Direct β-Acylation of 2-Arylidene-1,3-indandiones with Acyl Chlorides Catalyzed by Organophosphanes

Chia-Jui Lee, Chia-Ning Sheu, Cheng-Che Tsai, Zong-Ze Wu, and Wenwei Lin*

Department of Chemistry, National Taiwan Normal University
No. 88, Section 4, Tingchow Road, Taipei 11677, Taiwan, ROC
Fax: (+886) 02 29354249
e-mail: wenweilin@ntnu.edu.tw

Supplementary Data

Table of contents:

I. Representative Experimental procedures:

TP1: Typical procedure for the preparation of compounds **1**

Preparation of **1aa** (entry 1, Table 2): A dry and nitrogen-flushed 10-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 μL, 10 mol%), **11a** (42.6 μL, 1.2 equiv) and Et_3N (54.4 μL, 1.3 equiv) in THF (1.5 mL). The reaction mixture was stirred for 2 hours at room temperature (27-30 ^oC). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished furnished **1aa** as yellow solid (123.0 mg, 98%).

TP2: Typical procedure for the preparation of compounds **1xm**

Preparation of **1am** (Scheme 2): A dry and nitrogen-flushed 10-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of **6a** (93.9 mg, 0.3 mmol), $EtPPh_2$ (9.4 μL, 15 mol%), **11m** (54.2 μL, 1.3equiv) and Et_3N (58.9 μL, 1.4 equiv) in THF (1.5 mL). The reaction mixture was stirred for 10 minutes at room temperature (27-30 ^oC). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished furnished **1am** as yellow solid (120.3 mg, 98%).

TP3: Typical procedure for the preparation of compounds **2-5**

Preparation of **2a** (Scheme 6): A dry and nitrogen-flushed 10-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of **7a** (111.1 mg, 0.3 mmol), Bu_3P (8.7 μL, 10 mol%), **11a** (38.3 μL, 1.1equiv) and Et_3N (50.2 μL, 1.2 equiv) in THF (1.5 mL). The reaction mixture was stirred for 50 minutes at room temperature (27-30 ^oC). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **2a** as yellow solid (93.4 mg, 66%).

TP4: Typical procedure for the preparation of compounds **16**, **17**, **18**

Preparation of **16a** (Scheme 7): A 10-mL Schlenk flask, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of **1am** (122.7 mg, 0.3 mmol), hydrazine hydrate (22.0 μL, 1.5 equiv) in methanol (1.5 mL). The reaction mixture was stirred for 10 minutes at room temperature (27-30 ^oC). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/dichloromethane: 1/3) furnished **16a** as yellow solid (88.7 mg, 98%).

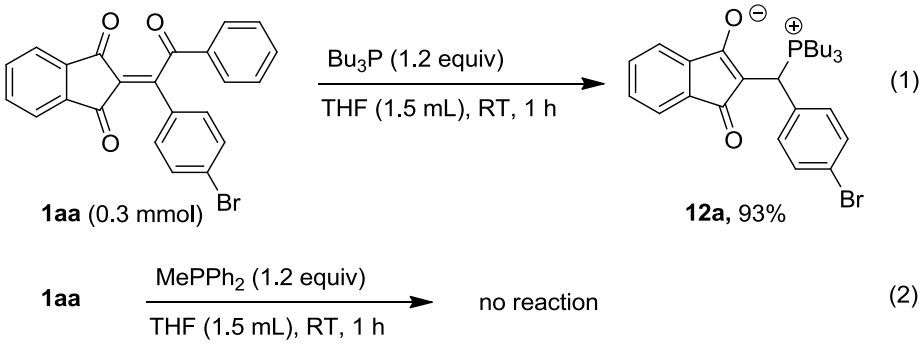
TP5: Typical procedure for the preparation of starting material **6**

Preparation of **6a**: A 50-mL Schlenk flask, equipped with a magnetic stirring bar, was sequentially charged with a solution of 1,3-indanedione (1506.5 mg, 10 mmol) *L*-proline

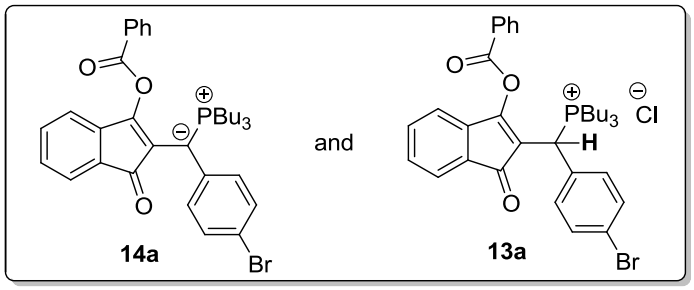
(349.0 mg, 0.3equiv) and benzaldehyde (2035.2 mg, 1.1 equiv) in methanol (20 mL). The reaction mixture was stirred for 12 hours at room temperature (27-30 ^{o}C). Thereafter, the resulting mixture was purified using vacuum-filtration and washed with methanol for several times. The resulted product yielded **6a** as solid (2974.0 mg, 95%).

II. Controlled experiment: formation of phosphorus zwitterion

In order to understand the mechanism of our developed β-acylation reactions, four interesting results were selected for discussion (Table 1, entries 4, 9, 11, and 12). We found that 1.2 equiv of Bu_3P did not catalyze the expected reaction of **6a** and **11a** towards **1aa**, which indicated that organophosphane may not only play an important role to direct our reaction pathway towards the final product (entry 4 vs 11). In addition, the same phenomena were not observed when $MePPh_2$ was used instead of Bu_3P (entries 11 and 12). Based on our hypothesis, we assumed that the formation of the intermediate **13a** as the final product was possible when a strong nucleophilic organophosphane, such as Bu_3P, was present (Schemes S1 and 5). Because of the labile ester funcitonality of **13a**, only the phosphorus zwitterion **12a** was possibly observed in $CDCl_3$ and purified (entry 11). One controlled experiment was carried out to support our assumption of possible reactive intermediates **13a** and **14a** coming from the reaction of **1aa** and Bu_3P (Scheme 5, equation 1). The phosphorus zwitterionic intermediate **12a** was given in 93% yield after the treatment of **1aa** with 1.2 equiv of Bu_3P in THF. However, the adduct **1aa** was quite stable in the presence of $MePPh_2$ (equation 2). And we found that $MePPh_2$, $EtPPh_2$ and PPh_3 do not have enough nucleophilicity to carry out this reaction (Schemes S2). On the other hand, PBu_3 is the better choice for these substrates.

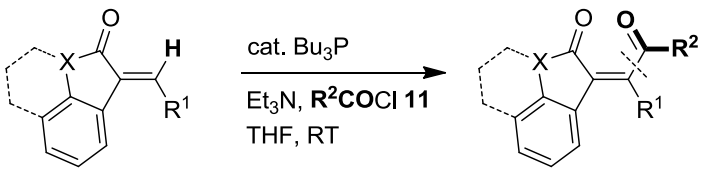


Presumable reactive intermediates:

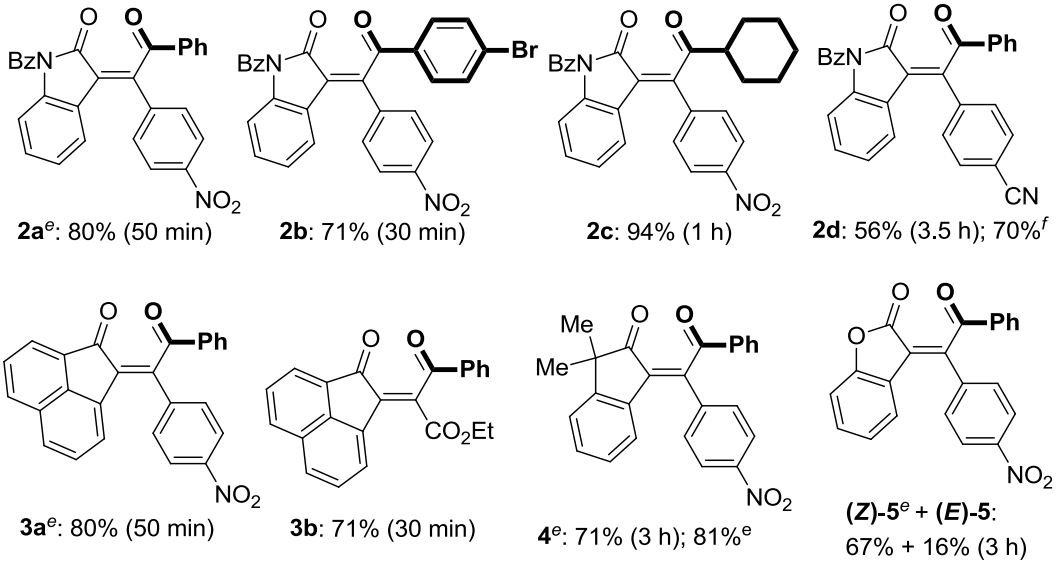


Scheme S1 Controlled experiment: formation of phosphorus zwitterion **12a.**

III. The reaction conditions for Scheme 6 (manuscript): organocatalytic synthesis of 2-5 via direct β-acylation.

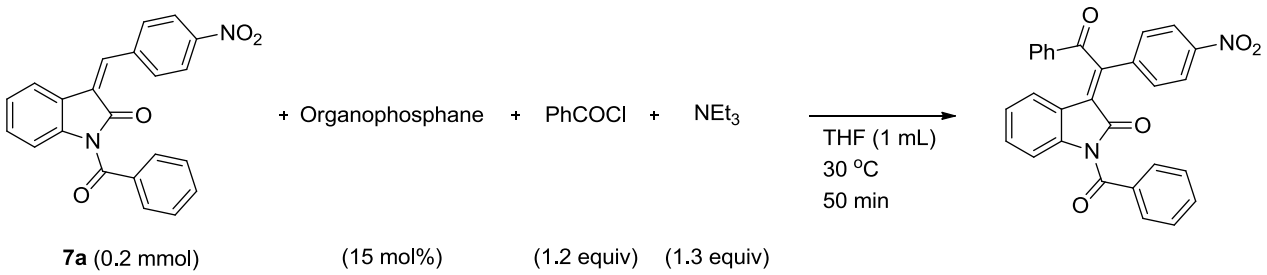


7, **8**, **9**, or **10** → **2**[b], **3**[c], **4**[d], or **5**[c]



Scheme S2 Organocatalytic synthesis of **2-5**[a] via direct β-acylation. [a]For all reactions 0.3 mmol of **7-10** were used in anhydrous THF (1.5 mL) under N_2. [b]1.1 Equiv of **11** and 1.2 equiv of Et_3N in the presence of Bu3P (10 mol%) were used. [c]1.3 Equiv of **11a** and 1.5 equiv of Et_3N in the presence of Bu_3P (20 mol%) were used. [d]1.2 Equiv of **11a** and 1.3 equiv of Et_3N in the presence of Bu_3P (20 mol%) were used. [e]The structures of **2a**, **3a**, **4**, and **5** were determined by X-ray analysis.[11] [f]Recovered yield.

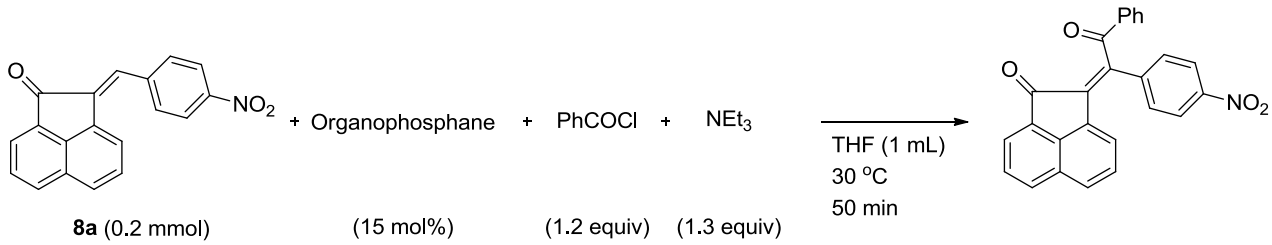
Table S1 The optimization of various organophosphanes with compound **7a**.



7a (0.2 mmol) (15 mol%) (1.2 equiv) (1.3 equiv)

entry	Organophosphane	yield
1	PBu_3	80
2	PPh_2Et	2
3	PPh_2Me	5
4	PPh_3	0

Table S2 The optimization of various organophosphanes with compound **8a**.

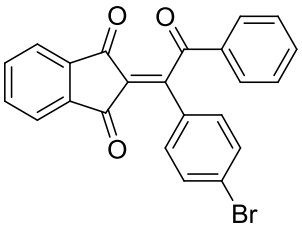


8a (0.2 mmol) (15 mol%) (1.2 equiv) (1.3 equiv)

entry	Organophosphane	yield
1	PBu_3	80
2	PPh_2Et	1
3	PPh_2Me	2
4	PPh_3	0

IV. Spectra data of the substrates

Synthesis of 2-(1-(4-bromophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1aa):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 2 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1aa** as yellow solid (123.0 mg, 98%).

mp: 193.2-194.0 ^oC; R_f 0.33 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 8.00 (dd, 1H, *J* = 6.6, 1.4 Hz), 7.95 (d, 2H, *J* = 7.8 Hz), 7.91-7.79 (m, 3H), 7.63-7.55 (m, 5H), 7.47 (t, 2H, *J* = 7.7 Hz).

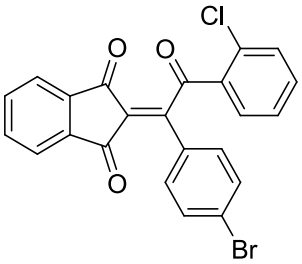
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 195.0, 188.7, 187.3, 157.3, 142.3, 140.1, 135.9, 135.8, 135.0, 134.0, 131.7, 131.4, 129.6, 128.9, 128.0, 126.6, 123.5, 123.4.

MS (70 eV, EI) m/z (%): 418 $[M+2]^+$ (42), 416 $[M]^+$ (50), 176 (49), 105 (100), 77 (46).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3076 (w), 2924 (w), 2855 (w), 1730 (m), 1691 (s), 1669 (s), 1585 (m), 1486 (m), 594 (m).

HRMS (FAB) for **$C_{23}H_{14}BrO_3$ $[M+H]^+$** (417.0126) found 417.0119.

Synthesis of 2-(1-(4-bromophenyl)-2-(2-chlorophenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ab):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), 2-chlorobenzoyl chloride **11b** (46.5 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ab** as yellow solid (131.0 mg, 97%).

mp: 217.4-217.9 ^oC; R_f 0.41 (hexanes/dichloromethane: 1/1)

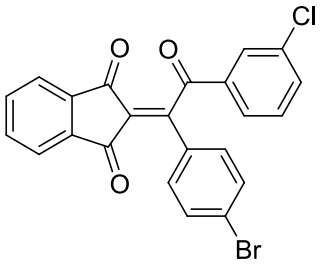
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 7.92-7.85 (m, 2H), 7.85-7.79 (m, 1H), 7.78-7.69 (m, 2H), 7.49 (s, 4H), 7.40-7.32 (m, 2H), 7.29-7.23 (m, 2H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 193.0, 189.2, 187.4, 158.0, 142.4, 140.0, 135.9, 135.7, 134.3, 134.1, 133.1, 132.3, 132.1, 131.8, 131.5, 128.7, 128.0, 127.0, 126.7, 123.5, 123.4.

MS (70 eV, EI) m/z (%): 450 $[M]^+$ (72), 414 (37), 176 (55), 139 (100), 111 (41), 75 (25).

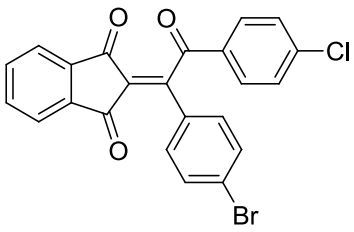
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 3063 (w), 2923 (w), 1727 (m), 1694 (s), 1608 (m), 1484 (m), 1241 (s), 618 (m).
HRMS (EI) for **$C_{23}H_{12}BrClO_3$ [M]$^+$** (449.9658) found 449.9656.

Synthesis of 2-(1-(4-bromophenyl)-2-(3-chlorophenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ac):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), 3-chlorobenzoyl chloride **11c** (47.5 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ac** as yellow solid (131.0 mg, 98%).
mp: 139.0-139.9 °C; R_f 0.46 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.99 (dd, 1H, *J* = 6.4, 1.3 Hz), 7.94 (t, 1H, *J* = 1.7 Hz), 7.90-7.78 (m, 4H, 7.60 (s, 4H), 7.54 (ddd, 1H, *J* = 8.0, 2.0, 0.9 Hz), 7.40 (t, 1H, *J* = 7.9 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 193.6, 188.6, 186.9, 155.9, 142.2, 139.9, 136.5, 135.9, 135.7, 135.1, 133.7, 131.7, 131.3, 130.2, 129.0, 128.4, 128.2, 127.0, 126.7, 123.5, 123.3.
MS (70 eV, EI) m/z (%): 452 [M+2]$^+$ (19), 450 [M]$^+$ (18), 176 (42), 139 (100), 111 (59), 75 (37).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3063 (w), 2952 (w), 2923 (w), 1731 (m), 1694 (s), 1606 (m), 1580 (m), 1484 (m), 1241 (s), 594 (m).
HRMS (EI) for **$C_{23}H_{12}BrClO_3$ [M]$^+$** (449.9658) found 449.9659.

Synthesis of 2-(1-(4-bromophenyl)-2-(4-chlorophenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ad):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), 4-chlorobenzoyl chloride **11d** (45.8µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ad** as yellow solid (126.6 mg, 93%).

mp: 207.6-208.4 °C; R_f 0.46 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.96 (d, 1H, *J* = 6.8 Hz), 7.91-7.74 (m, 5H), 7.57 (s, 4H), 7.41 (d, 2H, *J* =8.5 Hz).

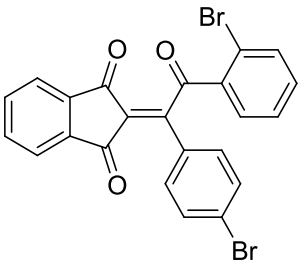
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 193.8, 188.7, 187.1, 156.5, 142.3, 140.4, 140.1, 136.0, 135.8, 133.4, 131.8, 131.4, 130.2, 129.3, 128.1, 126.8, 123.6, 123.4.

MS (70 eV, EI) m/z (%): 450 $[M]^+$, 176 (33), 139 (100), 111 (19), 75 (3).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 2924 (w), 1726 (m), 1695 (s), 1669 (s), 1585 (s), 1486 (m), 1250 (s), 594 (m).

HRMS (EI) for **$C_{23}H_{12}BrClO_3$ [M]$^+$** (449.9658) found 449.9659.

Synthesis of 2-(2-(2-bromophenyl)-1-(4-bromophenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ae):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), 2-bromobenzoyl chloride **11e** (48.0 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ae** as yellow solid (144.0 mg, 97%).

mp: 198.7-199.7 °C; R_f 0.40 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.95 (d, 1H, *J* = 6.8 Hz), 7.90 (d, 1H, *J* = 6.6 Hz), 7.85-7.76 (m, 3H), 7.73-7.65 (m, 1H), 7.62-7.53 (m, 4H), 7.37-7.29 (m, 2H).

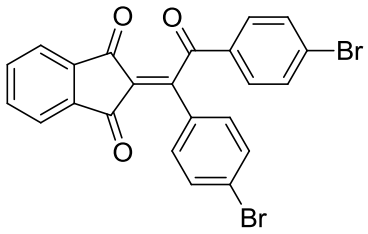
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 193.4, 189.0, 187.3, 157.2, 142.4, 140.0, 135.9, 135.7, 135.6, 133.8, 132.8, 131.9, 131.6, 129.1, 128.2, 127.3, 126.7, 123.5, 122.4.

MS (70 eV, EI) m/z (%): 496 $[M+2]^+$ (46), 415 (24), 311 (14), 183 (100), 176 (55), 155 (43), 76 (51).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3053 (w), 2924 (w), 1726 (m), 1691 (s), 1585 (s), 1482 (m), 594 (m).

HRMS (FAB) for **$C_{23}H_{12}Br_2O_3$ [M+H]$^+$** (494.9231) found 494.9236.

Synthesis of 2-(1,2-bis(4-bromophenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1af):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), 4-bromobenzoyl chloride **11f** (80.6 mg, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1af** as yellow solid (148.9 mg, 97%).

mp: 225.4-226.2 °C; R_f 0.46 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.98 (d, 1H, *J* =7.4 Hz), 7.89 (d, 1H, *J* = 7.4 Hz), 7.86-7.77 (m, 4H), 7.61-7.56 (m, 6H).

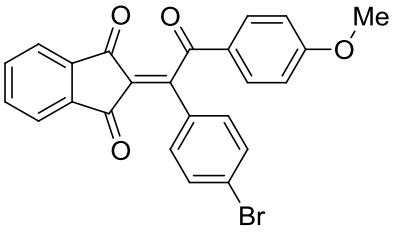
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.1, 188.8, 187.1, 156.5, 142.4, 140.1, 136.0, 135.9, 133.8, 132.3, 131.8, 131.4, 130.3, 129.3, 129.2, 127.1, 126.8, 123.6, 123.5.

MS (70 eV, EI) m/z (%): 496 $[M+2]^+$ (30), 494 $[M]^+$ (27), 185 (100), 176 (41), 155 (15), 104 (9), 76 (6).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3085 (w), 2923 (w), 1727 (m), 1694 (s), 1583 (m), 1488 (m), 592 (m).

HRMS (EI) for **$C_{23}H_{12}Br_2O_3$ [M]$^+$** (493.9153) found 493.9149.

Synthesis of 2-(1-(4-bromophenyl)-2-(4-methoxyphenyl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ag):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), 4-methoxybenzoyl chloride **11g** (49.7 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 7.5 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ag** as yellow solid (130.5 mg, 97%).

mp: 190.6-191.5 °C; R_f 0.2 (hexanes/dichloromethane: 1/1).

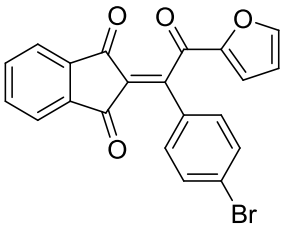
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.95 (d, 1H, *J* = 7.6 Hz), 7.92-7.74 (m, 5H), 7.60-7.51 (m, 4H), 6.90 (d, 2H, *J* = 8.8 Hz), 3.82 (s, 3H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 193.4, 188.7, 187.5, 164.2, 157.6, 142.2, 140.2, 135.8, 135.7, 131.6, 131.3, 131.3, 130.0, 128.2, 127.6, 126.4, 123.4, 123.4, 114.2, 55.5.

MS (70 eV, EI) m/z (%): 448 $[M+2]^+$ (62), 446 $[M]^+$ (70), 176 (18), 135 (100), 92 (5).

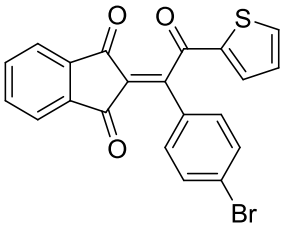
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2938 (w), 1726 (m), 1691 (s), 1661 (s), 1592 (s), 1486 (m), 1170 (s), 590 (m).
HRMS (EI) for **$C_{24}H_{15}BrO_4$ [M]$^+$** (446.0154) found 446.0159.

Synthesis of 2-(1-(4-bromophenyl)-2-(furan-2-yl)-2-oxoethylidene)-*1H*-indene-1,3(*2H*)-dione (1ah):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), 2-furoyl chloride **11h** (37.0 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 3 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ah** as yellow solid (86.7 mg, 71%).
mp: 226.7-227.5 °C; R_f 0.18 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.97 (dd, 1H, *J* = 6.3, 2.2 Hz), 7.91 (dd, 1H, *J* = 5.9, 1.9 Hz), 7.86-7.80 (m, 2H), 7.60-7.53 (m, 5H), 7.23 (d, 1H, *J* = 3.6 Hz), 6.55 (dd, 1H, *J* = 3.6, 1.6 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 188.6, 187.4, 182.6, 154.9, 151.5, 147.5, 142.3, 140.3, 135.9, 135.8, 131.6, 131.3, 129.6, 128.4, 126.4, 123.5, 123.5, 123.4, 119.1, 112.8.
MS (70 eV, EI) m/z (%): 408 [M+2]$^+$ (14), 406 [M]$^+$ (13), 379 (50), 311 (9), 207 (5), 127 (5), 76 (35), 95 (100), 76 (14).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3125 (w), 3093 (w), 1731 (m), 1692 (s), 1651 (s), 1586 (m), 1462 (m), 1219 (m), 575 (w).
HRMS (ESI) for **$C_{21}H_{12}BrO_4$ [M+H]$^+$** (406.9919) found 406.9931.

Synthesis of 2-(1-(4-bromophenyl)-2-oxo-2-(thiophen-2-yl)ethylidene)-*1H*-indene-1,3(*2H*)-dione (1ai):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), 2-thiophene carbonyl chloride **11i** (39.3 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 5 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ai** as yellow solid (110.4 mg, 87%).
mp: 223.1-224.0 °C; R_f 0.30 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.98 (dd, 1H, *J* = 6.0, 2.1 Hz), 7.91 (dd, 1H, *J* = 5.6, 1.9

Hz), 7.87-7.79 (m, 2H), 7.72 (d, 1H, *J* = 4.8 Hz), 7.63-7.56 (m, 4H), 7.54 (d, 1H, *J* = 3.8 Hz), 7.08 (t, 1H, *J* = 4.4 Hz).

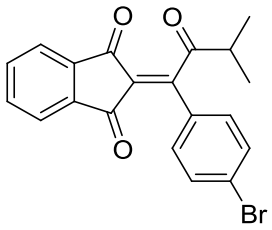
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 188.3, 187.4, 186.9, 155.8, 142.3, 142.2, 140.3, 135.9, 135.9, 135.2, 134.1, 131.7, 131.4, 129.8, 128.4, 127.9, 126.6, 123.5.

MS (70 eV, EI) m/z (%): 422 $[M]^+$ (35), 343 (2), 311 (3), 176 (29), 111 (100), 83 (14).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3111 (w), 3088 (w), 2923 (w), 1728 (m), 1690 (s), 1643 (s), 1585 (m), 1487 (m), 580 (m).

HRMS (ESI) for **$C_{21}H_{12}BrO_3S$ [M+H]$^+$** (422.9691) found 422.9704.

Synthesis of 2-(1-(4-bromophenyl)-3-methyl-2-oxobutylidene)-*1H*-indene-1,3(*2H*)-dione (1aj):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (28.5 µL, 50 mol%), isobutryl chloride **11j** (38.5 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1af** as yellow solid (91.0 mg, 79%).

mp: 129.3-130.2 ^{o}C; R_f 0.68 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 7.92-7.78 (m, 2H), 7.78-7.66 (m, 2H), 7.50 (d, 2H, *J* = 8.5 Hz), 7.38 (d, 2H, *J* = 8.5 Hz), 2.78 (sep, 1H, *J* = 7.0 Hz), 1.07 (d, 6H, *J* = 7.0 Hz).

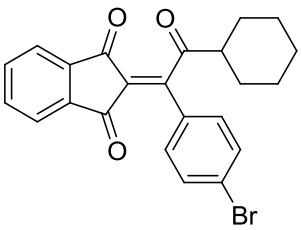
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 209.2, 189.2, 187.2, 159.4, 142.1, 140.0, 135.8, 135.7, 131.5, 130.9, 129.1, 126.6, 126.2, 123.4, 123.3, 41.0, 17.8.

MS (70 eV, EI) m/z (%): 384 $[M+2]^+$ (16), 382 $[M]^+$ (14), 340 (75), 313 (100), 233 (36), 150 (12), 128 (7), 76 (9), 71 (76).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3089 (w), 2969 (m), 1730 (m), 1691 (s), 1589 (m), 1482 (m), 590 (m).

HRMS (EI) for **$C_{20}H_{15}BrO_3$ [M]$^+$** (382.0205) found 382.0208.

Synthesis of 2-(1-(4-bromophenyl)-2-oxoundecylidene)-*1H*-indene-1,3(*2H*)-dione (1ak):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (28.5 µL, 50 mol%), cyclohexanecarbonyl chloride **11k** (50.2µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ak** as yellow solid (100.4 mg, 79%).

mp: 151.9-152.8 °C; R_f 0.68 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.99-7.89 (m, 2H), 7.86-7.78 (m, 2H), 7.59 (d, 2H, *J* = 8.5 Hz), 7.47 (d, 2H, *J* = 8.5 Hz), 2.76-2.60 (m, 1H), 1.96 (d, 2H, *J* = 11.9 Hz), 1.72 (d, 2H, *J* = 12.0 Hz), 1.62 (d, 2H, *J* = 10.6 Hz), 1.44-1.05 (m, 5H).

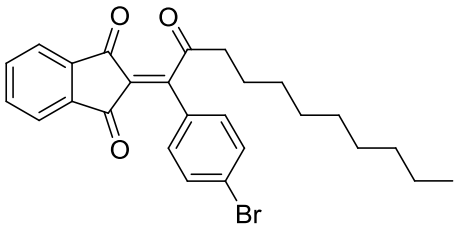
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 208.3, 189.2, 187.3, 159.5, 142.1, 140.0, 135.8, 135.6, 131.4, 130.9, 129.0, 126.4, 126.1, 123.4, 123.2, 28.2, 25.6, 25.6.

MS (70 eV, EI) m/z (%): 424 $[M+2]^+$ (20), 422 $[M]^+$ (19), 342 (14), 311 (14), 233 (14), 176 (45), 83 (72).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3090 (w), 3069 (w), 2932 (s), 1728 (s), 1693 (s), 1629 (m), 1587 (m), 1485 (m), 589 (m).

HRMS (EI) for **$C_{23}H_{19}BrO_3$ [M]$^+$** (422.0518) found 422.0516.

Synthesis of 2-(1-(4-bromophenyl)-2-oxoundecylidene)-*1H*-indene-1,3(*2H*)-dione (1al):



Prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (28.5 µL, 50 mol%), decanoyl chloride **11l** (76.2 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1al** as yellow solid (80.5 mg, 57%).

mp: 151.9-152.8 °C; R_f 0.80 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.00-7.90 (m, 2H), 7.86-7.80 (m, 2H), 7.60 (d, 2H, *J* = 8.6 Hz), 7.46 (d, 2H, *J* = 8.6 Hz), 2.67 (t, 2H, *J* = 7.5 Hz), 1.73 (quin, 2H, *J* = 7.3 Hz), 1.36-1.20 (m, 12H), 0.87 (t, 3H, *J* = 6.8 Hz).

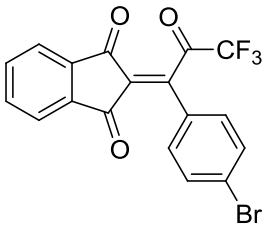
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 205.3, 189.3, 187.5, 159.2, 142.2, 140.1, 135.9, 135.7, 131.6, 131.0, 128.7, 126.4, 125.9, 123.5, 123.4, 42.1, 31.8, 29.3, 29.3, 29.2, 28.9, 22.9, 22.6, 14.0.

MS (70 eV, EI) m/z (%): 468 $[M+2]^+$ (17), 466$[M]^+$ (19), 311 (31), 233 (48), 176 (100), 155 (27), 104 (43), 76 (53), 57 (95).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3063 (w), 2925 (s), 2851 (m), 1732 (m), 1695 (s), 1602 (m), 1580 (m), 144 (w), 743 (s).

HRMS (EI) for **$C_{26}H_{27}BrO_3$ [M]$^+$** (466.1144) found 466.1132.

Synthesis of 2-(1-(4-bromophenyl)-3,3,3-trifluoro-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione (1am):



For table 2, prepared according to **TP 1** from 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), $MePPh_2$ (5.7 μL, 10 mol%), trifluoroacetic anhydride **11m** (50.0 μL, 1.2 equiv) and Et_3N (54.4 μL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1am** as yellow solid (98.5 mg, 80%).

For scheme 2, **1am** can also be prepared according to **TP 2**.

mp: 171.5-172.4 ^{o}C, R_f 0.51 (hexnaes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.07-7.99 (m, 2H), 7.95-7.87 (m, 2H), 7.66 (d, 2H, *J* = 8.6 Hz), 7.53 (d, 2H, *J* = 8.6 Hz).

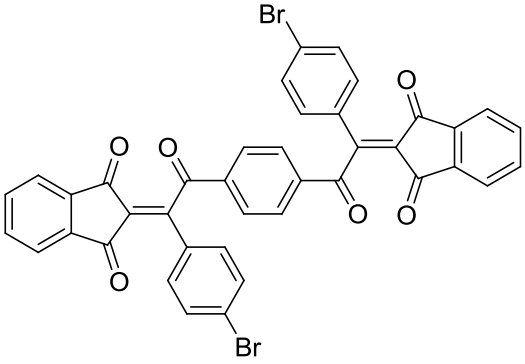
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.2, 187.2 (q, *J* = 38.8 Hz), 185.6, 149.8, 143.2, 139.3, 136.7, 136.3, 132.1, 131.7, 130.8, 128.0, 126.2, 124.0, 115.1 (q, *J* = 291.5 Hz)

MS (70 eV, EI) m/z (%): 408 $[M]^+$ (32), 341 (69), 313 (100), 284 (26), 176 (77), 127 (19), 75 (54), 69 (77).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3085 (w), 2923 (w), 1746 (m), 1727 (m), 1694 (s), 1617 (m), 1484 (w), 1218 (s), 595 (m).

HRMS (EI) for **$C_{18}H_8BrF_3O_3$ $[M]^+$** (407.9609) found 407.9607.

Synthesis of 2,2'-(1,4-phenylenebis(1-(4-bromophenyl)-2-oxoethan-2-yl-1-ylidene))bis(*1H*-indene-1,3(*2H*)-dione) (1an):



A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of terephthaloyl chloride **11n** (61.5 mg, 0.3 mmol), 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (194.2 mg, 2.1 equiv), $MePPh_2$ (30 mol%) and Et_3N (92.0 μL, 2.2 equiv) in dry THF (3.0 mL). The reaction mixture was stirred for 7 h at

room temperature (27-30 °C). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/dichloromethane 1/3; and then dichloromethane) furnished **1an** as yellow solid (167.0 mg, 74%).

mp: 351.4-352.3 °C; R_f 0.3 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.02-7.96 (m, 6H), 7.88-7.78 (m, 6H), 7.62-7.53 (m, 8H).

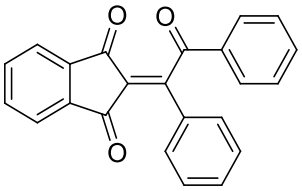
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.3, 188.9, 187.1, 156.5, 142.5, 140.0, 138.6, 136.1, 135.9, 131.9, 131.5, 129.3, 128.9, 128.3, 127.1, 123.7, 123.6.

MS (70 eV, EI) m/z (%): 758 $[M+4]^+$ (75), 756 $[M+2]^+$ (100), 443 (15), 311(16), 283 (17), 232 (14), 176 (100), 150 (8), 104 (73), 76 (27).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3098 (w), 3070 (w), 1737 (s), 1610 (m), 1601 (m), 1545 (m), 1474 (w).

HRMS (FAB) for **$C_{40}H_{20}Br_2O_6$ $[M+H]^+$** (754.9705) found 754.9713.

Synthesis of 2-(2-oxo-1,2-diphenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ba):



Prepared according to **TP 1** from 2-benzylidene-*1H*-indene-1,3(*2H*)-dione **6b** (70.3 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 1 h]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ba** as yellow solid (93.0 mg, 92%).

mp: 187.7-188.6 °C; R_f 0.25 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.97 (d, 3H, *J* = 7.2 Hz), 7.87 (d, 1H, *J* = 7.4 Hz), 7.85-7.76 (m, 2H), 7.72 (d, 2H, *J* = 7.6 Hz), 7.55 (t, 1H, *J* = 7.3 Hz), 7.52-7.39 (m, 5H).

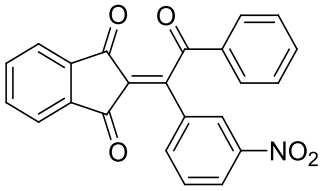
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 195.3, 189.0, 187.4, 159.0, 142.4, 140.2, 135.7, 135.6, 135.3, 133.8, 131.6, 130.9, 130.0, 129.0, 128.8, 128.4, 127.7, 123.5, 123.4.

MS (70 eV, EI) m/z (%): 338 $[M]^+$ (29), 176 (8), 105 (100), 77 (17).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 1727 (m), 1694 (s), 1668 (m), 1594 (m), 1451 (w).

HRMS (EI) for **$C_{23}H_{14}O_3$ $[M]^+$** (338.0943) found 338.0953.

Synthesis of 2-(1-(3-nitrophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ca):



Prepared according to **TP 1** from 2-(3-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6c** (83.7. mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 3 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **1ca** as yellow solid (86.1 mg, 75%).

mp: 228.8-229.7 °C; R_f 0.18 (hexnaes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.59 (s, 1H), 8.32 (1H, *J* = 8.5 Hz), 8.03-7.94 (m, 4H), 7.94-7.80 (m, 3H), 7.67-7.56 (m, 2H), 7.48 (t, 2H, *J* = 7.6 Hz).

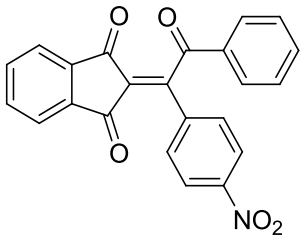
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.4, 188.2, 187.0, 154.9, 147.9, 142.3, 140.4, 136.2, 136.1, 135.0, 134.6, 134.3, 132.4, 129.5, 129.4, 129.1, 129.0, 125.5, 124.7, 123.8, 123.7.

MS (70 eV, EI) m/z (%): 383 $[M]^+$ (58), 176 (6), 105 (100), 77 (30).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3076 (w), 2924 (w), 1730 (m), 1691 (s), 1665 (s), 1596 (m), 1531 (s), 1451 (m), 1349 (s).

HRMS (EI) for **$C_{23}H_{13}NO_5$ [M]$^+$** (383.0794) found 383.0785.

Synthesis of 2-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1da):



Prepared according to **TP 1** from 2-(4-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6d** (83.8 mg, 0.3 mmol), $MePPh_2$ (5.7 μL, 10 mol%), benzoyl chloride **11a** (42.6 μL, 1.2 equiv) and Et_3N (54.4 μL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **1da** as yellow solid (122.8 mg, 97%).

mp: 210.6-211.3 °C; R_f 0.15 (hexnaes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.62-8.57 (m, 1H), 8.32 (d, 1H, *J* = 8.0 Hz), 8.02-7.95 (m, 4H), 7.93-7.81 (m, 3H), 7.66-7.57 (m, 2H), 7.49 (t, 2H, *J* = 7.7 Hz).

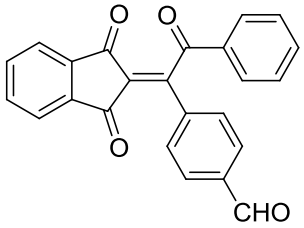
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.4, 188.2, 187.0, 154.9, 147.9, 142.3, 140.4, 136.2, 136.1, 135.0, 134.6, 134.3, 132.4, 129.5, 129.3, 129.1, 129.0, 125.5, 124.7, 123.8, 123.7.

MS (70 eV, EI) m/z (%): 383 $[M]^+$ (12), 176 (9), 105 (100), 77 (67).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3099 (w), 3061 (w), 2855 (w), 1733 (m), 1697 (s), 1664 (m), 1597 (m), 1516 (s), 1450 (w), 1347 (s).

HRMS (EI) for **$C_{23}H_{13}NO_5$ [M]$^+$** (383.0794) found 383.0792.

Synthesis of 4-(1-(1,3-dioxo-*1H*-inden-2(*3H*)-ylidene)-2-oxo-2-phenylethyl)benzaldehyde (1ea):



Prepared according to **TP 1** from 4-((1,3-dioxo-*1H*-inden-2(*3H*)-ylidene)methyl)benzaldehyde **6e** (79.6 mg, 0.3 mmol), $MePPh_2$ (5.7 μL, 10 mol%), benzoyl chloride **11a** (42.6 μL, 1.2 equiv) and Et_3N (54.4 μL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 0.5 hour]. Purification

by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ea** as yellow solid (106.0 mg, 97%).

mp: 169.2-170.1 °C; R_f 0.08 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 10.05 (s, 1H), 8.12-7.88 (m, 6H), 7.88-7.74 (m, 4H), 7.58 (t, 1H, *J* = 7.3 Hz), 7.47 (t, 2H, *J* = 7.5 Hz).

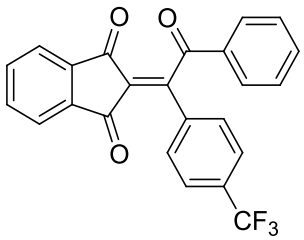
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.6, 191.3, 188.4, 187.1, 156.7, 142.4, 140.4, 137.6, 136.7, 136.1, 136.0, 134.9, 134.2, 130.1, 129.4, 129.1, 129.0, 128.9, 123.7, 123.6.

MS (70 eV, EI) m/z (%): 366 $[M]^+$ (23), 261 (3), 105 (100), 76 (75).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 2923 (w), 1731 (m), 1694 (s), 1668 (m), 1598 (m), 1447 (w).

HRMS (EI) for **$C_{24}H_{14}O_4$ [M]$^+$** (366.0892) found 366.0892.

Synthesis of 2-(2-oxo-2-phenyl-1-(4-(trifluoromethyl)phenyl)ethylidene)-*1H*-indene-1,3(*2H*)-dione (1fa):



Prepared according to **TP 1** from 2-(4-(trifluoromethyl)benzylidene)-*1H*-indene-1,3(*2H*)-dione **6f** (121.9 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 °C for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1fa** as yellow solid (118.0 mg, 97%).

mp: 190.8-191.7 °C; R_f 0.43 (hexnaes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8,01-7.93 (m, 3H), 7.93-7.77 (m, 5H), 7.69 (d, 2H, *J* = 8.3 Hz), 7.58 (t, 1H, *J* = 7.4 Hz), 7.47 (t, 2H, *J* = 7.7 Hz).

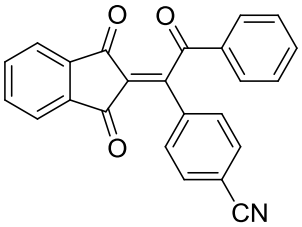
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.7, 188.4, 187.1, 156.5, 142.3, 140.3, 136.1, 136.0, 134.8, 134.4, 134.1, 132.6 (q, *J* = 32.8 Hz), 129.8, 129.0, 125.3 (q, *J* = 3.7 Hz), 123.6 (q, *J* = 272.6 Hz), 123.6, 123.6,

MS (70 eV, EI) m/z (%): 406 $[M]^+$ (56), 301 (3), 176 (11), 105 (100), 77 (44)

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3076 (w), 2924 (w), 1730 (m), 1695 (s), 1669 (s), 1596 (m), 1451 (m), 1337 (s), 1326 (s).

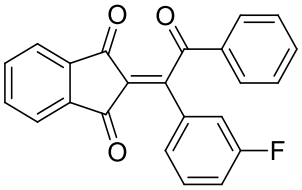
HRMS (EI) for **$C_{24}H_{13}F_3O_3$ [M]$^+$** (406.0817) found 406.0818.

Synthesis of 2-(1-(4-cyanophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ga):



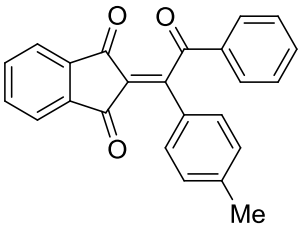
Prepared according to **TP 1** from 2-(4-(cyano)benzylidene)-*1H*-indene-1,3(*2H*)-dione **6g** (77.8 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 0.5 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ga** as yellow solid (107.7 mg, 99%).
mp: 221.9-222.9 °C; R_f 0.18 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.01-7.92 (m, 3H), 7.92-7.81 (m, 3H), 7.78 (d, 2H, *J* = 8.3 Hz), 7.71 (d, 2H, *J* = 8.1 Hz), 7.59 (t, 1H, *J* = 7.3 Hz), 7.47 (t, 2H, *J* = 7.7 Hz)
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.4, 188.2, 187.0, 155.5, 142.3, 140.4, 136.2, 136.1, 135.3, 134.7, 134.3, 132.0, 130.0, 129.3, 129.1, 129.0, 128.9, 123.7, 123.7, 118.0, 114.4.
MS (70 eV, EI) m/z (%): 363 $[M]^+$ (67), 105 (100), 77 (88).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3044 (w), 2920 (w), 2233 (m), 1730 9m), 1694 (s), 1668 (s), 1596 (m), 1452 (w).
HRMS (EI) for **$C_{24}H_{13}NO_3$ $[M]^+$** (363.0895) found 363.0902.

Synthesis of 2-(1-(3-fluorophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ha):



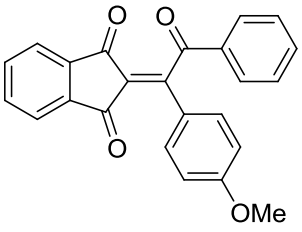
Prepared according to **TP 1** from 2-(3-fluorobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6h** (75.7 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 2/3) furnished **1ha** as yellow solid (97.0 mg, 91%).
mp: 194.8-195.6 °C; R_f 0.35 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.90 (dd, 1H, *J* = 12.8, 7.8 Hz), 7.81 (d, 2H, *J* = 7.2 Hz), 7.80-7.71 (m, 2H), 7.50 (t, 1H, *J* = 7.0 Hz), 7.44-7.30 (m, 5H), 7.11 (t, 1H, *J* = 8.2 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.8, 188.7, 187.1, 162.3 (d, *J* = 247.7 Hz), 157.0, 157.0, 124.4, 140.2, 136.0, 135.8, 135.0, 134.0, 132.8 (d, *J* = 8.1 Hz), 130.0 (d, *J* = 8.1 Hz), 129.0, 128.4, 125.6 (d, *J* = 3.1 Hz), 123.6, 123.5, 118.4 (d, *J* = 21.1 Hz), 116.7(d, *J* = 23.4 Hz).
MS (70 eV, EI) m/z (%): 356 $[M]^+$ (19), 105 (100), 77 (15).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3070 (w), 2922 (w), 1731 (m), 1693 (s), 1667 (s), 1581 (m), 1480 (w), 1255 (s).
HRMS (EI) for **$C_{23}H_{13}FO_3$ $[M]^+$** (356.0849) found 356.0846.

Synthesis of 2-(2-oxo-2-phenyl-1-(p-tolyl)ethylidene)-*1H*-indene-1,3(*2H*)-dione (1ia):



Prepared according to **TP 1** from 2-(4-methylbenzylidene)-*1H*-indene-1,3(*2H*)-dione **6i** (74.4 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 2 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ia** as yellow solid (106.3 mg, 99%).
mp: 166.6-167.4 ^{o}C; R_f 0.30 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 7.99-7.93 (m, 3H), 7.85 (d, 1H, *J* = 6.8 Hz), 7.83-7.73 (m, 2H), 7.65 (d, 2H, *J* = 8.2 Hz), 7.53 (t, 1H, *J* = 7.4 Hz), 7.43 (t, 2H, *J* = 7.7 Hz), 7.24 (d, 2H, *J* = 8.3 Hz), 2.38 (s, 3H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 195.4, 189.1, 187.4, 159.1, 142.7, 142.2, 139.8, 135.5, 135.4, 135.2, 133.5, 130.2, 129.0, 128.8, 128.7, 127.9, 126.9, 123.2, 123.1, 21.5.
MS (70 eV, EI) m/z (%): 352 $[M]^+$ (35), 105 (100), 77 (17).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3061 (w), 2924 (w), 1726 (m), 1691 (s), 1672 (s), 1600 (m), 1451 (m).
HRMS (ESI) for **$C_{24}H_{17}O_3$ $[M+H]^+$** (353.1178) found 353.1176.

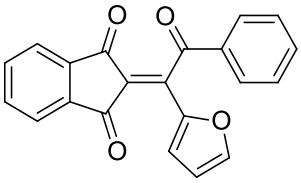
Synthesis of 2-(1-(4-methoxyphenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ja):



Prepared according to **TP 1** from 2-(4-methoxybenzylidene)-*1H*-indene-1,3(*2H*)-dione **6j** (79.3 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 3 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **1ja** as yellow solid (103.5 mg, 94%).
mp: 165.4-166.4 ^{o}C; R_f 0.15 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.00-7.92 (m, 3H), 7.86-7.73 (m, 5H), 7.54 (t, 1H, *J* = 7.4 Hz), 7.43 (t, 2H, *J* = 7.6 Hz), 6.95 (d, 2H, *J* = 8.9 Hz), 3.86 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 195.9, 189.4, 187.8, 163.0, 159.0, 142.2, 139.8, 135.6, 135.4, 135.3, 133.5, 133.2, 128.9, 128.7, 125.8, 123.2, 123.1, 113.9, 55.4.
MS (70 eV, EI) m/z (%): 368 $[M]^+$ (67), 263 (100), 235 (30), 105 (77), 77 (67).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3061 (w), 3016 (w), 2935 (w), 1726 (m), 1687 (s), 1596 (m), 1452 (w), 1258 (s).

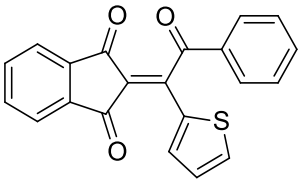
HRMS (FAB) for **$C_{24}H_{17}O_4$ [M+H]$^+$** (369.1127) found 369.1125.

Synthesis of 2-(1-(furan-2-yl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione (1ka):



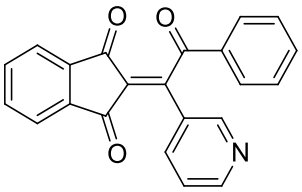
Prepared according to **TP 1** from 2-(furan-2-ylmethylene)-*1H*-indene-1,3(*2H*)-dione **6k** (67.3 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 7 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1ka** as yellow solid (32.6 mg, 33%).
mp: 288.1-289.0 ^{o}C; R_f 0.25 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.81 (d, 1H, *J* = 3.6 Hz), 8.03-7.93 (m, 3H), 7.97 (t, 2H, *J* = 6.5 Hz), 7.73 (t, 1H, *J* = 7.3 Hz), 7.65 (s, 1H), 7.58 (t, 1H, , *J* = 7.3 Hz), 7.47 (t, 2H, , *J* = 7.6 Hz), 6.73 (d, 1H, *J* = 2.5 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 193.8, 189.4, 188.5, 149.5, 148.6, 144.0, 142.4, 140.1, 136.2, 135.3, 135.2, 133.7, 128.8, 128.6, 126.4, 123.1, 123.1, 122.5, 114.3.
MS (70 eV, EI) m/z (%): 328 [M]$^+$ (10), 230 (74), 223 (5), 105 (100), 77 (57).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2924 (w), 1718 (m), 1680 (s), 1562 (s), 1448 (s), 1250 (s).
HRMS (FAB) for **$C_{21}H_{13}O_4$ [M+H]$^+$** (329.0814) found 329.0821.

Synthesis of 2-(2-oxo-2-phenyl-1-(thiophen-2-yl)ethylidene)-*1H*-indene-1,3(*2H*)-dione (1la):



Prepared according to **TP 1** from 2-(thiophen-2-ylmethylene)-*1H*-indene-1,3(*2H*)-dione **6l** (72.1 mg, 0.3 mmol), $MePPh_2$ (8.7 µL, 15 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 7 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1la** as yellow solid (54.5 mg, 53%).
mp: 235.9-236.5 ^{o}C; R_f 0.50 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 7.97 (dd, 1H, *J* = 6.4, 1.3 Hz), 7.88-7.75 (m, 5H), 7.61-7.53 (m, 6H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 195.6, 189.4, 188.8, 150.2, 142.2, 140.0, 139.9, 138.0, 136.1, 135.4, 135.3, 135.1, 133.8, 128.9, 128.9, 128.4, 123.2, 122.4.
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 1718 (m), 1680 (s), 1581 (m), 1448 (m).
HRMS (EI) for **$C_{21}H_{12}O_3S$ [M]$^+$** (344.0507) found 344.0510

Synthesis of 2-(2-oxo-2-phenyl-1-(pyridin-3-yl)ethylidene)-*1H*-indene-1,3(*2H*)-dione (1ma):



Prepared according to **TP 1** from 2-(pyridin-3-ylmethylene)-*1H*-indene-1,3(*2H*)-dione **6m** (70.6 mg, 0.3 mmol), $MePPh_2$ (5.7 µL, 10 mol%), benzoyl chloride **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/5) furnished **1ma** as yellow solid (96.0 mg, 94%).

mp: 203.8-204.7 °C; R_f 0.04 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.95 (s, 1H), 8.71 (d, 1H, *J* = 4.6 Hz), 8.09 (d, 1H, *J* = 8.0 Hz), 8.01 (d, 1H, *J* = 6.9 Hz), 7.96 (d, 2H, *J* = 7.8 Hz), 7.93-7.81 (m, 3H), 7.60 (t, 1H, *J* = 7.3 Hz), 7.52-7.44 (m, 3H).

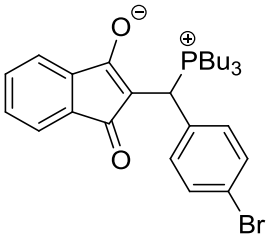
^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 194.6, 188.3, 187.2, 154.6, 151.5, 149.9, 142.3, 140.3, 136.7, 136.0, 136.0, 134.8, 134.2, 129.0, 129.0, 127.3, 123.6, 123.0.

MS (70 eV, EI) m/z (%): 339 $[M]^+$ (100), 105 (18), 77 (7).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3048 (w), 1727 (m), 1687 (s), 1676 (s), 1613 (m), 1591 (m), 1447 (m), 1244 (s).

HRMS (FAB) for **$C_{22}H_{14}NO_3$ [M+H]$^+$** (340.0974) found 340.0969.

Synthesis of 2-((4-bromophenyl)(tributylphosphonio)methyl)-1-oxo-*1H*-inden-3-olate (12a):



A dry and nitrogen-flushed 10-mL Schlenk tube, equipped with a magnetic stirring bar and a septum, was sequentially charged with a solution of 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6a** (93.9 mg, 0.3 mmol), Bu_3P (67.0 µL, 1.2 equiv) in dry THF (1.5 mL). The reaction mixture was stirred for less than 1 hour at room temperature (27-30 °C). Thereafter, the solvent was removed by evaporation *in vacuo*. Purification by flash chromatography (hexanes/ethyl acetate: 1/1) furnished **12a** as orange solid (143.8 mg, 93%).

mp: 187.7-190.2 °C; R_f 0.30 (hexanes/ ethyl acetate: 1/1).

^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 7.54 (dd, 2H, *J* = 8.5, 2.1 Hz), 7.43 (d, 2H, *J* = 8.3 Hz), 7.37-7.33 (m, 2H), 7.32-7.27 (m, 2H), 4.91 (d, 1H, *J* = 17.7 Hz), 2.36-2.13 (m, 6H), 1.46-1.29 (m, 12H), 0.91-0.85 (m, 9H).

^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 189.9 (d, *J* = 4.6 Hz), 139.1, 134.9, 131.4, 131.3 (d, *J* = 4.5 Hz), 129.4, 121.6 (d, *J* = 3.7 Hz), 117.4, 97.9, 34.8 (d, *J* = 44.1 Hz), 23.6 (d, *J* = 14.8 Hz),

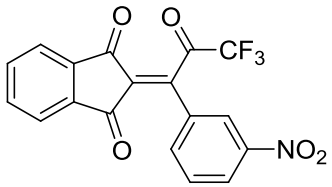
23.5 (d, *J* = 5.0 Hz), 19.3 (d, *J* = 44.1 Hz), 12.8.

^{31}P-NMR (200 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 33.4.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3055 (w), 3030 (w), 2929 (m), 1647 (w), 1615 (m), 1550 (s), 1487 (m).

HRMS (FAB) for **$C_{28}H_{37}O_2Br$ [M+H]$^+$** (515.1715) found 515.1719.

Synthesis of 2-(3,3,3-trifluoro-1-(3-nitrophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione (1cm):



Prepared according to **TP 2** from 2-(3-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6c** (83.8 mg, 0.3 mmol), $EtPPh_2$ (9.4 μL, 15 mol%), **11m** (54.2 μL, 1.3 equiv) and Et_3N (58.9 μL, 1.4 equiv) in THF (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1cm** as yellow solid (104.3 mg, 93%).

mp: 153.2-154.1 ^{o}C; R_f 0.40 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.56-8.52 (m, 1H), 8.44 (d, 1H, *J* = 8.3 Hz), 8.10-8.06 (m, 1H), 8.06-8.01 (m, 1H), 7.97-7.92 (m, 2H), 7.90 (d, 1H, *J* = 7.8 Hz), 7.72 (t, 1H, *J* = 8.0 Hz).

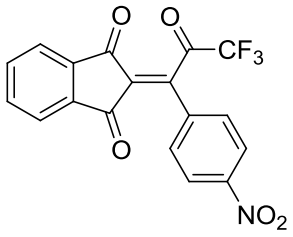
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 188.5, 186.7 (q, *J* = 39.4 Hz), 185.2, 148.2, 147.2, 143.3, 139.6, 137.1, 136.8, 135.1, 132.6, 129.9, 129.1, 126.6, 125.1, 124.3, 115.0 (q, *J* = 291.3 Hz).

MS (70 eV, EI) m/z (%): 375 [M]$^+$ (36), 307 (25), 278 (100), 251 (30), 176 (29), 104 (4), 69 (24).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3094 (w), 3070 (w), 2876 (w), 1734 (s), 1608 (m), 1590 (m), 1538 (s), 1483 (w), 1353 (s), 1261 (s).

HRMS (EI) for **$C_{18}H_8F_3NO_5$ [M]$^+$** (375.0355) found 375.0344.

Synthesis of 2-(3,3,3-trifluoro-1-(4-nitrophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione (1dm):



Prepared according to **TP 2** from 2-(4-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6d** (83.8 mg, 0.3 mmol), $EtPPh_2$ (9.4 μL, 15 mol%), **11m** (54.2 μL, 1.3 equiv) and Et_3N (58.9 μL, 1.4 equiv) in THF (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1dm** as yellow solid (92.2 mg, 82%).

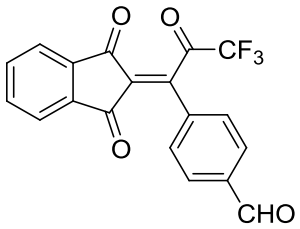
mp: 154.5-154.9 ^{o}C; R_f 0.34 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.35 (d, 2H, *J* = 8.8 Hz), 8.11-8.00 (m, 2H), 7.99-7.92 (m, 2H), 7.78 (d, 2H, *J* = 8.8 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 188.4, 186.7 (q, *J* = 39.3 Hz), 185.1, 149.5, 147.2,

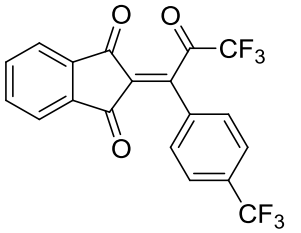
143.3, 139.6, 137.2, 136.8, 133.6, 132.9, 130.8, 124.3, 124.2, 123.7, 115.0 (q, *J* = 291.3 Hz).
MS (70 eV, EI) m/z (%): 375 $[M]^+$ (8), 307 (72), 279 (100), 250 (15), 176 (23), 76 (19), 69 (59).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 3023 (w), 2924 (w), 1741 (m), 17023 (s), 1634 (m), 1600 (m), 1528 (s), 1349 (s), 1219 (s).
HRMS (EI) for **$C_{18}H_8F_3NO_5$ [M]$^+$** (375.0355) found 375.0366.

Synthesis of 4-(1-(1,3-dioxo-*1H*-inden-2(*3H*)-ylidene)-3,3,3-trifluoro-2-oxopropyl)benzaldehyde (1em):



Prepared according to **TP 2** from 4-((1,3-dioxo-*1H*-inden-2(*3H*)-ylidene)methyl)benzaldehyde **6e** (79.6 mg, 0.3 mmol), $EtPPh_2$ (9.4 µL, 15 mol%), **11m** (54.2 µL, 1.3 equiv) and Et_3N (58.9 µL, 1.4 equiv) in THF (1.5 mL). [reaction condition: 27-30 °C for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **1em** as yellow solid (67.6 mg, 63%).
mp: 132.8-134.2; R_f 0.21 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 10.13 (s, 1H), 8.11-8.00 (m, 4H), 7.98-7.91 (m, 2H), 7.79 (d, 2H, *J* = 8.3 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 191.2, 188.7, 186.9 (q, *J* = 39.1 Hz), 185.3, 148.9, 143.3, 139.6, 138.3, 137.0, 136.6, 133.0, 132.2, 130.5, 129.6, 124.2, 124.1, 115.0 (q, *J* = 291.5 Hz).
MS (70 eV, EI) m/z (%): 358 $[M]^+$, 289 (55), 261 (100), 176 (39), 104 (9), 76 (14), 69 (77).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3061 (w), 2924 (w), 1745 (m), 1723 (s), 1611 (s), 1589 (m), 1215 (s).
HRMS (FAB) for **$C_{19}H_{10}F_3O_4$ [M+H]$^+$** (359.0531) found 359.0527.

Synthesis of 2-(3,3,3-trifluoro-2-oxo-1-(4-(trifluoromethyl)phenyl)propylidene)-*1H*-indene-1,3(*2H*)-dione (1fm):



Prepared according to **TP 2** from 2-(4-(trifluoromethyl)benzylidene)-*1H*-indene-1,3(*2H*)-dione **6f** (90.7 mg, 0.3 mmol), $EtPPh_2$ (9.4 µL, 15 mol%), **11m** (54.2 µL, 1.3 equiv) and Et_3N (58.9 µL, 1.4 equiv) in THF (1.5 mL). [reaction condition: 27-30 °C for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1fm** as yellow solid (102.3 mg, 86%).
mp: 127.1-128.0 °C; R_f 0.56 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.09-7.99 (m, 2H), 7.97-7.89 (m, 2H), 7.80-7.71 (m,

4H).

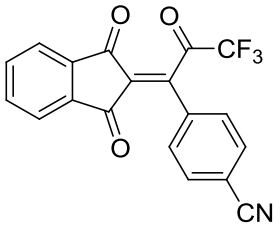
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.6, 164.1, 150.1 (q, *J* = 35.6 Hz), 140.2, 136.7, 135.1, 134.9, 133.4, 132.6, 131.9 (q, *J* = 32.9 Hz), 128.8, 127.8, 125.3, 125.2 (q, *J* = 3.7 Hz), 123.8 (q, *J* = 272.5 Hz), 123.2, 121.4 (q, *J* = 276.7 Hz).

MS (70 eV, EI) m/z (%): 398 $[M]^+$, 329 (73), 301 (100), 273 (34), 225 (31), 197 (32), 176 (27), 147 (8), 104 (6), 76 (14), 69 (24).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 2931 (w), 1745 (s), 1730 (s), 1695 (s), 1627 (m), 1589 (m), 1219 (s).

HRMS (EI) for **$C_{19}H_8F_6O_3$ [M]$^+$** (398.0378) found 398.0378.

Synthesis of 2-(3,3,3-cyano-2-oxo-1-(4-(trifluoromethyl)phenyl)propylidene)-*1H*-indene-1,3(*2H*)-dione (1gm):



Prepared according to **TP 2** from 2-(4-(cyano)benzylidene)-*1H*-indene-1,3(*2H*)-dione **6g** (77.8 mg, 0.3 mmol), $EtPPh_2$ (9.4 µL, 15 mol%), **11m** (54.2 µL, 1.3 equiv) and Et_3N (58.9 µL, 1.4 equiv) in THF (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **1gm** as yellow solid (108.8 mg, 97%).

mp: 191.4-192.1 ^{o}C; R_f 0.25 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.10-7.98 (m, 2H), 7.98-7.90 (m, 2H), 7.80 (d, 2H, *J* = 8.3 Hz), 7.72 (d, 2H, *J* = 8.3 Hz).

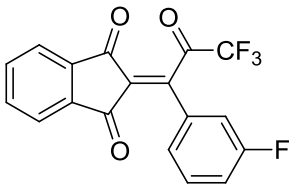
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 188.5, 186.7 (q, *J* = 39.2 Hz), 185.1, 147.6, 143.2, 139.5, 137.1, 136.7, 132.5, 132.2, 131.8, 130.3, 130.3, 124.2, 124.1, 117.7, 114.9 (q, *J* = 291.4 Hz), 117.7.

MS (70 eV, EI) m/z (%): 355 $[M]^+$ (11), 286 (100, 258 (90), 154 (47), 103 (14), 75 (44).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3085 (w), 3018 (w), 2930 (w), 2856 (w), 2229 (m), 1749 (m), 1731 (m), 1628 (m), 1587 (m), 1218 (s).

HRMS (EI) for **$C_{19}H_8F_3NO_3$ [M]$^+$** (355.0456) found 355.0460.

Synthesis of 2-(3,3,3-trifluoro-1-(3-fluorophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione (1hm):



Prepared according to **TP 2** from 2-(3-fluorobenzylidene)-*1H*-indene-1,3(*2H*)-dione **6h** (75.7 mg, 0.3 mmol), $EtPPh_2$ (9.4 µL, 15 mol%), **11m** (54.2 µL, 1.3 equiv) and Et_3N (58.9 µL, 1.4 equiv) in

THF (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 2/1) furnished **1hm** as yellow solid (89.6 mg, 86%).

mp: 128.5-129.2 ^{o}C; R_f 0.55 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.08-7.99 (m, 2H), 7.95-7.88 (m, 2H), 7.54-7.46 (m, 1H), 7.44-7.37 (m, 2H), 7.33-7.27 (m, 1H).

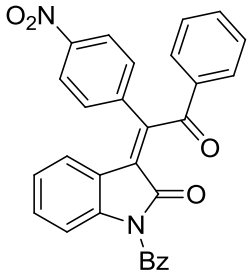
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.0, 187.1 (q, *J* = 38.9 Hz), 185.3, 162.4 (d, *J* = 248.6 Hz), 149.2, 149.2, 143.3, 139.4, 136.6 (d, *J* = 44.0 Hz), 131.4, 130.4 (d, C, *J* = 8.1 Hz), 129.3 (d, *J* = 8.3 Hz), 125.9 (d, *J* = 3.0 Hz), 124.1, 124.0, 119.6 (d, *J* = 21.1 Hz), 117.2 (d, *J* = 23.8 Hz), 115.0 (q, *J* = 291.6 Hz).

MS (70 eV, EI) m/z (%): 348 $[M]^+$ (37), 279 (75), 251 (100), 175 (29), 147 (55), 104 (15), 98 (30), 75 (52), 69 (84).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3077 (w), 2923 (w), 1746 (m), 1731 (m), 1694 (s), 1583 (m), 1222 (s).

HRMS (EI) for **$C_{18}H_8F_4O_3$ [M]$^+$** (348.0410) found 348.0406.

Synthesis of (*Z*)-1-benzoyl-3-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)indolin-2-one (2a):



Prepared according to **TP 3** from (*Z*)-1-benzoyl-3-(4-nitrobenzylidene)indolin-2-one **7a** (111.1 mg, 0.3 mmol), Bu_3P (29.8 μL, 10 mol%), **11a** (38.3 μL, 1.1equiv) and Et_3N (50.2 μL, 1.2 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 50 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **2a** as yellow solid (118.9 mg, 80%).

mp: 232.5-233.1 ^{o}C; R_f 0.25 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.35 (d, 2H, *J* = 8.7 Hz), 7.96 (d, 2H, *J* = 7.8 Hz), 7.82 (t, 3H, *J* = 8.6 Hz), 7.69 (d, 2H, *J* = 7.8 Hz), 7.58-7.49 (m, 2H), 7.47-7.34 (m, 5H), 6.99 (t, 1H, *J* = 7.8 Hz), 6.86 (d, 1H, *J* = 7.9 Hz).

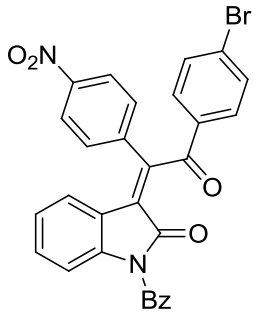
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 194.4, 168.7, 165.2, 148.5, 147.4, 141.7, 140.0, 134.4, 134.0, 133.2, 131.5, 129.7, 129.2, 129.0, 128.9, 128.2, 126.9, 124.6, 124.5, 123.2, 120.7, 115.4.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3116 (w), 3053 (w), 1736 (s), 1694 (s), 1671 (m), 1597 (m), 1519 (s), 1462 (m), 1341 (s).

HRMS (EI) for **$C_{29}H_{18}N_2O_5$ [M]$^+$** (474.1216) found 474.1210.

CCDC: 935873.

Synthesis of (*Z*)-1-benzoyl-3-(2-(4-bromophenyl)-1-(4-nitrophenyl)-2-oxoethylidene)indolin-2-one (2b):



Prepared according to **TP 3** from (*Z*)-1-benzoyl-3-(4-nitrobenzylidene)indolin-2-one **7a** (111.1 mg, 0.3 mmol), Bu_3P (29.8 µL, 10 mol%), **11f** (73.9 µL, 1.1equiv) and Et_3N (50.2 µL, 1.2 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 30 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **2b** as yellow solid (120.7 mg, 71%).

mp: 264.7-265.3 ^{o}C; R_f 0.32 (hexanes/dichloromethane: 1/1).

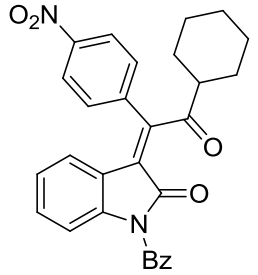
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.35 (d, 2H, *J* = 9.7 Hz), 7.85-7.77 (m, 5H), 7.69 (d, 2H, *J* = 7.3 Hz), 7.60-7.51 (m, 3H), 7.44-7.35 (m, 3H), 7.00 (t, 1H, *J* = 7.7 Hz), 6.87 (d, 1H, *J* = 7.8 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 193.5, 168.7, 165.2, 148.2, 146.6, 141.9, 139.7, 133.4, 133.3, 133.2, 132.3, 131.7, 130.4, 129.7, 129.4, 129.2, 128.3, 127.2, 124.8, 124.6, 123.2, 120.6, 115.5.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 1743 (s), 1690 (m), 1664 (m), 1600 (m), 1518 (s), 1464 (m), 1341 (s), 594 (m).

HRMS (EI) for **$C_{29}H_{17}BrN_2O_5$ [M]$^{+}$** (552.0321) found 552.0321.

Synthesis of (*Z*)-1-benzoyl-3-(2-cyclohexyl-1-(4-nitrophenyl)-2-oxoethylidene)indolin-2-one (2c):



Prepared according to **TP 3** from (*Z*)-1-benzoyl-3-(4-nitrobenzylidene)indolin-2-one **7a** (111.1 mg, 0.3 mmol), Bu_3P (29.8 µL, 10 mol%), **11k** (45.5 µL, 1.1equiv) and Et_3N (50.2 µL, 1.2 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 1 hour]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **2c** as yellow solid (135.4 mg, 94%).

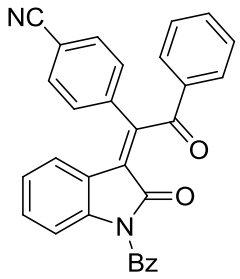
mp: 211.0-212.0 ^{o}C; R_f 0.30 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.38 (d, 2H, *J* = 8.5 Hz), 7.82-7.74 (m, 5H), 7.62 (t, 1H, *J* = 7.5 Hz), 7.48 (t, 2H, *J* = 7.7 Hz), 7.35 (t, 1H, *J* = 7.9 Hz), 6.93 (t, 1H, *J* = 7.7 Hz), 6.73 (d, 1H, *J* = 7.9 Hz), 2.63 (tt, 1H, *J* = 11.2, 3.2 Hz), 1.88 (d, 2H, *J* = 10.3 Hz), 1.67 (d, 2H, *J* = 12.0 Hz), 1.59 (d, 1H, *J* = 12.6 Hz), 1.29-1.02 (m, 5H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 207.8, 168.8, 165.6, 150.1, 148.6, 141.5, 140.3, 133.6,

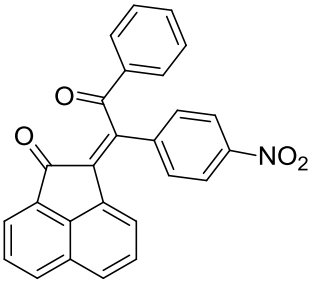
133.3, 131.2, 129.8, 129.0, 128.3, 125.3, 124.6, 124.5, 123.0, 120.9, 115.3, 50.7, 28.4, 25.6.
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3107 (w), 2924 (m), 1729 (s), 1685 (s), 1601 (m), 1520 (m), 1461 (m), 1343 (s).
HRMS (EI) for **$C_{29}H_{24}N_2O_5$ [M]$^+$** (480.1685) found 480.1679.

Synthesis of (*Z*)-4-(1-(1-benzoyl-2-oxoindolin-3-ylidene)-2-oxo-2-phenylethyl)benzonitrile (2d):



Prepared according to **TP 3** from (*Z*)-4-((1-benzoyl-2-oxoindolin-3-ylidene)methyl)benzonitrile **7b** (105.12 mg, 0.3 mmol), Bu_3P (8.7 µL, 10 mol%), **11a** (38.3 µL, 1.1equiv) and Et_3N (50.2 µL, 1.2 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 3.5 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **2a** as yellow solid (76.4 mg, 56%).
mp: 208.1-208.9 ^oC; R_f 0.12 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 7.95 (d, 2H, *J* = 7.2 Hz), 7.83 (d, 1H, *J* = 8.2 Hz), 7.76 (dd, 4H, *J* = 19.6, 8.3 Hz), 7.68 (d, 2H, *J* = 7.2 Hz), 7.53 (m, 2H), 7.40 (m, 5H), 7.00 (t, 1H, *J* = 7.2 Hz), 6.85 (d, 1H, *J* = 7.8 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^oC) δ/ppm: 194.5, 168.8, 165.3, 147.8, 141.8, 138.3, 134.5, 134.0, 133.3, 133.3, 133.2, 131.5, 129.8, 129.1, 129.0, 128.9, 128.2, 126.7, 124.6, 123.2, 120.8, 117.9, 115.5, 113.9.
MS (70 eV, EI) m/z (%): 454 (68), 104 (100), 79 (13).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3084 (w), 3053 (w), 2221 (m), 1749 (s), 1680 (s), 1669 (s), 1596 (m), 1459 (s).
HRMS (ESI) for **$C_{30}H_{18}N_2O_3Na$, [M+Na]$^+$** (477.1215) found: 477.1219.

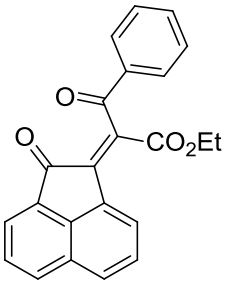
Synthesis of (*E*)-2-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)acenaphthylen-1(*2H*)-one (3a):



Prepared according to **TP 3** from (*E*)-2-(4-nitrobenzylidene)acenaphthylen-1(*2H*)-one **8a** (90.3 mg, 0.3 mmol), Bu_3P (17.4 µL, 20 mol%), **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.7 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 50 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **3a** as yellow solid (97.5 mg, 80%).
mp: 230.8-231.2 ℃; R_f 0.23 (hexanes/dichloromethane: 1/1).

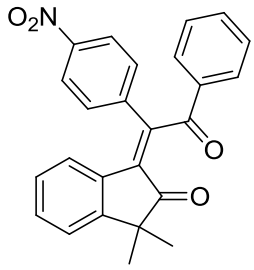
^{1}H-NMR (500 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.28 (d, 2H, *J* = 8.7 Hz), 8.03 (m, 3H), 7.87 (d, 1H, *J* = 7.0 Hz), 7.83 (m, 3H), 7.66 (t, 1H, *J* = 7.5 Hz), 7.50 (t, 1H, *J* = 7.4 Hz), 7.40 (t, 3H, *J* = 7.4 Hz), 6.98 (d, 1H, *J* = 7.2 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 196.1, 191.1, 148.4, 144.1, 141.5, 140.9, 135.3, 134.4, 133.9, 131.9, 131.4, 130.9, 130.8, 129.7, 129.1, 129.0, 129.0, 128.4, 128.1, 127.1, 124.5, 122.3, 120.8.
MS (70 eV, EI) m/z (%): 405 $[M]^+$ (40), 226 (22), 105 (100), 77 (65).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3107 (w), 1707 (s), 1686 (w), 1601 (w), 1517 (m), 1491 (w), 1344 (s).
HRMS (FAB) for **$C_{26}H_{16}NO_4$ $[M+H]^+$** (406.1079) found: 406.1070.
CCDC: 935872.

Synthesis of (*E*)-ethyl 3-oxo-2-(2-oxoacenaphthylen-1(*2H*)-ylidene)-3-phenylpropanoate (3b):



Prepared according to **TP 3** from (*E*)-(2-oxoacenaphthylen-1(*2H*)-ylidene)methyl propionate **8b** (75.7 mg, 0.3 mmol), Bu_3P (17.4 μL, 20 mol%), **11a** (42.6 μL, 1.2 equiv) and Et_3N (54.7 μL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 50 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **3b** as yellow solid (76.0 mg, 71%).
mp: 138.8-139.7 ℃; R_f 0.30 (hexanes/dichloromethane: 1/1).
^{1}H-NMR (500 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.70 (d, 1H, *J* = 7.3 Hz), 8.17 (d, 1H, *J* = 8.1 Hz), 8.07 (m, 3H), 7.93 (d, 1H, *J* = 6.9 Hz), 7.79 (t, 1H, *J* = 7.7 Hz), 7.74 (t, 1H, *J* = 7.3 Hz), 7.60 (m, 1H), 7.50 (t, 2H, *J* = 7.9 Hz), 4.38 (q, 2H, *J* = 7.1 Hz), 1.26 (t, 3H, *J* = 7.1 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 193.9, 191.6, 164.2, 142.9, 140.5, 136.5, 135.2, 133.4, 132.0, 130.7, 130.6, 129.9, 128.7, 128.7, 128.6, 128.2, 128.0, 125.5, 122.2, 62.3, 13.9.
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3062 (w), 2957 (w), 1706 (s), 1677 (s), 1596 (m), 1443 (w), 1241 (s).
HRMS (ESI) for **$C_{23}H_{16}O_4Na$, $[M+Na]^+$** (379.0947) found: 379.0961

Synthesis of (*Z*)-1,1-dimethyl-3-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)-*1H*-inden-2(*3H*)-one (4):



Prepared according to **TP 3** from (*E*)-1,1-dimethyl-3-(4-nitrobenzylidene)-*1H*-inden-2(*3H*)-one **9** (87.9 mg, 0.3 mmol), Bu_3P (17.4 µL, 20 mol%), **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 3 hours]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **4** as yellow solid (84.3 mg, 71%).

mp: 174.3-175.0 ^{o}C; R_f 0.50 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (500 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.24 (d, 2H, *J* = 8.8 Hz), 7.93 (d, 2H, *J* = 7.2 Hz), 7.74 (d, 2H, *J* = 8.8 Hz), 7.49 (t, 1H, *J* = 7.5 Hz), 7.39 (t, 2H, *J* = 7.7 Hz), 7.32 (t, 1H, *J* = 7.5 Hz), 7.28 (t, 1H, *J* = 7.2 Hz), 7.01 (t, 1H, *J* = 7.7 Hz), 6.80 (d, 1H, *J* = 7.8 Hz), 1.26 (s, 6H).

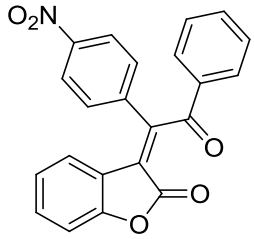
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 208.4, 196.1, 150.9, 148.2, 142.2, 141.0, 135.1, 133.7, 133.6, 133.3, 131.1, 129.3, 128.9, 127.5, 124.6, 123.8, 123.7, 47.1, 25.3.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3091 (w), 3066 (w), 2961 (m), 1729 (s), 1667 (s), 1594 (m), 1520 (s), 1468 (w), 1346 (s).

HRMS (EI) for **$C_{25}H_{19}NO_4$ [M]$^{+}$** (397.1314) found 397.1306.

CCDC: 935873.

Synthesis of (*Z*)-3-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)benzofuran-2(*3H*)-one ((*Z*)-5):



Prepared according to **TP 3** from (*E*)-3-(4-nitrobenzylidene)benzofuran-2(*3H*)-one **10** (80.2 mg, 0.3 mmol), Bu_3P (17.4 µL, 20 mol%), **11a** (42.6 µL, 1.2 equiv) and Et_3N (54.4 µL, 1.3 equiv) in THF (1.5 mL) [reaction condition: 27-30 ℃ for 3 hours]. Purification by flash chromatography (hexanes/dichloromethane/ethyl acetate: 20/5/1) furnished mixture of *E* and *Z*-form **5** as yellow solid (92.2 mg, 83%).

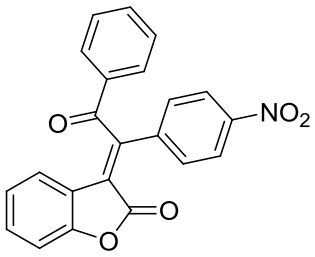
mp: 180.2-180.6 ^{o}C; R_f 0.48 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (500 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.35 (d, 2H, *J* = 9.7 Hz), 8.02 (d, 2H, *J* = 7.4 Hz), 7.85 (dt, 2H, *J* = 9.3, 2 2 Hz), 7.60 (t, 1H, *J* = 7.4 Hz), 7.48 (t, 2H, *J* = 7.8 Hz), 7.39 (t, 1H, *J* = 7.8 Hz), 7.13 (d, 1H, *J* = 8.2 Hz), 6.99 (t, 1H, *J* = 7.8 Hz), 6.93 (dd, 1H, *J* = 7.8, 1.2 Hz).

^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 193.7, 165.5, 155.4, 149.0, 148.7, 139.4, 134.4, 134.4, 132.4, 129.1, 129.1, 124.6, 124.2, 123.2, 120.7, 111.7.

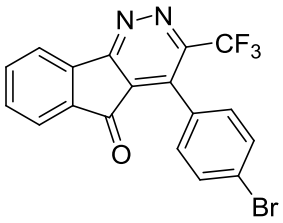
MS (70 eV, EI) m/z (%): 371 $[M]^+$ (10), 266 (5), 163 (14), 105 (100), 77 (95).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3108 (w), 3068 (w), 1776 (s), 1670 (s), 1609 (m), 1513 (s), 1459 (s), 1345 (s).
HRMS (EI) for **$C_{22}H_{13}NO_5$ [M]$^+$** (371.0794) found 371.0787.
CCDC: 937197.

Synthesis of (*E*)-3-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)benzofuran-2(*3H*)-one ((*E*)-5):



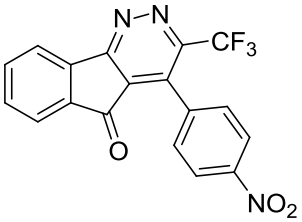
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.26 (d, 2H, *J* = 8.7 Hz), 8.07 (d, 2H, *J* = 7.6 Hz), 7.74 (d, 2H, *J* = 8.7 Hz), 7.68 (t, 1H, *J* = 7.3 Hz), 7.54 (t, 2H, *J* = 7.7 Hz), 7.34 (t, 1H, *J* = 7.7 Hz), 7.12 (d, 1H, *J* = 8.1 Hz), 7.01-6.91 (m, 2H).

Synthesis of 4-(4-bromophenyl)-3-(trifluoromethyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16a):



Prepared according to **TP4** from a solution of 2-(1-(4-bromophenyl)-3,3,3-trifluoro-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione **1am** (122.7 mg, 0.3 mmol), hydraine monohydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/2) furnished **16a** as yellow solid (94.5mg, 78%).
mp: 171.5-172.4 ^{o}C; R_f 0.68 (hexanes/dichloromethane: 1/3).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.27 (d, 1H, *J* = 7.5 Hz), 7.83-7.75 (m, 2H), 7.69-7.68 (m, 3H), 7.22 (d, 2H, *J* = 8.1 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.8, 164.1, 150.3 (q, *J* = 32.4 Hz), 140.2, 136.6, 135.7, 135.0, 133.3, 131.5, 129.8, 127.7, 125.3, 124.5, 123.1, 121.4 (q, *J* = 276.7 Hz).
MS (70 eV, EI) m/z (%): 406 $[M+2]^+$ (94), 404 $[M]^+$ (100), 334 (9), 325 (52), 200 (43), 69 (46).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3089 (w), 3052 (w), 1735 (s), 1609 (m), 1491 (m), 1177 (s), 1132 (s), 621 (w).
HRMS (EI) for **$C_{18}H_8BrF_3N_2O$ [M]$^+$** (403.9772) found 403.9765.

Synthesis of 4-(4-nitrophenyl)-3-(trifluoromethyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16b):



Prepared according to **TP4** from a solution of 2-(3,3,3-trifluoro-1-(4-nitrophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione **1dm** (112.6 mg, 0.3 mmol), hydraine hydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **16b** as yellow solid (84.4 mg, 76%).

mp: 184.2-185.2 ^{o}C; R_f 0.51 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.37 (d, 2H, *J* = 8.6 Hz), 8.25 (d, 1H, *J* = 7.5 Hz), 7.82 (t, 1H, *J* = 7.6 Hz), 7.78 (d, 1H, *J* = 7.4 Hz), 7.66 (t, 1H, *J* = 7.5 Hz), 7.56 (d, 2H, *J* = 8.5 Hz).

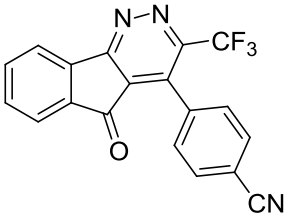
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.5, 164, 1, 149.6 (q, *J* = 32.8 Hz), 148.7, 140.1, 136.8, 135.4, 134.8, 134.1, 133.6, 129.5, 127.8, 123.4, 123.2, 123.1, 121.3 (q, *J* = 277.8 Hz).

MS (70 eV, EI) m/z (%): 371 $[M]^+$ (100), 325 (70), 302 (41), 274 (69), 229 (45), 200 (55).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3076 (m), 2859 (w), 1726 (s), 1607 (m), 1521 (s), 1472 (w), 1348 (s), 1176 (s), 1150 (s).

HRMS (EI) for **$C_{18}H_8F_3N_3O_3$ $[M]^+$** (371.0518) found 371.0523.

Synthesis of 4-(4-cyanophenyl)-3-(trifluoromethyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16c):



Prepared according to **TP4** from a solution of 2-(3,3,3-trifluoro-1-(4-cyanophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione **1gm** (106.6 mg, 0.3 mmol), hydraine monohydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **16c** as yellow solid (78.5 mg, 75%).

mp: 219.3-220.0 ^{o}C; R_f 0.38 (hexanes/dichloromethane: 1/3).

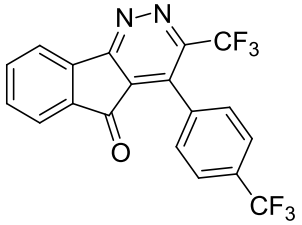
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.28 (d, 1H, *J* = 7.5 Hz), 7.87-7.75 (m, 4H), 7.65 (d, 1H, *J* = 7.5 Hz), 7.47 (d, 2H, *J* = 8.1 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.6, 164.2, 149.8 (q, *J* = 32.8 Hz), 140.2, 136.9, 134.9, 134.4, 133.6, 132.0, 129.1, 127.7, 125.5, 123.3, 121.3 (q, *J* = 276.6 Hz), 114.0.

MS (70 eV, EI) m/z (%): 351 $[M]^+$ (100), 282 (29), 254 (39), 226 (23), 199 (13), 75 (11).

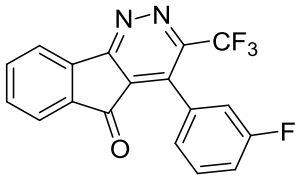
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3096 (m), 2924 (m), 2229 (s), 1731 (s), 1606 (m), 1583 (s), 1472 (s), 1258 (s).
HRMS (EI) for **$C_{19}H_8F_3N_3O$ [M]$^+$** (351.0619) found 351.0616.

Synthesis of 3-(trifluoromethyl)-4-(4-(trifluoromethyl)phenyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16d):



Prepared according to **TP4** from a solution of 2-(3,3,3-trifluoro-2-oxo-1-(4-(trifluoromethyl)phenyl)propylidene)-*1H*-indene-1,3(*2H*)-dione **1fm** (119.5 mg, 0.3 mmol), hydraine hydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **16d** as yellow solid (96.0 mg, 81%).
mp: 158.4-159.2 ^{o}C; R_f 0.68 (hexanes/dichloromethane: 1/3).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.26-8.19 (m, 1H), 7.84-.7.76 (m, 3H), 7.74 (d, 1H, *J* = 7.4 Hz), 7.62 (t, 1H, *J* = 7.5 Hz), 7.49 (d, 2H, *J* = 8.1 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.5, 164.1, 150.0 (q, *J* = 32.7 Hz), 140.1, 140.1, 136.7, 135.1, 134.9, 133.4, 132.6, 131.8 (q, *J* = 32.8 Hz), 128.8, 125.3, 125.2, 125.1 (q, *J* = 3.3 Hz), 123.7 (q, *J* = 276.4 Hz), 123.3, 123.1, 121.3 (q, *J* = 276.6 Hz).
MS (70 eV, EI) m/z (%): 394 [M]$^+$ (87), 325 (100), 298 (47), 269 (37), 250 (22), 200 (23), 69 (21).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3098 (m), 3071 (m), 1738 (s), 1610 (s), 1602 (s), 1592 (s), 1475 (w), 1380 (s), 1322 (s), 1265 (s).
HRMS (EI) for **$C_{19}H_8F_6N_2O$ [M]$^+$** (394.0541) found 394.0549.

Synthesis of 4-(3-fluorophenyl)-3-(trifluoromethyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16e):



Prepared according to **TP4** from a solution of 2-(3,3,3-trifluoro-1-(3-fluorophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione **1hm** (104.5 mg, 0.3 mmol), hydraine hydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/1) furnished **16e** as yellow solid (69.2 mg, 67%).
mp: 133.0-133.8 ^{o}C; R_f 0.65 (hexanes/dichloromethane: 1/3).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.26 (d, 1H, *J* = 7.5 Hz), 7.84-7.74 (m, 2H) 7.63 (t, 1H, *J* = 7.5 Hz), 7.49 (td, 1H, *J* = 7.9, 5.8 Hz), 7.26 (t, 1H, *J* = 8.5 Hz), 7.11 (d, 1H, *J* = 7.7 Hz), 7.06 (d,

1H, *J* = 8.9 Hz)

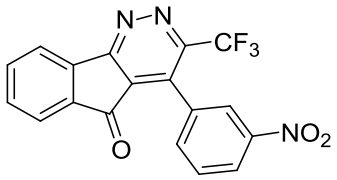
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.5, 164.1, 162.1 (q, *J* = 247.9 Hz), 150.2 (q, *J* = 32.5 Hz), 140.1, 136.6, 135.2, 135.1, 134.9, 133.3, 130.7 (q, *J* = 8.2 Hz), 130.0 (q, *J* = 8.4 Hz), 127.8, 125.2, 124.1, 124.1, 123.0, 121.4 (q, *J* = 276.8 Hz), 116.9 (q, *J* = 21.0 Hz), 115.6 (q, *J* = 23.5 Hz).

MS (70 eV, EI) m/z (%): 344 $[M]^+$ (100), 325 (35), 275 (40), 251 (67), 248 (82), 218 (92), 109 (36), 75 (51), 69 (66).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3088 (s), 3061 (w), 1734 (s), 1609 (m), 1587 (m), 1488 (m), 1378 (m), 1264 (s), 1186 (s).

HRMS (EI) for **$C_{18}H_8F_4N_2O$ [M]$^+$** (344.0573) found 344.0576.

Synthesis of 4-(3-nitrophenyl)-3-(trifluoromethyl)-*5H*-indeno[1,2-*c*]pyridazin-5-one (16f):



Prepared according to **TP4** from a solution of 2-(3,3,3-trifluoro-1-(3-nitrophenyl)-2-oxopropylidene)-*1H*-indene-1,3(*2H*)-dione **1cm** (112.6 mg, 0.3 mmol), hydraine hydrate (22.0 μL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 10 minutes]. Purification by flash chromatography (hexanes/dichloromethane: 1/3) furnished **16f** as yellow solid (88.0 mg, 79%).

mp: 188.0-188.9 ^{o}C; R_f 0.55 (hexanes/dichloromethane: 1/3).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.43 (d, 1H, *J* = 8.0 Hz), 8.34-8.20 (m, 2H), 7.79-7.59 (m, 5H).

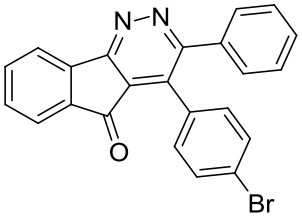
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 187.5, 164, 2, 149.9 (q, *J* = 32.7 Hz), 147.8, 140.1, 136.9, 134.9, 134.2, 133.8, 133.6, 130.4, 129.5, 128.0, 124.7, 123.6, 123.3, 121.3 (q, *J* = 277.6 Hz).

MS (70 eV, EI) m/z (%): 371 $[M]^+$ (100), 325 (88), 69 (83).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3092 (w), 3069 (m), 2924 (w), 1733 (s), 1604 (m), 1589 (s), 1478 (w), 1352 (s), 1257 (s).

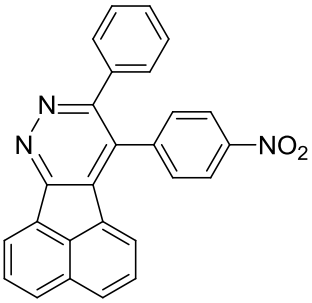
HRMS (EI) for **$C_{18}H_8F_3N_3O_3$ [M]$^+$** (371.0518) found 371.0518.

Synthesis of 4-(4-bromophenyl)-3-phenyl-*5H*-indeno[1,2-*c*]pyridazin-5-one (17):



Prepared according to **TP4** from a solution of 2-(1-(4-bromophenyl)-2-oxo-2-phenylethylidene)-*1H*-indene-1,3(*2H*)-dione **1aa** (118.9 mg, 0.3 mmol), hydrazine hydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 1.5 hours]. Purification by flash chromatography furnished **17** as yellow solid (117.3 mg, 95%).
mp: 194.8-195.4 ^{o}C; R_f 0.19 (hexanes/dichloromethane: 1/3).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.24 (d, 1H, *J* = 7.4 Hz), 7.8-7.71 (m, 2H), 7.56 (t, 1H, *J* = 7.5 Hz), 7.48 (d, 2H, *J* = 8.2 Hz), 7.39-7.27 (m, 5H), 7.11 (d, 2H, *J* = 8.3 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.5, 161.5, 161.0, 141.3, 136.3, 135.8, 135.4, 134.8, 132.2, 131.5, 131.3, 130.0, 129.9, 129.2, 128.2, 126.5, 124.9, 124.0, 122.4.
MS (70 eV, EI) m/z (%): 414 $[M+2]^+$ (32), 412 $[M]^+$ (35), 333 (100), 76 (21).
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3061 (w), 2924 (w), 1726 (s), 1604 (m), 1589 (m), 1486 (s), 610 (m).
HRMS (ESI) for **$C_{23}H_{14}BrN_2O$ [M+H]$^+$** (413.0290) found 413.0283.
CCDC: 935874

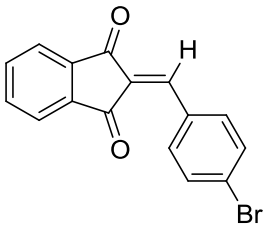
Synthesis of 10-(4-nitrophenyl)-9-phenylacenaphtho[1,2-*c*]pyridazine (18):



Prepared according to **TP4** from a solution of (*E*)-2-(1-(4-nitrophenyl)-2-oxo-2-phenylethylidene)acenaphthylen-1(*2H*)-one **3a** (121.6 mg, 0.3 mmol), hydrazine hydrate (22.0 µL, 1.5 equiv) in methanol (1.5 mL). [reaction condition: 27-30 ℃ for 2 hours]. Purification by flash chromatography (dichloromethane/ethyl acetate: 5/1) furnished **18** as yellow solid (98.7 mg, 82%).
mp: 247.8-248.5; R_f 0.63 (hexanes/dichloromethane: 1/3).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.48 (d, 1H, *J* = 6.6 Hz), 8.32 (d, 2H, *J* = 8.5 Hz), 7.99 (d, 2H, *J* = 8.0 Hz), 7.76 (t, 1H, *J* = 7.5 Hz), 7.59 (d, 2H, *J* = 8.6 Hz), 7.48 (t, 1H, *J* = 7.7 Hz), 7.37 (d, 2H, *J* = 6.8 Hz), 7.34-7.21 (m, 3H), 7.16 (d, 1H, *J* = 7.0 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 158.5, 157.2, 147.9, 142.1, 136.4, 133.6, 133.3, 131.8, 131.3, 130.7, 130.5, 130.2, 130.1, 129.9, 129.5, 128.8, 128.7, 128.1, 125.6, 124.1, 123.3.
MS (70 eV, EI) m/z (%): 401 $[M]^+$ (89), 400 $[M-1]^+$ (100), 354 (92), 324 (42).

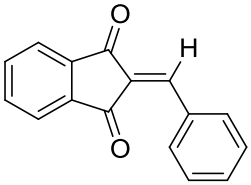
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3103 (w), 3050 (w), 2840 (w), 1597 (m), 1510 (s), 1460 (w), 1341 (s).
HRMS (EI) **for $C_{26}H_{15}N_3O_2$ [M]$^+$** (401.1164) found 401.1165.
CCDC: 935875

Synthesis of 2-(4-bromobenzylidene)-*1H*-indene-1,3(*2H*)-dione (6a):



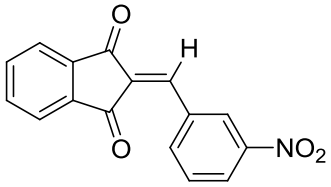
Prepared according to **TP 5**.
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.33 (d, 2H, *J* = 8.5 Hz), 8.06-7.97 (m, 2H), 7.87-7.77 (m, 3H), 7.64 (d, 2H, *J* = 8.5 Hz).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.7, 188.8, 145.1, 142.4, 140.0, 135.4, 135.3, 135.2, 132.0, 131.8, 129.5, 128.3, 123.3, 123.2.
MS (70 eV, EI) m/z (%): 314 [M+2]$^+$ (41), 312 [M]$^+$ (46), 233 (87), 104 (64), 76 (100).

Synthesis of 2-benzylidene-*1H*-indene-1,3(*2H*)-dione (6b):



Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), benzaldehyde (1.1181 mL, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6b** as dark green solid (2131.5 mg, 91%).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.47 (d, 2H, *J* = 8.0 Hz), 8.06-7.99 (m, 2H), 7.92 (s, 1H), 7.86-7.79 (m, 2H), 7.60 (m, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 190.3, 189.0, 147.0, 142.6, 140.1, 135.4, 135.2, 134.1, 133.2, 133.1, 129.2, 128.8, 123.4, 123.3.
MS (70 eV, EI) m/z (%):234 [M]$^+$ (62), 314 [M-1]$^+$ (100), 76 (30).

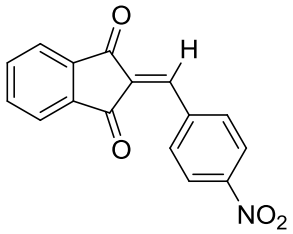
Synthesis of 2-(3-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione (6c):



Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 3-nitrobenzaldehyde (1511.2 mg, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6c** as dark green solid (2289.8 mg, 82%).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 9.40 (s, 1H), 8.68 (d, 1H, *J* = 7.7 Hz), 8.39 (d, 1H, *J* =

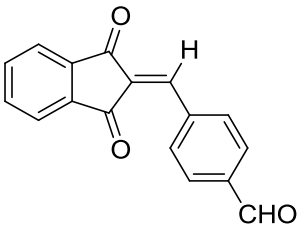
8.4 Hz), 8.12-8.03 (m, 2H), 7.91 (s, 1H), 7.88 (dd, 2H, *J* = 5.6, 3.0 Hz), 7.71 (t, 1H, *J* = 8.0 Hz).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.2, 188.6, 148.5, 143.0, 142.6, 140.3, 138.9, 135.9, 135.8, 134.3, 131.6, 129.7, 128.0, 126.7, 123.8, 123.7.
MS (70 eV, EI) m/z (%): 279 $[M]^+$ (54), 262 (73), 232 (76), 176 (83), 76 (100).

Synthesis of 2-(4-nitrobenzylidene)-*1H*-indene-1,3(*2H*)-dione (6d):



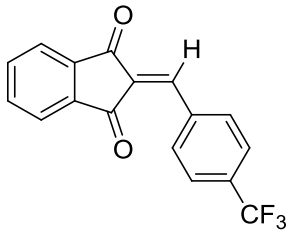
Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 4-nitrobenzaldehyde (1679.1 mg, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6d** as yellow solid (2454.0 mg, 94%).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.55 (d, 2H, *J* = 8.8 Hz), 8.34 (d, 2H, *J* = 8.8 Hz), 8.07 (dd, 2H, *J* = 5.6, 3.0 Hz), 7.92-7.85 (m, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.1, 188.4, 149.5, 142.6, 140.3, 138.4, 136.0, 135.9, 134.2, 132.3, 123.8, 123.7, 123.6.
MS (70 eV, EI) m/z (%): 279 $[M]^+$ (55), 262 (100), 232 (93), 176 (80), 104 (46), 76 (96).

Synthesis of 4-((1,3-dioxo-*1H*-inden-2(*3H*)-ylidene)methyl)benzaldehyde (6e):



Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), terephthalaldehyde (1475.5 mg, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6e** as yellow solid (2454.0 mg, 94%).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 10.11 (s, 1H), 8.55 (d, 2H, *J* = 8.0 Hz), 8.10-8.03 (m, 2H), 8.01 (d, 2H, *J* = 8.1 Hz), 7.92 (s, 1H), 7.90-7.83 (m, 2H).
^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 191.5, 189.5, 188.6, 144.3, 142.6, 140.2, 138.4, 138.1, 135.8, 135.7, 134.1, 131.5, 129.7, 123.7, 123.6.
MS (70 eV, EI) m/z (%):262 $[M]^+$ (100), 233 (69), 104 (23), 76 (39).

Synthesis of 2-(4-(trifluoromethyl)benzylidene)-*1H*-indene-1,3(*2H*)-dione (6f):



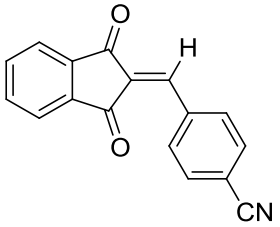
Prepared according to **TP 5** from 1,3-indanedione (753.3 mg, 5 mmol), aldehyde (819.4 mL, 1.1 equiv) and *L*-proline (174.5 mg, 0.3 equiv) in methanol (10 mL) furnished **6f** as light yellow solid (2454.0 mg, 94%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.52 (d, 2H, *J* = 8.2 Hz), 8.08-8.02 (m, 2H), 7.90 (s, 1H), 7.89-7.83 (m, 2H), 7.76 (d, 2H, *J* =8.3 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.5, 188.6, 144.2, 142.6, 140.2, 135.9, 135.7, 135.6, 133.8, 133.6 (q, *J* = 32.6 Hz), 131.1, 125.5 (q, *J* = 3.8 Hz), 123.6 (q, *J* = 272.7 Hz), 123.6, 123.6.

MS (70 eV, EI) m/z (%): 302 $[M]^+$ (61), 301 $[M-1]^+$ (79), 233 (100), 104 (50), 76 (77).

Synthesis of 2-(4-(cyano)benzylidene)-*1H*-indene-1,3(*2H*)-dione (6g):



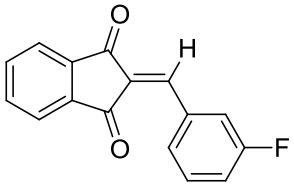
Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 4-formylbenzonitrile (1471.9 mg, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6g** as yellow solid (2444.0 mg, 94%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.50 (d, 2H, *J* = 8.3 Hz), 8.09-8.03 (m, 2H), 7.91-7.84 (m, 3H), 7.79 (d, 2H, *J* = 8.3 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.2, 188.4, 143.3, 142.6, 140.2, 136.7, 135.9, 135.8, 133.7, 132.2, 131.8, 123.7, 123.7, 118.2, 115.4.

MS (70 eV, EI) m/z (%): 259 $[M]^+$ (63), 258 $[M-1]^+$ (100), 104 (44), 76 (84).

Synthesis of 2-(3-fluorobenzylidene)-*1H*-indene-1,3(*2H*)-dione (6h):

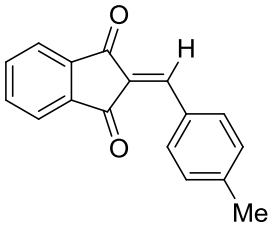


Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 3-fluorobenzaldehyde (1060.8 uL, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6h** as green solid (1841.4 mg, 73%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.43 (dd, 1H, *J* = 10.2, 1.3 Hz), 8.09-7.99 (m, 3H), 7.89-7.80 (m, 3H), 7.48 (dt, 1H, *J* = 8.0, 7.0 Hz), 7.26 (td, 1H, *J* = 8.4, 2.8).

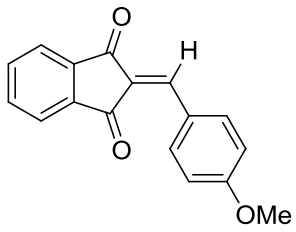
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.7, 188.7, 162.5 (d, *J* = 246.7 Hz), 145.1, 145.0, 142.5, 140.1, 135.6, 135.4, 134.9 (d, *J* = 8.5 Hz), 130.2 (d, *J* = 3.4 Hz), 130.1 (d, *J* = 4.1 Hz), 123.5 (d, *J* = 6.2 Hz), 120.1, 119.9, 119.7.
MS (70 eV, EI) m/z (%): 252 $[M]^+$ (65), 251 $[M-1]^+$ (100), 233 (7), 104 (31), 76 (47).

Synthesis of 2-(4-methylbenzylidene)-*1H*-indene-1,3(*2H*)-dione (6i):



Prepared according to **TP 5** from 1,3-indanedione (753.3 mg, 5 mmol), 4-methylbenzaldehyde (729.3 mL, 1.1 equiv) and *L*-proline (174.5 mg, 0.3 equiv) in methanol (10 mL) furnished **6i** as yellow green solid (1039.0 mg, 84%).
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.40 (d, 2H, *J* = 8.2 Hz), 8.04-7.98 (m, 2H), 7.89 (s, 1H), 7.84-7.78 (m, 2H), 7.33 (d, 2H, *J* = 8.1 Hz), 2.46 (s, 3H).
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 190.1, 188.8, 146.6, 144.3, 142.2, 139.7, 134.9, 134.7, 134.3, 130.4, 129.4, 127.9, 122.9, 122.9, 21.8.
MS (70 eV, EI) m/z (%): 248 $[M]^+$ (76), 247 $[M-1]^+$ (54), 233, (100), 76 (19).

Synthesis of 2-(4-methoxybenzylidene)-*1H*-indene-1,3(*2H*)-dione (6j):



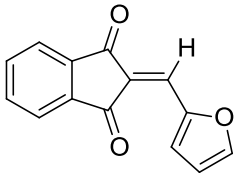
Prepared according to **TP 5** from 1,3-indanedione (753.35 mg, 5 mmol), 4-methoxybenzaldehyde (6.828 mL, 1.1 equiv) and *L*-proline (124.5 mg, 0.3 equiv) in methanol (20 mL) furnished **6j** as yellow solid (1107.0 mg, 84%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.51 (d, 2H, *J* = 8.5 Hz), 8.05-7.88 (m, 2H), 7.79 (s, 1H), 7.78-7.68 (m, 2H), 6.98 (d, 2H, *J* = 8.5 Hz), 3.88 (s, 3H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 190.6, 189.3, 163.9, 146.6, 142.3, 139.8, 137.1, 134.9, 134.7, 126.5, 126.4, 122.9, 122.8, 114.3, 55.5.

MS (70 eV, EI) m/z (%): 264 $[M]^+$ (100), 263 $[M-1]^+$ (78), 233 (27), 132 (20), 104 (34), 76 (52).

Synthesis of 2-(furan-2-ylmethylene)-*1H*-indene-1,3(*2H*)-dione (6k):



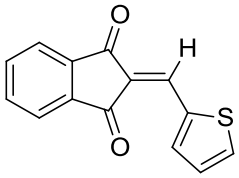
Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 2-furaldehyde (828.3 uL, 1.1 equiv) and *L*-proline (349.0 mg, 0.3 equiv) in methanol (20 mL) furnished **6k** as black green solid (1681.0 mg, 75%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.58 (d, 1H, *J* = 3.7 Hz), 8.01-7.94 (m, 2H), 7.82-7.77 (m, 3H), 7.76 (s, 1H), 6.73 (d, 1H, *J* = 3.8 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 190.0, 188.9, 151.4, 149.0, 142.3, 140.4, 135.1, 134.8, 129.2, 124.8, 124.7, 123.1, 122.9, 114.6.

MS (70 eV, EI) m/z (%): 224 $[M]^+$ (100), 168 (62), 119 (6), 104 (16), 76 (41).

Synthesis of 2-(thiophen-2-ylmethylene)-*1H*-indene-1,3(*2H*)-dione (6l):



Prepared according to **TP 5** from 1,3-indanedione (753.3 mg, 5 mmol), 2-thiophenecarbaldehyde (467.3 uL, 1.1 equiv) and *L*-proline (174.5 mg, 0.3 equiv) in mthanol (10 mL) furnished **6l** as yellow solid (2454.0 mg, 94%).

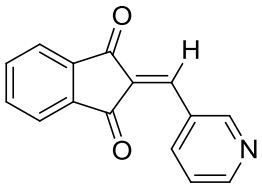
^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.07 (d, 1H, *J* = 3.4 Hz), 8.02 (s, 1H), 8.01-7.95 (m, 2H), 7.87 (d, 1H, *J* = 5.2 Hz), 7.92-7.76 (m, 2H), 7.25 (t, 1H, *J* = 4.4 Hz).

^{13}C-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 190.3, 189.4, 142.1, 141.6, 140.4, 138.2, 137.4, 136.2,

135.1, 134.9, 128.6, 124.8, 123.1, 123.0.

MS (70 eV, EI) m/z (%): 240 $[M]^+$ (100), 239 $[M-1]^+$ (83), 184 (48), 104 (27), 82 (8), 76 (55).

Synthesis of 2-(pyridin-3-ylmethylene)-*1H*-indene-1,3(*2H*)-dione (6m):



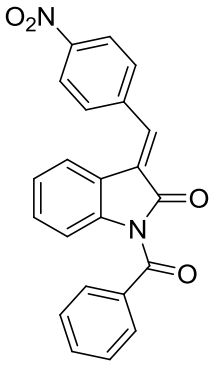
Prepared according to **TP 5** from 1,3-indanedione (1506.5 mg, 10 mmol), 3-pyridinecarboxaldehyde (1.1265 mL, 1.1 equiv) and *L*-proline (349.0 mg, 0.3equiv) in methanol (20 mL) furnished **6m** as yellow solid (1033.0 mg, 44%).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 9.18 (s, 1H), 9.15 (d, 1H, *J* = 8.2 Hz) 8.72 (d, 1H, *J* = 3.7 Hz), 8.01 (dd, 2H, *J* = 5.5, 3.1 Hz), 7.87-7.81 (m, 3H), 7.47 (dd, 1H, *J* = 7.8, 4.9 Hz).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 189.1, 188.6, 154.6, 152.7, 142.3, 142.2, 140.0, 139.6, 135.6, 135.5, 131.2, 128.9, 123.5, 123.4.

MS (70 eV, EI) m/z (%): 235 $[M]^+$ (62), 234 $[M-1]^+$ (100), 104 (26), 76 (58).

Synthesis of (*Z*)-1-benzoyl-3-(4-nitrobenzylidene)indolin-2-one (7a):



The synthesis is related to ref 1.

mp: 219.5-220.4 ℃; R_f 0.24 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.35 (d, 2H, *J* = 8.6 Hz), 7.91 (d, 1H, *J* = 8.2 Hz), 7.78 (m, 5H), 7.62 (t, 1H, *J* = 7.4 Hz), 7.51 (m, 3H), 7.41 (t, 1H, *J* = 7.7 Hz), 7.08 (t, 1H, *J* = 7.7 Hz).

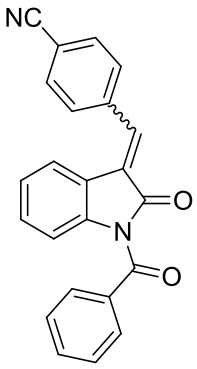
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 169.1, 166.9, 148.2, 141.2, 141.1, 134.9, 134.2, 133.1, 131.4, 129.9, 129.5, 128.7, 128.3, 124.6, 124.1, 122.7, 121.2, 115.6.

MS (70 eV, EI) m/z (%): 370 (33), 190 (13), 105 (100), 77 (82).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 1734 (s), 1674 (m), 1601 (w), 1518 (m), 1462 (w), 1348 (s).

HRMS (FAB) for **$C_{22}H_{15}N_2O_4$ [M+H]$^+$** (371.1032) found: 371.1032.

Synthesis of 4-((1-benzoyl-2-oxoindolin-3-ylidene)methyl)benzonitrile (7b):



The synthesis is related to ref 1.

mp: 191.8-193.2; R_f 0.20 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (125 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.15 (d, 2H, *J* = 8.3 Hz), 7.91 (d, 2H, *J* = 8.2 Hz), 7.83 (d, 1H, *J* = 8.1 Hz), 7.81-7.75 (m, 10H), 7.75-7.72 (m, 6H), 7.76-7.57 (m, 7H), 7.56-7.46 (m, 8H), 7.45-7.39 (m, 3H), 7.29-7.26 (m, 1H), 7.08 (t, 2H, *J* = 7.7 Hz). [For E, Z-form mixture with 1:2 ratio.]

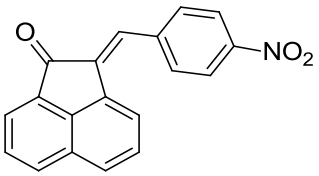
^{13}C-NMR (500 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 169.4, 169.2, 167.0, 165.0, 141.1, 139.6, 139.2, 127.3, 135.6, 135.4, 134.3, 134.2, 133.0, 132.6, 132.0, 132.0, 131.2, 130.5, 129.6, 129.5, 129.4, 128.4, 128.3, 128.2, 127.7, 124.7, 124.5, 124.3, 122.7, 121.3, 119.6, 118.5, 118.2, 115.6, 115.1, 113.4, 113.3. [For E, Z-form mixture]

MS (70 eV, EI) m/z (%): 350 (37), 190 (14), 105 (100), 77 (100).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3090 (w), 2929 (w), 2222 (m), 1729 (s), 1686 (s), 1598 (m), 1458 (m).

HRMS (FAB) for **$C_{23}H_{15}N_2O_2$ [M+H]$^+$** (351.1134) found: 351.1136.

Synthesis of (*E*)-2-(4-nitrobenzylidene)acenaphthylen-1(*2H*)-one (8a):



The synthesis is related to ref 2.

mp: 233.8-236.2; R_f 0.31 (hexanes/dichloromethane: 1/1).

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.40 (d, 2H, *J* = 8.6 Hz), 8.15 (m, 2H), 7.95 (d, 1H, *J*=8.3 Hz), 7.91 (m, 3H), 7.82 (t, 1H, *J*=7.3 Hz), 7.74 (d, 1H, *J*=7.1 Hz), 7.56 (t, 1H, *J*=7.4 Hz).

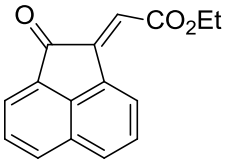
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 129.0, 147.9, 142.3, 141.2, 136.4, 132.0, 131.7, 131.4, 131.1, 130.9, 130.2, 128.3, 128.0, 126.9, 124.0, 122.1, 120.4.

MS (70 eV, EI) m/z (%): 302 $[M+1]^+$ (24), 301 $[M]^+$ (98), 255 (54), 254 (98), 226 (100), 213 (12), 200 (10), 150 (22), 113 (28), 100(16).

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2829 (w), 1708 (s), 1687 (w), 1624 (m), 1517 (s), 1489 (w), 1344 (s).

HRMS (FAB) for **$C_{19}H_{12}NO_3$, [M+H]$^+$** (302.0817) found: 302.0821.

Synthesis of (*E*)-ethyl 2-(2-oxoacenaphthylen-1(*2H*)-ylidene)acetate (8b):



The synthesis is related to ref 2.

mp: 106.3-107.0 °C; R_f 0.30 (hexanes/dichloromethane: 1/1).

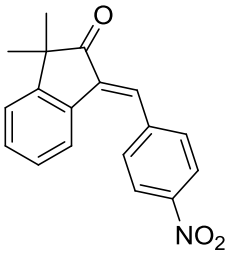
^{1}H-NMR (500 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.60 (d, 1H, *J* = 7.3 Hz), 8.08 (d, 1H, *J* = 8.3 Hz), 7.97 (t, 3H, *J* = 8.6 Hz), 7.83 (d, 1H, *J* = 6,9 Hz), 7.69 (t, 1H, *J* = 7.9 Hz), 7.65 (t, 1H, *J* = 7.6 Hz), 7.51 (t, 1H, *J* = 7.3 Hz), 7.40 (t, 2H, *J* = 7.7 Hz), 4.29 (q, 2H, *J* = 7.1 Hz), 1.17 (t, 3H, *J* = 7.1 Hz).

^{13}C-NMR (125 MHz, $CDCl_3$, 25 °C) δ/ppm: 193.9, 191.6, 164.2, 142.9, 140.5, 136.5, 135.2, 133.4, 132.0, 130.7, 130.6, 129.9, 128.7, 128.7, 128.6, 128.2, 128.0, 125.5, 122.2, 62.3, 13.9.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 2985 (w), 1719 (s), 1684 (w), 1638 (m), 1601 (w), 1266 (s), 1189 (s).

MS (70 eV, EI) m/z (%): 252 (100), 207 (63), 180 (69), 151 (93), 75 (18), 74 (8).

Synthesis of (*E*)-1,1-dimethyl-3-(4-nitrobenzylidene)-*1H*-inden-2(*3H*)-one (9):



The synthesis is related to ref 3.

mp: 156.7-157.6 °C; R_f 0.48 (hexanes/dichloromethane: 1/1).

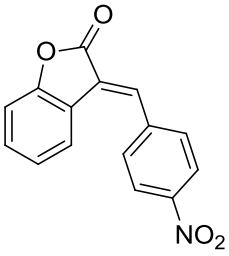
^{1}H-NMR (400 MHz, $CDCl_3$, 25 °C) δ/ppm: 8.31 (d, 2H, *J* = 8.7 Hz), 7.76 (d, 2H, *J* = 8.6 Hz), 7.52 (d, 1H, *J* = 7.9), 7.48 (s, 1H), 7.43-7.34 (m, 2H), 7.14 (td, 1H, *J* = 10.9, 1.8 Hz), 1.40 (s, 6H).

^{13}C-NMR (100 MHz, $CDCl_3$, 25 °C) δ/ppm: 209.3, 150.3, 147.7, 142.5, 135.4, 134.0, 130.8, 129.6, 129.5, 127.2, 124.0, 123.7, 123.2, 47.3, 25.5.

IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3100 (w), 2952 (w), 1726 (s), 1618 (w), 1514 (s), 1344 (s).

HRMS (EI) for $C_{18}H_{15}NO_3$ $[M]^+$ (293.1052) found 293.1059.

Synthesis of (*E*)-3-(4-nitrobenzylidene)benzofuran-2(*3H*)-one (10):



The synthesis is related to ref 4.

mp: 234.5-235.4 °C; R_f 0.50 (hexanes/dichloromethane: 1/1)

^{1}H-NMR (400 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm: 8.31 (d, 2H, *J* = 8.9 Hz), 8.26 (d, 2H, *J* = 8.8 Hz), 7.63 (s, 1H), 7.59 (d, 1H, *J* = 7.6 Hz), 7.42 (t, 1H, *J* = 7.7 Hz), 7.23 (t, 1H, *J* = 7.6 Hz), 7.15 (d, 1H, *J* = 8.1 Hz).

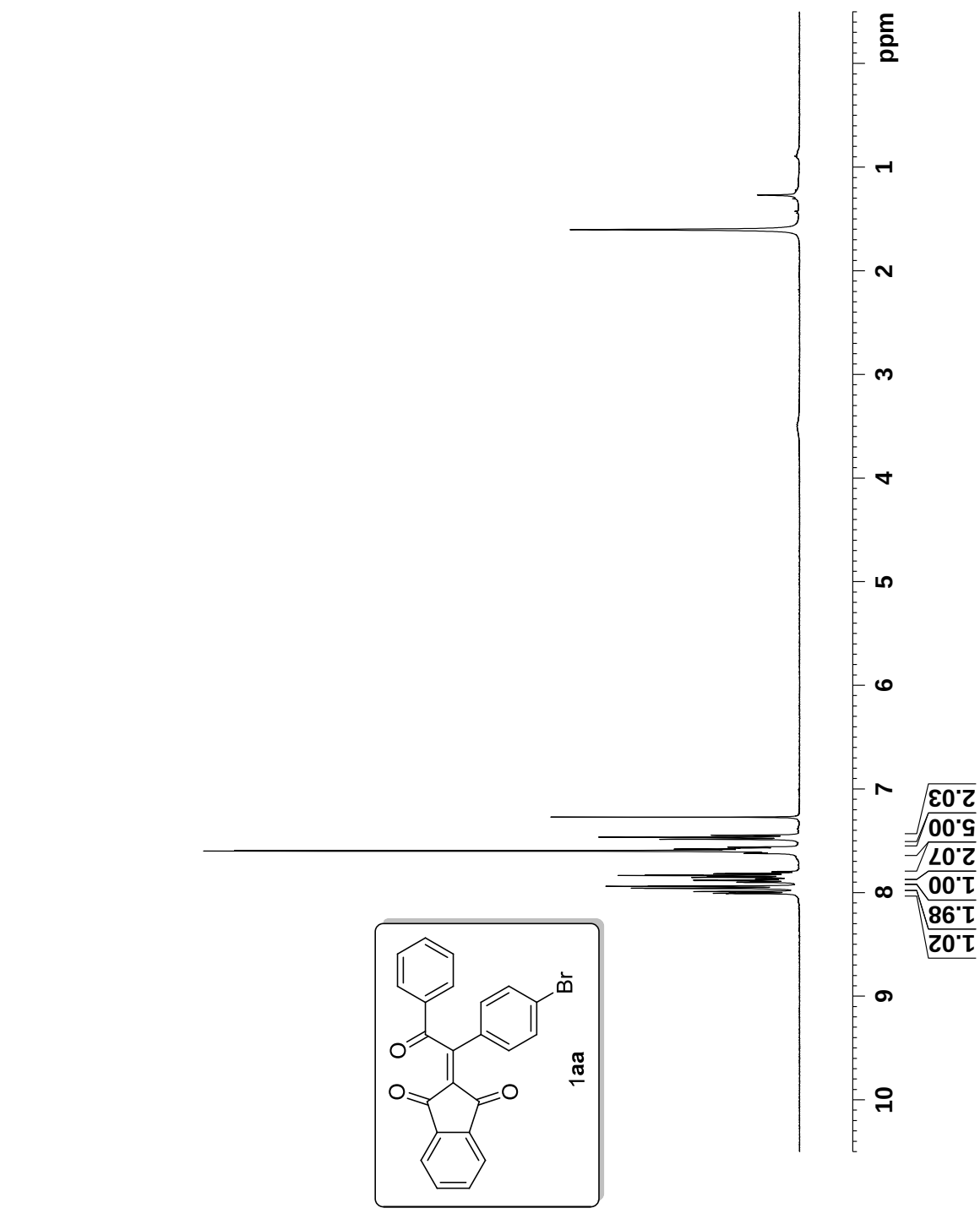
^{13}C-NMR (100 MHz, $CDCl_3$, 25 ^{o}C) δ/ppm:

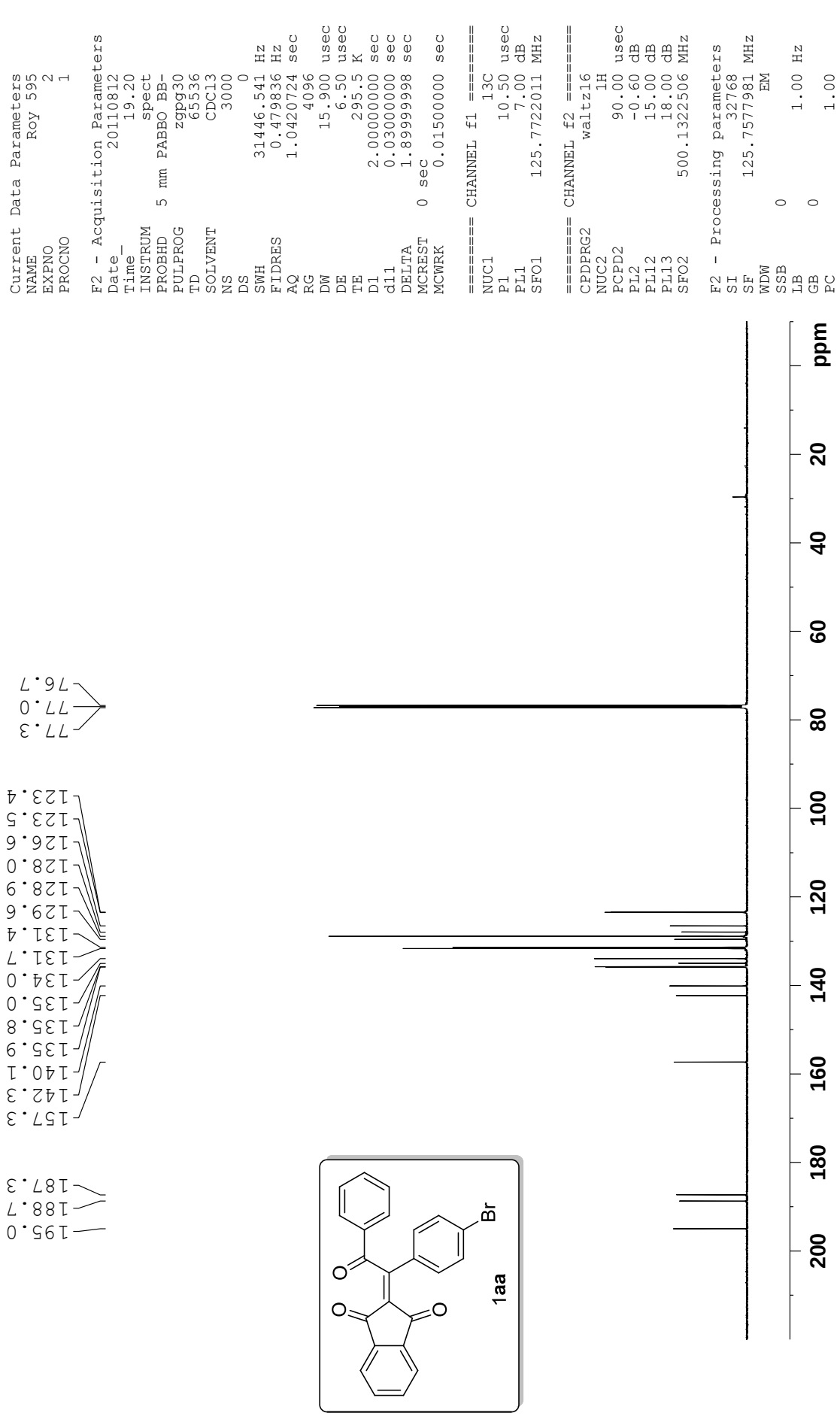
MS (70 eV, EI) m/z (%): 267 $[M]^+$ (100), 239 (5), 221 (6), 193 (15), 165 (86), 74 (15).

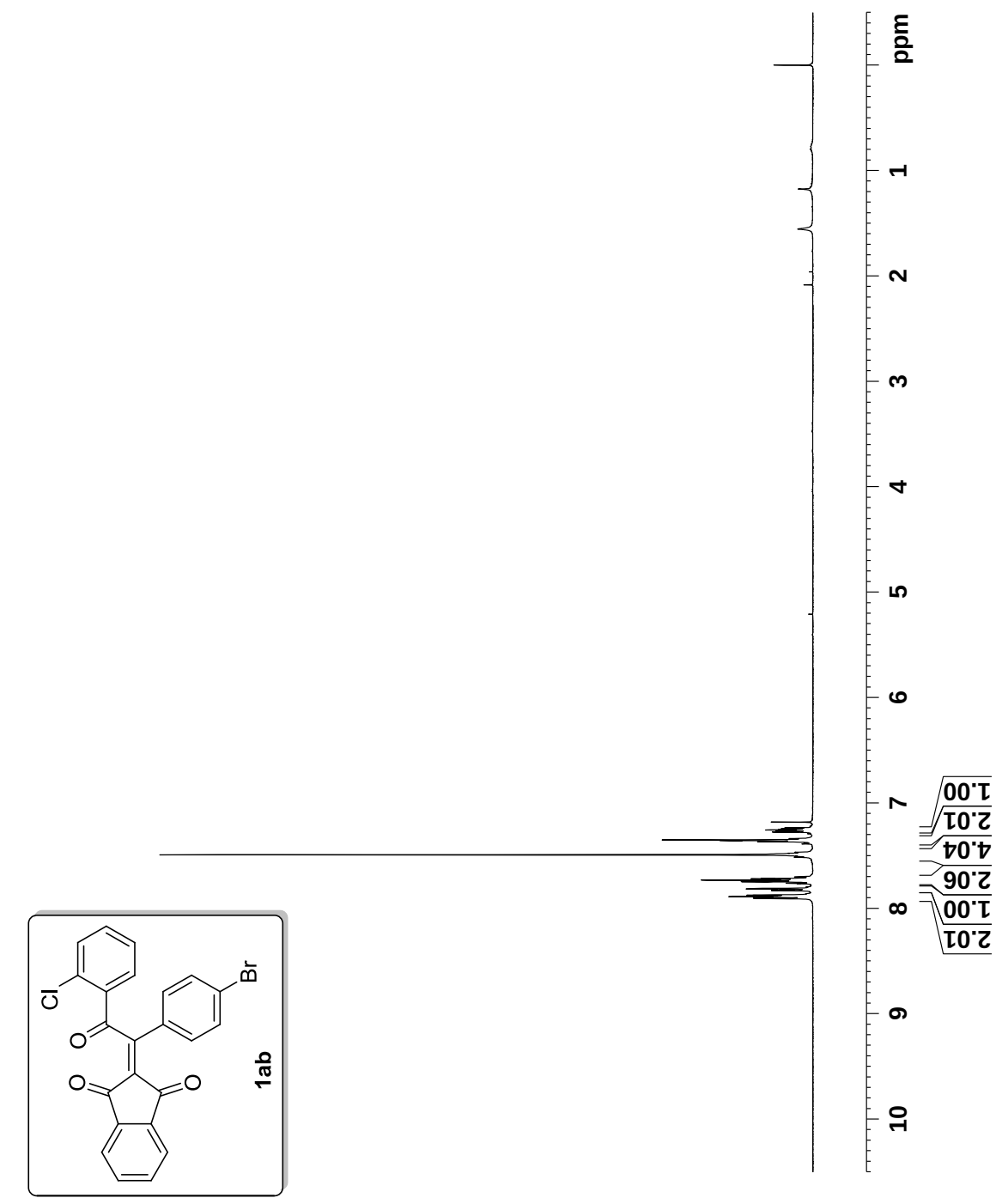
IR (KBr) $\tilde{\nu}$ (cm^{-1}): 3115 (w), 1753 (s), 1594 (m), 1513 (s), 1462 (m), 1344 (s).

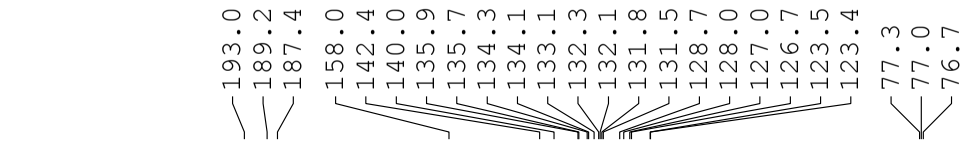
HRMS (EI) for $C_{15}H_9NO_4$ $[M]^+$ (267.0532) found 267.0530.

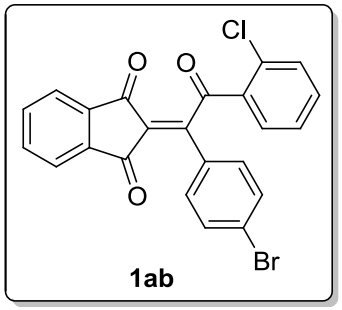
1. Mokrosz, M. J.; Charakchieva-Minol, S.; Kozioł, A.; Kłodzińska, A.; Chojnacka-Wójcik, E. *Bioorg. Med. Chem. Lett.* **2001**, *11*, 1229.
2. Tsuge, O.; Tashiro, M.; Shinkai, I. *Bull. Chem. Soc. Jpn.* **1969**, *42*, 181.
3. Martínez, A.; Fernández, M.; Estévez, J. C.; Estévez, R. J.; Castedo, L. *Tetrahedron* **2005**, *61*, 485.
4. Marelli, C.; Monti, C.; Galli, S.; Masciocchi, N.; Piarulli, U. *Tetrahedron* **2006**, *62*, 8943.


Current Data Parameters
NAME 595
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110812
Time_ 19.06
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 1.3631988 sec
RG 456.1
DW 83.200 usec
DE 6.50 usec
TE 299.6 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 400.1300031 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
1aa
Br
O
O
O
1.02
1.98
1.00
2.07
5.00
2.03
ppm
10
9
8
7
6
5
4
3
2
1

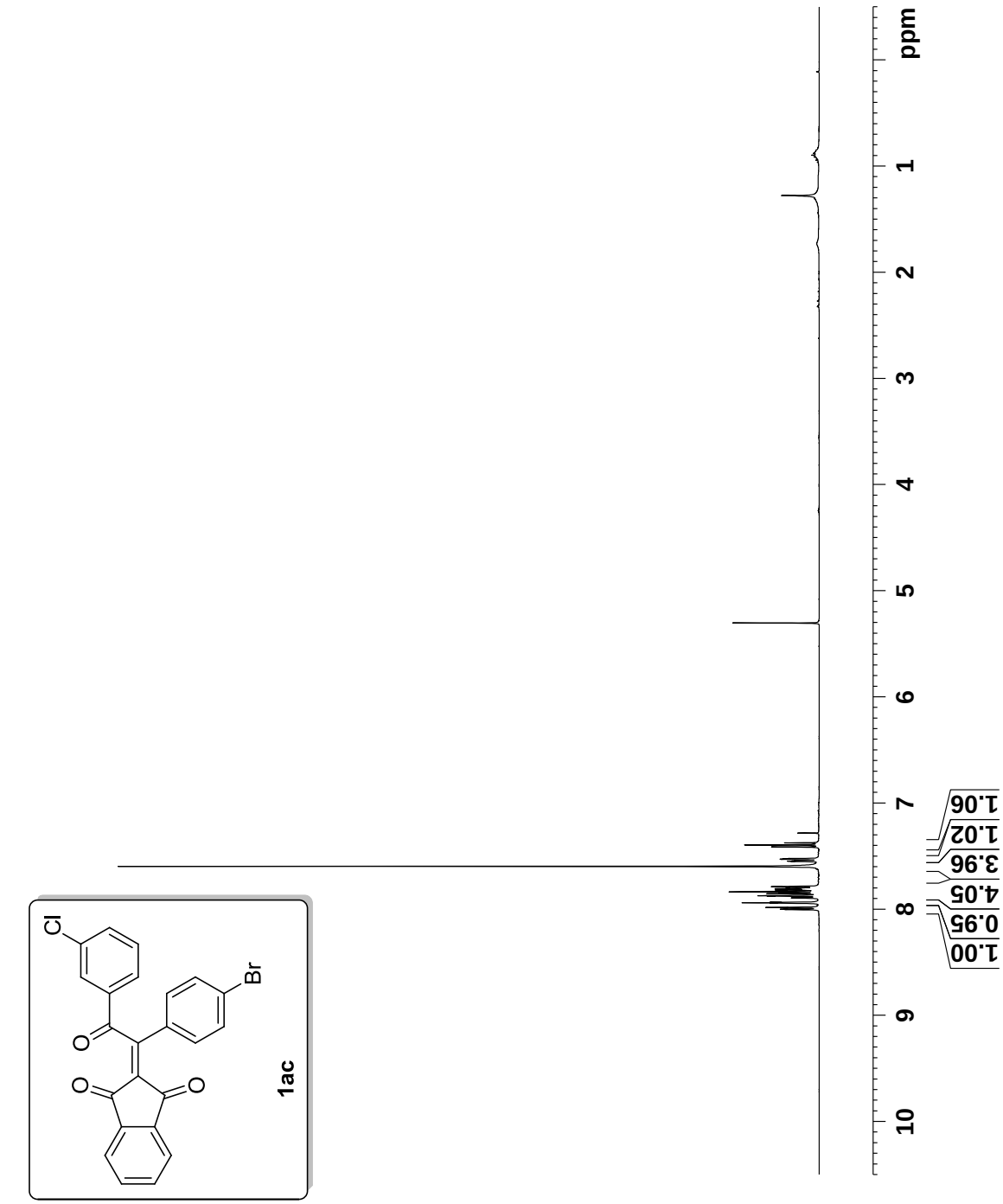

Current Data Parameters
NAME Roy 595
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110812
Time_ 19.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3000
DS 0
SWH 31446.541 Hz
FIDRES 0.479836 Hz
AQ 1.0420724 sec
RG 4096
DW 15.900 usec
DE 6.50 usec
TE 295.5 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0 sec 0.01500000 sec
MCWRK 0.01500000 sec
======== 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 125.7577981 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.4
123.5
126.6
128.0
128.9
129.6
131.4
131.7
134.0
135.0
135.8
135.9
140.1
142.3
157.3
195.0
188.7
187.3
Br
O
O
O
1aa
200
180
160
140
120
100
80
60
40
20
ppm

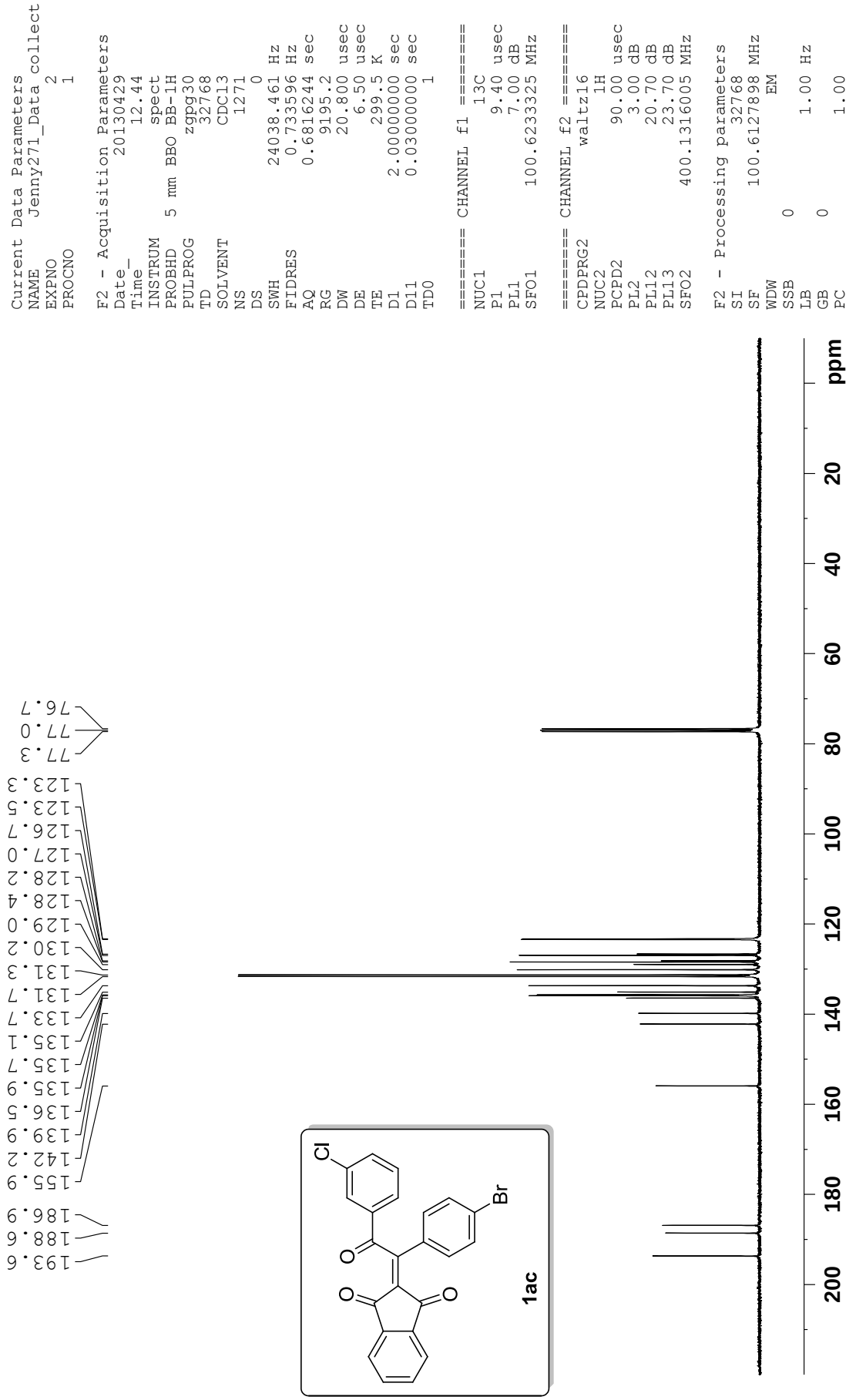

Current Data Parameters
NAME Jenny336
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130125
Time_ 19.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 128
DW 69.000 usec
DE 6.50 usec
TE 298.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300405 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
2.01
1.00
2.06
4.04
2.01
1.00
ppm
10
9
8
7
6
5
4
3
2
1
Cl
Br
O
O
O
1ab

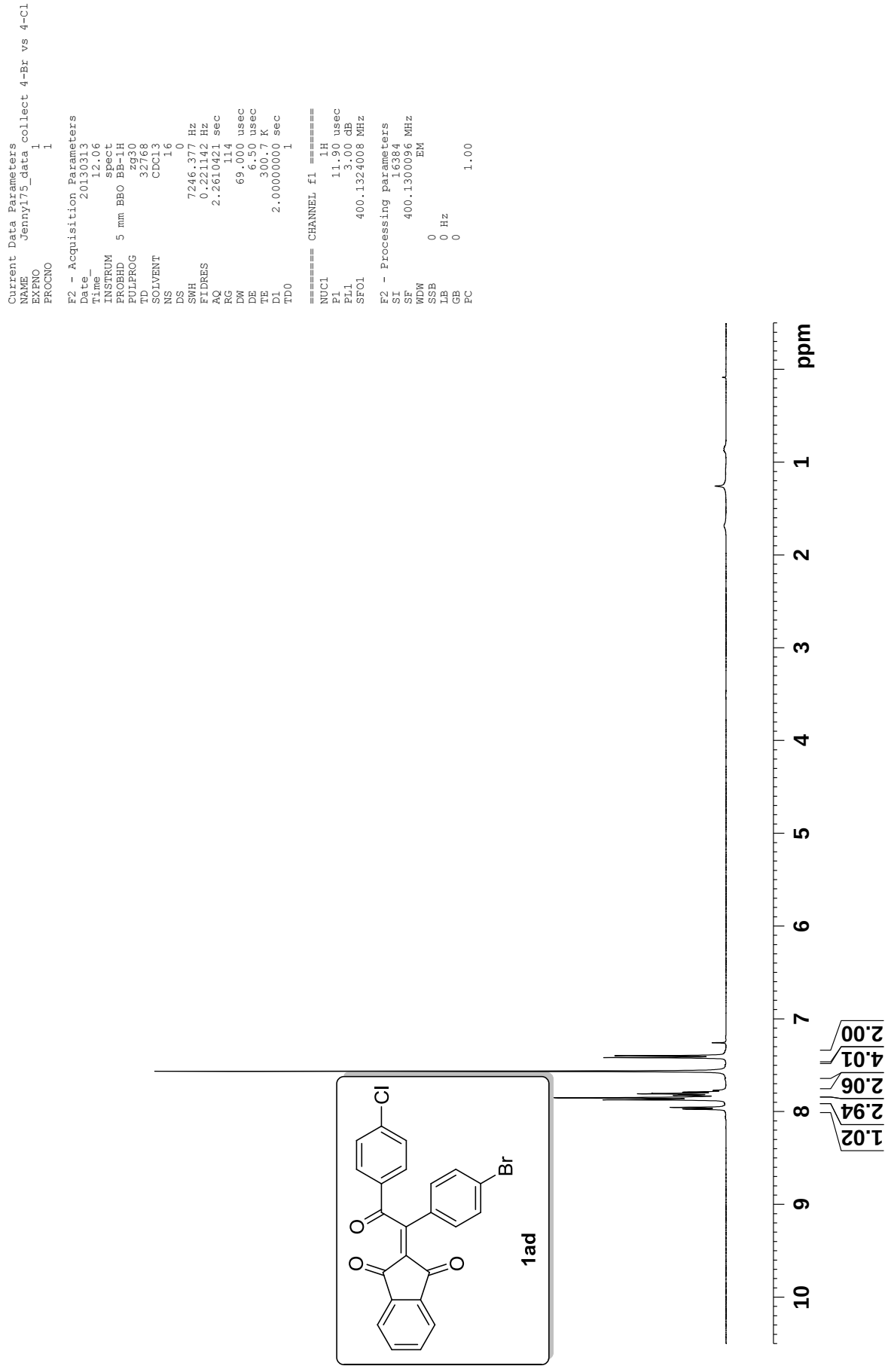


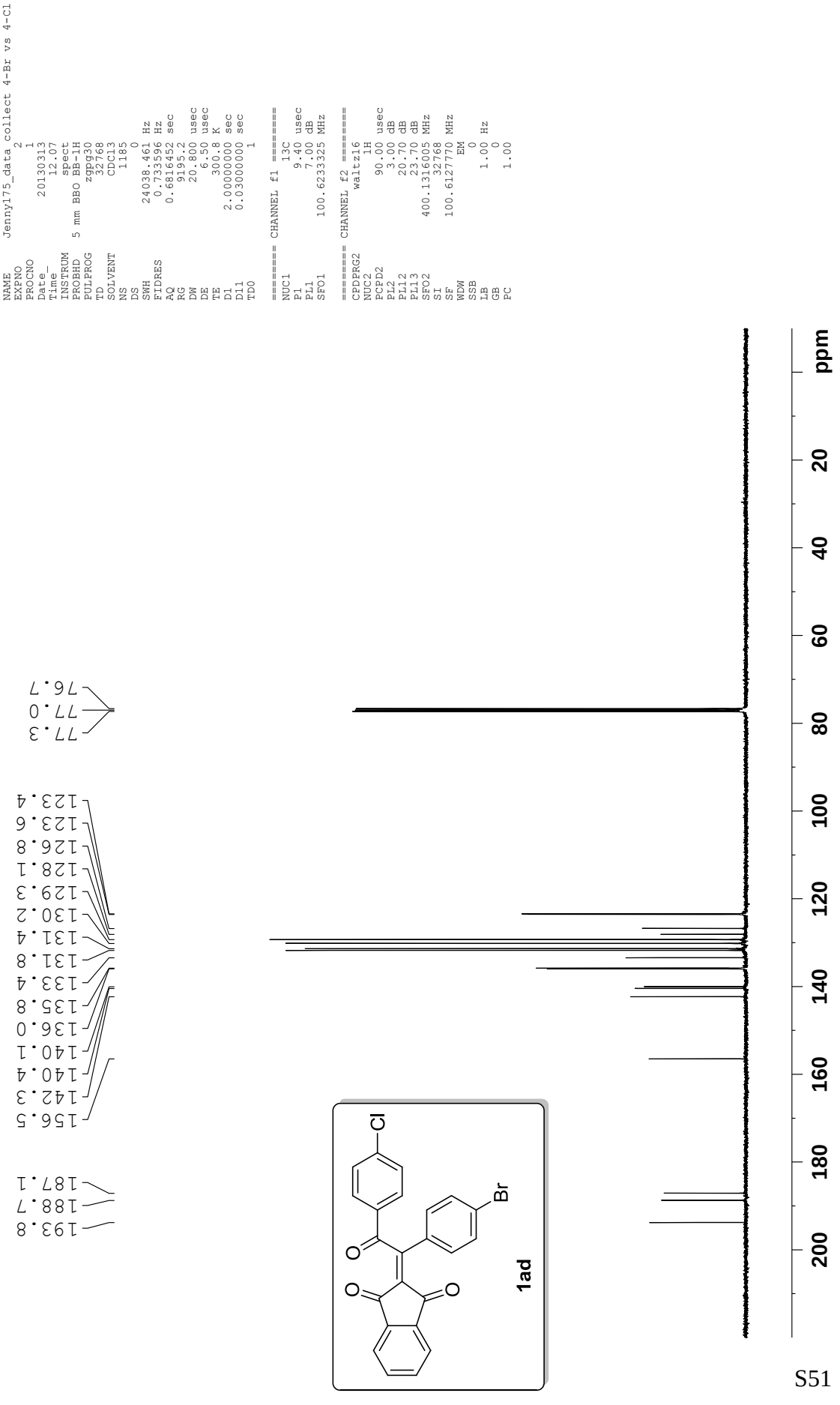


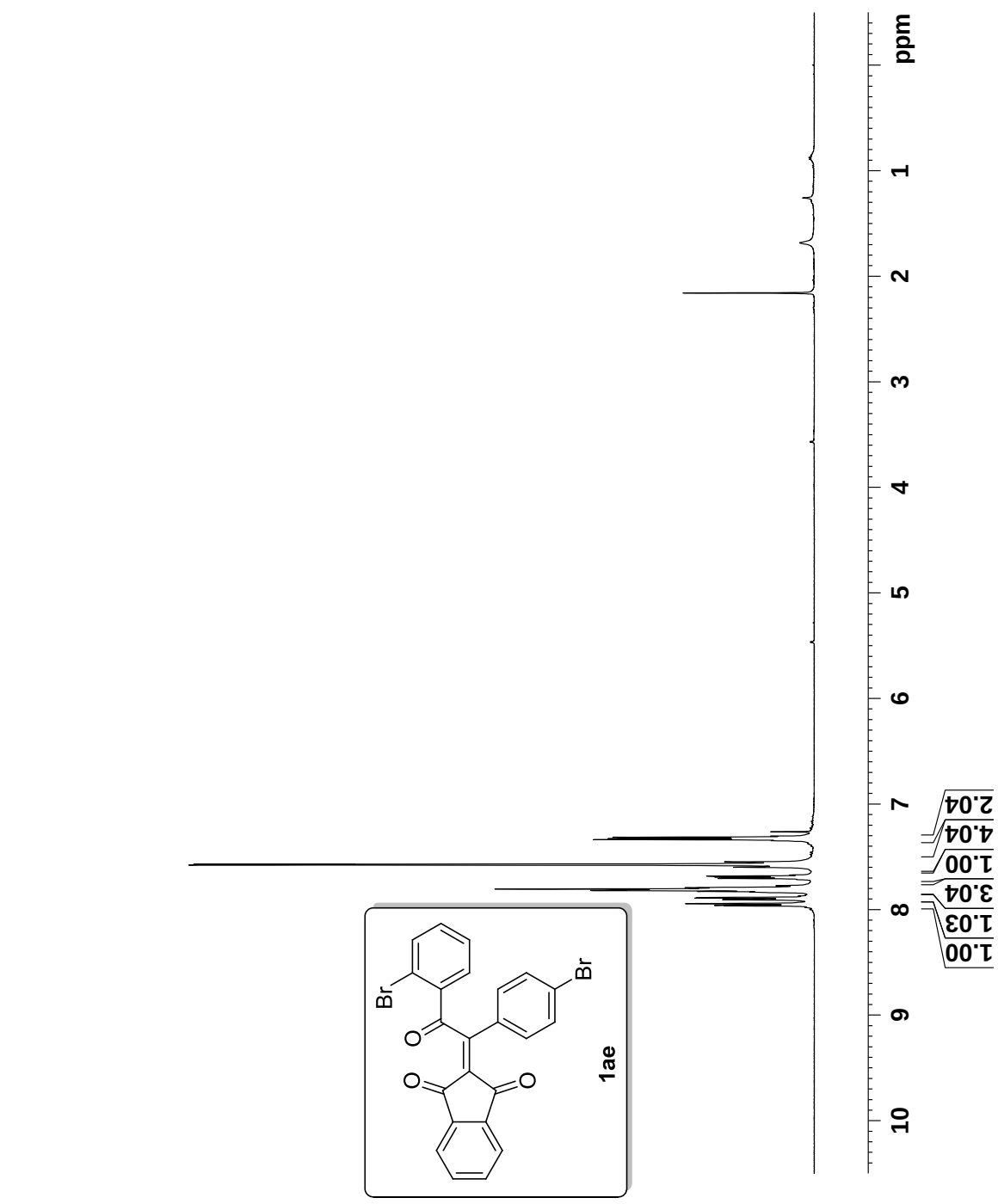

```
Current Data Parameters
NAME            Jenny270
EXPNO                  8
PROCNO                 1

F2 - Acquisition Parameters
Date_           20121231
Time               12.32
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1372
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                297.1 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 9.40 usec
PL1                7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             90.00 usec
PL2                3.00 dB
PL12              20.70 dB
PL13              23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127775 MHz
WDW                   EM
SSB      0
LB                 1.00 Hz
GB       0
PC                 1.00
```

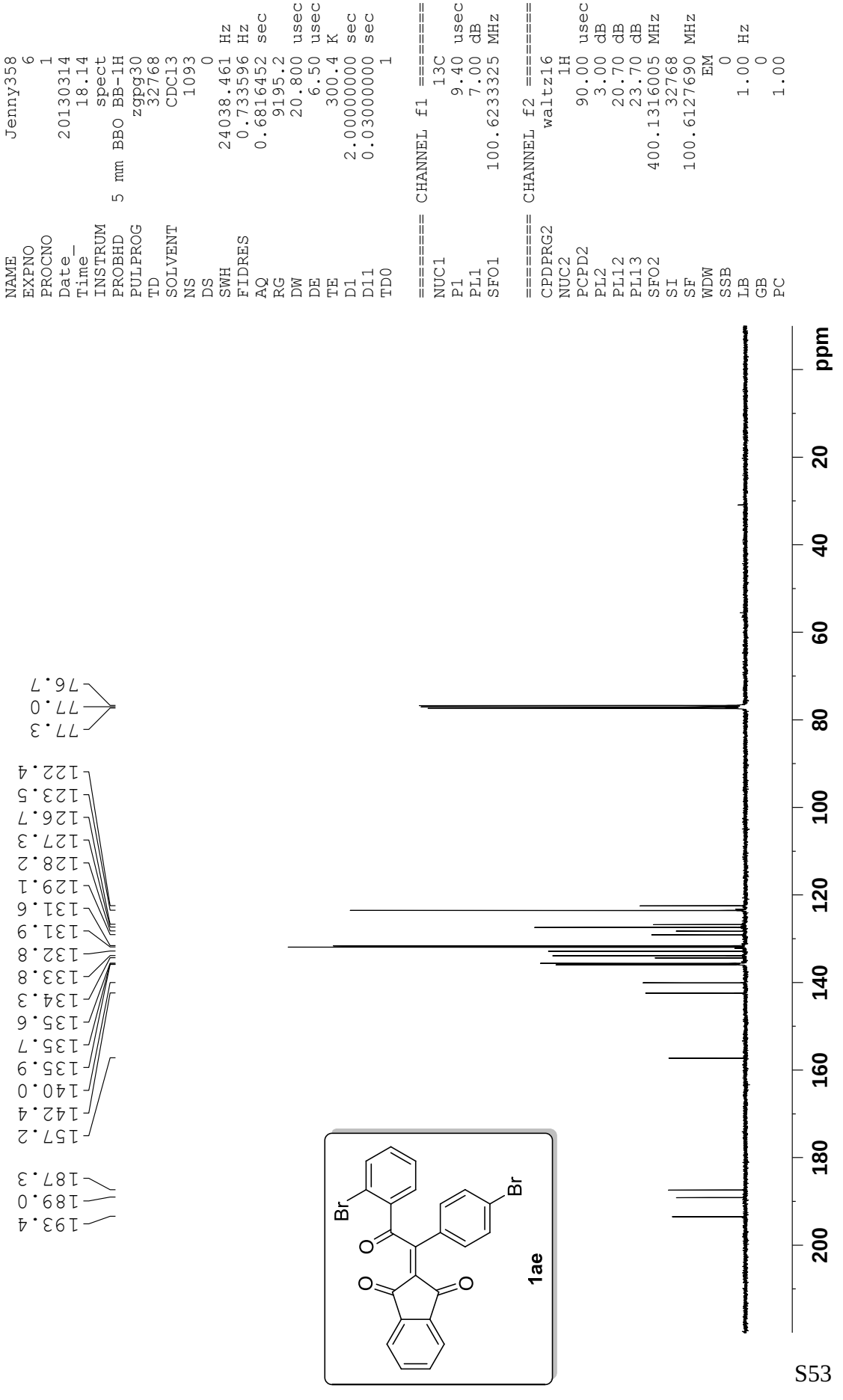

Current Data Parameters
NAME Jenny271
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130101
Time_ 18.11
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 71.8
DW 69.000 usec
DE 6.50 usec
TE 296.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
1.00
0.95
4.05
3.96
1.02
1.06
ppm
1
2
3
4
5
6
7
8
9
10
Cl
Br
O
O
O
1ac

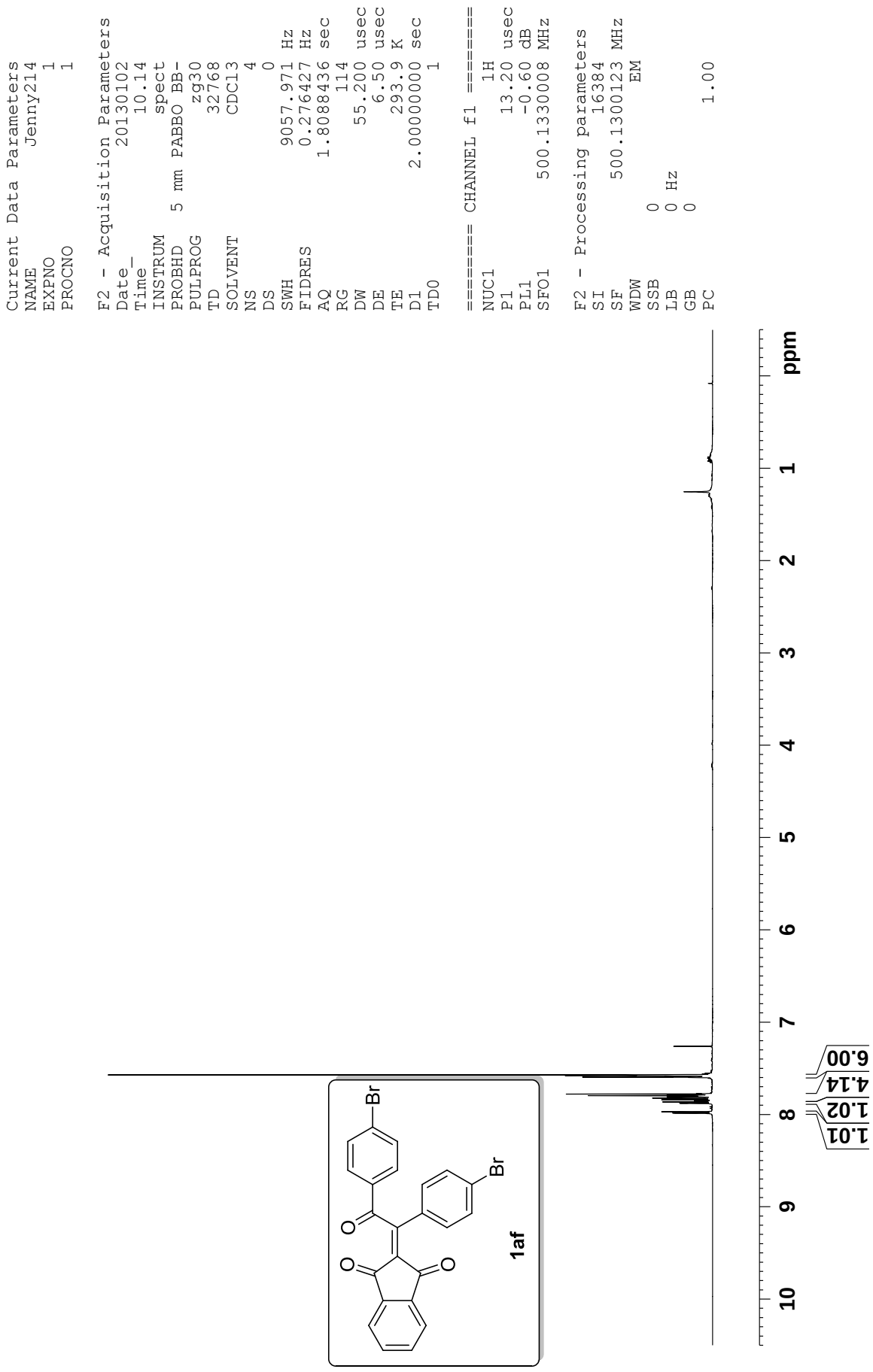

Current Data Parameters
NAME Jenny271_Data collect
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130429
Time_ 12.44
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1271
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127898 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
193.6
188.6
186.9
155.9
142.2
139.9
136.5
135.9
135.7
135.1
133.7
131.7
131.3
130.2
129.0
128.4
128.2
127.0
126.7
123.5
123.3
77.3
77.0
76.7
Cl
Br
O
O
O
1ac
200
180
160
140
120
100
80
60
40
20
ppm

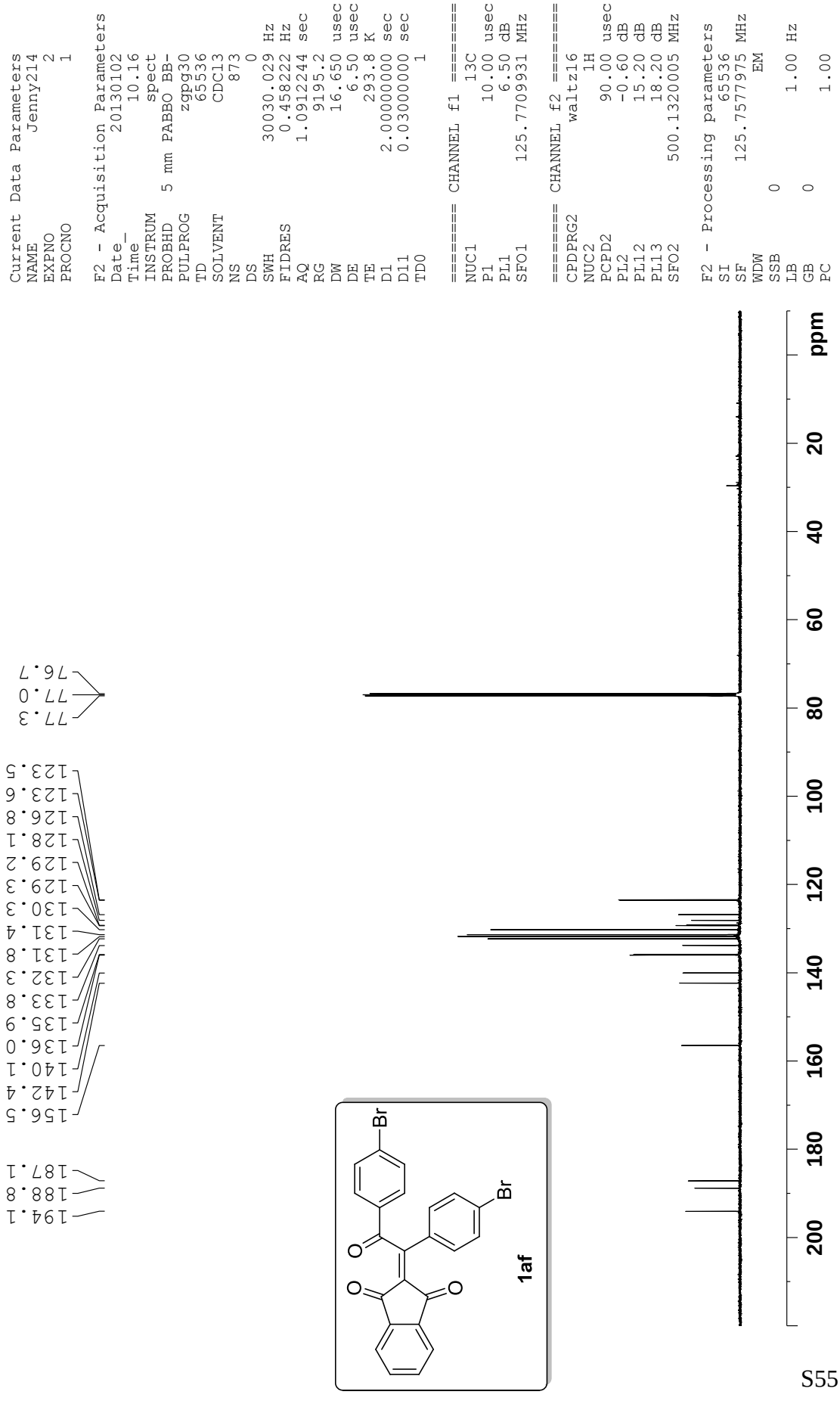

Current Data Parameters
NAME Jenny175_data collect 4-Br vs 4-Cl
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130313
Time_ 12.06
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 300.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300096 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
Br
O
O
O
1ad
1.02
2.94
2.06
4.01
2.00
10
9
8
7
6
5
4
3
2
1
ppm

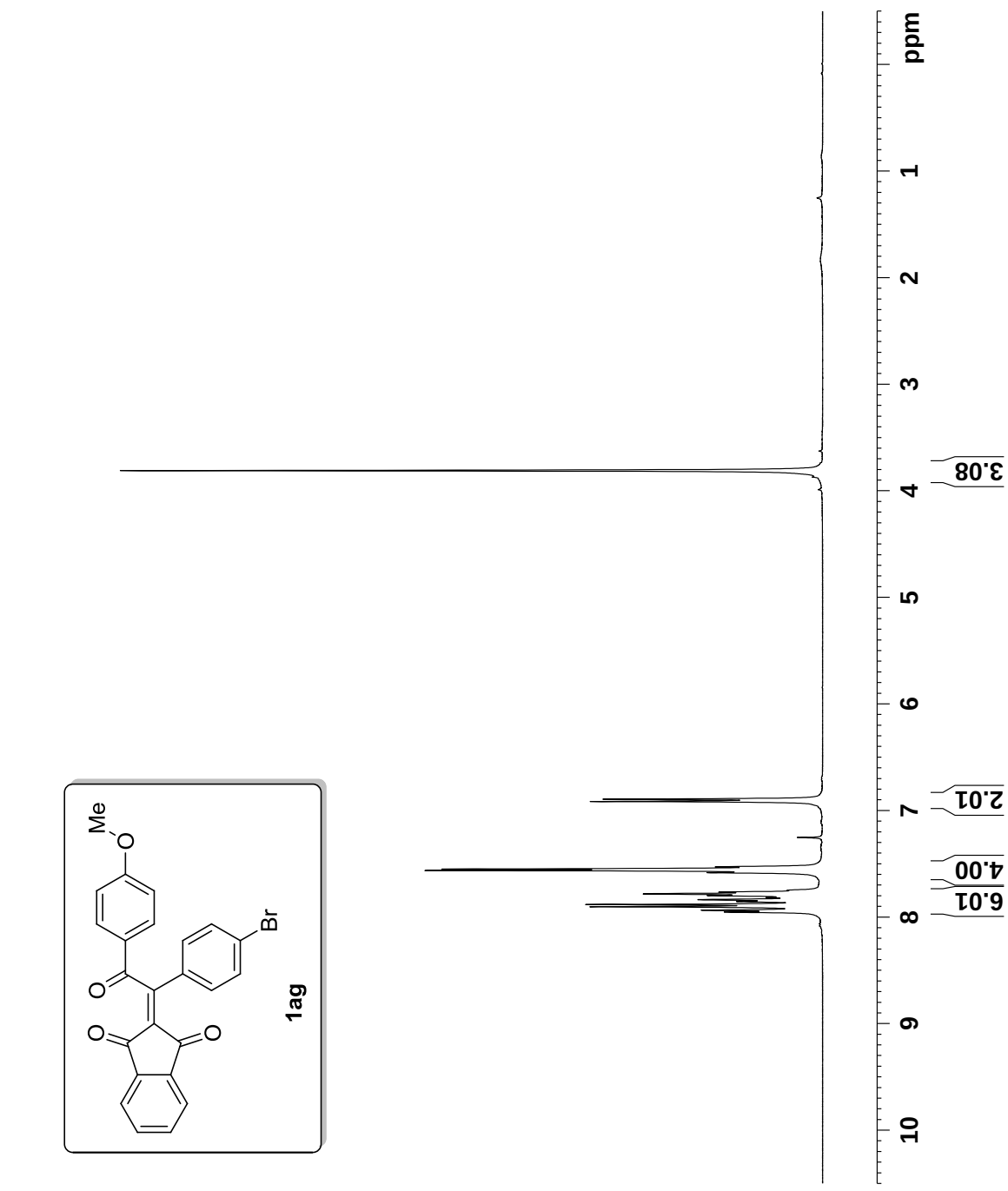

NAME Jenny175_data collect 4-Br vs 4-Cl
EXPNO 2
PROCNO 1
Date_ 20130313
Time_ 12.07
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1185
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127770 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.4
123.6
126.8
128.1
129.3
130.2
131.4
131.8
133.4
135.8
136.0
140.1
140.4
142.3
156.5
187.1
188.7
193.8
Cl
Br
O
O
O
1ad
ppm
200
180
160
140
120
100
80
60
40
20

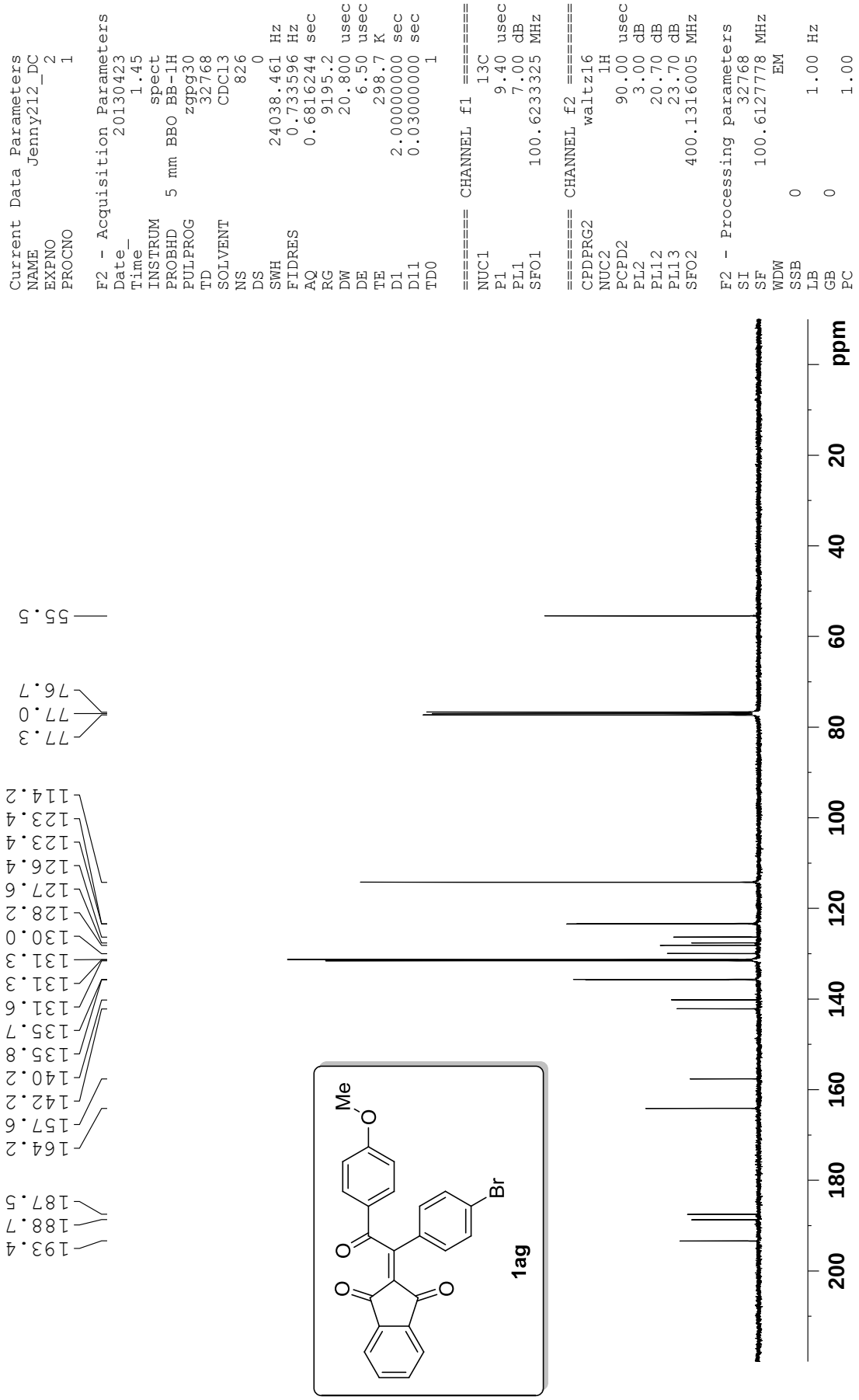

Current Data Parameters
NAME Jenny358
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130314
Time_ 18.13
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 300.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300076 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Br
Br
O
O
O
1ae
1.00
1.03
3.04
1.00
4.04
2.04
ppm

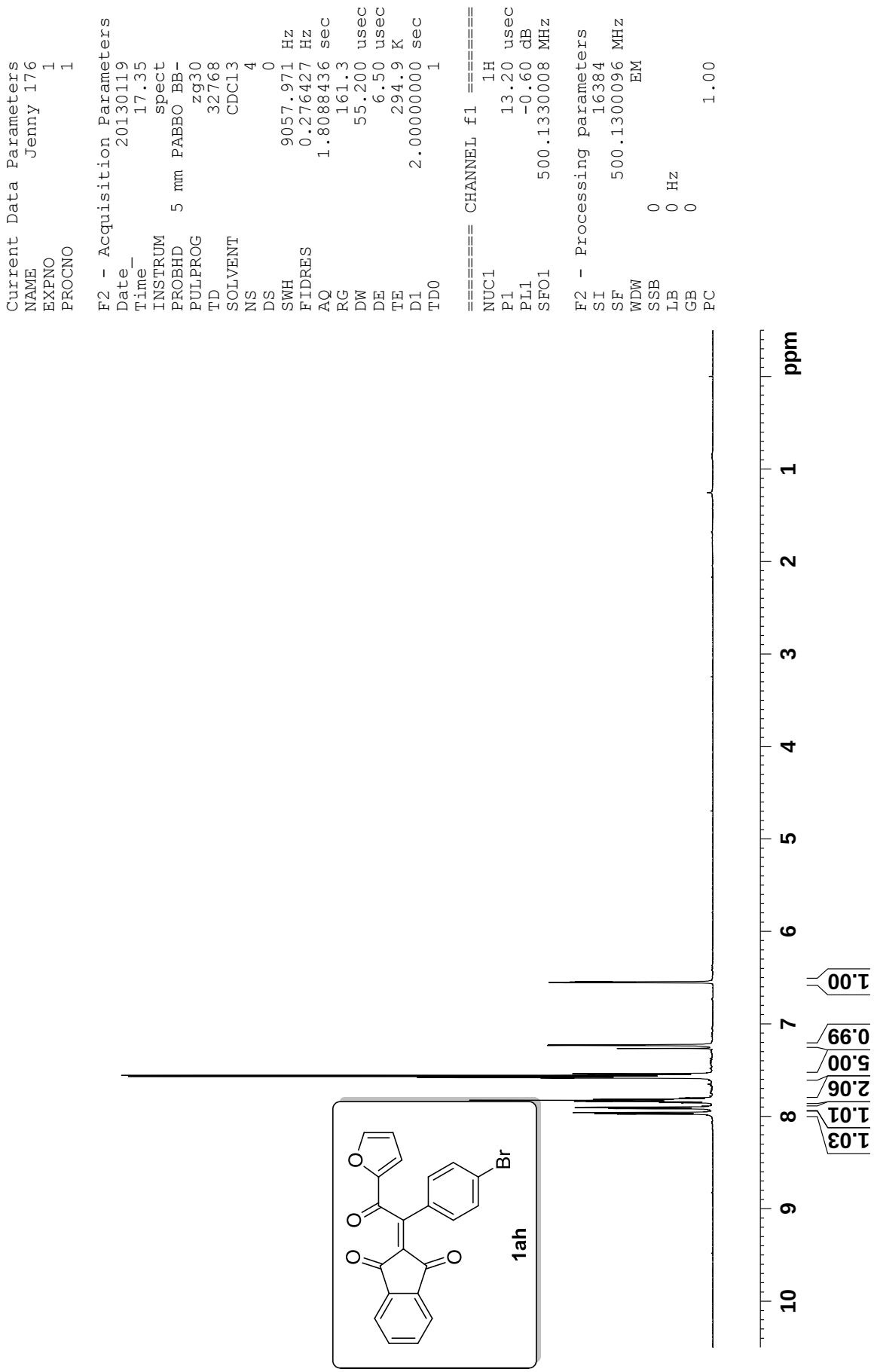

NAME Jenny358
EXPNO 6
PROCNO 1
Date_ 20130314
Time_ 18.14
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1093
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816452 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
122.4
123.5
126.7
127.3
128.2
129.1
131.6
131.9
132.8
133.8
134.3
135.6
135.7
135.9
140.0
142.4
157.2
193.4
189.0
187.3
Br
Br
O
O
O
1ae
ppm
200
180
160
140
120
100
80
60
40
20

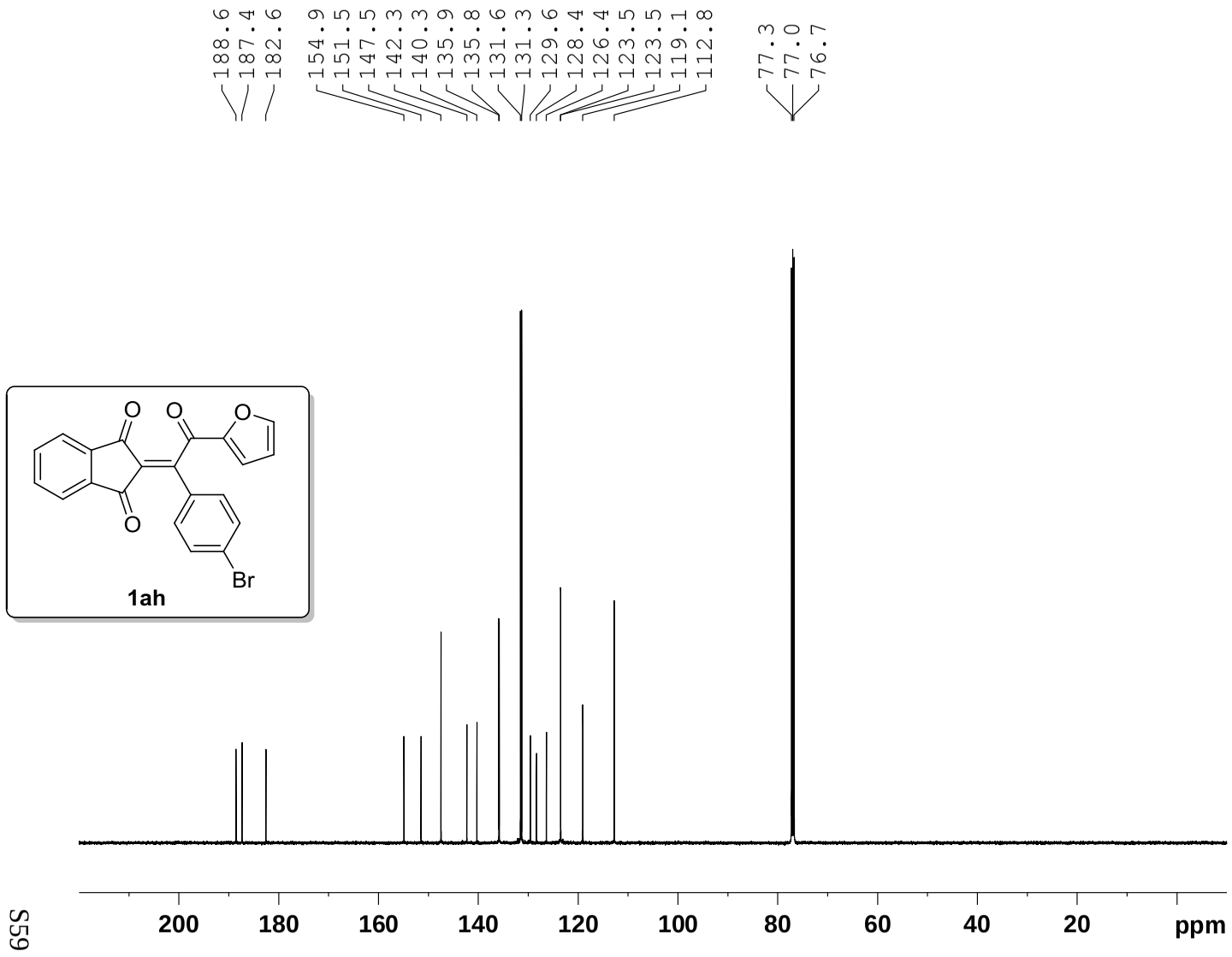

Current Data Parameters
NAME Jenny214
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130102
Time_ 10.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 114
DW 55.200 usec
DE 6.50 usec
TE 293.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300123 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Br
Br
O
O
O
1af
1.01
1.02
4.14
6.00
ppm
1
2
3
4
5
6
7
8
9
10


Current Data Parameters
NAME Jenny214
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130102
Time_ 10.16
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 873
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 293.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577975 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.5
123.6
123.8
126.8
128.1
129.2
129.3
130.3
131.4
131.8
132.3
133.8
135.9
136.0
140.1
142.4
156.5
187.1
188.8
194.1
Br
Br
O
O
O
1af
200
180
160
140
120
100
80
60
40
20
ppm

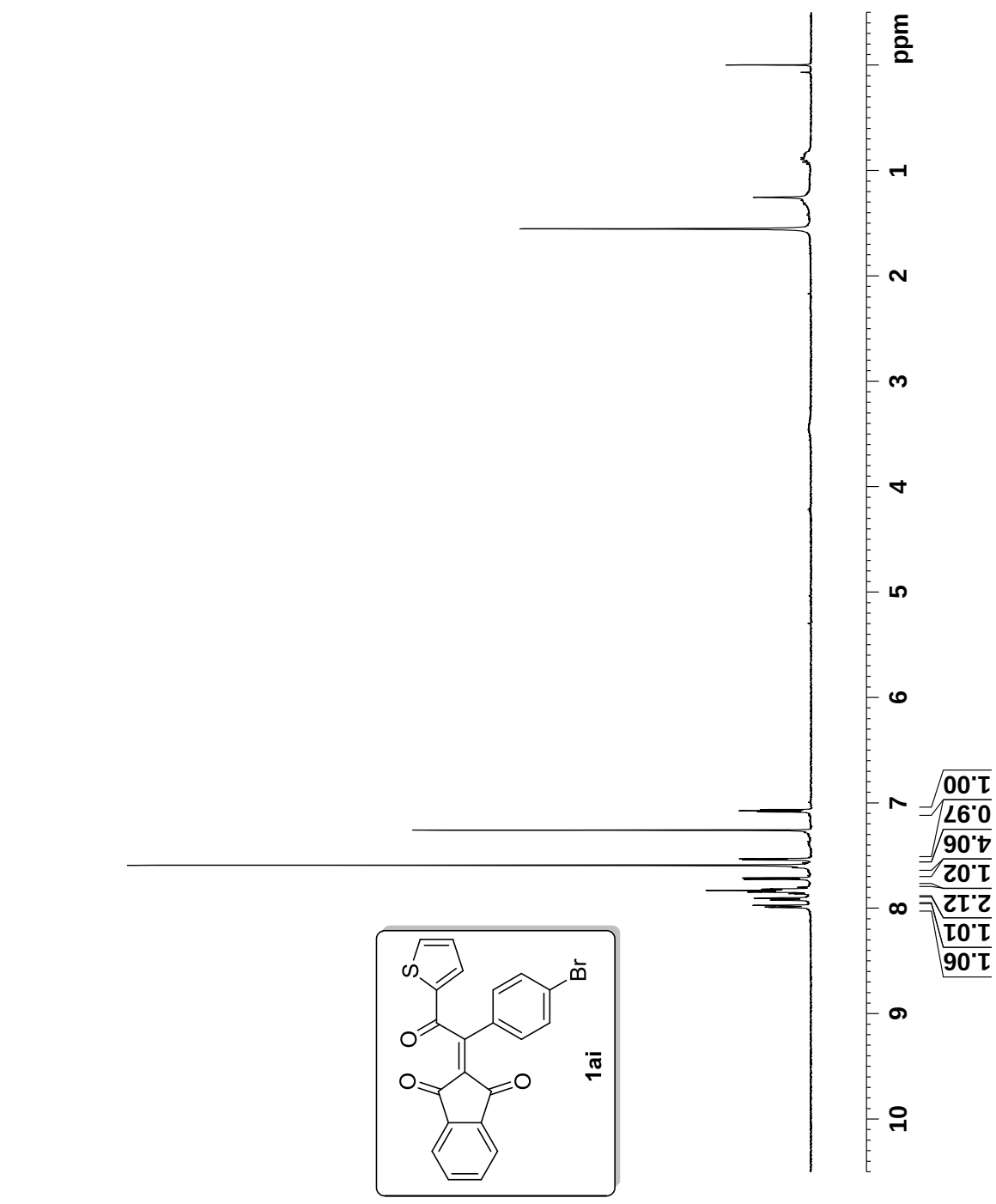

Current Data Parameters
NAME Jenny212_DC
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 1.43
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 57
DW 69.000 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300118 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Me
O
Br
O
O
O
1ag
ppm
10
9
8
7
6
5
4
3
2
1
6.01
4.00
2.01
3.08

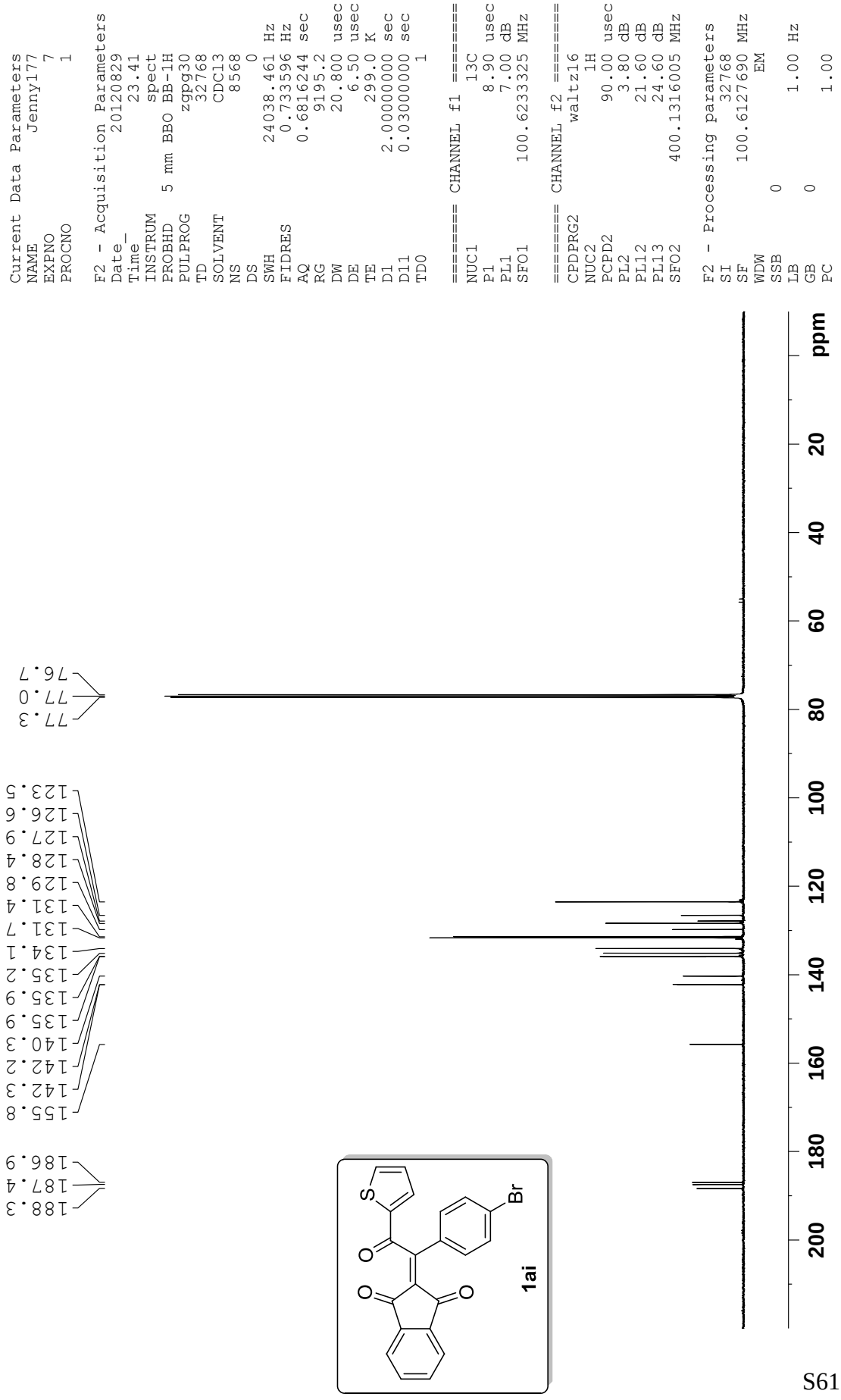

Current Data Parameters
NAME Jenny212_DC
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 1.45
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 826
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127778 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
55.5
77.3
77.0
76.7
114.2
123.4
123.4
126.4
127.6
128.2
130.0
131.3
131.3
131.6
135.7
135.8
140.2
142.2
157.6
164.2
187.5
188.7
193.4
Me
O
Br
O
O
O
1ag
200
180
160
140
120
100
80
60
40
20
ppm

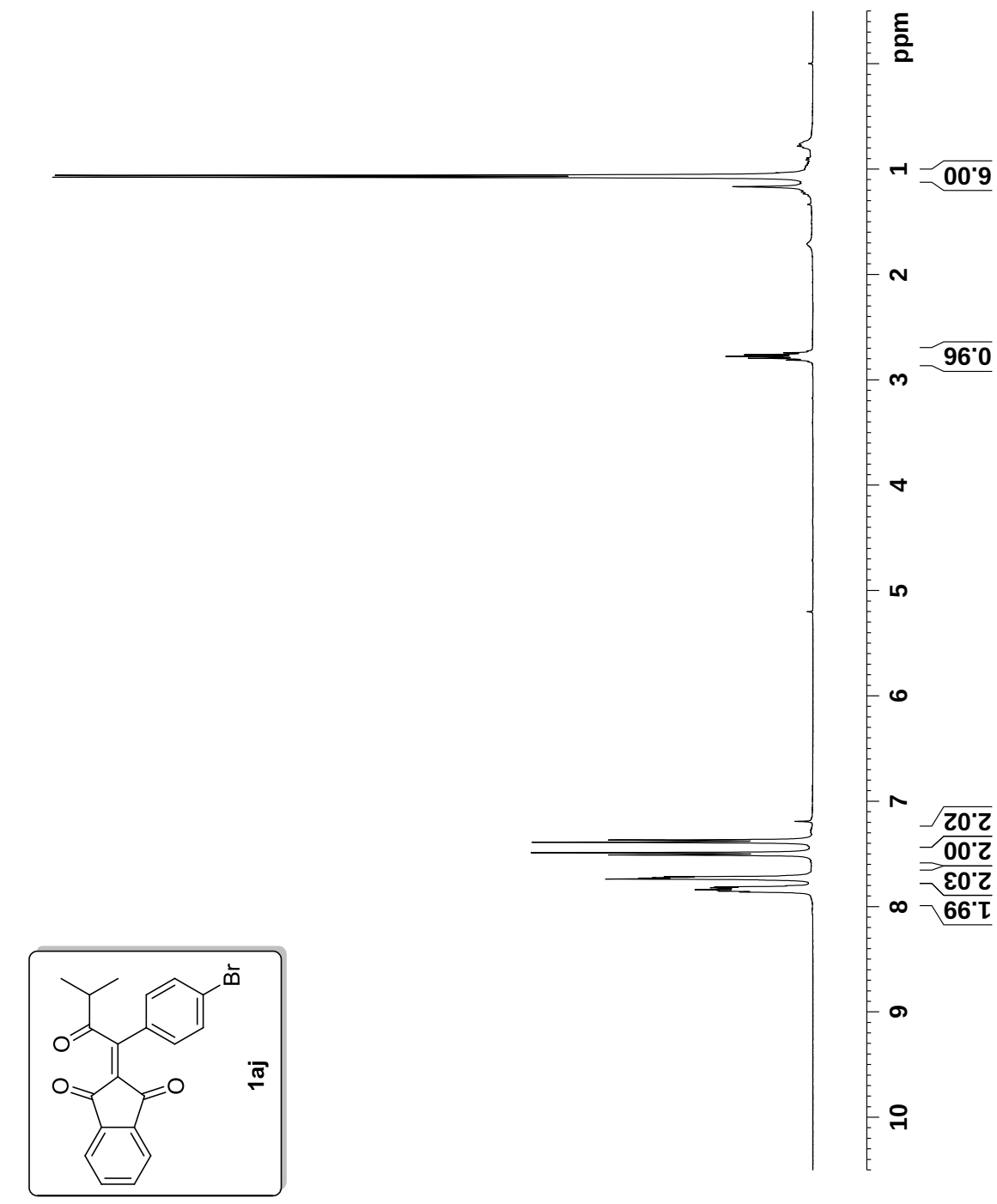

Current Data Parameters
NAME Jenny 176
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130119
Time_ 17.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 161.3
DW 55.200 usec
DE 6.50 usec
TE 294.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300096 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.03
1.01
2.06
5.00
0.99
1.00
ppm
1ah
Br

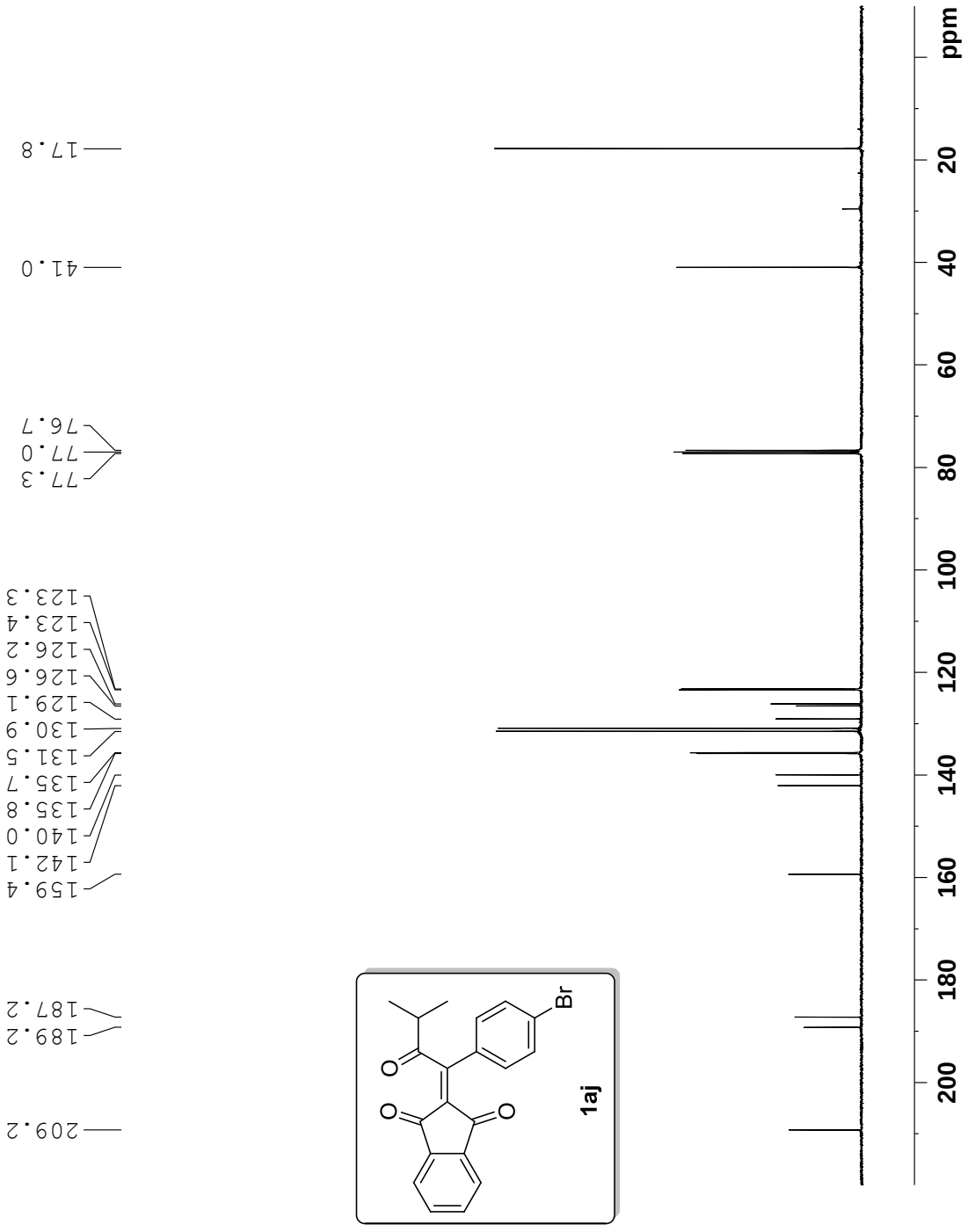


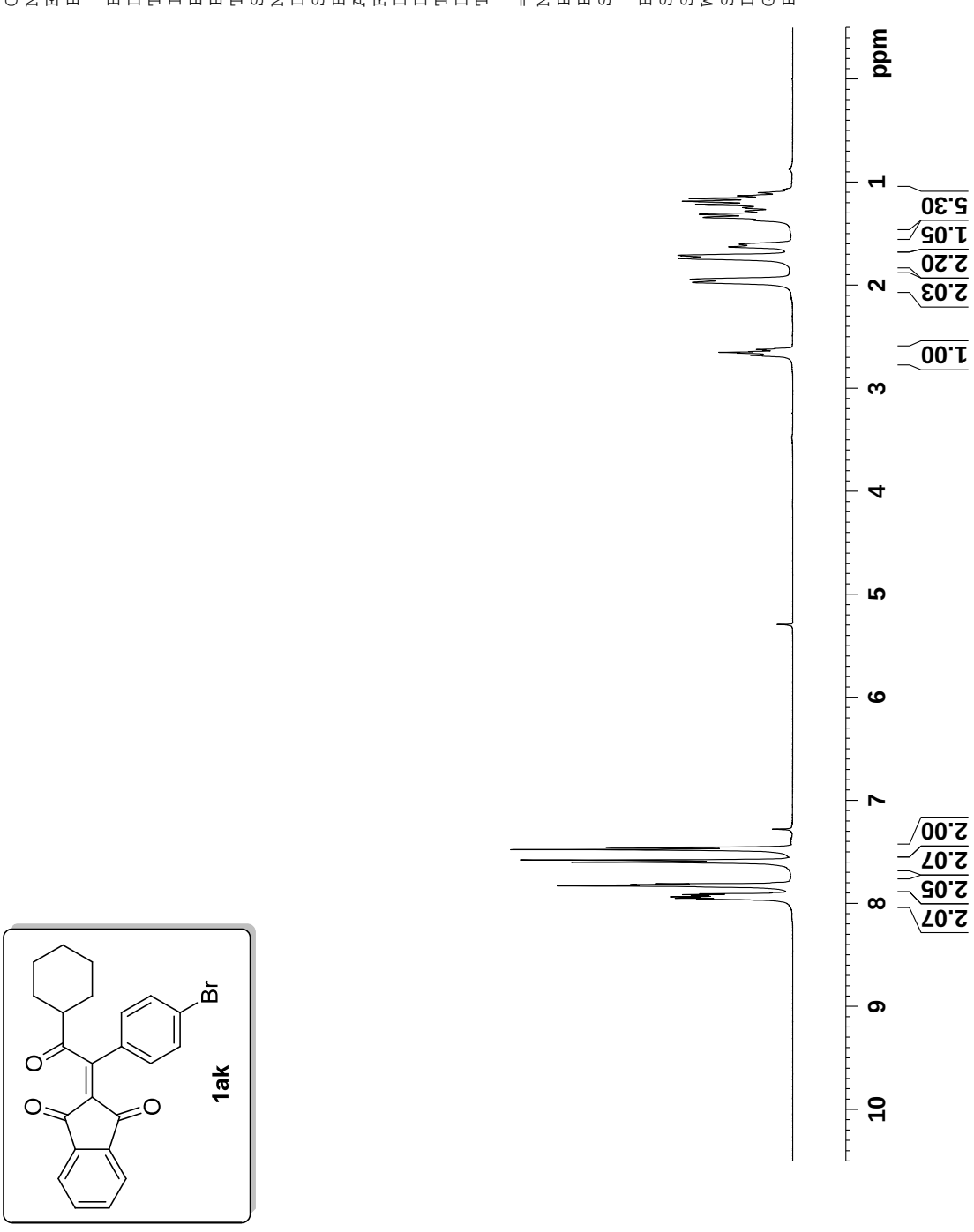

```
Current Data Parameters
NAME                 Jenny 176
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20130119
Time                     17.36
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                       9195.2
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                       10.00 usec
PL1                       6.50 dB
SFO1                125.7709931 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                    90.00 usec
PL2                      -0.60 dB
PL12                     15.20 dB
PL13                     18.20 dB
SFO2                500.1320005 MHz

F2 - Processing parameters
SI                       65536
SF                  125.7577959 MHz
WDW                         EM
SSB          0
LB                        1.00 Hz
GB           0
PC                        1.00
```

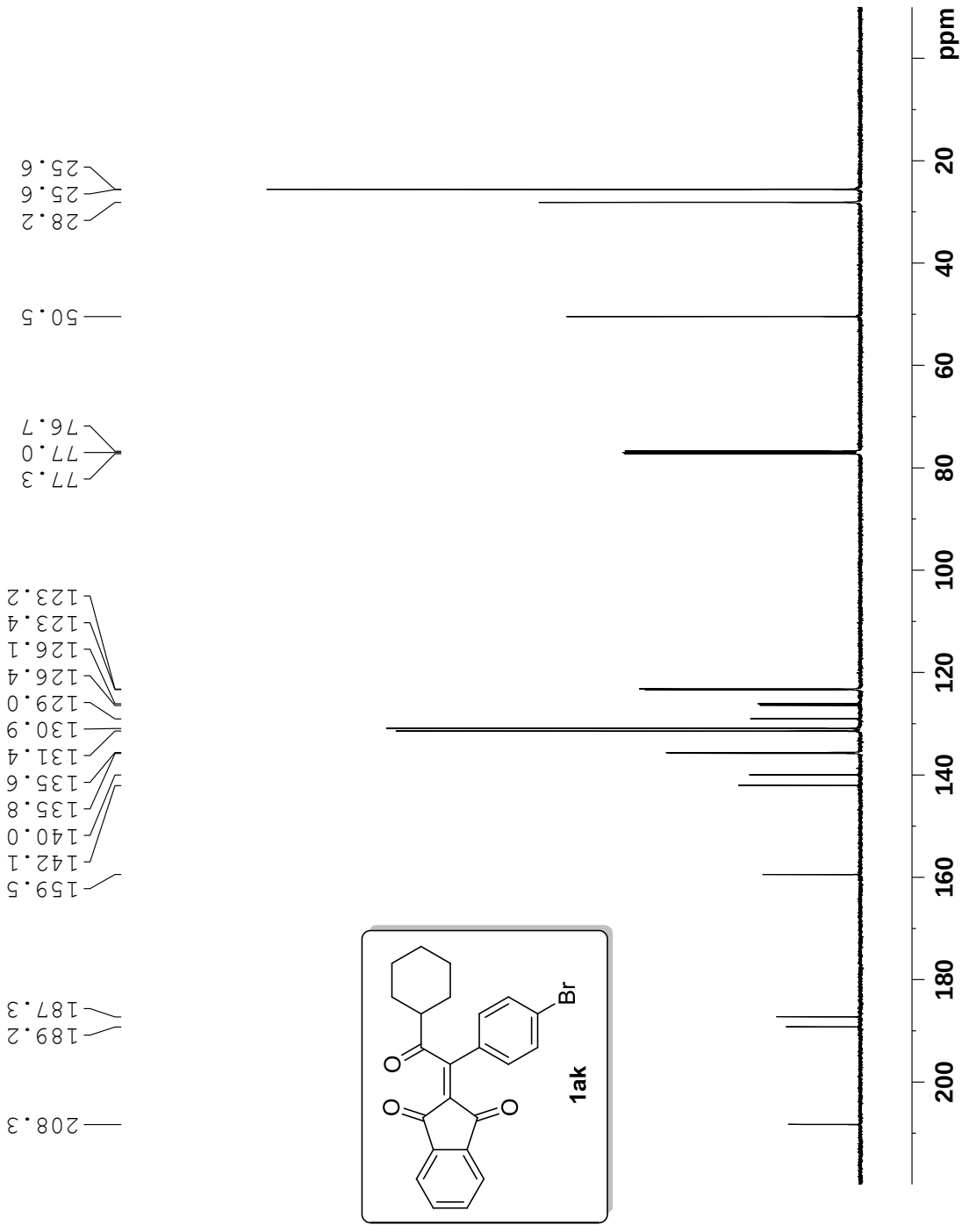

Current Data Parameters
NAME Jenny177-2
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121112
Time_ 17.34
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300092 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
S
O
O
O
Br
1ai
ppm
1
2
3
4
5
6
7
8
9
10
1.06
1.01
2.12
1.02
4.06
0.97
1.00

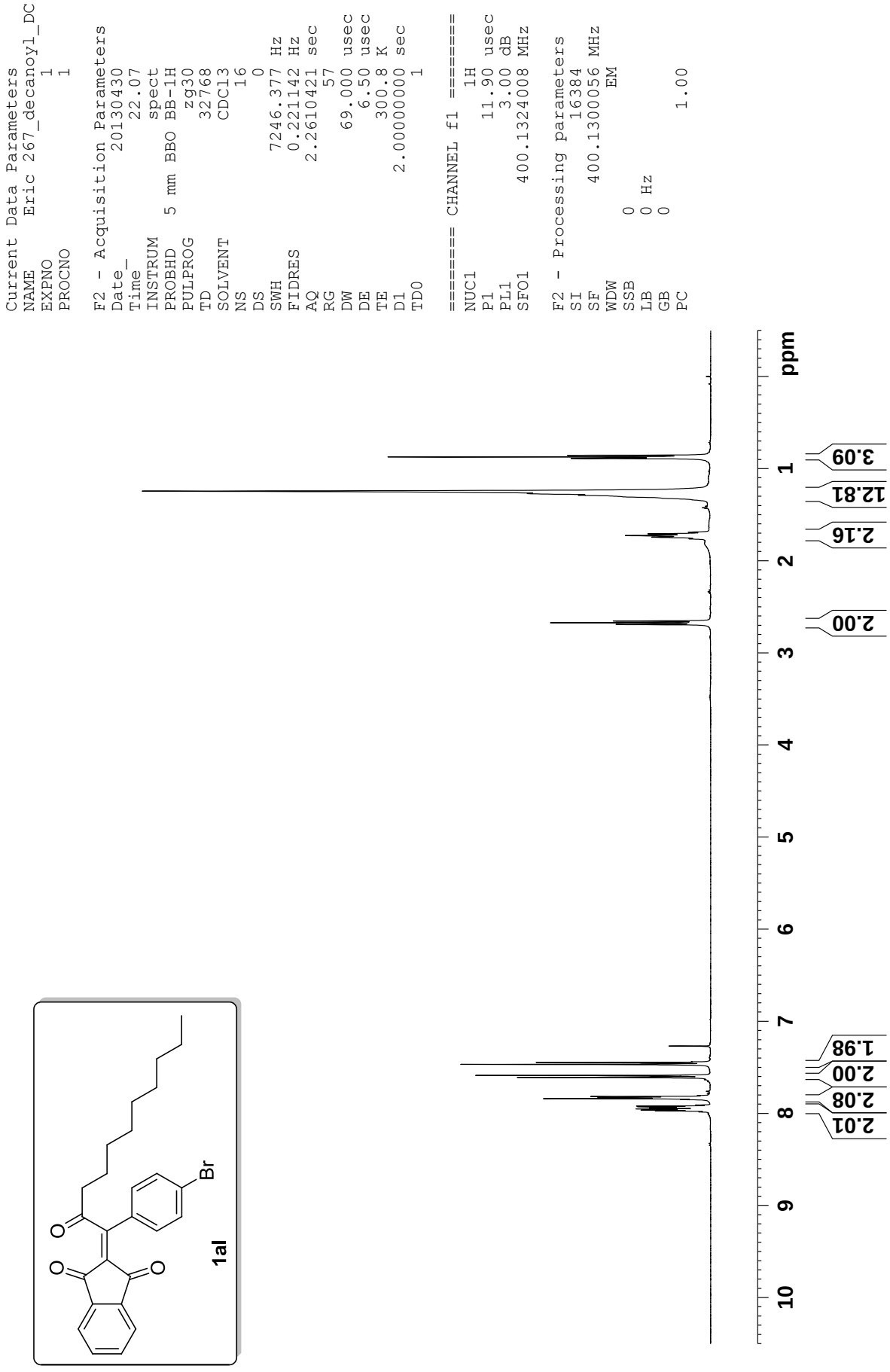

Current Data Parameters
NAME Jenny177
EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120829
Time_ 23.41
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 8568
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 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 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.5
126.6
127.9
128.4
129.8
131.4
131.7
134.1
135.2
135.9
135.9
140.3
142.2
142.3
155.8
188.3
187.4
186.9
S
O
O
O
Br
1ai
200
180
160
140
120
100
80
60
40
20
ppm

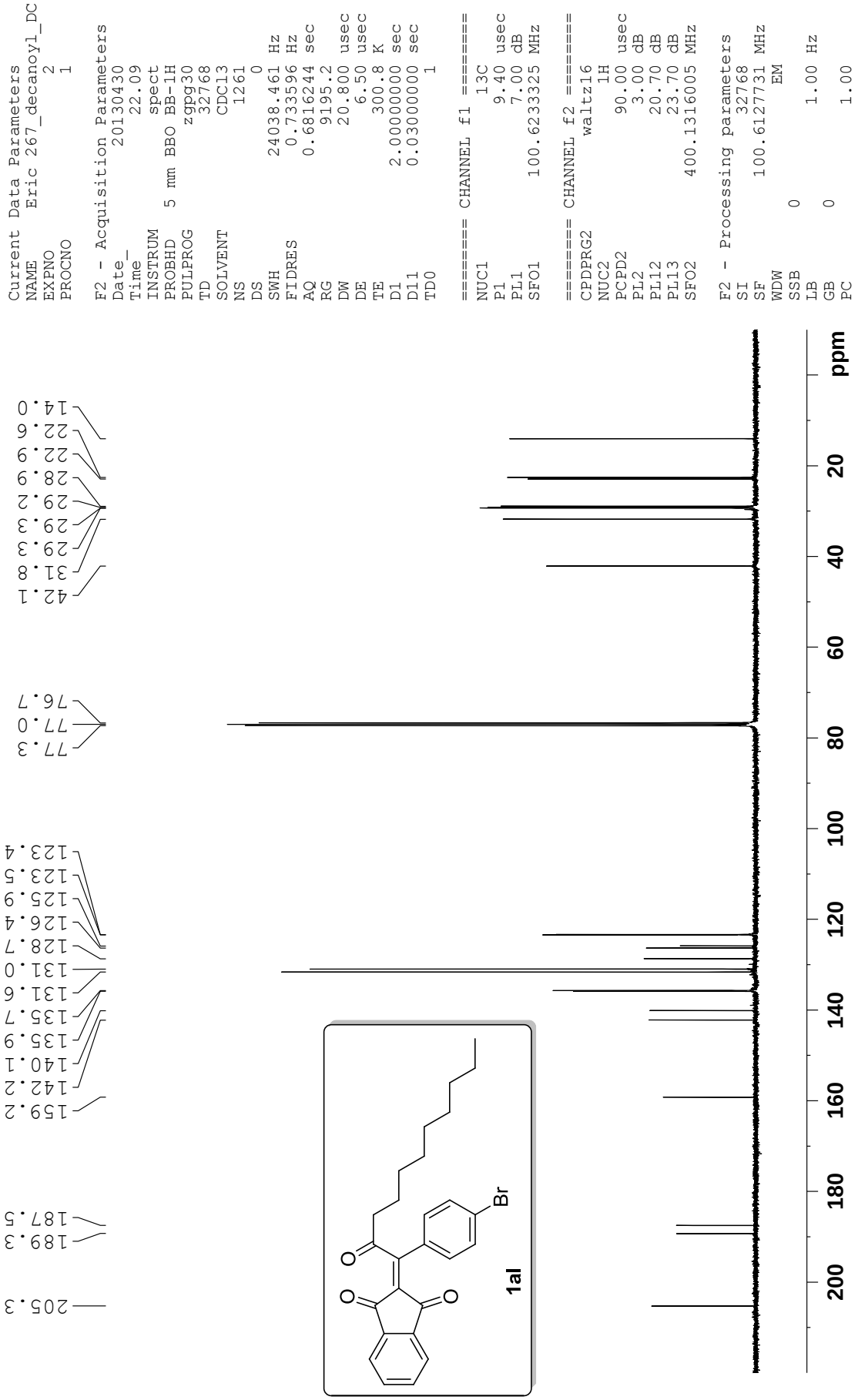

Current Data Parameters
NAME Jenny420_data
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130401
Time_ 18.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 35.9
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300369 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
6.00
0.96
2.02
2.00
2.03
1.99
Br
O
O
O
1aj

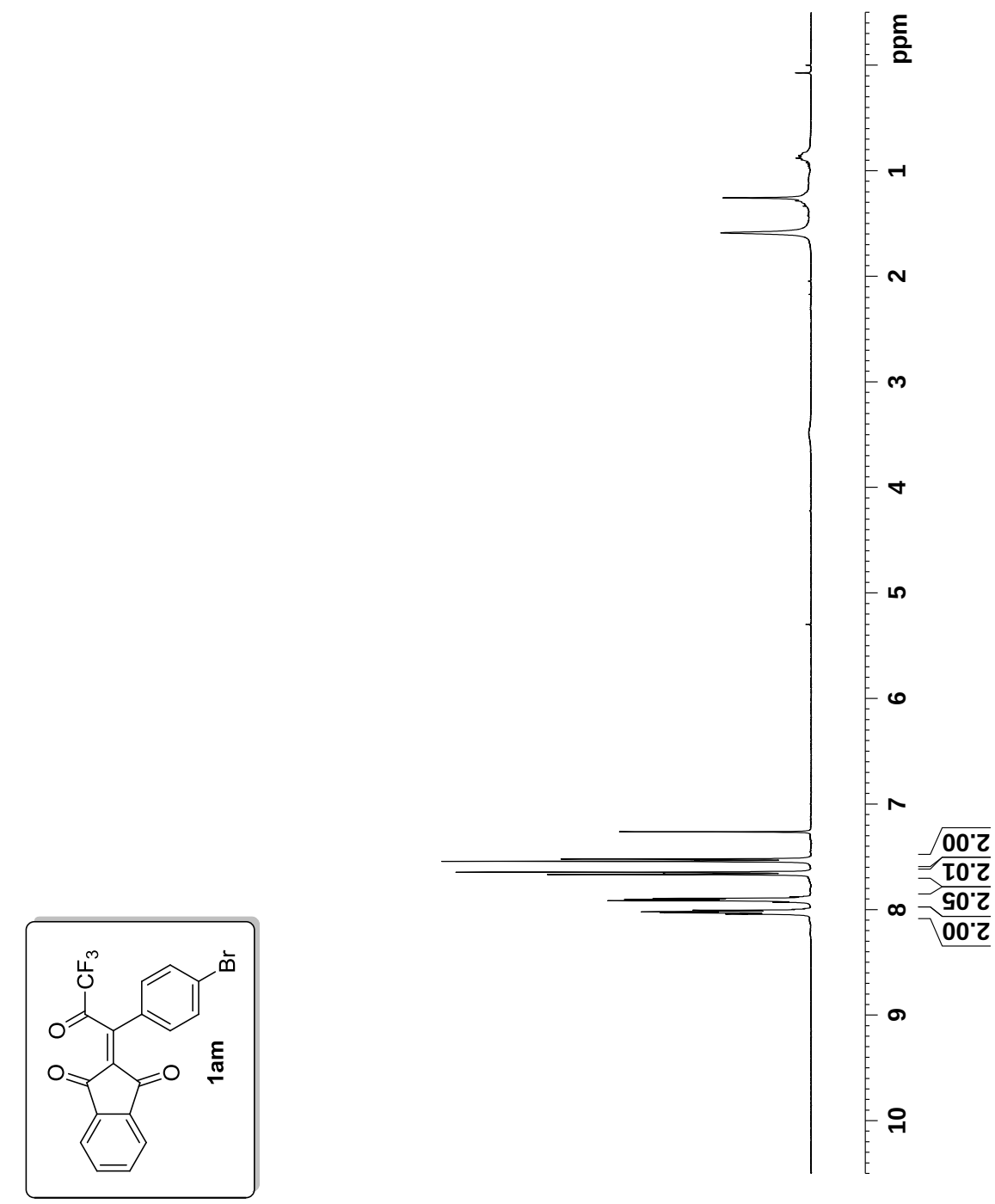

Current Data Parameters
NAME Jenny420_data
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130401
Time_ 18.22
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 844
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127790 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
209.2
189.2
187.2
159.4
142.1
140.0
135.8
135.7
131.5
130.9
129.1
126.6
126.2
123.4
123.3
77.3
77.0
76.7
41.0
17.8
Br
O
O
O
1aj
ppm
200
180
160
140
120
100
80
60
40
20

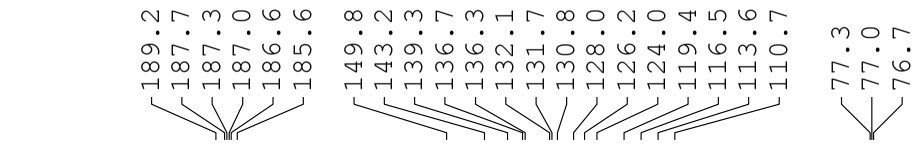

Current Data Parameters
NAME Jenny426_Cy DC
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130425
Time_ 21.44
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 45.3
DW 69.000 usec
DE 6.50 usec
TE 300.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300012 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
Br
O
O
O
1ak
ppm
1
2
3
4
5
6
7
8
9
10
5.30
1.05
2.20
2.03
1.00
2.00
2.07
2.05
2.07

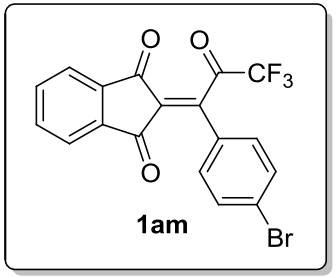

Current Data Parameters
NAME Jenny 426
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130425
Time_ 22.04
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 425
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 8192
DW 16.650 usec
DE 6.50 usec
TE 296.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578038 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
208.3
189.2
187.3
159.5
142.1
140.0
135.8
135.6
131.4
130.9
129.0
126.4
126.1
123.4
123.2
77.3
77.0
76.7
50.5
28.2
25.6
25.6
Br
O
O
O
1ak
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Eric 267_decanoyl_DC
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130430
Time_ 22.07
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 57
DW 69.000 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300056 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
3.09
12.81
2.16
2.00
1.98
2.00
2.08
2.01
O
O
O
Br
1al

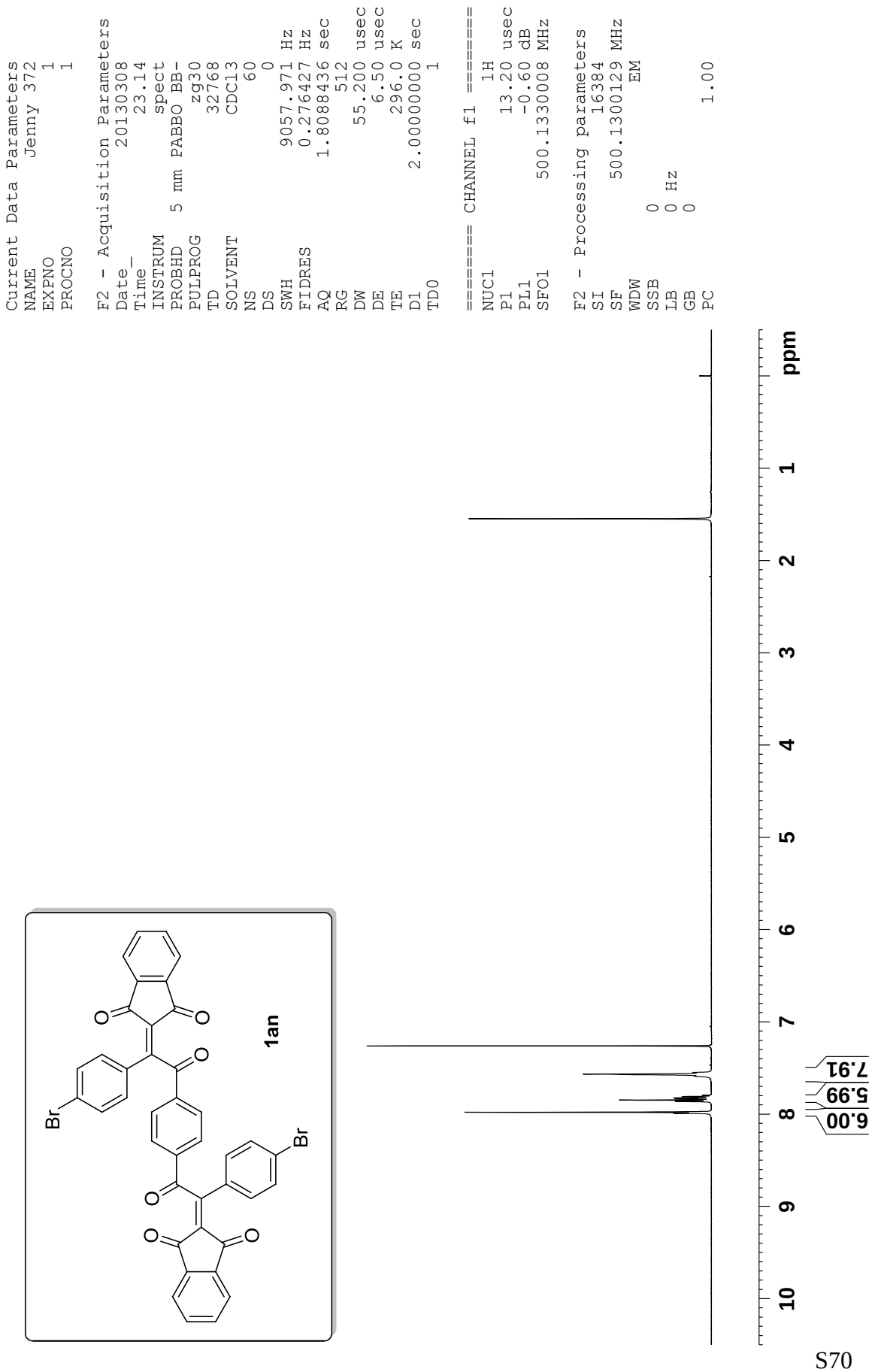

Current Data Parameters
NAME Eric 267_decanoyl_DC
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130430
Time_ 22.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1261
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127731 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
205.3
189.3
187.5
159.2
142.2
140.1
135.9
135.7
131.6
131.0
128.7
126.4
125.9
123.5
123.4
77.3
77.0
76.7
42.1
31.8
29.3
29.3
29.2
28.9
22.9
22.6
14.0
Br
O
O
O
1al
200
180
160
140
120
100
80
60
40
20
ppm

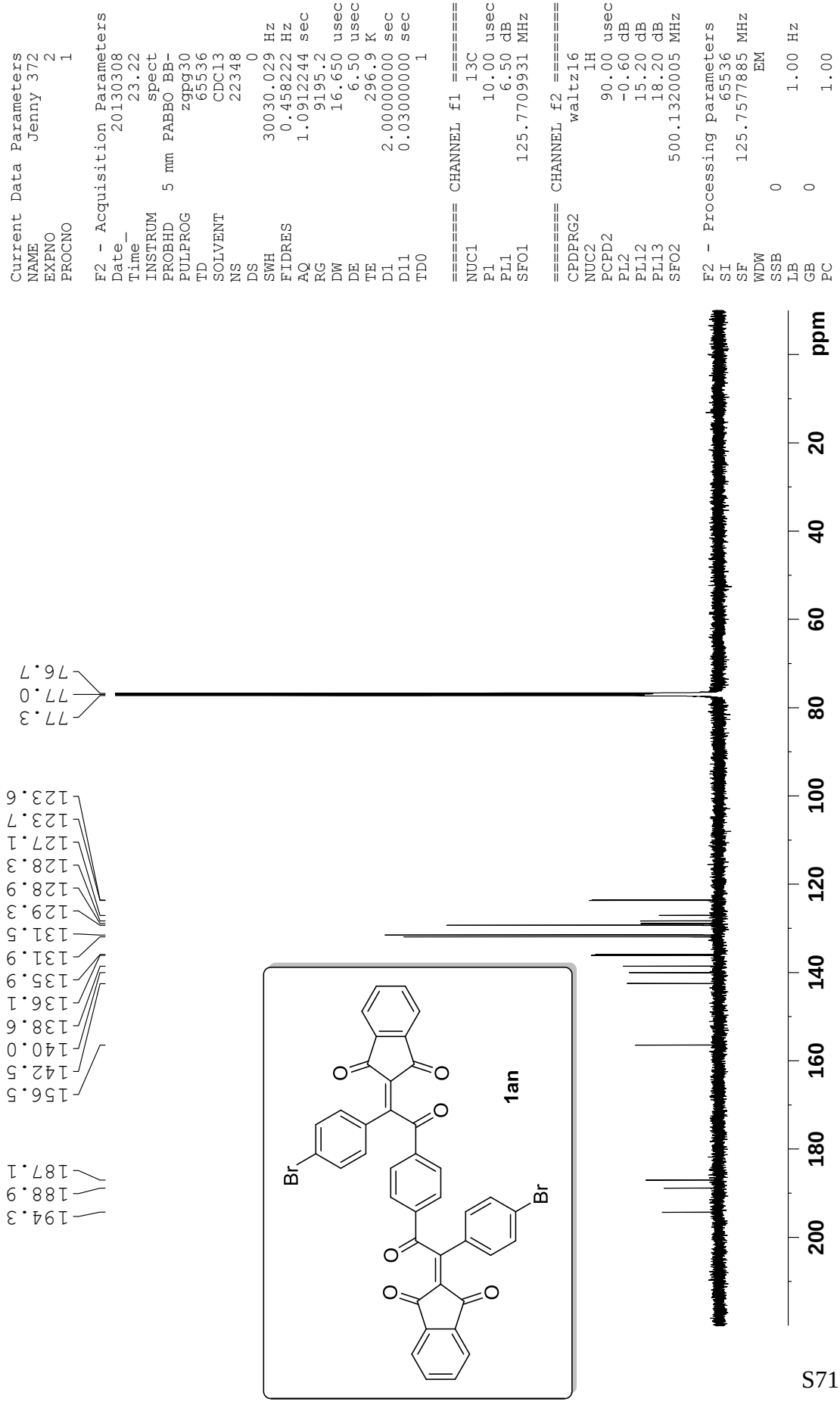

Current Data Parameters
NAME Jenny237
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121123
Time_ 13.32
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
2.00
2.05
2.01
2.00
ppm
1
2
3
4
5
6
7
8
9
10
1am
Br
CF3
O
O
O

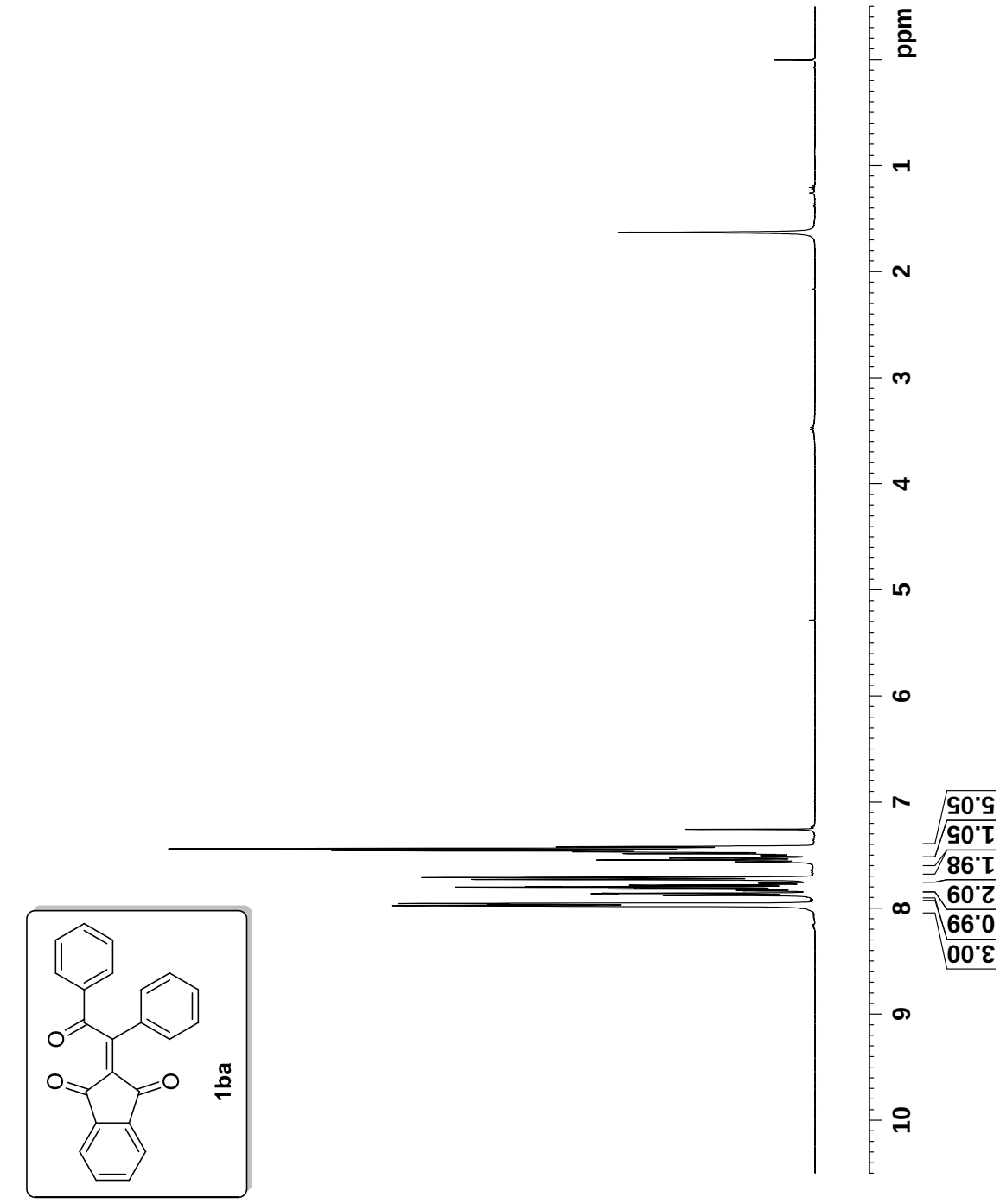


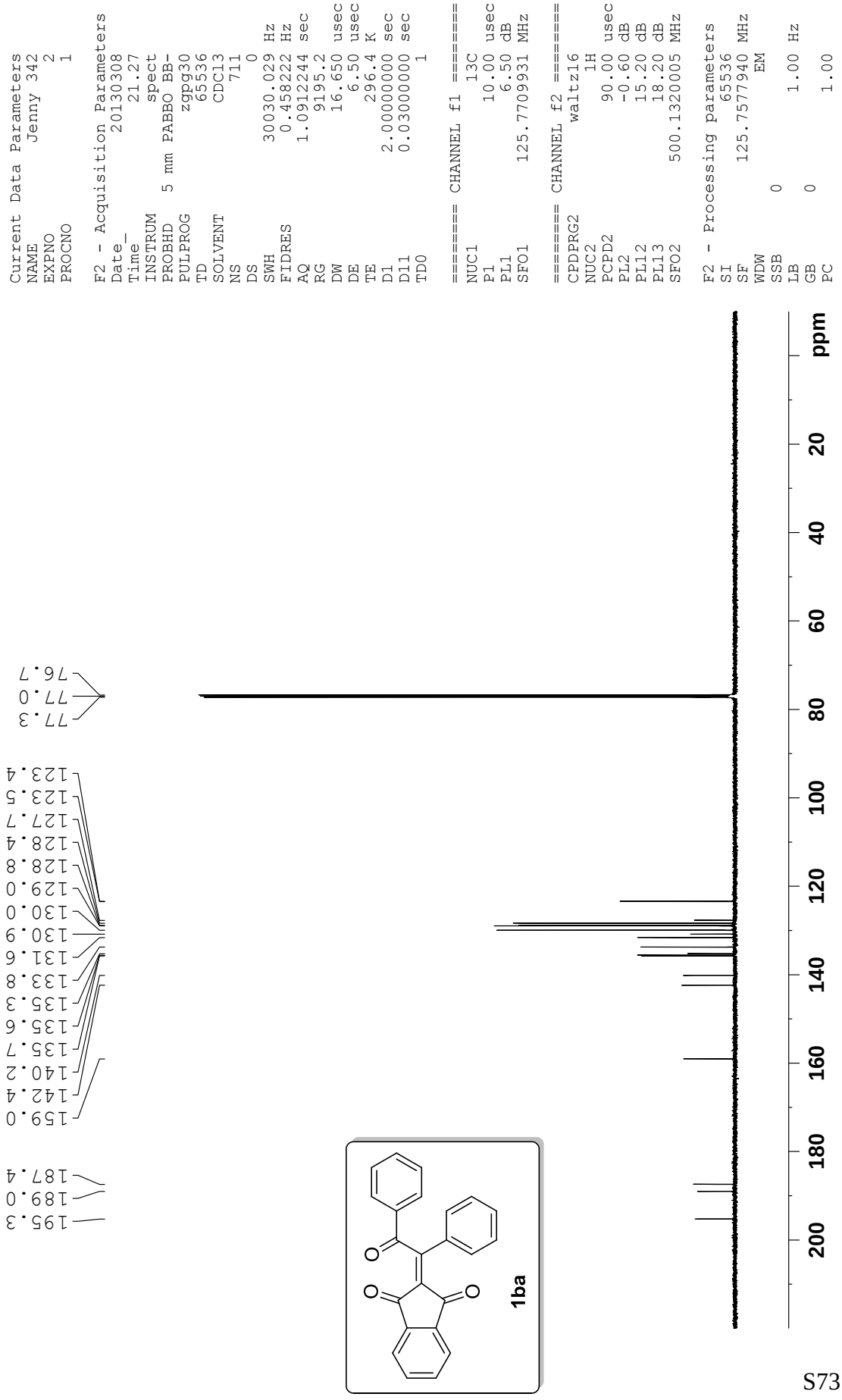


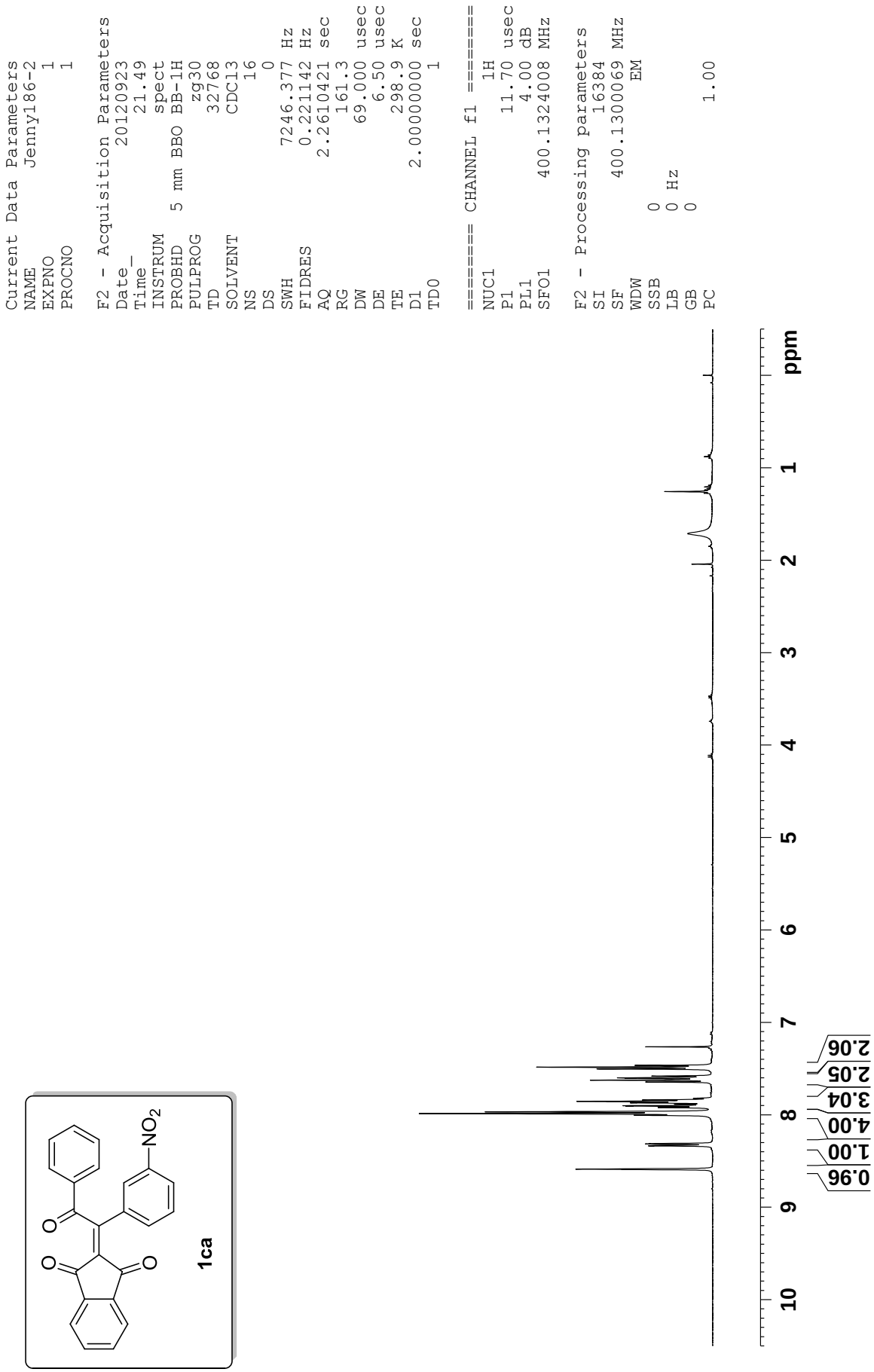

```
Current Data Parameters
NAME      Jenny237_DATA collect
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20121210
Time               12.22
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG           zgpg30
TD                 32768
SOLVENT            CDC13
NS                  1584
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                 9.40 usec
PL1                7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127723 MHz
WDW                  EM
SSB      0
LB                 1.00 Hz
GB       0
PC                 1.00
```

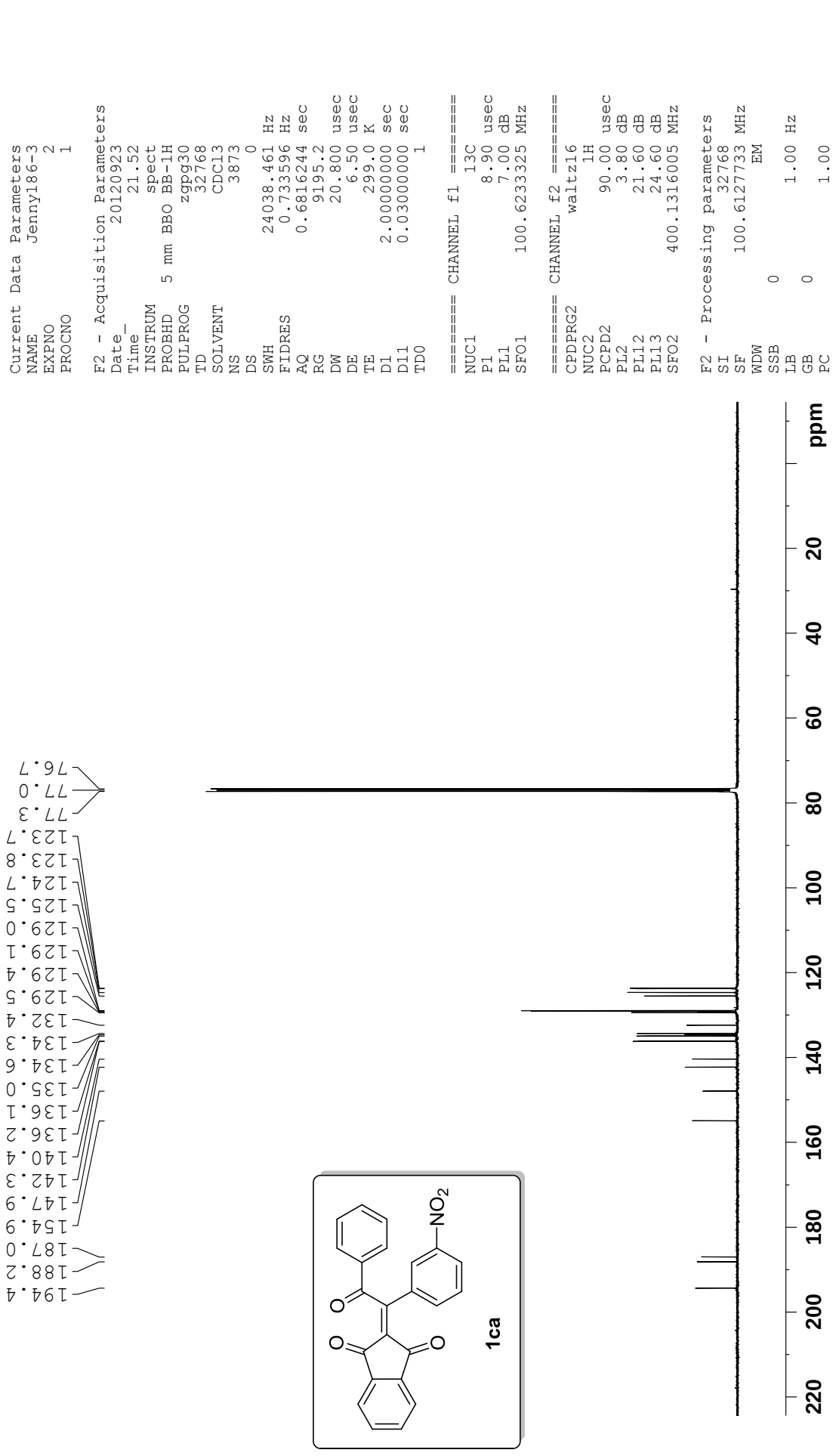

Current Data Parameters
NAME Jenny 372
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130308
Time_ 23.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 60
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 512
DW 55.200 usec
DE 6.50 usec
TE 296.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 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
1an
Br
Br
6.00
5.99
7.91
ppm

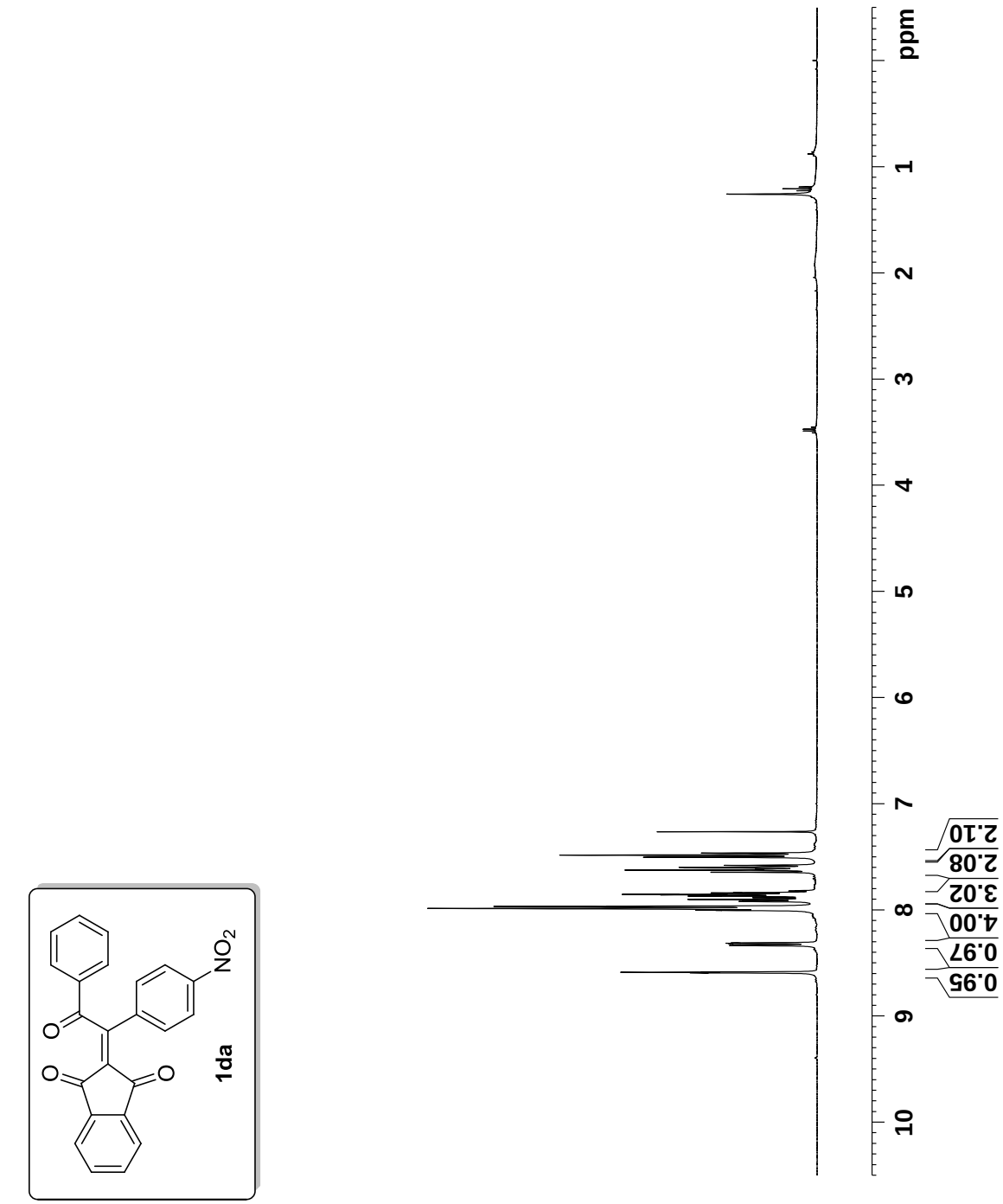

Current Data Parameters
NAME Jenny 372
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130308
Time_ 23.22
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 22348
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577885 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.6
123.7
127.1
128.3
128.9
129.3
131.5
131.9
135.9
136.1
138.6
140.0
142.5
156.5
187.1
188.9
194.3
1an
Br
Br
O
O
O
O
O
O
ppm
200
180
160
140
120
100
80
60
40
20

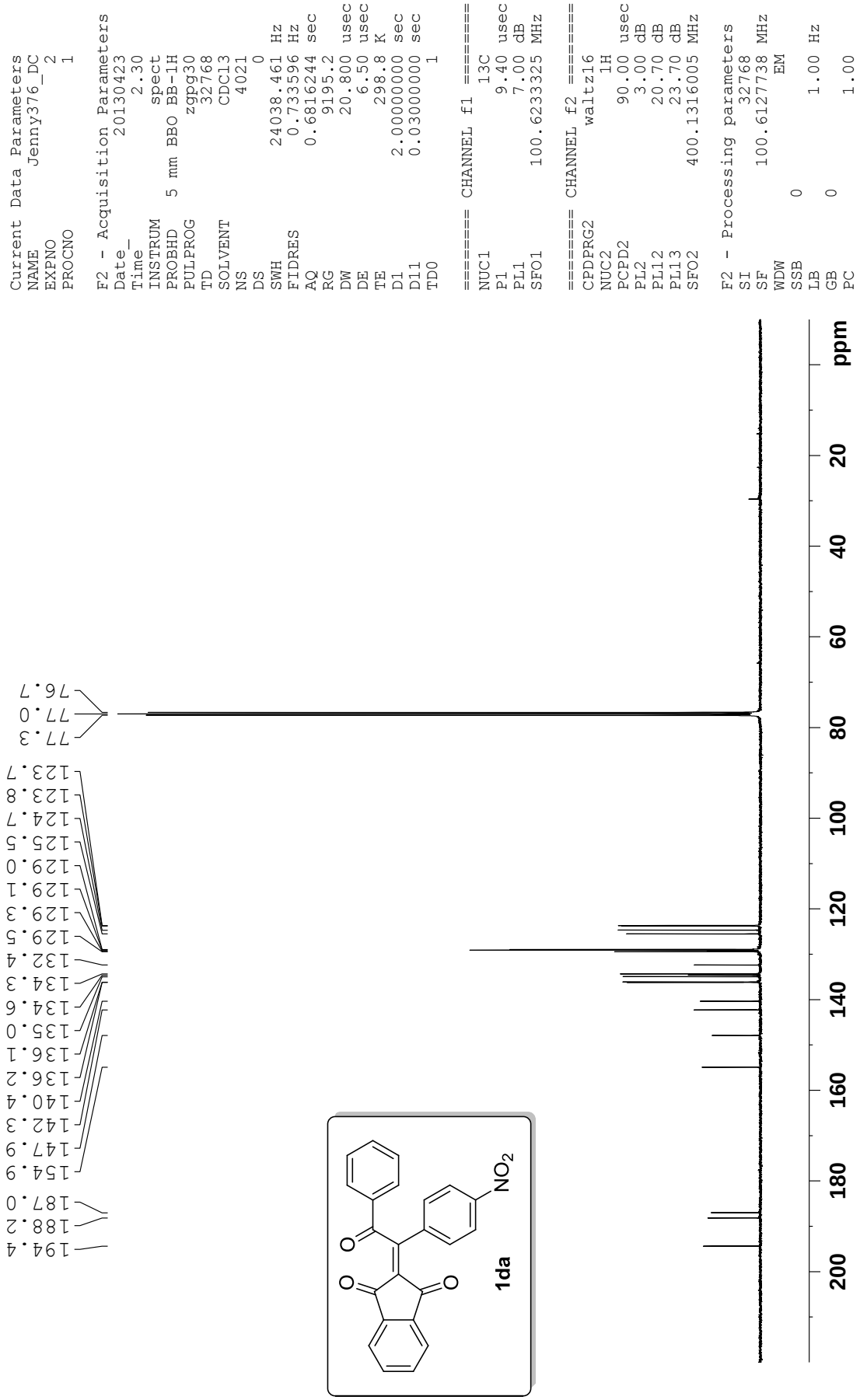

Current Data Parameters
NAME Jenny202
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121010
Time_ 17.57
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 161.3
DW 69.000 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
3.00
0.99
2.09
1.98
1.05
5.05
ppm
1ba

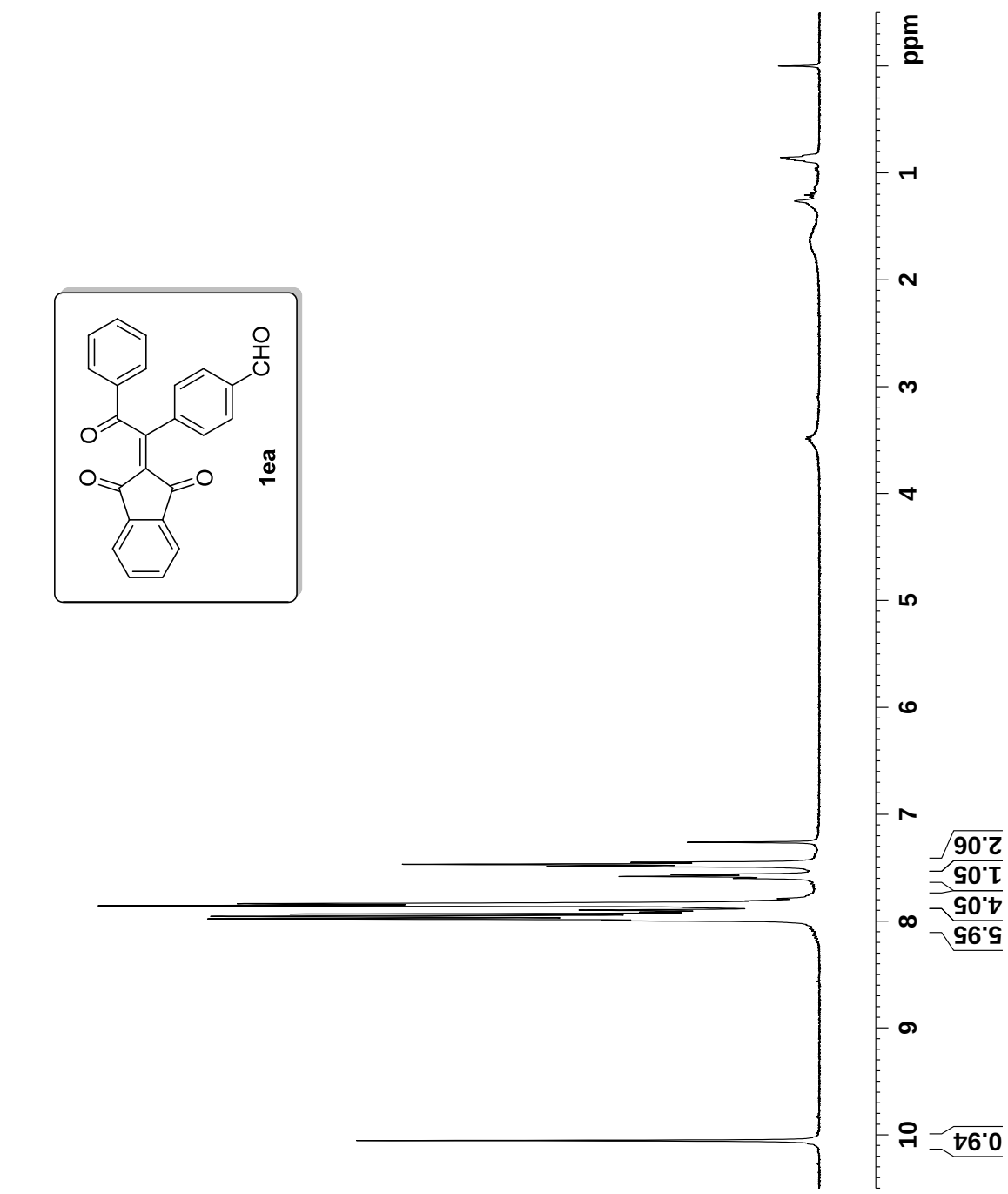

Current Data Parameters
NAME Jenny 342
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130308
Time_ 21.27
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 711
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 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
77.3
77.0
76.7
123.4
123.5
127.7
128.4
128.8
129.0
130.0
130.9
131.6
133.8
135.3
135.6
135.7
140.2
142.4
159.0
187.4
189.0
195.3
1ba
ppm
200
180
160
140
120
100
80
60
40
20

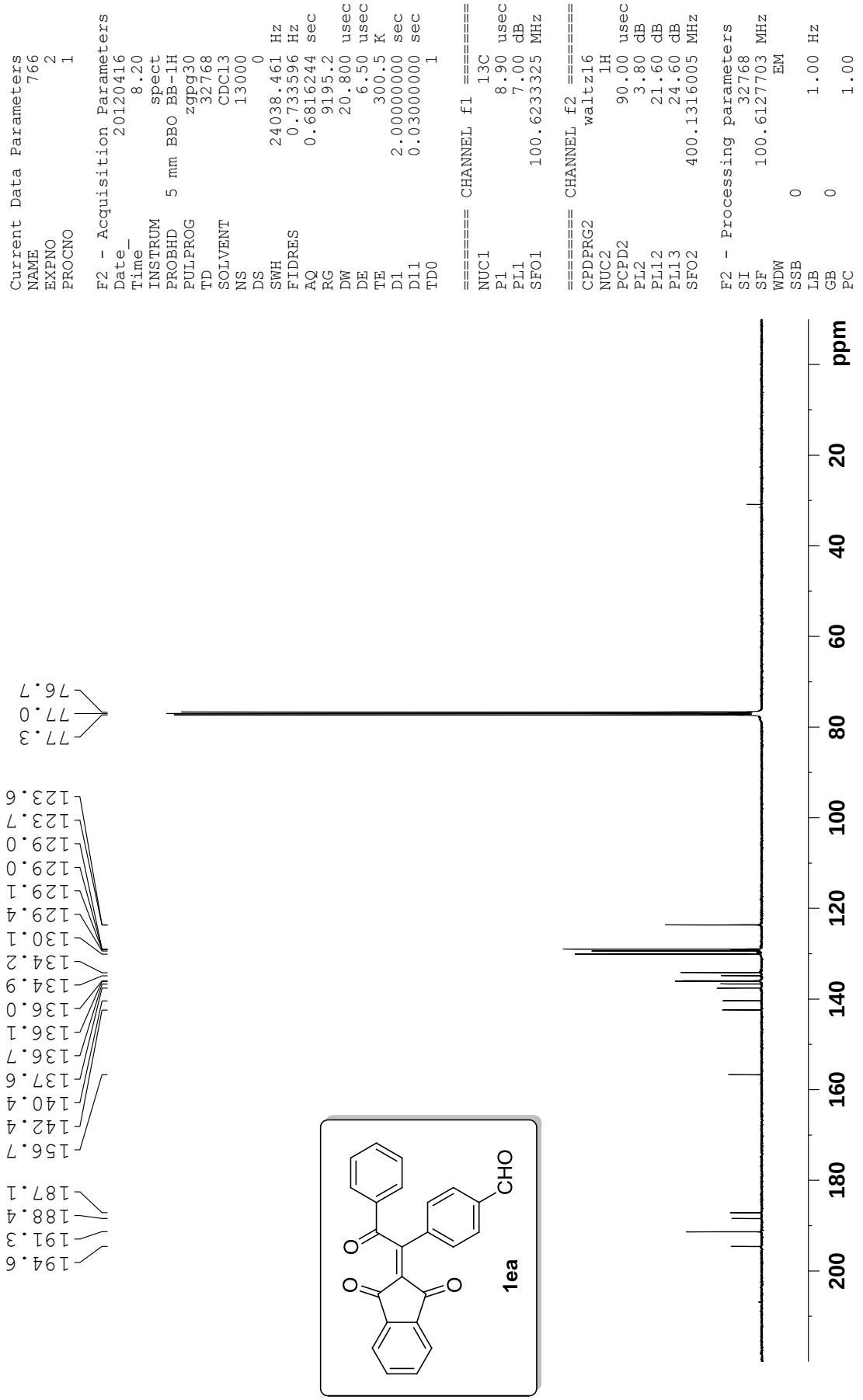

Current Data Parameters
NAME Jenny186-2
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120923
Time_ 21.49
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 161.3
DW 69.000 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 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 400.1300069 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
0.96
1.00
4.00
3.04
2.05
2.06
ppm
1ca

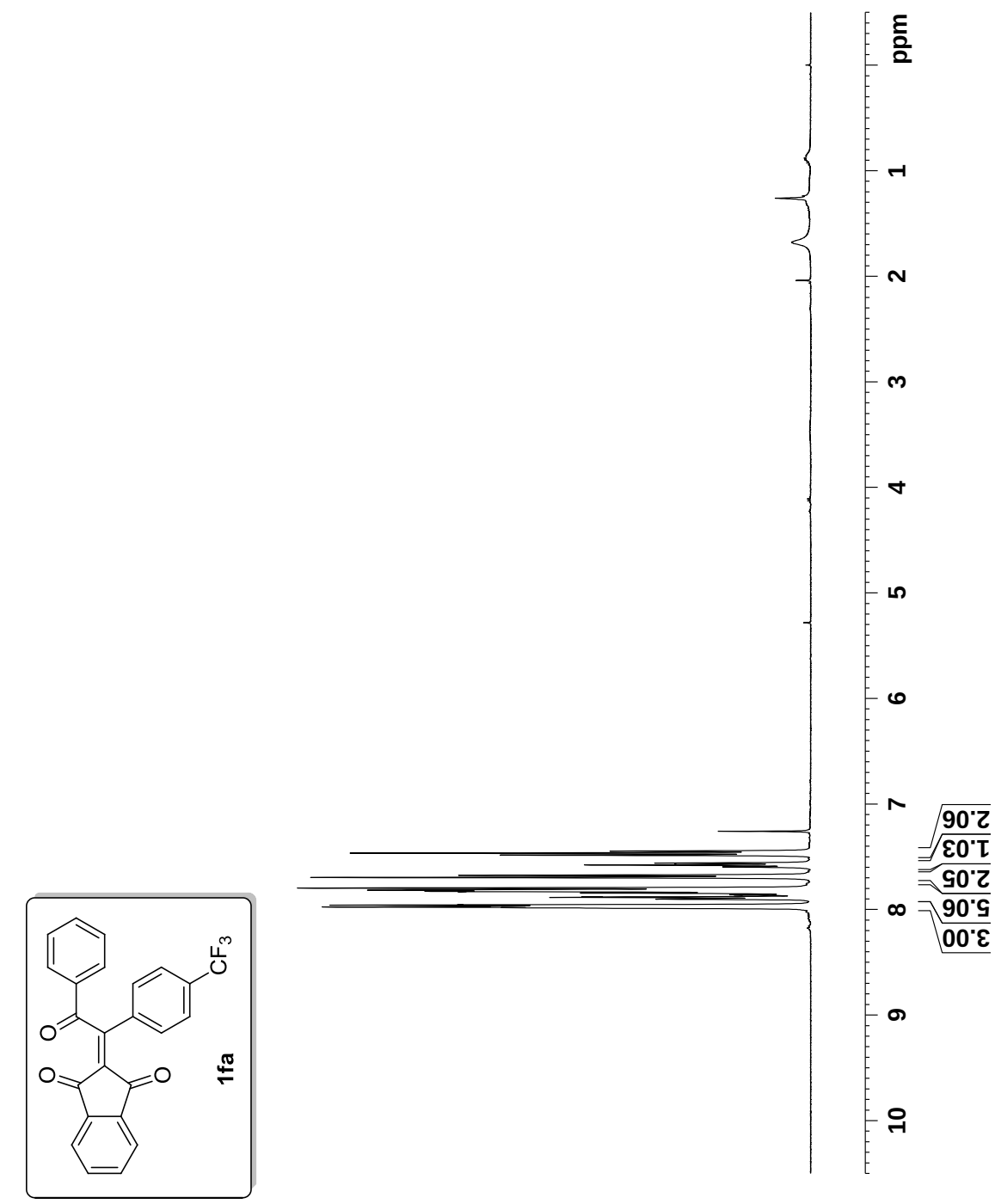

Current Data Parameters
NAME Jenny186-3
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120923
Time_ 21.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 3873
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
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 100.6127733 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
194.4
188.2
187.0
154.9
147.9
142.3
140.4
136.2
136.1
135.0
134.6
134.3
132.4
129.5
129.4
129.1
129.0
125.5
124.7
123.8
123.7
77.3
77.0
76.7
ppm
220
200
180
160
140
120
100
80
60
40
20
O
O
O
NO2
1ca

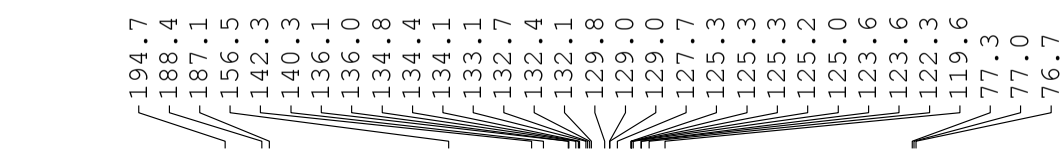

Current Data Parameters
NAME Jenny376_DC
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 2.28
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1
2
3
4
5
6
7
8
9
10
0.95
0.97
4.00
3.02
2.08
2.10
O
O
O
NO2
1da

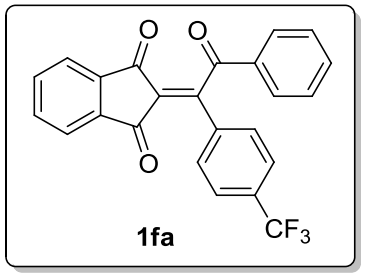

Current Data Parameters
NAME Jenny376_DC
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 2.30
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 4021
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127738 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
194.4
188.2
187.0
154.9
147.9
142.3
140.4
136.2
136.1
135.0
134.6
134.3
132.4
129.5
129.3
129.1
129.0
125.5
124.7
123.8
123.7
77.3
77.0
76.7
O
O
O
NO2
1da
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME 766
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120415
Time_ 21.43
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 161.3
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 400.1300078 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
CHO
O
O
O
1ea
ppm
10
9
8
7
6
5
4
3
2
1
0.94
5.95
4.05
1.05
2.06

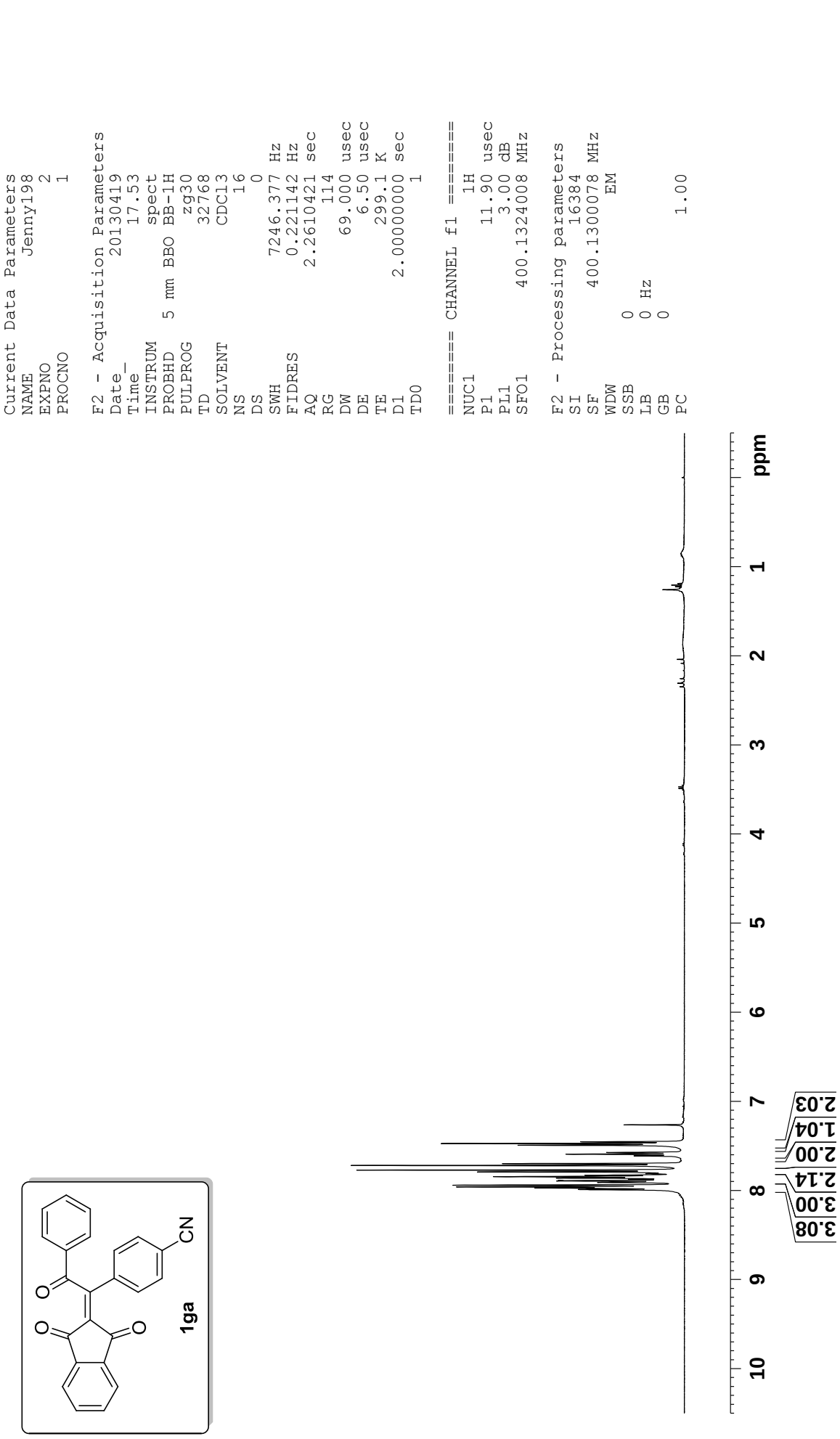

Current Data Parameters
NAME 766
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120416
Time_ 8.20
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 13000
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.5 K
D1 2.00000000 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 100.6127703 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.6
123.7
129.0
129.0
129.1
129.4
130.1
134.2
134.9
136.0
136.1
136.7
137.6
140.4
142.4
156.7
187.1
188.4
191.3
194.6
CHO
O
O
O
1ea
200
180
160
140
120
100
80
60
40
20
ppm

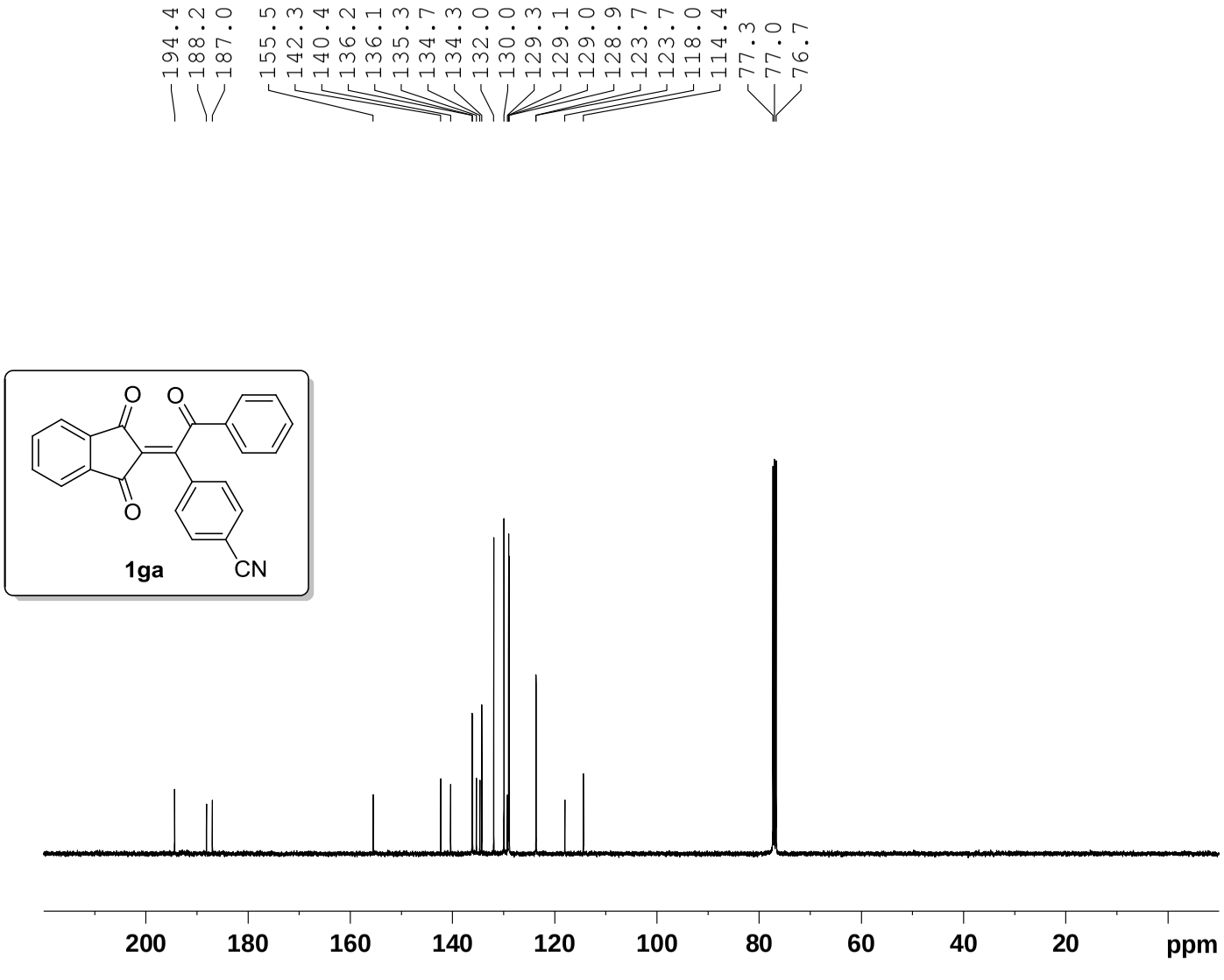

Current Data Parameters
NAME Jenny197
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121129
Time_ 18.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
3.00
5.06
2.05
1.03
2.06
ppm
1
2
3
4
5
6
7
8
9
10
O
O
O
CF3
1fa



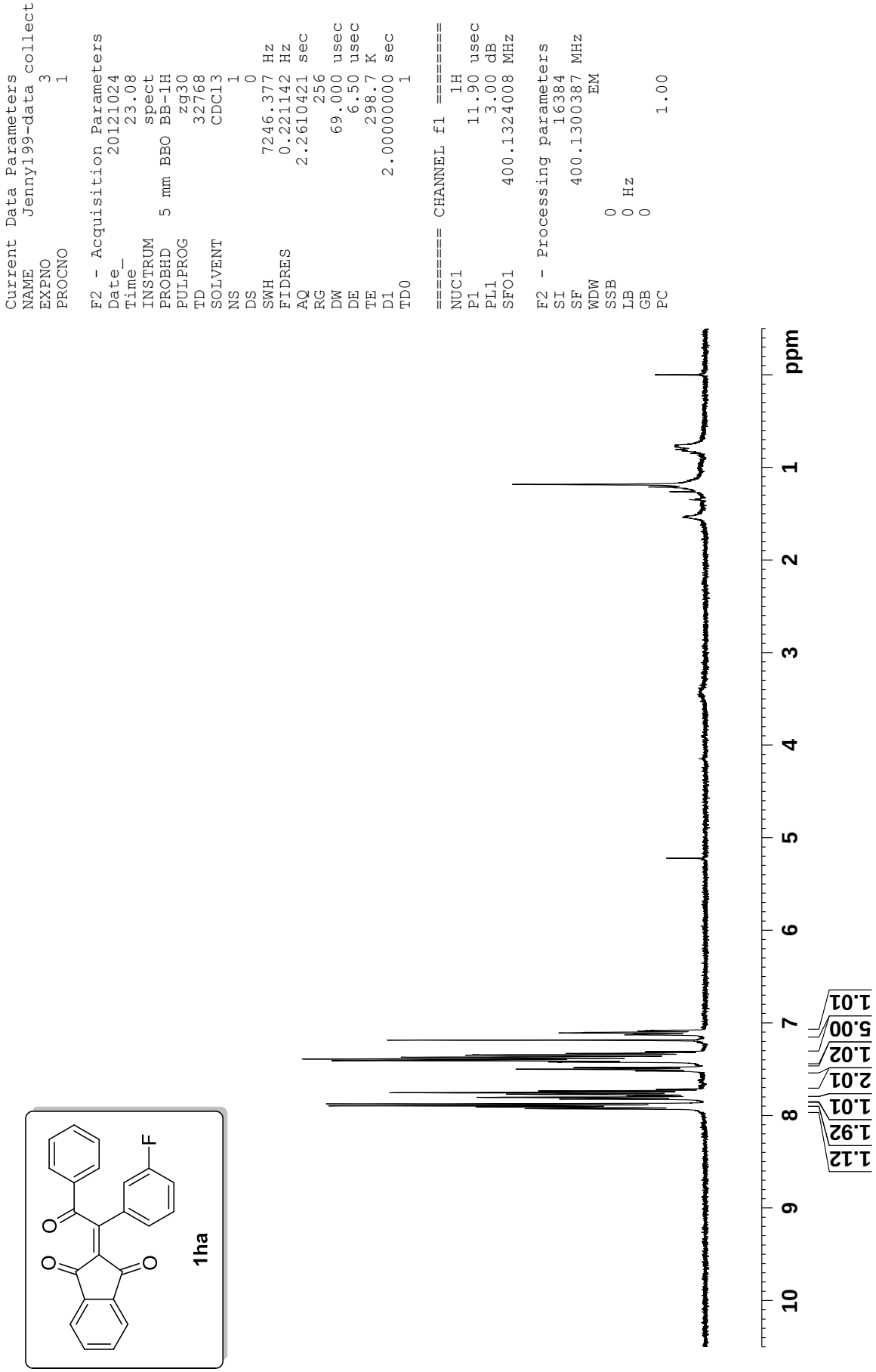


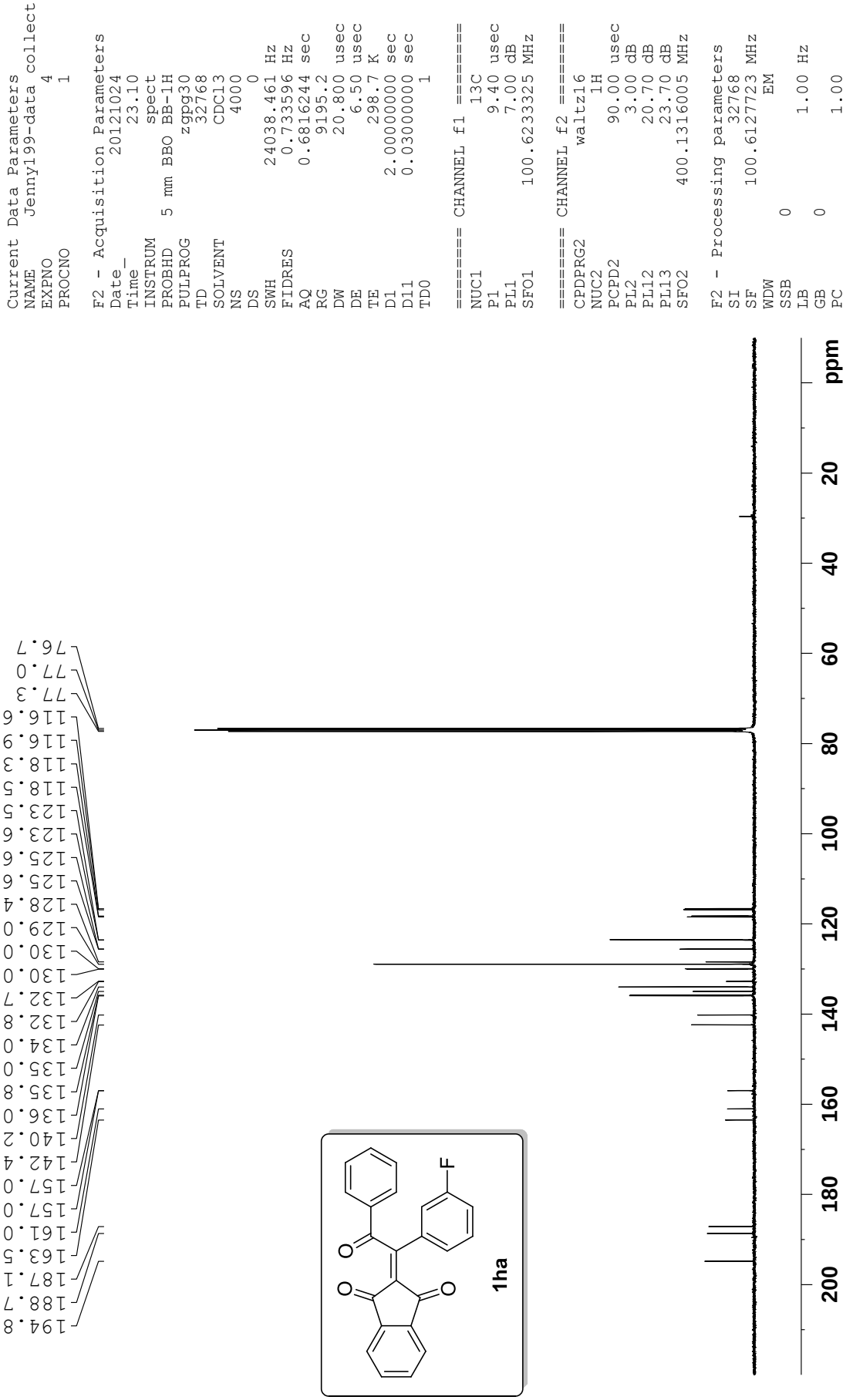
NAME	Jenny197	
EXPNO	7	
PROCNO	1	
Date_	20121129	
Time	18.10	
INSTRUM	spect	
PROBHD	5 mm BBO BB-1H	
PULPROG	zgpg30	
TD	32768	
SOLVENT	CDCl3	
NS	1528	
DS	0	
SWH	24038.461	Hz
FIDRES	0.733596	Hz
AQ	0.6816452	sec
RG	9195.2	
DW	20.800	usec
DE	6.50	usec
TE	298.7	K
D1	2.00000000	sec
D11	0.03000000	sec
TD0	1	
======== CHANNEL f1 ========		
NUC1	13C	
P1	9.40	usec
PL1	7.00	dB
SFO1	100.6233325	MHz
======== CHANNEL f2 ========		
CPDPRG2	waltz16	
NUC2	1H	
PCPD2	90.00	usec
PL2	3.00	dB
PL12	20.70	dB
PL13	23.70	dB
SFO2	400.1316005	MHz
SI	32768	
SF	100.6127745	MHz
WDW	EM	
SSB	0	
LB	1.00	Hz
GB	0	
PC	1.00	

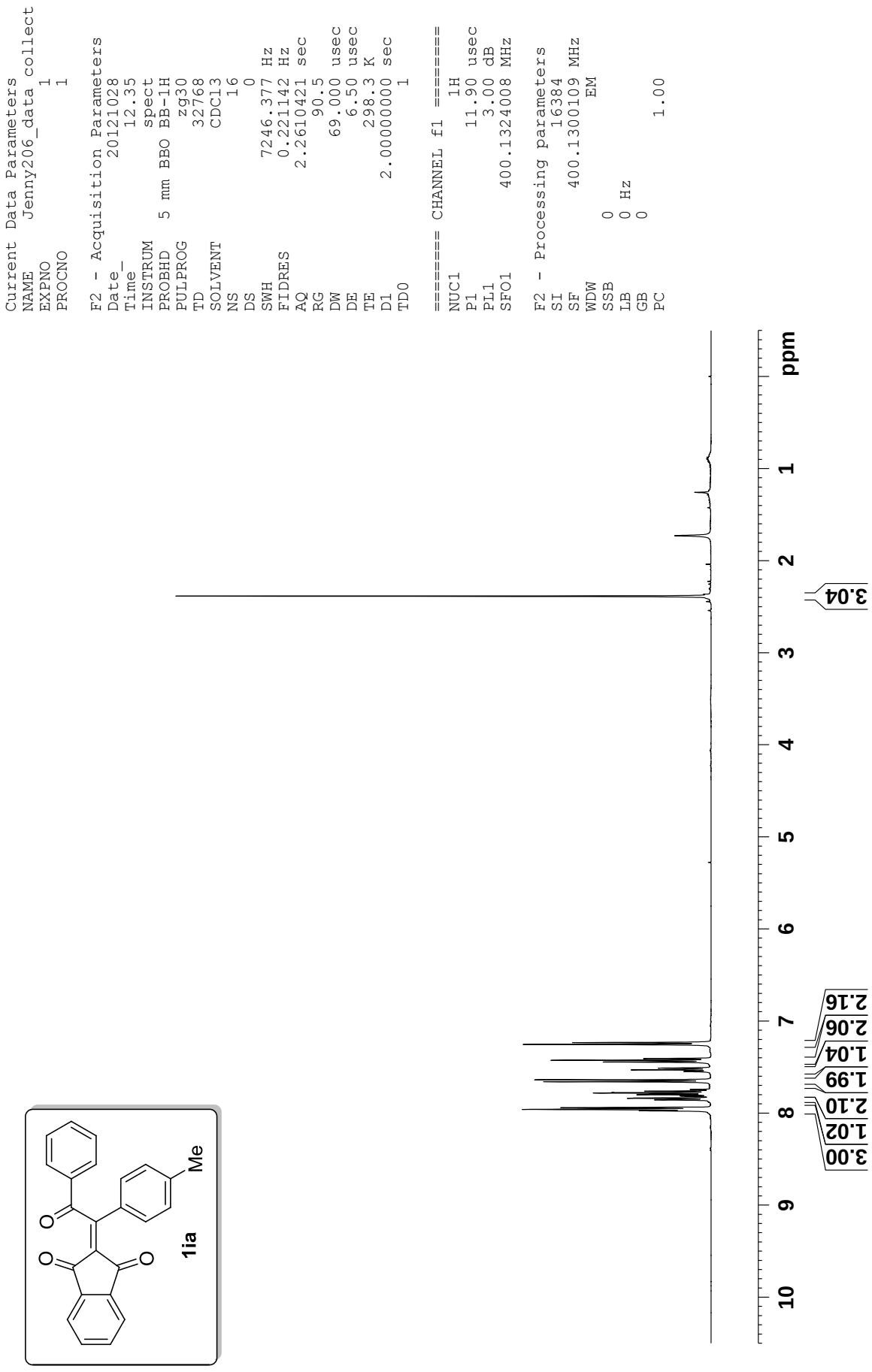

Current Data Parameters
NAME Jenny198
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130419
Time_ 17.53
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
3.08
3.00
2.14
2.00
1.04
2.03
ppm
1ga
O
O
O
CN

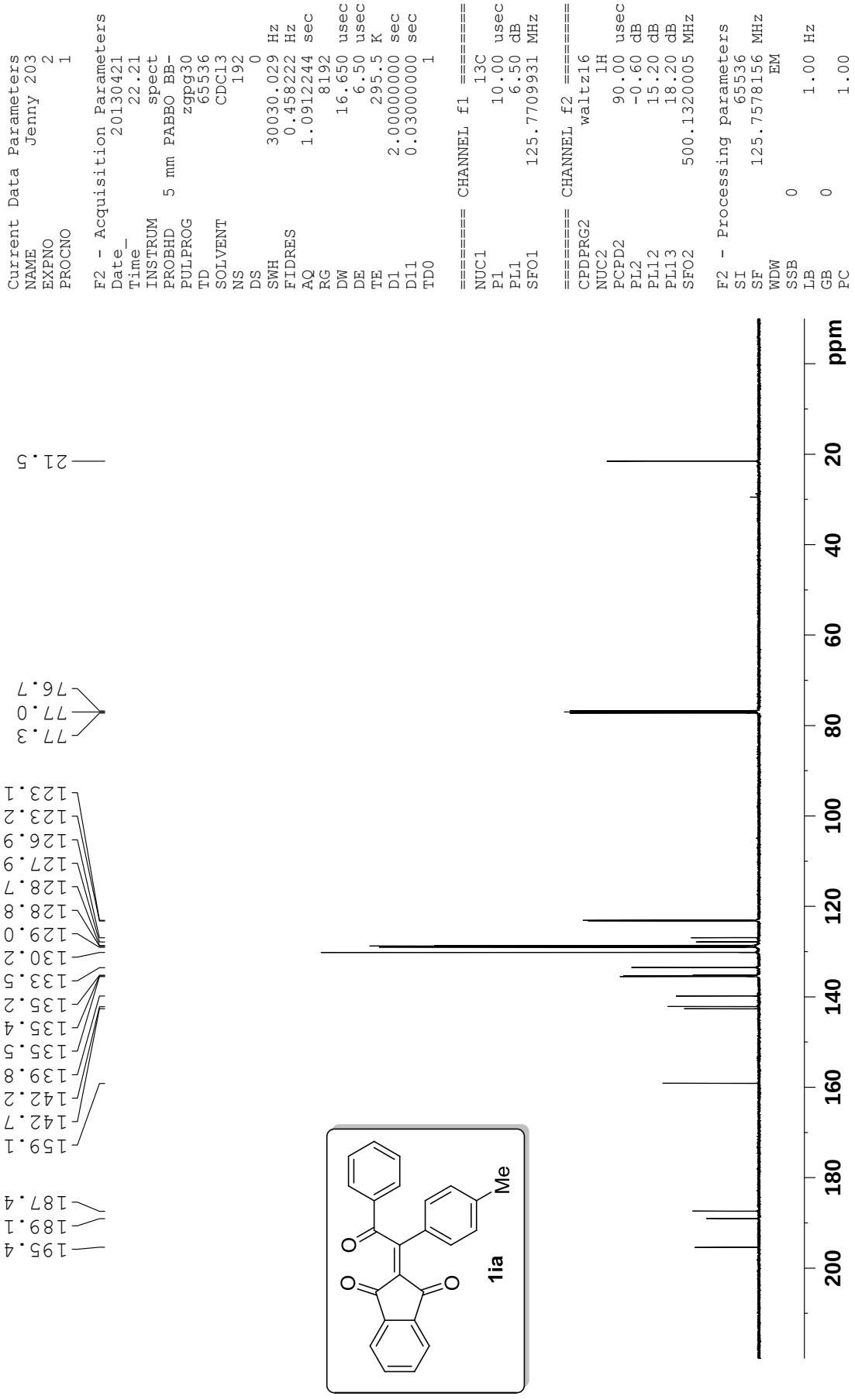


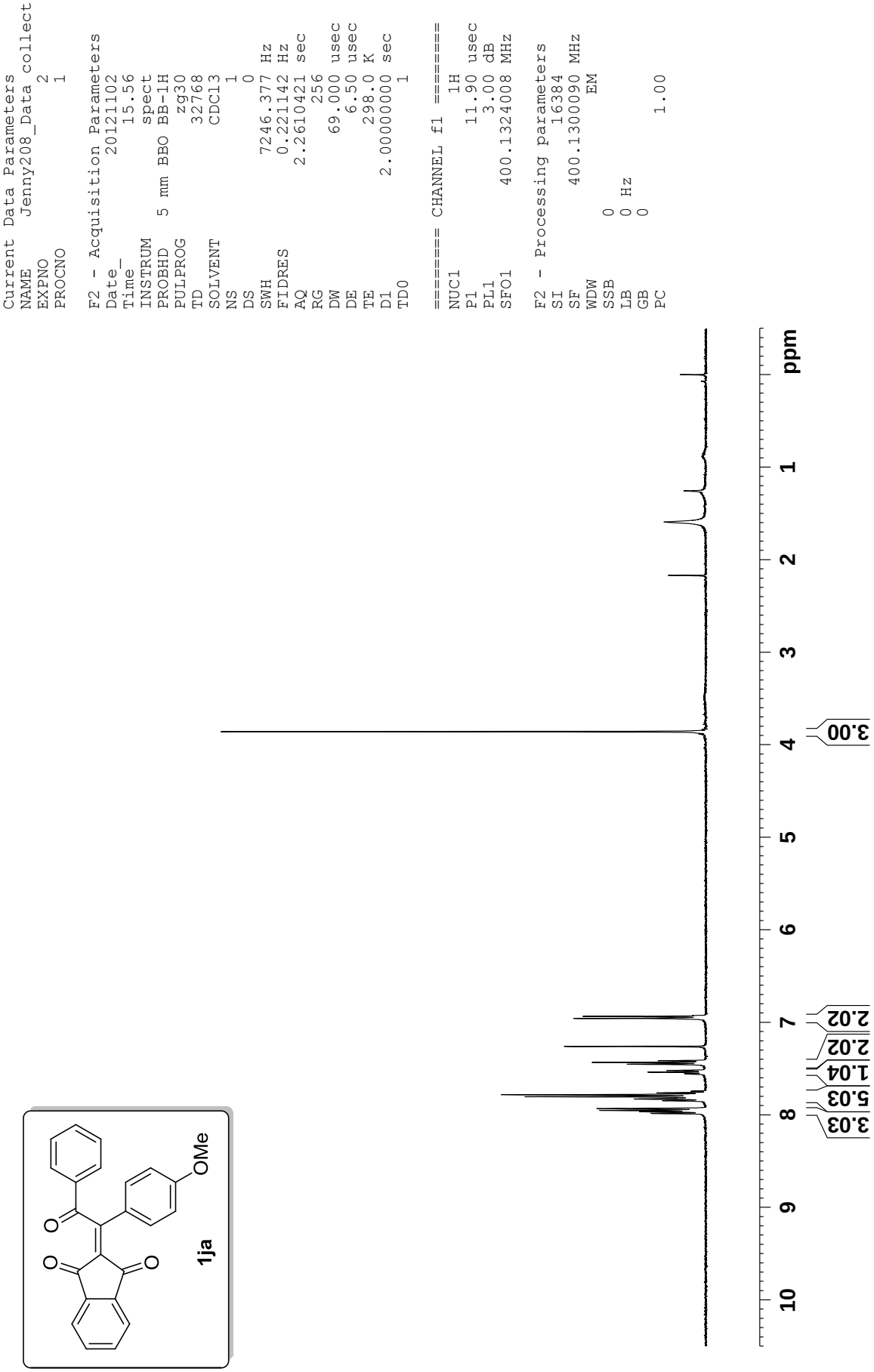

```
Current Data Parameters
NAME         Jenny198_DC
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130419
Time               18.06
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1226
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                299.1 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 9.40 usec
PL1                7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127751 MHz
WDW                   EM
SSB      0
LB                 1.00 Hz
GB       0
PC                 1.00
```

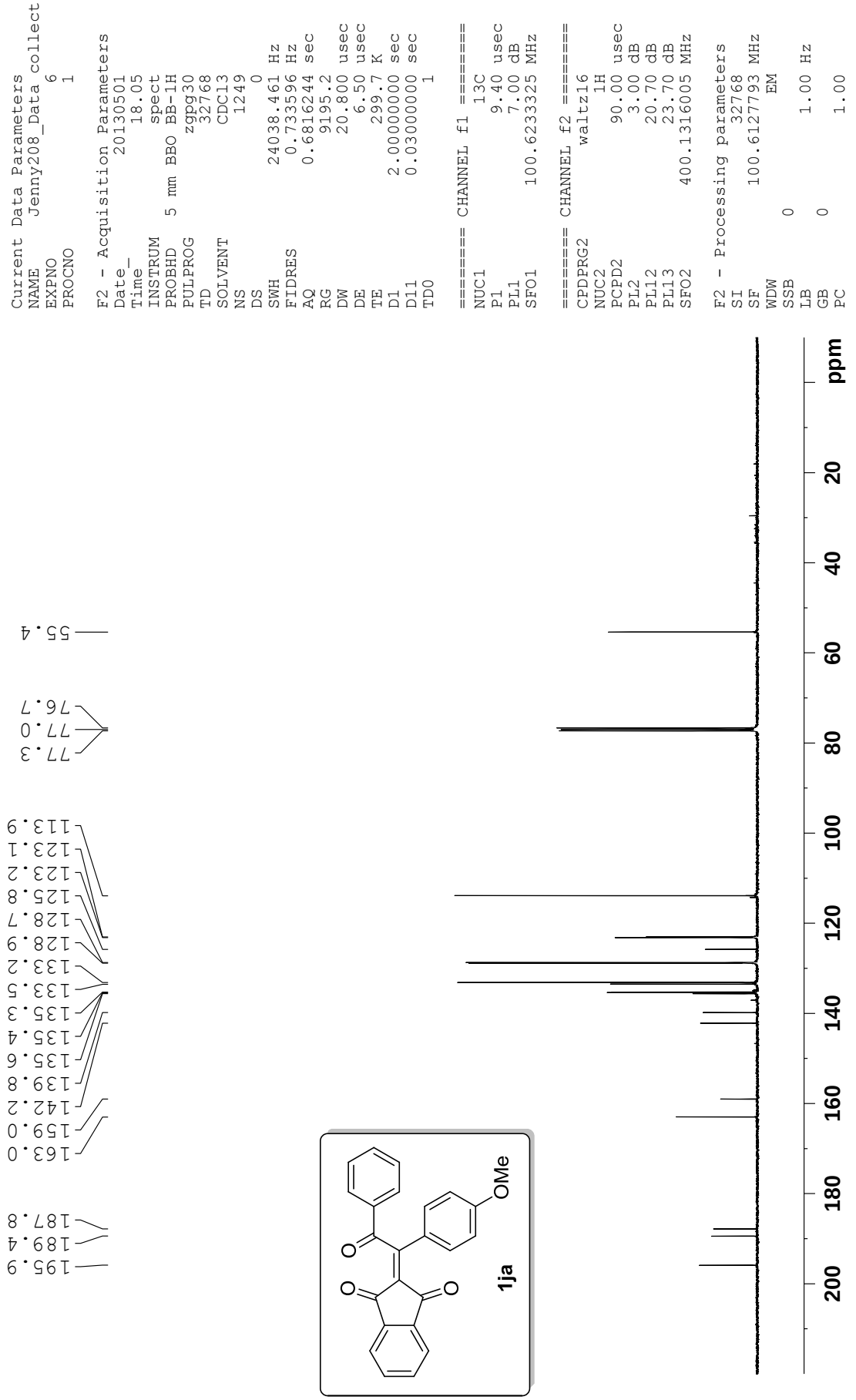

Current Data Parameters
NAME Jenny199-data collect
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121024
Time_ 23.08
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300387 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.12
1.92
1.01
2.01
1.02
5.00
1.01
ppm
1 2 3 4 5 6 7 8 9 10
O
O
O
F
1ha

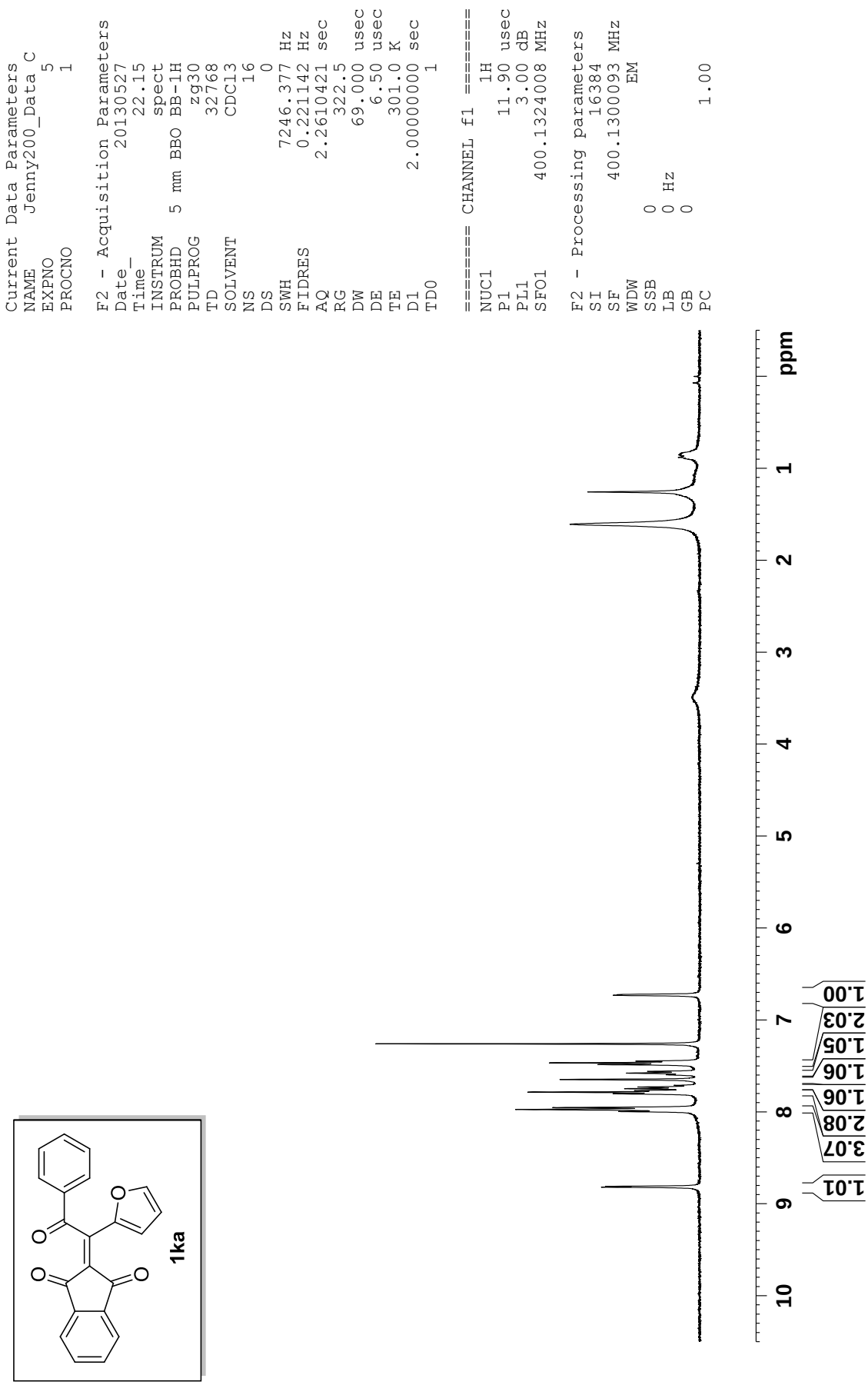

Current Data Parameters
NAME Jenny199-data collect
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121024
Time_ 23.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 4000
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127723 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
194.8
188.7
187.1
163.5
161.0
157.0
157.0
142.4
140.2
136.0
135.8
135.0
134.0
132.8
132.7
130.0
130.0
129.0
128.4
125.6
125.6
123.6
123.5
118.5
118.3
116.9
116.6
77.3
77.0
76.7
O
O
O
F
1ha
ppm
200
180
160
140
120
100
80
60
40
20

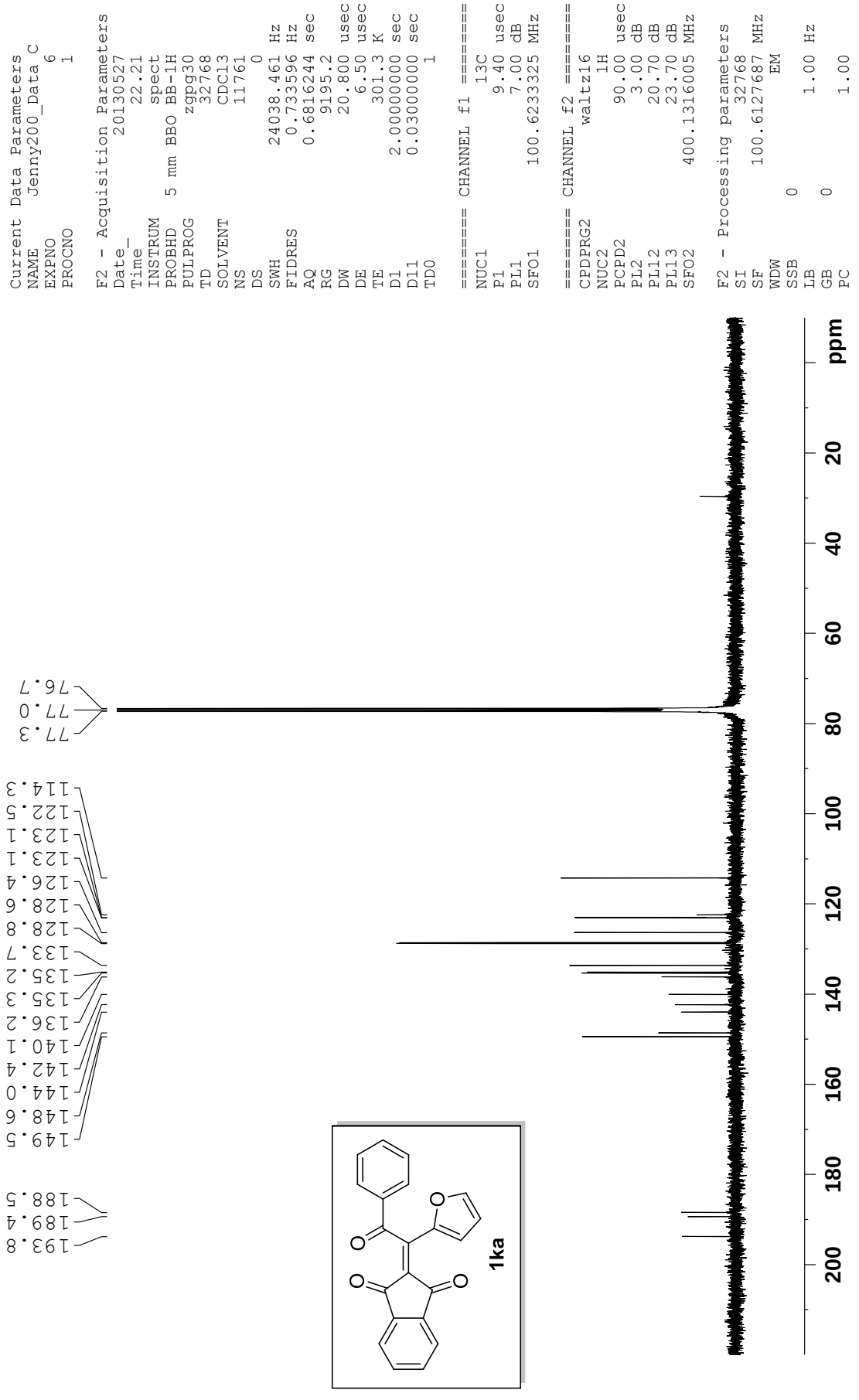

Current Data Parameters
NAME Jenny206_data collect
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121028
Time_ 12.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300109 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
10
9
8
7
6
5
4
3
2
1
3.04
3.00
1.02
2.10
1.99
1.04
2.06
2.16
O
O
O
Me
1ia

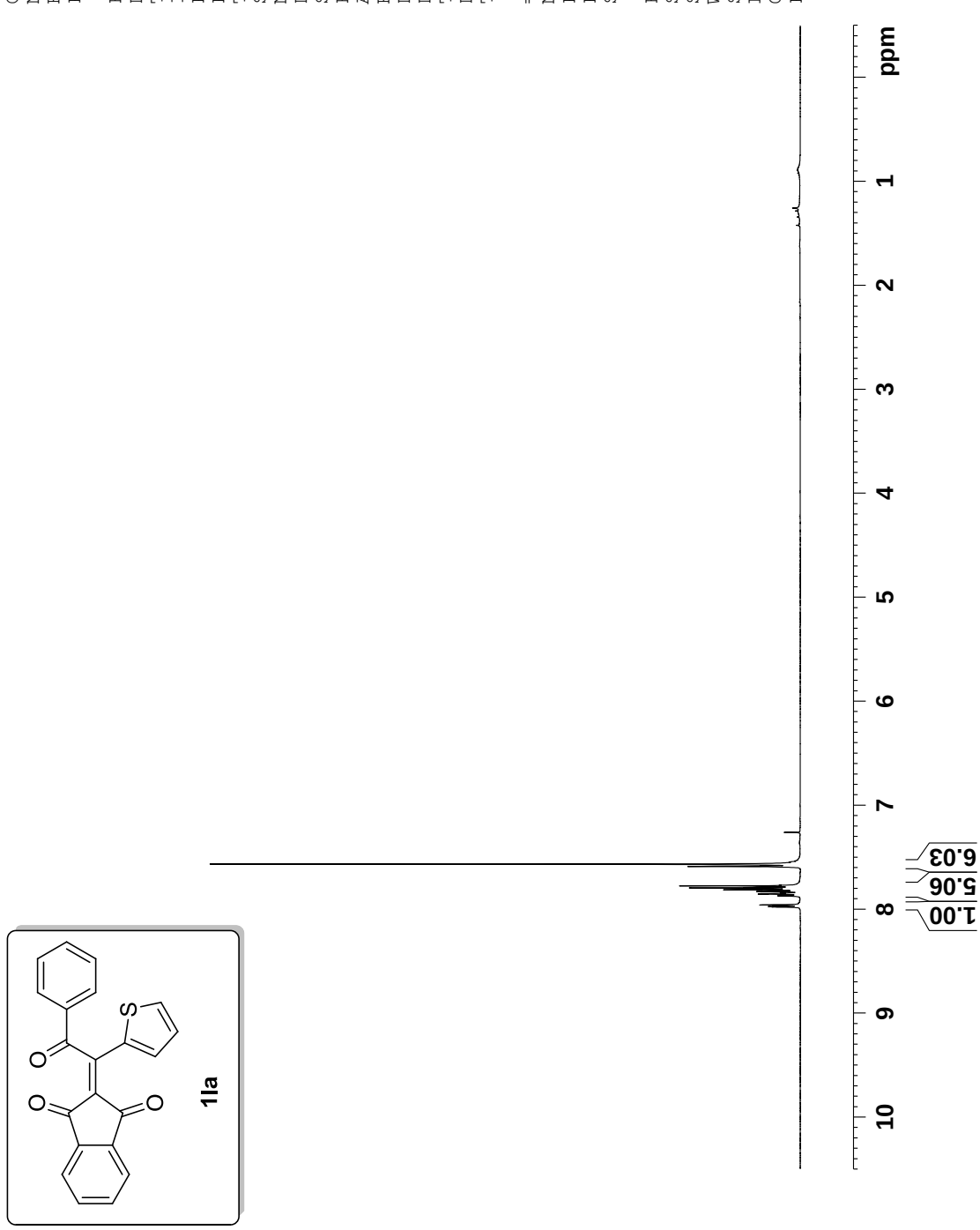

Current Data Parameters
NAME Jenny 203
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130421
Time_ 22.21
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 192
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 8192
DW 16.650 usec
DE 6.50 usec
TE 295.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578156 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.5
76.7
77.0
77.3
123.1
123.2
126.9
127.9
128.7
128.8
129.0
130.2
133.5
135.2
135.4
135.5
139.8
142.2
142.7
159.1
187.4
189.1
195.4
O
O
O
Me
1ia
200
180
160
140
120
100
80
60
40
20
ppm

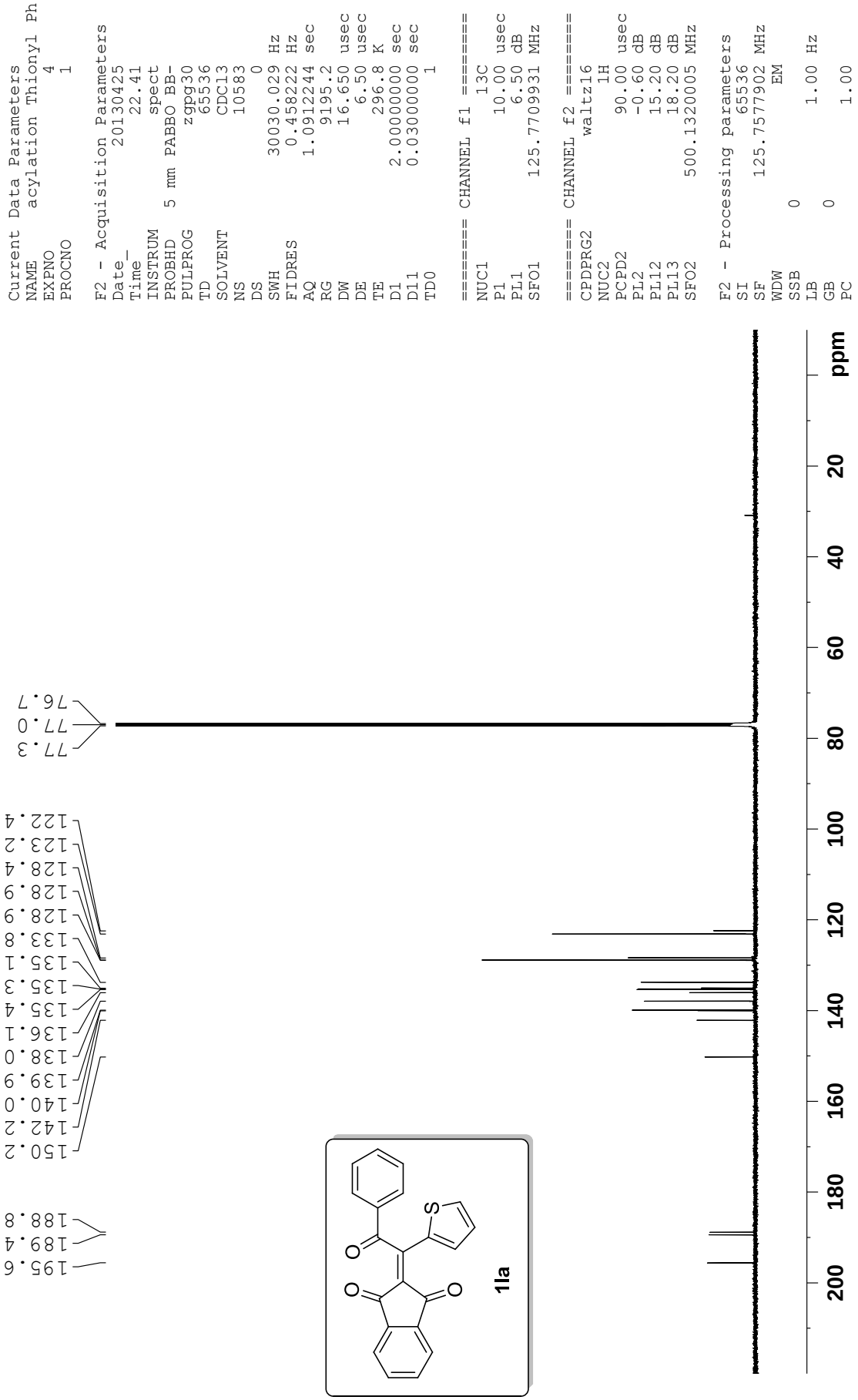

Current Data Parameters
NAME Jenny208_Data collect
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121102
Time_ 15.56
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300090 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
OMe
O
O
O
1ja
ppm
10
9
8
7
6
5
4
3
2
1
3.03
5.03
1.04
2.02
2.02
3.00

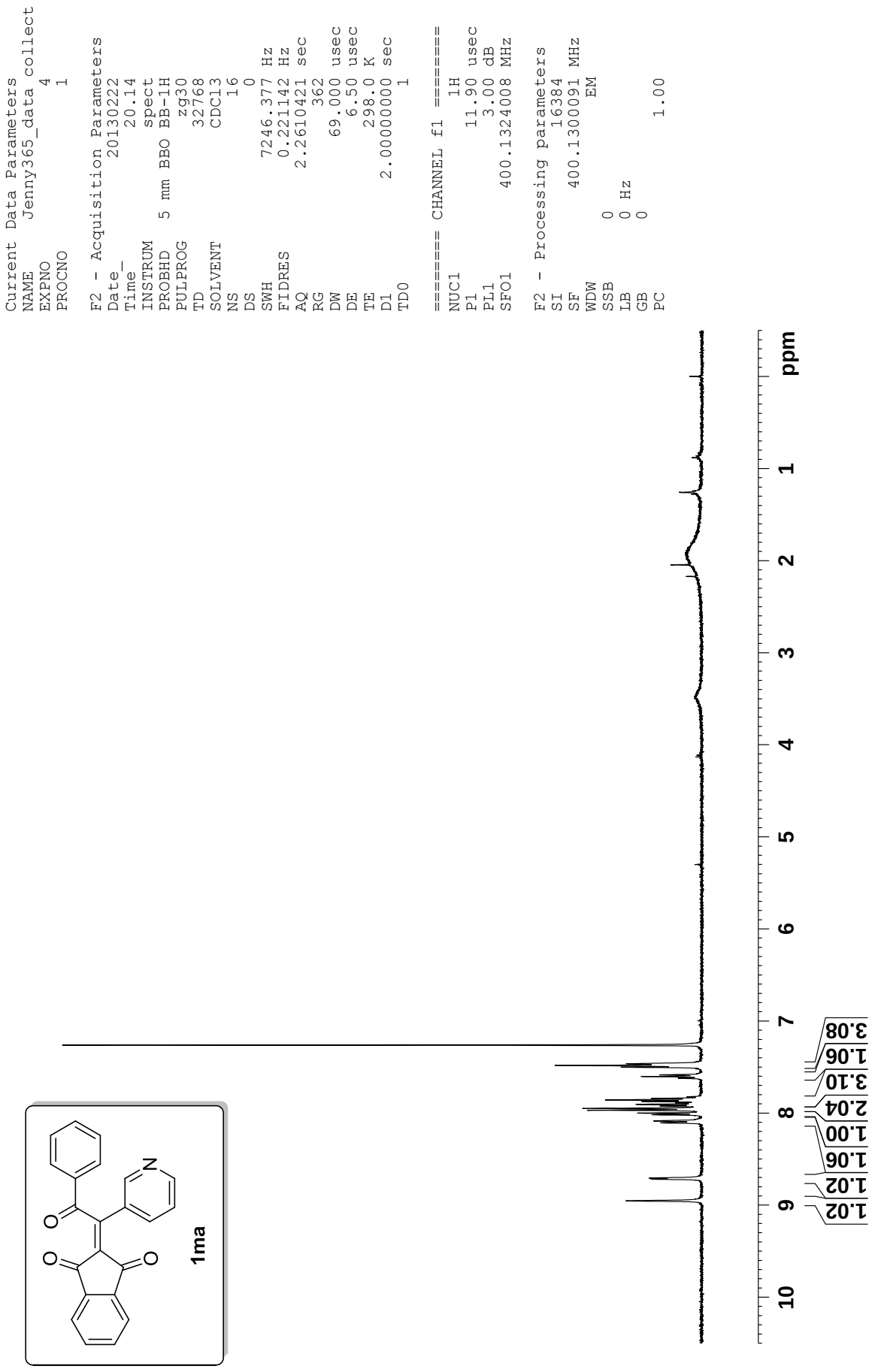

Current Data Parameters
NAME Jenny208_Data collect
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130501
Time_ 18.05
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1249
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127793 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
55.4
76.7
77.0
77.3
113.9
123.1
123.2
125.8
128.7
128.9
133.2
133.5
133.5
135.3
135.4
135.6
139.8
142.2
159.0
163.0
187.8
189.4
195.9
OMe
O
O
O
1ja
ppm
200
180
160
140
120
100
80
60
40
20

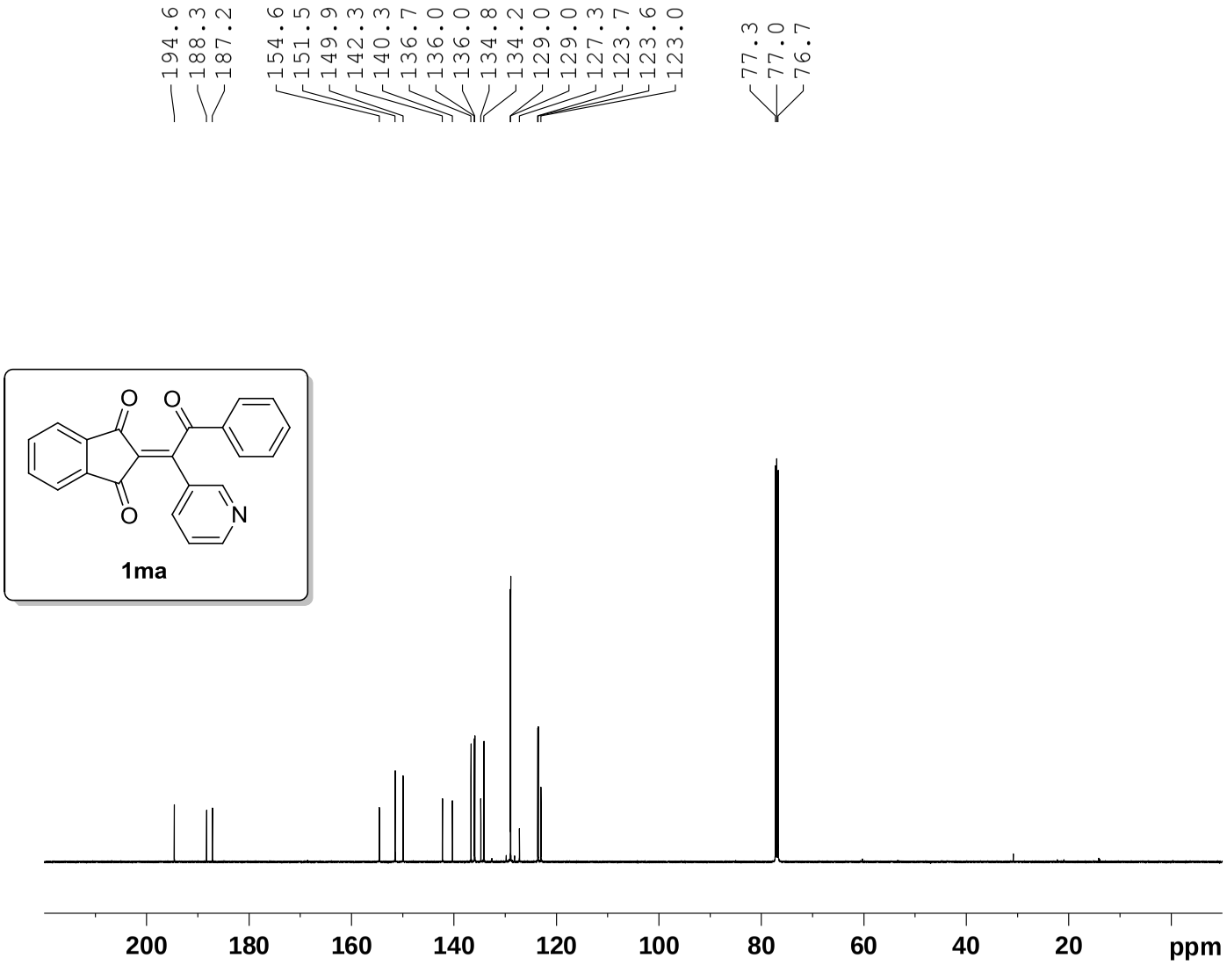

Current Data Parameters
NAME Jenny200_Data_C
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130527
Time_ 22.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 301.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300093 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1ka
ppm
1.01
3.07
2.08
1.06
1.06
1.05
2.03
1.00


Current Data Parameters
NAME Jenny200_Data_C
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130527
Time_ 22.21
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 11761
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 301.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127687 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
114.3
122.5
123.1
123.1
126.4
128.6
128.8
133.7
135.2
135.3
136.2
140.1
142.4
144.0
148.6
149.5
188.5
189.4
193.8
1ka
200
180
160
140
120
100
80
60
40
20
ppm

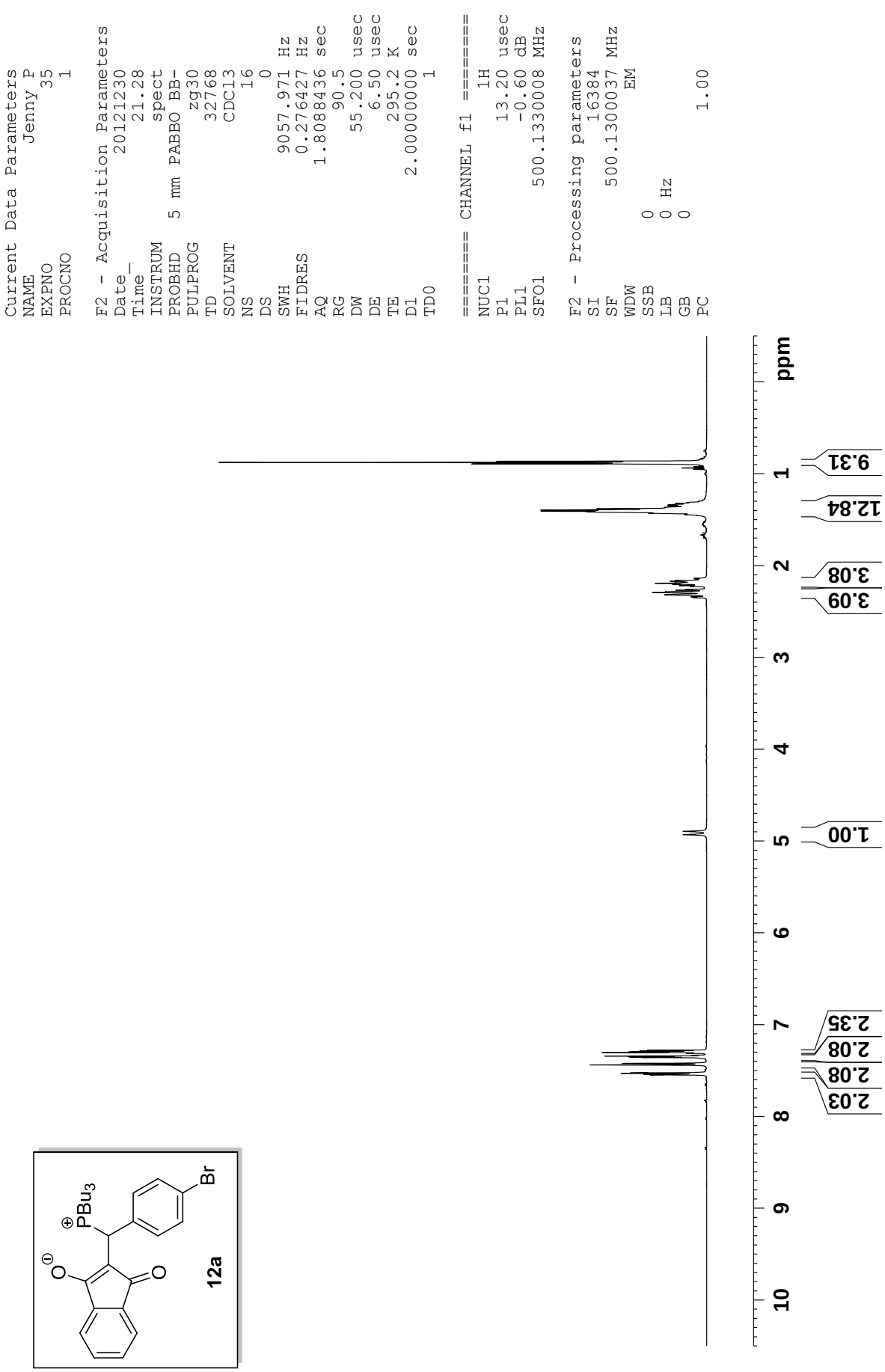

Current Data Parameters
NAME Jenny201_data
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130325
Time_ 20.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
1.00
5.06
6.03
ppm
10
9
8
7
6
5
4
3
2
1
O
O
O
S
1la

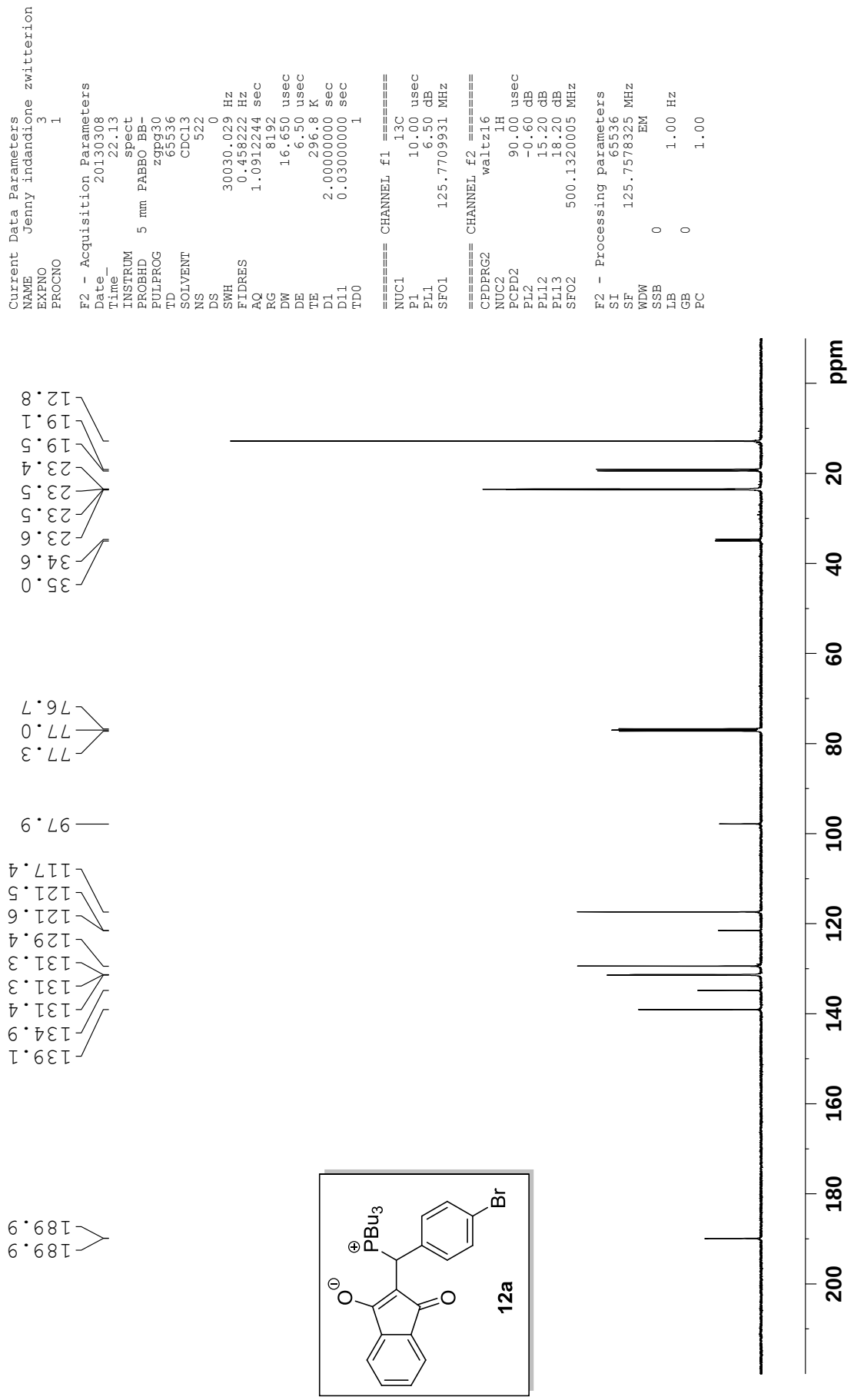

Current Data Parameters
NAME acylation Thionyl Ph
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130425
Time 22.41
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 10583
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577902 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
195.6
189.4
188.8
150.2
142.2
140.0
139.9
138.0
136.1
135.4
135.3
135.1
133.8
128.9
128.9
128.4
123.2
122.4
O
O
O
S
1la
ppm
200
180
160
140
120
100
80
60
40
20

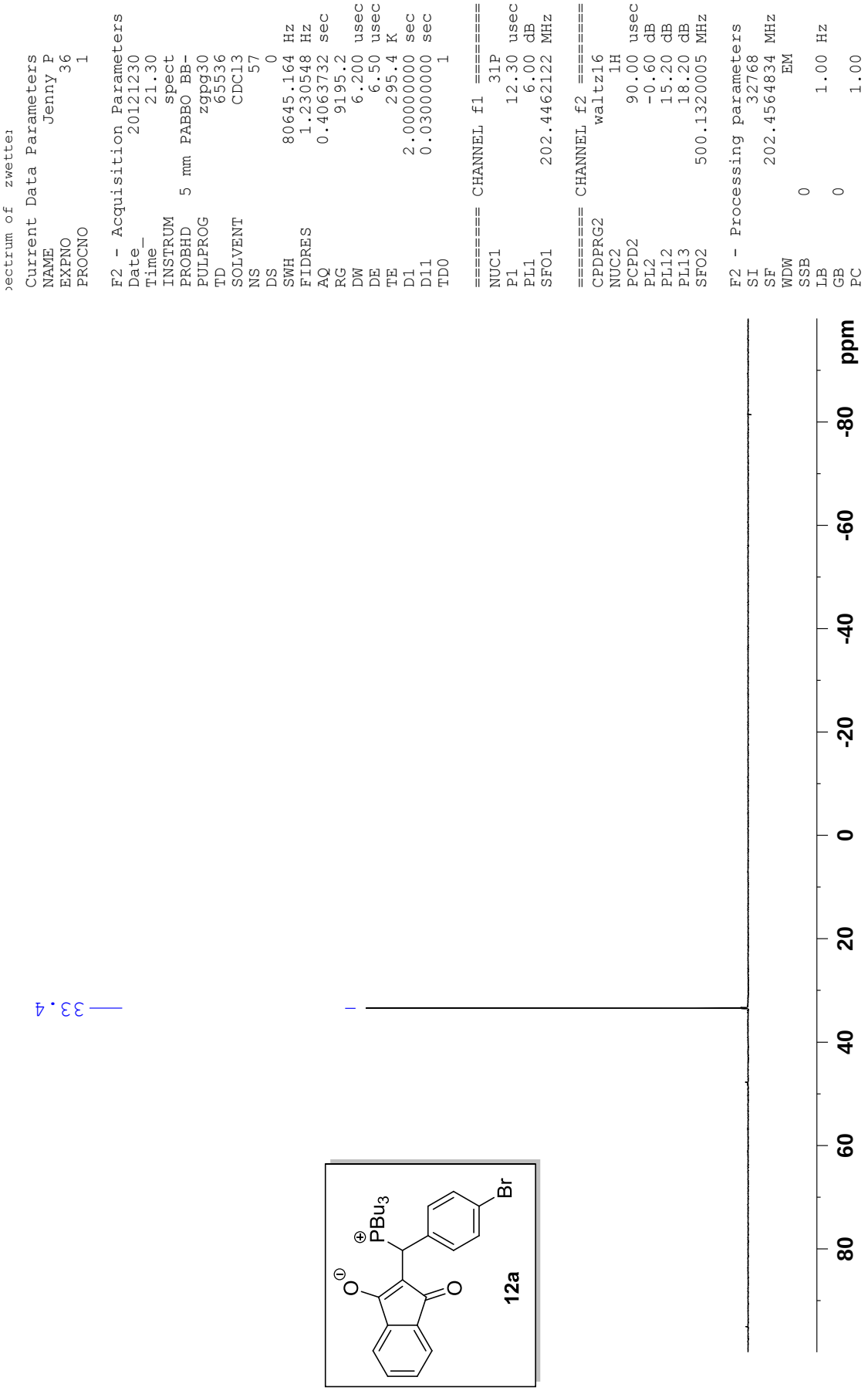

Current Data Parameters
NAME Jenny365_data collect
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130222
Time_ 20.14
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
1.02
1.02
1.06
1.00
2.04
3.10
1.06
3.08
ppm
1ma

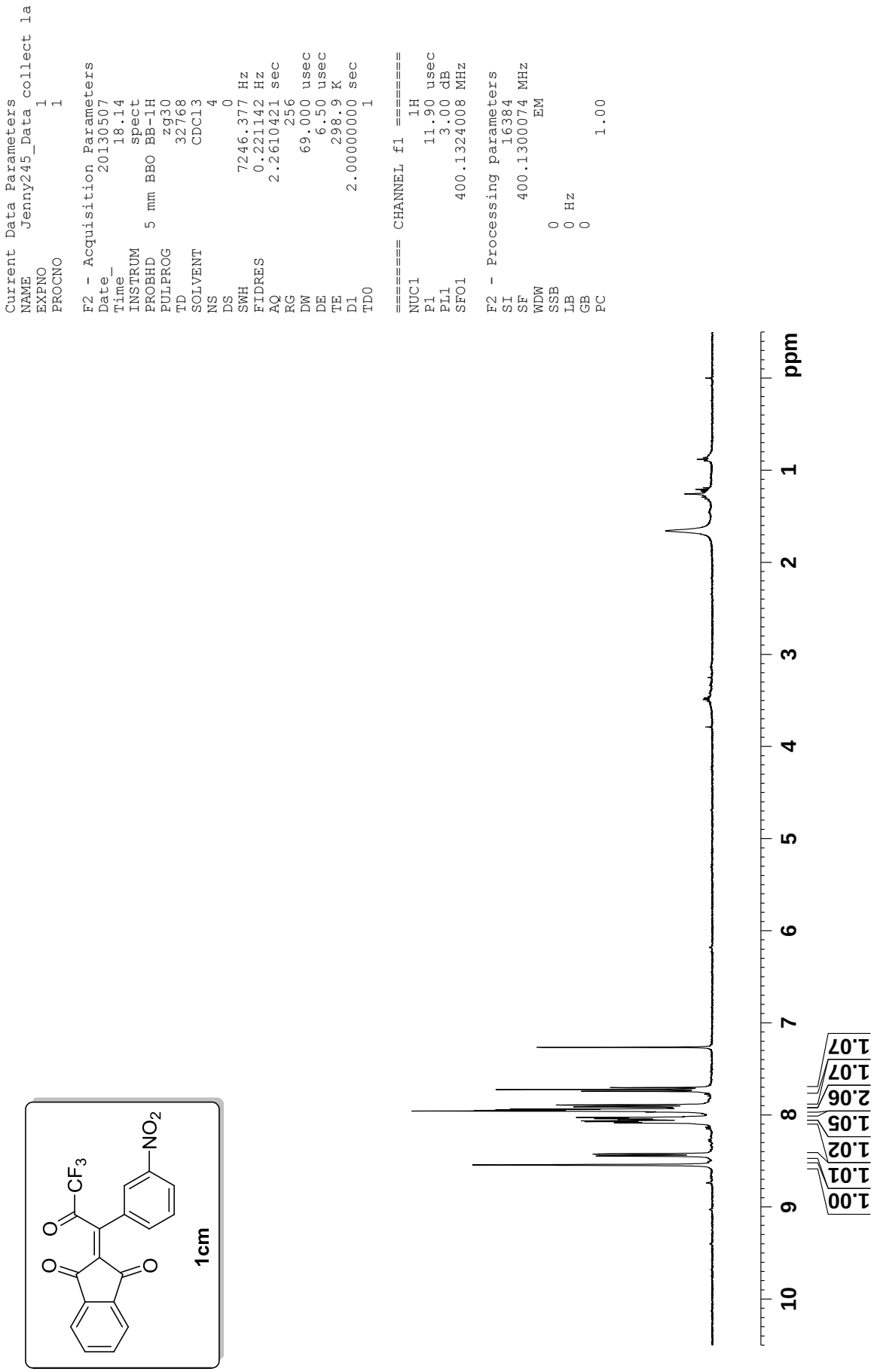


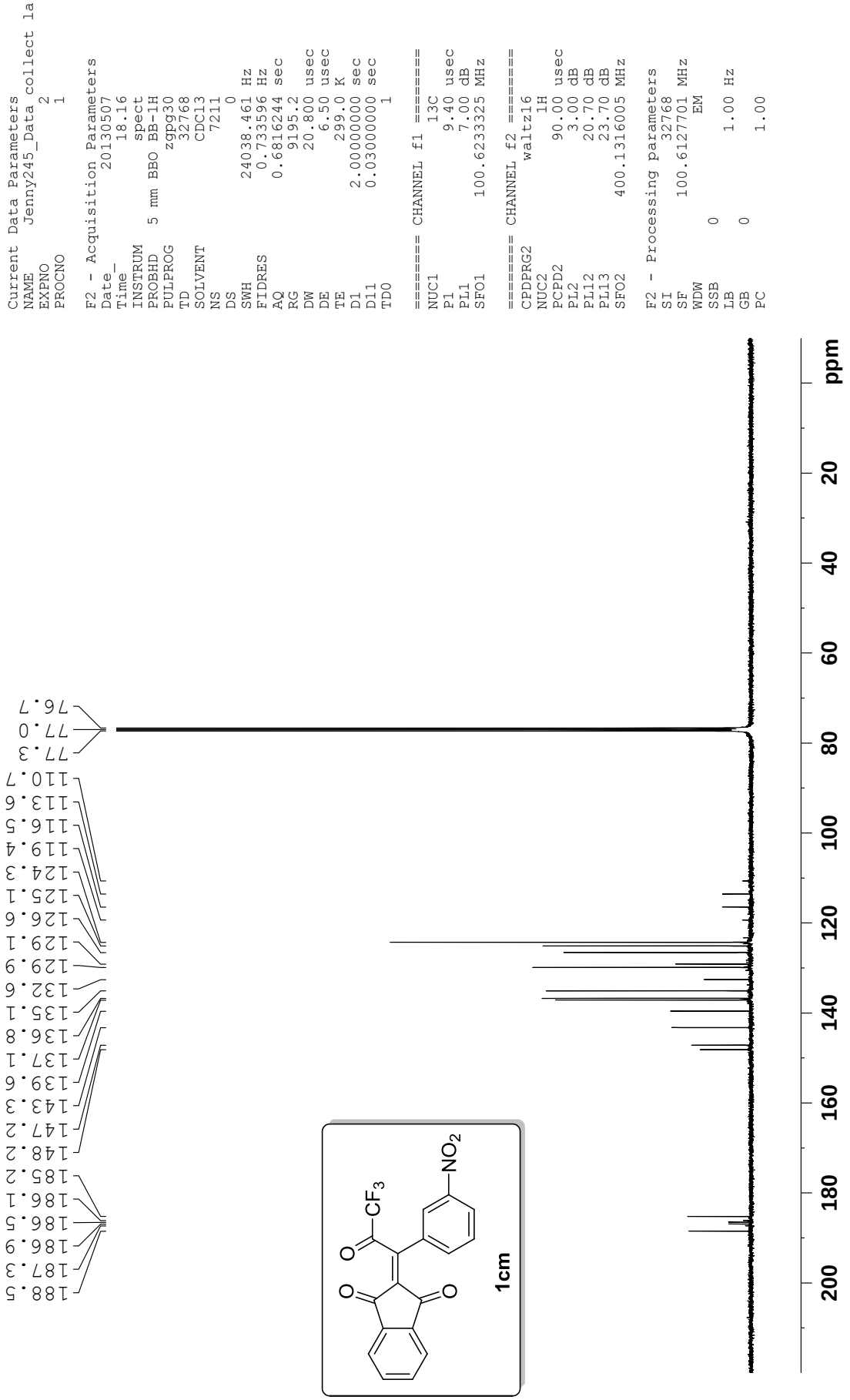

```
Current Data Parameters
NAME                  Jenny 365
EXPNO                         2
PROCNO                        1

F2 - Acquisition Parameters
Date_                  20130501
Time                      18.15
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                      9195.2
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                      10.00 usec
PL1                      6.50 dB
SFO1               125.7709931 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   90.00 usec
PL2                     -0.60 dB
PL12                    15.20 dB
PL13                    18.20 dB
SFO2               500.1320005 MHz

F2 - Processing parameters
SI                       65536
SF                 125.7577968 MHz
WDW                         EM
SSB          0
LB                      1.00 Hz
GB           0
PC                      1.00
```

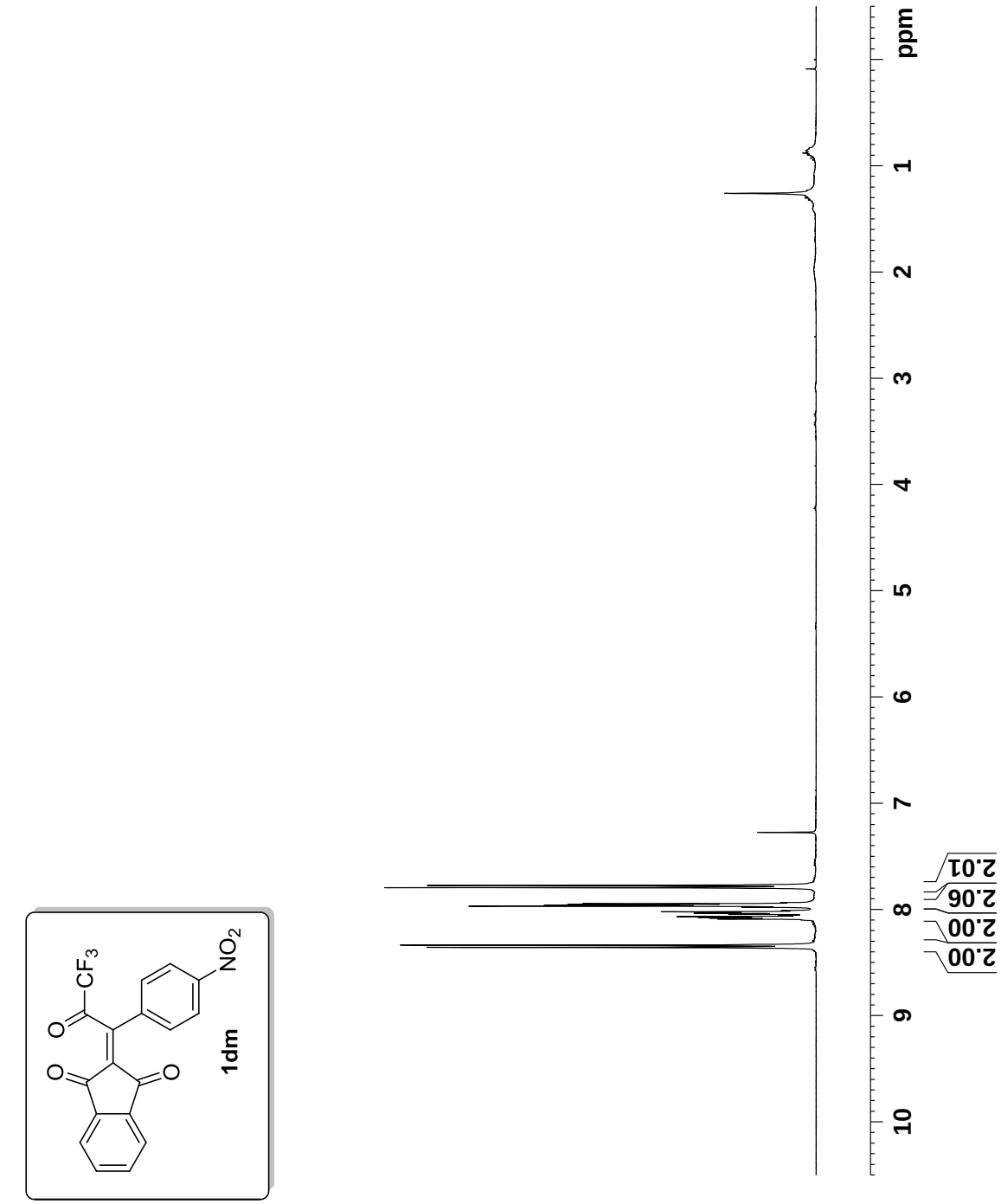

Current Data Parameters
NAME Jenny_P
EXPNO 35
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121230
Time_ 21.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 90.5
DW 55.200 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
TD0 1
========== CHANNEL f1 ==========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300037 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
9.31
12.84
3.08
3.09
1.00
2.35
2.08
2.08
2.03
PBu3
Br
O
O
12a

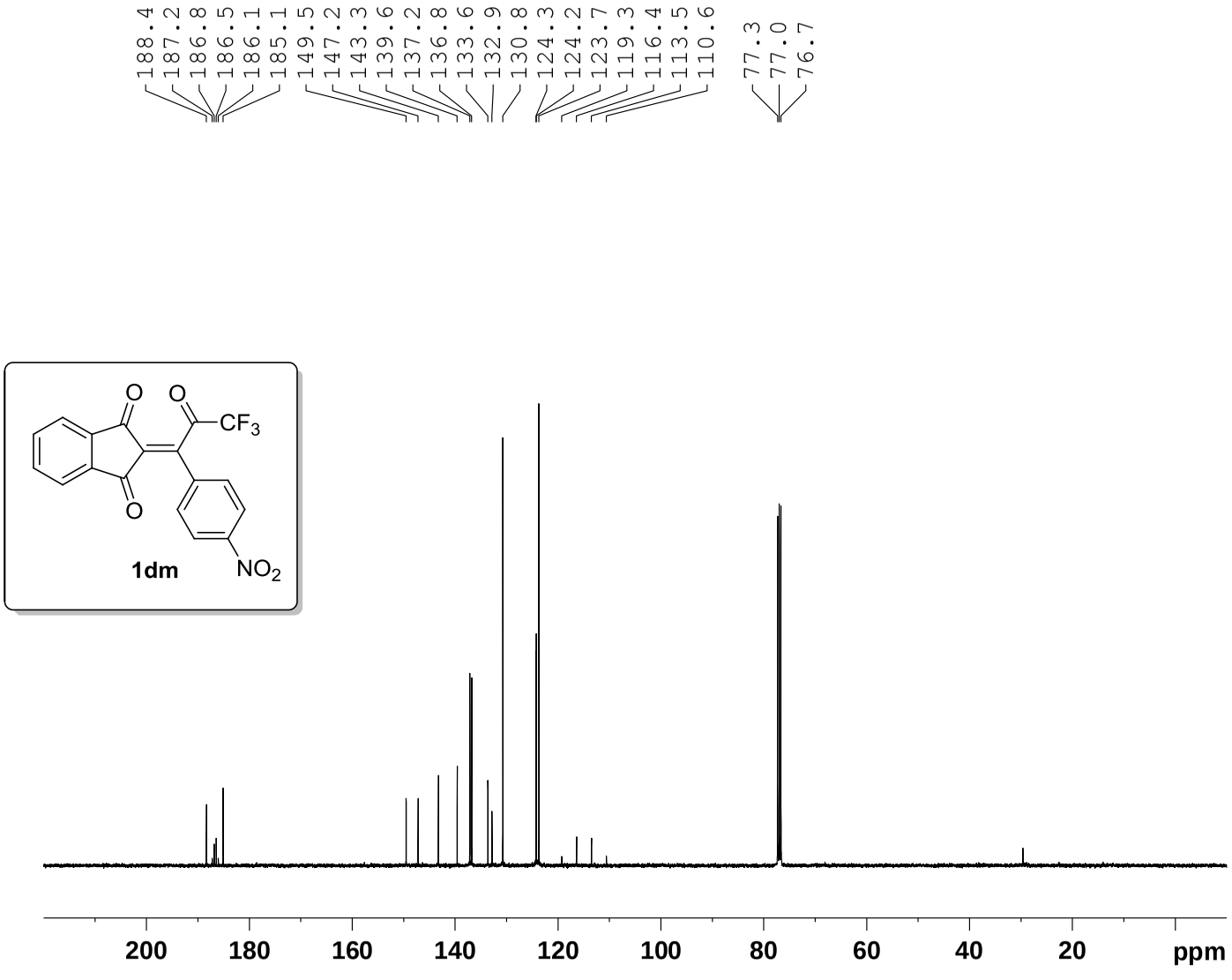

Current Data Parameters
NAME Jenny indandione zwitterion
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130308
Time_ 22.13
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 522
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 8192
DW 16.650 usec
DE 6.50 usec
TE 296.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7578325 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.9
189.9
139.1
134.9
131.4
131.3
131.3
129.4
121.6
121.5
117.4
97.9
77.3
77.0
76.7
35.0
34.6
23.6
23.5
23.5
23.4
19.5
19.1
12.8
PBu3
Br
O
O
12a
ppm
200
180
160
140
120
100
80
60
40
20


pectrum of zwetter
Current Data Parameters
NAME Jenny P
EXPNO 36
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121230
Time 21.30
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 57
DS 0
SWH 80645.164 Hz
FIDRES 1.230548 Hz
AQ 0.4063732 sec
RG 9195.2
DW 6.200 usec
DE 6.50 usec
TE 295.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 31P
P1 12.30 usec
PL1 6.00 dB
SFO1 202.4462122 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 32768
SF 202.4564834 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
33.4
80
60
40
20
0
-20
-40
-60
-80
ppm
PBu3
Br
O
O
12a

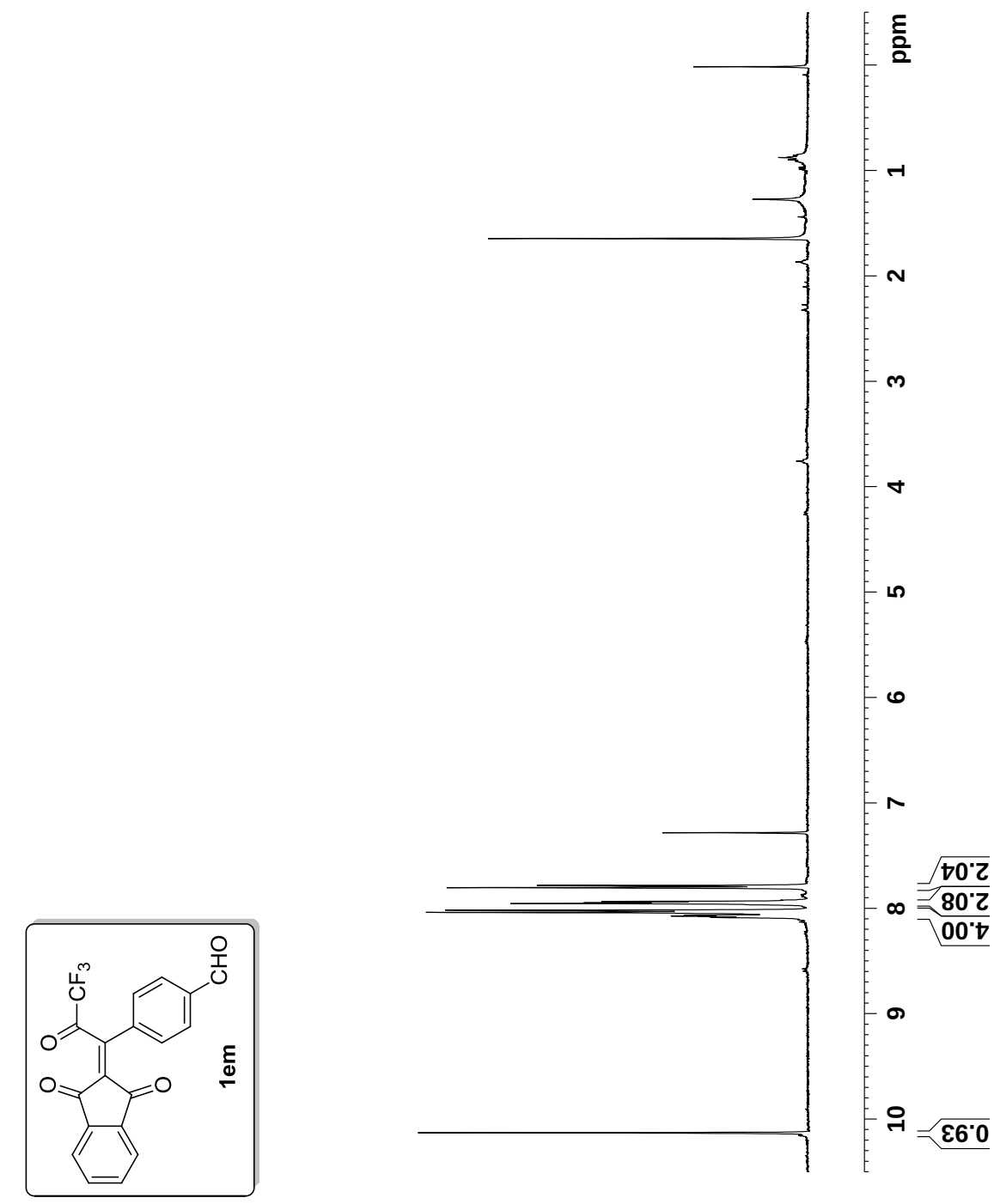

Current Data Parameters
NAME Jenny245_Data collect 1a
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130507
Time_ 18.14
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300074 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1cm
ppm
1.00
1.01
1.02
1.05
2.06
1.07
1.07

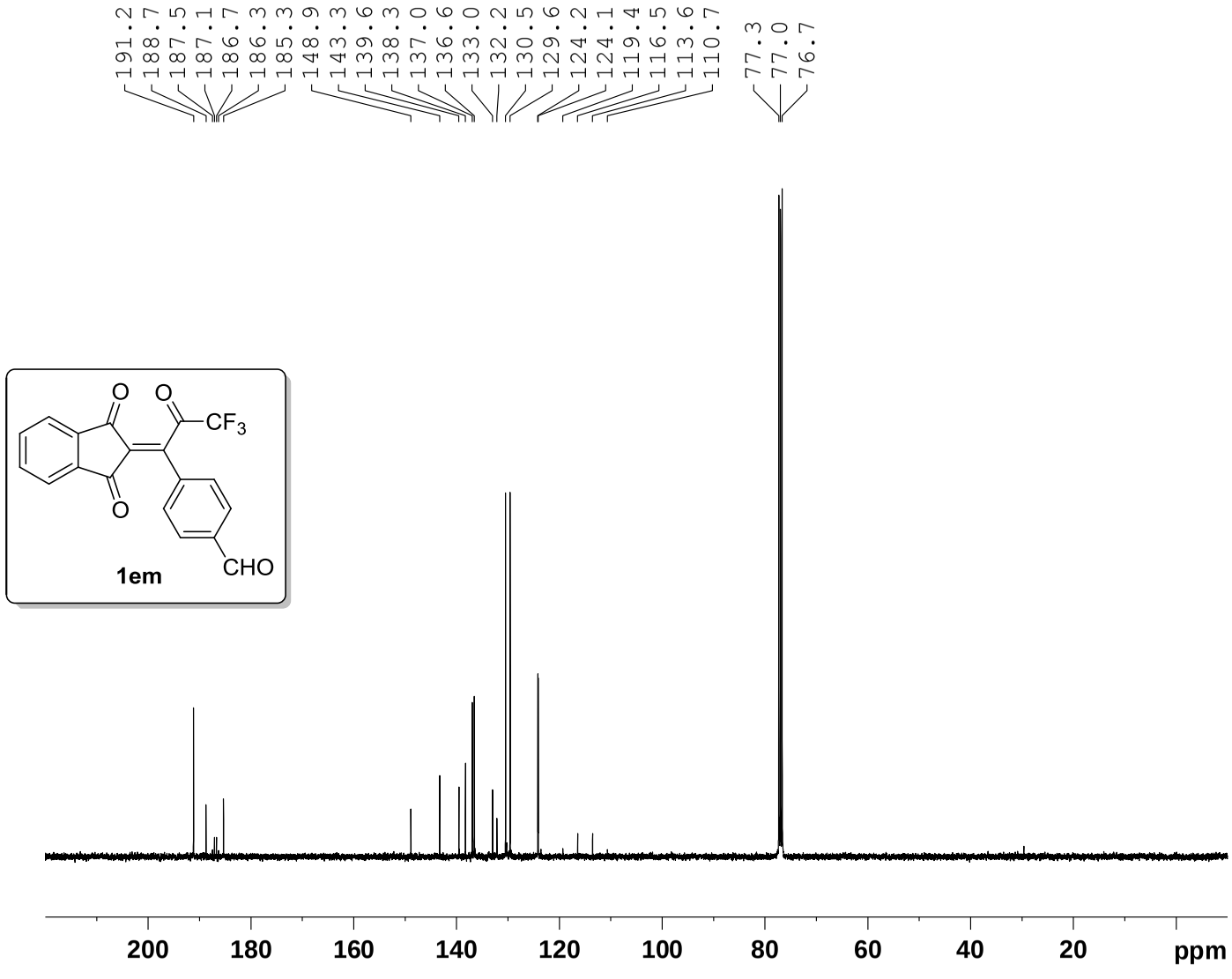

Current Data Parameters
NAME Jenny245_Data collect la
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130507
Time_ 18.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 7211
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127701 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
110.7
113.6
116.5
119.4
124.3
125.1
126.6
129.1
129.9
132.6
135.1
136.8
137.1
139.6
143.3
147.2
148.2
185.2
186.1
186.5
186.9
187.3
188.5
O
O
O
CF3
NO2
1cm
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Jenny253
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130118
Time_ 22.41
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 296.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
2.00
2.00
2.06
2.01
ppm
1dm

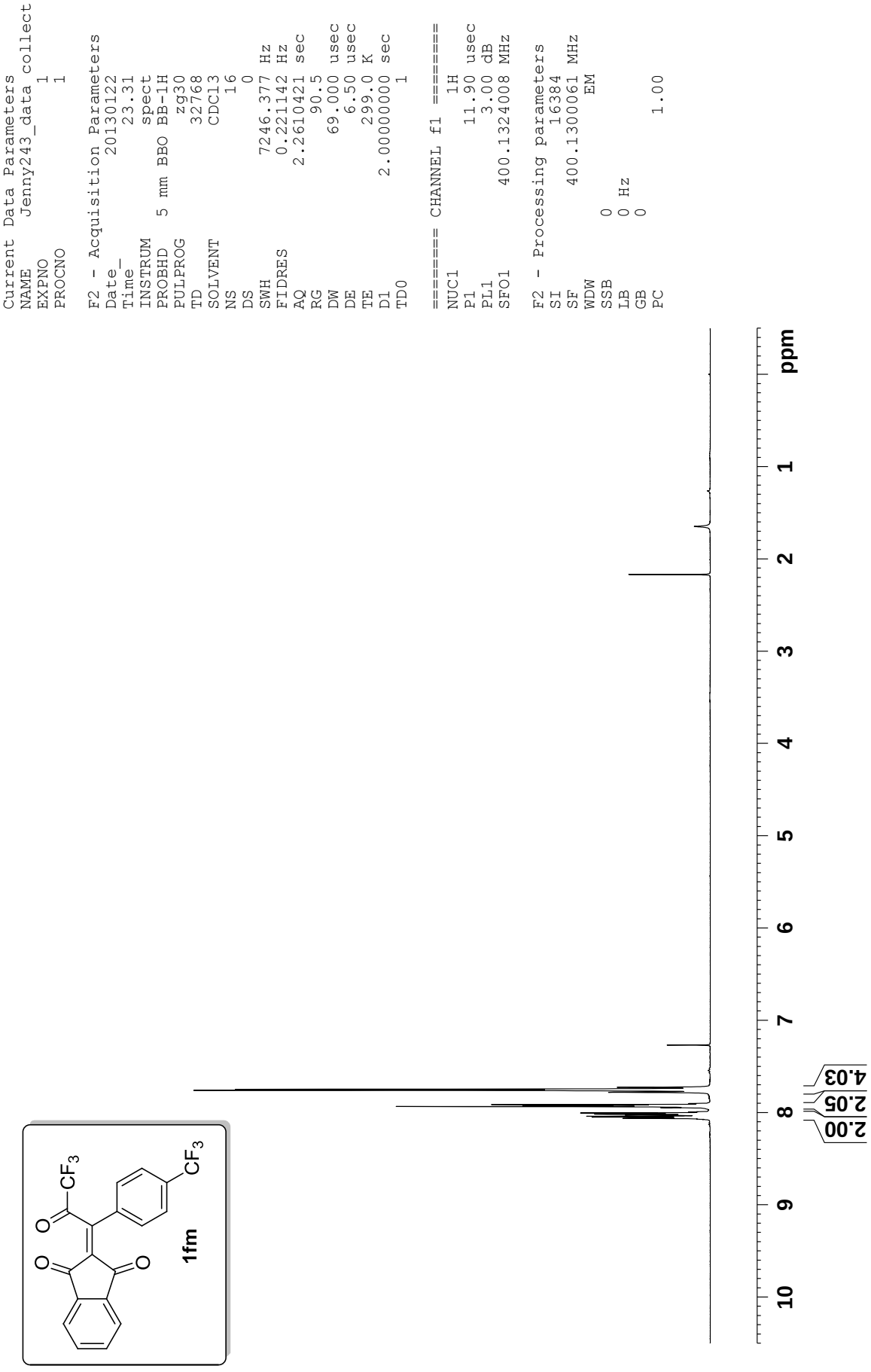


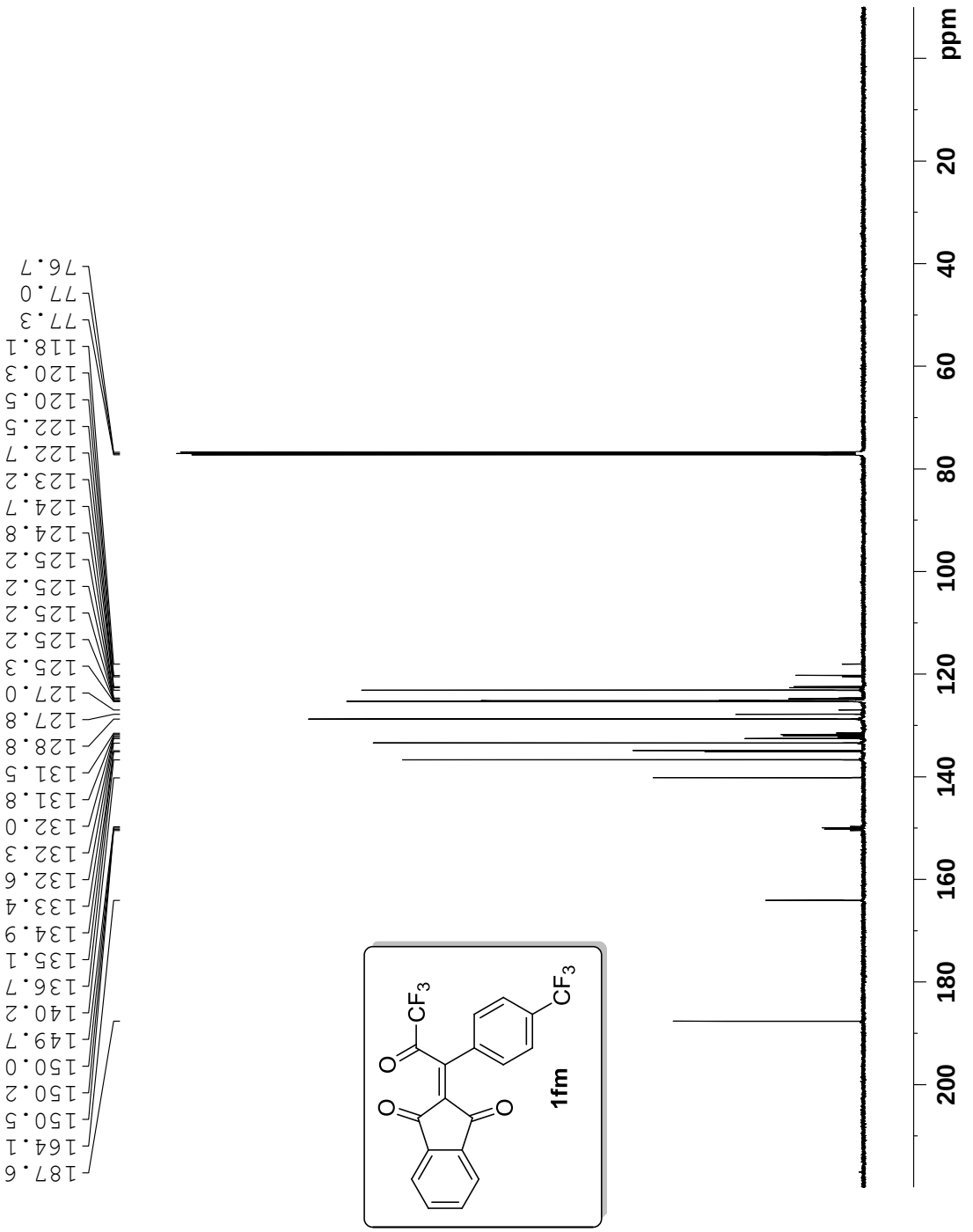

```
Current Data Parameters
NAME            Jenny253
EXPNO                  6
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130119
Time               12.22
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1073
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                296.8 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                 7.00 dB
SFO1         100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF           100.6127736 MHz
WDW                  EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.00
```

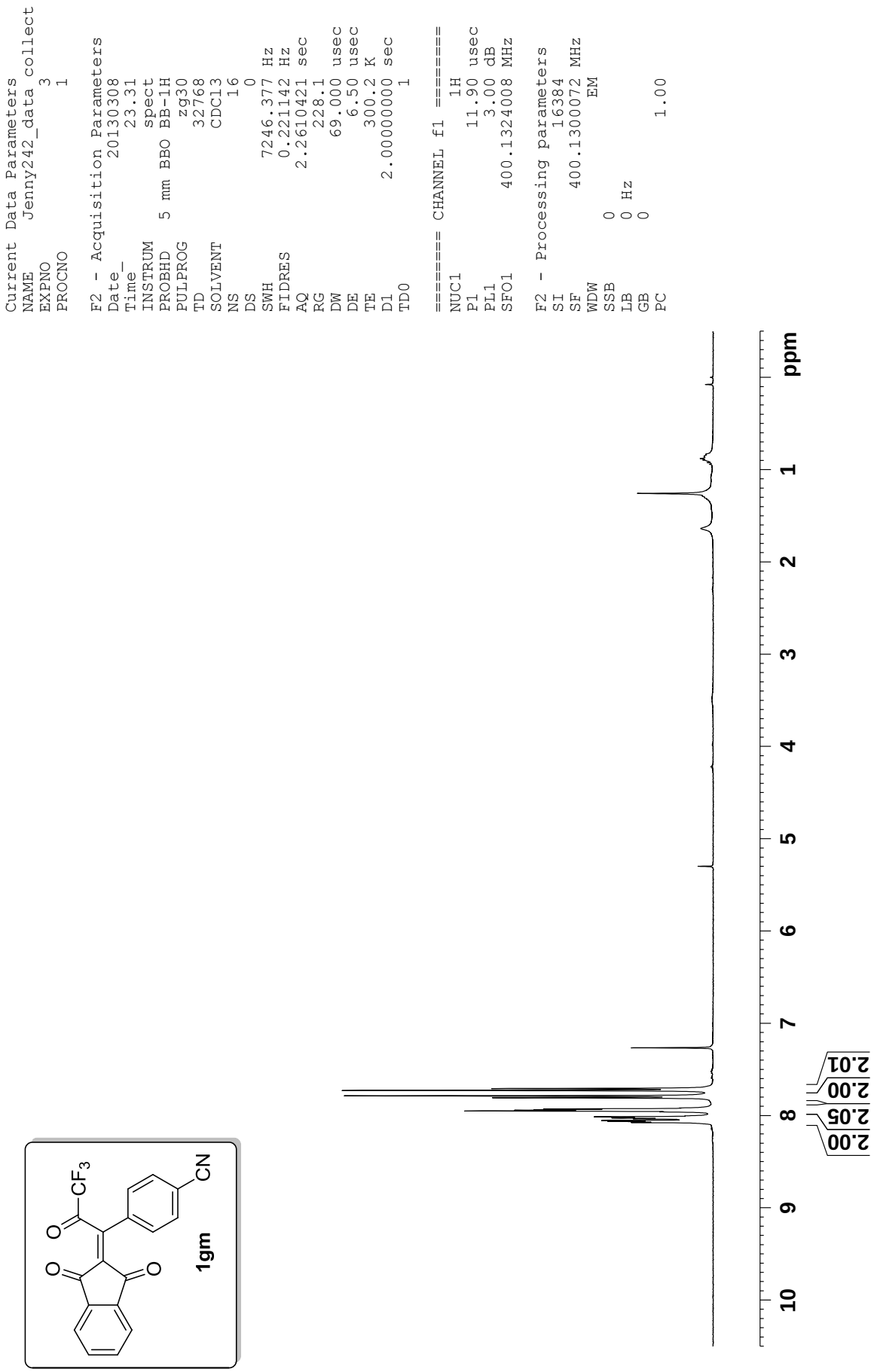

Current Data Parameters
NAME Jenny251
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121207
Time_ 20.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 4
DW 69.000 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
0.93
4.00
2.08
2.04
1em

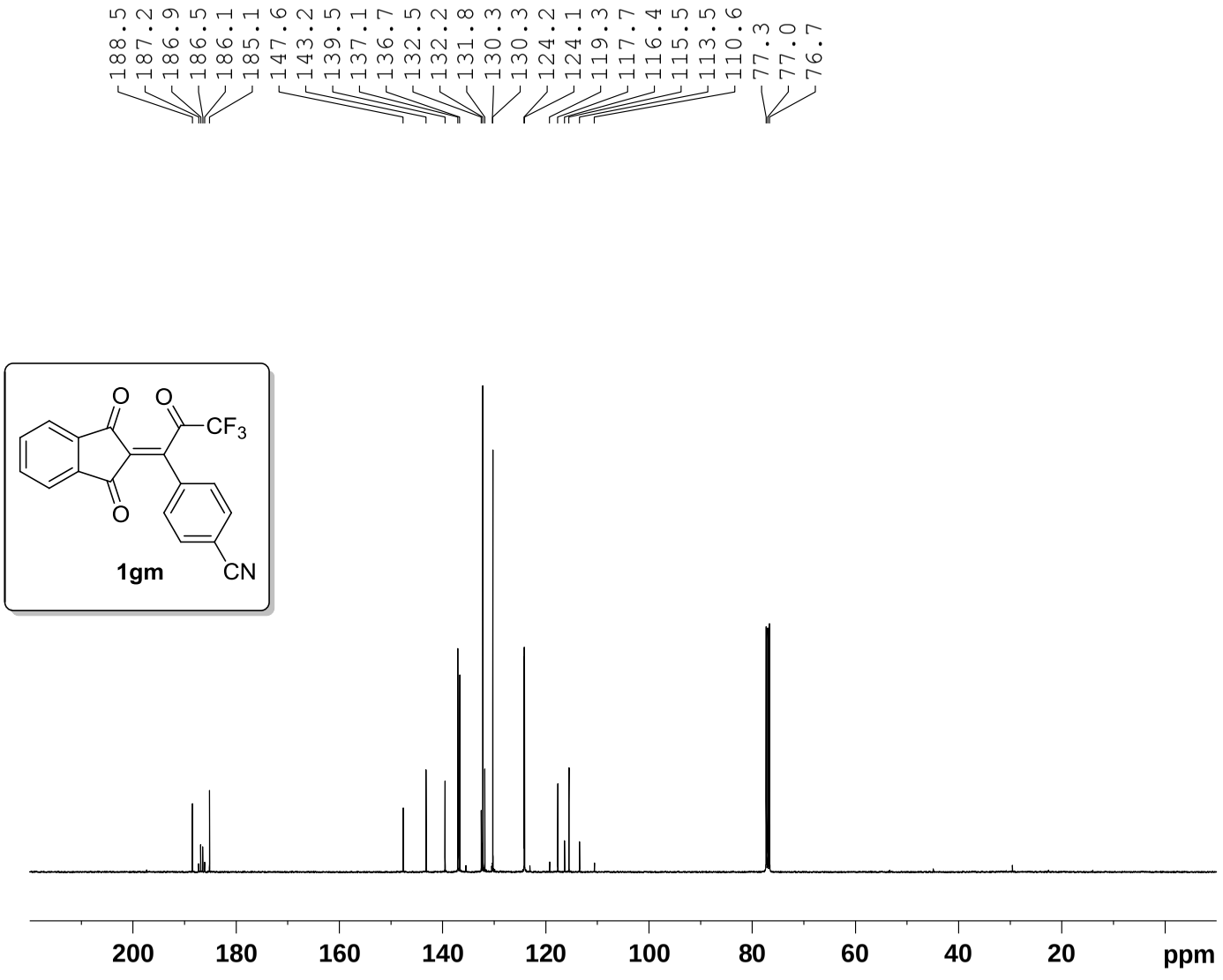



```
Current Data Parameters
NAME            Jenny251
EXPNO                  7
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130101
Time               18.19
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1104
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                296.3 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 9.40 usec
PL1                7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127720 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.00
```

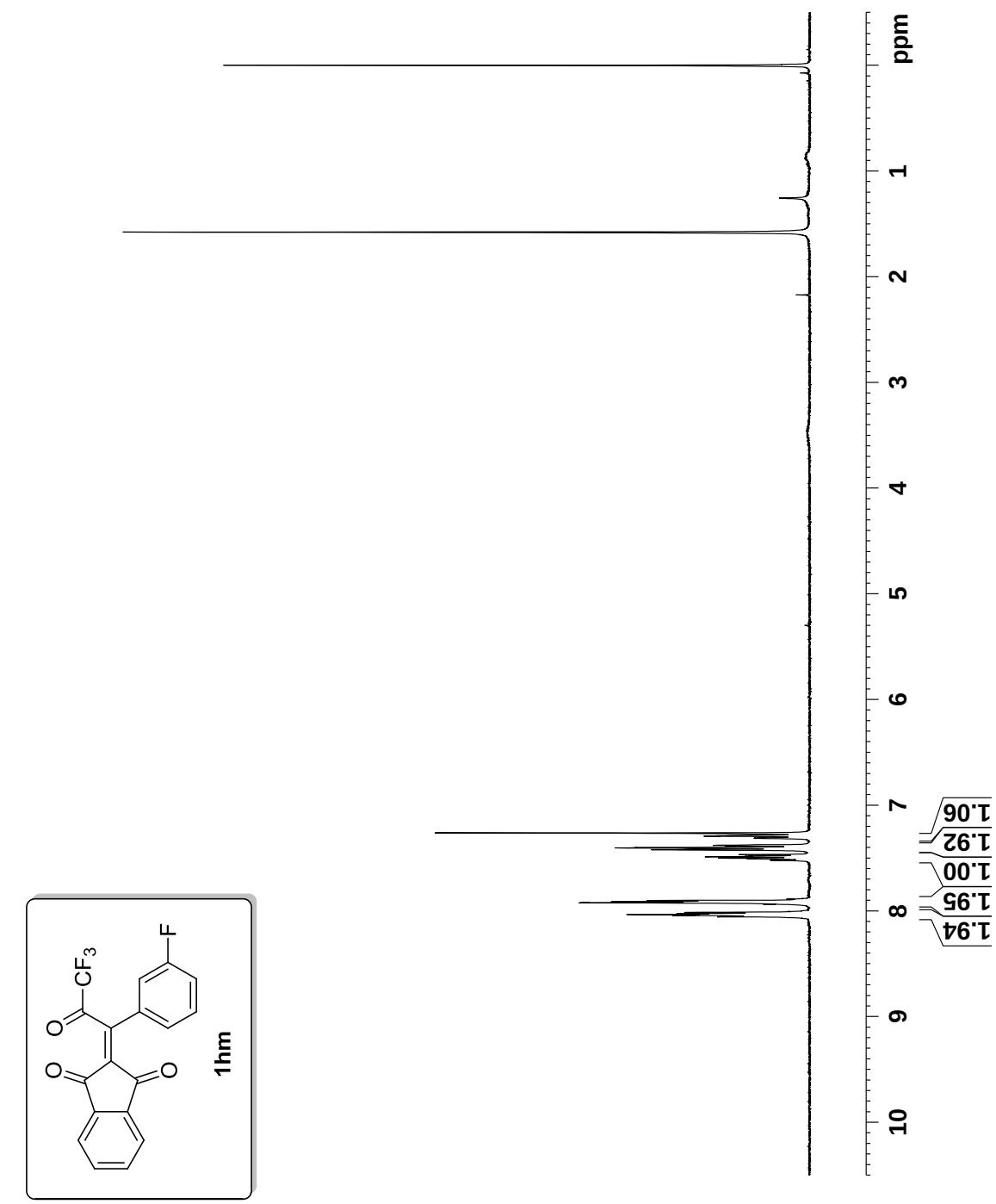

Current Data Parameters
NAME Jenny243_data collect
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130122
Time_ 23.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 90.5
DW 69.000 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300061 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
2.00
2.05
4.03
ppm
1fm

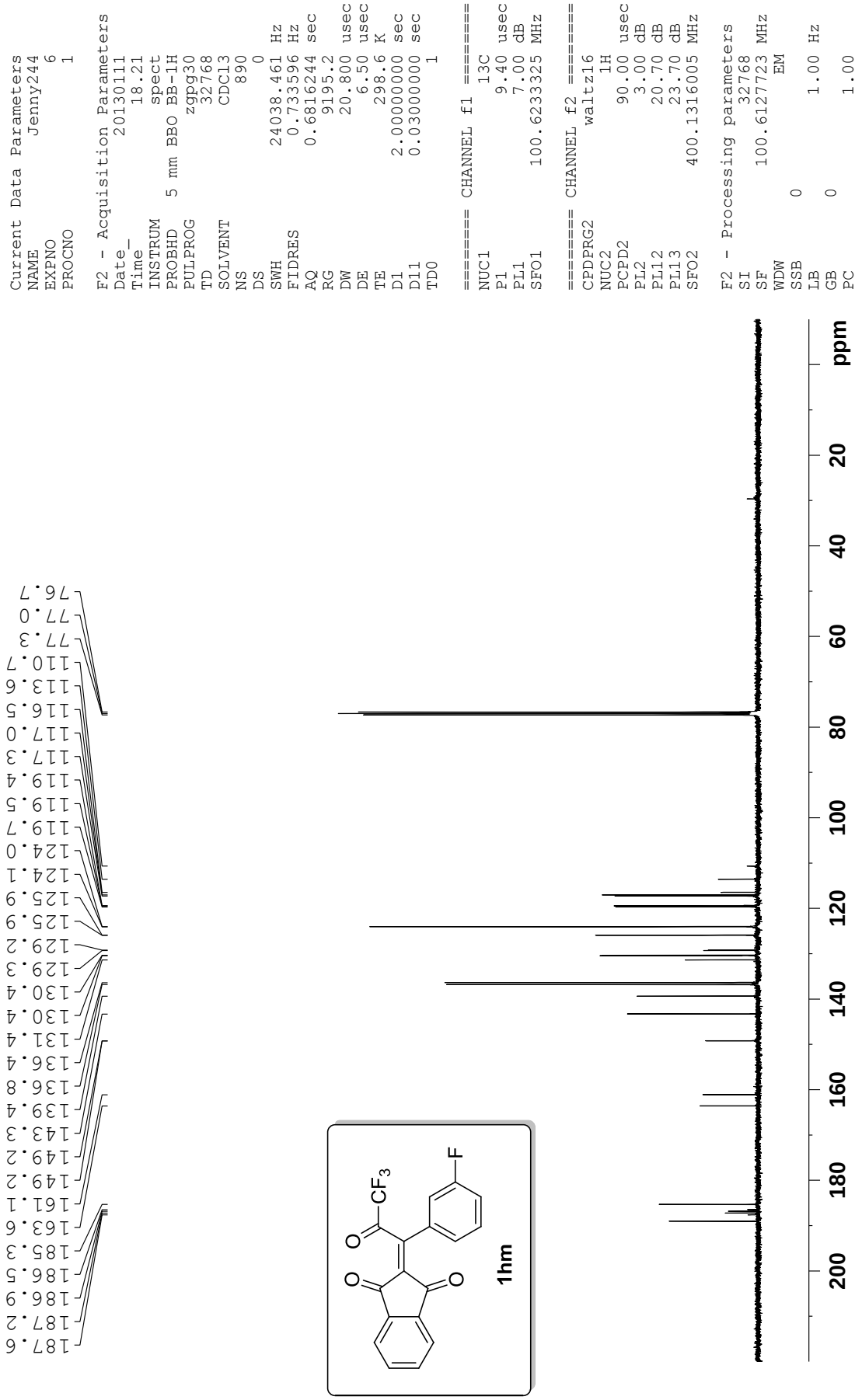

Current Data Parameters
NAME Jenny 265
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130420
Time_ 14.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1515
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
187.6
164.1
150.5
150.2
150.0
149.7
140.2
136.7
135.1
134.9
133.4
132.6
132.3
132.0
131.8
131.5
128.8
127.8
127.0
125.3
125.2
125.2
125.2
124.8
124.7
123.2
122.7
122.5
120.5
120.3
118.1
77.3
77.0
76.7
CF3
CF3
O
O
O
1fm
200
180
160
140
120
100
80
60
40
20
ppm

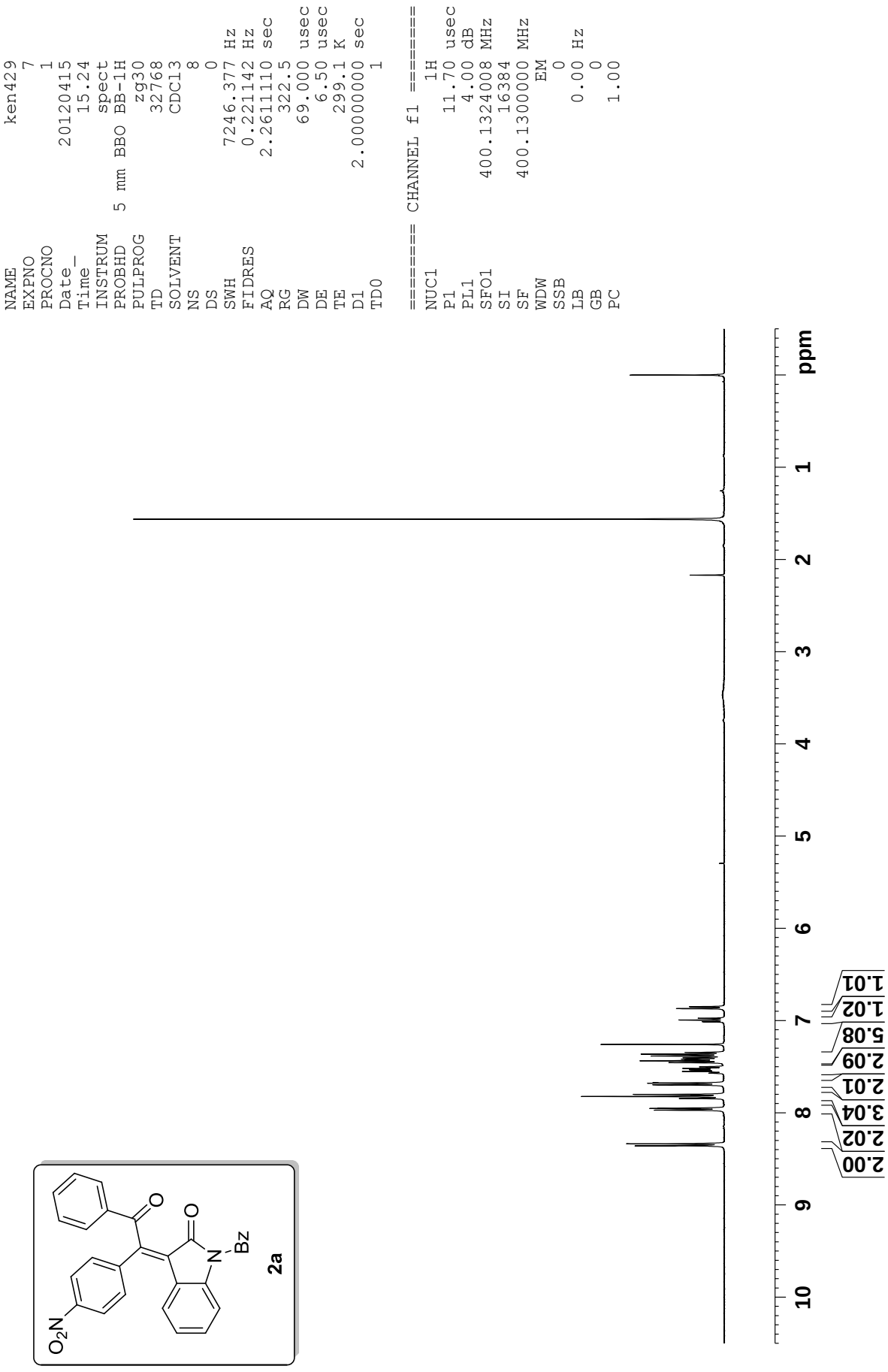

Current Data Parameters
NAME Jenny242_data collect
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130308
Time_ 23.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 300.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300072 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
2.00
2.05
2.00
2.01
ppm
1gm

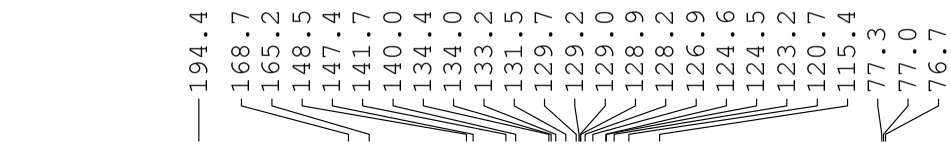


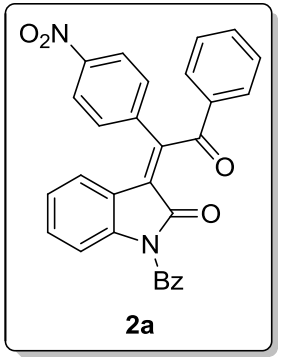

```
Current Data Parameters
NAME      Jenny384_data collect
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130308
Time              23.09
INSTRUM           spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 9548
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                300.1 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 9.40 usec
PL1                7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2            90.00 usec
PL2               3.00 dB
PL12              20.70 dB
PL13              23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                32768
SF          100.6127757 MHz
WDW                 EM
SSB      0
LB                1.00 Hz
GB       0
PC                1.00
```


Current Data Parameters
NAME Jenny244
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121203
Time_ 16.26
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 1149.4
DW 69.000 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1
2
3
4
5
6
7
8
9
10
1.94
1.95
1.00
1.92
1.06
1hm


Current Data Parameters
NAME Jenny244
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130111
Time_ 18.21
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 890
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 298.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127723 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
187.6
187.2
186.9
186.5
185.3
163.6
161.1
149.2
149.2
143.3
139.4
136.8
136.4
131.4
130.4
130.4
129.3
129.2
125.9
125.9
124.1
124.0
119.7
119.5
119.4
117.3
117.0
116.5
113.6
110.7
77.3
77.0
76.7
O
O
O
CF3
F
1hm
200
180
160
140
120
100
80
60
40
20
ppm

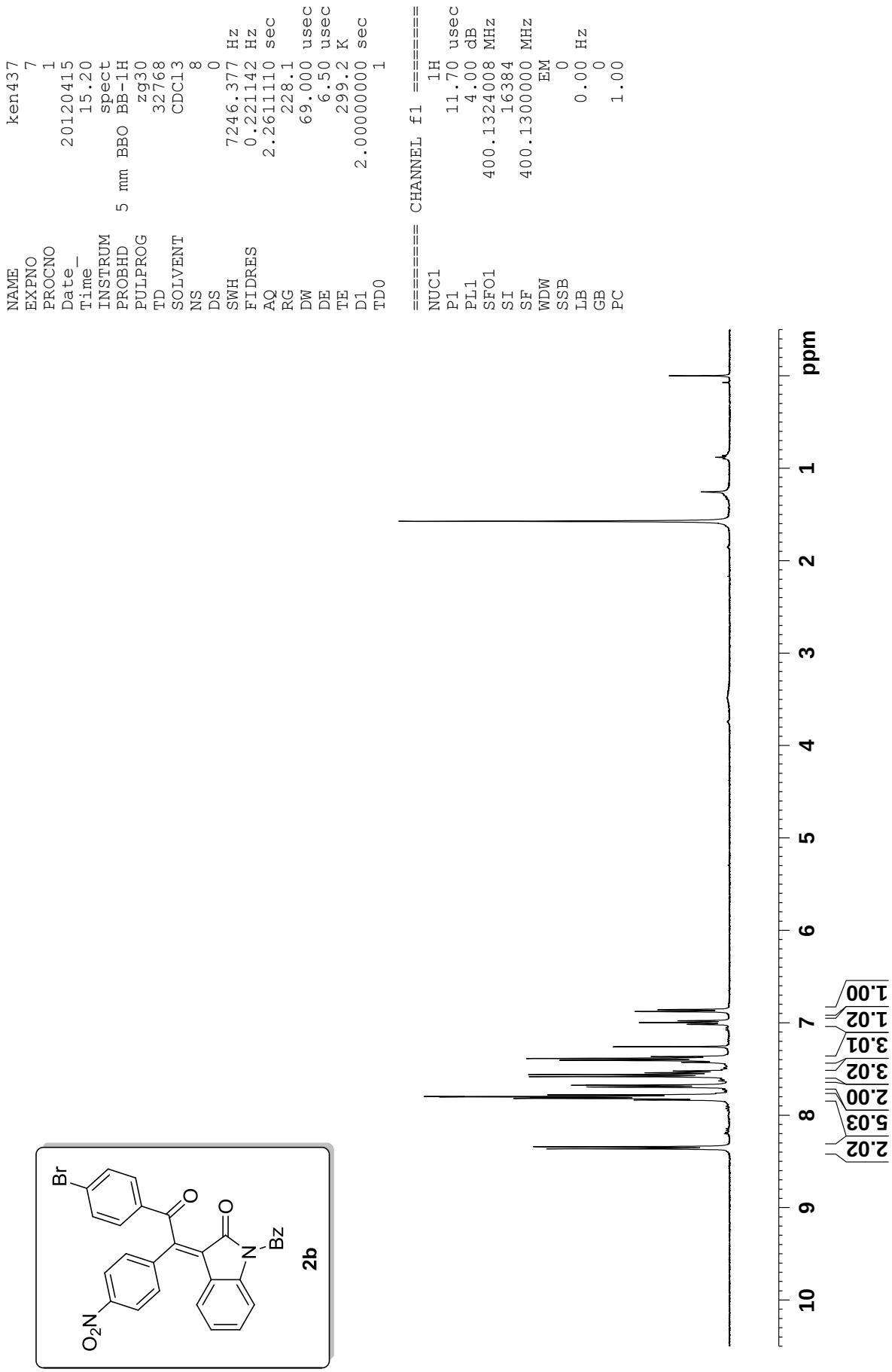


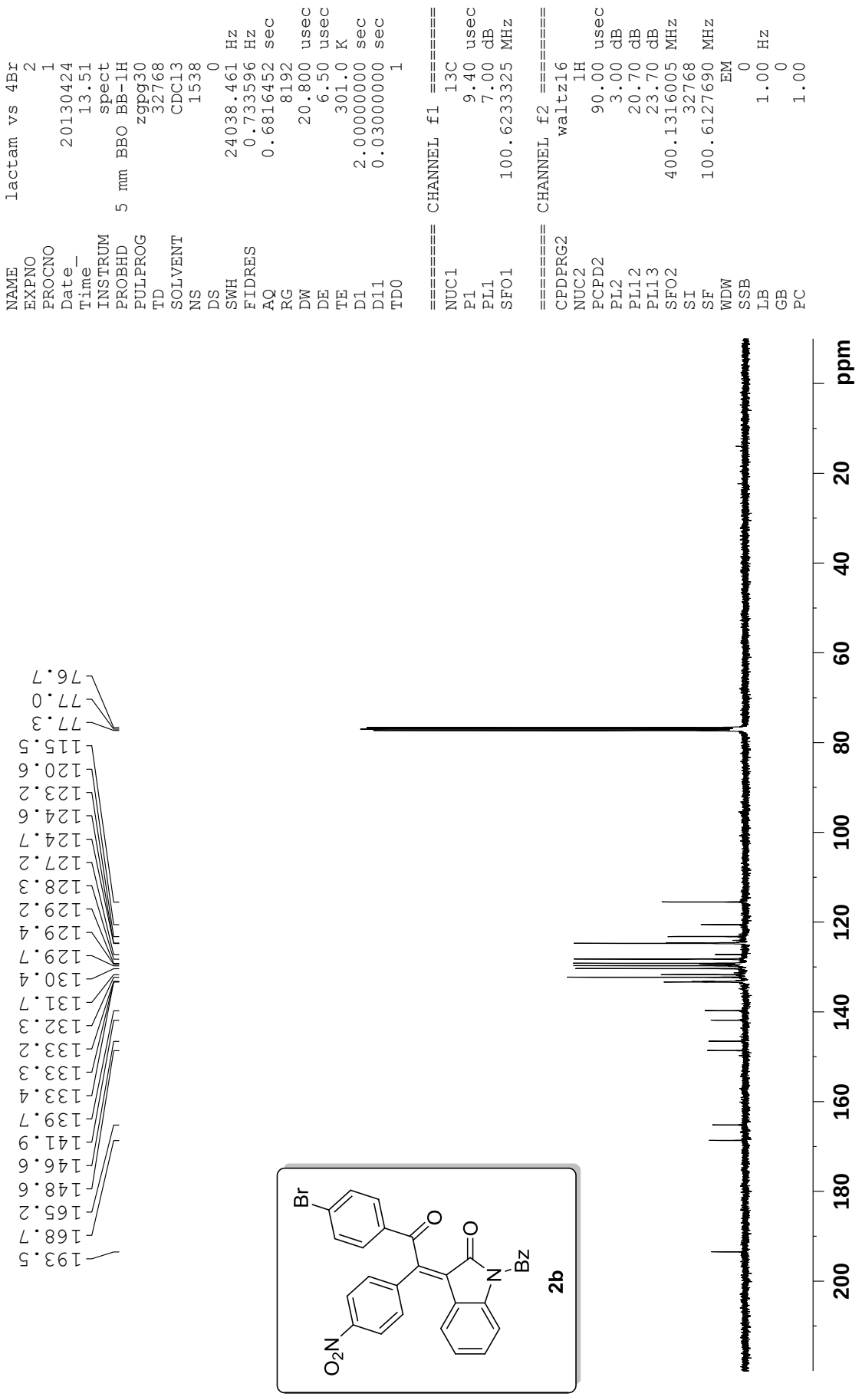


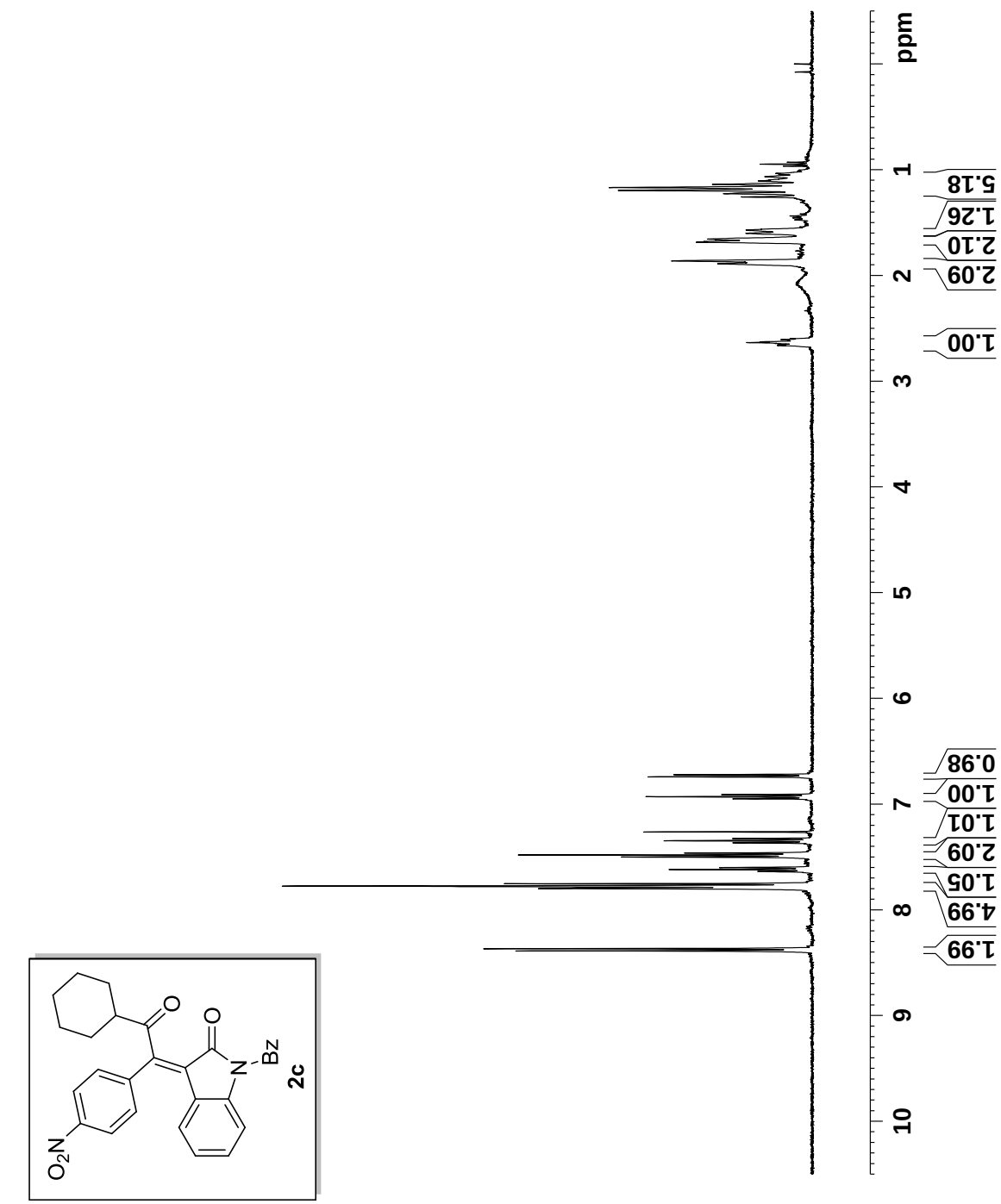


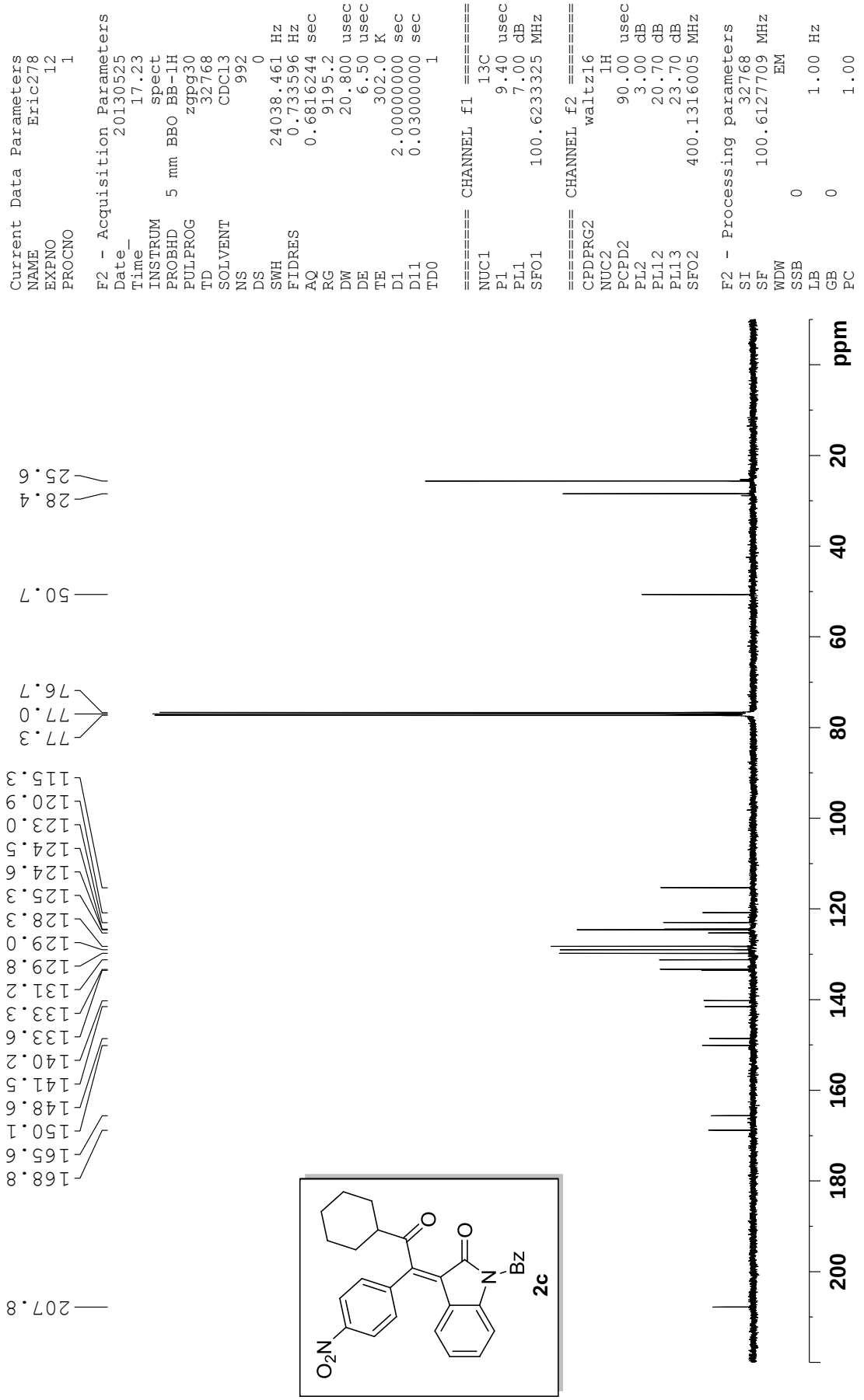
2a

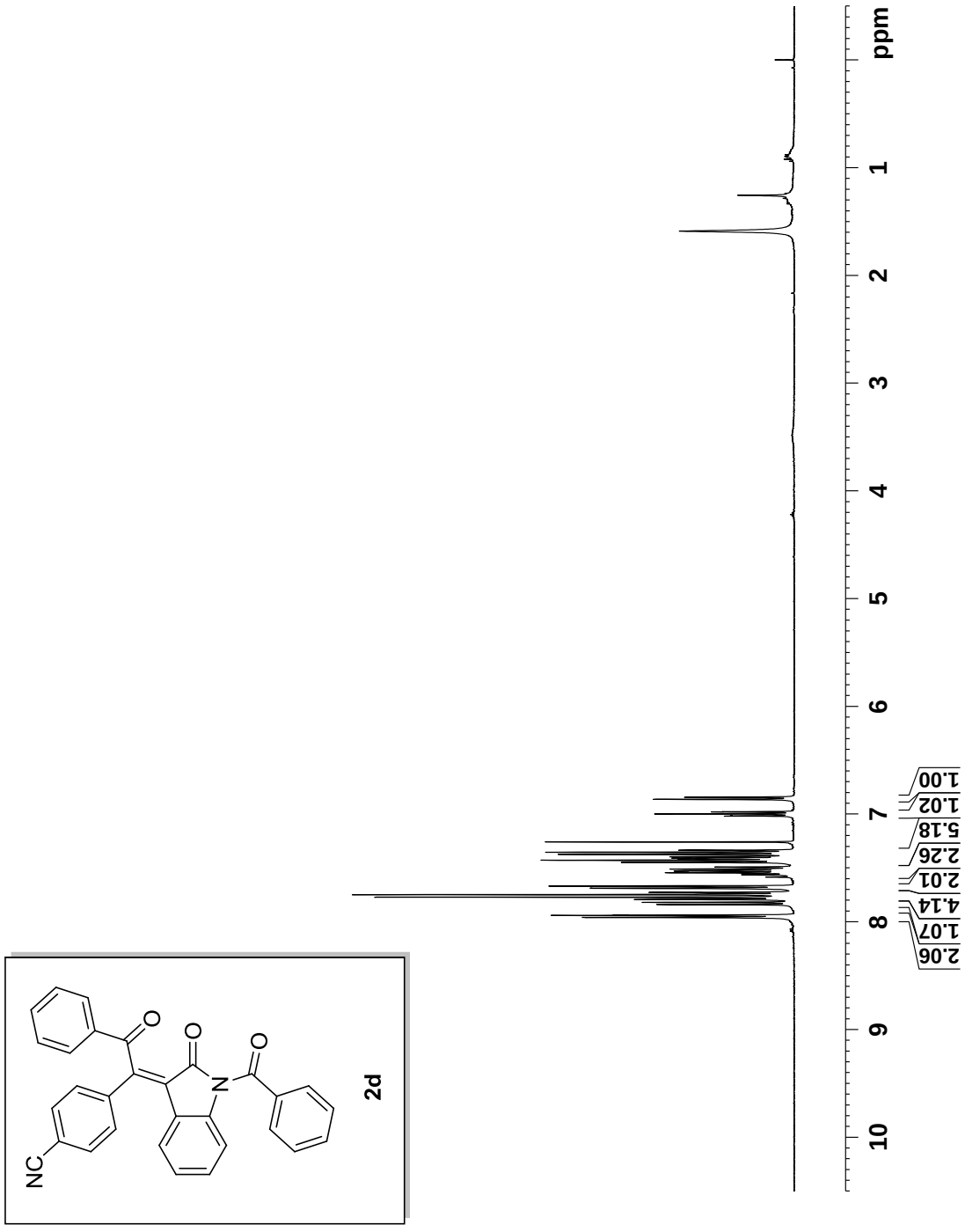

```
Current Data Parameters
NAME        lactam vs Ph
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130423
Time               16.00
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                  404
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                300.4 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                 7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                32768
SF          100.6127782 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.00
```

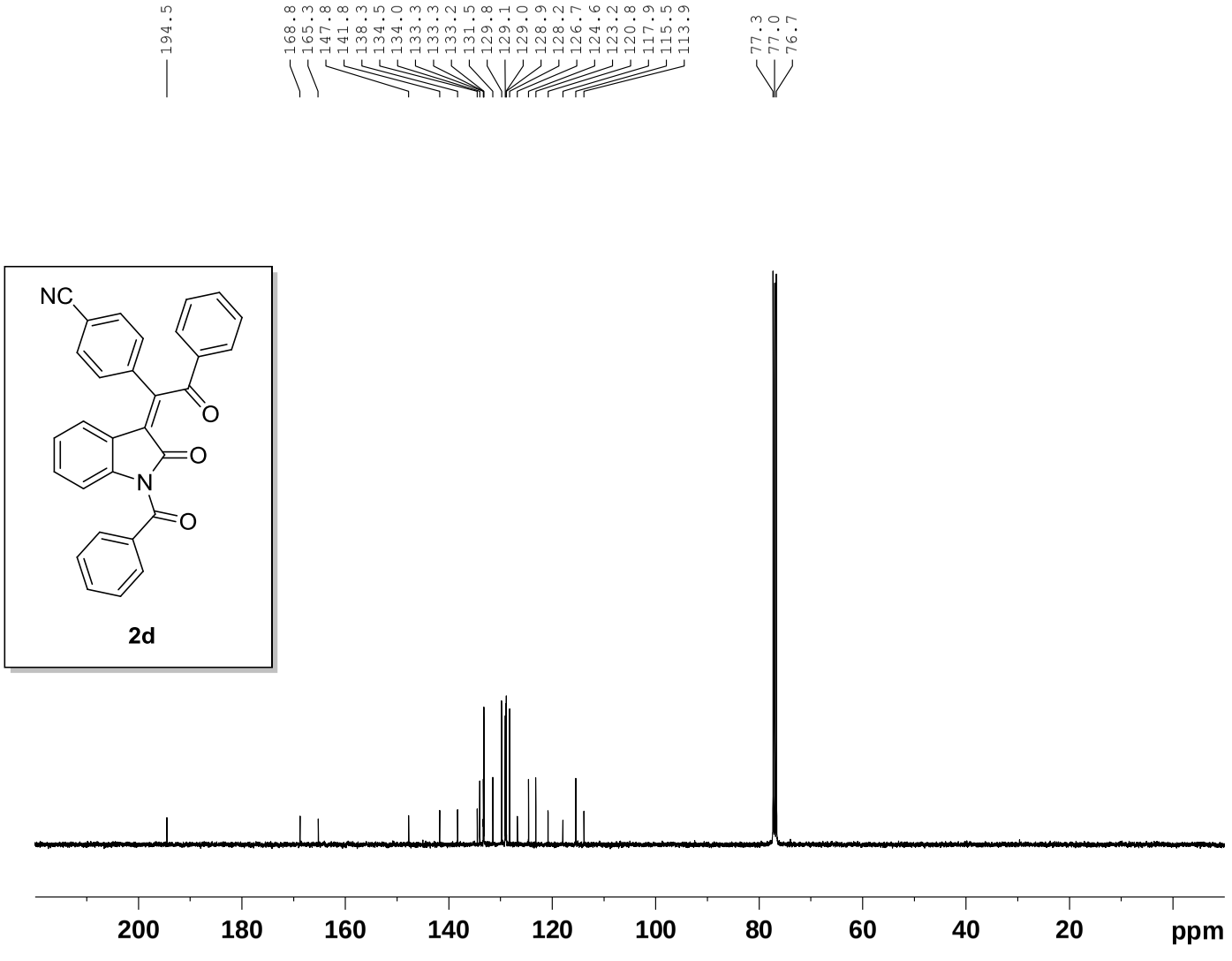

NAME ken437
EXPNO 7
PROCNO 1
Date_ 20120415
Time 15.20
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2611110 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 4.00 dB
SFO1 400.1324008 MHz
SI 16384
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
Br
O
O
N
Bz
O2N
2b
ppm
1
2
3
4
5
6
7
8
9
10
2.02
5.03
2.00
3.02
3.01
1.02
1.00



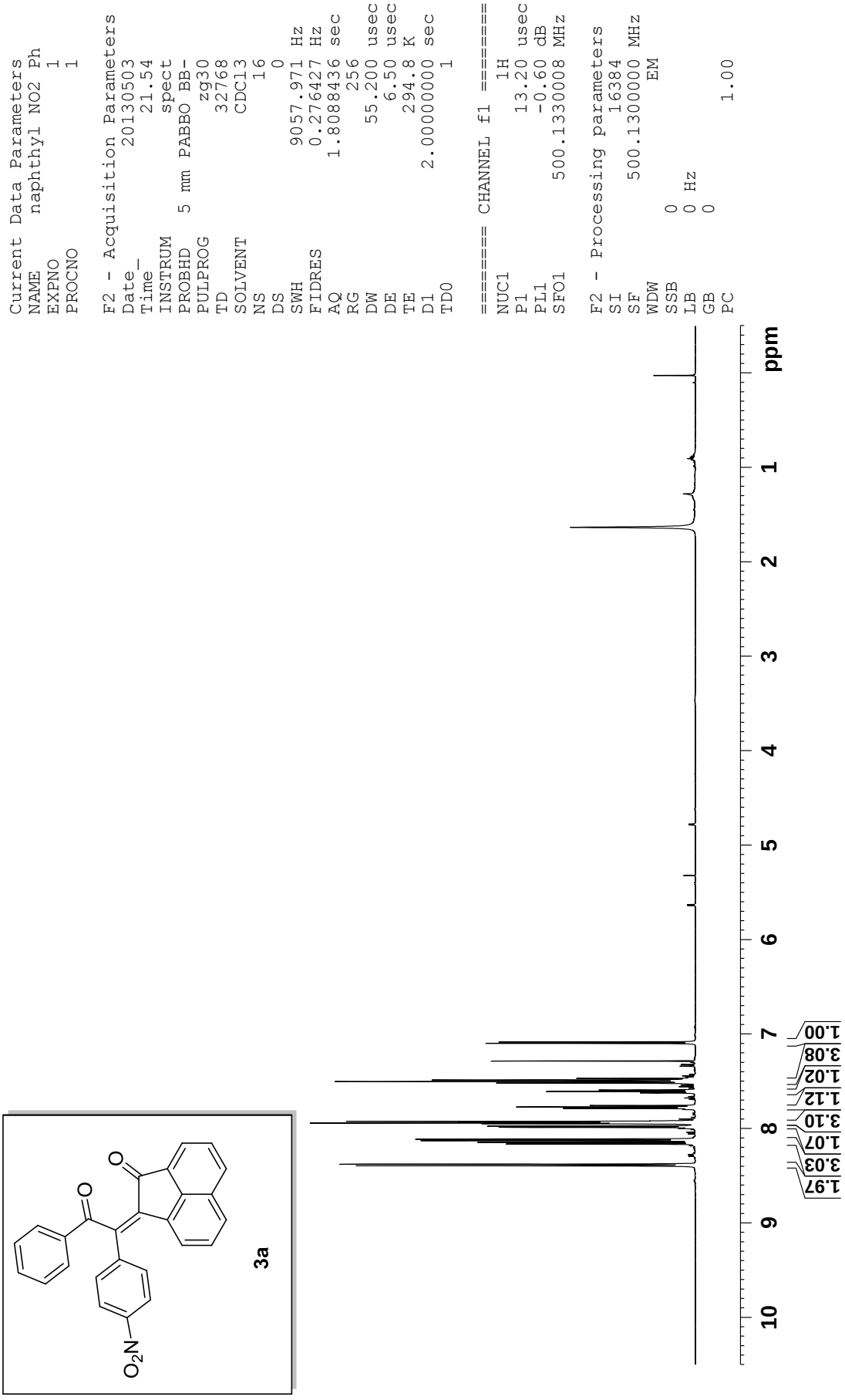

Current Data Parameters
NAME Eric278
EXPNO 11
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130525
Time_ 17.14
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 1
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 301.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1.99
4.99
1.05
2.09
1.01
1.00
0.98
1.00
2.09
2.10
1.26
5.18
2c
Bz
N
O
O
O2N

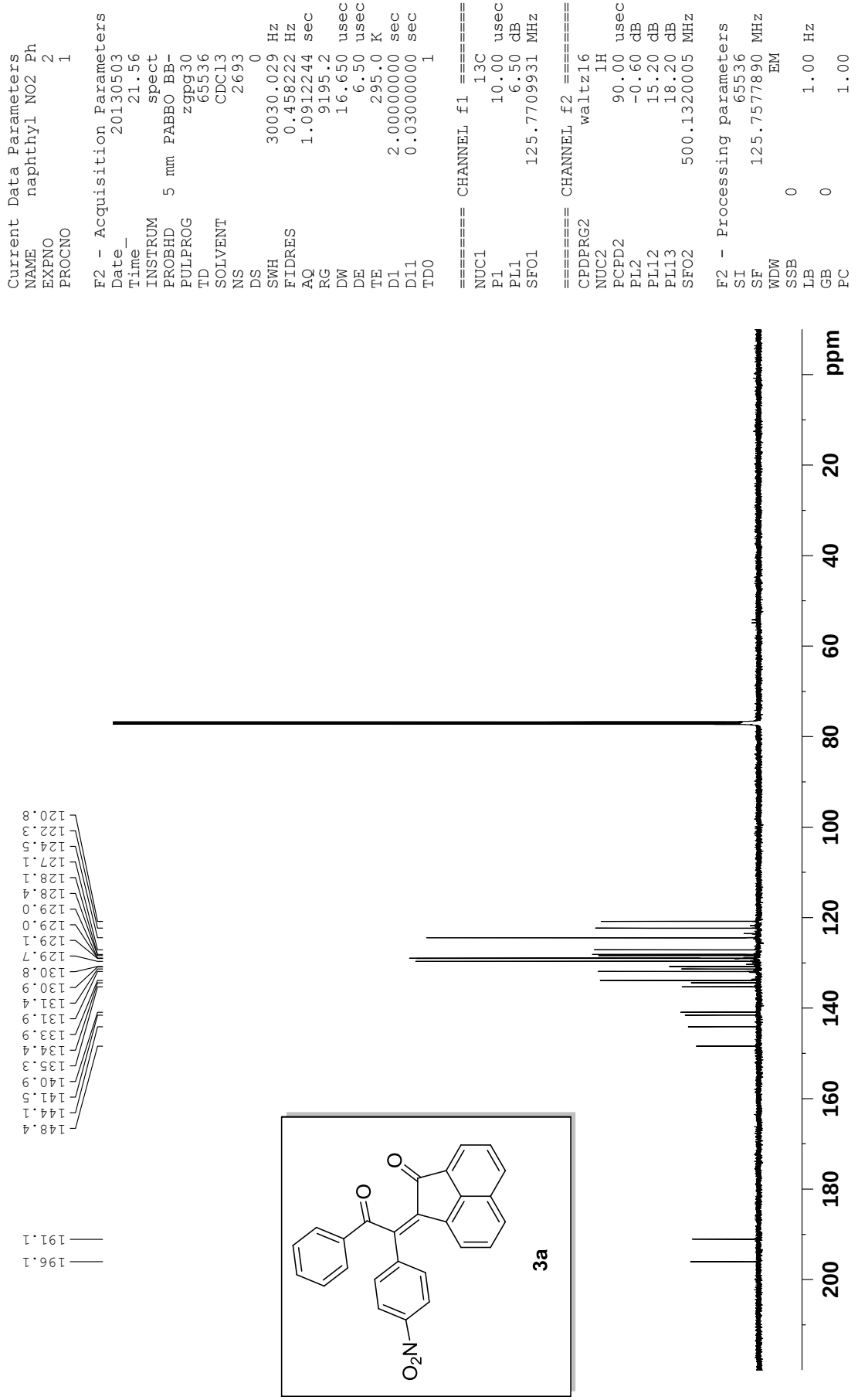

Current Data Parameters
NAME Eric278
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130525
Time_ 17.23
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 992
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 302.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127709 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
207.8
168.8
165.6
150.1
148.6
141.5
140.2
133.6
133.3
131.2
129.8
129.0
128.3
125.3
124.6
124.5
123.0
120.9
115.3
77.3
77.0
76.7
50.7
28.4
25.6
ppm
200
180
160
140
120
100
80
60
40
20
O2N
O
O
N
Bz
2c

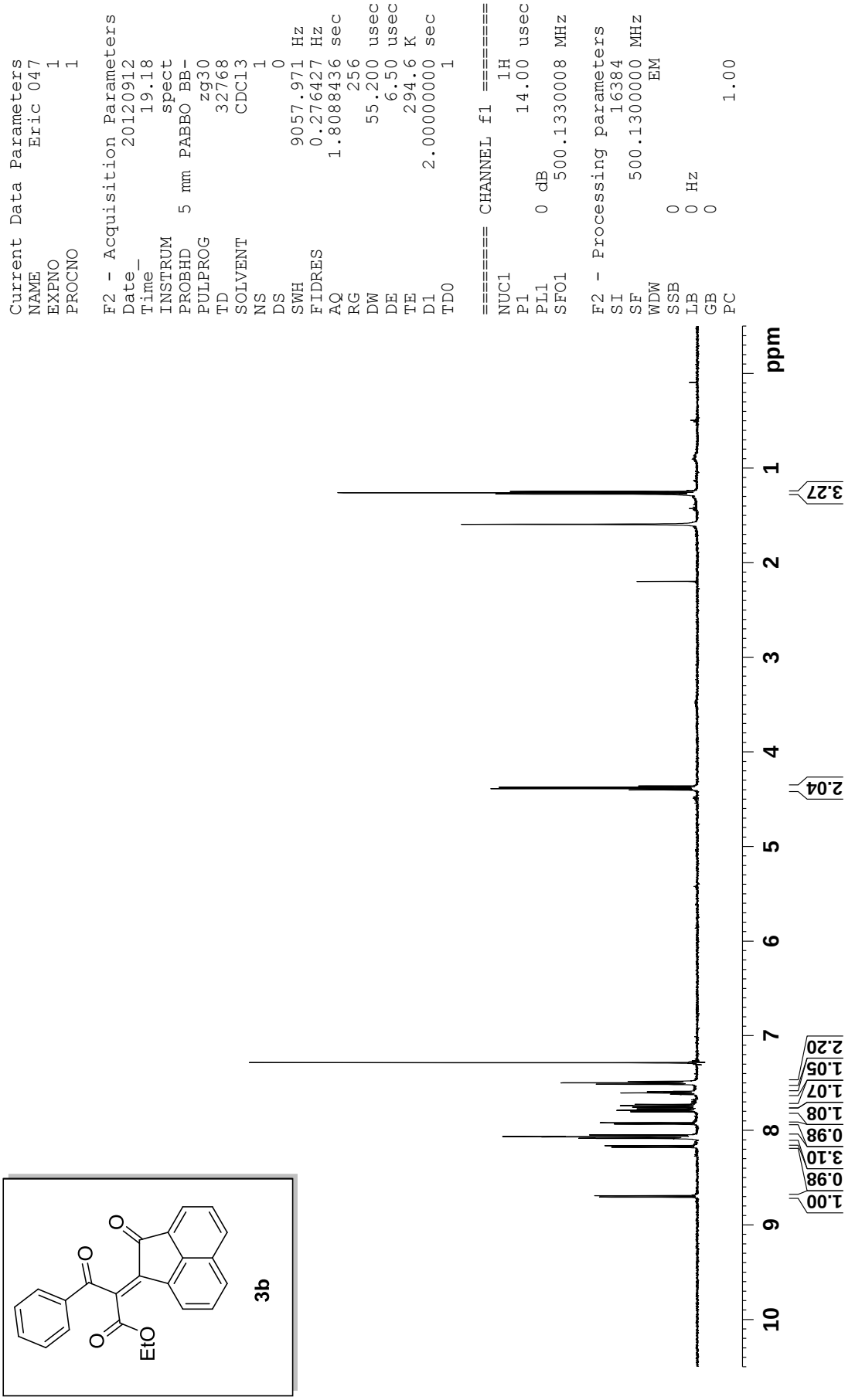

Current Data Parameters
NAME Eric 085_DC
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130430
Time_ 18.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300105 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
2.06
1.07
4.14
2.01
2.26
5.18
1.02
1.00
ppm
1
2
3
4
5
6
7
8
9
10
O
O
O
N
NC
2d

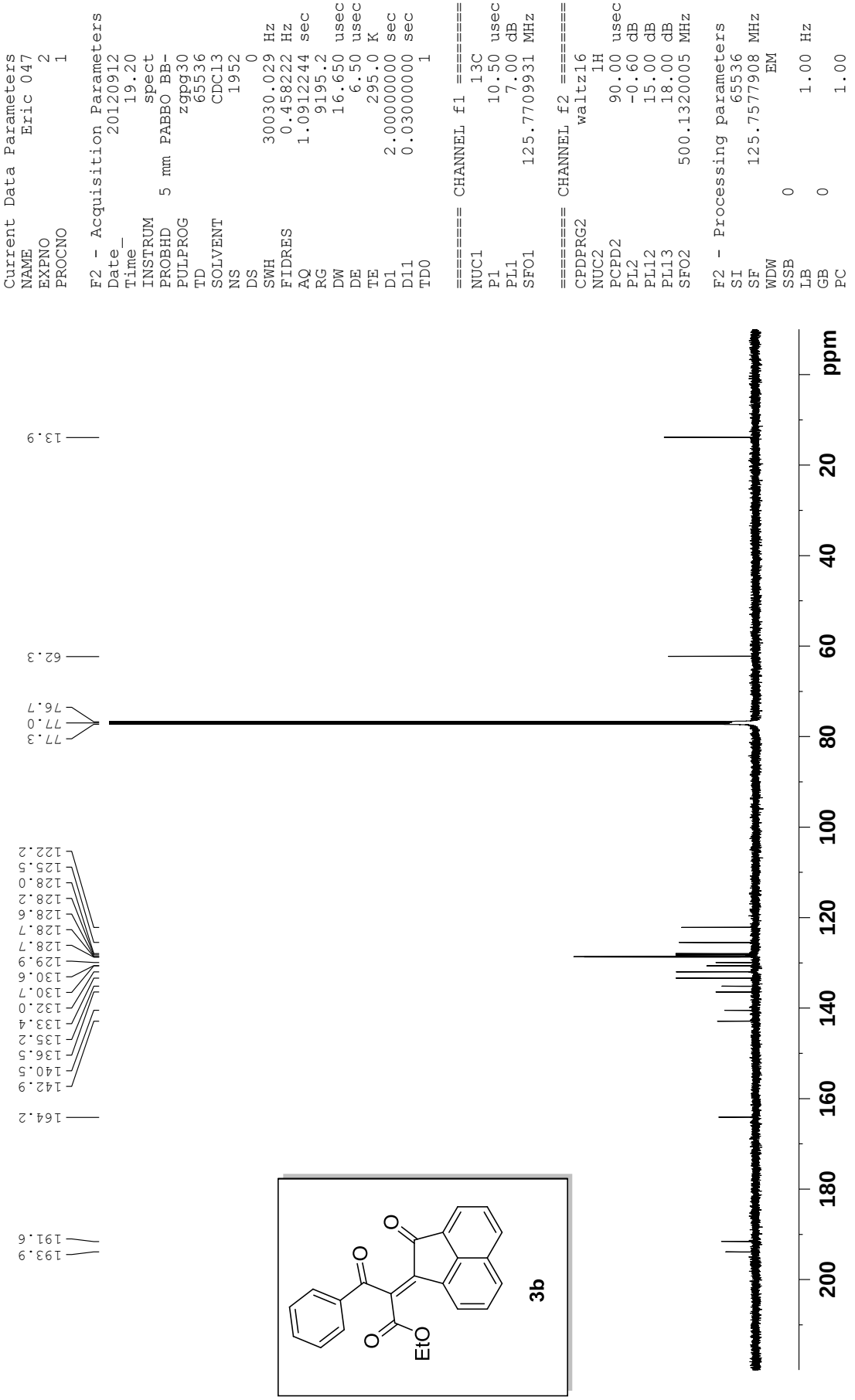


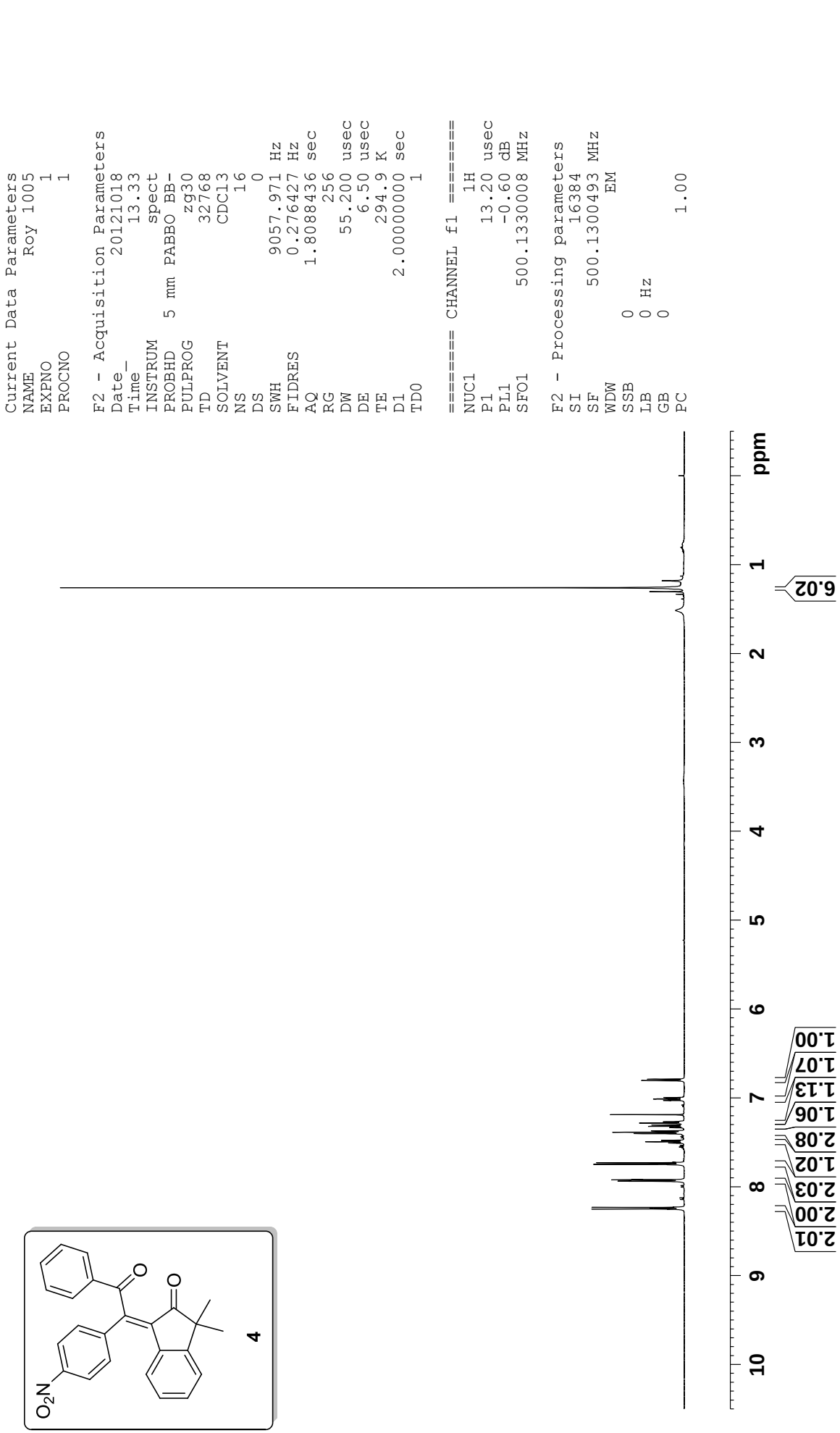

```
Current Data Parameters
NAME         Eric 085_DC
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130430
Time               12.20
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                12239
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                  9.40 usec
PL1                 7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12                20.70 dB
PL13                23.70 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
```

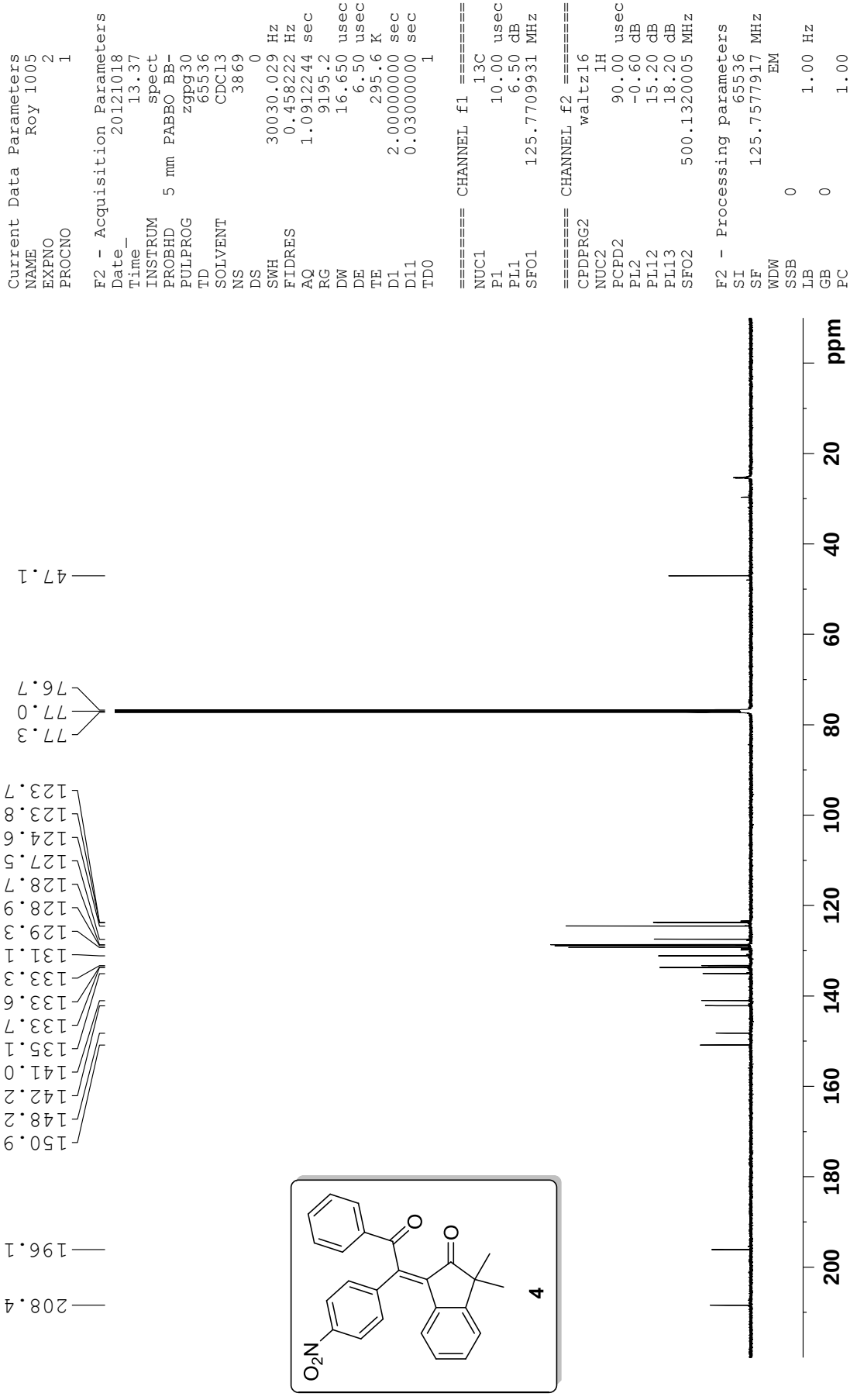


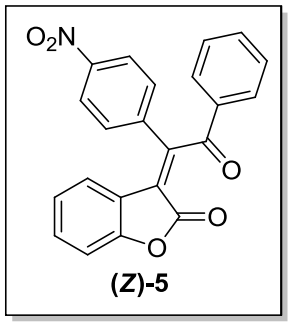

Current Data Parameters
NAME naphthyl NO2 Ph
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130503
Time_ 21.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2693
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 295.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
196.1
191.1
148.4
144.1
141.5
140.9
135.3
134.4
133.9
131.9
131.4
130.9
130.8
129.7
129.1
129.0
128.4
128.1
127.1
124.5
122.3
120.8
O
O
O2N
3a
200
180
160
140
120
100
80
60
40
20
ppm


Current Data Parameters
NAME Eric 047
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120912
Time_ 19.18
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 256
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 500.1300000 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
3.27
2.04
1.00
0.98
3.10
0.98
1.08
1.07
1.05
2.20
ppm
1
2
3
4
5
6
7
8
9
10
O
O
O
EtO
3b


Current Data Parameters
NAME Eric 047
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120912
Time 19.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1952
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
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 125.7577908 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
13.9
62.3
76.7
77.0
77.3
122.2
125.5
128.0
128.2
128.6
128.7
128.7
129.9
130.6
130.7
132.0
133.4
135.2
136.5
140.5
142.9
164.2
191.6
193.9
O
O
O
EtO
3b
200
180
160
140
120
100
80
60
40
20
ppm

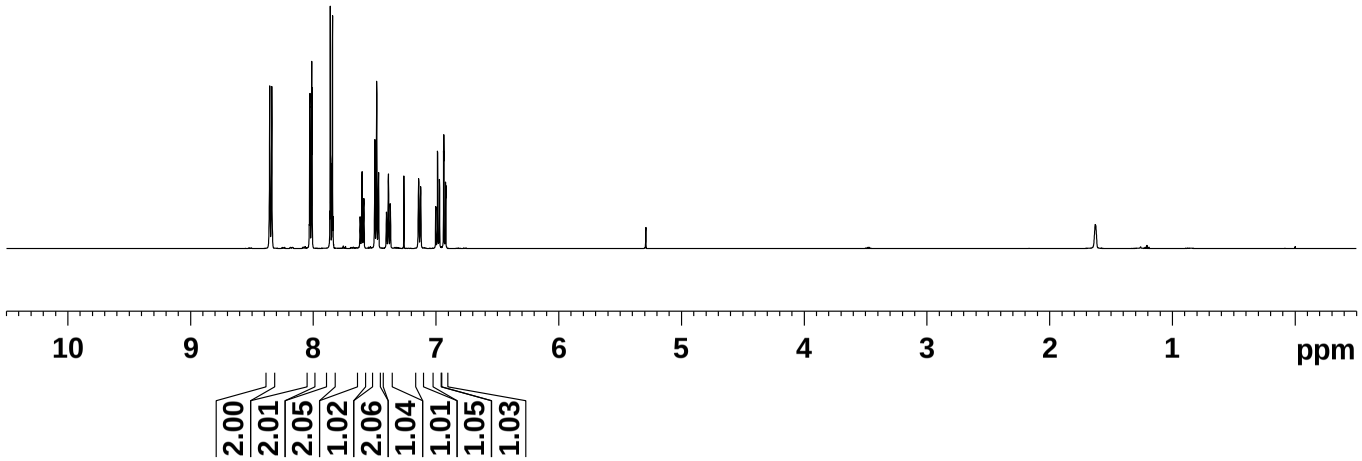

Current Data Parameters
NAME Roy 1005
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121018
Time_ 13.33
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 256
DW 55.200 usec
DE 6.50 usec
TE 294.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300493 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
10
9
8
7
6
5
4
3
2
1
6.02
2.01
2.00
2.03
1.02
2.08
1.06
1.13
1.07
1.00
O
O
O2N
4

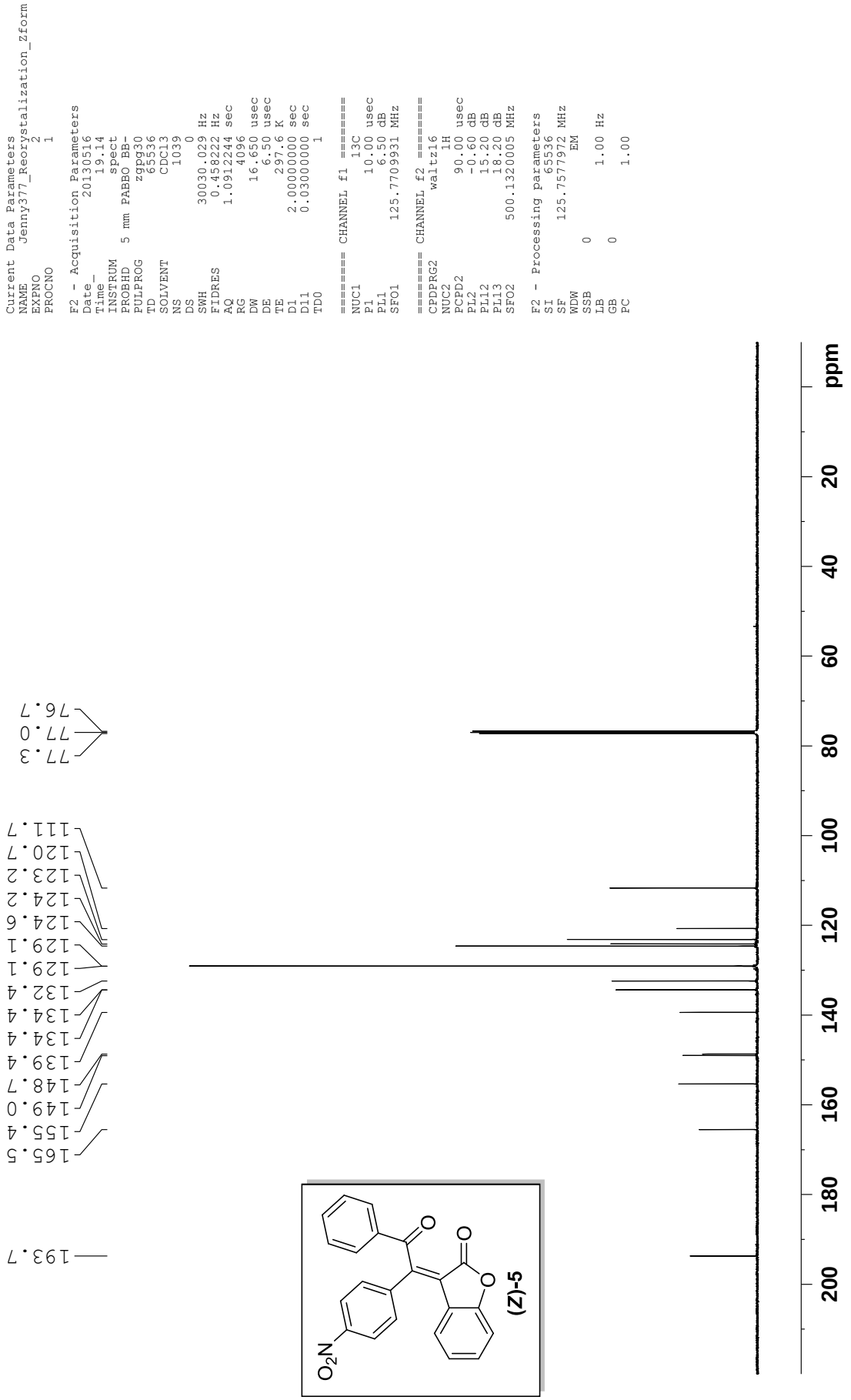

Current Data Parameters
NAME Roy 1005
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121018
Time_ 13.37
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3869
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 295.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 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
208.4
196.1
150.9
148.2
142.2
141.0
135.1
133.7
133.6
133.3
131.1
129.3
128.9
128.7
127.5
124.6
123.8
123.7
77.3
77.0
76.7
47.1
O
O
O2N
4
200
180
160
140
120
100
80
60
40
20
ppm

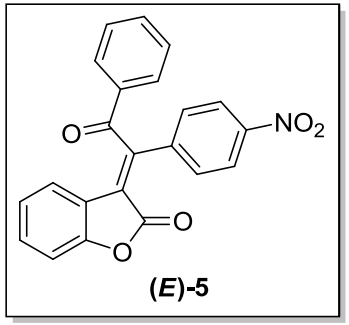


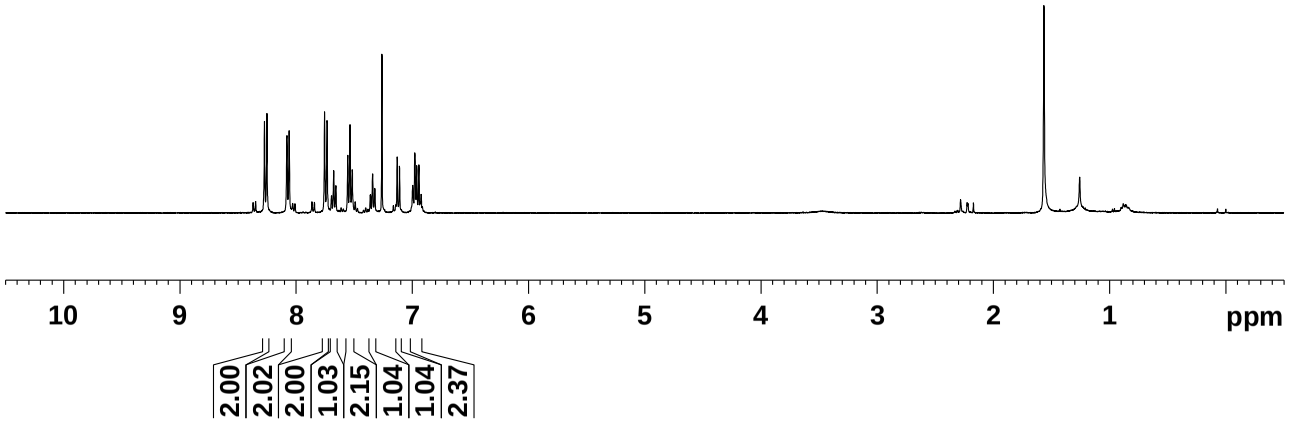
(*Z*)-5

```
Current Data Parameters
NAME      Jenny377_Reorystalization_Zform
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130516
Time              18.16
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
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                296.6 K
D1             2.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 13.20 usec
PL1                -0.60 dB
SFO1         500.1330008 MHz

F2 - Processing parameters
SI                 16384
SF           500.1300123 MHz
WDW                   EM
SSB       0
LB        0 Hz
GB        0
PC                 1.00
```

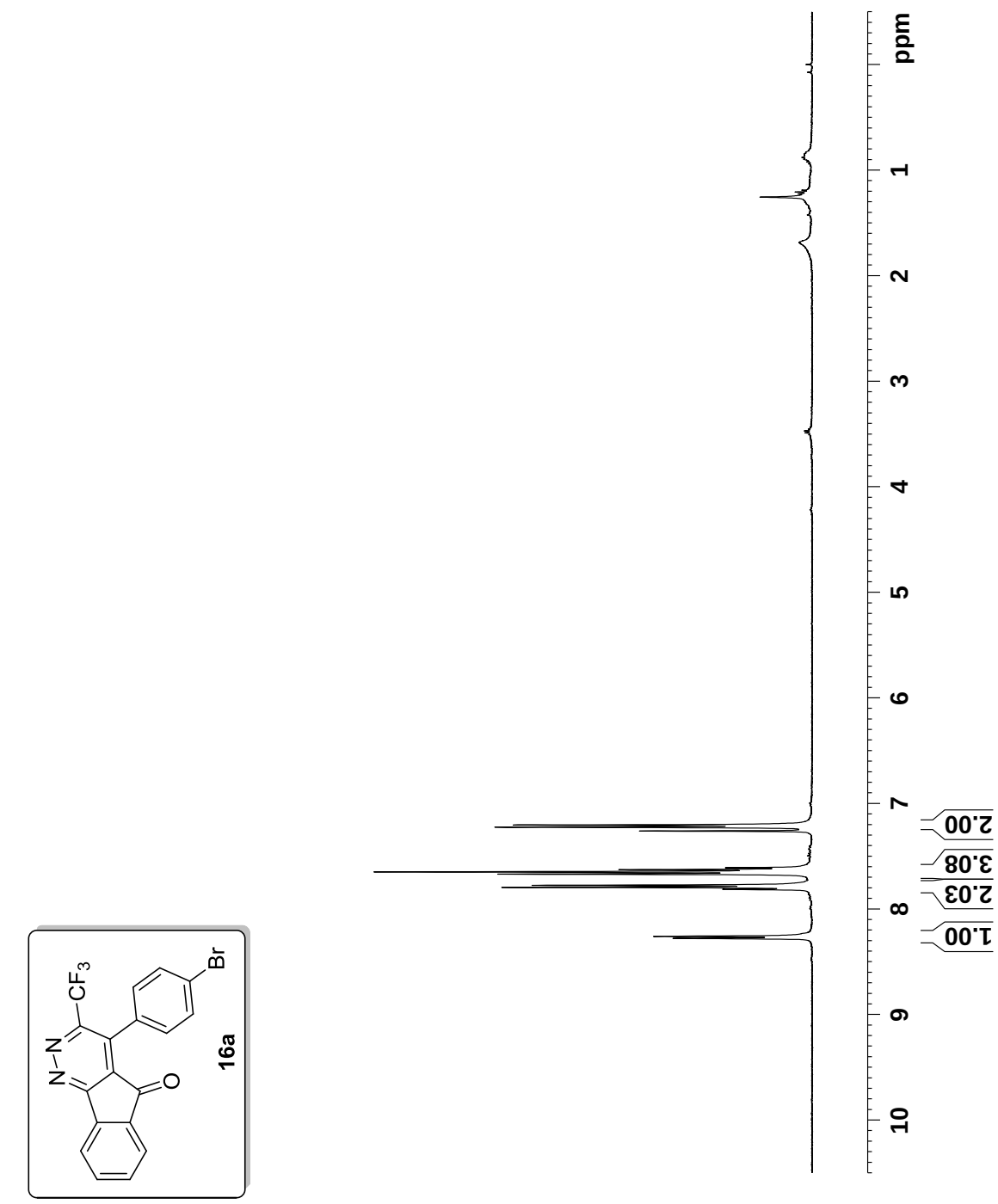


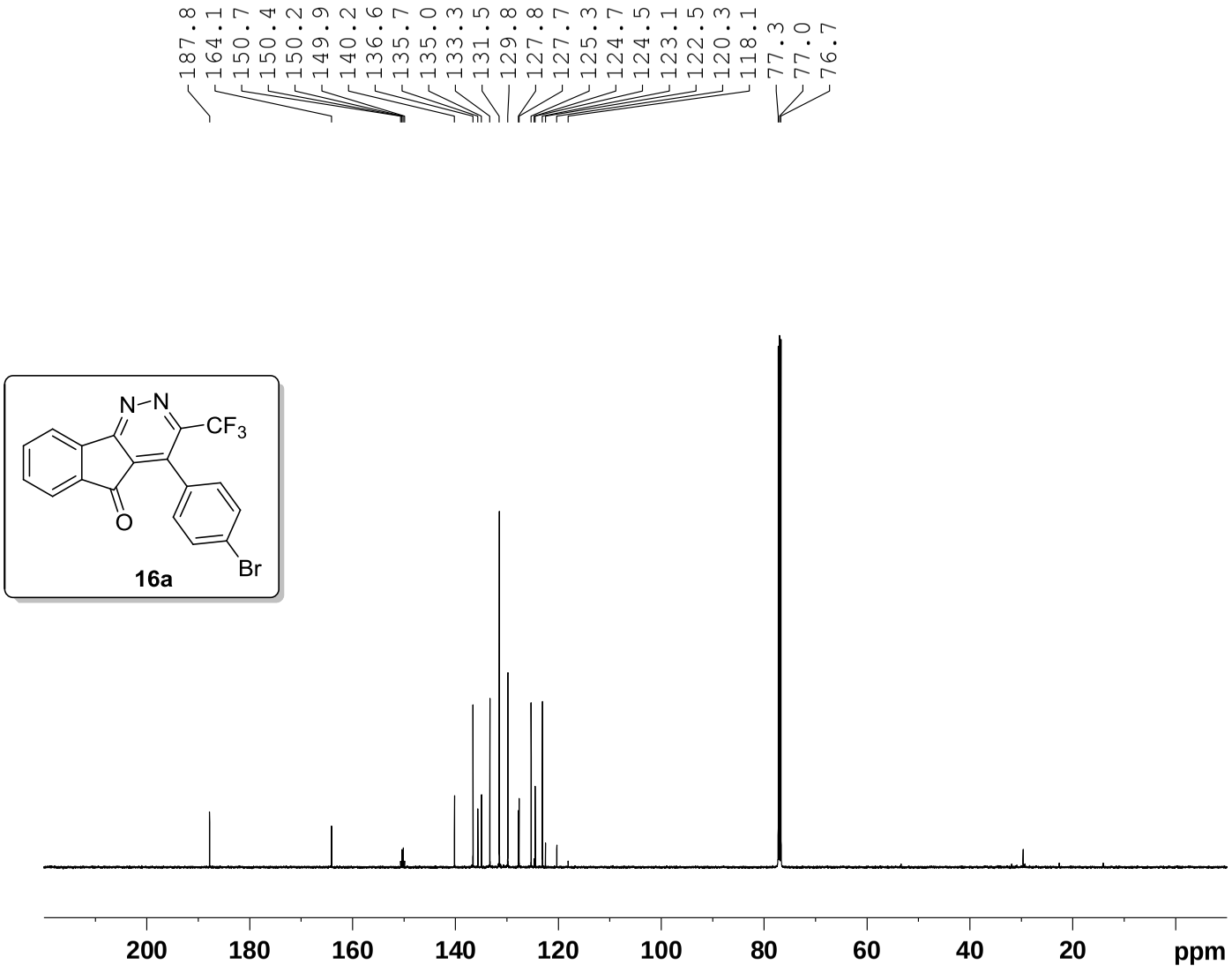

Current Data Parameters
NAME Jenny377_Recrystalization_Zform
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130516
Time_ 19.14
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1039
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 4096
DW 16.650 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577972 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
193.7
165.5
155.4
149.0
148.7
139.4
134.4
134.4
132.4
129.1
129.1
124.6
124.2
123.2
120.7
111.7
77.3
77.0
76.7
ppm
200
180
160
140
120
100
80
60
40
20
O2N
O
O
O
(Z)-5



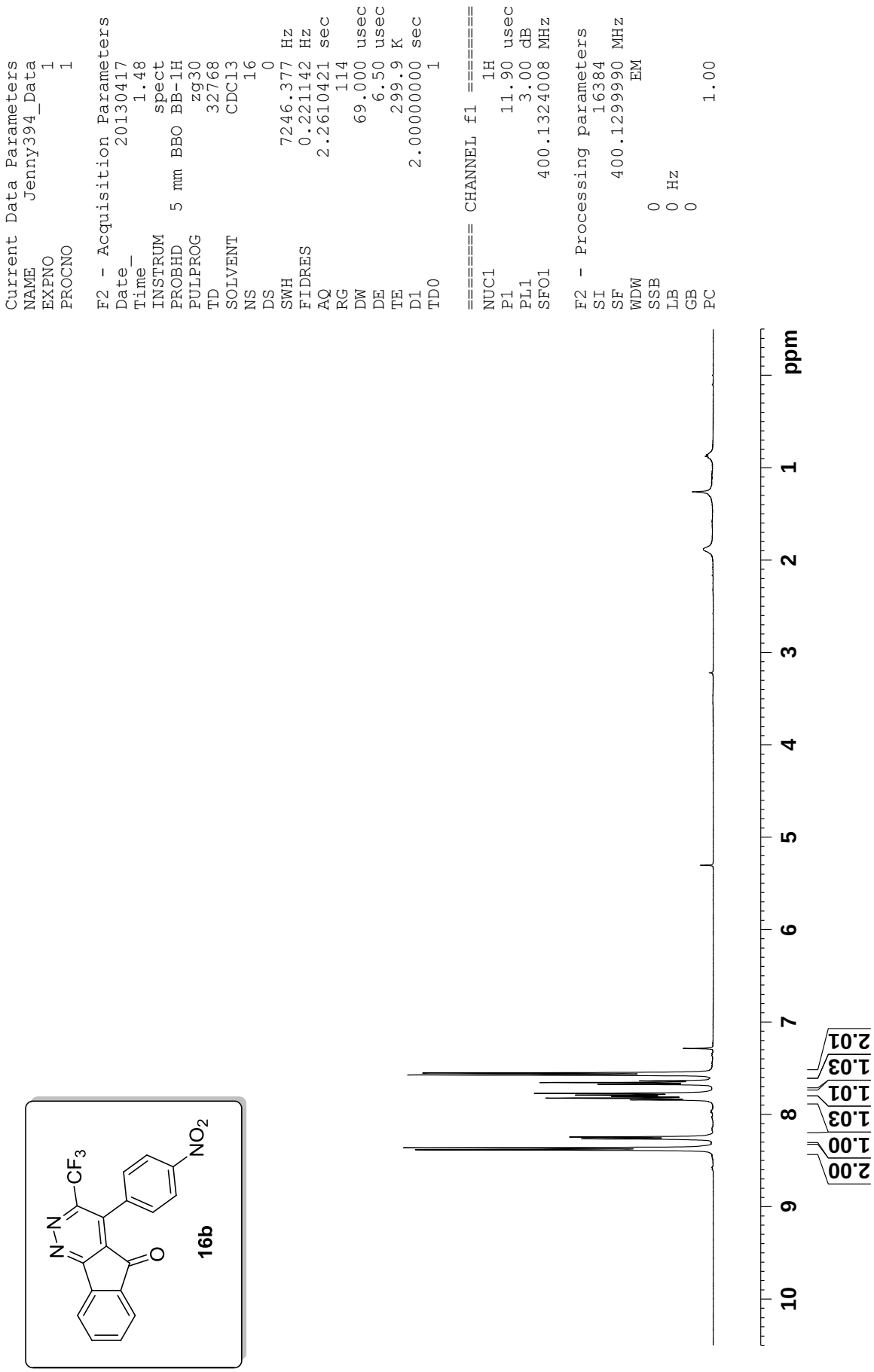


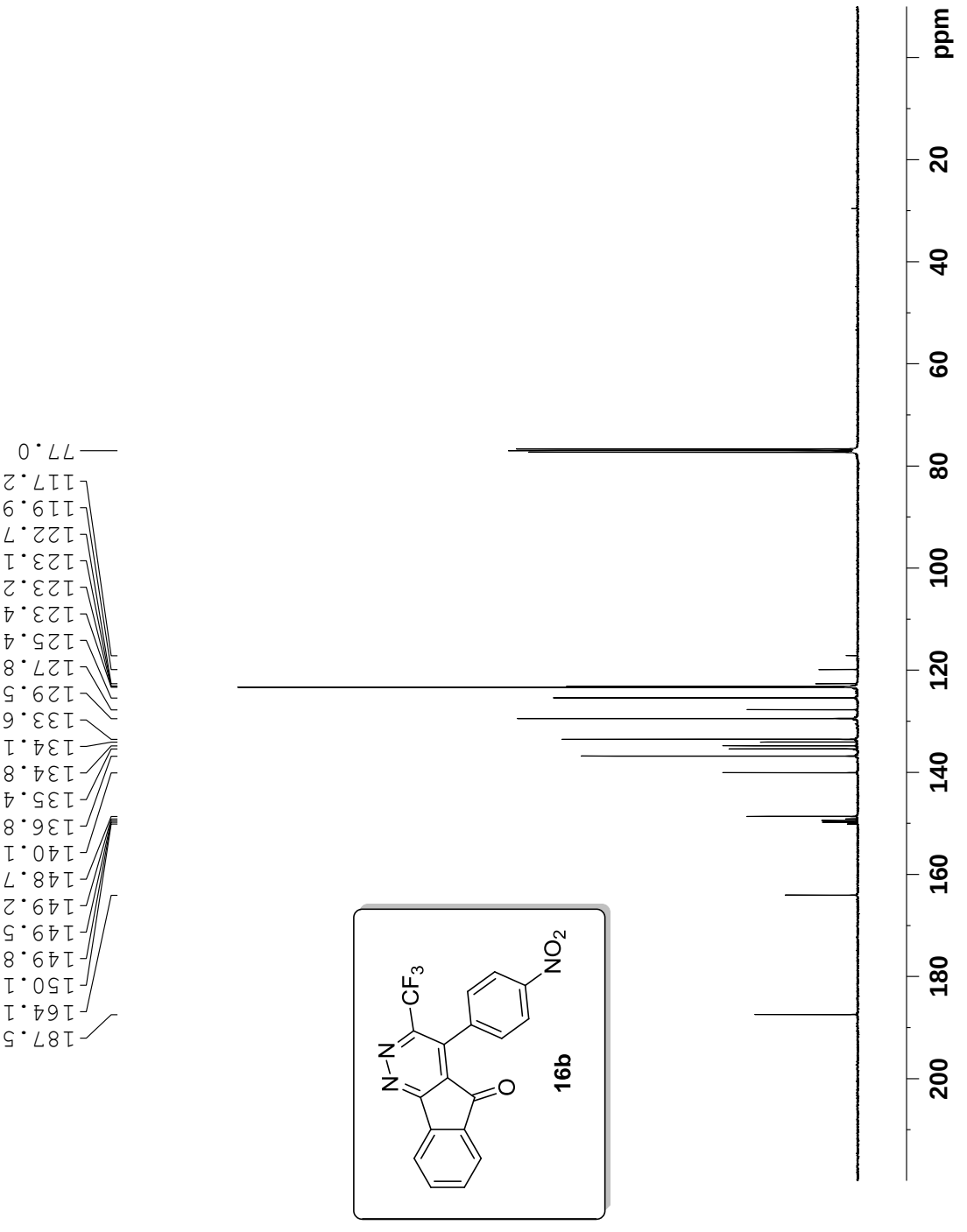

```
Current Data Parameters
NAME      Jenny377_data
EXPNO                 6
PROCNO                1

F2 - Acquisition Parameters
Date_          20130227
Time              10.51
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                  256
DW               69.000 usec
DE                6.50 usec
TE               300.0 K
D1           2.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                  1H
P1                11.90 usec
PL1                3.00 dB
SFO1        400.1324008 MHz

F2 - Processing parameters
SI                16384
SF          400.1300092 MHz
WDW                  EM
SSB       0
LB        0 Hz
GB        0
PC                1.00
```

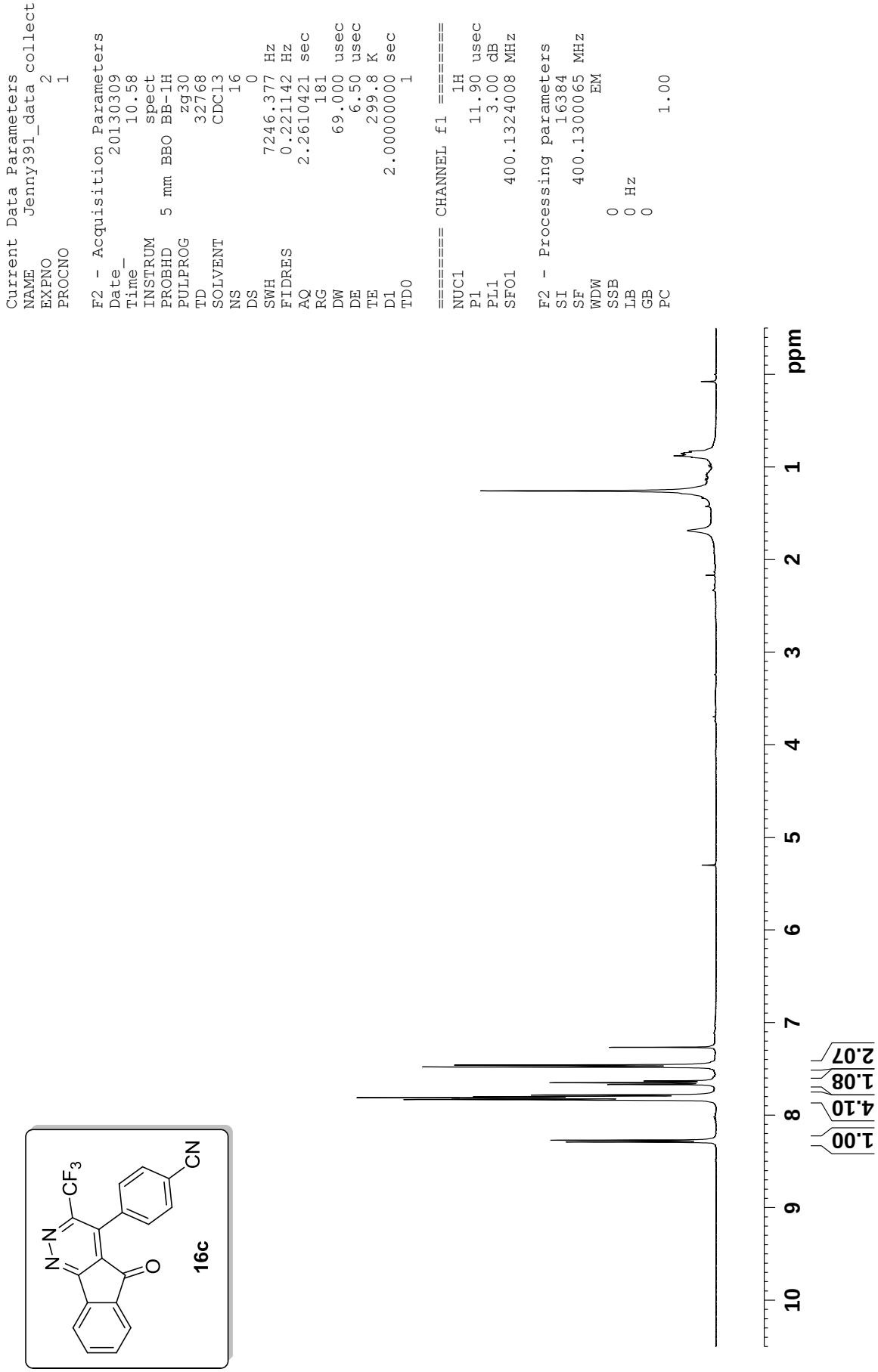

Current Data Parameters
NAME Jenny401
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130305
Time_ 8.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300088 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
2.03
3.08
2.00
16a

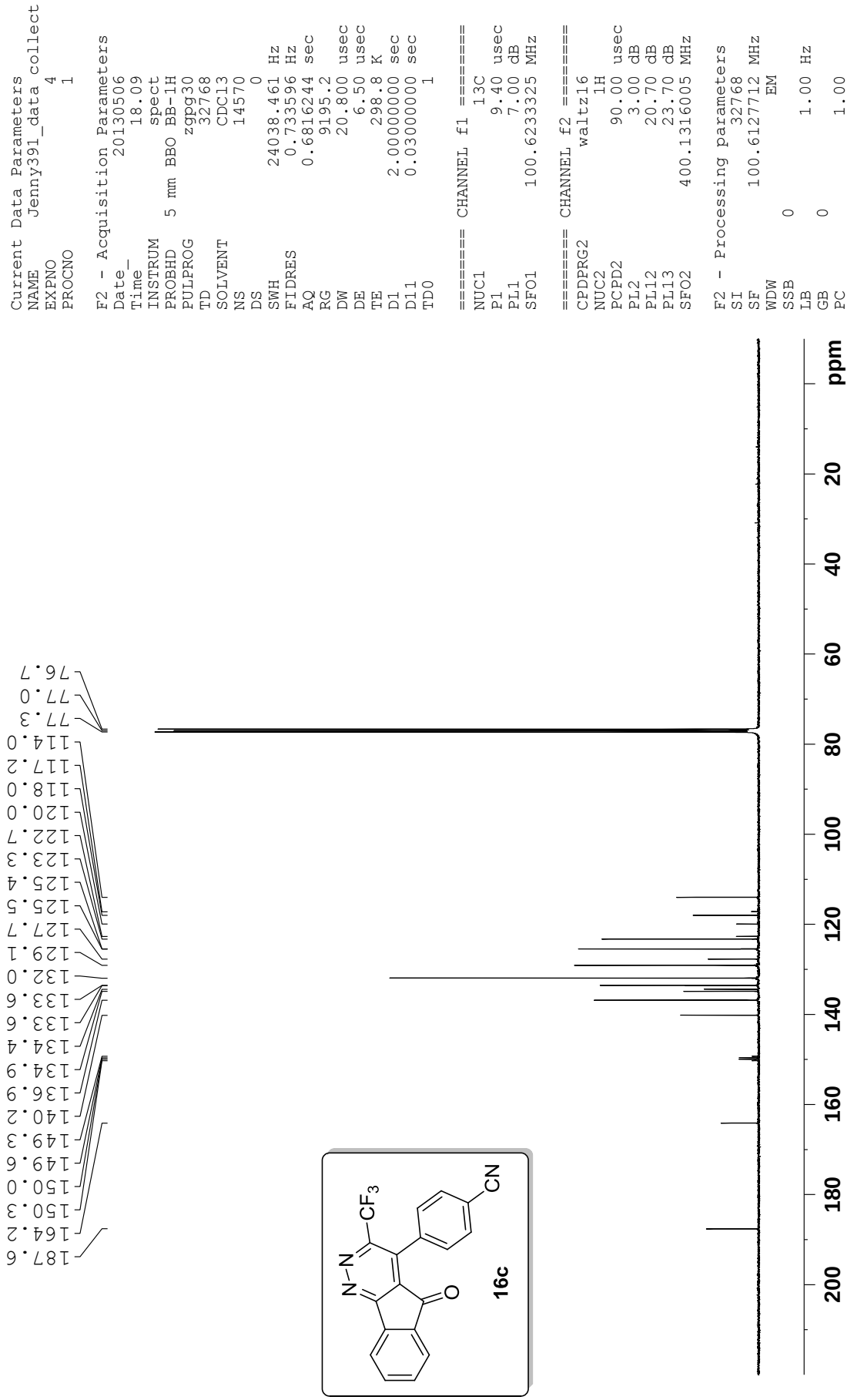


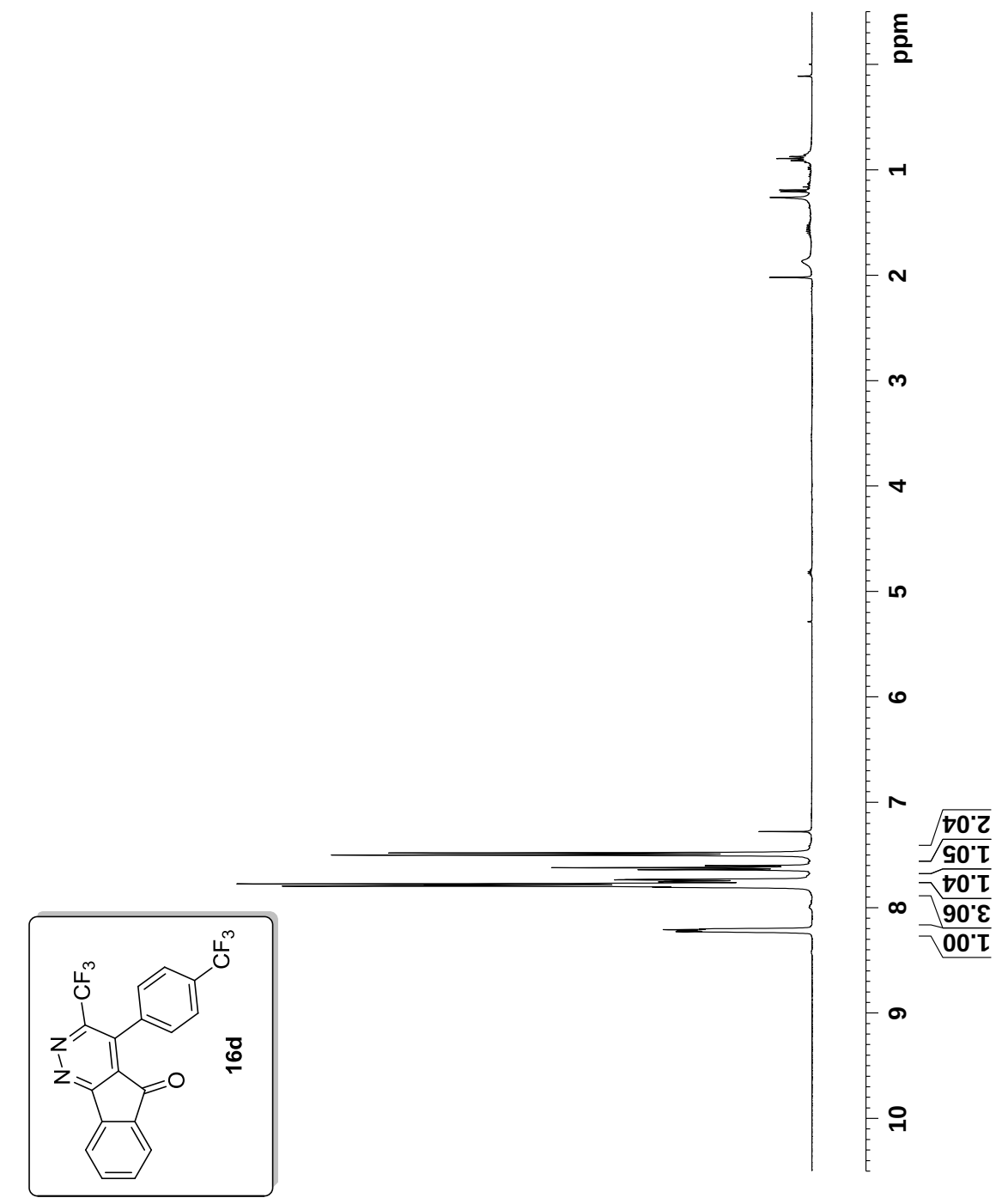

```
Current Data Parameters
NAME                 Jenny 395
EXPNO                        4
PROCNO                       1

F2 - Acquisition Parameters
Date_               20130421
Time                   19.50
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                     4153
DS                        0
SWH                30030.029 Hz
FIDRES             0.458222 Hz
AQ                 1.0912244 sec
RG                    9195.2
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                     10.00 usec
PL1                     6.50 dB
SFO1             125.7709931 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                  90.00 usec
PL2                    -0.60 dB
PL12                   15.20 dB
PL13                   18.20 dB
SFO2             500.1320005 MHz

F2 - Processing parameters
SI                        65536
SF               125.7577934 MHz
WDW                         EM
SSB          0
LB                      1.00 Hz
GB           0
PC                      1.00
```

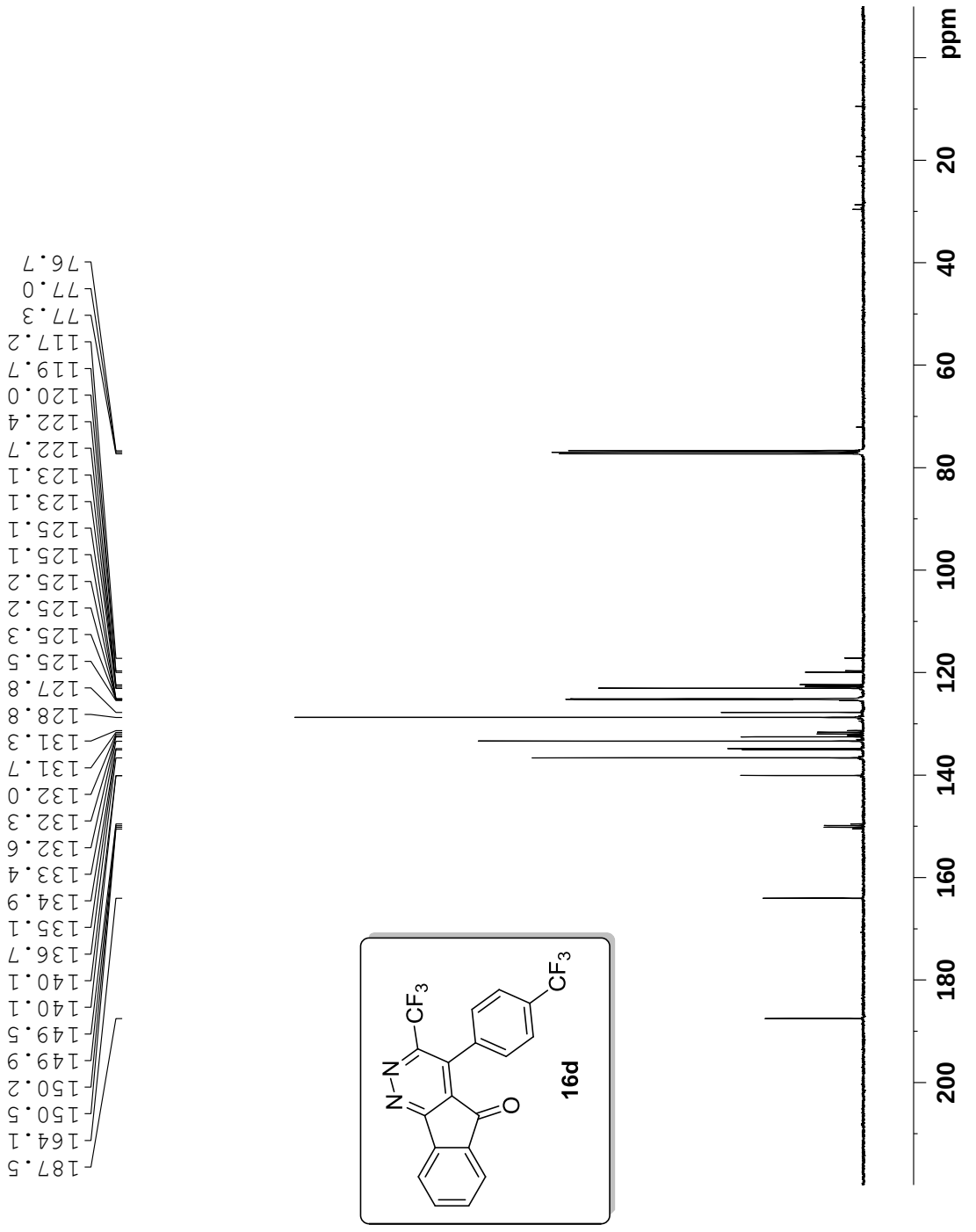

Current Data Parameters
NAME Jenny394_Data
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 1.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1299990 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
10
9
8
7
6
5
4
3
2
1
2.00
1.00
1.03
1.01
1.03
2.01
CF3
NO2
N
N
O
16b

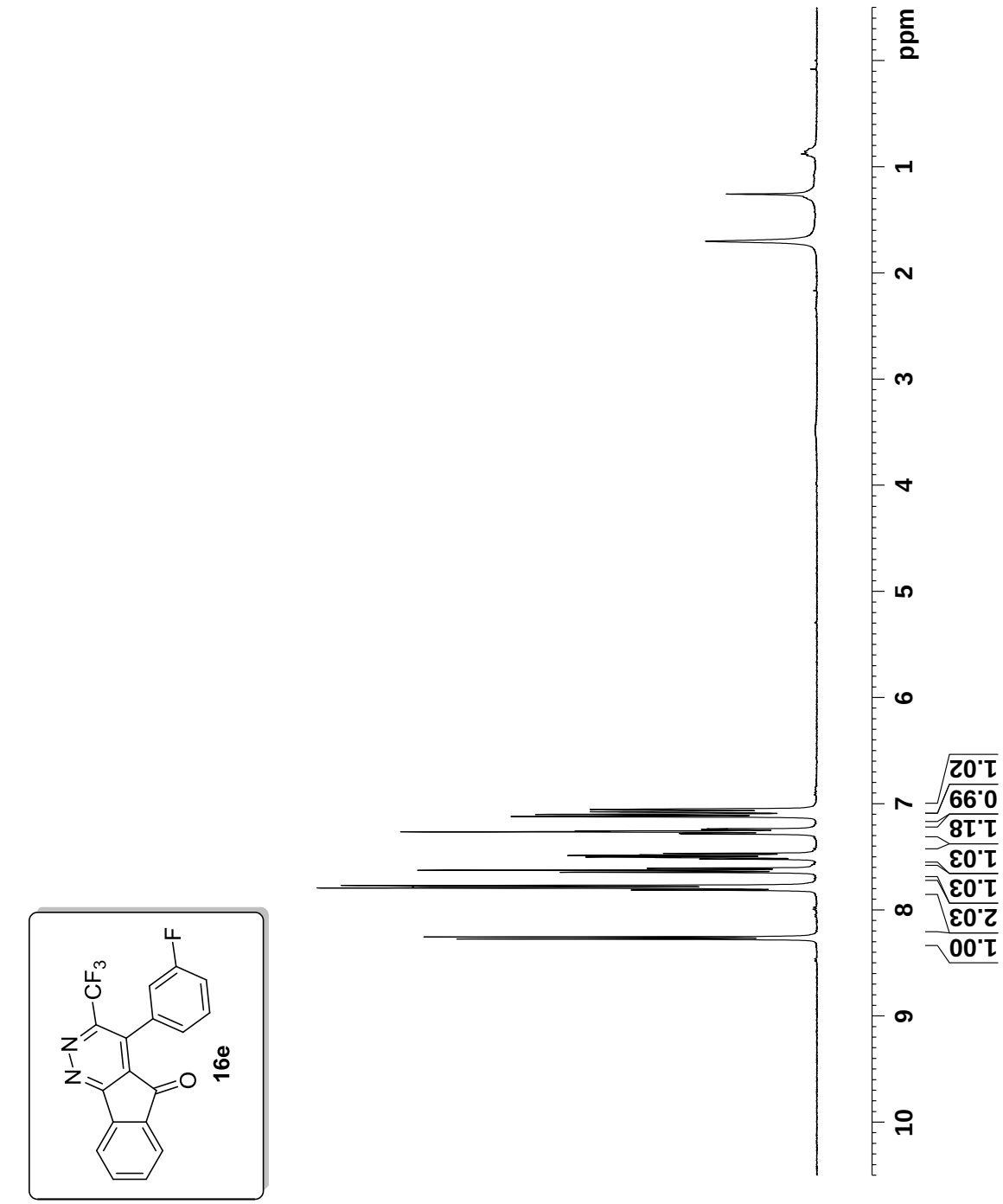

Current Data Parameters
NAME Jenny394_Data
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 1.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 4364
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127759 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.0
117.2
119.9
122.7
123.1
123.2
123.4
125.4
127.8
129.5
133.6
134.1
134.8
135.4
136.8
140.1
148.7
149.2
149.5
149.8
150.1
164.1
187.5
200
180
160
140
120
100
80
60
40
20
ppm
N–N
CF3
NO2
O
16b

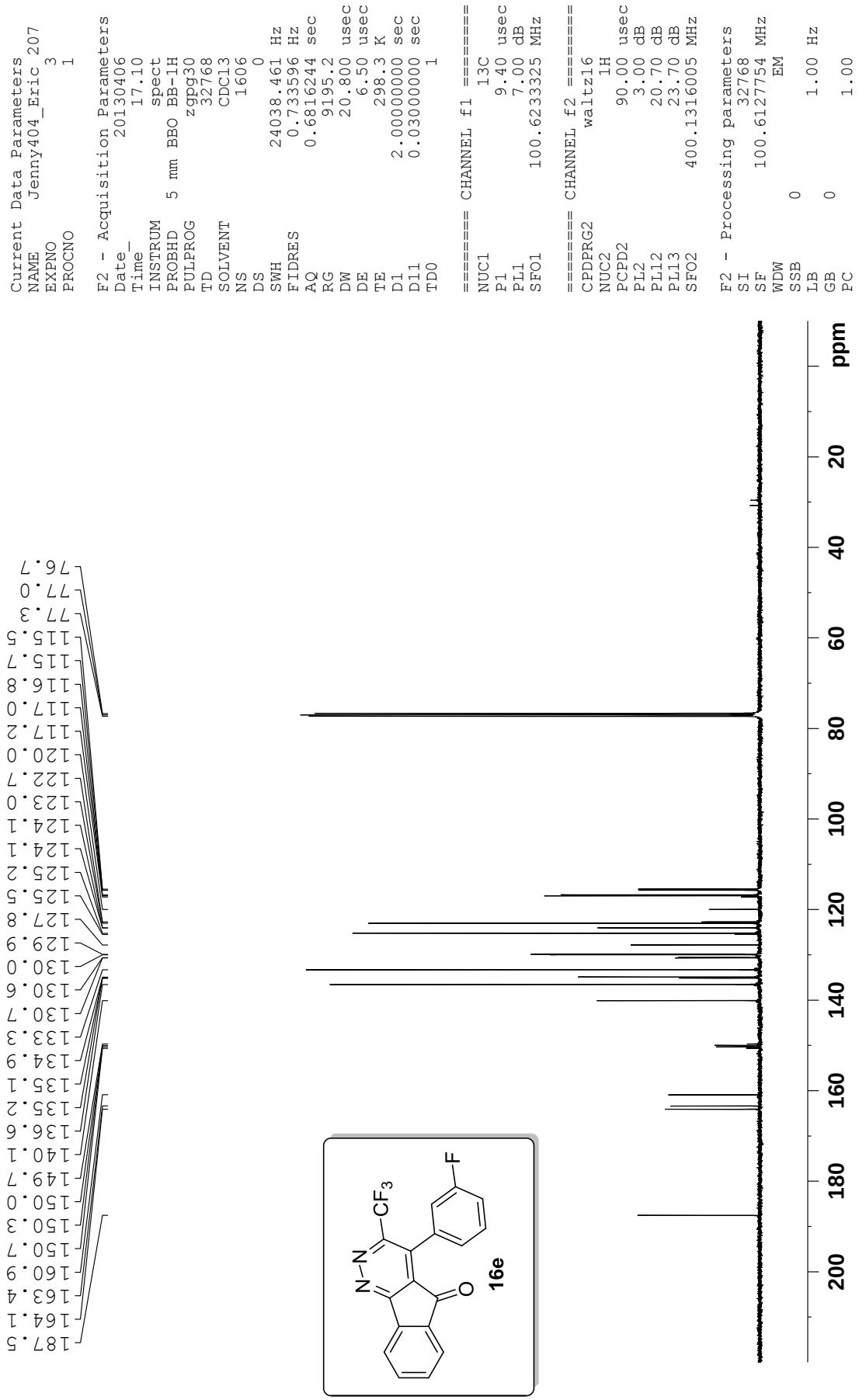

Current Data Parameters
NAME Jenny391_data collect
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130309
Time_ 10.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300065 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
4.10
1.08
2.07
16c

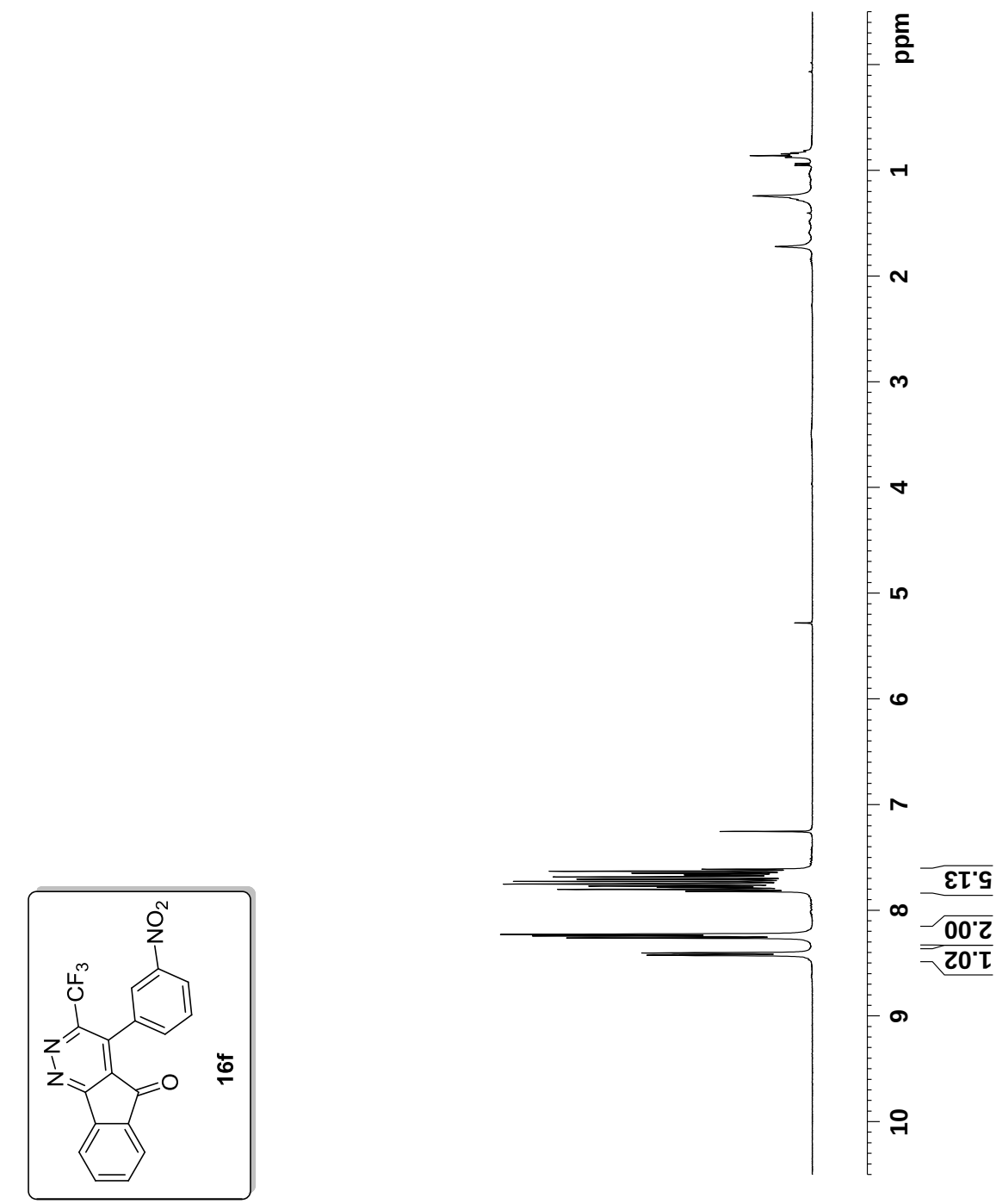

Current Data Parameters
NAME Jenny391_data_collect
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130506
Time_ 18.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 14570
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127712 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
187.6
164.2
150.3
150.0
149.6
149.3
140.2
136.9
134.9
134.4
133.6
133.6
132.0
129.1
127.7
125.5
125.4
123.3
122.7
120.0
118.0
117.2
114.0
77.3
77.0
76.7
ppm
200
180
160
140
120
100
80
60
40
20
N–N
CF3
CN
O
16c

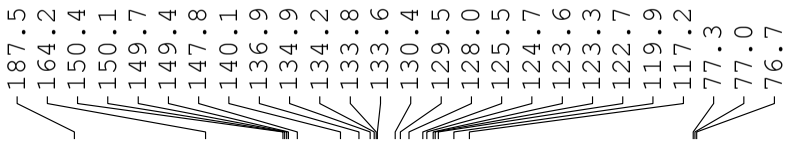

Current Data Parameters
NAME Jenny392_data
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130325
Time_ 22.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 57
DW 69.000 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300020 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
3.06
1.04
1.05
2.04
16d

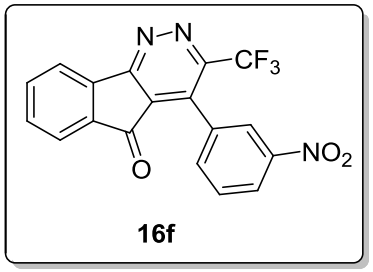

Current Data Parameters
NAME Jenny392_data
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130325
Time_ 22.15
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 2417
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 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
187.5
164.1
150.5
150.2
149.9
149.5
140.1
140.1
136.7
135.1
134.9
133.4
132.6
132.3
132.0
131.7
131.3
128.8
127.8
125.5
125.3
125.2
125.2
125.1
125.1
123.1
123.1
122.7
122.4
120.0
119.7
117.2
77.3
77.0
76.7
200
180
160
140
120
100
80
60
40
20
ppm
16d


Current Data Parameters
NAME Jenny404_Eric 207
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130405
Time_ 19.50
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 181
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300074 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.00
2.03
1.03
1.03
1.18
0.99
1.02
ppm
16e


Current Data Parameters
NAME Jenny404_Eric_207
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130406
Time_ 17.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1606
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 298.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127754 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
ppm
200
180
160
140
120
100
80
60
40
20
16e

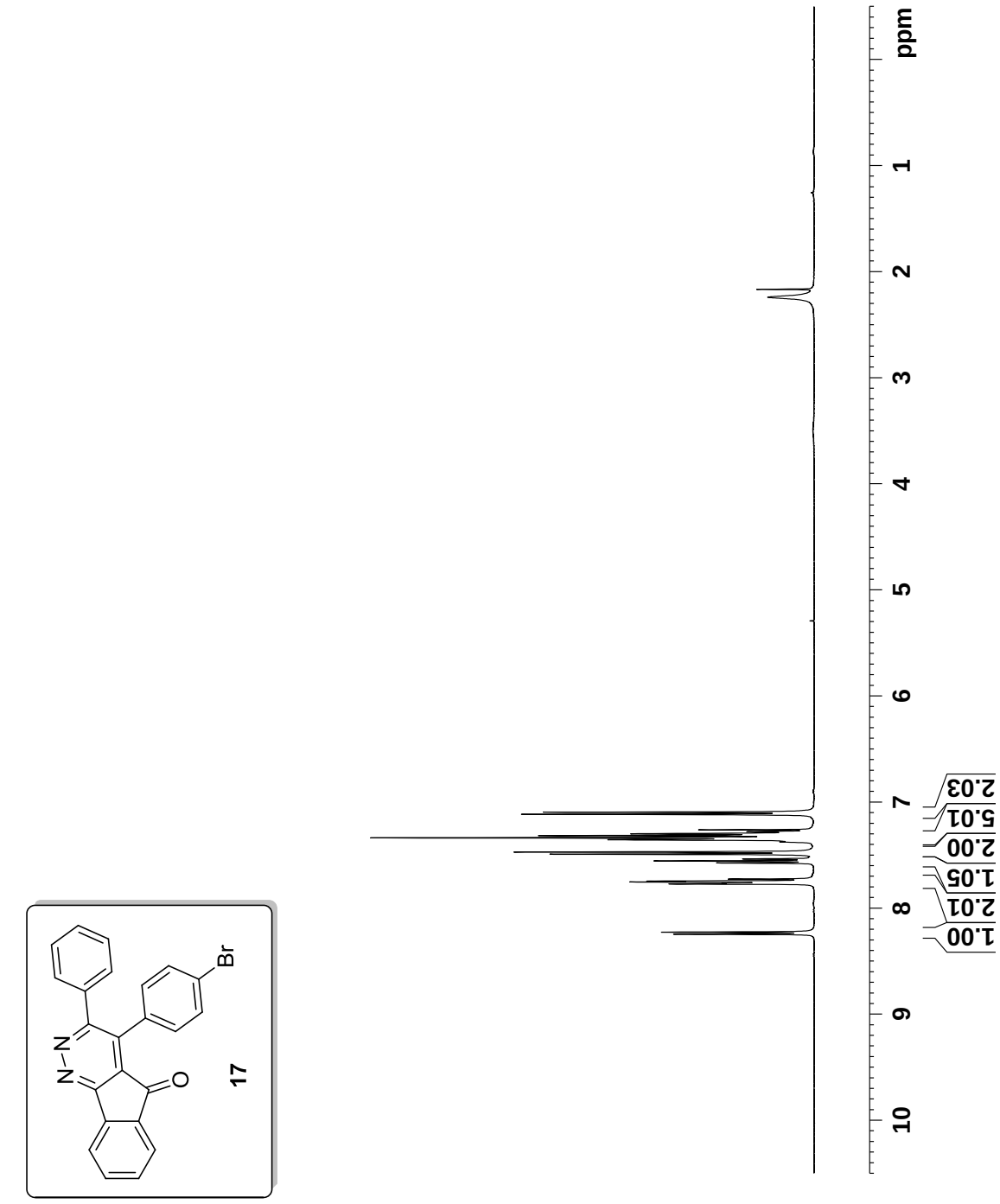

Current Data Parameters
NAME Jenny405_Eric 208
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130408
Time_ 22.22
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300118 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.02
2.00
5.13
ppm
10
9
8
7
6
5
4
3
2
1
16f

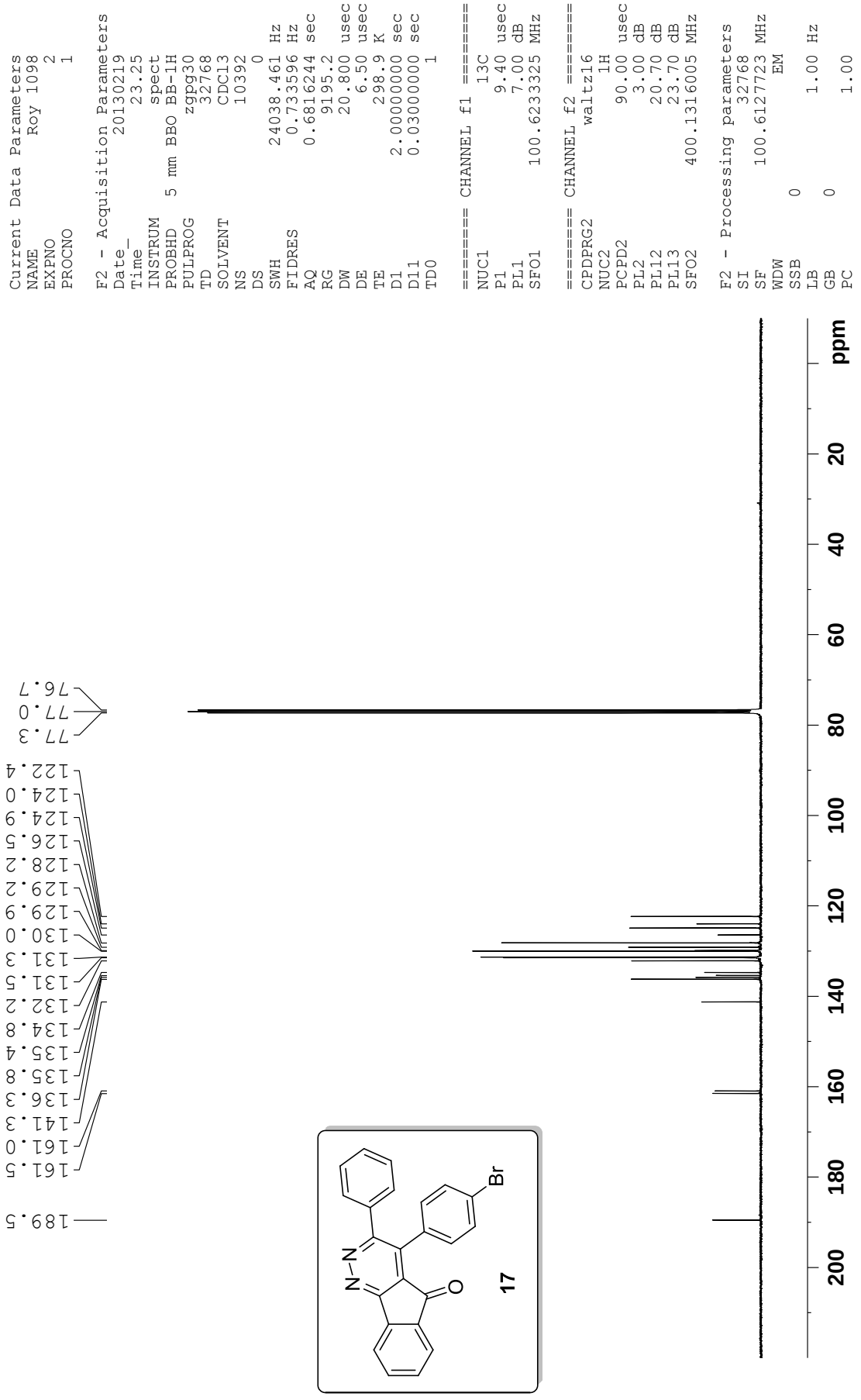


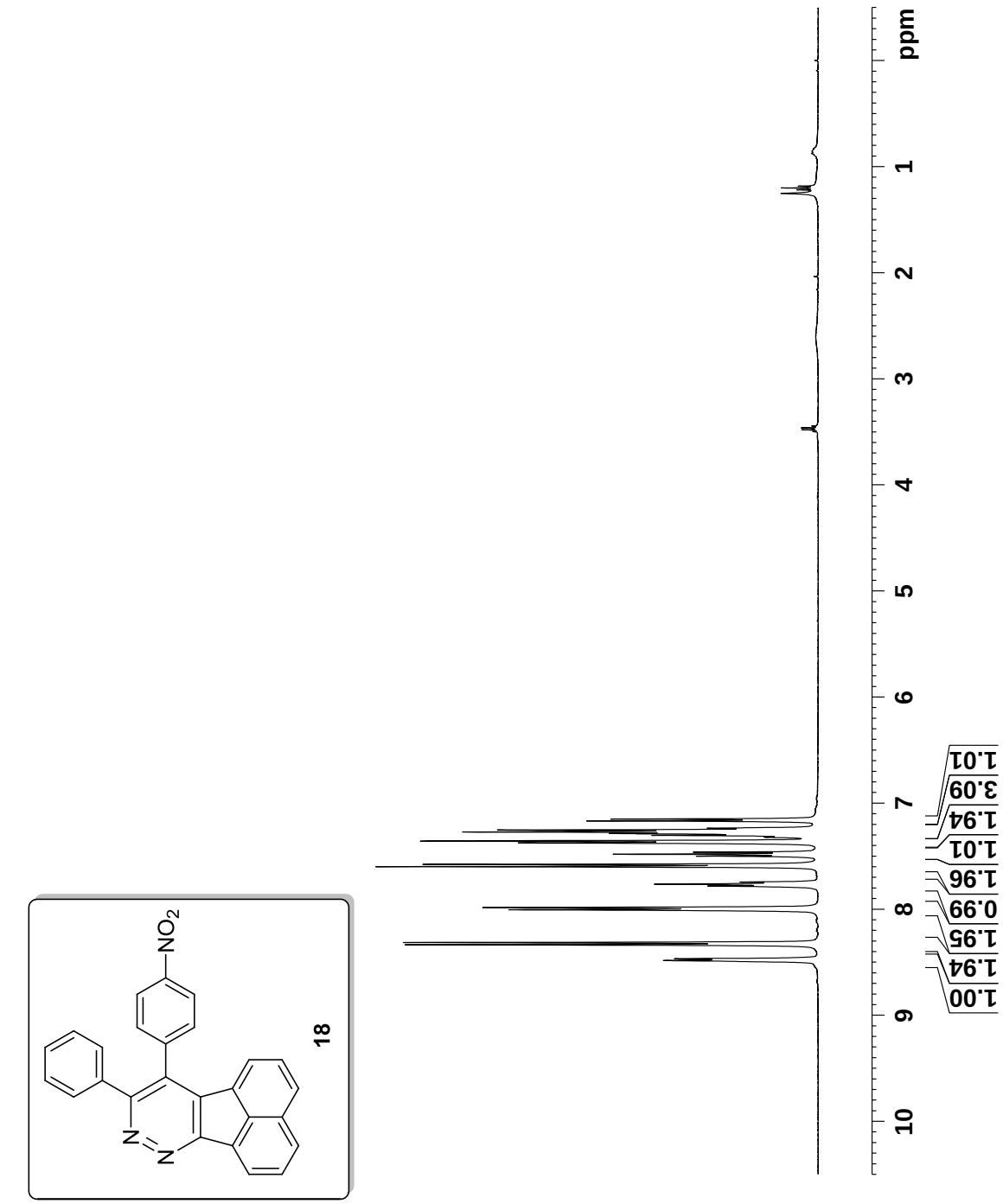


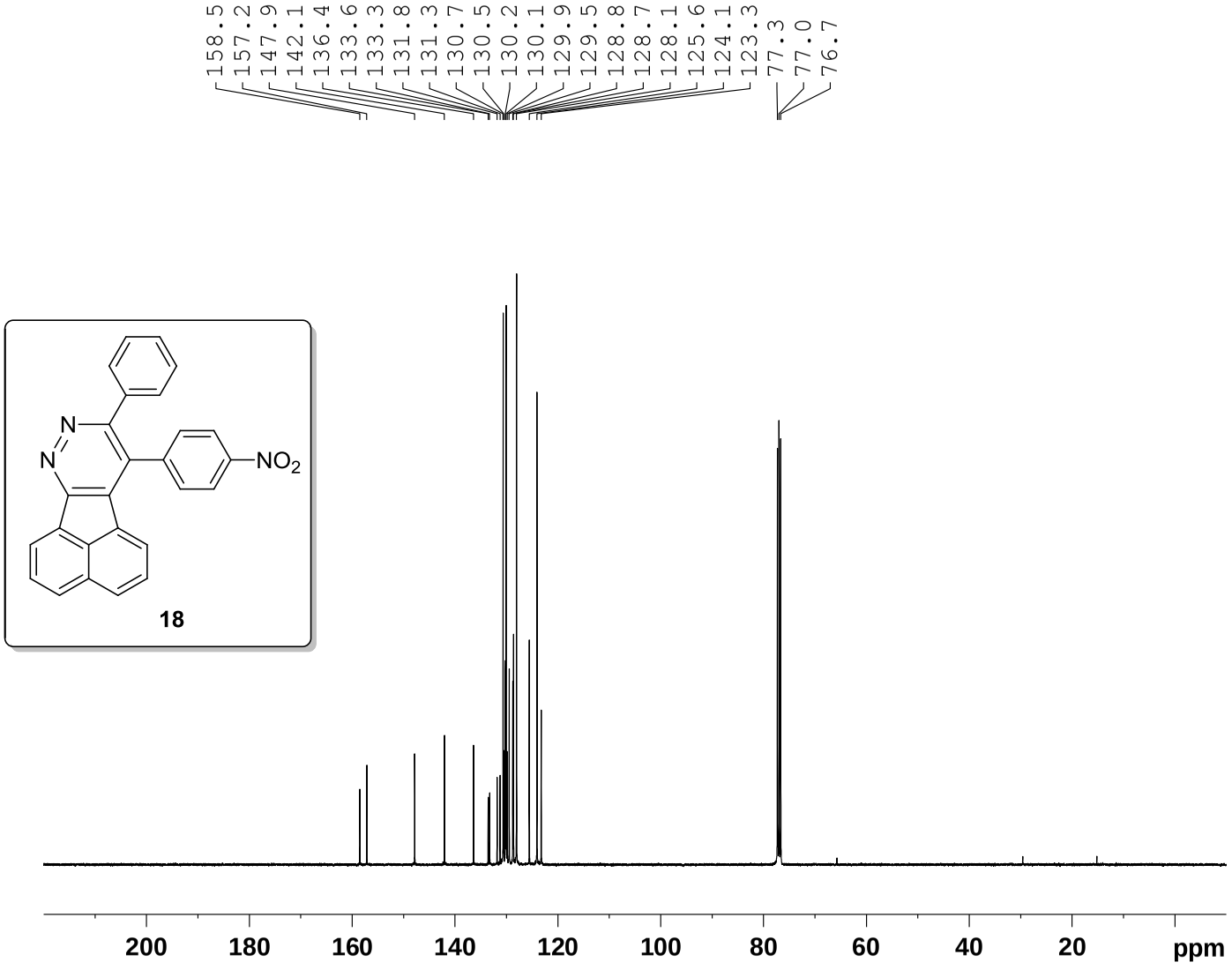
16f


```
Current Data Parameters
NAME      Jenny405_Eric 208
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_           20130408
Time               22.25
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1479
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                298.6 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                 7.00 dB
SFO1        100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              90.00 usec
PL2                 3.00 dB
PL12               20.70 dB
PL13               23.70 dB
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                32768
SF          100.6127740 MHz
WDW                  EM
SSB      0
LB                  1.00 Hz
GB       0
PC                  1.00
```

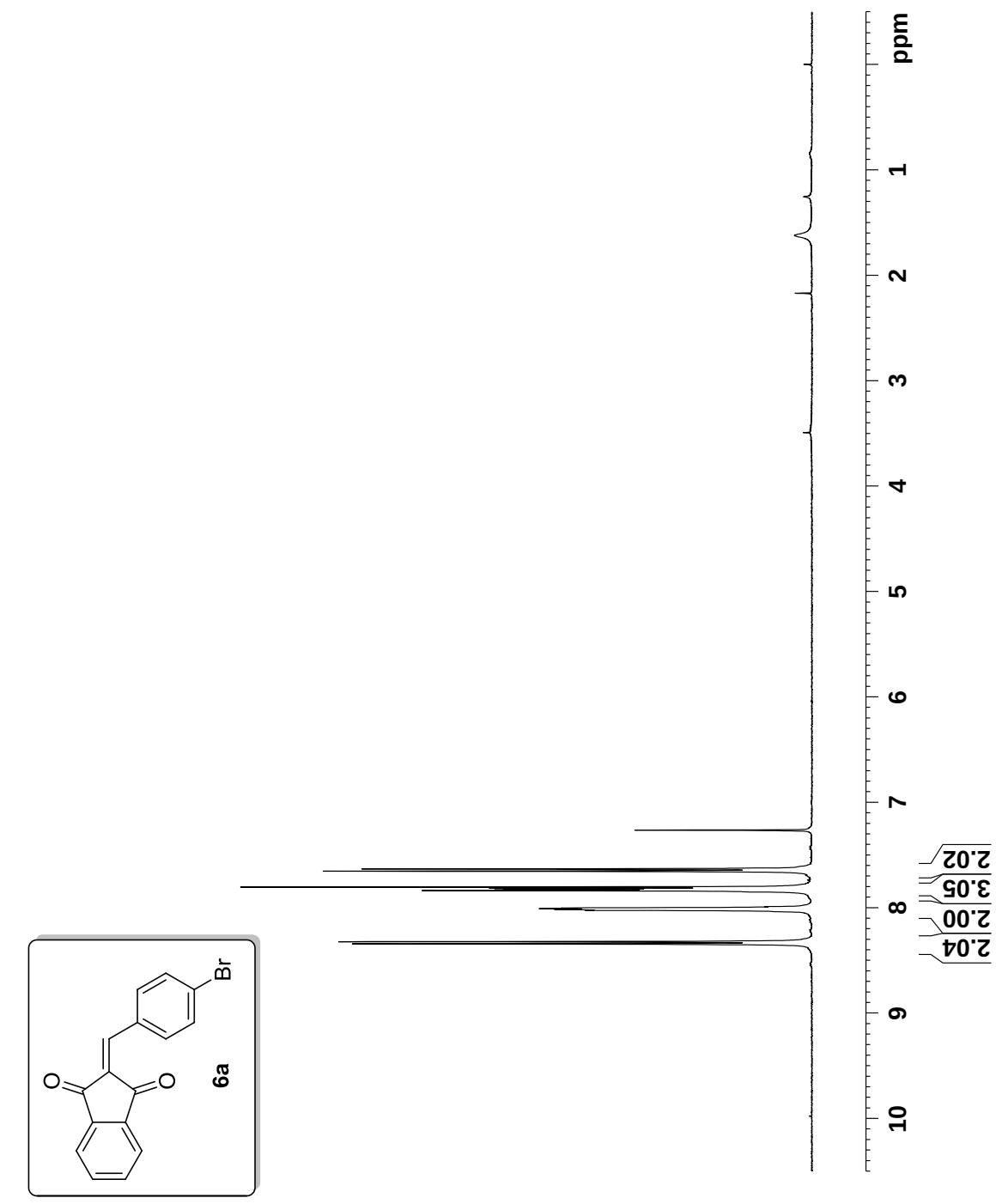

Current Data Parameters
NAME Roy 1098
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130219
Time_ 23.23
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1.00
2.01
1.05
2.00
5.01
2.03
Br
N
N
O
17

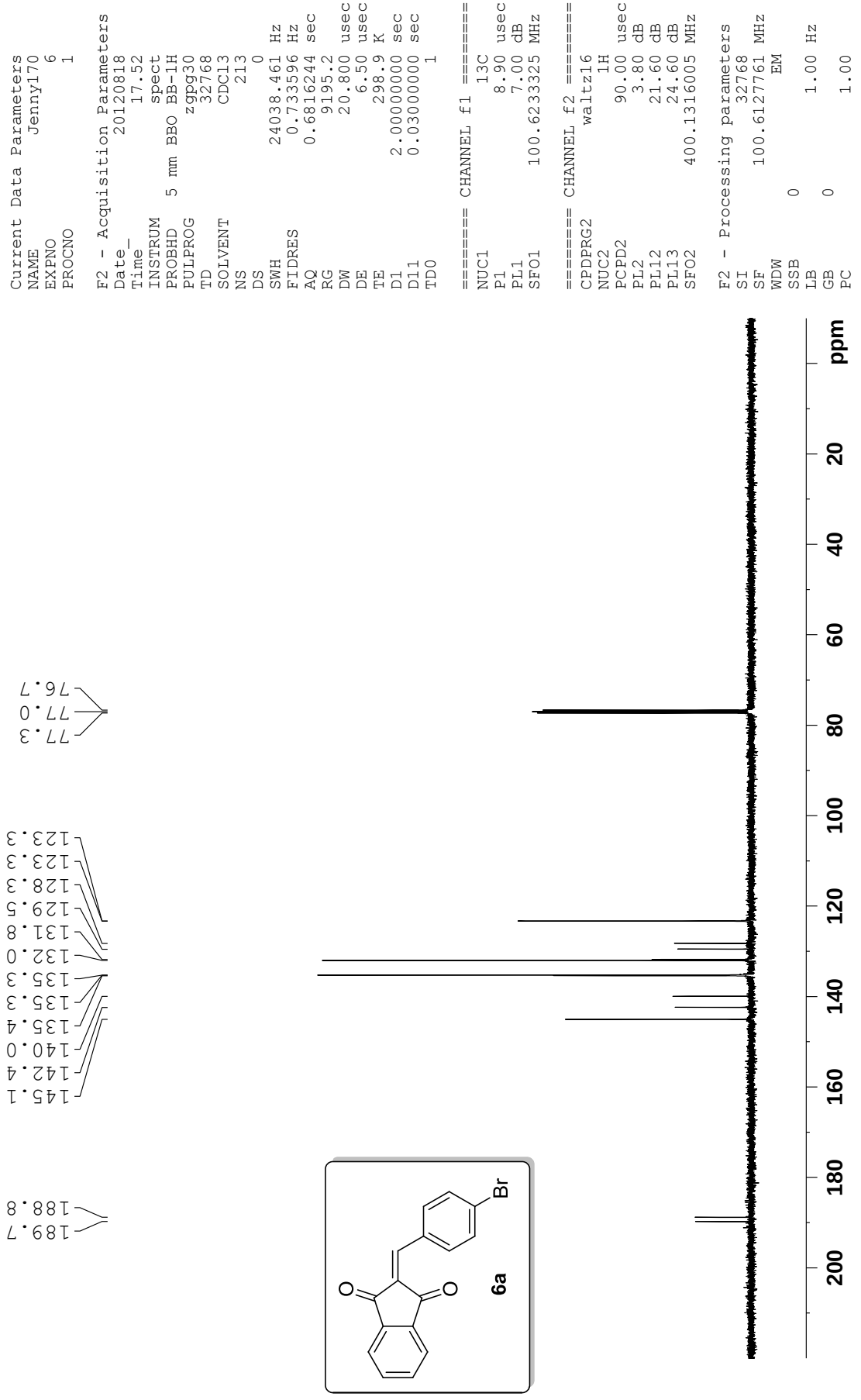

Current Data Parameters
NAME Roy 1098
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130219
Time_ 23.25
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 10392
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127723 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.5
161.5
161.0
141.3
136.3
135.8
135.4
134.8
132.2
131.5
131.3
130.0
129.9
129.2
128.2
126.5
124.9
124.0
122.4
77.3
77.0
76.7
200
180
160
140
120
100
80
60
40
20
ppm
Br
N
N
O
17

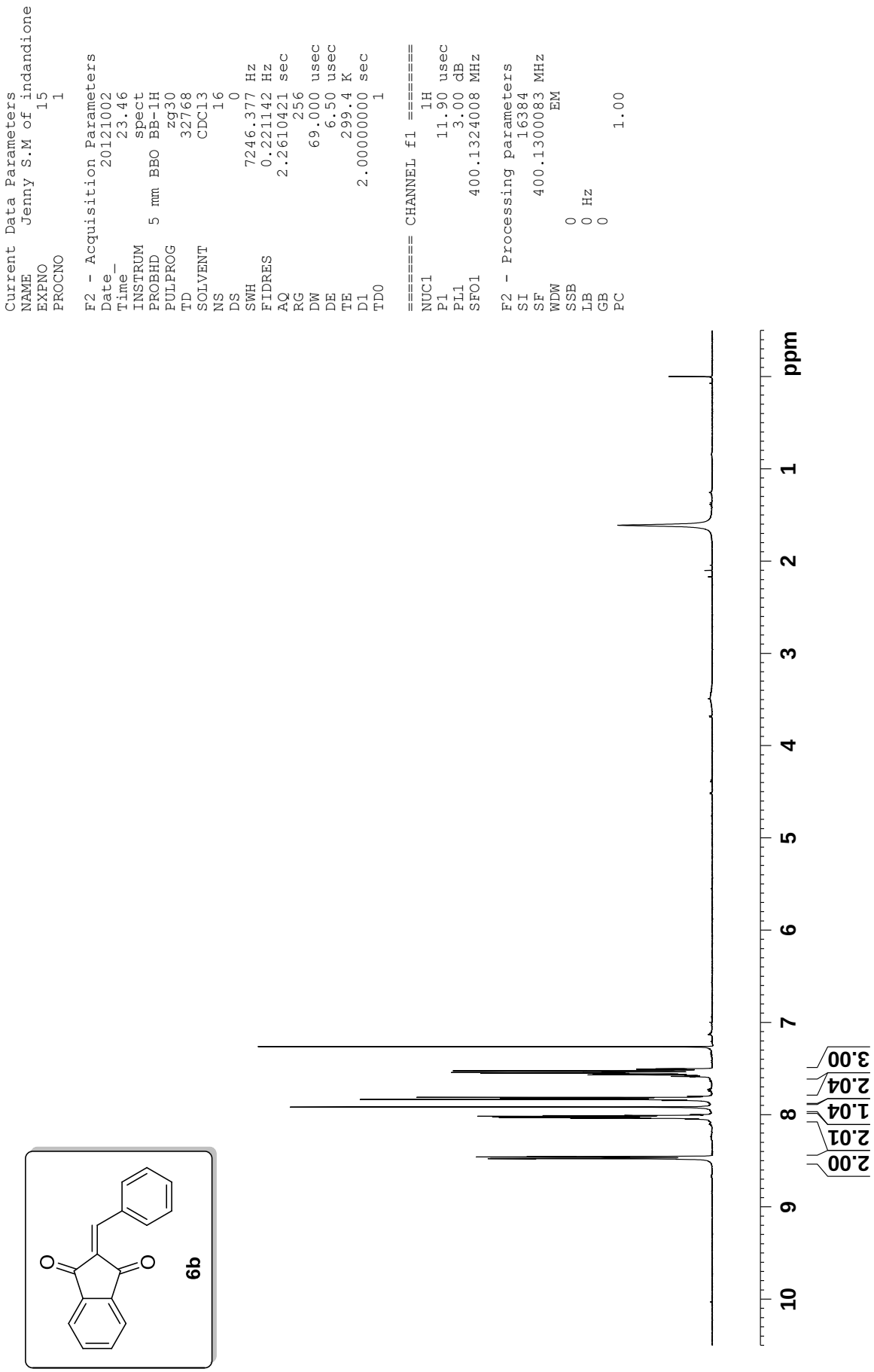

Current Data Parameters
NAME Roy1108
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130326
Time_ 0.11
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 114
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300071 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
1.94
1.95
0.99
1.96
1.01
1.94
3.09
1.01
NO2
N
N
18

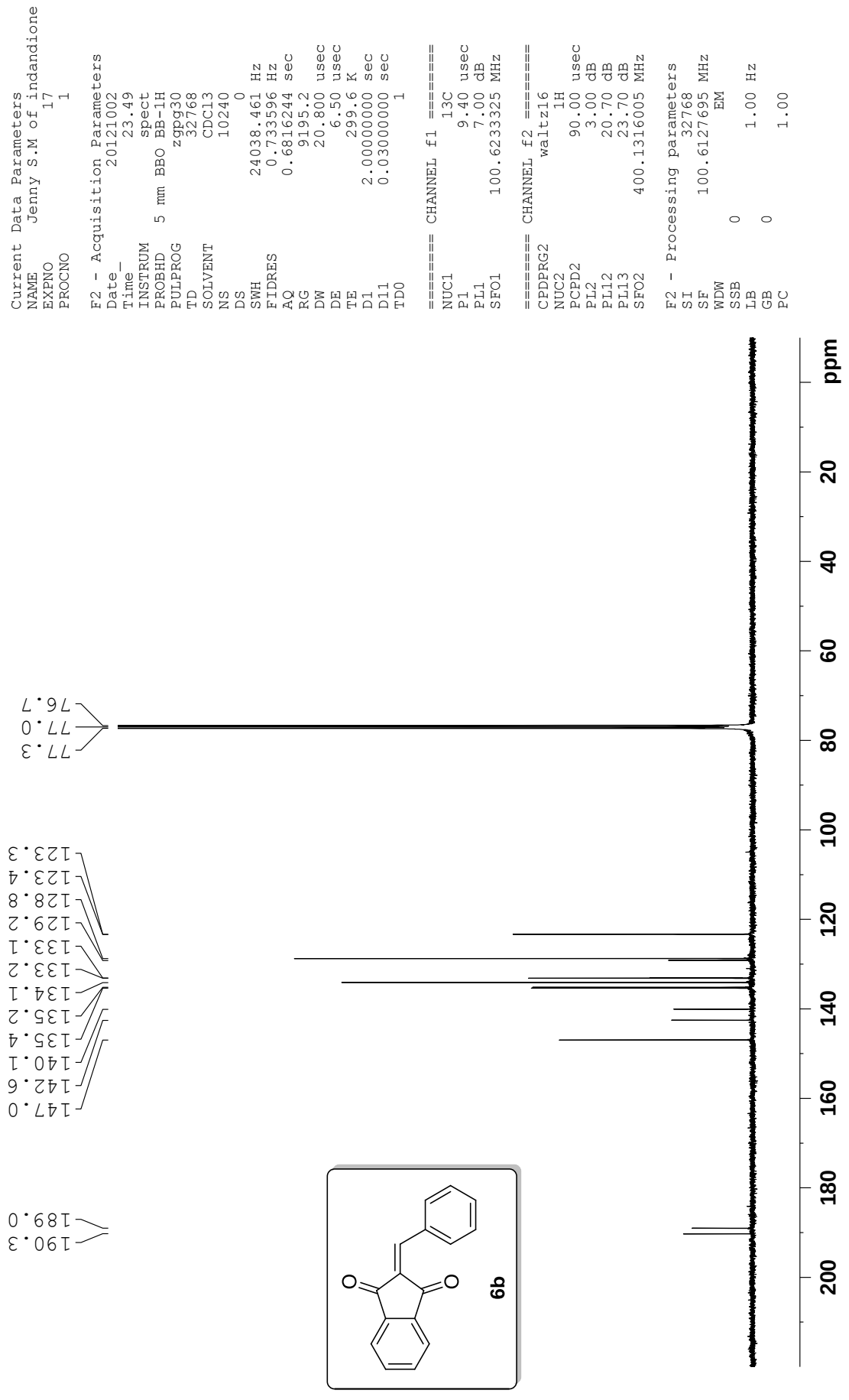


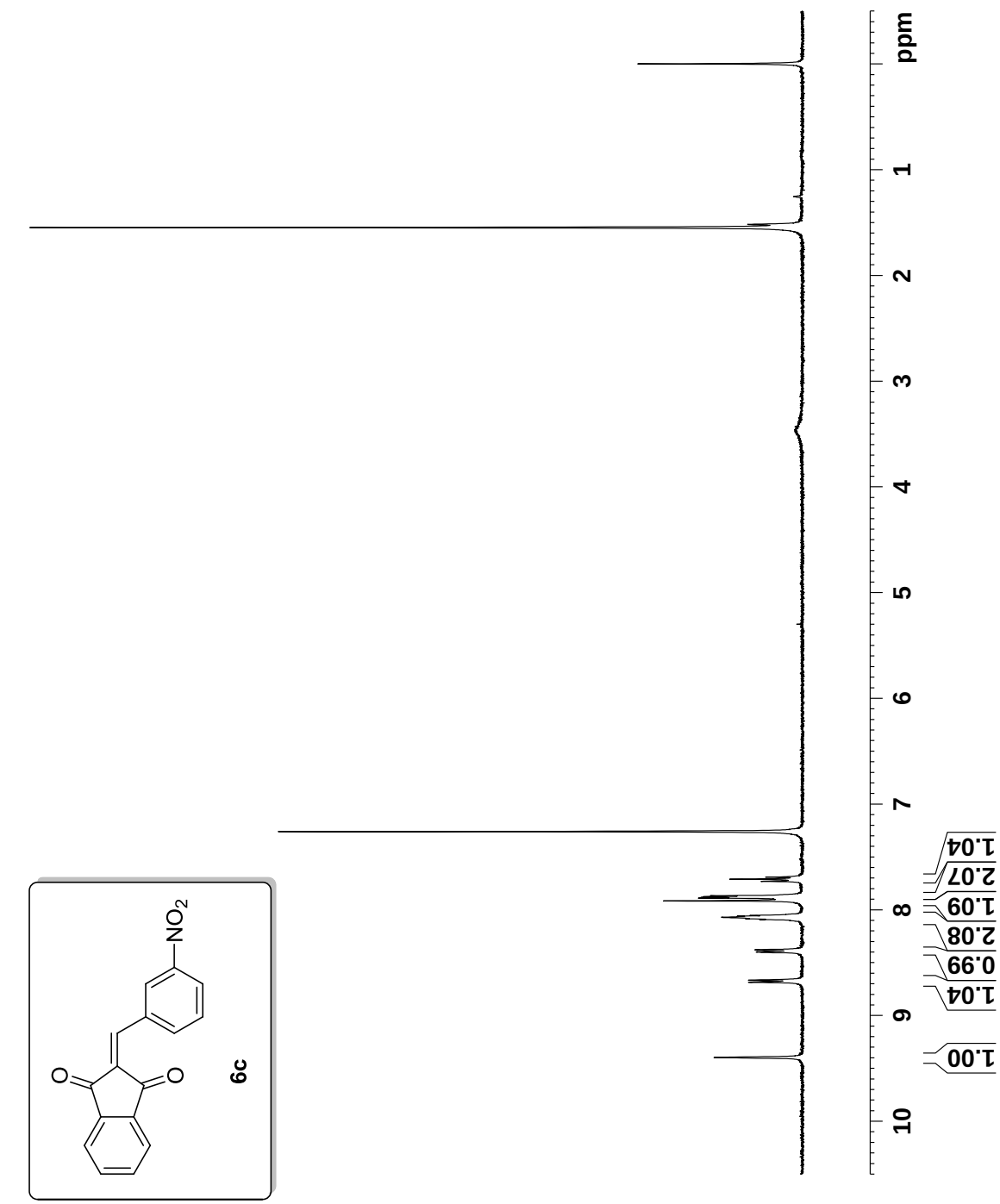

```
Current Data Parameters
NAME                  Roy1108
EXPNO                       5
PROCNO                      1

F2 - Acquisition Parameters
Date_                20130326
Time                     0.13
INSTRUM                 spect
PROBHD   5 mm BBO BB-1H
PULPROG                zgpg30
TD                      32768
SOLVENT                 CDCl3
NS                      10240
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                       9.40 usec
PL1                      7.00 dB
SFO1             100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                   90.00 usec
PL2                      3.00 dB
PL12                    20.70 dB
PL13                    23.70 dB
SFO2             400.1316005 MHz

F2 - Processing parameters
SI                      32768
SF               100.6127775 MHz
WDW                        EM
SSB          0
LB                       1.00 Hz
GB           0
PC                       1.00
```

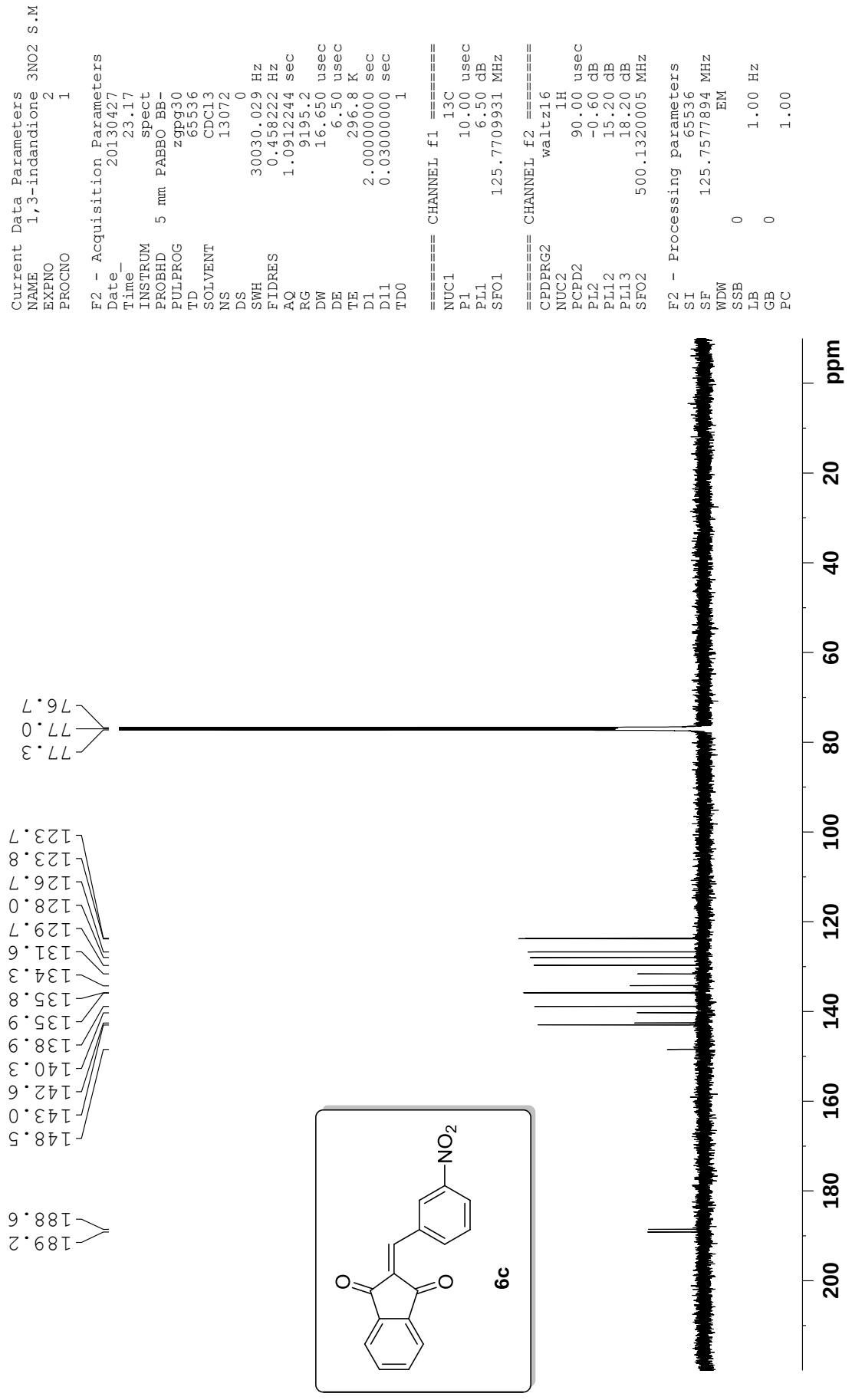

Current Data Parameters
NAME Jenny170
EXPNO 13
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130116
Time_ 13.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 228.1
DW 69.000 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300075 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
10
9
8
7
6
5
4
3
2
1
2.04
2.00
3.05
2.02
Br
O
O
6a

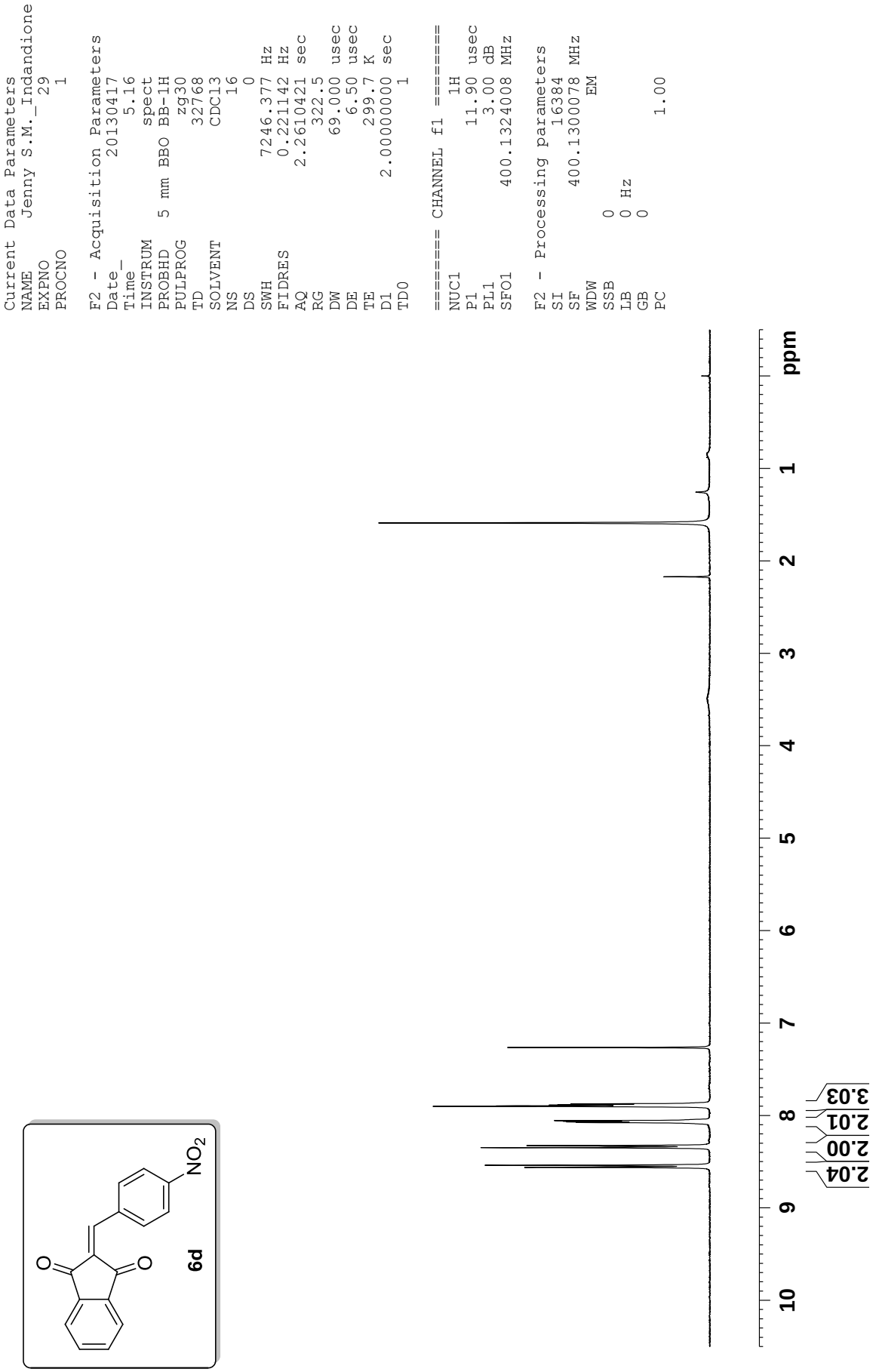

Current Data Parameters
NAME Jenny170
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120818
Time_ 17.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 213
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.9 K
D1 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 100.6127761 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.3
123.3
128.3
129.5
131.8
132.0
135.3
135.3
135.4
140.0
142.4
145.1
189.7
188.8
Br
O
O
6a
200
180
160
140
120
100
80
60
40
20
ppm

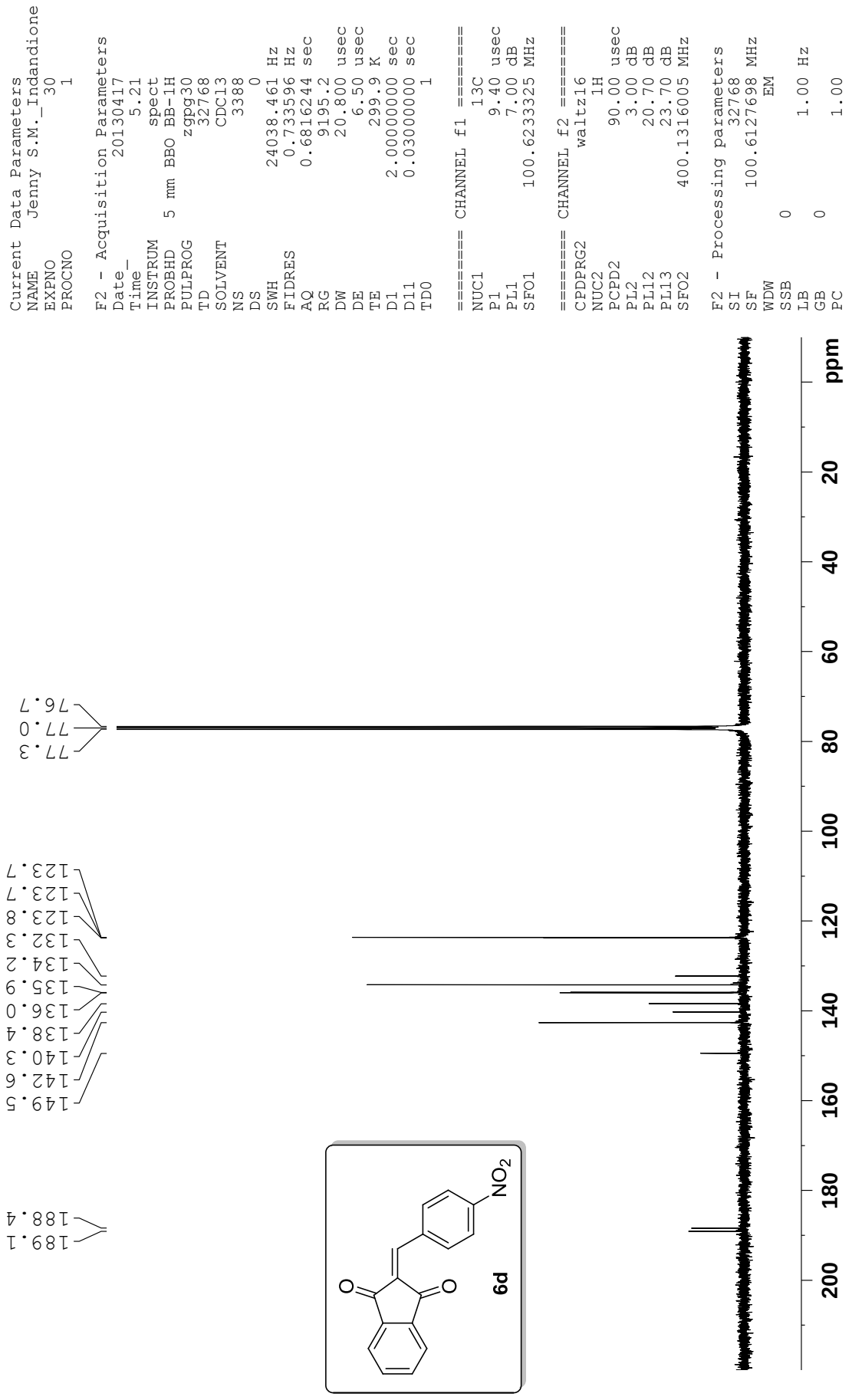

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 15
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121002
Time_ 23.46
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
10
9
8
7
6
5
4
3
2
1
2.00
2.01
1.04
2.04
3.00
O
O
6b

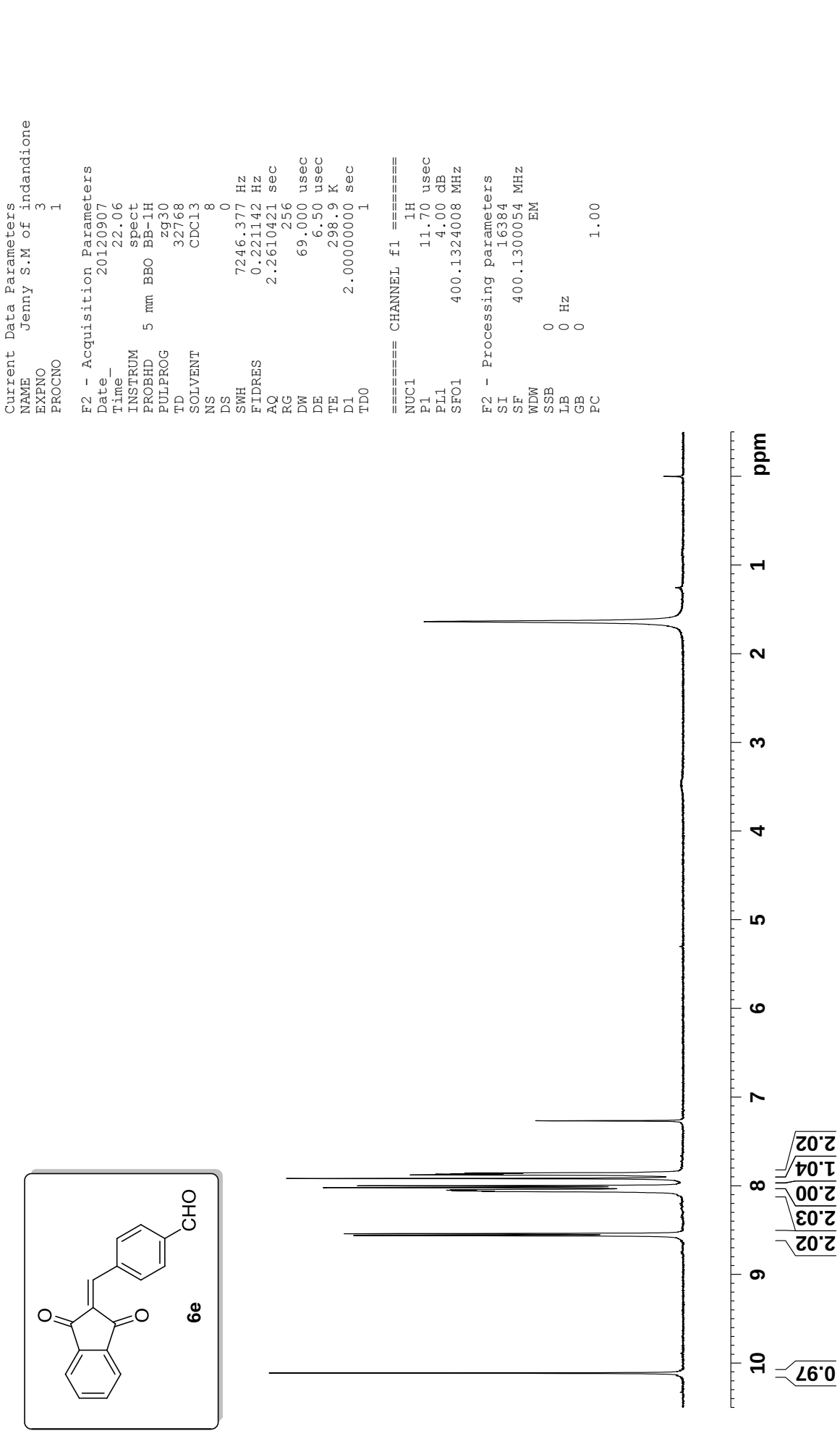

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 17
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121002
Time_ 23.49
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 10240
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127695 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.3
123.4
128.8
129.2
133.1
133.2
134.1
135.2
135.4
140.1
142.6
147.0
190.3
189.0
6b
ppm
200
180
160
140
120
100
80
60
40
20

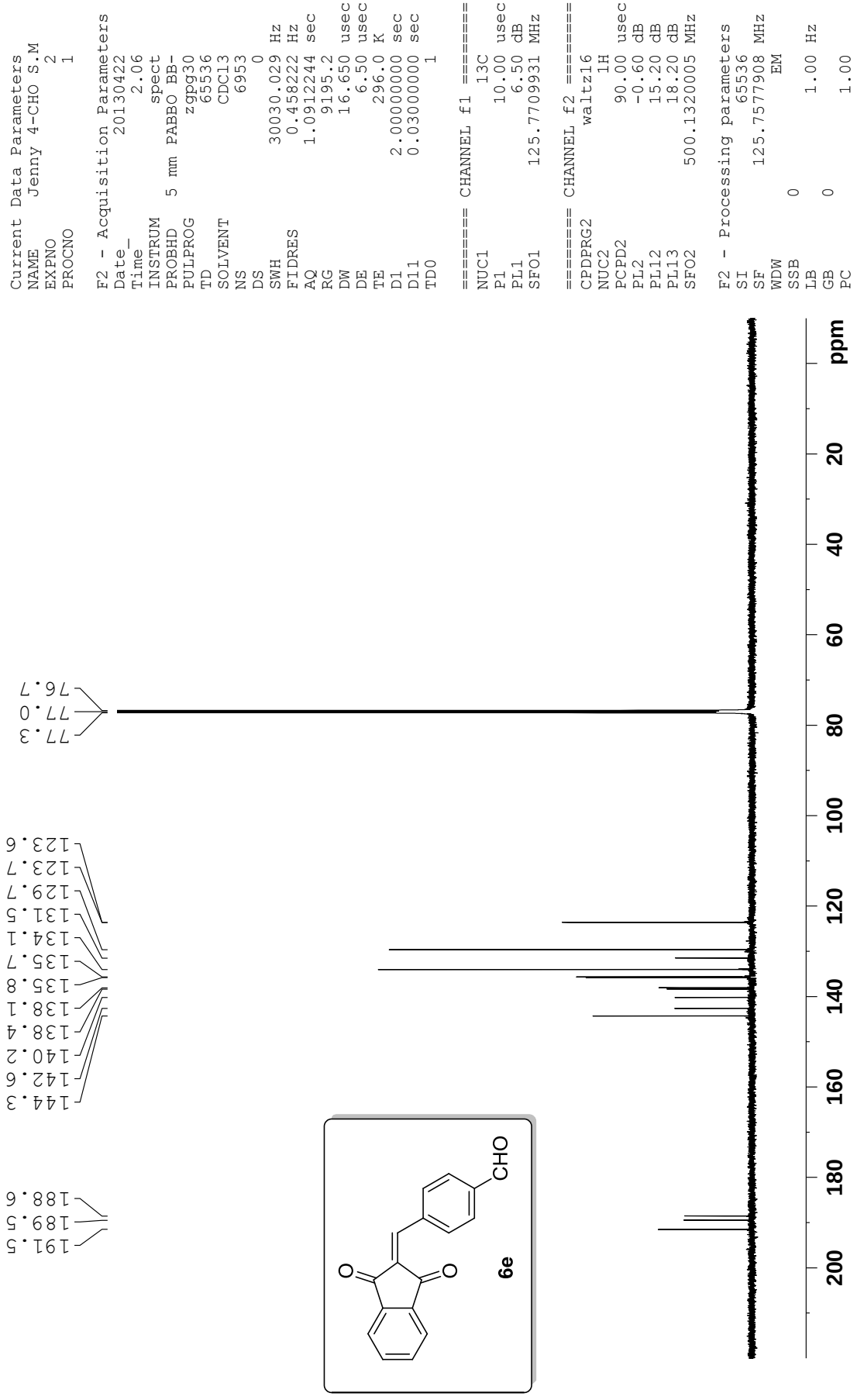

Current Data Parameters
NAME indandione S.M
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111229
Time_ 21.52
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 301.1 K
D1 2.00000000 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 400.1300087 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.00
1.04
0.99
2.08
1.09
2.07
1.04
6c

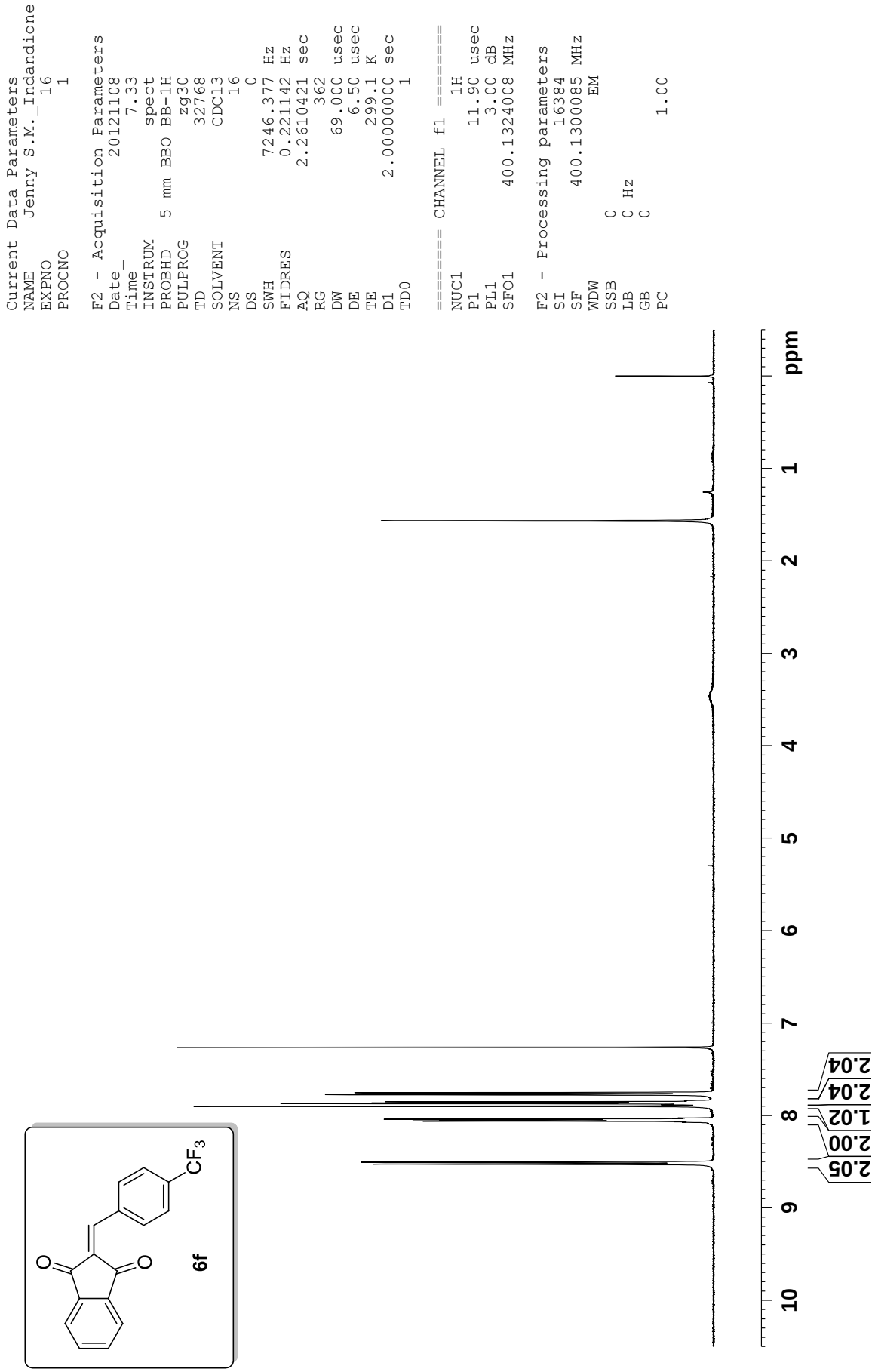

Current Data Parameters
NAME 1,3-indandione 3NO2 S.M
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130427
Time_ 23.17
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 13072
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577894 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
189.2
188.6
148.5
143.0
142.6
140.3
138.9
135.9
135.8
134.3
131.6
129.7
128.0
126.7
123.8
123.7
77.3
77.0
76.7
NO2
O
O
6c
ppm
200
180
160
140
120
100
80
60
40
20

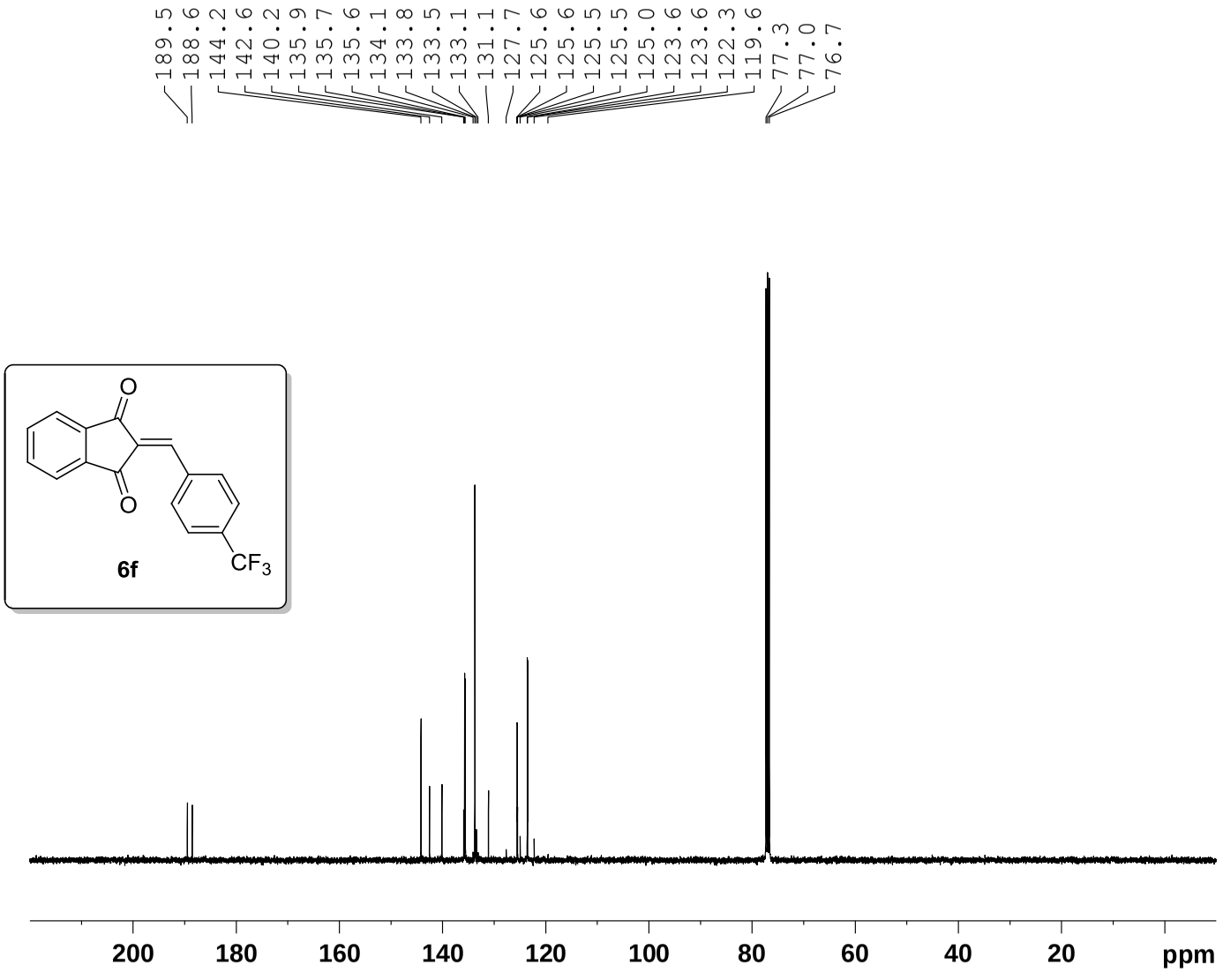

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 29
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 5.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 299.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
10
9
8
7
6
5
4
3
2
1
2.04
2.00
2.01
3.03
O
O
NO2
6d


Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 30
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 5.21
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 3388
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 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127698 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
149.5
142.6
140.3
138.4
136.0
135.9
134.2
132.3
123.8
123.7
123.7
188.4
189.1
NO2
O
O
6d
ppm
200
180
160
140
120
100
80
60
40
20

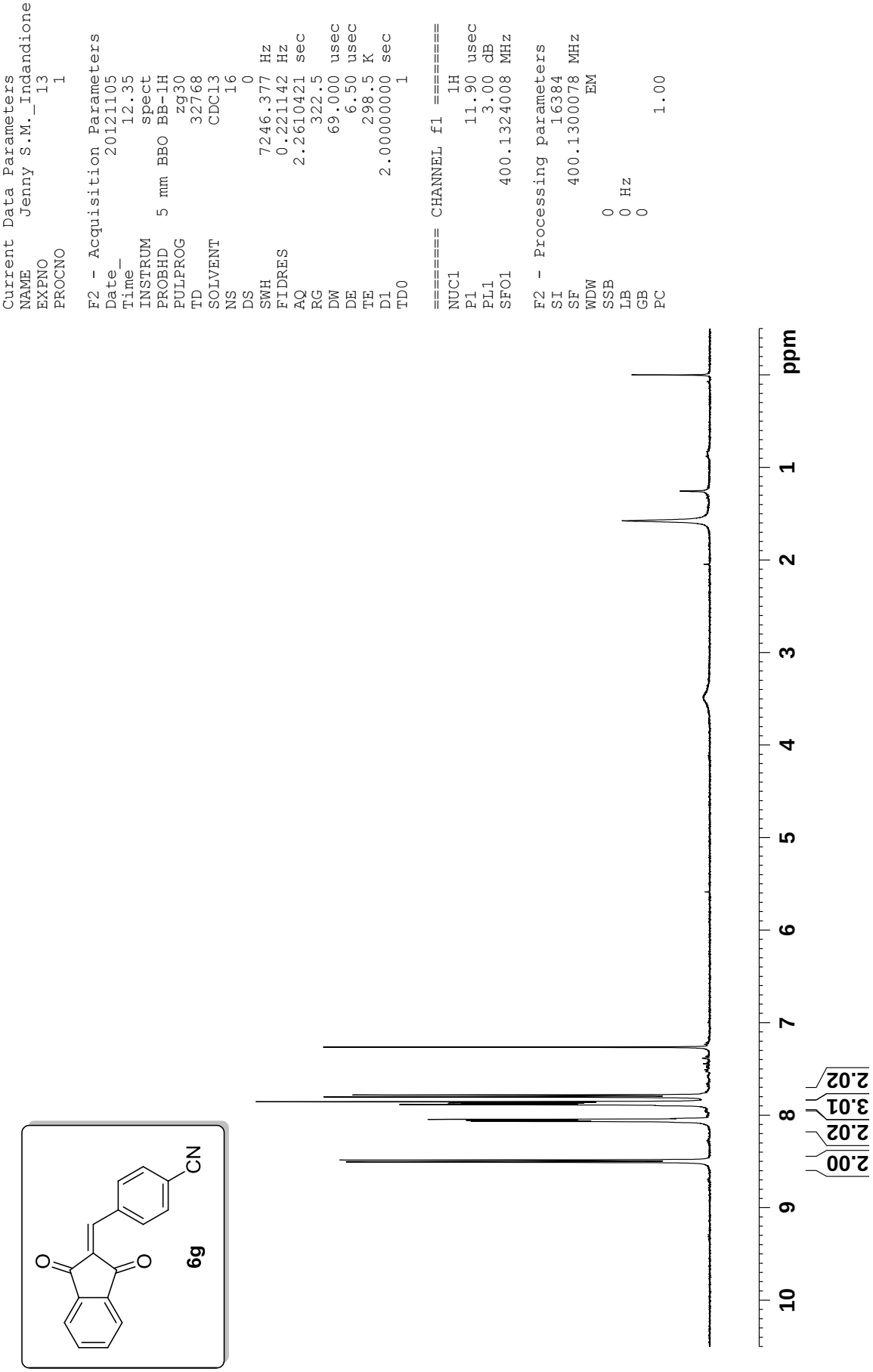

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120907
Time_ 22.06
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 8
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 298.9 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 400.1300054 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
CHO
O
O
6e
ppm
1
2
3
4
5
6
7
8
9
10
0.97
2.02
2.03
2.00
1.04
2.02

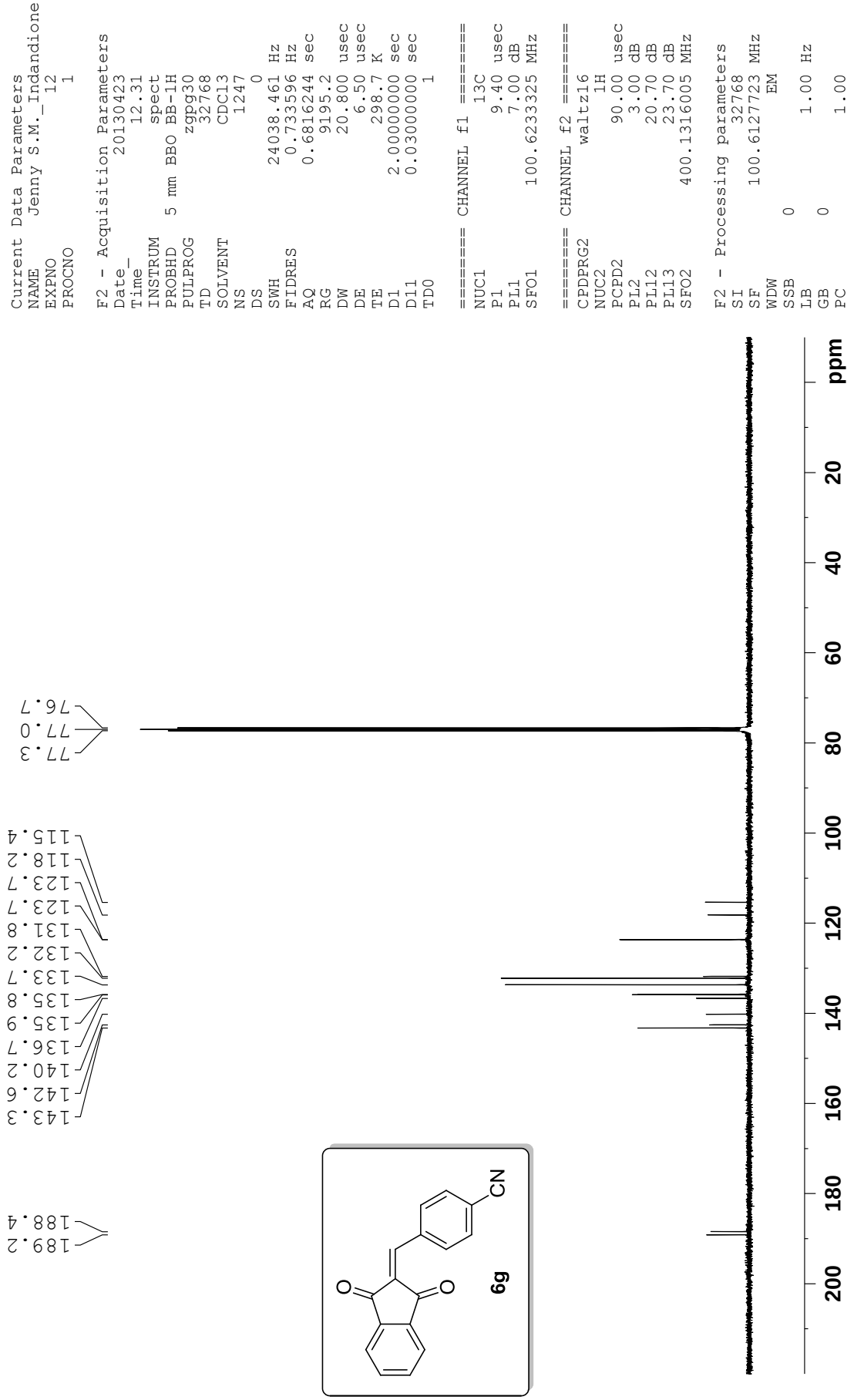

Current Data Parameters
NAME Jenny 4-CHO S.M
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130422
Time_ 2.06
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 6953
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 296.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 dB
SFO2 500.1320005 MHz
F2 - Processing parameters
SI 65536
SF 125.7577908 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
123.6
123.7
129.7
131.5
134.1
135.7
135.8
138.1
138.4
140.2
142.6
144.3
188.6
189.5
191.5
CHO
O
O
6e
ppm
200
180
160
140
120
100
80
60
40
20

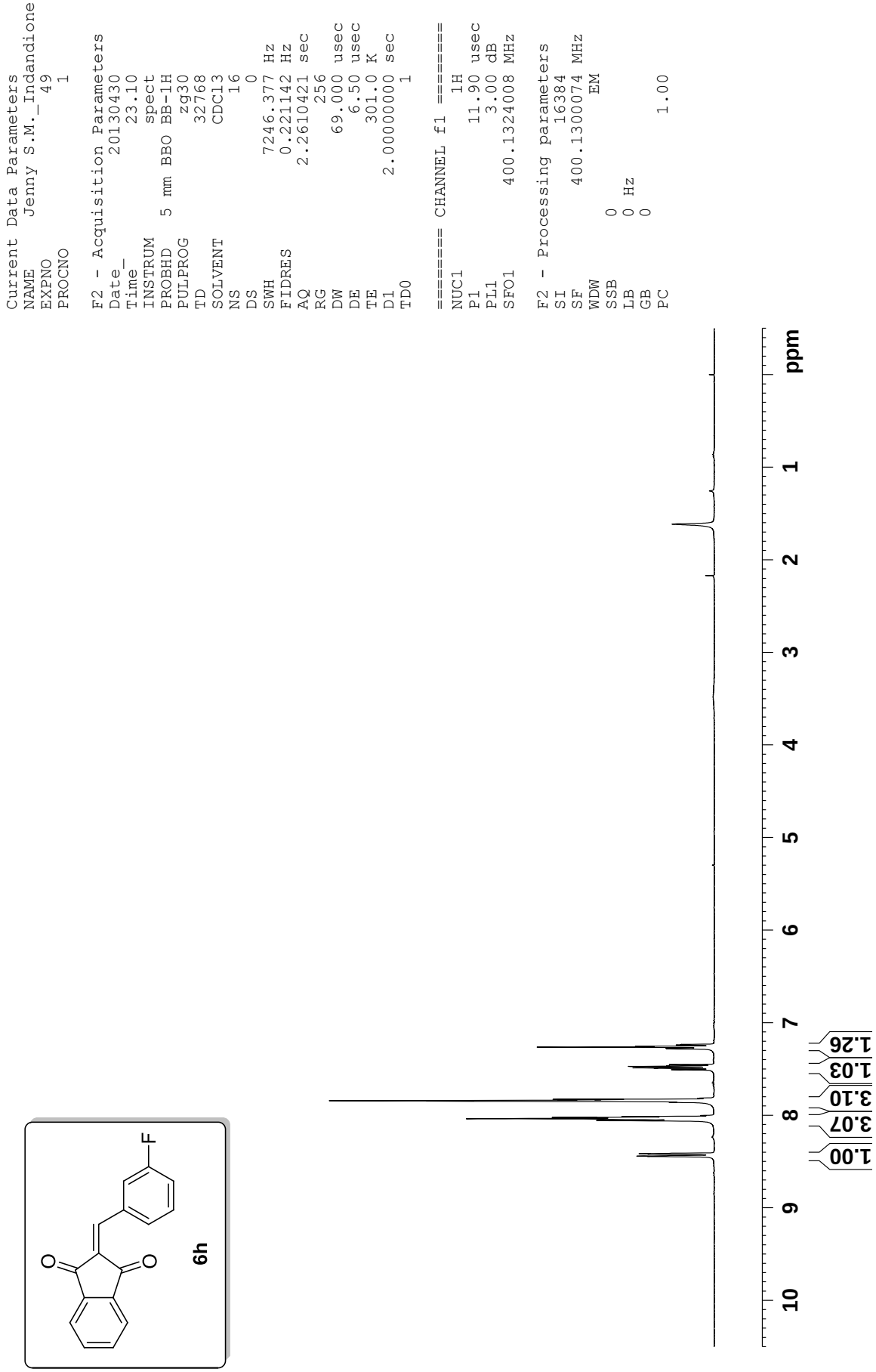

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 16
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121108
Time_ 7.33
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 299.1 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300085 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
2.00
1.02
2.04
2.04
CF3
O
O
6f

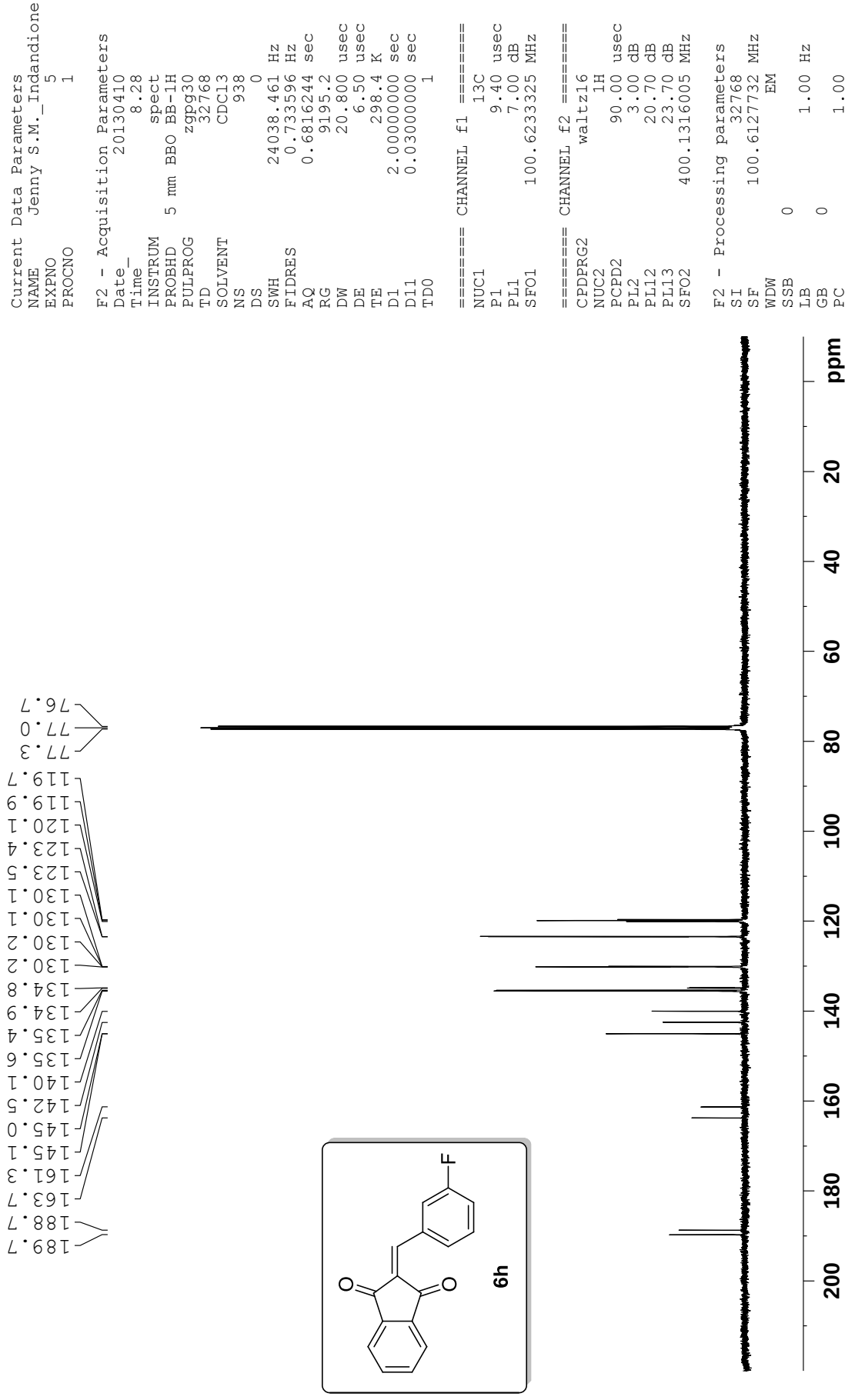


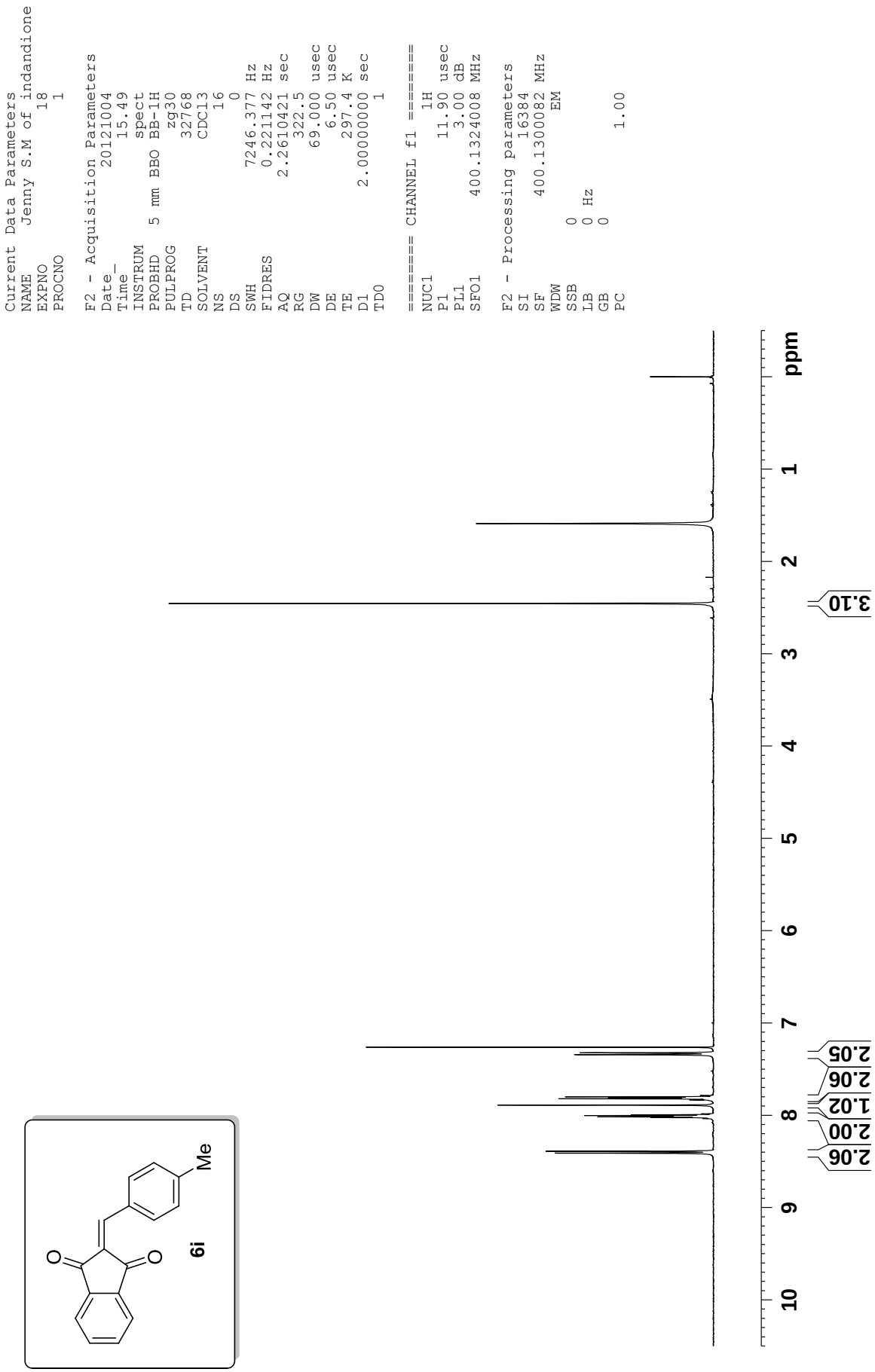

```
Current Data Parameters
NAME      Jenny S.M._Indandione
EXPNO                        17
PROCNO                        1

F2 - Acquisition Parameters
Date_              20130413
Time                   12.19
INSTRUM                spect
PROBHD   5 mm BBO BB-1H
PULPROG             zgpg30
TD                  32768
SOLVENT               CDC13
NS                      873
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                    297.7 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.40 usec
PL1                    7.00 dB
SFO1           100.6233325 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                90.00 usec
PL2                   3.00 dB
PL12                 20.70 dB
PL13                 23.70 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                    32768
SF               100.6127714 MHz
WDW                      EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.00
```

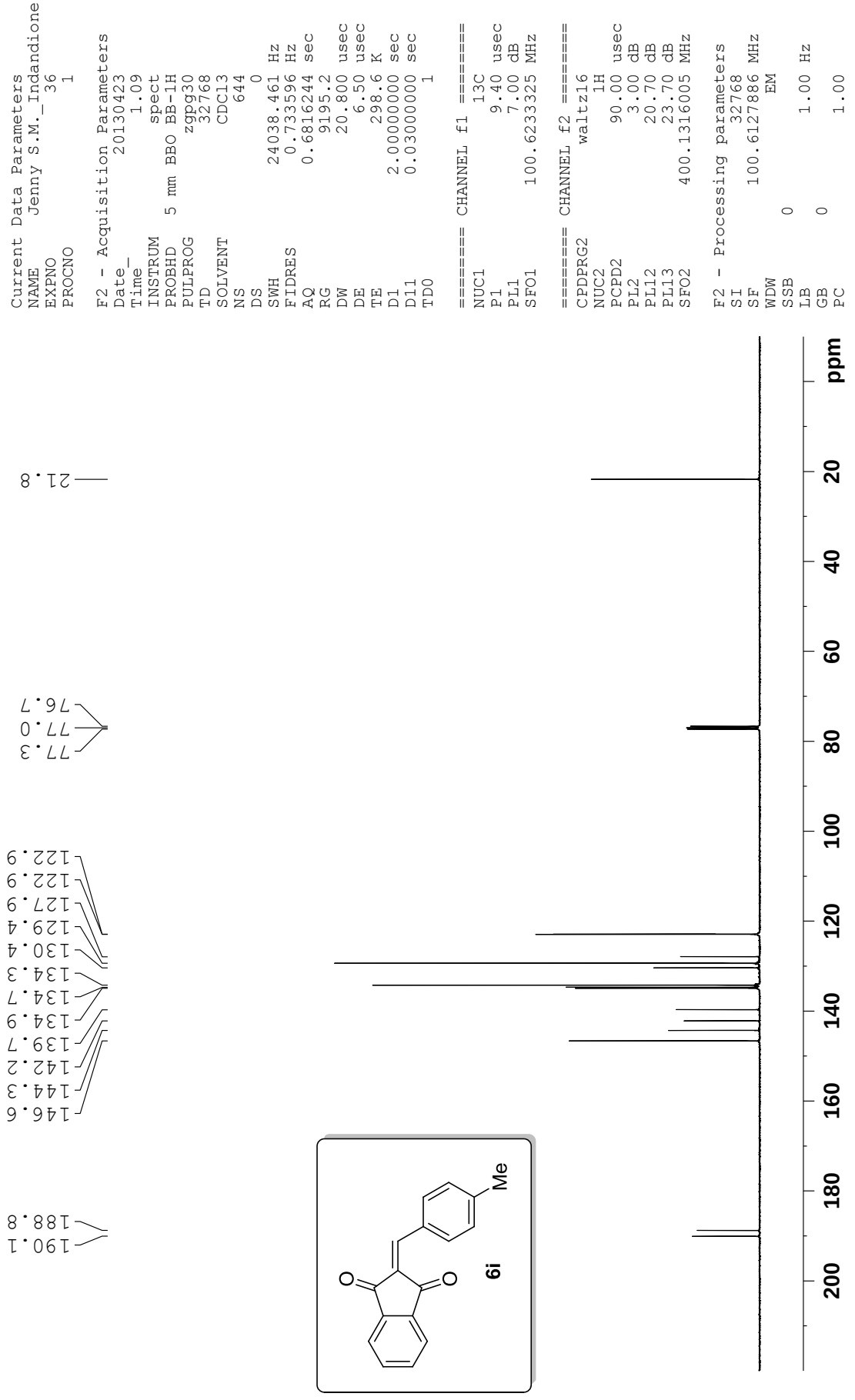

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 13
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121105
Time_ 12.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1
2
3
4
5
6
7
8
9
10
2.00
2.02
3.01
2.02
O
O
CN
6g

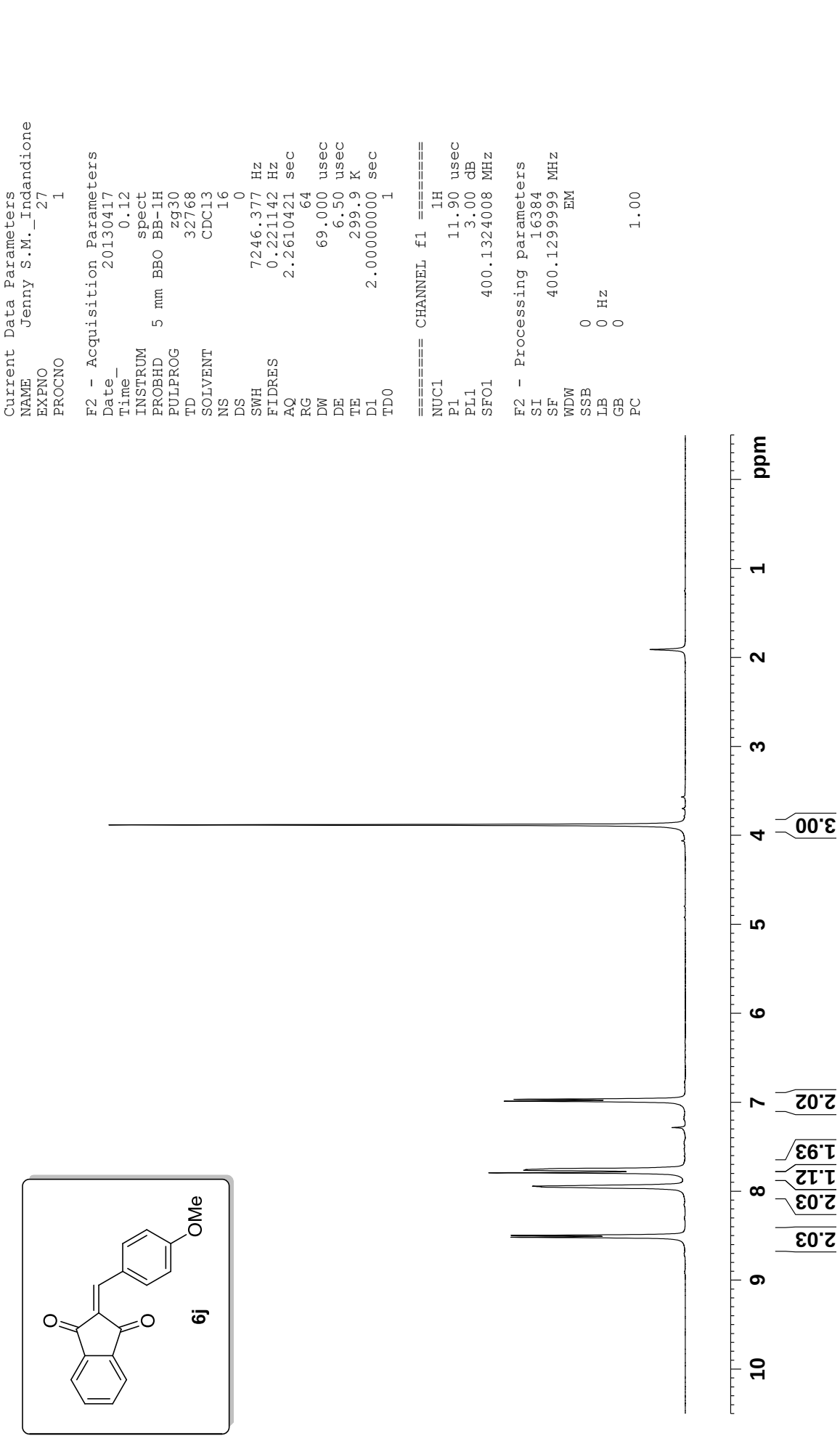

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 12.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1247
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127723 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
115.4
118.2
123.7
123.7
131.8
132.2
133.7
135.8
135.9
136.7
140.2
142.6
143.3
188.4
189.2
CN
O
O
6g
200
180
160
140
120
100
80
60
40
20
ppm

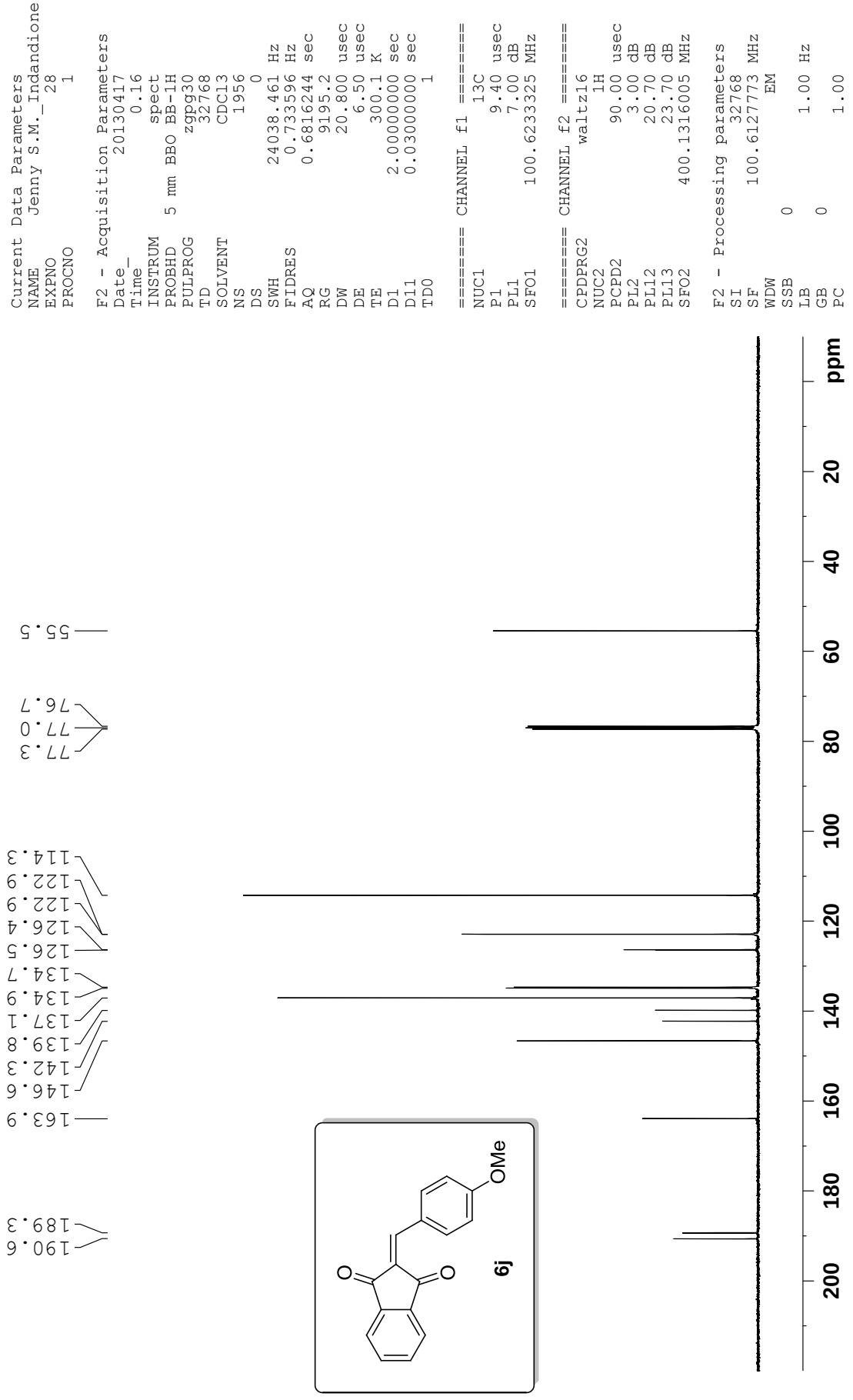

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 49
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130430
Time_ 23.10
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 301.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300074 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.00
3.07
3.10
1.03
1.26
ppm
10
9
8
7
6
5
4
3
2
1
F
O
O
6h

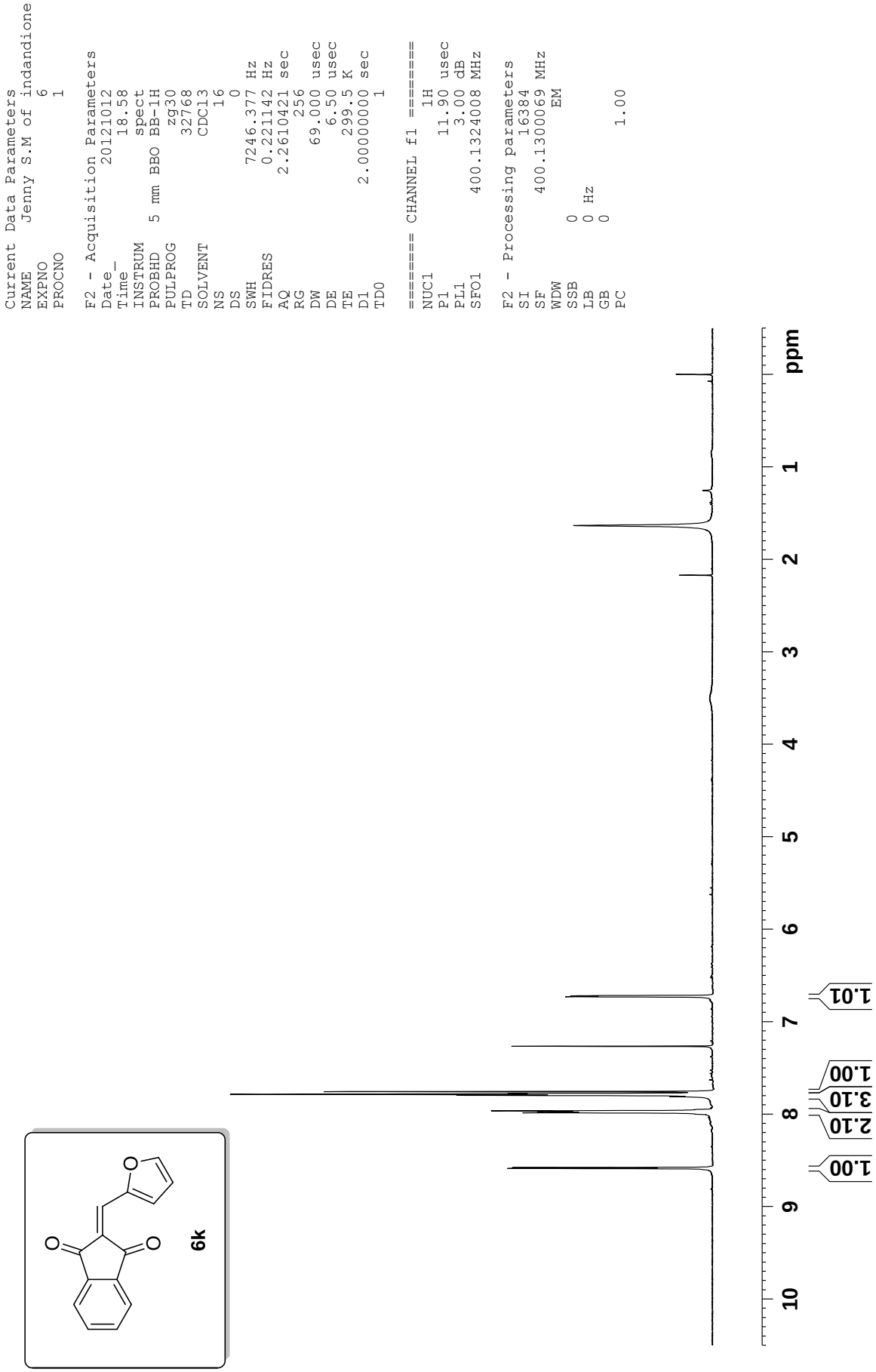

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130410
Time_ 8.28
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 938
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127732 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
77.3
77.0
76.7
119.7
119.9
120.1
123.4
123.5
130.1
130.1
130.2
130.2
134.8
134.9
135.4
135.6
140.1
142.5
145.0
145.1
161.3
163.7
188.7
189.7
6h
ppm
200
180
160
140
120
100
80
60
40
20

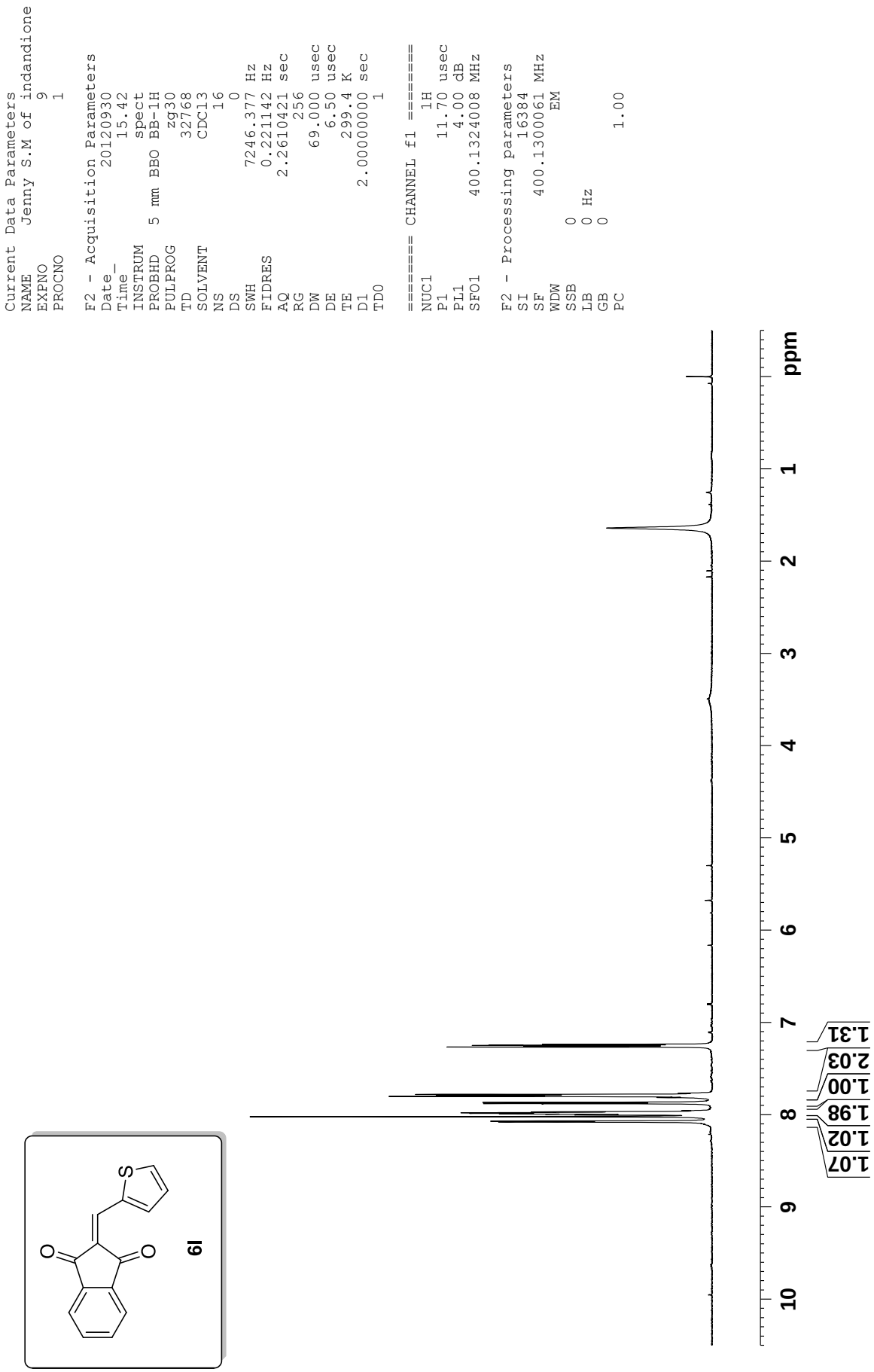

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 18
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121004
Time_ 15.49
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 322.5
DW 69.000 usec
DE 6.50 usec
TE 297.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300082 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
3.10
2.06
2.00
1.02
2.06
2.05
ppm
1
2
3
4
5
6
7
8
9
10
O
O
Me
6i

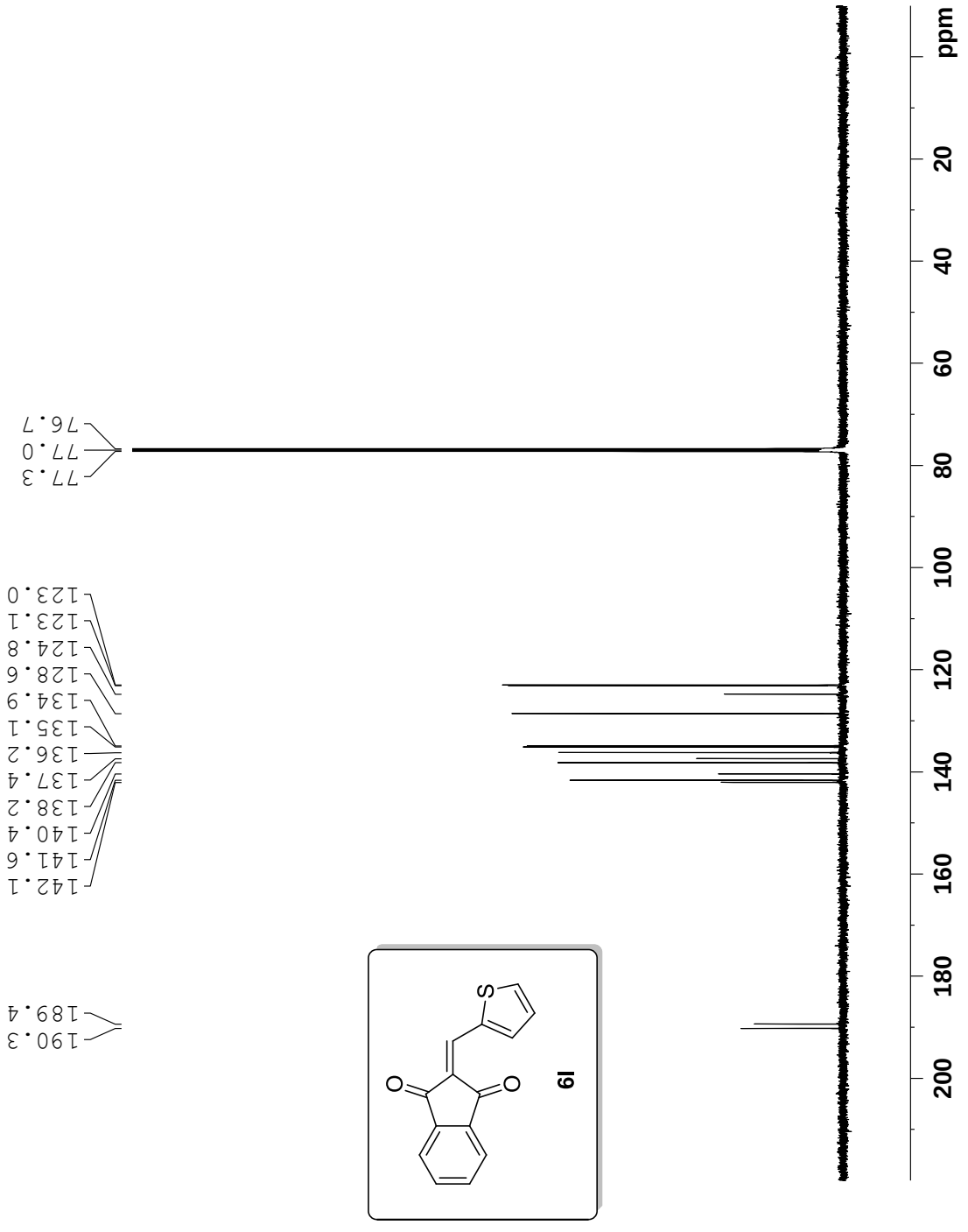

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 36
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130423
Time_ 1.09
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 644
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 298.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127886 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
21.8
77.3
77.0
76.7
122.9
122.9
127.9
129.4
130.4
134.3
134.7
134.9
139.7
142.2
144.3
146.6
188.8
190.1
Me
O
O
6i
ppm
200
180
160
140
120
100
80
60
40
20

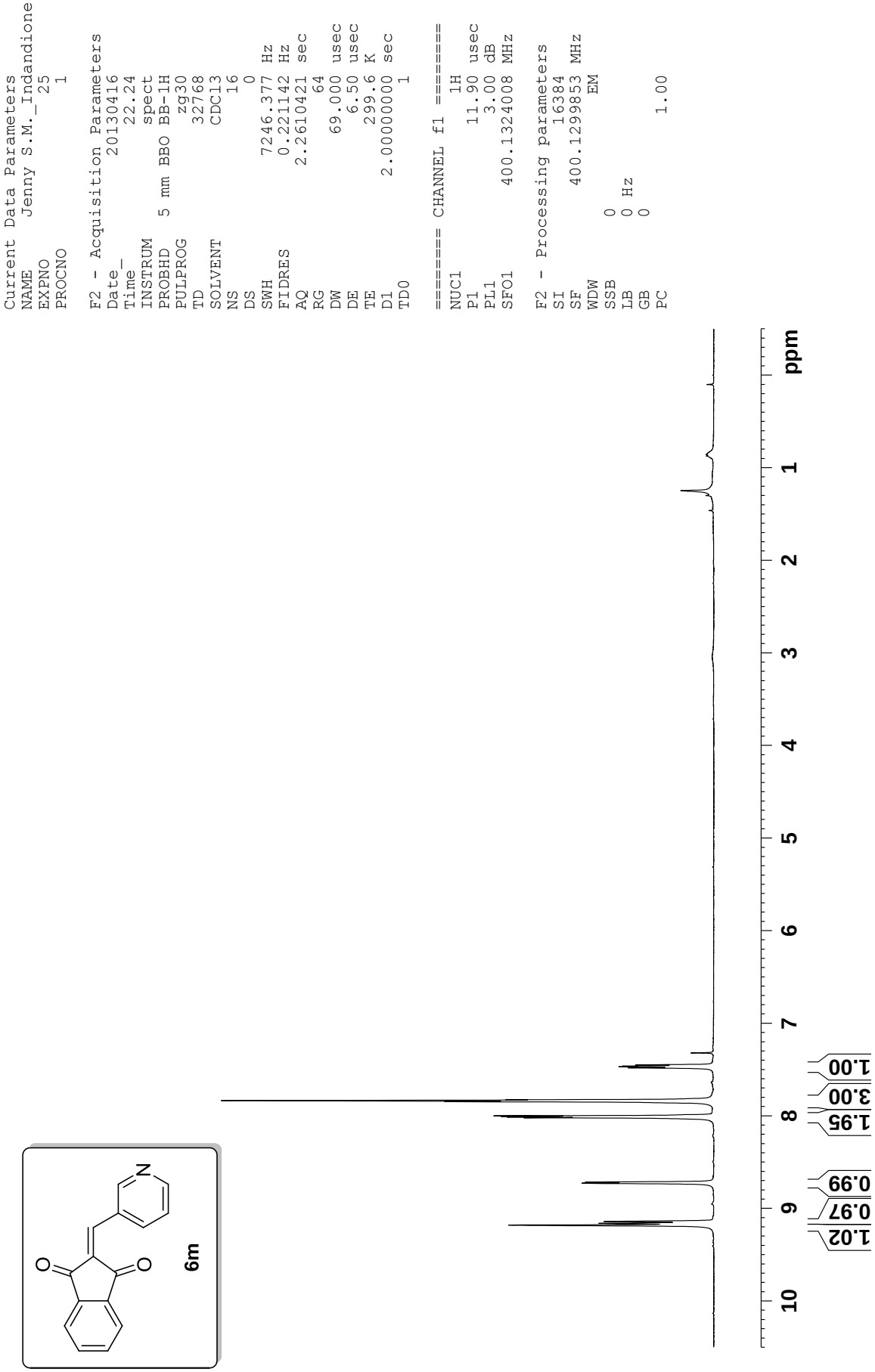

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 27
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 0.12
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 64
DW 69.000 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1299999 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
10
9
8
7
6
5
4
3
2
1
2.03
2.03
1.12
1.93
2.02
3.00
O
O
OMe
6j

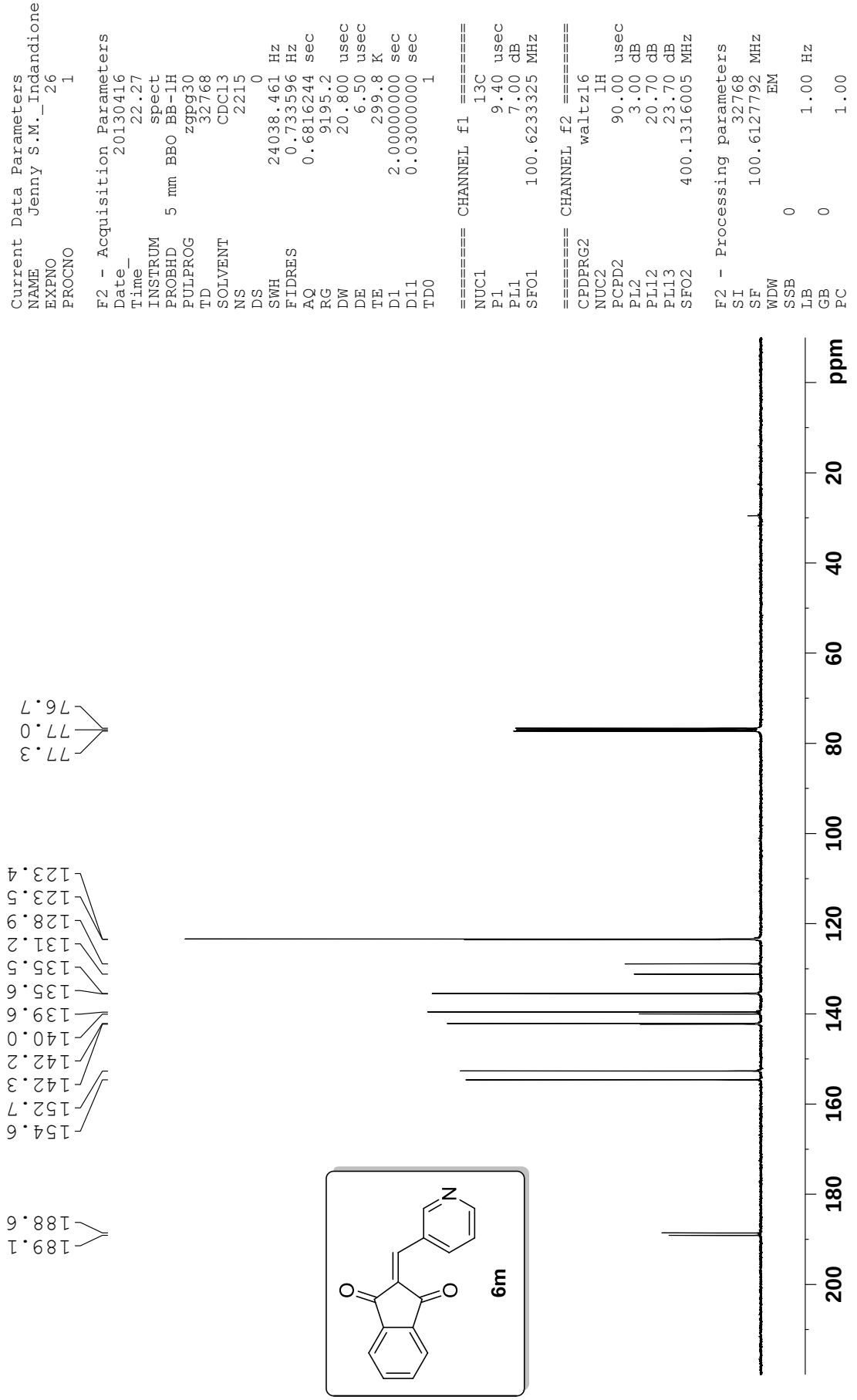

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 28
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130417
Time_ 0.16
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1956
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127773 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
190.6
189.3
163.9
146.6
142.3
139.8
137.1
134.9
134.7
126.5
126.4
122.9
122.9
114.3
77.3
77.0
76.7
55.5
OMe
O
O
6j
ppm
200
180
160
140
120
100
80
60
40
20

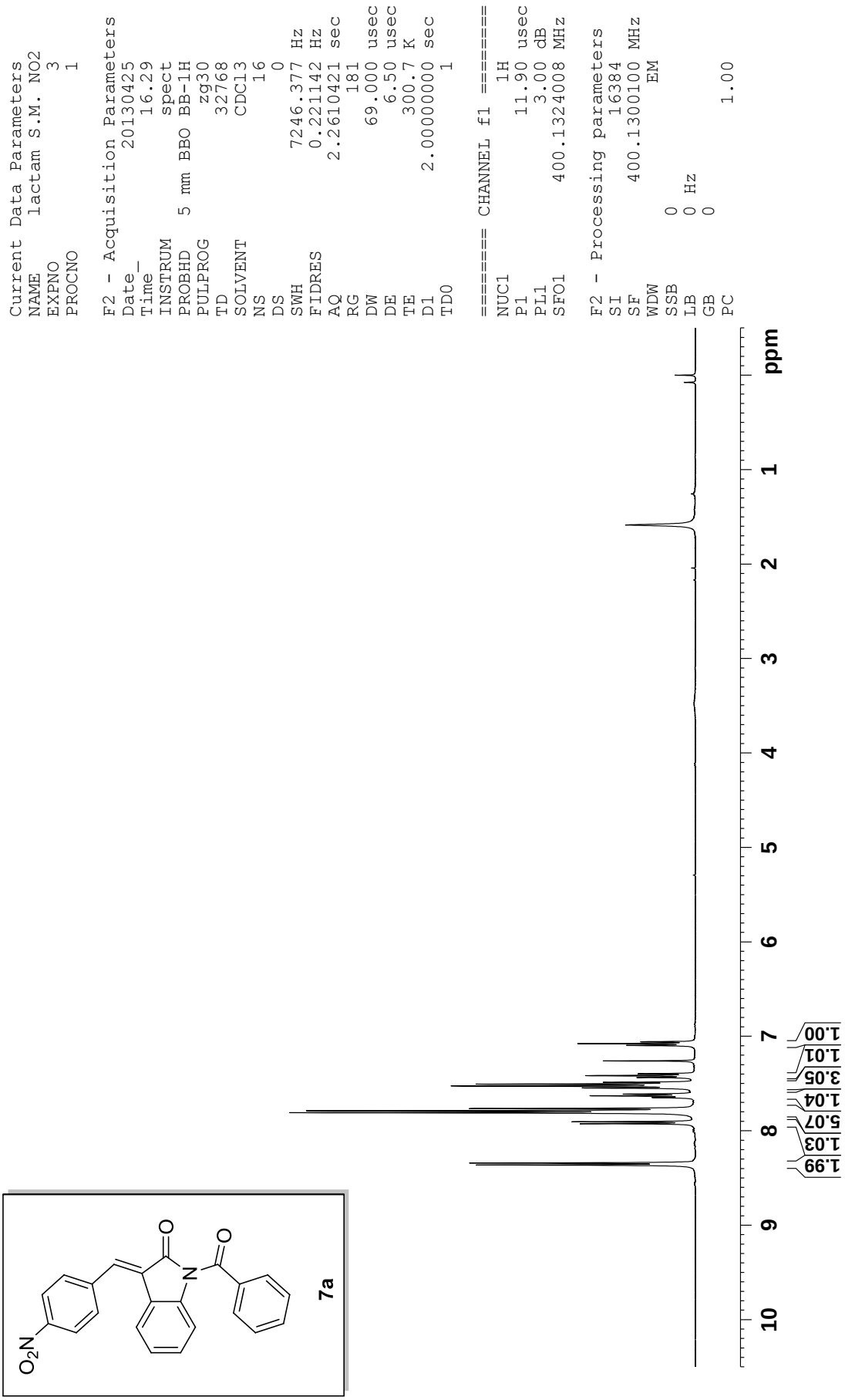

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121012
Time_ 18.58
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 299.5 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1300069 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.01
1.00
3.10
2.10
1.00
ppm
10
9
8
7
6
5
4
3
2
1
6k

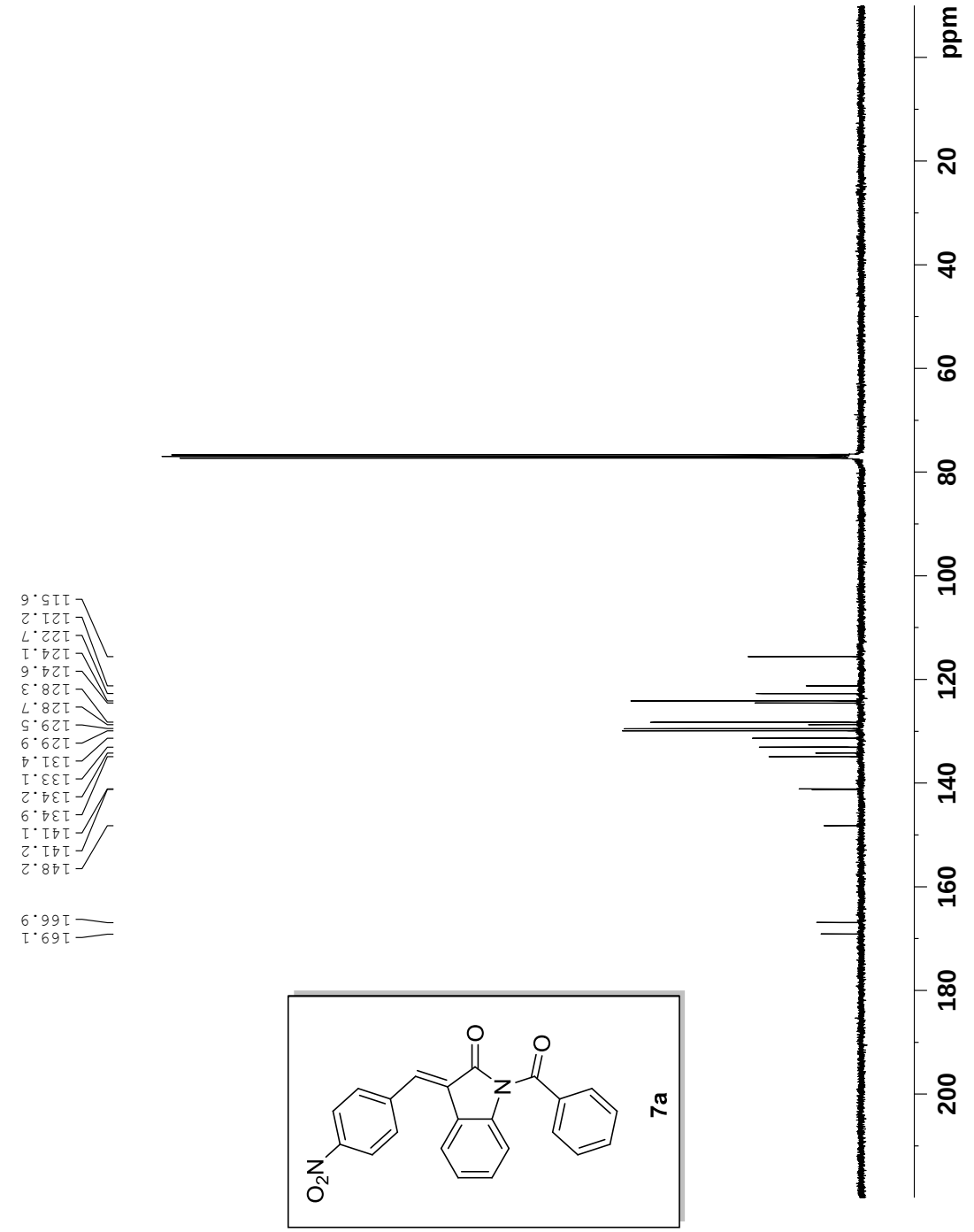

Current Data Parameters
NAME Jenny S.M of indandione
EXPNO 9
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120930
Time_ 15.42
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 256
DW 69.000 usec
DE 6.50 usec
TE 299.4 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 400.1300061 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.07
1.02
1.98
1.00
2.03
1.31
ppm
10
9
8
7
6
5
4
3
2
1
O
O
S
6l

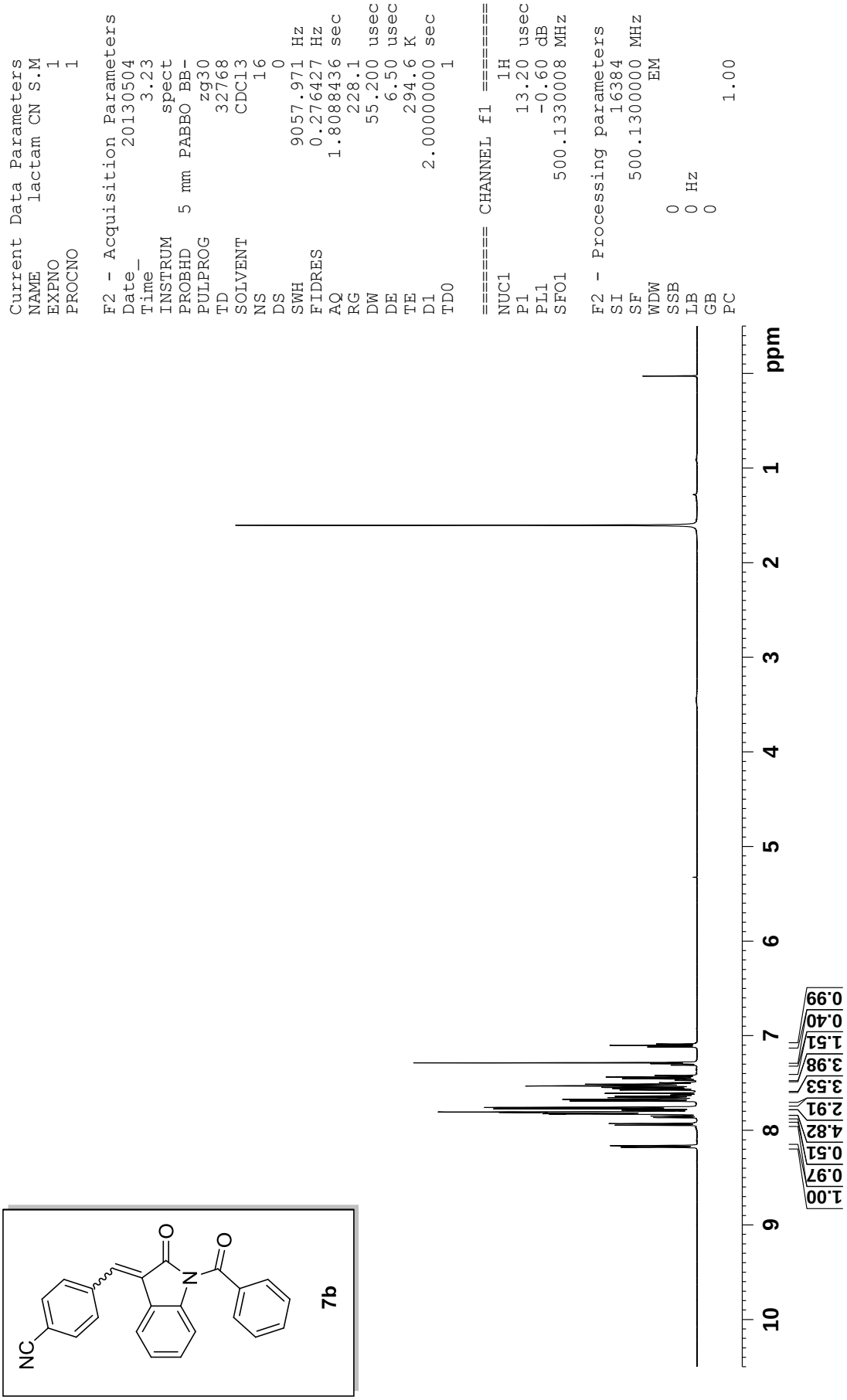

Current Data Parameters
NAME Jenny thio S.M
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130421
Time_ 22.40
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1935
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 10.00 usec
PL1 6.50 dB
SFO1 125.7709931 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -0.60 dB
PL12 15.20 dB
PL13 18.20 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
77.3
77.0
76.7
123.0
123.1
124.8
128.6
134.9
135.1
136.2
137.4
138.2
140.4
141.6
142.1
190.3
189.4
O
O
S
6l
200
180
160
140
120
100
80
60
40
20
ppm

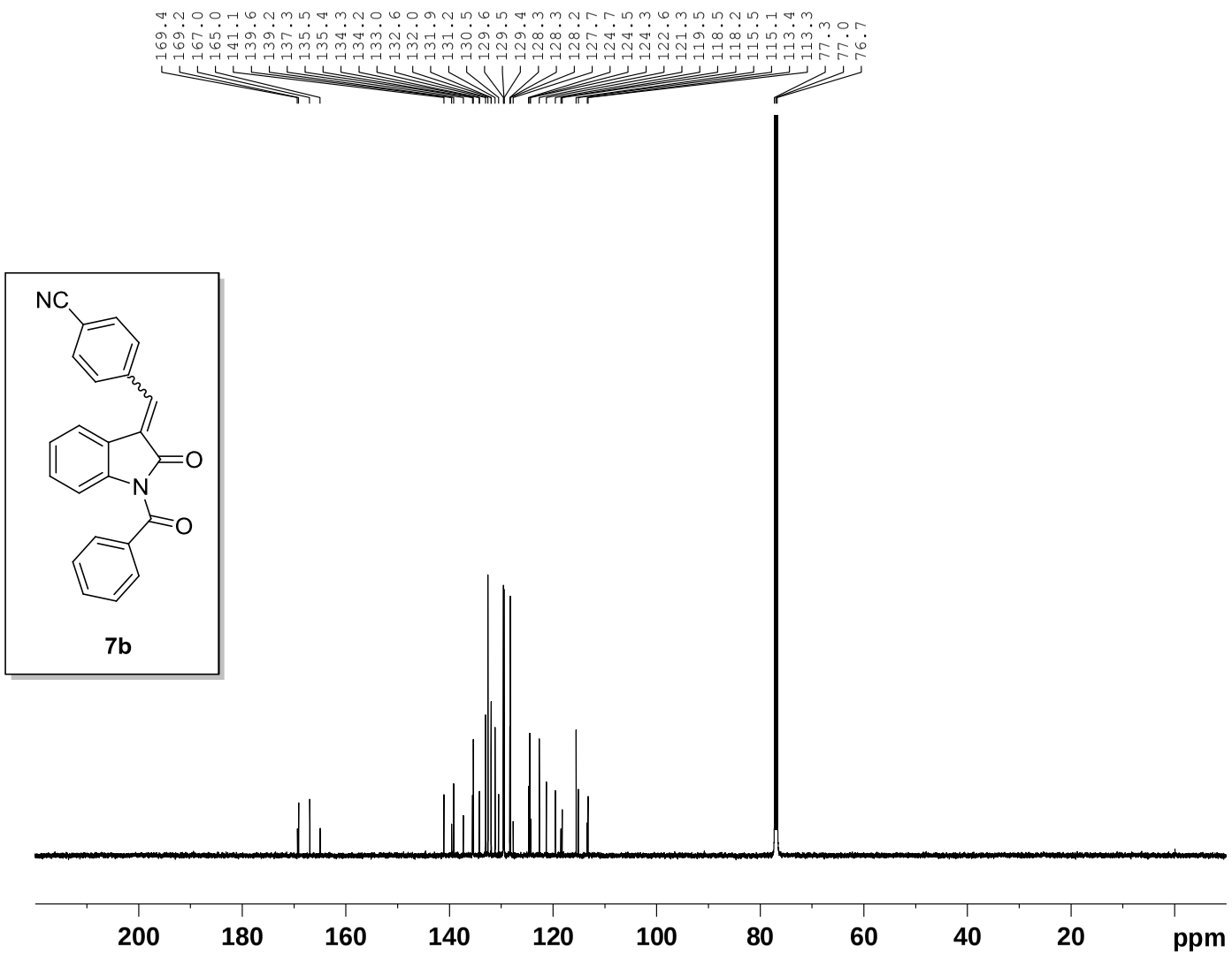

Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 25
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130416
Time_ 22.24
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 64
DW 69.000 usec
DE 6.50 usec
TE 299.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 16384
SF 400.1299853 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1.02
0.97
0.99
1.95
3.00
1.00
6m


Current Data Parameters
NAME Jenny S.M._Indandione
EXPNO 26
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130416
Time_ 22.27
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 2215
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 299.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 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
77.3
77.0
76.7
123.4
123.5
128.9
131.2
135.5
135.6
139.6
140.0
142.2
142.3
152.7
154.6
188.6
189.1
6m
ppm
200
180
160
140
120
100
80
60
40
20

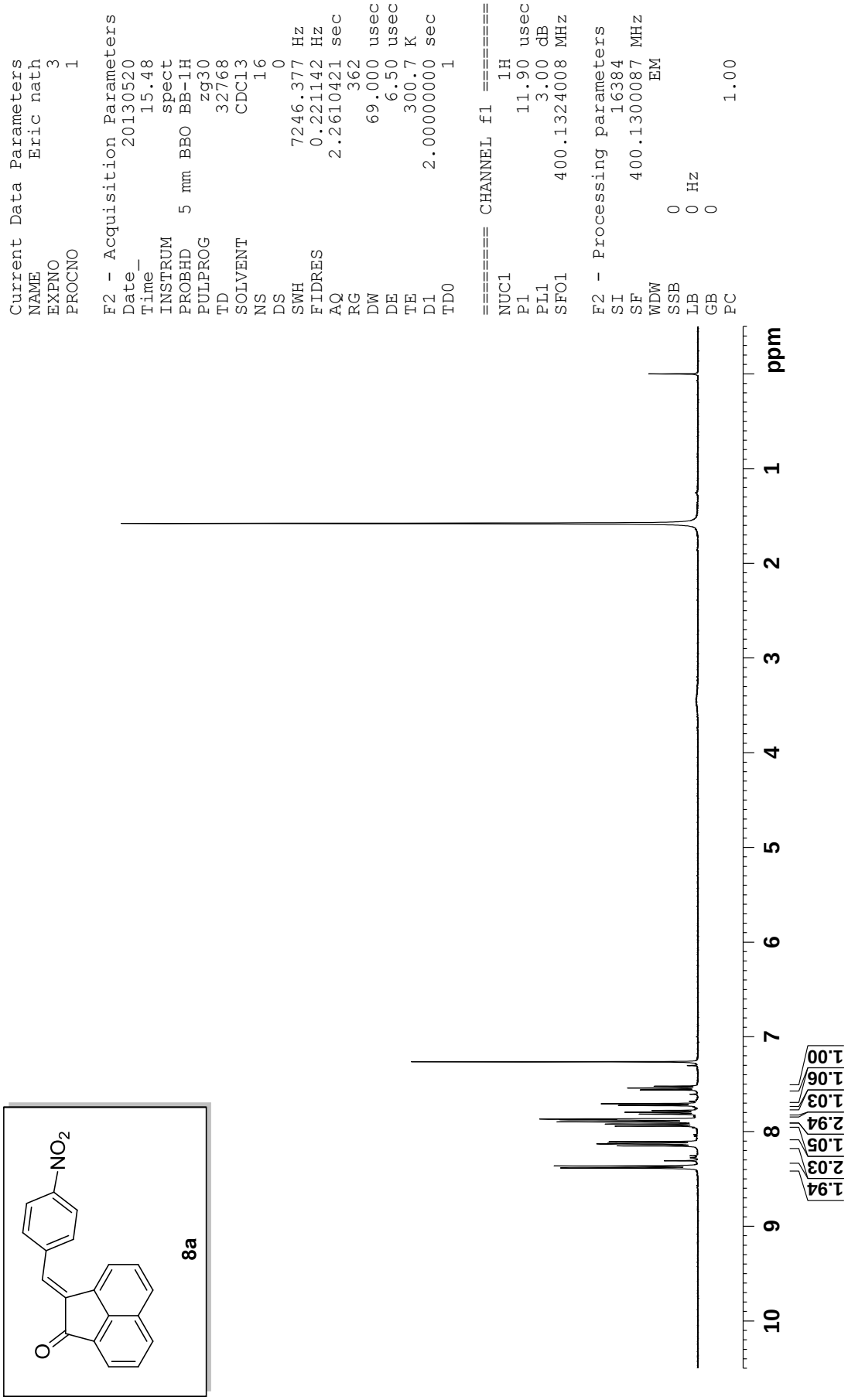

Current Data Parameters
NAME lactam S.M. NO2
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130425
Time_ 16.29
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 300.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
1.99
1.03
5.07
1.04
3.05
1.01
1.00
ppm
O2N
O
N
O
7a

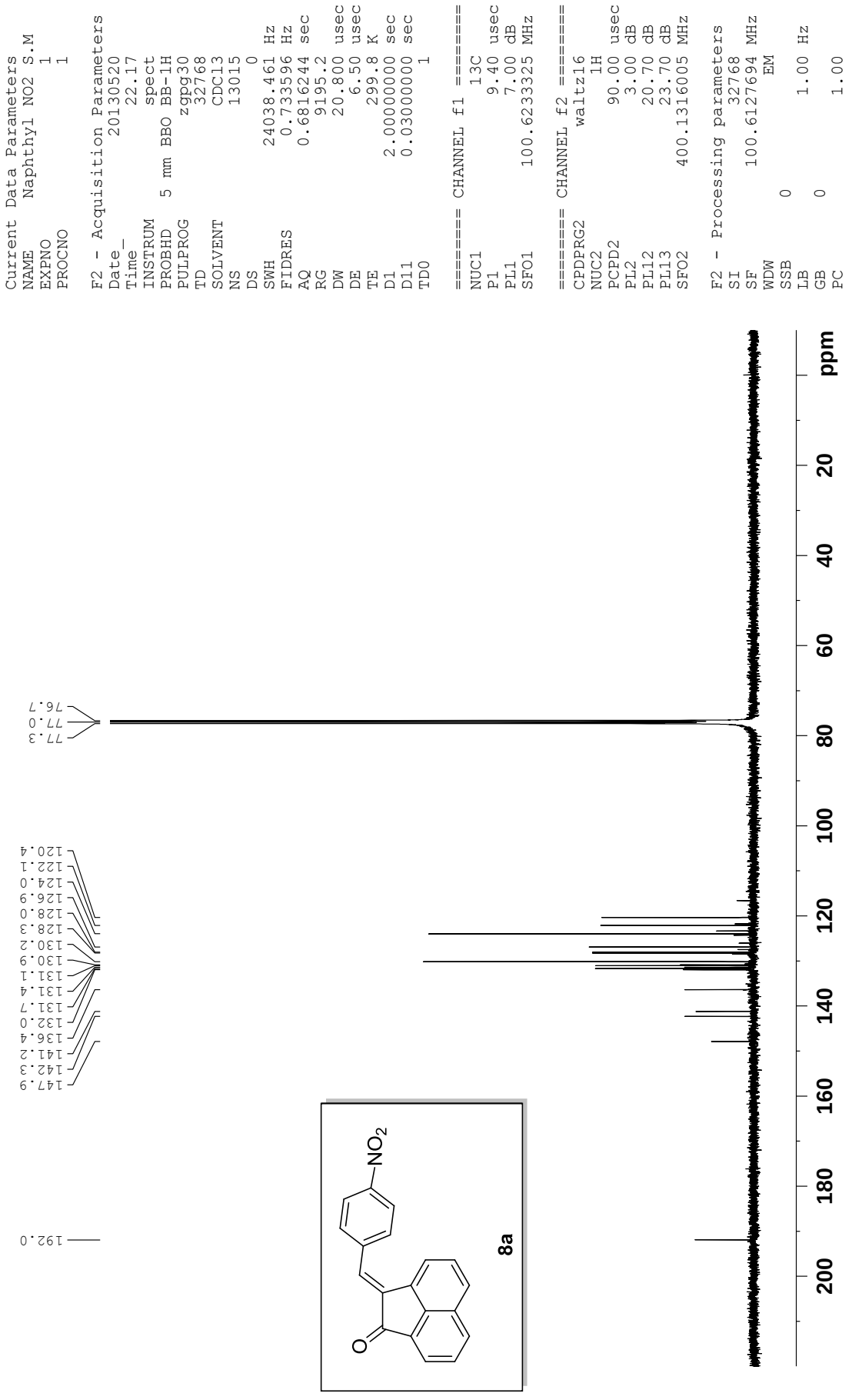

Current Data Parameters
NAME lactam S.M. NO2
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130425
Time 15.51
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 1007
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 300.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 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
169.1
166.9
148.2
141.2
141.1
134.9
134.2
133.1
131.4
129.9
129.5
128.7
128.3
124.6
124.1
122.7
121.2
115.6
200
180
160
140
120
100
80
60
40
20
ppm
O2N
O
N
O
7a

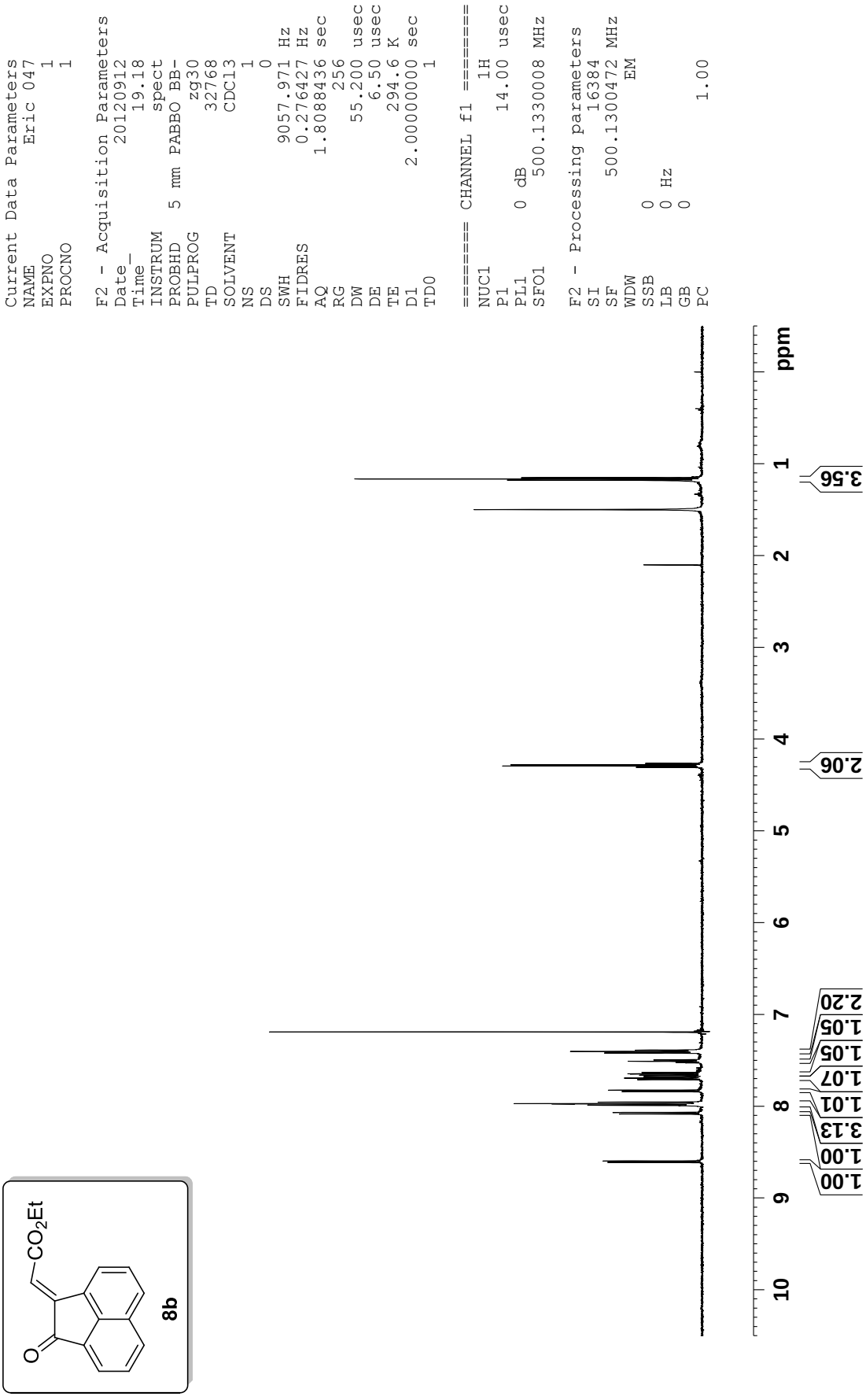

Current Data Parameters
NAME lactam CN S.M
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130504
Time_ 3.23
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 228.1
DW 55.200 usec
DE 6.50 usec
TE 294.6 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300000 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
1.00
0.97
0.51
4.82
2.91
3.53
3.98
1.51
0.40
0.99
ppm
1
2
3
4
5
6
7
8
9
10
NC
O
N
O
7b

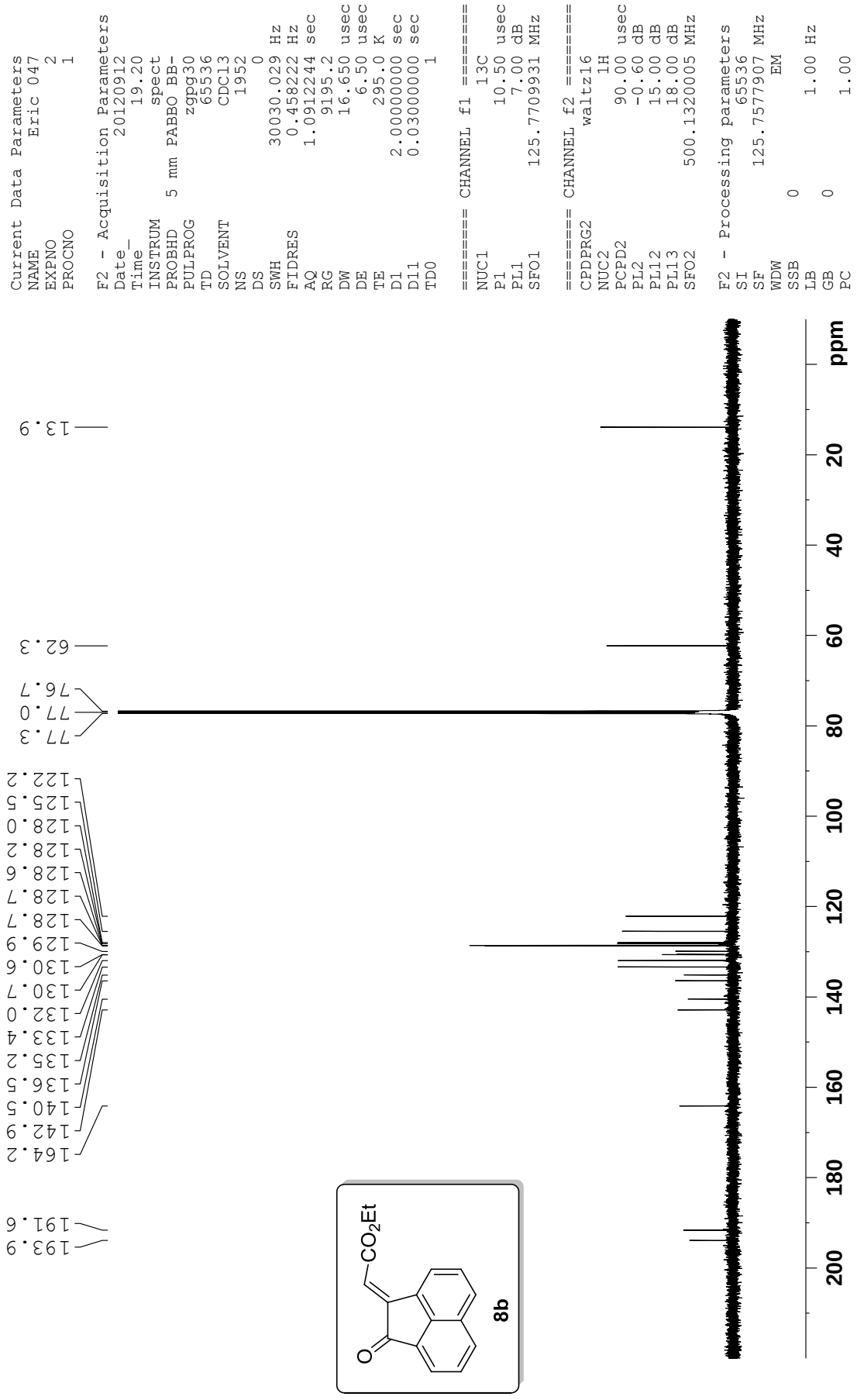


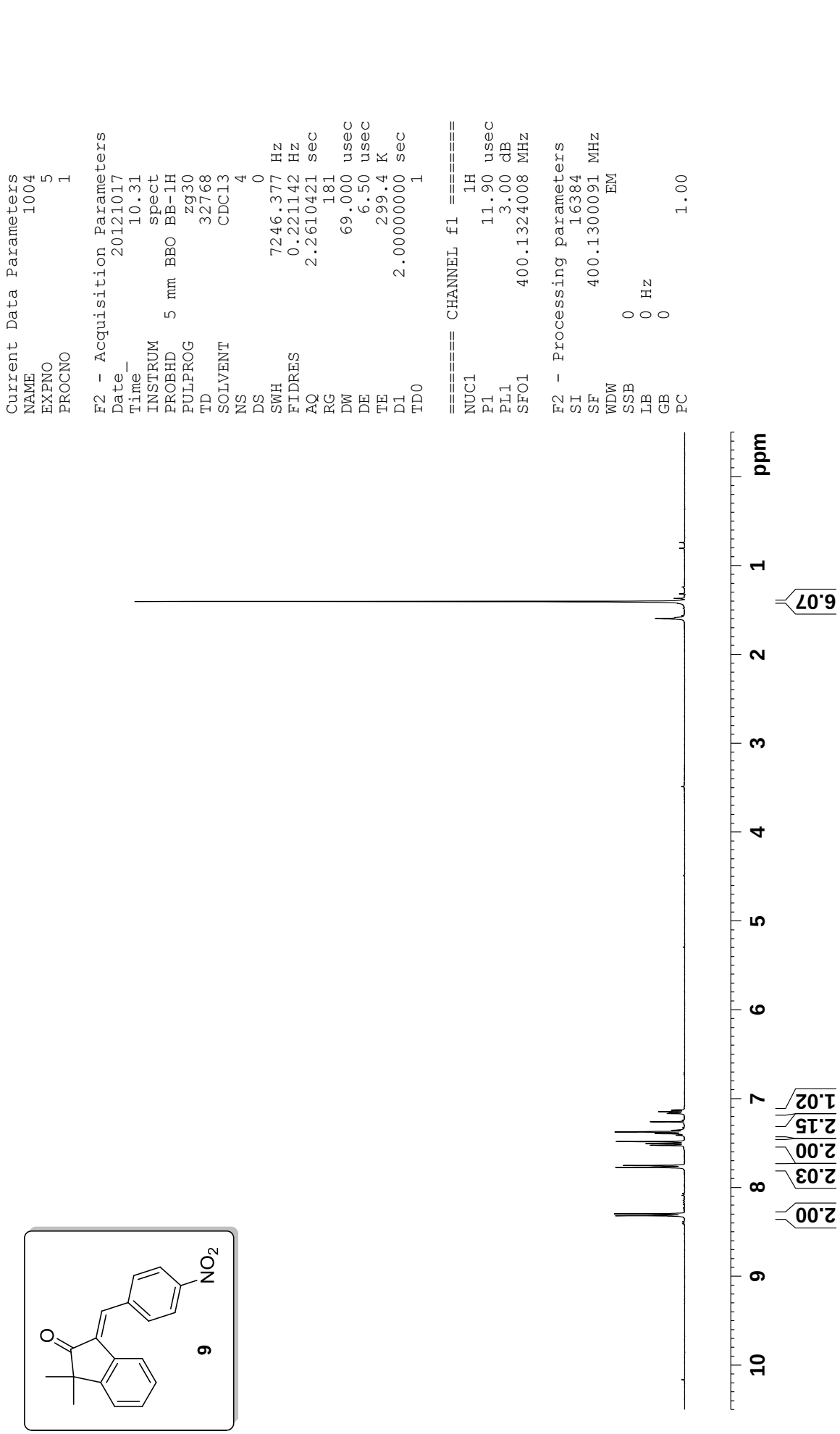

```
Current Data Parameters
NAME       lactam CN S.M
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20130504
Time               3.27
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                10000
DS                    0
SWH           30030.029 Hz
FIDRES         0.458222 Hz
AQ            1.0912244 sec
RG               9195.2
DW                16.650 usec
DE                 6.50 usec
TE                295.1 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                10.00 usec
PL1                6.50 dB
SFO1        125.7709931 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             90.00 usec
PL2               -0.60 dB
PL12              15.20 dB
PL13              18.20 dB
SFO2        500.1320005 MHz

F2 - Processing parameters
SI                65536
SF          125.7577918 MHz
WDW                  EM
SSB      0
LB                1.00 Hz
GB       0
PC                1.00
```

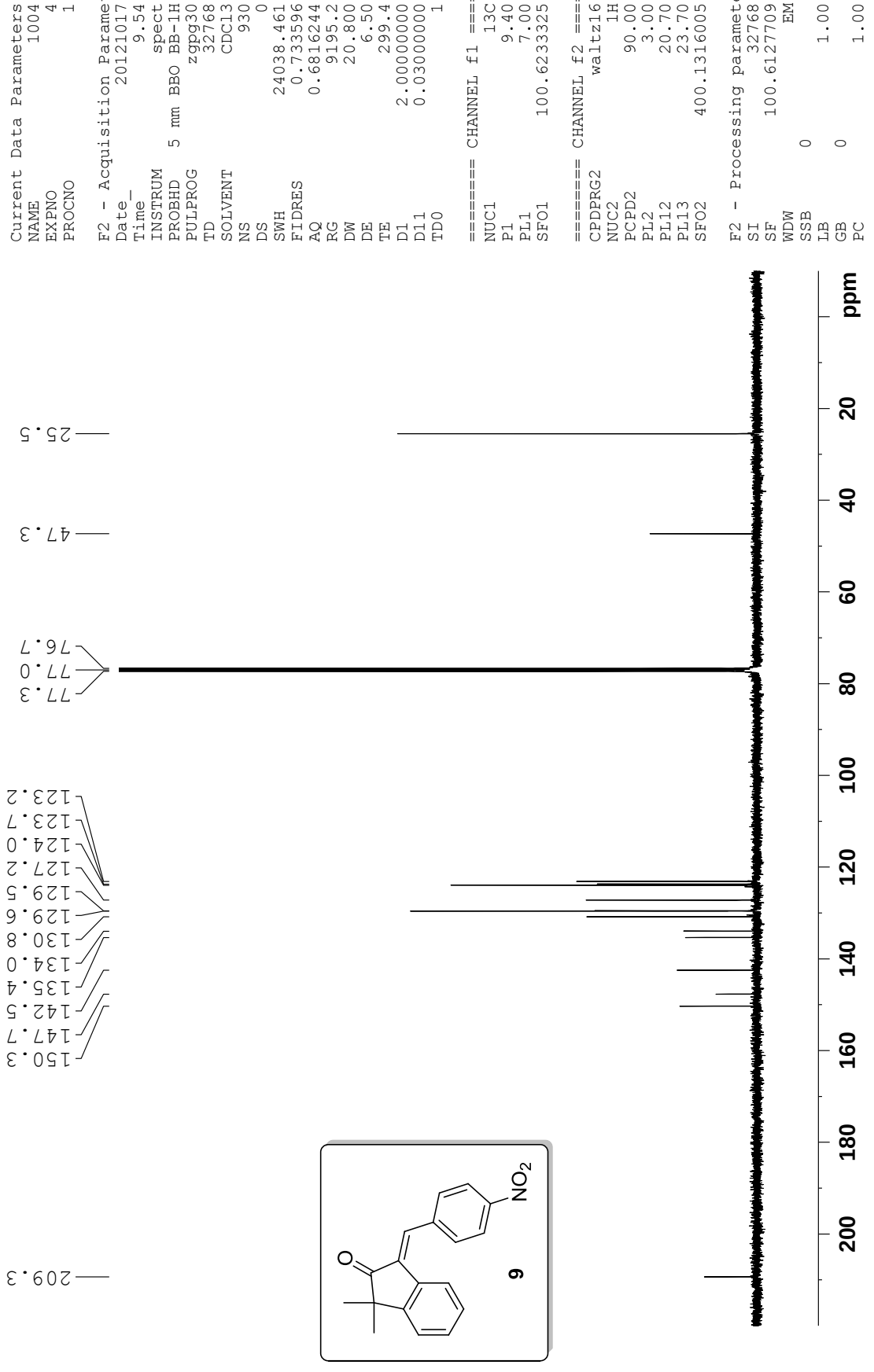

Current Data Parameters
NAME Eric nath
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130520
Time_ 15.48
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 362
DW 69.000 usec
DE 6.50 usec
TE 300.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
ppm
1.94
2.03
1.05
2.94
1.03
1.06
1.00
NO2
O
8a

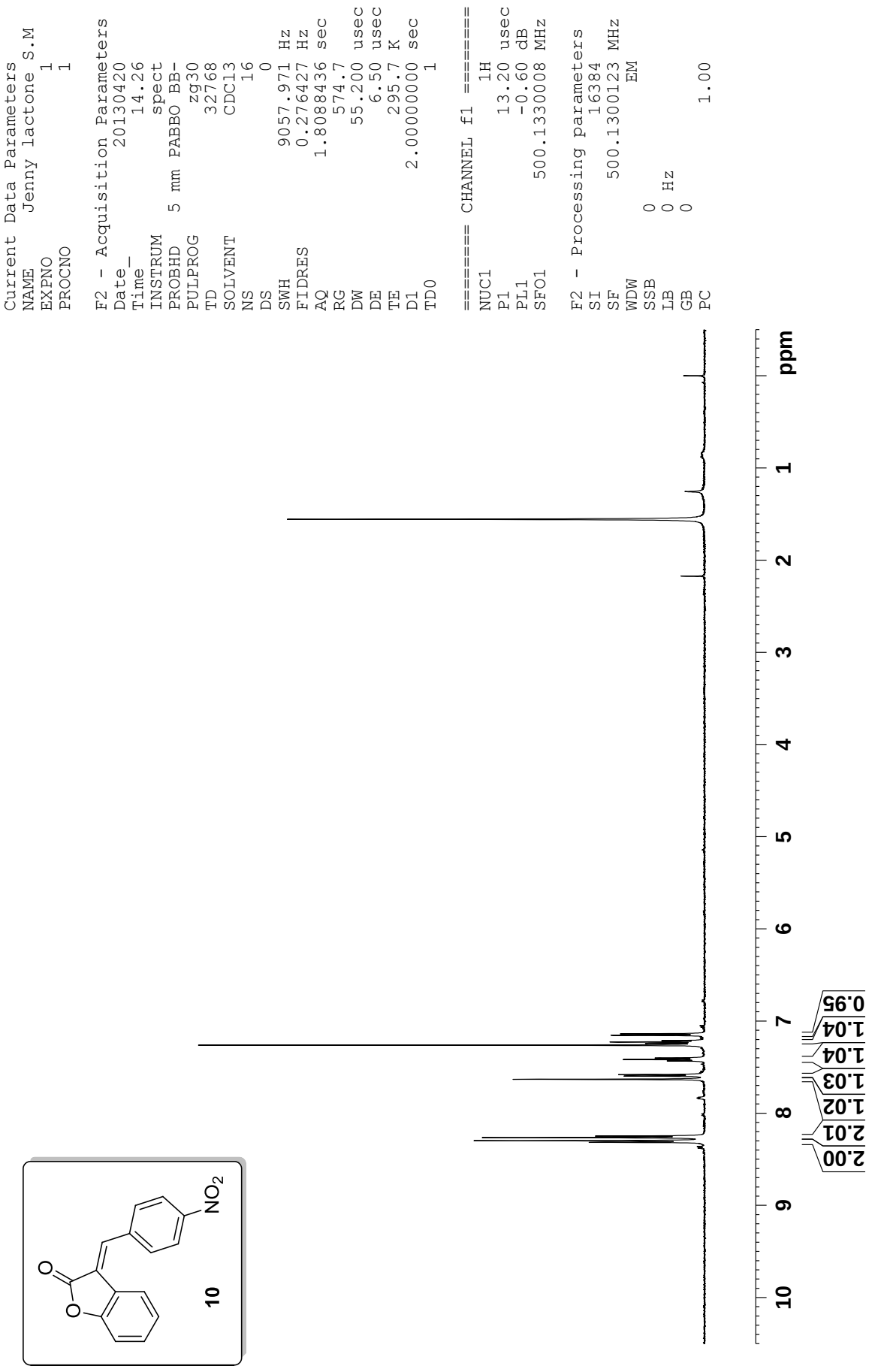

Current Data Parameters
NAME Naphthyl NO2 S.M
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130520
Time 22.17
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 13015
DS 0
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 9195.2
DW 20.800 usec
DE 6.50 usec
TE 299.8 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 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
192.0
147.9
142.3
141.2
136.4
132.0
131.7
131.4
131.1
130.9
130.2
128.3
128.0
126.9
124.0
122.1
120.4
77.3
77.0
76.7
ppm
200
180
160
140
120
100
80
60
40
20
O
NO2
8a


Current Data Parameters
NAME Eric 047
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120912
Time_ 19.18
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 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 500.1300472 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
3.56
2.06
1.00
1.00
3.13
1.01
1.07
1.05
1.05
2.20
CO2Et
O
8b

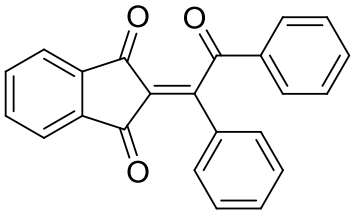

Current Data Parameters
NAME Eric 047
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120912
Time 19.20
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1952
DS 0
SWH 30030.029 Hz
FIDRES 0.458222 Hz
AQ 1.0912244 sec
RG 9195.2
DW 16.650 usec
DE 6.50 usec
TE 295.0 K
D1 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 125.7577907 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
13.9
62.3
76.7
77.0
77.3
122.2
125.5
128.0
128.2
128.6
128.7
128.7
129.9
130.6
130.7
132.0
133.4
135.2
136.5
140.5
142.9
164.2
191.6
193.9
CO2Et
O
8b
ppm
200
180
160
140
120
100
80
60
40
20

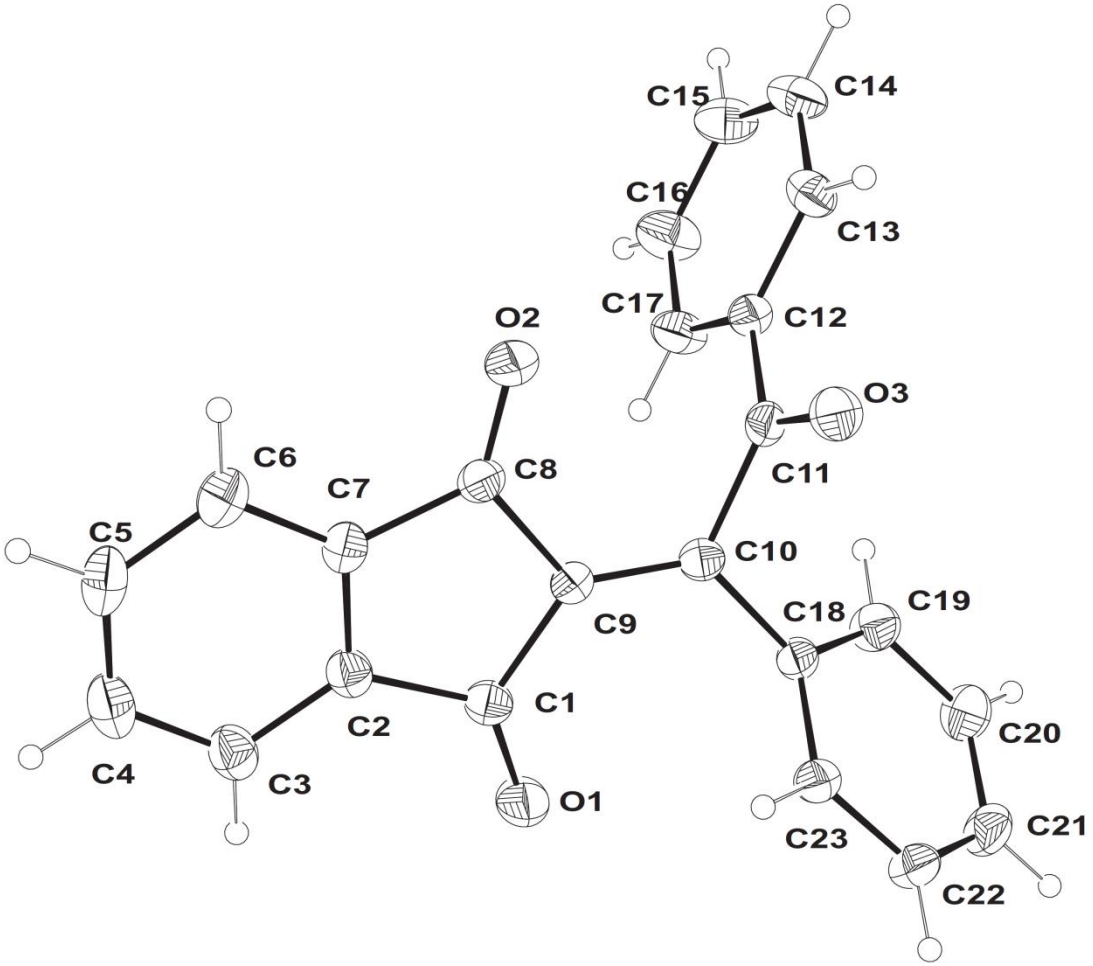

Current Data Parameters
NAME 1004
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121017
Time_ 10.31
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 7246.377 Hz
FIDRES 0.221142 Hz
AQ 2.2610421 sec
RG 181
DW 69.000 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 3.00 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
6.07
2.00
2.03
2.00
2.15
1.02
ppm
1
2
3
4
5
6
7
8
9
10
O
NO2
9


Current Data Parameters
NAME 1004
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20121017
Time_ 9.54
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 930
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 299.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.40 usec
PL1 7.00 dB
SFO1 100.6233325 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 3.00 dB
PL12 20.70 dB
PL13 23.70 dB
SFO2 400.1316005 MHz
F2 - Processing parameters
SI 32768
SF 100.6127709 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
209.3
150.3
147.7
142.5
135.4
134.0
130.8
129.6
129.5
127.2
124.0
123.7
123.2
77.3
77.0
76.7
47.3
25.5
O
NO2
9
200
180
160
140
120
100
80
60
40
20
ppm

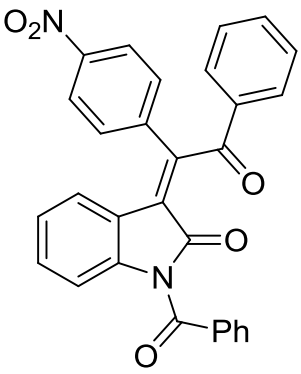

Current Data Parameters
NAME Jenny lactone S.M
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130420
Time_ 14.26
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9057.971 Hz
FIDRES 0.276427 Hz
AQ 1.8088436 sec
RG 574.7
DW 55.200 usec
DE 6.50 usec
TE 295.7 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -0.60 dB
SFO1 500.1330008 MHz
F2 - Processing parameters
SI 16384
SF 500.1300123 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
ppm
1
2
3
4
5
6
7
8
9
10
2.00
2.01
1.02
1.03
1.04
1.04
0.95
O
O
NO2
10

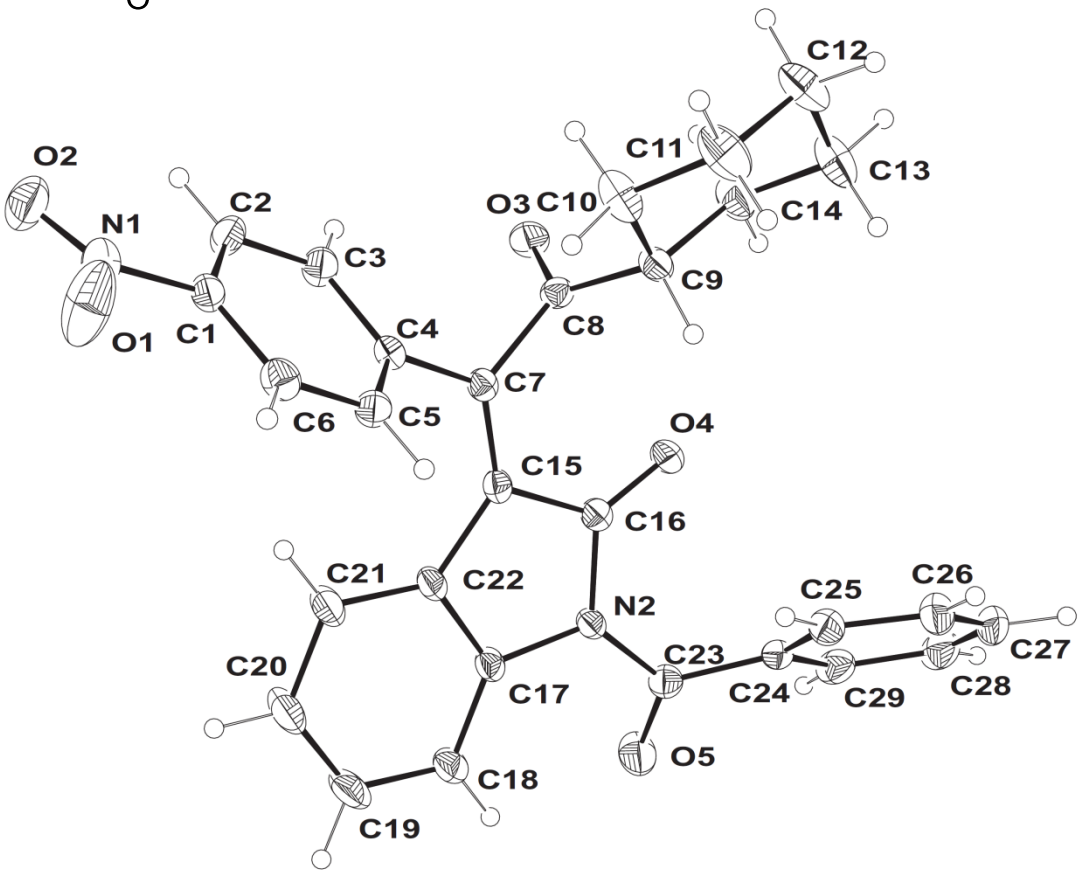
CCDC 935870 (1ab)



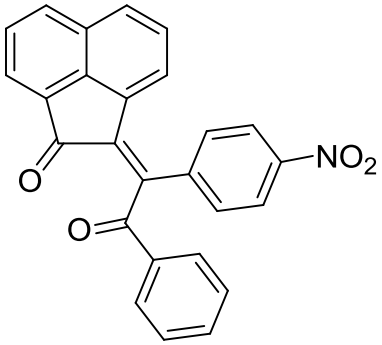


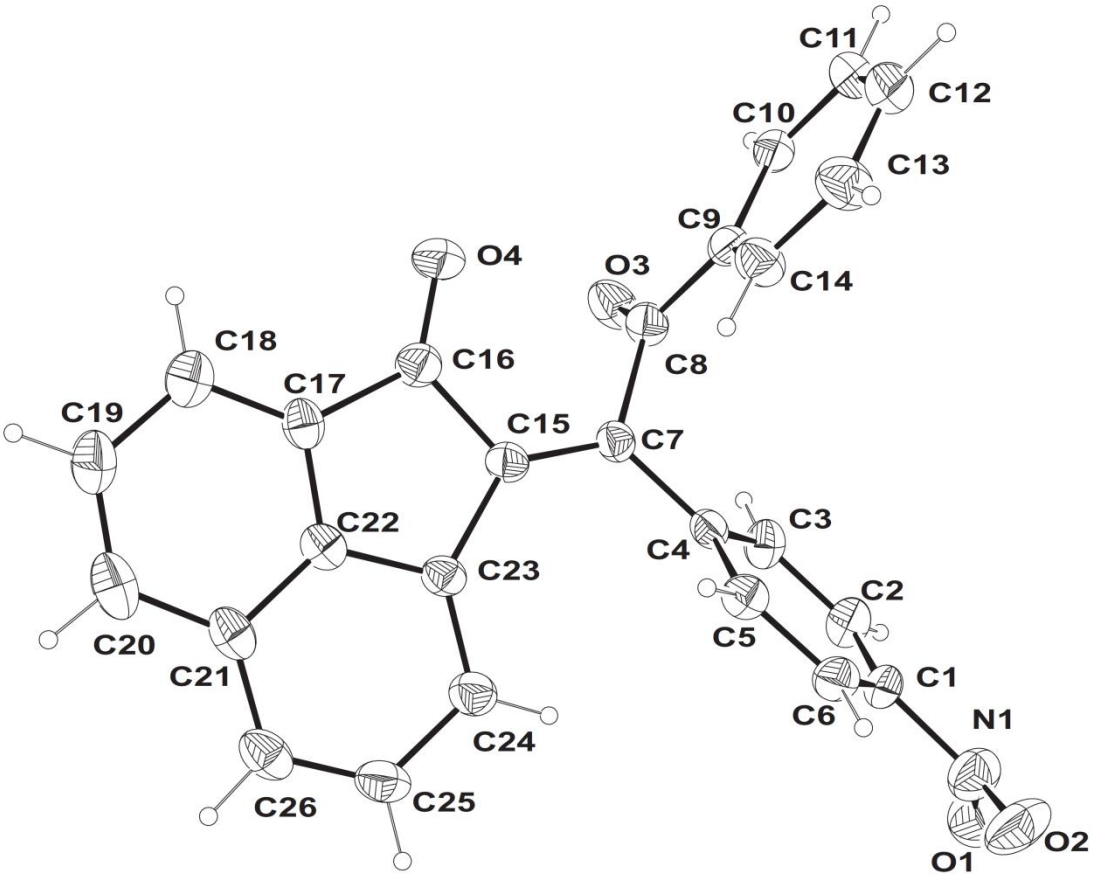
CCDC 935871 (2a)



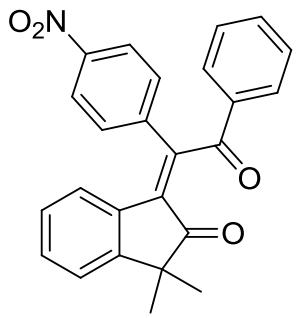


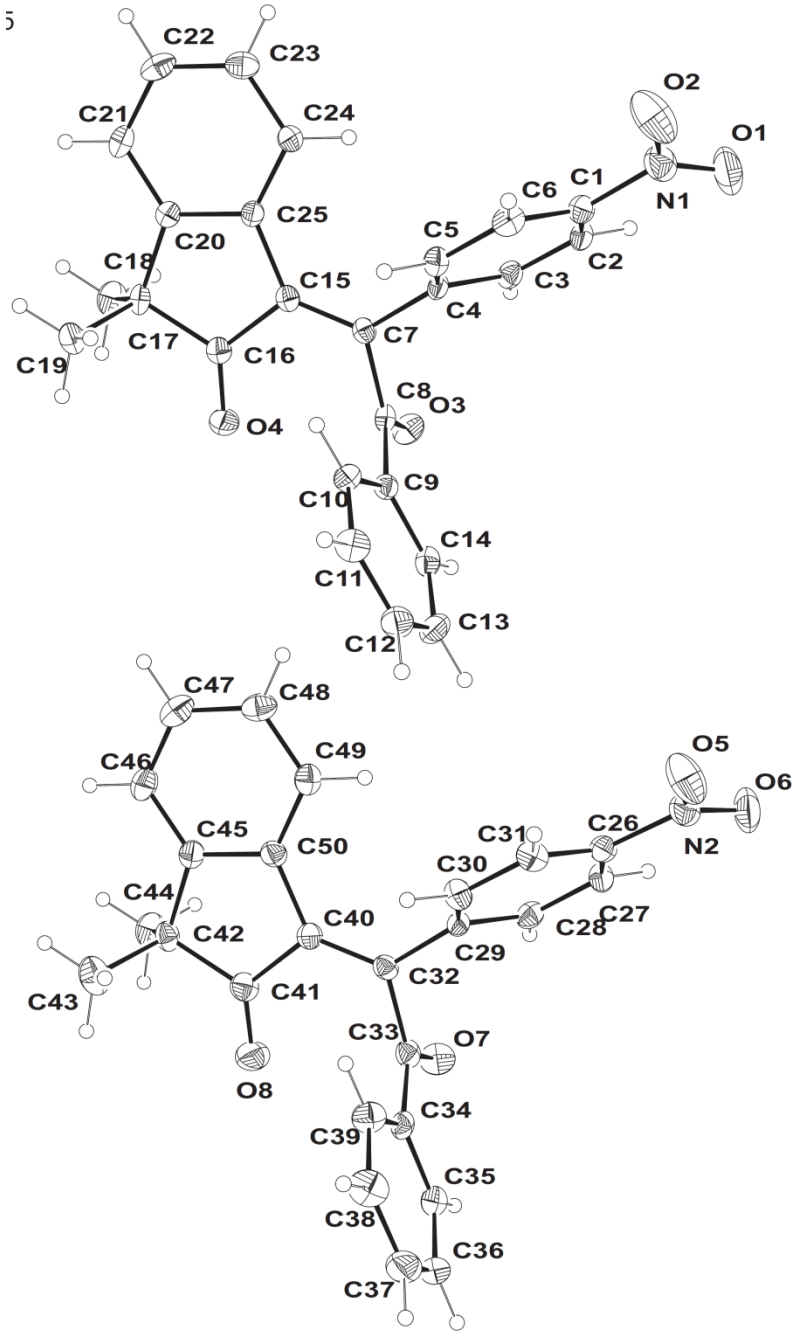
CCDC 935872 (3a)



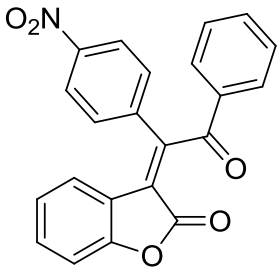


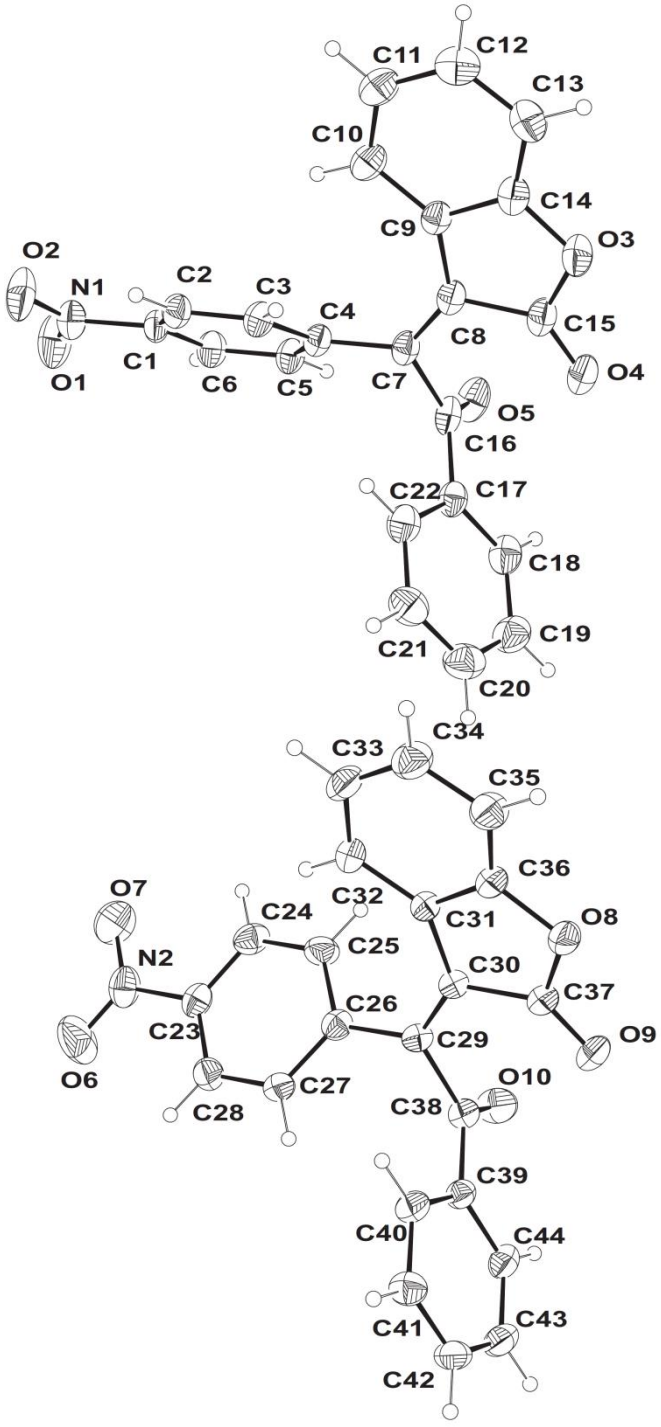
CCDC 935873 (4)



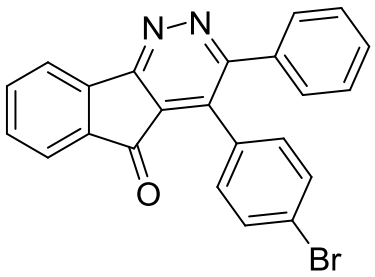


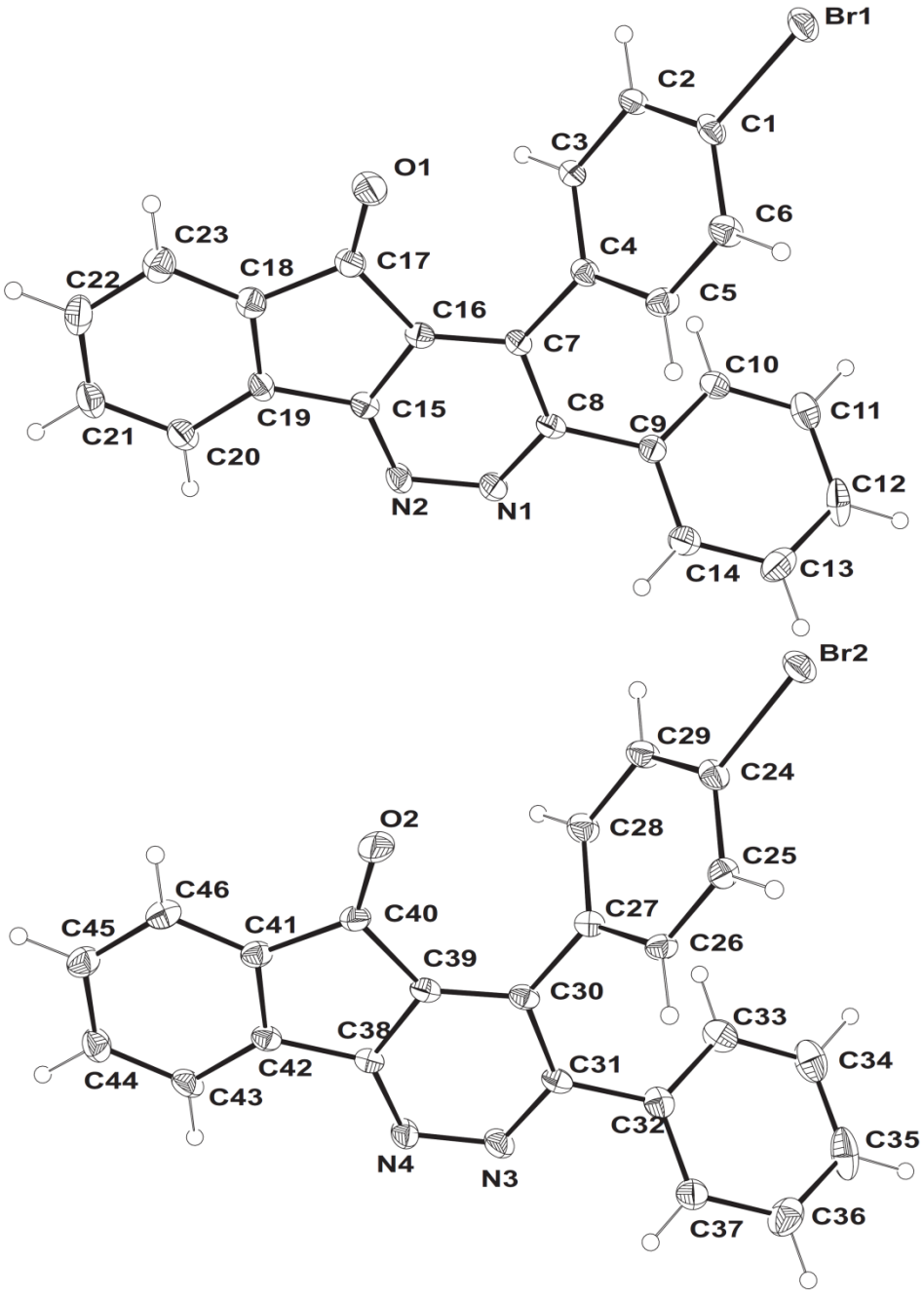
CCDC 937197 (5)



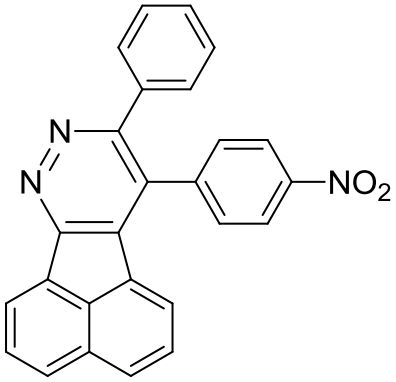


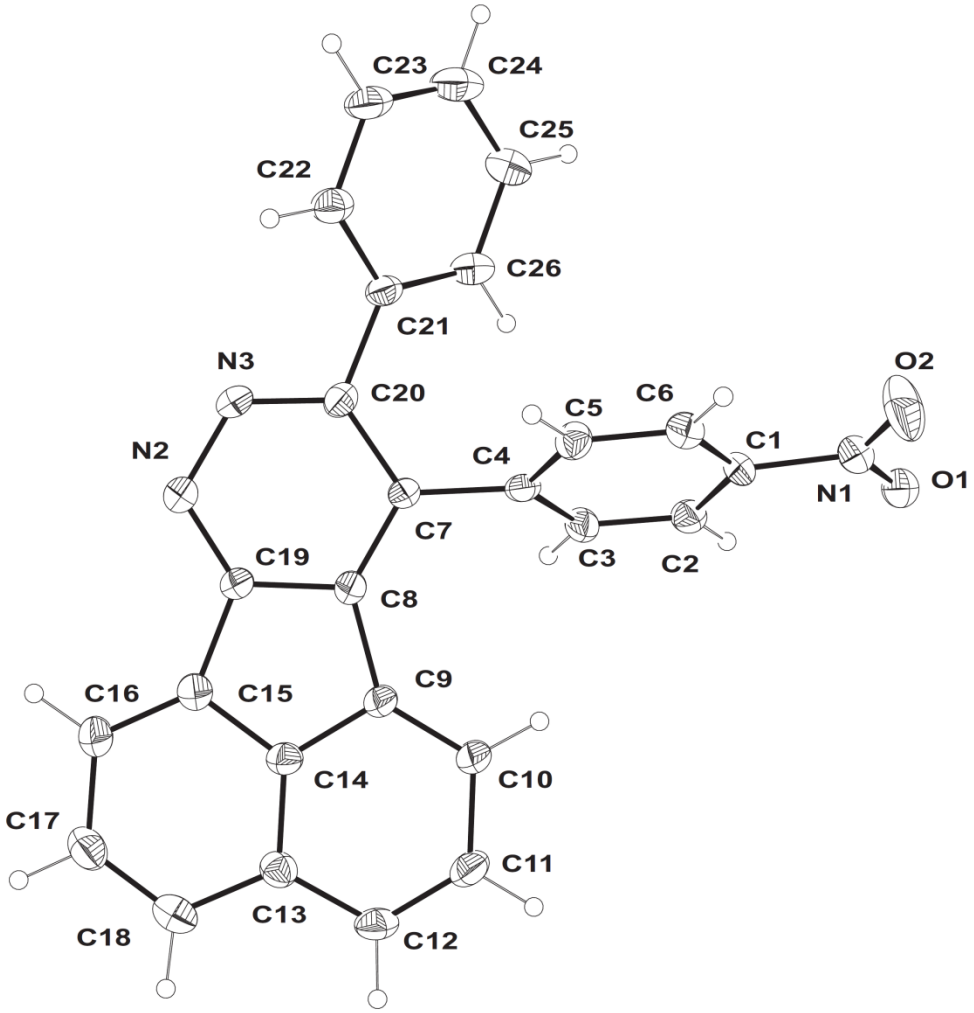
CCDC 935874 (17)





CCDC 935875 (18)





CCDC 935876 (9)