Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

Regioselective Hydrations of 1-Aryl-3-en-1-ynes with Gold and Platinum Catalysts: Selective Productions of 2-En-1-ones and 3-En-1-ones

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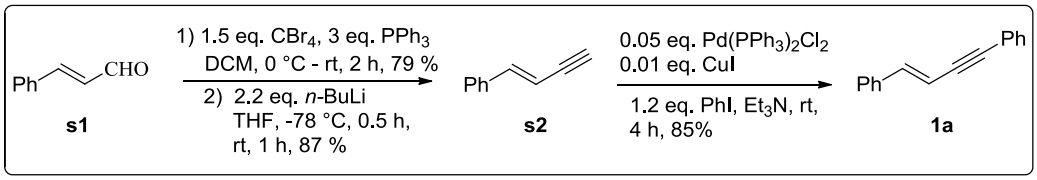
(1) Experimental Procedures

Unless otherwise noted, all the reactions for the preparation of the substrates were performed in oven-dried glassware under nitrogen atmosphere with freshly distilled solvents. The catalytic reactions were performed in wet solvent. DCM was distilled from CaH_2 under nitrogen. THF was distilled from Na metal under nitrogen. All other commercial reagents were used without further purification, unless otherwise indicated. ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker 400 MHz, Varian 500 MHz and 600 MHz Spectrometers using chloroform-d as the internal standards.

(1.1) Synthesis of (E)-but-1-en-3-yne-1,4-diyldibenzene (1a)



Synthesis of (*E*)-but-1-en-3-yn-1-ylbenzene (s2)

To a stirred solution of carbon tetrabromide (20.02 g, 60.30 mmol) in dichloromethane (200 mL) was added triphenylphosphine (23.75 g, 90.60 mmol) in DCM (100 mL) at 0 °C. The reaction mixture was stirred at 0 °C for 10 min, before a solution of cinamaldehyde (4.00 g, 30.20 mmol) in anhydrous DCM (10 mL) was added. The resulting mixture was stirred for 1 h at 0 °C before an addition of H_2O (100 mL) to partition the organic layer. The resulting mixture was extracted with DCM (3 x 50 mL); the combined organic layer was washed with brine, dried over Na_2SO_4, and concentrated under reduced pressure, to this residue was added 100 mL of pentane and the resulting suspension is filtered to remove triphenylphosphine oxide. The filtrate was concentrated in vacuo and chromatographed through a silica gel column (hexane/ether, 10:1) to afford (*E*)-(4,4-dibromobuta-1,3-dien-1-yl)benzene (8.10 g, 93.6 %) as a yellow solid.

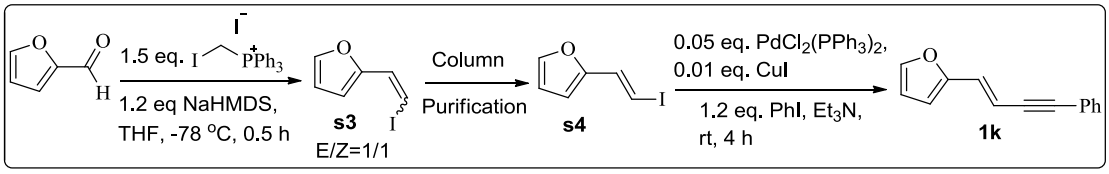
To a stirred solution of (*E*)-(4,4-dibromobuta-1,3-dien-1-yl)benzene (7.2 g, 25.08 mmol) in THF (70 mL) was added *n*BuLi (22.00 mL, 2.5 M in hexane, 50.00 mmol) dropwise at -78 °C for 30 min. The resulting solution was stirred for 30 min at -78 °C, before it was quenched with aqueous sat. NH_4Cl (5 mL) at -78 °C. The aqueous layer was extracted with (3 x 75 mL) of ether. The organic layer is washed with brine (50 mL), dried over Na_2SO_4, and concentrated under reduced pressure. The residue was eluted through a silica column to afford compound **s2** (2.80 g, 87 %) as a colorless liquid.

Synthesis of (1a)

To a triethylamine solution (10 mL) was added CuI (14.9 mg, 0.0780 mmol) and degassed reaction mixture using N_2 for about 20 minute before the addition of

$Pd(PPh_3)_2Cl_2$ (273.8 mg, 0.390 mmol) and Iodobenzene (1.9 gm 9.36 mmol). The mixture was stirred for 10 minute and was added compound **s2** (1.0 gm, 7.80 mmol) dropwise over 10 min. The resulting suspension was stirred for 4 h at room temperature. After completion of the reaction, the mixture was filtered through a short celite bed, and concentrated under reduced pressure. The residue was eluted through a silica column (hexane/ethyl acetate = 10:1) to afford compound **1a**, (1.20 gm, 80%) as a yellow solid. Follow the similar experimental procedure for the preparation of **1b-1j**, **1n**, **1q** and **1r**.

(1.2) Synthesis of (E)-2-(4-phenylbut-1-en-3-yn-1-yl)furan (1k)

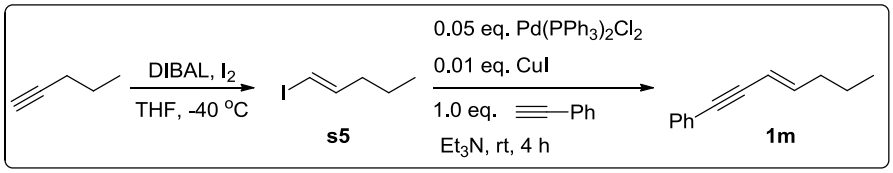


To a flame dried 250 mL round bottom flask equipped with a stir bar was added iodomethylenetriphenylphosphonium iodide (41.37 g, 78.04 mmol). The flask was then placed under vacuum for five minutes then purged with nitrogen. 50 mL of THF was added and the suspension was cooled to -20 ^oC and then solution of NaHMDS (62.4 mL, 0.91 M in hexane, 62.44 mmol) was added dropwise, and the solution was allowed to stir at -20 ^oC for 5 minutes. The flask was then cooled to -78 ^oC and then furan-2-carbaldehyde (5.0 g, 52.03 mmol) in 15 mL of THF was added dropwise. The reaction was allowed to stir for 10 minutes and then quenched with saturated aqueous ammonium chloride. Diethyl ether was added to the mixture and the layers were separated with a separatory funnel. The aqueous layer was washed twice with diethyl ether and the combined organic layers were dried with magnesium sulphate and concentrated to get E/Z (1:1) mixture of product **s3** (88%), which were purified using

silica column to afforded compound **s4** (42%) as yellow oil. For synthesis of **1k** from **s4** follow the similar experimental procedure as the synthesis of **1a.**

Follow the similar experimental procedure for the preparation of **1l** and **1o**.

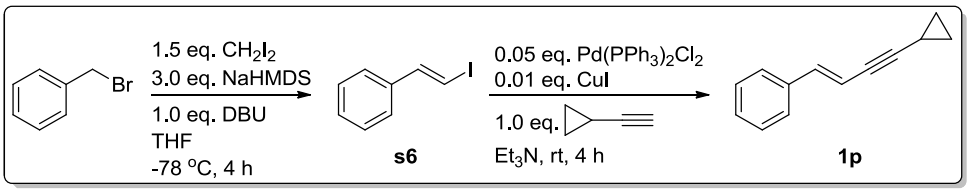
(1.3) Synthesis of (1m)



A 250 mL flame dried round bottom flask equipped with a stir bar was flame dried under vacuum and allowed to cool to room temperature. The flask was then purged with nitrogen and (5.0 g, 73.40 mmol) of 1-pentyne was charged into the flask. The flask was then cooled to a -40 ^{o}C bath and DIBAL (12.52 g, 88.07 mmol) was added dropwise. The reaction is then heated to 50 ^{o}C for 3 hours and then cooled to -50 ^{o}C and added iodine (22.33 g, 88.07 mmol) in 20 mL THF. The mixture is then warmed to room temperature and then cooled back down to 0 ^{o}C in an ice bath. 20% aqueous sulphuric acid was then added dropwise until there was no visible exotherm. The aqueous layer was extracted twice with pentane and the combined organic layers were washed twice with aqueous saturated sodium thiosulfate, dried with magnesium sulphate and concentrated. 12 g (83%) of crude material was isolated and used without any further purification.

For synthesis of **1m** from **s5** follow the similar experimental procedure as the synthesis of **1a.**

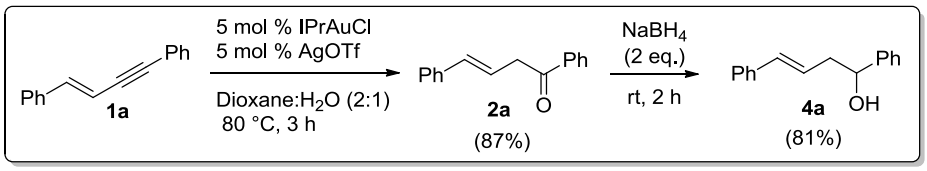
(1.4) Synthesis of (1p)



A solution of CH_2I_2 (1.41 mL, 17.5 mmol) in THF (10 mL) was added dropwise to a solution of NaHMDS (6.43 g, 35.1 mmol) in THF (20 mL) and ether (10 mL) at -78 ^oC in the dark. After 20 minute, a solution of the benzyl bromide (2 g, 11.7 mmol) in THF (10 mL) was added dropwise. The reaction mixture was stirred for 90 minute then removed from the cold bath to warm to room temperature. After 30 minute, DBU (1.75 mL, 11.7 mmol) was added dropwise and the solution stirred for 1 h before ether (75 mL) was added. The mixture was filtered through a plug of celite and the solvent removed under reduced pressure. The residue was purified by flash chromatography to provide the pure vinyl iodide **s6** (80%).

For synthesis of **1p** from **s6** follow the similar experimental procedure as the synthesis of **1a.**

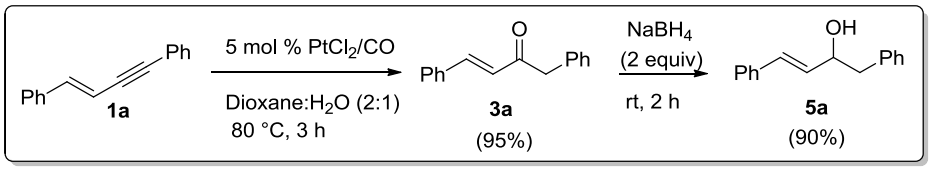
(1.5) Standard procedure for gold catalyzed one pot (E)-1,4-diphenylbut-3-en-1-ol.



A 20 mL sample vial was charged with Chloro[1,3-bis(2,6-diisopropylphenyl)imidazole-2-ylidene]gold(I) (0.0152 g, 0.0244 mmol) and Silver trifluoromethanesulfonate (0.0063 g, 0.0244 mmol) and to this mixture was added compound **1a** (0.1 g, 0.489 mmol) dissolved in 1,4-dioxane and Water (2:1

ratio). The resulting mixture was heated at 80 ^{o}C for 3 h and after the complete consumption of starting material reaction mixture was cooled to room temperature, $NaBH_4$ (2.0 eq.) was added slowly and reaction mixture is allowed to stir at room temperature for additional 2 h. and after complete consumption of intermediate **2a** the reaction mixture were filterd from small silica bed and dried over $MgSO_4$ and then purified by column chromatography to get pure compound **4a** as a off white solid (81 %).

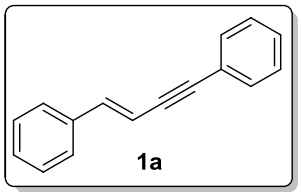
(1.6) Standard procedure for Platinum catalyzed one pot (E)-1,4-diphenylbut-3-en-2-ol.



A 20 mL catalytic sample vial was charged with platinum dichloride (0.0652 g, 0.0244 mmol) and CO balloon, before degas by using vacuum pump for about 20 minute. Compound **1a** (0.1 g, 0.489 mmol) dissolved in 1,4-dioxane (1.5 mL) and Water (5 eq) was added in to this vial. The resulting mixture was heated at 80 ^{o}C for 3 h and after the complete consumption of starting material reaction mixture was cooled to room temperature, $NaBH_4$ (2.0 eq.) was added slowly and reaction mixture is allowed to stir at room temperature for additional 2 h. and after complete consumption of intermediate **3a** the reaction mixture were filterd from small silica bed and dried over $MgSO_4$ and then purified by column chromatography to get pure compound **5a** as a yellow solid (90 %)

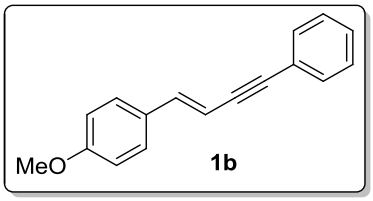
(2) Spectral data

Spectral data for (E)-but-1-en-3-yne-1,4-diyldibenzene (1a)



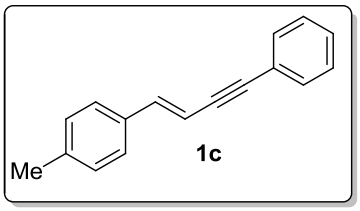
Yellow Solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.47 ~ 7.45 (m, 2 H), 7.44 ~ 7.40 (m, 2 H), 7.35 ~ 7.27 (m, 6 H), 7.03 (d, *J* = 16.2 Hz, 1 H), 6.37 (d, *J* = 16.2 Hz, 1 H); ^{13}C NMR (100 MHz, $CDCl_3$): 141.2, 136.3, 131.5, 128.7, 128.6, 128.3, 128.1, 126.3, 123.4, 108.1, 91.7, 88.9; HRMS; calcd. for $C_{16}H_{12}$: 204.0939; found: 204.0941.

Spectral data for (E)-1-methoxy-4-(4-phenylbut-1-en-3-yn-1-yl)benzene (1b)



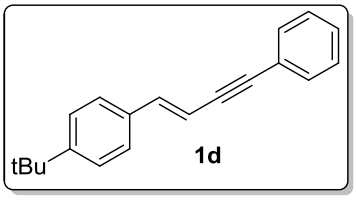
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.46 ~ 7.45 (m, 2 H), 7.36 ~ 7.34 (m, 2 H), 7.31 ~ 7.29 (m, 3 H), 6.99 (d, *J* = 16.2 Hz, 1 H), 6.87 (d, *J* = 9 Hz, 2 H), 6.23 (d, *J* = 16.2 Hz, 1 H), 3.80 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 160.1, 140.8, 131.4, 129.2, 128.3, 128.0, 127.6, 123.6, 114.2, 105.7, 91.0, 89.2, 55.3; HRMS calcd. for $C_{17}H_{14}O$: 234.1045; found: 234.1048.

Spectral data for (E)-1-methyl-4-(4-phenylbut-1-en-3-yn-1-yl)benzene (1c)



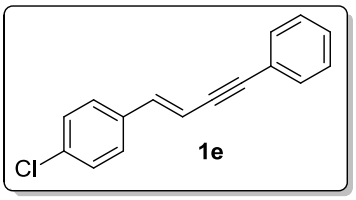
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.50 ~ 7.49 (m, 2 H), 7.35 ~ 7.31 (m, 5 H), 7.16 (d, *J* = 8.0 Hz, 2 H), 7.04 (d, *J* = 16.2 Hz, 1 H), 6.35 (d, *J* = 16.2 Hz, 1 H), 2.37 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 141.2, 138.7, 133.6, 131.4, 129.4, 128.3, 128.0, 126.2, 123.5, 107.0, 91.4, 89.1, 21.3; HRMS calcd. for $C_{17}H_{14}$: 218.1096; found: 218.1094.

Spectral data for (E)-1-(tert-butyl)-4-(4-phenylbut-1-en-3-yn-1-yl)benzene (1d)



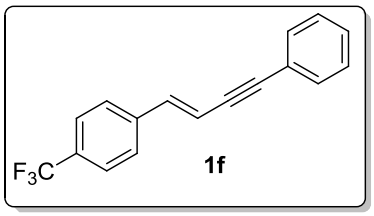
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.48 ~ 7.46 (m, 2 H), 7.37 (s, 5 H), 7.34 ~ 7.30 (m, 2 H), 7.03 (d, *J* = 16.2 Hz, 1 H), 6.35 (d, *J* = 16.2 Hz, 1 H), 1.32 (s, 9 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 151.9, 141.1, 133.6, 131.5, 128.3, 128.1, 126.1, 125.7, 123.5, 107.2, 91.4, 89.1, 34.7, 31.2; HRMS: calcd. for $C_{20}H_{20}$: 260.1565; Found: 260.1563.

Spectral data for (E)-1-chloro-4-(4-phenylbut-1-en-3-yn-1-yl)benzene (1e)



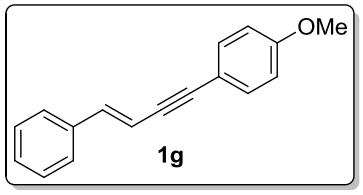
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.47 ~ 7.46 (m, 2 H), 7.34 ~ 7.29 (m, 7 H), 6.97 (d, *J* = 16.2 Hz, 1 H), 6.35 (d, *J* = 16.2 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 139.8, 134.8, 134.3, 131.5, 128.9, 128.4, 128.3, 127.4, 123.2, 108.8, 92.3, 88.6; HRMS: calcd. for $C_{16}H_{11}Cl$: 238.0549; found: 238.0547.

Spectral data for (E)-1-(4-phenylbut-1-en-3-yn-1-yl)-4-(trifluoromethyl)benzene (1f)



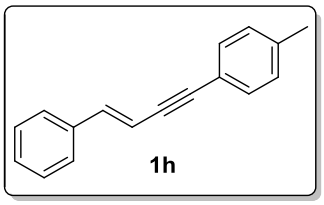
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.58 (d, *J* = 8.2 Hz, 2 H), 7.50 ~ 7.47 (m, 4 H), 7.34 ~ 7.32 (m, 3 H), 7.03 (d, *J* = 16.3 Hz, 1 H), 6.46 (d, *J* = 16.3 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 139.7, 139.5, 131.6, 130.2 (J_{CF} = 33 Hz), 128.5, 128.4, 126.4, 125.7, 125.7, 124.0 (J_{CF} = 271.5 Hz), 123.0, 110.9, 93.2, 88.3; HRMS: calcd. for $C_{17}H_{11}F_3$: 272.0813; found: 272.0812.

Spectral data for (E)-1-methoxy-4-(4-phenylbut-3-en-1-yn-1-yl)benzene (1g)



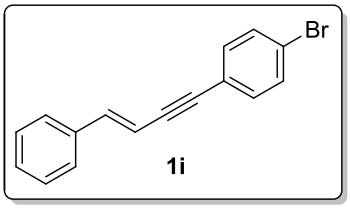
Pale Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.41 ~ 7.39 (m, 4 H), 7.34 ~ 7.31 (m, 2 H), 7.28 ~ 7.26 (m, 1 H), 6.99 (d, *J* =16.3 Hz, 1 H), 6.85 (d, *J* = 8.9 Hz, 2 H), 6.37 (d, *J* =16.3 Hz, 1 H), 3.81 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 159.6, 140.4, 136.5, 133.0, 128.7, 128.4, 126.2, 115.5, 114.0, 108.4, 91.8, 87.6, 55.3; HRMS: calcd. for $C_{17}H_{14}O$: 234.1045; Found: 234.1048.

Spectral data for (E)-1-methyl-4-(4-phenylbut-3-en-1-yn-1-yl)benzene (1h)



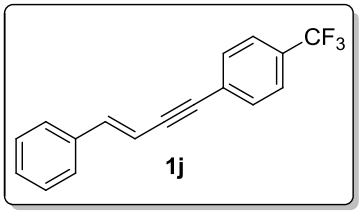
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.41 (d, *J* = 7.2 Hz, 2 H), 7.36 (d, *J* = 8.4 Hz, 2 H), 7.33 (t, *J* = 7.2 Hz, 2 H), 7.28 ~ 7.27 (m, 1 H), 7.13 (d, *J* = 7.8 Hz, 2 H), 7.02 (d, *J* = 16.2 Hz, 1 H), 6.38 (d, *J* =16.2 Hz, 1 H), 2.35(s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 140.9, 138.3, 136.4, 131.4, 129.1, 128.7, 128.5, 126.3, 120.3, 108.3, 92.0, 88.3, 21.5; HRMS: calcd. for $C_{17}H_{14}$: 218.1096; Found: 218.1092.

Spectral data for (E)-1-bromo-4-(4-phenylbut-3-en-1-yn-1-yl)benzene (1i)



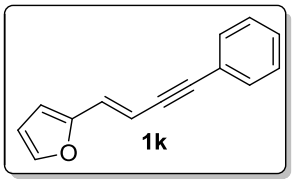
White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.46 ~ 7.44 (m, 2 H), 7.42 ~ 7.40 (m, 2 H), 7.35 ~ 7.27 (m, 5 H), 7.04 (d, *J* = 16.3 Hz, 1 H), 6.34 (d, *J* = 16.3 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 141.7, 136.2, 132.9, 131.6, 128.8, 126.3, 122.4, 122.4, 107.8, 90.6, 90.0; HRMS: calcd. for $C_{16}H_{11}Br$: 282.0044; Found: 282.0027.

Spectral data for (E)-1-(4-phenylbut-3-en-1-yn-1-yl)-4-(trifluoromethyl)benzene (1j)



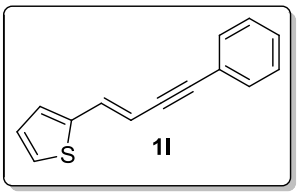
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.56 (q, *J* = 8.6 Hz, 4 H), 7.43 (d, *J* = 8.8 Hz, 2 H), 7.35 (t, *J* = 7.4 Hz, 2 H), 7.32 ~ 7.29 (m, 1 H), 7.08 (d, *J* = 16.3 Hz, 1 H), 6.37 (d, *J* = 16.3 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 142.5, 136.0, 131.7, 129.8 (J_{CF} = 33 Hz), 129.0, 128.8, 127.2, 126.4, 125.3, 125.2, 123.9 (J_{CF} = 271.5 Hz), 107.4, 91.3, 90.2; HRMS: calcd. for $C_{17}H_{11}F_3$: 272.0813; Found: 272.0818.

Spectral data for (E)-2-(4-phenylbut-1-en-3-yn-1-yl)furan (1k)



Brown Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.46 ~ 7.45 (m, 2 H), 7.39 (d, *J* = 1.7 Hz, 1 H), 7.33 ~ 7.30 (m, 3 H), 6.79 (d, *J* =16.0 Hz, 1 H), 6.41 (dd, *J* = 1.8, 1.8 Hz, 1 H), 6.35 (d, *J* = 3.3 Hz, 1 H), 6.29 (d, *J* = 16.0 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 152.3, 143.0, 131.4, 128.3, 128.3, 128.1, 123.4, 111.8, 110.0, 106.2, 92.6, 88.9; HRMS: calcd. for $C_{14}H_{10}O$: 194.0732; Found: 194.0731.

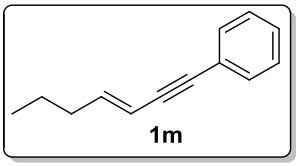
Spectral data for (E)-2-(4-phenylbut-1-en-3-yn-1-yl)thiophene (1l)



Light Brown Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.48 ~ 7.46 (m, 2 H), 7.34 ~ 7.31 (m, 3 H), 7.21 (d, *J* = 5.0 Hz, 1 H), 7.14 (d, *J* = 15.9 Hz, 1 H), 7.05 (d, *J* = 3.5 Hz, 1 H), 7.00 (dd, *J* = 3.7, 3.6 Hz, 1 H), 6.21 (d, *J* = 15.9 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ

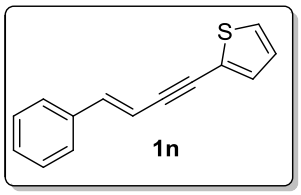
141.4, 134.0, 131.4, 128.3, 128.1, 127.7, 127.0, 125.5, 123.3, 107.3, 92.1, 88.7; HRMS: calcd. for $C_{14}H_{10}S$: 210.0503; Found: 210.0507.

Spectral data for (E)-hept-3-en-1-yn-1-ylbenzene (1m)



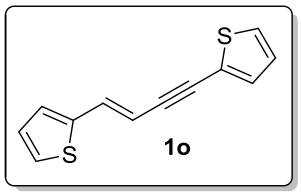
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.42 ~ 7.40 (m, 2 H), 7.30 ~ 7.26 (m, 3 H), 6.26 ~ 6.21 (m, 1 H), 5.69 (d, *J* = 16.2 Hz, 1 H), 2.15 ~ 2.11 (m, 2 H), 1.45 (q, *J* = 7.5 Hz, 2 H), 0.93 (t, *J* = 7.5 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 145.0, 131.4, 128.2, 127.8, 123.6, 109.6, 88.3, 87.8, 35.2, 22.0, 13.6; HRMS: calcd. for $C_{13}H_{14}$: 170.1096; Found: 170.1091.

Spectral data for (E)-2-(4-phenylbut-3-en-1-yn-1-yl)thiophene (1n)



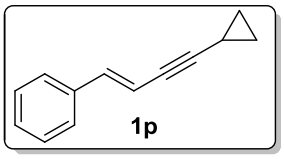
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.42 ~ 7.40 (m, 2 H), 7.35 ~ 7.32 (m, 2 H), 7.30 ~ 7.28 (m, 1 H), 7.27 ~ 7.25 (m, 1 H), 7.22 ~ 7.21 (m, 1 H), 7.02 (d, *J* = 16.2 Hz, 1 H), 6.98 (dd, *J* = 3.6, 3.6 Hz, 1 H), 6.37 (d, *J* = 16.2 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 141.2, 136.2, 131.7, 128.7, 128.7, 127.3, 127.1, 126.3, 123.5, 107.7, 92.8, 84.9; HRMS: calcd. for $C_{14}H_{10}S$: 210.0503; Found: 210.0502.

Spectral data for (E)-2,2'-(but-1-en-3-yne-1,4-diyl)dithiophene (1o)



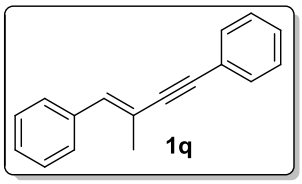
Light Brown Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.26 ~ 7.24 (m, 1 H), 7.21 ~ 7.19 (m, 2 H), 7.10 (d, *J* =15.6 Hz, 1 H), 7.04 ~ 7.04 (d, *J* = 4.2 Hz, 1 H), 6.99 ~ 6.97 (m, 2 H), 6.18 (d, *J* = 15.6 Hz, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 141.4, 133.9, 131.7, 127.8, 127.3, 127.2, 127.1, 125.6, 123.5, 106.9, 92.5, 85.3; HRMS: calcd. for $C_{12}H_8S_2$: 216.0067; Found: 216.0069.

Spectral data for (E)-(4-cyclopropylbut-1-en-3-yn-1-yl)benzene (1p)



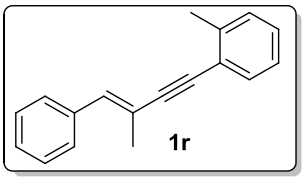
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.35 ~ 7.34 (m, 2 H), 7.31 ~ 7.29 (m, 2 H), 7.26 ~ 7.23 (m, 1 H), 6.85 (d, *J* = 16.2 Hz, 1 H), 6.12 (d, *J* = 16.2 Hz, 1 H), 1.43 ~ 1.40 (m, 1 H), 0.86 ~ 0.83 (m, 2 H), 0.80 ~ 0.75 (m, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 140.0, 136.6, 128.6, 128.2, 126.0, 108.7, 96.7, 75.1, 8.7, 0.4; HRMS: calcd. for $C_{13}H_{12}$: 168.0939; Found: 168.0941.

Spectral data for (E)-(2-methylbut-1-en-3-yne-1,4 diyl)dibenzene (1q)



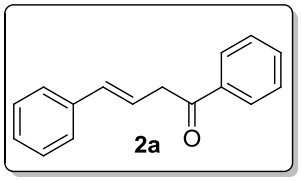
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.49 ~ 7.48 (m, 2 H), 7.38 ~ 7.30 (m, 7 H), 7.27 ~ 7.24 (m, 1 H), 6.95 (s, 1 H), 2.17 (d, *J* = 1.5 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 136.9, 136.1, 131.5, 129.0, 128.3, 128.3, 128.0, 127.2, 123.5, 119.9, 93.3, 88.4, 19.3; HRMS: calcd. for $C_{17}H_{14}$: 218.1096; Found: 218.1095.

Spectral data for (E)-1-methyl-2-(3-methyl-4-phenylbut-3-en-1-yn-1-yl)benzene (1r)



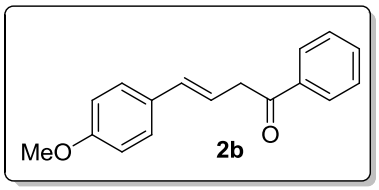
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.45 (d, *J* = 7.7 Hz, 1 H), 7.37 ~ 7.33 (m, 4 H), 7.27 ~ 7.24 (m, 1 H), 7.21 ~ 7.20 (m, 2 H), 7.16 ~ 7.14 (m, 1 H), 6.95 (s, 1 H), 2.49 (s, 3 H), 2.18 (m, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 140.0, 136.9, 135.7, 131.7, 129.4, 129.0, 128.3, 128.1, 127.1, 125.5, 123.2, 120.1, 97.3, 87.5, 20.7, 19.4; HRMS: calcd. for $C_{18}H_{16}$: 232.1252; Found: 232.1254.

Spectral data for (*E*)-1,4-diphenylbut-3-en-1-one (2a)



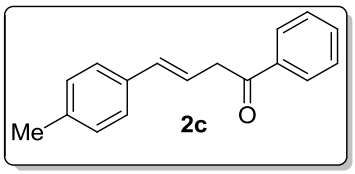
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$) : δ 8.0 ~ 7.98 (m, 2 H), 7.57 ~ 7.55 (m, 1 H), 7.48 ~ 7.46 (m, 2 H), 7.38 ~ 7.36 (m, 2 H), 7.30 ~ 7.27 (m, 2 H), 7.22 ~ 7.20 (m, 1 H), 6.54 (d, *J* = 15.6 Hz, 1 H), 6.49 ~ 6.44 (m, 1 H), 3.90 (dd, *J* = 1.2, 1.2 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.0, 137.0, 136.6, 133.6, 133.2, 128.7, 128.5, 128.3, 127.5, 126.3, 122.6, 42.7; HRMS: calcd. for $C_{16}H_{14}O$: 222.1045; Found: 222.1040.

Spectral data for (E)-4-(4-methoxyphenyl)-1-phenylbut-3-en-1-one (2b)



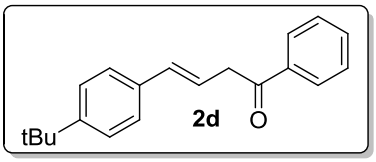
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.99 (dd, *J* = 1.2, 1.2 Hz, 2 H), 7.57 ~ 7.54 (m, 1 H), 7.47 ~ 7.45 (m, 2 H), 7.30 (dd, *J* = 2.4, 2.4 Hz, 2 H), 6.82 (dd, *J* = 1.8, 1.8 Hz, 2 H), 6.48 (d, *J* = 15.6 Hz, 1 H), 6.33 ~ 6.28 (m, 1 H), 3.87 (dd, *J* = 1.8, 1.2 Hz, 2 H), 3.78 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.2, 159.1, 136.6, 133.2, 133.0, 129.9, 128.6, 128.3, 127.4, 120.3, 113.9, 55.3, 42.7; HRMS: calcd. for $C_{17}H_{16}O_2$: 252.1150; Found: 252.1145.

Spectral data for (E)-1-phenyl-4-(p-tolyl)but-3-en-1-one (2c)



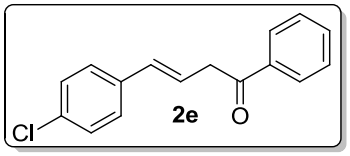
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.00 (dd, *J* = 1.8, 1.2 Hz, 2 H), 7.59 ~ 7.56 (m, 1 H), 7.49 ~ 7.47 (m, 2 H), 7.27 (t, *J* = 8.1, Hz, 2 H), 7.11 (d, *J* = 7.8 Hz, 2 H), 6.52 (d, *J* = 16.2 Hz, 1 H), 6.44 ~ 6.39 (m, 1 H), 3.90 (d, *J* = 6.6 Hz, 2 H), 2.32 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.1, 137.3, 136.7, 134.2, 133.4, 133.2, 129.2, 128.7, 128.3, 126.2, 121.5, 42.8, 21.2; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1192.

Spectral data for (E)-4-(4-(tert-butyl)phenyl)-1-phenylbut-3-en-1-one (2d)



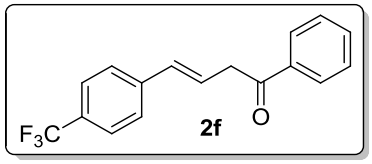
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.00 ~ 7.98 (m, 2 H), 7.57 ~ 7.54 (m, 1 H), 7.48 ~ 7.45 (m, 2 H), 7.32 (s, 4 H), 6.52 (d, *J* = 16.2 Hz, 1 H), 6.44 ~ 6.39 (m, 1 H), 3.89 (dd, *J* = 1.8, 1.2 Hz, 2 H), 1.30 (s, 9 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 198.1, 150.6, 136.6, 134.2, 133.3, 133.1, 128.6, 128.3, 126.0, 125.4, 121.7, 42.8, 34.5, 31.3; HRMS: calcd. for $C_{20}H_{22}O$: 278.1671; Found: 278.1669.

Spectral data for (E)-4-(4-chlorophenyl)-1-phenylbut-3-en-1-one (2e)



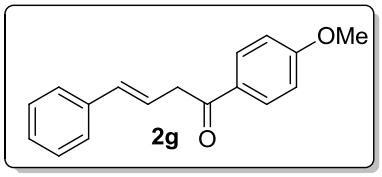
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.99 ~ 7.97 (m, 2 H), 7.58 ~ 7.56 (m, 1 H), 7.47 (t, *J* = 7.8 Hz, 2 H), 7.30 ~ 7.24 (m, 5 H), 6.49 ~ 6.42 (m, 1 H), 3.89 (d, *J* = 5.4 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.7, 136.5, 135.5, 133.3, 133.1, 132.3, 128.7, 128.6, 128.3, 127.5, 123.3, 42.5; HRMS: calcd. for $C_{16}H_{13}ClO$: 256.0655; Found: 256.0647.

Spectral data for (E)-1-phenyl-4-(4-(trifluoromethyl)phenyl)but-3-en-1-one (2f)



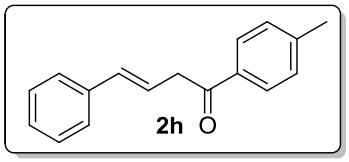
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.00 ~ 7.98 (m, 2 H), 7.59 ~ 7.56 (m, 1 H), 7.54 (d, *J* = 8.2 Hz, 2 H), 7.49 ~ 7.45 (m, 4 H), 6.61 ~ 6.54 (m, 2 H), 3.94 (d, *J* = 5.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.5, 140.4, 136.5, 133.4, 132.2, 129.3 (J_{CF} = 32.5 Hz), 128.7, 128.3, 126.4, 125.5, 124.2, (J_{CF} = 270.9 Hz), 42.5; HRMS: calcd. for $C_{17}H_{13}F_3O$: 290.0918; Found: 290.0913.

Spectral data for (E)-1-(4-methoxyphenyl)-4-phenylbut-3-en-1-one (2g)



Pale Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.97 (m, *J* = 2.1 Hz, 2 H), 7.37 ~ 7.35 (m, 2 H), 7.29 ~ 7.27 (m, 2 H), 7.21 ~ 7.19 (m, 1 H), 6.95 ~ 6.93 (m, 2 H), 6.52 (d, *J* = 16.2 Hz, 1 H), 6.48 ~ 6.43 (m, 1 H), 3.86 (s, 3 H), 3.84 (dd, *J* = 1.2, 1.2 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.5, 163.6, 137.0, 133.3, 130.6, 129.7, 128.5, 127.4, 126.2, 123.0, 113.8, 55.5, 42.5; HRMS: calcd. for $C_{17}H_{16}O_2$: 252.1150; Found: 252.1145.

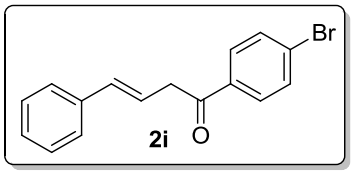
Spectral data for (E)-4-phenyl-1-(p-tolyl)but-3-en-1-one (2h)



Pale Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.00 (d, *J* = 8.4 Hz, 2 H), 7.47 (d, *J* = 8.4 Hz, 2 H), 7.40 ~ 7.35 (m, 4 H), 7.32 ~ 7.29 (m, 1 H), 6.64 (d, *J* = 15.6 Hz, 1 H), 6.58 ~ 6.53 (m, 1 H), 3.97 (t, *J* = 3.3 Hz, 2 H), 2.51 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ

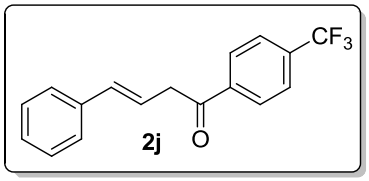
197.6, 144.0, 137.1, 134.2, 133.4, 129.3, 128.5, 128.4, 127.4, 126.3, 122.8, 42.6, 21.6; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1204.

Spectral data for (E)-1-(4-bromophenyl)-4-phenylbut-3-en-1-one (2i)



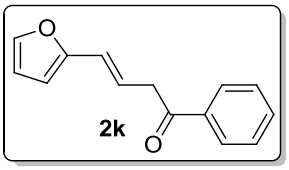
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.85 (d, *J* = 8.4 Hz, 2 H), 7.60 (d, *J* = 9.0 Hz, 2 H), 7.36 (d, *J* = 7.2 Hz, 2 H), 7.29 (t, *J* = 7.7 Hz, 2 H), 7.21 (t, *J* = 7.3 Hz, 1 H), 6.54 (d, *J* = 16.2 Hz, 1 H), 6.44 ~ 6.39 (m, 1 H), 3.85 (dd, *J* = 7.2, 1.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.9, 136.9, 135.3, 133.9, 132.0, 129.8, 128.5, 128.4, 127.6, 126.3, 122.1, 42.6; HRMS calcd. for $C_{16}H_{13}BrO$: 300.0150; Found: 300.0155.

Spectral data for (E)-4-phenyl-1-(4-(trifluoromethyl)phenyl)but-3-en-1-one (2j)



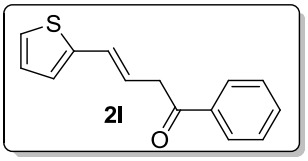
Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 8.09 (d, *J* = 8.1 Hz, 2 H), 7.74 (d, *J* = 8.2 Hz, 2 H), 7.37 (d, *J* = 8.8 Hz, 2 H), 7.30 (t, *J* = 7.7 Hz, 2 H), 7.24 ~ 7.21 (m, 1 H), 6.55 (d, *J* = 16.0 Hz, 1 H), 6.46 ~ 6.41 (m, 1 H), 3.92 (dd, *J* = 1.4, 1.4 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.9, 139.2, 136.7, 134.5 (J_{CF} = 33 Hz), 134.1, 128.7, 128.6, 127.7, 126.3, 125.8, 125.8, 123.6 (J_{CF} = 271.5 Hz), 121.6, 42.9; HRMS: calcd. for $C_{17}H_{13}F_3O$: 290.0918; Found: 290.0918.

Spectral data for (E)-4-(furan-2-yl)-1-phenylbut-3-en-1-one (2k)



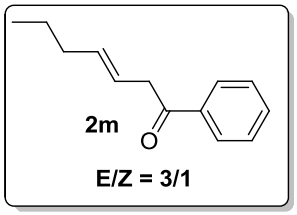
Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.97 (dd, *J* = 1.2, 1.2 Hz, 2 H), 7.56 ~ 7.54 (m, 1 H), 7.45 (t, *J* = 7.8 Hz, 2 H), 7.30 (d, *J* = 1.4 Hz, 1 H), 6.41 ~ 6.32 (m, 3 H), 6.19 (d, *J* = 3.2 Hz, 1 H), 3.84 (d, *J* = 6.0 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 152.4, 141.8, 136.5, 133.2, 128.6, 128.3, 122.0, 121.2, 111.1, 107.4, 42.4; HRMS: calcd. for $C_{14}H_{12}O_2$: 212.0837; Found: 212.0832.

Spectral data for (E)-1-phenyl-4-(thiophen-2-yl)but-3-en-1-one (2l)



Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.99 ~ 7.97 (m, 2 H), 7.58 ~ 7.55 (m, 1 H), 7.48 ~ 7.45 (m, 2 H), 7.12 ~ 7.11 (m, 1 H), 6.93 ~ 6.92 (m, 2 H), 6.67 ~ 6.64 (m, 1 H), 6.32 ~ 6.27 (m, 1 H), 3.86 (dd, *J* = 6.6, 1.5, Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 142.0, 136.5, 133.2, 128.7, 128.3, 127.2, 126.6, 125.3, 124.0, 122.1, 42.4; HRMS: calcd. for $C_{14}H_{12}OS$: 228.0609; Found: 228.0611.

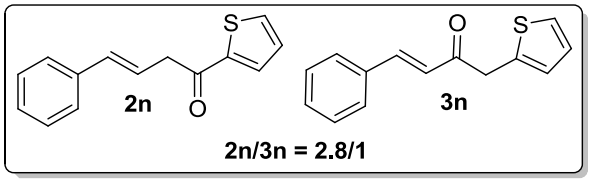
Spectral data for (E/Z)-1-phenylhept-3-en-1-one (2m)



Colorless Oil; ^{1}H NMR (600 MHz, $CDCl_3$) *(E isomer)*: δ 7.96 ~ 7.94 (m, 2 H), 7.55 ~ 7.52 (m, 1 H), 7.46 ~ 7.42 (m, 2 H), 5.67 ~ 5.59 (m, 2 H), 3.68 ~ 3.66 (m, 2 H), 2.03 ~ 2.00 (m, 2 H), 1.41 ~ 1.36 (m, 2 H), 0.86 (t, *J* = 7.5 Hz, 3 H); ^{1}H NMR (600 MHz, $CDCl_3$) *(Z isomer, major peaks)*: δ 3.73 ~ 3.72 (m, 2 H), 2.09 ~ 2.05 (m, 2 H), 0.91 (t, *J* = 7.5 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$) *(E isomer)*: δ 198.7, 136.7, 134.9, 133.0, 128.5, 128.3, 122.4, 42.6, 34.7, 22.3, 13.6; ^{13}C NMR (150 MHz, $CDCl_3$) *(Z isomer, major peaks)*: δ 198.2, 133.3, 128.3, 126.9, 121.4, 37.5, 34.4, 22.5, 13.8; HRMS: calcd. for $C_{13}H_{16}O$: 188.1201; Found: 188.1198.

Spectral data for

(E)-4-phenyl-1-(thiophen-2-yl)but-3-en-1-one/(E)-4-phenyl-1-(thiophen-2-yl)but-3-en-2-one (2n/3n)

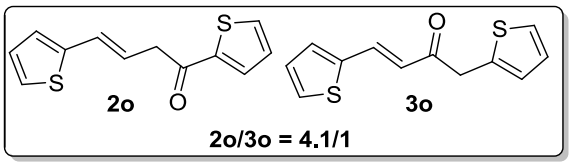


Pale Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$) *(major isomer)*: δ 7.78 (dd, *J* = 3.8, 1.1 Hz, 1 H), 7.64 (dd, *J* = 5.0, 1.2 Hz, 1 H), 7.38 ~ 7.36 (m, 2 H), 7.31 ~ 7.28 (m, 2 H), 7.23 ~ 7.20 (m, 1 H), 7.14 (dd, *J* = 5.0, 3.8 Hz, 1 H), 6.56 (d, *J* = 15.9 Hz, 1 H), 6.46 ~ 6.41 (m, 1 H), 3.82 (dd, *J* = 7.0, 1.4 Hz, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 7.67 (s, 1 H), 7.53 ~ 7.52 (m, 2 H), 6.98 (dd, *J* = 3.5, 3.4 Hz, 1 H), 6.94 ~ 6.94 (m, 1 H), 6.81 (d, *J* = 16.1 Hz, 1 H), 4.12 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) *(major isomer)*: δ 190.6, 143.7, 136.8, 133.9, 133.7, 132.3, 128.5, 128.1, 127.5, 126.2, 122.2, 43.5; ^{13}C NMR (150 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 195.6, 143.8, 135.5,

134.3, 130.6, 128.9, 128.4, 127.0, 126.8, 125.1, 124.5, 42.1; HRMS: calcd. for $C_{14}H_{12}OS$: 228.0609; Found: 228.0608.

Spectral data for

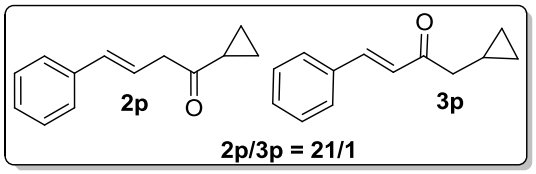
(E)-1,4-di(thiophen-2-yl)but-3-en-1-one/(E)-1,4-di(thiophen-2-yl)but-3-en-1-one (2o/3o)



Light Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$) *(major isomer)*: δ 7.77 ~ 7.74 (m, 1 H), 7.64 ~ 7.63 (m, 1 H), 7.14 ~ 7.11 (m, 2 H), 6.93 ~ 6.92 (m, 2 H), 6.67 (d, *J* = 15.9 Hz, 1 H), 6.27 ~ 6.22 (m, 1 H), 3.78 ~ 3.76 (m, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 7.38 (d, *J* = 5.1 Hz, 1 H), 7.29 ~ 7.28 (m, 1 H), 7.24 ~ 7.21 (m, 1 H), 7.05 ~ 7.04 (m, 2 H), 6.98 ~ 6.96 (m, 2 H), 6.60 (d, *J* = 15.7 Hz, 1 H), 4.07 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) *(major isomer)*: δ 190.3, 143.7, 141.8, 134.0, 132.3, 128.2, 127.2, 126.9, 125.4, 124.2, 121.8, 43.3; ^{13}C NMR (150 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 136.2, 132.0, 129.1, 128.3, 127.0, 126.8, 125.1, 123.2, 42.2; HRMS: calcd. for $C_{12}H_{10}OS_2$: 234.0173; Found: 234.0172.

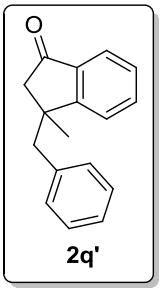
Spectral data for

(E)-1-cyclopropyl-4-phenylbut-3-en-1-one/(E)-1-cyclopropyl-4-phenylbut-3-en-2-one (2p/3p)



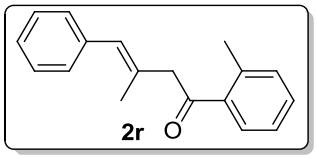
Pale Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$) *(major isomer)*: δ 7.38 ~ 7.36 (m, 2 H), 7.31 ~ 7.28 (m, 2 H), 7.23 ~ 7.20 (m, 1 H), 6.49 (d, *J* = 15.9 Hz, 1 H), 6.37 ~ 6.32 (m, 1 H), 3.46 ~ 3.44 (m, 2 H), 2.03 ~ 1.99 (m, 1 H), 1.07 ~ 1.04 (m, 2 H), 0.91 ~ 0.87 (m, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 7.55 ~ 7.52 (m, 2 H), 6.79 (d, *J* = 16.2 Hz, 1 H), 2.55 (d, *J* = 6.9 Hz, 1 H), 0.60 ~ 0.57 (m, 2 H), 0.19 ~ 0.16 (m, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) *(major isomer)*: δ 208.6, 137.0, 133.6, 128.5, 127.4, 126.2, 122.2, 47.5, 20.1, 11.1; HRMS: calcd. for $C_{13}H_{14}O$: 186.1045; Found: 186.1044.

Spectral data for 3-benzyl-3-methyl-2,3-dihydro-1H-inden-1-one (2q')



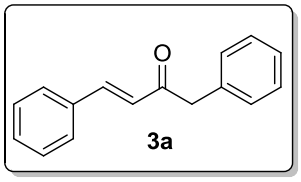
Yellow Oil; ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.64 ~ 7.57 (m, 2 H), 7.48 ~ 7.42 (m, 1 H), 7.39 ~ 7.32 (m, 1 H), 7.16 ~ 7.13 (m, 3 H), 6.87 ~ 6.84 (m, 2 H), 3.00 (d, *J* = 13.3 Hz, 1 H), 2.90 (d, *J* = 13.3 Hz, 1 H), 2.81 (d, *J* = 18.7 Hz, 1 H), 2.37 (d, *J* = 18.8 Hz, 1 H), 1.48 (s, 3 H); ^{13}C NMR (100 MHz, $CDCl_3$): δ 205.2, 161.8, 137.3, 136.2, 134.5, 130.2, 127.9, 127.6, 126.5, 124.3, 123.2, 49.7, 48.2, 43.0, 28.1; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1204.

Spectral data for (E)-3-methyl-1,4-diphenylbut-3-en-1-one (2r)



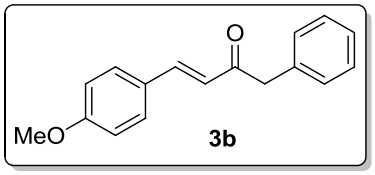
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.56 (d, *J* = 7.8 Hz, 1 H), 7.33 (t, *J* = 7.5 Hz, 1 H), 7.27 ~ 7.26 (m, 4 H), 7.24 ~ 7.22 (m, 2 H), 7.20 ~ 7.19 (m, 1 H), 6.52 (s, 1 H), 3.99 (s, 2 H), 2.49 (s, 3 H), 1.84 (d, *J* = 1.2 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 195.6, 156.4, 140.4, 139.0, 137.3, 131.5, 130.6, 129.1, 128.4, 128.4, 126.3, 125.8, 125.6, 39.3, 24.9, 20.6; HRMS: calcd. for $C_{18}H_{18}O$: 250.1358; Found: 250.1359.

Spectral data for (E)-1,4-diphenylbut-3-en-2-one (3a)



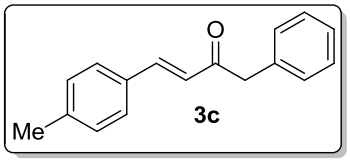
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.63 (d, *J* = 16.1 Hz, 1 H), 7.51 ~ 7.50 (m, 2 H), 7.37 ~ 7.33 (m, 5 H), 7.28 ~ 7.26 (m, 3 H), 6.78 (d, *J* = 16.1 Hz, 1 H), 3.94 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.2, 143.3, 134.4, 130.5, 129.4, 128.9, 128.7, 128.3, 126.9, 125.1, 48.3; HRMS: calcd. for $C_{16}H_{14}O$: 222.1045; Found: 222.1040.

Spectral data for (E)-4-(4-methoxyphenyl)-1-phenylbut-3-en-2-one (3b)



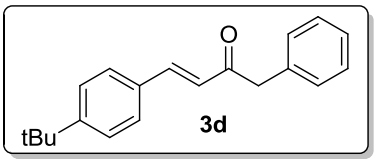
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.59 (d, *J* = 16.0 Hz, 1 H), 7.45 (d, *J* = 8.7 Hz, 2 H), 7.34 ~ 7.31 (m, 2 H), 7.27 ~ 7.25 (m, 3 H), 6.88 (d, *J* = 8.8 Hz, 2 H), 6.66 (d, *J* = 16.0 Hz, 1 H), 3.91 (s, 2 H), 3.81 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.2, 161.6, 143.1, 134.6, 130.0, 129.4, 128.6, 127.0, 126.8, 122.9, 114.3, 55.3, 48.2; HRMS: calcd. for $C_{17}H_{16}O_2$: 252.1150; Found: 252.1153.

Spectral data for (E)-1-phenyl-4-(p-tolyl)but-3-en-2-one (3c)



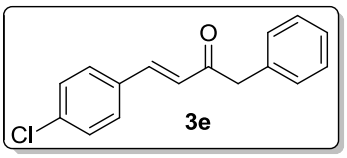
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.60 (d, *J* = 16.1 Hz, 1 H), 7.40 (d, *J* = 8.2 Hz, 2 H), 7.34 ~ 7.32 (m, 2 H), 7.26 (d, *J* = 7.2 Hz, 3 H), 7.17 (d, *J* = 8.0 Hz, 2 H), 6.73 (d, *J* = 16.1 Hz, 1 H), 3.92 (s, 2 H), 2.35 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.4, 143.5, 141.1, 134.5, 131.6, 129.6, 129.4, 128.7, 128.4, 126.9, 124.3, 48.3, 21.5; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1193.

Spectral data for (E)-4-(4-(tert-butyl)phenyl)-1-phenylbut-3-en-2-one (3d)



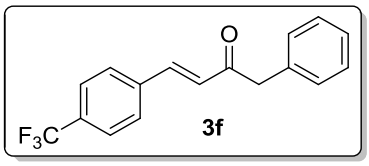
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.60 (d, *J* = 16.2 Hz, 1 H), 7.45 (m, *J* = 8.4 Hz, 2 H), 7.39 ~ 7.37 (m, 2 H), 7.35 ~ 7.31 (m, 2 H), 7.26 ~ 7.24 (m, 3 H), 6.73 (d, *J* = 16.2 Hz, 1 H), 3.92 (s, 2 H), 1.30 (s, 9 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.4, 154.2, 143.4, 134.6, 131.6, 129.5, 128.7, 128.2, 126.9, 125.9, 124.5, 48.3, 34.9, 31.1; HRMS: calcd. for $C_{20}H_{22}O$: 278.1671; Found: 278.1681.

Spectral data for (E)-4-(4-chlorophenyl)-1-phenylbut-3-en-2-one (3e)



Light Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.55 (d, *J* = 16.2 Hz, 1 H), 7.42 ~ 7.41 (m, 2 H), 7.33 ~ 7.31 (m, 4 H), 7.26 ~ 7.24 (m, 3 H), 6.73 (d, *J* = 16.2 Hz, 1 H), 3.92 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.0, 141.8, 136.4, 134.2, 132.9, 129.5, 129.4, 129.2, 128.8, 127.0, 125.4, 48.5; HRMS: calcd. for $C_{16}H_{13}ClO$: 256.0655; Found: 256.0651.

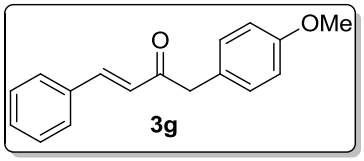
Spectral data for (E)-1-phenyl-4-(4-(trifluoromethyl)phenyl)but-3-en-2-one (3f)



Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.62 ~ 7.58 (m, 5 H), 7.34 (t, *J* = 7.8 Hz, 2 H), 7.28 ~ 7.25 (m, 3 H), 6.82 (d, *J* = 16.2 Hz, 1 H), 3.94 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.8, 141.3, 137.8, 134.0, 131.9 (J_{CF} = 33), 129.5, 128.9, 128.4, 127.2, 127.1,

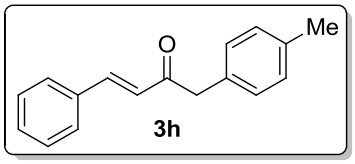
125.8, 125.8, 123.7 (J_{CF} = 271.5), 48.7; HRMS: calcd. for $C_{17}H_{13}F_3O$: 290.0918; Found: 290.0913.

Spectral data for (E)-1-(4-methoxyphenyl)-4-phenylbut-3-en-2-one (3g)



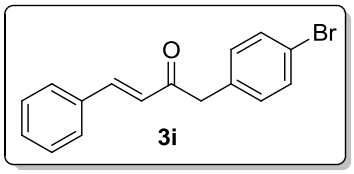
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.61 (d, *J* = 16.2 Hz, 1 H), 7.50 (dd, *J* = 6.0, 2.4 Hz, 2 H), 7.37 ~ 7.35 (m, 3 H), 7.17 (d, *J* = 8.5 Hz, 2 H), 6.88 ~ 6.86 (m, 2 H), 6.76 (d, *J* = 16.2 Hz, 1 H), 3.86 (s, 2 H), 3.78 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.6, 158.6, 143.2, 134.4, 130.5, 128.9, 128.3, 126.4, 125.1, 114.2, 55.2, 47.5; HRMS: calcd. for $C_{17}H_{16}O_2$: 252.1150; Found: 252.1152.

Spectral data for (E)-4-phenyl-1-(p-tolyl)but-3-en-2-one (3h)



Pale Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.60 (d, *J* = 16.1 Hz, 1 H), 7.50 ~ 7.48 (m, 2 H), 7.36 ~ 7.35 (dd, *J* = 5.5, 2.3 Hz, 3 H), 7.14 (s, 4 H), 6.75 (d, *J* = 16.2 Hz, 1 H), 3.88 (s, 2 H), 2.32 (s, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 197.5, 143.3, 136.6, 134.5, 131.3, 130.5, 129.5, 129.3, 128.9, 128.4, 125.2, 48.10, 21.0; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1208.

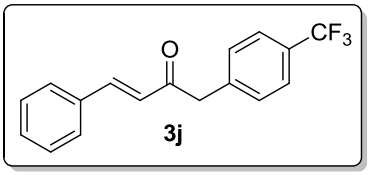
Spectral data for (E)-1-(4-bromophenyl)-4-phenylbut-3-en-2-one (3i)



3i

Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.61 (d, *J* = 16.1 Hz, 1 H), 7.51 ~ 7.50 (m, 2 H), 7.45 (d, *J* = 8.3 Hz, 2 H), 7.38 (m, 3 H), 7.12 (d, *J* = 8.2 Hz, 2 H), 6.75 (d, *J* = 16.1 Hz, 1 H), 3.88 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.5, 143.7, 134.3, 133.4, 131.8, 131.2, 130.7, 128.9, 128.4, 125.0, 121.0, 47.5; HRMS: calcd. for $C_{16}H_{13}BrO$: 300.0150; Found: 300.0147.

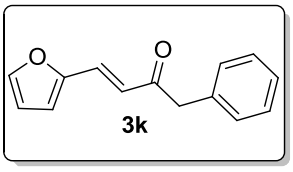
Spectral data for (E)-4-phenyl-1-(4-(trifluoromethyl)phenyl)but-3-en-2-one (3j)



3j

Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.63 (d, *J* = 16.1 Hz, 1 H), 7.59 (d, *J* = 8.3 Hz, 2 H), 7.53 ~ 7.52 (m, 2 H), 7.40 ~ 7.36 (m, 5 H), 6.77 (d, *J* = 16.1 Hz, 1 H), 4.01 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.2, 143.9, 138.4, 134.2, 130.8, 129.9, 129.3 (J_{CF} = 31.5 Hz), 129.0, 128.4, 125.6, 125.6, 125.1, 124.1 (J_{CF} = 271.5 Hz), 47.7; HRMS: calcd. for $C_{17}H_{13}F_3O$: 290.0918; Found: 290.0913.

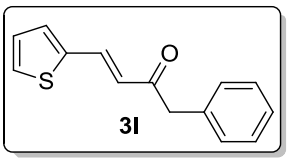
Spectral data for (E)-4-(furan-2-yl)-1-phenylbut-3-en-2-one (3k)



3k

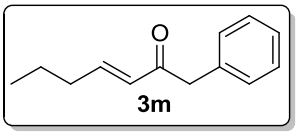
Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.45 ~ 7.45 (m, 1 H), 7.36 (d, *J* = 15.7 Hz, 1 H), 7.33 ~ 7.30 (m, 2 H), 7.26 ~ 7.23 (m, 3 H), 6.66 (d, *J* = 15.8 Hz, 1 H), 6.63 (d, *J* = 3.4 Hz, 1 H), 6.45 ~ 6.44 (m, 1 H), 3.86 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.9, 151.1, 145.0, 134.4, 129.5, 129.4, 128.7, 127.0, 122.4, 116.0, 112.5, 48.9; HRMS: calcd. for $C_{14}H_{12}O_2$: 212.0837; Found: 212.0826.

Spectral data for (E)-1-phenyl-4-(thiophen-2-yl)but-3-en-2-one (3l)



Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.74 (d, *J* = 15.7 Hz, 1 H), 7.36 ~ 7.31 (m, 3 H), 7.26 ~ 7.25 (m, 4 H), 7.03 (dd, *J* = 3.7, 3.6 Hz, 1 H), 6.58 (d, *J* = 15.7 Hz, 1 H), 3.88 (s, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 196.7, 139.8, 135.7, 134.4, 131.8, 129.4, 128.9, 128.7, 128.2, 126.9, 123.9, 48.4; HRMS: calcd. for $C_{14}H_{12}OS$: 228.0609; Found: 228.0613.

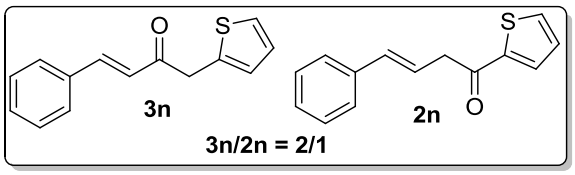
Spectral data for (E)-1-phenylhept-3-en-2-one (3m)



Colorless Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.31 ~ 7.29 (m, 2 H), 7.24 ~ 7.22 (m, 1 H), 7.20 ~ 7.18 (m, 2 H), 6.92 ~ 6.87 (m, 1 H), 6.12 (d, *J* = 16.2 Hz, 1 H), 3.81 (s, 2 H), 2.17 ~ 2.13 (m, 2 H), 1.45 (q, *J* = 7.5 Hz, 2 H), 0.90 ~ 0.88 (m, 3 H); ^{13}C NMR (150 MHz,

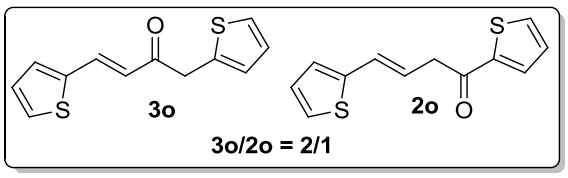
$CDCl_3$): δ 197.6, 148.4, 134.6, 129.5, 129.4, 128.6, 126.8, 47.6, 34.5, 21.3, 13.6; HRMS: calcd. for $C_{13}H_{16}O$: 188.1201; Found: 188.1198.

Spectral data for (E)-4-phenyl-1-(thiophen-2-yl)but-3-en-2-one/(E)-4-phenyl-1-(thiophen-2-yl)but-3-en-1-one (3n/2n)



Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$) (*major isomer*): δ 7.66 ~ 7.63 (m, 2 H), 7.53 ~ 7.52 (m, 2 H), 7.39 ~ 7.36 (m, 4 H), 7.30 ~ 7.28 (m, 2 H), 7.23 ~ 7.20 (m, 2 H), 6.81 (d, *J* = 15.6 Hz, 1 H), 4.12 (s, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) (*minor isomer, major peaks*): δ 7.78 ~ 7.77 (m, 1 H), 7.14 ~ 7.13 (m, 2 H), 6.99 ~ 6.97 (m, 2 H), 6.94 ~ 6.93 (m, 1 H), 6.56 (d, *J* = 16.2 Hz, 1 H), 6.45 ~ 6.40 (m, 1 H), 3.82 (q, *J* = 1.5 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) (*major isomer*): δ 195.6, 143.8, 135.5, 134.3, 130.7, 128.9, 128.4, 127.1, 126.8, 125.1, 124.5, 42.1; ^{13}C NMR (150 MHz, $CDCl_3$) (*minor isomer, major peaks*): δ 190.6, 136.8, 133.9, 133.8, 132.3, 128.5, 128.1, 127.5, 126.3, 122.2, 43.6; HRMS: calcd. for $C_{14}H_{12}OS$: 228.0609; Found: 228.0608.

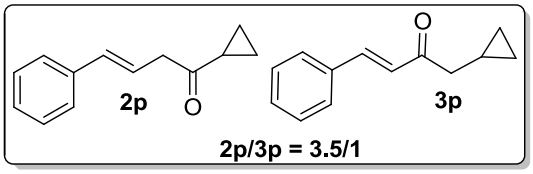
Spectral data for (E)-1,4-di(thiophen-2-yl)but-3-en-2-one/(E)-1,4-di(thiophen-2-yl)but-3-en-1-one (3o/2o)



Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$) (*major isomer*): δ 7.75 ~ 7.74 (m, 2 H), 7.38 (d, *J* = 5.4 Hz, 1 H), 7.28 (d, *J* = 4.2 Hz, 1 H), 7.22 ~ 7.21 (m, 1 H), 7.05 ~ 7.04 (m, 1 H), 6.98 ~ 6.96 (m, 1 H), 6.60 (d, *J* = 15.6 Hz, 1 H), 4.07 (s, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) (*minor isomer, major peaks*): δ 7.64 ~ 7.63 (m, 1 H), 7.13 ~ 7.11 (m, 2 H), 6.93 ~ 6.92 (m, 3 H), 6.67 (d, *J* = 16.2 Hz, 1 H), 6.27 ~ 6.22 (m, 1 H), 3.77 (dd, *J* = 7.2, 1.8 Hz, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) (*major isomer*): δ 195.1, 139.6, 136.1, 135.5, 132.0, 129.1, 128.3, 127.0, 126.8, 125.1, 123.2, 43.3; ^{13}C NMR (150 MHz, $CDCl_3$) (*minor isomer, major peaks*): δ 190.3, 143.6, 141.8, 133.9, 132.3, 128.1, 127.2, 126.9, 125.4, 124.1, 121.7, 42.1; HRMS: calcd. for $C_{12}H_{10}OS_2$: 234.0173; Found: 234.0172.

Spectral data for

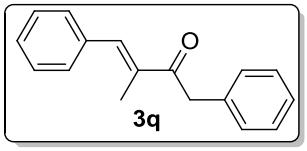
(E)-1-cyclopropyl-4-phenylbut-3-en-1-one/(E)-1-cyclopropyl-4-phenylbut-3-en-2-one (2p/3p)



Pale Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$) *(major isomer)*: δ 7.38 ~ 7.35 (m, 2 H), 7.31 ~ 7.27 (m, 2 H), 7.22 ~ 7.18 (m, 1 H), 6.48 (d, *J* = 15.9 Hz, 1 H), 6.36 ~ 6.31 (m, 1 H), 3.45 ~ 3.44 (m, 2 H), 2.02 ~ 1.98 (m, 1 H), 1.09 ~ 1.04 (m, 2 H), 0.90 ~ 0.86 (m, 2 H); ^{1}H NMR (600 MHz, $CDCl_3$) *(minor isomer, major peaks)*: δ 7.55 ~ 7.52 (m, 2 H), 6.79 (d, *J* = 16.2 Hz, 1 H), 2.54 (d, *J* = 6.9 Hz, 1 H), 0.60 ~ 0.57 (m, 2 H), 0.19 ~ 0.16 (m, 2 H); ^{13}C NMR (150 MHz, $CDCl_3$) *(major isomer)*: δ 208.6, 137.0, 133.6, 128.5, 127.5, 126.2, 122.2, 47.5, 20.2, 11.1; ^{13}C NMR (150 MHz, $CDCl_3$) *(minor isomer)*: δ 142.5,

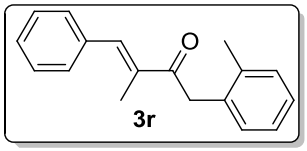
130.4, 128.9, 128.7, 128.2, 125.9, 46.1, 6.6, 4.6; HRMS: calcd. for $C_{13}H_{14}O$: 186.1045; Found: 186.1044.

Spectral data for (E)-3-methyl-1,4-diphenylbut-3-en-2-one (3q)



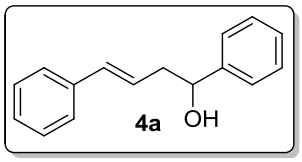
Yellow Oil; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.65 (s, 1 H), 7.41 (d, *J* = 5.0 Hz, 4 H), 7.36 ~ 7.32 (m, 3 H), 7.27 ~ 7.26 (m, 3 H), 4.14 (s, 2 H), 2.08 (d, *J* = 1.5 Hz, 3 H); ^{13}C NMR (110 MHz, $CDCl_3$): δ 199.7, 139.8, 136.9, 135.7, 135.3, 129.7, 129.2, 128.6, 128.4, 126.7, 44.6, 13.3; HRMS: calcd. for $C_{17}H_{16}O$: 236.1201; Found: 236.1201.

Spectral data for (E)-3-methyl-4-phenyl-1-(o-tolyl)but-3-en-2-one (3r)



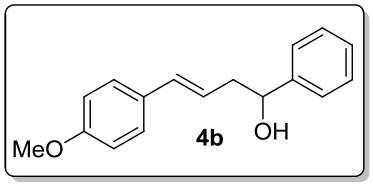
White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.66 (s, 1 H), 7.45 ~ 7.42 (m, 4 H), 7.38 ~ 7.36 (m, 1 H), 7.23 ~ 7.17 (m, 3 H), 7.15 ~ 7.13 (m, 1 H), 4.17 (s, 2 H), 2.30 (s, 3 H), 2.12 (d, *J* = 1.2 Hz, 3 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 199.7, 139.0, 137.4, 136.7, 135.9, 134.2, 130.3, 130.1, 129.7, 128.6, 128.5, 127.0, 126.1, 42.6, 19.8, 13.4; HRMS: calcd. for $C_{18}H_{18}O$: 250.1358; Found: 250.1359

Spectral data for (E)-1,4-diphenylbut-3-en-1-ol (4a)



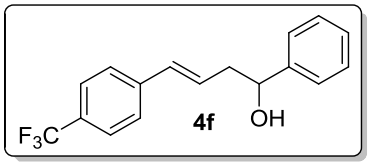
Light Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.39 ~ 7.32 (m, 6 H), 7.30 ~ 7.27 (m, 3 H), 7.20 (t, *J* = 7.3 Hz, 1 H), 6.49 (d, *J* = 15.9 Hz, 1 H), 6.22 ~ 6.17 (m, 1 H), 4.80 (t, *J* = 6.4 Hz, 1 H), 2.67 ~ 2.64 (m, 2 H), 2.06 (s, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 143.9, 137.2, 133.4, 128.5, 128.5, 127.6, 127.3, 126.2, 125.9, 125.8, 73.8, 43.1; HRMS: calcd. for $C_{16}H_{14}O$: 224.1201; Found: 224.1192.

Spectral data for (E)-4-(4-methoxyphenyl)-1-phenylbut-3-en-1-ol (4b)



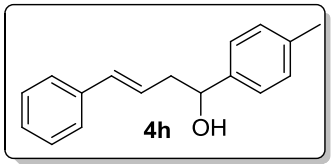
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.39 ~ 7.34 (m, 4 H), 7.29 ~ 7.26 (m, 3 H), 6.82 (dd, *J* = 1.8, 2.4 Hz, 2 H), 6.44 (d, *J* = 15.6 Hz, 1 H), 6.07 ~ 6.02 (m, 1 H), 4.78 (q, *J* = 5.4 Hz, 1 H), 3.79 (s, 3 H), 2.65 ~ 2.59 (m, 2 H), 2.13 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 159.0, 143.9, 132.9, 130.0, 128.4, 127.5, 127.3, 125.8, 123.5, 113.9, 73.7, 55.3, 43.1; HRMS: calcd. for $C_{17}H_{18}O_2$: 254.1307; Found: 254.1308.

Spectral data for (E)-1-phenyl-4-(4-(trifluoromethyl)phenyl)but-3-en-1-ol (4f)



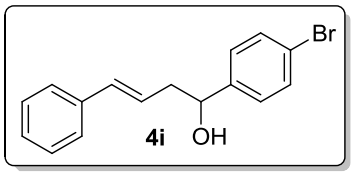
White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.53 (d, *J* = 7.8 Hz, 2 H), 7.40 (d, *J* = 8.4 Hz, 2 H), 7.37 ~ 7.28 (m, 5 H), 6.49 (d, *J* = 15.6 Hz, 1 H), 6.33 ~ 6.28 (m, 1 H), 4.82 (t, *J* = 6.3 Hz, 1 H), 2.69 ~ 2.67 (m, 2 H), 2.17 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 143.8, 140.7, 131.8, 129.5, 129.1, 128.5, 127.8, 126.2, 125.8, 125.5, 125.4, 124.2 (J_{CF} = 271.5 Hz), 73.8, 42.8; HRMS: calcd. for $C_{17}H_{15}F_3O$: 292.1075; Found: 292.9802.

Spectral data for (E)-4-phenyl-1-(p-tolyl)but-3-en-1-ol (4h)



Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.37 ~ 7.35 (m, 2 H), 7.32 ~ 7.29 (m, 4 H), 7.23 ~ 7.22 (m, 1 H), 7.20 (d, *J* = 7.2 Hz, 1 H), 6.52 (d, *J* = 16.2 Hz, 1 H), 6.25 ~ 6.20 (m, 1 H), 4.79 (t, *J* = 5.4 Hz, 1 H), 2.69 ~ 2.67 (m, 2 H), 2.38 (s, 3 H), 2.10 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 141.0, 137.3, 137.2, 133.2, 129.1, 128.5, 127.2, 126.1, 126.1, 125.7, 73.6, 43.0, 21.1; HRMS: calcd. for $C_{17}H_{18}O$: 238.1358; Found: 238.1915.

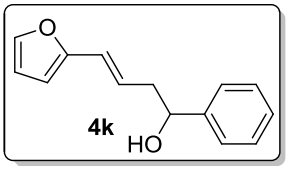
Spectral data for (E)-1-(4-bromophenyl)-4-phenylbut-3-en-1-ol (4i)



Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.47 (d, *J* = 8.4 Hz, 2 H), 7.33 ~ 7.28 (m, 4 H), 7.25 ~ 7.22 (m, 3 H), 6.48 (d, *J* = 15.6 Hz, 1 H), 6.17 ~ 6.12 (m, 1 H), 4.75 (q, *J* = 5.1 Hz, 1 H), 2.64 ~ 2.58 (m, 2 H), 2.19 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ

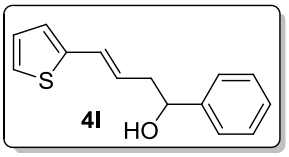
142.8, 137.0, 133.8, 131.5, 128.5, 127.5, 127.4, 126.2, 125.2, 121.3, 73.0, 43.0; HRMS: calcd. for $C_{16}H_{15}BrO$: 302.0306; Found: 301.9871.

Spectral data for (E)-4-(furan-2-yl)-1-phenylbut-3-en-1-ol (4k)



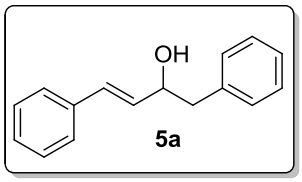
Brown Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.38 ~ 7.27 (m, 6 H), 6.34 ~ 6.33 (m, 1 H), 6.30 (d, *J* = 16.2 Hz, 1 H), 6.16 ~ 6.11 (m, 2 H), 4.78 (q, *J* = 5.1 Hz, 1 H), 2.63 ~ 2.60 (m, 2 H), 2.15 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 152.7, 143.8, 141.6, 128.5, 127.6, 125.8, 124.8, 121.8, 111.1, 107.0, 73.7, 42.9; HRMS: calcd. for $C_{14}H_{14}O_2$: 214.0994; Found: 214.0991.

Spectral data for (E)-1-phenyl-4-(thiophen-2-yl)but-3-en-1-ol (4l)



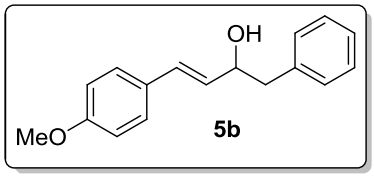
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.39 ~ 7.34 (m, 4 H), 7.30 ~ 7.27 (m, 1 H), 7.10 (d, *J* = 5.0 Hz, 1 H), 6.94 ~ 6.92 (m, 1 H), 6.89 (d, *J* = 3.3 Hz, 1 H), 6.61 (d, *J* = 15.7 Hz, 1 H), 6.06 ~ 6.01 (m, 1 H), 4.78 (q, *J* = 5.5 Hz, 1 H), 2.63 ~ 2.58 (m, 2 H), 2.15 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 143.8, 142.3, 128.5, 127.6, 127.2, 126.4, 125.8, 125.0, 123.7, 73.7, 42.9; HRMS: calcd. for $C_{14}H_{14}OS$: 230.0765; Found: 230.9852.

Spectral data for (E)-1,4-diphenylbut-3-en-2-ol (5a)



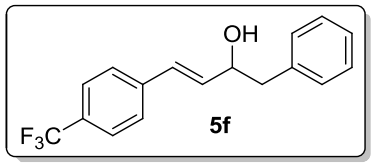
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.38 ~ 7.37 (m, 2 H), 7.34 ~ 7.31 (m, 4 H), 7.27 ~ 7.25 (m, 4 H), 6.59 (d, *J* = 15.6 Hz, 1 H), 6.29 (dd, *J* = 15.6, 6.0 Hz, 1 H), 4.54 ~ 4.51 (m, 1 H), 2.98 ~ 2.87 (m, 2 H), 1.92 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 137.6, 136.6, 131.4, 130.3, 129.5, 128.5, 128.5, 127.6, 126.6, 126.4, 73.4, 44.1; HRMS: calcd. for $C_{16}H_{16}O$: 224.1201; Found: 224.1202.

Spectral data for (E)-4-(4-methoxyphenyl)-1-phenylbut-3-en-2-ol (5b)



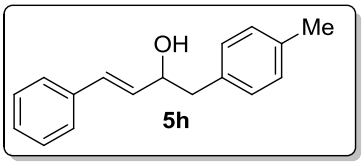
Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$) : δ 7.32 ~ 7.23 (m, 4 H), 7.25 ~ 7.23 (m, 3 H) 6.84 (dd, *J* = 2.4, 1.8 Hz, 2 H), 6.52 (d, *J* = 16.2 Hz, 1 H), 6.13 (dd, *J* = 16.2, 6.6 Hz, 1 H), 4.49 (q, *J* = 6.6 Hz, 1 H), 3.79 (s, 3 H), 2.95 (dd, *J* = 4.8, 5.4 Hz, 1 H), 2.86 (dd, *J* = 8.4, 7.8 Hz, 1 H), 1.74 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 159.3, 137.8, 130.0, 129.6, 129.4, 129.3, 128.5, 127.6, 126.5, 114.0, 73.6, 55.3, 44.2; HRMS: calcd. for $C_{17}H_{18}O_2$: 254.1307; Found: 254.1302.

Spectral data for (E)-1-phenyl-4-(4-(trifluoromethyl)phenyl)but-3-en-2-ol (5f)



Off White Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.56 (d, *J* = 7.8 Hz, 2 H), 7.44 (d, *J* = 8.4 Hz, 2 H), 7.35 ~ 7.32 (m, 2 H), 7.27 ~ 7.25 (m, 3 H), 6.62 (d, *J* = 16.2 Hz, 1 H), 6.37 (dd, *J* = 16.2, 6.0 Hz, 1 H), 4.54 (d, *J* = 6.6 Hz, 1 H), 2.99 ~ 2.86 (m, 2 H), 1.95 (s, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 140.2, 137.3, 134.1, 129.5, 129.4, 129.2, 128.7, 128.6, 126.7, 125.5, 125.5, 125.2, 125.1, 73.1, 44.1; HRMS: calcd. for $C_{17}H_{15}F_3O$: 292.1075; Found: 292.1081.

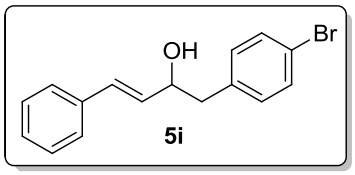
Spectral data for (E)-4-phenyl-1-(p-tolyl)but-3-en-2-ol (5h)



5h

Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.37 ~ 7.36 (m, 2 H), 7.31 (t, *J* = 7.5 Hz, 2 H), 7.24 ~ 7.22 (m, 1 H), 7.16 ~ 7.12 (m, 4 H), 6.59 (d, *J* = 15.6 Hz, 1 H), 6.28 (dd, *J* = 15.6, 6.0 Hz, 1 H), 4.51 ~ 4.48 (m, 1 H), 2.93 (dd, *J* = 13.8, 4.8 Hz, 1 H), 2.83 (dd, *J* = 13.8, 8.4 Hz, 1 H), 2.33 (s, 3 H), 1.80 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 136.7, 136.1, 134.5, 131.6, 130.3, 129.4, 129.2, 128.5, 127.6, 126.5, 73.5, 43.7, 21.0; HRMS: calcd. for $C_{17}H_{18}O$: 238.1358; Found: 238.1915.

Spectral data for (E)-1-(4-bromophenyl)-4-phenylbut-3-en-2-ol (5i)

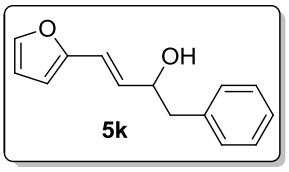


5i

Light Yellow Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.42 (d, *J* = 8.4 Hz, 2 H), 7.35 ~ 7.34 (m, 2 H), 7.32 ~ 7.29 (m, 2 H), 7.25 ~ 7.22 (m, 1 H), 7.12 (d, *J* = 8.4 Hz, 2 H), 6.56 (d, *J*

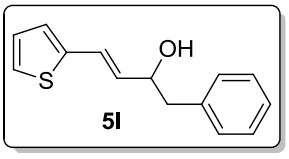
= 16.2 Hz, 1 H), 6.23 (dd, *J* = 16.2, 6.6 Hz, 1 H), 4.48 (q, *J* = 6.3 Hz, 1 H), 2.91 ~ 2.82 (m, 2 H), 1.76 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 136.7, 136.5, 131.5, 131.3, 131.1, 130.8, 128.6, 127.8, 126.5, 120.5, 73.3, 43.4; HRMS: calcd. for $C_{16}H_{15}BrO$: 302.0306; Found: 301.9871.

Spectral data for (E)-4-(furan-2-yl)-1-phenylbut-3-en-2-ol (5k)



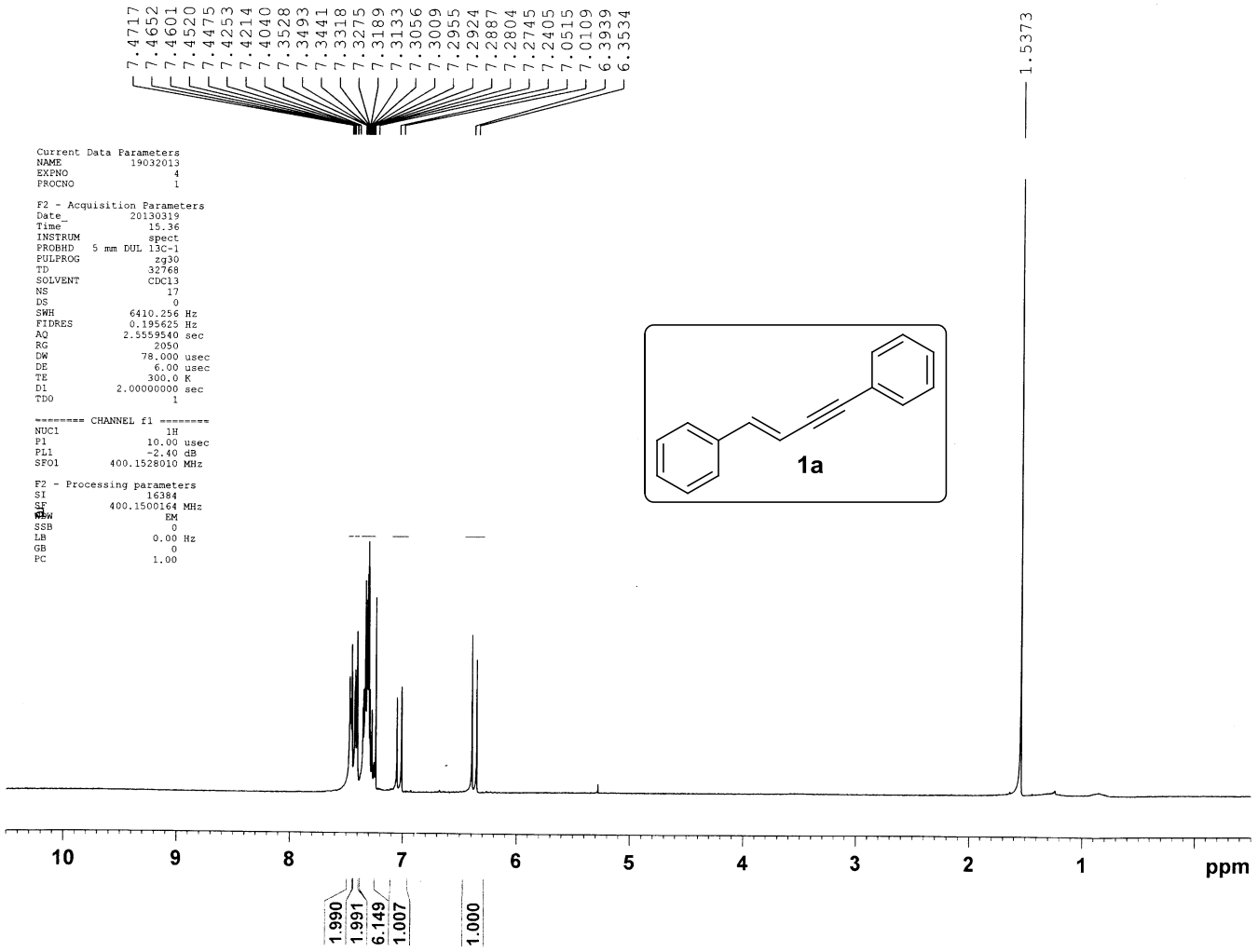
Yellow Oil; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.31 ~ 7.23 (m, 6 H), 6.41 (dd, *J* = 1.2, 1.2 Hz, 1 H), 6.35 (dd, *J* = 1.8, 1.8 Hz, 1 H), 6.25 ~ 6.21 (m, 2 H), 4.48 ~ 4.46 (m, 1 H), 2.95 ~ 2.81 (m, 2 H), 1.97 (bs, 1 H); ^{13}C NMR (150 MHz, $CDCl_3$): δ 152.3, 141.9, 137.6, 130.1, 129.5, 128.5, 126.6, 118.6, 111.2, 108.0, 73.0, 44.1; HRMS: calcd. for $C_{14}H_{14}O_2$: 214.0994; Found: 214.0991.

Spectral data for (E)-1-phenyl-4-(thiophen-2-yl)but-3-en-2-ol (5l)



Brown Solid; ^{1}H NMR (600 MHz, $CDCl_3$): δ 7.33 ~ 7.31 (m, 2 H), 7.25 ~ 7.23 (m, 3 H), 7.15 (d, *J* = 5.1 Hz, 1 H), 6.96 ~ 6.93 (m, 2 H), 6.73 (d, *J* = 15.6 Hz, 1 H), 6.14 (dd, *J* = 15.6, 6.2 Hz, 1 H), 4.49 ~ 4.46 (m, 1 H), 2.96 ~ 2.83 (m, 2 H), 1.81 (bs, 1 H); ^{13}C NMR

(150 MHz, $CDCl_3$): δ 141.8, 137.5, 131.1, 129.5, 128.5, 127.3, 126.6, 125.8, 124.3, 123.5, 73.1, 44.1; HRMS: calcd. for $C_{14}H_{14}OS$: 230.0765; Found: 230.9852.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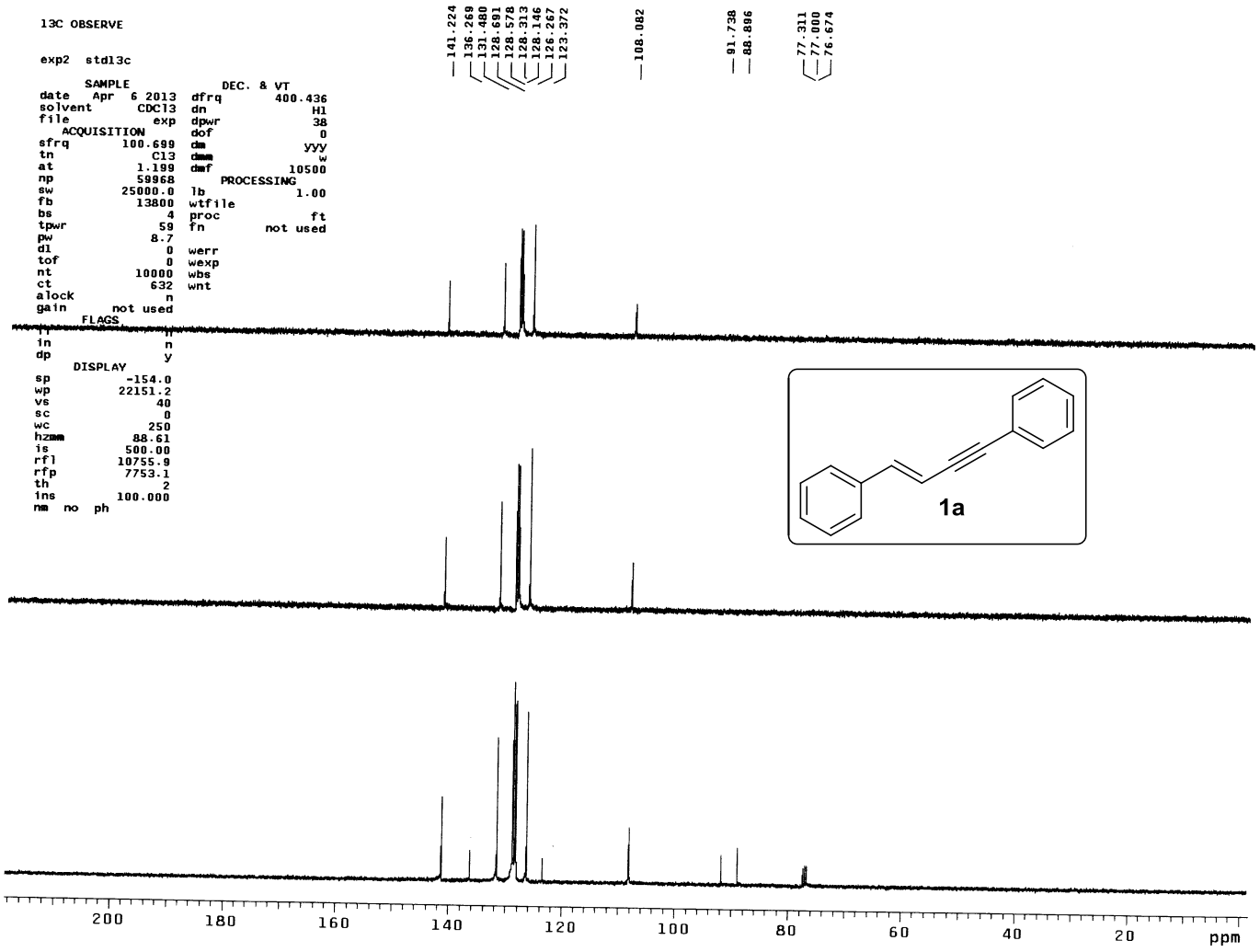
7.4652
7.4601
7.4520
7.4475
7.4253
7.4214
7.4040
7.3528
7.3493
7.3441
7.3318
7.3275
7.3189
7.3133
7.3056
7.3009
7.2955
7.2924
7.2887
7.2804
7.2745
7.2405
7.0515
7.0109
6.3939
6.3534
1.5373
Current Data Parameters
NAME 19032013
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130319
Time 15.36
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 17
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 2050
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500164 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1a
10
9
8
7
6
5
4
3
2
1
ppm
1.990
1.991
6.149
1.007
1.000


13C OBSERVE
exp2 std13c
SAMPLE
date Apr 6 2013
solvent CDCl3
file exp
ACQUISITION
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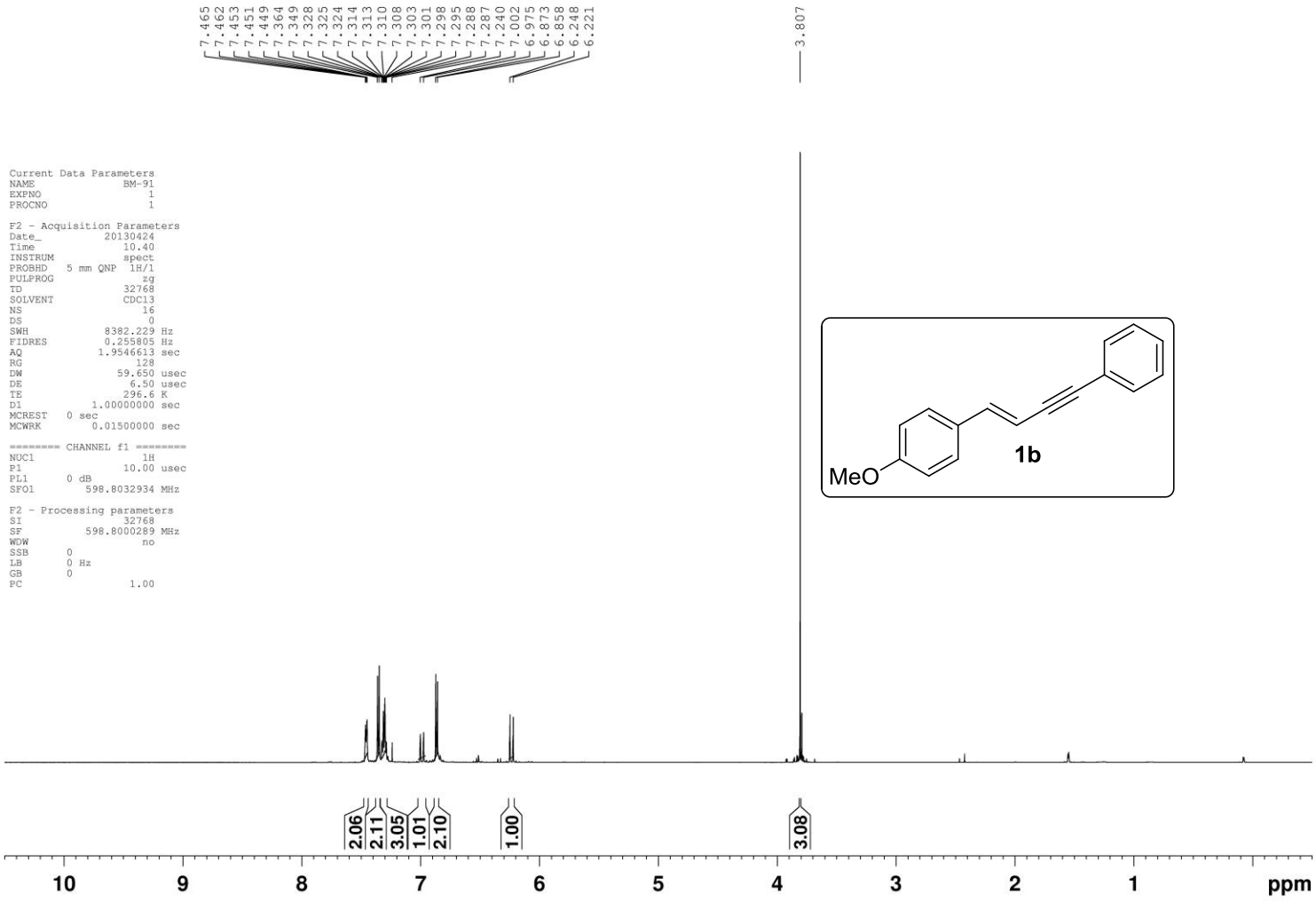
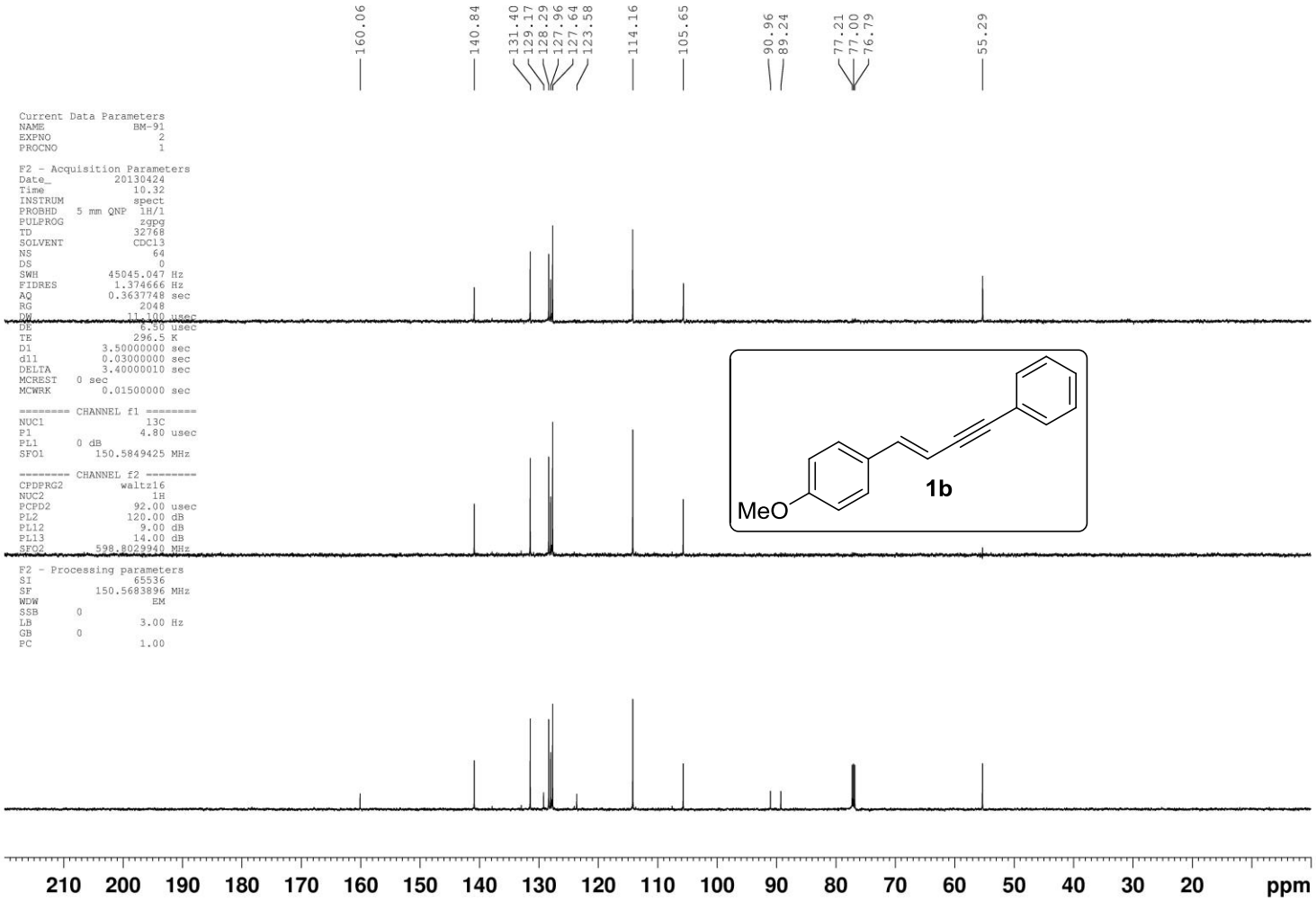
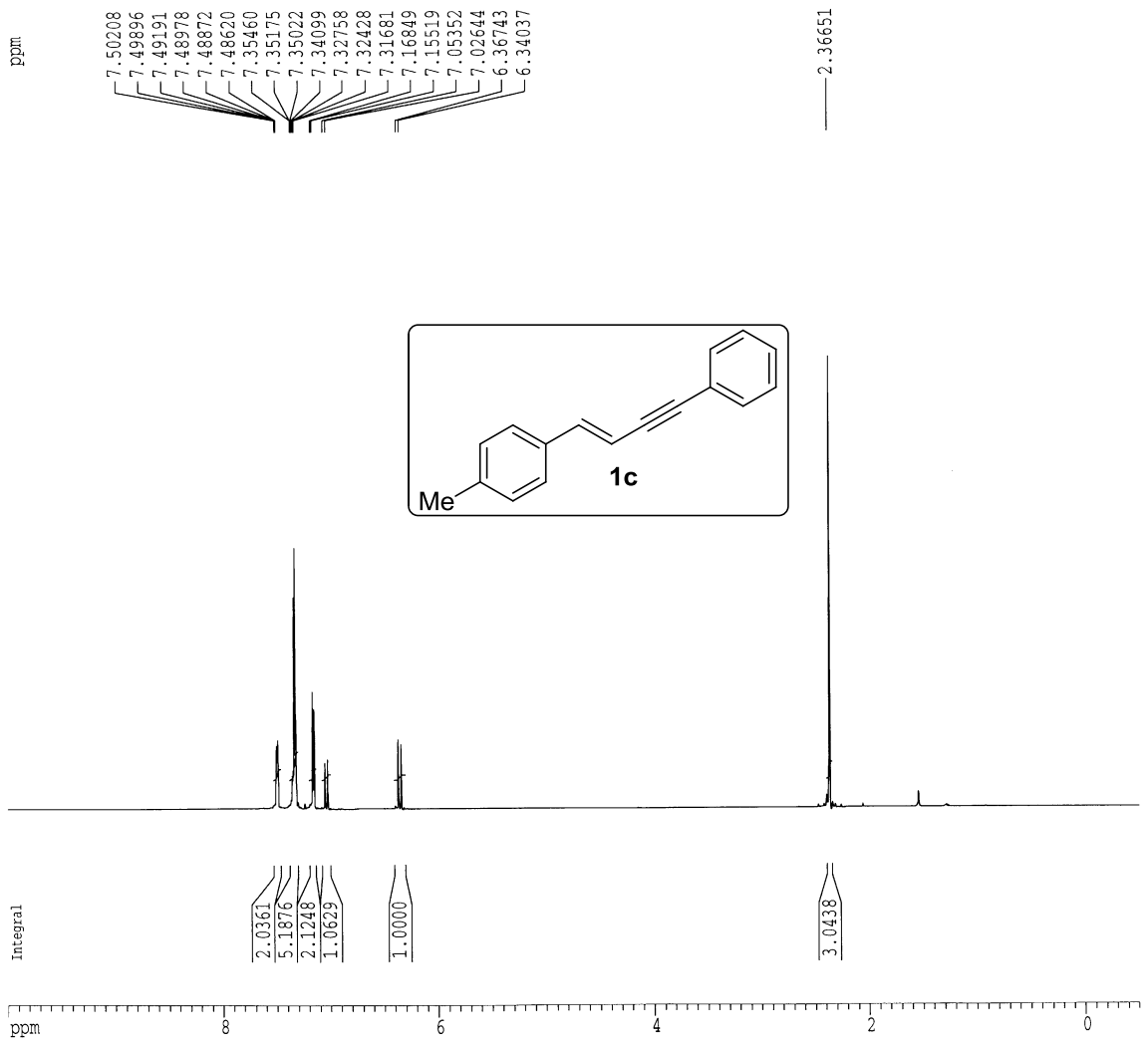
tn C13
at 1.199
np 59968
sw 25000.0
fb 13800
bs 4
tpwr 59
pw 8.7
dl 0
tof 0
nt 10000
ct 632
alock n
gain not used
FLAGS
in n
dp y
DISPLAY
sp -154.0
wp 22151.2
vs 40
sc 0
wc 250
hzmm 88.61
is 500.00
rfl 10755.9
rfp 7753.1
th 2
ins 100.000
nm no ph
DEC. & VT
dfrq 400.436
dn H1
dpwr 38
dof 0
yyy
w
dmf 10500
PROCESSING
lb 1.00
wtfile
proc ft
fn not used
werr
wexp
wbs
wnt
141.224
136.269
131.480
128.691
128.578
128.313
128.146
126.267
123.372
108.082
91.738
88.896
77.311
77.000
76.674
1a
200
180
160
140
120
100
80
60
40
20
ppm

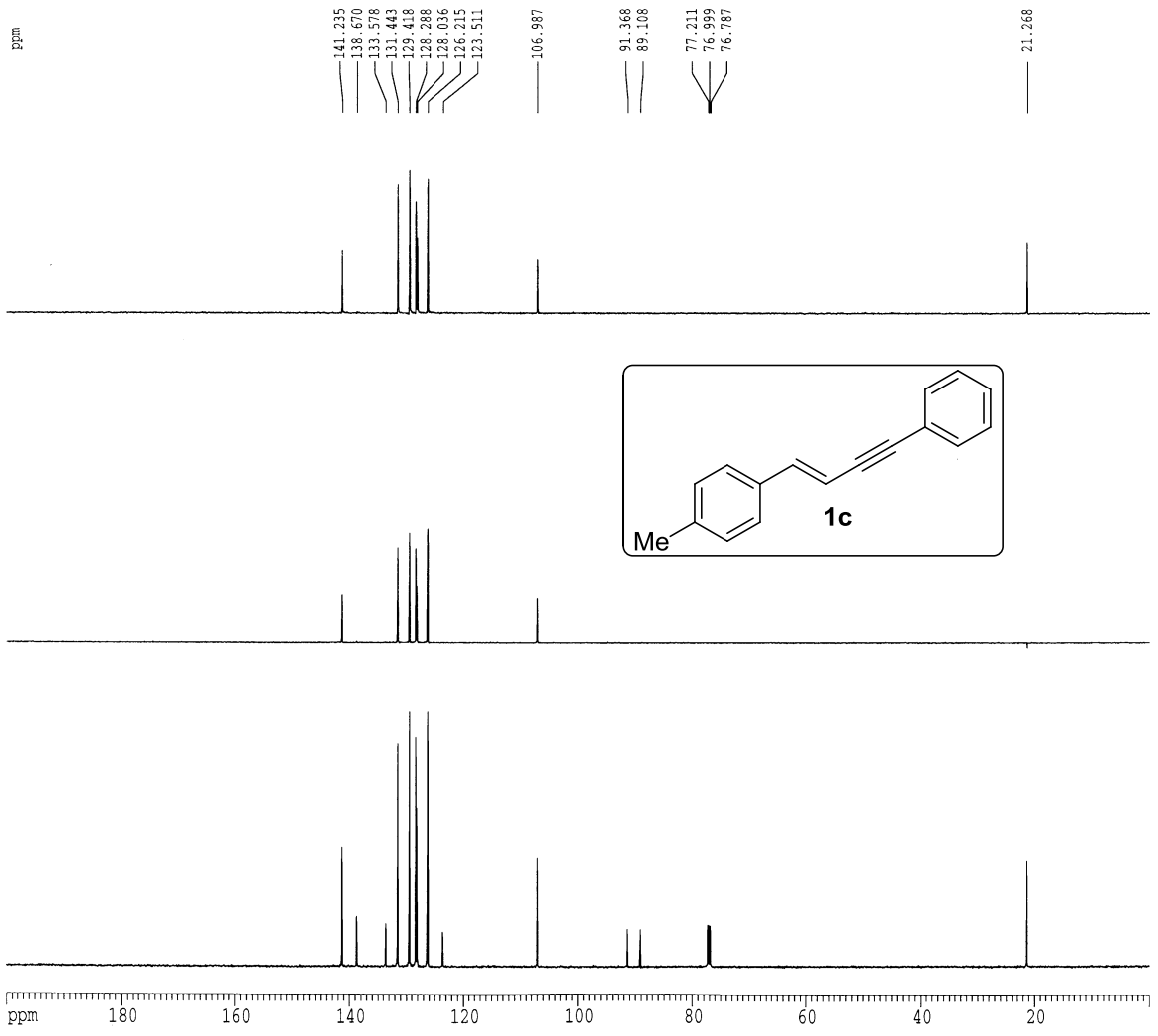

7.465
7.462
7.453
7.451
7.449
7.364
7.349
7.328
7.325
7.324
7.314
7.313
7.310
7.308
7.303
7.301
7.298
7.295
7.288
7.287
7.240
7.002
6.975
6.873
6.858
6.248
6.221
3.807
Current Data Parameters
NAME BM-91
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130424
Time 10.40
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 296.6 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000289 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
MeO
1b
2.06
2.11
3.05
1.01
2.10
1.00
3.08
10
9
8
7
6
5
4
3
2
1
ppm

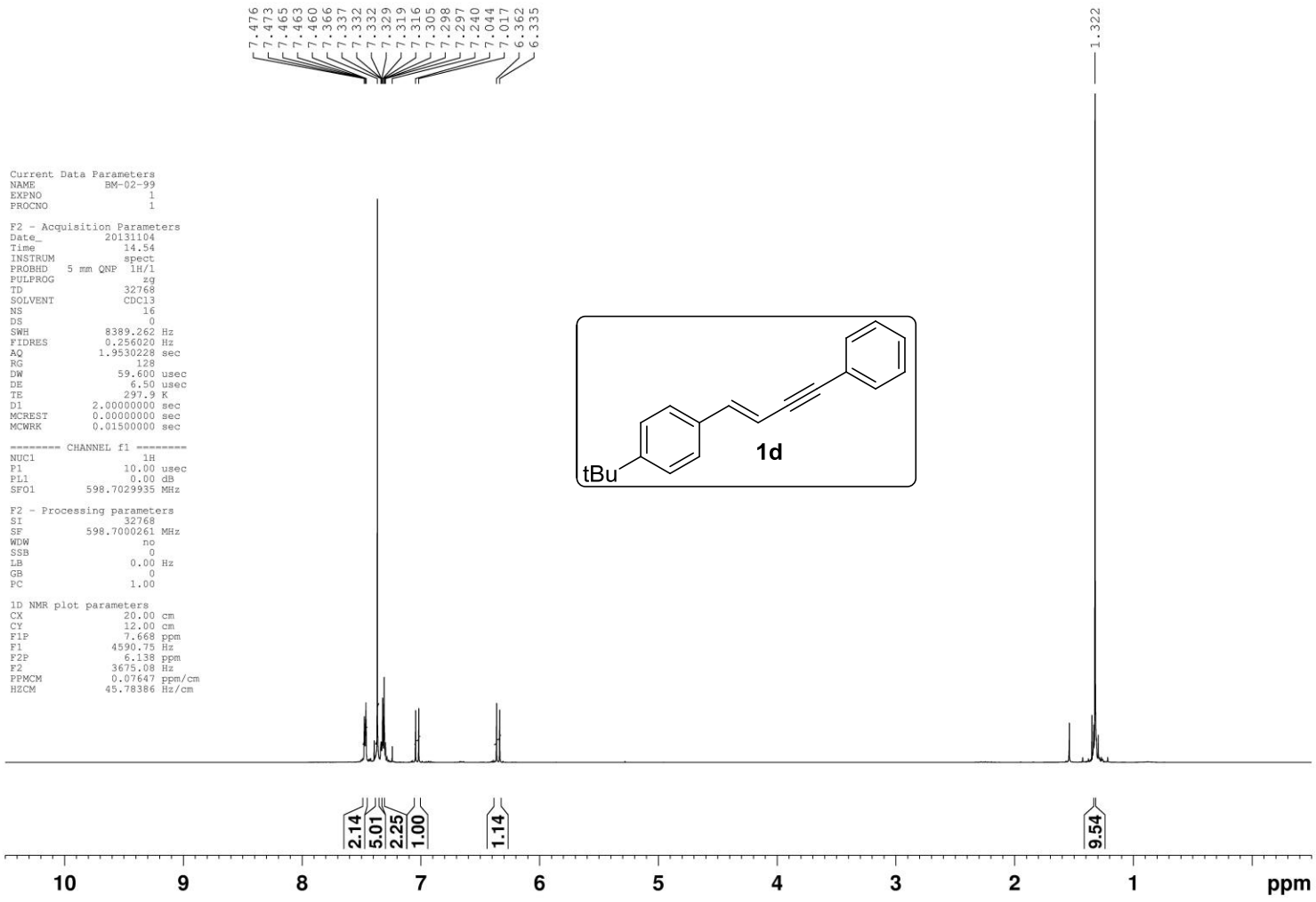

160.06
140.84
131.40
129.17
128.29
127.96
127.64
123.58
114.16
105.65
90.96
89.24
77.21
77.00
76.79
55.29
Current Data Parameters
NAME BM-91
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130424
Time 10.32
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 64
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683896 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
MeO
1b
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

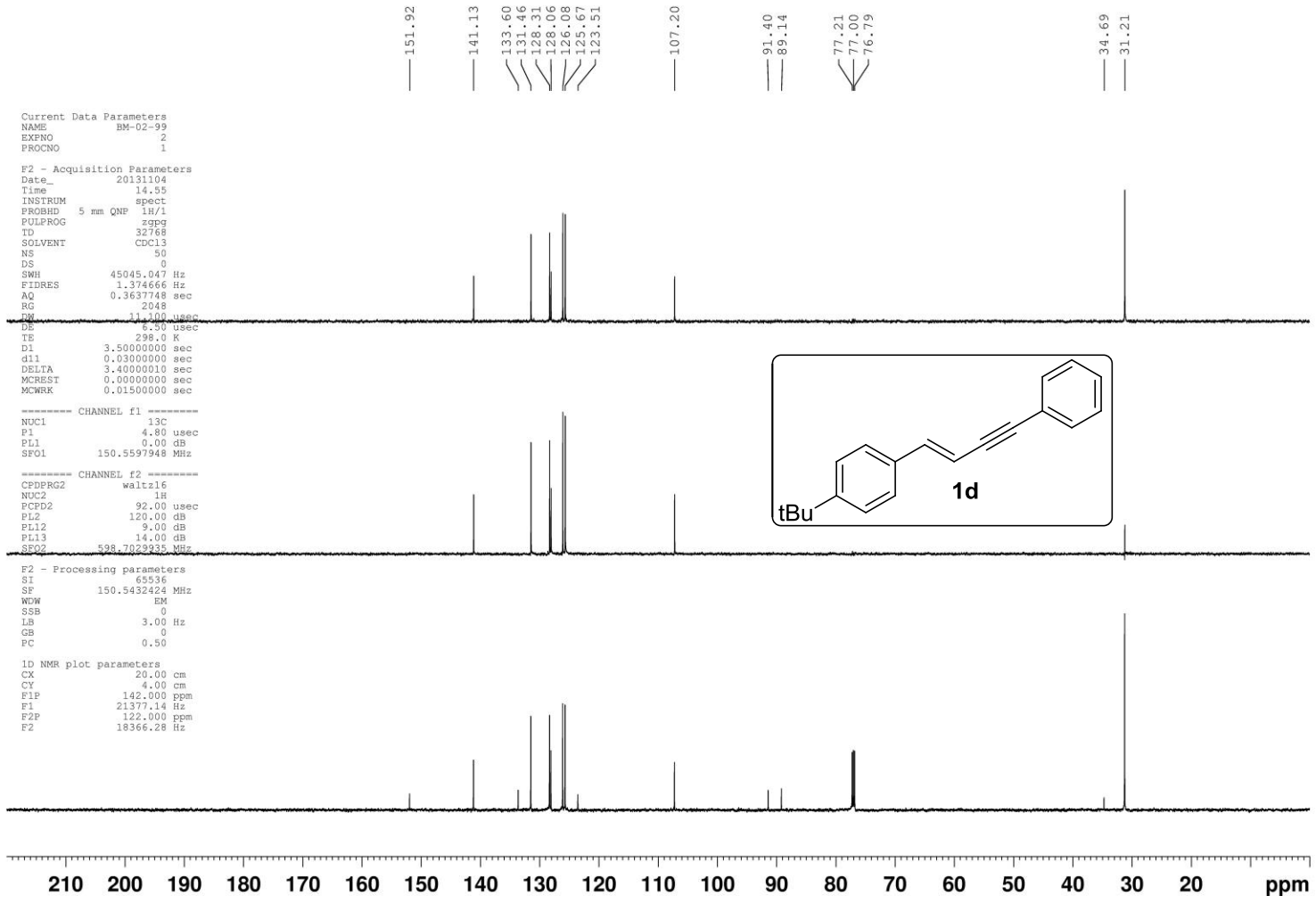
```
Current Data Parameters
NAME              BM-106
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130509
Time               16.06
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8382.229 Hz
FIDRES         0.255805 Hz
AQ            1.9546613 sec
RG                  128
DW               59.650 usec
DE                6.50 usec
TE               298.7 K
D1            2.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                10.00 usec
PL1                0.00 dB
SFO1        598.8029940 MHz

F2 - Processing parameters
SI                32768
SF          598.8000296 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 8.00 cm
F1P               10.000 ppm
F1              5988.00 Hz
F2P               -0.500 ppm
F2              -299.40 Hz
PPMCM           0.52500 ppm/cm
HZCM          314.37003 Hz/cm
```

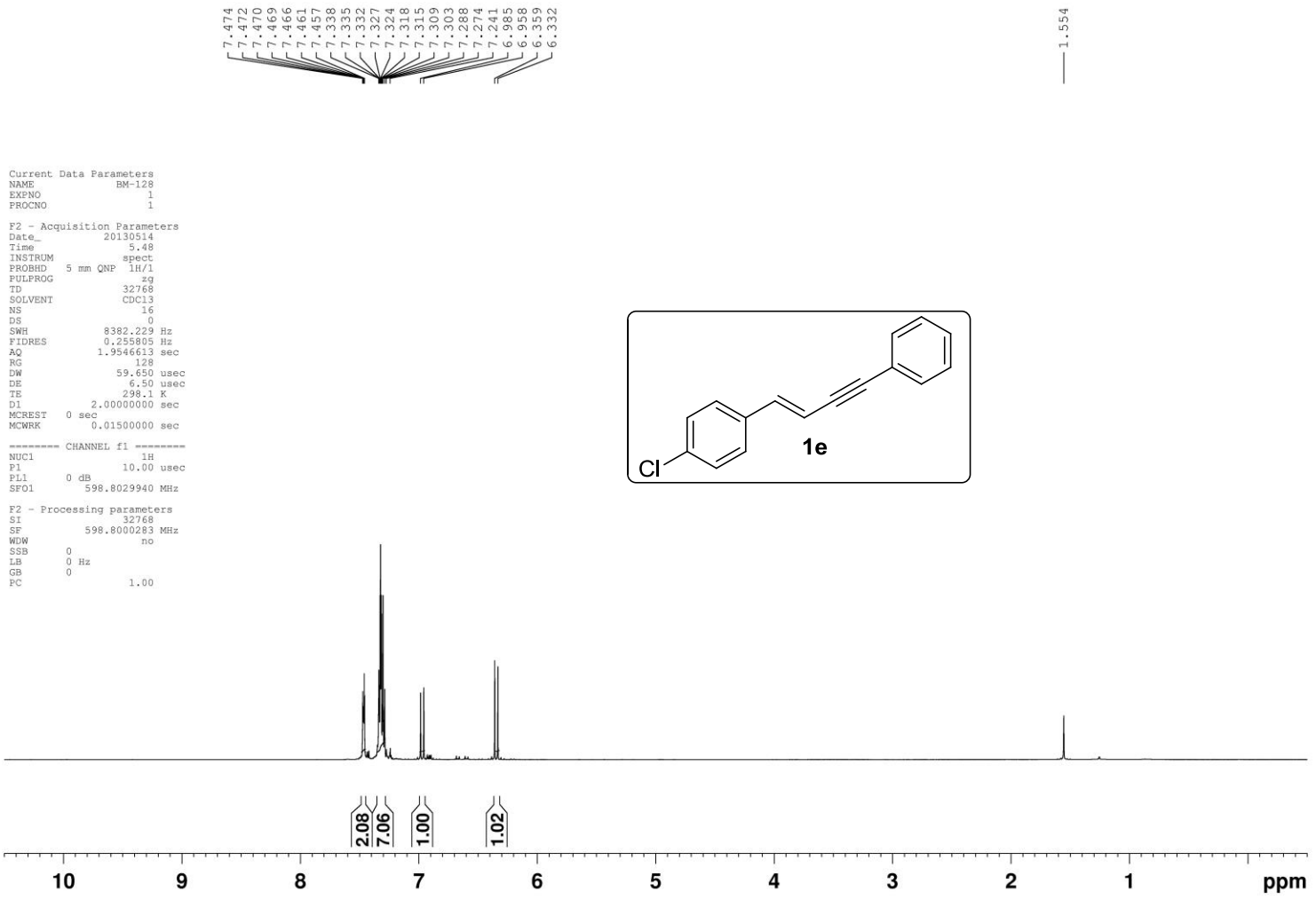


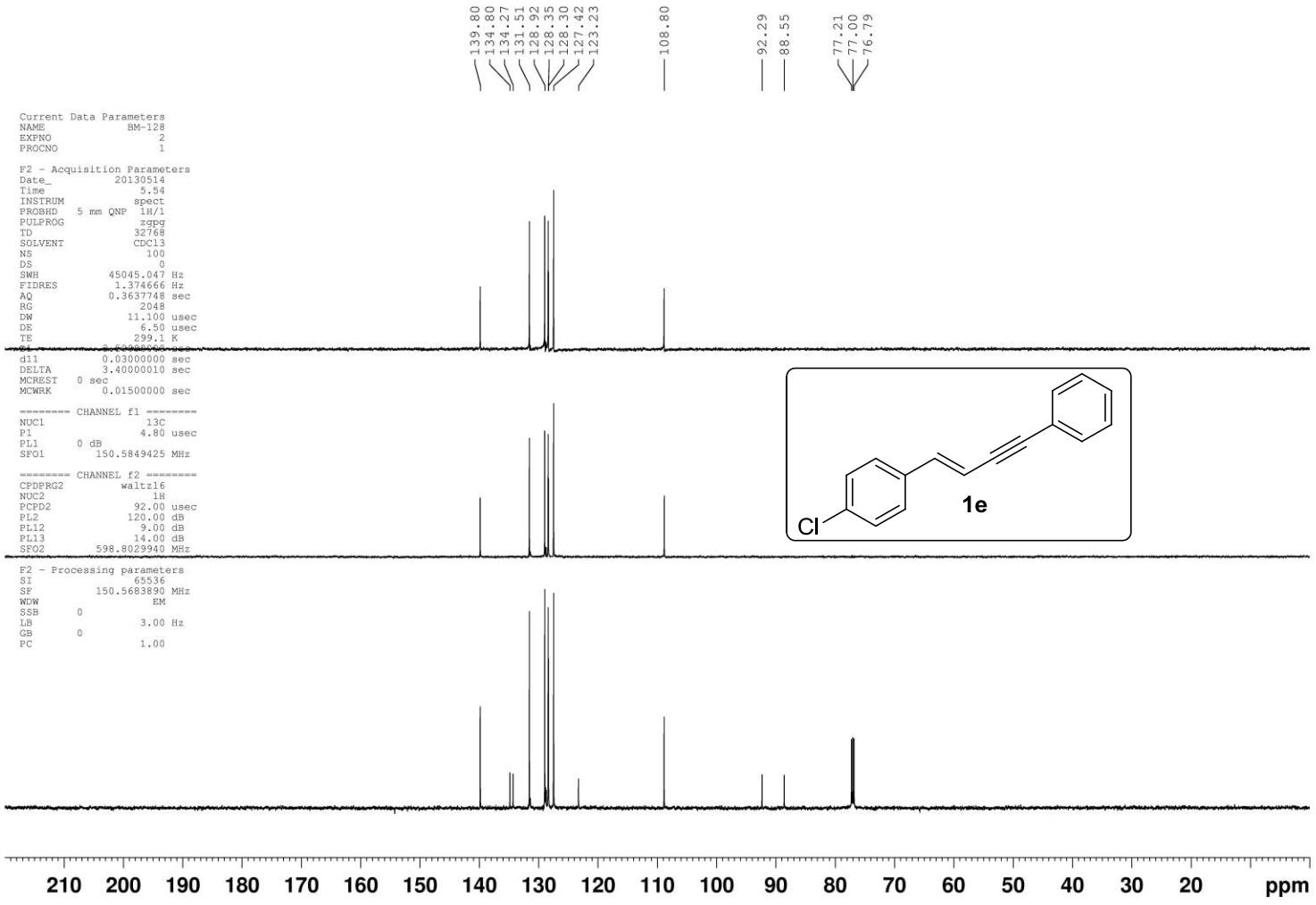
```
Current Data Parameters
NAME              BM-106
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130509
Time               12.46
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG            zgpg
TD                32768
SOLVENT           CDCl3
NS                  100
DS                    0
SWH            45045.047 Hz
FIDRES             1.374666 Hz
AQ             0.3637748 sec
RG                 2048
DW                11.100 usec
DE                 6.50 usec
TE                299.6 K
D1             3.50000000 sec
d11            0.03000000 sec
DELTA          3.40000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  4.80 usec
PL1                 0.00 dB
SFO1         150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              92.00 usec
PL2               120.00 dB
PL12                9.00 dB
PL13               14.00 dB
SFO2         598.8029940 MHz

F2 - Processing parameters
SI                  65536
SF           150.5683958 MHz
WDW                    EM
SSB                    0
LB                  3.00 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
CY                  4.50 cm
F1P              200.000 ppm
F1             30113.68 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM           10.00000 ppm/cm
HZCM          1505.68384 Hz/cm
```

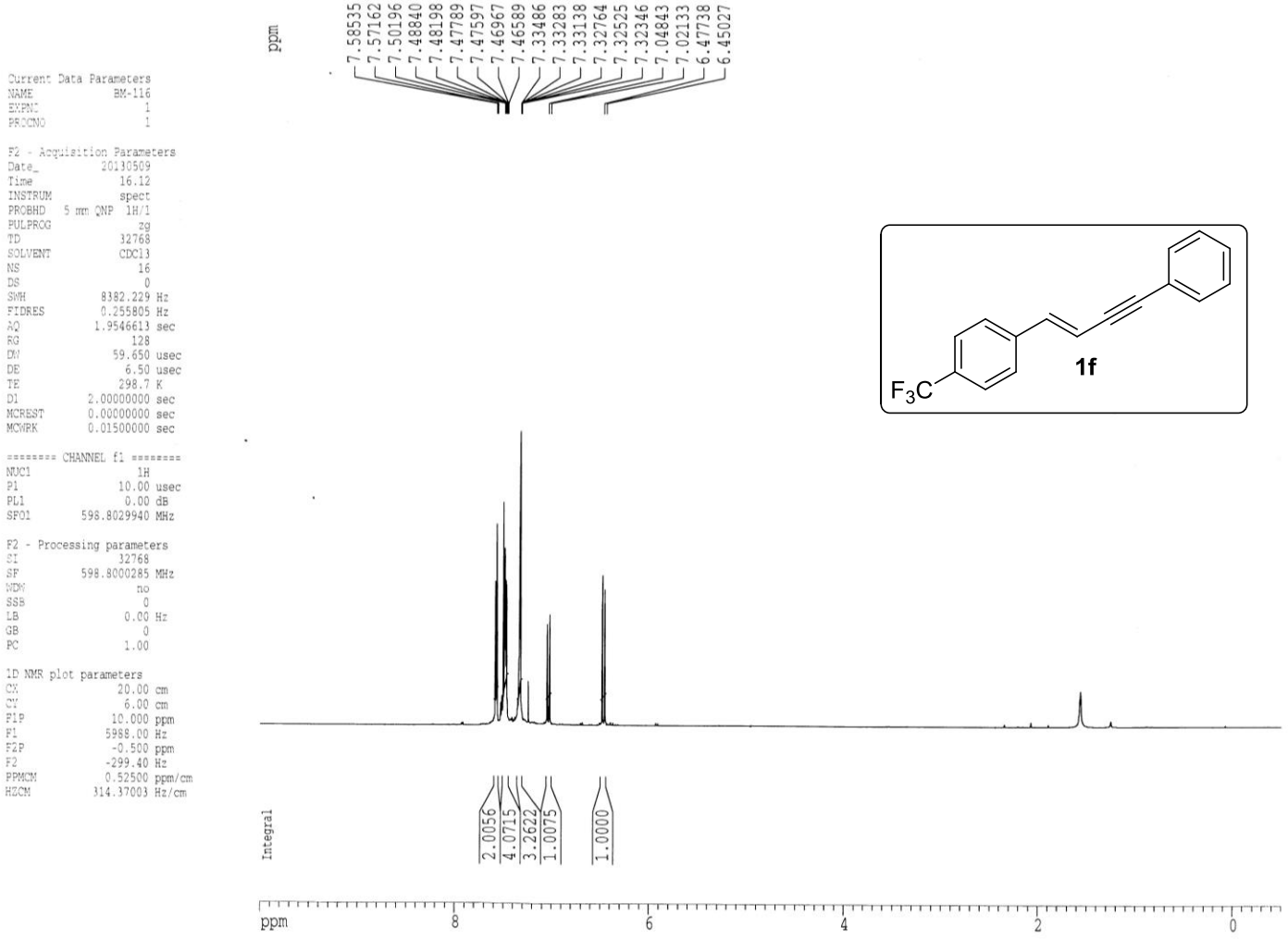


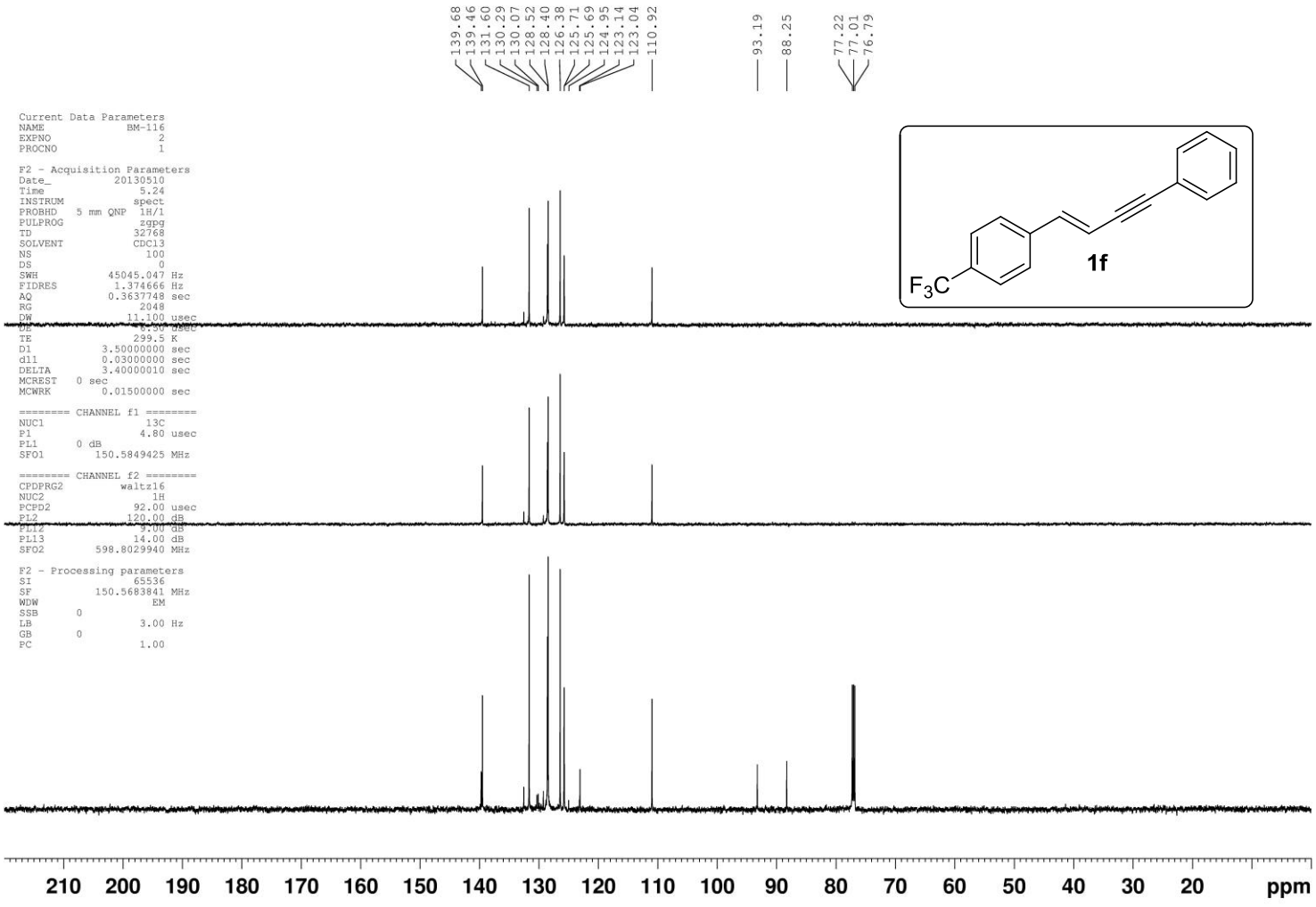

7.476
7.473
7.465
7.463
7.460
7.366
7.337
7.332
7.332
7.329
7.319
7.316
7.305
7.298
7.297
7.240
7.044
7.017
6.362
6.335
1.322
Current Data Parameters
NAME BM-02-99
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131104
Time 14.54
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 12.00 cm
F1P 7.668 ppm
F1 4590.75 Hz
F2P 6.138 ppm
F2 3675.08 Hz
PPMCM 0.07647 ppm/cm
HZCM 45.78386 Hz/cm
tBu
1d
2.14
5.01
2.25
1.00
1.14
9.54
10
9
8
7
6
5
4
3
2
1
ppm

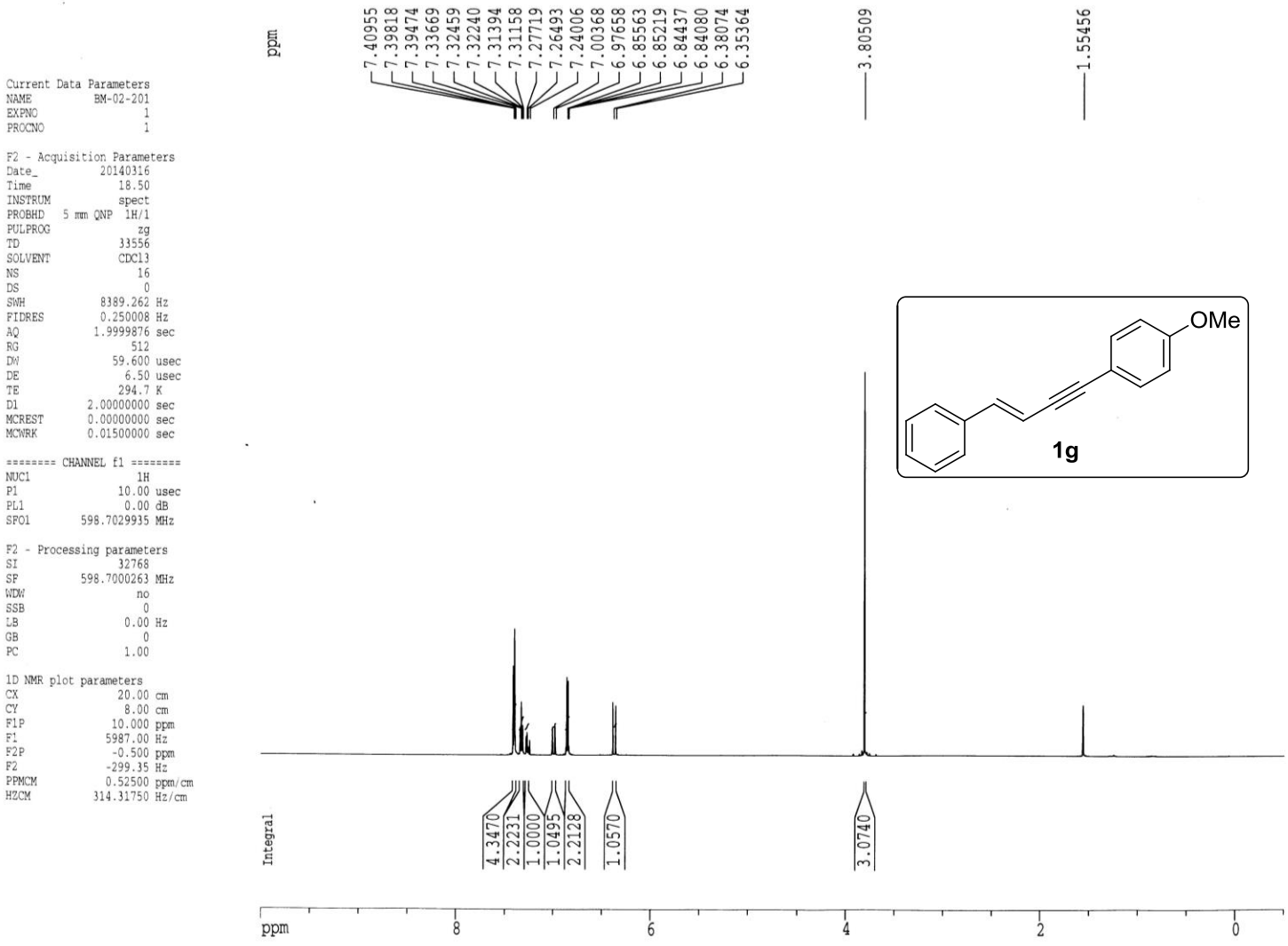

151.92
141.13
133.60
131.46
128.31
128.06
126.08
125.67
123.51
107.20
91.40
89.14
77.21
77.00
76.79
34.69
31.21
Current Data Parameters
NAME BM-02-99
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131104
Time 14.55
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 50
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 298.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7023935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432424 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 142.000 ppm
F1 21377.14 Hz
F2P 122.000 ppm
F2 18366.28 Hz
tBu
1d
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.474
7.472
7.470
7.469
7.466
7.461
7.457
7.338
7.335
7.332
7.327
7.324
7.318
7.315
7.309
7.303
7.288
7.274
7.241
6.985
6.958
6.359
6.332
1.554
Current Data Parameters
NAME BM-128
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130514
Time 5.48
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.1 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000283 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
1e
2.08
7.06
1.00
1.02
10
9
8
7
6
5
4
3
2
1
ppm

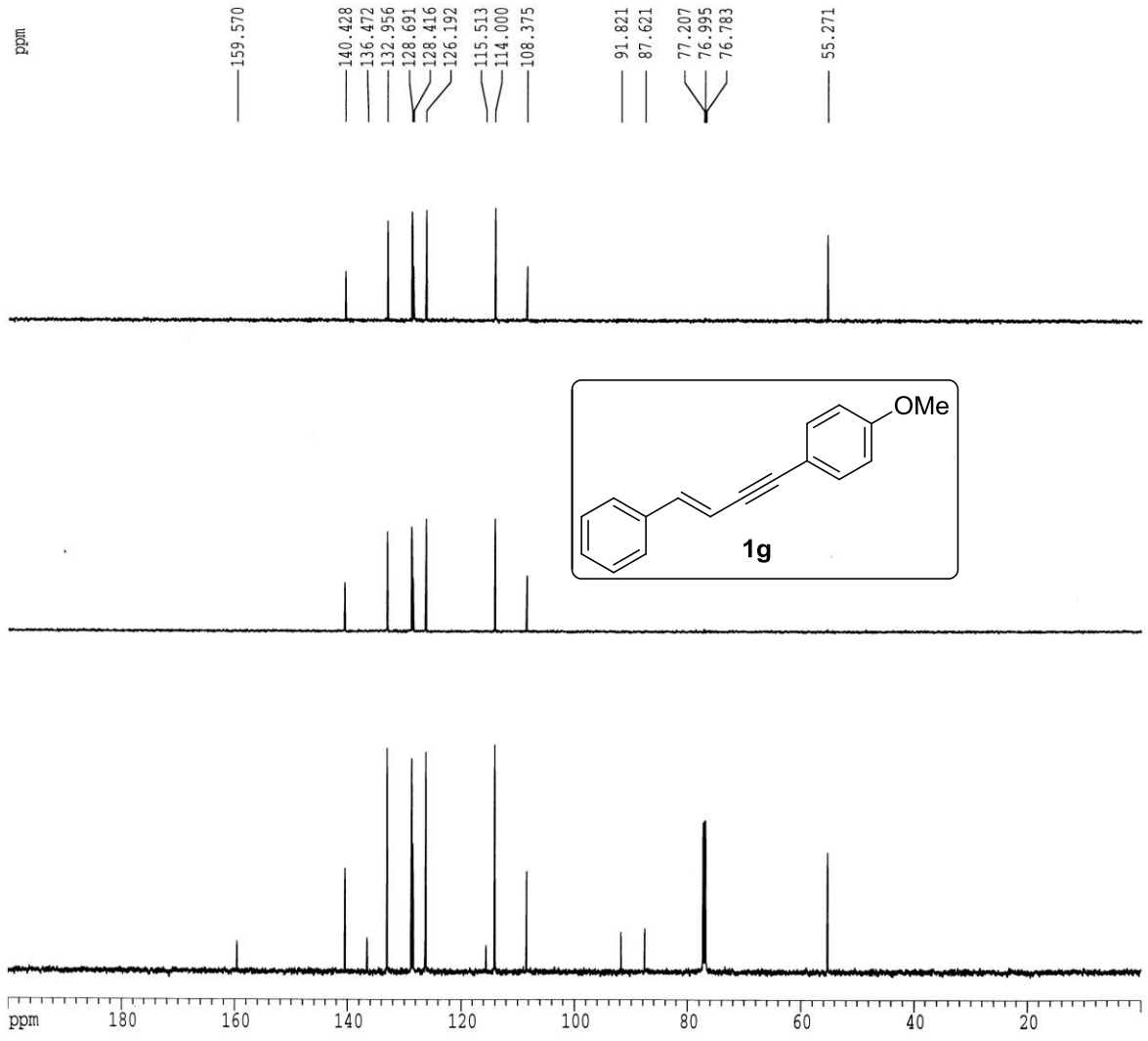

139.80
134.80
134.27
131.51
128.92
128.35
128.30
127.42
123.23
108.80
92.29
88.55
77.21
77.00
76.79
Current Data Parameters
NAME BM-128
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130514
Time 5.54
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.1 K
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683890 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
Cl
1e
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


Current Data Parameters
NAME BM-116
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130509
Time 16.12
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000285 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.58535
7.57162
7.50196
7.48840
7.48198
7.47789
7.47597
7.46967
7.46589
7.33486
7.33283
7.33138
7.32764
7.32525
7.32346
7.04843
7.02133
6.47738
6.45027
F3C
1f
Integral
2.0056
4.0715
3.2622
1.0075
1.0000
ppm
8
6
4
2
0


139.68
139.46
131.60
130.29
130.07
128.52
128.40
126.38
125.71
125.69
124.95
123.14
123.04
110.92
93.19
88.25
77.22
77.01
76.79
Current Data Parameters
NAME BM-116
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130510
Time 5.24
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
TE 299.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683841 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
F3C
1f
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


Current Data Parameters
NAME BM-02-201
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140316
Time 18.50
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 33556
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.250008 Hz
AQ 1.9999876 sec
RG 512
DW 59.600 usec
DE 6.50 usec
TE 294.7 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000263 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.40955
7.39818
7.39474
7.33669
7.32459
7.32240
7.31394
7.31158
7.27719
7.26493
7.24006
7.00368
6.97658
6.85563
6.85219
6.84437
6.84080
6.38074
6.35364
3.80509
1.55456
OMe
1g
Integral
4.3470
2.2231
1.0000
1.0495
2.2128
1.0570
3.0740
ppm
8
6
4
2
0

```
Current Data Parameters
NAME          BM-02-201
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20140316
Time              18.57
INSTRUM           spect
PROBHD   5 mm QNP  1H/1
PULPROG           zgpg
TD               32768
SOLVENT           CDCl3
NS                  100
DS                    0
SWH           45045.047 Hz
FIDRES         1.374666 Hz
AQ            0.3637748 sec
RG                 2048
DW               11.100 usec
DE                6.50 usec
TE                296.2 K
D1           3.50000000 sec
d11          0.03000000 sec
DELTA        3.40000010 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 4.80 usec
PL1                0.00 dB
SFO1        150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             92.00 usec
PL2              120.00 dB
PL12               9.00 dB
PL13              14.00 dB
SFO2        598.7029935 MHz

F2 - Processing parameters
SI                 65536
SF          150.5432418 MHz
WDW                   EM
SSB                    0
LB                  3.00 Hz
GB                     0
PC                  0.50

1D NMR plot parameters
CX                 20.00 cm
CY                  4.00 cm
F1P               200.000 ppm
F1              30108.65 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM             10.00000 ppm/cm
HZCM            1505.43237 Hz/cm
```



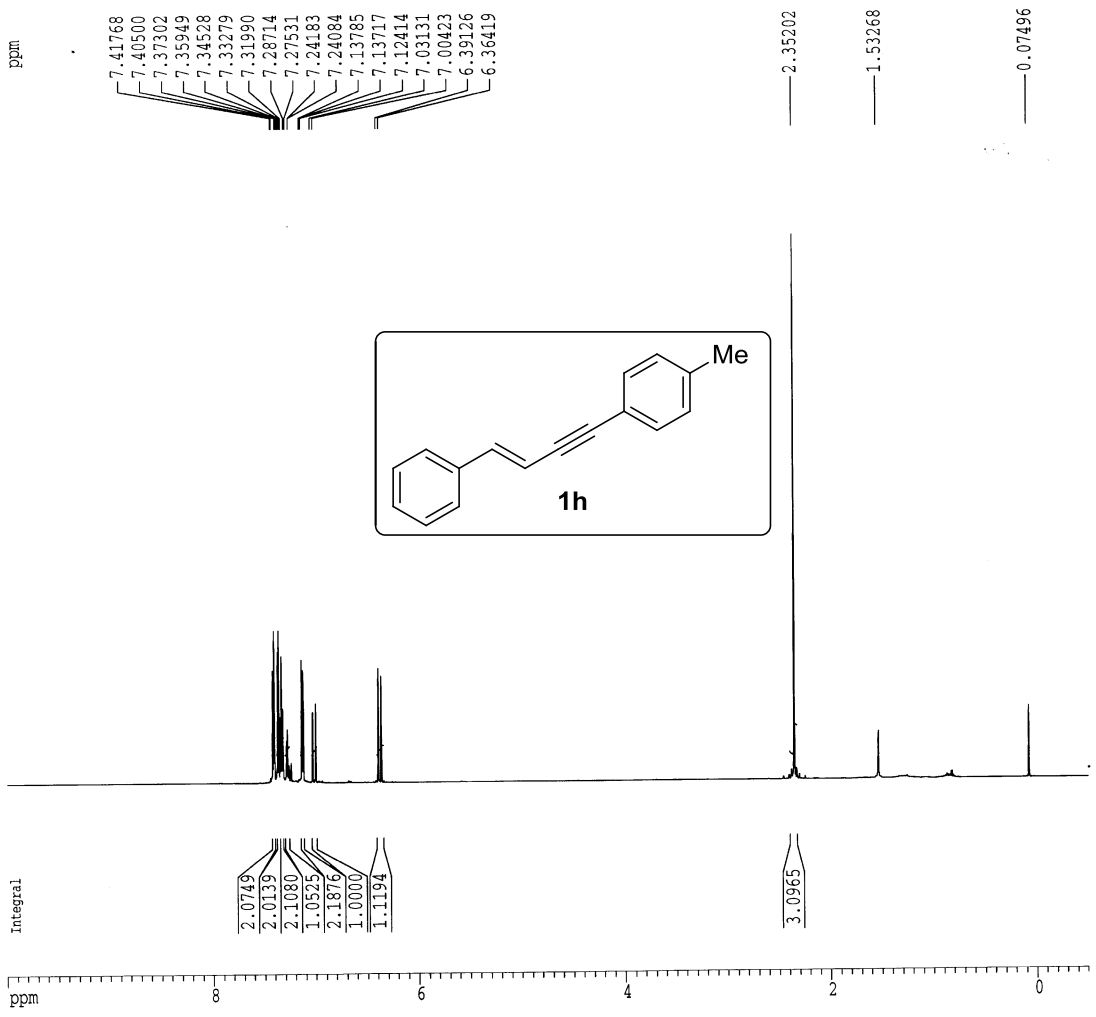
Current Data Parameters
NAME RD-1298
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130703
Time 17.14
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 256
DW 59.650 usec
DE 6.50 usec
TE 300.7 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

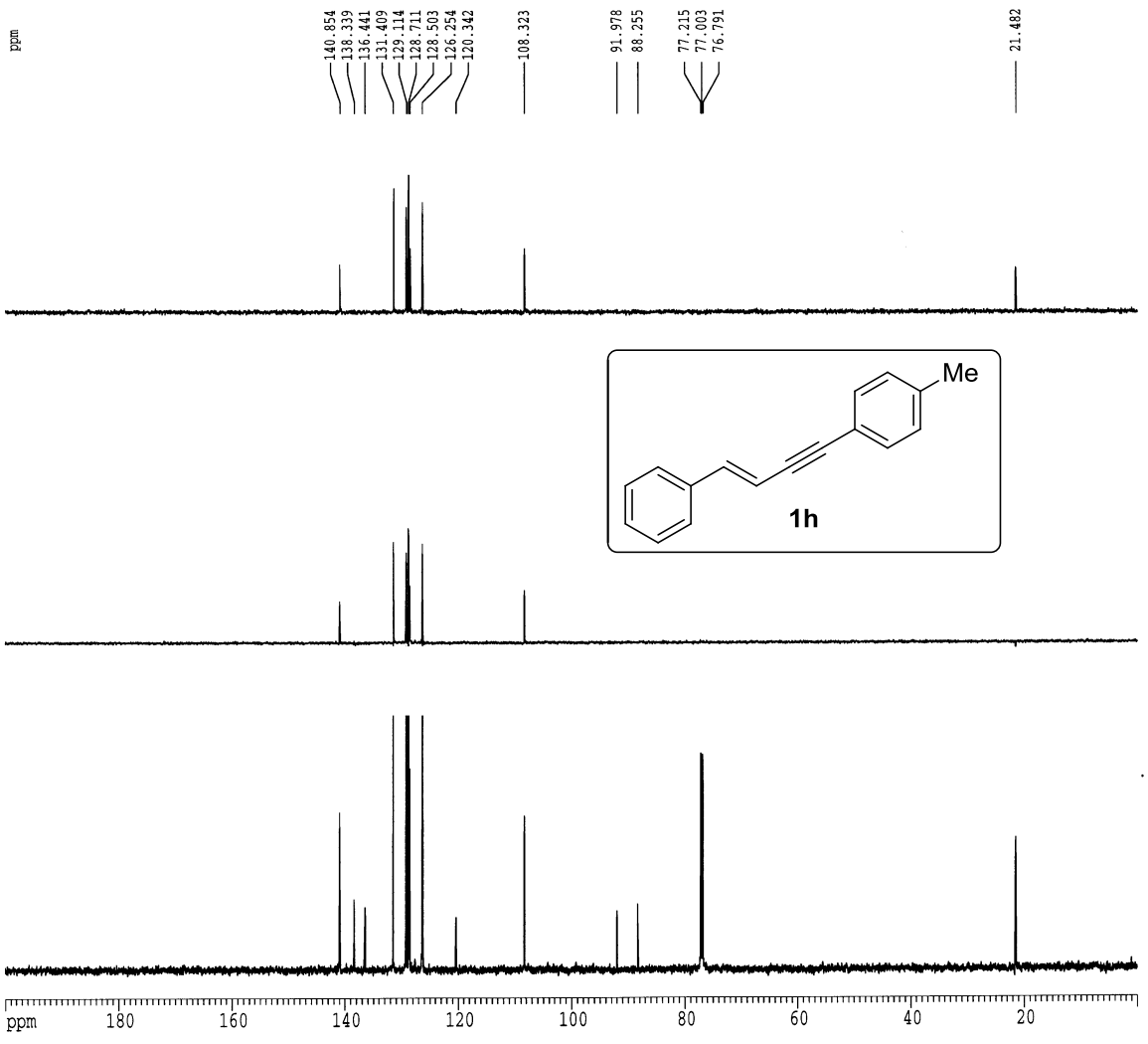
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8026946 MHz

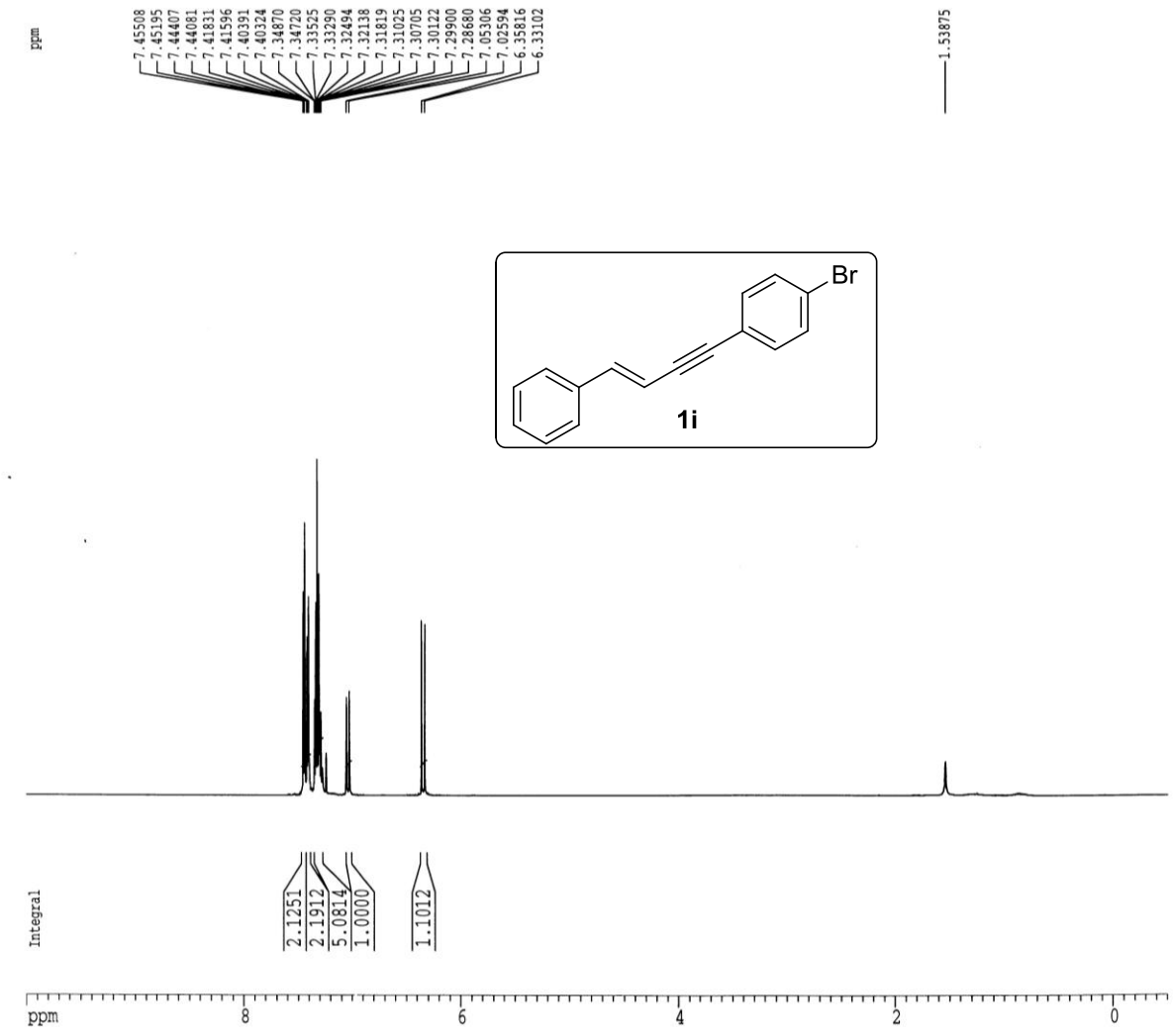
F2 - Processing parameters
SI 32768
SF 598.8000282 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm

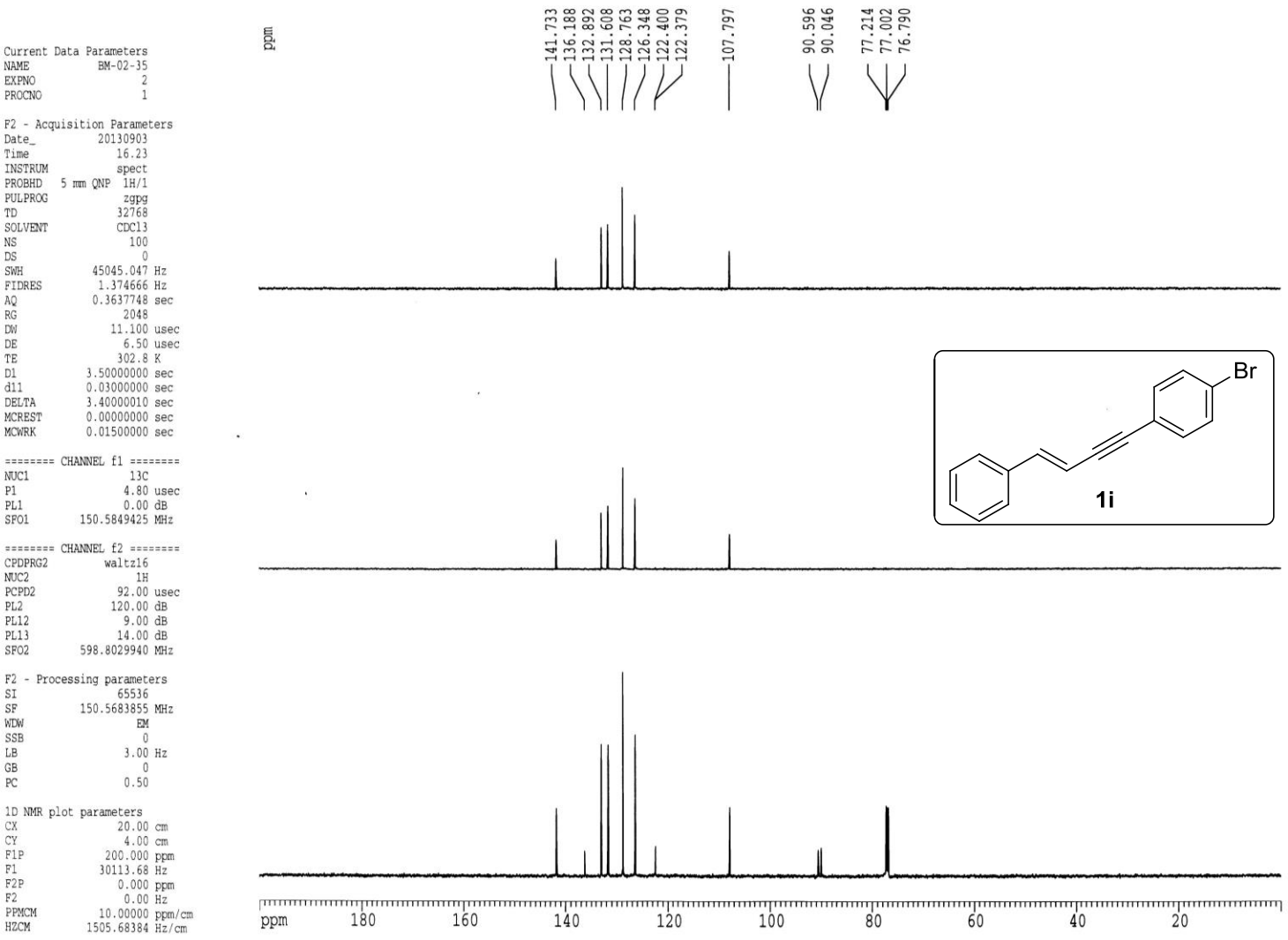


```
Current Data Parameters
NAME                  RD-1298
EXPNO                       2
PROCNO                      1

F2 - Acquisition Parameters
Date_                20130703
Time                    17.15
INSTRUM                 spect
PROBHD   5 mm QNP  1H/1
PULPROG                 zgpg
TD                      32768
SOLVENT                 CDCl3
NS                        100
DS                          0
SWH                 45045.047 Hz
FIDRES               1.374666 Hz
AQ                   0.3637748 sec
RG                       2048
DW                     11.100 usec
DE                      6.50 usec
TE                     300.8 K
D1                 3.50000000 sec
d11                0.03000000 sec
DELTA              3.40000010 sec
MCREST             0.00000000 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                      13C
P1                       4.80 usec
PL1                      0.00 dB
SFO1               150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   92.00 usec
PL2                    120.00 dB
PL12                     9.00 dB
PL13                    14.00 dB
SFO2               598.8029940 MHz

F2 - Processing parameters
SI                        65536
SF                 150.5683855 MHz
WDW                          EM
SSB                         0
LB                       3.00 Hz
GB                          0
PC                       0.50

1D NMR plot parameters
CX                      20.00 cm
CY                       6.00 cm
F1P                    200.000 ppm
F1                   30113.68 Hz
F2P                      0.000 ppm
F2                       0.00 Hz
PPMCM                 10.00000 ppm/cm
HZCM                1505.68384 Hz/cm
```

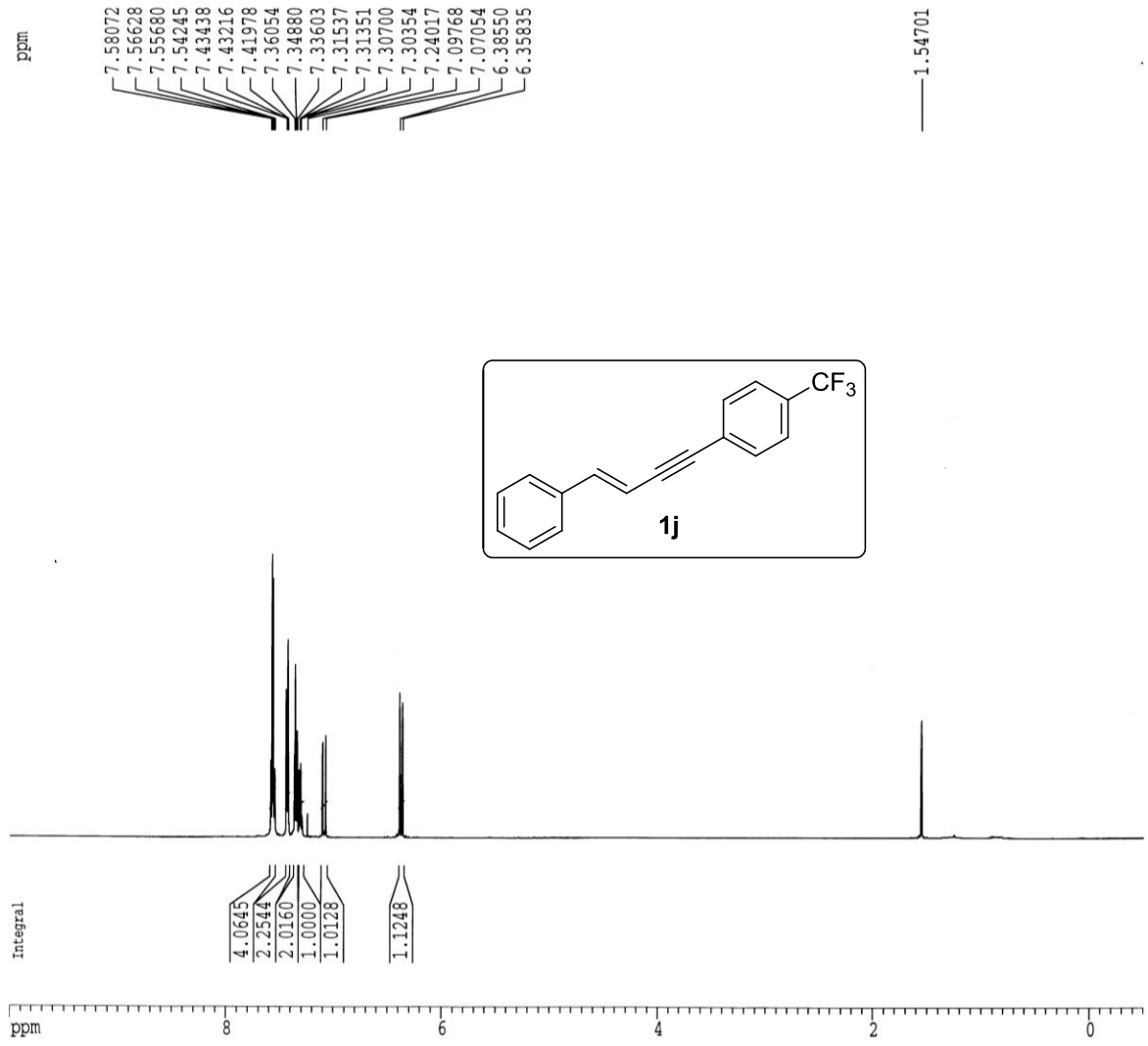


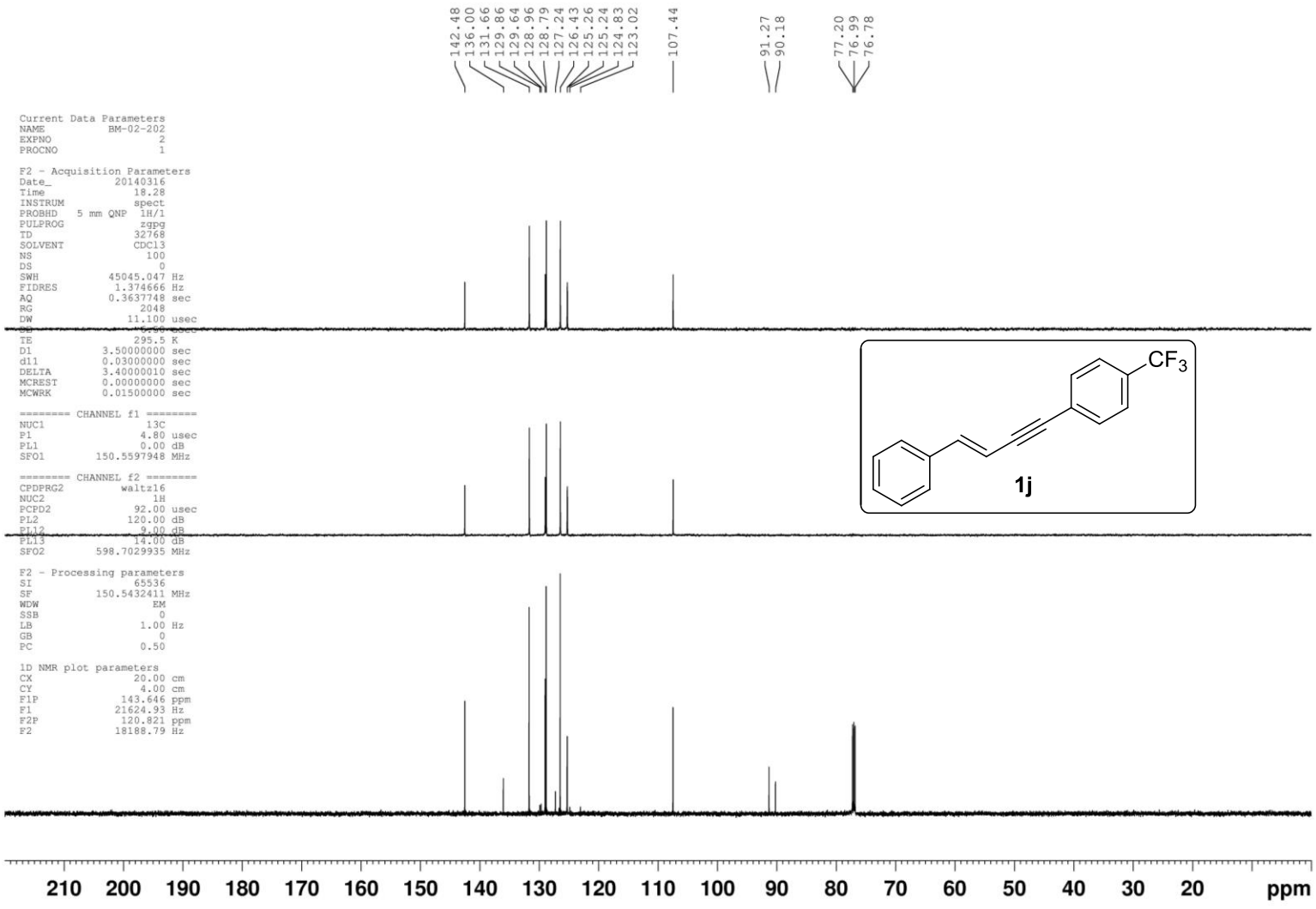



```
Current Data Parameters
NAME            BM-02-35
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130903
Time               16.16
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH             9578.544 Hz
FIDRES          0.292314 Hz
AQ             1.7105396 sec
RG                  128
DW                52.200 usec
DE                 6.50 usec
TE                301.8 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                10.00 usec
PL1                0.00 dB
SFO1        598.8041916 MHz

F2 - Processing parameters
SI                32768
SF           598.8000293 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 6.00 cm
F1P               10.000 ppm
F1              5988.00 Hz
F2P               -0.500 ppm
F2              -299.40 Hz
PPMCM           0.52500 ppm/cm
HZCM          314.37003 Hz/cm
```

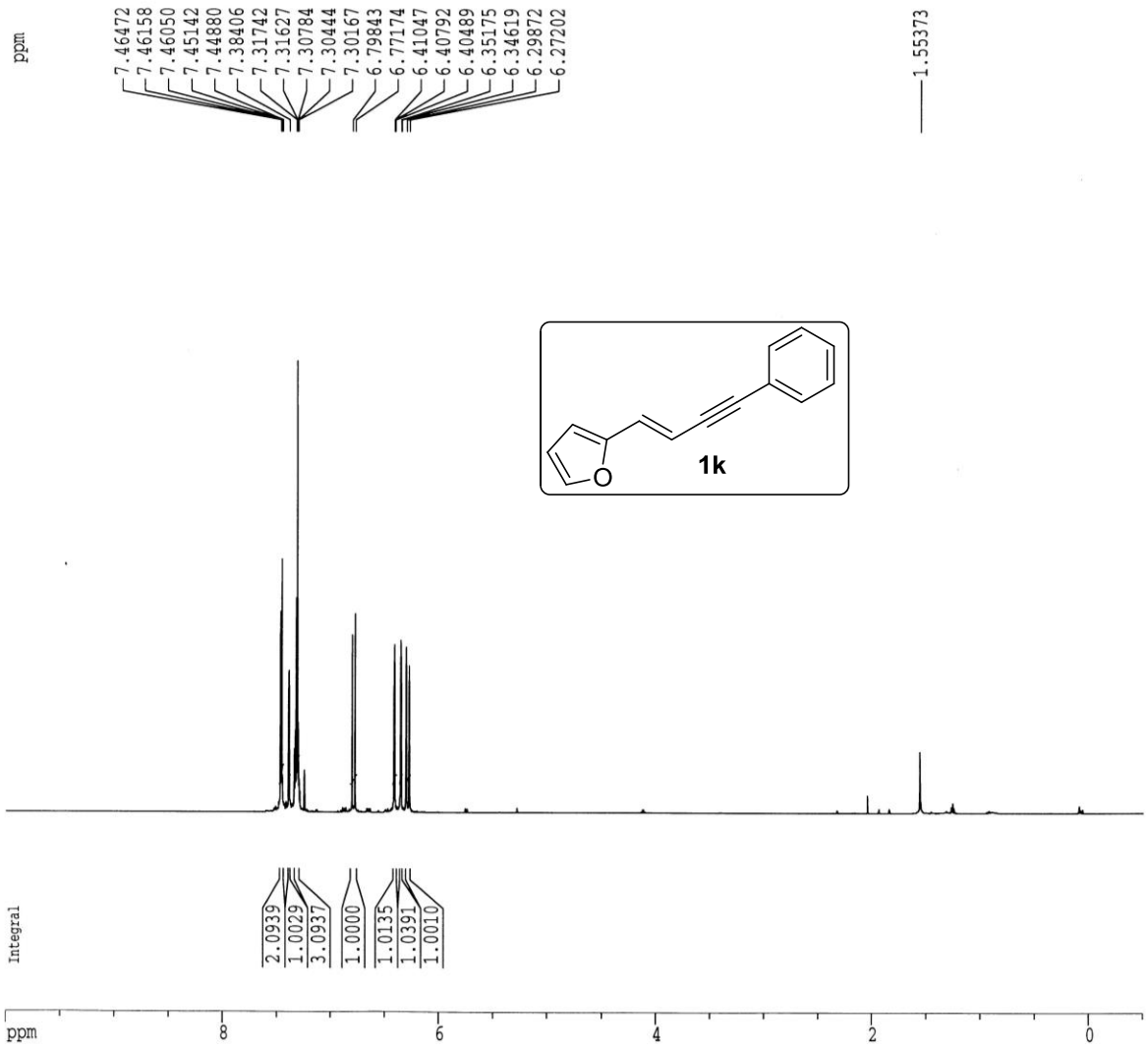

Current Data Parameters
NAME BM-02-35
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130903
Time 16.23
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 302.8 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683855 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30113.68 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.68384 Hz/cm
ppm
141.733
136.188
132.892
131.608
128.763
126.348
122.400
122.379
107.797
90.596
90.046
77.214
77.002
76.790
Br
1i
ppm
180
160
140
120
100
80
60
40
20

```
Current Data Parameters
NAME          BM-02-202
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20140316
Time              18.25
INSTRUM           spect
PROBHD   5 mm QNP  1H/1
PULPROG             zg
TD                33556
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8389.262 Hz
FIDRES        0.250008 Hz
AQ           1.9999876 sec
RG                  512
DW               59.600 usec
DE                6.50 usec
TE               294.6 K
D1           2.00000000 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                1H
P1               10.00 usec
PL1               0.00 dB
SFO1       598.7029935 MHz

F2 - Processing parameters
SI                32768
SF         598.7000261 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 5.00 cm
F1P               10.000 ppm
F1              5987.00 Hz
F2P               -0.500 ppm
F2             -299.35 Hz
PPMCM          0.52500 ppm/cm
HZCM         314.31750 Hz/cm
```

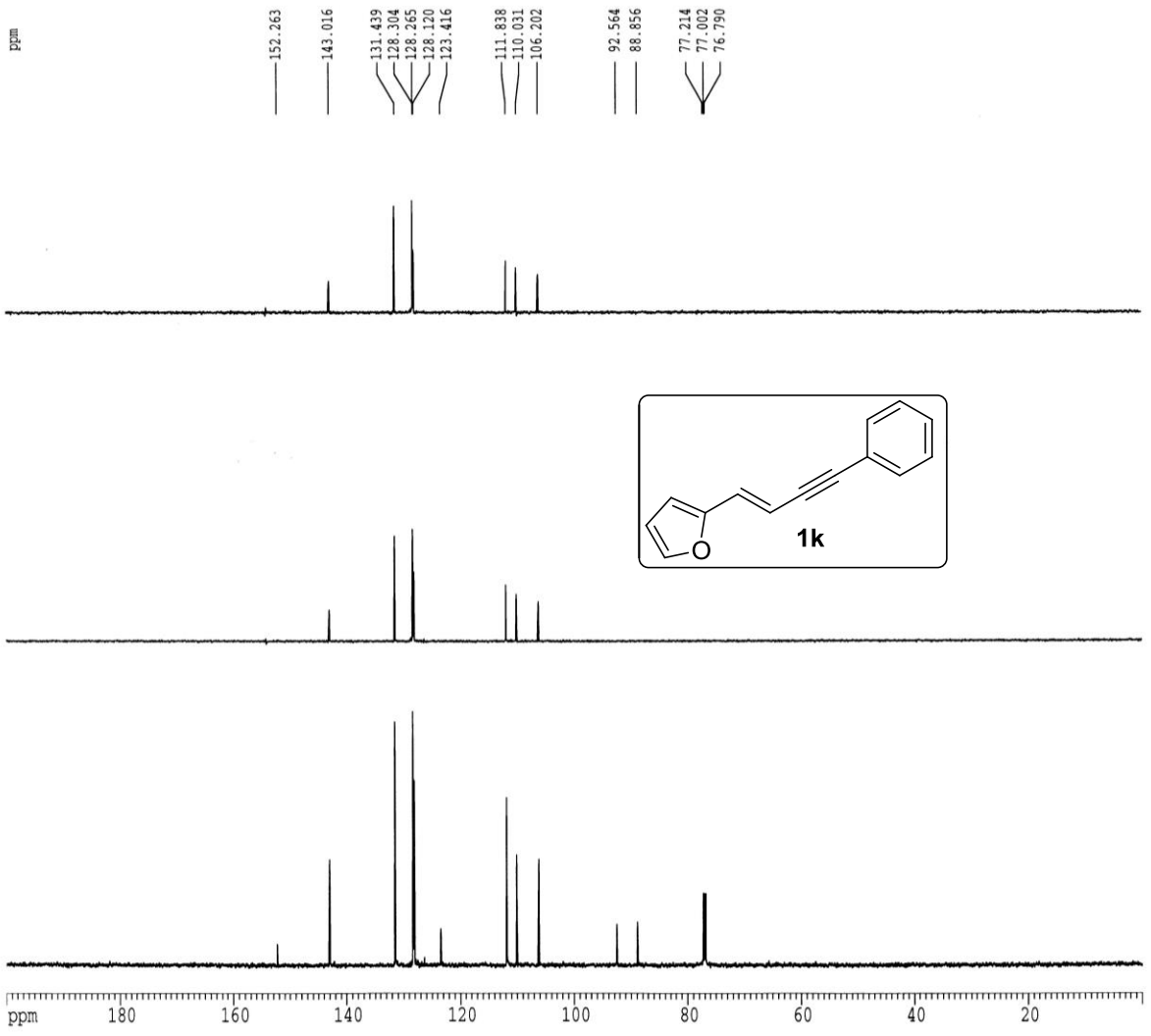


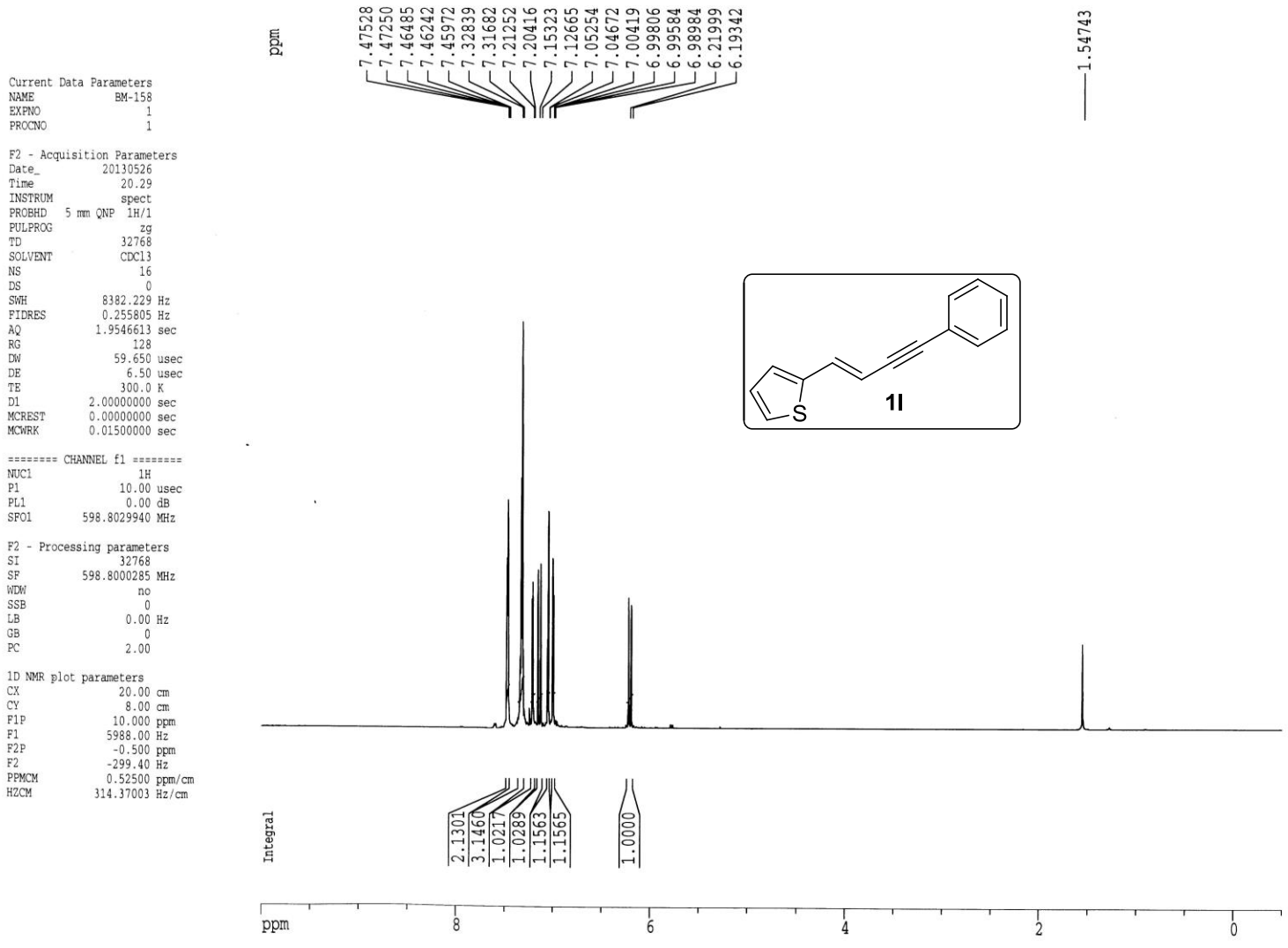

142.48
136.00
131.66
129.86
129.64
128.96
128.79
127.24
126.43
125.26
125.24
124.83
123.02
107.44
91.27
90.18
77.20
76.99
76.78
Current Data Parameters
NAME BM-02-202
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140316
Time 18.28
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 295.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432411 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 143.646 ppm
F1 21624.93 Hz
F2P 120.821 ppm
F2 18188.79 Hz
CF3
1j
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

```
Current Data Parameters
NAME                  BM-150
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20130521
Time                  17.20
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                  zg
TD                    32768
SOLVENT               CDCl3
NS                       16
DS                        0
SWH                8382.229 Hz
FIDRES                0.255805 Hz
AQ                 1.9546613 sec
RG                      128
DW                    59.650 usec
DE                     6.50 usec
TE                    299.2 K
D1                 2.00000000 sec
MCREST             0.00000000 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                      1H
P1                     10.00 usec
PL1                     0.00 dB
SFO1             598.8029940 MHz

F2 - Processing parameters
SI                    32768
SF               598.8000293 MHz
WDW                      no
SSB                       0
LB                     0.00 Hz
GB                        0
PC                     1.00

1D NMR plot parameters
CX                    20.00 cm
CY                     8.00 cm
F1P                  10.000 ppm
F1                 5988.00 Hz
F2P                  -0.500 ppm
F2                 -299.40 Hz
PPMCM                0.52500 ppm/cm
HZCM               314.37003 Hz/cm
```

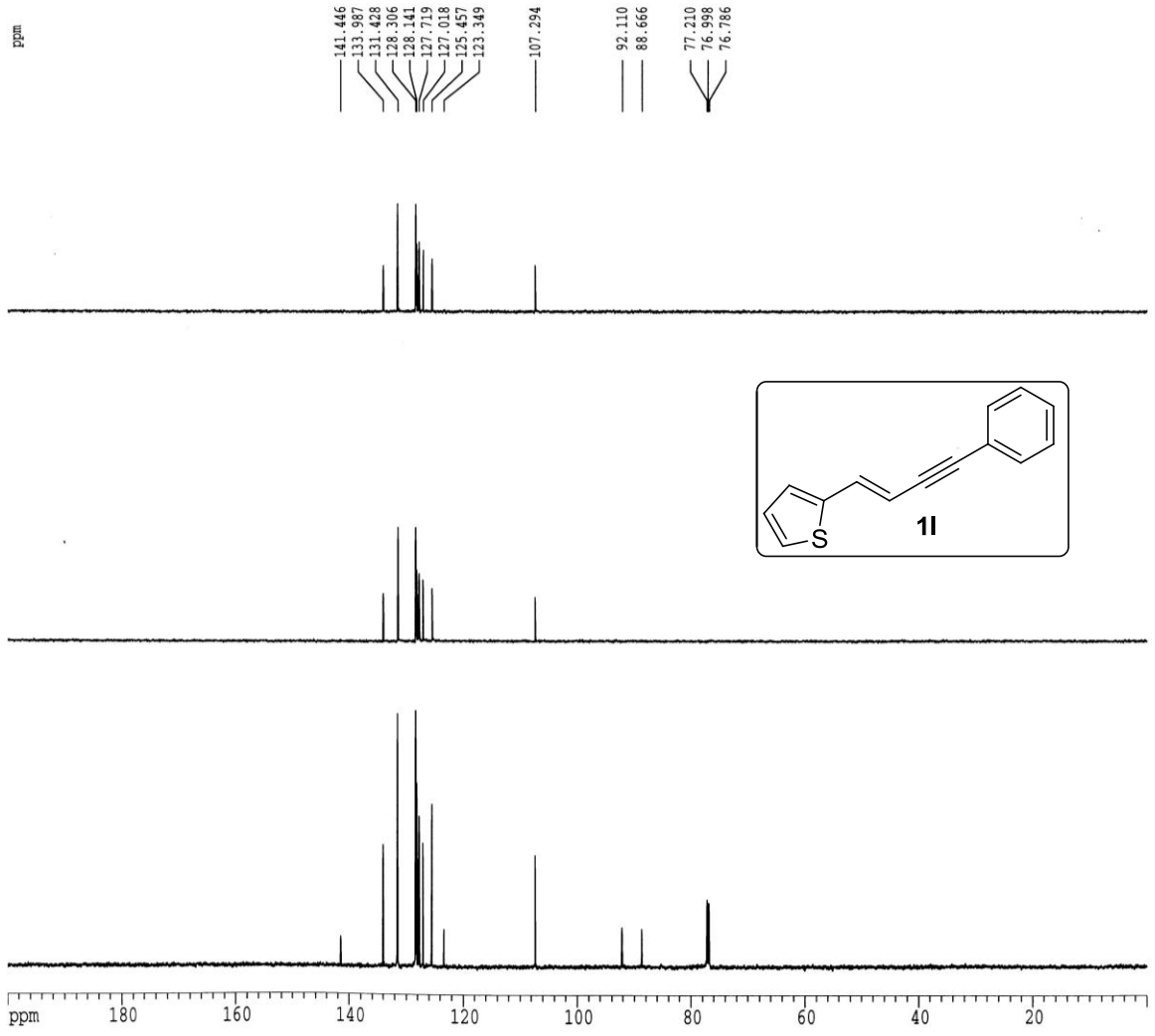


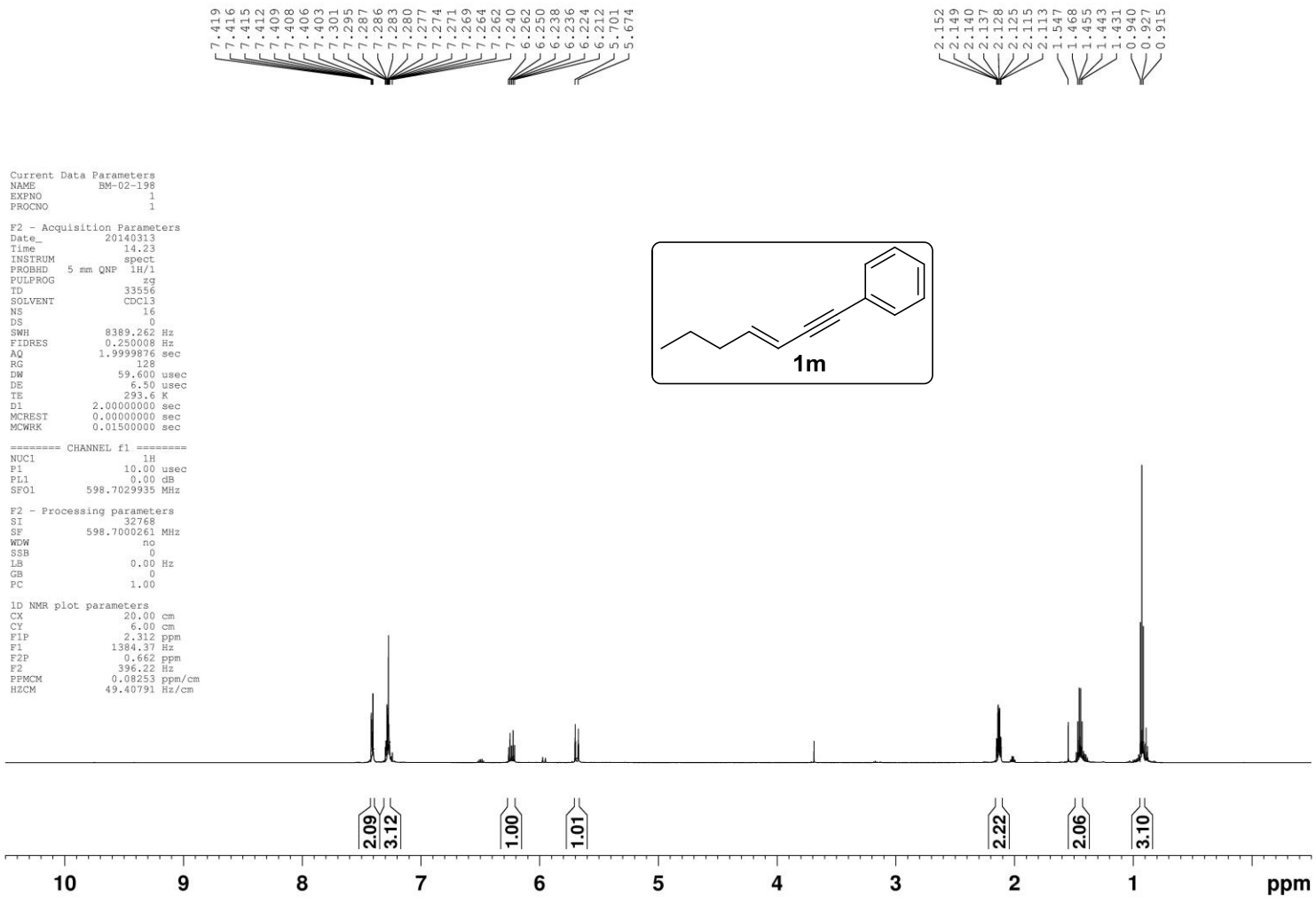
```
Current Data Parameters
NAME                  BM-150
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_               20130521
Time                   17.20
INSTRUM                spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                     32768
SOLVENT                CDCl3
NS                        51
DS                         0
SWH                45045.047 Hz
FIDRES                 1.374666 Hz
AQ                     0.3637748 sec
RG                        2048
DW                       11.100 usec
DE                        6.50 usec
TE                       299.2 K
D1                 3.50000000 sec
d11                0.03000000 sec
DELTA              3.40000010 sec
MCREST             0.00000000 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                      13C
P1                        4.80 usec
PL1                       0.00 dB
SFO1               150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    92.00 usec
PL2                      120.00 dB
PL12                       9.00 dB
PL13                      14.00 dB
SFO2               598.8029940 MHz

F2 - Processing parameters
SI                        65536
SF                 150.5683897 MHz
WDW                          EM
SSB                           0
LB                         3.00 Hz
GB                            0
PC                         1.00

1D NMR plot parameters
CX                        20.00 cm
CY                         4.50 cm
F1P                      200.000 ppm
F1                     30113.68 Hz
F2P                        0.000 ppm
F2                         0.00 Hz
PPMCM                 10.00000 ppm/cm
HZCM                1505.68384 Hz/cm
```

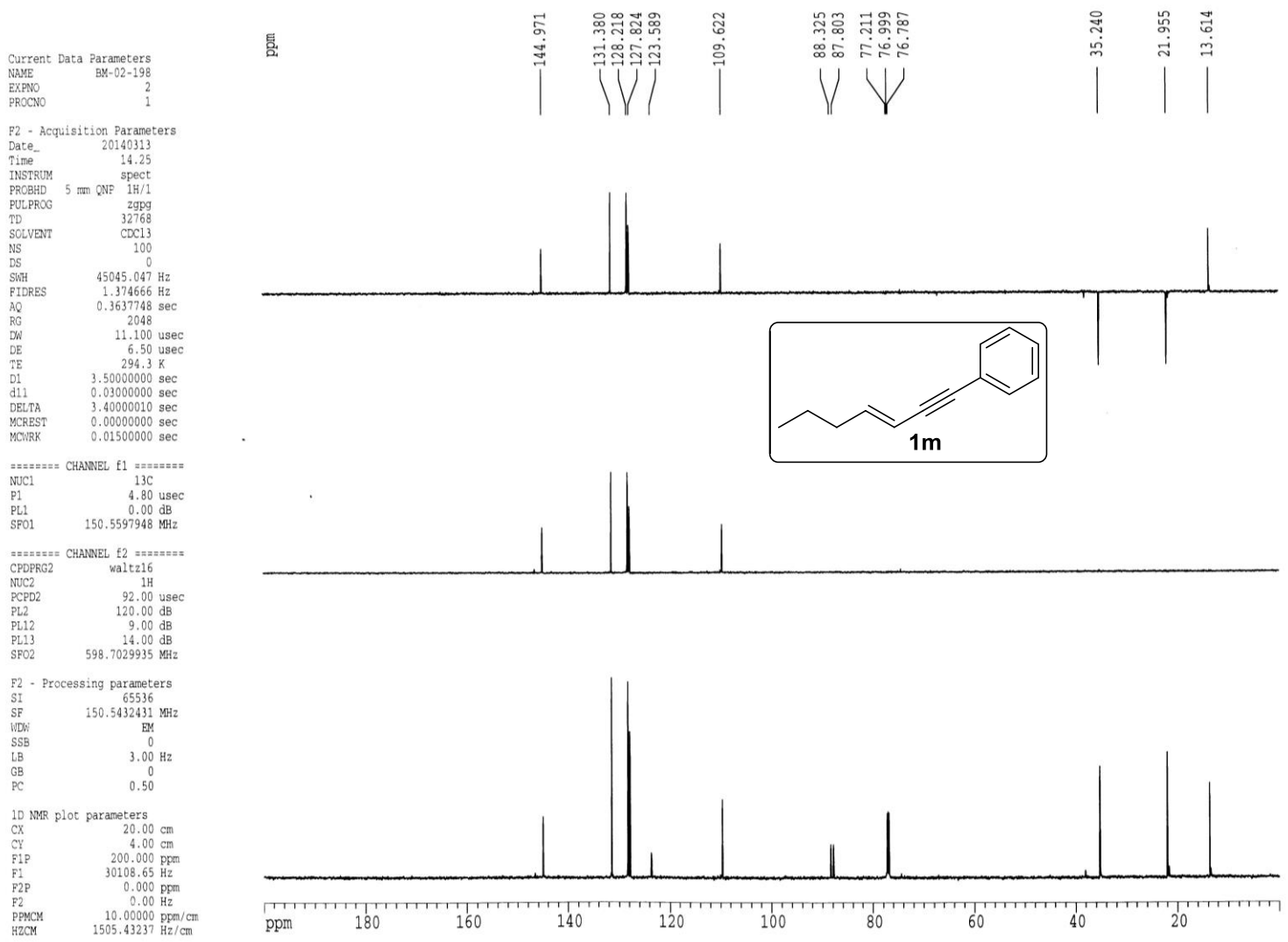


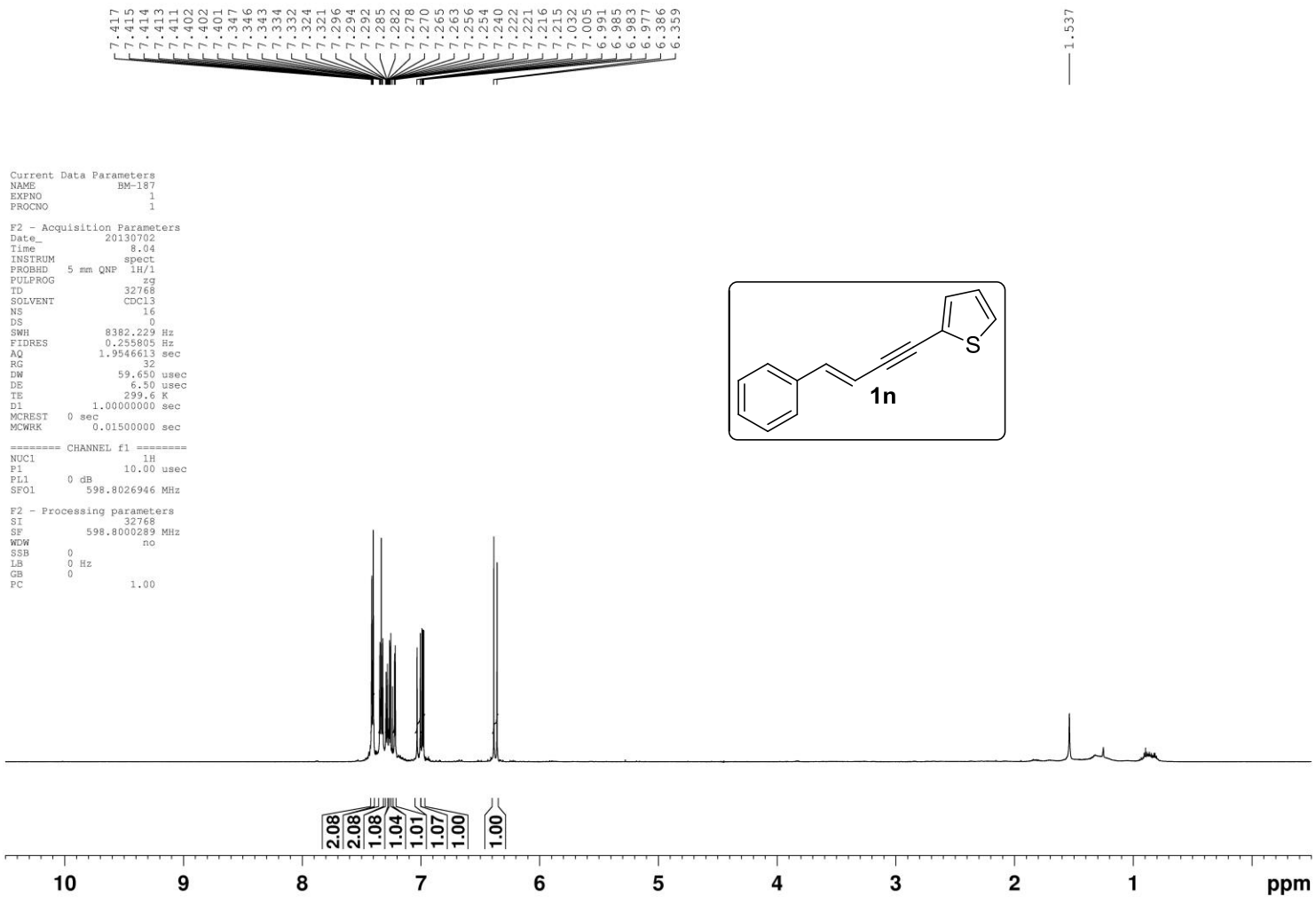

Current Data Parameters
NAME BM-158
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130526
Time 20.29
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000285 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 2.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.47528
7.47250
7.46485
7.46242
7.45972
7.32839
7.31682
7.21252
7.20416
7.15323
7.12665
7.05254
7.04672
7.00419
6.99806
6.99584
6.98984
6.21999
6.19342
1.54743
S
1l
Integral
2.1301
3.1460
1.0217
1.0289
1.1563
1.1565
1.0000
ppm
8
6
4
2
0

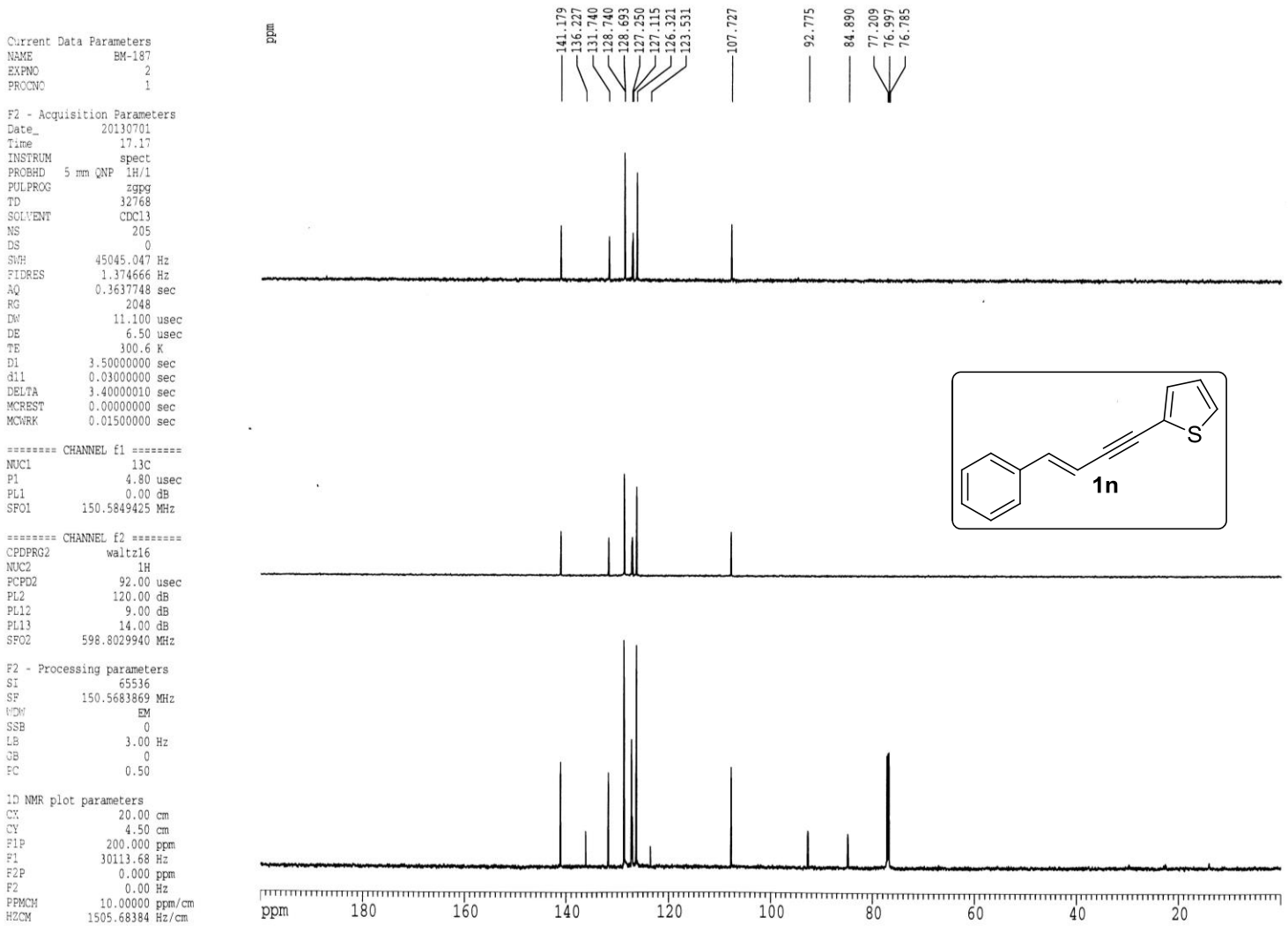
```
Current Data Parameters
NAME                  BM-158
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20130526
Time                  20.30
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                    32768
SOLVENT               CDCl3
NS                       35
DS                        0
SWH               45045.047 Hz
FIDRES             1.374666 Hz
AQ                 0.3637748 sec
RG                     2048
DW                   11.100 usec
DE                    6.50 usec
TE                   300.2 K
D1                3.50000000 sec
d11               0.03000000 sec
DELTA             3.40000010 sec
MCREST            0.00000000 sec
MCWRK             0.01500000 sec

======== CHANNEL f1 ========
NUC1                    13C
P1                    4.80 usec
PL1                   0.00 dB
SFO1            150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                92.00 usec
PL2                 120.00 dB
PL12                  9.00 dB
PL13                 14.00 dB
SFO2            598.8029940 MHz

F2 - Processing parameters
SI                     65536
SF              150.5683945 MHz
WDW                       EM
SSB                        0
LB                    3.00 Hz
GB                         0
PC                    1.00

1D NMR plot parameters
CX                    20.00 cm
CY                     4.50 cm
F1P                  200.000 ppm
F1                 30113.68 Hz
F2P                    0.000 ppm
F2                     0.00 Hz
PPMCM                10.00000 ppm/cm
HZCM              1505.68384 Hz/cm
```

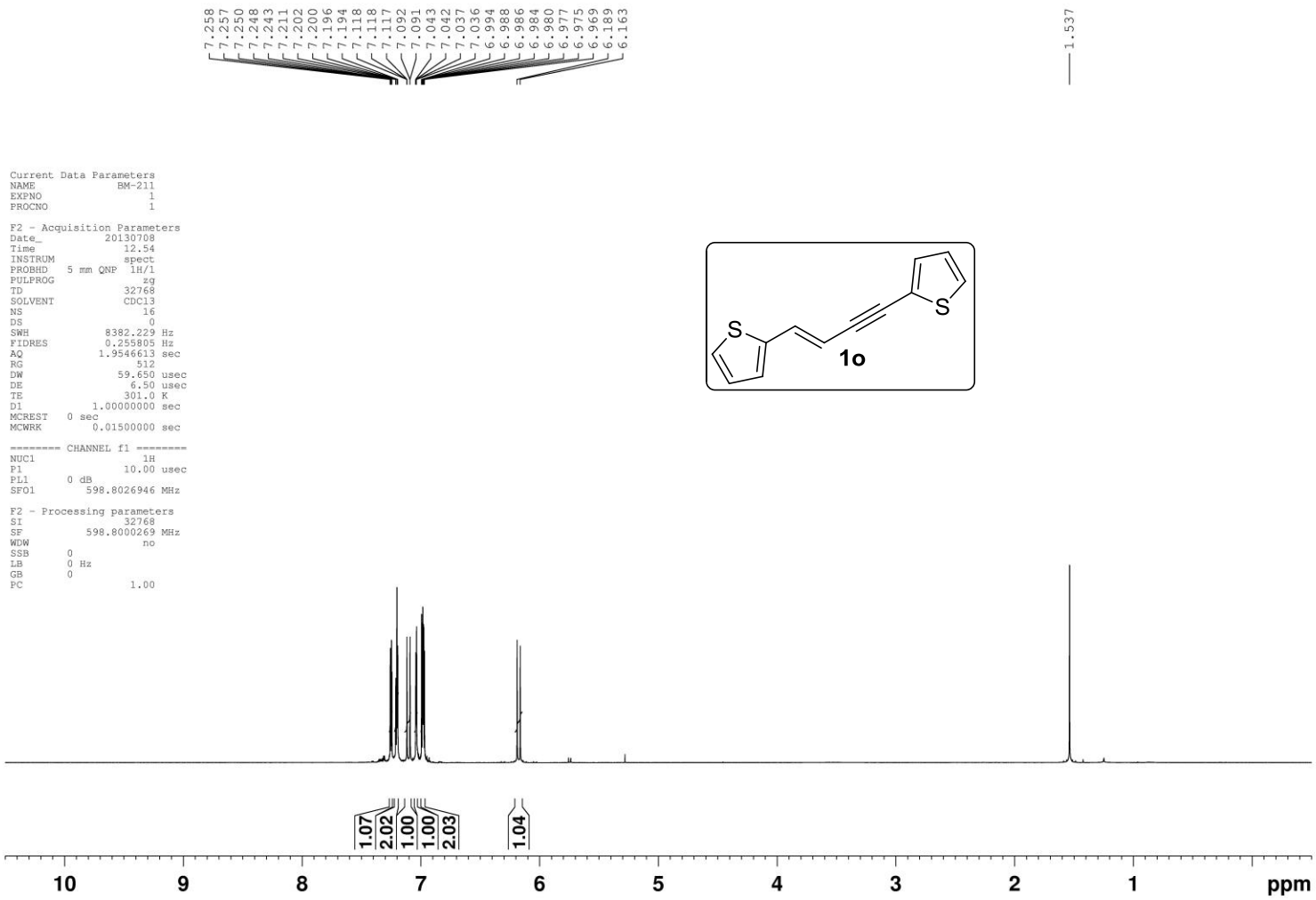



7.419
7.416
7.415
7.412
7.409
7.408
7.406
7.403
7.301
7.295
7.287
7.286
7.283
7.280
7.277
7.274
7.271
7.269
7.264
7.262
7.240
6.262
6.250
6.238
6.236
6.224
6.212
5.701
5.674
2.152
2.149
2.140
2.137
2.128
2.125
2.115
2.113
1.547
1.468
1.455
1.443
1.431
0.940
0.927
0.915
Current Data Parameters
NAME BM-02-198
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140313
Time 14.23
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 33556
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.250008 Hz
AQ 1.9999876 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 293.6 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 2.312 ppm
F1 1384.37 Hz
F2P 0.662 ppm
F2 396.22 Hz
PPMCM 0.08253 ppm/cm
HZCM 49.40791 Hz/cm
1m
2.09
3.12
1.00
1.01
2.22
2.06
3.10
10
9
8
7
6
5
4
3
2
1
ppm

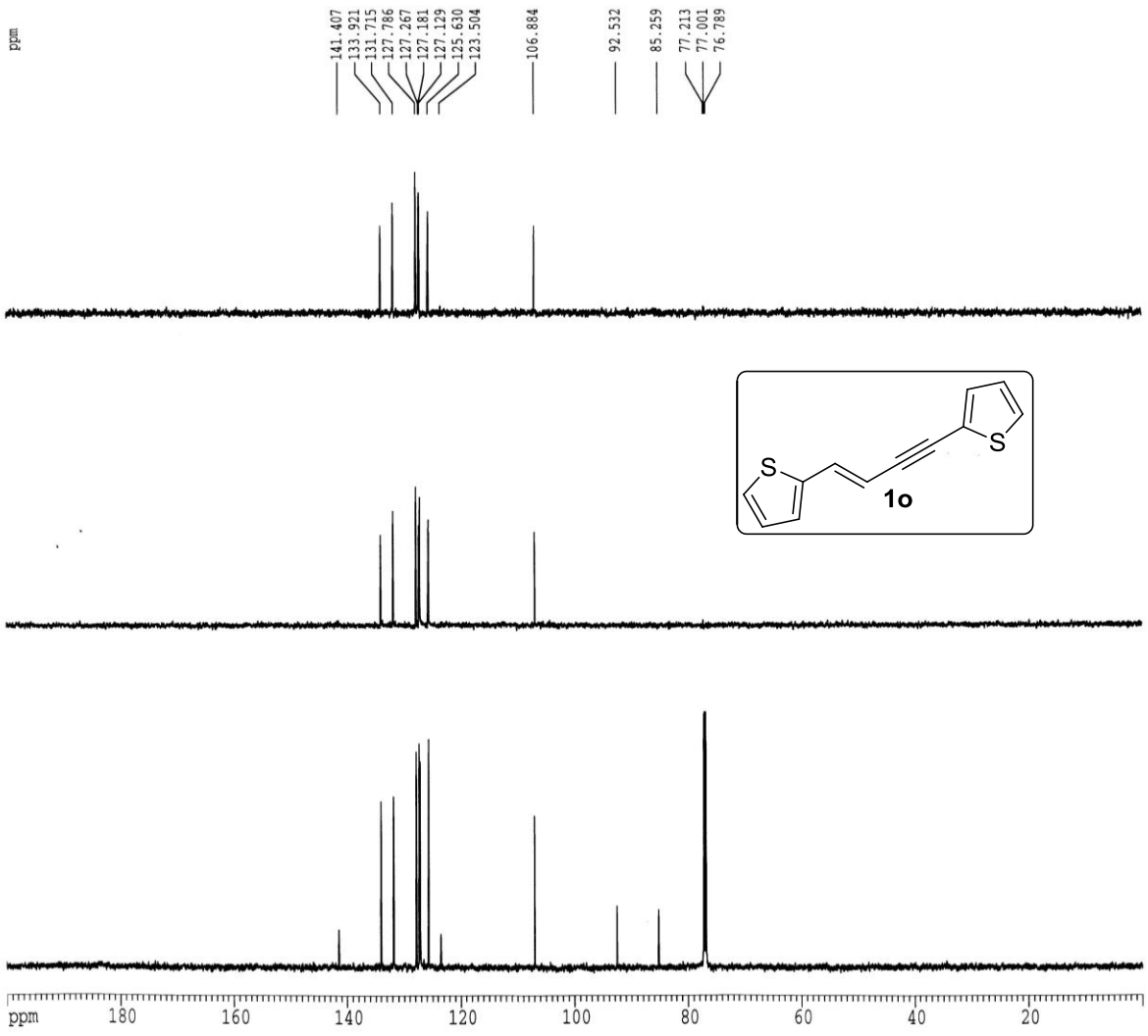

Current Data Parameters
NAME BM-02-198
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140313
Time 14.25
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 294.3 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432431 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30108.65 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.43237 Hz/cm
ppm
144.971
131.380
128.218
127.824
123.589
109.622
88.325
87.803
77.211
76.999
76.787
35.240
21.955
13.614
1m
ppm
180
160
140
120
100
80
60
40
20


7.417
7.415
7.414
7.413
7.411
7.402
7.402
7.401
7.347
7.346
7.343
7.334
7.332
7.324
7.321
7.296
7.294
7.292
7.285
7.282
7.278
7.270
7.265
7.263
7.256
7.254
7.240
7.222
7.221
7.216
7.215
7.032
7.005
6.991
6.985
6.983
6.977
6.386
6.359
1.537
Current Data Parameters
NAME BM-187
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130702
Time 8.04
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 32
DW 59.650 usec
DE 6.50 usec
TE 299.6 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8026946 MHz
F2 - Processing parameters
SI 32768
SF 598.8000289 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
S
1n
2.08
2.08
1.08
1.04
1.01
1.07
1.00
1.00
10
9
8
7
6
5
4
3
2
1
ppm

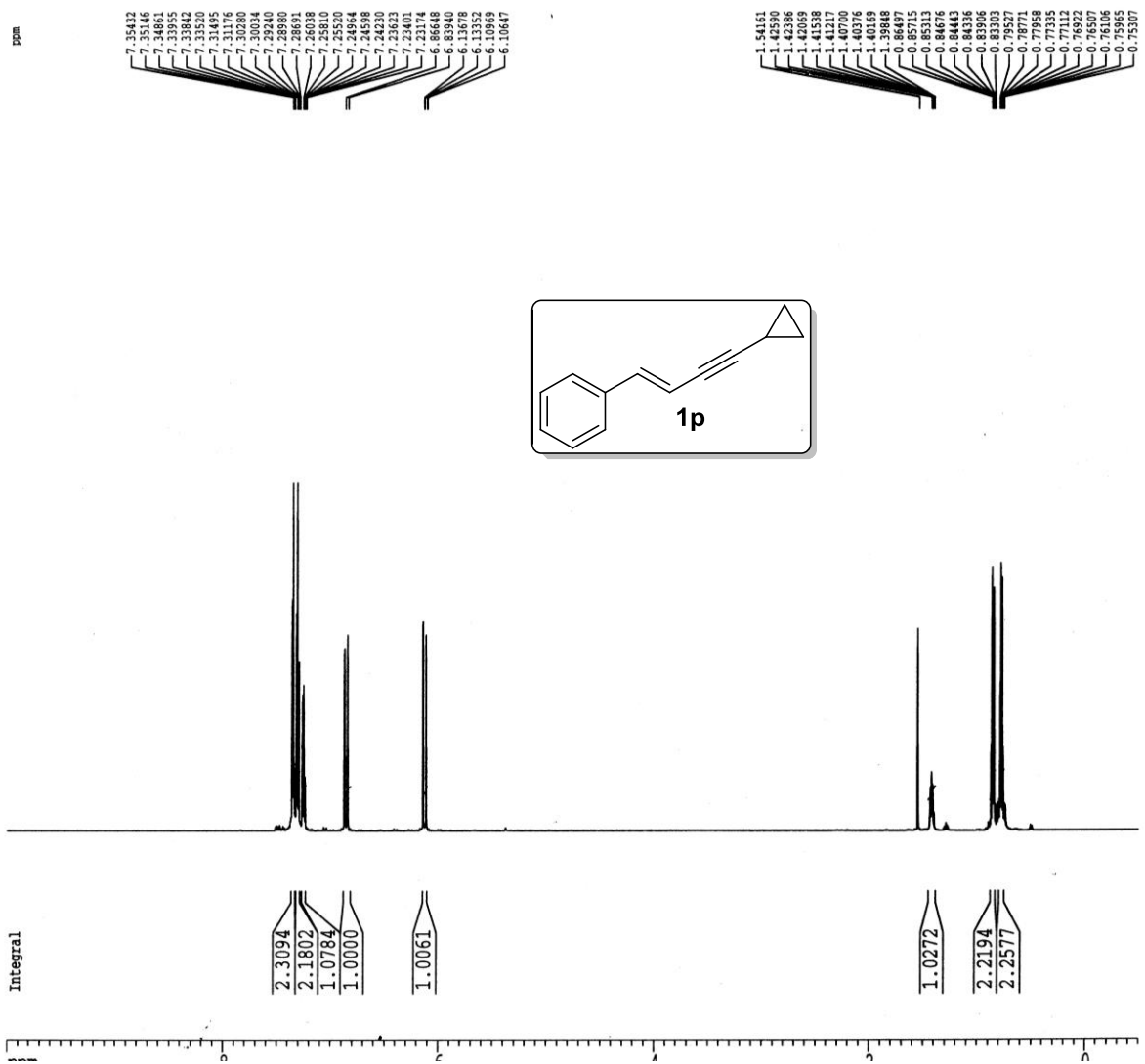

Current Data Parameters
NAME BM-187
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130701
Time 17.17
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 205
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 300.6 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683869 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.50 cm
F1P 200.000 ppm
F1 30113.68 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.68384 Hz/cm
ppm
141.179
136.227
131.740
128.740
128.693
127.250
127.115
126.321
123.531
107.727
92.775
84.890
77.209
76.997
76.785
S
1n
ppm
180
160
140
120
100
80
60
40
20


7.258
7.257
7.250
7.248
7.243
7.211
7.202
7.200
7.196
7.194
7.118
7.118
7.117
7.092
7.091
7.043
7.042
7.037
7.036
6.994
6.988
6.986
6.984
6.980
6.977
6.975
6.969
6.189
6.163
1.537
Current Data Parameters
NAME BM-211
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130708
Time 12.54
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 512
DW 59.650 usec
DE 6.50 usec
TE 301.0 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8026946 MHz
F2 - Processing parameters
SI 32768
SF 598.8000269 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
S
S
1o
1.07
2.02
1.00
1.00
2.03
1.04
10
9
8
7
6
5
4
3
2
1
ppm

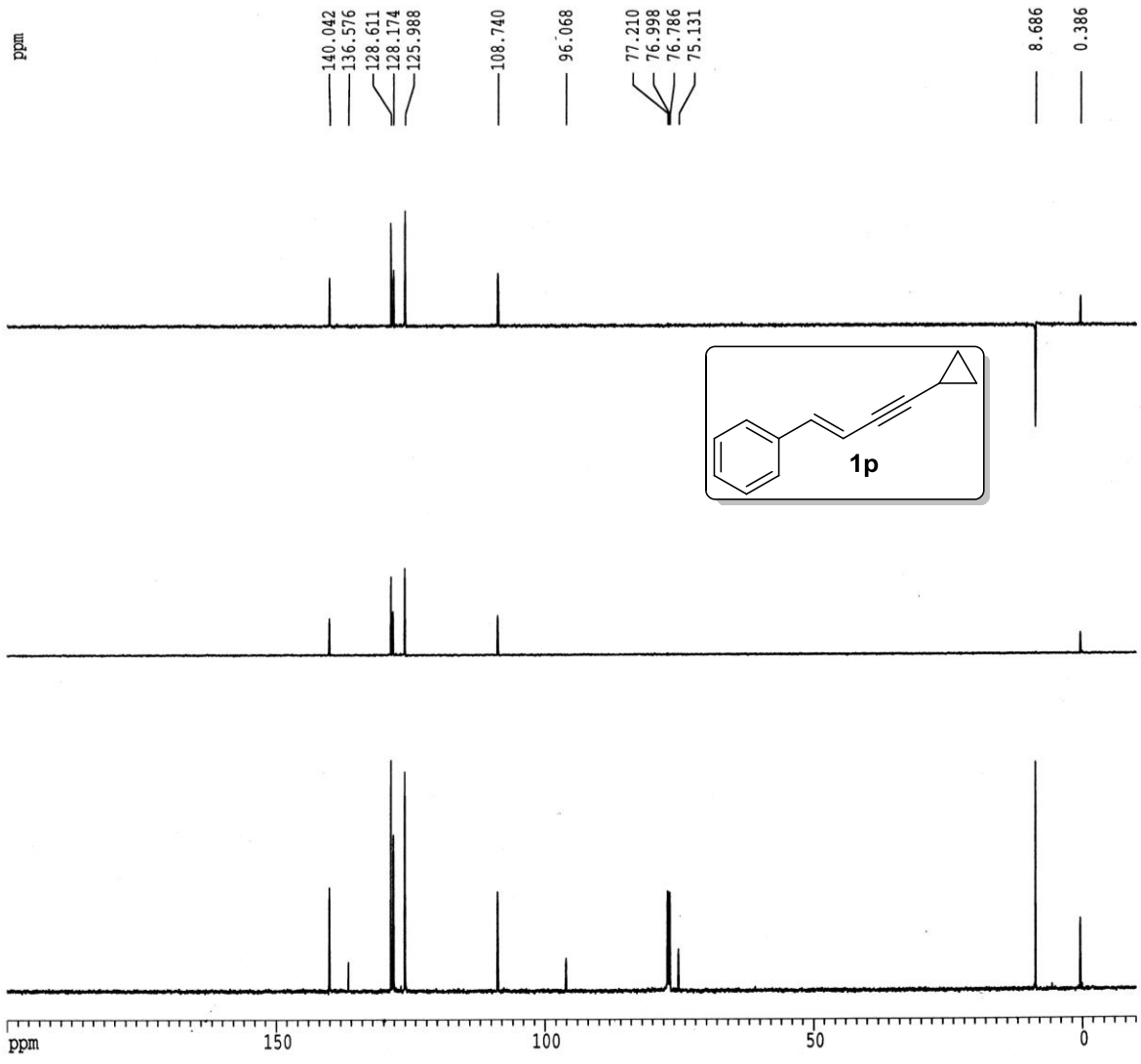
```
Current Data Parameters
NAME                  BM-211
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20130707
Time                  16.08
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                    32768
SOLVENT               CDCl3
NS                      325
DS                        0
SWH               45045.047 Hz
FIDRES                1.374666 Hz
AQ                0.3637748 sec
RG                     2048
DW                   11.100 usec
DE                    6.50 usec
TE                   300.6 K
D1              3.50000000 sec
d11             0.03000000 sec
DELTA           3.40000010 sec
MCREST          0.00000000 sec
MCWRK           0.01500000 sec

======== CHANNEL f1 ========
NUC1                    13C
P1                    4.80 usec
PL1                   0.00 dB
SFO1           150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                92.00 usec
PL2                 120.00 dB
PL12                  9.00 dB
PL13                 14.00 dB
SFO2           598.8029940 MHz

F2 - Processing parameters
SI                     65536
SF             150.5683848 MHz
WDW                       EM
SSB                        0
LB                    3.00 Hz
GB                         0
PC                     0.50

1D NMR plot parameters
CX                    20.00 cm
CY                     4.50 cm
F1P                  200.000 ppm
F1                 30113.68 Hz
F2P                    0.000 ppm
F2                     0.00 Hz
PPMCM                10.00000 ppm/cm
HZCM               1505.68384 Hz/cm
```

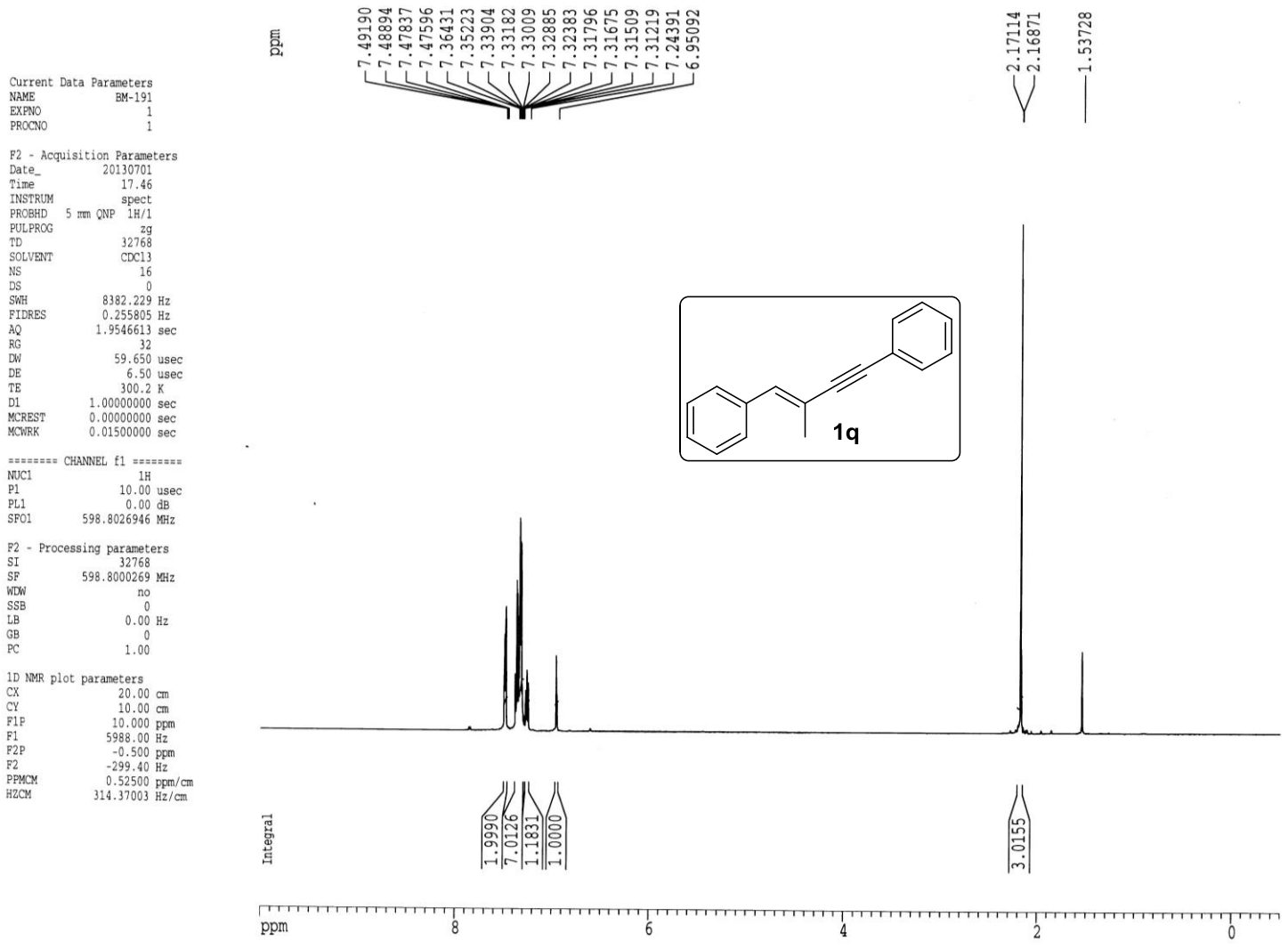


```
Current Data Parameters
NAME            BM-03-08
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20140521
Time               20.40
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH             8389.262 Hz
FIDRES             0.256020 Hz
AQ              1.9530228 sec
RG                   256
DW                59.600 usec
DE                 6.50 usec
TE                298.5 K
D1             2.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                 10.00 usec
PL1                 3.00 dB
SFO1          598.7029935 MHz

F2 - Processing parameters
SI                32768
SF          598.7000173 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 6.00 cm
F1P               10.000 ppm
F1              5987.00 Hz
F2P                -0.500 ppm
F2              -299.35 Hz
PPMCM              0.52500 ppm/cm
HZCM             314.31750 Hz/cm
```

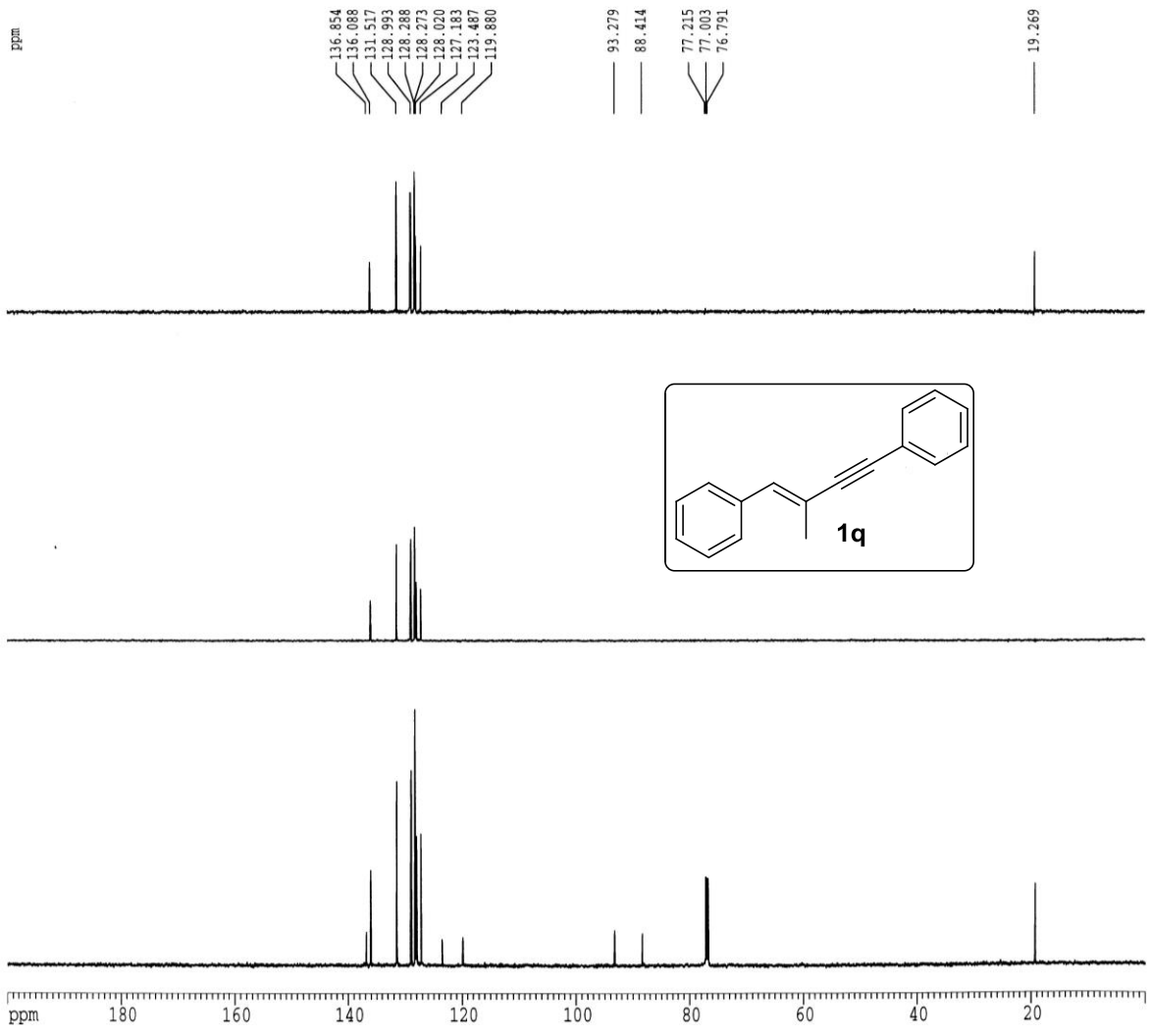


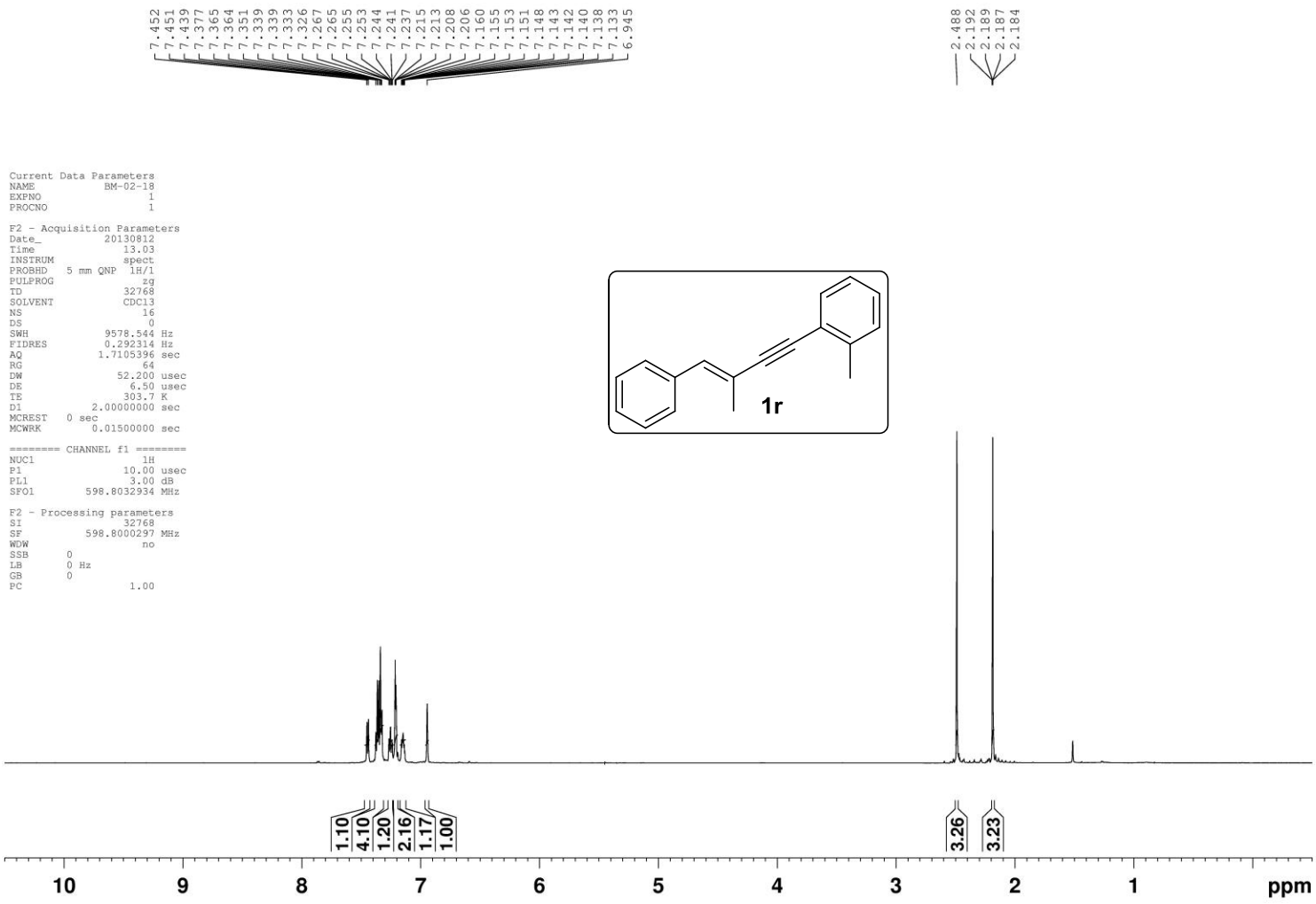
```
Current Data Parameters
NAME            BM-03-08
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20140521
Time               20.51
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG             zgpg
TD                 32768
SOLVENT             CDCl3
NS                   166
DS                     0
SWH            45045.047 Hz
FIDRES          1.374666 Hz
AQ              0.3637748 sec
RG                  2048
DW                11.100 usec
DE                 6.50 usec
TE                299.7 K
D1            3.50000000 sec
d11           0.03000000 sec
DELTA         3.40000010 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 4.80 usec
PL1                0.00 dB
SFO1         150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             92.00 usec
PL2              120.00 dB
PL12               9.00 dB
PL13              14.00 dB
SFO2         598.7029935 MHz

F2 - Processing parameters
SI                 65536
SF           150.5432397 MHz
WDW                   EM
SSB                    0
LB                 3.00 Hz
GB                     0
PC                  0.50

1D NMR plot parameters
CX                20.00 cm
CY                 4.00 cm
F1P              200.000 ppm
F1             30108.65 Hz
F2P              -10.000 ppm
F2             -1505.43 Hz
PPMCM           10.50000 ppm/cm
HZCM          1580.70410 Hz/cm
```

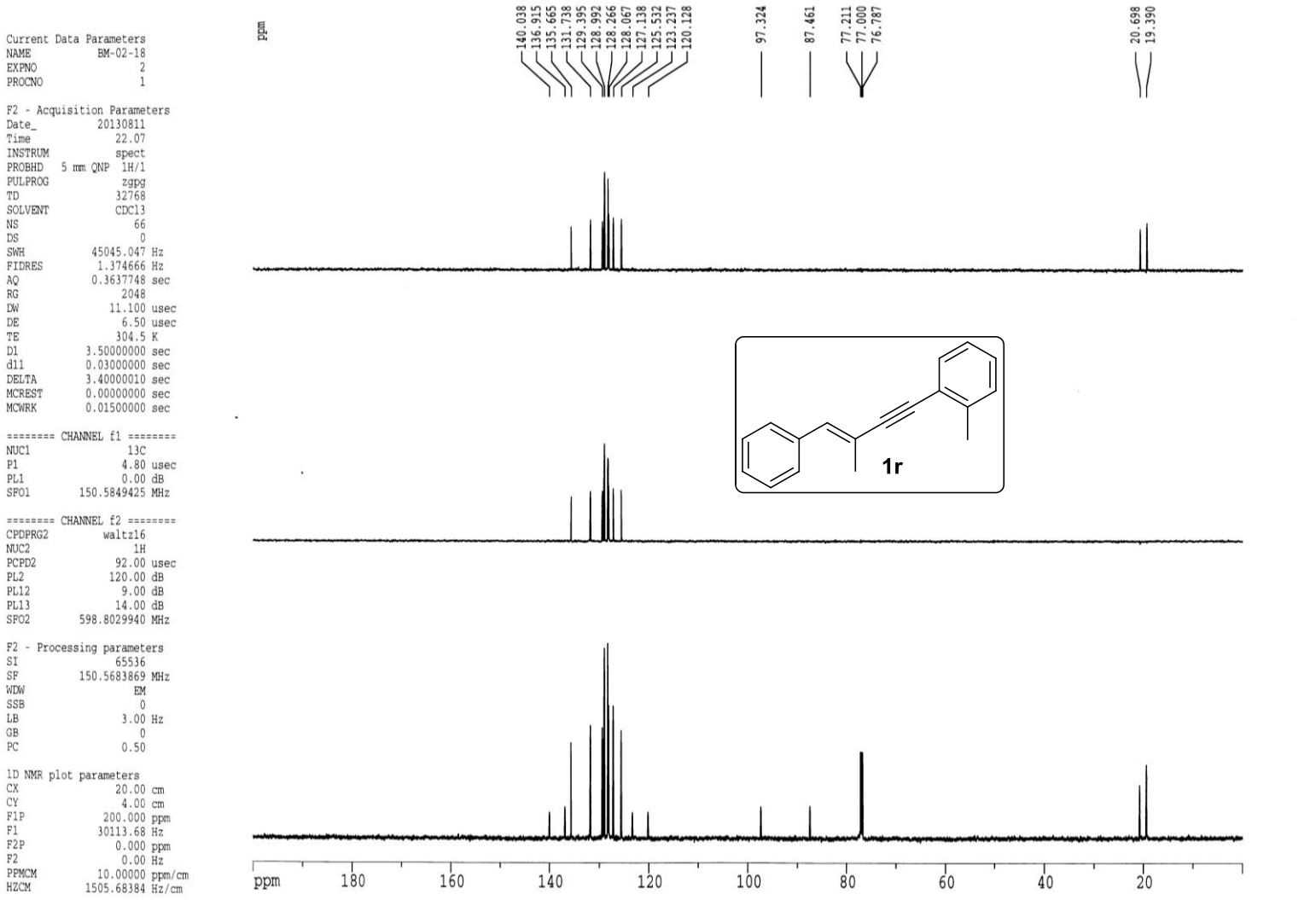


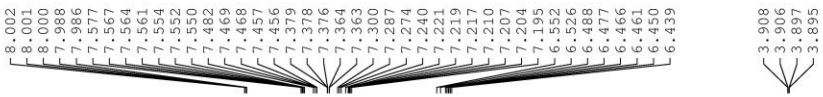

Current Data Parameters
NAME BM-191
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130701
Time 17.46
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 32
DW 59.650 usec
DE 6.50 usec
TE 300.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8026946 MHz
F2 - Processing parameters
SI 32768
SF 598.8000269 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.49190
7.48894
7.47837
7.47596
7.36431
7.35223
7.33904
7.33182
7.33009
7.32885
7.32383
7.31796
7.31675
7.31509
7.31219
7.24391
6.95092
2.17114
2.16871
1.53728
1q
Integral
1.9990
7.0126
1.1831
1.0000
3.0155
ppm
8
6
4
2
0

```
Current Data Parameters
NAME                  BM-191
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20130701
Time                  17.53
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                    32768
SOLVENT               CDCl3
NS                      100
DS                        0
SWH               45045.047 Hz
FIDRES             1.374666 Hz
AQ                0.3637748 sec
RG                     2048
DW                   11.100 usec
DE                    6.50 usec
TE                   301.0 K
D1              3.50000000 sec
d11             0.03000000 sec
DELTA           3.40000010 sec
MCREST          0.00000000 sec
MCWRK           0.01500000 sec

======== CHANNEL f1 ========
NUC1                    13C
P1                     4.80 usec
PL1                    0.00 dB
SFO1           150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                92.00 usec
PL2                 120.00 dB
PL12                  9.00 dB
PL13                 14.00 dB
SFO2           598.8029940 MHz

F2 - Processing parameters
SI                     65536
SF             150.5683869 MHz
WDW                       EM
SSB                        0
LB                      3.00 Hz
GB                         0
PC                      0.50

1D NMR plot parameters
CX                     20.00 cm
CY                      4.50 cm
F1P                  200.000 ppm
F1                  30113.68 Hz
F2P                    0.000 ppm
F2                     0.00 Hz
PPMCM                10.00000 ppm/cm
HZCM              1505.68384 Hz/cm
```

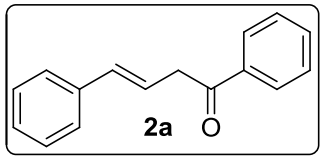


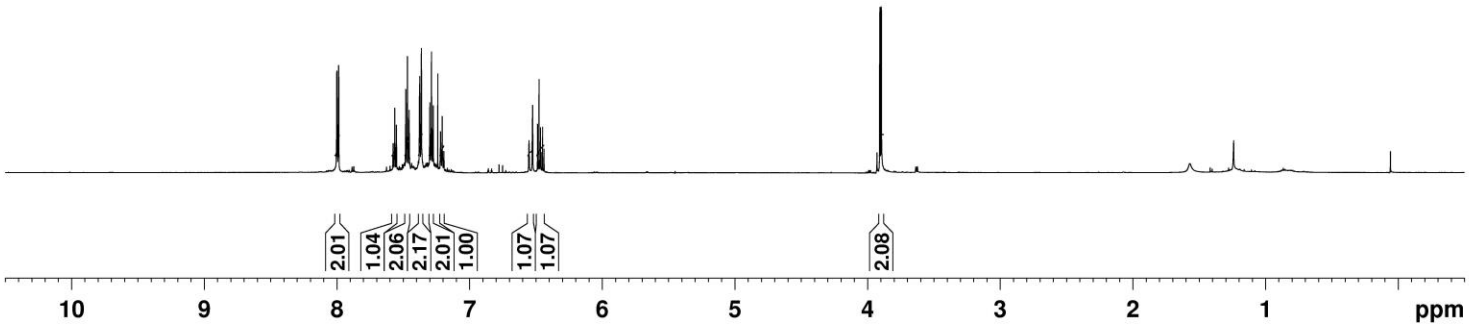

7.452
7.451
7.439
7.377
7.365
7.364
7.351
7.339
7.339
7.333
7.326
7.267
7.265
7.255
7.253
7.244
7.241
7.237
7.215
7.213
7.208
7.206
7.160
7.155
7.153
7.151
7.148
7.143
7.142
7.140
7.138
7.133
6.945
2.488
2.192
2.189
2.187
2.184
Current Data Parameters
NAME BM-02-18
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130812
Time 13.03
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 64
DW 52.200 usec
DE 6.50 usec
TE 303.7 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000297 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
1r
1.10
4.10
1.20
2.16
1.17
1.00
3.26
3.23
10
9
8
7
6
5
4
3
2
1
ppm

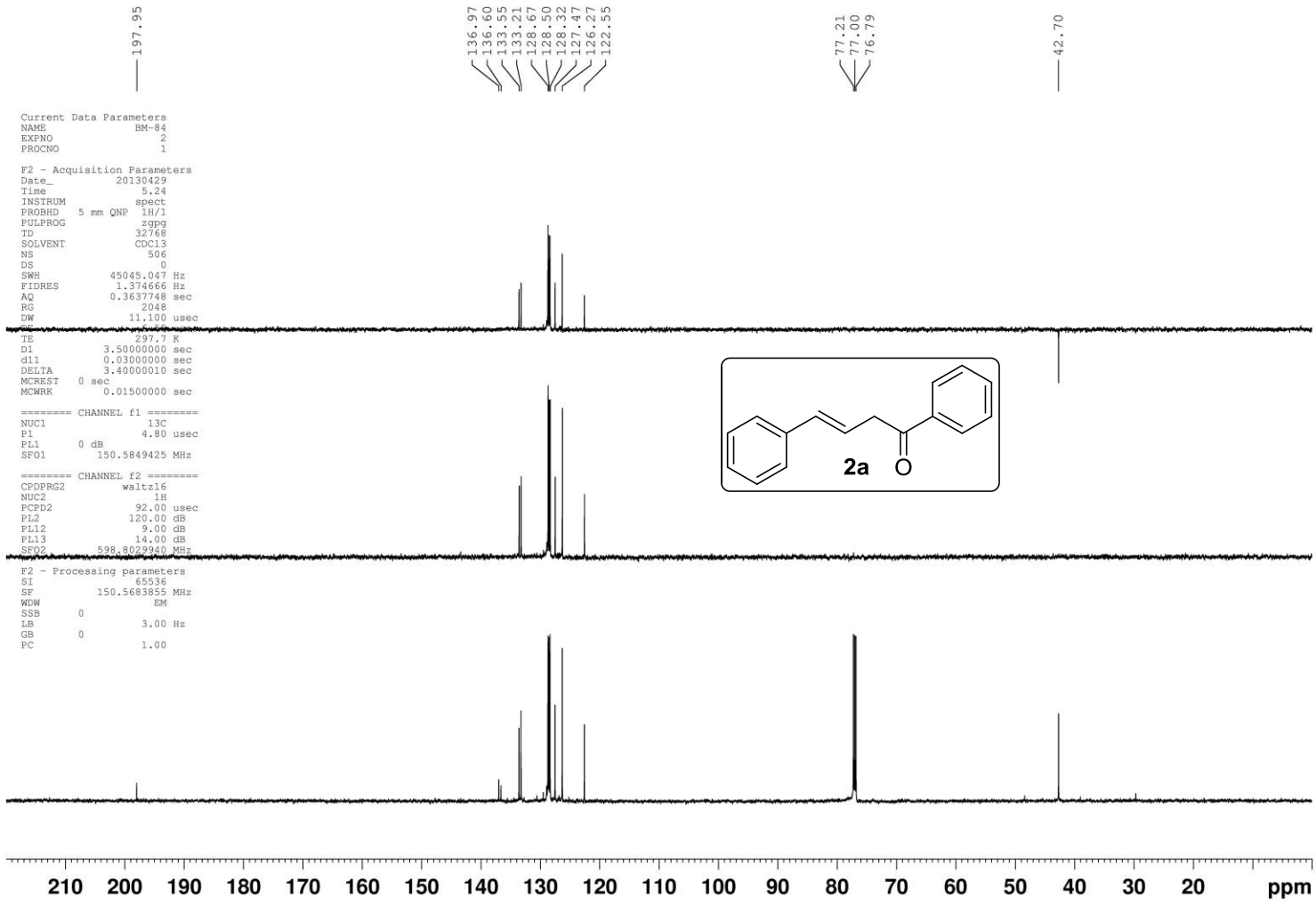

Current Data Parameters
NAME BM-02-18
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130811
Time 22.07
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 66
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 304.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683869 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30113.68 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.68384 Hz/cm
ppm
140.038
136.915
135.665
131.738
129.395
128.992
128.266
128.067
127.138
125.532
123.237
120.128
97.324
87.461
77.211
77.000
76.787
20.698
19.390
1r
ppm
180
160
140
120
100
80
60
40
20

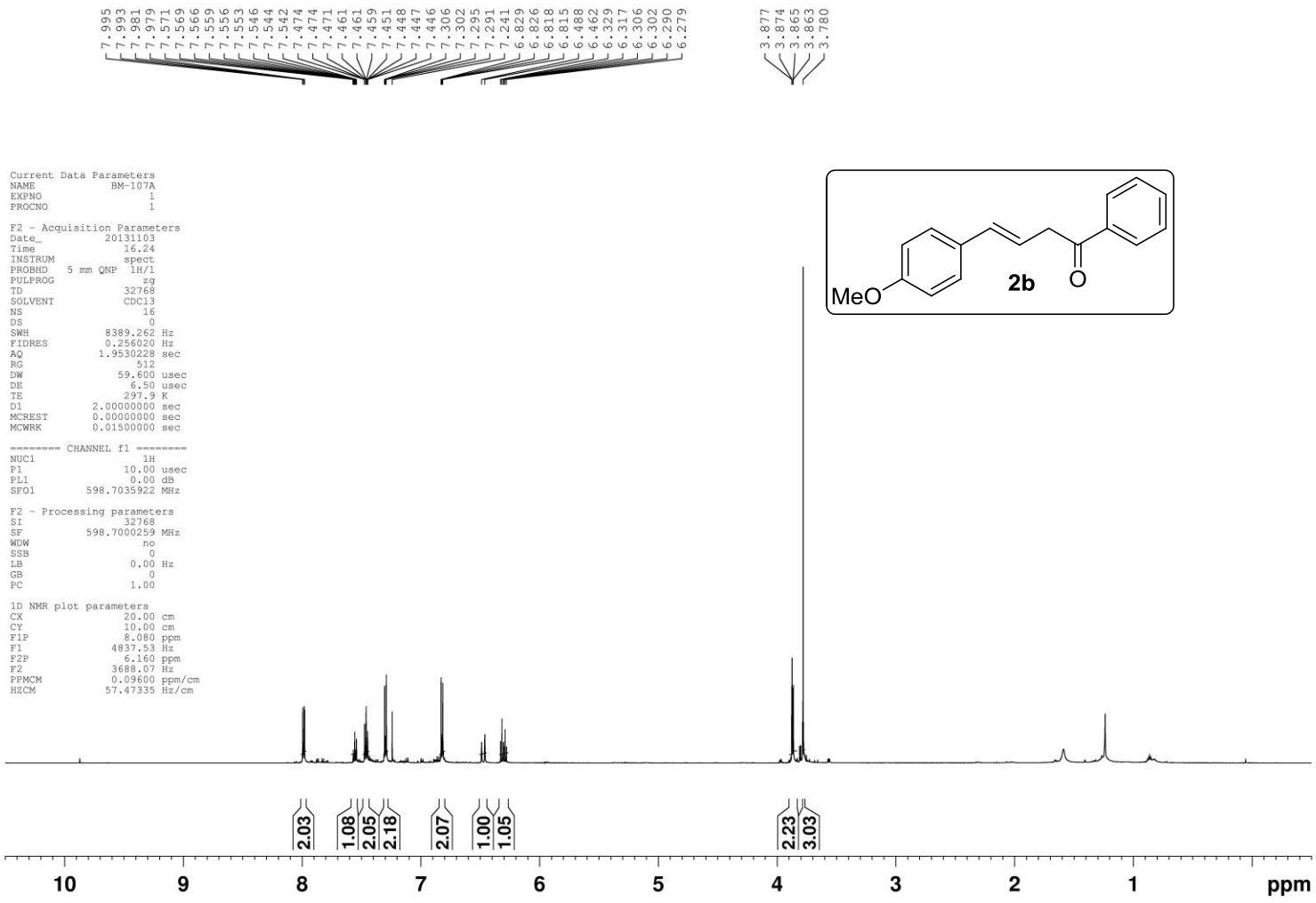


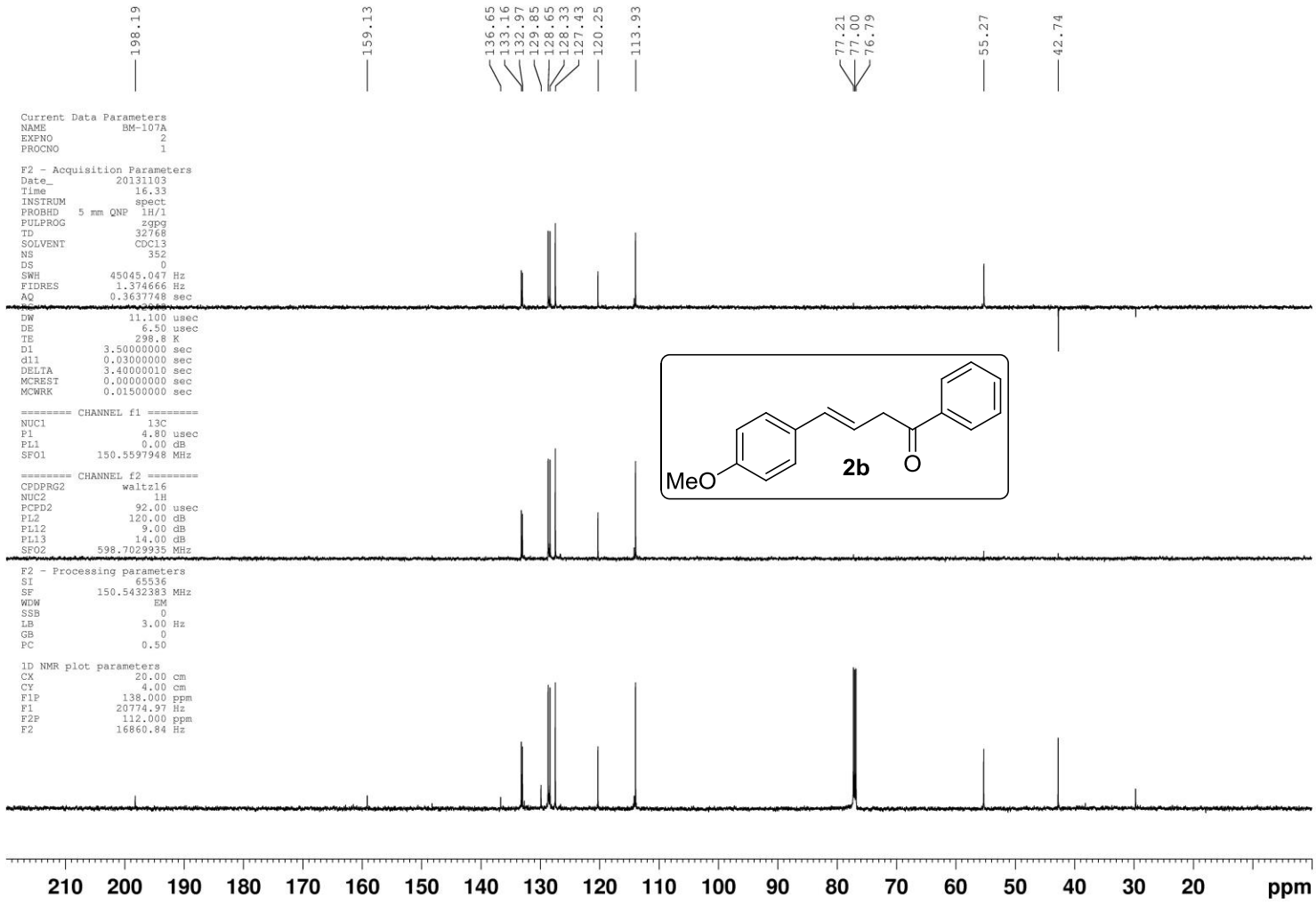

```
Current Data Parameters
NAME                  BM-84
EXPNO                     1
PROCNO                    1

F2 - Acquisition Parameters
Date_              20130429
Time                   5.15
INSTRUM               spect
PROBHD    5 mm QNP  1H/1
PULPROG                 zg
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       0
SWH                8382.229 Hz
FIDRES             0.255805 Hz
AQ                 1.9546613 sec
RG                      128
DW                   59.650 usec
DE                    6.50 usec
TE                   296.7 K
D1                 1.00000000 sec
MCREST    0 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                     1H
P1                    10.00 usec
PL1         0 dB
SFO1          598.8032934 MHz

F2 - Processing parameters
SI                       32768
SF              598.8000289 MHz
WDW                      no
SSB         0
LB          0 Hz
GB          0
PC                     1.00
```

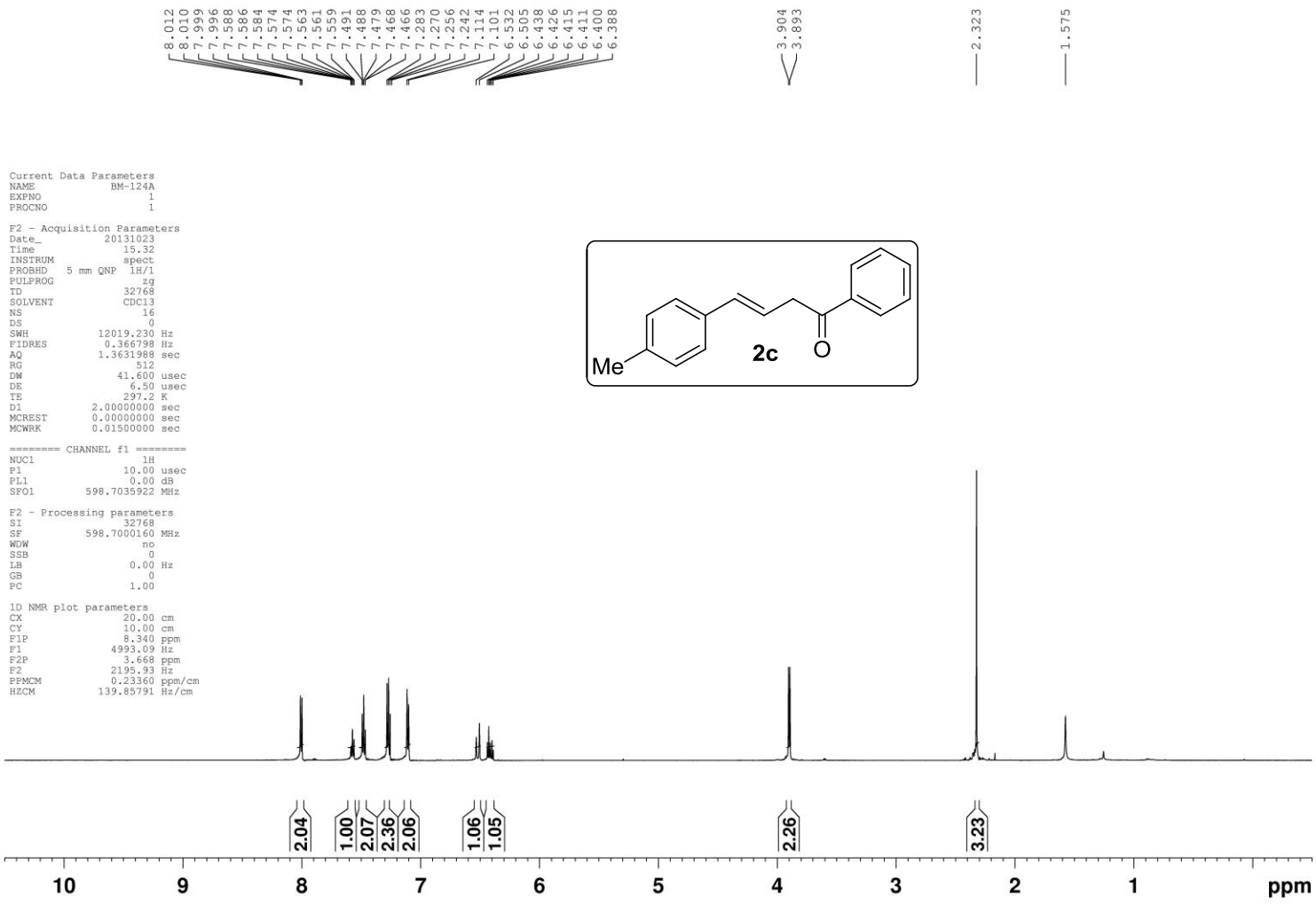





197.95
136.97
136.60
133.55
133.21
128.67
128.50
128.32
127.47
126.27
122.55
77.21
77.00
76.79
42.70
Current Data Parameters
NAME BM-84
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130429
Time 5.24
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 506
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
TE 297.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683855 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
2a
O
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.995
7.993
7.981
7.979
7.571
7.569
7.566
7.559
7.556
7.553
7.546
7.544
7.542
7.474
7.474
7.471
7.461
7.461
7.459
7.451
7.448
7.447
7.446
7.306
7.302
7.295
7.291
7.241
6.829
6.826
6.818
6.815
6.488
6.462
6.329
6.317
6.306
6.302
6.290
6.279
3.877
3.874
3.865
3.863
3.780
Current Data Parameters
NAME BM-107A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131103
Time 16.24
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 512
DW 59.600 usec
DE 6.50 usec
TE 297.9 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7035922 MHz
F2 - Processing parameters
SI 32768
SF 598.7000259 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 8.080 ppm
F1 4837.53 Hz
F2P 6.160 ppm
F2 3688.07 Hz
PPMCM 0.09600 ppm/cm
HZCM 57.47335 Hz/cm
MeO
2b
O
2.03
1.08
2.05
2.18
2.07
1.00
1.05
2.23
3.03
10
9
8
7
6
5
4
3
2
1
ppm


198.19
159.13
136.65
133.16
132.97
129.85
128.65
128.33
127.43
120.25
113.93
77.21
77.00
76.79
55.27
42.74
Current Data Parameters
NAME BM-107A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131103
Time 16.33
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 352
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
DW 11.100 usec
DE 6.50 usec
TE 298.8 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432383 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 138.000 ppm
F1 20774.97 Hz
F2P 112.000 ppm
F2 16860.84 Hz
MeO
2b
O
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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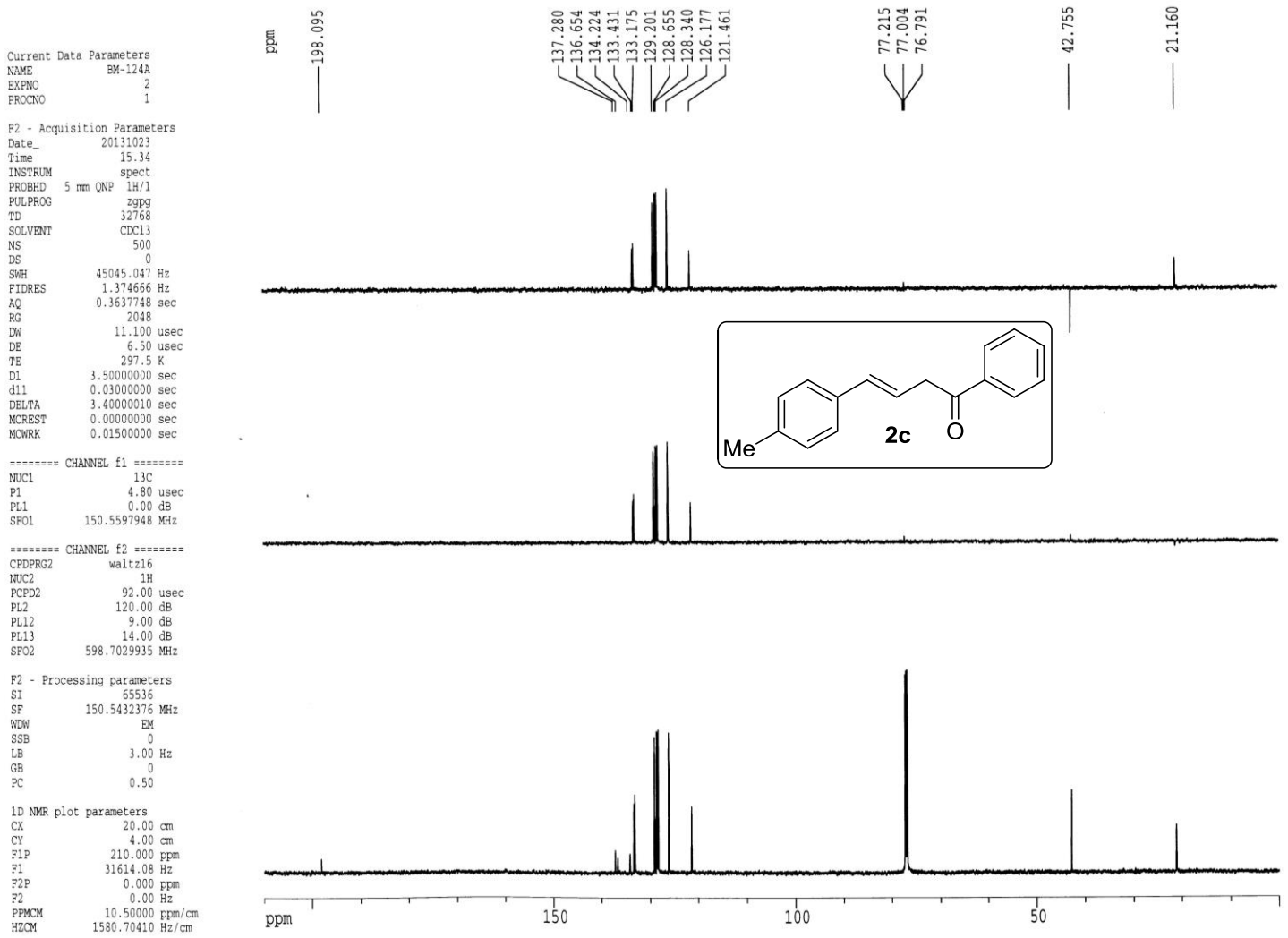
8.010
7.999
7.996
7.588
7.586
7.584
7.574
7.574
7.563
7.561
7.559
7.491
7.488
7.479
7.468
7.466
7.283
7.270
7.256
7.242
7.114
7.101
6.532
6.505
6.438
6.426
6.415
6.411
6.400
6.388
3.904
3.893
2.323
1.575
Current Data Parameters
NAME BM-124A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131023
Time 15.32
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 12019.230 Hz
FIDRES 0.366798 Hz
AQ 1.3631988 sec
RG 512
DW 41.600 usec
DE 6.50 usec
TE 297.2 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7035922 MHz
F2 - Processing parameters
SI 32768
SF 598.7000160 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 8.340 ppm
F1 4993.09 Hz
F2P 3.668 ppm
F2 2195.93 Hz
PPMCM 0.23360 ppm/cm
HZCM 139.85791 Hz/cm
Me
2c
O
2.04
1.00
2.07
2.36
2.06
1.06
1.05
2.26
3.23
10
9
8
7
6
5
4
3
2
1
ppm



Current Data Parameters
NAME BM-124A
EXPNO 2
PROCNO 1

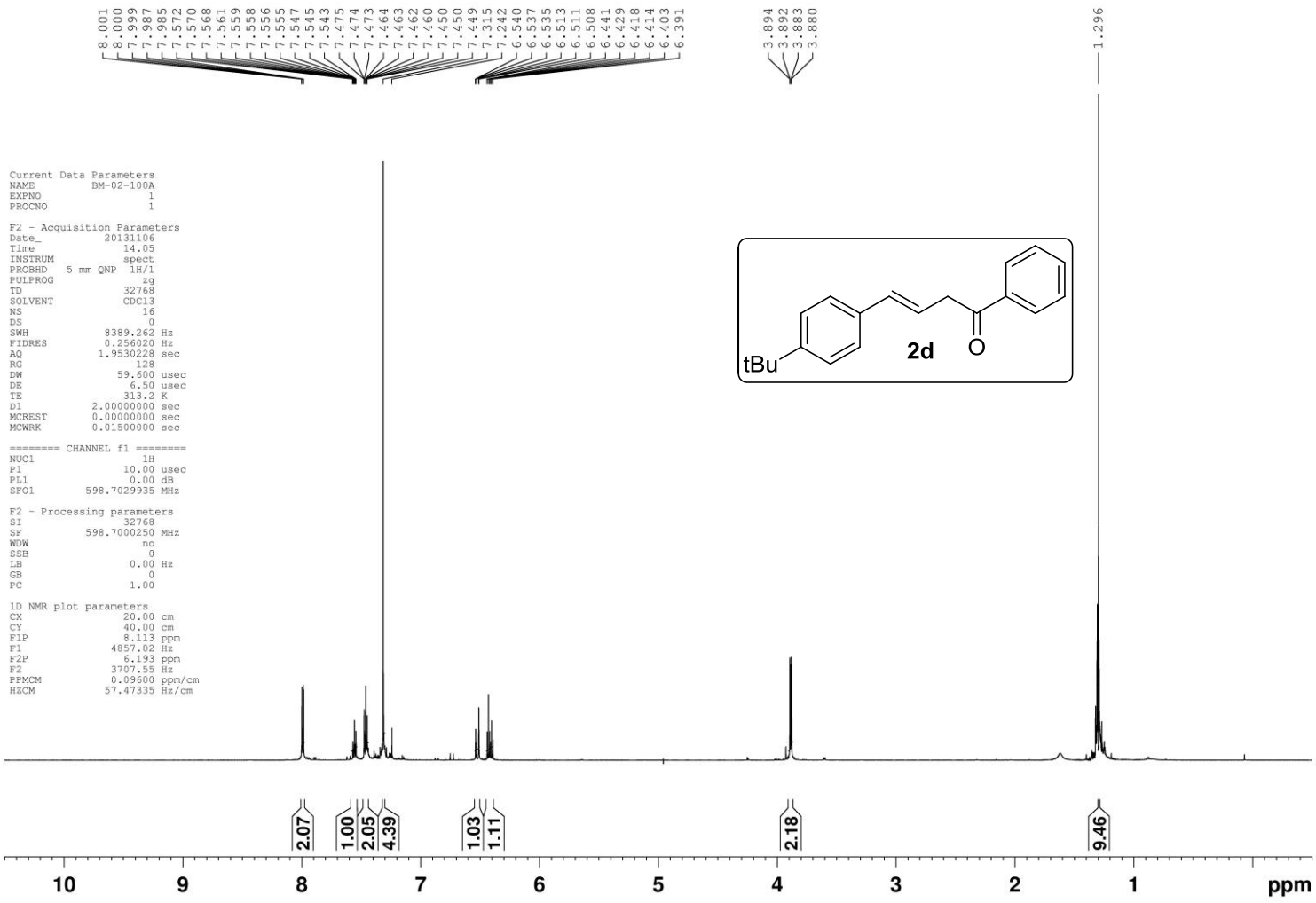
F2 - Acquisition Parameters
Date_ 20131023
Time 15.34
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 500
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 297.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec

======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz

F2 - Processing parameters
SI 65536
SF 150.5432376 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50

1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 210.000 ppm
F1 31614.08 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.50000 ppm/cm
HZCM 1580.70410 Hz/cm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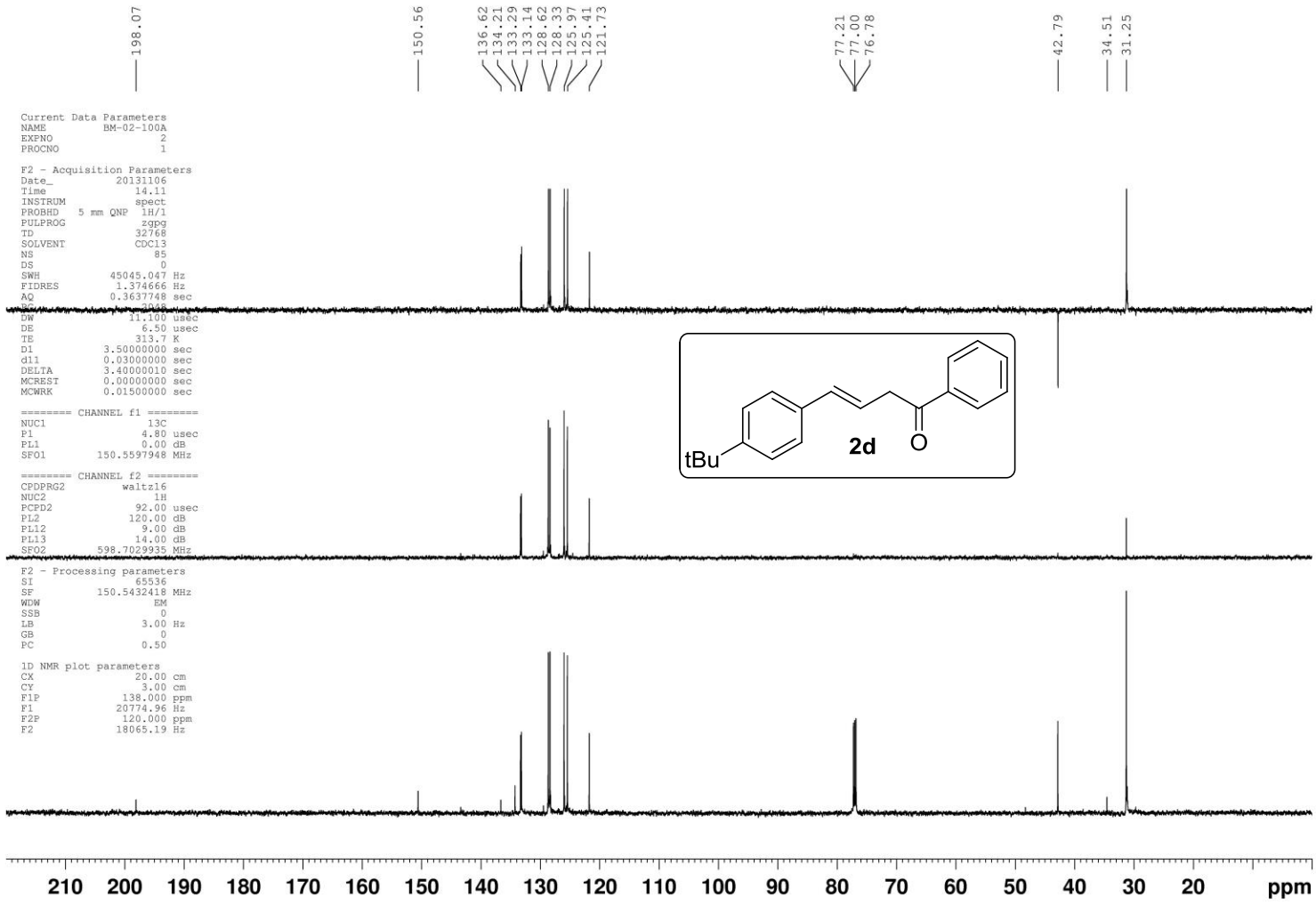
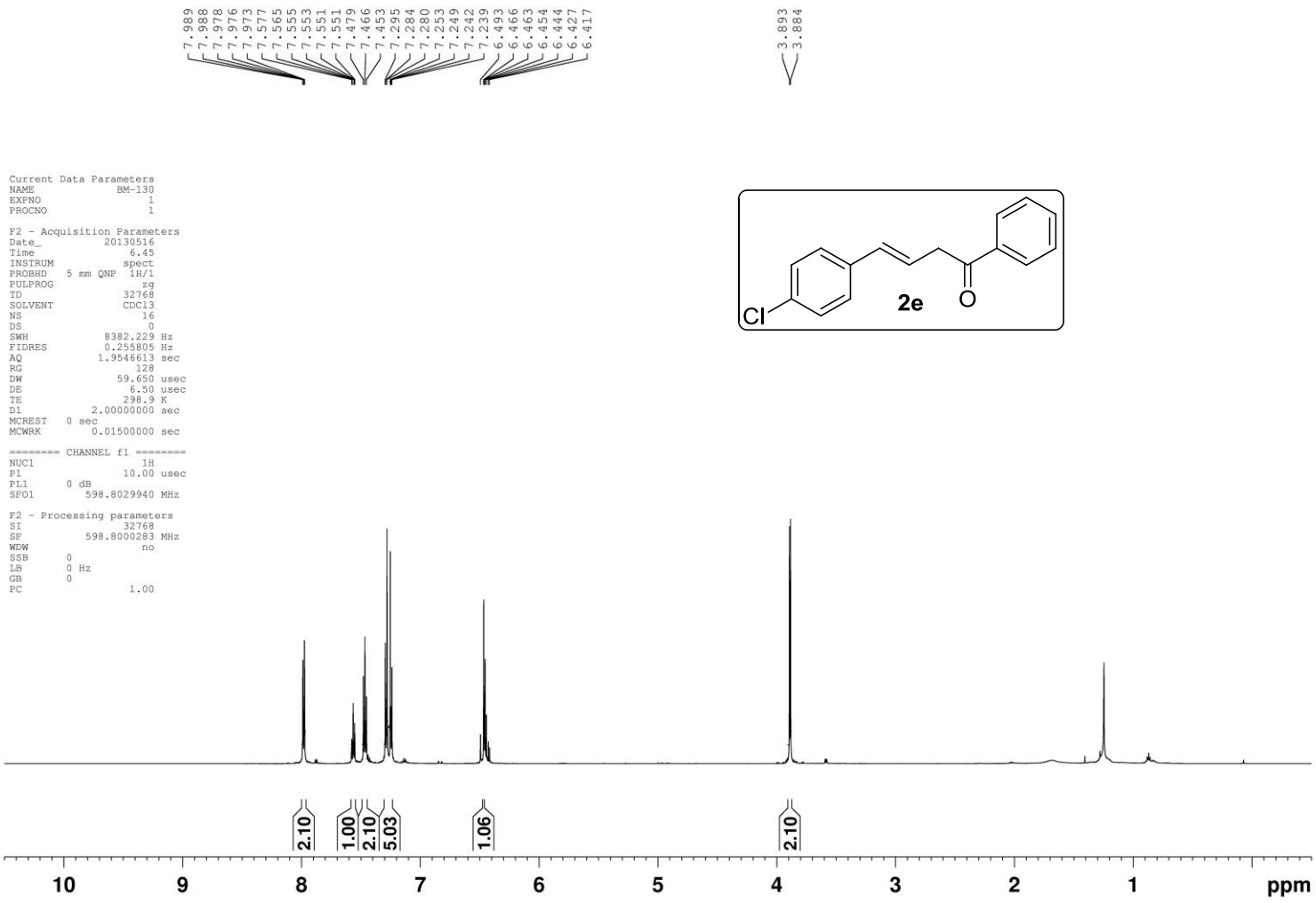
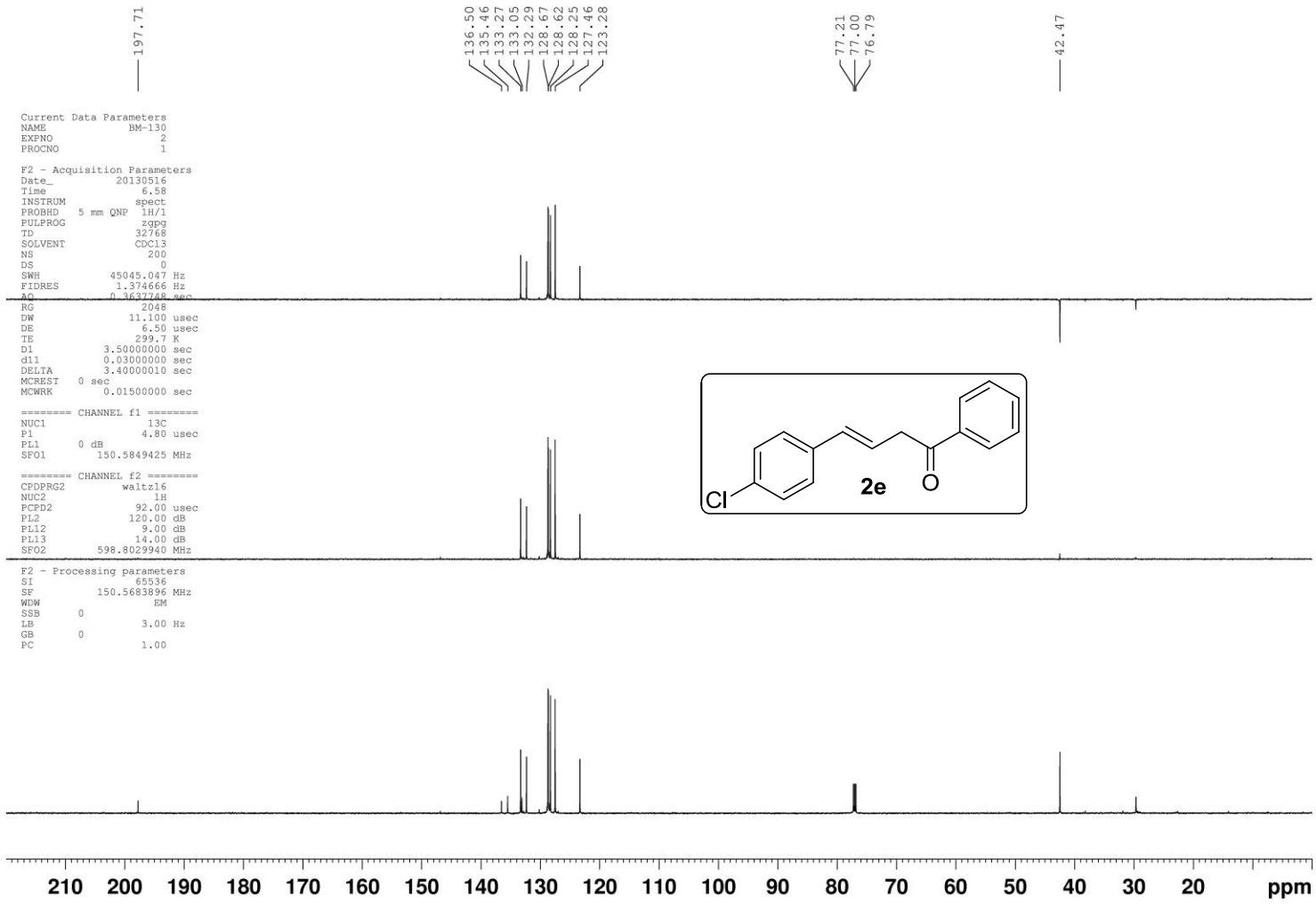
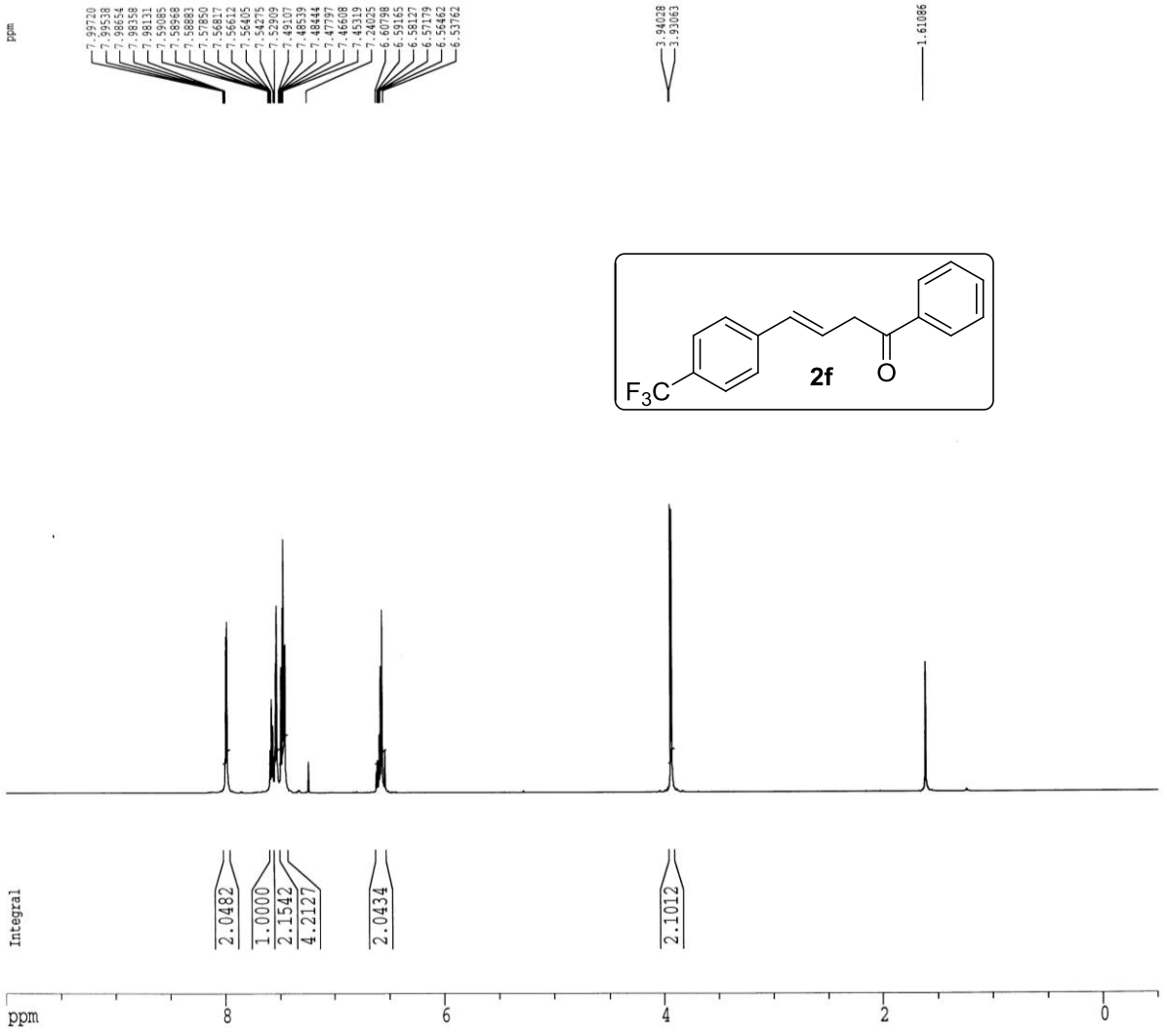
8.000
7.999
7.987
7.985
7.572
7.570
7.568
7.561
7.559
7.558
7.556
7.555
7.547
7.545
7.543
7.475
7.474
7.473
7.464
7.463
7.462
7.460
7.450
7.450
7.449
7.315
7.242
6.540
6.537
6.535
6.513
6.511
6.508
6.441
6.429
6.418
6.414
6.403
6.391
3.894
3.892
3.883
3.880
1.296
Current Data Parameters
NAME BM-02-100A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131106
Time 14.05
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 313.2 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000250 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 40.00 cm
F1P 8.113 ppm
F1 4857.02 Hz
F2P 6.193 ppm
F2 3707.55 Hz
PPMCM 0.09600 ppm/cm
HZCM 57.47335 Hz/cm
tBu
2d
O
2.07
1.00
2.05
4.39
1.03
1.11
2.18
9.46
10
9
8
7
6
5
4
3
2
1
ppm

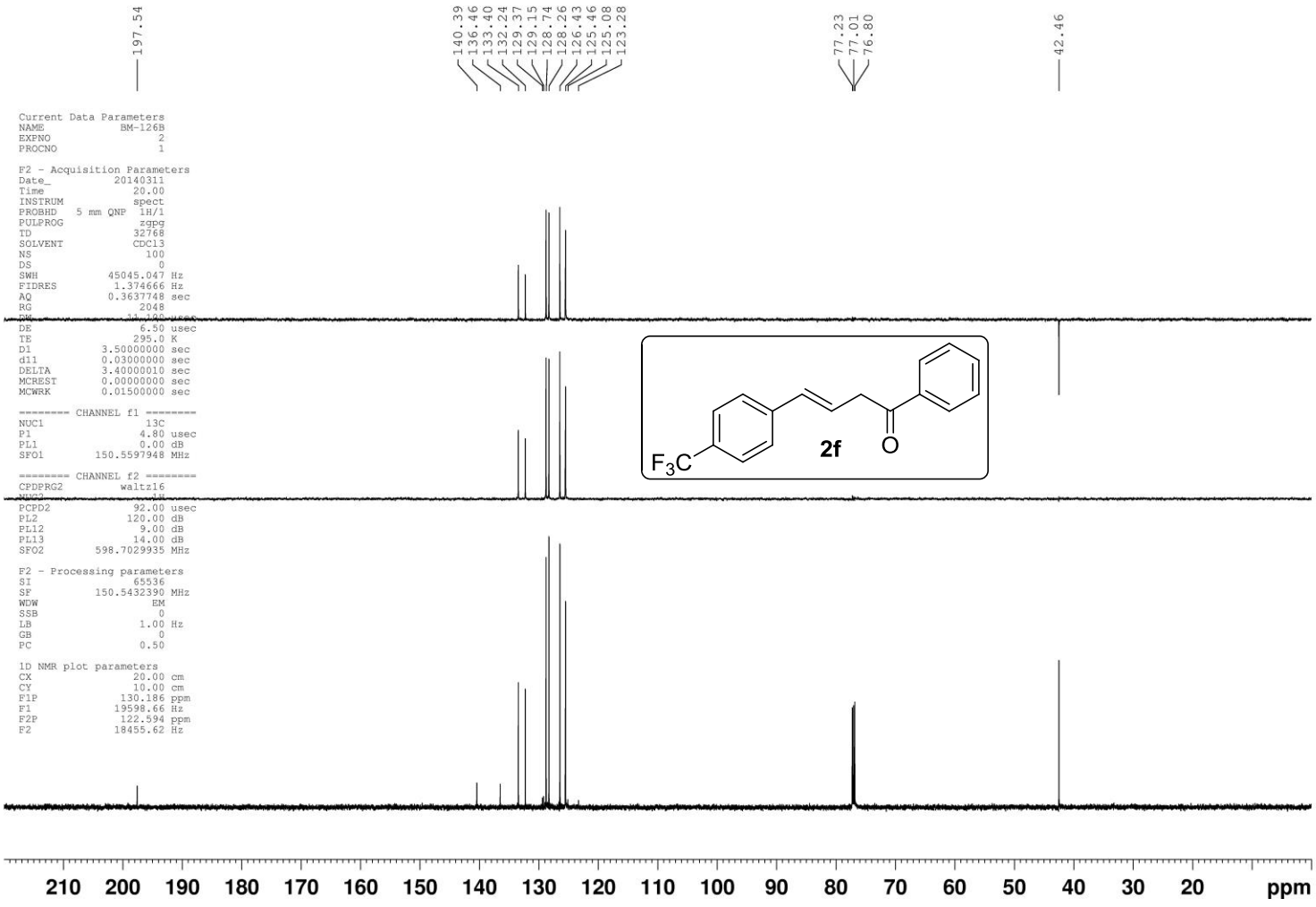

198.07
150.56
136.62
134.21
133.29
133.14
128.62
128.33
125.97
125.41
121.73
77.21
77.00
76.78
42.79
34.51
31.25
Current Data Parameters
NAME BM-02-100A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131106
Time 14.11
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 85
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
DW 11.100 usec
DE 6.50 usec
TE 313.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432418 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 3.00 cm
F1P 138.000 ppm
F1 20774.96 Hz
F2P 120.000 ppm
F2 18065.19 Hz
tBu
2d
O
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

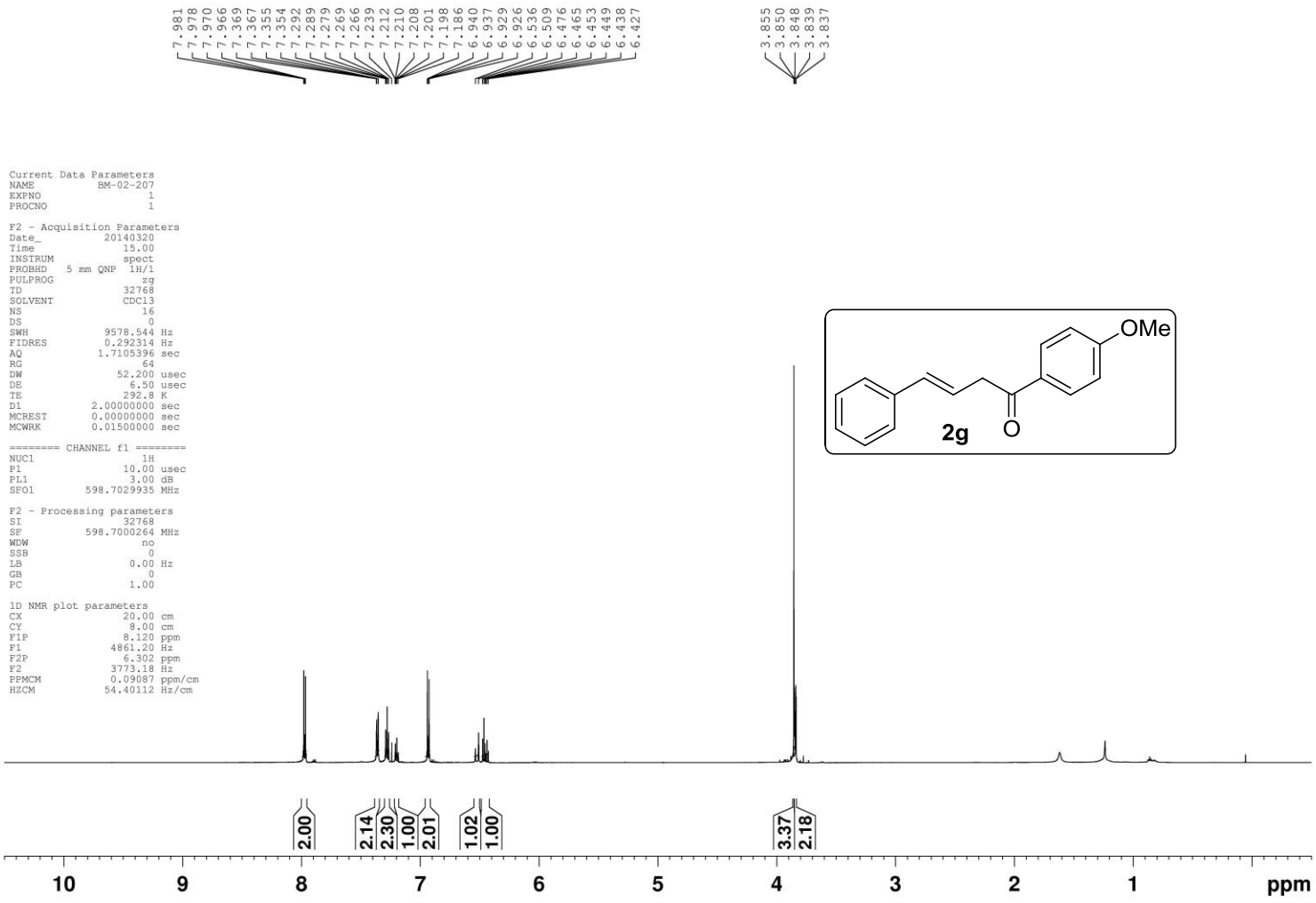

7.989
7.988
7.978
7.976
7.973
7.577
7.565
7.555
7.553
7.551
7.551
7.479
7.466
7.453
7.295
7.284
7.280
7.253
7.249
7.242
7.239
6.493
6.466
6.463
6.454
6.444
6.427
6.417
3.893
3.884
Current Data Parameters
NAME BM-130
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130516
Time 6.45
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.9 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000283 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
Cl
2e
O
2.10
1.00
2.10
5.03
1.06
2.10
10
9
8
7
6
5
4
3
2
1
ppm

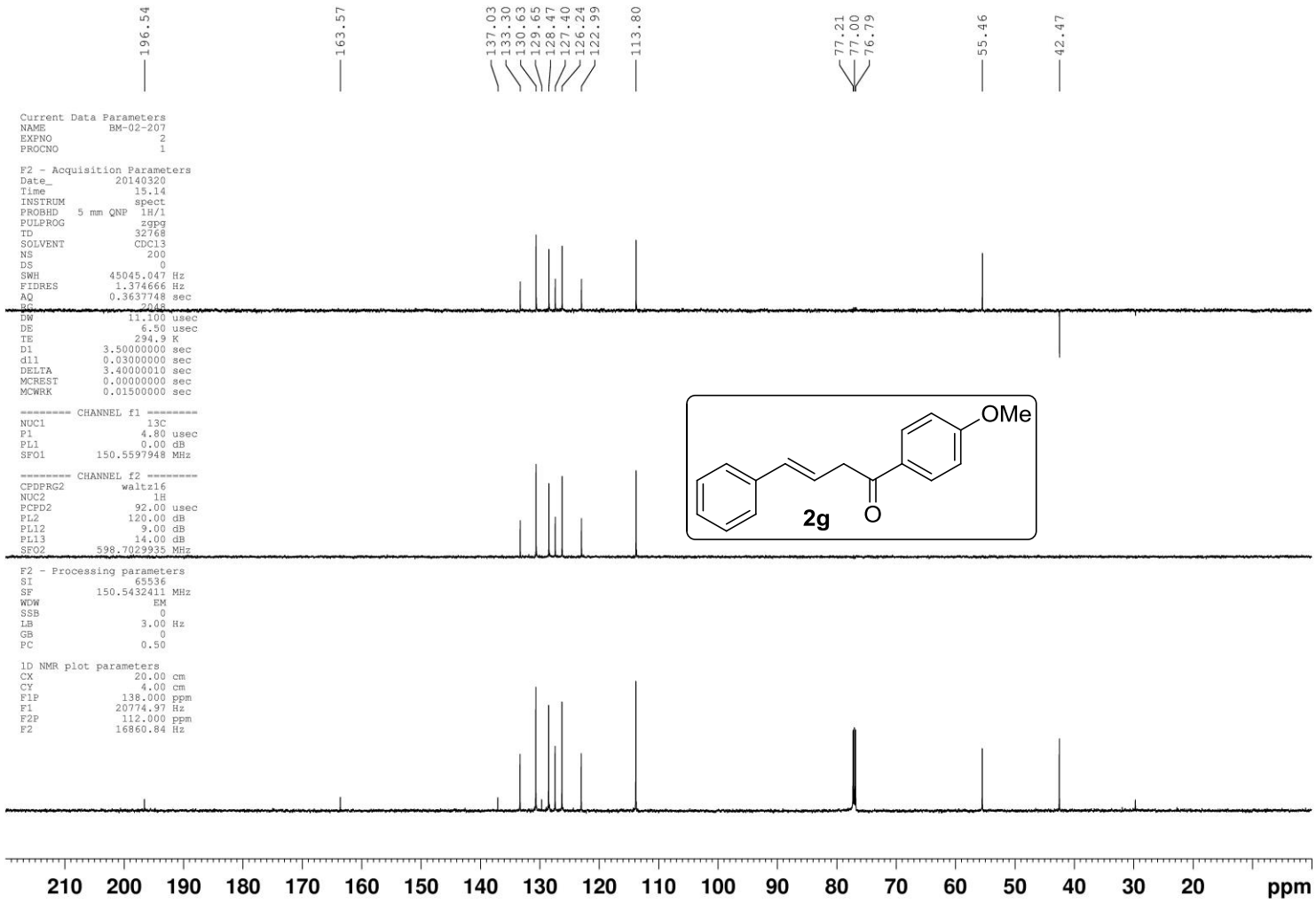

197.71
136.50
135.46
133.27
133.05
132.29
128.67
128.62
128.25
127.46
123.28
77.21
77.00
76.79
42.47
Current Data Parameters
NAME BM-130
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130516
Time 6.58
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683896 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
Cl
O
2e
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

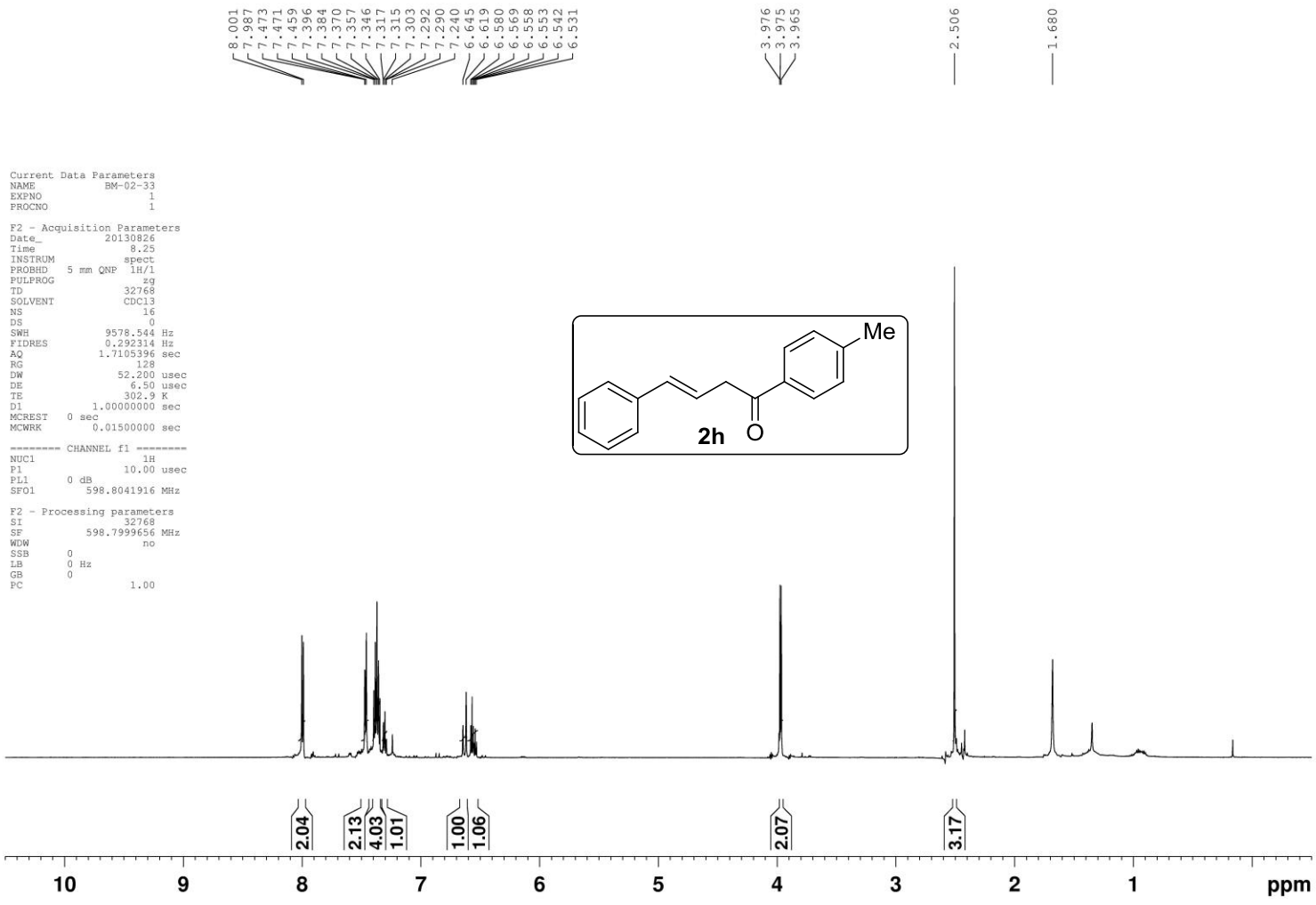
```
Current Data Parameters
NAME              BM-126B
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20140311
Time                19.52
INSTRUM             spect
PROBHD   5 mm QNP  1H/1
PULPROG                zg
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH              8382.229 Hz
FIDRES           0.255805 Hz
AQ               1.9546613 sec
RG                    128
DW                59.650 usec
DE                 6.50 usec
TE                293.5 K
D1             2.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                 10.00 usec
PL1                 0.00 dB
SFO1         598.7032929 MHz

F2 - Processing parameters
SI                  32768
SF           598.7000259 MHz
WDW                    no
SSB                     0
LB                 0.00 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                 20.00 cm
CY                  5.00 cm
F1P               10.000 ppm
F1                5987.00 Hz
F2P                -0.500 ppm
F2                -299.35 Hz
PPMCM             0.52500 ppm/cm
HZCM            314.31750 Hz/cm
```

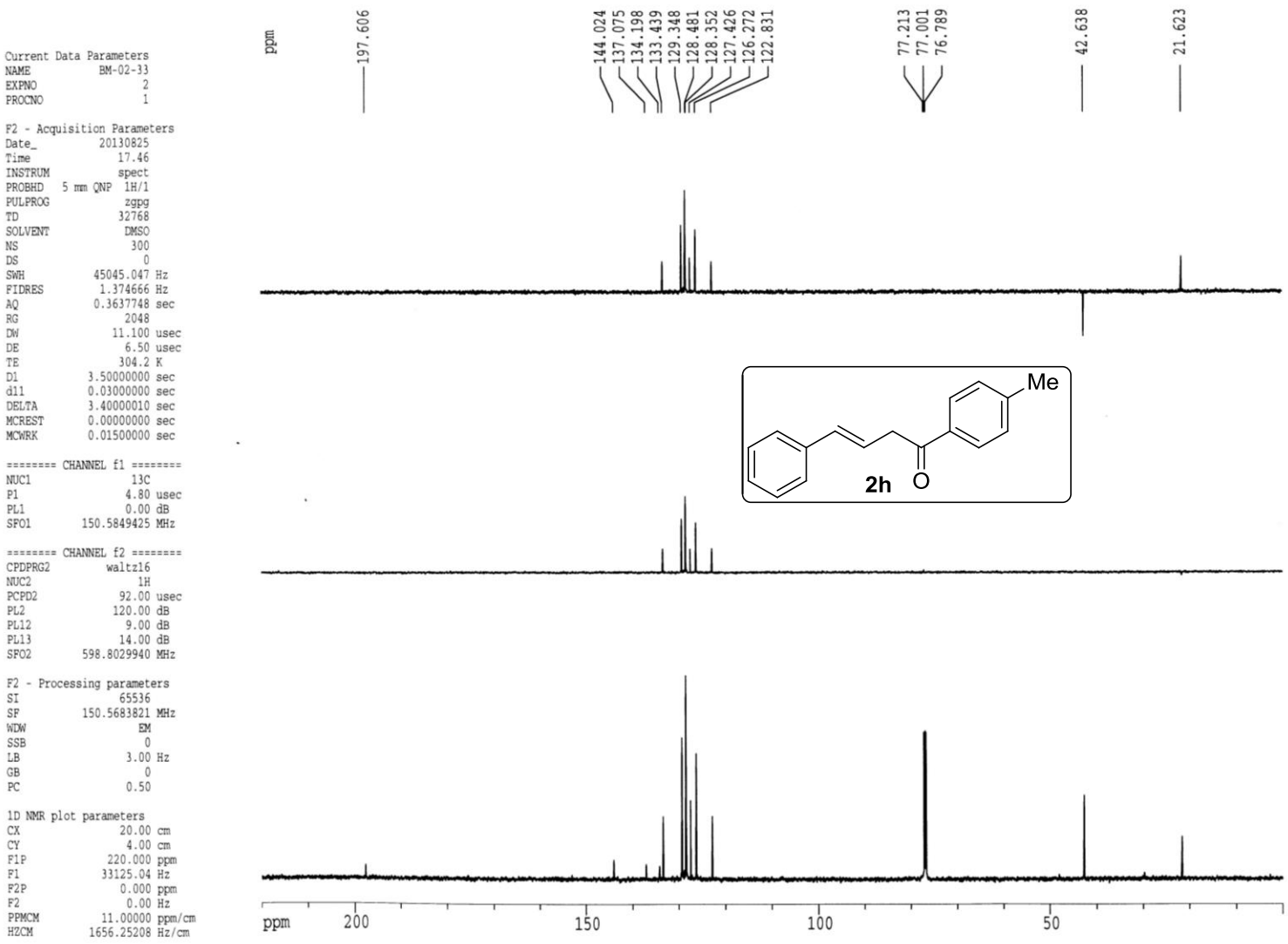


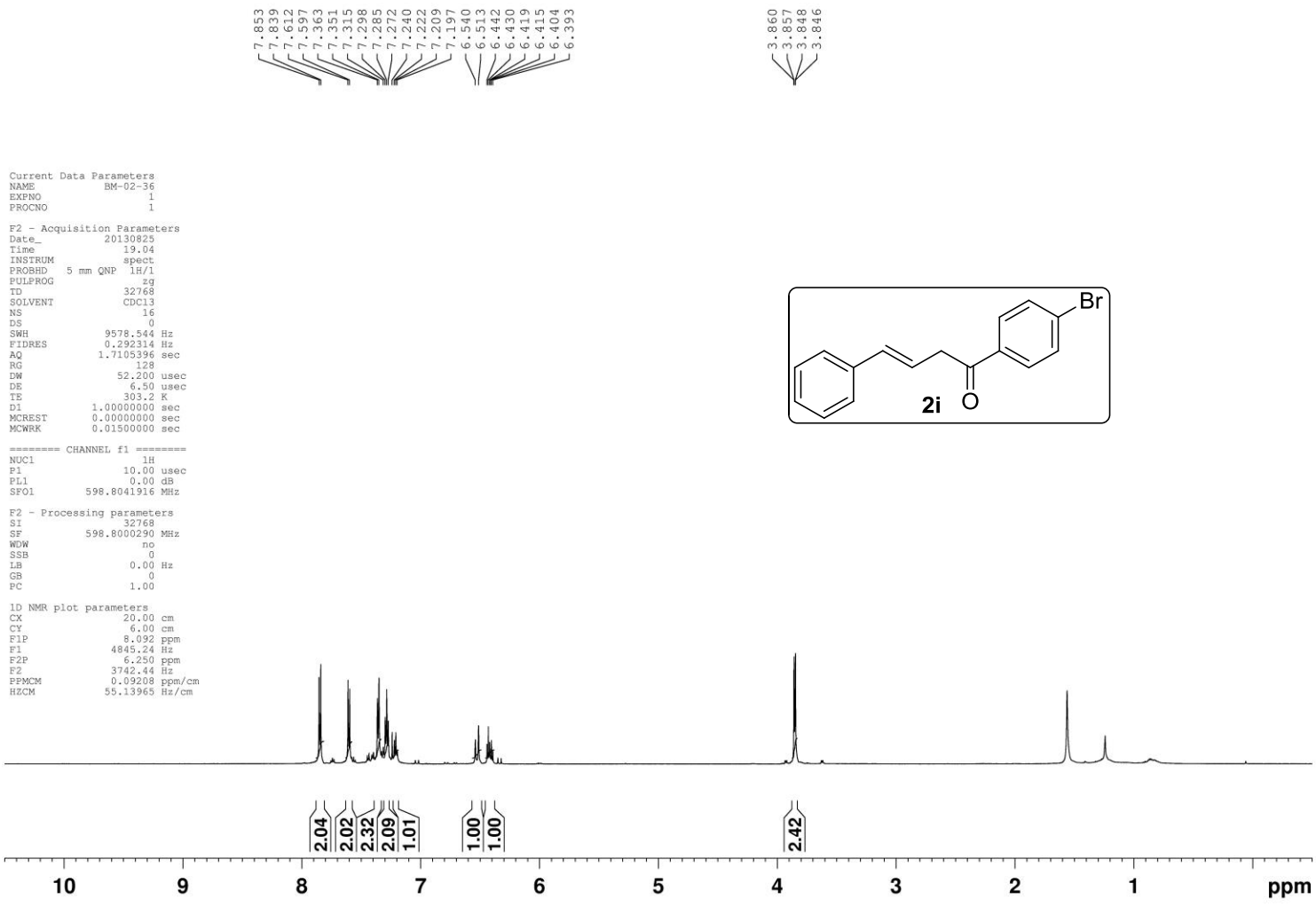

197.54
140.39
136.46
133.40
132.24
129.37
129.15
128.74
128.26
126.43
125.46
125.08
123.28
77.23
77.01
76.80
42.46
Current Data Parameters
NAME BM-126B
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140311
Time 20.00
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DE 6.50 usec
TE 295.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432390 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 130.186 ppm
F1 19598.66 Hz
F2P 122.594 ppm
F2 18455.62 Hz
F3C
O
2f
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

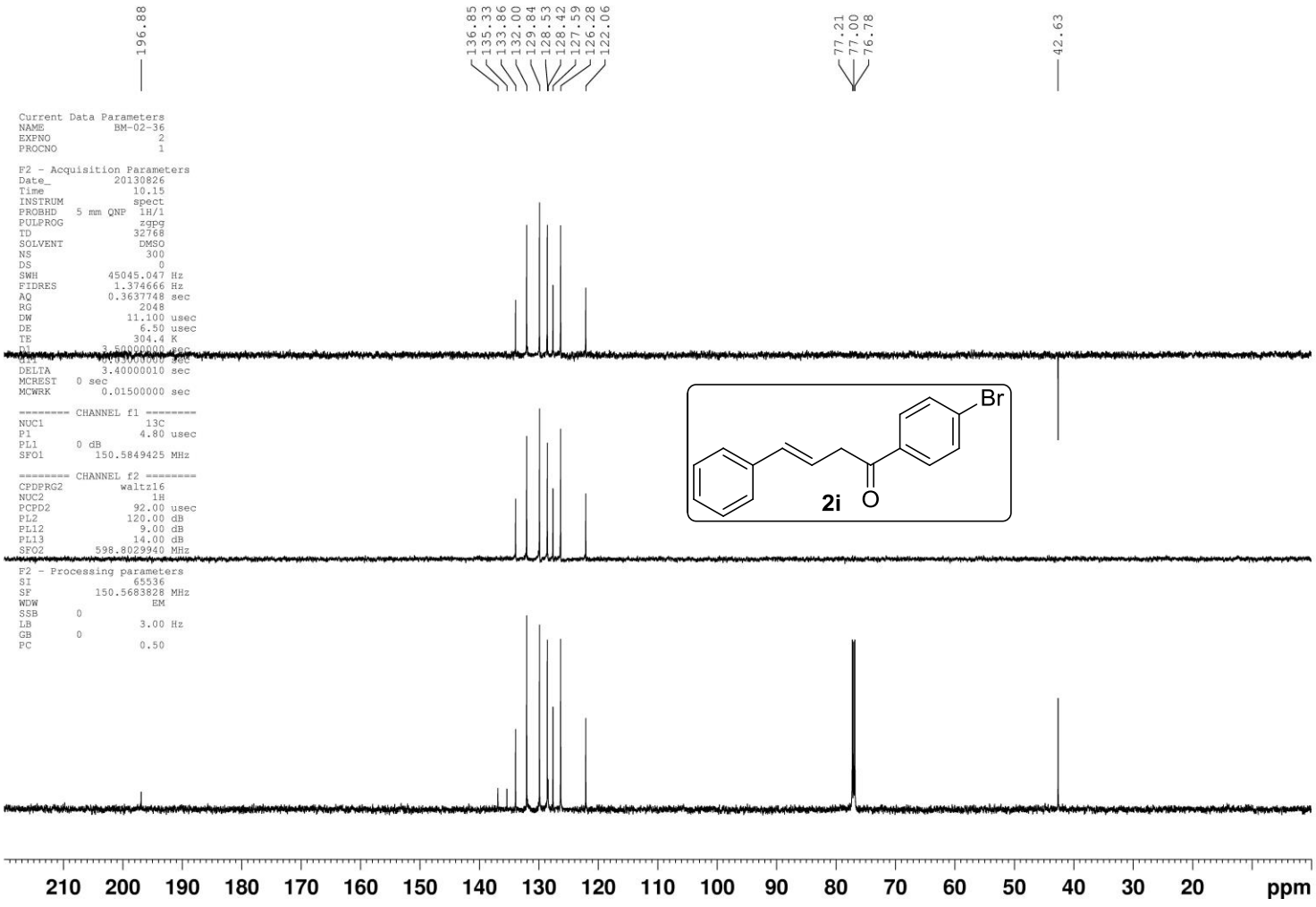

7.981
7.978
7.970
7.966
7.369
7.367
7.355
7.354
7.292
7.289
7.279
7.269
7.266
7.239
7.212
7.210
7.208
7.201
7.198
7.186
6.940
6.937
6.929
6.926
6.536
6.509
6.476
6.465
6.453
6.449
6.438
6.427
3.855
3.850
3.848
3.839
3.837
Current Data Parameters
NAME BM-02-207
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140320
Time 15.00
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 64
DW 52.200 usec
DE 6.50 usec
TE 292.8 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000264 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 8.120 ppm
F1 4861.20 Hz
F2P 6.302 ppm
F2 3773.18 Hz
PPMCM 0.09087 ppm/cm
HZCM 54.40112 Hz/cm
OMe
O
2g
2.00
2.14
2.30
1.00
2.01
1.02
1.00
3.37
2.18
10
9
8
7
6
5
4
3
2
1
ppm


196.54
163.57
137.03
133.30
130.63
129.65
128.47
127.40
126.24
122.99
113.80
77.21
77.00
76.79
55.46
42.47
Current Data Parameters
NAME BM-02-207
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140320
Time 15.14
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 294.9 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432411 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 138.000 ppm
F1 20774.97 Hz
F2P 112.000 ppm
F2 16860.84 Hz
OMe
O
2g
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


8.001
7.987
7.473
7.471
7.459
7.396
7.384
7.370
7.357
7.346
7.317
7.315
7.303
7.292
7.290
7.240
6.645
6.619
6.580
6.569
6.558
6.553
6.542
6.531
3.976
3.975
3.965
2.506
1.680
Current Data Parameters
NAME BM-02-33
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130826
Time 8.25
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 302.9 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.7999656 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
Me
O
2h
2.04
2.13
4.03
1.01
1.00
1.06
2.07
3.17
10
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME BM-02-33
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130825
Time 17.46
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT DMSO
NS 300
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 304.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683821 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 220.000 ppm
F1 33125.04 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 11.00000 ppm/cm
HZCM 1656.25208 Hz/cm
ppm
197.606
144.024
137.075
134.198
133.439
129.348
128.481
128.352
127.426
126.272
122.831
77.213
77.001
76.789
42.638
21.623
Me
2h
O
ppm
200
150
100
50


7.853
7.839
7.612
7.597
7.363
7.351
7.315
7.298
7.285
7.272
7.240
7.222
7.209
7.197
6.540
6.513
6.442
6.430
6.419
6.415
6.404
6.393
3.860
3.857
3.848
3.846
Current Data Parameters
NAME BM-02-36
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130825
Time 19.04
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 303.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.8000290 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 8.092 ppm
F1 4845.24 Hz
F2P 6.250 ppm
F2 3742.44 Hz
PPMCM 0.09208 ppm/cm
HZCM 55.13965 Hz/cm
Br
2i
O
2.04
2.02
2.32
2.09
1.01
1.00
1.00
2.42
10
9
8
7
6
5
4
3
2
1
ppm



Current Data Parameters
NAME BM-02-36
EXPNO 2
PROCNO 1

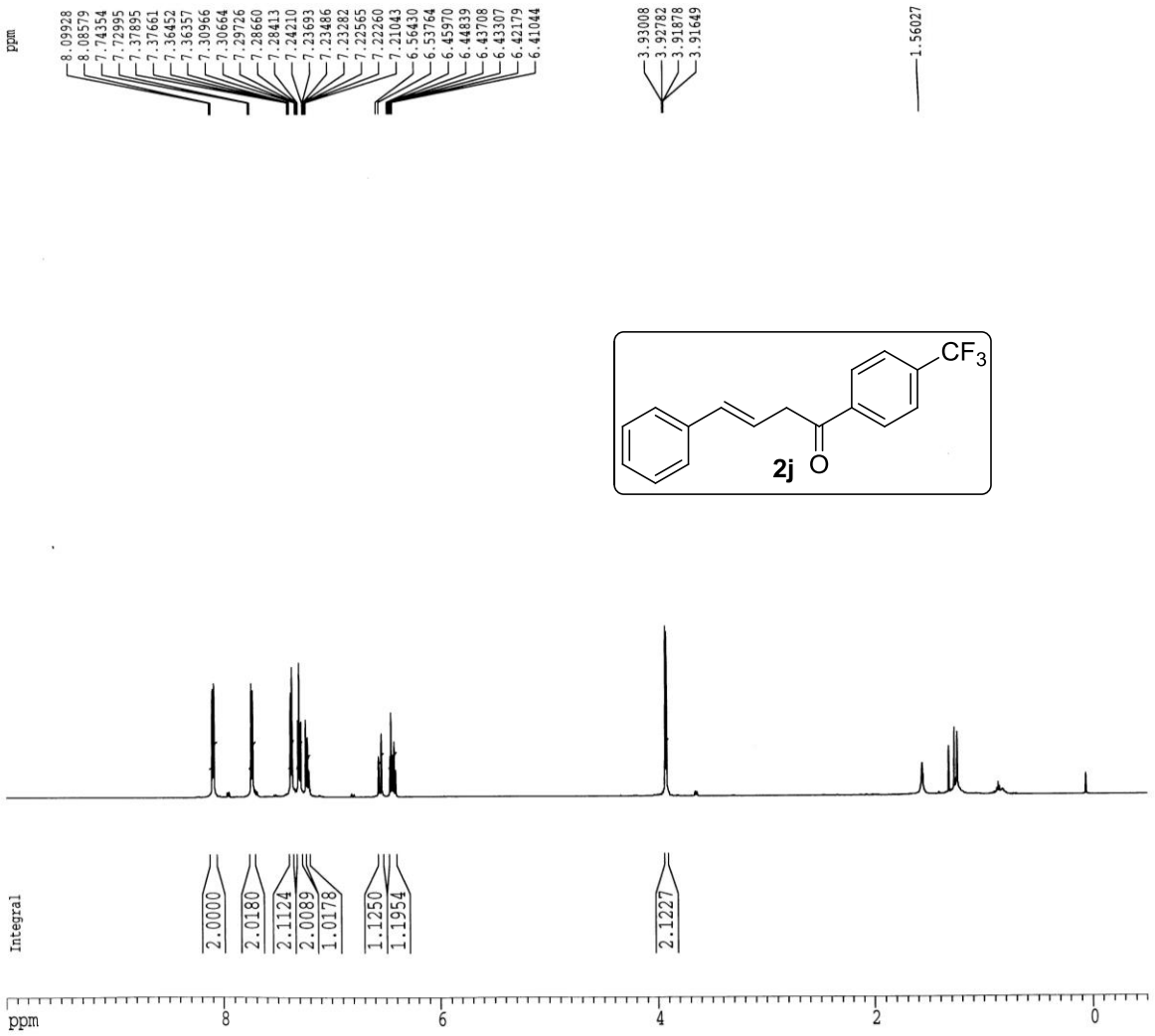
F2 - Acquisition Parameters
Date_ 20130826
Time 10.15
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT DMSO
NS 300
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 304.4 K
D1 3.50000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec

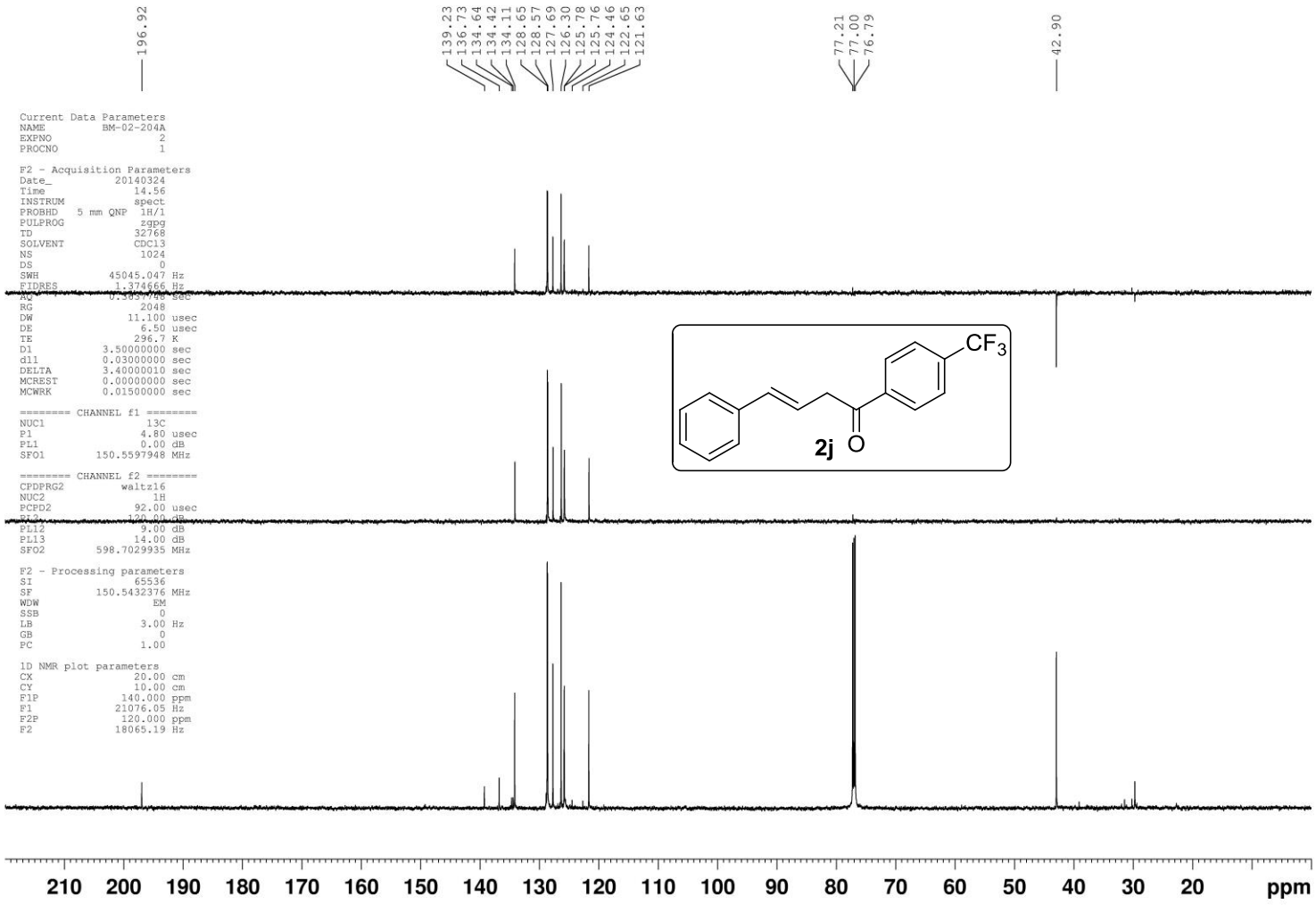
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz

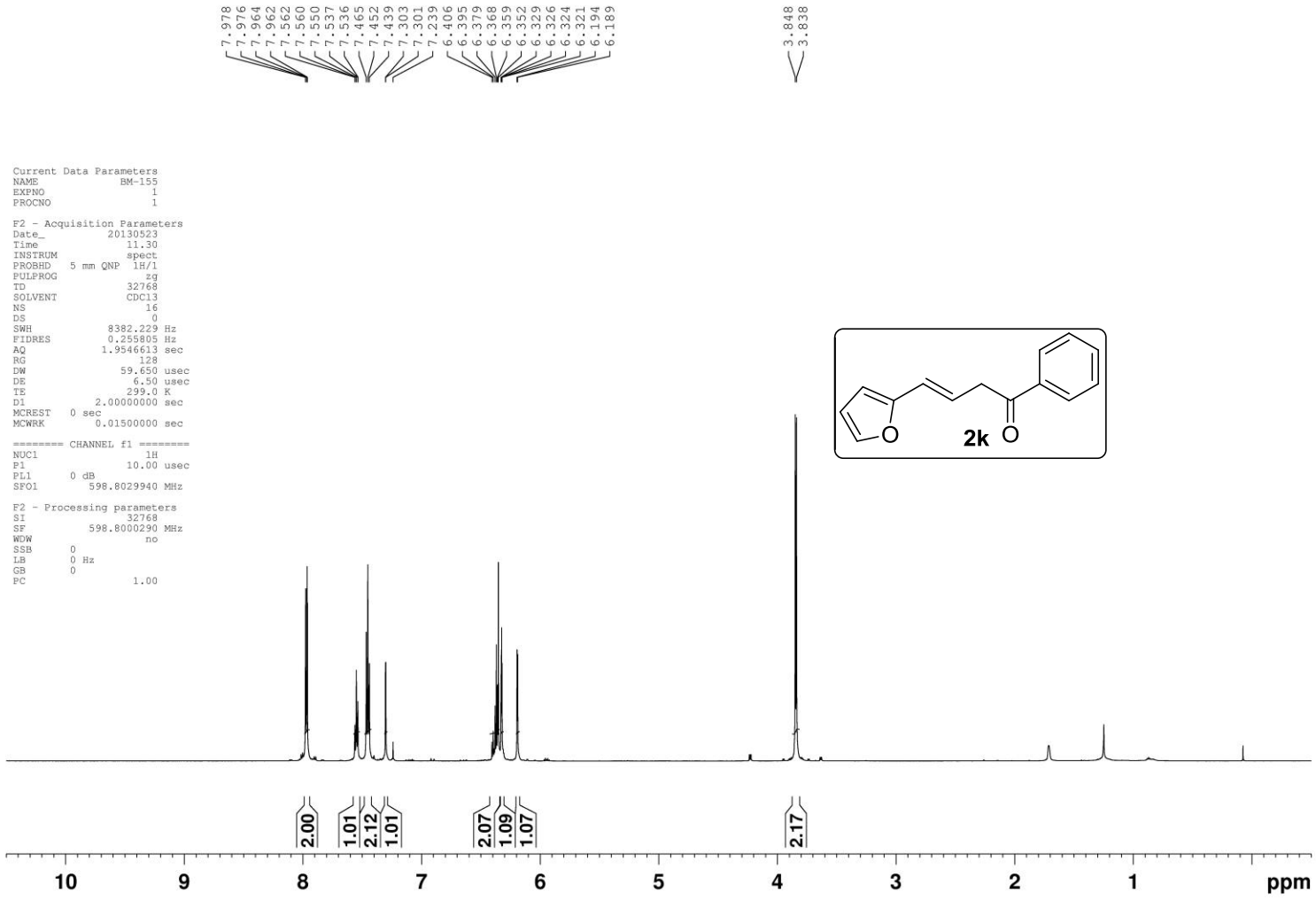
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz

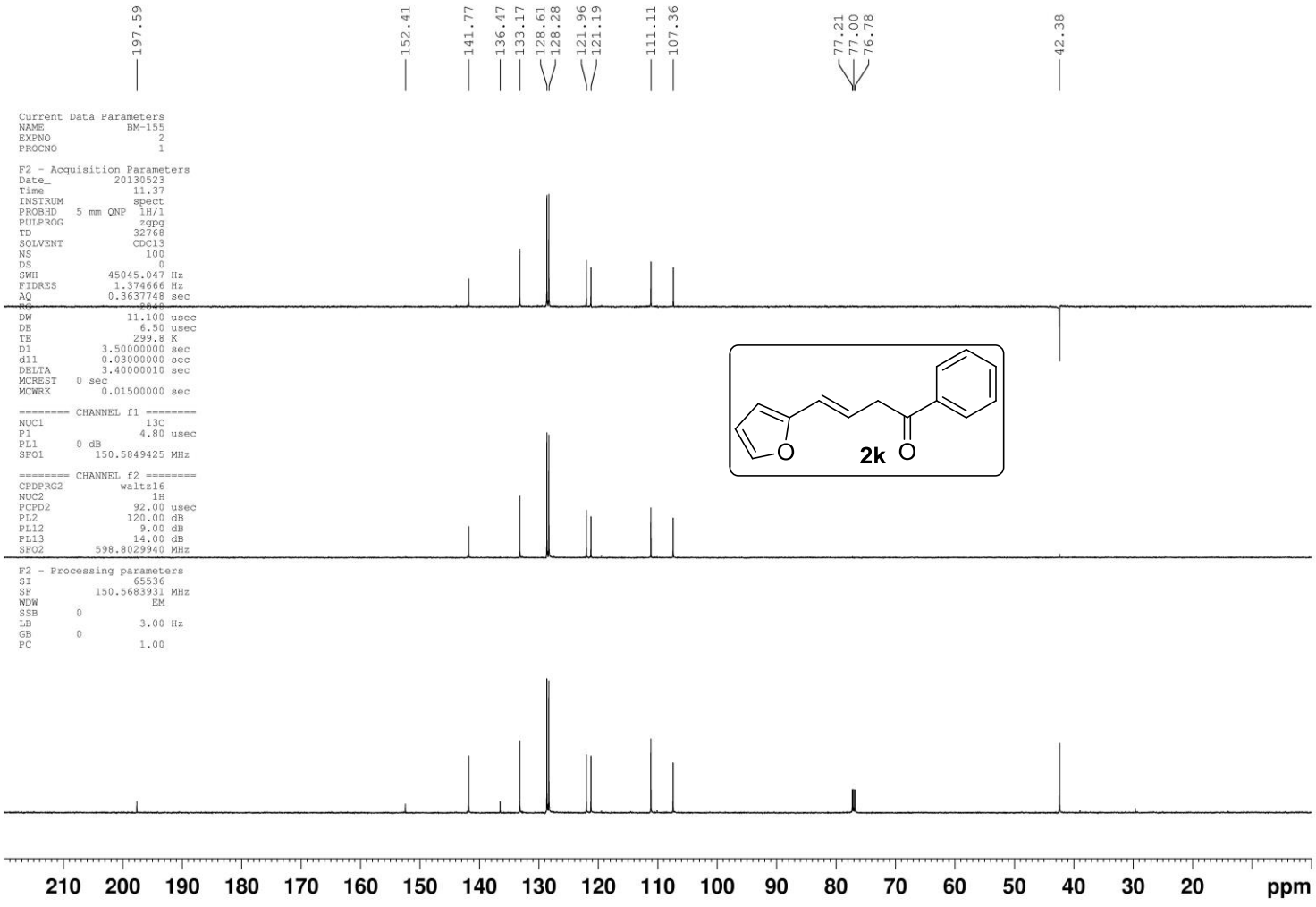
F2 - Processing parameters
SI 65536
SF 150.5683828 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50

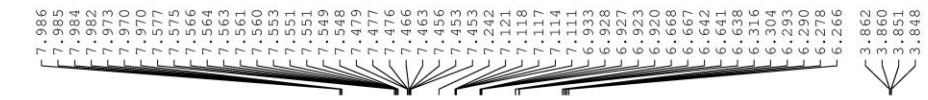
```
Current Data Parameters
NAME          BM-02-204A
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_           20140327
Time               19.47
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG              zg
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    0
SWH            8382.229 Hz
FIDRES        0.255805 Hz
AQ            1.9546613 sec
RG                  128
DW               59.650 usec
DE                6.50 usec
TE               295.6 K
D1            2.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                10.00 usec
PL1                0.00 dB
SFO1        598.7035922 MHz

F2 - Processing parameters
SI                32768
SF          598.7000250 MHz
WDW                  no
SSB                   0
LB                 0.00 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 3.00 cm
F1P               10.000 ppm
F1              5987.00 Hz
F2P               -0.500 ppm
F2              -299.35 Hz
PPMCM          0.52500 ppm/cm
HZCM         314.31750 Hz/cm
```

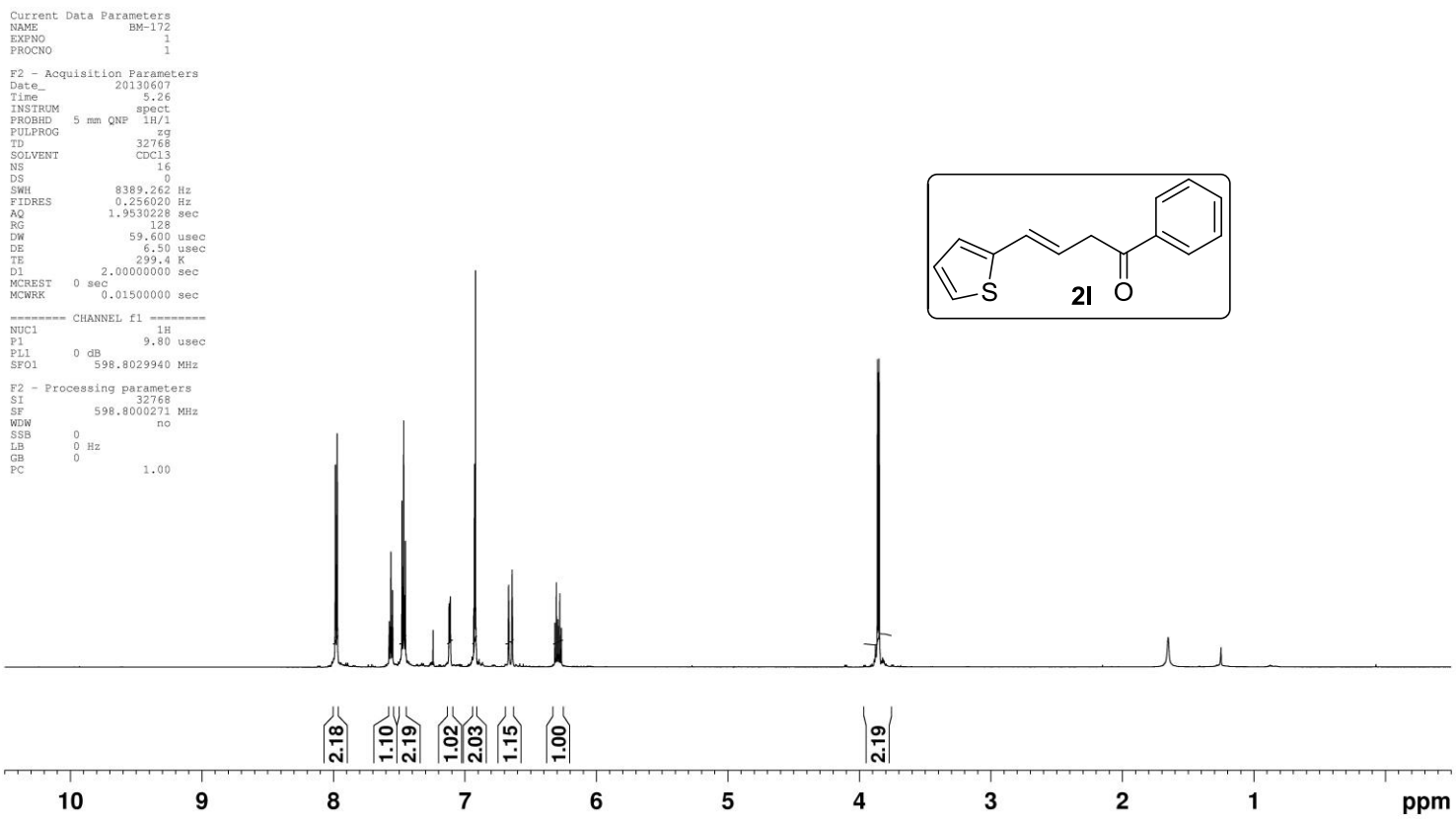



196.92
139.23
136.73
134.64
134.42
134.11
128.65
128.57
127.69
126.30
125.78
125.76
124.46
122.65
121.63
77.21
77.00
76.79
42.90
Current Data Parameters
NAME BM-02-204A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140324
Time 14.56
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 1024
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432376 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 140.000 ppm
F1 21076.05 Hz
F2P 120.000 ppm
F2 18065.19 Hz
CF3
O
2j
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

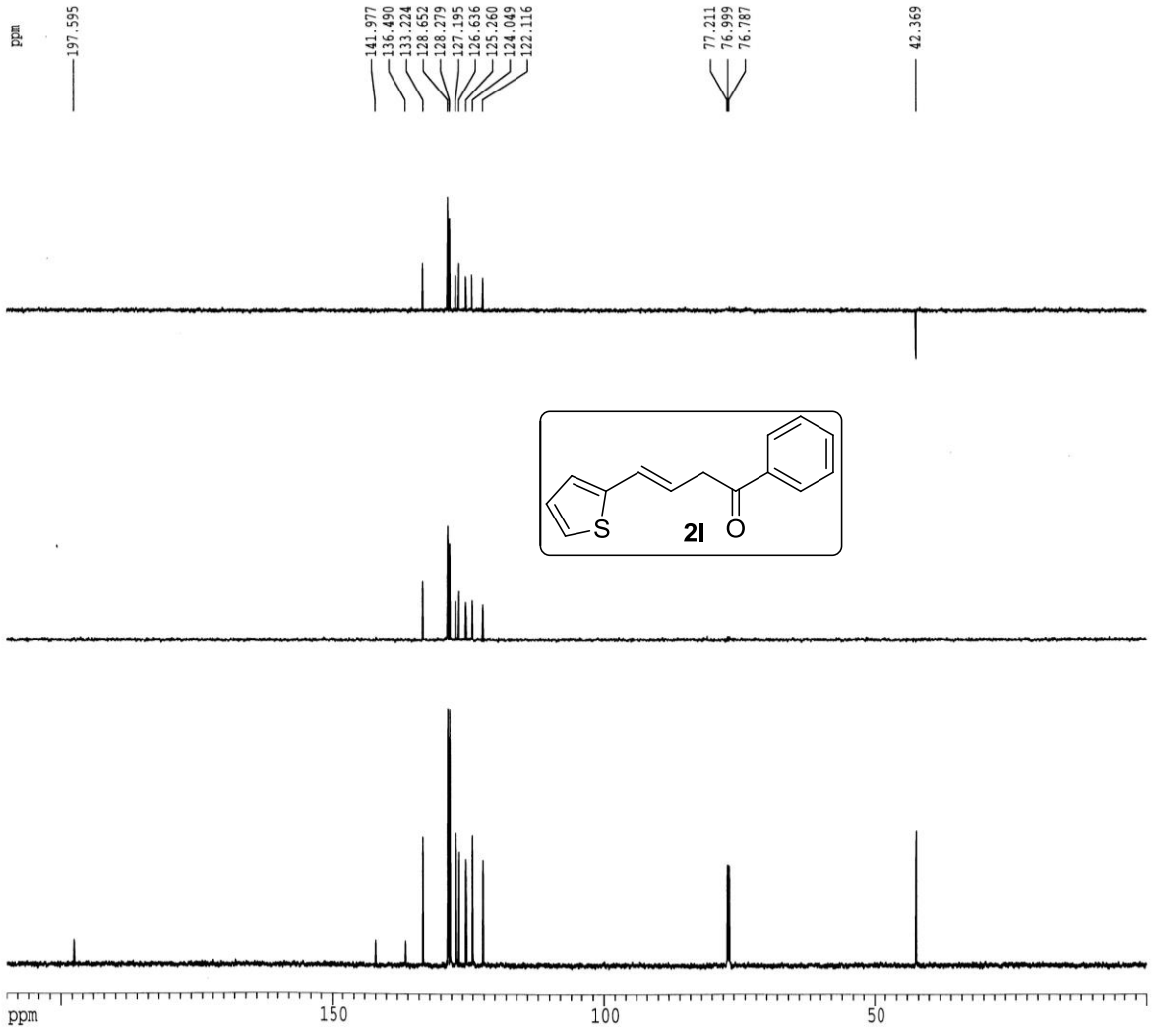

7.978
7.976
7.964
7.962
7.562
7.560
7.550
7.537
7.536
7.465
7.452
7.439
7.303
7.301
7.239
6.406
6.395
6.379
6.368
6.359
6.352
6.329
6.326
6.324
6.321
6.194
6.189
3.848
3.838
Current Data Parameters
NAME BM-155
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130523
Time 11.30
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 299.0 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000290 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
2k O
2.00
1.01
2.12
1.01
2.07
1.09
1.07
2.17
10
9
8
7
6
5
4
3
2
1
ppm

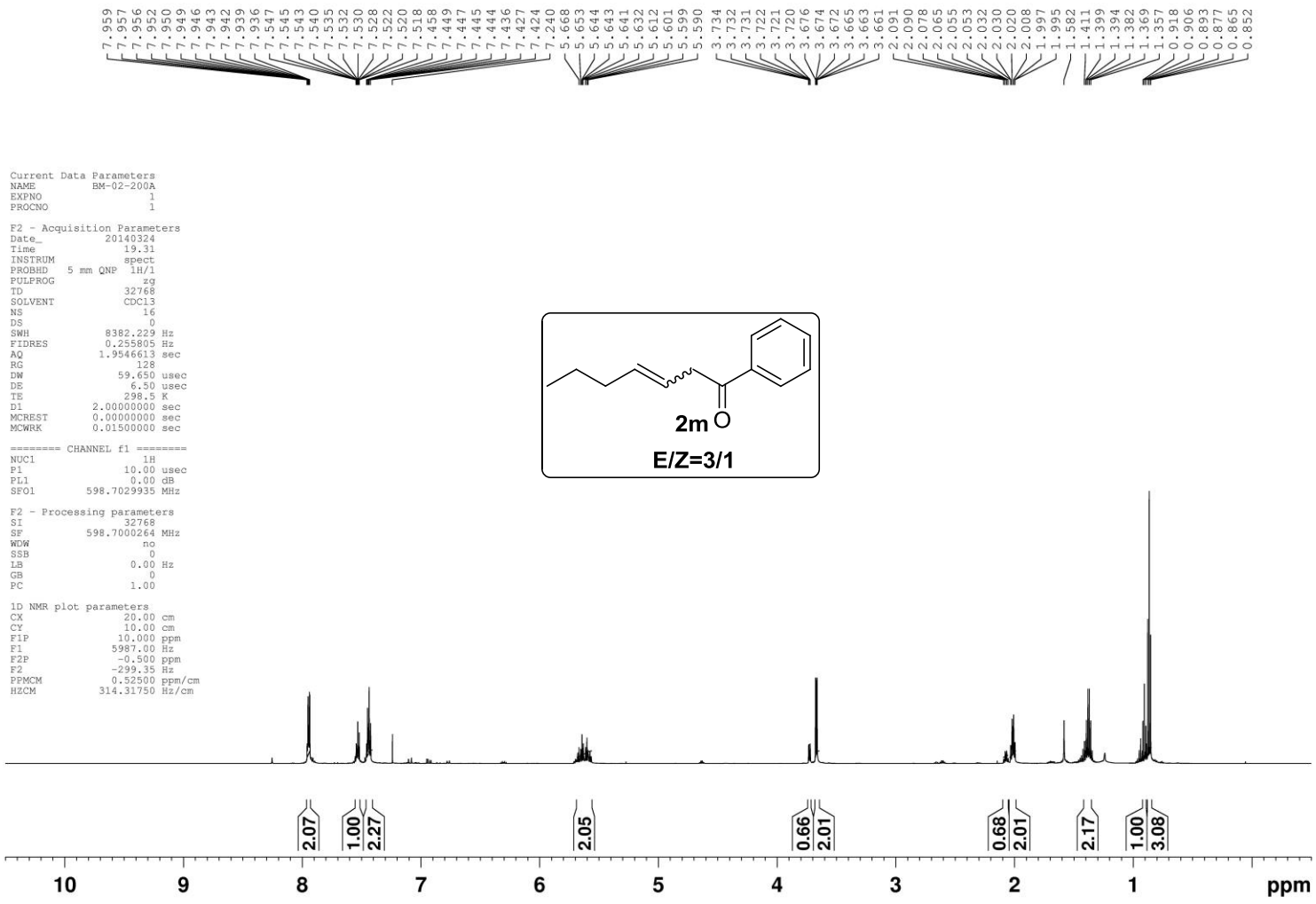

197.59
152.41
141.77
136.47
133.17
128.61
128.28
121.96
121.19
111.11
107.36
77.21
77.00
76.78
42.38
Current Data Parameters
NAME BM-155
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130523
Time 11.37
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.8 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683931 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
O
2k
O
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

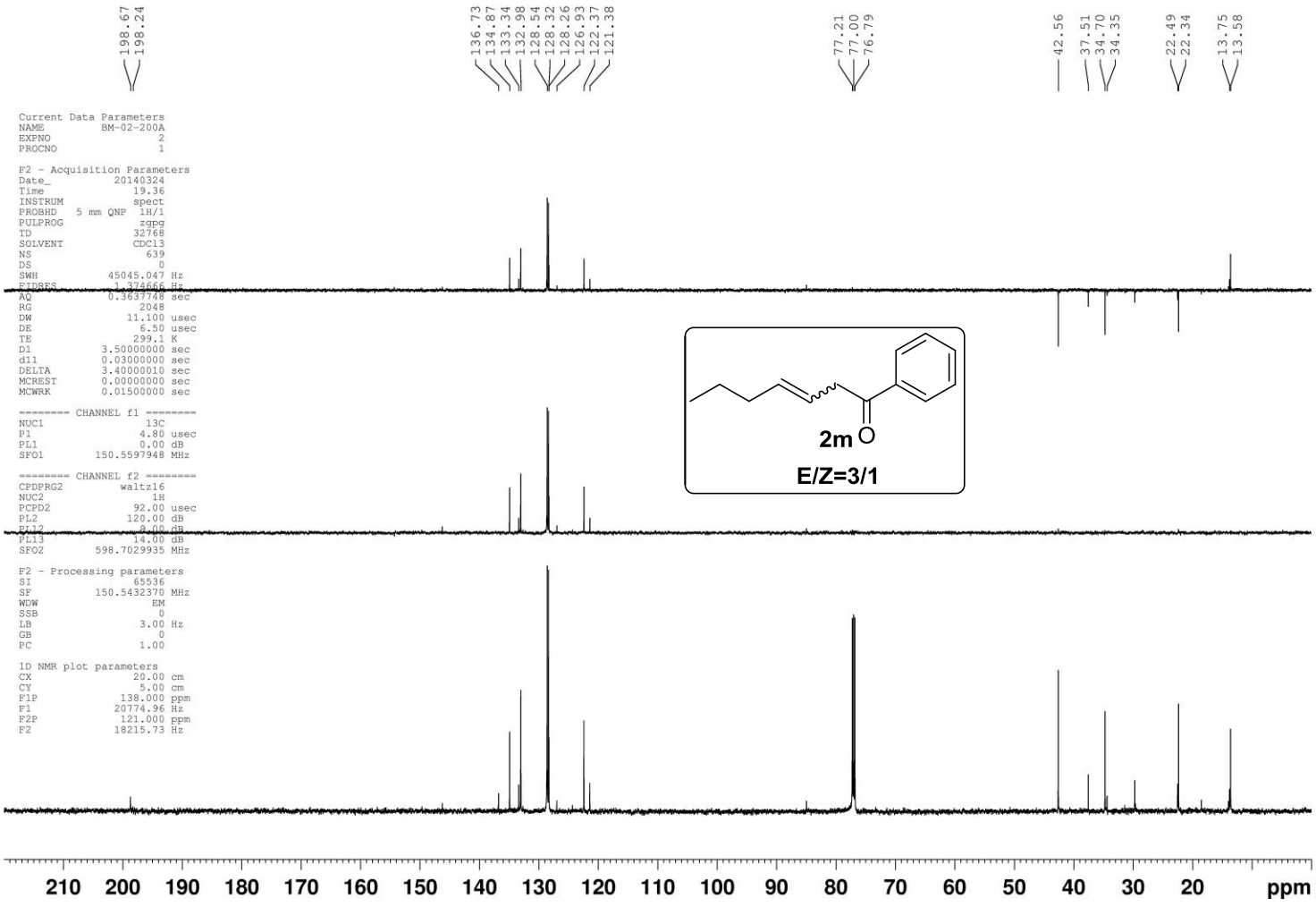

7.986
7.985
7.984
7.982
7.973
7.970
7.970
7.577
7.575
7.566
7.564
7.563
7.561
7.560
7.553
7.551
7.551
7.549
7.548
7.479
7.477
7.476
7.466
7.463
7.456
7.453
7.453
7.242
7.121
7.118
7.117
7.114
7.111
6.933
6.928
6.927
6.923
6.920
6.668
6.667
6.642
6.641
6.638
6.316
6.304
6.293
6.290
6.278
6.266
3.862
3.860
3.851
3.848

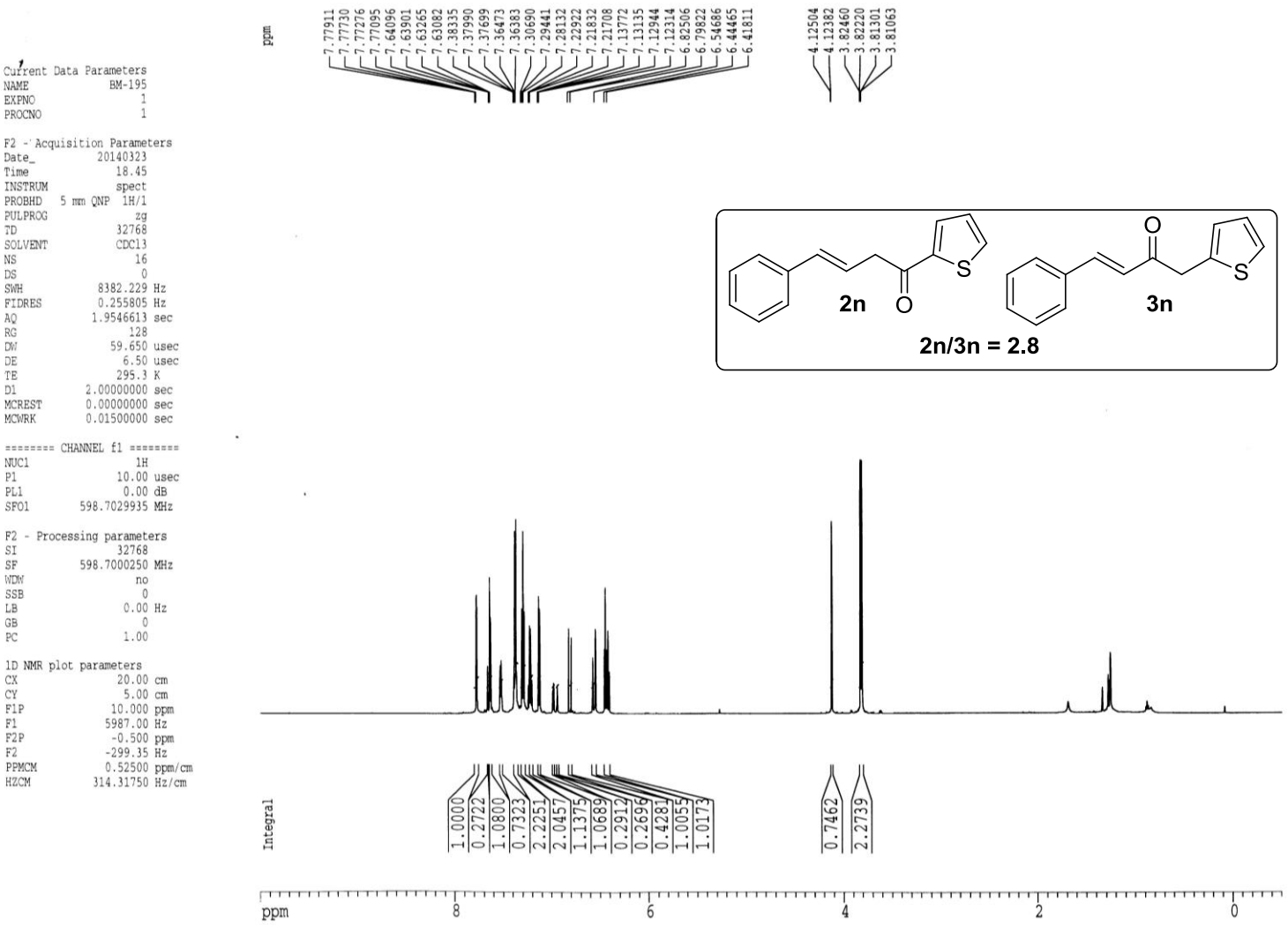

Current Data Parameters
NAME BM-172
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130607
Time 5.26
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 299.4 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 9.80 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000271 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
S
2l
O
2.18
1.10
2.19
1.02
2.03
1.15
1.00
2.19
10
9
8
7
6
5
4
3
2
1
ppm

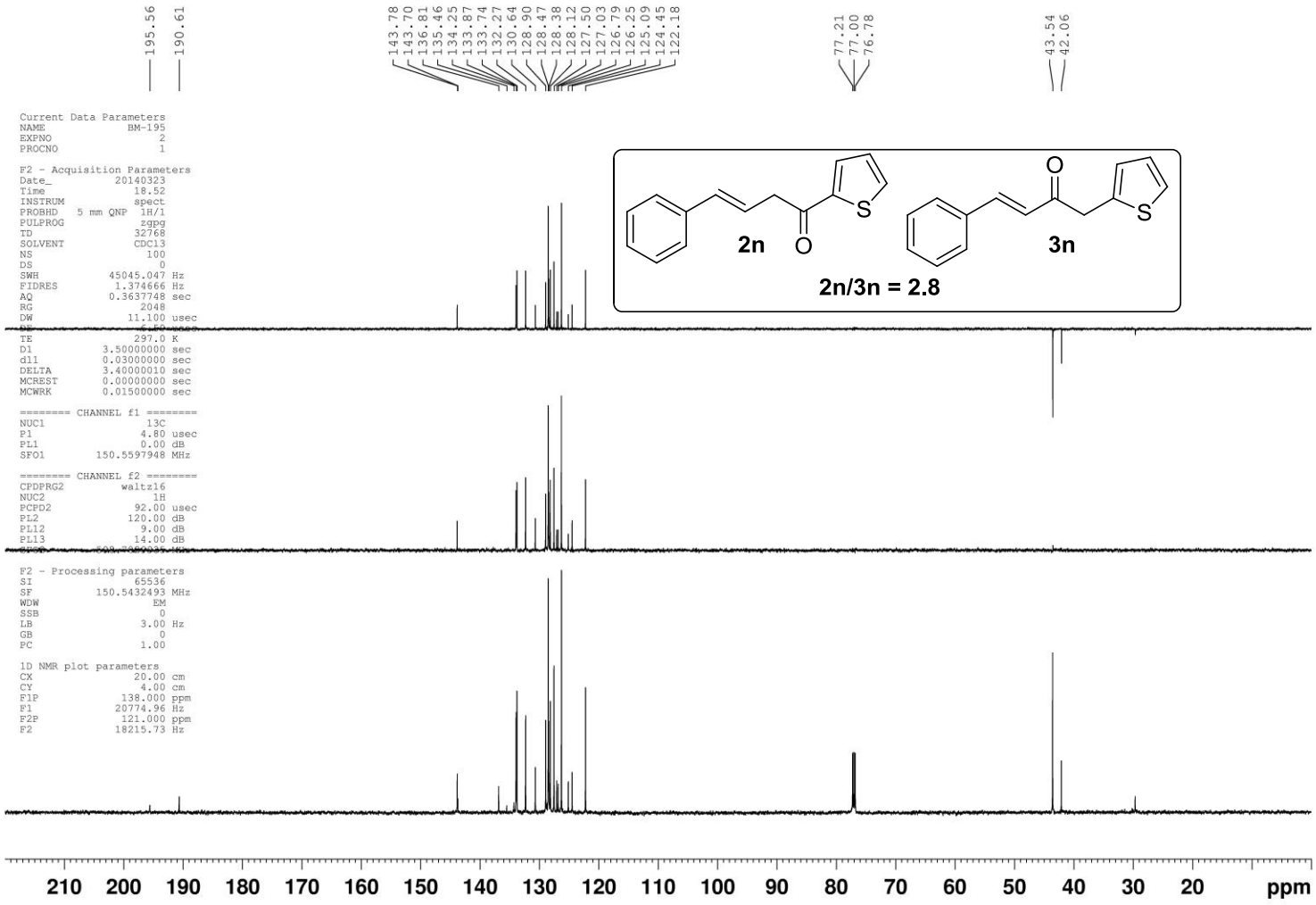
```
Current Data Parameters
NAME              BM-172
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130606
Time               14.18
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG            zgpg
TD                32768
SOLVENT           CDCl3
NS                   46
DS                    0
SWH            45045.047 Hz
FIDRES             1.374666 Hz
AQ              0.3637748 sec
RG                 2048
DW                11.100 usec
DE                 6.50 usec
TE                299.7 K
D1             3.50000000 sec
d11            0.03000000 sec
DELTA          3.40000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 4.80 usec
PL1                0.00 dB
SFO1         150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2             92.00 usec
PL2              120.00 dB
PL12               9.00 dB
PL13              14.00 dB
SFO2         598.8029940 MHz

F2 - Processing parameters
SI                 65536
SF           150.5683910 MHz
WDW                   EM
SSB                    0
LB                 3.00 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                20.00 cm
CY                 4.50 cm
F1P              210.000 ppm
F1             31619.36 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM          10.50000 ppm/cm
HZCM         1580.96814 Hz/cm
```

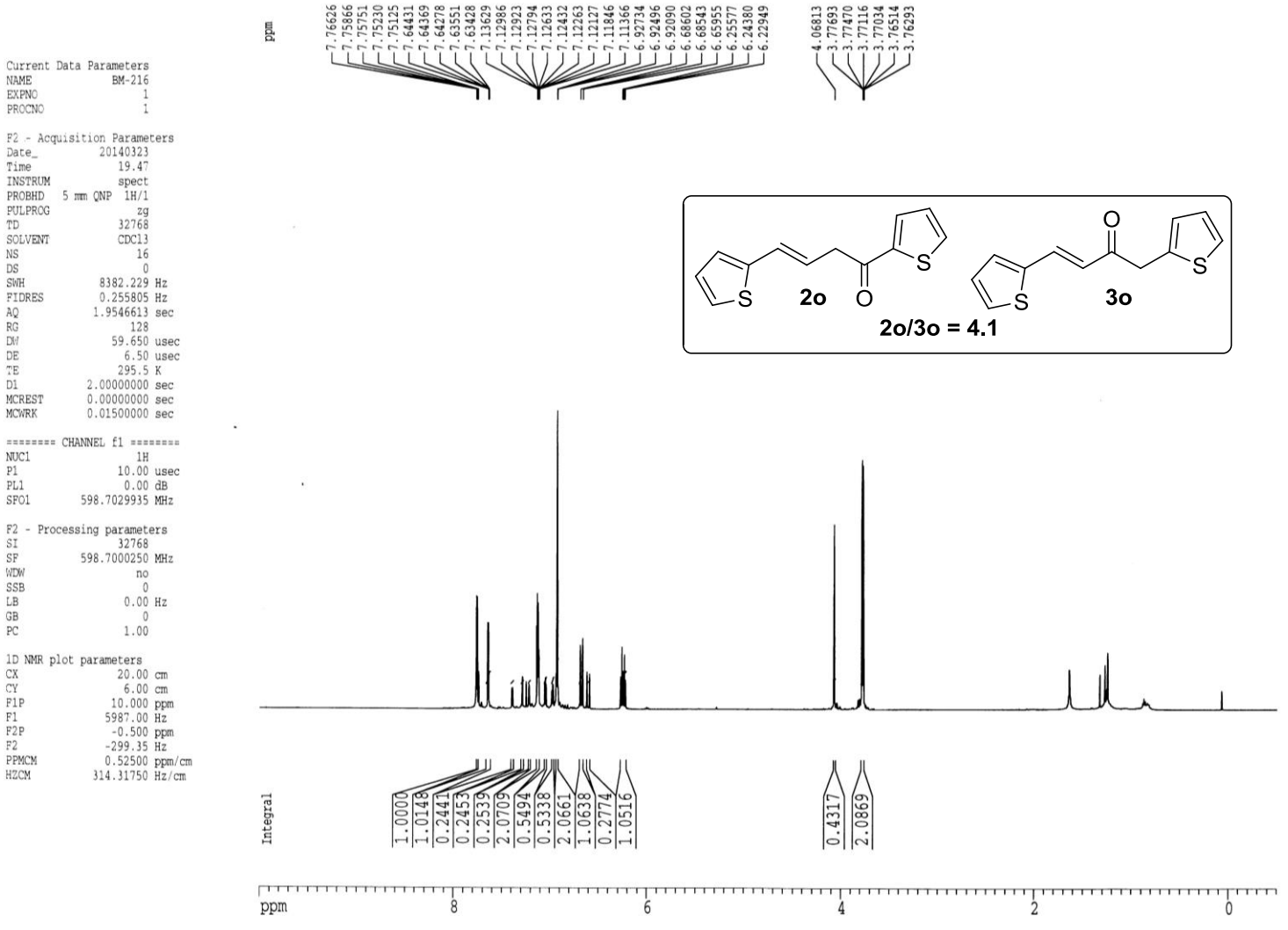



7.959
7.957
7.956
7.952
7.950
7.949
7.946
7.943
7.942
7.939
7.936
7.547
7.545
7.543
7.540
7.535
7.532
7.530
7.528
7.522
7.520
7.518
7.458
7.449
7.447
7.445
7.444
7.436
7.427
7.424
7.240
5.668
5.653
5.644
5.643
5.641
5.632
5.612
5.601
5.599
5.590
3.734
3.732
3.731
3.722
3.721
3.720
3.676
3.674
3.672
3.665
3.663
3.661
2.091
2.090
2.078
2.065
2.055
2.053
2.032
2.030
2.020
2.008
1.997
1.995
1.582
1.411
1.399
1.394
1.382
1.369
1.357
0.918
0.906
0.893
0.877
0.865
0.852
Current Data Parameters
NAME BM-02-200A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140324
Time 19.31
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000264 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
2m
E/Z=3/1
2.07
1.00
2.27
2.05
0.66
2.01
0.68
2.01
2.17
1.00
3.08
10
9
8
7
6
5
4
3
2
1
ppm

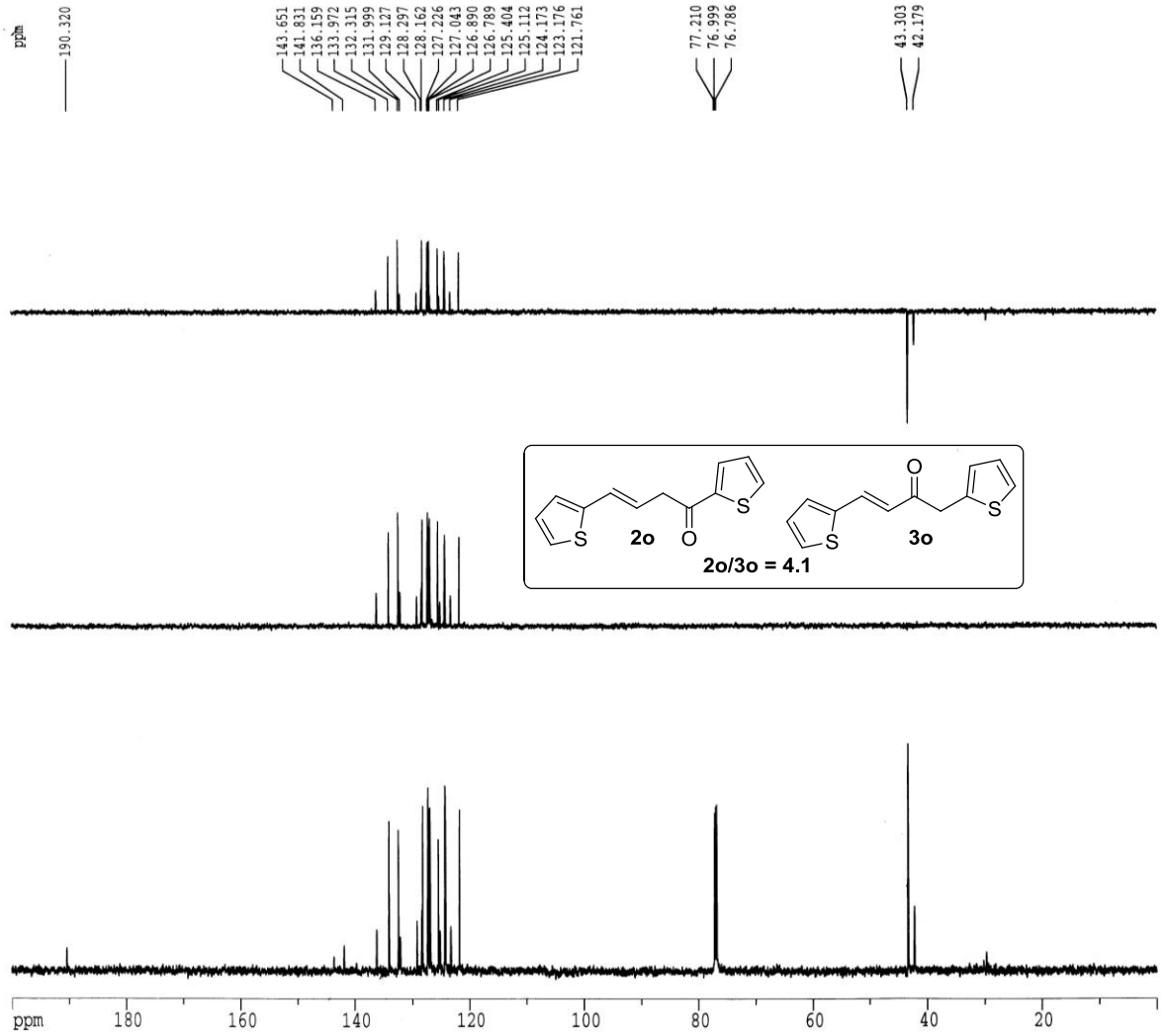

198.67
198.24
136.73
134.87
133.34
132.98
128.54
128.32
128.26
126.93
122.37
121.38
77.21
77.00
76.79
42.56
37.51
34.70
34.35
22.49
22.34
13.75
13.58
Current Data Parameters
NAME BM-02-200A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140324
Time 19.36
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 639
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.1 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 8.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432370 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 5.00 cm
F1P 138.000 ppm
F1 20774.96 Hz
F2P 121.000 ppm
F2 18215.73 Hz
2m
E/Z=3/1
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

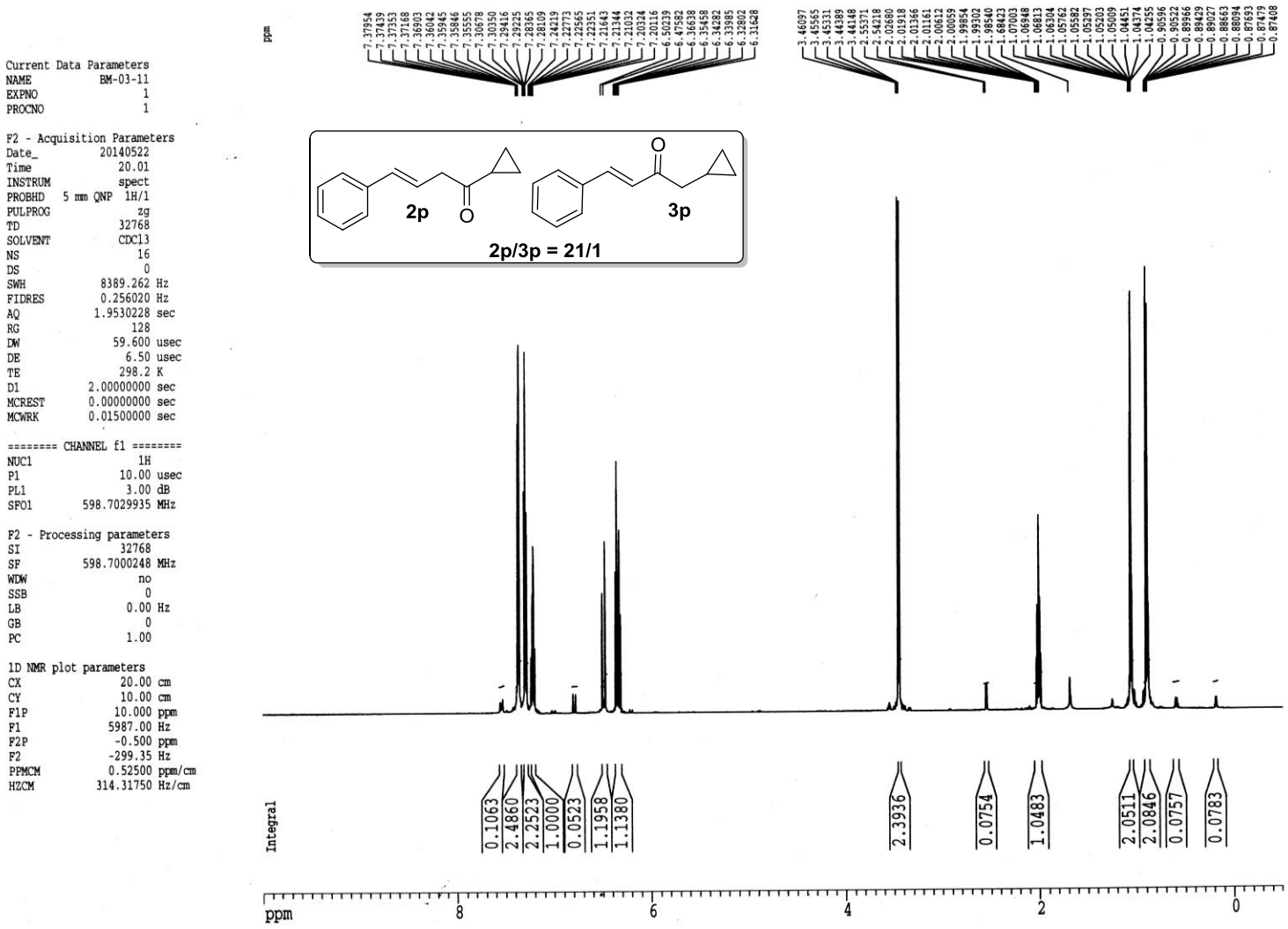

Current Data Parameters
NAME BM-195
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 18.45
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 295.3 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000250 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 5.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.77911
7.77730
7.77276
7.77095
7.64096
7.63901
7.63265
7.63082
7.38335
7.37990
7.37699
7.36473
7.36383
7.30690
7.29441
7.28132
7.22922
7.21832
7.21708
7.13772
7.13135
7.12944
7.12314
6.82506
6.79822
6.54686
6.44465
6.41811
4.12504
4.12382
3.82460
3.82220
3.81301
3.81063
2n
3n
2n/3n = 2.8
Integral
1.0000
0.2722
1.0800
0.7323
2.2251
2.0457
1.1375
1.0689
0.2912
0.2696
0.4281
1.0055
1.0173
0.7462
2.2739
ppm
8
6
4
2
0


195.56
190.61
143.78
143.70
136.81
135.46
134.25
133.87
133.74
132.27
130.64
128.90
128.47
128.38
128.12
127.50
127.03
126.79
126.25
125.09
124.45
122.18
77.21
77.00
76.78
43.54
42.06
2n
3n
2n/3n = 2.8
Current Data Parameters
NAME BM-195
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 18.52
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
TE 297.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
F2 - Processing parameters
SI 65536
SF 150.5432493 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 138.000 ppm
F1 20774.96 Hz
F2P 121.000 ppm
F2 18215.73 Hz
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

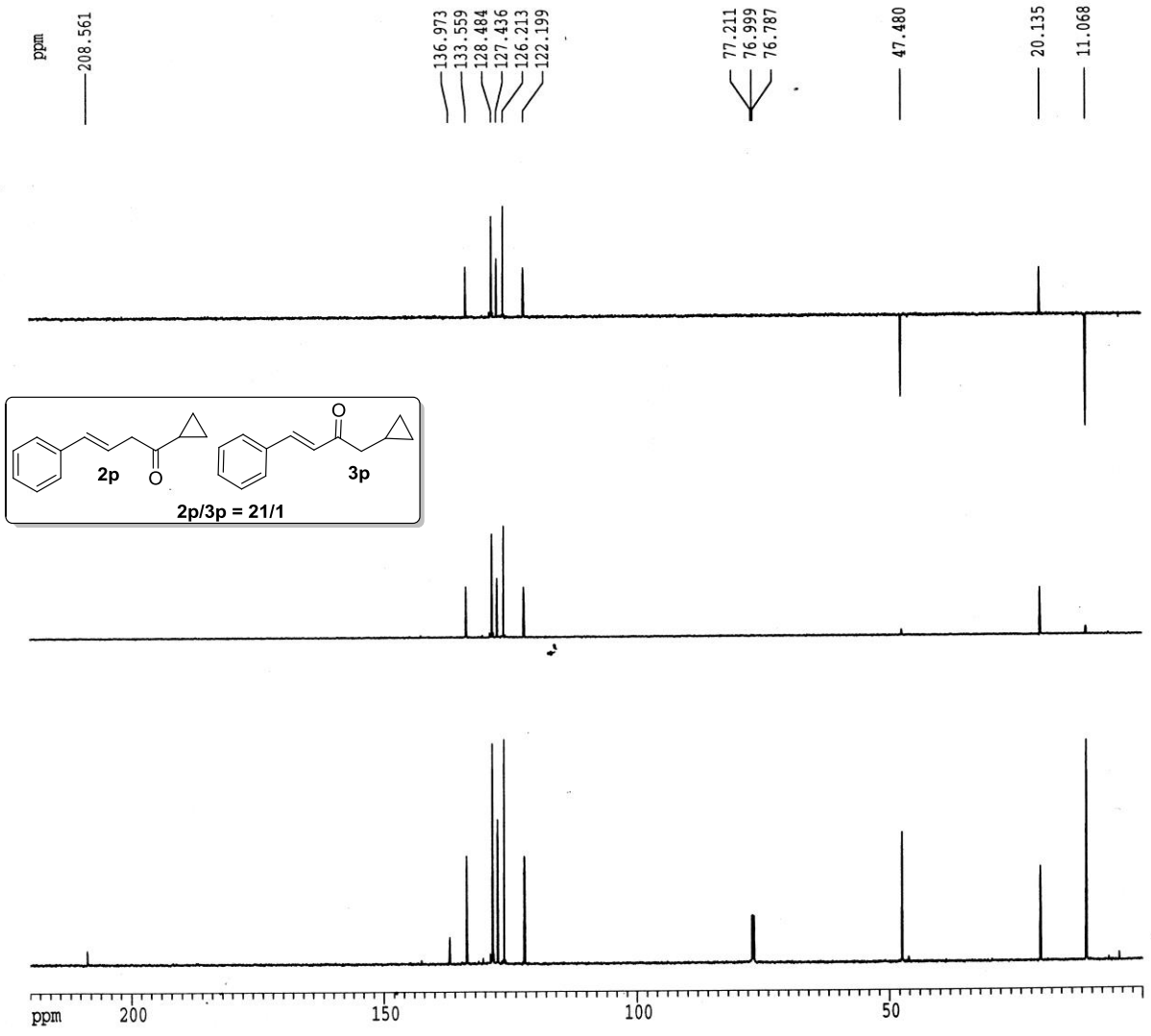

Current Data Parameters
NAME BM-216
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 19.47
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 295.5 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000250 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.76626
7.75866
7.75751
7.75230
7.75125
7.64431
7.64369
7.64278
7.63551
7.63428
7.13629
7.12986
7.12923
7.12794
7.12633
7.12432
7.12263
7.12127
7.11846
7.11366
6.92734
6.92496
6.92090
6.68602
6.68543
6.65955
6.25577
6.24380
6.22949
4.06813
3.77693
3.77470
3.77116
3.77034
3.76514
3.76293
2o
3o
2o/3o = 4.1
Integral
1.0000
1.0148
0.2441
0.2453
0.2539
2.0709
0.5494
0.5338
2.0661
1.0638
0.2774
1.0516
0.4317
2.0869
ppm
8
6
4
2
0

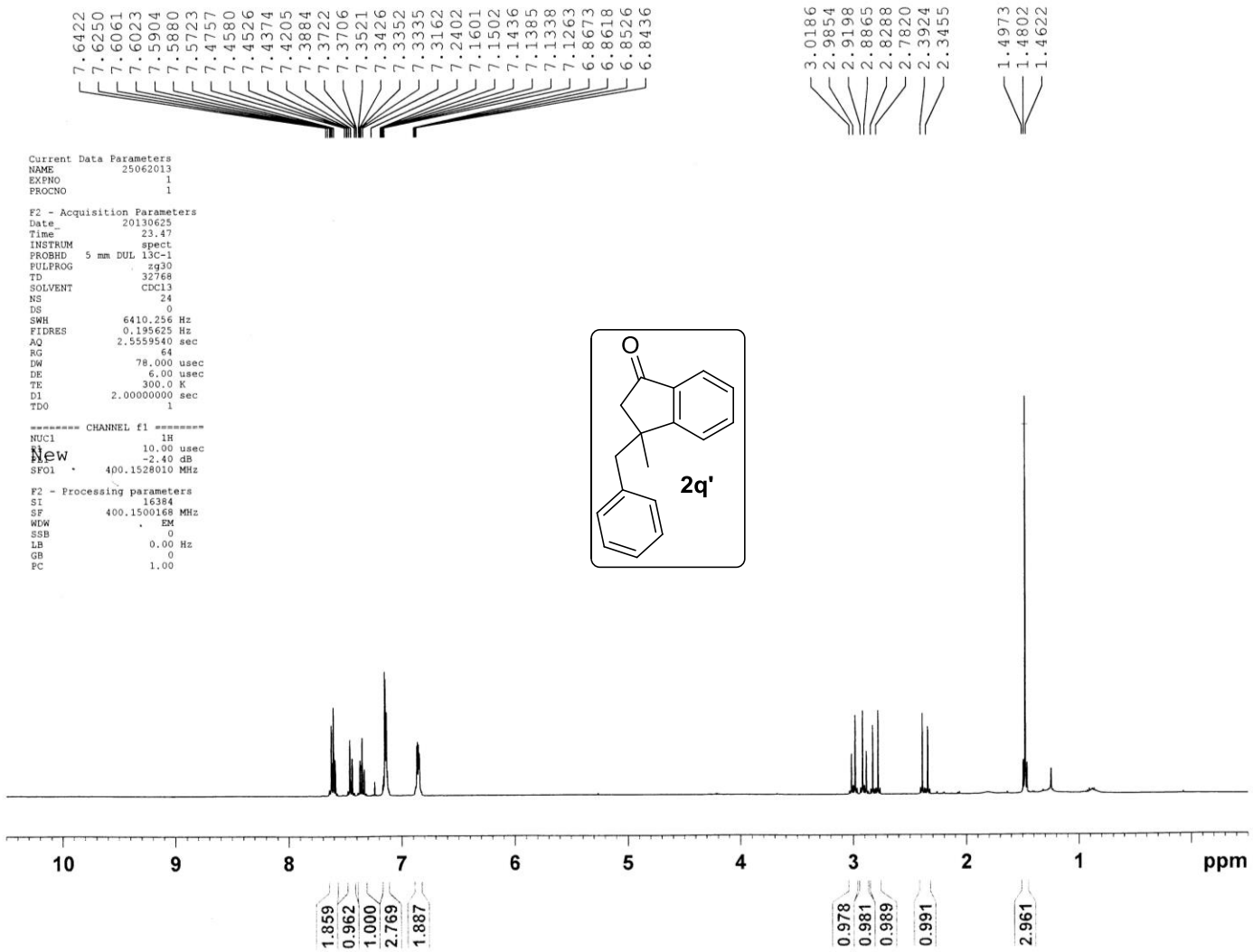
```
Current Data Parameters
NAME                  BM-216
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20140323
Time                  19.54
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                     32768
SOLVENT                CDCl3
NS                       100
DS                         0
SWH               45045.047 Hz
FIDRES             1.374666 Hz
AQ                 0.3637748 sec
RG                      2048
DW                   11.100 usec
DE                    6.50 usec
TE                    297.0 K
D1                 3.50000000 sec
d11                0.03000000 sec
DELTA              3.40000010 sec
MCREST             0.00000000 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                      13C
P1                       4.80 usec
PL1                      0.00 dB
SFO1             150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   92.00 usec
PL2                    120.00 dB
PL12                     9.00 dB
PL13                    14.00 dB
SFO2             598.7029935 MHz

F2 - Processing parameters
SI                       65536
SF               150.5432431 MHz
WDW                         EM
SSB                          0
LB                       3.00 Hz
GB                           0
PC                        1.00

1D NMR plot parameters
CX                      20.00 cm
CY                       4.00 cm
F1P                    200.000 ppm
F1                   30108.65 Hz
F2P                      0.000 ppm
F2                       0.00 Hz
PPMCM                10.00000 ppm/cm
HZCM                 1505.43237 Hz/cm
```

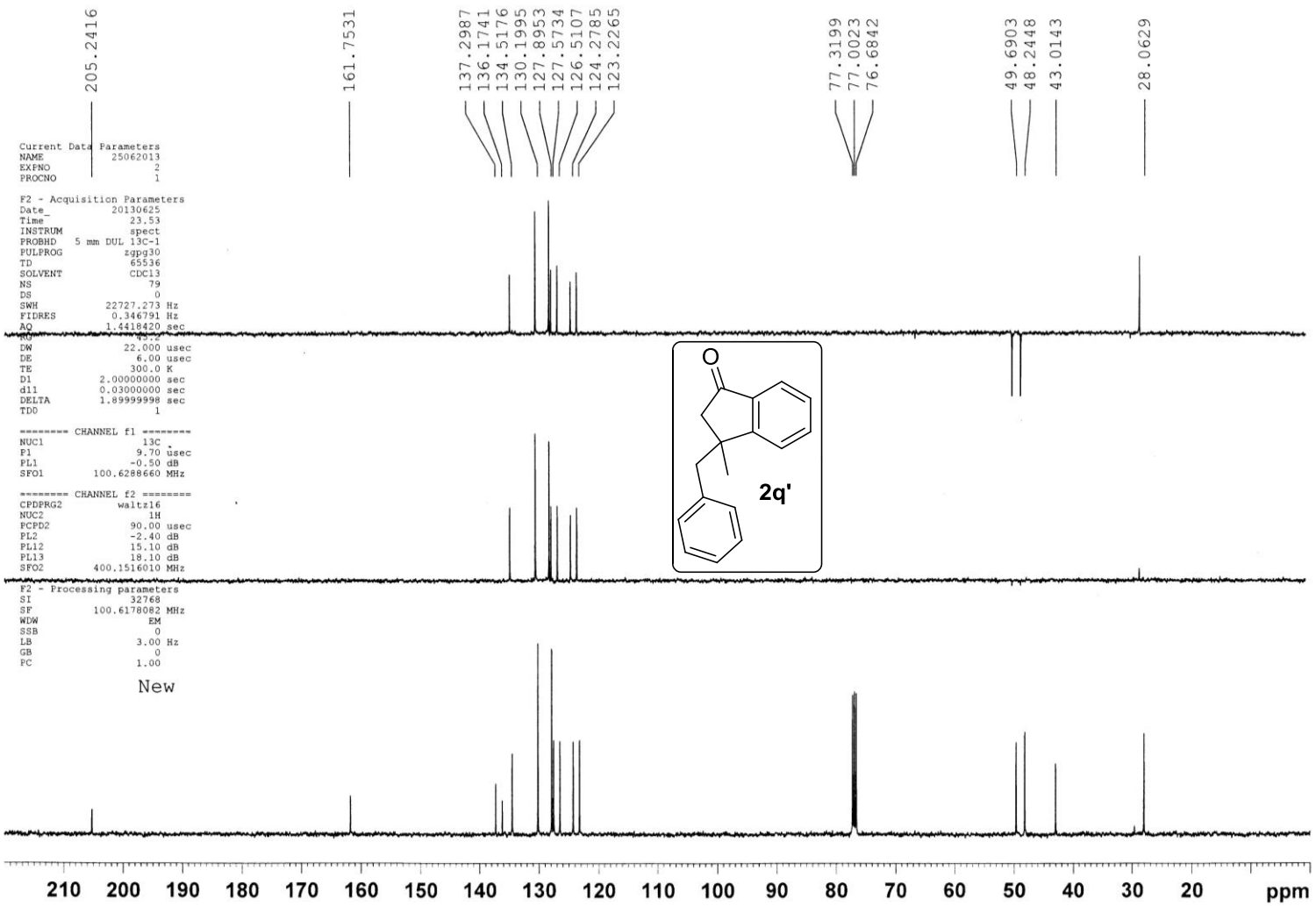


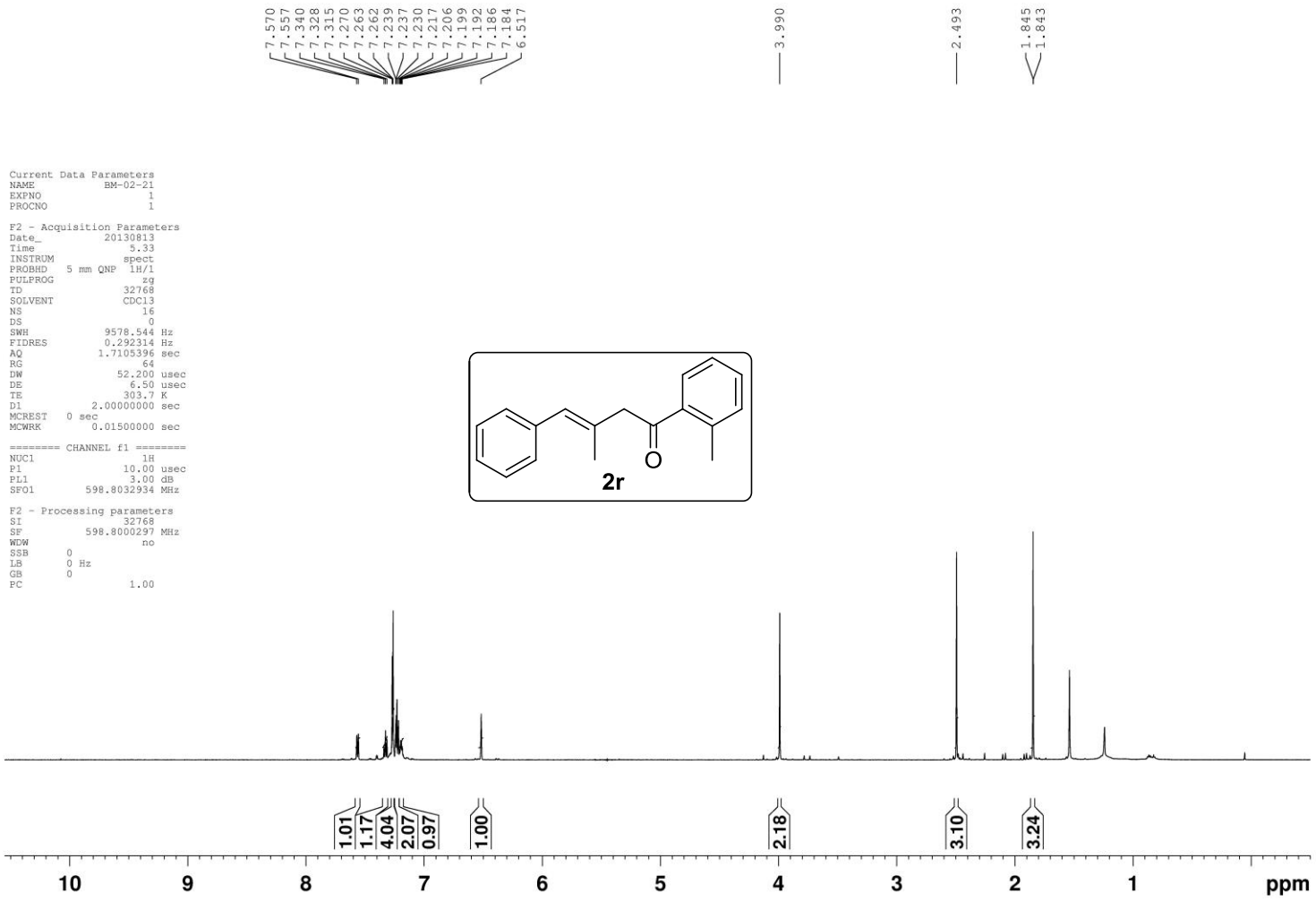

Current Data Parameters
NAME BM-03-11
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140522
Time 20.01
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000248 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.37954 7.37439 7.37353 7.37168 7.36903 7.36042 7.35945 7.35846 7.35555 7.30678 7.30350 7.29416 7.29225 7.28365 7.28109 7.24219 7.22773 7.22565 7.22351 7.21643 7.21344 7.21032 7.20324 7.20116 6.50239 6.47582 6.36638 6.35458 6.34282 6.33985 6.32802 6.31628
3.46097 3.45565 3.45331 3.44389 3.44148 2.55371 2.54218 2.02680 2.01918 2.01366 2.01161 2.00612 2.00059 1.99854 1.99302 1.98540 1.68423 1.07003 1.06948 1.06813 1.06304 1.05762 1.05582 1.05297 1.05203 1.05009 1.04451 1.04374 1.04255 0.90596 0.90522 0.89966 0.89429 0.89027 0.88663 0.88094 0.87693 0.87479 0.87408
2p
O
O
3p
2p/3p = 21/1
Integral
0.1063 2.4860 2.2523 1.0000 0.0523 1.1958 1.1380
2.3936 0.0754 1.0483 2.0511 2.0846 0.0757 0.0783
ppm
8
6
4
2
0

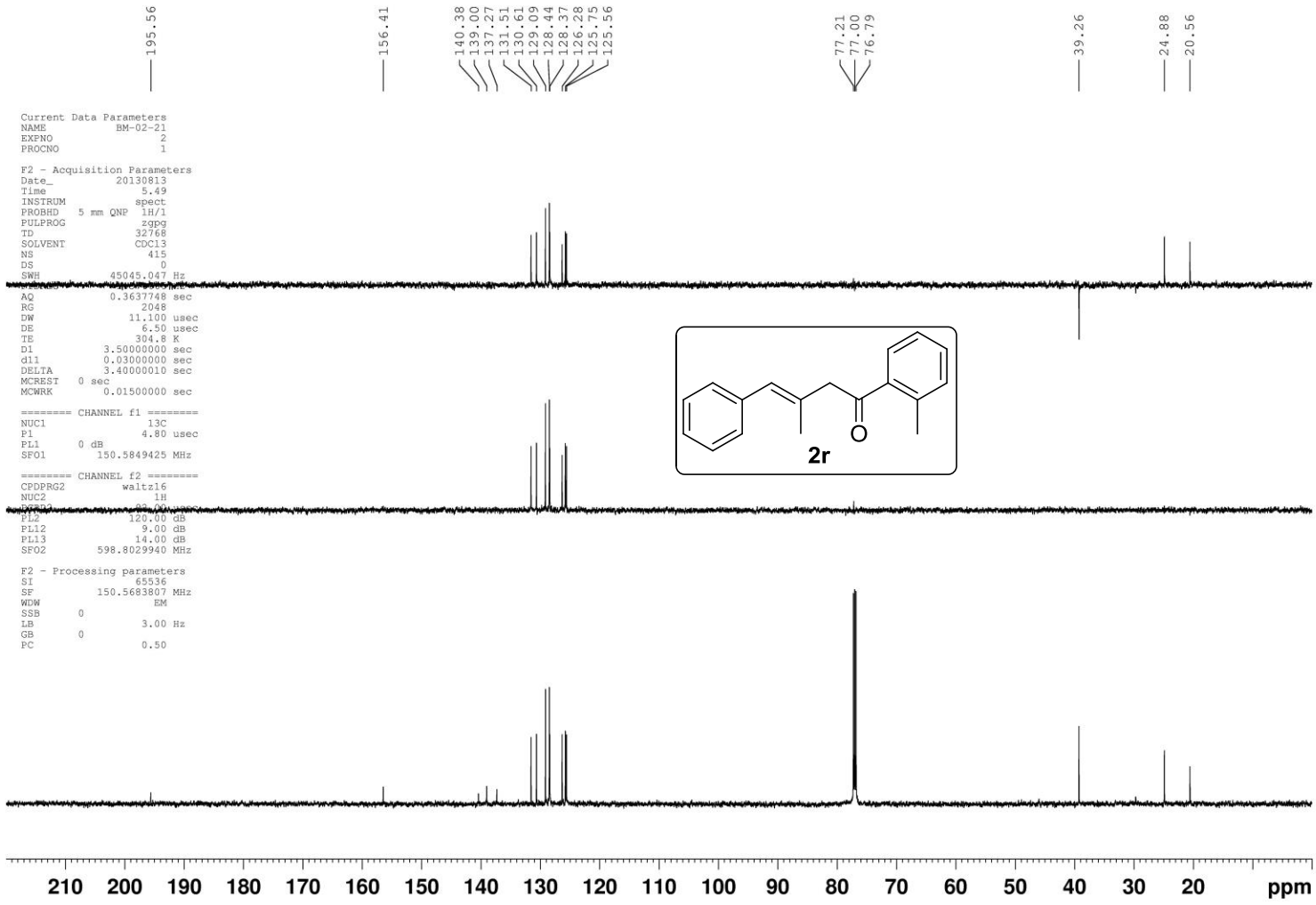
```
Current Data Parameters
NAME            BM-03-11
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20140522
Time               20.15
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG            zgpg
TD                 32768
SOLVENT            CDCl3
NS                   200
DS                     0
SWH            45045.047 Hz
FIDRES          1.374666 Hz
AQ              0.3637748 sec
RG                  2048
DW                11.100 usec
DE                 6.50 usec
TE                299.4 K
D1             3.50000000 sec
d11            0.03000000 sec
DELTA          3.40000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  4.80 usec
PL1                 0.00 dB
SFO1         150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              92.00 usec
PL2               120.00 dB
PL12                9.00 dB
PL13               14.00 dB
SFO2         598.7029935 MHz

F2 - Processing parameters
SI                  65536
SF           150.5432445 MHz
WDW                    EM
SSB                    0
LB                  3.00 Hz
GB                     0
PC                  0.50

1D NMR plot parameters
CX                 20.00 cm
CY                  4.00 cm
F1P              220.000 ppm
F1              33119.51 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM          11.00000 ppm/cm
HZCM         1655.97571 Hz/cm
```

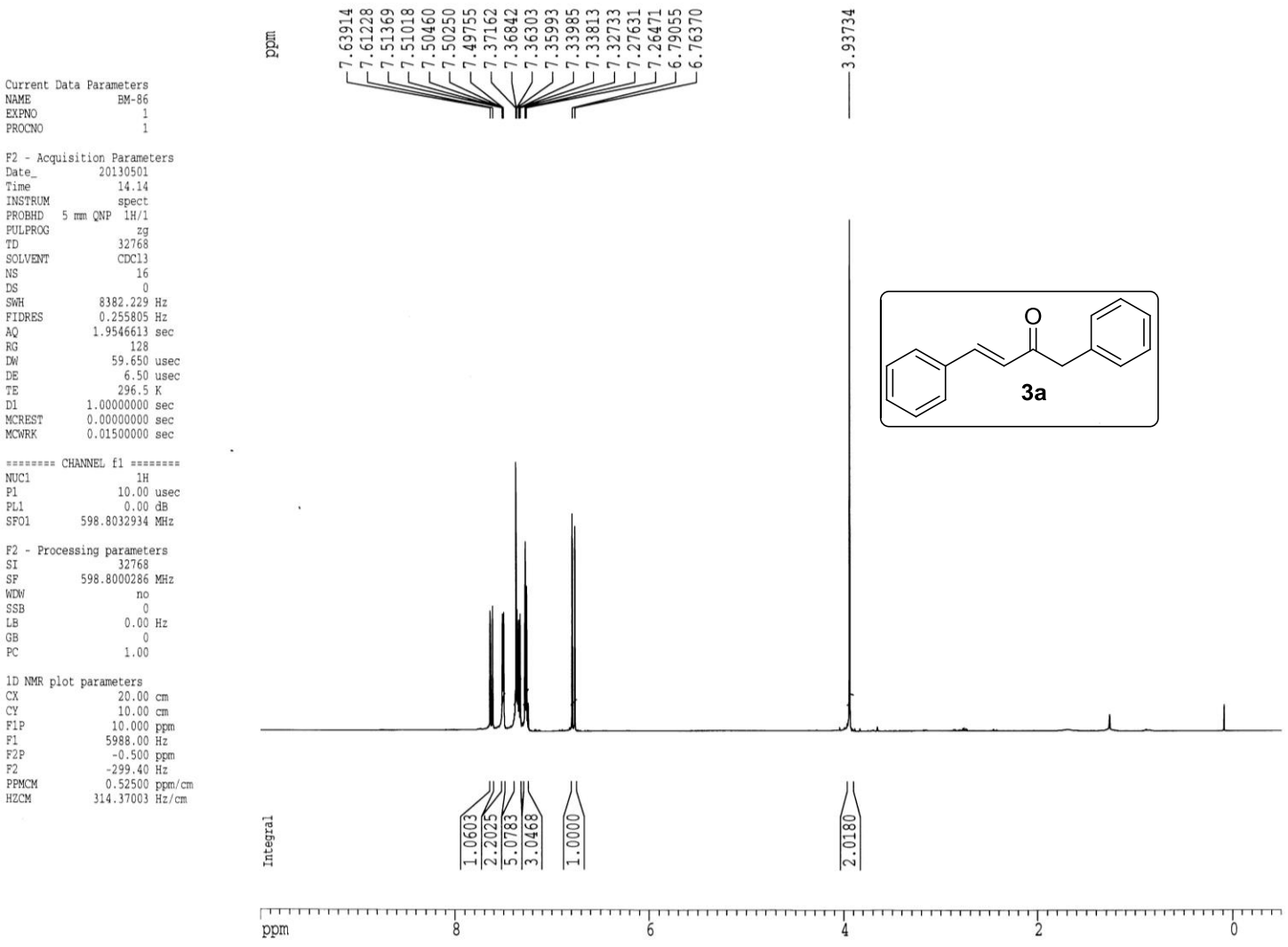


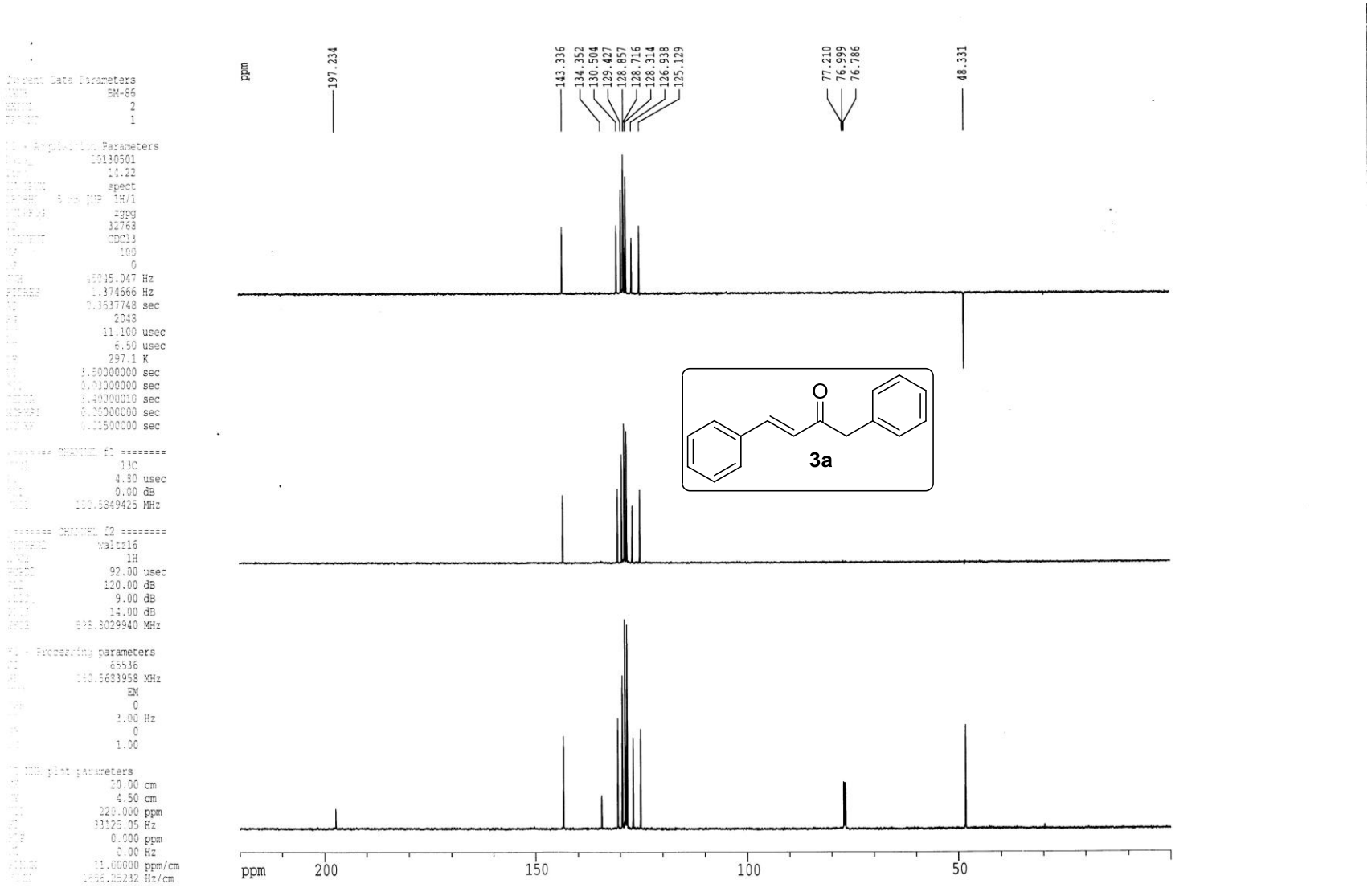

7.6422
7.6250
7.6061
7.6023
7.5904
7.5880
7.5723
7.4757
7.4580
7.4526
7.4374
7.4205
7.3884
7.3722
7.3706
7.3521
7.3426
7.3352
7.3335
7.3162
7.2402
7.1601
7.1502
7.1436
7.1385
7.1338
7.1263
6.8673
6.8618
6.8526
6.8436
3.0186
2.9854
2.9198
2.8865
2.8288
2.7820
2.3924
2.3455
1.4973
1.4802
1.4622
Current Data Parameters
NAME 25062013
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130625
Time 23.47
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 24
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 64
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500168 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
New
O
2q'
10
9
8
7
6
5
4
3
2
1
ppm
1.859
0.962
1.000
2.769
1.887
0.978
0.981
0.989
0.991
2.961

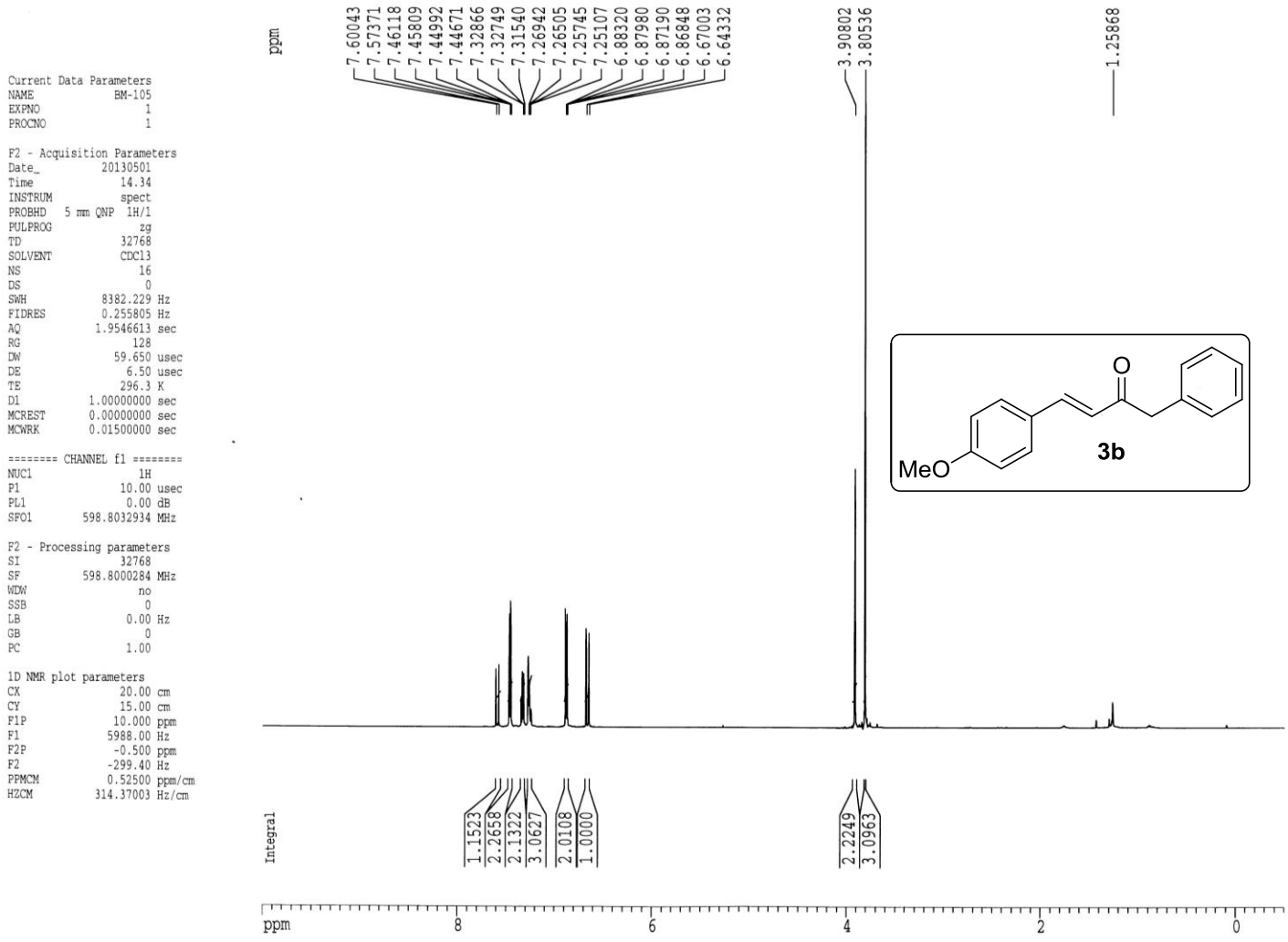

205.2416
161.7531
137.2987
136.1741
134.5176
130.1995
127.8953
127.5734
126.5107
124.2785
123.2265
77.3199
77.0023
76.6842
49.6903
48.2448
43.0143
28.0629
Current Data Parameters
NAME 25062013
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130625
Time 23.53
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 79
DS 0
SWH 22727.273 Hz
FIDRES 0.346791 Hz
AQ 1.4418420 sec
RG 45.5
DW 22.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.70 usec
PL1 -0.50 dB
SFO1 100.6288660 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 usec
PL2 -2.40 dB
PL12 15.10 dB
PL13 18.10 dB
SFO2 400.1516010 MHz
F2 - Processing parameters
SI 32768
SF 100.6178082 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
New
O
2q'
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

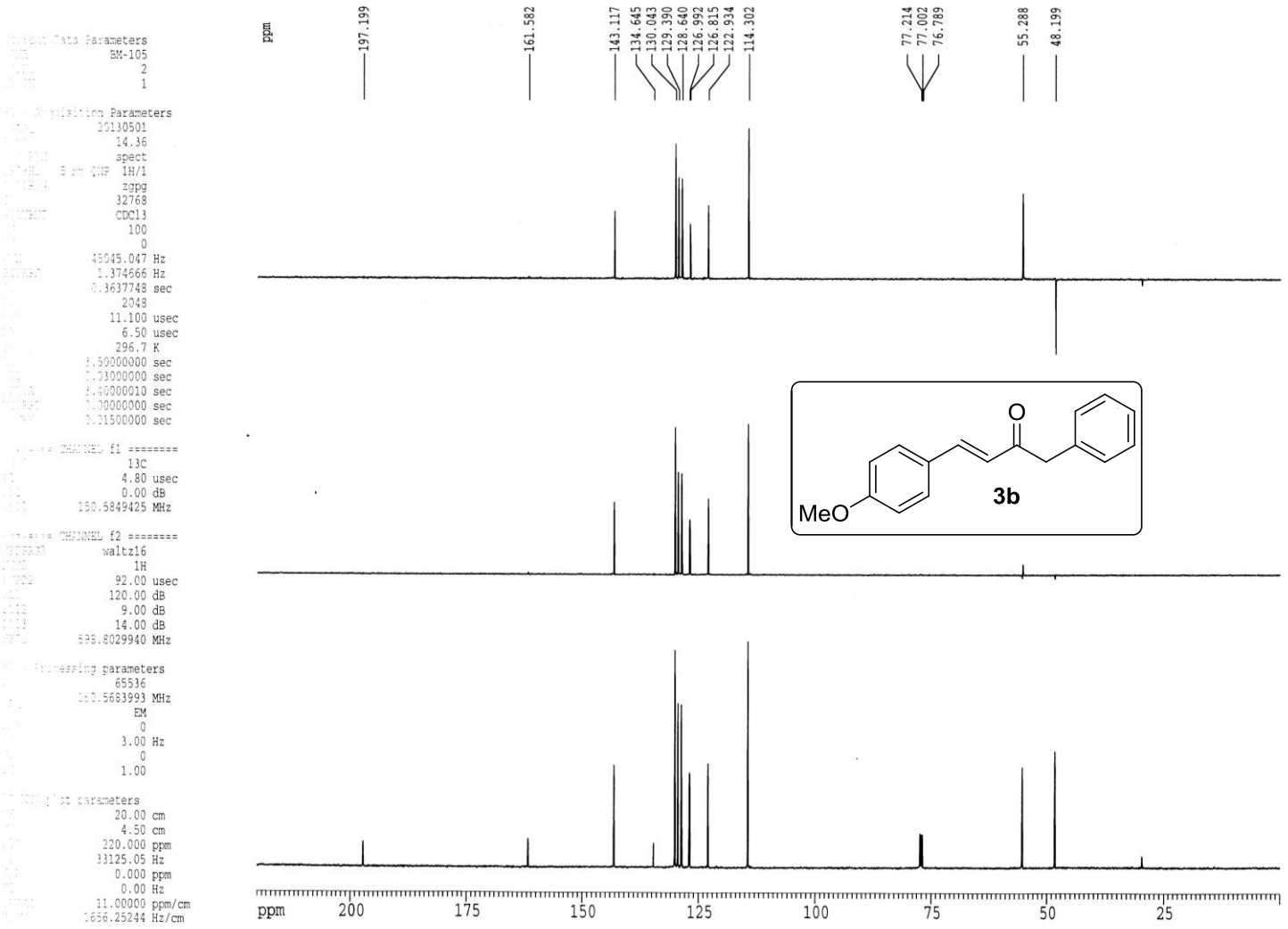

7.570
7.557
7.340
7.328
7.315
7.270
7.263
7.262
7.239
7.237
7.230
7.217
7.206
7.199
7.192
7.186
7.184
6.517
3.990
2.493
1.845
1.843
Current Data Parameters
NAME BM-02-21
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130813
Time 5.33
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 64
DW 52.200 usec
DE 6.50 usec
TE 303.7 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000297 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
2r
1.01
1.17
4.04
2.07
0.97
1.00
2.18
3.10
3.24
10
9
8
7
6
5
4
3
2
1
ppm

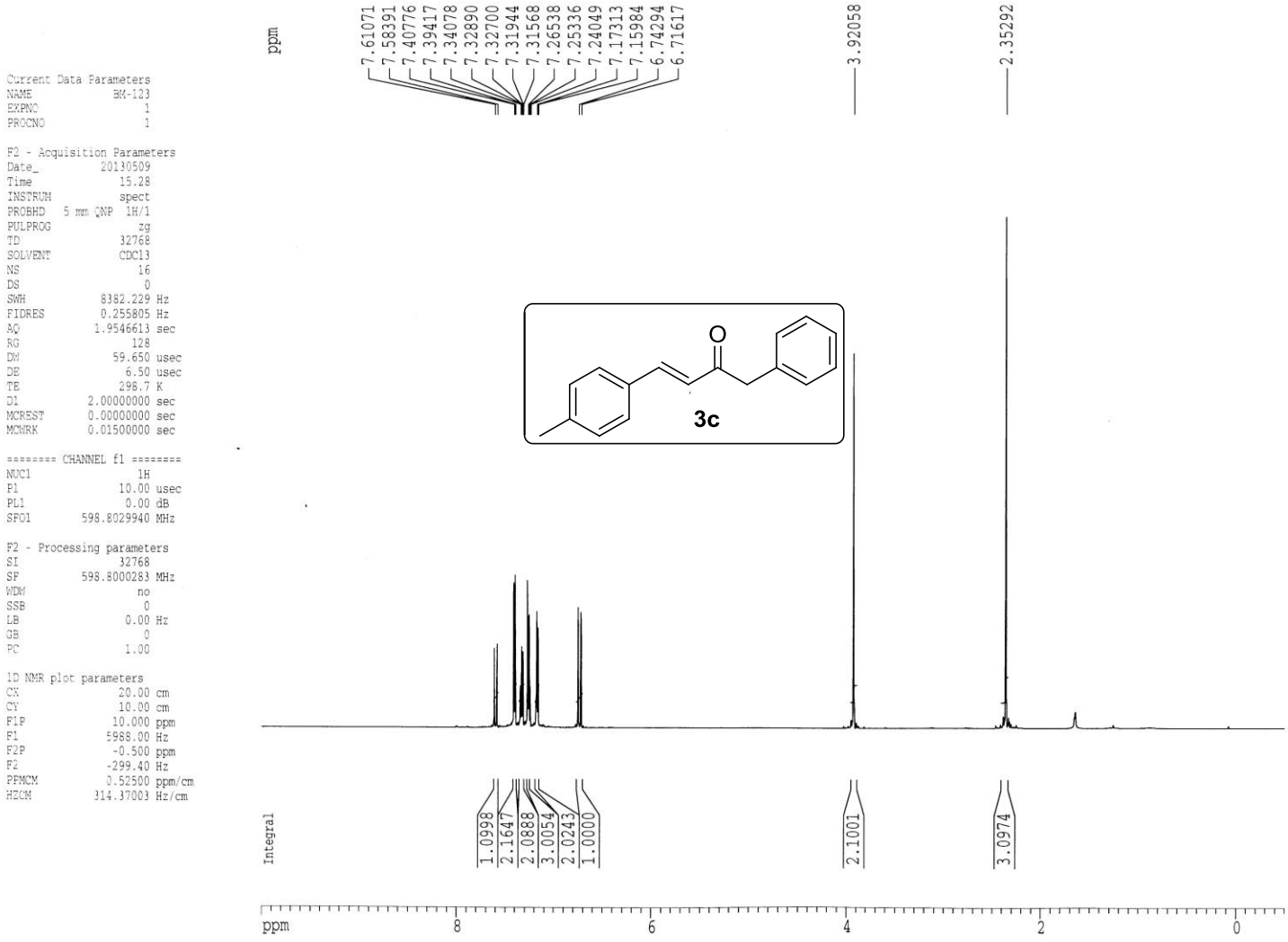

195.56
156.41
140.38
139.00
137.27
131.51
130.61
129.09
128.44
128.37
126.28
125.75
125.56
77.21
77.00
76.79
39.26
24.88
20.56
Current Data Parameters
NAME BM-02-21
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130813
Time 5.49
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 415
DS 0
SWH 45045.047 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 304.8 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683807 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
O
2r
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

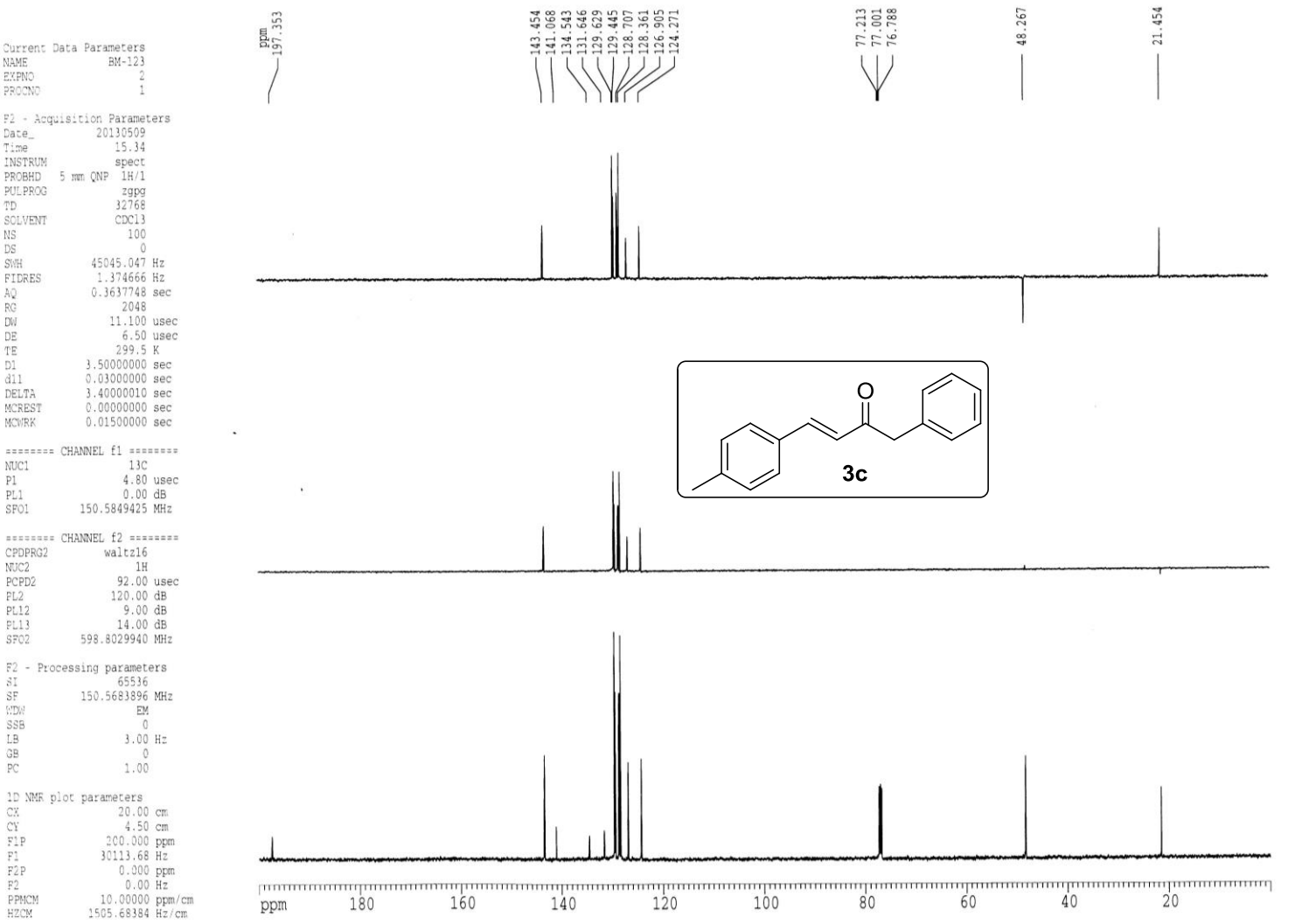

Current Data Parameters
NAME BM-86
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130501
Time 14.14
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 296.5 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000286 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.63914
7.61228
7.51369
7.51018
7.50460
7.50250
7.49755
7.37162
7.36842
7.36303
7.35993
7.33985
7.33813
7.32733
7.27631
7.26471
6.79055
6.76370
3.93734
O
3a
Integral
1.0603
2.2025
5.0783
3.0468
1.0000
2.0180
ppm
8
6
4
2
0

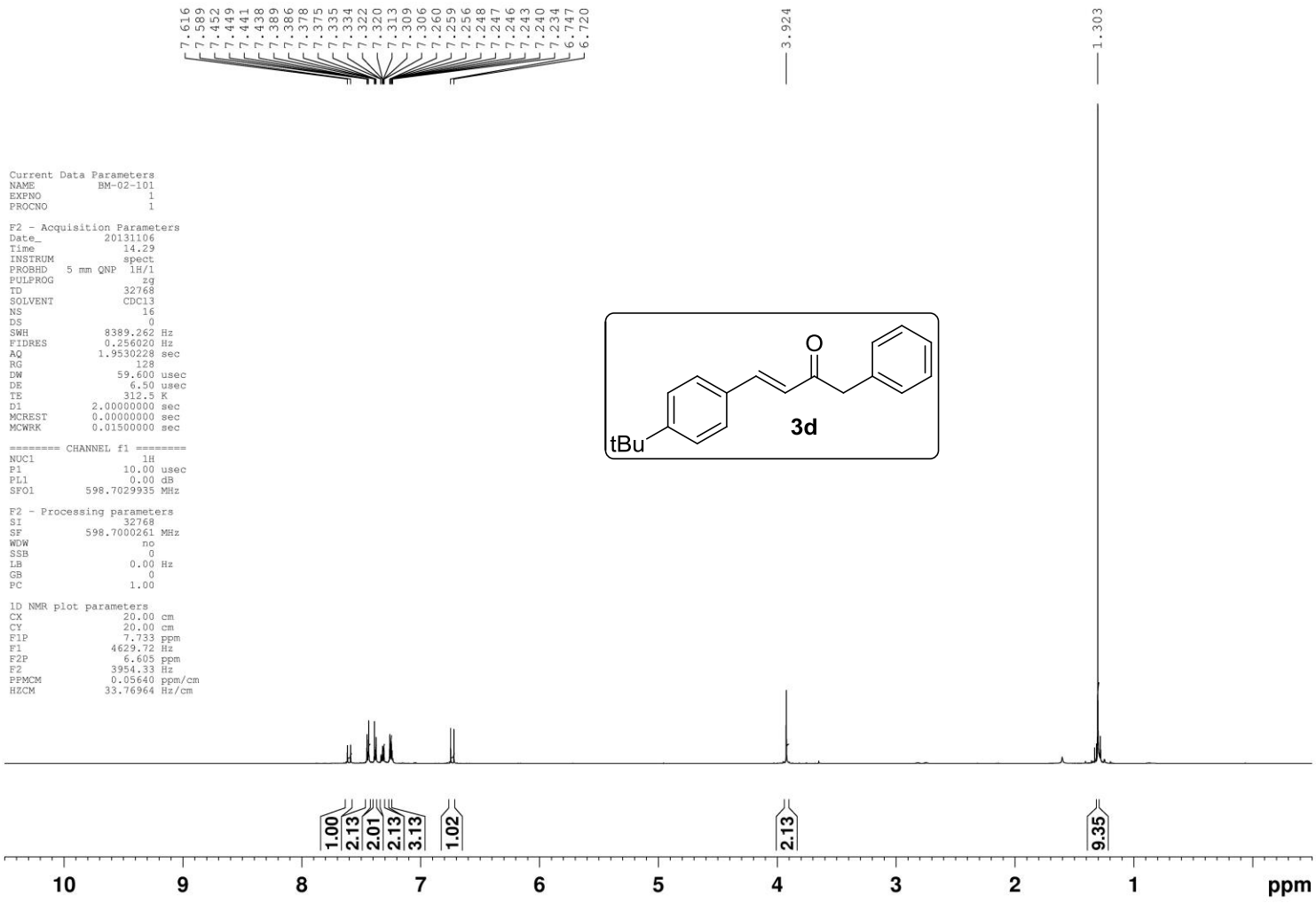

ppm
197.234
143.336
134.352
130.504
129.427
128.857
128.716
128.314
126.938
125.129
77.210
76.999
76.786
48.331
O
3a
ppm
200
150
100
50


Current Data Parameters
NAME BM-105
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130501
Time 14.34
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 296.3 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000284 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 15.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.60043
7.57371
7.46118
7.45809
7.44992
7.44671
7.32866
7.32749
7.31540
7.26942
7.26505
7.25745
7.25107
6.88320
6.87980
6.87190
6.86848
6.67003
6.64332
3.90802
3.80536
1.25868
O
MeO
3b
Integral
1.1523
2.2658
2.1322
3.0627
2.0108
1.0000
2.2249
3.0963
ppm
8
6
4
2
0

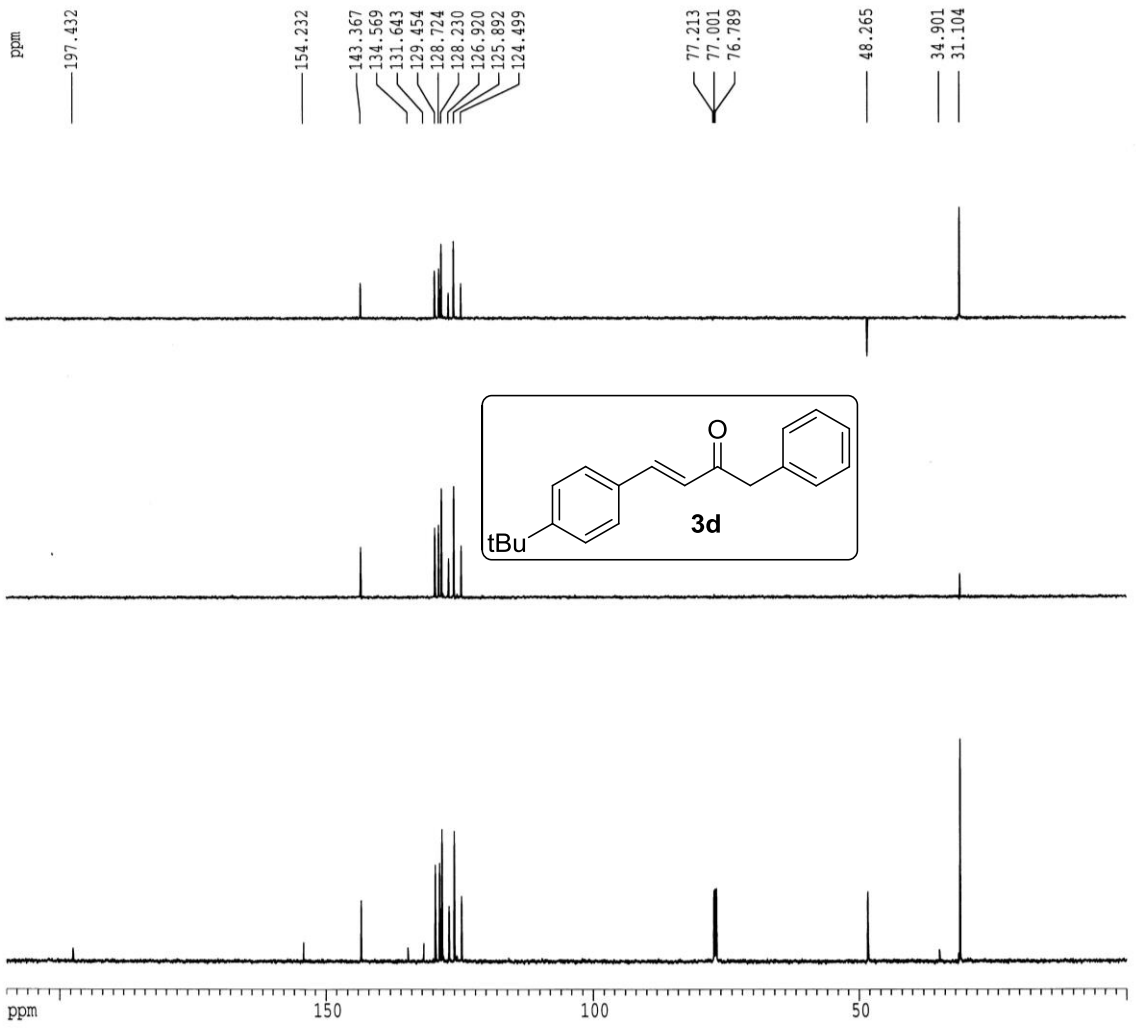

ppm
197.199
161.582
143.117
134.645
130.043
129.390
128.640
126.992
126.815
122.934
114.302
77.214
77.002
76.789
55.288
48.199
MeO
3b
ppm 200 175 150 125 100 75 50 25

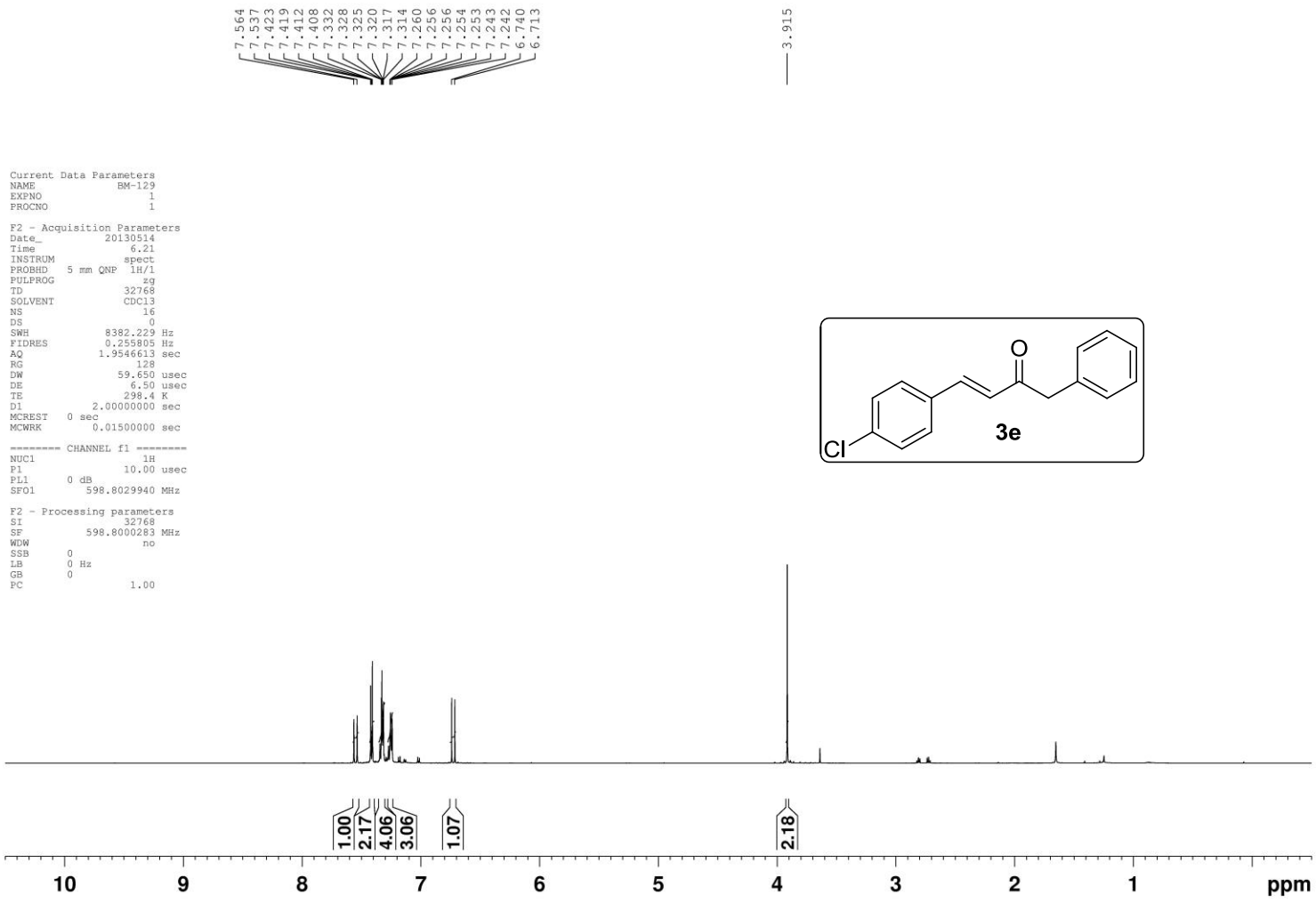

Current Data Parameters
NAME BM-123
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130509
Time 15.28
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.7 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000283 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.61071
7.58391
7.40776
7.39417
7.34078
7.32890
7.32700
7.31944
7.31568
7.26538
7.25336
7.24049
7.17313
7.15984
6.74294
6.71617
3.92058
2.35292
O
3c
Integral
1.0998
2.1647
2.0888
3.0054
2.0243
1.0000
2.1001
3.0974
ppm
8
6
4
2
0

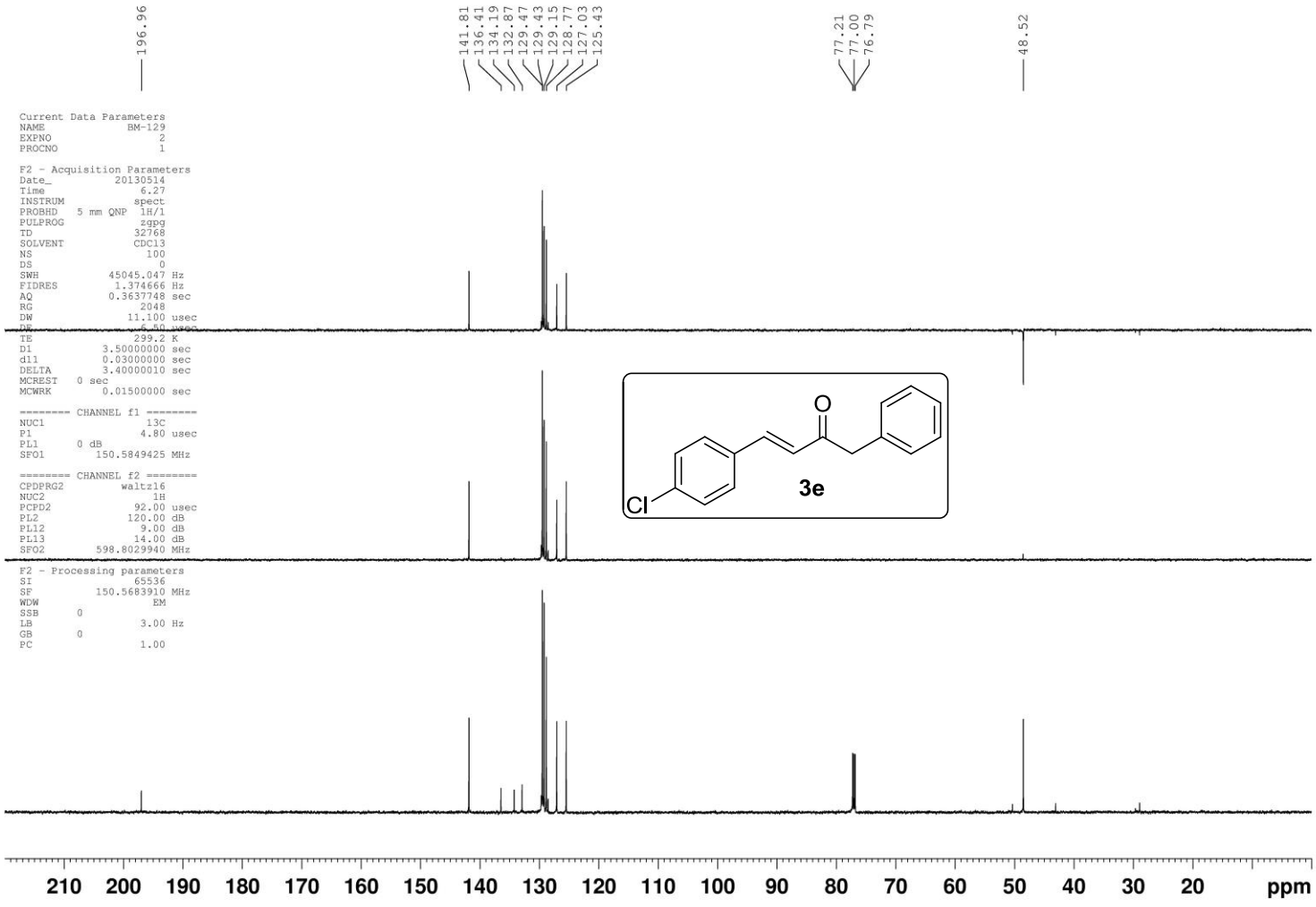

Current Data Parameters
NAME BM-123
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130509
Time 15.34
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.5 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683896 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 4.50 cm
F1P 200.000 ppm
F1 30113.68 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.68384 Hz/cm
ppm
197.353
143.454
141.068
134.543
131.646
129.629
129.445
128.707
128.361
126.905
124.271
77.213
77.001
76.788
48.267
21.454
O
3c
ppm
180
160
140
120
100
80
60
40
20

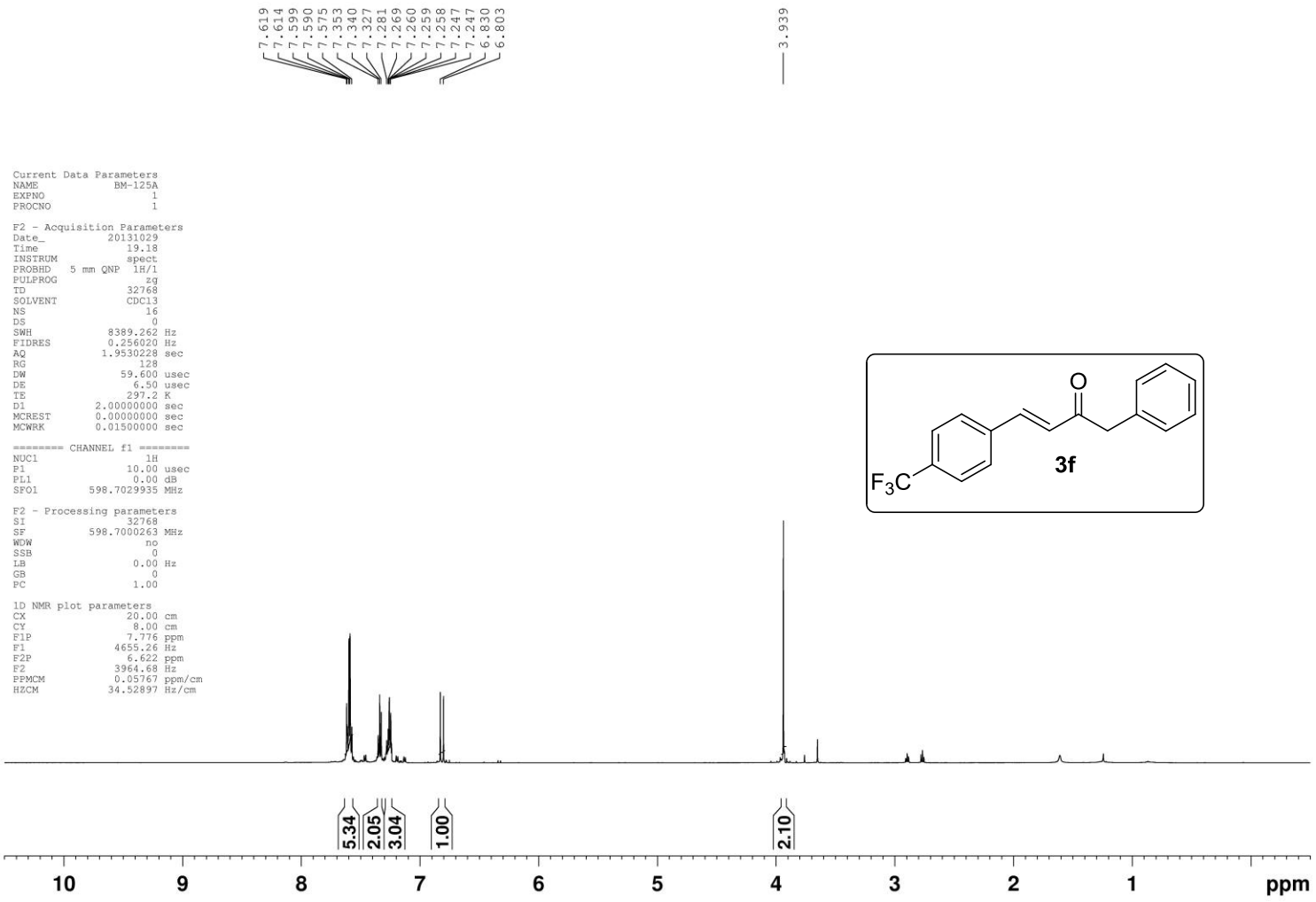

7.616
7.589
7.452
7.449
7.441
7.438
7.389
7.386
7.378
7.375
7.335
7.334
7.322
7.320
7.313
7.309
7.306
7.260
7.259
7.256
7.248
7.247
7.246
7.243
7.240
7.234
6.747
6.720
3.924
1.303
Current Data Parameters
NAME BM-02-101
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131106
Time 14.29
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 312.5 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 20.00 cm
F1P 7.733 ppm
F1 4629.72 Hz
F2P 6.605 ppm
F2 3954.33 Hz
PPMCM 0.05640 ppm/cm
HZCM 33.76964 Hz/cm
O
tBu
3d
1.00
2.13
2.01
2.13
3.13
1.02
2.13
9.35
10
9
8
7
6
5
4
3
2
1
ppm

```
Current Data Parameters
NAME          BM-02-101
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20131106
Time              14.36
INSTRUM           spect
PROBHD   5 mm QNP  1H/1
PULPROG           zgpg
TD               32768
SOLVENT           CDCl3
NS                  100
DS                    0
SWH           45045.047 Hz
FIDRES         1.374666 Hz
AQ            0.3637748 sec
RG                 2048
DW               11.100 usec
DE                6.50 usec
TE                313.7 K
D1           3.50000000 sec
d11          0.03000000 sec
DEL/TA       3.40000010 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 4.80 usec
PL1                0.00 dB
SFO1       150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             92.00 usec
PL2              120.00 dB
PL12               9.00 dB
PL13              14.00 dB
SFO2       598.7029935 MHz

F2 - Processing parameters
SI                 65536
SF          150.5432404 MHz
WDW                   EM
SSB                   0
LB                 3.00 Hz
GB                    0
PC                 0.50

1D NMR plot parameters
CX                20.00 cm
CY                 4.00 cm
F1P              210.000 ppm
F1             31614.08 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM          10.50000 ppm/cm
HZCM         1580.70410 Hz/cm
```

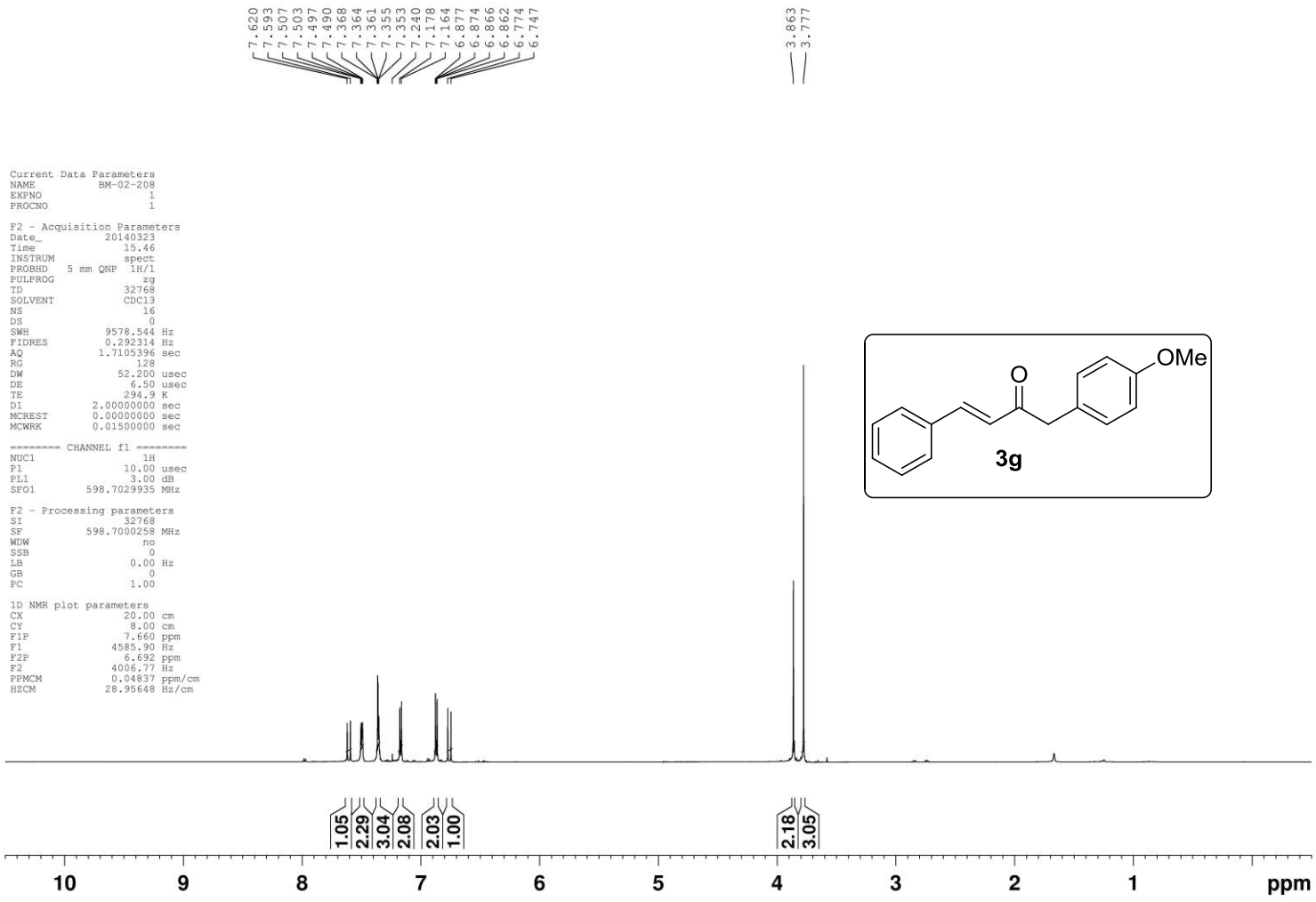



7.564
7.537
7.423
7.419
7.412
7.408
7.332
7.328
7.325
7.320
7.317
7.314
7.260
7.256
7.256
7.254
7.253
7.243
7.242
6.740
6.713
3.915
Current Data Parameters
NAME BM-129
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130514
Time 6.21
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000283 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
Cl
3e
1.00
2.17
4.06
3.06
1.07
2.18
10
9
8
7
6
5
4
3
2
1
ppm


196.96
141.81
136.41
134.19
132.87
129.47
129.43
129.15
128.77
127.03
125.43
77.21
77.00
76.79
48.52
Current Data Parameters
NAME BM-129
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130514
Time 6.27
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 299.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683910 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
O
Cl
3e
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.619
7.614
7.599
7.590
7.575
7.353
7.340
7.327
7.281
7.269
7.260
7.259
7.258
7.247
7.247
6.830
6.803
3.939
Current Data Parameters
NAME BM-125A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131029
Time 19.18
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 297.2 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000263 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 7.776 ppm
F1 4655.26 Hz
F2P 6.622 ppm
F2 3964.68 Hz
PPMCM 0.05767 ppm/cm
HZCM 34.52897 Hz/cm
O
F3C
3f
5.34
2.05
3.04
1.00
2.10
10
9
8
7
6
5
4
3
2
1
ppm


196.82
141.27
137.82
133.97
132.02
131.80
129.46
128.85
128.42
127.15
127.10
125.84
125.81
124.66
122.85
77.21
77.00
76.79
48.68
Current Data Parameters
NAME BM-125A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131029
Time 19.29
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 298.3 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5582893 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432409 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 142.000 ppm
F1 21377.14 Hz
F2P 125.000 ppm
F2 18817.91 Hz
O
F3C
3f
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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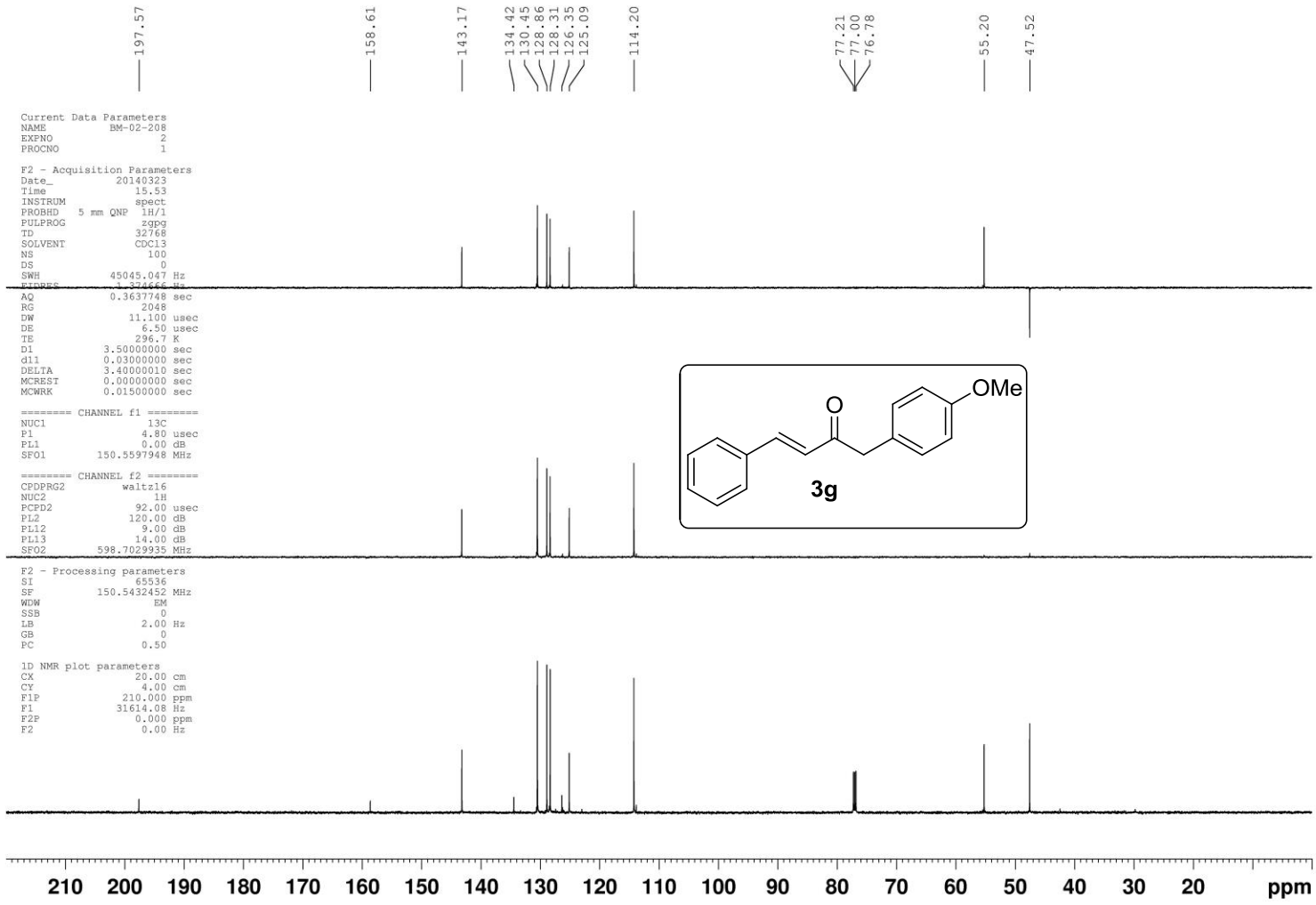
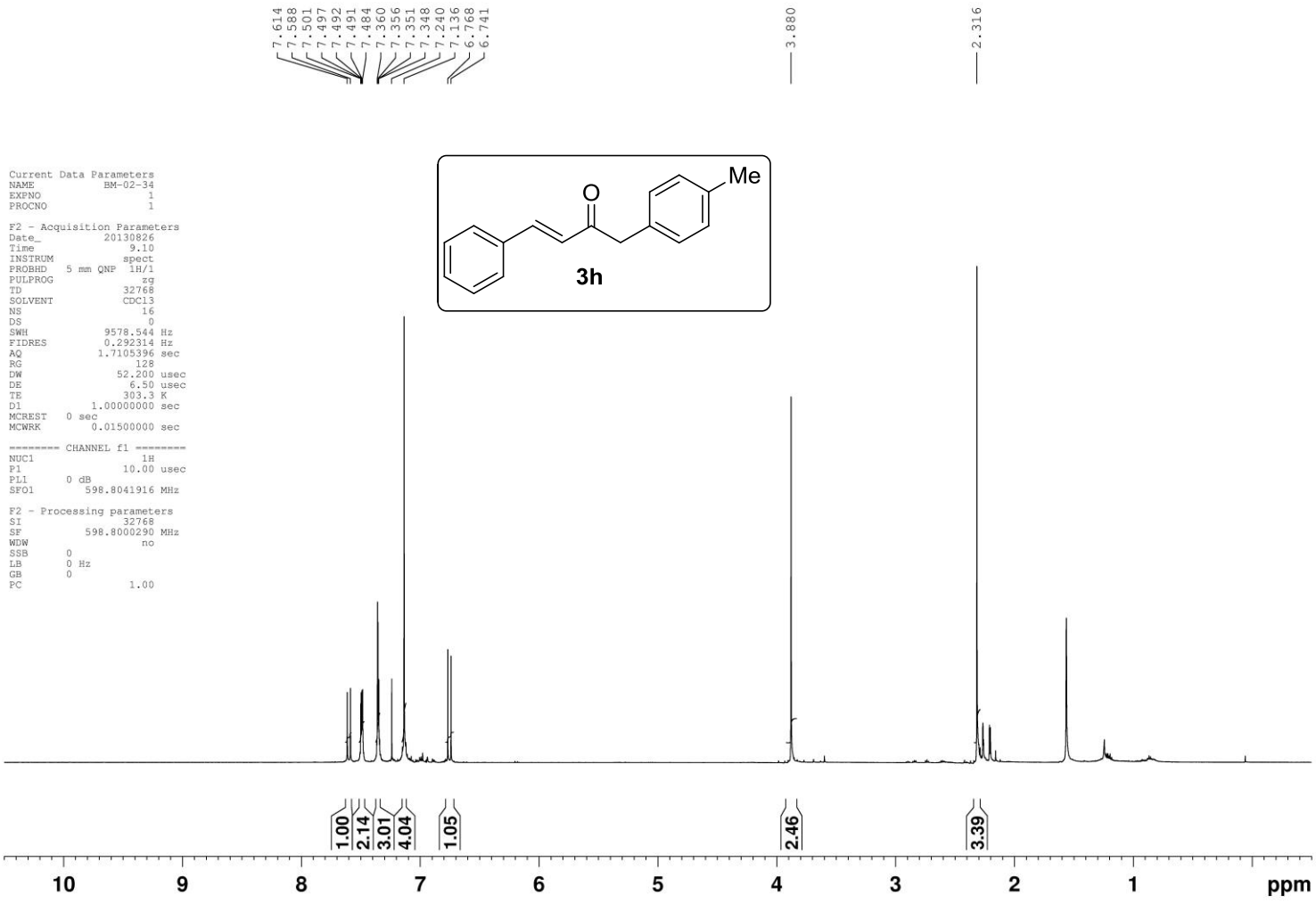
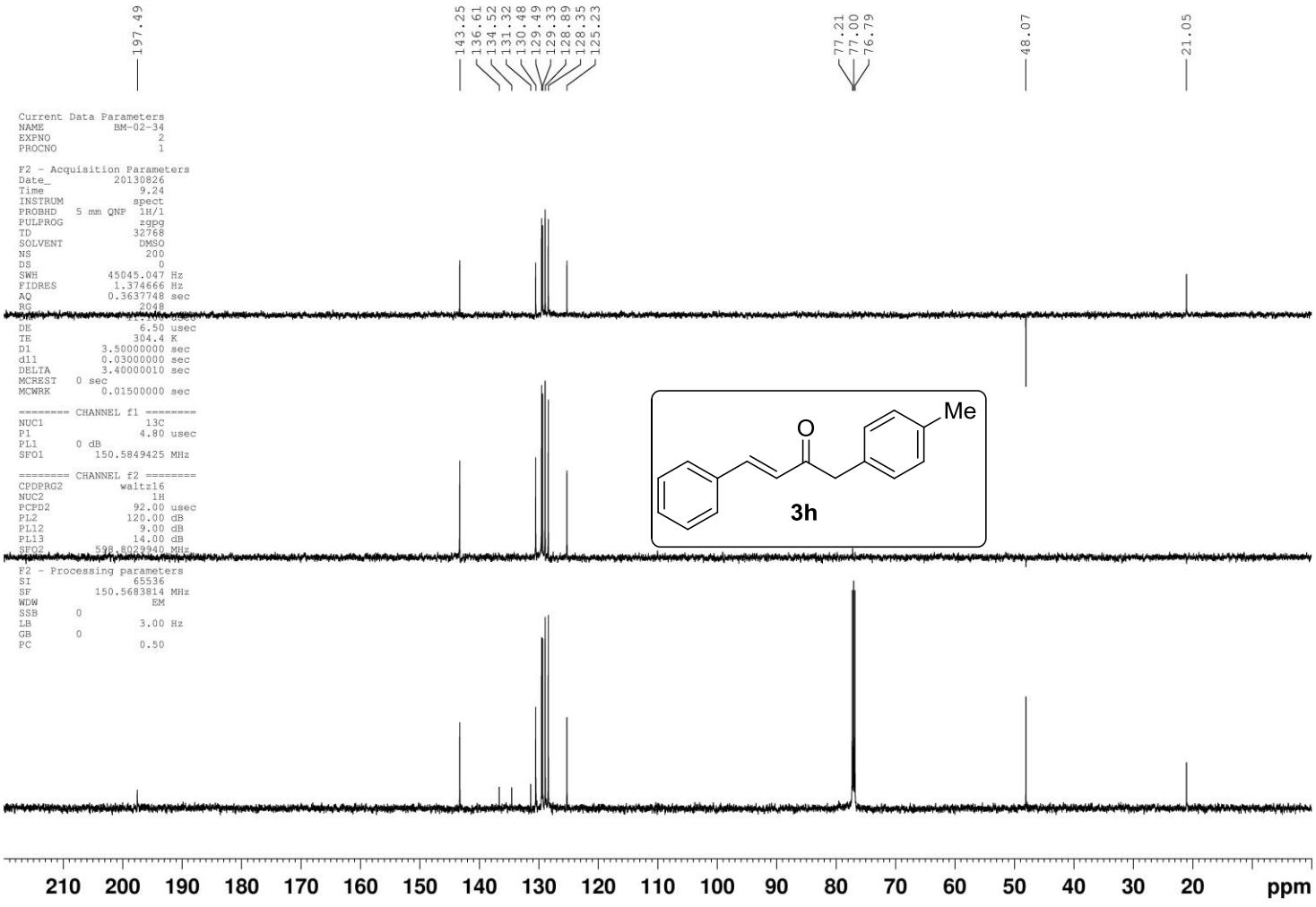
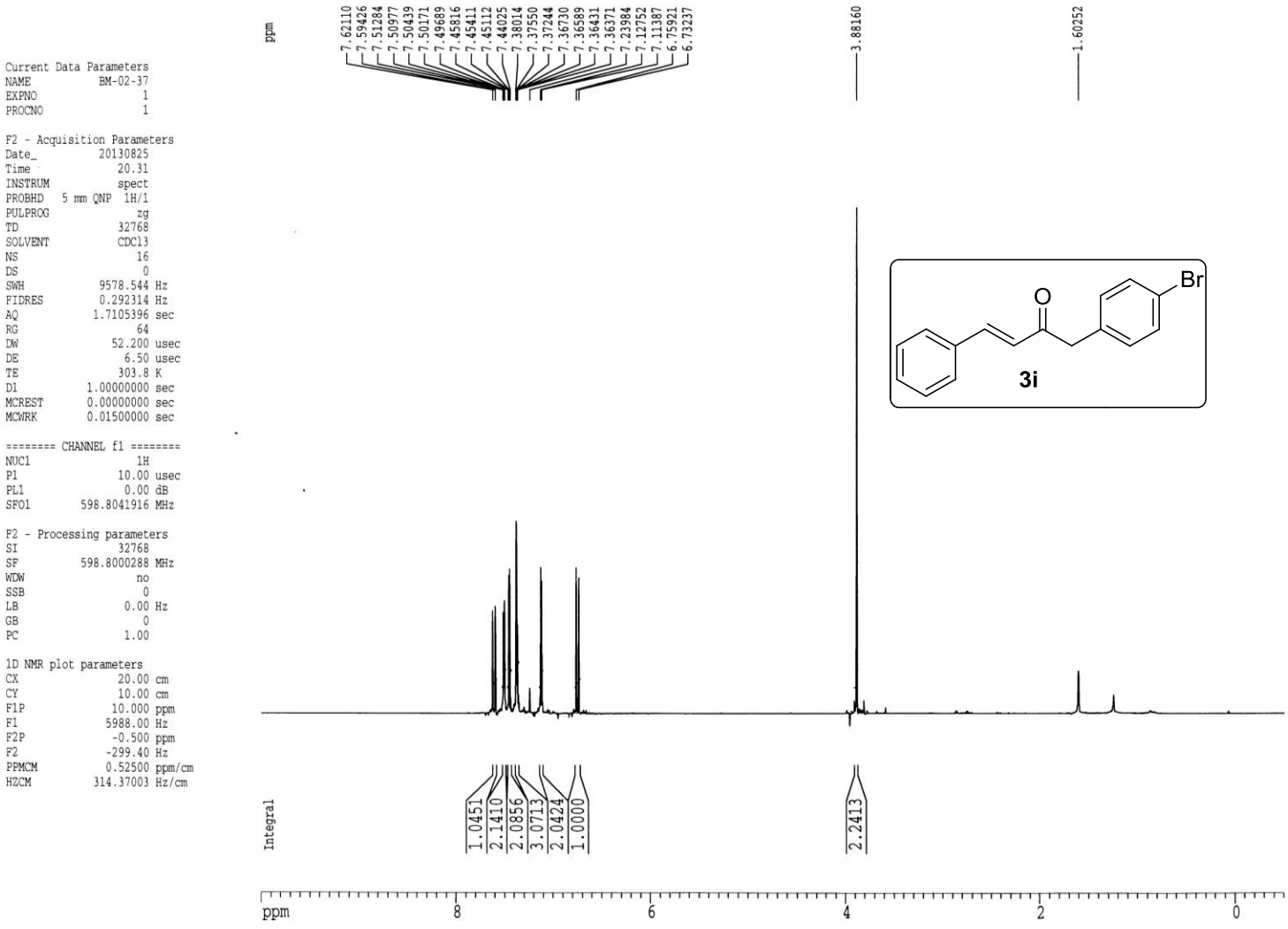
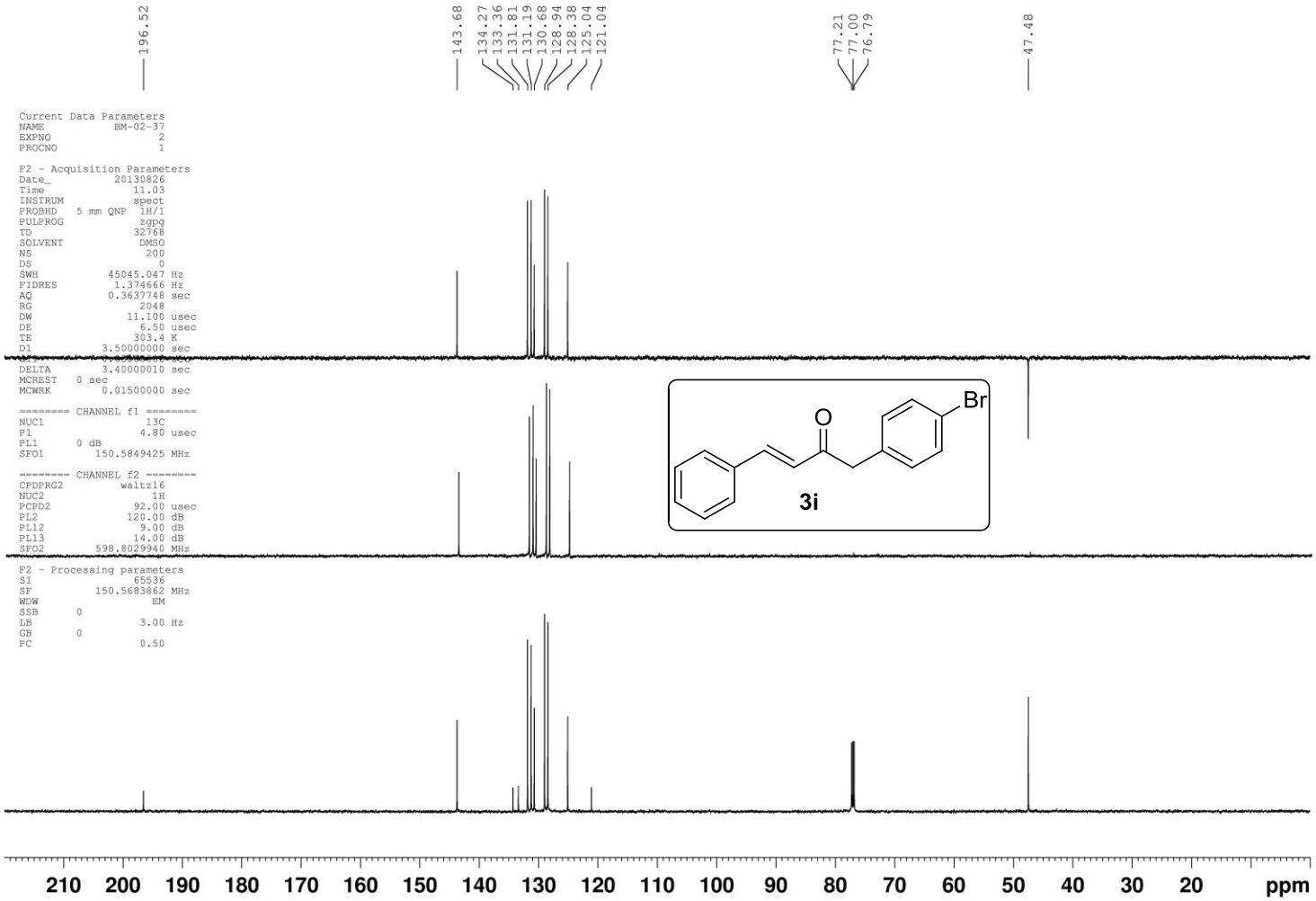
7.593
7.507
7.503
7.497
7.490
7.368
7.364
7.361
7.355
7.353
7.240
7.178
7.164
6.877
6.874
6.866
6.862
6.774
6.747
3.863
3.777
Current Data Parameters
NAME BM-02-208
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 15.46
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 294.9 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000258 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 7.660 ppm
F1 4585.90 Hz
F2P 6.692 ppm
F2 4006.77 Hz
PPMCM 0.04837 ppm/cm
HZCM 28.95648 Hz/cm
O
OMe
3g
1.05
2.29
3.04
2.08
2.03
1.00
2.18
3.05
10
9
8
7
6
5
4
3
2
1
ppm

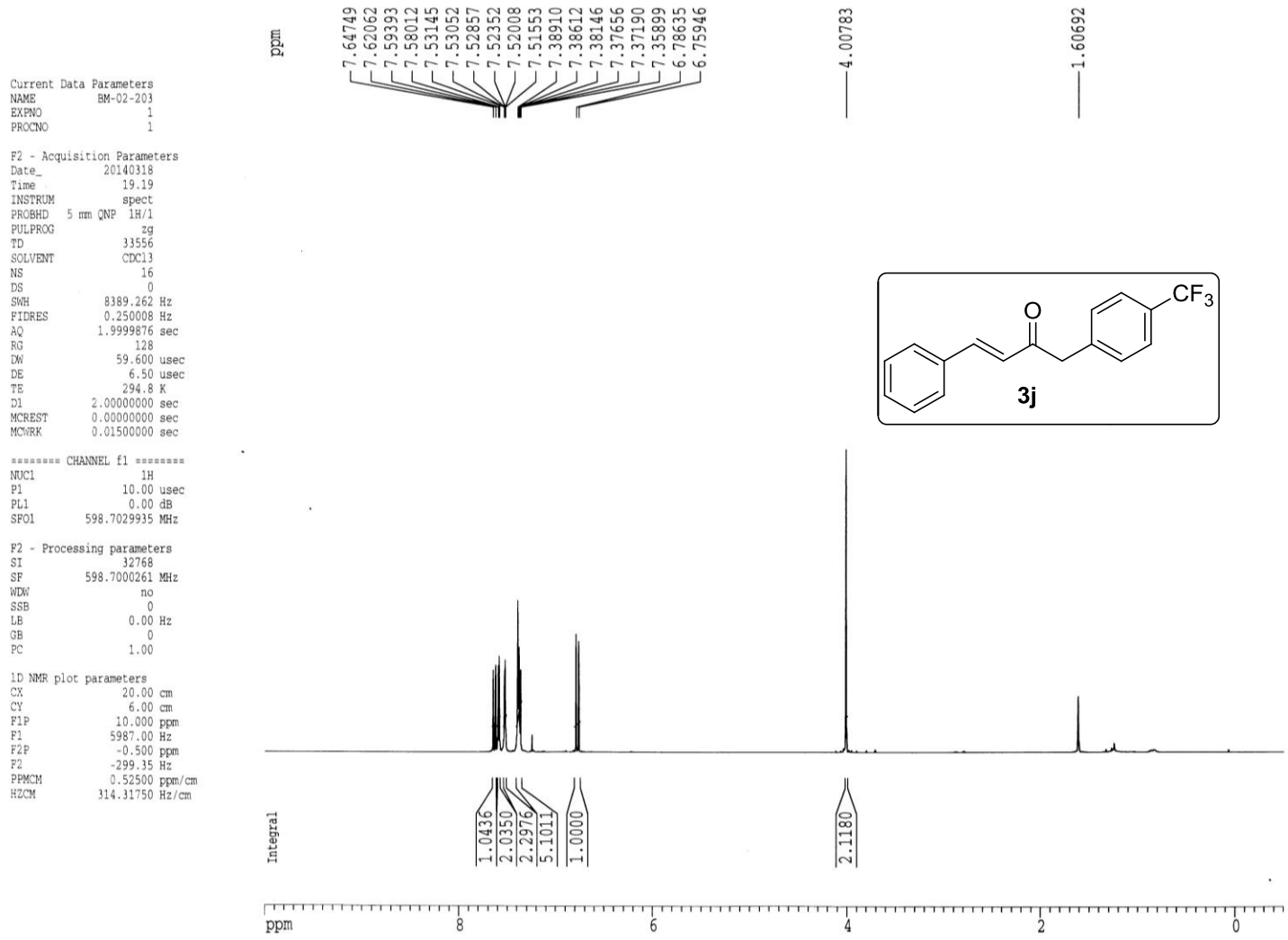

197.57
158.61
143.17
134.42
130.45
128.86
128.31
126.35
125.09
114.20
77.21
77.00
76.78
55.20
47.52
Current Data Parameters
NAME BM-02-208
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 15.53
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432452 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 210.000 ppm
F1 31614.08 Hz
F2P 0.000 ppm
F2 0.00 Hz
O
OMe
3g
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.614
7.588
7.501
7.497
7.492
7.491
7.484
7.360
7.356
7.351
7.348
7.240
7.136
6.768
6.741
3.880
2.316
Current Data Parameters
NAME BM-02-34
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130826
Time 9.10
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 303.3 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.8000290 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
Me
3h
1.00
2.14
3.01
4.04
1.05
2.46
3.39
10
9
8
7
6
5
4
3
2
1
ppm


197.49
143.25
136.61
134.52
131.32
130.48
129.49
129.33
128.89
128.35
125.23
77.21
77.00
76.79
48.07
21.05
Current Data Parameters
NAME BM-02-34
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130826
Time 9.24
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT DMSO
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DE 6.50 usec
TE 304.4 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683814 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
O
Me
3h
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


Current Data Parameters
NAME BM-02-37
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130825
Time 20.31
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 64
DW 52.200 usec
DE 6.50 usec
TE 303.8 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.62110
7.59426
7.51284
7.50977
7.50439
7.50171
7.49689
7.45816
7.45411
7.45112
7.44025
7.38014
7.37550
7.37244
7.36730
7.36589
7.36431
7.36371
7.23984
7.12752
7.11387
6.75921
6.73237
3.88160
1.60252
Br
O
3i
Integral
1.0451
2.1410
2.0856
3.0713
2.0424
1.0000
2.2413
ppm
8
6
4
2
0


196.52
143.68
134.27
133.36
131.81
131.19
130.68
128.94
128.38
125.04
121.04
77.21
77.00
76.79
47.48
Current Data Parameters
NAME BM-02-37
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130826
Time 11.03
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT DMSO
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 303.4 K
D1 3.50000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683862 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
O
Br
3i
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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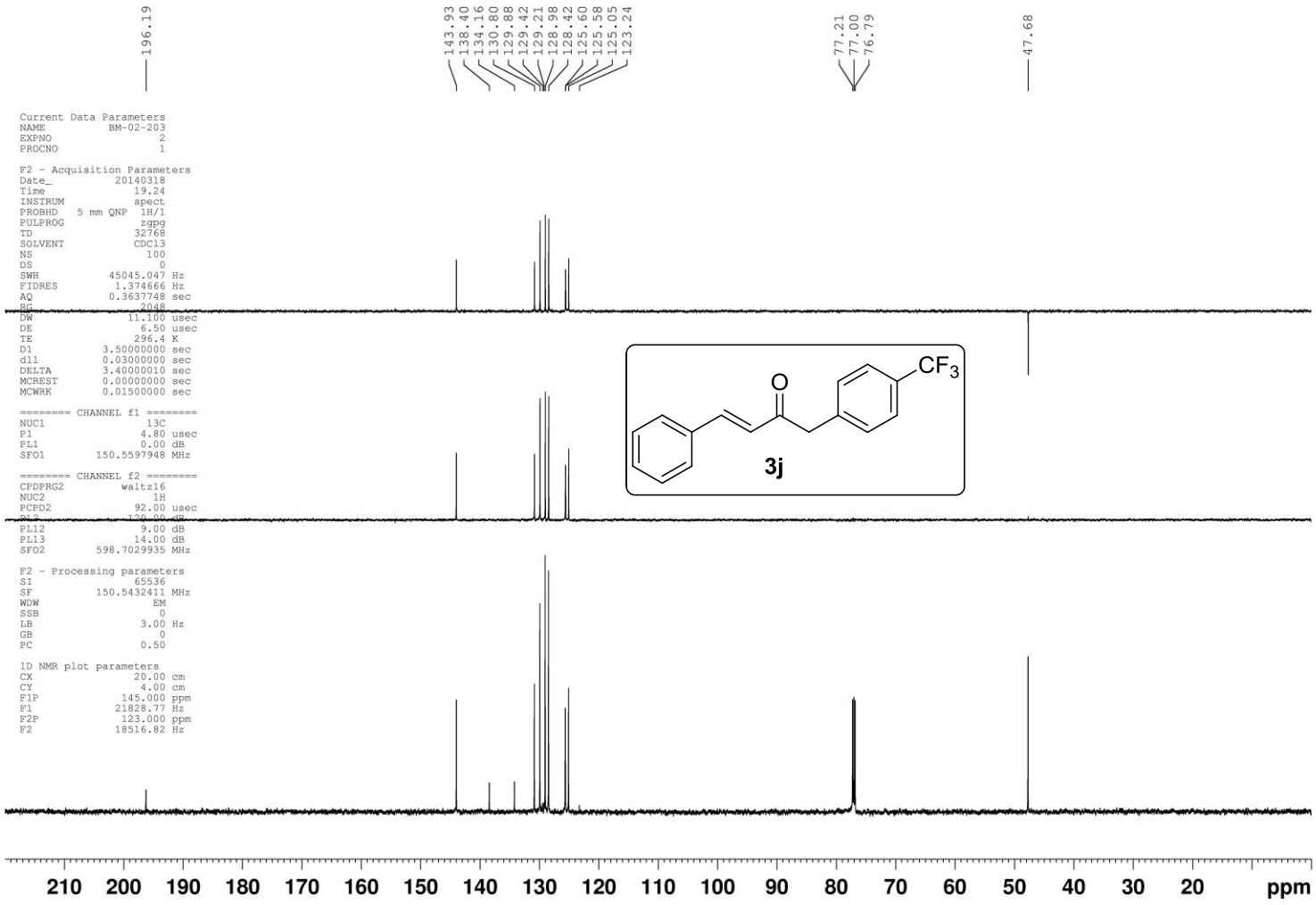
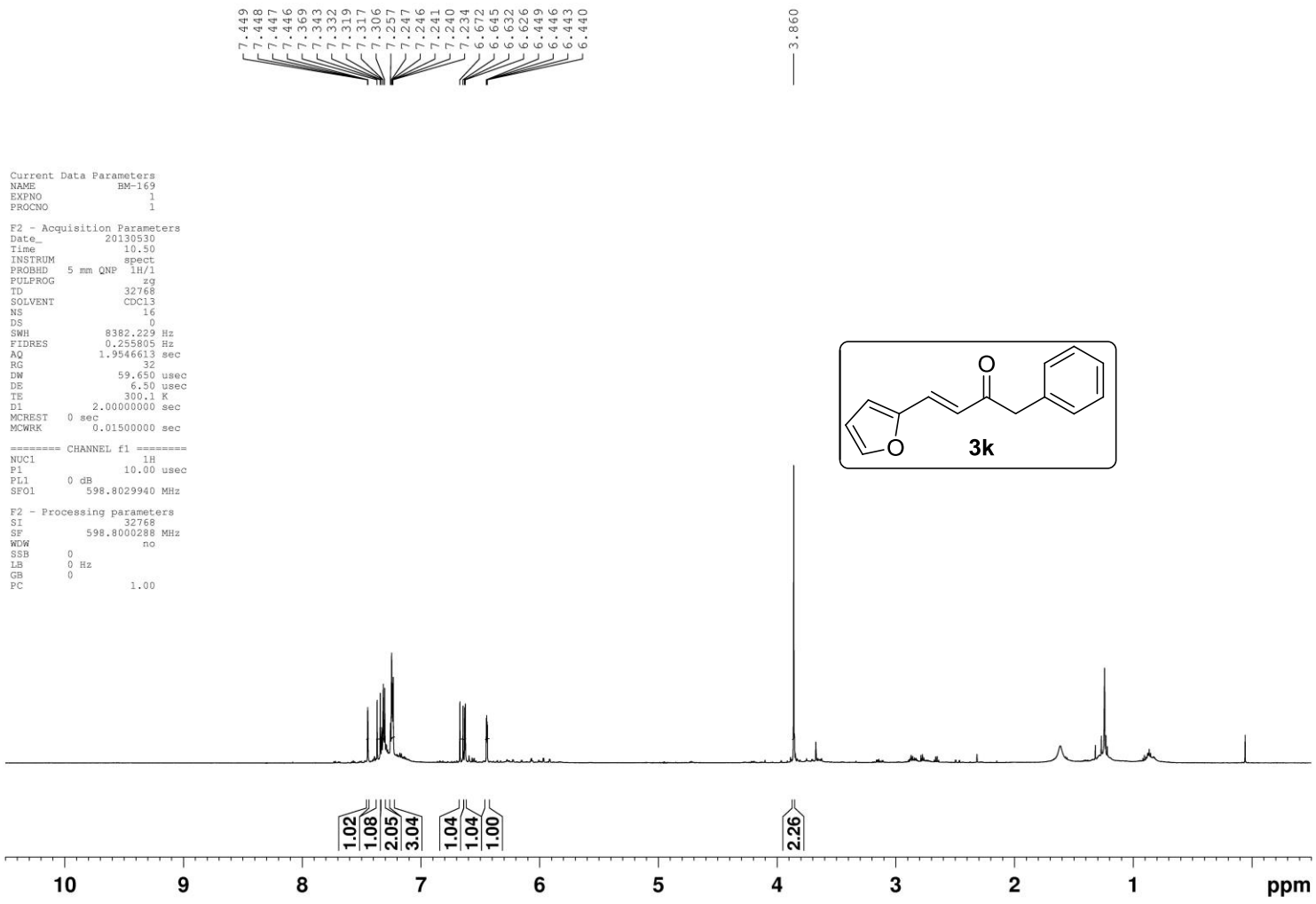
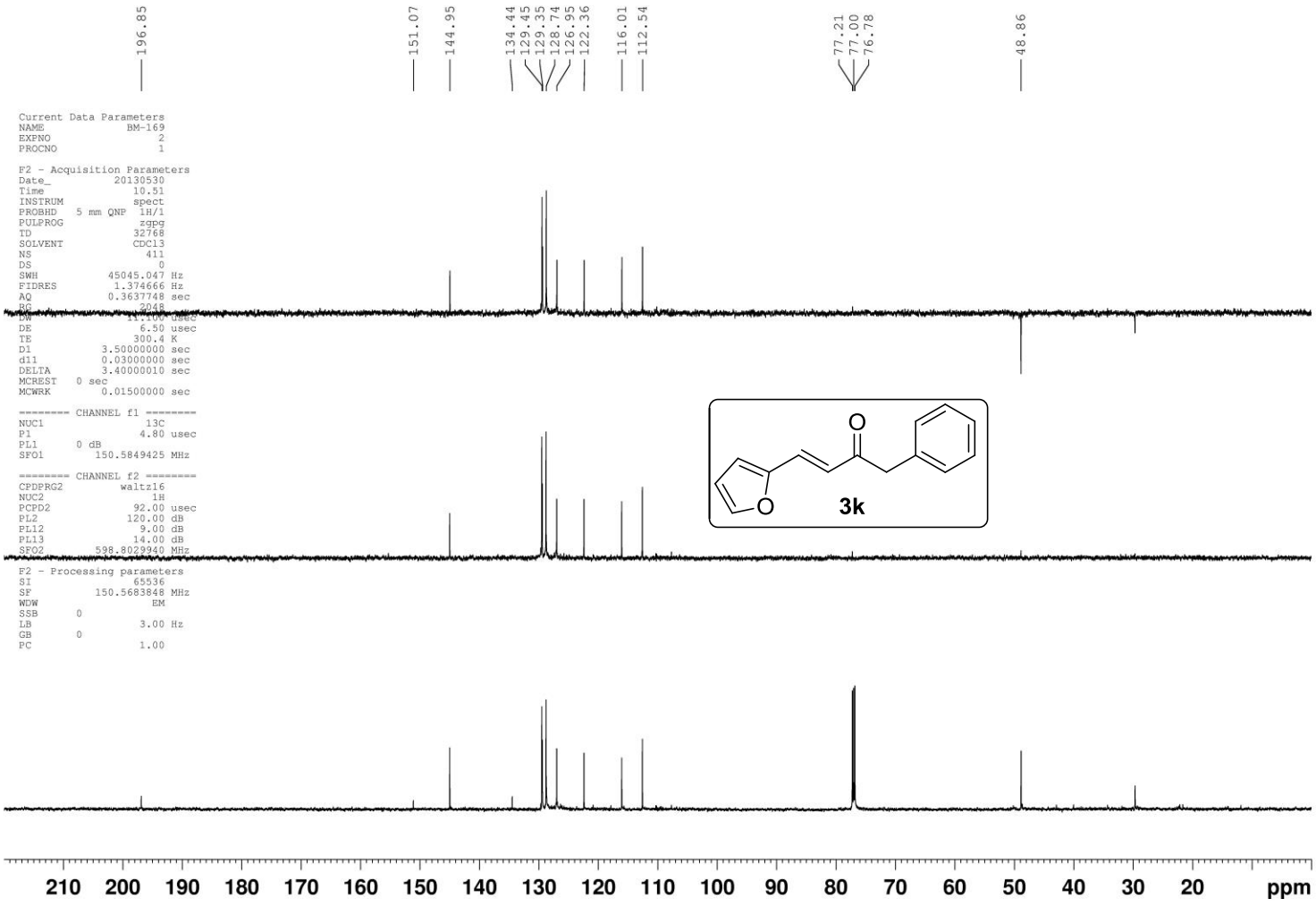
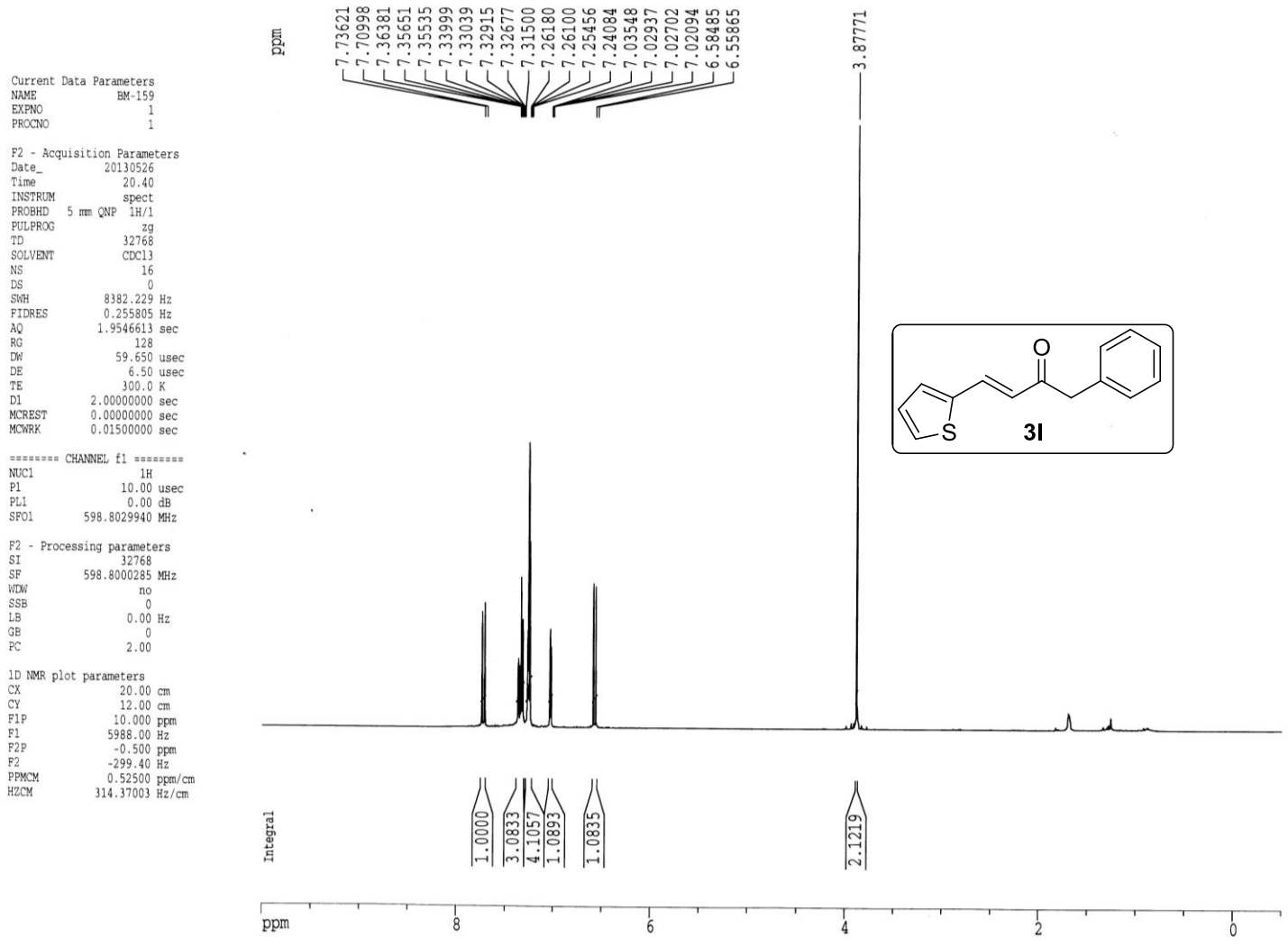
NAME BM-02-203
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140318
Time 19.19
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 33556
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.250008 Hz
AQ 1.9999876 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 294.8 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.64749
7.62062
7.59393
7.58012
7.53145
7.53052
7.52857
7.52352
7.52008
7.51553
7.38910
7.38612
7.38146
7.37656
7.37190
7.35899
6.78635
6.75946
4.00783
1.60692
O
CF3
3j
Integral
1.0436
2.0350
2.2976
5.1011
1.0000
2.1180
ppm
8
6
4
2
0

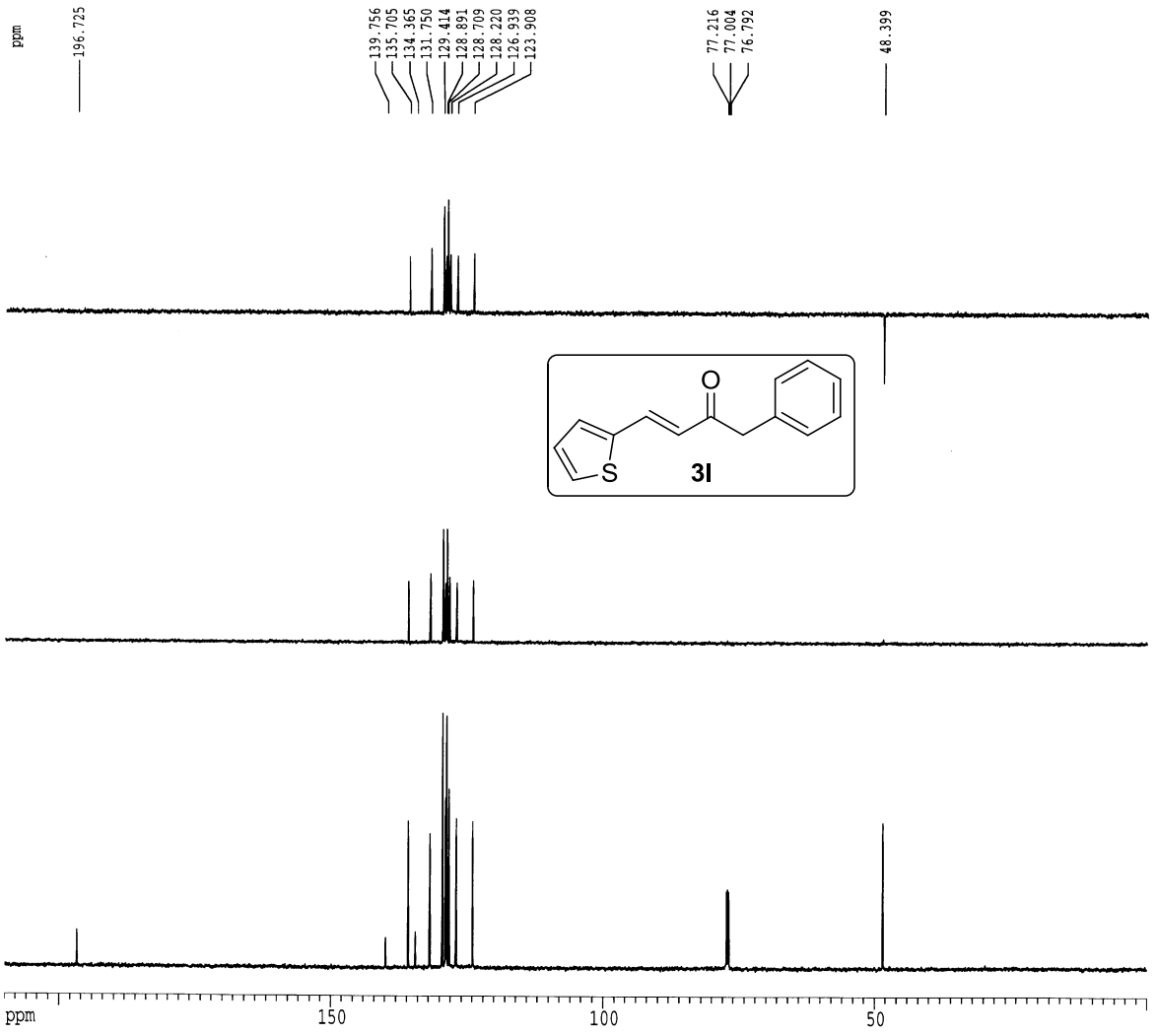

196.19
143.93
138.40
134.16
130.80
129.88
129.42
129.21
128.98
128.42
125.60
125.58
125.05
123.24
77.21
77.00
76.79
47.68
Current Data Parameters
NAME BM-02-203
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140318
Time 19.24
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.4 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432411 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 145.000 ppm
F1 21828.77 Hz
F2P 123.000 ppm
F2 18516.82 Hz
O
CF3
3j
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

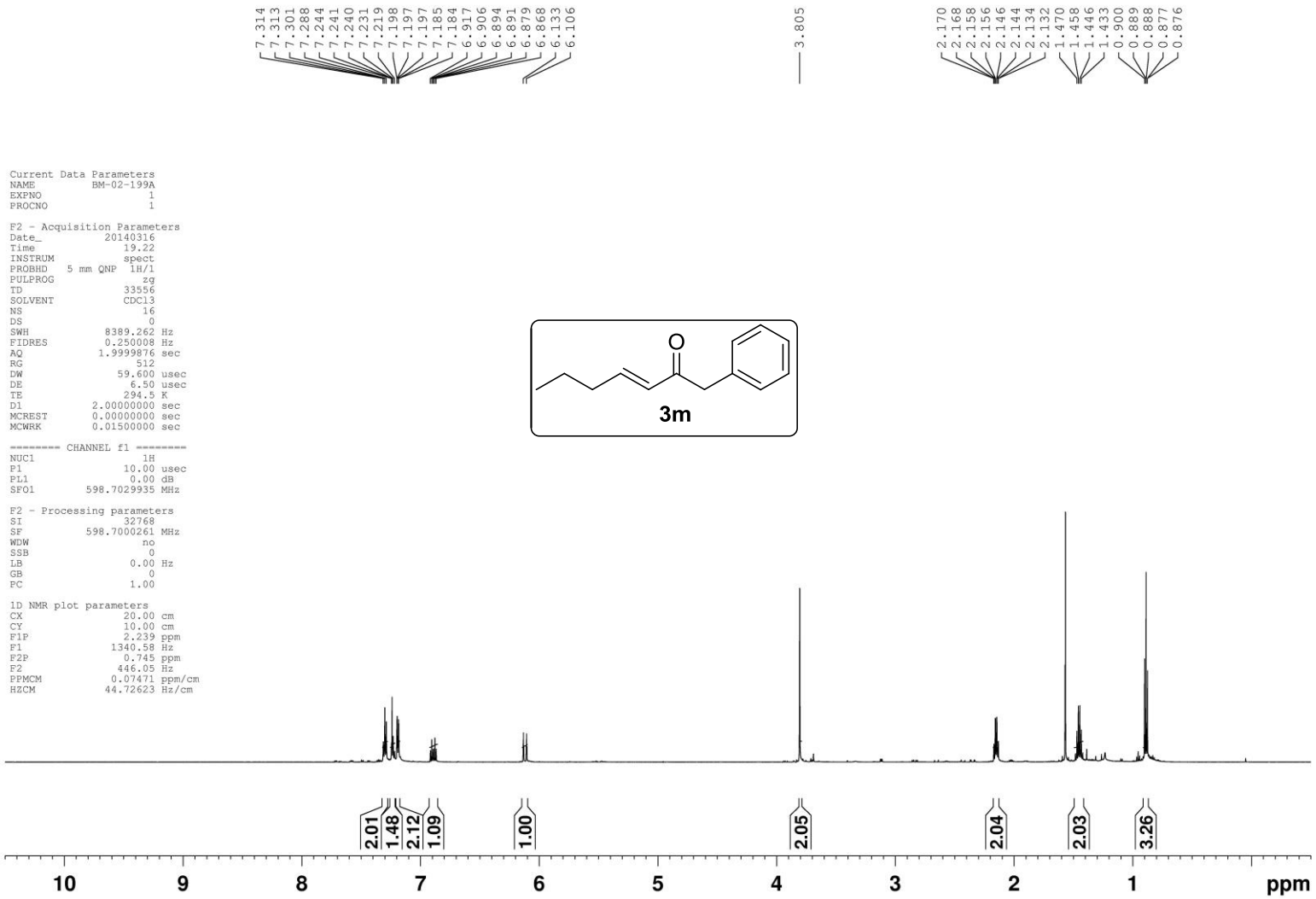

7.449
7.448
7.447
7.446
7.369
7.343
7.332
7.319
7.317
7.306
7.257
7.247
7.246
7.241
7.240
7.234
6.672
6.645
6.632
6.626
6.449
6.446
6.443
6.440
3.860
Current Data Parameters
NAME BM-169
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130530
Time 10.50
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 32
DW 59.650 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
O
3k
1.02
1.08
2.05
3.04
1.04
1.04
1.00
2.26
10
9
8
7
6
5
4
3
2
1
ppm

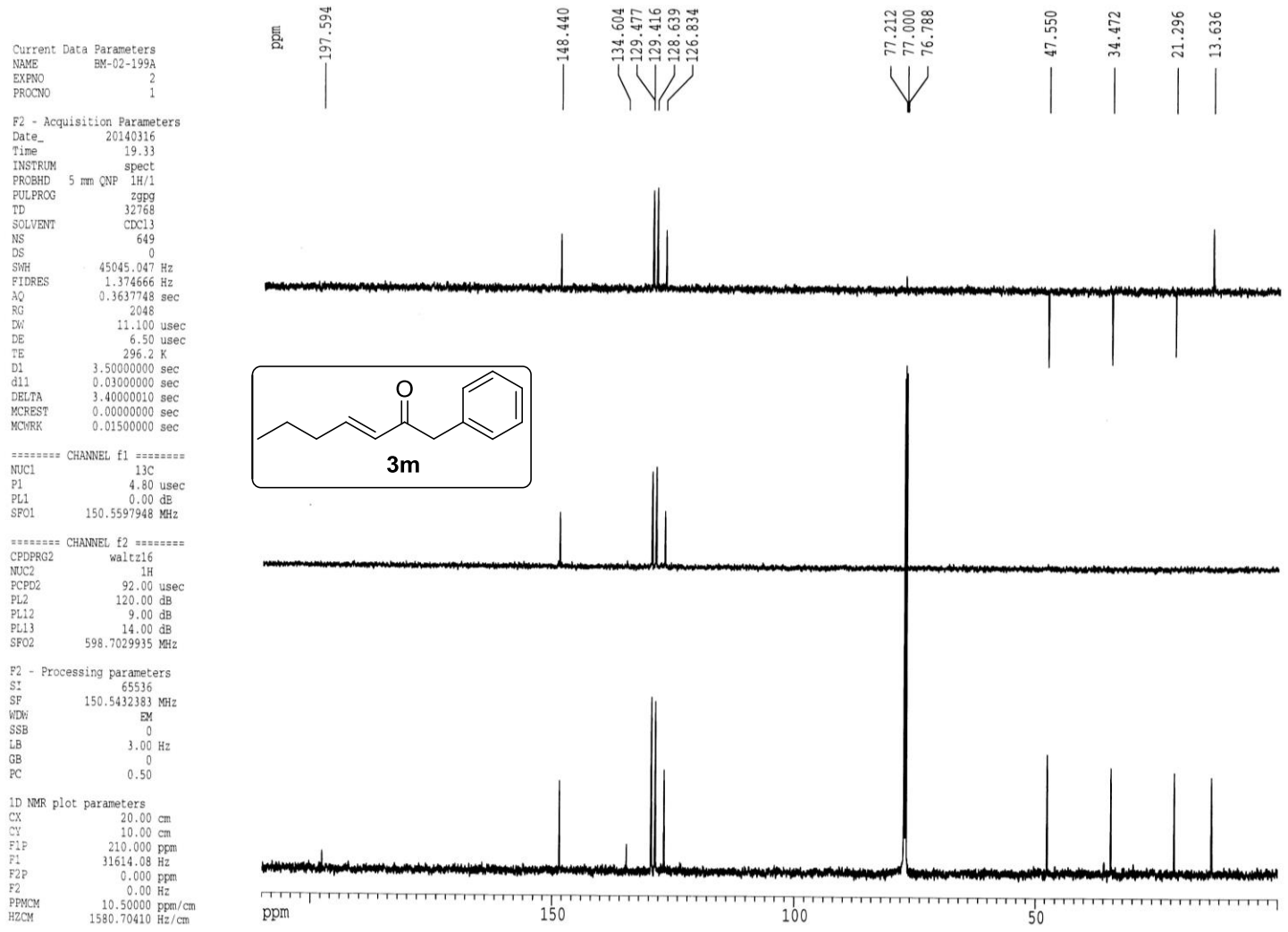

196.85
151.07
144.95
134.44
129.45
129.35
128.74
126.95
122.36
116.01
112.54
77.21
77.00
76.78
48.86
Current Data Parameters
NAME BM-169
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130530
Time 10.51
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 411
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 300.4 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683848 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
O
O
3k
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
ppm

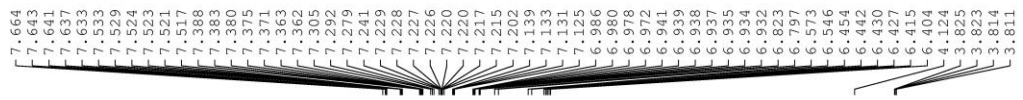

Current Data Parameters
NAME BM-159
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130526
Time 20.40
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 300.0 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000285 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 2.00
1D NMR plot parameters
CX 20.00 cm
CY 12.00 cm
F1P 10.000 ppm
F1 5988.00 Hz
F2P -0.500 ppm
F2 -299.40 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.37003 Hz/cm
ppm
7.73621
7.70998
7.36381
7.35651
7.35535
7.33999
7.33039
7.32915
7.32677
7.31500
7.26180
7.26100
7.25456
7.24084
7.03548
7.02937
7.02702
7.02094
6.58485
6.55865
3.87771
O
S
3l
Integral
1.0000
3.0833
4.1057
1.0893
1.0835
2.1219
ppm
8
6
4
2
0

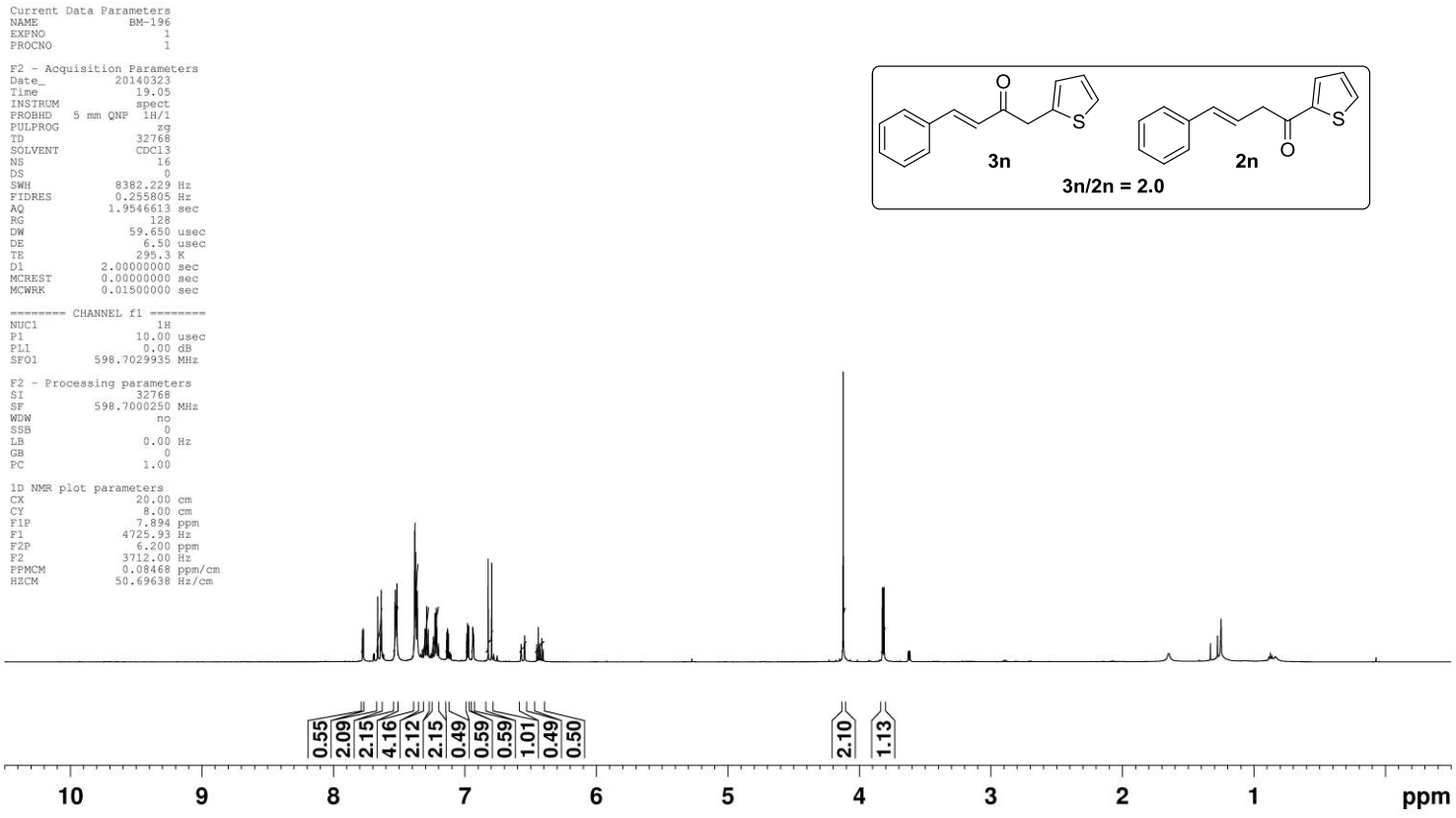
```
Current Data Parameters
NAME              BM-159
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130526
Time               20.41
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG            zgpg
TD                 32768
SOLVENT            CDCl3
NS                   100
DS                     0
SWH            45045.047 Hz
FIDRES          1.374666 Hz
AQ             0.3637748 sec
RG                  2048
DW                11.100 usec
DE                 6.50 usec
TE                300.1 K
D1           3.50000000 sec
d11          0.03000000 sec
DELTA        3.40000010 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 4.80 usec
PL1                0.00 dB
SFO1        150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2             92.00 usec
PL2              120.00 dB
PL12               9.00 dB
PL13              14.00 dB
SFO2        598.8029940 MHz

F2 - Processing parameters
SI                 65536
SF          150.5683924 MHz
WDW                EM
SSB                 0
LB                 3.00 Hz
GB                  0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 4.50 cm
F1P              210.000 ppm
F1             31619.36 Hz
F2P              0.000 ppm
F2               0.00 Hz
PPMCM          10.50000 ppm/cm
HZCM         1580.96814 Hz/cm
```




7.314
7.313
7.301
7.288
7.244
7.241
7.240
7.231
7.219
7.198
7.197
7.197
7.185
7.184
6.917
6.906
6.894
6.891
6.879
6.868
6.133
6.106
3.805
2.170
2.168
2.158
2.156
2.146
2.144
2.134
2.132
1.470
1.458
1.446
1.433
0.900
0.889
0.888
0.877
0.876
Current Data Parameters
NAME BM-02-199A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140316
Time 19.22
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 33556
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.250008 Hz
AQ 1.9999876 sec
RG 512
DW 59.600 usec
DE 6.50 usec
TE 294.5 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 2.239 ppm
F1 1340.58 Hz
F2P 0.745 ppm
F2 446.05 Hz
PPMCM 0.07471 ppm/cm
HZCM 44.72623 Hz/cm
O
3m
2.01
1.48
2.12
1.09
1.00
2.05
2.04
2.03
3.26
10
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME BM-02-199A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140316
Time 19.33
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 649
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432383 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 210.000 ppm
F1 31614.08 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.50000 ppm/cm
HZCM 1580.70410 Hz/cm
ppm
197.594
148.440
134.604
129.477
129.416
128.639
126.834
77.212
77.000
76.788
47.550
34.472
21.296
13.636
O
3m
ppm
150
100
50


7.664
7.643
7.641
7.637
7.633
7.533
7.529
7.524
7.523
7.521
7.517
7.388
7.383
7.380
7.375
7.371
7.363
7.362
7.305
7.292
7.279
7.241
7.229
7.228
7.227
7.226
7.220
7.220
7.217
7.215
7.202
7.139
7.133
7.131
7.125
6.986
6.980
6.978
6.972
6.941
6.939
6.938
6.937
6.935
6.934
6.932
6.823
6.797
6.573
6.546
6.454
6.442
6.430
6.427
6.415
6.404
4.124
3.825
3.823
3.814
3.811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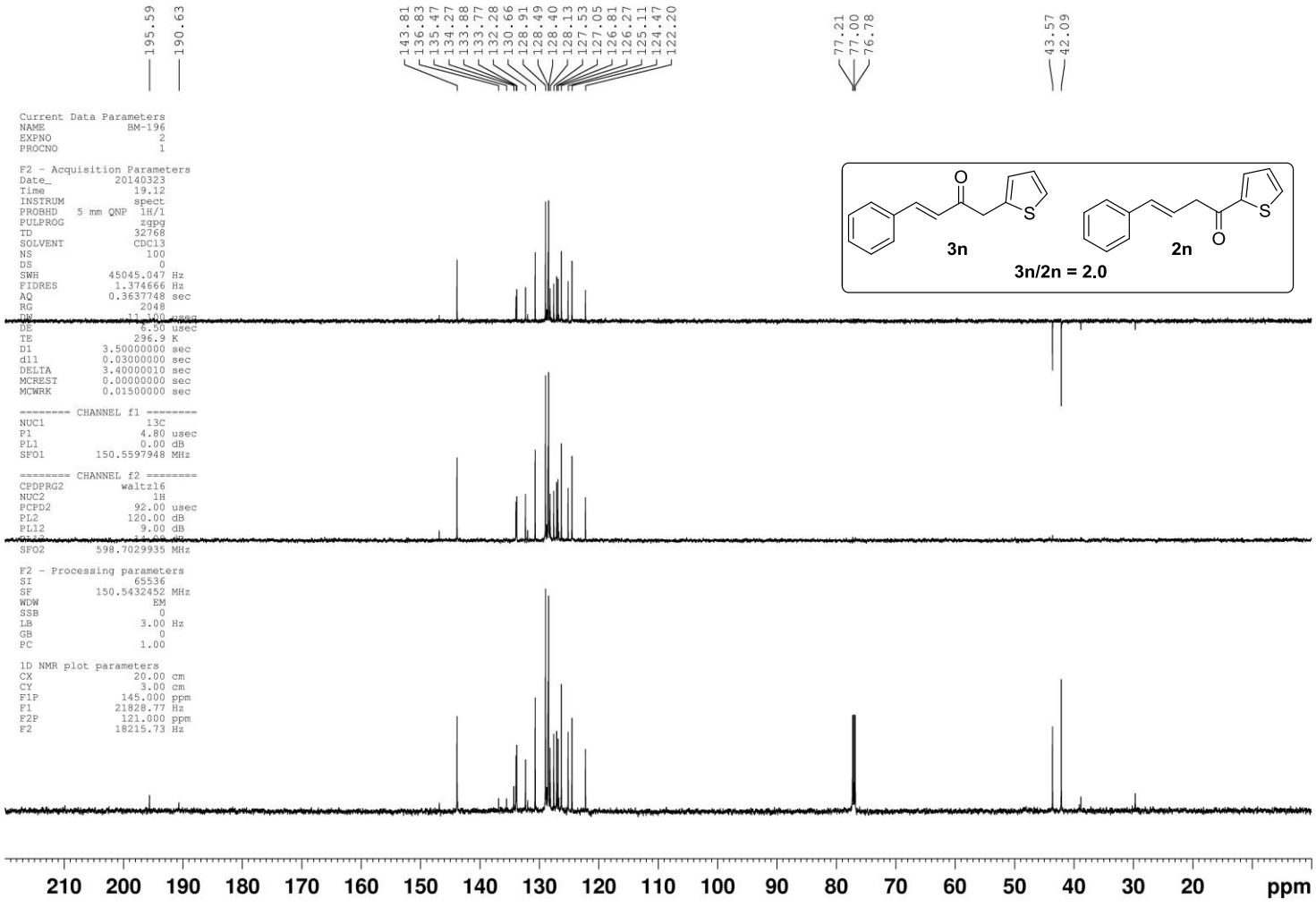
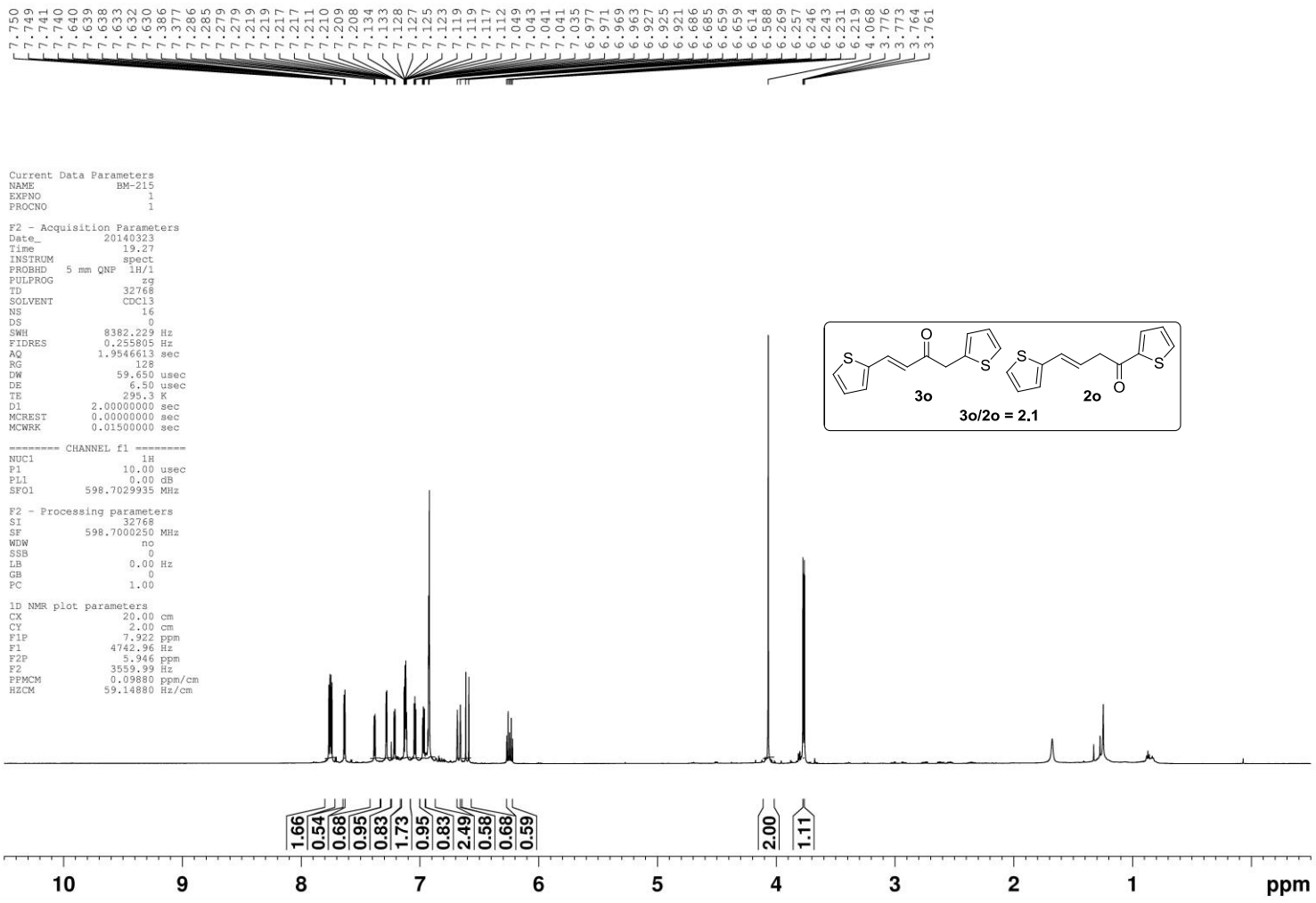
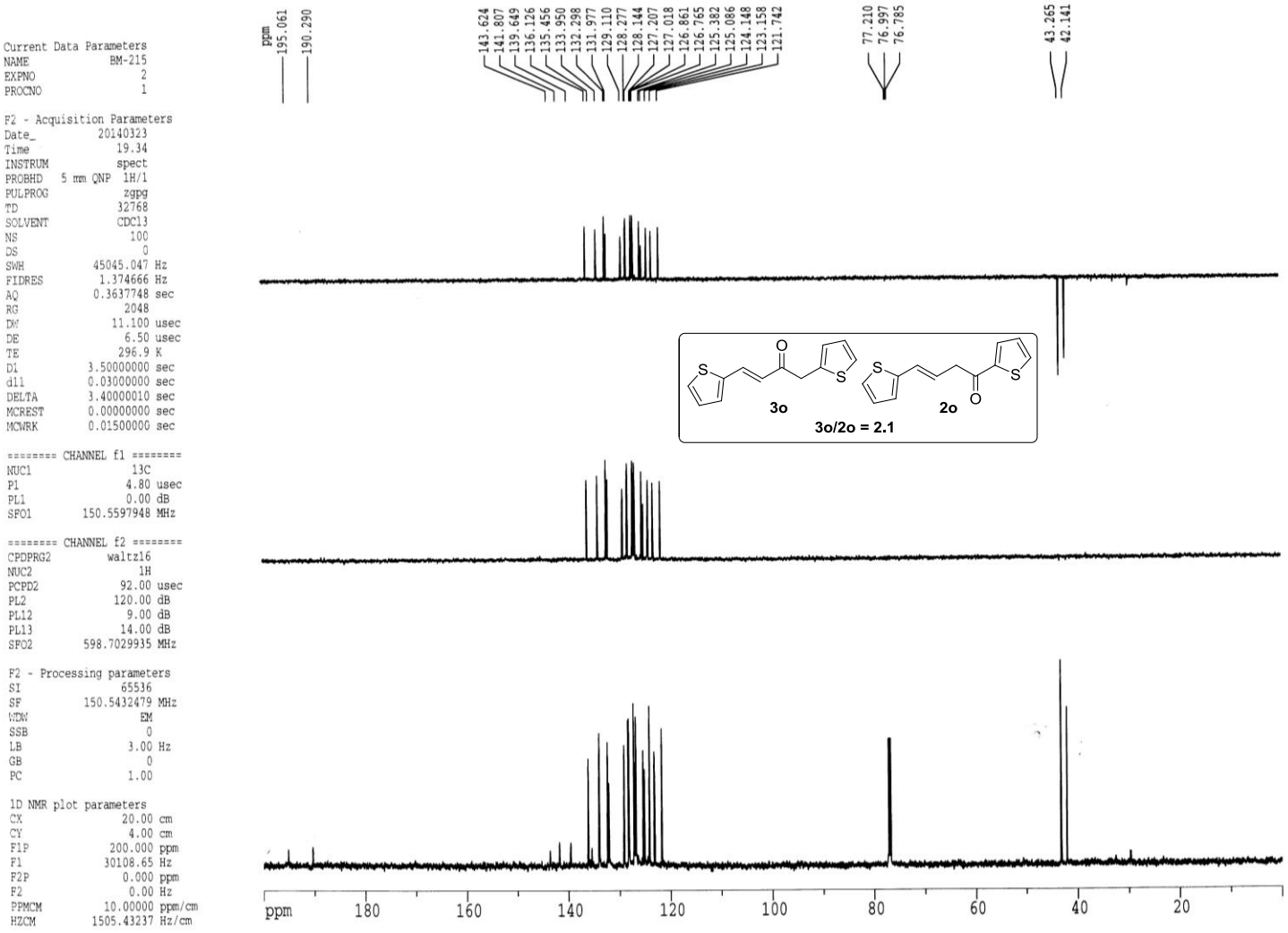
NAME BM-196
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 19.05
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 295.3 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000250 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 8.00 cm
F1P 7.894 ppm
F1 4725.93 Hz
F2P 6.200 ppm
F2 3712.00 Hz
PPMCM 0.08468 ppm/cm
HZCM 50.69638 Hz/cm
3n
2n
3n/2n = 2.0
0.55
2.09
2.15
4.16
2.12
2.15
0.49
0.59
0.59
1.01
0.49
0.50
2.10
1.13
10
9
8
7
6
5
4
3
2
1
ppm


195.59
190.63
143.81
136.83
135.47
134.27
133.88
133.77
132.28
130.66
128.91
128.49
128.40
128.13
127.53
127.05
126.81
126.27
125.11
124.47
122.20
77.21
77.00
76.78
43.57
42.09
Current Data Parameters
NAME BM-196
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 19.12
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.9 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432452 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 3.00 cm
F1P 145.000 ppm
F1 21828.77 Hz
F2P 121.000 ppm
F2 18215.73 Hz
O
S
3n
O
S
2n
3n/2n = 2.0
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.750
7.749
7.741
7.740
7.640
7.639
7.638
7.633
7.632
7.630
7.386
7.377
7.286
7.285
7.279
7.279
7.219
7.219
7.217
7.217
7.211
7.210
7.209
7.208
7.134
7.133
7.128
7.127
7.125
7.123
7.119
7.119
7.117
7.112
7.049
7.043
7.041
7.041
7.035
6.977
6.971
6.969
6.963
6.927
6.925
6.921
6.686
6.685
6.659
6.659
6.614
6.588
6.269
6.257
6.246
6.243
6.231
6.219
4.068
3.776
3.773
3.764
3.761
Current Data Parameters
NAME BM-215
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 19.27
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 295.3 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000250 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 2.00 cm
F1P 7.922 ppm
F1 4742.96 Hz
F2P 5.946 ppm
F2 3559.99 Hz
PPMCM 0.09880 ppm/cm
HZCM 59.14880 Hz/cm
3o
2o
3o/2o = 2.1
1.66
0.54
0.68
0.95
0.83
1.73
0.95
0.83
2.49
0.58
0.68
0.59
2.00
1.11
10
9
8
7
6
5
4
3
2
1
ppm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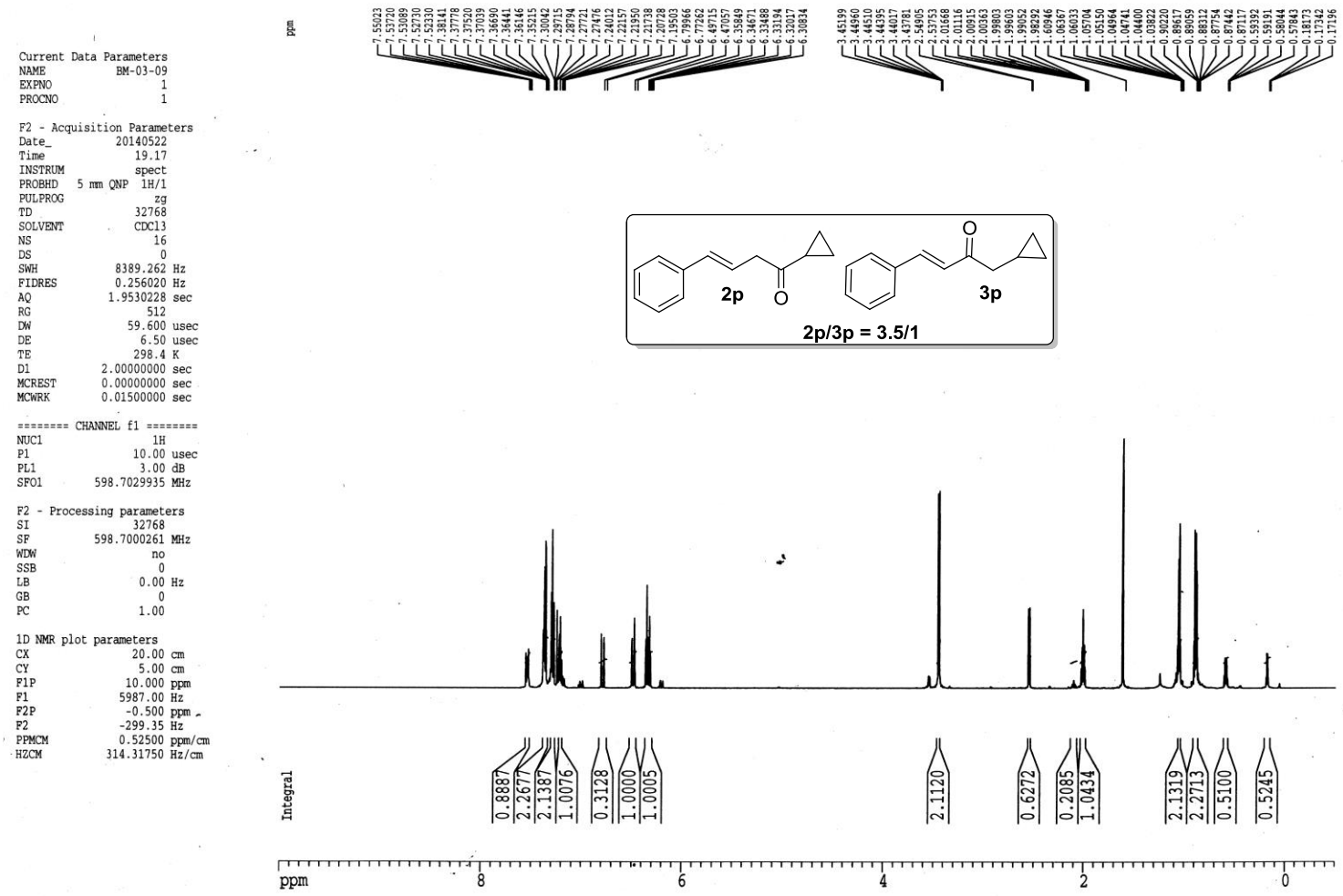
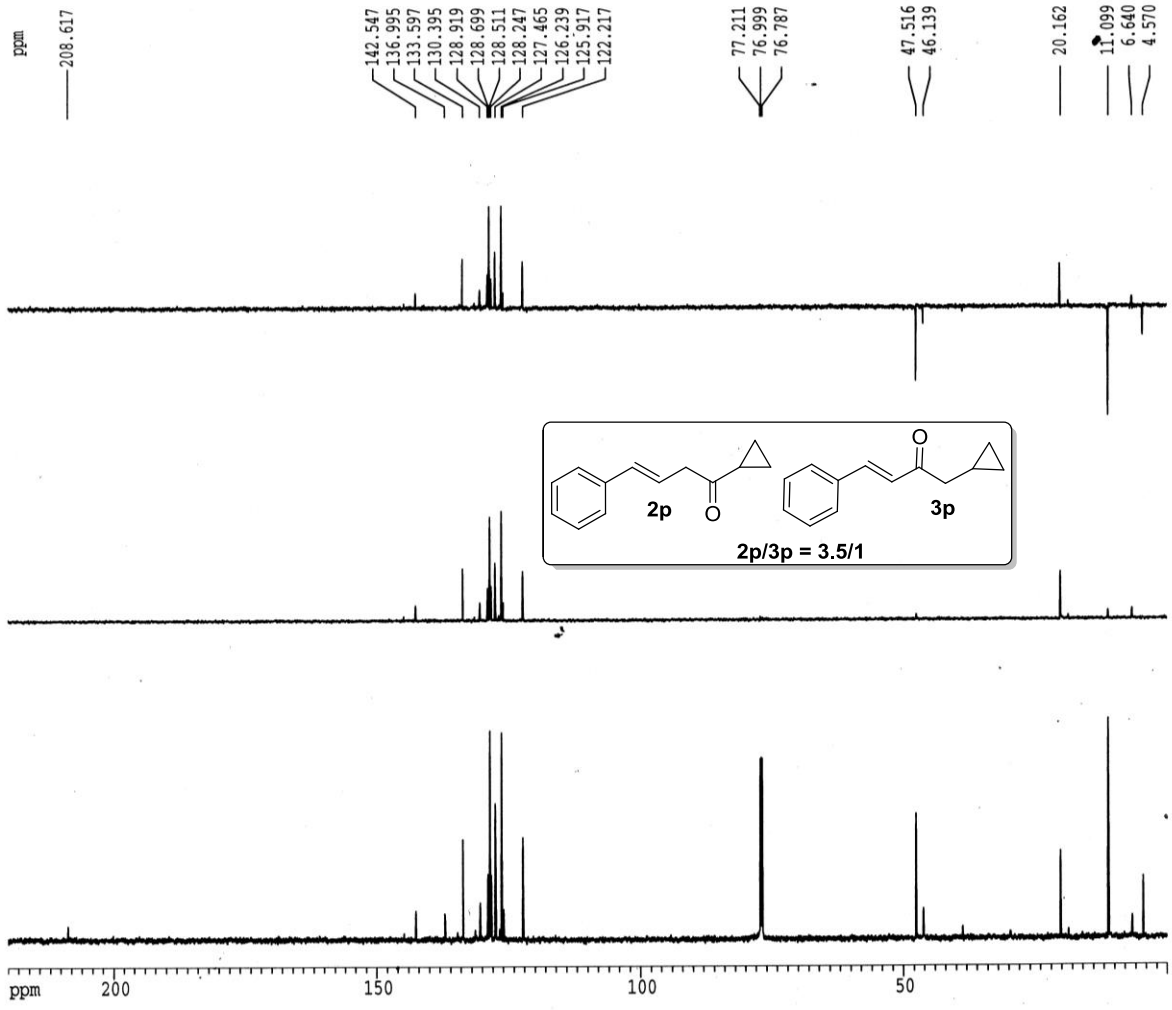
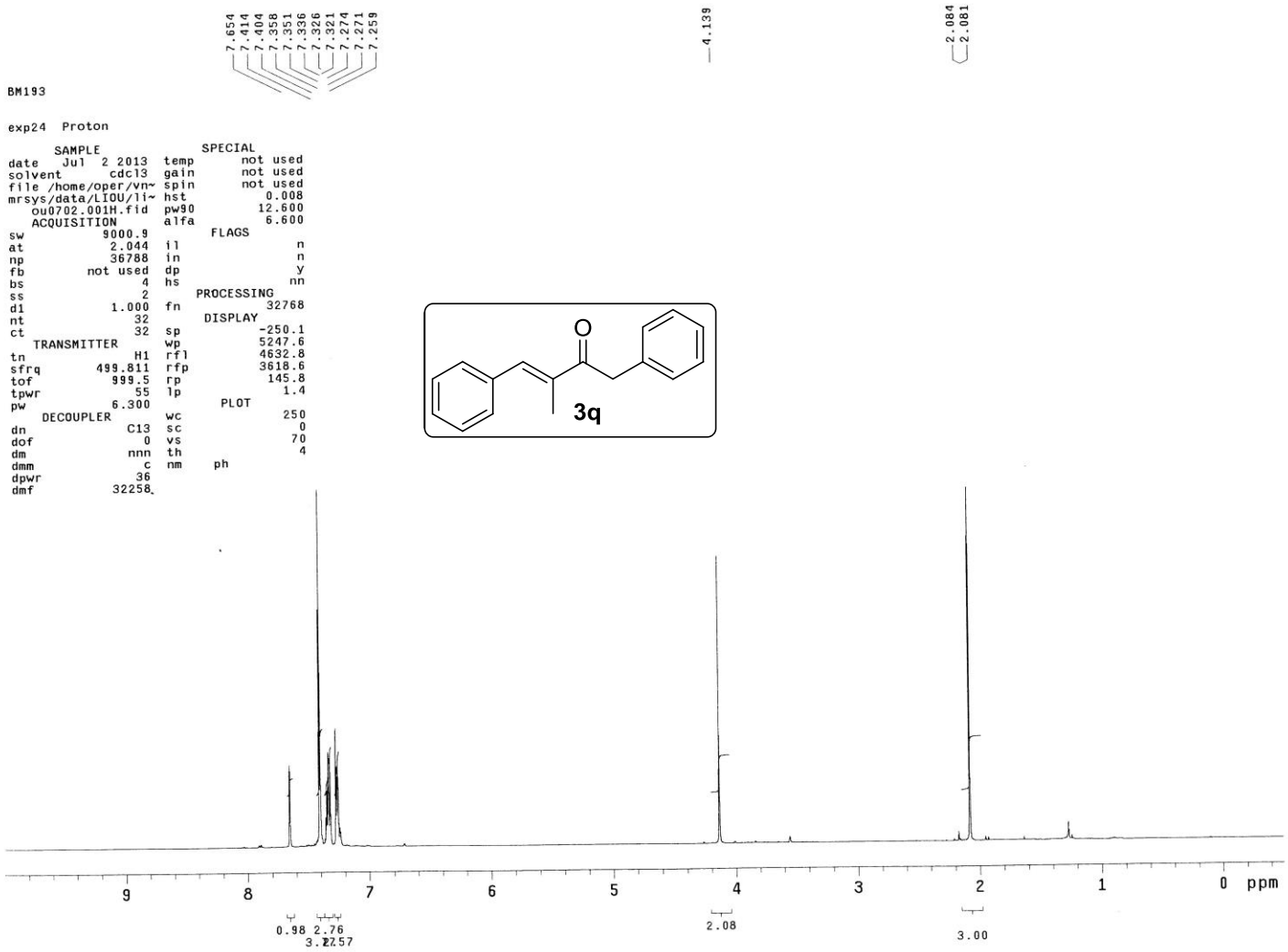
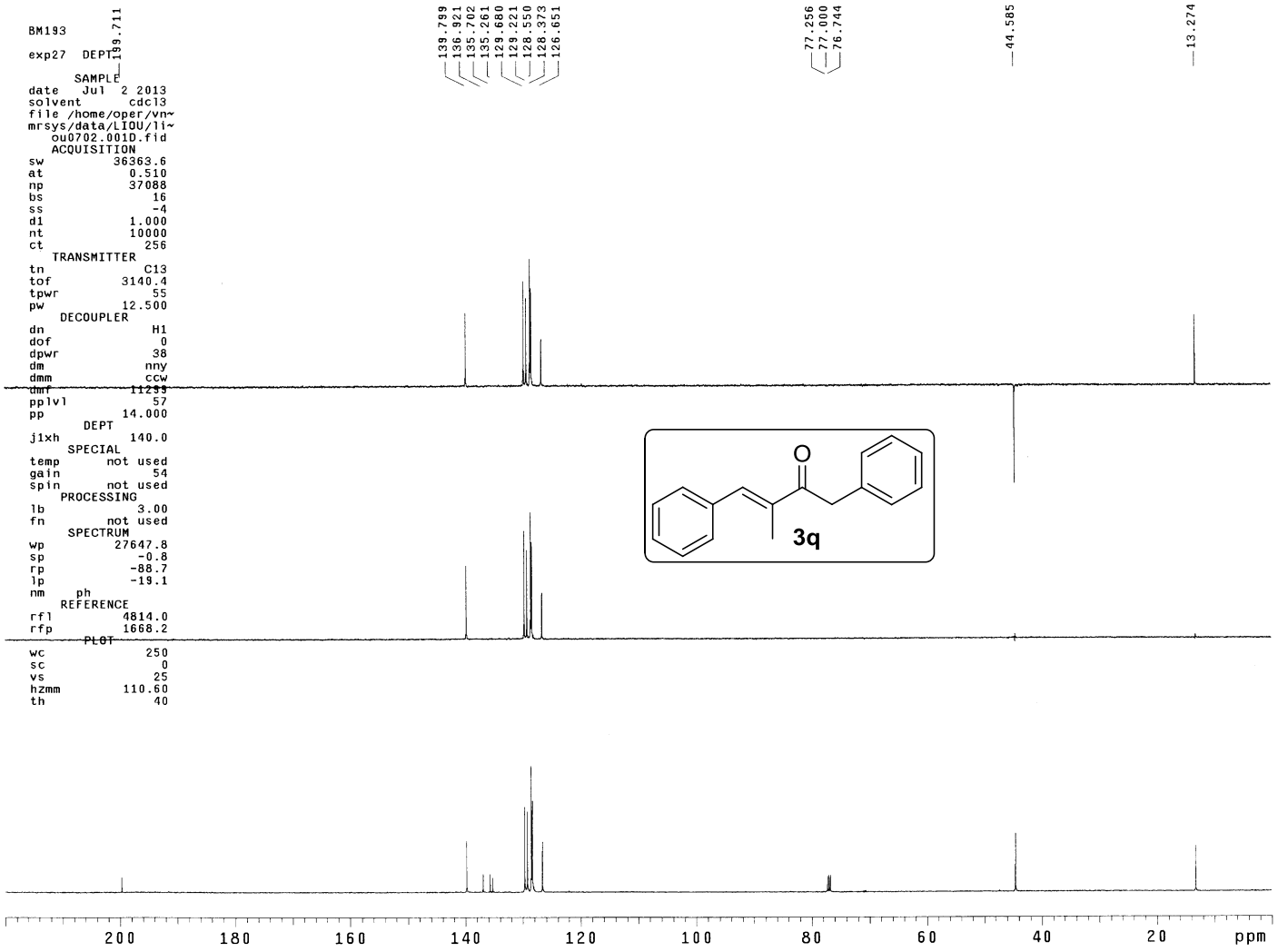
NAME BM-215
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140323
Time 19.34
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 296.9 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432479 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30108.65 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.43237 Hz/cm
ppm
195.061
190.290
143.624
141.807
139.649
136.126
135.456
133.950
132.298
131.977
129.110
128.277
128.144
127.207
127.018
126.861
126.765
125.382
125.086
124.148
123.158
121.742
77.210
76.997
76.785
43.265
42.141
3o
2o
3o/2o = 2.1
ppm
180
160
140
120
100
80
60
40
20

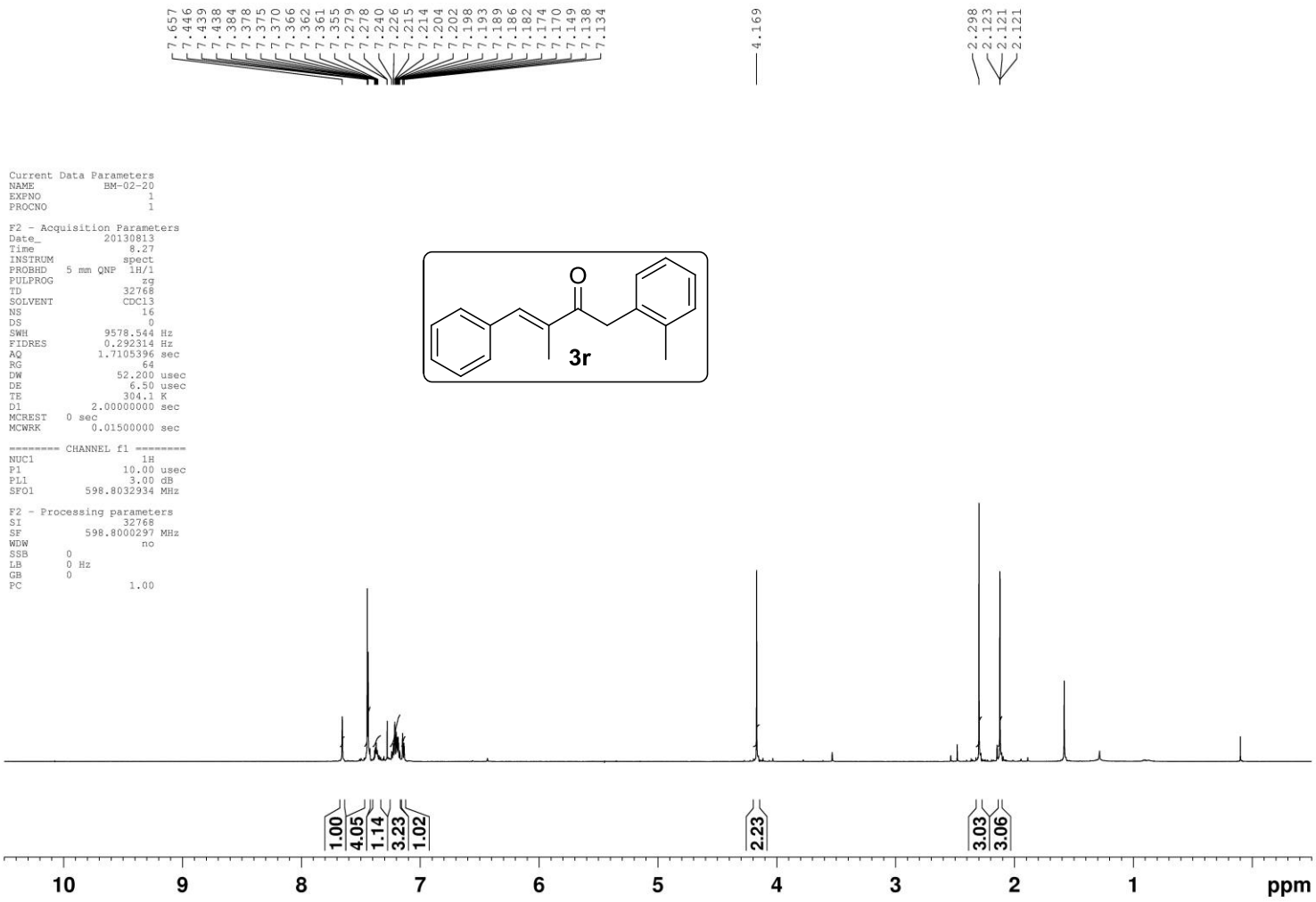

Current Data Parameters
NAME BM-03-09
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140522
Time 19.17
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 512
DW 59.600 usec
DE 6.50 usec
TE 298.4 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 5.00 cm
F1P 10.000 ppm
F1 5987.00 Hz
F2P -0.500 ppm
F2 -299.35 Hz
PPMCM 0.52500 ppm/cm
HZCM 314.31750 Hz/cm
ppm
7.55023
7.53720
7.53089
7.52730
7.52330
7.38141
7.37778
7.37520
7.37039
7.36690
7.36441
7.36146
7.35215
7.30042
7.29715
7.28794
7.27721
7.27476
7.24012
7.22157
7.21950
7.21738
7.20728
7.19503
6.79966
6.77262
6.49715
6.47057
6.35849
6.34671
6.33488
6.33194
6.32017
6.30834
3.45199
3.44960
3.44510
3.44395
3.44017
3.43781
2.54905
2.53753
2.01668
2.01116
2.00915
2.00363
1.99803
1.99603
1.99052
1.98292
1.60946
1.06367
1.06033
1.05704
1.05150
1.04964
1.04741
1.04400
1.03822
0.90220
0.89617
0.89059
0.88312
0.87754
0.87442
0.87117
0.59392
0.59191
0.58044
0.57843
0.18173
0.17342
0.17196
2p
O
O
3p
2p/3p = 3.5/1
Integral
0.8887
2.2677
2.1387
1.0076
0.3128
1.0000
1.0005
2.1120
0.6272
0.2085
1.0434
2.1319
2.2713
0.5100
0.5245
ppm
8
6
4
2
0

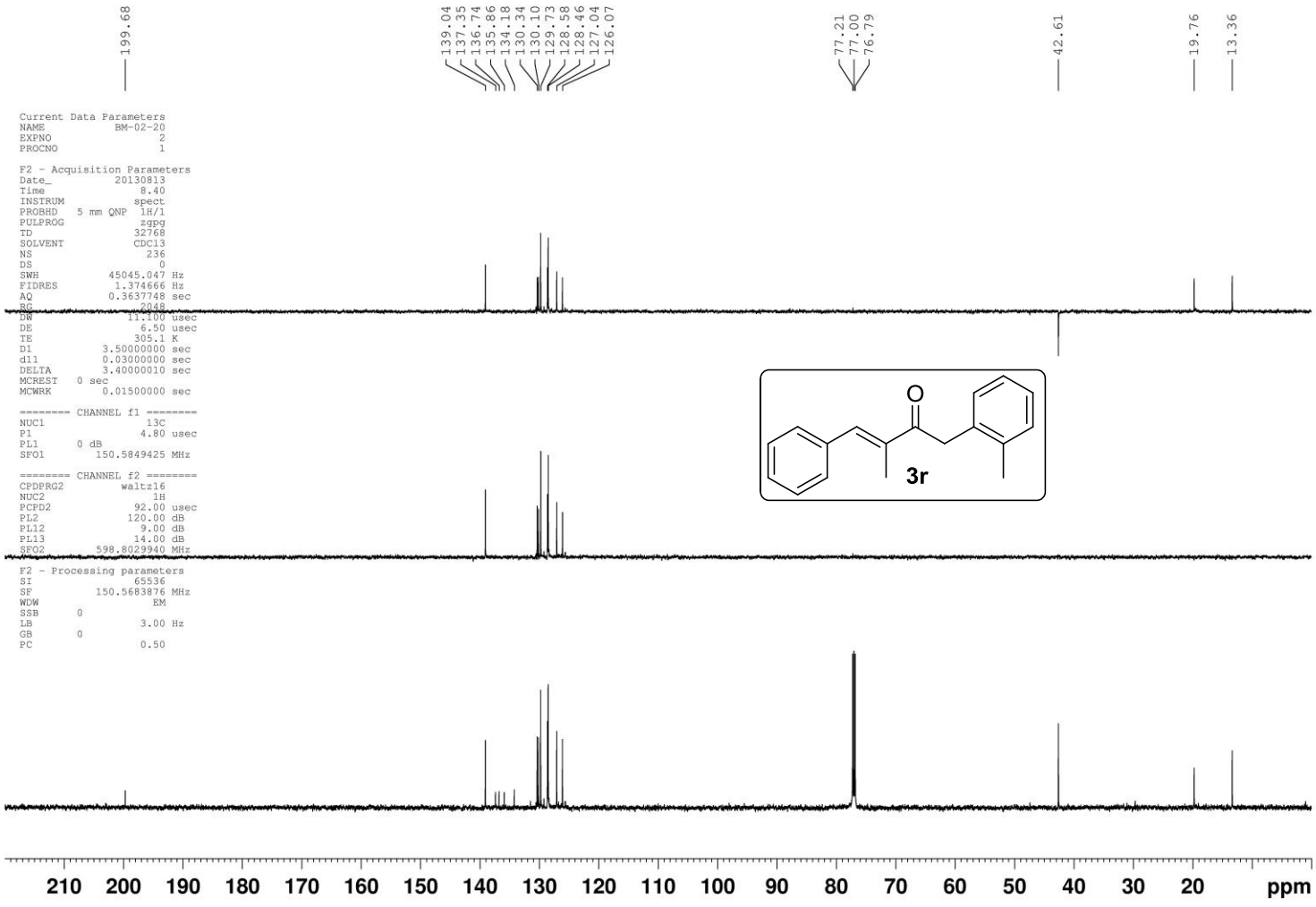
```
Current Data Parameters
NAME            BM-03-09
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20140522
Time               19.19
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG            zgpg
TD                32768
SOLVENT           CDCl3
NS                   211
DS                     0
SWH            45045.047 Hz
FIDRES             1.374666 Hz
AQ              0.3637748 sec
RG                  2048
DW                11.100 usec
DE                 6.50 usec
TE                299.1 K
D1             3.50000000 sec
d11            0.03000000 sec
DELTA          3.40000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   4.80 usec
PL1                  0.00 dB
SFO1         150.5597948 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               92.00 usec
PL2                120.00 dB
PL12                9.00 dB
PL13               14.00 dB
SFO2         598.7029935 MHz

F2 - Processing parameters
SI                 65536
SF           150.5432397 MHz
WDW                   EM
SSB                    0
LB                  3.00 Hz
GB                     0
PC                  0.50

1D NMR plot parameters
CX                 20.00 cm
CY                  4.00 cm
F1P               220.000 ppm
F1              33119.51 Hz
F2P                0.000 ppm
F2                 0.00 Hz
PPMCM          11.00000 ppm/cm
HZCM         1655.97571 Hz/cm
```



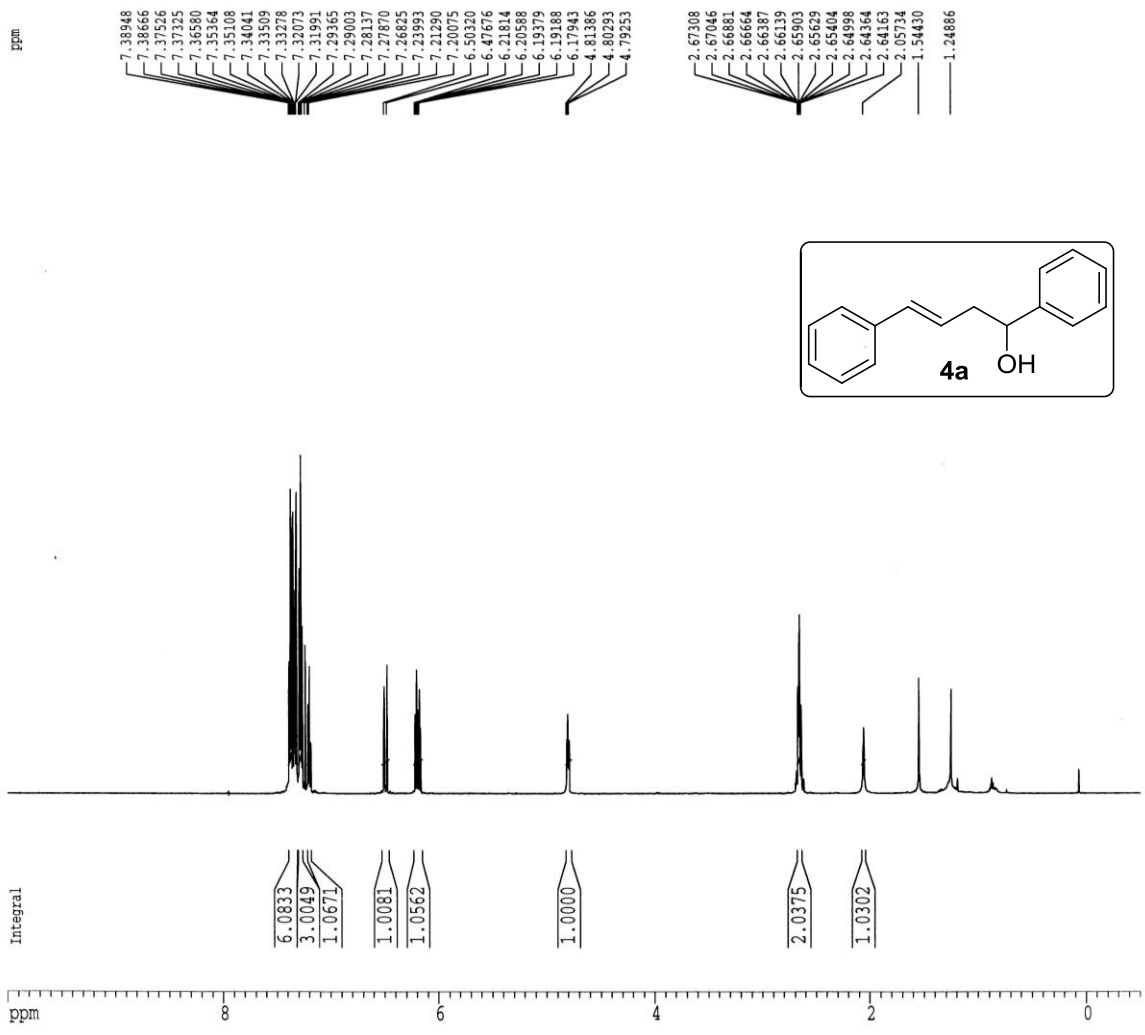

7.654
7.414
7.404
7.358
7.351
7.336
7.326
7.321
7.274
7.271
7.259
4.139
2.084
2.081
BM193
exp24 Proton
SAMPLE
date Jul 2 2013
solvent cdcl3
file /home/oper/vn~
mrsys/data/LIOU/li~
ou0702.001H.fid
ACQUISITION
sw 9000.9
at 2.044
np 36788
fb not used
bs 4
ss 2
d1 1.000
nt 32
ct 32
TRANSMITTER
tn H1
sfrq 499.811
tof 999.5
tpwr 55
pw 6.300
DECOUPLER
dn C13
dof 0
dm nnn
dmm c
dpwr 36
dmf 32258.
SPECIAL
temp not used
gain not used
spin not used
hst 0.008
pw90 12.600
alfa 6.600
FLAGS
il n
in n
dp y
hs nn
PROCESSING
fn 32768
DISPLAY
sp -250.1
wp 5247.6
rfl 4632.8
rfp 3618.6
rp 145.8
lp 1.4
PLOT
wc 250
sc 0
vs 70
th 4
nm ph
O
3q
9
8
7
6
5
4
3
2
1
0 ppm
0.98
2.76
3.22
57
2.08
3.00

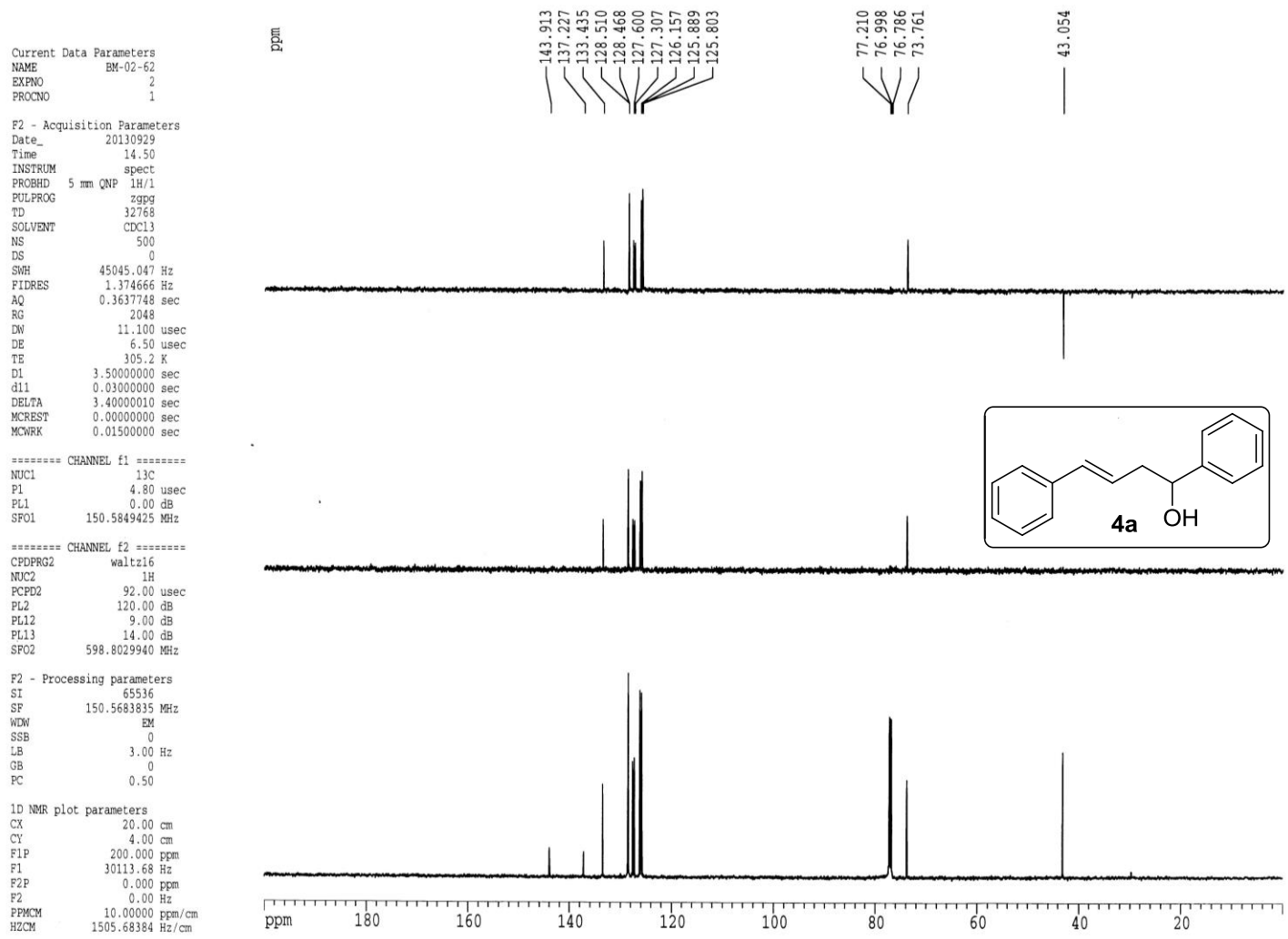

BM193
exp27 DEPT
SAMPLE
date Jul 2 2013
solvent cdcl3
file /home/oper/vn~
mrsys/data/LIOU/li~
ou0702.001D.fid
ACQUISITION
sw 36363.6
at 0.510
np 37088
bs 16
ss -4
d1 1.000
nt 10000
ct 256
TRANSMITTER
tn C13
tof 3140.4
tpwr 55
pw 12.500
DECOUPLER
dn H1
dof 0
dpwr 38
dm nny
dmm ccw
dmf 11233
pplvl 57
pp 14.000
DEPT
jlxh 140.0
SPECIAL
temp not used
gain 54
spin not used
PROCESSING
lb 3.00
fn not used
SPECTRUM
wp 27647.8
sp -0.8
rp -88.7
lp -19.1
nm ph
REFERENCE
rfl 4814.0
rfp 1668.2
PLOT
wc 250
sc 0
vs 25
hzmm 110.60
th 40
199.711
139.799
136.921
135.702
135.261
129.680
129.221
128.550
128.373
126.651
77.256
77.000
76.744
44.585
13.274
O
3q
200
180
160
140
120
100
80
60
40
20
ppm

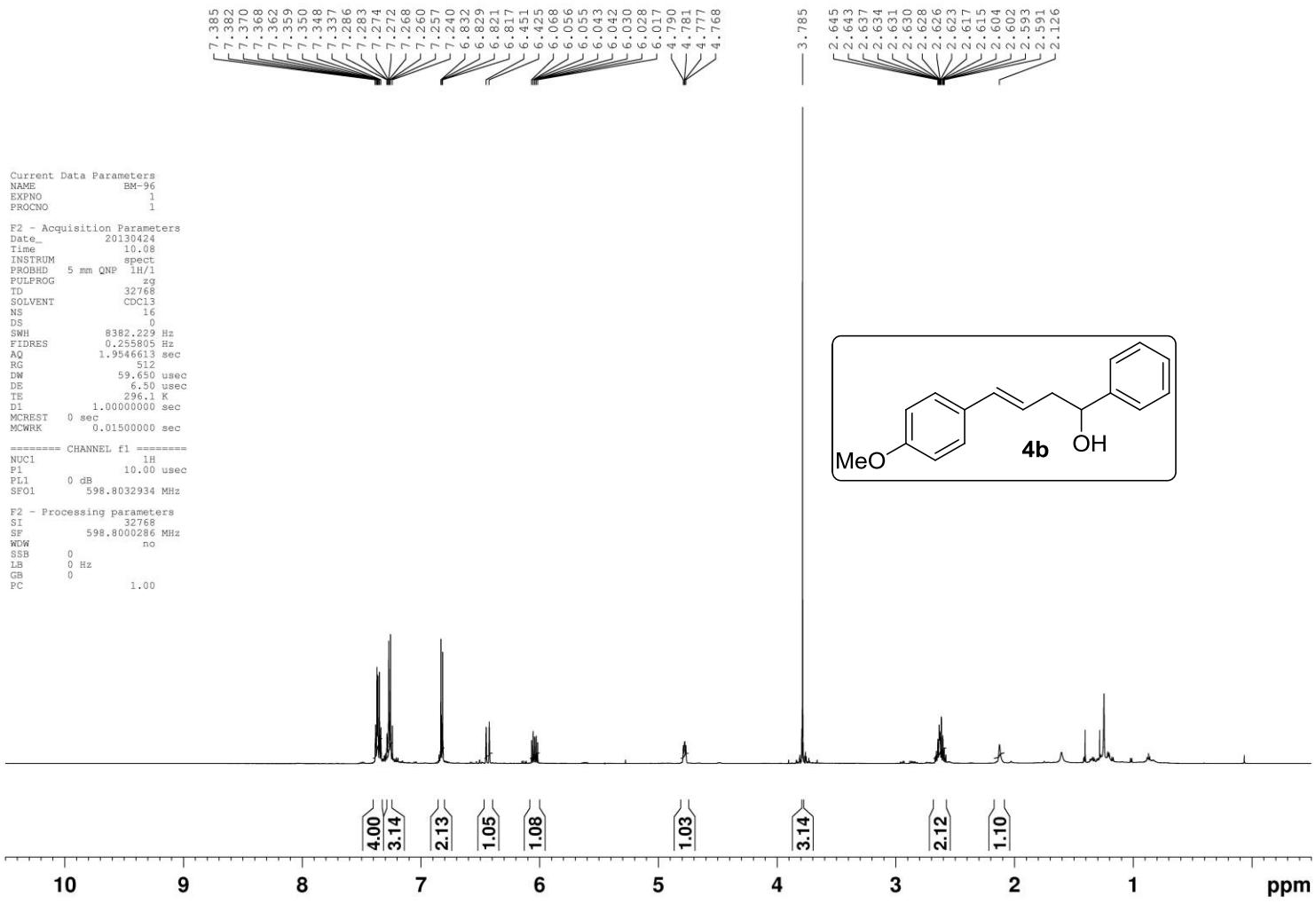

7.657
7.446
7.439
7.438
7.384
7.378
7.375
7.370
7.366
7.362
7.361
7.355
7.279
7.278
7.240
7.226
7.215
7.214
7.204
7.202
7.198
7.193
7.189
7.186
7.182
7.174
7.170
7.149
7.138
7.134
4.169
2.298
2.123
2.121
2.121
Current Data Parameters
NAME BM-02-20
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130813
Time 8.27
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 64
DW 52.200 usec
DE 6.50 usec
TE 304.1 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 3.00 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000297 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
O
3r
1.00
4.05
1.14
3.23
1.02
2.23
3.03
3.06
10
9
8
7
6
5
4
3
2
1
ppm

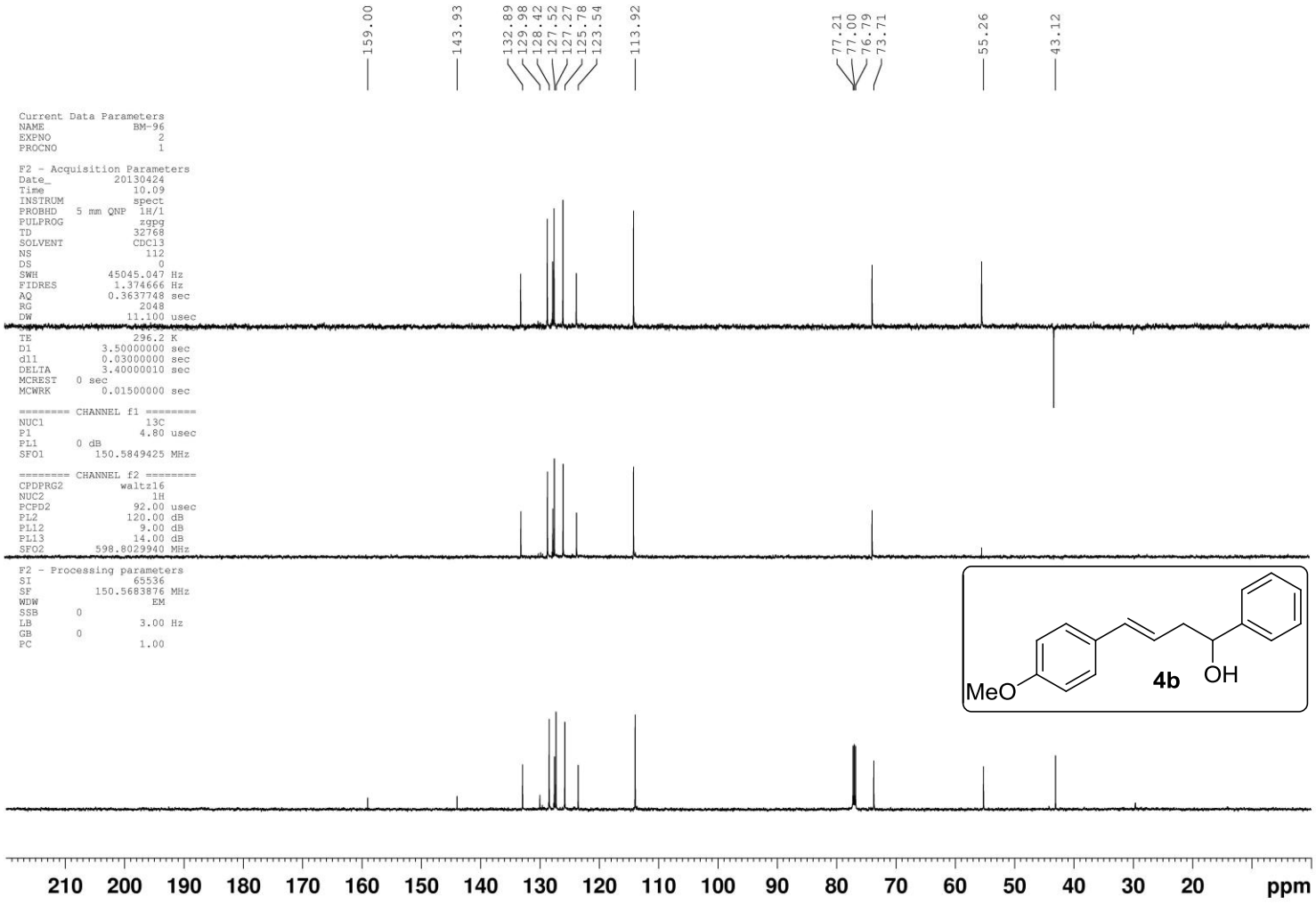

199.68
139.04
137.35
136.74
135.86
134.18
130.34
130.10
129.73
128.58
128.46
127.04
126.07
77.21
77.00
76.79
42.61
19.76
13.36
Current Data Parameters
NAME BM-02-20
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130813
Time 8.40
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 236
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 305.1 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683876 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
O
3r
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

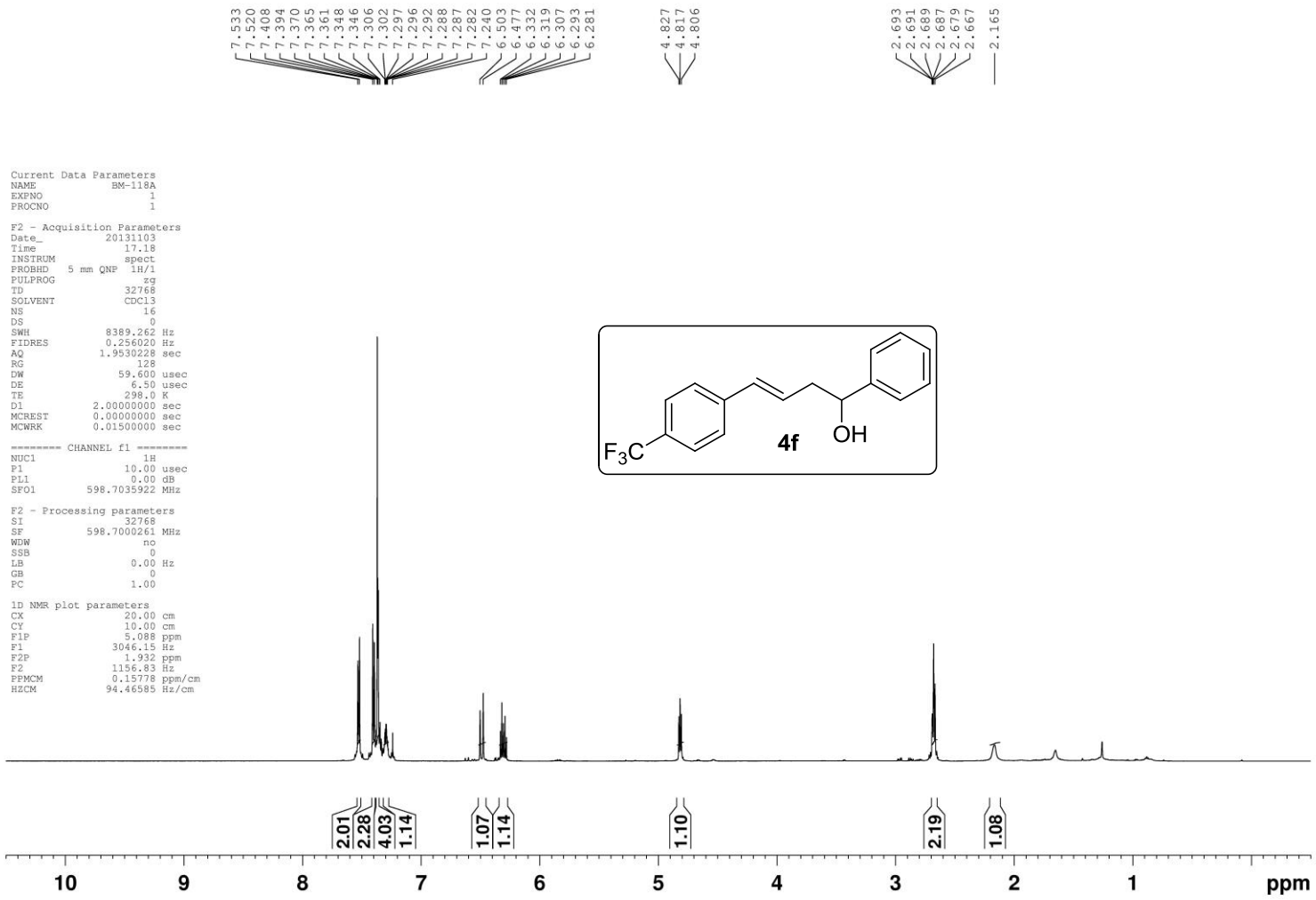
```
Current Data Parameters
NAME            BM-02-62
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130929
Time               14.17
INSTRUM            spect
PROBHD   5 mm QNP  1H/1
PULPROG              zg
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     0
SWH           13123.359 Hz
FIDRES            0.400493 Hz
AQ             1.2485108 sec
RG                   256
DW                38.100 usec
DE                 6.50 usec
TE                304.5 K
D1            2.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                10.00 usec
PL1                0.00 dB
SFO1        598.8047904 MHz

F2 - Processing parameters
SI                 32768
SF          598.8000290 MHz
WDW                   no
SSB                    0
LB                 0.00 Hz
GB                     0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
CY                 6.00 cm
F1P               10.000 ppm
F1              5988.00 Hz
F2P               -0.500 ppm
F2              -299.40 Hz
PPMCM             0.52500 ppm/cm
HZCM            314.37003 Hz/cm
```

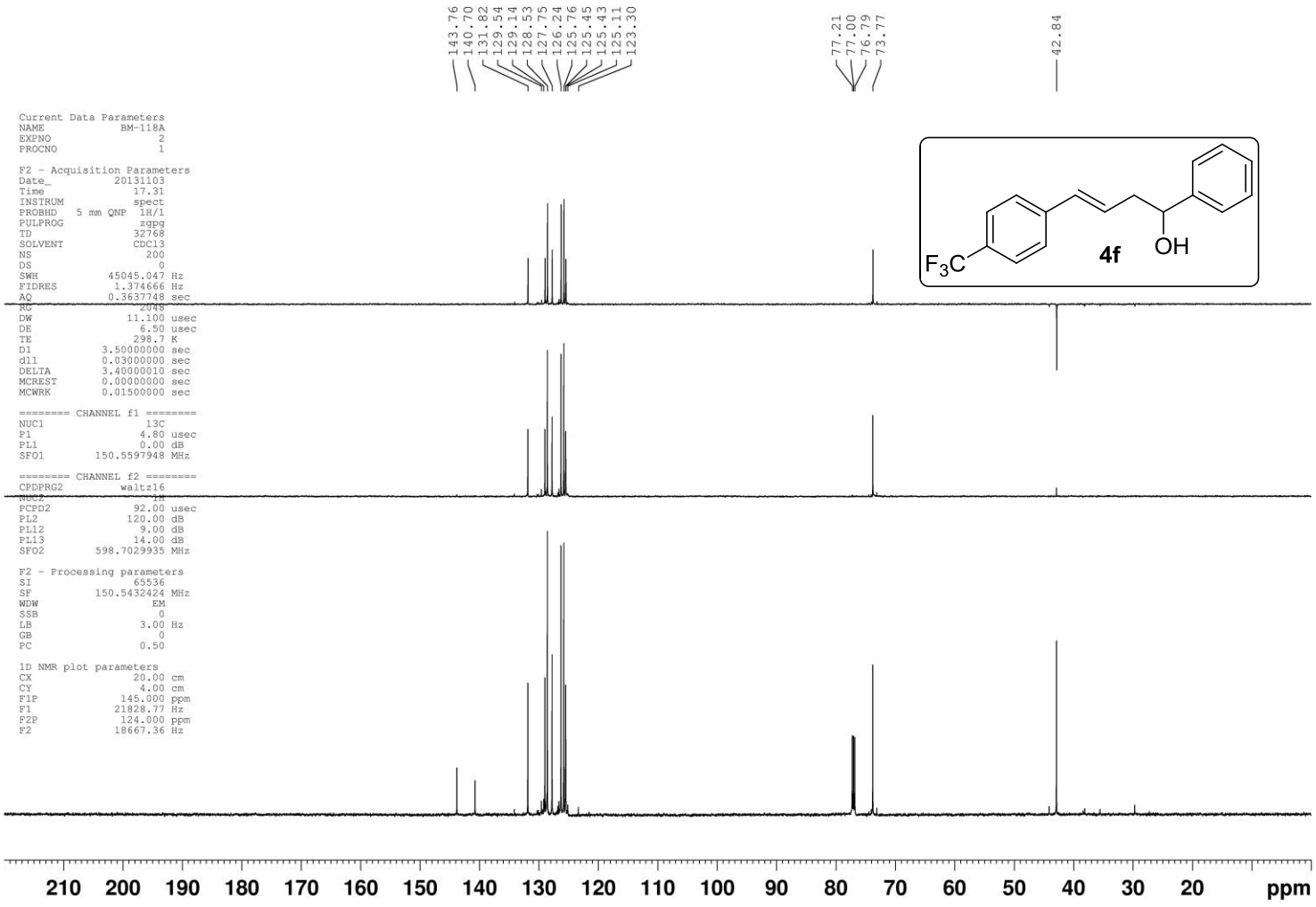


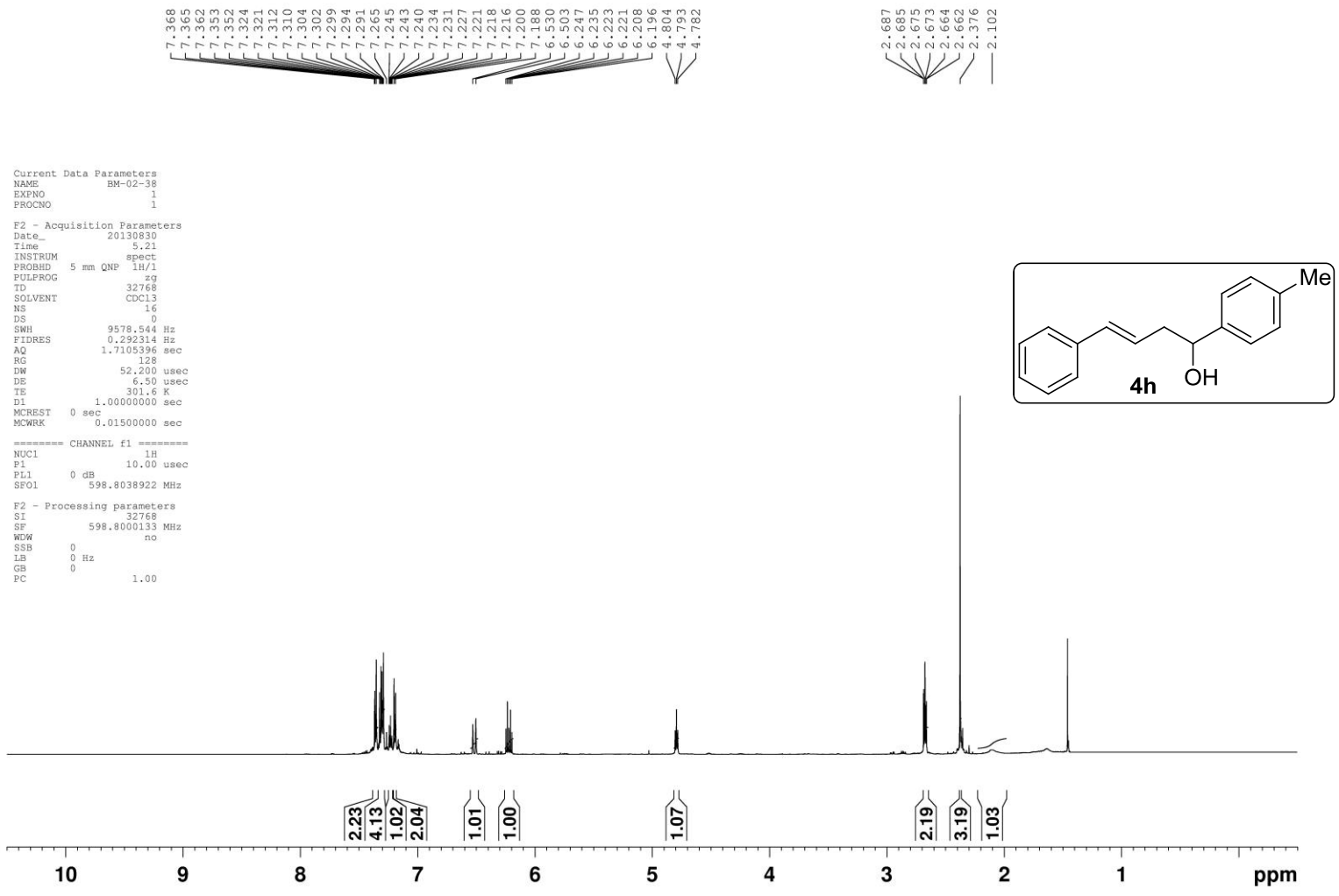

Current Data Parameters
NAME BM-02-62
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130929
Time 14.50
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 500
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 305.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683835 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30113.68 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.68384 Hz/cm
ppm
143.913
137.227
133.435
128.510
128.468
127.600
127.307
126.157
125.889
125.803
77.210
76.998
76.786
73.761
43.054
4a
OH
ppm
180
160
140
120
100
80
60
40
20

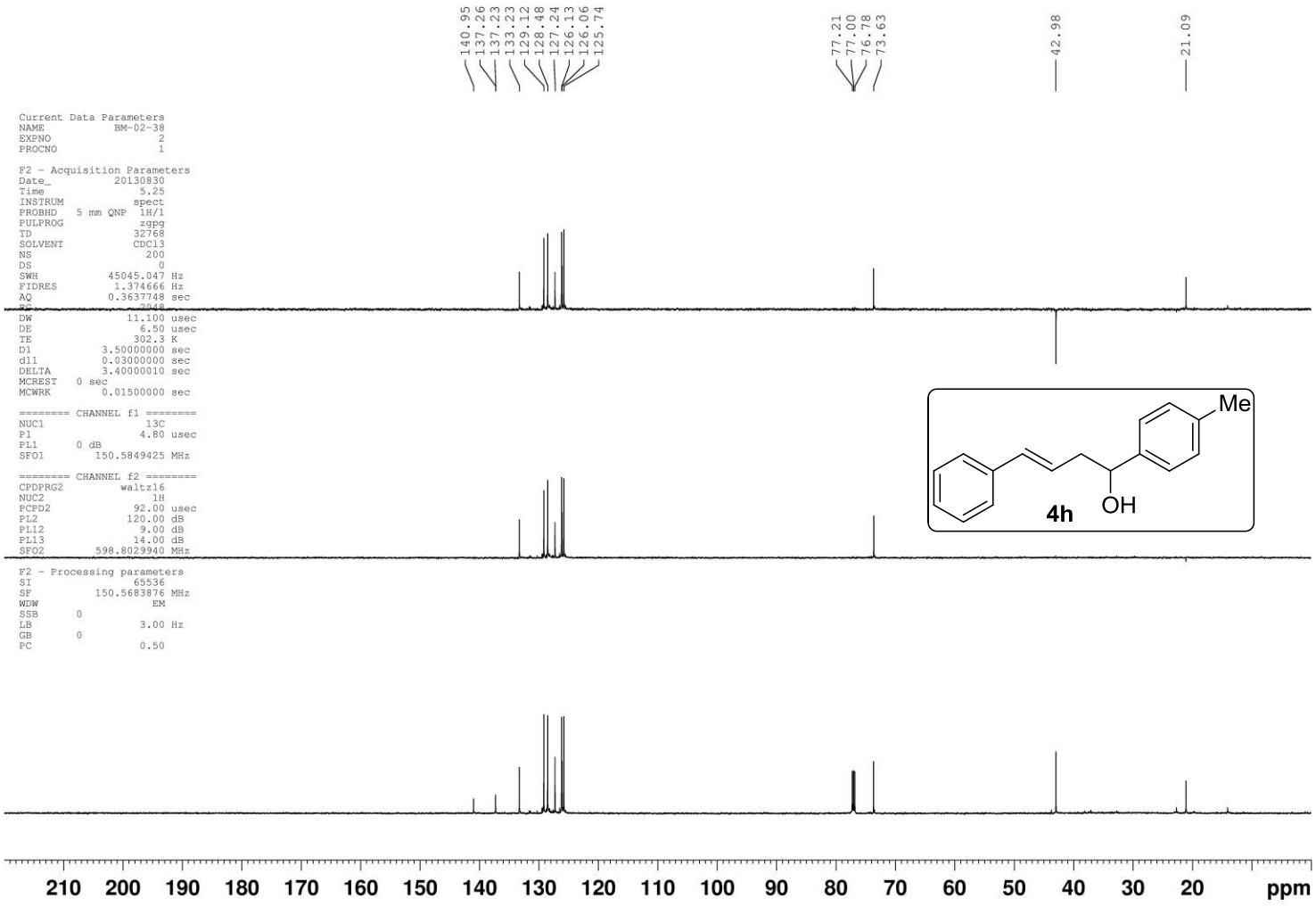

7.385
7.382
7.370
7.368
7.362
7.359
7.350
7.348
7.337
7.286
7.283
7.274
7.272
7.268
7.260
7.257
7.240
6.832
6.829
6.821
6.817
6.451
6.425
6.068
6.056
6.055
6.043
6.042
6.030
6.028
6.017
4.790
4.781
4.777
4.768
3.785
2.645
2.643
2.637
2.634
2.631
2.630
2.628
2.626
2.623
2.617
2.615
2.604
2.602
2.593
2.591
2.126
Current Data Parameters
NAME BM-96
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130424
Time 10.08
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 512
DW 59.650 usec
DE 6.50 usec
TE 296.1 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000286 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
MeO
4b
OH
4.00
3.14
2.13
1.05
1.08
1.03
3.14
2.12
1.10
10
9
8
7
6
5
4
3
2
1
ppm

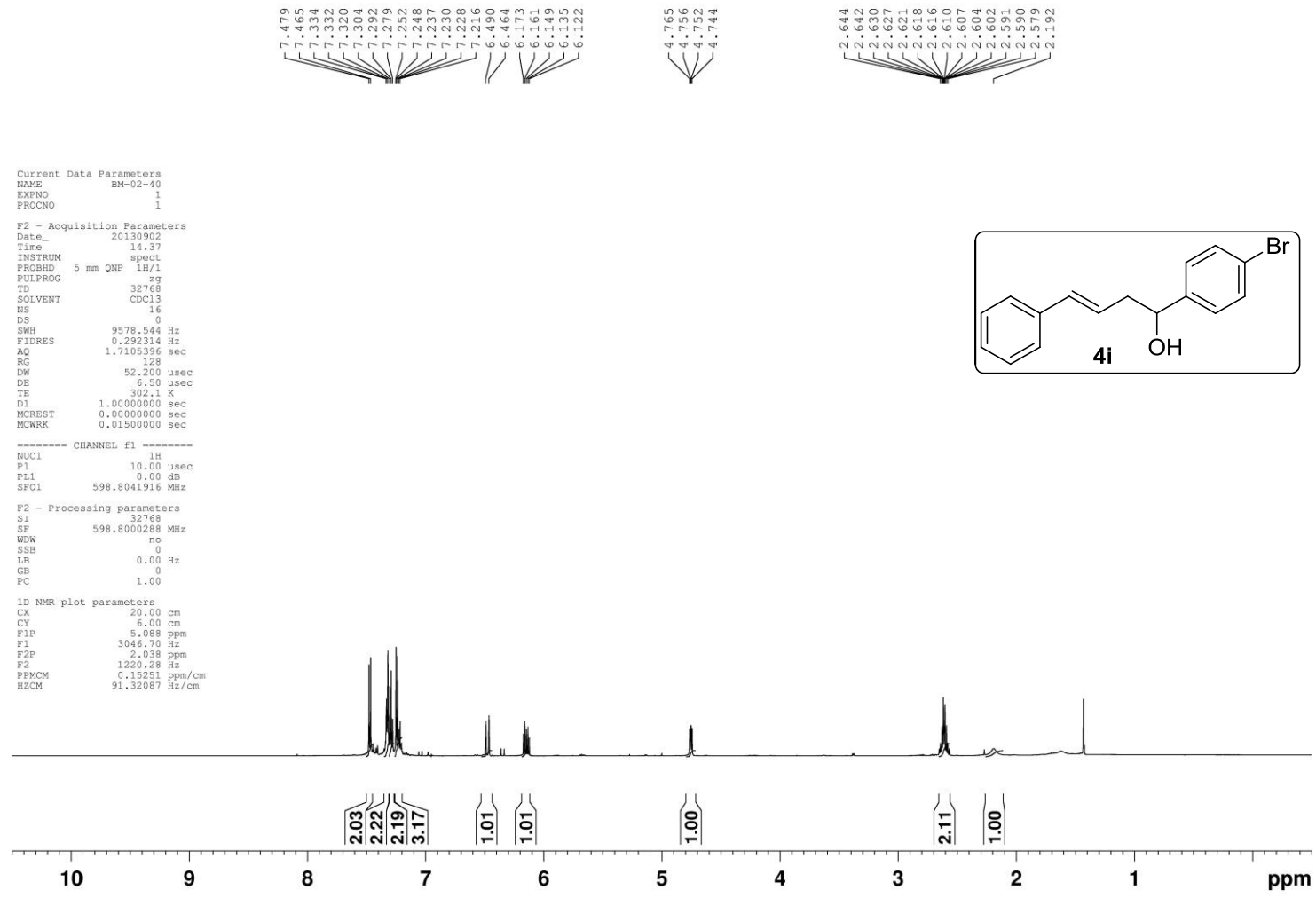

159.00
143.93
132.89
129.98
128.42
127.52
127.27
125.78
123.54
113.92
77.21
77.00
76.79
73.71
55.26
43.12
Current Data Parameters
NAME BM-96
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130424
Time 10.09
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 112
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
TE 296.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683876 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
MeO
4b
OH
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

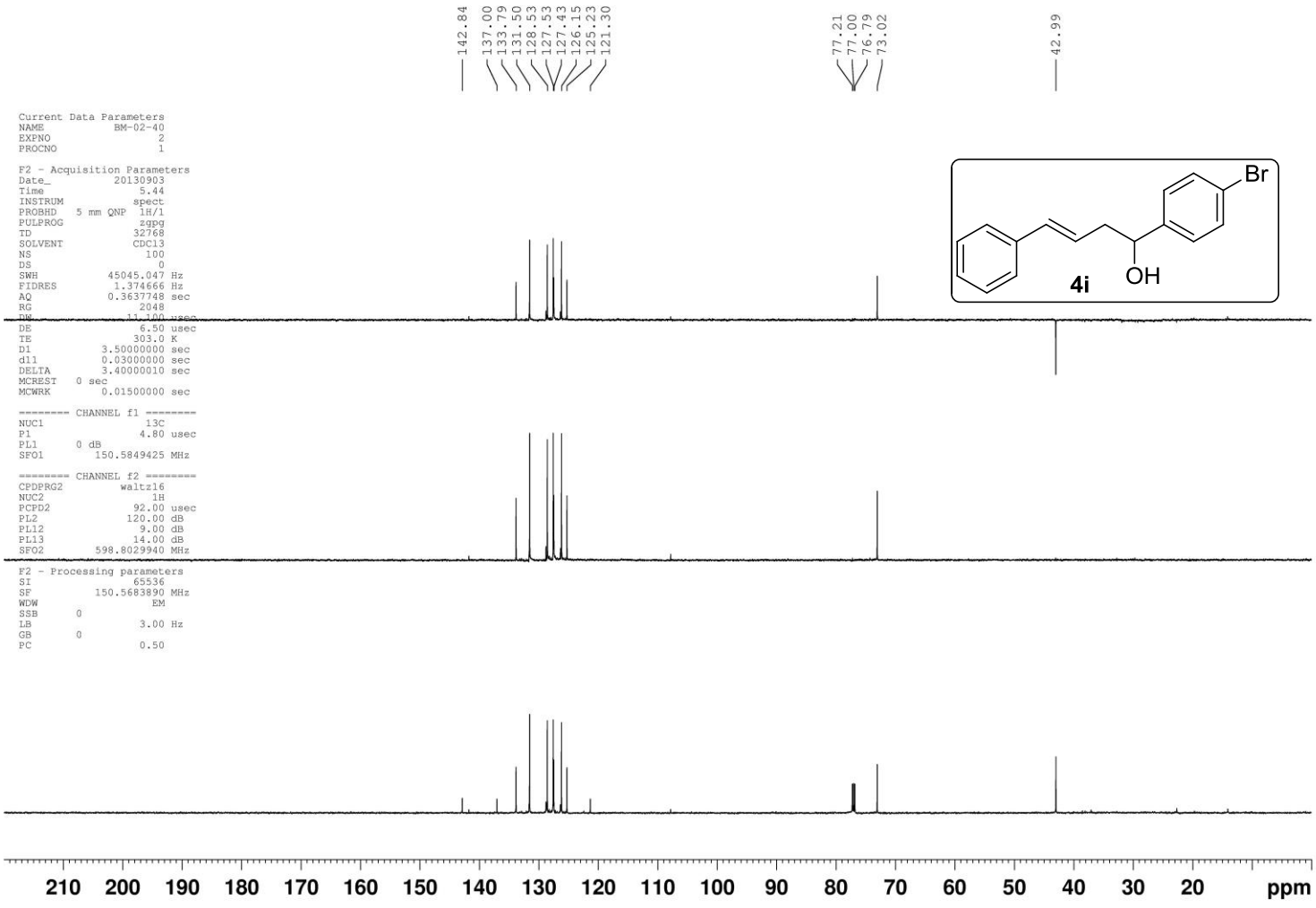

7.533
7.520
7.408
7.394
7.370
7.365
7.361
7.348
7.346
7.306
7.302
7.297
7.296
7.292
7.288
7.287
7.282
7.240
6.503
6.477
6.332
6.319
6.307
6.293
6.281
4.827
4.817
4.806
2.693
2.691
2.689
2.687
2.679
2.667
2.165
Current Data Parameters
NAME BM-118A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131103
Time 17.18
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7035922 MHz
F2 - Processing parameters
SI 32768
SF 598.7000261 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 10.00 cm
F1P 5.088 ppm
F1 3046.15 Hz
F2P 1.932 ppm
F2 1156.83 Hz
PPMCM 0.15778 ppm/cm
HZCM 94.46585 Hz/cm
F3C
4f
OH
2.01
2.28
4.03
1.14
1.07
1.14
1.10
2.19
1.08
10
9
8
7
6
5
4
3
2
1
ppm

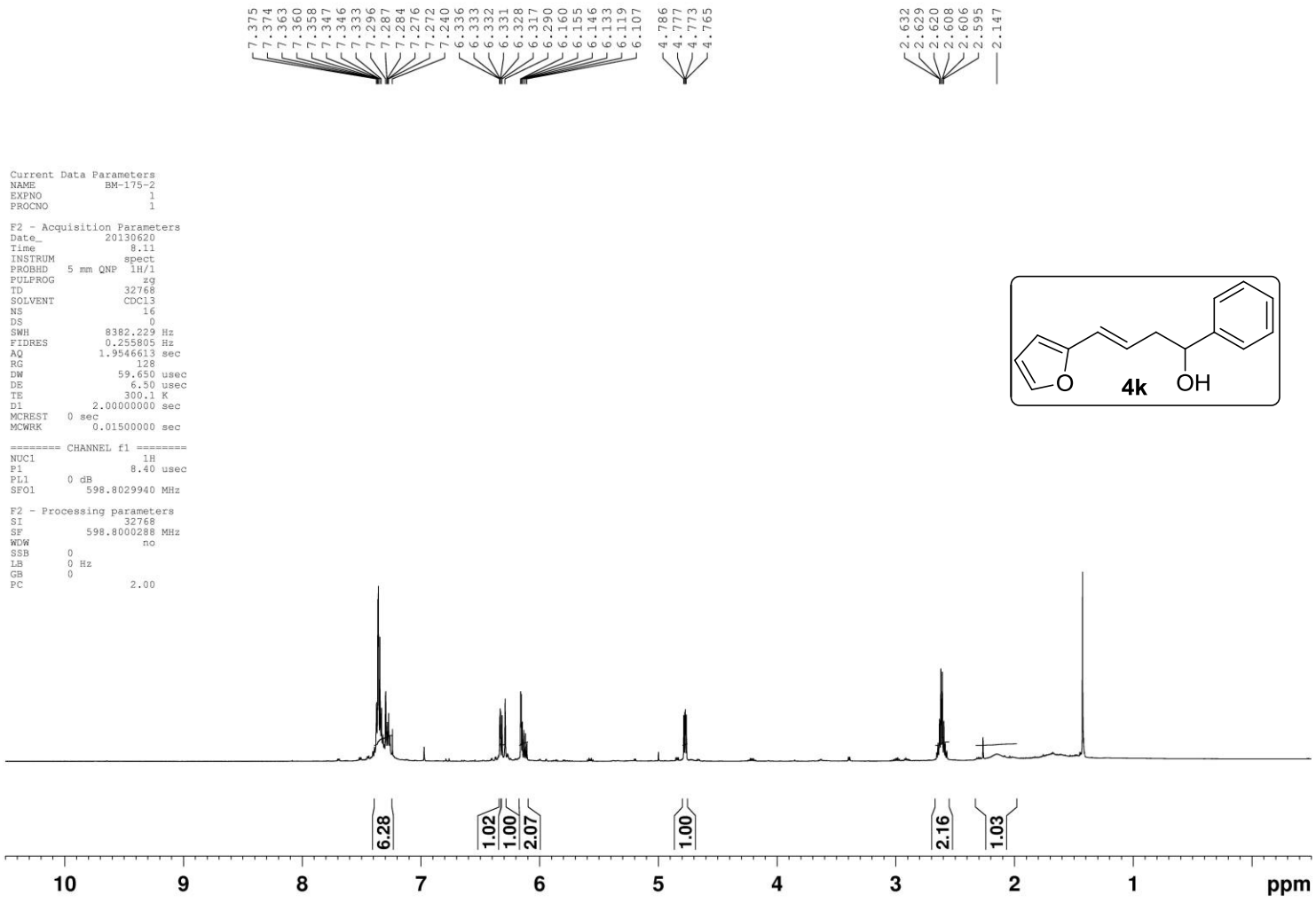

143.76
140.70
131.82
129.54
129.14
128.53
127.75
126.24
125.76
125.45
125.43
125.11
123.30
77.21
77.00
76.79
73.77
42.84
Current Data Parameters
NAME BM-118A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131103
Time 17.31
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 298.7 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432424 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 145.000 ppm
F1 21828.77 Hz
F2P 124.000 ppm
F2 18667.36 Hz
F3C
OH
4f
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

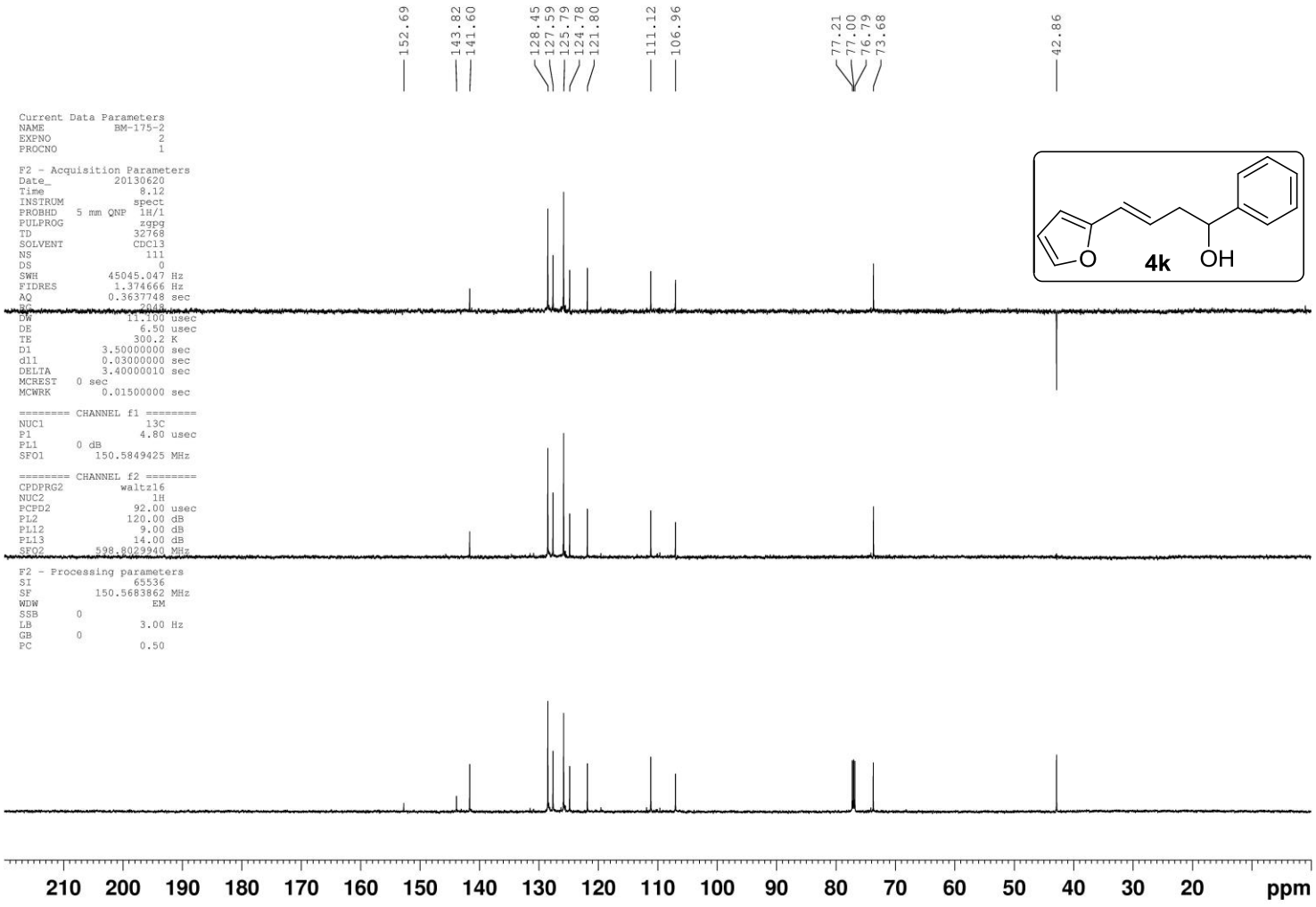

7.368
7.365
7.362
7.353
7.352
7.324
7.321
7.312
7.310
7.304
7.302
7.299
7.294
7.291
7.265
7.245
7.243
7.240
7.234
7.231
7.227
7.221
7.218
7.216
7.200
7.188
6.530
6.503
6.247
6.235
6.223
6.221
6.208
6.196
4.804
4.793
4.782
2.687
2.685
2.675
2.673
2.664
2.662
2.376
2.102
Current Data Parameters
NAME BM-02-38
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130830
Time 5.21
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 301.6 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8038922 MHz
F2 - Processing parameters
SI 32768
SF 598.8000133 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
Me
OH
4h
2.23
4.13
1.02
2.04
1.01
1.00
1.07
2.19
3.19
1.03
10
9
8
7
6
5
4
3
2
1
ppm


140.95
137.26
137.23
133.23
129.12
128.48
127.24
126.13
126.06
125.74
77.21
77.00
76.78
73.63
42.98
21.09
Current Data Parameters
NAME BM-02-38
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130830
Time 5.25
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 200
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
DW 11.100 usec
DE 6.50 usec
TE 302.3 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683876 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
Me
OH
4h
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

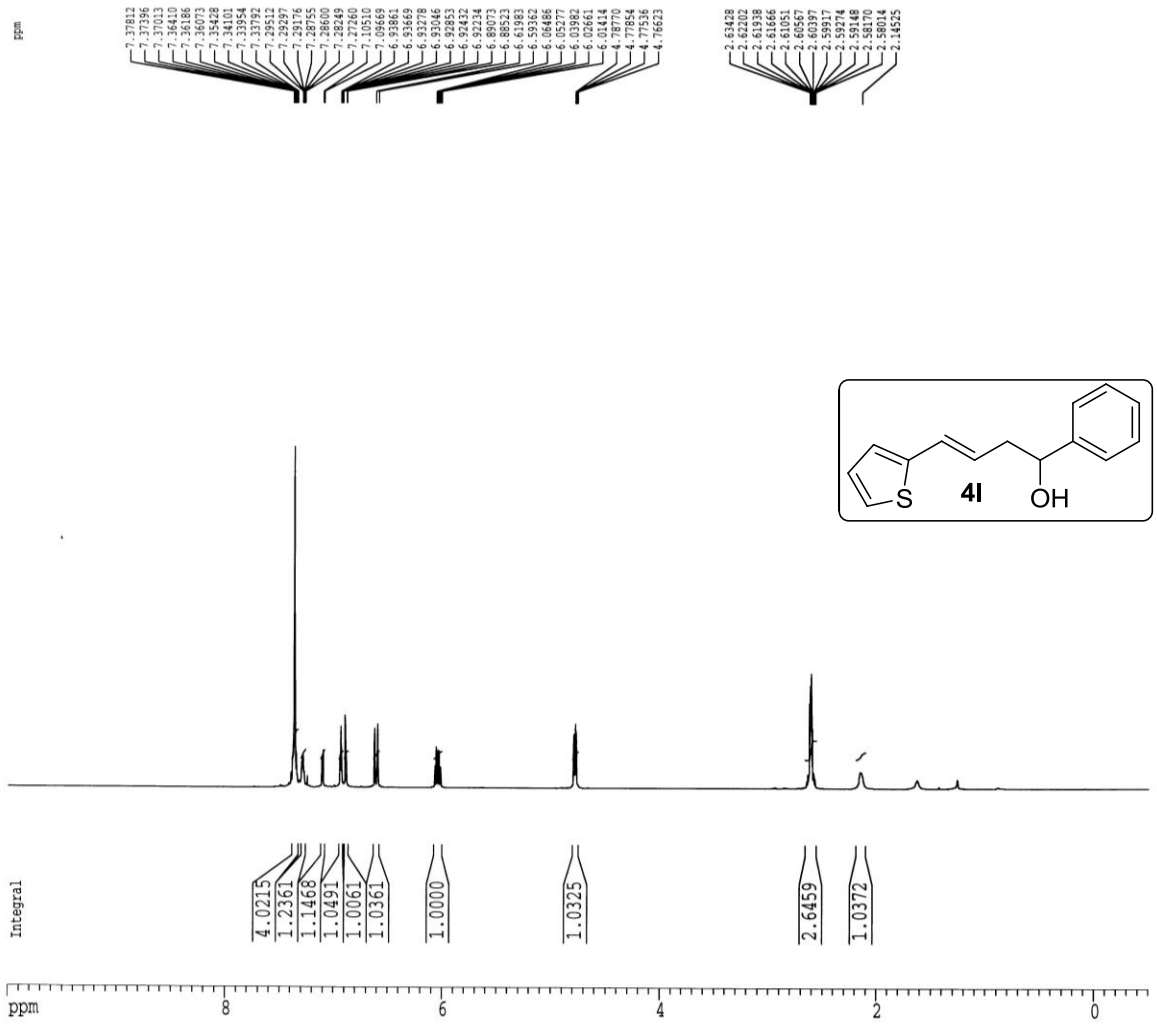

7.479
7.465
7.334
7.332
7.320
7.304
7.292
7.279
7.252
7.248
7.237
7.230
7.228
7.216
6.490
6.464
6.173
6.161
6.149
6.135
6.122
4.765
4.756
4.752
4.744
2.644
2.642
2.630
2.627
2.621
2.618
2.616
2.610
2.607
2.604
2.602
2.591
2.590
2.579
2.192
Current Data Parameters
NAME BM-02-40
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130902
Time 14.37
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 302.1 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 6.00 cm
F1P 5.088 ppm
F1 3046.70 Hz
F2P 2.038 ppm
F2 1220.28 Hz
PPMCM 0.15251 ppm/cm
HZCM 91.32087 Hz/cm
Br
OH
4i
2.03
2.22
2.19
3.17
1.01
1.01
1.00
2.11
1.00
10
9
8
7
6
5
4
3
2
1
ppm

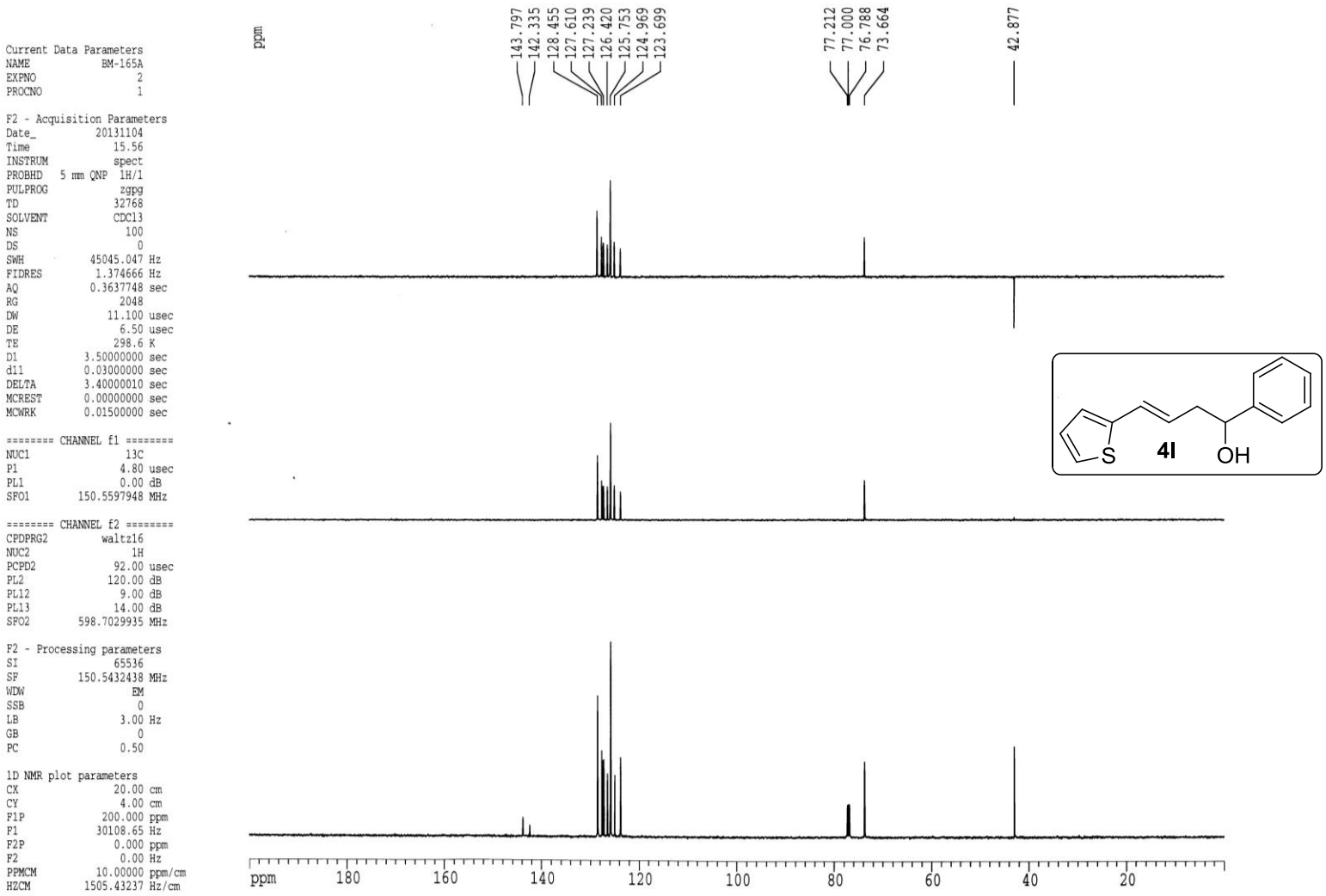

142.84
137.00
133.79
131.50
128.53
127.53
127.43
126.15
125.23
121.30
77.21
77.00
76.79
73.02
42.99
Br
OH
4i
Current Data Parameters
NAME BM-02-40
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130903
Time 5.44
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 303.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683890 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

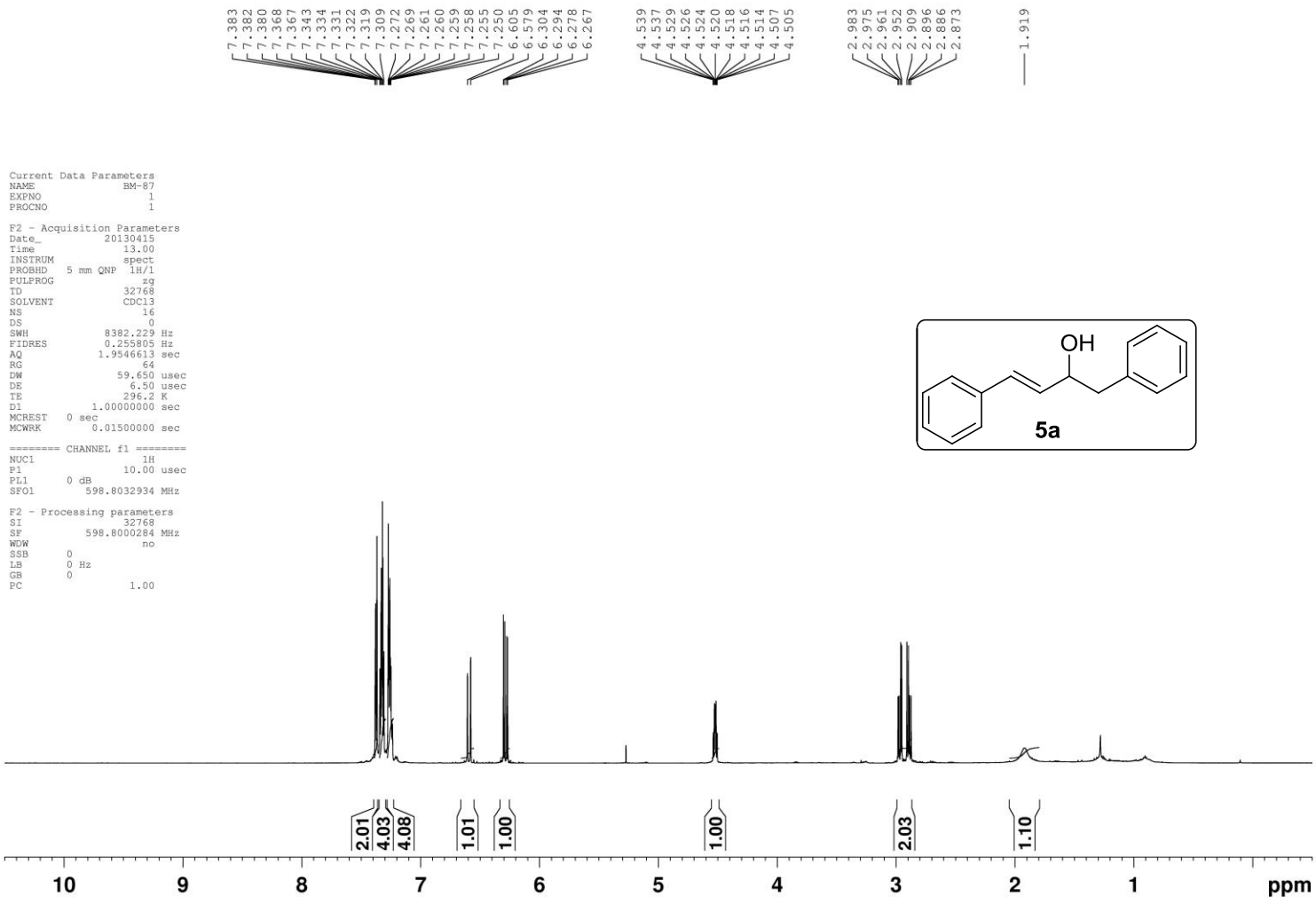

7.375
7.374
7.363
7.360
7.358
7.347
7.346
7.333
7.296
7.287
7.284
7.276
7.272
7.240
6.336
6.333
6.332
6.331
6.328
6.317
6.290
6.160
6.155
6.146
6.133
6.119
6.107
4.786
4.777
4.773
4.765
2.632
2.629
2.620
2.608
2.606
2.595
2.147
Current Data Parameters
NAME BM-175-2
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130620
Time 8.11
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 8.40 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 2.00
O
4k
OH
6.28
1.02
1.00
2.07
1.00
2.16
1.03
10
9
8
7
6
5
4
3
2
1
ppm


152.69
143.82
141.60
128.45
127.59
125.79
124.78
121.80
111.12
106.96
77.21
77.00
76.79
73.68
42.86
Current Data Parameters
NAME BM-175-2
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130620
Time 8.12
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 111
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 300.2 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683862 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
O
4k
OH
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

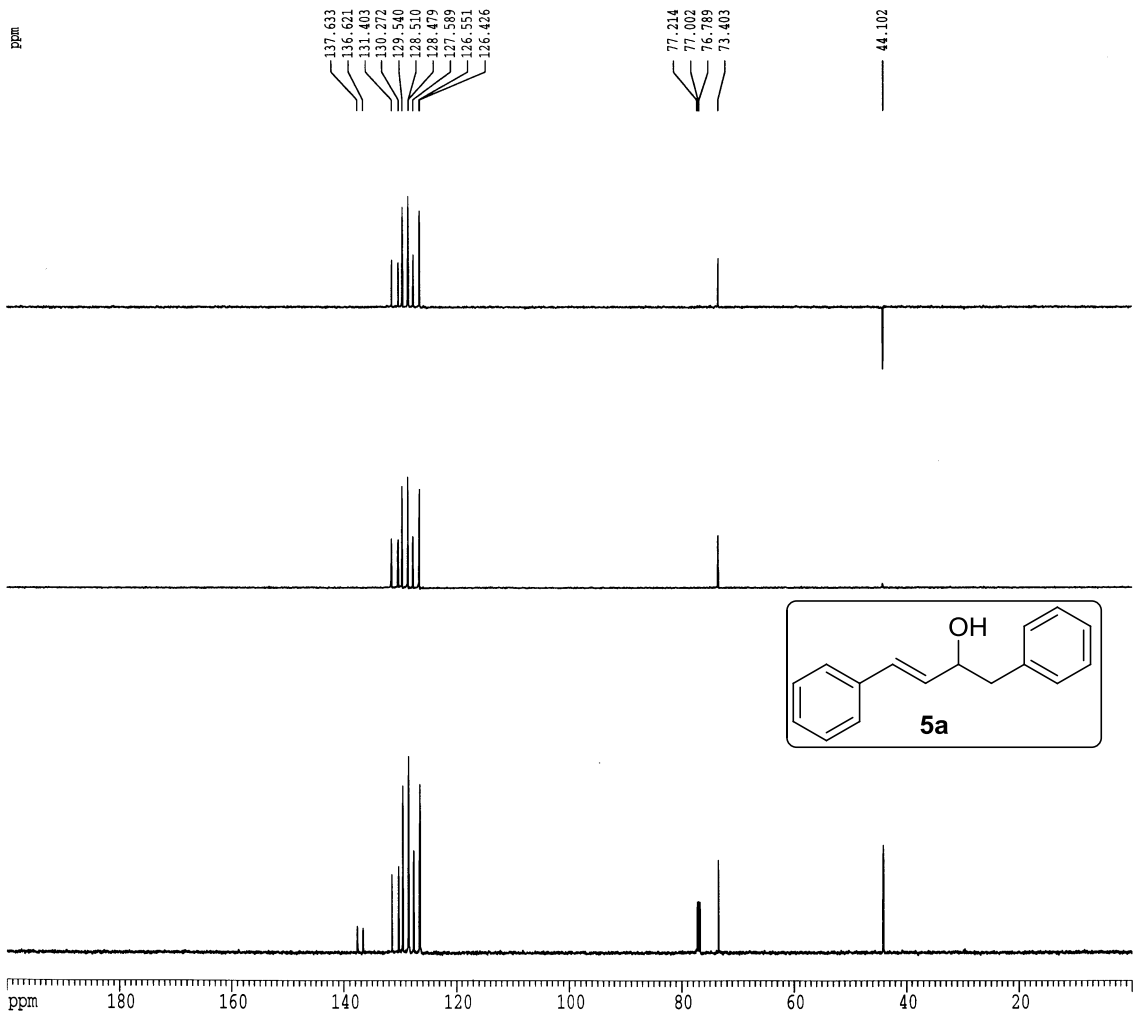
```
Current Data Parameters
NAME              BM-165A
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20131104
Time                15.49
INSTRUM             spect
PROBHD   5 mm QNP  1H/1
PULPROG                zg
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      0
SWH              8389.262 Hz
FIDRES           0.256020 Hz
AQ               1.9530228 sec
RG                    128
DW                 59.600 usec
DE                  6.50 usec
TE                 297.7 K
D1             2.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                  10.00 usec
PL1                  0.00 dB
SFO1         598.7029935 MHz

F2 - Processing parameters
SI                  32768
SF           598.7000261 MHz
WDW                    no
SSB                     0
LB                   0.00 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  20.00 cm
CY                   6.00 cm
F1P                10.000 ppm
F1                 5987.00 Hz
F2P                -0.500 ppm
F2                 -299.35 Hz
PPMCM              0.52500 ppm/cm
HZCM             314.31750 Hz/cm
```

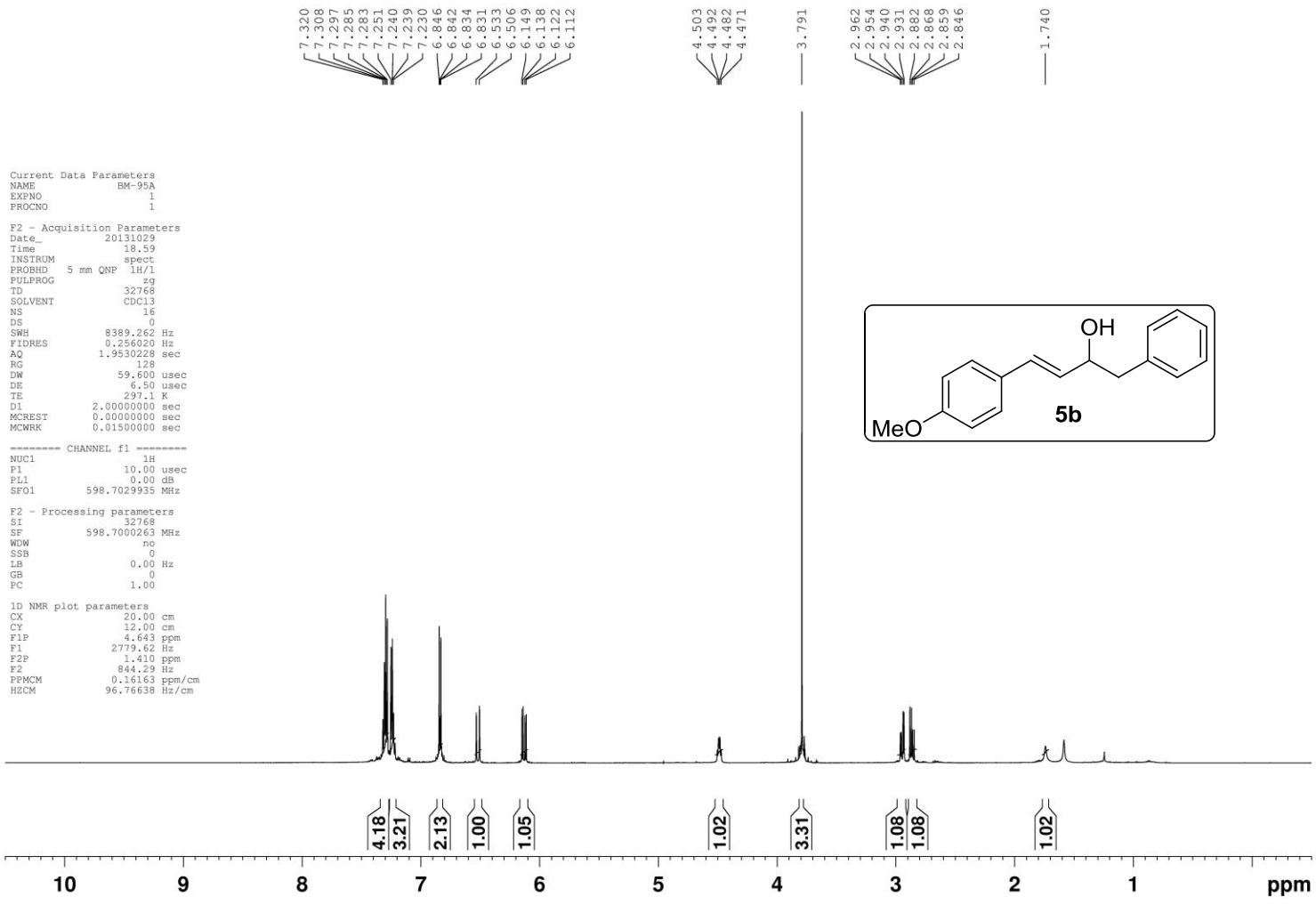


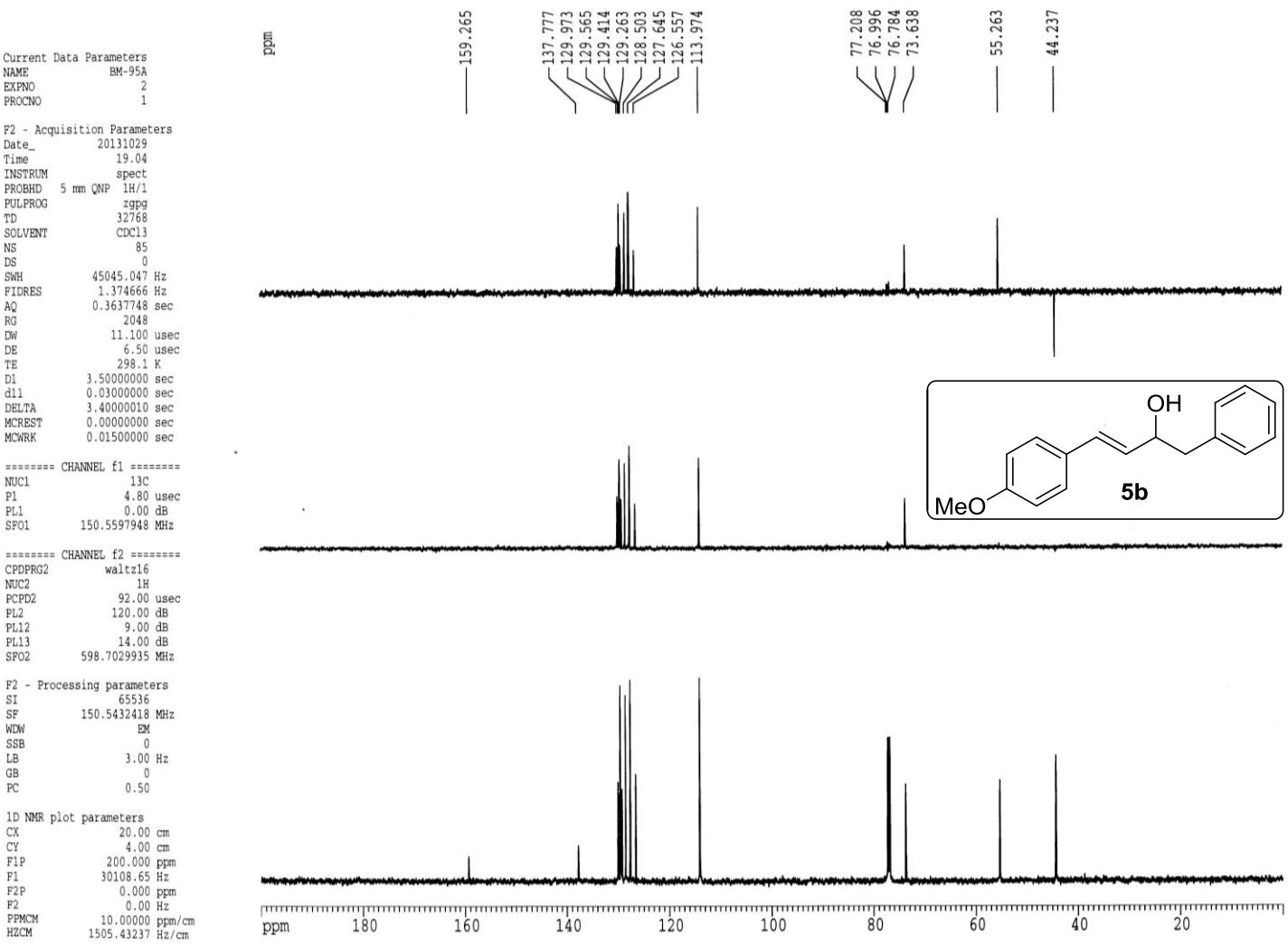

Current Data Parameters
NAME BM-165A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131104
Time 15.56
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 298.6 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432438 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30108.65 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.43237 Hz/cm
ppm
143.797
142.335
128.455
127.610
127.239
126.420
125.753
124.969
123.699
77.212
77.000
76.788
73.664
42.877
S
4l
OH
ppm
180
160
140
120
100
80
60
40
20

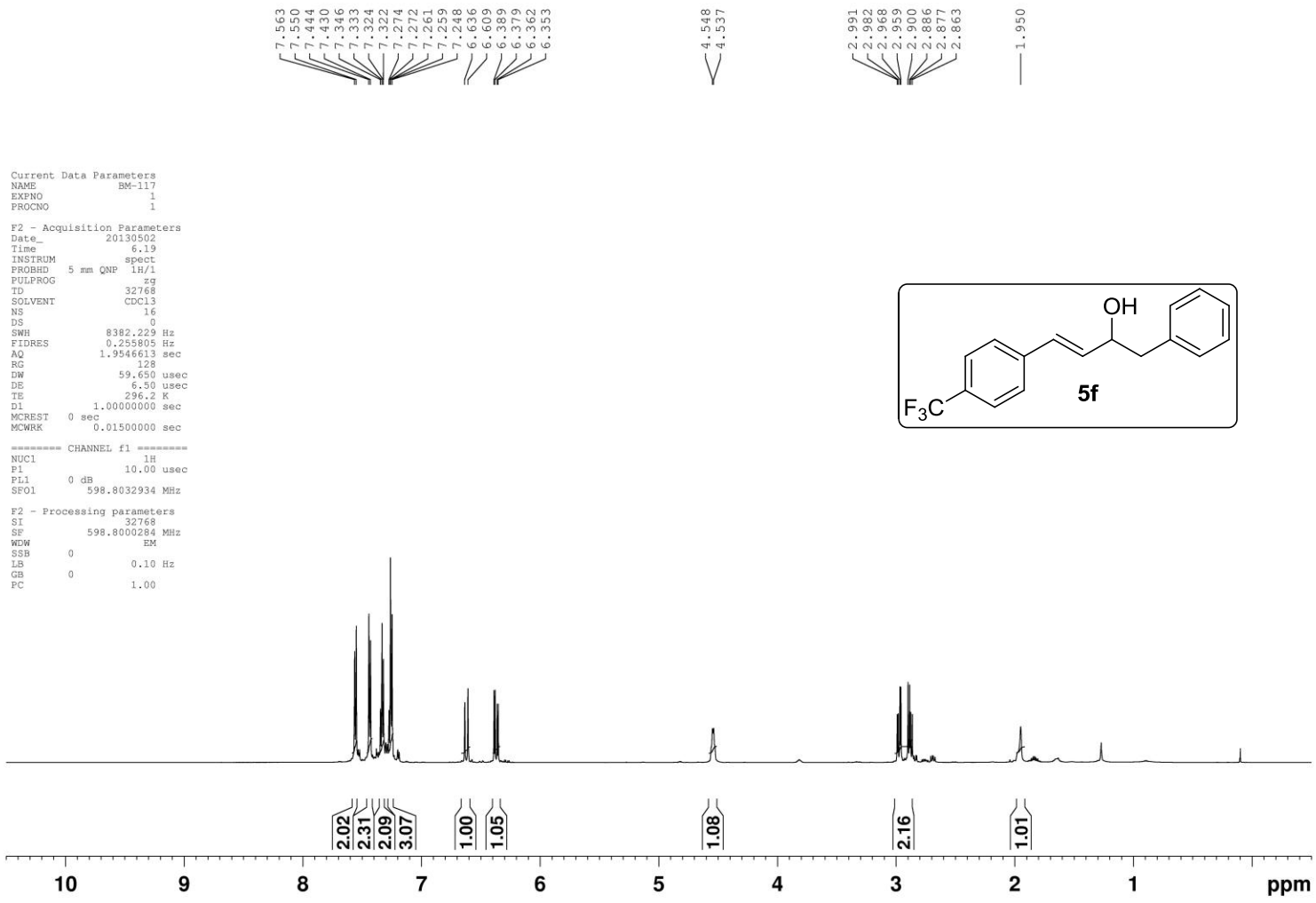

7.383
7.382
7.380
7.368
7.367
7.343
7.334
7.331
7.322
7.319
7.309
7.272
7.269
7.261
7.260
7.259
7.258
7.255
7.250
6.605
6.579
6.304
6.294
6.278
6.267
4.539
4.537
4.529
4.526
4.524
4.520
4.518
4.516
4.514
4.507
4.505
2.983
2.975
2.961
2.952
2.909
2.896
2.886
2.873
1.919
Current Data Parameters
NAME BM-87
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130415
Time 13.00
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 64
DW 59.650 usec
DE 6.50 usec
TE 296.2 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000284 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OH
5a
2.01
4.03
4.08
1.01
1.00
1.00
2.03
1.10
10
9
8
7
6
5
4
3
2
1
ppm

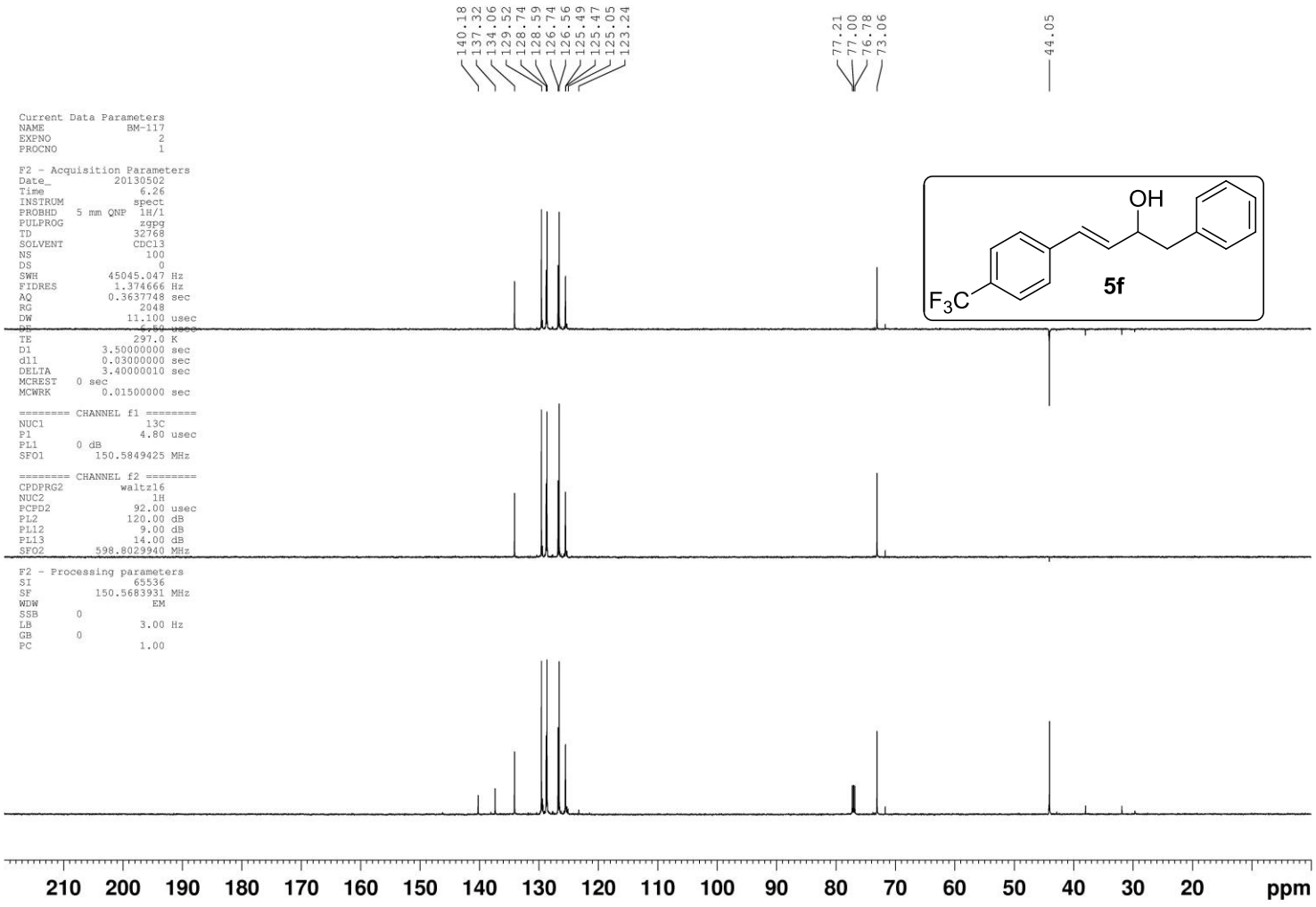
```
Current Data Parameters
NAME                  BM-87
EXPNO                     2
PROCNO                    1

F2 - Acquisition Parameters
Date_              20130414
Time                  22.06
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG                zgpg
TD                    32768
SOLVENT               CDCl3
NS                       19
DS                        0
SWH               45045.047 Hz
FIDRES             1.374666 Hz
AQ                 0.3637748 sec
RG                     2048
DW                   11.100 usec
DE                    6.50 usec
TE                   296.2 K
D1                3.50000000 sec
d11               0.03000000 sec
DELTA             3.40000010 sec
MCREST            0.00000000 sec
MCWRK             0.01500000 sec

======== CHANNEL f1 ========
NUC1                     13C
P1                      4.80 usec
PL1                     0.00 dB
SFO1             150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 92.00 usec
PL2                  120.00 dB
PL12                   9.00 dB
PL13                  14.00 dB
SFO2             598.8029940 MHz

F2 - Processing parameters
SI                    65536
SF               150.5683993 MHz
WDW                      EM
SSB                       0
LB                     3.00 Hz
GB                        0
PC                     1.00

1D NMR plot parameters
CX                    20.00 cm
CY                     3.50 cm
F1P                  200.000 ppm
F1                 30113.68 Hz
F2P                    0.000 ppm
F2                     0.00 Hz
PPMCM                10.00000 ppm/cm
HZCM               1505.68408 Hz/cm
```

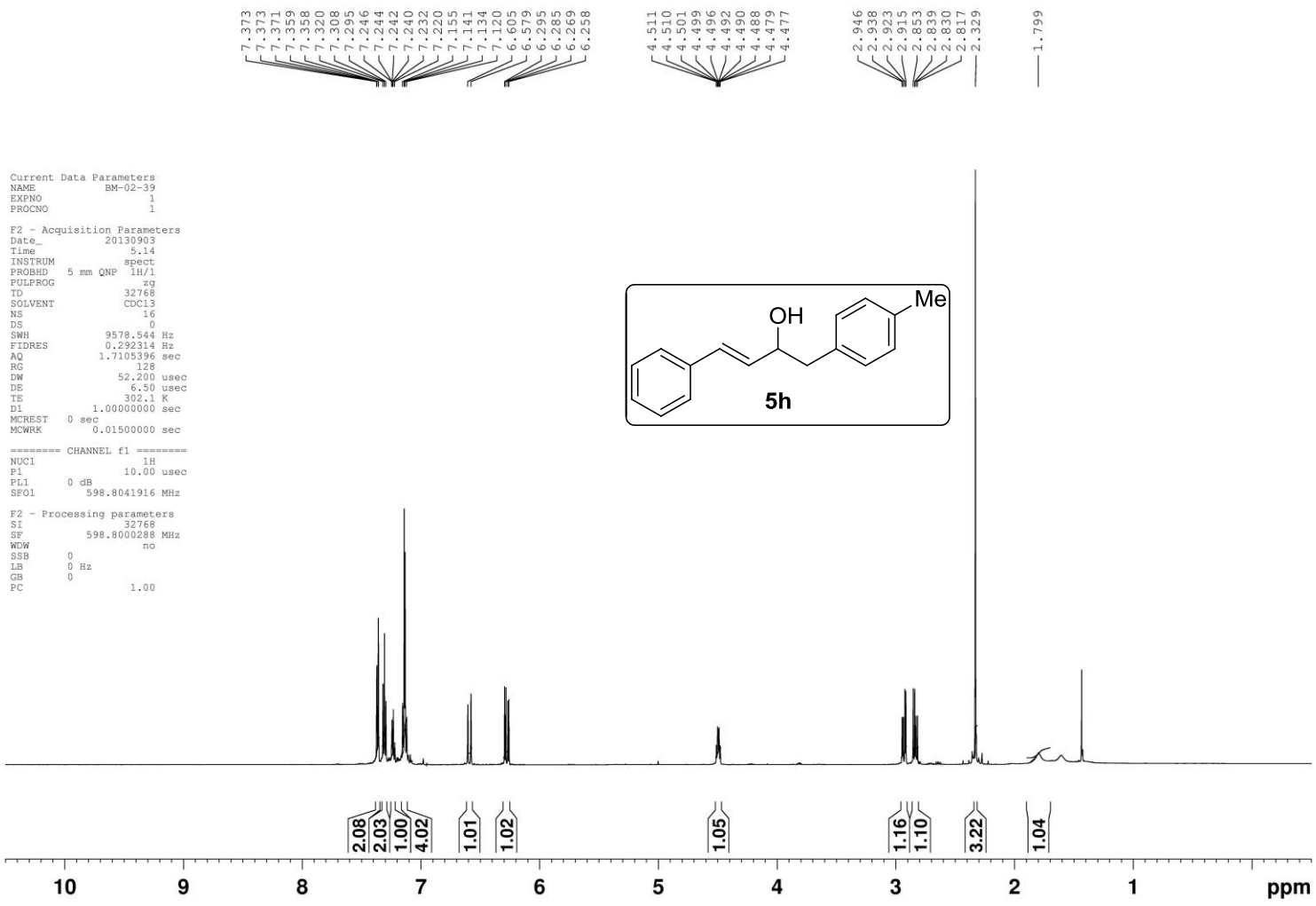



7.320
7.308
7.297
7.285
7.283
7.251
7.240
7.239
7.230
6.846
6.842
6.834
6.831
6.533
6.506
6.149
6.138
6.122
6.112
4.503
4.492
4.482
4.471
3.791
2.962
2.954
2.940
2.931
2.882
2.868
2.859
2.846
1.740
Current Data Parameters
NAME BM-95A
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131029
Time 18.59
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8389.262 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 128
DW 59.600 usec
DE 6.50 usec
TE 297.1 K
D1 2.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
-------- CHANNEL f1 --------
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 598.7029935 MHz
F2 - Processing parameters
SI 32768
SF 598.7000263 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
CY 12.00 cm
F1P 4.643 ppm
F1 2779.62 Hz
F2P 1.410 ppm
F2 844.29 Hz
PPMCM 0.16163 ppm/cm
HZCM 96.76638 Hz/cm
OH
MeO
5b
4.18
3.21
2.13
1.00
1.05
1.02
3.31
1.08
1.08
1.02
10
9
8
7
6
5
4
3
2
1
ppm

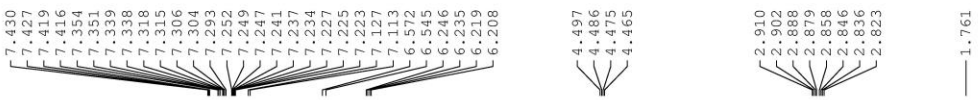

Current Data Parameters
NAME BM-95A
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20131029
Time 19.04
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 85
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 298.1 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0.00 dB
SFO1 150.5597948 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.7029935 MHz
F2 - Processing parameters
SI 65536
SF 150.5432418 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
1D NMR plot parameters
CX 20.00 cm
CY 4.00 cm
F1P 200.000 ppm
F1 30108.65 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 10.00000 ppm/cm
HZCM 1505.43237 Hz/cm
ppm
159.265
137.777
129.973
129.565
129.414
129.263
128.503
127.645
126.557
113.974
77.208
76.996
76.784
73.638
55.263
44.237
OH
MeO
5b
ppm
180
160
140
120
100
80
60
40
20


7.563
7.550
7.444
7.430
7.346
7.333
7.324
7.322
7.274
7.272
7.261
7.259
7.248
6.636
6.609
6.389
6.379
6.362
6.353
4.548
4.537
2.991
2.982
2.968
2.959
2.900
2.886
2.877
2.863
1.950
Current Data Parameters
NAME BM-117
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130502
Time 6.19
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 296.2 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8032934 MHz
F2 - Processing parameters
SI 32768
SF 598.8000284 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00
OH
F3C
5f
2.02
2.31
2.09
3.07
1.00
1.05
1.08
2.16
1.01
10
9
8
7
6
5
4
3
2
1
ppm

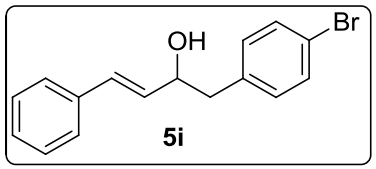

140.18
137.32
134.06
129.52
128.74
128.59
126.74
126.56
125.49
125.47
125.05
123.24
77.21
77.00
76.78
73.06
44.05
OH
F3C
5f
Current Data Parameters
NAME BM-117
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130502
Time 6.26
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 297.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683931 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

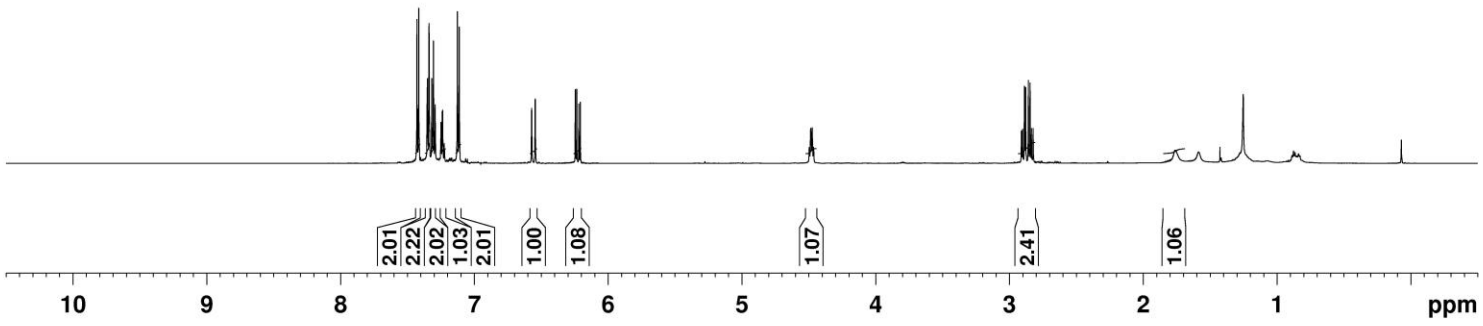

7.373
7.373
7.371
7.359
7.358
7.320
7.308
7.295
7.246
7.244
7.242
7.240
7.232
7.220
7.155
7.141
7.134
7.120
6.605
6.579
6.295
6.285
6.269
6.258
4.511
4.510
4.501
4.499
4.496
4.492
4.490
4.488
4.479
4.477
2.946
2.938
2.923
2.915
2.853
2.839
2.830
2.817
2.329
1.799
Current Data Parameters
NAME BM-02-39
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130903
Time 5.14
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 9578.544 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 128
DW 52.200 usec
DE 6.50 usec
TE 302.1 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8041916 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OH
Me
5h
2.08
2.03
1.00
4.02
1.01
1.02
1.05
1.16
1.10
3.22
1.04
10
9
8
7
6
5
4
3
2
1
ppm

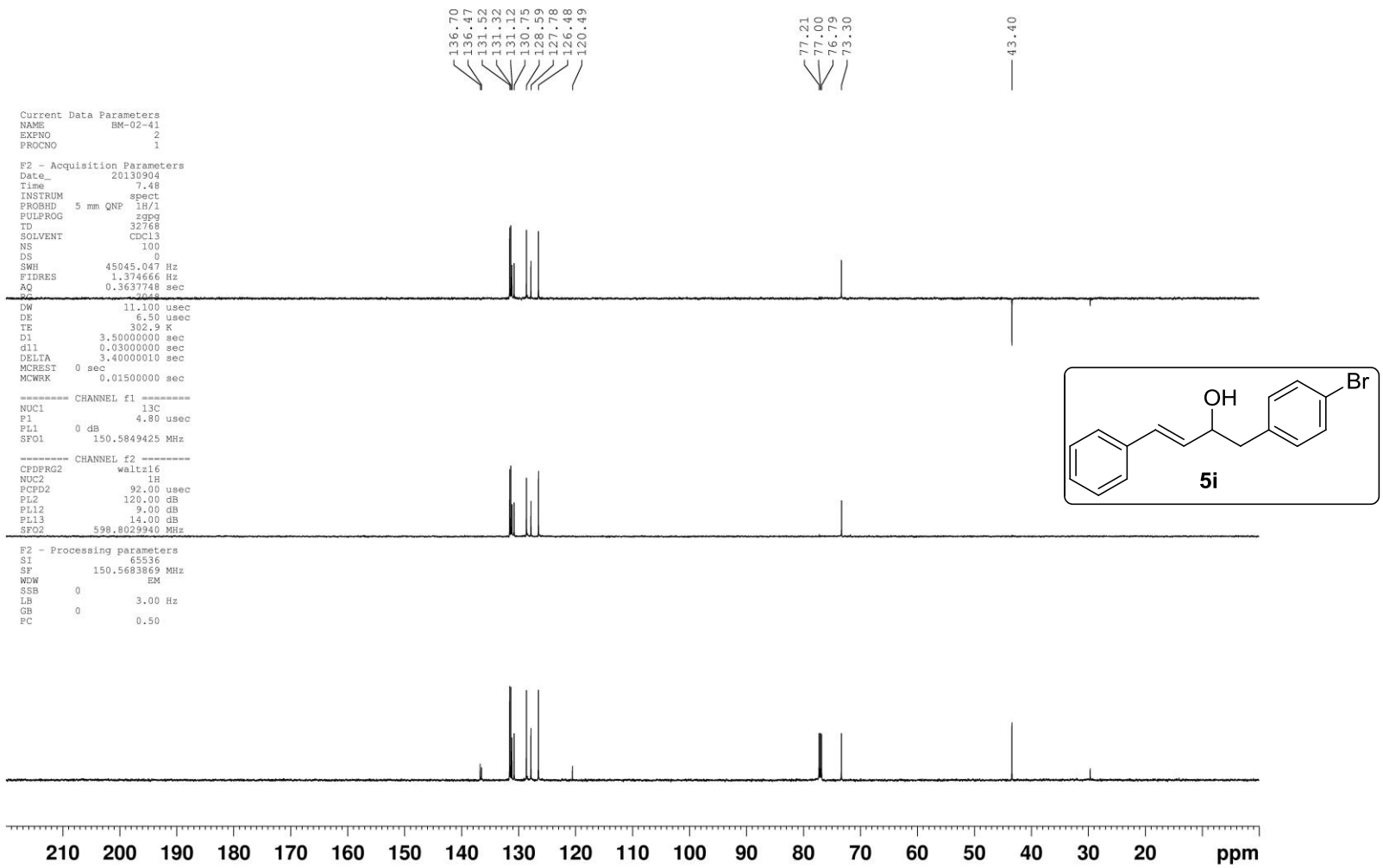

136.74
136.14
134.45
131.57
130.25
129.43
129.24
128.52
127.58
126.46
77.20
76.99
76.78
73.45
43.74
21.00
Current Data Parameters
NAME BM-02-39
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130903
Time 5.21
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 303.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683890 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
OH
Me
5h
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

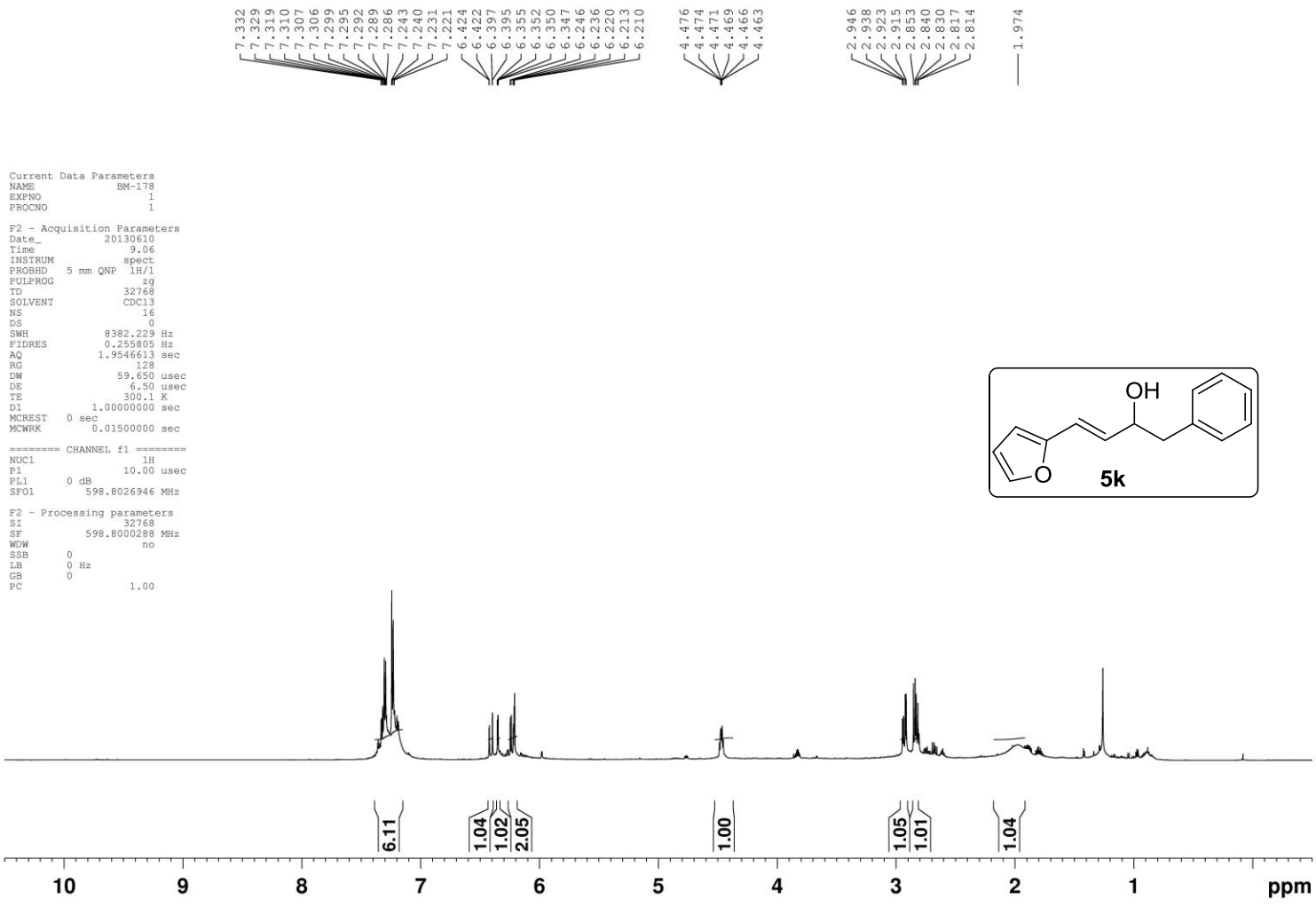


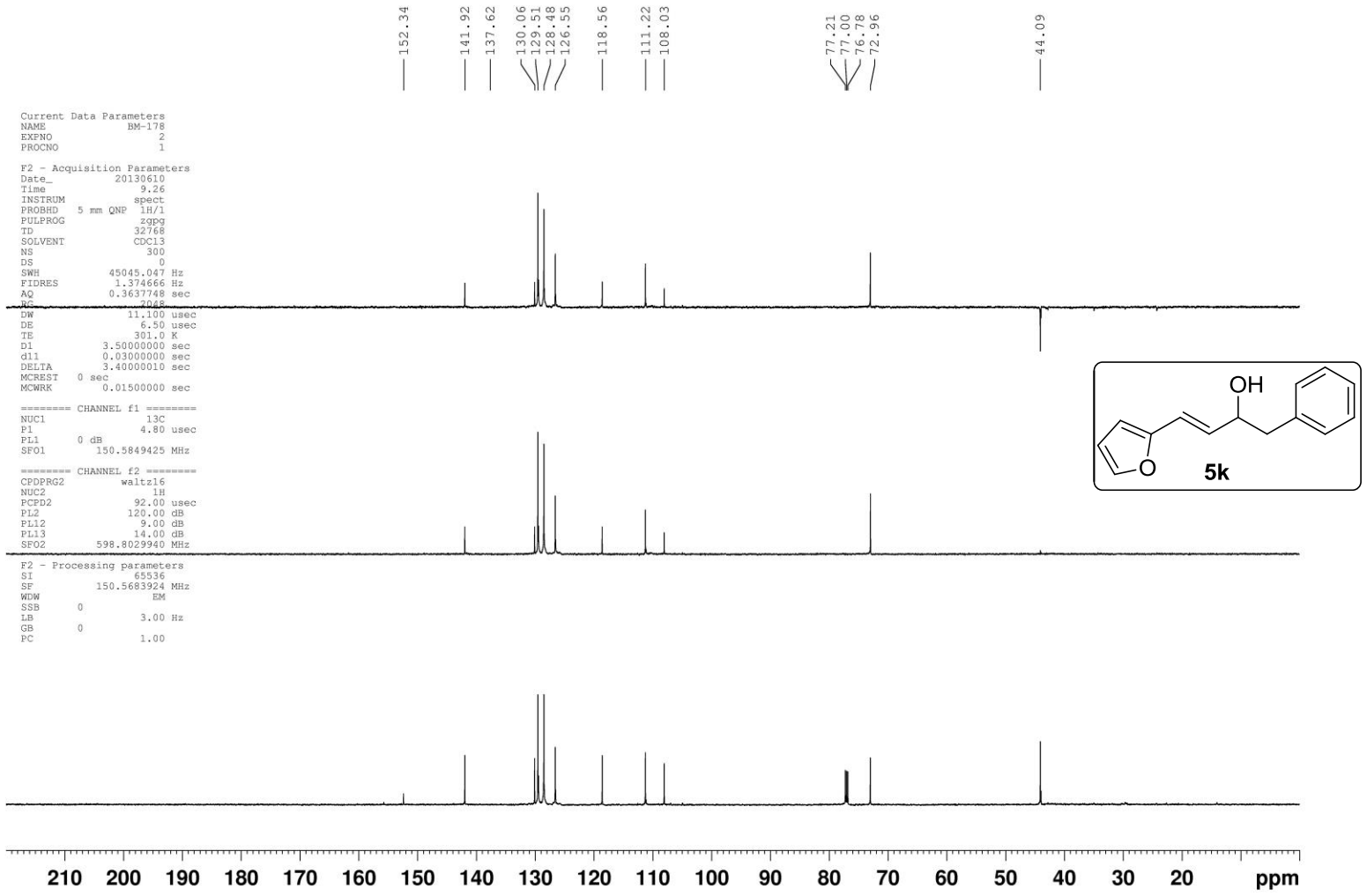

```
Current Data Parameters
NAME                  BM-02-41
EXPNO                        1
PROCNO                       1

F2 - Acquisition Parameters
Date_              20130904
Time                    7.41
INSTRUM                spect
PROBHD    5 mm QNP  1H/1
PULPROG                   zg
TD                     32768
SOLVENT                CDC13
NS                        16
DS                         0
SWH                 9578.544 Hz
FIDRES              0.292314 Hz
AQ                  1.7105396 sec
RG                       128
DW                    52.200 usec
DE                     6.50 usec
TE                     302.1 K
D1                 1.00000000 sec
MCREST    0 sec
MCWRK              0.01500000 sec

======== CHANNEL f1 ========
NUC1                      1H
P1                     10.00 usec
PL1       0 dB
SFO1             598.8041916 MHz

F2 - Processing parameters
SI                     32768
SF               598.8000288 MHz
WDW                       no
SSB       0
LB        0 Hz
GB        0
PC                      1.00
```

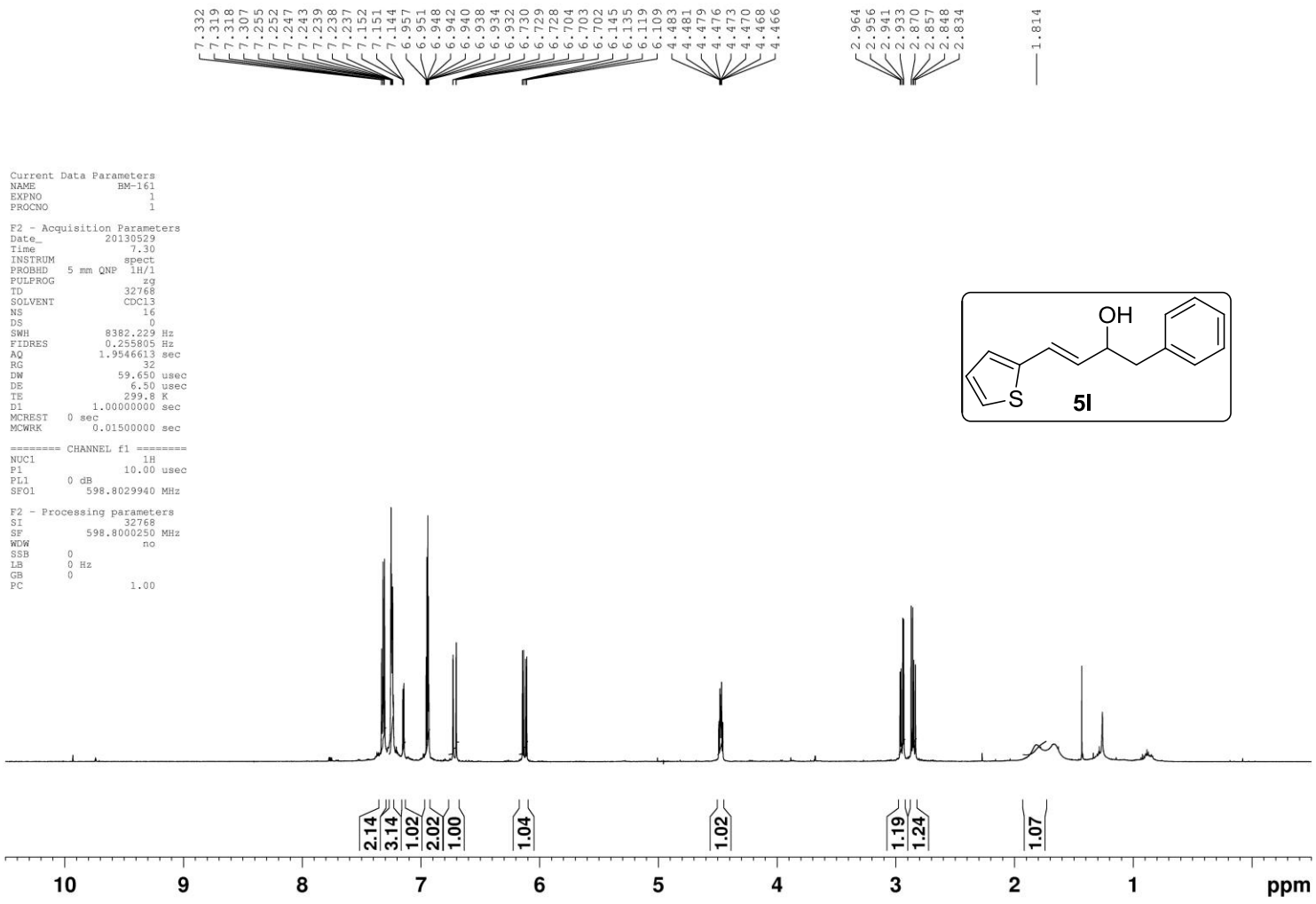





136.70
136.47
131.52
131.32
131.12
130.75
128.59
127.78
126.48
120.49
77.21
77.00
76.79
73.30
43.40
Current Data Parameters
NAME BM-02-41
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130904
Time 7.48
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 1.2048
DW 11.100 usec
DE 6.50 usec
TE 302.9 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683869 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 0.50
OH
Br
5i
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.332
7.329
7.319
7.310
7.307
7.306
7.299
7.295
7.292
7.289
7.286
7.243
7.240
7.231
7.221
6.424
6.422
6.397
6.395
6.355
6.352
6.350
6.347
6.246
6.236
6.220
6.213
6.210
4.476
4.474
4.471
4.469
4.466
4.463
2.946
2.938
2.923
2.915
2.853
2.840
2.830
2.817
2.814
1.974
Current Data Parameters
NAME BM-178
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130610
Time 9.06
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 128
DW 59.650 usec
DE 6.50 usec
TE 300.1 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8026946 MHz
F2 - Processing parameters
SI 32768
SF 598.8000288 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OH
O
5k
6.11
1.04
1.02
2.05
1.00
1.05
1.01
1.04
10
9
8
7
6
5
4
3
2
1
ppm


152.34
141.92
137.62
130.06
129.51
128.48
126.55
118.56
111.22
108.03
77.21
77.00
76.78
72.96
44.09
Current Data Parameters
NAME BM-178
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130610
Time 9.26
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg
TD 32768
SOLVENT CDC13
NS 300
DS 0
SWH 45045.047 Hz
FIDRES 1.374666 Hz
AQ 0.3637748 sec
RG 2048
DW 11.100 usec
DE 6.50 usec
TE 301.0 K
D1 3.50000000 sec
d11 0.03000000 sec
DELTA 3.40000010 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 4.80 usec
PL1 0 dB
SFO1 150.5849425 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 92.00 usec
PL2 120.00 dB
PL12 9.00 dB
PL13 14.00 dB
SFO2 598.8029940 MHz
F2 - Processing parameters
SI 65536
SF 150.5683924 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
OH
O
5k
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm


7.332
7.319
7.318
7.307
7.255
7.252
7.247
7.243
7.239
7.238
7.237
7.152
7.151
7.144
6.957
6.951
6.948
6.942
6.940
6.938
6.934
6.932
6.730
6.729
6.728
6.704
6.703
6.702
6.145
6.135
6.119
6.109
4.483
4.481
4.479
4.476
4.473
4.470
4.468
4.466
2.964
2.956
2.941
2.933
2.870
2.857
2.848
2.834
1.814
Current Data Parameters
NAME BM-161
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130529
Time 7.30
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg
TD 32768
SOLVENT CDC13
NS 16
DS 0
SWH 8382.229 Hz
FIDRES 0.255805 Hz
AQ 1.9546613 sec
RG 32
DW 59.650 usec
DE 6.50 usec
TE 299.8 K
D1 1.00000000 sec
MCREST 0 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0 dB
SFO1 598.8029940 MHz
F2 - Processing parameters
SI 32768
SF 598.8000250 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OH
S
5l
2.14
3.14
1.02
2.02
1.00
1.04
1.02
1.19
1.24
1.07
10
9
8
7
6
5
4
3
2
1
ppm

```
Current Data Parameters
NAME                  BM-161
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20130528
Time                  16.37
INSTRUM               spect
PROBHD   5 mm QNP  1H/1
PULPROG               zgpg
TD                    32768
SOLVENT               CDCl3
NS                      100
DS                        0
SWH               45045.047 Hz
FIDRES             1.374666 Hz
AQ                0.3637748 sec
RG                     2048
DW                   11.100 usec
DE                    6.50 usec
TE                   300.4 K
D1                3.50000000 sec
d11               0.03000000 sec
DELTA             3.40000010 sec
MCREST            0.00000000 sec
MCWRK             0.01500000 sec

======== CHANNEL f1 ========
NUC1                     13C
P1                    4.80 usec
PL1                   0.00 dB
SFO1            150.5849425 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                92.00 usec
PL2                 120.00 dB
PL12                  9.00 dB
PL13                 14.00 dB
SFO2            598.8029940 MHz

F2 - Processing parameters
SI                    65536
SF              150.5683890 MHz
WDW                      EM
SSB                       0
LB                    3.00 Hz
GB                        0
PC                    1.00

1D NMR plot parameters
CX                   20.00 cm
CY                    4.50 cm
F1P                 200.000 ppm
F1                30113.68 Hz
F2P                   0.000 ppm
F2                    0.00 Hz
PPMCM             10.00000 ppm/cm
HZCM            1505.68384 Hz/cm
```