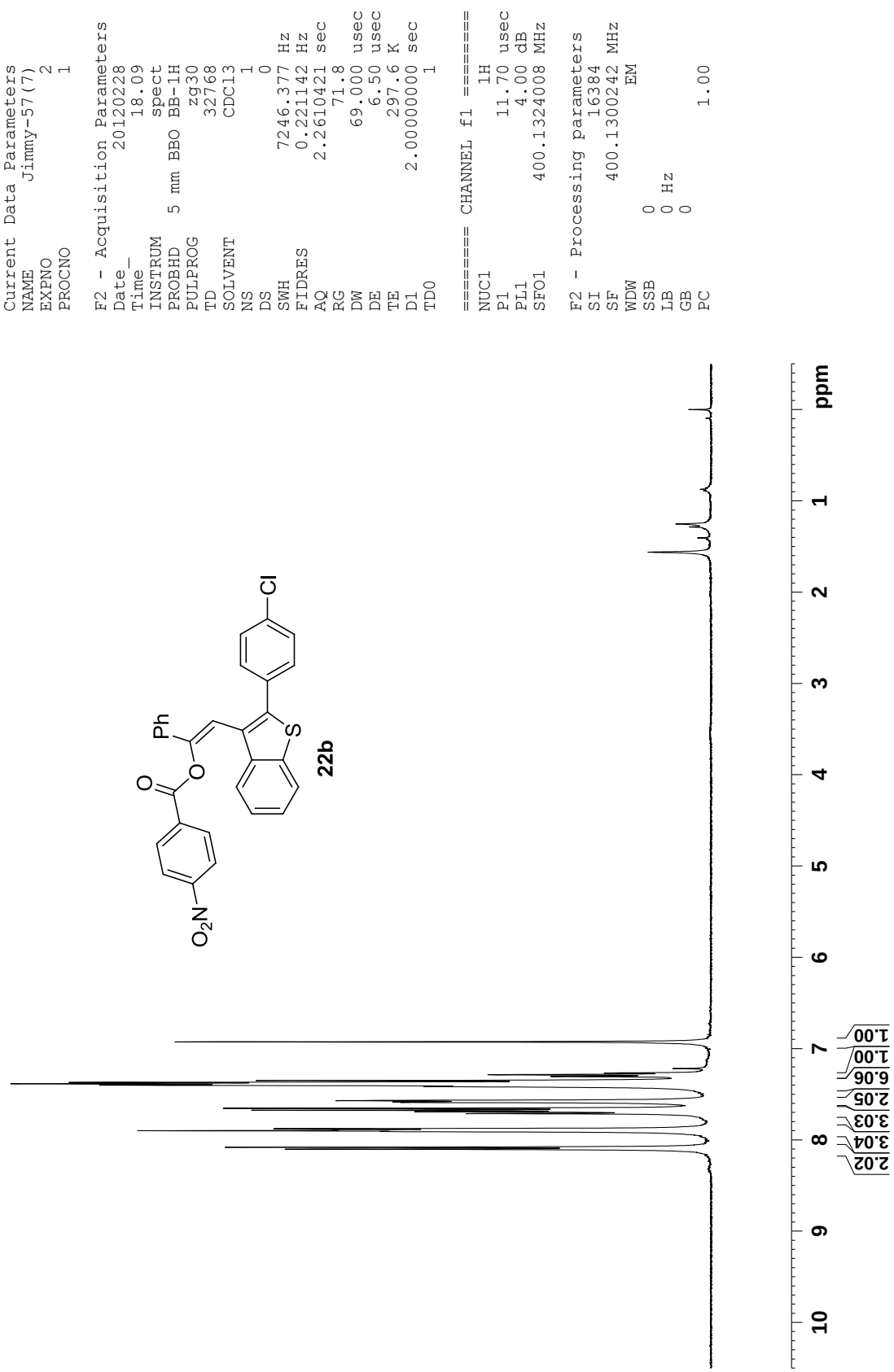

Current Data Parameters
NAME Jimmy-33
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120415
Time_ 19.56
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 299.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300125 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
COPh
O
S
Cl
21
ppm
1
2
3
4
5
6
7
8
9
10
1.00
3.97
0.99
1.03
6.07
1.93

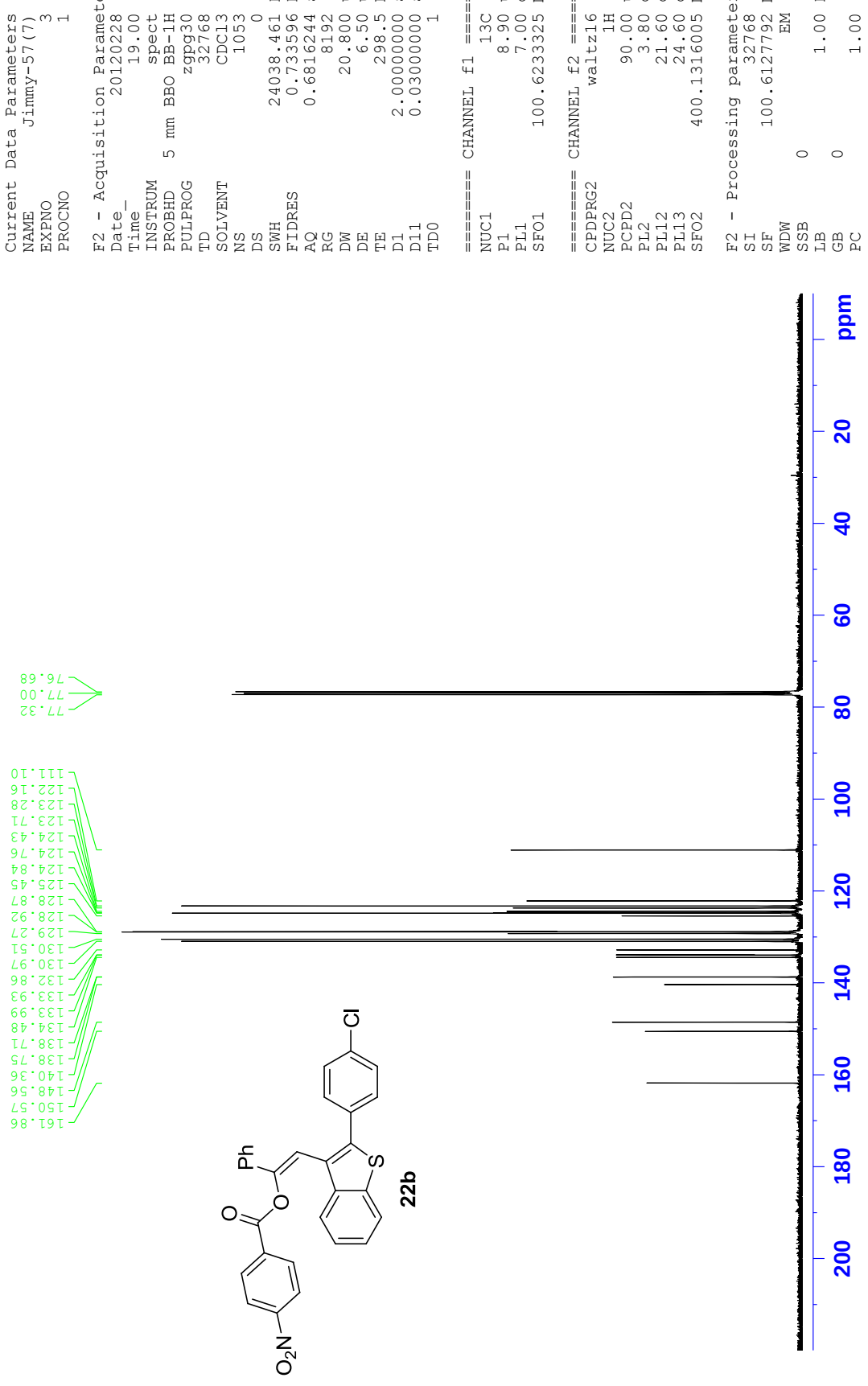

Current Data Parameters
NAME Jimmy-33
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120415
Time_ 20.03
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1483
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127761 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.32
77.00
76.68
124.95
127.35
128.35
128.51
128.54
128.98
129.08
130.55
130.59
132.76
134.59
137.25
137.85
139.13
140.30
141.85
187.81
190.51
COPh
O
S
Cl
21
ppm
200
180
160
140
120
100
80
60
40
20

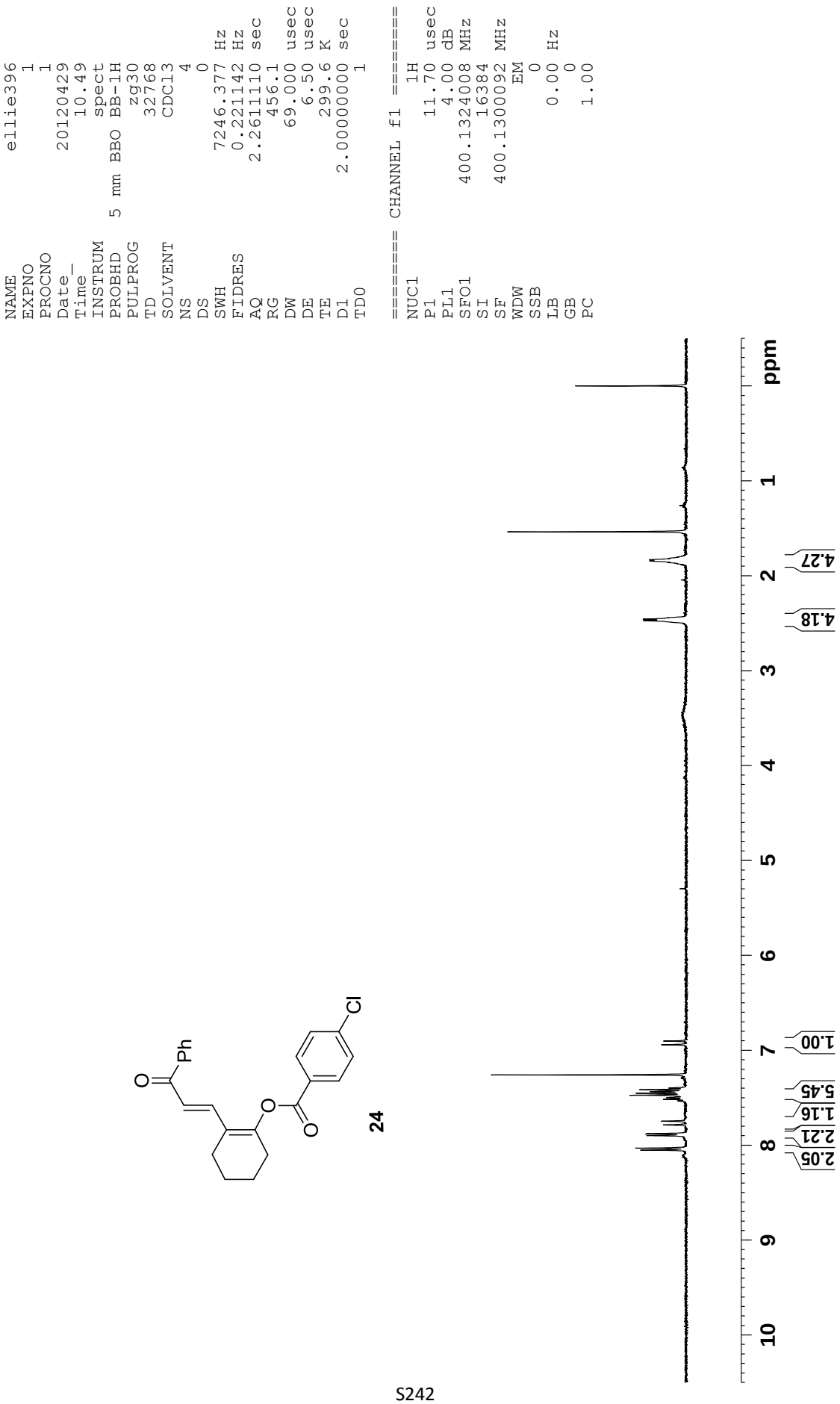

Current Data Parameters
NAME Jimmy-43(4)
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111120
Time 14.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 300.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300229 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
O
O
S
Cl
22a
ppm
1
2
3
4
5
6
7
8
9
10
1.06
5.02
2.11
6.08
3.22
1.00

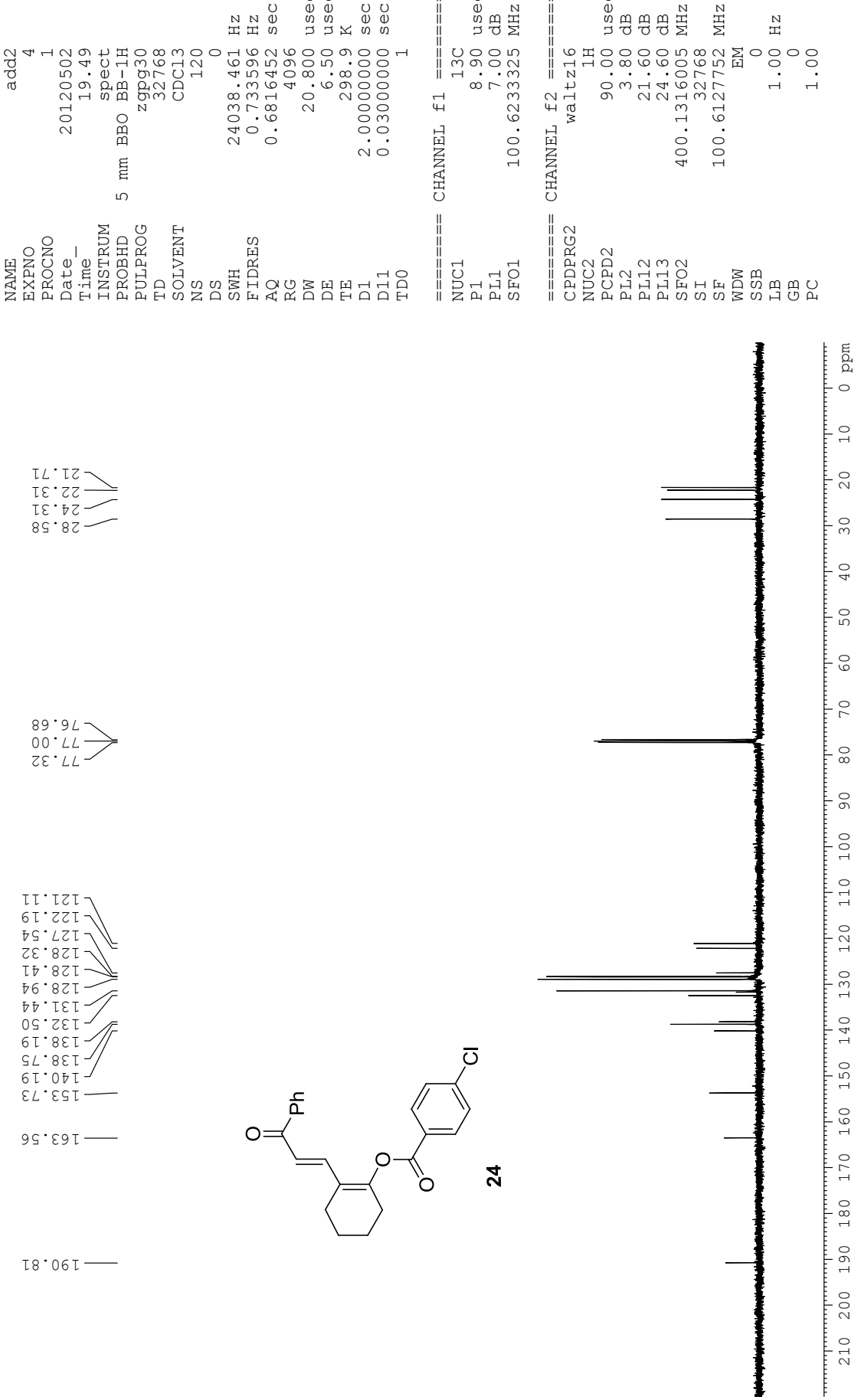


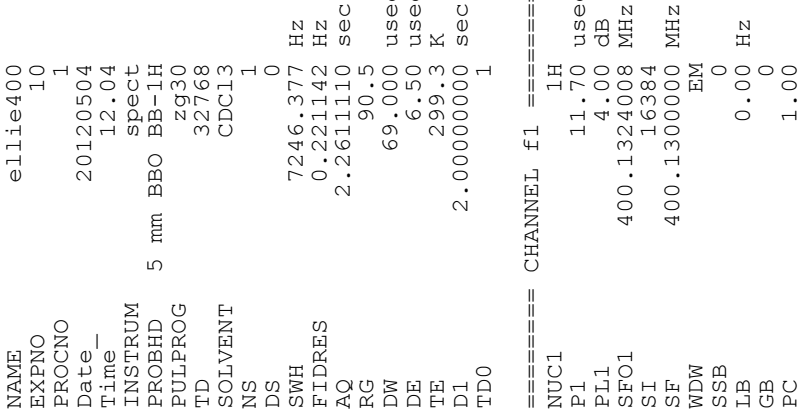

```
Current Data Parameters
NAME         Jimmy-43(4)
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20111120
Time               15.36
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1296
DS                    0
SWH           24038.461 Hz
FIDRES         0.733596 Hz
AQ             0.6816244 sec
RG                9195.2
DW                20.800 usec
DE                 6.50 usec
TE                301.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.90 usec
PL1                 7.00 dB
SFO1         100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                 3.80 dB
PL12               21.60 dB
PL13               24.60 dB
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                32768
SF           100.6127753 MHz
WDW                  EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.00
```


Current Data Parameters
NAME Jimmy-57(7)
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120228
Time_ 18.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300242 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
S
Ph
O
O
O2N
22b
ppm
1
2
3
4
5
6
7
8
9
10
2.02
3.04
3.03
2.05
6.06
1.00
1.00

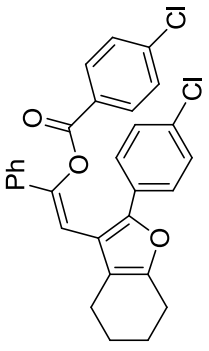

Current Data Parameters
NAME Jimmy-57(7)
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120228
Time 19.00
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1053
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127792 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.32
77.00
76.68
111.10
122.16
123.28
123.71
124.43
124.76
124.84
125.45
128.87
128.92
129.27
130.51
130.97
132.86
133.93
133.99
134.48
138.71
138.75
140.36
148.56
150.57
161.86
ppm
200
180
160
140
120
100
80
60
40
20
Ph
O
O
S
Cl
O2N
22b


NAME ellie396
EXPNO 1
PROCNO 1
Date_ 20120429
Time_ 10.49
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 456.1
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300092 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
Ph
O
O
Cl
24
ppm
1
2
3
4
5
6
7
8
9
10
4.27
4.18
1.00
5.45
1.16
2.21
2.05

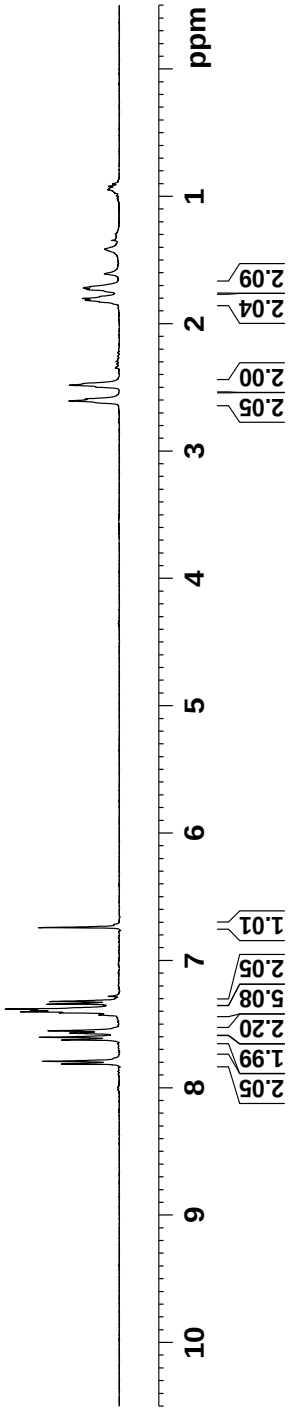

add2
4
1
20120502
19.49
spect
5 mm BBO BB-1H
zgpg30
32768
CDC13
120
0
24038.461 Hz
0.733596 Hz
0.6816452 sec
4096
20.800 usec
6.50 usec
298.9 K
2.00000000 sec
0.03000000 sec
1
NAME
EXPNO
PROCNO
Date_
Time_
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
D11
TD0
======== CHANNEL f1 ========
13C
8.90 usec
7.00 dB
100.6233325 MHz
NUC1
P1
PL1
SFO1
======== CHANNEL f2 ========
waltz16
1H
90.00 usec
3.80 dB
21.60 dB
24.60 dB
400.1316005 MHz
32768
100.6127752 MHz
EM
0
1.00 Hz
0
1.00
CPDPRG2
NUC2
PCPD2
PL2
PL12
PL13
SFO2
SI
SF
WDW
SSB
LB
GB
PC
21.71
22.31
24.31
28.58
76.68
77.00
77.32
121.11
122.19
127.54
128.32
128.41
128.94
131.44
132.50
138.19
138.75
140.19
153.73
163.56
190.81
O
Ph
O
O
Cl
24
ppm

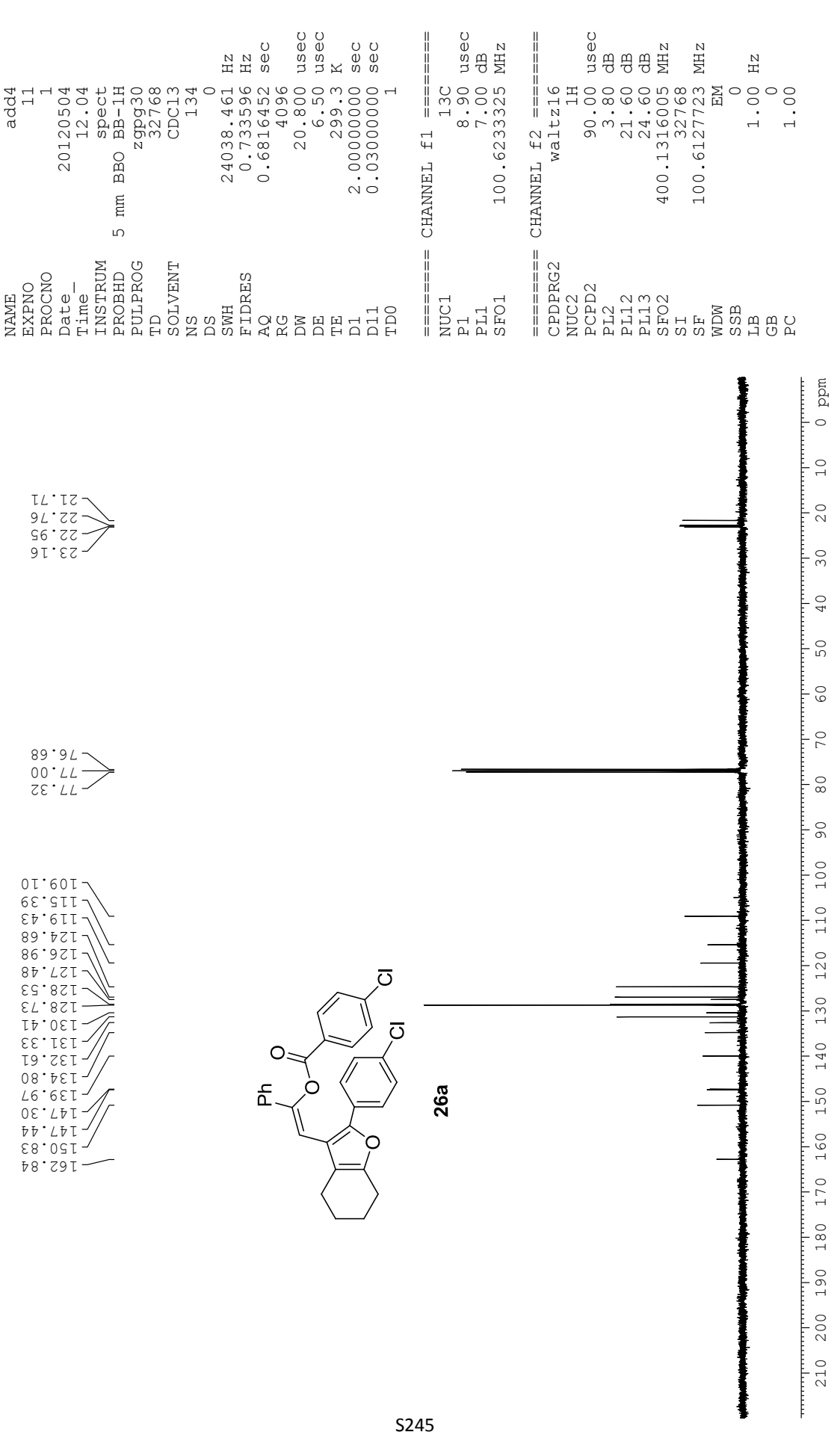


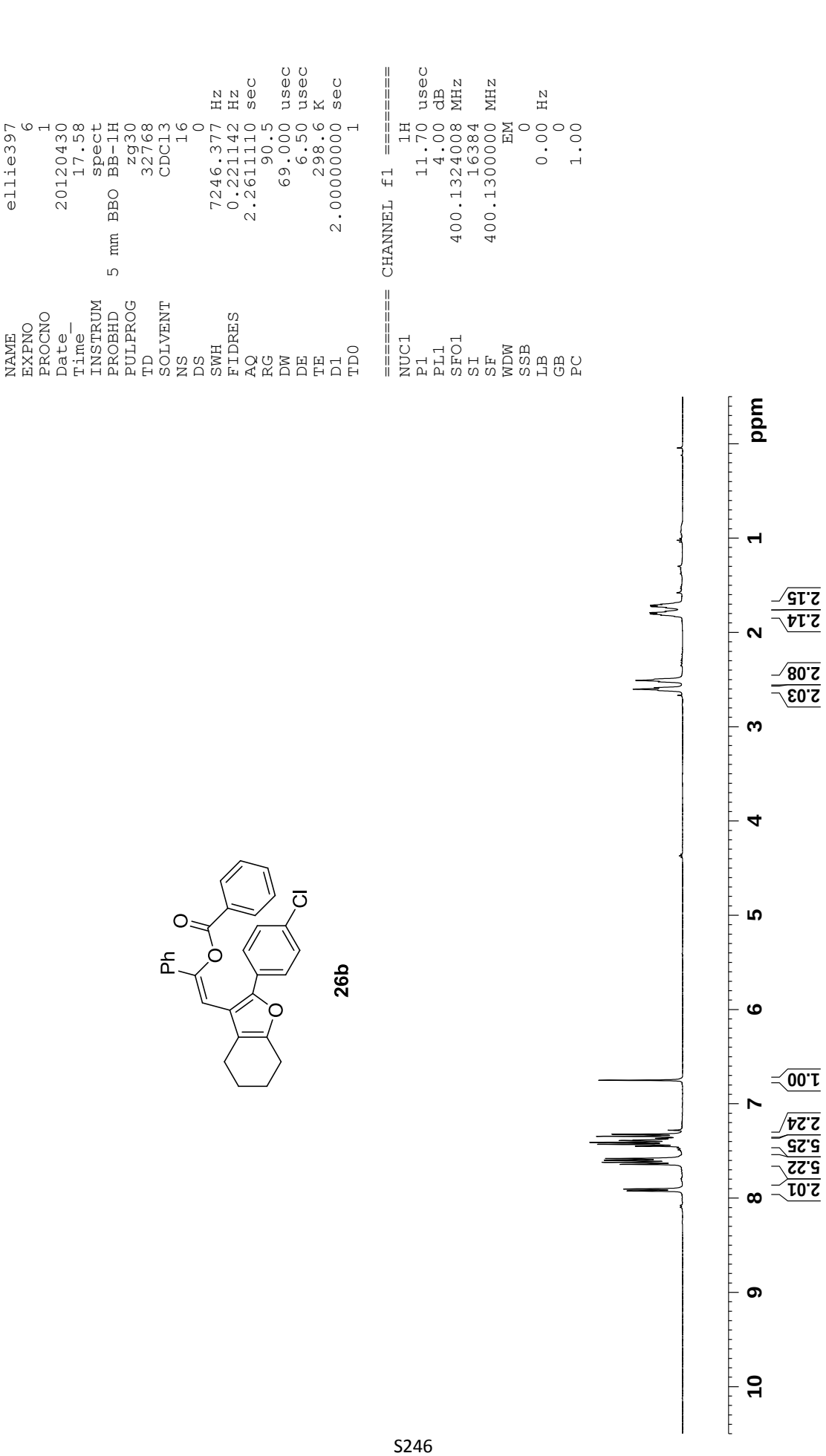
```
NAME                 ellie400
EXPNO                      10
PROCNO                      1
Date_                20120504
Time_                   12.04
INSTRUM                 spect
PROBHD   5 mm BBO BB-1H
PULPROG                 zg30
TD                     32768
SOLVENT                CDC13
NS                         1
DS                         0
SWH                7246.377 Hz
FIDRES             0.221142 Hz
AQ                 2.2611110 sec
RG                      90.5
DW                    69.000 usec
DE                     6.50 usec
TE                      299.3 K
D1                 2.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     11.70 usec
PL1                     4.00 dB
SFO1           400.1324008 MHz
SI                     16384
SF             400.1300000 MHz
WDW                       EM
SSB                        0
LB                      0.00 Hz
GB                         0
PC                      1.00
```

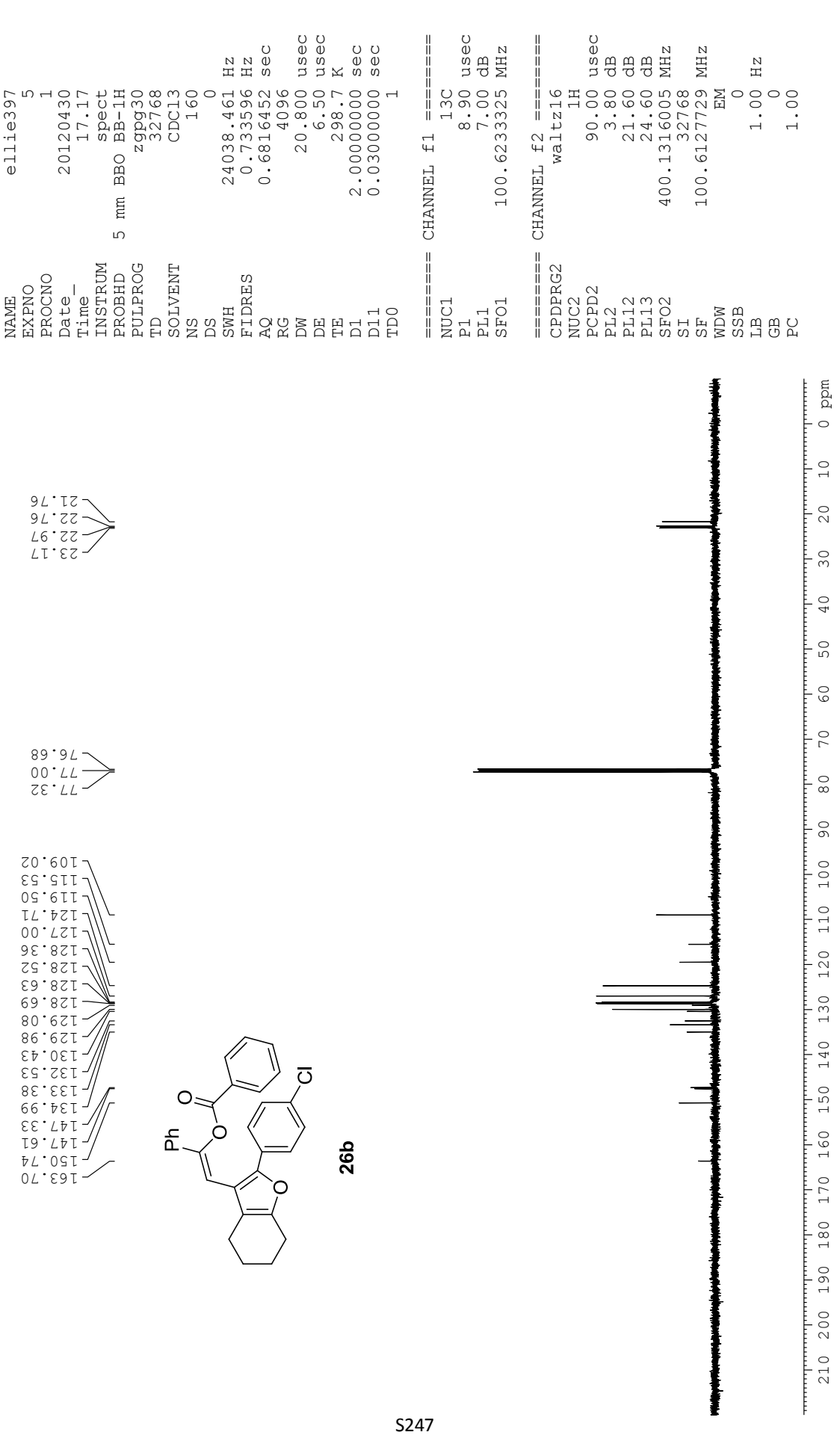


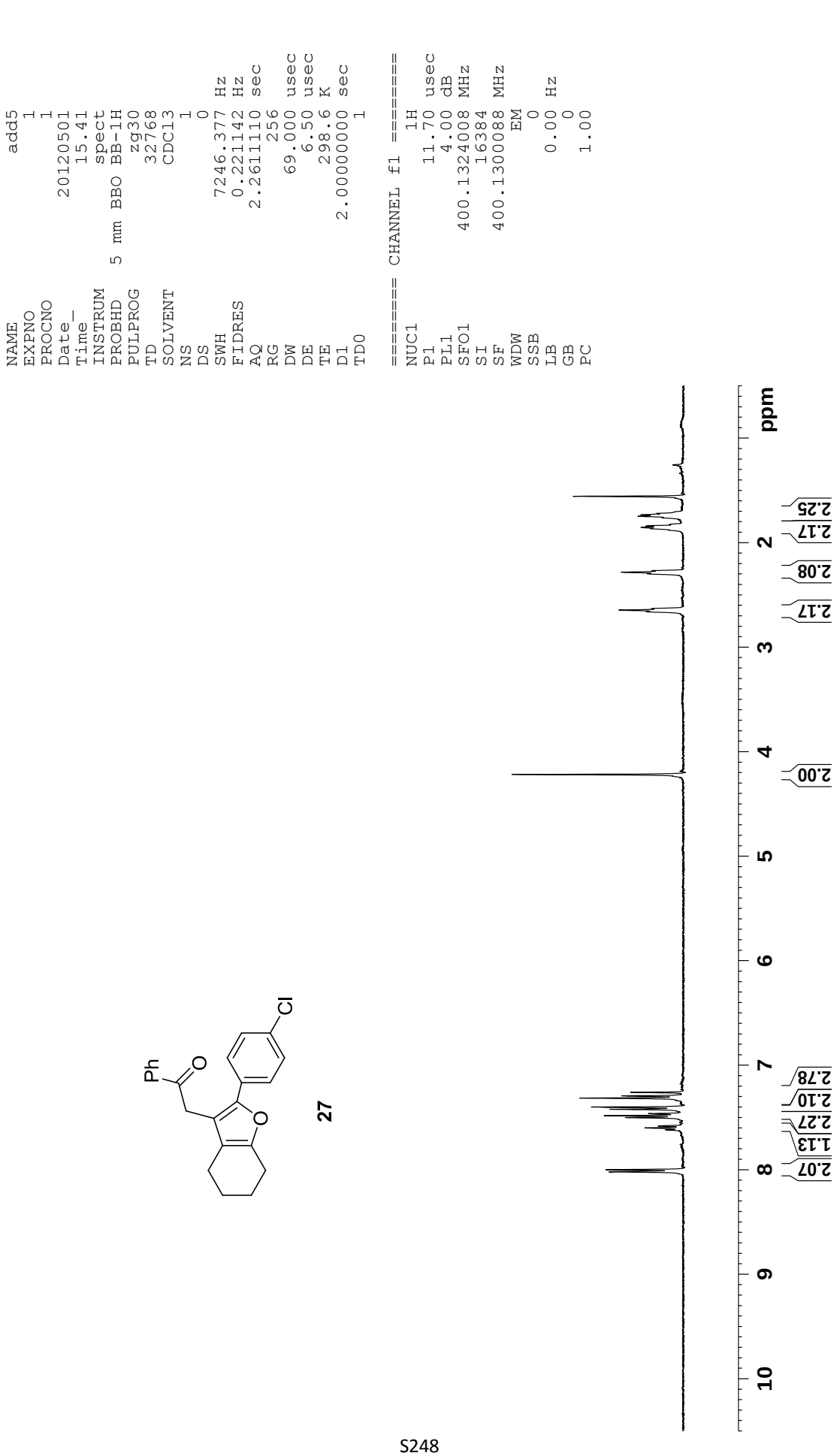
26a

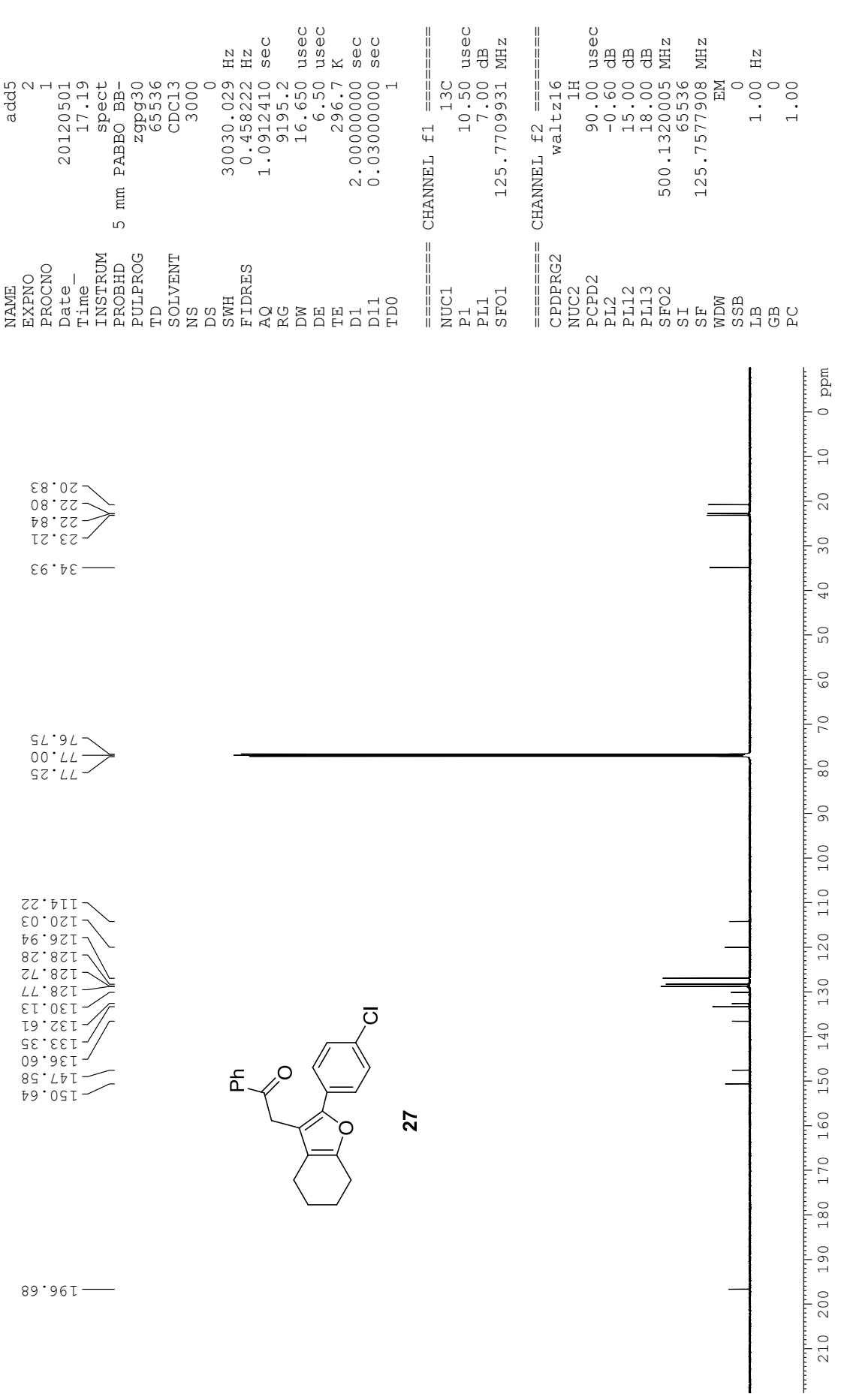


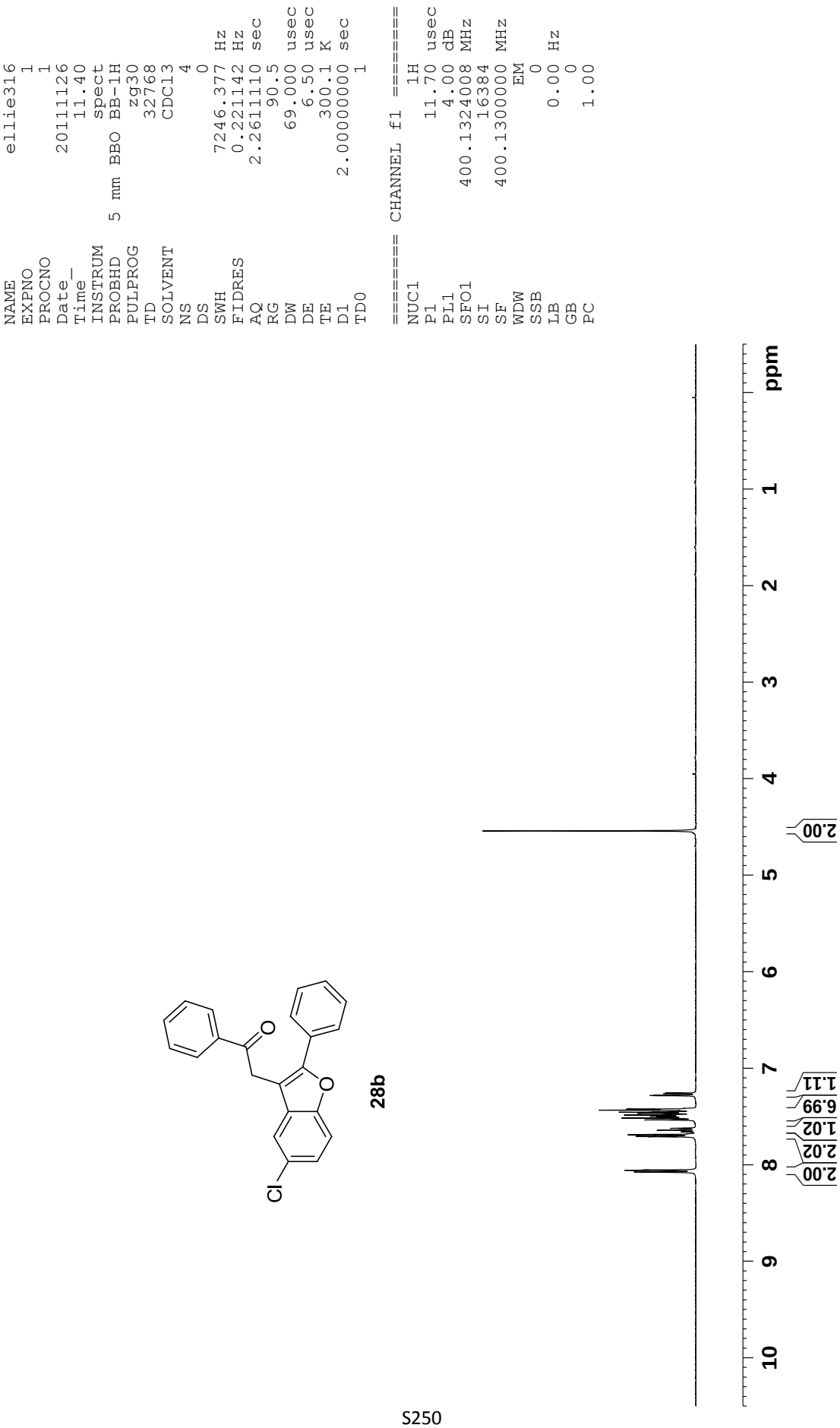

NAME add4
EXPNO 11
PROCNO 1
Date_ 20120504
Time_ 12.04
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 134
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127723 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
23.16
22.95
22.76
21.71
77.32
77.00
76.68
109.10
115.39
119.43
124.68
126.98
127.48
128.53
128.73
130.41
131.33
132.61
134.80
139.97
147.30
147.44
150.83
162.84
Ph
O
O
O
Cl
Cl
26a
0 ppm

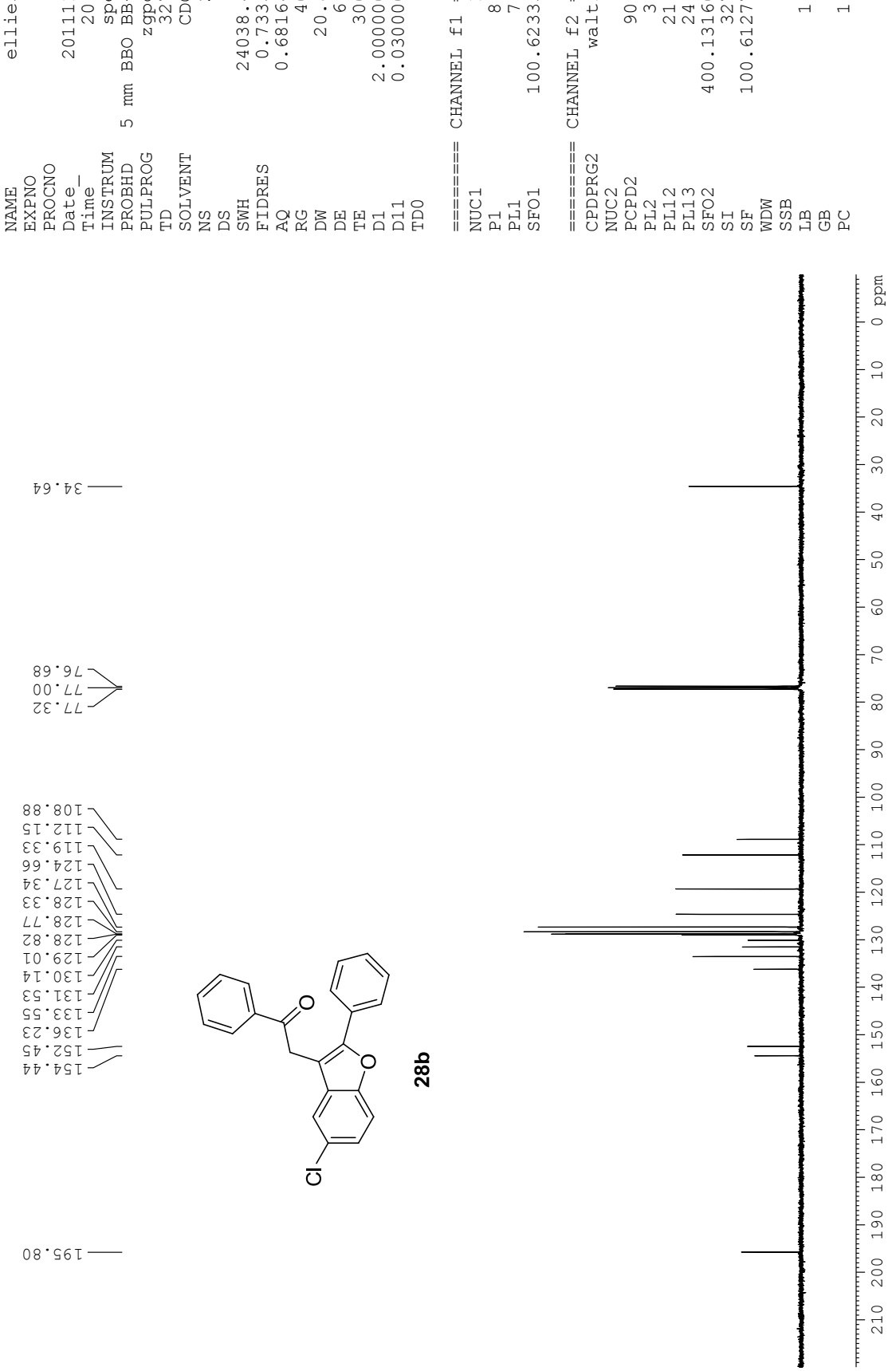

NAME ellie397
EXPNO 6
PROCNO 1
Date_ 20120430
Time_ 17.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
O
Cl
26b
ppm
10
9
8
7
6
5
4
3
2
1
2.01
5.22
5.25
2.24
1.00
2.03
2.08
2.14
2.15

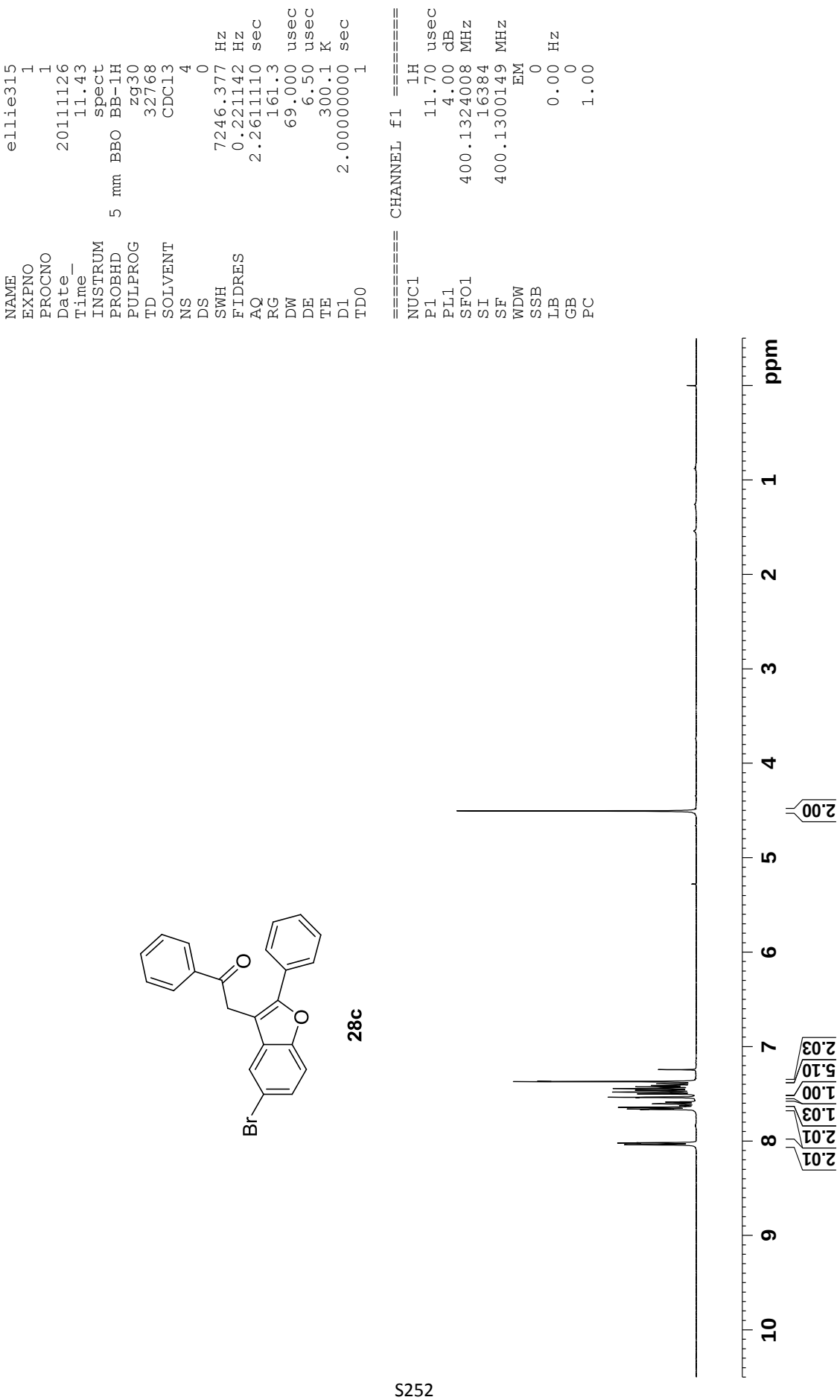

NAME ellie397
EXPNO 5
PROCNO 1
Date_ 20120430
Time_ 17.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 160
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127729 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.76
22.76
22.97
23.17
76.68
77.00
77.32
109.02
115.53
119.50
124.71
127.00
128.36
128.52
128.63
128.69
129.08
129.98
130.43
132.53
133.38
134.99
147.33
147.61
150.74
163.70
Ph
O
O
O
Cl
26b
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

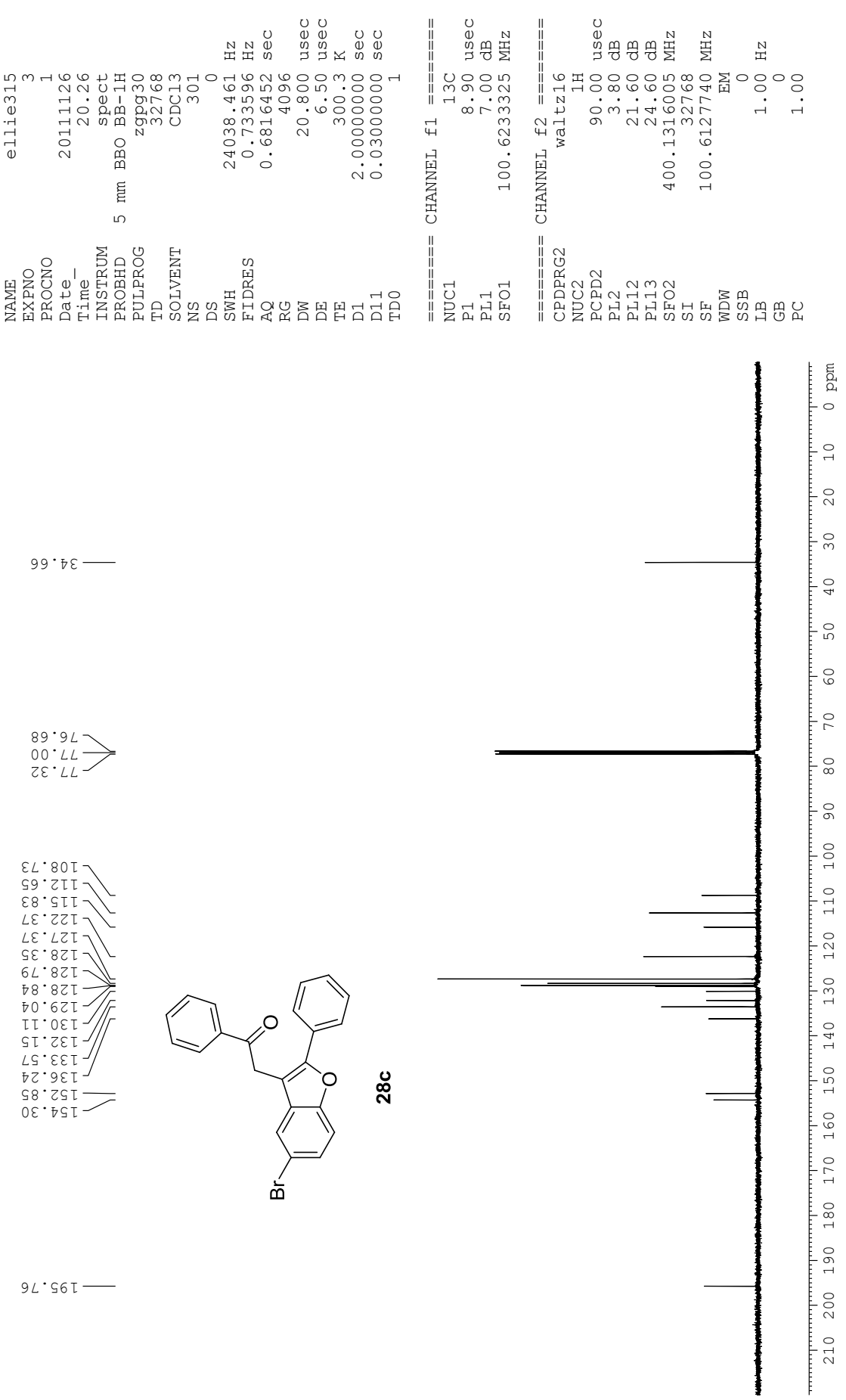

add5
1
1
20120501
15.41
spect
5 mm BBO BB-1H
zg30
32768
CDCl3
1
0
7246.377 Hz
0.221142 Hz
2.2611110 sec
256
69.000 usec
6.50 usec
298.6 K
2.00000000 sec
1
CHANNEL f1
1H
11.70 usec
4.00 dB
400.1324008 MHz
16384
400.1300088 MHz
EM
0
0.00 Hz
0
1.00
ppm
2.25
2.17
2.08
2.17
2.00
2.07
1.13
2.27
2.10
2.78
Ph
O
Cl
O
27

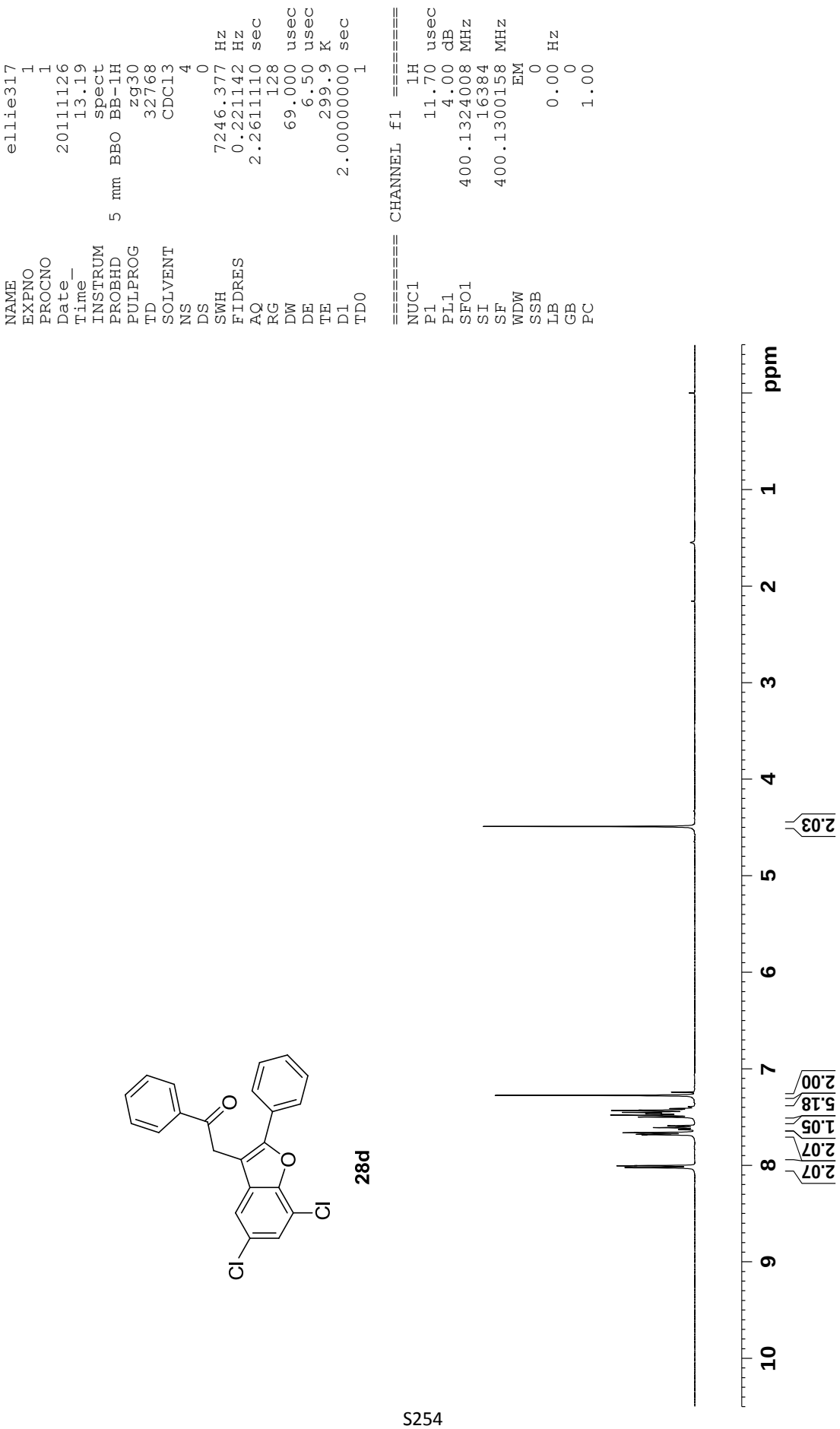

NAME add5
EXPNO 2
PROCNO 1
Date_ 20120501
Time_ 17.19
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 3000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912410 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
SI 65536
SF 125.7577908 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
20.83
22.80
22.84
23.21
34.93
76.75
77.00
77.25
114.22
120.03
126.94
128.28
128.72
128.77
130.13
132.61
133.35
136.60
147.58
150.64
196.68
Ph
O
O
Cl
27
0 ppm

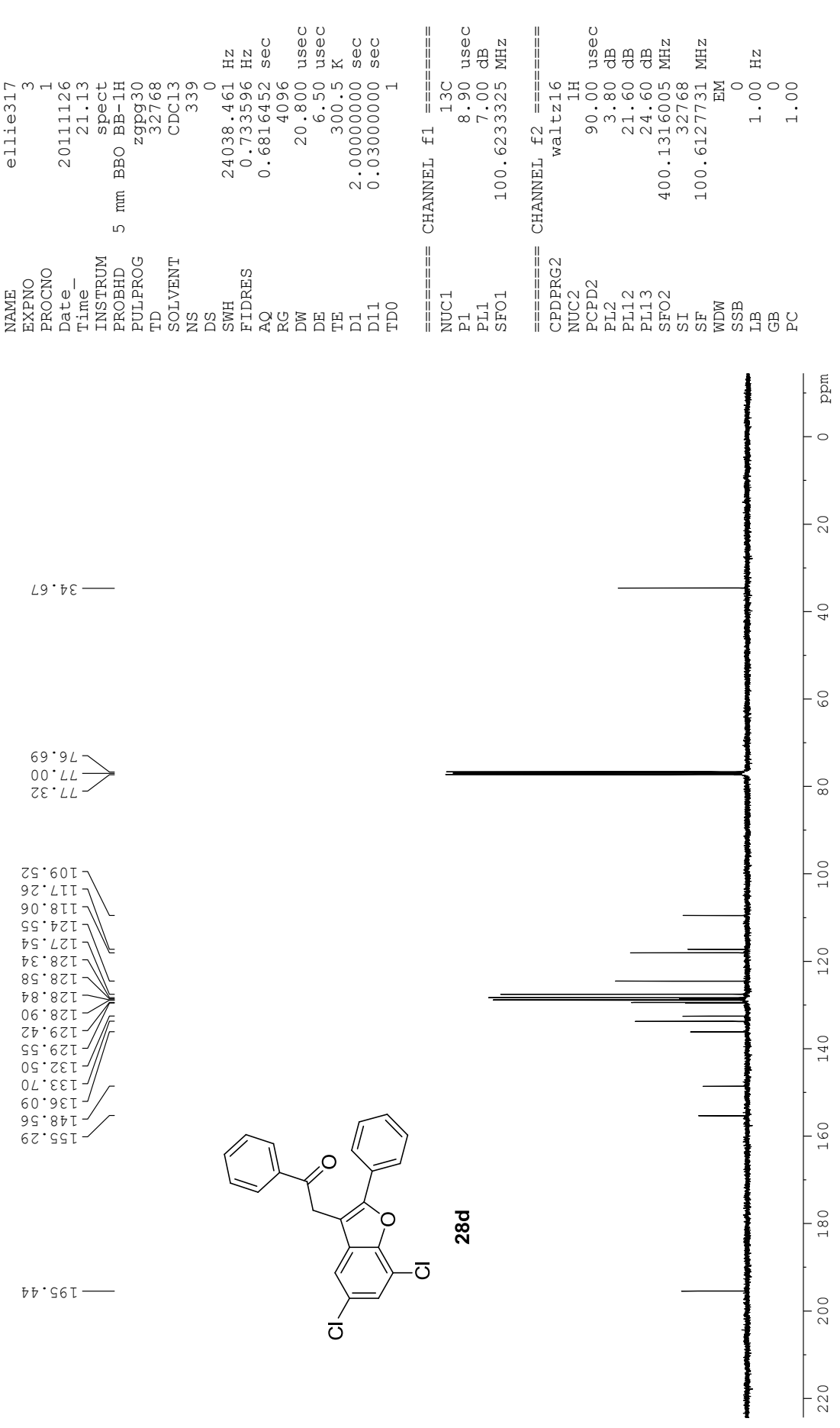

NAME ellie316
EXPNO 1
PROCNO 1
Date_ 20111126
Time_ 11.40
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
O
Cl
28b
ppm
10
9
8
7
6
5
4
3
2
1
2.00
2.00
2.02
1.02
6.99
1.11
2.00

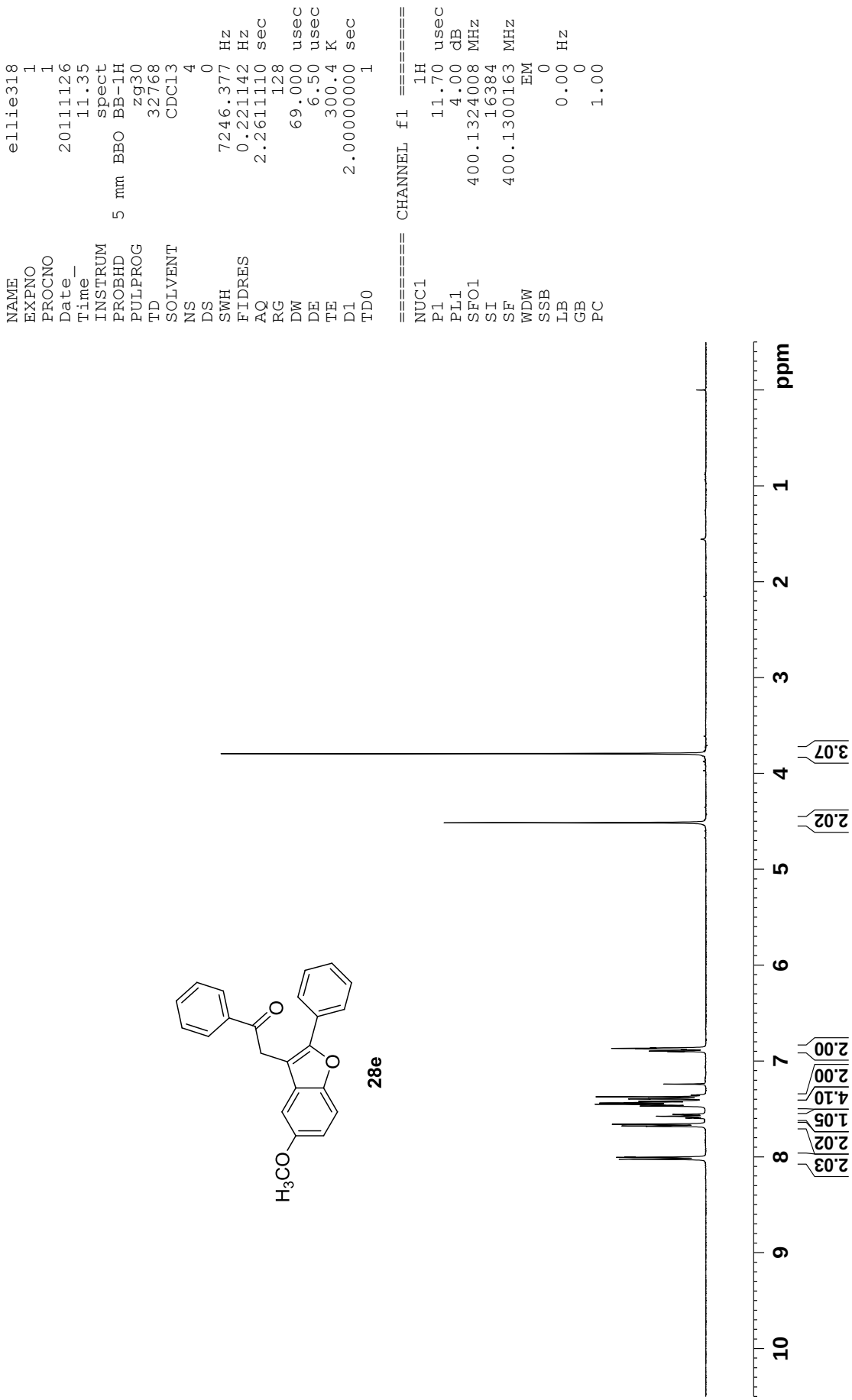

NAME ellie316
EXPNO 3
PROCNO 1
Date_ 20111126
Time_ 20.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 213
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127760 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
34.64
77.32
77.00
76.68
108.88
112.15
119.33
124.66
127.34
128.33
128.77
128.82
129.01
130.14
131.53
133.55
136.23
152.45
154.44
195.80
28b
Cl
O
O
0 ppm

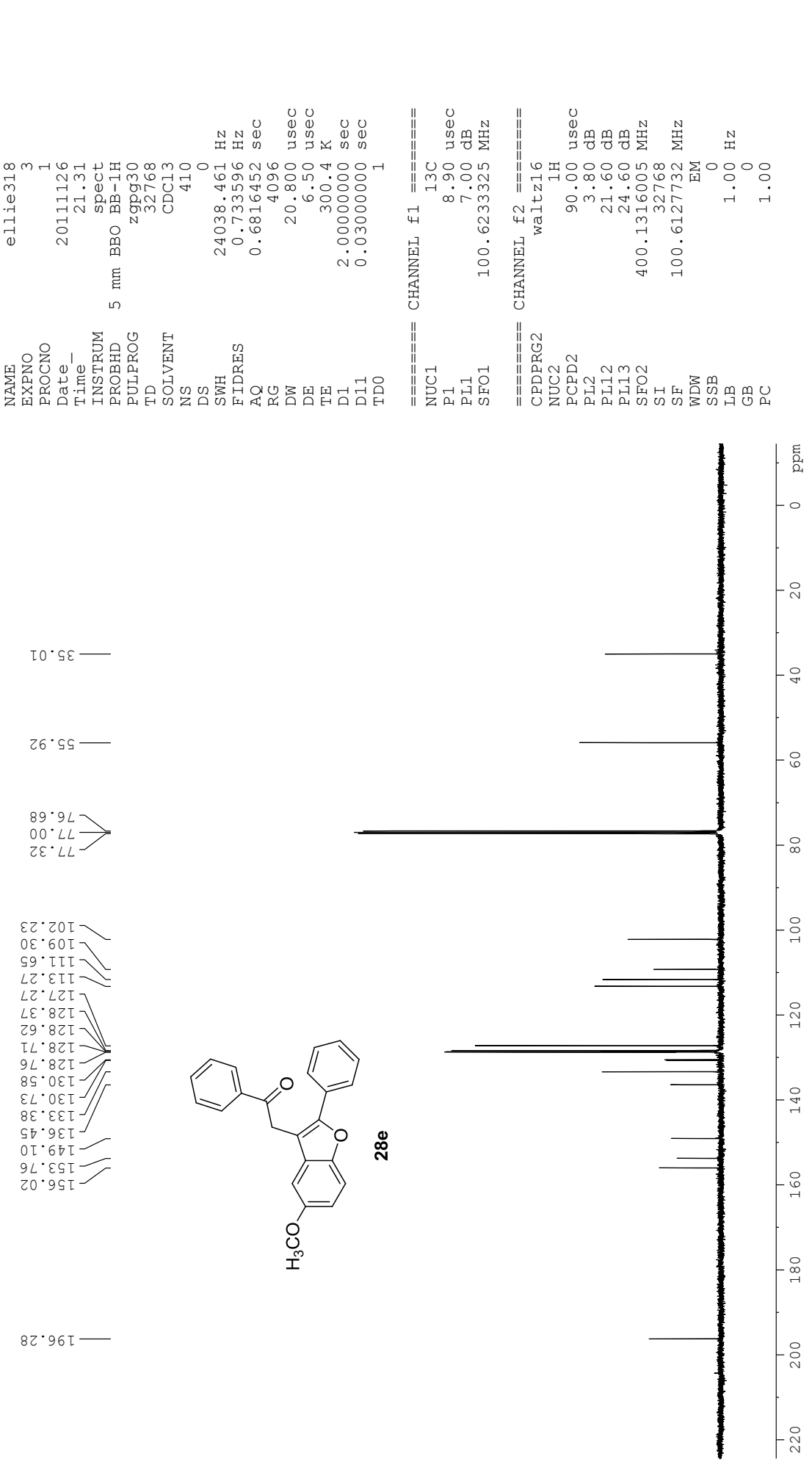

NAME ellie315
EXPNO 1
PROCNO 1
Date_ 20111126
Time_ 11.43
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 161.3
DW 69.000 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300149 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
O
Br
28c
ppm
10
9
8
7
6
5
4
3
2
1
2.01
2.01
1.03
1.00
5.10
2.03
2.00

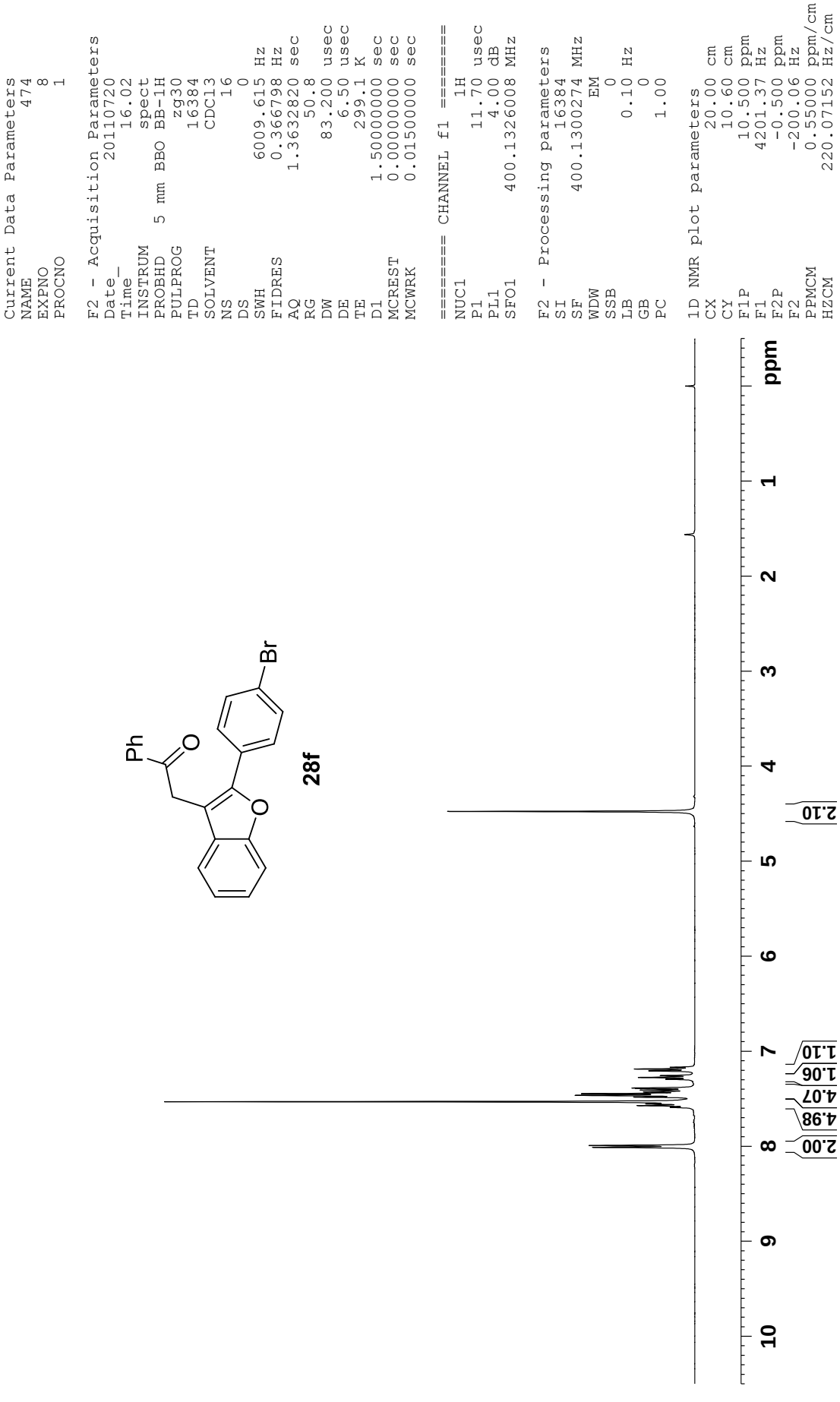

NAME ellie315
EXPNO 3
PROCNO 1
Date_ 20111126
Time_ 20.26
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 301
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127740 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
34.66
77.32
77.00
76.68
108.73
112.65
115.83
122.37
127.37
128.35
128.79
128.84
129.04
130.11
132.15
133.57
136.24
152.85
154.30
195.76
Br
O
O
28c
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

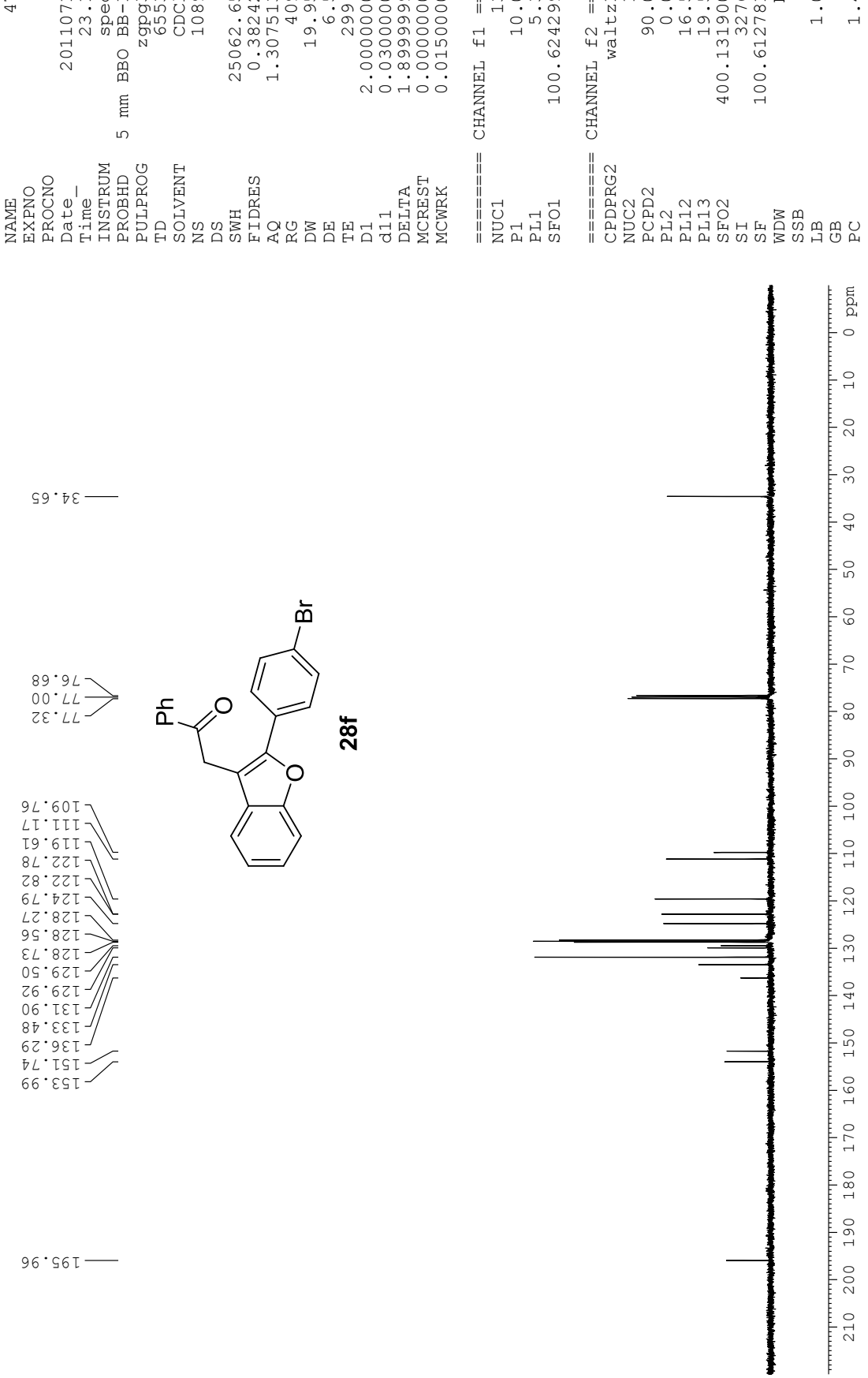

NAME ellie317
EXPNO 1
PROCNO 1
Date_ 20111126
Time 13.19
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300158 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
O
Cl
Cl
28d
2.03
2.07
2.07
1.05
5.18
2.00
ppm
10
9
8
7
6
5
4
3
2
1

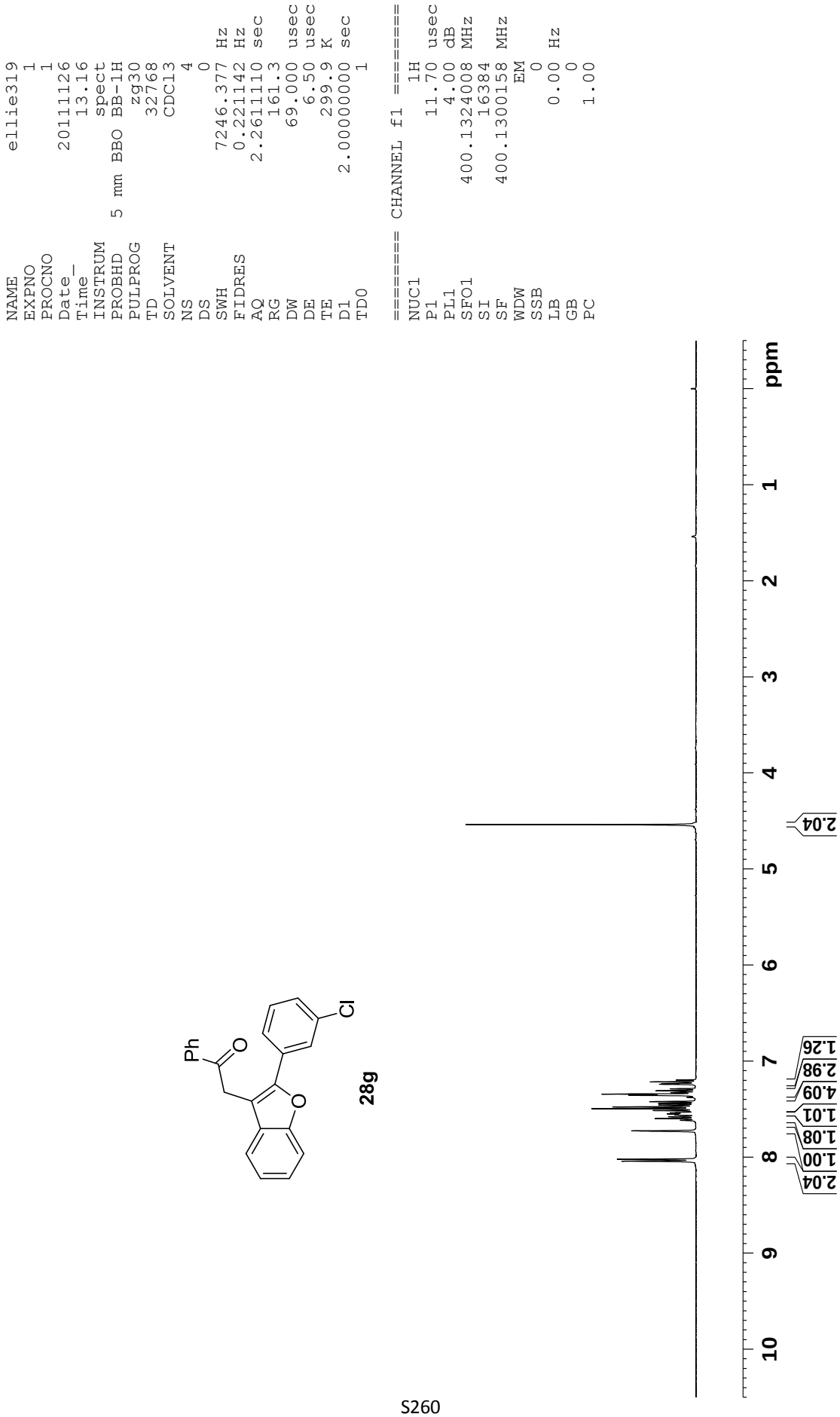

NAME ellie317
EXPNO 3
PROCNO 1
Date_ 20111126
Time_ 21.13
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 339
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127731 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
34.67
76.69
77.00
77.32
109.52
117.26
118.06
124.55
127.54
128.34
128.58
128.84
128.90
129.42
129.55
132.50
133.70
136.09
148.56
155.29
195.44
O
O
Cl
Cl
28d
ppm
0
20
40
60
80
100
120
140
160
180
200
220

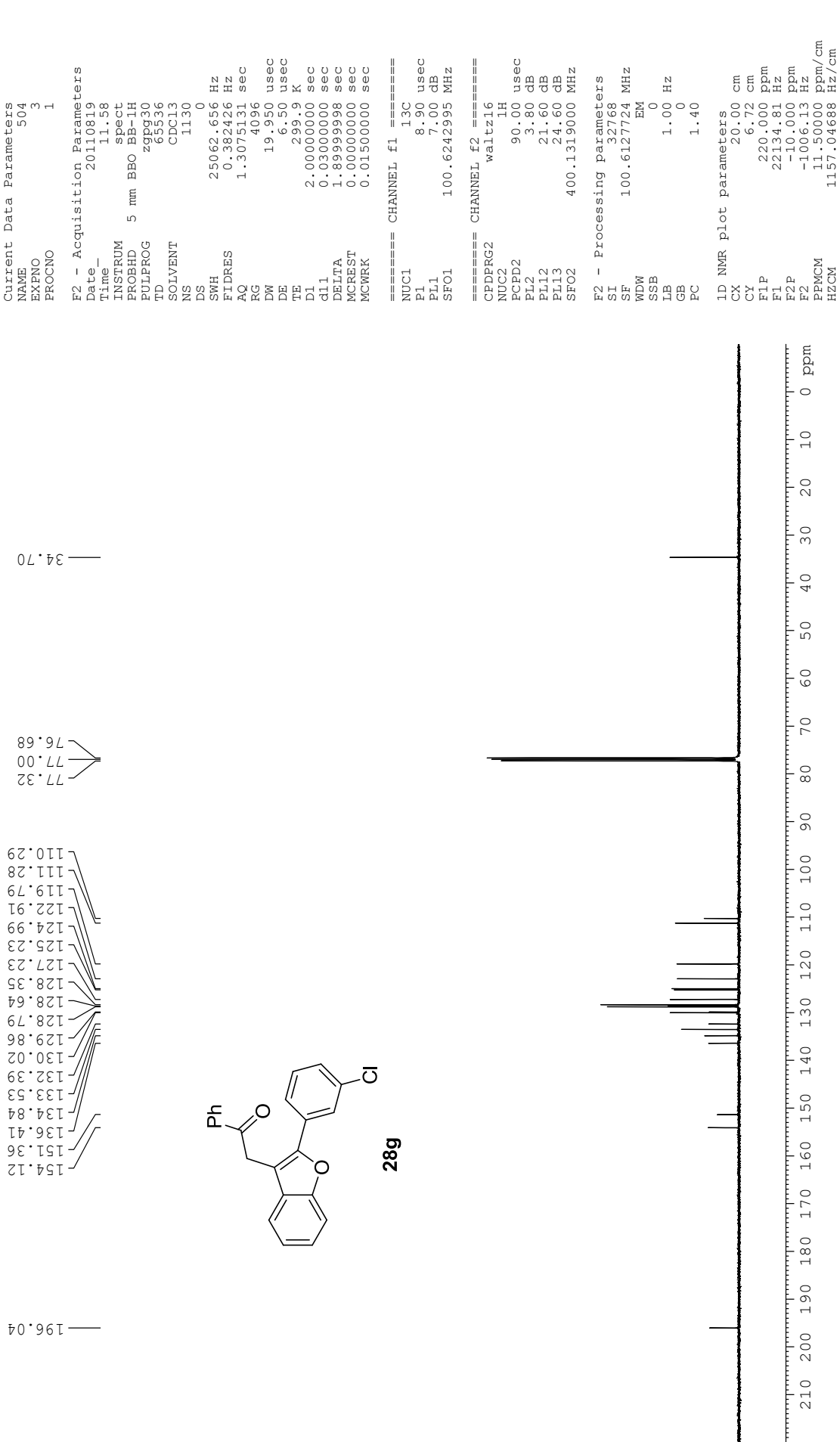

NAME ellie318
EXPNO 1
PROCNO 1
Date_ 20111126
Time 11.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300163 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
O
H3CO
28e
ppm
1
2
3
4
5
6
7
8
9
10
3.07
2.02
2.00
2.00
4.10
1.05
2.02
2.03

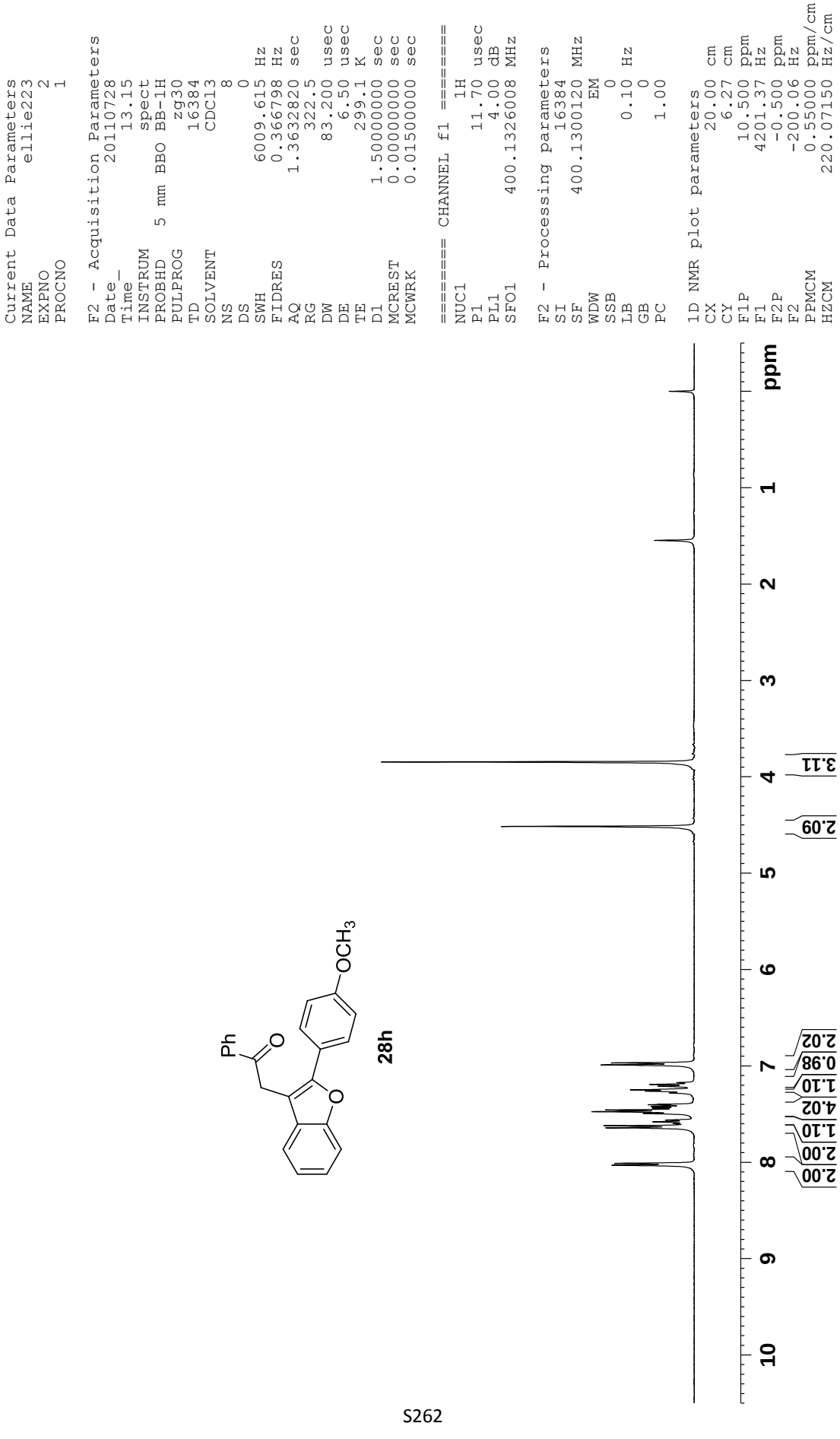

NAME ellie318
EXPNO 3
PROCNO 1
Date_ 20111126
Time_ 21.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 410
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127732 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
196.28
156.02
153.76
149.10
136.45
133.38
130.73
130.58
128.76
128.71
128.62
128.37
127.27
113.27
111.65
109.30
102.23
77.32
77.00
76.68
55.92
35.01
H3CO
28e
ppm
0
20
40
60
80
100
120
140
160
180
200
220

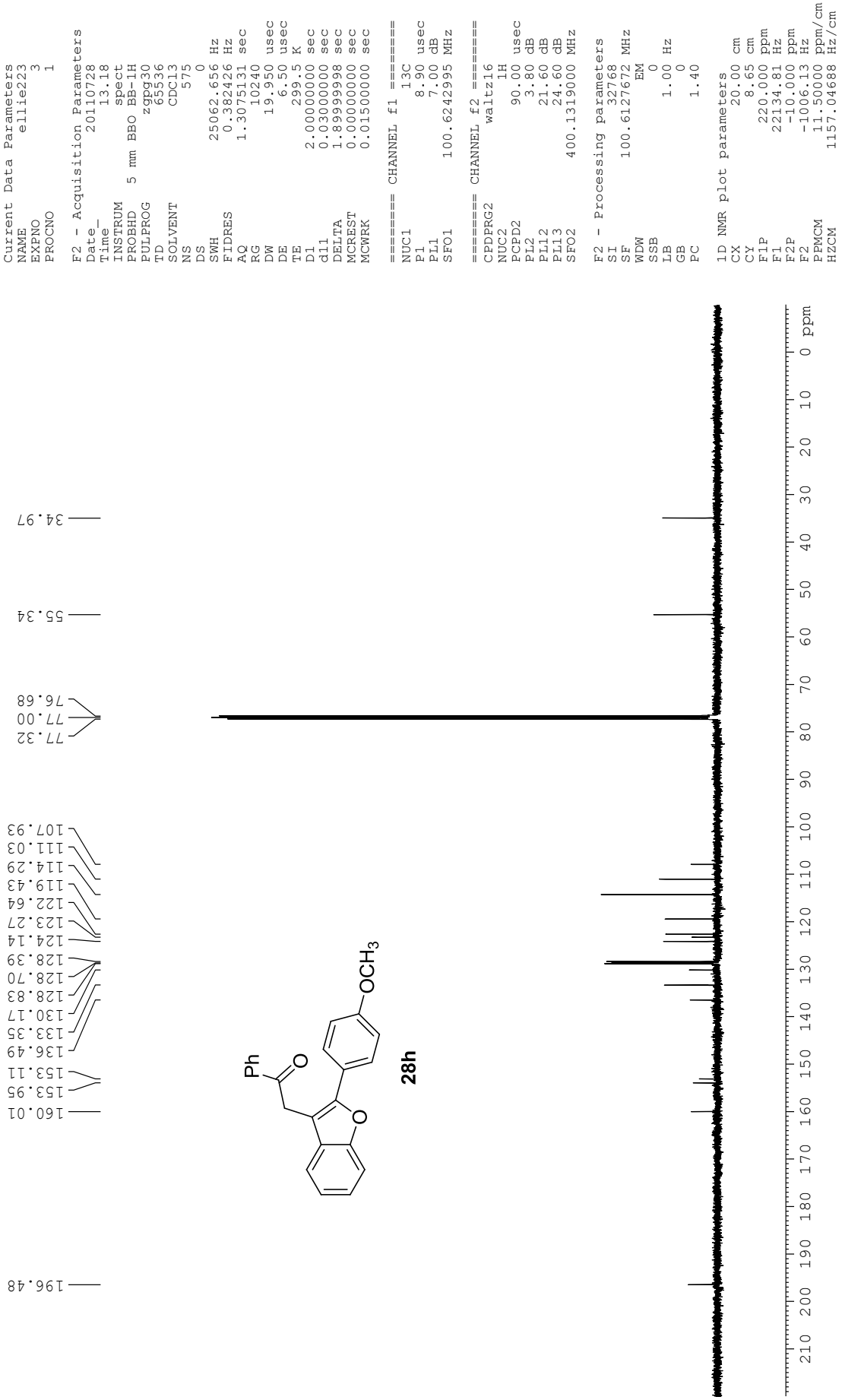

Current Data Parameters
NAME 474
EXPNO 8
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110720
Time_ 16.02
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 50.8
DW 83.200 usec
DE 6.50 usec
TE 299.1 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300274 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.60 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07152 Hz/cm
Ph
O
O
Br
28f
ppm
10
9
8
7
6
5
4
3
2
1
2.00
4.98
4.07
1.06
1.10
2.10

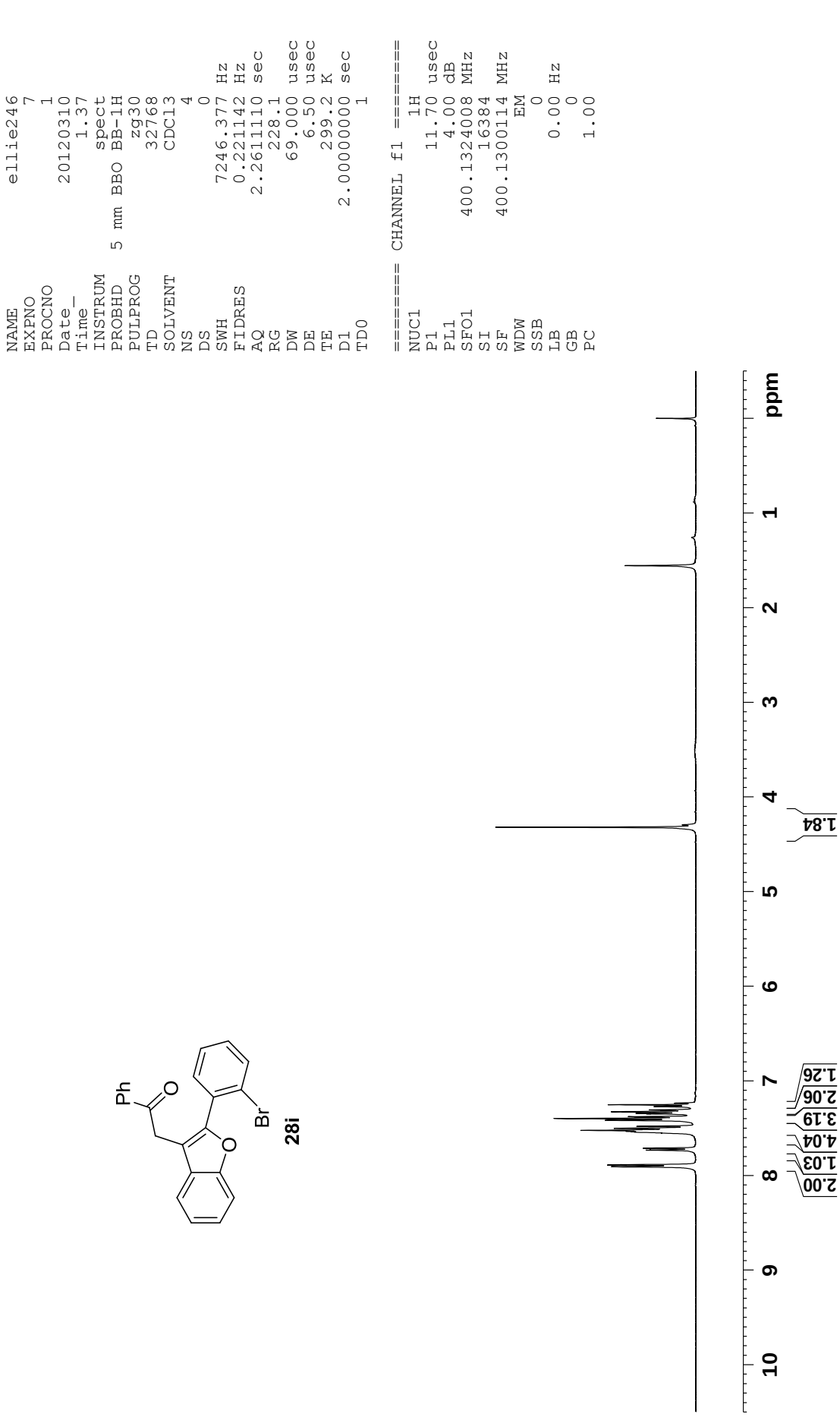

NAME 474
EXPNO 6
PROCNO 1
Date_ 20110715
Time_ 23.18
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 10896
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0.00 dB
PL12 16.50 dB
PL13 19.50 dB
SFO2 400.1319000 MHz
SI 32768
SF 100.6127813 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
195.96
153.99
151.74
136.29
133.48
131.90
129.92
129.50
128.73
128.56
128.27
124.79
122.82
122.78
119.61
111.17
109.76
77.32
77.00
76.68
34.65
Ph
O
O
Br
28f
0 ppm

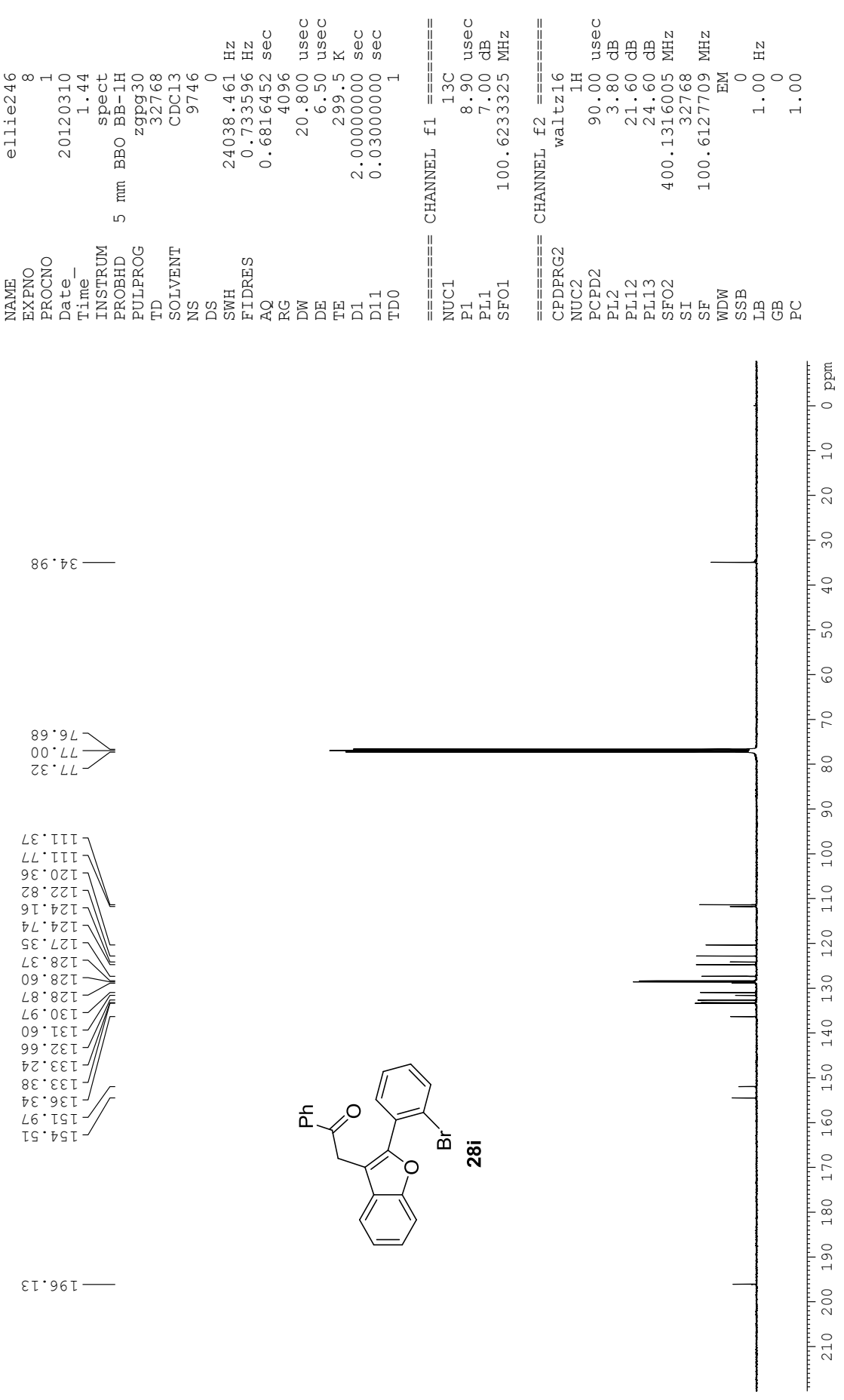

NAME ellie319
EXPNO 1
PROCNO 1
Date_ 20111126
Time_ 13.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 161.3
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300158 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
Cl
O
28g
ppm
10
9
8
7
6
5
4
3
2
1
2.04
1.00
1.08
1.01
4.09
2.98
1.26
2.04

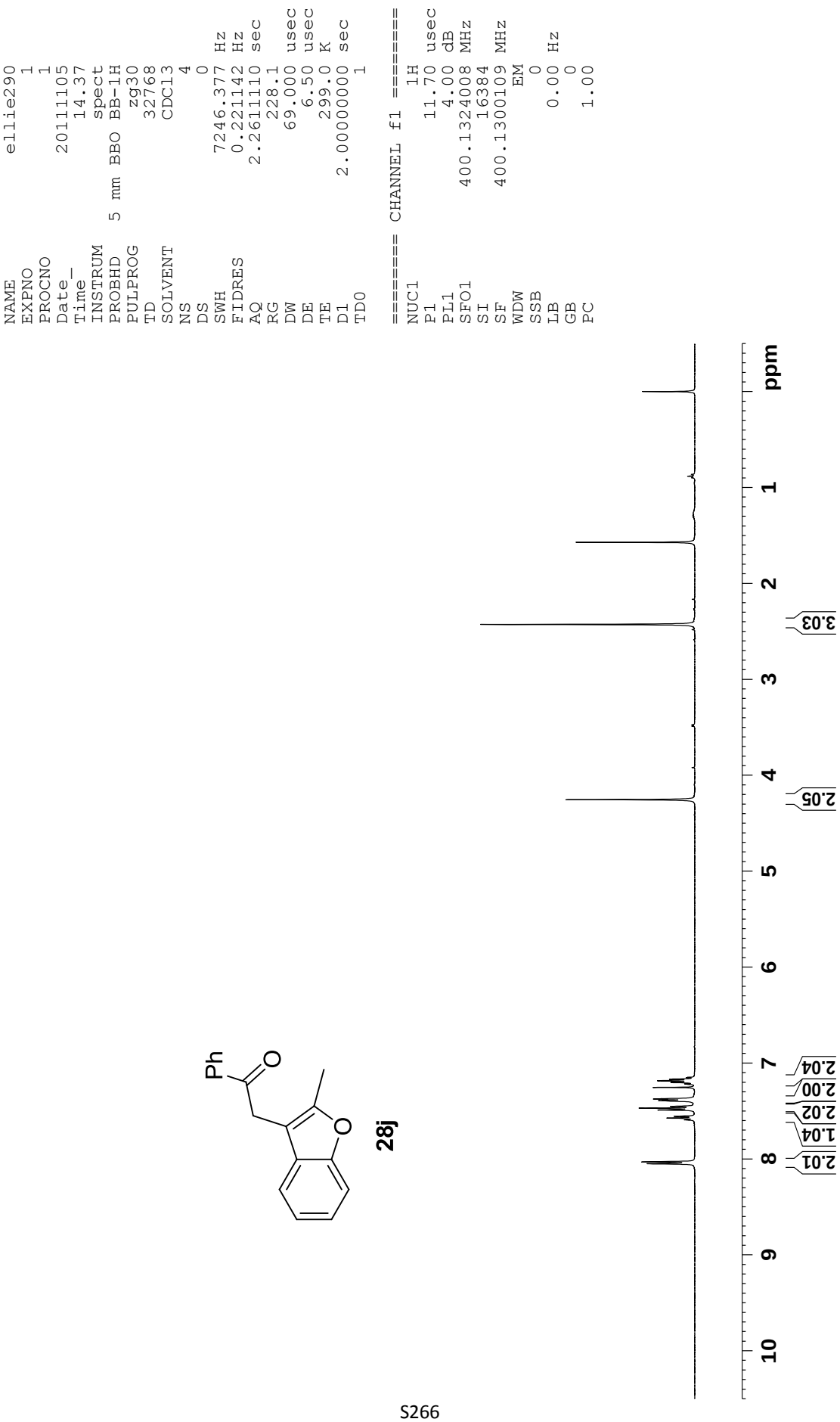

Current Data Parameters
NAME 504
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110819
Time_ 11.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1130
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 4096
DW 19.950 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127724 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 6.72 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
196.04
154.12
151.36
136.41
134.84
133.53
132.39
130.02
129.86
128.79
128.64
128.35
127.23
125.23
124.99
122.91
119.79
111.28
110.29
77.32
77.00
76.68
34.70
Ph
O
O
Cl
28g
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

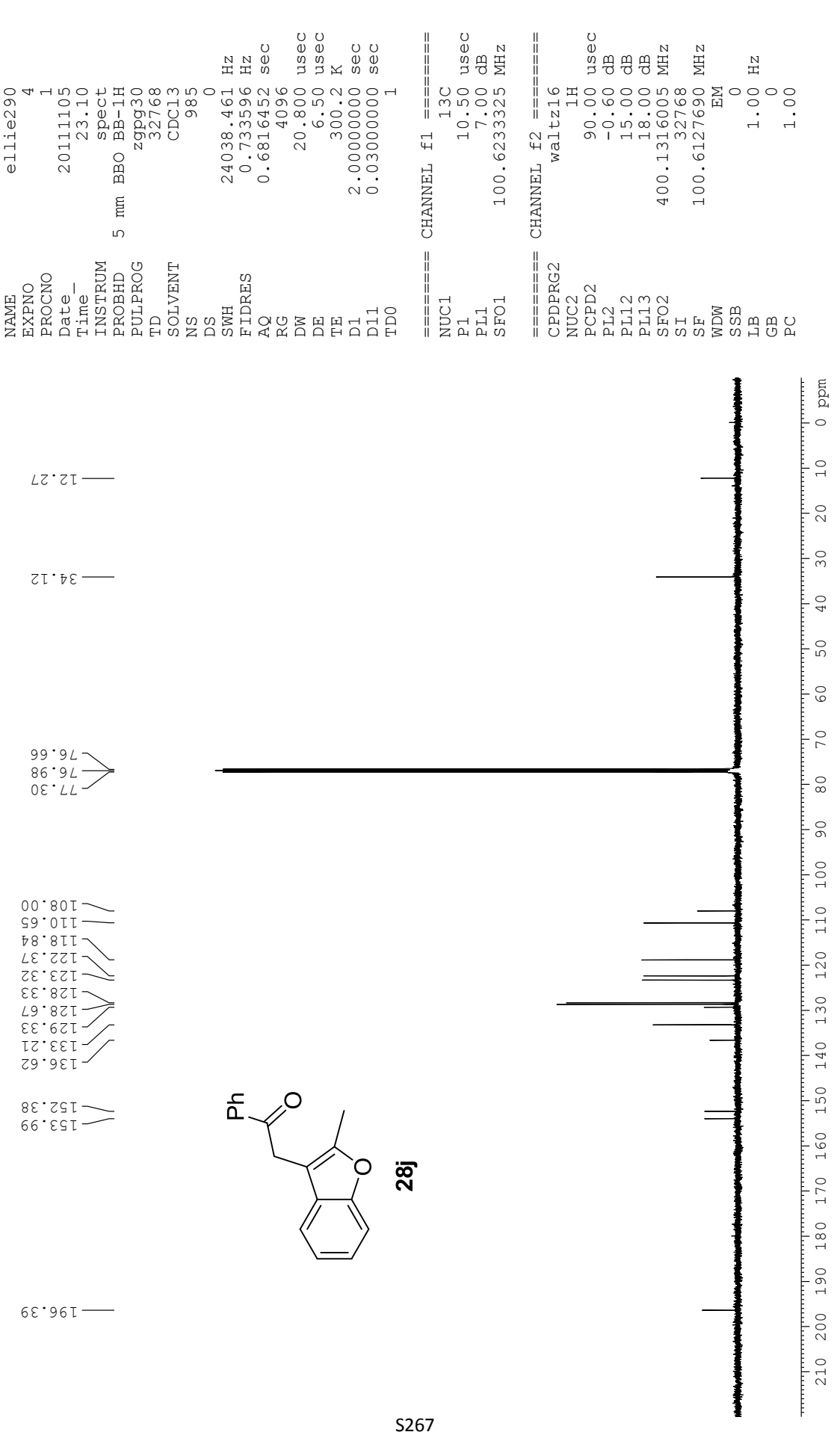

Current Data Parameters
NAME ellie223
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110728
Time_ 13.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 322.5
DW 83.200 usec
DE 6.50 usec
TE 299.1 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300120 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.27 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
Ph
O
O
OCH3
28h
ppm
10
9
8
7
6
5
4
3
2
1
2.00
2.00
1.10
4.02
1.10
0.98
2.02
2.09
3.11

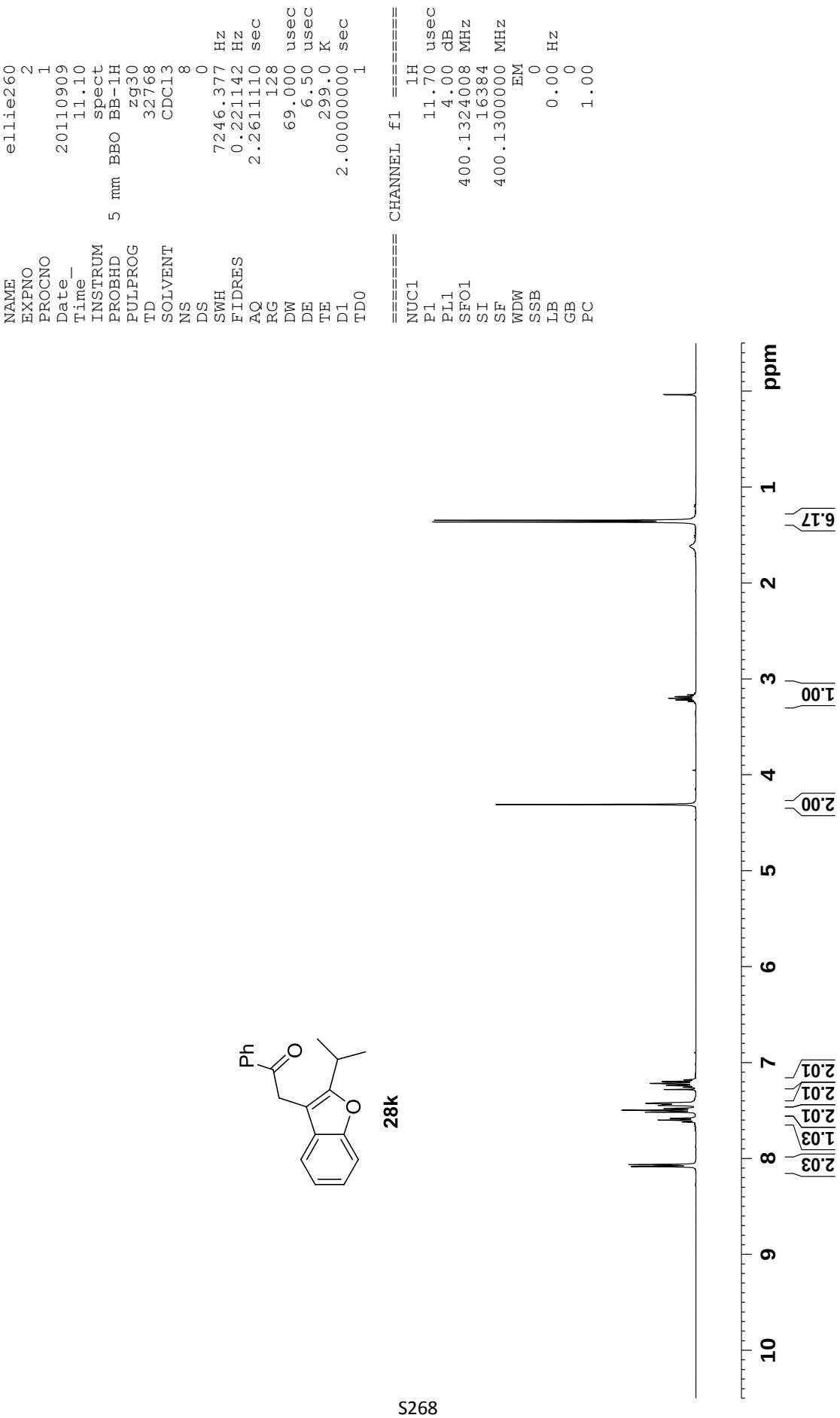

Current Data Parameters
NAME ellie223
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110728
Time_ 13.18
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 575
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 10240
DW 19.950 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127672 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.65 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
196.48
160.01
153.95
153.11
136.49
133.35
130.17
128.83
128.70
128.39
124.14
123.27
122.64
119.43
114.29
111.03
107.93
77.32
77.00
76.68
55.34
34.97
Ph
O
O
OCH3
28h
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

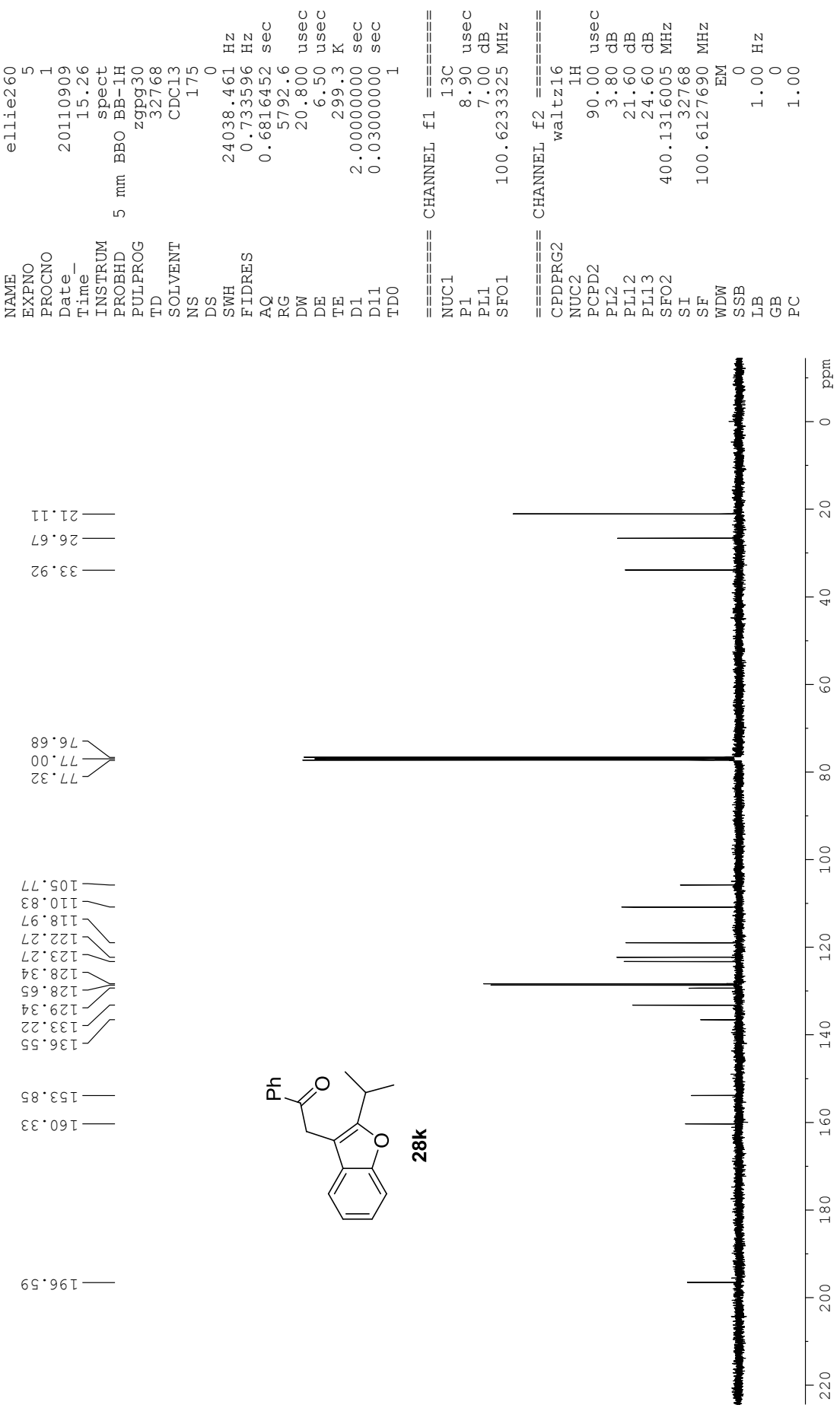

NAME ellie246
EXPNO 7
PROCNO 1
Date_ 20120310
Time_ 1.37
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300114 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
Br
O
28i
ppm
1
2
3
4
5
6
7
8
9
10
1.84
2.00
1.03
4.04
3.19
2.06
1.26

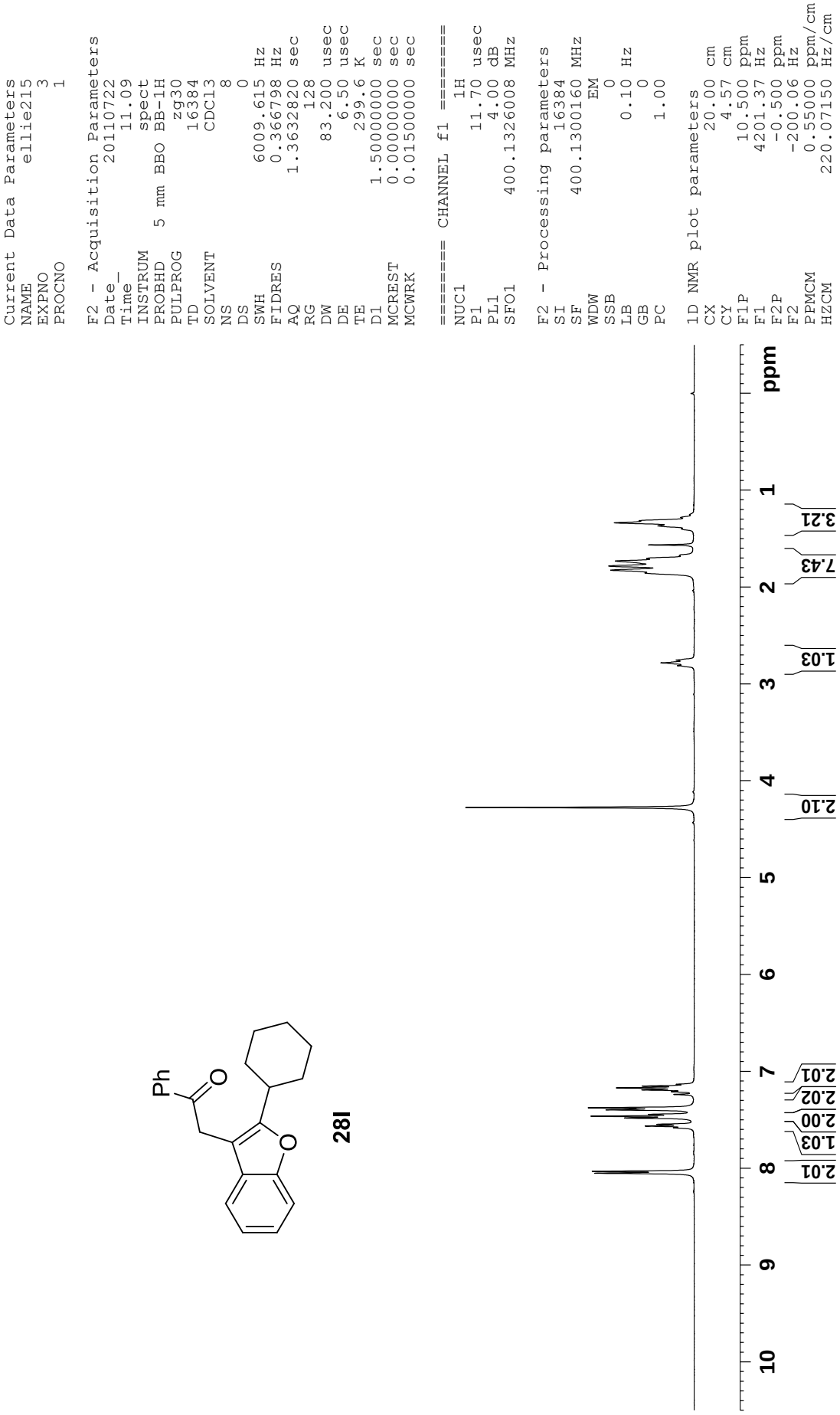

NAME ellie246
EXPNO 8
PROCNO 1
Date_ 20120310
Time_ 1.44
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 9746
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127709 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
34.98
77.32
77.00
76.68
111.37
111.77
120.36
122.82
124.16
124.74
127.35
128.37
128.60
128.87
130.97
131.60
132.66
133.24
133.38
136.34
151.97
154.51
196.13
Ph
O
Br
O
28i
0 ppm

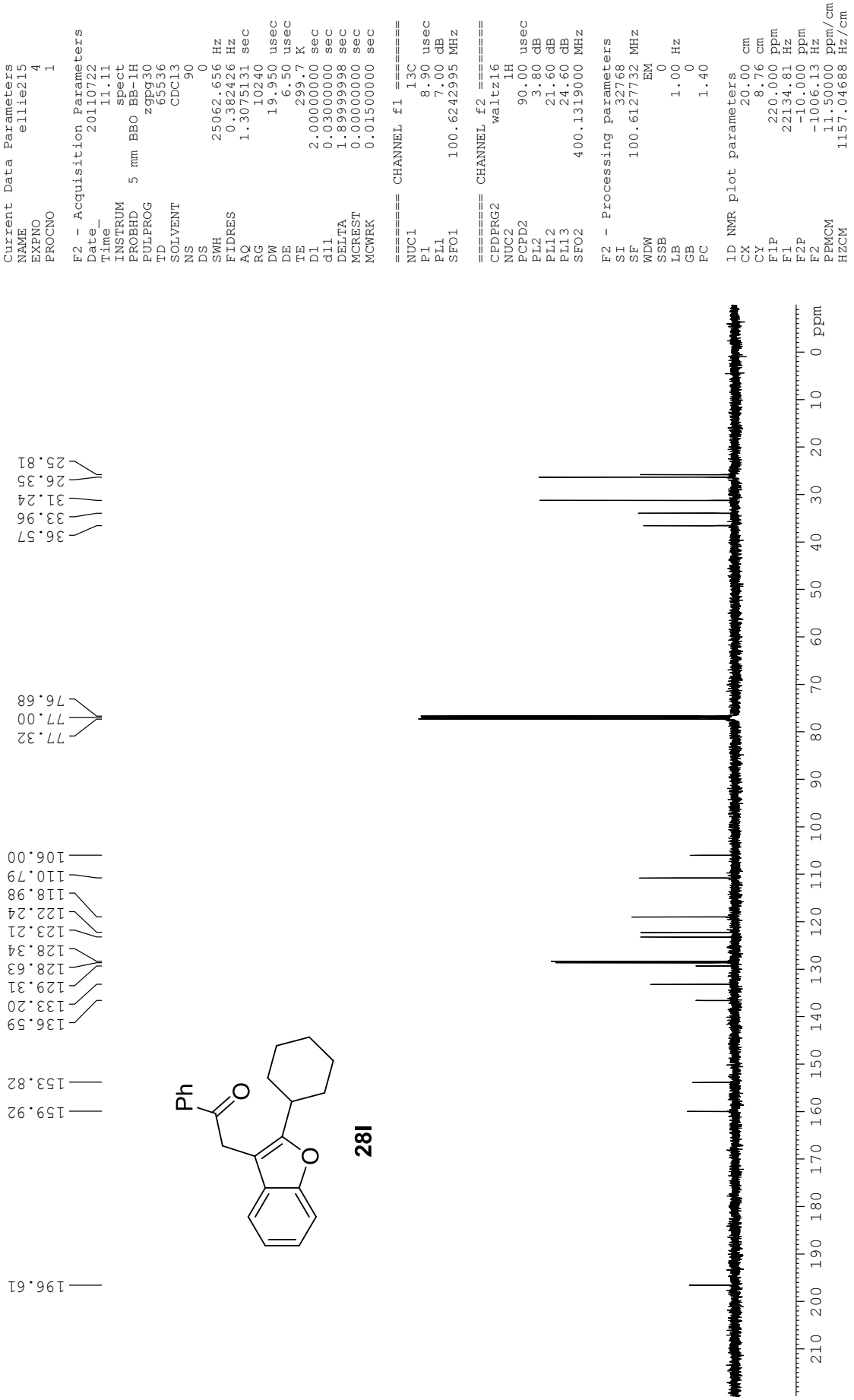

NAME ellie290
EXPNO 1
PROCNO 1
Date_ 20111105
Time_ 14.37
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300109 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
28j
ppm
1
2
3
4
5
6
7
8
9
10
3.03
2.05
2.04
2.00
2.02
1.04
2.01

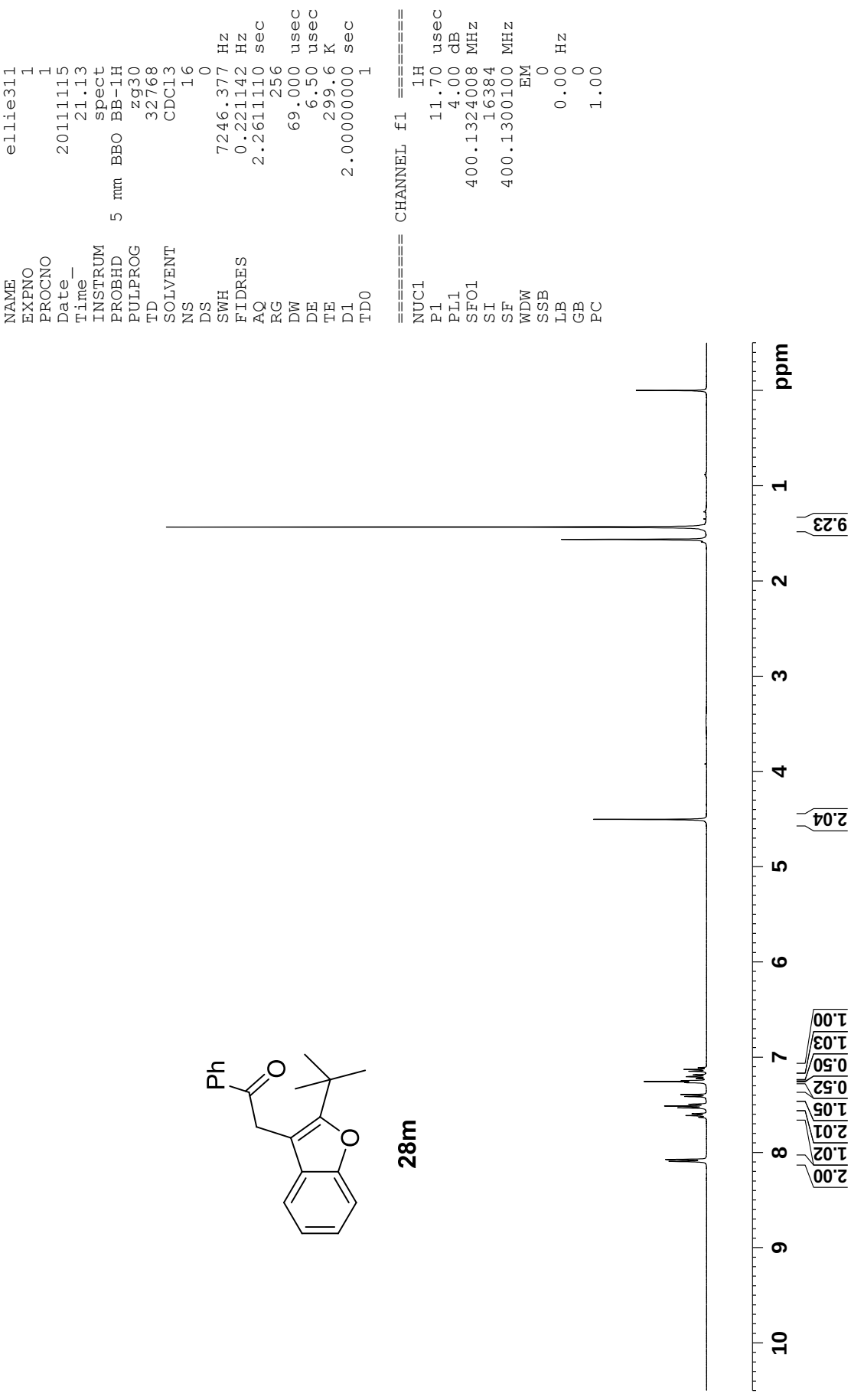

ellie290
4
1
20111105
23.10
spect
5 mm BBO BB-1H
zgpg30
32768
CDCl3
985
0
24038.461 Hz
0.733596 Hz
0.6816452 sec
4096
20.800 usec
6.50 usec
300.2 K
2.00000000 sec
0.03000000 sec
1
CHANNEL f1
13C
10.50 usec
7.00 dB
100.6233325 MHz
CHANNEL f2
waltz16
1H
90.00 usec
-0.60 dB
15.00 dB
18.00 dB
400.1316005 MHz
32768
100.6127690 MHz
EM
0
1.00 Hz
0
1.00
12.27
34.12
76.66
76.98
77.30
108.00
110.65
118.84
122.37
123.32
128.33
128.67
129.33
133.21
136.62
152.38
153.99
196.39
Ph
O
O
28j
0 ppm

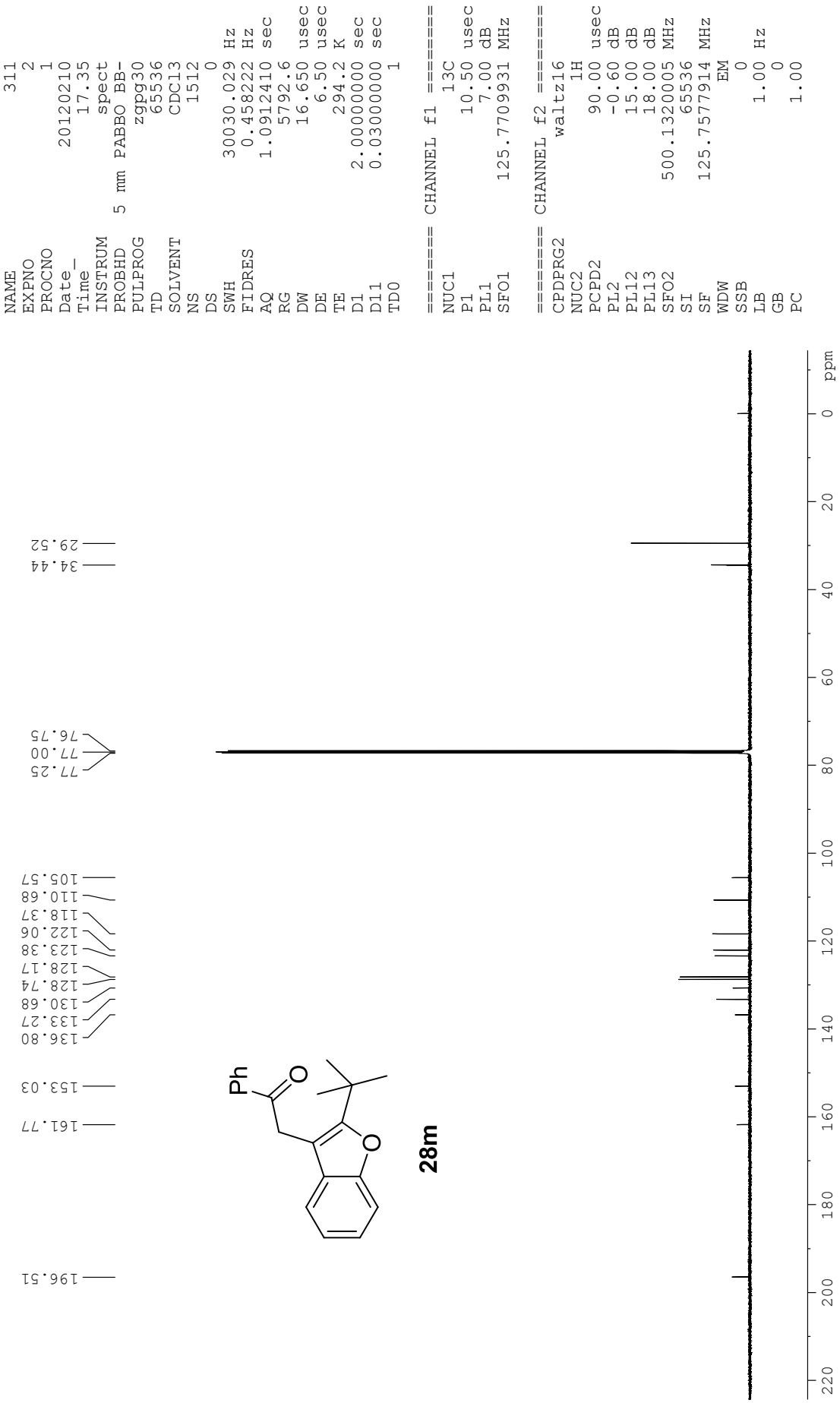

NAME ellie260
EXPNO 2
PROCNO 1
Date_ 20110909
Time 11.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
28k
ppm
1
2
3
4
5
6
7
8
9
10
6.17
1.00
2.00
2.03
1.03
2.01
2.01
2.01

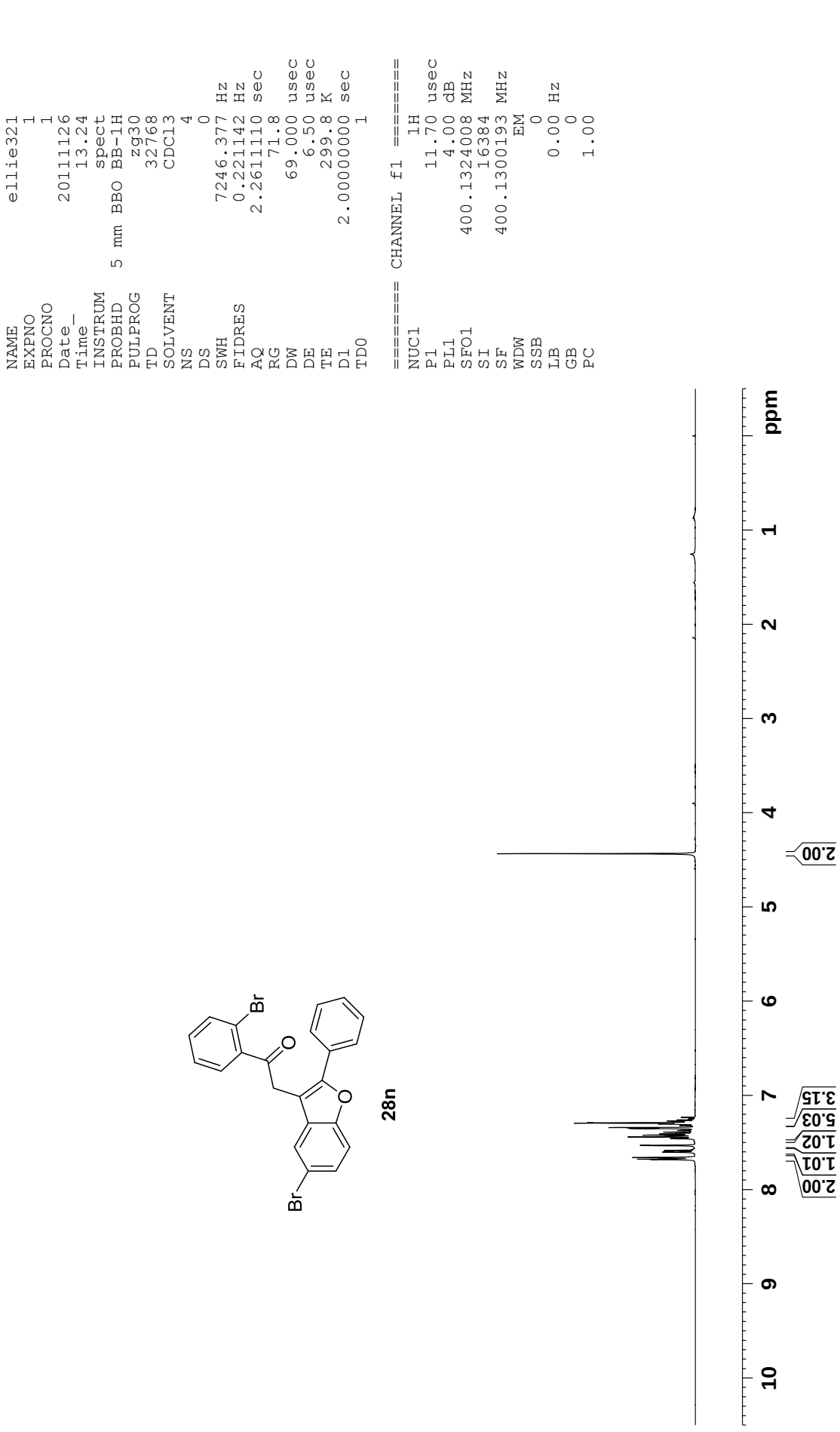

NAME ellie260
EXPNO 5
PROCNO 1
Date_ 20110909
Time_ 15.26
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 175
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 5792.6
DW 20.800 usec
DE 6.50 usec
TE 299.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.11
26.67
33.92
76.68
77.00
77.32
105.77
110.83
118.97
122.27
123.27
128.34
128.65
129.34
133.22
136.55
153.85
160.33
196.59
Ph
O
O
28k
ppm
0
20
40
60
80
100
120
140
160
180
200
220

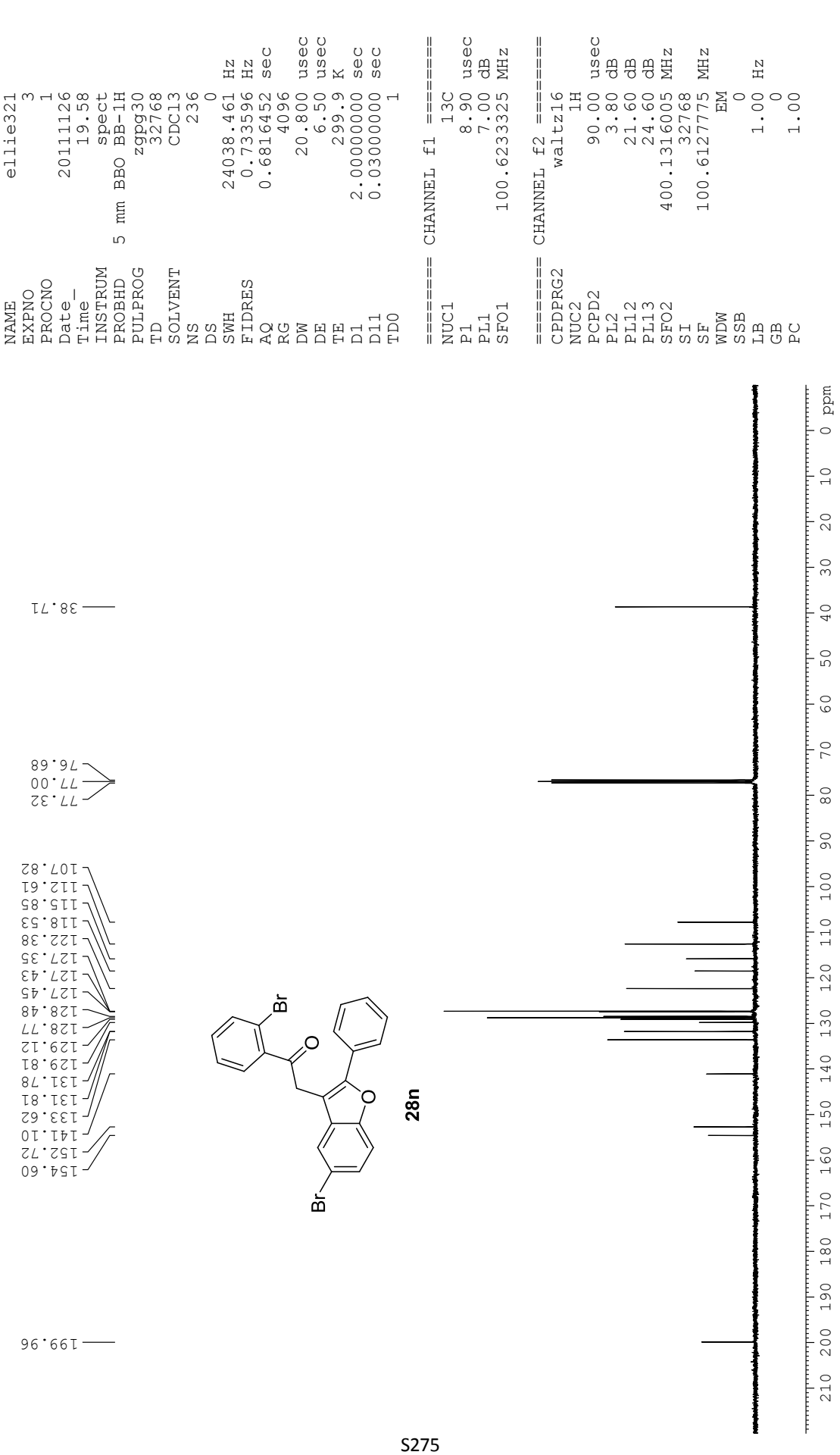

Current Data Parameters
NAME ellie215
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110722
Time_ 11.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 128
DW 83.200 usec
DE 6.50 usec
TE 299.6 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300160 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 4.57 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
Ph
O
O
28l
ppm
10
9
8
7
6
5
4
3
2
1
2.01
1.03
2.00
2.02
2.01
2.10
1.03
7.43
3.21

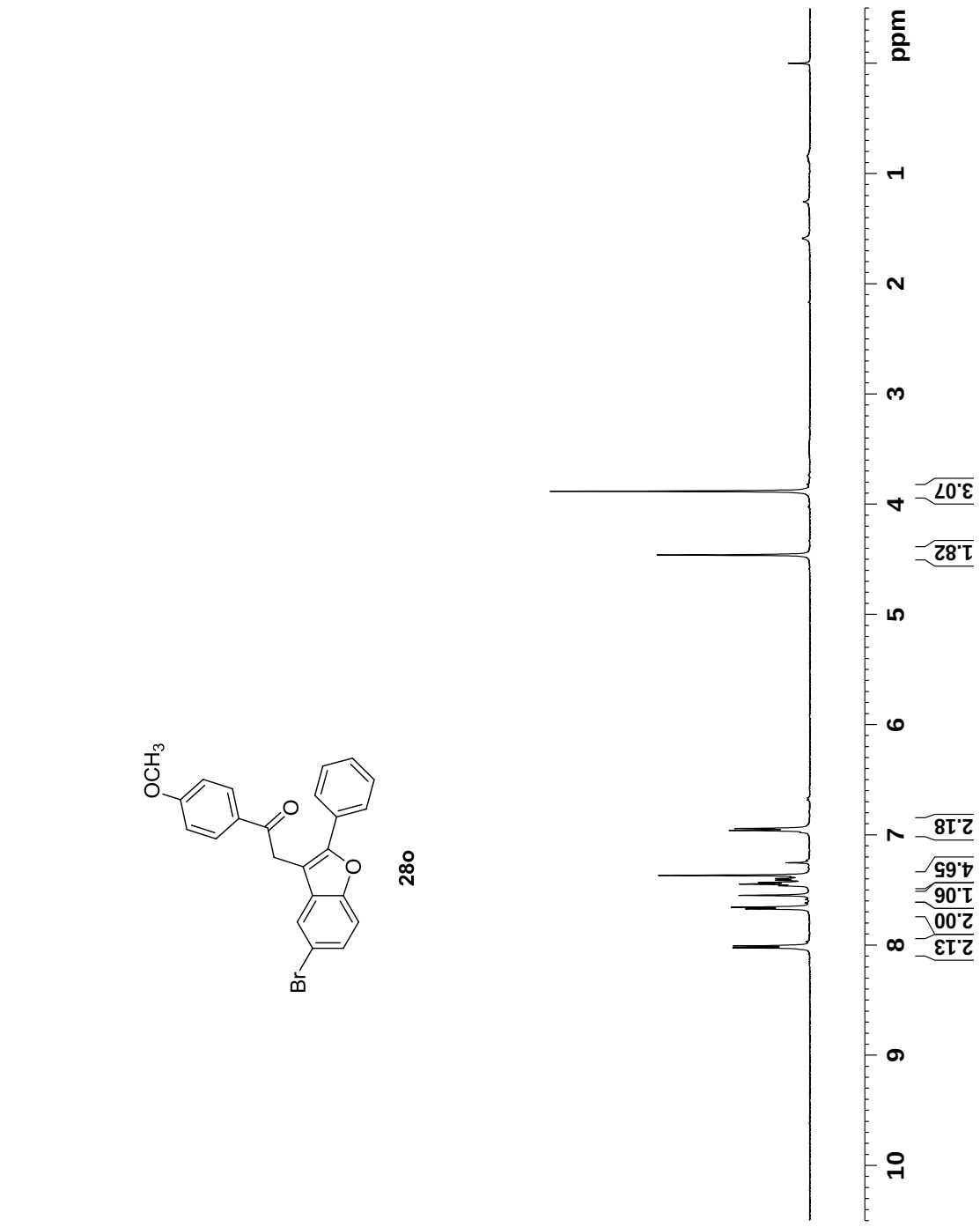

Current Data Parameters
NAME ellie215
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110722
Time_ 11.11
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 90
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 10240
DW 19.950 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127732 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
CY 8.76 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 11.50000 ppm/cm
HZCM 1157.04688 Hz/cm
25.81
26.35
31.24
33.96
36.57
77.32
77.00
76.68
106.00
110.79
118.98
122.24
123.21
128.34
128.63
129.31
133.20
136.59
153.82
159.92
196.61
Ph
O
O
28l
0 ppm

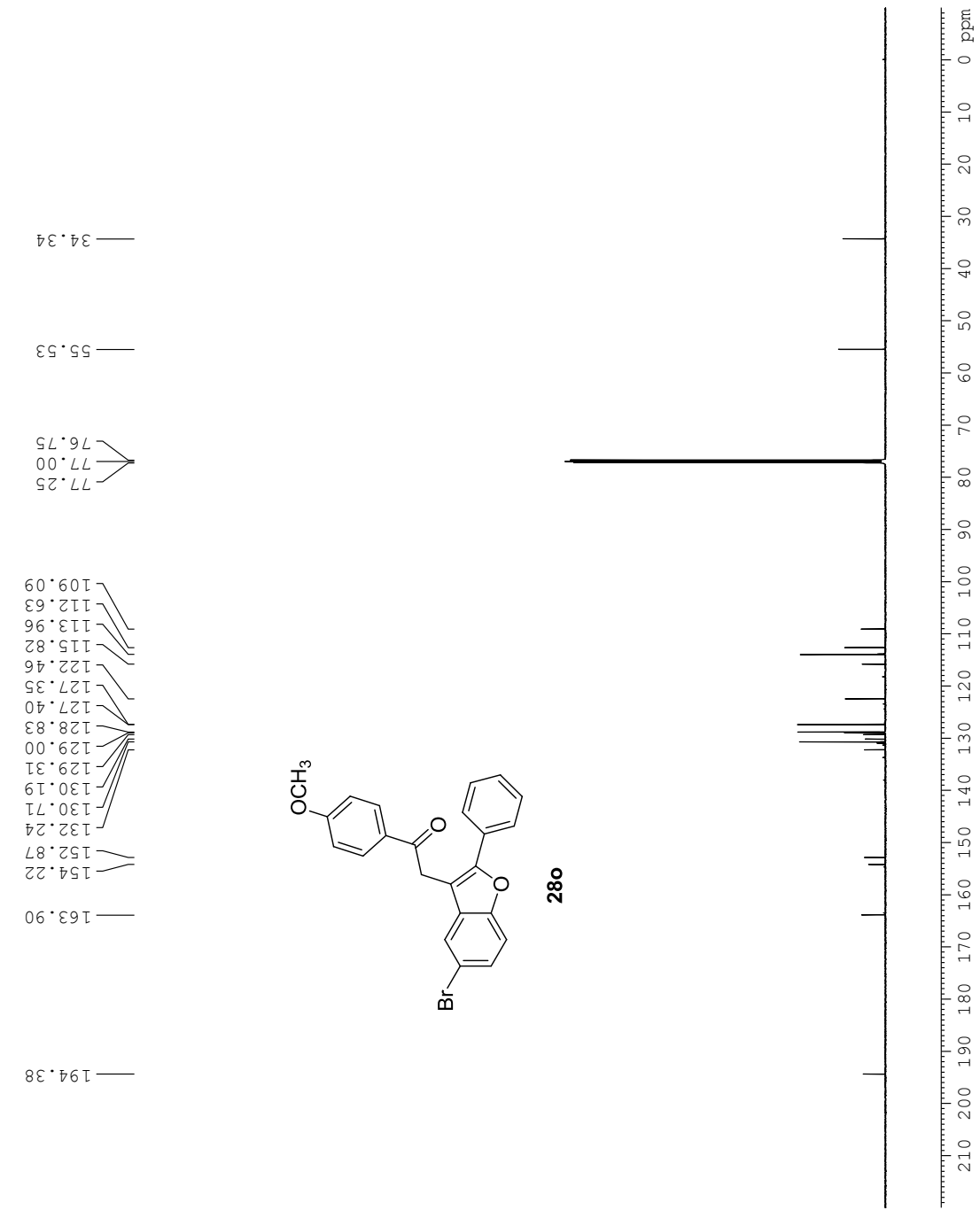

NAME ellie311
EXPNO 1
PROCNO 1
Date_ 20111115
Time_ 21.13
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300100 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
O
28m
ppm
1
2
3
4
5
6
7
8
9
10
9.23
2.04
2.00
1.02
2.01
1.05
0.52
0.50
1.03
1.00

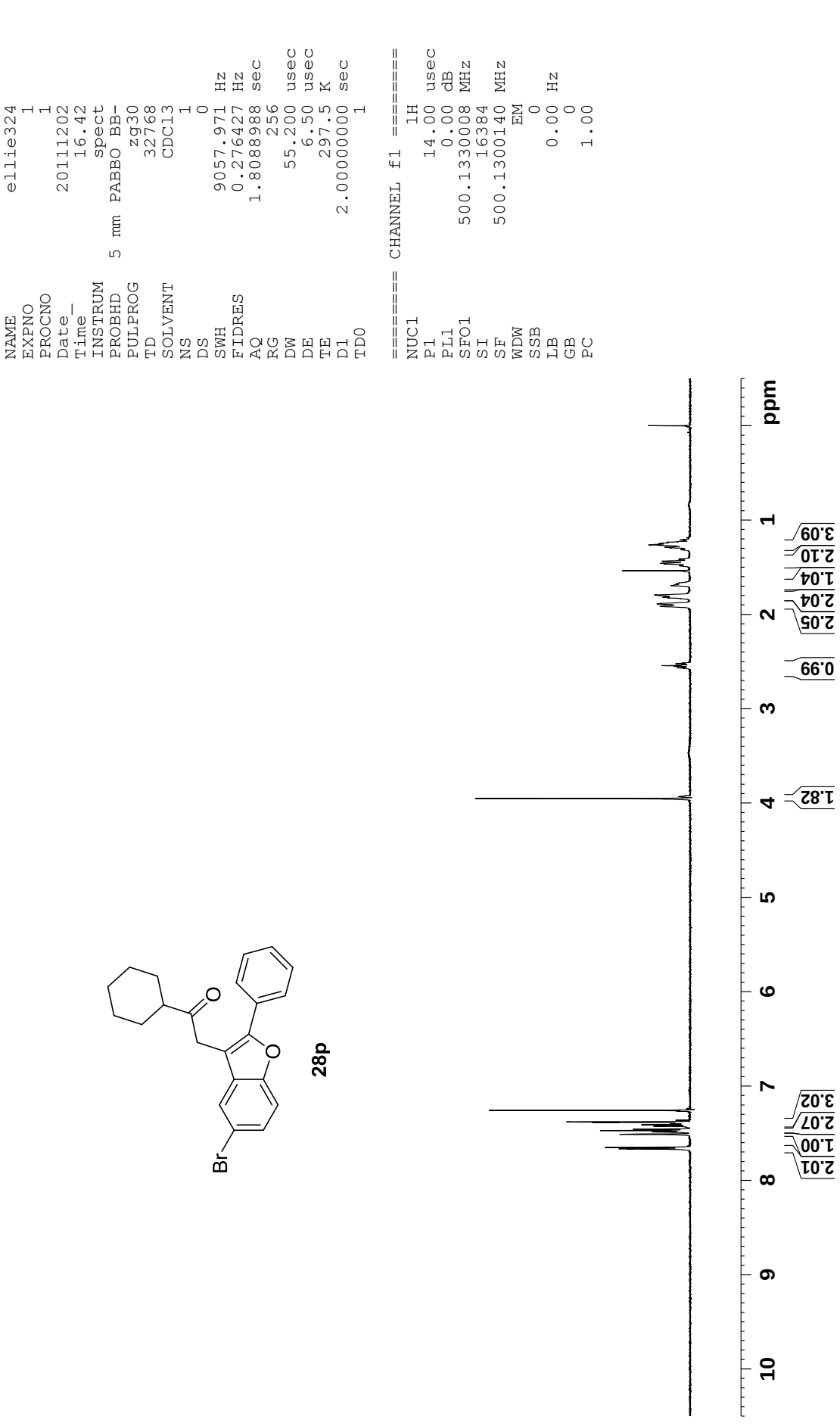

NAME 311
EXPNO 2
PROCNO 1
Date_ 20120210
Time_ 17.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1512
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912410 sec
RG 5792.6
DW 16.650 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
SI 65536
SF 125.7577914 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
29.52
34.44
77.25
77.00
76.75
105.57
110.68
118.37
122.06
123.38
128.17
128.74
130.68
133.27
136.80
153.03
161.77
196.51
Ph
O
O
28m
ppm
0
20
40
60
80
100
120
140
160
180
200
220

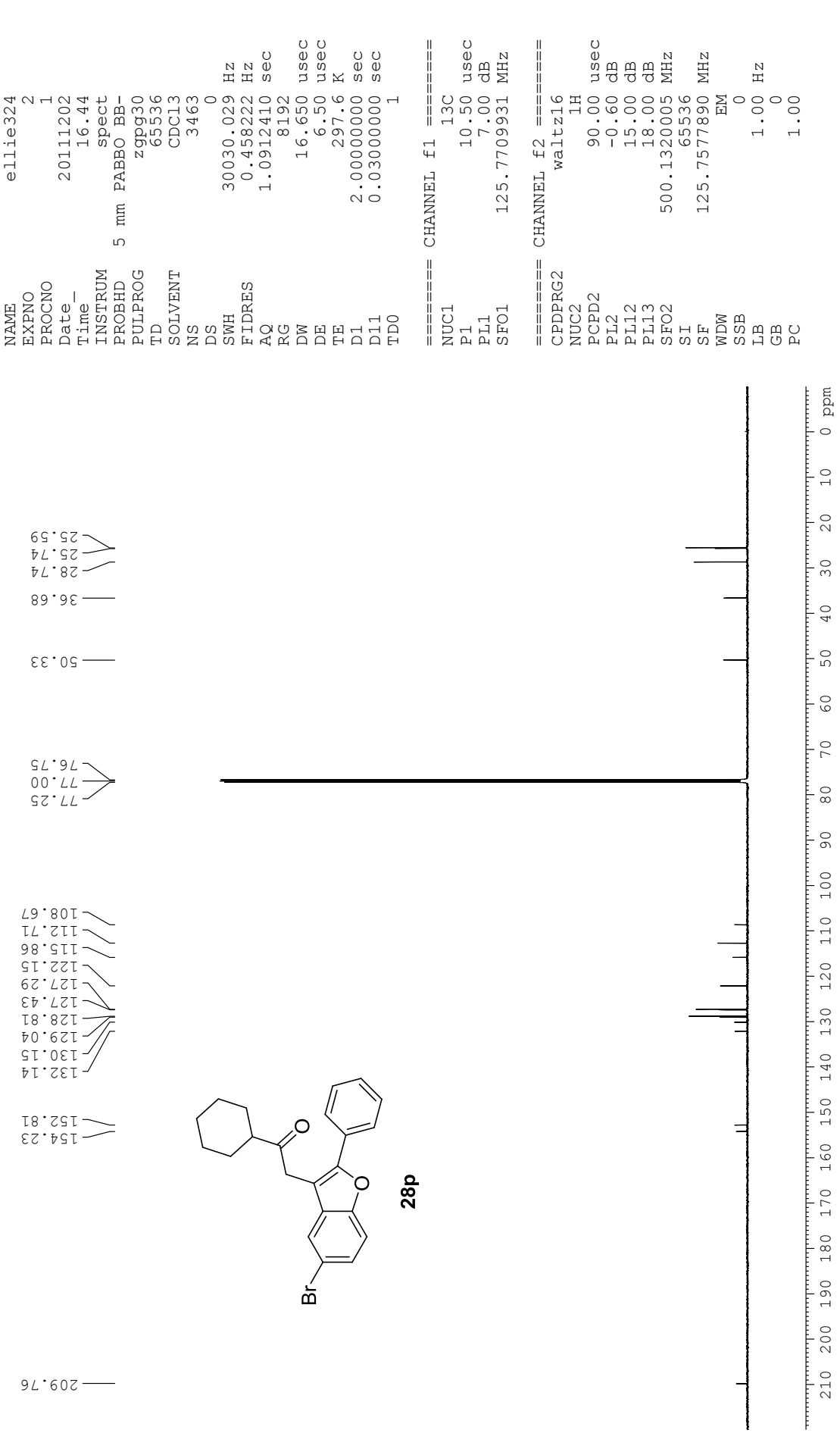

NAME ellie321
EXPNO 1
PROCNO 1
Date_ 20111126
Time_ 13.24
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300193 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Br
O
O
Br
28n
ppm
1
2
3
4
5
6
7
8
9
10
2.00
3.15
5.03
1.02
1.01
2.00

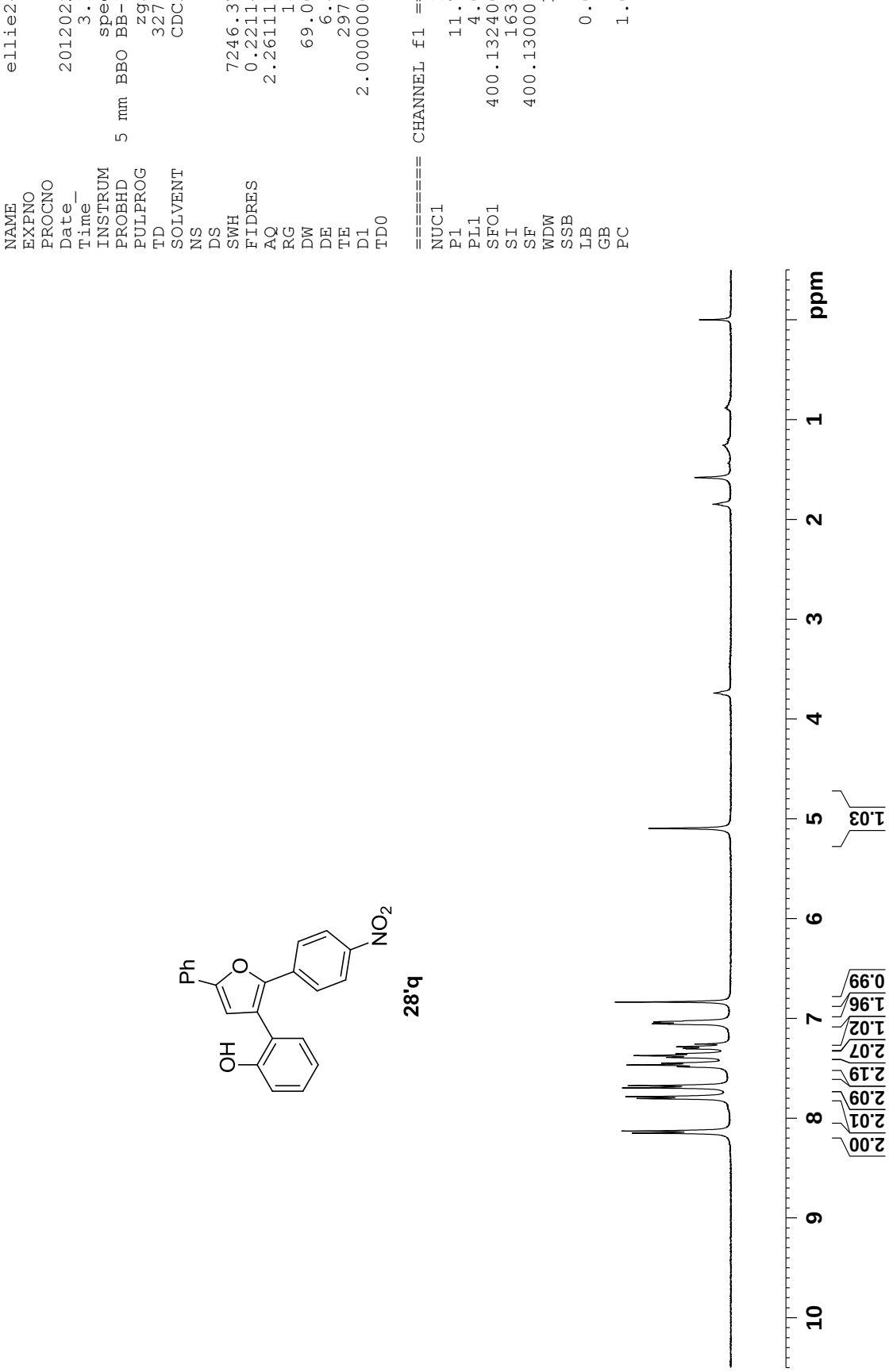

NAME ellie321
EXPNO 3
PROCNO 1
Date_ 20111126
Time_ 19.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 236
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127775 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
38.71
76.68
77.00
77.32
107.82
112.61
115.85
118.53
122.38
127.35
127.43
127.45
128.48
128.77
129.12
129.81
131.78
131.81
133.62
141.10
152.72
154.60
199.96
Br
O
O
Br
28n
0 ppm

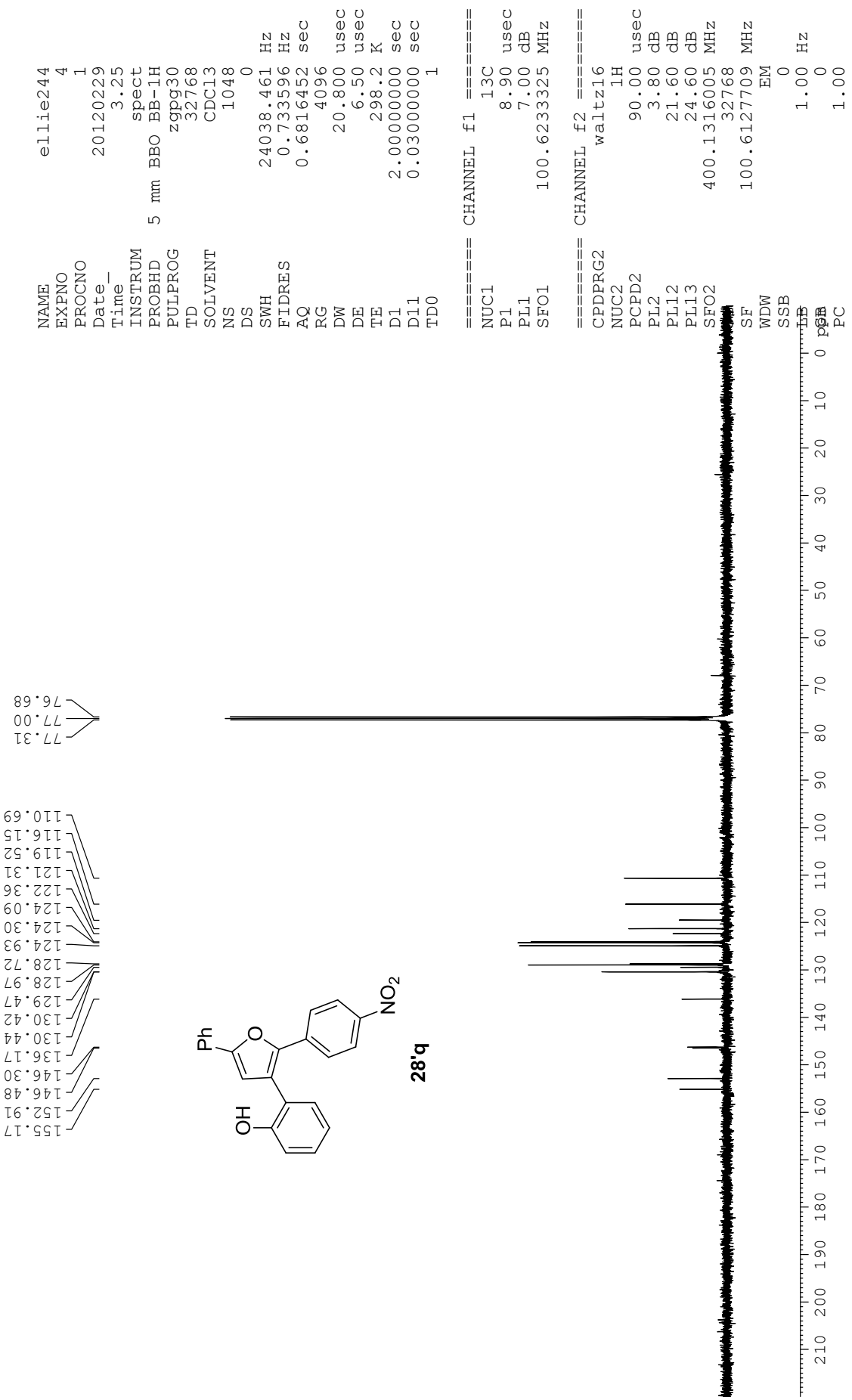

NAME ChiChi-354
EXPNO 1
PROCNO 1
Date_ 20120225
Time_ 15.01
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088988 sec
RG 161.3
DW 55.200 usec
DE 6.50 usec
TE 296.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0.00 dB
SFO1 500.1330008 MHz
SI 16384
SF 500.1300158 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
OCH3
O
O
Br
28o
ppm
10
9
8
7
6
5
4
3
2
1
2.13
2.00
1.06
4.65
2.18
1.82
3.07

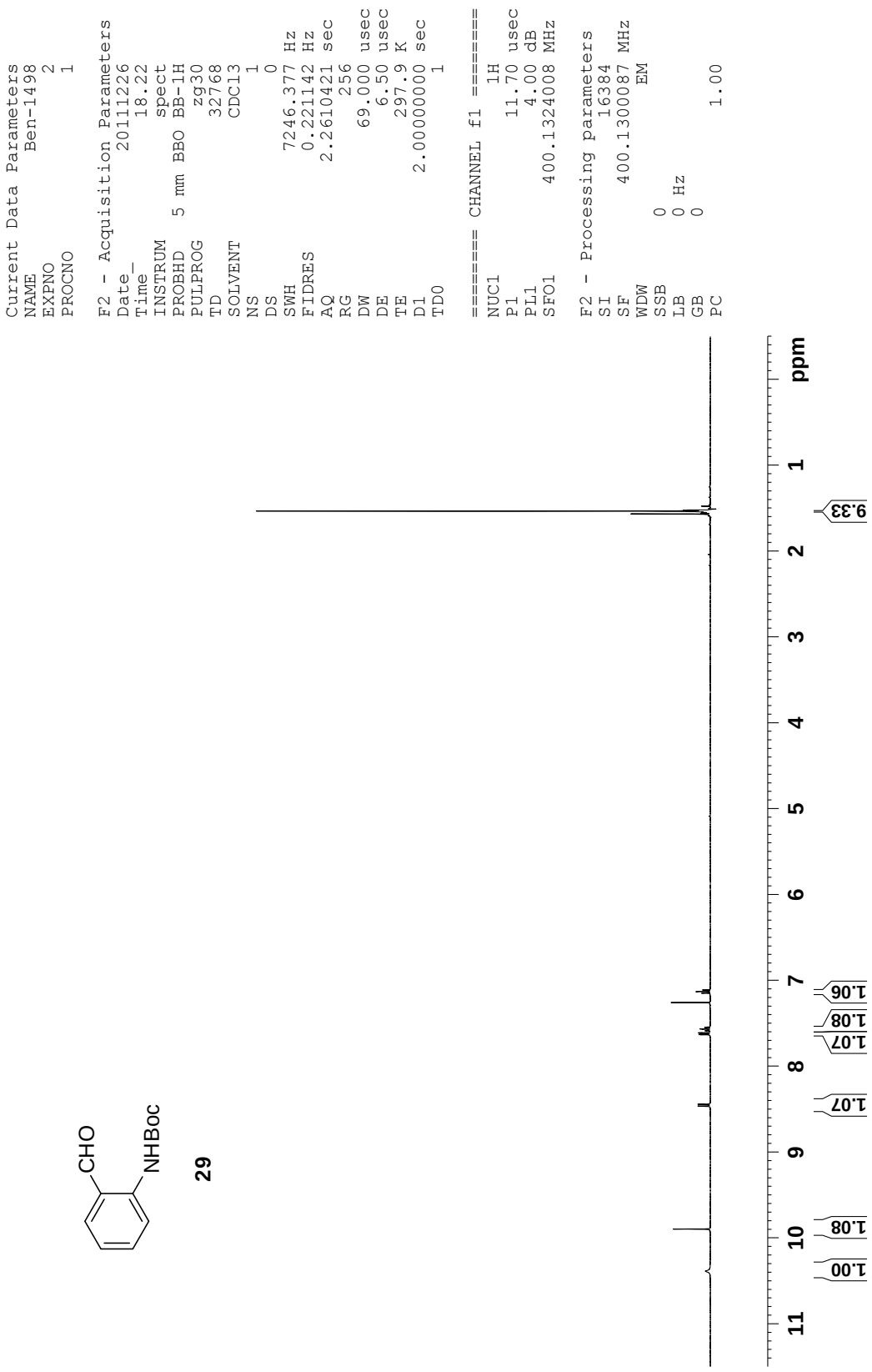

NAME ChiChi-354
EXPNO 2
PROCNO 1
Date_ 20120225
Time 15.02
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 5000
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912410 sec
RG 4597.6
DW 16.650 usec
DE 6.50 usec
TE 296.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
SI 65536
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
34.34
55.53
76.75
77.00
77.25
109.09
112.63
113.96
115.82
122.46
127.35
127.40
128.83
129.00
129.31
130.19
130.71
132.24
152.87
154.22
163.90
194.38
OCH3
O
O
Br
28o
0 ppm

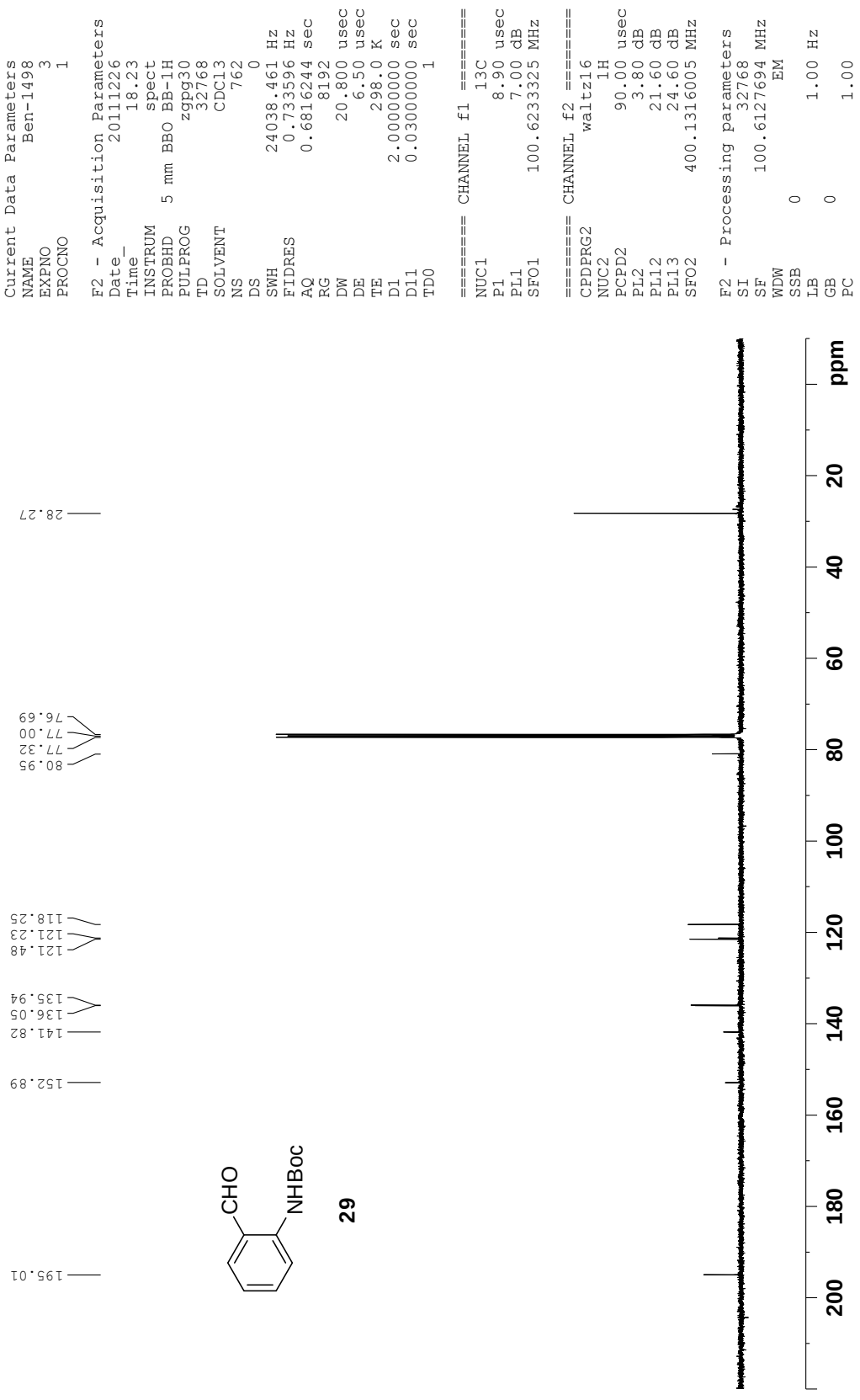

NAME ellie324
EXPNO 1
PROCNO 1
Date_ 20111202
Time_ 16.42
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088988 sec
RG 256
DW 55.200 usec
DE 6.50 usec
TE 297.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0.00 dB
SFO1 500.1330008 MHz
SI 16384
SF 500.1300140 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
O
O
Br
28p
ppm
1
2
3
4
5
6
7
8
9
10
3.09
2.10
1.04
2.04
2.05
0.99
1.82
2.01
1.00
2.07
3.02

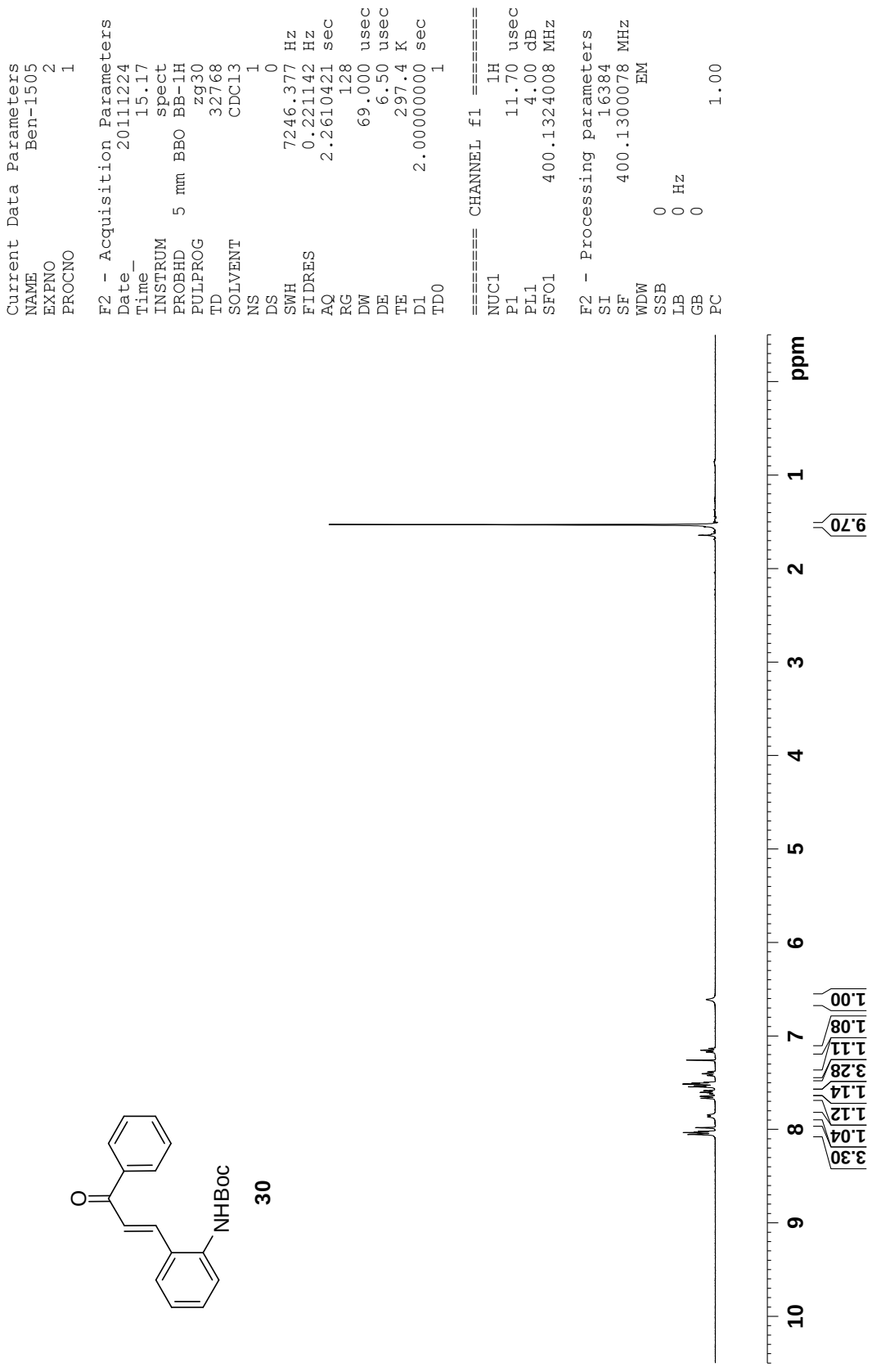

NAME ellie324
EXPNO 2
PROCNO 1
Date_ 20111202
Time_ 16.44
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3463
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912410 sec
RG 8192
DW 16.650 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
SI 65536
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
209.76
154.23
152.81
132.14
130.15
129.04
128.81
127.43
127.29
122.15
115.86
112.71
108.67
77.25
77.00
76.75
50.33
36.68
28.74
25.74
25.59
Br
O
O
28p
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

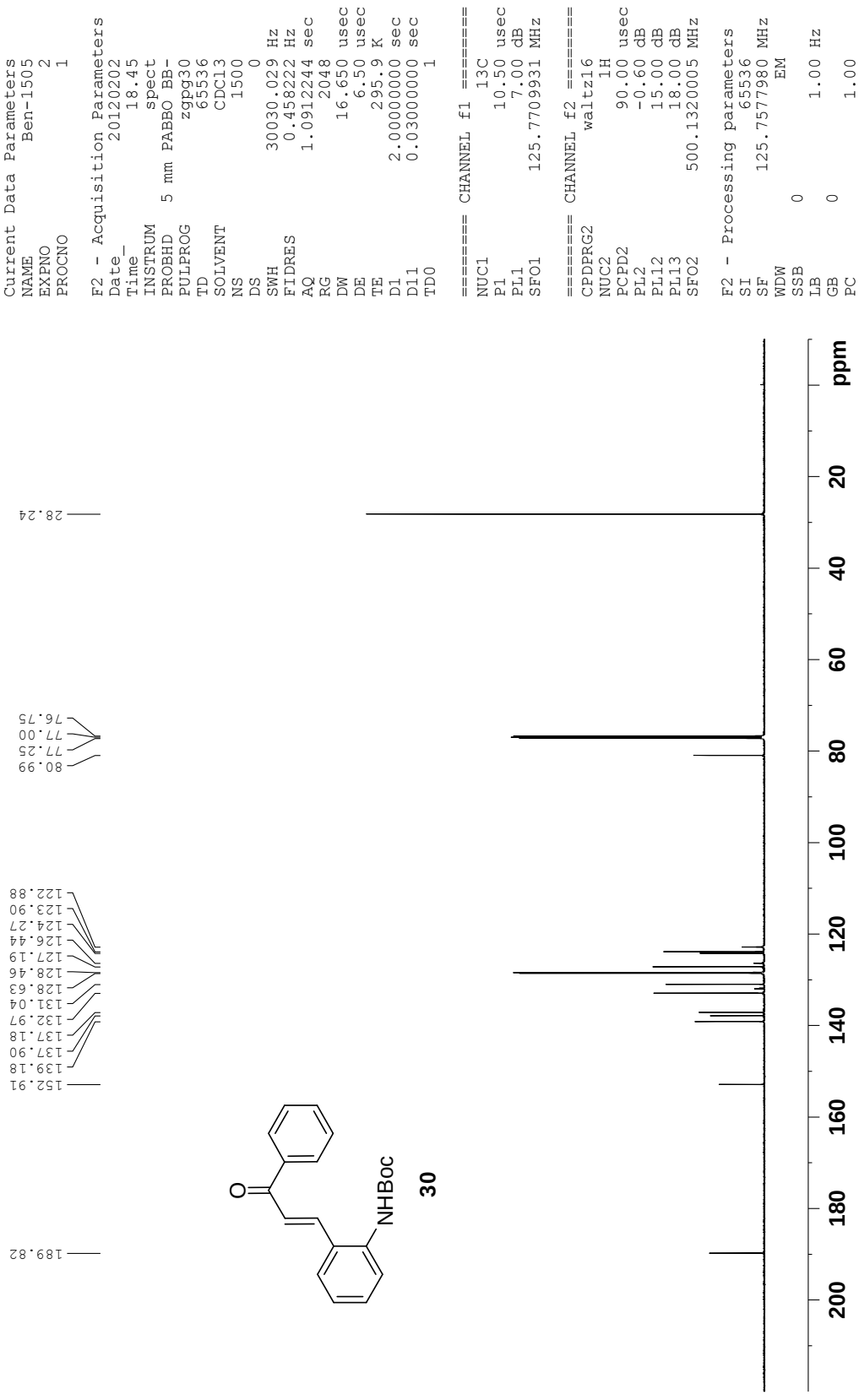

NAME ellie244
EXPNO 3
PROCNO 1
Date_ 20120229
Time_ 3.14
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300099 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Ph
O
NO2
OH
28'q
ppm
1.03
2.00
2.01
2.09
2.19
2.07
1.02
1.96
0.99

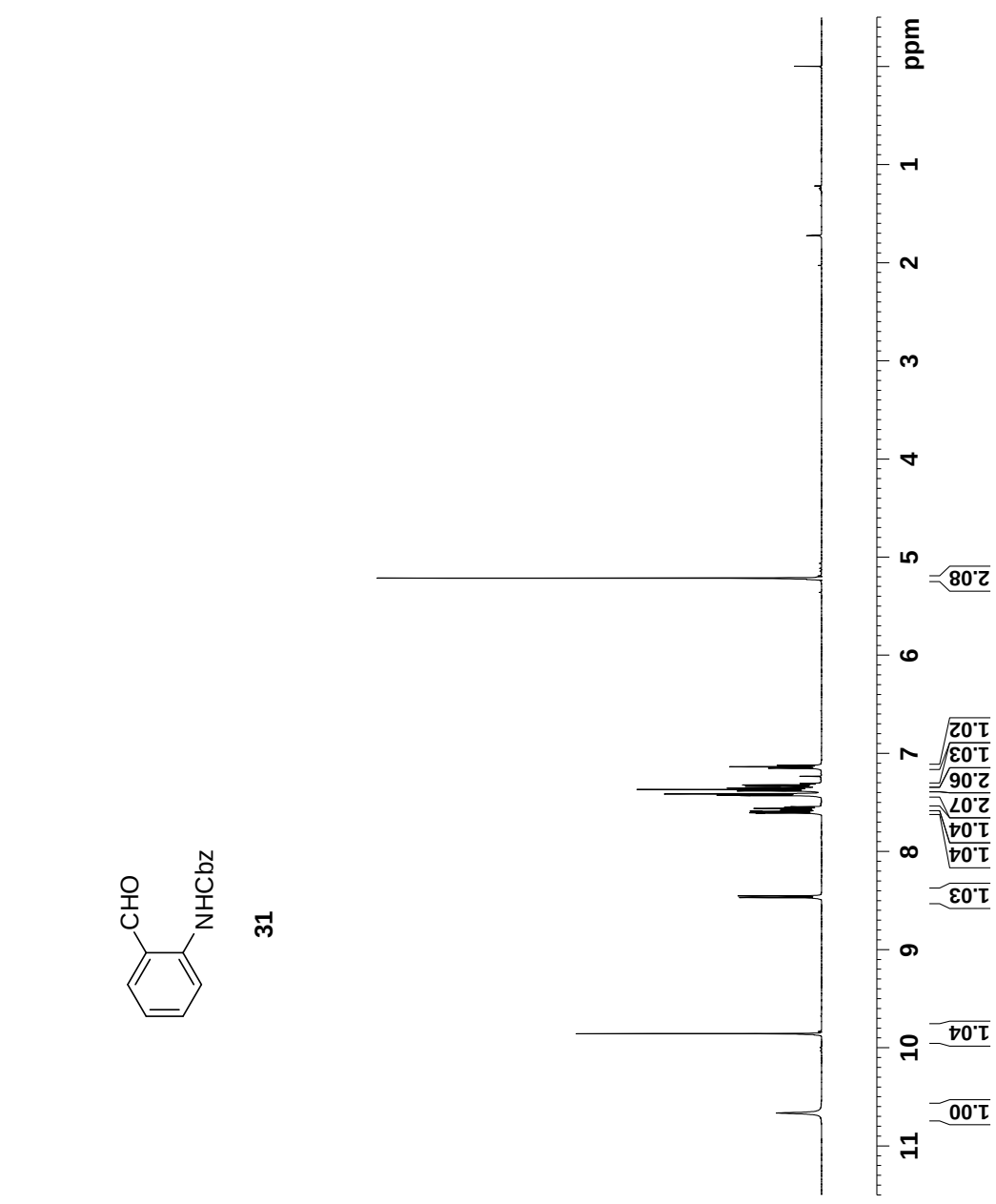

NAME ellie244
EXPNO 4
PROCNO 1
Date_ 20120229
Time_ 3.25
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1048
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127709 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.31
77.00
76.68
110.69
116.15
119.52
121.31
122.36
124.09
124.30
124.93
128.72
128.97
129.47
130.42
130.44
136.17
146.30
146.48
152.91
155.17
Ph
O
OH
NO2
28'q

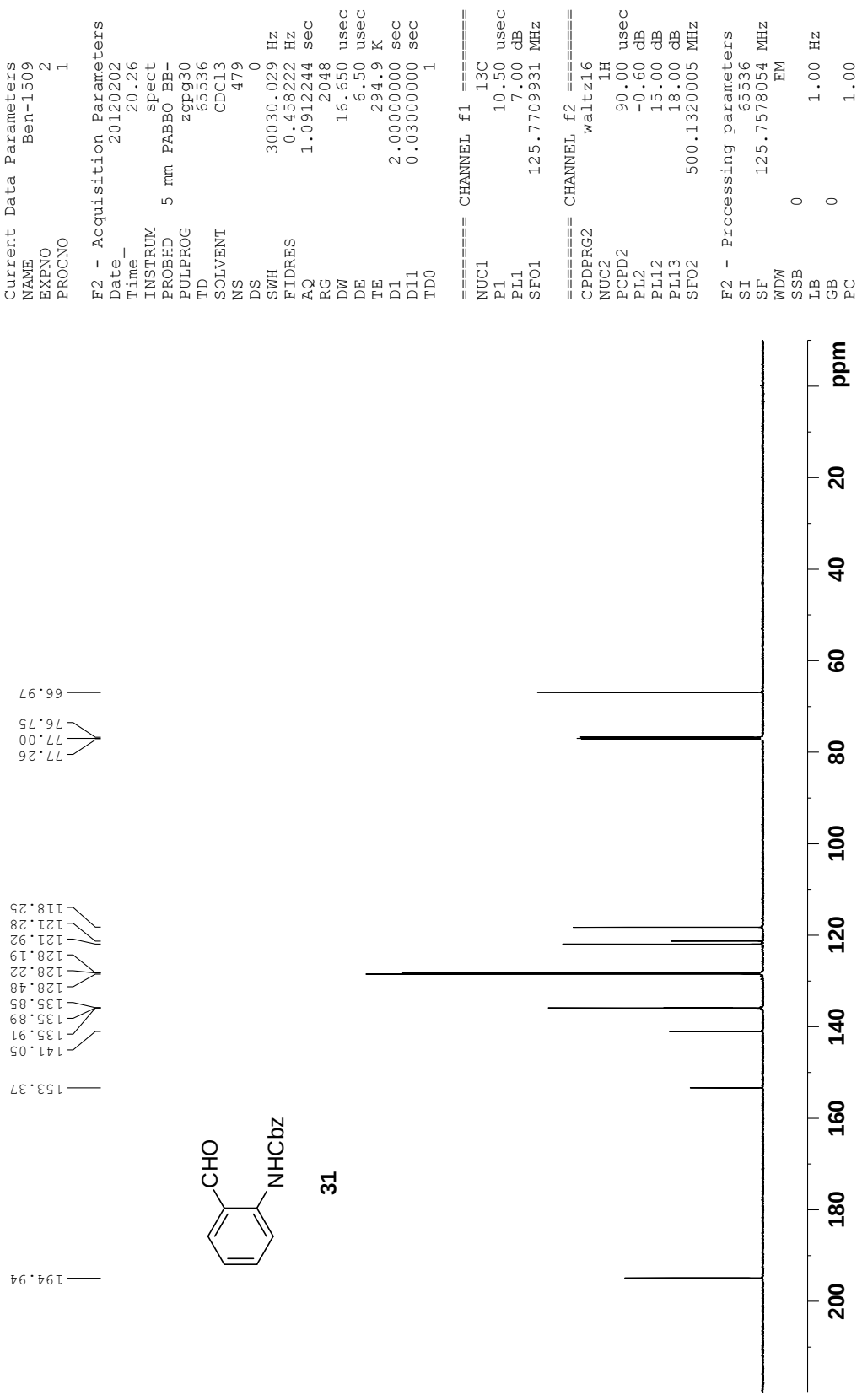

Current Data Parameters
NAME Ben-1498
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111226
Time_ 18.22
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300087 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
CHO
NHBoc
29
ppm
1
2
3
4
5
6
7
8
9
10
11
9.33
1.06
1.08
1.07
1.07
1.08
1.00

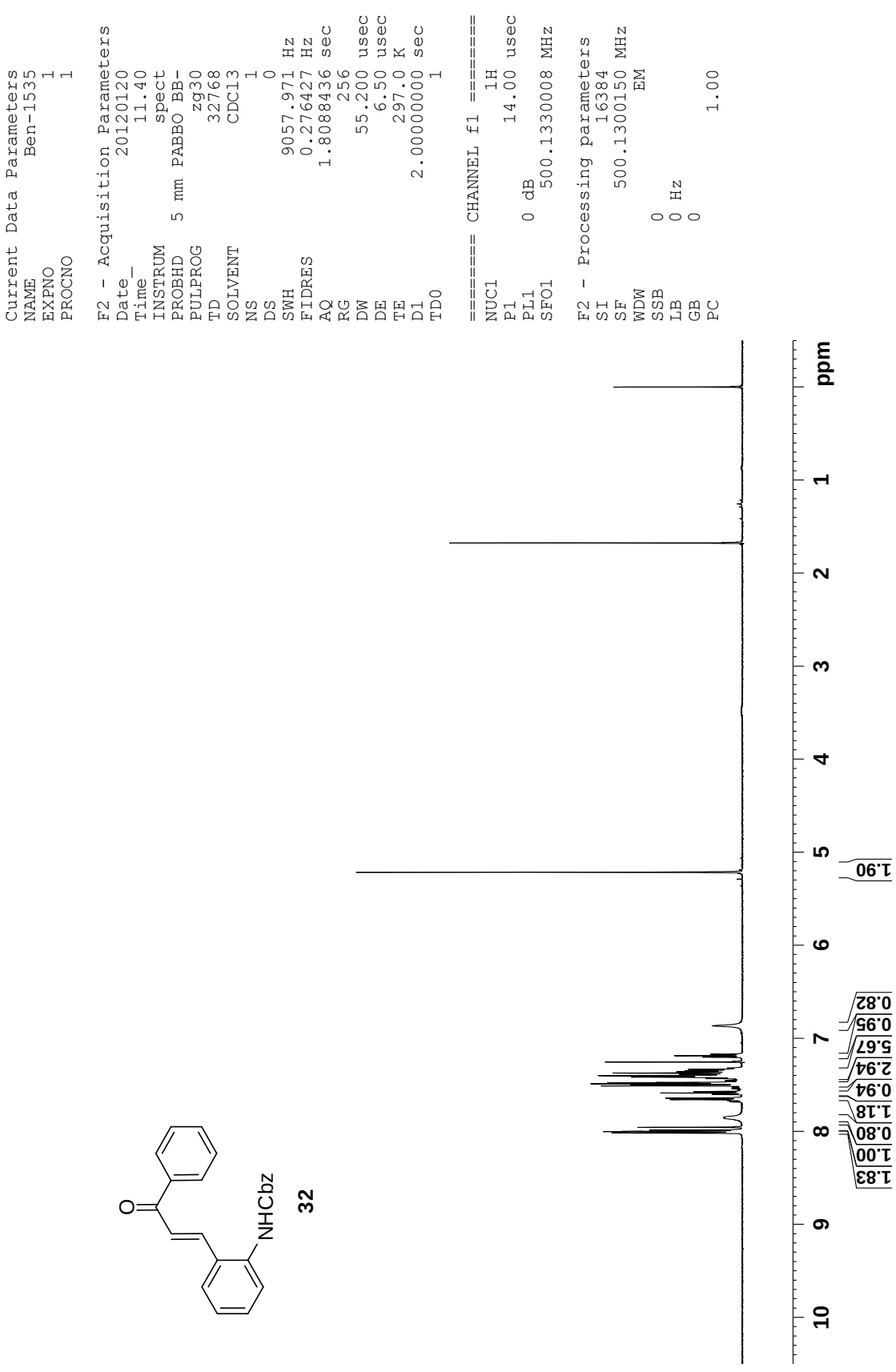

Current Data Parameters
NAME Ben-1498
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111226
Time 18.23
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 762
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127694 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
28.27
76.69
77.00
77.32
80.95
118.25
121.23
121.48
135.94
136.05
141.82
152.89
195.01
CHO
NHBoc
29
ppm
200
180
160
140
120
100
80
60
40
20

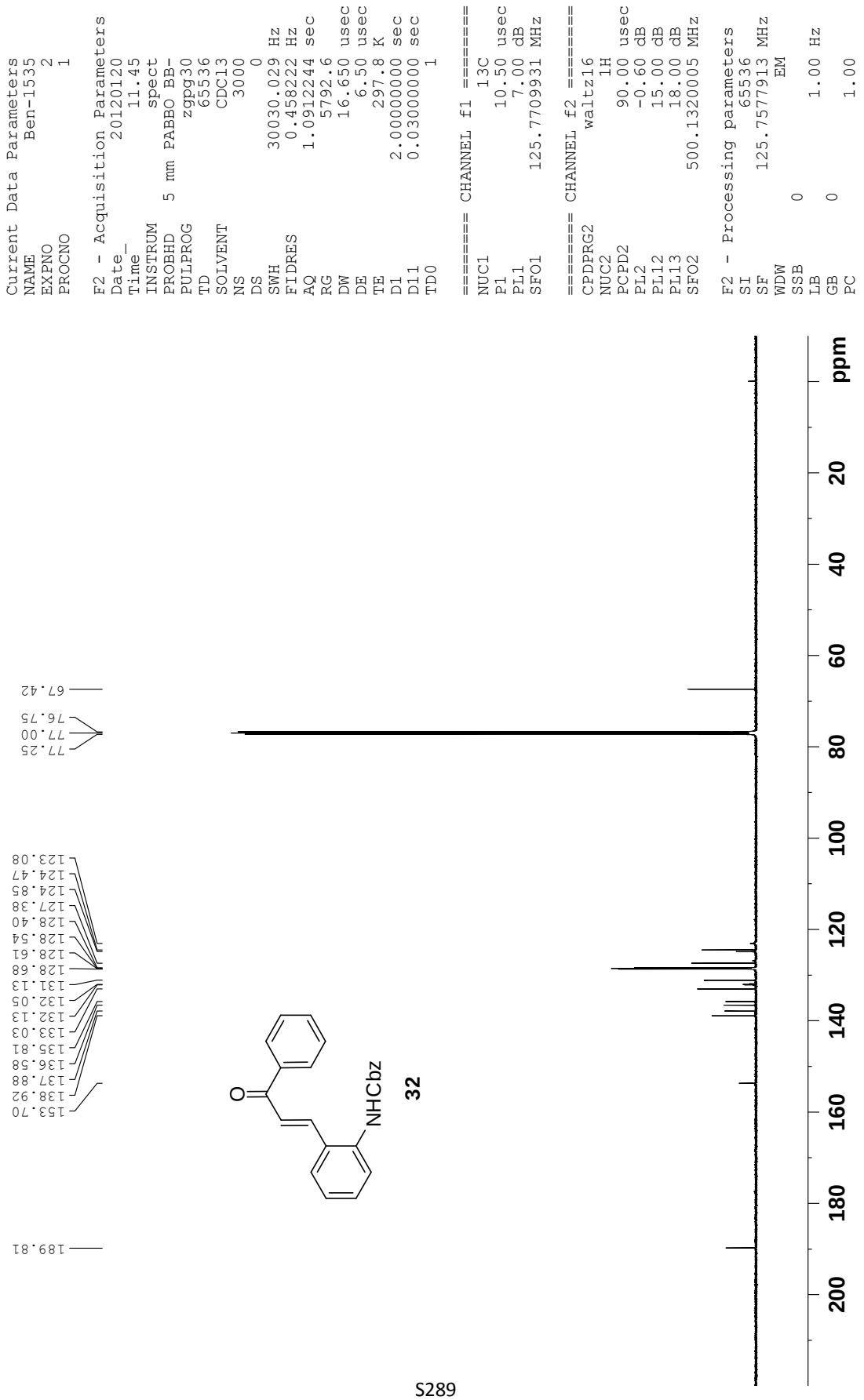

Current Data Parameters
NAME Ben-1505
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111224
Time_ 15.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 297.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300078 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
NHBoc
O
30
9.70
1.00
1.08
1.11
3.28
1.14
1.12
1.04
3.30
ppm

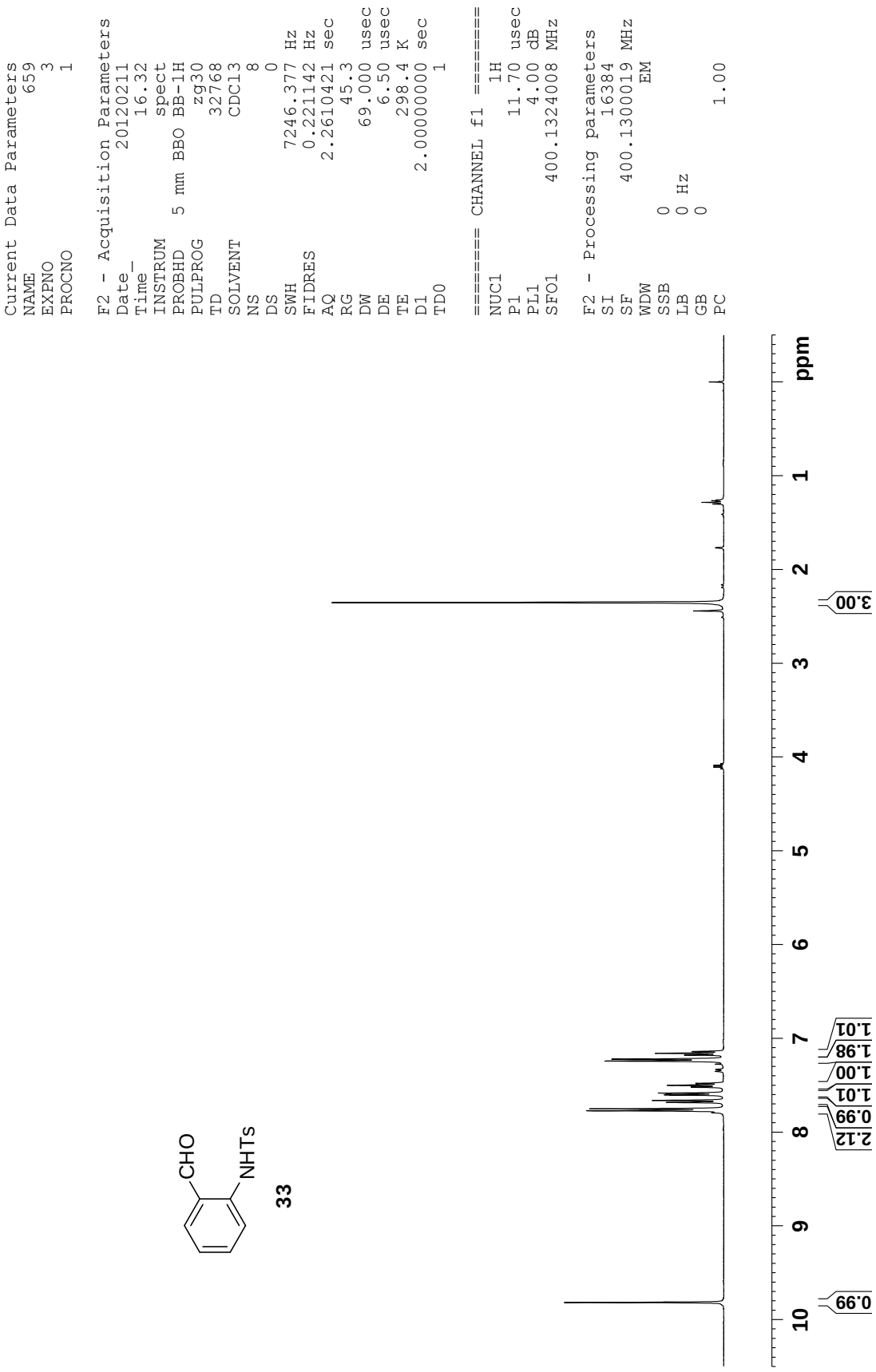

Current Data Parameters
NAME Ben-1505
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120202
Time_ 18.45
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1500
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 295.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577980 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
28.24
76.75
77.00
77.25
80.99
122.88
123.90
124.27
126.44
127.19
128.46
128.63
131.04
132.97
137.18
137.90
139.18
152.91
189.82
O
NHBoc
30
ppm
200
180
160
140
120
100
80
60
40
20

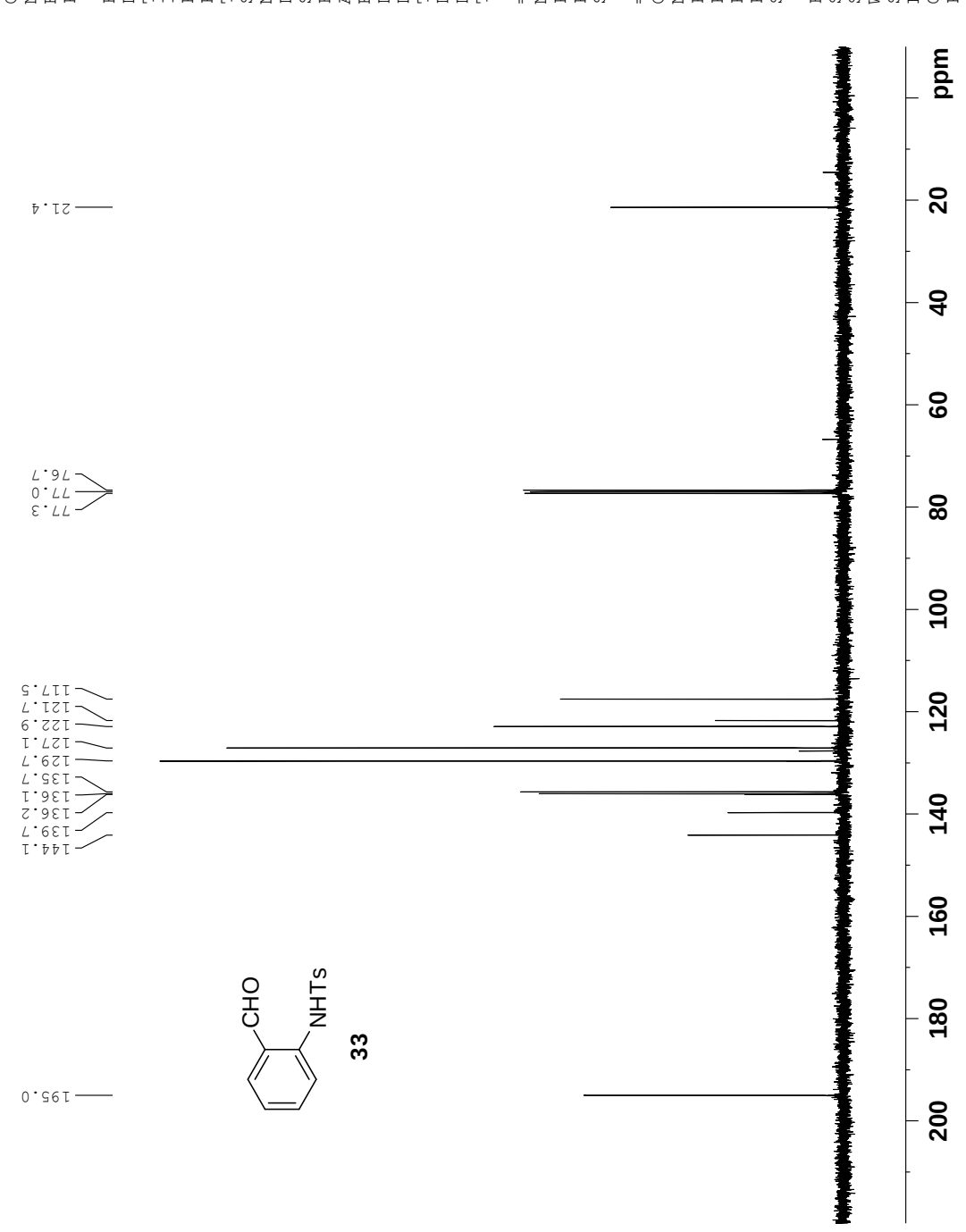

Current Data Parameters
NAME Ben-1509
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120202
Time_ 20.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 40.3
DW 55.200 usec
DE 6.50 usec
TE 294.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300245 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
CHO
NHCbz
31
ppm
1.00
1.04
1.03
1.04
2.07
2.06
1.03
1.02
2.08

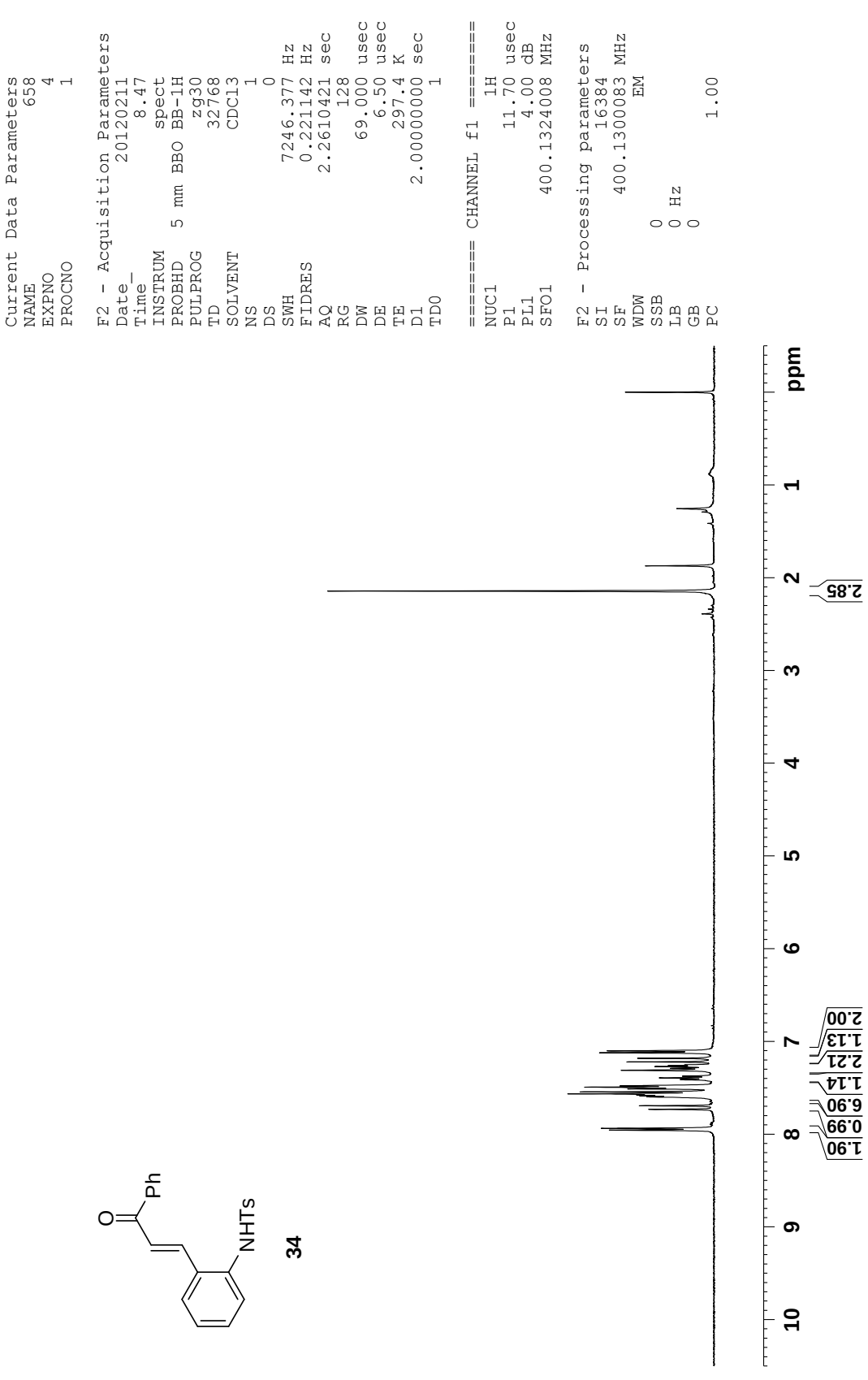

Current Data Parameters
NAME Ben-1509
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120202
Time_ 20.26
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 479
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 2048
DW 16.650 usec
DE 6.50 usec
TE 294.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578054 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
194.94
153.37
141.05
135.91
135.89
135.85
128.48
128.22
128.19
121.92
121.28
118.25
77.26
77.00
76.75
66.97
CHO
NHCbz
31
ppm
200
180
160
140
120
100
80
60
40
20

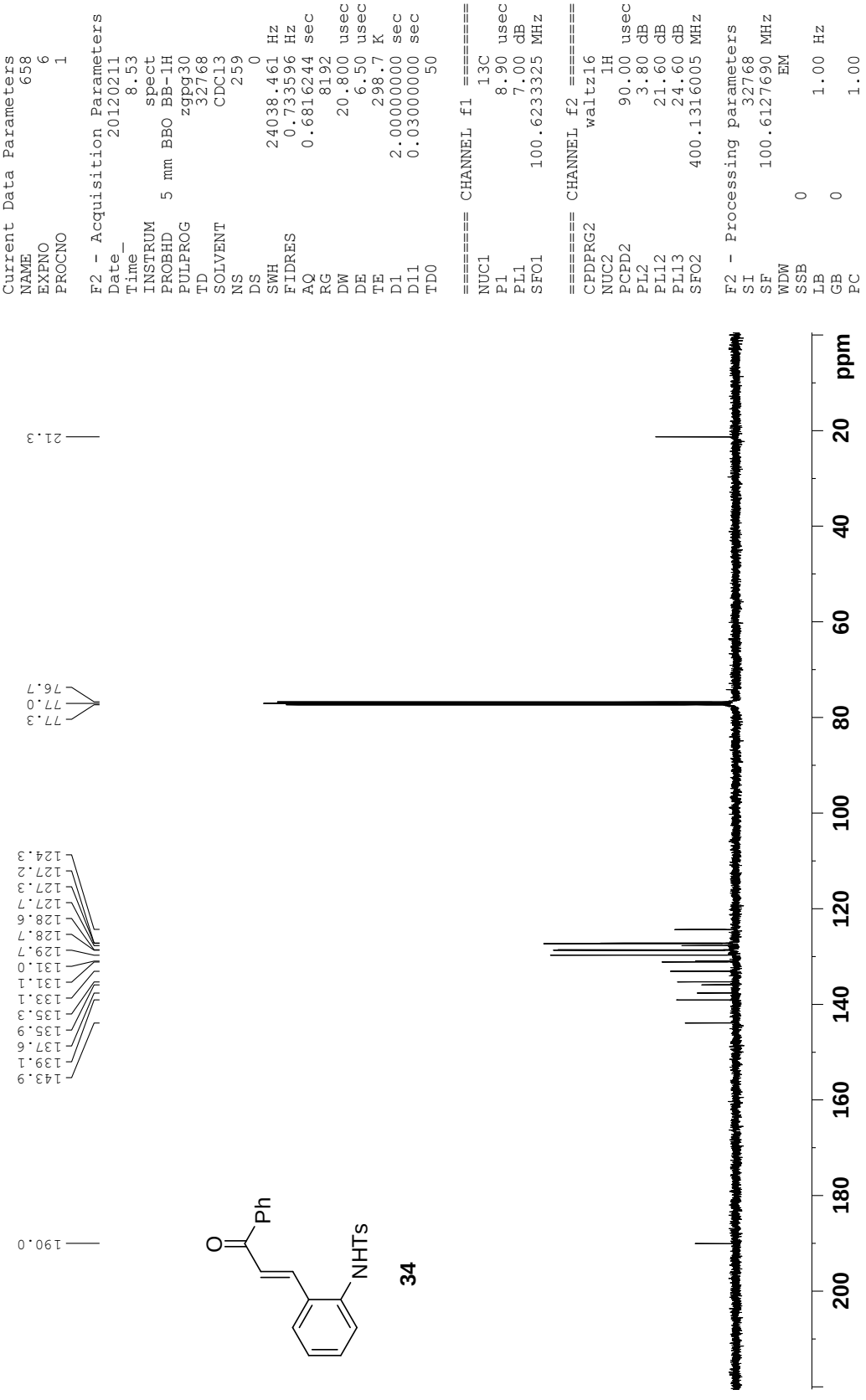

Current Data Parameters
NAME Ben-1535
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120120
Time_ 11.40
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 256
DW 55.200 usec
DE 6.50 usec
TE 297.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300150 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
NHCbz
32
ppm
1
2
3
4
5
6
7
8
9
10
1.90
1.83
1.00
0.80
1.18
0.94
2.94
5.67
0.95
0.82

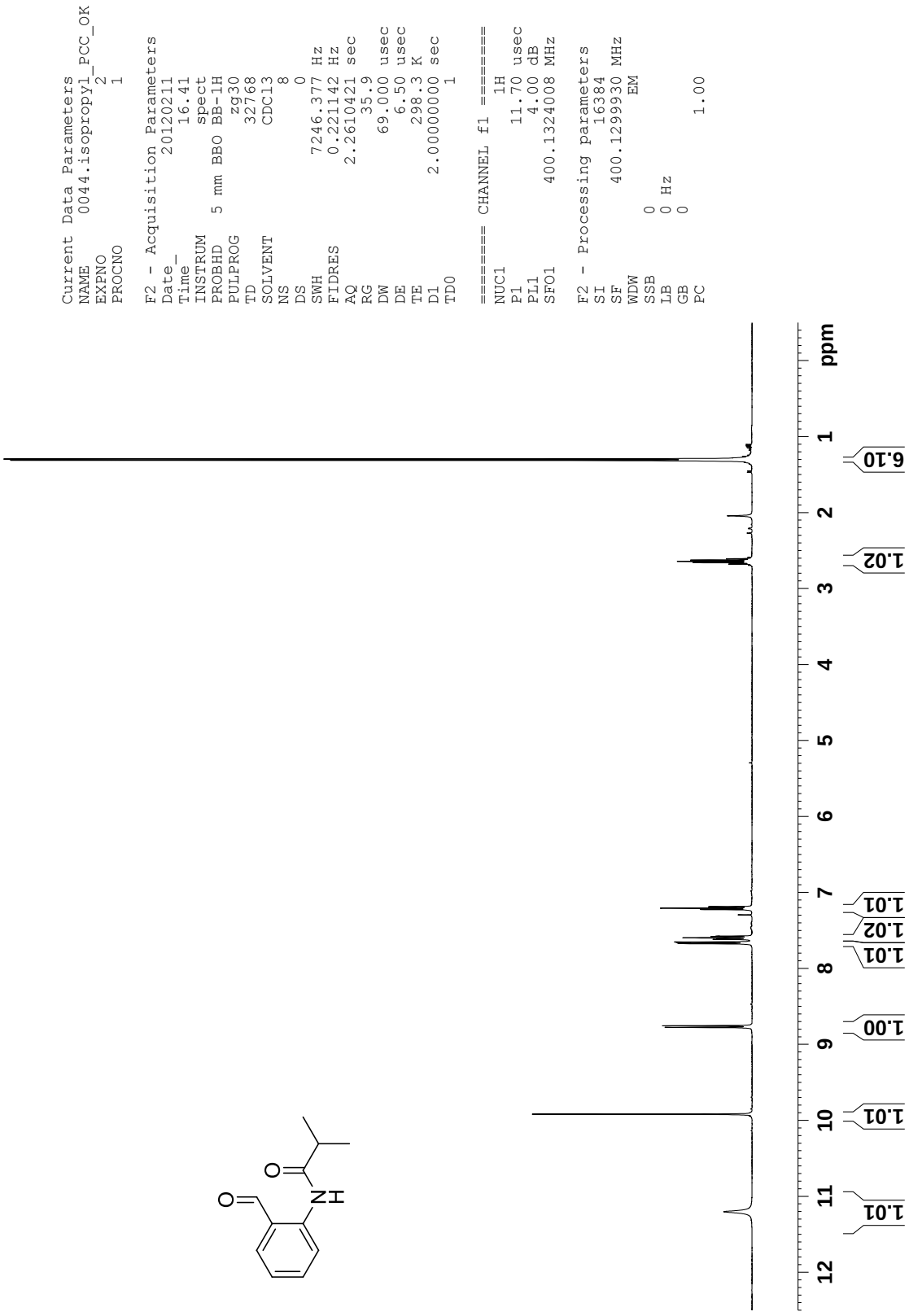


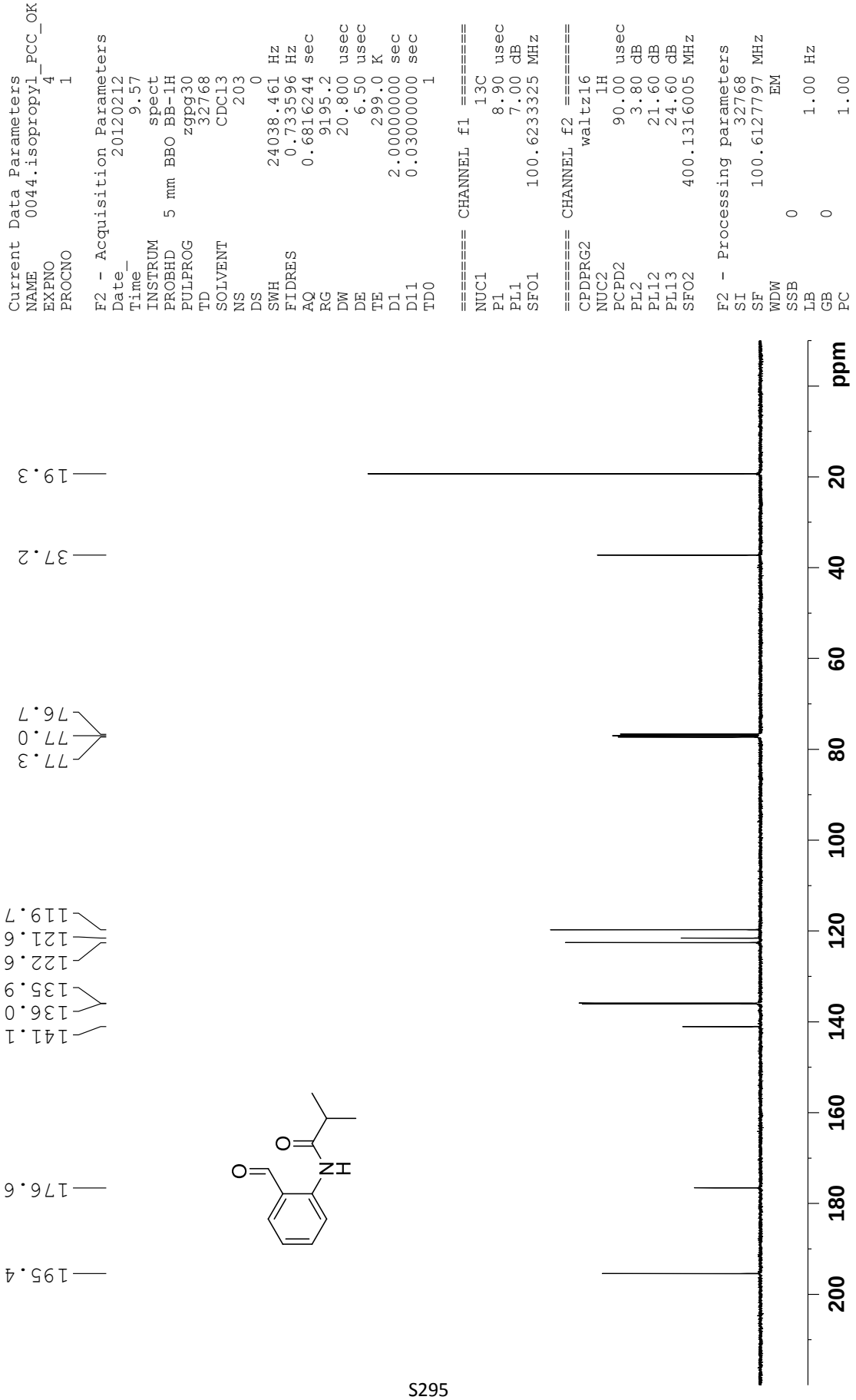

Current Data Parameters
NAME 659
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 16.32
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 45.3
DW 69.000 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300019 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
CHO
NHTs
33
ppm
3.00
2.12
0.99
1.01
1.00
1.98
1.01
0.99

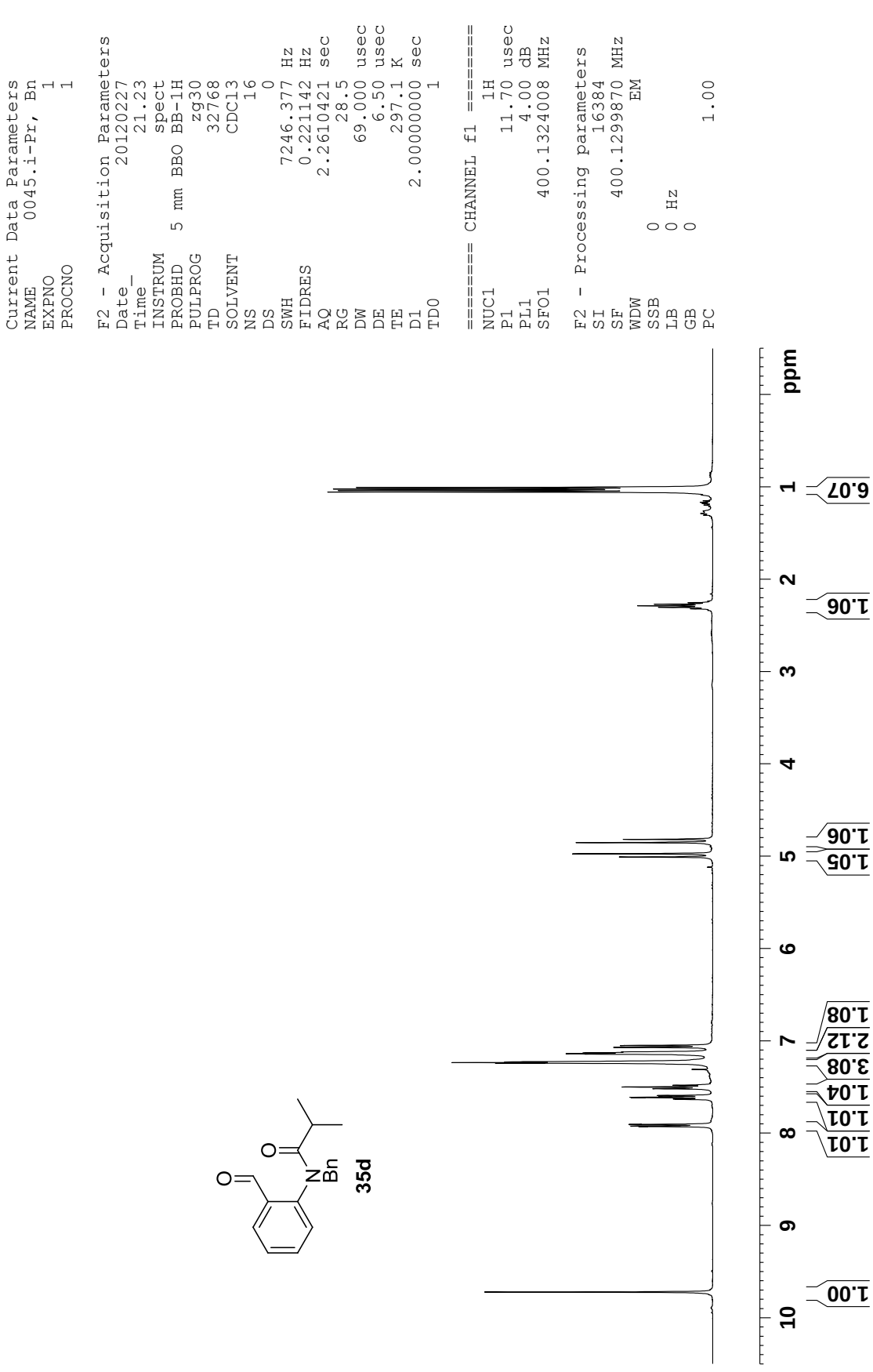

Current Data Parameters
NAME 659
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 16.34
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 44
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 32768
DW 20.800 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1000
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127831 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
195.0
144.1
139.7
136.2
136.1
135.7
129.7
127.1
122.9
121.7
117.5
77.3
77.0
76.7
21.4
CHO
NHTs
33
ppm
200
180
160
140
120
100
80
60
40
20

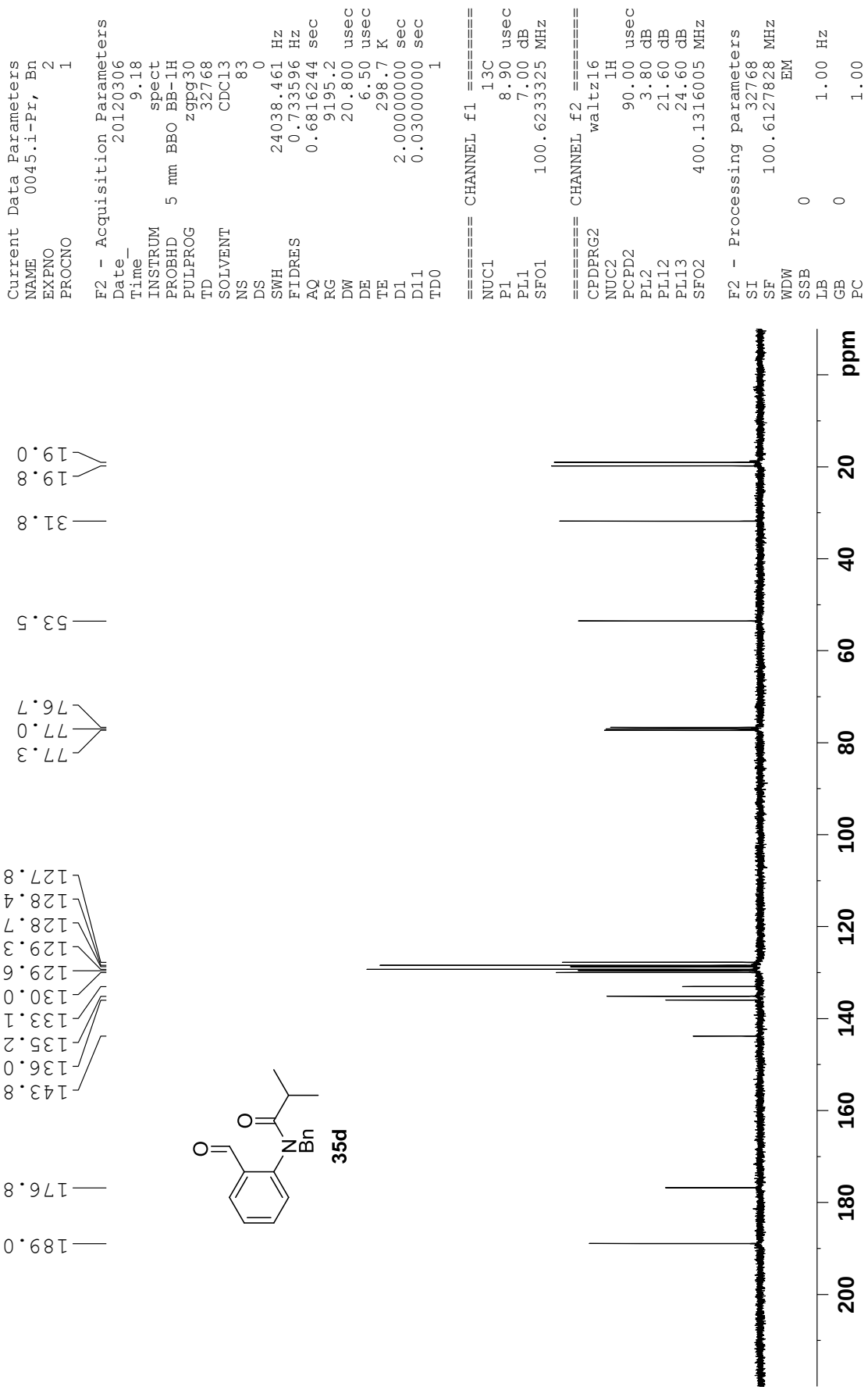

Current Data Parameters
NAME 658
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 8.47
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 297.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300083 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
Ph
NHTs
34
ppm
1
2
3
4
5
6
7
8
9
10
2.85
1.90
0.99
6.90
1.14
2.21
1.13
2.00

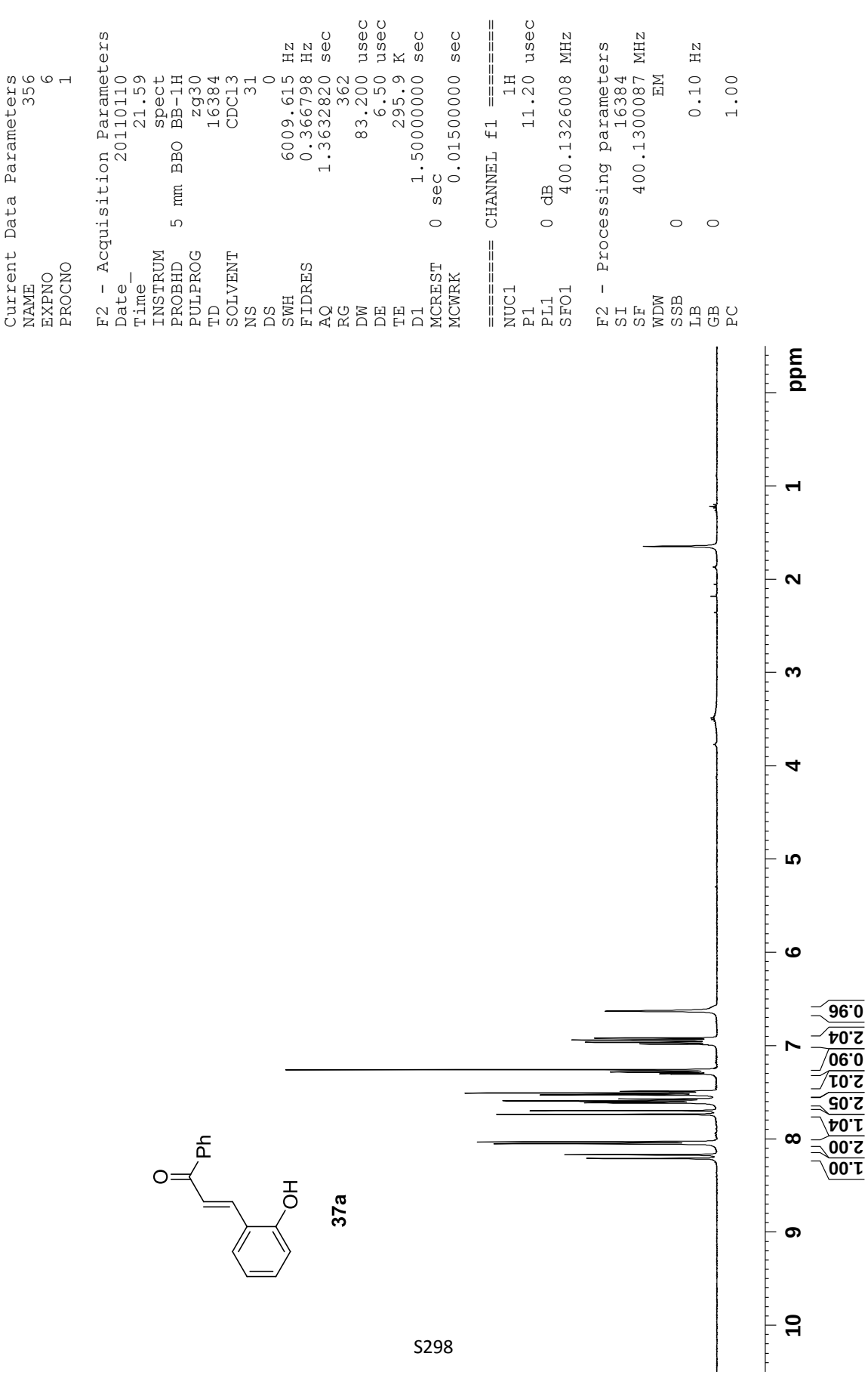

Current Data Parameters
NAME 658
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 8.53
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 259
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 50
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.0
143.9
139.1
137.6
135.9
135.3
133.1
131.1
131.0
129.7
128.7
128.6
127.7
127.3
127.2
124.3
77.3
77.0
76.7
21.3
O
Ph
NHTs
34
200
180
160
140
120
100
80
60
40
20
ppm

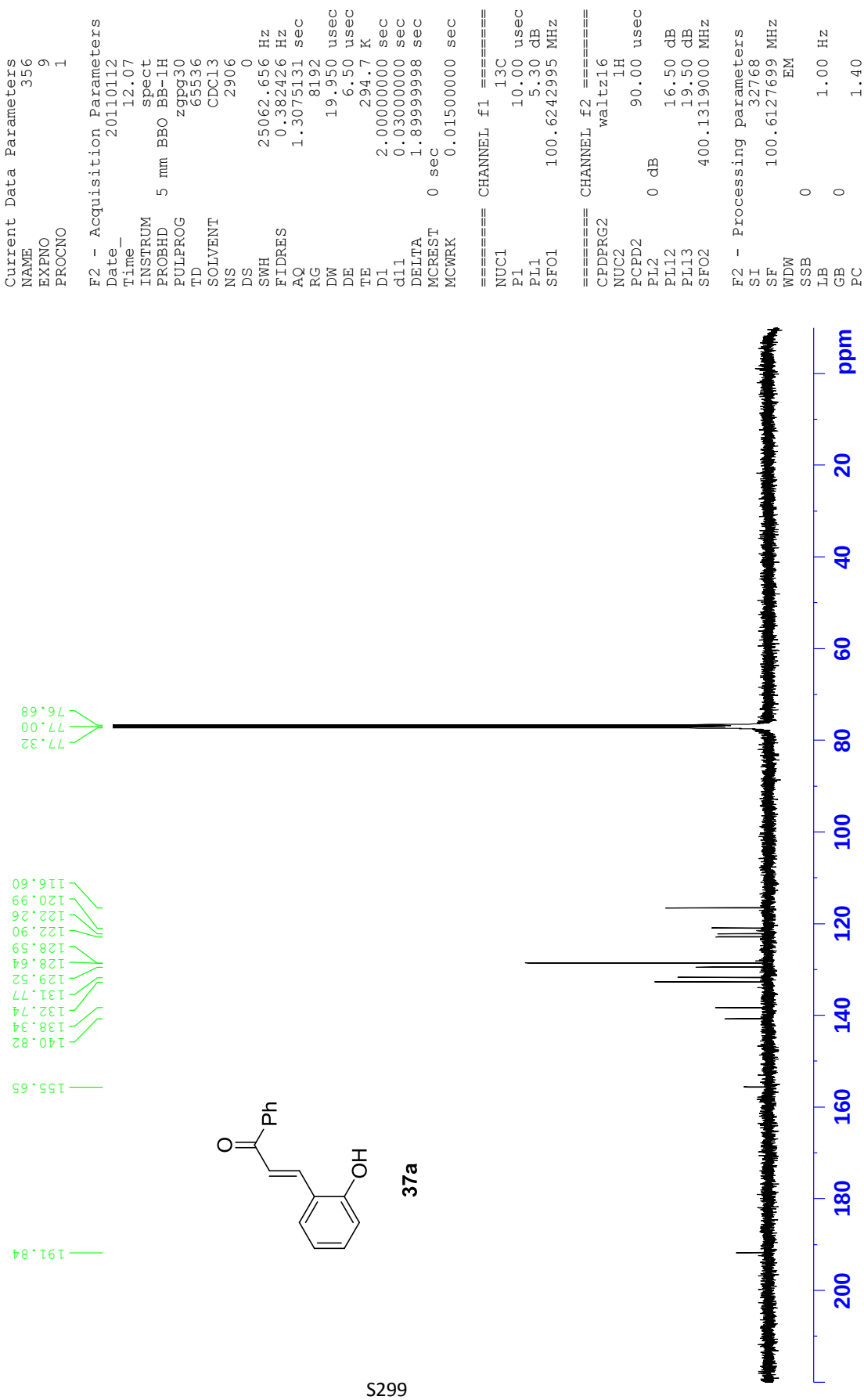

Current Data Parameters
NAME 0044.isopropyl_PCC_OK
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120211
Time_ 16.41
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 35.9
DW 69.000 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1299930 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
11
12
6.10
1.02
1.01
1.02
1.01
1.00
1.01
1.01
O
NH
O

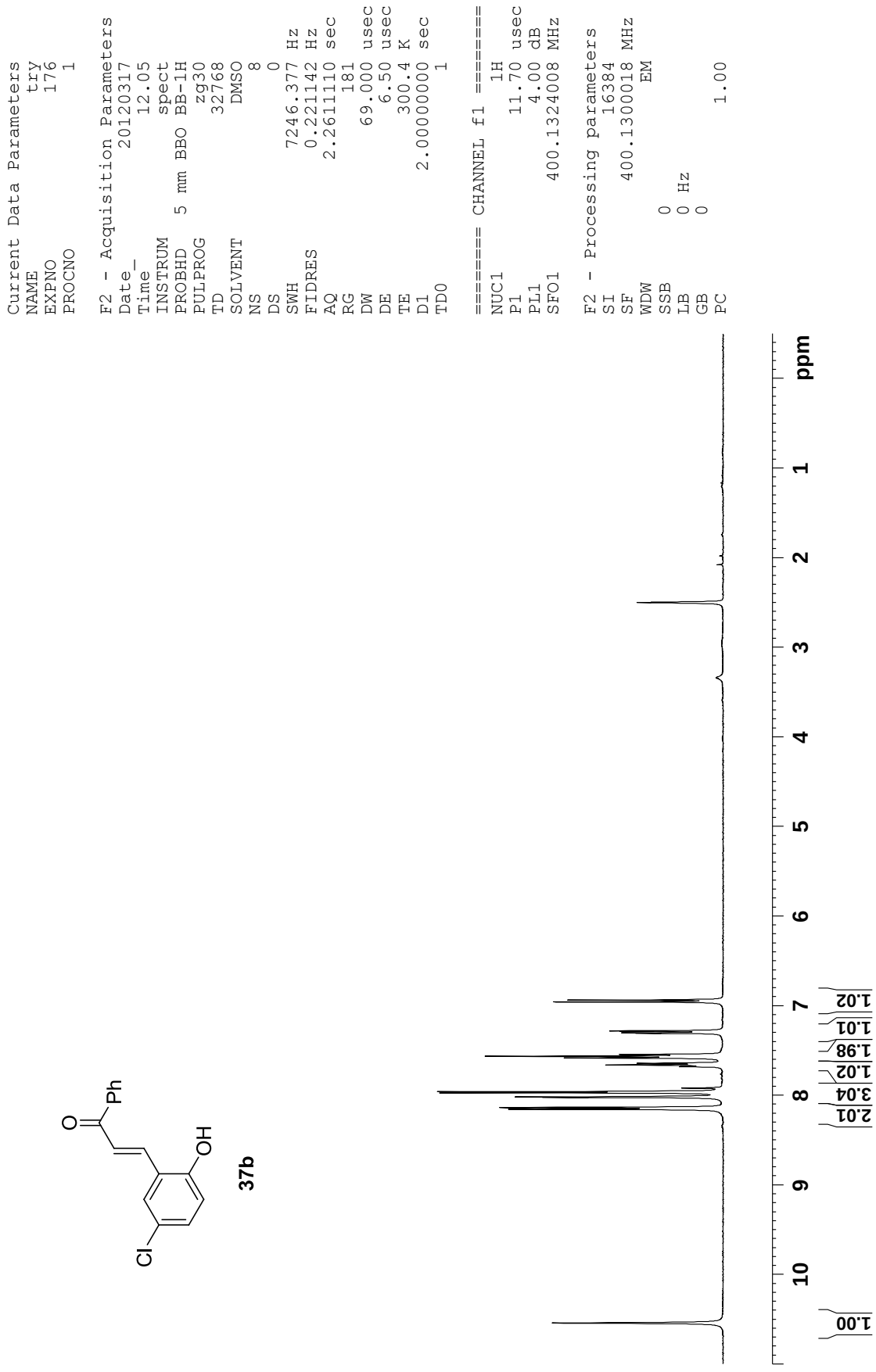

Current Data Parameters
NAME 0044.isopropyl_PCC_OK
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120212
Time 9.57
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 203
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127797 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
19.3
37.2
76.7
77.0
77.3
119.7
121.6
122.6
135.9
136.0
141.1
176.6
195.4
O
NH
O
ppm
200
180
160
140
120
100
80
60
40
20

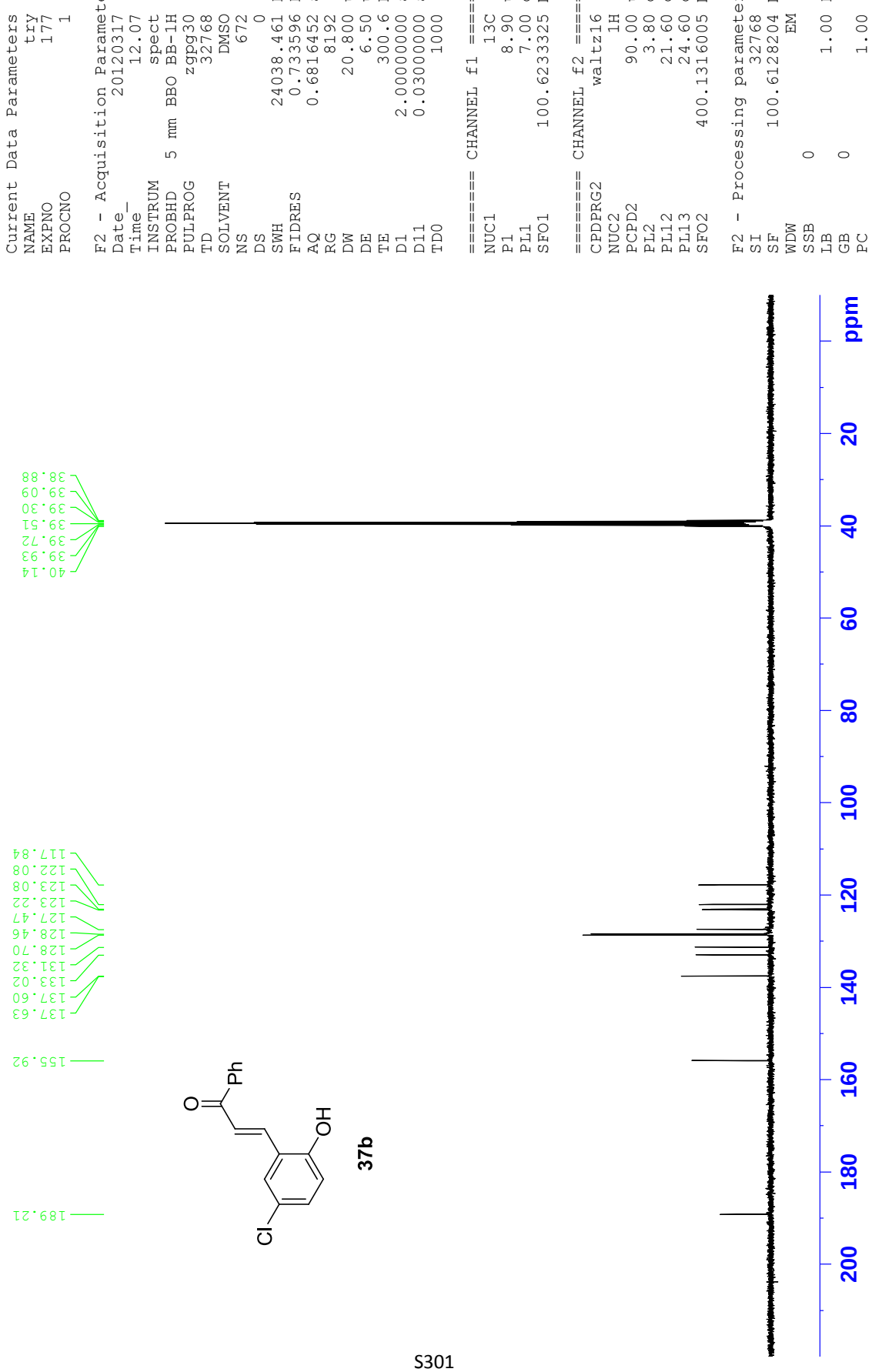

Current Data Parameters
NAME 0045.i-Pr, Bn
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120227
Time_ 21.23
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 28.5
DW 69.000 usec
DE 6.50 usec
TE 297.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1299870 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
1.01
1.01
1.04
3.08
2.12
1.08
1.05
1.06
1.06
6.07
35d

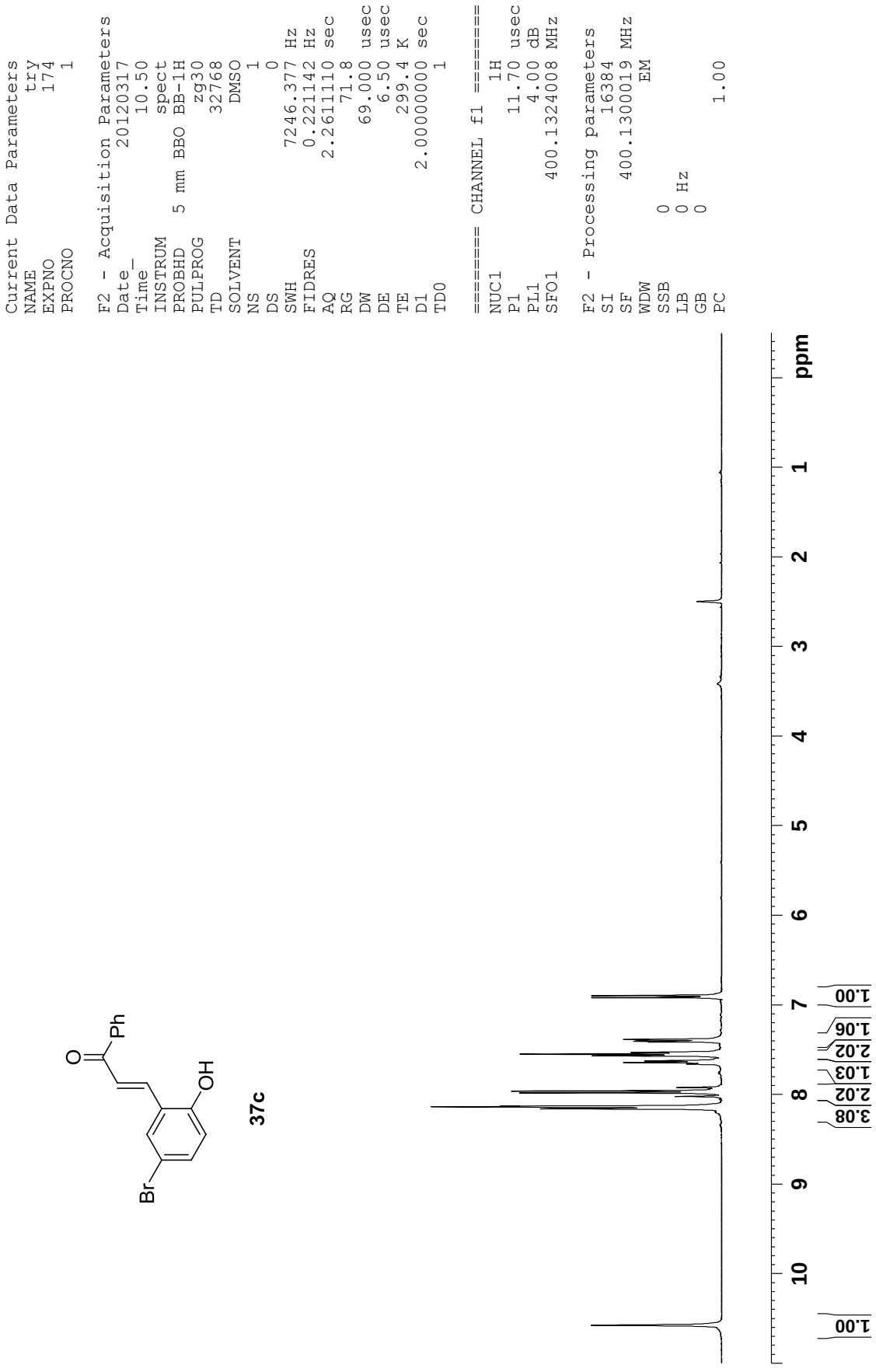

Current Data Parameters
NAME 0045.i-Pr, Bn
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120306
Time_ 9.18
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 83
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127828 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.0
176.8
143.8
136.0
135.2
133.1
130.0
129.6
129.3
128.7
128.4
127.8
77.3
77.0
76.7
53.5
31.8
19.8
19.0
35d
ppm
200
180
160
140
120
100
80
60
40
20

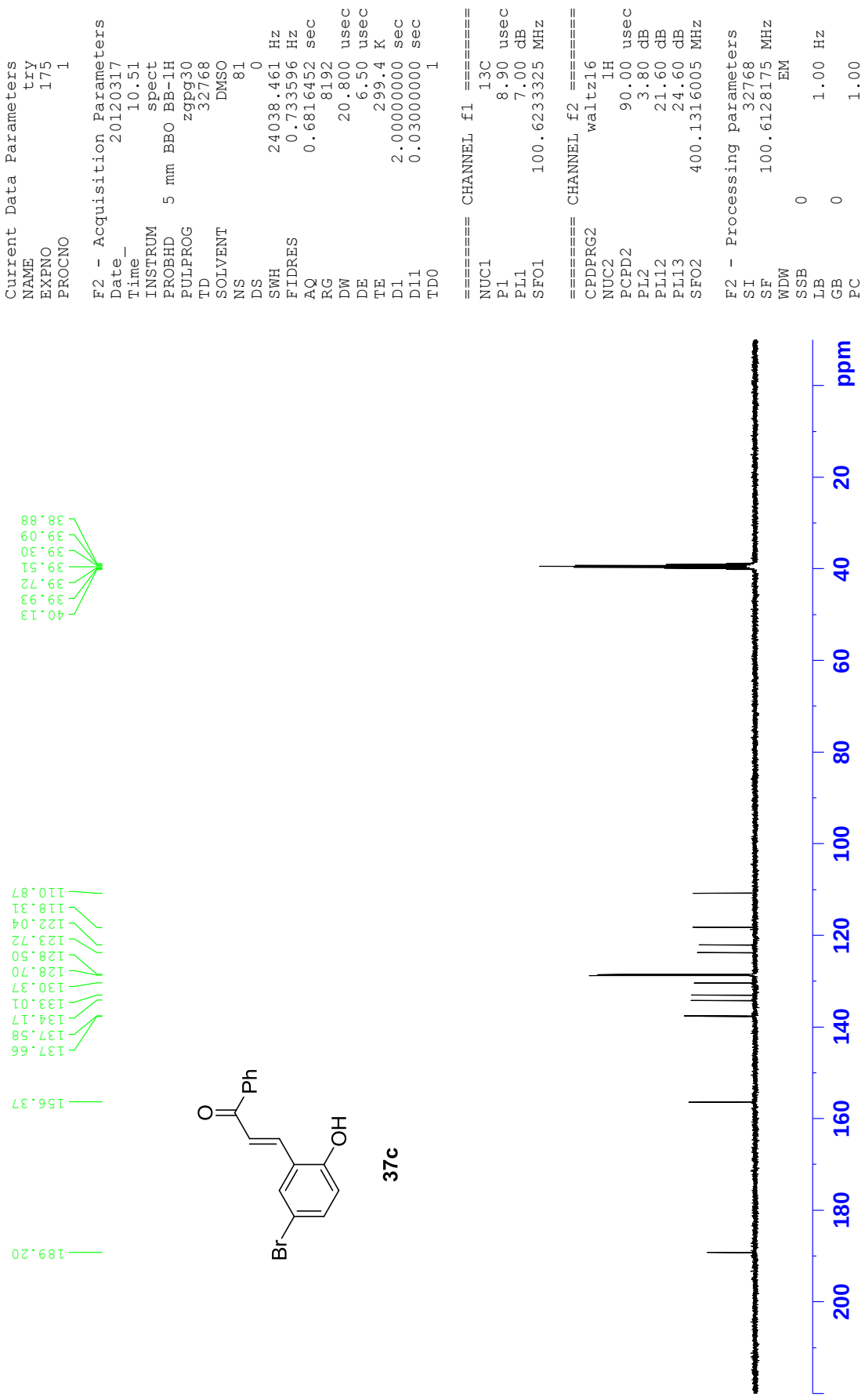

Current Data Parameters
NAME 356
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110110
Time_ 21.59
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 31
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 362
DW 83.200 usec
DE 6.50 usec
TE 295.9 K
D1 1.50000000 sec
MCREST 0 sec 0.01500000 sec
MCWRK
======== CHANNEL f1 ========
NUC1 1H
P1 11.20 usec
PL1 0 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300087 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
ppm
1.00
2.00
1.04
2.05
2.01
0.90
2.04
0.96
O
Ph
OH
37a

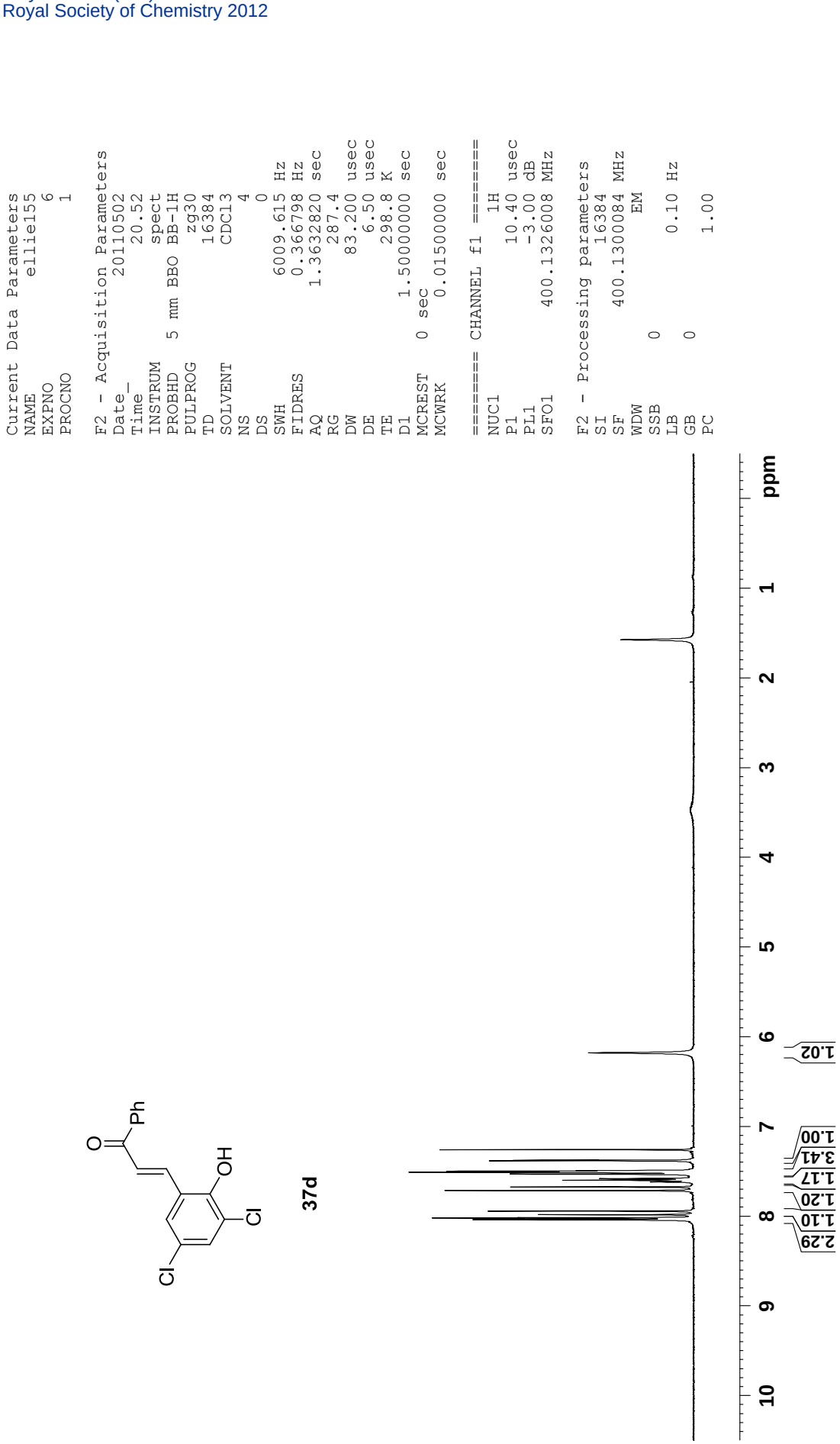

Current Data Parameters
NAME 356
EXPNO 9
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110112
Time 12.07
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 2906
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.30751311 sec
RG 8192
DW 19.950 usec
DE 6.50 usec
TE 294.7 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec 0.01500000 sec
MCWRK
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 5.30 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 0 dB 16.50 dB
PL12 19.50 dB
PL13 400.1319000 MHz
SFO2
F2 - Processing parameters
SI 32768
SF 100.6127699 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
77.32
77.00
76.68
116.60
120.99
122.26
122.90
128.59
128.64
129.52
131.77
132.74
138.34
140.82
155.65
191.84
O
Ph
OH
37a
ppm
200
180
160
140
120
100
80
60
40
20

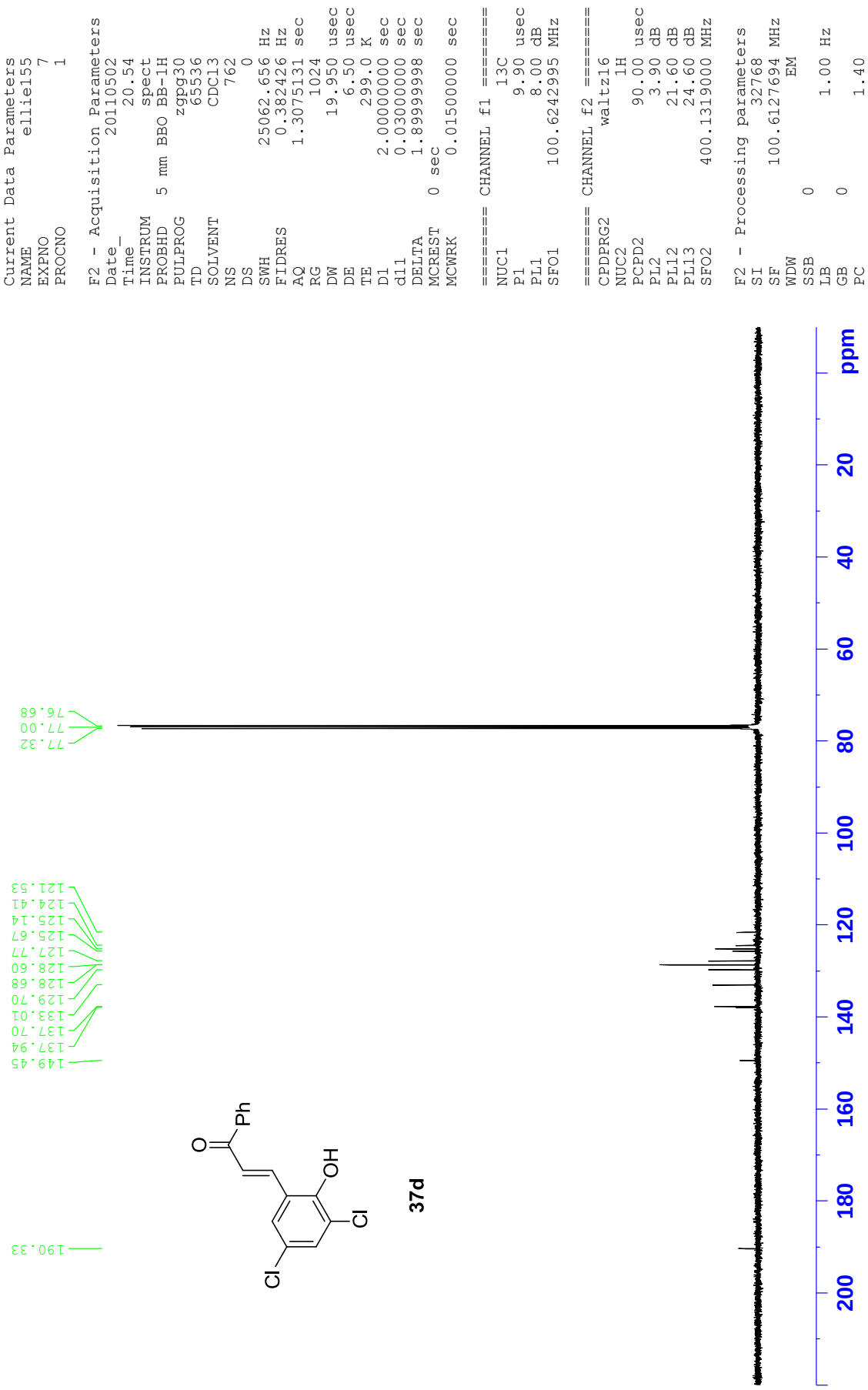

Current Data Parameters
NAME try
EXPNO 176
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120317
Time_ 12.05
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300018 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
Ph
OH
Cl
37b
ppm
1
2
3
4
5
6
7
8
9
10
1.00
2.01
3.04
1.02
1.98
1.01
1.02

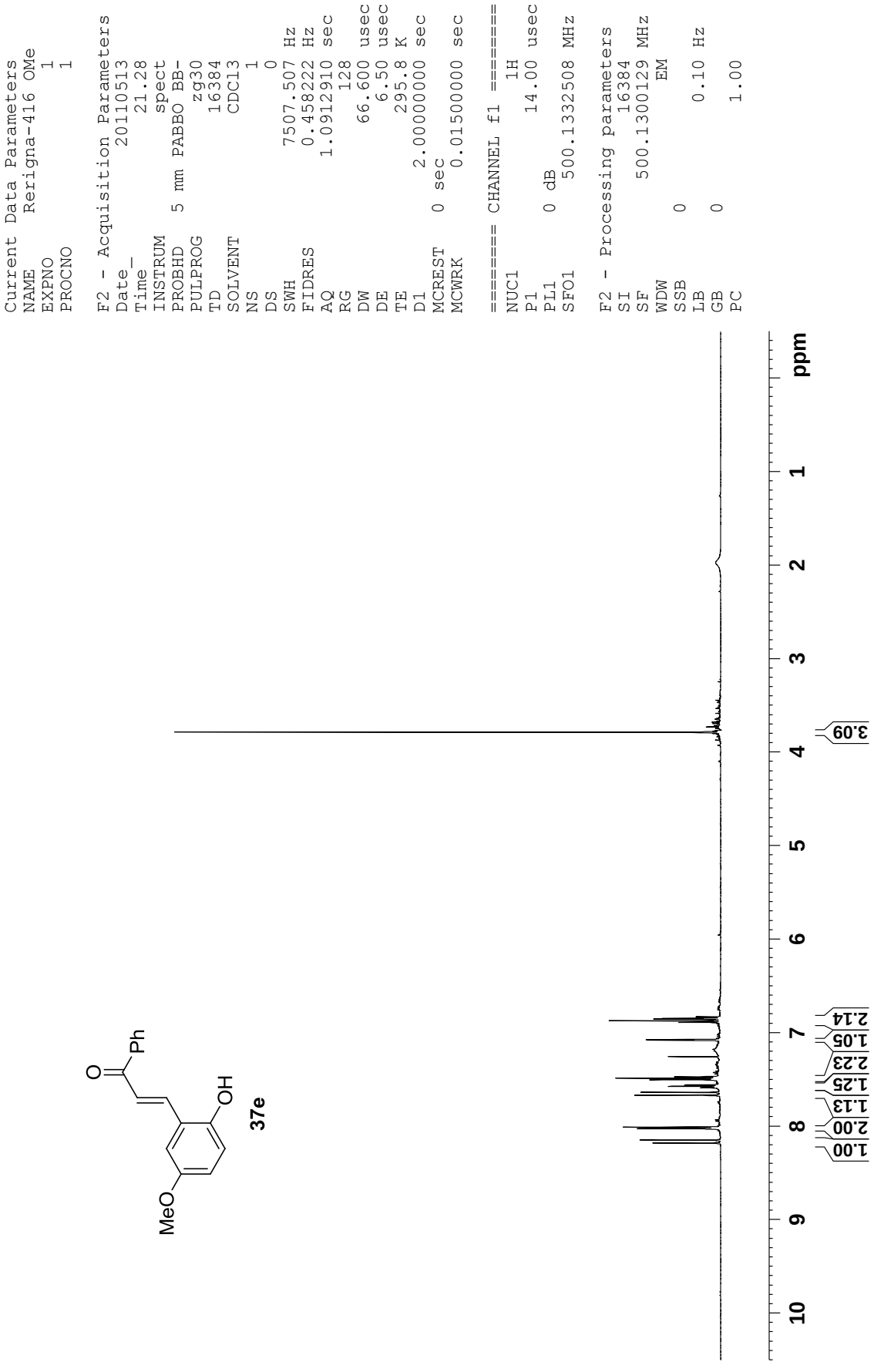

Current Data Parameters
NAME try
EXPNO 177
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120317
Time_ 12.07
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT DMSO
NS 672
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 300.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1000
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6128204 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
38.88
39.09
39.30
39.51
39.72
39.93
40.14
117.84
122.08
123.08
123.22
127.47
128.46
128.70
131.32
133.02
137.60
137.63
155.92
189.21
O
Ph
OH
Cl
37b
ppm
200
180
160
140
120
100
80
60
40
20

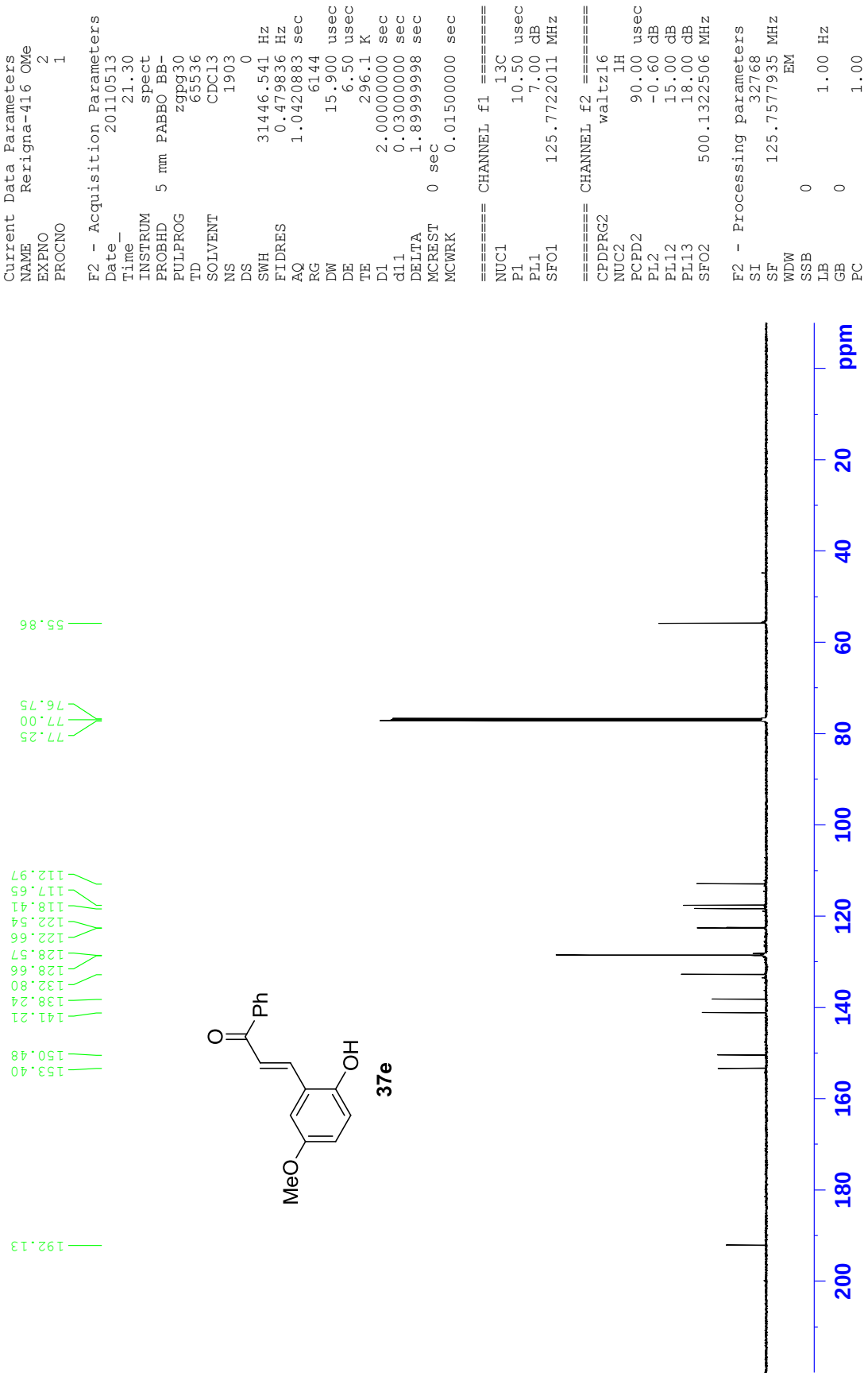

Current Data Parameters
NAME try
EXPNO 174
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120317
Time_ 10.50
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT DMSO
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300019 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Ph
O
OH
Br
37c
1.00
1.06
2.02
1.03
2.02
3.08
1.00
ppm

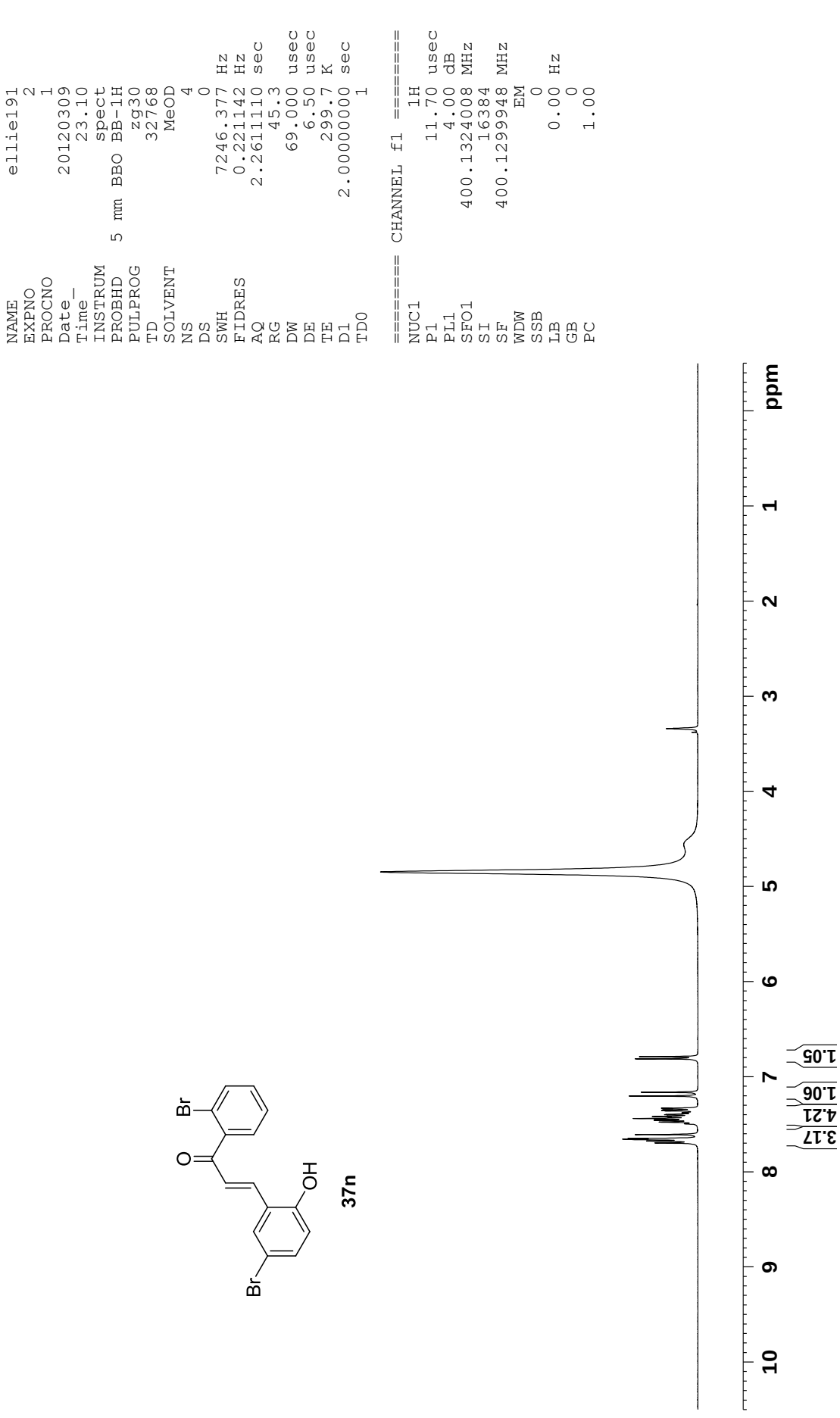

Current Data Parameters
NAME try
EXPNO 175
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120317
Time_ 10.51
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT DMSO
NS 81
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 8192
DW 20.800 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6128175 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
38.88
39.09
39.30
39.51
39.72
39.93
40.13
110.87
118.31
122.04
123.72
128.50
128.70
130.37
133.01
134.17
137.58
137.66
156.37
189.20
O
Ph
OH
Br
37c
200
180
160
140
120
100
80
60
40
20
ppm

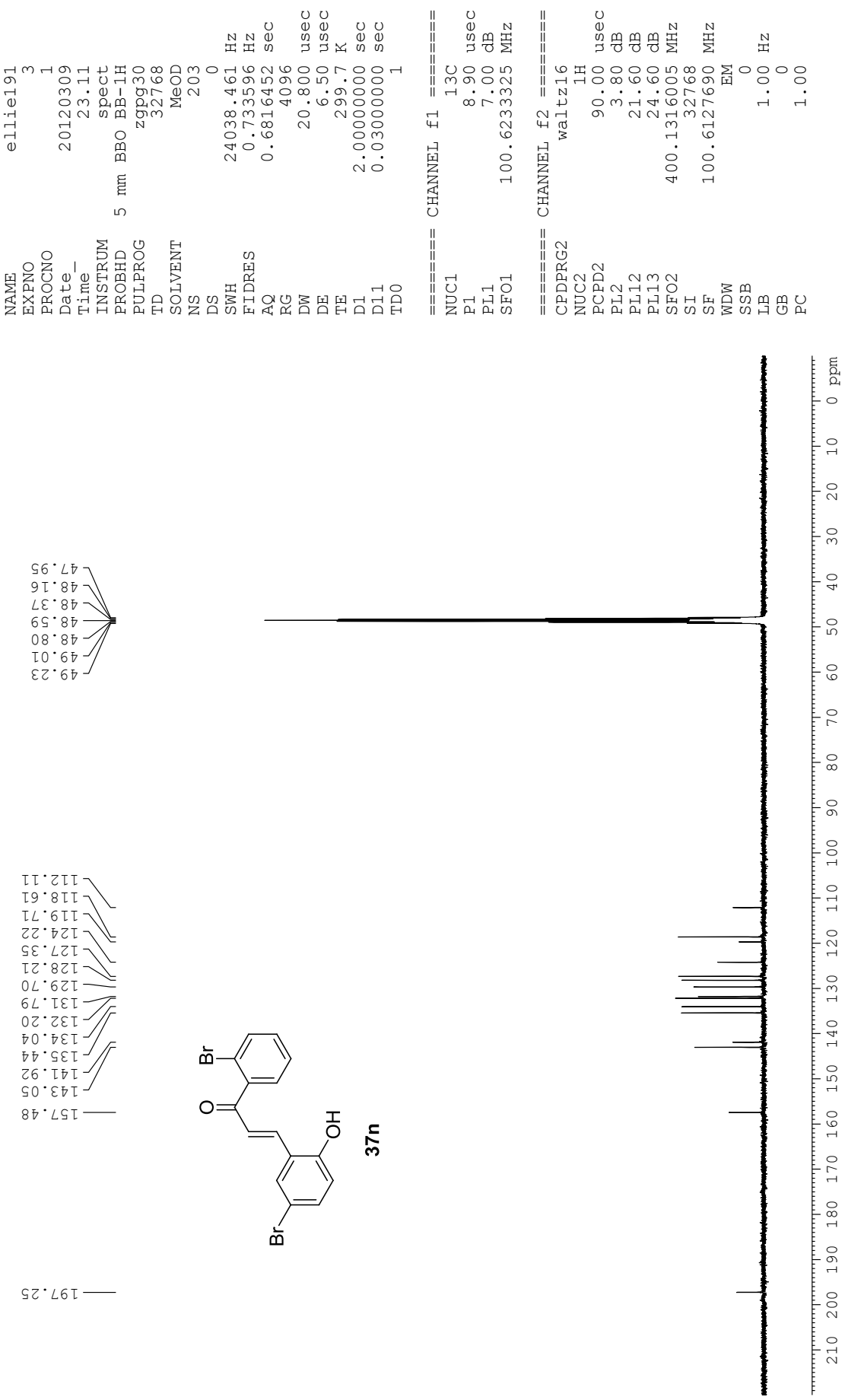

Current Data Parameters
NAME ellie155
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110502
Time_ 20.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 4
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 287.4
DW 83.200 usec
DE 6.50 usec
TE 298.8 K
D1 1.50000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.40 usec
PL1 -3.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300084 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
O
Ph
OH
Cl
Cl
37d
1.02
2.29
1.10
1.20
1.17
3.41
1.00
ppm

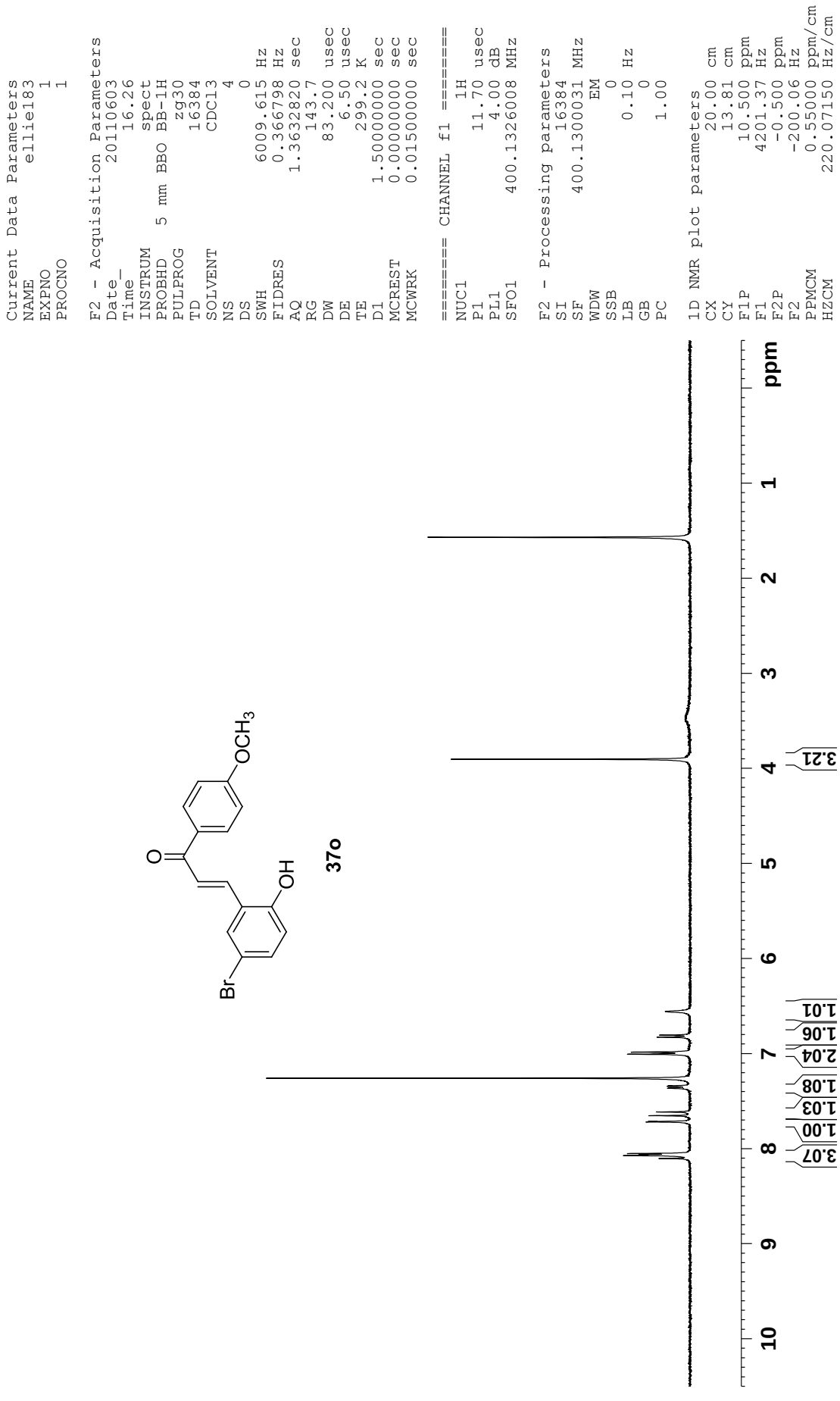

Current Data Parameters
NAME ellie155
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110502
Time_ 20.54
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 762
DS 0
SWH 25062.656 Hz
FIDRES 0.382426 Hz
AQ 1.3075131 sec
RG 1024
DW 19.950 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.90 usec
PL1 8.00 dB
SFO1 100.6242995 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.90 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1319000 MHz
F2 - Processing parameters
SI 32768
SF 100.6127694 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190.33
149.45
137.94
137.70
133.01
129.70
128.68
128.60
127.77
125.67
125.14
124.41
121.53
77.32
77.00
76.68
O
Ph
OH
Cl
Cl
37d
ppm
200
180
160
140
120
100
80
60
40
20

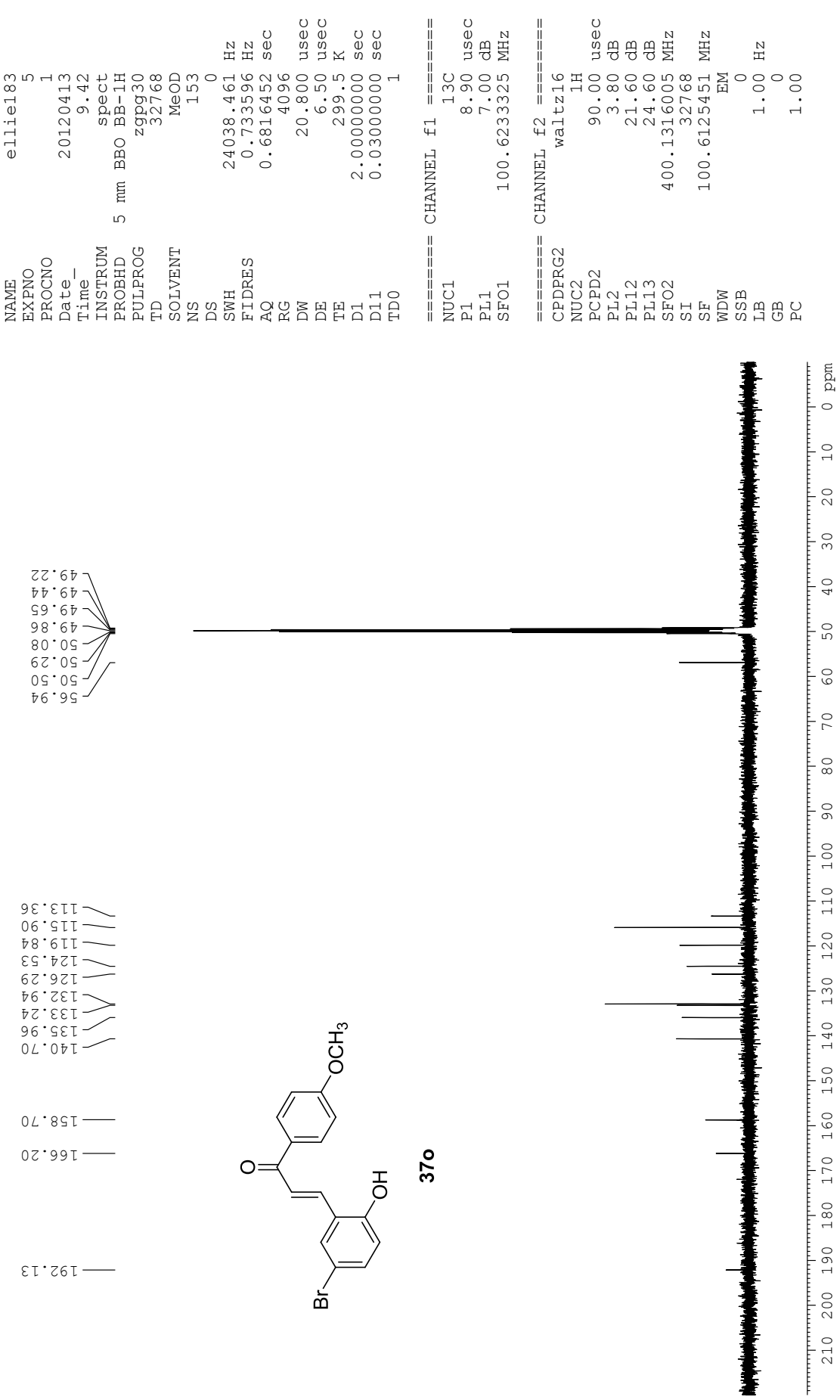

Current Data Parameters
NAME Rerigna-416 OMe
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110513
Time_ 21.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 1
DS 0
SWH 7507.507 Hz
FIDRES 0.458222 Hz
AQ 1.0912910 sec
RG 128
DW 66.600 usec
DE 6.50 usec
TE 295.8 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 14.00 usec
PL1 0 dB
SFO1 500.1332508 MHz
F2 - Processing parameters
SI 16384
SF 500.1300129 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
O
Ph
OH
MeO
37e
ppm
1
2
3
4
5
6
7
8
9
10
3.09
1.00
2.00
1.13
1.25
2.23
1.05
2.14

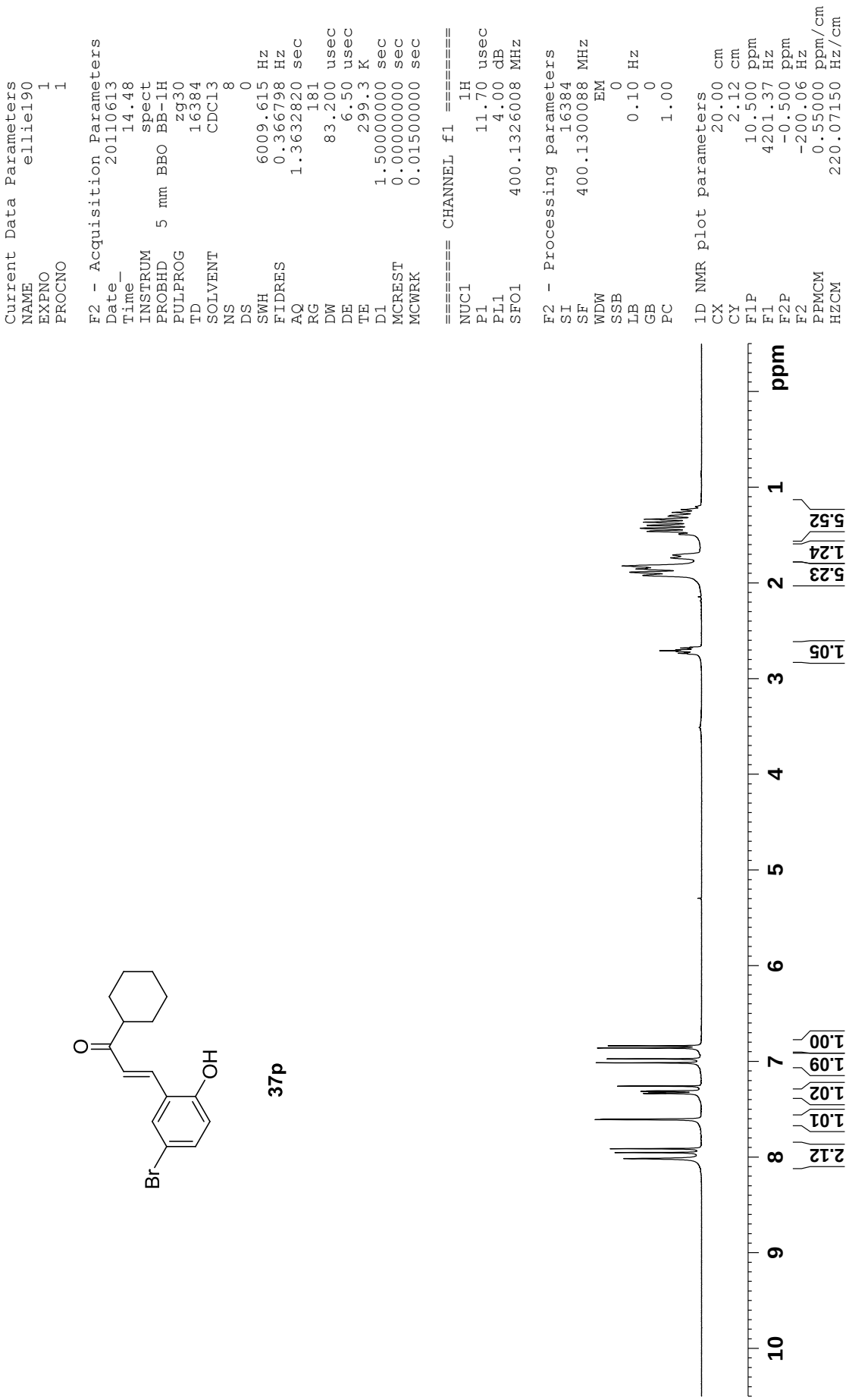

Current Data Parameters
NAME Rerigna-416 OMe
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110513
Time_ 21.30
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1903
DS 0
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420883 sec
RG 6144
DW 15.900 usec
DE 6.50 usec
TE 296.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec 0.01500000 sec
MCWRK
======== CHANNEL f1 ========
NUC1 13C
P1 10.50 usec
PL1 7.00 dB
SFO1 125.7722011 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.00 dB
PL13 18.00 dB
SFO2 500.1322506 MHz
F2 - Processing parameters
SI 32768
SF 125.7577935 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
192.13
153.40
150.48
141.21
138.24
132.80
128.66
128.57
122.66
122.54
118.41
117.65
112.97
77.25
77.00
76.75
55.86
O
Ph
OH
MeO
37e
200
180
160
140
120
100
80
60
40
20
ppm

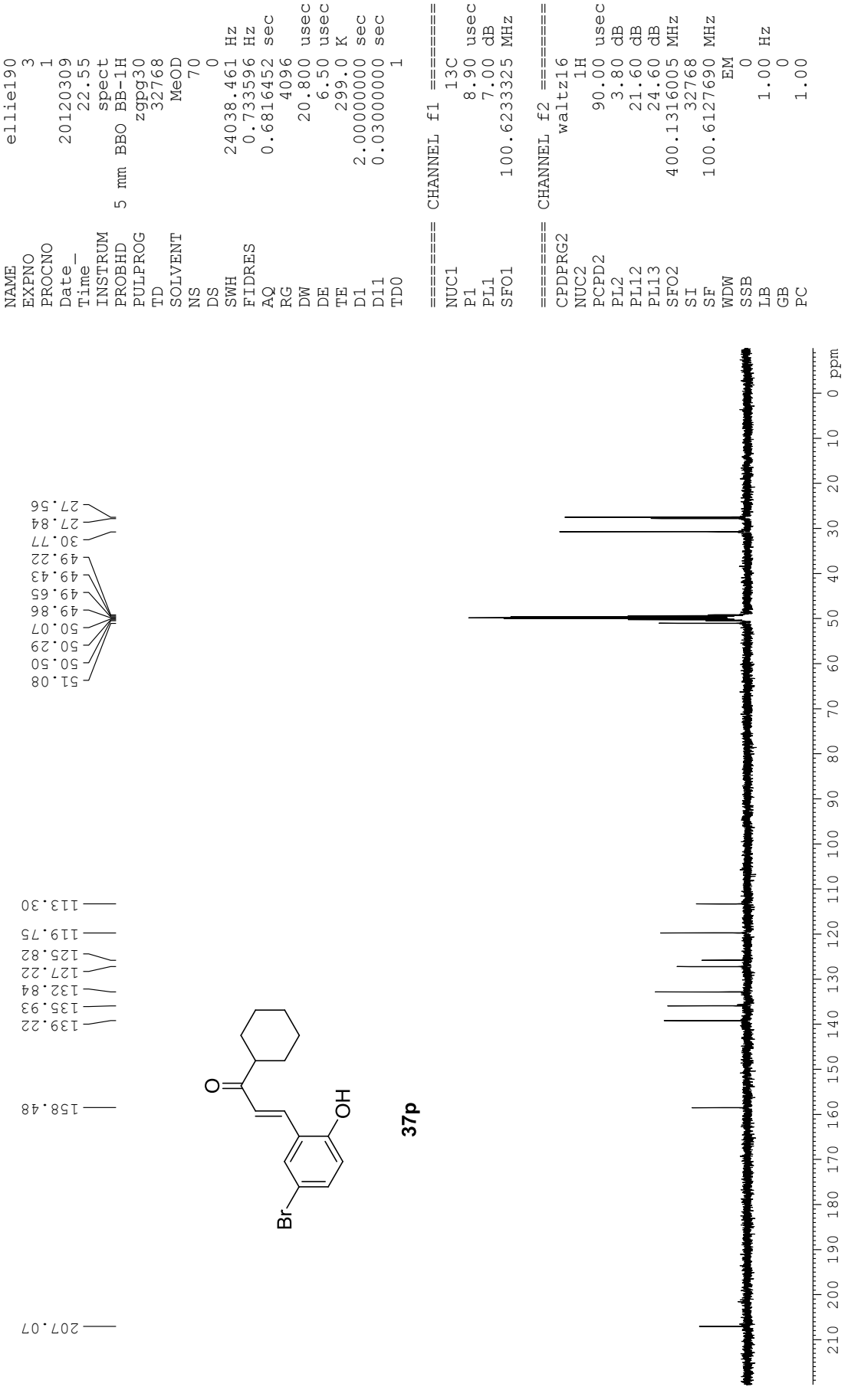

NAME ellie191
EXPNO 2
PROCNO 1
Date_ 20120309
Time 23.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT MeOD
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 45.3
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1299948 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Br
O
OH
Br
37n
ppm
1
2
3
4
5
6
7
8
9
10
3.17
4.21
1.06
1.05

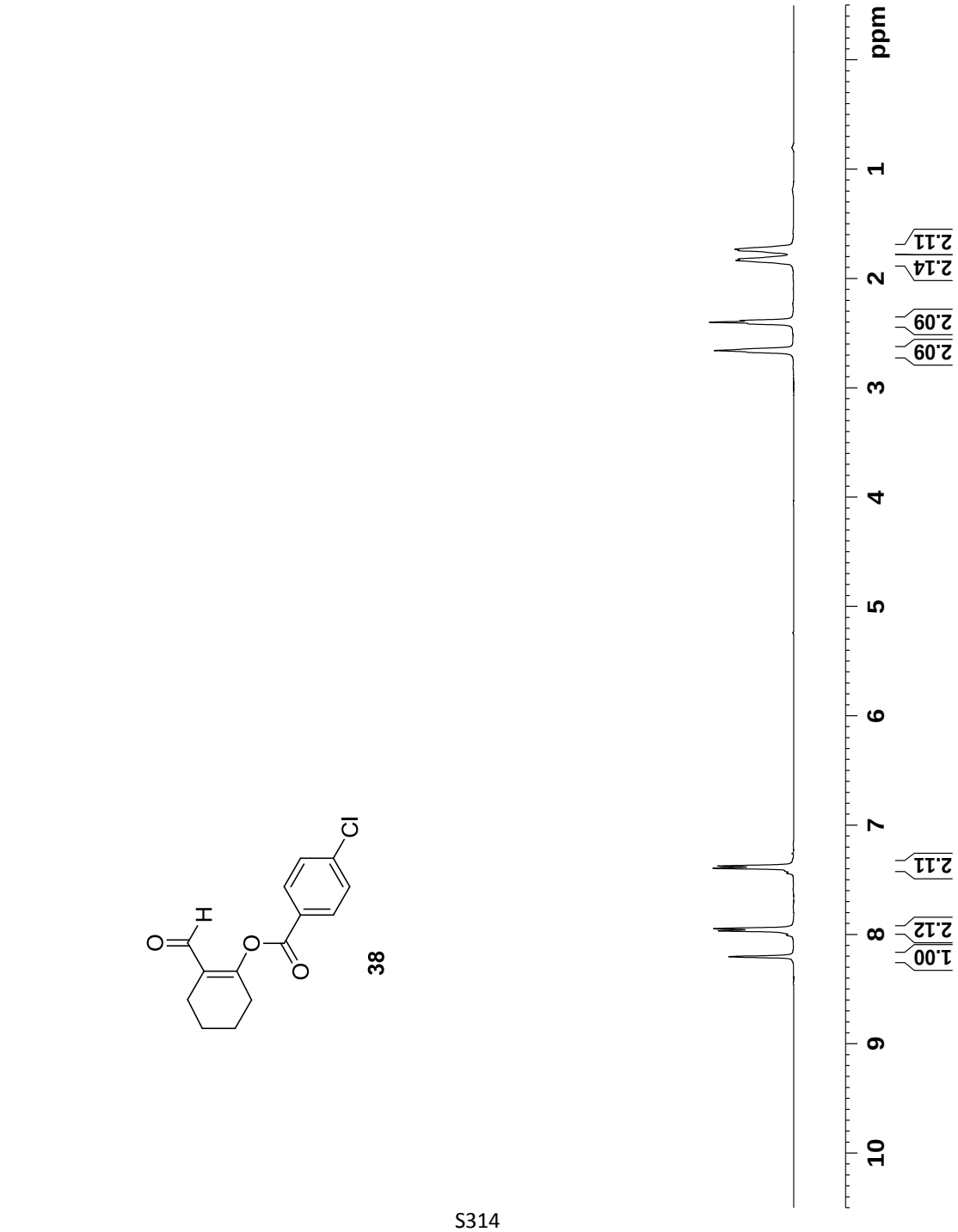

NAME ellie191
EXPNO 3
PROCNO 1
Date_ 20120309
Time_ 23.11
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 203
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
49.23
49.01
48.80
48.59
48.37
48.16
47.95
112.11
118.61
119.71
124.22
127.35
128.21
129.70
131.79
132.20
134.04
135.44
141.92
143.05
157.48
197.25
Br
O
OH
Br
37n
0 ppm

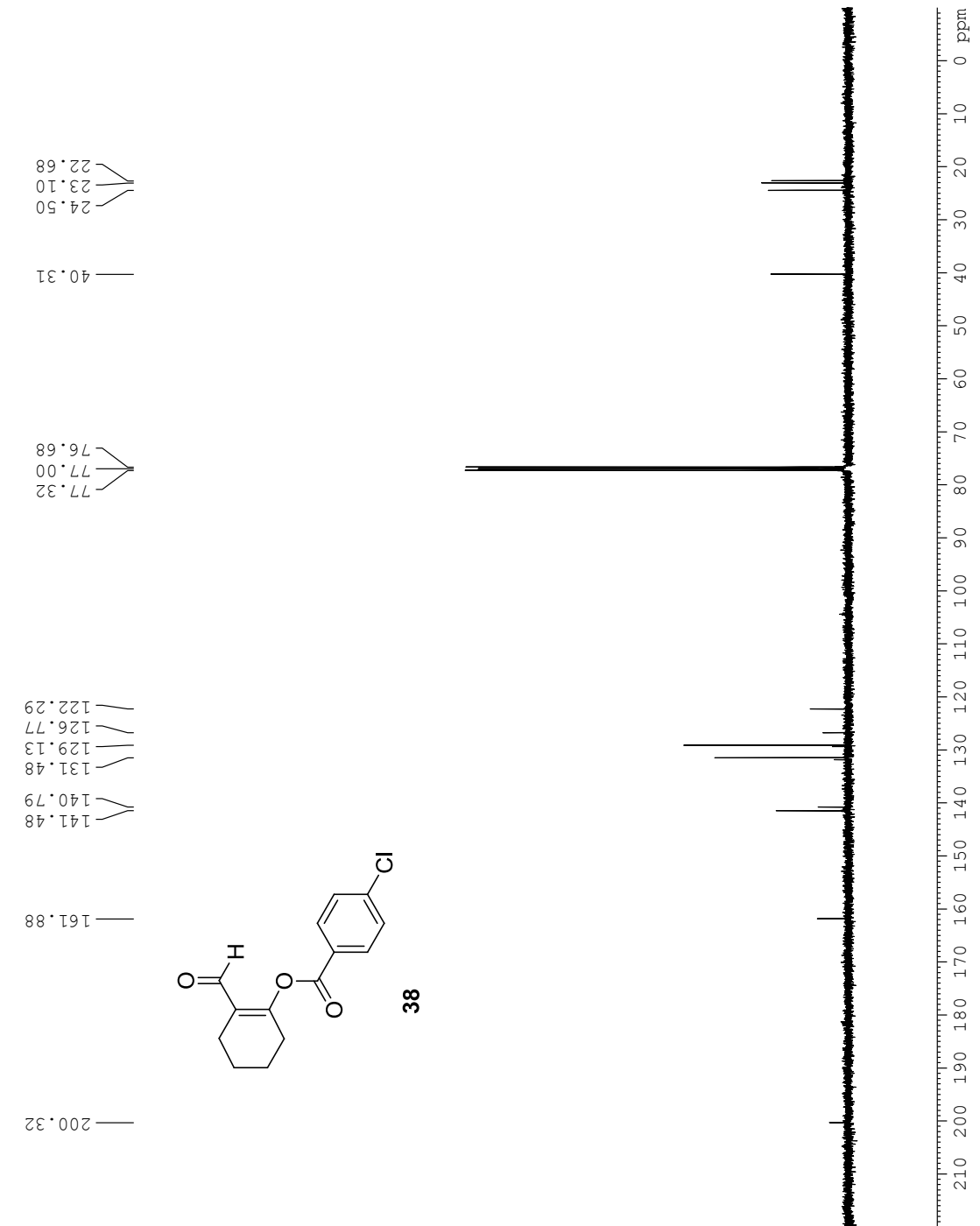

Current Data Parameters
NAME ellie183
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110603
Time_ 16.26
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 4
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 143.7
DW 83.200 usec
DE 6.50 usec
TE 299.2 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300031 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 13.81 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
OCH3
O
OH
Br
37o
3.21
3.07
1.00
1.03
1.08
2.04
1.06
1.01
ppm
10
9
8
7
6
5
4
3
2
1


NAME ellie183
EXPNO 5
PROCNO 1
Date_ 20120413
Time_ 9.42
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 153
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6125451 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
192.13
166.20
158.70
140.70
135.96
133.24
132.94
126.29
124.53
119.84
115.90
113.36
56.94
50.50
50.29
50.08
49.86
49.65
49.44
49.22
O
OCH3
OH
Br
37o
0 ppm


Current Data Parameters
NAME ellie190
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110613
Time_ 14.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 16384
SOLVENT CDC13
NS 8
DS 0
SWH 6009.615 Hz
FIDRES 0.366798 Hz
AQ 1.3632820 sec
RG 181
DW 83.200 usec
DE 6.50 usec
TE 299.3 K
D1 1.50000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1326008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300088 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 2.12 cm
F1P 10.500 ppm
F1 4201.37 Hz
F2P -0.500 ppm
F2 -200.06 Hz
PPMCM 0.55000 ppm/cm
HZCM 220.07150 Hz/cm
O
OH
Br
37p
ppm
10
9
8
7
6
5
4
3
2
1
2.12
1.01
1.02
1.09
1.00
1.05
5.23
1.24
5.52

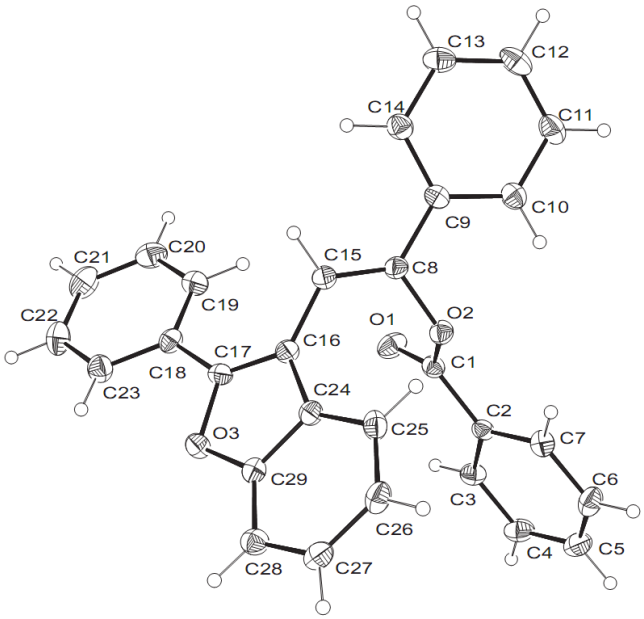

NAME ellie190
EXPNO 3
PROCNO 1
Date_ 20120309
Time_ 22.55
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 70
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
207.07
158.48
139.22
135.93
132.84
127.22
125.82
119.75
113.30
51.08
50.50
50.29
50.07
49.86
49.65
49.43
49.22
30.77
27.84
27.56
O
OH
Br
37p
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

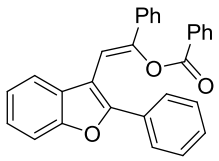

NAME
EXPNO
PROCNO
Date_
Time_
INSTRUM
PROBHD
PULPROG
TD
SOLVENT
NS
DS
SWH
FIDRES
AQ
RG
DW
DE
TE
D1
TD0
5 mm BBO BB-1H
spect
19.41
20120503
1
8
zg30
32768
CDC13
4
0
7246.377 Hz
0.221142 Hz
2.261110 sec
32
69.000 usec
6.50 usec
298.8 K
2.00000000 sec
1
CHANNEL f1
NUC1
P1
PL1
SFO1
SI
SF
WDW
SSB
LB
GB
PC
1H
11.70 usec
4.00 dB
400.1324008 MHz
16384
400.1300078 MHz
EM
0
0.00 Hz
0
1.00
ppm
1
2
3
4
5
6
7
8
9
10
2.11
2.14
2.09
2.09
2.11
2.12
1.00
O
H
O
O
Cl
38


NAME ellie399
EXPNO 9
PROCNO 1
Date_ 20120503
Time 9.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 162
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 4096
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 13C
P1 8.90 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.80 dB
PL12 21.60 dB
PL13 24.60 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127713 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
200.32
161.88
141.48
140.79
131.48
129.13
126.77
122.29
77.32
77.00
76.68
40.31
24.50
23.10
22.68
O
H
O
O
Cl
38
ppm

VIII. Spectra of X-ray crystallography 4a, 4'q, 8, 17e, 18d, 19a, 20a, 20b, and 22b

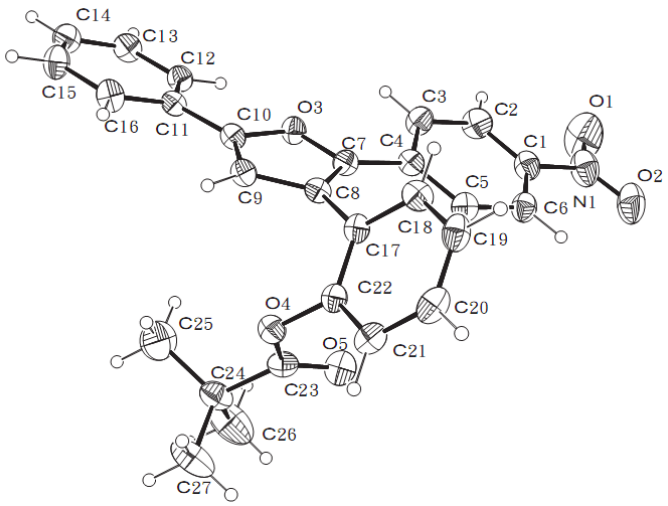
4a:

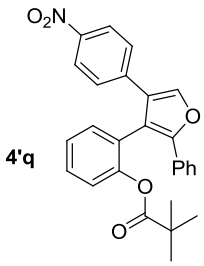




4a

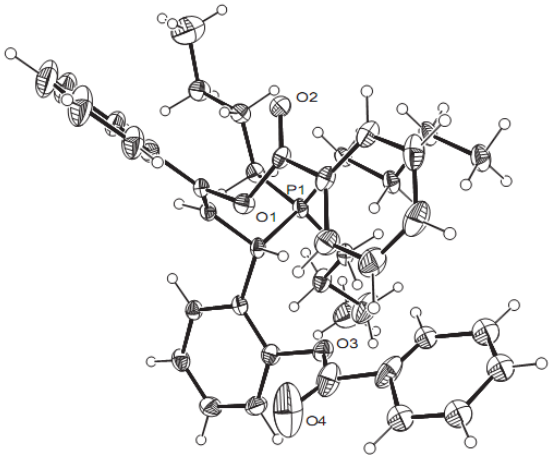
4'q:

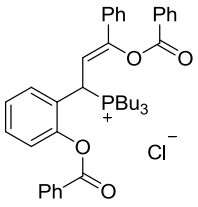




4'q

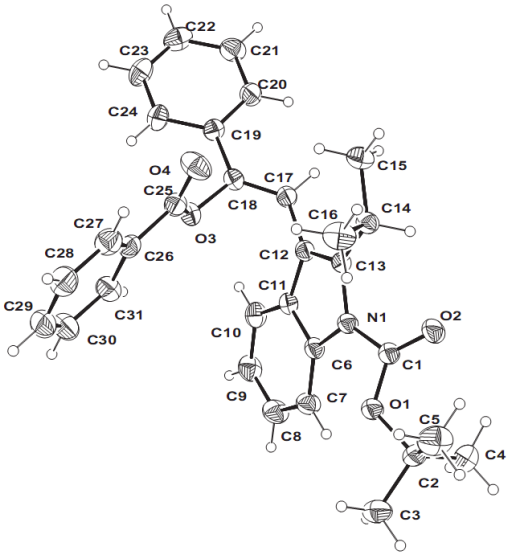
8:

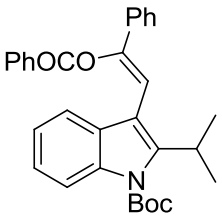

O2
P1
O1
O3
O4


Ph
Ph
O
O
PBu3
+
O
Cl
−
Ph
O

8

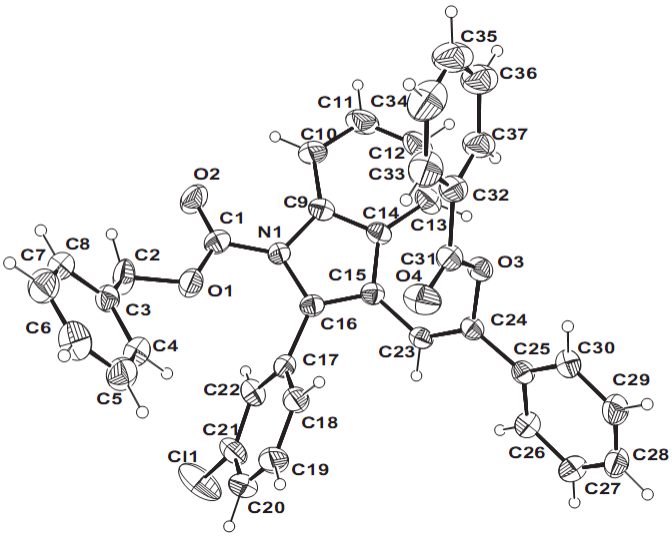
17e:

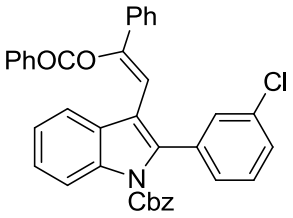

C22
C23
C21
C20
C24
C19
O4
C25
C17
C15
C18
C16
C14
C27
O3
C26
C12
C13
C28
C11
C29
C31
N1
O2
C10
C6
C1
C30
C9
C7
O1
C5
C8
C4
C2
C3


Ph
PhOCO
N
Boc

17e

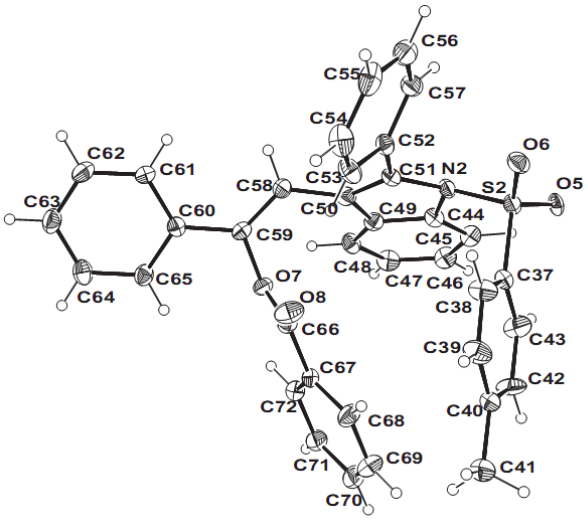
18d:

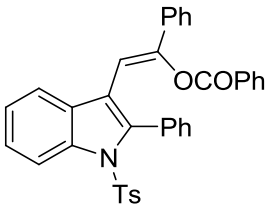




18d

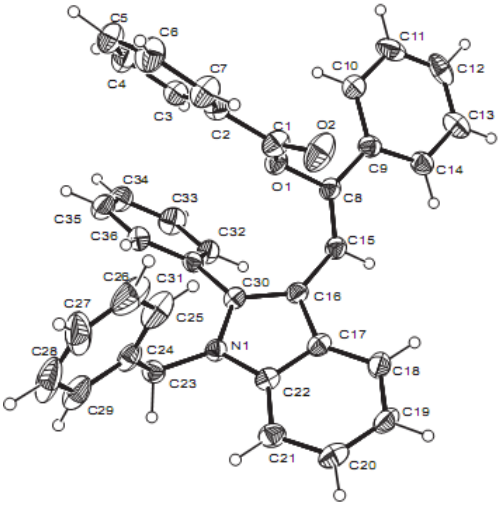
19a:

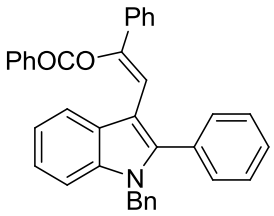




19a

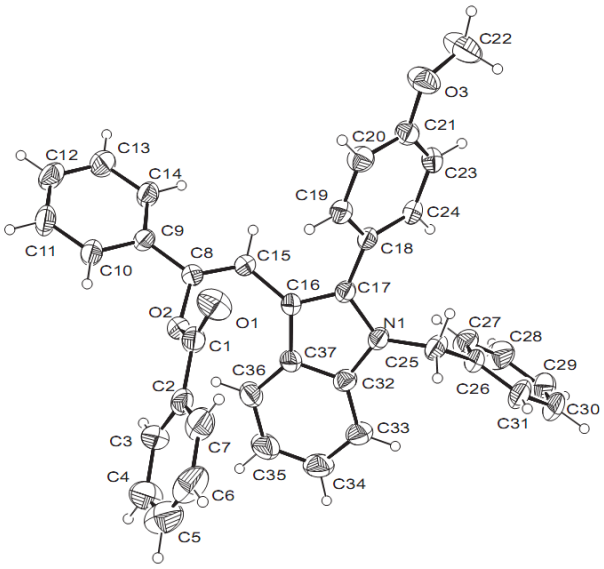
20a:

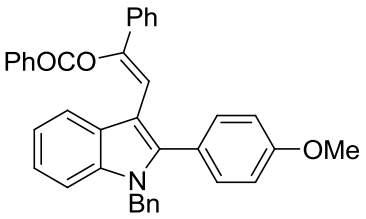




20a

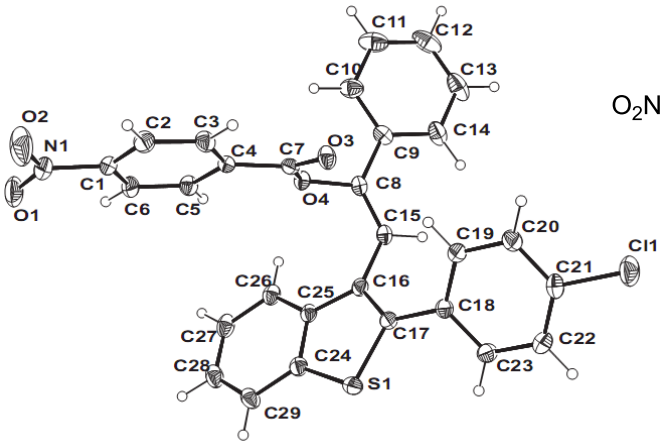
20b:

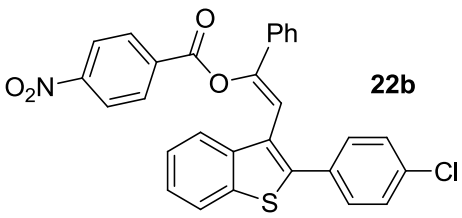




20b

22b:


C11
C12
C10
C13
O2
C2
C3
N1
C4
C7
O3
C14
C9
C1
C8
O1
C6
C5
O4
C15
C19
C20
Cl1
C21
C26
C25
C16
C18
C27
C17
C22
C28
C24
C23
S1
C29


O
Ph
O2N
O
22b
S
Cl