Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supporting Information

N-Heterocyclic Carbene Catalyzed Synthesis of Benzotrifluorides from Enals and β-Trifluoromethylenones

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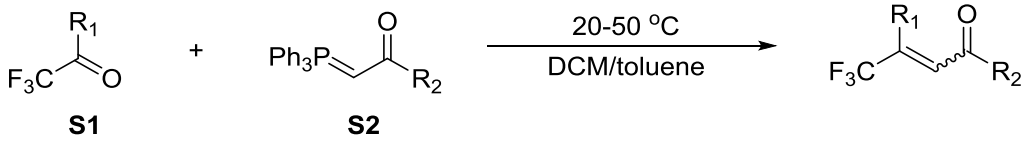
Part I General Information

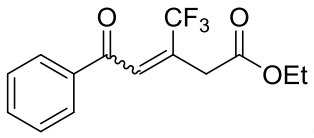
Unless otherwise indicated, all reactions were carried out under an N_2 atmosphere in oven-dried glassware with magnetic stirring. Anhydrous THF, Et_2O, 1,4-dioxane and toluene were distilled from sodium and benzophenone, CH_3CN and CH_2Cl_2 were distilled from CaH_2. Pre-catalyst **A-E** were synthesized according to the literatures.[1] α,β-Unsaturated aldehyde were used as received from commercially available sources. β-Trifluoromethylenones were synthesized according to the literatures.[2] Column chromatograph was performed on silica gel 200~300 mesh. All ^1H, ^{13}C NMR spectra were recorded on a Bruker AV 400 and 500 spectrometers. Chemical shifts were reported in parts per million (ppm, δ), and the residual solvent peak was used as internal reference. ^{1}HNMR Spectroscopy splitting patterns were designated as singlet (s), doublet (d) and triplet (t). Splitting patterns that could not be interpreted or easily visualized were designated as multiplet (m) or broad (br). Coupling constants were reported in Herz (Hz). Infrared spectra were recorded on a JASCO FT/IR-480 spectrophotometer and reported as wave number (cm^{-1}).

Part II Experimental Part

1. Preparation of β-trifluromethylenones



To a solution of trifluoromethyl ketone **S1** (typically, 10 mmol) in dichloromethane (50 ml) was added the Wittig reagent **S2** (1.5 equiv.). The reaction mixture was stirred overnight at room temperature. In case of low conversion or incomplete consumption of trifluoromethyl ketone, 20 ml of toluene was added and the reaction mixture was heated to 50 ℃ until the full consumption of the ketone (monitored by TLC). The reaction mixture was concentered under reduced pressure, and the residue was purified by column chromatography on silica with petroleum ether/ethyl acetate (typically 40:1).



(zba-003-39)

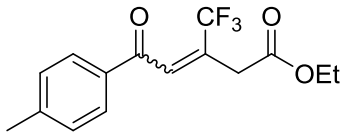
ethyl 5-oxo-5-phenyl-3-(trifluoromethyl)pent-3-enoate (2a)

Yield: 2.5 g, 86%, yellow oil, R_f = 0.52 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 8.05 – 7.90 (m, 2H), 7.65 – 7.55 (m, 1H), 7.55 – 7.45 (m, 2.4H), 6.65 (s, 0.6H), 4.44 (s, 1.4H), 4.20 – 4.10 (m, 2H), 3.69 (s, 0.6H), 1.30 – 1.15 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 192.9, 190.3, 168.3, 164.6, 138.9 (q, *J* = 30.9 Hz), 137.1, 136.4, 136.1 (q, *J* = 30.9 Hz), 134.1, 133.7, 129.0, 128.9, 128.7, 128.5 (q, *J* = 4.9 Hz), 128.3, 125.5 (q, *J* = 5.7 Hz), 123.2 (q, *J* = 274.2 Hz), 123.0 (q, *J* = 274.2 Hz), 61.6, 61.3, 36.9, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{14}F_3O_3$ ($[M+H]^+$) 287.0890, Found 287.0885.



(zba-002-137)

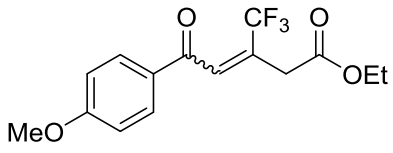
ethyl 5-oxo-5-(p-tolyl)-3-(trifluoromethyl)pent-3-enoate (2b)

Yield: 0.8 g, 55%, yellow oil, R_f = 0.45 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 – 7.82 (m, 2H), 7.48 (s, 0.7H), 7.35 – 7.22 (m, 2H), 6.64 (s, 0.3H), 4.41 (s, 0.7H), 4.20 – 4.10 (m, 2H), 3.67 (s, 1.3H), 2.45 – 2.40 (m, 3H), 1.25 – 1.18 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 192.4, 189.7, 168.2, 164.5, 145.1, 144.4, 138.9 (q, *J* = 30.9 Hz), 135.5 (q, *J* = 30.9 Hz), 134.6, 133.8, 129.6, 129.4, 128.8, 128.5 (q, *J* = 4.6 Hz), 128.3, 125.3(q, *J* = 5.6 Hz), 123.1 (q, *J* = 274.3 Hz), 122.9 (q, *J* = 274.3 Hz), 61.4, 61.2, 36.6, 32.3, 21.8, 21.7, 14.04, 14.00.

HRMS (ESI) *m*/*z*: Calc. For $C_{15}H_{15}F_3O_3Na$ ($[M+Na]^+$) 323.0866, Found 323.0863.



(zba-002-139)

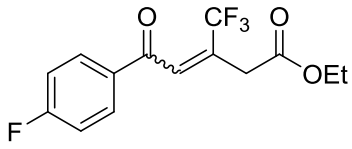
ethyl 5-(4-methoxyphenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2c)

Yield: 2.5 g, 65%, yellow oil, R_f = 0.41 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.99 – 7.91 (m, 2H), 7.47 (s, 0.7H), 7.00 – 6.93 (m, 2H), 6.63 (s, 0.3H), 4.39 (s, 0.5H), 4.19 – 4.08 (m, 2H), 3.90 – 3.80 (m, 3H), 3.66 (s, 1.5H), 1.30 – 1.10 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.4, 188.6, 168.4, 164.6, 164.4, 163.9, 139.2 (q, *J* = 31.2 Hz), 135.2 (q, *J* = 30.9 Hz), 131.2, 130.6, 130.2, 129.4, 128.8 (q, *J* = 5.5 Hz), 125.4 (q, *J* = 5.5 Hz), 123.3 (q, *J* = 274.3 Hz), 123.0 (q, *J* = 274.3 Hz), 114.3, 114.0, 61.5, 61.3, 55.7, 55.6, 36.5, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{15}H_{15}F_3O_4Na$ ($[M+Na]^+$) 339.0815, Found 339.0811.



(zba-002-159)

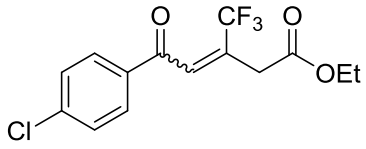
ethyl 5-(4-fluorophenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2d)

Yield: 1.3 g, 62%, yellow oil, R_f = 0.25 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 8.05 – 7.96 (m, 2H), 7.45 (s, 0.5H), 7.17 (m, 2H), 6.65 (s, 0.5H), 4.40 (s, 1H), 4.20 – 4.10 (m, 2H), 3.68 (s, 1H), 1.30 – 1.10 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.4, 188.7, 168.2, 166.4 (d, *J* = 256.7 Hz), 166.1 (d, *J* = 255.8 Hz), 164.6, 138.7 (q, *J* = 30.9 Hz), 136.3 (q, *J* = 30.9 Hz), 133.6 (d, *J* = 2.7 Hz), 132.8 (d, *J* = 2.7 Hz), 131.5 (d, *J* = 9.9 Hz), 131.0 (d, *J* = 9.3 Hz), 128.2 (q, *J* = 5.2 Hz), 125.6 (q, *J* = 5.7 Hz), 123.1 (q, *J* = 274.1 Hz), 122.9 (q, *J* = 274.1 Hz), 116.3 (d, *J* = 22.0 Hz), 116.1 (d, *J* = 22.1 Hz), 61.6, 61.4, 36.8, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{12}F_4O_3Na$ ($[M+Na]^+$) 327.0615, Found 327.0613.



(zba-002-155)

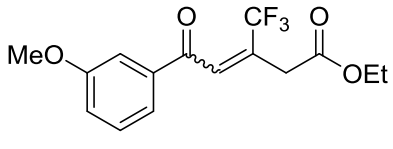
ethyl 5-(4-chlorophenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2e)

Yield: 1.4 g, 44%, yellow oil, R_f = 0.48 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.96 – 7.87 (m, 2H), 7.52 – 7.43 (m, 2.5H), 6.65 (s, 0.5H), 4.39 (s, 1H), 4.20 – 4.05 (m, 2H), 3.68 (s, 1H), 1.32 – 1.15 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.8, 189.1, 168.2, 164.6, 140.8, 140.2, 138.7 (q, *J* = 30.9 Hz), 136.6 (q, *J* = 30.9 Hz), 135.4, 134.7, 130.1, 129.7, 129.4, 129.2, 128.0 (q, *J* = 5.2 Hz), 125.6 (q, *J* = 6.1 Hz), 123.1 (q, *J* = 274.4 Hz), 122.9 (q, *J* = 274.2 Hz), 61.6, 61.4, 36.8, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{12}F_3O_3ClNa$ ($[M+Na]^+$) 343.0319, Found 343.0316.



(zba-002-161)

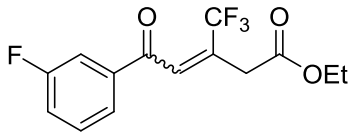
ethyl 5-(3-methoxyphenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2f)

Yield: 1.5 g, 78%, yellow oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.60 – 7.45 (m, 2.5H), 7.45 – 7.35 (m, 1H), 7.19 – 7.11 (m, 1H), 6.65 (s, 0.5H), 4.42 (s, 1H), 4.19 – 4.12 (m, 2H), 4.00 – 3.80 (m, 3H), 3.68 (s, 1H), 1.35 – 1.10 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 192.7, 190.0, 168.2, 164.6, 160.2, 160.1, 138.9 (q, *J* = 31.2 Hz), 138.5, 137.7, 136.1 (q, *J* = 31.0 Hz), 130.0, 129.9, 128.4 (q, *J* = 5.5 Hz), 125.5 (q, *J* = 5.0 Hz), 123.2 (q, *J* = 274.1 Hz), 123.0 (q, *J* = 273.2 Hz), 121.5, 120.9, 120.8, 120.2, 112.6, 112.5, 61.6, 61.3, 55.64, 55.60, 37.0, 32.5, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{15}H_{15}F_3O_4Na$ ($[M+Na]^+$) 339.0815, Found 339.0811.



(zba-002-163)

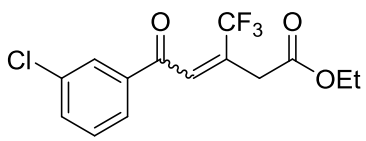
ethyl 5-(3-fluorophenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2g)

Yield: 1.0 g, 79%, yellow oil, R_f = 0.29 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 – 7.70 (m, 1H), 7.69 – 7.60 (m, 1H), 7.55 – 7.40 (m, 1.5H), 7.35 – 7.25 (m, 1H), 6.65 (s, 0.5H), 4.40 (s, 1H), 4.19 – 4.11 (m, 2H), 3.69 (s, 1H), 1.30 – 1.20 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.8, 189.0, 168.1, 164.6, 163.1 (d, *J* = 249.1 Hz), 163.0 (d, *J* = 248.1 Hz), 139.1 (d, *J* =6.6 Hz), 138.6 (q, *J* = 31.6 Hz), 138.4 (d, *J* =6.3 Hz), 136.9 (q, *J* = 31.1 Hz), 130.8 (d, *J* =7.5 Hz), 130.6 (d, *J* =7.5 Hz), 127.9 (q, *J* = 5.4 Hz), 125.6 (q, *J* = 5.8 Hz), 124.5 (d, *J* =3.2 Hz), 124.1 (d, *J* =2.8 Hz), 123.1 (q, *J* = 274.2 Hz), 122.9 (q, *J* = 274.1 Hz), 121.2 (d, *J* =21.5 Hz), 120.7 (d, *J* =21.2 Hz), 115.4 (d, *J* = 22.8 Hz), 115.1 (d, *J* = 22.5 Hz), 61.7, 61.4, 37.0, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{12}F_4O_3$ ($[M+H]^+$) 305.0795, Found 305.0792.



(zba-002-160)

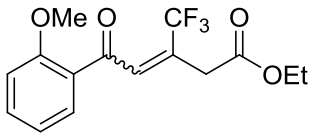
ethyl 5-(3-chlorophenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2h)

Yield: 2.0 g, 90%, yellow oil, R_f = 0.29 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.99 – 7.90 (m, 1H), 7.89 – 7.80 (m, 1H), 7.70 – 7.50 (m, 1H), 7.50 – 7.40 (m, 1.5H), 6.65 (s, 0.5H), 4.39 (s, 1H), 4.20 – 4.11 (m, 2H), 3.69 (s, 1H), 1.30 – 1.15 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.7, 189.0, 168.1, 164.6, 138.60, 138.58 (q, *J* = 31.0 Hz), 137.9, 137.0 (q, *J* = 31.0 Hz), 135.5, 135.3, 134.0, 133.6, 130.4, 130.2, 128.7, 128.4, 127.8 (q, *J* = 5.4 Hz), 126.8, 126.4, 125.6 (q, *J* = 5.6 Hz), 123.1 (q, *J* = 274.3 Hz), 122.9 (q, *J* = 274.3 Hz), 61.7, 61.4, 37.0, 32.4, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{13}F_3O_3ClNa$ ($[M+H]^+$) 321.0500, Found 321.0498.



(zba-002-177)

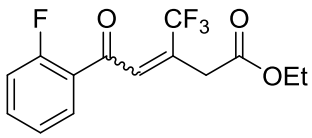
ethyl 5-(2-methoxyphenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2i)

Yield: 1.5 g, 79%, yellow oil, R_f = 0.16 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.80 (d, *J* = 7.7 Hz, 0.3H), 7.72 (d, *J* = 7.7 Hz, 0.7H), 7.55 – 7.45 (m, 1.7H), 7.07 – 6.95 (m, 2H), 6.60 (s, 0.3H), 4.44 (s, 0.7H), 4.20 – 4.12 (m, 2H), 3.95(s, 1H), 3.92 (s, 2H), 3.65 (s, 1.3H), 1.27 – 1.20 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 194.2, 191.1, 168.6, 164.7, 159.2, 159.1, 139.4 (q, *J* = 31.2 Hz), 134.9, 134.3, 132.8 (q, *J* = 30.7 Hz), 132.7 (q, *J* = 5.4 Hz), 131.2, 131.1, 127.9, 127.0, 125.2 (q, *J* = 6.0 Hz), 123.6 (q, *J* = 274.1 Hz), 123.2 (q, *J* = 274.1 Hz), 121.2, 121.0, 112.0, 111.7, 61.4, 61.2, 55.8, 55.7, 41.8, 32.5, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{15}H_{16}F_3O_4$ ($[M+H]^+$) 317.0995, Found 317.0989.



(zba-002-173)

ethyl 5-(2-fluorophenyl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2j)

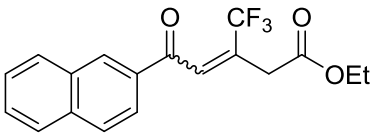
Yield: 1.5 g, 81%, yellow oil, R_f = 0.30 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.99 – 7.80 (m, 1H), 7.60 – 7.45 (m, 1H), 7.43 (s,

0.2H), 7.35 – 7.10 (m, 2H), 6.63 (s, 0.8H), 4.40 (s, 1.6H), 4.21 – 4.12 (m, 2H), 3.69 (s, 0.4H), 1.28 – 1.20 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 191.0 (d, *J* = 4.3 Hz), 188.0 (d, *J* = 2.7 Hz), 168.2, 164.5, 162.2 (d, *J* = 254.5 Hz), 161.9 (d, *J* = 255.2 Hz), 138.6 (q, *J* =31.7 Hz), 135.7 (q, *J* = 9.8 Hz), 135.3 (d, *J* = 9.3 Hz), 131.2, 131.0, 128.9, 125.5 (q, *J* = 5.8 Hz), 124.9, 124.79, 124.76, 123.2 (q, *J* = 274.1 Hz), 123.0 (q, *J* = 274.1 Hz), 117.0 (d, *J* = 23.2 Hz), 116.9 (d, *J* = 23.9 Hz), 61.6, 61.3, 41.3, 41.2, 32.6, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{14}H_{13}F_4O_3$ ($[M+H]^+$) 305.0795, Found 305.0790.



(zba-002-162)

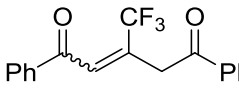
ethyl 5-(naphthalen-2-yl)-5-oxo-3-(trifluoromethyl)pent-3-enoate (2k)

Yield: 2.0 g, 70%, yellow wax, R_f = 0.25 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 8.52 (s, 0.3H), 8.47 (s, 0.7H), 8.07 – 7.95 (m, 2H), 7.95 – 7.87 (m, 2H), 7.67 – 7.54 (m, 2.7H), 6.68 (s, 0.3H), 4.58 (s, 0.7H), 4.20 – 4.10 (m, 2H), 3.73 (s, 1.3H), 1.27 – 1.17 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 192.8, 190.1, 168.3, 164.7, 139.0 (q, *J* = 30.8 Hz), 136.1, 136.0 (q, *J* = 30.6 Hz), 135.9, 134.5, 133.7, 132.63, 132.56, 131.0, 130.1, 129.9, 129.8, 129.3, 129.1, 128.84, 128.80, 128.6 (q, *J* = 5.1 Hz), 128.04, 127.96, 127.3, 127.1, 125.6 (q, *J* = 5.5 Hz), 123.3 (q, *J* = 274.8 Hz), 123.0 (q, *J* = 273.9 Hz), 61.6, 61.3, 37.0, 32.5, 14.2, 14.1.

HRMS (ESI) *m*/*z*: Calc. For $C_{18}H_{15}F_3O_3Na$ ($[M+Na]^+$) 359.0866, Found 359.0862.



(zba-002-106)

1,5-diphenyl-3-(trifluoromethyl)pent-2-ene-1,5-dione (2l)

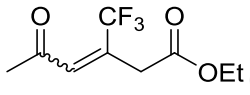
Yield: 1.4 g, 43%, yellow solid, m.p. 80-81 ^{o}C, R_f = 0.32 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 8.00 – 7.90 (m, 4H), 7.65 – 7.55 (m, 3H), 7.52 – 7.47

(m, 4H), 4.43 (s, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 193.0, 190.2, 137.33, 137.31 (q, *J* = 31.2 Hz), 136.5, 134.0, 133.6, 129.0, 128.9, 128.7, 128.4, 128.2 (q, *J* = 5.4 Hz), 123.3 (q, *J* = 273.4 Hz), 37.0.

HRMS (ESI) *m*/*z*: Calc. For $C_{18}H_{14}F_3O_3$ ($[M+H]^+$) 319.0940, Found 319.0936.



(zba-002-168)

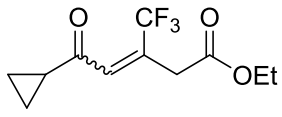
ethyl 5-oxo-3-(trifluoromethyl)hex-3-enoate (2m)

Yield: 0.9 g, 66%, yellow oil, R_f = 0.27 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 6.81 (s, 0.3H), 6.54 (s, 0.7H), 4.24 – 4.13 (m, 2H), 3.83 (s, 1.5H), 3.64 (s, 0.5H), 2.34 (s, 0.8H), 2.26 (s, 2.2H), 1.35 – 1.20 (m, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 200.9, 197.8, 168.2, 164.6, 138.7 (q, *J* = 31.2 Hz), 135.1 (q, *J* = 31.2 Hz), 129.9 (q, *J* = 5.0 Hz), 125.0 (q, *J* = 5.9 Hz), 123.0 (q, *J* = 273.4 Hz), 122.9 (q, *J* = 274.4 Hz), 61.6, 61.4, 41.2, 32.05, 32.00, 29.9, 14.2, 14.2.

HRMS (ESI) *m*/*z*: Calc. For $C_9H_{12}F_3O_3$ ($[M+H]^+$) 225.0733, Found 225.0730.



(zba-002-194)

ethyl 5-cyclopropyl-5-oxo-3-(trifluoromethyl)pent-3-enoate (2n)

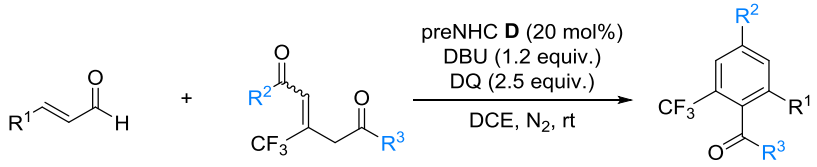
Yield: 1.4 g, 93%, yellow oil, R_f = 0.30 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 6.95 (s, 0.7H), 6.54 (s, 0.3H), 4.24 – 4.10 (m, 2H), 4.05 – 3.95 (m, 0.7H), 3.65 – 3.60 (m, 1.3H), 2.15 – 2.05 (m, 0.7H), 2.05 – 1.95 (m, 0.3H), 1.31 – 1.20 (m, 3H), 1.18 – 0.90 (m, 4H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 203.0, 200.0, 168.3, 164.6, 138.5 (q, *J* = 31.5 Hz), 134.4 (q, *J* = 31.5 Hz), 130.0 (q, *J* = 5.0 Hz), 125.1 (q, *J* = 5.5 Hz), 123.1 (q, *J* = 273.9 Hz), 122.9 (q, *J* = 273.9 Hz), 61.5, 61.3, 41.0, 32.3, 23.2, 20.7, 14.19, 14.17, 12.83, 12.82, 11.27, 11.25.

HRMS (ESI) *m*/*z*: Calc. For $C_{11}H_{13}F_3O_3Na$ ($[M+Na]^+$) 273.0709, Found 273.0706.

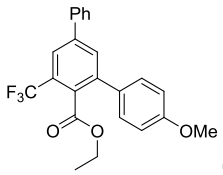
2. NHC-catalyzed synthesis of Benzotrifluorides (Table 2 and 3)



1 2 3

Typical procedure. To an oven-dried 15 ml Schlenk tube equipped with a stir bar was charged with preNHC **D** (13.0 mg, 20 mmol%), oxidant **DQ** (204 mg, 2.5 equiv.), enal **1** (1.5 equiv.) and β-trifluoromethylenone **2** (0.2 mmol). The tube was closed with a septum, evacuated, back-filled with nitrogen three times. To this mixture was added freshly distilled DCE (4 mL) and DBU (36.5 mg, 1.2 equiv.). The reaction mixture was stirred vigorously until complete consumption of the enone 2 (monitored by TLC). The reaction mixture was concentrated under reduced pressure. The residue was purified by column chromatography on silica gel (petroleum ether/Et_2O = 20:1-10:1) to furnish the corresponding product **3**.

3. Characterization data



(zba-002-190)

ethyl 4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3a)

Yield: 57 mg, 71%, yellow solid, m.p. 89-90 ^{o}C, R_f = 0.17 (petroleum ether/ethyl acetate, 20:1).

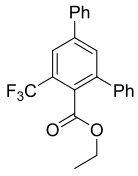
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.87 (s, 1H), 7.74 (s, 1H), 7.62 – 7.61 (m, 2H), 7.48 (t, *J* = 7.6 Hz, 2H), 7.42 (d, *J* = 7.5 Hz, 1H), 7.36 (d, *J* = 8.6 Hz, 2H), 6.95 (d, *J* = 8.6 Hz, 2H), 4.15 (q, *J* = 7.2 Hz, 2H), 3.85 (s, 3H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.5, 159.8, 142.7, 141.8, 139.0, 132.2, 131.7, 130.5, 129.9, 129.2, 128.6, 128.4 (q, *J* = 30.9 Hz), 127.4, 123.7 (q, *J* = 274.3 Hz), 123.4 (q, *J* = 4.6 Hz), 114.0, 61.9, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3036, 2983, 1732, 1611, 1460, 1359, 1134, 1060, 1031, 765, 700.

HRMS (ESI) *m/z*: Calc. For $C_{23}H_{20}F_3O_3$ ($[M+H]^+$) 401.1359, Found 401.1352.



(zba-002-118）

ethyl 5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3b)

Yield: 51 mg, 69%, colorless oil, R_f = 0.40 (petroleum ether/ethyl acetate, 20:1).

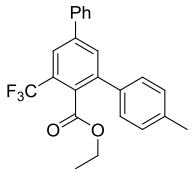
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.77 (s, 1H), 7.62 – 7.61 (m, 2H), 7.49 – 7.46 (m, 2H), 7.42 (d, *J* = 5.6 Hz, 6H), 4.11 (q, *J* = 7.1 Hz, 2H), 1.04 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.3, 142.8, 142.2, 139.4, 138.9, 132.1, 130.5, 129.3, 128.74, 128.70, 128.6, 128.3, 127.4, 123.69 (q, *J* = 274.0 Hz), 123.67 (q, *J* = 4.6 Hz), 61.9, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3061, 2984, 1734, 1610, 1462, 1358, 1135, 1060, 1016, 760, 700.

HRMS (ESI) *m/z*: Calc. For $C_{22}H_{18}F_3O_2$ ($[M+H]^+$) 371.1253, Found 371.1248.



(zba-002-122)

ethyl 4''-methyl-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3c)

Yield: 49 mg, 64%, white solid, m.p. 87-88 ^oC, R_f = 0.29 (petroleum ether/ethyl acetate, 20:1).

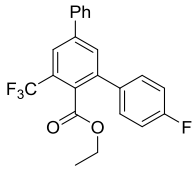
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.88 (s, 1H), 7.75 (s, 1H), 7.61 (d, *J* = 7.7 Hz, 2H), 7.49 – 7.46 (m, 2H), 7.43 – 7.40 (m, 1H), 7.32 – 7.31 (m, 2H), 7.25 – 7.22 (m, 2H), 4.14 (q, *J* = 7.0 Hz, 2H), 2.40 (s, 3H), 1.09 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.5, 142.7, 142.2, 139.0, 138.2, 136.5, 132.2, 130.5, 129.27, 129.25, 128.7, 128.6, 128.4 (q, *J* = 32.0 Hz), 127.4, 123.7 (q, *J* = 274.0 Hz), 123.6 (q, *J* = 4.6 Hz), 61.9, 21.3, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3029, 2984, 1735, 1457, 1358, 1274, 1163, 1060, 1046, 764, 701.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{20}F_3O_2$ ($[M+H]^+$) 385.1410, Found 385.1403.



(zba-002-119c)

ethyl 4''-fluoro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3d)

Yield: 48 mg, 62%, white solid, m.p. 103-104 °C, R_f = 0.33 (petroleum ether/ethyl acetate, 20:1).

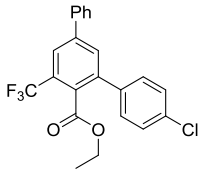
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.73 (s, 1H), 7.62 – 7.61 (m, 2H), 7.50 – 7.47 (m, 2H), 7.44 – 7.38 (m, 3H), 7.13 – 7.10 (m, 2H), 4.14 (q, *J* = 7.1 Hz, 2H), 1.09 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.3, 162.9 (d, *J* = 249.1 Hz), 142.9, 141.0, 138.8, 135.4, 135.3, 132.1, 130.6 (d, *J* = 8.1 Hz), 129.3, 128.8, 128.5 (q, *J* = 32.0 Hz), 127.4, 123.9 (q, *J* =4.6 Hz), 123.6 (q, *J* = 274.3 Hz), 115.6 (d, *J* = 21.8 Hz), 62.0, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -113.7.

IR (KBr) ν 3089, 2995, 1729, 1611, 1458, 1362, 1132, 1061, 1045, 767, 701.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}F_4O_2$ ($[M+H]^+$) 389.1159, Found 389.1155.



(zba-002-119a)

ethyl 4''-chloro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3e)

Yield: 45 mg, 56%, yellow solid, m.p. 114-115 °C, R_f = 0.42 (petroleum ether/ethyl acetate, 20:1).

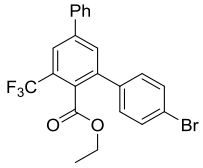
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.72 (s, 1H), 7.62 – 7.61 (m, 2H), 7.50 – 7.47 (m, 2H), 7.45 – 7.40 (m, 3H), 7.37 – 7.35 (m, 2H), 4.15 (q, *J* = 7.1 Hz, 2H), 1.11 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.2, 143.0, 140.9, 138.7, 137.8, 134.6, 131.9, 130.5, 130.1, 129.3, 128.83, 128.80, 128.6 (q, *J* =31.5 Hz), 127.4, 124.1(q, *J* = 4.6 Hz), 123.6 (q, *J* = 274.0 Hz), 62.1, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 2930, 1735, 1494, 1357, 1275, 1185, 1136, 1060, 1015, 763, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}ClF_3O_2$ ($[M+H]^+$) 405.0864, Found 405.0856.



(zba-002-119b)

ethyl 4''-fluoro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3f)

Yield: 51 mg, 56%, yellow solid, m.p. 109-110 ^{o}C, R_f = 0.42 (petroleum ether/ethyl acetate, 20:1).

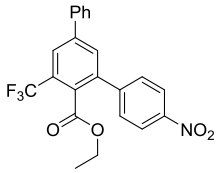
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.71 (s, 1H), 7.61 – 7.55 (m, 4H), 7.50 – 7.42 (m, 3H), 7.31 – 7.29 (m, 2H), 4.15 (q, *J* = 7.2 Hz, 2H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.1, 143.0, 140.9, 138.7, 138.2, 131.8, 131.7, 130.4, 129.3, 128.8, 128.6 (q, *J* = 31.5 Hz), 127.3, 124.1 (q, *J* =4.6 Hz), 123.6 (q, *J* = 274.3 Hz), 122.8, 62.1, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 2923, 1734, 1459, 1358, 1274, 1164, 1135, 1060, 1011, 762, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}BrF_3O_2$ ($[M+H]^+$) 449.0359, Found 449.0358.



(zba-002-120c)

ethyl 4''-nitro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3g)

Yield: 41 mg, 50%, yellow solid, m.p. 185-186 ^{o}C, R_f = 0.17 (petroleum ether/ethyl acetate, 20:1).

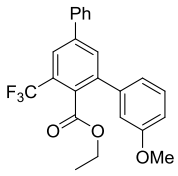
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.31 – 8.29 (m, 2H), 7.98 (s, 1H), 7.75 (s, 1H), 7.63 – 7.60 (m, 4H), 7.52 – 7.45 (m, 3H), 4.15 (q, *J* = 7.1 Hz, 2H), 1.12 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 166.8, 147.9, 145.9, 143.4, 139.8, 138.4, 131.6, 130.4, 129.9, 129.4, 129.1, 129.0 (q, *J* = 32.0 Hz), 127.4, 125.0 (q, *J* =4.6 Hz), 123.8, 123.4 (q, *J* = 274.0 Hz), 62.3, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3081, 2984, 1733, 1600, 1521, 1347, 1275, 1138, 1061, 766, 700.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}F_3NO_4$ ($[M+H]^+$) 416.1104, Found 416.1103.



(zba-002-146)

ethyl 3''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3h)

Yield: 60 mg, 74%, white oil, R_f = 0.18 (petroleum ether/ethyl acetate, 20:1).

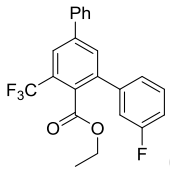
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.78 (s, 1H), 7.62 (d, *J* = 6.7 Hz, 2H), 7.49 – 7.46 (m, 2H), 7.43 – 7.40 (m, 1H), 7.33 (t, *J* = 7.9 Hz, 1H), 7.01 (d, *J* = 7.6 Hz, 1H), 6.97 – 6.94 (m, 2H), 4.14 (q, *J* = 7.2 Hz, 2H), 3.82 (s, 3H), 1.08 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 159.7, 142.8, 142.0, 140.7, 138.9, 132.0, 130.49, 130.48, 129.6, 129.3, 128.7, 128.4 (q, *J* = 32.0 Hz), 123.8 (q, *J* =4.6 Hz), 123.7 (q, *J* = 274.3 Hz), 121.1, 114.2, 114.1, 62.0, 55.4, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3070, 2989, 1735, 1602, 1459, 1358, 1279, 1135, 1058, 1026, 765, 702.

HRMS (ESI) m/z: Calc. For $C_{23}H_{19}ClF_3O_2$ ($[M]^+$) 400.1281, Found 400.1275.



(zba-002-131)

ethyl 3''-fluoro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3i)

Yield: 55 mg, 71%, yellow solid, m.p. 83-84 ^{o}C, R_f = 0.25 (petroleum ether/ethyl acetate, 20:1).

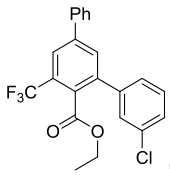
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.92 (s, 1H), 7.75 (s, 1H), 7.62 (d, *J* = 7.5 Hz, 2H), 7.50 – 7.47 (m, 2H), 7.45 – 7.37 (m, 2H), 7.21 (d, *J* = 7.7 Hz, 1H), 7.16 – 7.10 (m, 2H), 4.16 (q, *J* = 7.1 Hz, 2H), 1.10 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.1, 162.7 (d, *J* = 249.0 Hz), 143.0, 141.4 (d, *J* = 8.1 Hz), 140.8, 138.7, 131.9, 130.5, 130.2 (d, *J* = 8.1 Hz), 129.3, 128.8, 128.6 (q, *J* = 32.0 Hz), 127.4, 124.6 (d, *J* = 3.0 Hz), 124.2 (q, *J* =4.6 Hz), 123.6 (q, *J* = 274.3 Hz), 116.0 (d, *J* = 21.8 Hz), 115.3 (d, *J* = 21.3 Hz), 62.1, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -112.6.

IR (KBr) ν 2926, 1737, 1586, 1458, 1358, 1273, 1163, 1139, 1060, 764, 699.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}F_4O_2$ ($[M+H]^+$) 389.1159, Found 389.1155.



(zba-003-65)

ethyl 3''-chloro-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3j)

Yield: 44 mg, 55%, yellow oil, R_f = 0.29 (petroleum ether/ethyl acetate, 20:1).

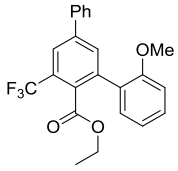
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.92 (s, 1H), 7.74 (s, 1H), 7.62 (d, *J* = 7.4 Hz, 2H), 7.51 – 7.48 (m, 2H), 7.44 – 7.42 (m, 2H), 7.40 – 7.35 (m, 2H), 7.32 – 7.30 (m, 1H), 4.17 (d, *J* = 7.1 Hz, 2H), 1.12 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.0, 143.0, 141.0, 140.6, 138.7, 134.5, 131.9, 130.5, 129.9, 129.3, 128.94, 128.86, 128.6 (q, *J* = 32.0 Hz), 128.5, 127.4, 126.8, 124.3 (q, *J* =4.6 Hz), 123.6 (q, *J* = 274.3 Hz), 62.1, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3062, 2984, 1735, 1459, 1356, 1274, 1136, 1060, 755, 699.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{17}ClF_3O_2$ ($[M+H]^+$) 405.0864, Found 405.0857.



(zba-002-120b)

ethyl 2''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate (3k)

Yield: 57 mg, 70%, yellow oil, R_f = 0.20 (petroleum ether/ethyl acetate, 20:1).

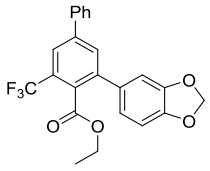
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (s, 1H), 7.75 (s, 1H), 7.61 (d, *J* = 7.5 Hz, 2H), 7.48 – 7.45 (m, 2H), 7.42 – 7.35 (m, 2H), 7.24 – 7.22 (m, 1H), 7.02 – 6.95 (m, 2H), 4.07 (q, *J* = 7.2 Hz, 2H), 3.76 (s, 3H), 1.03 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.0, 156.7, 142.3, 139.13, 139.07, 133.2, 131.2, 130.9, 129.9, 129.2, 128.5, 128.4 (q, *J* = 32.0 Hz), 128.1, 127.4, 123.78 (q, *J* = 274.0 Hz), 123.84 (q, *J* = 4.6 Hz), 120.5, 111.0, 61.6, 55.7, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.2.

IR (KBr) ν 3033, 2983, 1735, 1606, 1460, 1357, 1275, 1135, 1058, 1026, 755, 699.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{20}F_3O_3$ ($[M+H]^+$) 401.1359, Found 401.1353.



（zba-002-145）

ethyl

3-(benzo[d][1,3]dioxol-5-yl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3l)

Yield: 59 mg, 72%, yellow oil, R_f = 0.12 (petroleum ether/ethyl acetate, 20:1).

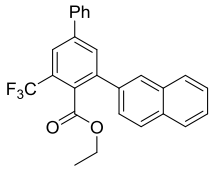
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 (s, 1H), 7.73 (s, 1H), 7.61 (d, *J* = 8.2 Hz, 2H), 7.50 – 7.46 (m, 2H), 7.44 – 7.40 (m, 1H), 6.91 – 6.84 (m, 3H), 6.01 (s, 2H), 4.20 (q, *J* = 7.1 Hz, 2H), 1.16 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 147.9, 147.8, 142.8, 141.7, 138.9, 133.2, 132.1, 130.53, 130.52, 129.3, 128.7, 128.4 (q, *J* = 32.0 Hz), 127.4, 123.66 (q, *J* =4.6 Hz), 123.67 (q, *J* = 274.3 Hz), 109.4, 108.4, 101.5, 62.0, 13.9.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3067, 2983, 1733, 1607, 1463, 1358, 1247, 1138, 1059, 1040, 764, 699.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{18}F_3O_4$ ($[M+H]^+$) 415.1152, Found 415.1151.



（zba-002-147)

ethyl 3-(naphthalen-2-yl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3m)

Yield: 41 mg, 48%, colorless oil, R_f = 0.33 (petroleum ether/ethyl acetate, 20:1).

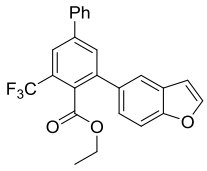
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.00 (s, 1H), 7.89 (d, *J* = 8.2 Hz, 2H), 7.81 (s, 1H), 7.63 (d, *J* = 7.5 Hz, 2H), 7.60 (d, *J* = 8.4 Hz, 1H), 7.51 – 7.41 (m, 7H), 3.81 (d, *J* = 7.1 Hz, 2H), 0.63 (t, *J* = 7.1Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 166.8, 142.3, 140.7, 138.8, 136.4, 133.6, 133.0, 132.1, 131.9, 131.8, 129.3, 128.8, 128.7, 128.5 (q, *J* = 32.0 Hz), 128.2, 127.44, 127.40, 126.5, 126.2, 125.0, 124.1 (q, *J* =4.6 Hz), 123.7 (q, *J* = 274.3 Hz), 61.5, 13.3.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3061, 2983, 1735, 1608, 1455, 1351, 1287, 1135, 1059, 1017, 765, 701.

HRMS (ESI) *m*/*z*: Calc. For $C_{26}H_{20}F_3O_2$ ($[M+H]^+$) 421.1410, Found 421.1404.



(zba-002-142)

ethyl 3-(benzofuran-5-yl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3n)

Yield: 54 mg, 66%, yellow oil, R_f = 0.21 (petroleum ether/ethyl acetate, 20:1).

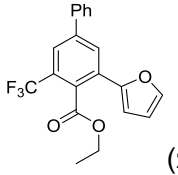
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.80 (s, 1H), 7.67 – 7.62 (m, 4H), 7.54 (d2, *J* = 8.2, 1H), 7.49 – 7.46 (m, 2H), 7.43 – 7.40 (m, 1H), 7.35 (d, *J* = 8.2, 1H), 6.79 (s, 1H), 4.09 (d, *J* = 7.1 Hz, 2H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.5, 154.8, 146.0, 142.7, 142.3, 139.0, 134.2, 132.5, 130.8, 129.3, 128.7, 128.4 (q, *J* = 32.0 Hz), 127.7, 127.4, 125.2, 123.7 (q, *J* = 274.3 Hz), 123.6 (q, *J* =4.6 Hz), 121.6, 111.4, 106.8, 61.9, 13.7.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3073, 2989, 1733, 1459, 1356, 1273, 1134, 1060, 1029, 765, 698.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{18}F_3O_3$ ($[M+H]^+$) 411.1203, Found 411.1198.



(zba-002-148)

ethyl 3-(furan-2-yl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3o)

Yield: 55 mg, 76%, yellow oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

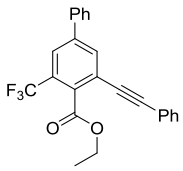
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.06 (s, 1H), 7.82 (s, 1H), 7.62 (d, *J* = 7.9 Hz, 2H), 7.52 – 7.48 (m, 3H), 7.45 – 7.42 (m, 1H), 6.69 (d, *J* = 3.4 Hz, 1H), 6.50 (dd, *J* = 3.5, 1.8 Hz, 1H), 4.40 (q, *J* = 7.2 Hz, 2H), 1.34 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.6, 150.8, 143.5, 143.0, 138.9, 130.2, 129.3, 128.9, 128.8, 127.8, 127.4, 124.0 (q, *J* =4.6 Hz), 123.6 (q, *J* = 274.3 Hz), 112.1, 109.4, 62.4, 14.0.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6.

IR (KBr) ν 3062, 2984, 1737, 1612, 1453, 1366, 1278, 1135, 1059, 1018, 755, 699.

HRMS (ESI) *m*/*z*: Calc. For $C_{20}H_{16}F_3O_3$ ($[M+H]^+$) 361.1046, Found 361.1040.



(zba-003-3)

ethyl 3-(phenylethynyl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3p)

Yield: 39 mg, 50%, white solid, m.p. 72-73 ^{o}C, R_f = 0.32 (petroleum ether/ethyl acetate, 20:1).

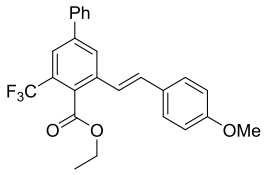
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.96 (s, 1H), 7.83 (s, 1H), 7.61 (d, *J* = 7.6 Hz, 2H), 7.53 – 7.42 (m, 5H), 7.38 – 7.37 (m, 3H), 4.48 (q, *J* = 7.2 Hz, 2H), 1.40 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 166.6, 143.0, 138.3, 133.8, 133.5, 131.9, 129.3, 129.2, 128.9, 128.6, 128.5 (q, *J* = 32.0 Hz), 127.3, 123.5 (q, *J* = 4.6 Hz), 123.39, 123.34 (q, *J* = 274.0 Hz), 122.4, 94.5, 85.5, 62.4, 14.2.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.9.

IR (KBr) ν 3064, 2988, 1738, 1603, 1458, 1364, 1274, 1138, 1057, 1015, 758, 692.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{18}F_3O_2$ ($[M+H]^+$) 395.1253, Found 395.1248.



(zba-003-2)

ethyl (E)-3-(4-methoxystyryl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3q)

Yield: 42 mg, 49%, white solid, m.p. 116-117 ^{o}C, R_f = 0.18 (petroleum ether/ethyl acetate, 20:1).

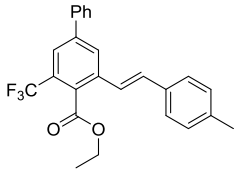
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.03 (s, 1H), 7.76 (s, 1H), 7.63 (d, *J* = 7.2 Hz, 2H), 7.52 – 7.49 (m, 2H), 7.45 – 7.43 (m, 3H), 7.15 – 7.04 (m, 2H), 6.91 (d, *J* = 8.6 Hz, 2H), 4.47 (q, *J* = 7.2 Hz, 2H), 3.83 (s, 3H), 1.41 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.6, 160.1, 143.0, 139.3, 137.3, 133.2, 129.54, 129.53, 129.4, 129.2, 128.64, 128.56 (q, *J* = 32.0 Hz), 128.4, 127.4, 123.7 (q, *J* = 274.8 Hz), 123.6 (q, *J* = 4.6 Hz), 121.8, 114.4, 62.3, 55.5, 14.2.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6.

IR (KBr) ν 3036, 2988, 1731, 1604, 1460, 1354, 1273, 1143, 1060, 1033, 762, 700.

HRMS (ESI) *m*/*z*: Calc. For $C_{25}H_{22}F_3O_3$ ($[M+H]^+$) 427.1516, Found 427.1510.



(zba-003-17)

ethyl (E)-3-(4-methylstyryl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3r)

Yield: 51 mg, 62%, white solid, m.p. 117-118 ^{o}C, R_f = 0.29 (petroleum ether/ethyl acetate, 20:1).

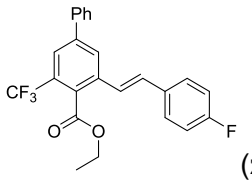
^{1}H NMR (500 MHz, CDCl$_3$) δ 8.03 (s, 1H), 7.77 (s, 1H), 7.62 (d, *J* = 7.5 Hz, 2H), 7.51 – 7.48 (m, 2H), 7.44 – 7.38 (m, 3H), 7.19 – 7.15 (m, 4H), 4.47 (q, *J* = 7.2 Hz, 2H), 2.36 (s, 3H), 1.40 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, CDCl$_3$) δ 167.6, 143.0, 139.3, 138.8, 137.2, 133.9, 133.6, 129.7, 129.2, 128.7, 128.6 (q, *J* = 32.0 Hz), 127.6, 127.4, 127.0, 123.8 (q, *J* = 4.6 Hz), 123.7 (q, *J* = 274.5 Hz), 123.1, 62.3, 21.4, 14.2.

^{19}F NMR (377 MHz, CDCl$_3$) δ -59.5.

IR (KBr) ν 3033, 2988, 1732, 1353, 1273, 1136, 1060, 964, 765, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{25}H_{22}F_3O_2$ ([M+H]$^+$) 411.1566, Found 411.1560.



(zba-003-21)

ethyl (E)-3-(4-fluorostyryl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3s)

Yield: 49 mg, 59%, white solid, m.p. 97-98 ^{o}C, R_f = 0.28 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, CDCl$_3$) δ 8.02 (s, 1H), 7.79 (s, 1H), 7.62 (d, *J* = 7.5 Hz, 2H), 7.52 – 7.42 (m, 5H), 7.12 (s, 2H), 7.08 – 7.04 (m, 2H), 4.47 (q, *J* = 7.2 Hz, 2H), 1.40 (t, *J* = 7.2 Hz, 3H).

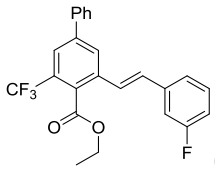
^{13}C NMR (126 MHz, CDCl$_3$) δ 167.5, 163.0 (d, *J* = 248.8 Hz), 143.1, 139.1, 136.9, 132.8 (d, *J* = 3.8 Hz), 132.5, 129.7, 129.3, 128.68, 128.67 (q, *J* = 32.0 Hz), 128.64 (d,

J = 8.3 Hz), 127.6, 127.4, 124.1 (q, *J* = 5.3 Hz), 123.9 (d, *J* = 1.9 Hz), 123.7 (q, *J* = 274.5 Hz), 116.0 (d, *J* = 21.8 Hz), 62.4, 14.2.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6, -112.6.

IR (KBr) ν 3064, 2988, 1731, 1600, 1509, 1353, 1275, 1141, 1060, 1026, 760, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{19}F_4O_2$ ($[M+H]^+$) 415.1316, Found 415.1309.



(zba-003-22)

ethyl (E)-3-(3-fluorostyryl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3t)

Yield: 50 mg, 60%, white solid, m.p. 92-93 ^oC, R_f = 0.28 (petroleum ether/ethyl acetate, 20:1).

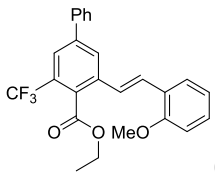
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.02 (s, 1H), 7.80 (s, 1H), 7.62 (d, *J* = 7.6 Hz, 2H), 7.52 – 7.49 (m, 2H), 7.45 – 7.43 (m, 1H), 7.35 – 7.31 (m, 1H), 7.26 – 7.17 (m, 3H), 7.12 (d, *J* = 16.1 Hz, 1H), 7.02 – 6.98 (m, 1H), 4.48 (q, *J* = 7.2 Hz, 2H), 1.41 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 163.3 (d, *J* = 246.8 Hz), 143.2, 139.1, 138.9 (d, *J* = 8.6 Hz), 136.6, 132.5, 130.4 (d, *J* = 8.6 Hz), 130.0, 129.3, 128.8, 128.74 (q, *J* = 32.0 Hz), 127.72, 127.4, 125.5, 124.3 (q, *J* = 4.6 Hz), 123.6 (q, *J* = 274.5 Hz), 123.0 (d, *J* = 2.1 Hz), 115.5 (d, *J* = 21.7 Hz), 113.4 (d, *J* = 22.3 Hz), 62.5, 14.2.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6, -112.9.

IR (KBr) ν 2991, 1731, 1611, 1454, 1352, 1273, 1137, 1061, 762, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{18}F_4O_2$ ($[M]^+$) 414.1237, Found 414.1240.



(zba-003-19)

ethyl (E)-3-(2-methoxystyryl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3u)

Yield: 62 mg, 73%, yellow oil, R_f = 0.22 (petroleum ether/ethyl acetate, 20:1).

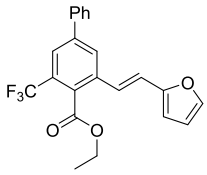
^{1}H NMR (500 MHz, $CDCl_3$) δ 8.08 (s, 1H), 7.76 (s, 1H), 7.63 (d, *J* = 7.6Hz, 2H), 7.55 – 7.48 (m, 4H), 7.44 – 7.41 (m, 1H), 7.30 – 7.22 (m, 2H), 6.99 – 6.96 (m, 1H), 6.91 (d, *J* = 8.3 Hz, 1H), 4.46 (q, *J* = 7.2 Hz, 2H), 3.87 (s, 3H), 1.40 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.6, 157.4, 143.0, 139.4, 137.6, 129.8, 129.2, 128.7, 128.6, 128.5 (q, *J* = 32.0 Hz), 127.7, 127.5, 127.2, 125.7, 124.5, 123.74 (q, *J* = 274.5 Hz), 123.72 (q, *J* = 5.3 Hz), 120.9, 111.1, 62.3, 55.6, 14.2.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3064, 2988, 1732, 1599, 1461, 1353, 1273, 1135, 1059, 1026, 752, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{25}H_{22}F_3O_3$ ($[M+H]^+$) 427.1516, Found 427.1508.



(zba-003-18)

ethyl

(E)-3-(2-(furan-2-yl)vinyl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (3v)

Yield: 55 mg, 71%, white solid, m.p. 58-59 ^oC, R_f = 0.23 (petroleum ether/ethyl acetate, 20:1).

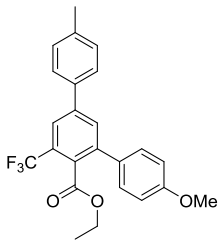
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.97 (s, 1H), 7.75 (s, 1H), 7.61 (d, *J* = 7.6 Hz, 2H), 7.51 – 7.48 (m, 2H), 7.44 – 7.43 (m, 2H), 7.11 (d, *J* = 15.9 Hz, 1H), 6.97 (d, *J* = 15.9 Hz, 1H), 6.43 – 6.42 (m, 2H), 4.49 (q, *J* = 7.2, 2H), 1.42 (t, *J* = 7.2, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 152.5, 143.2, 143.0, 139.2, 136.7, 129.8, 129.2, 128.68, 128.67 (q, *J* = 32.0 Hz), 127.4, 127.0, 123.9 (q, *J* = 5.3 Hz), 123.7 (q, *J* = 274.5 Hz), 122.2, 120.8, 112.0, 110.7, 62.4, 14.1.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6.

IR (KBr) ν 3064, 2985, 1732, 1604, 1454, 1350, 1279, 1141, 1060, 1015, 762, 697.

HRMS (ESI) *m*/*z*: Calc. For $C_{22}H_{18}F_3O_3$ ($[M+H]^+$) 387.1203, Found 387.1198.



(zba-002-152)

ethyl

4''-methoxy-4-methyl-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3w)

Yield: 56 mg, 67%, yellow oil, R_f = 0.27 (petroleum ether/ethyl acetate, 20:1).

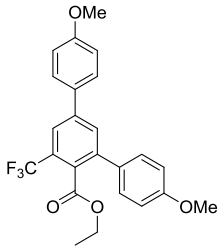
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.85 (s, 1H), 7.72 (s, 1H), 7.51 (d, *J* = 7.7 Hz, 2H), 7.35 (d, *J* = 7.7 Hz, 2H), 7.28 (d, *J* = 7.7 Hz, 2H), 6.95 (d, *J* = 7.7 Hz, 2H), 4.14 (q, *J* = 7.2 Hz, 2H), 3.84 (s, 3H), 2.40 (s, 3H), 1.10 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.6, 159.7, 142.6, 141.7, 138.7, 136.1, 131.9, 131.8, 130.2, 130.0, 129.9, 128.3 (q, *J* = 32.0 Hz), 127.2, 123.8 (q, *J* = 274.3 Hz), 123.2 (q, *J* =4.6 Hz), 114.0, 61.9, 55.5, 21.3, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3030, 2929, 1734, 1610, 1461, 1359, 1250, 1135, 1058, 1045, 790, 699.

HRMS (ESI) *m/z*: Calc. For $C_{24}H_{22}F_3O_3$ ($[M+H]^+$) 415.1516, Found 415.1514.



(zba-002-153)

ethyl 4,4''-dimethoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3x)

Yield: 62 mg, 72%, yellow oil, R_f = 0.33 (petroleum ether/ethyl acetate, 5:1).

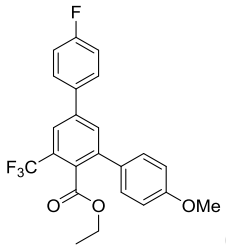
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.82 (s, 1H), 7.69 (s, 1H), 7.56 (d, *J* = 8.4 Hz, 2H), 7.35 (d, *J* = 8.4 Hz, 2H), 7.00 (d, *J* = 8.6 Hz, 2H), 6.95 (d, *J* = 8.4 Hz, 2H), 4.14 (q, *J* = 7.2 Hz, 2H), 3.85 (d, *J* = 5.9 Hz, 6H), 1.10 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.7, 160.2, 159.7, 142.3, 141.7, 131.9, 131.6, 131.4, 129.93, 129.88, 128.5, 128.3 (q, *J* = 32.0 Hz), 123.8 (q, *J* = 274.3 Hz), 122.9 (q, *J* = 4.6 Hz), 114.7, 114.0, 61.9, 55.6, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 2960, 1733, 1610, 1462, 1359, 1250, 1134, 1059, 1031, 791.

HRMS (ESI) *m/z*: Calc. For $C_{24}H_{22}F_3O_4$ ($[M+H]^+$) 431.1465, Found 431.1463.



(zba-002-165)

ethyl

4-fluoro-4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3y)

Yield: 44 mg, 52%, yellow oil, R_f = 0.22 (petroleum ether/ethyl acetate, 20:1).

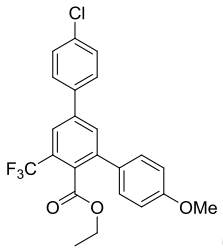
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.81 (s, 1H), 7.77 (s, 1H), 7.69 (s, 1H), 7.60 – 7.56 (m, 2H), 7.35 (d, *J* = 8.3 Hz, 2H), 7.18 – 7.14 (m, 2H), 6.95 (d, *J* = 8.3 Hz, 2H), 4.15 (q, *J* = 7.2 Hz, 2H), 3.85 (s, 3H), 1.10 (d, *J* = 7.2 Hz, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 163.3 (d, *J* = 249.0 Hz), 159.8, 141.9, 141.7, 135.2, 132.0, 131.6, 130.6, 129.9, 129.1 (d, *J* = 8.6 Hz), 128.4 (q, *J* = 32.0 Hz), 123.7 (q, *J* = 274.3 Hz), 123.2 (q, *J* = 4.6 Hz), 116.2 (d, *J* = 21.0 Hz), 114.0, 61.9, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -113.5.

IR (KBr) ν 2991, 2940, 1734, 1610, 1462, 1359, 1284, 1136, 1059, 1028, 834.

HRMS (ESI) *m/z*: Calc. For $C_{23}H_{19}F_4O_3$ ($[M+H]^+$) 419.1265, Found 419.1261.



(zba-002-157)

ethyl

4-chloro-4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3z)

Yield: 49 mg, 56%, yellow oil, R_f = 0.21 (petroleum ether/ethyl acetate, 20:1).

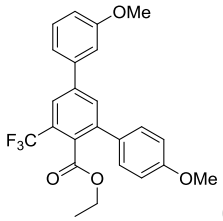
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.82 (s, 1H), 7.70 (s, 1H), 7.55 (d, *J* = 8.0 Hz, 2H), 7.45 (d, *J* = 8.0 Hz, 2H), 7.34 (d, *J* = 8.4 Hz, 2H), 6.95 (d, *J* = 8.4 Hz, 2H), 4.15 (q, *J* = 7.1 Hz, 2H), 3.85 (s, 3H), 1.10 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 159.8, 142.0, 141.4, 137.4, 135.0, 132.0, 131.5, 130.9, 129.9, 129.5, 128.6, 128.5 (q, *J* = 32.0 Hz), 123.6 (q, *J* = 274.3 Hz), 123.2 (q, *J* = 4.6 Hz), 114.1, 62.0, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 2961, 1734, 1611, 1461, 1358, 1251, 1136, 1059, 1044, 790, 722.

HRMS (ESI) *m/z*: Calc. For $C_{23}H_{19}ClF_3O_3$ ($[M+H]^+$) 435.0969, Found 435.0965.



(zba-002-166)

ethyl 3,4''-dimethoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3aa)

Yield: 64 mg, 74%, yellow oil, R_f = 0.14 (petroleum ether/ethyl acetate, 20:1).

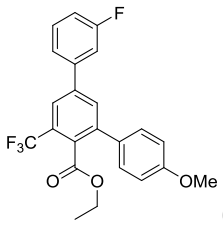
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.85 (s, 1H), 7.73 (s, 1H), 7.40 – 7.34 (m, 3H), 7.19 (d, *J* = 7.2 Hz, 1H), 7.12 (s, 1H), 6.96 – 6.95 (m, 3H), 4.15 (q, *J* = 7.1 Hz, 2H), 3.87 (s, 3H), 3.85 (s, 3H), 1.11 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.5, 160.3, 159.8, 142.6, 141.8, 140.5, 132.2, 131.7, 130.7, 130.3, 130.0, 128.3 (q, *J* = 32.0 Hz), 123.7 (q, *J* = 274.3 Hz), 123.5 (q, *J* = 4.6 Hz), 119.8, 114.0, 113.9, 113.2, 61.9, 55.6, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 2937, 1733, 1606, 1465, 1358, 1266, 1134, 1057, 786, 702.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{22}F_3O_4$ ($[M+H]^+$) 431.1465, Found 431.1461.



(zba-002-172)

ethyl

3-fluoro-4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3ab)

Yield: 49 mg, 59%, yellow oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

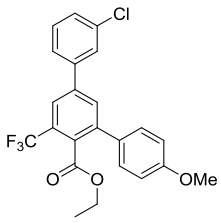
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.84 (s, 1H), 7.72 (s, 1H), 7.45 – 7.39 (m, 2H), 7.36 – 7.30 (m, 3H), 7.13 – 7.10 (m, 1H), 6.96 (d, *J* = 8.6 Hz, 2H), 4.15 (q, *J* = 7.2 Hz, 2H), 3.85 (s, 3H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.3, 163.4 (d, *J* = 247.0 Hz), 159.9, 142.0, 141.4, 141.2 (q, *J* = 7.2 Hz), 132.2, 131.5, 131.1, 130.8 (d, *J* = 8.6 Hz), 130.0, 128.6 (q, *J* = 32.0 Hz), 123.6 (q, *J* = 276.3 Hz), 123.4 (q, *J* = 4.6 Hz), 123.1 (d, *J* = 2.9 Hz), 115.5 (d, *J* = 21.0 Hz), 114.4 (d, *J* = 22.6 Hz), 114.1, 62.0, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -112.1.

IR (KBr) ν 2979, 1736, 1611, 1463, 1358, 1282, 1136, 1050, 787, 706.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{18}ClF_4O_3$ ($[M]^+$) 418.1187, Found 418.1188.



(zba-002-171)

ethyl

3-chloro-4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3ac)

Yield: 52 mg, 59%, colorless oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

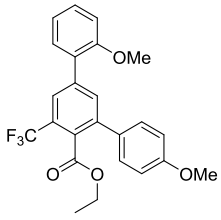
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.83 (s, 1H), 7.71 (s, 1H), 7.60 (s, 1H), 7.50 – 7.49 (m, 1H), 7.43 – 7.40 (m, 2H), 7.35 (d, *J* = 8.6 Hz, 2H), 6.96 (d, *J* = 8.6 Hz, 2H), 4.16 (q, *J* = 7.1 Hz, 2H), 3.85 (s, 3H), 1.11 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.3, 159.9, 142.0, 141.2, 140.8, 135.2, 132.2, 131.4, 131.1, 130.5, 129.9, 128.7, 128.6 (q, *J* = 32.0 Hz), 127.5, 125.6, 123.6 (q, *J* = 274.3 Hz), 123.4 (q, *J* = 4.6 Hz), 114.1, 62.0, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3072, 2985, 1736, 1611, 1460, 1356, 1278, 1136, 1060, 1029, 786, 698.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{19}ClF_3O_3$ ($[M+H]^+$) 435.0969, Found 435.0967.



(zba-002-181)

ethyl 2,4''-dimethoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3ad)

Yield: 55 mg, 64%, yellow oil, R_f = 0.15 (petroleum ether/ethyl acetate, 20:1).

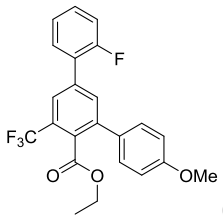
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.84 (s, 1H), 7.69 (s, 1H), 7.39 – 7.32 (m, 4H), 7.06 – 6.99 (m, 2H), 6.94 (d, *J* = 8.6 Hz, 2H), 4.15 (q, *J* = 7.2 Hz, 2H), 3.84 (s, 3H), 3.82 (s, 3H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 159.6, 156.6, 140.8, 140.2, 134.6, 132.0, 130.8, 130.1, 129.98, 129.96, 128.4, 127.5 (q, *J* = 32.0 Hz), 126.0 (q, *J* = 4.6 Hz), 123.8 (q, *J* = 274.1 Hz), 121.2, 113.9, 111.5, 61.8, 55.7, 55.4, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.3.

IR (KBr) ν 3069, 2938, 1732, 1611, 1465, 1358, 1257, 1164, 1058, 1027, 756, 702.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{22}F_3O_4$ ($[M+H]^+$) 431.1465, Found 431.1461.



(zba-002-180)

ethyl

2-fluoro-4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carboxylate

(3ae)

Yield: 61 mg, 72%, yellow oil, R_f = 0.15 (petroleum ether/ethyl acetate, 20:1).

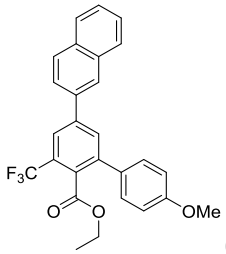
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.84 (s, 1H), 7.72 (s, 1H), 7.47 – 7.44 (m, 1H), 7.39 – 7.35 (m, 3H), 7.25 – 7.23 (m, 1H), 7.21 – 7.17 (m, 1H), 6.95 (d, *J* = 7.2 Hz, 2H), 4.16 (q, *J* = 7.2 Hz, 2H), 3.84 (s, 3H), 1.11 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.4, 159.84 (d, *J* = 249.0 Hz), 159.79, 141.4, 137.4, 134.1, 131.5, 130.9, 130.7, 130.4 (d, *J* = 8.6 Hz), 130.0, 128.1 (q, *J* = 32.0 Hz), 127.0 (d, *J* = 13.4 Hz), 125.3 (q, *J* = 4.6 Hz), 124.9 (d, *J* = 3.7 Hz), 123.7 (q, *J* = 274.1 Hz), 116.5 (d, *J* = 22.4 Hz), 114.0, 62.0, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -117.6.

IR (KBr) ν 3075, 2988, 1736, 1612, 1462, 1358, 1287, 1136, 1061, 1033, 760, 706.

HRMS (ESI) *m*/*z*: Calc. For $C_{23}H_{19}F_4O_3$ ($[M+H]^+$) 419.1265, Found 419.1263.



(zba-002-167)

ethyl

4'-methoxy-5-(naphthalen-2-yl)-3-(trifluoromethyl)-[1,1'-biphenyl]-2-carboxylate (3af)

Yield: 66 mg, 73%, white solid, m.p. 135-136 ^{o}C, R_f = 0.25 (petroleum ether/ethyl acetate, 10:1).

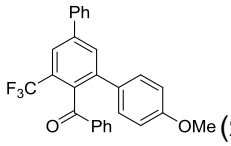
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.07 (s, 1H), 7.99 (s, 1H), 7.95 – 7.86 (m, 4H), 7.74 – 7.72 (m, 1H), 7.55 – 7.50 (m, 2H), 7.39 (d, *J* = 8.6 Hz, 2H), 6.97 (d, *J* = 8.6 Hz, 2H), 4.17 (q, *J* = 7.1 Hz, 2H), 3.85 (s, 3H), 1.12 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.5, 159.8, 142.6, 141.9, 136.2, 133.6, 133.2, 132.4, 131.7, 130.6, 130.0, 129.1, 128.5, 128.4 (q, *J* = 32.0 Hz), 127.8, 126.9, 126.8, 126.6, 125.1, 123.8 (q, *J* = 274.5 Hz), 123.6 (q, *J* = 4.6 Hz), 114.0, 61.9, 55.5, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4.

IR (KBr) ν 3061, 2979, 1734, 1610, 1459, 1355, 1272, 1134, 1058, 1046, 834.

HRMS (ESI) *m*/*z*: Calc. For $C_{27}H_{22}F_3O_3$ ($[M+H]^+$) 451.1516, Found 451.1509.



(zba-002-174)

(4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-yl)(phenyl)methanone (3ag)

Yield: 39 mg, 45%, colorless oil, R_f = 0.16 (petroleum ether/ethyl acetate, 20:1).

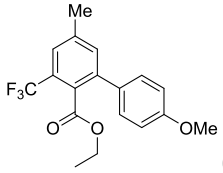
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.97 (s, 1H), 7.77 (d, 1H), 7.68 (d, *J* = 7.4 Hz, 2H), 7.57 (d, *J* = 7.4 Hz, 2H), 7.52 – 7.49 (m, 2H), 7.45 – 7.39 (m, 2H), 7.27 – 7.24 (m, 2H), 7.16 (d, *J* = 8.7 Hz, 2H), 6.71 (d, *J* = 8.6 Hz, 2H), 3.71 (s, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 196.6, 159.4, 142.5, 141.7, 139.0, 137.2, 135.9, 133.4, 132.3, 131.2, 130.7, 129.5, 129.3, 128.7, 128.3, 127.4, 123.8 (q, *J* = 274.3 Hz), 123.7 (q, *J* = 4.6 Hz), 113.8, 55.3.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3069, 2935, 1675, 1610, 1451, 1357, 1286, 1133, 1049, 1031, 734, 712.

HRMS (ESI) *m*/*z*: Calc. For $C_{27}H_{20}F_3O_2$ ($[M+H]^+$) 433.1410, Found 433.1401.



(zba-002-175)

ethyl 4'-methoxy-5-methyl-3-(trifluoromethyl)-[1,1'-biphenyl]-2-carboxylate (3ah)

Yield: 34 mg, 50%, yellow oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

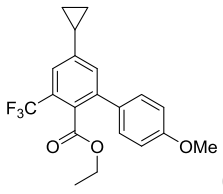
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.46 (s, 1H), 7.33 (s, 1H), 7.28 (d, *J* = 8.4 Hz, 2H), 6.92 (d, *J* = 8.4 Hz, 2H), 4.11 (q, *J* = 7.2 Hz, 2H), 3.83 (s, 3H), 2.45 (s, 3H), 1.08 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 159.6, 141.1, 139.8, 134.2, 131.9, 129.9, 129.2, 127.7 (q, *J* = 32.0 Hz), 125.3 (q, *J* = 5.3 Hz), 123.8 (q, *J* = 274.0 Hz), 113.9, 61.7, 55.4, 21.4, 13.8.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 2985, 1737, 1611, 1464, 1349, 1274, 1134, 1057, 1033, 833.

HRMS (ESI) *m*/*z*: Calc. For $C_{18}H_{16}ClF_3O_3$ ($[M-H]^-$) 337.1057, Found 337.1059.



(zba-002-198)

ethyl 5-cyclopropyl-4'-methoxy-3-(trifluoromethyl)-[1,1'-biphenyl]-2-carboxylate (3ai)

Yield: 49 mg, 65%, colorless oil, R_f = 0.19 (petroleum ether/ethyl acetate, 20:1).

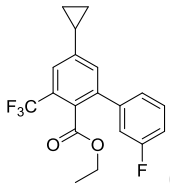
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.33 (s, 1H), 7.28 (d, *J* = 8.6 Hz, 2H), 7.18 (s, 1H), 6.93 (d, *J* = 8.6 Hz, 2H), 4.10 (q, *J* = 7.2 Hz, 2H), 3.84 (s, 3H), 2.01 – 1.95 (m, 1H), 1.09 – 1.06 (m, 5H), 0.78 – 0.77 (m, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 159.6, 146.3, 141.1, 131.9, 130.6, 129.8, 128.87, 128.85, 127.7 (q, *J* = 32.0 Hz), 123.7 (q, *J* = 274.2 Hz), 122.0 (q, *J* = 4.6 Hz), 113.9, 61.7, 55.4, 15.5, 13.8, 10.1.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5.

IR (KBr) ν 3086, 2935, 1735, 1611, 1464, 1330, 1274, 1134, 1053, 1026, 837.

HRMS (ESI) *m*/*z*: Calc. For $C_{20}H_{20}F_3O_3$ ($[M+H]^+$) 365.1359, Found 365.1356.



(zba-003-16)

ethyl 5-cyclopropyl-3'-fluoro-3-(trifluoromethyl)-[1,1'-biphenyl]-2-carboxylate (3aj)

Yield: 34 mg, 48%, yellow oil, R_f = 0.28 (petroleum ether/ethyl acetate, 20:1).

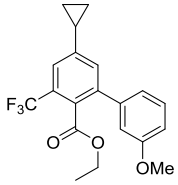
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38 – 7.33 (m, 2H), 7.20 (s, 1H), 7.13 (d, *J* = 7.6 Hz, 1H), 7.10 – 7.06 (m, 2H), 4.11 (q, *J* = 7.1 Hz, 2H), 2.03 – 1.96 (m, 1H), 1.11 – 1.05 (m, 5H), 0.81 – 0.77 (m, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.3, 163.6 (d, *J* = 246.8 Hz), 146.6, 141.7 (d, *J* =8.1 Hz), 140.2, 130.4, 130.0 (d, *J* =8.5 Hz), 128.9, 128.0 (q, *J* = 32.0 Hz), 124.5 (d, *J* = 2.5 Hz), 123.6 (q, *J* = 274.5 Hz), 122.9 (q, *J* = 4.6 Hz), 115.9 (d, *J* =22.0 Hz), 115.1 (d, *J* =20.8 Hz), 61.9, 15.5, 13.7, 10.1.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.5, -112.9.

IR (KBr) ν 3086, 2988, 1736, 1612, 1443, 1381, 1275, 1136, 1053, 789, 701.

HRMS (ESI) *m*/*z*: Calc. For $C_{19}H_{17}F_4O_2$ ($[M+H]^+$) 353.1159, Found 353.1154.



(zba-003-28)

ethyl 5-cyclopropyl-3'-methoxy-3-(trifluoromethyl)-[1,1'-biphenyl]-2-carboxylate (3ak)

Yield: 33 mg, 45%, yellow oil, R_f = 0.17 (petroleum ether/ethyl acetate, 20:1).

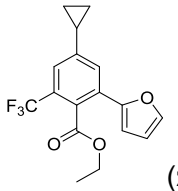
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.36 (s, 1H), 7.31 – 7.30 (m, 1H), 7.22 (s, 1H), 6.93 – 6.89 (m, 3H), 4.09 (q, *J* = 7.1 Hz, 2H), 3.81 (s, 3H), 2.02 – 1.96 (m, 1H), 1.08 – 1.03 (m, 5H), 0.80 – 0.76 (m, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.6, 159.6, 146.4, 141.4, 141.0, 130.4, 129.5, 128.9, 127.9 (q, *J* = 32.0 Hz), 123.7 (q, *J* = 274.5 Hz), 122.5 (q, *J* = 4.7 Hz), 121.1, 114.1, 114.0, 61.8, 55.4, 15.5, 13.7, 10.1.

^{19}F NMR (377 MHz, $CDCl_3$) δ -60.4.

IR (KBr) ν 3083, 2982, 1735, 1605, 1432, 1381, 1276, 1134, 1057, 786, 703.

HRMS (ESI) *m/z*: Calc. For $C_{20}H_{19}F_3O_3$ ($[M]^+$) 364.1281, Found 364.1273.



(zba-003-12)

ethyl 4-cyclopropyl-2-(furan-2-yl)-6-(trifluoromethyl)benzoate (3al)

Yield: 40 mg, 61%, yellow oil, R_f = 0.23 (petroleum ether/ethyl acetate, 20:1).

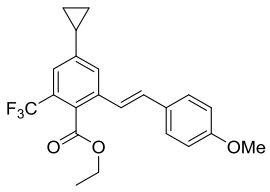
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.52 (s, 1H), 7.49 (s, 1H), 7.30 (s, 1H), 6.60 (d, *J* = 3.4 Hz, 1H), 6.47 (dd, *J* = 3.4, 1.8 Hz, 1H), 4.35 (q, *J* = 7.2 Hz, 2H), 2.02 – 1.96 (m, 1H), 1.30 (t, *J* = 7.2 Hz, 3H), 1.10 – 1.06 (m, 2H), 0.81 – 0.77 (m, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 151.0, 146.4, 143.2, 129.7, 128.3 (q, *J* = 32.0 Hz), 127.5, 126.4, 123.7 (q, *J* = 274.5 Hz), 122.7 (q, *J* = 4.6 Hz), 111.9, 109.0, 62.2, 15.5, 14.0, 9.9.

^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6.

IR (KBr) ν 3089, 2982, 1735, 1613, 1371, 1324, 1275, 1135, 1056, 1021, 745.

HRMS (ESI) *m/z*: Calc. For $C_{17}H_{16}F_3O_3$ ([M+H]$^+$) 325.1046, Found 325.1043.



(zba-003-15)

ethyl (E)-4-cyclopropyl-2-(4-methoxystyryl)-6-(trifluoromethyl)benzoate (3am)

Yield: 51 mg, 65%, yellow oil, R_f = 0.27 (petroleum ether/ethyl acetate, 10:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.52 (s, 1H), 7.42 – 7.41 (m, 2H), 7.22 (s, 1H), 7.03 (d, *J* = 16.0 Hz, 1H), 6.98 (d, *J* = 16.0 Hz, 1H), 6.91 – 6.89 (m, 2H), 4.42 (q, *J* = 7.2 Hz, 2H), 3.83 (s, 3H), 2.01 – 1.96 (m, 1H), 1.37 (t, *J* = 7.2 Hz, 3H), 1.09 – 1.05 (m, 2H), 0.81 – 0.78 (m, 2H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 160.0, 146.3, 136.7, 132.6, 129.5, 128.3, 128.0 (q, *J* = 32.0 Hz), 126.1, 123.8 (q, *J* = 274.5 Hz), 122.13 (q, *J* = 4.6 Hz), 122.09, 114.4, 62.1, 55.5, 15.6, 14.2, 9.8.

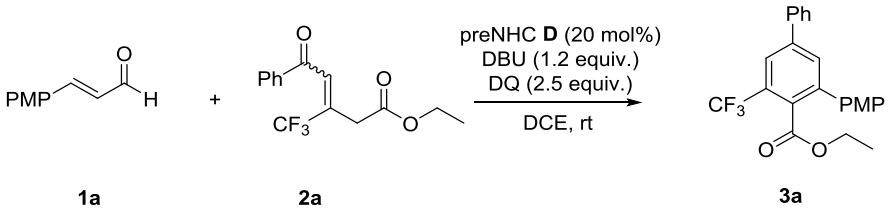
^{19}F NMR (377 MHz, $CDCl_3$) δ -59.6.

IR (KBr) ν 3089, 2938, 1731, 1605, 1512, 1321, 1276, 1135, 1095, 1033,712.

HRMS (ESI) *m/z*: Calc. For $C_{22}H_{22}F_3O_3$ ([M+H]$^+$) 391.1516, Found 391.1510.

4. Gram-scale synthesis and chemical transformations (Scheme 2)

4.1 gram-scale synthesis of 3a

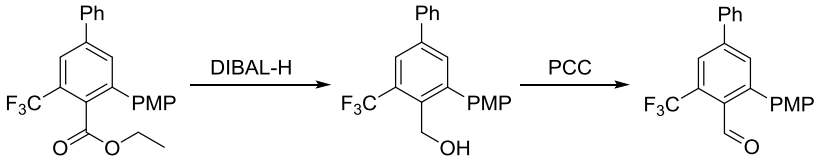


1a **2a** **3a**

To an oven-dried 250 ml Schlenk tube equipped with a stir bar was charged with preNHC **D** (325 mg, 20 mmol%), DQ (5.1 g, 2.5 equiv.), 4-methoxy cinnamic aldehyde **1a** (1.23 g, 1.5 equiv.) and β-trifluoromethylenone **2a** (1.45 g, 5 mmol). This tube was closed with a septum, evacuated, back-filled with nitrogen three times. To this mixture was added freshly distilled DCE (100 mL) and DBU (0.92 g, 1.2 equiv.).

The reaction mixture was stirred vigorously until complete consumption of the enone 2a (monitored by TLC). The reaction mixture was concentrated under reduced pressure. The residue was purified by column chromatography on silica gel (petroleum ether/Et_2O = 20:1-10:1) to furnish benzotrifluorides **3a** (1.37 g, 69% yield) as yellow solid.

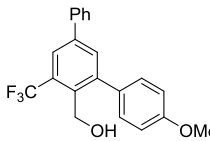
4.2 Chemical Transformation



3a **5**, 98% **6**, 95%

To an oven-dried 15 ml Schlenk tube equipped with a stir bar was charged with **3a** (40 mg, 0.1 mmol). This tube was closed with a septum, evacuated, back-filled with nitrogen. After adding freshly distilled DCM (1 mL), to the solution was added DIBAL-H (2.5 equiv., 0.16 mL, 1.5 M in hexane) at 0 ℃. The mixture was stirred for 5 h at 0 ℃. The reaction mixture was quenched with saturated NH_4Cl(aq.) and extracted by DCM. The extract was dried over $MgSO_4$. The solvent was removed under reduced pressure, and the residue was purified by column chromatography to furnish alcohol **5** (35.6 mg, 98% yield).

To an oven-dried Schlenk tube equipped with a stir bar was charged with alcohol **5** (35.6 mg, 0.1 mmol). This tube was closed with a septum, evacuated, back-filled with nitrogen. Freshly distilled DCM (1 mL) was added, followed by PCC (2.0 eq, 43 mg) and 3 Å MS (100 mg). The mixture was stirred for 6 h at room temperature. The reaction mixture was filtered and concentrated to give the crude product, which was purified by column chromatography to give aldehyde **6** (33.9 mg, 95% yield).



(zba-003-24)

(4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-yl)methanol (5)

Yield: 35.6 mg, 98%, white solid, m.p. 93-94 ^{o}C, R_f = 0.39 (petroleum ether/ethyl acetate, 5:1).

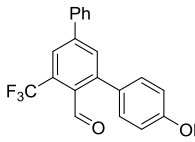
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.72 (s, 1H), 7.61 (d, *J* = 7.6 Hz, 2H), 7.47 – 7.45 (m, 4H), 7.41 – 7.38 (m, 1H), 7.01 (d, *J* = 8.6 Hz, 2H), 4.69 (d, *J* = 6.6 Hz, 2H), 3.87 (s, 3H), 1.89 (t, *J* = 6.7 Hz, 1H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 159.6, 146.0, 141.1, 139.4, 134.9, 133.2, 132.3, 130.8, 130.2 (q, *J* = 30.0 Hz), 129.2, 128.3, 127.3, 124.9 (q, *J* = 274.0 Hz), 123.9 (q, *J* = 4.7 Hz), 113.9, 58.6, 55.5.

^{19}F NMR (377 MHz, $CDCl_3$) δ -58.0.

IR (KBr) ν 3445, 2927, 1610, 1513, 1458, 1353, 1291, 1146, 1048, 762, 701.

HRMS (ESI) *m/z*: Calc. For $C_{21}H_{17}F_3O_2$ ($[M]^+$) 358.1175, Found 358.1170.



(zba-003-42)

4''-methoxy-5'-(trifluoromethyl)-[1,1':3',1''-terphenyl]-4'-carbaldehyde (6)

Yield: 33.9 mg, 95%, yellow oil, R_f = 0.15 (petroleum ether/ethyl acetate, 20:1).

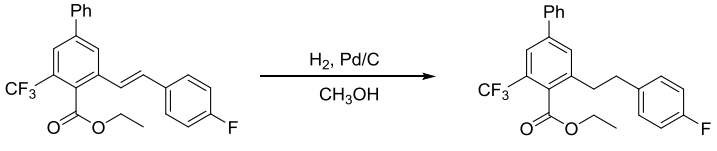
^{1}H NMR (400 MHz, $CDCl_3$) δ 10.09 (s, 1H), 8.00 (s, 1H), 7.79 (s, 1H), 7.65 (d, *J* = 7.6 Hz, 2H), 7.51 – 7.44 (m, 3H), 7.29 (d, *J* = 8.6 Hz, 2H), 7.00 (d, *J* = 8.6 Hz, 2H), 3.87 (s, 3H).

^{13}C NMR (101 MHz, $CDCl_3$) δ 191.7, 160.2, 146.2, 144.6, 138.6, 132.9, 132.1, 131.2, 130.1, 129.7 (q, *J* = 32.0 Hz), 129.3, 129.1, 127.5, 124.5 (q, *J* = 5.7 Hz), 123.6 (q, *J* = 274.2 Hz), 114.3, 55.5.

^{19}F NMR (377 MHz, $CDCl_3$) δ -57.7.

IR (KBr) ν 3038, 2963, 1707, 1607, 1454, 1354, 1253, 1143, 1069, 764, 701.

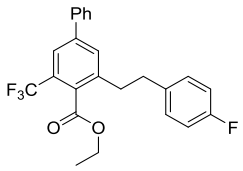
HRMS (ESI) *m/z*: Calc. For $C_{21}H_{16}F_3O_2$ ($[M+H]^+$) 357.1097, Found 357.1093.



3s **7**, 93%

To an oven-dried Schlenk tube equipped with a stir bar was charged with **3s** (21 mg,

0.05 mmol) and Pd/C (2.1 mg, 10%). This tube was closed with a septum, evacuated, back-filled with H_2. Methanol (1 mL) was added. The mixture was stirred for 24 h at room temperature. Then the reaction mixture was filtered and concentrated to give the crude product, which was purified by column chromatography to give product **7** (19.6 mg, 93% yield).



(zba-003-47)

ethyl 3-(4-fluorophenethyl)-5-(trifluoromethyl)-[1,1'-biphenyl]-4-carboxylate (7)

Yield: 19.6 mg, 93%, yellow oil, R_f = 0.28 (petroleum ether/ethyl acetate, 20:1).

^{1}H NMR (500 MHz, $CDCl_3$) δ 7.74 (s, 1H), 7.49 – 7.45 (m, 5H), 7.42 – 7.40 (m, 1H), 7.13 – 7.11 (m, 2H), 7.00 – 6.96 (m, 2H), 4.44 (q, *J* = 7.1 Hz, 2H), 2.97 – 2.95 (m, 4H), 1.40 (t, *J* = 7.1 Hz, 3H).

^{13}C NMR (126 MHz, $CDCl_3$) δ 167.8, 161.6 (d, *J* = 243.8 Hz), 142.7, 140.4, 139.1, 136.7 (d, *J* = 3.4 Hz), 132.0, 130.6, 130.0 (d, *J* = 8.2 Hz), 129.2, 128.6, 128.4 (q, *J* = 32.0 Hz), 127.3, 123.8 (q, *J* = 274.6 Hz), 123.1 (q, *J* = 5.1 Hz), 115.4 (d, *J* = 21.4 Hz), 62.2, 36.9, 36.2, 14.1

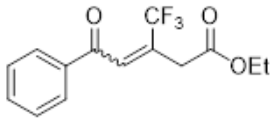
^{19}F NMR (377 MHz, $CDCl_3$) δ -59.4, -117.0.

IR (KBr) ν 3613, 1732, 1509, 1357, 1273, 1133, 1093, 1060, 760, 698.

HRMS (ESI) *m*/*z*: Calc. For $C_{24}H_{21}F_4O_2$ ($[M+H]^+$) 417.1472, Found 417.1468.

5. Reference

1. a) A. J. Arduengo Iii, R. Krafczyk, R. Schmutzler, H. A. Craig, J. R. Goerlich, W. J. Marshall, M. Unverzagt, *Tetrahedron*, **1999**, *55*, 14523. b) S. S. Sohn, E. L. Rosen, J. W. Bode, *J. Am. Chem. Soc.*, **2004**, *126*, 14370. c) C. Burstein, F. Glorius, *Angew. Chem.* **2004**, *116*, 6331; *Angew. Chem., Int. Ed.*, **2004**, *43*, 6205. d) J. W. Bode, S. S. Sohn, *J. Am. Chem. Soc.* **2007**, *129*, 13798.
2. P. Kwiatkowski, A. Cholewiak, A. Kasztelan, *Org. Lett.* **2014**, *16*, 5930.



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PROCNO                 1

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PLW12     0 W
PLW13     0 W

F2 - Processing parameters
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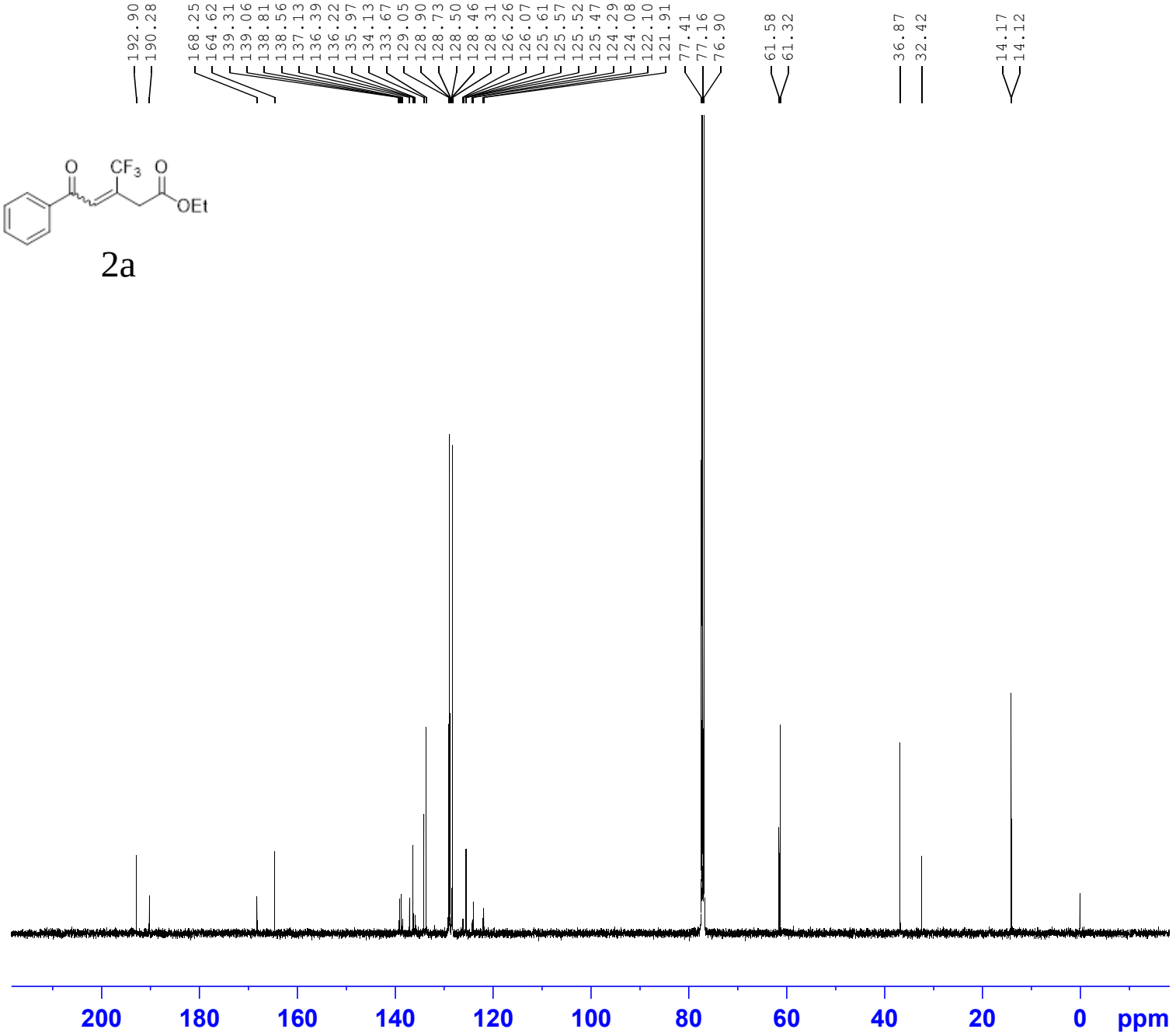


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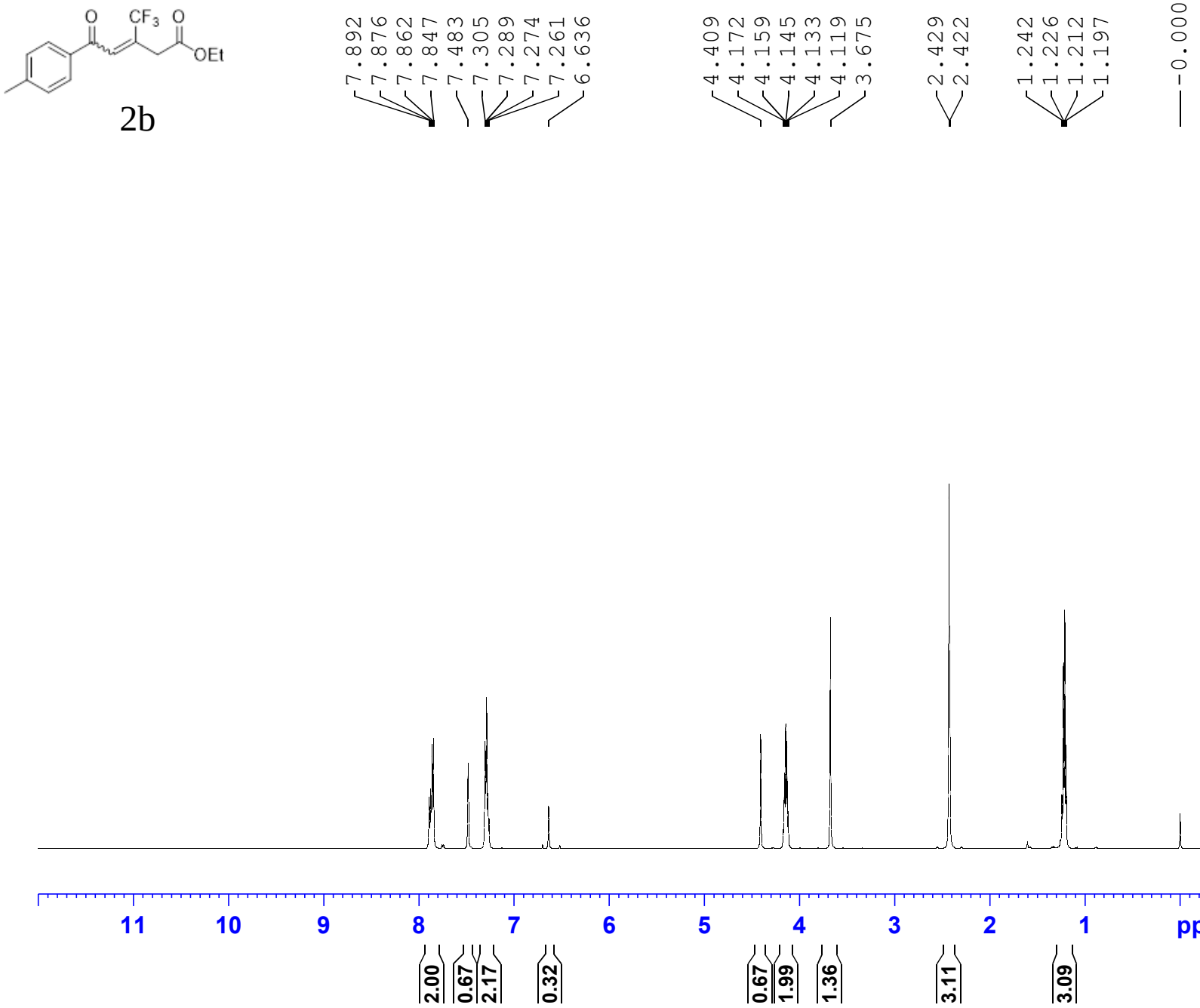


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PROCNO                 1

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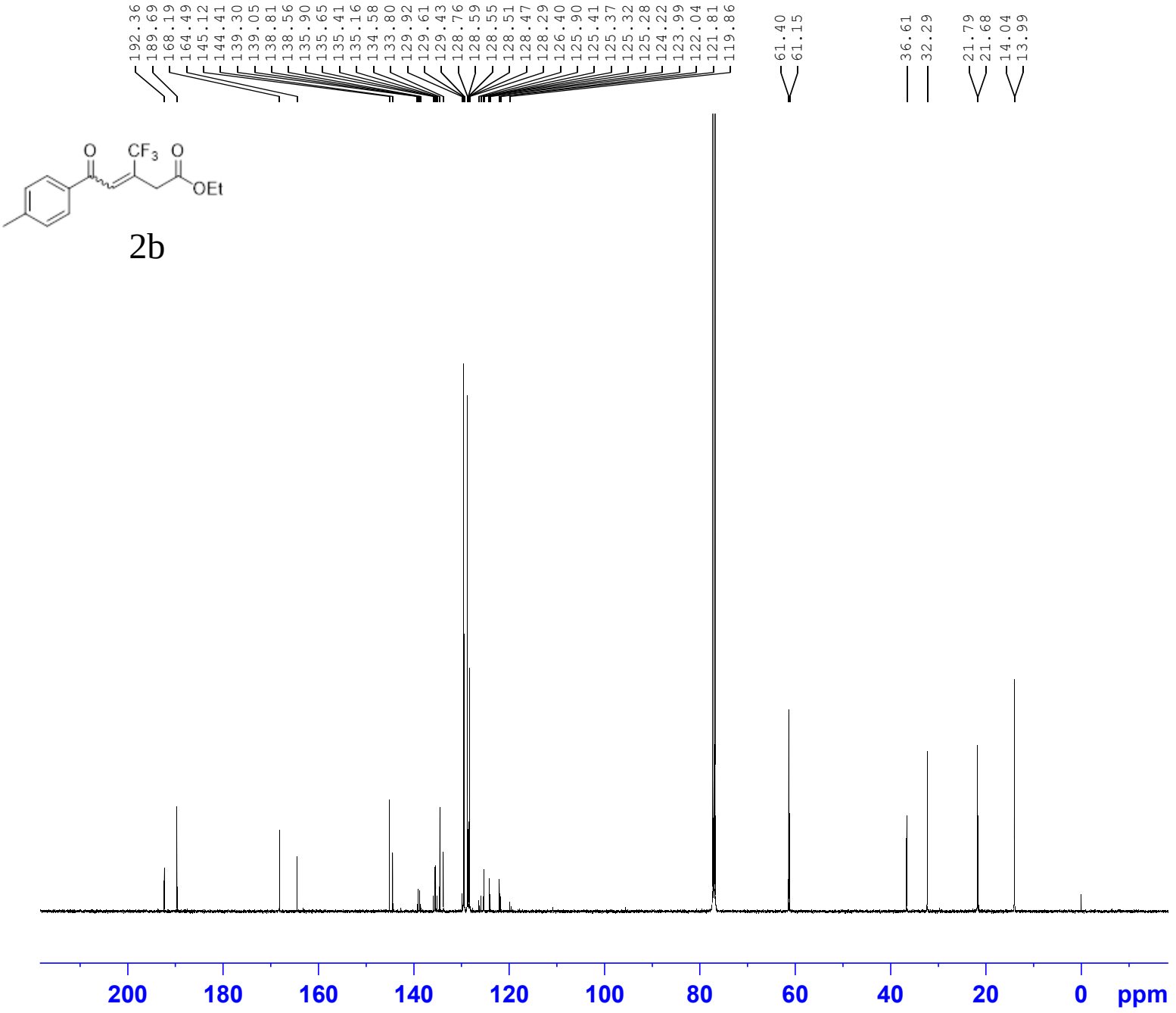


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NS                  666
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
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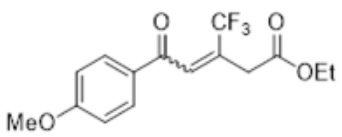

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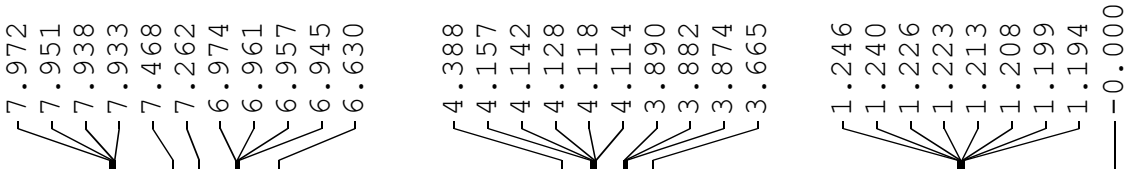

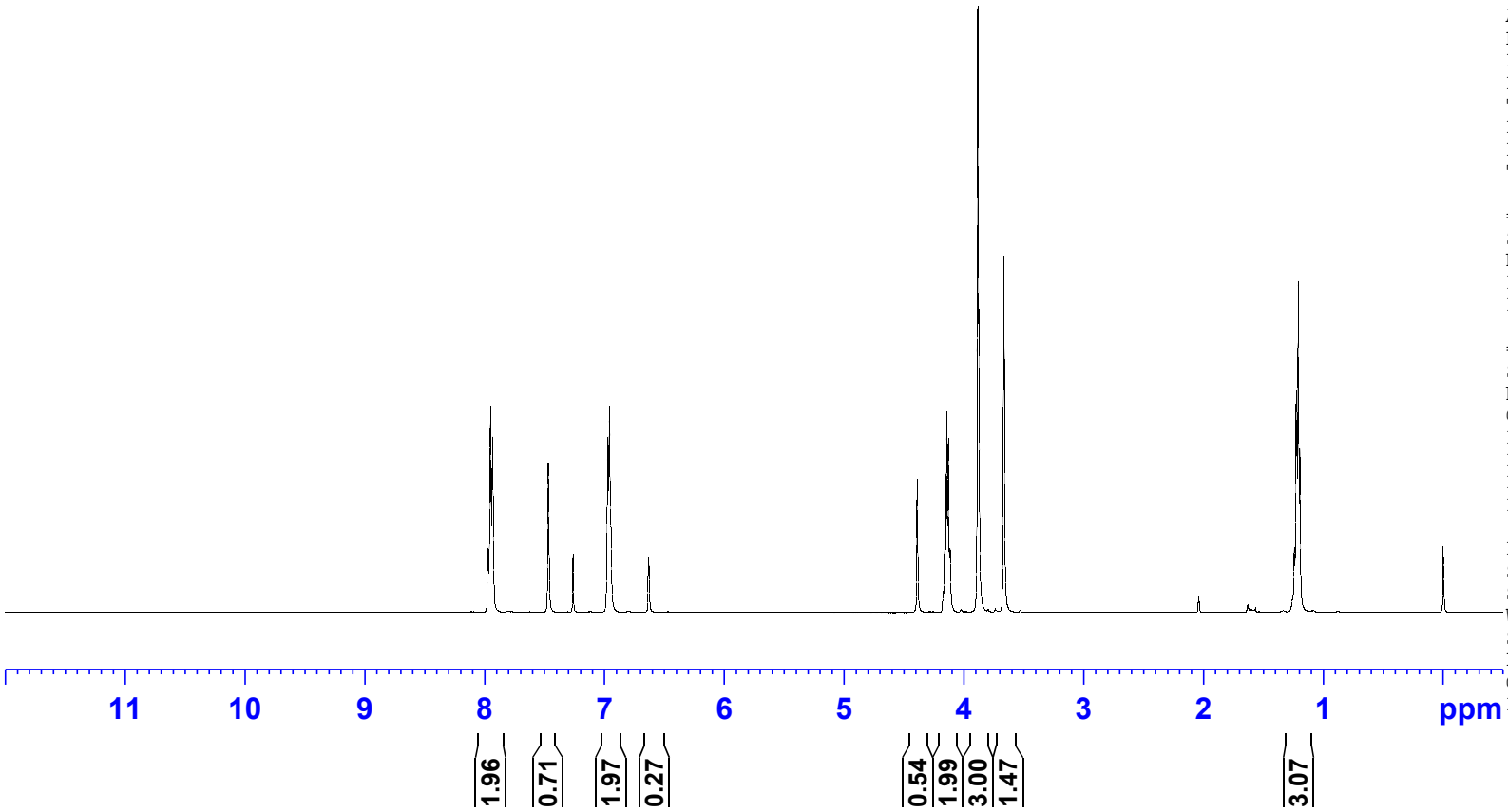


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PROCNO                 1

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D11      0 sec
TD0                    1

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NUC1                   1H
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NUC2                 off
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PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

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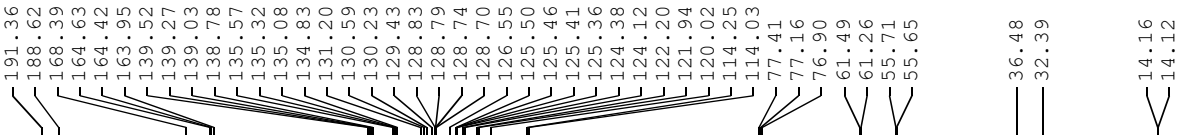

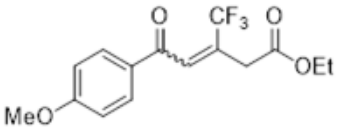

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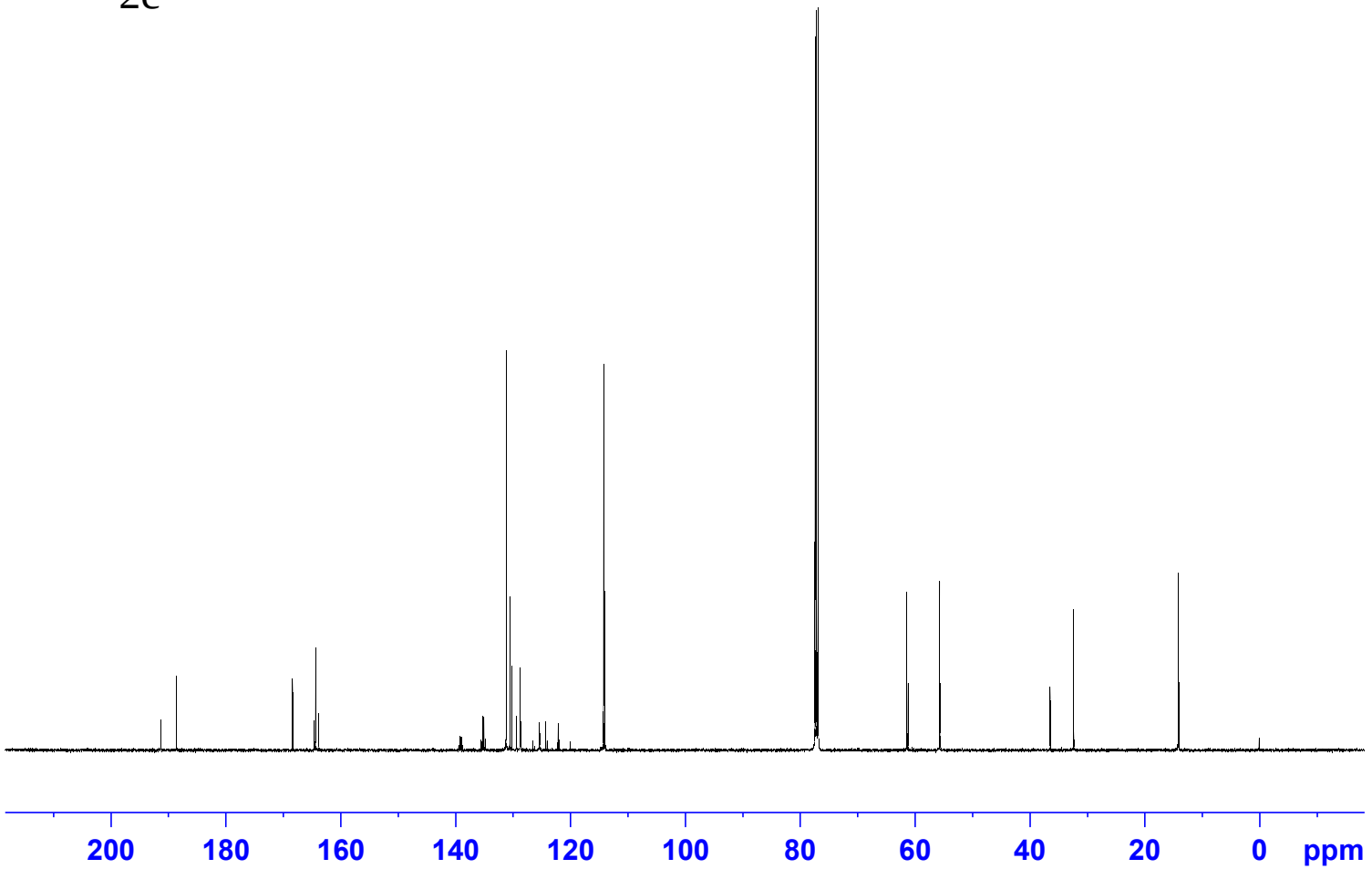


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NS                  666
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SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

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NUC1                13C
P1                9.80 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
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PLW12        0.35778001 W
PLW13        0.22898000 W

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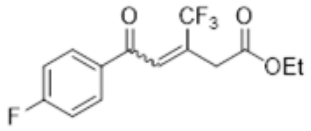

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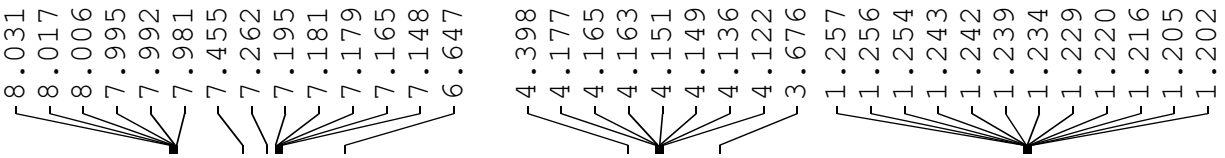
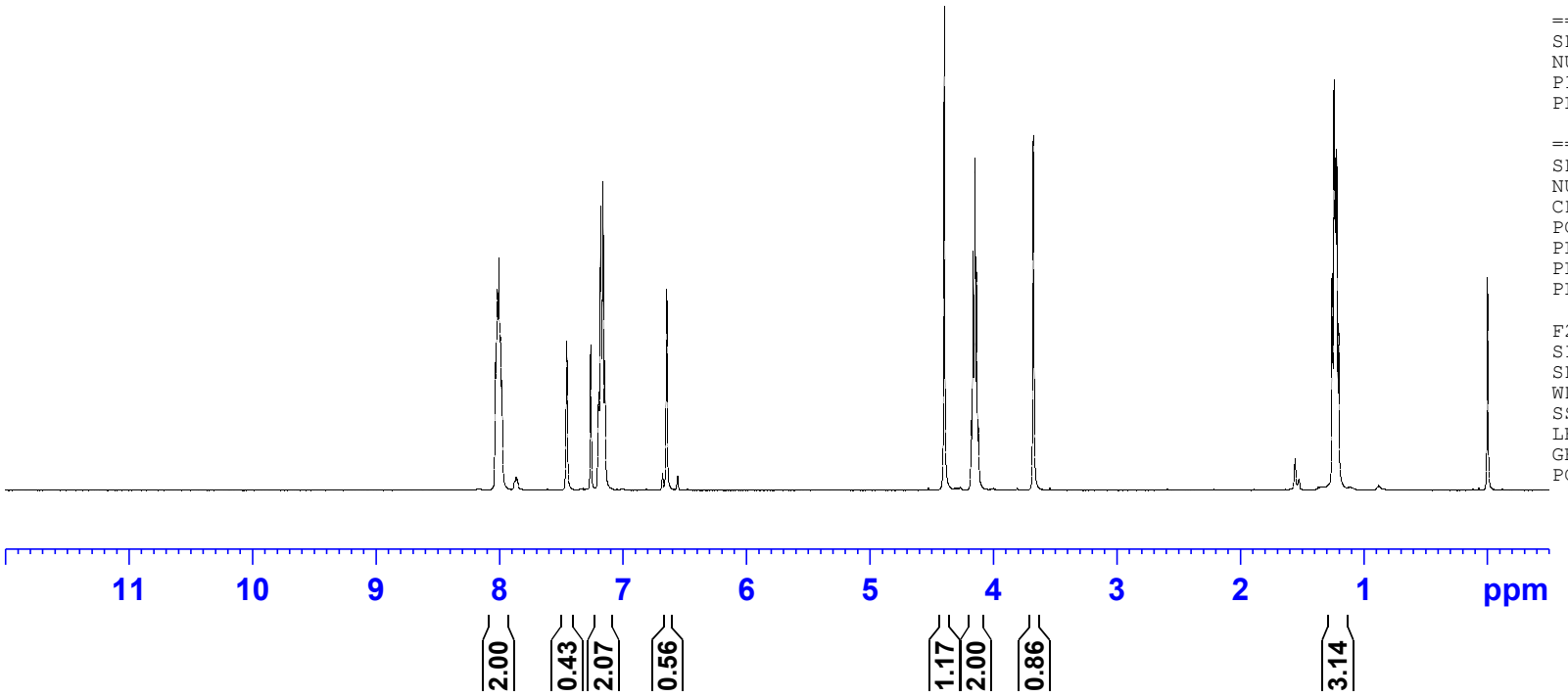




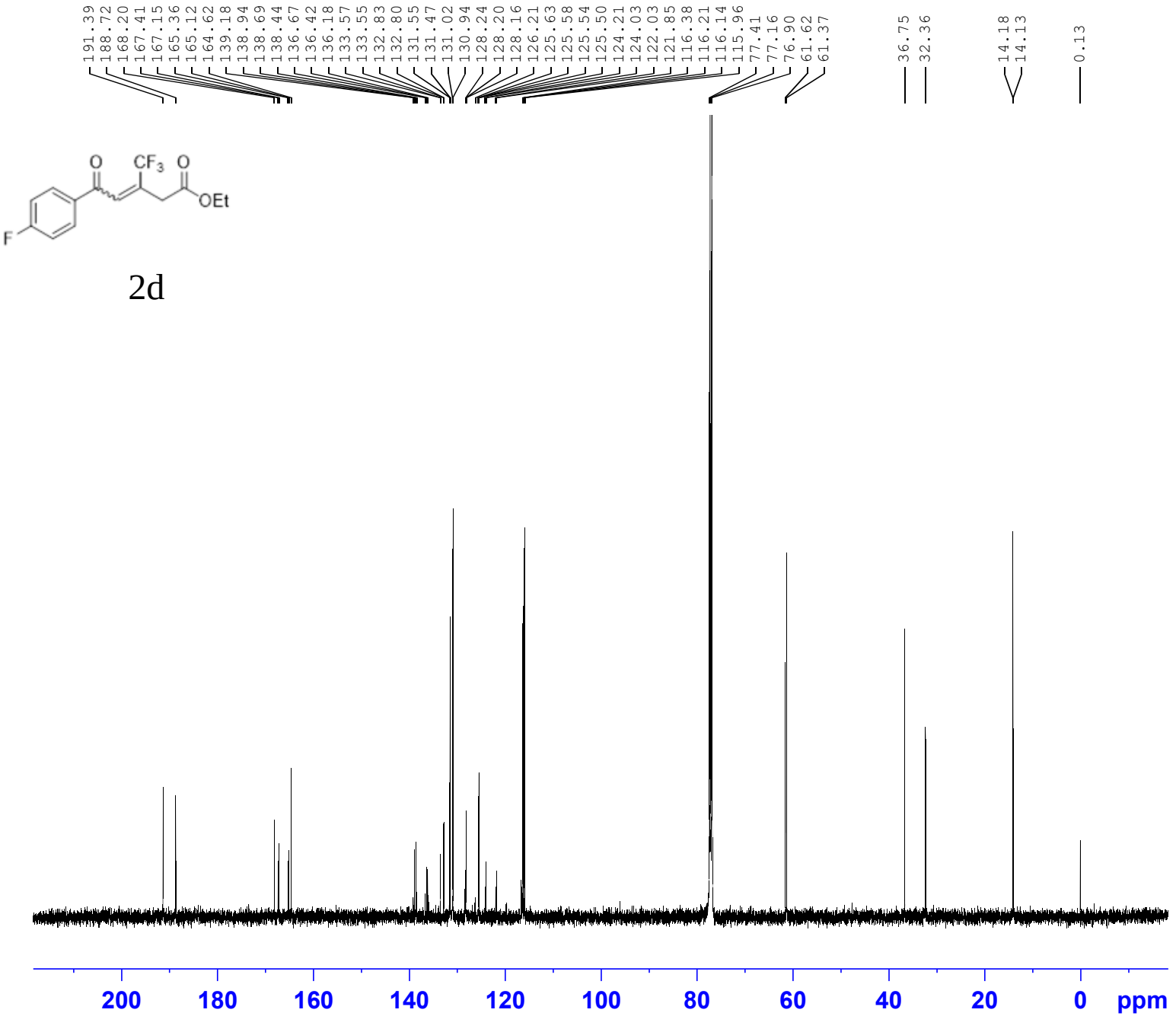

```
Current Data Parameters
NAME      zba-002-159-4-f-pu1105
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_           20211105
Time              23.41
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 69.95
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                10.59 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300106 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



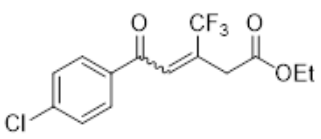

```
Current Data Parameters
NAME      zba-002-159-4-f-pu1105
EXPNO                          3
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211106
Time                    0.07
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     500
DS                       4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1            125.7703637 MHz
NUC1                    13C
P1                     9.80 usec
PLW1            57.00000000 W

======== CHANNEL f2 ========
SFO2            500.1320005 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                  80.00 usec
PLW2            20.00000000 W
PLW12            0.35778001 W
PLW13            0.22898000 W

F2 - Processing parameters
SI                     32768
SF              125.7577711 MHz
WDW                       EM
SSB          0
LB                     1.00 Hz
GB           0
PC                     1.40
```



2e

7.938
7.921
7.908
7.891
7.494
7.478
7.462
7.447
7.262
6.647
4.388
4.164
4.151
4.150
4.138
3.680
1.257
1.242
1.237
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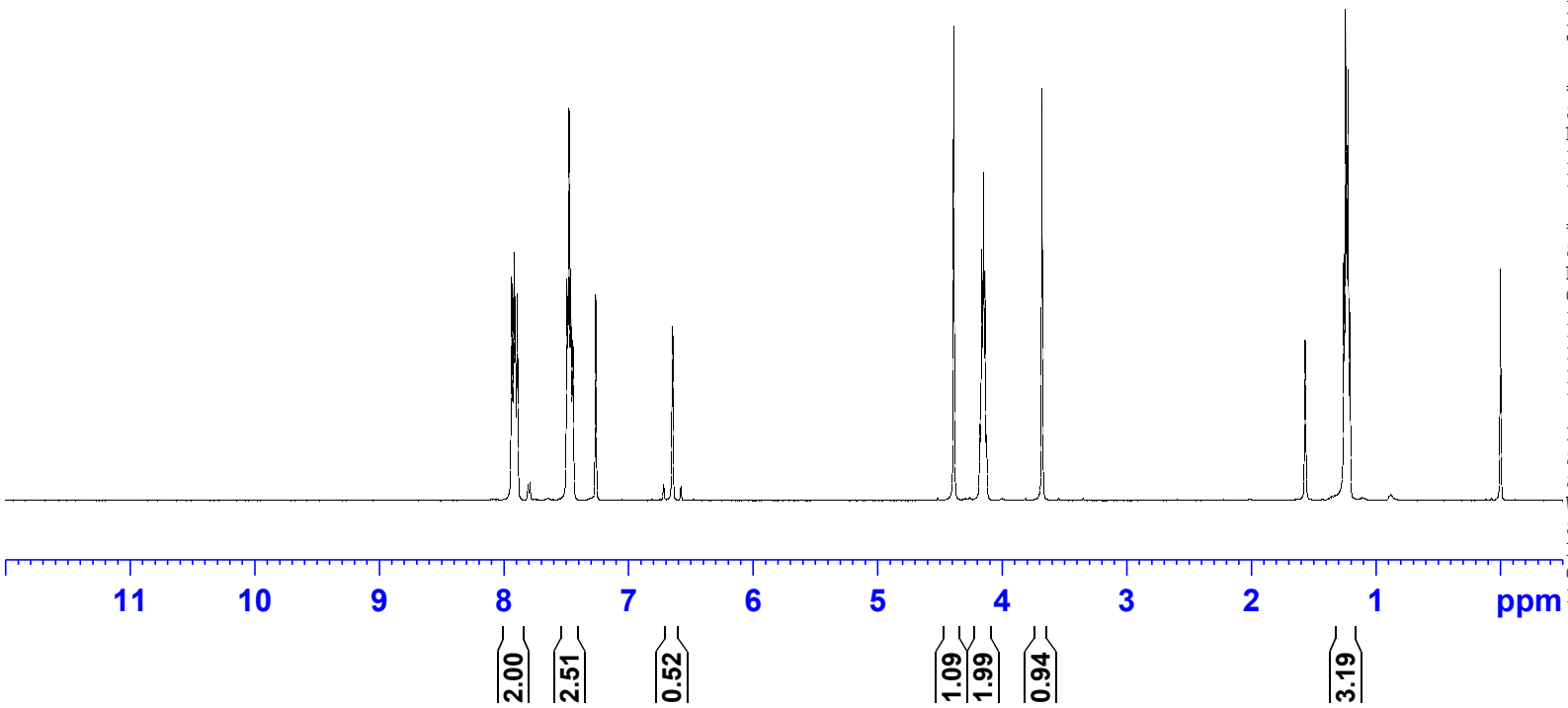
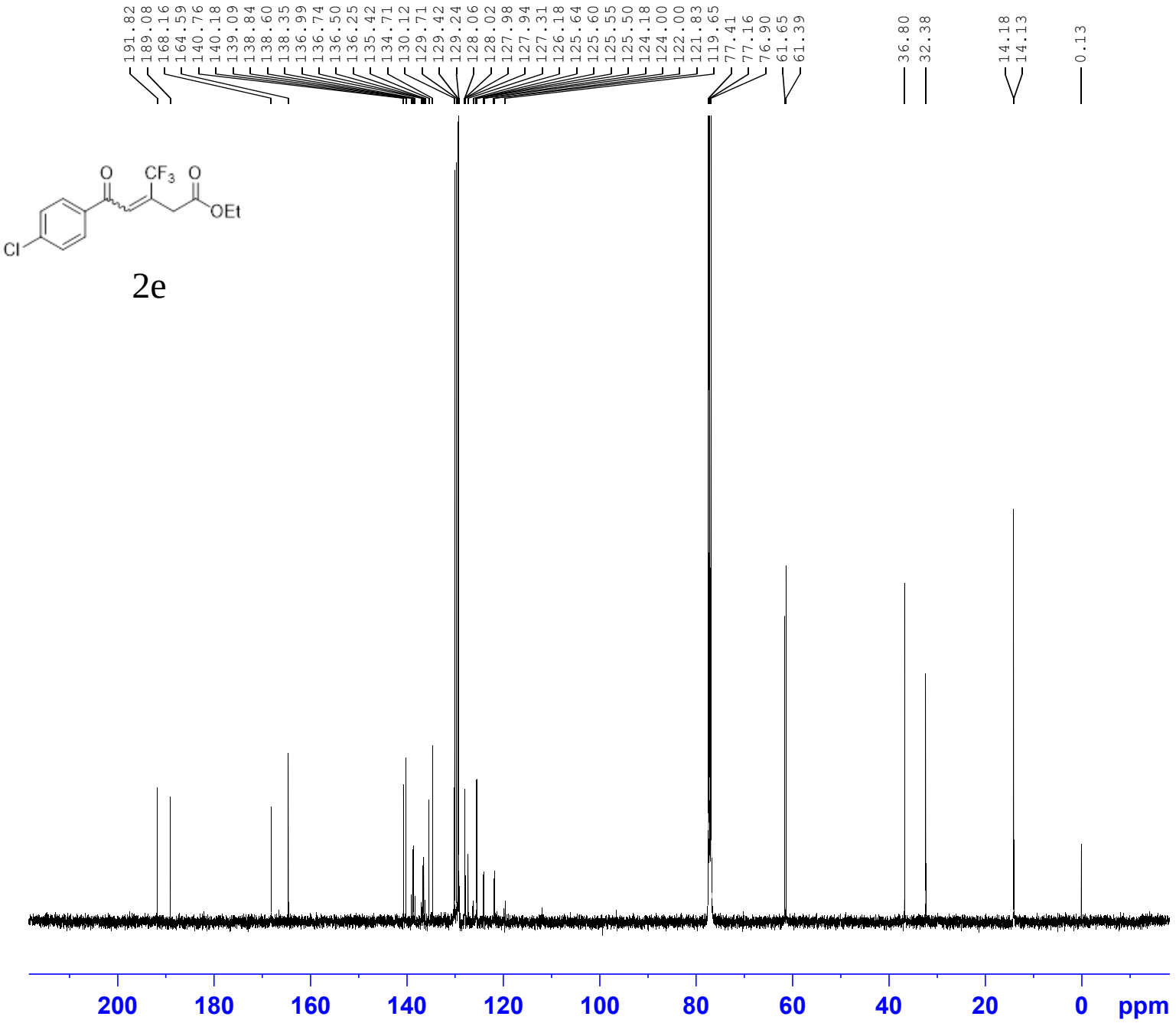
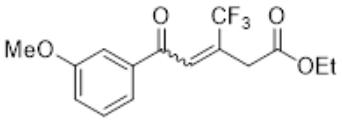
1.222
1.208
0.000



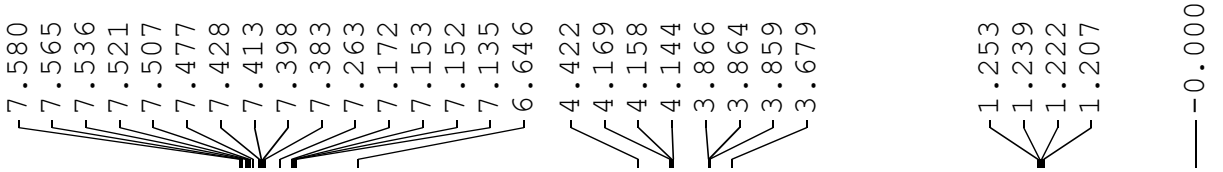

```
Current Data Parameters
NAME      zba-002-155-0707
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_             20230707
Time                 9.51
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH            10000.000 Hz
FIDRES          0.152588 Hz
AQ             3.2767999 sec
RG                  77.18
DW                 50.000 usec
DE                  6.50 usec
TE                 298.0 K
D1           1.00000000 sec
D11      0 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 11.85 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF           500.1300114 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

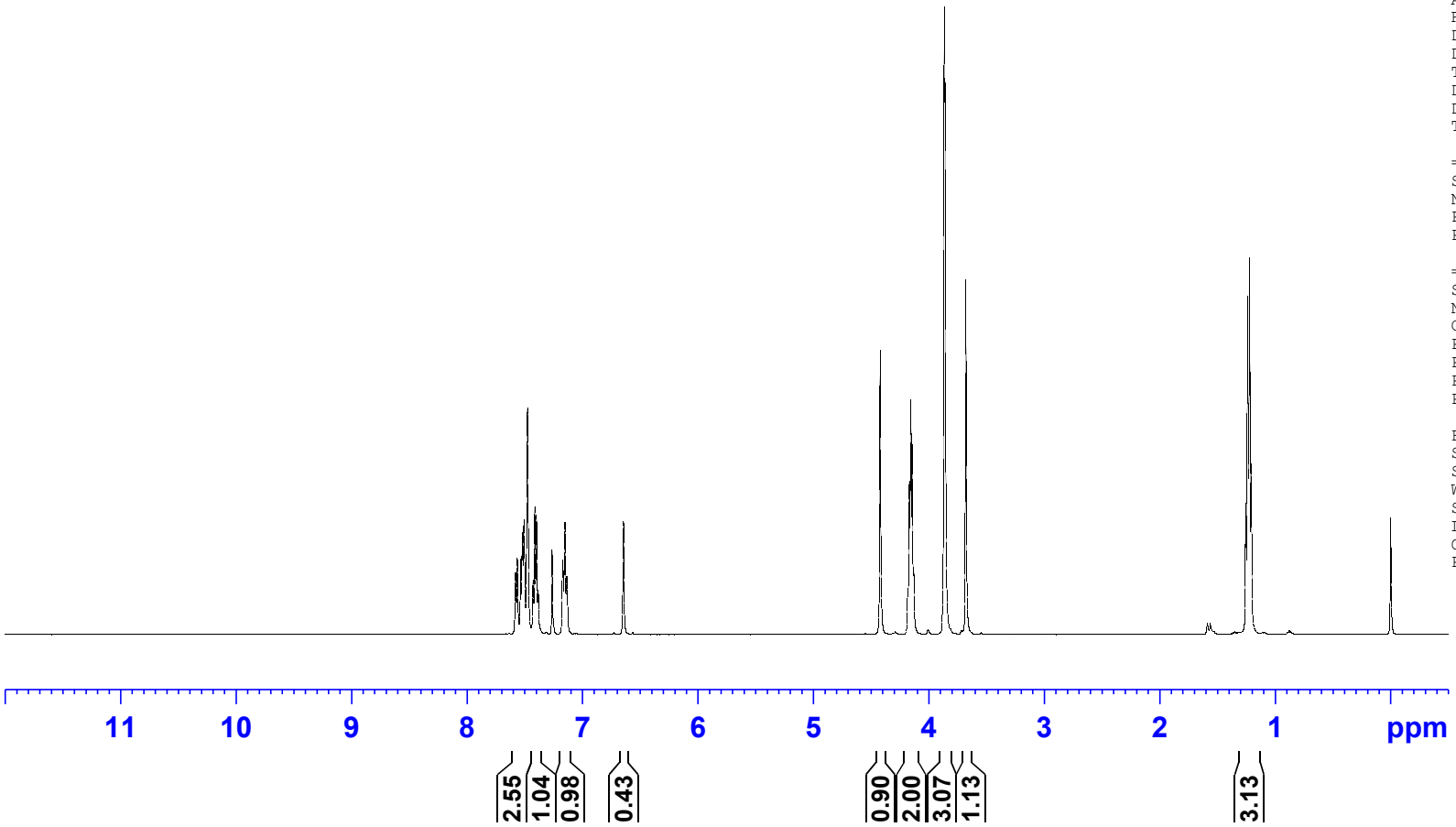



```
Current Data Parameters
NAME      zba-002-155-0707
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_             20230707
Time                 10.33
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   800
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                 192.89
DW                16.800 usec
DE                18.00 usec
TE                298.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                 10.75 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         20.00000000 W
PLW12         0.43882000 W
PLW13         0.28084999 W

F2 - Processing parameters
SI                 32768
SF           125.7577719 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

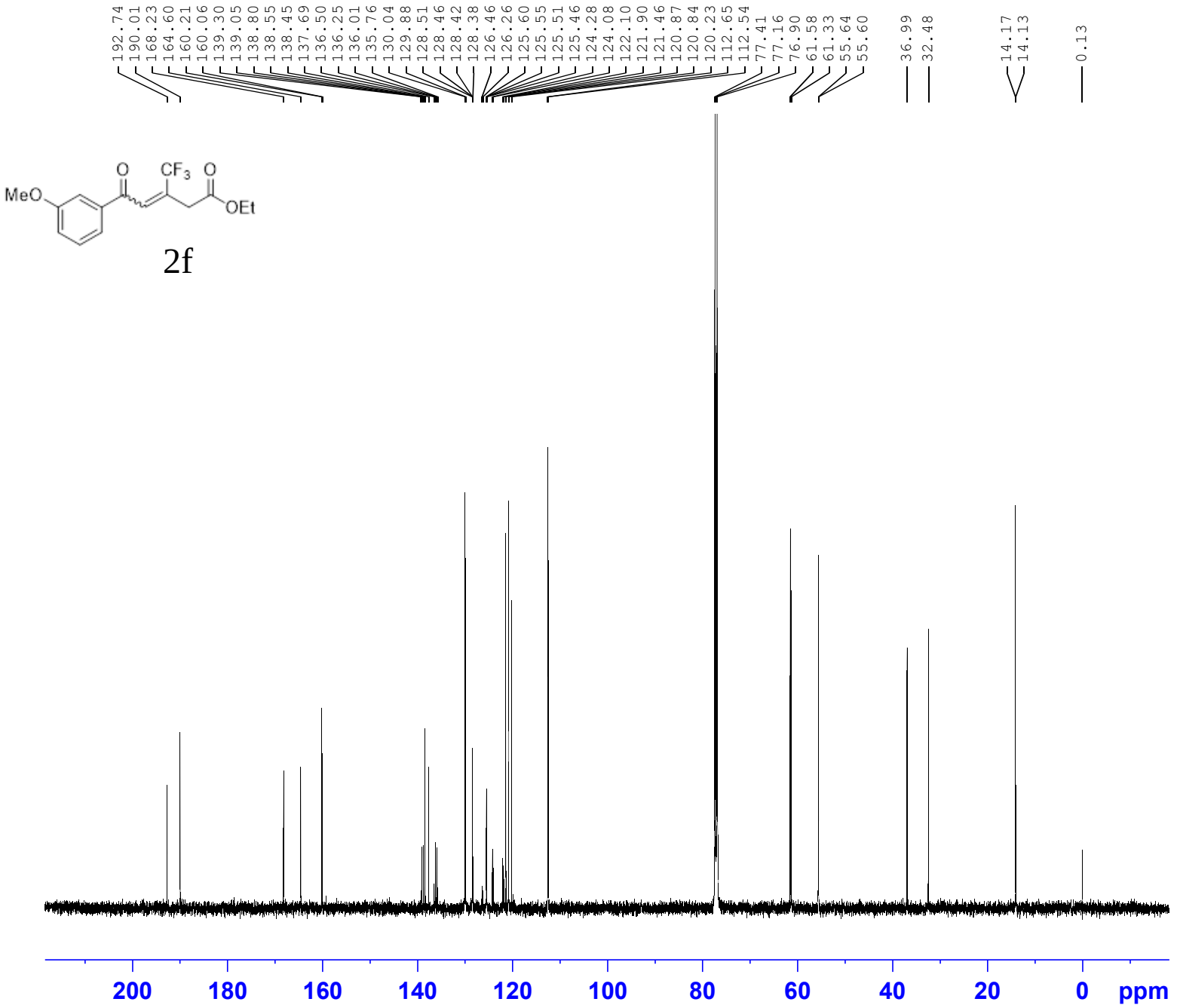


2f

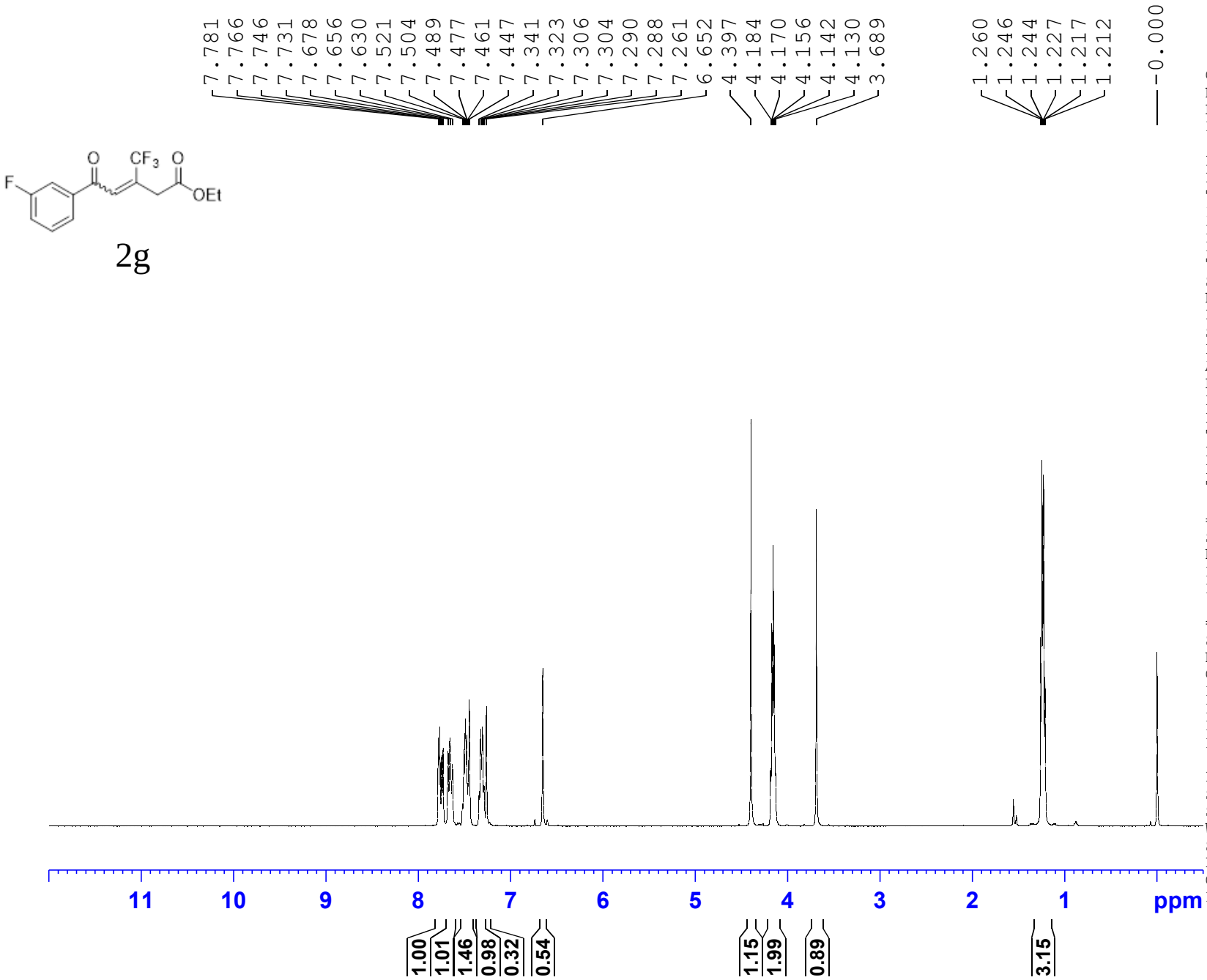




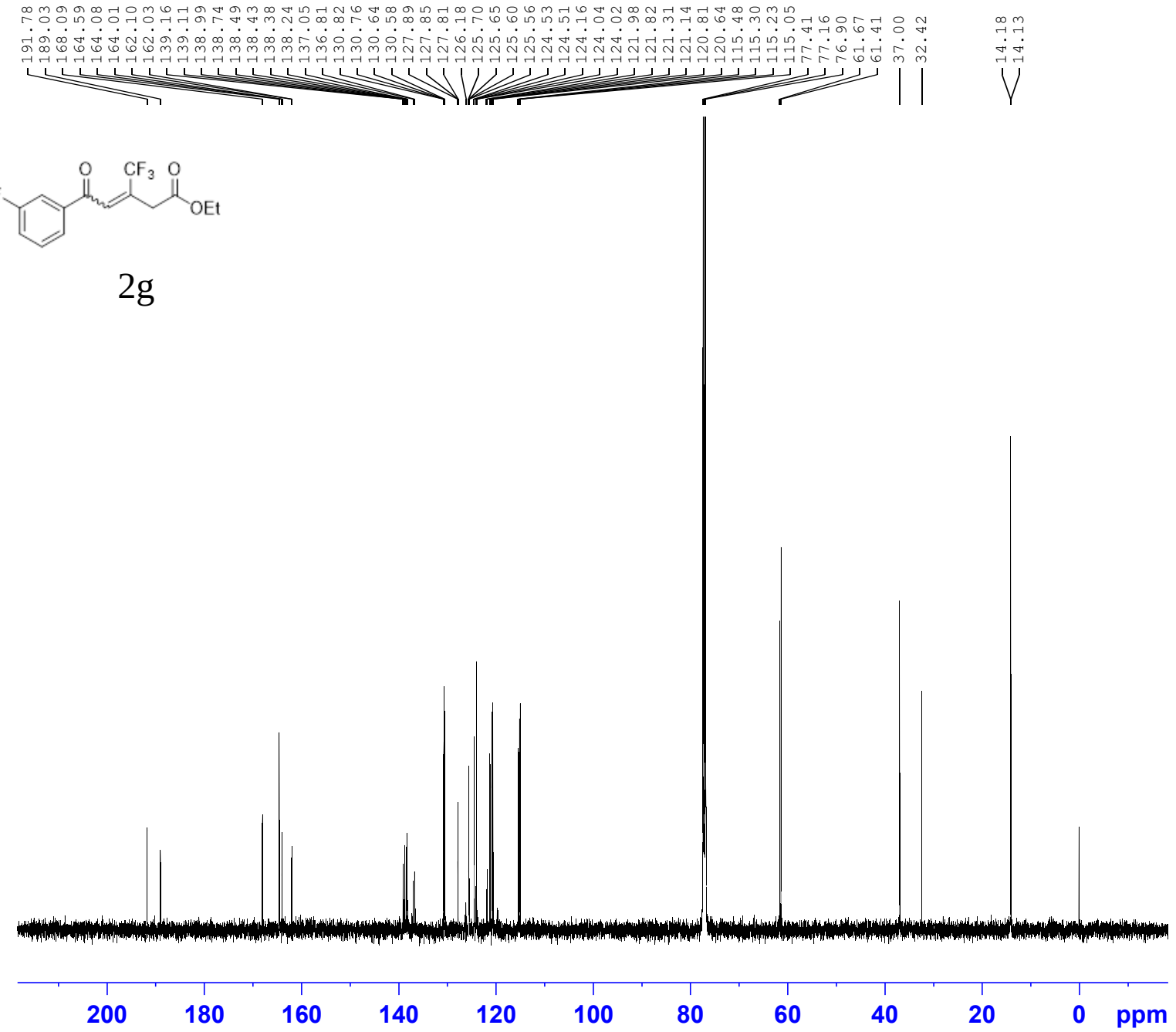

```
Current Data Parameters
NAME      zba-002-161-3-ome-pu1105
EXPNO                            3
PROCNO                           1

F2 - Acquisition Parameters
Date_                     20211106
Time                          0.11
INSTRUM                      spect
PROBHD    5 mm CPPBBO BB
PULPROG                       zg30
TD                           65536
SOLVENT                     CDCl3
NS                              16
DS                               2
SWH                     10000.000 Hz
FIDRES                   0.152588 Hz
AQ                       3.2767999 sec
RG                           62.06
DW                          50.000 usec
DE                           6.50 usec
TE                          298.2 K
D1                    1.00000000 sec
D11       0 sec
TD0                              1

======== CHANNEL f1 ========
SFO1                500.1330885 MHz
NUC1                           1H
P1                          10.59 usec
PLW1                20.00000000 W

======== CHANNEL f2 ========
SFO2                500.1330885 MHz
NUC2                          off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                           65536
SF                  500.1300096 MHz
WDW                             EM
SSB       0
LB                           0.30 Hz
GB        0
PC                           1.00
```



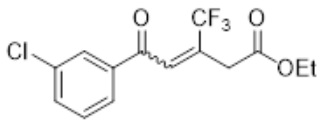

```
Current Data Parameters
NAME      zba-002-161-3-ome-pu1105
EXPNO                  4
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211106
Time               0.38
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  500
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE                18.00 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                 9.80 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.35778001 W
PLW13        0.22898000 W

F2 - Processing parameters
SI                 32768
SF          125.7577711 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



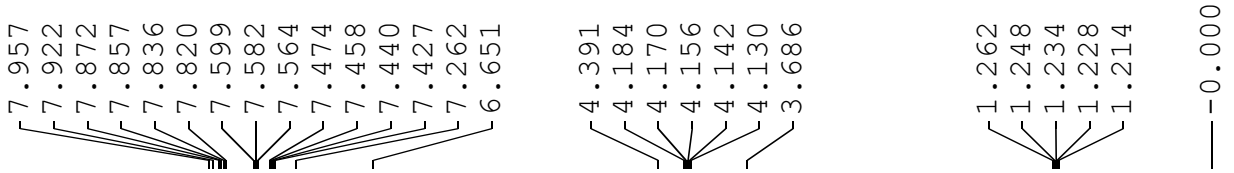

```
Current Data Parameters
NAME      zba-002-163-3-f
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211109
Time                4.27
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 62.06
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300105 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

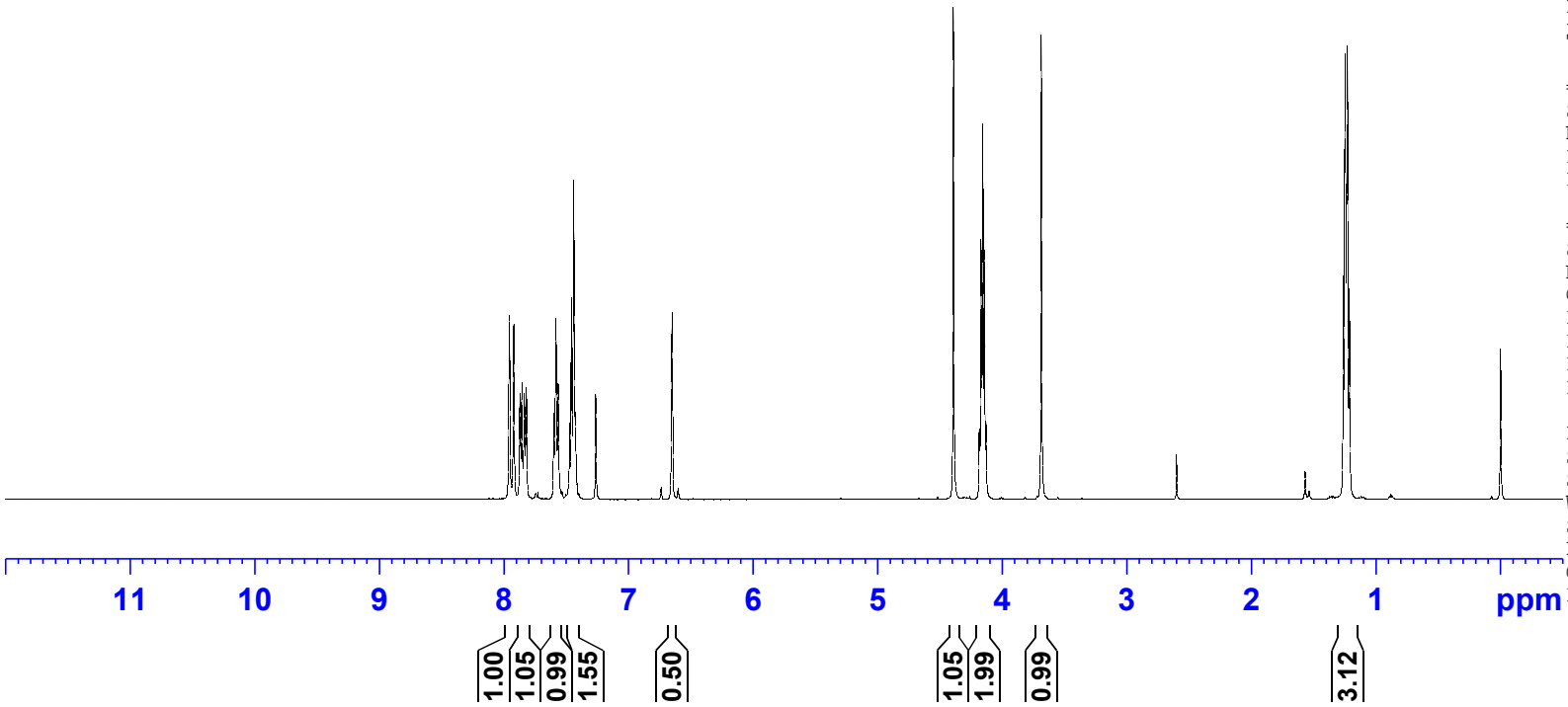



```
Current Data Parameters
NAME      zba-002-163-3-f
EXPNO                   2
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211109
Time               4.54
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  500
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                 9.80 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2        20.00000000 W
PLW12        0.35778001 W
PLW13        0.22898000 W

F2 - Processing parameters
SI                 32768
SF           125.7577705 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

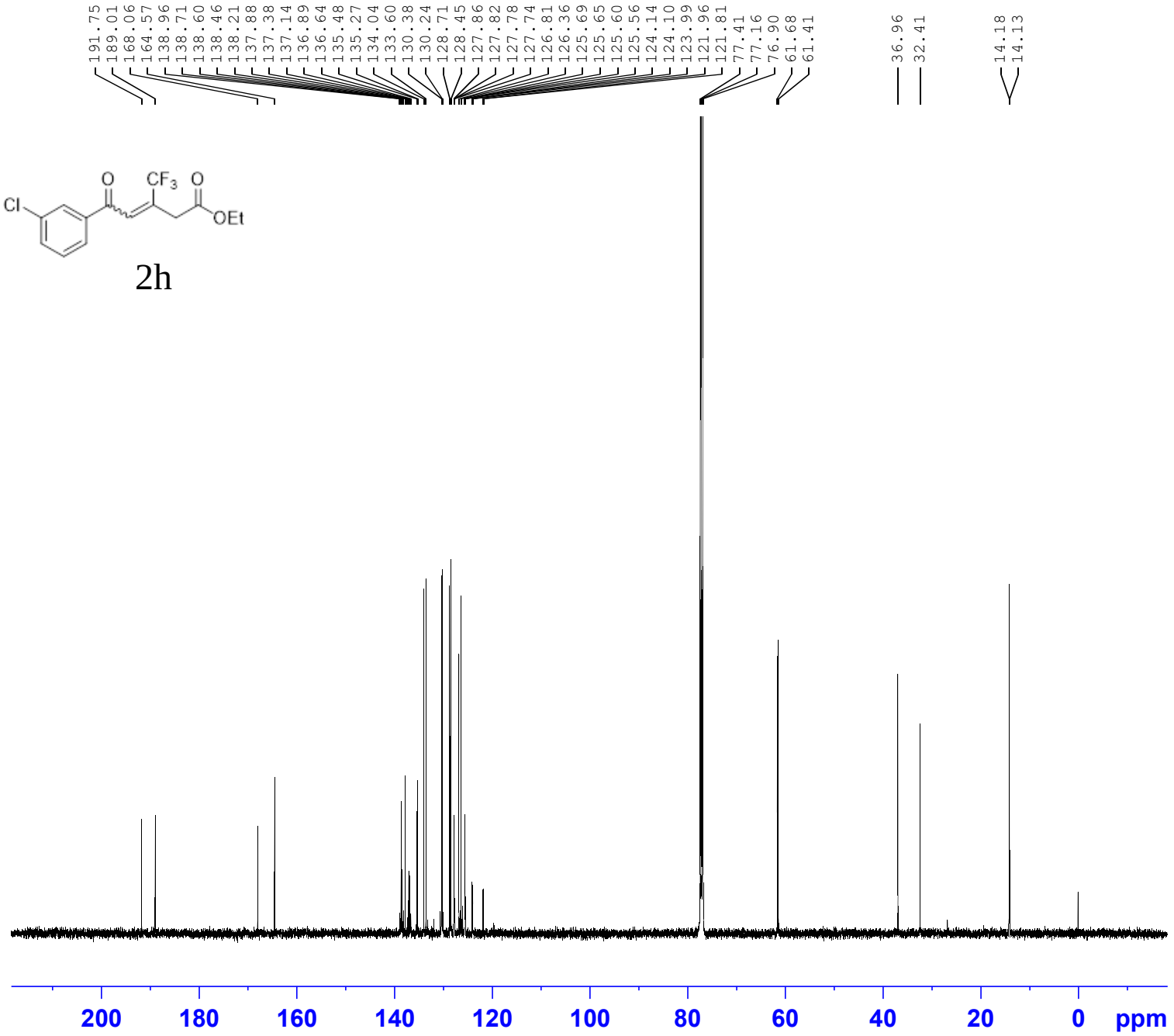


2h

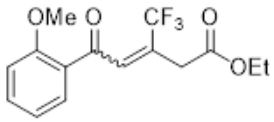





```
Current Data Parameters
NAME      zba-002-160-3-cl
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_             20211109
Time                 3.56
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH            10000.000 Hz
FIDRES          0.152588 Hz
AQ             3.2767999 sec
RG                  62.06
DW                 50.000 usec
DE                  6.50 usec
TE                 298.2 K
D1           1.00000000 sec
D11       0 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                  10.59 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF           500.1300094 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

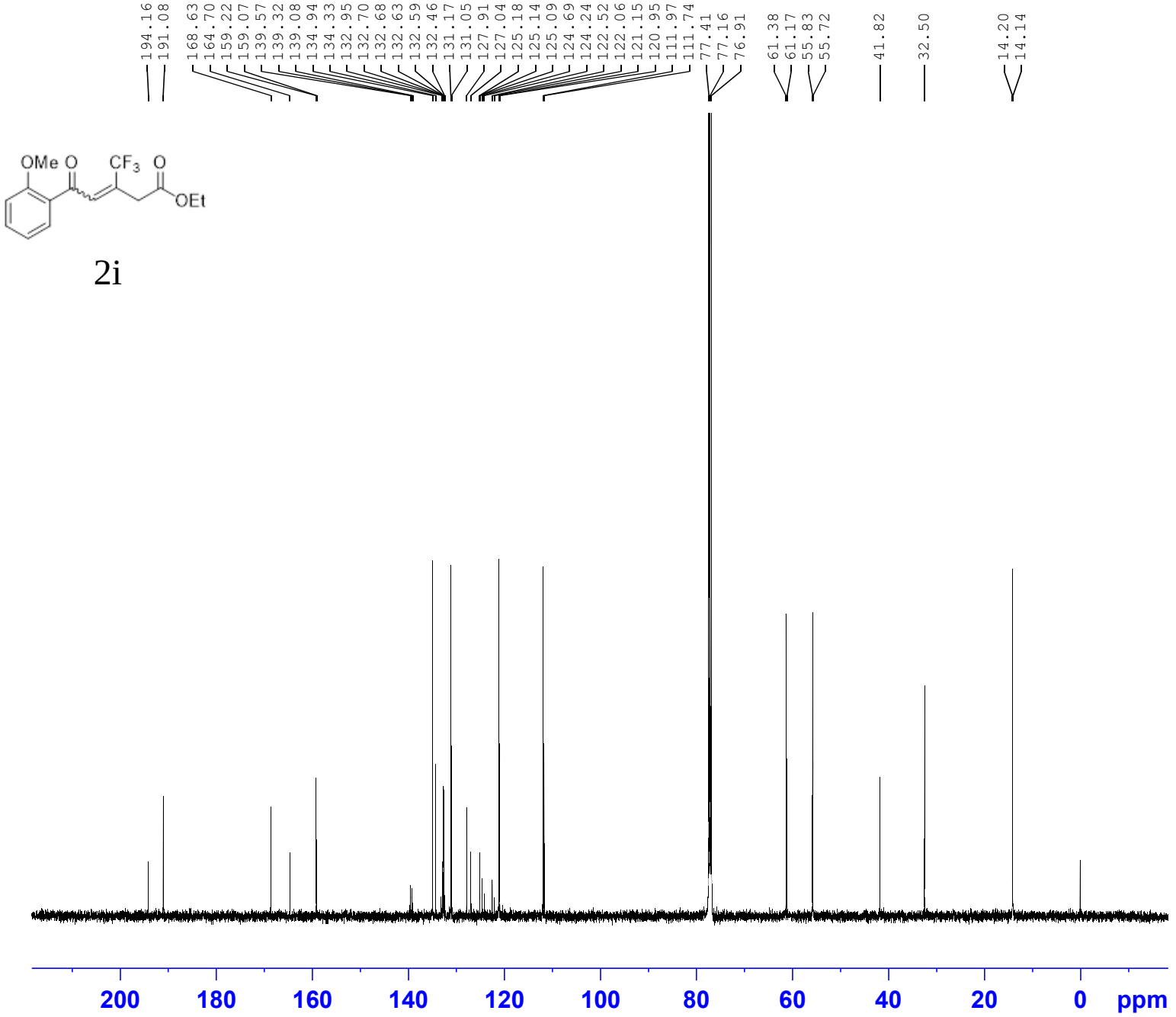



```
Current Data Parameters
NAME      zba-002-160-3-cl
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211109
Time               4.23
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  500
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1               13C
P1                9.80 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2               1H
CPDPRG[2        waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.35778001 W
PLW13        0.22898000 W

F2 - Processing parameters
SI                32768
SF          125.7577711 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

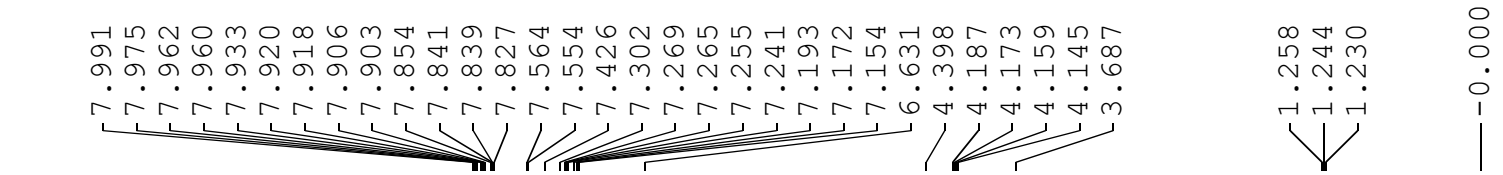


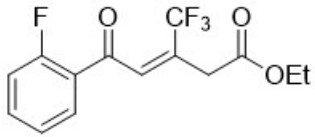
2i


```
Current Data Parameters
NAME      zba-002-177-2ome-0713
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20230713
Time                  12.28
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    69.95
DW                  50.000 usec
DE                   6.50 usec
TE                   298.0 K
D1             1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                     1H
P1                   11.85 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                    off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF               500.1300118 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

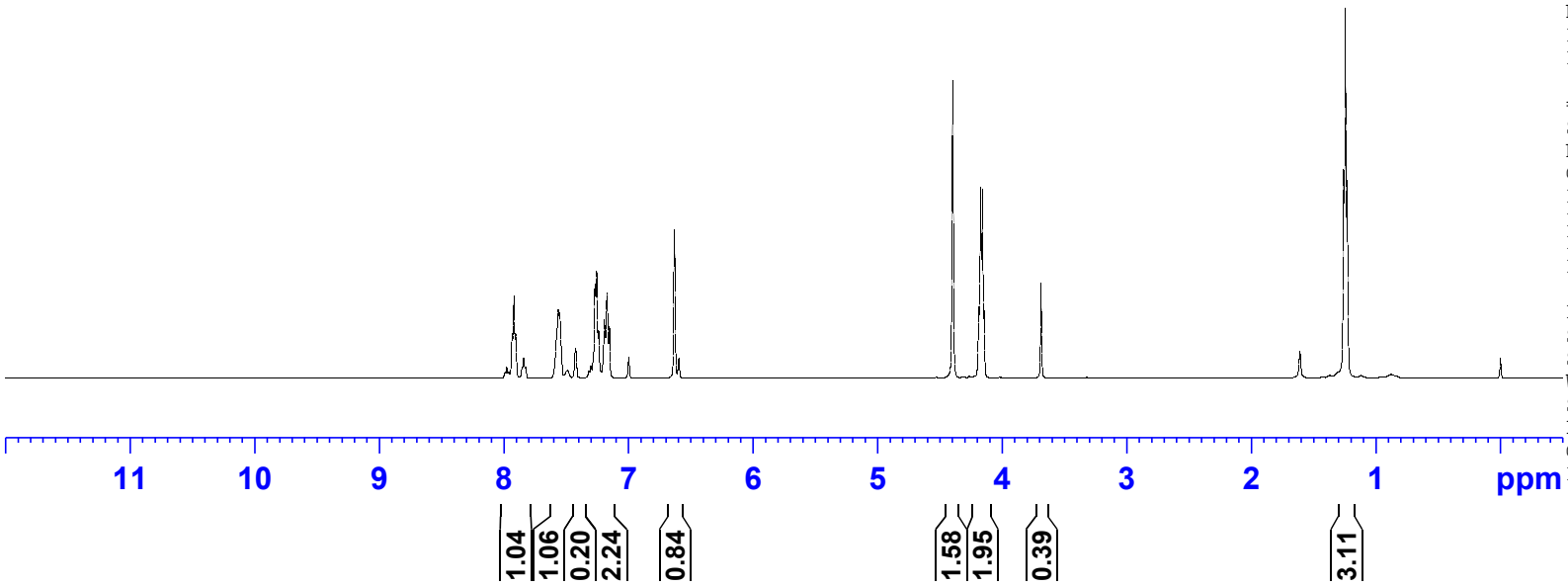



```
Current Data Parameters
NAME      zba-002-177-2ome-0713
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20230713
Time                  12.55
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     500
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.0 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                   10.75 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.43882000 W
PLW13           0.28084999 W

F2 - Processing parameters
SI                   32768
SF             125.7577717 MHz
WDW                     EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

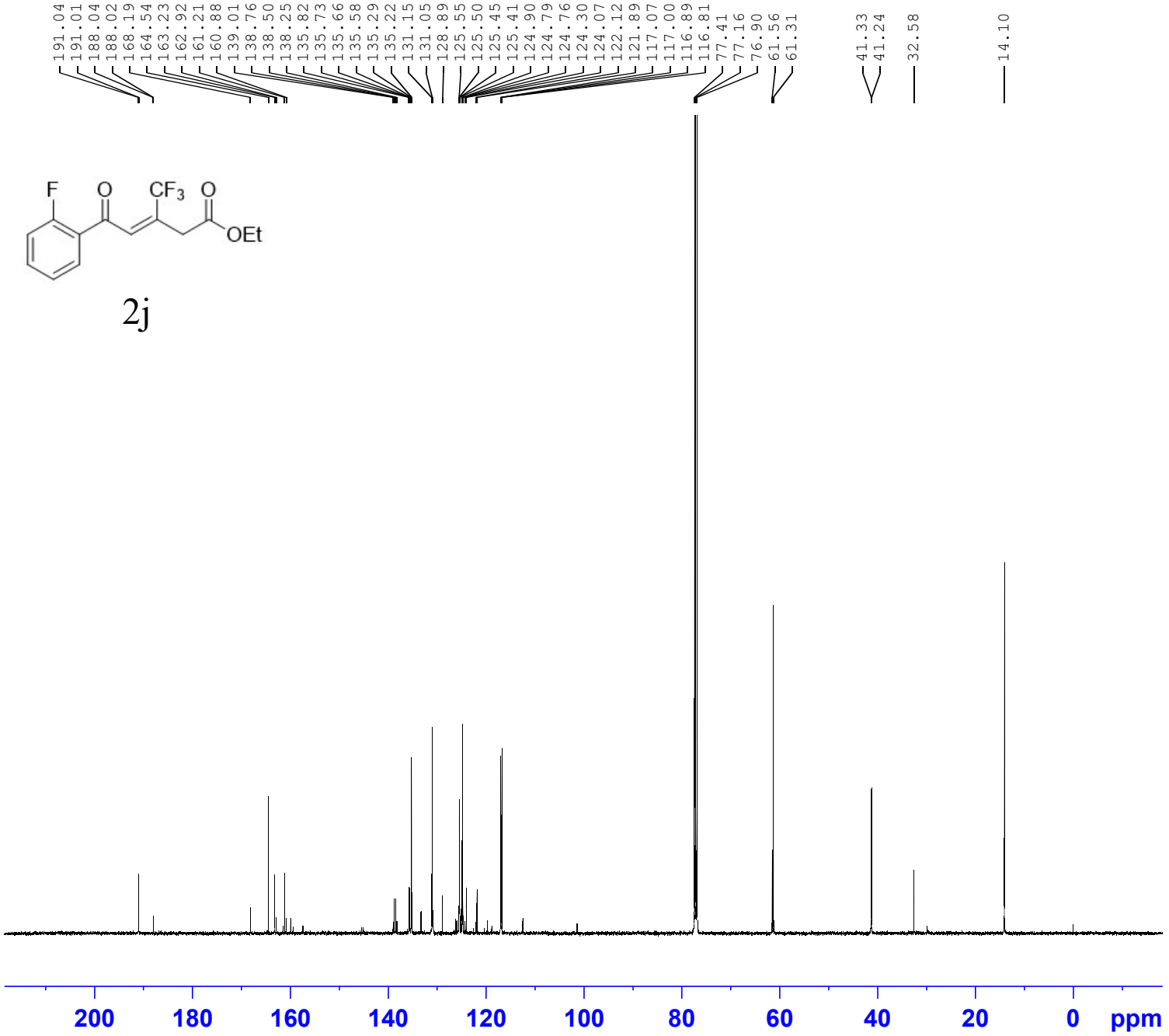




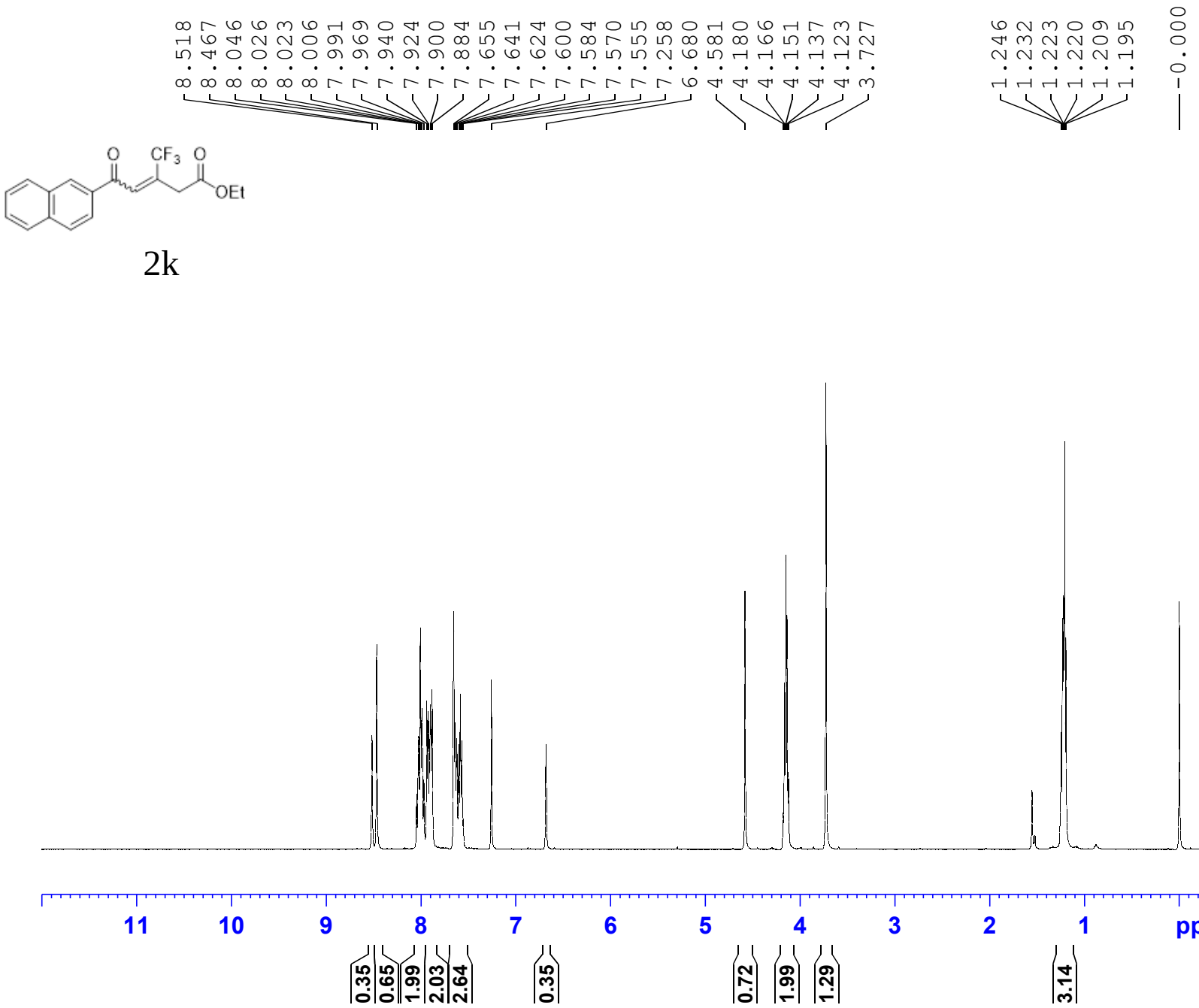
2j

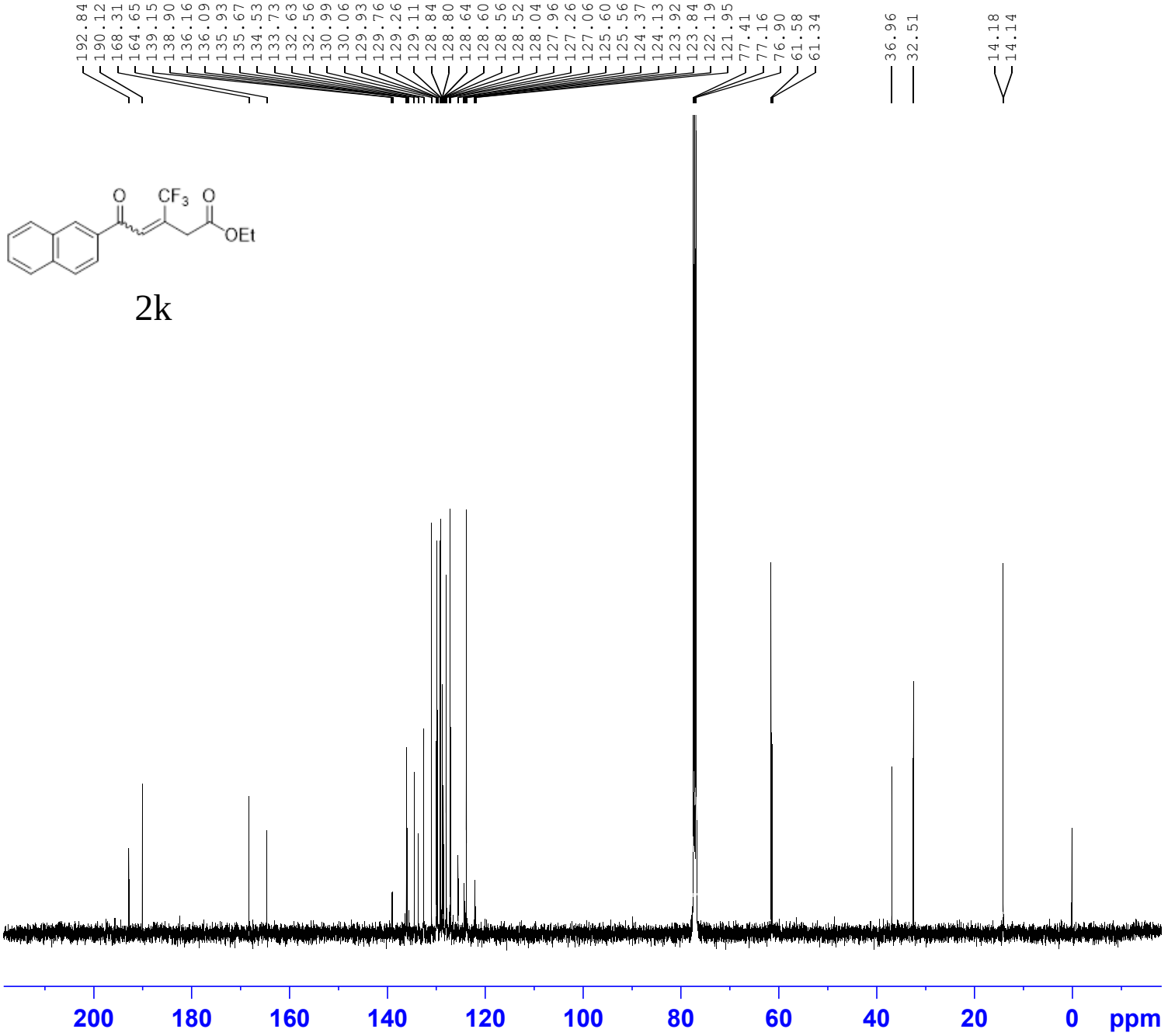



```
Current Data Parameters
NAME      zba-002-173-0816
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230816
Time              15.57
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                55.37
DW               50.000 usec
DE                6.50 usec
TE                298.8 K
D1          1.00000000 sec
D11       0 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                  1H
P1                11.85 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                 off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                65536
SF          500.1300094 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

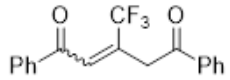



```
Current Data Parameters
NAME      zba-002-173-0816
EXPNO                    4
PROCNO                   1

F2 - Acquisition Parameters
Date_             20230816
Time                 16.41
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     500
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.5 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                   10.75 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.43882000 W
PLW13           0.28084999 W

F2 - Processing parameters
SI                   32768
SF             125.7577718 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```


8.518
8.467
8.046
8.026
8.023
8.006
7.991
7.969
7.940
7.924
7.900
7.884
7.655
7.641
7.624
7.600
7.584
7.570
7.555
7.258
6.680
4.581
4.180
4.166
4.151
4.137
4.123
3.727
1.246
1.232
1.223
1.220
1.209
1.195
0.000
O
CF3
O
OEt
2k
Current Data Parameters
NAME zba-002-162-nap-1106
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20211106
Time 23.04
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 77.18
DW 50.000 usec
DE 6.50 usec
TE 298.2 K
D1 1.00000000 sec
D11 0 sec
TD0 1
======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 10.59 usec
PLW1 20.00000000 W
======== CHANNEL f2 ========
SFO2 500.1330885 MHz
NUC2 off
CPDPRG[2
PCPD2 0 usec
PLW2 0 W
PLW12 0 W
PLW13 0 W
F2 - Processing parameters
SI 65536
SF 500.1300122 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
11
10
9
8
7
6
5
4
3
2
1
ppm
0.35
0.65
1.99
2.03
2.64
0.35
0.72
1.99
1.29
3.14




```
Current Data Parameters
NAME      zba-002-162-nap-1106
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211106
Time                  23.31
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      500
DS                        4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1            125.7703637 MHz
NUC1                    13C
P1                     9.80 usec
PLW1            57.00000000 W

======== CHANNEL f2 ========
SFO2            500.1320005 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                  80.00 usec
PLW2            20.00000000 W
PLW12            0.35778001 W
PLW13            0.22898000 W

F2 - Processing parameters
SI                      32768
SF              125.7577715 MHz
WDW                        EM
SSB          0
LB                     1.00 Hz
GB           0
PC                     1.40
```

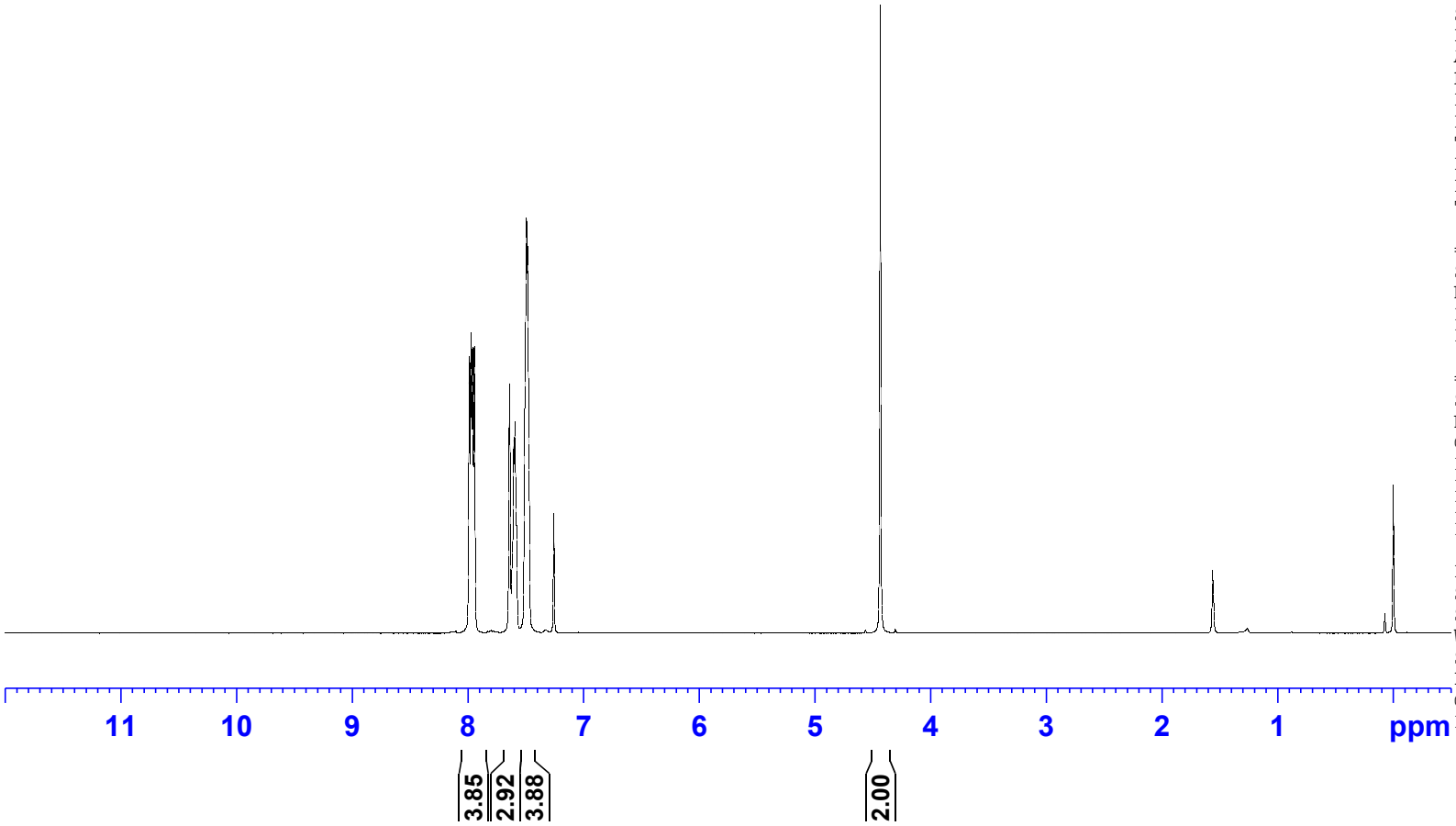


2l

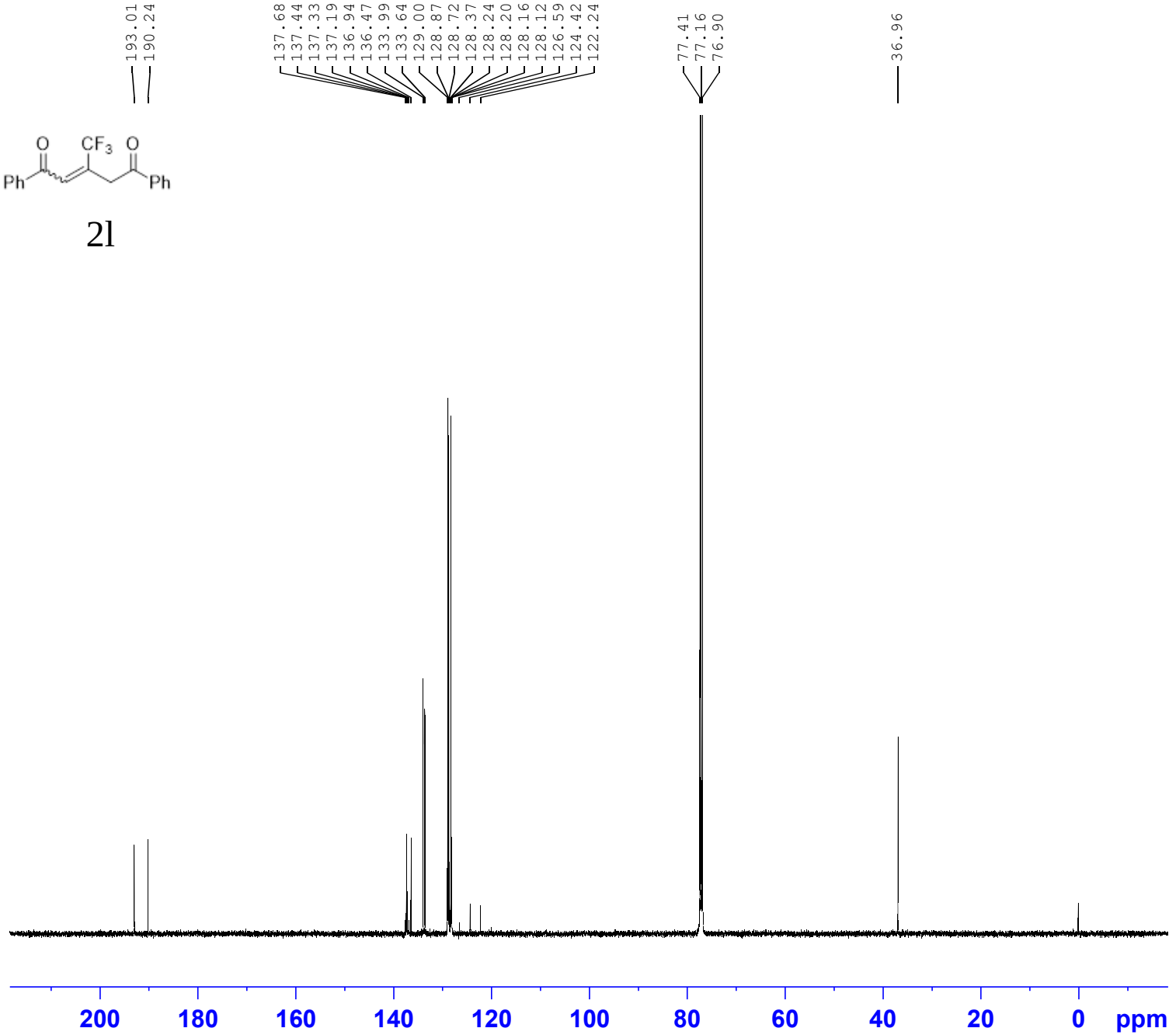
7.989
7.974
7.960
7.945
7.640
7.604
7.593
7.580
7.494
7.485
7.257

4.435

-0.000

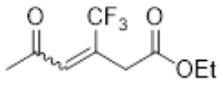



```
Current Data Parameters
NAME      zba-002-106-0712
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230713
Time               9.10
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG            zg30
TD                65536
SOLVENT           CDC13
NS                   16
DS                    2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                87.79
DW               50.000 usec
DE                6.50 usec
TE                298.0 K
D1           1.00000000 sec
D11      0 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                  1H
P1                11.85 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                 off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                65536
SF          500.1300138 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```



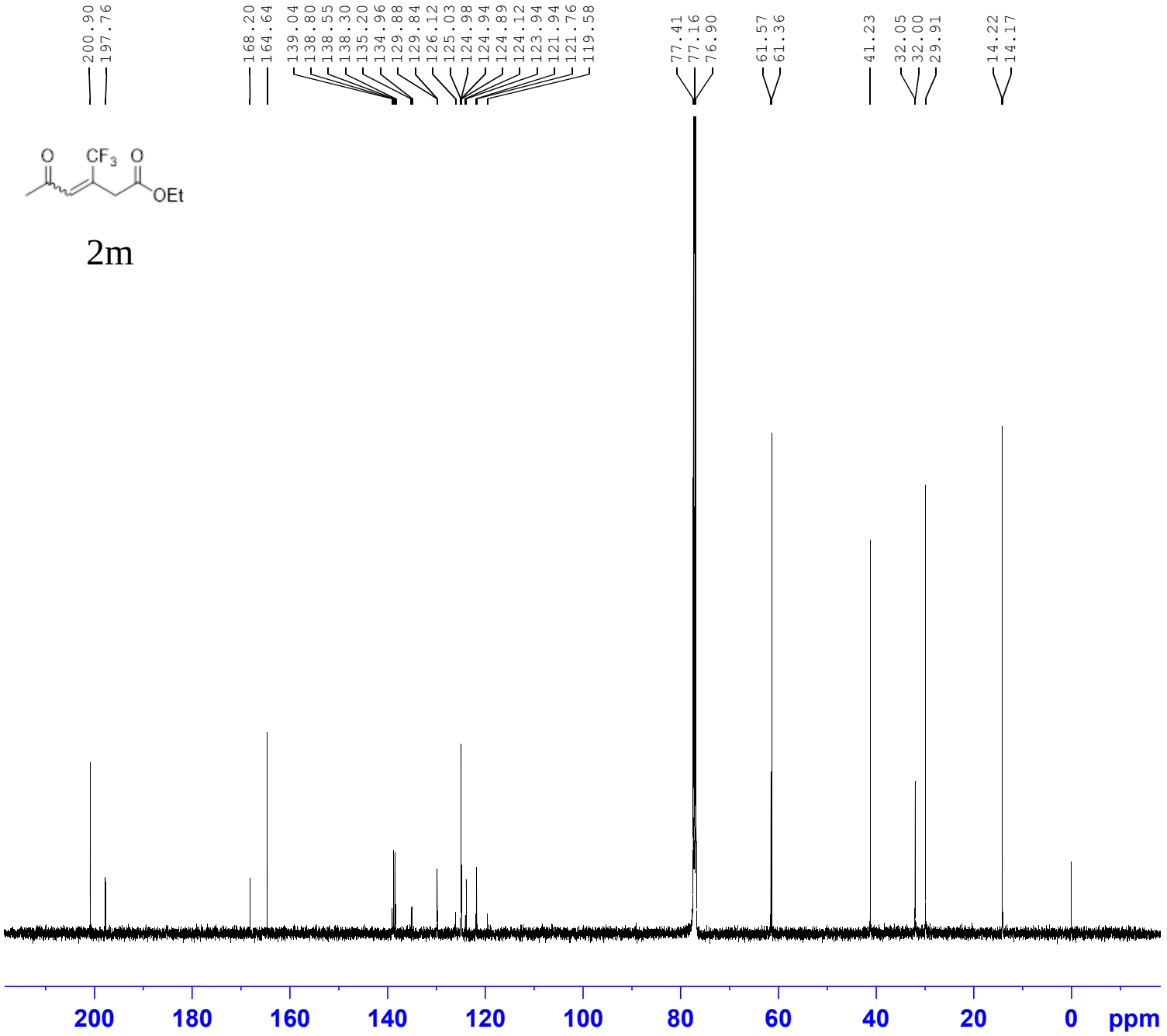
2l

```
Current Data Parameters
NAME      zba-002-106-0712
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_           20230713
Time                9.37
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  500
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                10.75 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2        20.00000000 W
PLW12        0.43882000 W
PLW13        0.28084999 W

F2 - Processing parameters
SI                 32768
SF           125.7577722 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

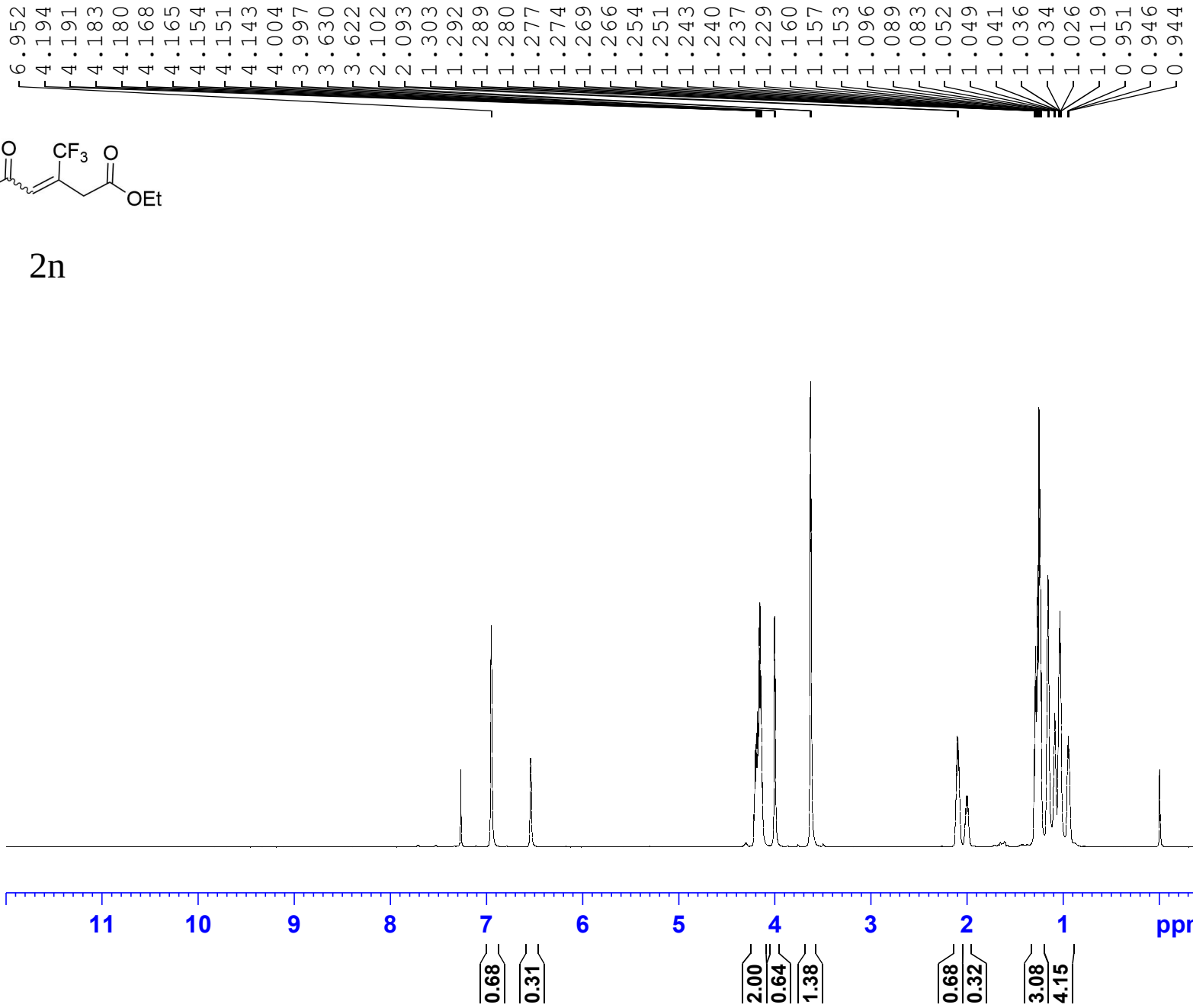


2m


```
Current Data Parameters
NAME      zba-002-168-1111
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211112
Time                4.43
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 62.06
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300093 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

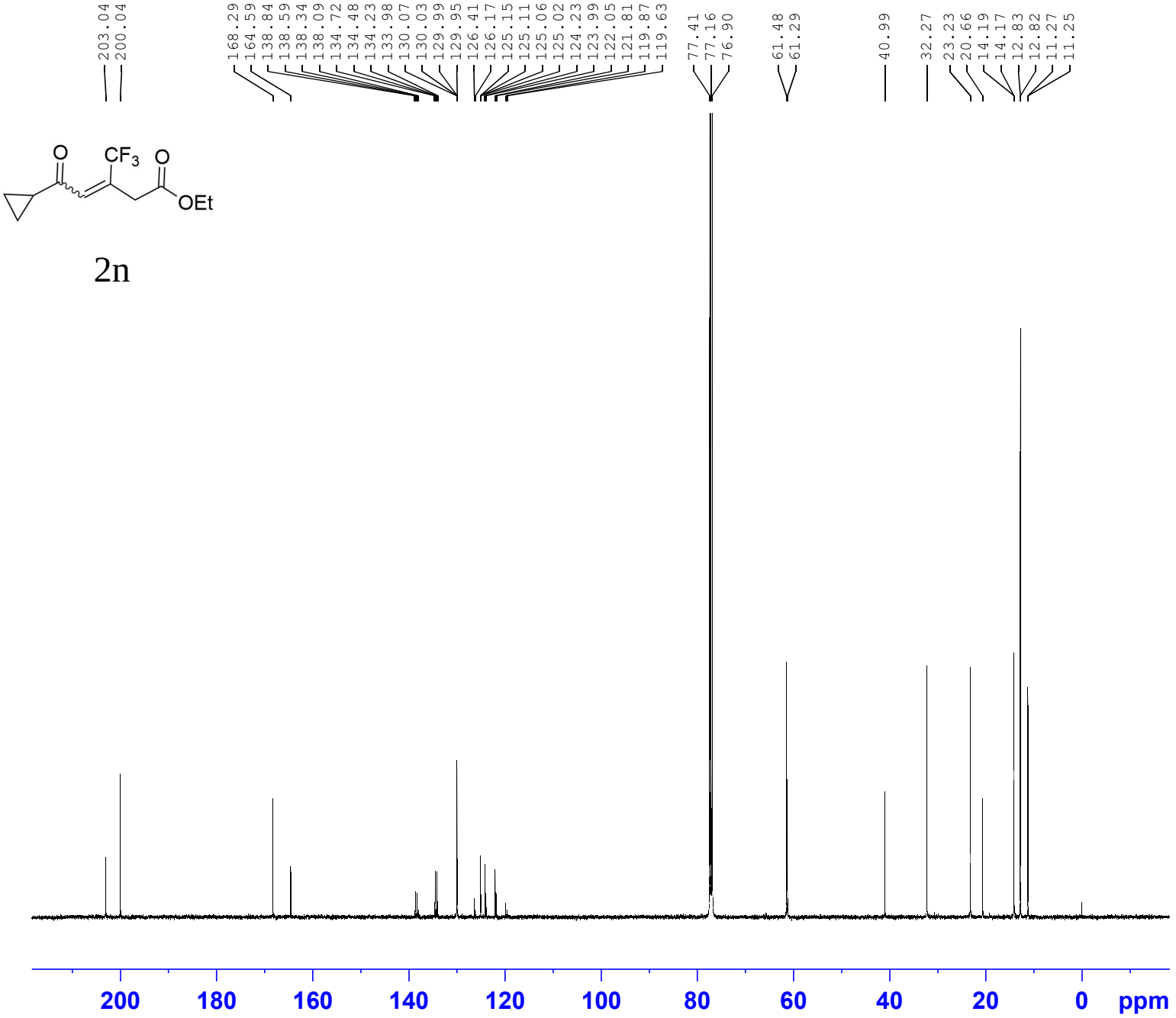



```
Current Data Parameters
NAME      zba-002-168-1112
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_             20211113
Time                 13.16
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   700
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                 192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                   9.80 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         20.00000000 W
PLW12         0.35778001 W
PLW13         0.22898000 W

F2 - Processing parameters
SI                   32768
SF           125.7577706 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

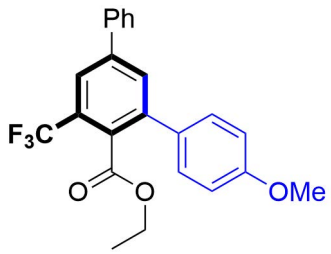


2n

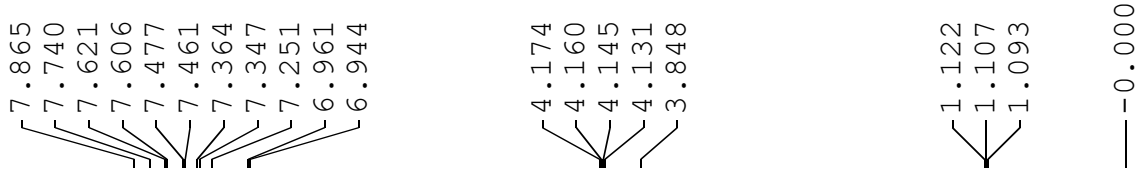
```
Current Data Parameters
NAME      zba-002-194-p1128
EXPNO                     1
PROCNO                    1

F2 - Acquisition Parameters
Date_           20211129
Time               4.36
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 62.06
DW                50.000 usec
DE                 6.50 usec
TE        0 K
D1          1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                  1H
P1                10.59 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                 off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300067 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



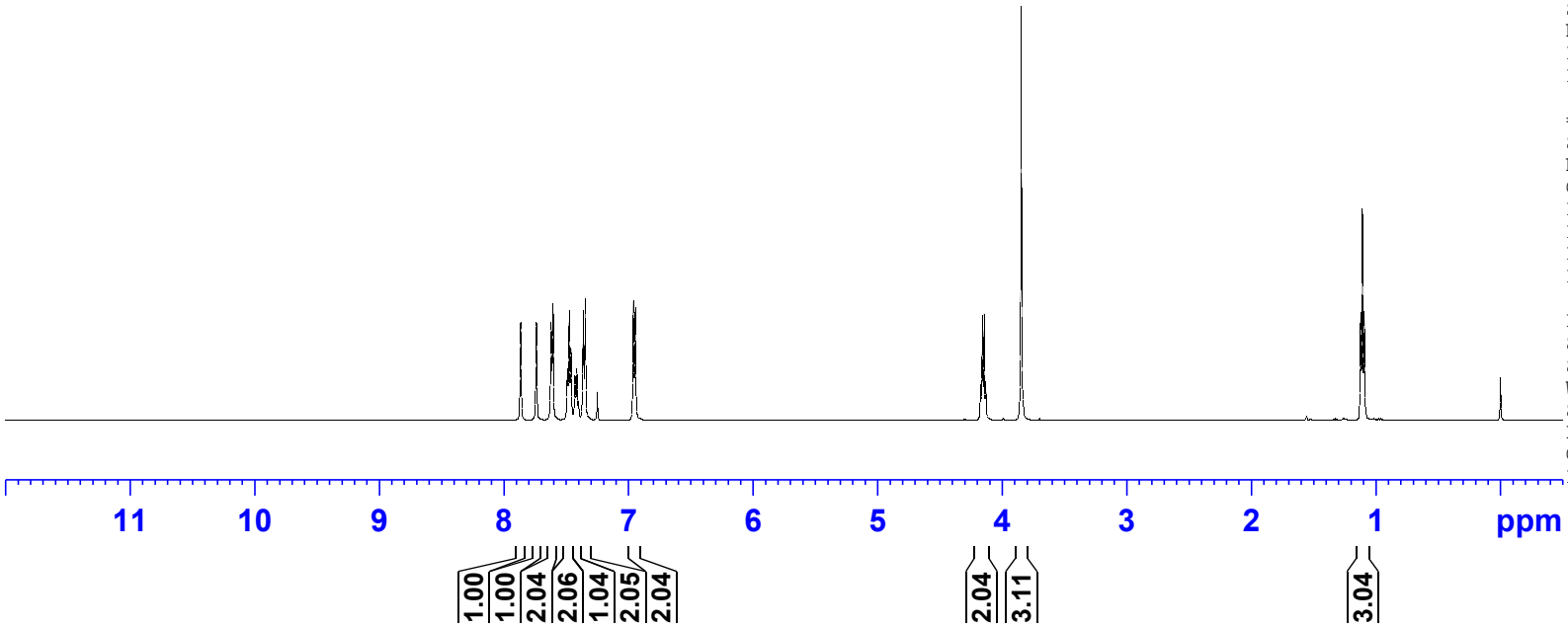

```
Current Data Parameters
NAME      zba-002-194-p1128
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211129
Time                5.30
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE        0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                 9.80 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2        20.00000000 W
PLW12        0.35778001 W
PLW13        0.22898000 W

F2 - Processing parameters
SI                 32768
SF           125.7577734 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

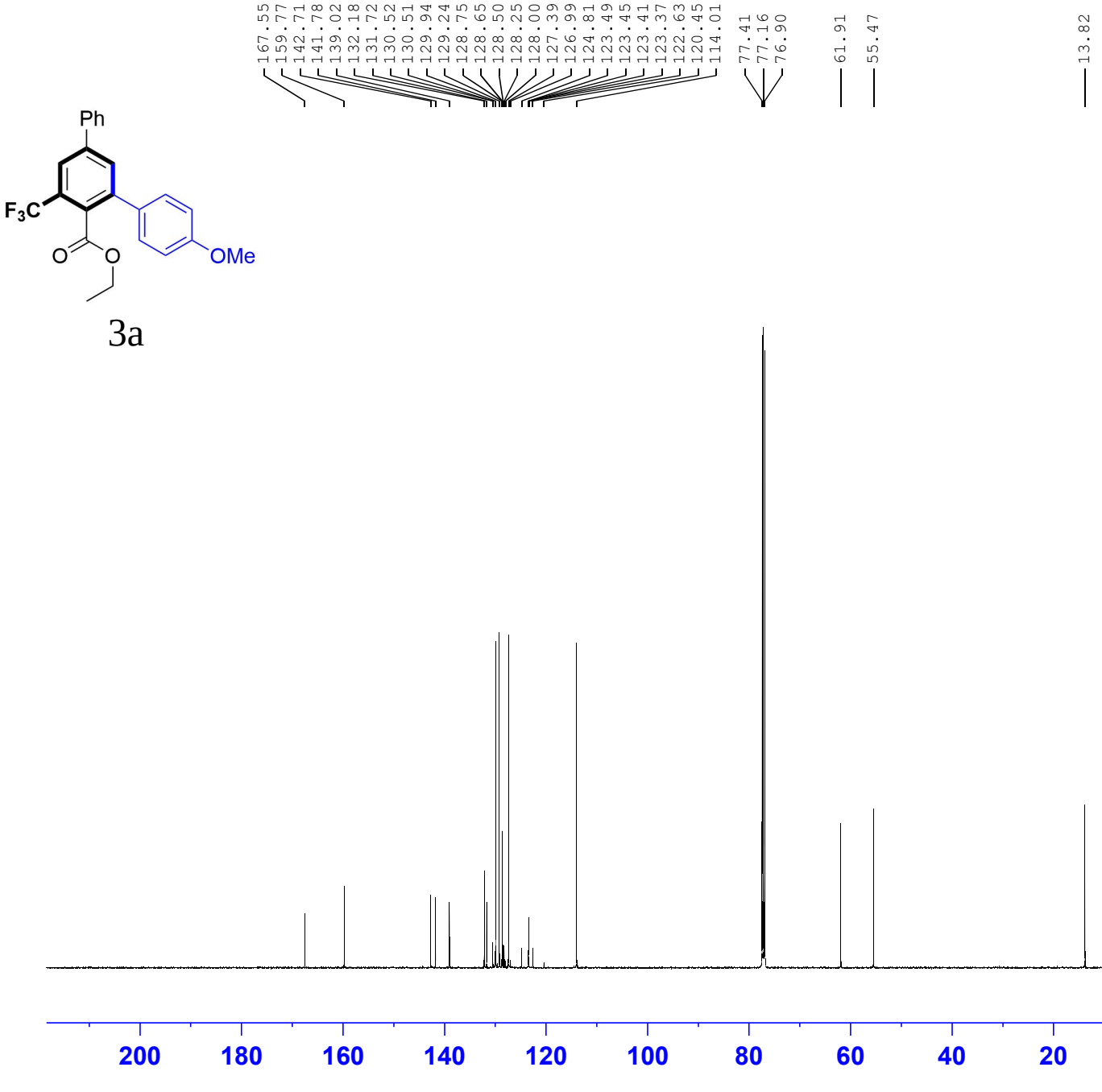


3a

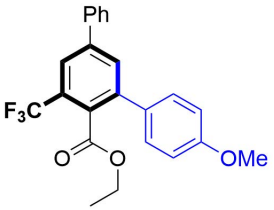



```
Current Data Parameters
NAME      zba-002-190-pmp-1202
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211202
Time                  22.44
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH               10000.000 Hz
FIDRES             0.152588 Hz
AQ                3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE                    298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1            500.1330885 MHz
NUC1                      1H
P1                    11.25 usec
PLW1            20.00000000 W

======== CHANNEL f2 ========
SFO2            500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                       65536
SF              500.1300149 MHz
WDW                        EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

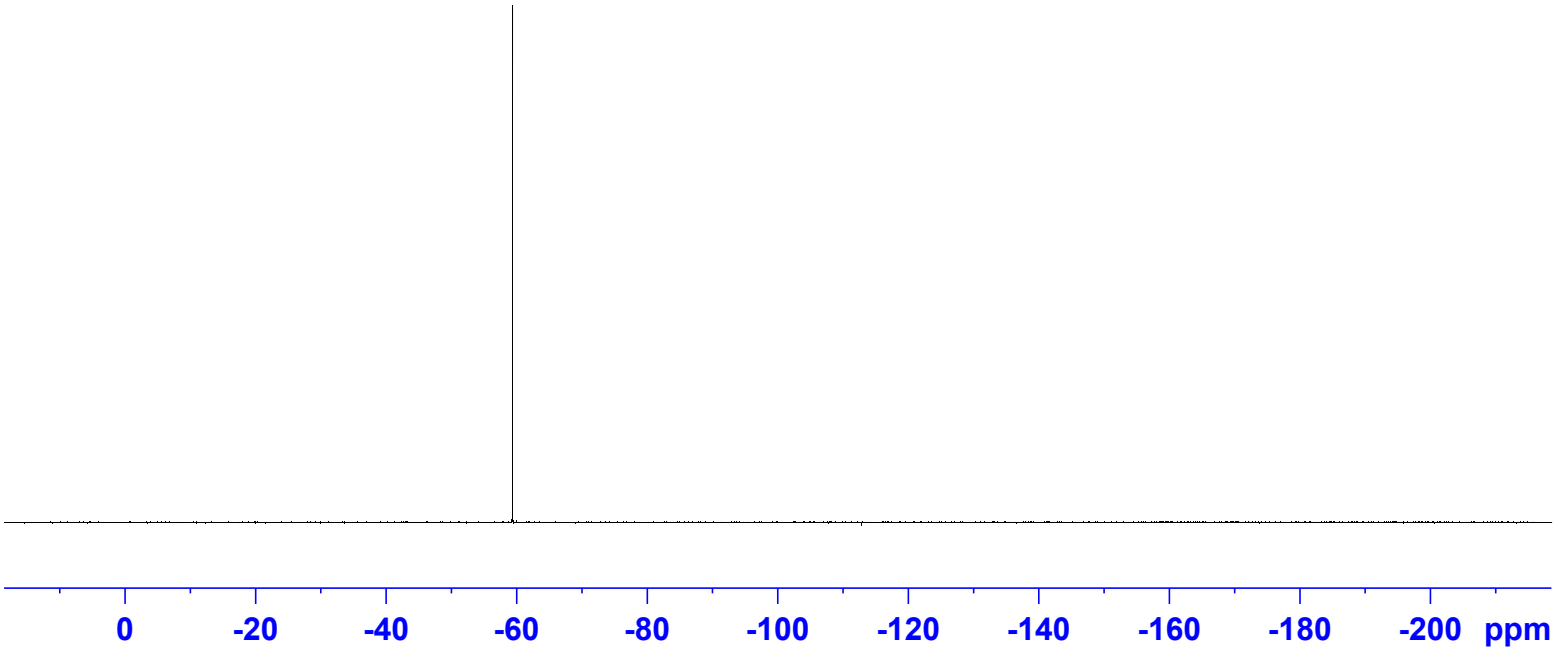




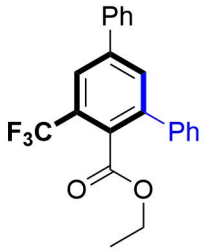

```
Current Data Parameters
NAME      zba-002-190-pmp-1202
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211202
Time                  23.39
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                   10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                   32768
SF            125.7577729 MHz
WDW                     EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```



3a

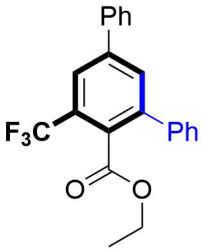



```
Current Data Parameters
NAME                  F19
EXPNO                  33
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211205
Time               18.53
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.1 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



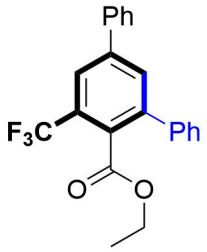
3b


```
Current Data Parameters
NAME      zba-002-118ph-new1231
EXPNO                         1
PROCNO                        1

F2 - Acquisition Parameters
Date_              20211231
Time                  13.17
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    31.72
DW                  50.000 usec
DE                   6.50 usec
TE                   298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                    11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                    off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF          500.1300206 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```



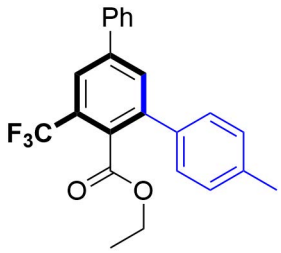
3b


```
Current Data Parameters
NAME      zba-002-118ph-new1231
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211231
Time                 14.56
INSTRUM              spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                   13C
P1                   10.50 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.39550999 W
PLW13           0.25312999 W

F2 - Processing parameters
SI                    32768
SF             125.7577738 MHz
WDW                      EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```



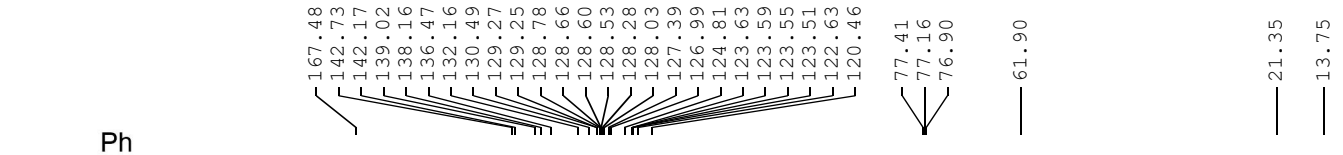
3b

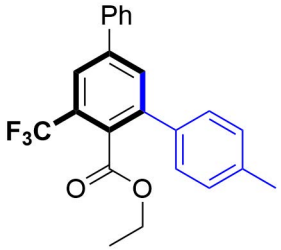

```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-118
PROCNO                  1

F2 - Acquisition Parameters
Date_              20211027
Time                 12.05
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG        zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                       4
DS                       4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   299.4 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                     65536
SF             376.6018696 MHz
WDW                      EM
SSB         0
LB                   0.30 Hz
GB          0
PC                   1.00
```



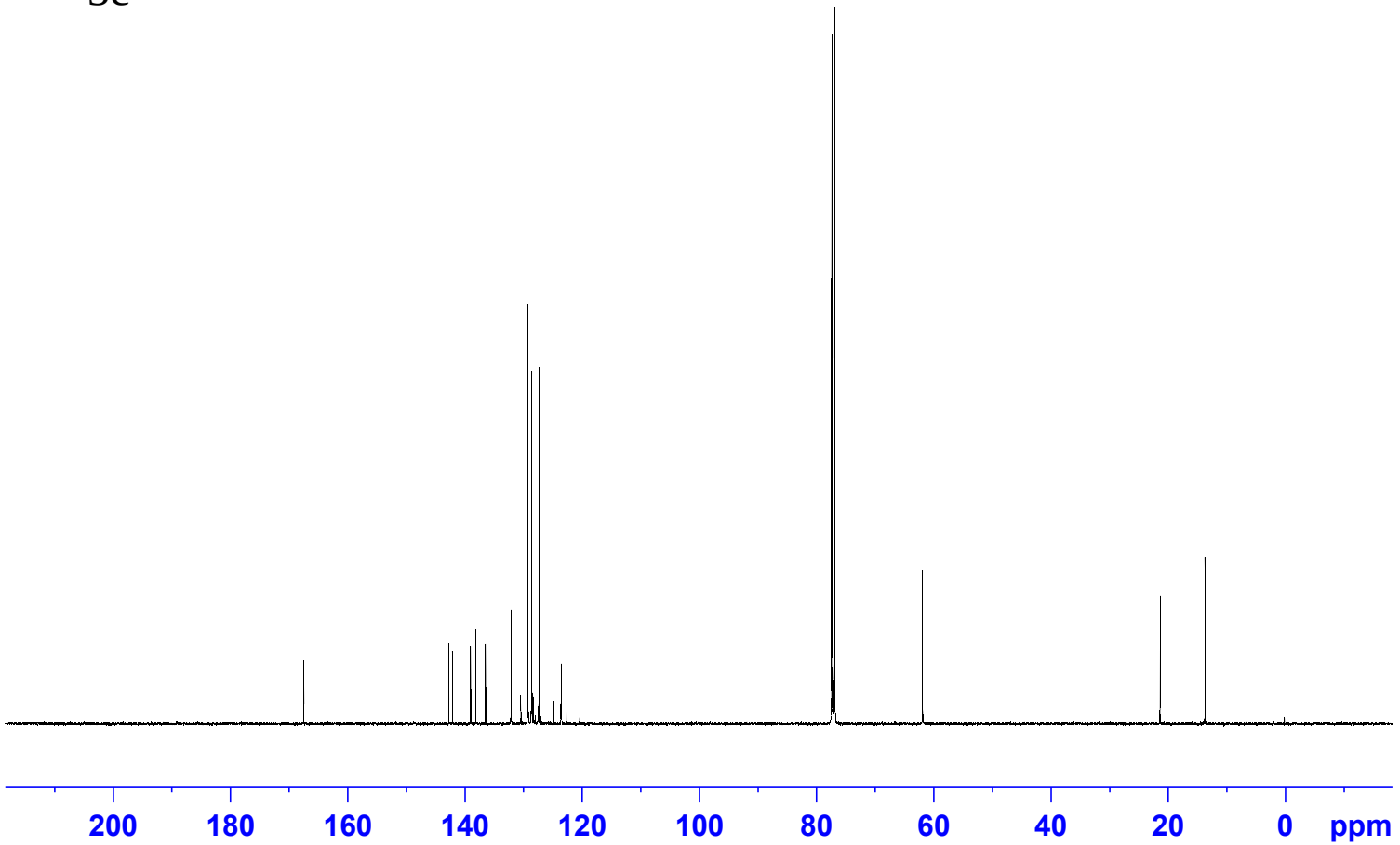
3c


```
Current Data Parameters
NAME      zba-002-122-pu-20211018
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211018
Time                   23.38
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG                zg30
TD                     65536
SOLVENT                CDCl3
NS                        16
DS                         2
SWH              10000.000 Hz
FIDRES               0.152588 Hz
AQ                3.2767999 sec
RG                     62.06
DW                    50.000 usec
DE                     6.50 usec
TE                     298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                        1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                     10.59 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                     65536
SF           500.1300225 MHz
WDW                       EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

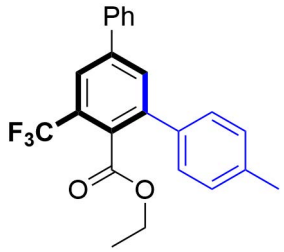




3c

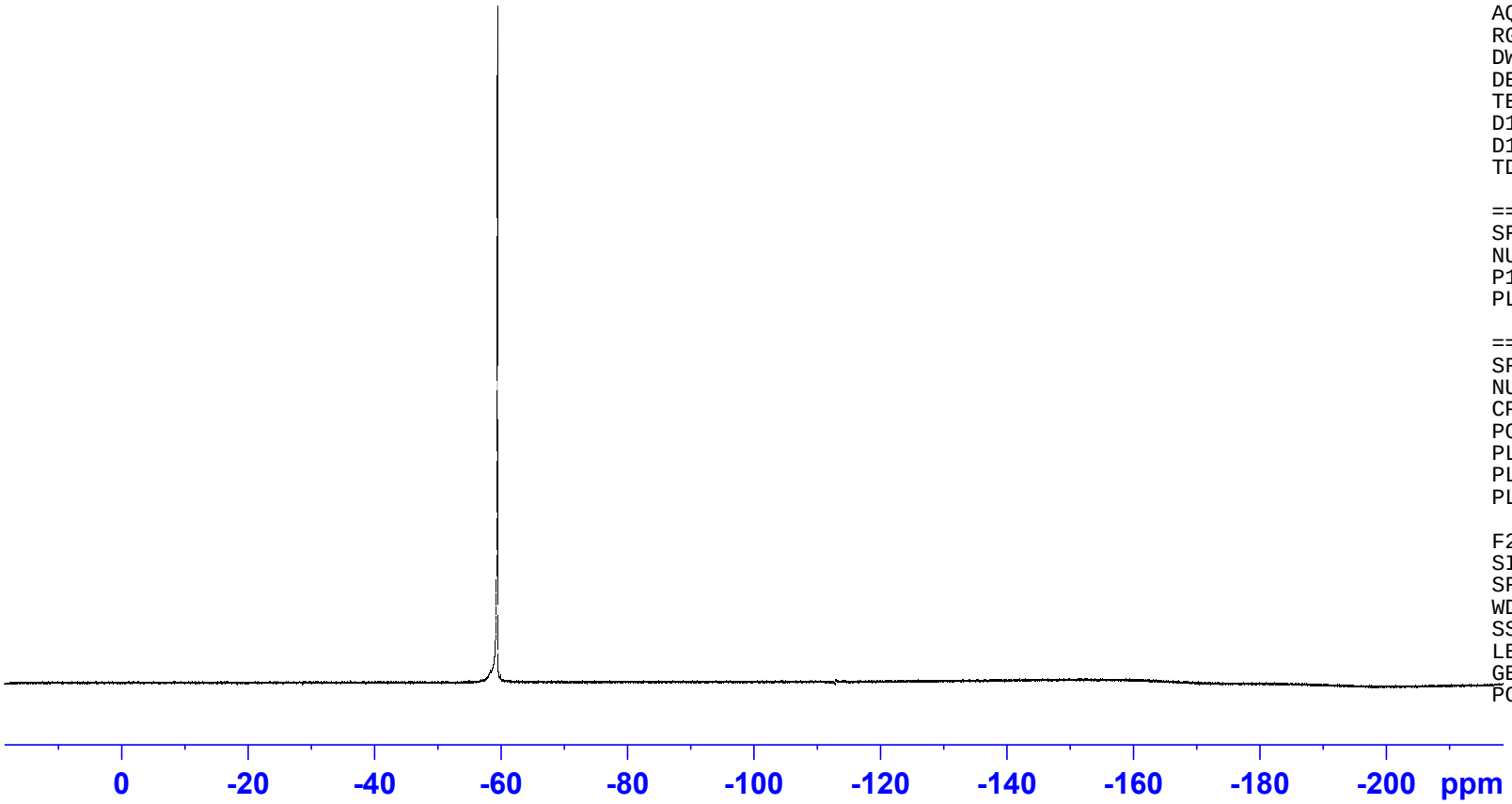



```
Current Data Parameters
NAME      zba-002-122-pu-20211018
EXPNO                          4
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211019
Time                    0.27
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      500
DS                        4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.35778001 W
PLW13           0.22898000 W

F2 - Processing parameters
SI                     32768
SF             125.7577738 MHz
WDW                       EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

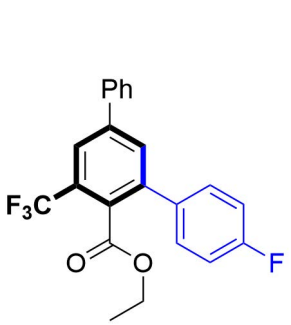


3c

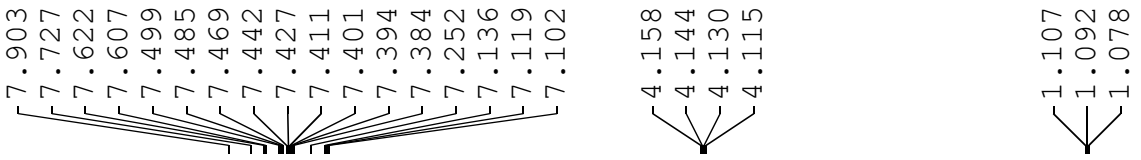
-59.44

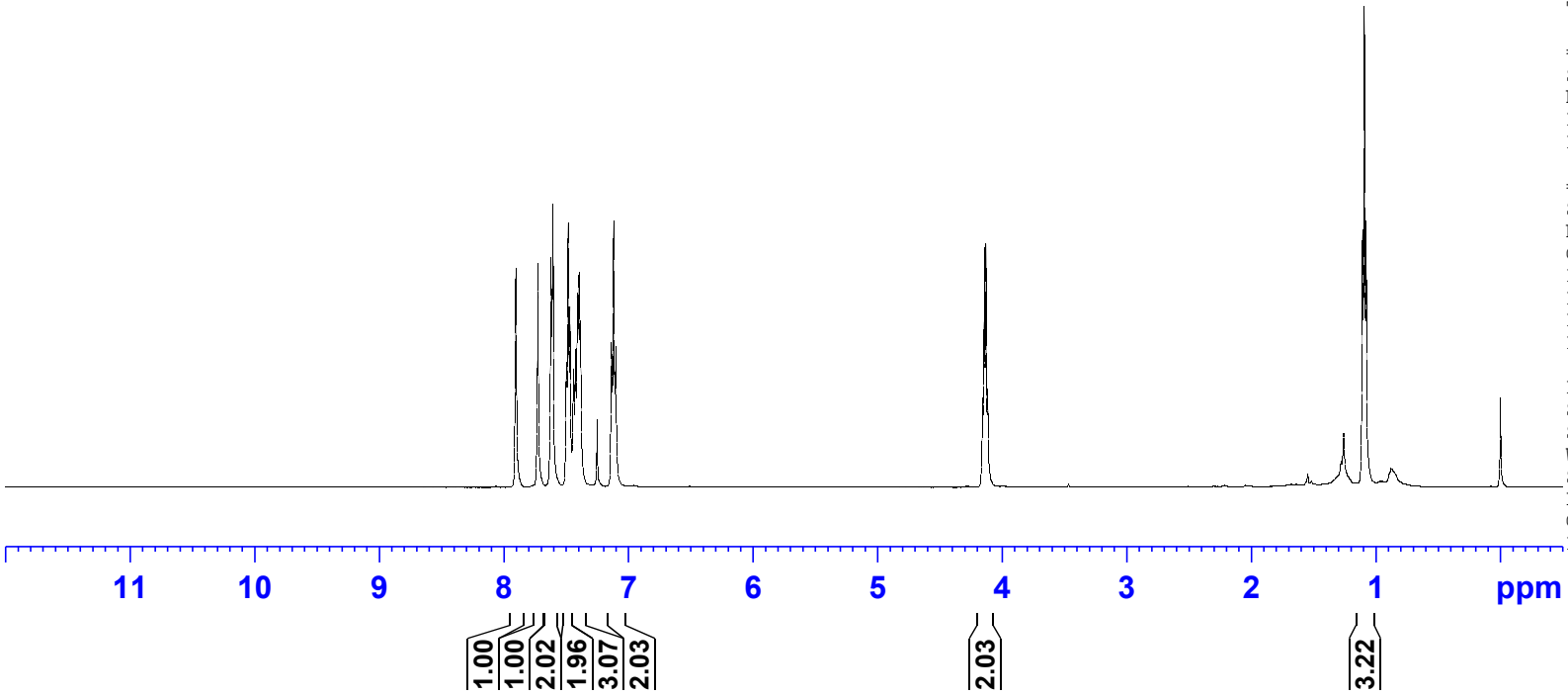



```
Current Data Parameters
NAME                  19F
EXPNO                  12
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211027
Time               11.33
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     4
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.7 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

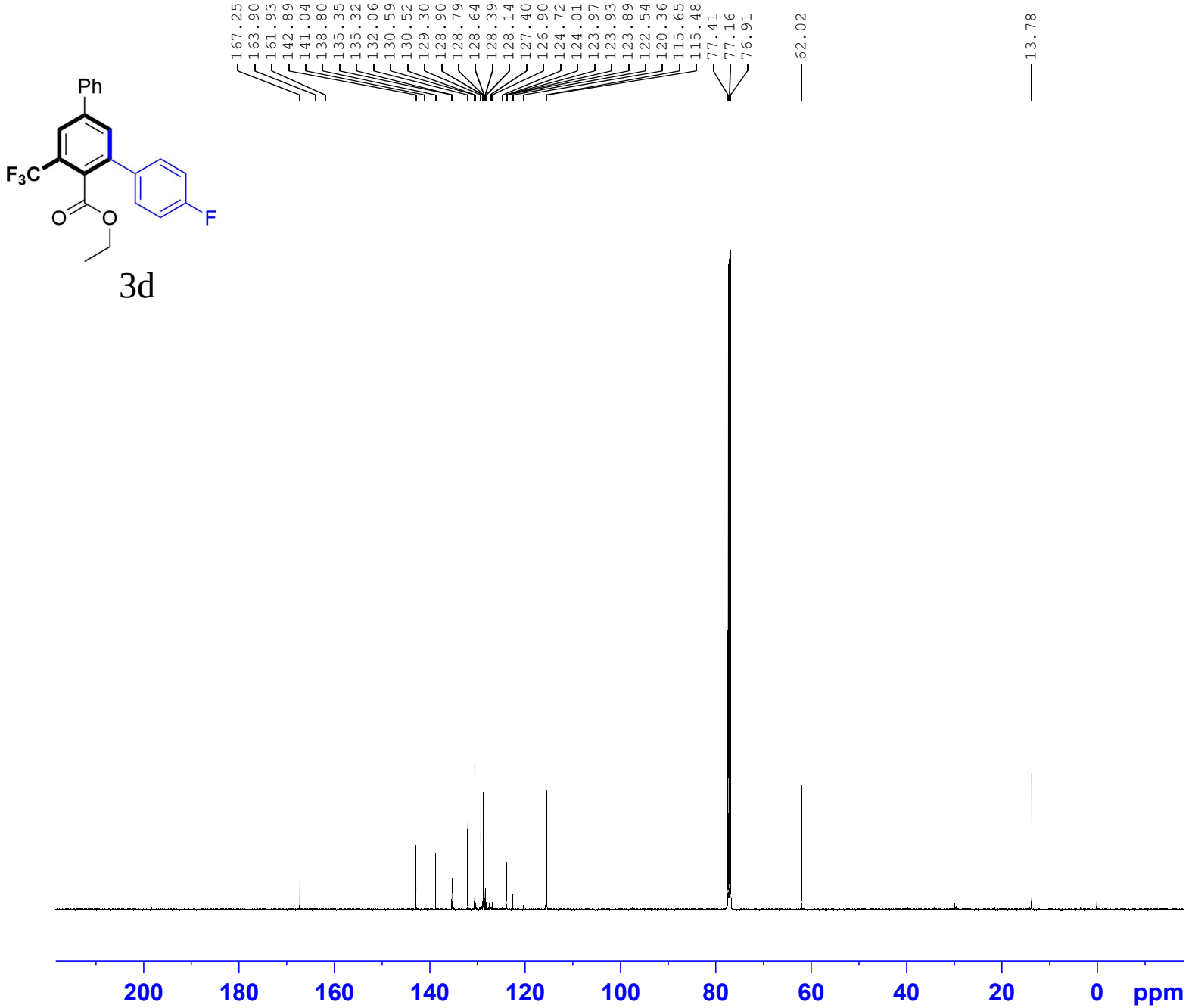


3d

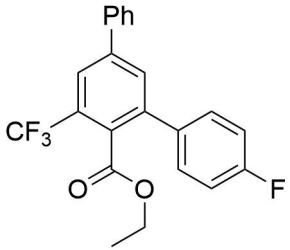





```
Current Data Parameters
NAME      zba-002-119c-4f-1225
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211226
Time                   2.02
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ                3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE                   298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                    11.25 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                        65536
SF             500.1300152 MHz
WDW                         EM
SSB       0
LB                     0.30 Hz
GB        0
PC                     1.00
```

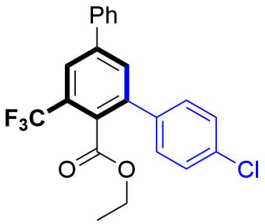



```
Current Data Parameters
NAME      zba-002-119c-4f-1225
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_              20211226
Time                   2.57
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2           20.00000000 W
PLW12           0.39550999 W
PLW13           0.25312999 W

F2 - Processing parameters
SI                    32768
SF             125.7577719 MHz
WDW                      EM
SSB         0
LB                   1.00 Hz
GB          0
PC                   1.40
```

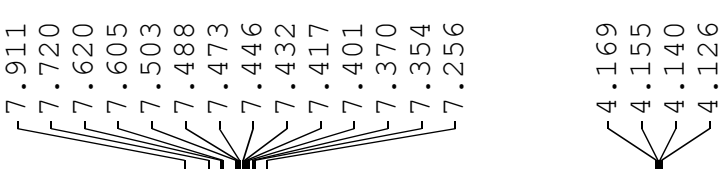


3d

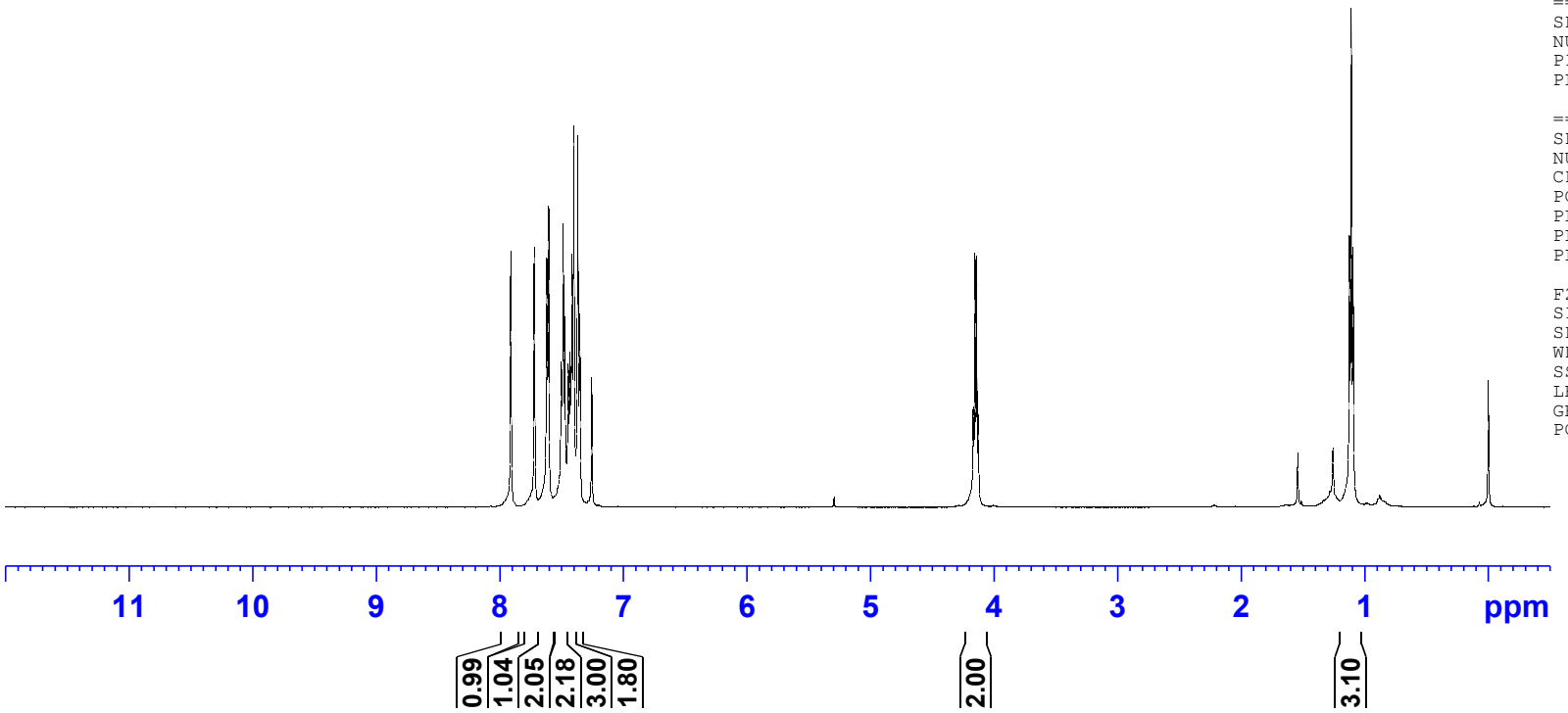

```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-119c
PROCNO                   1

F2 - Acquisition Parameters
Date_              20211027
Time                 11.46
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.9 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                    65536
SF            376.6018696 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

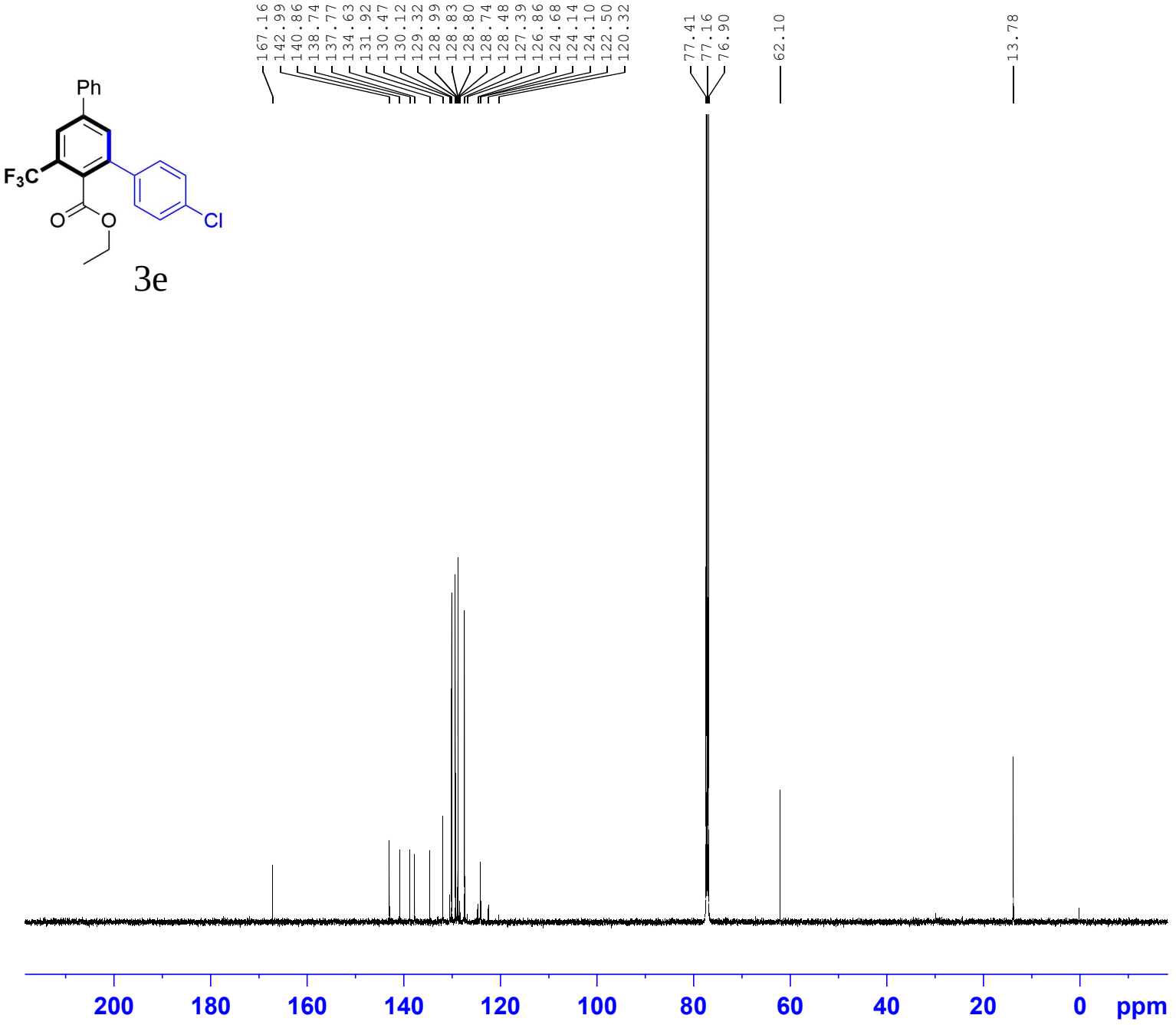


3e

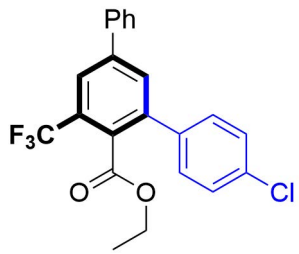



```
Current Data Parameters
NAME      zba-002-119a-pu-20211016
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211016
Time              22.13
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH          10000.000 Hz
FIDRES        0.152588 Hz
AQ            3.2767999 sec
RG               55.37
DW              50.000 usec
DE               6.50 usec
TE              298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                1H
P1                10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2               off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI               65536
SF          500.1300174 MHz
WDW                EM
SSB       0
LB               0.30 Hz
GB        0
PC               1.00
```



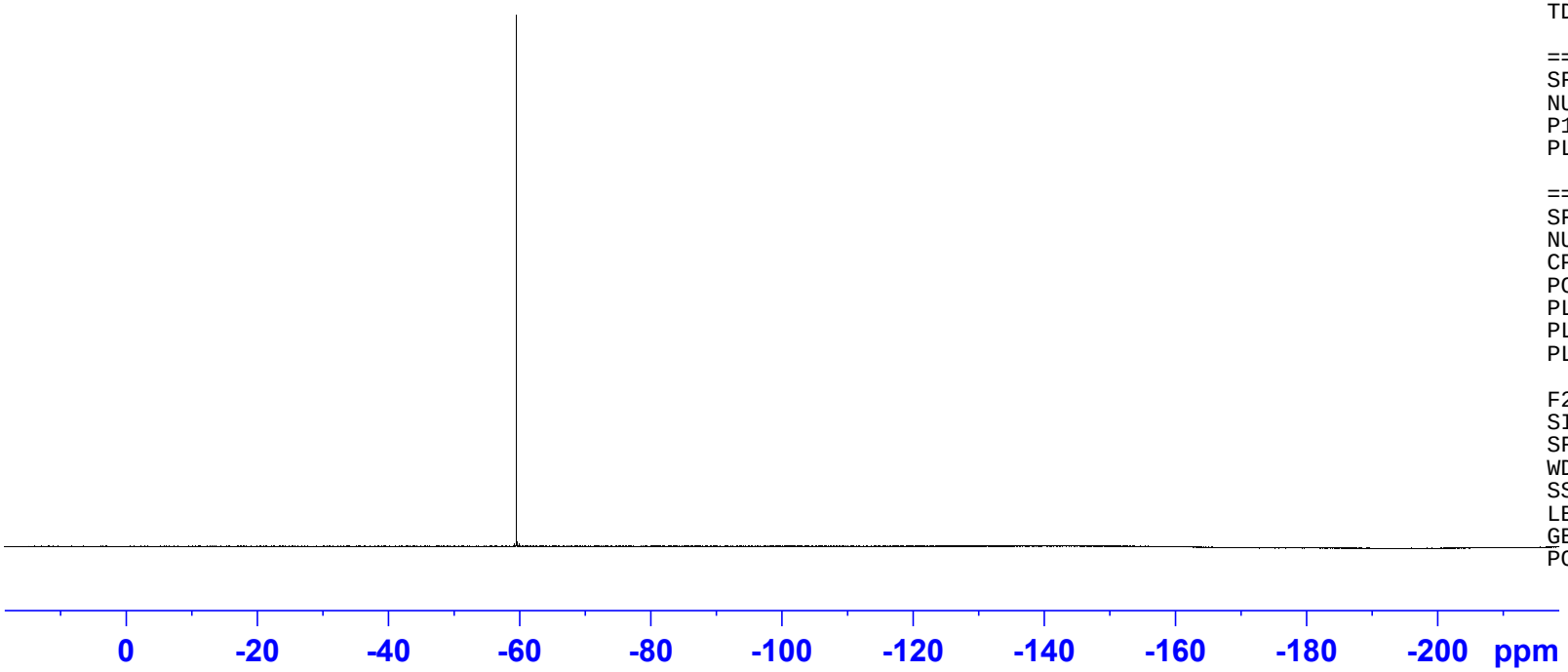



```
Current Data Parameters
NAME      zba-002-119a-pu-20211016
EXPNO                           3
PROCNO                          1

F2 - Acquisition Parameters
Date_                    20211016
Time                        22.36
INSTRUM                     spect
PROBHD    5 mm CPPBBO BB
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          300
DS                            4
SWH                   29761.904 Hz
FIDRES                 0.454131 Hz
AQ                    1.1010048 sec
RG                       192.89
DW                       16.800 usec
DE                       18.00 usec
TE                       298.2 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

======== CHANNEL f1 ========
SFO1                125.7703637 MHz
NUC1                        13C
P1                         9.80 usec
PLW1                57.00000000 W

======== CHANNEL f2 ========
SFO2                500.1320005 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                     80.00 usec
PLW2                20.00000000 W
PLW12                0.35778001 W
PLW13                0.22898000 W

F2 - Processing parameters
SI                          32768
SF                  125.7577728 MHz
WDW                            EM
SSB                 0
LB                         1.00 Hz
GB                  0
PC                         1.40
```

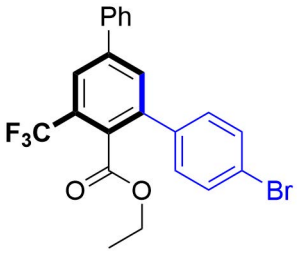


3e

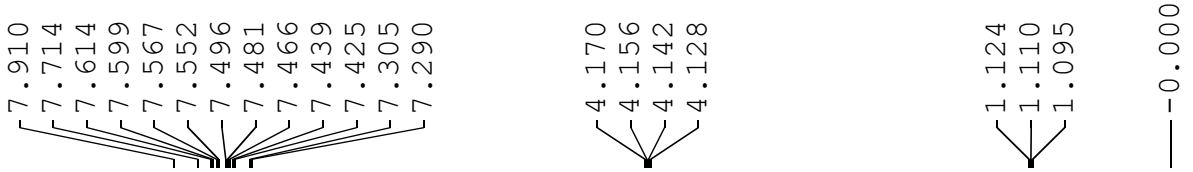
-59.50

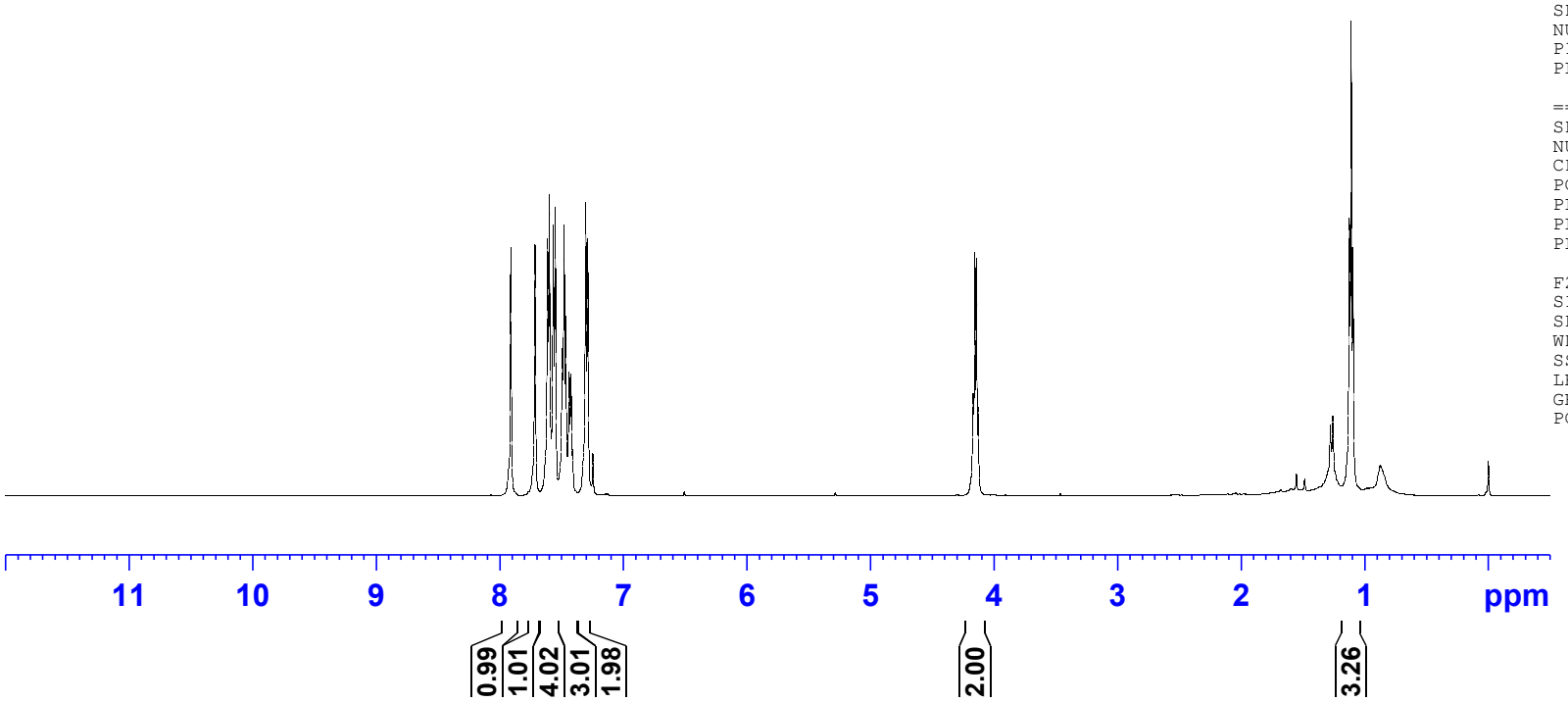



```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-119a
PROCNO                   1

F2 - Acquisition Parameters
Date_              20211027
Time                 11.47
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG        zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       4
SWH               89285.711 Hz
FIDRES             0.681196 Hz
AQ                0.7340032 sec
RG                   206.33
DW                    5.600 usec
DE                    6.50 usec
TE                   298.8 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                      EM
SSB         0
LB                    0.30 Hz
GB          0
PC                    1.00
```

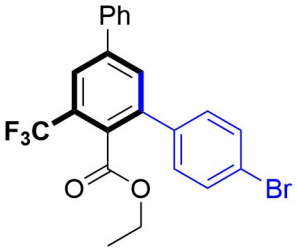


3f



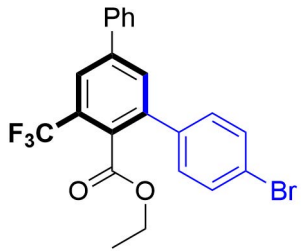



```
Current Data Parameters
NAME      zba-002-119b-pu-20211016
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211016
Time               22.41
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 31.72
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300204 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



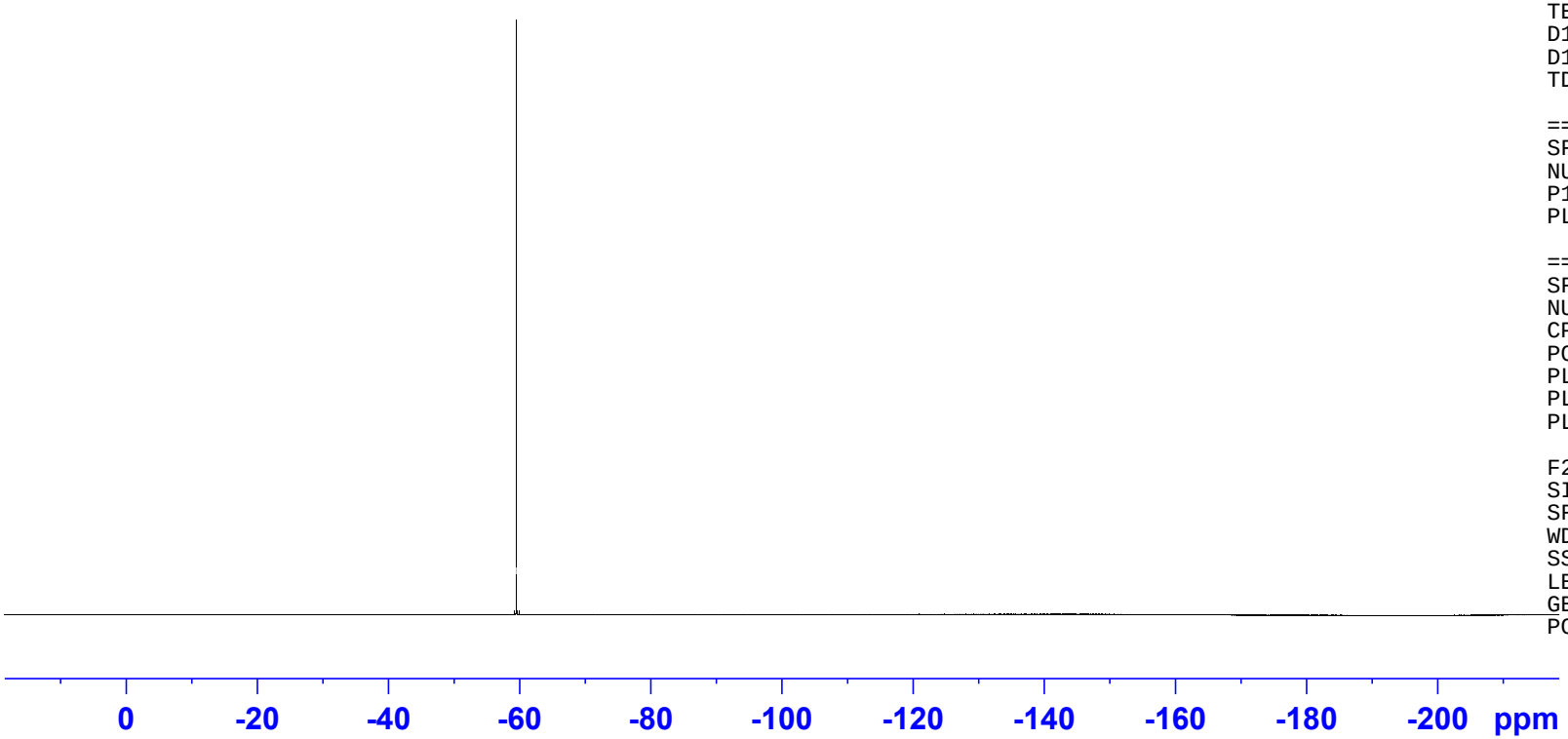
3f


```
Current Data Parameters
NAME      zba-002-119b-pu-20211016
EXPNO                           3
PROCNO                          1

F2 - Acquisition Parameters
Date_                    20211016
Time                        23.04
INSTRUM                     spect
PROBHD    5 mm CPPBBO BB
PULPROG                  zgpg30
TD                        65536
SOLVENT                    CDCl3
NS                           300
DS                             4
SWH                    29761.904 Hz
FIDRES                  0.454131 Hz
AQ                     1.1010048 sec
RG                        192.89
DW                        16.800 usec
DE                        18.00 usec
TE                        298.2 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
SFO1                125.7703637 MHz
NUC1                        13C
P1                         9.80 usec
PLW1                57.00000000 W

======== CHANNEL f2 ========
SFO2                500.1320005 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                     80.00 usec
PLW2                20.00000000 W
PLW12                0.35778001 W
PLW13                0.22898000 W

F2 - Processing parameters
SI                         32768
SF                  125.7577747 MHz
WDW                           EM
SSB       0
LB                         1.00 Hz
GB        0
PC                         1.40
```

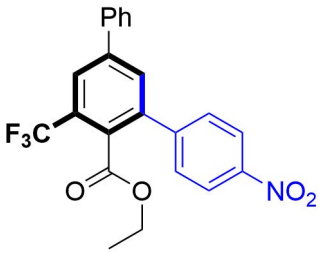


3f

-59.49

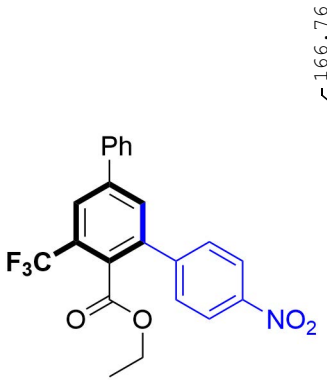



```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-119b
PROCNO                   1

F2 - Acquisition Parameters
Date_              20211027
Time                 11.49
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.8 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```



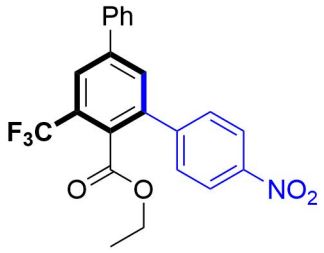
3g


```
Current Data Parameters
NAME      zba-002-120c-pu-20211016
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20211016
Time              23.34
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                62.06
DW               50.000 usec
DE                6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                  1H
P1                10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                 off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                  65536
SF          500.1300133 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



3g

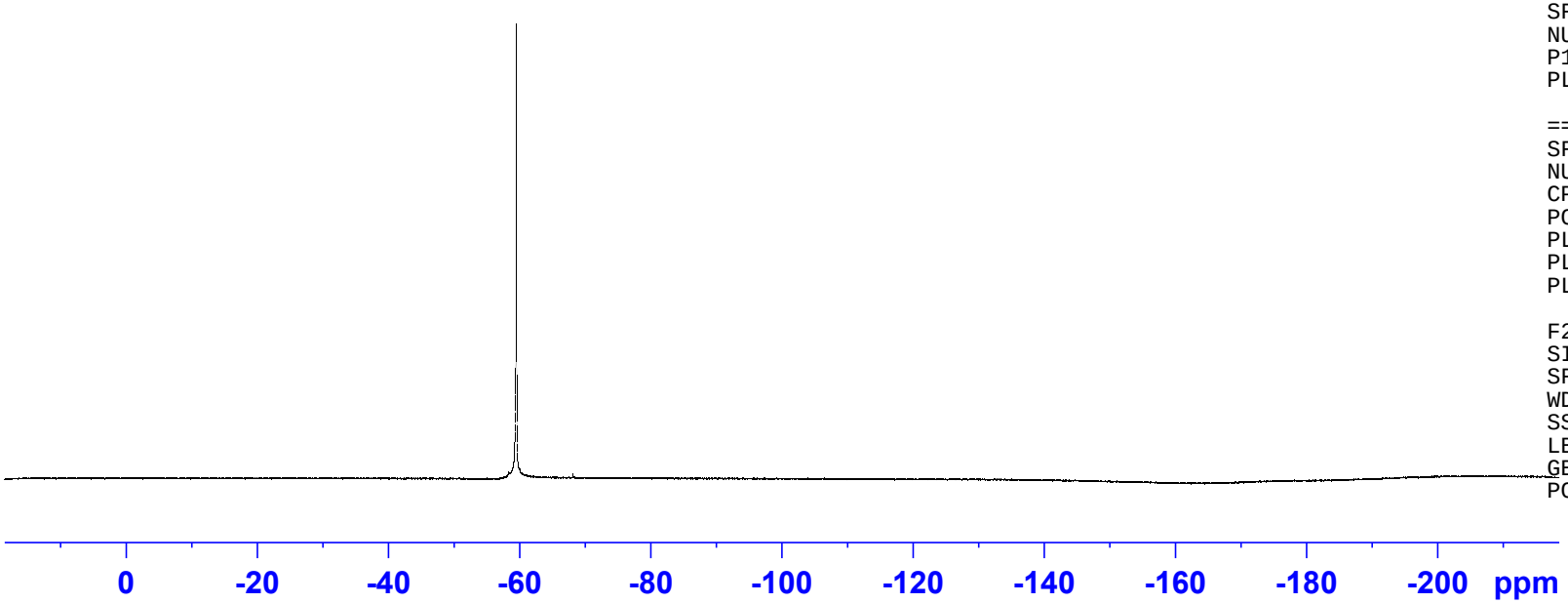

```
Current Data Parameters
NAME      zba-002-120c-pu-20211016
EXPNO                           3
PROCNO                          1

F2 - Acquisition Parameters
Date_                    20211016
Time                        23.57
INSTRUM                     spect
PROBHD    5 mm CPPBBO BB
PULPROG                   zgpg30
TD                         65536
SOLVENT                     CDCl3
NS                            300
DS                              4
SWH                    29761.904 Hz
FIDRES                  0.454131 Hz
AQ                     1.1010048 sec
RG                        192.89
DW                        16.800 usec
DE                        18.00 usec
TE                        298.2 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                             1

======== CHANNEL f1 ========
SFO1                125.7703637 MHz
NUC1                        13C
P1                         9.80 usec
PLW1                57.00000000 W

======== CHANNEL f2 ========
SFO2                500.1320005 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                     80.00 usec
PLW2                20.00000000 W
PLW12                0.35778001 W
PLW13                0.22898000 W

F2 - Processing parameters
SI                          32768
SF                  125.7577729 MHz
WDW                            EM
SSB                0
LB                         1.00 Hz
GB                 0
PC                         1.40
```

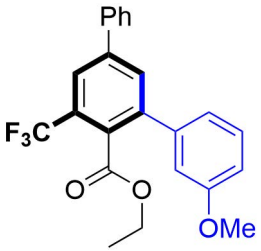


3g

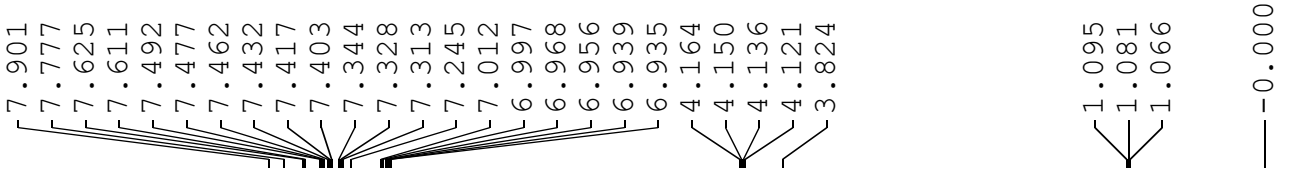
-59.53

```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-120c
PROCNO                   1

F2 - Acquisition Parameters
Date_            20211027
Time                11.38
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.8 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                   65536
SF            376.6018696 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

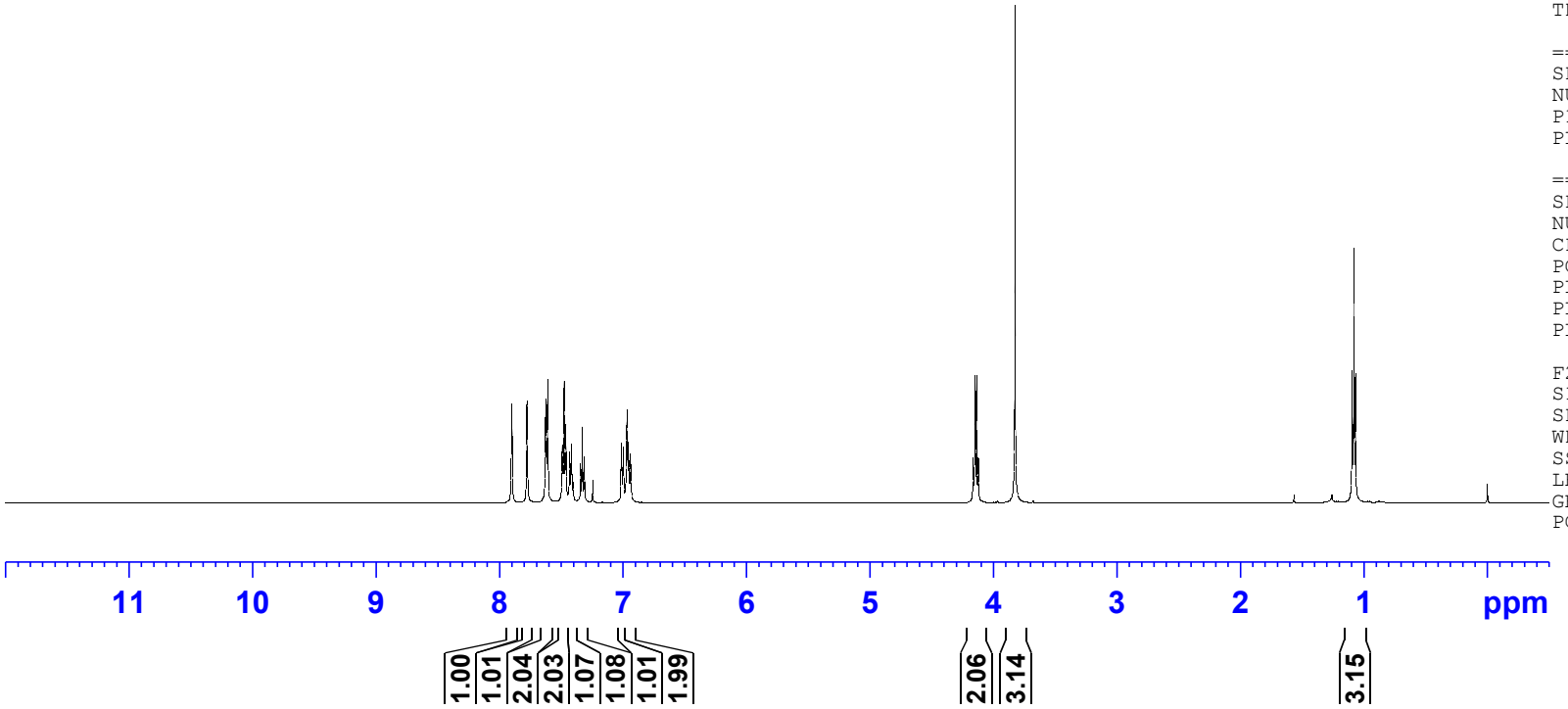


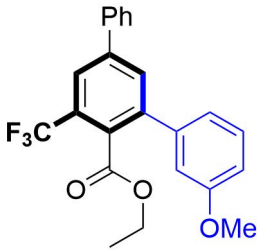


3h

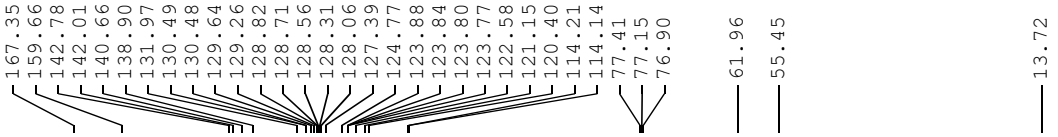


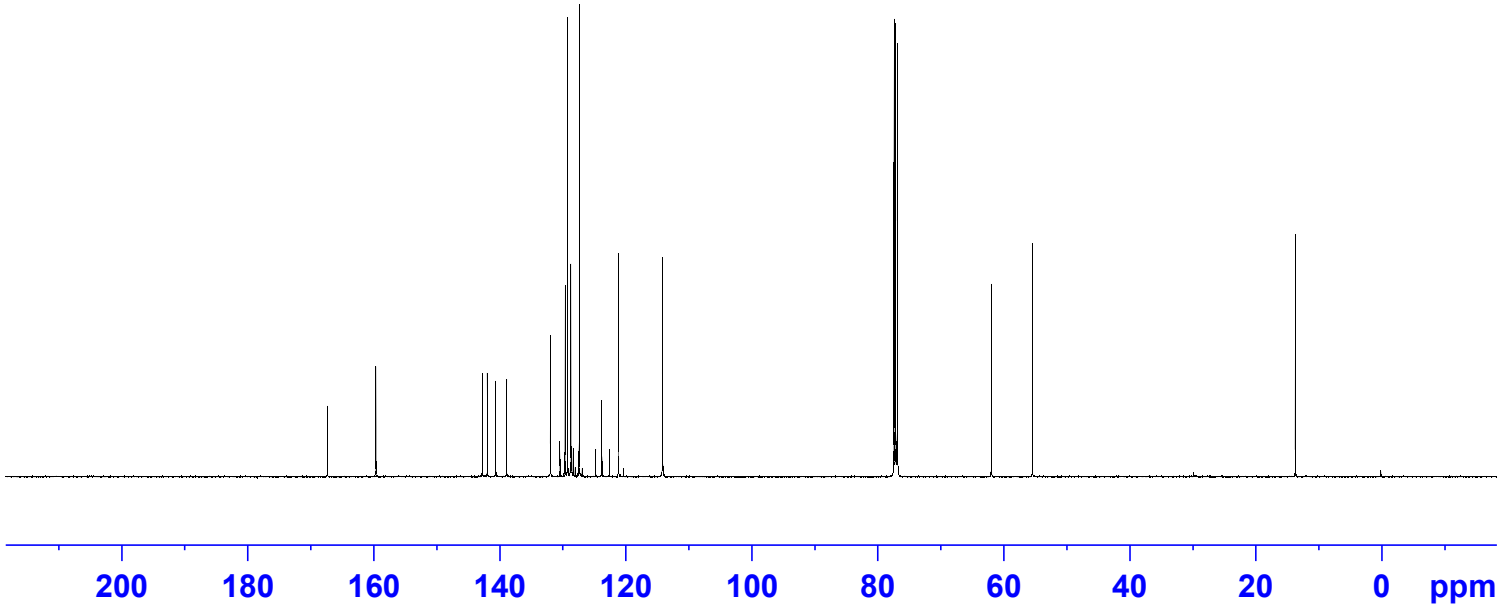

```
Current Data Parameters
NAME      zba-002-146-3Ome-0104
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                  7.45
INSTRUM              spect
PROBHD    5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES           0.152588 Hz
AQ               3.2767999 sec
RG                   31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                    1H
P1                  11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2      0 usec
PLW2       0 W
PLW12      0 W
PLW13      0 W

F2 - Processing parameters
SI                   65536
SF            500.1300197 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```



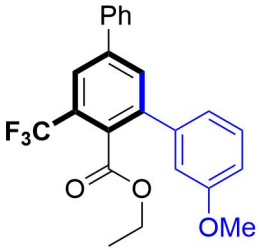


3h



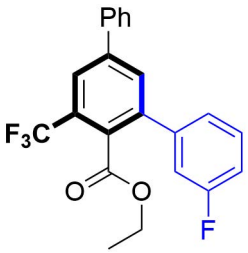



```
Current Data Parameters
NAME      zba-002-146-3Ome-0104
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                   8.40
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577747 MHz
WDW                      EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

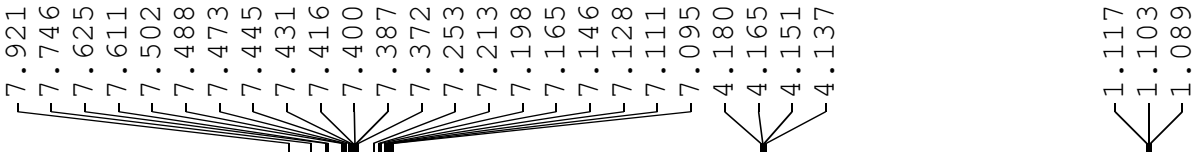


3h

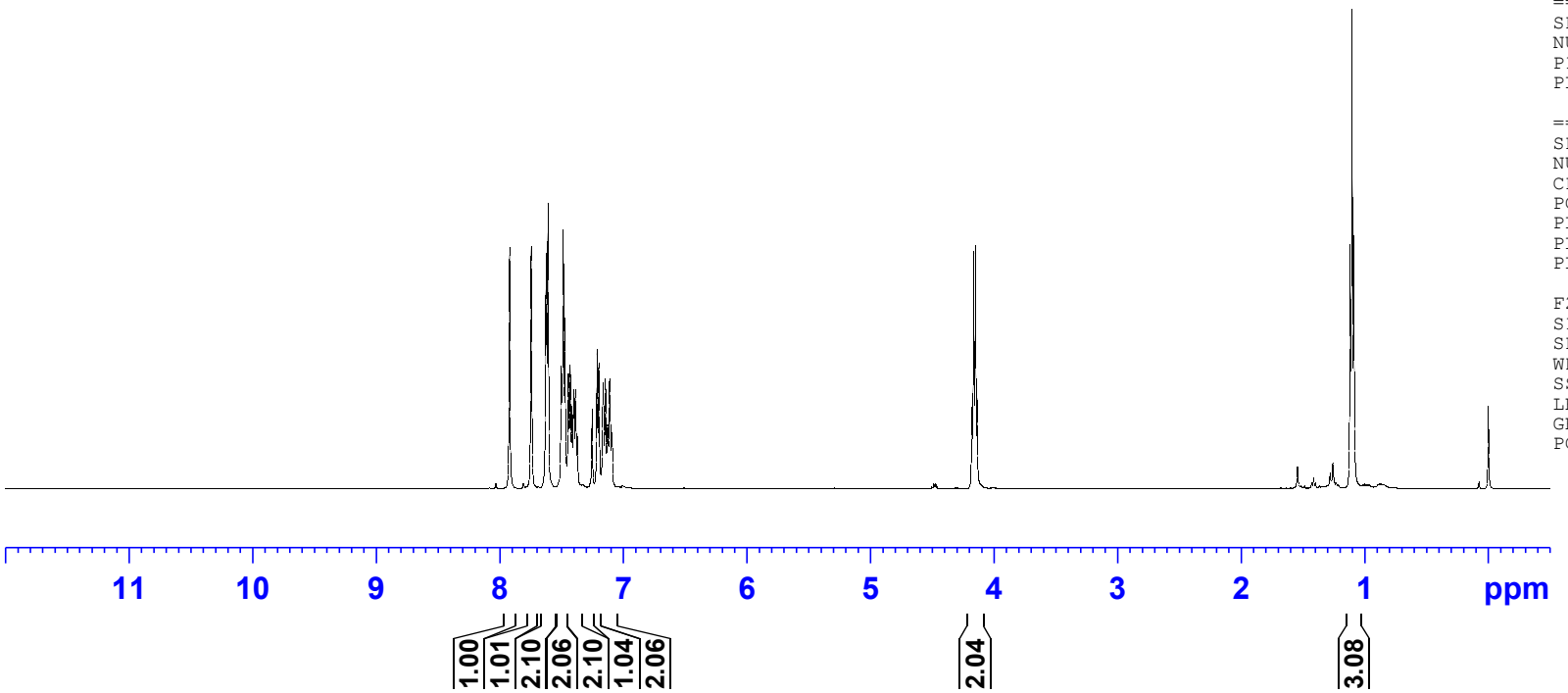

```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-146
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220105
Time                15.46
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 297.5 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                    65536
SF          376.6018696 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

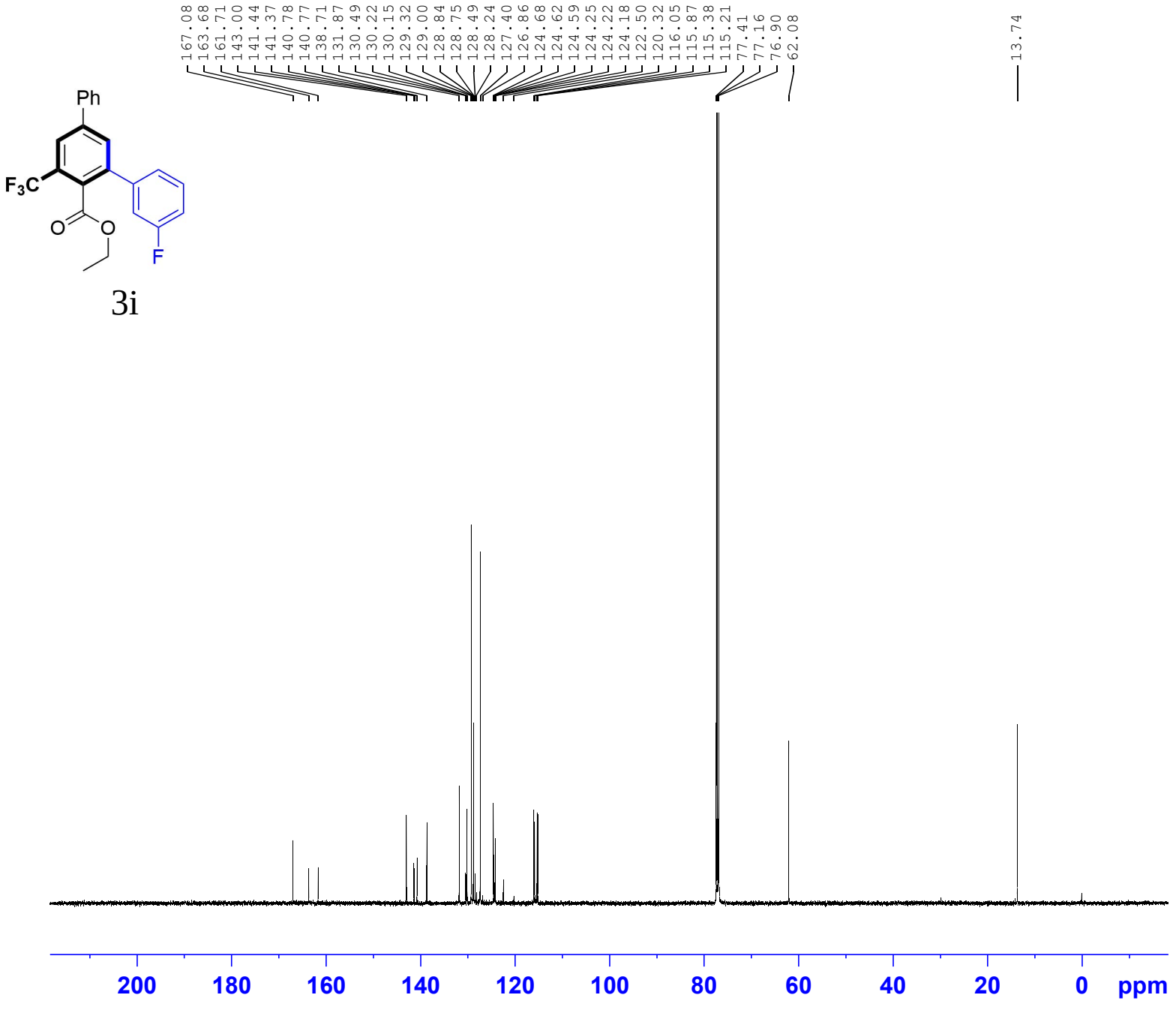


3i



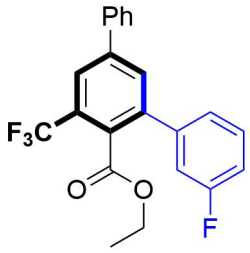

```
Current Data Parameters
NAME      zba-002-128-pu-20211022
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211022
Time               14.43
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 55.37
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300149 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```





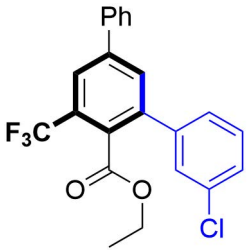
3i

```
Current Data Parameters
NAME      zba-002-128-pu-20211022
EXPNO                          3
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211022
Time                  15.05
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     300
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.35778001 W
PLW13          0.22898000 W

F2 - Processing parameters
SI                   32768
SF            125.7577720 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

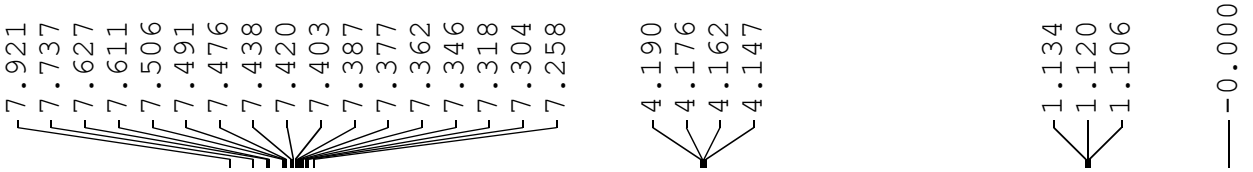


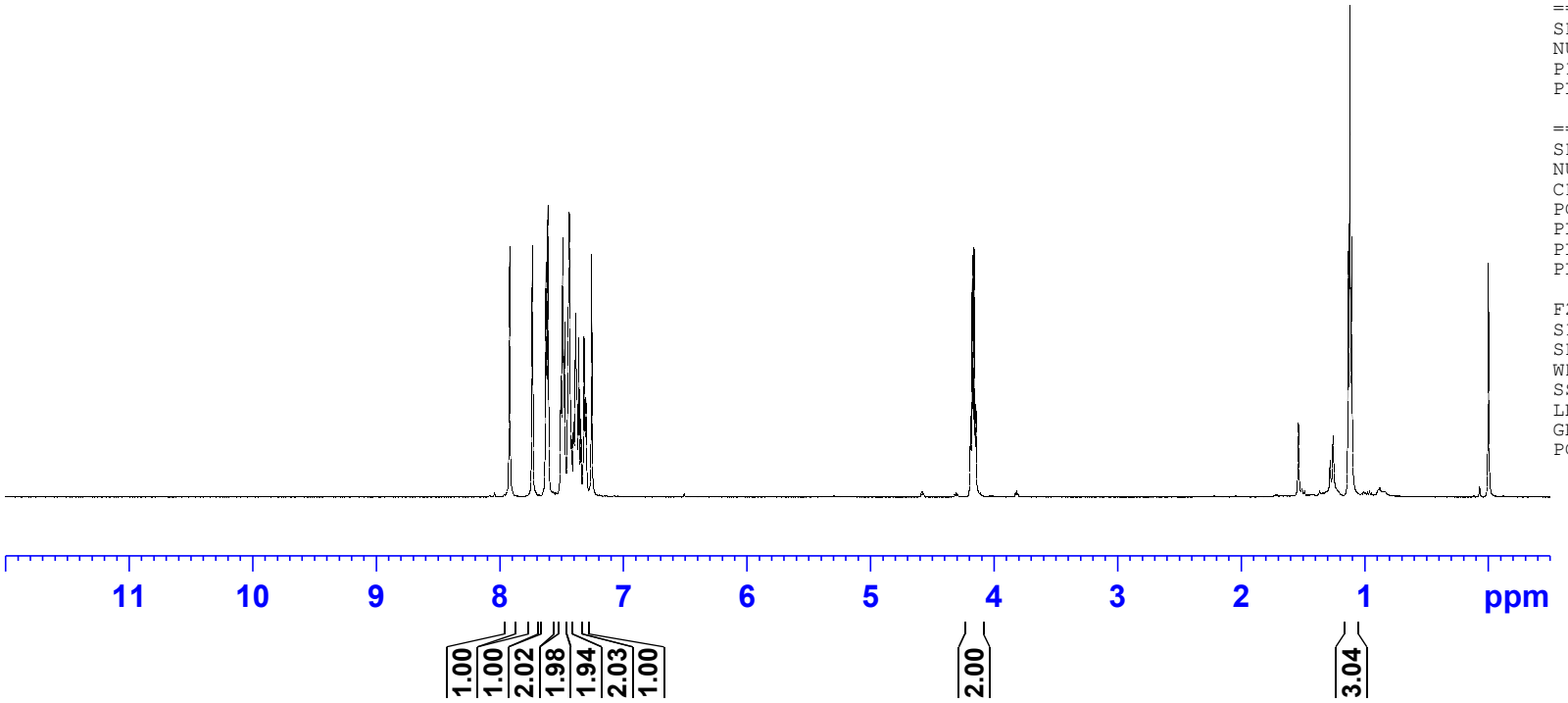
3i


```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-131
PROCNO                  1

F2 - Acquisition Parameters
Date_              20211027
Time                 11.31
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG        zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.7 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB         0
LB                   0.30 Hz
GB          0
PC                   1.00
```

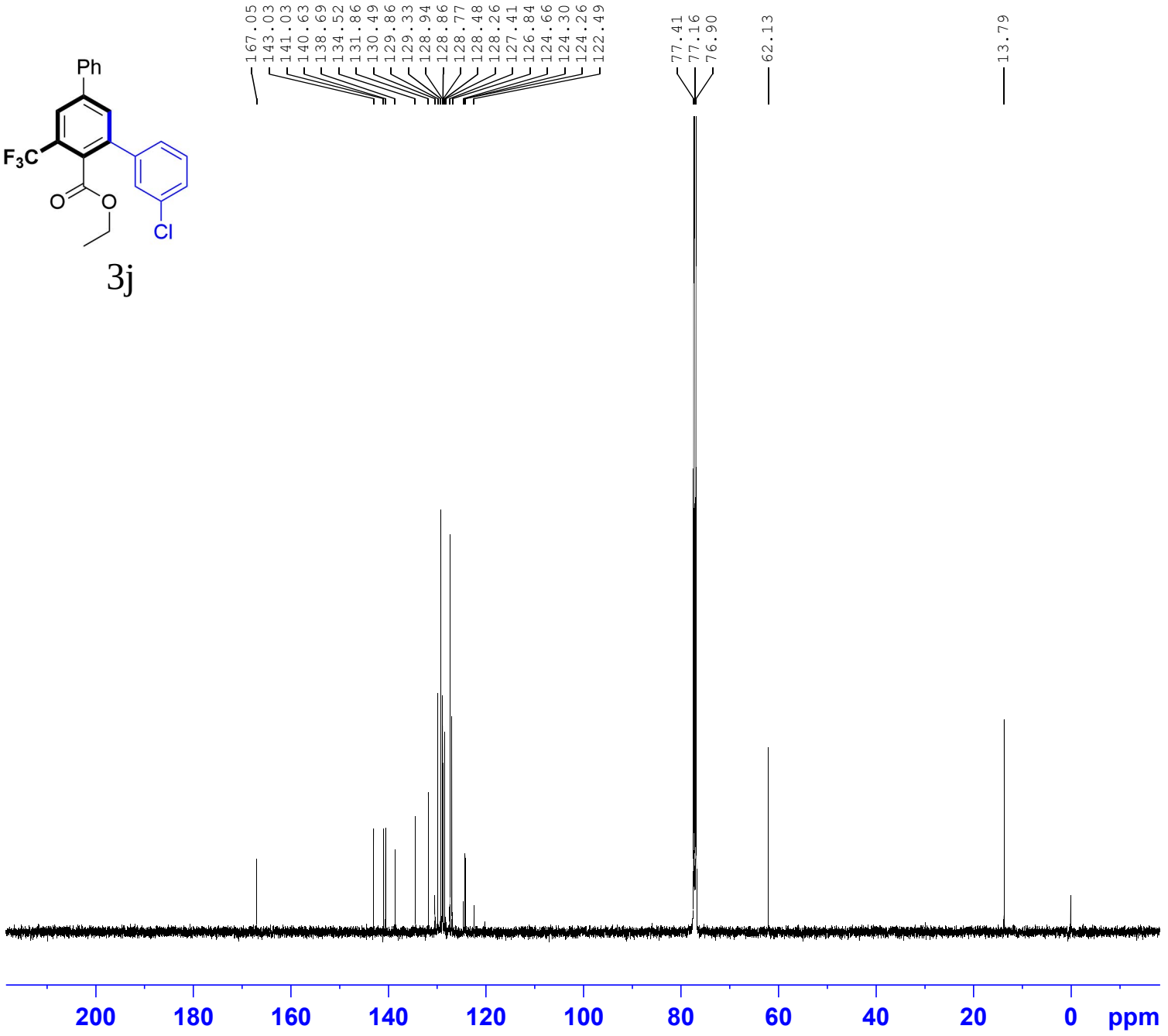


3j

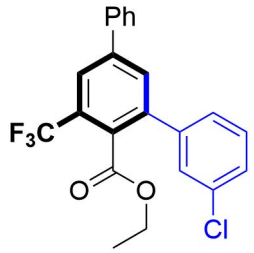





```
Current Data Parameters
NAME      zba-002-127-pu-20211022
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211022
Time                 13.49
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES              0.152588 Hz
AQ                3.2767999 sec
RG                     62.06
DW                  50.000 usec
DE                   6.50 usec
TE                    298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                   10.59 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                   65536
SF          500.1300127 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

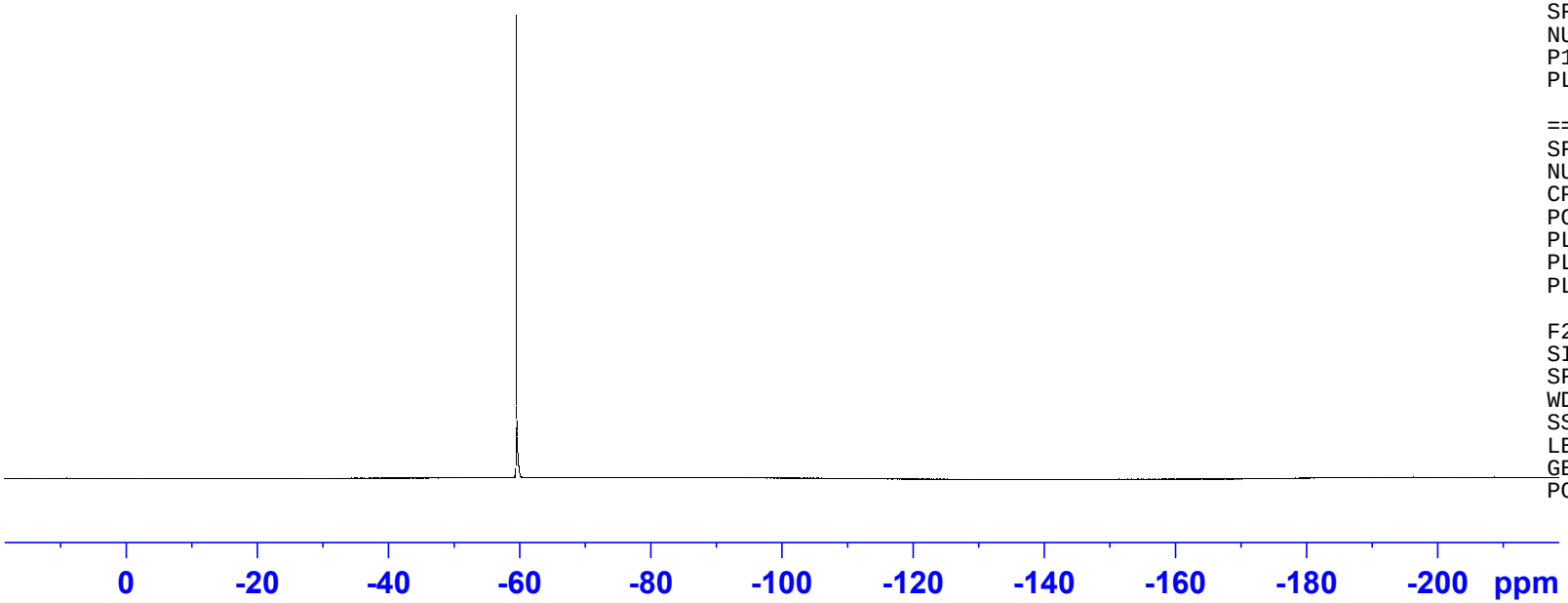



```
Current Data Parameters
NAME      zba-002-127-pu-20211022
EXPNO                          4
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211022
Time                  14.39
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     512
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.35778001 W
PLW13          0.22898000 W

F2 - Processing parameters
SI                    32768
SF            125.7577711 MHz
WDW                      EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

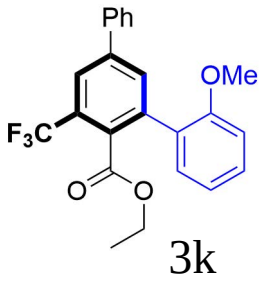


3j

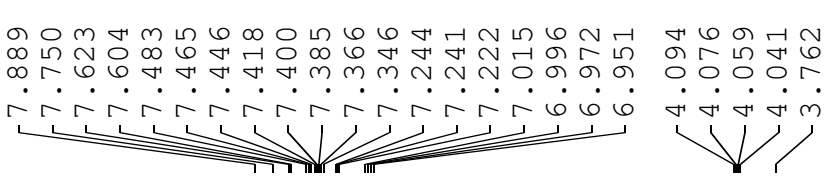
-59.48

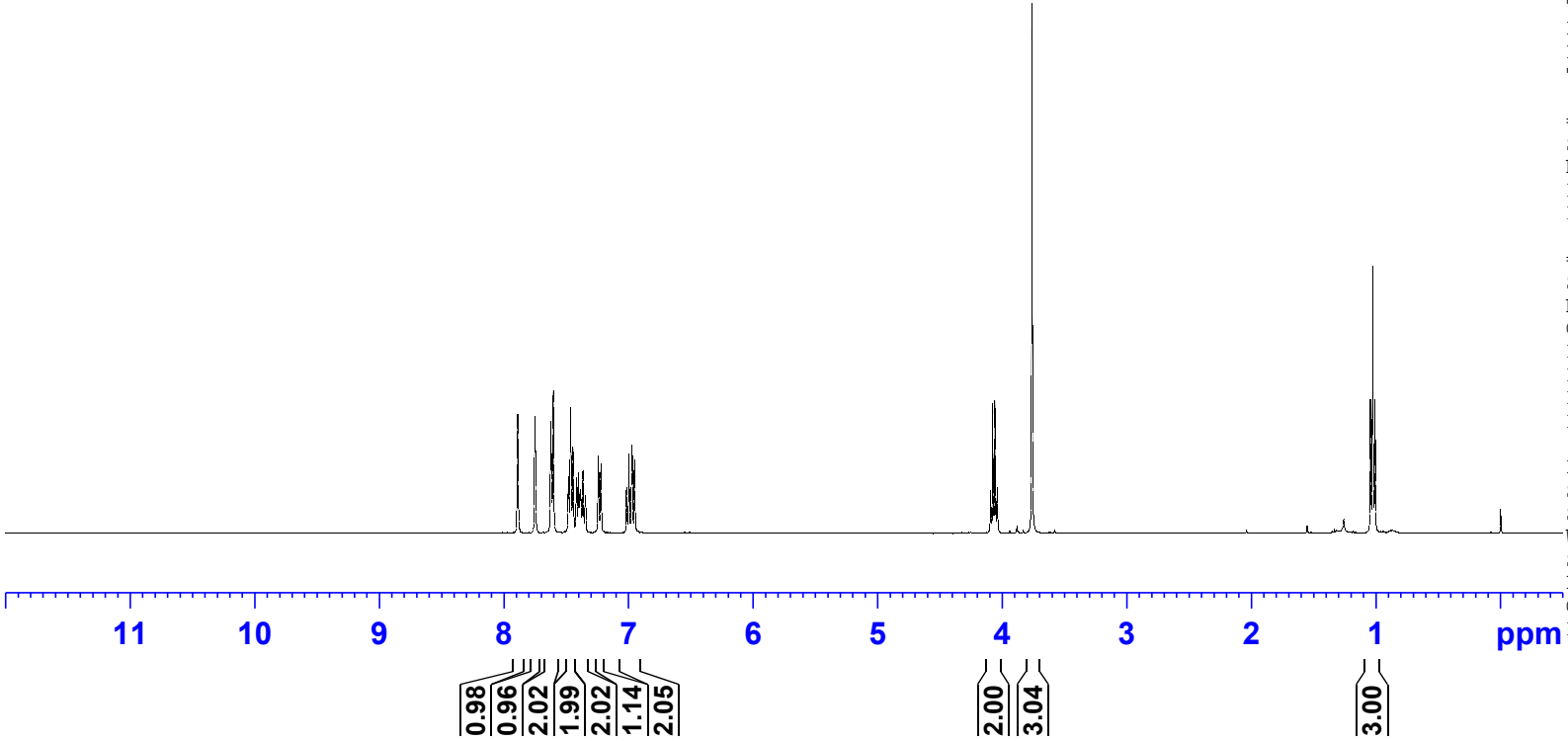



```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-65
PROCNO                 1

F2 - Acquisition Parameters
Date_            20220121
Time                15.52
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 296.1 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                  65536
SF           376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

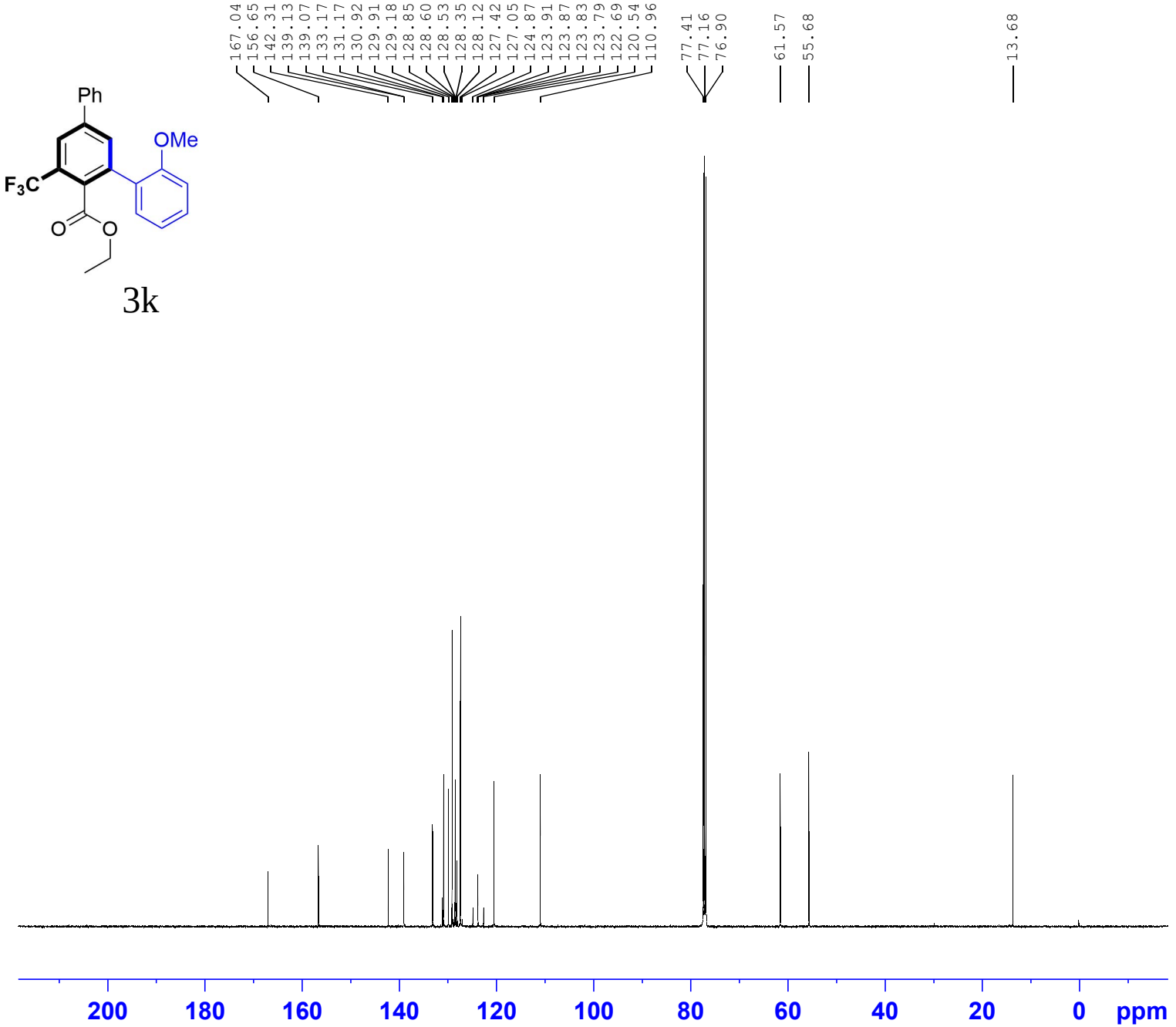


3k

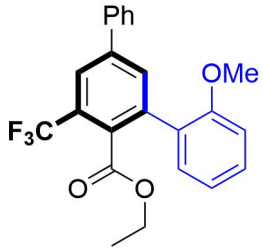





```
Current Data Parameters
NAME      zba-002-120b-1229
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211229
Time                8.52
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.244532 Hz
AQ             2.0447233 sec
RG                125.02
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1          2.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1         12.00000000 W

======== CHANNEL f2 ========
SFO2         400.2424716 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          400.2400162 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

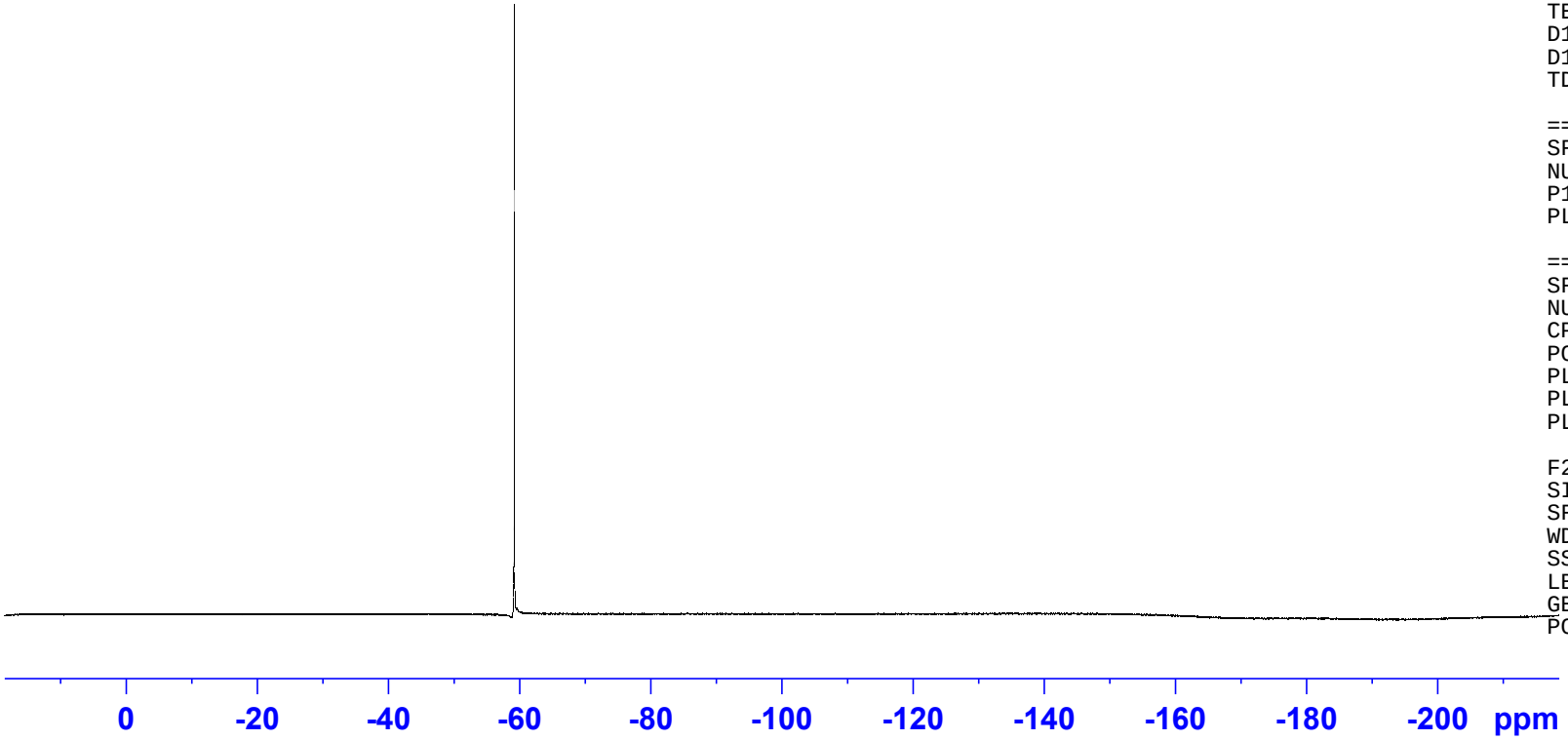



```
Current Data Parameters
NAME      zba-002-120b-2ome1228
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211229
Time                   8.13
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                   10.50 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.39550999 W
PLW13           0.25312999 W

F2 - Processing parameters
SI                   32768
SF             125.7577738 MHz
WDW                     EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

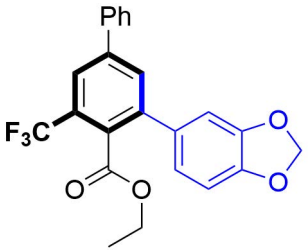


3k

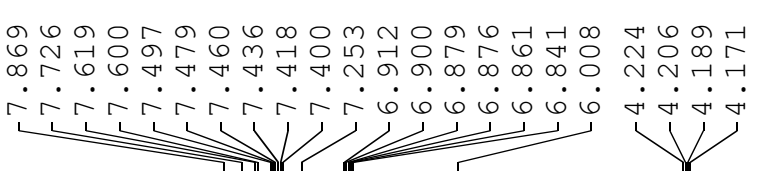
-59.21

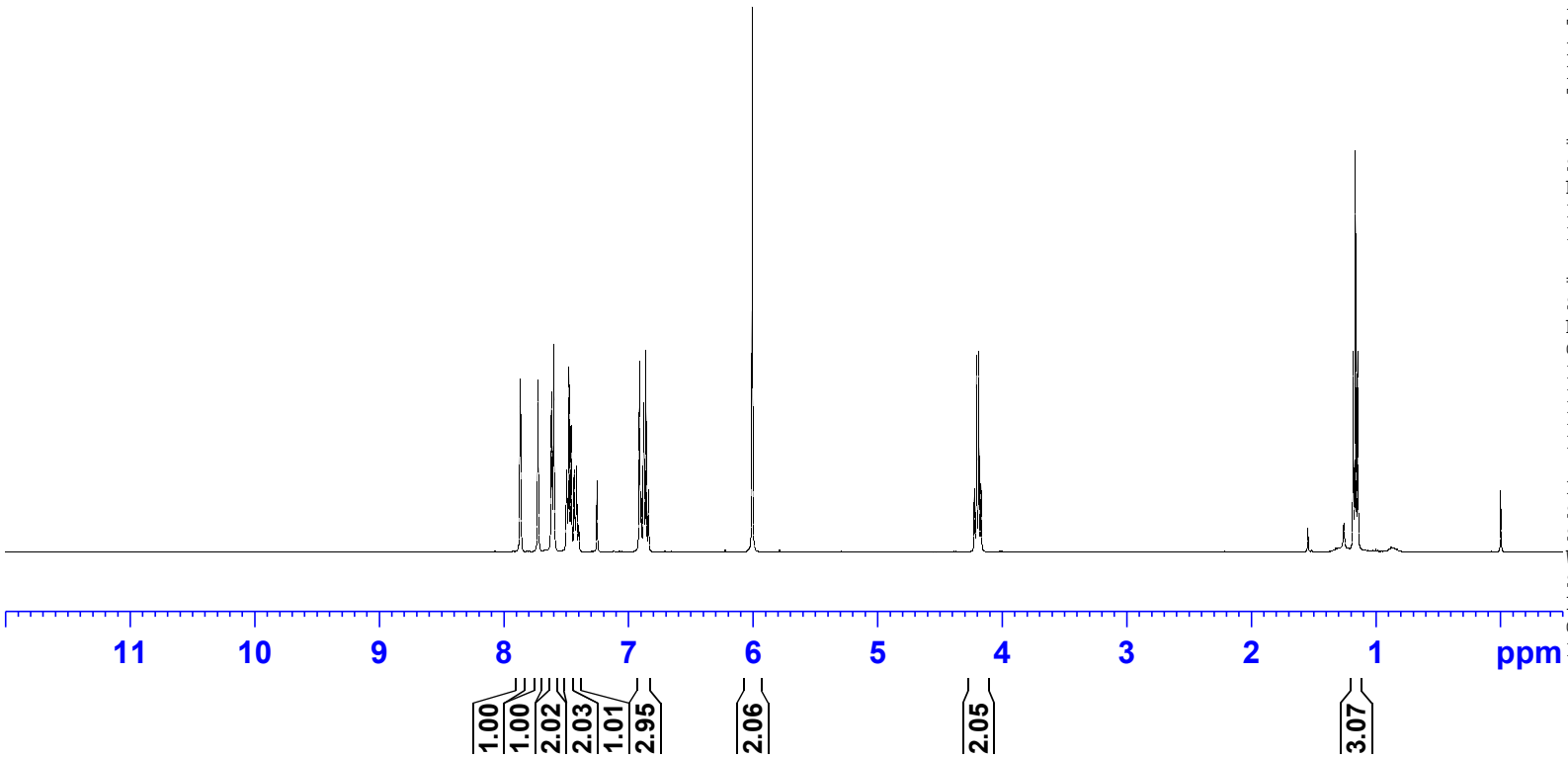



```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-120b
PROCNO                   1

F2 - Acquisition Parameters
Date_              20211027
Time                 11.44
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.8 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

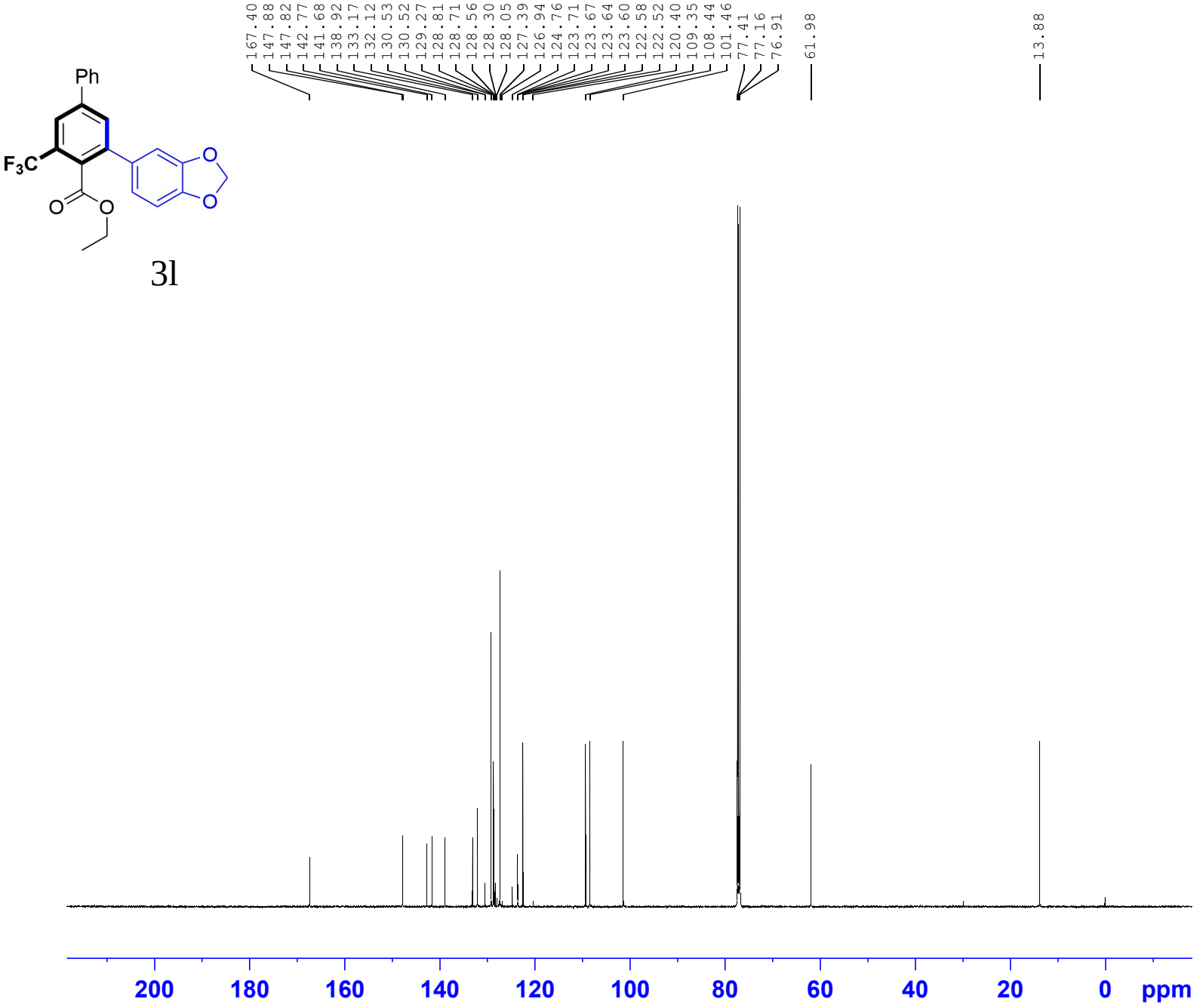


3l

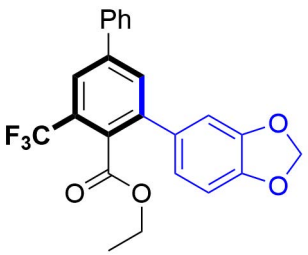





```
Current Data Parameters
NAME      zba-002-145-0105
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220105
Time               9.37
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8012.820 Hz
FIDRES         0.244532 Hz
AQ            2.0447233 sec
RG               206.33
DW               62.400 usec
DE                6.50 usec
TE               298.7 K
D1          2.00000000 sec
D11      0 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        400.2424716 MHz
NUC1                1H
P1                14.30 usec
PLW1        12.00000000 W

======== CHANNEL f2 ========
SFO2        400.2424716 MHz
NUC2               off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                65536
SF          400.2400126 MHz
WDW                EM
SSB       0
LB              0.30 Hz
GB        0
PC              1.00
```



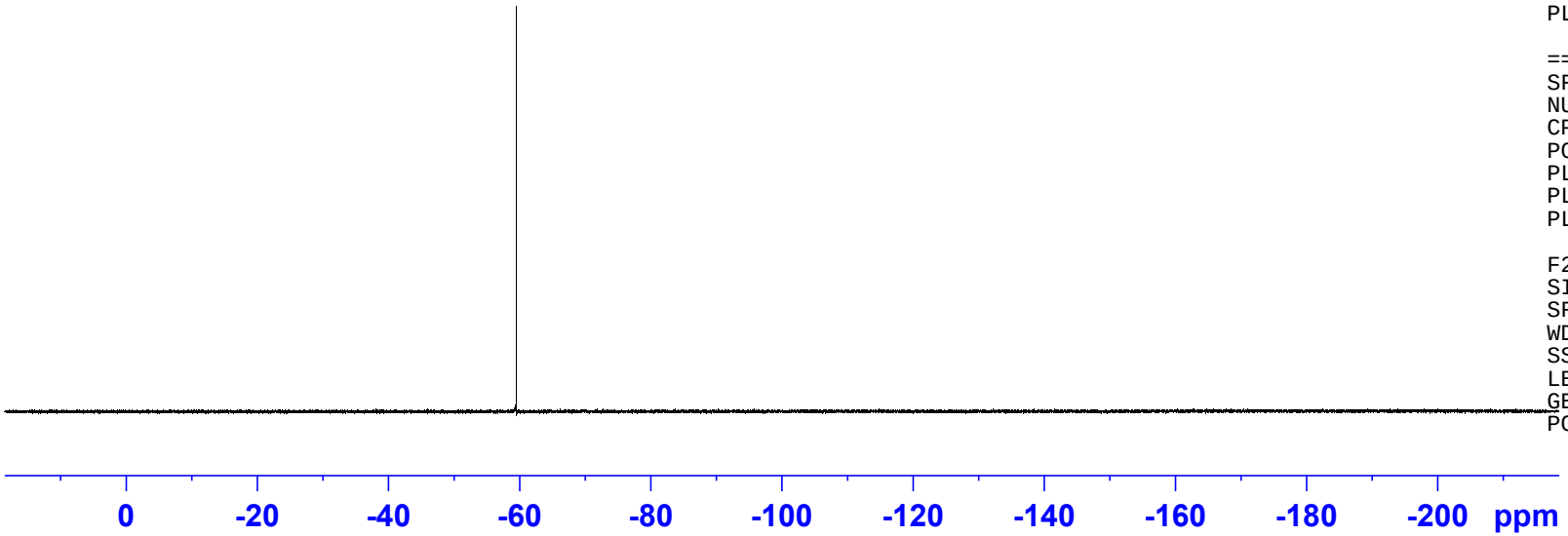

```
Current Data Parameters
NAME      zba-002-145-2O-0104
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220105
Time                   7.41
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577720 MHz
WDW                      EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

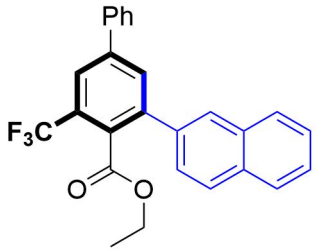


31

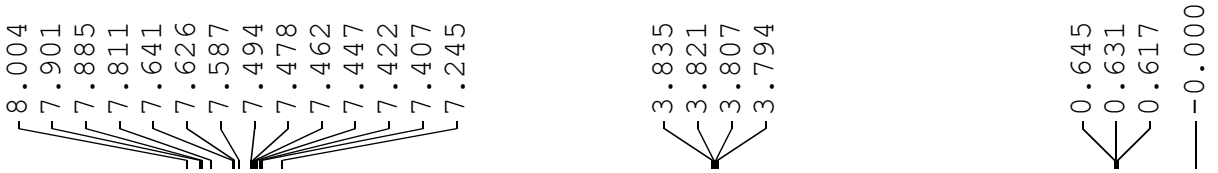
-59.47

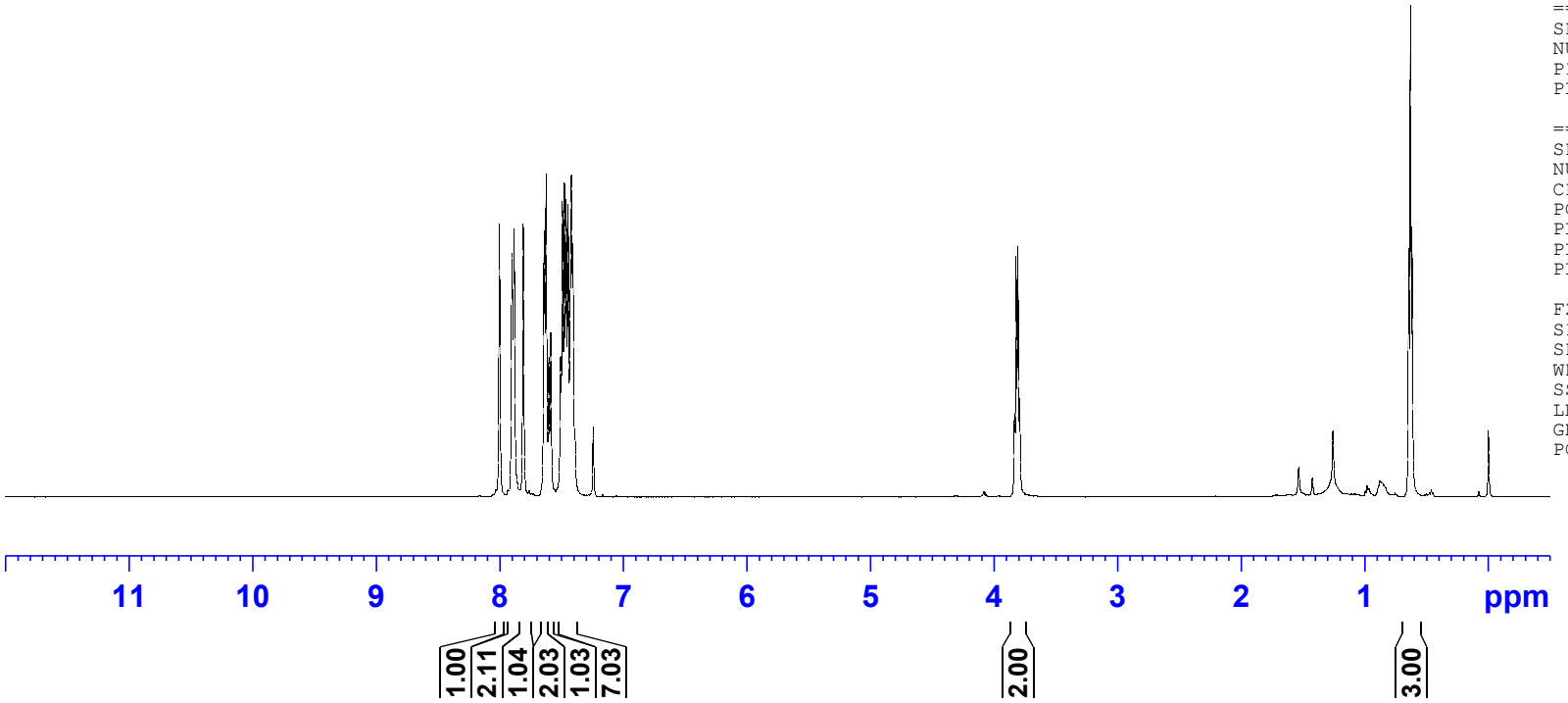
```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-145
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211229
Time                10.31
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.0 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



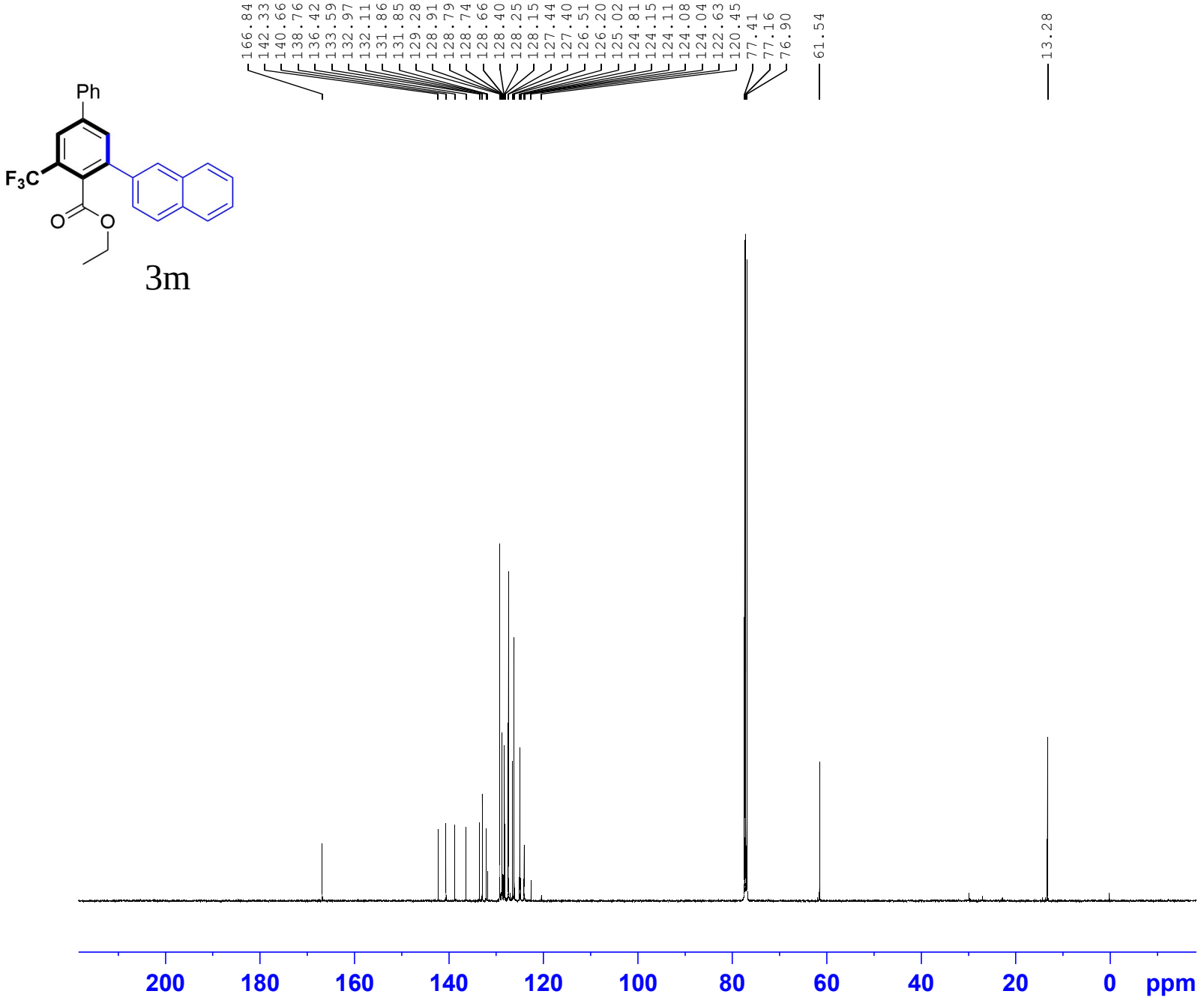


3m

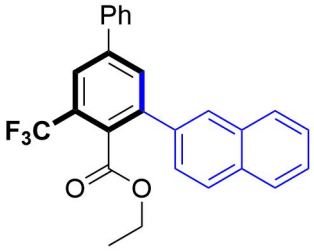





```
Current Data Parameters
NAME      zba-002-147-pu-20211029
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211029
Time              22.24
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                31.72
DW               50.000 usec
DE                6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300187 MHz
WDW                   EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

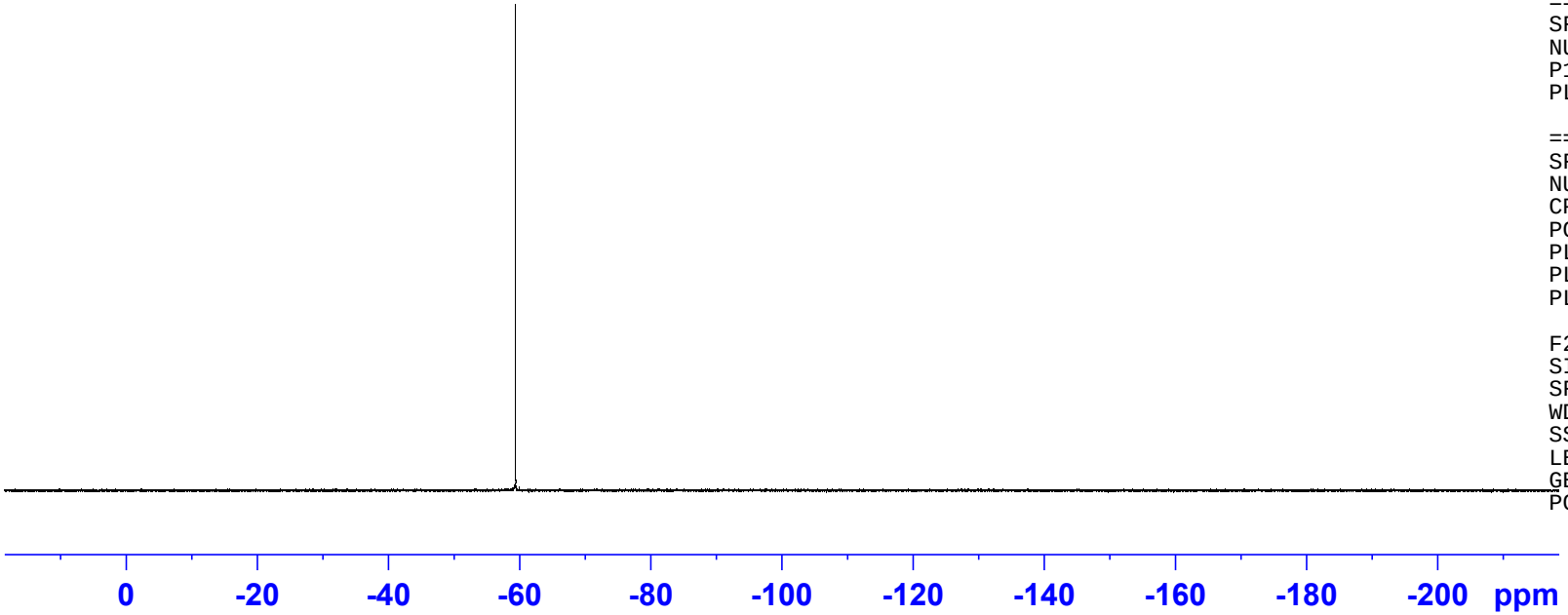



```
Current Data Parameters
NAME      zba-002-147-pu-20211029
EXPNO                          4
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211031
Time                    3.43
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.35778001 W
PLW13          0.22898000 W

F2 - Processing parameters
SI                   32768
SF            125.7577737 MHz
WDW                     EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

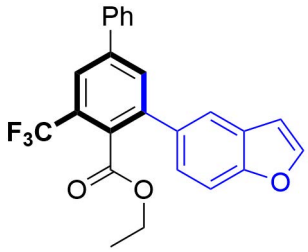


3m

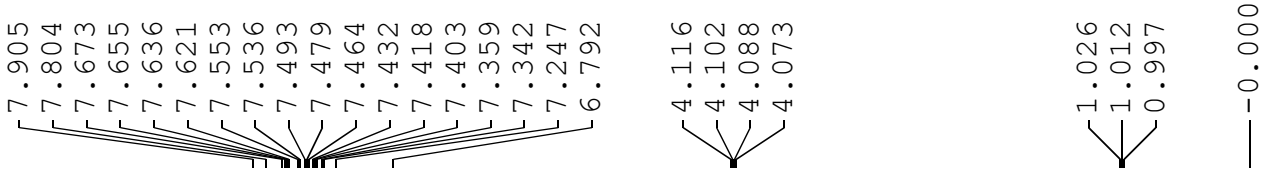
-59.41



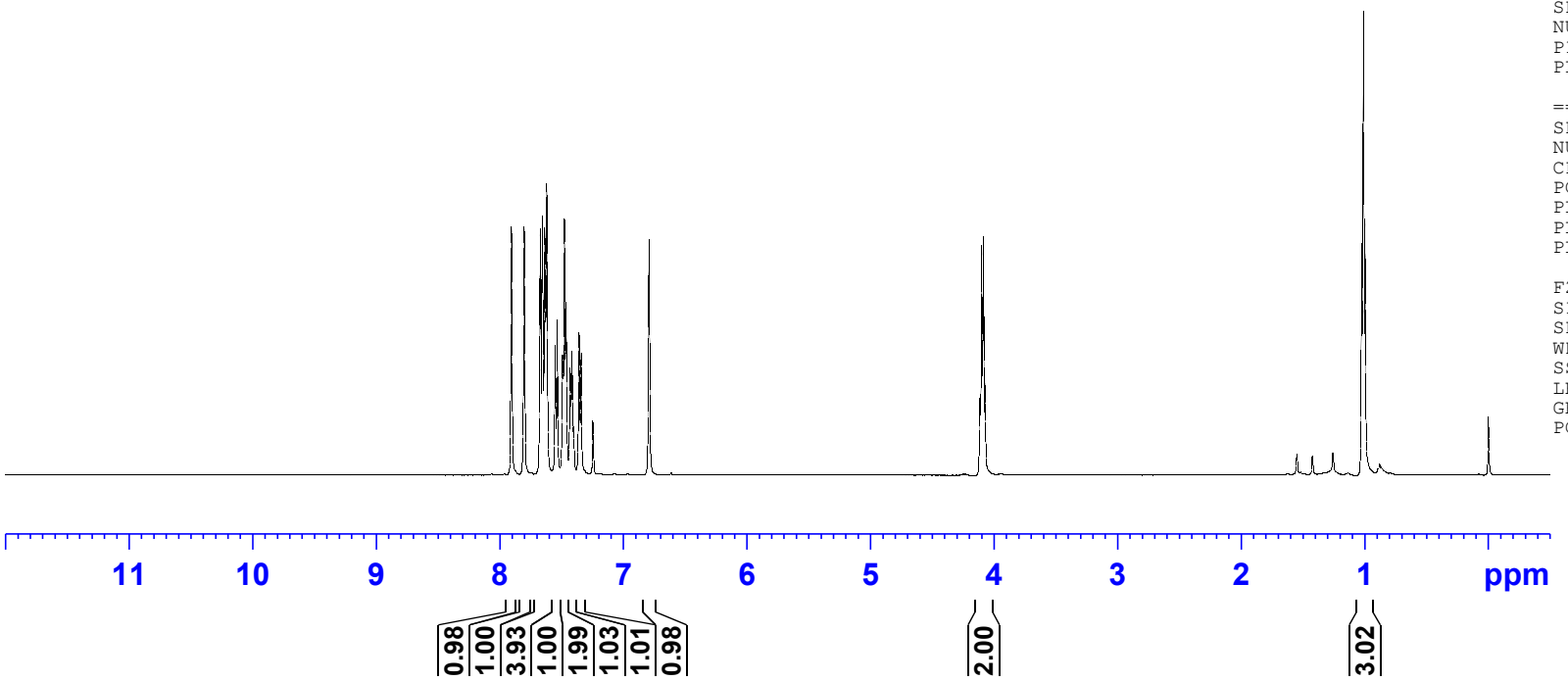

```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-147
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211108
Time                9.07
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      4
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.1 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                    65536
SF          376.6018696 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

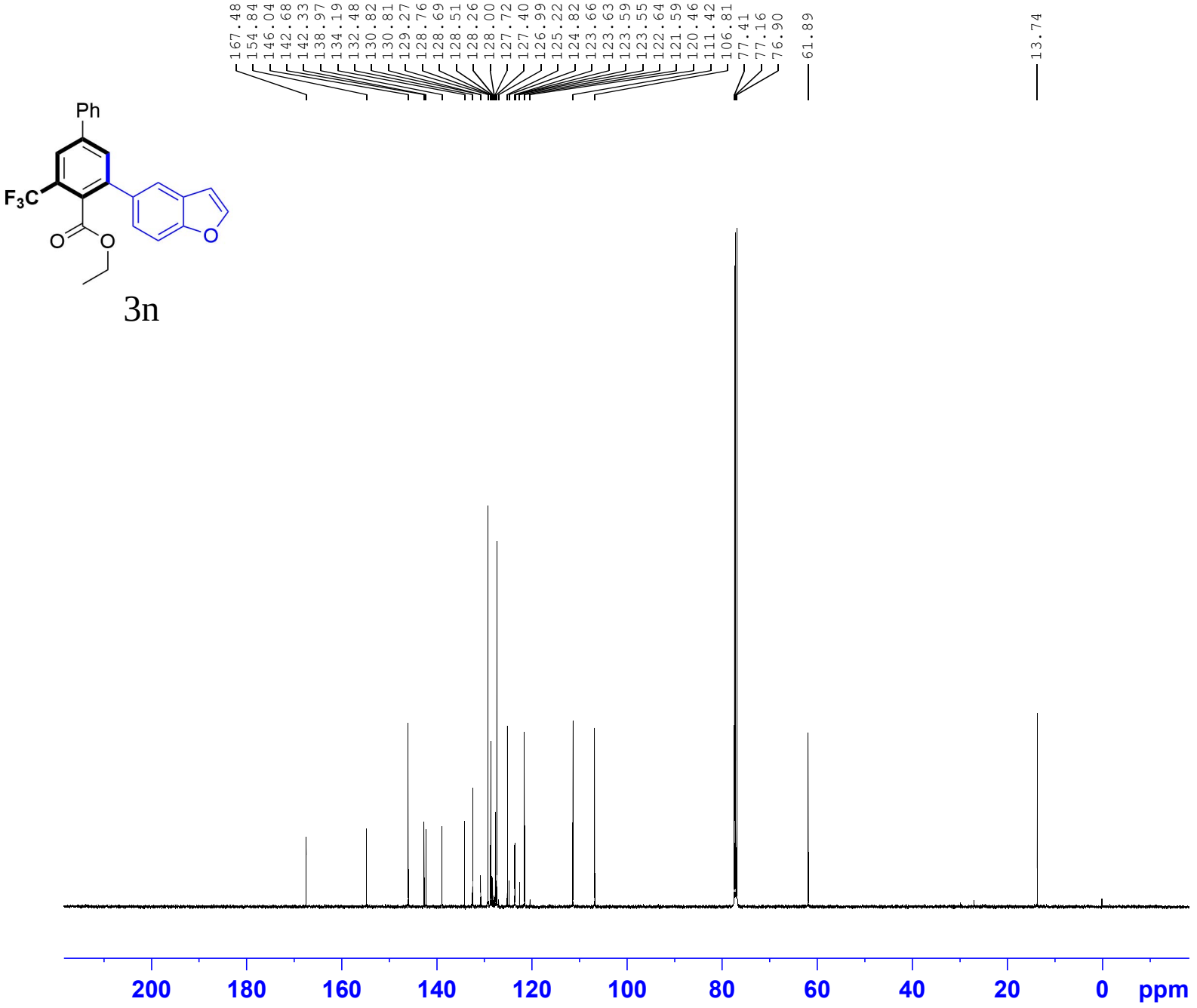


3n

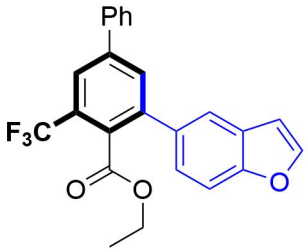



```
Current Data Parameters
NAME      zba-002-142-pu-20211028
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211028
Time                 22.42
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES              0.152588 Hz
AQ                3.2767999 sec
RG                   49.27
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                   10.59 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                   65536
SF            500.1300174 MHz
WDW                    EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```



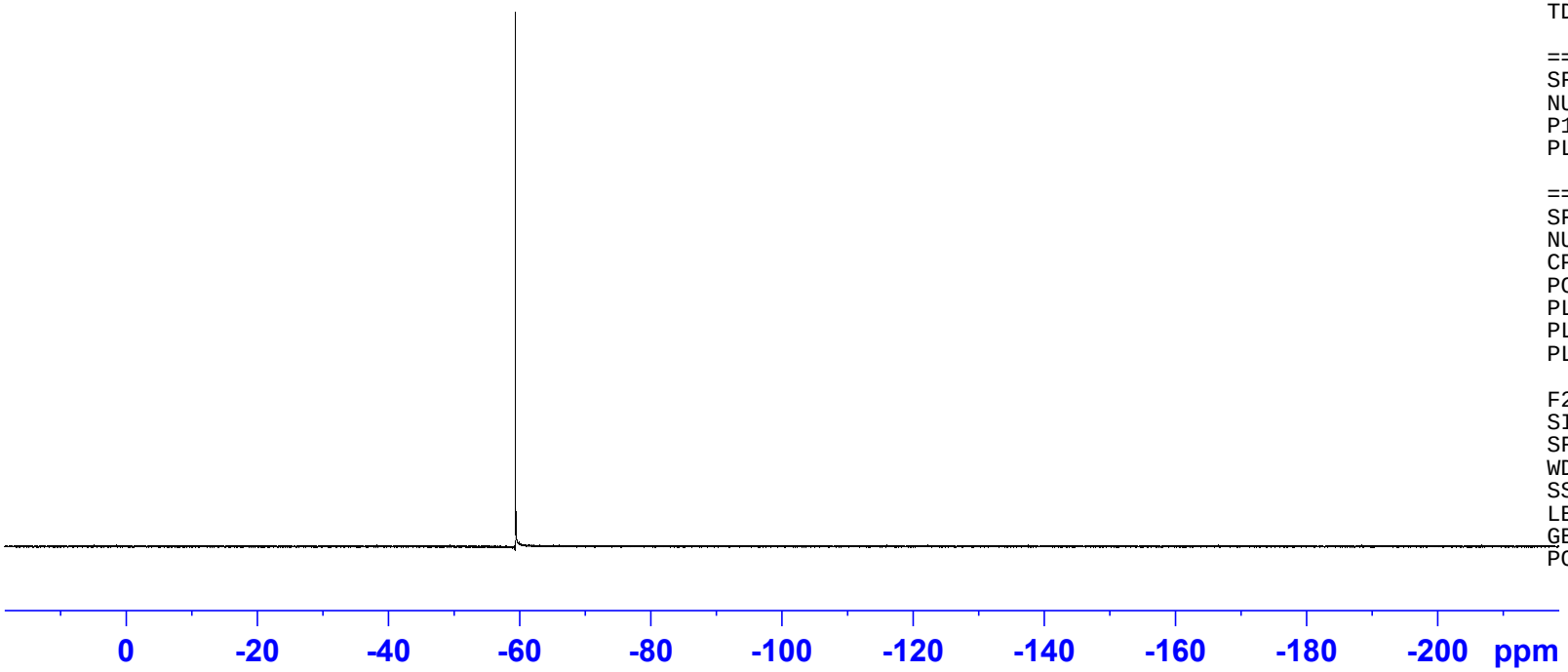



```
Current Data Parameters
NAME      zba-002-142-pu-20211028
EXPNO                          3
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211028
Time                  23.04
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     300
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.35778001 W
PLW13          0.22898000 W

F2 - Processing parameters
SI                    32768
SF            125.7577729 MHz
WDW                      EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

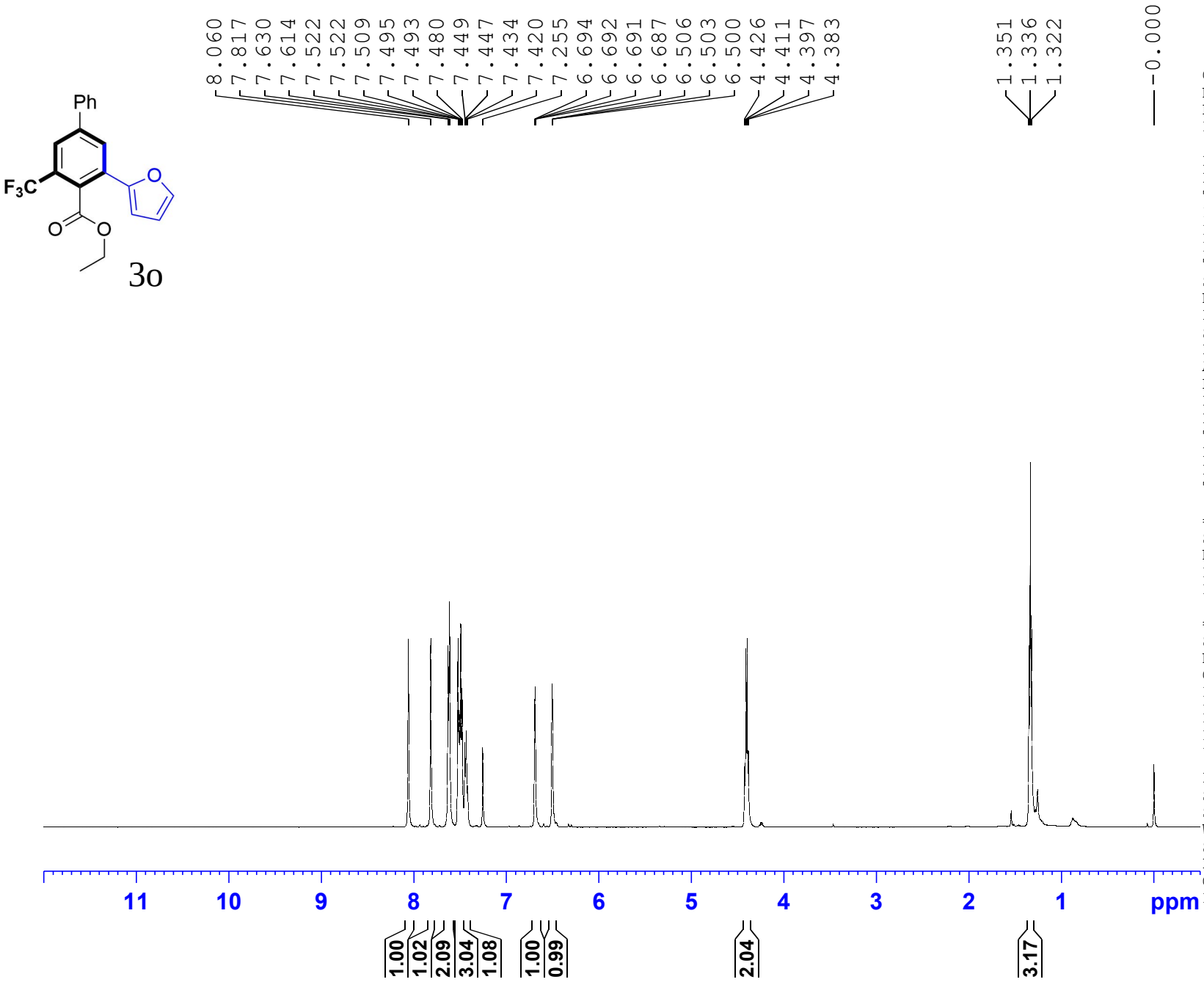


3n

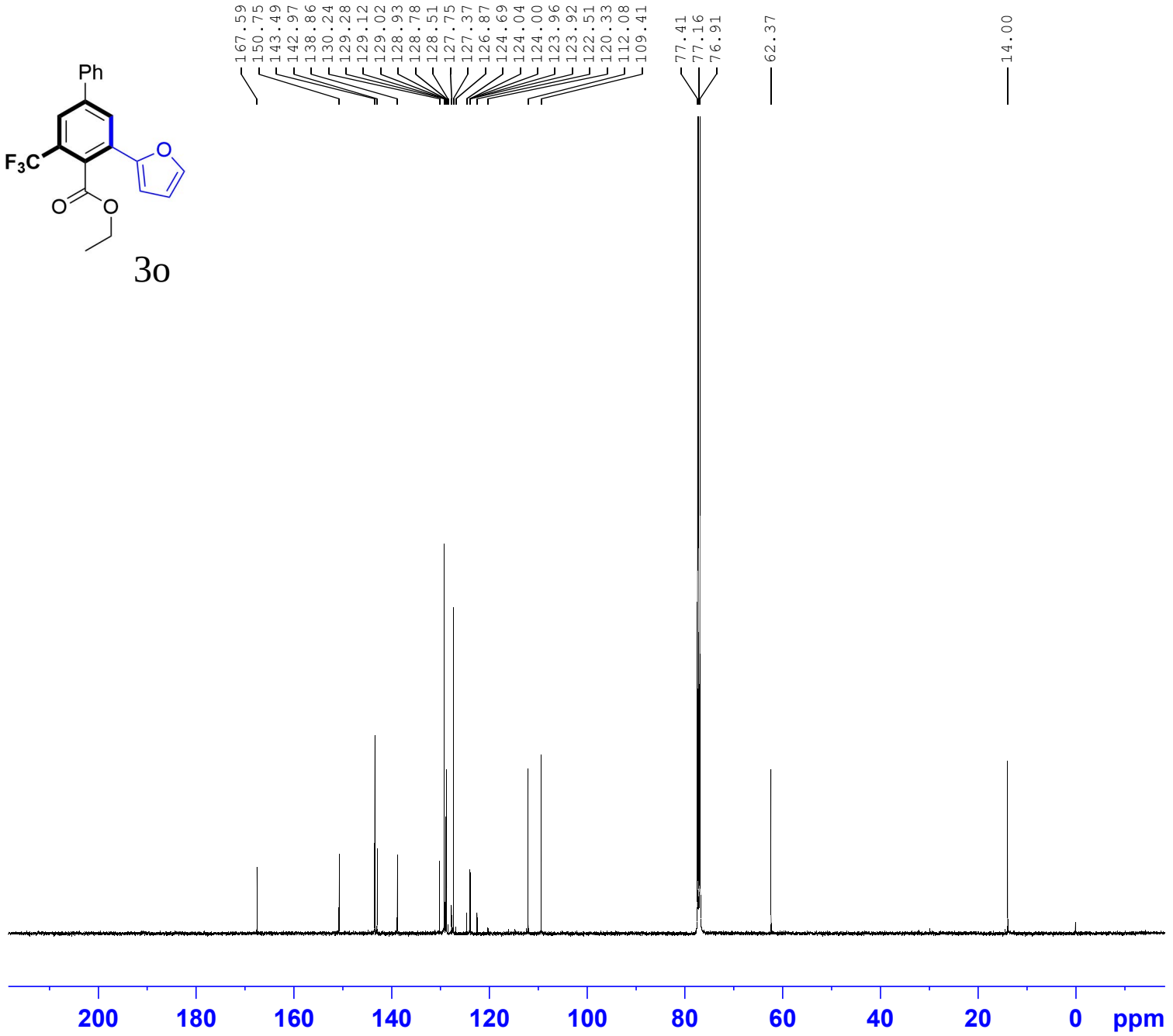
-59.41



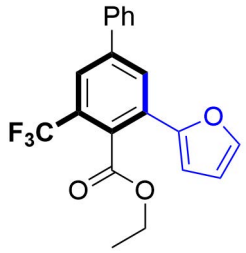

```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-142
PROCNO                  1

F2 - Acquisition Parameters
Date_              20211108
Time                  8.58
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       4
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.1 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```




```
Current Data Parameters
NAME      zba-002-148-o-1225
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211226
Time                3.59
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 62.06
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300139 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

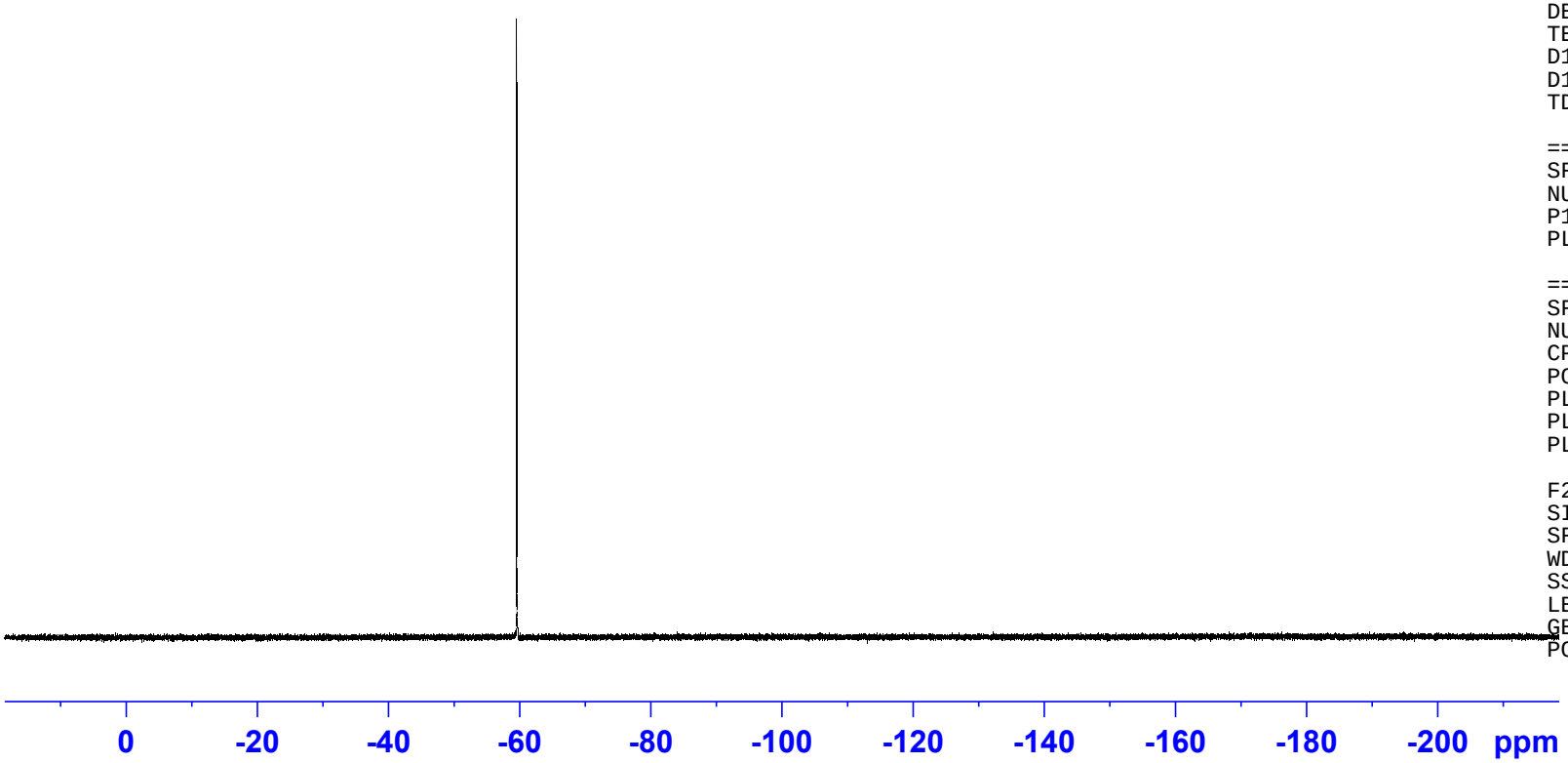



```
Current Data Parameters
NAME      zba-002-148-o-1226
EXPNO                     2
PROCNO                    1

F2 - Acquisition Parameters
Date_           20211226
Time                16.03
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1500
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                10.50 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2         20.00000000 W
PLW12         0.39550999 W
PLW13         0.25312999 W

F2 - Processing parameters
SI                 32768
SF           125.7577711 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

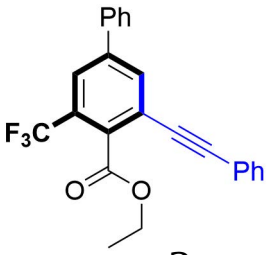


3o

-59.57

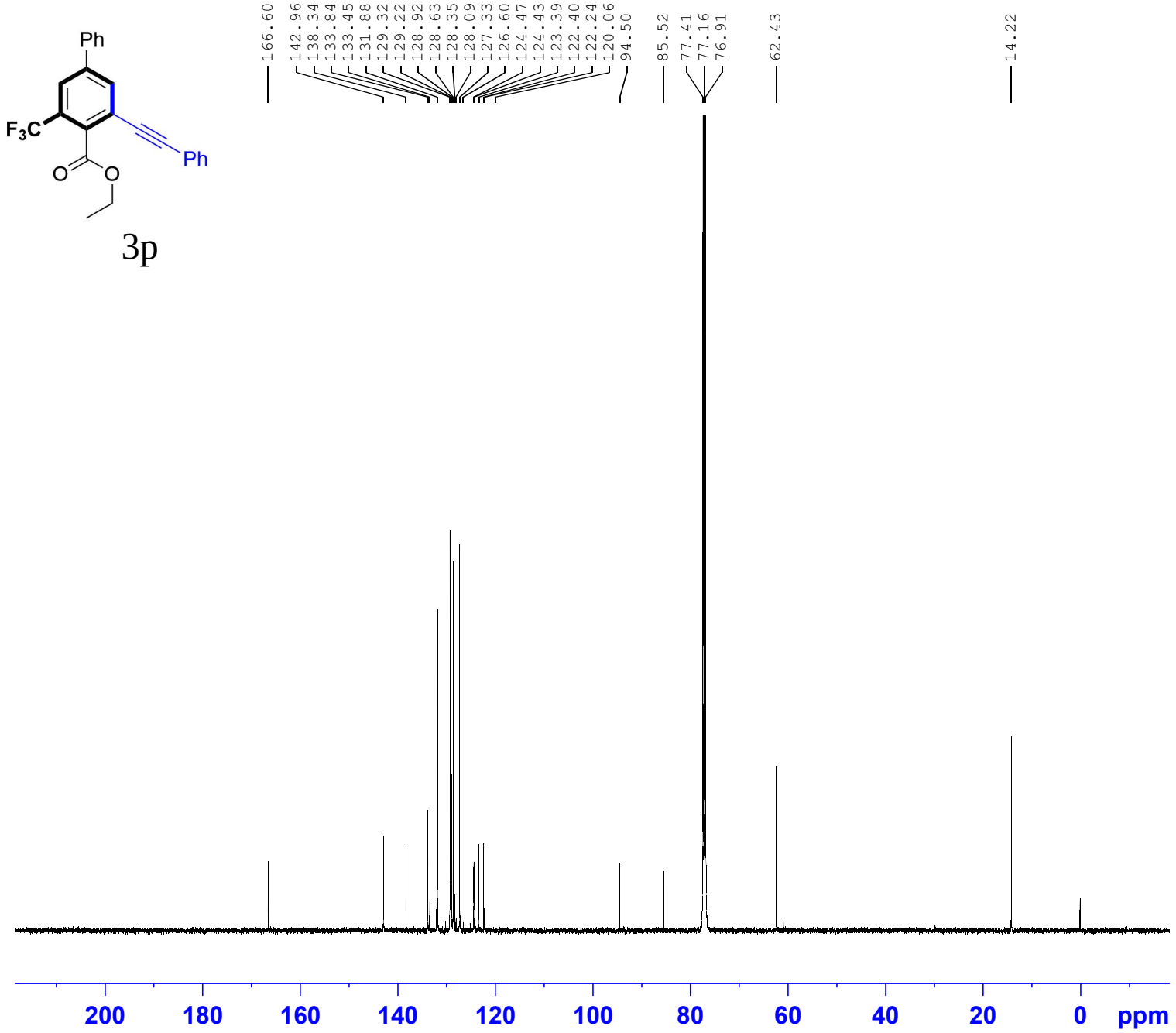



```
Current Data Parameters
NAME                  19F
EXPNO           zba-002-148
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211229
Time                10.33
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

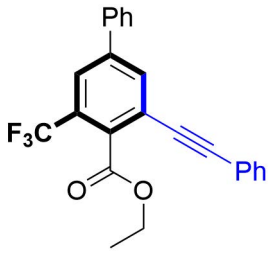


3p


```
Current Data Parameters
NAME      zba-003-3-que-0109-3
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220110
Time                   8.37
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH               10000.000 Hz
FIDRES             0.152588 Hz
AQ                3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE                    298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1            500.1330885 MHz
NUC1                       1H
P1                    11.25 usec
PLW1            20.00000000 W

======== CHANNEL f2 ========
SFO2            500.1330885 MHz
NUC2                      off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                        65536
SF              500.1300149 MHz
WDW                        EM
SSB       0
LB                     0.30 Hz
GB        0
PC                     1.00
```

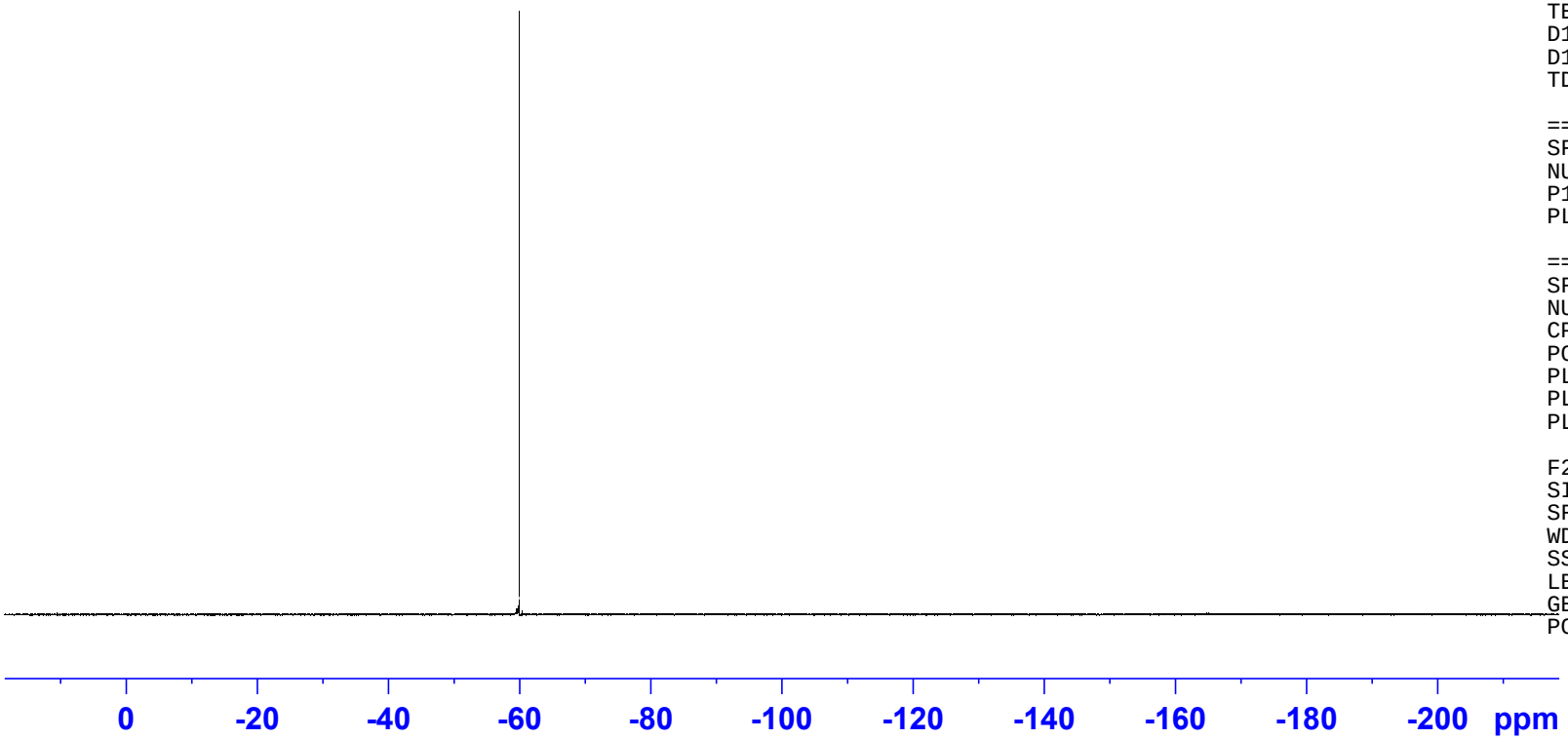



```
Current Data Parameters
NAME      zba-003-3-que-0109-3
EXPNO                        4
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220110
Time                   9.57
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1500
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2           20.00000000 W
PLW12           0.39550999 W
PLW13           0.25312999 W

F2 - Processing parameters
SI                    32768
SF             125.7577719 MHz
WDW                      EM
SSB         0
LB                   1.00 Hz
GB          0
PC                   1.40
```

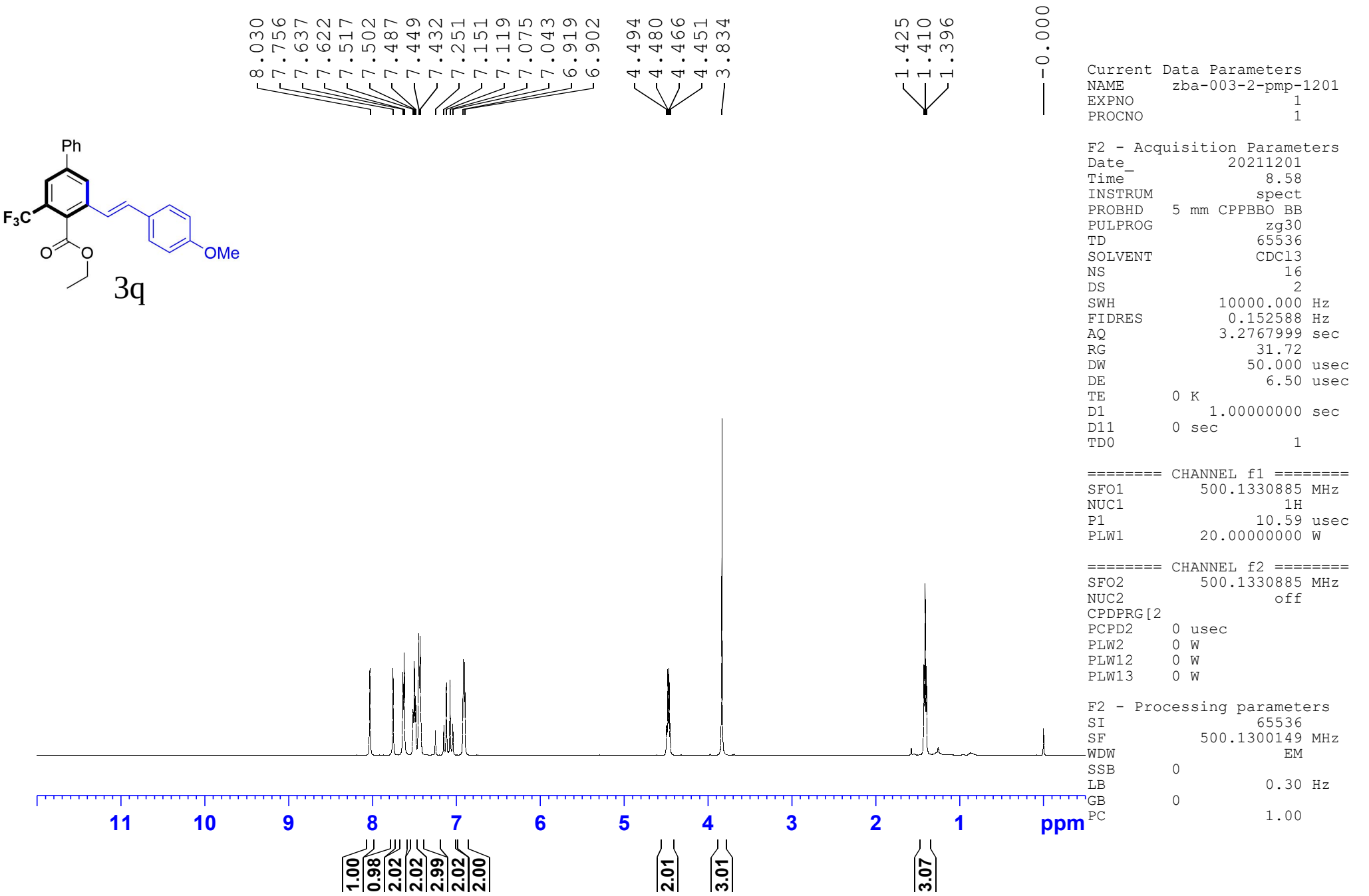


3p

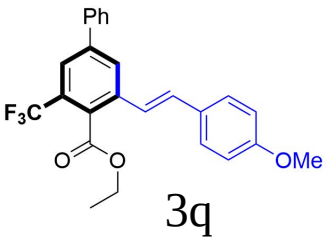
-59.94



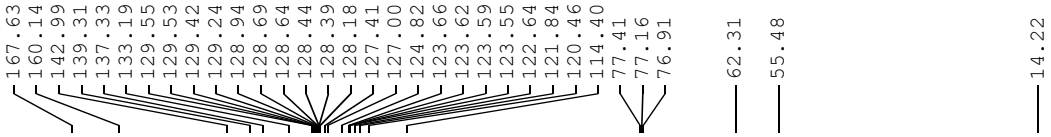

```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-3
PROCNO                1

F2 - Acquisition Parameters
Date_            20211205
Time                19.20
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                  298.5 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

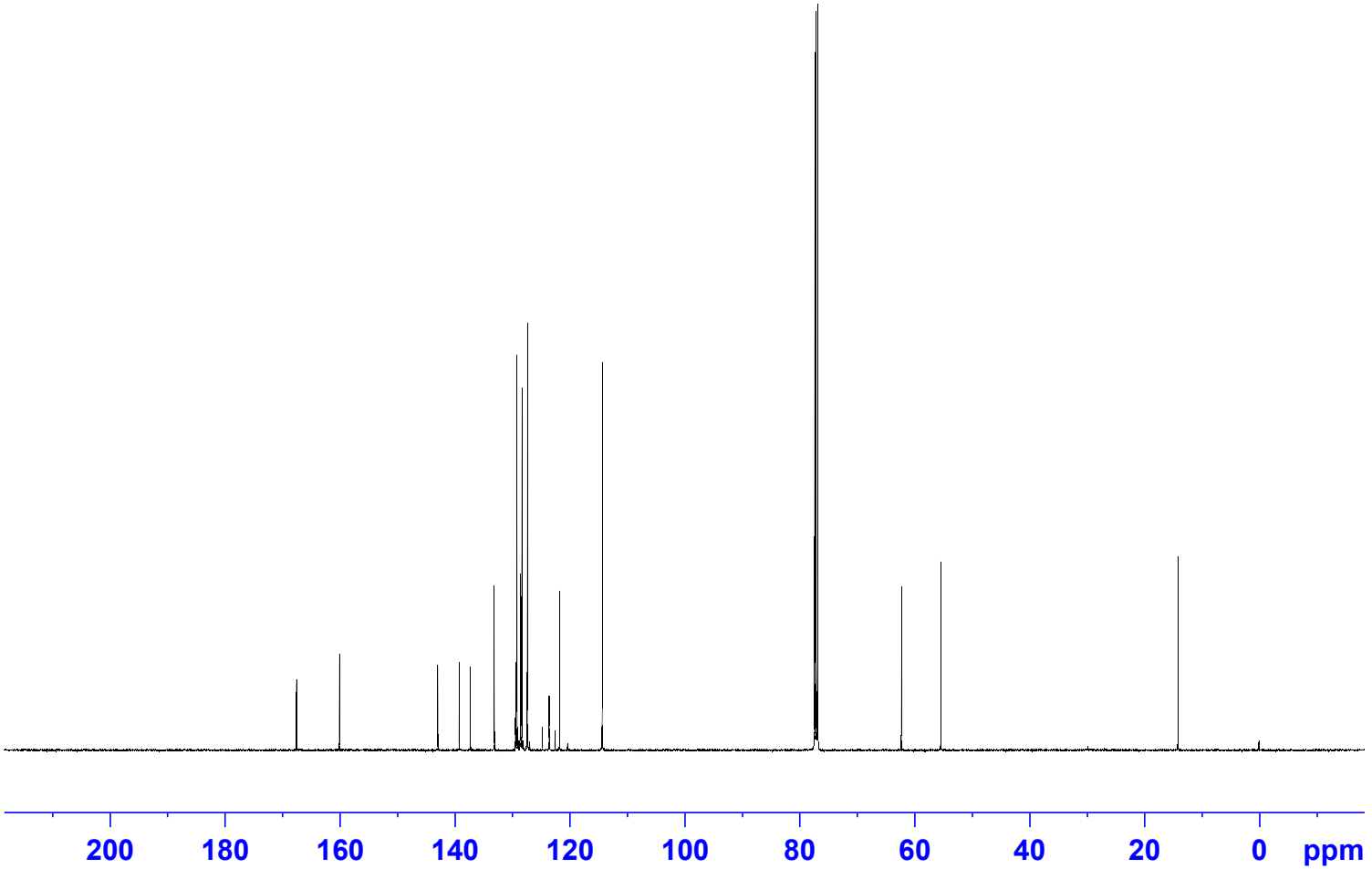



```
Current Data Parameters
NAME      zba-003-2-pmp-1201
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211201
Time                8.58
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 31.72
DW                50.000 usec
DE                 6.50 usec
TE        0 K
D1           1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300149 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

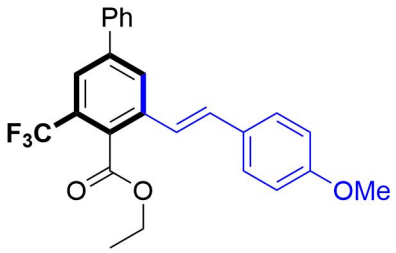


3q



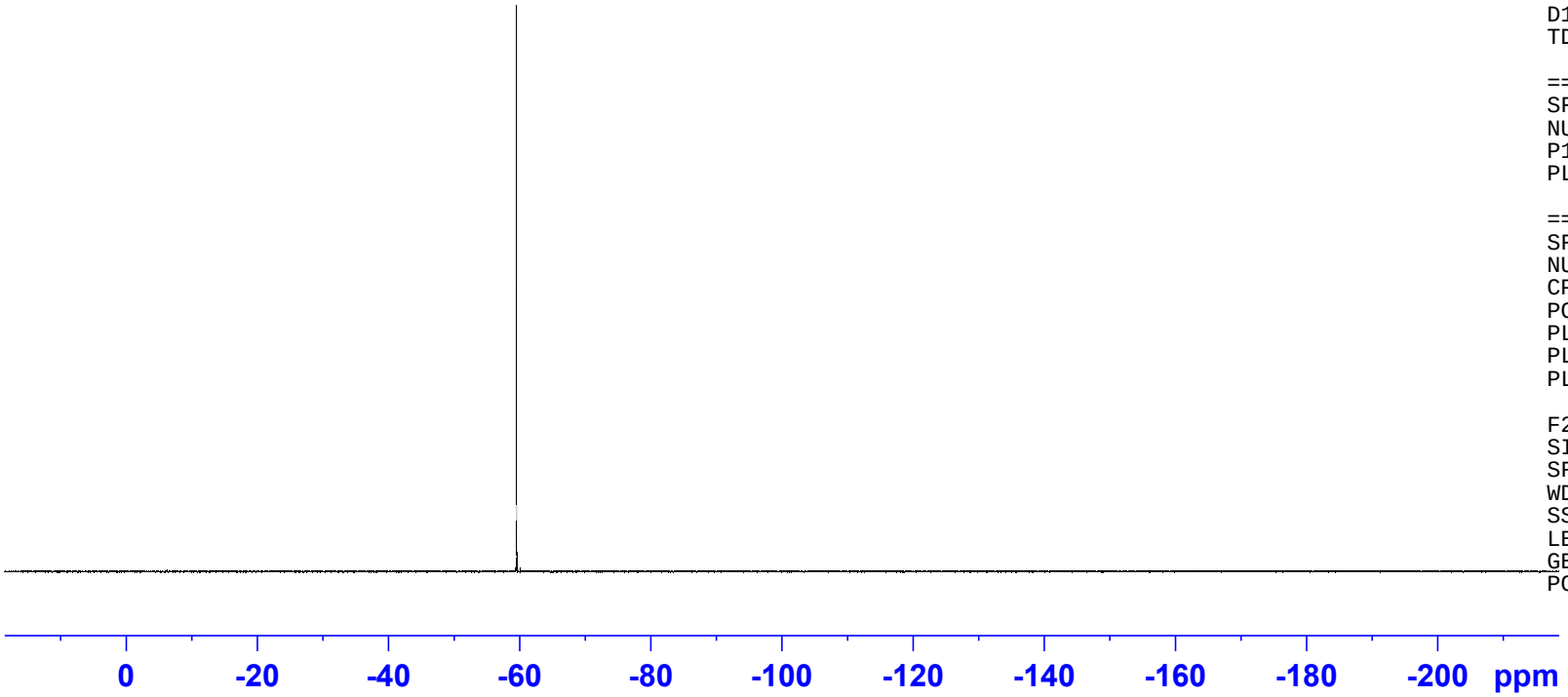



```
Current Data Parameters
NAME      zba-003-2-pmp-1201
EXPNO                      4
PROCNO                     1

F2 - Acquisition Parameters
Date_           20211202
Time                2.54
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                10.50 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.39550999 W
PLW13        0.25312999 W

F2 - Processing parameters
SI                32768
SF           125.7577727 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

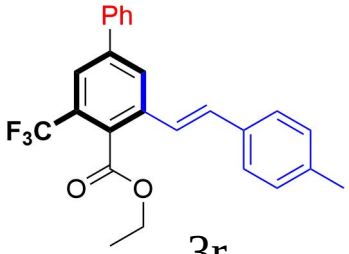


3q

-59.57

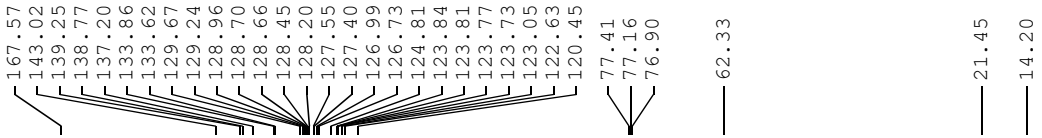


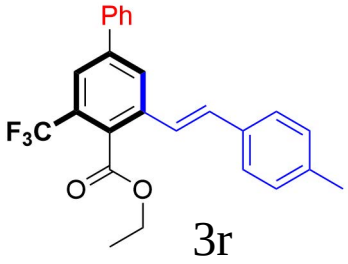

```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-2
PROCNO                1

F2 - Acquisition Parameters
Date_            20211205
Time                19.15
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.6 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



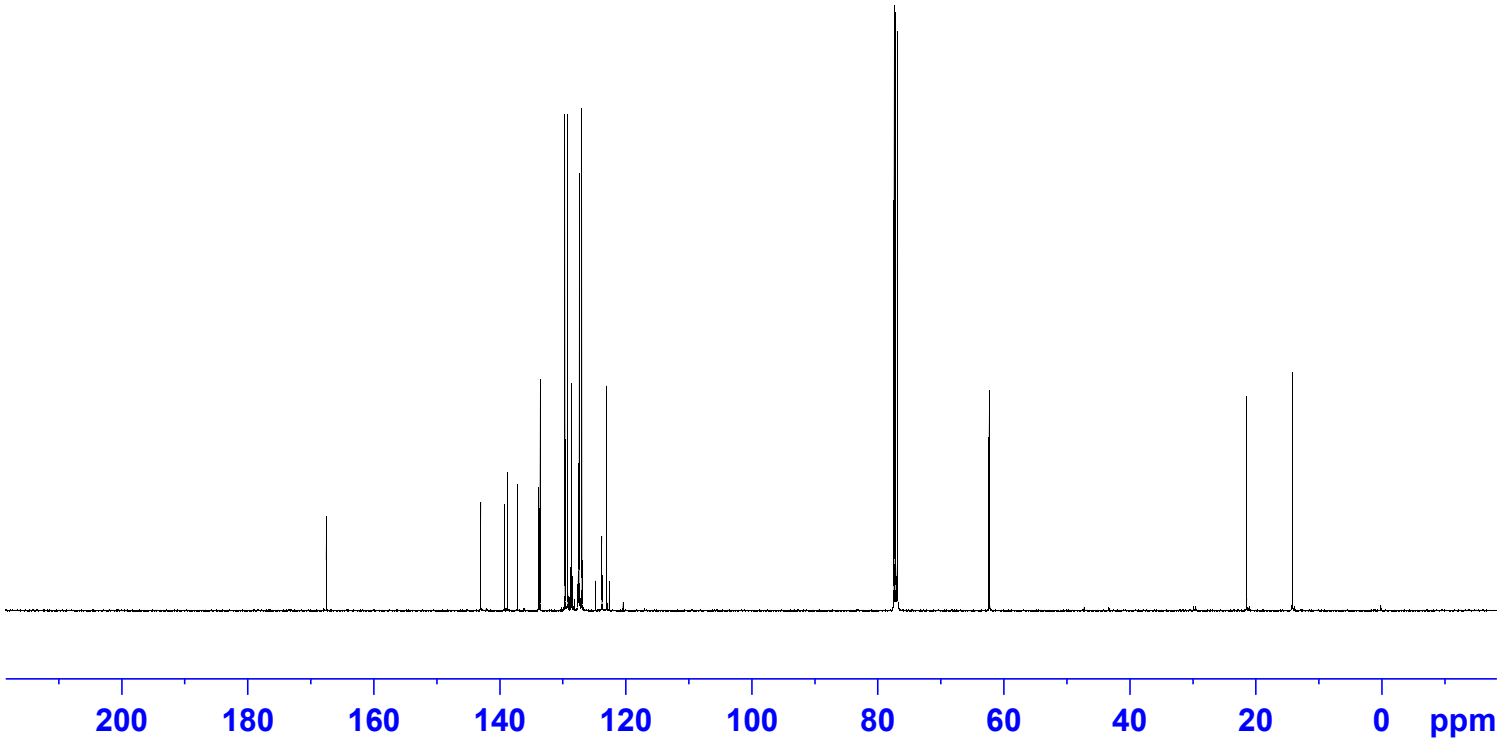
3r


```
Current Data Parameters
NAME      zba-003-17-4me-1209
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211210
Time                 6.25
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG              zg30
TD                  65536
SOLVENT             CDC13
NS                     16
DS                      2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ             3.2767999 sec
RG                  31.72
DW                 50.000 usec
DE                  6.50 usec
TE                 298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                  65536
SF           500.1300211 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

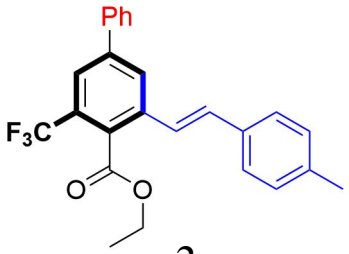




3r

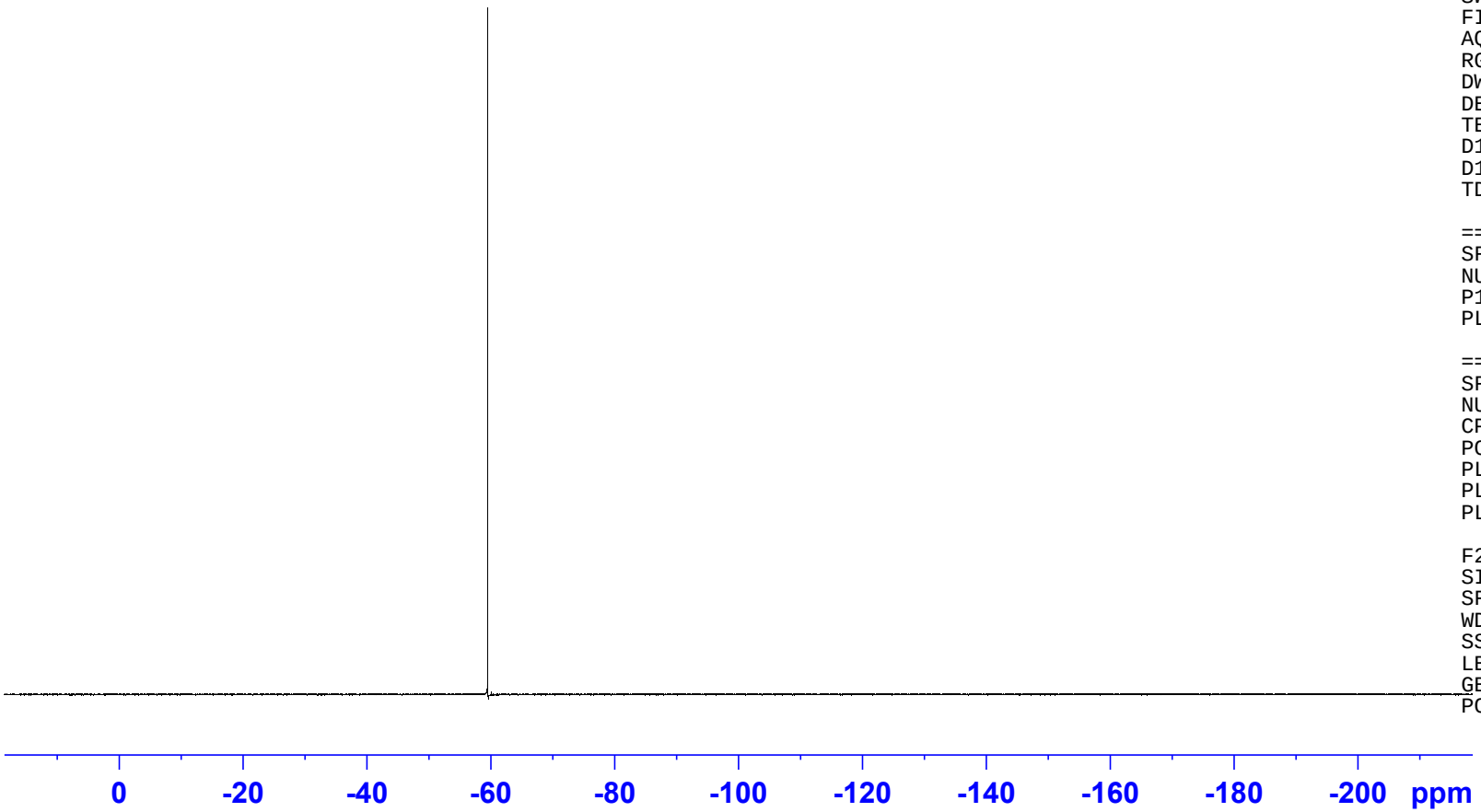



```
Current Data Parameters
NAME      zba-003-17-4me-1209
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_              20211210
Time                   7.20
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH             29761.904 Hz
FIDRES           0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577742 MHz
WDW                     EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.40
```

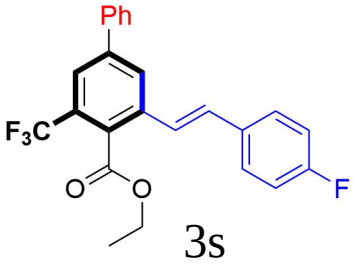


3r

-59.54

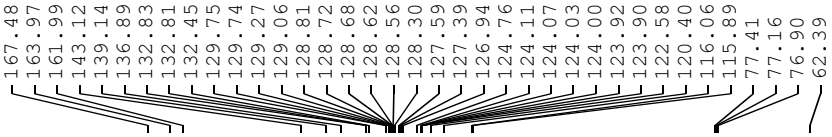


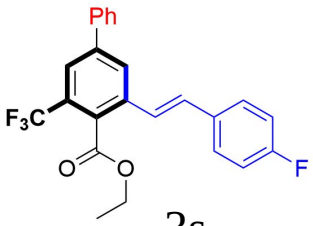

```
Current Data Parameters
NAME                  19F
EXPNO           zba-003-17
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211229
Time               10.37
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.1 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB      0
LB                 0.30 Hz
GB       0
PC                 1.00
```



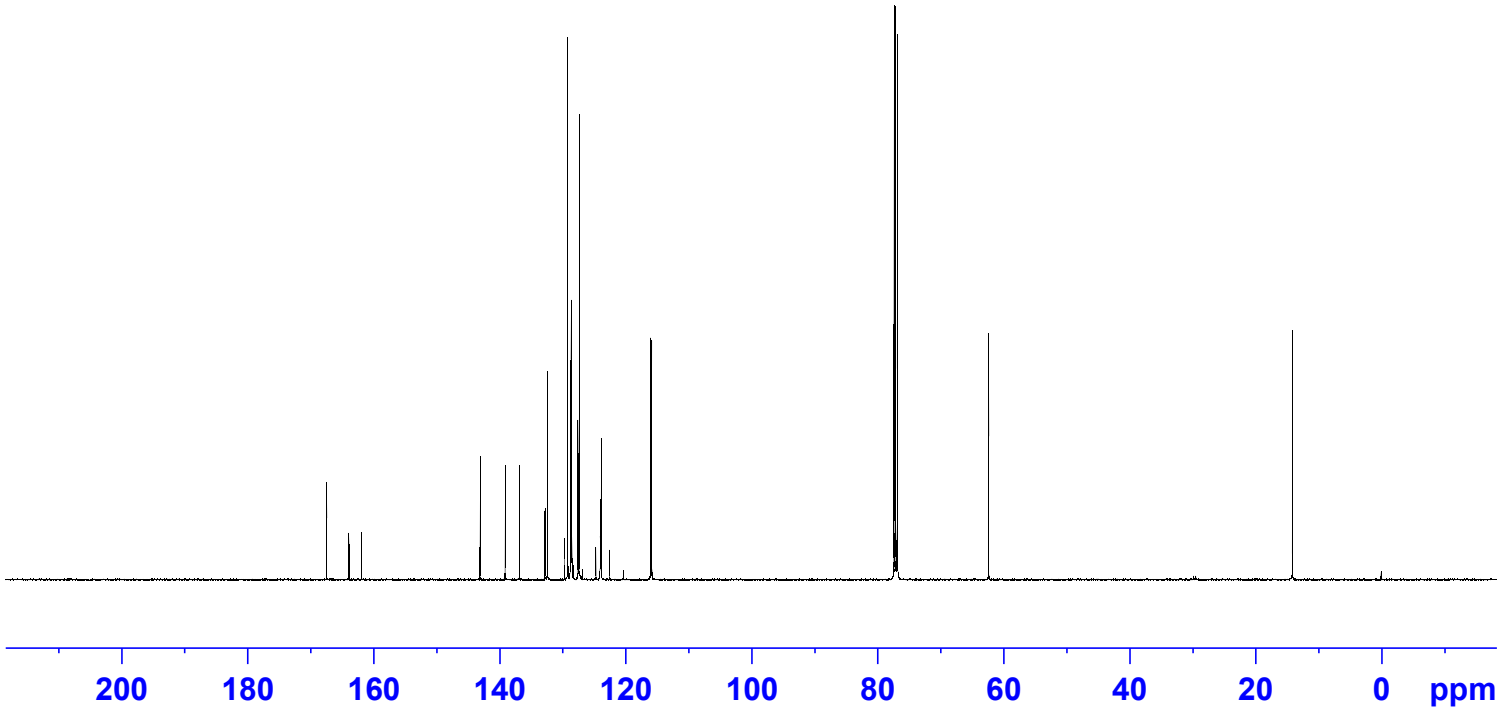
3s


```
Current Data Parameters
NAME      zba-003-21-4f-1211
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211212
Time                13.49
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 31.72
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300179 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

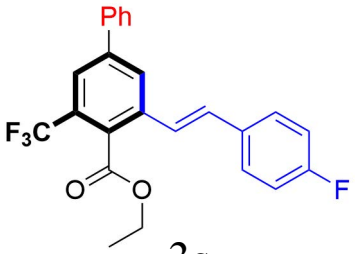




3s

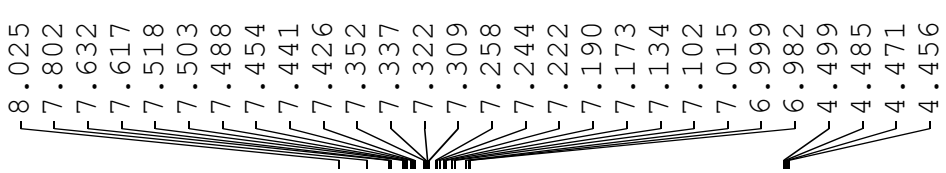


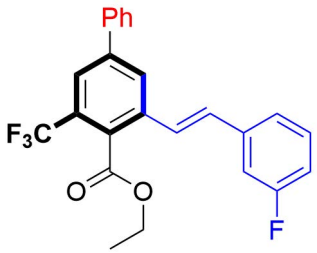

```
Current Data Parameters
NAME      zba-003-21-4f-1211
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211212
Time                14.43
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                 10.50 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         20.00000000 W
PLW12         0.39550999 W
PLW13         0.25312999 W

F2 - Processing parameters
SI                 32768
SF           125.7577734 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



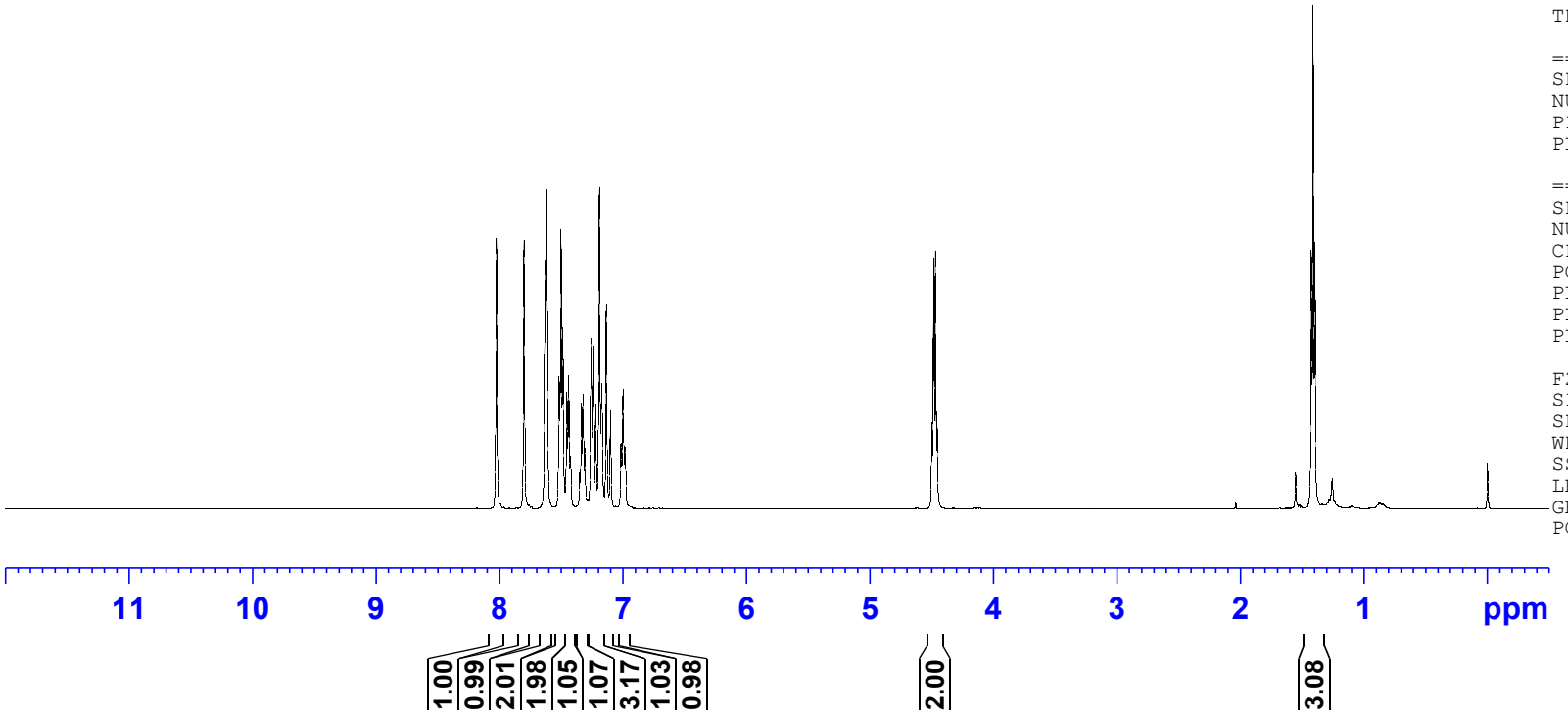
3s


```
Current Data Parameters
NAME                  19F
EXPNO           zba-003-21
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211229
Time               11.16
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.1 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

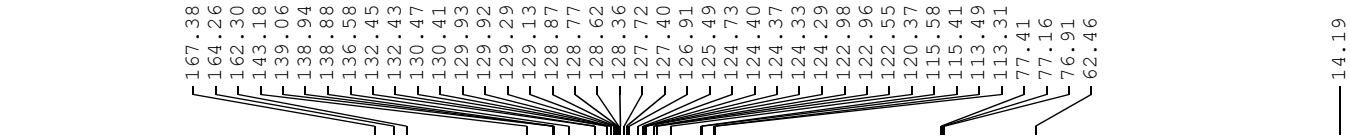


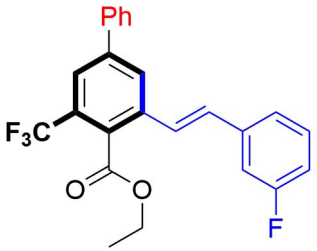


3t

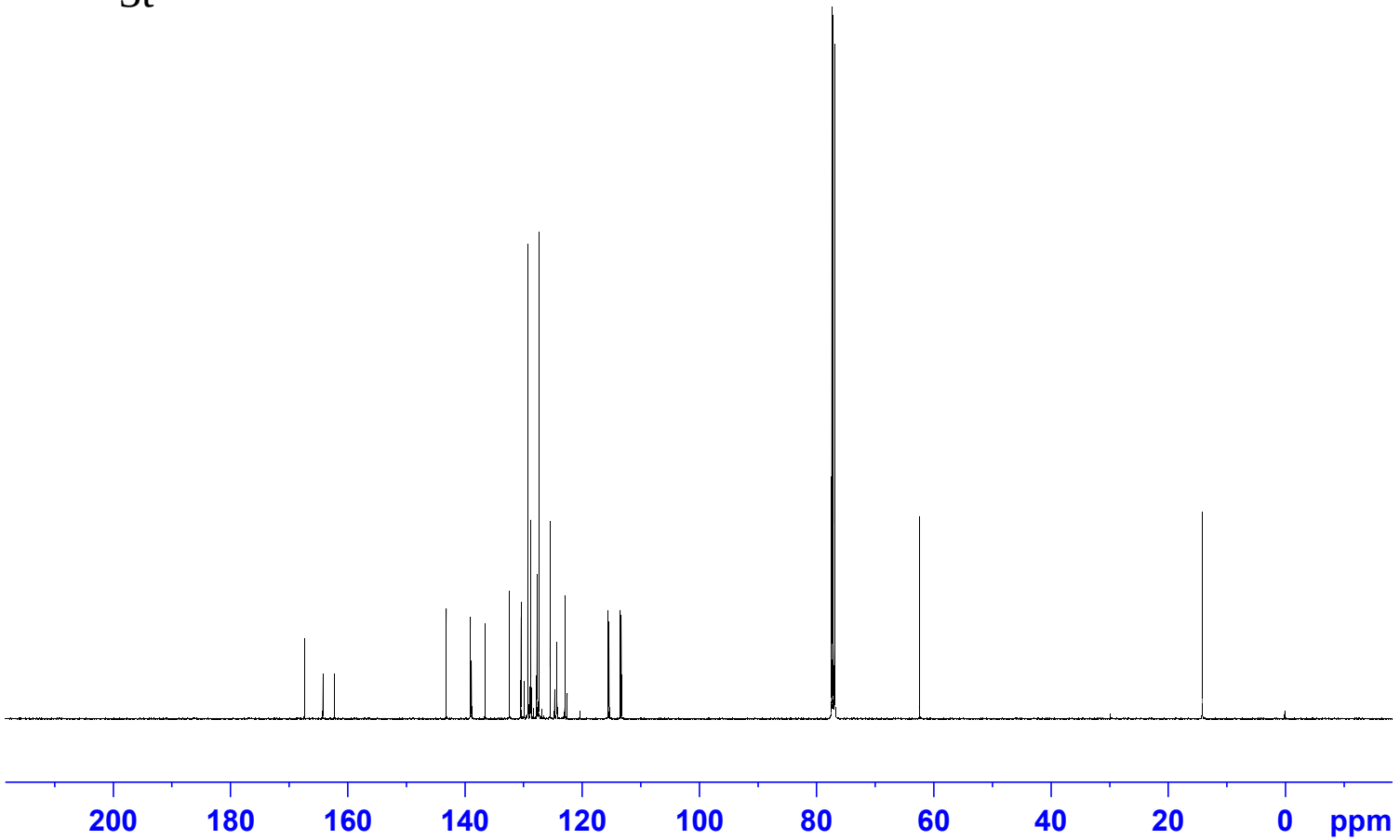



```
Current Data Parameters
NAME      zba-003-22-3f-gua1213
EXPNO                         1
PROCNO                        1

F2 - Acquisition Parameters
Date_              20211214
Time                   6.31
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                    11.25 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                    off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF           500.1300180 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                    1.00
```

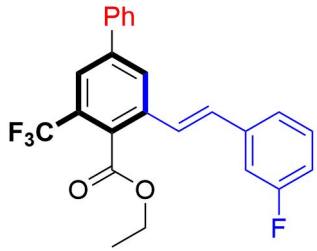




3t

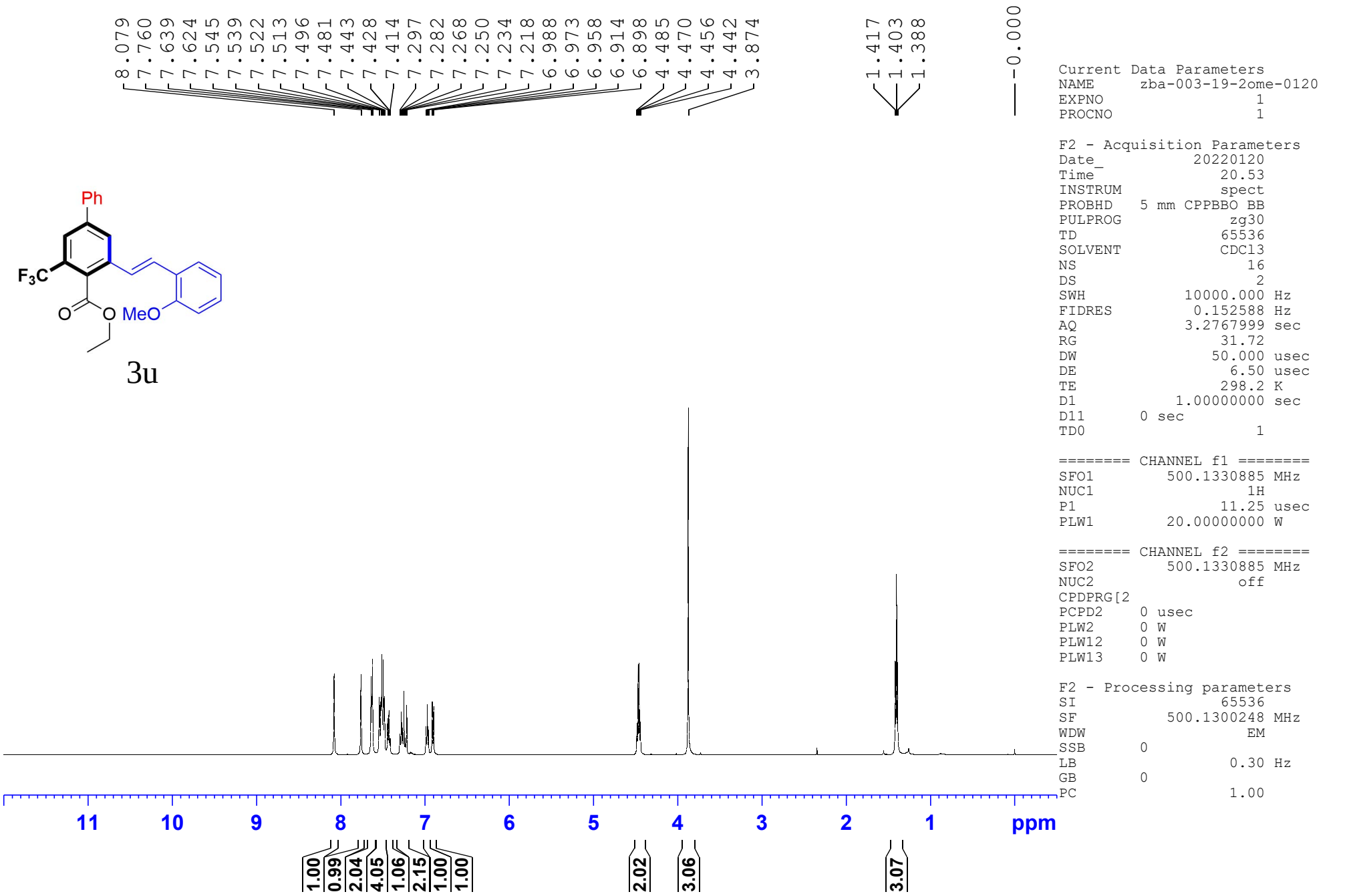



```
Current Data Parameters
NAME      zba-003-22-3f-gua1213
EXPNO                         2
PROCNO                        1

F2 - Acquisition Parameters
Date_              20211214
Time                   7.26
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                   10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577730 MHz
WDW                      EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

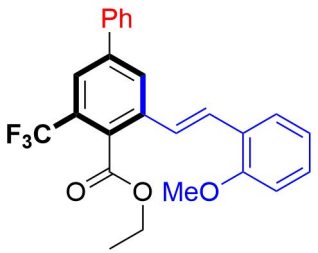


3t

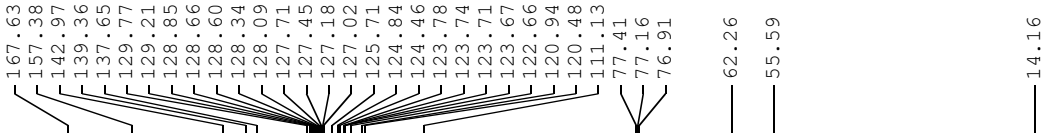

```
Current Data Parameters
NAME                  19F
EXPNO              zba-003-22
PROCNO                 1

F2 - Acquisition Parameters
Date_            20211229
Time                11.18
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.1 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

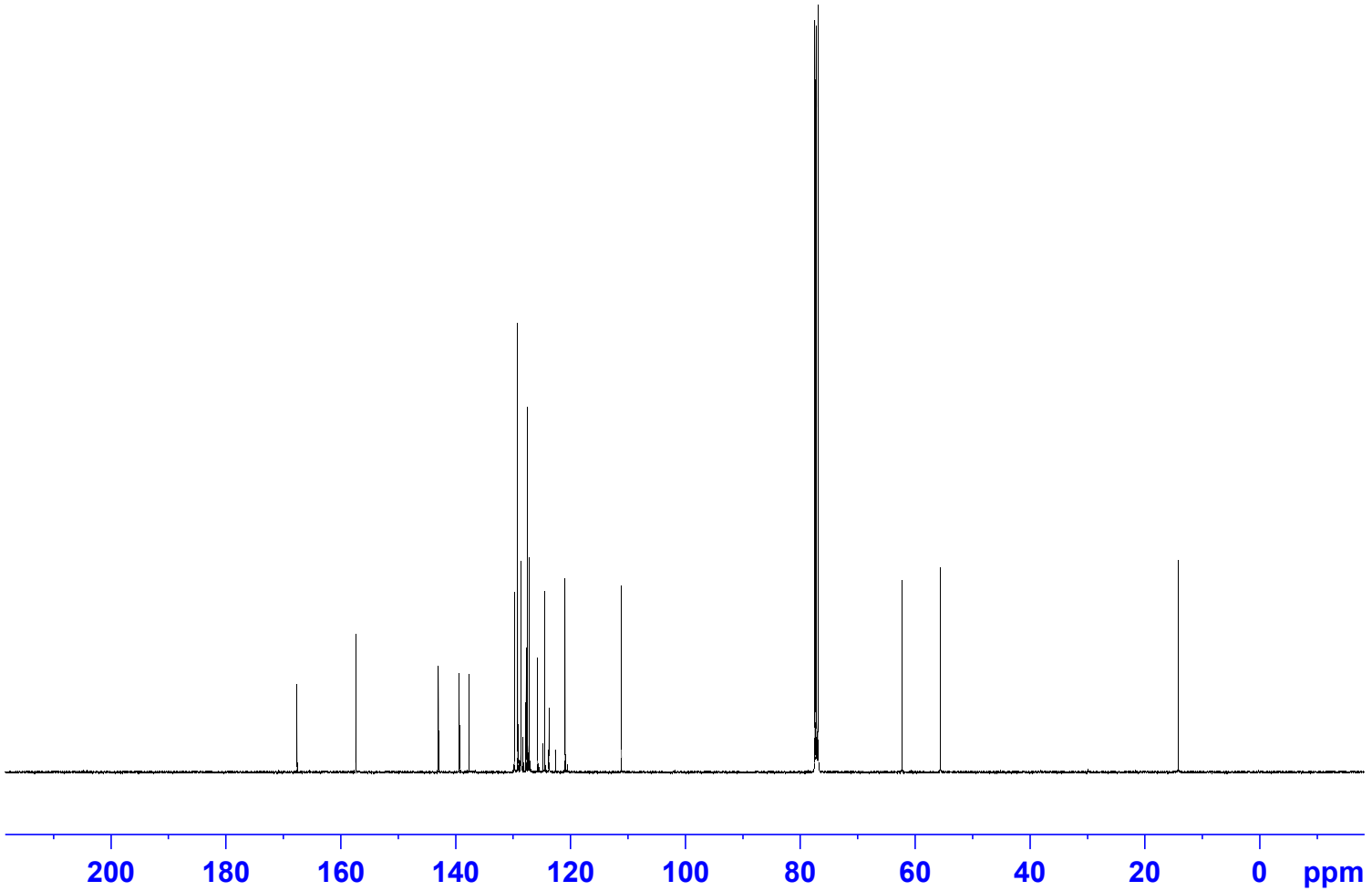



```
Current Data Parameters
NAME      zba-003-19-2ome-0120
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_            20220120
Time                20.53
INSTRUM             spect
PROBHD    5 mm CPPBBO BB
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             10000.000 Hz
FIDRES          0.152588 Hz
AQ              3.2767999 sec
RG                  31.72
DW                 50.000 usec
DE                  6.50 usec
TE                  298.2 K
D1            1.00000000 sec
D11       0 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                  65536
SF            500.1300248 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

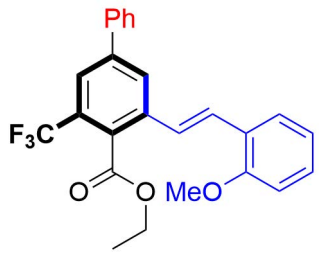


3u



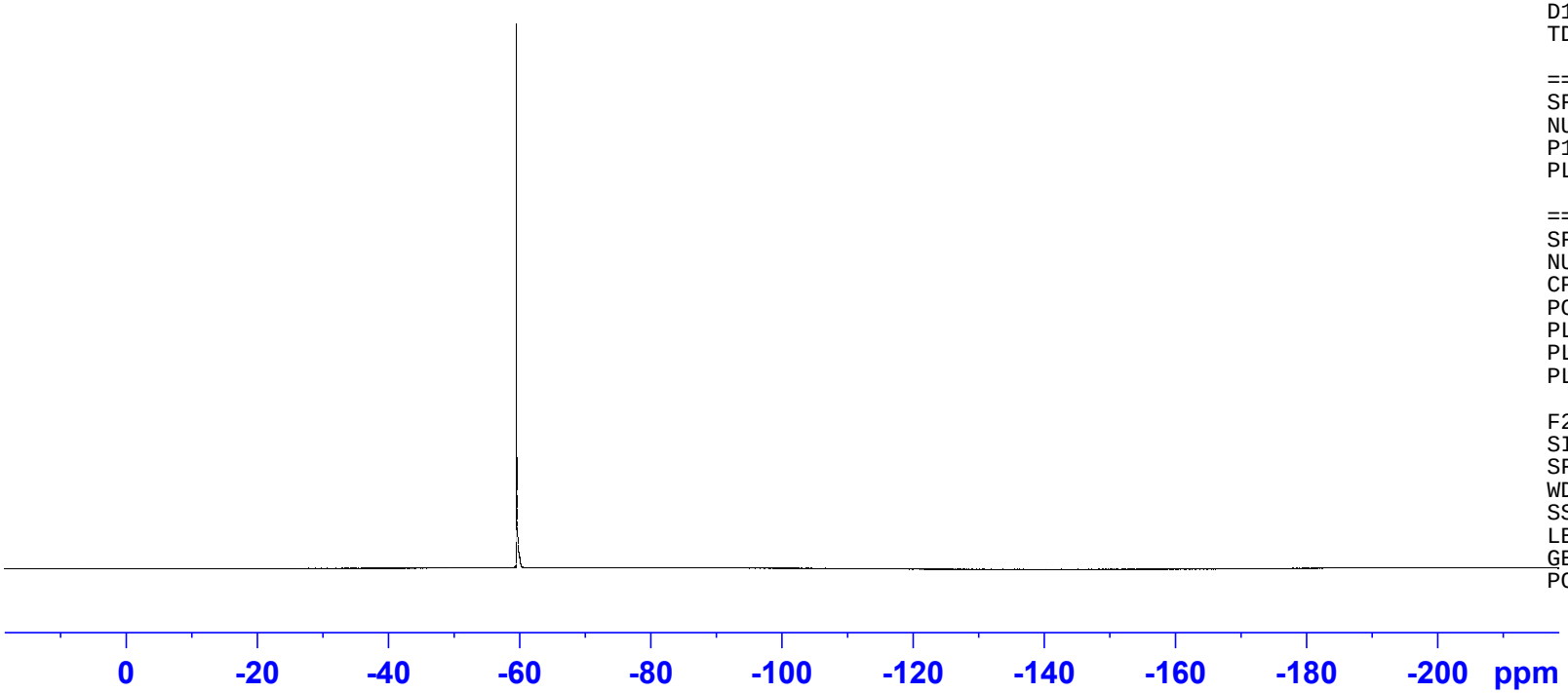



```
Current Data Parameters
NAME      zba-003-19-2ome-0120
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_            20220120
Time                21.48
INSTRUM             spect
PROBHD    5 mm CPPBBO BB
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH             29761.904 Hz
FIDRES           0.454131 Hz
AQ               1.1010048 sec
RG                 192.89
DW                 16.800 usec
DE                 18.00 usec
TE                 298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                 13C
P1                 10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                 1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                  32768
SF            125.7577756 MHz
WDW                    EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.40
```

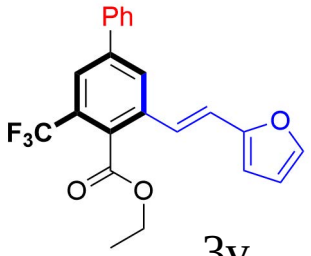


3u

-59.53

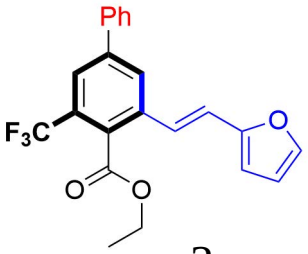



```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-19
PROCNO                 1

F2 - Acquisition Parameters
Date_            20220121
Time                15.49
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 296.1 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                  65536
SF           376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



3v


```
Current Data Parameters
NAME      zba-003-18-o-1209
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211210
Time                7.23
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 49.27
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300163 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



3v

167.45
152.53
143.19
143.01
139.19
136.66
129.77
129.76
129.25
129.05
128.80
128.68
128.55
128.30
127.38
127.04
126.95
124.77
123.95
123.91
123.87
123.83
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120.85
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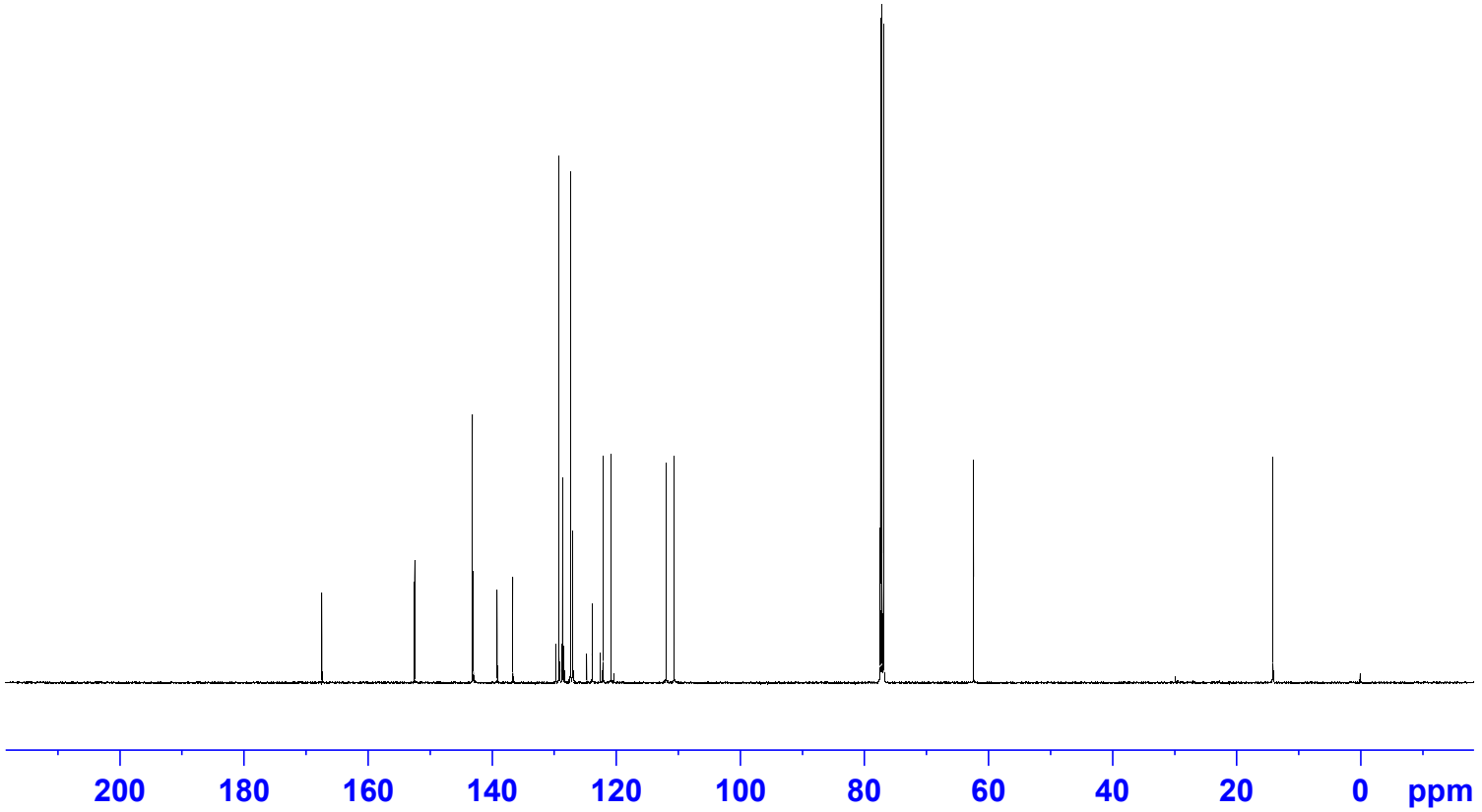
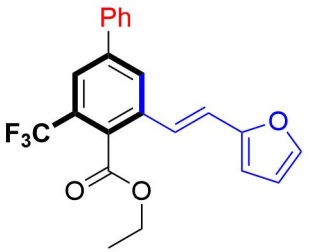
110.67
77.41
77.16
76.91
62.39
14.14

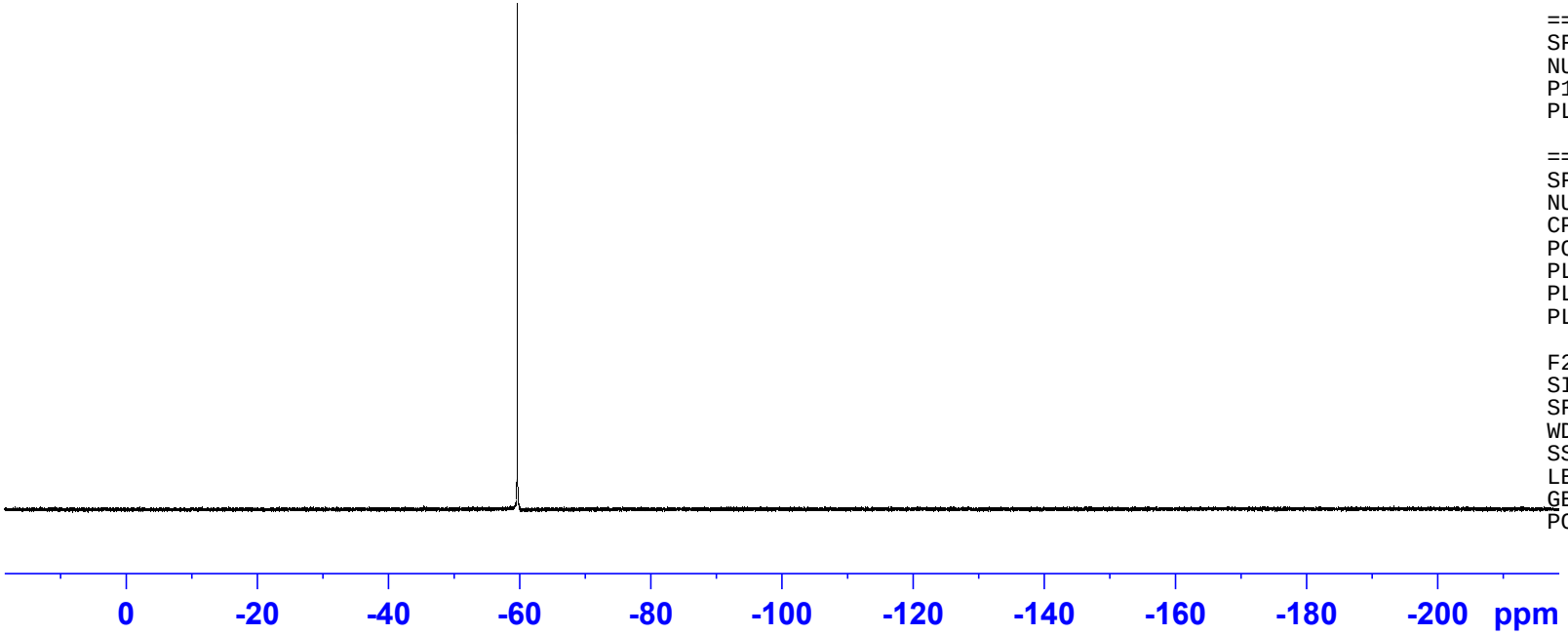



```
Current Data Parameters
NAME      zba-003-18-o-1209
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_           20211210
Time                8.18
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                10.50 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.39550999 W
PLW13        0.25312999 W

F2 - Processing parameters
SI                32768
SF          125.7577724 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

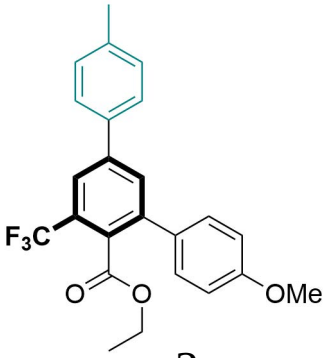


3v

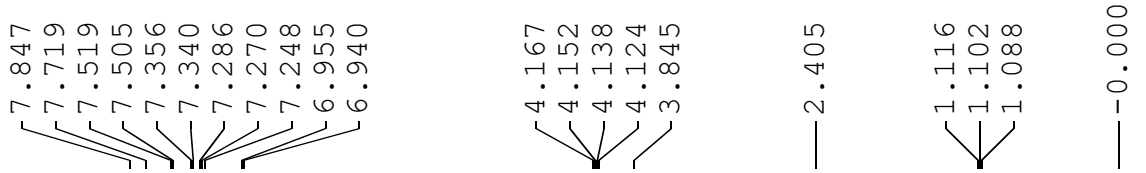
-59.60

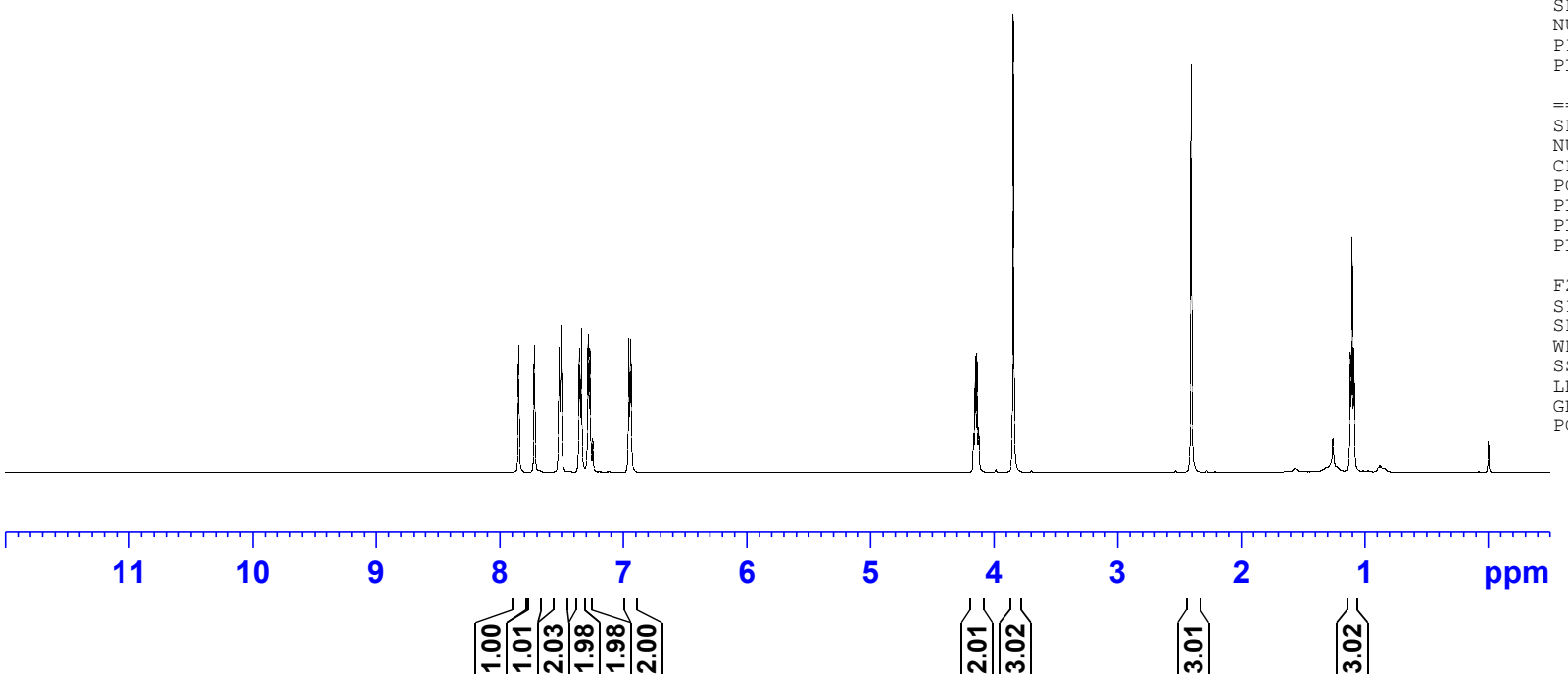



```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-18
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211229
Time               11.12
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.1 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB      0
LB                 0.30 Hz
GB       0
PC                 1.00
```

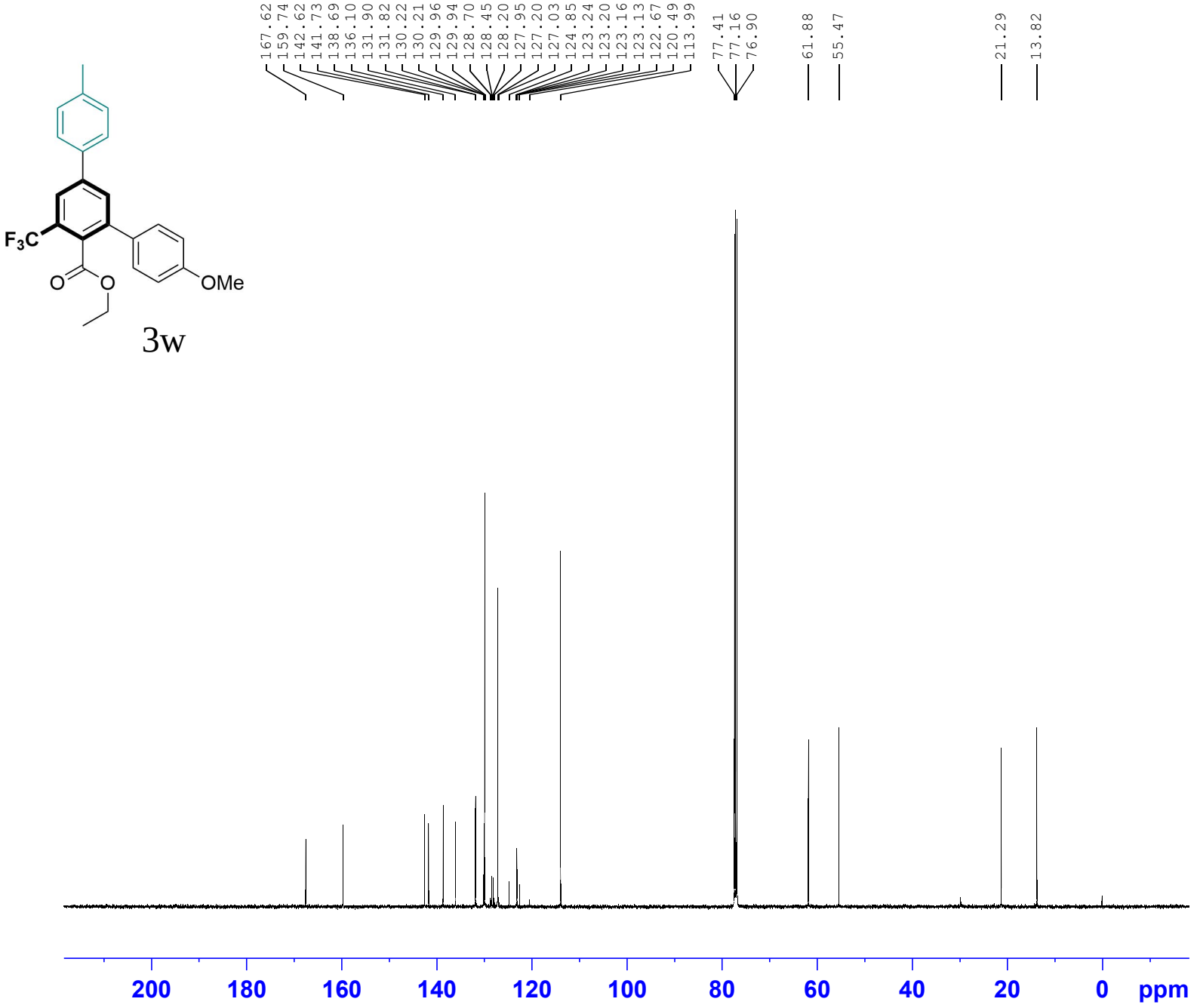


3w

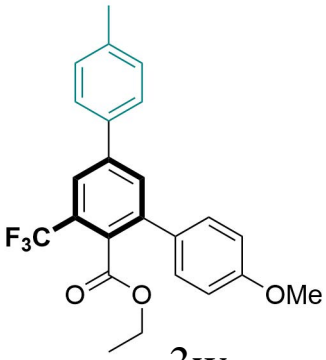





```
Current Data Parameters
NAME      zba-002-152-pu-20211103
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211103
Time                   15.09
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES               0.152588 Hz
AQ                3.2767999 sec
RG                     31.72
DW                    50.000 usec
DE                     6.50 usec
TE                     298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                     10.59 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF               500.1300167 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

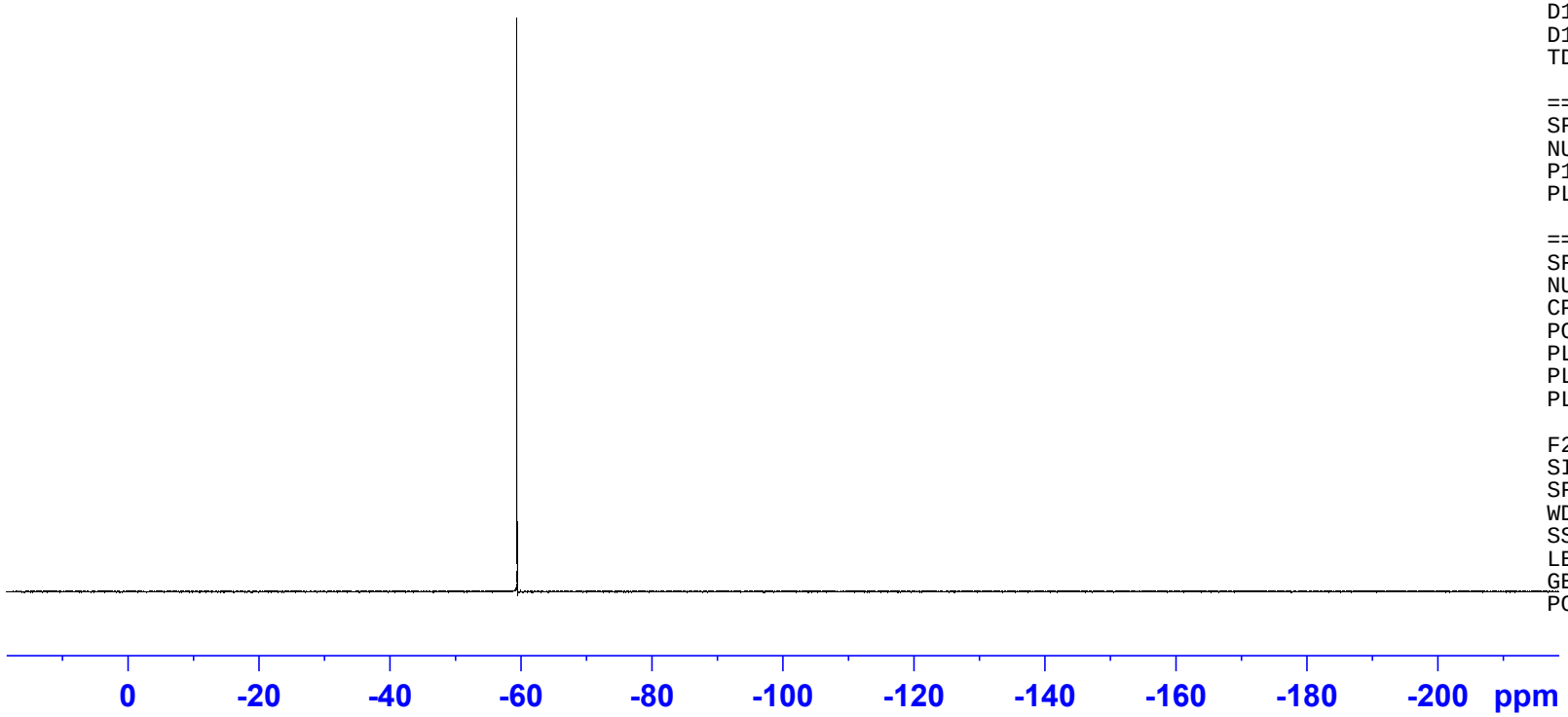



```
Current Data Parameters
NAME      zba-002-152-pu-20211103
EXPNO                          2
PROCNO                         1

F2 - Acquisition Parameters
Date_               20211103
Time                   15.25
INSTRUM                spect
PROBHD   5 mm CPPBBO BB
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      300
DS                        4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.35778001 W
PLW13           0.22898000 W

F2 - Processing parameters
SI                    32768
SF             125.7577728 MHz
WDW                      EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

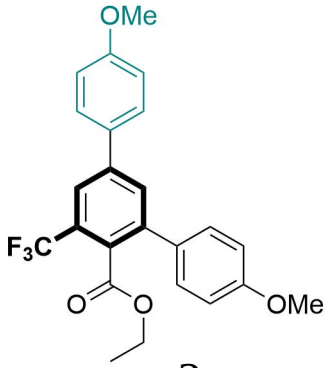


3w

-59.43

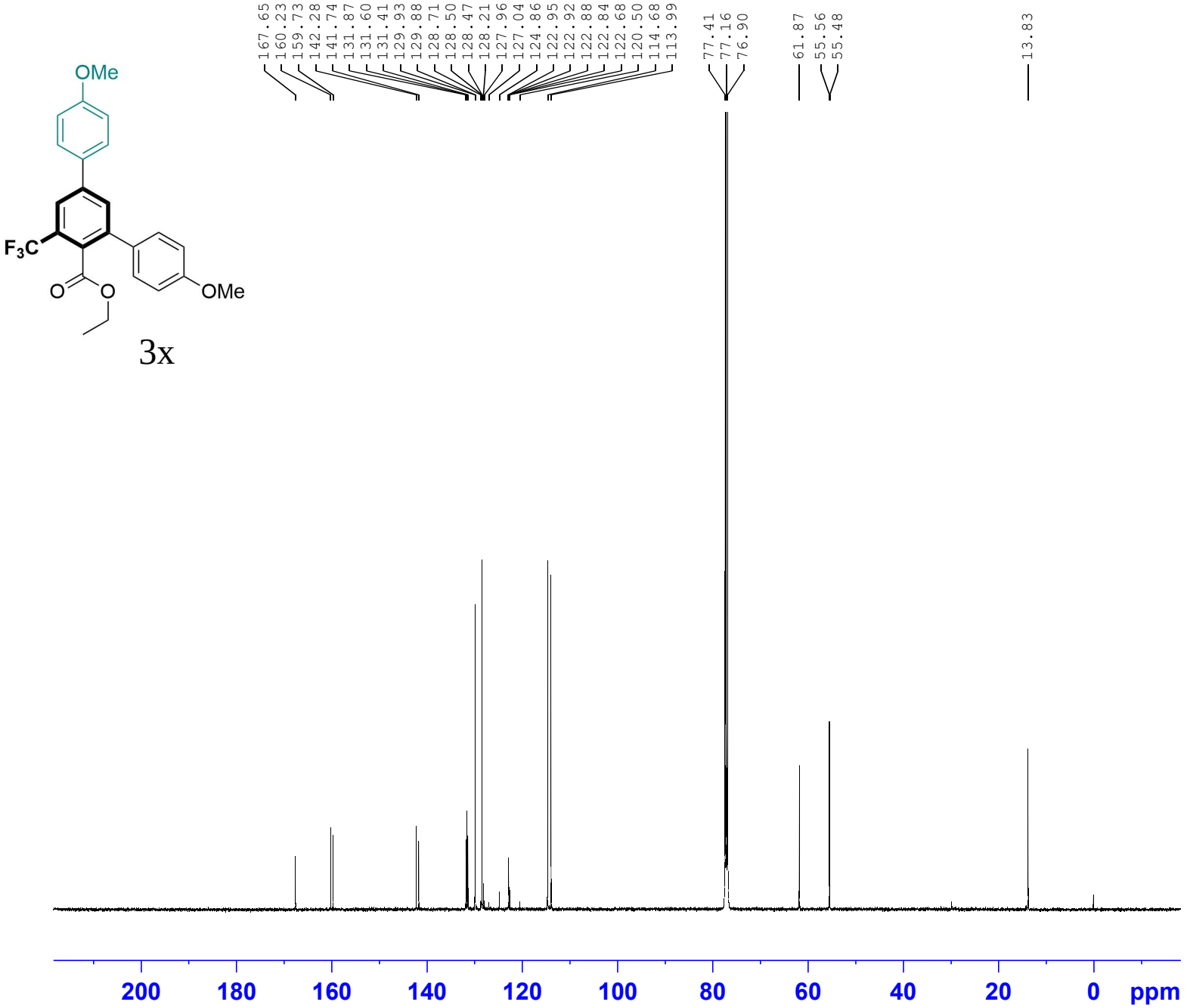



```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-152
PROCNO                  1

F2 - Acquisition Parameters
Date_              20211108
Time                  9.24
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                  298.0 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

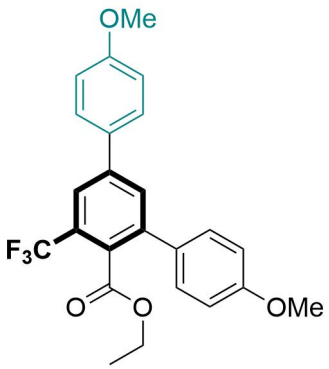


3x


```
Current Data Parameters
NAME      zba-002-153-4ome-0104
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                   2.52
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    62.06
DW                  50.000 usec
DE                   6.50 usec
TE                   298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                    11.25 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2      0 usec
PLW2       0 W
PLW12      0 W
PLW13      0 W

F2 - Processing parameters
SI                    65536
SF               500.1300143 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```



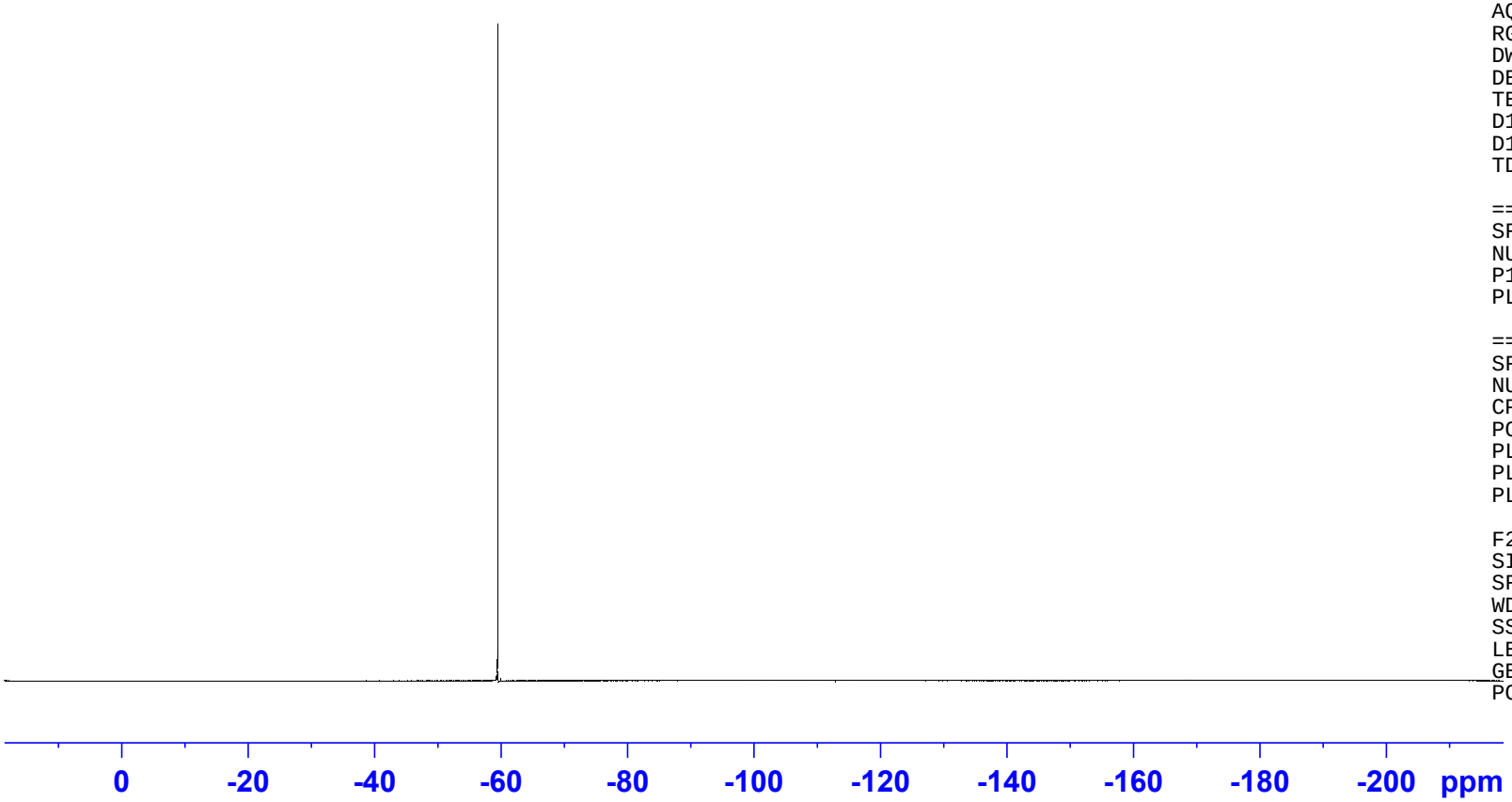

```
Current Data Parameters
NAME      zba-002-153-4ome-0104
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                   3.46
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES           0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577719 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

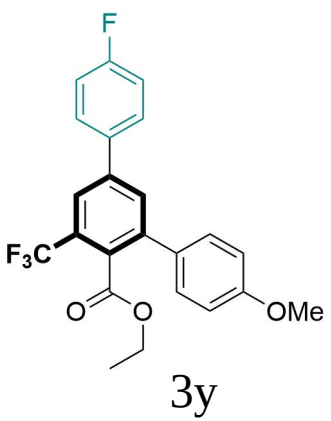


3x

-59.45

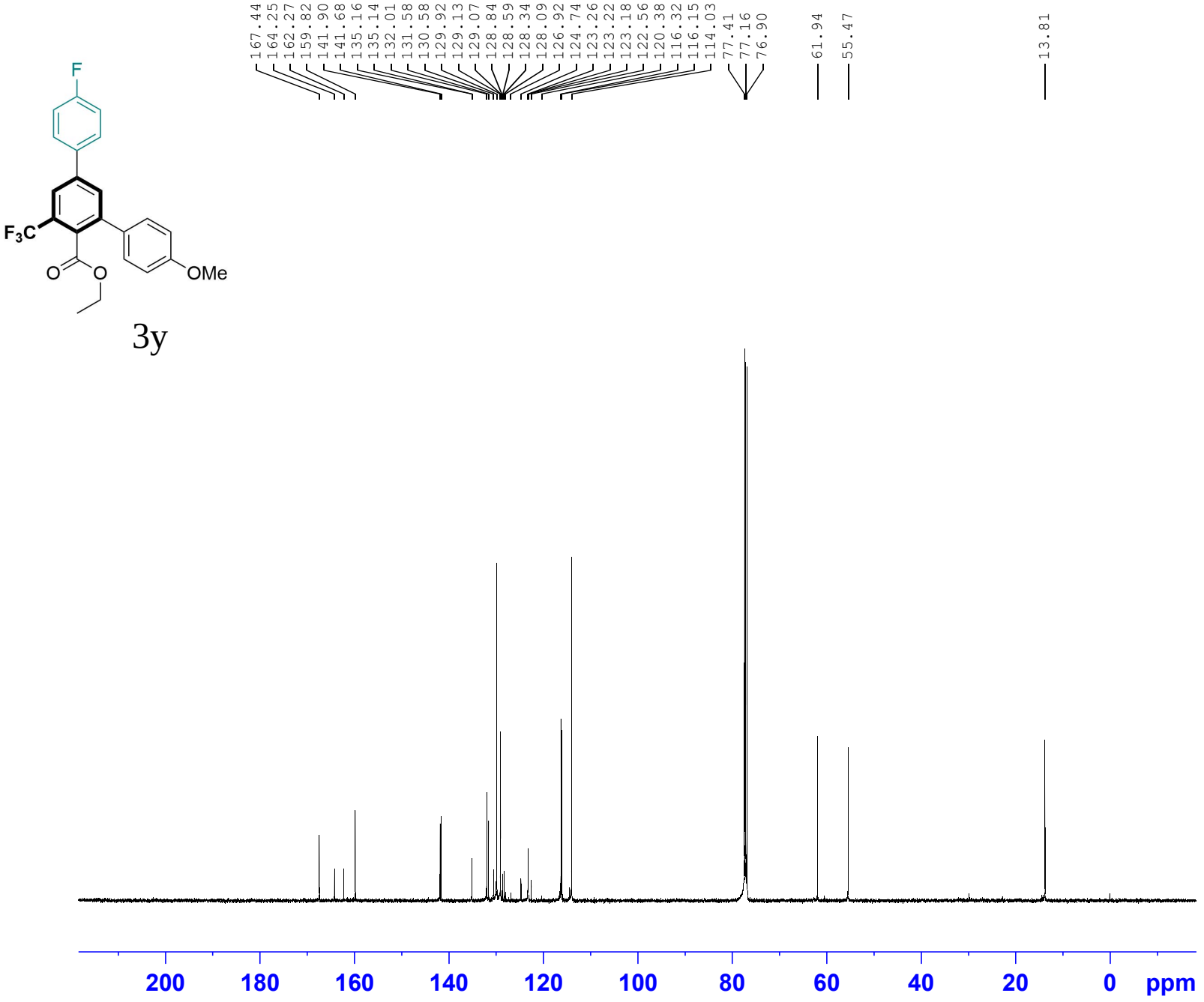
```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-153
PROCNO                1

F2 - Acquisition Parameters
Date_            20220105
Time                15.50
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 297.5 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                   EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



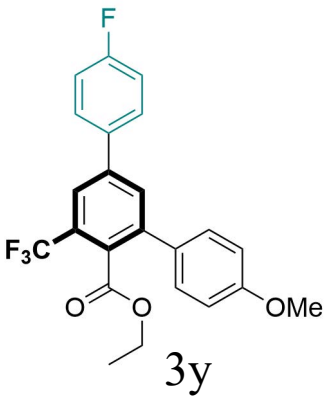


3y


```
Current Data Parameters
NAME      zba-002-165-4-f-1109
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211110
Time                   5.50
INSTRUM               spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8012.820 Hz
FIDRES            0.244532 Hz
AQ                2.0447233 sec
RG                   125.02
DW                   62.400 usec
DE                    6.50 usec
TE                   298.0 K
D1              2.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1           400.2424716 MHz
NUC1                      1H
P1                    14.30 usec
PLW1           12.00000000 W

======== CHANNEL f2 ========
SFO2           400.2424716 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                       65536
SF             400.2400126 MHz
WDW                        EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

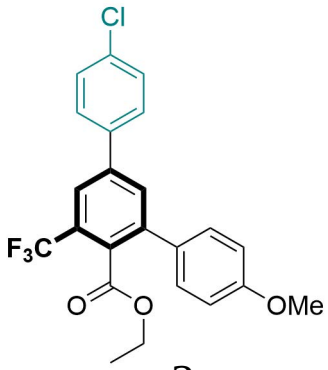



```
Current Data Parameters
NAME      zba-002-165-4f-1111
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_           20211111
Time                16.58
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   300
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                 192.89
DW                 16.800 usec
DE                 18.00 usec
TE                 298.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                 9.80 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2         20.00000000 W
PLW12         0.35778001 W
PLW13         0.22898000 W

F2 - Processing parameters
SI                 32768
SF           125.7577731 MHz
WDW                  EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

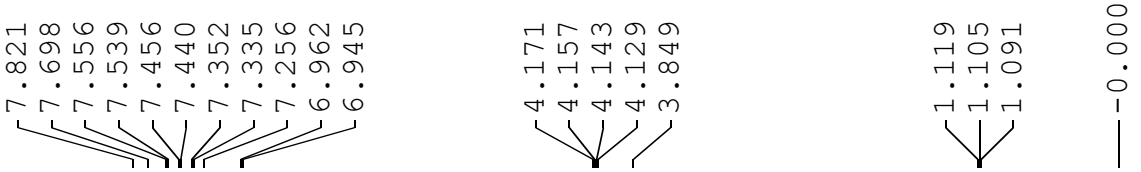


3y

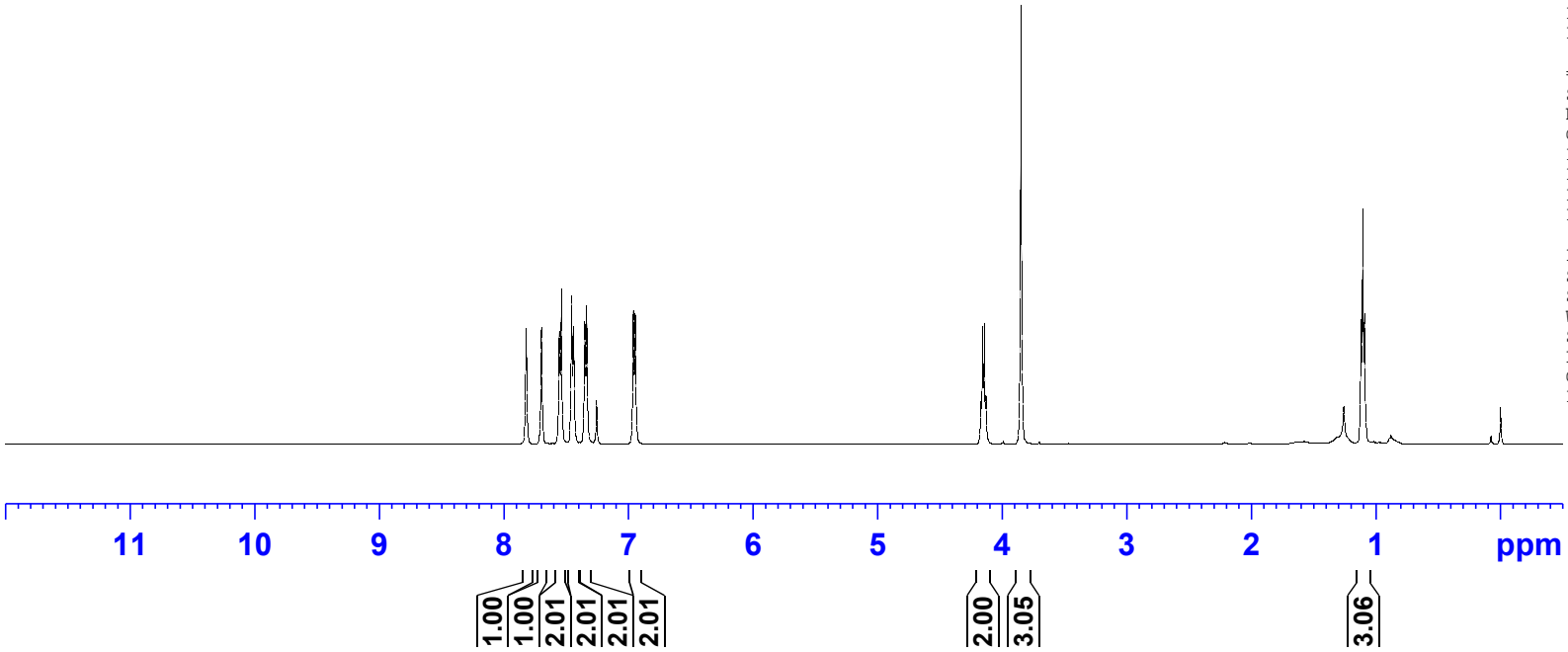

```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-165
PROCNO                  1

F2 - Acquisition Parameters
Date_              20220105
Time                 15.52
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   297.5 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

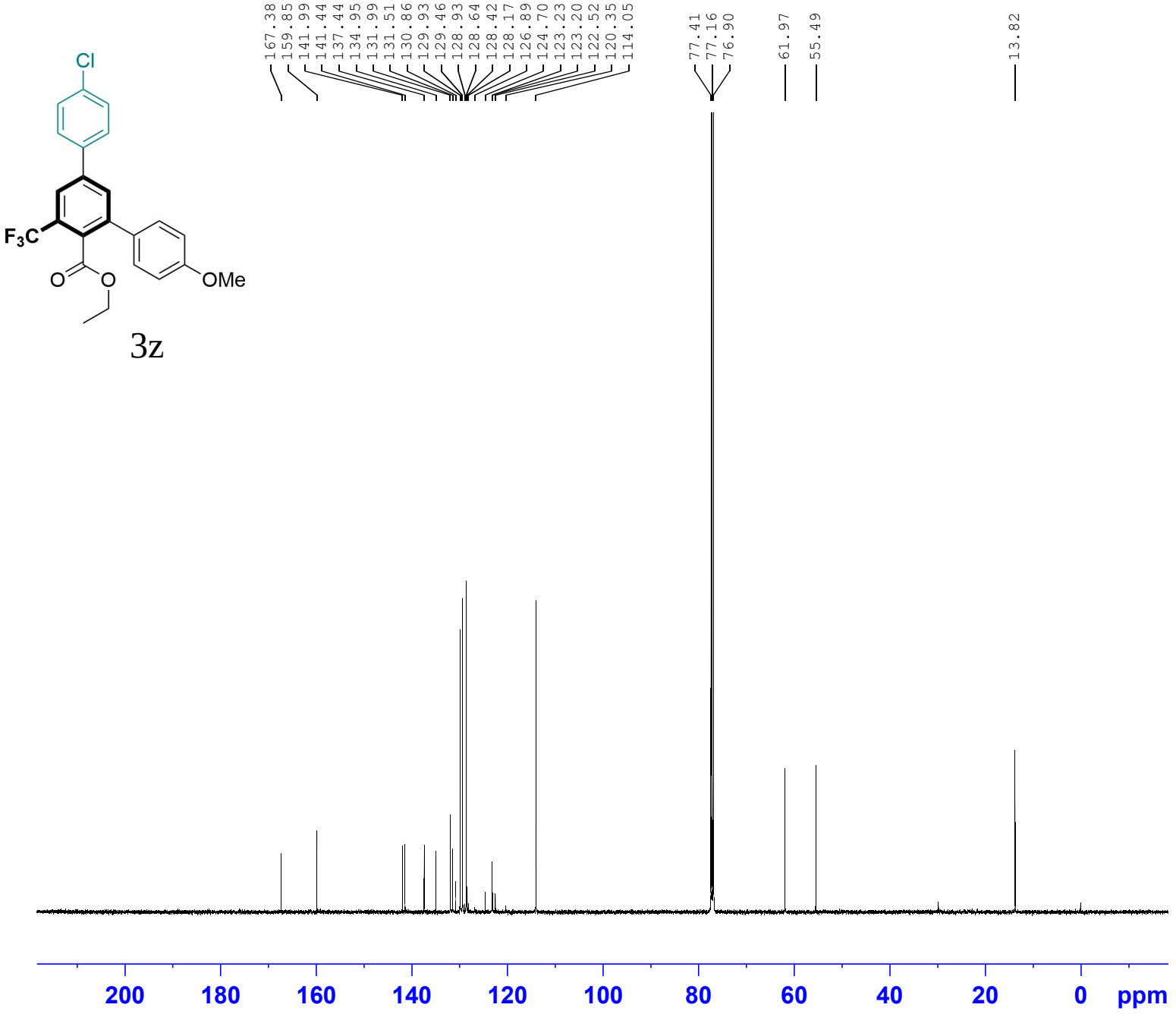


3z

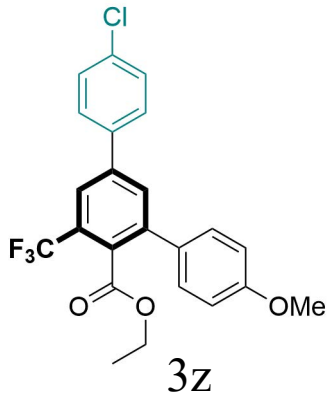



```
Current Data Parameters
NAME      zba-002-157-pu-20211103
EXPNO                          1
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211103
Time                 15.29
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES              0.152588 Hz
AQ                3.2767999 sec
RG                   31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                   10.59 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF            500.1300124 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```





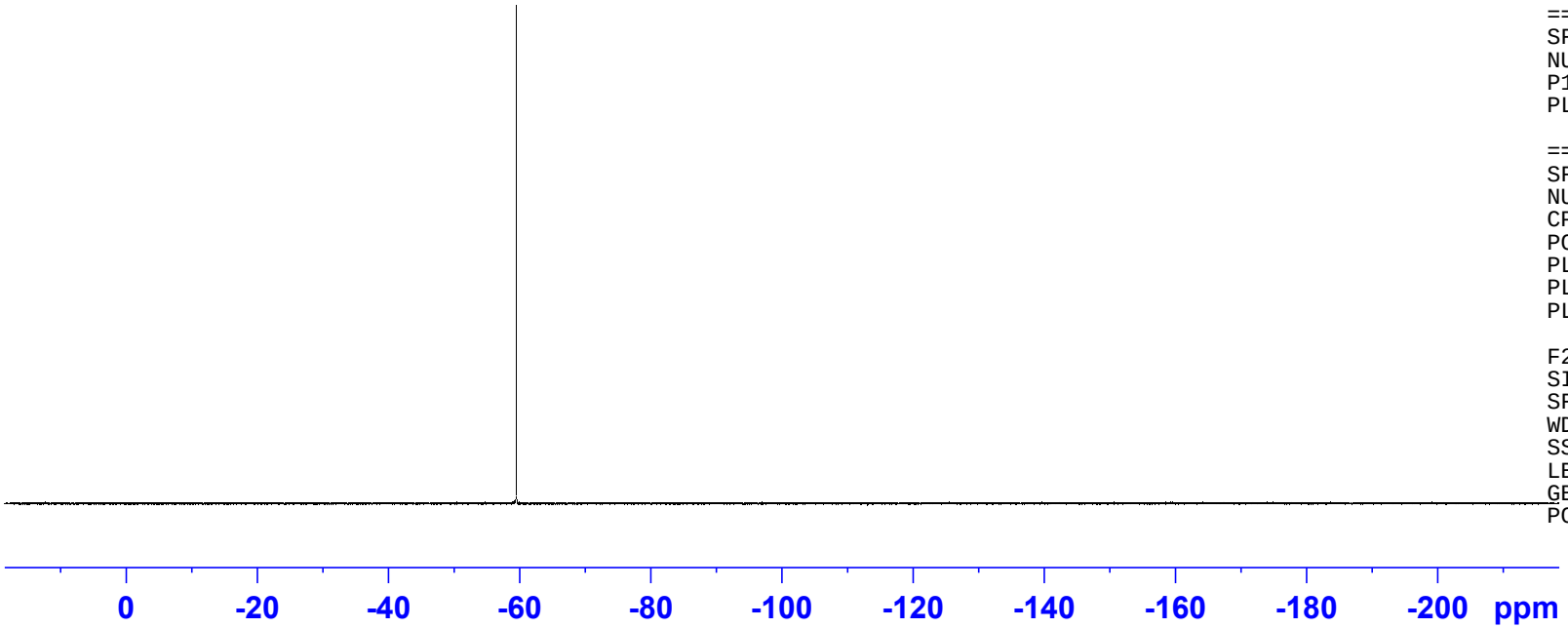

```
Current Data Parameters
NAME      zba-002-157-pu-20211103
EXPNO                          2
PROCNO                         1

F2 - Acquisition Parameters
Date_              20211103
Time                  15.46
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     300
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.35778001 W
PLW13          0.22898000 W

F2 - Processing parameters
SI                    32768
SF            125.7577719 MHz
WDW                      EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

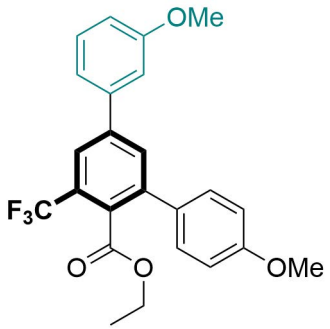


3z

-59.50

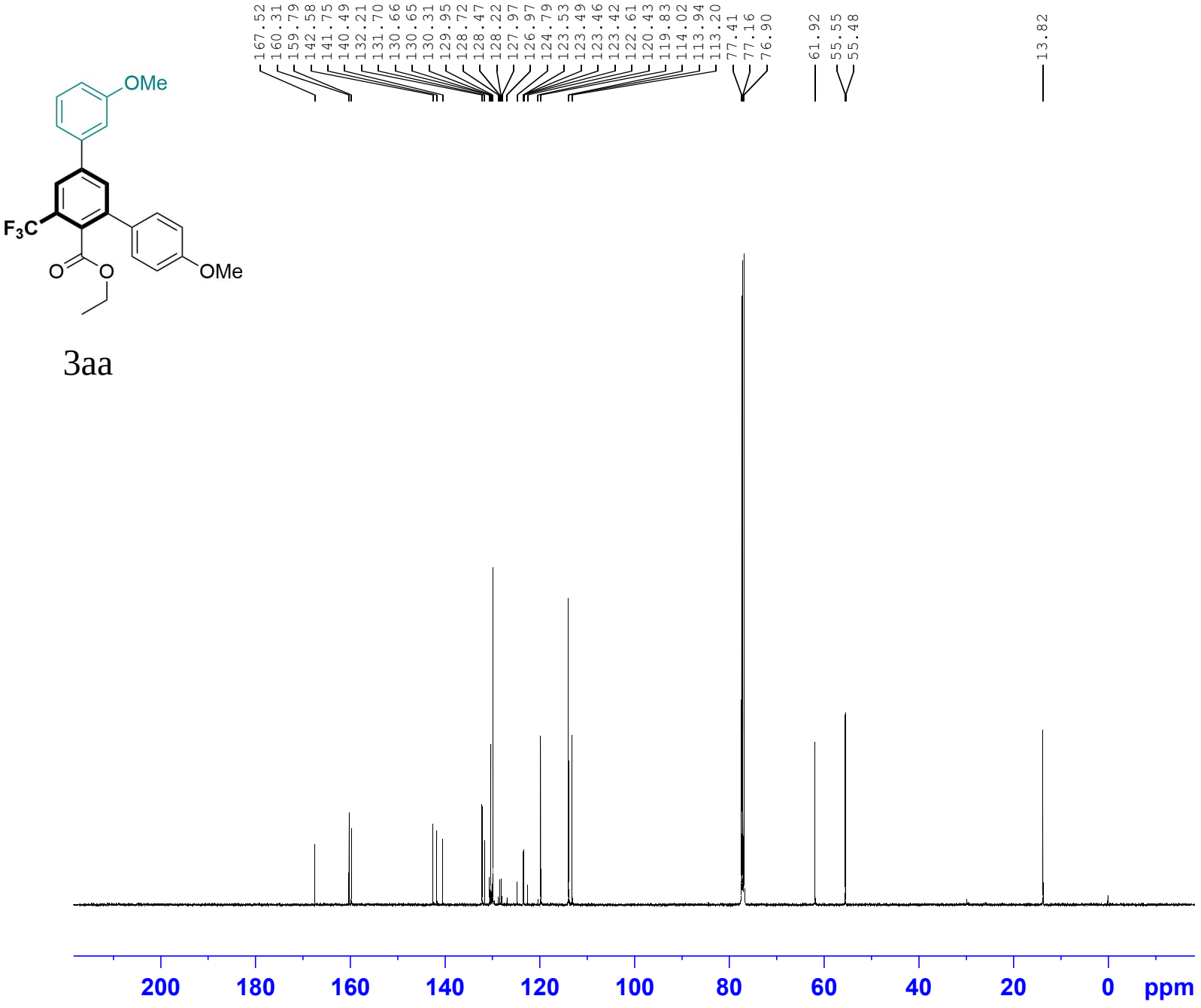
```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-157
PROCNO                  1

F2 - Acquisition Parameters
Date_            20211108
Time                 9.17
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.2 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



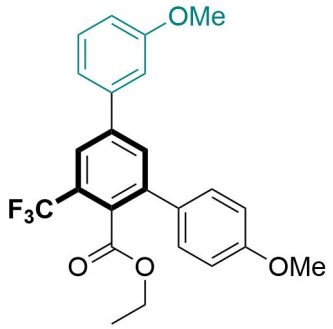


3aa


```
Current Data Parameters
NAME      zba-002-166-3ome-0106
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220106
Time                 13.38
INSTRUM              spect
PROBHD    5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES           0.152588 Hz
AQ               3.2767999 sec
RG                   49.27
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                    1H
P1                   11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                   65536
SF            500.1300160 MHz
WDW                    EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

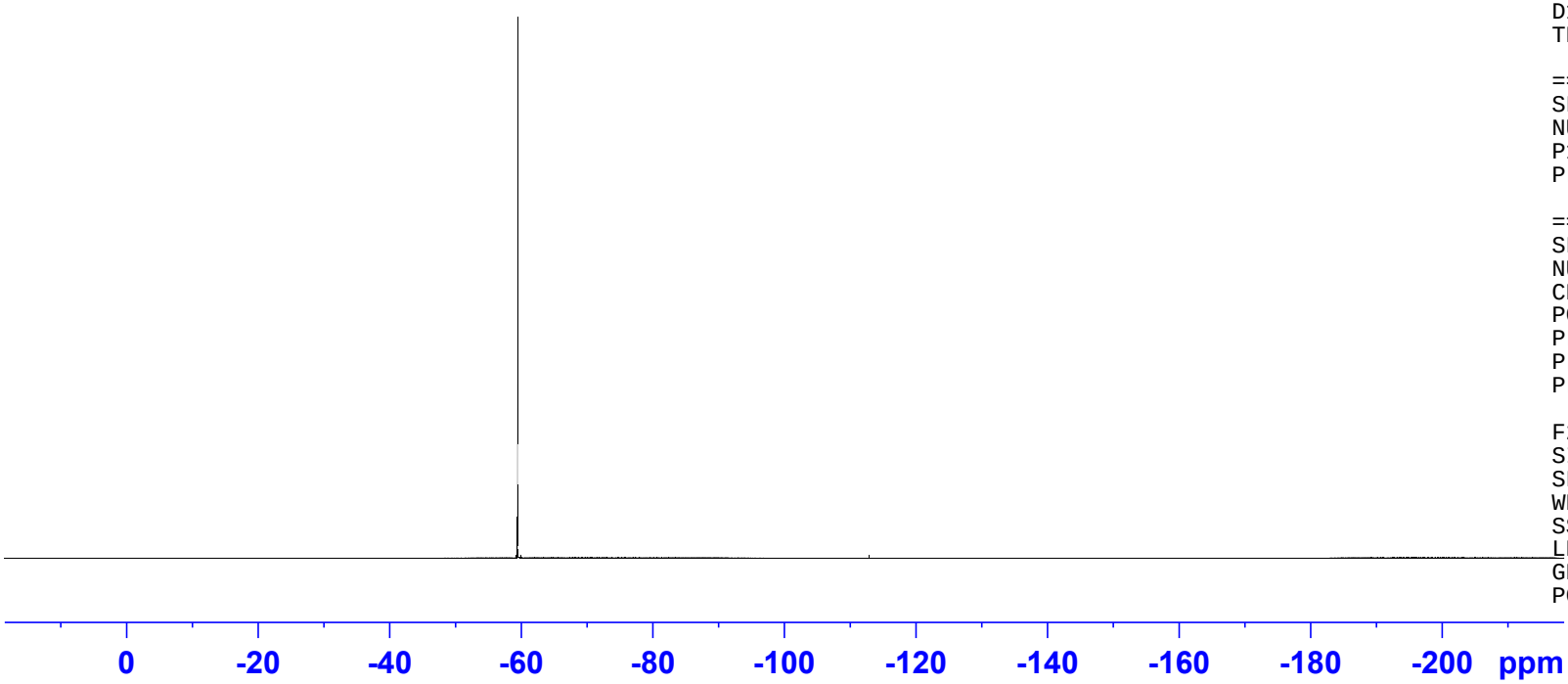



```
Current Data Parameters
NAME      zba-002-166-3ome-0106
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220106
Time                 13.59
INSTRUM              spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     461
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                   10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                   32768
SF            125.7577729 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

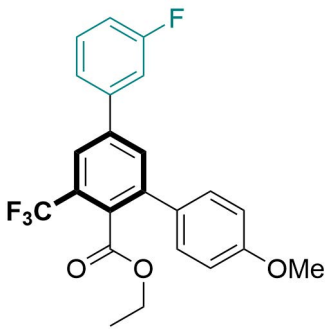


3aa

-59.44

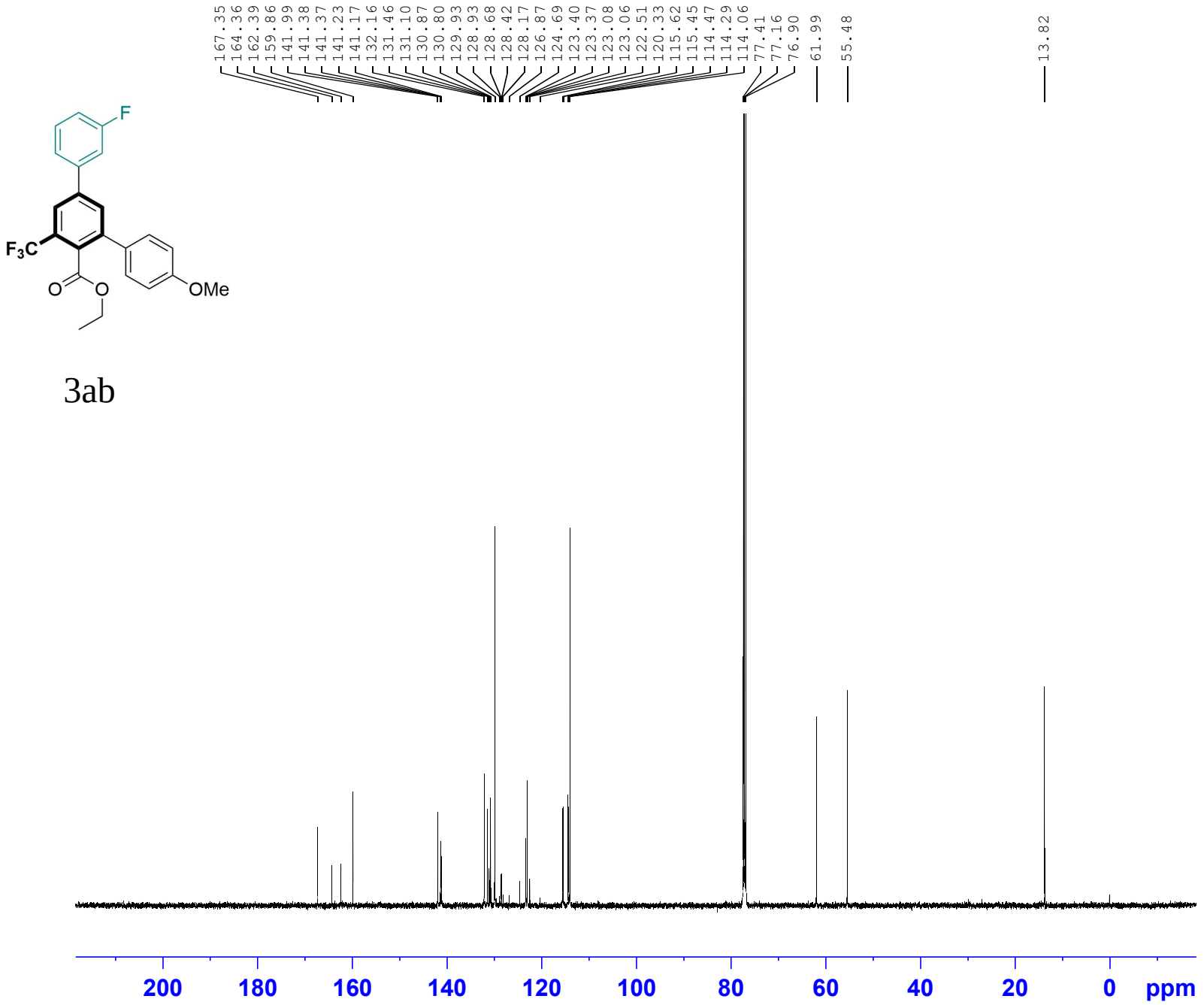



```
Current Data Parameters
NAME                  19F
EXPNO           zba-002-166
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220105
Time                15.55
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                  297.6 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                  65536
SF           376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



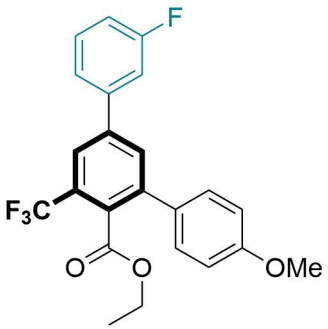
3ab


```
Current Data Parameters
NAME      zba-002-172-3f-1112
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211113
Time                12.34
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 49.27
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 10.59 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300160 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



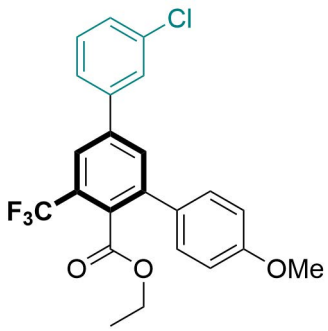
3ab

```
Current Data Parameters
NAME      zba-002-172-3f-1112
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20211113
Time                  12.45
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     200
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                   192.89
DW                 16.800 usec
DE                 18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.35778001 W
PLW13           0.22898000 W

F2 - Processing parameters
SI                     32768
SF             125.7577727 MHz
WDW                       EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```



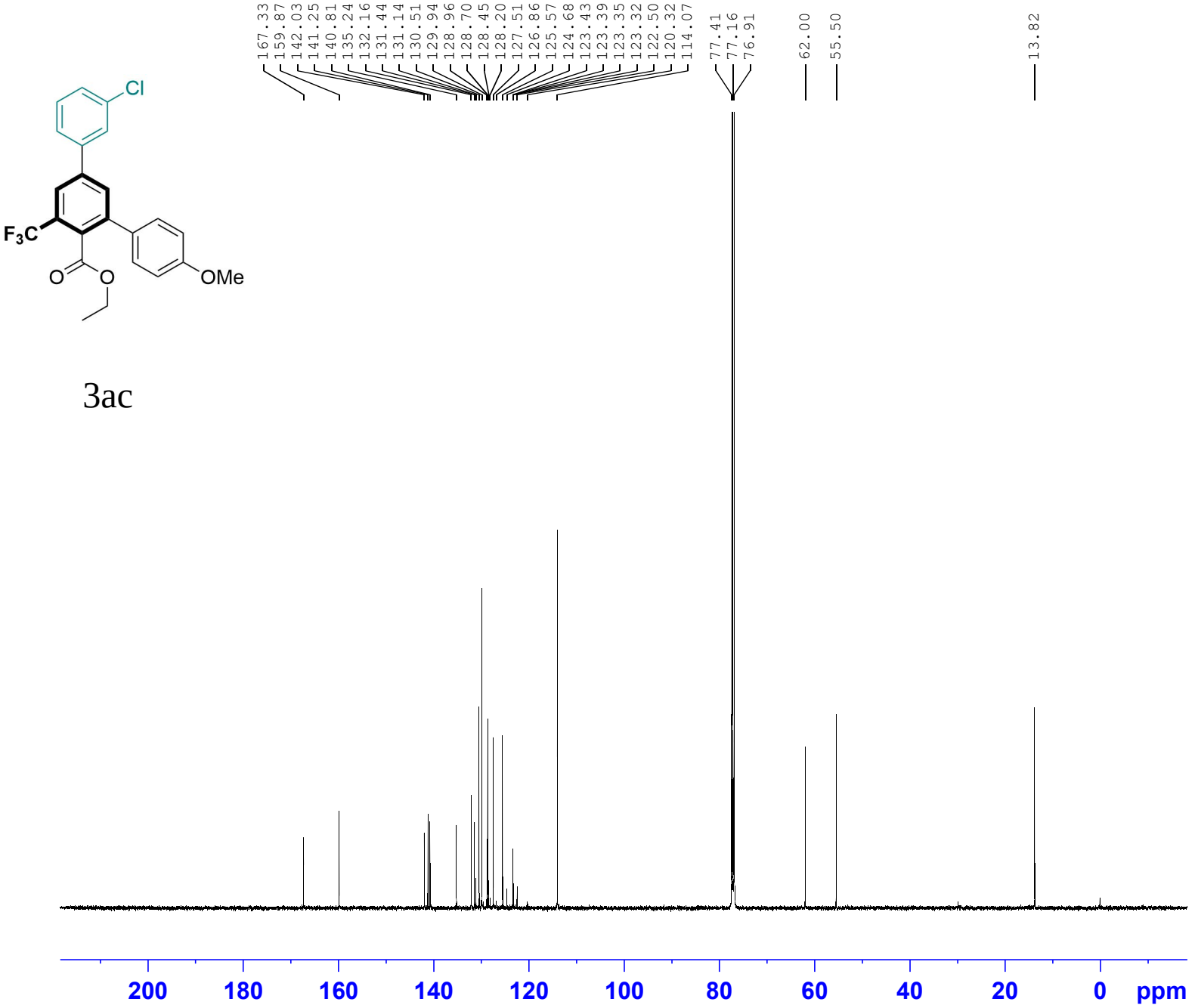
3ab


```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-172
PROCNO                  1

F2 - Acquisition Parameters
Date_              20220105
Time                 15.59
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG        zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   297.6 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

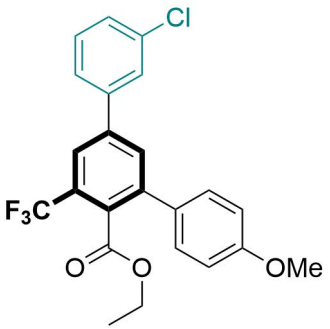


3ac


```
Current Data Parameters
NAME      zba-002-171-3cl-0107
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220107
Time                  18.04
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ                3.2767999 sec
RG                   31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                   11.25 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF               500.1300143 MHz
WDW                       EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

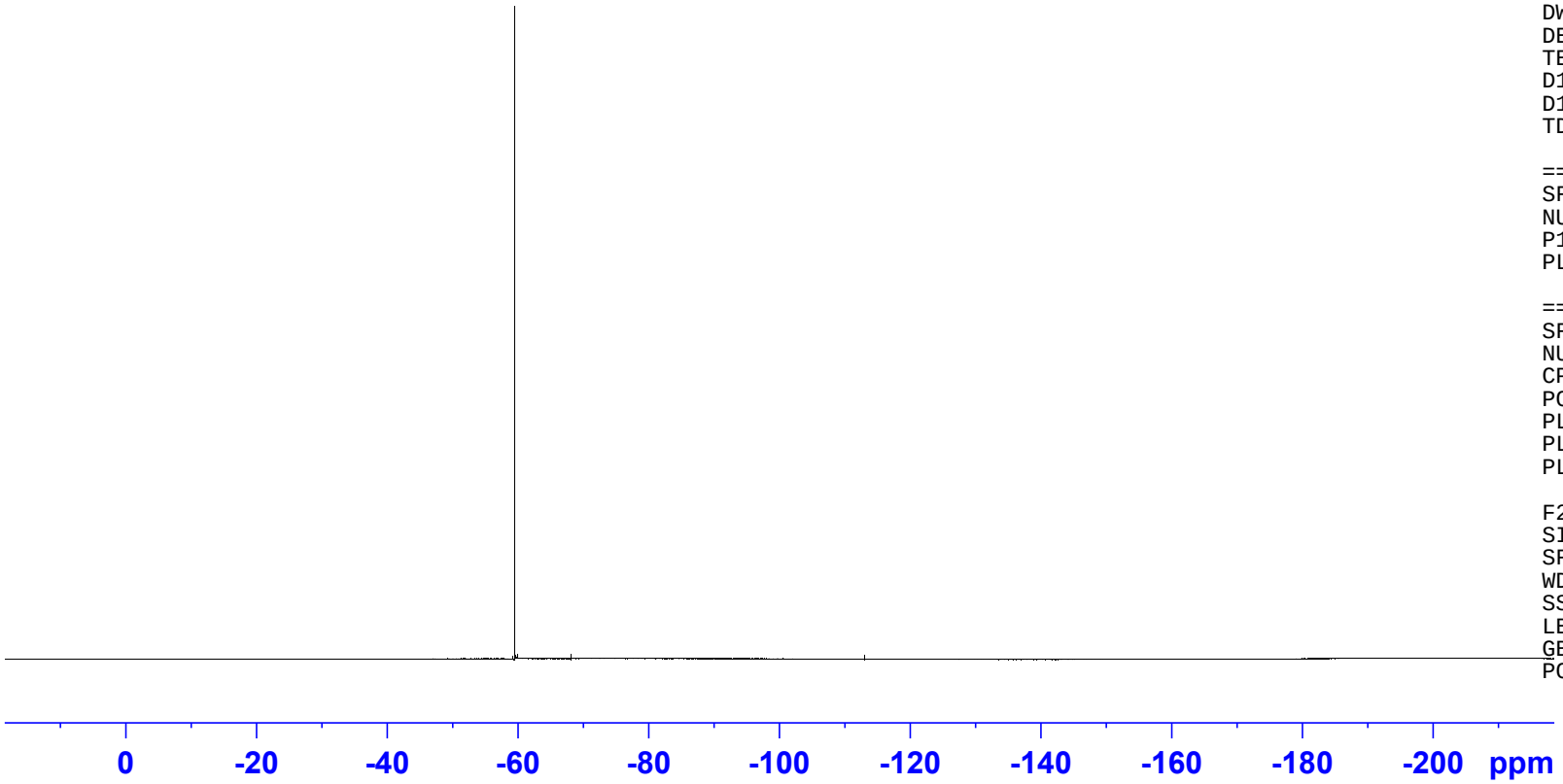



```
Current Data Parameters
NAME      zba-002-171-3cl-0107
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220107
Time                  18.21
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      300
DS                        4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1            125.7703637 MHz
NUC1                    13C
P1                   10.50 usec
PLW1            57.00000000 W

======== CHANNEL f2 ========
SFO2            500.1320005 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                80.00 usec
PLW2            20.00000000 W
PLW12            0.39550999 W
PLW13            0.25312999 W

F2 - Processing parameters
SI                      32768
SF              125.7577720 MHz
WDW                        EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

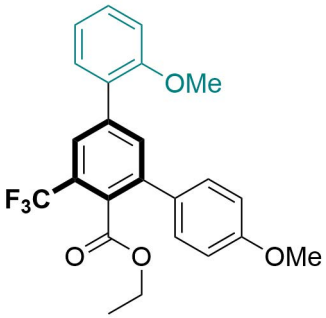


3ac

-59.50

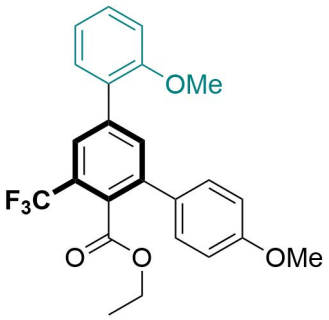



```
Current Data Parameters
NAME                  19F
EXPNO           zba-002-171
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220108
Time                9.21
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                300.5 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

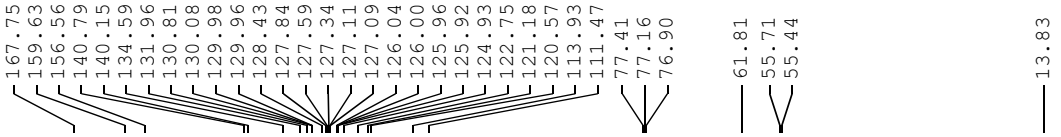


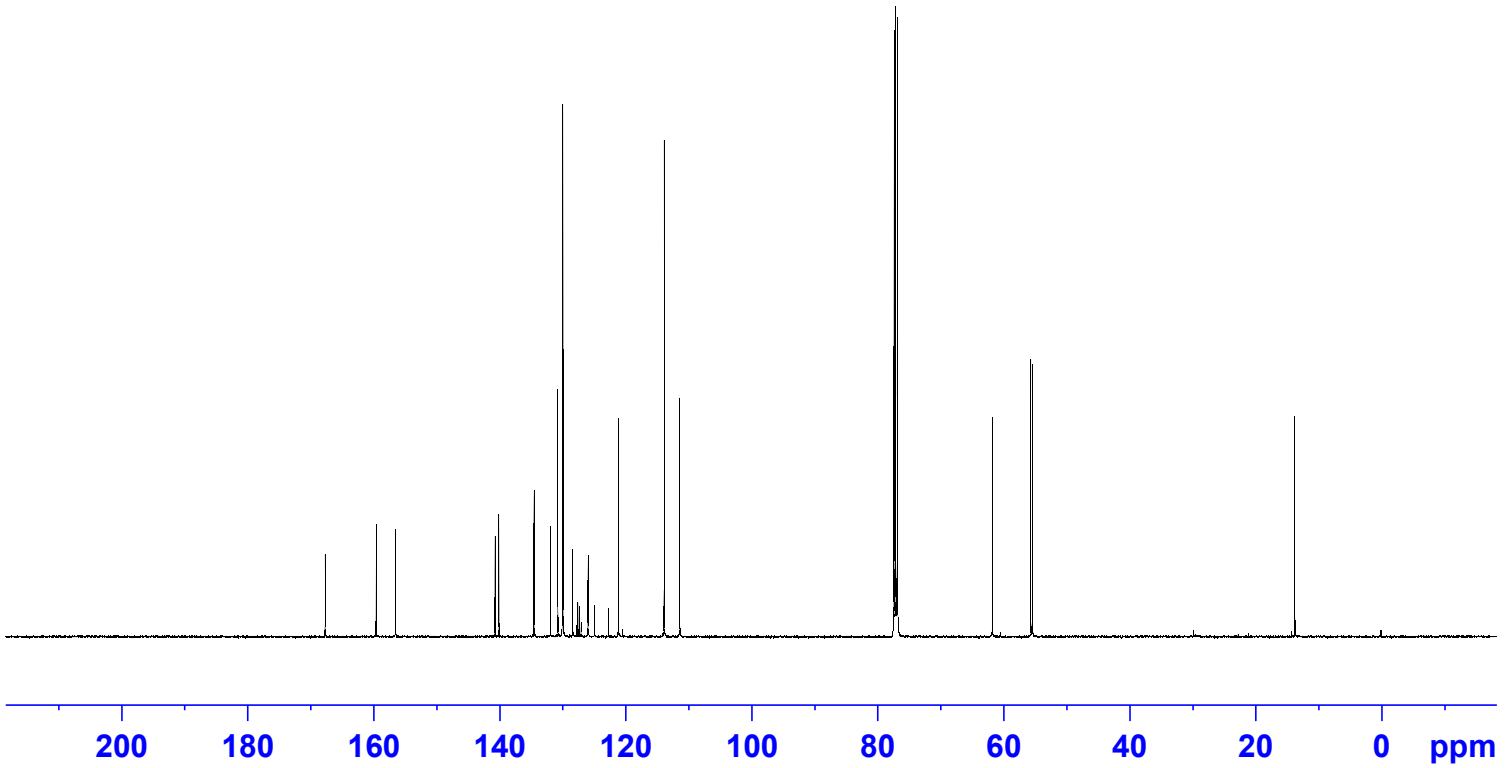
3ad


```
Current Data Parameters
NAME      zba-002-181-2ome-0104
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                   5.48
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE                   298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                   11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF          500.1300182 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

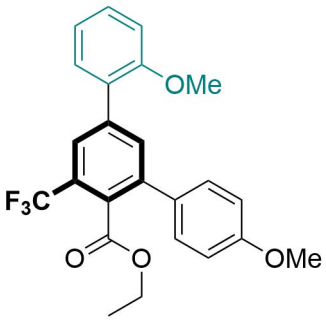


3ad



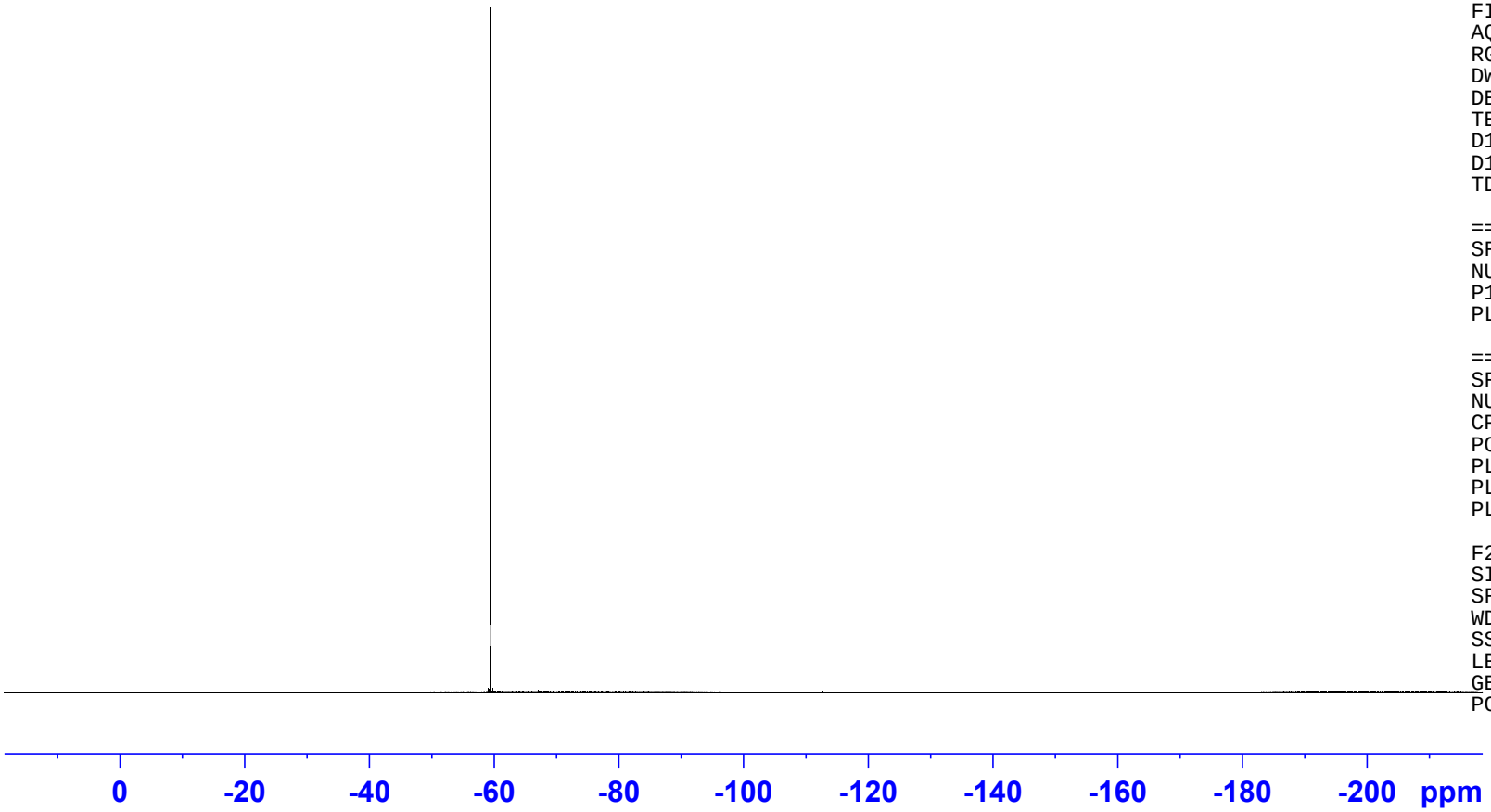



```
Current Data Parameters
NAME      zba-002-181-2ome-0104
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220105
Time                   6.42
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2               80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577736 MHz
WDW                     EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

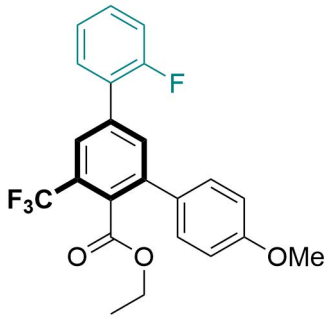


3ad

-59.34

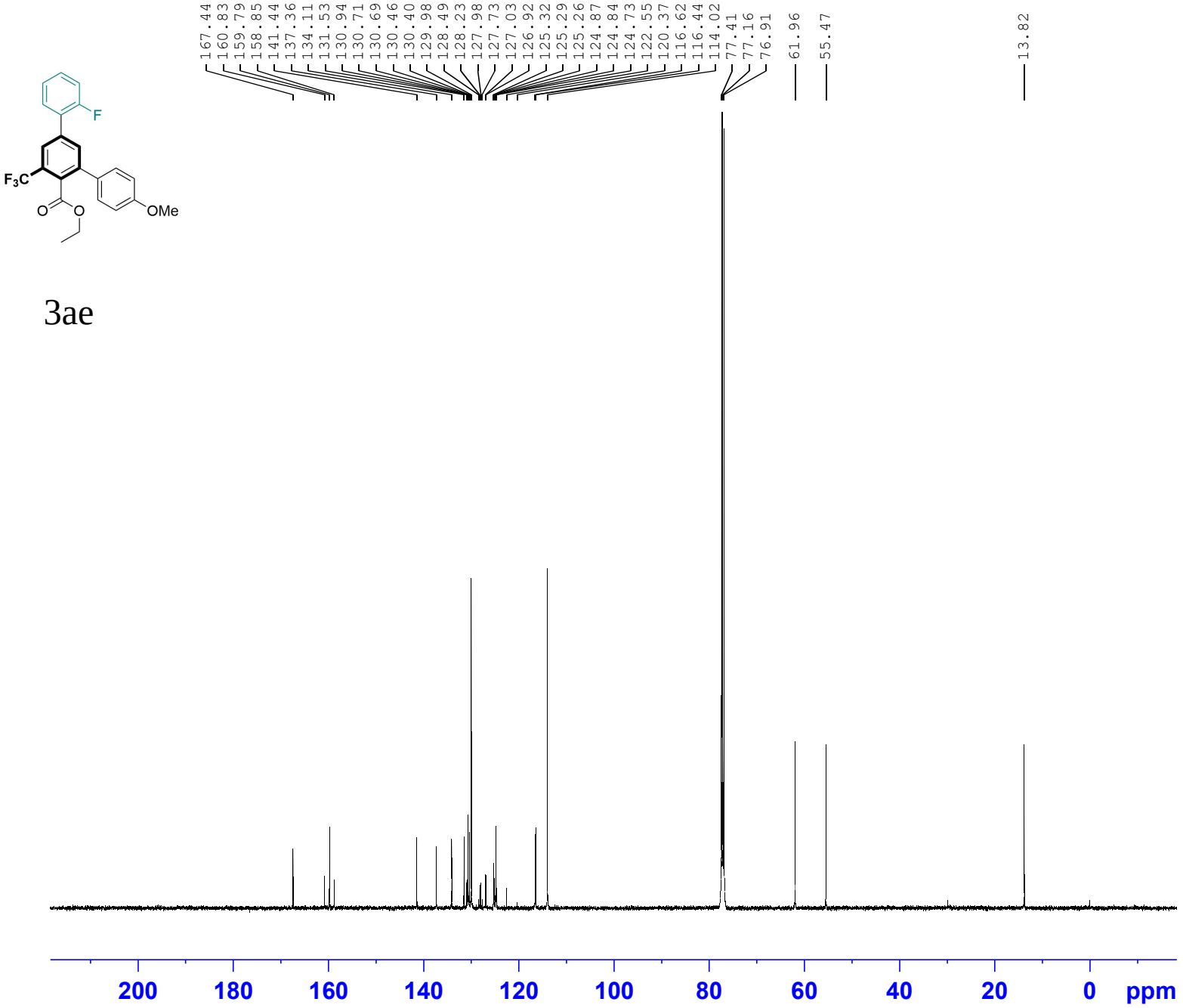



```
Current Data Parameters
NAME                  19F
EXPNO           zba-002-181
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220105
Time                16.02
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 297.6 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

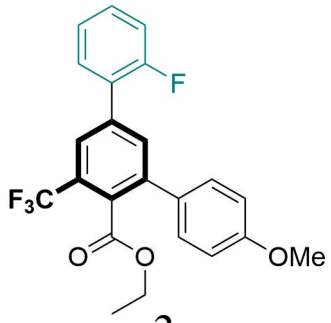


3ae


```
Current Data Parameters
NAME      zba-002-180-2f-0107
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220107
Time                  18.25
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                     1H
P1                   11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                    off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF               500.1300160 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

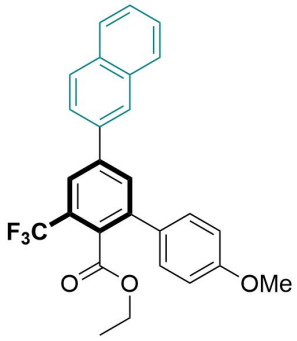



```
Current Data Parameters
NAME      zba-002-180-2f-0107
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20220107
Time                  18.42
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     300
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                   32768
SF            125.7577721 MHz
WDW                     EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.40
```



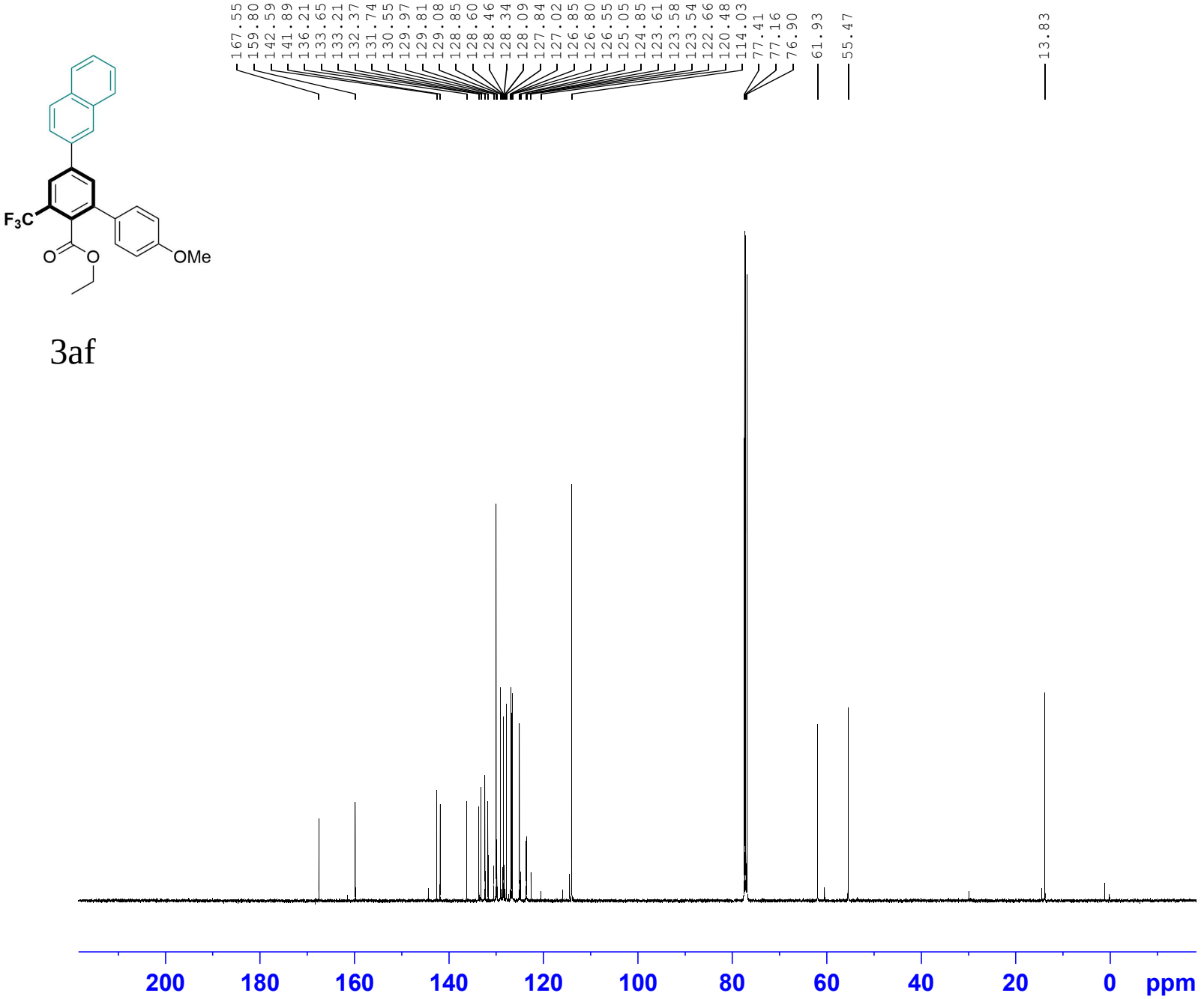
3ae


```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-180
PROCNO                  1

F2 - Acquisition Parameters
Date_              20220108
Time                  9.23
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   300.5 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2                90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                    65536
SF            376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

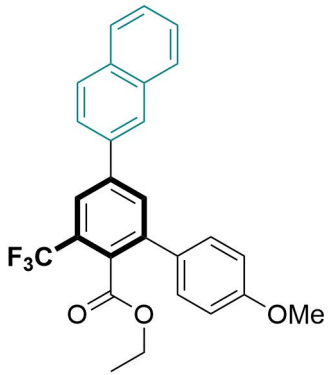


3af


```
Current Data Parameters
NAME      zba-002-167-0105
EXPNO                    1
PROCNO                   1

F2 - Acquisition Parameters
Date_           20220105
Time                9.29
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.244532 Hz
AQ             2.0447233 sec
RG                 80.72
DW                62.400 usec
DE                 6.50 usec
TE                298.9 K
D1          2.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1         12.00000000 W

======== CHANNEL f2 ========
SFO2         400.2424716 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           400.2400177 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

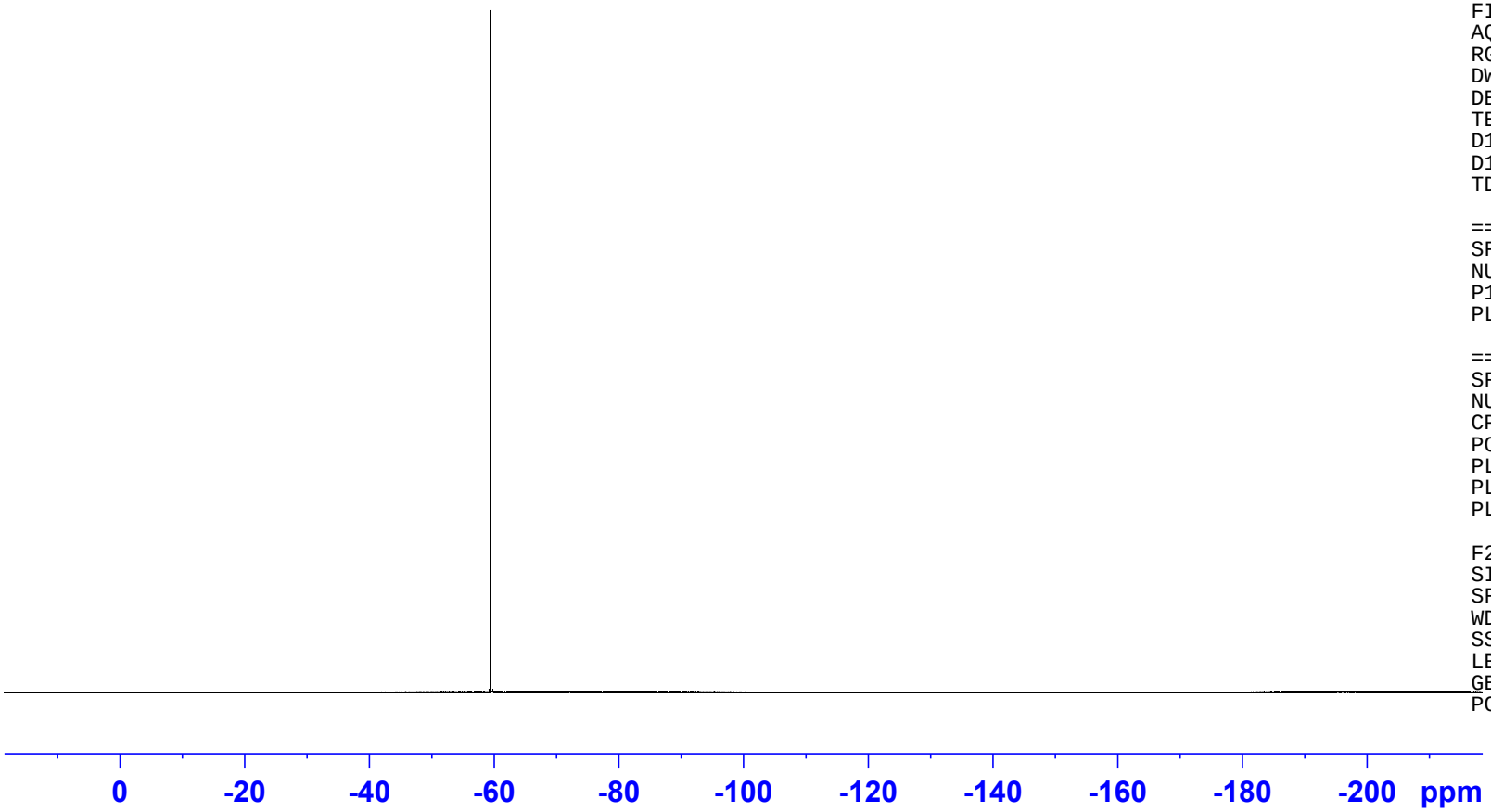



```
Current Data Parameters
NAME      zba-002-167-nap-1111
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211111
Time                 17.39
INSTRUM              spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     300
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE                   298.2 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                     9.80 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                  80.00 usec
PLW2           20.00000000 W
PLW12           0.35778001 W
PLW13           0.22898000 W

F2 - Processing parameters
SI                     32768
SF             125.7577754 MHz
WDW                       EM
SSB          0
LB                     1.00 Hz
GB           0
PC                     1.40
```

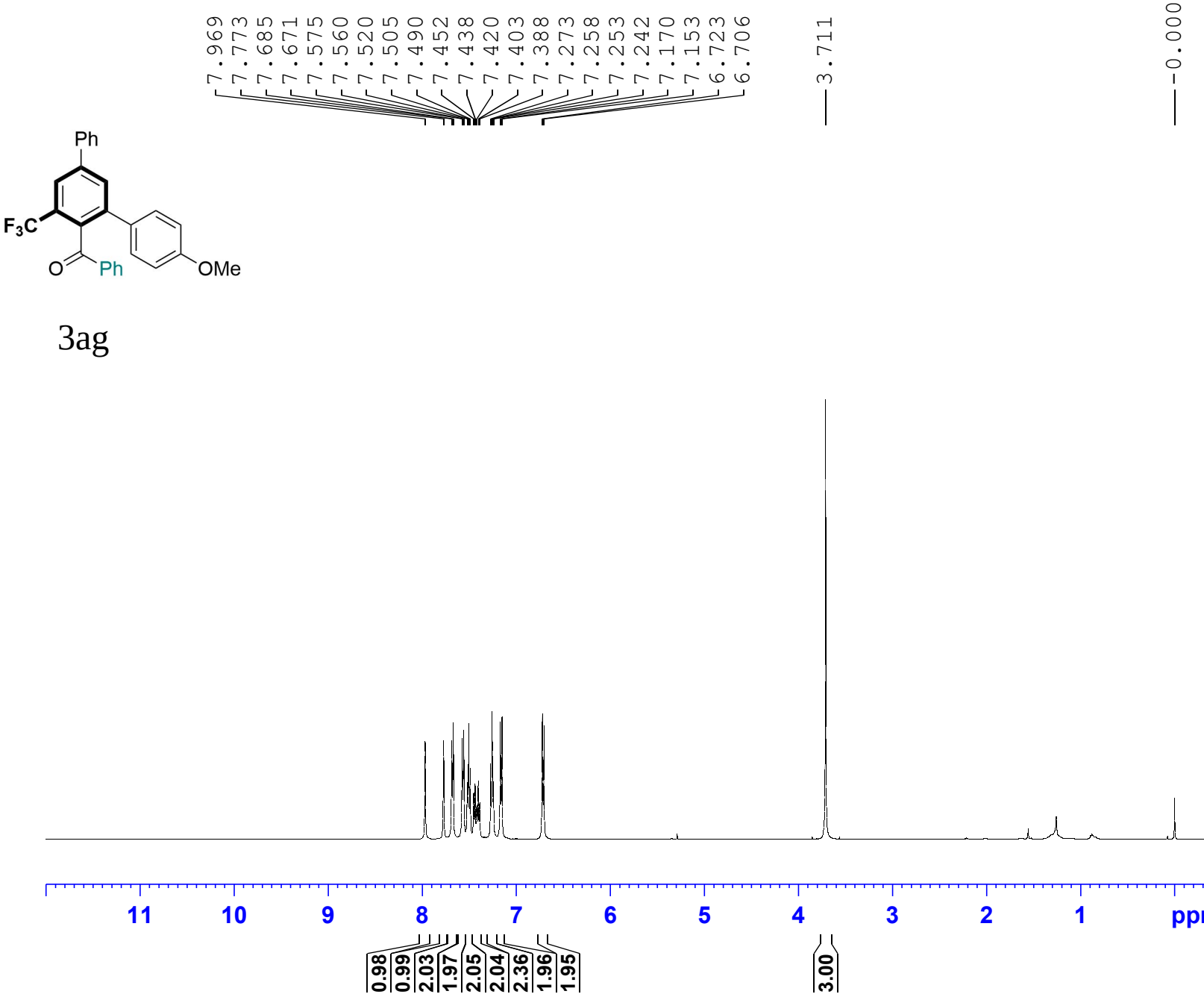


3af

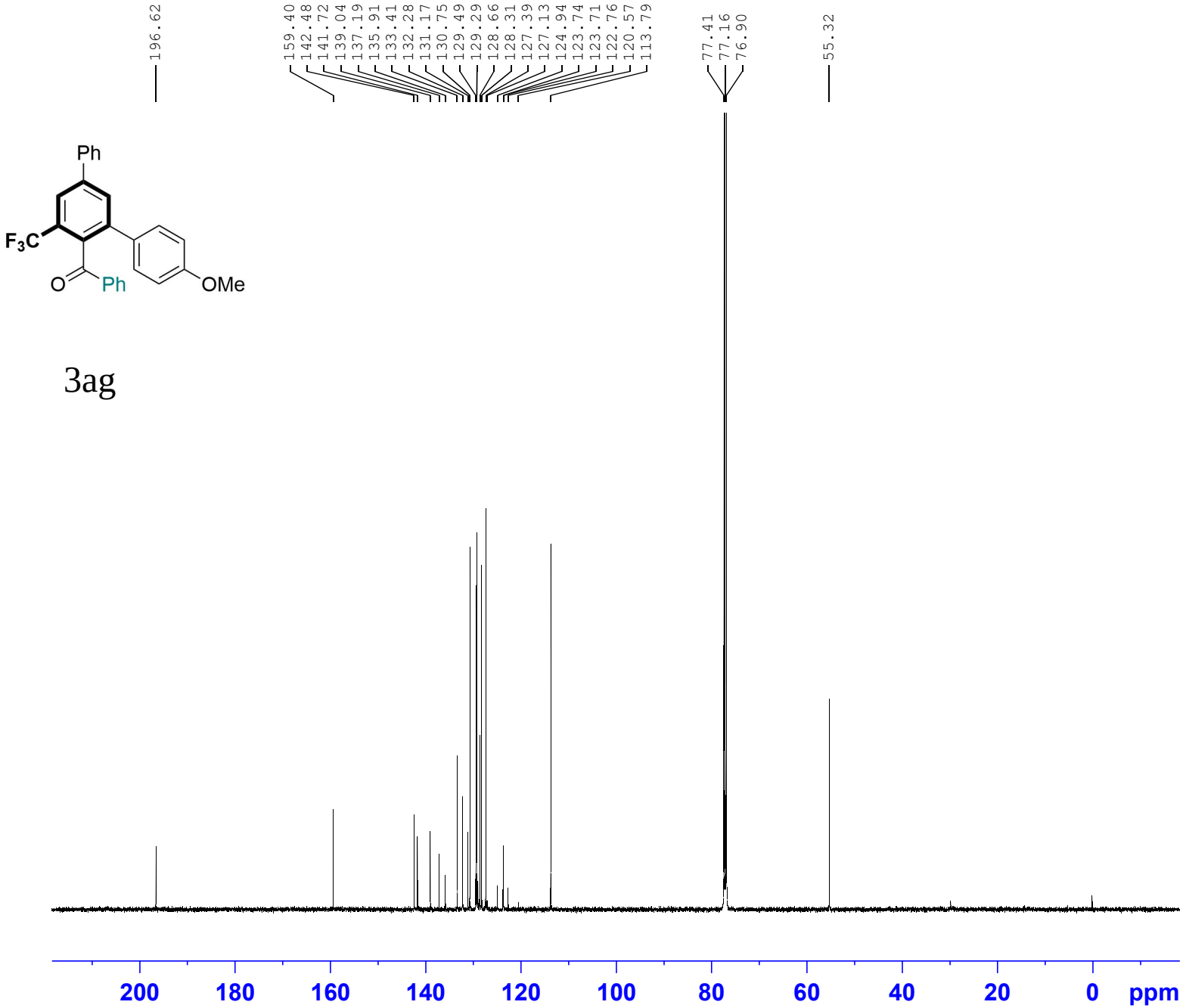
-59.37



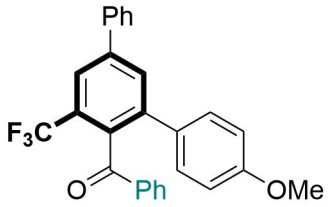

```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-167
PROCNO                  1

F2 - Acquisition Parameters
Date_           20220105
Time               15.57
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                297.6 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```




```
Current Data Parameters
NAME      zba-002-174-ph-0107
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220107
Time                 17.43
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             10000.000 Hz
FIDRES           0.152588 Hz
AQ               3.2767999 sec
RG                   31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                         1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                     1H
P1                   11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2          500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                       65536
SF            500.1300158 MHz
WDW                        EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

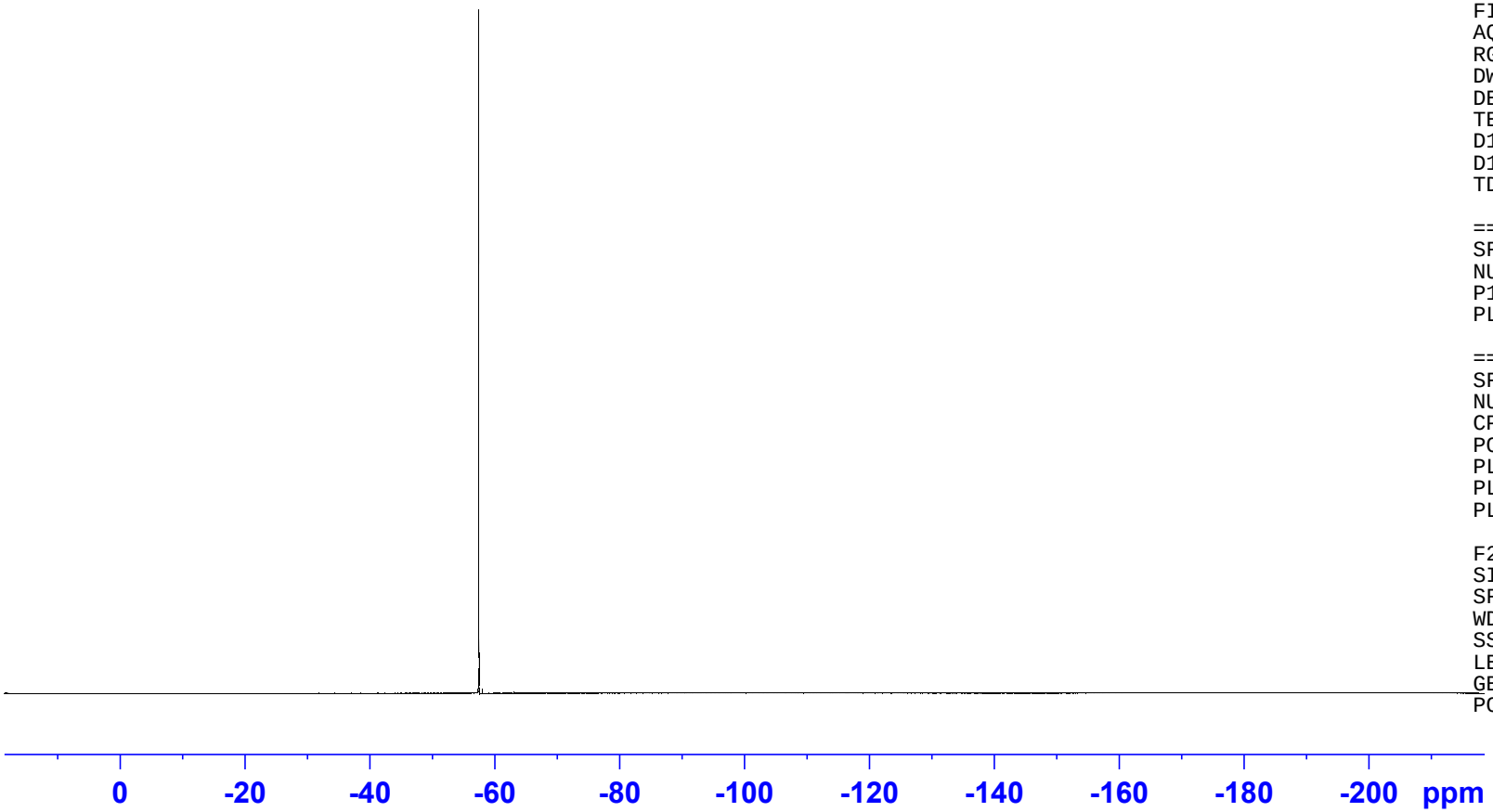



```
Current Data Parameters
NAME      zba-002-174-ph-0107
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220107
Time                 18.00
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    300
DS                      4
SWH             29761.904 Hz
FIDRES           0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                 13C
P1                 10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                 1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                  32768
SF            125.7577727 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

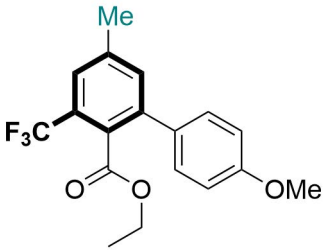


3ag

-57.48

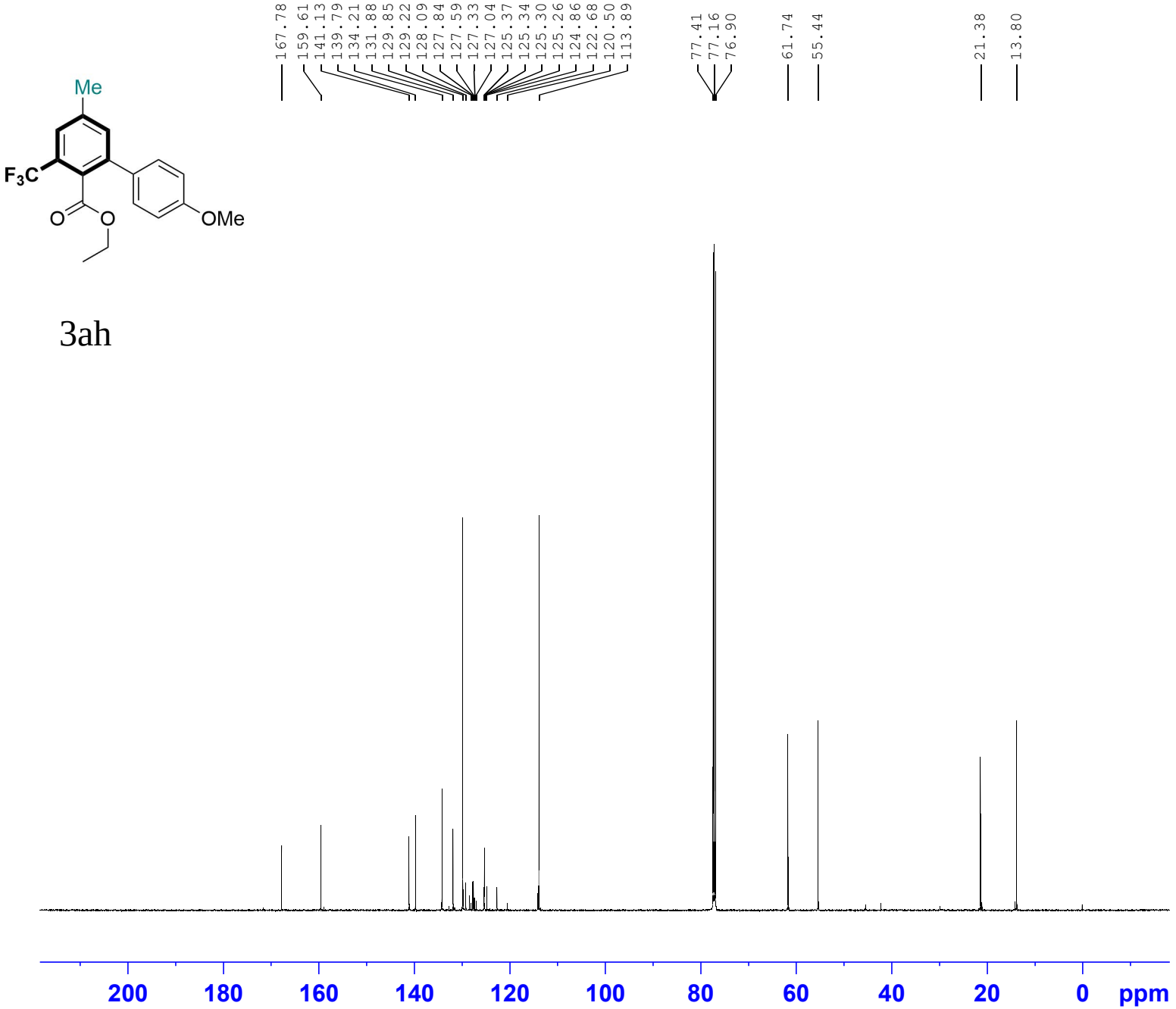



```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-174
PROCNO                  1

F2 - Acquisition Parameters
Date_              20220108
Time                  9.19
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   300.5 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

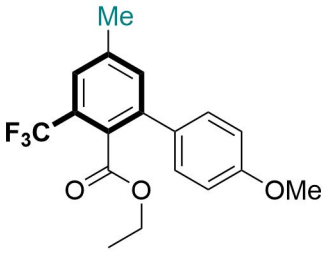


3ah


```
Current Data Parameters
NAME      zba-002-175-me-0106
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220107
Time                   2.43
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ               3.2767999 sec
RG                    31.72
DW                  50.000 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
D11       0 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                     1H
P1                   11.25 usec
PLW1          20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                    off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF           500.1300142 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```




```
Current Data Parameters
NAME      zba-002-175-me-0106
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_              20220107
Time                   3.38
INSTRUM               spect
PROBHD   5 mm CPPBBO BB
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH             29761.904 Hz
FIDRES           0.454131 Hz
AQ              1.1010048 sec
RG                 192.89
DW                 16.800 usec
DE                 18.00 usec
TE                 298.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          125.7703637 MHz
NUC1                   13C
P1                  10.50 usec
PLW1          57.00000000 W

======== CHANNEL f2 ========
SFO2          500.1320005 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2          20.00000000 W
PLW12          0.39550999 W
PLW13          0.25312999 W

F2 - Processing parameters
SI                    32768
SF            125.7577725 MHz
WDW                     EM
SSB       0
LB                  1.00 Hz
GB        0
PC                  1.40
```



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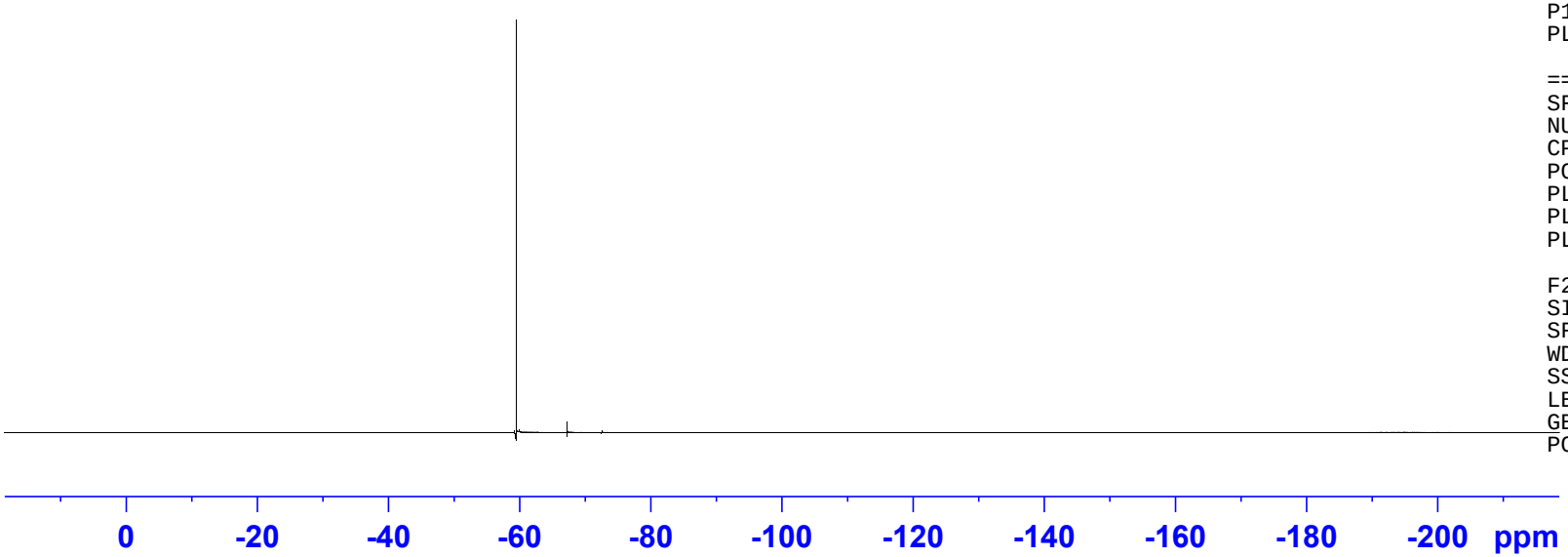
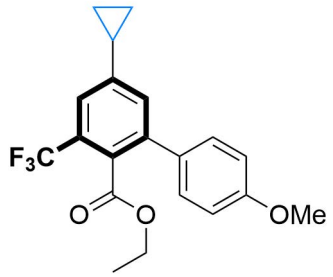
-59.45

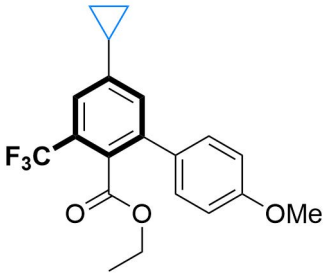



```
Current Data Parameters
NAME                  19F
EXPNO          zba-002-175
PROCNO                  1

F2 - Acquisition Parameters
Date_            20220108
Time                9.14
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 300.4 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



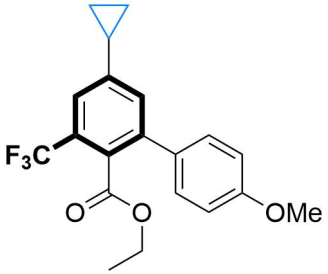
3ai


```
Current Data Parameters
NAME      zba-002-198-hjj-1130
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211130
Time                  11.39
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH              10000.000 Hz
FIDRES            0.152588 Hz
AQ                3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE          0 K
D1             1.00000000 sec
D11         0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1           500.1330885 MHz
NUC1                      1H
P1                     10.59 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2           500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2       0 usec
PLW2        0 W
PLW12       0 W
PLW13       0 W

F2 - Processing parameters
SI                    65536
SF               500.1300114 MHz
WDW                      EM
SSB         0
LB                    0.30 Hz
GB          0
PC                    1.00
```



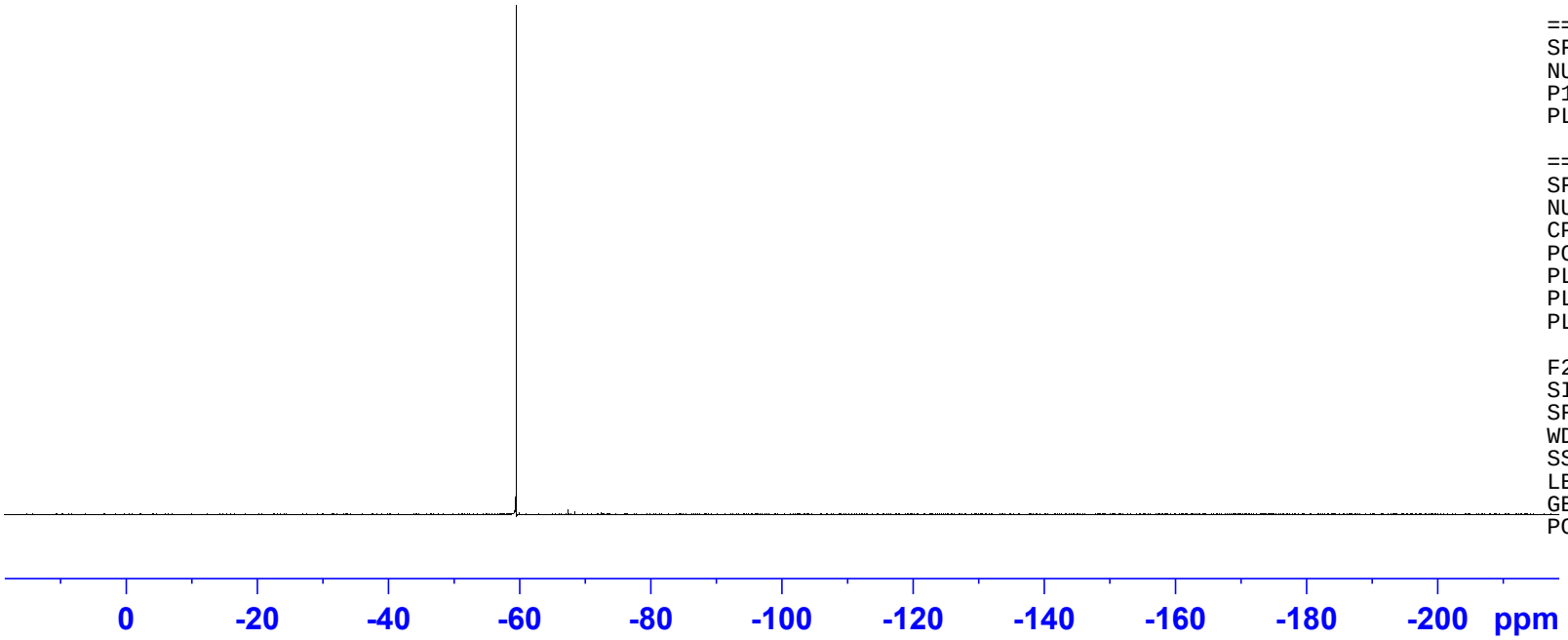
3ai


```
Current Data Parameters
NAME      zba-002-198-hjj-1130
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20211130
Time                  12.16
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      700
DS                        4
SWH               29761.904 Hz
FIDRES             0.454131 Hz
AQ                1.1010048 sec
RG                   192.89
DW                   16.800 usec
DE                   18.00 usec
TE          0 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                    9.80 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2           waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.35778001 W
PLW13           0.22898000 W

F2 - Processing parameters
SI                    32768
SF             125.7577756 MHz
WDW                      EM
SSB         0
LB                    1.00 Hz
GB          0
PC                    1.40
```

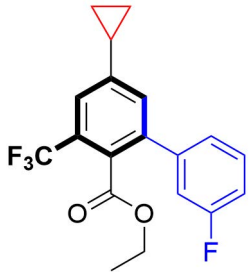


3ai

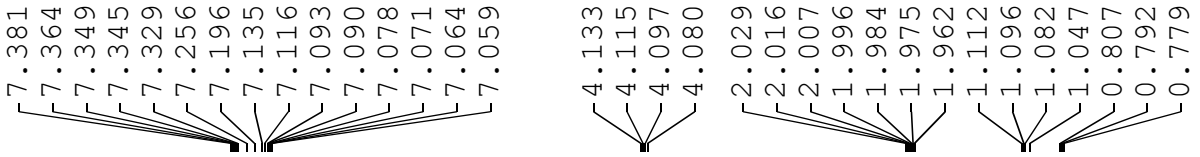
-59.45

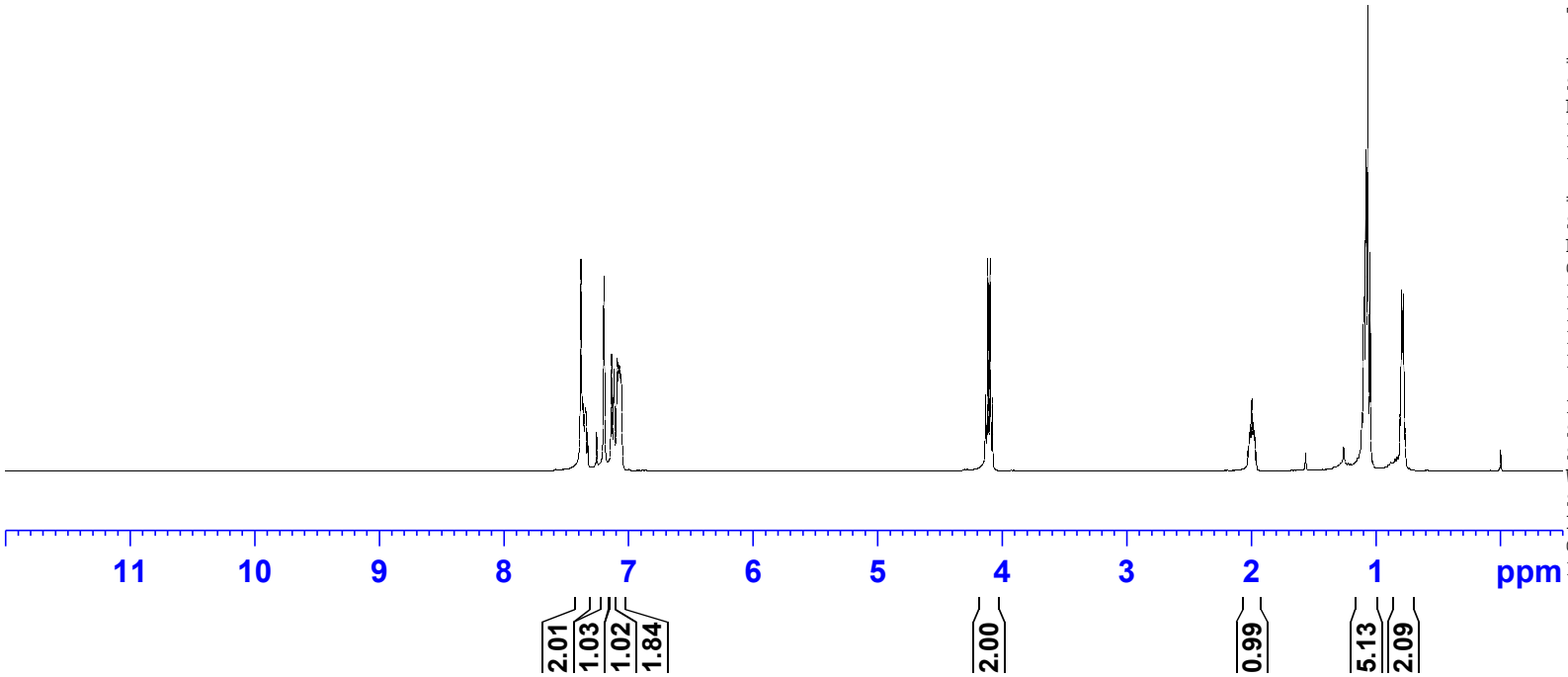



```
Current Data Parameters
NAME                  19F
EXPNO            zba-002-198
PROCNO                  1

F2 - Acquisition Parameters
Date_              20211205
Time                 19.06
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG        zgfhigqn.2
TD                  131072
SOLVENT              CDCl3
NS                      16
DS                       0
SWH              89285.711 Hz
FIDRES            0.681196 Hz
AQ               0.7340032 sec
RG                  206.33
DW                   5.600 usec
DE                   6.50 usec
TE                   298.2 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1           376.5642094 MHz
NUC1                   19F
P1                   14.50 usec
PLW1           17.98900032 W

======== CHANNEL f2 ========
SFO2           400.2416010 MHz
NUC2                   1H
CPDPRG[2           waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.30294999 W
PLW13           0.24539000 W

F2 - Processing parameters
SI                    65536
SF             376.6018696 MHz
WDW                     EM
SSB       0
LB                   0.30 Hz
GB        0
PC                   1.00
```

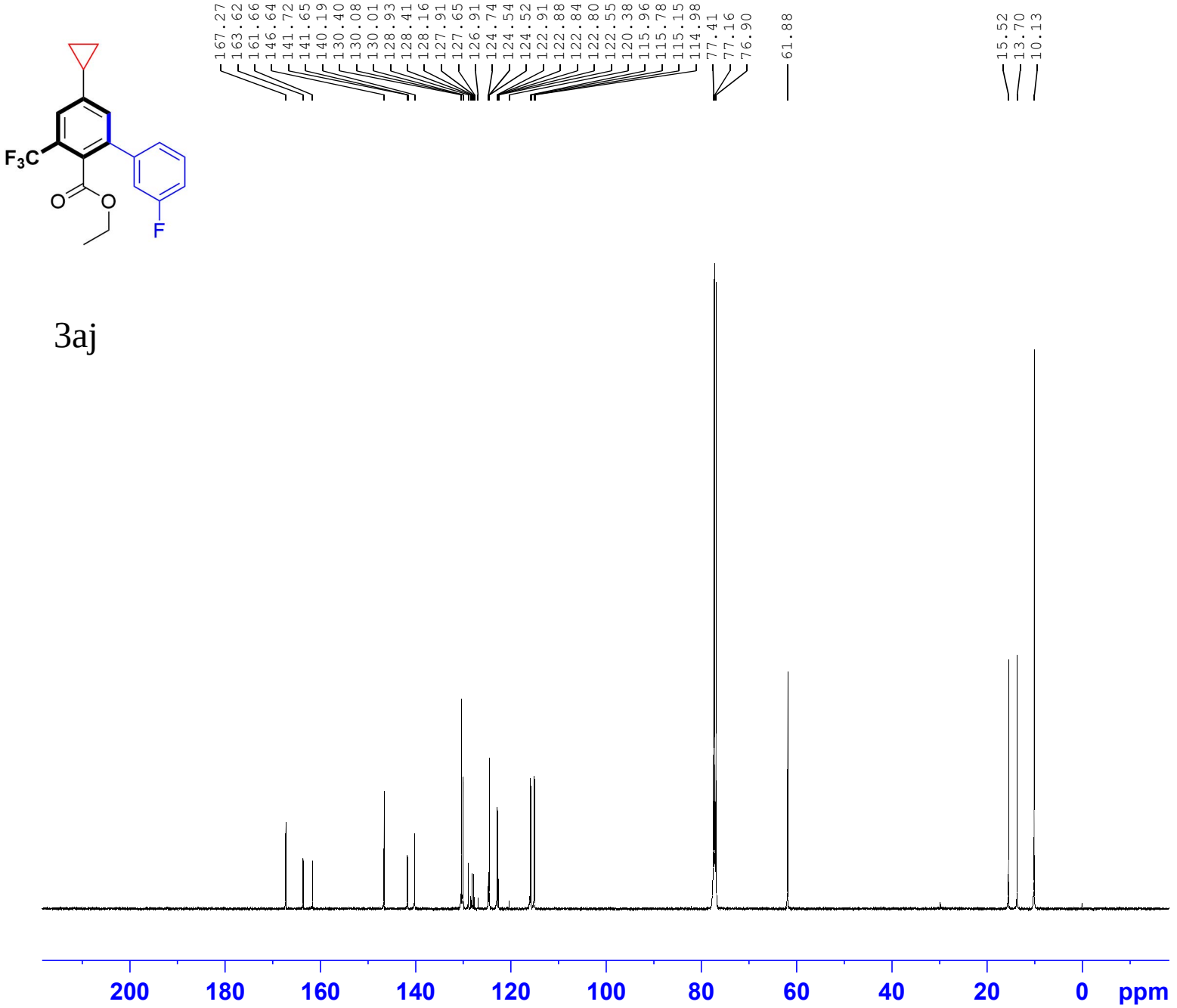


3aj

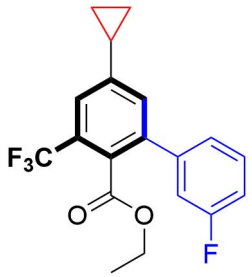





```
Current Data Parameters
NAME      zba-003-16-3f-1212
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211212
Time                16.41
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDC13
NS                    16
DS                     0
SWH              8012.820 Hz
FIDRES           0.244532 Hz
AQ              2.0447233 sec
RG                 92.09
DW                62.400 usec
DE                 6.50 usec
TE                298.0 K
D1           2.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1         12.00000000 W

======== CHANNEL f2 ========
SFO2         400.2424716 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           400.2400117 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```




```
Current Data Parameters
NAME      zba-003-16-3f-1211
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211212
Time                 13.45
INSTRUM              spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                 10.50 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         20.00000000 W
PLW12         0.39550999 W
PLW13         0.25312999 W

F2 - Processing parameters
SI                 32768
SF           125.7577709 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

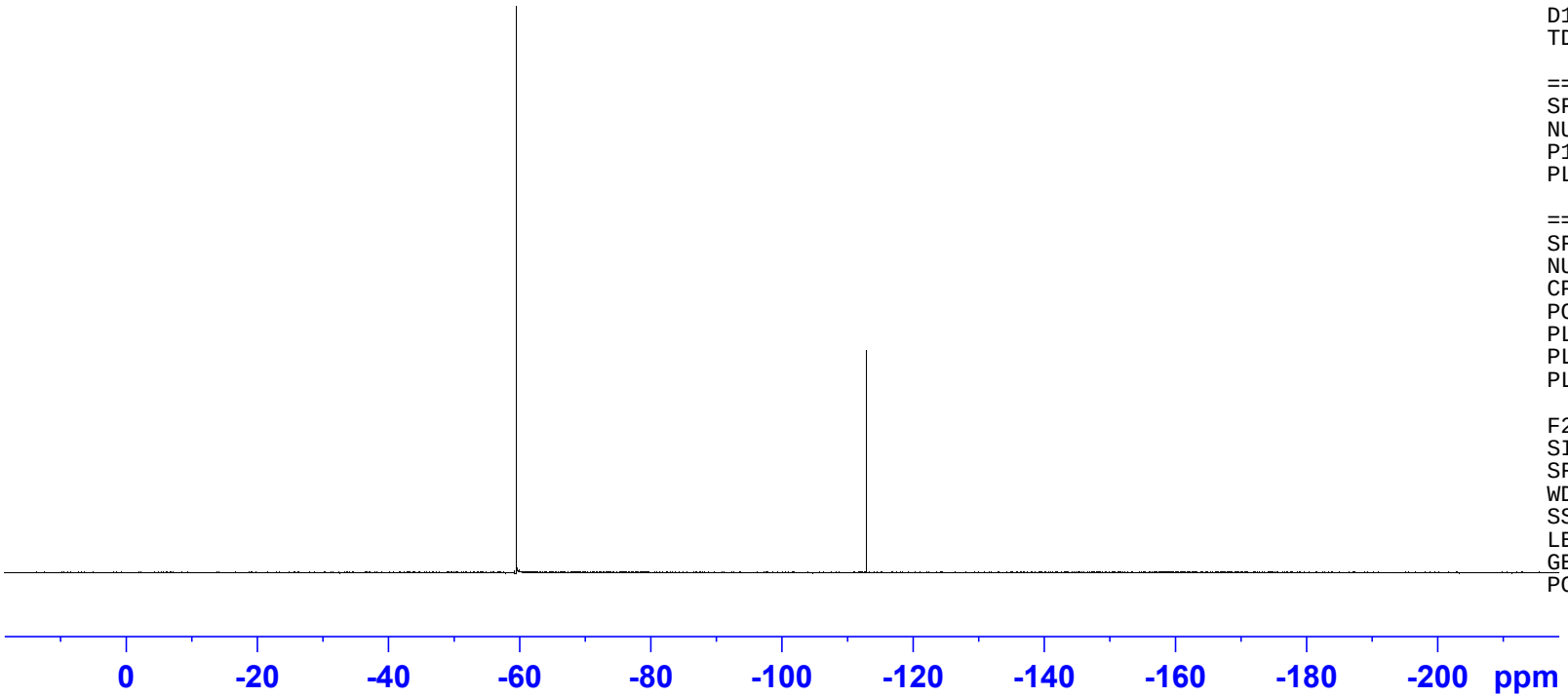


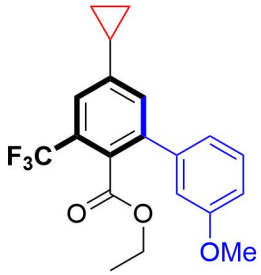
3aj

-59.51

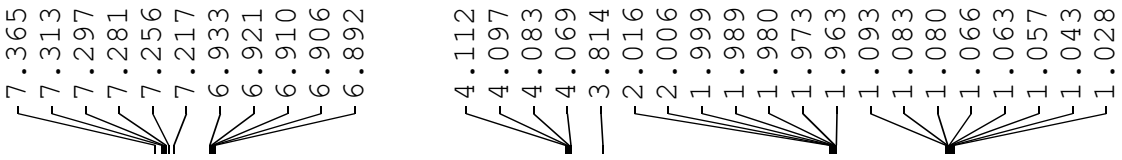
-112.87

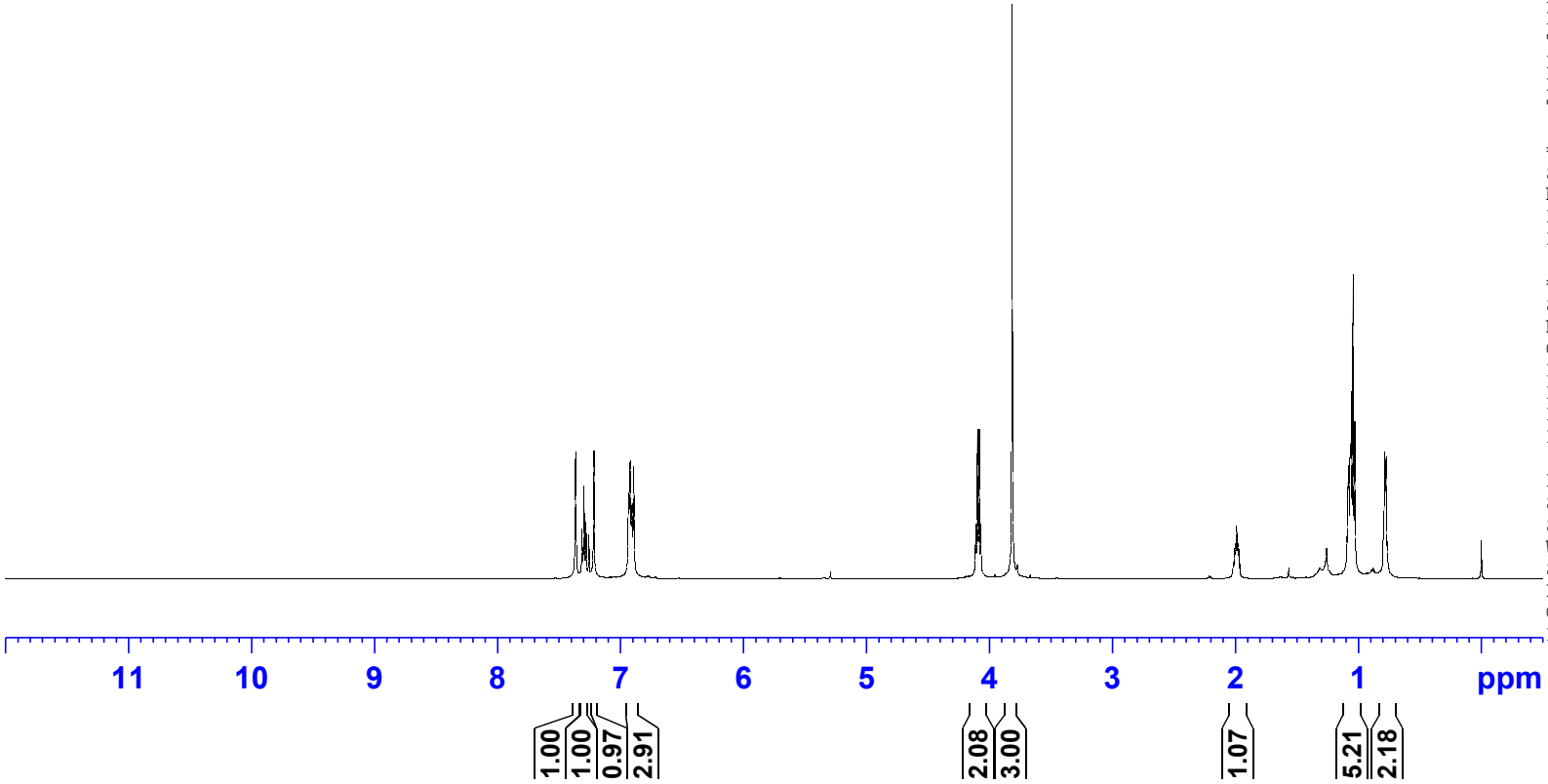
```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-16
PROCNO                 1

F2 - Acquisition Parameters
Date_            20211212
Time                17.43
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 298.1 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```



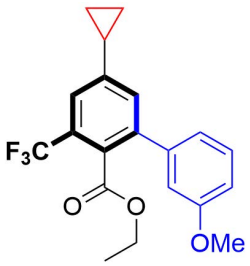


3ak



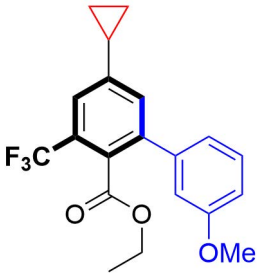



```
Current Data Parameters
NAME      zba-003-28-3ome-0113
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220112
Time                   9.02
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH               10000.000 Hz
FIDRES             0.152588 Hz
AQ                3.2767999 sec
RG                    31.72
DW                   50.000 usec
DE                    6.50 usec
TE                   298.2 K
D1              1.00000000 sec
D11       0 sec
TD0                          1

======== CHANNEL f1 ========
SFO1            500.1330885 MHz
NUC1                      1H
P1                     11.25 usec
PLW1           20.00000000 W

======== CHANNEL f2 ========
SFO2            500.1330885 MHz
NUC2                     off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                    65536
SF              500.1300142 MHz
WDW                      EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```



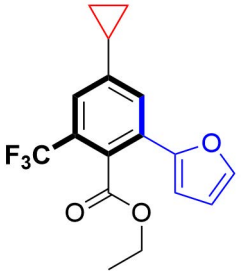
3ak


```
Current Data Parameters
NAME      zba-003-28-3ome-0113
EXPNO                        2
PROCNO                       1

F2 - Acquisition Parameters
Date_              20220112
Time                   9.40
INSTRUM               spect
PROBHD    5 mm CPPBBO BB
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              29761.904 Hz
FIDRES            0.454131 Hz
AQ               1.1010048 sec
RG                  192.89
DW                  16.800 usec
DE                  18.00 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1           125.7703637 MHz
NUC1                    13C
P1                   10.50 usec
PLW1           57.00000000 W

======== CHANNEL f2 ========
SFO2           500.1320005 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                80.00 usec
PLW2           20.00000000 W
PLW12           0.39550999 W
PLW13           0.25312999 W

F2 - Processing parameters
SI                    32768
SF             125.7577723 MHz
WDW                      EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

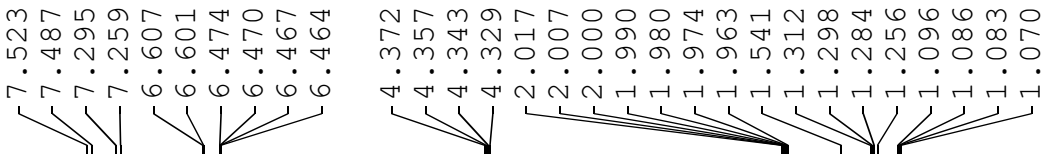


3ak

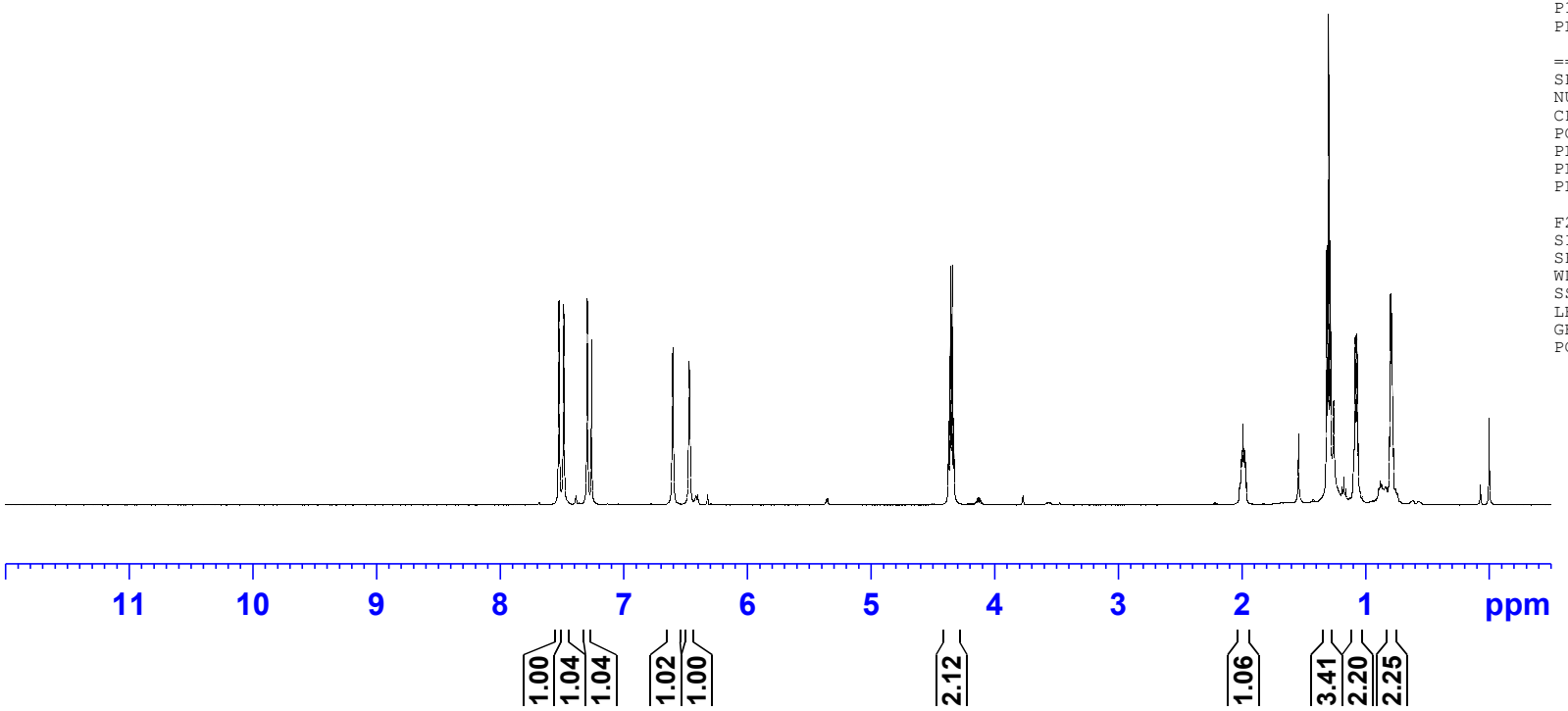

```
Current Data Parameters
NAME                  19F
EXPNO           zba-003-28
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220113
Time               15.33
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT          Acetone
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.9 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                  1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB      0
LB                 0.30 Hz
GB       0
PC                 1.00
```

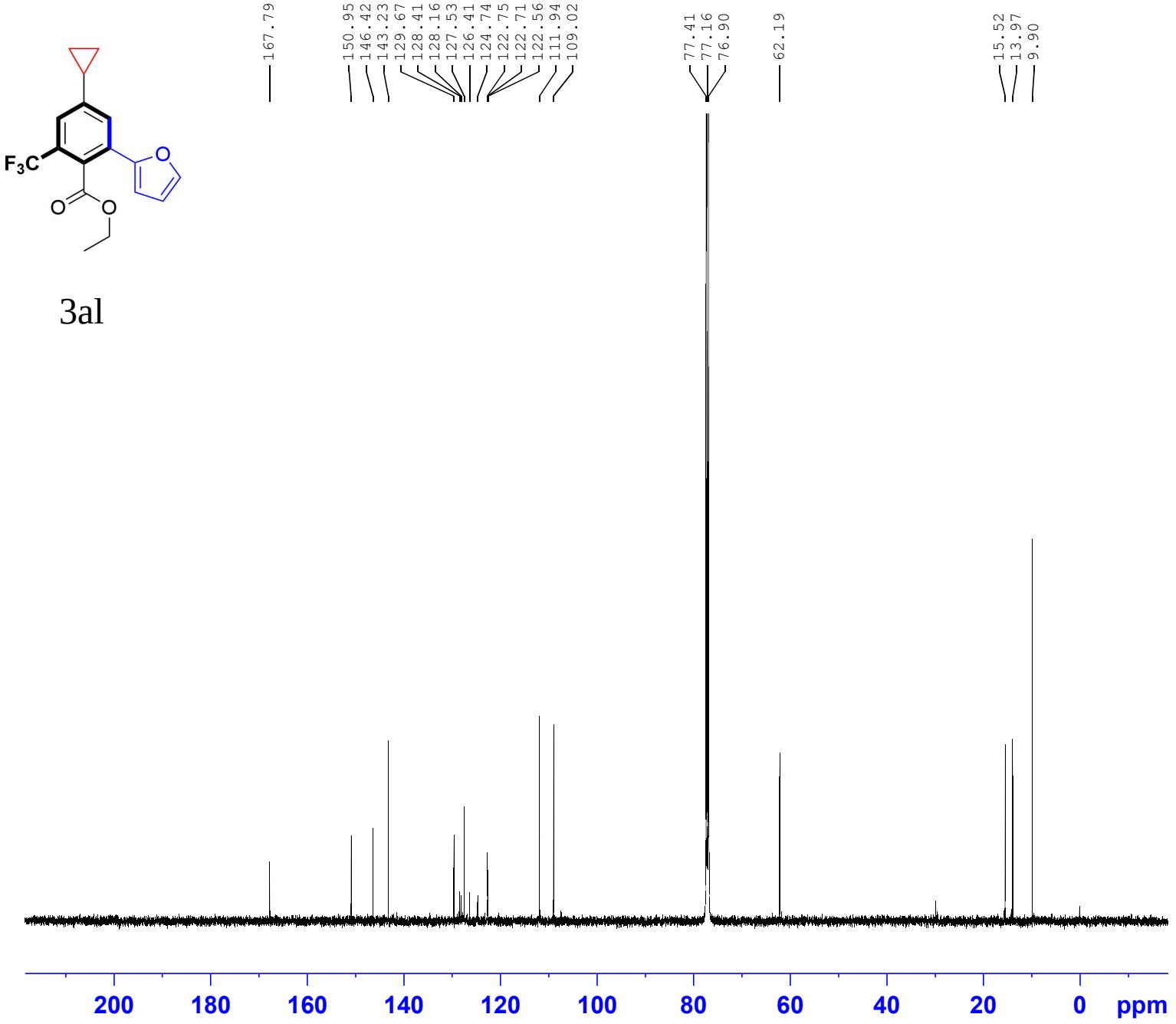


3al



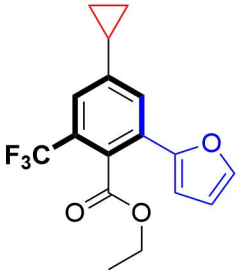

```
Current Data Parameters
NAME      zba-003-64-o-0120£¨003-12£©
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20220121
Time               7.30
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                65536
SOLVENT           CDC13
NS                   16
DS                    2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                31.72
DW               50.000 usec
DE                6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11       0 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                 1H
P1                11.25 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                 off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300129 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```





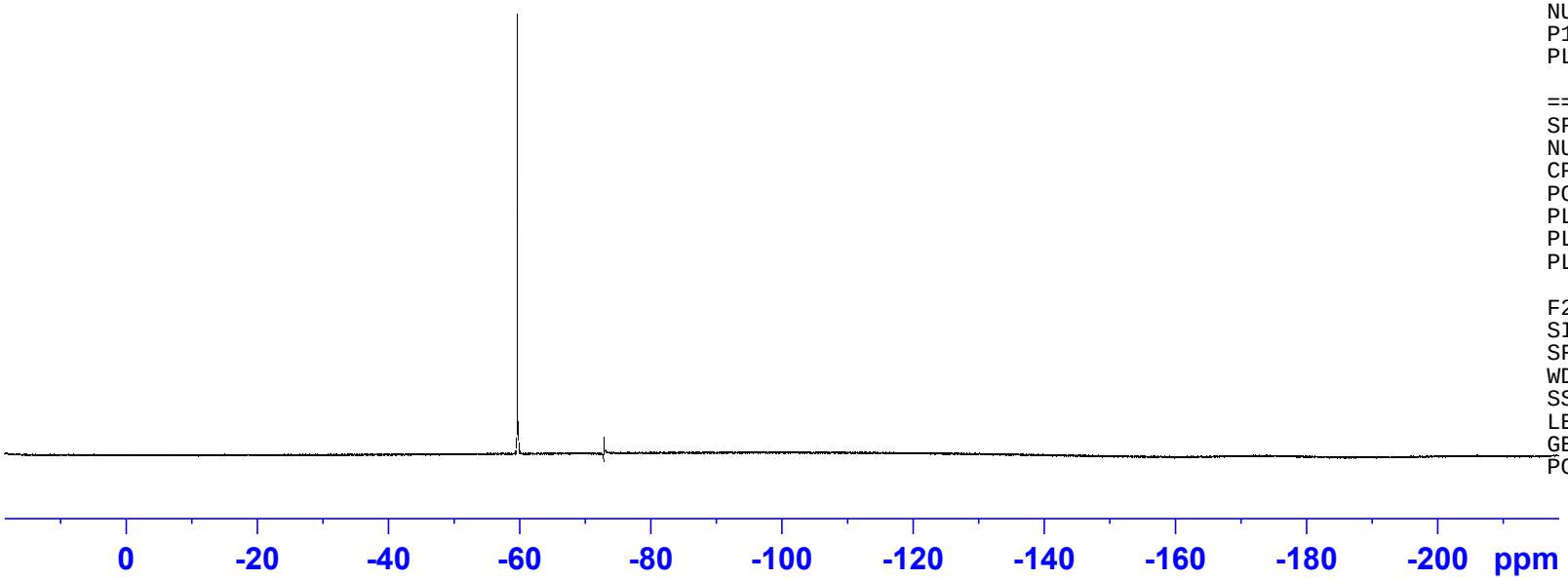
3al

```
Current Data Parameters
NAME      zba-003-64-o-0120£¨003-12£©
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220121
Time               8.24
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                10.50 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.39550999 W
PLW13        0.25312999 W

F2 - Processing parameters
SI                32768
SF          125.7577710 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

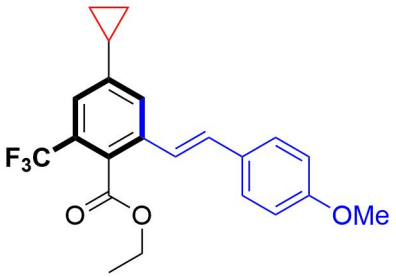


3al

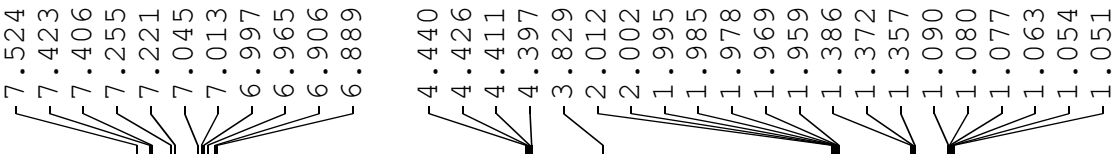
-59.61

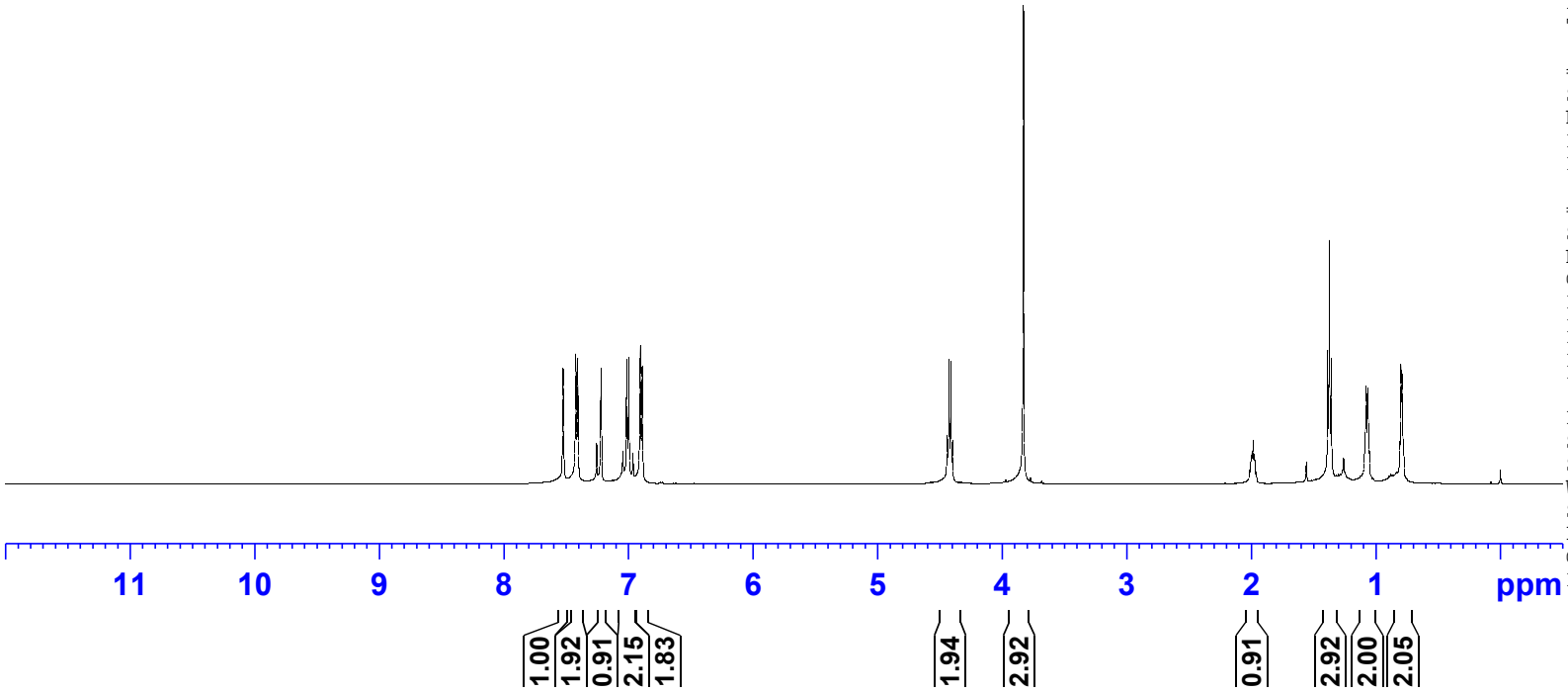



```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-12
PROCNO                 1

F2 - Acquisition Parameters
Date_            20220121
Time                15.50
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 296.1 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                 14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                 65536
SF            376.6018696 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

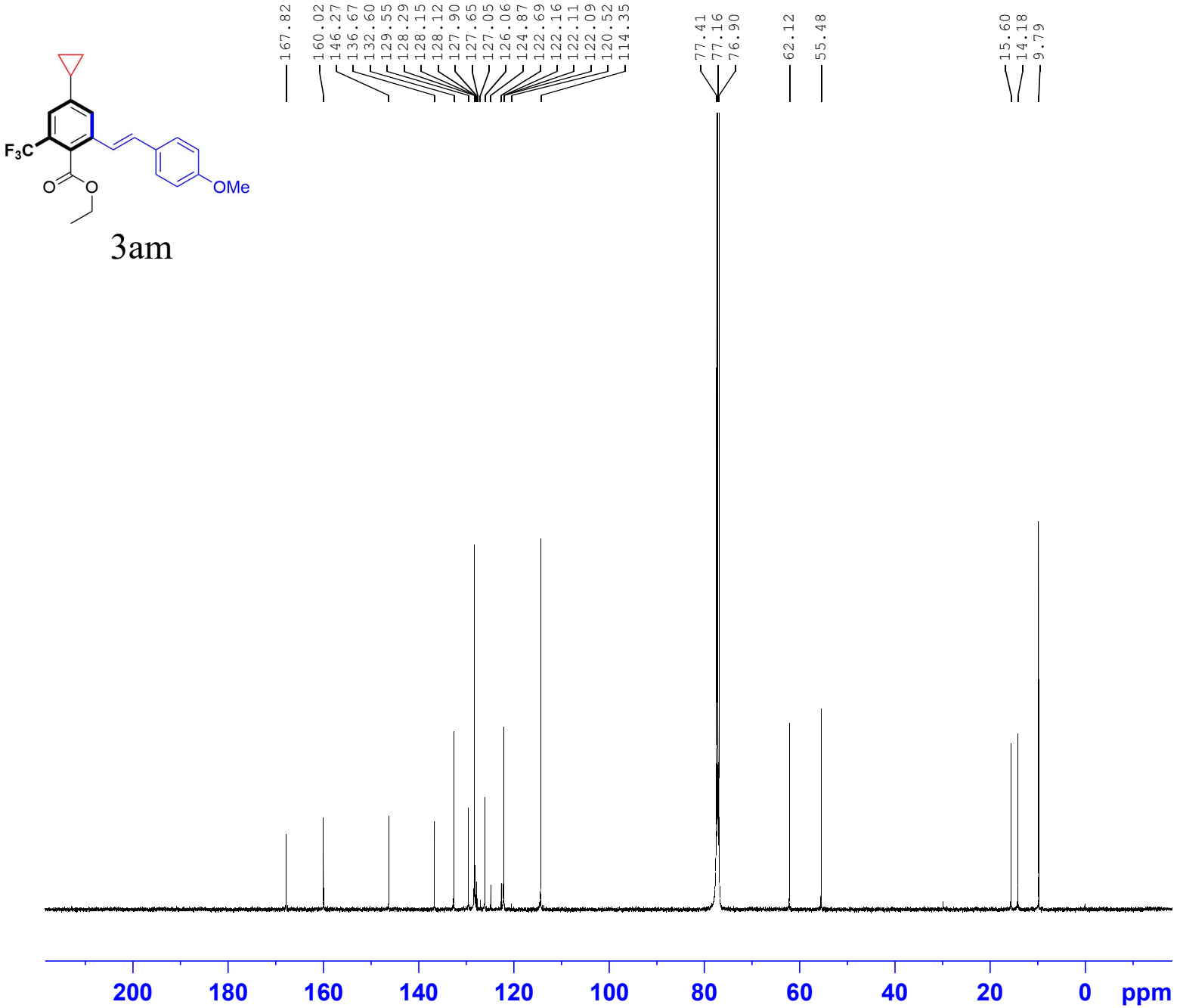


3am

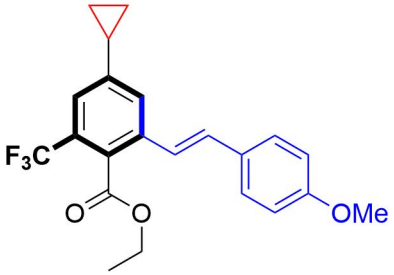




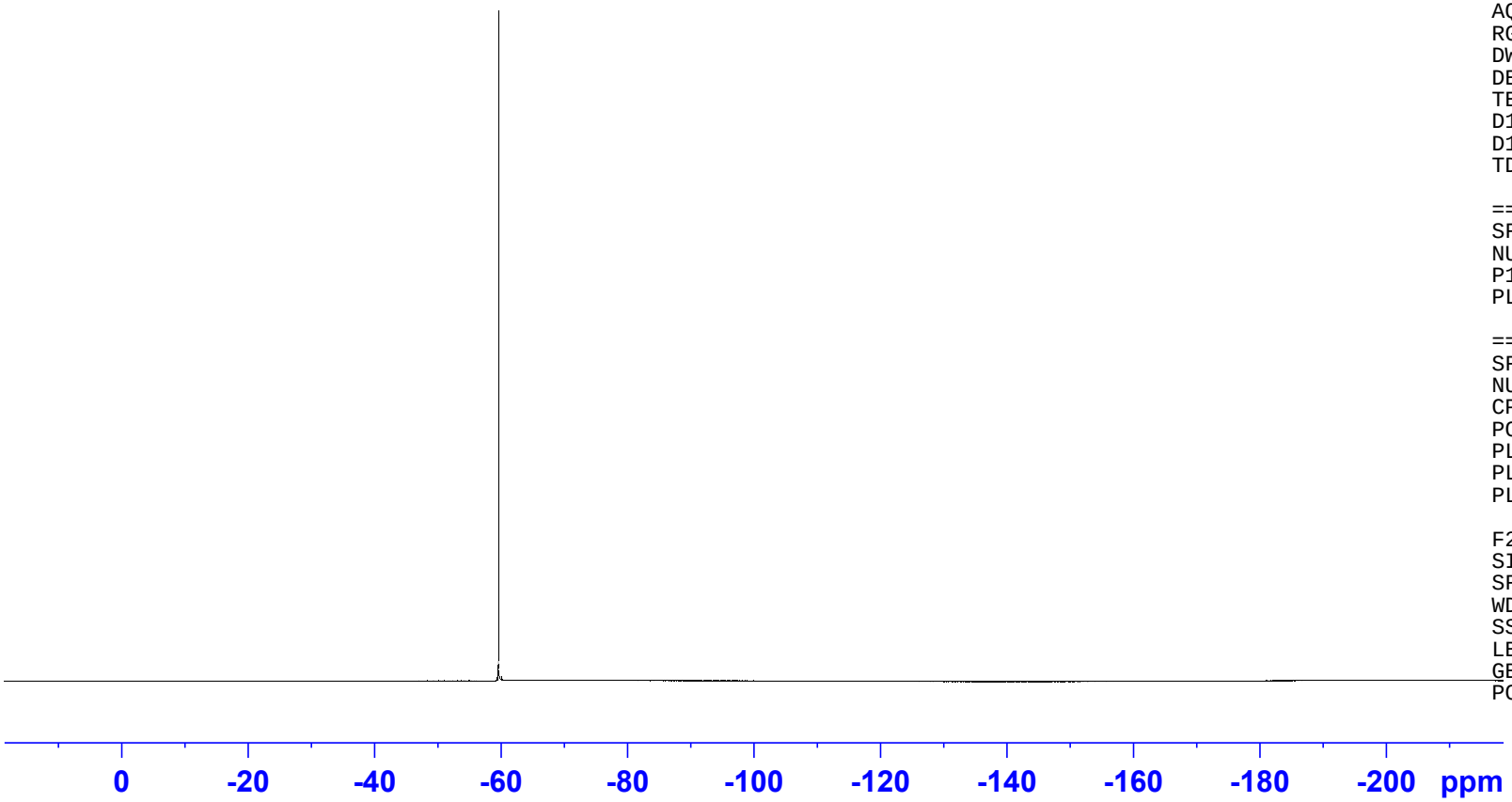

```
Current Data Parameters
NAME      zba-003-15-0121
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_           20220122
Time                0.33
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDC13
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 31.72
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1          1.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           500.1300150 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



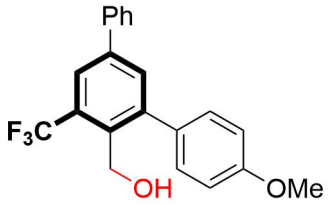

```
Current Data Parameters
NAME      zba-003-15-0121
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220122
Time               2.19
INSTRUM           spect
PROBHD   5 mm CPPBBO BB
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2000
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1               13C
P1               10.50 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2               1H
CPDPRG[2        waltz16
PCPD2            80.00 usec
PLW2        20.00000000 W
PLW12        0.39550999 W
PLW13        0.25312999 W

F2 - Processing parameters
SI                32768
SF          125.7577728 MHz
WDW                EM
SSB       0
LB               1.00 Hz
GB        0
PC               1.40
```



3am

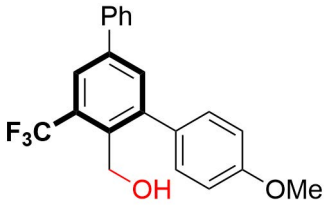



```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-15
PROCNO                 1

F2 - Acquisition Parameters
Date_            20220121
Time                15.47
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 296.0 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                  EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

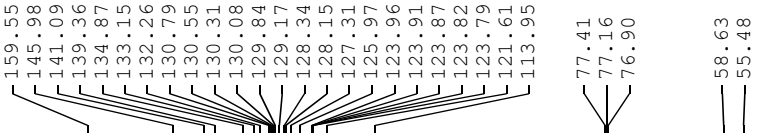


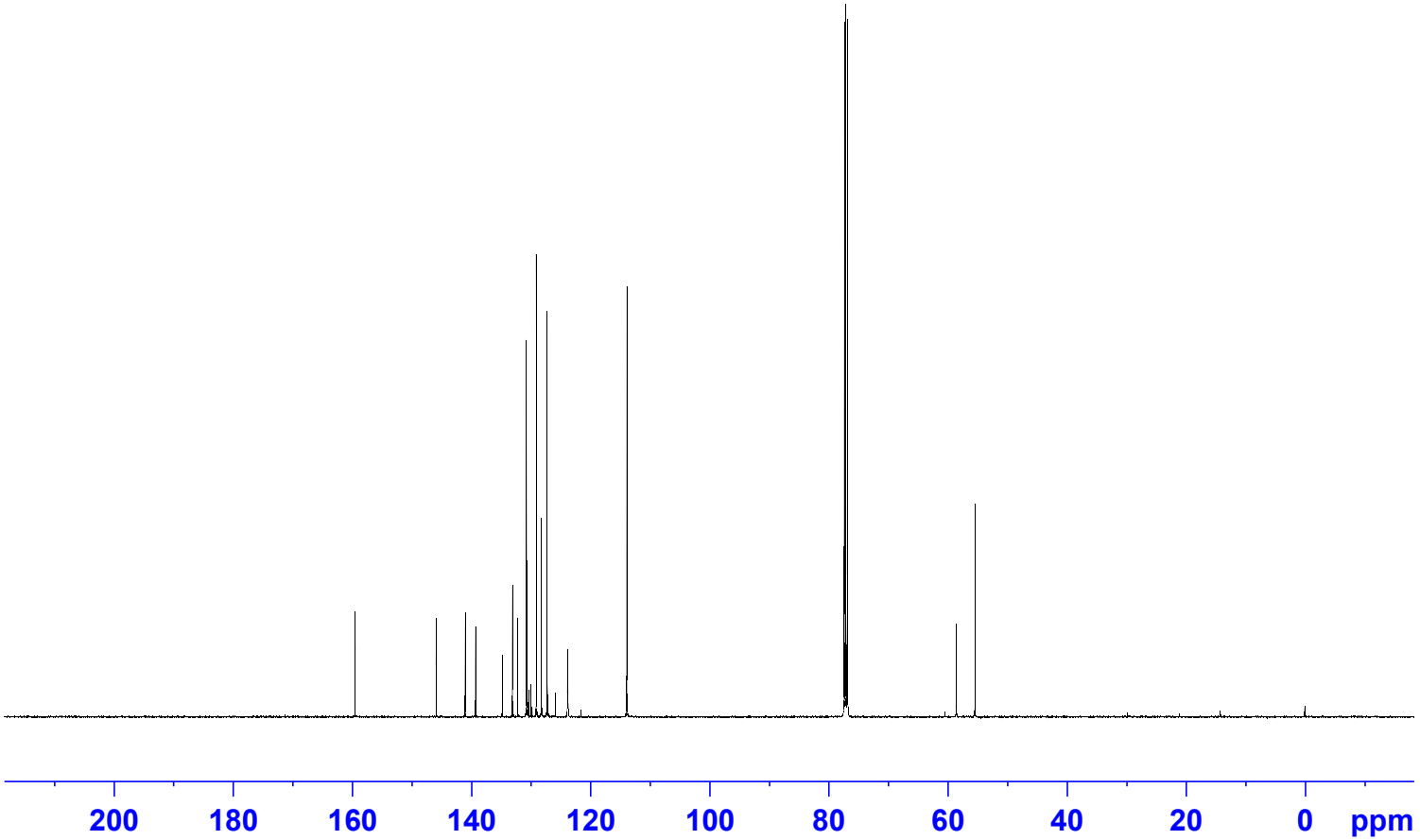
5


```
Current Data Parameters
NAME      zba-003-24-gua1214
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211214
Time                22.47
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG              zg30
TD                  65536
SOLVENT             CDC13
NS                     16
DS                      2
SWH             10000.000 Hz
FIDRES          0.152588 Hz
AQ              3.2767999 sec
RG                  31.72
DW                 50.000 usec
DE                  6.50 usec
TE                 298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                        1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                    1H
P1                  11.25 usec
PLW1         20.00000000 W

======== CHANNEL f2 ========
SFO2         500.1330885 MHz
NUC2                   off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                  65536
SF           500.1300154 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

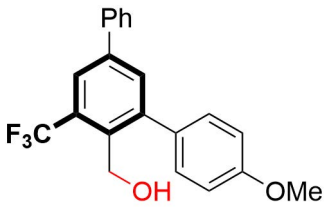


5



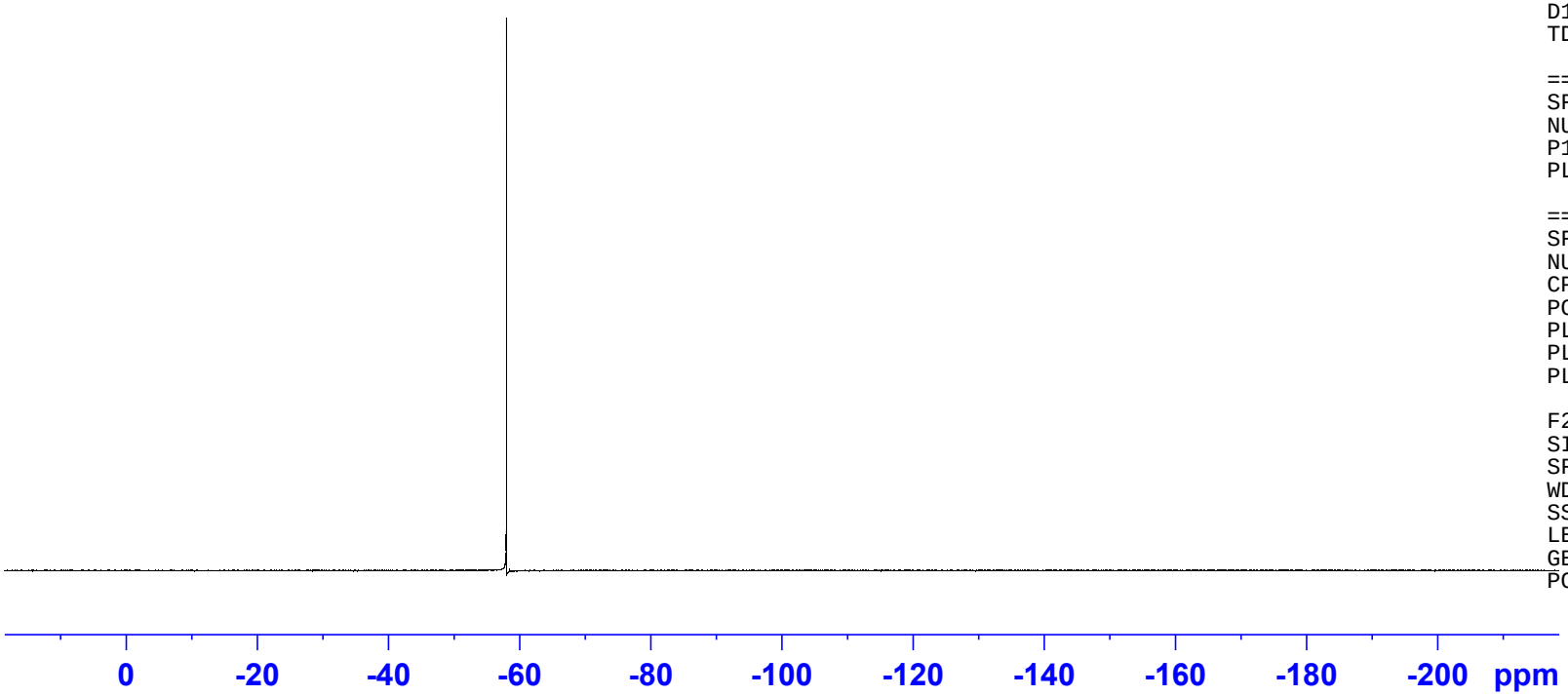



```
Current Data Parameters
NAME      zba-003-24-gua1214
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211214
Time                23.42
INSTRUM             spect
PROBHD   5 mm CPPBBO BB
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ             1.1010048 sec
RG                192.89
DW                16.800 usec
DE                18.00 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                 10.50 usec
PLW1         57.00000000 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         20.00000000 W
PLW12         0.39550999 W
PLW13         0.25312999 W

F2 - Processing parameters
SI                 32768
SF           125.7577727 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```

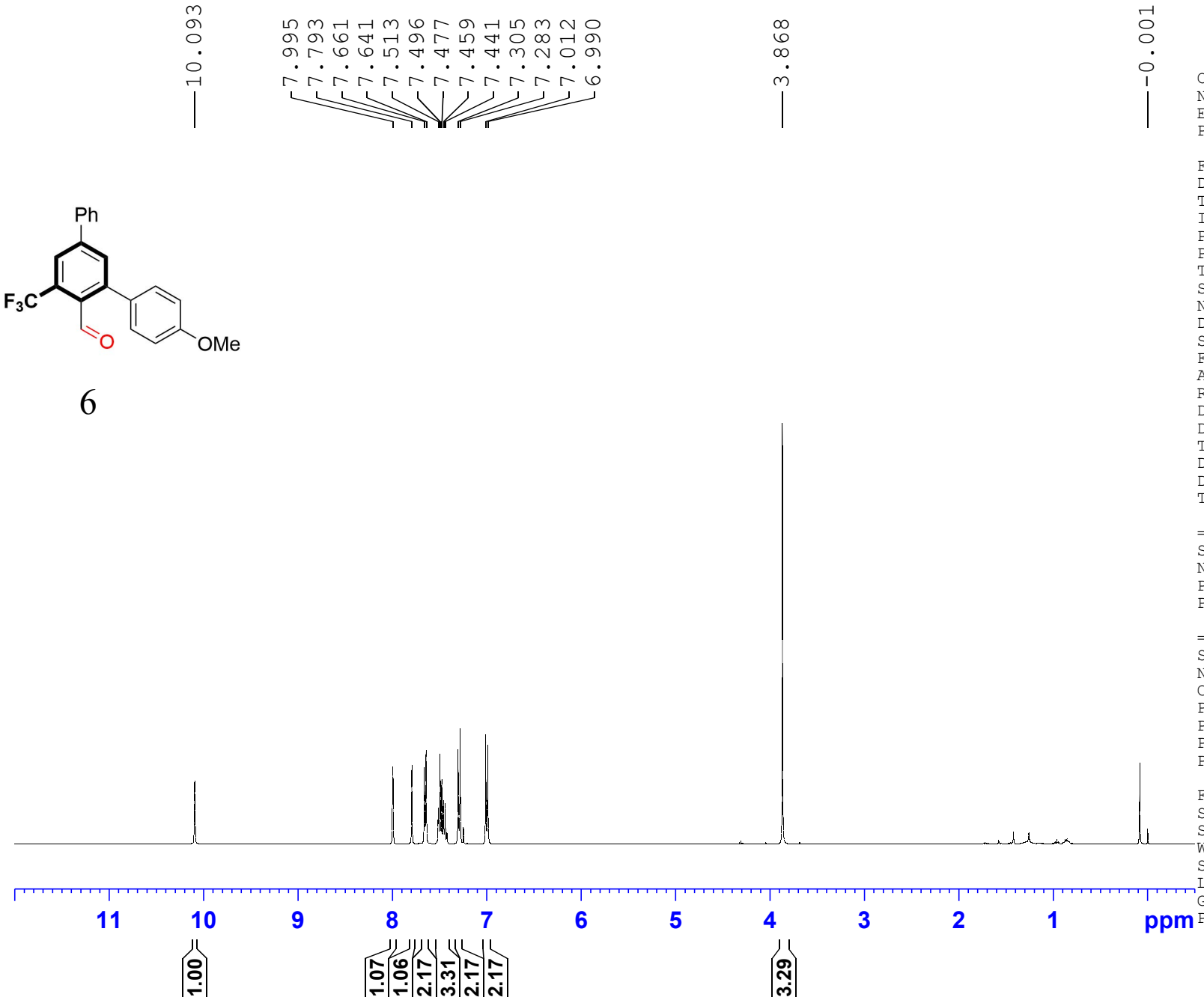


5

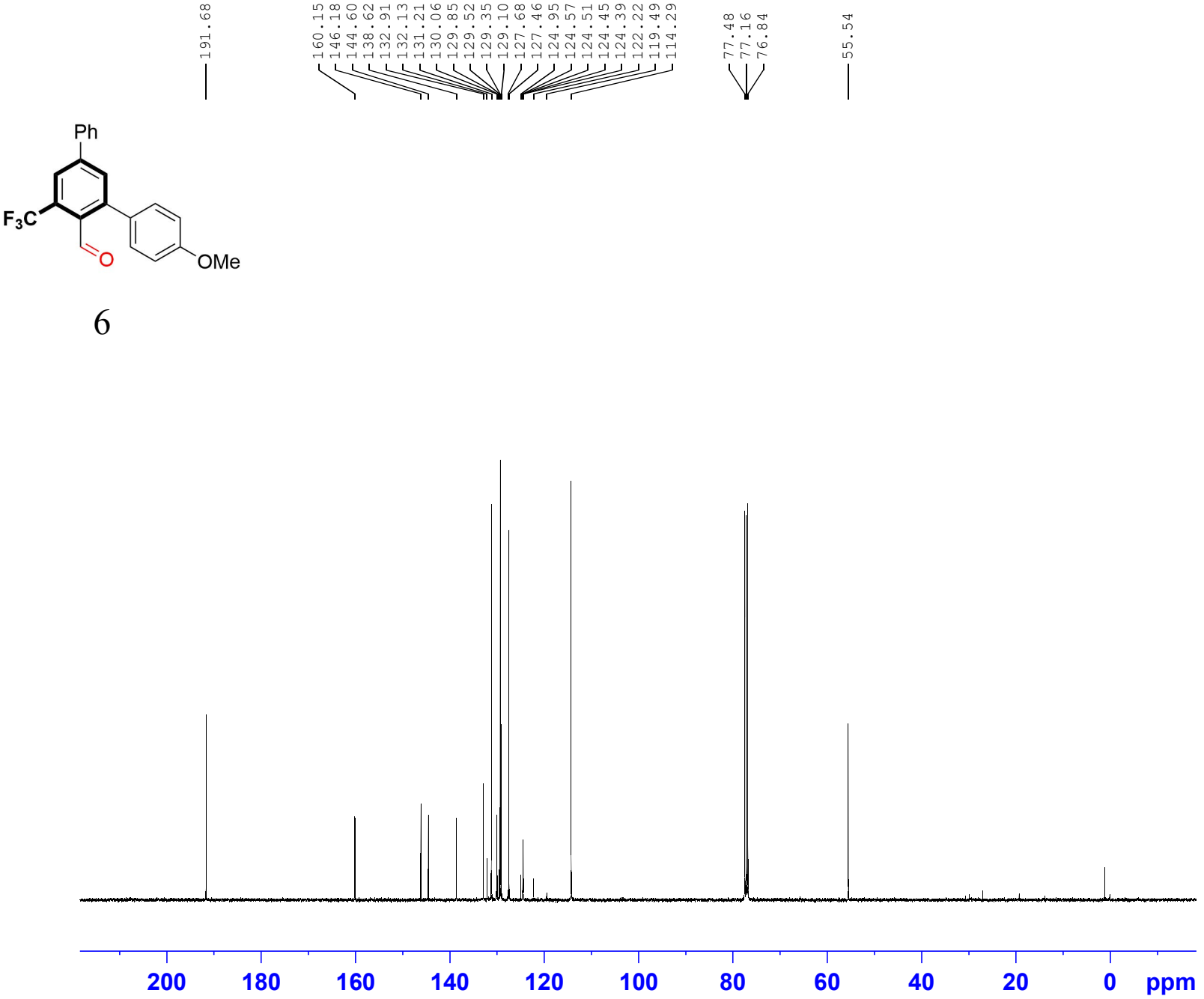
-57.95




```
Current Data Parameters
NAME                  19F
EXPNO           zba-003-24
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211229
Time               10.09
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.1 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                  EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

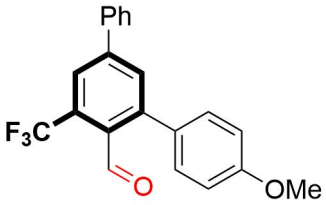



```
Current Data Parameters
NAME      zba-003-42-cho1228
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_            20211229
Time                1.35
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH             8012.820 Hz
FIDRES          0.244532 Hz
AQ             2.0447233 sec
RG                 80.72
DW                62.400 usec
DE                 6.50 usec
TE                299.0 K
D1          2.00000000 sec
D11       0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.2424716 MHz
NUC1                   1H
P1                 14.30 usec
PLW1         12.00000000 W

======== CHANNEL f2 ========
SFO2         400.2424716 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF           400.2400149 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



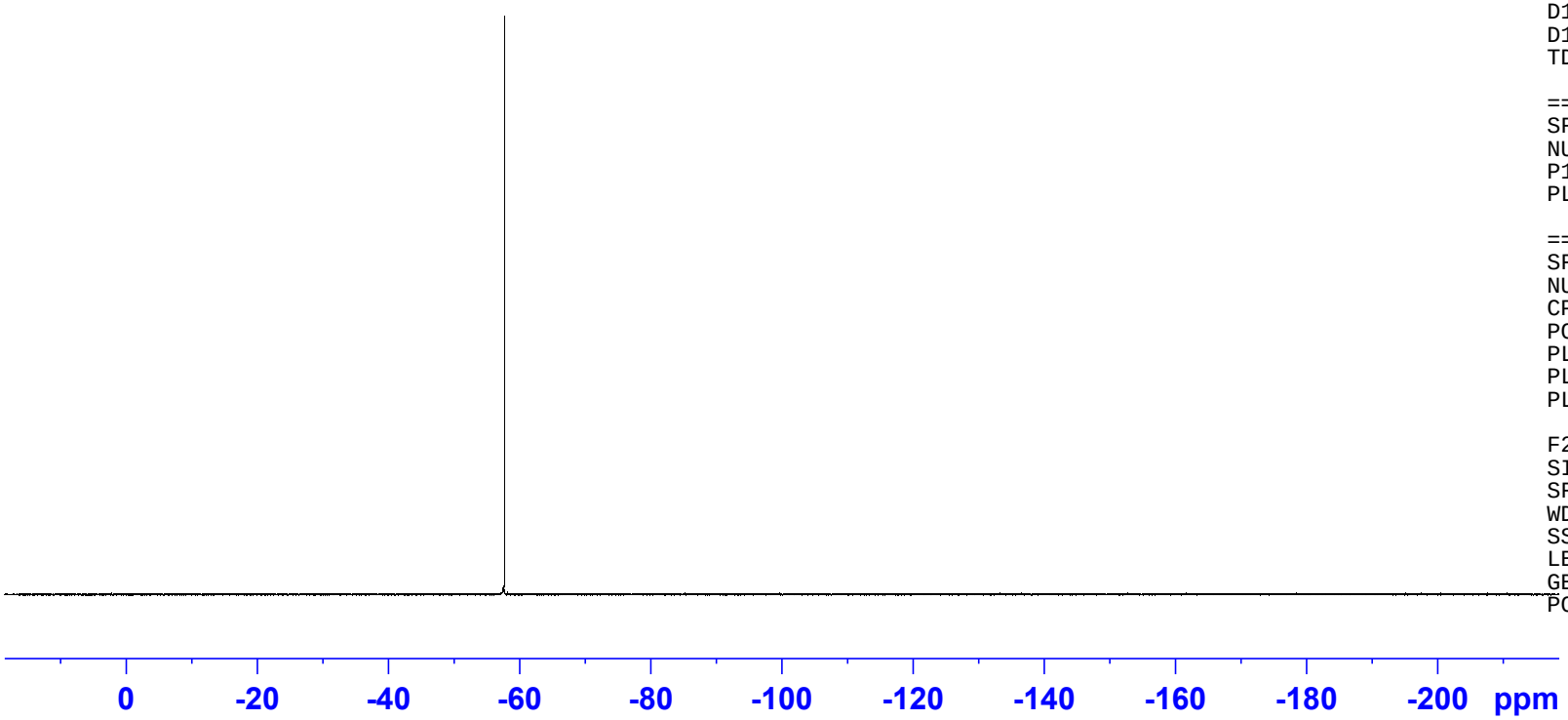
6

```
Current Data Parameters
NAME      zba-003-42-cho1228
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_           20211229
Time               2.34
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD               65536
SOLVENT          CDCl3
NS                1024
DS                   4
SWH          24038.461 Hz
FIDRES        0.366798 Hz
AQ           1.3631488 sec
RG              206.33
DW              20.800 usec
DE               6.50 usec
TE              299.9 K
D1          2.00000000 sec
D11         0.03000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        100.6504916 MHz
NUC1               13C
P1               10.00 usec
PLW1        54.00000000 W

======== CHANNEL f2 ========
SFO2        400.2416010 MHz
NUC2               1H
CPDPRG[2        waltz16
PCPD2            90.00 usec
PLW2        12.00000000 W
PLW12        0.30294999 W
PLW13        0.24539000 W

F2 - Processing parameters
SI                32768
SF          100.6404162 MHz
WDW                EM
SSB       0
LB               1.00 Hz
GB        0
PC               1.40
```

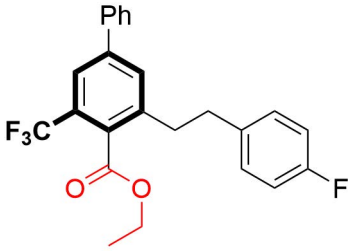


6

-57.72




```
Current Data Parameters
NAME                  19F
EXPNO           zba-003-42
PROCNO                 1

F2 - Acquisition Parameters
Date_           20211229
Time               10.21
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG      zgfhigqn.2
TD                131072
SOLVENT            CDCl3
NS                    16
DS                     0
SWH            89285.711 Hz
FIDRES          0.681196 Hz
AQ             0.7340032 sec
RG                206.33
DW                 5.600 usec
DE                 6.50 usec
TE                298.0 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         376.5642094 MHz
NUC1                19F
P1                 14.50 usec
PLW1         17.98900032 W

======== CHANNEL f2 ========
SFO2         400.2416010 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2         12.00000000 W
PLW12         0.30294999 W
PLW13         0.24539000 W

F2 - Processing parameters
SI                 65536
SF           376.6018696 MHz
WDW                   EM
SSB      0
LB                 0.30 Hz
GB       0
PC                 1.00
```



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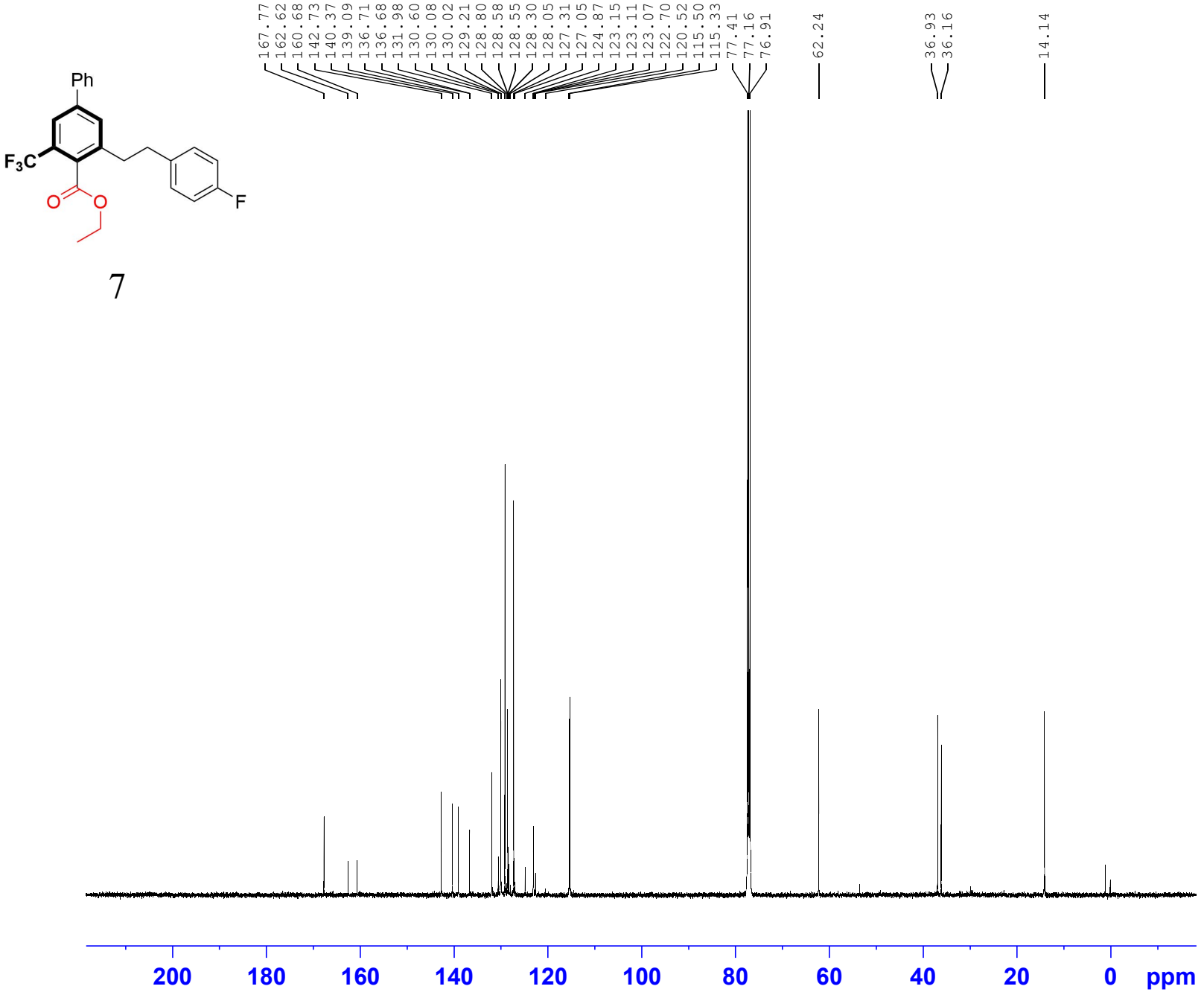
```
Current Data Parameters
NAME          zba-003-47
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20220111
Time               22.24
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.152588 Hz
AQ            3.2767999 sec
RG                 31.72
DW                50.000 usec
DE                 6.50 usec
TE                298.2 K
D1           1.00000000 sec
D11      0 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1330885 MHz
NUC1                   1H
P1                 11.25 usec
PLW1        20.00000000 W

======== CHANNEL f2 ========
SFO2        500.1330885 MHz
NUC2                  off
CPDPRG[2
PCPD2     0 usec
PLW2      0 W
PLW12     0 W
PLW13     0 W

F2 - Processing parameters
SI                 65536
SF          500.1300166 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```



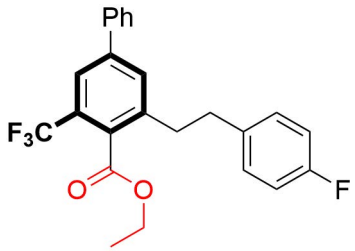

```
Current Data Parameters
NAME      zba-003-47-0111
EXPNO                   2
PROCNO                  1

F2 - Acquisition Parameters
Date_           20220111
Time                8.01
INSTRUM            spect
PROBHD   5 mm CPPBBO BB
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               192.89
DW               16.800 usec
DE               18.00 usec
TE               298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                10.50 usec
PLW1        57.00000000 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        20.00000000 W
PLW12        0.39550999 W
PLW13        0.25312999 W

F2 - Processing parameters
SI                 32768
SF          125.7577722 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```



7


```
Current Data Parameters
NAME                  19F
EXPNO            zba-003-47
PROCNO                 1

F2 - Acquisition Parameters
Date_            20220110
Time                14.11
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG       zgfhigqn.2
TD                 131072
SOLVENT             CDCl3
NS                     16
DS                      0
SWH             89285.711 Hz
FIDRES           0.681196 Hz
AQ              0.7340032 sec
RG                 206.33
DW                  5.600 usec
DE                  6.50 usec
TE                 299.3 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          376.5642094 MHz
NUC1                  19F
P1                  14.50 usec
PLW1          17.98900032 W

======== CHANNEL f2 ========
SFO2          400.2416010 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 usec
PLW2          12.00000000 W
PLW12          0.30294999 W
PLW13          0.24539000 W

F2 - Processing parameters
SI                  65536
SF            376.6018696 MHz
WDW                   EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```