Supporting Information

Intramolecular Carbocupration of *N*-Aryl-ynamides: a Modular Indole Synthesis

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General Information.

All reactions were carried out in oven-dried glassware under an argon atmosphere employing standard techniques in handling air-sensitive materials.

All solvents were reagent grade. THF, diethyl ether and toluene were freshly distilled from sodium/benzophenone under argon and degassed immediately prior to use. *N*,*N*,*N'*,*N'*-tetramethylethylenediamine was distilled over calcium hydride.

Finely powdered potassium phosphate tribasic (Alfa Aesar) was used for copper-mediated coupling reactions. CuCN·2LiCl was freshly prepared according to the procedure of Knochel and co-workers.[S1] All other reagents were used as supplied.

Reactions were magnetically stirred and monitored by thin layer chromatography using Merck-Kiesegel $60F_{254}$ plates. Flash chromatography was performed with silica gel 60 (particle size 35-70 μm) supplied by SDS. Yields refer to chromatographically and spectroscopically pure compounds, unless otherwise noted.

Proton NMR spectra were recorded using an internal deuterium lock at ambient temperature on a Bruker 300 MHz spectrometer. Internal reference of δ_H 7.26 was used for $CDCl_3$. Data are presented as follows: chemical shift (in ppm on the δ scale relative to $\delta_{TMS} = 0$), multiplicity (s = singlet, d = doublet, t = triplet, q = quadruplet, quint. = quintuplet, sext. = sextuplet, m = multiplet, br. = broad, app. = apparent), coupling constant (*J*/Hz) and integration. Resonances that are either partially or fully obscured are denoted obscured (obs.). Carbon-13 NMR spectra were recorded at 75 MHz. Internal reference of δ_C 77.16 was used for $CDCl_3$. Fluorine-19 NMR spectra were recorded at 188 MHz. Internal reference of δ_F 0.00 was used for $CFCl_3$.

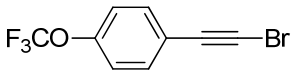
Infrared spectra were recorded on a Nicolet iS 10 (SMART iTR diamond ATR) spectrophotometer. Mass spectra were obtained on a Waters XevoQTof spectrometer.

[S1] Knochel, P.; Yeh, M. C. P.; Berk, S. C.; Talbert, J. *J. Org. Chem.* **1988**, *53*, 2390.

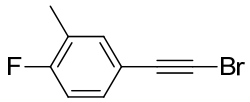
Experimental Procedures and Characterization Data: Unreported Bromoalkynes and Starting Ynamides

General procedure for the synthesis of bromoalkynes:[S2]

To a solution of the alkyne (10.0 mmol) in acetone (50 mL) was added *N*-bromosuccinimide (2.0 g, 11.0 mmol) and silver(I) nitrate (170 mg, 1.0 mmol) at room temperature. After 2-3 hours, the reaction mixture was concentrated under reduced pressure and passed through a plug of silica gel using pentane as the eluent. The filtrate was concentrated under reduced pressure to give the corresponding bromoalkyne which was used without further purification in the next step.



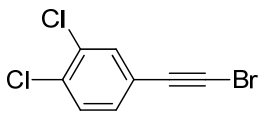
1-(2-Bromoethynyl)-4-(trifluoromethoxy)benzene. Yield: 76%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.49 (d, *J* = 8.8 Hz, 2H), 7.18 (d, *J* = 8.2 Hz, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.2, 133.4, 121.5, 120.8, 120.3 (q, $J_{C\text{-}F}$ = 256.4 Hz), 78.7, 51.0; ^{19}F NMR (188 MHz, $CDCl_3$): δ -57.92 (s); IR (ATR) ν_{max} 2926, 1718, 1606, 1507, 1426, 1310, 1212, 1169, 1018, 925, 854 cm^{-1}; ESIHRMS *m/z* calcd for $C_9H_5OF_3Br$ $[M+H]^+$ 264.9476, found 264.9477.



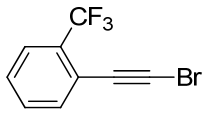
4-(2-Bromoethynyl)-1-fluoro-2-methylbenzene. Yield: 80%. Colorless solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.20-7.12 (m, 2H), 6.84 (t, *J* = 8.9 Hz, 1H), 2.15 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ

[S2] Nie, X.; Wang, G. *J. Org. Chem.* **2006**, *71*, 4734.

161.0 (d, J_{C-F} = 247.3 Hz), 135.2 (d, J_{C-F} = 5.6 Hz), 131.2 (d, J_{C-F} = 8.4 Hz), 125.3 (d, J_{C-F} = 18.0 Hz), 118.3, 115.2 (d, J_{C-F} = 23.1 Hz), 79.3, 49.0, 14.3; ^{19}F NMR (188 MHz, $CDCl_3$): δ -114.30 (s); IR (ATR) ν_{max} 2927, 1718, 1589, 1507, 1441, 1290, 1251, 1120, 823, 758 cm^{-1}; ESIHRMS *m/z* calcd for C_9H_7FBr $[M+H]^+$ 212.9715, found 212.9715.



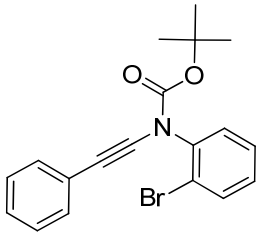
4-(2-Bromoethynyl)-1,2-dichlorobenzene. Yield: 79%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.49 (d, *J* = 1.9 Hz, 1H), 7.36 (d, *J* = 8.3 Hz, 1H), 7.24 (dd, *J* = 8.3 and 1.9 Hz, 1H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 133.6, 133.3, 132.6, 131.1, 130.4, 122.6, 78.0, 52.8; IR (ATR) ν_{max} 2921, 1543, 1471, 1457, 1370, 1265, 1223, 1125, 1033, 905, 881, 811 cm^{-1}; ESIHRMS *m/z* calcd for $C_8H_4BrCl_2$ $[M+H]^+$ 248.8873, found 248.8871.



1-(2-Bromoethynyl)-2-(trifluoromethyl)benzene. Yield: 91%. Colorless solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.64 (d, *J* = 8.5 Hz, 1H), 7.61 (d, *J* = 8.2 Hz, 1H), 7.52-7.44 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 134.5, 132.1 (q, J_{C-F} = 30.5 Hz), 131.5, 128.8, 125.8 (q, J_{C-F} = 5.0 Hz), 123.4 (q, J_{C-F} = 271.7 Hz), 120.8, 76.1, 55.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -62.38 (s); IR (ATR) ν_{max} 2929, 1780, 1723, 1603, 1449, 1316, 1267, 1176, 1123, 1036, 766 cm^{-1}; ESIHRMS *m/z* calcd for $C_9H_5F_3Br$ $[M+H]^+$ 248.9527, found 248.9527.

General procedure for the synthesis of *N*-Aryl-ynamides:[S3]

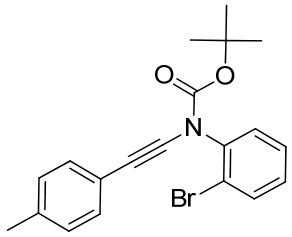
To a solution of a bromoalkyne (10.0 mmol) in dry toluene (50 mL), were sequentially added the *N*-Boc-aniline derivative (11.0 mmol), K_3PO_4 (5.1 g, 24.0 mmol), $CuSO_4{\cdot}5H_2O$ (1.0 g, 4.0 mmol) and 1,10-phenanthroline (1.45 g, 8.0 mmol). The reaction mixture was heated to reflux for 24 hours, cooled to room temperature, filtered through a plug of silica gel (washed with EtOAc), and concentrated. The crude residue was purified by flash column chromatography over silica gel (petroleum ether).



5a

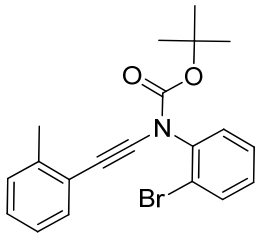
***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5a.** Yield: 60%. Brown solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.57 (d, *J* = 7.8 Hz, 1H), 7.40 (d, *J* = 7.6 Hz, 1H), 7.31-7.29 (m, 3H), 7.21-7.12 (m, 4H), 1.45 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.6, 139.4 (br.), 133.6, 131.1, 129.8, 129.3, 128.5, 128.2, 127.5, 123.3, 122.6, 83.6, 83.0, 69.8 (br.), 28.0; IR (ATR) ν_{max} 2984, 2972, 2251, 1737, 1475, 1368, 1310, 1156, 754, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{18}NO_2NaBr$ $[M+Na]^+$ 394.0419, found 394.0418.

[S3] (a) Zhang, Y.; Hsung, R. P.; Tracey, M. R.; Kurtz, K. C. M.; Vera, E. L. *Org. Lett.* **2004**, *6*, 1151. (b) Istrate, F. M.; Buzas, A. K.; Jurberg, I. D.; Odabachian, Y.; Gagosz, F. *Org. Lett*. **2008**, *10*, 925.



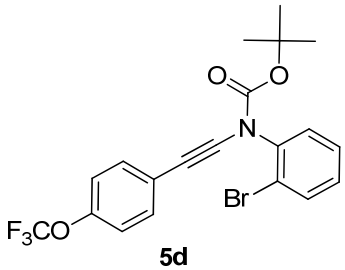
5b

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-4-tolylethynylamine 5b.** Yield: 56%. Yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.68 (dd, *J* = 8.0 and 1.0 Hz, 1H), 7.38 (d, *J* = 7.8 Hz, 1H), 7.27 (td, *J* = 7.2 and 0.8 Hz, 1H), 7.19 (d, *J* = 7.9 Hz, 2H), 7.11 (td, *J* = 7.9 and 1.5 Hz, 1H), 6.96 (d, *J* = 7.9 Hz, 2H), 2.20 (s, 3H), 1.42 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.7, 138.8 (br.), 137.5, 133.5, 131.2, 129.8, 129.3, 129.0, 128.5, 122.6, 120.1, 83.5, 82.2, 69.7 (br.), 28.0, 21.5; IR (ATR) ν_{max} 2993, 2966, 2920, 2247, 1750, 1367, 1315, 1262, 1155, 818, 761, 736 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{20}NO_2BrNa$ $[M+Na]^+$ 408.0575, found 408.0570.



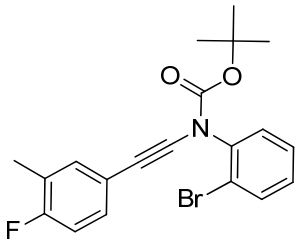
5c

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-2-tolylethynylamine 5c.** Yield: 61%. Brown solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.69 (dd, *J* = 8.0 and 1.3 Hz, 1H), 7.52 (dd, *J* = 8.1 and 1.4 Hz, 1H), 7.40 (td, *J* = 7.6 and 1.3 Hz, 1H), 7.34 (d, *J* = 7.3 Hz, 1H), 7.28-7.25 (m, 1H), 7.18-7.09 (m, 3H), 2.31 (s, 3H), 1.45 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.6, 139.4 (br.), 133.6, 132.6, 131.0, 129.8, 129.3, 128.5, 127.4, 125.4, 123.1, 122.6, 119.4, 86.9, 83.6, 68.9 (br.), 28.0, 20.8; IR (ATR) ν_{max} 2979, 2252, 1745, 1474, 1368, 1305, 1255, 1155, 756 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{20}NO_2BrNa$ $[M+Na]^+$ 408.0575, found 408.0579.



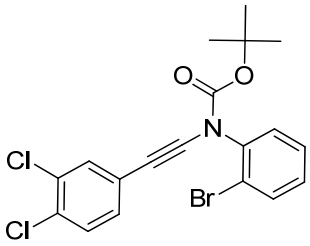
5d

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(4-trifluoromethoxyphenyl)ethynylamine 5d.** Yield: 76%. Yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.59 (dd, *J* = 8.7 and 1.4 Hz, 1H), 7.40 (dd, *J* = 8.2 and 1.2 Hz, 1H), 7.34-7.28 (m, 3H), 7.17 (td, *J* = 7.9 and 1.2 Hz, 1H), 7.04 (d, *J* = 8.9 Hz, 2H), 1.44 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.4, 148.3, 138.4, 133.6, 132.6, 129.9, 129.3, 128.5, 122.6, 122.2, 120.8, 120.4 (q, J_{C-F} = 252.8 Hz), 83.8, 83.7, 68.6, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -57.85 (s); IR (ATR) ν_{max} 2981, 2257, 1739, 1509, 1476, 1370, 1272, 1156, 861, 757 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{17}NO_3F_3BrNa$ $[M+Na]^+$ 478.0242, found 478.0246.



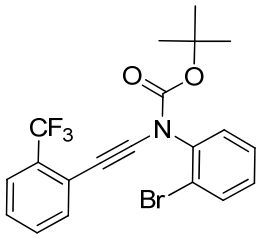
5e

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(4-fluoro-3-methylphenyl)ethynylamine 5e.** Yield: 51%. Dark yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.54 (dd, *J* = 8.0 and 1.0 Hz, 1H), 7.37 (dd, *J* = 7.8 and 1.0 Hz, 1H), 7.25 (td, *J* = 8.0 and 0.9 Hz, 1H), 7.13-7.07 (m, 3H), 6.78 (t, *J* = 9.1 Hz, 1H), 2.10 (d, *J* = 1.4 Hz, 3H), 1.41 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 159.4 (d, J_{C-F} = 245.6 Hz), 151.2, 137.3, 133.3, 132.1, 129.1, 128.4, 127.9, 127.1, 123.4 (d, J_{C-F} = 18.6 Hz), 121.2, 117.4 (d, J_{C-F} = 3.3 Hz), 113.6 (d, J_{C-F} = 22.9 Hz), 82.2, 80.7, 67.5, 26.5, 13.0; ^{19}F NMR (188 MHz, $CDCl_3$): δ -116.40 (s); IR (ATR) ν_{max} 2980, 2931, 2253, 1734, 1501, 1475, 1368, 1298, 1255, 1227, 1154, 758 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{20}NO_2FBr$ $[M+H]^+$ 404.0656, found 404.0651.



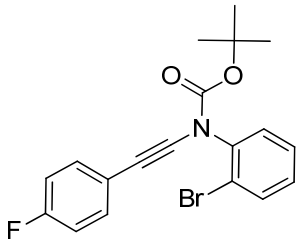
5f

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(3,4-dichlorophenyl)ethynylamine 5f.** Yield: 78%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.58 (dd, *J* = 8.7 and 1.2 Hz, 1H), 7.39-7.37 (m, 2H), 7.30 (td, *J* = 8.6 and 0.9 Hz, 1H), 7.24 (d, *J* = 9.0 Hz, 1H), 7.18-7.08 (m, 2H), 1.43 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.3, 138.3 (br.), 133.6, 132.5, 132.5, 132.3, 131.6, 130.2, 130.0, 129.3, 128.6, 123.4, 122.5, 84.8, 84.0, 68.0 (br.), 27.9; IR (ATR) ν_{max} 2979, 2932, 2255, 1736, 1590, 1518, 1380, 1368, 1297, 1255, 1155, 1030, 757 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{16}NO_2Cl_2BrNa$ $[M+Na]^+$ 461.9639, found 461.9645.



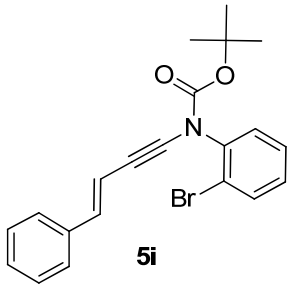
5g

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(2-trifluoromethylphenyl)ethynylamine 5g.** Yield: 69%. Brown solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.60 (dd, *J* = 8.7 and 1.4 Hz, 1H), 7.51 (d, *J* = 8.2 Hz, 1H), 7.42 (dd, *J* = 8.8 and 1.1 Hz, 2H), 7.40-7.28 (m, 2H), 7.25-7.14 (m, 2H), 1.47 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.2, 138.3, 133.5, 132.8, 131.2, 130.2 (q, J_{C-F} = 30.8 Hz), 129.9, 129.3, 129.0, 128.5, 126.8, 125.6 (q, J_{C-F} = 5.5 Hz), 123.6 (q, J_{C-F} = 271.6 Hz), 122.5, 88.5, 84.1, 66.8, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -62.64 (s); IR (ATR) ν_{max} 2981, 2933, 2256, 1734, 1473, 1369, 1316, 1260, 1153, 1060, 759, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{17}NO_2F_3BrNa$ $[M+Na]^+$ 462.0292, found 462.0292.



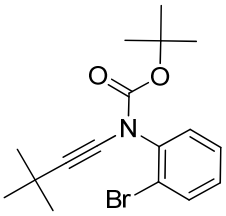
5h

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(4-fluorophenyl)ethynylamine 5h.** Yield: 60%. Pale yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.59 (dd, *J* = 8.5 and 1.4 Hz, 1H), 7.40 (dd, *J* = 8.2 and 1.2 Hz, 1H), 7.33-7.27 (m, 3H), 7.16 (td, *J* = 8.4 and 1.2 Hz, 1H), 6.88 (t, *J* = 8.9 Hz, 2H), 1.46 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 162.1 (d, J_{C-F} = 246.8 Hz), 152.6, 133.6, 133.2, 133.1, 129.8, 129.3, 128.5, 122.6, 119.3, 115.4 (d, J_{C-F} = 21.8 Hz), 83.7, 82.5, 68.7, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -112.30 (s); IR (ATR) ν_{max} 2976, 2931, 2256, 1734, 1600, 1510, 1475, 1368, 1306, 1219, 1154, 840 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{17}NO_2FBrNa$ $[M+Na]^+$ 412.0324, found 412.0321.



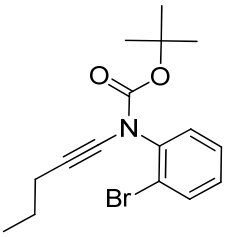
5i

(*E*)-*N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-(4-phenylbut-3-en-1-yn-1-yl)amine 5i. Yield: 53%. Pale yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.55 (dd, *J* = 8.0 and 1.0 Hz, 1H), 7.36 (d, *J* = 1.1 Hz, 1H), 7.34-7.08 (m, 7H), 6.74 (d, *J* = 16.0 Hz, 1H), 6.16 (d, *J* = 16.2 Hz, 1H), 1.41 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.5, 139.0, 138.7 (br.), 136.5, 133.5, 129.8, 129.3, 128.7, 128.6, 128.4, 126.1, 122.6, 107.9, 85.1, 83.8, 69.5 (br.), 27.9; IR (ATR) ν_{max} 2979, 2929, 2259, 1725, 1594, 1519, 1476, 1369, 1308, 1155, 1027, 751 cm^{-1}; ESIHRMS *m/z* calcd for $C_{21}H_{20}NO_2BrNa$ $[M+Na]^+$ 420.0575, found 420.0580.



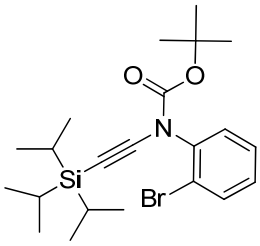
5j

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-3,3-dimethylbut-1-yn-1-ylamine 5j.** Yield: 58%. Brown solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.52 (dd, *J* = 9.0 and 3.1 Hz, 1H), 7.32-7.18 (m, 2H), 7.09 (td, *J* = 9.1 and 3.1 Hz, 1H), 1.39 (s, 9H), 1.14 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 153.2, 139.3 (br.), 133.4, 133.1, 129.3, 129.1, 128.3, 122.4, 82.7, 79.9, 72.9, 31.2, 27.9; IR (ATR) ν_{max} 2972, 2931, 2864, 2265, 1732, 1476, 1370, 1317, 1260, 1157, 759, 737 cm^{-1}; ESIHRMS *m/z* calcd for $C_{17}H_{22}NO_2NaBr$ $[M+Na]^+$ 374.0732, found 374.0733.



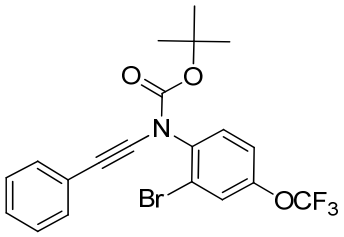
5k

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-pent-1-yn-1-ylamine 5k.** Yield: 59%. Pale yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.54 (dd, *J* = 8.0 and 1.1 Hz, 1H), 7.33 (d, *J* = 7.9 Hz, 1H), 7.27 (t, *J* = 8.3 Hz, 1H), 7.11 (td, *J* = 8.0 and 1.8 Hz, 1H), 2.18 (t, *J* = 7.0 Hz, 2H), 1.64-1.48 (m, 11H), 0.98 (t, *J* = 7.3 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 153.3, 139.6, 133.4, 129.4, 129.1, 128.4, 122.5, 83.0, 73.9, 69.0, 27.9, 22.4, 20.5, 13.5; IR (ATR) ν_{max} 2962, 2932, 2872, 2259, 1741, 1475, 1366, 1320, 1261, 1158, 1064, 759, 749 cm^{-1}; ESIHRMS *m/z* calcd for $C_{16}H_{20}NO_2BrNa$ $[M+Na]^+$ 360.0575, found 360.0583.



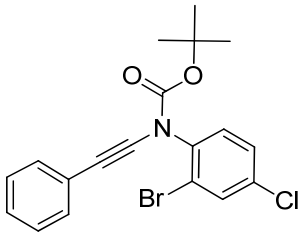
5l

***N*-(2-Bromophenyl)-*N*-*tert*-butoxycarbonyl-triisopropylsilylethynylamine 5l.** Yield: 53%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.57 (dd, *J* = 8.5 and 1.2 Hz, 1H), 7.37 (dd, *J* = 8.3 and 1.4 Hz, 1H), 7.28 (td, *J* = 9.0 and 1.4 Hz, 1H), 7.13 (td, *J* = 8.9 and 1.2 Hz, 1H), 1.53 (s, 9H), 1.07 (s, 21H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.8, 138.8, 133.5, 129.6, 129.2, 128.4, 122.4, 96.6, 83.4, 76.8, 28.0, 18.6, 11.4; IR (ATR) ν_{max} 2942, 2891, 2864, 2177, 1738, 1474, 1369, 1299, 1254, 1155, 883, 758 cm^{-1}; ESIHRMS *m/z* calcd for $C_{22}H_{35}NO_2SiBr$ $[M+H]^+$ 452.1615, found 452.1614.



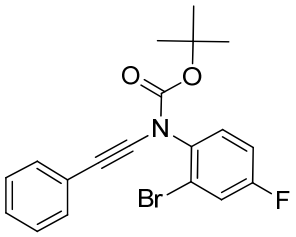
5m

***N*-(2-Bromo-4-trifluoromethoxy-phenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5m.** Yield: 53%. Pale yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.57-7.54 (m, 2H), 7.43-7.41 (m, 2H), 7.30-7.28 (m, 4H), 1.56 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.3, 148.7, 137.4, 131.2, 130.3, 128.3, 127.7, 126.0, 123.3, 123.0, 120.9, 120.3 (q, J_{C-F} = 258.0 Hz), 84.1, 82.4, 70.1, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -58.00 (s); IR (ATR) ν_{max} 2980, 2252, 1735, 1596, 1486, 1308, 1246, 1221, 1151, 1005, 859, 756 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{17}NO_3F_3BrNa$ $[M+Na]^+$ 478.0242, found 478.0245.



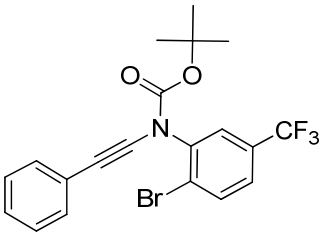
5n

***N*-(2-Bromo-4-chloro-phenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5n.** Yield: 68%. Pale yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.70 (d, *J* = 2.2 Hz, 1H), 7.46-7.36 (m, 4H), 7.31-7.28 (m, 3H), 1.55 (br. s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.3, 137.5 (br.), 134.9, 133.2, 131.2, 130.1, 128.8, 128.3, 127.7, 123.3, 123.1, 84.0, 82.6, 70.0 (br.), 28.0; IR (ATR) ν_{max} 2974, 2255, 2229, 1735, 1473, 1367, 1288, 1251, 1148, 1099, 865, 827, 751 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{17}NO_2ClBrNa$ $[M+Na]^+$ 428.0029, found 428.0034.



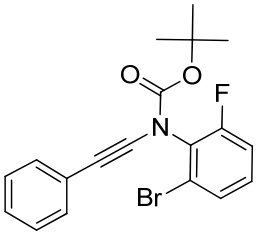
5o

***N*-(2-Bromo-4-fluoro-phenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5o.** Yield: 75%. Yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.39 (dd, *J* = 9.1 and 1.4 Hz, 1H), 7.34-7.29 (m, 3H), 7.22-7.17 (m, 3H), 7.02 (m, 1H), 1.47 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 161.7 (d, J_{C-F} = 251.3 Hz), 152.5, 135.3, 131.1, 131.0, 130.3, 128.2, 127.5, 123.2 (d, J_{C-F} = 15.0 Hz), 120.7 (d, J_{C-F} = 25.5 Hz), 115.6 (d, J_{C-F} = 22.5 Hz), 83.8, 82.7, 69.8, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -110.61 (s); IR (ATR) ν_{max} 2979, 2933, 2254, 1738, 1596, 1487, 1369, 1303, 1251, 1196, 1155, 1051, 1007, 861, 755 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{17}NO_2FBrNa$ $[M+Na]^+$ 412.0319, found 412.0318.



5p

***N*-(2-Bromo-5-trifluoromethyl-phenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5p.** Yield: 59%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.83 (d, *J* = 9.2 Hz, 1H), 7.77 (s, 1H), 7.51 (dd, *J* = 8.8 and 1.4 Hz, 1H), 7.43-7.40 (m, 2H), 7.33-7.28 (m, 3H), 1.55 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 152.1, 139.5, 134.4, 131.2 (q, J_{C-F} = 33.8 Hz), 131.2, 128.2, 127.8, 126.9, 126.4, 126.4, 122.9, 122.7 (q, J_{C-F} = 270.8 Hz), 84.3, 82.1, 70.3, 27.9; ^{19}F NMR (188 MHz, $CDCl_3$): δ -62.63 (s); IR (ATR) ν_{max} 2981, 2931, 2256, 1738, 1606, 1419, 1370, 1328, 1303, 1255, 1228, 1173, 1154, 1081, 1016, 909, 755, 735 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{17}NO_2F_3BrNa$ $[M+Na]^+$ 462.0292, found 462.0287.



5q

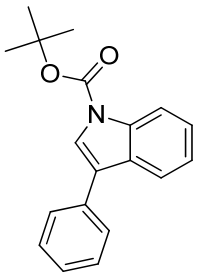
***N*-(2-Bromo-6-fluoro-phenyl)-*N*-*tert*-butoxycarbonyl-phenylethynylamine 5q.** Yield: 50%. Colorless solid. ^{1}H NMR (300 MHz, DMSO, 50°C): δ 7.65-7.61 (m, 1H), 7.47-7.42 (m, 2H), 7.37-7.31 (m, 5H), 1.46 (s, 9H); ^{13}C NMR (75 MHz, DMSO, 50°C): δ 158.6 (d, J_{C-F} = 252.0 Hz), 151.6, 132.2 (d, J_{C-F} = 9.0 Hz), 131.3, 129.5 (d, J_{C-F} = 3.8 Hz), 129.0, 128.5, 127.0 (d, J_{C-F} = 15.0 Hz), 123.6, 122.6, 116.6 (d, J_{C-F} = 20.3 Hz), 84.4, 82.6, 69.2, 27.9; ^{19}F NMR (188 MHz, DMSO, 25°C): δ -117.09 and -117.49 (s, rotamers); IR (ATR) ν_{max} 2980, 2932, 2255, 1736, 1596, 1578, 1475, 1454, 1368, 1307, 1256, 1152, 1006, 877, 753, 736 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{17}NO_2FBrNa$ $[M+Na]^+$ 412.0324, found 412.0322.

Experimental Procedures and Characterization Data:

Indoles

General procedure for the synthesis of indoles 8:

To a solution of ynamide **5** (0.25 mmol) in freshly distilled and degassed diethyl ether (3 mL) was added *tert*-butyllithium (1.7M in pentane, 220 μL, 0.37 mmol) dropwise at -78 °C. Freshly prepared CuCN·2LiCl (1M solution in THF, 250 μL, 0.25 mmol) was next added to the resulting dark red solution and the reaction mixture was slowly warmed to room temperature over 14 hours. The reaction was then quenched with an aqueous mixture of saturated ammonium chloride and 28% ammonium hydroxide (1:1 solution) and stirred for 1 hour. The aqueous layer was extracted with EtOAc and the combined organic layers were washed with brine, dried over $MgSO_4$, filtered and concentrated. The residue was finally purified by flash column chromatography over silica gel (petroleum ether/EtOAc: 9/1) to give the corresponding indole **8**.

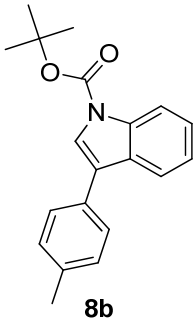


8a

***N-tert*-Butoxycarbonyl-3-phenyl-indole 8a**.[S4] Yield: 55%. Pale yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.26 (d, *J* = 9.0 Hz, 1H), 7.86 (d, *J* = 8.9 Hz, 1H), 7.74 (s, 1H), 7.68 (d, *J* = 8.7 Hz, 2H),

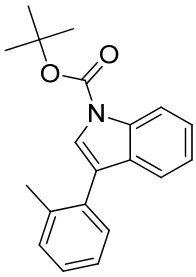
[S4] Kuwano, R.; Kashiwabara, M. *Org. Lett.* **2009**, *8*, 2653.

7.50 (t, *J* = 8.9 Hz, 2H), 7.42-7.29 (m, 3H), 1.72 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.7, 135.9, 133.9, 129.0, 128.8, 128.7, 128.0, 127.2, 124.6, 122.9, 122.2, 120.0, 115.4, 83.8, 28.2; IR (ATR) ν_{max} 3055, 2879, 2931, 1733, 1607, 1452, 1375, 1157, 767, 747 cm^{-1}; EIHRMS *m/z* calcd for $C_{19}H_{20}NO_2$ $[M+H]^+$ 294.1494, found 294.1497.



8b

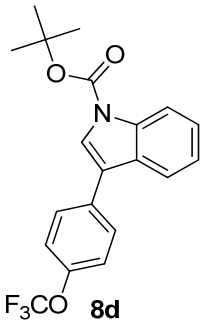
***N-tert*-Butoxycarbonyl-3-(4-tolyl)-indole 8b**. Yield: 48%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.14 (d, *J* = 9.0 Hz, 1H), 7.73 (d, *J* = 8.7 Hz, 1H), 7.60 (s, 1H), 7.47 (d, *J* = 9.2 Hz, 2H), 7.30-7.16 (m, 4H), 2.33 (s, 3H), 1.61 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.8, 136.9, 135.9, 130.9, 129.5, 129.2, 127.8, 124.5, 122.9, 122.6, 122.2, 120.0, 115.5, 83.8, 28.3, 21.3; IR (ATR) ν_{max} 2978, 2929, 1734, 1452, 1360, 1158, 1052, 764, 747 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{22}NO_2$ $[M+H]^+$ 308.1651, found 308.1656.



8c

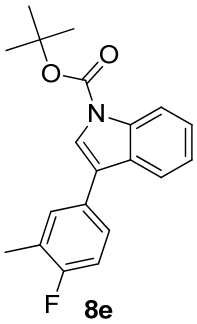
***N-tert*-Butoxycarbonyl-3-(2-tolyl)-indole 8c**. Yield: 52%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.13 (d, *J* = 9.0 Hz, 1H), 7.48 (s, 1H), 7.29-7.14 (m, 7H), 2.20 (s, 3H), 1.60 (s, 9H); ^{13}C NMR (75

MHz, $CDCl_3$): δ 149.9, 137.1, 135.2, 132.9, 130.7, 130.4, 130.4, 127.7, 125.7, 124.4, 123.8, 122.8, 121.8, 120.3, 115.3, 83.7, 28.3, 20.5; IR (ATR) ν_{max} 3137, 2976, 2928, 1727, 1453, 1376, 1152, 766 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{22}NO_2$ $[M+H]^+$ 308.1651, found 308.1650.



8d

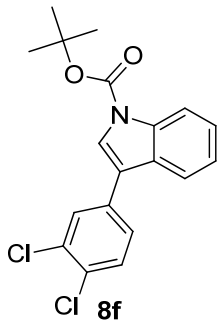
***N-tert*-Butoxycarbonyl-3-(4-trifluoromethoxyphenyl)-indole 8d**. Yield: 47%. Colorless oil. ^1H NMR (300 MHz, $CDCl_3$): δ 8.15 (d, *J* = 8.9 Hz, 1H), 7.69 (d, *J* = 9.0 Hz, 1H), 7.63 (s, 1H), 7.58 (d, *J* = 9.0 Hz, 2H), 7.33-7.20 (m, 2H), 7.24 (d, *J* = 9.0 Hz, 2H), 1.62 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.7, 148.3, 135.9, 132.7, 129.2, 128.7, 124.8, 123.1, 121.5, 120.9, 120.6 (q, J_{C-F} = 255.6 Hz), 119.7, 118.8, 115.6, 84.1, 28.2; ^{19}F NMR (188 MHz, $CDCl_3$): δ -57.60 (s); IR (ATR) ν_{max} 2981, 2933, 1737, 1452, 1376, 1160, 1053, 747 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{19}NO_3F_3$ $[M+H]^+$ 378.1317, found 378.1333.



8e

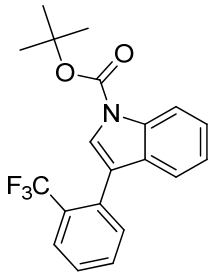
***N-tert*-Butoxycarbonyl-3-(3-methyl-4-fluoro-phenyl)-indole 8e**. Yield: 42%. Colorless oil. ^1H NMR (300 MHz, $CDCl_3$): δ 8.15 (d, *J* = 9.1 Hz, 1H), 7.69 (d, *J* = 9.0 Hz, 1H), 7.58 (s, 1H), 7.38-7.18

(m, 4H), 7.02 (t, J = 9.0 Hz, 1H), 2.28 (s, 3H), 1.62 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 160.8 (d, J_{C-F} = 244.9 Hz), 149.7, 135.8, 130.9 (d, J_{C-F} = 5.0 Hz), 129.5 (d, J_{C-F} = 3.8 Hz), 128.9, 126.8 (d, J_{C-F} = 7.8 Hz), 125.2 (d, J_{C-F} = 17.4 Hz), 124.6, 123.0, 122.6, 121.4, 119.9, 115.5, 115.4 (d, J_{C-F} = 22.2 Hz), 114.2, 82.5, 26.8; ^{19}F NMR (188 MHz, $CDCl_3$): δ -119.47 (d, J = 5.9 Hz); IR (ATR) ν_{max} 2974, 2927, 1728, 1454, 1365, 1240, 1153, 1051, 762 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{21}NO_2F$ $[M+H]^+$ 326.1556, found 326.1555.



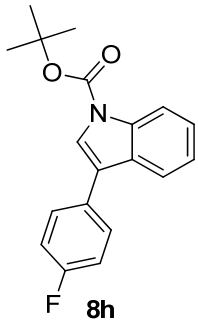
8f

***N-tert*-Butoxycarbonyl-3-(3,4-dichlorophenyl)-indole 8f**. Yield: 58%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.26 (d, J = 9.1 Hz, 1H) 7.78-7.75 (m, 3H), 7.56-7.47 (m, 2H), 7.44-7.31 (m, 2H), 1.73 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.5, 135.9, 134.1, 132.9, 131.0, 130.8, 129.5, 128.2, 127.1, 125.0, 123.4, 123.3, 119.9, 119.5, 115.6, 84.3, 28.3; IR (ATR) ν_{max} 2979, 2931, 1738, 1598, 1452, 1308, 1282, 1240, 1157, 1054, 761, 747 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{18}NO_2Cl_2$ $[M+H]^+$ 362.0715, found 362.0726.



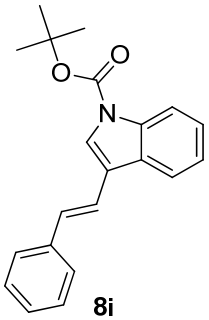
8g

***N-tert*-Butoxycarbonyl-3-(2-trifluoromethylphenyl)-indole 8g**. Yield: 44%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.13 (d, *J* = 9.2 Hz, 1H), 7.74 (d, *J* = 8.9 Hz, 1H), 7.58 (s, 1H), 7.52 (d, *J* = 8.9 Hz, 1H), 7.44-7.42 (m, 2H), 7.31-7.24 (m, 2H), 7.18-7.12 (m, 1H), 1.61 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.8, 134.8, 132.9, 132.3, 131.4, 130.7, 129.7 (q, J_{C-F} = 32.3 Hz), 127.7, 126.5, 126.4, 124.6, 124.0 (q, J_{C-F} = 247.5 Hz), 122.9, 119.6, 118.7, 115.5, 84.0, 28.2; ^{19}F NMR (188 MHz, $CDCl_3$): δ -58.05 (s); IR (ATR) ν_{max} 2975, 2917, 2849, 1736, 1454, 1348, 1280, 1065, 1035, 763, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{19}NO_2F_3$ $[M+H]^+$ 362.1368, found 362.1362.



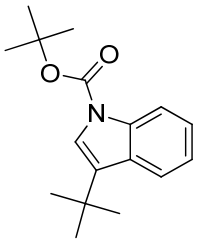
8h

***N-tert*-Butoxycarbonyl-3-(4-fluorophenyl)-indole 8h**. Yield: 44%. White solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.15 (d, *J* = 9.1 Hz, 1H), 7.68 (d, *J* = 9.0 Hz, 1H), 7.60 (s, 1H), 7.53 (dd, *J* = 8.6 and 5.2 Hz, 2H), 7.32-7.18 (m, 2H), 7.08 (t, *J* = 8.9 Hz, 2H), 1.62 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 160.6 (d, J_{C-F} = 253.5 Hz), 148.3, 134.4, 128.4, 128.1 (d, J_{C-F} = 7.6 Hz), 127.4, 123.3, 121.6, 121.3, 119.8, 118.2, 114.3 (d, J_{C-F} = 21.3 Hz), 114.2, 82.5, 26.8; ^{19}F NMR (188 MHz, $CDCl_3$): δ -115.04 – -115.20 (m); IR (ATR) ν_{max} 2976, 2918, 2849, 1725, 1504, 1452, 1152, 1106, 1053, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{19}NO_2F$ $[M+H]^+$ 312.1400, found 312.1398.



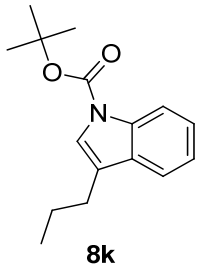
8i

***N-tert*-Butoxycarbonyl-3-styryl-indole 8i**. Yield: 54%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.13 (d, *J* = 8.9 Hz, 1H), 7.84 (d, *J* = 8.8 Hz, 1H), 7.68 (s, 1H), 7.47 (d, *J* = 9.0 Hz, 2H), 7.33-7.15 (m, 7H), 1.62 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.6, 137.8, 136.1, 128.9, 128.8, 128.7, 127.4, 126.2, 124.8, 124.0, 123.0, 120.0, 119.9, 119.0, 115.5, 84.0, 28.3; IR (ATR) ν_{max} 2924, 2852, 1733, 1479, 1453, 1369, 1254, 1152, 751 cm^{-1}; ESIHRMS *m/z* calcd for $C_{21}H_{22}NO_2$ $[M+H]^+$ 320.1651, found 320.1649.



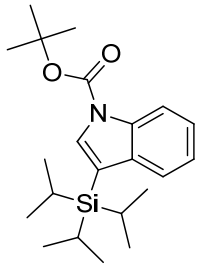
8j

***N-tert*-Butoxycarbonyl-3-*tert*-butyl-indole 8j**. Yield: 45%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.19 (d, *J* = 8.8 Hz, 1H), 7.78 (d, *J* = 8.6 Hz, 1H), 7.34 (s, 1H), 7.31-7.24 (m, 2H), 1.69 (s, 9H), 1.47 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 150.0, 136.4, 130.6, 129.3, 123.7, 121.9, 121.4, 120.6, 115.5, 83.3, 31.6, 30.2, 28.3; IR (ATR) ν_{max} 2972, 2869, 1732, 1461, 1352, 1272, 1248, 1206, 1159, 1065, 861, 766, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{17}H_{24}NO_2$ $[M+H]^+$ 274.1807, found 274.1815.



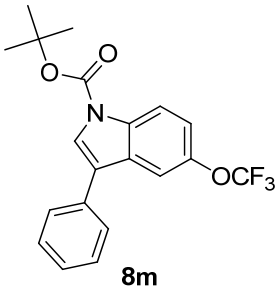
8k

***N-tert*-Butoxycarbonyl-3-propyl-indole 8k**. Yield: 40%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.04 (d, *J* = 9.0 Hz, 1H), 7.45 (d, *J* = 8.9 Hz, 1H), 7.27-7.12 (m, 3H), 2.58 (t, *J* = 8.8 Hz, 2H), 1.66 (q, *J* = 8.7 Hz, 2H), 1.59 (s, 9H), 0.93 (t, *J* = 8.8 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.9, 135.6, 130.9, 124.1, 122.3, 122.2, 121.3, 119.1, 115.2, 83.2, 28.3, 27.0, 22.5, 14.1; IR (ATR) ν_{max} 2962, 2931, 2871, 1731, 1454, 1380, 1255, 1255, 1161, 1099, 767, 746 cm^{-1}; ESIHRMS *m/z* calcd for $C_{16}H_{22}NO_2$ $[M+H]^+$ 260.1651, found 260.1656.



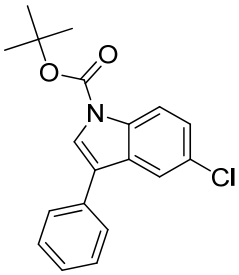
8l

***N-tert*-Butoxycarbonyl-3-triisopropylsilyl-indole 8l**. Yield: 34%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.04 (d, *J* = 9.1 Hz, 1H), 7.56 (s, 1H), 7.54 (d, *J* = 9.2 Hz, 1H), 7.23-7.10 (m, 2H), 1.72 (s, 9H), 1.42-1.37 (m, 3H), 1.45 (d, *J* = 9.3 Hz, 18H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.8, 136.3, 135.4, 133.6, 123.8, 123.0, 122.4, 115.0, 111.1, 83.7, 28.2, 18.9, 11.9; IR (ATR) ν_{max} 2943, 2889, 2865, 1736, 1450, 1360, 1248, 1158, 1058, 769, 745 cm^{-1}; ESIHRMS *m/z* calcd for $C_{22}H_{35}NO_2NaSi$ $[M+Na]^+$ 396.2335, found 396.2336.



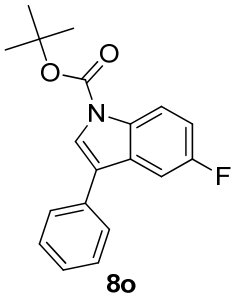
8m

***N-tert*-Butoxycarbonyl-3-phenyl-5-trifluoromethoxy-indole 8m**. Yield: 64%. Yellow solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.28 (d, *J* = 9.0 Hz, 1H), 7.80 (s, 1H), 7.68 (s, 1H), 7.63 (d, *J* = 8.7 Hz, 2H), 7.52 (t, *J* = 9.0 Hz, 2H), 7.41 (t, *J* = 9.0 Hz, 1H), 7.28 (d, *J* = 9.2 Hz, 1H), 1.73 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.4, 145.3, 134.2, 133.1, 129.8, 129.0, 127.9, 127.5, 124.5, 122.1, 120.7 (q, $J_{C\text{-}F}$ = 254.3 Hz), 118.1, 116.4, 112.6, 84.4, 28.2; ^{19}F NMR (188 MHz, $CDCl_3$): δ -58.00 (s); IR (ATR) ν_{max} 2982, 2933, 1729, 1470, 1451, 1377, 1245, 1151, 1053, 807, 764 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{19}NO_3F_3$ $[M+H]^+$ 378.1317, found 378.1326.



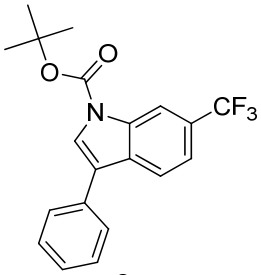
8n

***N-tert*-Butoxycarbonyl-5-chloro-3-phenyl-indole 8n**. Yield: 46%. Colorless solid. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.07 (d, *J* = 9.1 Hz, 1H), 7.69 (d, *J* = 2.0 Hz, 1H), 7.63 (s, 1H), 7.53 (d, *J* = 9.1 Hz, 2H), 7.40 (t, *J* = 8.9 Hz, 2H), 7.32-7.18 (m, 2H), 1.61 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.4, 134.3, 133.2, 130.2, 129.0, 128.8, 127.9, 127.5, 124.8, 124.0, 121.7, 119.6, 116.5, 84.3, 28.2; IR (ATR) ν_{max} 2985, 2930, 1743, 1453, 1453, 1375, 1239, 1160, 1051, 757 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{19}NO_2Cl$ $[M+H]^+$ 328.1104, found 328.1110.



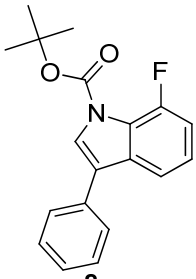
8o

***N-tert*-Butoxycarbonyl-5-fluoro-3-phenyl-indole 8o**. Yield: 41%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.19 (dd, *J* = 9.2 and 6.0 Hz, 1H), 7.76 (s, 1H), 7.62 (d, *J* = 8.8 Hz, 2H), 7.49 (t, *J* = 9.0 Hz, 3H), 7.39 (t, *J* = 9.0 Hz, 1H), 7.11 (td, *J* = 9.1 and 3.0 Hz, 1H), 1.61 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 159.6 (d, J_{C-F} = 237.8 Hz), 149.5, 133.4, 132.3, 129.9 (d, J_{C-F} = 9.0 Hz), 128.9, 127.8, 127.4, 124.3, 122.0, 116.5 (d, J_{C-F} = 9.0 Hz), 112.4 (d, J_{C-F} = 24.8 Hz), 105.5 (d, J_{C-F} = 28.5 Hz), 84.1, 28.2; ^{19}F NMR (188 MHz, $CDCl_3$): δ -120.30 – -120.40 (m); IR (ATR) ν_{max} 2978, 2929, 1737, 1606, 1469, 1379, 1246, 1159, 1093, 1051, 800, 758 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{19}NO_2F$ $[M+H]^+$ 312.1400, found 312.1400.



8p

***N-tert*-Butoxycarbonyl-3-phenyl-6-trifluoromethyl-indole 8p**. Yield: 49%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 8.60 (s, 1H), 7.93 (d, *J* = 9.1 Hz, 1H), 7.86 (s, 1H), 7.66 (d, *J* = 9.0 Hz, 2H), 7.58-7.50 (m, 3H), 7.42-7.39 (m, 1H), 1.74 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 149.3, 135.1, 133.1, 131.4, 129.0, 128.0, 127.6, 126.7 (d, J_{C-F} = 31.5 Hz), 125.1, 124.8 (q, J_{C-F} = 270.0 Hz), 122.1, 120.3, 119.7 (q, J_{C-F} = 3.8 Hz), 113.1 (q, J_{C-F} = 4.5 Hz), 84.8, 28.2; ^{19}F NMR (188 MHz, $CDCl_3$): δ -61.10 (s); IR (ATR) ν_{max} 2978, 2935, 1738, 1448, 1373, 1322, 1240, 1145, 1105, 613, 813, 759 cm^{-1}; ESIHRMS *m/z* calcd for $C_{20}H_{19}NO_2F_3$ $[M+H]^+$ 362.1368, found 362.1362.

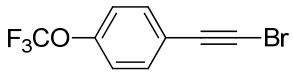


8q

***N-tert*-Butoxycarbonyl-7-fluoro-3-phenyl-indole 8q**. Yield: 50%. Colorless oil. ^{1}H NMR (300 MHz, $CDCl_3$): δ 7.65 (s, 1H), 7.53-7.47 (m, 3H), 7.41-7.36 (m, 2H), 7.31-7.26 (m, 1H), 7.16-7.10 (m, 1H), 7.03-6.96 (m, 1H), 1.59 (s, 9H); ^{13}C NMR (75 MHz, $CDCl_3$): δ 150.2 (d, J_{C-F} = 251.3 Hz), 148.9, 133.3, 128.9, 128.1, 127.4, 125.4, 123.8 (d, J_{C-F} = 7.2 Hz), 122.6 (d, J_{C-F} = 9.8 Hz), 122.3, 115.7 (d, J_{C-F} = 3.7 Hz), 112.0 (d, J_{C-F} = 22.0 Hz), 84.3, 28.0; ^{19}F NMR (188 MHz, $CDCl_3$): δ -115.69 (dd, J = 13.2 and 3.8 Hz); IR (ATR) ν_{max} 2979, 2931, 1734, 1570, 1452, 1233, 1158, 759, 734 cm^{-1}; ESIHRMS *m/z* calcd for $C_{19}H_{19}NO_2F$ $[M+H]^+$ 312.1400, found 312.1402.

Supporting Information

^{1}H and ^{13}C NMR spectra

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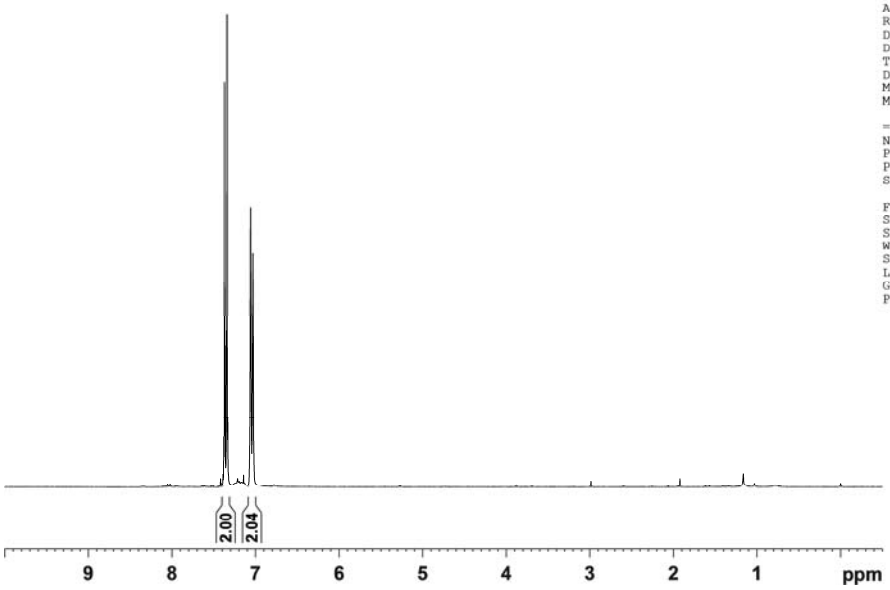


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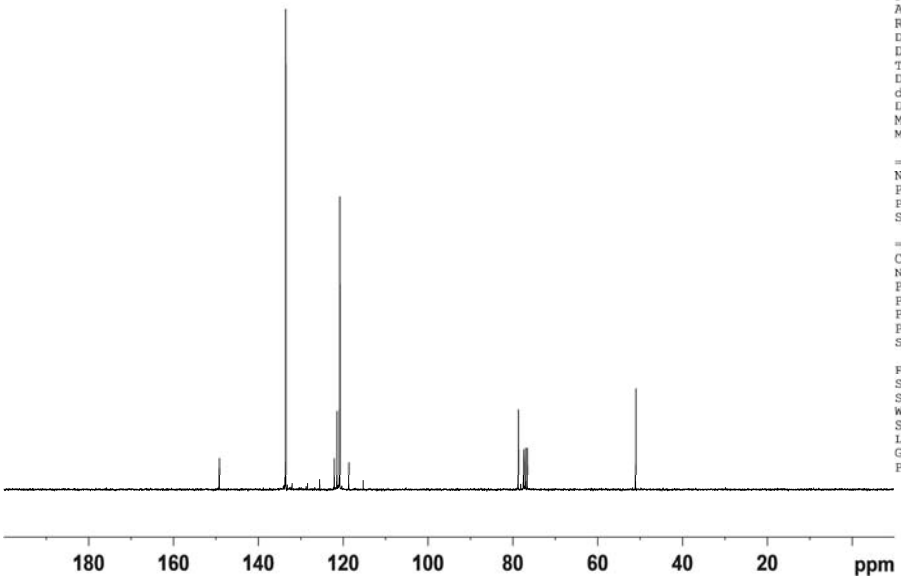

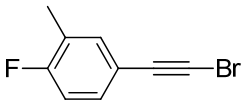


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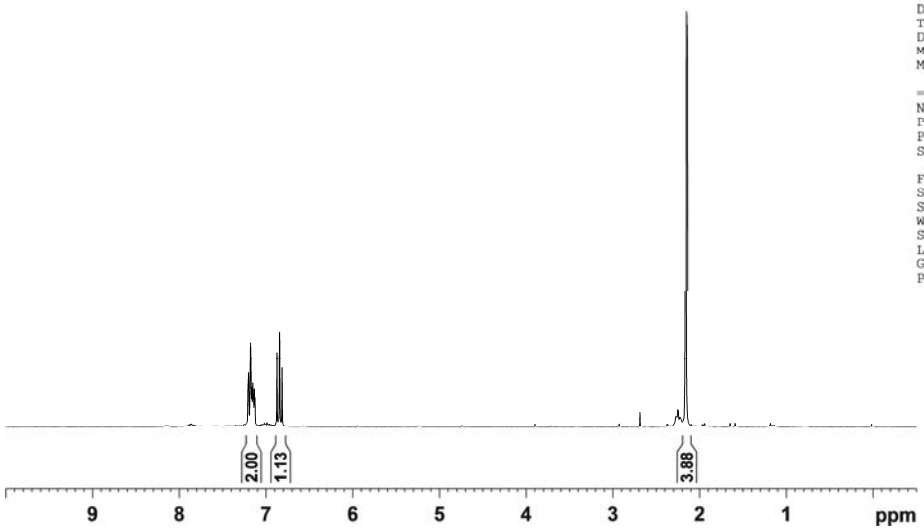


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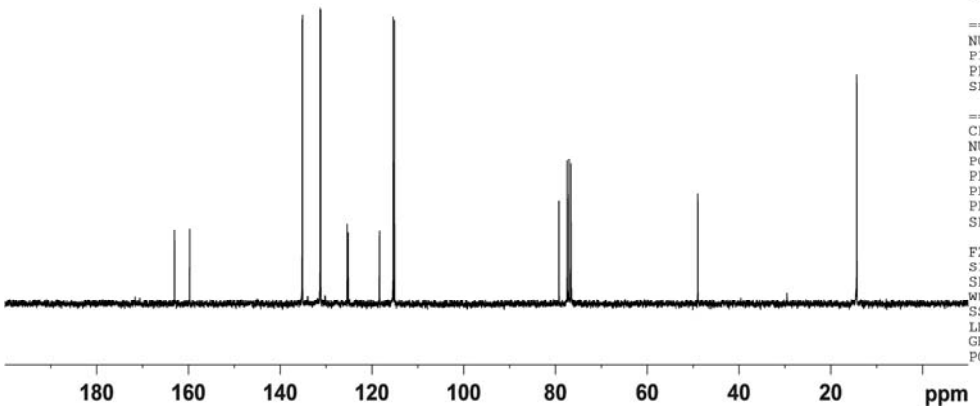

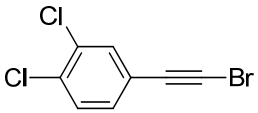


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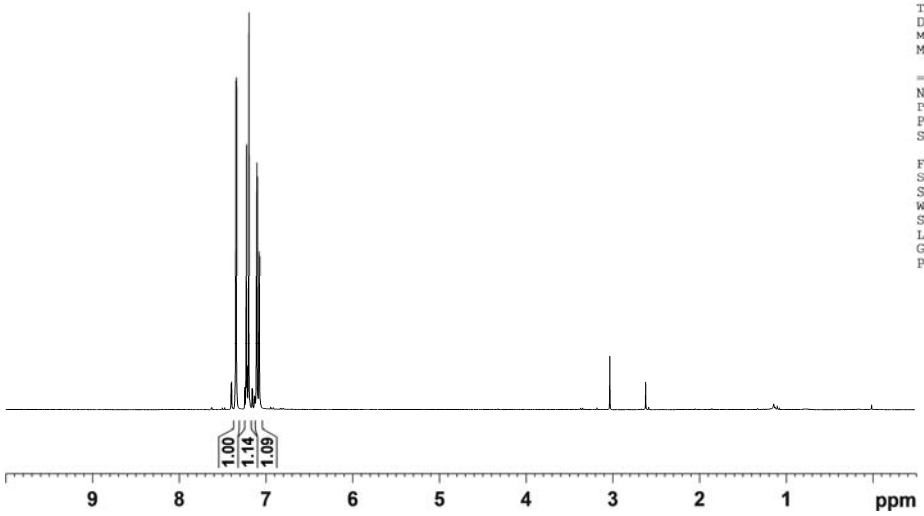


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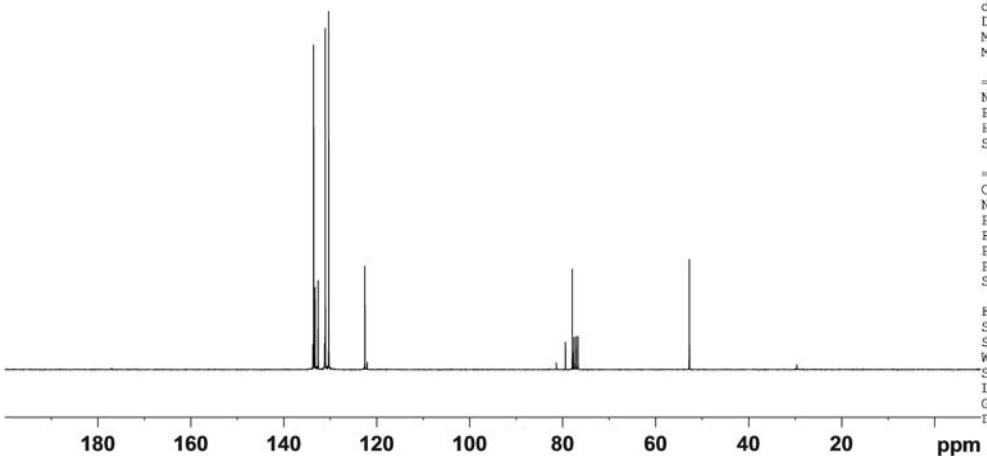

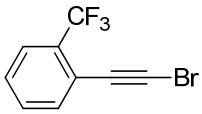


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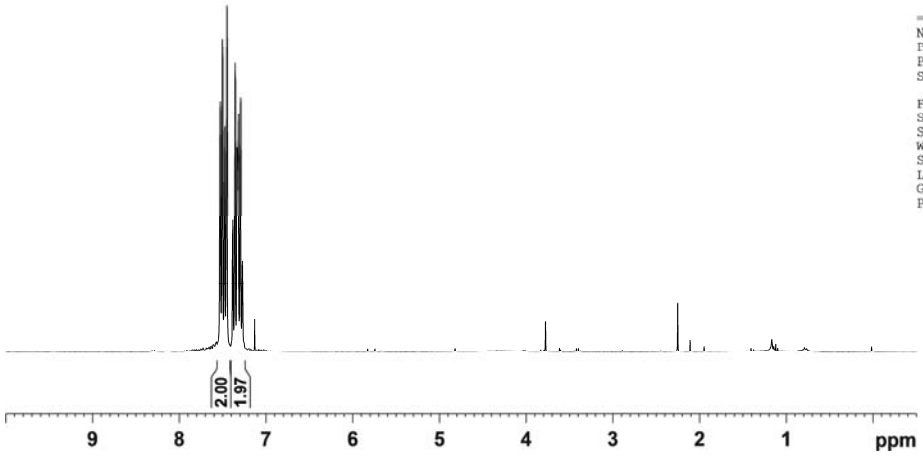
DS                      2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                    114
DW              119.200 usec
DE                 6.50 usec
TE                294.0 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                  32768
SF           300.1300464 MHz
WDW                    EM
SSB                     0
LB                   0.10 Hz
GB                      0
PC                   1.00
```



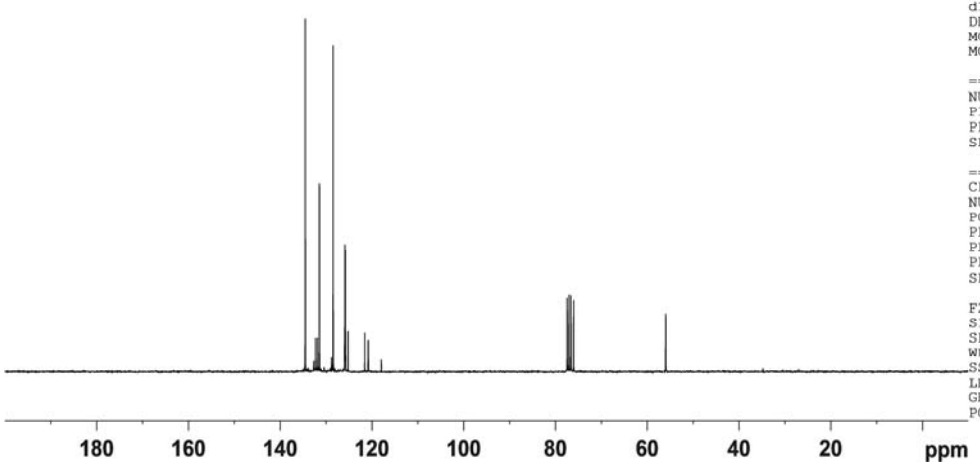

```
Current Data Parameters
NAME          fc19wa407-2
EXPNO                  12
PROCNO                  1

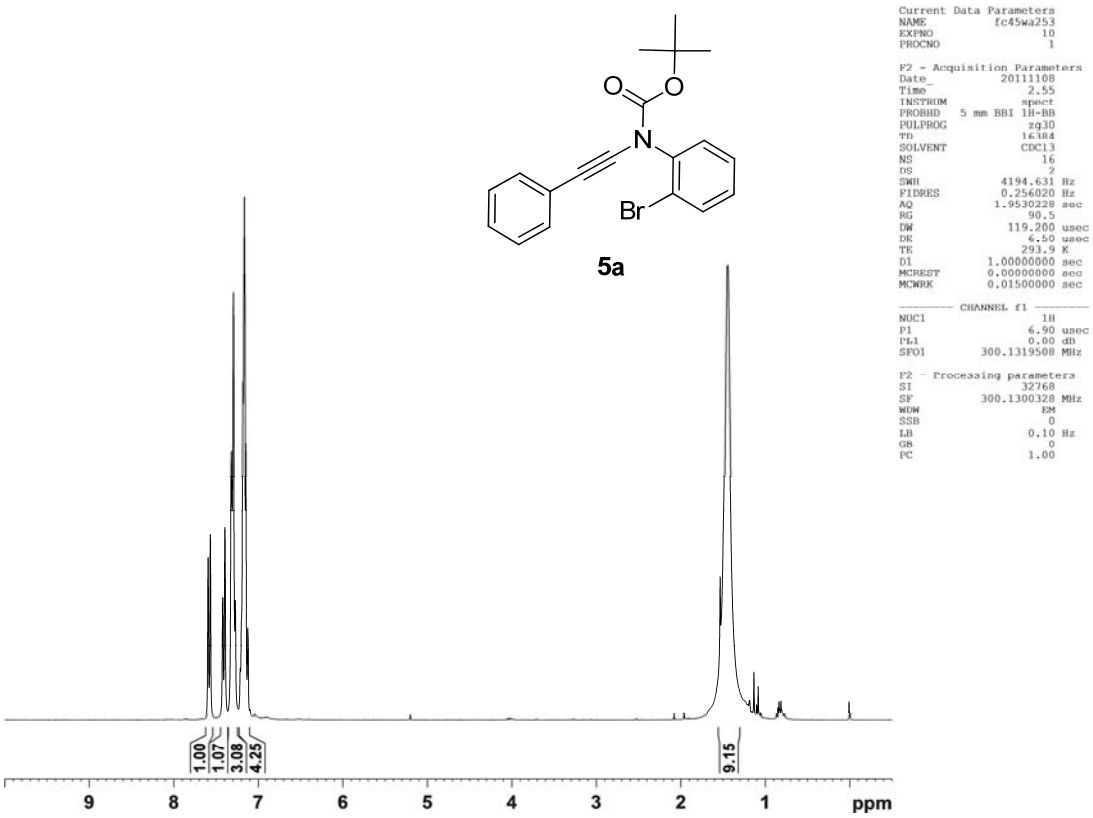
F2 - Acquisition Parameters
Date_             20120509
Time                  6.11
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zgpg30
TD                  32768
SOLVENT             CDCl3
NS                   1024
DS                      4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                   2048
DW               27.600 usec
DE                10.00 usec
TE                294.0 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF           75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



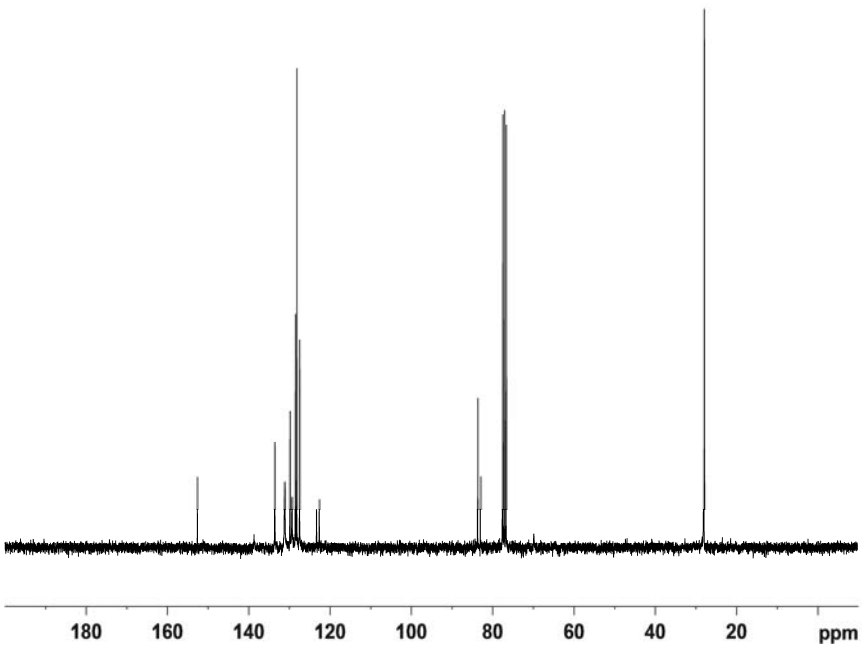



```
Current Data Parameters
NAME          fc45wa253
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20111108
Time                2.55
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ            1.9530228 sec
RG                 90.5
DW              119.200 usec
DE                6.50 usec
TE                293.9 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

-------- CHANNEL f1 --------
NUC1                  1H
P1                  6.90 usec
PL1                 0.00 dB
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF           300.1300328 MHz
WDW                   EM
SSB                    0
LB                  0.10 Hz
GB                     0
PC                  1.00
```



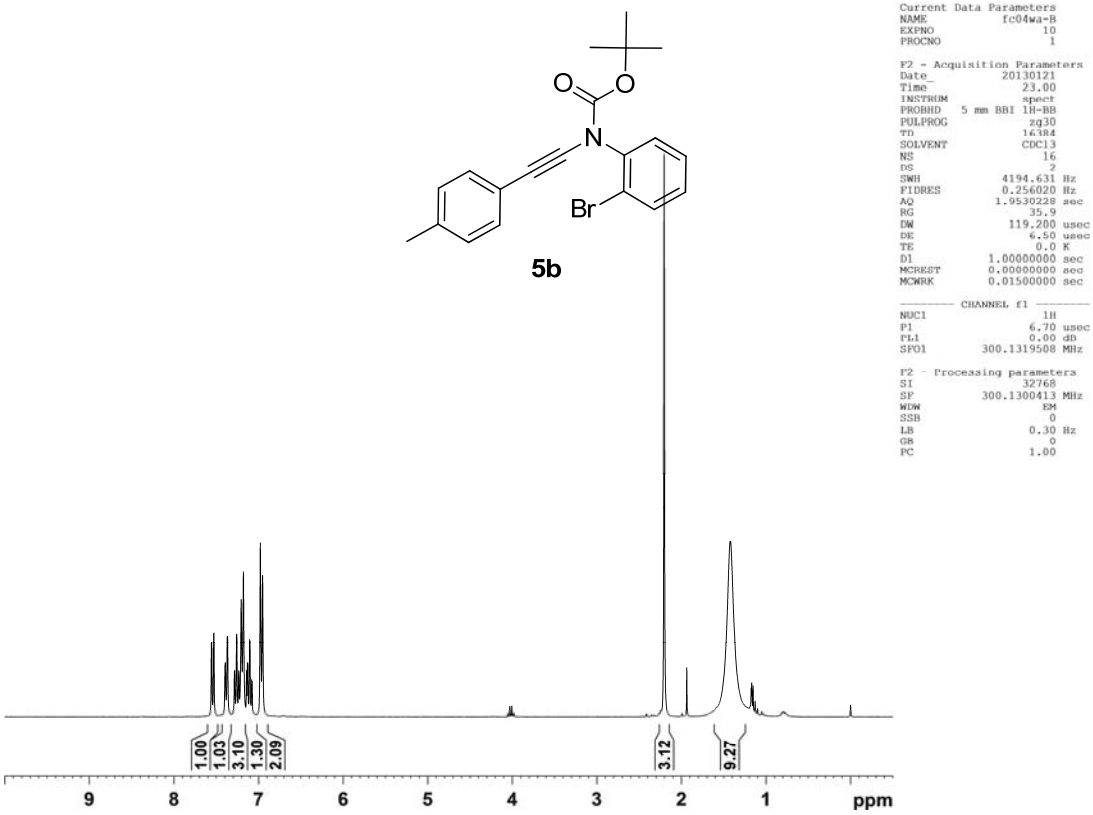

```
Current Data Parameters
NAME          fc45wa253
EXPNO                14
PROCNO                1

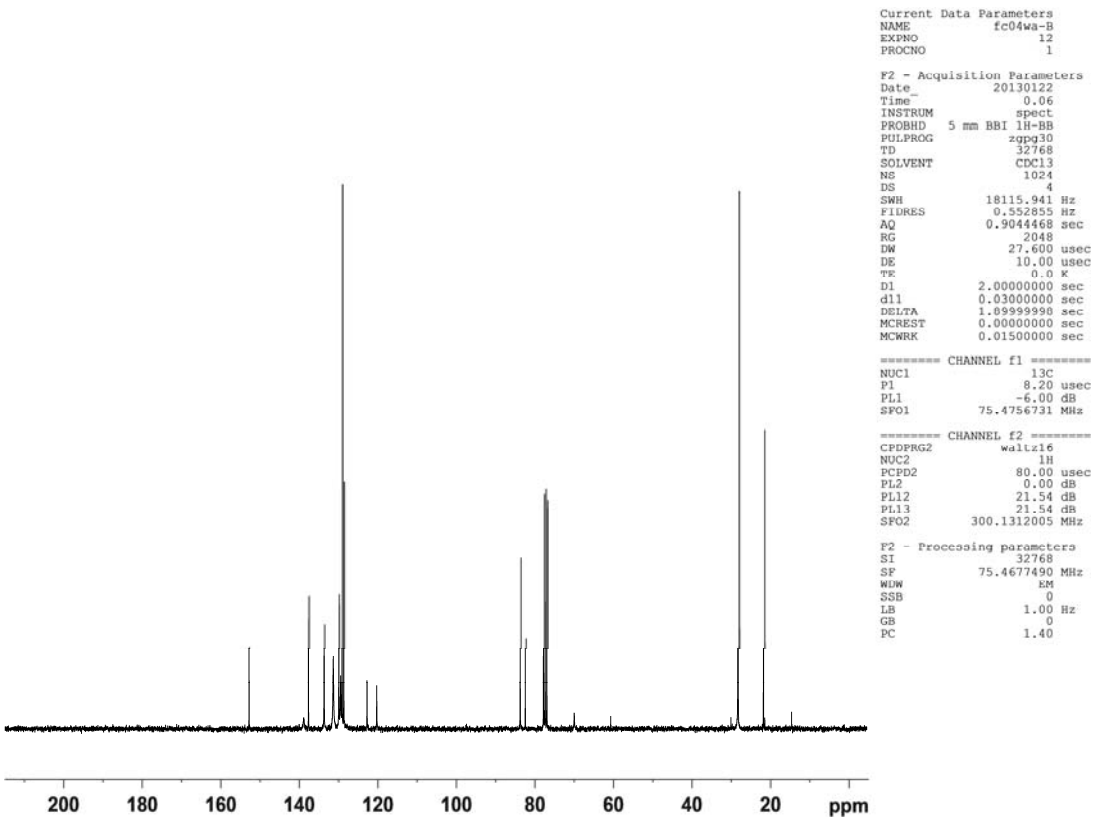
F2 - Acquisition Parameters
Date_           20111108
Time                5.15
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ            0.9044468 sec
RG                 2048
DW               27.600 usec
DE                10.00 usec
TE                294.2 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

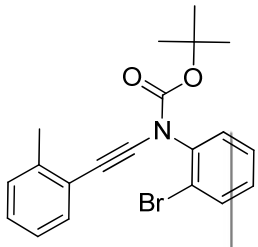
======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               22.00 dB
PL13               22.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF           75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```


5b
Br
N
O
O
1.00
1.03
3.10
1.30
2.09
3.12
9.27
9
8
7
6
5
4
3
2
1
ppm
Current Data Parameters
NAME fc04wa-B
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130121
Time 23.00
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 35.9
DW 119.200 usec
DE 6.50 usec
TE 0.0 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
CHANNEL f1
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300413 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00


200
180
160
140
120
100
80
60
40
20
ppm
Current Data Parameters
NAME fc04wa-B
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130122
Time 0.06
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1024
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 2048
DW 27.600 usec
DE 10.00 usec
TE 0.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.09999990 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
CHANNEL f1
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
SFO1 75.4756731 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



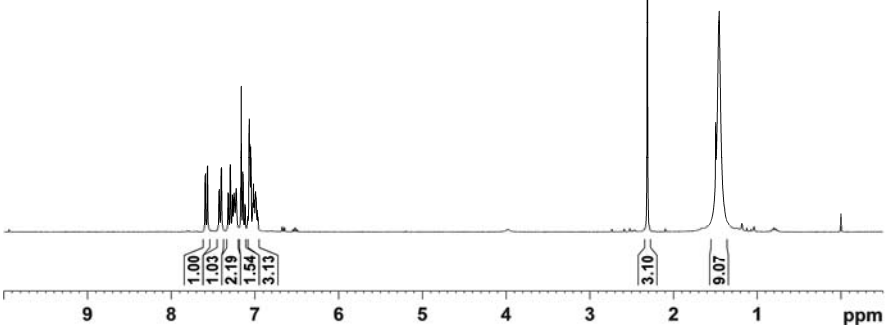
5c

```
Current Data Parameters
NAME          fc21wa415
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120524
Time                4.26
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ            1.9530228 sec
RG                161.3
DW              119.200 usec
DE                 6.50 usec
TE                299.4 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

-------- CHANNEL f1 --------
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300356 MHz
WDW                   EM
SSB                    0
LB                  0.10 Hz
GB                     0
PC                  1.00
```



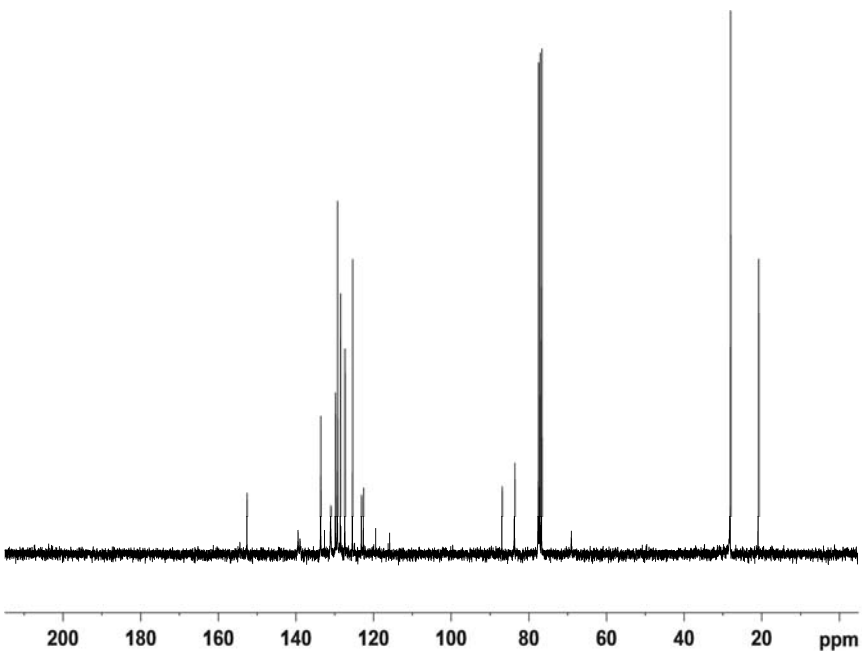

```
Current Data Parameters
NAME          fc21wa415
EXPNO                14
PROCNO                1

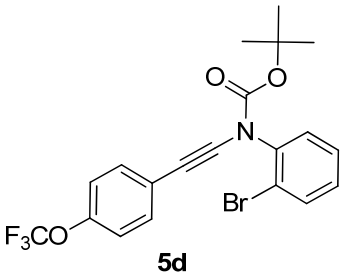
F2 - Acquisition Parameters
Date_           20120524
Time                6.18
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           10115.941 Hz
FIDRES         0.552855 Hz
AQ            0.9044468 sec
RG               1149.4
DW               27.600 usec
DE               10.00 usec
TE               299.2 K
D1            2.00000000 sec
d11           0.03000000 sec
DELTA         1.89999998 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```





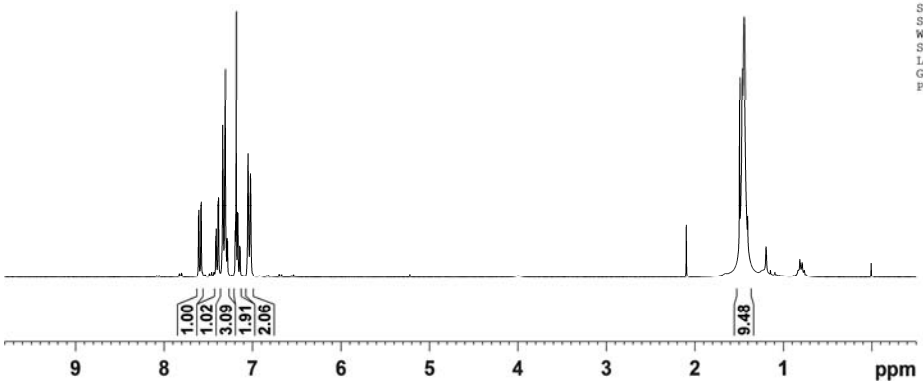
5d

```
Current Data Parameters
NAME          fc21wa419
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120528
Time               14.30
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                 406.4
DW               119.200 usec
DE                  6.50 usec
TE                 300.8 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF           300.1300295 MHz
WDW                   EM
SSB                    0
LB                  0.10 Hz
GB                     0
PC                  1.00
```



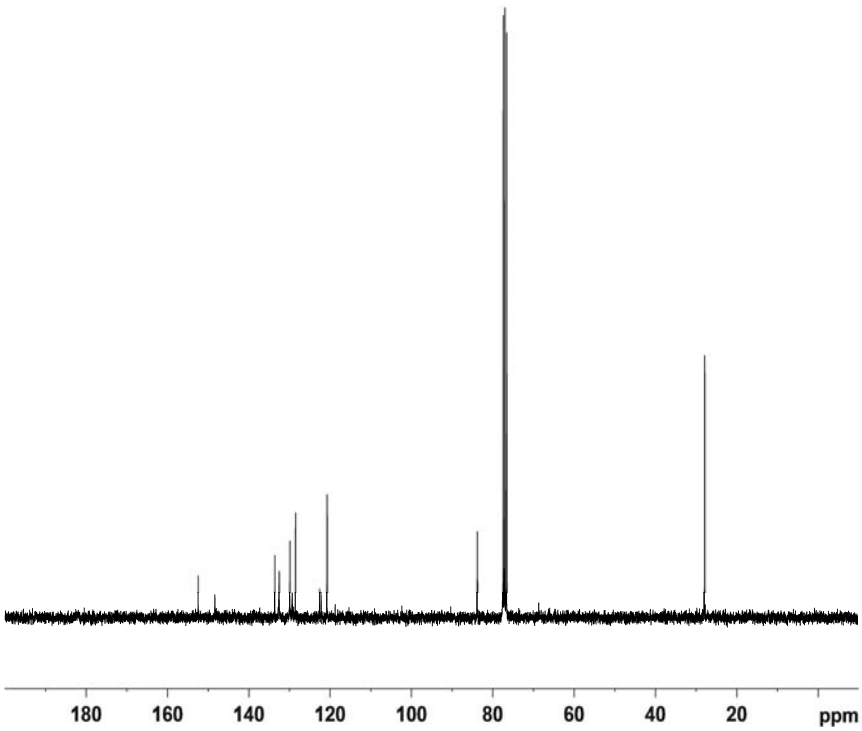

```
Current Data Parameters
NAME          fc21wa419
EXPNO                14
PROCNO                1

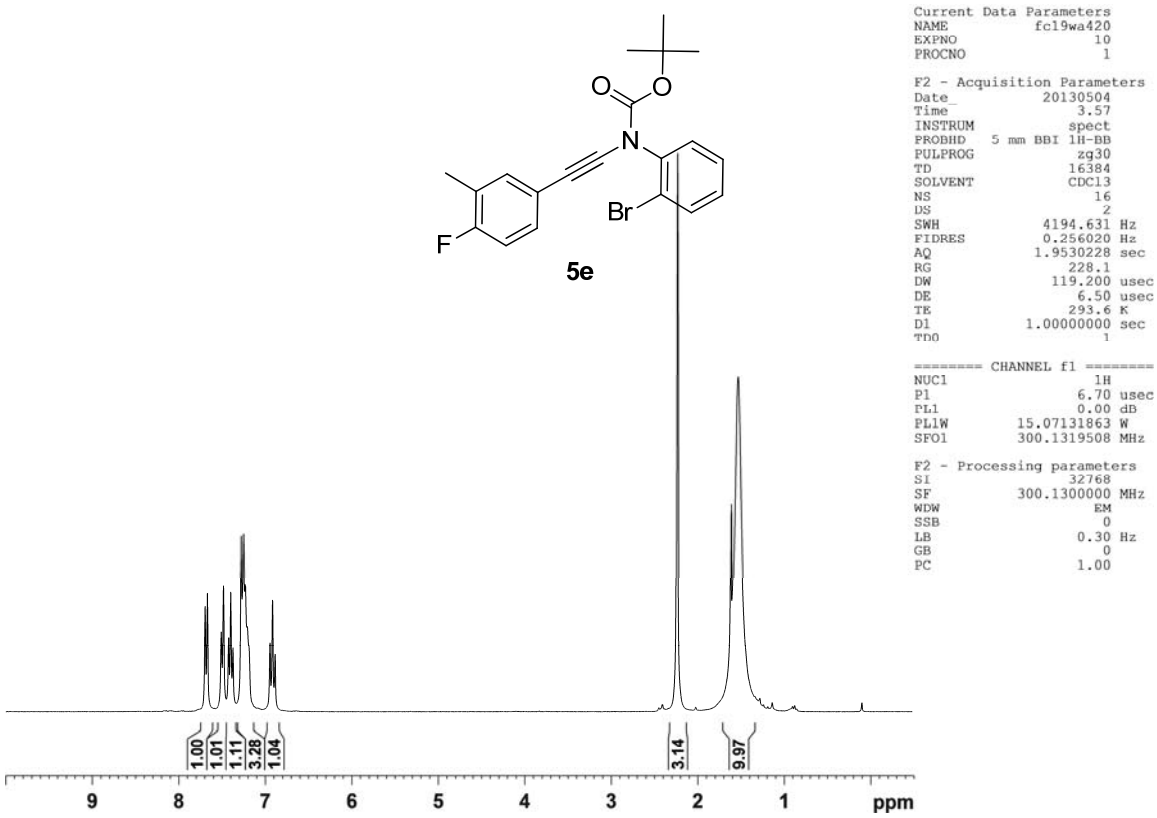
F2 - Acquisition Parameters
Date_           20120528
Time               16.39
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            10115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                1290.2
DW                27.600 usec
DE                 10.00 usec
TE                 301.1 K
D1             3.00000000 sec
d11            0.03000000 sec
DELTA          2.90000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

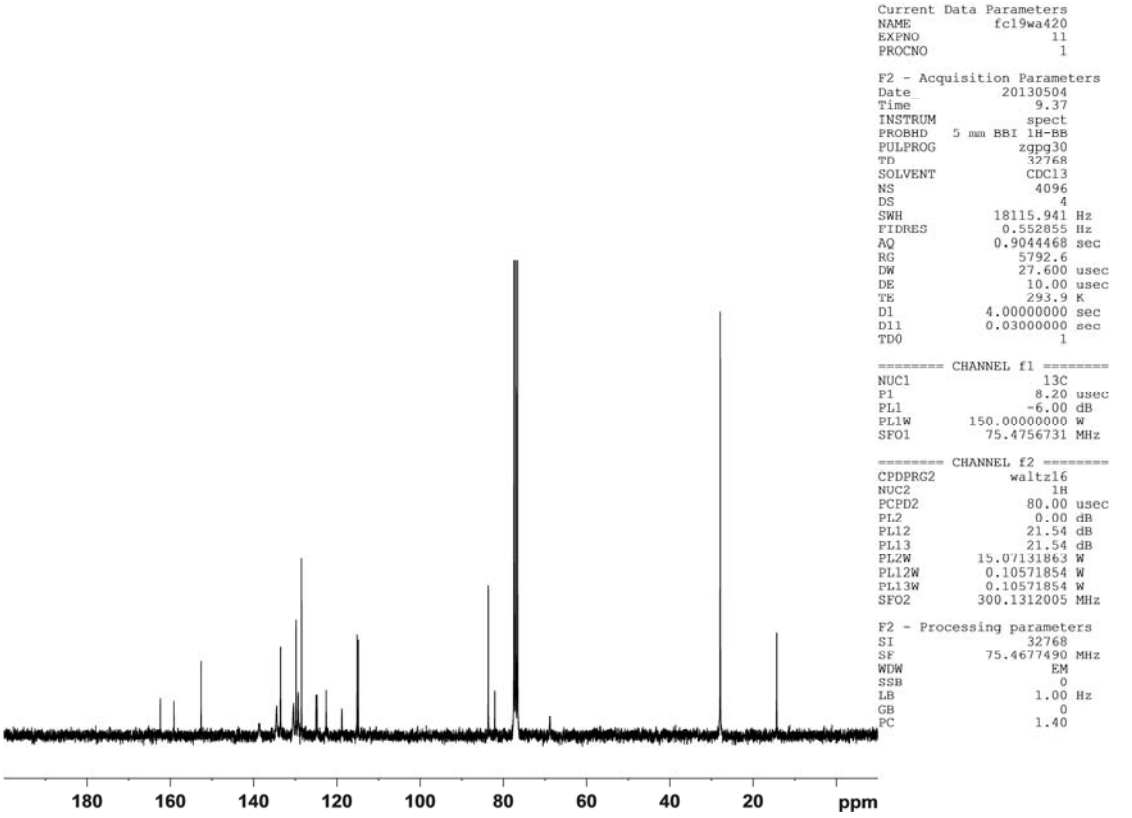
======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1          75.4756731 MHz

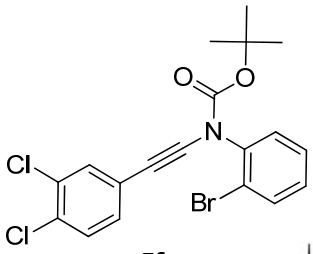
======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

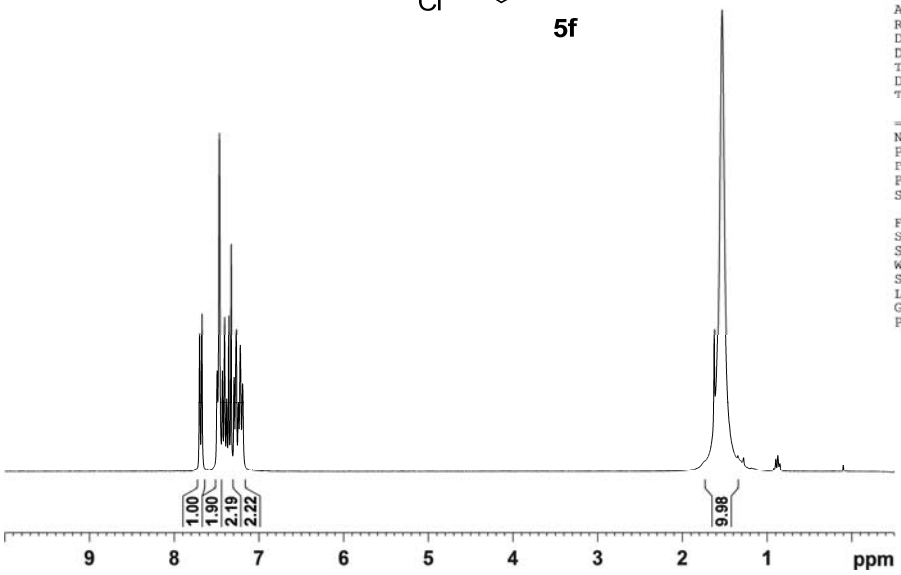



O
O
N
Br
F
5e
Current Data Parameters
NAME fc19wa420
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130504
Time 3.57
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 228.1
DW 119.200 usec
DE 6.50 usec
TE 293.6 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
PL1W 15.07131863 W
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1.00
1.01
1.11
3.28
1.04
3.14
9.97
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME fc19wa420
EXPNO 11
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130504
Time 9.37
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 4096
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 5792.6
DW 27.600 usec
DE 10.00 usec
TE 293.9 K
D1 4.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
PL1W 150.00000000 W
SFO1 75.4756731 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
PL2W 15.07131863 W
PL12W 0.10571854 W
PL13W 0.10571854 W
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
180
160
140
120
100
80
60
40
20
ppm



5f

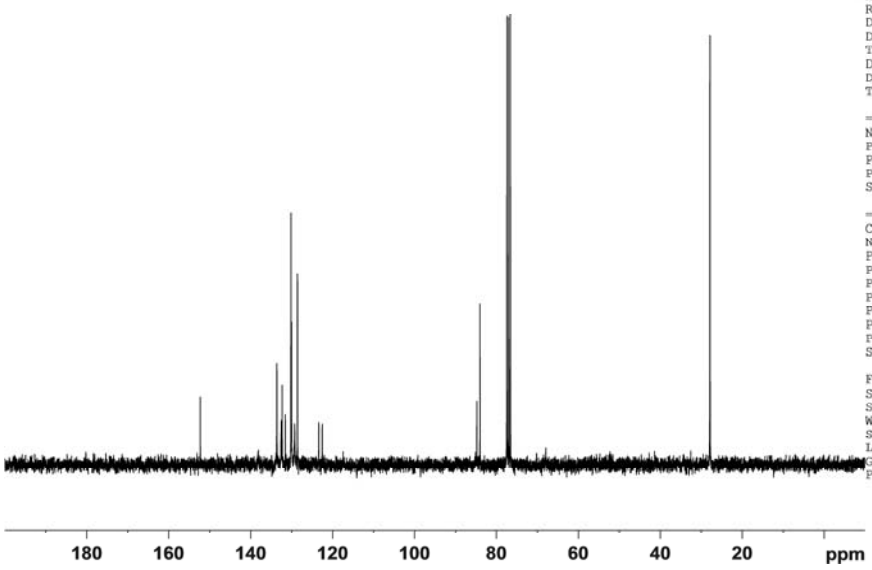



```
Current Data Parameters
NAME            fc19wa669
EXPNO                 300
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130507
Time                 14.01
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG              zg30
TD                  16384
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                 161.3
DW               119.200 usec
DE                  6.50 usec
TE                 293.8 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                   6.70 usec
PL1                  0.00 dB
PL1W        15.07131863 W
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                  32768
SF          300.1300016 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



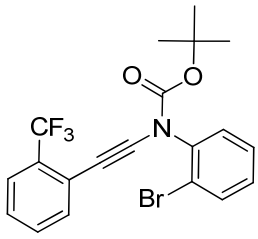

```
Current Data Parameters
NAME            fc19wa669
EXPNO                 301
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130507
Time                 14.04
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zgpg30
TD                  32768
SOLVENT             CDCl3
NS                    512
DS                      4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                 5160.6
DW                 27.600 usec
DE                 10.00 usec
TE                 293.9 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                     1

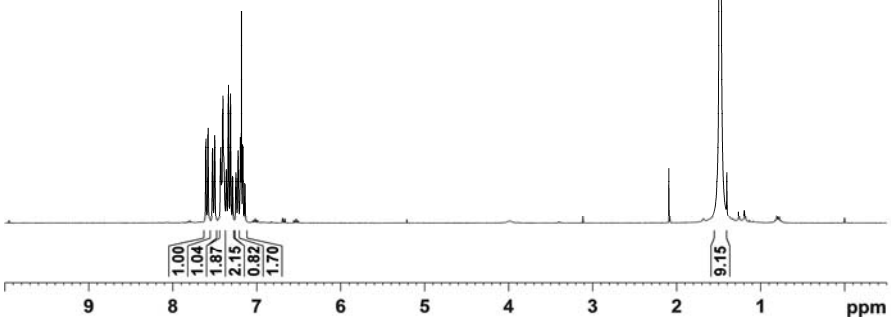
======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF          75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



5g

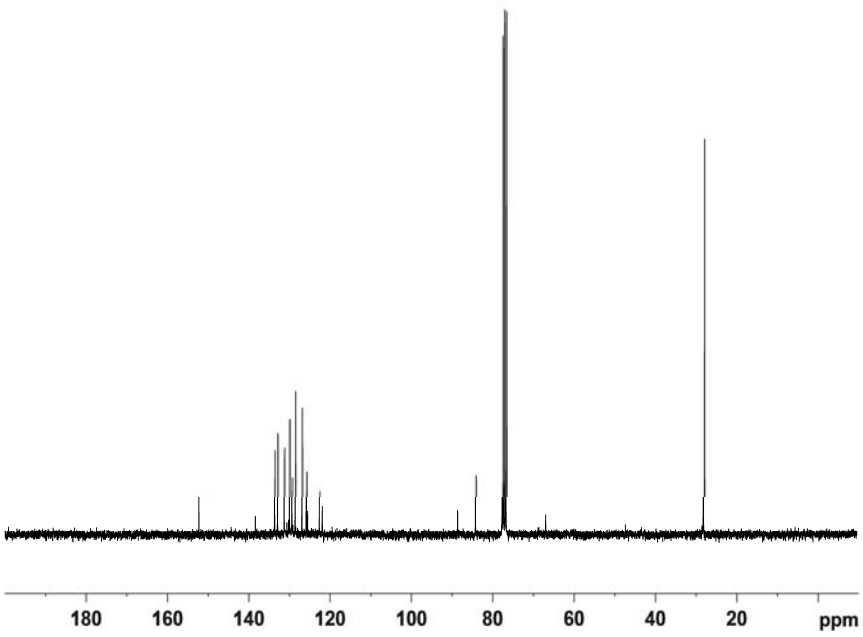



```
Current Data Parameters
NAME          fc21wa416
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120528
Time                9.59
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ            1.9530228 sec
RG                  287.4
DW                119.200 usec
DE                   6.50 usec
TE                  300.4 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

-------- CHANNEL f1 --------
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF           300.1300308 MHz
WDW                   EM
SSB                    0
LB                  0.10 Hz
GB                     0
PC                  1.00
```



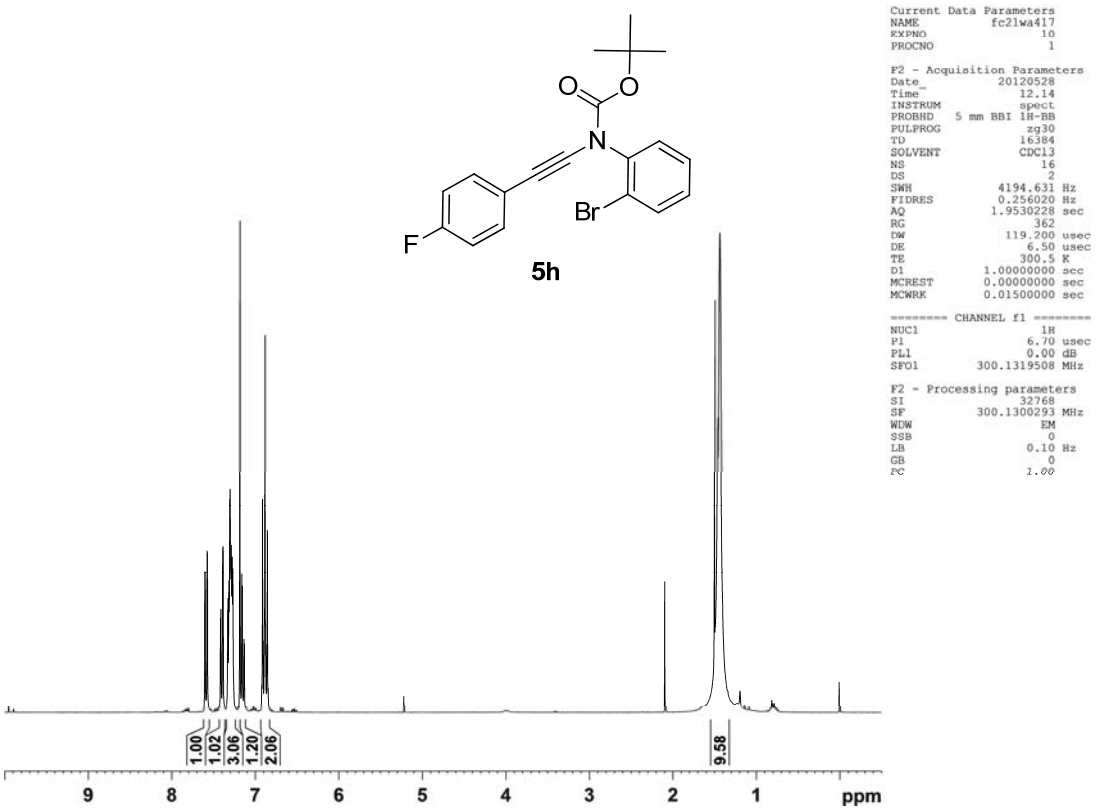

```
Current Data Parameters
NAME          fc21wa416
EXPNO                14
PROCNO                1

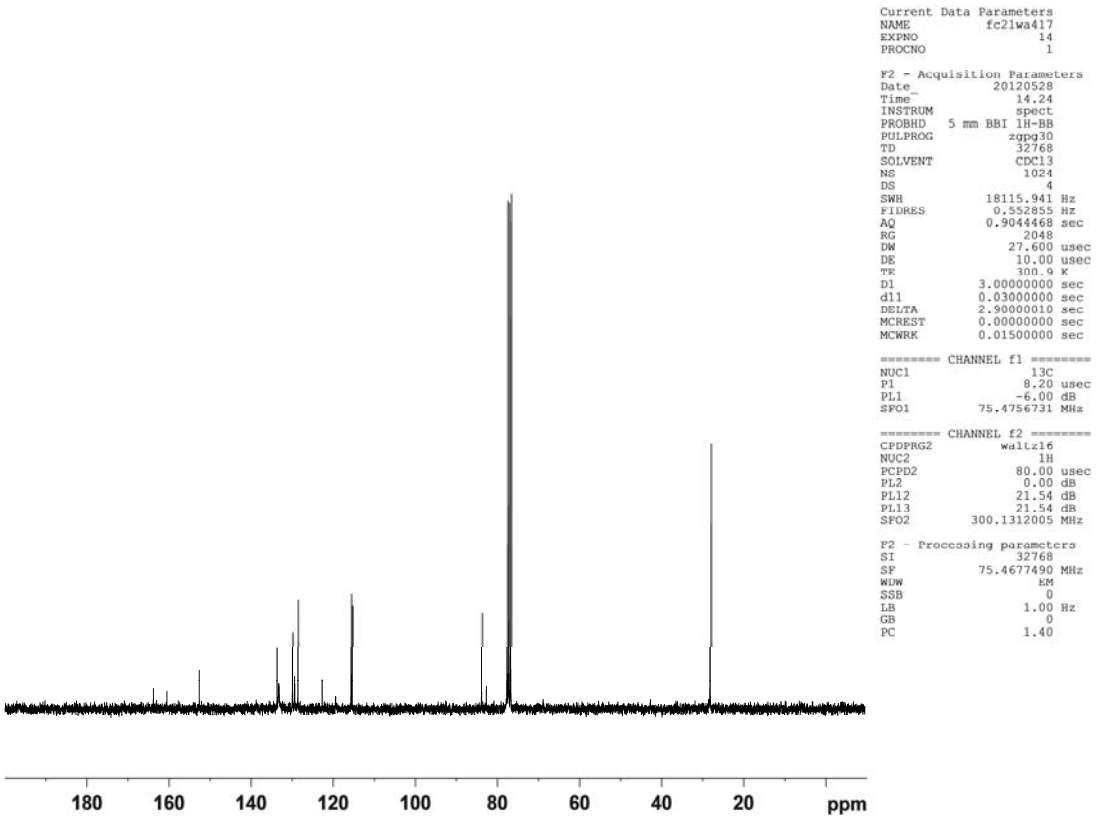
F2 - Acquisition Parameters
Date_           20120528
Time               12.08
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            10115.941 Hz
FIDRES          0.552855 Hz
AQ            0.9044468 sec
RG                  2048
DW                27.600 usec
DE                 10.00 usec
TE                 300.6 K
D1            3.00000000 sec
d11           0.03000000 sec
DELTA         2.90000010 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

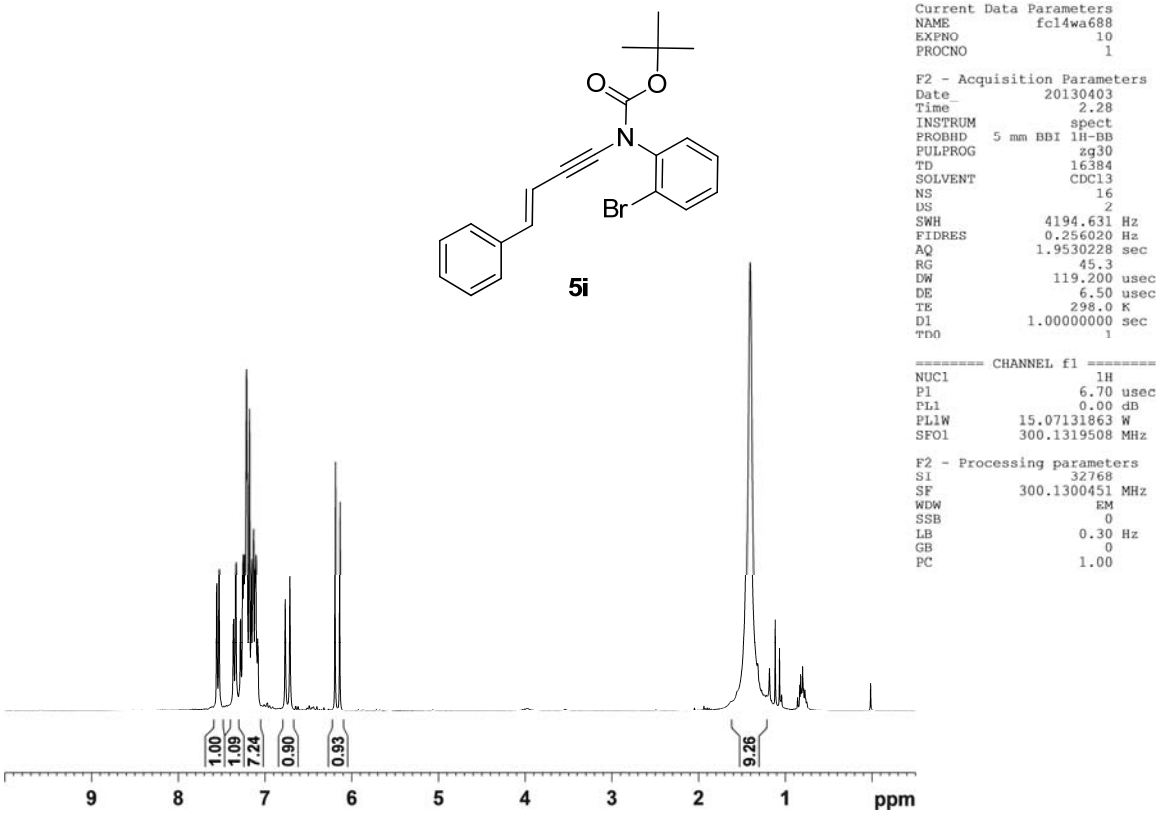
======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1         75.4756731 MHz

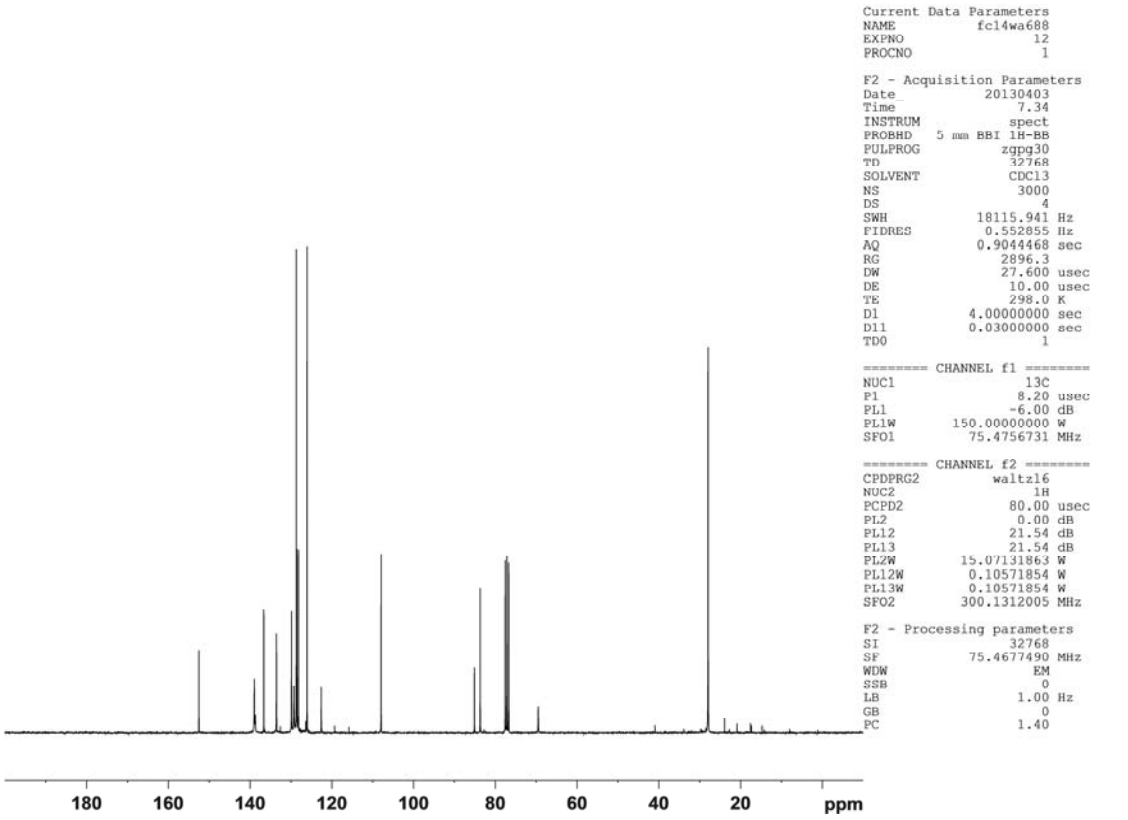
======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2         300.1312005 MHz

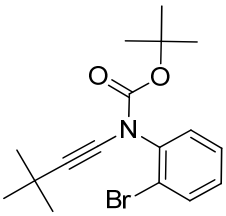
F2 - Processing parameters
SI                 32768
SF           75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```


O
O
N
Br
F
5h
1.00
1.02
3.06
1.20
2.06
9.58
9
8
7
6
5
4
3
2
1
ppm
Current Data Parameters
NAME fc21wa417
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120528
Time 12.14
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 362
DW 119.200 usec
DE 6.50 usec
TE 300.5 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300293 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00

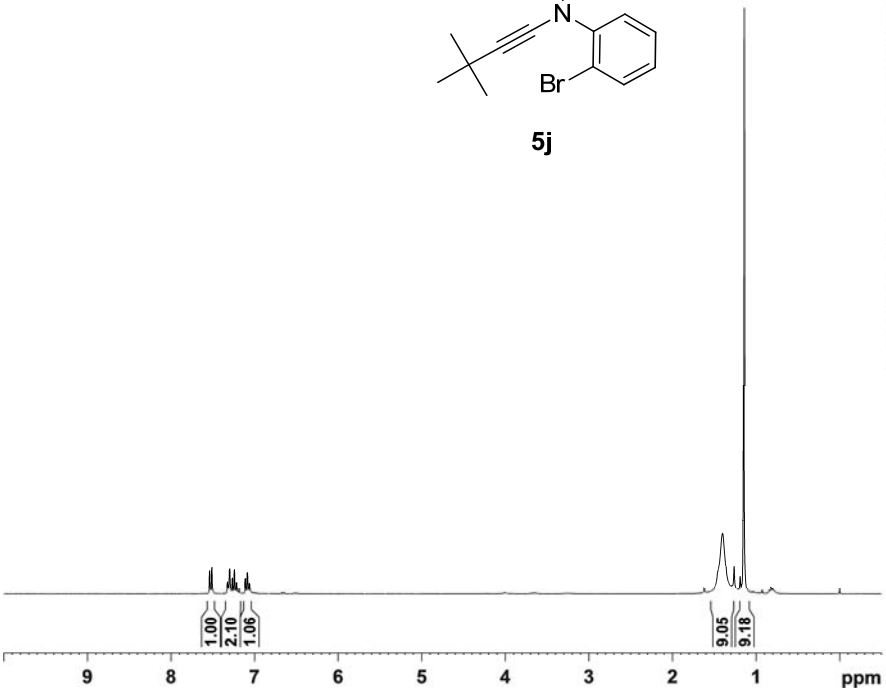

180
160
140
120
100
80
60
40
20
ppm
Current Data Parameters
NAME fc21wa417
EXPNO 14
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120528
Time 14.24
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1024
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 2048
DW 27.600 usec
DE 10.00 usec
TE 300.9 K
D1 3.00000000 sec
d11 0.03000000 sec
DELTA 2.90000010 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
SFO1 75.4756731 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40


5i
Current Data Parameters
NAME fcl4wa688
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130403
Time 2.28
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 45.3
DW 119.200 usec
DE 6.50 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
PL1W 15.07131863 W
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300451 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1.00
1.09
7.24
0.90
0.93
9.26
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME fcl4wa688
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130403
Time 7.34
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 3000
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 2896.3
DW 27.600 usec
DE 10.00 usec
TE 298.0 K
D1 4.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
PL1W 150.00000000 W
SFO1 75.4756731 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
PL2W 15.07131863 W
PL12W 0.10571854 W
PL13W 0.10571854 W
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
180
160
140
120
100
80
60
40
20
ppm



5j

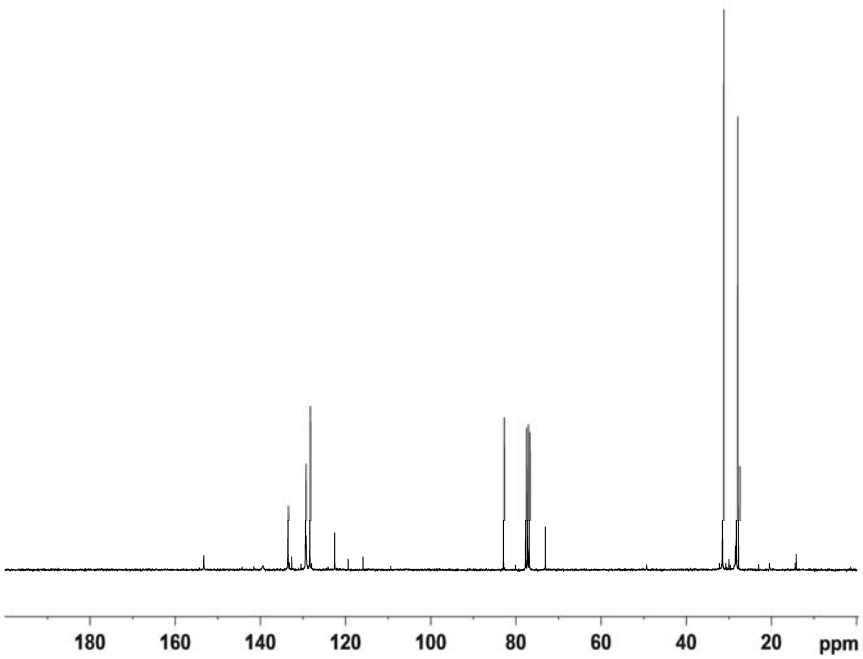



```
Current Data Parameters
NAME          fc07wa638-3
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20130214
Time                 18.59
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               4194.631 Hz
FIDRES            0.256020 Hz
AQ               1.9530228 sec
RG                    35.9
DW                 119.200 usec
DE                    6.50 usec
TE                   298.0 K
D1               1.00000000 sec
MCREST           0.00000000 sec
MCWRK            0.01500000 sec

======== CHANNEL f1 ========
NUC1                     1H
P1                     6.70 usec
PL1                    0.00 dB
SFO1           300.1319508 MHz

F2 - Processing parameters
SI                    32768
SF             300.1300289 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



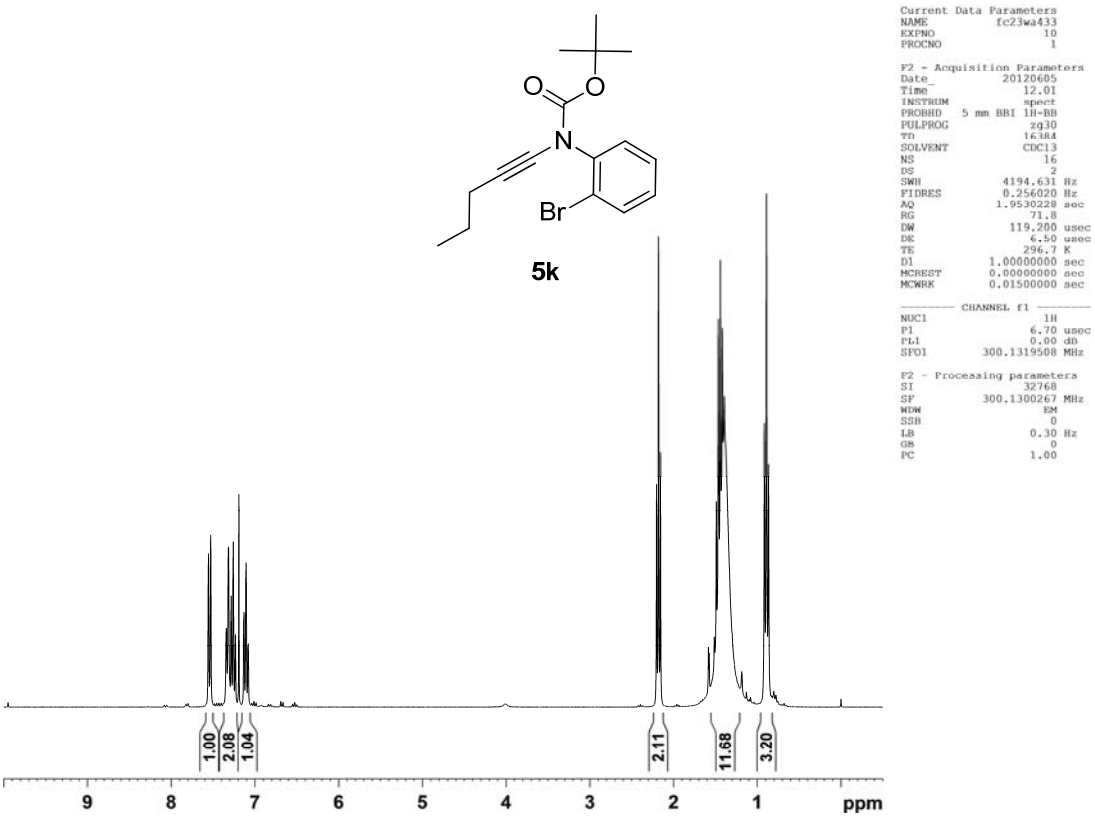

```
Current Data Parameters
NAME          fc07wa638-3
EXPNO                  14
PROCNO                  1

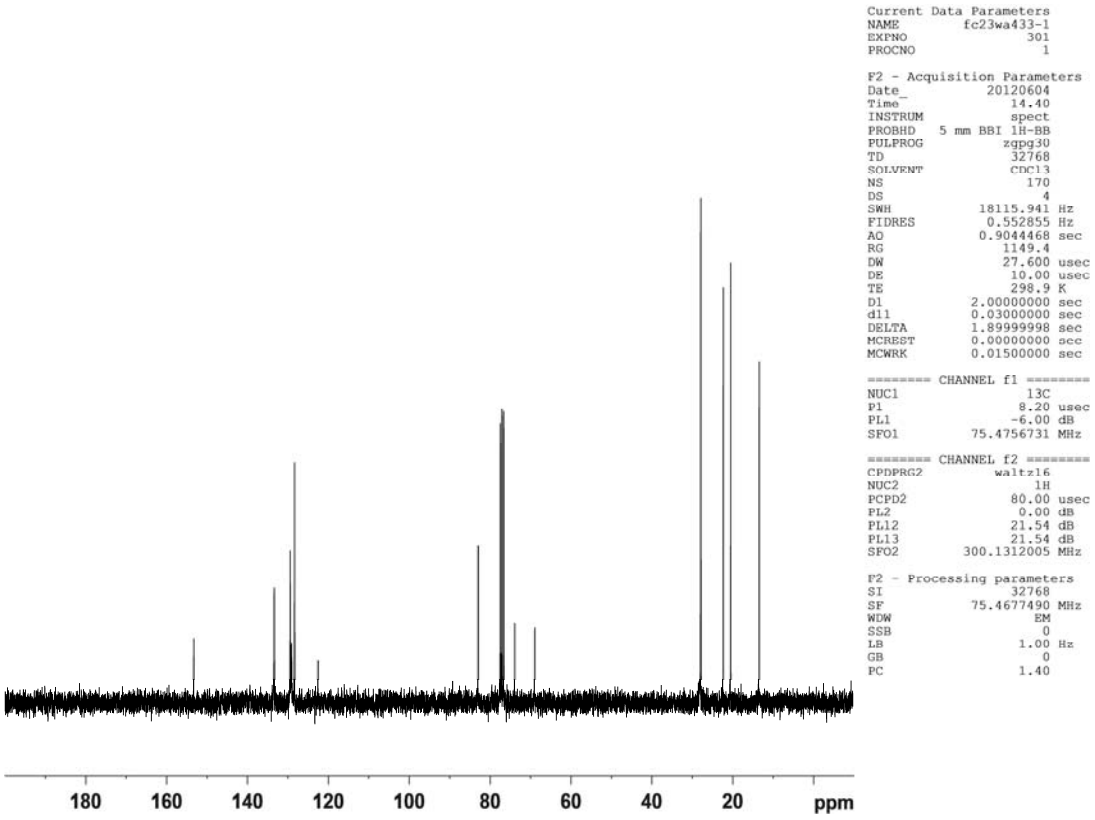
F2 - Acquisition Parameters
Date_            20130214
Time                 22.16
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    2048
DS                       4
SWH              10115.941 Hz
FIDRES            0.552855 Hz
AQ               0.9044468 sec
RG                  1448.2
DW                 27.600 usec
DE                  10.00 usec
TE                  298.0 K
D1               3.00000000 sec
d11              0.03000000 sec
DELTA            2.90000010 sec
MCREST           0.00000000 sec
MCWRK            0.01500000 sec

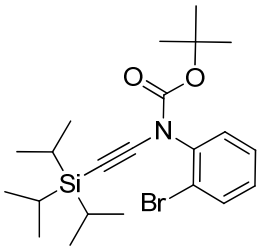
======== CHANNEL f1 ========
NUC1                    13C
P1                     8.20 usec
PL1                   -6.00 dB
SFO1           75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                    0.00 dB
PL12                  21.54 dB
PL13                  21.54 dB
SFO2           300.1312005 MHz

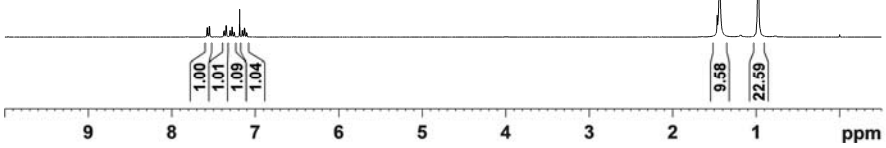
F2 - Processing parameters
SI                    32768
SF             75.4677490 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```


Current Data Parameters
NAME fc23wa433
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120605
Time 12.01
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 71.8
DW 119.200 usec
DE 6.50 usec
TE 296.7 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
CHANNEL f1
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300267 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
O
O
N
Br
5k
1.00
2.08
1.04
2.11
11.68
3.20
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME fc23wa433-1
EXPNO 301
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120604
Time 14.40
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 170
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 1149.4
DW 27.600 usec
DE 10.00 usec
TE 298.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
CHANNEL f1
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
SFO1 75.4756731 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
180
160
140
120
100
80
60
40
20
ppm



5l

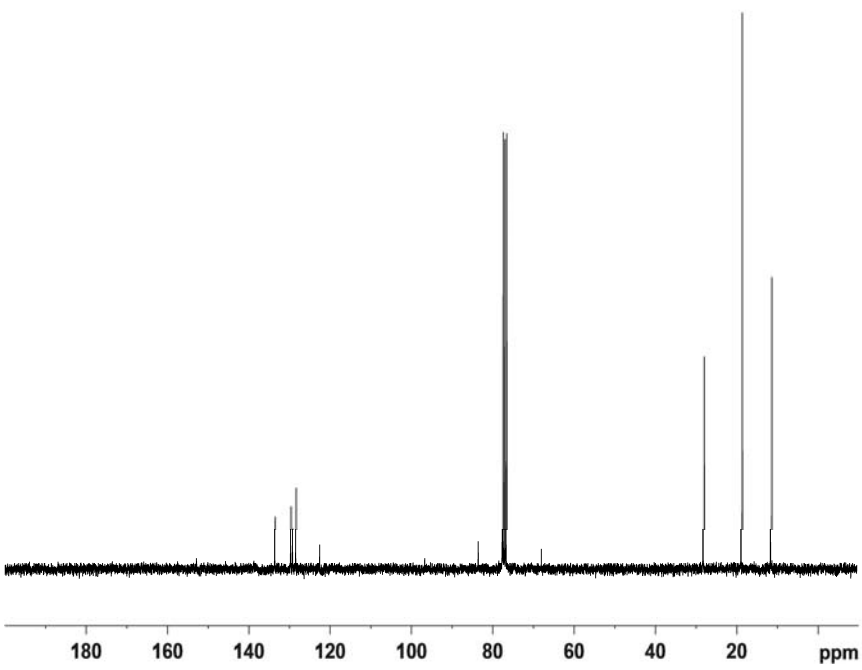



```
Current Data Parameters
NAME          fc27wa453
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120703
Time               18.10
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG               203.2
DW             119.200 usec
DE                6.50 usec
TE               301.2 K
D1           1.00000000 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

-------- CHANNEL f1 --------
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300284 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



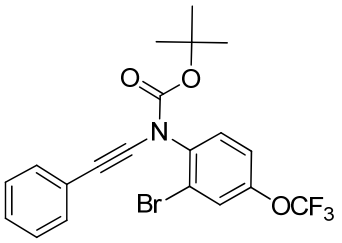

```
Current Data Parameters
NAME          fc27wa453
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20120703
Time               20.02
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           10115.941 Hz
FIDRES         0.552855 Hz
AQ            0.9044468 sec
RG               2048
DW              27.600 usec
DE              10.00 usec
TE              301.5 K
D1           2.00000000 sec
d11          0.03000000 sec
DELTA        1.89999998 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

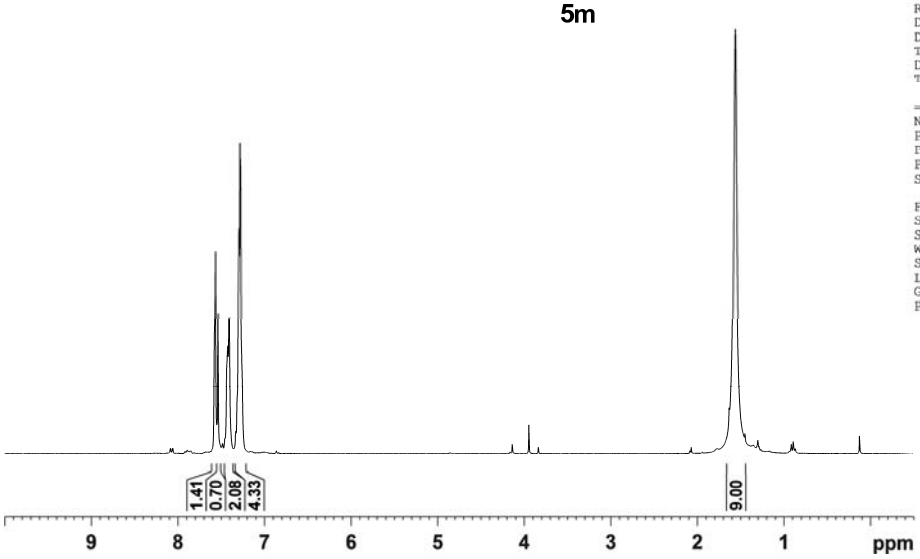
======== CHANNEL f1 ========
NUC1                13C
P1                 8.20 usec
PL1               -6.00 dB
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



5m

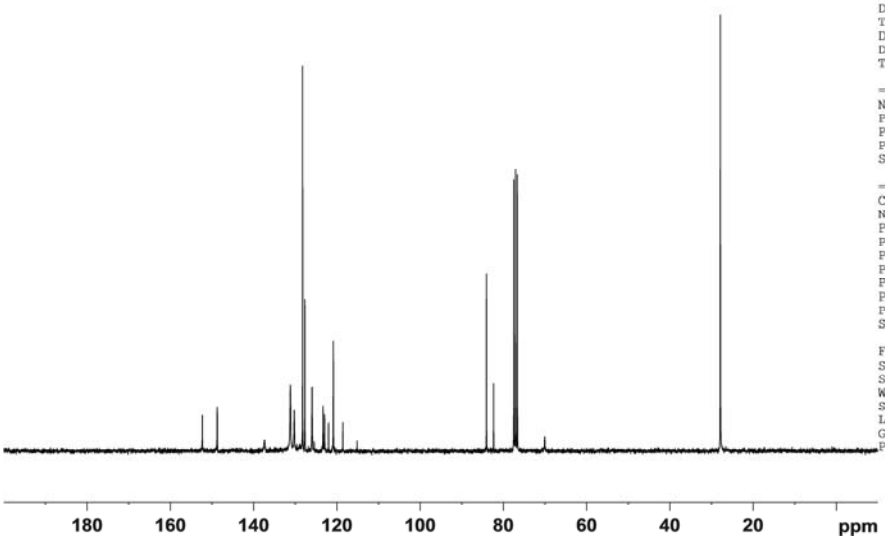



```
Current Data Parameters
NAME            fc12wa668
EXPNO                 300
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130319
Time                 18.21
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG              zg30
TD                  16384
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ            1.9530228 sec
RG                   90.5
DW                119.200 usec
DE                   6.50 usec
TE                  298.0 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                   6.70 usec
PL1                  0.00 dB
PL1W        15.07131863 W
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                  32768
SF          300.1300016 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



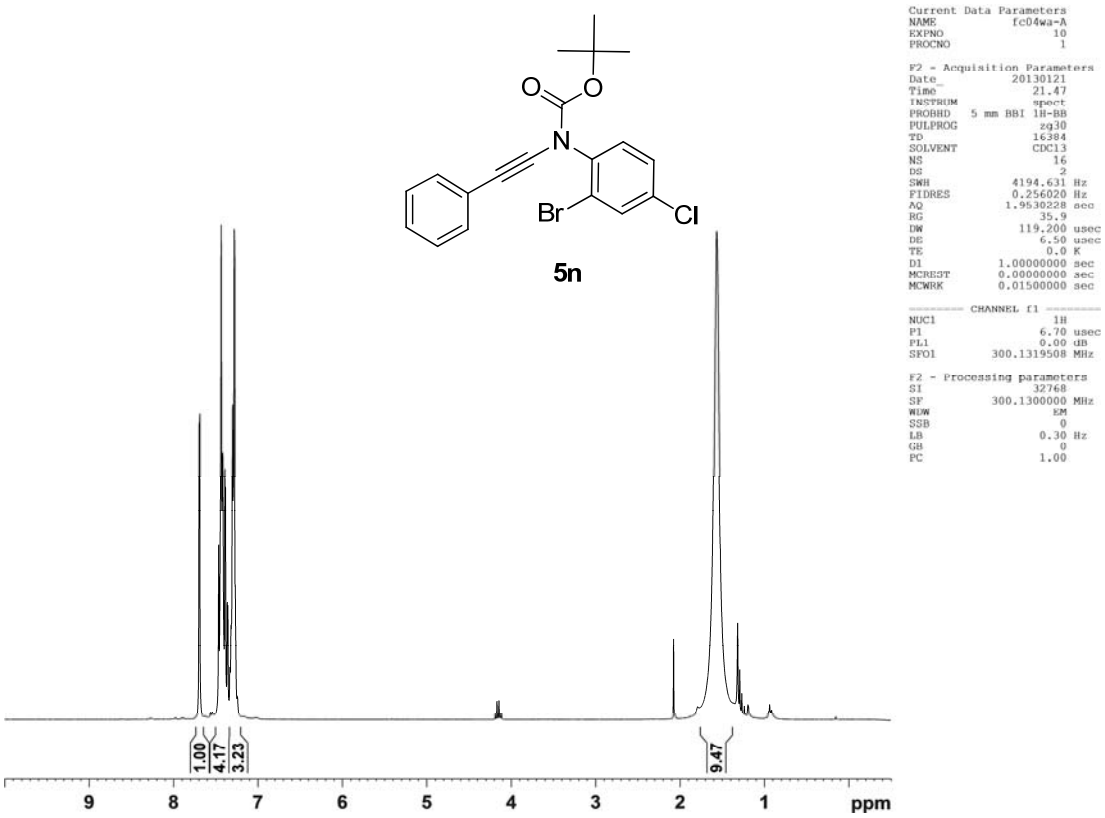

```
Current Data Parameters
NAME            fc18wa668
EXPNO                  10
PROCNO                  1

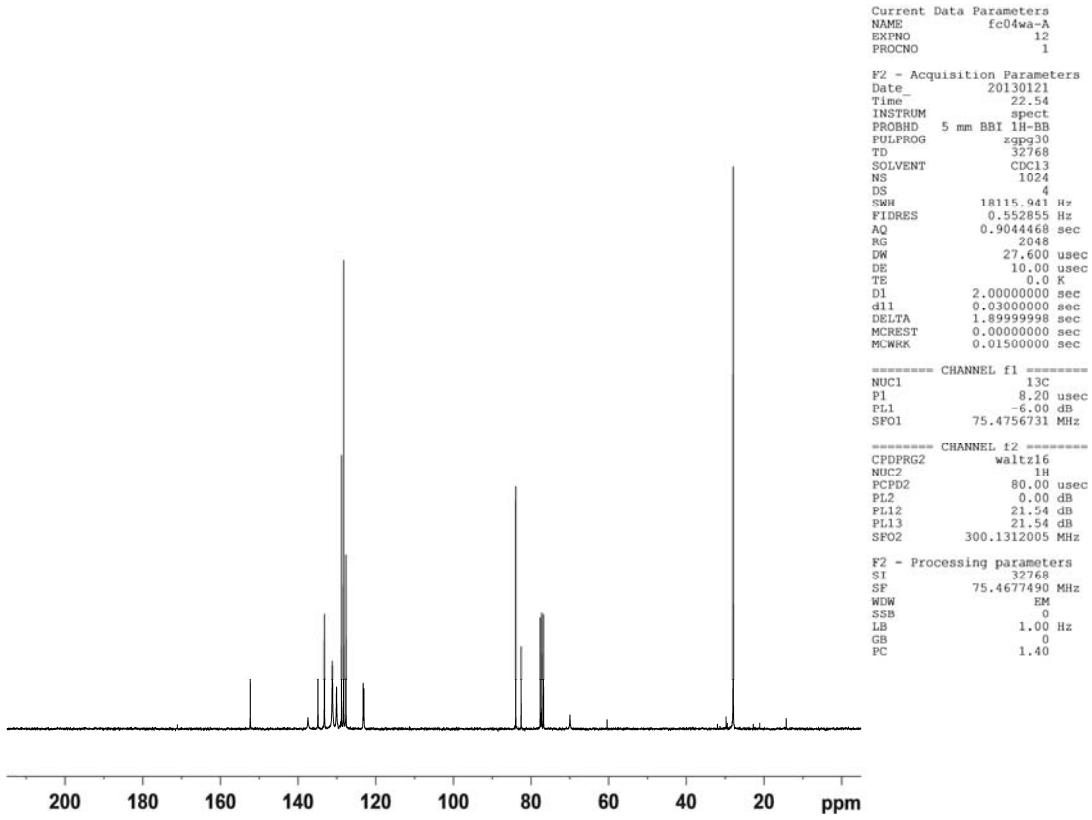
F2 - Acquisition Parameters
Date_             20130506
Time                  8.27
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zgpg30
TD                  32768
SOLVENT             CDCl3
NS                   1585
DS                      4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ            0.9044468 sec
RG                 5792.6
DW                 27.600 usec
DE                  10.00 usec
TE                  293.9 K
D1            4.00000000 sec
D11           0.03000000 sec
TD0                     1

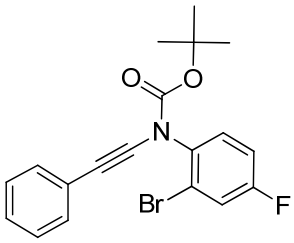
======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2        300.1312005 MHz

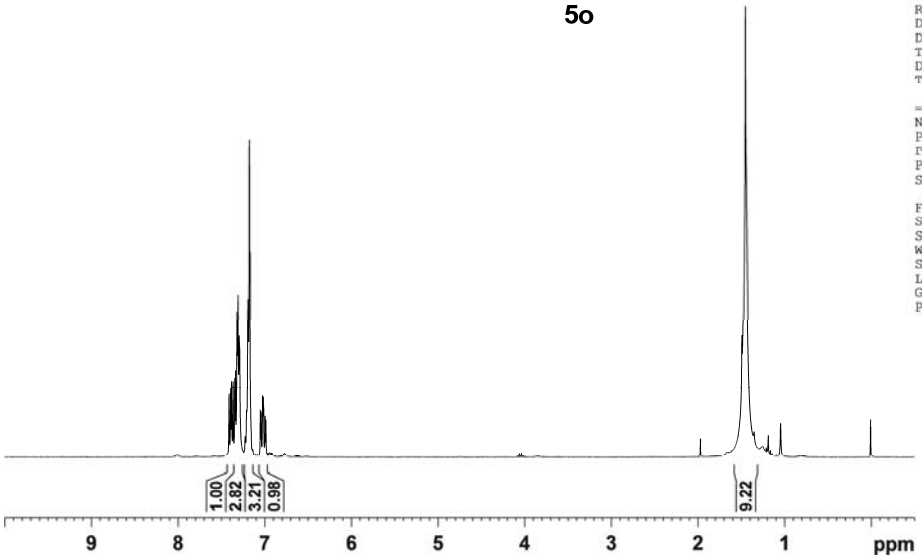
F2 - Processing parameters
SI                  32768
SF          75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```


Current Data Parameters
NAME fc04wa-A
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130121
Time 21.47
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 4194.631 Hz
FIDRES 0.256020 Hz
AQ 1.9530228 sec
RG 35.9
DW 119.200 usec
DE 6.50 usec
TE 0.0 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 6.70 usec
PL1 0.00 dB
SFO1 300.1319508 MHz
F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
O
O
N
Br
Cl
5n
1.00
4.17
3.23
9.47
9
8
7
6
5
4
3
2
1
ppm


Current Data Parameters
NAME fc04wa-A
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130121
Time 22.54
INSTRUM spect
PROBHD 5 mm BBI 1H-BB
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1024
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 2048
DW 27.600 usec
DE 10.00 usec
TE 0.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 8.20 usec
PL1 -6.00 dB
SFO1 75.4756731 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 21.54 dB
PL13 21.54 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677490 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
200
180
160
140
120
100
80
60
40
20
ppm



5o

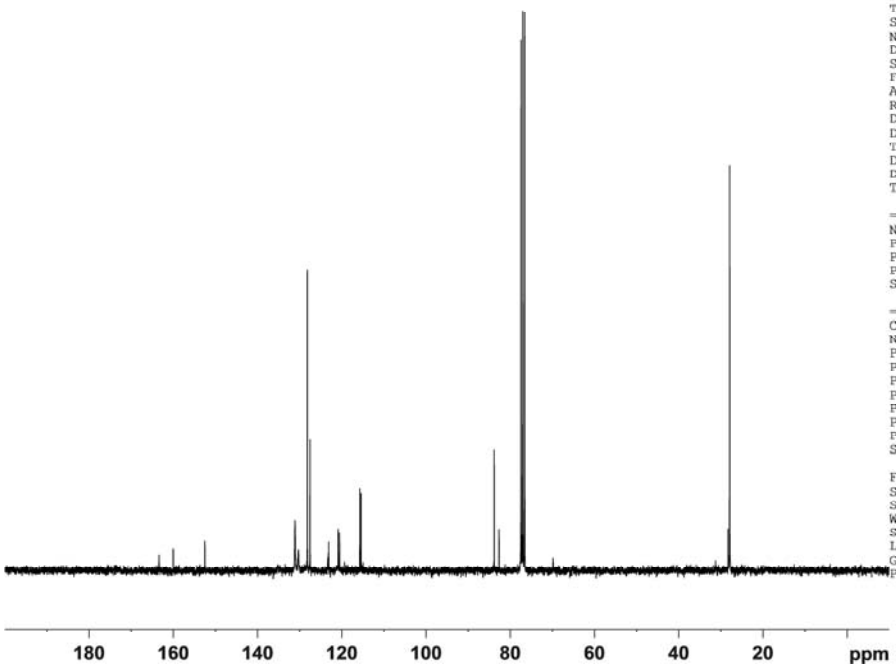



```
Current Data Parameters
NAME            fc13wa663
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130327
Time                  2.50
INSTRUM              spect
PROBHD   5 mm DBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ            1.9530228 sec
RG                  228.1
DW                119.200 usec
DE                   6.50 usec
TE                  298.0 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                   6.70 usec
PL1                  0.00 dB
PL1W        15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                   32768
SF            300.1300303 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```



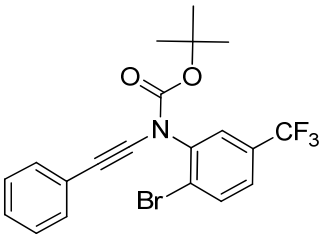

```
Current Data Parameters
NAME            fc13wa663
EXPNO                  14
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130327
Time                  6.06
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    2048
DS                       4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ            0.9044468 sec
RG                 2896.3
DW                 27.600 usec
DE                  10.00 usec
TE                  298.0 K
D1            3.00000000 sec
D11           0.03000000 sec
TD0                     1

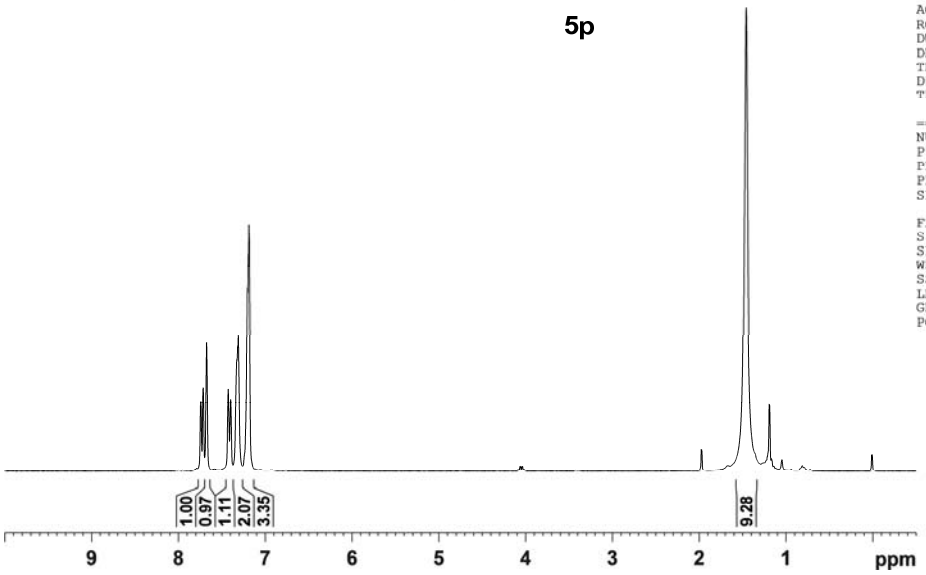
======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                   32768
SF           75.4677490 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```



5p

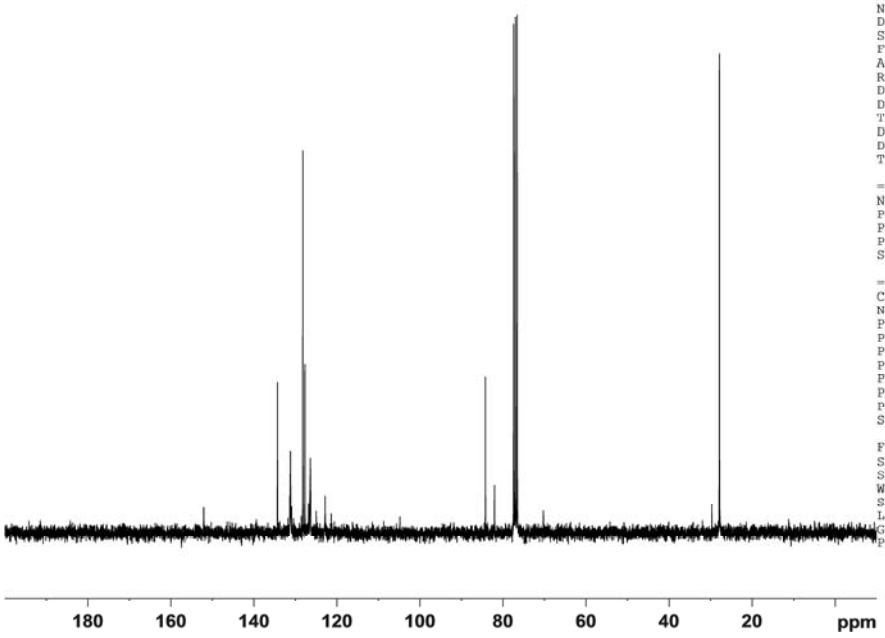



```
Current Data Parameters
NAME          fc12wa667
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130321
Time              19.38
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG               228.1
DW             119.200 usec
DE               6.50 usec
TE              298.0 K
D1          1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
PL1W        15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300305 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



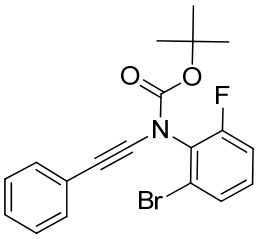

```
Current Data Parameters
NAME          fc12wa667
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20130321
Time              21.30
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ           0.9044468 sec
RG                 3251
DW              27.600 usec
DE              10.00 usec
TE              298.0 K
D1          2.00000000 sec
D11         0.03000000 sec
TD0                   1

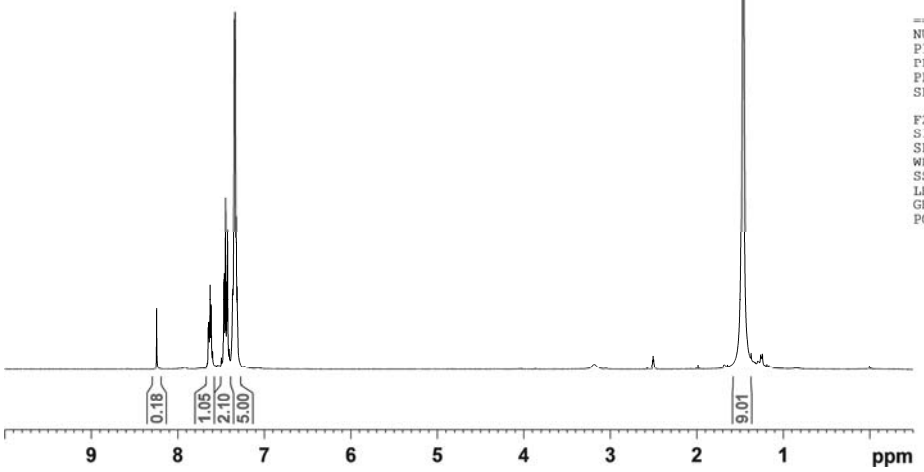
======== CHANNEL f1 ========
NUC1                 13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W       150.00000000 W
SFO1        75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



5q

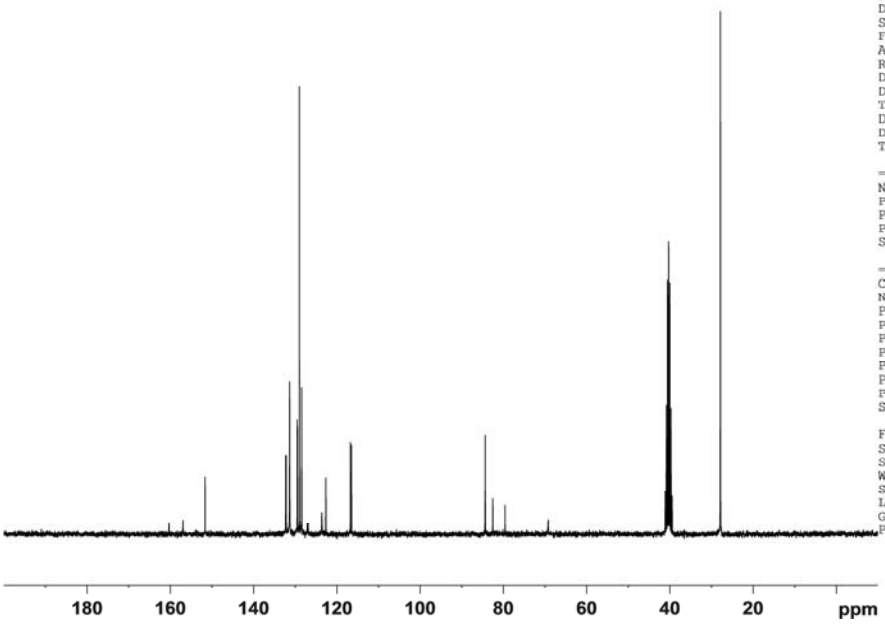



```
Current Data Parameters
NAME        fc15wa664dmso
EXPNO                 302
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130409
Time                 13.57
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT               DMSO
NS                        4
DS                        2
SWH               4194.631 Hz
FIDRES            0.256020 Hz
AQ              1.9530228 sec
RG                     90.5
DW                  119.200 usec
DE                     6.50 usec
TE                    323.1 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                     6.70 usec
PL1                    0.00 dB
PL1W          15.07131863 W
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                    32768
SF            300.1300016 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



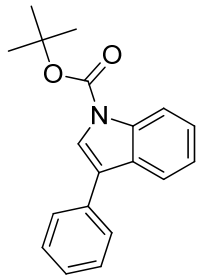

```
Current Data Parameters
NAME        fc15wa664dmso
EXPNO                 303
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130409
Time                 14.02
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG             zgpg30
TD                   32768
SOLVENT               DMSO
NS                     1280
DS                        4
SWH              18115.941 Hz
FIDRES            0.552855 Hz
AQ              0.9044468 sec
RG                     2048
DW                  27.600 usec
DE                   10.00 usec
TE                   323.1 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

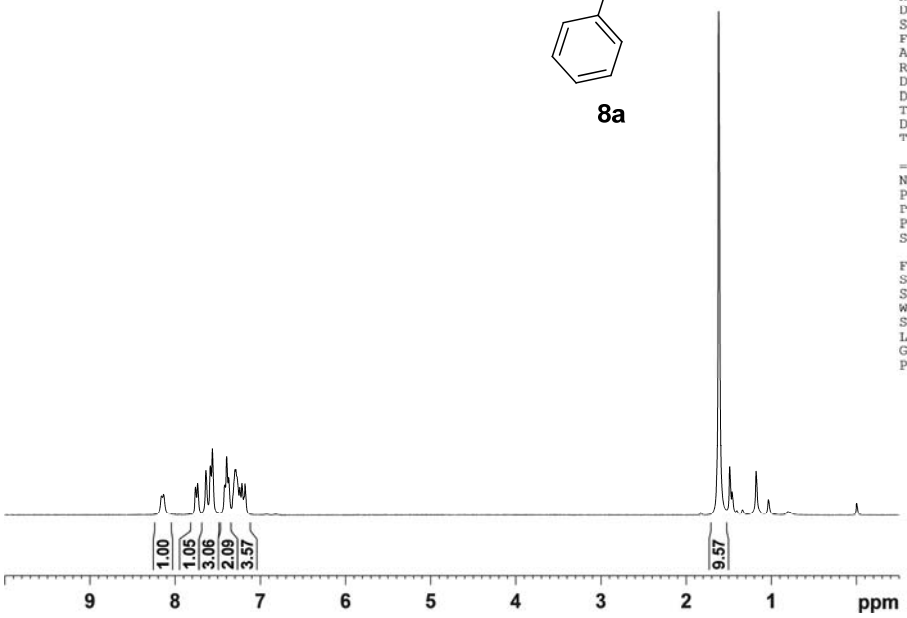
======== CHANNEL f1 ========
NUC1                     13C
P1                     8.20 usec
PL1                   -6.00 dB
PL1W         150.00000000 W
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                    0.00 dB
PL12                  21.54 dB
PL13                  21.54 dB
PL2W          15.07131863 W
PL12W          0.10571854 W
PL13W          0.10571854 W
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                    32768
SF             75.4677490 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```



8a

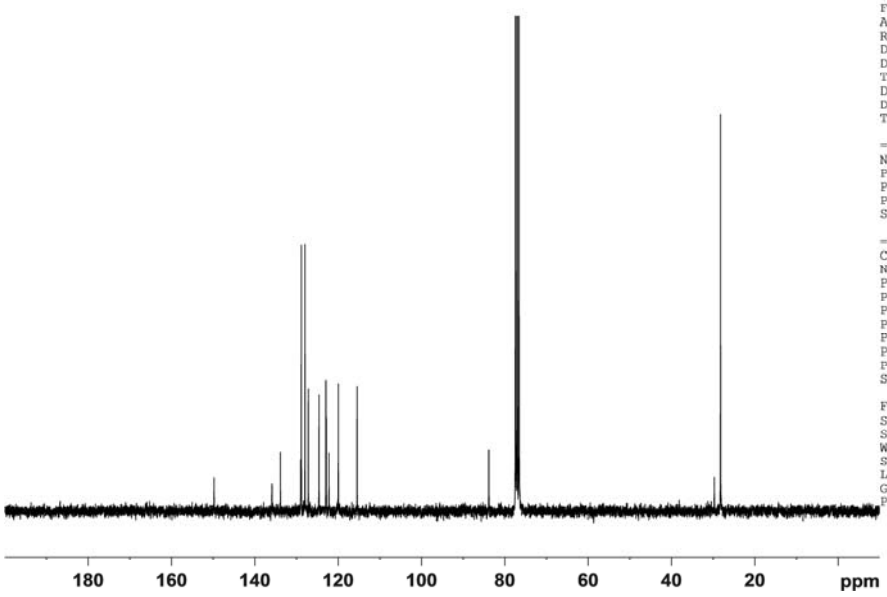



```
Current Data Parameters
NAME          fc19wa454-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130504
Time                  9.43
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               4194.631 Hz
FIDRES            0.256020 Hz
AQ               1.9530228 sec
RG                   322.5
DW                 119.200 usec
DE                    6.50 usec
TE                   293.7 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                    1H
P1                    6.70 usec
PL1                   0.00 dB
PL1W          15.07131863 W
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                   32768
SF            300.1300314 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```



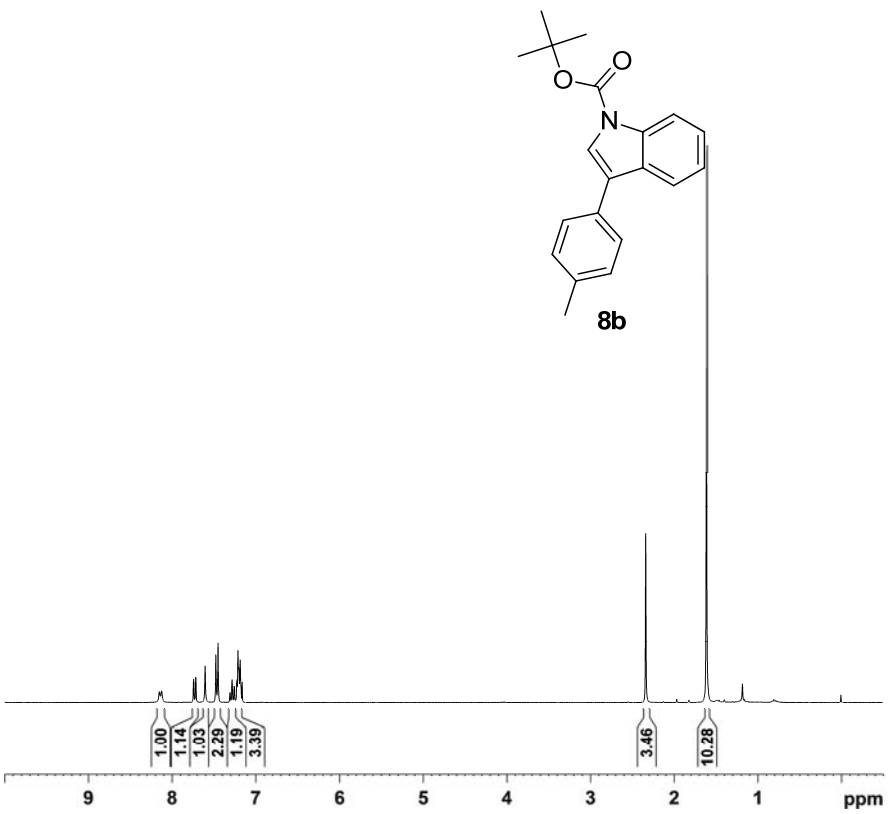

```
Current Data Parameters
NAME          fc19wa454-1
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130504
Time                 15.23
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG            zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    4096
DS                       4
SWH              18115.941 Hz
FIDRES            0.552855 Hz
AQ               0.9044468 sec
RG                  5792.6
DW                  27.600 usec
DE                   10.00 usec
TE                   294.1 K
D1              4.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.20 usec
PL1                  -6.00 dB
PL1W         150.00000000 W
SFO1           75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                   0.00 dB
PL12                 21.54 dB
PL13                 21.54 dB
PL2W          15.07131863 W
PL12W          0.10571854 W
PL13W          0.10571854 W
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                   32768
SF            75.4677490 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

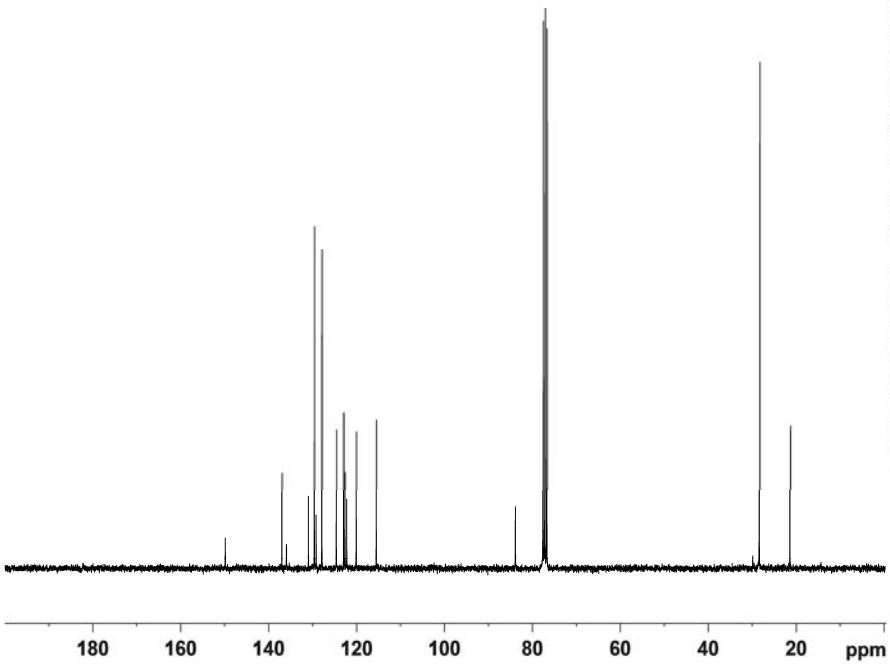



```
Current Data Parameters
NAME          fc04wa617
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130125
Time               18.44
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                   181
DW              119.200 usec
DE                6.50 usec
TE                 0.0 K
D1           1.00000000 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300360 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



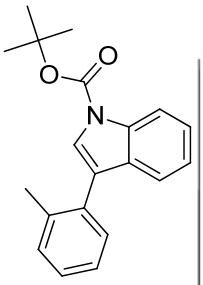

```
Current Data Parameters
NAME          fc04wa617
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20130125
Time               22.01
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  2048
DS                     4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                  2048
DW               27.600 usec
DE               10.00 usec
TE                 0.0 K
D1           3.00000000 sec
d11          0.03000000 sec
DELTA        2.90000010 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



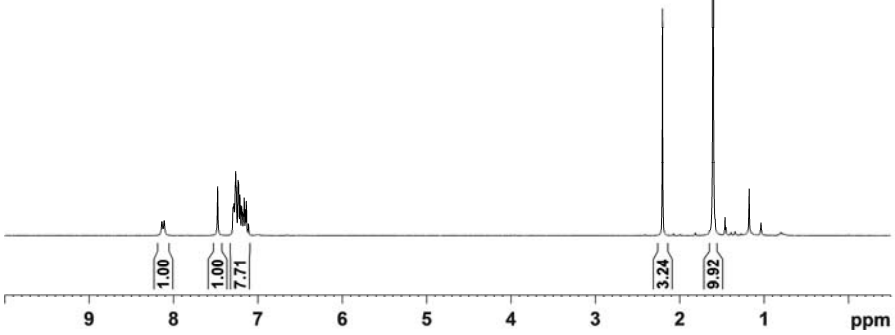
8c

```
Current Data Parameters
NAME          fc27wa460-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20120708
Time                 1.59
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG              zg30
TD                  16384
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                    114
DW               119.200 usec
DE                  6.50 usec
TE                 301.3 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   6.70 usec
PL1                  0.00 dB
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300401 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



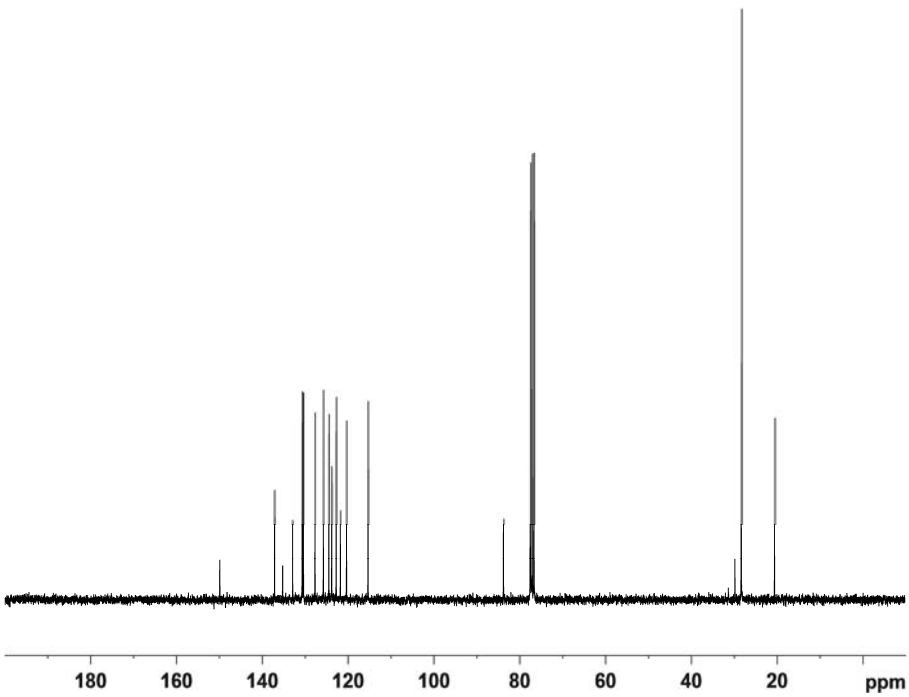

```
Current Data Parameters
NAME          fc27wa460-1
EXPNO                  14
PROCNO                  1

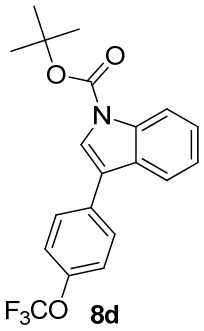
F2 - Acquisition Parameters
Date_            20120708
Time                 4.08
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zgpg30
TD                  32768
SOLVENT             CDCl3
NS                    1024
DS                       4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                    2048
DW               27.600 usec
DE                  10.00 usec
TE                 301.4 K
D1             3.00000000 sec
d11            0.03000000 sec
DELTA          2.90000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
SFO1           75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF             75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



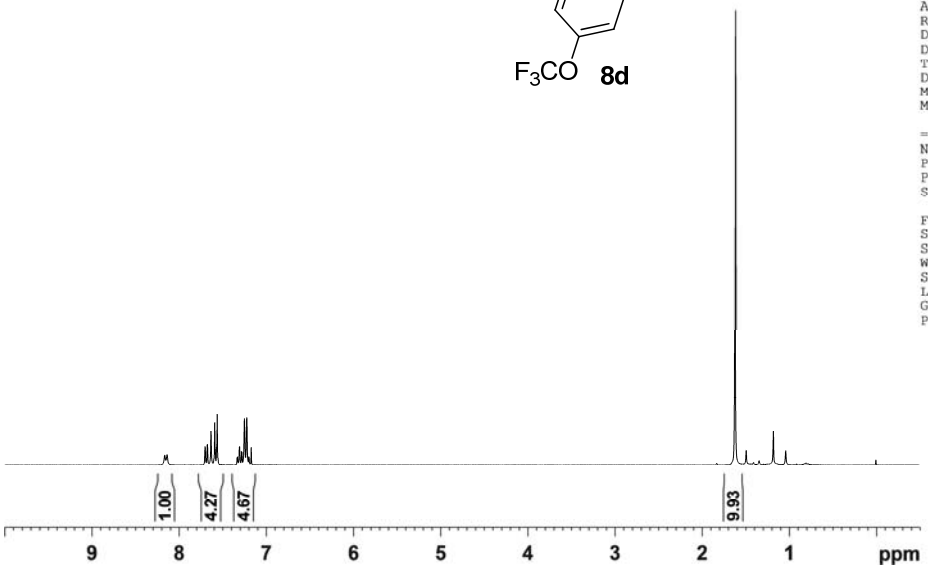



```
Current Data Parameters
NAME          fc37wa463
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_             20120913
Time                  3.31
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                 203.2
DW               119.200 usec
DE                  6.50 usec
TE                 294.6 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF            300.1300328 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



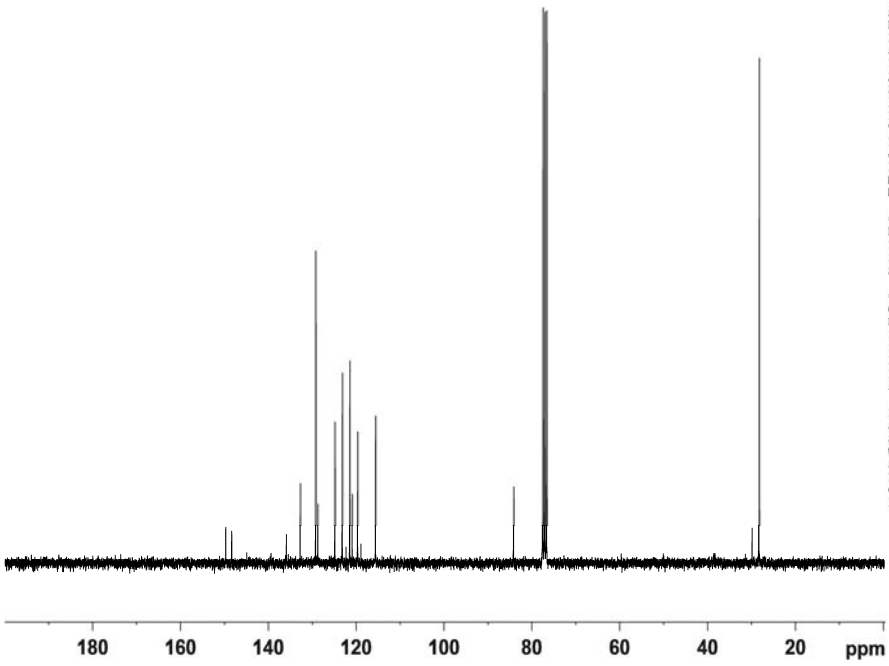

```
Current Data Parameters
NAME          fc37wa463
EXPNO                14
PROCNO                1

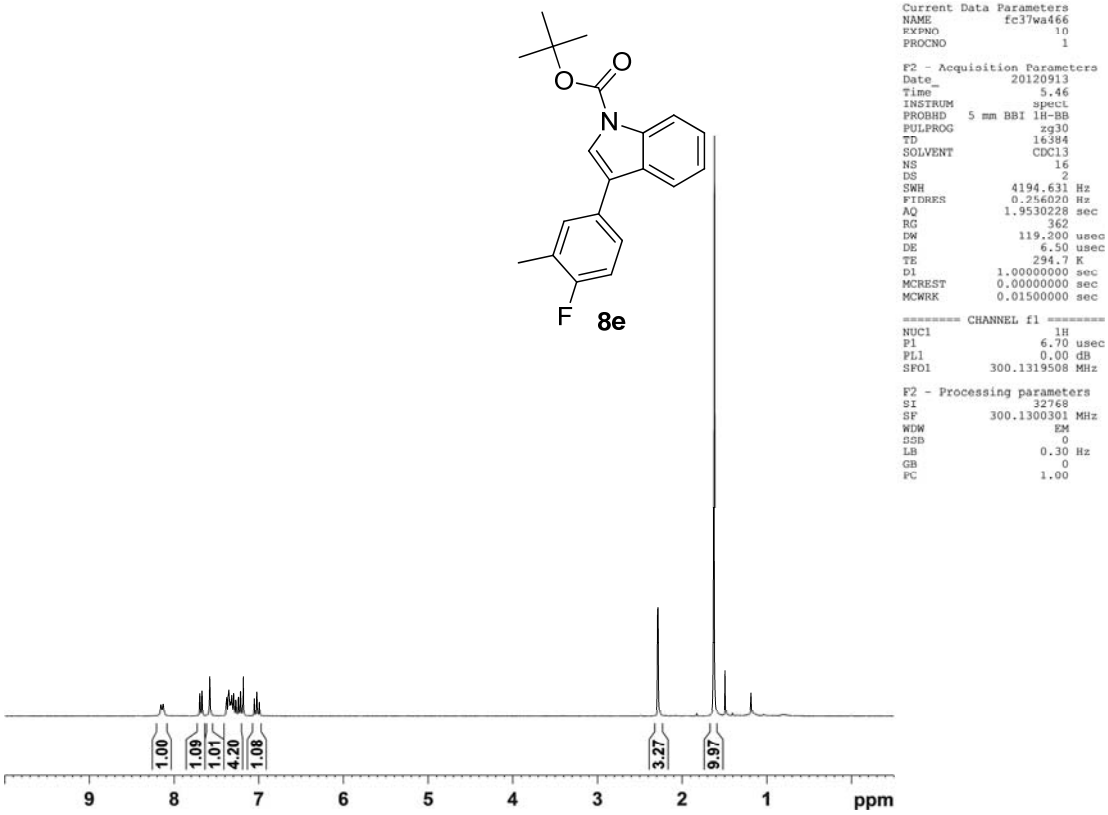
F2 - Acquisition Parameters
Date_             20120913
Time                  5.40
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                  2048
DW                27.600 usec
DE                 10.00 usec
TE                 294.8 K
D1             3.00000000 sec
d11            0.03000000 sec
DELTA          2.90000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF            75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



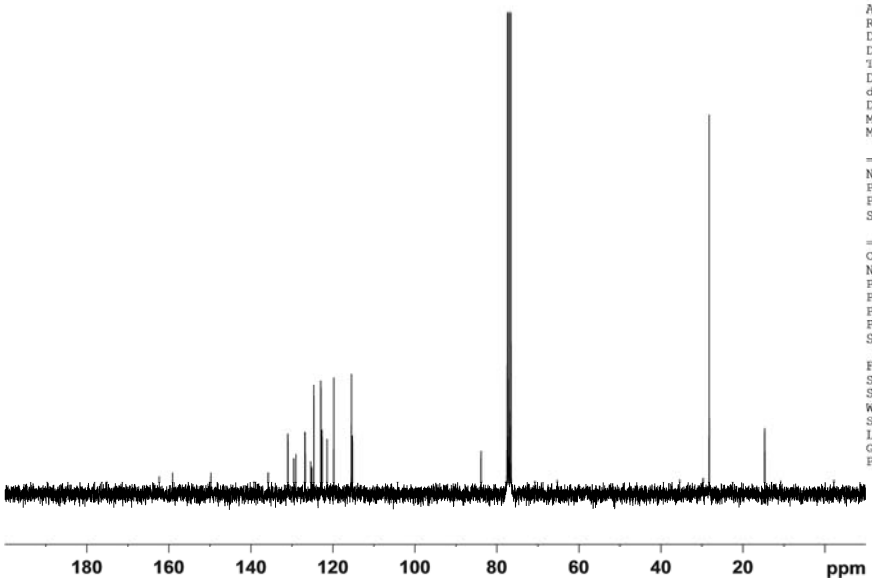



```
Current Data Parameters
NAME          fc37wa466
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120913
Time                5.46
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ            1.9530228 sec
RG                   362
DW              119.200 usec
DE                6.50 usec
TE                294.7 K
D1            1.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300301 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



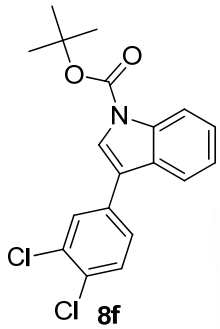

```
Current Data Parameters
NAME          fc37wa466
EXPNO                14
PROCNO                1

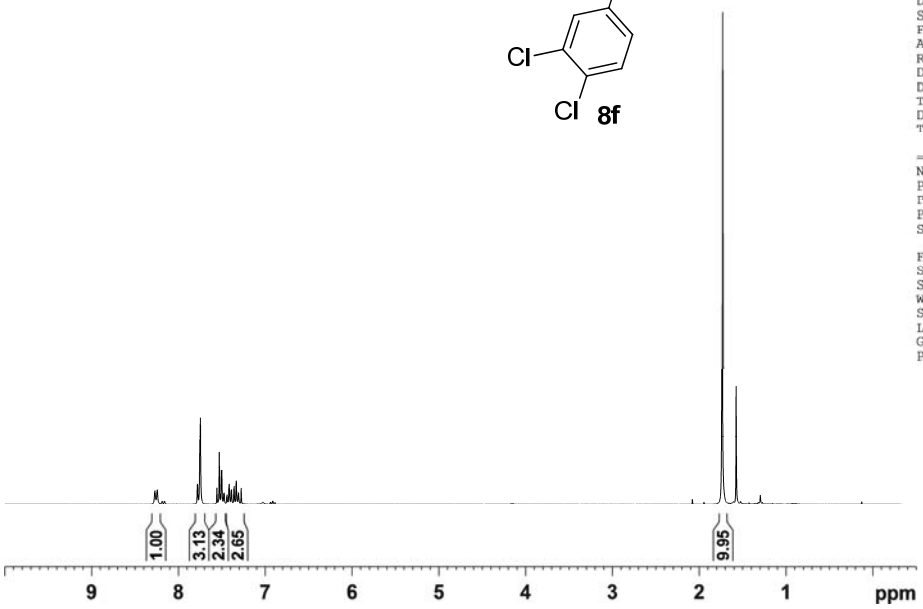
F2 - Acquisition Parameters
Date            20120913
Time                7.47
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                 32768
SOLVENT            CDCl3
NS                   902
DS                     4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ            0.9044468 sec
RG                  2048
DW               27.600 usec
DE                10.00 usec
TE                295.0 K
D1            3.00000000 sec
d11           0.03000000 sec
DELTA         2.90000010 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



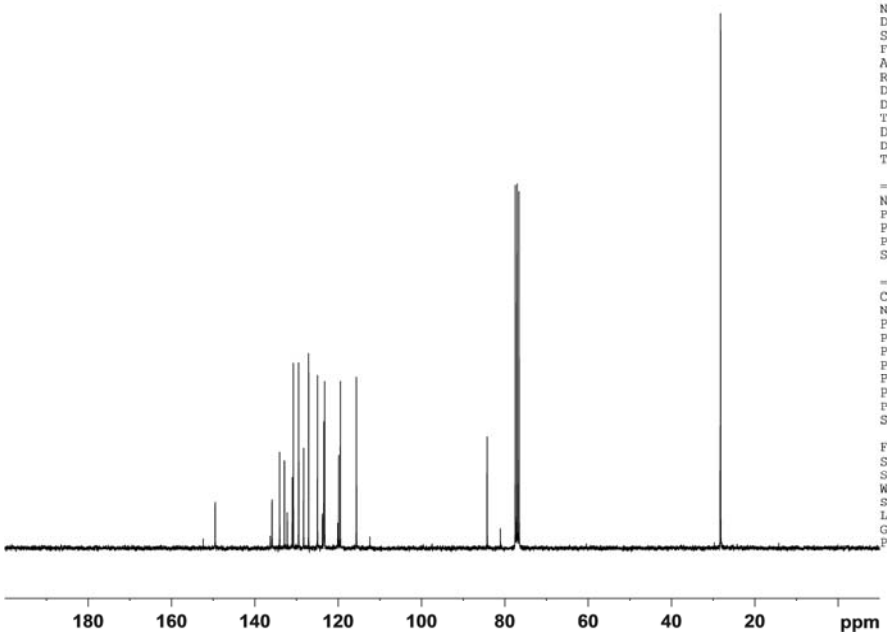



```
Current Data Parameters
NAME            fcl2wa678
EXPNO                 300
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130322
Time                 16.12
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               4194.631 Hz
FIDRES            0.256020 Hz
AQ              1.9530228 sec
RG                     128
DW                 119.200 usec
DE                    6.50 usec
TE                   298.0 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                    1H
P1                    6.70 usec
PL1                   0.00 dB
PL1W          15.07131863 W
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                    32768
SF           300.1300016 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



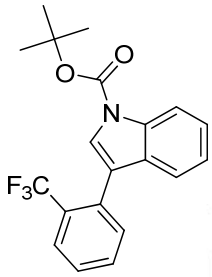

```
Current Data Parameters
NAME            fcl2wa678
EXPNO                  14
PROCNO                  1

F2 - Acquisition Parameters
Date_             20130324
Time                  0.58
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG            zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    2000
DS                       4
SWH              18115.941 Hz
FIDRES            0.552855 Hz
AQ               0.9044468 sec
RG                    3251
DW                  27.600 usec
DE                   10.00 usec
TE                   298.0 K
D1              4.00000000 sec
D11             0.03000000 sec
TD0                     1

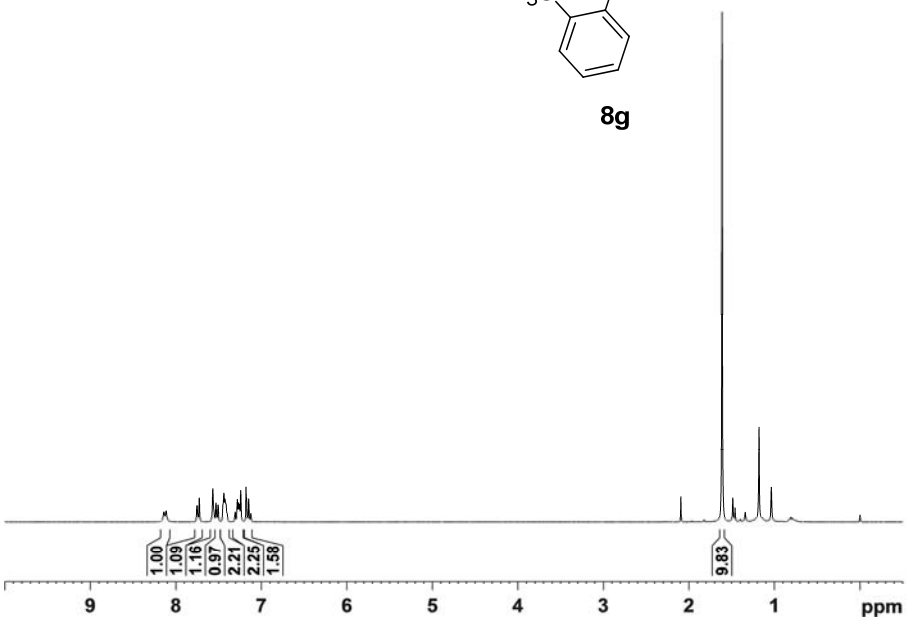
======== CHANNEL f1 ========
NUC1                   13C
P1                    8.20 usec
PL1                  -6.00 dB
PL1W         150.00000000 W
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                   0.00 dB
PL12                 21.54 dB
PL13                 21.54 dB
PL2W          15.07131863 W
PL12W          0.10571854 W
PL13W          0.10571854 W
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                    32768
SF            75.4677490 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```



8g

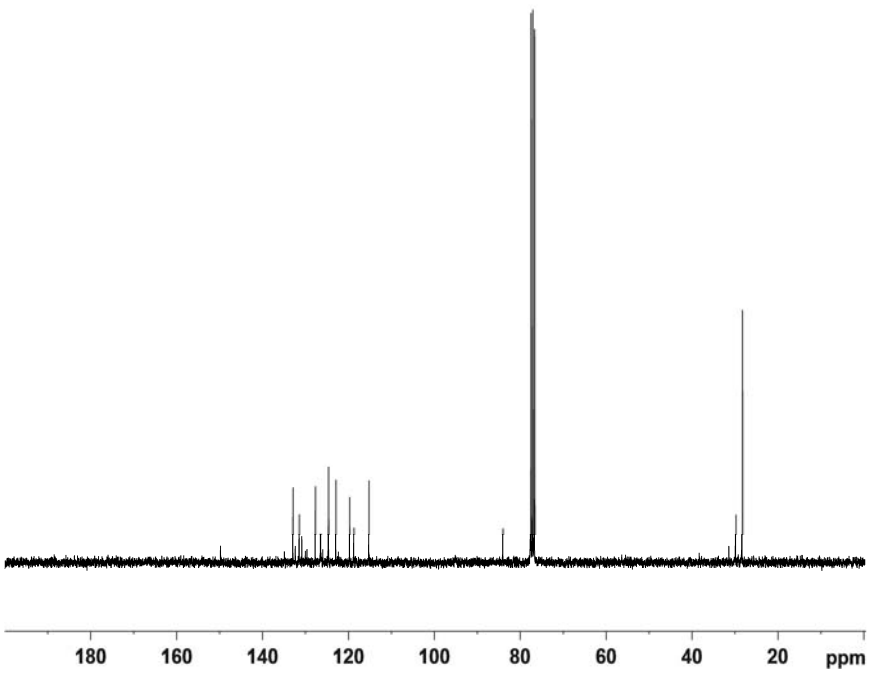



```
Current Data Parameters
NAME          fc37wa464
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20120914
Time                2.46
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT             MeOD
NS                     16
DS                      2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ              1.9530228 sec
RG                  287.4
DW                119.200 usec
DE                   6.50 usec
TE                  294.8 K
D1             1.00000000 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   6.70 usec
PL1                  0.00 dB
SFO1         300.1319508 MHz

F2 - Processing parameters
SI                  32768
SF          300.1300356 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



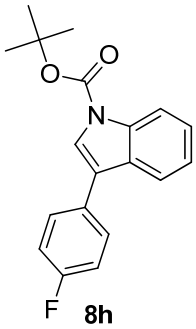

```
Current Data Parameters
NAME          fc37wa464
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20120914
Time                4.55
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  1024
DS                     4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ              0.9044468 sec
RG                   2048
DW                 27.600 usec
DE                 10.00 usec
TE                 294.8 K
D1             3.00000000 sec
d11            0.03000000 sec
DELTA          2.90000010 sec
MCREST         0.00000000 sec
MCWRK          0.01500000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF           75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



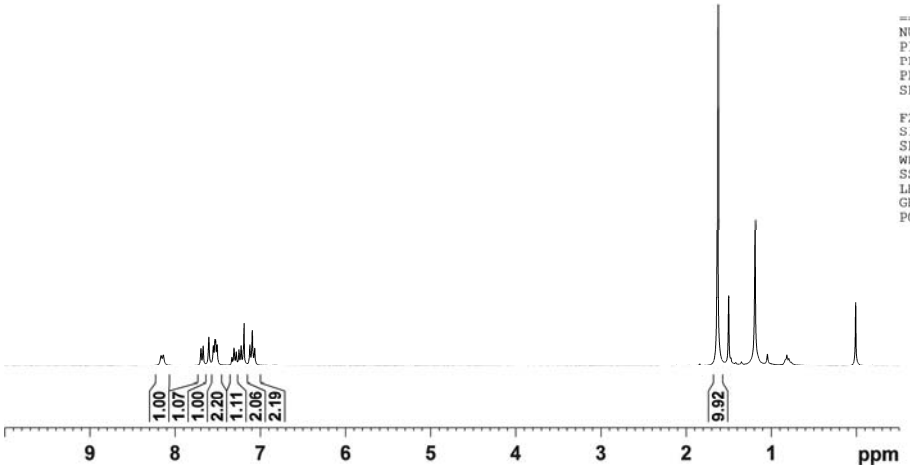
8h

```
Current Data Parameters
NAME          fc19wa462
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130504
Time               15.29
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG               456.1
DW             119.200 usec
DE               6.50 usec
TE              294.0 K
D1          1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
PL1W       15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                32768
SF         300.1300276 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



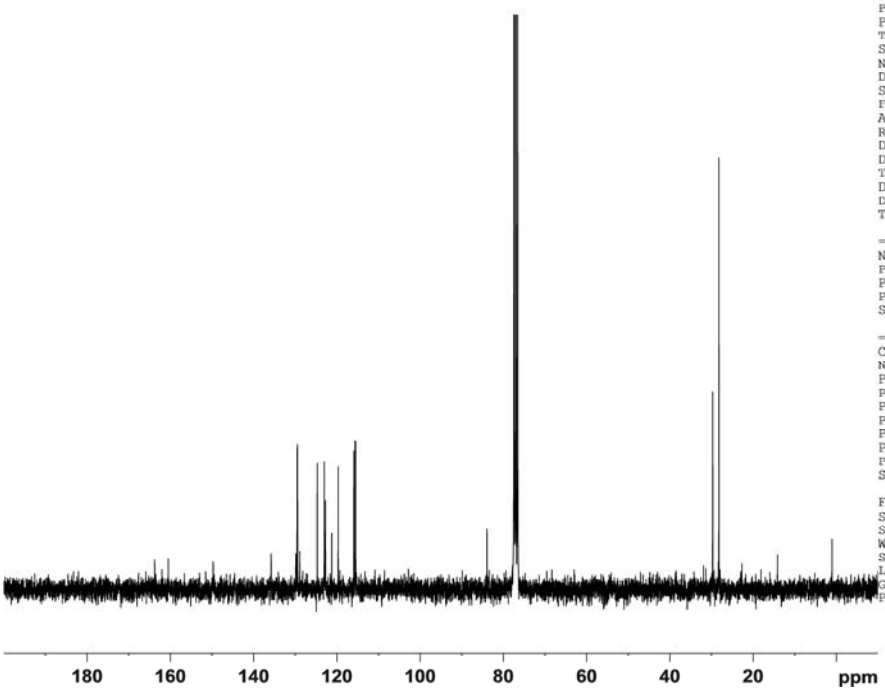

```
Current Data Parameters
NAME          fc19wa462
EXPNO                11
PROCNO                1

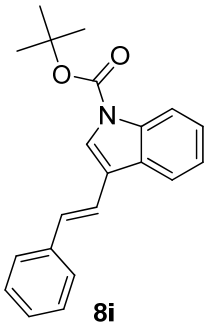
F2 - Acquisition Parameters
Date_           20130504
Time               21.09
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 4096
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ           0.9044468 sec
RG                 6502
DW               27.600 usec
DE               10.00 usec
TE               294.2 K
D1          4.00000000 sec
D11         0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W      150.00000000 W
SFO1        75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W       15.07131863 W
PL12W       0.10571854 W
PL13W       0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                32768
SF         75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```





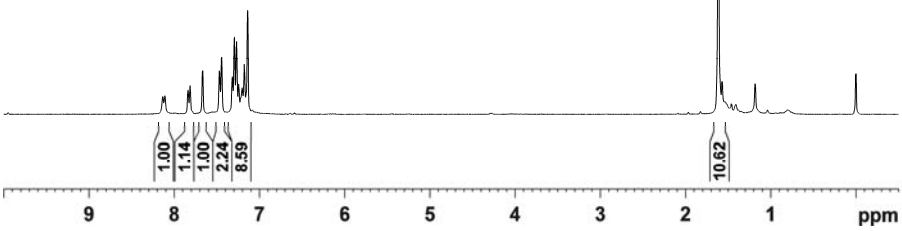
8i

```
Current Data Parameters
NAME          fc14wa689
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130406
Time               3.08
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG                  256
DW              119.200 usec
DE                 6.50 usec
TE                298.0 K
D1           1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                6.70 usec
PL1               0.00 dB
PL1W        15.07131863 W
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300315 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



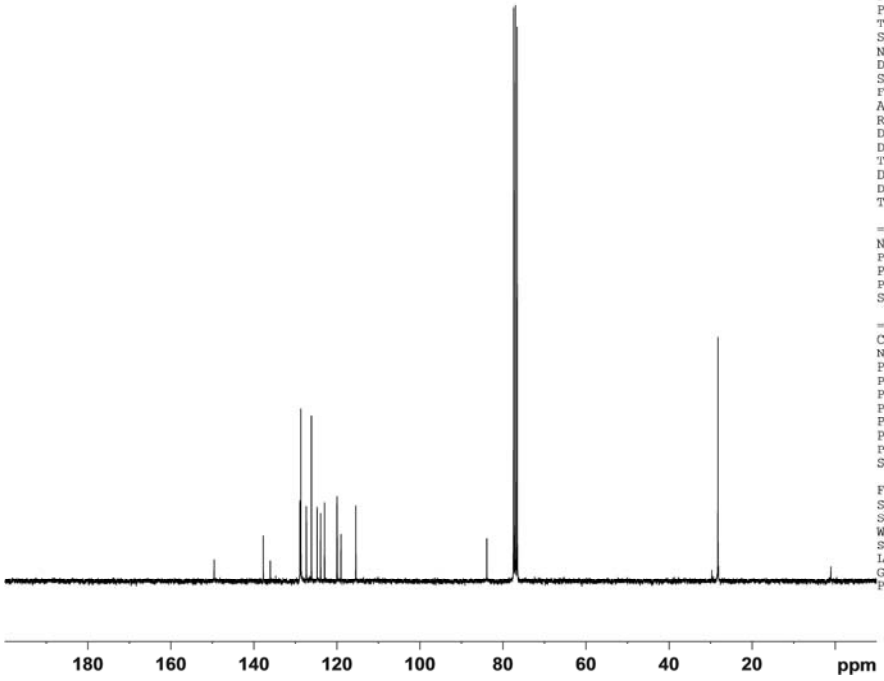

```
Current Data Parameters
NAME          fc14wa689
EXPNO                14
PROCNO                1

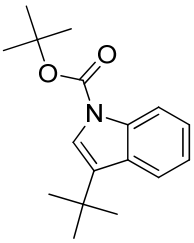
F2 - Acquisition Parameters
Date_           20130406
Time              10.22
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 4000
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ           0.9044468 sec
RG                 3251
DW              27.600 usec
DE              10.00 usec
TE              298.0 K
D1           4.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

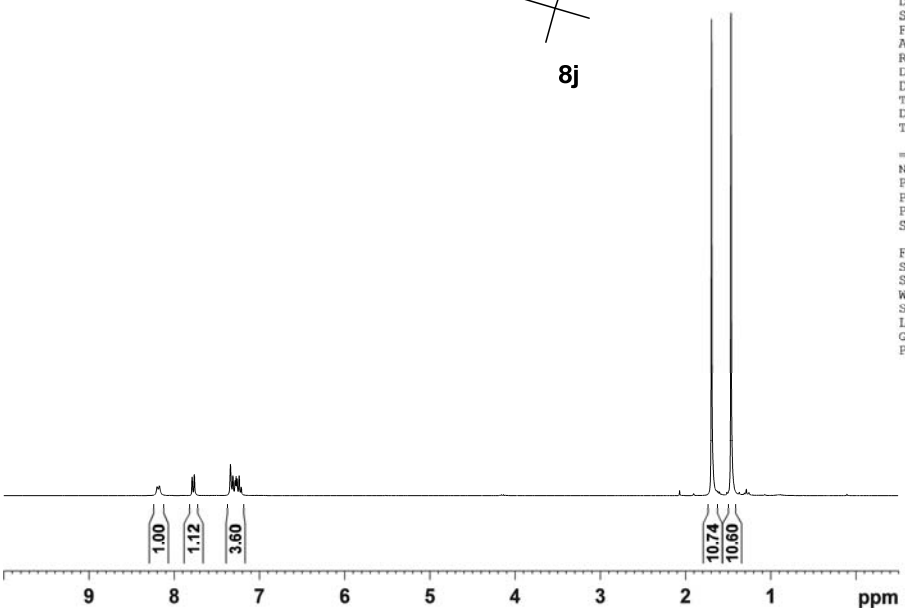
======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF           75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```





8j

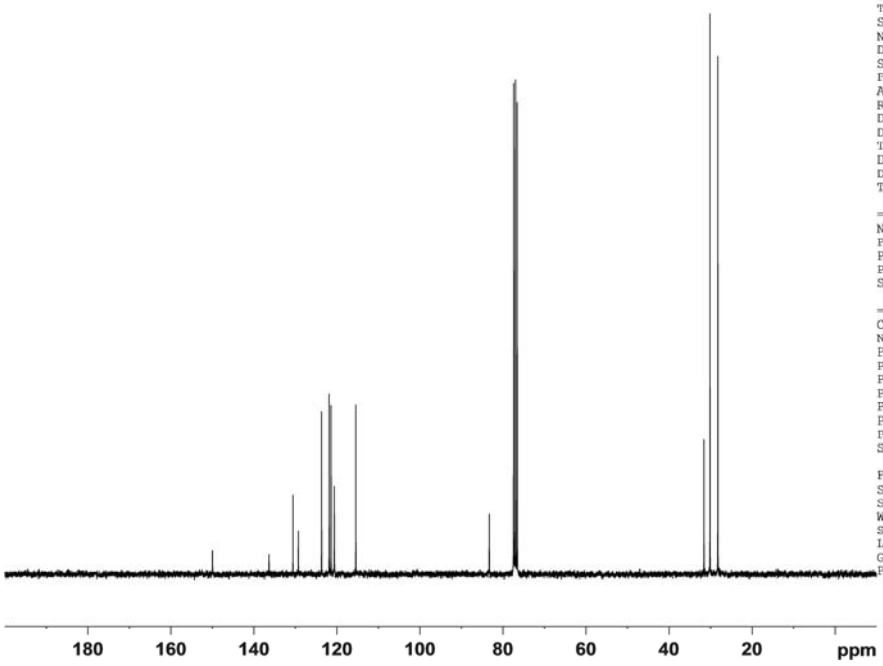



```
Current Data Parameters
NAME          fcl1wa673
EXPNO               300
PROCNO                1

F2 - Acquisition Parameters
Date_           20130315
Time               17.10
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                 16384
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ             1.9530228 sec
RG                 161.3
DW               119.200 usec
DE                  6.50 usec
TE                 298.0 K
D1            1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
PL1W        15.07131863 W
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300016 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



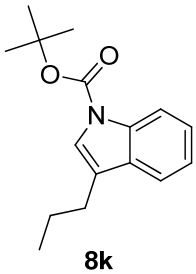

```
Current Data Parameters
NAME          fcl1wa673
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20130317
Time               12.12
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                 32768
SOLVENT            CDCl3
NS                  2000
DS                     4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ             0.9044468 sec
RG                  3251
DW                27.600 usec
DE                 10.00 usec
TE                 298.0 K
D1            3.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



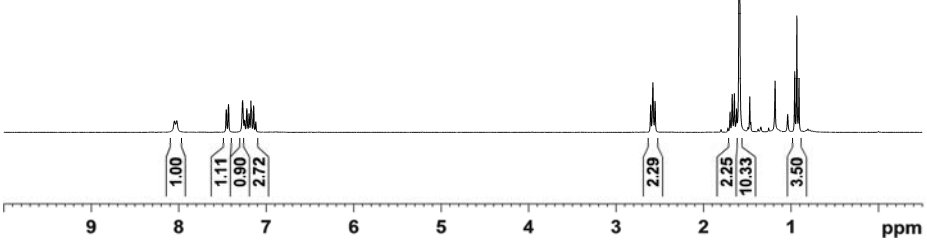
8k

```
Current Data Parameters
NAME          fc27wa458-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_             20120707
Time                 21.29
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               4194.631 Hz
FIDRES            0.256020 Hz
AQ               1.9530228 sec
RG                   228.1
DW                 119.200 usec
DE                    6.50 usec
TE                   301.3 K
D1               1.00000000 sec
MCREST           0.00000000 sec
MCWRK            0.01500000 sec

======== CHANNEL f1 ========
NUC1                     1H
P1                     6.70 usec
PL1                    0.00 dB
SFO1            300.1319508 MHz

F2 - Processing parameters
SI                    32768
SF              300.1300316 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



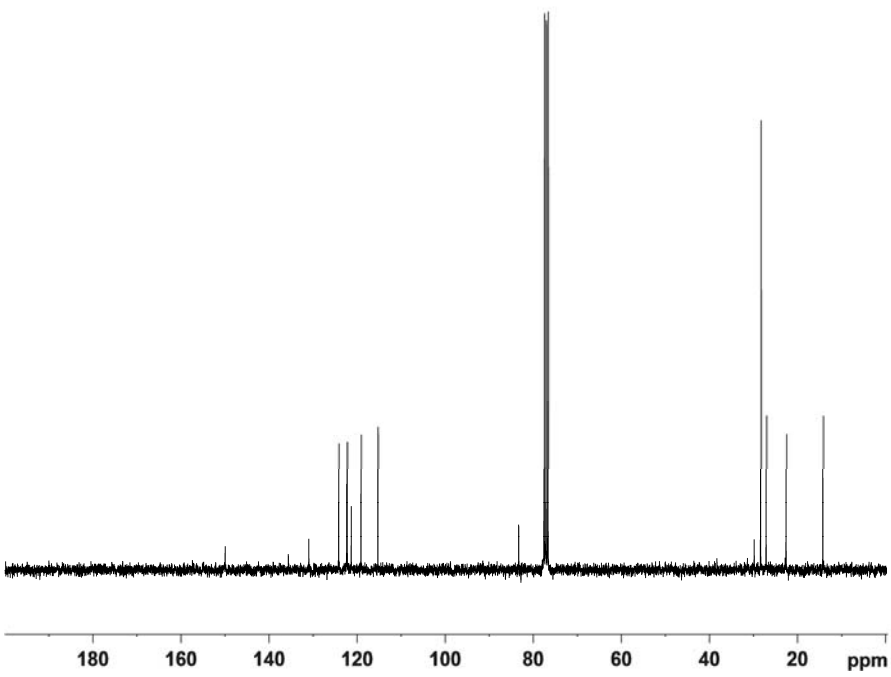

```
Current Data Parameters
NAME          fc27wa458-1
EXPNO                  14
PROCNO                  1

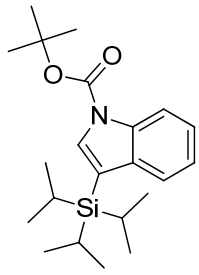
F2 - Acquisition Parameters
Date_             20120707
Time                 23.38
INSTRUM              spect
PROBHD    5 mm BBI 1H-BB
PULPROG             zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH              18115.941 Hz
FIDRES            0.552855 Hz
AQ               0.9044468 sec
RG                  1625.5
DW                 27.600 usec
DE                  10.00 usec
TE                  301.5 K
D1               3.00000000 sec
d11              0.03000000 sec
DELTA            2.90000010 sec
MCREST           0.00000000 sec
MCWRK            0.01500000 sec

======== CHANNEL f1 ========
NUC1                    13C
P1                      8.20 usec
PL1                    -6.00 dB
SFO1            75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                     1H
PCPD2                  80.00 usec
PL2                     0.00 dB
PL12                   21.54 dB
PL13                   21.54 dB
SFO2            300.1312005 MHz

F2 - Processing parameters
SI                    32768
SF              75.4677490 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```





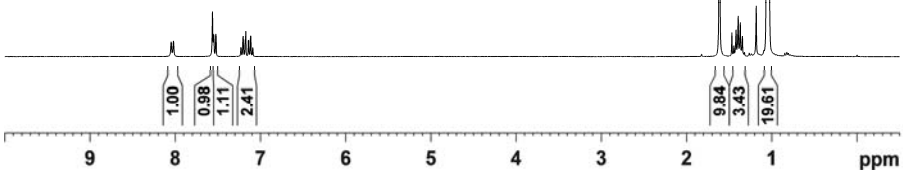
8l

```
Current Data Parameters
NAME          fc27wa457-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_             20120705
Time                  4.46
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG               zg30
TD                   16384
SOLVENT              CDCl3
NS                      16
DS                       2
SWH             4194.631 Hz
FIDRES          0.256020 Hz
AQ            1.9530228 sec
RG                     128
DW               119.200 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                   6.70 usec
PL1                  0.00 dB
SFO1          300.1319508 MHz

F2 - Processing parameters
SI                    32768
SF            300.1300326 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



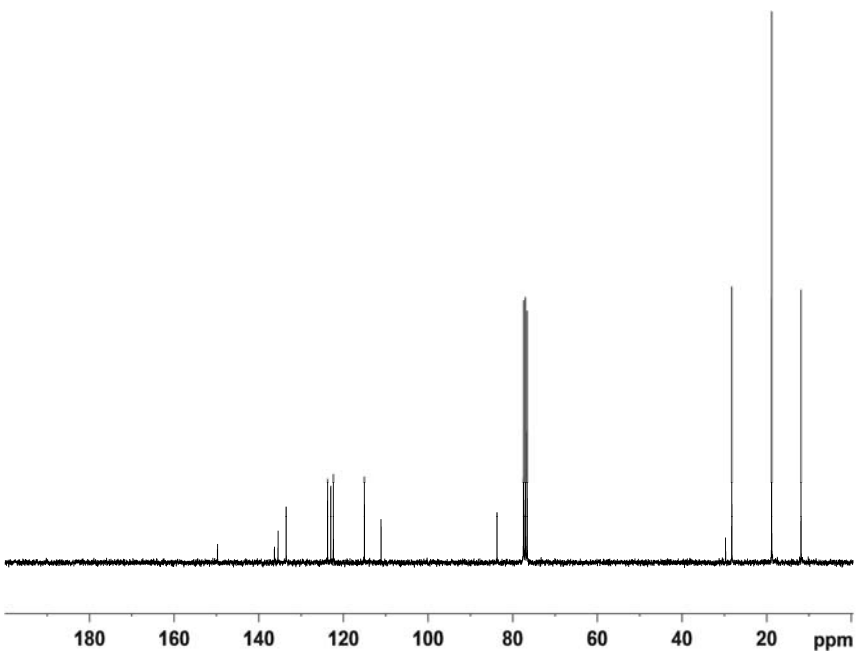

```
Current Data Parameters
NAME          fc27wa457-1
EXPNO                  14
PROCNO                  1

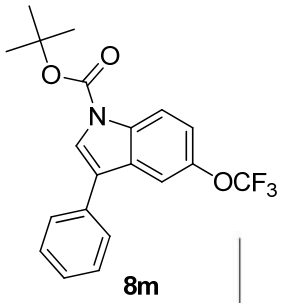
F2 - Acquisition Parameters
Date_             20120705
Time                  6.56
INSTRUM              spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zgpg30
TD                   32768
SOLVENT              CDCl3
NS                    1024
DS                       4
SWH            18115.941 Hz
FIDRES          0.552855 Hz
AQ            0.9044468 sec
RG                  1290.2
DW                27.600 usec
DE                 10.00 usec
TE                 302.2 K
D1            3.00000000 sec
d11           0.03000000 sec
DELTA         2.90000010 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.20 usec
PL1                 -6.00 dB
SFO1          75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                    32768
SF            75.4677490 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```



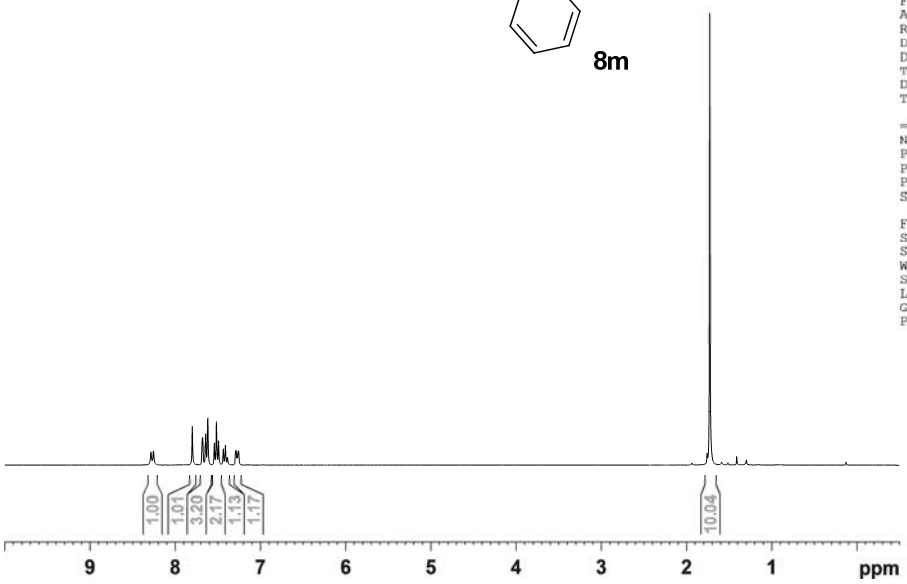



```
Current Data Parameters
NAME          fc12wa681
EXPNO               301
PROCNO                1

F2 - Acquisition Parameters
Date_           20130322
Time              16.33
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG                  128
DW              119.200 usec
DE                 6.50 usec
TE                298.0 K
D1           1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
PL1W        15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                32768
SF         300.1300016 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



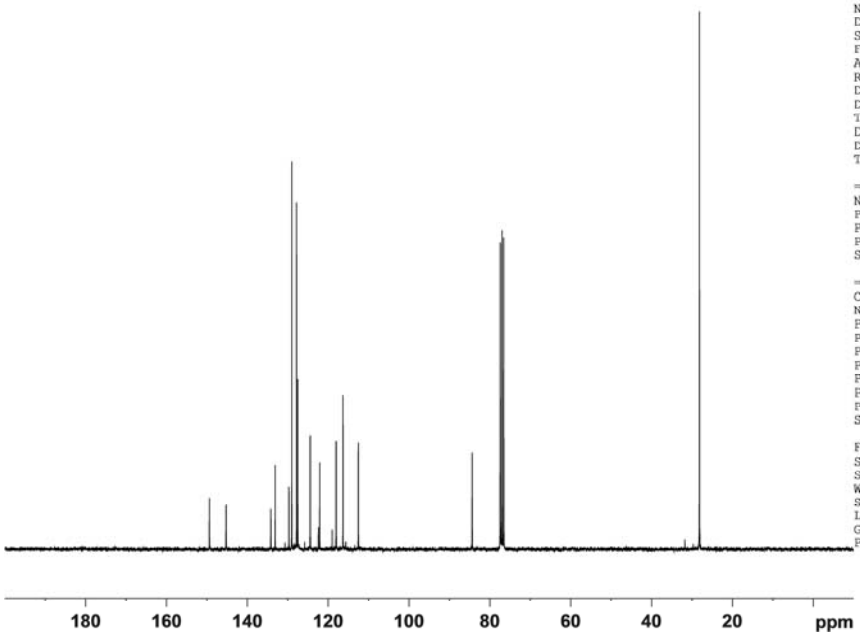

```
Current Data Parameters
NAME          fc12wa681
EXPNO                14
PROCNO                1

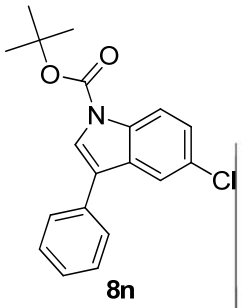
F2 - Acquisition Parameters
Date            20130324
Time              18.32
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG         zgpg30
TD                32768
SOLVENT           CDCl3
NS                 2000
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ            0.9044468 sec
RG                 3251
DW               27.600 usec
DE                10.00 usec
TE                298.0 K
D1            4.00000000 sec
D11           0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                32768
SF         75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



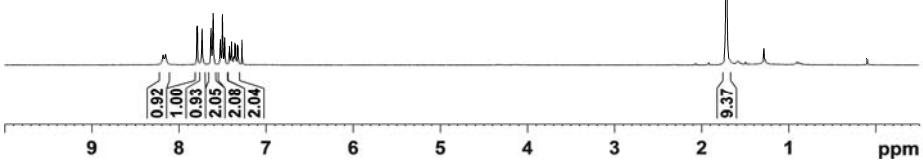



```
Current Data Parameters
NAME          fc04wa616
EXPNO               301
PROCNO                1

F2 - Acquisition Parameters
Date_           20130124
Time              17.49
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16304
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ             1.9530228 sec
RG                287.4
DW               119.200 usec
DE                  6.50 usec
TE                   0.0 K
D1           1.00000000 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300016 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



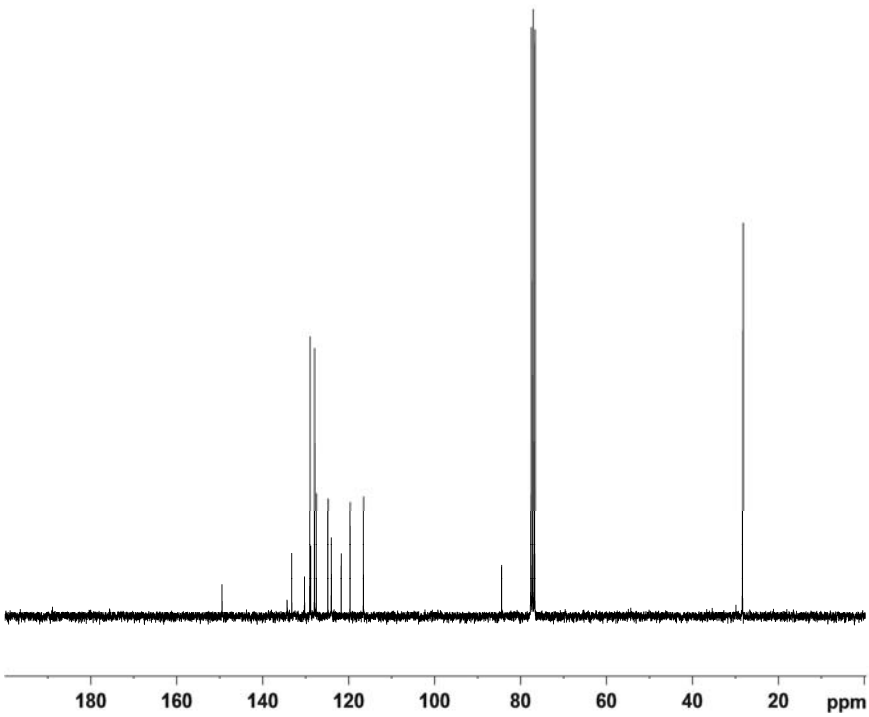

```
Current Data Parameters
NAME          fc04wa616-
EXPNO                14
PROCNO                1

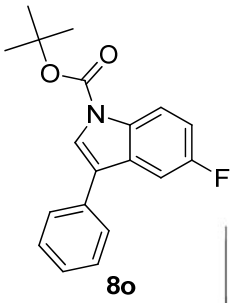
F2 - Acquisition Parameters
Date_           20130125
Time                6.36
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ             0.9044468 sec
RG                 2048
DW               27.600 usec
DE               10.00 usec
TE                   0.0 K
D1           3.00000000 sec
d11          0.03000000 sec
DELTA        2.90000010 sec
MCREST       0.00000000 sec
MCWRK        0.01500000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2               80.00 usec
PL2                  0.00 dB
PL12                21.54 dB
PL13                21.54 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```





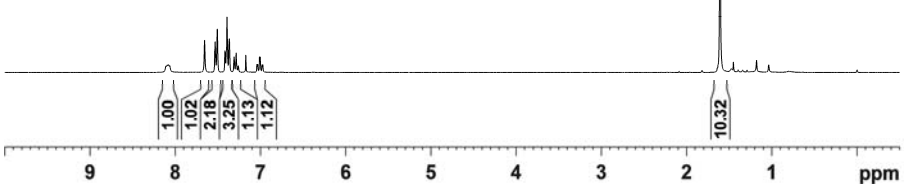
8o

```
Current Data Parameters
NAME          fcl1wa672
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_            20130317
Time                 5.09
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG              zg30
TD                  16384
SOLVENT             CDCl3
NS                     16
DS                      2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG                    256
DW              119.200 usec
DE                 6.50 usec
TE                298.0 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                  6.70 usec
PL1                 0.00 dB
PL1W        15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300324 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



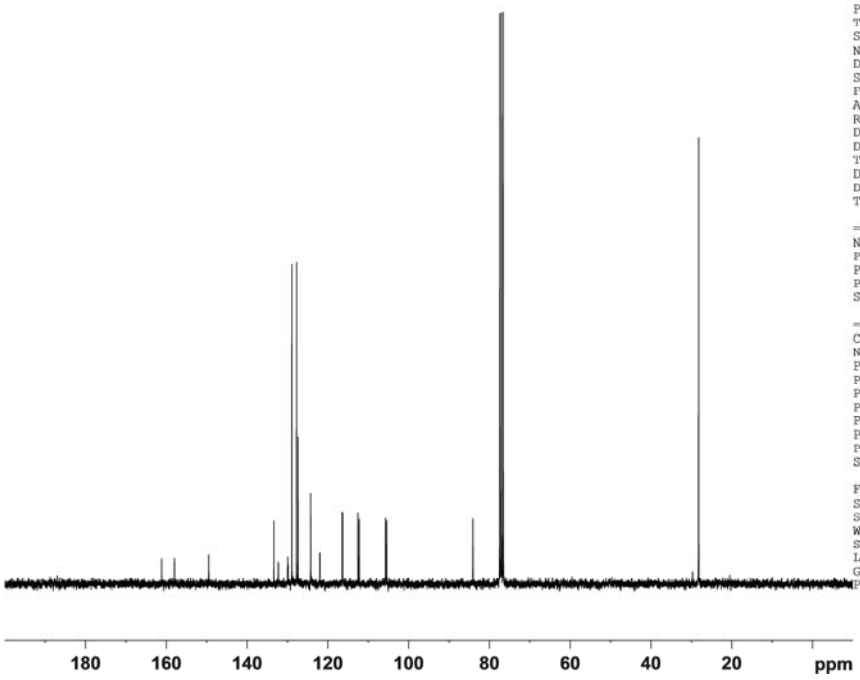

```
Current Data Parameters
NAME          fcl1wa672
EXPNO                14
PROCNO                1

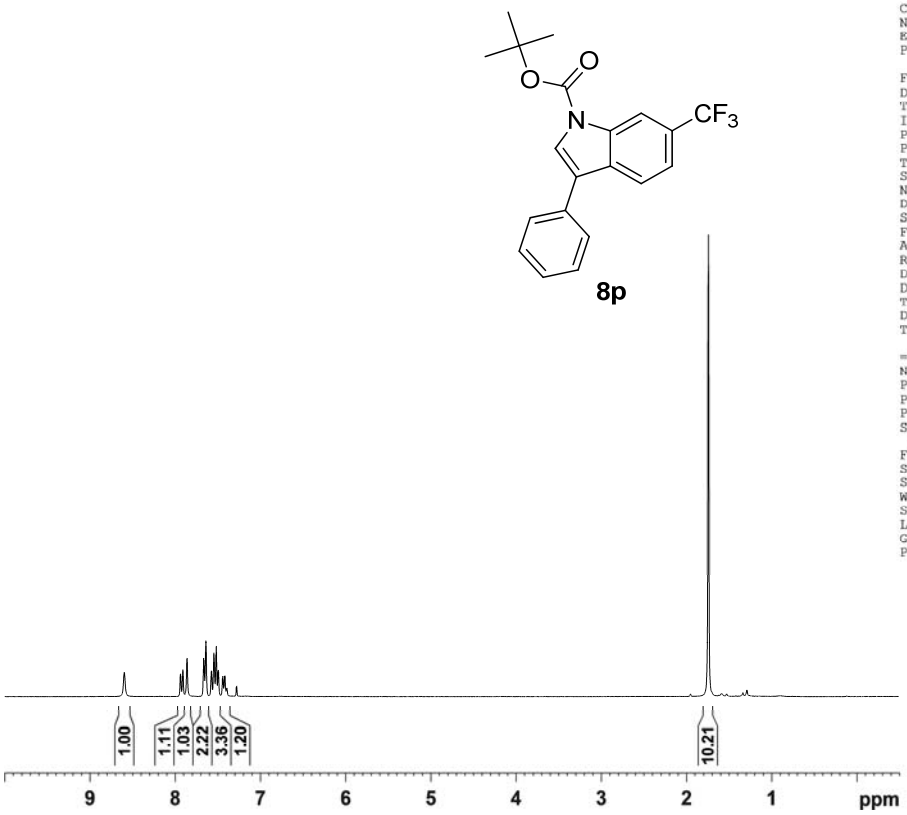
F2 - Acquisition Parameters
Date_            20130317
Time                 8.22
INSTRUM             spect
PROBHD   5 mm BBI 1H-BB
PULPROG           zgpg30
TD                 32768
SOLVENT             CDCl3
NS                  2000
DS                     4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ           0.9044468 sec
RG                  3251
DW               27.600 usec
DE                10.00 usec
TE                298.0 K
D1           3.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.20 usec
PL1                -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                 0.00 dB
PL12               21.54 dB
PL13               21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



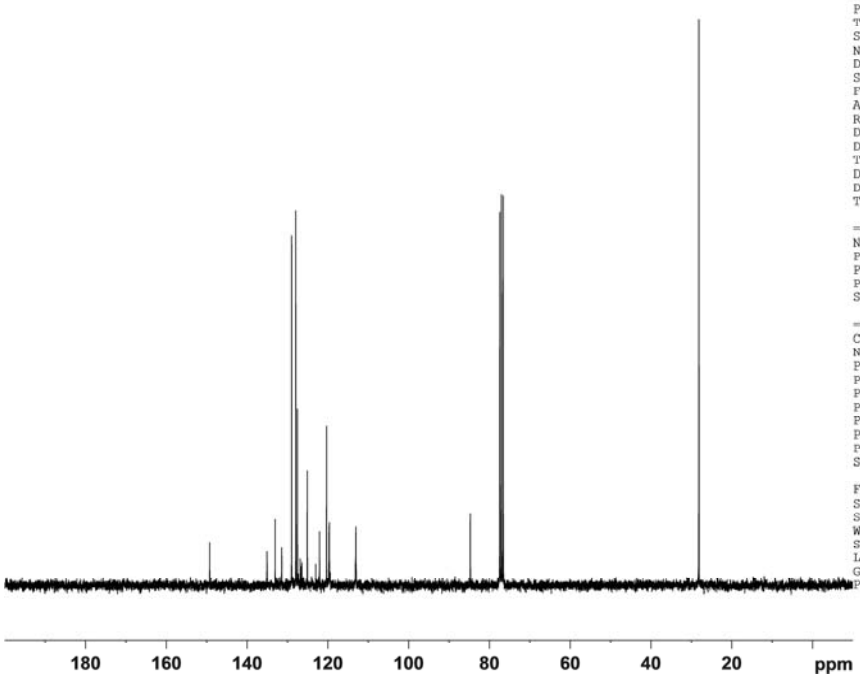



```
Current Data Parameters
NAME          fc13wa682
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130327
Time              11.39
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG             zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ           1.9530228 sec
RG                  181
DW              119.200 usec
DE                 6.50 usec
TE                297.8 K
D1           1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
PL1W        15.07131863 W
SFO1       300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300000 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```



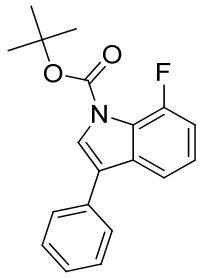

```
Current Data Parameters
NAME          fc13wa682
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date            20130327
Time              13.31
INSTRUM           spect
PROBHD   5 mm BBI 1H-BB
PULPROG         zgpg30
TD                32768
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH           18115.941 Hz
FIDRES         0.552855 Hz
AQ            0.9044468 sec
RG                 2048
DW               27.600 usec
DE                10.00 usec
TE                298.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W       150.00000000 W
SFO1         75.4756731 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2       300.1312005 MHz

F2 - Processing parameters
SI                32768
SF           75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



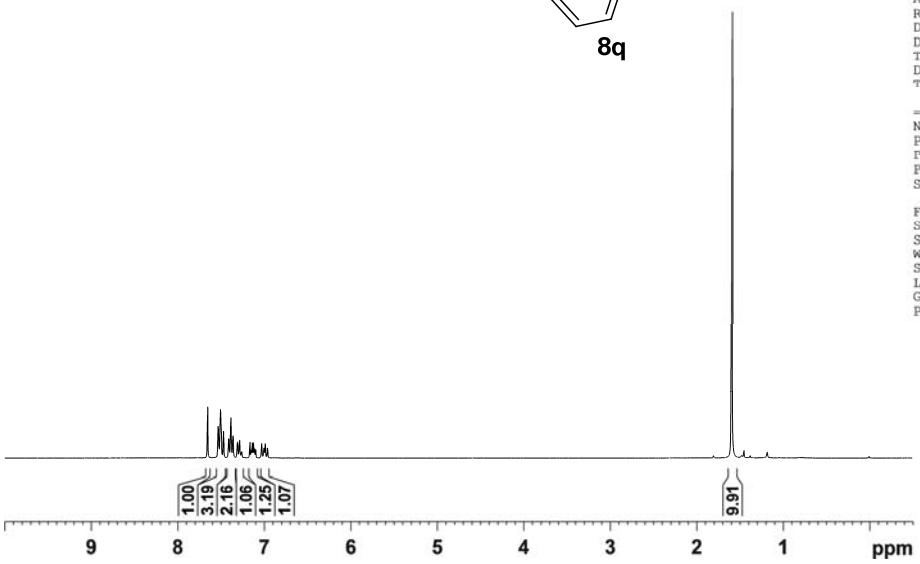
8q

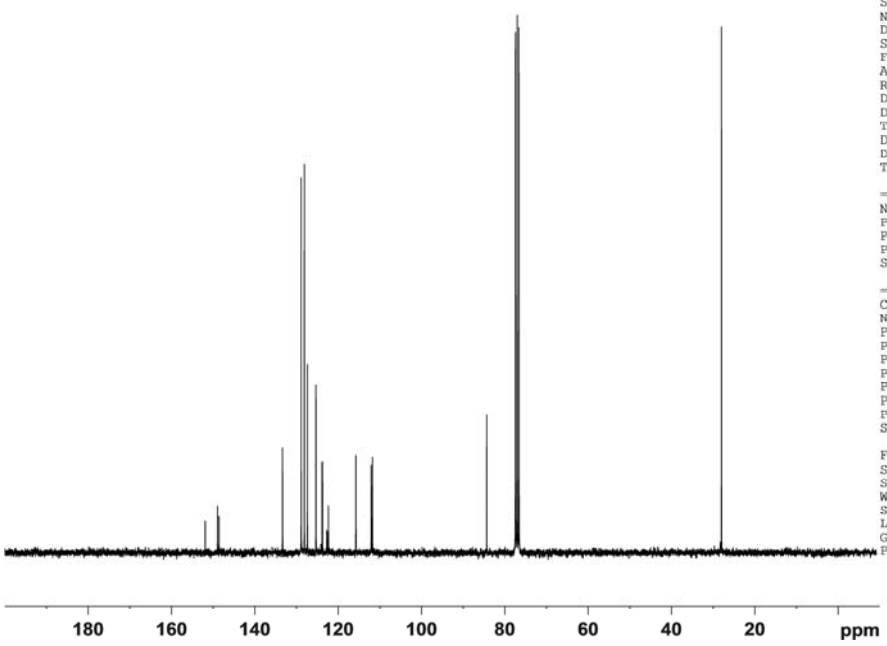
```
Current Data Parameters
NAME          FC13WA685
EXPNO                10
PROCNO                1

F2 - Acquisition Parameters
Date_           20130329
Time                1.06
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG            zg30
TD                16384
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            4194.631 Hz
FIDRES         0.256020 Hz
AQ             1.9530228 sec
RG                  181
DW              119.200 usec
DE                 6.50 usec
TE                298.0 K
D1           1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                 6.70 usec
PL1                0.00 dB
PL1W        15.07131863 W
SFO1        300.1319508 MHz

F2 - Processing parameters
SI                32768
SF          300.1300345 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME          FC13WA685
EXPNO                14
PROCNO                1

F2 - Acquisition Parameters
Date_           20130329
Time                4.20
INSTRUM            spect
PROBHD   5 mm BBI 1H-BB
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                 2000
DS                    4
SWH           17985.611 Hz
FIDRES         0.548877 Hz
AQ             0.9110004 sec
RG              2896.3
DW              27.800 usec
DE               10.00 usec
TE               298.0 K
D1           3.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 8.20 usec
PL1               -6.00 dB
PL1W       150.00000000 W
SFO1         75.4760505 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              21.54 dB
PL13              21.54 dB
PL2W        15.07131863 W
PL12W        0.10571854 W
PL13W        0.10571854 W
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF           75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```