Suppplementary Information

Palladium catalyzed C-H bond acetoxylation: isoxazolinyl as a directing group

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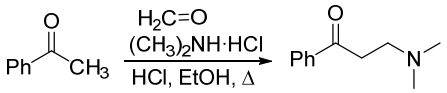
General information

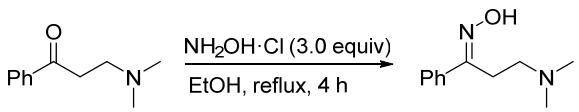
Commercial reagents and solvents were used as received. Thin-layer chromatography was performed on precoated silica gel (0.2–0.25 mm thick) plates with fluorescent indicator 254 nm. The plate was visualized with 254 nm UV lamp, PMA or $KMnO_4$ stain. Column chromatography was performed on 200–300 mesh silica gel.

^1H NMR and ^{13}C NMR spectra were recorded on a Bruker Avance 400 spectrometer at 400 MHz and 100 MHz respectively. Chemical shifts of ^1H NMR and ^{13}C NMR were referred to TMS ($\delta = 0$) and chloroform ($\delta = 77.16$) respectively. The following abbreviations were used to denote the multiplicity of each peak: s (singlet), d (doublet), t (triplet), q (quartet), dd (doublet of doublets), m (multiplet). IR spectra were recorded on a Nicolet AVATAR 360 FT-IR spectrometer. The sample was prepared as a thin-film on a NaCl disc. MS spectra were obtained on a Waters Quattro Micro triple quadrupole mass spectrometer.

General procedure I: preparations of 1a–1g

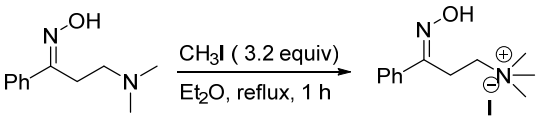


A 250 mL three-neck round-bottom flask were charged with acetophenone (29.3 mL, 250 mmol), paraformaldehyde (9.9 g, 326 mmol) and dimethylamine hydrochloride (26.5 g, 325 mmol). After the addition of 0.5 mL of concentrated hydrochloric acid in 40 mL ethanol, the mixture was refluxed for 4 h. The yellowish solution was diluted with cold acetone (200 mL) and chilled for several hours at 0 °C. The crystals were filtered, washed with acetone (2 × 20 mL), and dissolved in water (100 mL). The aqueous layer was treated with solid K_2CO_3 until pH = 10, and then extracted with CH_2Cl_2 (3 × 30 mL). The combined organic layers were dried over Na_2SO_4 and concentrated to give crude 3-dimethylamino-1-phenyl-1-propanone.

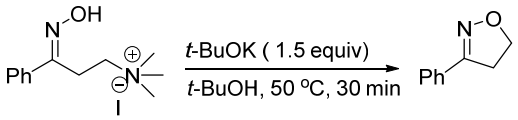


A 250 mL three-neck round-bottom flask were charged with crude 3-dimethylamino-1-phenyl-1-propanone (10.5 g, 59.0 mmol, 1.0 equiv),

hydroxylamine hydrochloride (12.4 g, 178 mmol, 3.0 equiv) and EtOH (100 mL). The solution was refluxed for 4 h, and then the solvent was evaporated. Aq. sodium hydroxide (2 N) was added until pH = 9. The precipitate of 3-dimethylamino-1-phenyl-1-propanone oxime was collected by filtration.

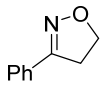


To a solution of crude 3-dimethylamino-1-phenyl-1-propanone oxime (2.98 g, 15.5 mmol, 1.0 equiv) in Et_2O (10 mL) was added CH_3I (3.10 mL, 49.6 mmol, 3.2 equiv). After the solution was refluxed for 1 h, the methiodide precipitated.



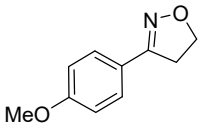
It (4.51 g, 13.5 mmol, 1.0 equiv) was suspended in *t*-butyl alcohol (15 mL) and potassium *t*-butoxide (2.27 g, 20.3 mmol, 1.5 equiv) was added. The solution was maintained at 50 °C for 30 min. Water (20 mL) and 2 N HCl were added until pH = 6. *t*-Butyl alcohol was removed under reduced pressure. The aqueous mixture was extracted with CH_2Cl_2. The extracts were dried over Na_2SO_4 and concentrated. Purification by column chromatography gave **1a**.

3-Phenyl-2-isoxazoline (1a)[1]



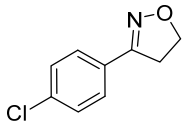
White solid (1.96 g, 99% yield), R_f = 0.52 (5:1 hexanes/AcOEt); ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.71–7.68 (m, 2H), 7.42–7.40 (m, 3H), 4.49 (t, *J* = 10.1 Hz, 2H), 3.34 (t, *J* = 10.2 Hz, 2H).

3-(*p*-Methoxyphenyl)-2-isoxazoline (1b)[2]



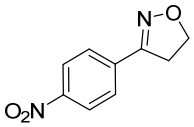
White solid (473 mg, 89% yield), R_f = 0.28 (5:1 hexanes/AcOEt); ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.63 (d, *J* = 8.9 Hz, 2H), 6.92 (d, *J* = 8.9 Hz, 2H), 4.46 (t, *J* = 10.0 Hz, 2H), 3.84 (s, 3H), 3.31 (t, *J* = 10.0 Hz, 2H).

3-(*p*-Chlorophenyl)-2-isoxazoline (1c) [2]



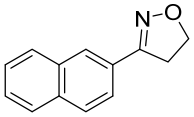
White solid (1.07 g, 96% yield), R_f = 0.34 (5:1 hexanes/AcOEt); ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.64–7.61 (m, 2H), 7.40–7.37 (m, 2H), 4.51 (t, *J* = 10.1 Hz, 2H), 3.32 (t, *J* = 10.2 Hz, 2H).

3-(*p*-Nitrophenyl)-2-isoxazoline (1d)[2]



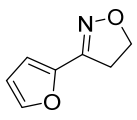
Yellow solid (168 mg, 26% yield), R_f = 0.22 (5:1 hexanes/AcOEt); ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.30–8.26 (m, 2H), 7.88–7.84 (m, 2H), 4.60 (t, *J* = 10.3 Hz, 2H), 3.38 (t, *J* = 10.3 Hz, 2H).

3-(2-Naphthyl)-2-isoxazoline (1e)



Light yellow solid (442 mg, 68% yield), m.p. 84–85 °C, R_f = 0.44 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (dd, *J* = 8.6, 1.6 Hz, 1H), 7.92 (s, 1H), 7.87–7.84 (m, 3H), 7.55–7.50 (m, 2H), 4.54 (t, *J* = 10.1 Hz, 2H), 3.46 (t, *J* = 10.0 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.0, 134.0, 133.0, 128.5, 128.4, 127.9, 127.1, 127.0, 126.7, 123.7, 69.4, 35.2; IR (cm^{-1}): 3059, 2961, 2886, 1601, 1435, 1393, 1369, 1128, 928, 907, 866, 833, 820, 752, 476; MS (ESI): calculated for $C_{13}H_{11}NO$ $[M+H]^+$ 198.0919, found 198.0914.

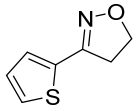
3-(2-Furyl)-2-isoxazoline (1f)



Light yellow oil (342 mg, 54% yield), R_f = 0.23 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.51 (dd, *J* = 1.8, 0.6 Hz, 1H), 6.72 (d, *J* = 3.2 Hz, 1H), 6.49 (dd, *J* = 3.4, 1.8 Hz, 1H), 4.44 (t, *J* = 10.1 Hz, 2H), 3.30 (t, *J* = 10.1 Hz, 2H); ^{13}C NMR (100

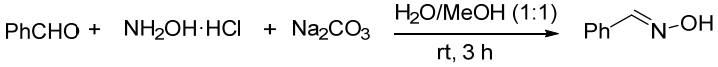
MHz, $CDCl_3$) δ: 149.1, 145.0, 144.4, 111.9, 111.8, 69.0, 35.3; IR (cm^{-1}): 3144, 3123, 2963, 2889, 1485, 1437, 1404, 1329, 1261, 1227, 1161, 1009, 922, 874, 748, 594, 446; MS (ESI): calculated for $C_7H_7NO_2$ $[M+H]^+$ 138.0555, found 138.0557.

3-(2-Thienyl)-2-isoxazoline (1g)

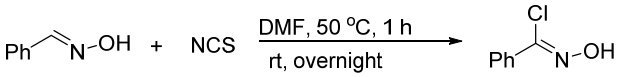


Light yellow solid (456 mg, 55% yield), m.p. 43–44 °C, R_f = 0.31 (5:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 7.38 (dd, *J* = 5.1, 1.0 Hz, 1H), 7.21 (dd, *J* = 3.6, 1.0 Hz, 1H), 7.06 (dd, *J* = 5.0, 3.6 Hz, 1H), 4.47 (t, *J* = 10.1 Hz, 2H), 3.34 (t, *J* = 10.1 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 152.5, 131.7, 128.4, 128.0, 127.2, 69.2, 35.9; IR (cm^{-1}): 3105, 2962, 2887, 1587, 1522, 1437, 1354, 1329, 1231, 1173, 1084, 1051, 1001, 961, 932, 880, 833, 710, 640, 581, 530; MS (ESI): calculated for C_7H_7NOS $[M+H]^+$ 154.0327, found 154.0324.

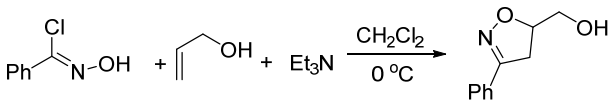
General procedure II: preparations of 3a–3k, 5b–5g



To a suspension of benzaldehyde (3.0 mL, 30 mmol, 1.0 equiv) and hydroxylamine hydrochloride (2.29 g, 33 mmol, 1.1 equiv) in a 1:1 mixture of H_2O/methanol (40 mL), an aqueous solution of Na_2CO_3 (0.75 M, 20 mL, 0.5 equiv) was slowly added. The resulting mixture was stirred at rt for 3 h, and then methanol was evaporated. The aqueous phase was extracted with CH_2Cl_2. The combined organic layers were washed with brine, dried over Na_2SO_4 and concentrated to give crude benzaldoxime.

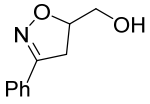


To a solution of crude benzaldoxime (1.21 g, 10 mmol, 1.0 equiv) in DMF (20 mL) at 50 °C was added dropwise a solution of *N*-chlorosuccinimide (1.34 g, 10 mmol, 1.0 equiv) in DMF (15 mL) over 30 min. The mixture was stirred at 50 °C for another 1 h, then it was allowed to stir at rt overnight. The reaction was quenched by pouring the mixture into ice-water. The mixture was extracted with CH_2Cl_2. The combined organic extracts were washed with ice-water and brine, dried over Na_2SO_4, and concentrated under reduced pressure to give crude *α*-chlorobenzaldoxime.



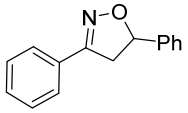
To a solution of crude α-chlorobenzaldoxime (1.27 g, 8.2 mmol, 1.0 equiv) in CH_2Cl_2 (30 mL) were added Et_3N (1.73 mL, 12.3 mmol, 1.5 equiv) and allyl alcohol (559 μL, 8.2 mmol, 1.0 equiv). The mixture was stirred at 0 °C for 2 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.

(3-Phenyl-2-isoxazolin-5-yl)methanol[3]



White solid (756 mg, 52% yield), R_f = 0.45 (1:2 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.67 (dd, *J* = 5.5, 2.1 Hz, 2H), 7.42–7.40 (m, 3H), 4.91–4.85 (m, 1H), 3.91–3.86 (m, 1H), 3.72–3.66 (m, 1H), 3.40 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.28 (dd, *J* = 16.6, 7.8 Hz, 1H), 1.93 (t, *J* = 6.6 Hz, 1H).

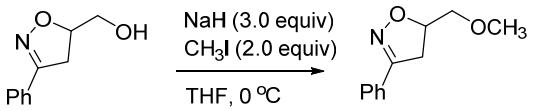
3,5-Diphenyl-2-isoxazoline (3a)[4]



General procedure II was applied using styrene instead of allyl alcohol.

Light yellow oil (520 mg, 69% yield), R_f = 0.38 (20:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.71–7.68 (m, 2H), 7.44–7.30 (m, 8H), 5.74 (dd, *J* = 11.0, 8.2 Hz, 1H), 3.78 (dd, *J* = 16.6, 11.0 Hz, 1H), 3.35 (dd, *J* = 16.6, 8.2 Hz, 1H).

5-Methoxymethyl-3-phenyl-2-isoxazoline (3b)[5]

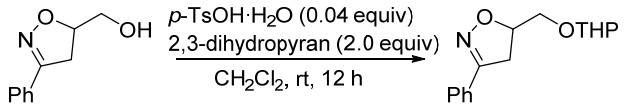


To a solution of (3-phenyl-2-isoxazolin-5-yl)methanol (213 mg, 1.2 mmol) in THF (10 mL) were added NaH (86 mg, 3.6 mmol) and CH_3I (150 μL, 2.4 mmol). The mixture was stirred at 0 °C for 3 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.

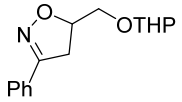
Light yellow oil (210 mg, 92% yield), R_f = 0.42 (1:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.68–7.66 (m, 2H), 7.40–7.39 (m, 3H), 4.93–4.86 (m, 1H), 4.49 (qd, *J* = 10.4, 5.2 Hz, 2H), 3.42 (s, 3H), 3.38 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.23 (dd, *J* =

16.6, 7.6 Hz, 1H).

3-Phenyl-5-(2-tetrahydropyranyloxymethyl)-2-isoxazoline (3c)

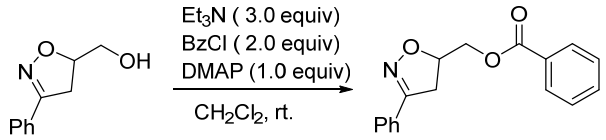


A solution of (3-phenyl-2-isoxazolin-5-yl)methanol (135 mg, 0.76 mmol), 3,4-dihydro-2*H*-pyran (139 μL, 1.52 mmol) and *p*-TsOH·H_2O (10 mg, 0.04 mmol) in CH_2Cl_2 (10 mL) was stirred at rt for 12 h and then treated with sat. aq. $NaHCO_3$ (10 mL). The organic layer was separated, washed with brine (10 mL), dried over Na_2SO_4 and concentrated. Purification by column chromatography gave **3c**.

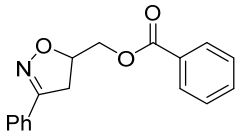


Light yellow oil (193 mg, 97% yield), R_f = 0.55 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.69–7.67 (m, 2H), 7.41–7.40 (m, 3H), 4.99–4.90 (m, 1H), 4.68–4.67 (m, 1H), 3.92–3.82 (m, 2H), 3.65–3.60 (m, 1H), 3.54–3.51 (m, 1H), 3.46–3.17 (m, 2H), 1.83–1.50 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 156.5, 156.3, 130.1, 130.0, 129.73, 129.68, 128.7, 126.7, 99.4, 99.1, 68.6, 68.1, 62.5, 62.3, 37.5, 37.2, 30.5, 30.5, 25.42, 25.41, 19.5, 19.3; IR (cm^{-1}): 2941, 2868, 1449, 1356, 1125, 1076, 1034, 968, 903, 870, 816, 760, 692, 546; MS (ESI): calculated for $C_{15}H_{19}NO_3$ $[M+Na]^+$ 284.1263, found 284.1255.

(3-Phenyl-2-isoxazolin-5-yl)methyl benzoate (3d)

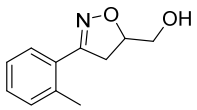


To a solution of (3-phenyl-2-isoxazolin-5-yl)methanol (370 mg, 2.1 mmol) in CH_2Cl_2 (15 mL) were added Et_3N (886 μL, 6.3 mmol), DMAP (257 mg, 2.1 mmol) and PhCOCl (486 μL, 4.2 mmol). The mixture was stirred at rt for 2 h before the solvent was evaporated. The crude product (**3d**) was purified by silica gel chromatography.



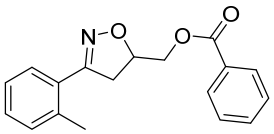
Light yellow oil (591 mg, 100% yield), R_f = 0.42 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.02–8.00 (m, 2H), 7.71–7.68 (m, 2H),7.56–7.52 (m, 1H), 7.43–7.38 (m, 5H), 5.16–5.09 (m, 1H), 4.54–4.44 (m, 2H), 3.54 (dd, *J* = 16.9, 10.9 Hz, 1H), 3.27 (dd, *J* = 16.9, 6.9 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 156.4, 133.3, 130.3, 129.8, 129.6, 129.3, 128.8, 128.5, 126.8, 78.4, 65.6, 37.4; IR (cm^{-1}): 3065, 2947, 2938, 1773, 1719, 1601, 1449, 1271, 1196, 1177, 1119, 1070, 1026, 912, 897, 760, 712, 692, 669, 548; MS (ESI): calculated for $C_{17}H_{15}NO_3$ $[M+H]^+$ 282.1130, found 282.1134.

[3-(*o*-Tolyl)-2-isoxazolin-5-yl]methanol



Light yellow solid (2.45 g, 56% yield), R_f = 0.32 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.35–7.21 (m, 4H), 4.84–4.77 (m, 1H), 3.85 (dd, *J* = 12.1, 3.2 Hz, 1H), 3.68 (dd, *J* = 12.2, 4.7 Hz, 1H), 3.42 (dd, *J* = 16.6, 10.7 Hz, 1H), 3.31 (dd, *J* = 16.6, 7.7 Hz, 1H), 2.54 (s, 3H), 2.12 (br s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 158.0, 137.8, 131.5, 129.4, 128.9, 128.5, 125.8, 80.3, 63.6, 39.1, 22.8; IR (cm^{-1}): 3410, 3063, 3024, 2924, 2872, 1603, 1589, 1495, 1454, 1435, 1383, 1339, 1283, 1242, 1165, 1096, 1049, 893, 870, 820, 793, 760, 719, 658, 554; MS (ESI): calculated for $C_{11}H_{13}NO_2$ $[M+H]^+$ 192.1025, found 192.1026.

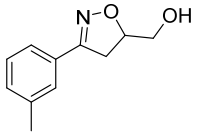
[3-(*o*-Tolyl)-2-isoxazolin-5-yl]methyl benzoate (3e)



White solid (1.36 g, 92% yield), m.p. 71–72 °C, R_f = 0.33 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.03–8.01 (m, 2H), 7.58–7.54 (m, 1H), 7.43–7.22 (m, 6H), 5.10–5.03 (m, 1H), 4.54–4.44 (m, 2H), 3.59 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.31 (dd, *J* = 16.6, 6.8 Hz, 1H), 2.57 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 157.1, 138.1, 133.3, 131.7, 129.8, 129.6, 129.5, 128.9, 128.4, 128.3, 125.9, 77.3, 65.6, 39.9, 23.0; IR (cm^{-1}): 3034, 2951, 2924, 1722, 1601, 1450, 1437, 1314, 1271, 1177, 1119, 1070, 1026, 910, 806, 787, 712, 694, 675; MS (ESI): calculated for $C_{18}H_{17}NO_3$

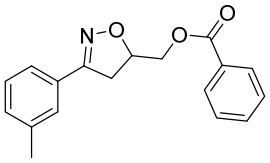
$[M+H]^+$ 296.1287, found 296.1285.

[3-(*m*-Tolyl)-2-isoxazolin-5-yl]methanol



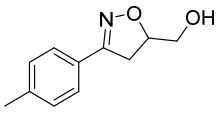
Light yellow oil (2.97 g, 68% yield), R_f = 0.35 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.51 (s, 1H), 7.44 (d, *J* = 7.6 Hz, 1H), 7.31–7.21 (m, 2H), 4.89–4.83 (m, 1H), 3.89–3.85 (dd, *J* = 12.2, 2.8 Hz, 1H), 3.70–3.66 (dd, *J* = 12.2, 4.7 Hz, 1H), 3.38 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.26 (dd, *J* = 16.6, 7.8 Hz, 1H), 2.38 (s, 3H), 1.93 (br s, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.2, 138.3, 130.9, 129.2, 128.5, 127.2, 123.9, 81.3, 63.5, 36.4, 21.3; IR (cm^{-1}): 3383, 3038, 2924, 2872, 1576, 1437, 1381, 1362, 1346, 1094, 1047, 955, 914, 878, 802, 787, 694, 446; MS (ESI): calculated for $C_{11}H_{13}NO_2$ $[M+H]^+$ 192.1025, found 192.1022.

[3-(*m*-Tolyl)-2-isoxazolin-5-yl]methyl benzoate (3f)



Light yellow solid (1.35 g, 91% yield), m.p. 85–86 °C, R_f = 0.31 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.01 (d, *J* = 7.4 Hz, 2H), 7.57–7.53 (m, 2H), 7.47 (d, *J* = 7.6 Hz, 1H), 7.40 (t, *J* = 7.8 Hz, 2H), 7.30 (t, *J* = 7.6 Hz, 1H), 7.23 (d, *J* = 7.6 Hz, 1H), 5.14–5.07 (m, 1H), 4.53–4.44 (m, 2H), 3.52 (dd, *J* = 16.7, 10.8 Hz, 1H), 3.26 (dd, *J* = 16.7, 6.9 Hz, 1H), 2.38 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 156.5, 138.6, 133.3, 131.1, 129.8, 129.6, 129.2, 128.7, 128.5, 127.4, 124.0, 78.3, 65.6, 37.5, 21.4; IR (cm^{-1}): 3061, 3034, 2951, 2924, 2857, 1722, 1601, 1450, 1344, 1314, 1273, 1177, 1119, 1070, 1026, 910, 806, 787, 712, 694; MS (ESI): calculated for $C_{18}H_{17}NO_3$ $[M+H]^+$ 296.1287, found 296.1285.

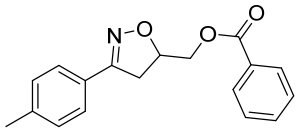
[3-(*p*-Tolyl)-2-isoxazolin-5-yl]methanol



Light yellow solid (3.38 g, 59% yield), R_f = 0.36 (1:1 hexanes/AcOEt). ^{1}H NMR (400

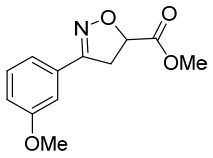
MHz, $CDCl_3$) δ: 7.55 (d, *J* = 7.9 Hz, 2H), 7.20 (d, *J* = 8.0 Hz, 2H), 4.88–4.82 (m, 1H), 3.86 (dd, *J* = 12.2, 2.6 Hz, 1H), 3.38 (dd, *J* = 12.2, 4.8 Hz, 1H), 3.37 (dd, *J* = 16.6, 10.7 Hz, 1H), 3.26 (dd, *J* = 16.6, 7.8 Hz, 1H), 2.38 (s, 3H), 1.93 (br s, 1H).

[3-(*p*-Tolyl)-2-isoxazolin-5-yl]methyl benzoate (3g)



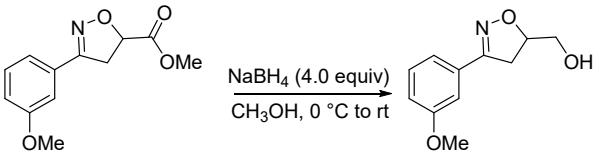
White solid (1.33 g, 90% yield), m.p. 124–125 °C, R_f = 0.28 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.01 (d, *J* = 8.1 Hz, 2H), 7.59–7.53 (m, 3H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.21 (d, *J* = 7.9 Hz, 2H), 5.13–5.07 (m, 1H), 4.53–4.43 (m, 2H), 3.52 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.25 (dd, *J* = 16.6, 6.8 Hz, 1H), 2.39 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.3, 156.3, 140.5, 133.2, 129.7, 129.6, 129.5, 128.4, 126.7, 126.4, 78.1, 65.6, 37.5, 21.4; IR (cm^{-1}): 2955, 1719, 1450, 1273, 1177, 1119, 1070, 1026, 912, 897, 816, 712, 546; MS (ESI): calculated for $C_{18}H_{17}NO_3$ $[M+H]^+$ 296.1287, found 296.1286.

[3-(3-Methoxyphenyl)-2-isoxazolin-5-yl]carboxylic acid methyl ester



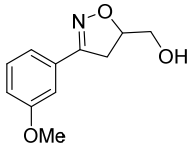
Colorless oil (619 mg, 43% yield), R_f = 0.30 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.31 (t, *J* = 8.0 Hz, 1H, ArH), 7.28–7.26 (m, 1H, ArH), 7.18–7.16 (m, 1H, ArH), 6.98–6.96 (m, 1H, ArH), 5.18 (dd, *J* = 10.3, 7.9 Hz, 1H, OCH), 3.82 (s, 3H, OCH_3), 3.81 (s, 3H, OCH_3), 3.64–3.61 (m, 2H, CHC**H**$_2$); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.8, 159.8, 156.2, 129.9, 129.8, 119.7, 117.0, 111.6, 78.1, 55.5, 52.9, 39.1; IR (cm^{-1}): 2955, 1744, 1608, 1575, 1433, 1360, 1292, 1219, 1030, 670, 557; MS (ESI): calculated for $C_{12}H_{13}NO_4$ $[M+Na]^+$ 258.0742, found 258.0735.

[3-(3-Methoxyphenyl)-2-isoxazolin-5-yl]methanol



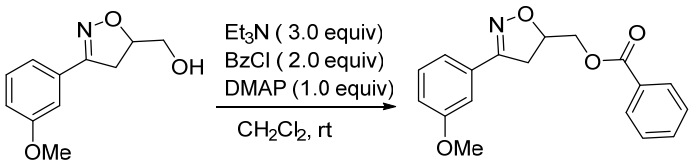
To a solution of the starting isoxazoline (2.09 g, 8.9 mmol) in CH_3OH (50 mL) was

added $NaBH_4$ (1.35 g, 35.6 mmol) at 0 °C. The mixture was warmed to room temperature and stirred overnight. The solvent was removed under vacuum. The crude product was purified by silica gel chromatography.

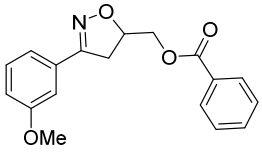


Colorless oil (1.47 g, 80% yield), R_f = 0.22 (1:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.31 (t, *J* = 7.9 Hz, 1H, ArH), 7.27–7.26 (m, 1H, ArH), 7.18 (d, *J* = 7.6 Hz, 1H, ArH), 6.95–6.91 (m, 1H, ArH), 4.90–4.83 (m, 1H, CH), 3.87 (d, *J* = 12.2 Hz, 1H, C**H**$_2$OH), 3.83 (s, 3H, OCH_3), 3.68 (d, *J* = 12.0 Hz, 1H, C**H**$_2$OH), 3.37 (dd, *J* = 16.6, 10.7 Hz, 1H, CCH_2), 3.26 (dd, *J* = 16.6, 7.8 Hz, 1H, CCH_2), 2.01 (s, 1H, OH); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 159.9, 157.2, 130.8, 129.9, 119.5, 116.7, 111.5, 81.4, 63.9, 55.5, 36.6; IR (cm^{-1}): 3410, 2937, 1608, 1573, 1216, 1033, 690; MS (ESI): calculated for $C_{11}H_{13}NO_3$ $[M+Na]^+$ 230.0793, found 230.0786.

[3-(3-Methoxyphenyl)-2-isoxazolin-5-yl)]methyl benzoate (3h)



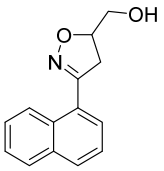
To a solution of the starting isoxazoline (450 mg, 2.6 mmol) in CH_2Cl_2 (25 mL) were added Et_3N (1.09 mL, 7.8 mmol), DMAP (316 mg, 2.6 mmol) and PhCOCl (0.6 mL, 5.2 mmol). The mixture was stirred at rt for 2 h before the solvent was evaporated. The crude product (**3h**) was purified by silica gel chromatography.



Light yellow oil (663 mg, 92% yield), R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.00 (m, 2H, ArH), 7.56–7.52 (m, 1H, ArH), 7.39 (t, *J* = 7.8 Hz, 2H, ArH), 7.33–7.28 (m, 2H, ArH), 7.21–7.19 (m, 1H, ArH), 6.98–6.96 (m, 1H, ArH), 5.15–5.07 (m, 1H, CH), 4.51 (dd, *J* = 11.8, 4.3 Hz, 1H, OCH_2), 4.45 (dd, *J* = 11.8, 5.3 Hz, 1H, OCH_2), 3.82 (s, 3H, OCH_3), 3.51 (dd, *J* = 16.7, 10.9 Hz, 1H, N=CCH_2), 3.25 (dd, *J* = 16.7, 6.9 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 159.9,

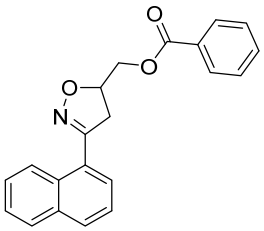
156.4, 133.4, 130.6, 129.91, 129.89, 129.7, 128.5, 119.5, 116.7, 111.5, 78.5, 65.6, 55.5, 37.5; IR (cm^{-1}): 2942, 1722, 1602, 1573, 1453, 1273, 1217, 1178, 1120, 1027, 915, 712, 689; MS (ESI): calculated for $C_{18}H_{17}NO_4$ $[M+Na]^+$ 334.1055, found 334.1052.

[3-(1-Naphthyl)-2-isoxazolin-5-yl]methanol



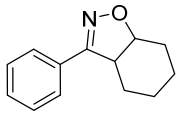
Light yellow oil (5.46 g, 96% yield), R_f = 0.31 (1:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.94 (d, *J* = 8.6 Hz, 1H), 7.90 (t, *J* = 8.2 Hz, 2H), 7.63–7.46 (m, 4H), 4.93–4.87 (m, 1H), 3.97–3.92 (ddd, *J* = 9.0, 5.8, 3.2 Hz, 1H), 3.79–3.73 (ddd, *J* = 12.2, 7.6, 4.6 Hz, 1H), 3.59 (dd, *J* = 16.5, 10.6 Hz, 1H), 3.50 (dd, *J* = 16.5, 7.8 Hz, 1H), 1.98 (dd, *J* = 7.5, 5.9 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.6, 133.8, 130.6, 130.5, 128.5, 127.7, 127.4, 126.8, 126.3, 126.2, 124.7, 80.2, 63.5, 39.3; IR (cm^{-1}): 3406, 3050, 2927, 1595, 1510, 1320, 1049, 957, 894, 802, 775, 640; MS (ESI): calculated for $C_{14}H_{13}NO_2$ $[M+H]^+$ 228.1025, found 228.1021.

[3-(1-Naphthyl)-2-isoxazolin-5-yl]methyl benzoate (3i)



Light yellow solid (1.62 g, 81% yield), m.p. 123–124 °C, R_f = 0.32 (3:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 9.01 (d, *J* = 8.2 Hz, 1H), 8.03–8.01 (m, 2H), 7.93–7.88 (m, 2H), 7.61–7.46 (m, 5H), 7.33 (t, *J* = 7.8 Hz, 2H), 5.18–5.12 (m, 1H), 4.61–4.51 (m, 2H), 3.78 (dd, *J* = 16.6, 10.9 Hz, 1H), 3.47 (dd, *J* = 16.6, 6.6 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 156.8, 134.0, 133.2, 131.0, 130.6, 129.8, 129.5, 128.6, 128.4, 127.8, 127.6, 127.1, 126.4, 126.2, 124.8, 77.2, 65.7, 40.2; IR (cm^{-1}): 3061, 2950, 1720, 1601, 1510, 1451, 1316, 1273, 1177, 1119, 1071, 1026, 895, 801, 775, 711, 653, 550, 446; MS (ESI): calculated for $C_{21}H_{17}NO_3$ $[M+H]^+$ 332.1287, found 332.1289.

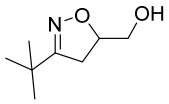
3-Phenyl-3a,4,5,6,7,7a-hexahydrobenzisoxazole (3j)



General procedure II was applied using cyclohexene instead of allyl alcohol.

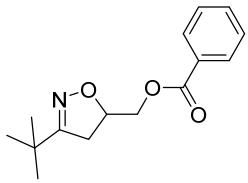
Yellow oil (100 mg, 10% yield), R_f = 0.34 (10:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.72–7.71 (m, 2H), 7.41–7.39 (m, 3H), 4.52–4.48 (m, 1H), 3.30–3.23 (m, 1H), 2.28 (m, 1H), 1.98 (m, 1H), 1.78–1.57 (m, 4H), 1.26 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 163.7, 129.7, 129.2, 128.5, 126.6, 80.1, 44.1, 26.2, 24.8, 22.1, 20.0; IR (cm^{-1}): 3061, 2936, 2860, 1726, 1589, 1555, 1497, 1445, 1375, 1350, 1310, 1257, 1188, 1155, 1076, 993, 939, 928, 891, 866, 810, 766, 692, 679, 642, 600, 500; MS (ESI): calculated for $C_{13}H_{15}NO$ $[M+H]^+$ 202.1232, found 202.1227.

[3-(*t*-Butyl)-2-isoxazolin-5-yl]methanol



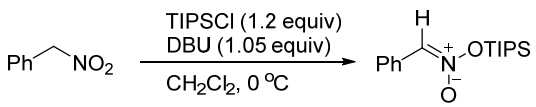
Yellow oil (841 mg, 47% yield), R_f = 0.34 (1:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 4.67–4.61 (m, 1H), 3.75–3.70 (m, 1H), 3.57–3.51 (m, 1H), 2.99 (dd, *J* = 16.8, 10.5 Hz, 1H), 2.86 (dd, *J* = 16.8, 7.3 Hz, 1H), 2.19–2.11 (m, 1H), 1.19 (s, 9H).

[3-(*t*-Butyl)-2-isoxazolin-5-yl]methyl benzoate (3k)[6]



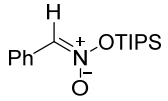
Colorless oil (589 mg, 100% yield), R_f = 0.38 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.05–8.03 (m, 2H), 7.56 (m, 1H), 7.46–7.42 (m, 2H), 4.94–4.88 (m, 1H), 4.42–4.34 (m, 2H), 3.14 (dd, *J* = 17.0, 10.8 Hz, 1H), 2.87 (dd, *J* = 16.9, 6.5 Hz, 1H), 1.20 (s, 9H).

(*E*)-Triisopropylsilyl benzylidenenitronate



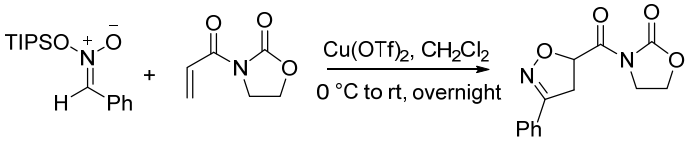
TIPS-Cl (1.27 mL, 6.0 mmol, 1.2 equiv) was added to a stirred solution of

phenylnitromethane (686 mg, 5.0 mmol, 1.0 equiv) in anhydrous dichloromethane at 0 °C under N_2. The solution was stirred at 0 °C for 20 min, then 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU, 783 μL, 5.25 mmol, 1.05 equiv) was added dropwise via syringe at 0 °C. The mixture was stirred at 0 °C for another 20 min, then the solvent was removed under high vacuum and hexanes were added. When DBU·HCl precipitated, the hexanes solution of the silyl nitronate was collected via syringe. The silyl nitronate was immediately purified by column chromatography (20 mL silica gel) and used directly in the cycloaddition reaction as indicated below.

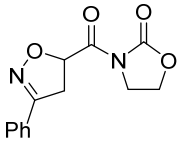


Yellow oil (1.39 g, 95% yield), R_f = 0.65 (30:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.89–7.87 (m, 2H), 7.41–7.38 (m, 2H), 7.35–7.31 (m, 1H), 7.09 (s, 1H), 1.43–1.32 (m, 3H), 1.13 (d, J = 7.4 Hz, 18H).

***N*-[(3-Phenyl-2-isoxazolin-5-yl)carbonyl]-2-oxazolidinone (5a)**



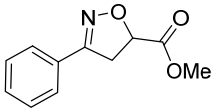
A dry 50 mL Schlenk tube were charged with *N*-acryloyl-2-oxazolidinone (282 mg, 2.0 mmol), $Cu(OTf)_2$ (144 mg, 0.4 mmol), triisopropylsilyl benzylidenenitronate (880 mg, 3.0 mmol) and anhydrous CH_2Cl_2 (15 mL). The mixture was stirred at 0 °C and then rt overnight. After evaporation of CH_2Cl_2, the crude product was purified by silica gel chromatography.



White solid (261 mg, 50% yield), m.p. 161–162 °C, R_f = 0.45 (1:2 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.68 (dd, J = 7.2 , 1.7 Hz, 2H), 7.45–7.38 (m, 3H), 6.13 (dd, J = 11.6 , 6.2 Hz, 1H), 4.53 (t, J = 7.9 Hz, 2H), 4.14–4.02 (m, 2H), 3.80 (dd, J = 17.1, 11.6 Hz, 1H), 3.60 (dd, J = 17.1, 6.1 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.3, 156.1, 153.5, 130.6, 128.9, 128.7, 127.0, 77.9, 63.1, 42.6, 39.0; IR (cm^{-1}):

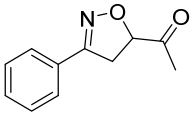
1771, 1715, 1387, 1356, 1273, 1223, 1113, 1034, 880, 864, 766, 756, 694, 548; MS (ESI): calculated for $C_{13}H_{12}N_2O_4$ $[M+H]^+$ 261.0875, found 261.0870.

(3-Phenyl-2-isoxazolin-5-yl)carboxylic acid methyl ester (5b)[7]



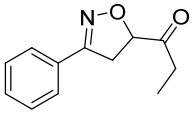
General procedure II was applied using methyl acrylate instead of allyl alcohol. Light yellow oil (853 mg, 83% yield), R_f = 0.45 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.69–7.65 (m, 2H), 7.44–7.37 (m, 3H), 5.18 (dd, *J* = 10.6, 7.6 Hz, 1H), 3.80 (s, 3H), 3.64 (dd, *J* = 7.6, 2.0 Hz, 2H).

Methyl 3-phenyl-2-isoxazolin-5-yl ketone (5c)[8]



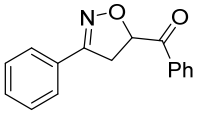
General procedure II was applied using methyl vinyl ketone instead of allyl alcohol. White solid (1.22 g, 65% yield), R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.69–7.66 (m, 2H), 7.44–7.39 (m, 3H), 5.03 (dd, *J* = 11.8, 6.3 Hz, 1H), 3.64 (dd, *J* = 17.0, 6.2 Hz, 1H), 3.50 (dd, *J* = 17.0, 11.8 Hz, 1H), 2.36 (s, 3H).

Ethyl 3-phenyl-2-isoxazolin-5-yl ketone (5d)



Light yellow oil (521 mg, 51% yield), R_f = 0.31 (10:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.69–7.65 (m, 2H), 7.45–7.38 (m, 3H), 5.05 (dd, *J* = 11.9, 6.3 Hz, 1H), 3.67–3.61 (dd, *J* = 17.0, 6.3 Hz, 1H), 3.53–3.46 (dd, *J* = 17.0, 11.9 Hz, 1H), 2.79–2.73 (m, 2H), 1.08 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 210.0, 156.7, 130.5, 128.8, 128.7, 126.9, 84.1, 37.4, 32.2, 7.1; IR (cm^{-1}): 3061, 2978, 2940, 1721, 1497, 1447, 1356, 1126, 1076, 920, 891, 864, 760, 692, 673, 544; MS (ESI): calculated for $C_{12}H_{13}NO_2$ $[M+H]^+$ 204.1025, found 204.1025.

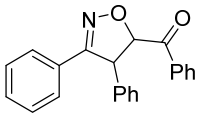
Phenyl 3-phenyl-2-isoxazolin-5-yl ketone (5e)



Light yellow solid (700 mg, 56% yield), m.p. 100–101 °C, R_f = 0.38 (5:1

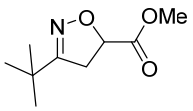
hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.13–8.11 (m, 2H), 7.73–7.71 (m, 2H), 7.65–7.61 (m, 1H), 7.54–7.50 (m, 2H), 7.44–7.39 (m, 3H), 5.88 (dd, *J* = 11.5, 7.1 Hz, 1H), 4.09 (dd, *J* = 16.8, 7.1 Hz, 1H), 3.54 (dd, *J* = 16.8, 11.6 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 193.8, 156.9, 134.6, 134.0, 130.5, 129.7, 128.9, 128.84, 128.81, 127.0, 81.5, 36.2; IR (cm^{-1}): 3059, 2926, 1686, 1597, 1449, 1356, 1229, 912, 889, 762, 691, 544; MS (ESI): calculated for $C_{16}H_{13}NO_2$ $[M+H]^+$ 252.1025, found 252.1027.

3,4-Diphenyl-2-isoxazolin-5-yl phenyl ketone (5f)



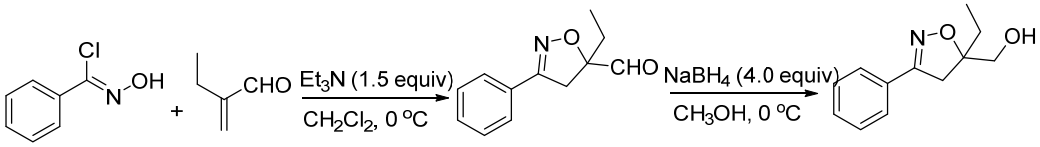
Light yellow oil (565 mg, 34% yield), R_f = 0.25 (20:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.07–8.05 (m, 2H), 7.64–7.60 (m, 3H), 7.50 (t, *J* = 7.8 Hz, 2H), 7.39–7.27 (m, 8H), 5.68 (d, *J* = 4.8 Hz, 1H), 5.45 (d, *J* = 4.8 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 193.5, 158.6, 138.3, 134.2, 134.0, 130.2, 129.7, 129.5, 128.8, 128.7, 128.1, 127.9, 127.6, 90.1, 55.2; IR (cm^{-1}): 3061, 3028, 1688, 1597, 1580, 1495, 1447, 1344, 1329, 1252, 1182, 1076, 949, 887, 754, 691, 557, 532; MS (ESI): calculated for $C_{22}H_{17}NO_2$ $[M+H]^+$ 328.1338, found 328.1333.

(3-*t*-Butyl-2-isoxazolin-5-yl)carboxylic acid methyl ester (5g)[9]



Light yellow oil (2.43 g, 85% yield), R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 4.97 (dd, *J* = 10.2, 7.4 Hz, 1H), 3.77 (s, 3H), 3.29–3.18 (m, 2H), 1.20 (s, 9H).

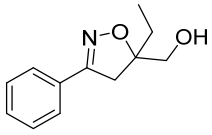
General procedure III: preparations of 7a–7h



To a solution of *α*-chlorobenzaldoxime (1.55 g, 10 mmol, 1.0 equiv) in CH_2Cl_2 (30 mL) were added Et_3N (2.11 mL, 15 mmol, 1.5 equiv) and 2-ethylacrolein (1.0 mL, 10 mmol, 1.0 equiv). The mixture was stirred at 0 °C for 2 h before the solvent was

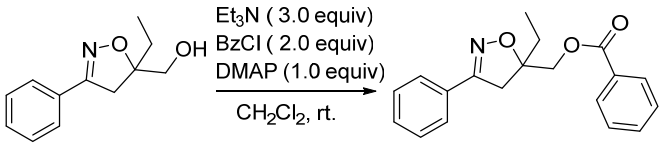
removed under high vacuum. To the crude product were added CH_3OH (15 mL) and $NaBH_4$ (1.51 g, 40 mmol, 4.0 equiv). The mixture was stirred at 0 °C for 2 h. The solvent was evaporated and the crude product purified by silica gel chromatography.

(5-Ethyl-3-phenyl-2-isoxazolin-5-yl)methanol

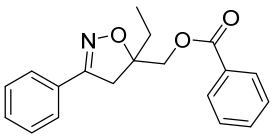


Colorless oil (1.93 g, 94% yield), R_f = 0.46 (1:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.67–7.65 (m, 2H), 7.41–7.39 (m, 3H), 3.76 (d, *J* = 12.0 Hz, 1H), 3.60 (d, *J* = 12.0 Hz, 1H), 3.39 (d, *J* = 16.8 Hz, 1H), 3.09 (d, *J* = 16.8 Hz, 1H), 1.96 (br s, 1H), 1.81–1.68 (m, 2H), 0.98 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 156.8, 129.9, 129.7, 128.7, 126.6, 90.5, 66.1, 39.4, 28.3, 7.7; IR (cm^{-1}): 3398, 2970, 2932, 1599, 1454, 1362, 1072, 922, 760, 694, 540; MS (ESI): calculated for $C_{12}H_{15}NO_2$ $[M+H]^+$ 206.1181, found 206.1183.

(5-Ethyl-3-phenyl-2-isoxazolin-5-yl)methyl benzoate (7a)



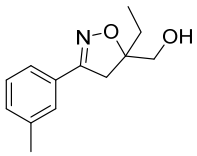
To a solution of (5-methyl-3-phenyl-2-isoxazolin-5-yl)methanol (308 mg, 1.5 mmol, 1.0 equiv) in CH_2Cl_2 (10 mL) were added Et_3N (633 μL, 4.5 mmol, 3.0 equiv), DMAP (183 mg, 1.5 mmol, 1.0 equiv) and BzCl (347 μL, 3.0 mmol, 2.0 equiv). The mixture was stirred at rt for 2 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.



Colorless oil (452 mg, 97% yield), R_f = 0.37 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.98–7.96 (m, 2H), 7.69–7.67 (m, 2H), 7.55–7.51 (m, 1H), 7.43–7.35 (m, 5H), 4.44 (s, 2H), 3.34 (d, *J* = 16.9 Hz, 1H), 3.23 (d, *J* = 16.8 Hz, 1H), 1.96–1.90 (m, 2H), 1.07 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ:166.3, 156.1, 133.2, 130.1, 129.7, 129.6, 128.7, 128.4, 126.6, 88.0, 67.6, 40.7, 28.7, 7.9; IR (cm^{-1}): 3061,

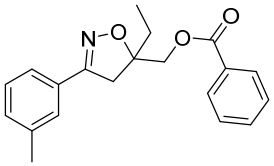
2970, 2939, 2881, 1718, 1600, 1450, 1360, 1315, 1273, 1178, 1072, 1026, 922, 760, 712, 692, 540; MS (ESI): calculated for $C_{19}H_{19}NO_3$ $[M+H]^+$ 310.1443, found 310.1448.

[5-Ethyl-3-(3-methylphenyl)-2-isoxazolin-5-yl]methanol



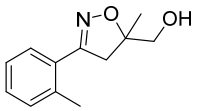
Light yellow oil (2.04 g, 100% yield), R_f = 0.34 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.49 (s, 1H), 7.44 (d, *J* = 7.7 Hz, 1H), 7.30–7.26 (m, 1H), 7.21 (d, *J* = 7.6 Hz, 1H), 3.74 (dd, *J* = 12.0, 4.7 Hz, 1H), 3.59 (dd, *J* = 12.0, 8.9 Hz, 1H), 3.38 (d, *J* = 16.8 Hz, 1H), 3.07 (d, *J* = 16.8 Hz, 1H), 2.37 (s, 3H), 2.26–2.21 (m, 1H), 1.81–1.66 (m, 2H), 0.97 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.0, 138.4, 130.8, 129.7, 128.6, 127.2, 123.8, 90.4, 66.2, 39.5, 28.4, 21.4, 7.7; IR (cm^{-1}): 3414, 2969, 2924, 2881, 1610, 1597, 1575, 1462, 1437, 1363, 1067, 1005, 926, 823, 786, 694; MS (ESI): calculated for $C_{13}H_{17}NO_2$ $[M+H]^+$ 220.1338, found 220.1333.

[5-Ethyl-3-(3-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (7b)



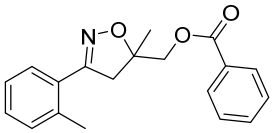
Light yellow oil (1.47 g, 95% yield), R_f = 0.46 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.98 (dd, *J* = 8.2, 1.1 Hz, 2H), 7.55–7.51 (m, 2H), 7.46 (d, *J* = 7.6 Hz, 1H), 7.39–7.35 (m, 2H), 7.29 (t, *J* = 7.6 Hz, 1H), 7.22 (d, *J* = 7.6 Hz, 1H), 4.43 (q, *J* = 11.6 Hz, 2H), 3.33 (d, *J* = 16.9 Hz, 1H), 3.22 (d, *J* = 16.9 Hz, 1H), 2.37 (s, 3H), 1.97–1.87 (m, 2H), 1.06 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.2, 156.1, 138.3, 133.1, 130.8, 129.6, 129.54, 129.49, 128.5, 128.3, 127.1, 123.7, 87.8, 67.6, 40.6, 28.6, 21.3, 7.8; IR (cm^{-1}): 3062, 3034, 2970, 2941, 2926, 2882, 1723, 1602, 1575, 1492, 1462, 1451, 1381, 1363, 1348, 1315, 1272, 1177, 1116, 1071, 1027, 923, 823, 787, 712, 694, 674; MS (ESI): calculated for $C_{20}H_{21}NO_3$ $[M+H]^+$ 324.1600, found 324.1592.

[5-Methyl-3-(2-methylphenyl)-2-isoxazolin-5-yl]methanol



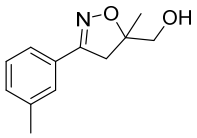
Light yellow oil (2.11 g, 85% yield), R_f = 0.16 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.34–7.21 (m, 4H), 3.73 (d, *J* = 11.6 Hz, 1H), 3.60 (d, *J* = 8.5 Hz, 1H), 3.54 (d, *J* = 16.4 Hz, 1H), 3.05 (d, *J* = 16.6 Hz, 1H), 2.55 (s, 3H), 2.14 (br s, 1H), 1.43 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 158.1, 137.8, 131.5, 129.3, 128.94, 128.86, 125.8, 86.3, 67.2, 44.7, 22.8, 22.6; IR (cm^{-1}): 3422, 2970, 2927, 2871, 1603, 1588, 1495, 1457, 1435, 1383, 1345, 1291, 1191, 1047, 893, 845, 809, 787, 763, 719, 680, 648, 553, 460; MS (ESI): calculated for $C_{12}H_{15}NO_2$ $[M+H]^+$ 206.1181, found 206.1175.

[5-Methyl-3-(2-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (7c)



Light yellow solid (1.31 g, 85% yield), m.p. 87–88 °C, R_f = 0.43 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.00 (d, *J* = 7.8 Hz, 2H), 7.55 (t, *J* = 7.3 Hz, 1H), 7.40 (t, *J* = 7.5 Hz, 2H), 7.33–7.22 (m, 4H), 4.43 (q, *J* = 11.5 Hz, 2H), 3.48 (d, *J* = 16.7 Hz, 1H), 3.23 (d, *J* = 16.6 Hz, 1H), 2.56 (s, 3H), 1.62 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.3, 157.3, 138.0, 133.3, 131.7, 129.8, 129.7, 129.4, 128.8, 128.7, 128.5, 125.9, 84.0, 68.6, 45.8, 23.1, 23.0; IR (cm^{-1}): 3063, 2976, 2932, 1716, 1602, 1585, 1493, 1451, 1376, 1344, 1277, 1177, 1116, 1071, 1027, 998, 907, 838, 789, 759, 711, 687, 671, 618, 554, 462; MS (ESI): calculated for $C_{19}H_{19}NO_3$ $[M+H]^+$ 310.1443, found 310.1438.

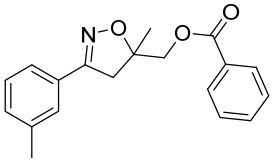
[5-Methyl-3-(3-methylphenyl)-2-isoxazolin-5-yl]methanol



Colorless oil (1.94 g, 100% yield), R_f = 0.34 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.48 (s, 1H), 7.43 (d, *J* = 7.6 Hz, 1H), 7.30–7.20 (m, 2H), 3.73 (dd, *J* = 12.0, 3.5 Hz, 1H), 3.58 (dd, *J* = 12.0, 3.5 Hz, 1H), 3.48 (d, *J* = 16.6 Hz, 1H), 3.00 (d,

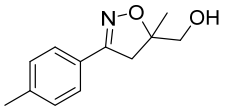
J = 16.6 Hz, 1H), 2.37 (s, 3H), 2.21 (br s, 1H), 1.42 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.2, 138.4, 130.9, 129.7, 128.6. 127.2, 123.8, 87.5, 67.3, 42.1, 22.7, 21.4; IR (cm^{-1}): 3391, 2970, 2924, 2868, 1576, 1456, 1437, 1362, 1348, 1059, 926, 858, 787, 694; MS (ESI): calculated for $C_{12}H_{15}NO_2$ $[M+H]^+$ 206.1181, found 206.1175.

[5-Methyl-3-(3-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (7d)



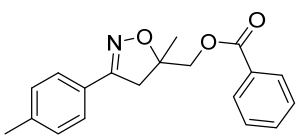
Light yellow oil (1.20 g, 100% yield), R_f = 0.36 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (d, *J* = 7.8 Hz, 2H), 7.56–7.50 (m, 2H), 7.45 (d, *J* = 7.6 Hz, 1H), 7.39 (t, *J* = 7.4 Hz, 2H), 7.29 (t, *J* = 7.5 Hz, 1H), 7.22 (d, *J* = 7.5 Hz, 1H), 4.42 (q, *J* = 11.5 Hz, 2H), 3.43 (d, *J* = 16.7 Hz, 1H), 3.17 (d, *J* = 16.7 Hz, 1H), 2.38 (s, 3H), 1.61 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.3, 156.5, 138.5, 133.3, 131.0, 129.8, 129.62, 129.60, 128.7, 128.5, 127.2, 123.8, 85.1, 68.6, 43.3, 23.2, 21.4; IR (cm^{-1}): 3061, 2974, 2930, 2872, 1722, 1601, 1574, 1491, 1450, 1377, 1314, 1277, 1177, 1113, 1070, 1026, 922, 789, 712, 694; MS (ESI): calculated for $C_{19}H_{19}NO_3$ $[M+H]^+$ 310.1443, found 310.1436.

[5-Methyl-3-(4-methylphenyl)-2-isoxazolin-5-yl]methanol



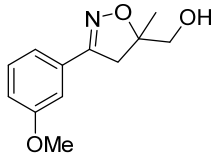
Light yellow oil (2.64 g, 100% yield), R_f = 0.16 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (d, *J* = 7.9 Hz, 2H), 7.19 (d, *J* = 7.8 Hz, 2H), 3.72 (d, *J* = 11.8 Hz, 1H), 3.58 (t, *J* = 8.5 Hz, 1H), 3.47 (d, *J* = 16.6 Hz, 1H), 3.00 (d, *J* = 16.6 Hz, 1H), 2.37 (s, 3H), 2.15 (br s, 1H), 1.42 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 157.0, 140.2, 129.3, 126.9, 126.5, 87.3, 67.0, 42.0, 22.7, 21.4; IR (cm^{-1}): 3422, 3406, 2970, 2924, 2868, 1516, 1358, 1057, 922, 908, 816, 783, 546, 534; MS (ESI): calculated for $C_{12}H_{15}NO_2$ $[M+H]^+$ 206.1181, found 206.1177.

[5-Methyl-3-(4-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (7e)



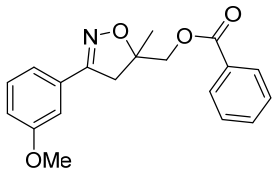
Light yellow solid (1.44 g, 93% yield), m.p. 89–90 °C, R_f = 0.36 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (d, *J* = 7.8 Hz, 2H), 7.57–7.52 (m, 3H), 7.38 (t, *J* = 7.4 Hz, 2H), 7.20 (d, *J* = 7.7 Hz, 2H), 4.41 (q, *J* = 11.5 Hz, 2H), 3.42 (d, *J* = 16.7 Hz, 1H), 3.16 (d, *J* = 16.7 Hz, 1H), 2.38 (s, 3H), 1.60 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 156.4, 140.5, 133.3, 129.9, 129.7, 129.6, 128.5, 127.0, 126.7, 85.1, 68.7, 43.5, 23.3, 21.6; IR (cm^{-1}): 3062, 3034, 2976, 2926, 1733, 1602, 1517, 1451, 1376, 1358, 1315, 1287, 1177, 1111, 1071, 998, 912, 818, 786, 717, 539, 492; MS (ESI): calculated for $C_{19}H_{19}NO_3$ $[M+H]^+$ 310.1443, found 310.1437.

[3-(3-Methoxyphenyl)-5-methyl-2-isoxazolin-5-yl]methanol



Light yellow oil (2.03 g, 75% yield), R_f = 0.16 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.31–7.25 (m, 2H), 7.16 (d, 1H), 6.95 (dd, *J* = 8.2, 2.4 Hz, 1H), 3.82 (s, 3H), 3.74 (dd, *J* = 12.0, 4.0 Hz, 1H), 3.58 (dd, *J* = 11.9, 8.8 Hz, 1H), 3.49 (d, *J* = 16.6 Hz, 1H), 3.00 (d, *J* = 16.6 Hz, 1H), 2.46 (m, 1H), 1.42 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 159.5, 156.9, 130.9, 129.6, 119.2, 116.2, 111.0, 87.6, 66.9, 55.2, 41.8, 22.6; IR (cm^{-1}): 3417, 2971, 2933, 1605, 1572, 1466, 1457, 1432, 1349, 1291, 1219, 1180, 1054, 1034, 927, 861, 823, 786, 690; MS (ESI): calculated for $C_{12}H_{15}NO_3$ $[M+H]^+$ 222.1130, found 222.1127.

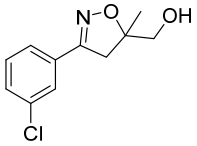
[3-(3-Methoxyphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (7f)



Yellow oil (1.13 g, 90% yield), R_f = 0.34 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (d, *J* = 7.8 Hz, 2H), 7.54 (t, *J* = 7.6 Hz, 1H), 7.38 (t, *J* = 7.4 Hz, 2H), 7.33–7.26 (m, 2H), 7.17 (d, *J* = 7.6 Hz, 1H), 6.96 (d, *J* = 8.2 Hz, 1H), 4.42 (q, *J* = 11.5 Hz, 2H), 3.83 (s, 3H), 3.42 (d, *J* = 16.7 Hz, 1H), 3.17 (d, *J* = 16.7 Hz, 1H), 1.61 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.2, 159.7, 156.3, 133.2, 130.9, 129.72, 129.67, 129.5, 128.4, 119.2, 116.4, 111.1, 85.3, 68.5, 55.3, 43.2, 23.0; IR (cm^{-1}): 3070,

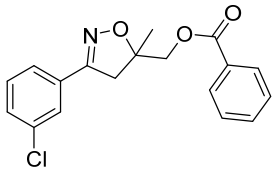
2975, 2939, 2837, 1723, 1602, 1572, 1491, 1451, 1432, 1365, 1350, 1315, 1279, 1226, 1178, 1114, 1071, 1028, 995, 923, 865, 790, 712, 689, 472; MS (ESI): calculated for $C_{19}H_{19}NO_4$ $[M+H]^+$ 326.1392, found 326.1388.

[3-(3-Chlorophenyl)-5-methyl-2-isoxazolin-5-yl]methanol



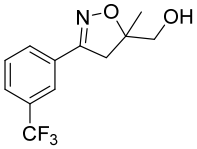
Light yellow oil (1.93 g, 91% yield), R_f = 0.21 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.64 (s, 1H), 7.53 (d, *J* = 7.4 Hz, 1H), 7.38–7.31 (m, 2H), 3.75 (dd, *J* = 12.0, 4.1 Hz, 1H), 3.58 (t, *J* = 9.6 Hz, 1H), 3.47 (d, *J* = 16.6 Hz, 1H), 2.98 (d, *J* = 16.6 Hz, 1H), 2.08–2.05 (m, 1H), 1.44 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 155.8, 134.4, 131.4, 129.9, 129.8, 126.4, 124.6, 88.1, 66.9, 41.5, 22.6; IR (cm^{-1}): 3414, 2973, 2931, 2871, 1596, 1560, 1431, 1361, 1346, 1105, 1056, 930, 786, 751, 685; MS (ESI): calculated for $C_{11}H_{12}ClNO_2$ $[M+H]^+$ 226.0635, found 226.0630.

[3-(3-Chlorophenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (7g)



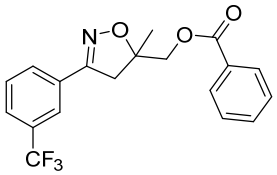
Light yellow oil (1.48 g, 90% yield), R_f = 0.27 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.98 (d, *J* = 7.8 Hz, 2H), 7.65 (s, 1H), 7.54 (t, *J* = 7.4 Hz, 2H), 7.41–7.31 (m, 4H), 4.42 (q, *J* = 11.6 Hz, 2H), 3.40 (d, *J* = 16.7 Hz, 1H), 3.15 (d, *J* = 17.0 Hz, 1H), 1.62 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.0, 155.2, 134.6, 133.2, 131.4, 130.0, 129.9, 129.6, 129.4, 128.3, 126.4, 124.6, 85.6, 77.4, 68.4, 42.8, 22.9; IR (cm^{-1}): 3071, 2979, 2926, 1723, 1598, 1496, 1451, 1438, 1404, 1380, 1356, 1314, 1278, 1248, 1175, 1114, 1095, 1071, 1027, 926, 822, 802, 713, 539, 503; MS (ESI): calculated for $C_{18}H_{16}ClNO_3$ $[M+H]^+$ 330.0897, found 330.0890.

[5-Methyl-3-(3-trifluoromethylphenyl)-2-isoxazolin-5-yl]methanol



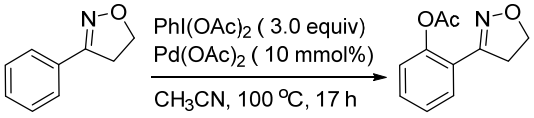
Light yellow oil (2.93 g, 100% yield), R_f= 0.21 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.88 (s, 1H), 7.86 (d, *J* = 8.0 Hz, 1H), 7.66 (d, *J* = 7.8 Hz, 1H), 7.53 (t, *J* = 7.8 Hz, 1H), 3.78 (dd, *J* = 12.1, 4.6 Hz, 1H), 3.59 (dd, *J* = 12.1, 9.2 Hz, 1H), 3.53 (d, *J* = 16.6 Hz, 1H), 3.04 (d, *J* = 16.6 Hz, 1H), 2.06–2.03 (m, 1H), 1.45 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 156.0, 131.1 (q, J_{C-F} = 33 Hz), 130.7, 129.7, 129.3, 126.4 (q, J_{C-F} = 3.0 Hz), 123.8 (q, J_{C-F} = 273 Hz, CF_3), 123.3 (q, J_{C-F} = 4.0 Hz), 88.4, 67.2, 41.6, 22.7; IR (cm^{-1}): 3397, 2976, 2933, 2873, 1431, 1376, 1323, 1168, 1126, 1073, 1055, 934, 804, 780, 704; MS (ESI): calculated for $C_{12}H_{12}F_3NO_2$ $[M+H]^+$ 260.0898, found 260.0894.

[5-Methyl-3-(3-trifluoromethylphenyl)-2-isoxazolin-5-yl]methyl benzoate (7h)



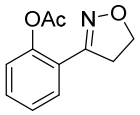
Light yellow oil (1.38 g, 76% yield), R_f = 0.43 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.98 (d, *J* = 7.9 Hz, 2H), 7.87 (t, *J* = 7.8 Hz, 2H), 7.66 (d, *J* = 7.8 Hz, 1H), 7.53 (t, *J* = 7.5 Hz, 2H), 7.38 (t, *J* = 7.5 Hz, 2H), 4.43 (q, *J* = 11.6 Hz, 2H), 3.45 (d, *J* = 16.7 Hz, 1H), 3.20 (d, *J* = 16.7 Hz, 1H), 1.63 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.2, 155.3, 133.4, 131.32 (q, J_{C-F} = 32 Hz), 130.66, 129.75, 129.71, 129.52, 129.41, 128.51, 126.6 (q, J_{C-F} = 4.0 Hz), 123.8 (q, J_{C-F} = 273 Hz, CF_3), 123.4 (q, J_{C-F} = 4.0 Hz), 86.1, 68.6, 42.9, 23.1; IR (cm^{-1}): 3072, 2979, 2939, 1724, 1602, 1452, 1376, 1323, 1316, 1277, 1169, 1126, 1072, 1027, 929, 804, 783, 712; MS (ESI): calculated for $C_{19}H_{16}F_3NO_3$ $[M+H]^+$ 364.1161, found 364.1156.

General procedure IV: acetoxylations of 1, 3, 5, 7



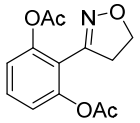
A dry 100 mL Schlenk tube was charged with the isoxazoline (1.0 equiv), $Pd(OAc)_2$ (10 mmol%), $PhI(OAc)_2$ (3.0 equiv) and CH_3CN (8 mL). The mixture was stirred at 100 °C for 17 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.

3-(2-Acetoxyphenyl)-2-isoxazoline (2a)



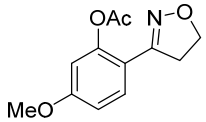
Light yellow solid (103 mg, 65% yield), m.p. 71–72 °C, R_f = 0.31 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.42 (td, *J* = 7.8, 1.6 Hz, 1H), 7.29 (td, *J* = 7.6, 1.2 Hz, 1H), 7.14 (dd, *J* = 8.1, 1.0 Hz, 1H), 4.41 (t, *J* = 10.2 Hz, 2H), 3.33 (t, *J* = 10.2 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.6, 154.1, 148.3, 130.7, 129.5, 126.2, 123.7, 122.7, 68.4, 36.6, 21.2; IR (cm^{-1}): 2926, 1755, 1497, 1447, 1368, 1341, 1192, 1119, 1043, 1009, 912, 881, 820, 760, 669, 642, 592, 546; MS (ESI): calculated for $C_{11}H_{11}NO_3$ $[M+H]^+$ 206.0817, found 206.0812.

3-(2,6-Diacetoxyphenyl)-2-isoxazoline (2a')



Light yellow solid (49 mg, 24% yield), m.p. 119–120 °C, R_f = 0.14 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.43 (t, *J* = 8.2 Hz, 1H), 7.08 (d, *J* = 8.2 Hz, 2H), 4.41 (t, *J* = 10.1 Hz, 2H), 3.22 (t, *J* = 10.1 Hz, 2H), 2.28 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.8, 151.5, 149.5, 130.4, 120.6, 117.5, 69.1, 37.7, 21.0; IR (cm^{-1}): 2889, 1771, 1611, 1595, 1458, 1435, 1369, 1327, 1248, 1188, 1032, 903, 878, 739, 667, 594, 523; MS (ESI): calculated for $C_{13}H_{13}NO_5$ $[M+H]^+$ 264.0872, found 264.0868.

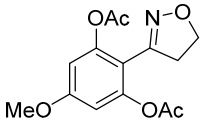
3-(2-Acetoxy-4-methoxyphenyl)-2-isoxazoline (2b)



Light yellow solid (83 mg, 46% yield), m.p. 80–81 °C, R_f = 0.23 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.43 (d, *J* = 8.7 Hz, 1H), 6.82 (dd, *J* = 8.7, 2.6 Hz, 1H), 6.68 (d, *J* = 2.5 Hz, 1H), 4.37 (t, *J* = 10.1 Hz, 2H), 3.83 (s, 3H), 3.30 (t, *J* = 10.1 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.5, 161.3, 153.8, 149.6, 130.4, 115.2, 111.9, 109.5, 68.0, 55.5, 36.7, 21.2; IR (cm^{-1}): 2963, 2938, 1763, 1616, 1558, 1508, 1466, 1425, 1368, 1348, 1302, 1246, 1207, 1161, 1132, 1121,

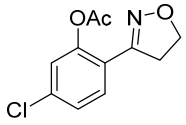
1042, 1015, 961, 934, 889, 814, 594; MS (ESI): calculated for $C_{12}H_{13}NO_4$ $[M+H]^+$ 236.0923, found 236.0917.

3-(2,6-Diacetoxy-4-methoxyphenyl)-2-isoxazoline (2b')



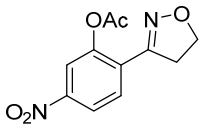
Light yellow oil (32 mg, 14% yield), R_f = 0.19 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 6.62 (s, 2H), 4.36 (t, *J* = 10.0 Hz, 2H), 3.80 (s, 3H), 3.18 (t, *J* = 10.0 Hz, 2H), 2.27 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.8, 161.1, 151.5, 150.3, 109.8, 107.0, 68.9, 55.9, 37.8, 21.1; IR (cm^{-1}): 3094, 2941, 1771, 1624, 1497, 1464, 1433, 1369, 1337, 1188, 1146, 1042, 1015, 883, 598; MS (ESI): calculated for $C_{14}H_{15}NO_6$ $[M+Na]^+$ 316.0797, found 316.0792.

3-(2-Acetoxy-4-chlorophenyl)-2-isoxazoline (2c)



Light yellow solid (38 mg, 59% yield), m.p. 77–78 °C, R_f = 0.25 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.46 (d, *J* = 8.4 Hz, 1H), 7.29–7.25 (m, 1H), 7.17 (d, *J* = 2.0 Hz, 1H), 4.42 (t, *J* = 10.2 Hz, 2H), 3.30 (t, *J* = 10.2 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.2, 153.4, 148.9, 136.0, 130.2, 126.6, 124.4, 121.6, 68.7, 36.5, 21.2; IR (cm^{-1}): 2960, 1774, 1751, 1602, 1490, 1435, 1367, 1340, 1222, 1199, 1087, 1010, 931, 883, 812, 487; MS (ESI): calculated for $C_{11}H_{10}ClNO_3$ $[M+H]^+$ 240.0427, found 240.0421.

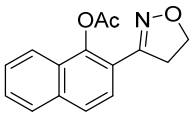
3-(2-Acetoxy-4-nitrophenyl)-2-isoxazoline (2d)



Light yellow solid (4 mg, 5% yield), m.p. 64–65 °C, R_f = 0.23 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.15 (dd, *J* = 8.6, 2.2 Hz, 1H), 8.03 (d, *J* = 2.2 Hz, 1H), 7.73 (d, *J* = 8.6 Hz, 1H), 4.51 (t, *J* = 10.3 Hz, 2H), 3.37 (t, *J* = 10.3 Hz, 2H), 2.37 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.9, 152.9, 148.7, 129.9, 129.1, 128.8, 121.0, 119.6, 69.3, 36.1, 21.1; IR (cm^{-1}): 2961, 2924, 1773, 1522, 1342, 1260, 1186, 1092,

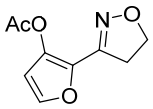
1013, 953, 934, 895, 847, 810, 745, 658, 602; MS (ESI): calculated for $C_{11}H_{10}N_2O_5$ $[M+H]^+$ 251.0668, found 251.0669.

3-(1-Acetoxy-2-naphthyl)-2-isoxazoline (2e)



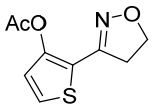
Light yellow solid (173 mg, 72% yield), m.p. 137–138 °C, R_f = 0.25 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.94 (s, 1H), 7.86–7.79 (dd, *J* = 21.6, 8.0 Hz, 2H), 7.58 (s, 1H), 7.56–7.48 (m, 2H), 4.46 (t, *J* = 10.2 Hz, 2H), 3.47 (t, *J* = 10.2 Hz, 2H), 2.38 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.2, 154.3, 145.6, 133.7, 131.0, 130.2, 128.1, 127.7, 127.1, 126.4, 121.9, 121.0, 68.2, 36.5, 21.2; IR (cm^{-1}): 2968, 2918, 1751, 1431, 1369, 1340, 1278, 1201, 1099, 1014, 929, 839, 750, 474; MS (ESI): calculated for $C_{15}H_{13}NO_3$ $[M+Na]^+$ 278.0793, found 278.0795.

3-(3-Acetoxy-2-furyl)-2-isoxazoline (2f)



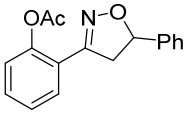
Yellow oil (22 mg, 13% yield), R_f = 0.19 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.70 (d, *J* = 5.6 Hz, 1H), 6.31 (d, *J* = 5.6 Hz, 1H), 4.51–4.39 (m, 2H), 3.29 (m, 1H), 3.11 (m, 1H), 2.13 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.3, 167.9, 155.6, 151.3, 123.3, 101.6, 70.0, 34.1, 21.2; IR (cm^{-1}): 3109, 2965, 2920, 2897, 1800, 1761, 1616, 1437, 1369, 1204, 1090, 1015, 910, 880, 824, 729, 702, 598, 567; MS (ESI): calculated for $C_9H_9NO_4$ $[M+H]^+$ 196.0610, found 196.0605.

3-(3-Acetoxy-2-thienyl)-2-isoxazoline (2g)



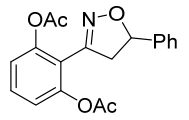
Purple solid (30 mg, 18% yield), m.p. 115–116 °C, R_f = 0.25 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 6.95 (d, *J* = 4.1 Hz, 1H), 6.67 (d, *J* = 4.1 Hz, 1H), 4.45 (t, *J* = 10.0 Hz, 2H), 3.29 (t, *J* = 10.0 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 167.0, 153.7, 152.7, 125.0, 124.4, 113.4, 69.3, 35.7, 20.7; IR (cm^{-1}): 1757, 1541, 1474, 1425, 1373, 1198, 1182, 1051, 1011, 930, 910, 876, 841, 804, 770, 669, 573, 540; MS (ESI): calculated for $C_9H_9NO_3S$ $[M+H]^+$ 212.0381, found 212.0383.

3-(2-Acetoxyphenyl)-5-phenyl-2-isoxazoline (4a)



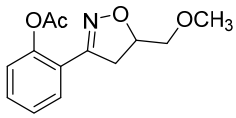
Light yellow oil (179 mg, 66% yield), R_f = 0.25 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.43 (td, *J* = 7.8, 1.6 Hz, 1H), 7.38–7.27 (m, 6H), 7.15 (dd, *J* = 8.1, 1.1 Hz, 1H), 5.67 (dd, *J* = 11.0, 8.4 Hz, 1H), 3.77 (dd, *J* = 16.6, 11.0 Hz, 1H), 3.35 (dd, *J* = 16.6, 8.4 Hz, 1H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.6, 153.5, 148.4, 140.6, 130.8, 129.5, 128.7, 128.3, 126.2, 125.9, 123.8, 122.7, 81.9, 44.5, 21.2; IR (cm^{-1}): 3065, 3032, 2932, 1771, 1759, 1589, 1495, 1449, 1368, 1341, 1194, 1011, 912, 820, 758, 700, 673, 646, 594, 494; MS (ESI): calculated for $C_{17}H_{15}NO_3$ $[M+H]^+$ 282.1130, found 282.1125.

3-(2,6-Diacetoxyphenyl)-5-phenyl-2-isoxazoline (4a')



Light yellow oil (92 mg, 28% yield), R_f = 0.16 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.45–7.30 (m, 6H), 7.07 (d, *J* = 8.2 Hz, 2H), 5.72 (dd, *J* = 10.9, 6.8 Hz, 1H), 3.65 (dd, *J* = 16.9, 10.9 Hz, 1H), 3.25 (dd, *J* = 16.9, 6.8 Hz, 1H), 2.12 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.9, 150.6, 149.6, 141.1, 130.6, 128.9, 128.3, 125.7, 120.6, 117.5, 82.0, 45.8, 20.9; IR (cm^{-1}): 2932, 1771, 1601, 1458, 1369, 1329, 1186, 1034, 901, 883, 854, 760, 739, 700, 594, 557; MS (ESI): calculated for $C_{19}H_{17}NO_5$ $[M+H]^+$ 340.1185, found 340.1177.

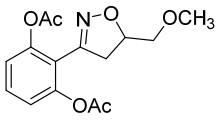
3-(2-Acetoxyphenyl)-5-methoxymethyl-2-isoxazoline (4b)



Light yellow oil (91 mg, 55% yield), R_f = 0.43 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.51 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.42 (td, *J* = 7.8, 1.6 Hz, 1H), 7.28 (td, *J* = 7.6, 1.2 Hz, 1H), 7.13 (dd, *J* = 8.0, 1.0 Hz, 1H), 4.86–4.79 (m, 1H), 3.57 (dd, *J* = 10.3, 5.4 Hz, 1H), 3.50 (dd, *J* = 10.3, 5.0 Hz, 1H), 3.41 (s, 3H), 3.37 (dd, *J* = 17.0, 11.2 Hz, 1H), 3.22 (dd, *J* = 16.6, 7.6 Hz, 1H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.6, 153.7, 148.4, 130.7, 129.5, 126.2, 123.7, 122.8, 79.0, 73.3, 59.4,

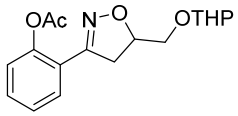
38.5, 21.2; IR (cm^{-1}): 3069, 2984, 2932, 2887, 1759, 1607, 1591, 1497, 1449, 1368, 1344, 1194, 1121, 1042, 1011, 912, 816, 760, 673, 646, 592, 548, 490; MS (ESI): calculated for $C_{13}H_{15}NO_4$ $[M+H]^+$ 250.1079, found 250.1072.

3-(2,6-Diacetoxyphenyl)-5-methoxymethyl-2-isoxazoline (4b')



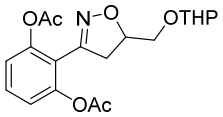
Light yellow oil (23 mg, 18% yield), R_f = 0.31 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 7.33 (t, *J* = 8.2 Hz, 1H), 6.98 (d, *J* = 8.3 Hz, 2H), 4.78–4.71 (m, 1H), 3.47–3.39 (m, 2H), 3.33 (s, 3H), 3.17 (dd, *J* = 17.0, 10.8 Hz, 1H), 3.07 (dd, *J* = 17.0, 7.4 Hz, 1H), 2.19 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.8, 150.9, 149.4, 130.4, 120.5, 117.5, 79.3, 73.1, 59.4, 39.2, 20.9; IR (cm^{-1}): 2934, 2891, 2253, 1771, 1611, 1458, 1435, 1369, 1331, 1252, 1188, 1121, 1080, 1034, 905, 876, 816, 739, 669, 594, 523; MS (ESI): calculated for $C_{15}H_{17}NO_6$ $[M+H]^+$ 308.1134, found 308.1131.

3-(2-Acetoxyphenyl)-5-(2-tetrahydropyranyloxymethyl)-2-isoxazoline (4c)



Light yellow oil (190 mg, 62% yield), R_f = 0.35 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 7.52 (ddd, *J* = 7.7, 4.6, 1.6 Hz, 1H), 7.42 (td, *J* = 7.8, 1.6 Hz, 1H), 7.29 (td, *J* = 7.7, 1.2 Hz, 1H), 7.13 (dd, *J* = 8.1, 1.1 Hz, 1H), 4.91–4.82 (m, 1H), 4.67–4.64 (m, 1H), 3.89–3.79 (m, 2H), 3.63–3.58 (m, 1H), 3.54–3.49 (m, 1H), 3.34–3.16 (m, 2H), 2.31 (s, 3H), 1.82–1.48 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.6, 153.8, 153.7, 148.4, 130.75, 130.73, 129.5, 126.2, 123.82, 123.80, 122.9, 122.8, 99.3, 99.0, 79.17, 79.15, 68.4, 67.9, 62.5, 62.2, 38.9, 38.5, 30.49, 30.44, 25.39, 25.36, 21.2, 19.4, 19.2; IR (cm^{-1}): 2941, 2868, 1771, 1761, 1607, 1591, 1497, 1447, 1368, 1344, 1194, 1125, 1069, 1034, 908, 816, 760, 673, 646, 592, 548; MS (ESI): calculated for $C_{17}H_{21}NO_5$ $[M+Na]^+$ 342.1317, found 342.1318.

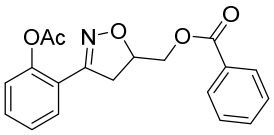
3-(2,6-Diacetoxyphenyl)-5-(2-tetrahydropyranyloxymethyl)-2-isoxazoline (4c')



Light yellow oil (36 mg, 21% yield), R_f = 0.22 (2:1 hexanes/AcOEt). ^1H NMR (400

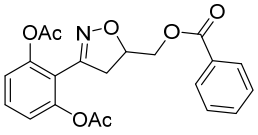
MHz, $CDCl_3$) δ: 7.42 (t, *J* = 8.2 Hz, 1H), 7.07 (d, *J* = 8.2 Hz, 2H), 4.91–4.85 (m, 1H), 4.69–4.66 (m, 1H), 3.90–3.76 (m, 2H), 3.62–3.58 (m, 1H), 3.55–3.49 (m, 1H), 3.33–3.07 (m, 2H), 2.29 (s, 6H), 1.84–1.50 (m, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.91, 168.88, 151.06, 150.96, 149.5, 130.4, 120.65, 120.63, 117.54, 117.47, 99.6, 99.0, 79.6, 68.1, 67.7, 62.7, 62.3, 39.8, 39.5, 30.6, 30.5, 25.41, 25.38, 21.1, 19.6, 19.3; IR (cm^{-1}): 2943, 2870, 1771, 1611, 1591, 1458, 1441, 1369, 1333, 1188, 1134, 1069, 1034, 905, 870, 816, 735, 594, 523; MS (ESI): calculated for $C_{19}H_{23}NO_7$ $[M+Na]^+$ 400.1372, found 400.1366.

[3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (4d)



Yellow oil (102 mg, 66% yield), R_f = 0.38 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.02 (d, *J* = 8.4 Hz, 2H), 7.51–7.52 (m, 2H), 7.46–7.39 (m, 3H), 7.29 (td, *J* = 7.6, 1.2 Hz, 1H), 7.16 (dd, *J* = 8.1, 1.0 Hz, 1H), 5.09–5.02 (m, 1H), 4.52–4.42 (m, 2H), 3.54 (dd, *J* = 16.7, 10.9 Hz, 1H), 3.28 (dd, *J* = 16.6, 7.1 Hz, 1H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.5, 166.2, 153.6, 148.4, 133.2, 130.9, 129.6, 129.5, 129.4, 128.4, 126.2, 123.8, 122.4, 77.6, 65.4, 38.6, 21.1; IR (cm^{-1}): 2940, 1767, 1759, 1722, 1601, 1497, 1450, 1368, 1344, 1315, 1273, 1194, 1121, 1070, 1026, 912, 818, 760, 712, 675; MS (ESI): calculated for $C_{19}H_{17}NO_5$ $[M+H]^+$ 340.1185, found 340.1184.

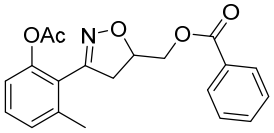
[3-(2,6-Diacetoxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (4d')



Yellow oil (67 mg, 22% yield), R_f = 0.21 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.05 (d, *J* = 7.3 Hz, 2H), 7.56 (t, *J* = 7.4 Hz, 1H), 7.45–7.39 (m, 3H), 7.07 (d, *J* = 8.2 Hz, 2H), 5.08–5.01 (m, 1H), 4.54–4.38 (m, 2H), 3.41 (dd, *J* = 17.0, 10.9 Hz, 1H), 3.17 (dd, *J* = 17.1, 7.1 Hz, 1H), 2.23 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.8, 166.3, 151.0, 149.5, 133.4, 130.6, 129.8, 129.7, 129.5, 128.5, 120.6, 117.0,

78.0, 65.0, 39.6, 21.0; IR (cm^{-1}): 2938, 1771, 1722, 1601, 1458, 1369, 1331, 1315, 1273, 1188, 1119, 1070, 1036, 907, 874, 714, 523; MS (ESI): calculated for $C_{21}H_{19}NO_7$ $[M+H]^+$ 398.1240, found 398.1233.

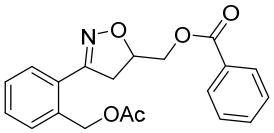
[3-(2-Acetoxy-6-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (4e)



*Note: A mixture (235 mg) of **4e** and **4e''** was isolated in 72% yield. Pure **4e** or **4e''** was isolated by eluting the mixture through a silica gel column using hexanes. **4e** was eluted out first.*

R_f = 0.33 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.07 (d, *J* = 7.2 Hz, 2H), 7.57 (t, *J* = 7.4 Hz, 1H), 7.44 (t, *J* = 7.8 Hz, 2H), 7.31(t, *J* = 7.9 Hz, 1H), 7.12 (d, *J* = 7.6 Hz, 1H), 7.00 (d, *J* = 8.1 Hz, 1H), 5.13–5.06 (m, 1H), 4.52–4.44 (m, 2H), 3.38 (dd, *J* = 17.3, 10.8 Hz, 1H), 3.11 (dd, *J* = 17.3, 7.2 Hz, 1H), 2.34 (s, 3H), 2.23 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.2, 166.4, 153.8, 149.0, 138.9, 133.4, 130.1, 129.8, 129.6, 128.5, 128.1, 122.5, 120.3, 77.9, 65.0, 40.6, 21.0, 20.2; IR (cm^{-1}): 3065, 2957, 2928, 2857, 2255, 1771, 1724, 1601, 1584, 1464, 1452, 1371, 1327, 1315, 1271, 1196, 1117, 1070, 1026, 957, 907, 870, 793, 762, 712, 687, 602; MS (ESI): calculated for $C_{20}H_{19}NO_5$ $[M+H]^+$ 354.1341, found 354.1342.

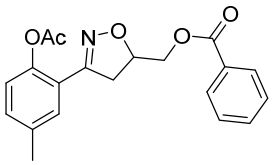
[3-(2-Acetoxymethylphenyl)-2-isoxazolin-5-yl]methyl benzoate (4e'')



R_f = 0.33 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.03–8.01 (m, 2H), 7.57–7.51 (m, 2H), 7.45–7.36 (m, 5H), 5.44 (s, 2H), 5.12–5.05 (m, 1H), 4.54–4.45 (m, 2H), 3.59 (dd, *J* = 16.6, 10.8 Hz, 1H), 3.32 (dd, *J* = 16.7, 7.0 Hz, 1H), 2.13 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.5, 166.3, 156.2, 135.8, 133.3, 129.8, 129.7, 129.5, 129.0, 128.4, 128.3, 127.9, 127.3, 77.6, 65.4, 65.0, 39.4, 21.0; IR (cm^{-1}): 3065, 2953, 1732, 1601, 1493, 1452, 1381, 1362, 1342, 1315, 1273, 1231, 1177, 1121, 1070, 1026, 910, 762, 712; MS (ESI): calculated for $C_{20}H_{19}NO_5$ $[M+H]^+$ 354.1341, found

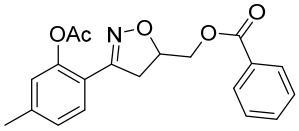
354.1342.

[3-(2-Acetoxy-5-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (4f)



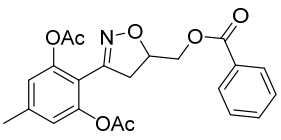
Light yellow solid (225 mg, 82% yield), m.p. 110–111 °C, R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.02 (d, *J* = 7.6 Hz, 2H), 7.55 (t, *J* = 7.5 Hz, 1H), 7.42 (t, *J* = 7.7 Hz, 2H), 7.32 (s, 1H), 7.23 (d, *J* = 8.2 Hz, 1H), 7.03 (d, *J* = 8.2 Hz, 1H), 5.08–5.01 (m, 1H), 4.51–4.42 (m, 2H), 3.51 (dd, *J* = 16.7, 10.9 Hz, 1H), 3.26 (dd, *J* = 16.7, 7.1 Hz, 1H), 2.36 (s, 3H), 2.30 (s, 3H); ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ: 169.9, 166.4, 153.9, 146.3, 136.1, 133.4, 131.7, 130.0, 129.9, 129.6, 128.5, 123.6, 122.1, 77.7, 65.5, 38.9, 21.3, 20.9; IR (cm^{-1}): 1763, 1721, 1501, 1450, 1368, 1348, 1273, 1196, 1119, 1070, 1026, 907, 712; MS (ESI): calculated for $C_{20}H_{19}NO_5$ $[M+H]^+$ 354.1341, found 354.1337.

[3-(2-Acetoxy-4-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (4g)



White solid (147 mg, 54% yield), m.p. 132–133 °C, R_f = 0.20 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.02 (d, *J* = 8.0 Hz, 2H), 7.55 (t, *J* = 7.4 Hz, 1H), 7.43–7.39 (m, 3H), 7.09 (d, *J* = 8.0 Hz, 1H), 6.97 (s, 1H), 5.06–4.99 (m, 1H), 4.51–4.41 (m, 2H), 3.51 (dd, *J* = 16.6, 10.9 Hz, 1H), 3.25 (dd, *J* = 16.6, 7.1 Hz, 1H), 2.39 (s, 3H), 2.31 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.7, 166.3, 153.6, 148.3, 141.8, 133.2, 129.8, 129.5, 129.3, 128.4, 127.1, 124.4, 119.6, 65.5, 38.8, 21.22, 21.21; IR (cm^{-1}): 2938, 1773, 1719, 1364, 1273, 1204, 1121, 1070, 1024, 899, 818, 714; MS (ESI): calculated for $C_{20}H_{19}NO_5$ $[M+H]^+$ 354.1341, found 354.1340.

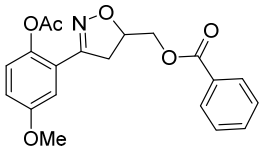
[3-(2,6-Diacetoxy-4-methylphenyl)-2-isoxazolin-5-yl]methyl benzoate (4g')



Yellow oil (52 mg, 15% yield), R_f = 0.28 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz,

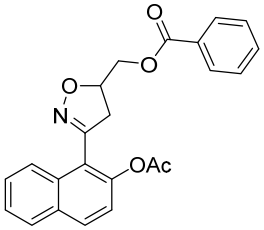
$CDCl_3$) δ: 8.06–8.04 (m, 2H), 7.57 (t, *J* = 7.4 Hz, 1H), 7.43 (t, *J* = 7.8 Hz, 2H), 6.89 (s, 2H), 5.06–4.99 (m, 1H), 4.44–4.42 (m, 2H), 3.39 (dd, *J* = 17.0, 10.9 Hz, 1H), 3.15 (dd, *J* = 17.0, 7.1 Hz, 1H), 2.37 (s, 3H), 2.22 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.0, 166.4, 151.0, 149.2, 141.8, 133.4, 129.9, 129.6, 128.5, 121.4, 114.0, 77.9, 65.0, 39.7, 21.4, 21.1; IR (cm^{-1}): 3063, 2940, 2864, 1771, 1722, 1626, 1601, 1585, 1452, 1369, 1333, 1273, 1188, 1119, 1051, 1026, 893, 714, 525; MS (ESI): calculated for $C_{22}H_{21}NO_7$ $[M+H]^+$ 412.1396, found 412.1389.

[3-(2-Acetoxy-5-methoxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (4h)



Light yellow oil (185 mg, 53% yield), R_f = 0.33 (3:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.02 (dd, *J* = 7.72, 0.6 Hz, 2H, ArH), 7.55 (t, *J* = 5.8 Hz, 1H, ArH), 7.41 (t, *J*= 7.8 Hz, 2H, ArH), 7.07 (m, 2H, ArH), 6.95 (dd, *J* = 8.9, 3.0 Hz, 1H, ArH), 5.08–5.01 (m, 1H, OCH), 4.46 (qd, 2H, OCH_2), 3.80 (s, 3H, OCH_3), 3.50 (dd, *J* = 16.7, 10.9 Hz, 1H, N=CCH_2), 3.24 (dd, *J* = 16.7, 7.1 Hz, 1H, N=CCH_2), 2.28 (s, 3H, $COCH_3$); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.0, 166.4, 157.4, 153.8, 142.1, 133.4, 129.9, 129.6, 128.6, 124.7, 123.2, 116.2, 114.6, 78.0, 65.5, 55.8, 38.9, 21.2; IR (cm^{-1}): 1764, 1722, 1503, 1369, 1272, 1194, 1180, 1119, 1027, 713; MS (ESI): calculated for $C_{20}H_{19}NO_6$ $[M+Na]^+$ 392.1110, found 392.1106.

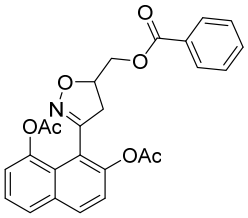
[3-(2-Acetoxy-1-naphthyl)-2-isoxazolin-5-yl]methyl benzoate (4i)



Light yellow oil (285 mg, 73% yield), R_f = 0.33 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.11–8.09 (m, 2H), 7.95–7.92 (dd, *J* = 8.2, 1.0 Hz, 1H), 7.81–7.80 (m, 1H), 7.62–7.58 (m, 1H), 7.53 (t, *J* = 15.8 Hz, 1H), 7.49–7.39 (m, 4H), 7.27–7.25 (dd, *J* = 7.5, 1.0 Hz, 1H), 5.21–5.14 (m, 1H), 4.59–4.57 (m, 2H), 3.75 (dd, *J* = 17.2, 10.8 Hz, 1H), 3.15 (dd, *J* = 17.2, 7.8 Hz, 1H), 2.38 (s, 3H); ^{13}C NMR (100 MHz,

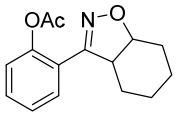
$CDCl_3$) δ: 169.1, 166.3, 159.6, 145.6, 135.3, 133.3, 130.2, 129.7, 129.5, 128.6, 128.4, 126.9, 126.0, 125.6, 124.4, 124.1, 121.0, 78.0, 65.5, 43.8, 20.8; IR (cm^{-1}): 3061, 2945, 1769, 1723, 1601, 1450, 1368, 1315, 1273, 1198, 1119, 1070, 1026, 874, 762, 714; MS (ESI): calculated for $C_{23}H_{19}NO_5$ $[M+H]^+$ 390.1341, found 390.1342.

[3-(2,8-Diacetoxy-1-naphthyl)-2-isoxazolin-5-yl]methyl benzoate (4i')



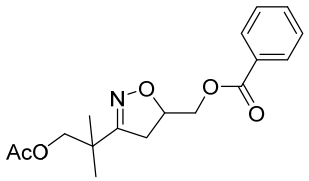
Light yellow oil (14 mg, 3% yield), R_f = 0.24 (2:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.11–8.09 (m, 2H), 7.97 (d, *J* = 8.9 Hz, 1H), 7.80 (d, *J* = 7.6 Hz, 1H), 7.59 (t, *J* = 7.4 Hz, 1H), 7.53 (t, *J* = 7.8 Hz, 1H), 7.47 (t, *J* = 7.8 Hz, 2H), 7.33 (d, *J* = 8.9 Hz, 1H), 7.28 (dd, *J* = 7.6, 0.8 Hz, 1H), 5.21–5.15 (m, 1H), 4.59–4.49 (m, 2H), 3.64–3.59 (m, 1H), 3.14–3.11 (m, 1H), 2.37 (s, 3H), 2.35 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.4, 169.2, 166.5, 148.0, 145.9, 133.6, 133.5, 130.0, 129.7, 129.0, 128.6, 127.0, 126.2, 125.3, 122.4, 122.1, 115.5, 65.5, 43.4, 29.8, 21.1, 21.0; IR (cm^{-1}): 3063, 2959, 2918, 2851, 1773, 1719, 1369, 1271, 1188, 1117, 1015, 878, 764, 714; MS (ESI): calculated for $C_{22}H_{21}NO_7$ $[M+H]^+$ 448.1396, found 448.1392.

3-(2-Acetoxyphenyl)-3a,4,5,6,7,7a-hexahydrobenzisoxazole (4j)



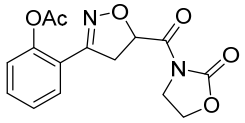
Yellow oil (49 mg, 38% yield), R_f = 0.16 (10:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 7.52 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.41 (td, *J* = 7.6, 1.6 Hz, 1H), 7.29 (td, *J* = 7.6, 1.2 Hz, 1H), 7.14 (dd, *J* = 8.0, 1.2 Hz, 1H), 4.47–4.43 (m, 1H), 3.32–3.26 (m, 1H), 2.31 (s, 3H), 2.21–2.16 (m, 1H), 1.91–1.72 (m, 2H), 1.63–1.48 (m, 3H), 1.13–1.16 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.7, 161.3, 148.8, 130.6, 129.8, 126.2, 124.0, 122.6, 79.6, 45.8, 25.8, 25.1, 22.2, 21.3, 20.2; IR (cm^{-1}): 3067, 2936, 2862, 1769, 1607, 1584, 1493, 1447, 1368, 1337, 1194, 1121, 1042, 1011, 912, 891, 822, 760, 677, 654, 590, 550; MS (ESI): calculated for $C_{15}H_{17}NO_3$ $[M+H]^+$ 260.1287, found 260.1286.

[3-(2-Acetoxy-1,1-dimethylethyl)-2-isoxazolin-5-yl]methyl benzoate (4k)



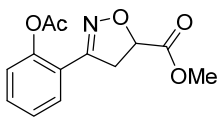
Light yellow oil (76 mg, 51% yield), R_f = 0.16 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.04 (d, *J* = 7.3 Hz, 2H), 7.57 (t, *J* = 7.4 Hz, 1H), 7.44 (t, *J* = 7.8 Hz, 2H), 4.97–4.90 (m, 1H), 4.41–4.33 (m, 2H), 4.05 (s, 2H), 3.14 (dd, *J* = 16.9, 10.8 Hz, 1H), 2.87 (dd, *J* = 17.0, 6.7 Hz, 1H), 2.04 (s, 3H), 1.236 (s, 3H), 1.229 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.7, 166.2, 162.3, 133.2, 129.7, 129.6, 128.4, 77.5, 70.2, 65.2, 37.0, 36.8, 23.2, 23.1, 20.7; IR (cm^{-1}): 3064, 2973, 1740, 1724, 1602, 1475, 1452, 1377, 1316, 1273, 1249, 1178, 1120, 1072, 1043, 884, 714; MS (ESI): calculated for $C_{17}H_{21}NO_5$ $[M+H]^+$ 320.1498, found 320.1503.

***N*-{[3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl]carbonyl}-2-oxazolidinone (6a)**



Light yellow solid (35 mg, 30% yield), m.p. 147–148 °C, R_f = 0.45 (1:2 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.56 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.44 (td, *J* = 7.7, 1.6 Hz, 1H), 7.29 (td, *J* = 7.7, 1.2 Hz, 1H), 7.15 (dd, *J* = 8.1, 1.0 Hz, 1H), 6.06 (dd, *J* = 11.6, 6.2 Hz, 1H), 4.51 (t, *J* = 8.3 Hz, 2H), 4.10–4.06 (m, 2H), 3.78 (dd, *J* = 17.0, 11.6 Hz, 1H), 3.62 (dd, *J* = 17.0, 6.2 Hz, 1H), 2.34 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.7, 169.0, 153.5, 153.4, 148.7, 131.3, 129.7, 126.4, 124.0, 122.1, 77.4, 63.1, 42.7, 40.3, 21.4; IR (cm^{-1}): 2924, 1773, 1709, 1393, 1368, 1342, 1279, 1221, 1194, 1119, 1040, 914, 760; MS (ESI): calculated for $C_{15}H_{14}N_2O_6$ $[M+H]^+$ 319.0930, found 319.0924.

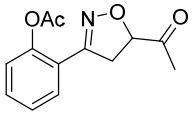
[3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl]carboxylic acid methyl ester (6b)



Light yellow solid (82 mg, 58% yield), m.p. 105–106 °C, R_f = 0.31 (2:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.45

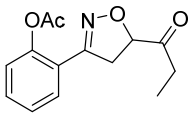
(td, *J* = 7.6, 1.6 Hz, 1H), 7.29 (td, *J* = 7.6, 1.6 Hz, 1H), 7.15 (dd, *J* = 8.0, 1.1 Hz, 1H), 5.12 (dd, *J* = 11.5, 6.9 Hz, 1H), 3.81 (s, 3H), 3.65 (dd, *J* = 16.8, 6.9 Hz, 2H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.2, 169.3, 153.3, 148.3, 131.0, 129.4, 126.1, 123.6, 121.6, 76.6, 52.6, 39.9, 21.0; IR (cm^{-1}): 2955, 1757, 1605, 1497, 1449, 1437, 1368, 1342, 1277, 1217, 1192, 1121, 1013, 912, 822, 760, 673, 646, 594, 548, 494; MS (ESI): calculated for $C_{13}H_{13}NO_5$ $[M+H]^+$ 264.0872, found 264.0869.

3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl methyl ketone (6c)



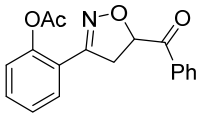
Colorless oil (86 mg, 56% yield), R_f = 0.25 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.53 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.45 (td, *J* = 7.7, 1.6 Hz, 1H), 7.29 (td, *J* = 7.6, 1.2 Hz, 1H), 7.14 (dd, *J* = 8.1, 1.1 Hz, 1H), 4.95 (dd, *J* = 11.9, 6.3 Hz, 1H), 3.67–3.61 (dd, *J* = 17.0, 6.3 Hz, 1H), 3.51–3.43 (dd, *J* = 17.0, 11.9 Hz, 1H), 2.34 (s, 3H), 2.33 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 207.1, 169.4, 154.1, 148.4, 131.2, 129.6, 126.3, 123.8, 121.9, 83.6, 38.5, 26.3, 21.1; IR (cm^{-1}): 2960, 2926, 1757, 1722, 1606, 1593, 1497, 1449, 1368, 1281, 1190, 1121, 1045, 1011, 911, 889, 759, 675, 648, 596, 548; MS (ESI): calculated for $C_{13}H_{13}NO_4$ $[M+H]^+$ 248.0923, found 248.0920.

3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl ethyl ketone (6d)



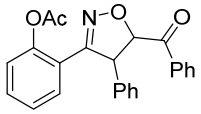
Light yellow oil (36 mg, 43% yield), R_f = 0.19 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.54 (dd, *J* = 7.8, 1.6 Hz, 1H), 7.45 (td, *J* = 7.8, 1.6 Hz, 1H), 7.30 (td, *J* = 7.7, 1.2 Hz, 1H), 7.15 (dd, *J* = 8.1, 1.1 Hz, 1H), 4.99 (dd, *J* = 11.9, 6.3 Hz, 1H), 3.69–3.63 (dd, *J* = 17.0, 6.4 Hz, 1H), 3.51–3.44 (dd, *J* = 17.0, 11.9 Hz, 1H), 2.78–2.70 (m, 2H), 2.33 (s, 3H), 1.08 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 209.9, 169.5, 154.2, 148.5, 131.3, 129.7, 126.4, 123.9, 122.0, 83.5, 38.8, 32.2, 21.2, 7.1; IR (cm^{-1}): 2978, 2937, 1768, 1759, 1718, 1604, 1593, 1496, 1448, 1367, 1342, 1192, 1120, 1010, 912, 891, 860, 819, 758, 673, 594, 547; MS (ESI): calculated for $C_{14}H_{15}NO_4$ $[M+H]^+$ 262.1079, found 262.1083.

3-(2-Acetoxyphenyl)-2-isoxazolin-5-yl phenyl ketone (6e)



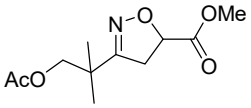
Light yellow oil (53 mg, 31% yield), R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.10 (dd, *J* = 8.6, 1.4 Hz, 2H), 7.64–7.59 (m, 2H), 7.54–7.50 (m, 2H), 7.45 (td, *J* = 7.8, 1.5 Hz, 1H), 7.31 (td, *J* = 7.6, 1.2 Hz, 1H), 7.15 (dd, *J* = 8.1, 1.1 Hz, 1H), 5.82 (dd, *J* = 11.6, 7.3 Hz, 1H), 4.16–4.10 (dd, *J* = 16.8, 7.3 Hz, 1H), 3.54–3.47 (dd, *J* = 16.8, 11.6 Hz, 1H), 2.33 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 193.4, 169.6, 154.2, 148.5, 134.5, 133.9, 131.1, 129.8, 129.6, 128.7, 126.3, 123.9, 122.1, 80.6, 37.4, 21.2; IR (cm^{-1}): 3065, 2959, 2926, 2853, 1771, 1724, 1694, 1603, 1450, 1420, 1369, 1319, 1287, 1229, 1194, 1072, 1024, 912, 758, 712, 690; MS (ESI): calculated for $C_{18}H_{15}NO_4$ $[M+H]^+$ 310.1079, found 310.1071.

3-(2-Acetoxyphenyl)-4-phenyl-2-isoxazolin-5-yl phenyl ketone (6f)



Light yellow oil (17 mg, 21% yield), R_f = 0.16 (10:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.06 (d, *J* = 7.6 Hz, 2H), 7.62 (t, *J* = 7.2 Hz, 1H), 7.50 (m, 2H), 7.39–7.28 (m, 7H), 7.14–7.08 (m, 2H), 5.64 (d, *J* = 5.1 Hz, 1H), 5.54 (d, *J* = 5.1 Hz, 1H), 2.38 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 193.2, 169.6, 156.3, 149.0, 138.0, 134.4, 134.1, 131.0, 130.5, 129.7, 129.5, 128.8, 128.1, 128.0, 126.1, 123.8, 121.5, 89.2, 56.1, 21.3; MS (ESI): calculated for $C_{24}H_{19}NO_4$ $[M+H]^+$ 386.1392, found 386.1384.

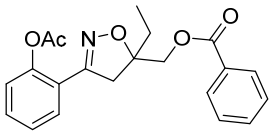
[3-(2-Acetoxy-1,1-dimethylethyl)-2-isoxazolin-5-yl]carboxylic acid methyl ester (6g)



Light yellow oil (30 mg, 35% yield), R_f = 0.21 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 5.00 (dd, *J* = 10.5, 7.2 Hz, 1H), 4.04 (q, *J* = 11.1 Hz, 2H), 3.79 (s, 3H), 3.31–3.20 (m, 2H), 2.06 (s, 3H), 1.25 (s, 3H), 1.24 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.79, 170.76, 162.3, 70.1, 52.7, 38.6, 36.9, 30.9, 23.2, 23.1, 20.8; IR (cm^{-1}): 2973, 2958, 1741, 1475, 1438, 1377, 1286, 1221, 1042, 876, 833, 647, 607;

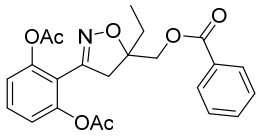
MS (ESI): calculated for $C_{11}H_{17}NO_5$ $[M+H]^+$ 244.1185, found 244.1185.

[3-(2-Acetoxyphenyl)-5-ethyl-2-isoxazolin-5-yl]methyl benzoate (8a)



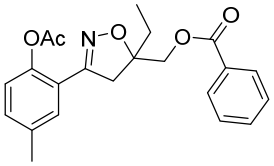
Light yellow oil (210 mg, 72% yield), R_f = 0.34 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (dd, *J* = 8.0, 0.9 Hz, 2H), 7.56–7.38 (m, 5H), 7.29 (dd, *J* = 7.6, 1.2 Hz, 1H), 7.15 (dd, *J* = 8.1, 1.1 Hz, 1H), 4.42 (s, 2H), 3.35 (d, *J* = 16.8 Hz, 1H), 3.22 (d, *J* = 16.8 Hz, 1H), 2.30 (s, 3H), 1.95–1.85 (m, 2H), 1.05 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.5, 166.2, 153.4, 148.3, 133.2, 130.7, 129.63, 129.60, 129.44, 129.36, 128.41, 128.38, 126.1, 123.8, 122.8, 87.1, 67.5, 42.0, 28.6, 21.1, 7.7; IR (cm^{-1}): 3430, 3064, 2970, 2940, 2883, 1770, 1723, 1602, 1492, 1451, 1369, 1315, 1273, 1193, 1114, 1071, 913, 820, 759, 713; MS (ESI): calculated for $C_{21}H_{21}NO_5$ $[M+H]^+$ 368.1498, found 368.1495.

[3-(2,6-Diacetoxyphenyl)-5-ethyl-2-isoxazolin-5-yl]methyl benzoate (8a')



Light yellow oil (39 mg, 12% yield), R_f = 0.24 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.04 (d, *J* = 7.3 Hz, 2H), 7.57 (t, *J* = 7.4 Hz, 1H), 7.45–7.40 (m, 3H), 7.07 (d, *J* = 8.2 Hz, 2H), 4.41 (s, 2H), 3.27 (d, *J* = 17.3 Hz, 1H), 3.10 (d, *J* = 17.3 Hz, 1H), 2.20 (s, 6H), 1.94–1.83 (m, 2H), 1.05 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.9, 166.4, 150.6, 149.6, 133.5, 130.5, 129.9, 129.7, 128.6, 120.7, 117.5, 87.7, 67.1, 43.0, 29.8, 28.6, 21.0, 7.8; IR (cm^{-1}): 2972, 2920, 2849, 2255, 1773, 1722, 1601, 1458, 1369, 1337, 1273, 1188, 1115, 1072, 1036, 1024, 912, 733, 714; MS (ESI): calculated for $C_{23}H_{23}NO_7$ $[M+H]^+$ 426.1553, found 426.1548.

[3-(2-Acetoxy-5-methylphenyl)-5-ethyl-2-isoxazolin-5-yl]methyl benzoate (8b)

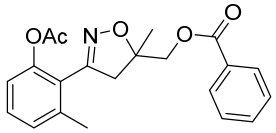


Light yellow oil (249 mg, 75% yield), R_f = 0.33 (5:1 hexanes/AcOEt). ^{1}H NMR (400

MHz, $CDCl_3$) δ: 7.99 (d, *J* = 7.7 Hz, 2H), 7.54 (t, *J* = 7.4 Hz, 1H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.30 (s, 1H), 7.21 (d, *J* = 8.2 Hz, 1H), 7.02 (d, *J* = 8.2 Hz, 1H), 4.42 (s, 2H), 3.34 (d, *J* = 16.8 Hz, 1H), 3.21 (d, *J* = 16.8 Hz, 1H), 2.35 (s, 3H), 2.28 (s, 3H), 1.93–1.86 (m, 2H), 1.05 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.9, 166.4, 153.6, 146.2, 136.0, 133.3, 131.4, 130.0, 129.8, 129.6, 128.5, 123.6, 122.5, 87.2, 67.6, 42.2, 28.8, 21.3, 20.9, 7.9; IR (cm^{-1}): 3063, 2971, 2942, 2929, 2883, 1765, 1723, 1602, 1502, 1451, 1368, 1315, 1274, 1197, 1116, 1071, 1027, 929, 911, 713, 640; MS (ESI): calculated for $C_{22}H_{23}NO_5$ $[M+H]^+$ 382.1654, found 382.1648.

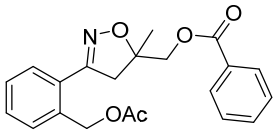
[3-(2-Acetoxy-6-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8c)

Note: A mixture (212 mg) of ***8c*** *and* ***8c''*** *was isolated in 58% yield.* ***8c*** *and* ***8c''*** *were not separable on silica gel. A mixture was used for NMR and MS analyses. Preparation of pure* ***8c*** *was reported in the section of "****Preparation of 8c****".*



R_f = 0.35 (5:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.07 (d, *J* = 7.8 Hz, 2H), 7.57 (t, *J* = 7.3 Hz, 1H), 7.43 (t, *J* = 7.7 Hz, 2H), 7.30 (t, *J* = 7.8 Hz, 1H), 7.12 (d, *J* = 7.6 Hz, 1H), 6.99 (d, *J* = 8.1 Hz, 1H), 4.44 (s, 2H), 3.30 (d, *J* = 17.4 Hz, 1H), 3.00 (d, *J* = 17.4 Hz, 1H), 2.34 (s, 3H), 2.22 (s, 3H), 1.60 (s, 3H).

[3-(2-Acetoxymethylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8c'')



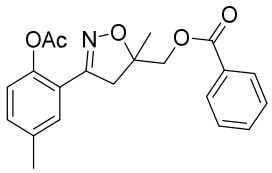
R_f = 0.35 (5:1 hexanes/AcOEt). ^1H NMR (400 MHz, $CDCl_3$) δ: 8.00 (d, *J* = 7.9 Hz, 2H), 7.55 (m, 2H), 7.42 (m, 5H), 5.43 (q, *J* = 14.3 Hz, 2H), 4.45 (m, 2H), 3.50 (d, *J* = 16.6 Hz, 1H), 3.23 (d, *J* = 16.6 Hz, 1H), 2.12 (s, 3H), 1.62 (s, 3H).

8c and 8c''

^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.2, 168.8, 165.91, 165.87, 156.1, 153.5, 148.8, 138.5, 135.4, 133.1, 133.0, 129.7, 129.5, 129.4, 128.7, 128.3, 128.2, 128.0, 127.7, 127.6, 127.5, 122.7, 120.0, 84.5, 84.2, 77.4, 68.2, 67.4, 64.8, 46.0, 44.9, 23.0, 22.7,

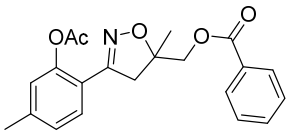
20.7, 20.6, 19.8; MS (ESI): calculated for $C_{21}H_{21}NO_5$ $[M+H]^+$ 368.1498, found 368.1493.

[3-(2-Acetoxy-5-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8d)



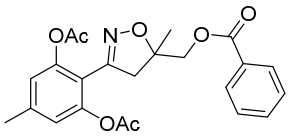
Light yellow oil (227 mg, 69% yield), R_f = 0.22 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.00 (d, *J* = 7.8 Hz, 2H), 7.55 (t, *J* = 7.4 Hz, 1H), 7.41 (t, *J* = 7.6 Hz, 2H), 7.29 (s, 1H), 7.21 (d, *J* = 8.2 Hz, 1H), 7.02 (d, *J* = 8.2 Hz, 1H), 4.40 (q, *J* = 11.6 Hz, 2H), 3.43 (d, *J* = 16.7 Hz, 1H), 3.16 (d, *J* = 16.7 Hz, 1H), 2.35 (s, 3H), 2.28 (s, 3H), 1.58 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.9, 166.3, 153.9, 146.2, 136.0, 133.3, 131.5, 130.0, 129.8, 129.6, 128.5, 123.6, 122.4, 84.5, 68.8, 44.8, 23.1, 21.3, 20.9; IR (cm^{-1}): 2977, 2934, 1765, 1723, 1602, 1502, 1452, 1369, 1351, 1278, 1197, 1114, 1071, 1027, 928, 908, 713; MS (ESI): calculated for $C_{21}H_{21}NO_5$ $[M+H]^+$ 368.1498, found 368.1495.

[3-(2-Acetoxy-4-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8e)



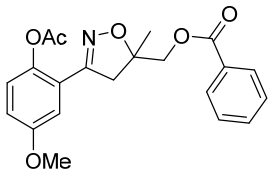
Light yellow oil (188 mg, 58% yield), R_f = 0.23 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.01–7.99 (m, 2H), 7.57–7.53 (m, 1H), 7.41 (t, *J* = 7.9 Hz, 2H), 7.36 (d, *J* = 8.0 Hz, 1H), 7.09 (dd, *J* = 8.0, 0.8 Hz, 1H), 6.96 (d, *J* = 0.6 Hz, 1H), 4.39 (q, *J* = 11.6 Hz, 2H), 3.42 (d, *J* = 16.6 Hz, 1H), 3.15 (d, *J* = 16.6 Hz, 1H), 2.38 (s, 3H), 2.29 (s, 3H), 1.58 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.8, 166.3, 153.7, 148.3, 141.7, 133.3, 129.8, 129.6, 129.3, 128.5, 127.1, 124.5, 120.0, 84.2, 68.6, 44.7, 23.1, 21.31, 21.29; IR (cm^{-1}): 2977, 2936, 1770, 1723, 1620, 1602, 1511, 1452, 1369, 1350, 1316, 1278, 1204, 1115, 1072, 1027, 953, 903, 820, 714; MS (ESI): calculated for $C_{21}H_{21}NO_5$ $[M+Na]^+$ 390.1317, found 390.1311.

[3-(2,6-Diacetoxy-4-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8e')



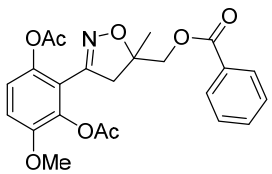
Yellow oil (150 mg, 40% yield), R_f = 0.25 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.06–8.04 (m, 2H), 7.59–7.55 (m, 1H), 7.44 (t, *J* = 7.8 Hz, 2H), 6.88 (s, 2H), 4.39 (q, *J* = 11.6 Hz, 2H), 3.35 (d, *J* = 17.0 Hz, 1H), 3.00 (d, *J* = 17.0 Hz, 1H), 2.37 (s, 3H), 2.19 (s, 6H), 1.54 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 168.9, 166.2, 150.8, 149.1, 141.5, 133.4, 129.8, 129.6, 128.5, 121.3, 114.4, 84.7, 67.8, 45.4, 23.0, 21.3, 20.9; IR (cm^{-1}): 2976, 2934, 1773, 1722, 1628, 1450, 1369, 1277, 1188, 1113, 1026, 893, 714; MS (ESI): calculated for $C_{23}H_{23}NO_7$ $[M+H]^+$ 426.1553, found 426.1546.

[3-(2-Acetoxy-5-methoxyphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8f)



Light yellow oil (225 mg, 66% yield), R_f = 0.28 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.00 (dd, *J* = 7.9, 0.8 Hz, 2H), 7.57–7.53 (m, 1H), 7.43–7.39 (m, 2H), 7.06–7.02 (m, 2H), 6.94 (dd, *J* = 8.8, 3.0 Hz, 1H), 4.40 (q, *J* = 11.6 Hz, 2H), 3.80 (s, 3H), 3.41 (d, *J* = 16.7 Hz, 1H), 3.14 (d, *J* = 16.7 Hz, 1H), 2.27 (s, 3H), 1.58 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 170.0, 166.2, 157.2, 153.7, 141.8, 133.3, 129.8, 129.5, 128.5, 124.6, 123.4, 115.9, 114.4, 84.7, 68.5, 55.7, 44.5, 23.0, 21.2; IR (cm^{-1}): 3071, 2974, 2939, 1764, 1723, 1602, 1569, 1504, 1452, 1370, 1277, 1194, 1114, 1039, 933, 713; MS (ESI): calculated for $C_{21}H_{21}NO_6$ $[M+H]^+$ 384.1447, found 384.1443.

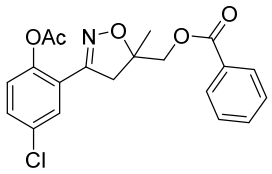
[3-(2,6-Diacetoxy-3-methoxyphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8f')



Light yellow oil (63 mg, 14% yield), R_f = 0.34 (2:1 hexanes/AcOEt). ^{1}H NMR (400

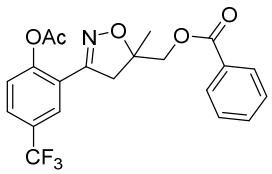
MHz, $CDCl_3$) δ: 8.05–8.03 (m, 2H), 7.56 (t, *J* = 7.4 Hz, 1H), 7.43 (t, *J* = 7.8 Hz, 2H), 7.00 (q, *J* = 9.0 Hz, 2H), 4.39 (m, 2H), 3.82 (s, 3H), 3.33 (d, *J* = 17.1 Hz, 1H), 2.99 (d, *J* = 17.1 Hz, 1H), 2.195 (s, 3H), 2.191 (s, 3H), 1.54 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.5, 168.2, 166.3, 150.7, 149.6, 141.9, 138.7, 133.4, 129.9, 129.6, 128.6, 120.6, 118.7, 113.2, 85.0, 67.8, 56.5, 45.5, 23.1, 20.9, 20.5; IR (cm^{-1}): 2974, 2940, 2845, 1771, 1722, 1601, 1584, 1483, 1452, 1439, 1369, 1337, 1275, 1192, 1117, 1072, 1028, 914, 818, 789, 714, 503; MS (ESI): calculated for $C_{23}H_{23}NO_8$ $[M+H]^+$ 442.1502, found 442.1495.

[3-(2-Acetoxy-5-chlorophenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8g)



Light yellow oil (51 mg, 24% yield), R_f = 0.21 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.00 (d, *J* = 4.5 Hz, 2H), 7.56 (t, *J* = 7.5 Hz, 1H), 7.47–7.37 (m, 4H), 7.09 (d, *J* = 8.6 Hz, 1H), 4.40 (q, *J* = 11.6 Hz, 2H), 3.42 (d, *J* = 16.7 Hz, 1H), 3.15 (d, *J* = 16.7 Hz, 1H), 2.30 (s, 3H), 1.59 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.5, 166.3, 152.9, 146.9, 133.5, 131.8, 130.7, 129.9, 129.5, 129.3, 128.6, 125.3, 124.5, 85.1, 68.5, 44.4, 23.1, 21.3; IR (cm^{-1}): 3072, 2977, 2935, 1770, 1723, 1602, 1492, 1452, 1371, 1345, 1316, 1277, 1191, 1114, 1072, 1027, 930, 906, 753, 713; MS (ESI): calculated for $C_{20}H_{18}ClNO_5$ $[M+H]^+$ 388.0952, found 388.0946.

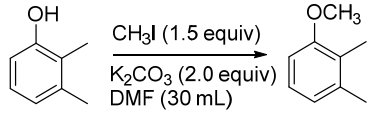
[3-(2-Acetoxy-5-trifluoromethylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8h)



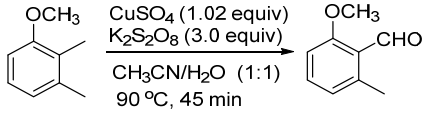
Light yellow oil (19 mg, 25% yield), R_f = 0.21 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.99 (dd, *J* = 8.5, 1.3 Hz, 2H), 7.75 (d, *J* = 1.6 Hz, 1H), 7.67 (dd, *J* = 8.4, 1.8 Hz, 1H), 7.57–7.53 (m, 1H), 7.40 (t, *J* = 7.9 Hz, 2H), 7.28 (d, *J* = 8.4 Hz, 1H), 4.42 (q, *J* = 11.6 Hz, 2H), 3.46 (d, *J* = 16.7 Hz, 1H), 3.20 (d, *J* = 16.7 Hz, 1H), 2.31 (s,

3H), 1.60 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.1, 166.3, 152.9, 150.9, 133.5, 129.8, 129.5, 129.0, 128.6, 127.71 (q, $J_{C\text{-}F}$ = 4.0 Hz), 126.65 (q, $J_{C\text{-}F}$ = 4.0 Hz), 124.8, 124.0, 123.5 (q, $J_{C\text{-}F}$ = 273 Hz, CF_3), 85.4, 68.5, 44.4, 23.1, 21.2; IR (cm^{-1}): 3073, 2978, 2937, 1771, 1724, 1601, 1452, 1371, 1360, 1317, 1275, 1192, 1128, 1072, 1049, 1028, 932, 907, 802, 714; MS (ESI): calculated for $C_{21}H_{18}F_3NO_5$ $[M+Na]^+$ 444.1035, found 444.1031.

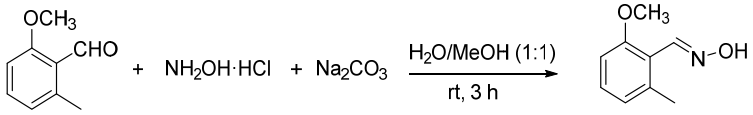
Preparation of 8c[10, 11]



A 250 mL round bottom flask were charged with 2,3-dimethylphenol (12.23 g, 100 mmol), CH_3I (9.38 mL, 150 mmol), K_2CO_3 (27.63 g, 200 mmol) and DMF (30 mL). The flask was closed tightly, and vigorously stirred at 55 °C for 24 h. Then, the mixture was poured into water (200 mL) and extracted with CH_2Cl_2 (3 × 50 mL). The combined organic phases were washed with water (200 mL), brine (200 mL), dried over Na_2SO_4, filtered, and evaporated under reduced pressure. The residue was purified by silica gel chromatography to give 2,3-dimethyl anisole as a colorless liquid. Yield: 5.73 g, 84%. R_f = 0.60 (10:1 hexanes/AcOEt).

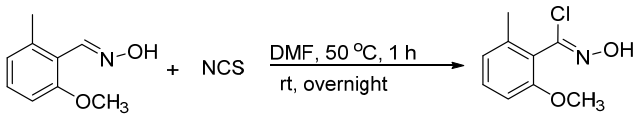


A 100 mL round bottom flask were charged with 2,3-dimethyl anisole (1.36 g, 10 mmol), $CuSO_4$ (1.63 g, 10.2 mmol), $K_2S_2O_8$ (8.11 g, 30 mmol) and a mixture of CH_3CN/H_2O (1:1, 30 mL). The suspension was vigorously stirred at 90 °C for 45 min before it was allowed to cool to rt. The non-dissolved copper salt was removed by filtration. CH_2Cl_2 was added and the phases were separated. The aqueous phase was extracted with CH_2Cl_2 (3 × 20 mL). The combined organic layers were dried over Na_2SO_4, filtered, and evaporated under reduced pressure. The crude product was purified by chromatography. Yield: 957 mg, 65%. R_f = 0.50 (5:1 hexanes/AcOEt).



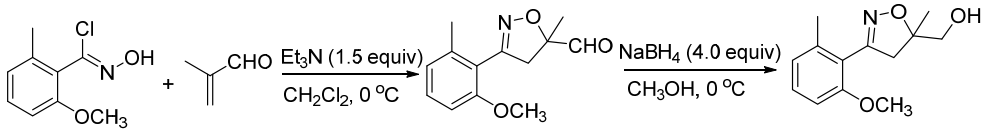
To a suspension of 2-methoxy-6-methylbenzaldehyde (947 mg, 6.3 mmol, 1.0 equiv)

and hydroxylamine hydrochloride (487 mg, 7 mmol, 1.1 equiv) in a 1:1 mixture of H_2O/methanol (20 mL), an aqueous solution of Na_2CO_3 (0.75 M, 10 mL, 0.5 equiv) was slowly added. The resulting mixture was stirred at rt for 3 h, and then methanol was evaporated. The aqueous phase was extracted with CH_2Cl_2. The combined organic layers were washed with brine, dried over Na_2SO_4 and concentrated to give the crude benzaldoxime.

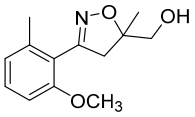


To a solution of the crude benzaldoxime (925 mg, 5.6 mmol, 1.0 equiv) in DMF (20 mL) at 50 °C was added dropwise a solution of *N*-chlorosuccinimide (747 mg, 5.6 mmol, 1.0 equiv) in DMF (15 mL) over 30 min. The mixture was stirred at 50 °C for another 1 h. Then it was allowed to stir at rt overnight. The reaction was quenched by pouring the mixture into ice-water. The mixture was extracted with CH_2Cl_2. The combined organic extracts were washed with ice-water and brine, dried over Na_2SO_4, and concentrated under reduced pressure to give the crude *α*-chlorobenzaldoxime.

[3-(2-Methoxy-6-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methanol



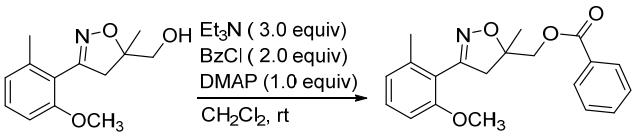
To a solution of the *α*-chlorobenzaldoxime (981 mg, 4.9 mmol, 1.0 equiv) in CH_2Cl_2 (20 mL) were added Et_3N (1.03 mL, 7.4 mmol, 1.5 equiv) and 2-methylacrolein (0.5 mL, 4.9 mmol, 1.0 equiv). The mixture was stirred at 0 °C for 2 h before the solvent was removed under high vacuum. The crude product in CH_3OH (10 mL) was cooled to 0 °C before $NaBH_4$ (741 mg, 19.6 mmol, 4.0 equiv) was added. The mixture was stirred at 0 °C for 2 h. The solvent was evaporated and the crude product purified by silica gel chromatography.



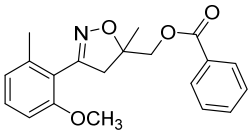
Yellow oil (901 mg, 83% yield), R_f = 0.41 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.22 (t, *J* = 8.0 Hz, 1H), 6.83 (d, *J* = 7.6 Hz, 1H), 6.73 (d, *J* = 8.3 Hz, 1H),

3.78 (s, 3H), 3.69 (dd, *J* = 11.9, 4.3 Hz, 1H), 3.60 (dd, *J* = 11.8, 7.6 Hz, 1H), 3.31 (d, *J* = 17.0 Hz, 1H), 2.92 (d, *J* = 17.0 Hz, 1H), 2.48–2.43 (m, 1H), 2.31 (s, 3H), 1.44 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 158.0, 156.5, 138.6, 130.0, 122.7, 118.9, 108.2, 86.6, 67.1, 55.7, 45.5, 22.5, 19.9; IR (cm^{-1}): 3379, 2932, 2839, 1585, 1472, 1437, 1333, 1265, 1188, 1082, 1003, 910, 887, 777; MS (ESI): calculated for $C_{13}H_{17}NO_3$ $[M+H]^+$ 236.1287, found 236.1280.

[3-(2-Methoxy-6-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate

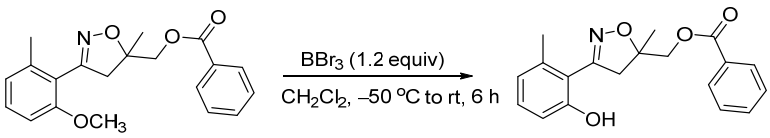


To a solution of the starting isoxazoline (828 mg, 3.7 mmol) in CH_2Cl_2 (15 mL) were added Et_3N (1.56 mL, 11.1 mmol), DMAP (452 mg, 3.7 mmol) and PhCOCl (856 μL, 7.4 mmol). The mixture was stirred at rt for 2 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.



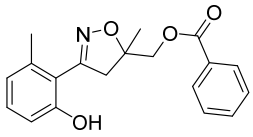
Yellow oil (995 mg, 83% yield), R_f = 0.38 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.09 (dd, *J* = 8.3, 1.3 Hz, 2H), 7.59–7.55 (m, 1H), 7.43 (t, *J* = 7.9 Hz, 2H), 7.23 (t, *J* = 8.0 Hz, 1H), 6.85 (d, *J* = 7.6 Hz, 1H), 6.72 (d, *J* = 8.3 Hz, 1H), 4.46 (s, 2H), 3.70 (s, 3H), 3.40 (d, *J* = 17.1 Hz, 1H), 3.04 (d, *J* = 17.1 Hz, 1H), 2.35 (s, 3H), 1.61 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 158.1, 155.5, 138.7, 133.2, 130.0, 129.8, 128.4, 122.8, 118.7, 108.1, 84.4, 68.0, 55.5, 46.5, 23.2, 20.1; IR (cm^{-1}): 3376, 2976, 2938, 2878, 1722, 1585, 1466, 1447, 1377, 1279, 1177, 1115, 1070, 1026, 955, 804, 781, 762, 712; MS (ESI): calculated for $C_{20}H_{21}NO_4$ $[M+H]^+$ 340.1549, found 340.1545.

[3-(2-Hydroxy-6-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate



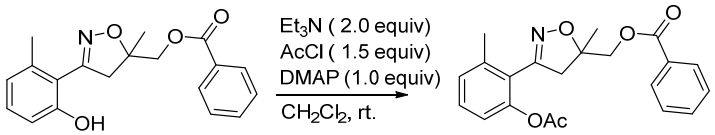
A dry Schlenk tube were charged with the starting isoxazoline (961 mg, 2.96 mmol,

1.0 equiv) and CH_2Cl_2 (15 mL). The mixture was cooled to –50 °C before BBr_3 (474 μL, 3.55 mmol, 1.2 equiv) was added. The mixture was allowed to warm to rt over 6 h. H_2O was added and the phases separated. The aqueous layer was extracted with CH_2Cl_2 (3 × 20 mL). The combined organic layers were dried over Na_2SO_4 and concentrated. The crude product was purified by silica gel chromatography.

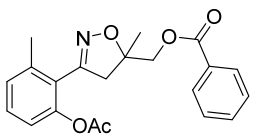


Yellow oil (700 mg, 76% yield), R_f = 0.30 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 7.97 (dd, *J* = 8.4, 1.4 Hz, 2H), 7.56–7.52 (m, 1H), 7.39 (t, *J* = 7.9 Hz, 2H), 7.16 (t, *J* = 7.9 Hz, 1H), 6.90 (d, *J* = 8.2 Hz, 1H), 6.71 (d, *J* = 7.4 Hz, 1H), 4.42 (q, *J* = 11.7 Hz, 2H), 3.62 (d, *J* = 16.8 Hz, 1H), 3.38 (d, *J* = 16.8 Hz, 1H), 2.43 (s, 3H), 1.62 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.2, 158.4, 157.8, 137.5, 133.4, 131.0, 129.7, 129.4, 128.5, 123.0, 115.3, 114.2, 84.5, 68.5, 46.9, 22.9, 22.7; IR (cm^{-1}): 2972, 2938, 2837, 1722, 1584, 1470, 1452, 1375, 1335, 1279, 1263, 1177, 1113, 1072, 910, 891, 802, 777, 712; MS (ESI): calculated for $C_{19}H_{19}NO_4$ $[M+H]^+$ 326.1392, found 326.1388.

[3-(2-Acetoxy-6-methylphenyl)-5-methyl-2-isoxazolin-5-yl]methyl benzoate (8c)



To a solution of the starting isoxazoline (368 mg, 1.2 mmol) in CH_2Cl_2 (15 mL) were added Et_3N (338 μL, 2.4 mmol), DMAP (147 mg, 1.2 mmol) and AcCl (126 μL, 1.8 mmol). The mixture was stirred at rt for 2 h before the solvent was evaporated. The crude product was purified by silica gel chromatography.

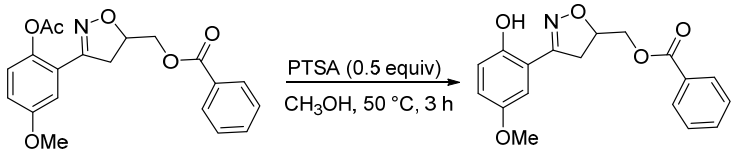


Light yellow oil (436 mg, 100% yield), R_f = 0.35 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.06 (d, *J* = 7.8 Hz, 2H), 7.57 (t, *J* = 7.3 Hz, 1H), 7.43 (t, *J* = 7.7 Hz, 2H), 7.29 (t, *J* = 7.8 Hz, 1H), 7.10 (d, *J* = 7.6 Hz, 1H), 6.98 (d, *J* = 8.1 Hz, 1H), 4.44

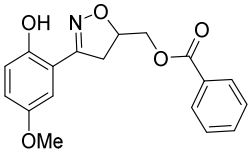
(s, 2H), 3.30 (d, J = 17.4 Hz, 1H), 2.99 (d, J = 17.4 Hz, 1H), 2.33 (s, 3H), 2.21 (s, 3H), 1.59 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 169.1, 166.2, 153.6, 149.0, 138.8, 133.4, 130.0, 129.7, 129.6, 128.5, 128.0, 122.8, 120.2, 84.7, 67.7, 46.3, 23.3, 20.9, 20.1; IR (cm^{-1}): 3065, 3028, 2976, 2934, 2880, 1767, 1721, 1601, 1462, 1450, 1371, 1335, 1315, 1277, 1196, 1113, 1070, 1026, 957, 903, 868, 802, 760, 712, 602; MS (ESI): calculated for $C_{21}H_{21}NO_5$ $[M+H]^+$ 368.1498, found 368.1493.

Preparations of 9, 10, 11

[3-(2-Hydroxy-5-methoxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (9)

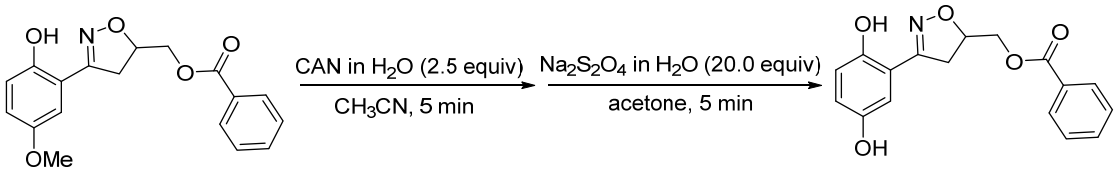


PTSA (165 mg, 0.96 mmol) was added to a solution of **4h** (709 mg, 1.92 mmol) in CH_3OH, then the mixture was stirred at 50 °C for 3 h before the solvent was evaporated. The crude product (**9**) was purified by silica gel chromatography.



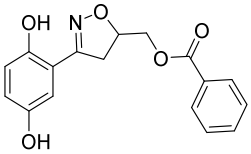
Light yellow oil (519 mg, 83% yield), R_f = 0.36 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 9.32 (s, 1H, OH), 7.99 (m, 2H, ArH), 7.57–7.53 (m, 1H, ArH), 7.40 (t, J = 8.0 Hz, 2H, ArH), 6.99 (d, J = 9.0 Hz, 1H, ArH), 6.93 (dd, J = 9.0, 2.9 Hz, 1H, ArH), 6.7 (d, J = 2.9 Hz, 1H, ArH), 5.13–5.06 (m, 1H, OCH), 4.54 (dd, J = 12.0, 4.0 Hz, 1H, OCH_2), 4.47 (dd, J = 12.0, 5.3 Hz, 1H, OCH_2), 3.77 (s, 3H, OCH_3), 3.60 (dd, J = 16.6, 10.8 Hz, 1H, N=CCH_2), 3.34 (dd, J = 16.7, 7.0 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 158.2, 152.7, 151.7, 133.5, 129.8, 129.5, 128.6, 118.0, 117.8, 113.8, 113.3, 77.5, 65.3, 56.1, 37.7; IR (cm^{-1}): 3244, 2942, 1722, 1497, 1399, 1271, 1120, 942, 712; MS (ESI): calculated for $C_{18}H_{17}NO_5$ $[M+Na]^+$ 350.1004, found 350.1000.

[3-(2,5-Dihydroxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (10)



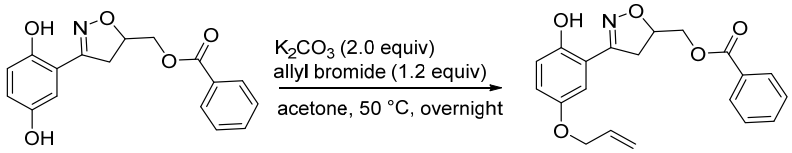
A solution of CAN (2.18 g, 3.98 mmol) in H_2O (10 mL) was added to a solution of **9** (0.52 g, 1.59 mmol) in CH_3CN (15 mL) at room temperature. After 5 min, the aq. mixture was extracted with CH_2Cl_2 (3 × 30 mL). The combined organic layers were dried over Na_2SO_4 and concentrated to give the crude benzoquinone product.

To a solution of the crude benzoquinone in acetone (15 mL) was added a solution of $Na_2S_2O_4$ (5.5 g, 31.8 mmol, 20.0 equiv) in H_2O (5 mL) at 0 °C. After 5 min, the reaction mixture was diluted with brine (15 mL) and extracted with AcOEt (3 × 15 mL). The combined organic phases were dried over Na_2SO_4 and concentrated. The crude product was purified by silica gel chromatography.



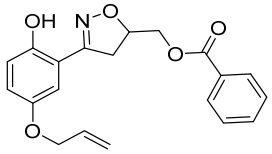
White solid (389 mg, 78% yield), R_f = 0.13 (3:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 9.33 (s, 1H, OH), 7.99–7.97 (m, 2H, ArH), 7.57–7.54 (m, 1H, ArH), 7.40 (t, *J* = 7.7 Hz, 2H, ArH), 6.93 (d, *J* = 8.8 Hz, 1H, ArH), 6.84 (dd, *J* = 8.8, 2.9 Hz, 1H, ArH), 6.68 (d, *J* = 2.9 Hz, 1H, ArH), 5.12–5.05 (m, 1H, OCH), 4.77 (s, 1H, OH), 4.53 (dd, *J* = 12.0, 4.0 Hz, 1H, OCH_2), 4.46 (dd, *J* = 12.0, 5.4 Hz, 1H, OCH_2), 3.55 (dd, *J* = 16.7, 10.9 Hz, 1H, N=CCH_2), 3.29 (dd, *J* = 16.7, 6.9 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 158.0, 151.6, 148.3, 133.5, 129.8, 129.4, 128.6, 119.5, 117.9, 114.3, 113.8, 77.5, 65.2, 37.561; IR (cm^{-1}): 1721, 1495, 1273, 1122, 784, 712; MS (ESI): calculated for $C_{17}H_{15}NO_5$ $[M+Na]^+$ 336.0848, found 336.0844.

[3-(5-Allyloxy-2-hydroxyphenyl)-2-isoxazolin-5-yl]methyl benzoate



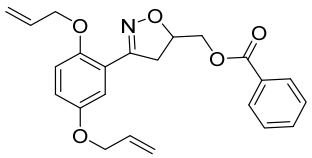
To a solution of **10** (335 mg, 1.07 mmol) in acetone (20 mL) were added K_2CO_3 (296

mg, 2.14 mmol) and allyl bromide (107 μL, 1.28 mmol). The mixture was stirred at 50 °C overnight. Then the solids were filtered off, the filtrate was concentrated under reduced pressure. The crude product was purified by silica gel chromatography.



White solid (220 mg, 58% yield), R_f = 0.21 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 9.33 (s, 1H, OH), 7.98 (d, *J* = 7.2 Hz, 2H, ArH), 7.54 (t, *J* = 7.4 Hz, 1H, ArH), 7.40 (t, *J* = 7.8 Hz, 2H, ArH), 6.95 (m, 2H, ArH), 6.74 (d, *J* = 2.6 Hz, 1H, ArH), 6.07–5.98 (m, 1H, C**H**=CH_2), 5.39 (dd, *J* = 17.2, 1.5 Hz, 1H, CH=C**H**$_2$), 5.28 (dd, *J* = 10.4, 1.2 Hz, 1H, CH=C**H**$_2$), 5.12–5.05 (m, 1H, OCH), 4.55–4.44 (m, 4H, OCH_2), 3.58 (dd, *J* = 16.7, 10.8 Hz, 1H, N=CCH_2), 3.32 (dd, *J* = 16.7, 7.0 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.3, 158.2, 151.8, 151.6, 133.44, 133.36, 129.8, 129.4, 128.6, 118.8, 117.9, 117.7, 114.5, 113.7, 69.9, 65.2, 37.6; IR (cm^{-1}): 3224, 2922, 1722, 1496, 1402, 1270, 1201, 1119, 713; MS (ESI): calculated for $C_{20}H_{19}NO_5$ $[M+Na]^+$ 376.1161, found 376.1158.

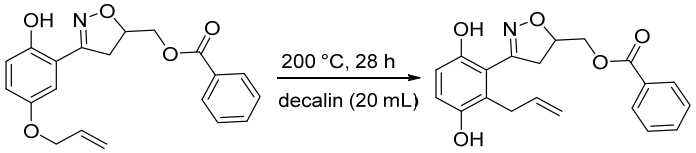
[3-(2,5-Diallyloxyphenyl)-2-isoxazolin-5-yl]methyl benzoate



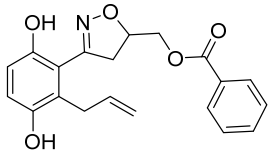
Light yellow oil (95 mg, 22% yield), R_f = 0.30 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.03 (d, *J* = 8.0 Hz, 2H, ArH), 7.55 (t, *J* = 7.4 Hz, 1H, ArH), 7.40 (t, *J* = 7.7 Hz, 2H, ArH), 7.35 (d, *J* = 3.1 Hz, 1H, ArH), 6.94 (dd, *J* = 9.0, 3.1 Hz, 1H, ArH), 6.85 (d, *J* = 9.0 Hz, 1H, ArH), 6.08–5.94 (m, 2H, C**H**=CH_2), 5.42–5.32 (m, 2H, CH=C**H**$_2$), 5.28–5.23 (m, 2H, CH=C**H**$_2$), 5.10–5.03 (m, 1H, OCH), 4.50–4.40 (m, 6H, OCH_2), 3.65 (dd, *J* = 17.6, 10.8 Hz, 1H, N=CCH_2), 3.41 (dd, *J* = 17.6, 6.7 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.4, 155.9, 152.7, 151.1, 133.3, 133.2, 133.0, 129.8, 129.7, 128.4, 119.3, 118.6, 118.2, 117.7, 114.5, 114.4, 78.5, 70.2, 69.4, 65.8, 39.9; IR (cm^{-1}): 3081, 2925, 2867, 1722, 1494, 1429, 1273, 1202, 1118, 1024, 998, 926, 804, 713; MS (ESI): calculated for $C_{23}H_{23}NO_5$ $[M+Na]^+$ 416.1474, found

416.1467.

[3-(2-Allyl-3,6-dihydroxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (11)



A mixture of [3-(5-allyloxy-2-hydroxyphenyl)-2-isoxazolin-5-yl]methyl benzoate (92 mg, 0.26 mmol) and decalin (20 mL) was stirred at 200 °C under N_2 for 28 h. The crude product (**11**) was purified by silica gel chromatography.



Colorless oil (92 mg, 100% yield), R_f = 0.21 (5:1 hexanes/AcOEt). ^{1}H NMR (400 MHz, $CDCl_3$) δ: 8.44 (s, 1H, OH), 7.99 (m, 2H, ArH), 7.57–7.53 (m, 1H, ArH), 7.40 (t, *J* = 7.9 Hz, 2H, ArH), 6.81 (d, *J* = 8.8 Hz, 1H, ArH), 6.78 (d, *J* = 8.8 Hz, 1H, ArH), 6.02–5.92 (m, 1H, C**H**=CH_2), 5.17 (s, 1H, OH), 5.09–5.02 (m, 2H, OCH, CH=C**H**$_2$), 4.90 (dd, *J* = 17.3, 1.6 Hz, 1H, CH=C**H**$_2$), 4.51–4.42 (m, 2H, OCH_2), 3.57 (dd, *J* = 17.0, 11.8 Hz, 1H, N=CCH_2), 3.46–3.44 (m, 2H, CH_2=CHC**H**$_2$), 3.33 (dd, *J* = 17.0, 6.7 Hz, 1H, N=CCH_2); ^{13}C NMR (100 MHz, $CDCl_3$) δ: 166.6, 157.3, 150.5, 147.7, 135.9, 133.5, 129.9, 129.4, 128.6, 124.5, 119.2, 116.5, 115.9, 115.6, 78.0, 65.4, 40.6, 31.7; IR (cm^{-1}): 3419, 2925, 1720, 1699, 1489, 1273, 1122, 911, 811, 734.9, 713; MS (ESI): calculated for $C_{20}H_{20}NO_5$ $[M+Na]^+$ 376.1161, found 376.1158.

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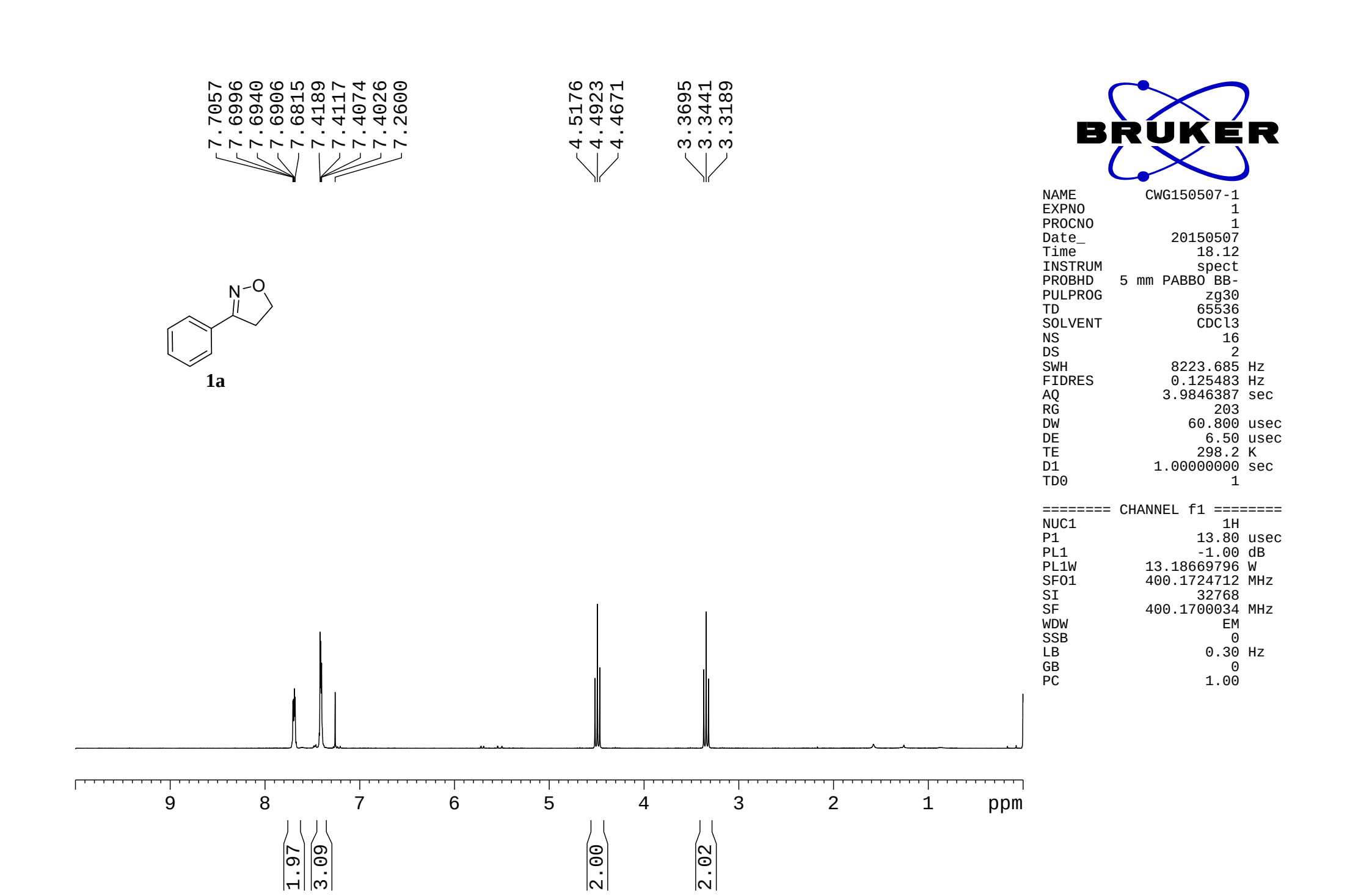
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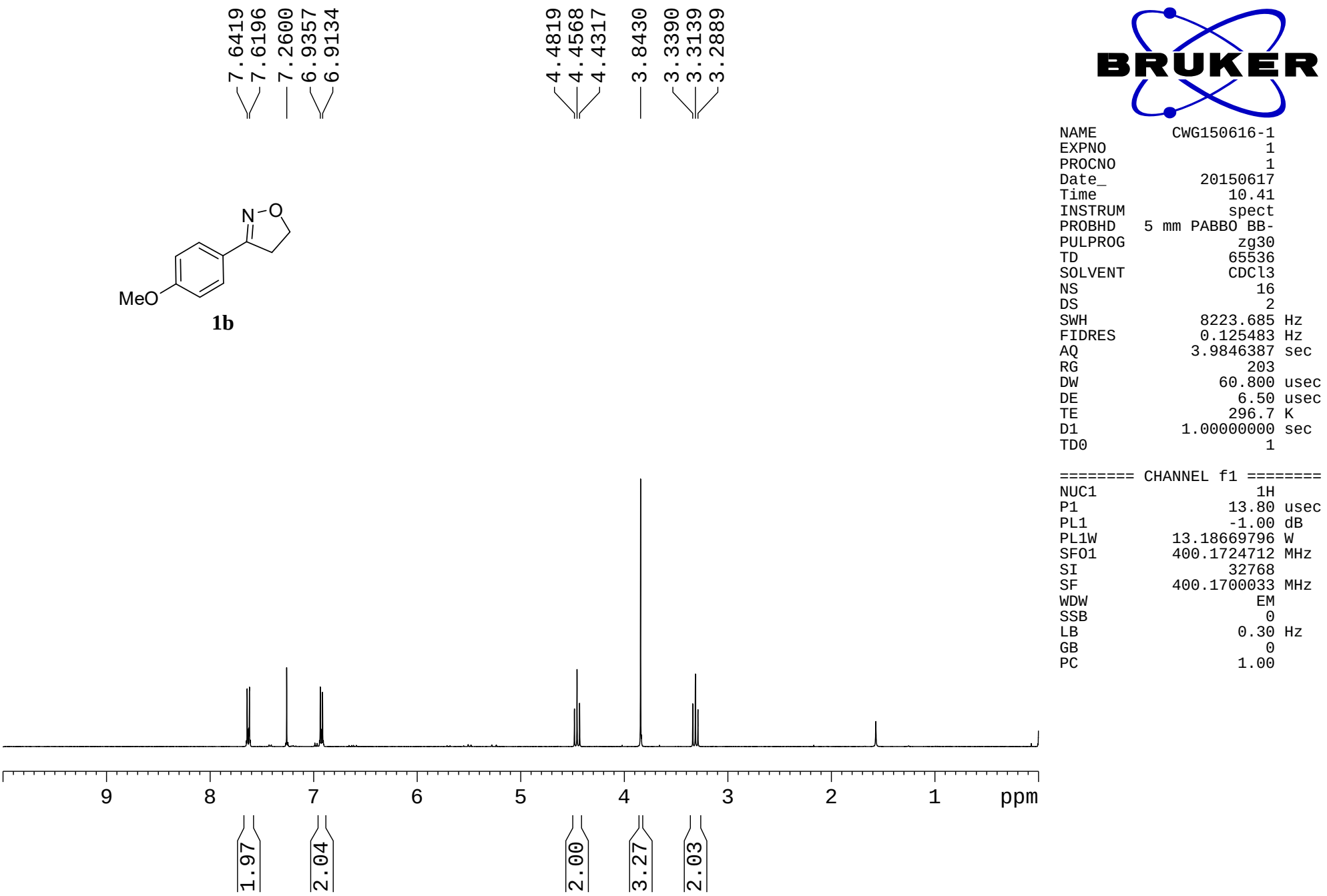


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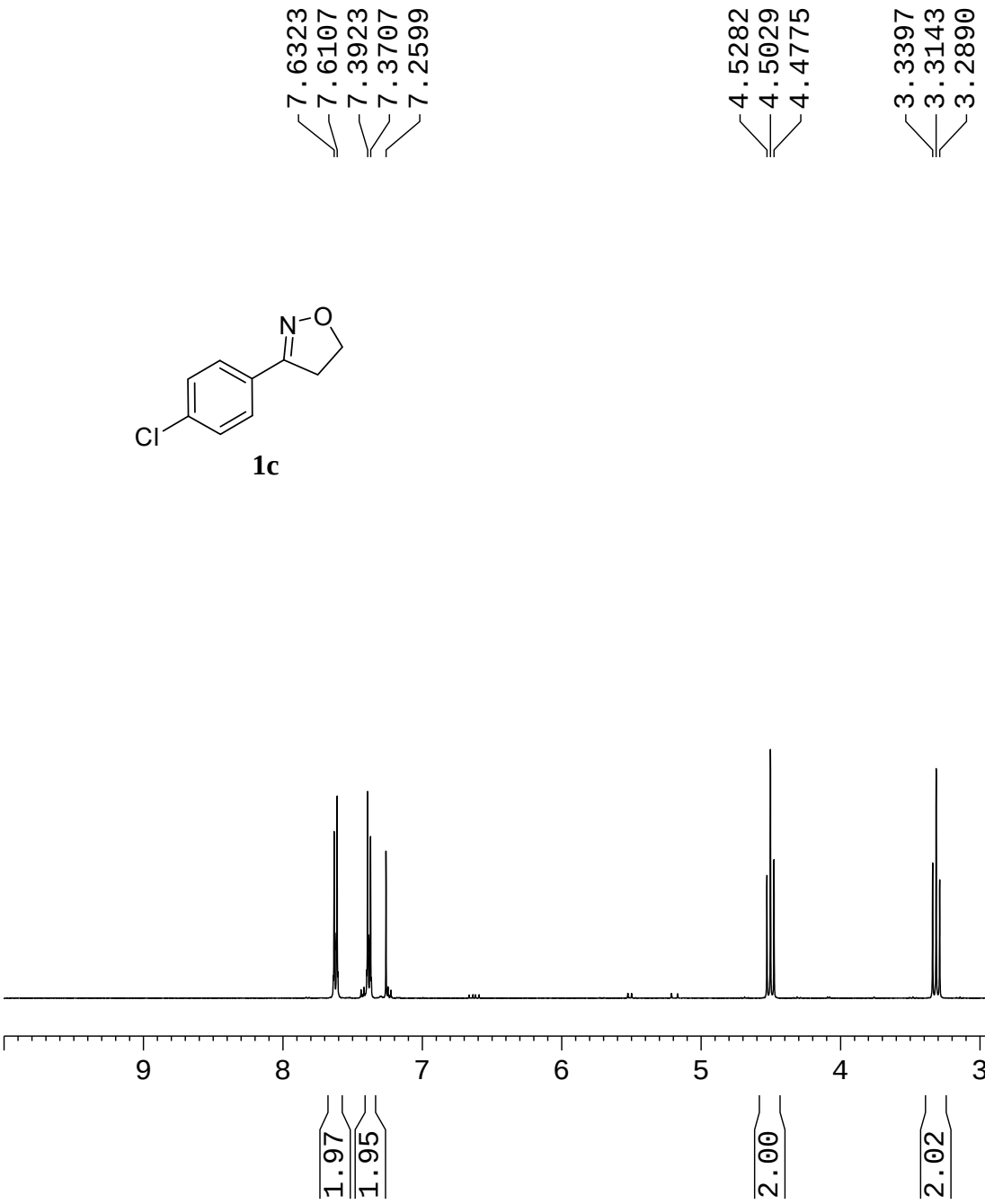

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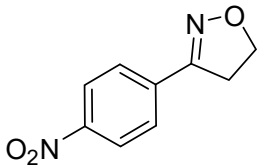
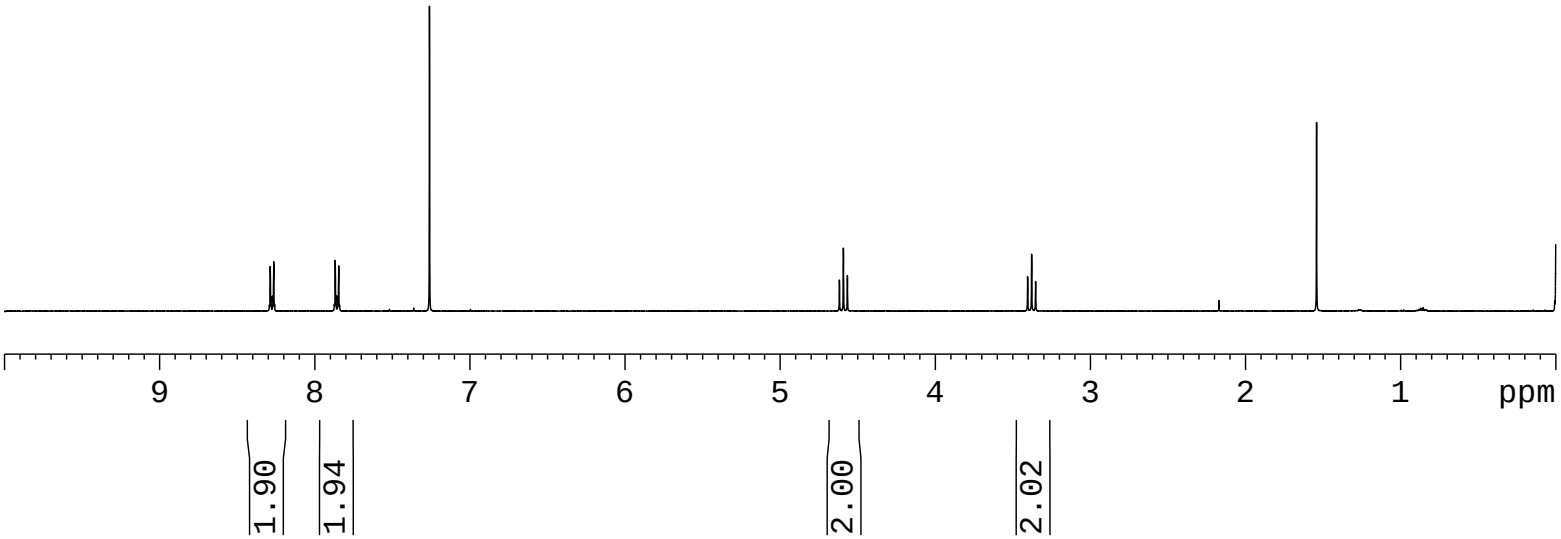
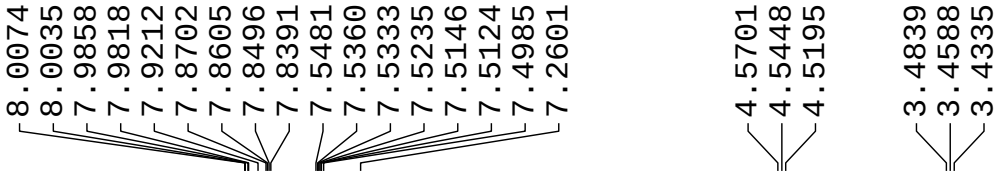
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

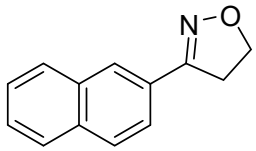


1d

```
NAME      CWG150630-2-pure
EXPNO                   1
PROCNO                  1
Date_            20150701
Time                21.55
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 296.4 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

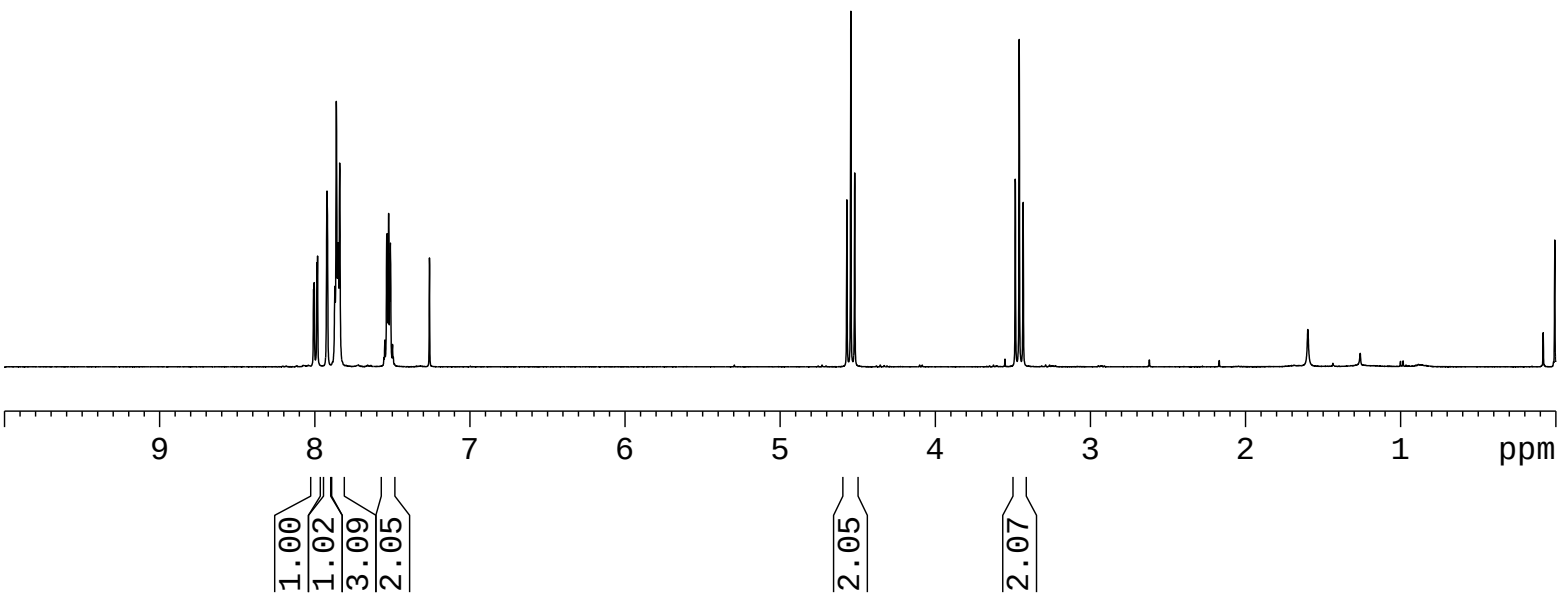


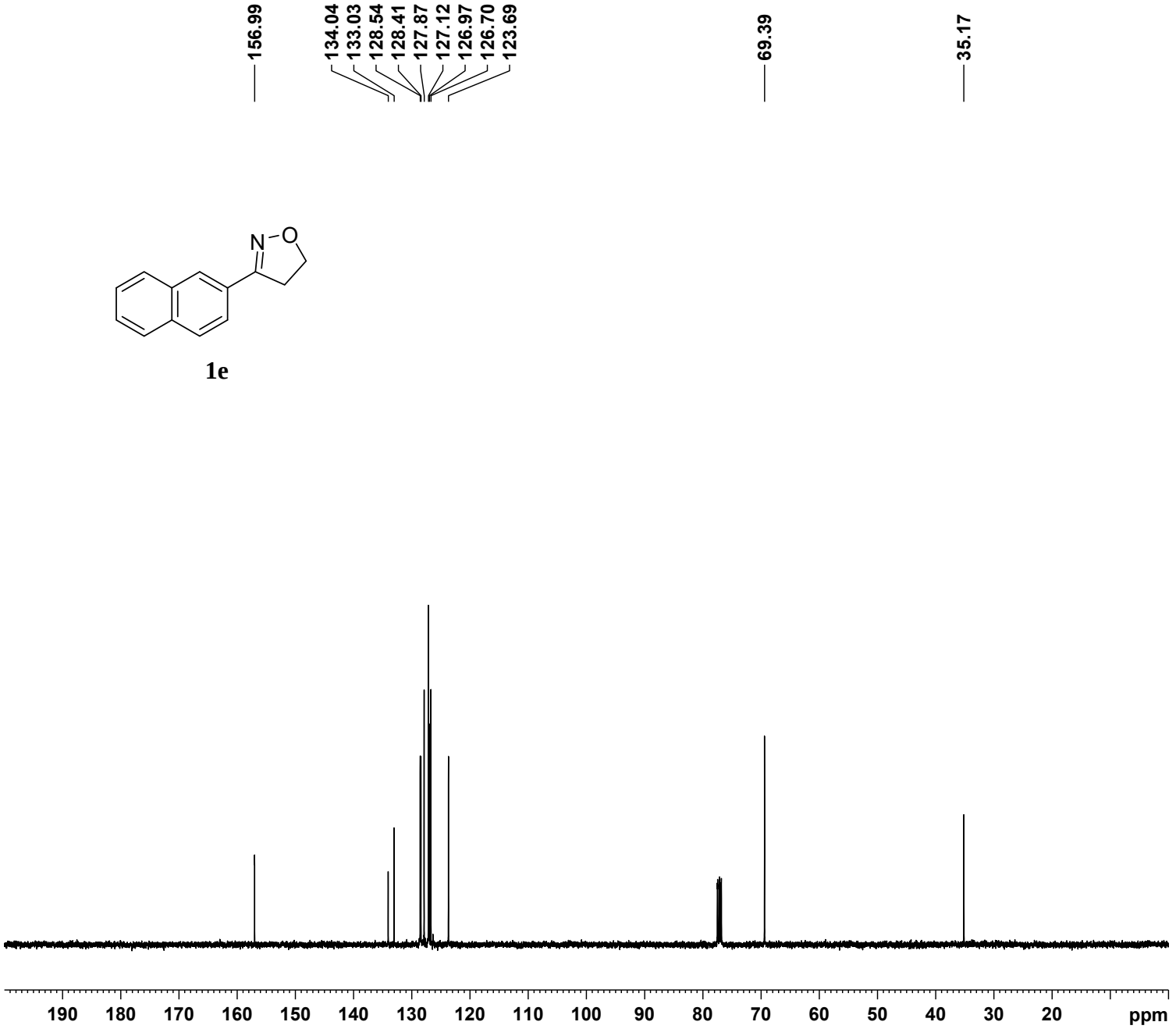




1e

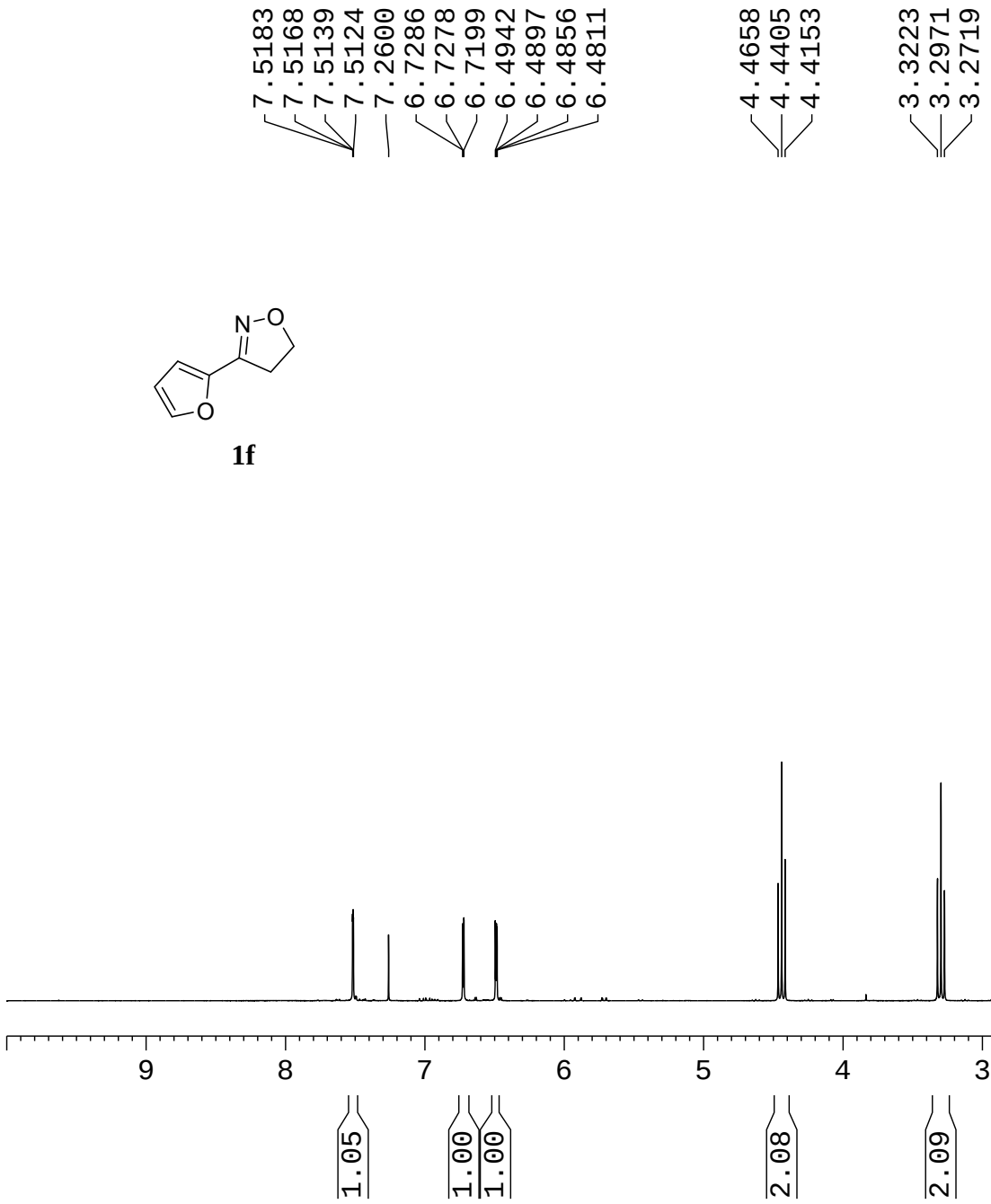
```
NAME          CWG150610-1
EXPNO                   1
PROCNO                  1
Date_            20150610
Time                18.40
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    181
DW                 60.800 usec
DE                  6.50 usec
TE                 297.6 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700032 MHz
WDW                    EM
SSB                     0
LB                  0.30 Hz
GB                      0
PC                  1.00
```



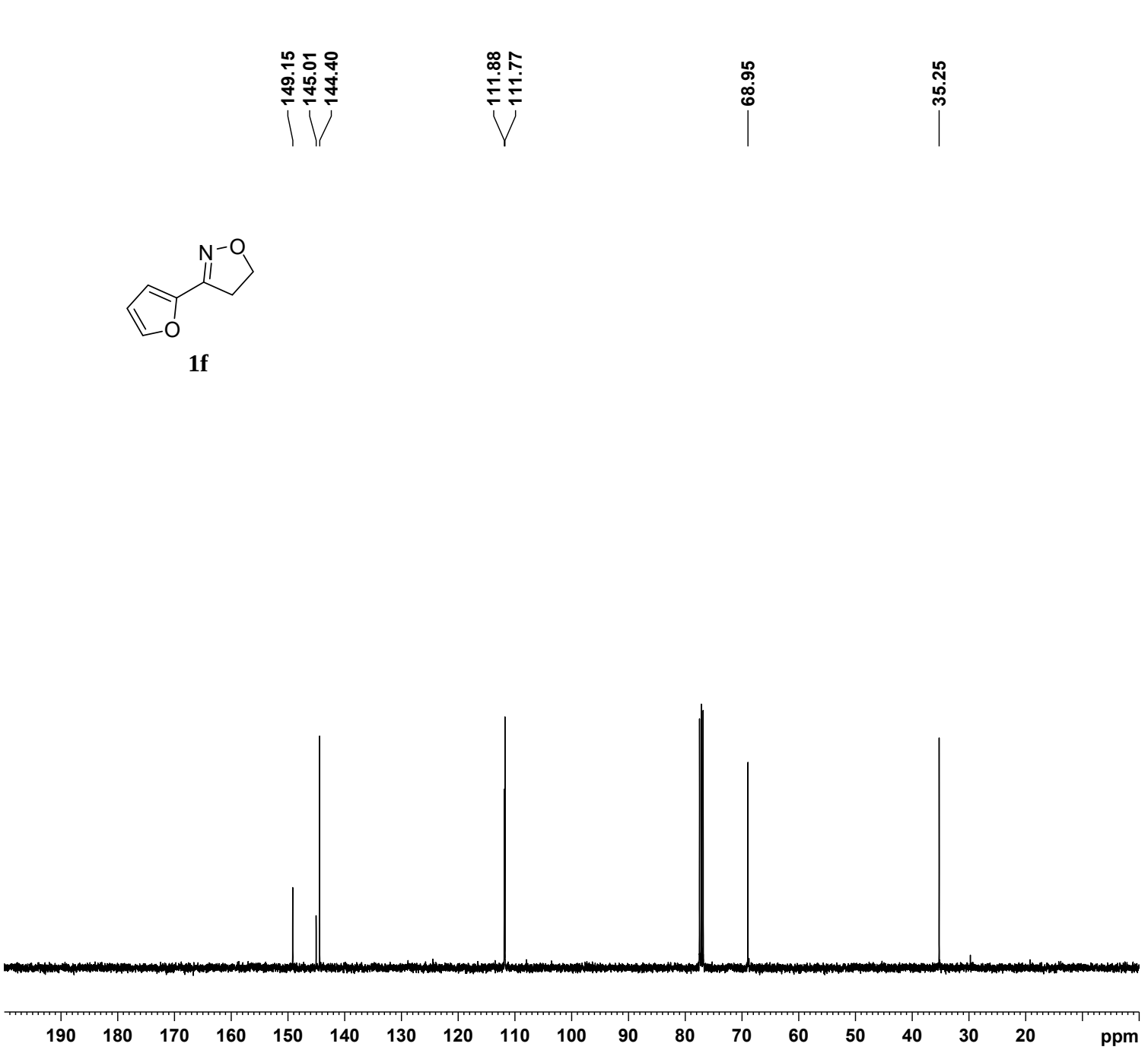


1e

```
NAME        CWG150610-1-C13
EXPNO                    1
PROCNO                   1
Date_             20150916
Time                 13.00
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     97
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                  20.800 usec
DE                   6.50 usec
TE                  298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W          57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W          13.18669796 W
PL12W          0.39276794 W
PL13W          0.37509048 W
SFO2          400.1716007 MHz
SI                  32768
SF            100.6228242 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```

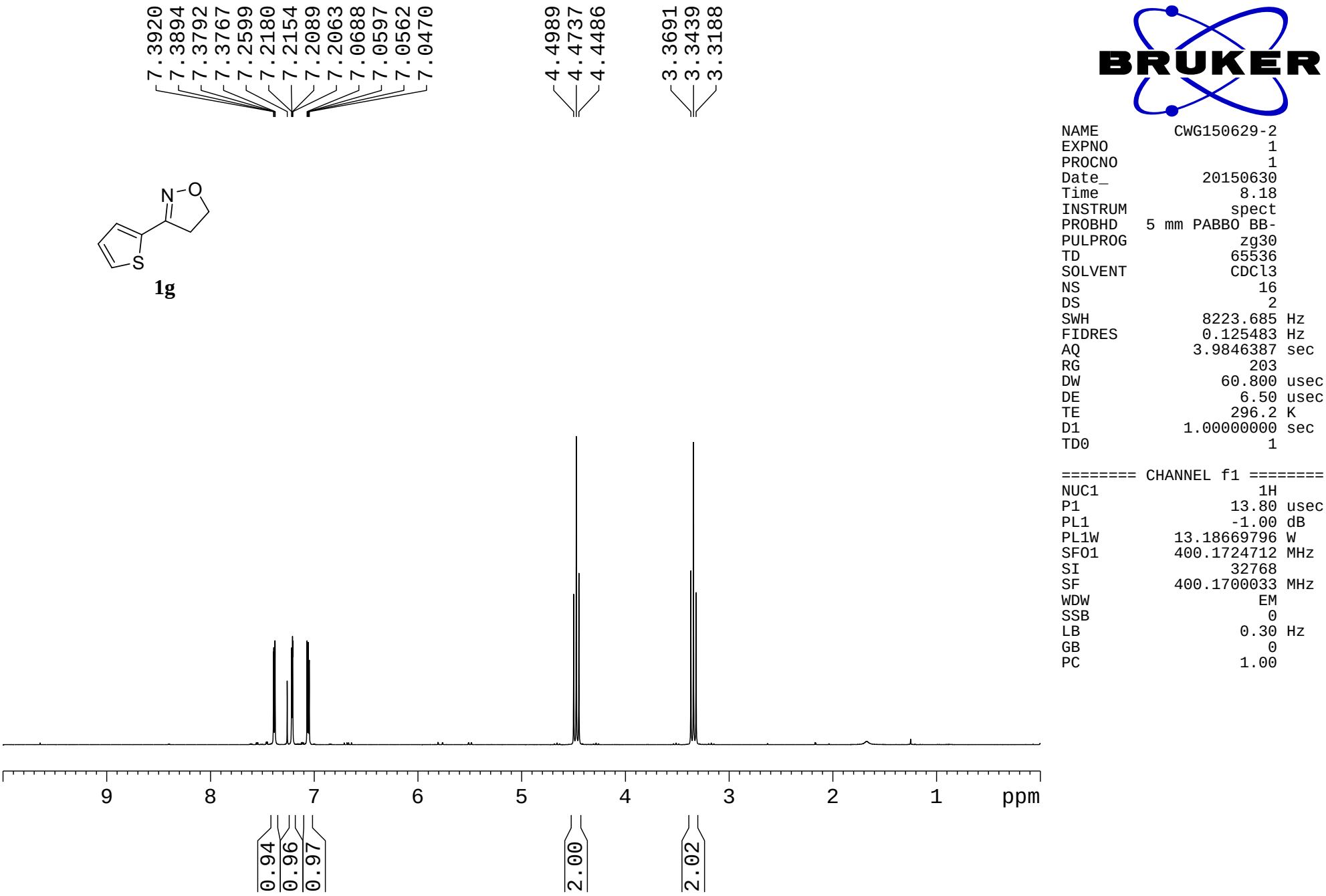


NAME	CWG150626-2
EXPNO	1
PROCNO	1
Date_	20150629
Time	9.44
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

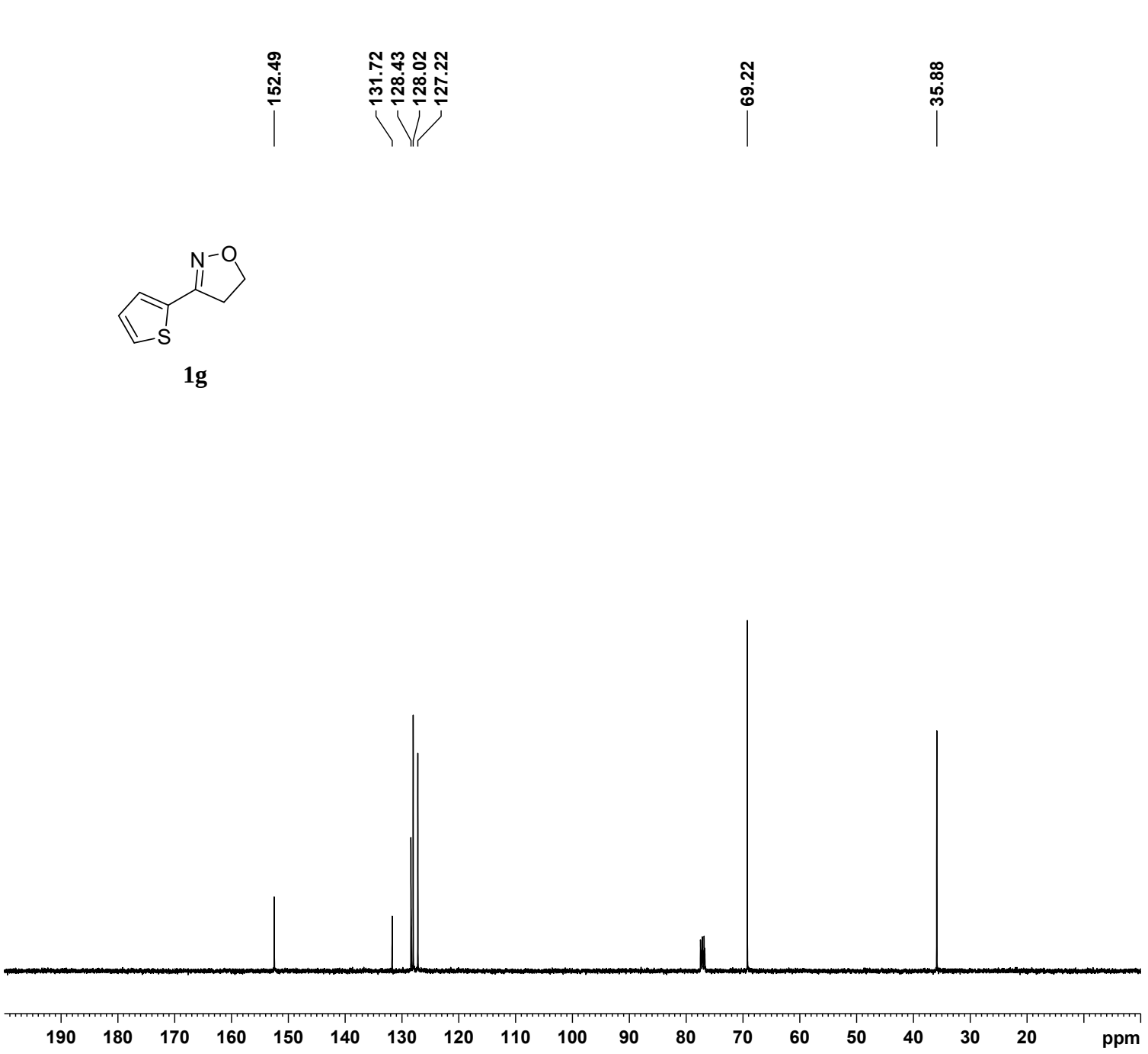


1f

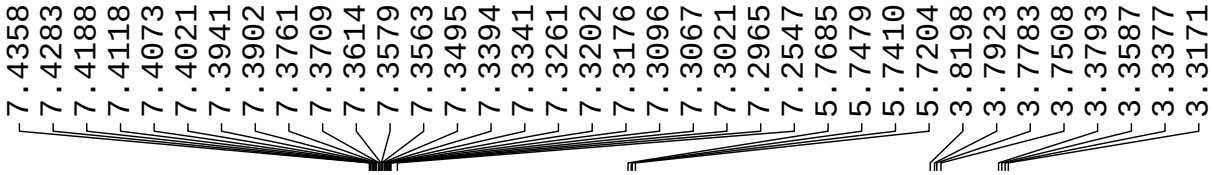
```
NAME          CWG150601-C13
EXPNO                     1
PROCNO                    1
Date_              20150916
Time                 13.39
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      95
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  298.1 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228179 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

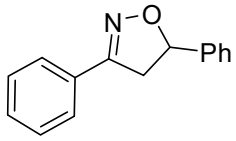


NAME	CWG150629-2
EXPNO	1
PROCNO	1
Date_	20150630
Time	8.18
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



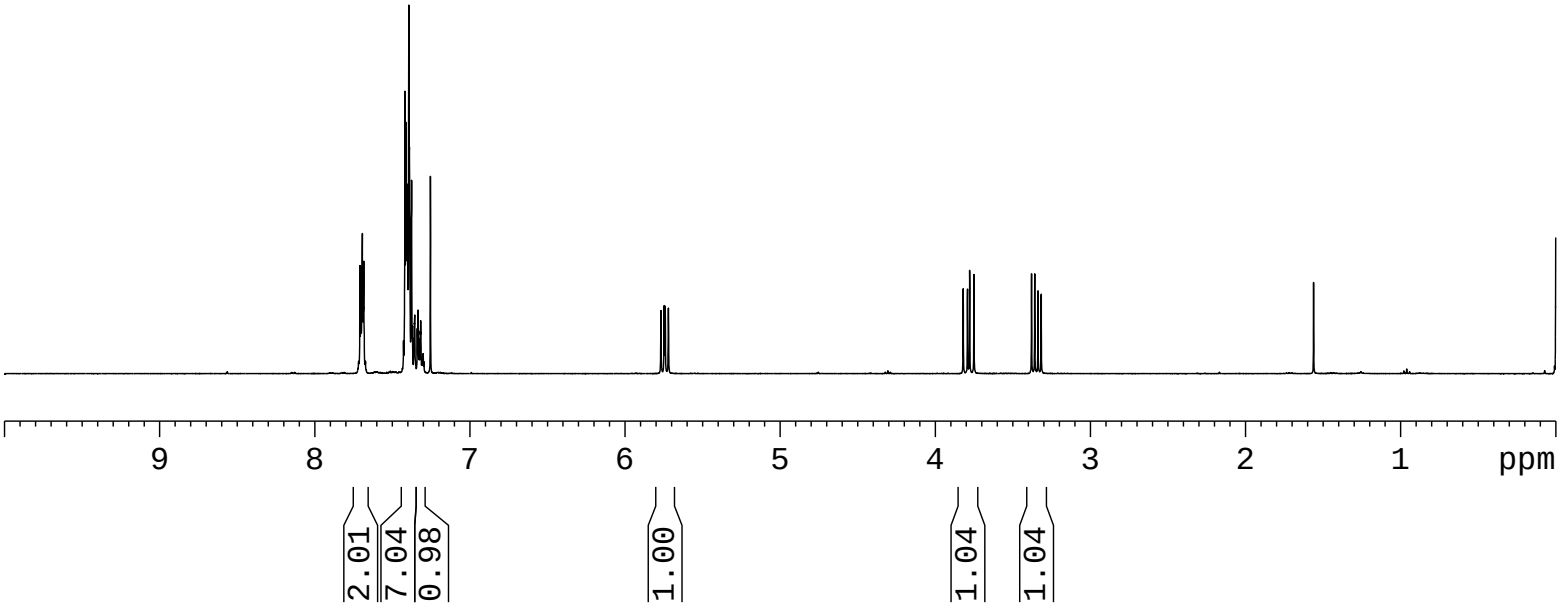

```
NAME      CWG150629-2-C13
EXPNO                  1
PROCNO                 1
Date_           20150916
Time               13.31
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   73
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228437 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

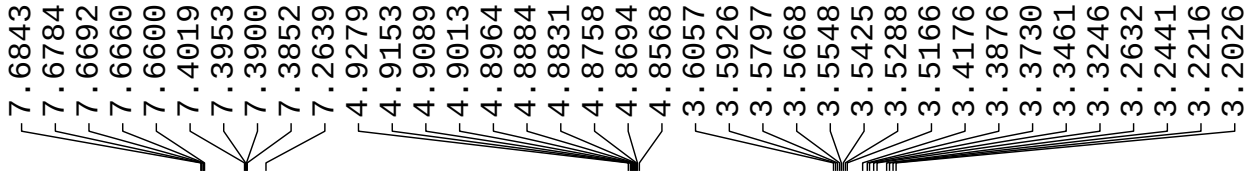


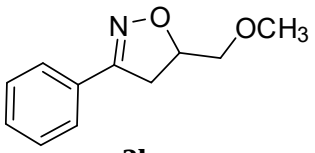


3a

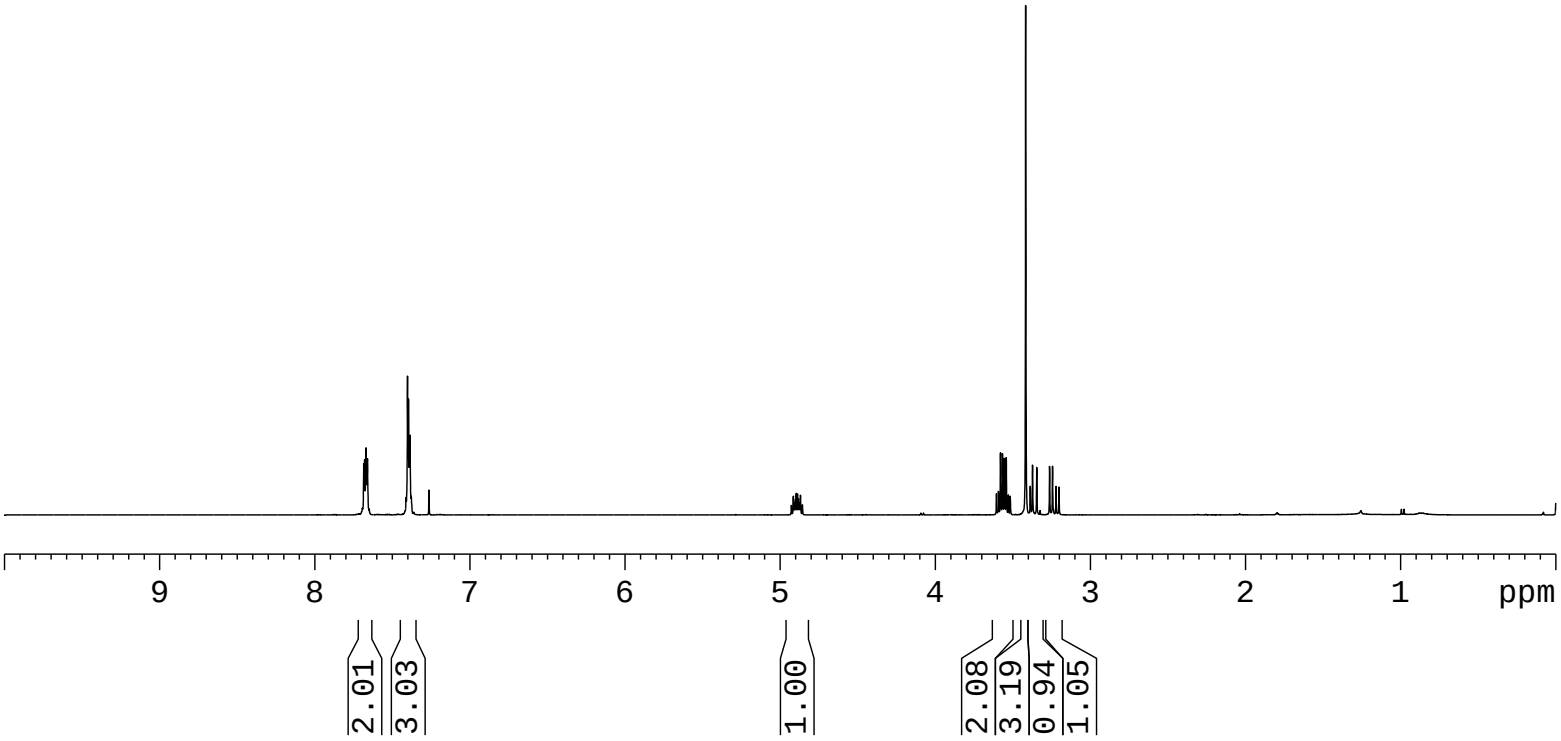
NAME	CWG150418-1
EXPNO	1
PROCNO	1
Date_	20150418
Time	21.06
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700059 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



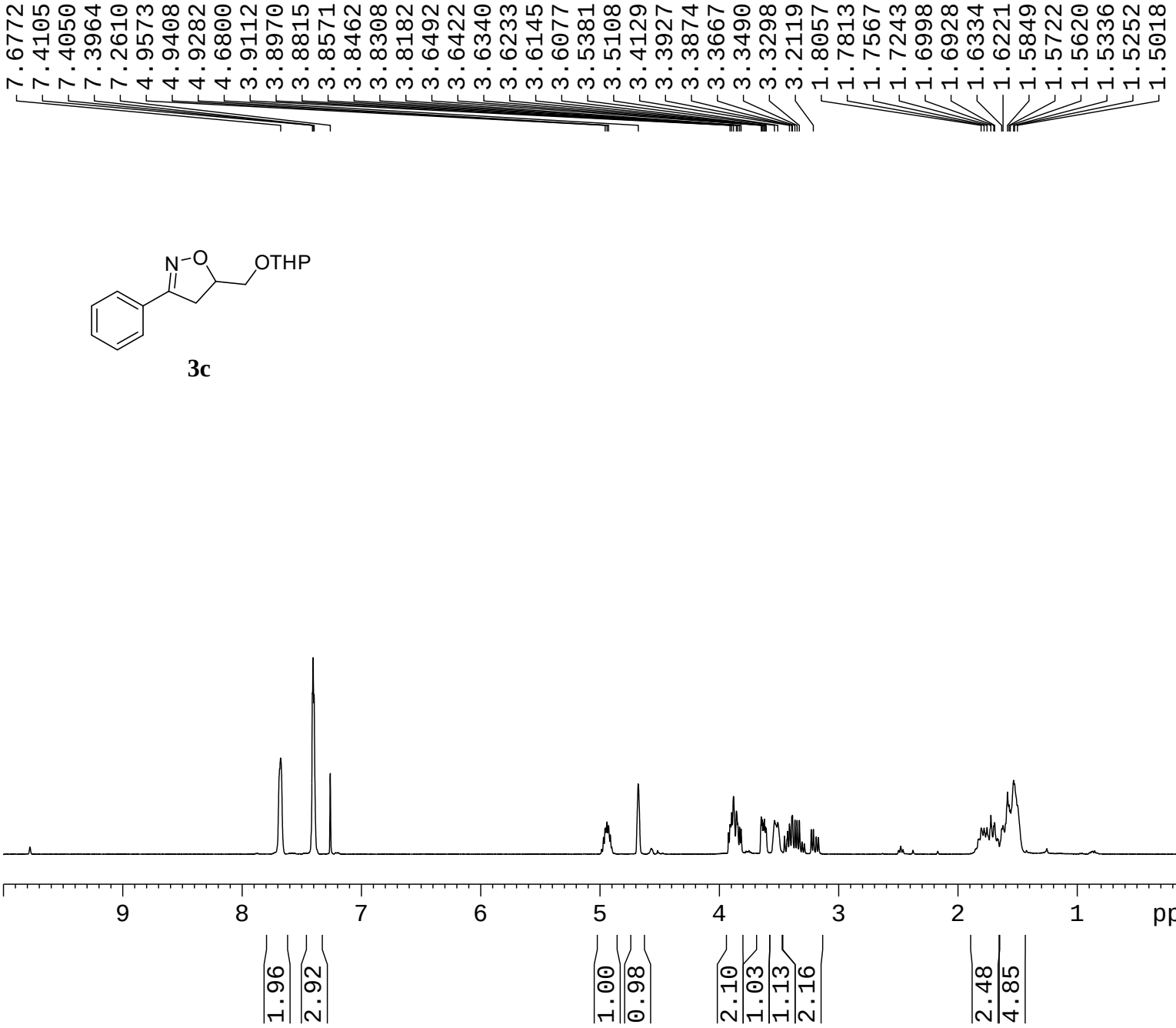




3b

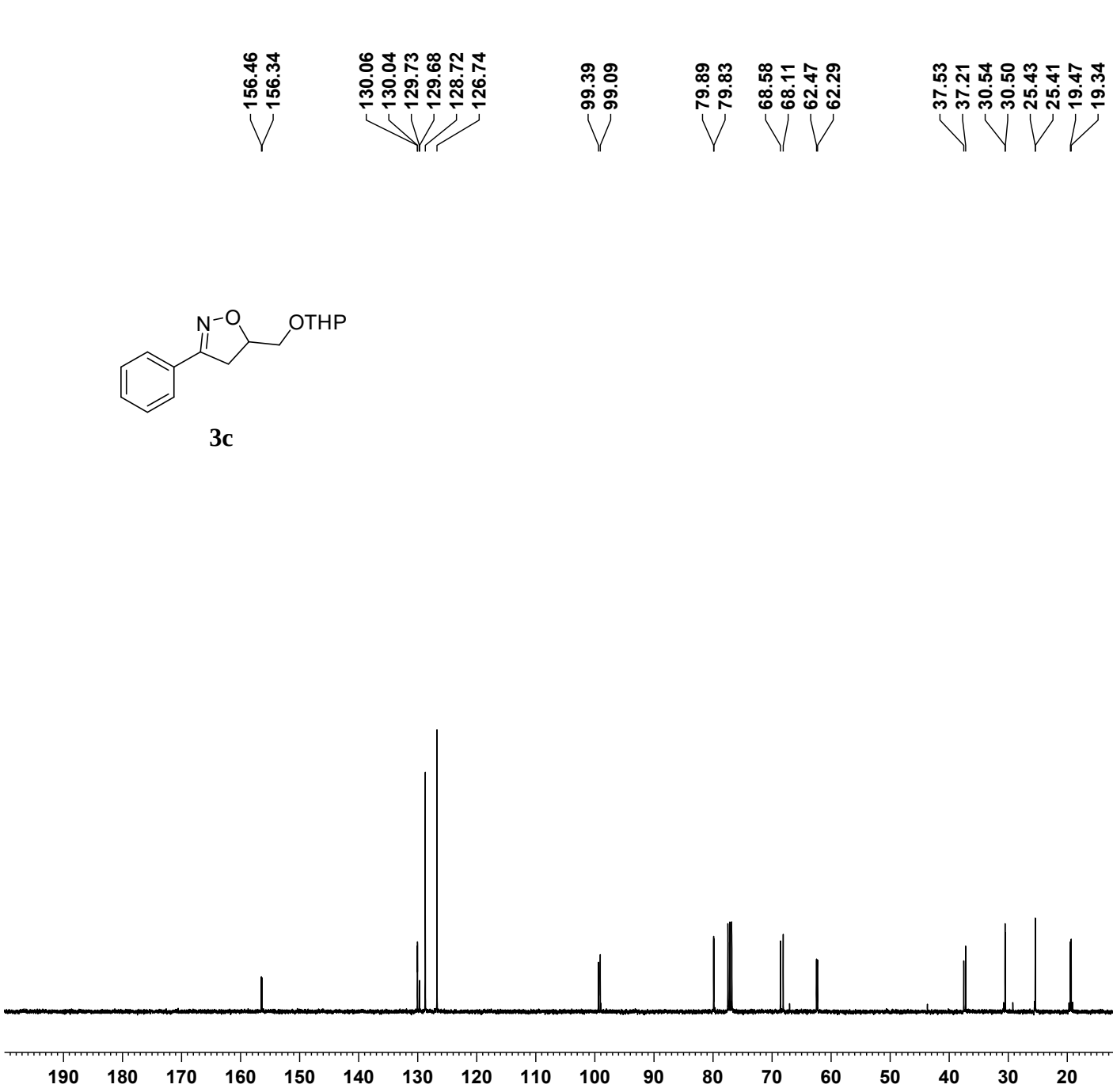


NAME	CWG150413-1
EXPNO	1
PROCNO	1
Date_	20150413
Time	17.44
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	80.6
DW	60.800 usec
DE	6.50 usec
TE	294.4 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700024 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



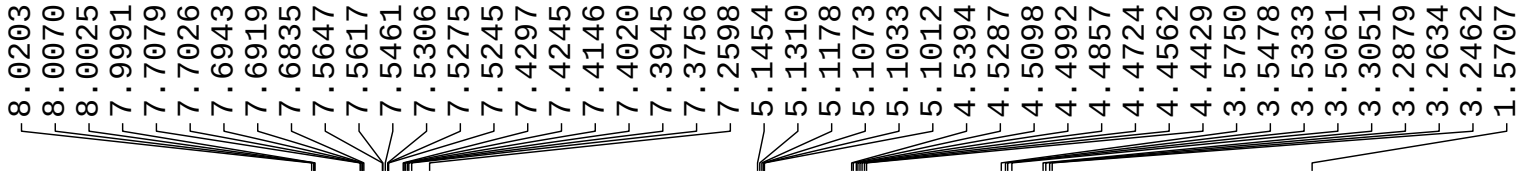
3c

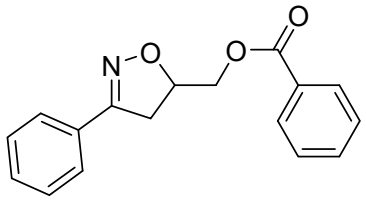
```
NAME          CWG150323-1-1
EXPNO                     1
PROCNO                    1
Date_              20151013
Time                  10.33
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                   60.800 usec
DE                    6.50 usec
TE                   297.8 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700030 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```



3c

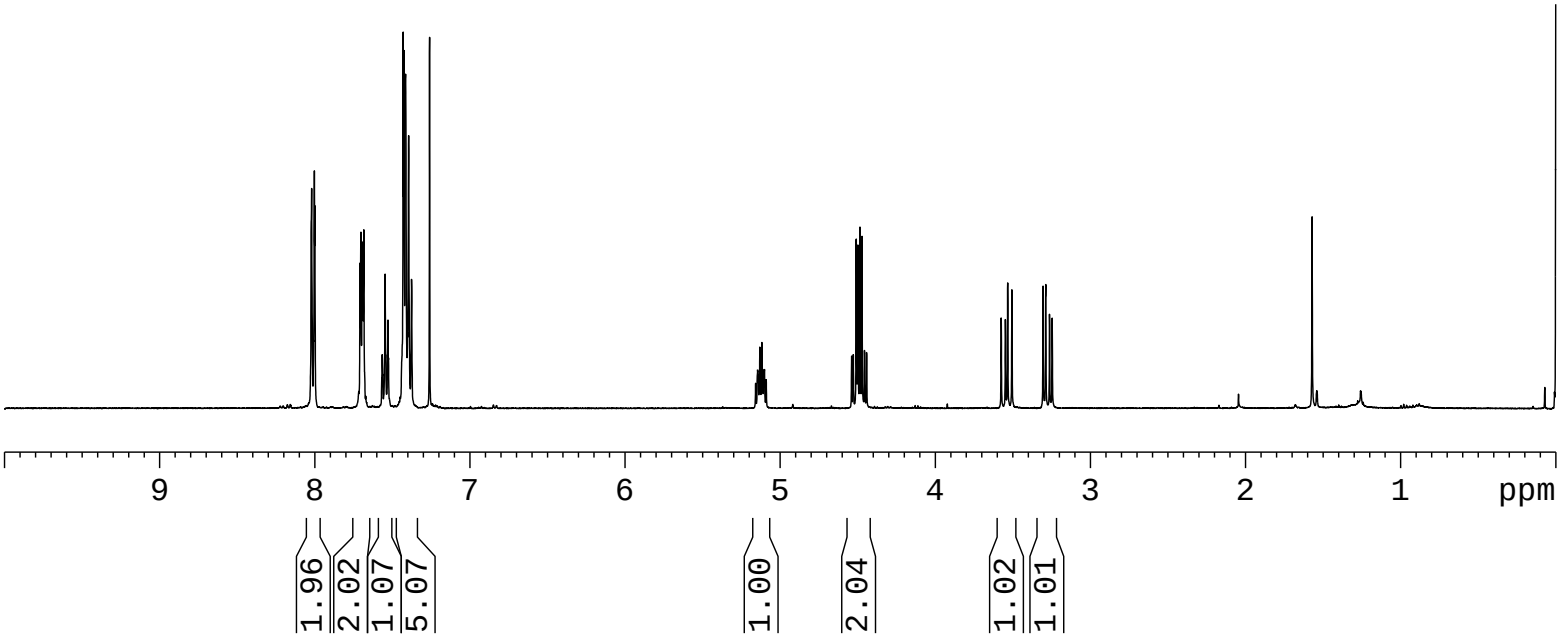
```
NAME        CWG150323-1-1-C13
EXPNO                      1
PROCNO                     1
Date_               20151013
Time                   11.00
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                       206
DS                         4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                 1.3631988 sec
RG                       203
DW                  20.800 usec
DE                   6.50 usec
TE                   298.2 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                    32768
SF            100.6228194 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

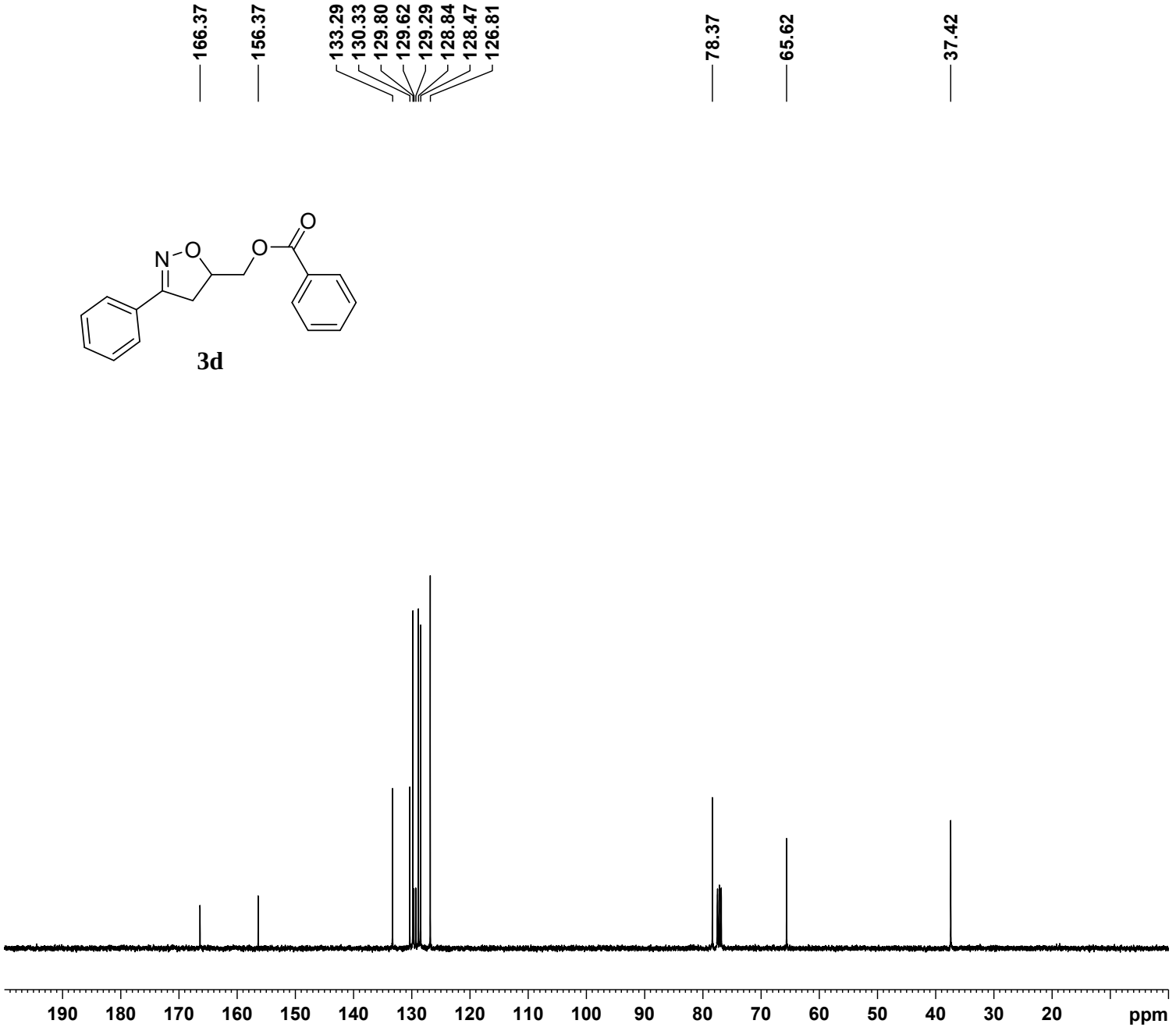




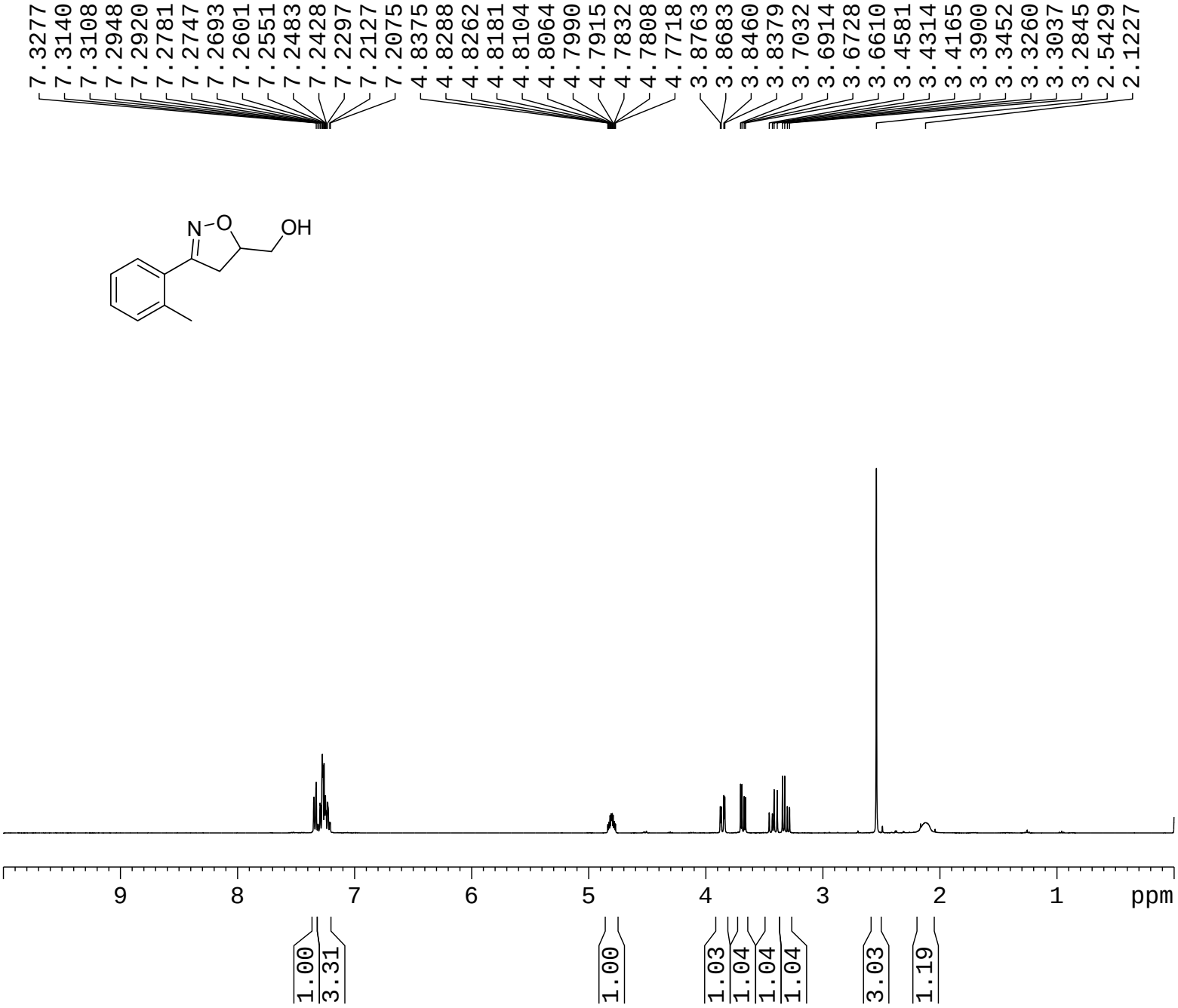
3d

```
NAME            CWG150325
EXPNO                   1
PROCNO                  1
Date_            20150325
Time                21.54
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                     203
DW                60.800 usec
DE                 6.50 usec
TE                 295.8 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700039 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                   1.00
```



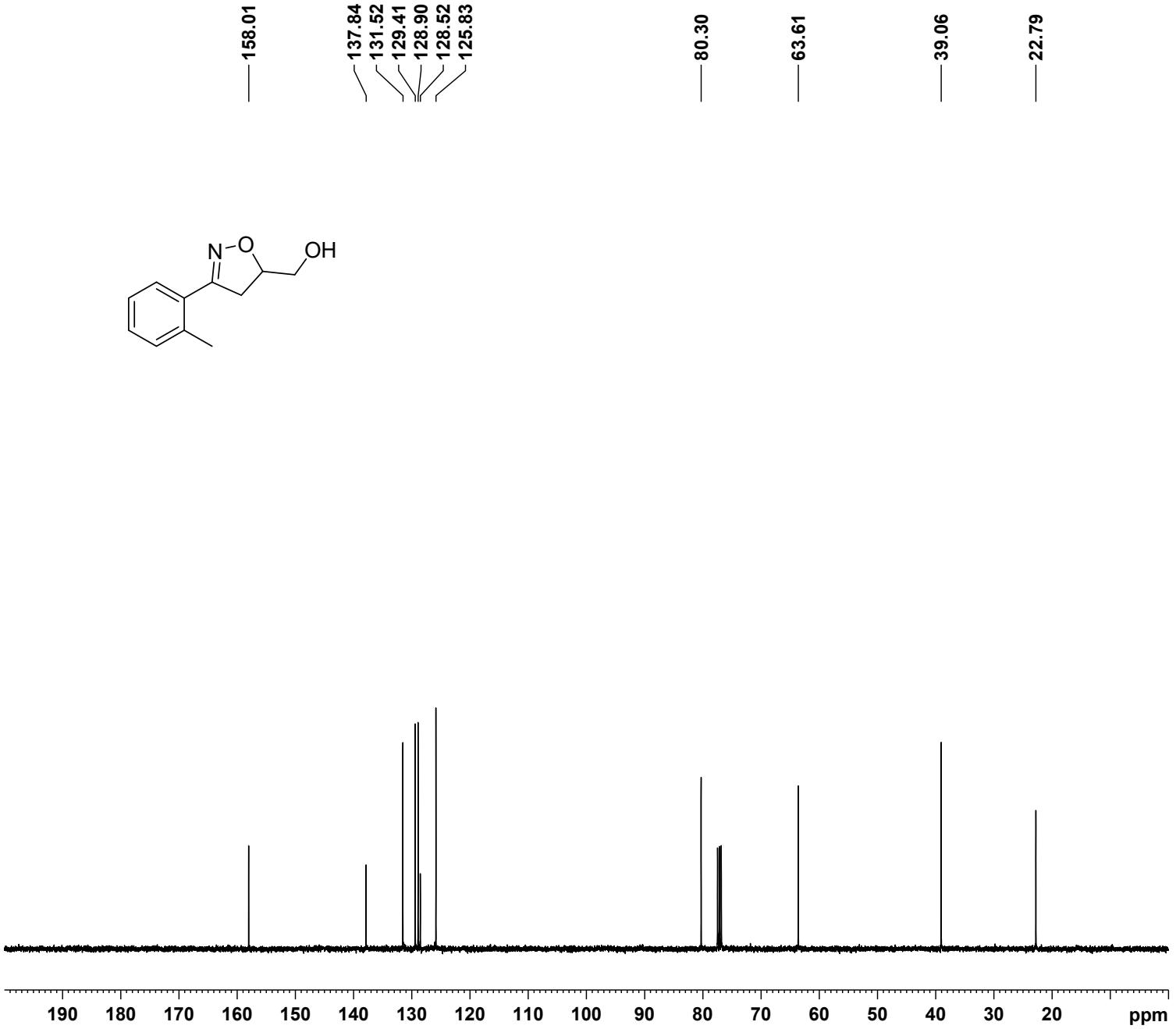



```
NAME          CWG150409-C13
EXPNO                     1
PROCNO                    1
Date_              20150916
Time                 13.21
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    130
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                 20.800 usec
DE                  6.50 usec
TE                 298.5 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W          57.32743073 W
SFO1         100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                    1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W          13.18669796 W
PL12W          0.39276794 W
PL13W          0.37509048 W
SFO2         400.1716007 MHz
SI                  32768
SF           100.6228206 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```

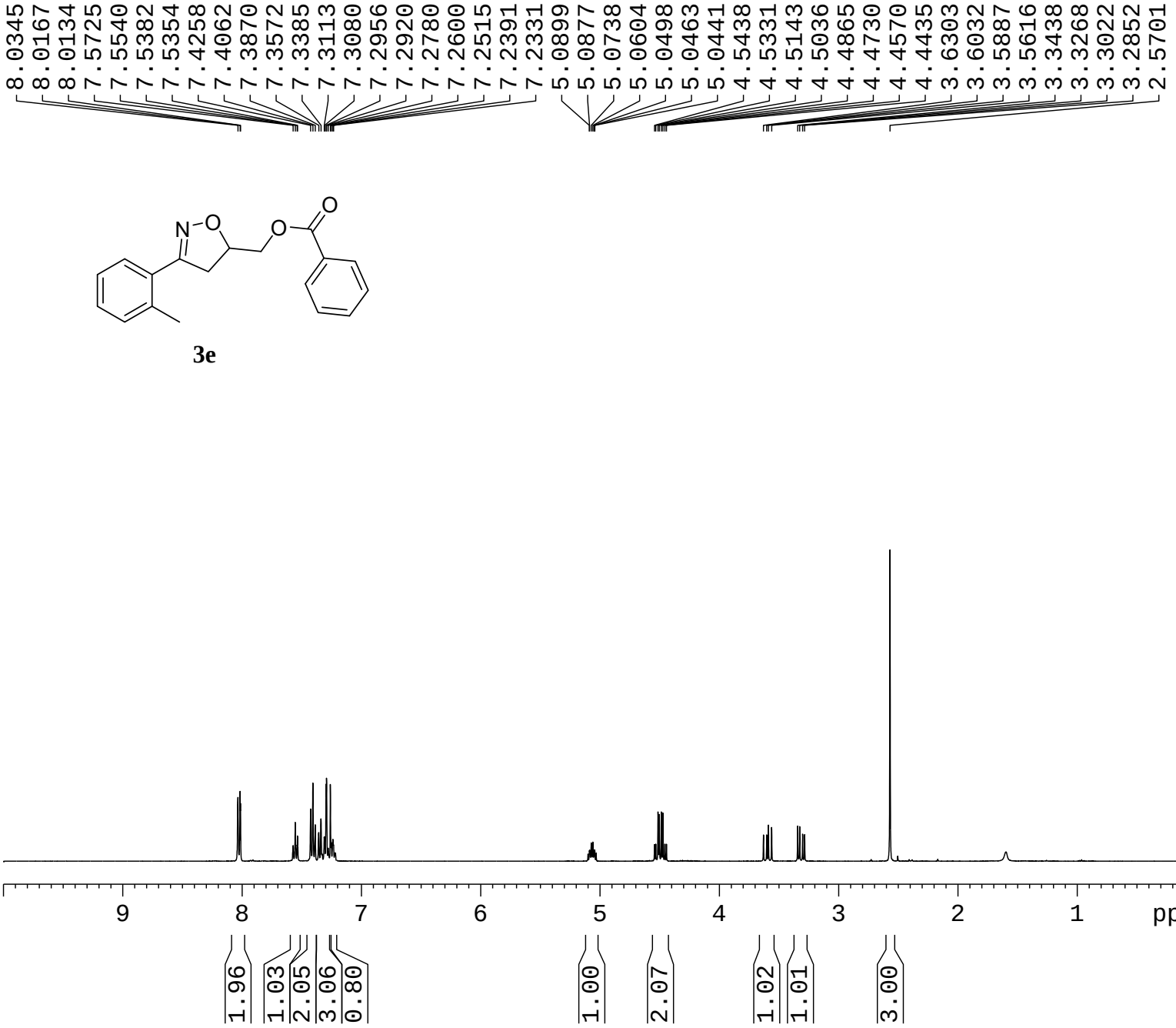


BRUKER

NAME	CWG150920-1-1
EXPNO	1
PROCNO	1
Date_	20150922
Time	21.16
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	298.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

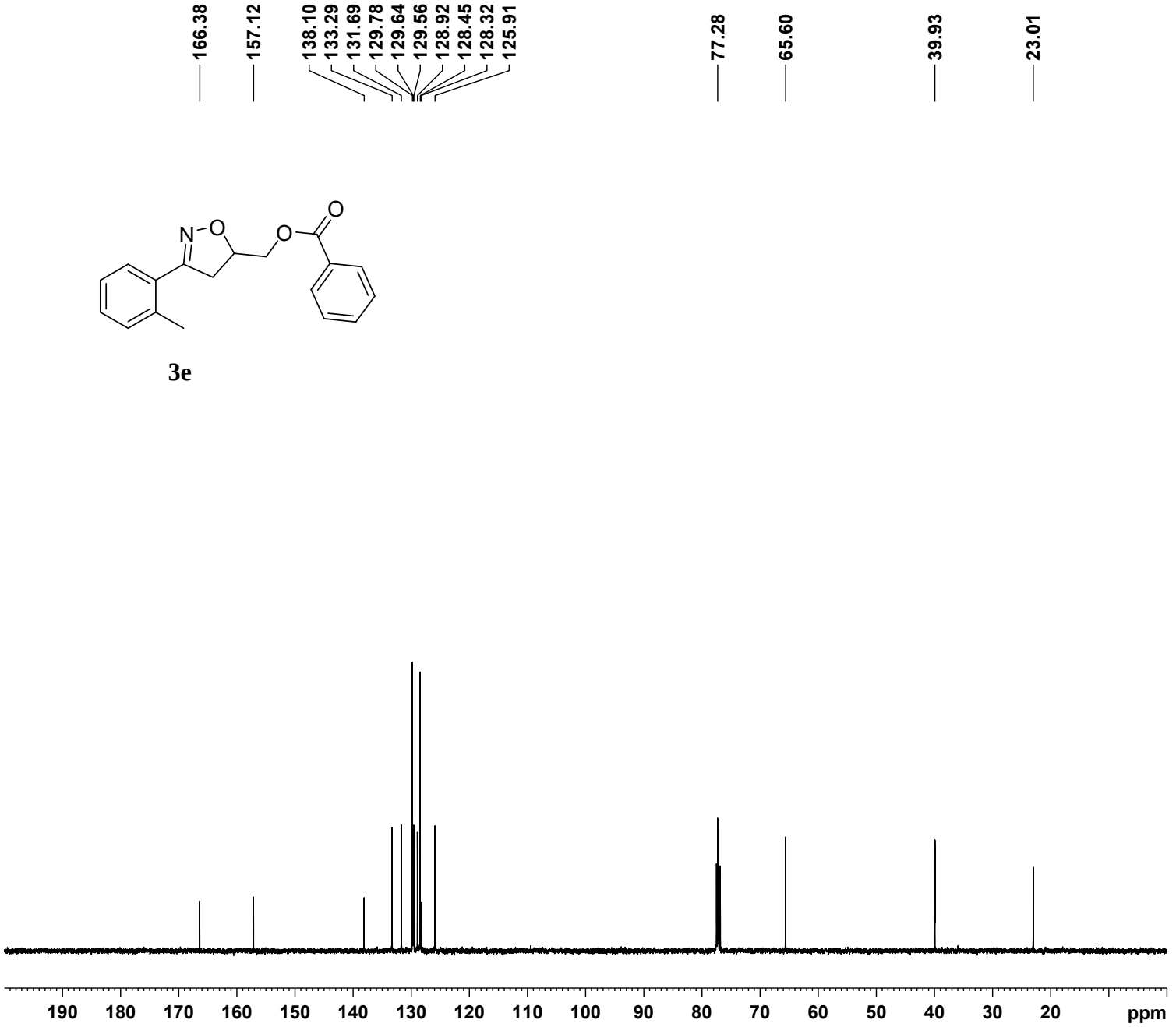



```
NAME      CWG150920-1-C13
EXPNO                  1
PROCNO                 1
Date_           20150928
Time               18.22
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   64
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE               296.9 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228259 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



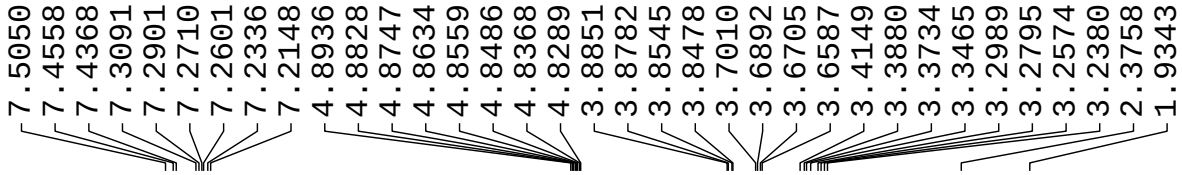
3e

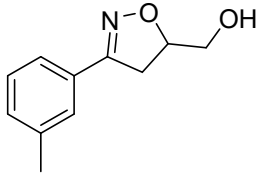
```
NAME          CWG150922-2
EXPNO                   1
PROCNO                  1
Date_            20150922
Time                20.55
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 298.2 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700033 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

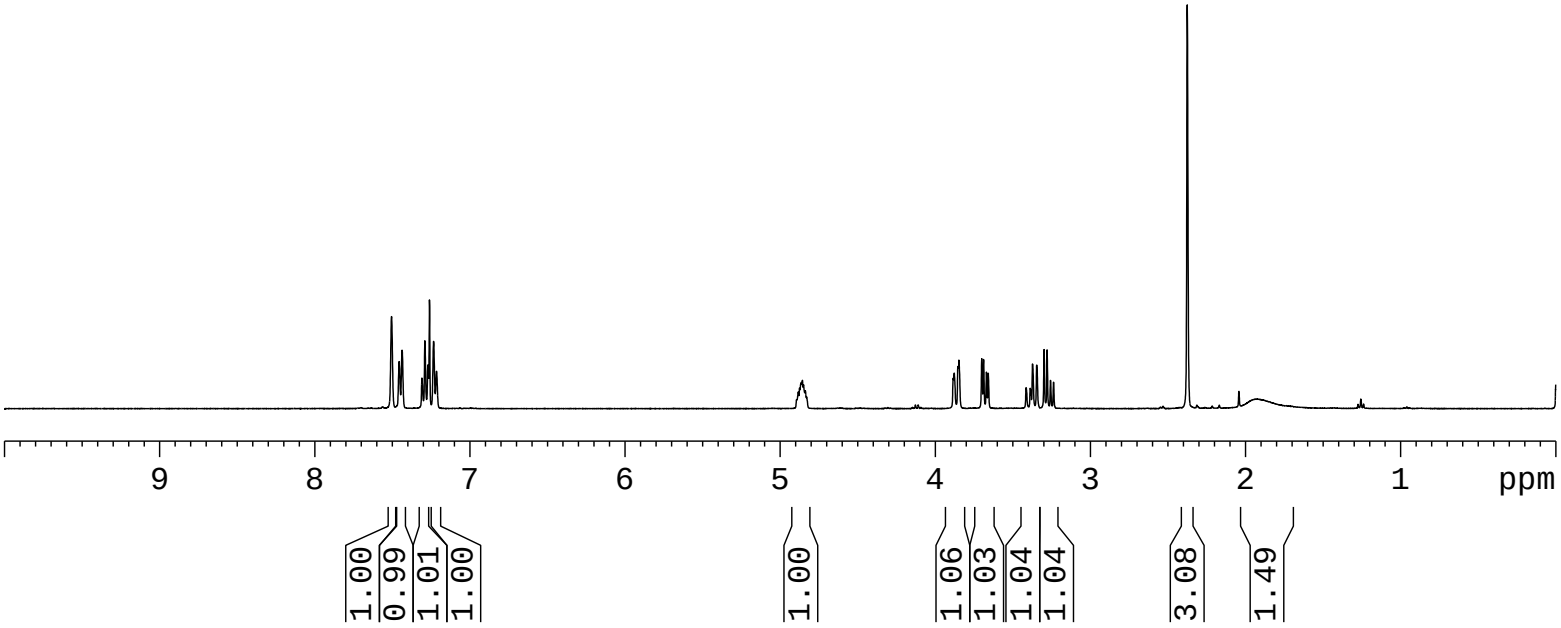


3e

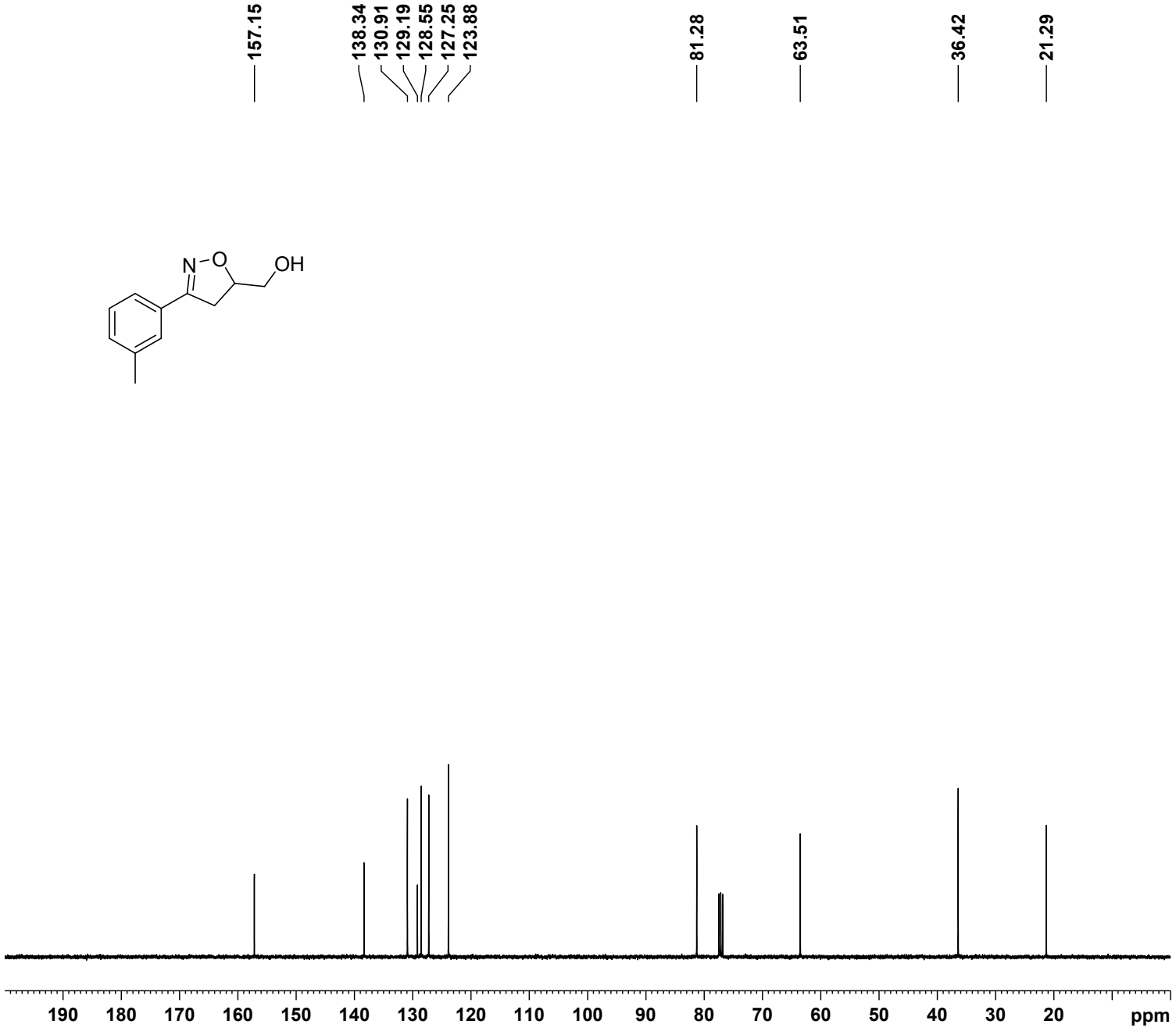
```
NAME        CWG150922-2-C13
EXPNO                    1
PROCNO                   1
Date_             20151008
Time                 16.55
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      71
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  297.6 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228225 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40
```



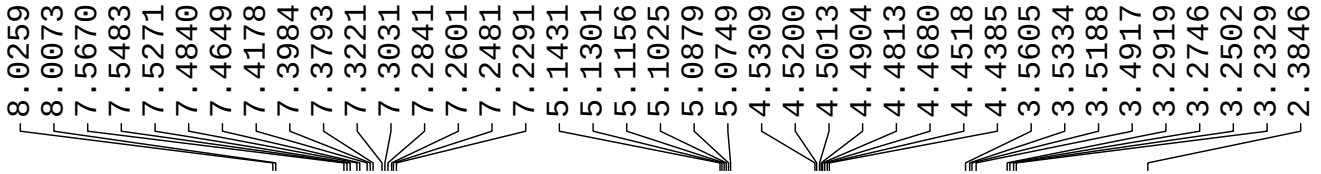


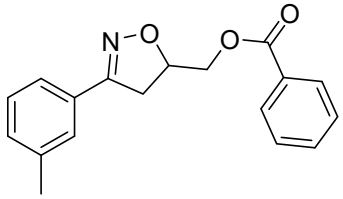


NAME	CWG150920-3-1
EXPNO	1
PROCNO	1
Date_	20150924
Time	16.59
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	161
DW	60.800 usec
DE	6.50 usec
TE	297.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



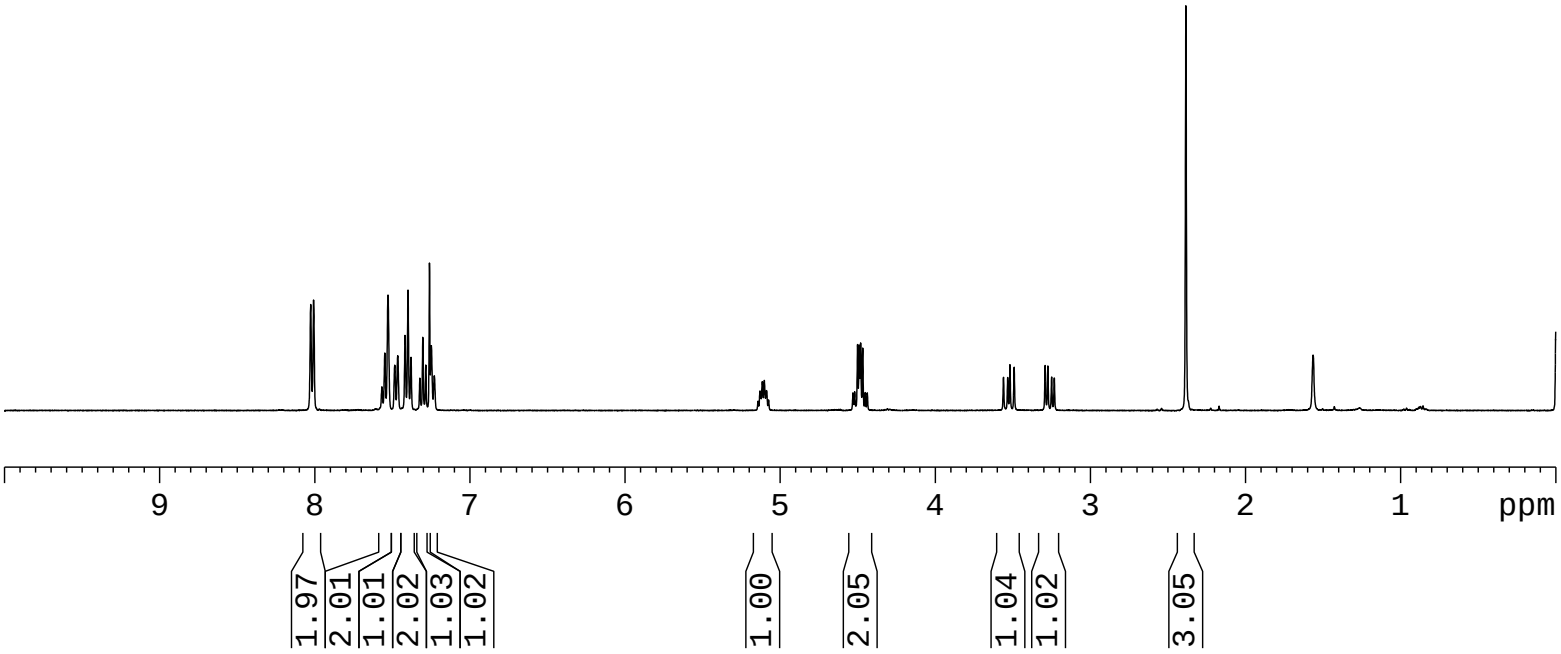

```
NAME      CWG150920-3-1-C13
EXPNO                    1
PROCNO                   1
Date_             20150928
Time                 18.29
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    61
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                296.7 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228297 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

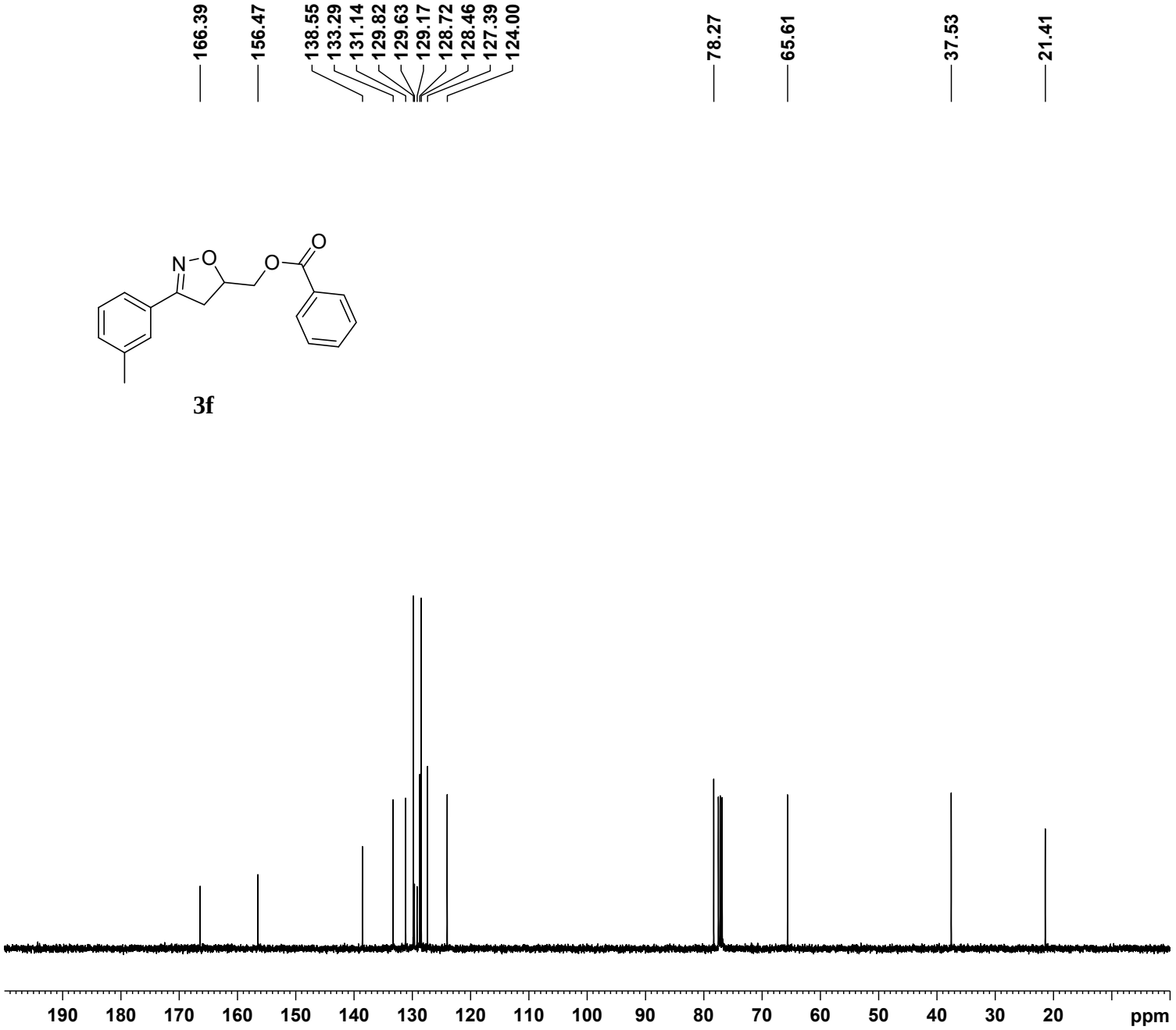




3f

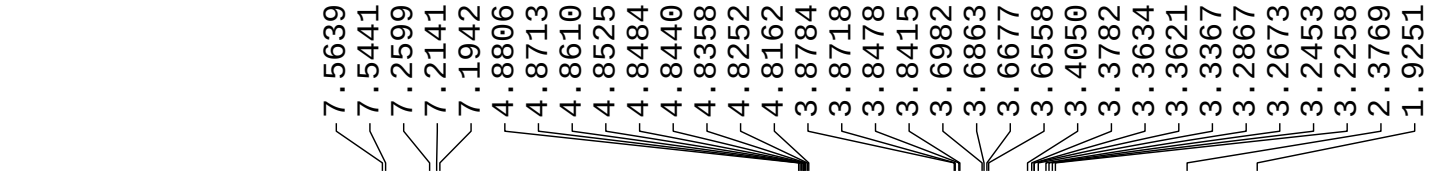
NAME	CWG150924
EXPNO	1
PROCNO	1
Date_	20150924
Time	17.04
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	297.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

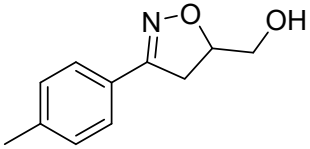




3f

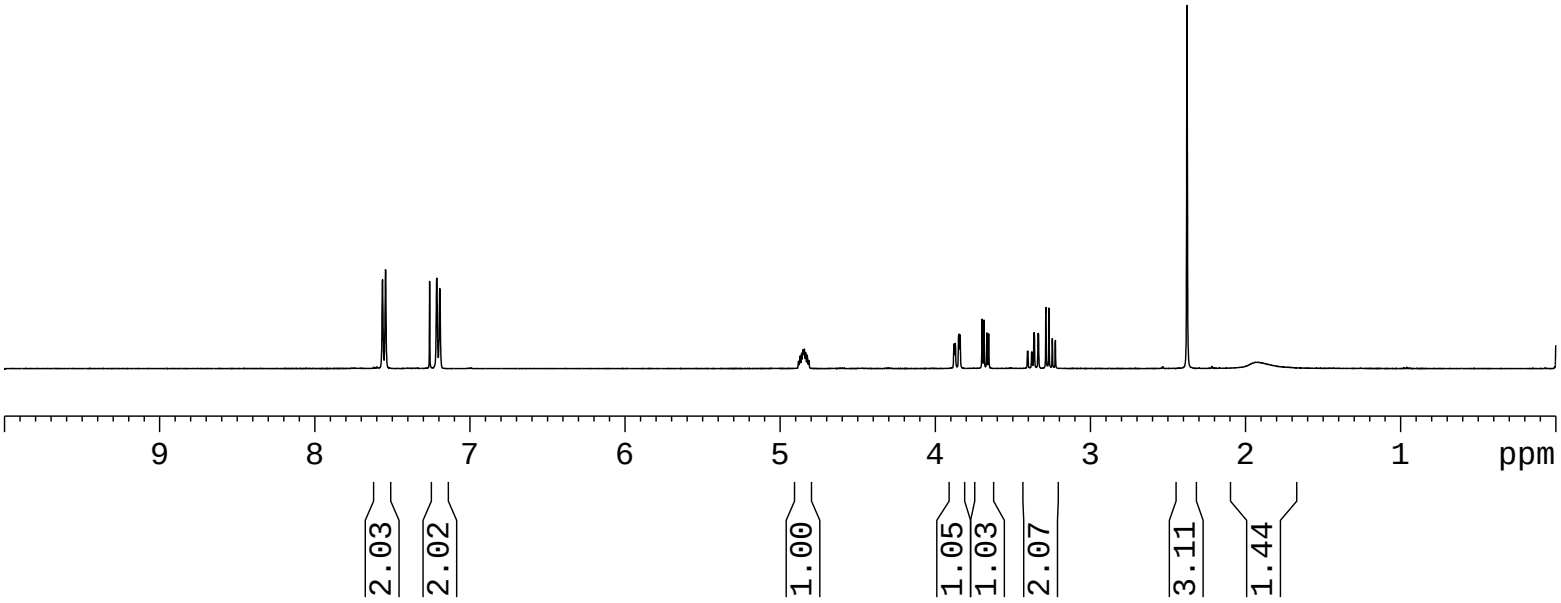
```
NAME          CWG150924-C13
EXPNO                     1
PROCNO                    1
Date_              20150928
Time                 18.37
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      84
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  296.7 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228203 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

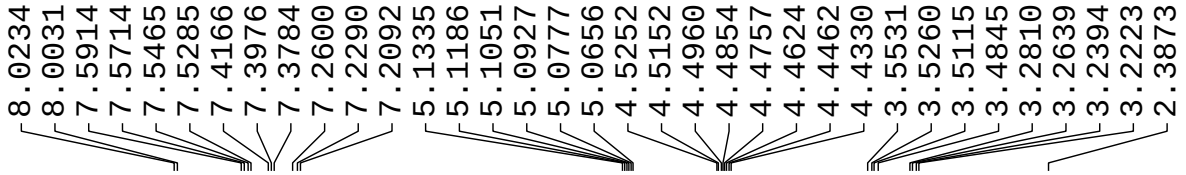


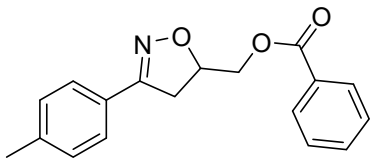


NAME	CWG150920-5
EXPNO	1
PROCNO	1
Date_	20150922
Time	21.07
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	13
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	298.2 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700034 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

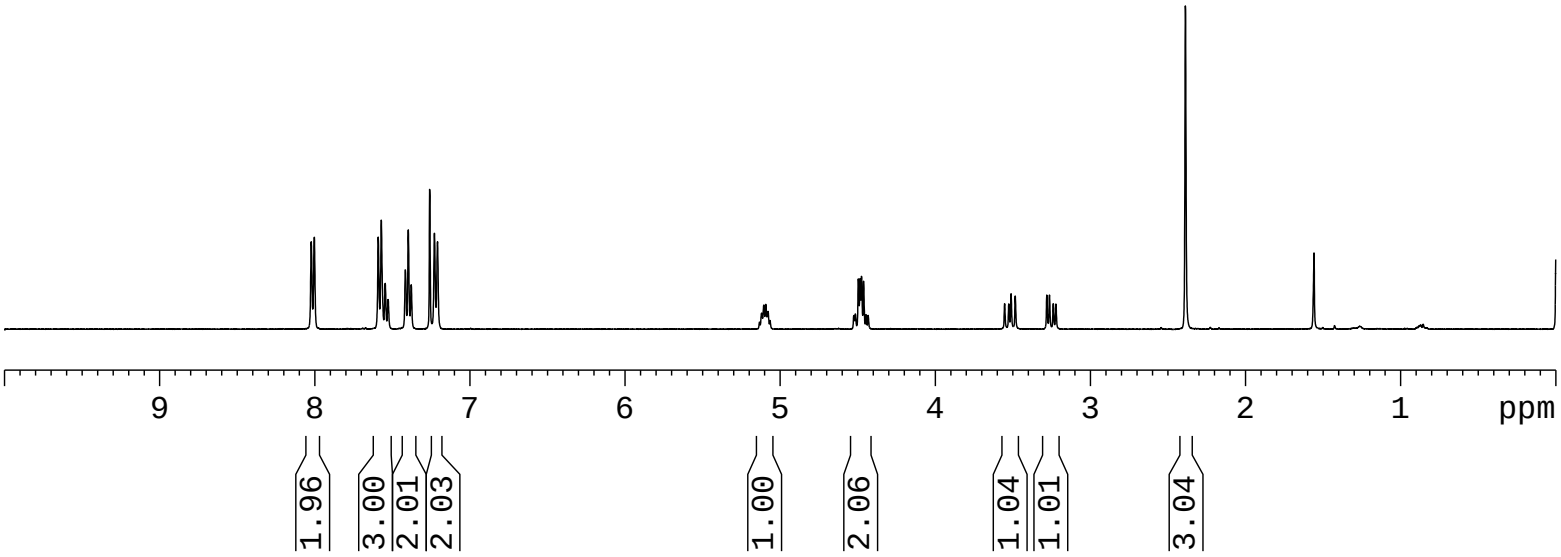


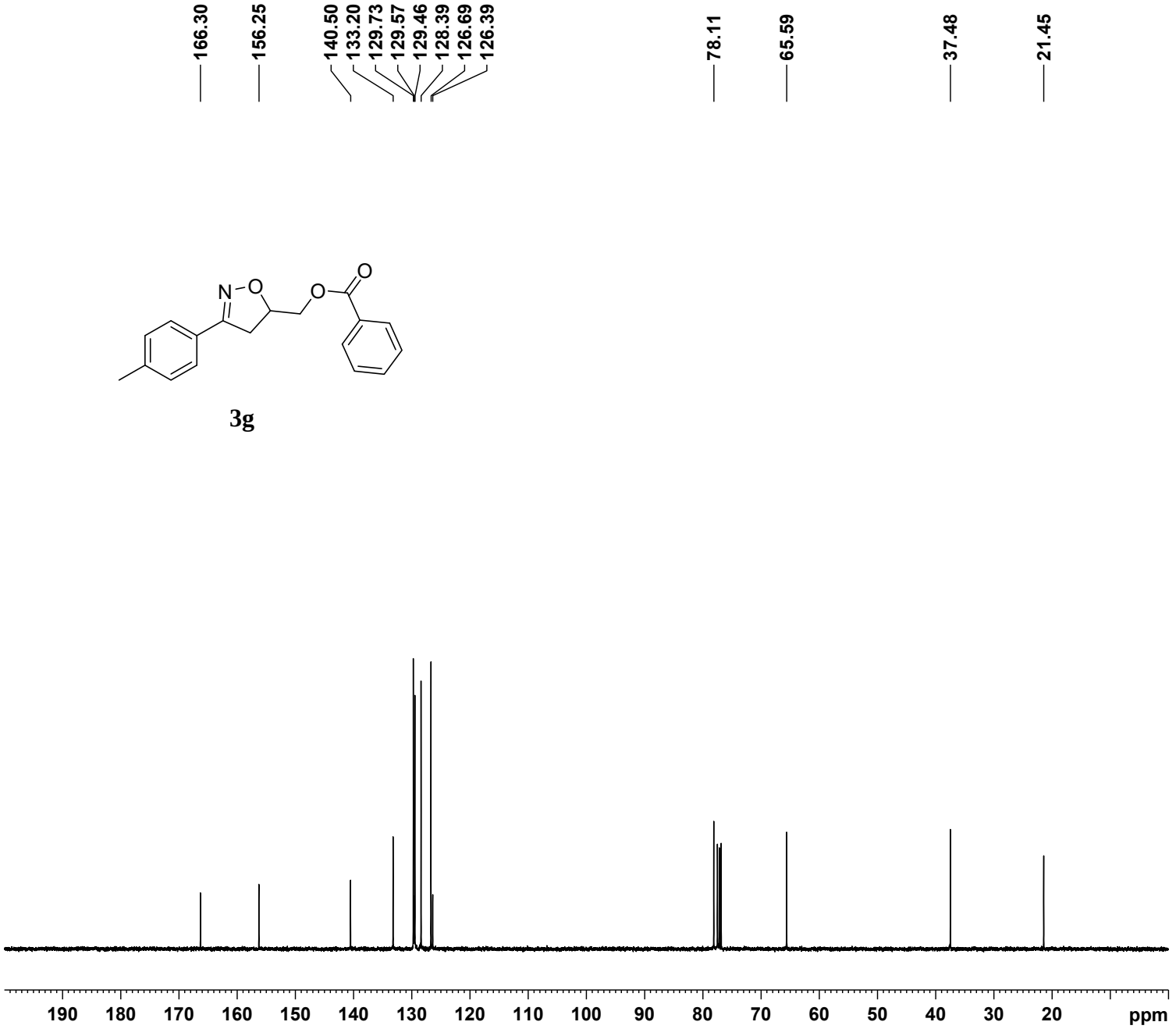




3g

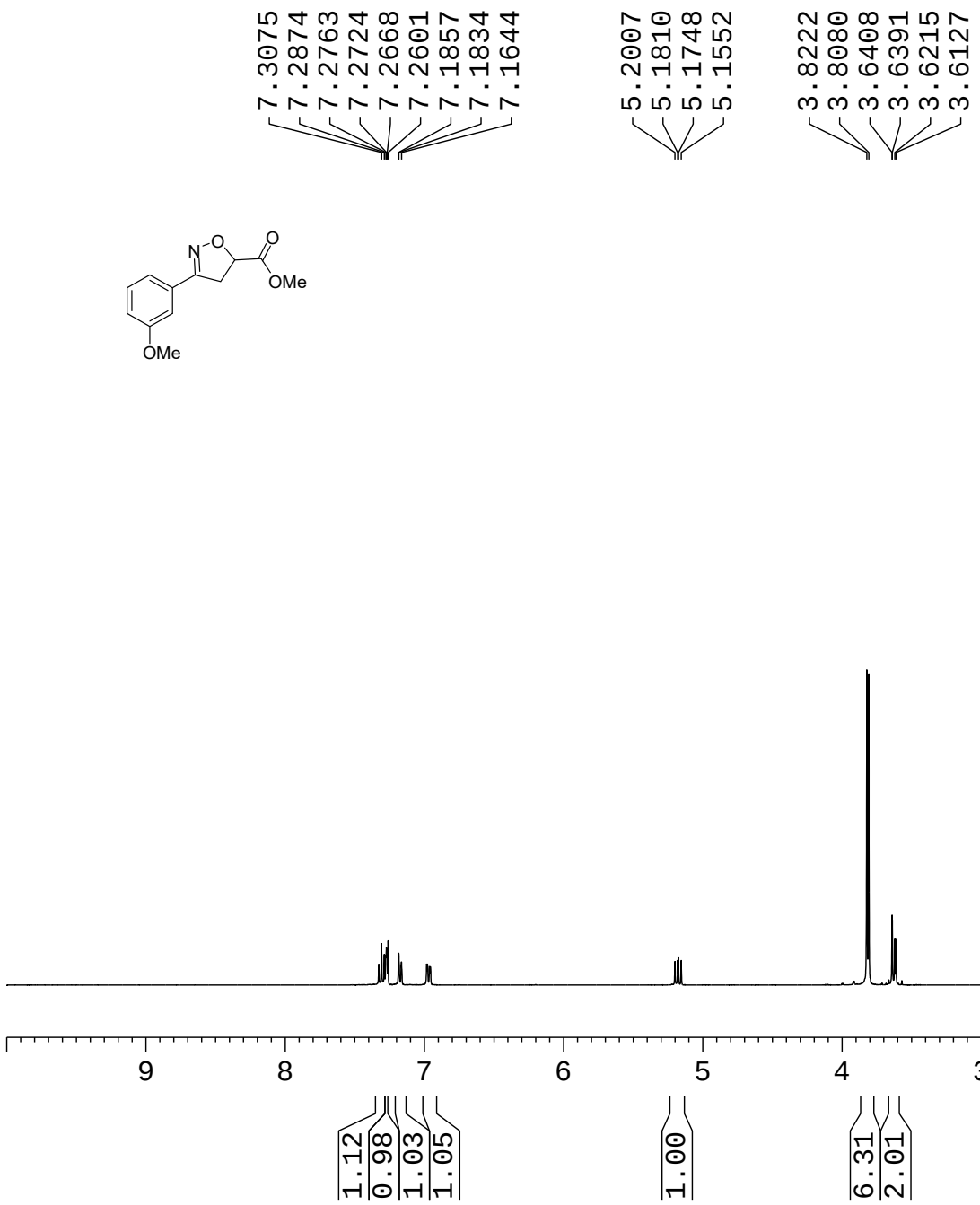
NAME	CWG150922-5-1
EXPNO	1
PROCNO	1
Date_	20150928
Time	17.33
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	15
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700036 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



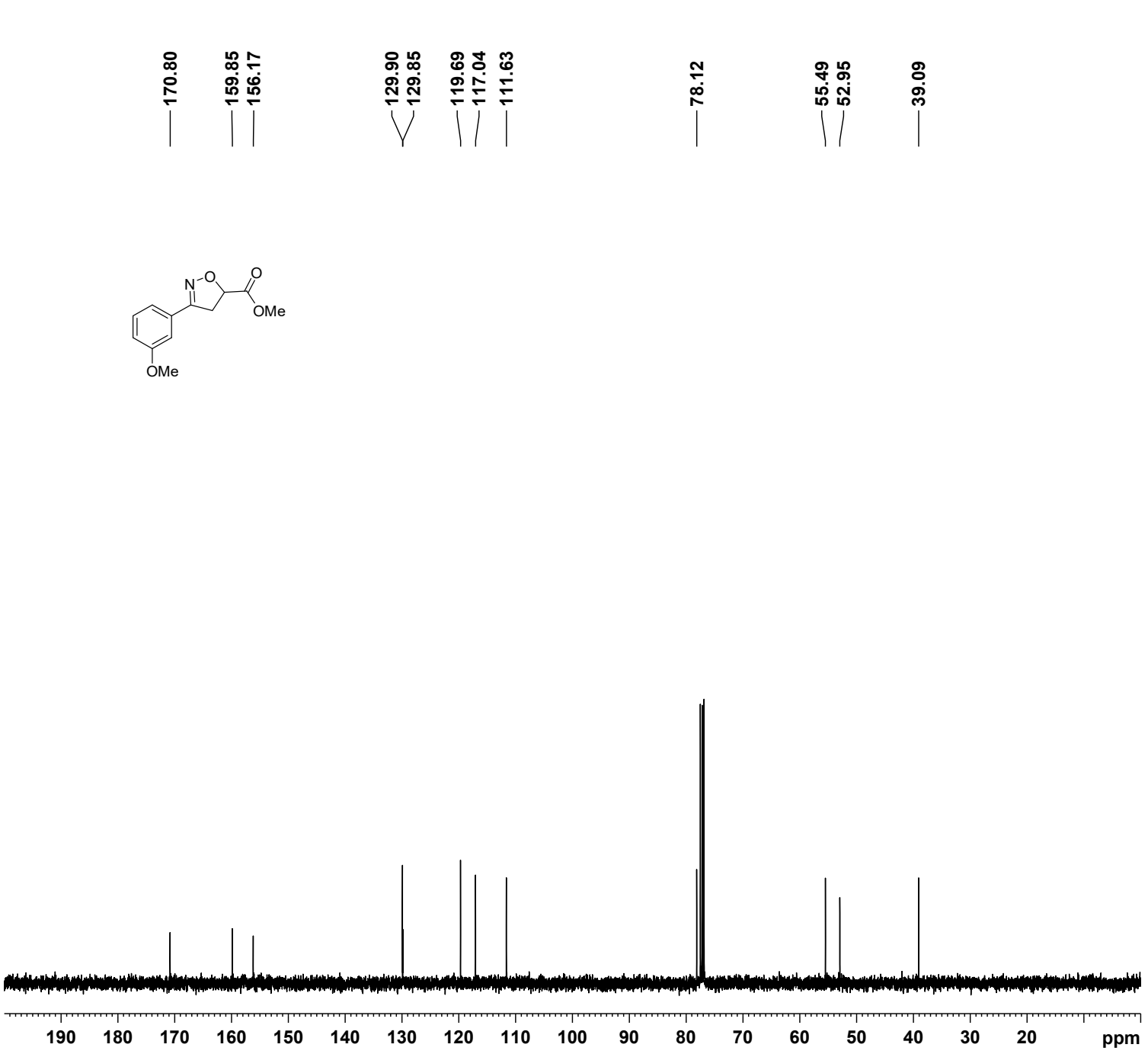


3g

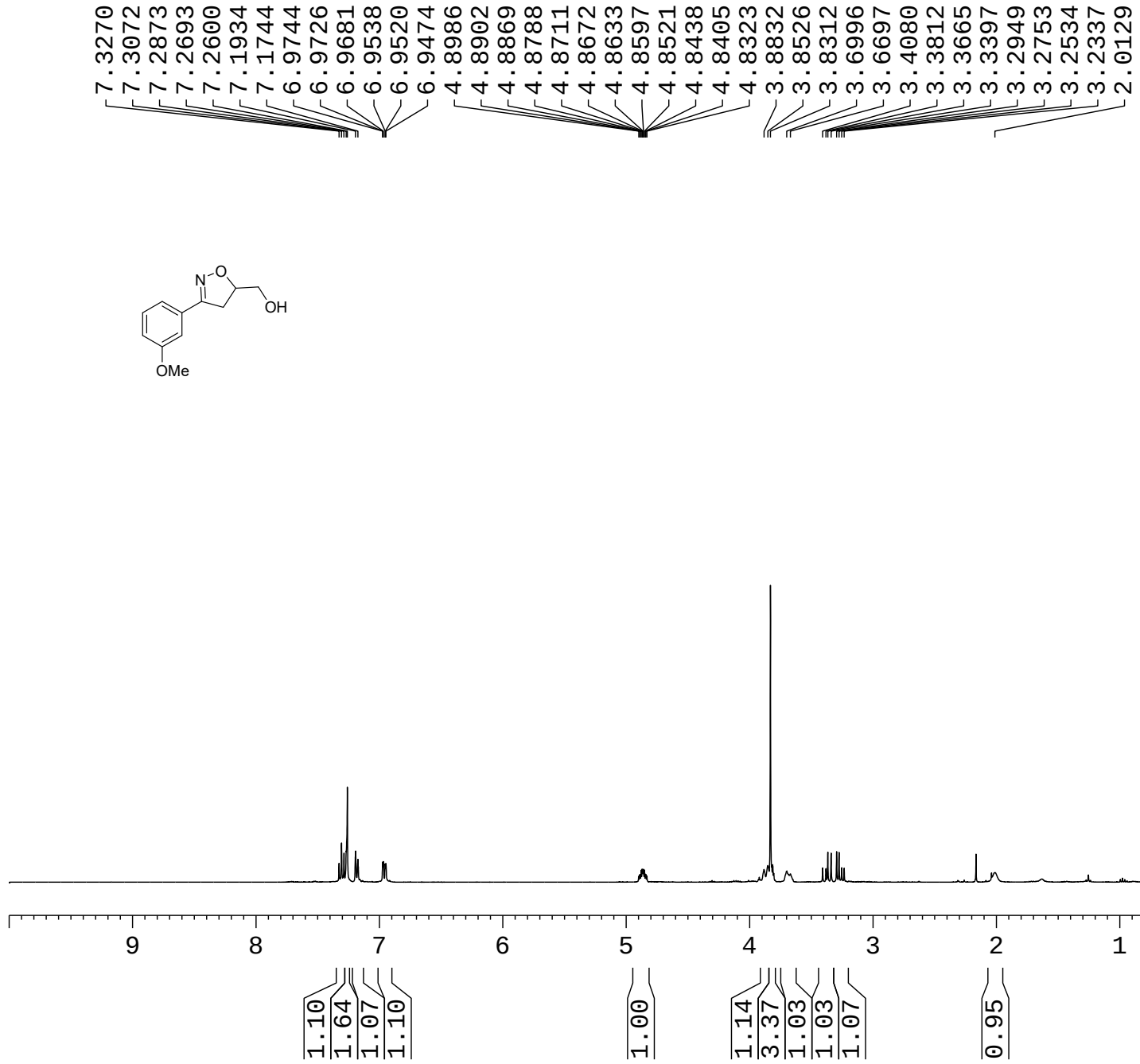
```
NAME          CWG150922-5-C13
EXPNO                      1
PROCNO                     1
Date_               20150928
Time                   20.07
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         69
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     296.4 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                      32768
SF               100.6228278 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```



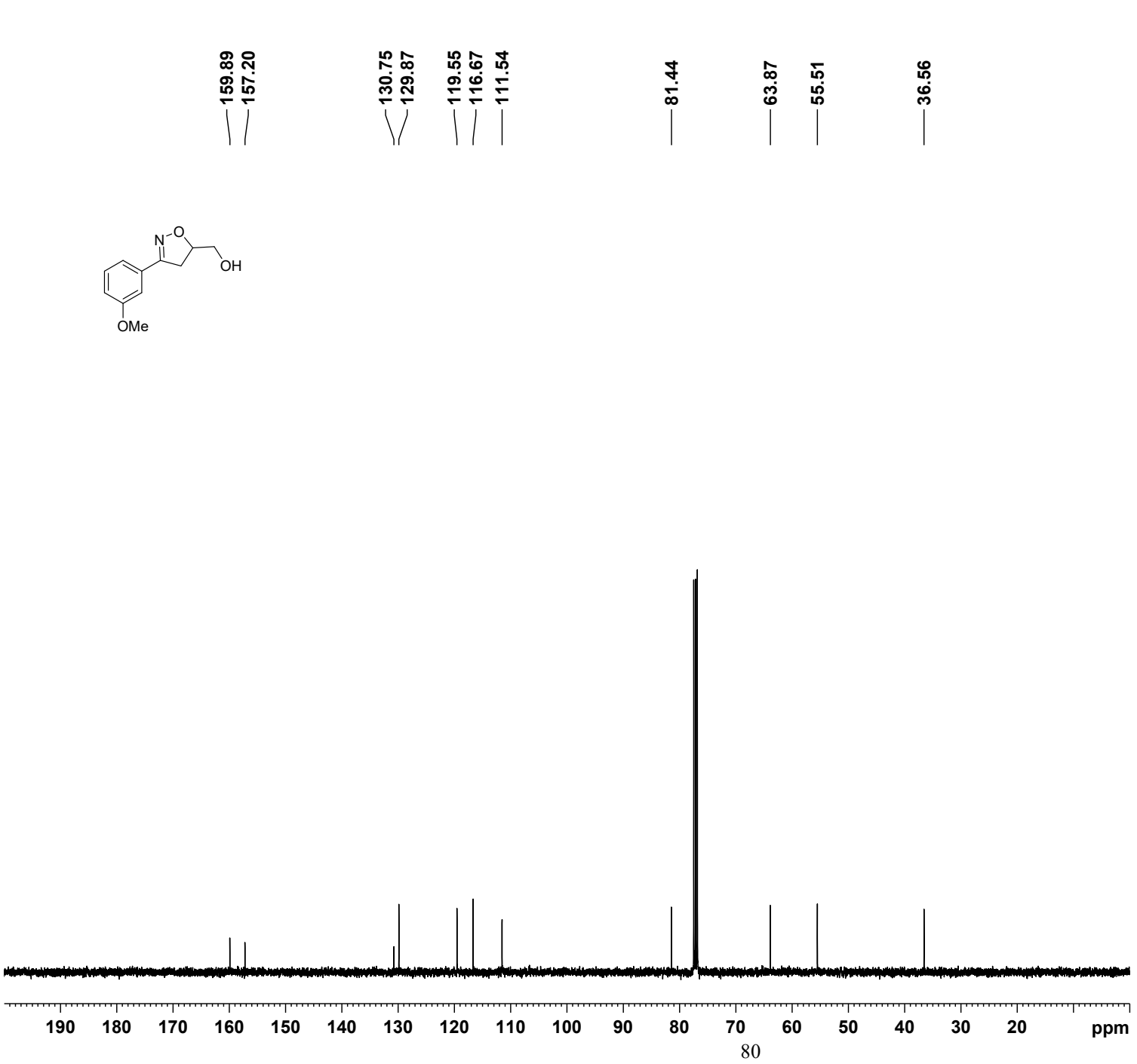
NAME	CWG160429-1-PURE
EXPNO	1
PROCNO	1
Date_	20160430
Time	8.08
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	128
DW	60.800 usec
DE	6.50 usec
TE	298.4 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



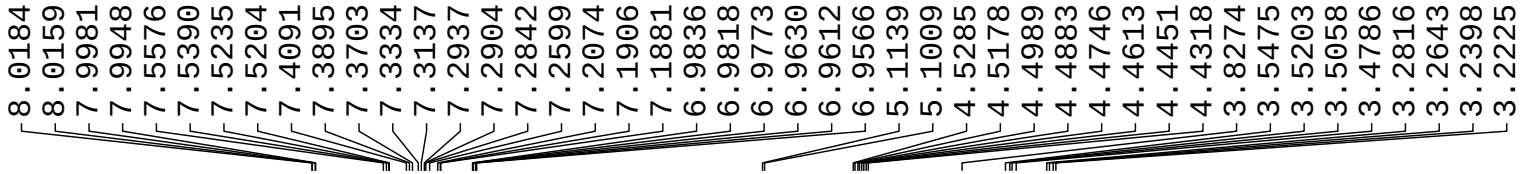
NAME	CWG160429-1-PURE-C13
EXPNO	1
PROCNO	1
Date_	20160430
Time	8.13
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	27
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	298.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228147 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

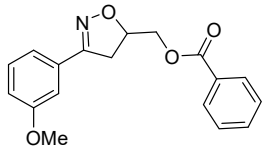


NAME	CWG160430
EXPNO	1
PROCNO	1
Date_	20160501
Time	13.44
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	301.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700031 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

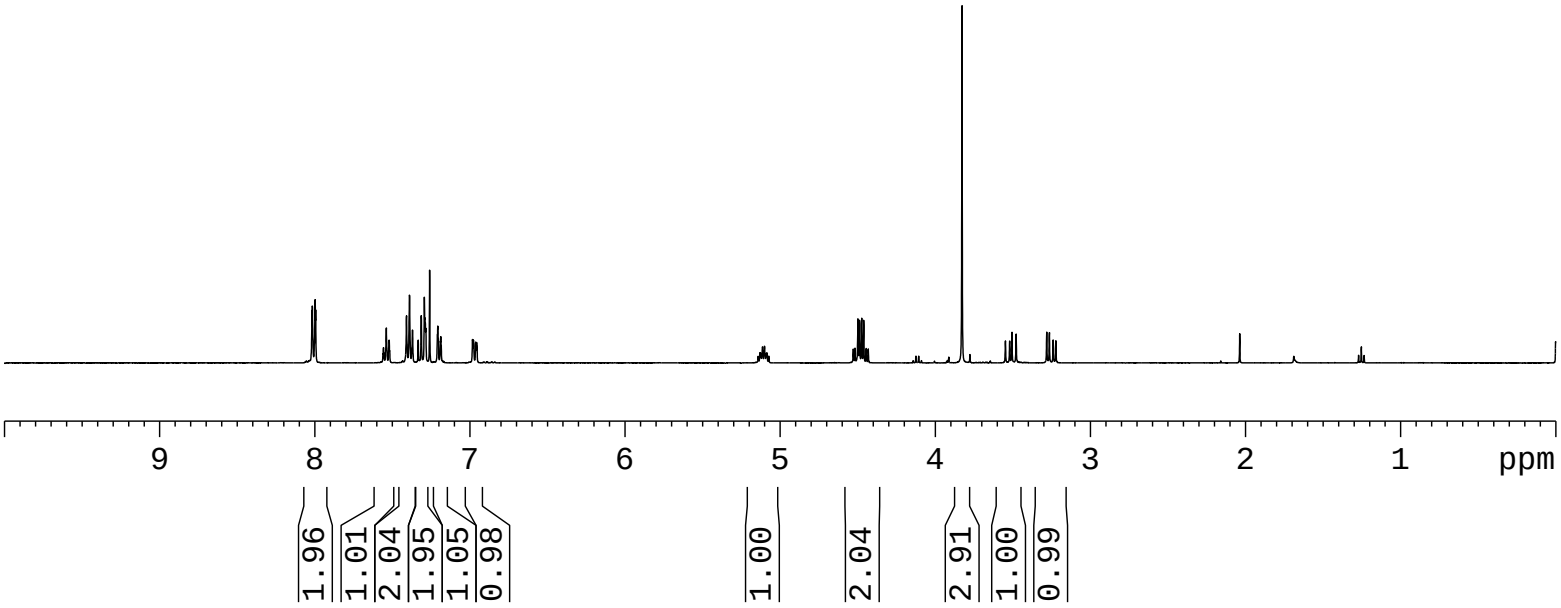



```
NAME          CWG160430-C13
EXPNO                     1
PROCNO                    1
Date_              20160501
Time                 13.49
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     211
DS                       4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                     203
DW                20.800 usec
DE                 6.50 usec
TE                 301.8 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228106 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

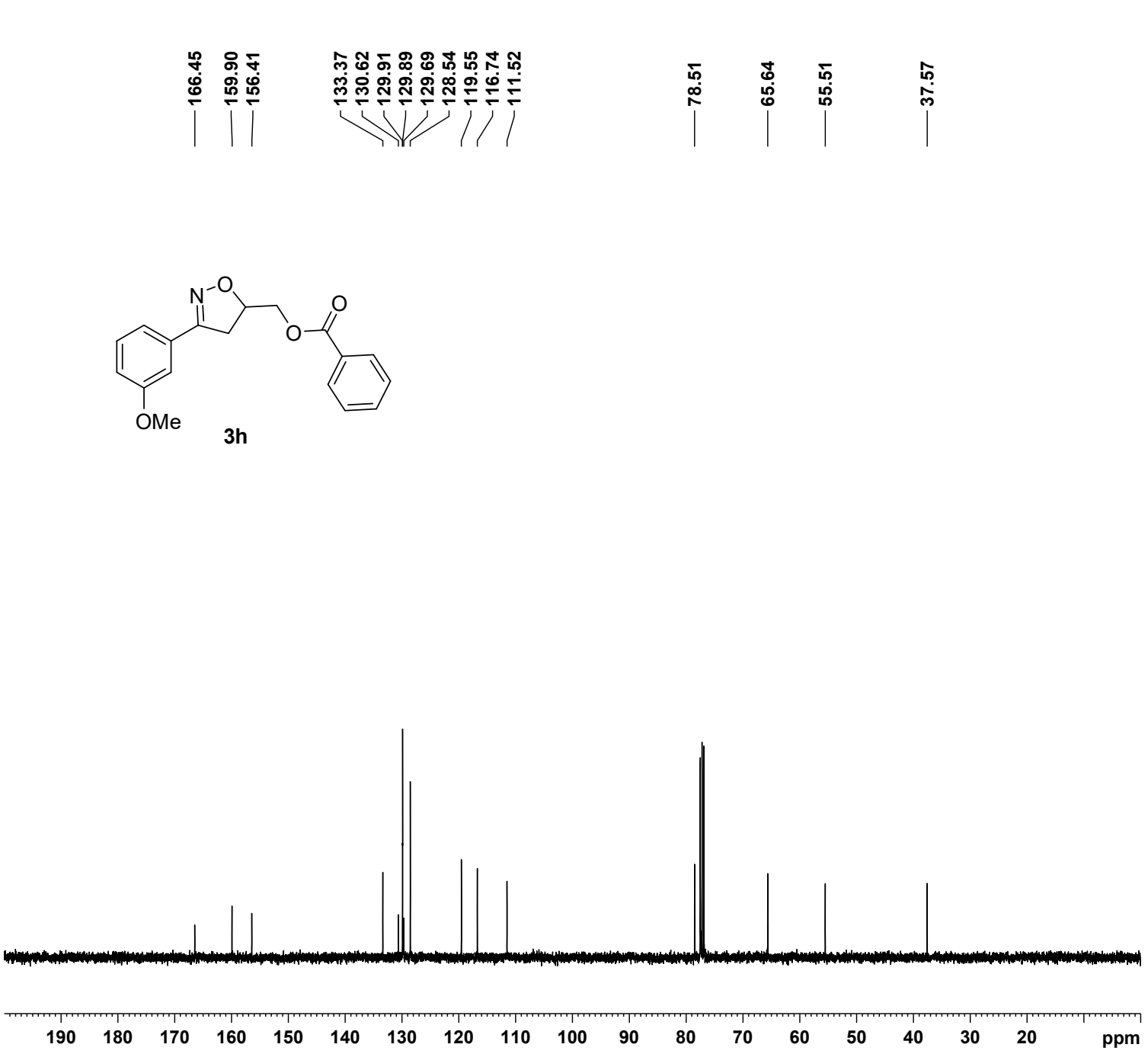




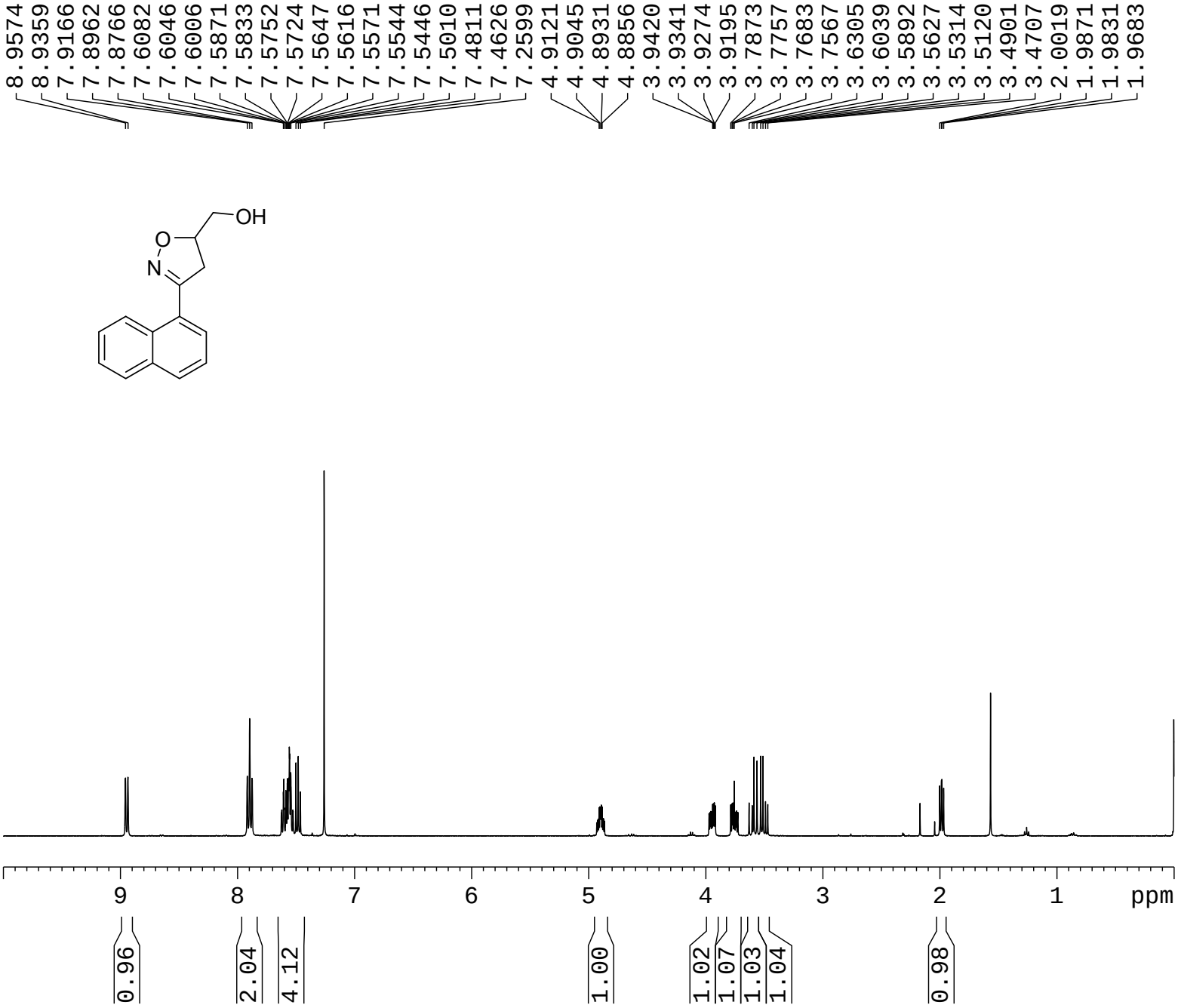
3h




```
NAME      CWG1600430-1-pure
EXPNO                    1
PROCNO                   1
Date_             20160502
Time                 10.51
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    144
DW                 60.800 usec
DE                  6.50 usec
TE                 299.3 K
D1              1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                   32768
SF            400.1700032 MHz
WDW                     EM
SSB                      0
LB                  0.30 Hz
GB                       0
PC                    1.00
```



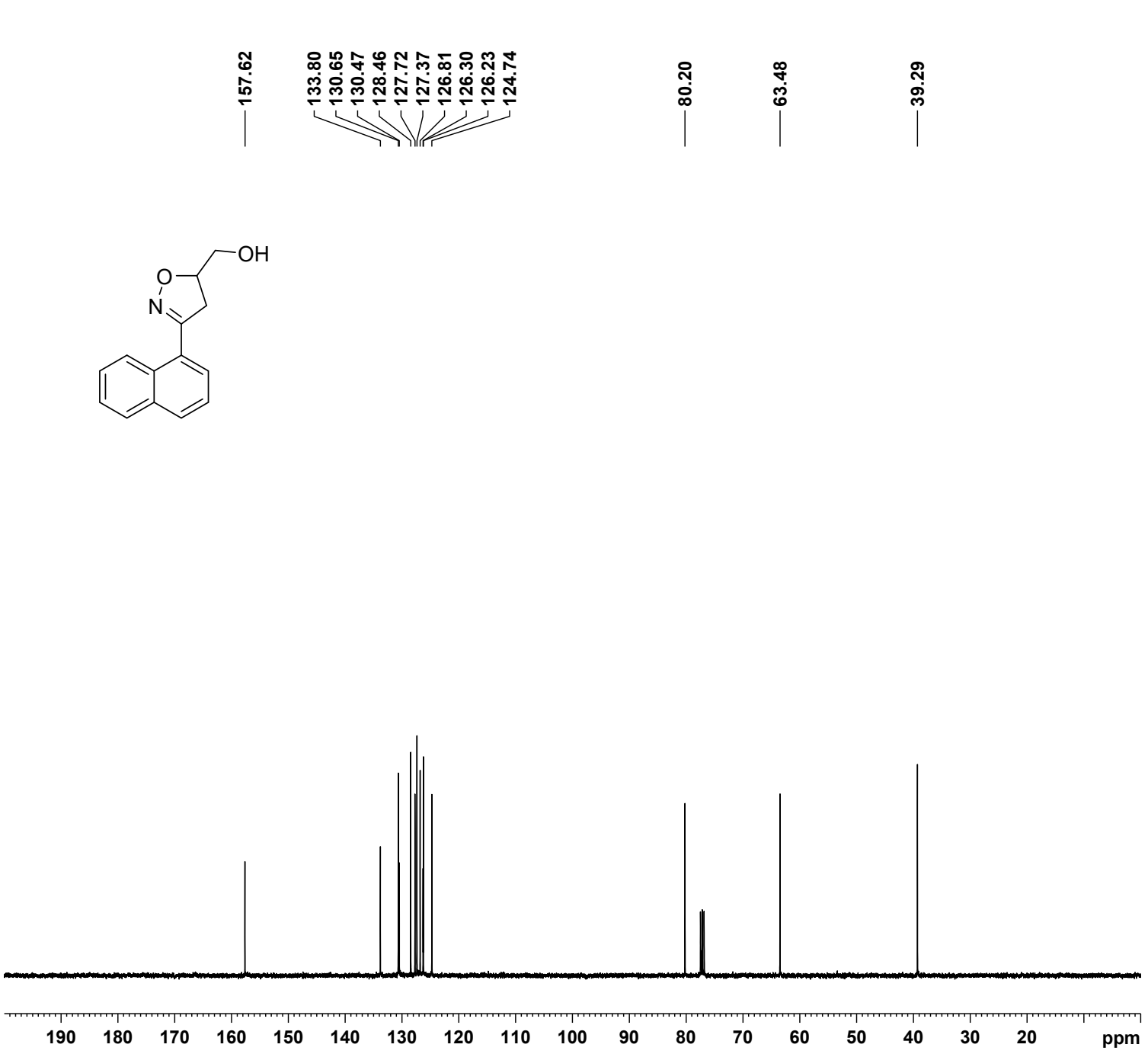

```
NAME      CWG16000430-1-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160502
Time                       10.55
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                            34
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        299.5 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                         32768
SF                  100.6228121 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```



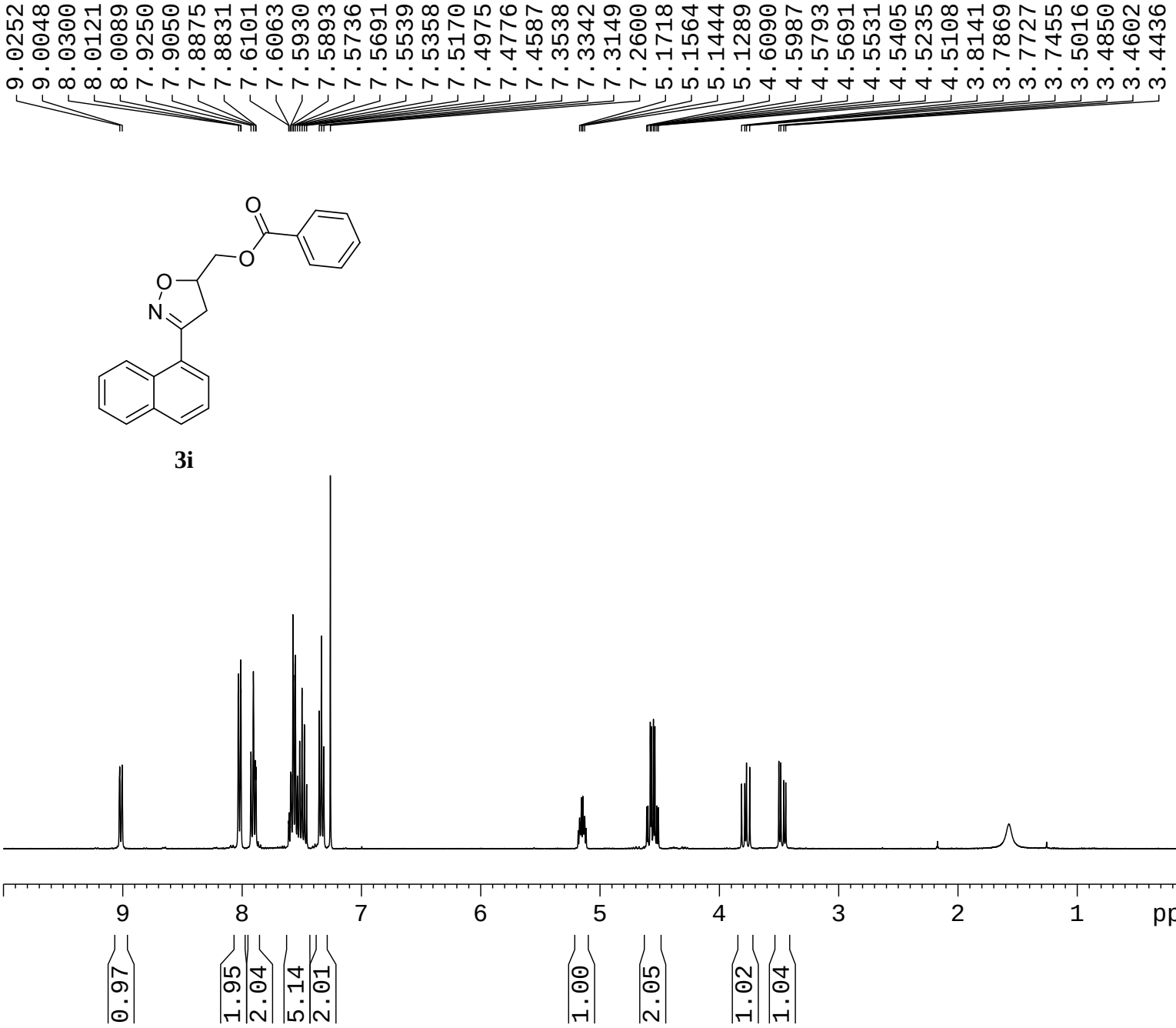
NAME	CWG150914-1
EXPNO	1
PROCNO	1
Date_	20150915
Time	11.20
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	298.5 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



NAME	CWG150914-1-C13
EXPNO	1
PROCNO	1
Date_	20150915
Time	12.30
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	39
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	298.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228392 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

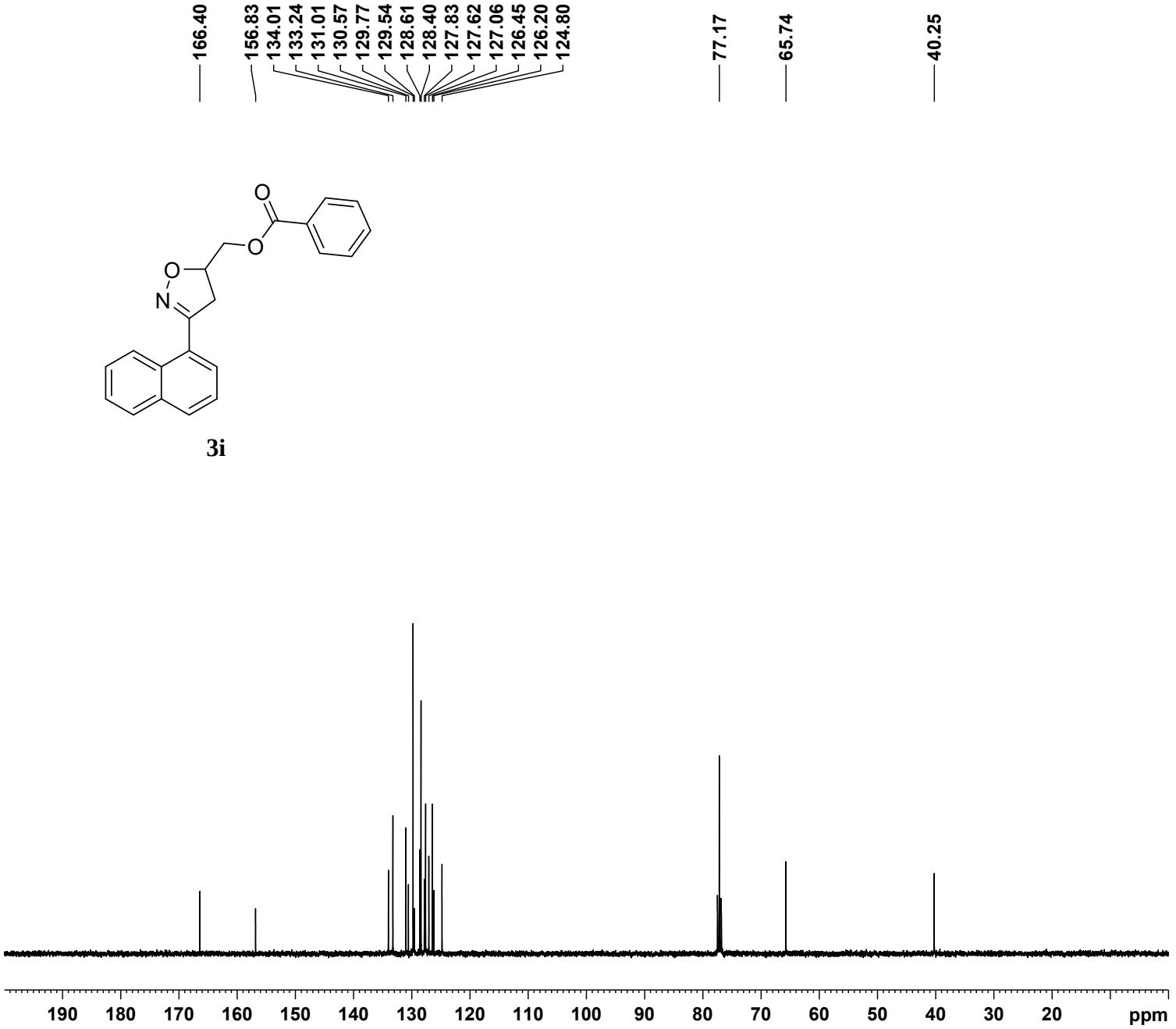


BRUKER

NAME	CWG150915-1
EXPNO	1
PROCNO	1
Date_	20150915
Time	19.17
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.9 K
D1	1.00000000 sec
TD0	1

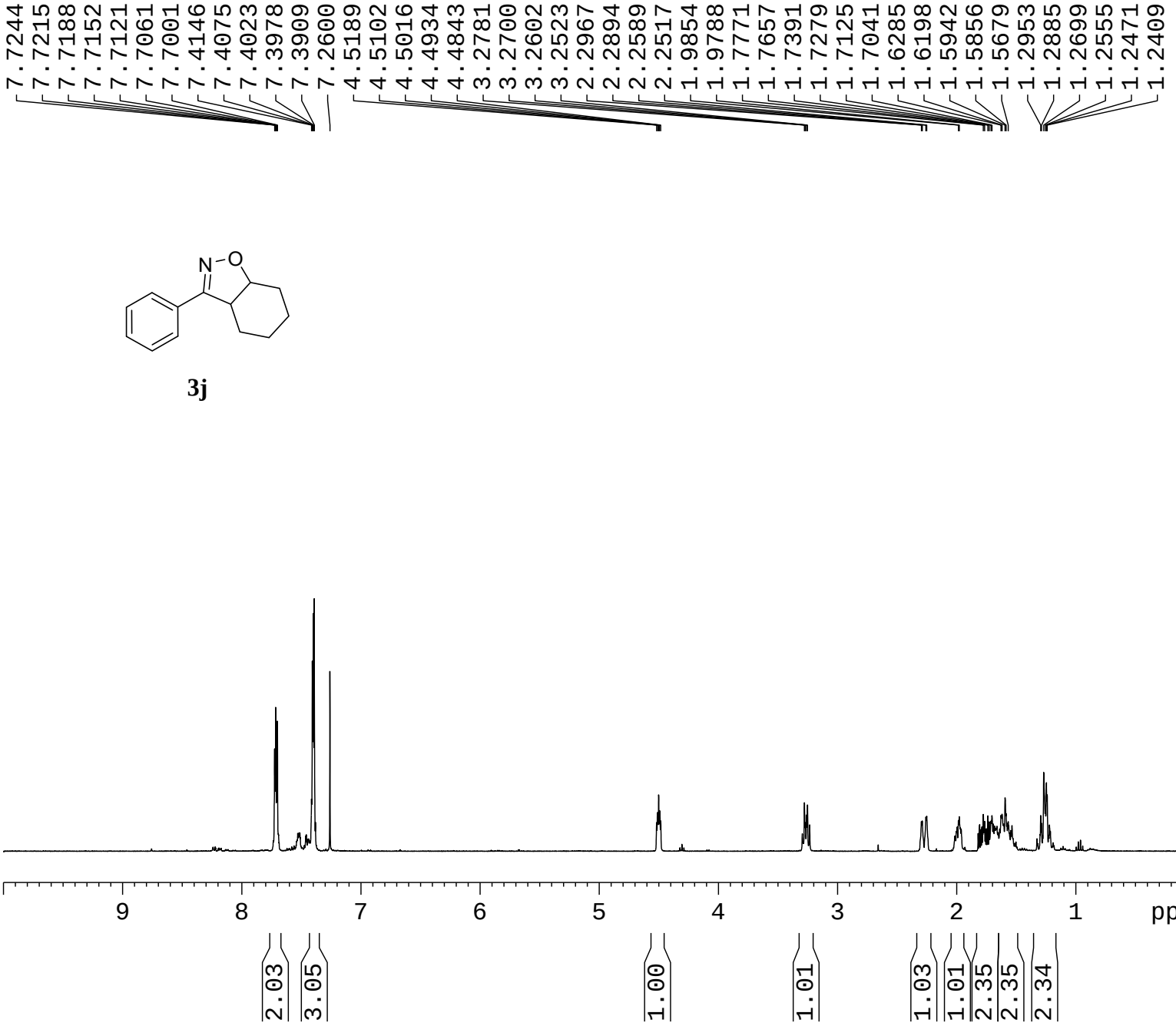
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

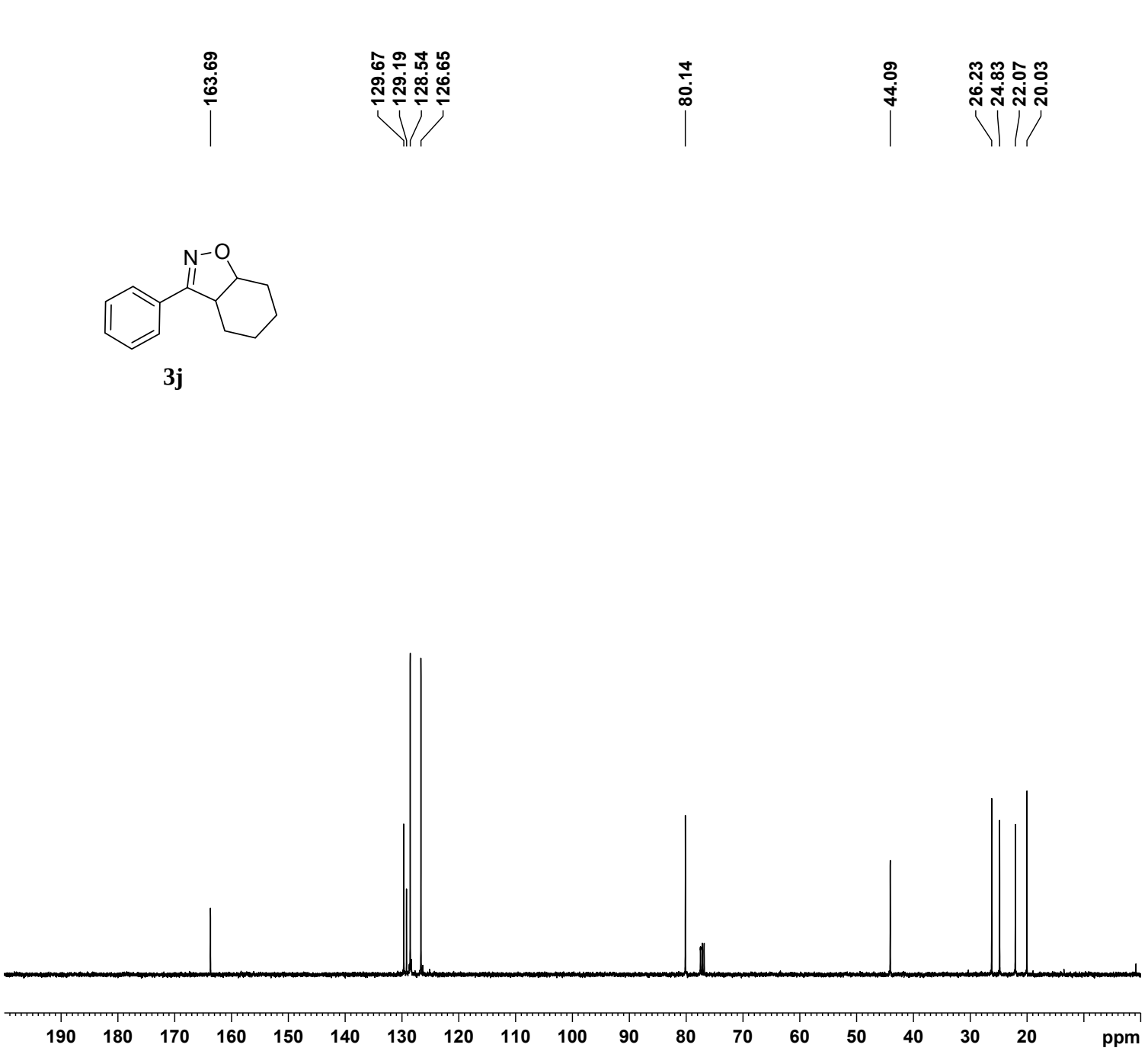


3i

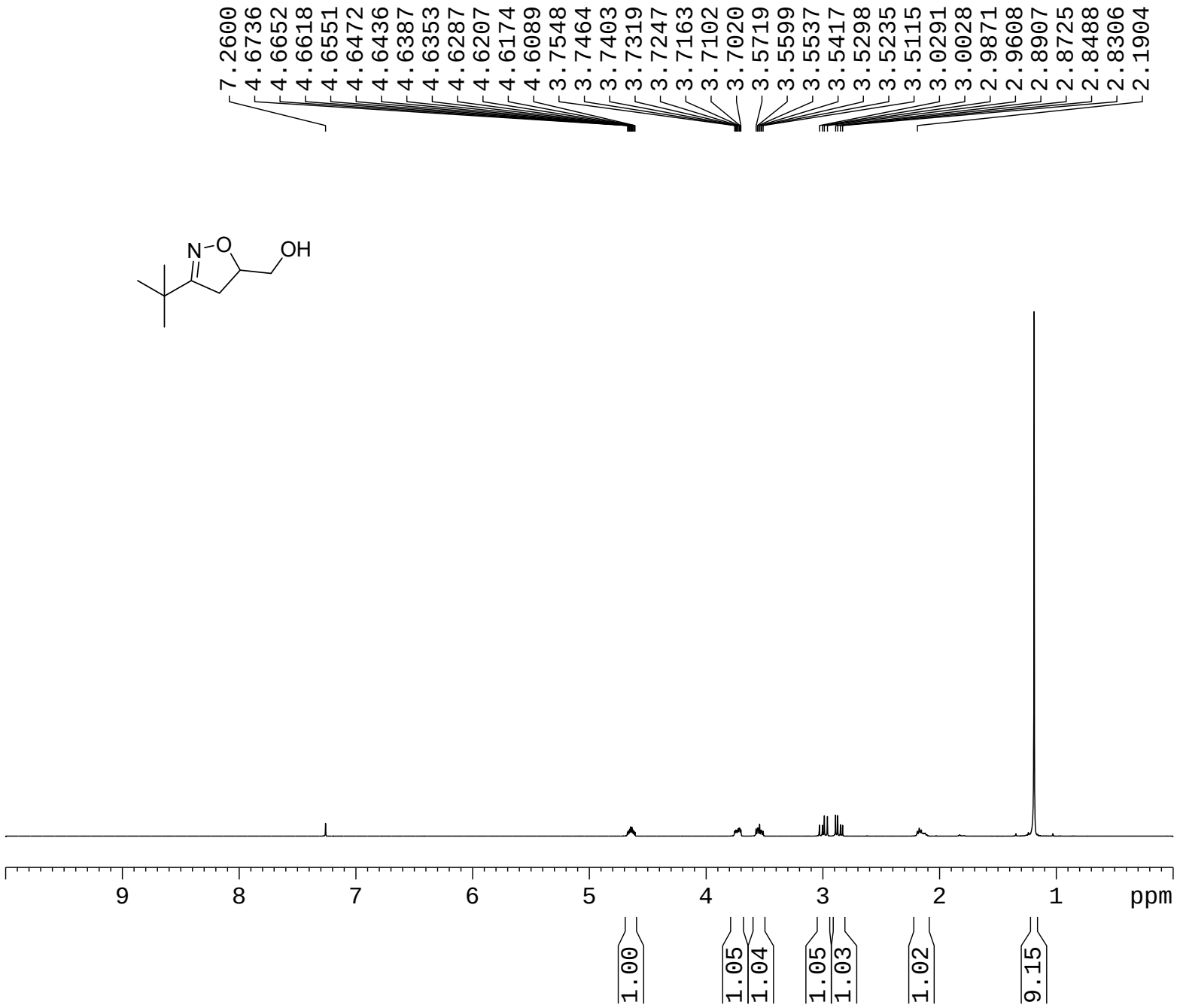
```
NAME        CWG150915-1-C13
EXPNO                    1
PROCNO                   1
Date_             20150915
Time                 19.26
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     71
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                 20.800 usec
DE                  6.50 usec
TE                 297.3 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228270 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```




```
NAME          CWG150425-4
EXPNO                   1
PROCNO                  1
Date_            20150427
Time                13.45
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    181
DW                 60.800 usec
DE                  6.50 usec
TE                 296.7 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700033 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```




```
NAME      CWG150420-2-C13
EXPNO                  1
PROCNO                 1
Date_           20160223
Time               14.59
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   19
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  203
DW                20.800 usec
DE                 6.50 usec
TE                297.7 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228485 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

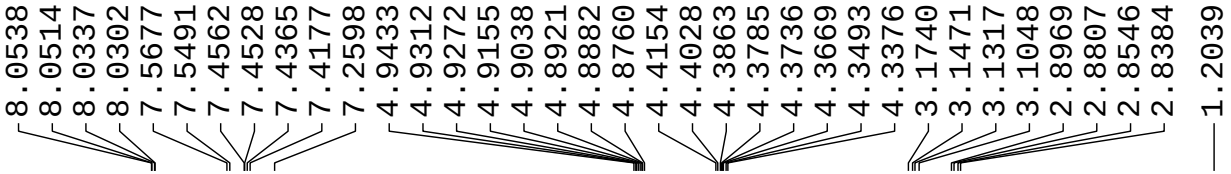


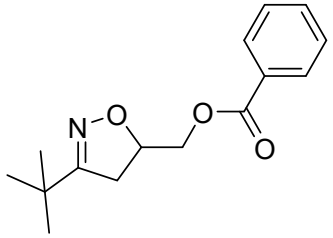
BRUKER

NAME	CWG150813-1
EXPNO	1
PROCNO	1
Date_	20150814
Time	10.54
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	90.5
DW	60.800 usec
DE	6.50 usec
TE	298.2 K
D1	1.00000000 sec
TD0	1

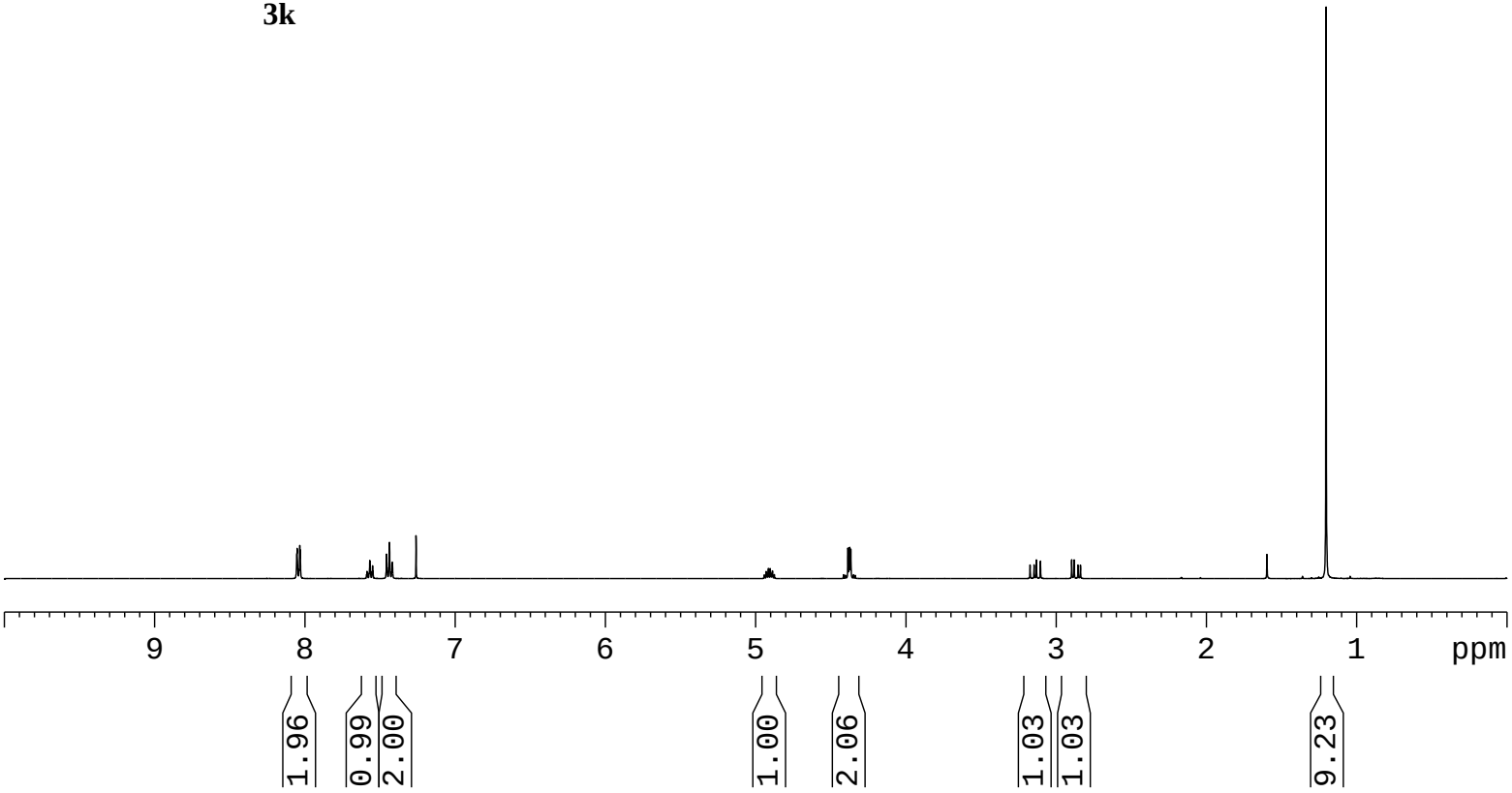
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

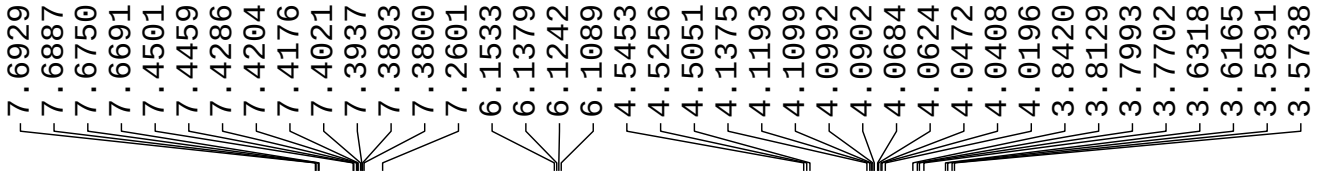


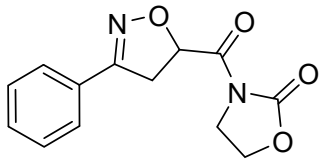


3k

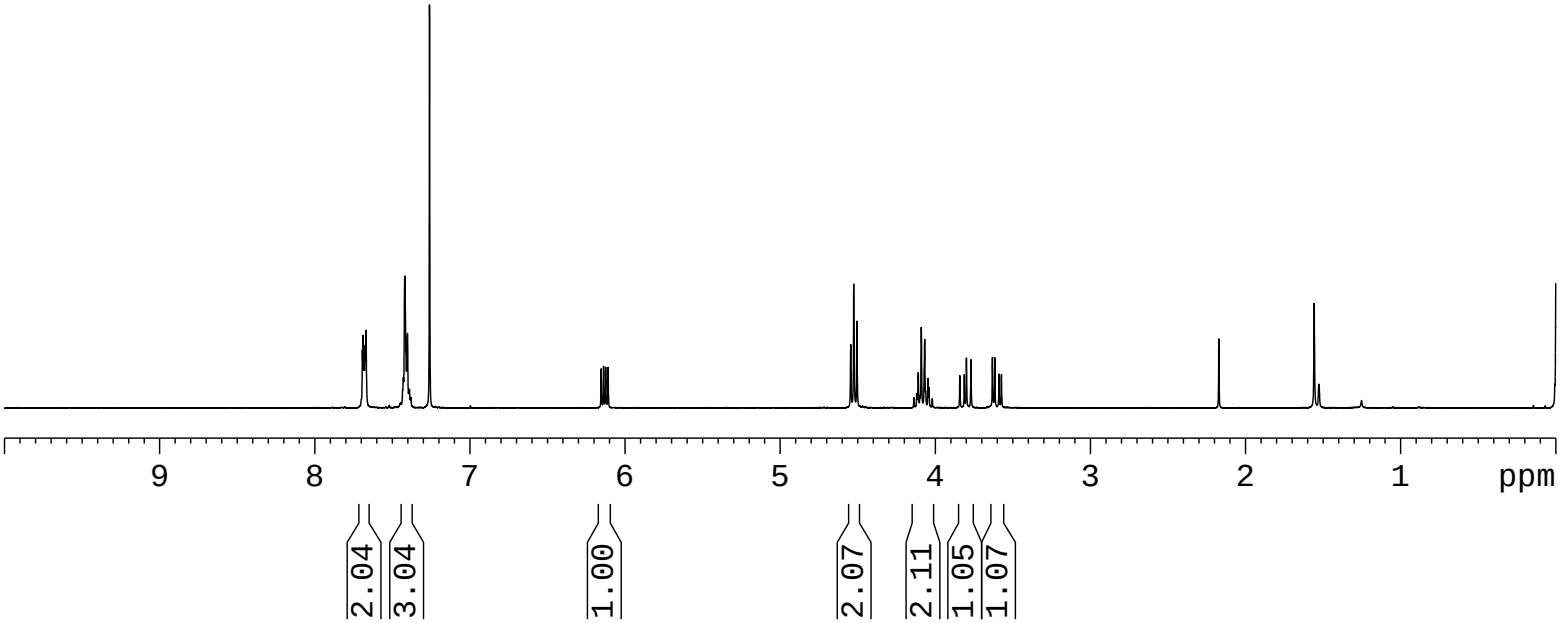



```
NAME            CWG150814
EXPNO                   1
PROCNO                  1
Date_            20150814
Time                15.59
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 298.3 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

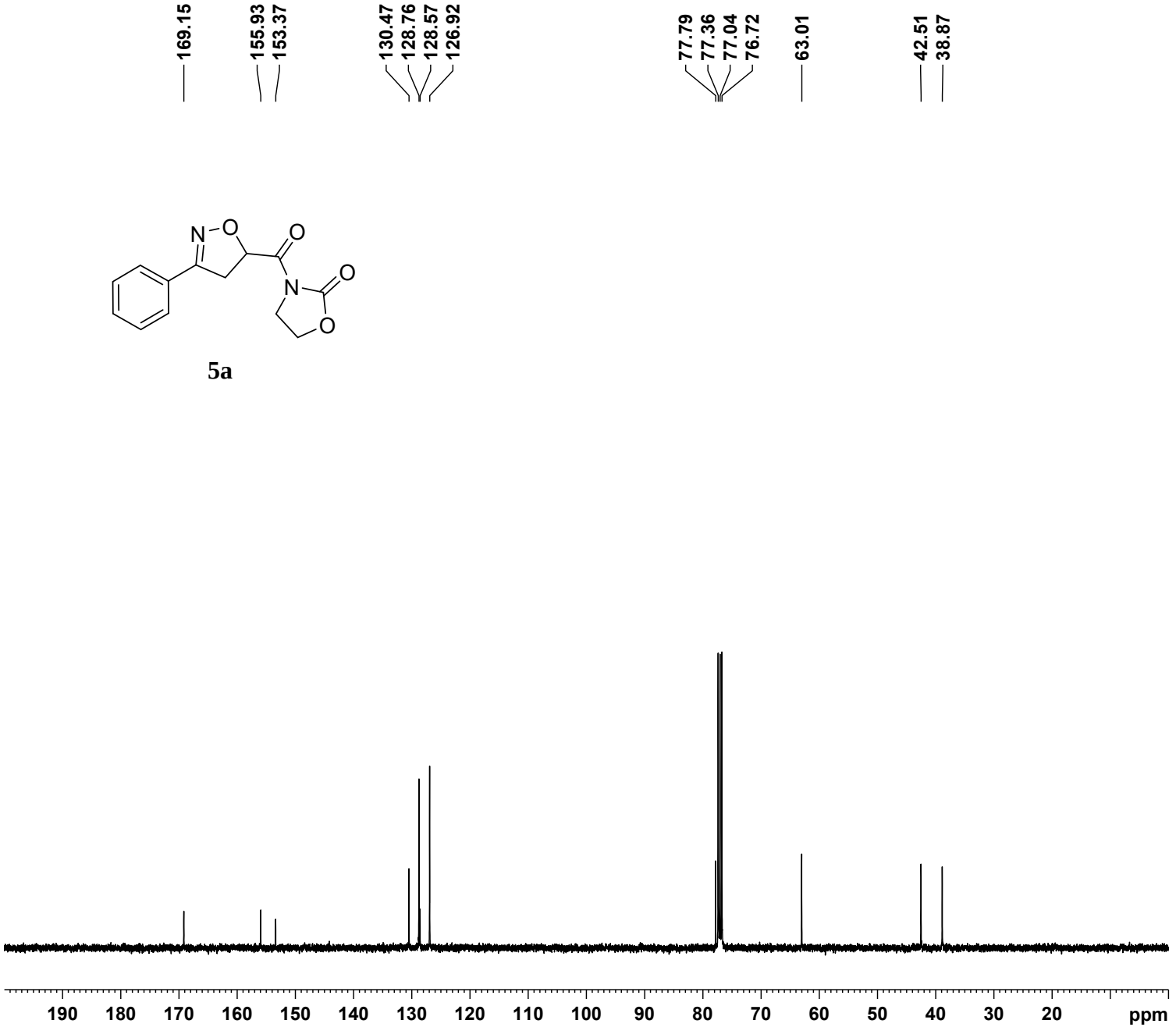




5a

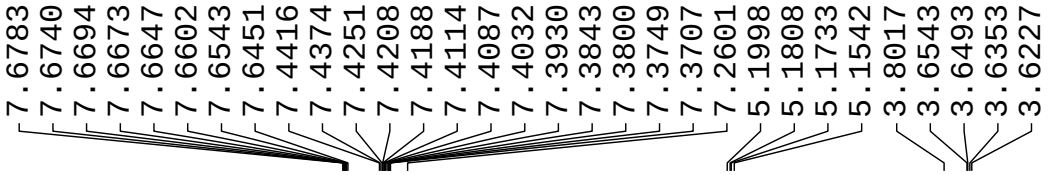


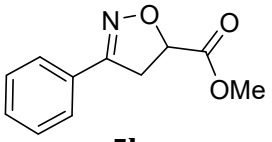

```
NAME          CWG150311-1
EXPNO                   1
PROCNO                  1
Date_            20150312
Time                11.59
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 294.5 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700039 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



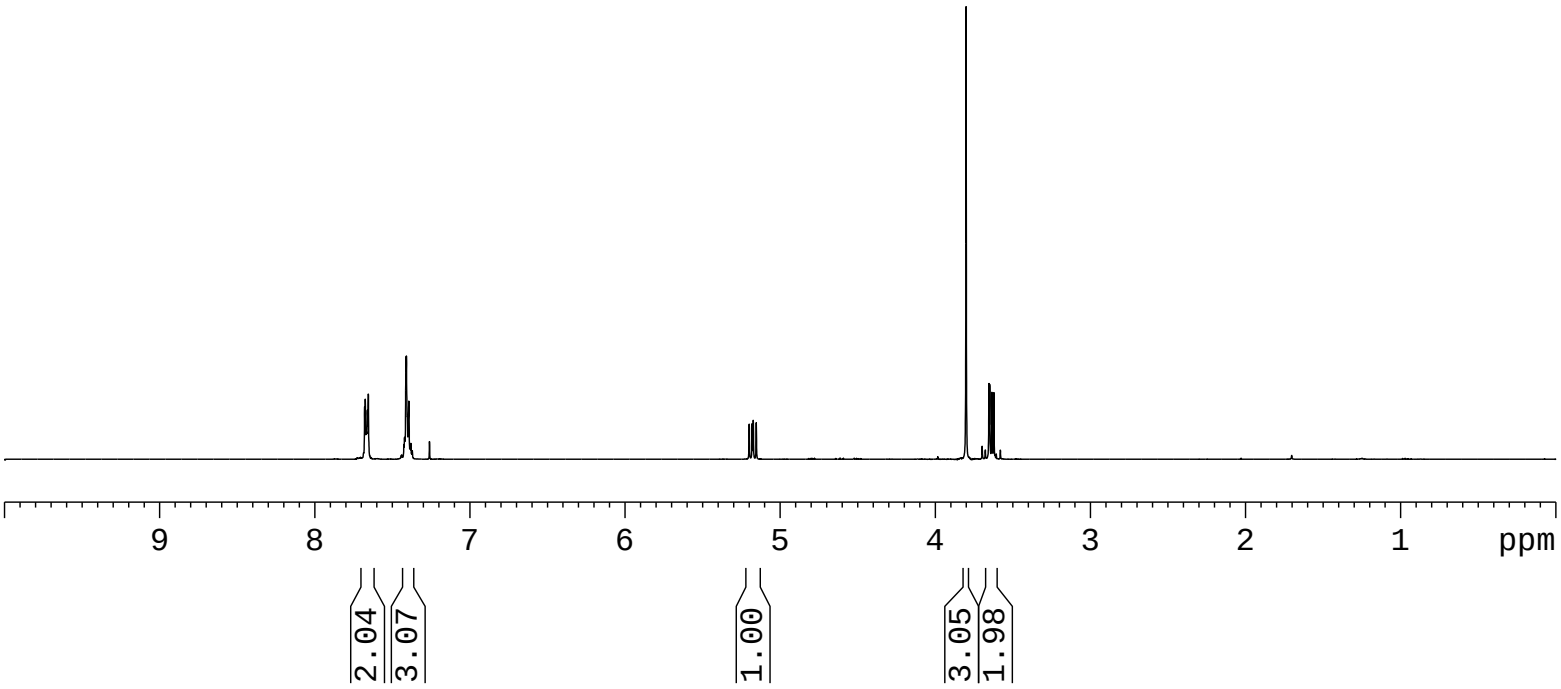
5a

```
NAME          CWG150311-1-C13
EXPNO                      1
PROCNO                     1
Date_               20150313
Time                   19.05
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                       460
DS                         4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                 1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    296.7 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228270 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

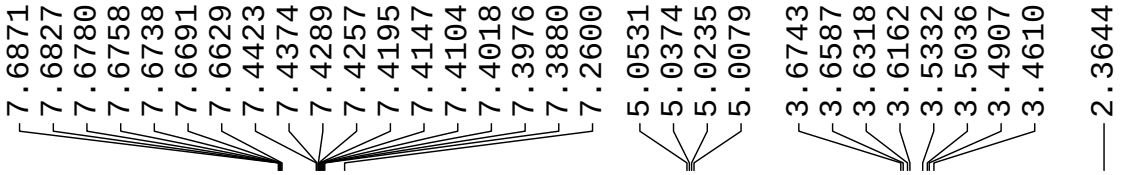


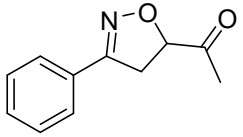


5b

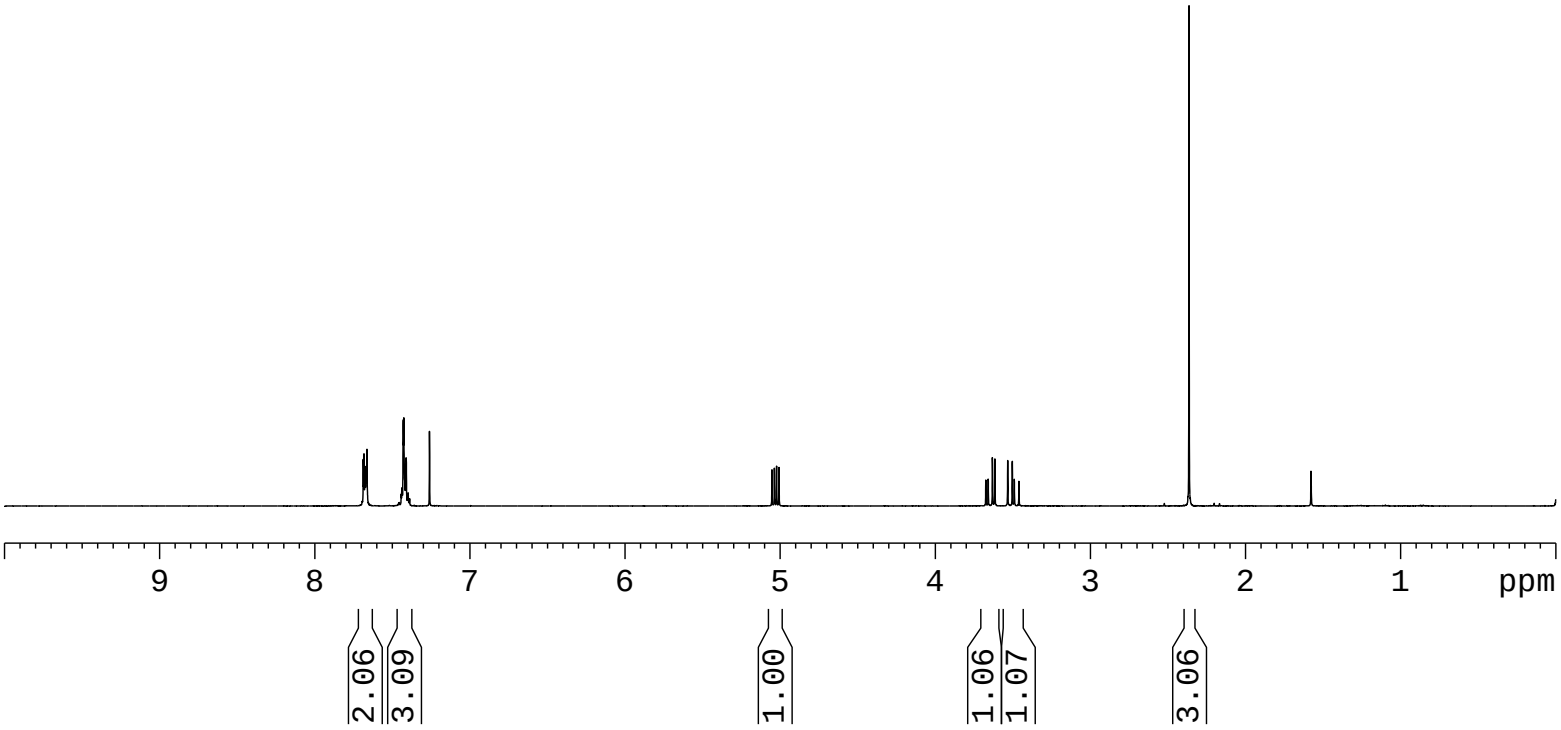



```
NAME          CWG150421-1
EXPNO                   1
PROCNO                  1
Date_            20150422
Time                12.01
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               8223.685 Hz
FIDRES            0.125483 Hz
AQ                3.9846387 sec
RG                     114
DW                  60.800 usec
DE                   6.50 usec
TE                  298.2 K
D1             1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                   32768
SF            400.1700038 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

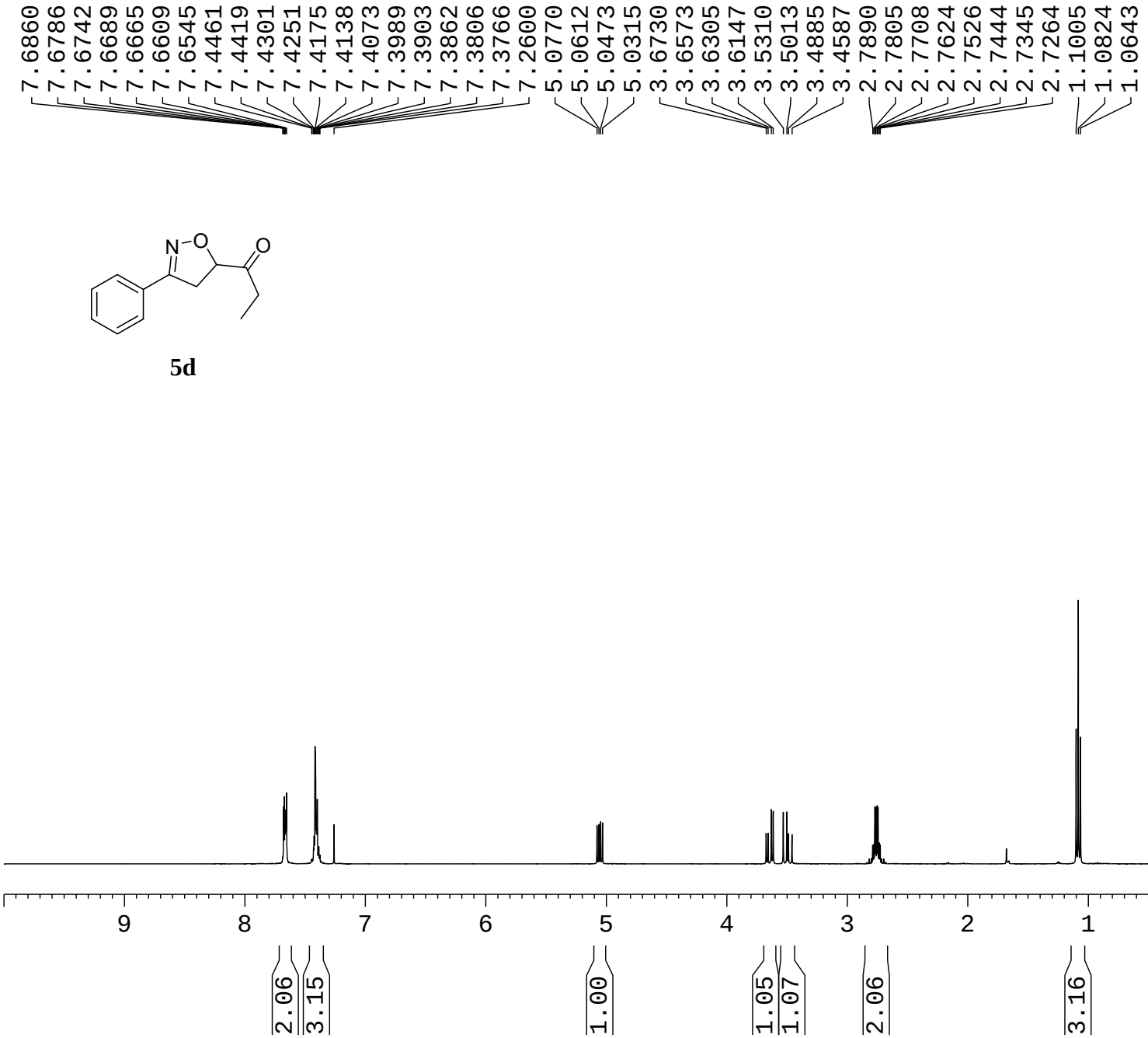




5c

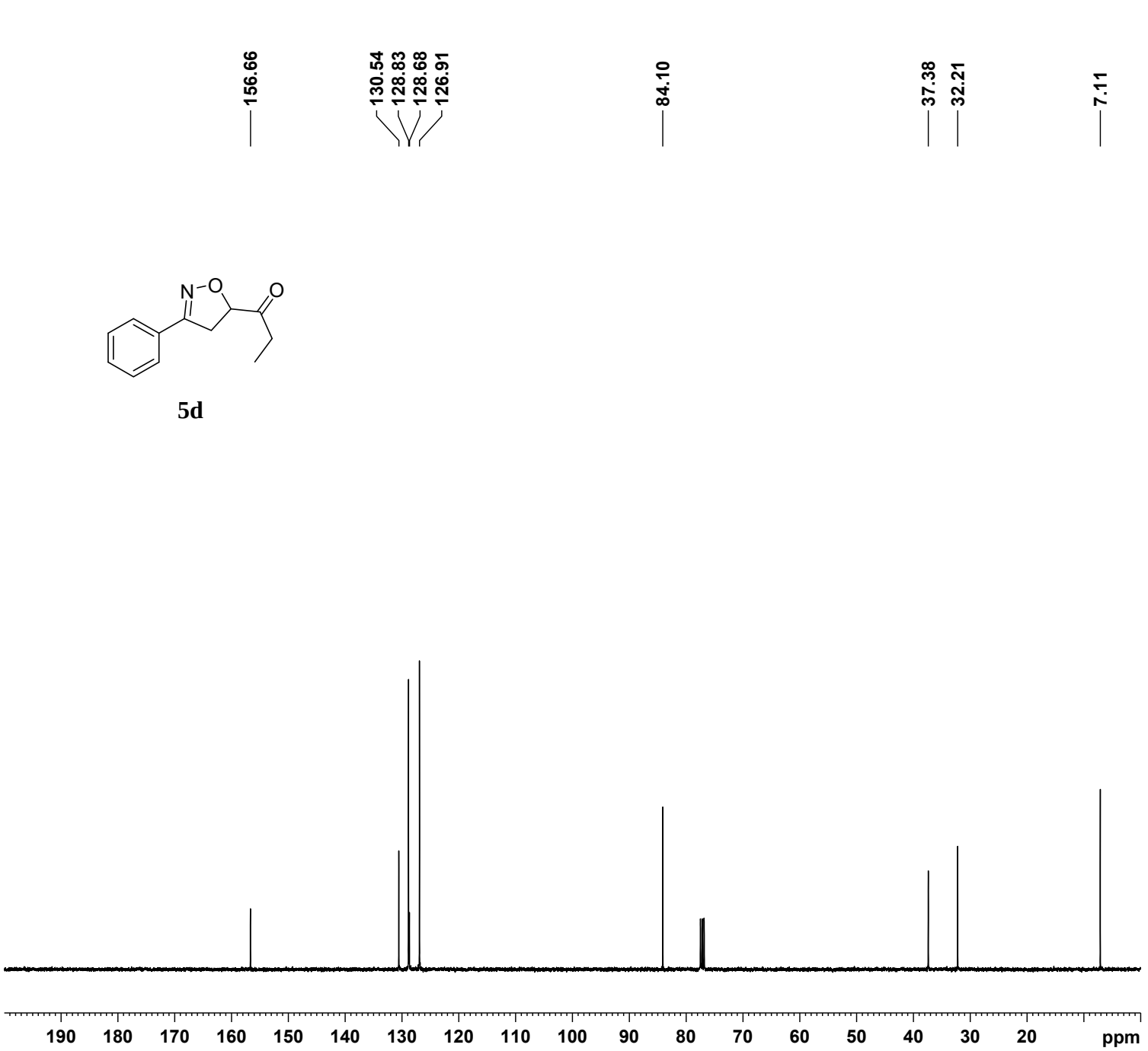



```
NAME          CWG150707-1-1
EXPNO                     1
PROCNO                    1
Date_              20150707
Time                  17.31
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                    60.800 usec
DE                     6.50 usec
TE                    297.6 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700033 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



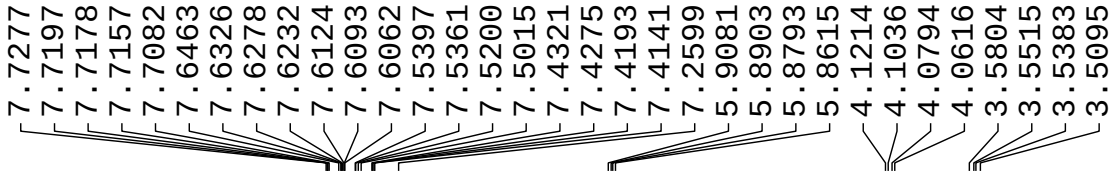
5d

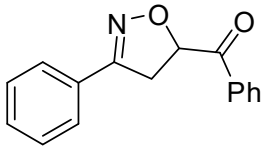
NAME	CWG150709-1
EXPNO	1
PROCNO	1
Date_	20150710
Time	10.15
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	90.5
DW	60.800 usec
DE	6.50 usec
TE	296.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



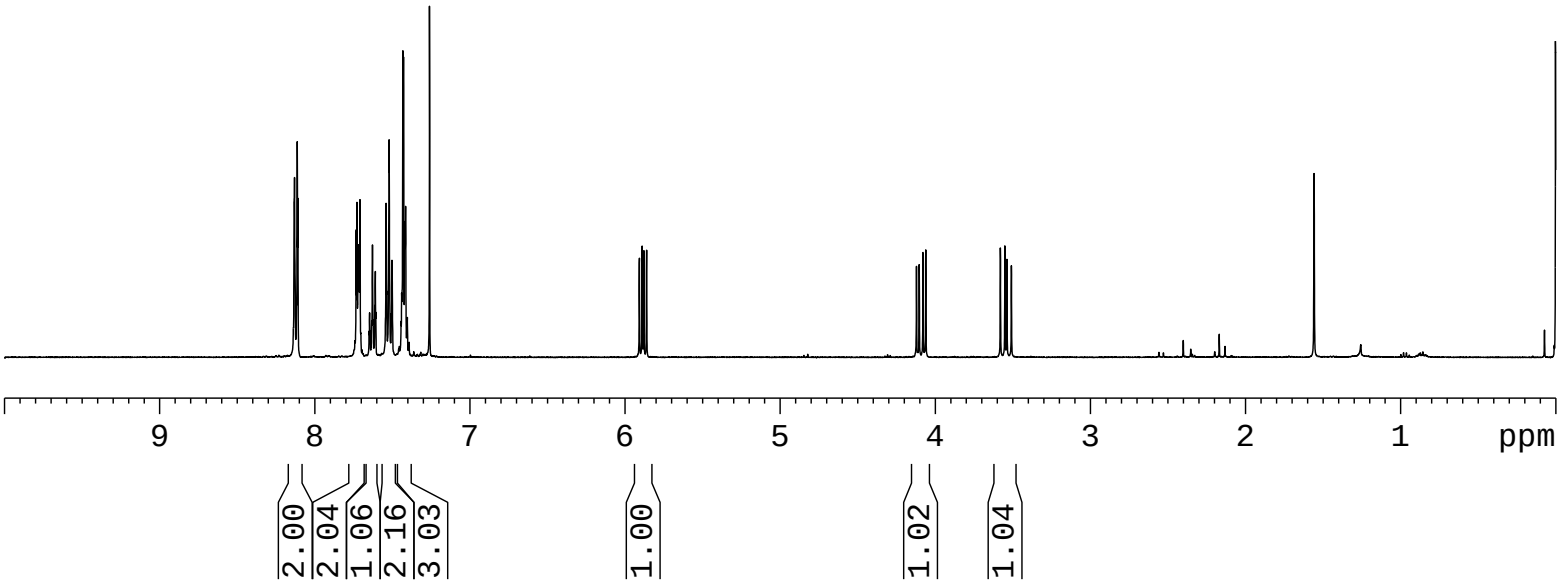
5d

```
NAME          CWG150709-1-C13
EXPNO                      1
PROCNO                     1
Date_               20150928
Time                   17.49
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       101
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    296.6 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228229 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

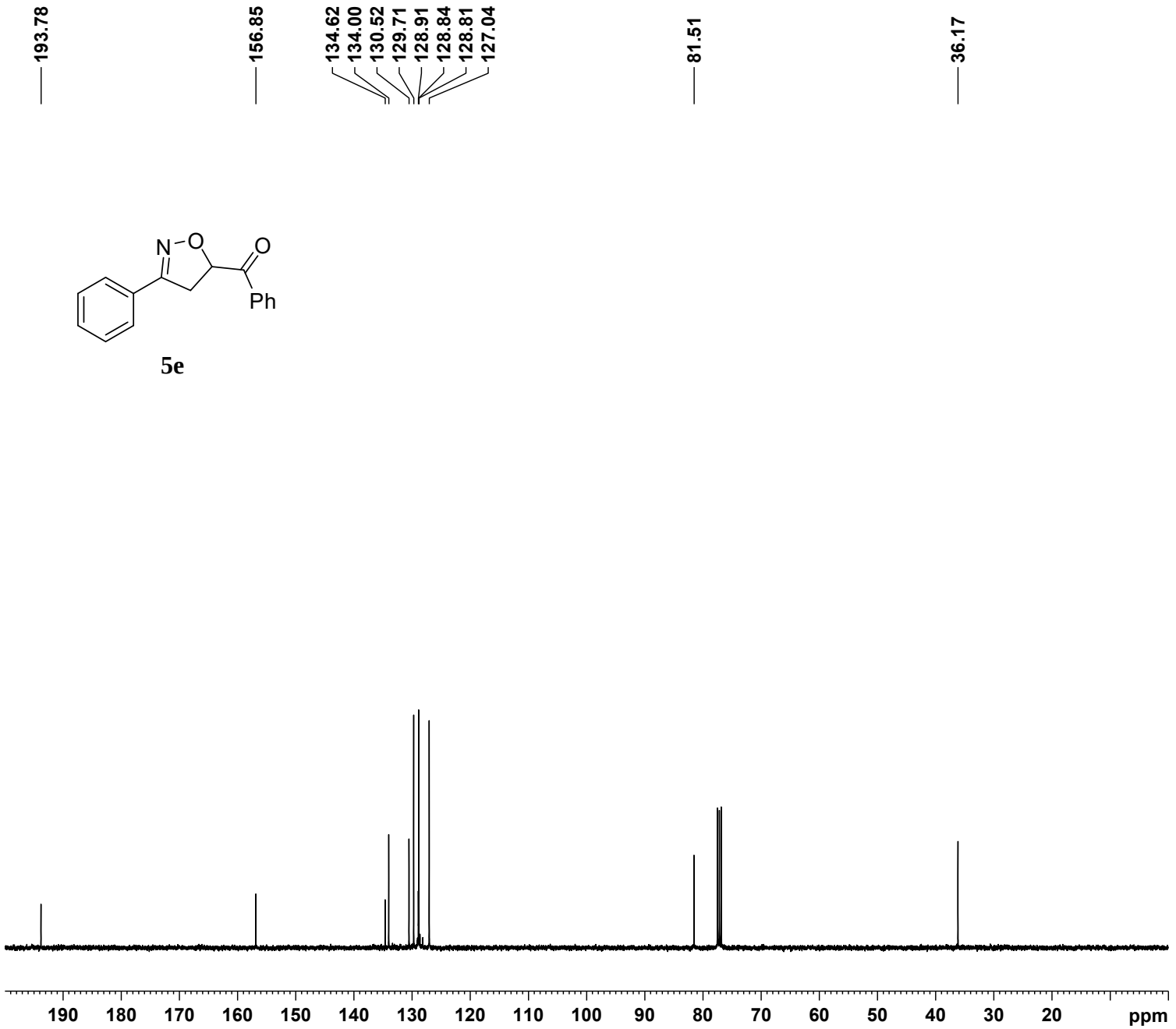




5e

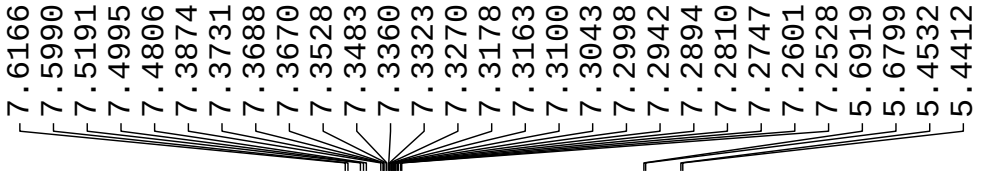


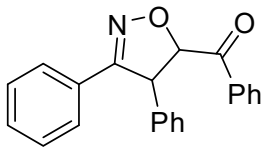

```
NAME          CWG150713-1-1
EXPNO                     1
PROCNO                    1
Date_              20150714
Time                  12.13
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                    60.800 usec
DE                     6.50 usec
TE                    298.7 K
D1                 1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700033 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



5e

```
NAME          CWG150709-4-C13
EXPNO                      1
PROCNO                     1
Date_               20150916
Time                   13.09
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       127
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    298.1 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228190 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

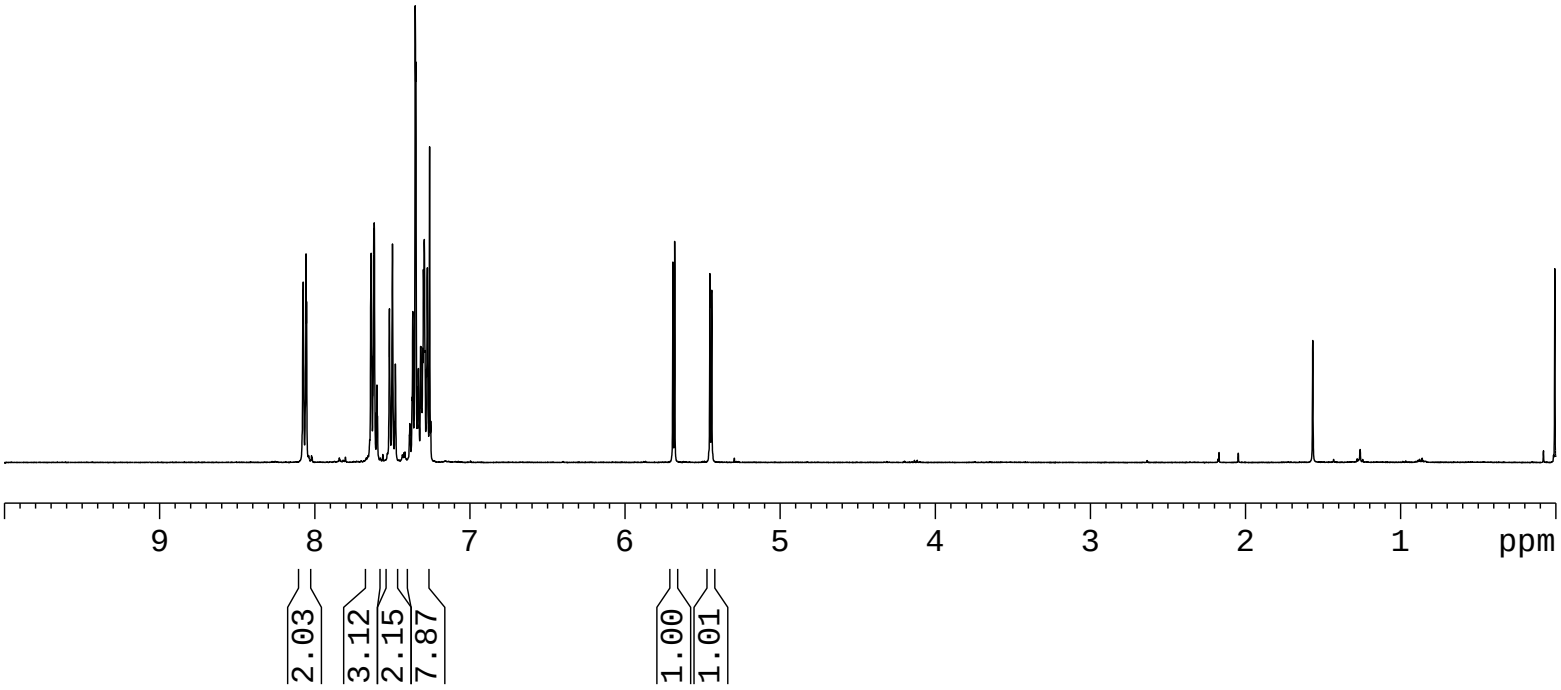


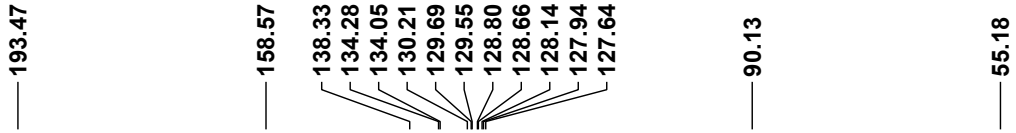


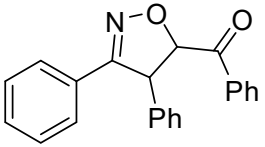
5f

NAME CWG150709-2-1
EXPNO 1
PROCNO 1
Date_ 20150709
Time 17.36
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 298.6 K
D1 1.00000000 sec
TD0 1

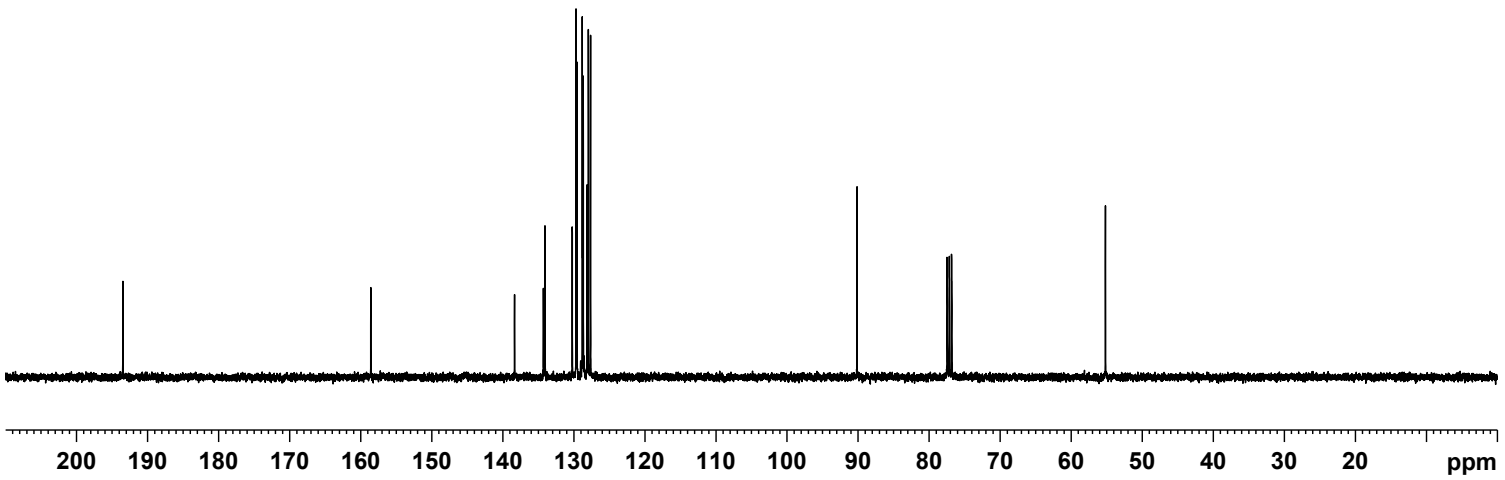
======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700032 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



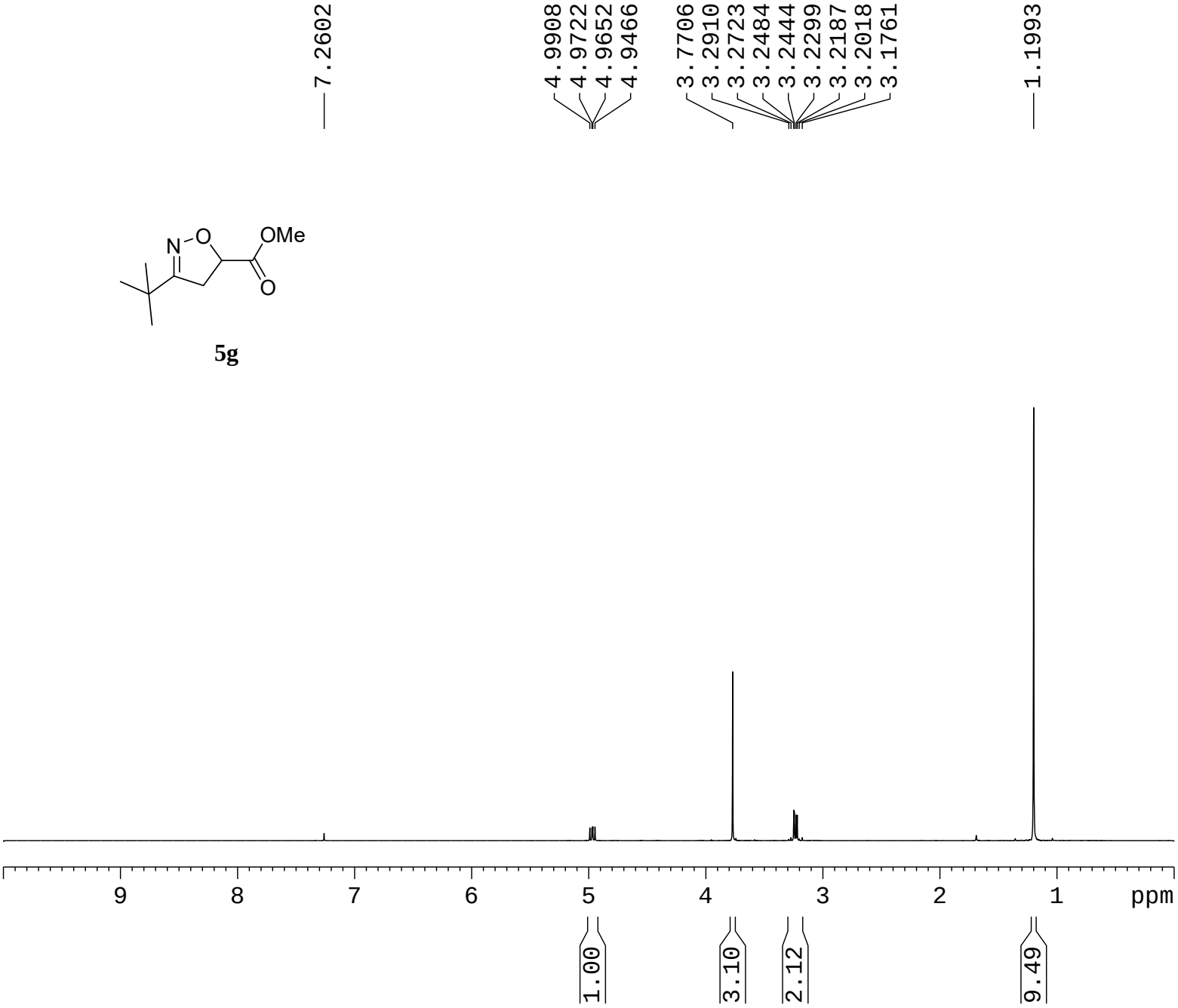




5f

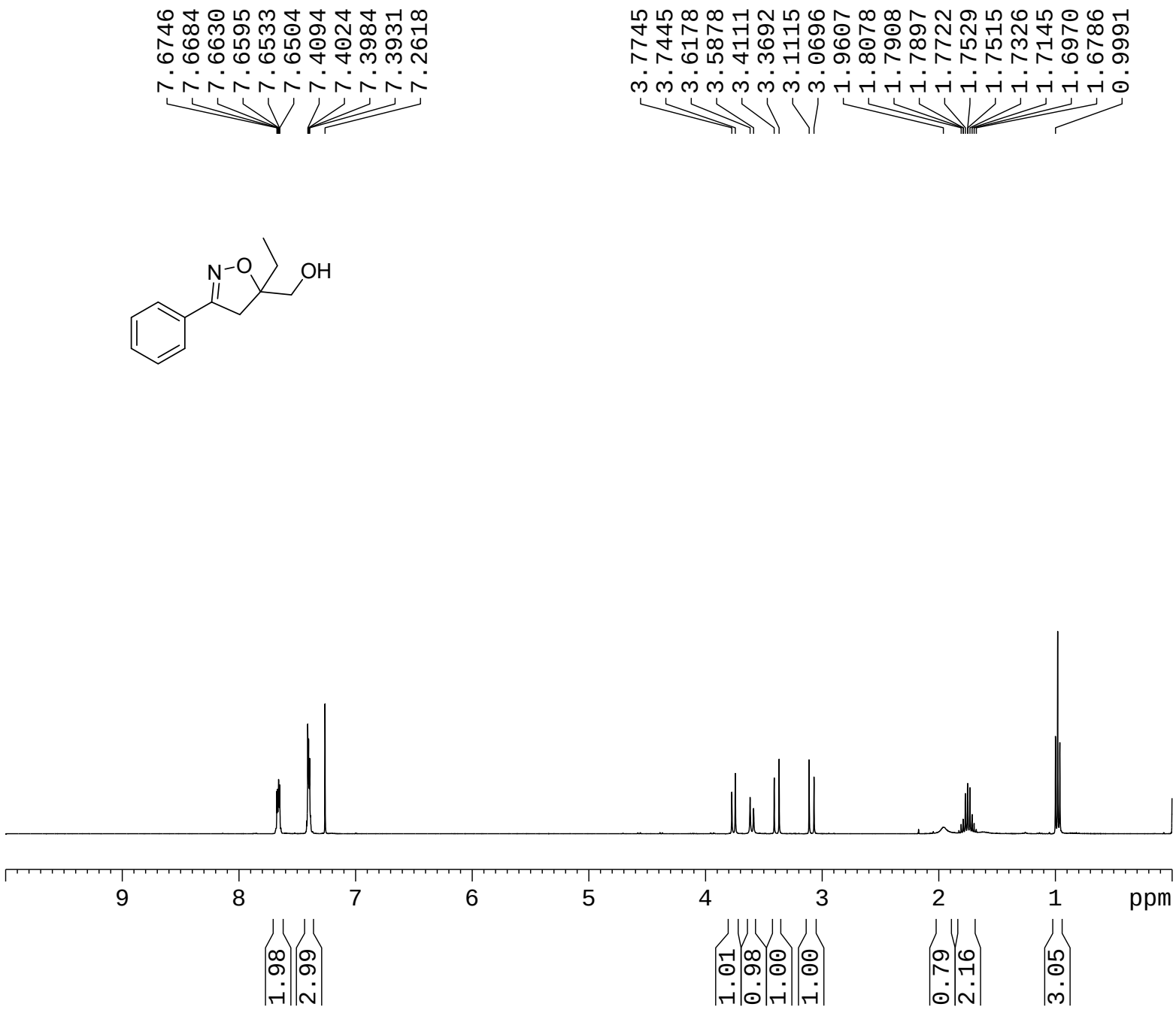



```
NAME      CWG150709-2--C13
EXPNO                   1
PROCNO                  1
Date_            20150916
Time                12.52
INSTRUM             spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    91
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                298.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228229 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

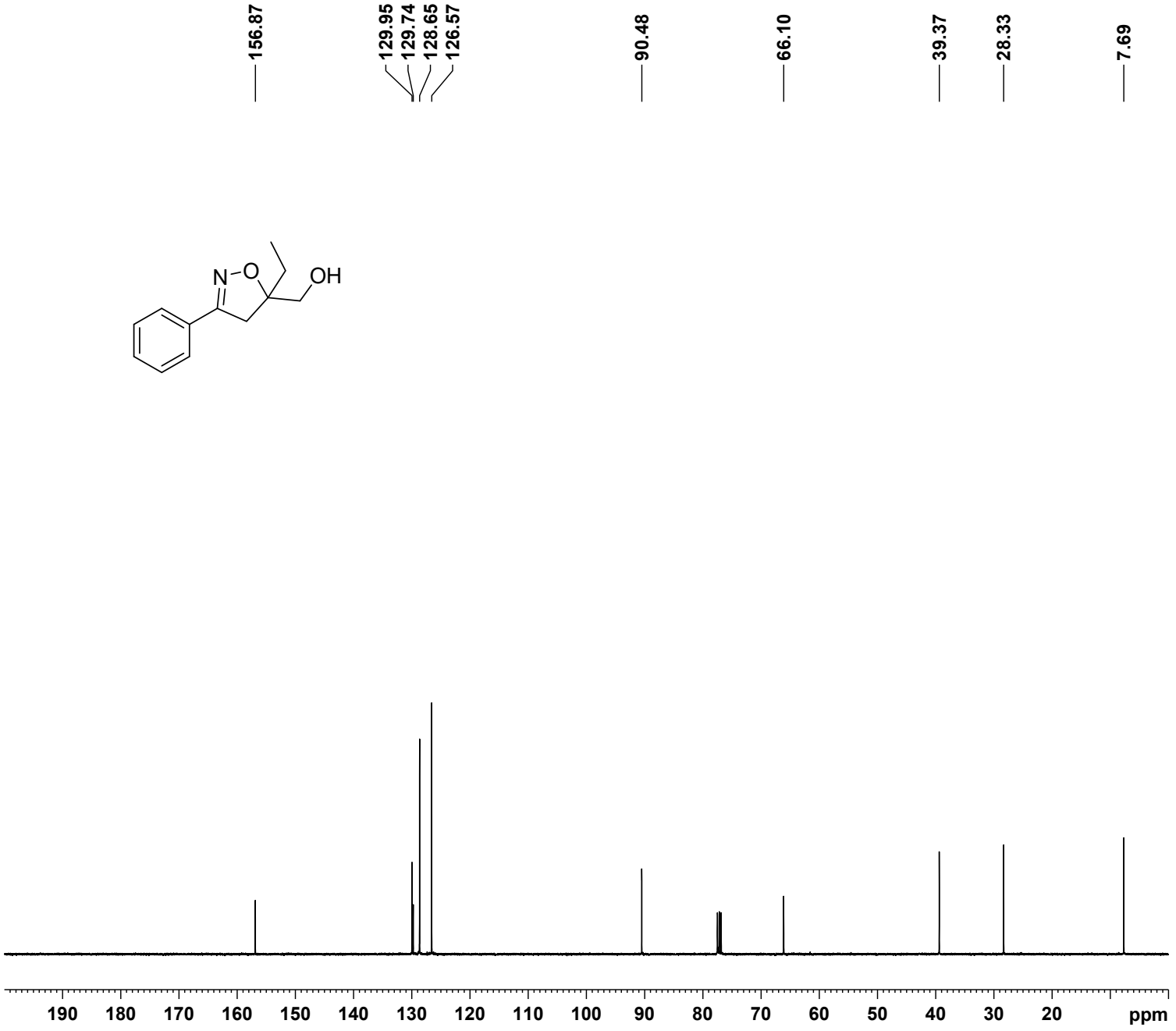


5g

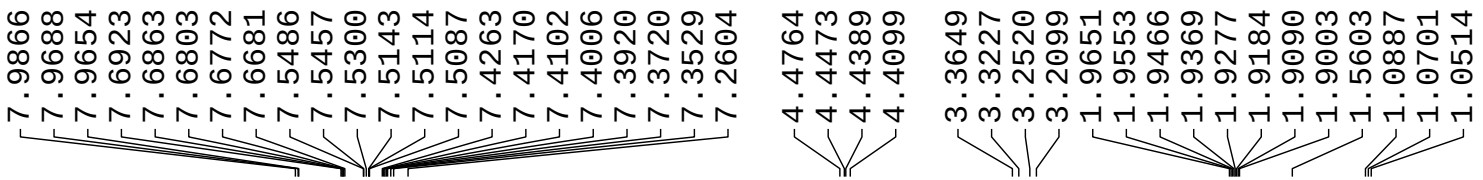
```
NAME            CWG150819-1
EXPNO                     1
PROCNO                    1
Date_              20150820
Time                  11.07
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      80.6
DW                    60.800 usec
DE                     6.50 usec
TE                    296.5 K
D1                 1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700030 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```

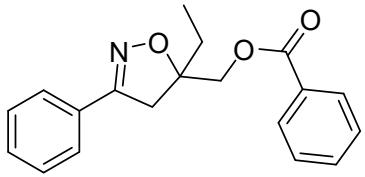


NAME	XYH150307-1
EXPNO	1
PROCNO	1
Date_	20150307
Time	10.07
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	294.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



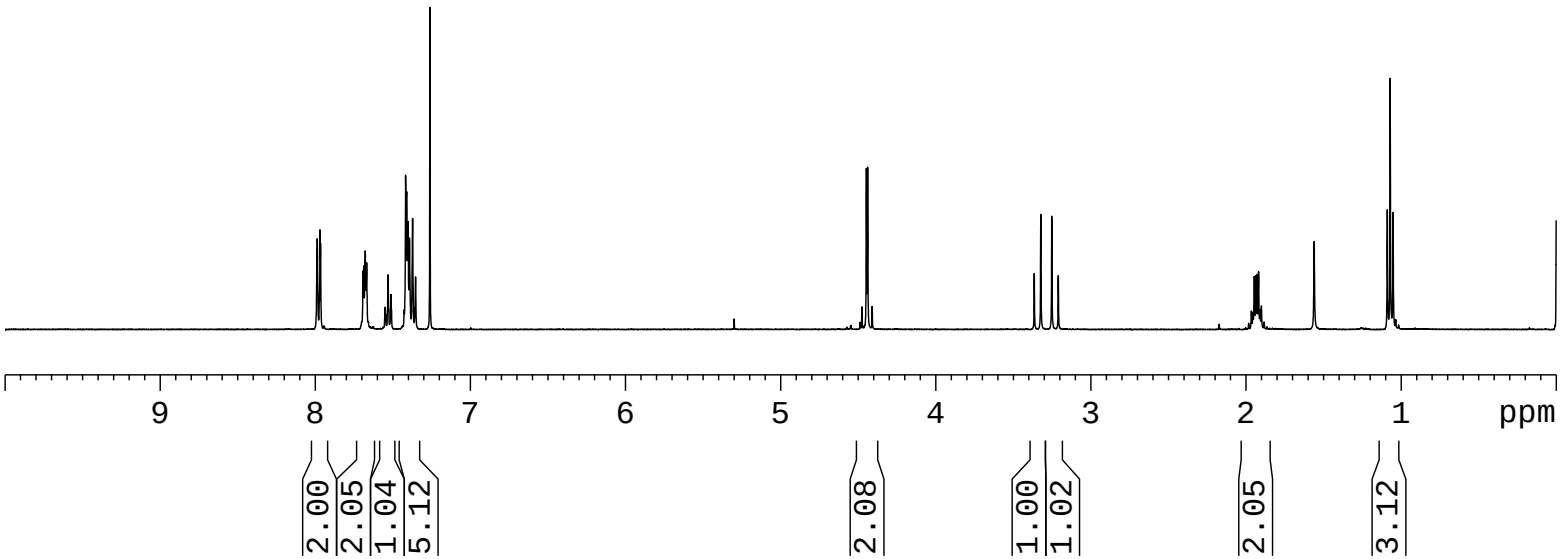

```
NAME          XYH150307-1-C13
EXPNO                       1
PROCNO                      1
Date_                20150307
Time                    10.28
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         85
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     295.2 K
D1                  2.00000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                      32768
SF                100.6228270 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

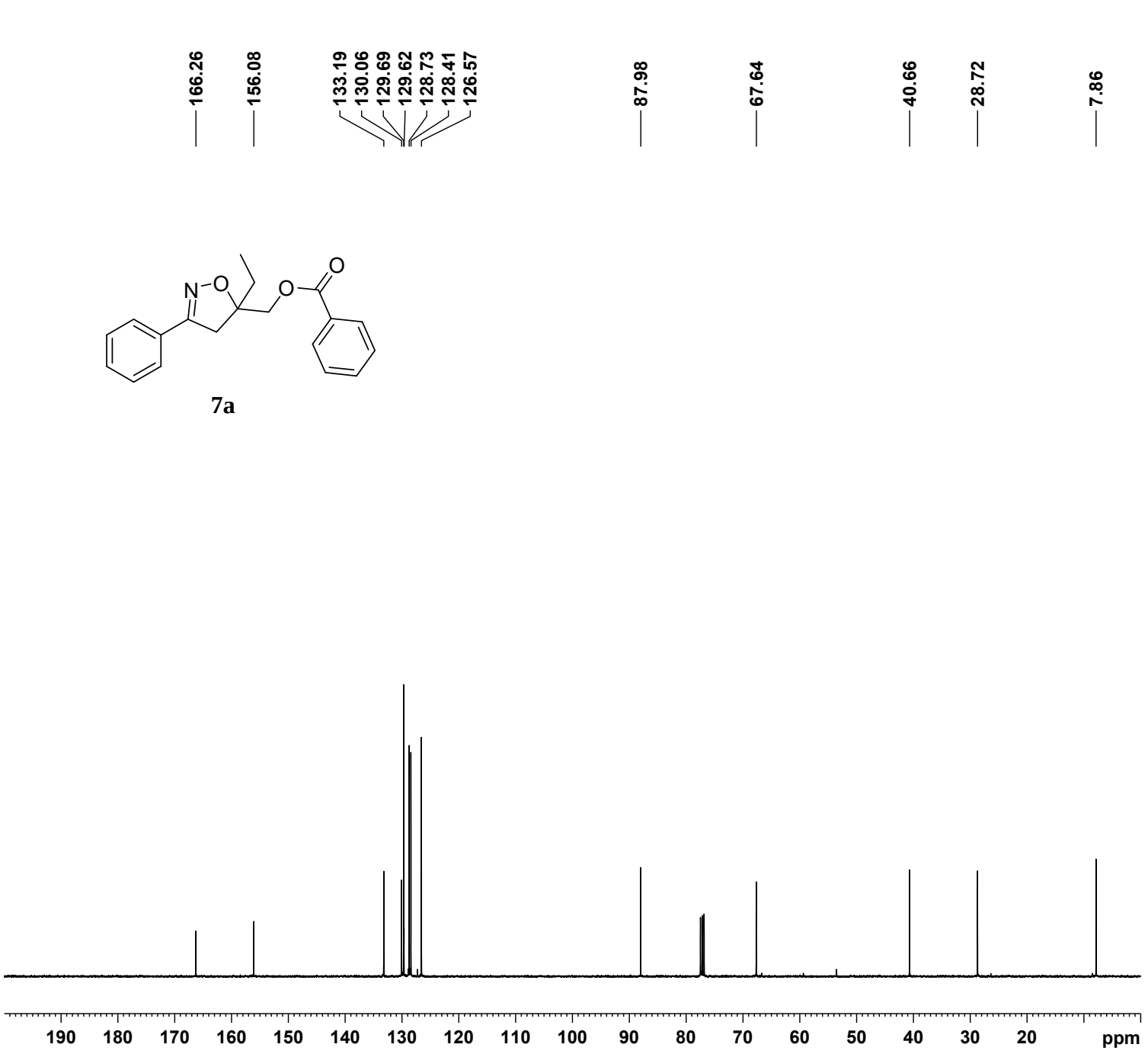




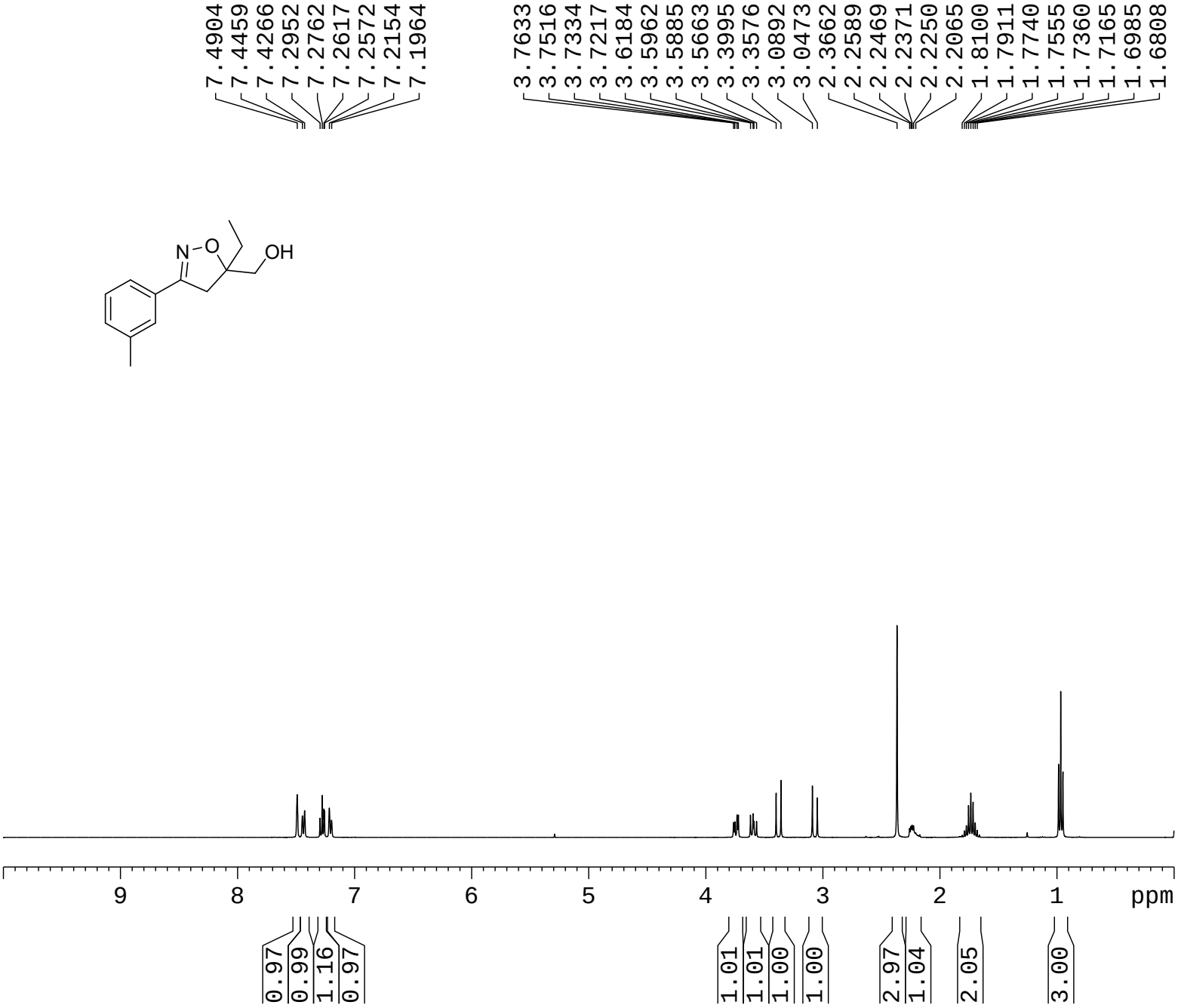
7a

```
NAME          XYH150307-2
EXPNO                   1
PROCNO                  1
Date_            20150308
Time                7.53
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 295.2 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700037 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```






```
NAME      XYH150307-2-C13
EXPNO                  1
PROCNO                 1
Date_           20150308
Time                8.30
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  257
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE               296.4 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI               32768
SF         100.6228270 MHz
WDW                 EM
SSB                  0
LB                1.00 Hz
GB                   0
PC                1.40
```

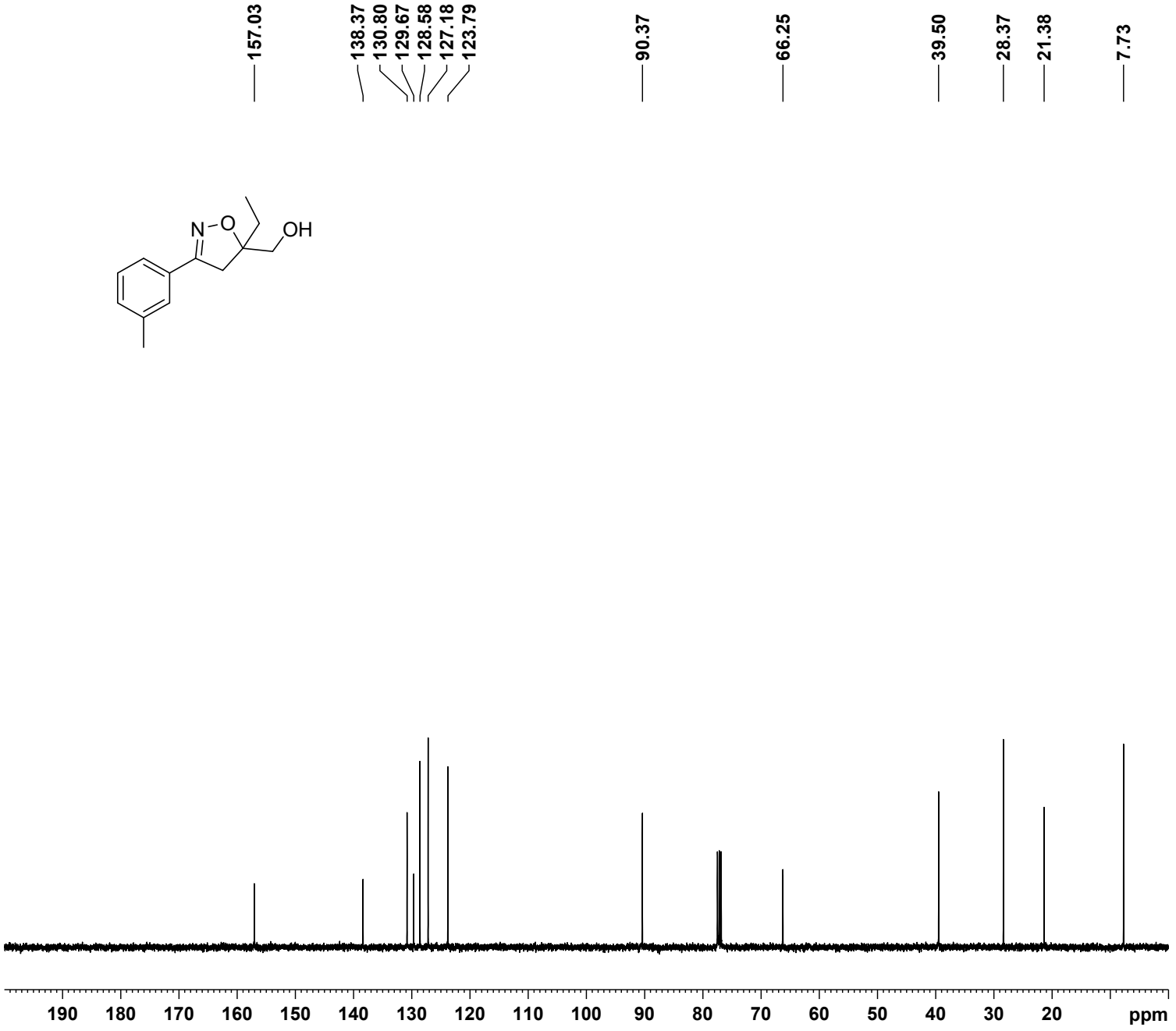


BRUKER

NAME	CWG151023-1
EXPNO	1
PROCNO	1
Date_	20151204
Time	15.00
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	80.6
DW	60.800 usec
DE	6.50 usec
TE	294.0 K
D1	1.00000000 sec
TD0	1

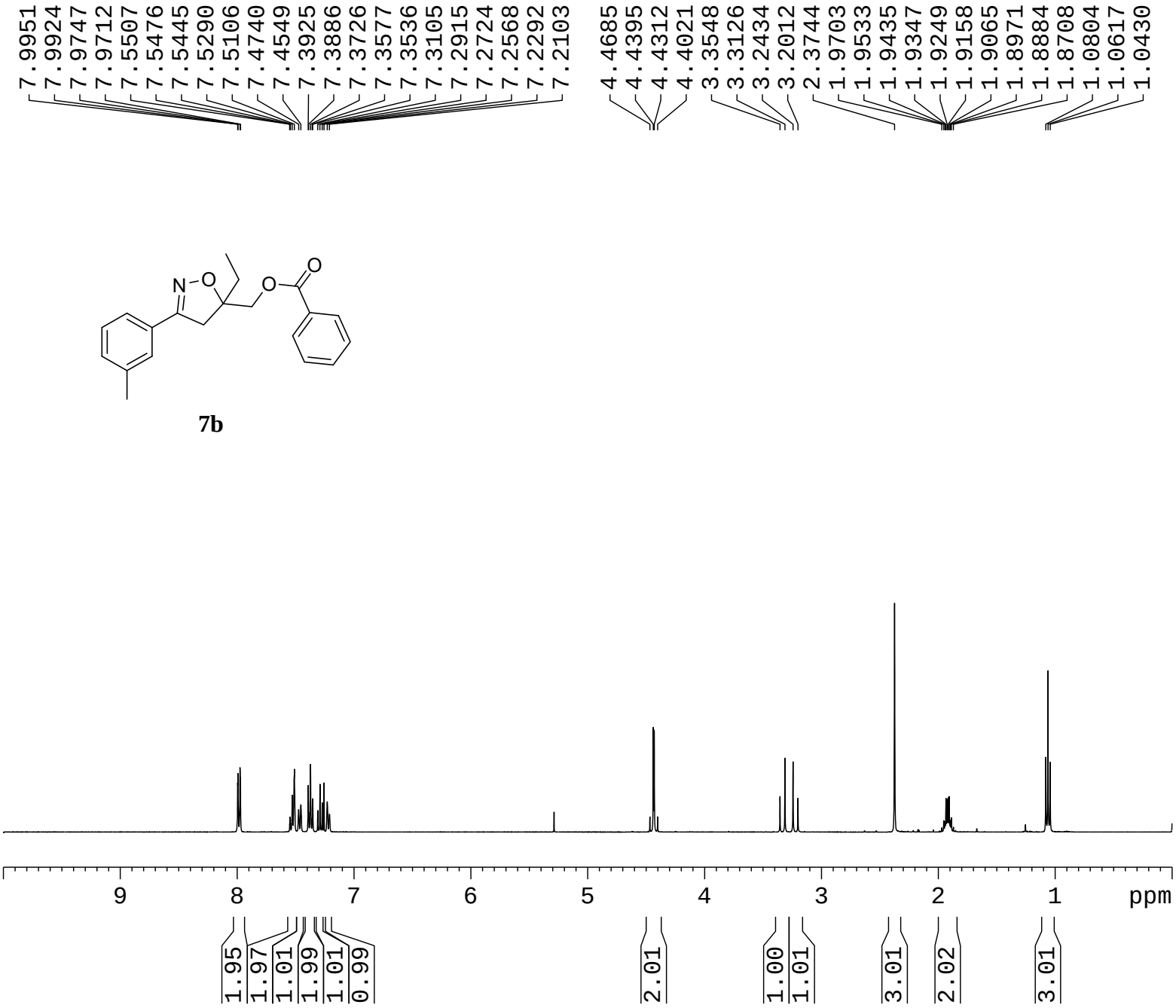
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700025 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



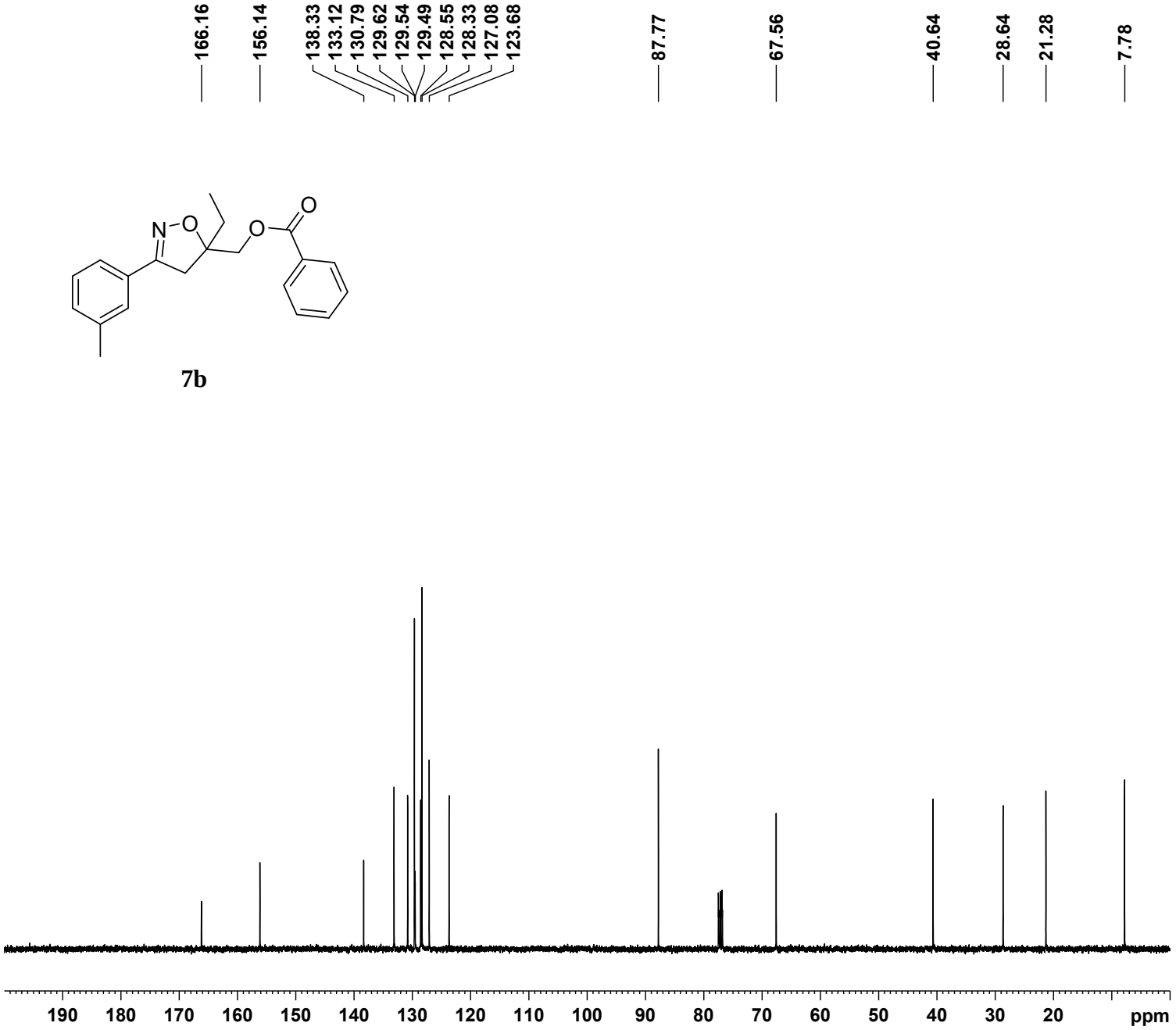
BRUKER

NAME	CWG151023-1C13
EXPNO	1
PROCNO	1
Date_	20151204
Time	15.05
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	44
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	294.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228227 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



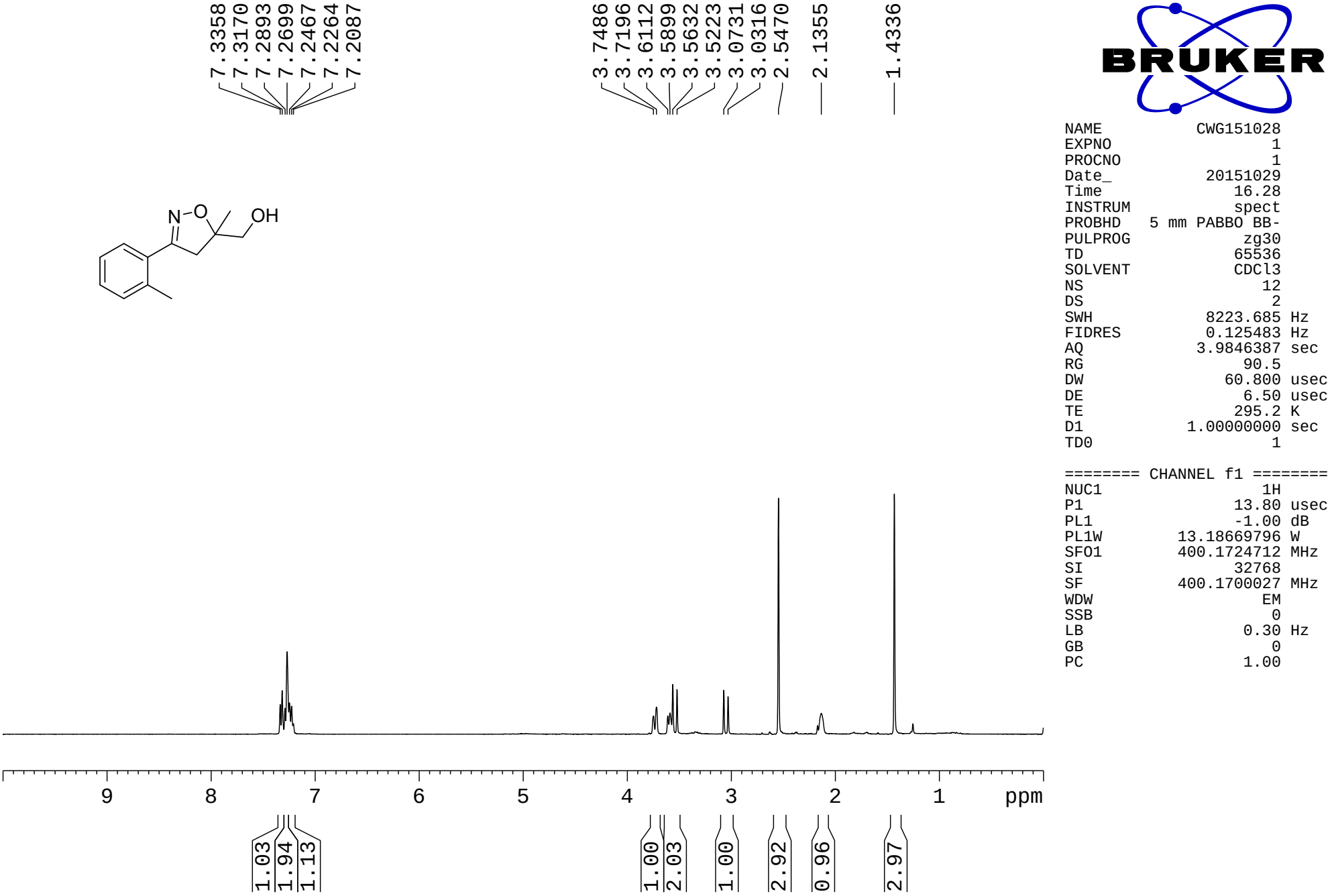
7b

```
NAME          CWG151024-2-1
EXPNO                     1
PROCNO                    1
Date_              20151203
Time                  16.58
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      90.5
DW                    60.800 usec
DE                     6.50 usec
TE                    292.4 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                     32768
SF             400.1700046 MHz
WDW                       EM
SSB                        0
LB                     0.30 Hz
GB                         0
PC                     1.00
```



7b

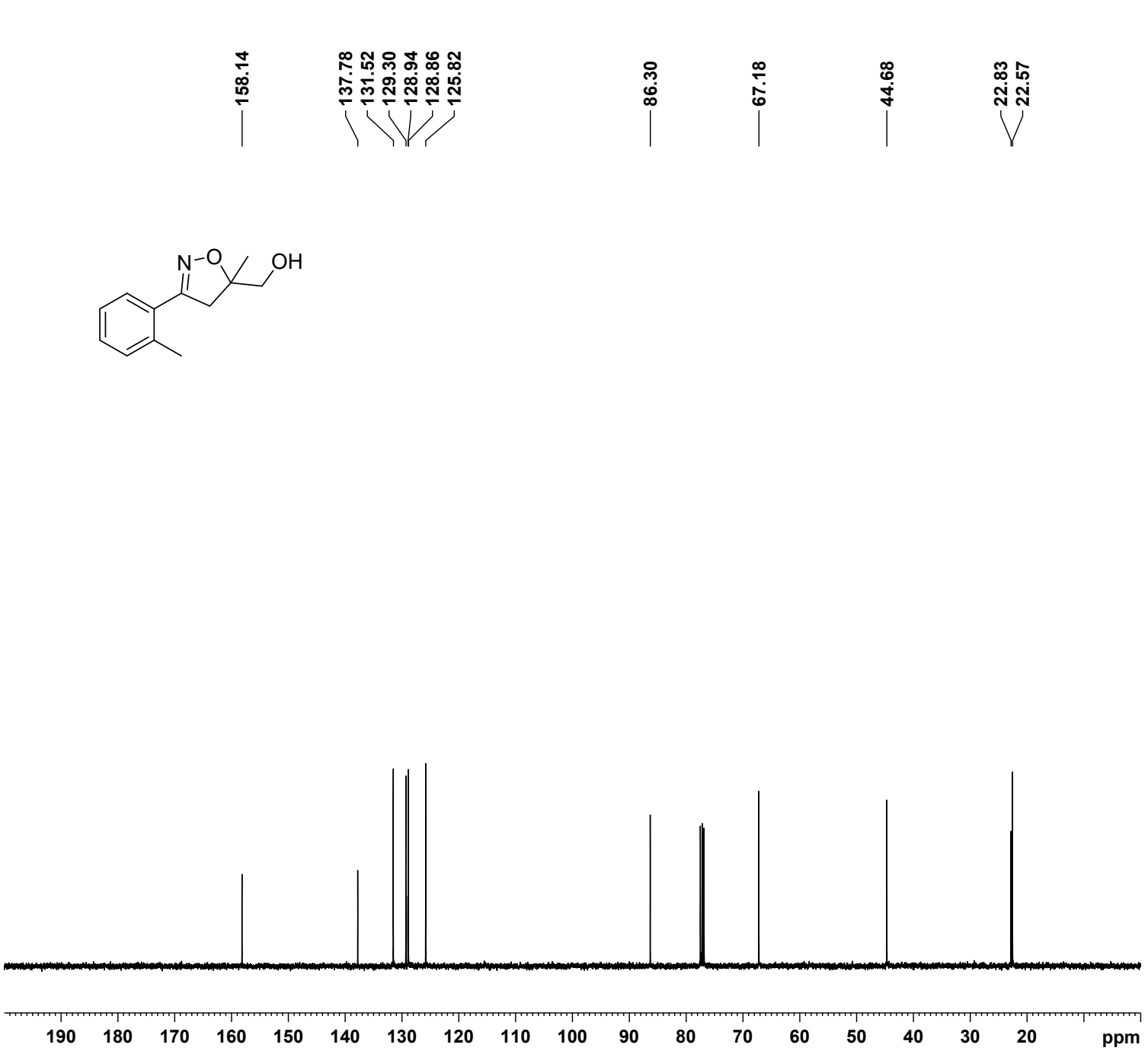
```
NAME        CWG151024-2-1-C13
EXPNO                       1
PROCNO                      1
Date_                20151203
Time                    17.03
INSTRUM                 spect
PROBHD    5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         32
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     292.5 K
D1                  2.00000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228357 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```



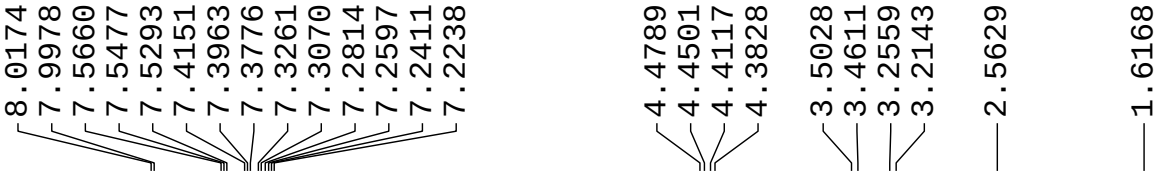
NAME	CWG151028
EXPNO	1
PROCNO	1
Date_	20151029
Time	16.28
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	90.5
DW	60.800 usec
DE	6.50 usec
TE	295.2 K
D1	1.00000000 sec
TD0	1

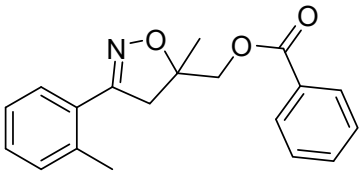
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700027 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



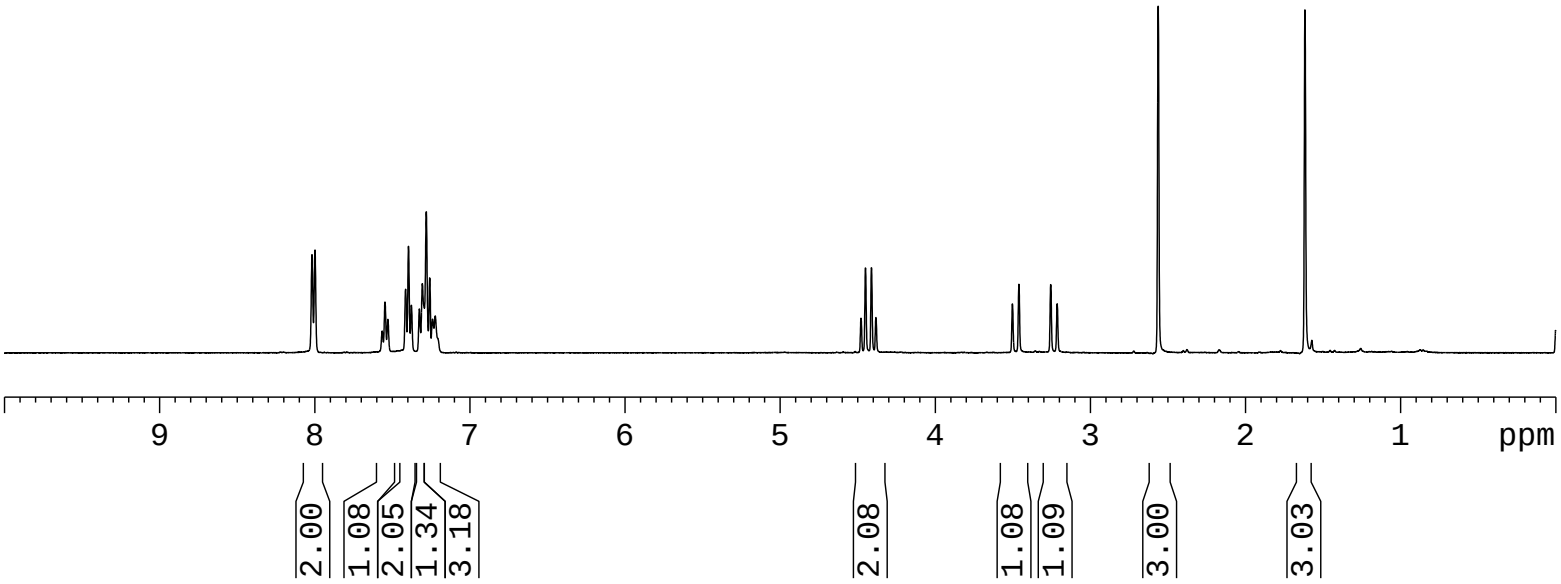

```
NAME          CWG151028-C13
EXPNO                     1
PROCNO                    1
Date_              20151031
Time                 17.04
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      57
DS                       4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                     203
DW                20.800 usec
DE                 6.50 usec
TE                 295.1 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                   13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228242 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

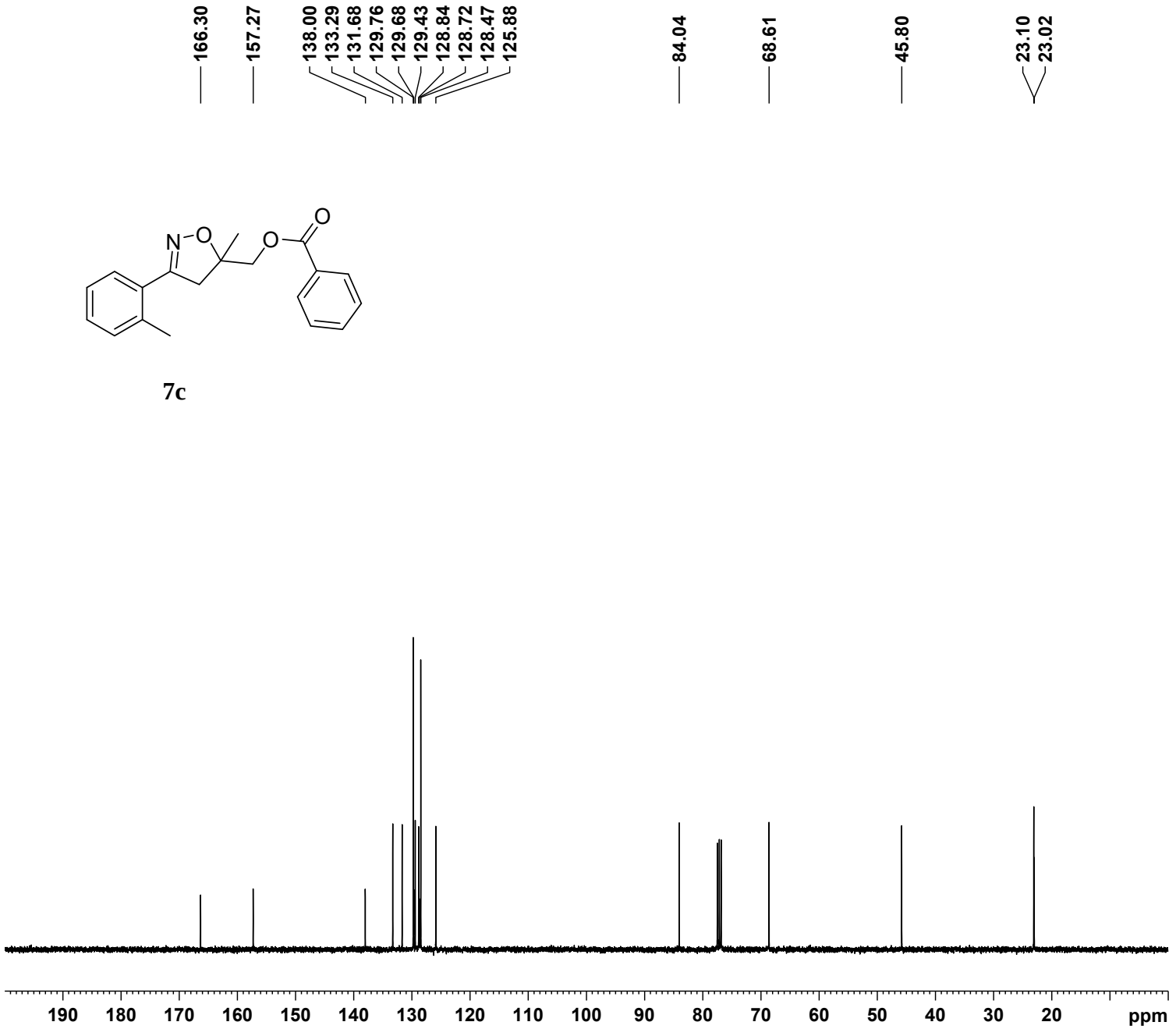




7c

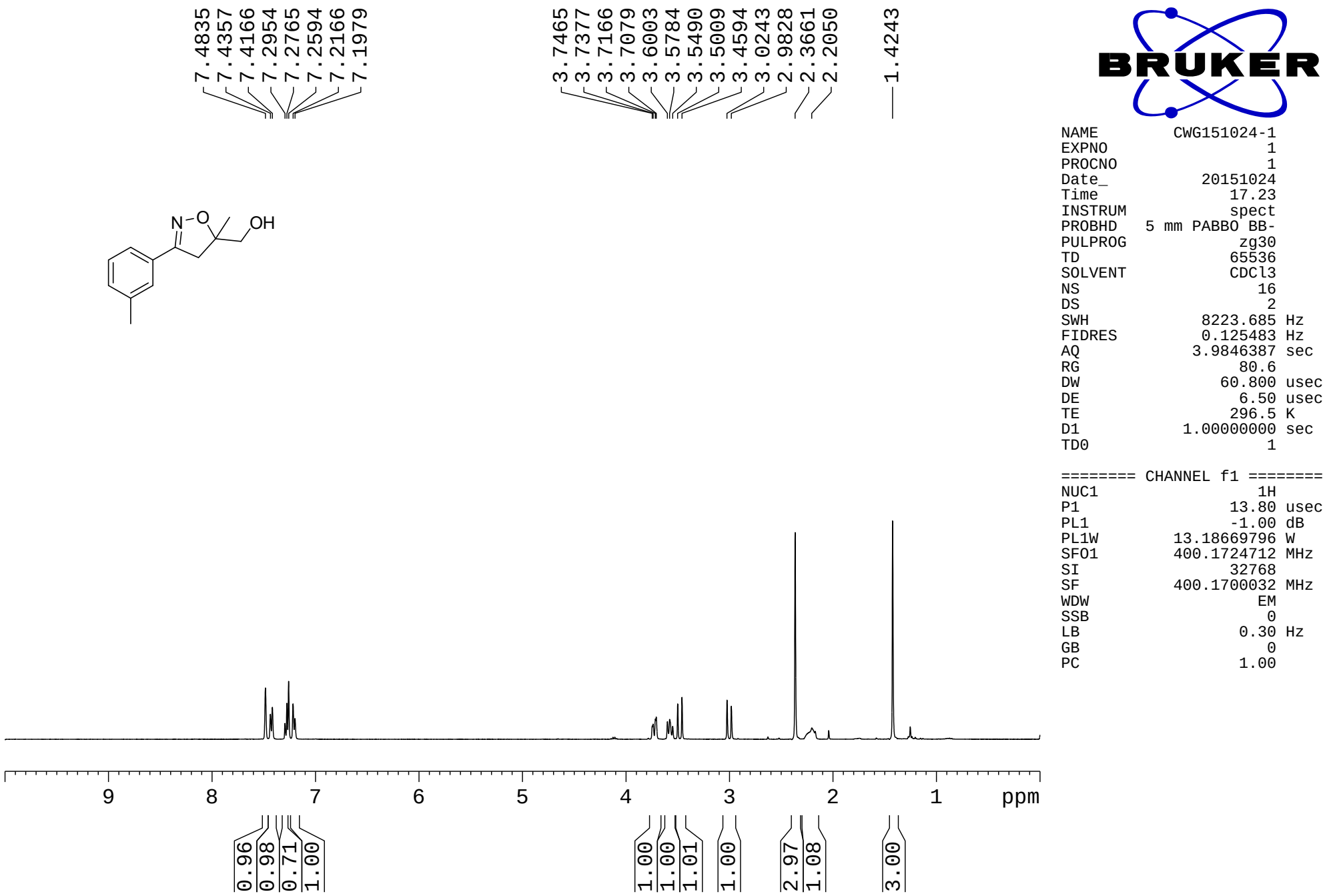
```
NAME          CWG151029-3
EXPNO                   1
PROCNO                  1
Date_            20151029
Time                16.33
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     13
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 295.1 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700036 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```





7c

```
NAME          CWG151029-3-C13
EXPNO                      1
PROCNO                     1
Date_               20151031
Time                   17.11
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                       70
DS                        4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                      203
DW                   20.800 usec
DE                    6.50 usec
TE                   295.2 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                    32768
SF            100.6228216 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

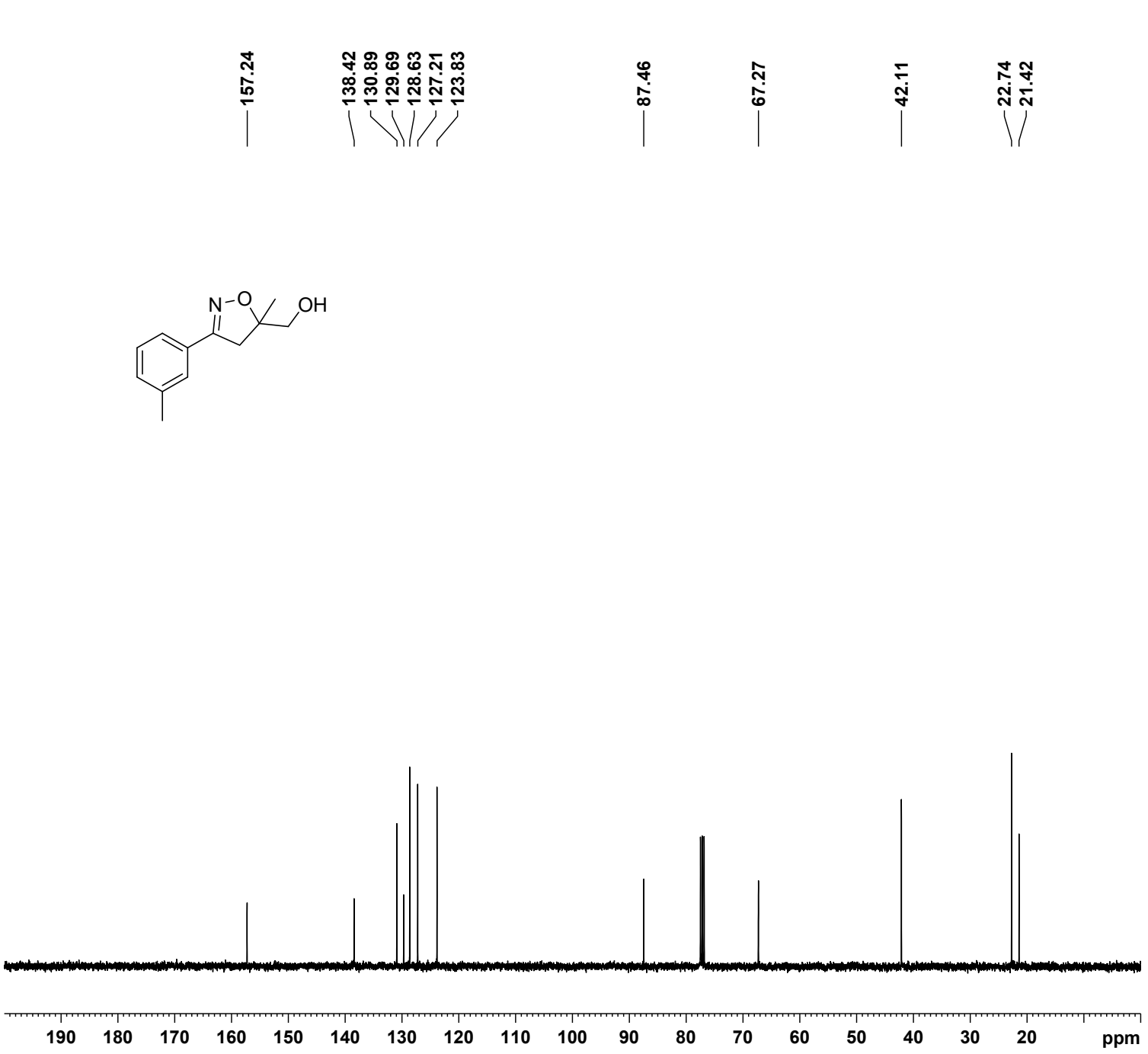


BRUKER

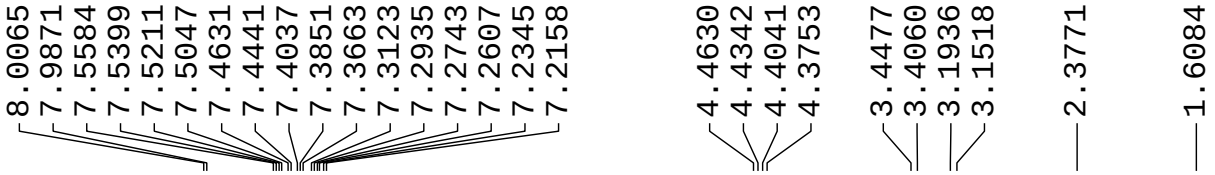
NAME	CWG151024-1
EXPNO	1
PROCNO	1
Date_	20151024
Time	17.23
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	80.6
DW	60.800 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1

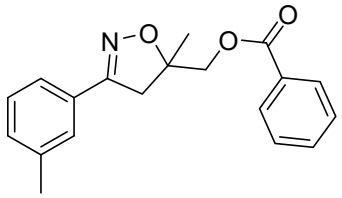
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

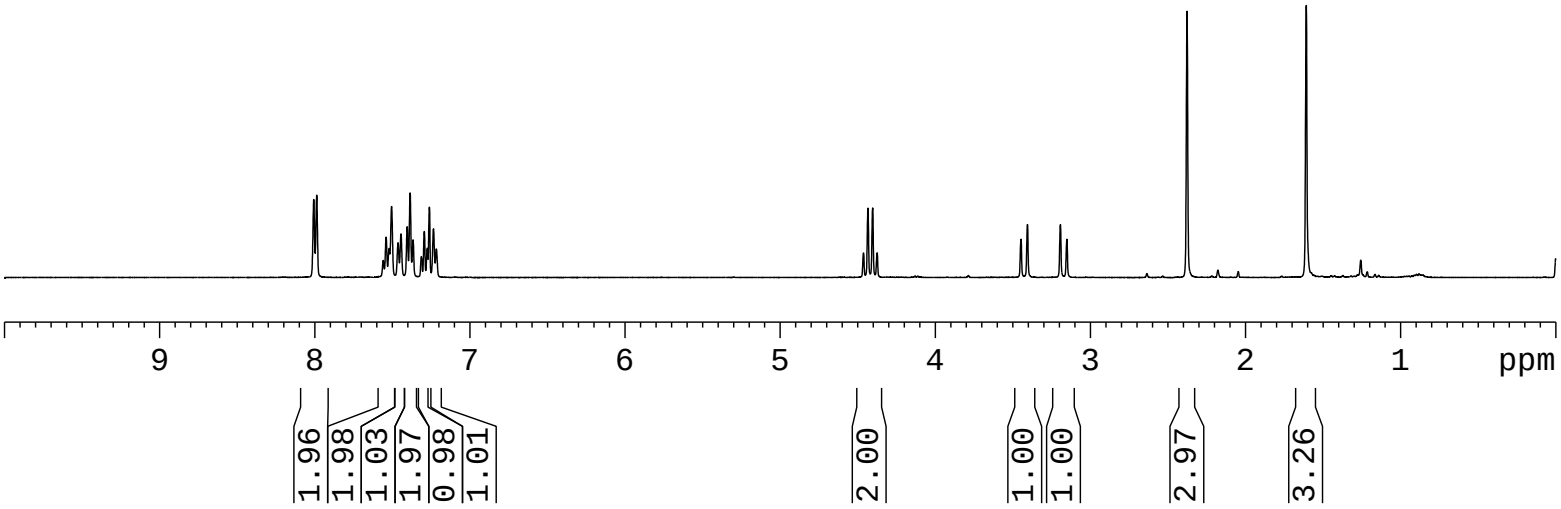


NAME	CWG151024-1-1-C13
EXPNO	1
PROCNO	1
Date_	20151128
Time	17.18
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	73
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	291.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228208 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

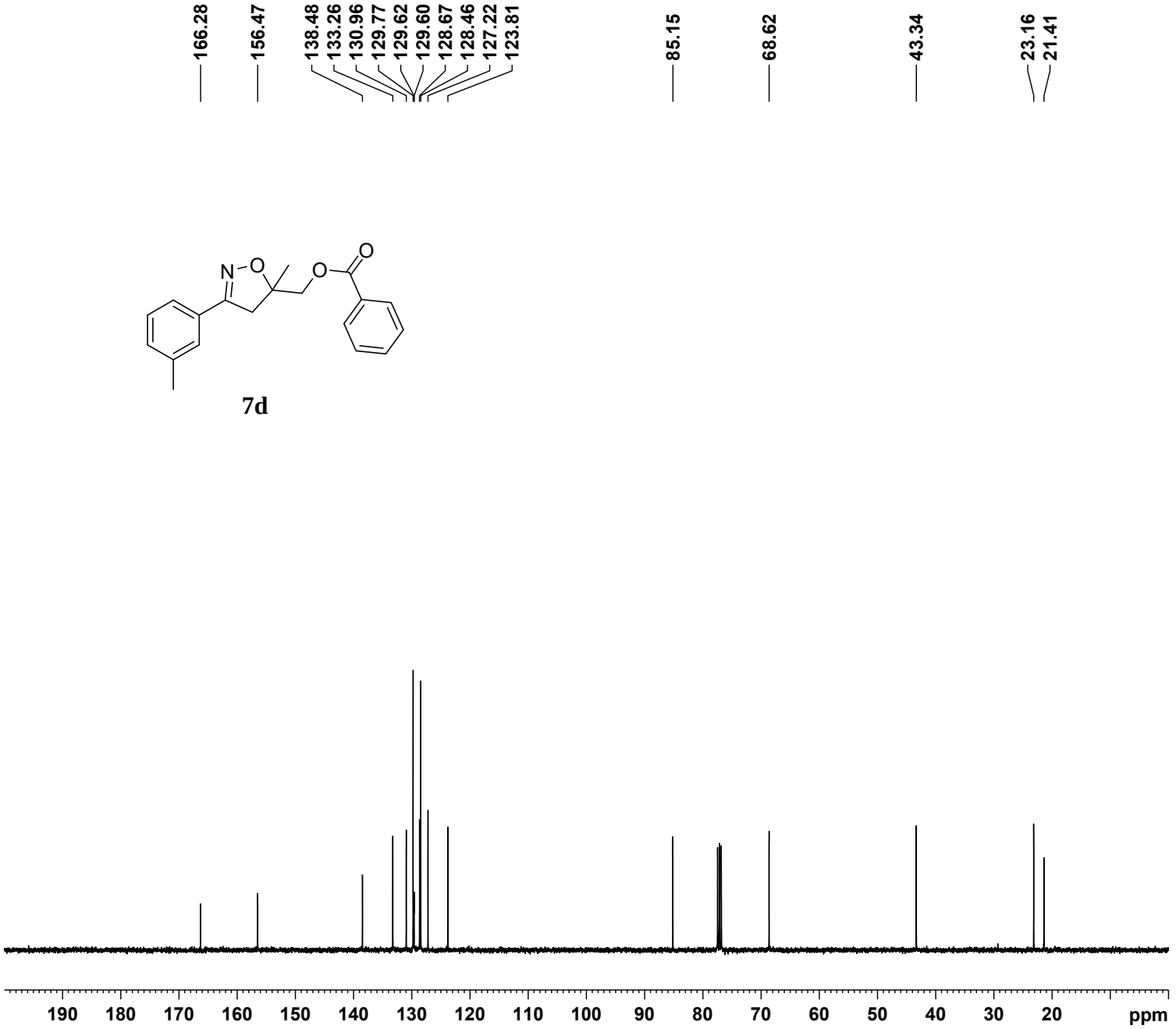




7d

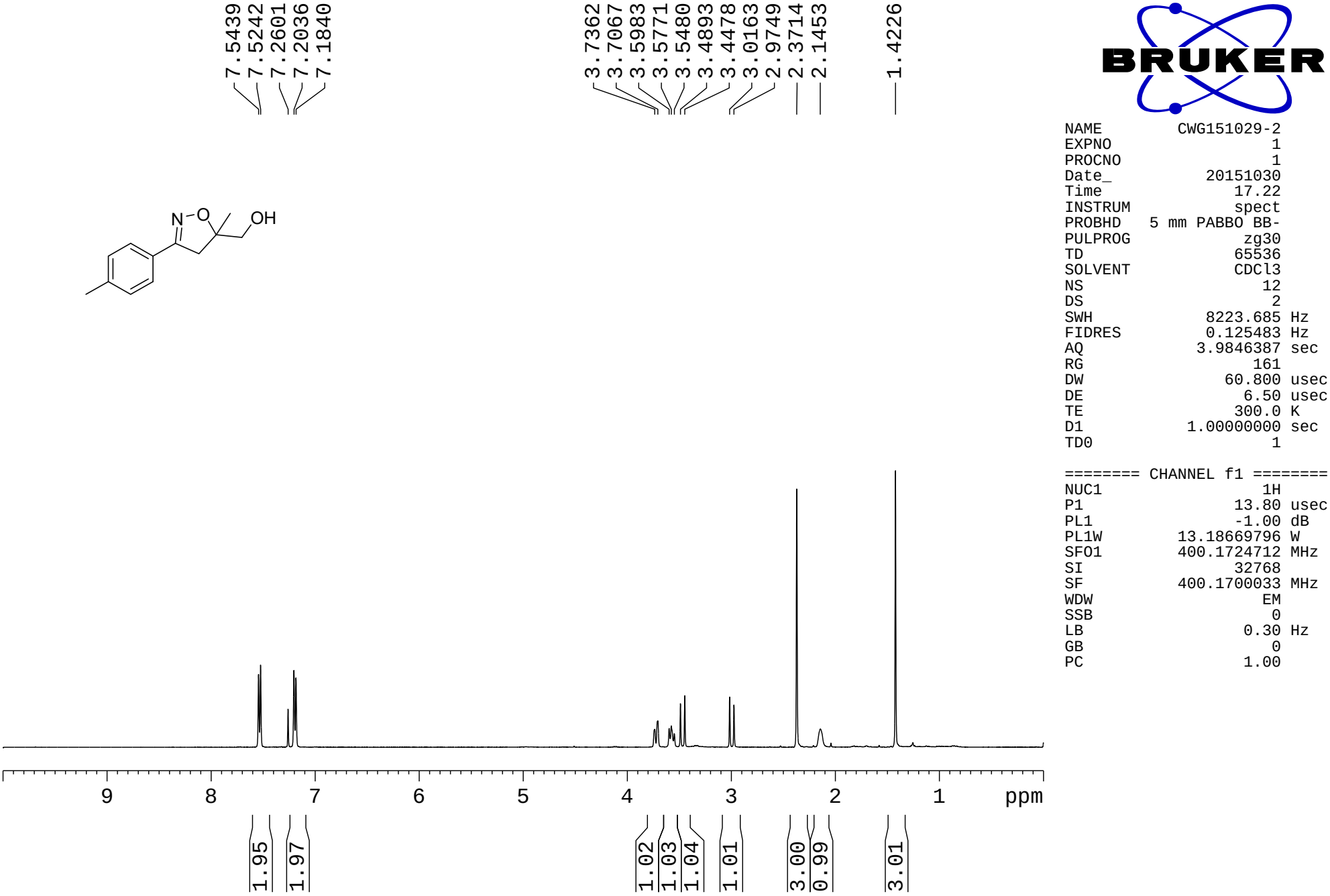


NAME	CWG151026-3
EXPNO	1
PROCNO	1
Date_	20151026
Time	11.09
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	293.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700030 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

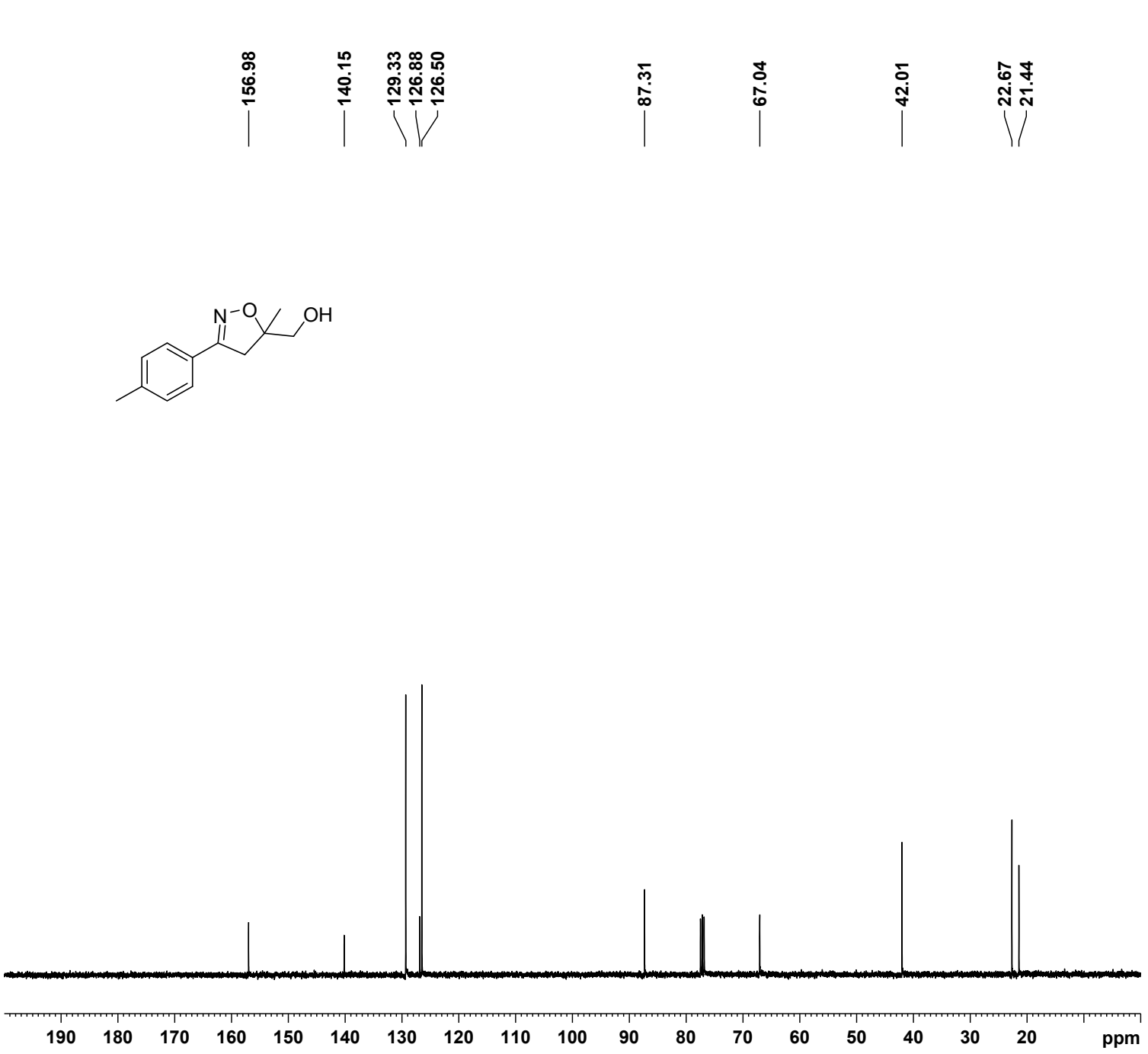


7d

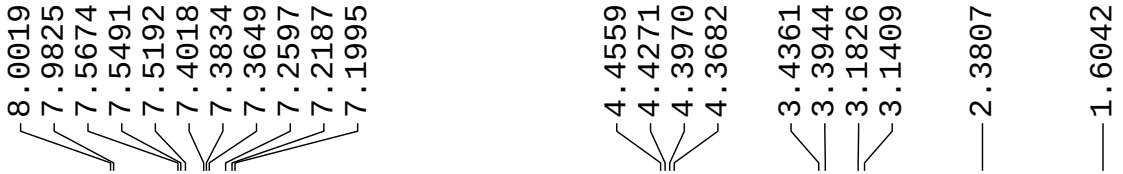
```
NAME          CWG151026-3-C13
EXPNO                       1
PROCNO                      1
Date_                20151026
Time                    11.30
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                        114
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     293.2 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                      32768
SF               100.6228224 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

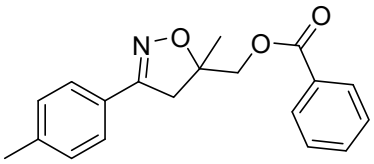



```
NAME          CWG151029-2
EXPNO                   1
PROCNO                  1
Date_            20151030
Time                17.22
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     12
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    161
DW                 60.800 usec
DE                  6.50 usec
TE                 300.0 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700033 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

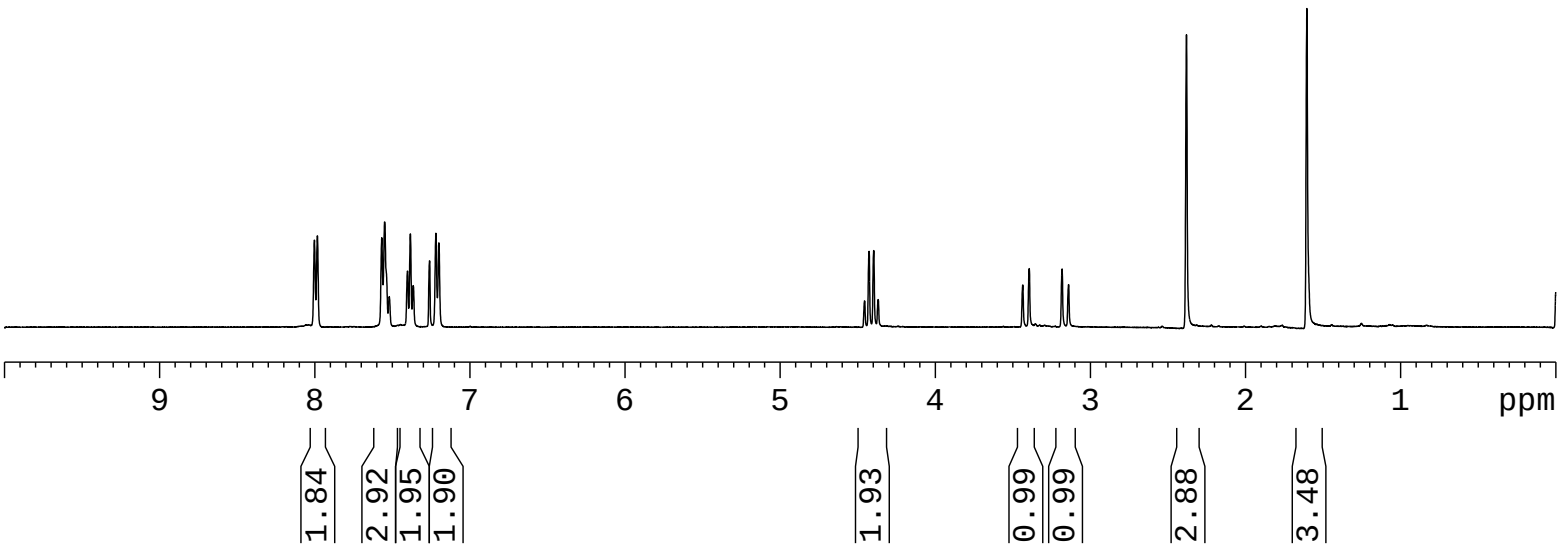



```
NAME        CWG151029-2-C13
EXPNO                    1
PROCNO                   1
Date_             20151229
Time                 10.53
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      17
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  288.3 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228295 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

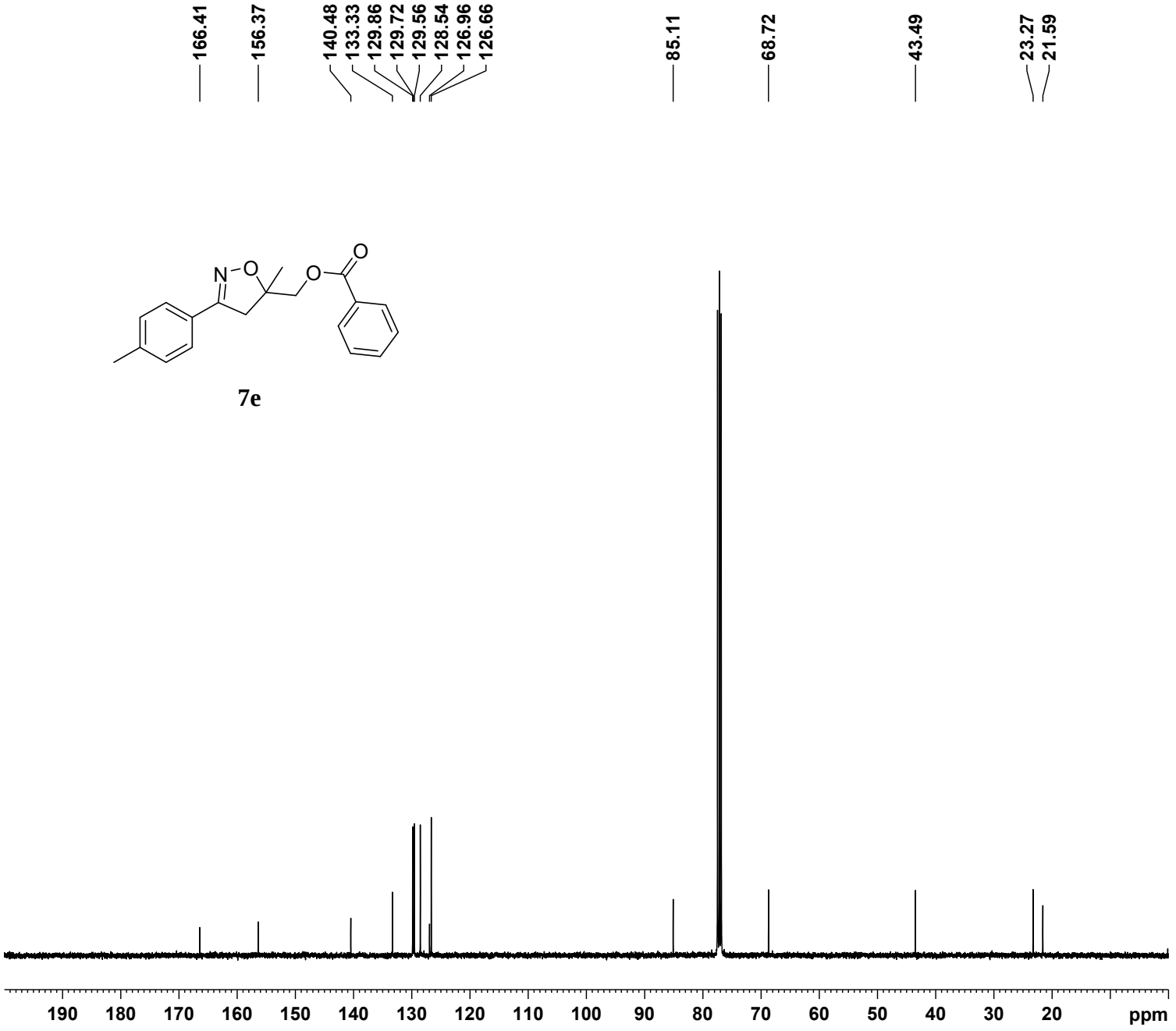




7e

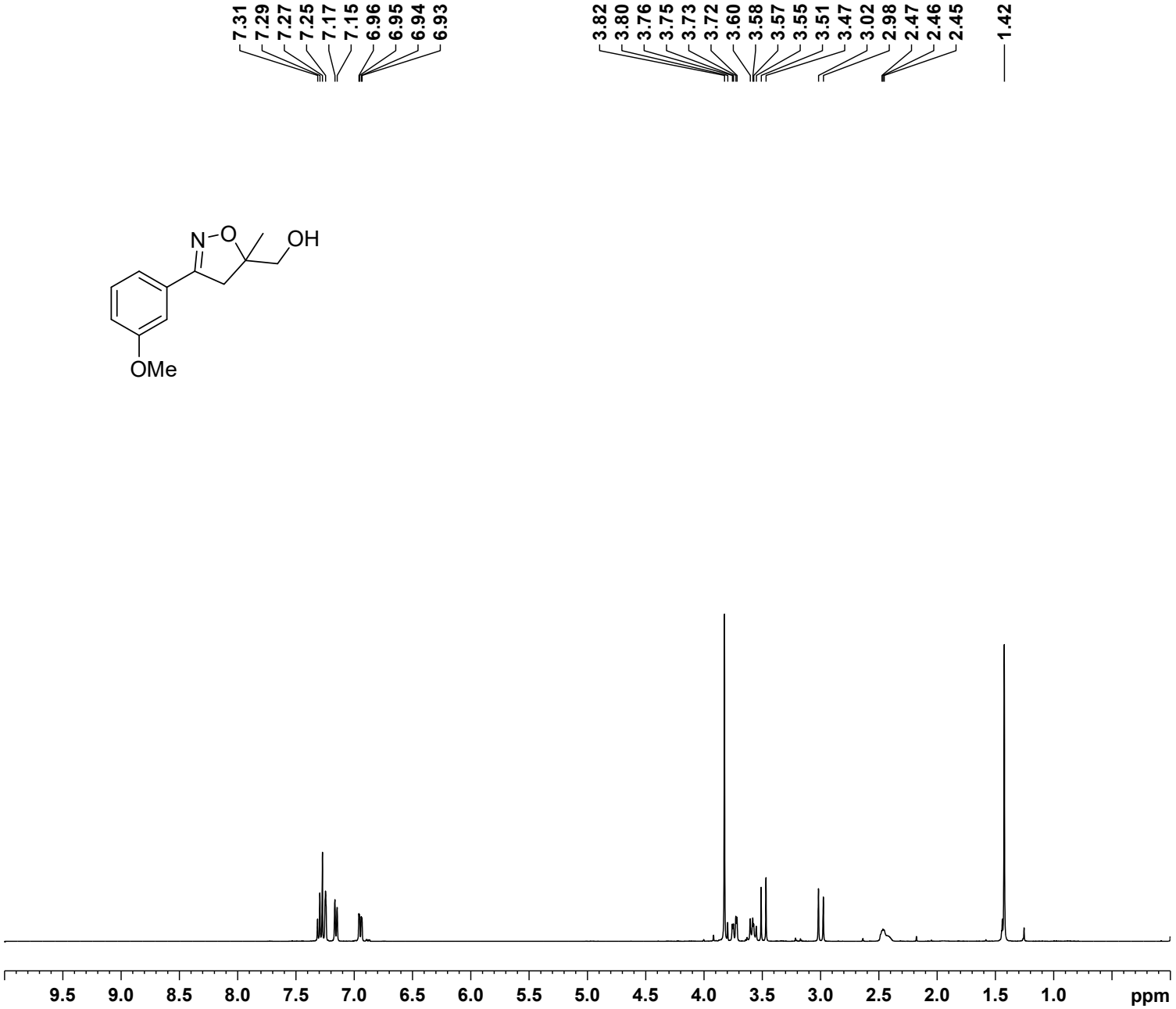


NAME	CWG151106-1
EXPNO	1
PROCNO	1
Date_	20151106
Time	17.43
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	10
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	291.5 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700030 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

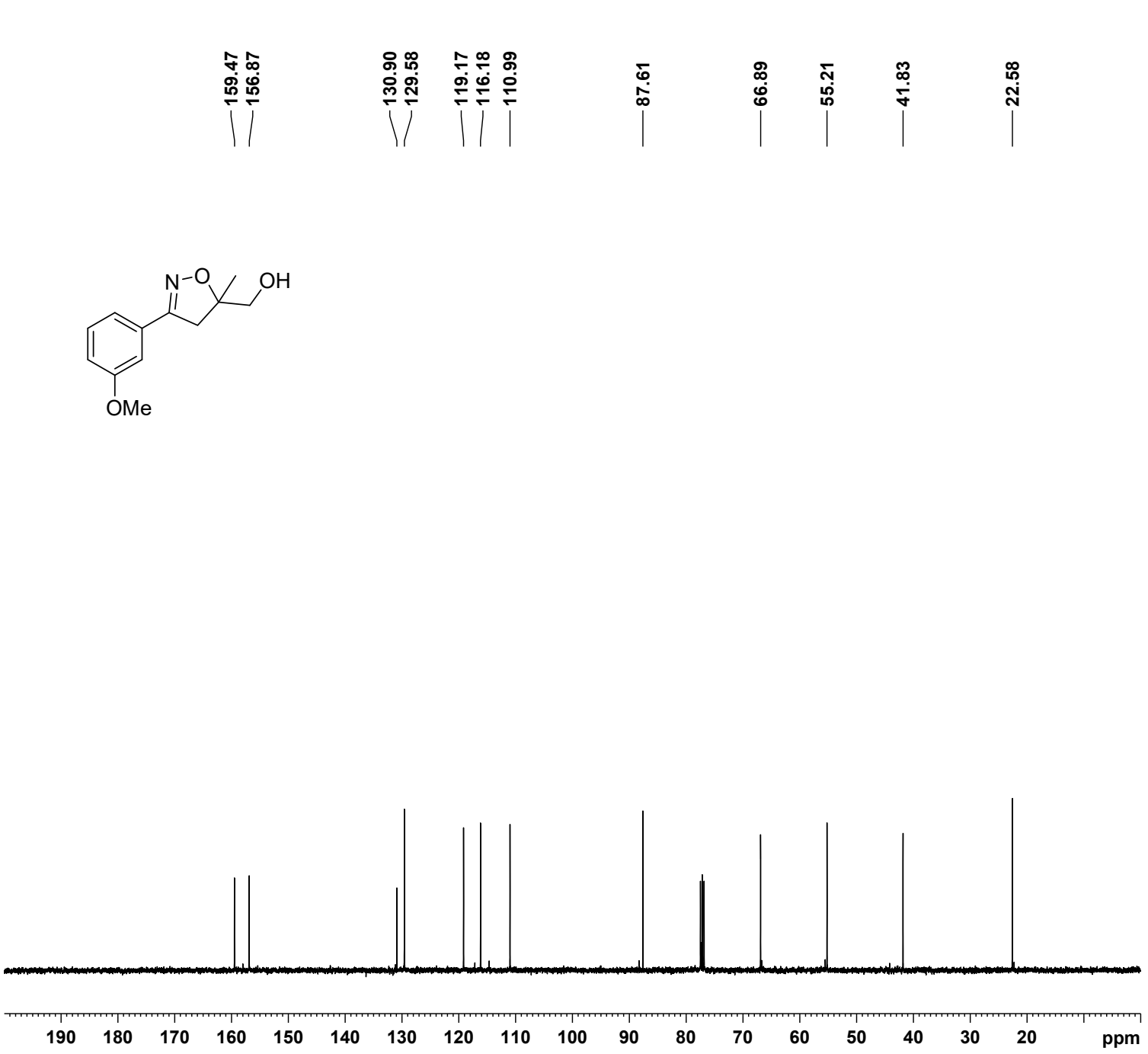


7e

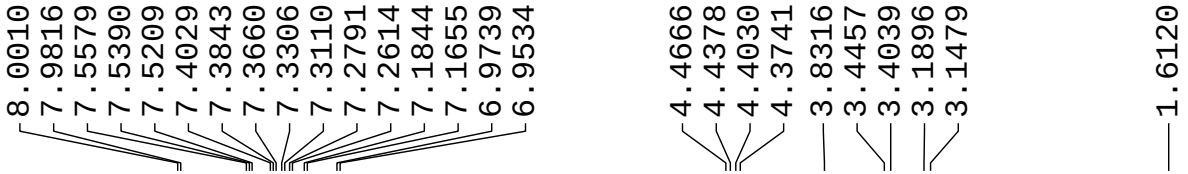
```
NAME          CWG151106-1-C13
EXPNO                       1
PROCNO                      1
Date_                20151106
Time                    18.07
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                       1024
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     291.8 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                      32768
SF               100.6228128 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

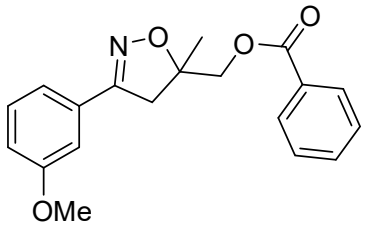


NAME	CWG151109-2-2
EXPNO	1
PROCNO	1
Date_	20151229
Time	10.47
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	71.8
DW	60.800 usec
DE	6.50 usec
TE	288.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1699985 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00




```
NAME      CWG151109-2-2-C13
EXPNO                    1
PROCNO                   1
Date_             20151229
Time                 11.26
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    14
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                288.5 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228355 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```





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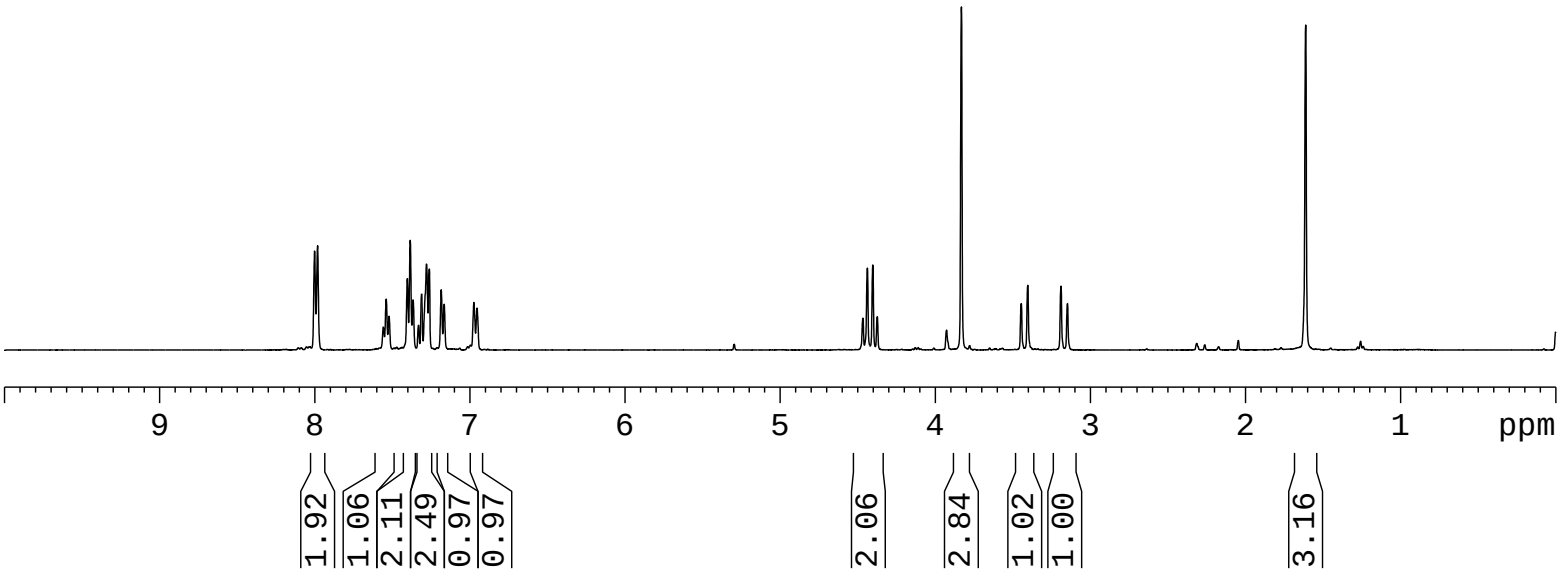
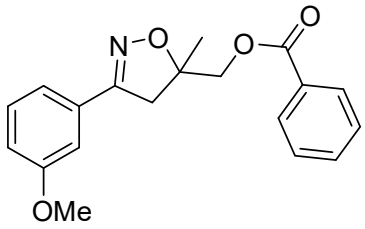
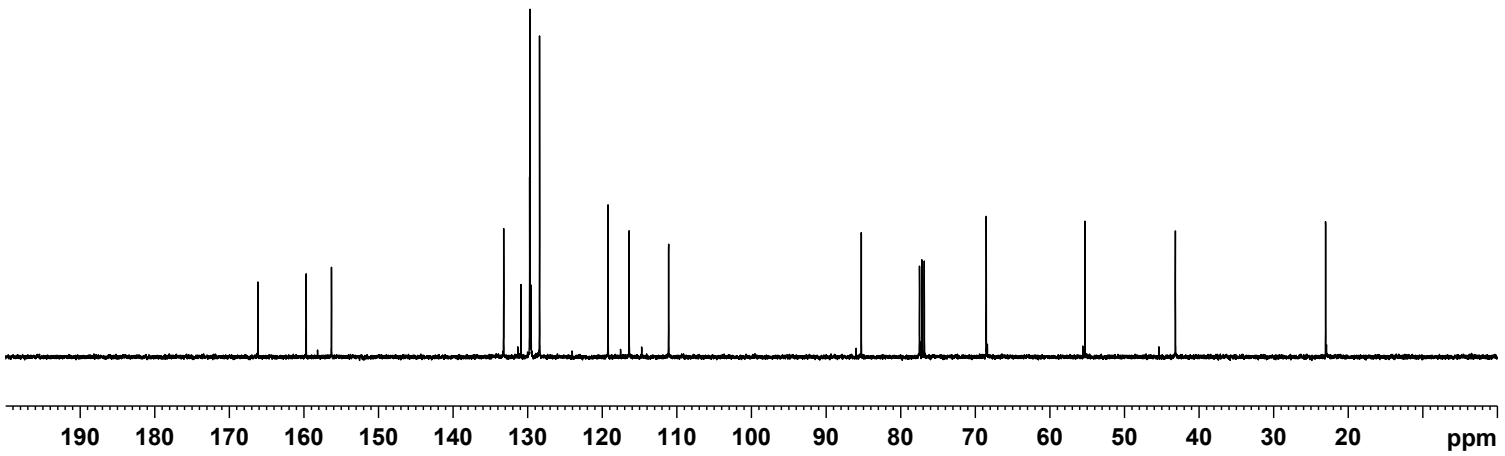


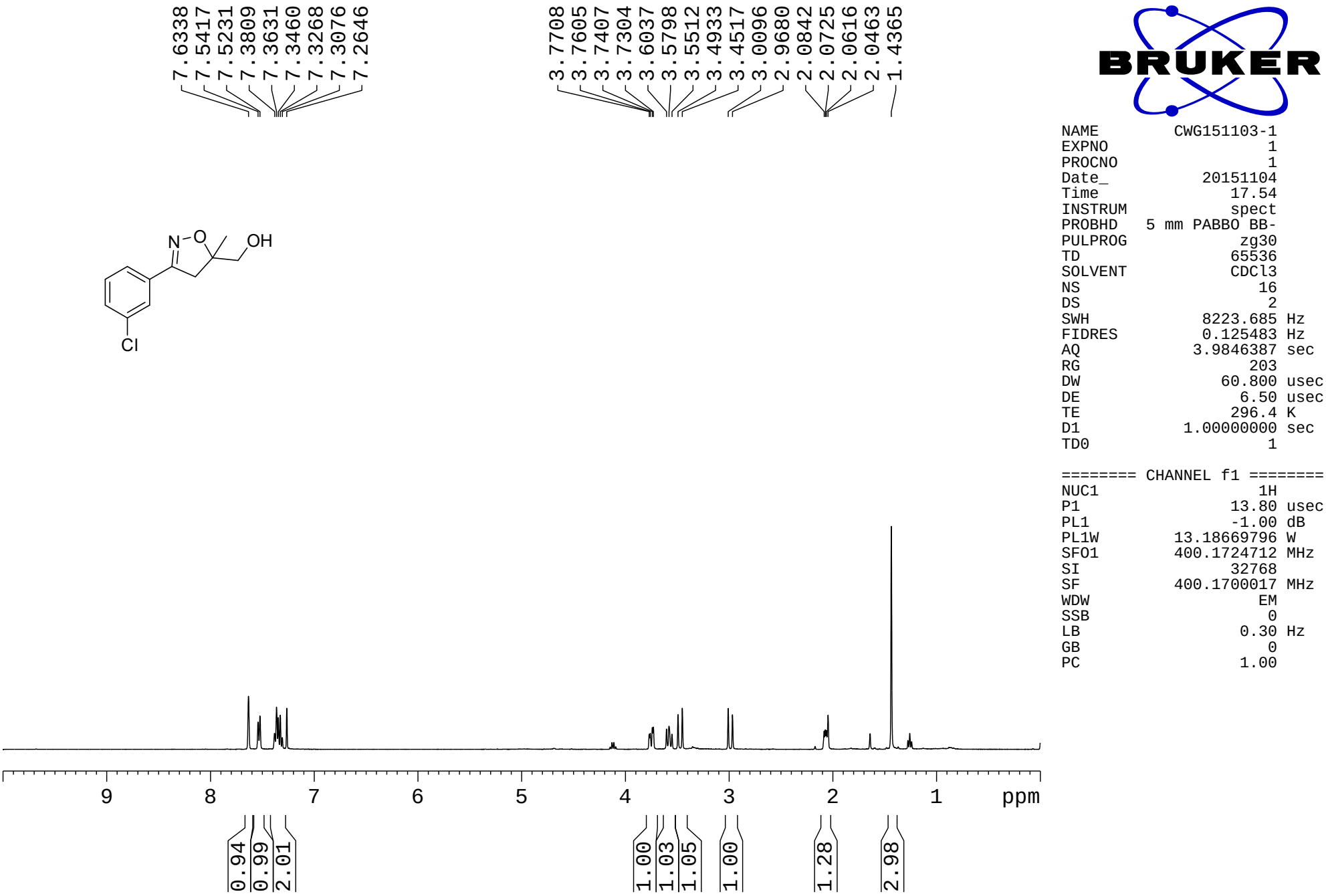

```
NAME          CWG151110-1-2
EXPNO                     1
PROCNO                    1
Date_              20151116
Time                  11.09
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      144
DW                   60.800 usec
DE                    6.50 usec
TE                   292.3 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700024 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```



7f

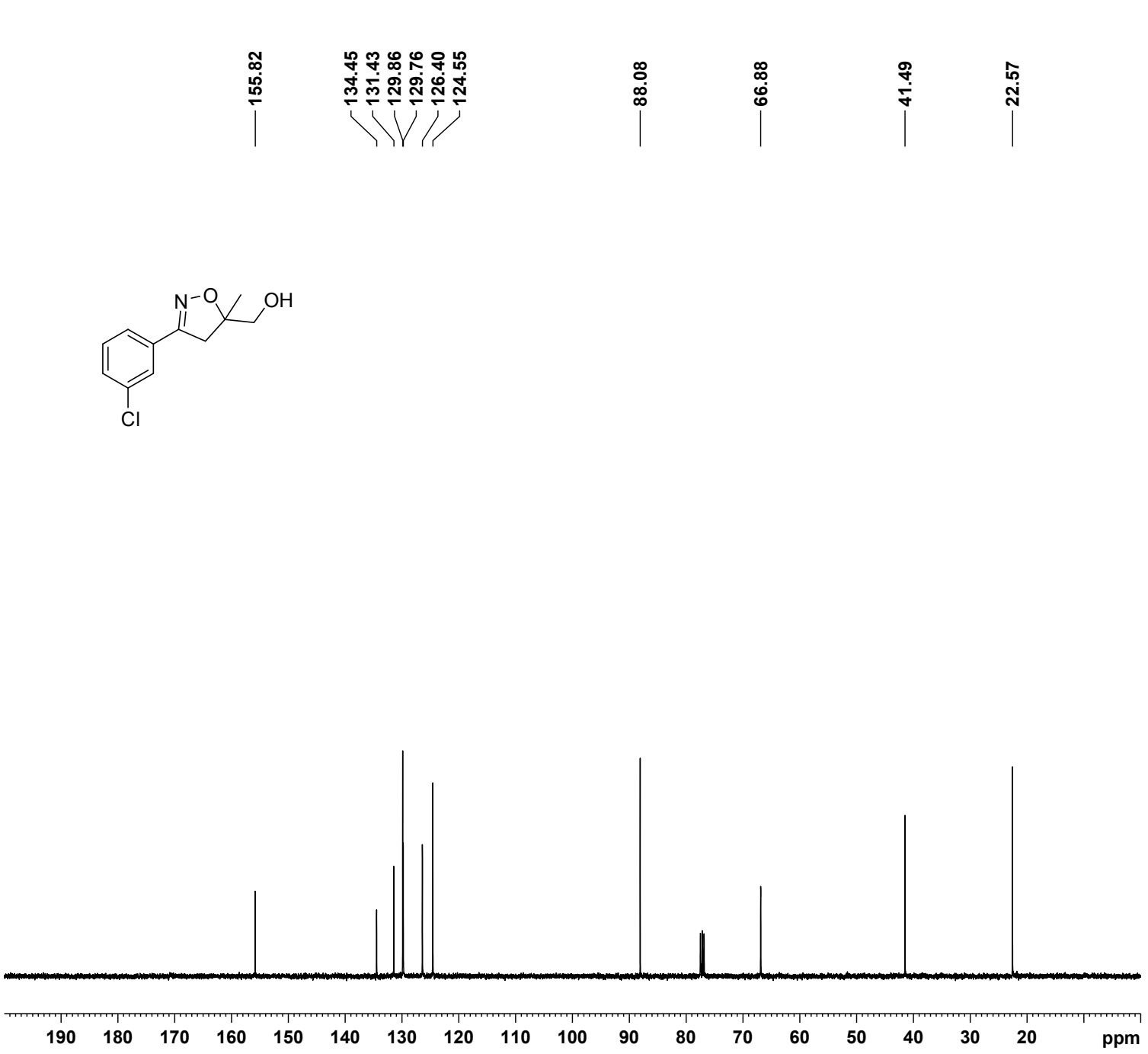



```
NAME        CWG151110-1-C13
EXPNO                     1
PROCNO                    1
Date_              20151128
Time                  17.00
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      62
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ               1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  292.2 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228303 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

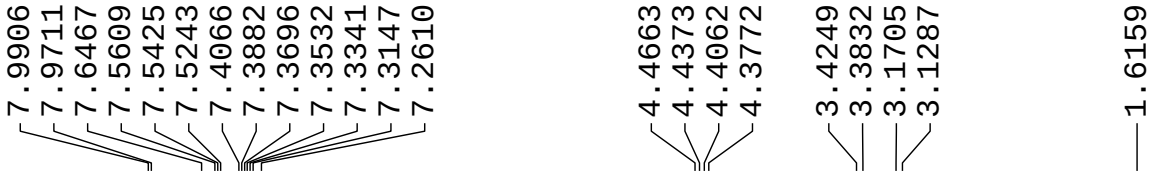


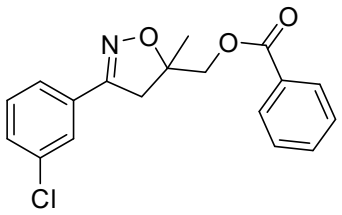
NAME	CWG151103-1
EXPNO	1
PROCNO	1
Date_	20151104
Time	17.54
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.4 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700017 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



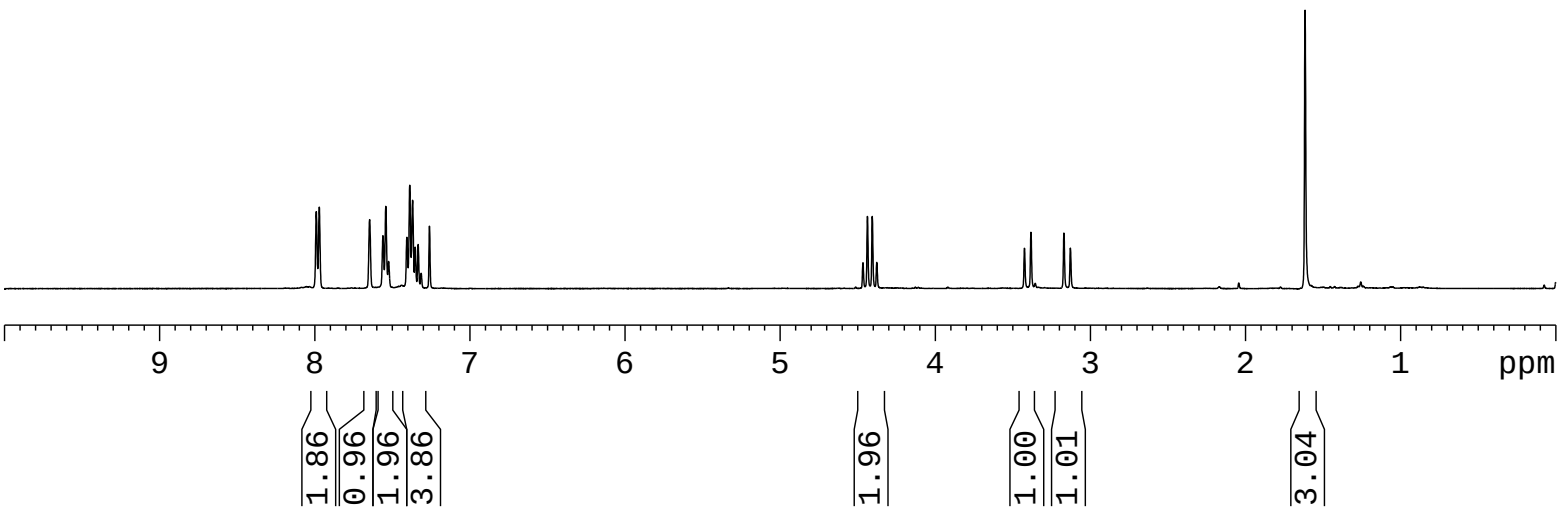

```
NAME          CWG151103-1-C13
EXPNO                       1
PROCNO                      1
Date_                20151128
Time                    17.13
INSTRUM                 spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         20
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     292.1 K
D1                  2.00000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                      32768
SF                100.6228347 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

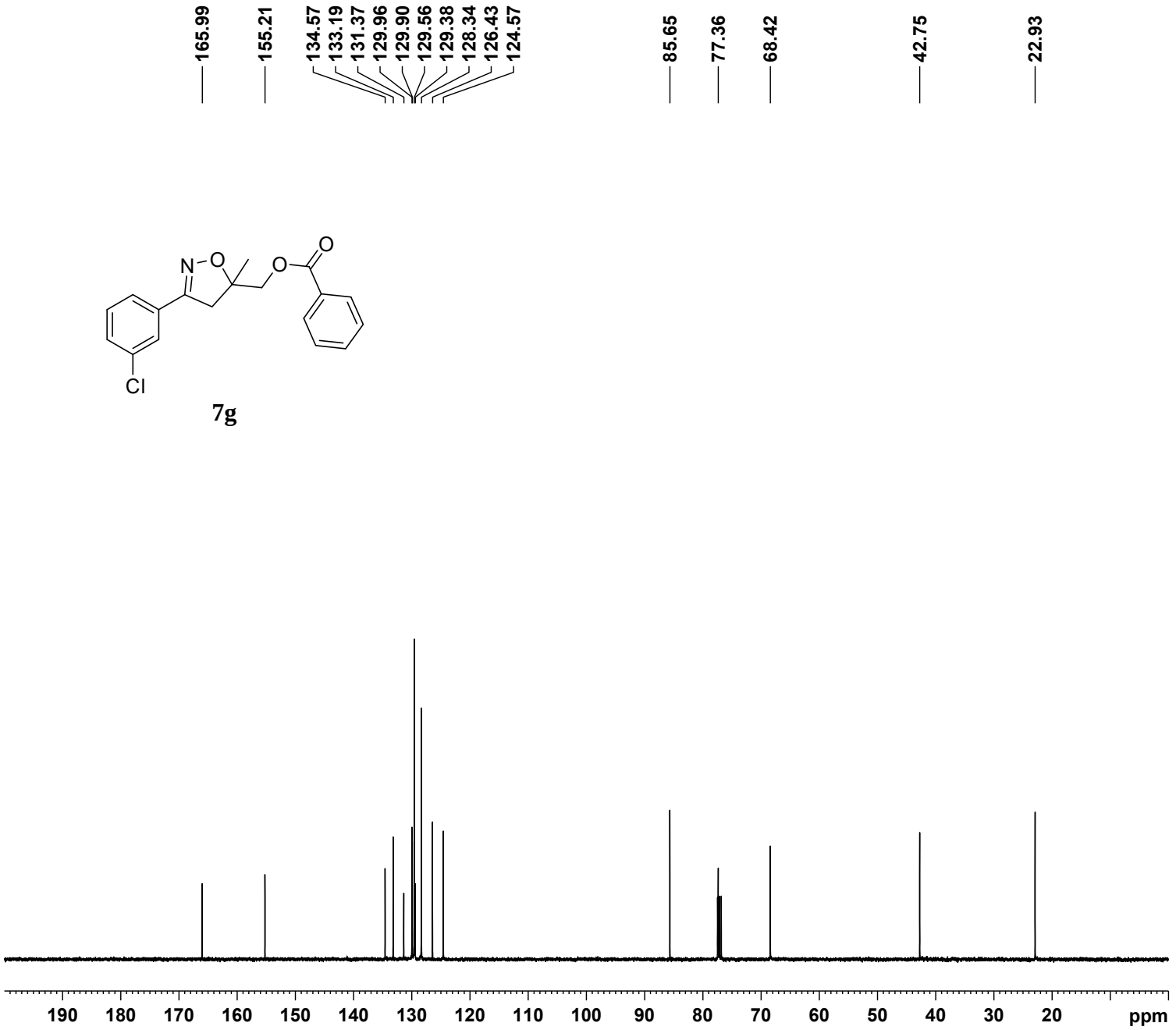




7g

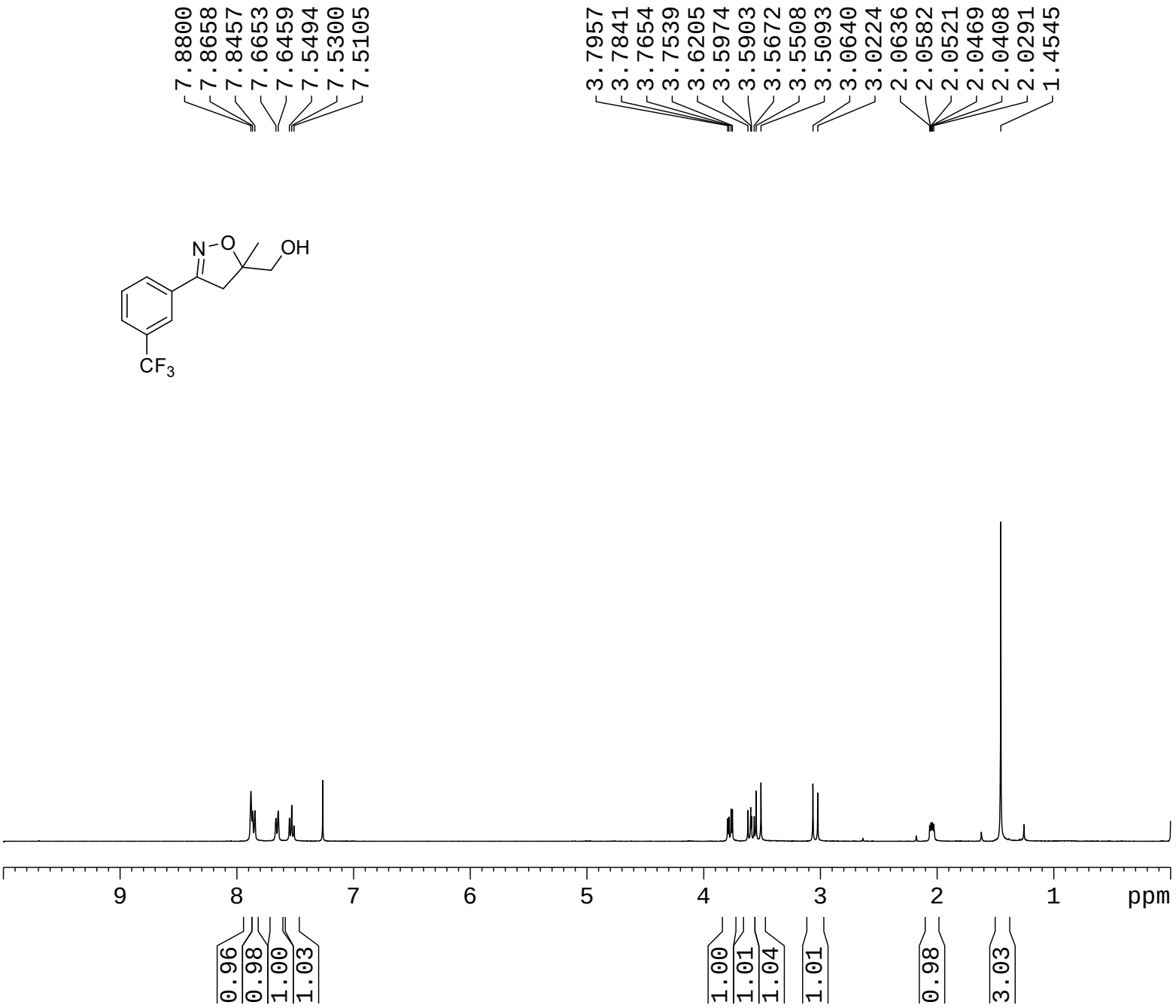
```
NAME          CWG151104-1
EXPNO                   1
PROCNO                  1
Date_            20151104
Time                17.59
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 296.2 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700029 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```





7g

```
NAME          CWG151104-1-C13
EXPNO                      1
PROCNO                     1
Date_               20151128
Time                   17.08
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                        31
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    292.3 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228368 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

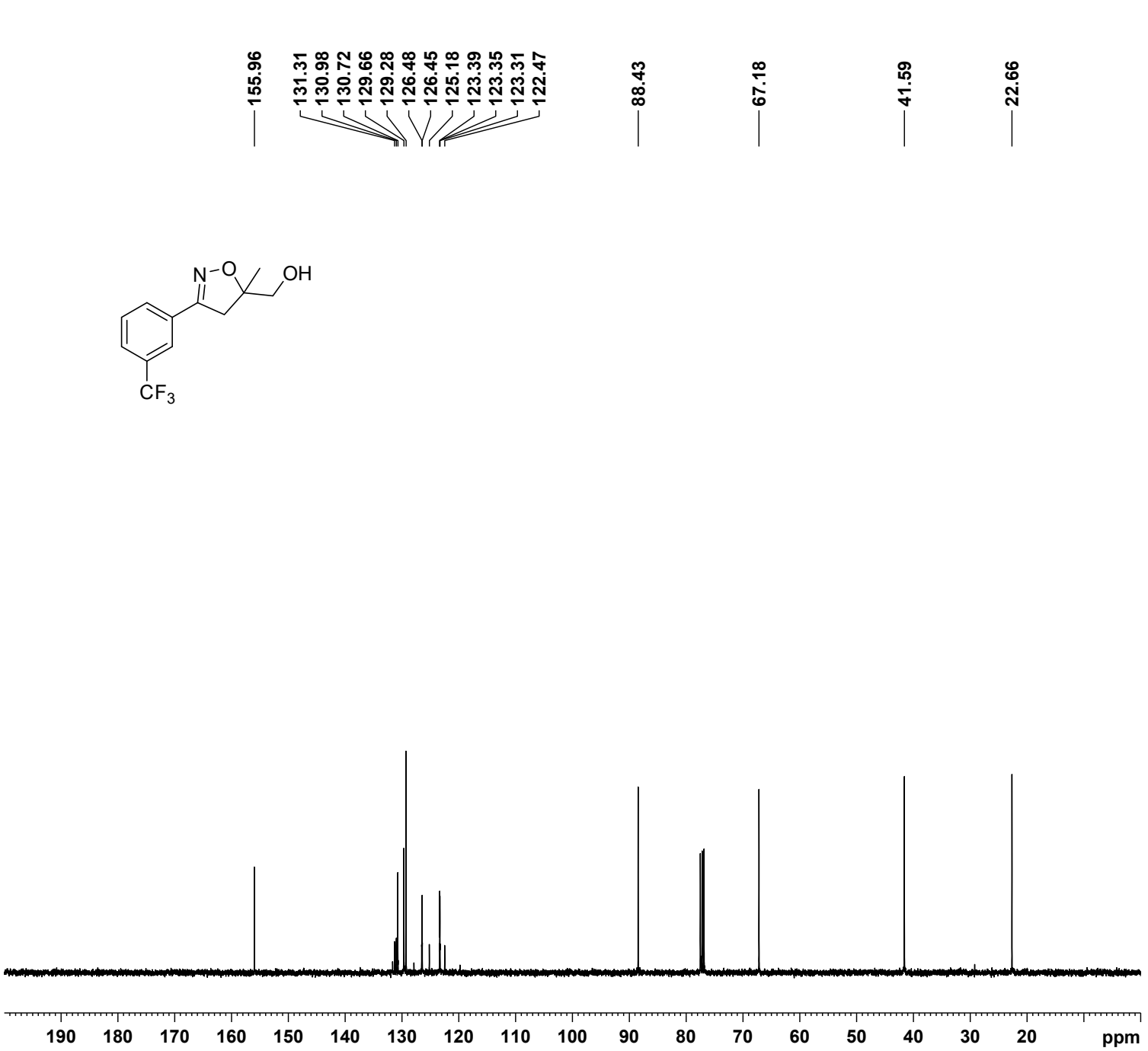


BRUKER

NAME	CWG151030-3-1
EXPNO	1
PROCNO	1
Date_	20151210
Time	17.56
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	294.4 K
D1	1.00000000 sec
TD0	1

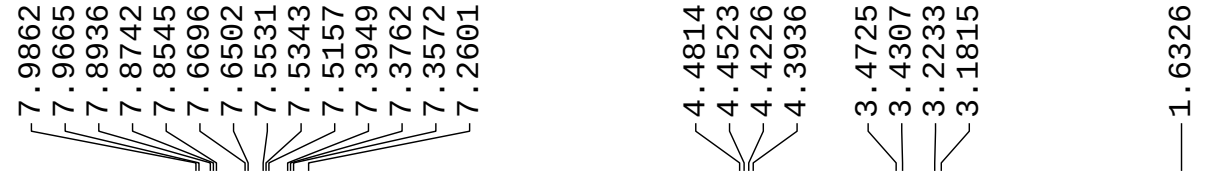
======== CHANNEL f1 ========

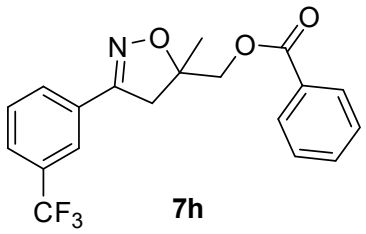
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700016 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



BRUKER

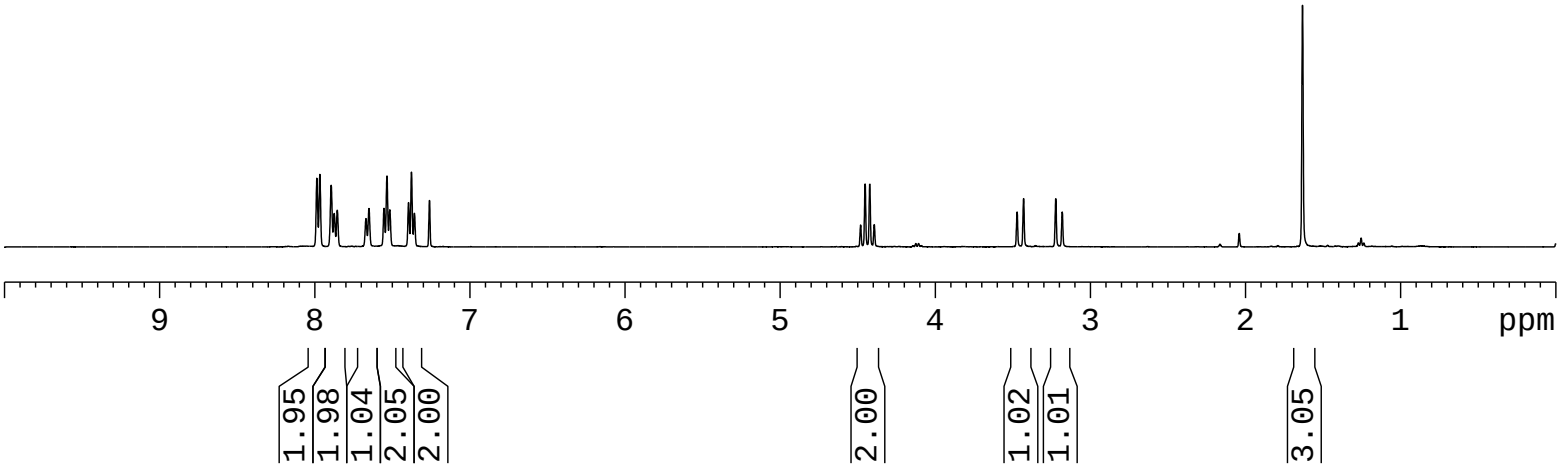
NAME	CWG151030-3-1-C13
EXPNO	1
PROCNO	1
Date_	20151210
Time	18.00
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	41
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	294.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228191 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

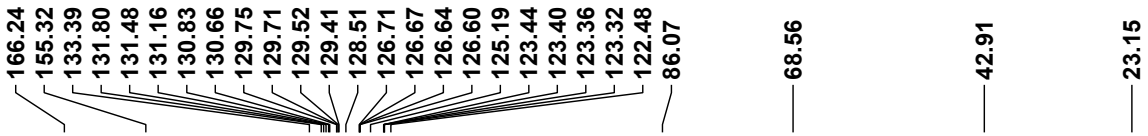


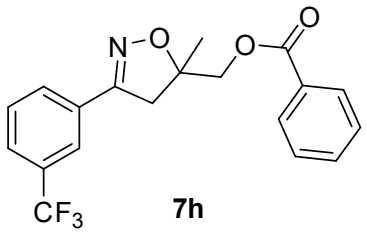


7h

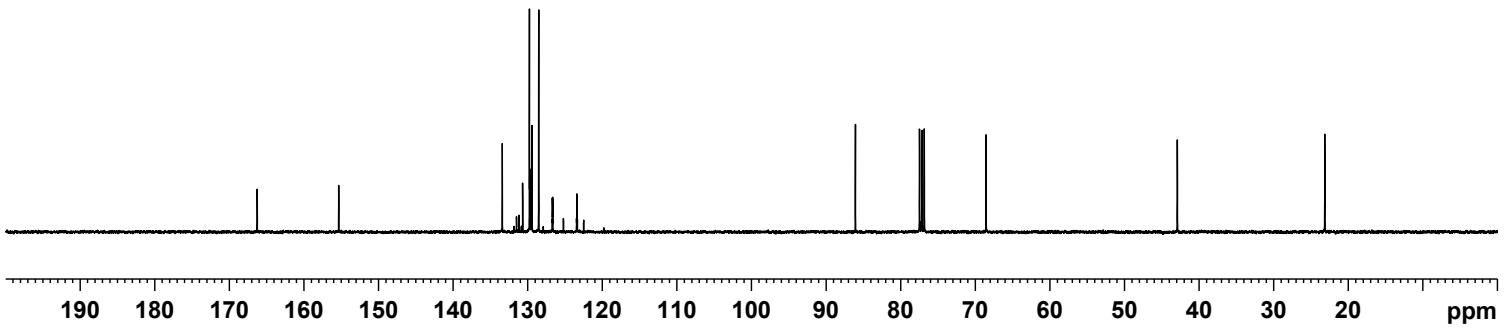
```
NAME          CWG151030-4
EXPNO                   1
PROCNO                  1
Date_            20151031
Time                17.00
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     11
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                   80.6
DW                 60.800 usec
DE                  6.50 usec
TE                 294.9 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700031 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

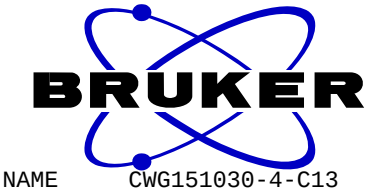




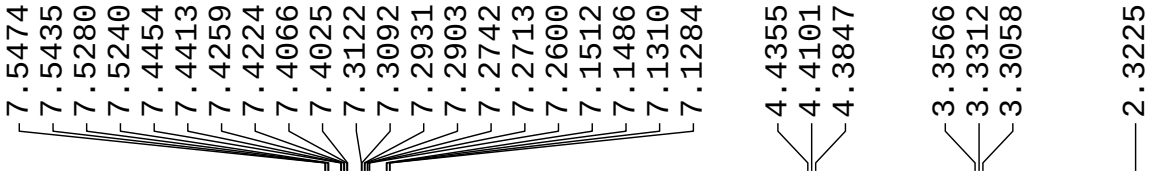


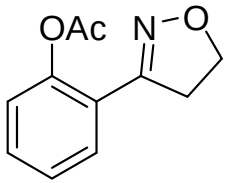
7h





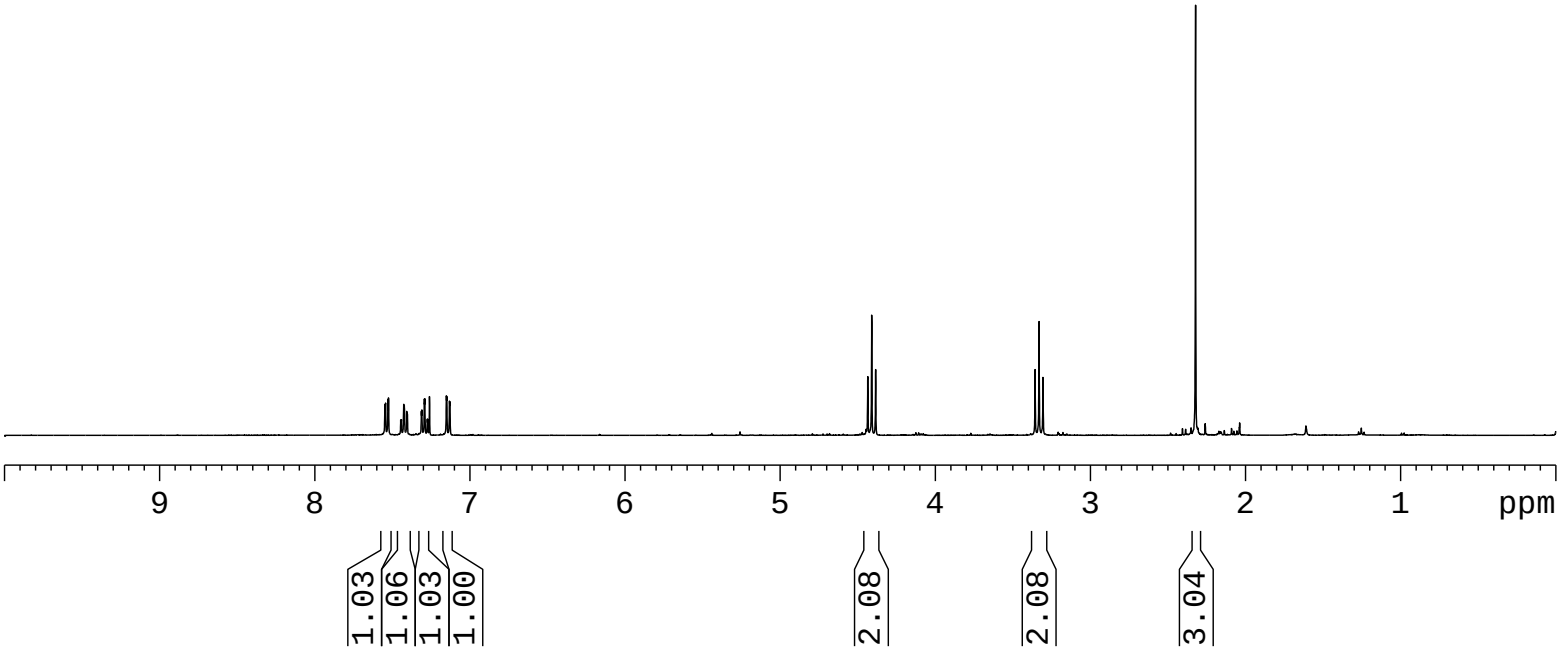
NAME	CWG151030-4-C13
EXPNO	1
PROCNO	1
Date_	20151128
Time	17.26
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	292.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228185 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

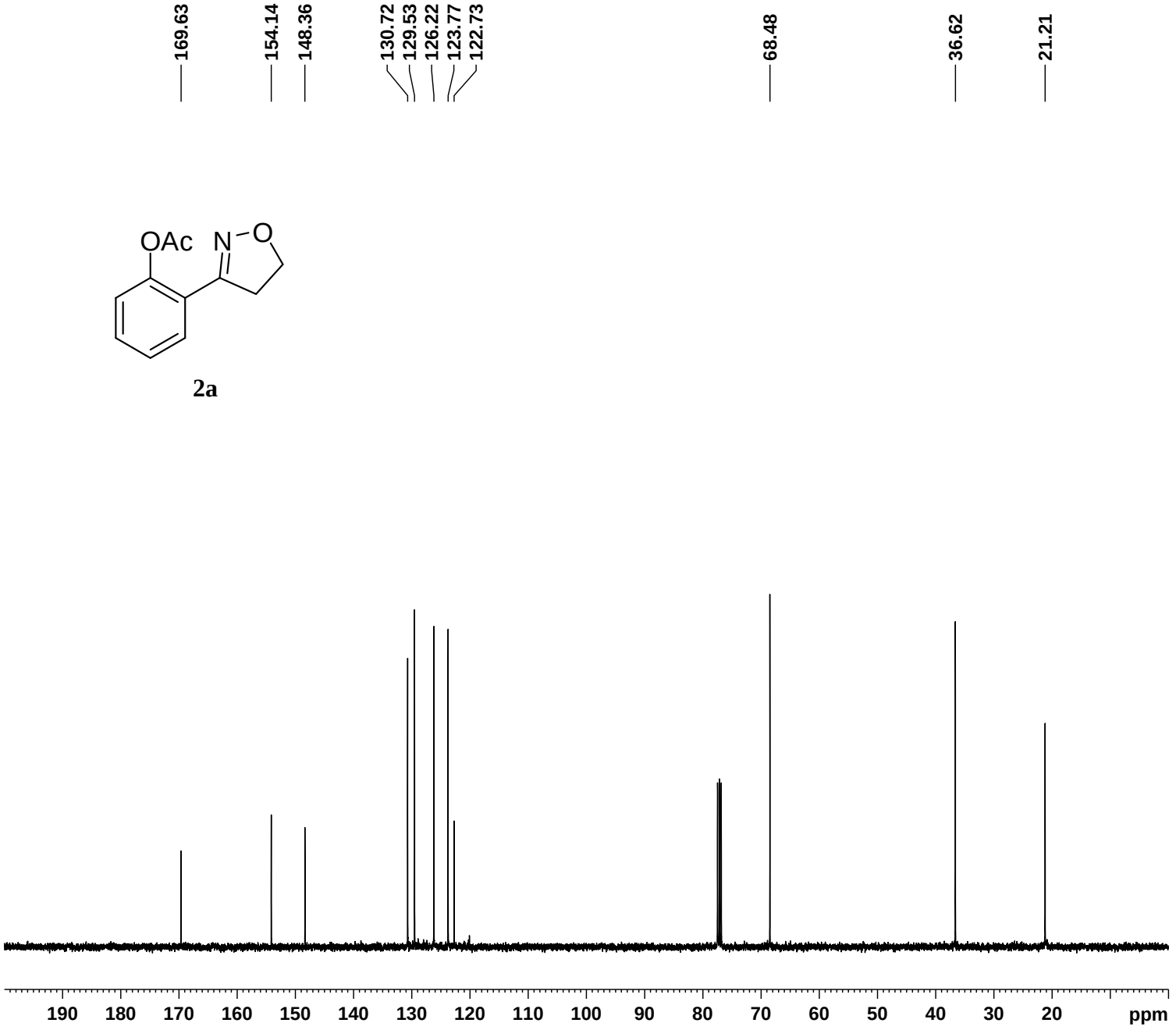




2a

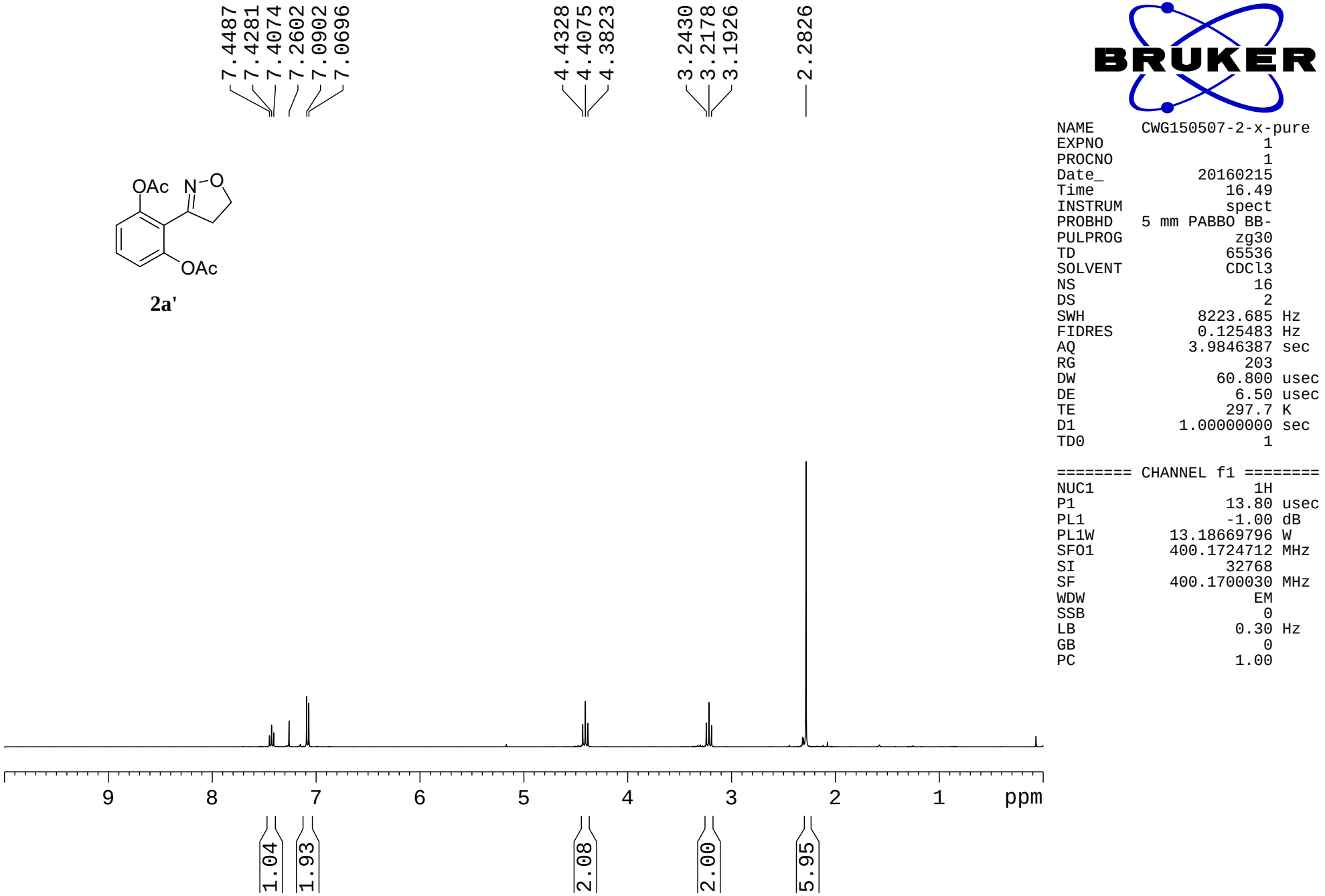
```
NAME        CWG150507-2-S
EXPNO                   1
PROCNO                  1
Date_            20150508
Time                20.04
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    144
DW                 60.800 usec
DE                  6.50 usec
TE                 299.4 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

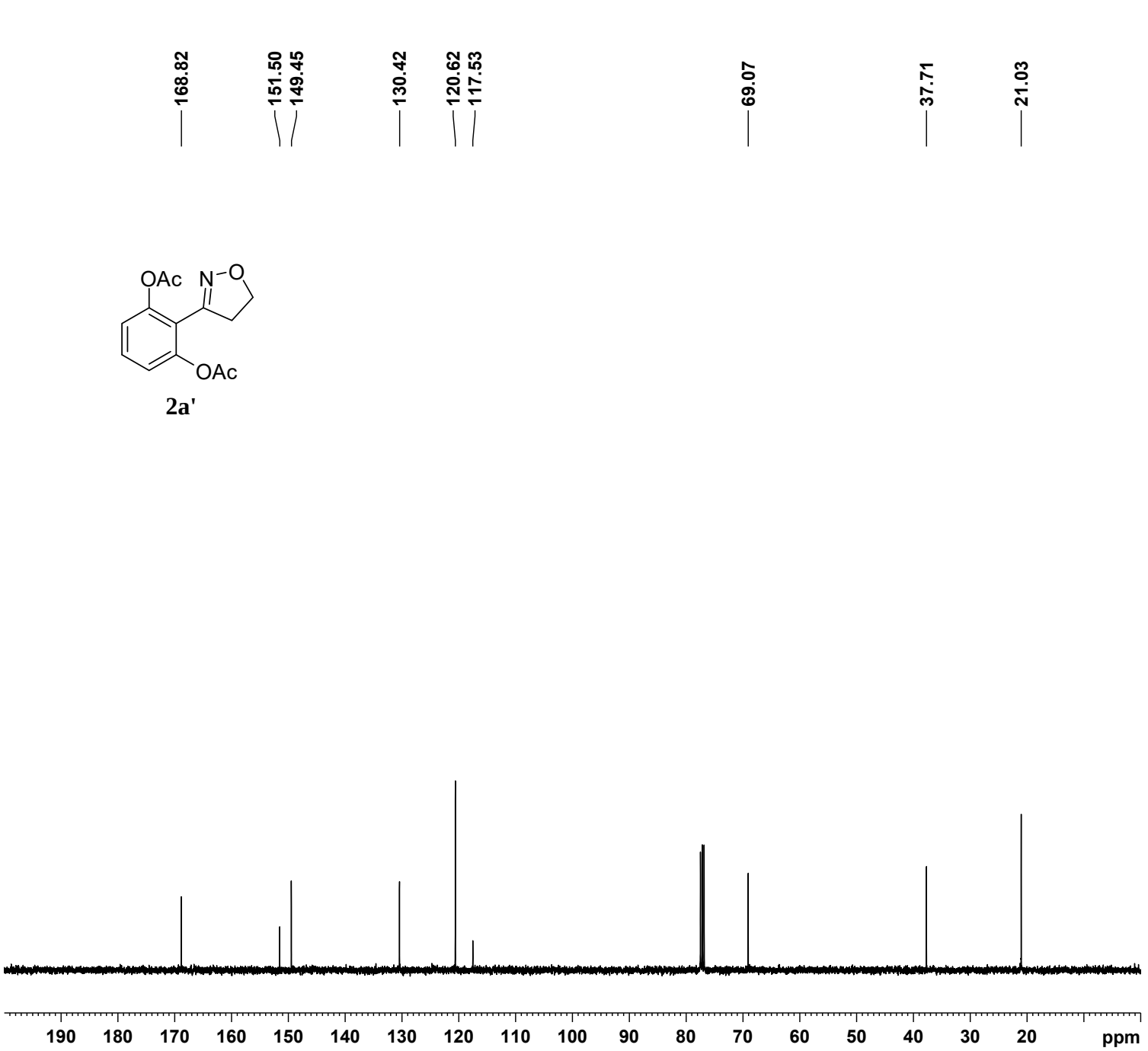




2a

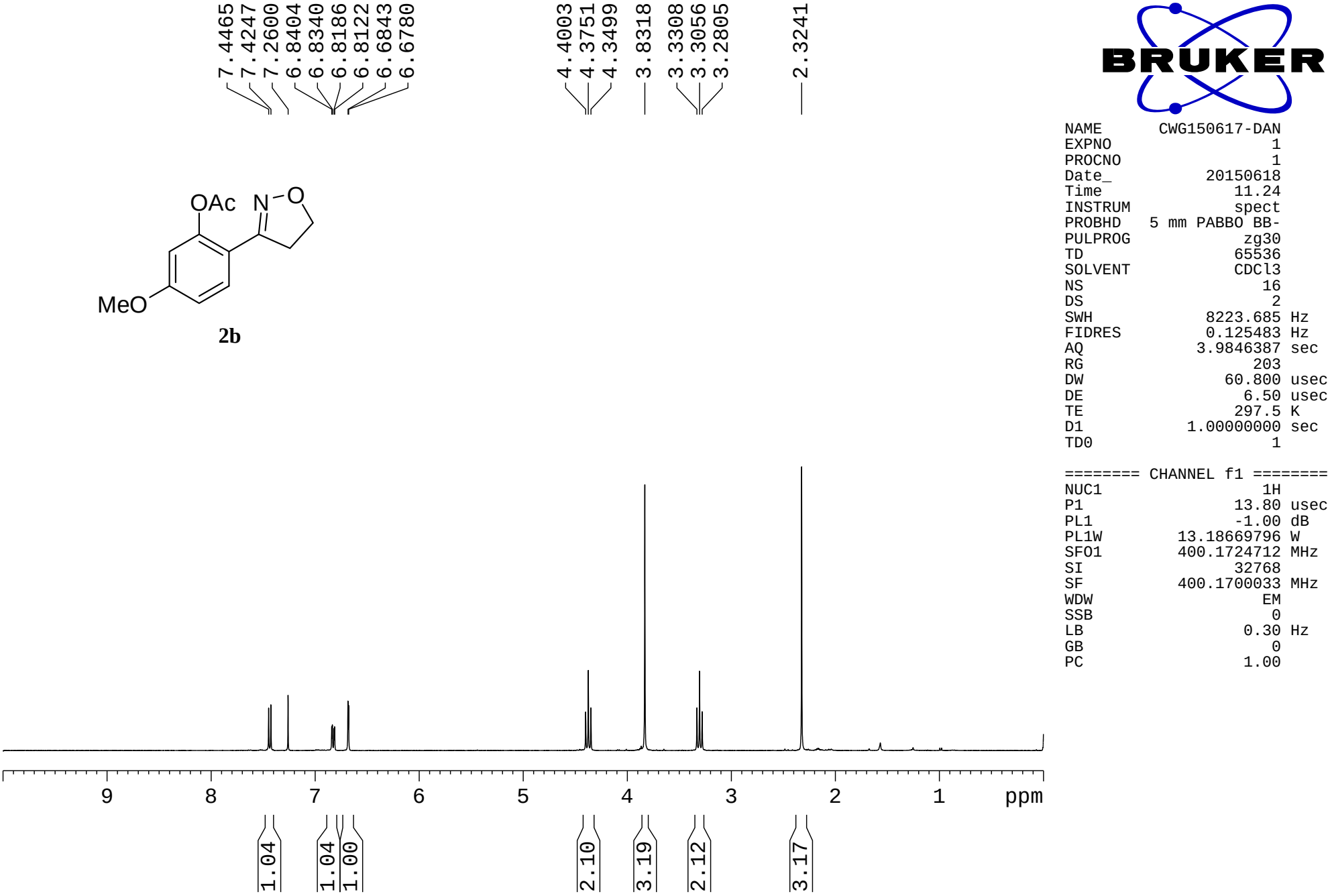
```
NAME        CWG150507-2-S-C13
EXPNO                      1
PROCNO                     1
Date_               20150509
Time                   17.14
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                       78
DS                        4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                      203
DW                   20.800 usec
DE                    6.50 usec
TE                   297.4 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                    32768
SF            100.6228284 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```


7.4487
7.4281
7.4074
7.2602
7.0902
7.0696
4.4328
4.4075
4.3823
3.2430
3.2178
3.1926
2.2826
OAc
N
O
OAc
2a'
NAME CWG150507-2-x-pure
EXPNO 1
PROCNO 1
Date_ 20160215
Time 16.49
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.7 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700030 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9
8
7
6
5
4
3
2
1
ppm
1.04
1.93
2.08
2.00
5.95



2a'

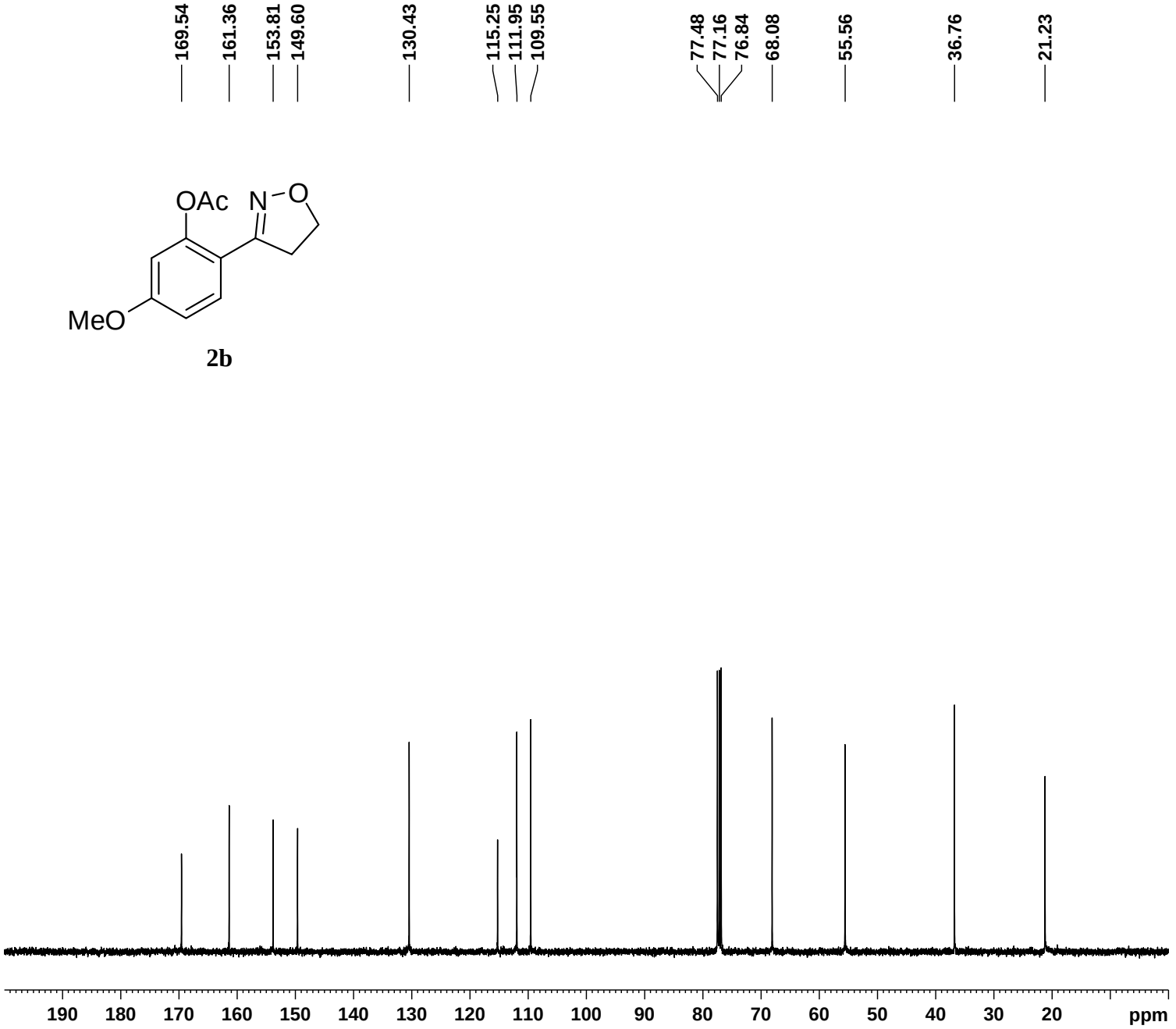
```
NAME      CWG150507-2-x-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160215
Time                       17.00
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                            33
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        297.5 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                         32768
SF                  100.6228208 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```



NAME	CWG150617-DAN
EXPNO	1
PROCNO	1
Date_	20150618
Time	11.24
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	297.5 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

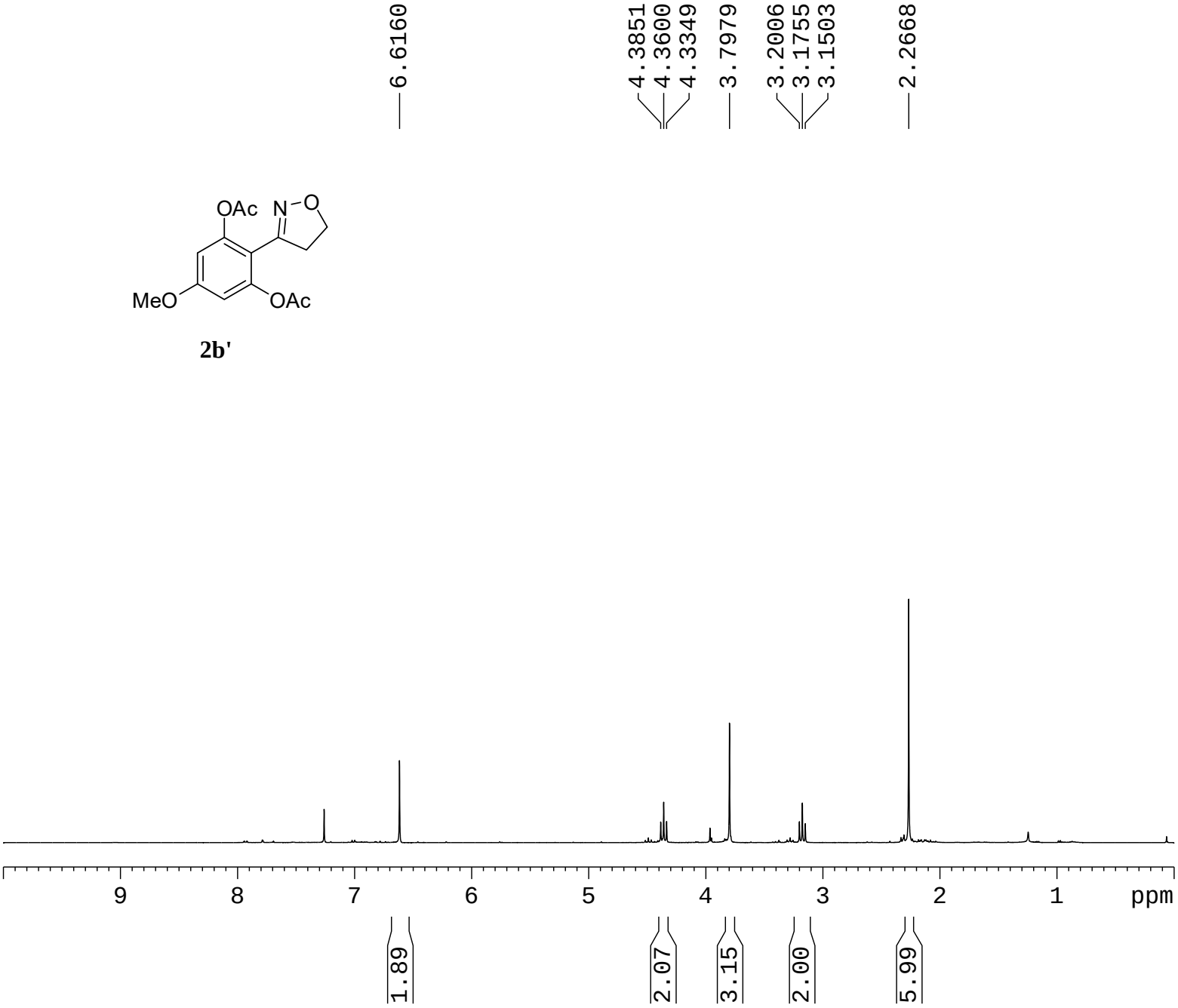


2b

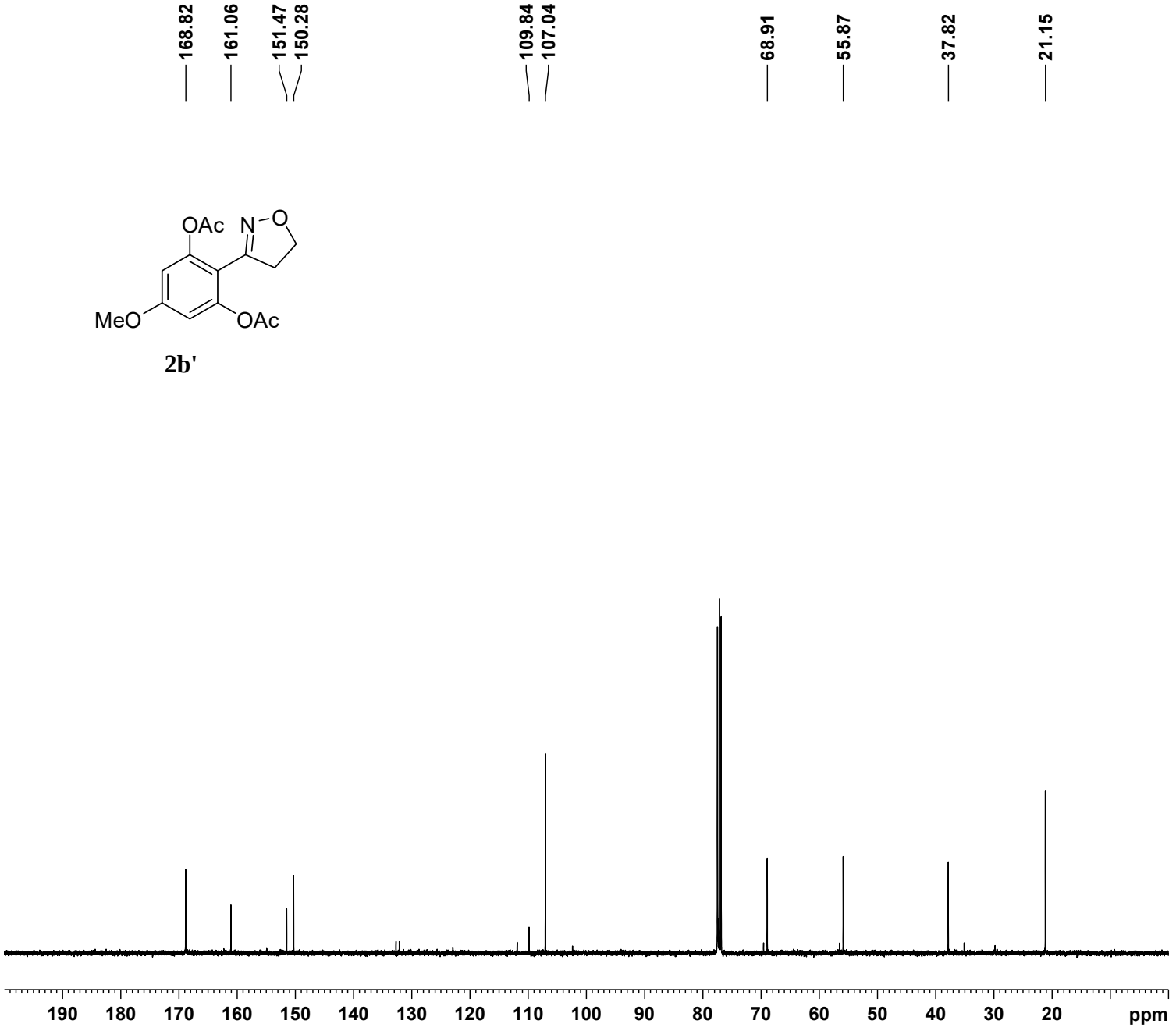
BRUKER

NAME	CWG150617-dan-C13
EXPNO	1
PROCNO	1
Date_	20150618
Time	12.21
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	600
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	298.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228270 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

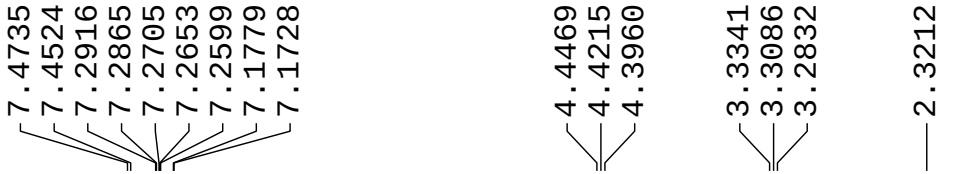
2b'

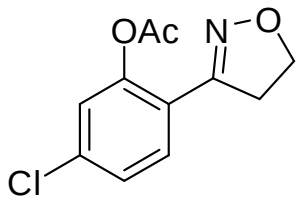



```
NAME      CWG150625-4-X-PURE
EXPNO                      1
PROCNO                     1
Date_               20160218
Time                   18.22
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG                 zg30
TD                     65536
SOLVENT                CDCl3
NS                        16
DS                         2
SWH                 8223.685 Hz
FIDRES              0.125483 Hz
AQ                3.9846387 sec
RG                       101
DW                    60.800 usec
DE                     6.50 usec
TE                    296.2 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     13.80 usec
PL1                    -1.00 dB
PL1W            13.18669796 W
SFO1           400.1724712 MHz
SI                     32768
SF             400.1700035 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```



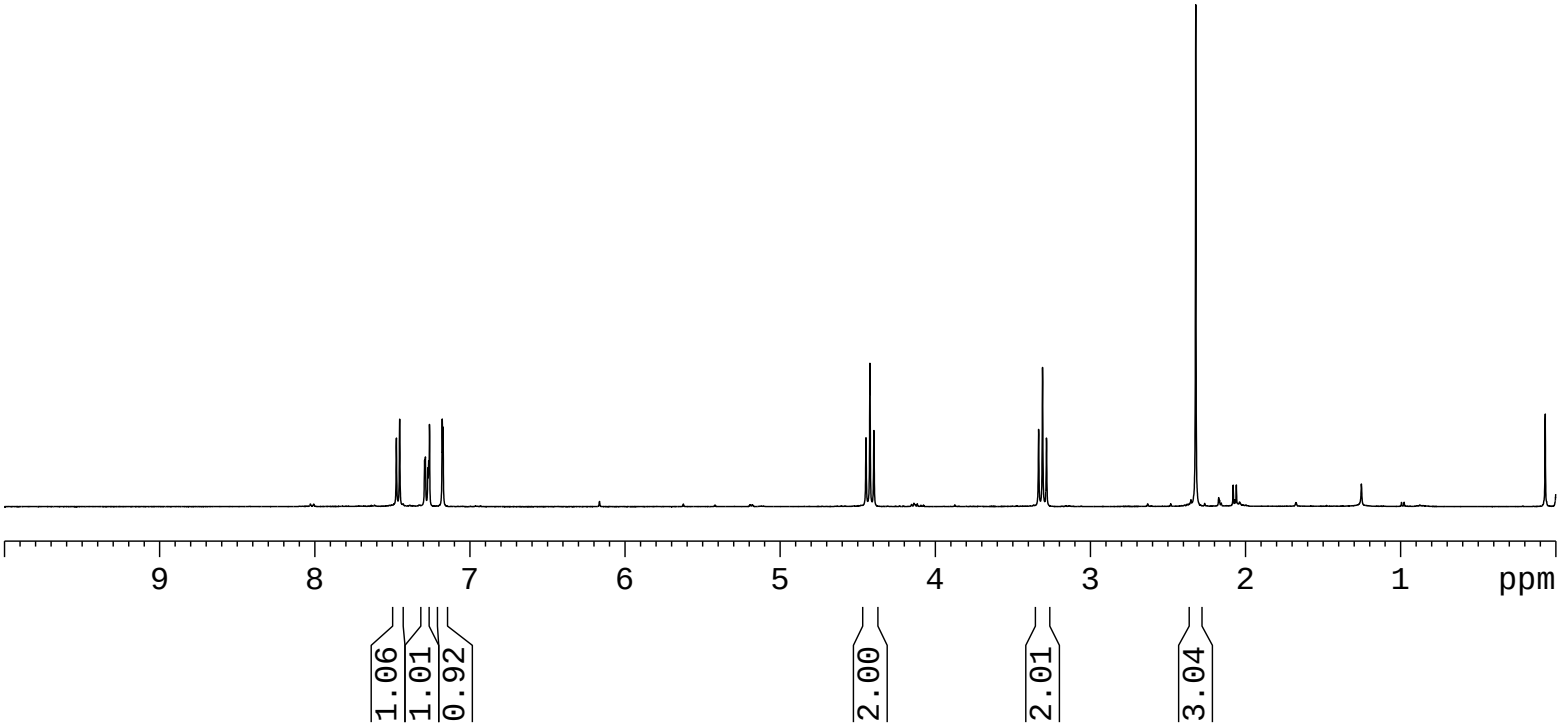

```
NAME      CWG150625-4-X-PURE-C13
EXPNO                  1
PROCNO                 1
Date_           20160218
Time               18.43
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   435
DS                     4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ              1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                297.4 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228151 MHz
WDW                  EM
SSB                  0
LB                1.00 Hz
GB                   0
PC                1.40
```

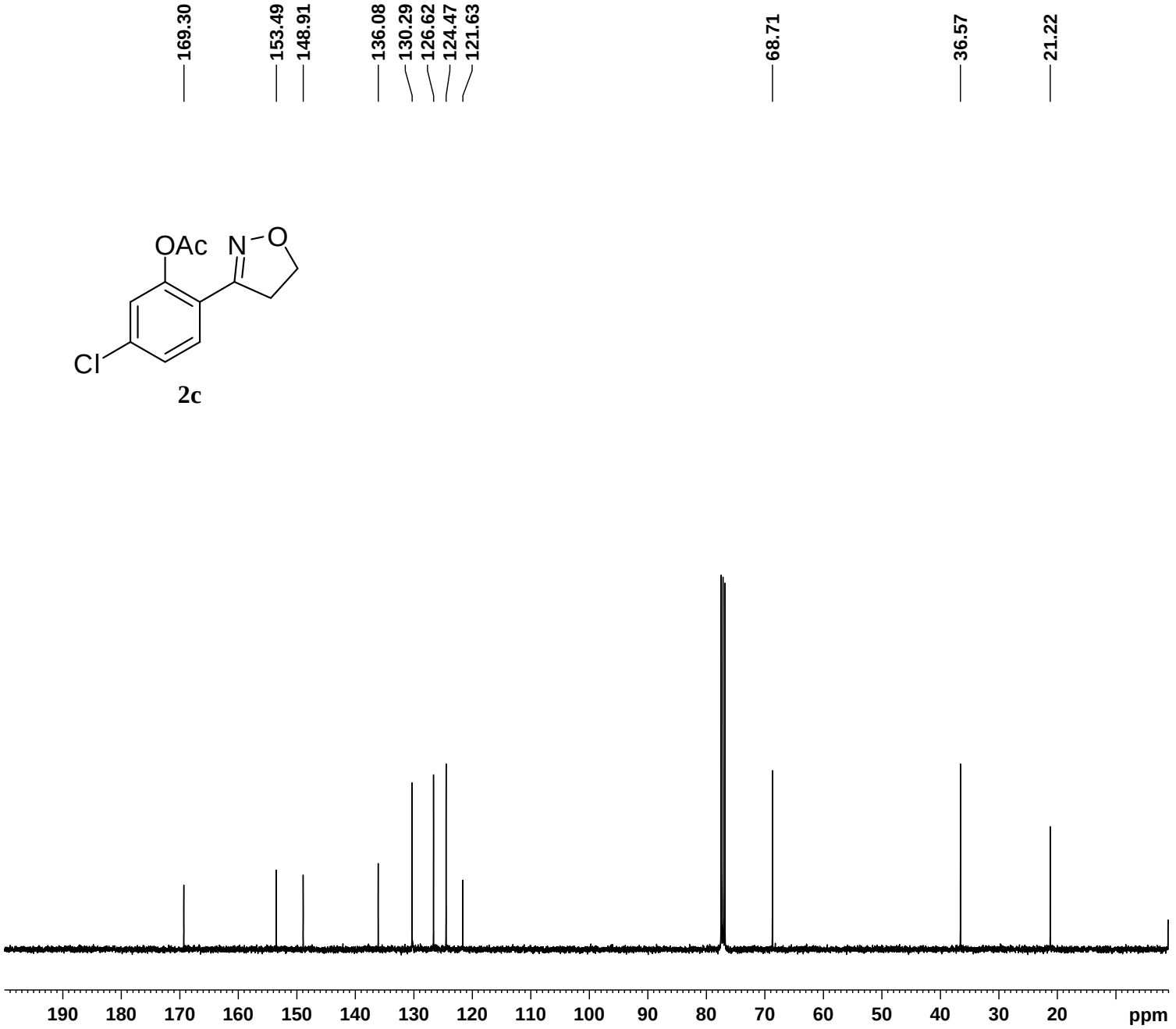




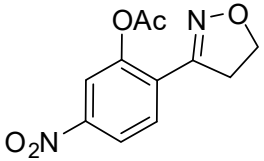
2c

```
NAME          CWG150613-2
EXPNO                   1
PROCNO                  1
Date_            20150614
Time                18.35
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 297.4 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```



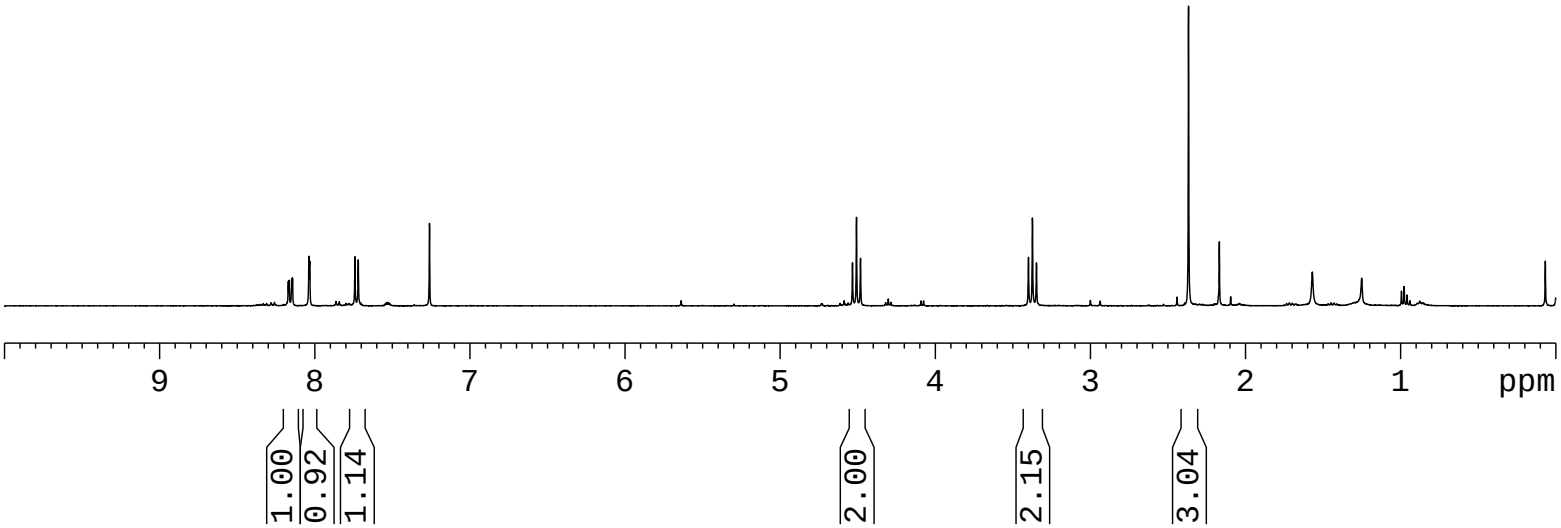


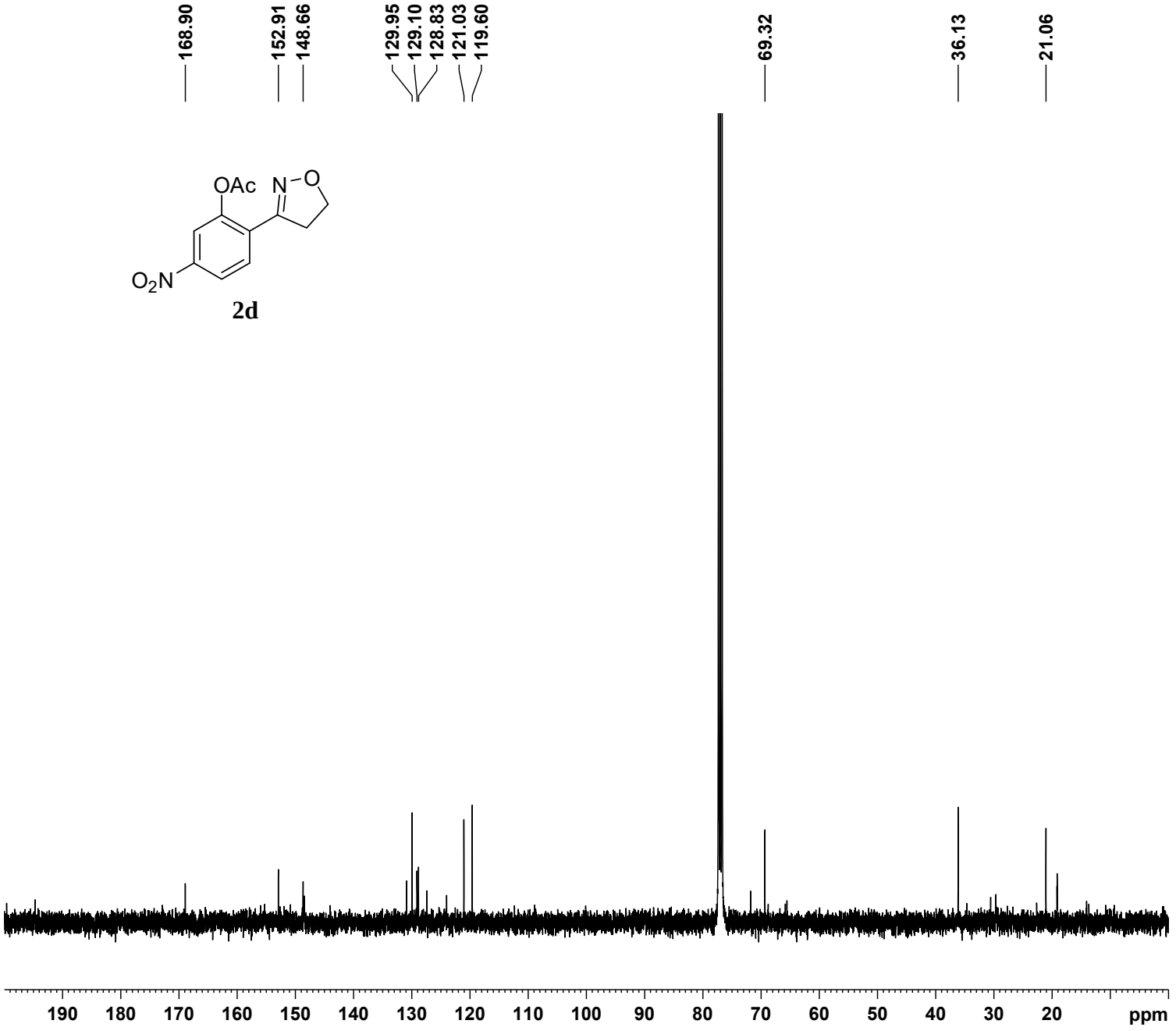

```
NAME      CWG150613-2-C13
EXPNO                  1
PROCNO                 1
Date_           20150614
Time               19.40
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  350
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE               297.7 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228169 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```



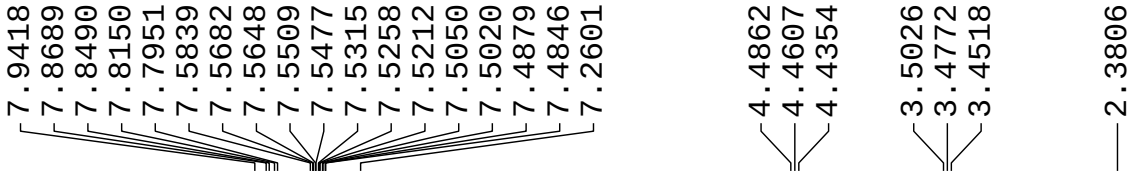
2d

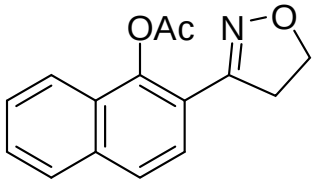
```
NAME        CWG150702-2-2
EXPNO                   1
PROCNO                  1
Date_            20150703
Time                20.04
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 296.8 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700032 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```






```
NAME      CWG150702-2-C13
EXPNO                  1
PROCNO                 1
Date_           20151007
Time               11.44
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2389
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE               297.3 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228270 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

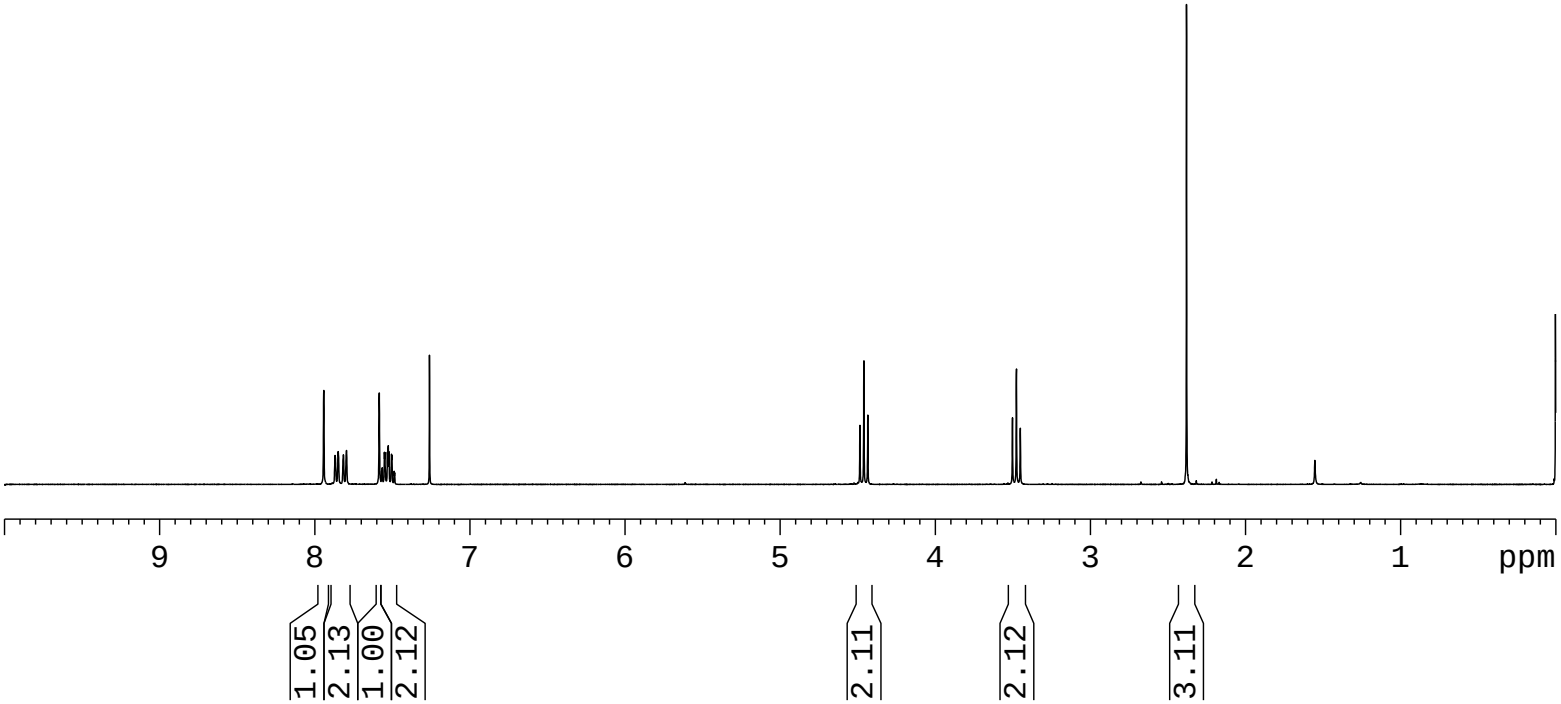


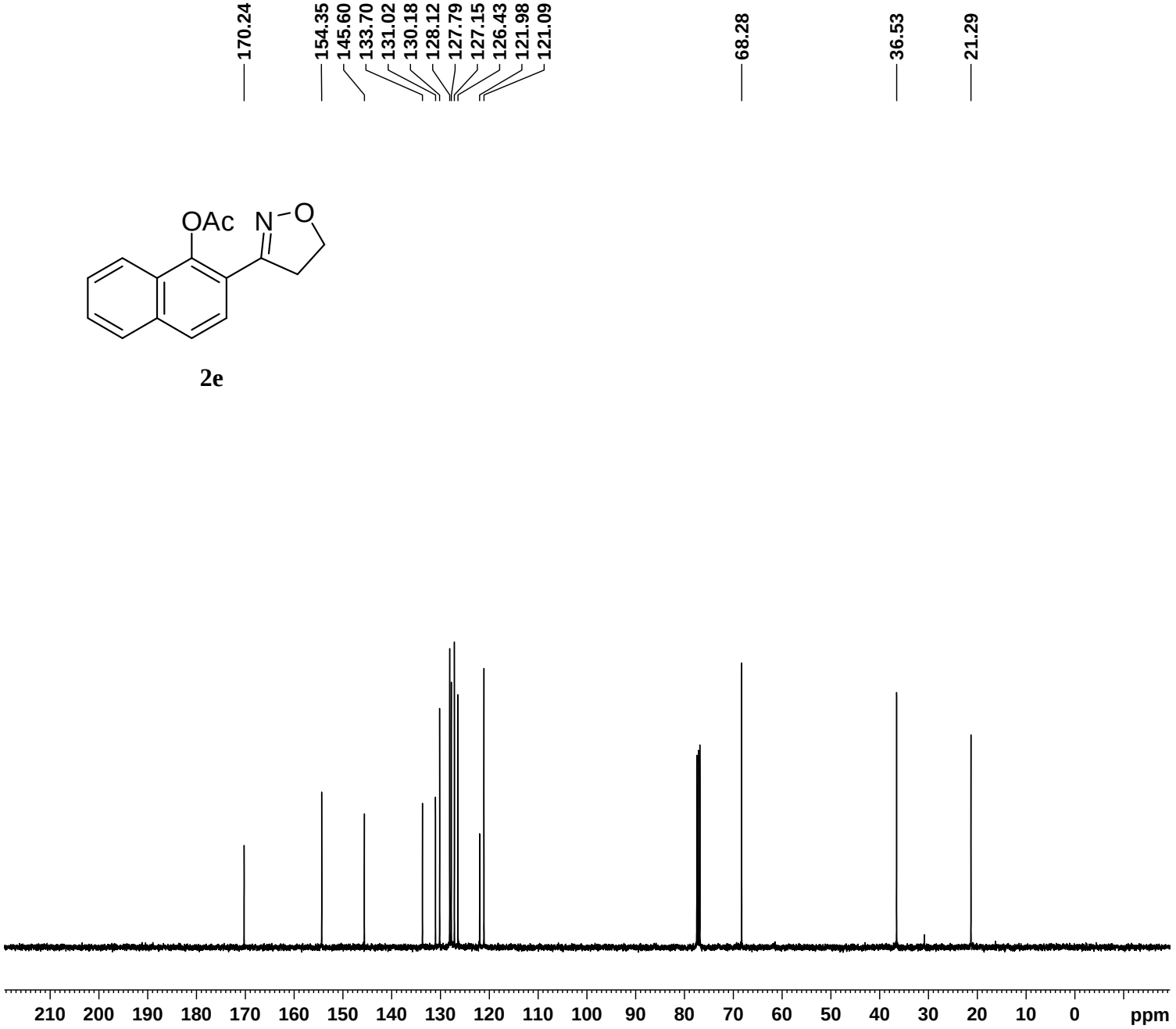


2e

NAME CWG150610-2-S
EXPNO 1
PROCNO 1
Date_ 20150611
Time 15.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.6 K
D1 1.00000000 sec
TD0 1

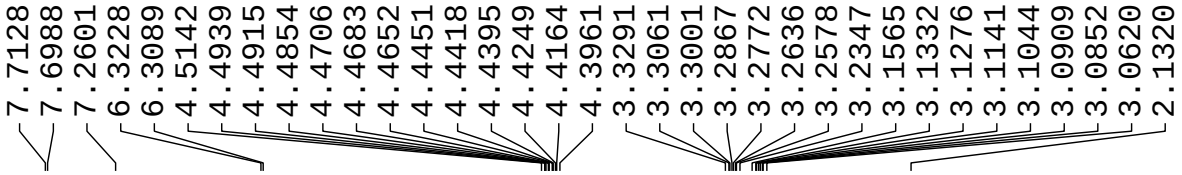
======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700033 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

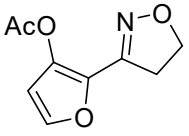




2e

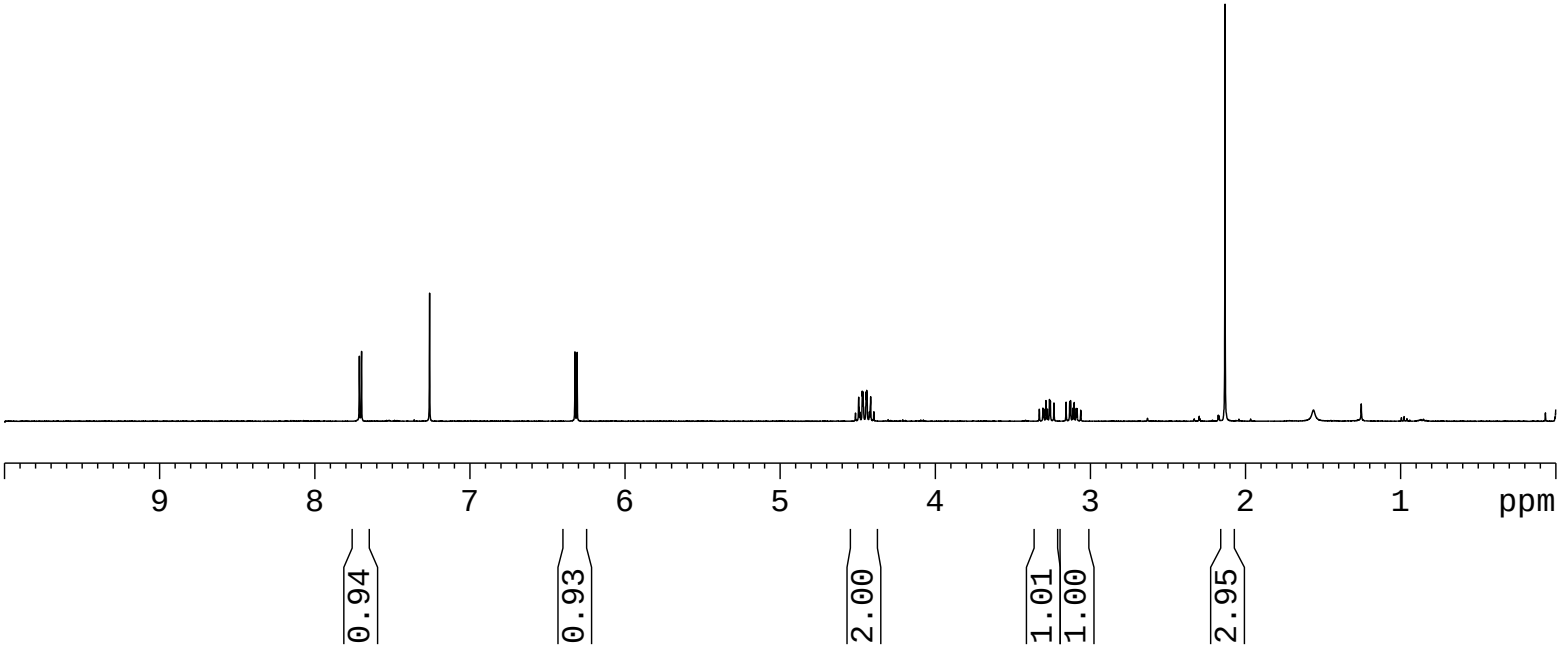
```
NAME        CWG150610-2-S-C13
EXPNO                      1
PROCNO                     1
Date_               20150611
Time                   17.19
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      111
DS                        4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                      203
DW                   20.800 usec
DE                    6.50 usec
TE                   297.8 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                    1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                    32768
SF            100.6228330 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

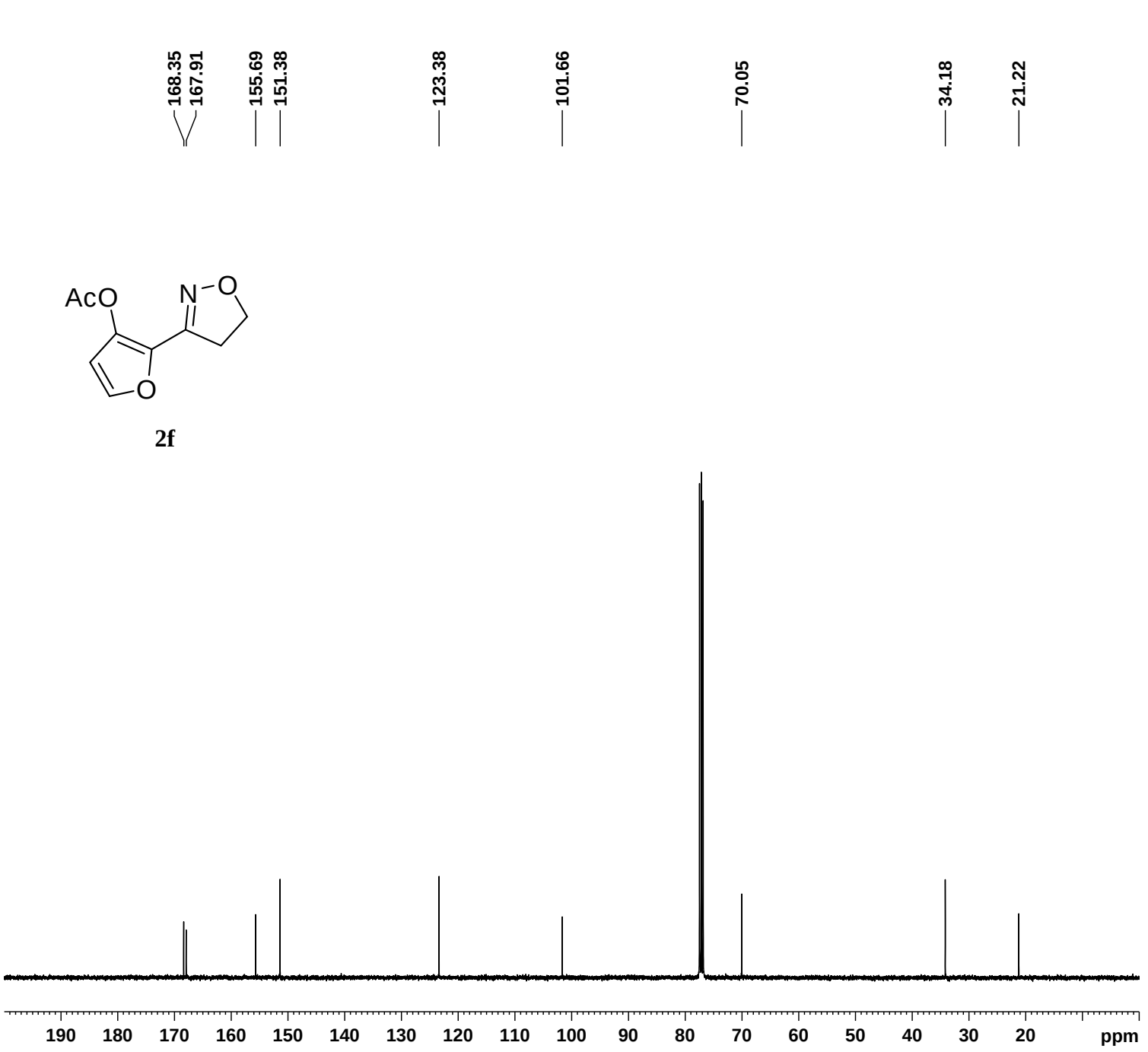




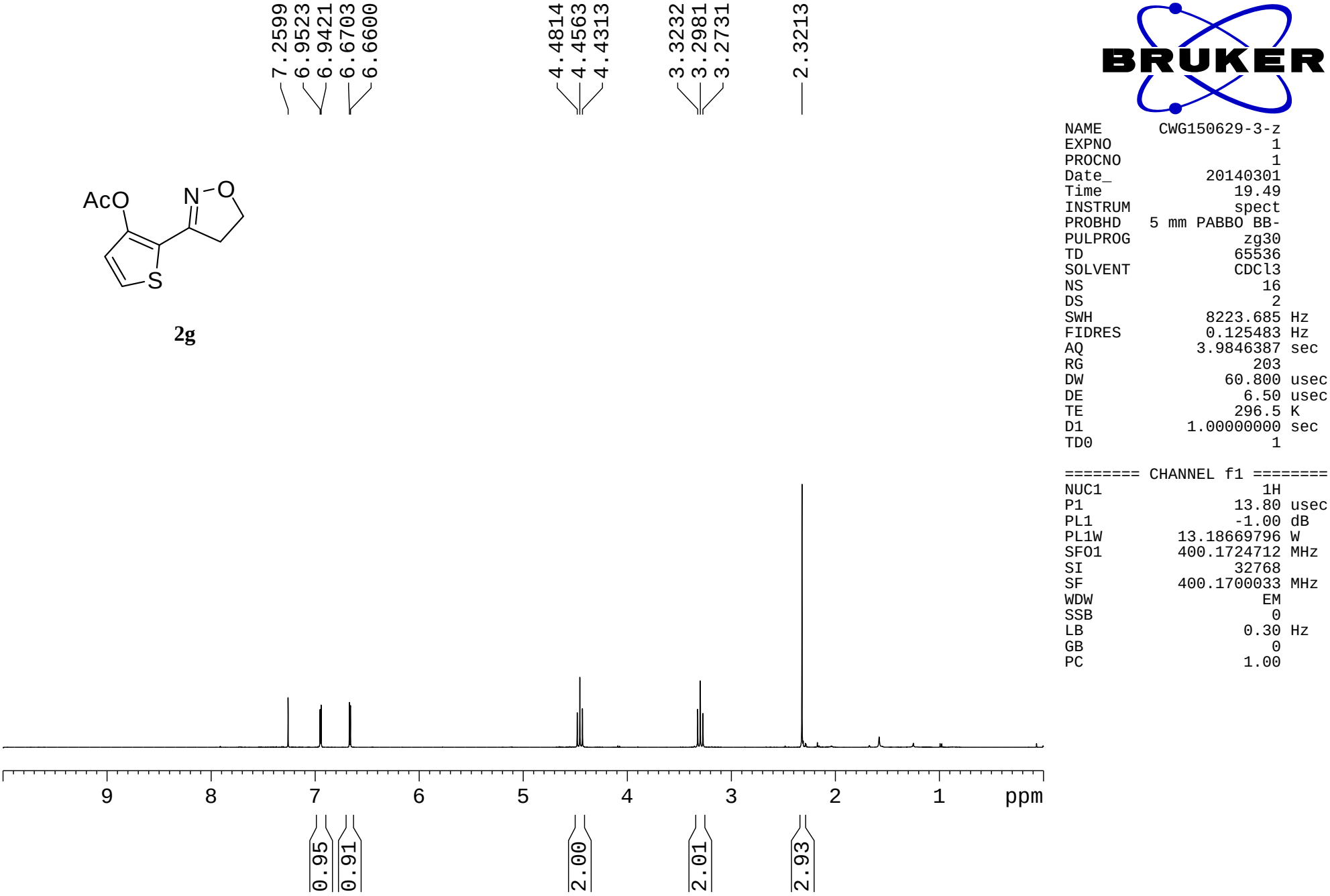
2f

```
NAME          CWG150705-1
EXPNO                   1
PROCNO                  1
Date_            20150706
Time                13.12
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 297.0 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700032 MHz
WDW                    EM
SSB                     0
LB                  0.30 Hz
GB                      0
PC                   1.00
```






```
NAME      CWG150705-1-C13
EXPNO                  1
PROCNO                 1
Date_           20150706
Time               17.00
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1643
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  203
DW                20.800 usec
DE                 6.50 usec
TE                297.5 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228128 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

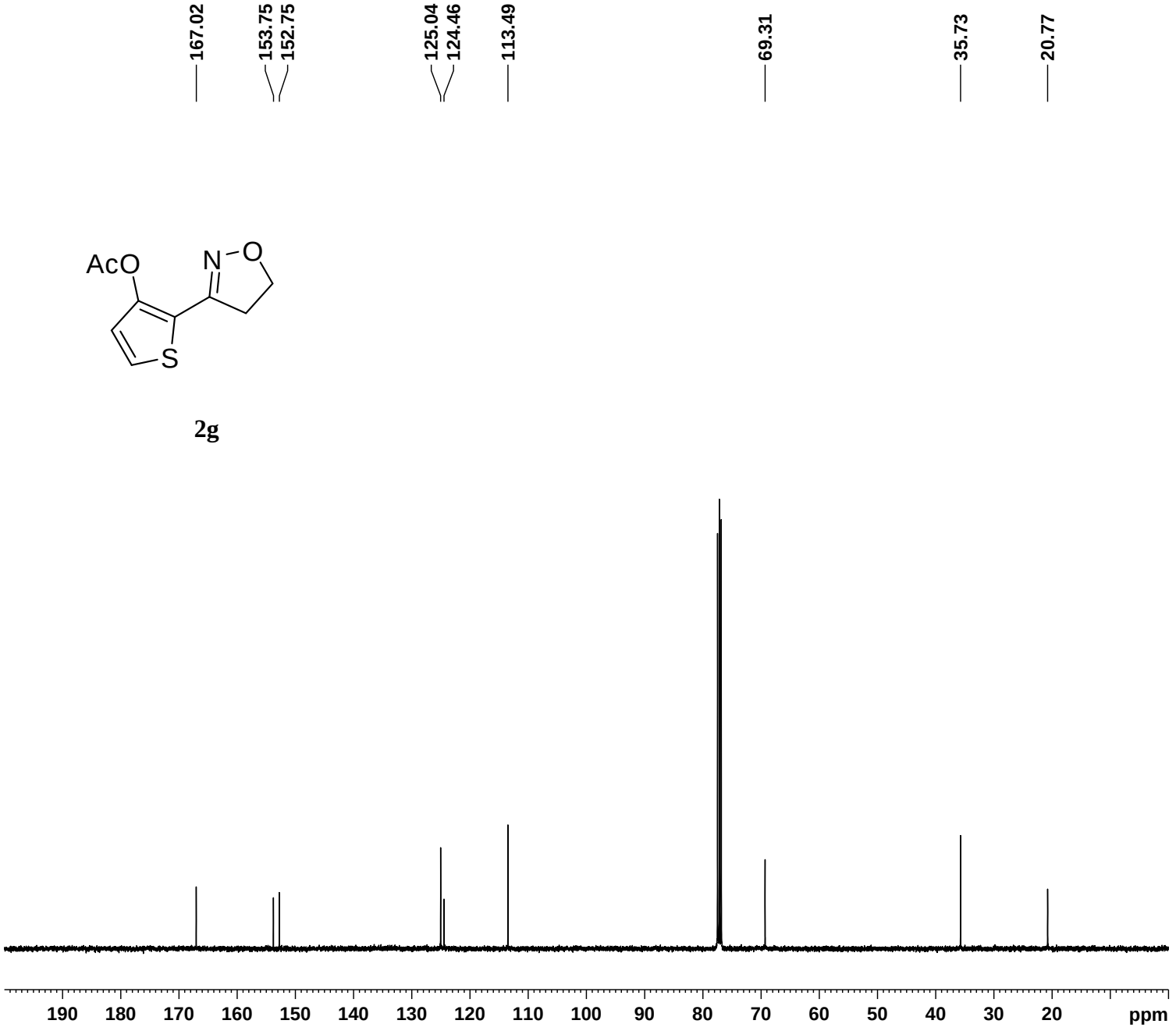


BRUKER

NAME	CWG150629-3-z
EXPNO	1
PROCNO	1
Date_	20140301
Time	19.49
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1

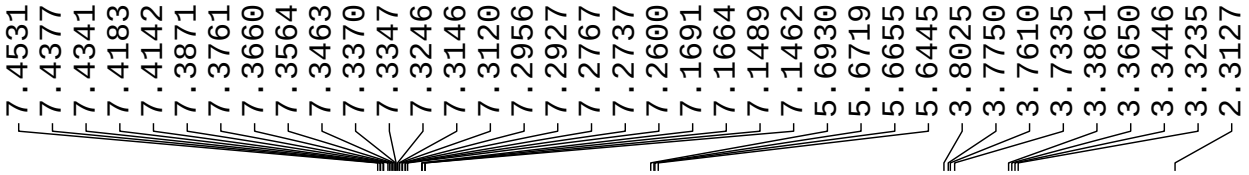
======== CHANNEL f1 ========

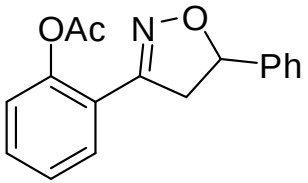
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



2g

```
NAME        CWG150629-3-C13
EXPNO                    1
PROCNO                   1
Date_             20150708
Time                 14.37
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1453
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                299.5 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                 32768
SF         100.6228150 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

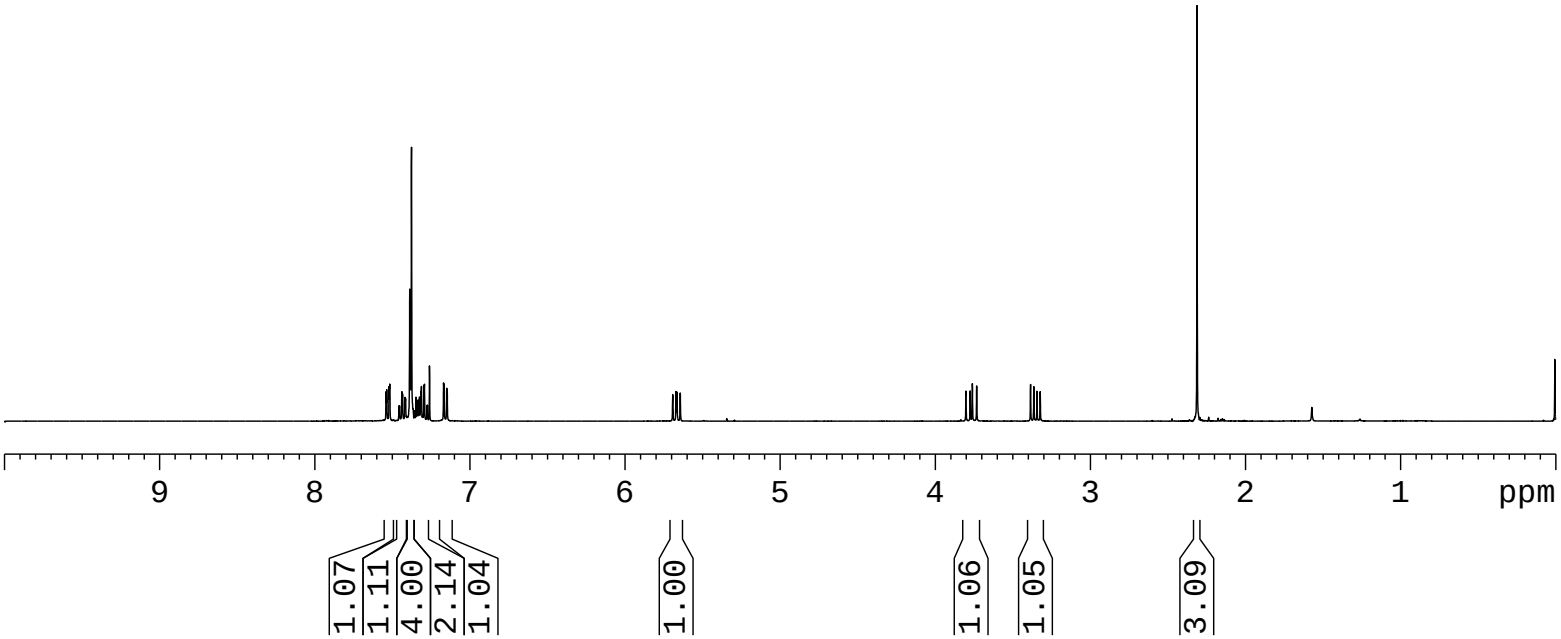


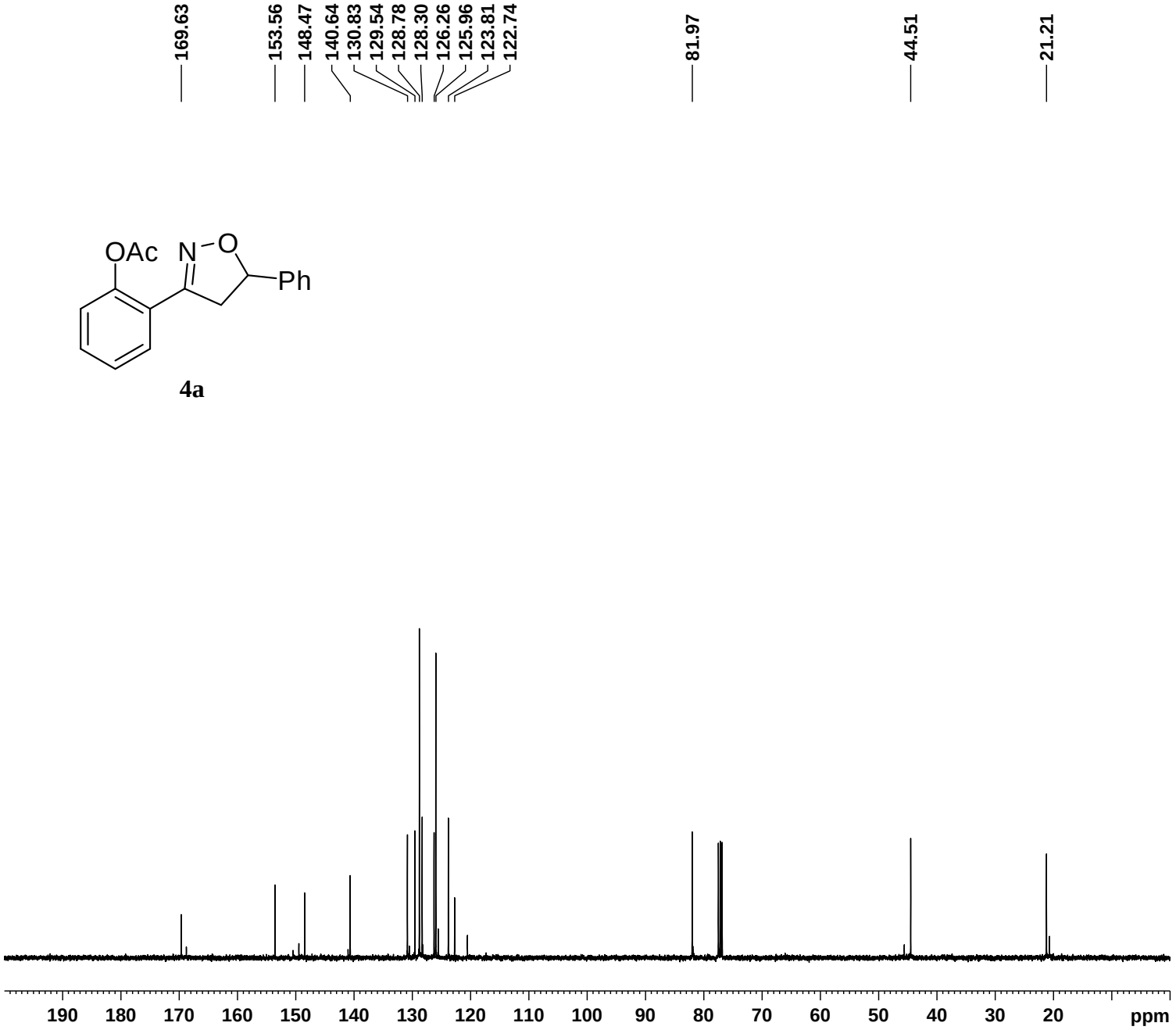


4a

NAME CWG150420-S(1)
EXPNO 1
PROCNO 1
Date_ 20150606
Time 14.01
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.8 K
D1 1.00000000 sec
TD0 1

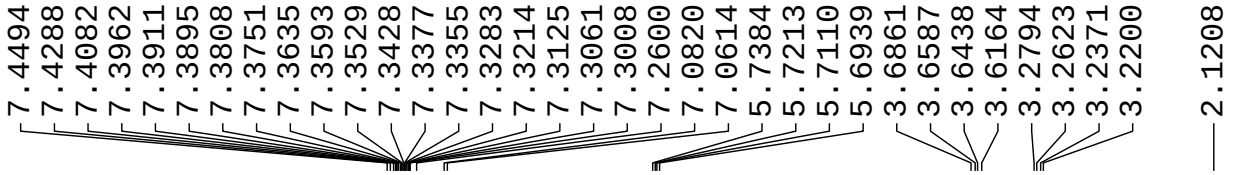
======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700033 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

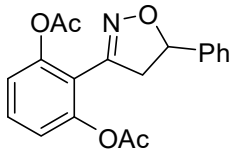




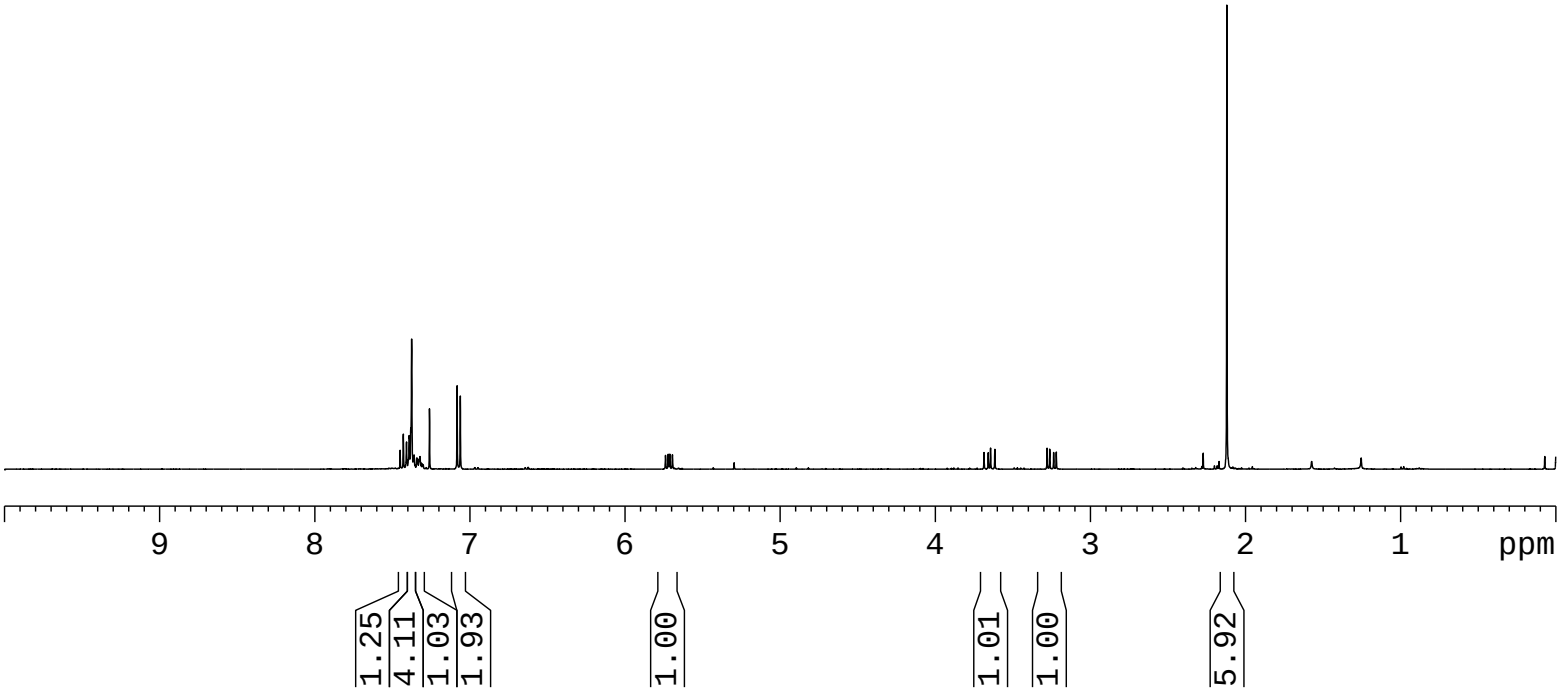
4a

```
NAME        CWG150420-S(1)C13
EXPNO                      1
PROCNO                     1
Date_               20150606
Time                   14.24
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                        52
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     297.6 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                     32768
SF               100.6228308 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

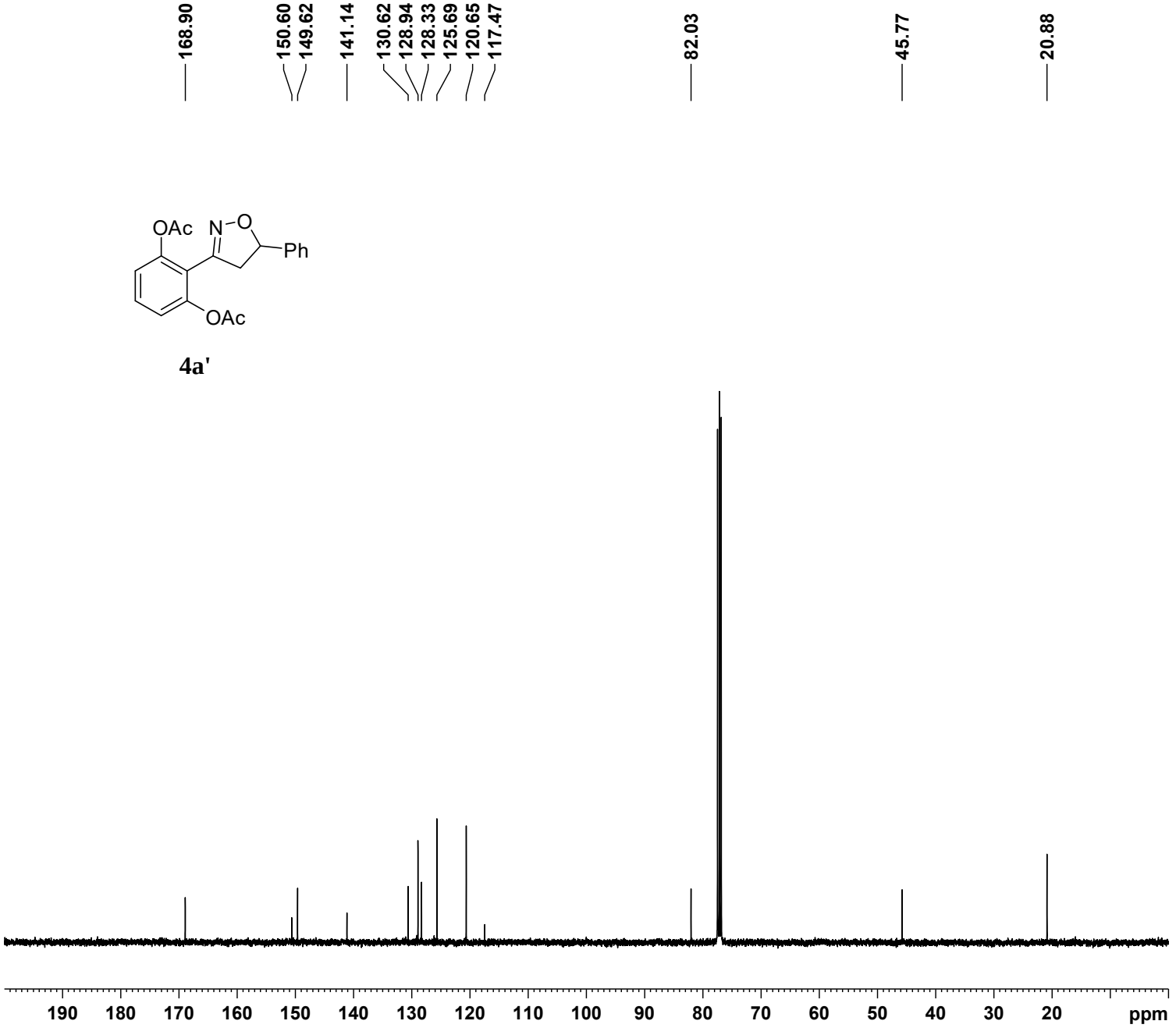




4a'

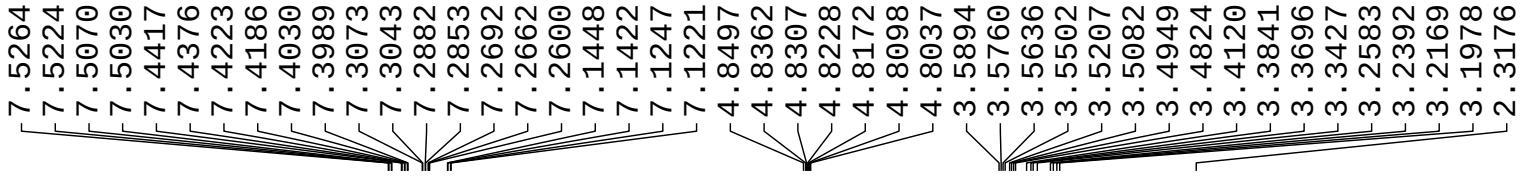


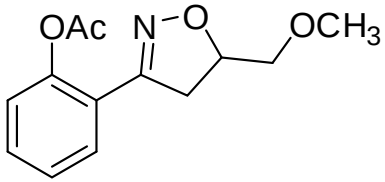

```
NAME        CWG150420-X-1
EXPNO                   1
PROCNO                  1
Date_            20160223
Time                9.49
INSTRUM            spect
PROBHD    5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9846387 sec
RG                   144
DW                60.800 usec
DE                 6.50 usec
TE                294.5 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                 32768
SF           400.1700033 MHz
WDW                   EM
SSB                    0
LB                 0.30 Hz
GB                     0
PC                  1.00
```



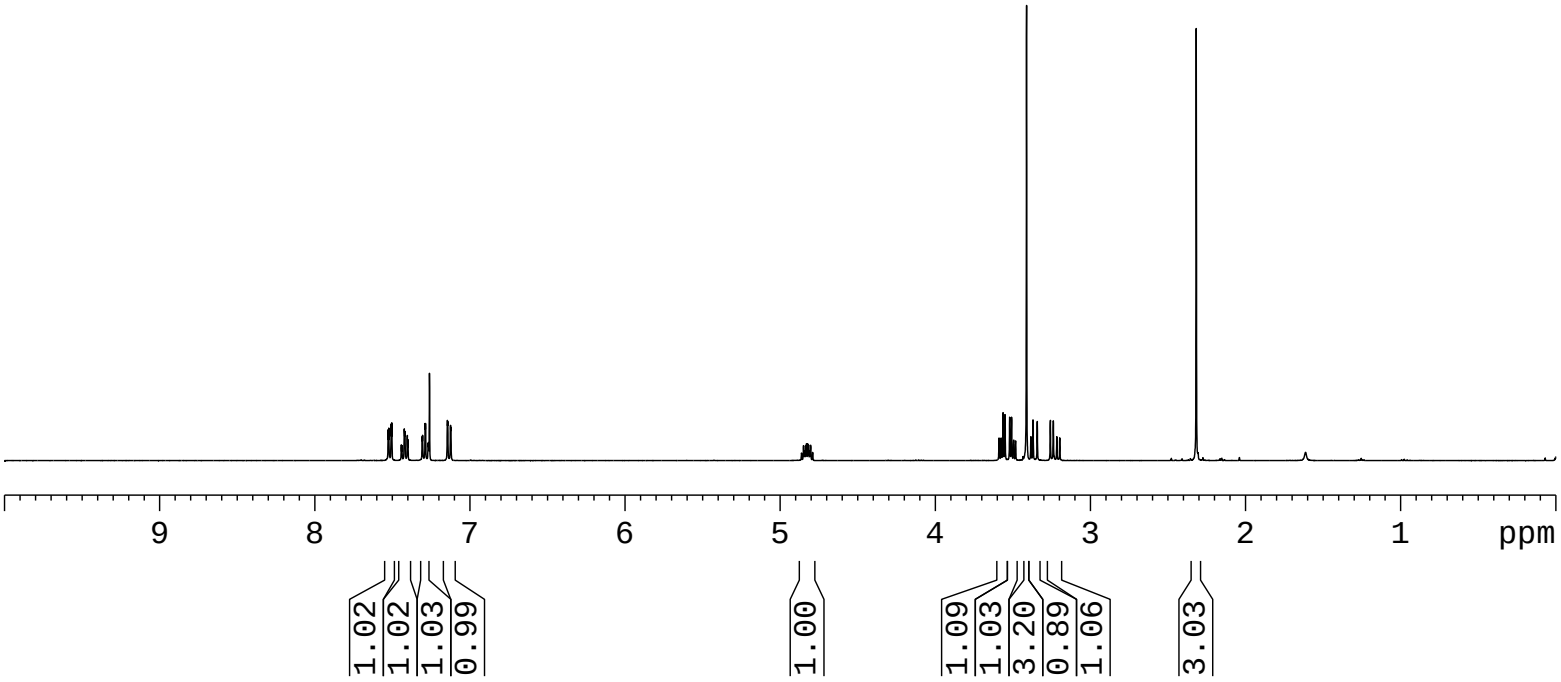
4a'

```
NAME          CWG150420-x-1-C13
EXPNO                        1
PROCNO                       1
Date_                 20160223
Time                     15.10
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         508
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      297.5 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                       8.50 usec
PL1                     -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                     -1.00 dB
PL12                    14.26 dB
PL13                    14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                       32768
SF               100.6228114 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

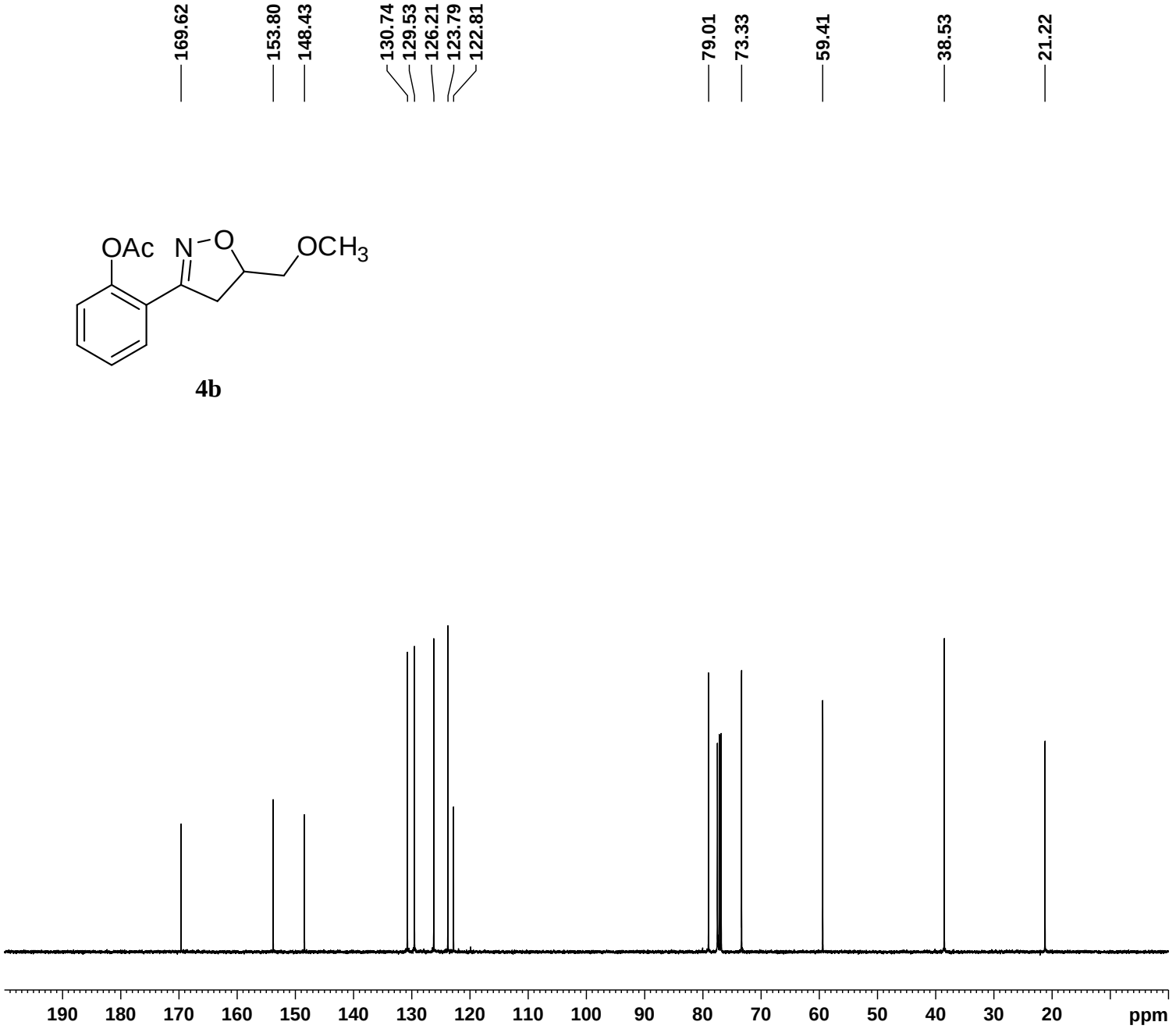




4b

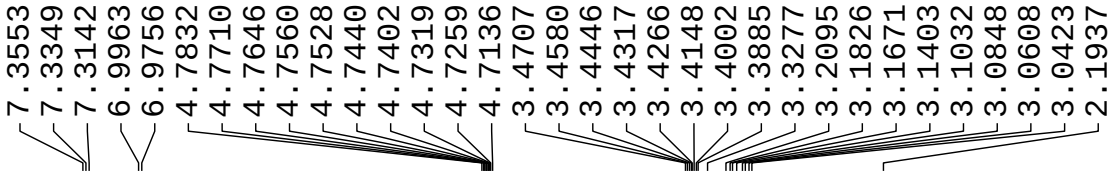


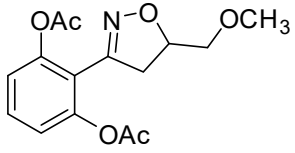

```
NAME          CWG150413-3
EXPNO                   1
PROCNO                  1
Date_            20150207
Time                11.22
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    161
DW                 60.800 usec
DE                  6.50 usec
TE                 297.6 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700030 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



4b

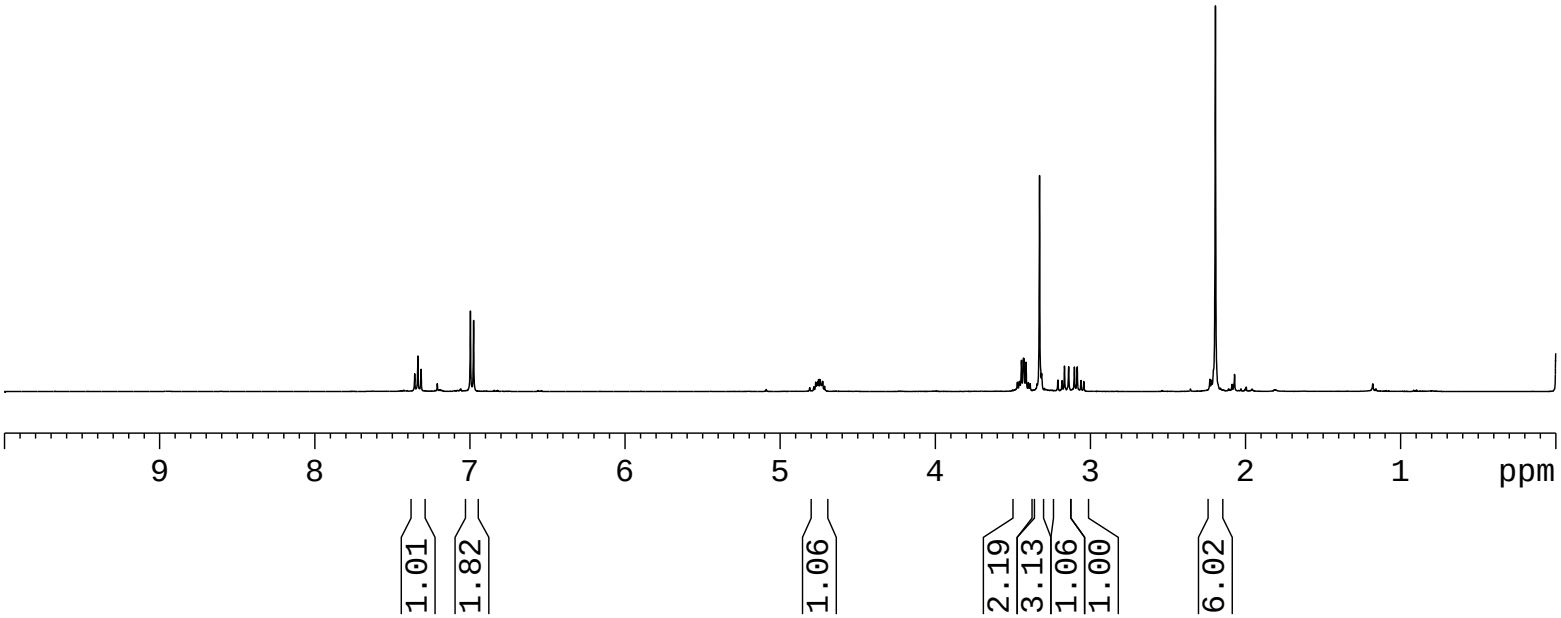
```
NAME        CWG150413-3-C13
EXPNO                    1
PROCNO                   1
Date_             20150207
Time                 14.02
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   500
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                299.2 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                32768
SF          100.6228249 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

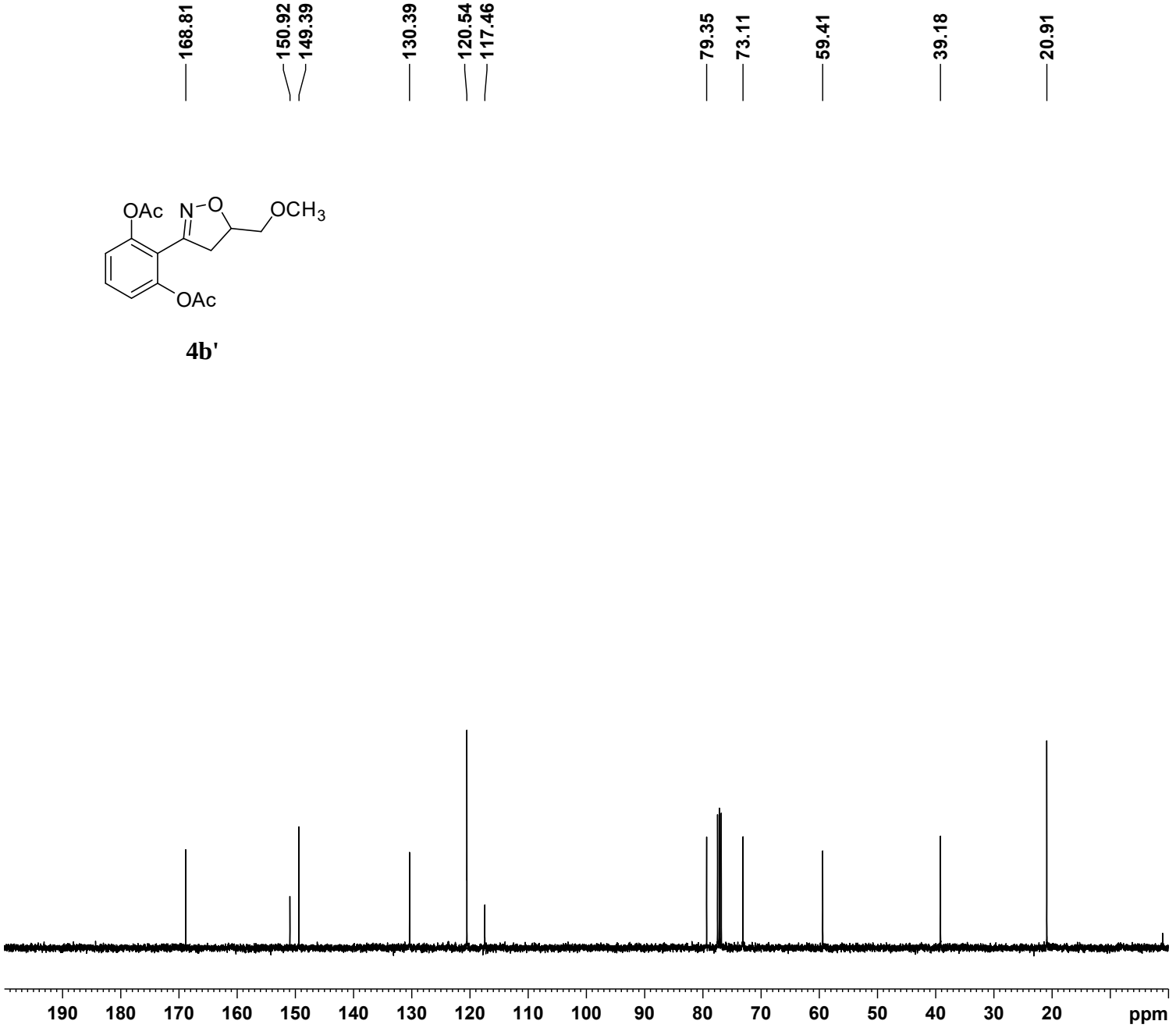




4b'

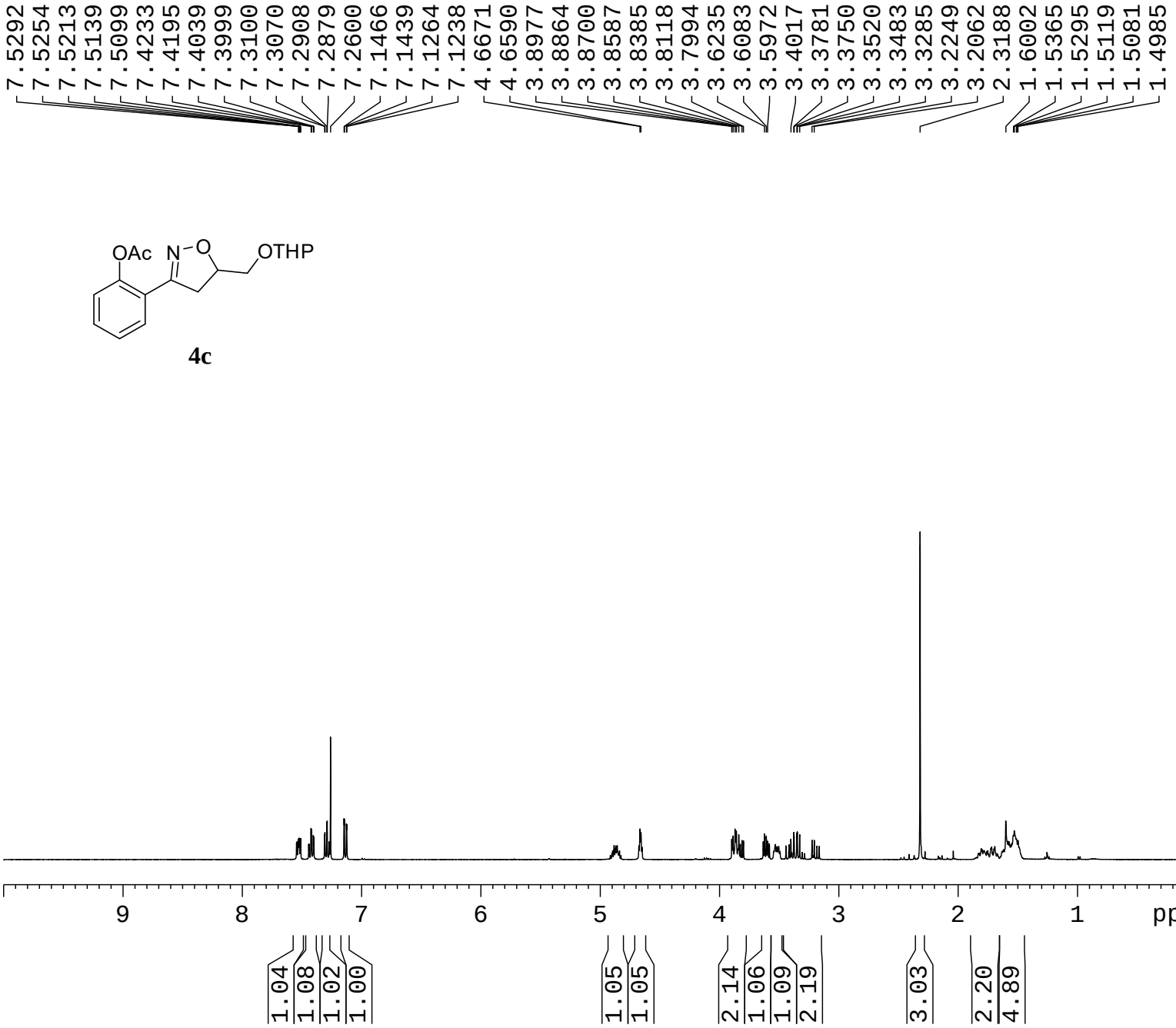
```
NAME      CWG150522-1-x-PURE
EXPNO                      1
PROCNO                     1
Date_               20160225
Time                   16.52
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG                 zg30
TD                     65536
SOLVENT                CDCl3
NS                        14
DS                         2
SWH                 8223.685 Hz
FIDRES              0.125483 Hz
AQ                3.9846387 sec
RG                      45.2
DW                    60.800 usec
DE                     6.50 usec
TE                    294.0 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     13.80 usec
PL1                    -1.00 dB
PL1W            13.18669796 W
SFO1           400.1724712 MHz
SI                     32768
SF             400.1700230 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```





4b'

```
NAME      CWG150522-1-x-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160225
Time                       16.57
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                           18
DS                            4
SWH                   24038.461 Hz
FIDRES                 0.366798 Hz
AQ                     1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        294.3 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                        32768
SF                  100.6228275 MHz
WDW                          EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
```

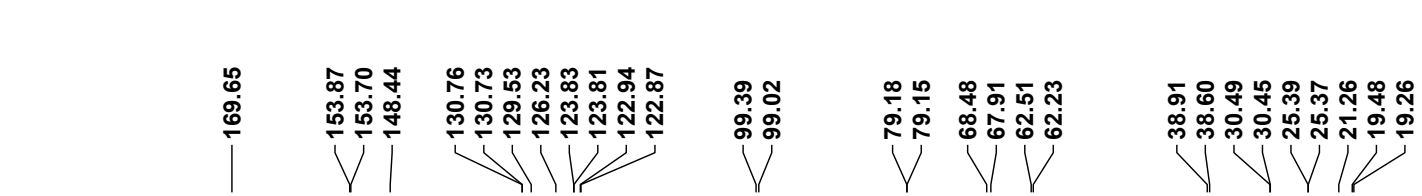


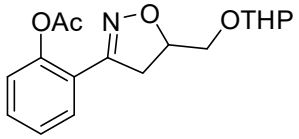
BRUKER

NAME	CWG150406-1(1)
EXPNO	1
PROCNO	1
Date_	20150617
Time	19.44
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	144
DW	60.800 usec
DE	6.50 usec
TE	297.4 K
D1	1.00000000 sec
TD0	1

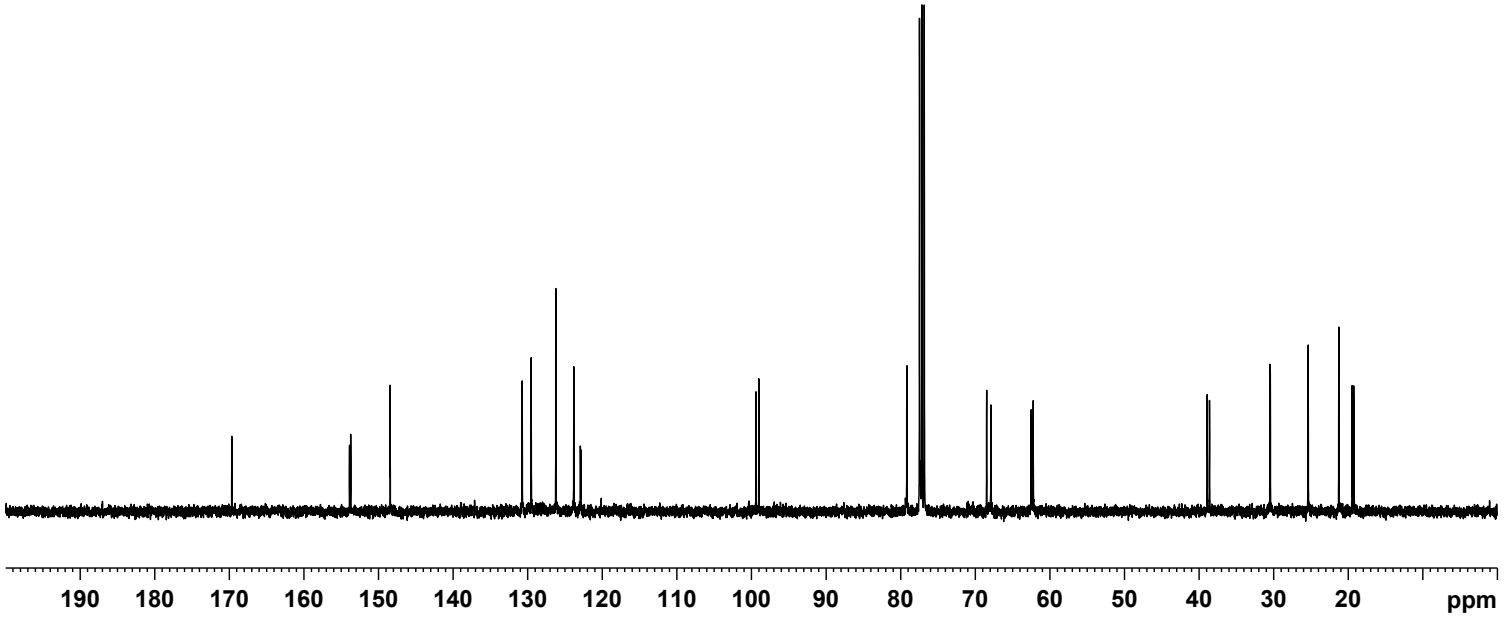
======== CHANNEL f1 ========

NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

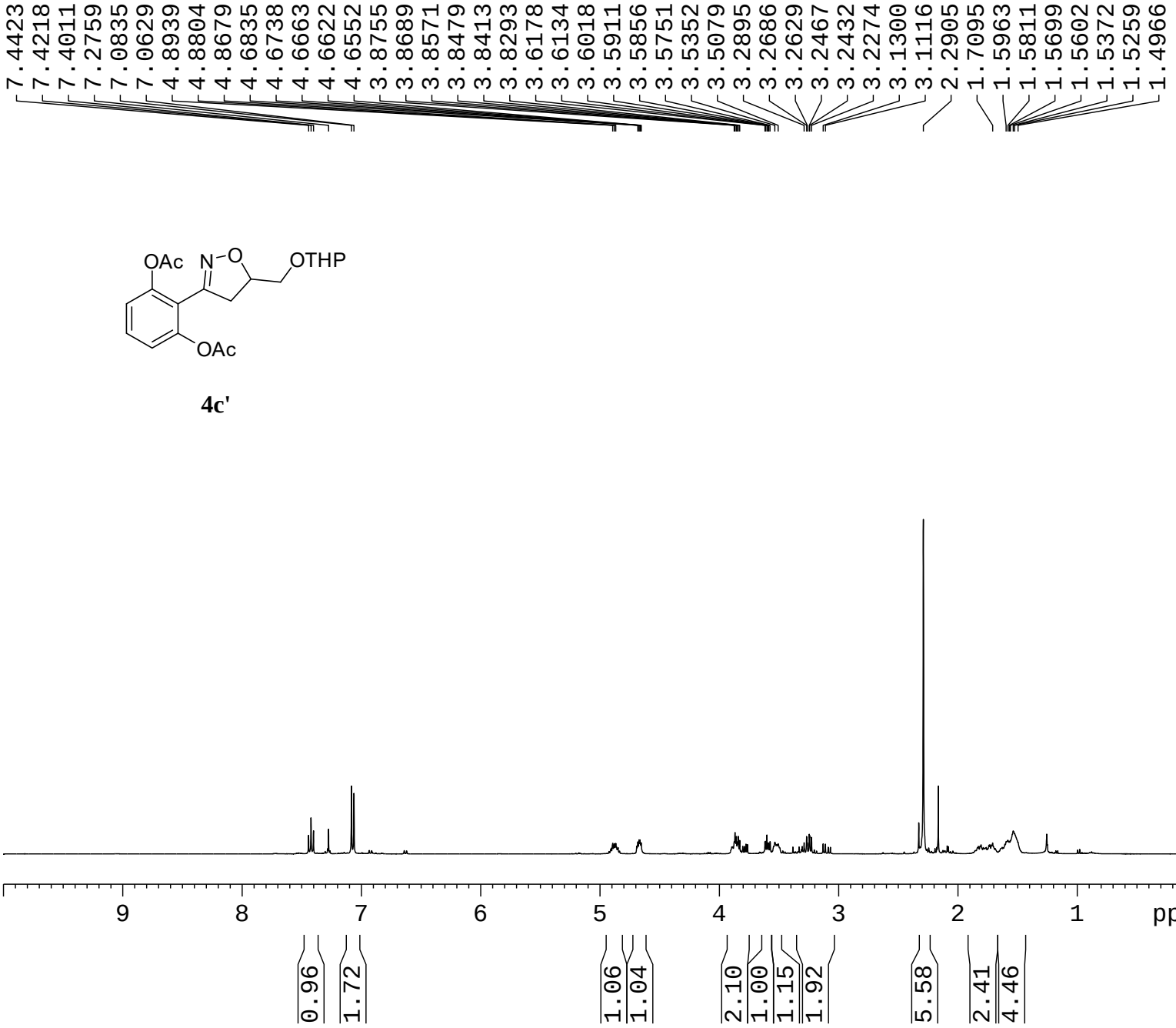




4c

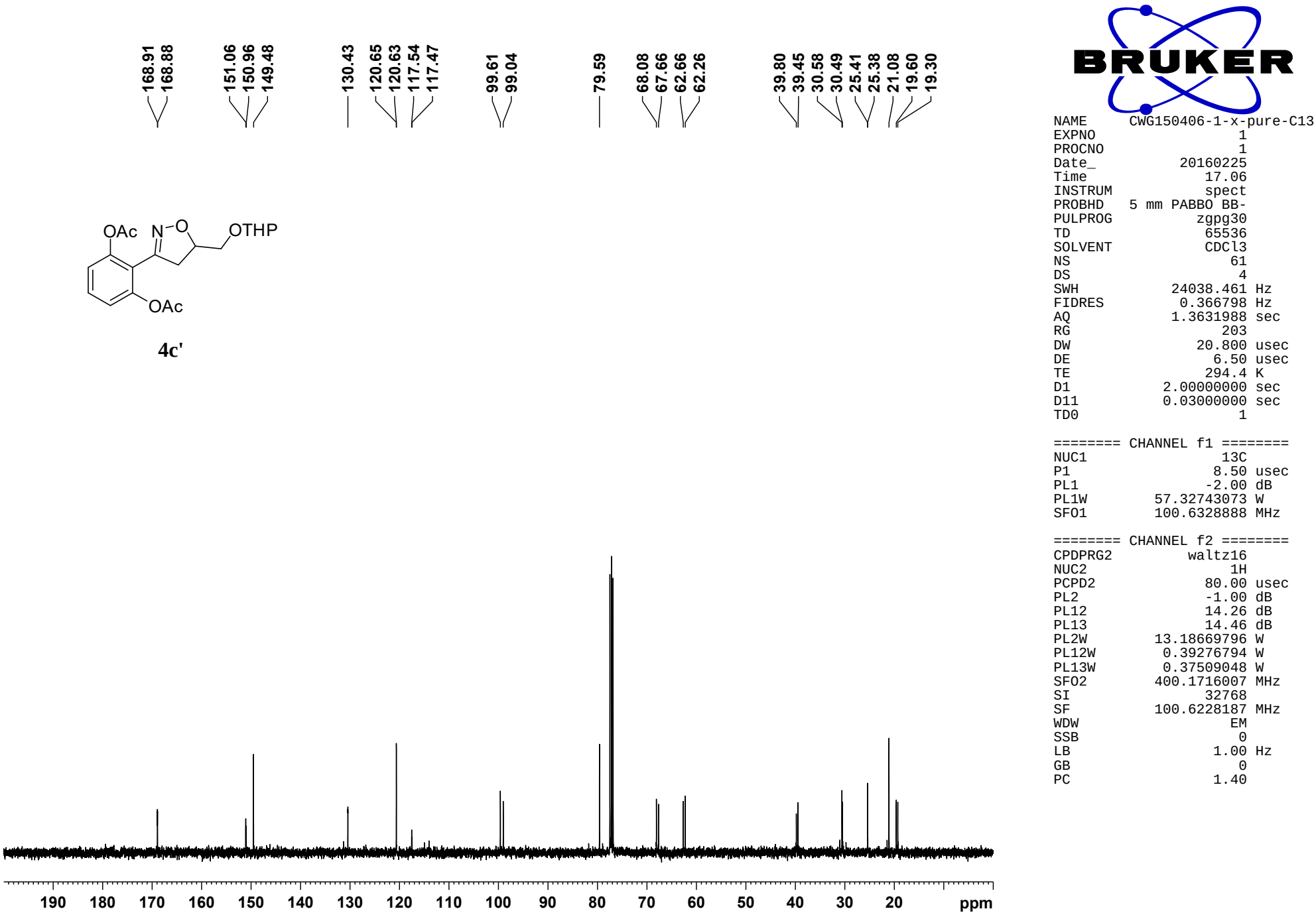



```
NAME        CWG150406-1(1)C13
EXPNO                      1
PROCNO                     1
Date_               20150617
Time                   20.37
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       570
DS                         4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                       203
DW                  20.800 usec
DE                   6.50 usec
TE                   298.4 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228216 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```



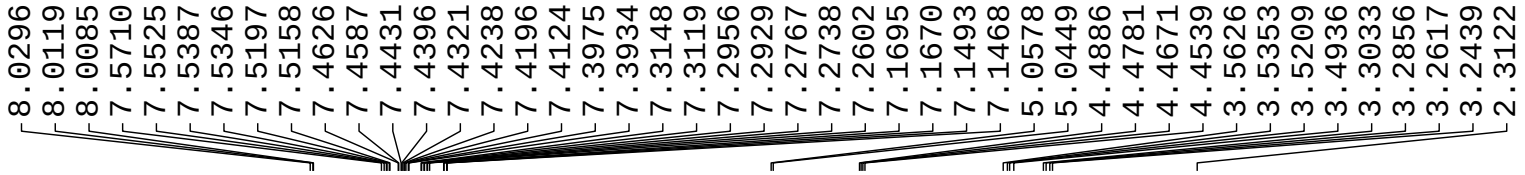
4c'

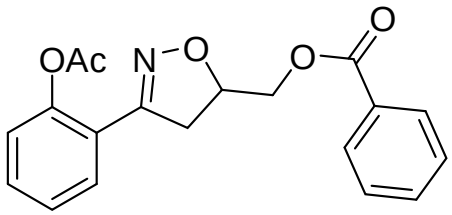
```
NAME          CWG150406-1-x-PURE
EXPNO                         1
PROCNO                        1
Date_                  20160225
Time                      17.01
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                    zg30
TD                        65536
SOLVENT                   CDCl3
NS                           16
DS                            2
SWH                    8223.685 Hz
FIDRES                 0.125483 Hz
AQ                     3.9846387 sec
RG                         71.8
DW                        60.800 usec
DE                         6.50 usec
TE                        294.1 K
D1                  1.00000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                         1H
P1                        13.80 usec
PL1                       -1.00 dB
PL1W               13.18669796 W
SFO1               400.1724712 MHz
SI                        32768
SF                 400.1699968 MHz
WDW                          EM
SSB                           0
LB                         0.30 Hz
GB                            0
PC                         1.00
```



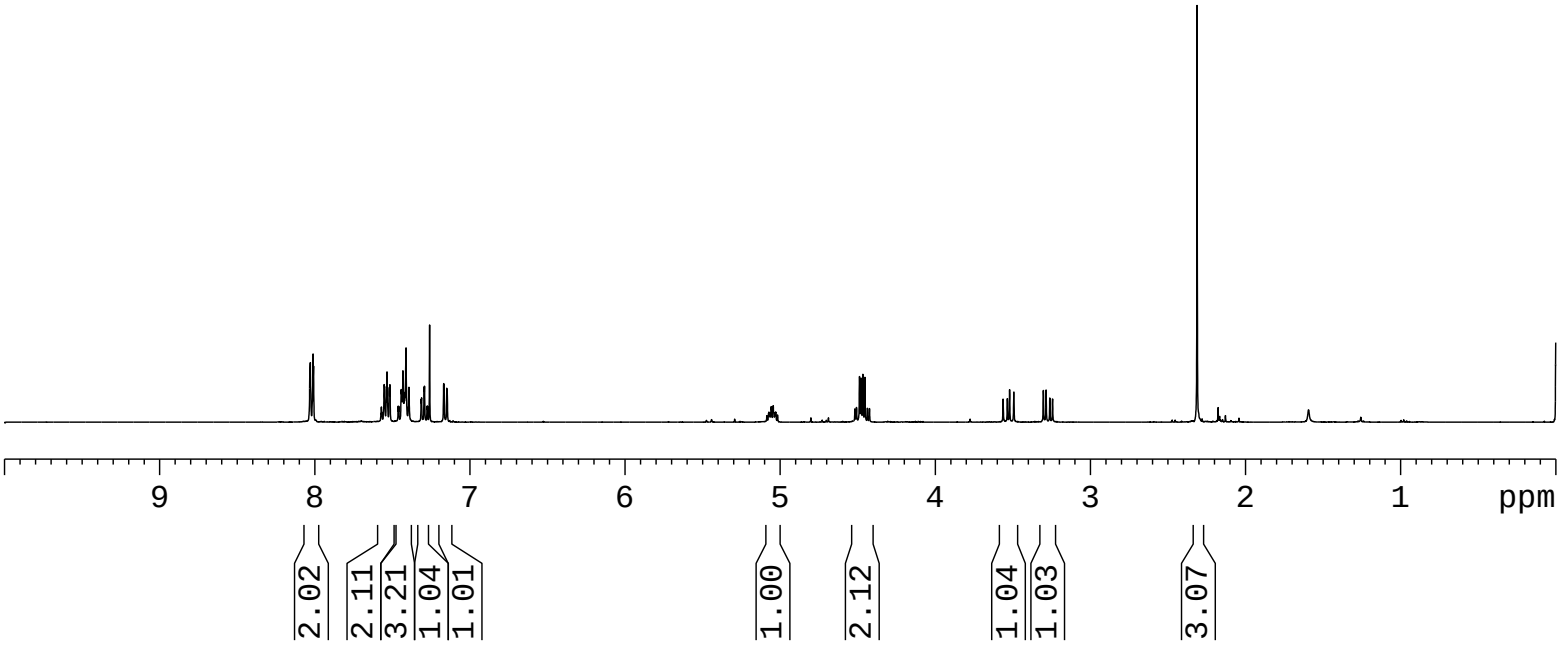
4c'

```
NAME      CWG150406-1-x-pure-C13
EXPNO                  1
PROCNO                 1
Date_           20160225
Time              17.06
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   61
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  203
DW                20.800 usec
DE                 6.50 usec
TE                294.4 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228187 MHz
WDW                EM
SSB                 0
LB                1.00 Hz
GB                  0
PC                1.40
```

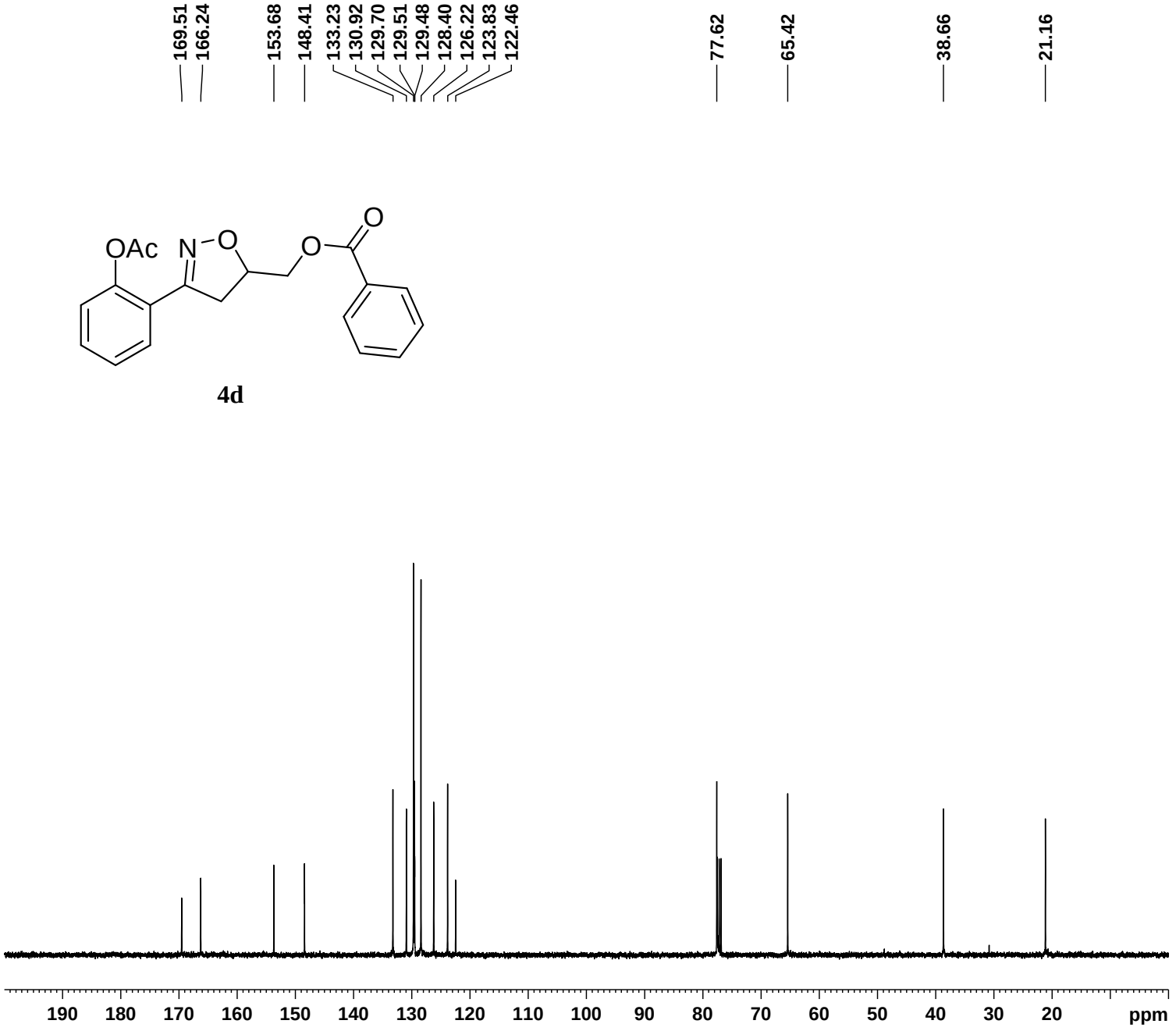




4d

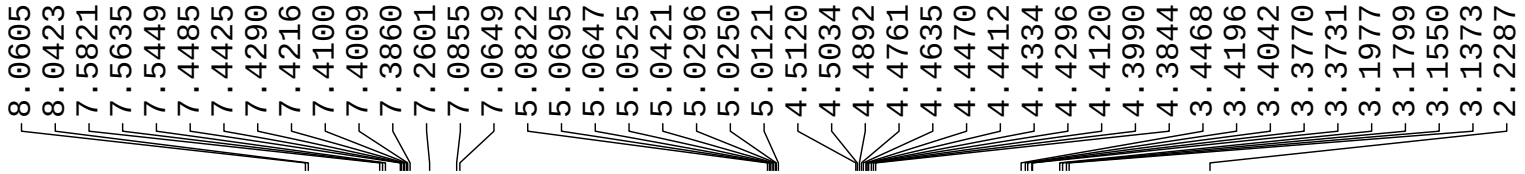


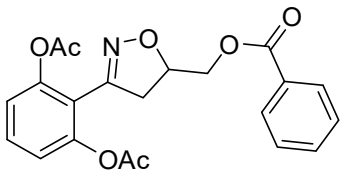
NAME	CWG150409-(1)
EXPNO	1
PROCNO	1
Date_	20150521
Time	19.46
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	161
DW	60.800 usec
DE	6.50 usec
TE	298.2 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700031 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



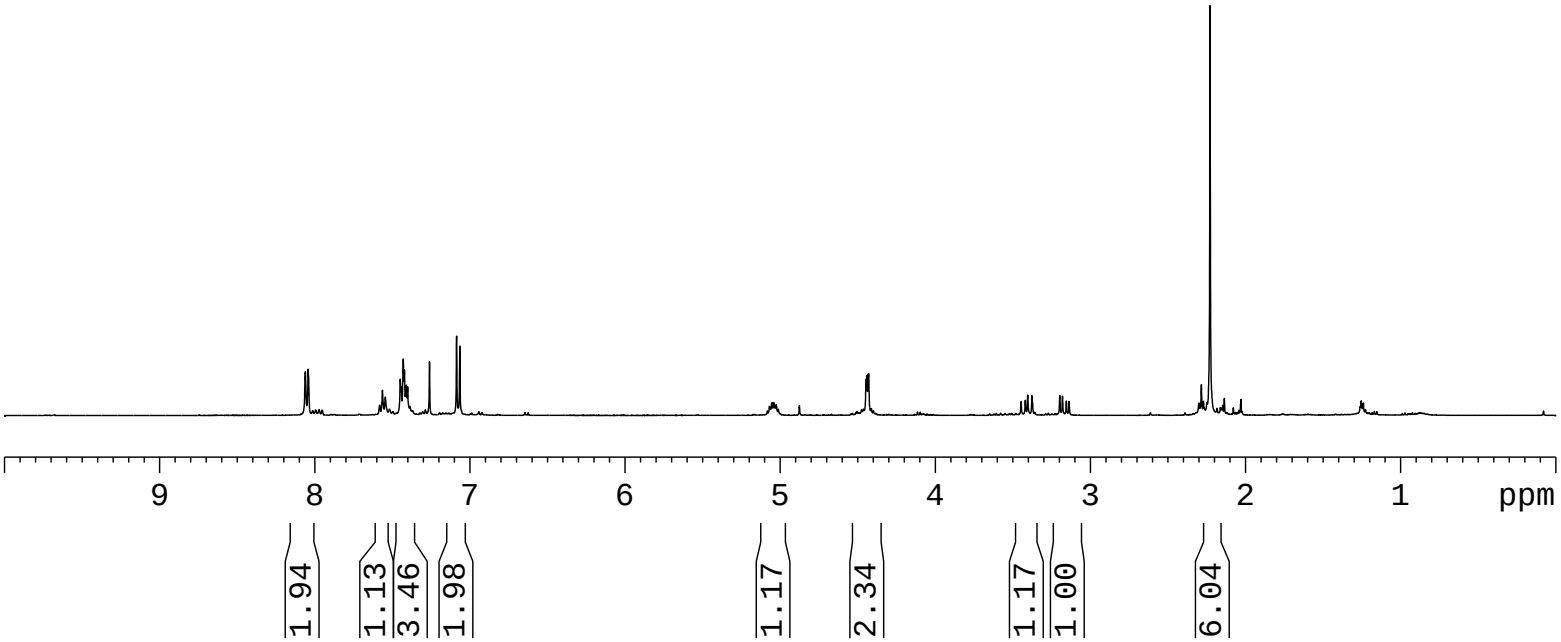
4d

```
NAME        CWG150409-(1)-C13
EXPNO                      1
PROCNO                     1
Date_               20150522
Time                   14.38
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                     65536
SOLVENT                CDCl3
NS                        80
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    298.7 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228302 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

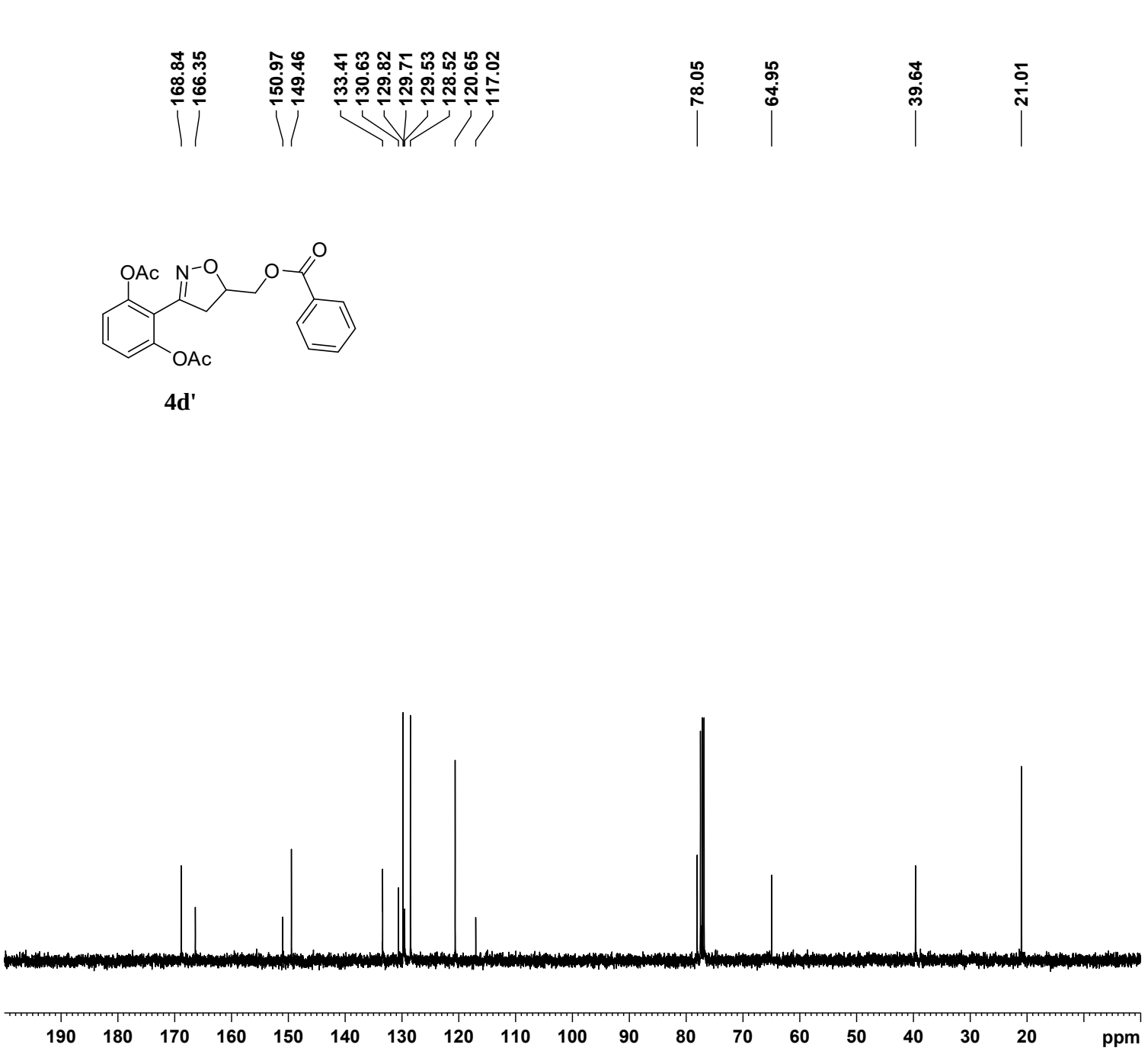




4d'

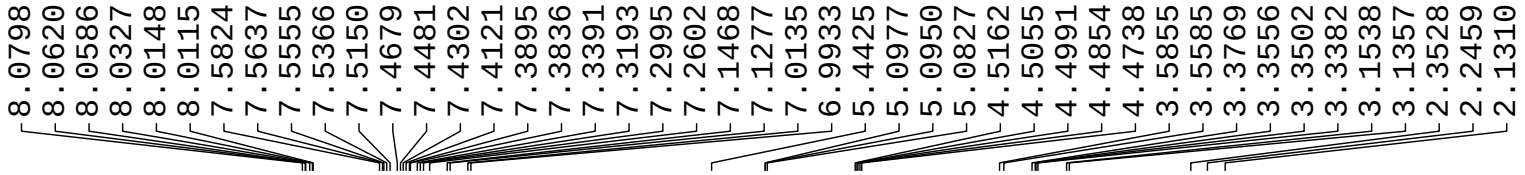


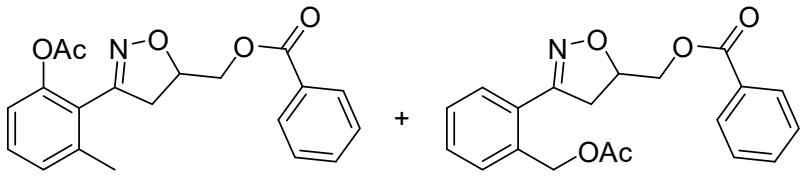

```
NAME          CWG151016-1-x-PURE
EXPNO                          1
PROCNO                         1
Date_                   20160226
Time                       16.23
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                            14
DS                             2
SWH                     8223.685 Hz
FIDRES                  0.125483 Hz
AQ                      3.9846387 sec
RG                            57
DW                         60.800 usec
DE                          6.50 usec
TE                         294.7 K
D1                    1.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                         13.80 usec
PL1                        -1.00 dB
PL1W                13.18669796 W
SFO1                400.1724712 MHz
SI                         32768
SF                  400.1700029 MHz
WDW                           EM
SSB                            0
LB                          0.30 Hz
GB                             0
PC                          1.00
```



4d'

```
NAME      CWG151016-1-x-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160226
Time                       16.26
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                           23
DS                            4
SWH                   24038.461 Hz
FIDRES                 0.366798 Hz
AQ                     1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        294.8 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                        32768
SF                  100.6228224 MHz
WDW                          EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
```



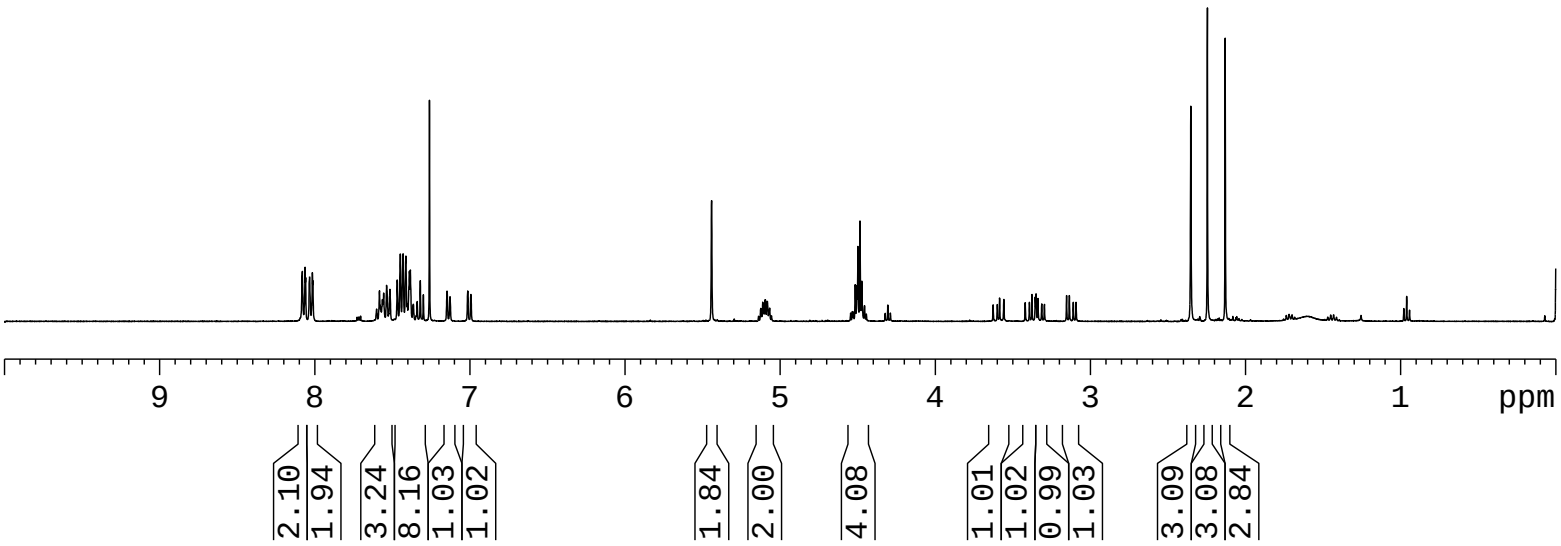


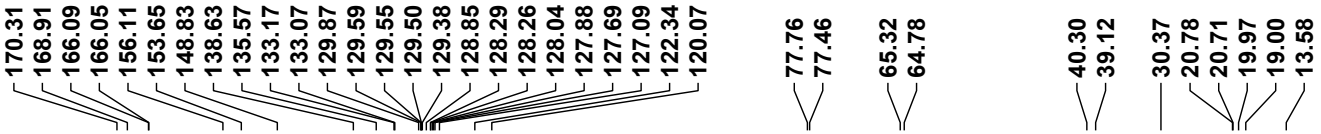
1.1 : **1**

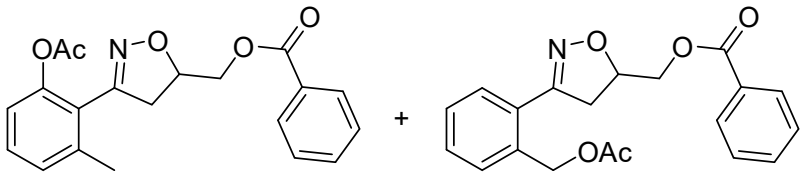
4e **4e''**

NAME CWG150922-3-s-1
EXPNO 1
PROCNO 1
Date_ 20150923
Time 19.15
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.5 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700033 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

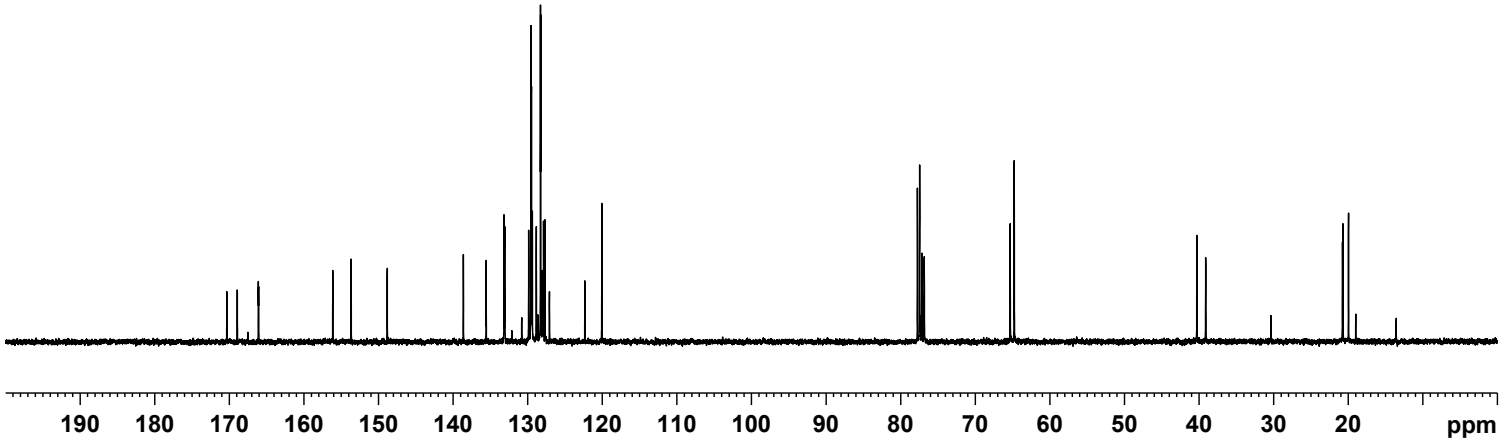




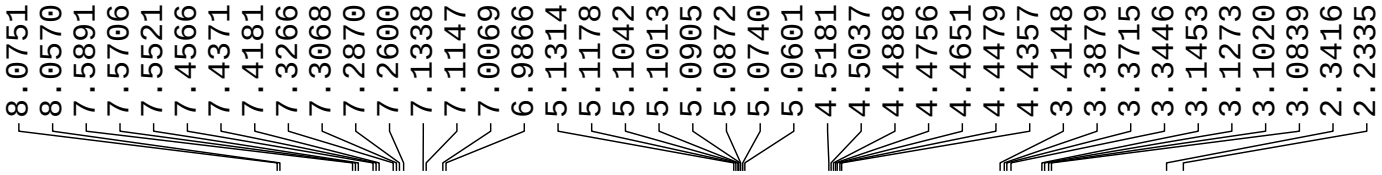


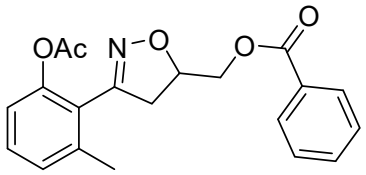
1.1 : **1**

4e **4e''**



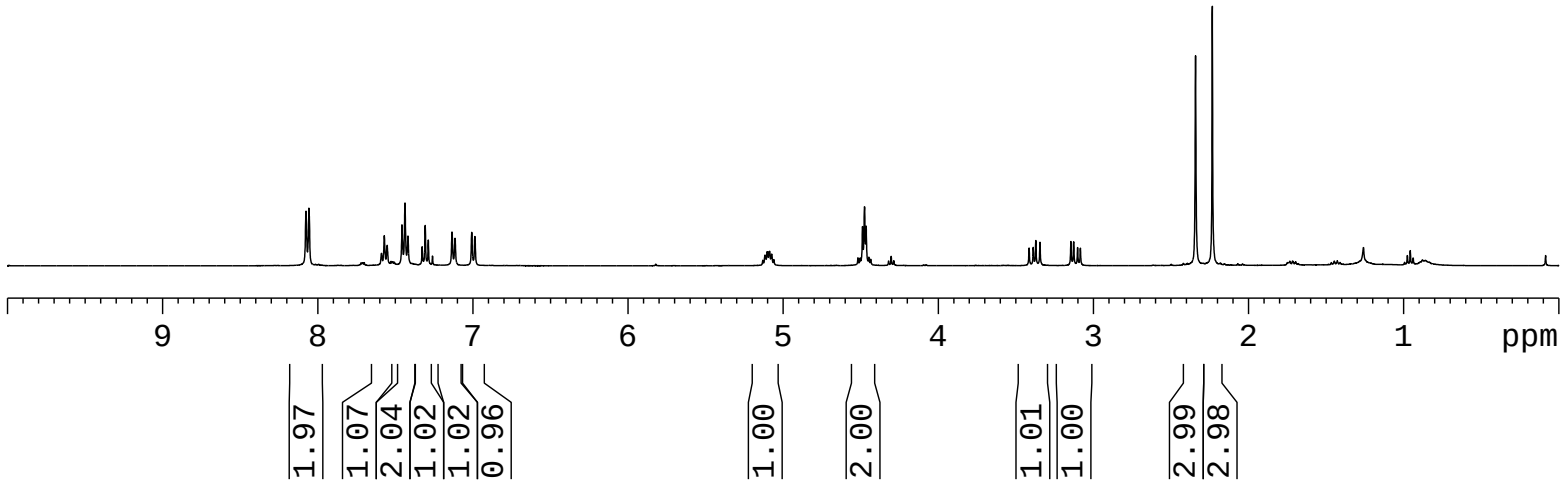

```
NAME          CWG150922-3-X-C13
EXPNO                        1
PROCNO                       1
Date_                 20160217
Time                     10.51
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                          70
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      296.0 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228438 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

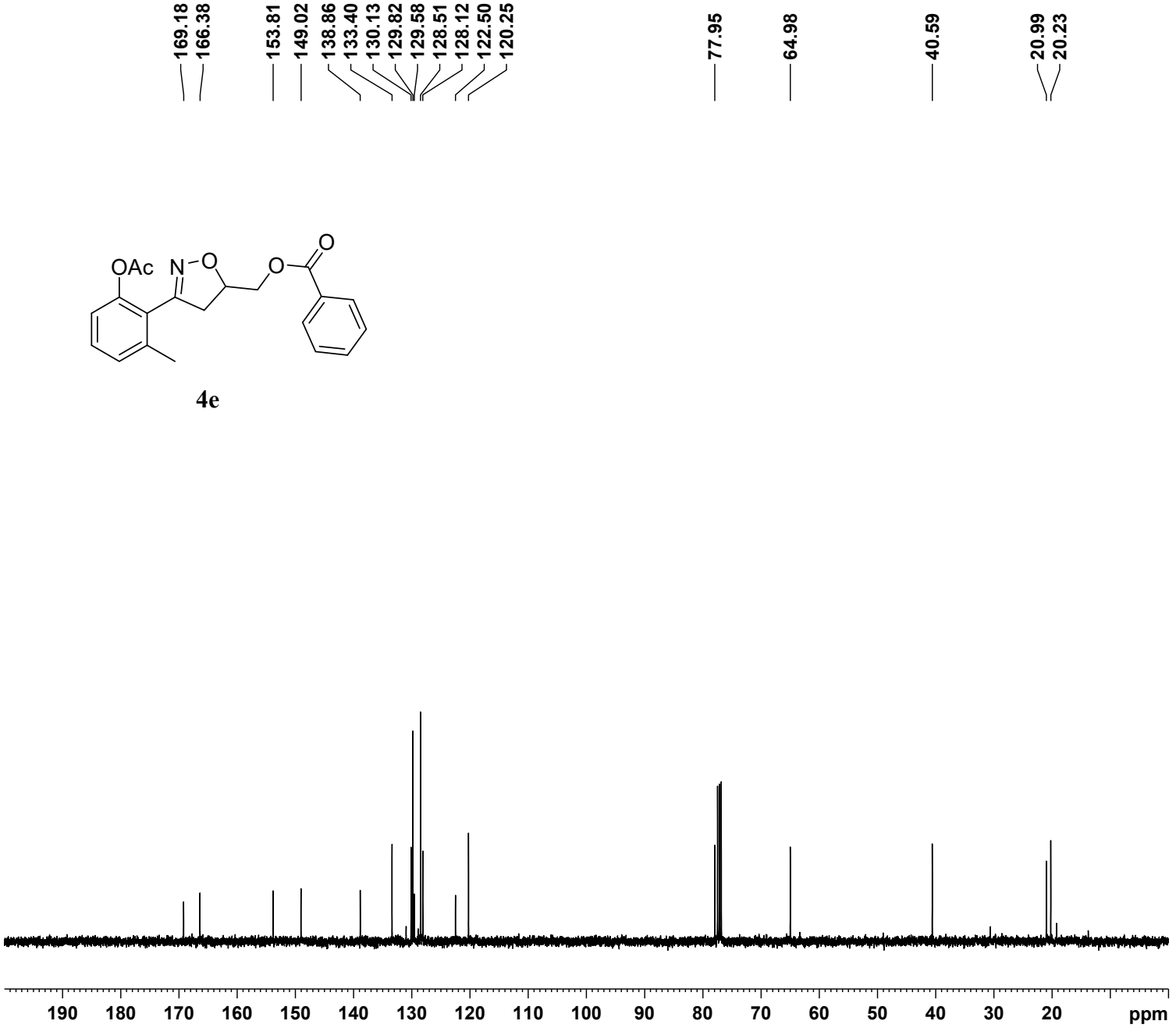




4e

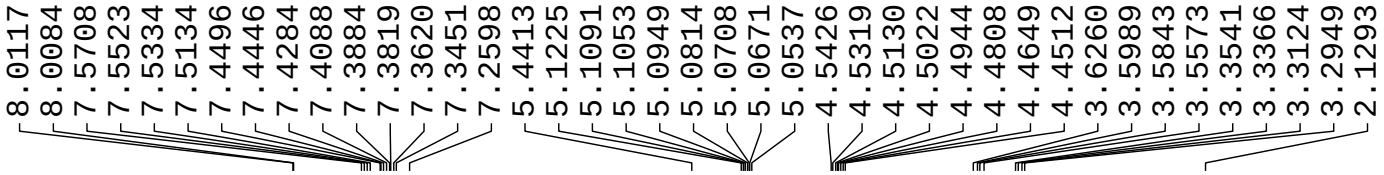
```
NAME        CWG150922-3-2
EXPNO                   1
PROCNO                  1
Date_            20160321
Time                17.00
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     13
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                     57
DW                 60.800 usec
DE                  6.50 usec
TE                 295.7 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700031 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

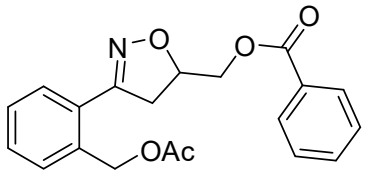




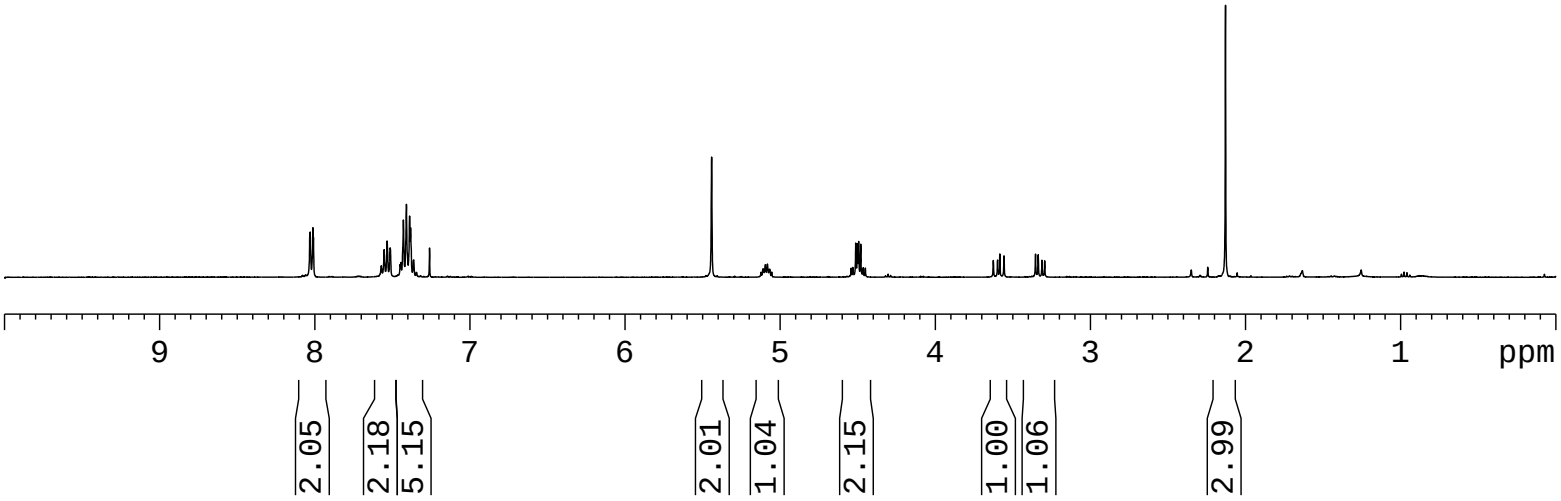
4e

```
NAME        CWG150922-3-2-C13
EXPNO                      1
PROCNO                     1
Date_               20160321
Time                   17.04
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                        23
DS                         4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                 1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    295.9 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228223 MHz
WDW                       EM
SSB                        0
LB                     1.00 Hz
GB                         0
PC                     1.40
```

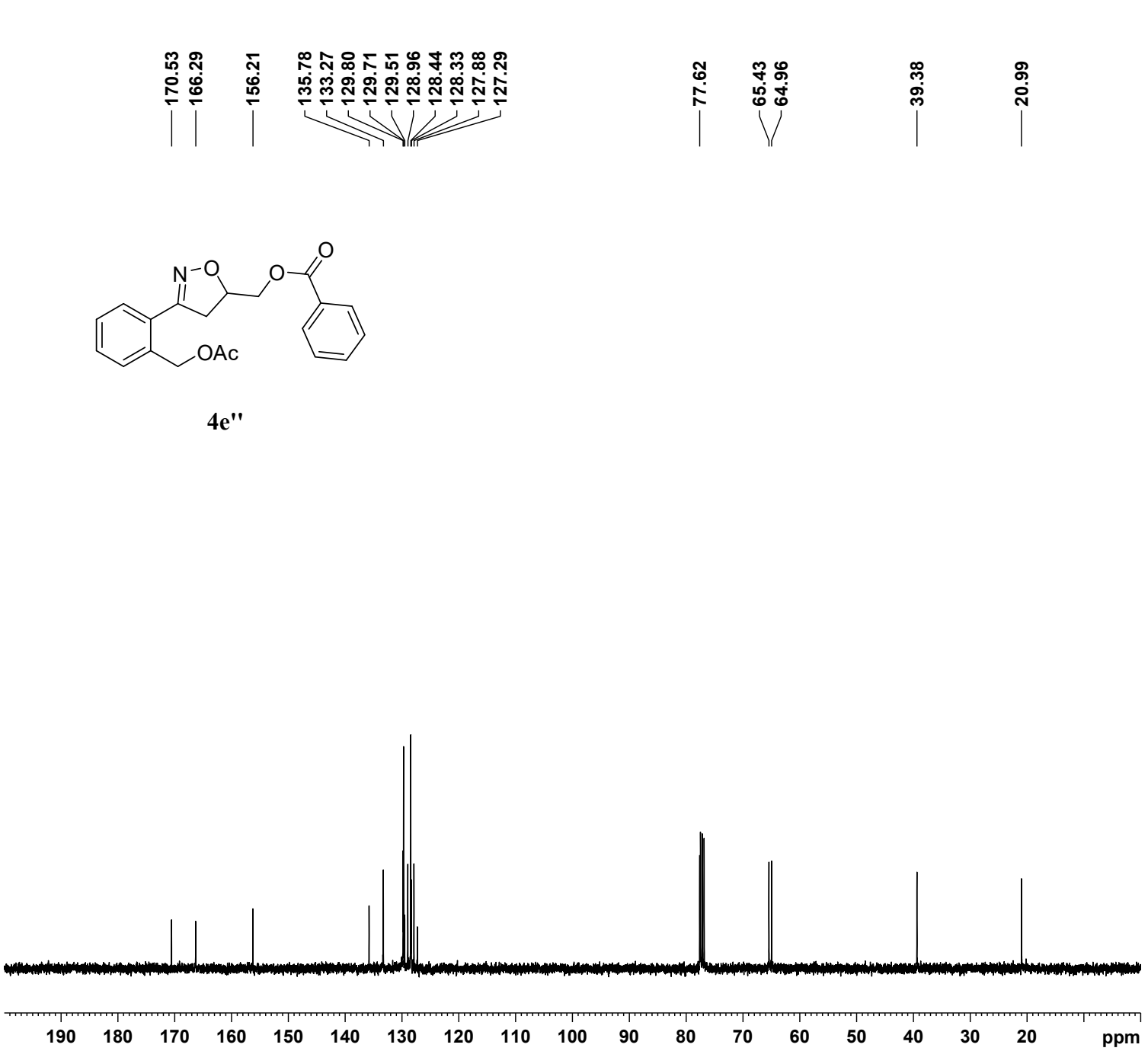




4e''



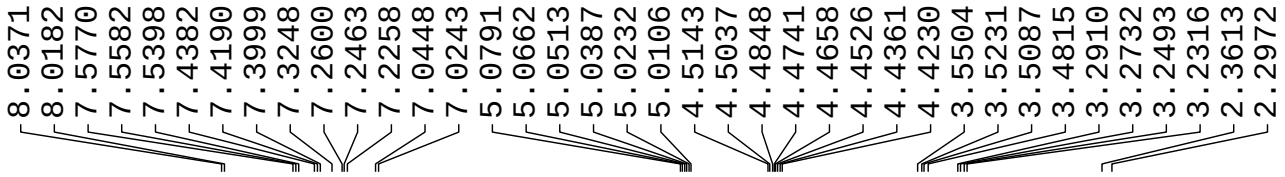

```
NAME          CWG150922-3-3
EXPNO                     1
PROCNO                    1
Date_              20160321
Time                  17.09
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               8223.685 Hz
FIDRES            0.125483 Hz
AQ                3.9846387 sec
RG                     144
DW                  60.800 usec
DE                   6.50 usec
TE                  295.8 K
D1               1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                   13.80 usec
PL1                  -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                   32768
SF             400.1700032 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

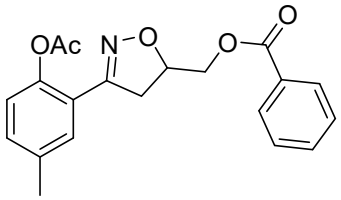


4e''

BRUKER

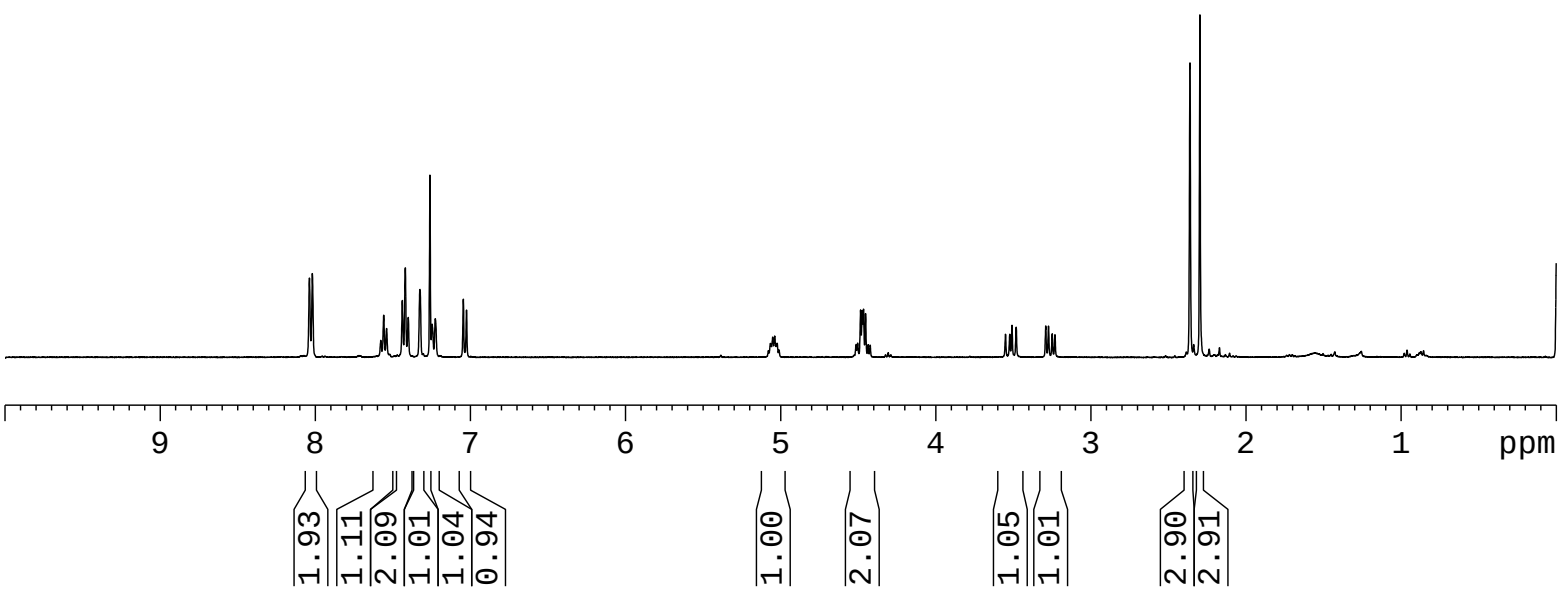
NAME	CWG150922-3-3-C13
EXPNO	1
PROCNO	1
Date_	20160322
Time	9.02
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	23
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	295.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228272 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

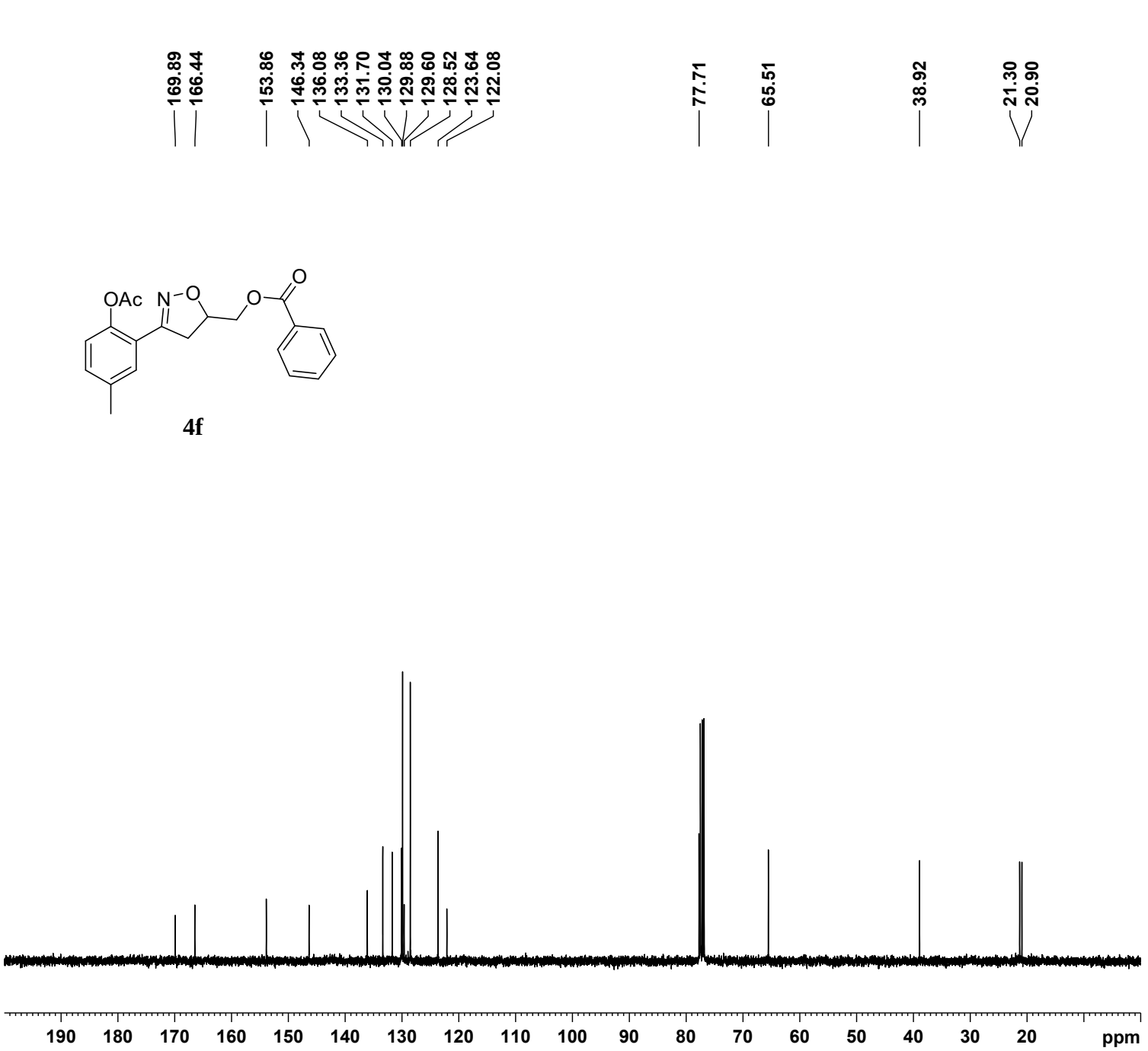




4f

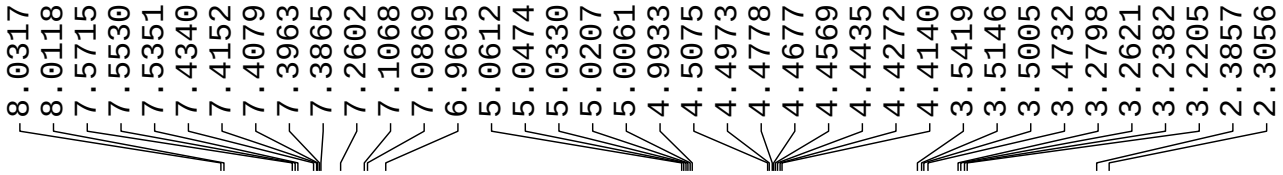
```
NAME          CWG150924-1-S
EXPNO                     1
PROCNO                    1
Date_              20150925
Time                  14.02
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                    60.800 usec
DE                     6.50 usec
TE                    297.5 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700033 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```

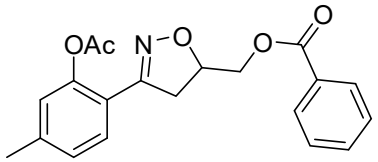




4f

```
NAME        CWG150924-1-S-C13
EXPNO                      1
PROCNO                     1
Date_               20150928
Time                   18.45
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                        126
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     296.8 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228169 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

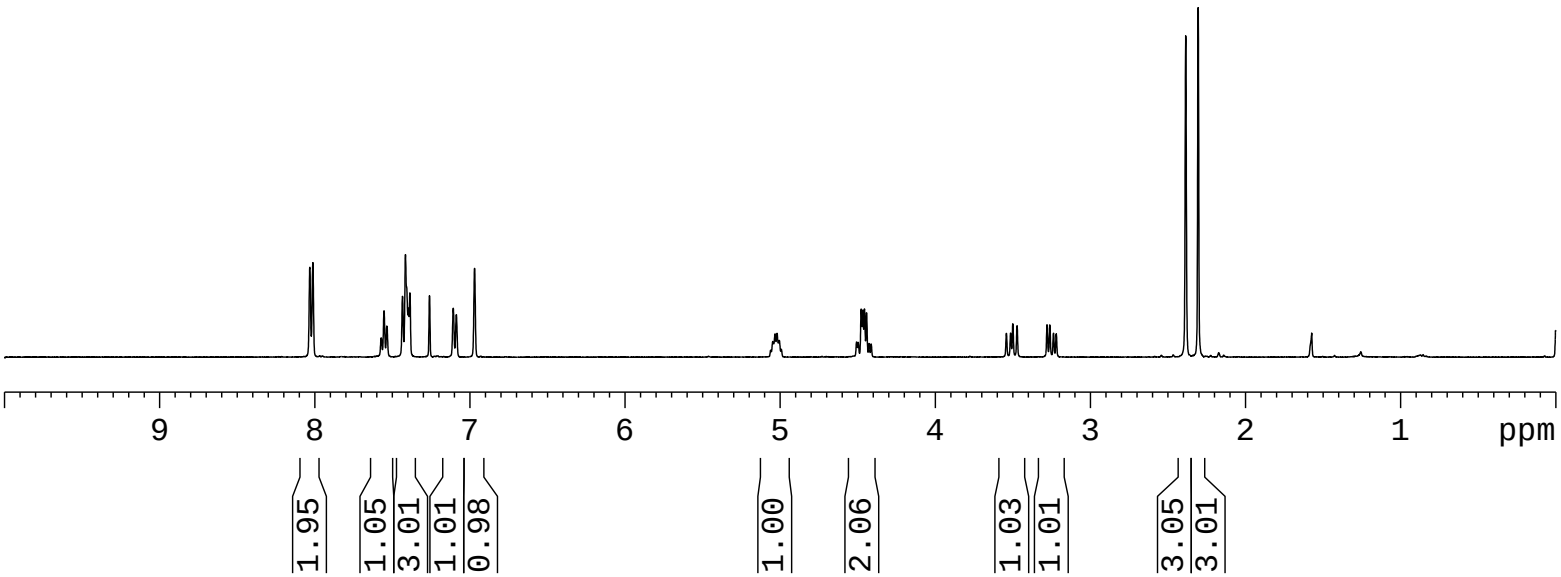


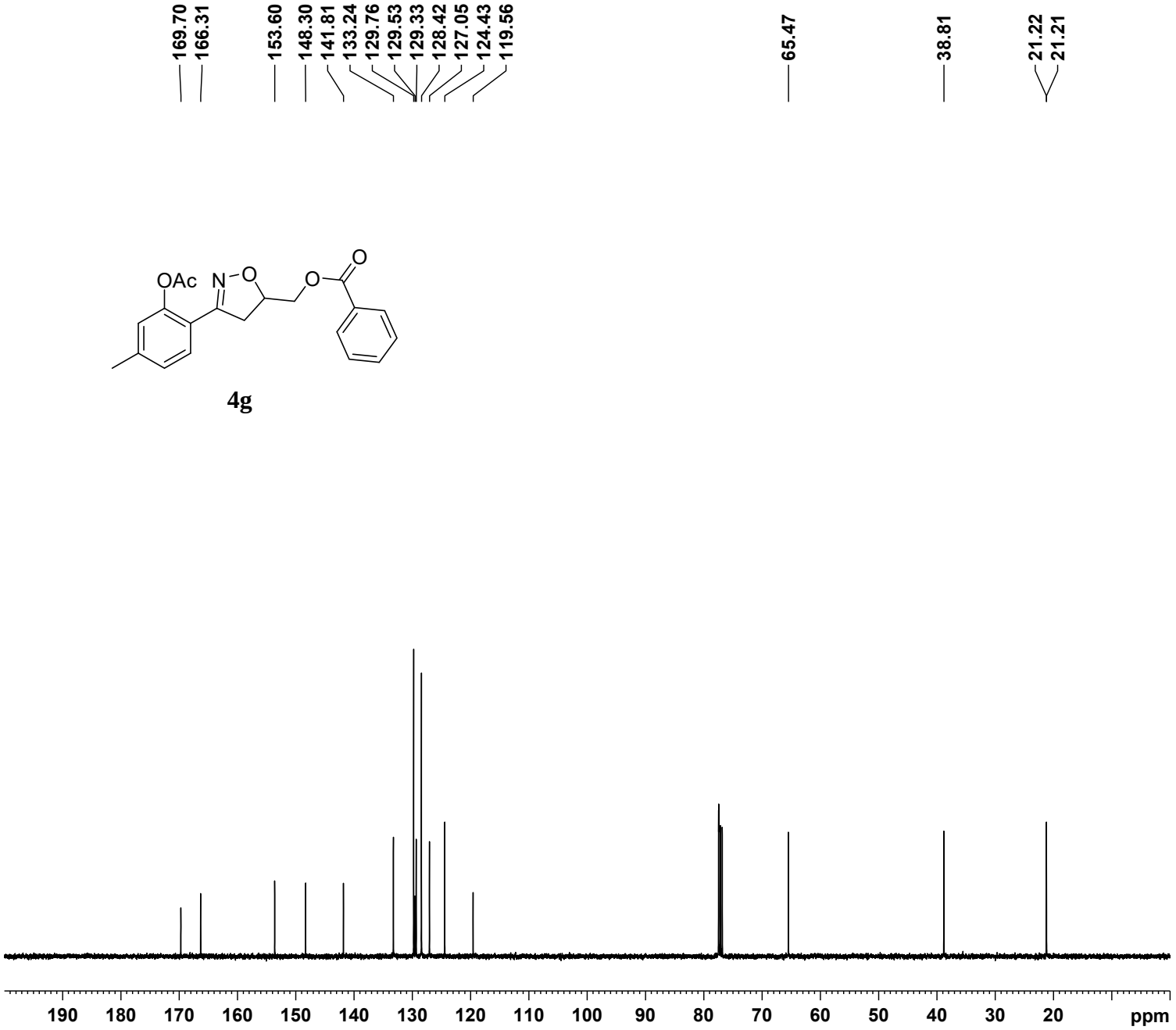


4g

NAME CWG150922-6-1
EXPNO 1
PROCNO 1
Date_ 20151015
Time 15.08
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 203
DW 60.800 usec
DE 6.50 usec
TE 297.7 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700033 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

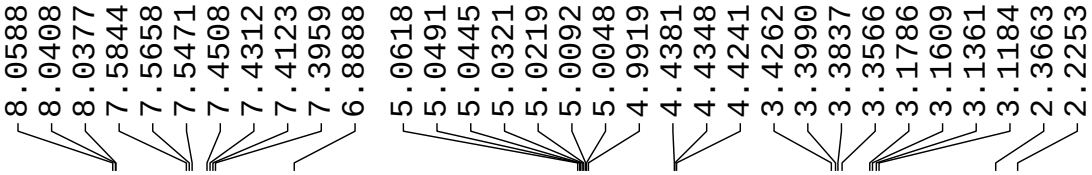


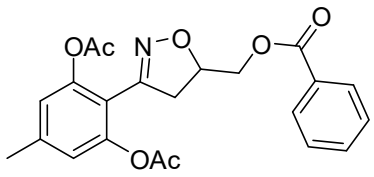


4g

BRUKER

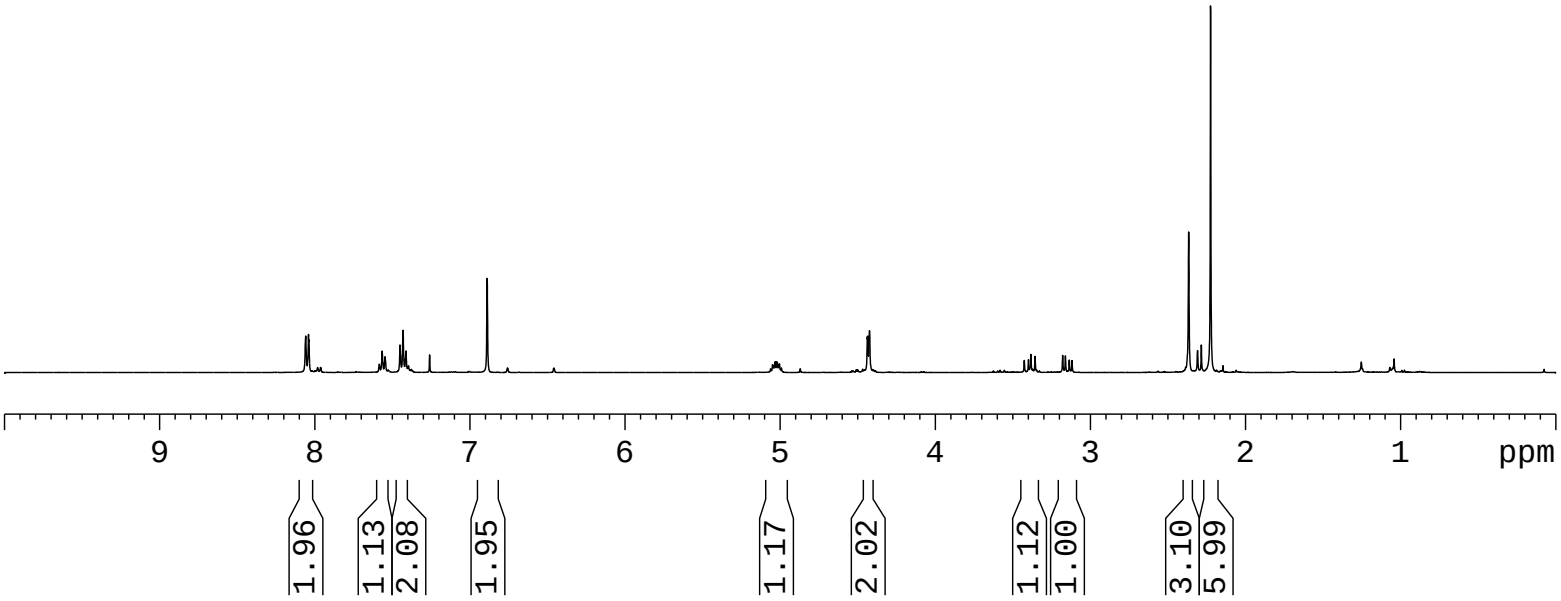
NAME	CWG150922-6-1-C13
EXPNO	1
PROCNO	1
Date_	20151015
Time	17.46
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	84
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	298.6 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228270 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

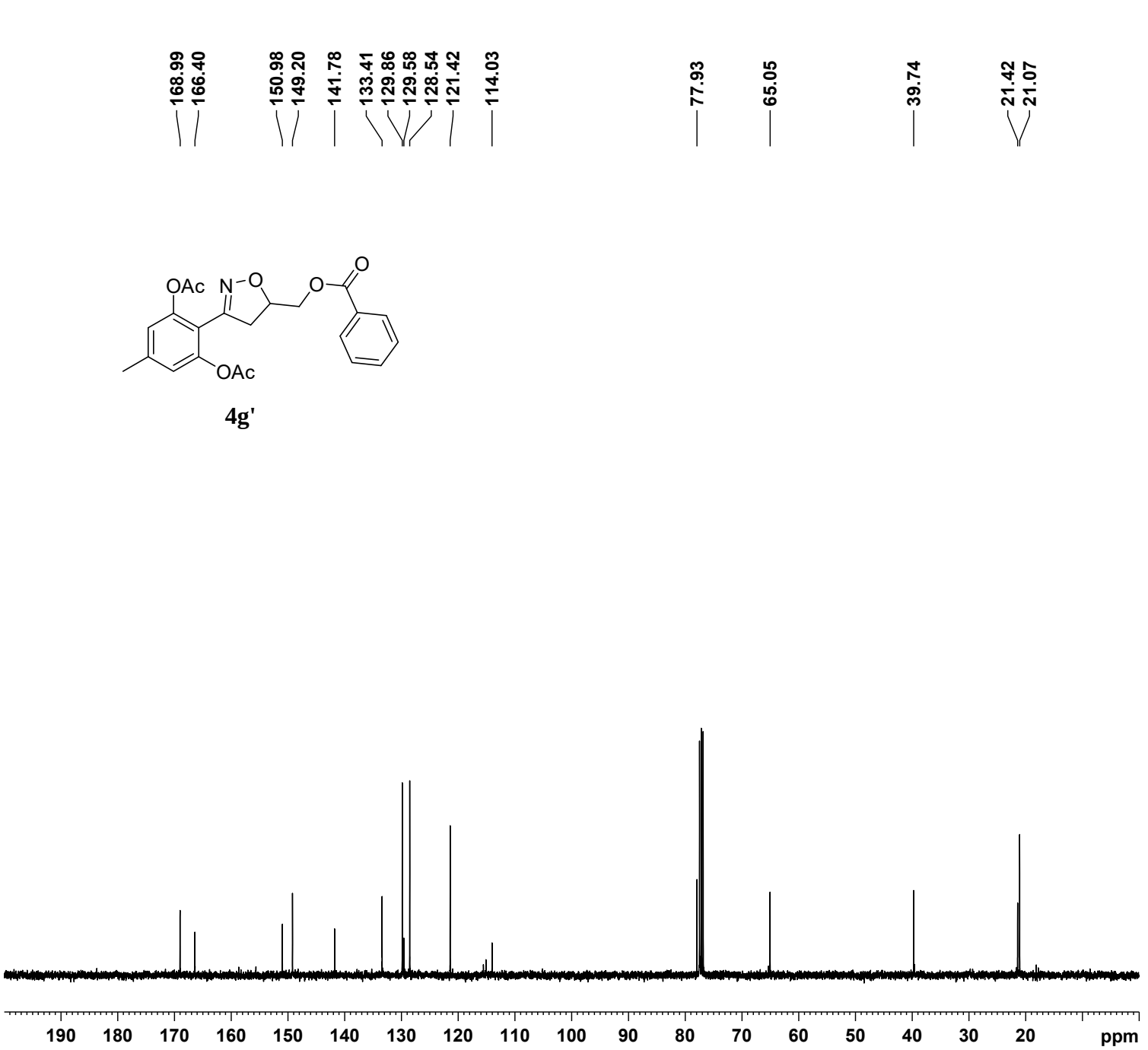




4g'

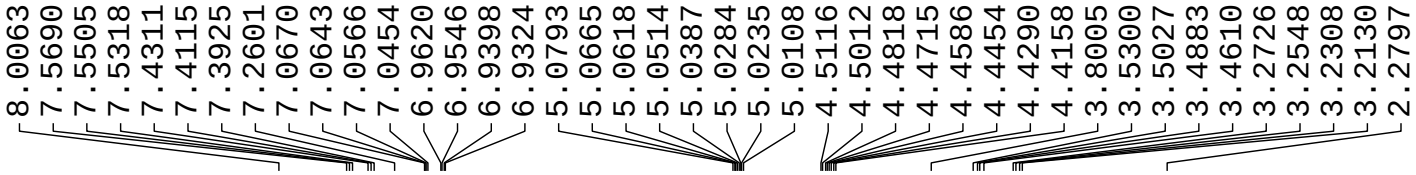
```
NAME          CWG150922-6-x-pure
EXPNO                          1
PROCNO                         1
Date_                   20160224
Time                       15.28
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                            16
DS                             2
SWH                     8223.685 Hz
FIDRES                  0.125483 Hz
AQ                      3.9846387 sec
RG                          90.5
DW                         60.800 usec
DE                          6.50 usec
TE                         294.9 K
D1                    1.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                         13.80 usec
PL1                        -1.00 dB
PL1W                13.18669796 W
SFO1                400.1724712 MHz
SI                         32768
SF                  400.1700032 MHz
WDW                           EM
SSB                            0
LB                          0.30 Hz
GB                             0
PC                          1.00
```

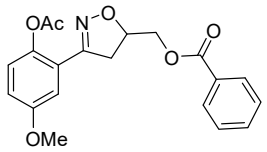




4g'

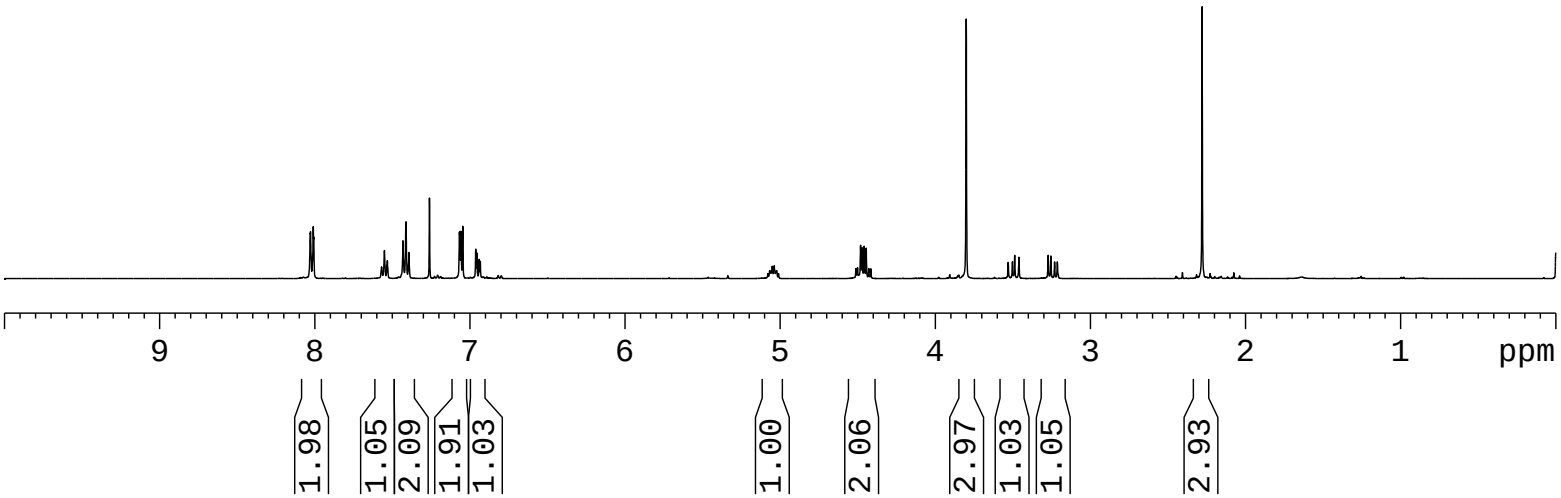
```
NAME      CWG150922-6-X-PURE-C13
EXPNO                          1
PROCNO                         1
Date_                   20160224
Time                       15.33
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                            73
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        295.0 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                         32768
SF                  100.6228187 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```

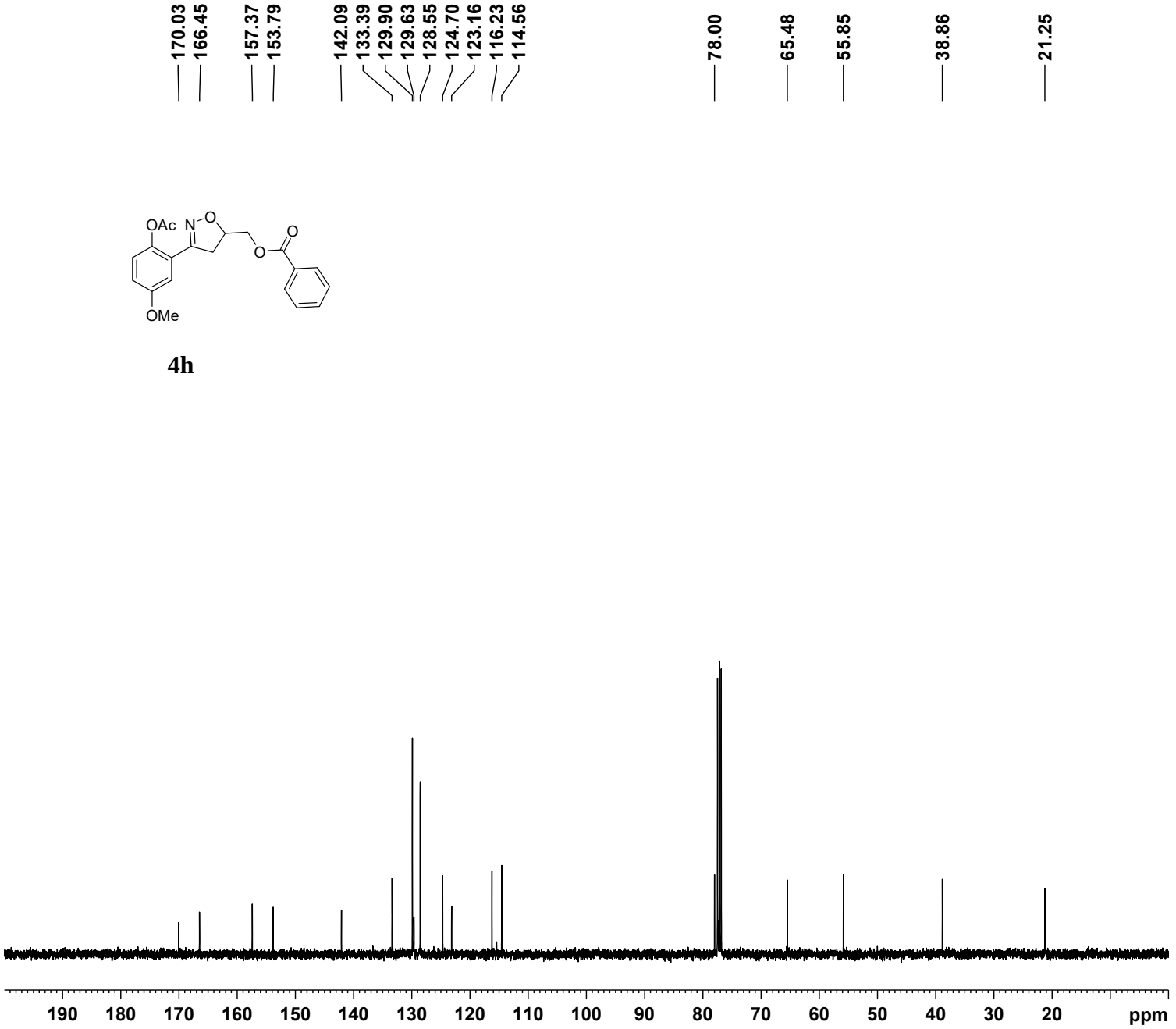




4h

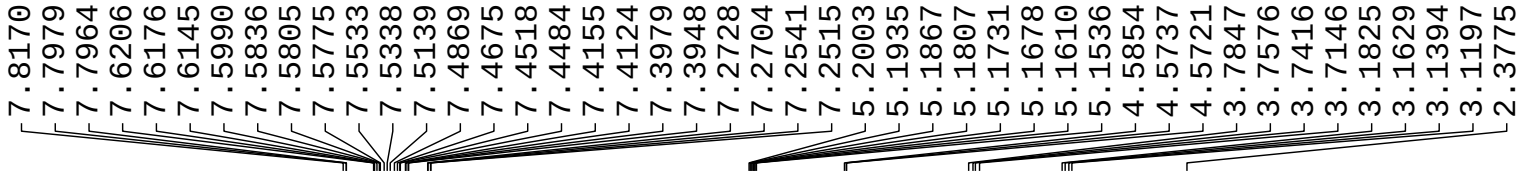
```
NAME        CWG160430-2-2
EXPNO                   1
PROCNO                  1
Date_            20160501
Time                14.10
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    128
DW                 60.800 usec
DE                  6.50 usec
TE                 301.3 K
D1            1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700031 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

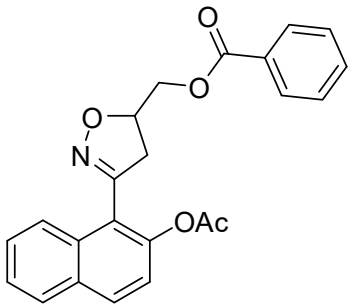




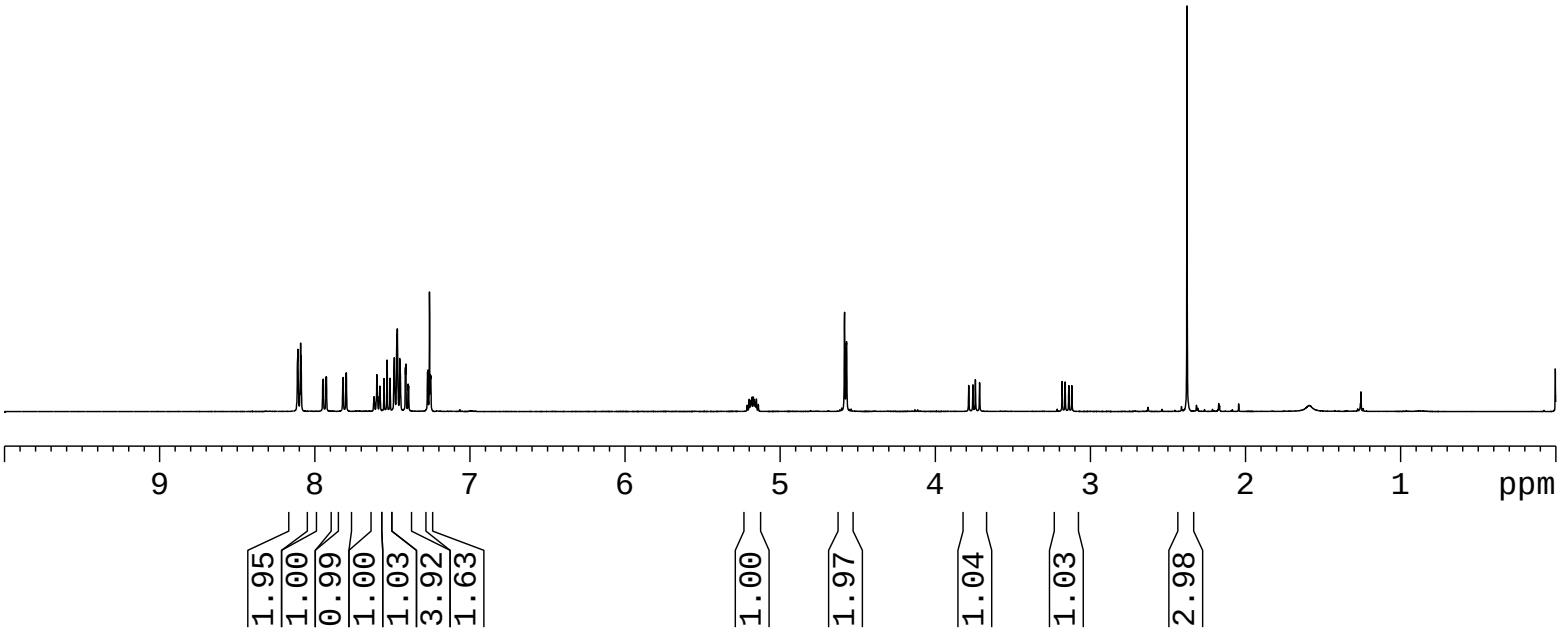
4h

```
NAME        CWG160430-2-C13
EXPNO                    1
PROCNO                   1
Date_             20160501
Time                 14.14
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   100
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                301.7 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                32768
SF          100.6228136 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

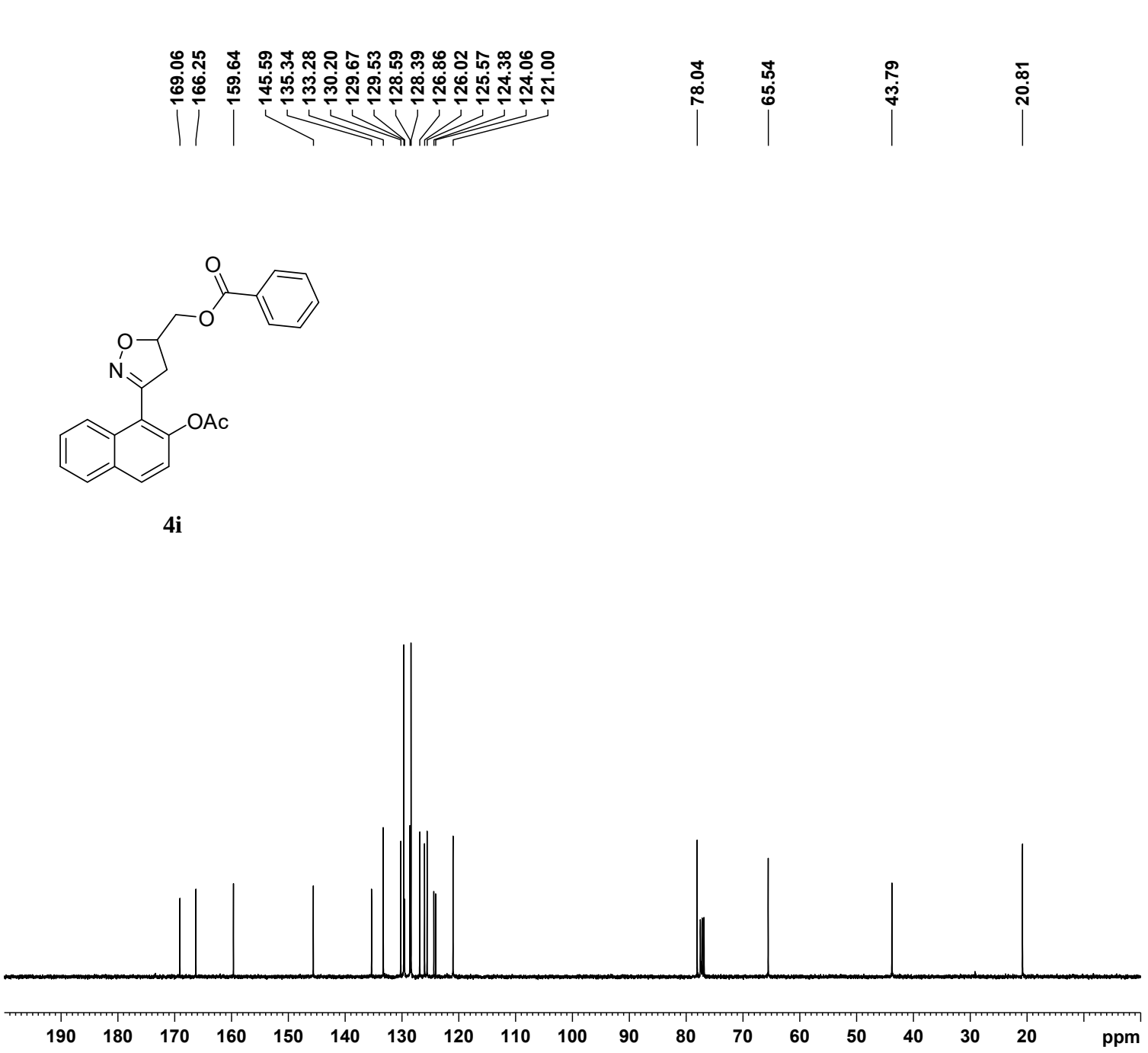




4i

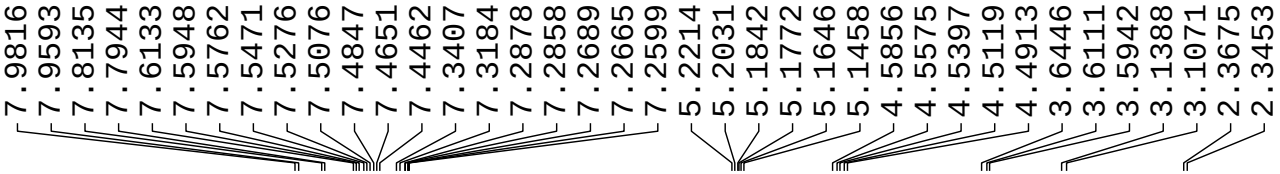


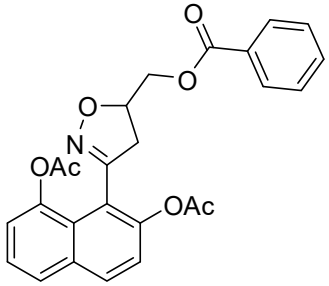

```
NAME          CWG150915-2-S
EXPNO                     1
PROCNO                    1
Date_              20150917
Time                   8.46
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                   60.800 usec
DE                    6.50 usec
TE                   299.4 K
D1               1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700033 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```



4i

```
NAME        CWG150915-2-S-C13
EXPNO                      1
PROCNO                     1
Date_               20150917
Time                   17.33
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       101
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    297.6 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                     32768
SF               100.6228396 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

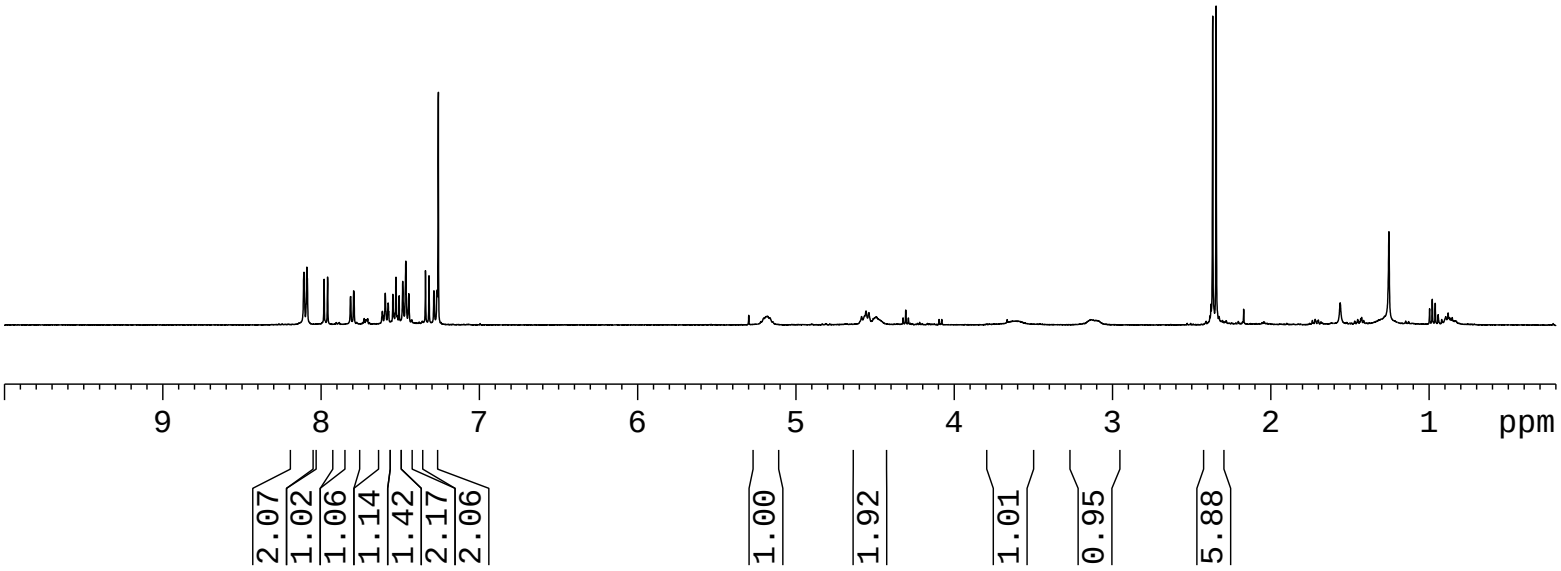


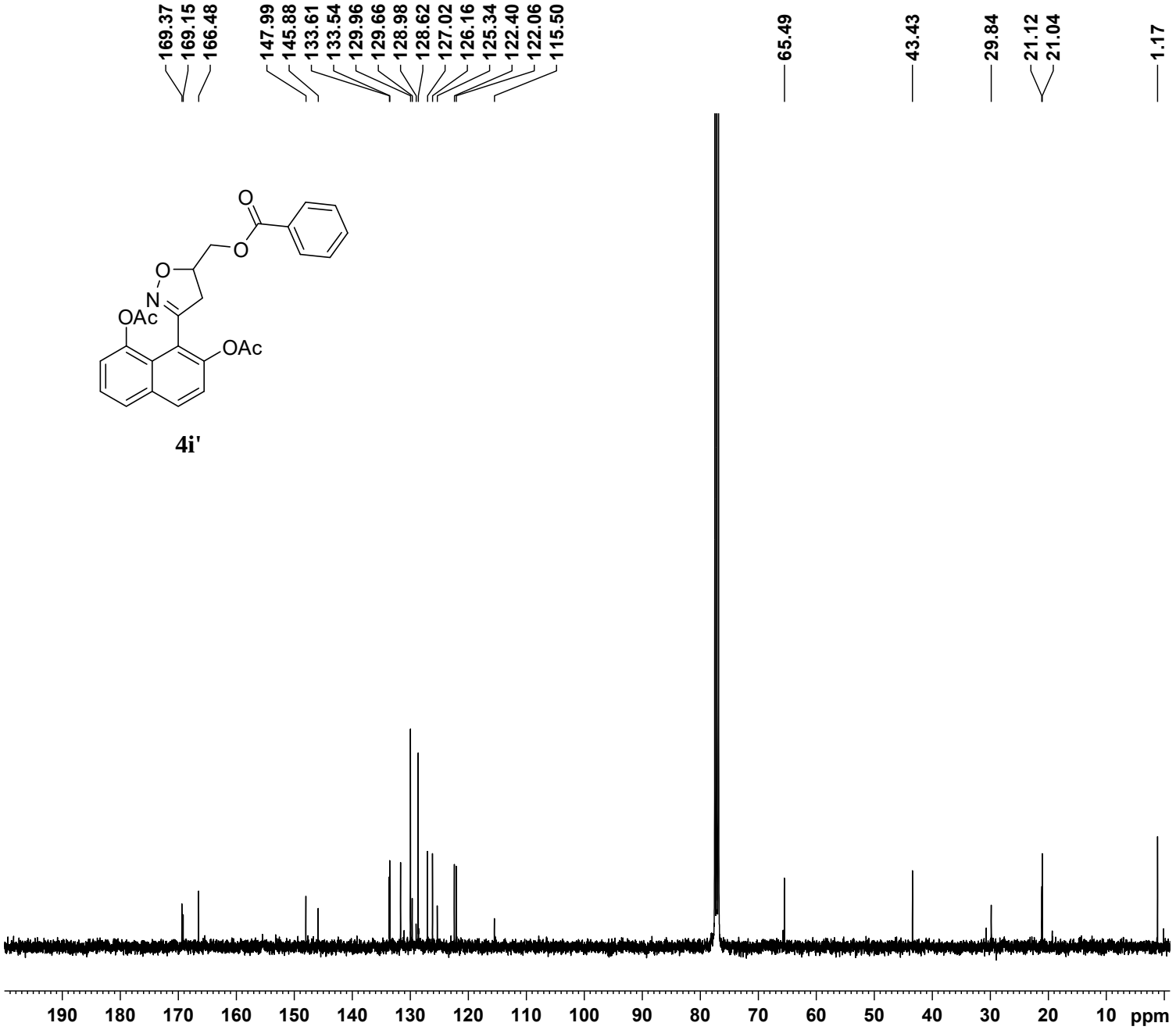


4i'

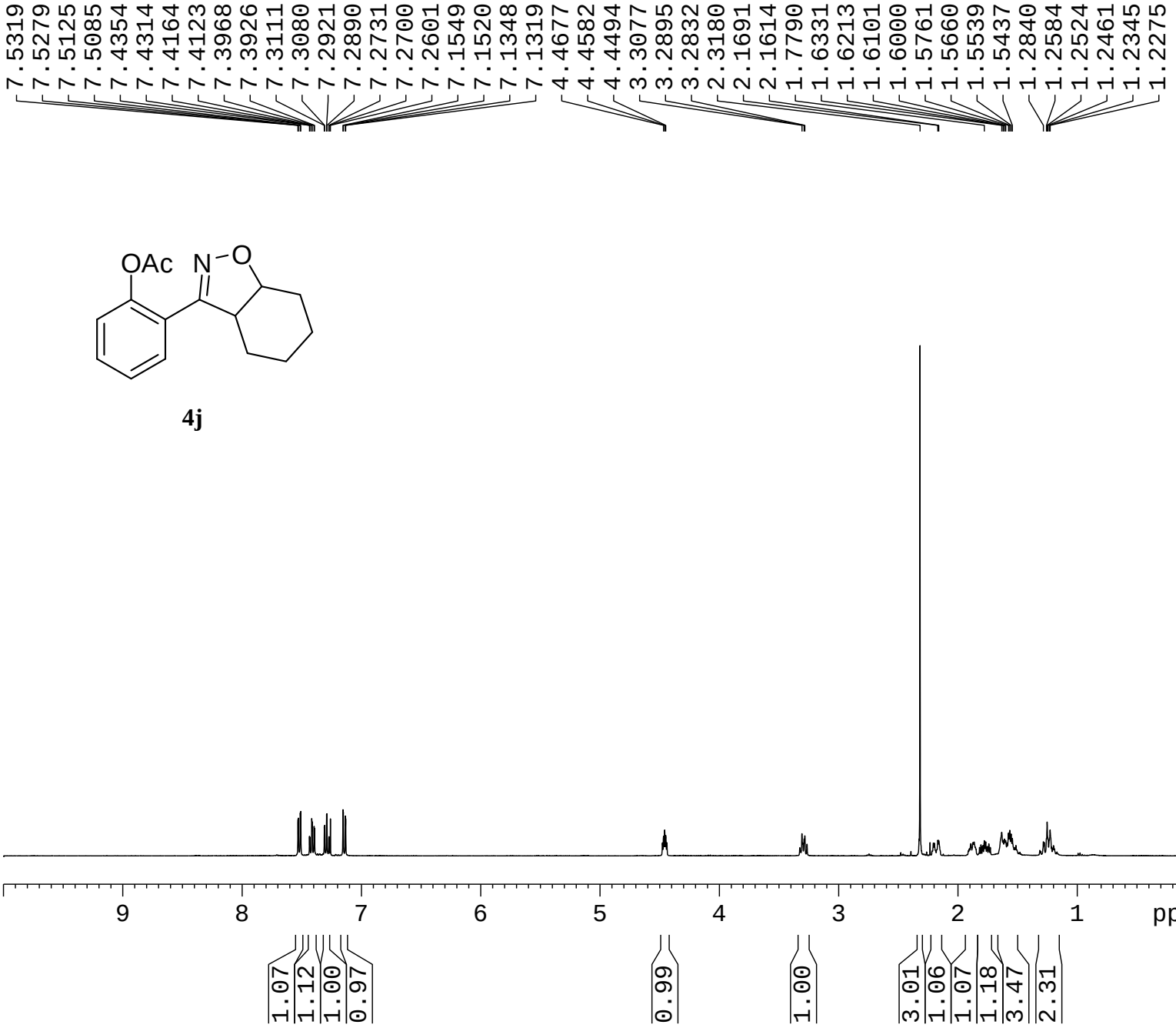
BRUKER

```
NAME      CWG150915-2-z-PURE
EXPNO                     1
PROCNO                    1
Date_              20160226
Time                  16.17
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES            0.125483 Hz
AQ                3.9846387 sec
RG                      181
DW                   60.800 usec
DE                    6.50 usec
TE                   294.8 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700034 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```

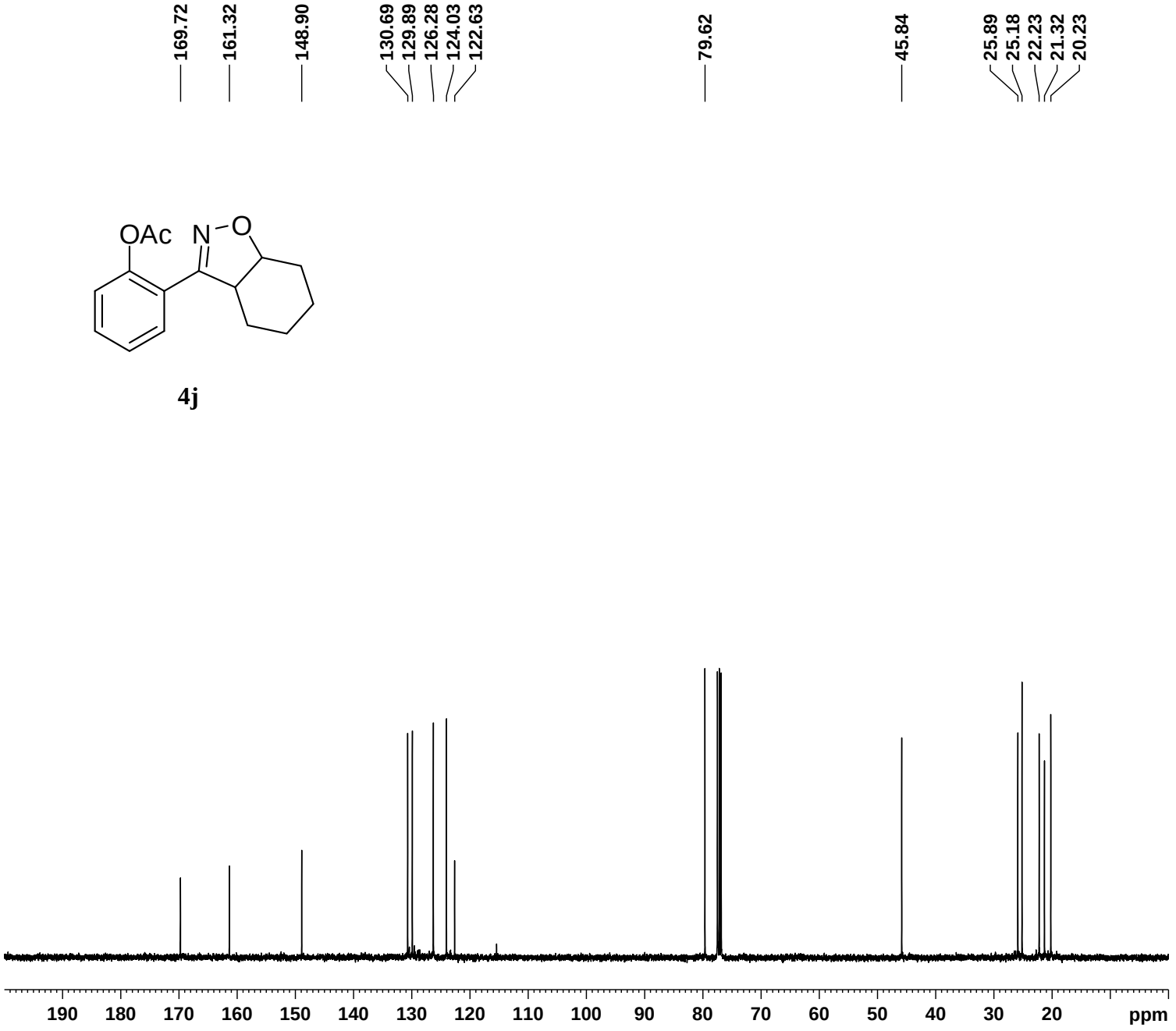





```
NAME      CWG150915-2-z-pure-C13
EXPNO                  1
PROCNO                 1
Date_           20160229
Time              17.07
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3000
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                  203
DW                20.800 usec
DE                 6.50 usec
TE                294.2 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                 8.50 usec
PL1               -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228118 MHz
WDW                EM
SSB                 0
LB                1.00 Hz
GB                  0
PC                1.40
```

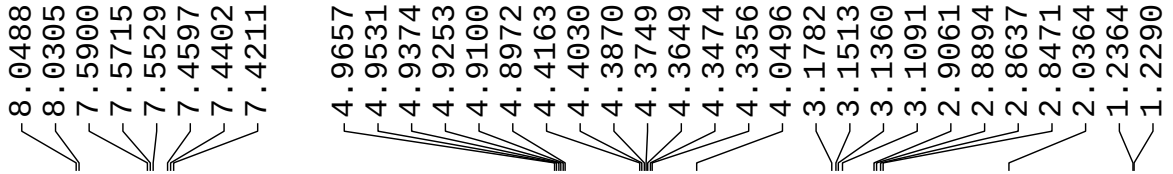


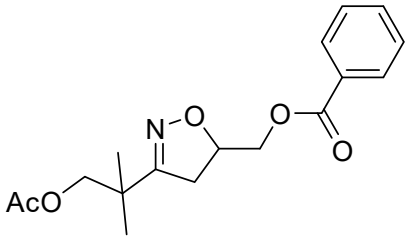

```
NAME      CWG150603-2-DAN
EXPNO                  1
PROCNO                 1
Date_           20150604
Time               17.38
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8223.685 Hz
FIDRES          0.125483 Hz
AQ              3.9846387 sec
RG                  90.5
DW                60.800 usec
DE                 6.50 usec
TE                297.6 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                13.80 usec
PL1               -1.00 dB
PL1W        13.18669796 W
SFO1        400.1724712 MHz
SI                 32768
SF          400.1700031 MHz
WDW                   EM
SSB                    0
LB                0.30 Hz
GB                     0
PC                1.00
```



4j

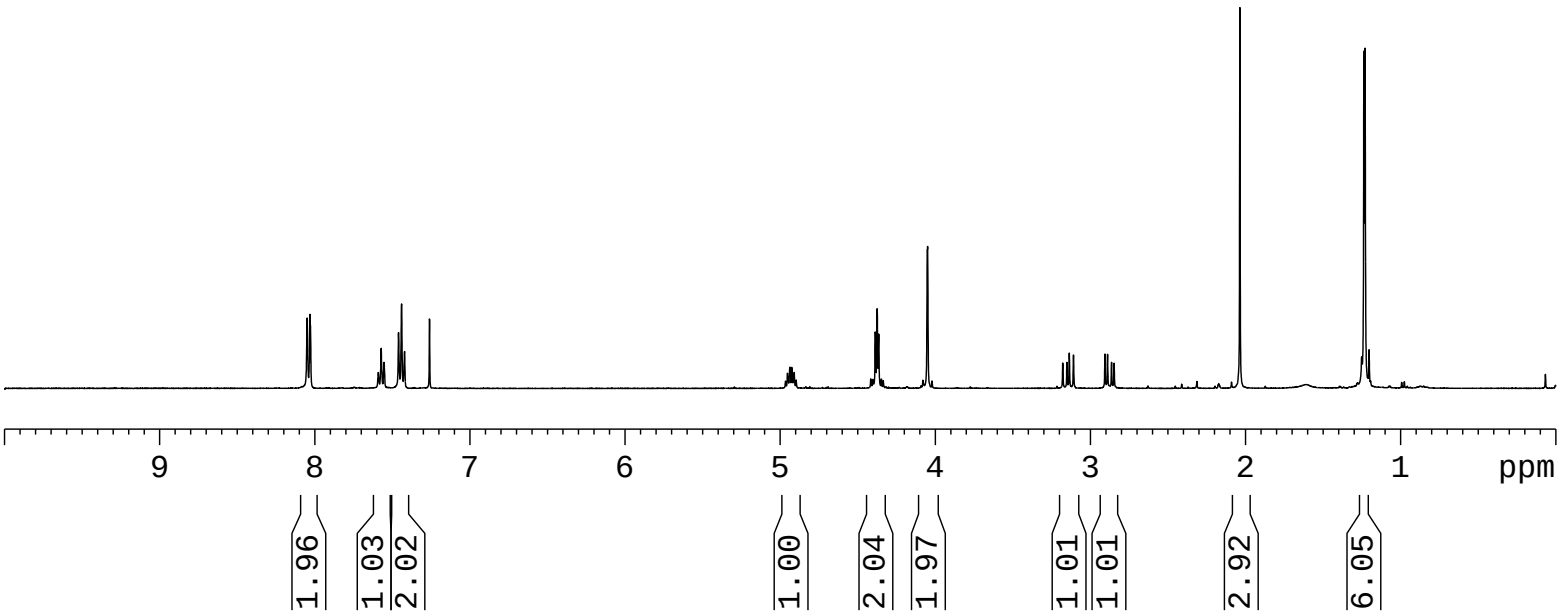
```
NAME        CWG150603-2-dan1-C13
EXPNO                         1
PROCNO                        1
Date_                  20150604
Time                      18.38
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          251
DS                            4
SWH                   24038.461 Hz
FIDRES                 0.366798 Hz
AQ                    1.3631988 sec
RG                          203
DW                       20.800 usec
DE                        6.50 usec
TE                       297.8 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                        13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                        32768
SF                100.6228191 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

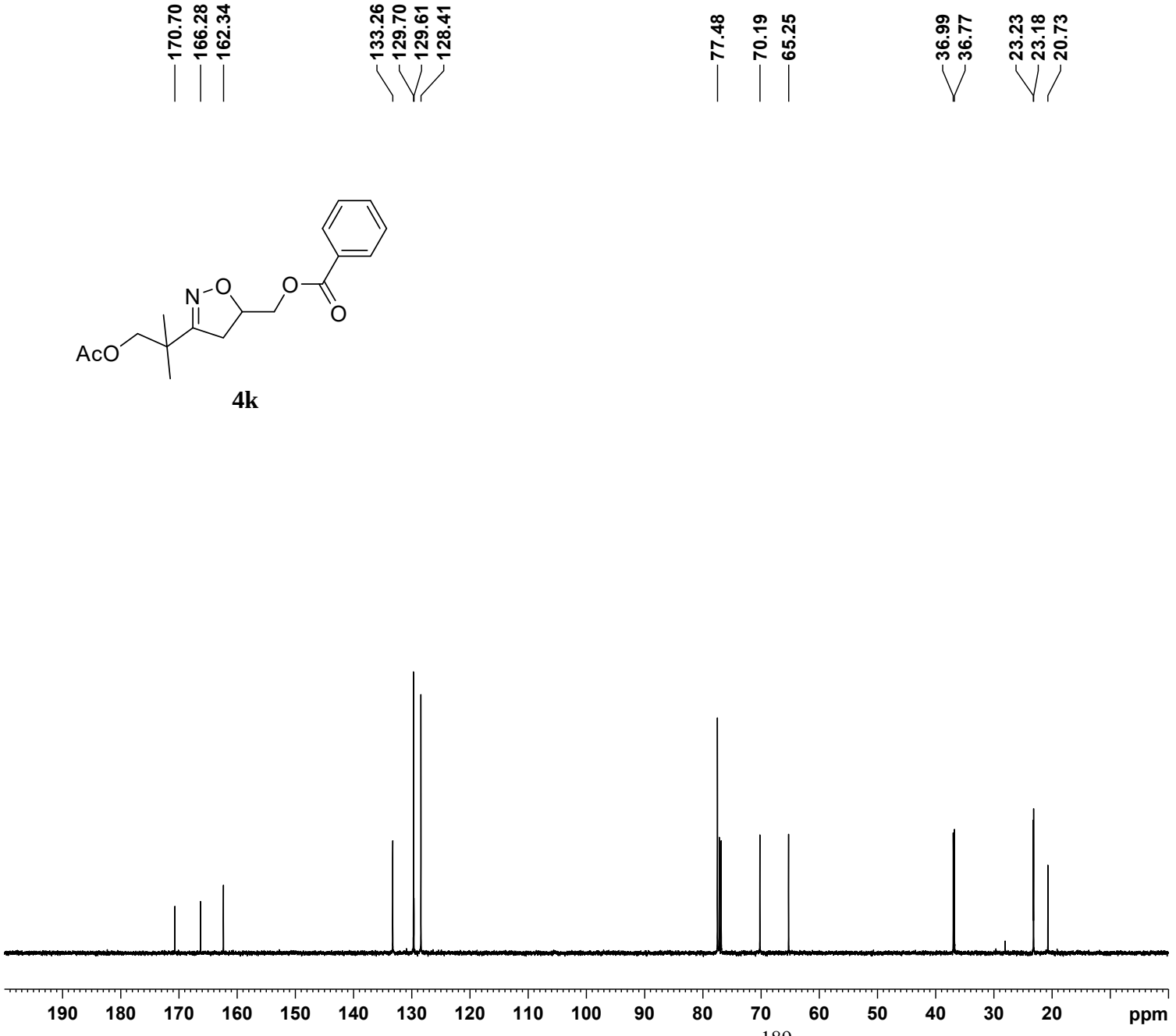




4k

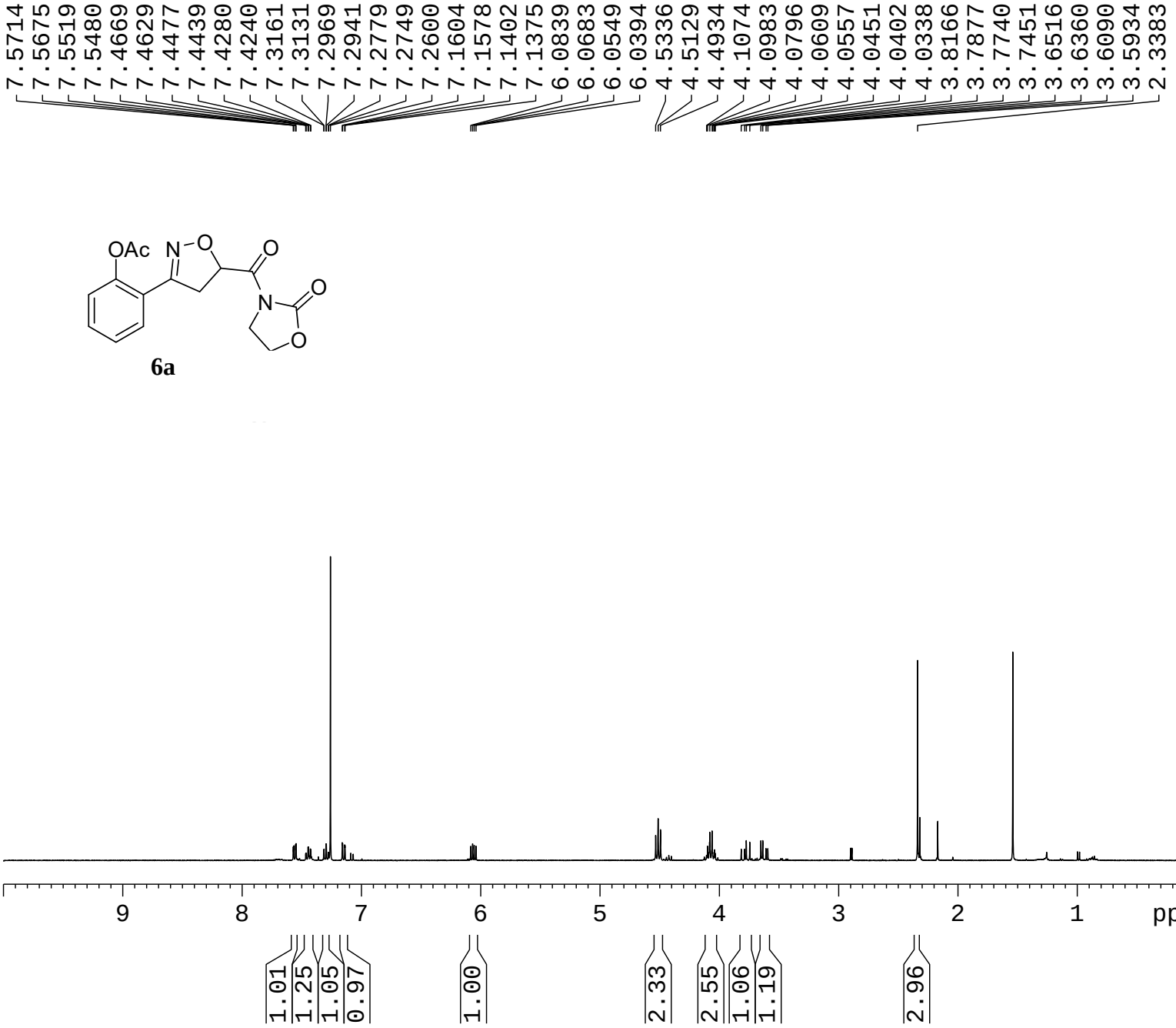
```
NAME          CWG150814-1
EXPNO                   1
PROCNO                  1
Date_            20150815
Time                11.21
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 297.5 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700032 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```





4k

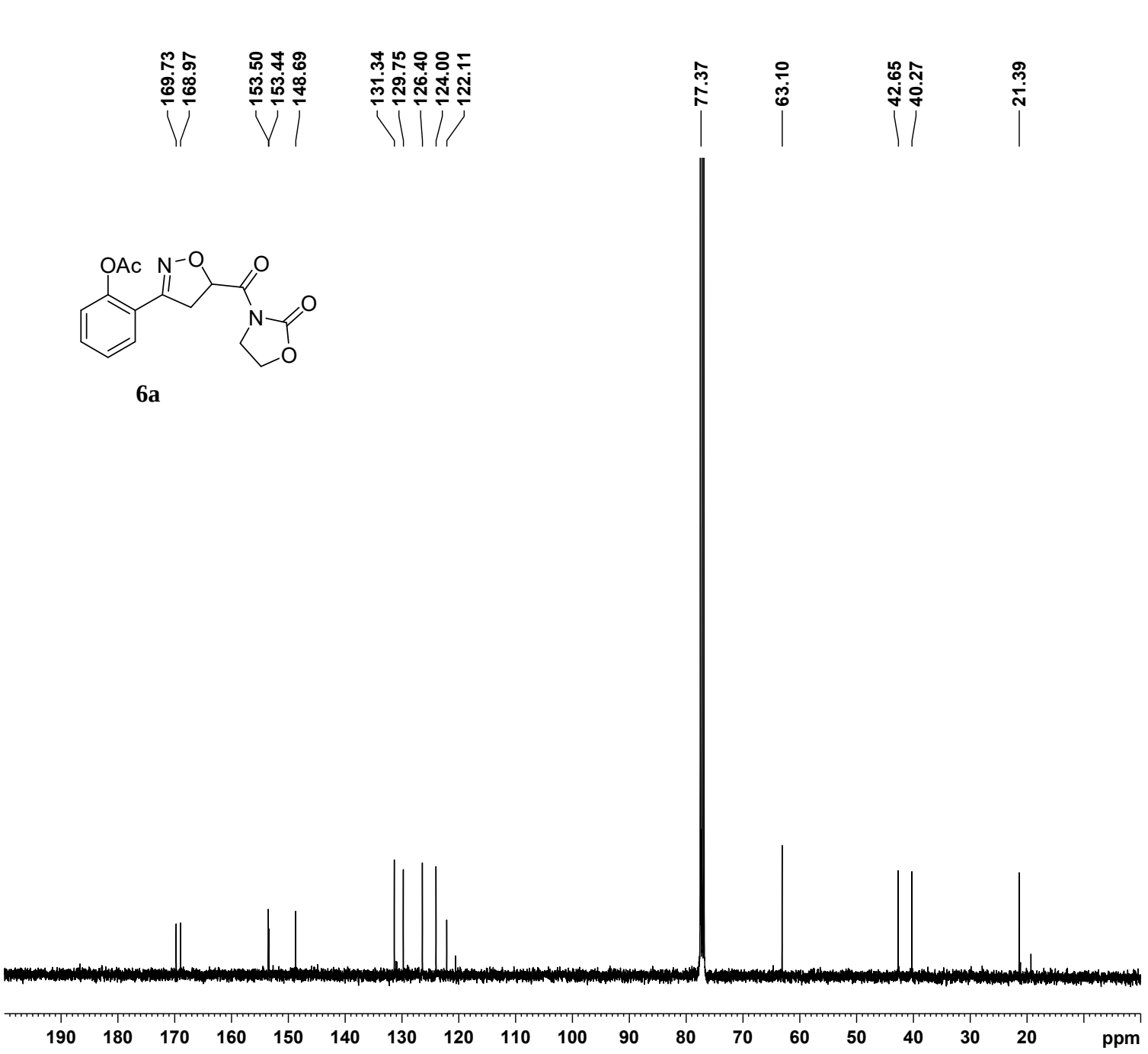
```
NAME        CWG150814-1-C13
EXPNO                    1
PROCNO                   1
Date_             20150815
Time                 15.34
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    83
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                298.6 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1       100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2       400.1716007 MHz
SI                32768
SF         100.6228249 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```



NAME	CWG150708-2-1
EXPNO	1
PROCNO	1
Date_	20150713
Time	20.49
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	300.0 K
D1	1.00000000 sec
TD0	1

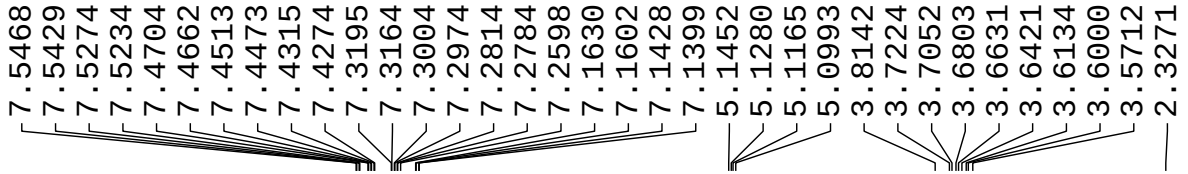
======== CHANNEL f1 ========

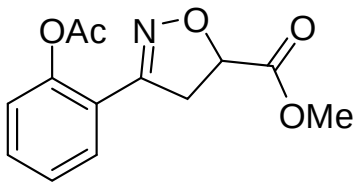
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



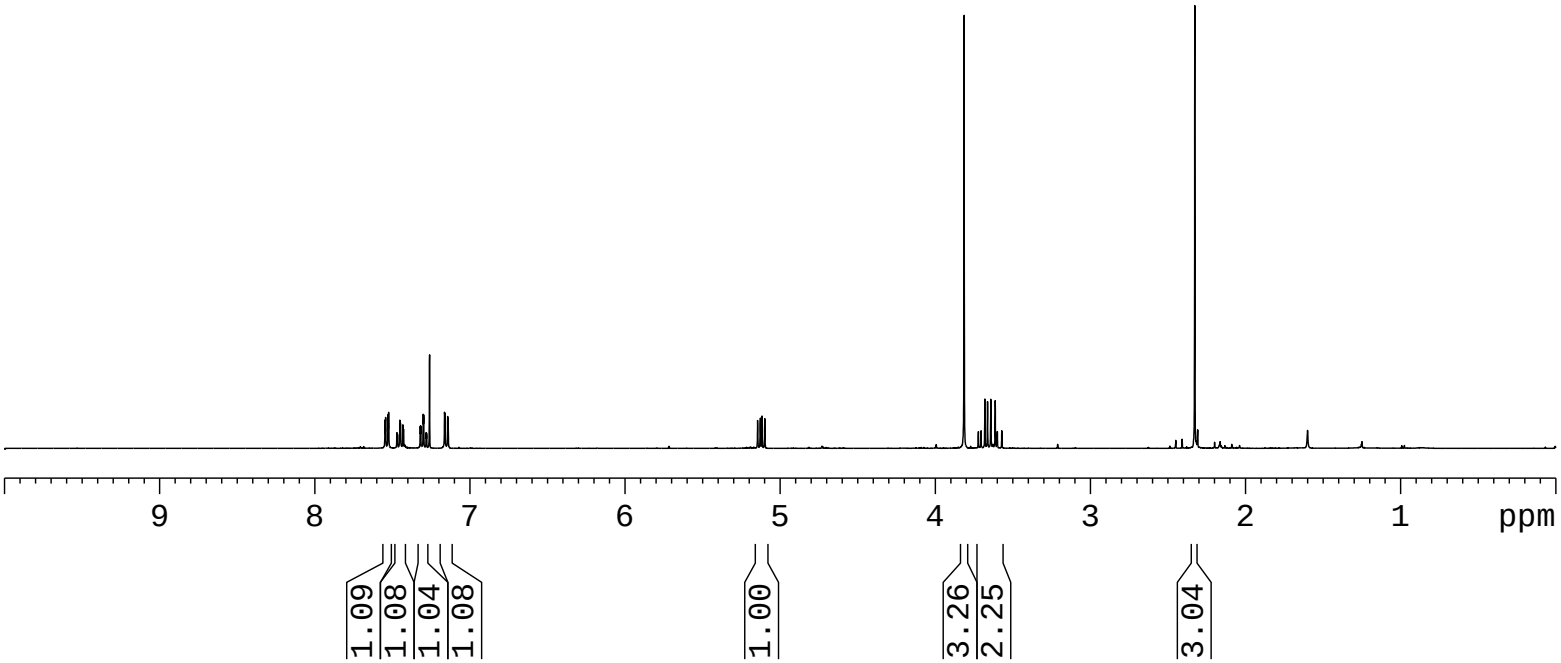
6a

```
NAME        CWG150708-2-C13
EXPNO                    1
PROCNO                   1
Date_             20160216
Time                 16.19
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                    1284
DS                       4
SWH              24038.461 Hz
FIDRES            0.366798 Hz
AQ                1.3631988 sec
RG                     203
DW                  20.800 usec
DE                   6.50 usec
TE                  298.3 K
D1               2.00000000 sec
D11              0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                   32768
SF            100.6228107 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

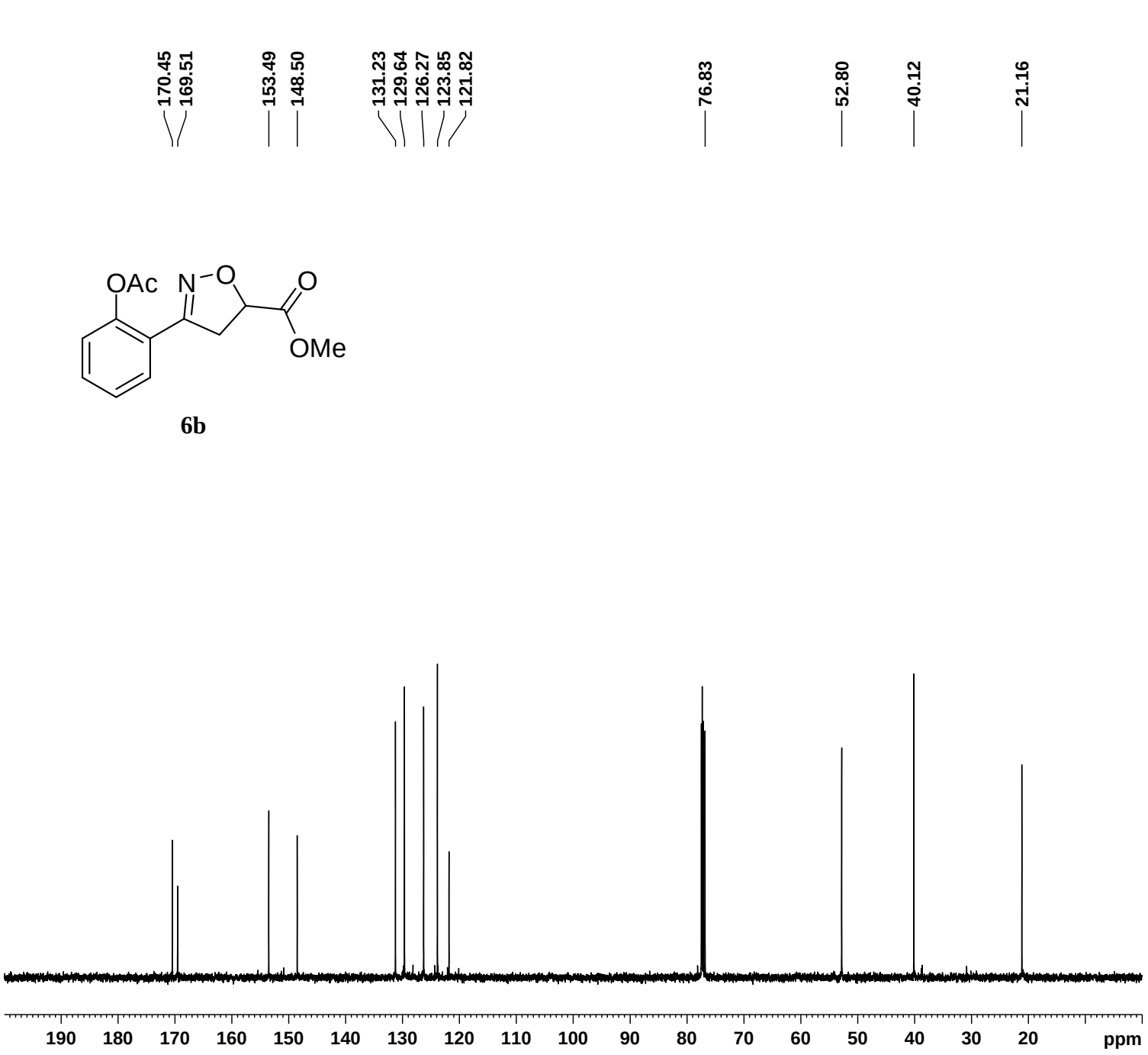




6b

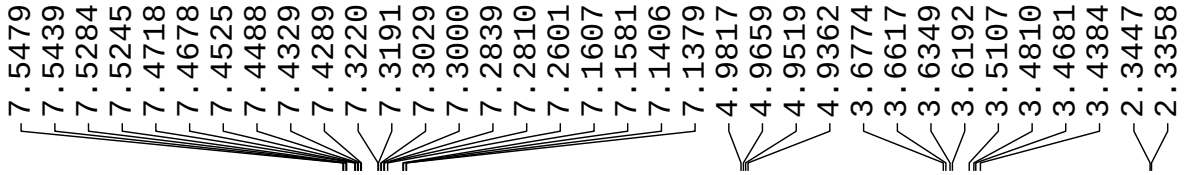


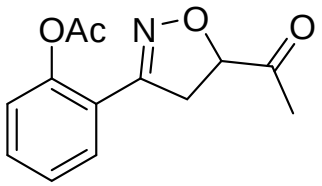
NAME	CWG150410(1)
EXPNO	1
PROCNO	1
Date_	20150609
Time	21.20
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	181
DW	60.800 usec
DE	6.50 usec
TE	297.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700032 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



6b

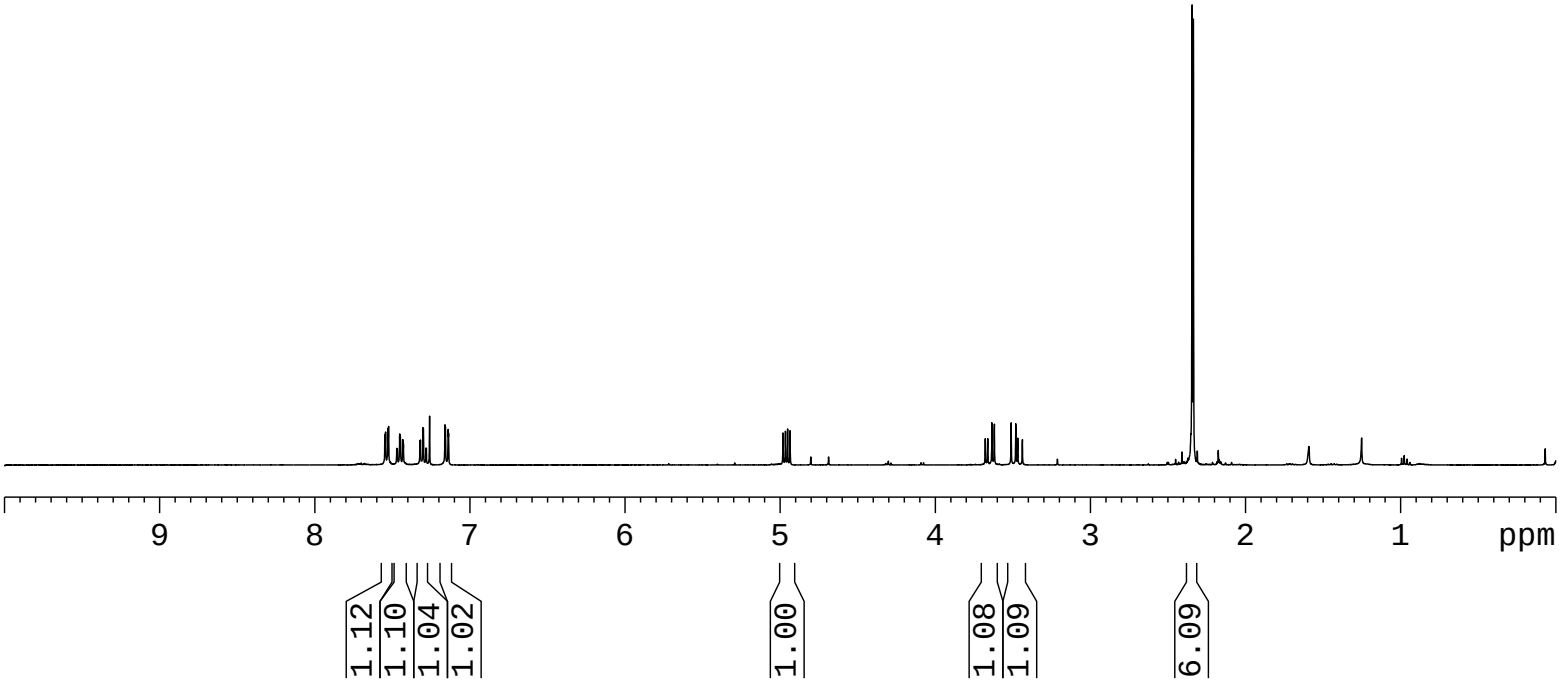
```
NAME          CWG150410-C13
EXPNO                     1
PROCNO                    1
Date_              20150614
Time                 19.29
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    117
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                 20.800 usec
DE                  6.50 usec
TE                 297.4 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W         57.32743073 W
SFO1         100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2         400.1716007 MHz
SI                 32768
SF           100.6228270 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

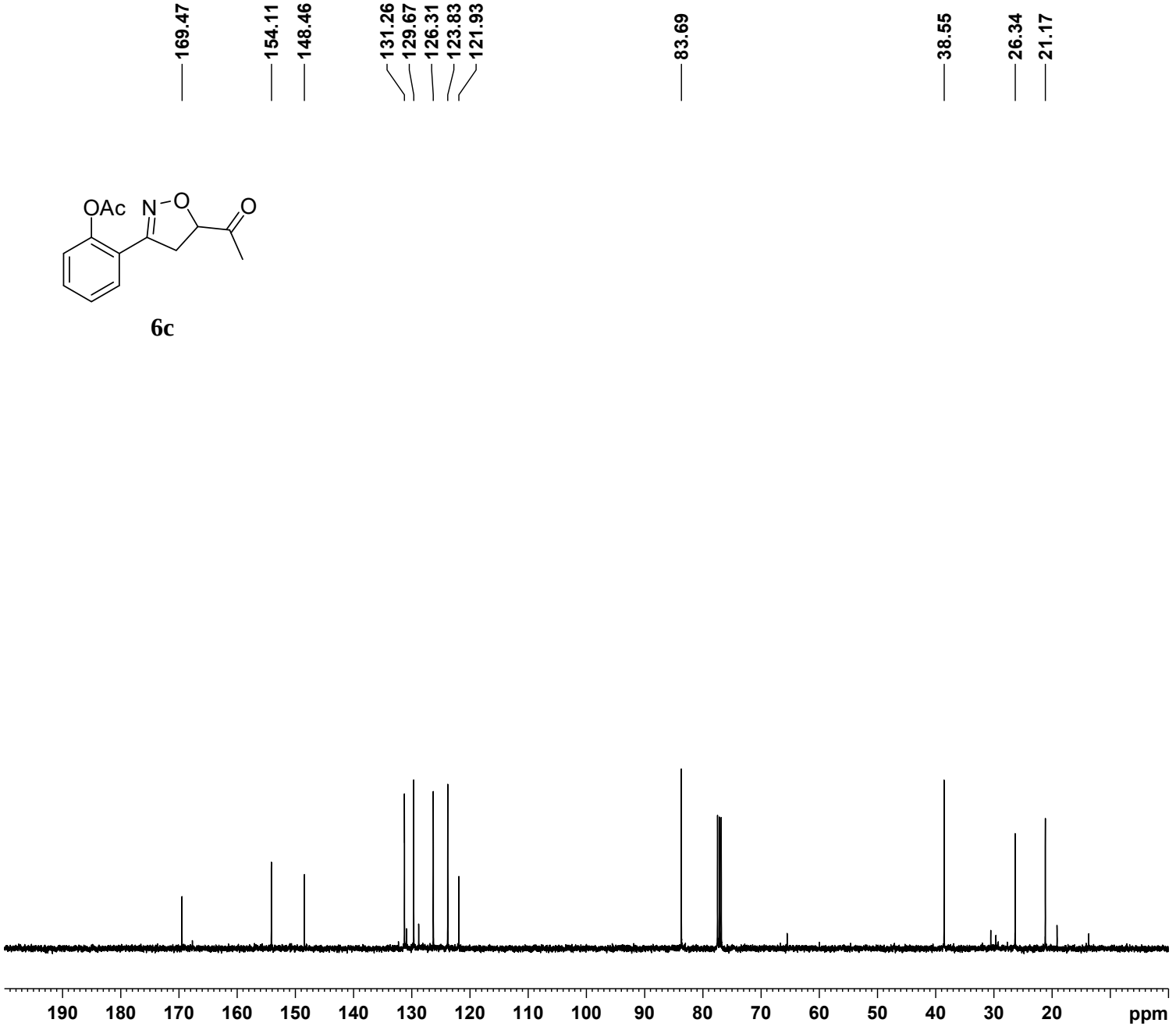




6c

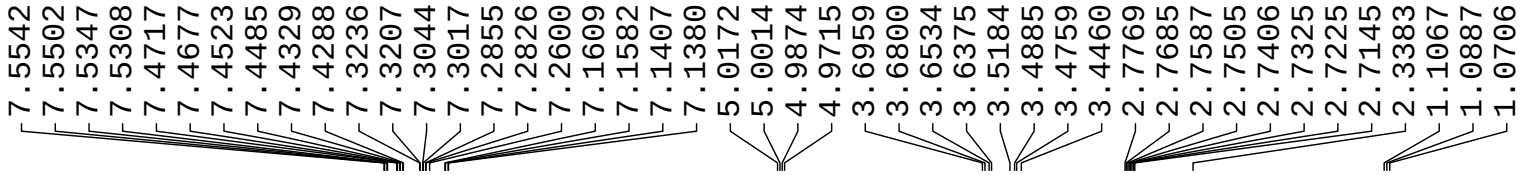
```
NAME      CWG150707-3-pure
EXPNO                    1
PROCNO                   1
Date_             20150708
Time                 21.23
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    144
DW                 60.800 usec
DE                  6.50 usec
TE                 297.9 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700032 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```

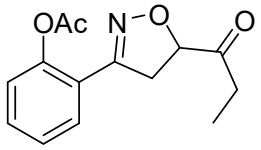




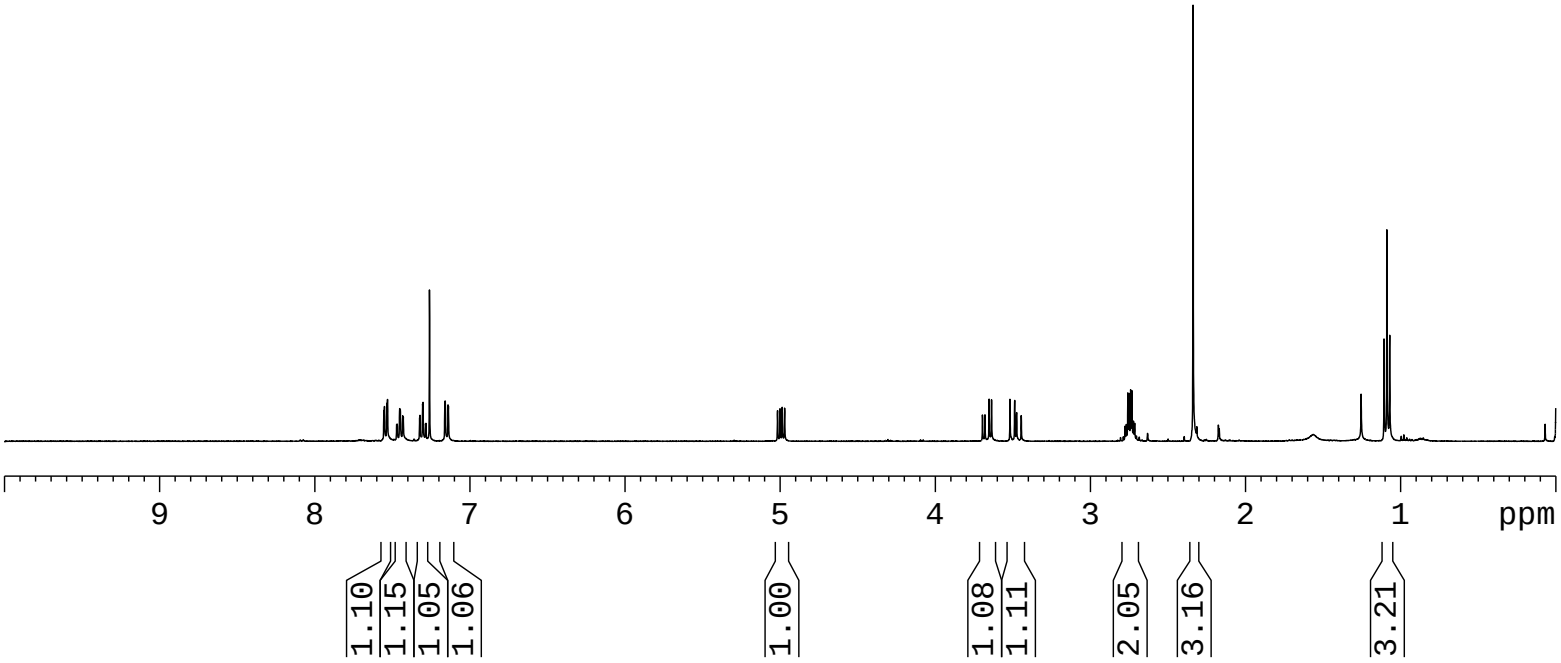
6c

```
NAME        CWG150707-3-C13
EXPNO                    1
PROCNO                   1
Date_             20150708
Time                 22.06
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     69
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                  20.800 usec
DE                   6.50 usec
TE                  298.3 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W          57.32743073 W
SFO1         100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W          13.18669796 W
PL12W          0.39276794 W
PL13W          0.37509048 W
SFO2         400.1716007 MHz
SI                   32768
SF           100.6228260 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

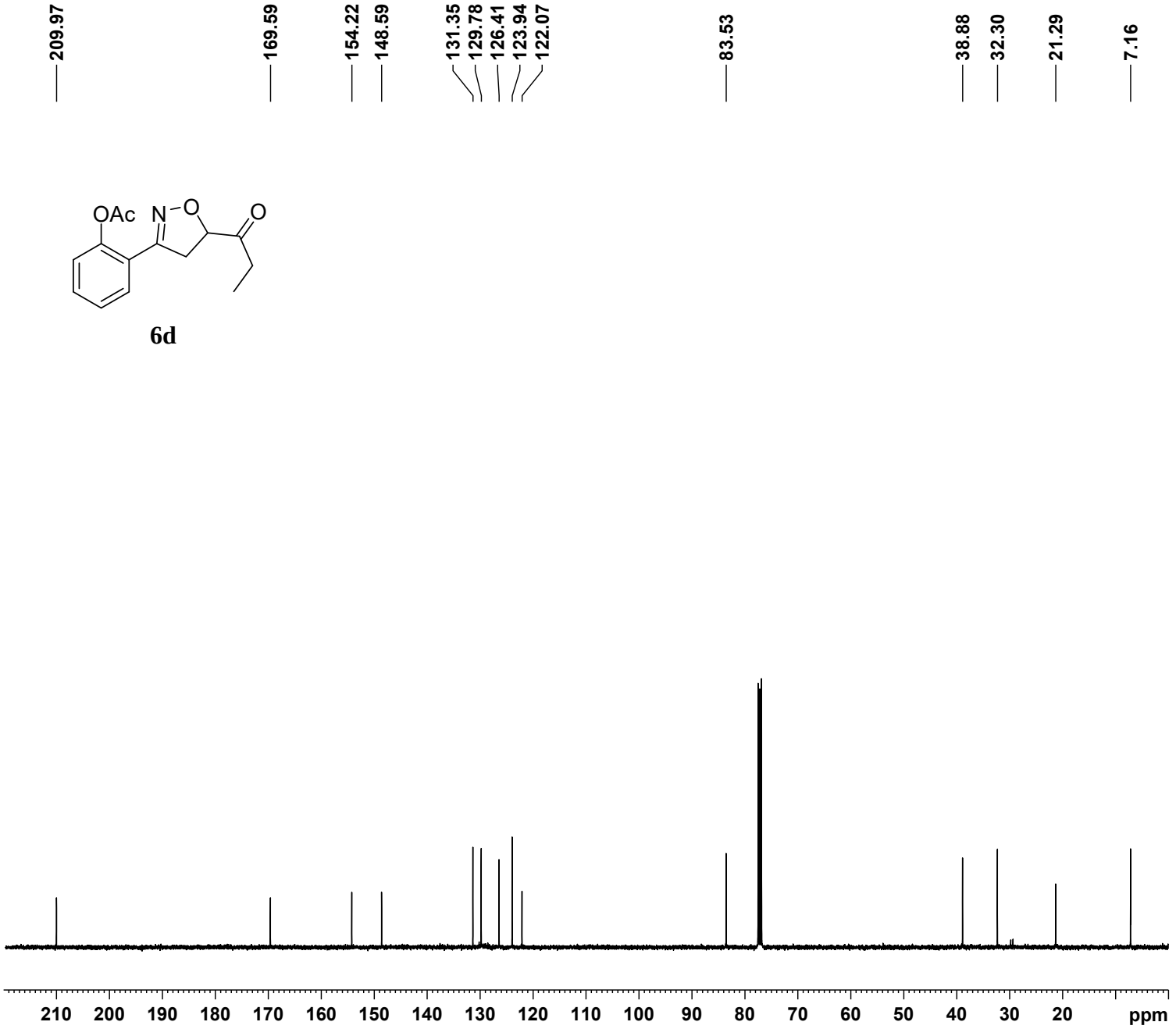




6d

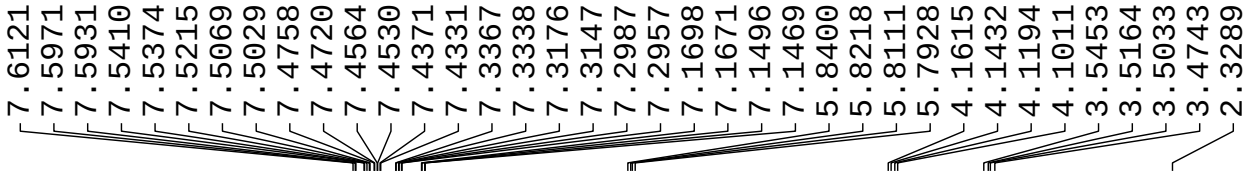


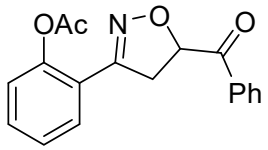

```
NAME          CWG150710-3
EXPNO                   1
PROCNO                  1
Date_            20150711
Time                17.18
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 298.1 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```



6d

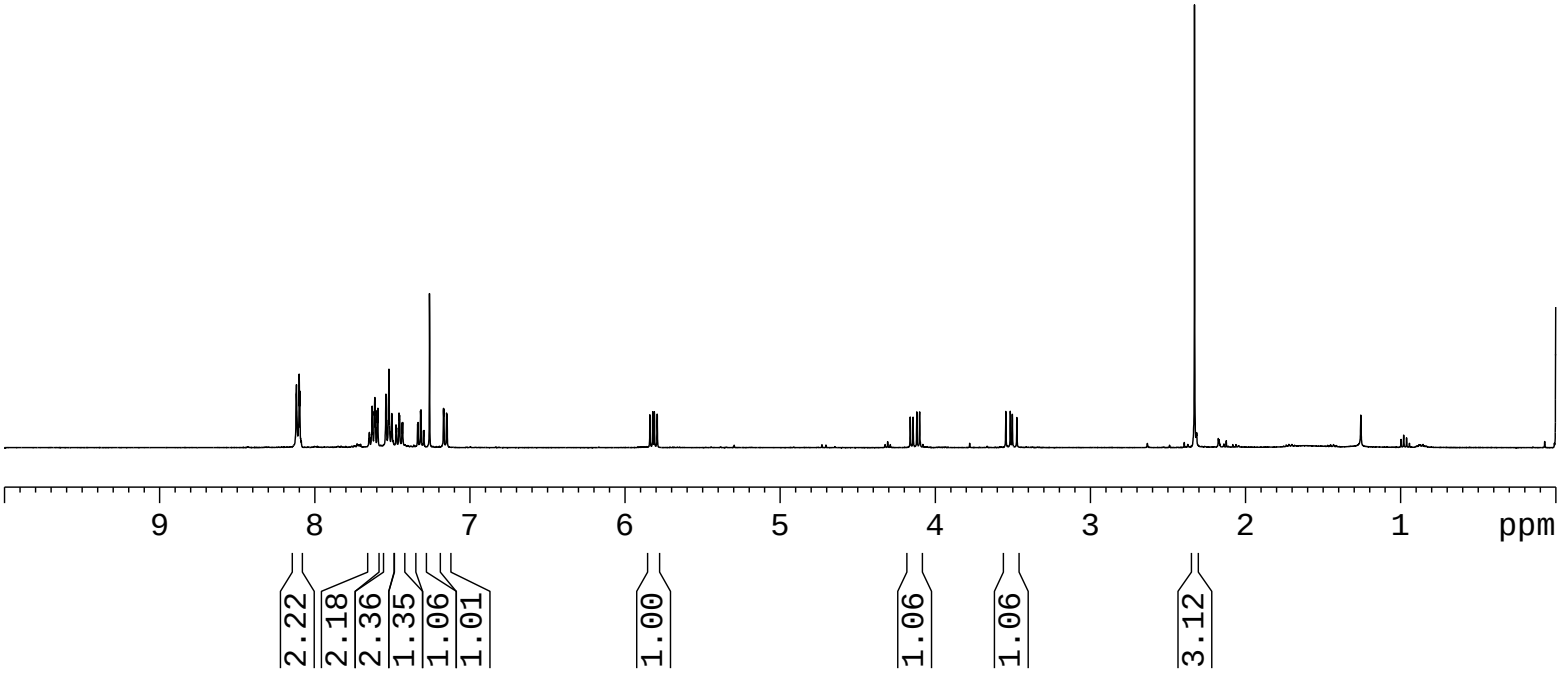
```
NAME        CWG150710-3-C13
EXPNO                    1
PROCNO                   1
Date_             20150711
Time                 17.39
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    567
DS                      4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                    203
DW                 20.800 usec
DE                  6.50 usec
TE                 298.2 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W          57.32743073 W
SFO1         100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W          13.18669796 W
PL12W          0.39276794 W
PL13W          0.37509048 W
SFO2         400.1716007 MHz
SI                 32768
SF           100.6228161 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

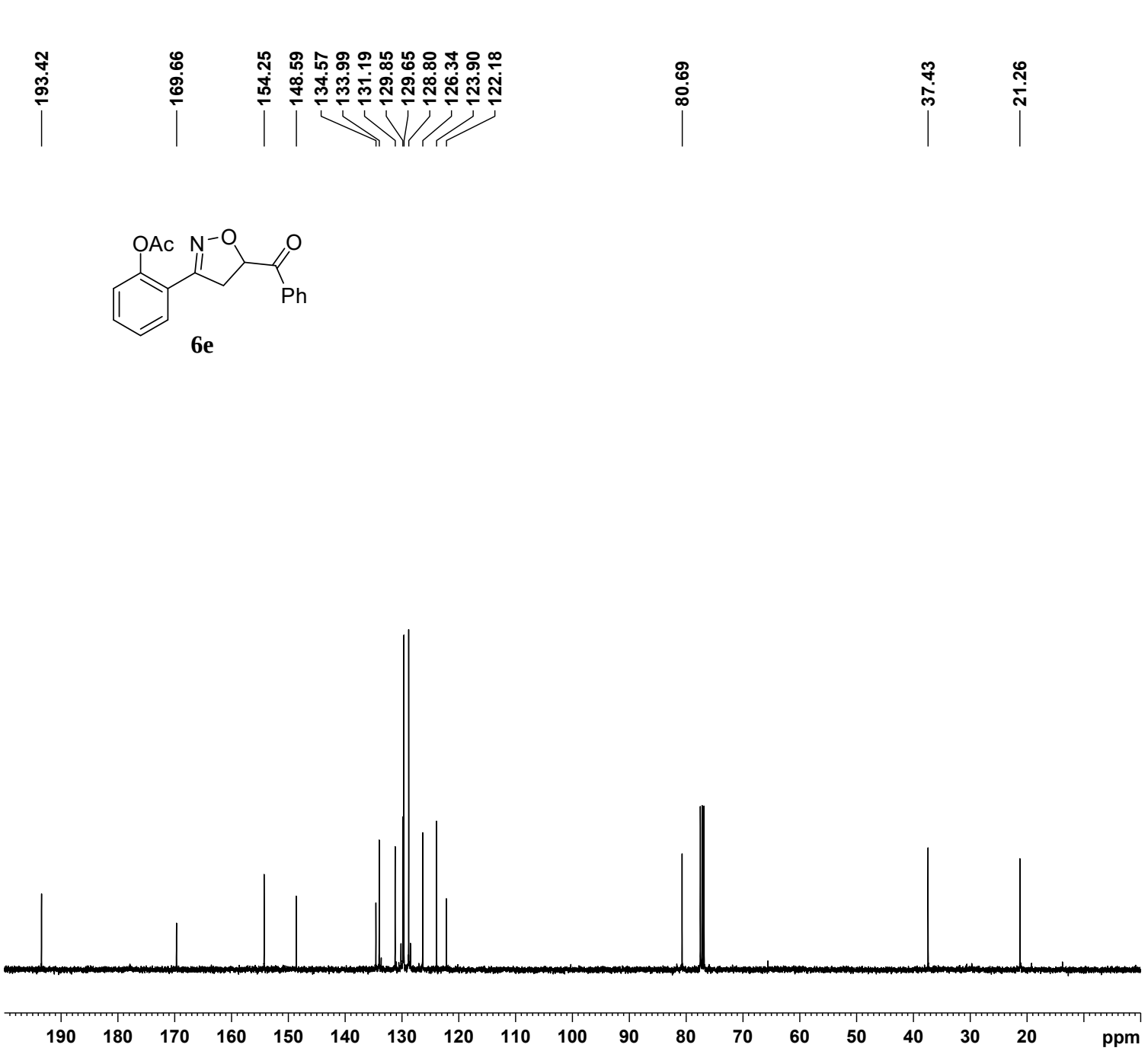




6e

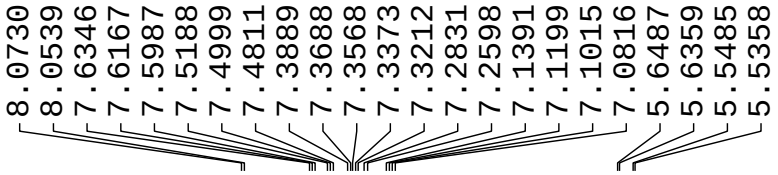
```
NAME        CWG150713-1-2
EXPNO                   1
PROCNO                  1
Date_            20150714
Time                12.21
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 298.8 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

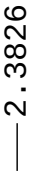


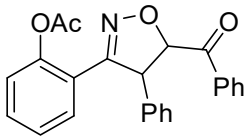


6e

```
NAME          CWG150713-1-C13
EXPNO                      1
PROCNO                     1
Date_               20150715
Time                   18.42
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                       103
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                     297.9 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228228 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

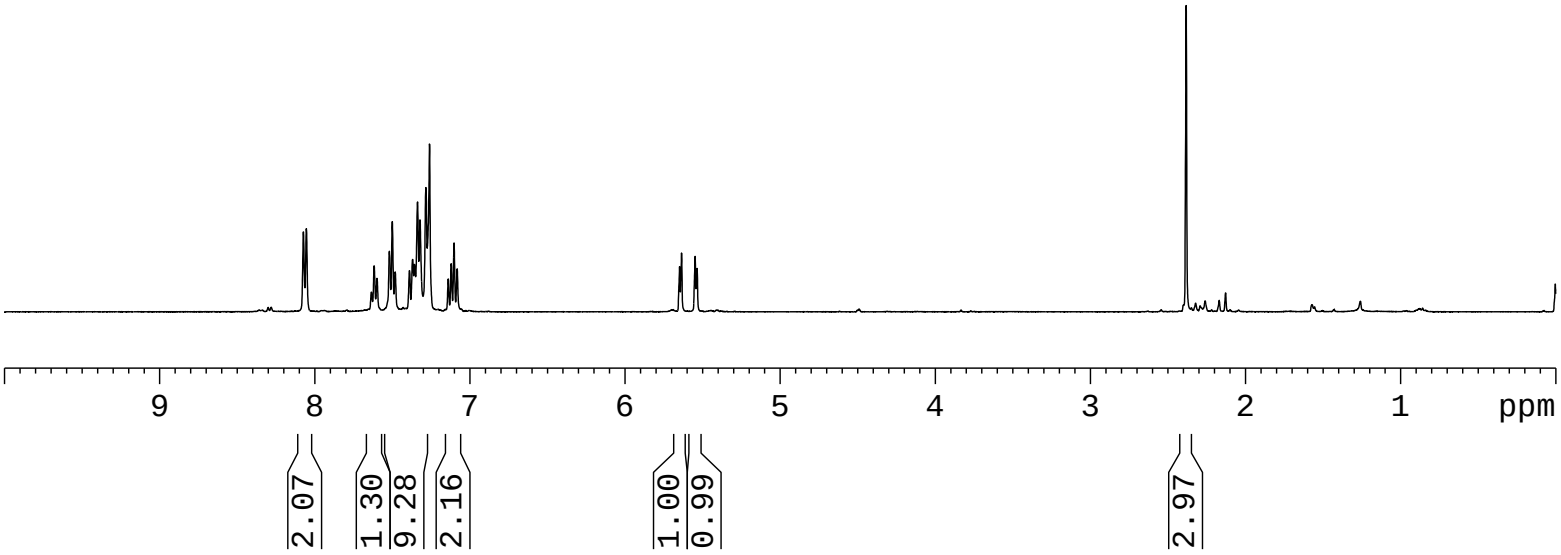


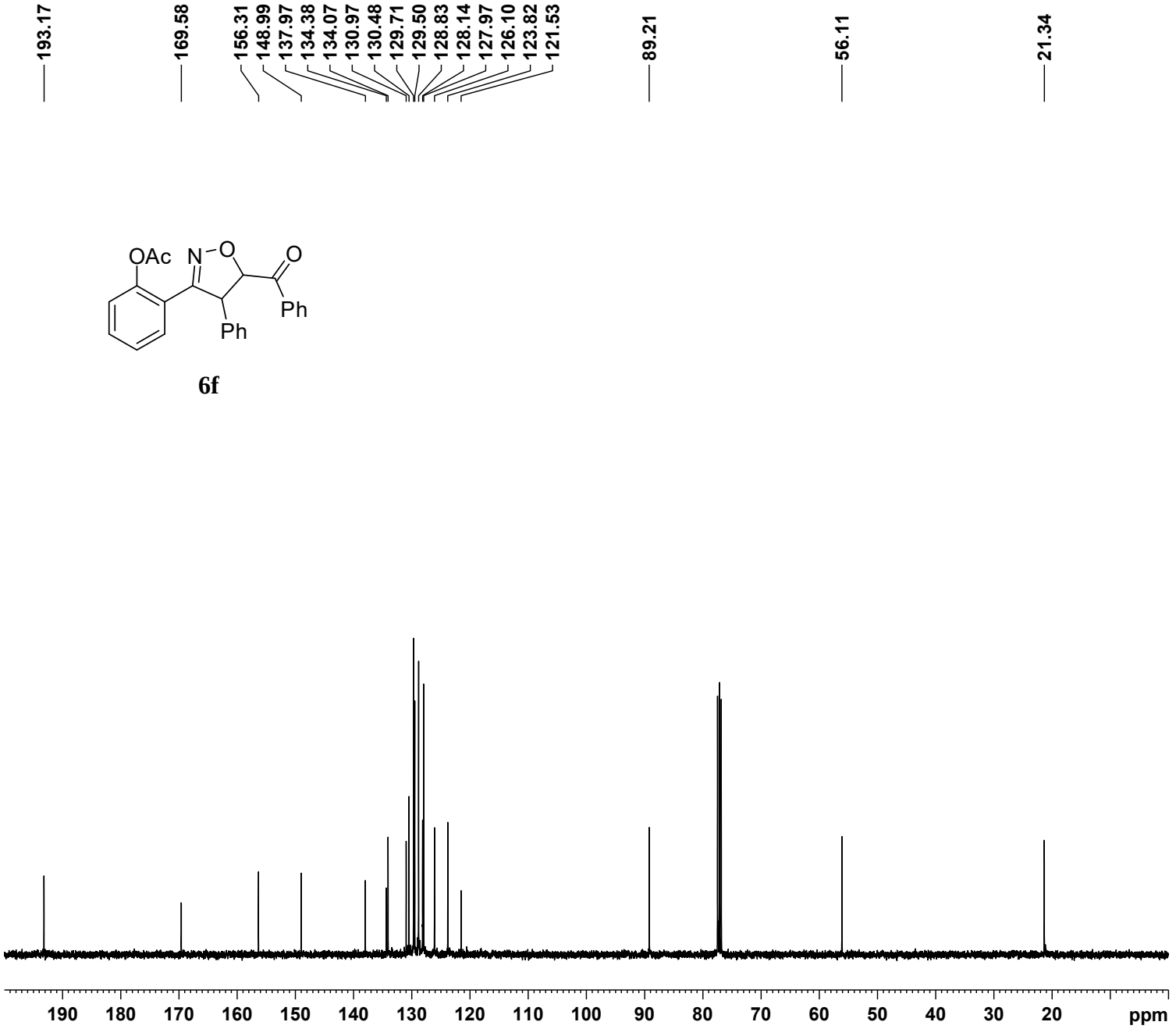




6f

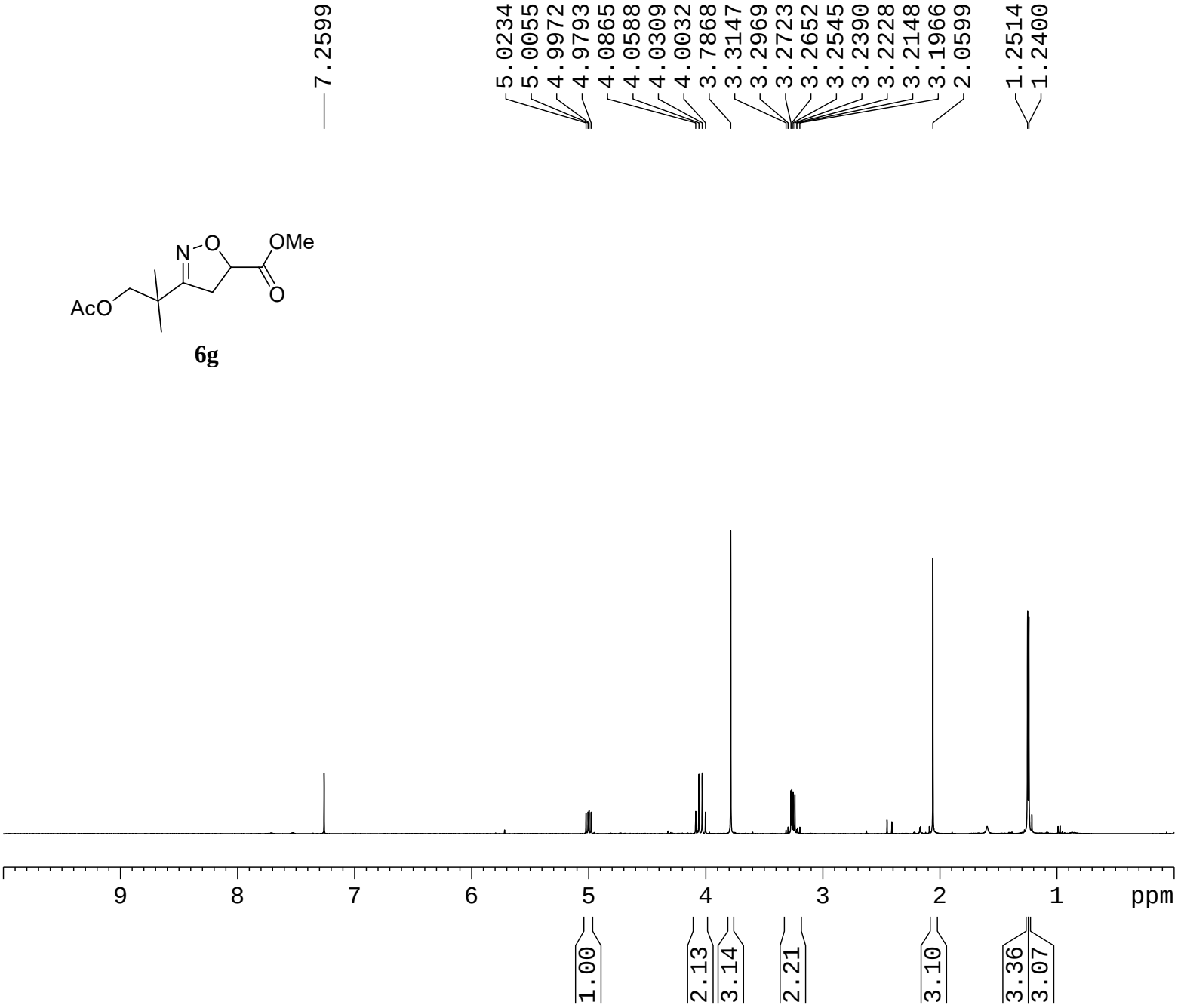
```
NAME        CWG151008-2-1
EXPNO                   1
PROCNO                  1
Date_            20151013
Time                10.28
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 297.7 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700035 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```





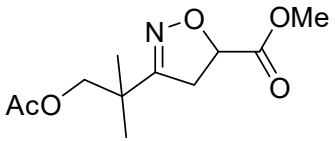
6f

```
NAME        CWG151008-2-1-C13
EXPNO                       1
PROCNO                      1
Date_                20151013
Time                    10.50
INSTRUM                 spect
PROBHD    5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                        128
DS                          4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     298.2 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                      32768
SF               100.6228202 MHz
WDW                        EM
SSB                         0
LB                      1.00 Hz
GB                          0
PC                      1.40
```

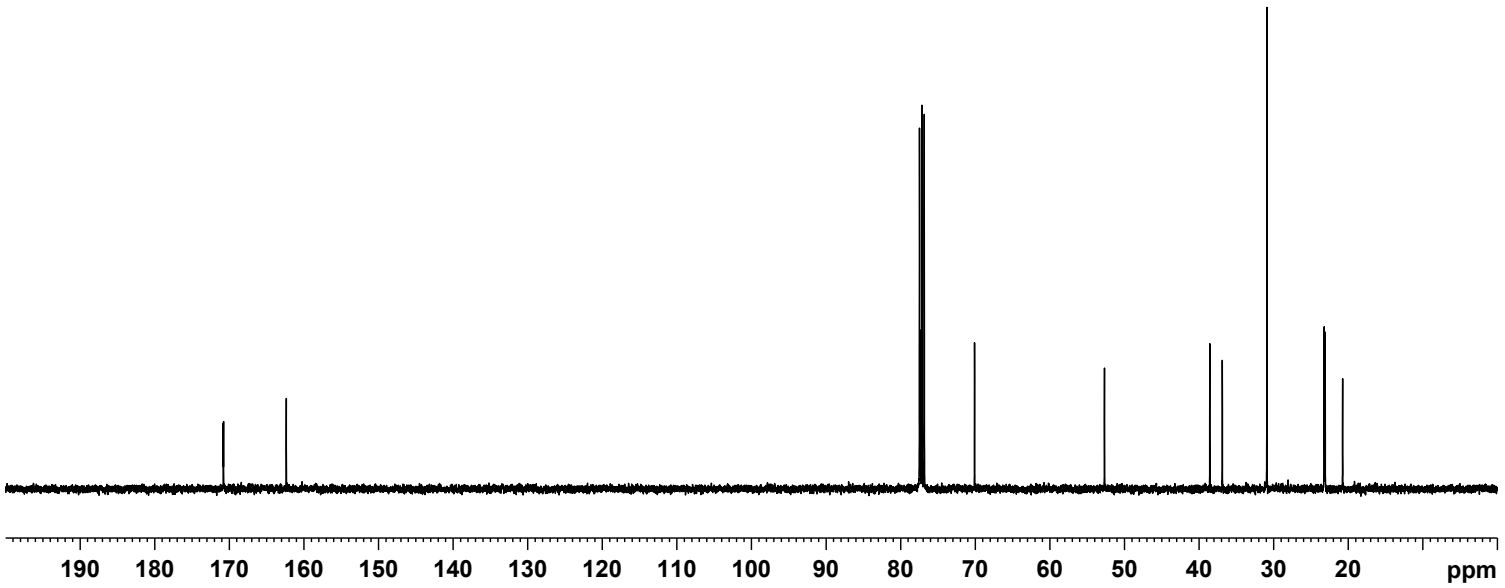


6g

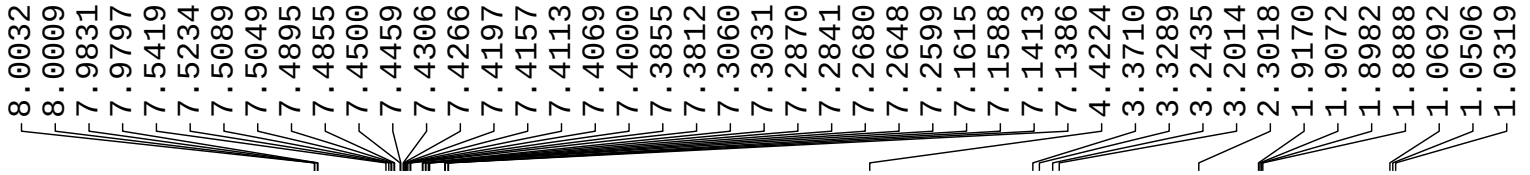
```
NAME          CWG150820-s
EXPNO                   1
PROCNO                  1
Date_            20150821
Time                11.22
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                    203
DW                 60.800 usec
DE                  6.50 usec
TE                 296.7 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                 13.80 usec
PL1                -1.00 dB
PL1W         13.18669796 W
SFO1         400.1724712 MHz
SI                  32768
SF           400.1700033 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                 1.00
```

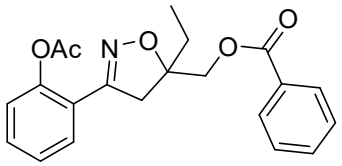


6g

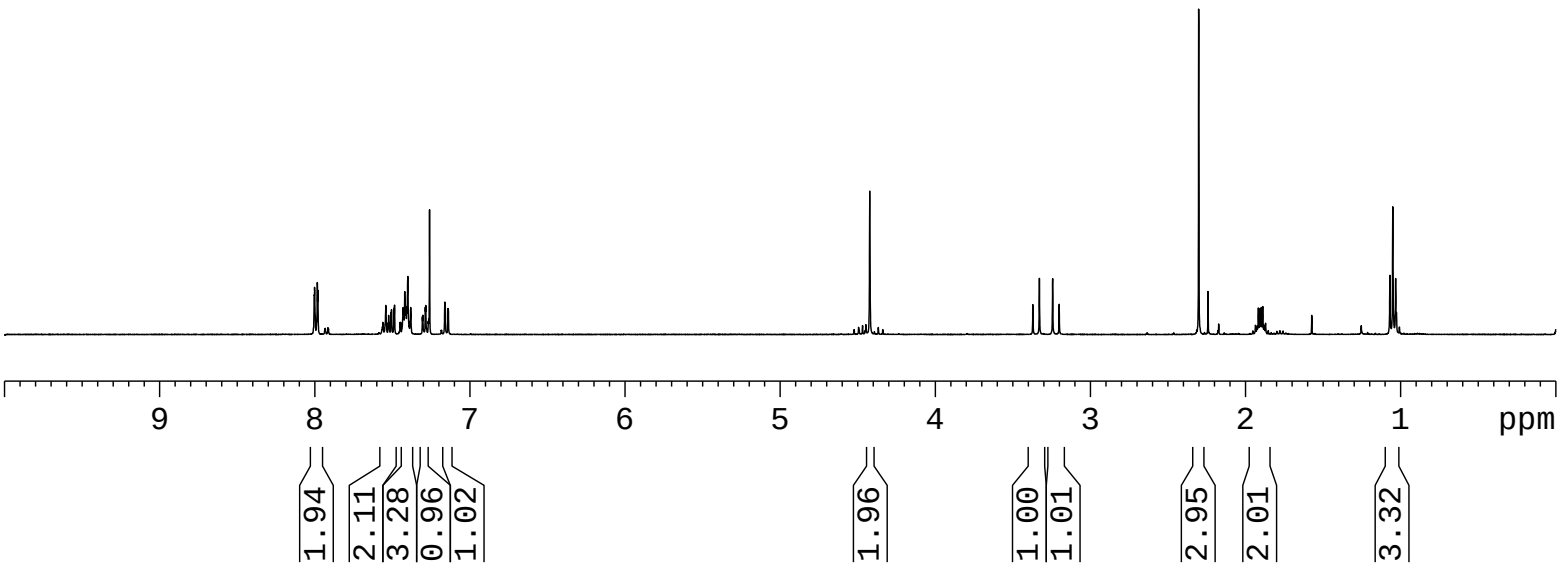



```
NAME        CWG150820-S-C13
EXPNO                    1
PROCNO                   1
Date_             20150914
Time                 18.18
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   222
DS                     4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ              1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                297.5 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228187 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

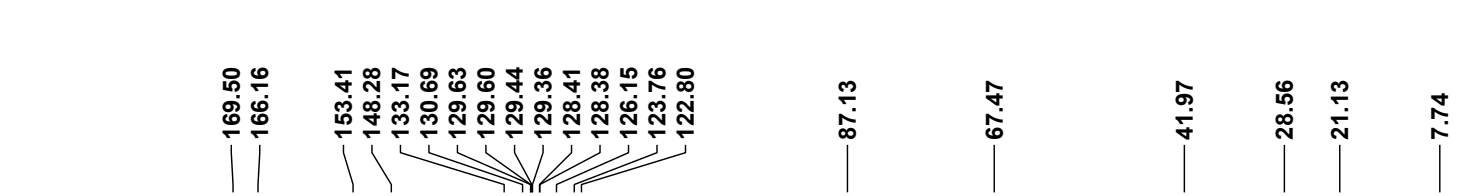


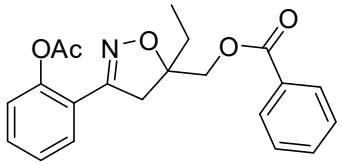


8a

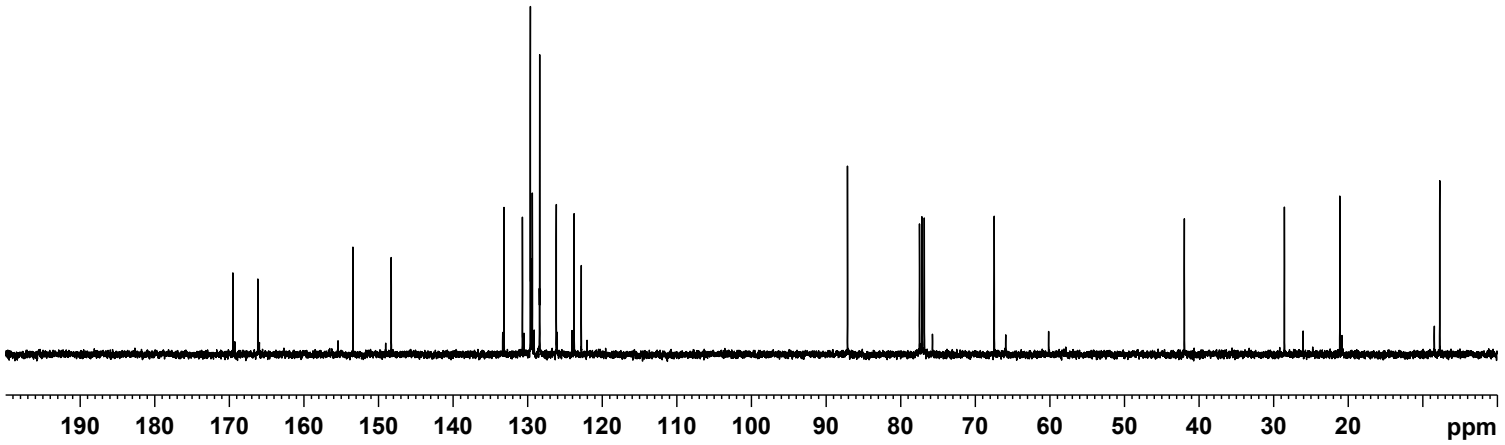


NAME	CWG151019-1-1
EXPNO	1
PROCNO	1
Date_	20151126
Time	14.38
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	291.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700034 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

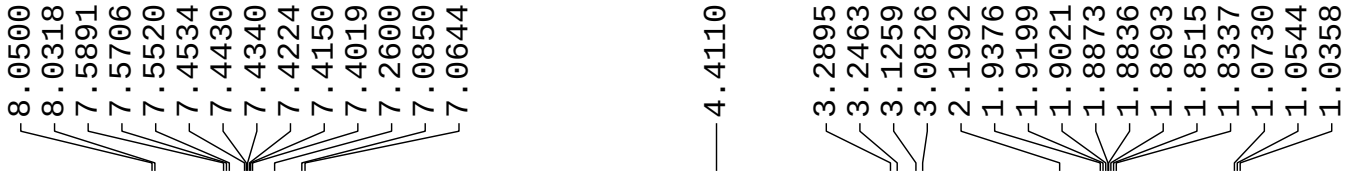


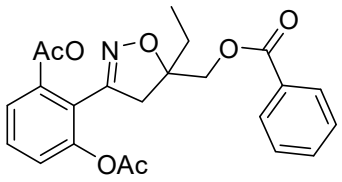


8a



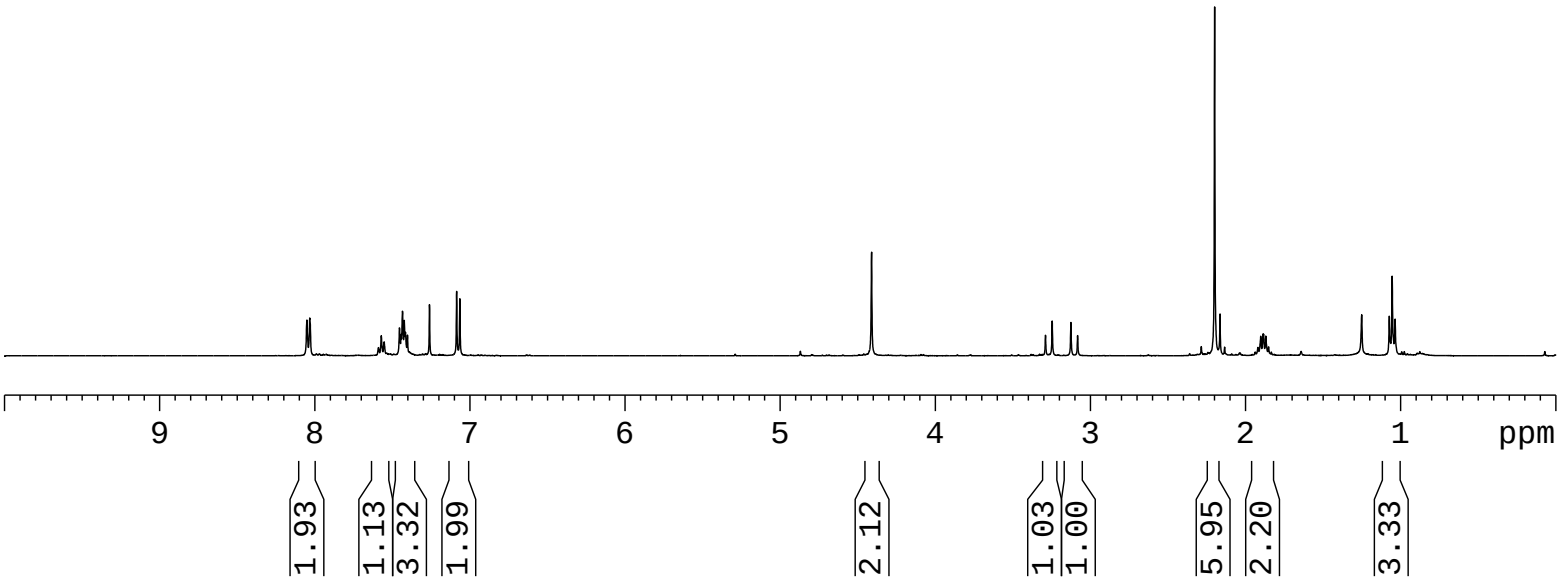

```
NAME        CWG151019-1-1-C13
EXPNO                       1
PROCNO                      1
Date_                20151126
Time                    16.00
INSTRUM                 spect
PROBHD    5 mm PABBO BB-
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         18
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                        203
DW                     20.800 usec
DE                      6.50 usec
TE                     293.4 K
D1                  2.00000000 sec
D11                 0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       13C
P1                      8.50 usec
PL1                    -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                    -1.00 dB
PL12                   14.26 dB
PL13                   14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228360 MHz
WDW                         EM
SSB                          0
LB                      1.00 Hz
GB                           0
PC                      1.40
```

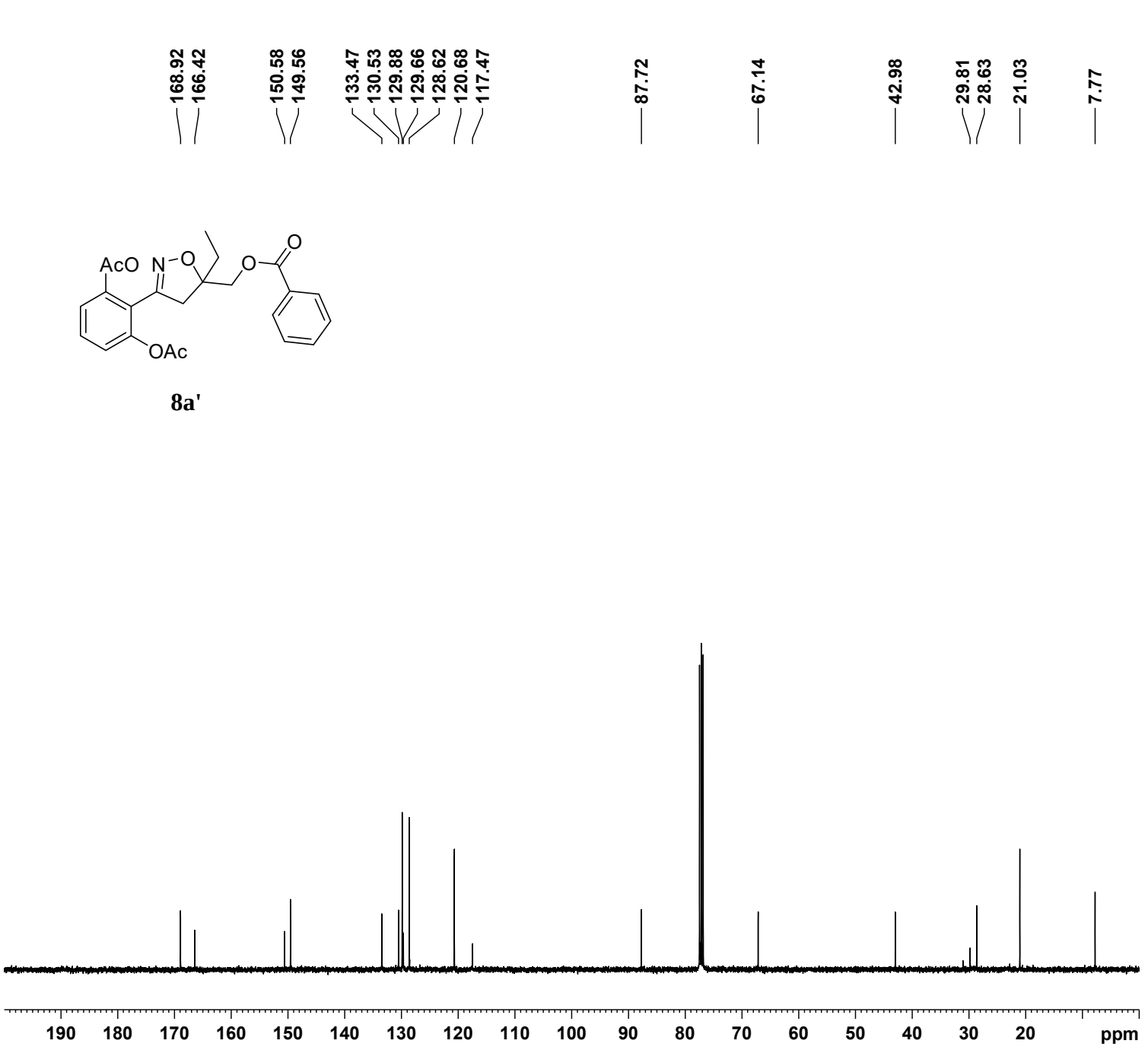




8a'

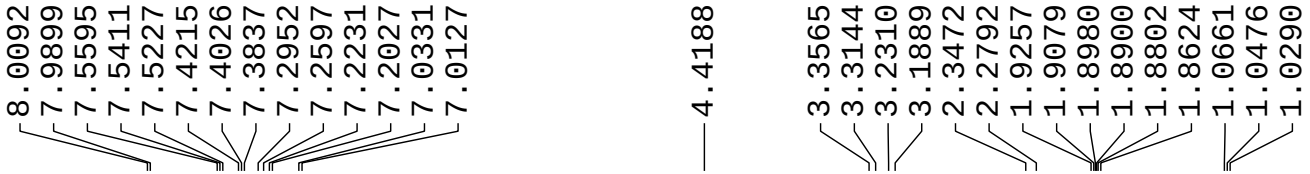
```
NAME          CWG151019-1-x-pure
EXPNO                          1
PROCNO                         1
Date_                   20160224
Time                       11.00
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                     zg30
TD                         65536
SOLVENT                    CDCl3
NS                            16
DS                             2
SWH                     8223.685 Hz
FIDRES                  0.125483 Hz
AQ                      3.9846387 sec
RG                          90.5
DW                         60.800 usec
DE                          6.50 usec
TE                         293.2 K
D1                    1.00000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                          1H
P1                         13.80 usec
PL1                        -1.00 dB
PL1W                13.18669796 W
SFO1                400.1724712 MHz
SI                         32768
SF                  400.1700033 MHz
WDW                           EM
SSB                            0
LB                          0.30 Hz
GB                             0
PC                          1.00
```

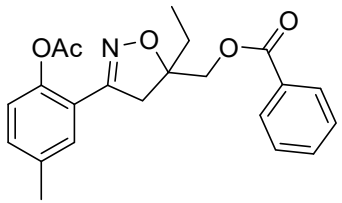




8a'

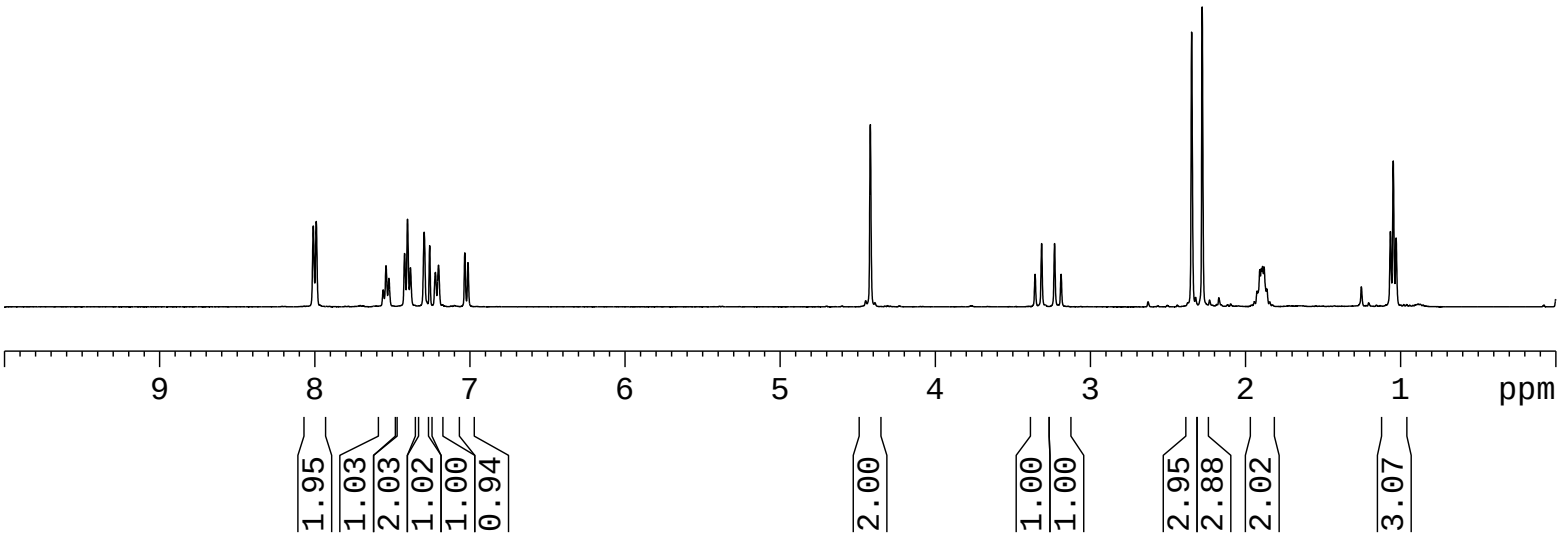
```
NAME      CWG151019-1-X-PURE-C13
EXPNO                          1
PROCNO                         1
Date_                   20160224
Time                       11.11
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           311
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        293.9 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                  waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                       32768
SF                  100.6228150 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

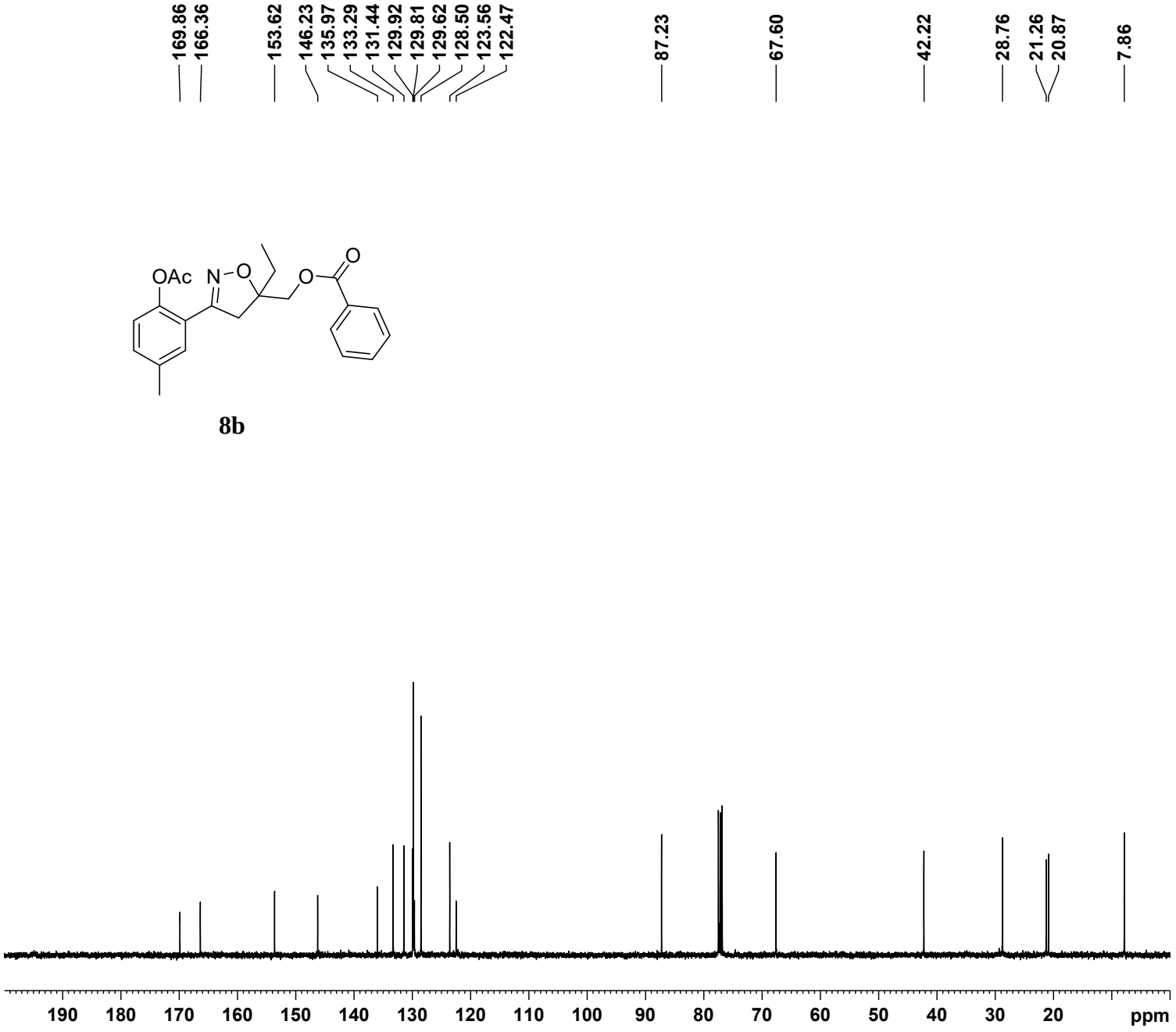




8b

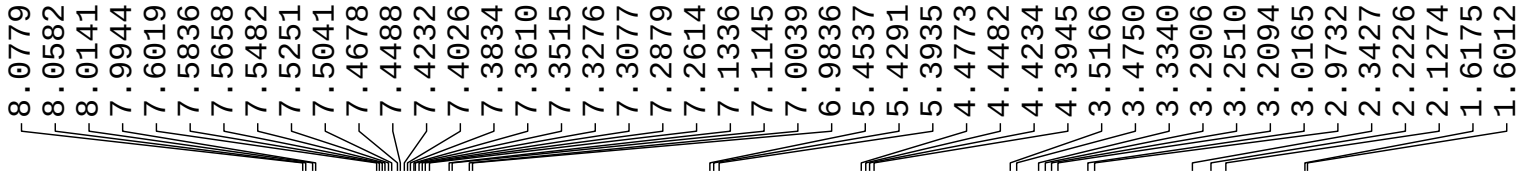
NAME	CWG151026-4-S
EXPNO	1
PROCNO	1
Date_	20151028
Time	16.07
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	71.8
DW	60.800 usec
DE	6.50 usec
TE	295.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

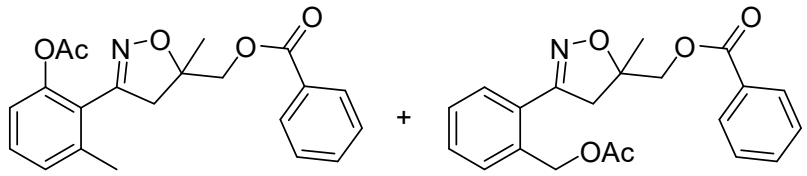




8b

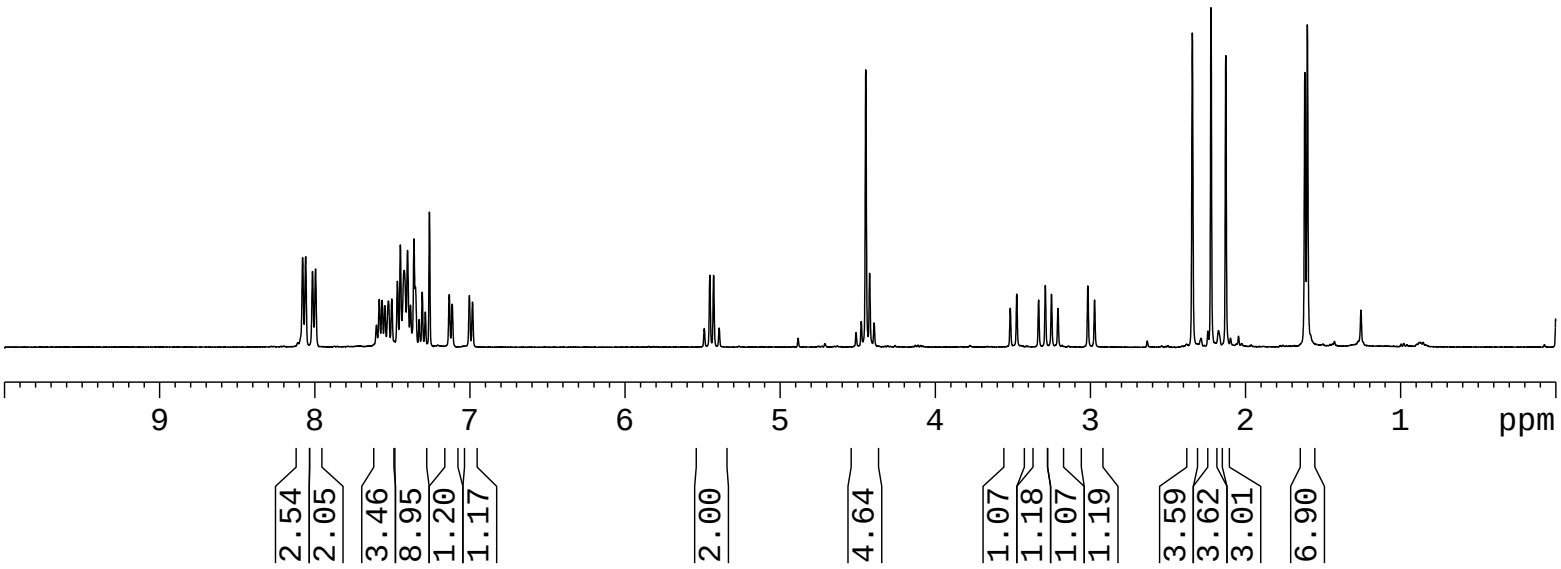
```
NAME          CWG151026-4-S-C13
EXPNO                        1
PROCNO                       1
Date_                 20151028
Time                     16.54
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         102
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      295.4 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228211 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```



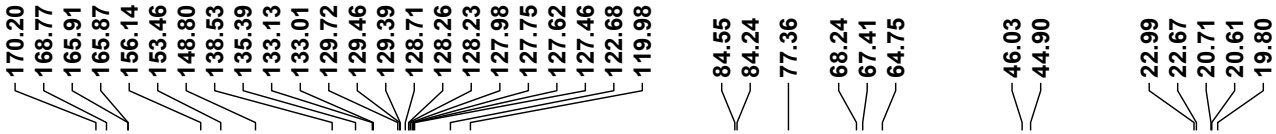


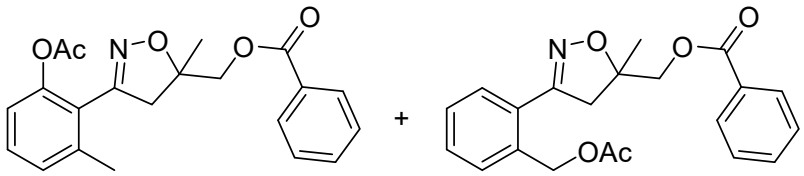
1.2 : **1**

8c **8c''**



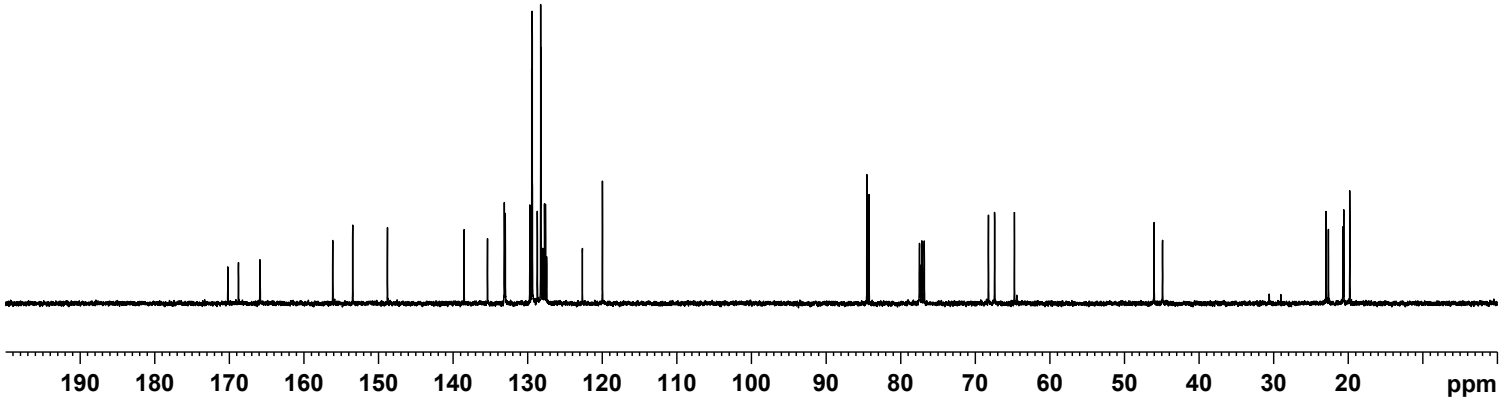

```
NAME          CWG151029-4-S
EXPNO                     1
PROCNO                    1
Date_              20151030
Time                  17.26
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      161
DW                    60.800 usec
DE                     6.50 usec
TE                    300.0 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                     32768
SF             400.1700028 MHz
WDW                       EM
SSB                        0
LB                     0.30 Hz
GB                         0
PC                     1.00
```



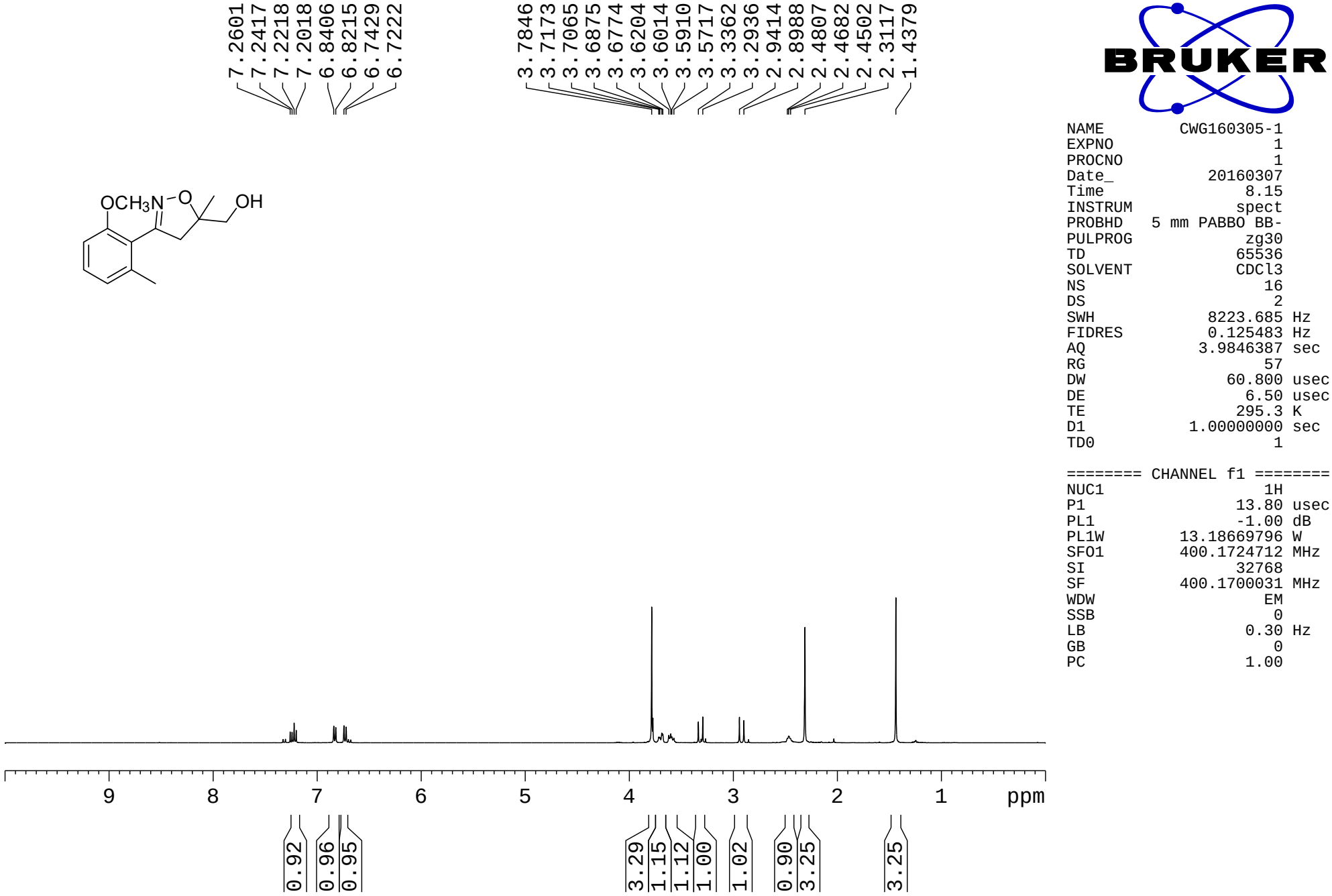


1.2 : **1**

8c **8c''**

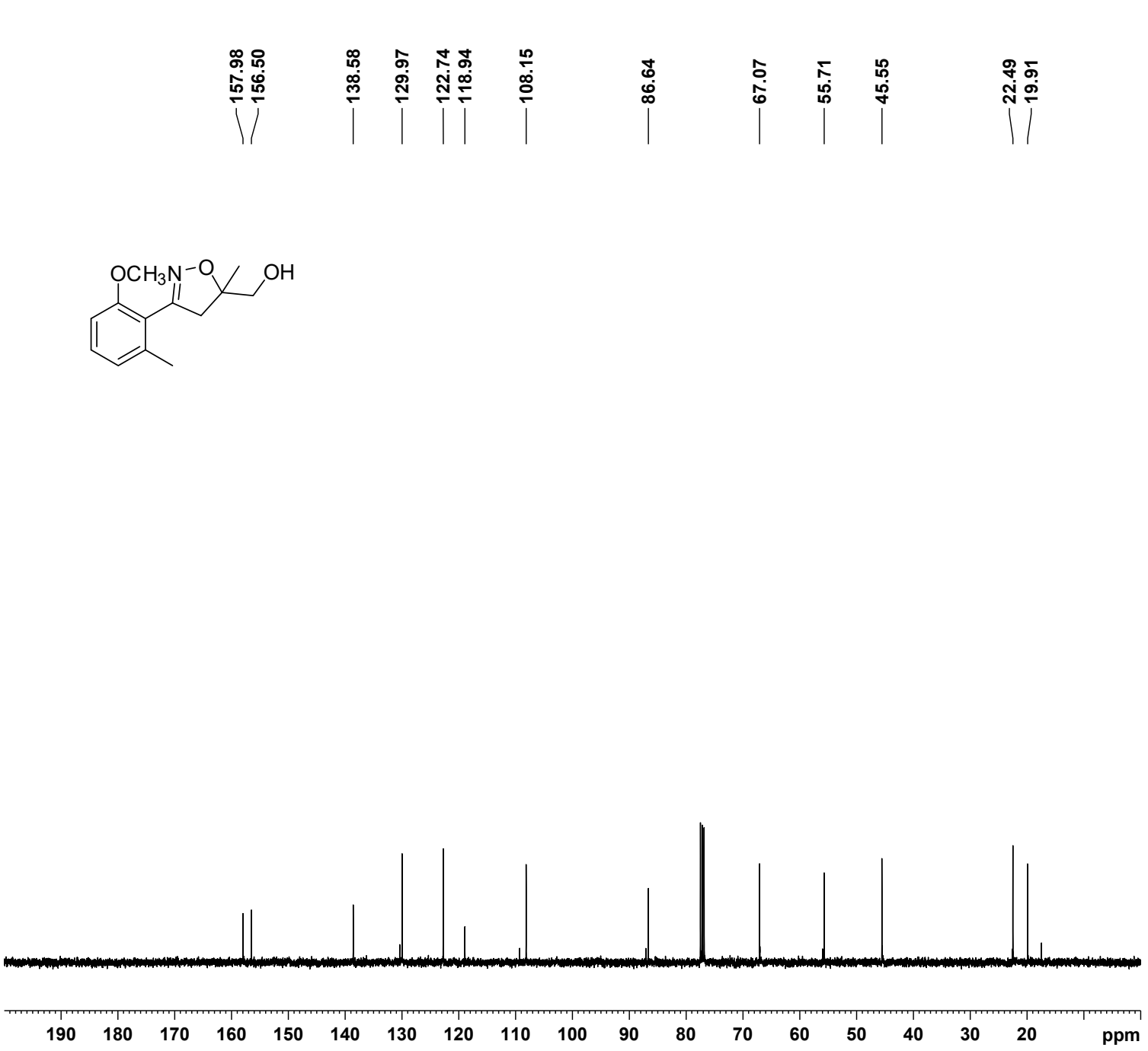



```
NAME          CWG151029-4-S-C13
EXPNO                        1
PROCNO                       1
Date_                 20160217
Time                     10.58
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                          55
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      296.1 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                       32768
SF               100.6228482 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```



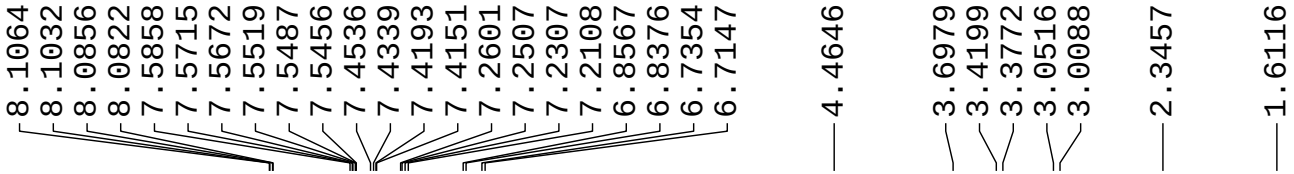
NAME	CWG160305-1
EXPNO	1
PROCNO	1
Date_	20160307
Time	8.15
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	57
DW	60.800 usec
DE	6.50 usec
TE	295.3 K
D1	1.00000000 sec
TD0	1

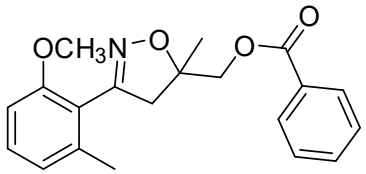
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700031 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



BRUKER

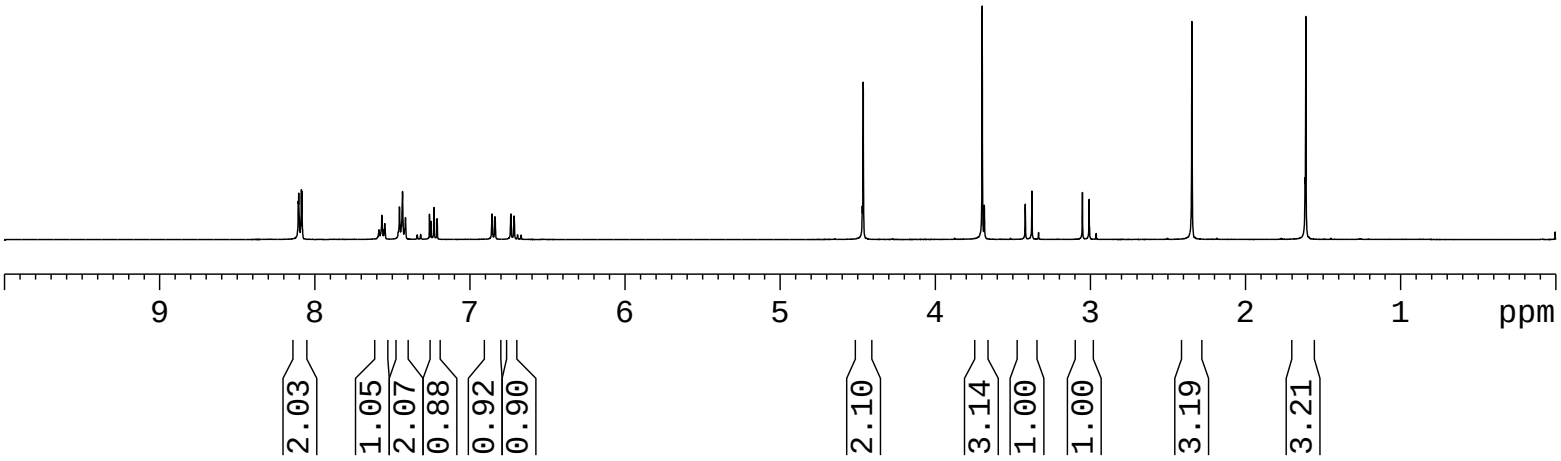
```
NAME      CWG160305-1-C13
EXPNO                  1
PROCNO                 1
Date_           20160307
Time                8.19
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   18
DS                    4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                  203
DW               20.800 usec
DE                6.50 usec
TE               295.6 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                32768
SF          100.6228224 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

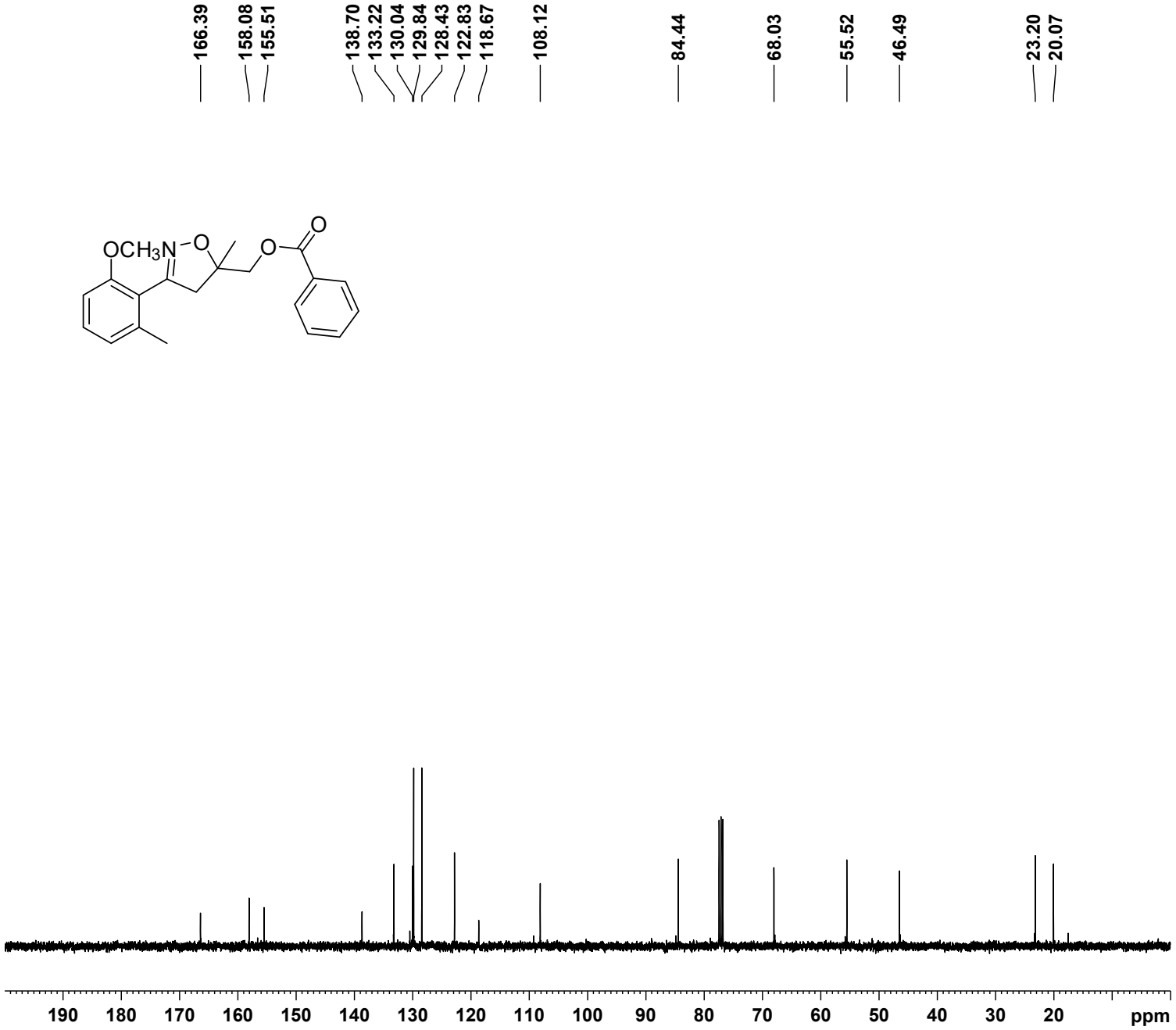




NAME	CWG160307-1
EXPNO	1
PROCNO	1
Date_	20160307
Time	14.21
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	13
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	57
DW	60.800 usec
DE	6.50 usec
TE	297.2 K
D1	1.00000000 sec
TD0	1

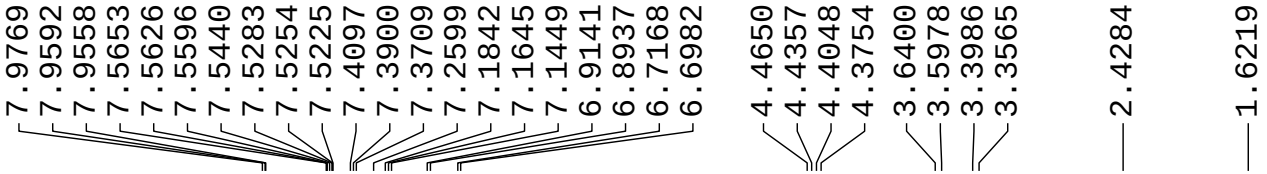
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700030 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

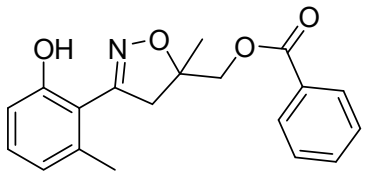


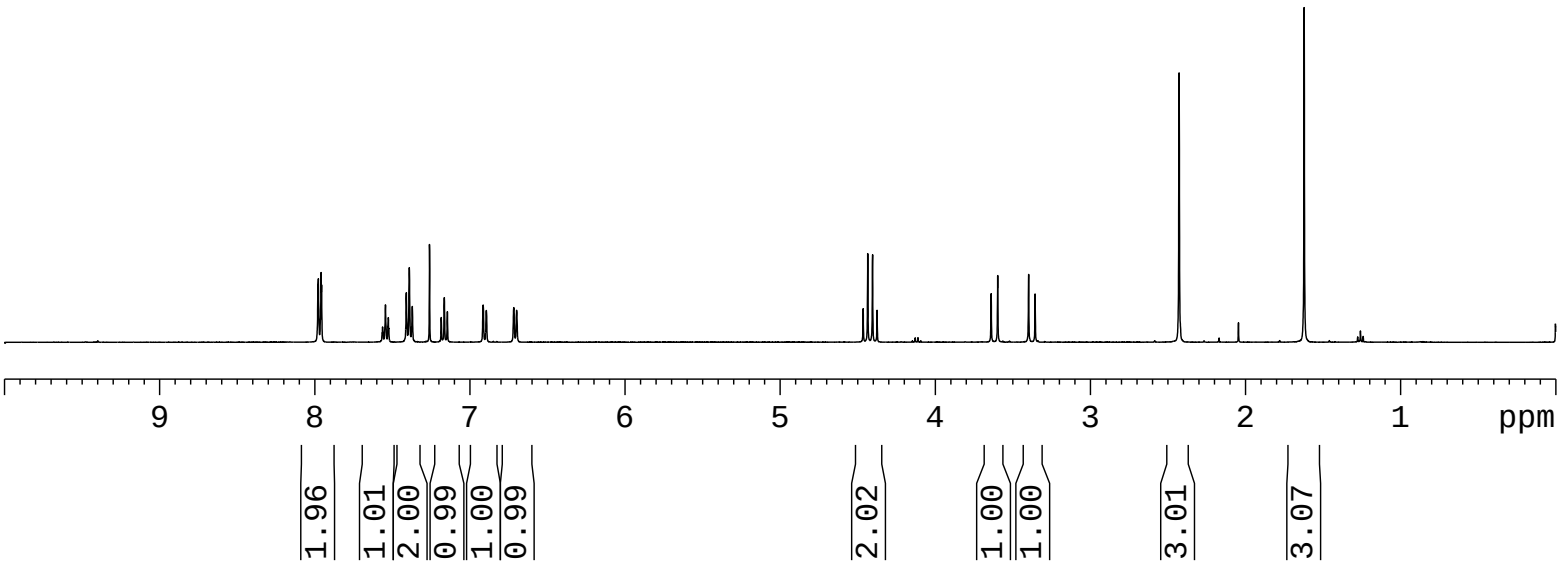


BRUKER

NAME	CWG160307-1-C13
EXPNO	1
PROCNO	1
Date_	20160307
Time	14.26
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	32
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	297.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228224 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

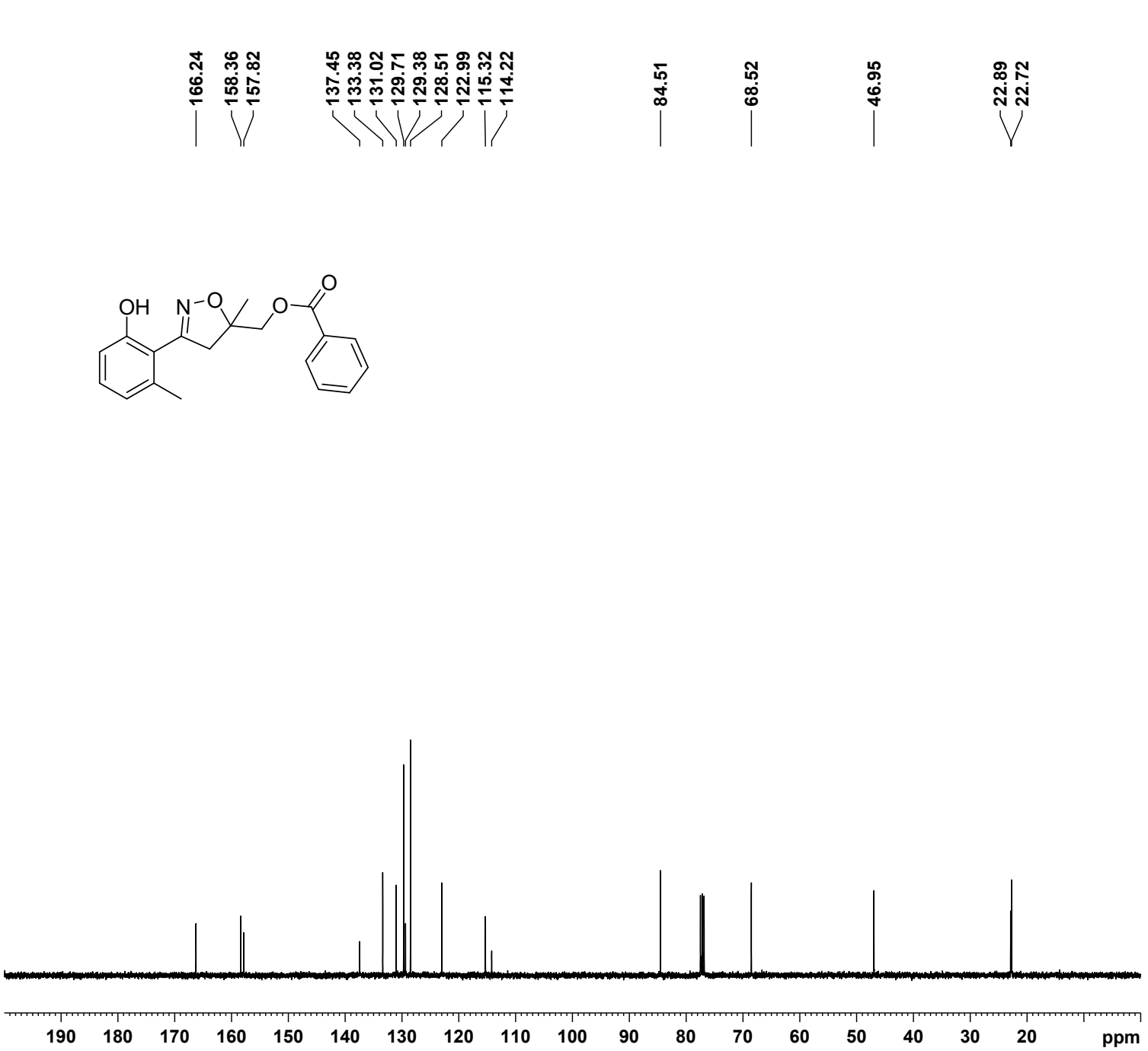




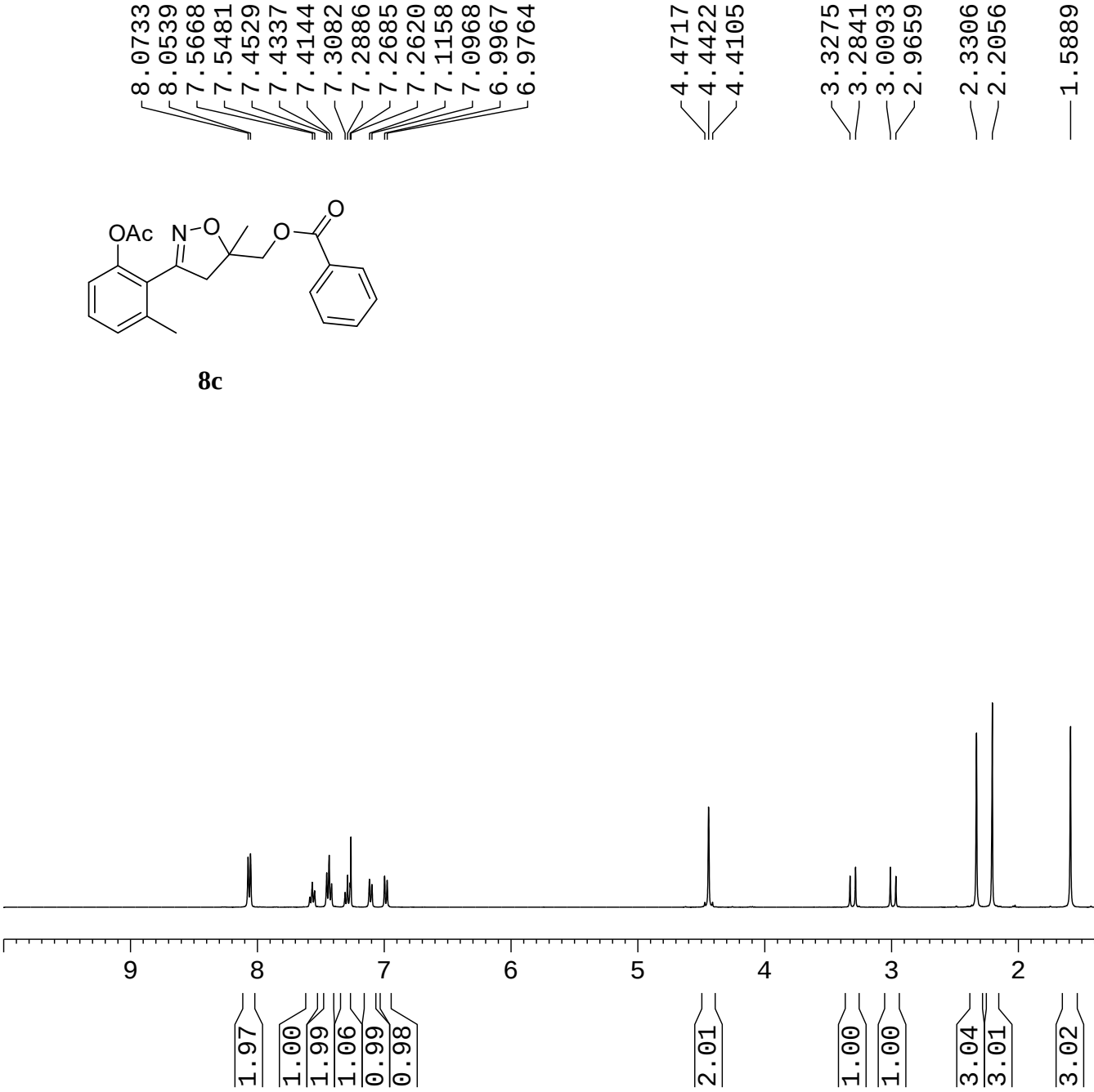


NAME	CWG160307-3-pure
EXPNO	1
PROCNO	1
Date_	20160308
Time	17.03
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	128
DW	60.800 usec
DE	6.50 usec
TE	293.5 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

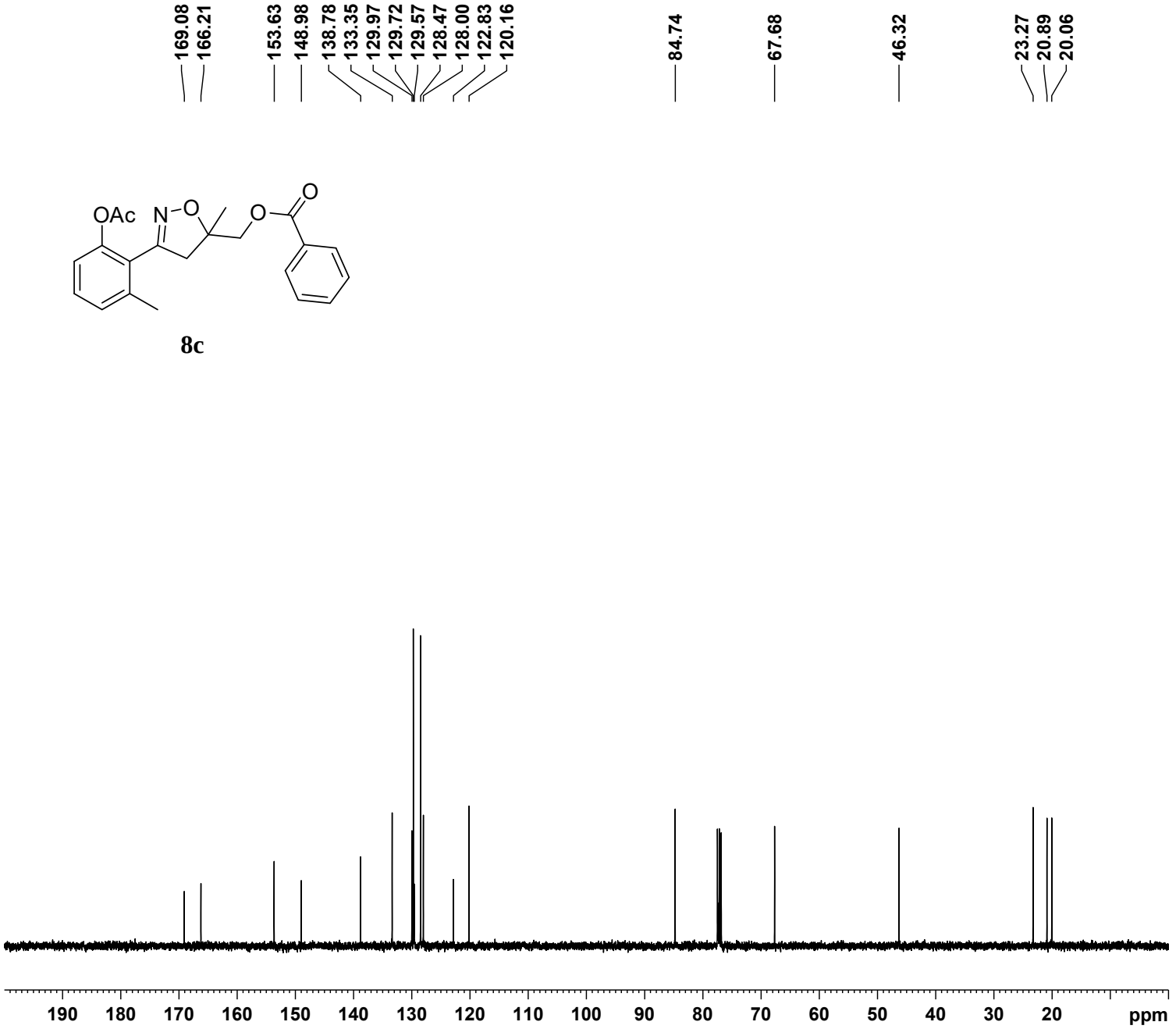



```
NAME          CWG160307-3-C13
EXPNO                      1
PROCNO                     1
Date_               20160309
Time                    8.22
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG             zgpg30
TD                     65536
SOLVENT                CDCl3
NS                        21
DS                         4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631988 sec
RG                       203
DW                    20.800 usec
DE                     6.50 usec
TE                    293.3 K
D1                 2.00000000 sec
D11                0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                     8.50 usec
PL1                   -2.00 dB
PL1W            57.32743073 W
SFO1           100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                     1H
PCPD2                 80.00 usec
PL2                   -1.00 dB
PL12                  14.26 dB
PL13                  14.46 dB
PL2W            13.18669796 W
PL12W            0.39276794 W
PL13W            0.37509048 W
SFO2           400.1716007 MHz
SI                     32768
SF             100.6228245 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```



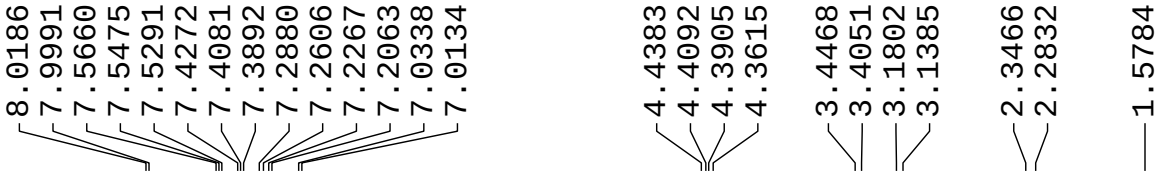
8c

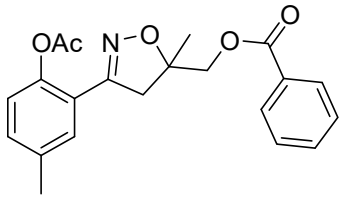
```
NAME          CWG160309-1
EXPNO                   1
PROCNO                  1
Date_            20160309
Time                14.36
INSTRUM             spect
PROBHD    5 mm PABBO BB-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8223.685 Hz
FIDRES           0.125483 Hz
AQ               3.9846387 sec
RG                   40.3
DW                 60.800 usec
DE                  6.50 usec
TE                 294.9 K
D1              1.00000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   1H
P1                  13.80 usec
PL1                 -1.00 dB
PL1W          13.18669796 W
SFO1          400.1724712 MHz
SI                  32768
SF            400.1700020 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00
```



8c

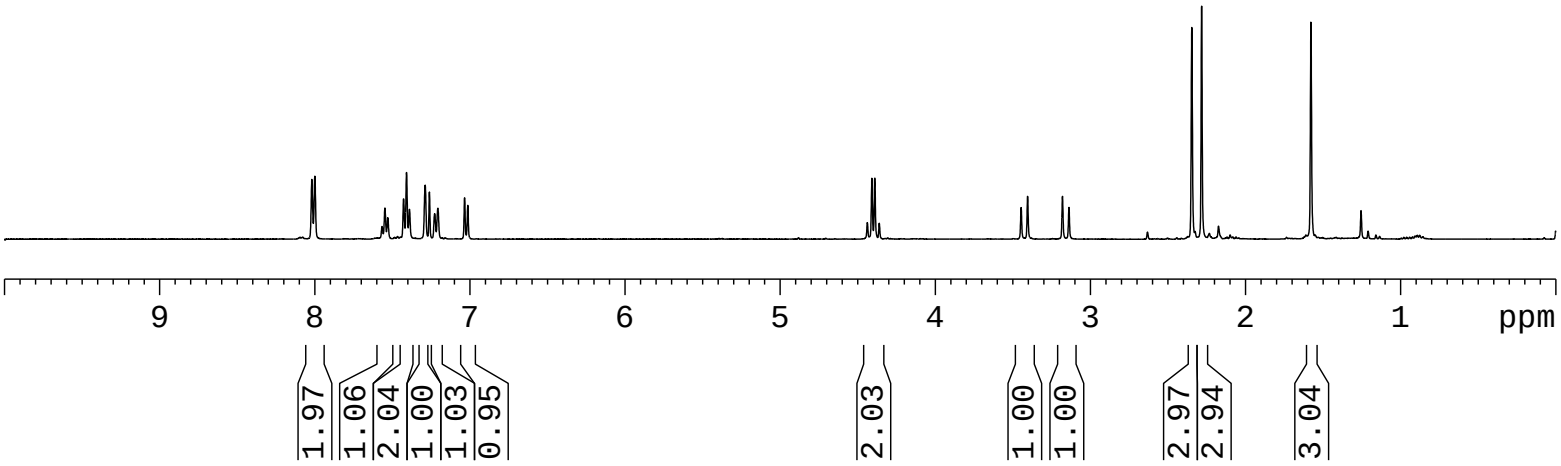
```
NAME        CWG160309-1-C13
EXPNO                    1
PROCNO                   1
Date_             20160309
Time                 14.39
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    23
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ            1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                295.1 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  13C
P1                   8.50 usec
PL1                 -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                14.26 dB
PL13                14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228286 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

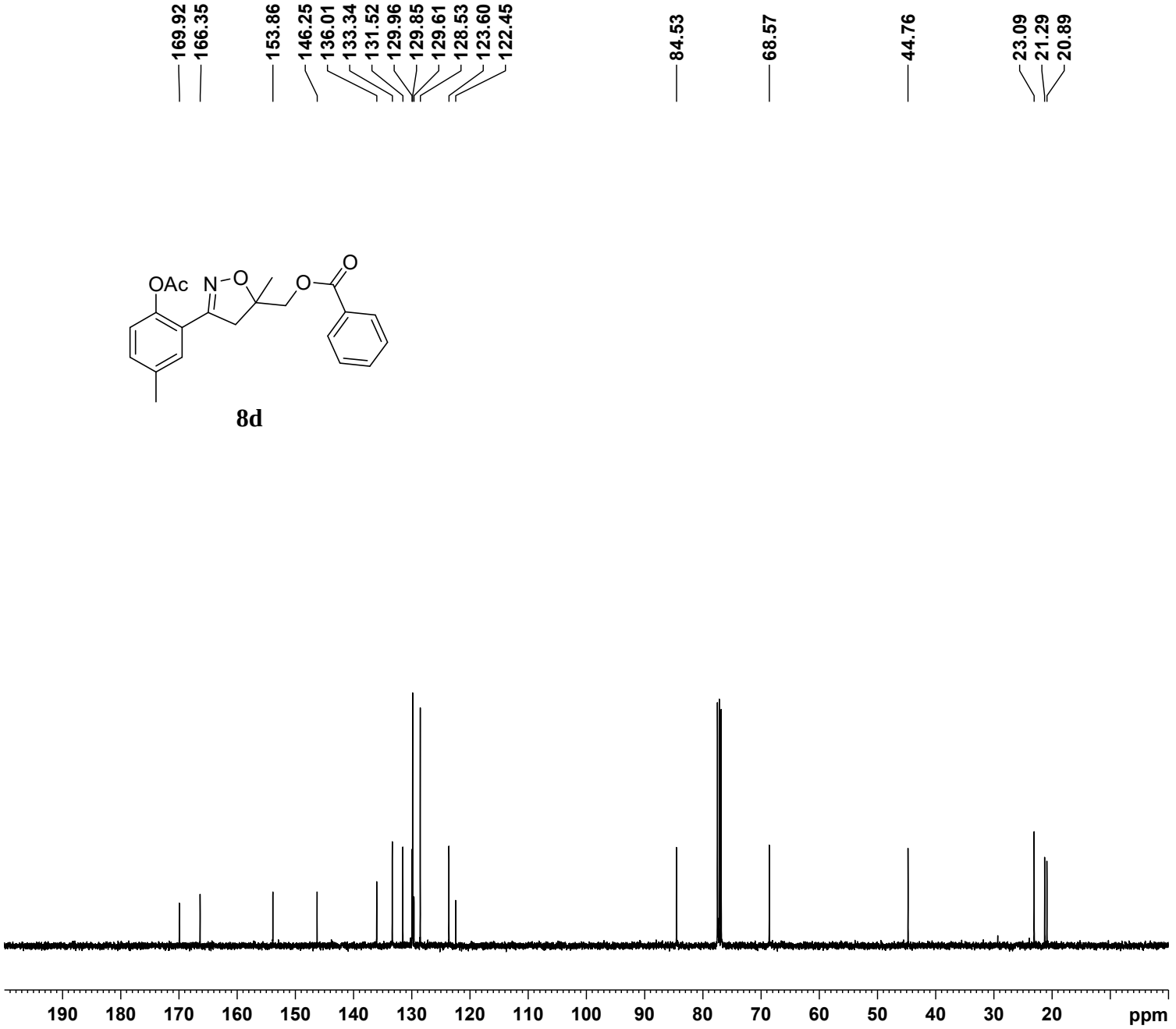




8d

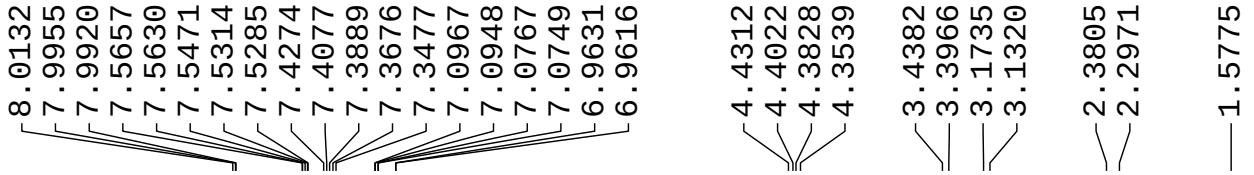
```
NAME          CWG151026-5-S
EXPNO                     1
PROCNO                    1
Date_              20151028
Time                  16.15
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      181
DW                   60.800 usec
DE                    6.50 usec
TE                   295.6 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700030 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```

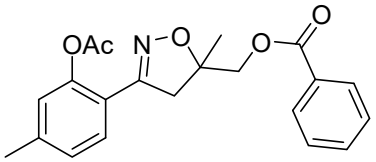




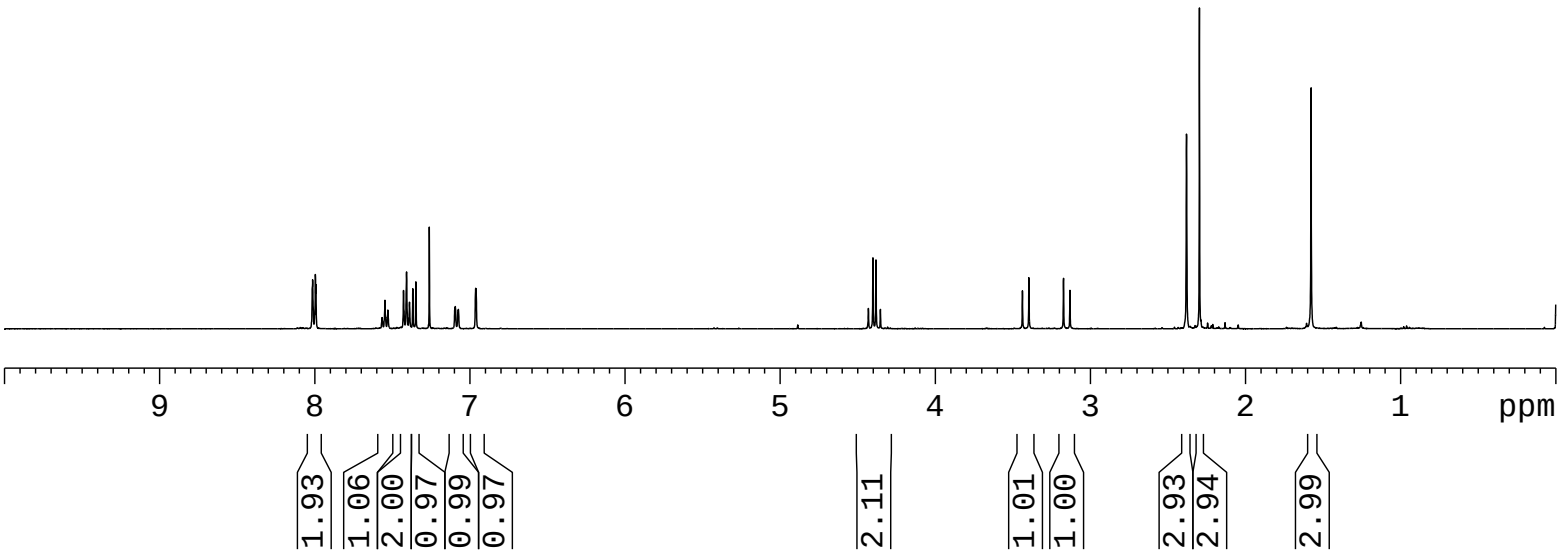
8d

```
NAME          CWG151026-5-S-C13
EXPNO                        1
PROCNO                       1
Date_                 20151028
Time                     17.04
INSTRUM                  spect
PROBHD   5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         106
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      295.8 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                       8.50 usec
PL1                     -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                     -1.00 dB
PL12                    14.26 dB
PL13                    14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228183 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

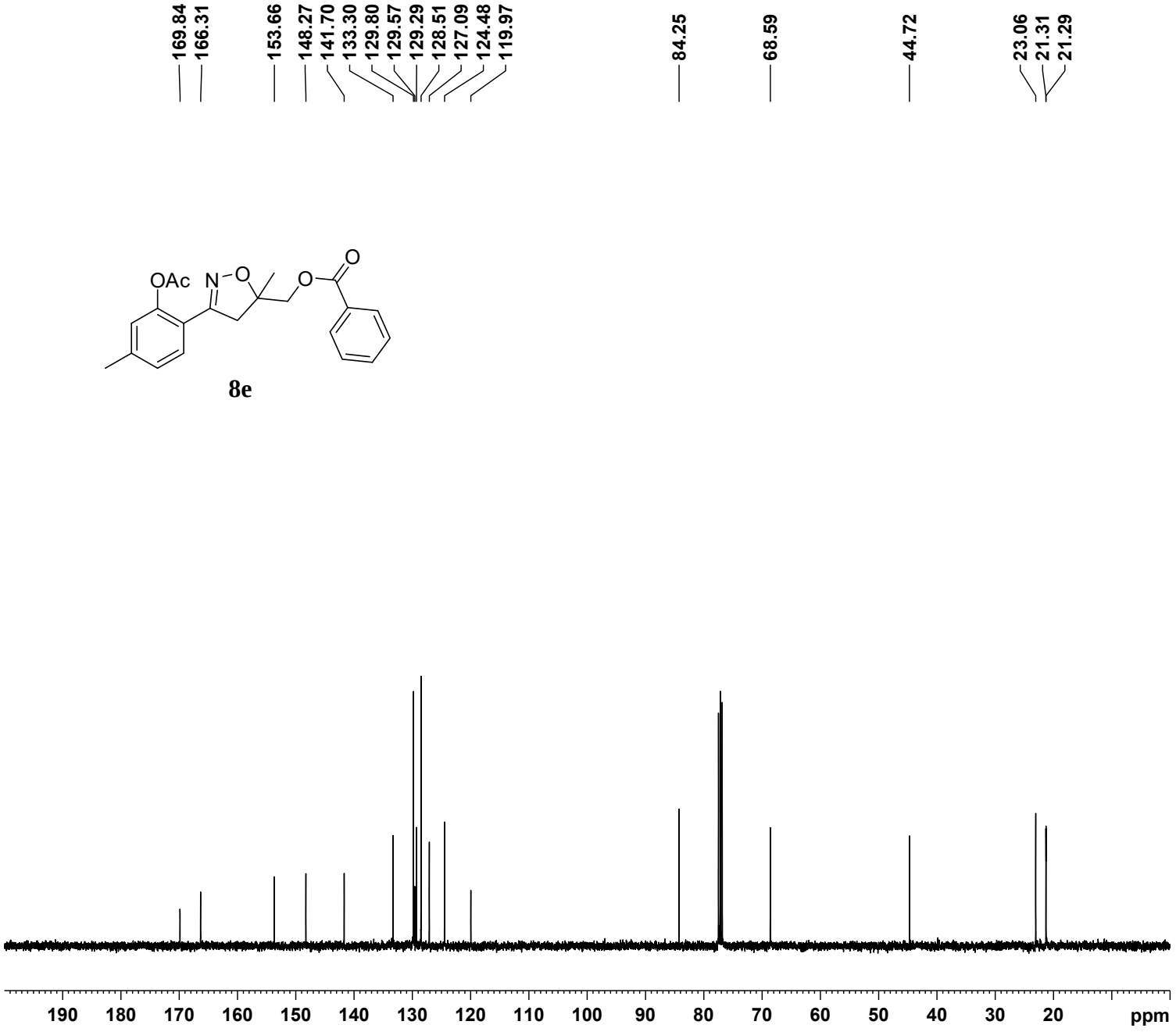




8e

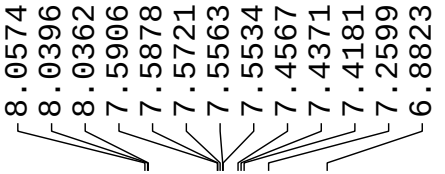


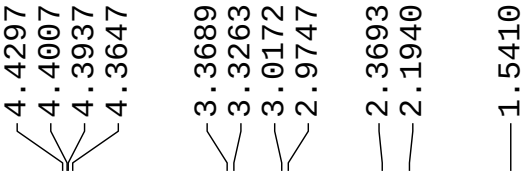

```
NAME          CWG151106-4-1
EXPNO                     1
PROCNO                    1
Date_              20151203
Time                  11.04
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      161
DW                   60.800 usec
DE                    6.50 usec
TE                   292.5 K
D1               1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                   13.80 usec
PL1                  -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700026 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```

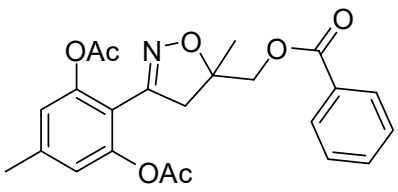


8e

```
NAME          CWG151106-4-1-C13
EXPNO                        1
PROCNO                       1
Date_                 20151203
Time                     11.34
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                          51
DS                           4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631988 sec
RG                         203
DW                      20.800 usec
DE                       6.50 usec
TE                      293.1 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                       8.50 usec
PL1                     -2.00 dB
PL1W              57.32743073 W
SFO1             100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   80.00 usec
PL2                     -1.00 dB
PL12                    14.26 dB
PL13                    14.46 dB
PL2W              13.18669796 W
PL12W              0.39276794 W
PL13W              0.37509048 W
SFO2             400.1716007 MHz
SI                       32768
SF               100.6228216 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

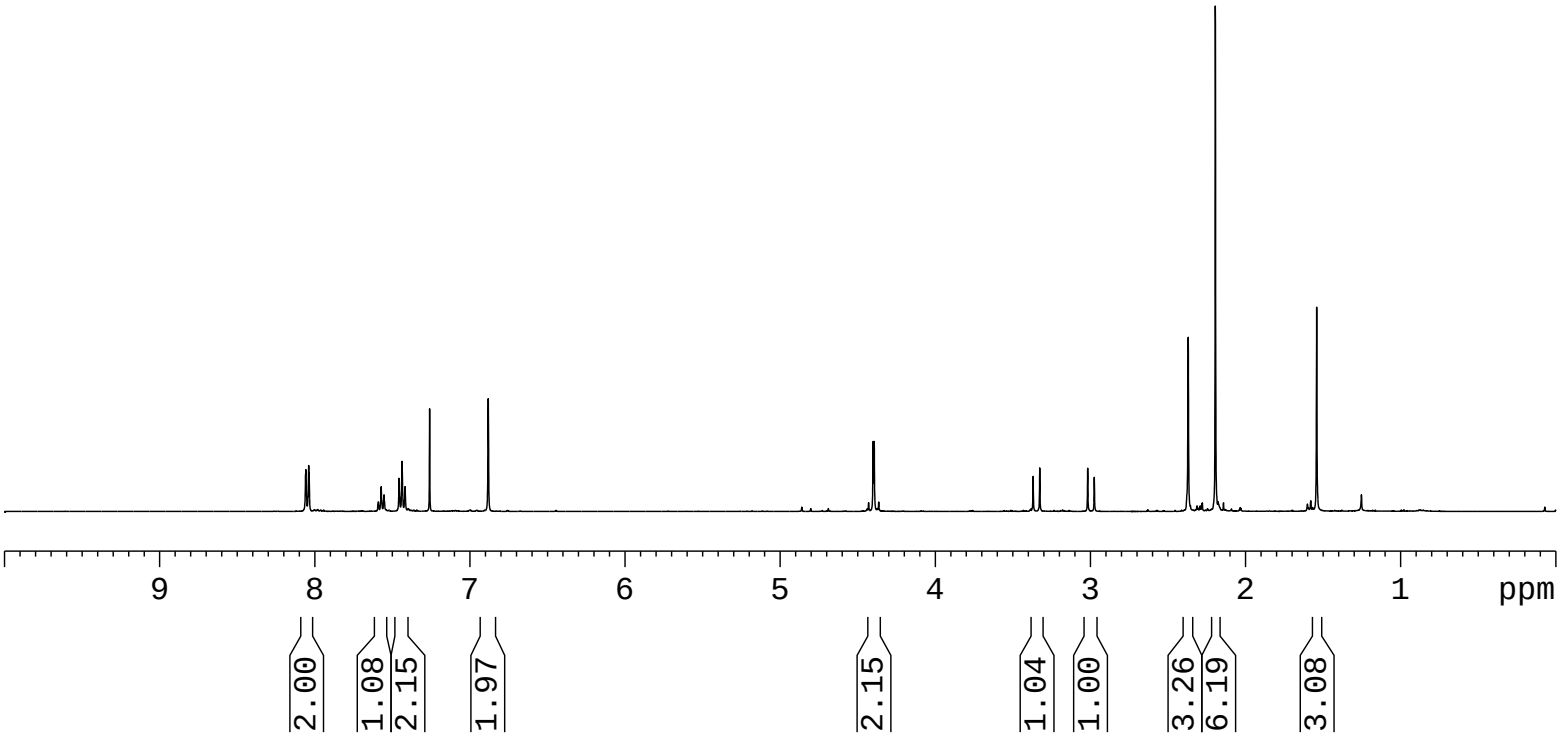


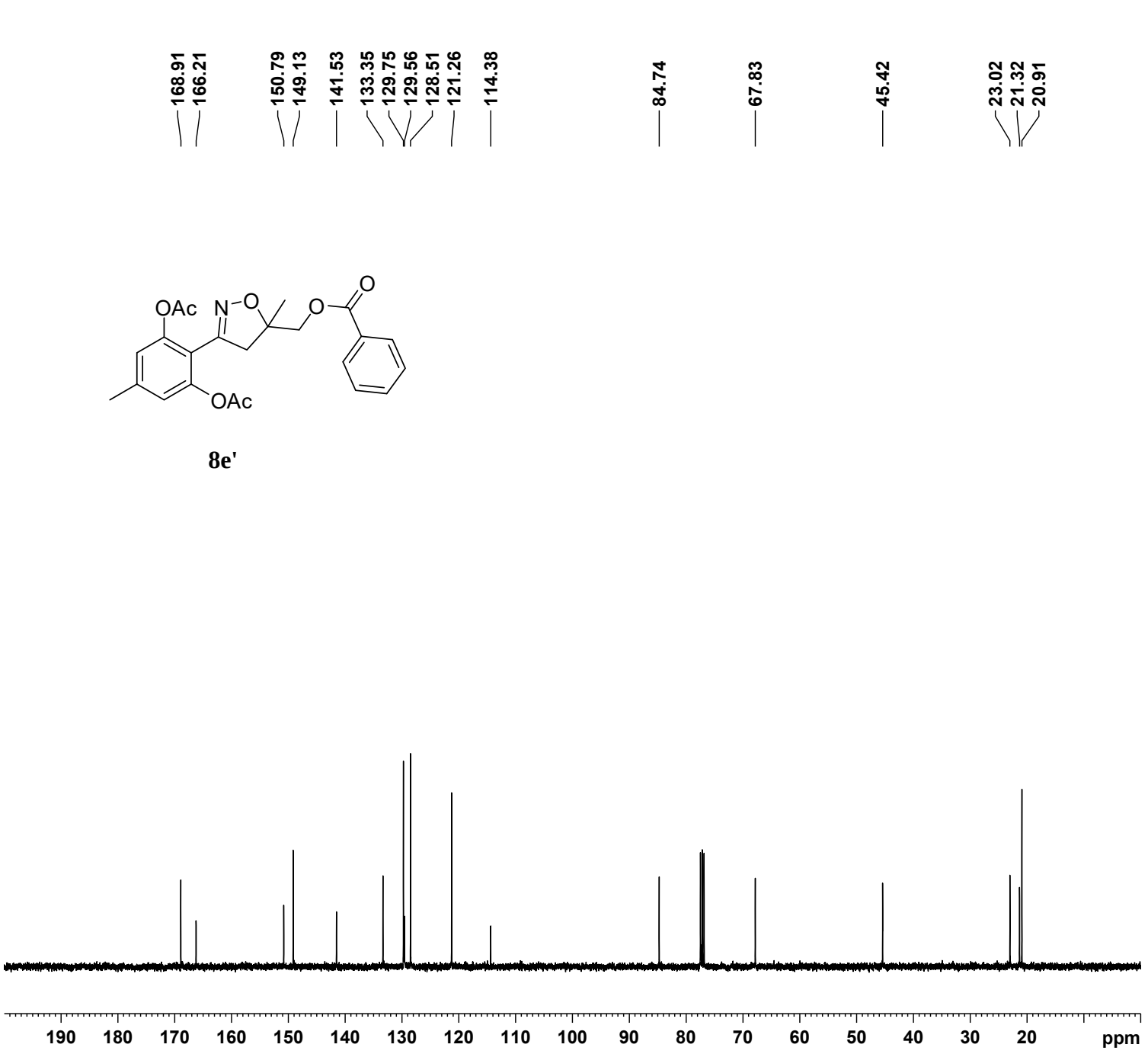




8e'

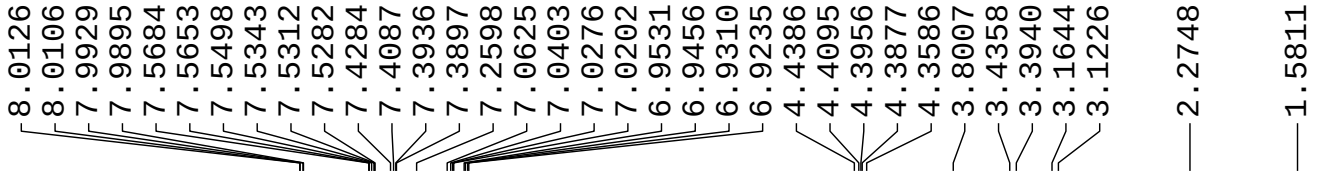
```
NAME          CWG151106-4-X-PURE
EXPNO                         1
PROCNO                        1
Date_                  20160217
Time                      10.45
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                    zg30
TD                        65536
SOLVENT                   CDCl3
NS                           16
DS                            2
SWH                    8223.685 Hz
FIDRES                 0.125483 Hz
AQ                     3.9846387 sec
RG                          128
DW                       60.800 usec
DE                        6.50 usec
TE                       295.5 K
D1                  1.00000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                         1H
P1                       13.80 usec
PL1                      -1.00 dB
PL1W               13.18669796 W
SFO1               400.1724712 MHz
SI                        32768
SF                 400.1700034 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```

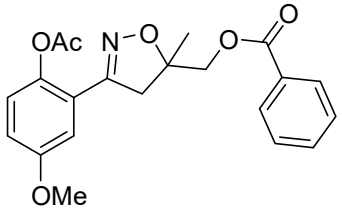




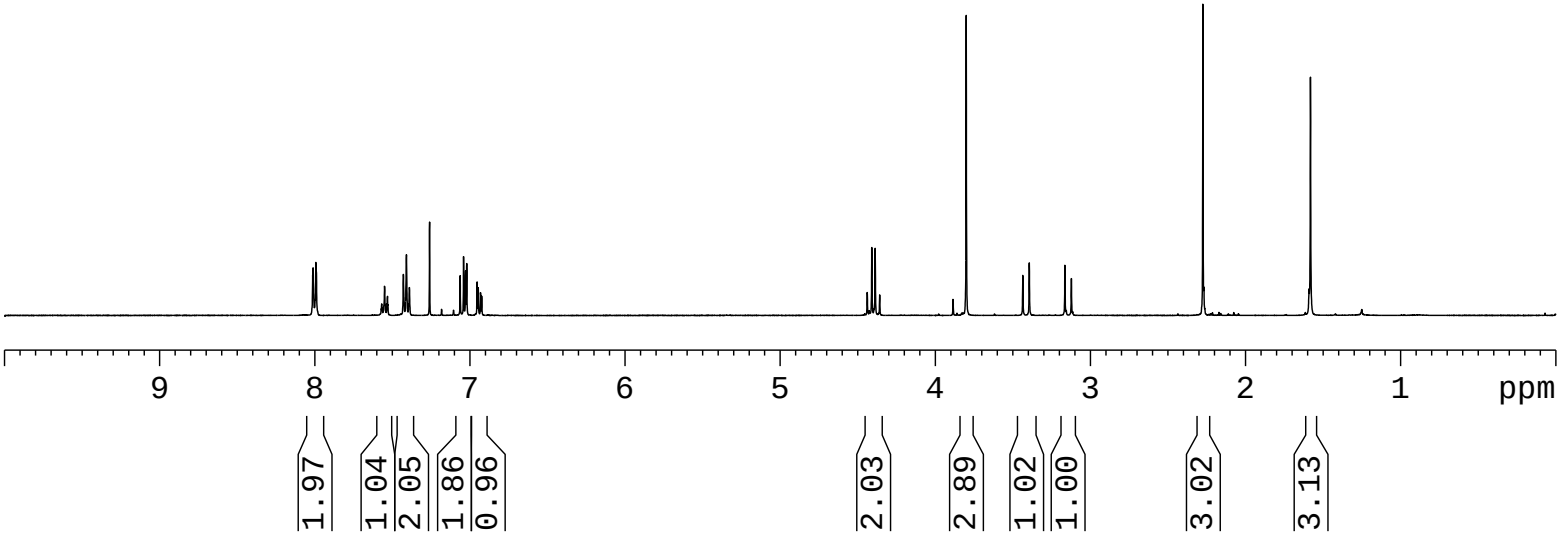
8e'

```
NAME          CWG1511106-4-X-C13
EXPNO                         1
PROCNO                        1
Date_                  20160217
Time                      11.08
INSTRUM                   spect
PROBHD    5 mm PABBO BB-
PULPROG                 zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                          32
DS                           4
SWH                  24038.461 Hz
FIDRES                0.366798 Hz
AQ                    1.3631988 sec
RG                         203
DW                       20.800 usec
DE                        6.50 usec
TE                       296.2 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                       13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W               57.32743073 W
SFO1              100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W               13.18669796 W
PL12W               0.39276794 W
PL13W               0.37509048 W
SFO2              400.1716007 MHz
SI                       32768
SF                100.6228260 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

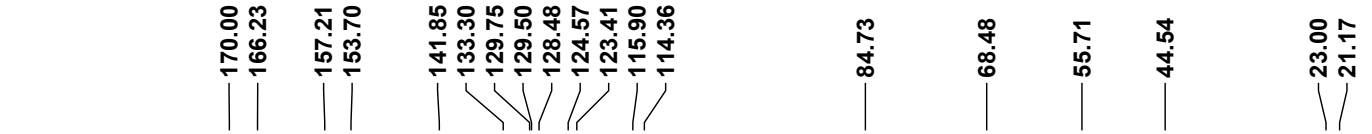


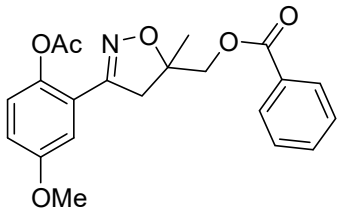


8f

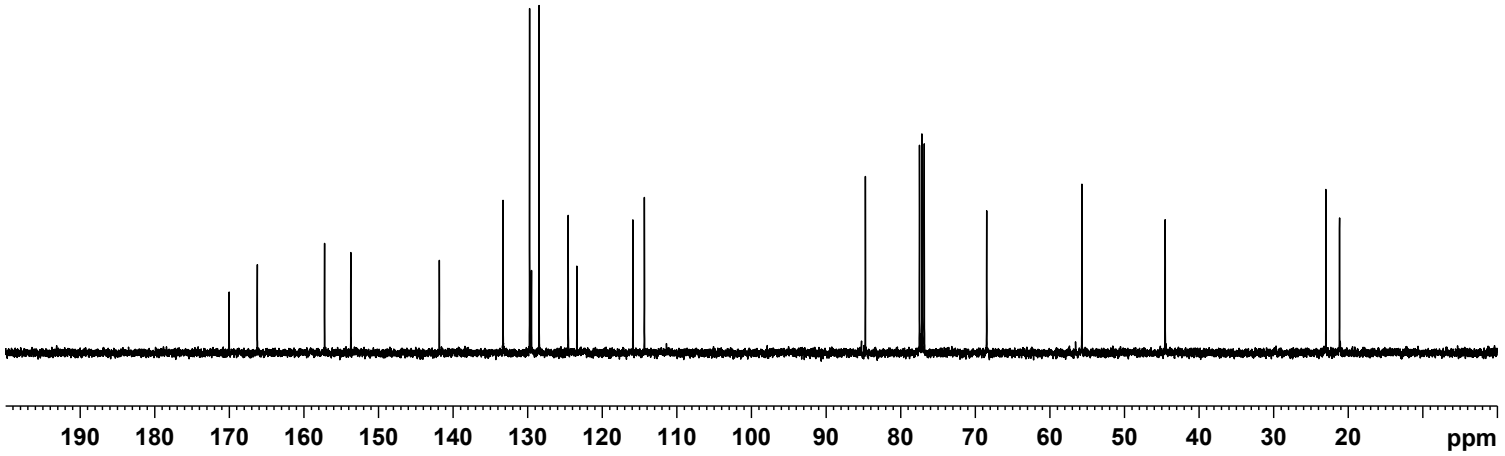


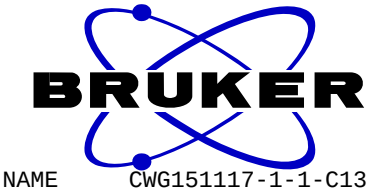

```
NAME          CWG151117-1-1
EXPNO                     1
PROCNO                    1
Date_              20151126
Time                  14.33
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      203
DW                    60.800 usec
DE                     6.50 usec
TE                    291.1 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700034 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```



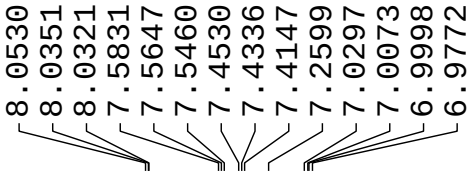


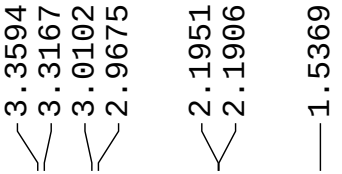
8f

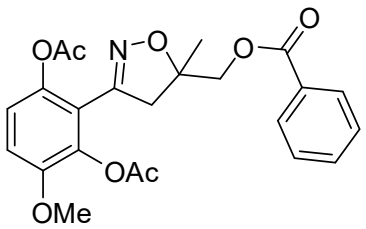




NAME	CWG151117-1-1-C13
EXPNO	1
PROCNO	1
Date_	20151126
Time	15.54
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	39
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	293.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228253 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

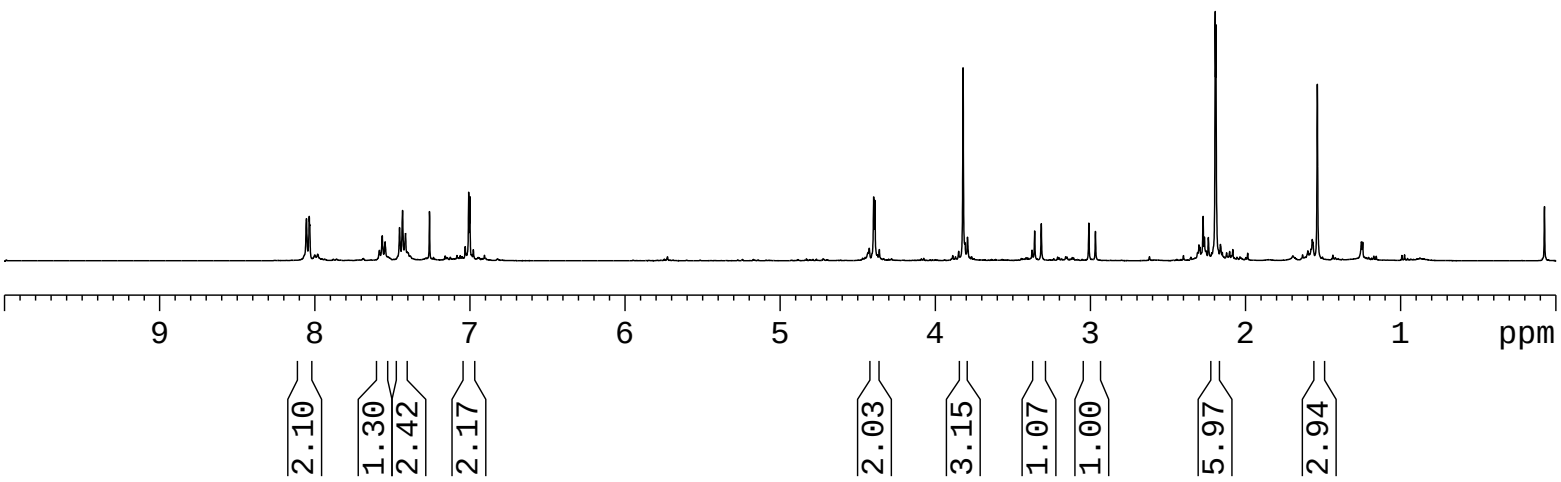


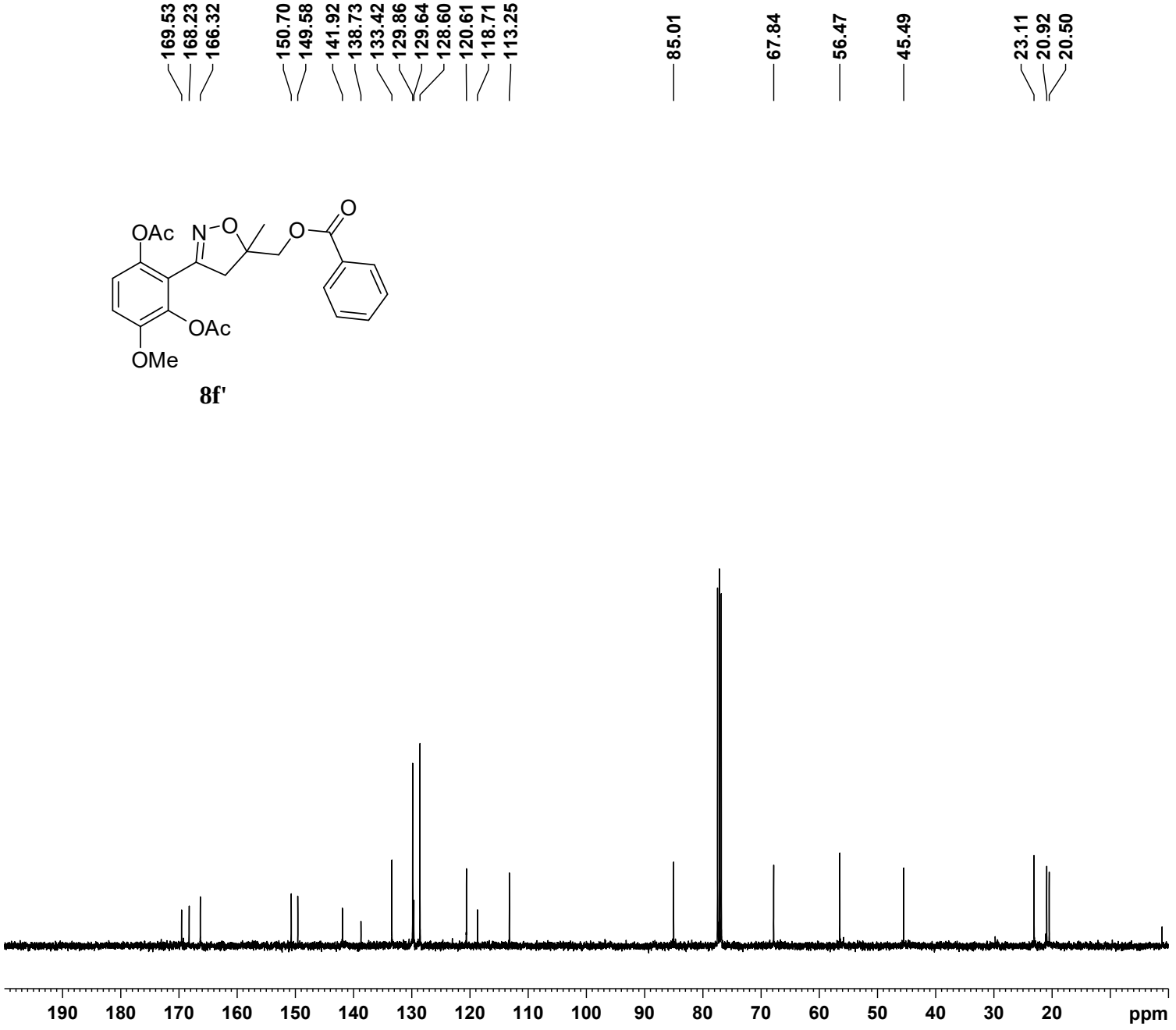




8f'

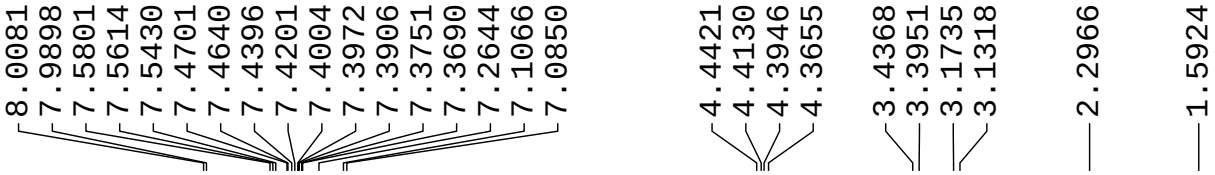
```
NAME        CWG151110-2-x-pure
EXPNO                        1
PROCNO                       1
Date_                 20160215
Time                     16.55
INSTRUM                  spect
PROBHD    5 mm PABBO BB-
PULPROG                  zg30
TD                       65536
SOLVENT                  CDCl3
NS                          16
DS                           2
SWH                   8223.685 Hz
FIDRES                0.125483 Hz
AQ                    3.9846387 sec
RG                        80.6
DW                      60.800 usec
DE                       6.50 usec
TE                      297.4 K
D1                    1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                       13.80 usec
PL1                      -1.00 dB
PL1W             13.18669796 W
SFO1             400.1724712 MHz
SI                       32768
SF               400.1700031 MHz
WDW                         EM
SSB                          0
LB                       0.30 Hz
GB                           0
PC                       1.00
```

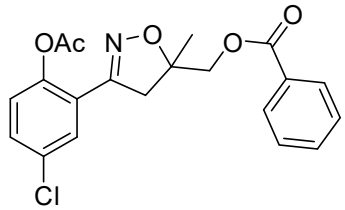




8f'

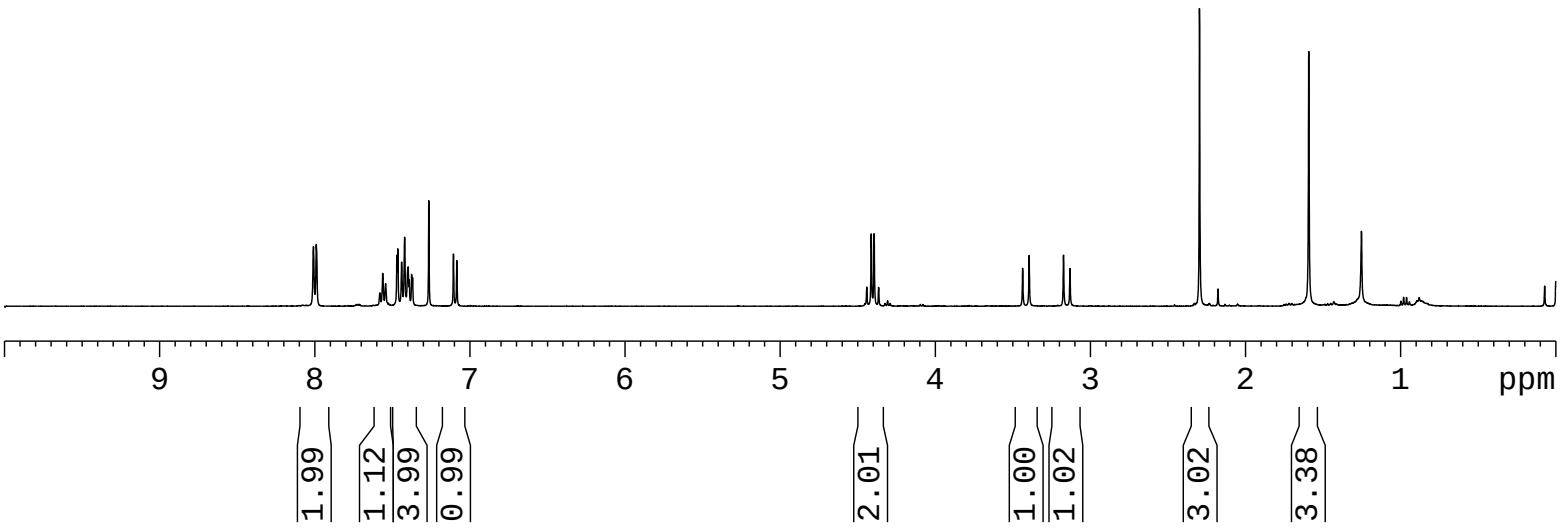
```
NAME      CWG151110-2-x-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160215
Time                       17.06
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                  zgpg30
TD                        65536
SOLVENT                   CDCl3
NS                          224
DS                            4
SWH                   24038.461 Hz
FIDRES                 0.366798 Hz
AQ                     1.3631988 sec
RG                          203
DW                       20.800 usec
DE                        6.50 usec
TE                       297.3 K
D1                    2.00000000 sec
D11                   0.03000000 sec
TD0                           1

======== CHANNEL f1 ========
NUC1                        13C
P1                        8.50 usec
PL1                      -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                    80.00 usec
PL2                      -1.00 dB
PL12                     14.26 dB
PL13                     14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                        32768
SF                  100.6228165 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

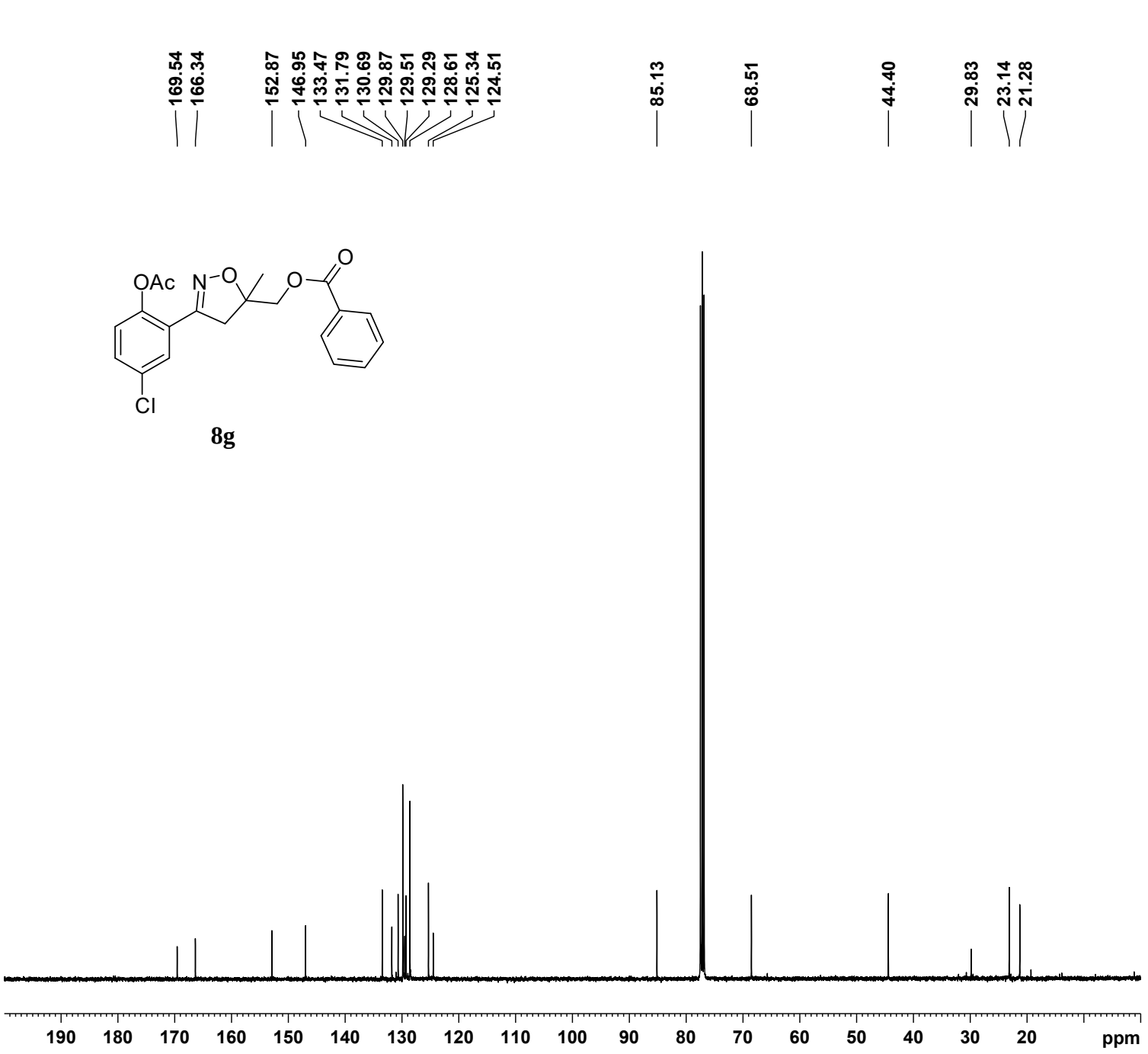




8g

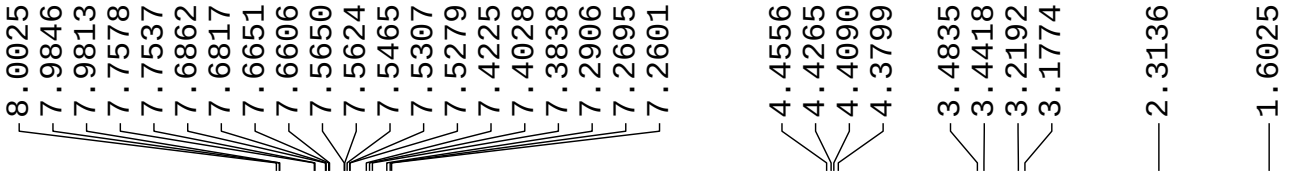
```
NAME          CWG151106-3-2
EXPNO                     1
PROCNO                    1
Date_              20151228
Time                  16.06
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      181
DW                   60.800 usec
DE                    6.50 usec
TE                   289.0 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                    32768
SF             400.1700016 MHz
WDW                      EM
SSB                       0
LB                    0.30 Hz
GB                        0
PC                    1.00
```

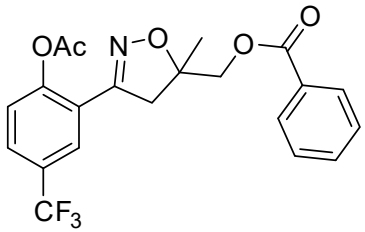




8g

```
NAME        CWG151106-3-2-C13
EXPNO                      1
PROCNO                     1
Date_               20151228
Time                   17.31
INSTRUM                spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                      65536
SOLVENT                CDCl3
NS                      2000
DS                         4
SWH               24038.461 Hz
FIDRES             0.366798 Hz
AQ                1.3631988 sec
RG                       203
DW                  20.800 usec
DE                   6.50 usec
TE                   289.2 K
D1                2.00000000 sec
D11               0.03000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                     13C
P1                    8.50 usec
PL1                  -2.00 dB
PL1W           57.32743073 W
SFO1          100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                80.00 usec
PL2                  -1.00 dB
PL12                 14.26 dB
PL13                 14.46 dB
PL2W           13.18669796 W
PL12W           0.39276794 W
PL13W           0.37509048 W
SFO2          400.1716007 MHz
SI                    32768
SF            100.6228143 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

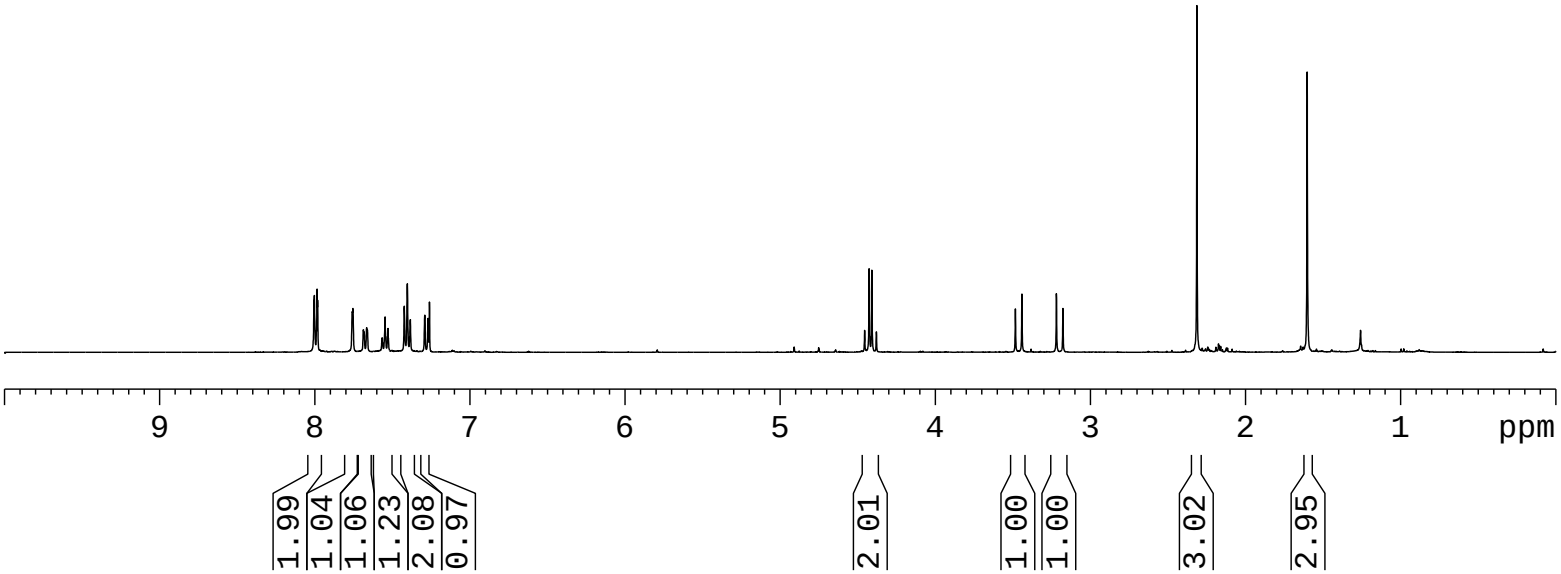


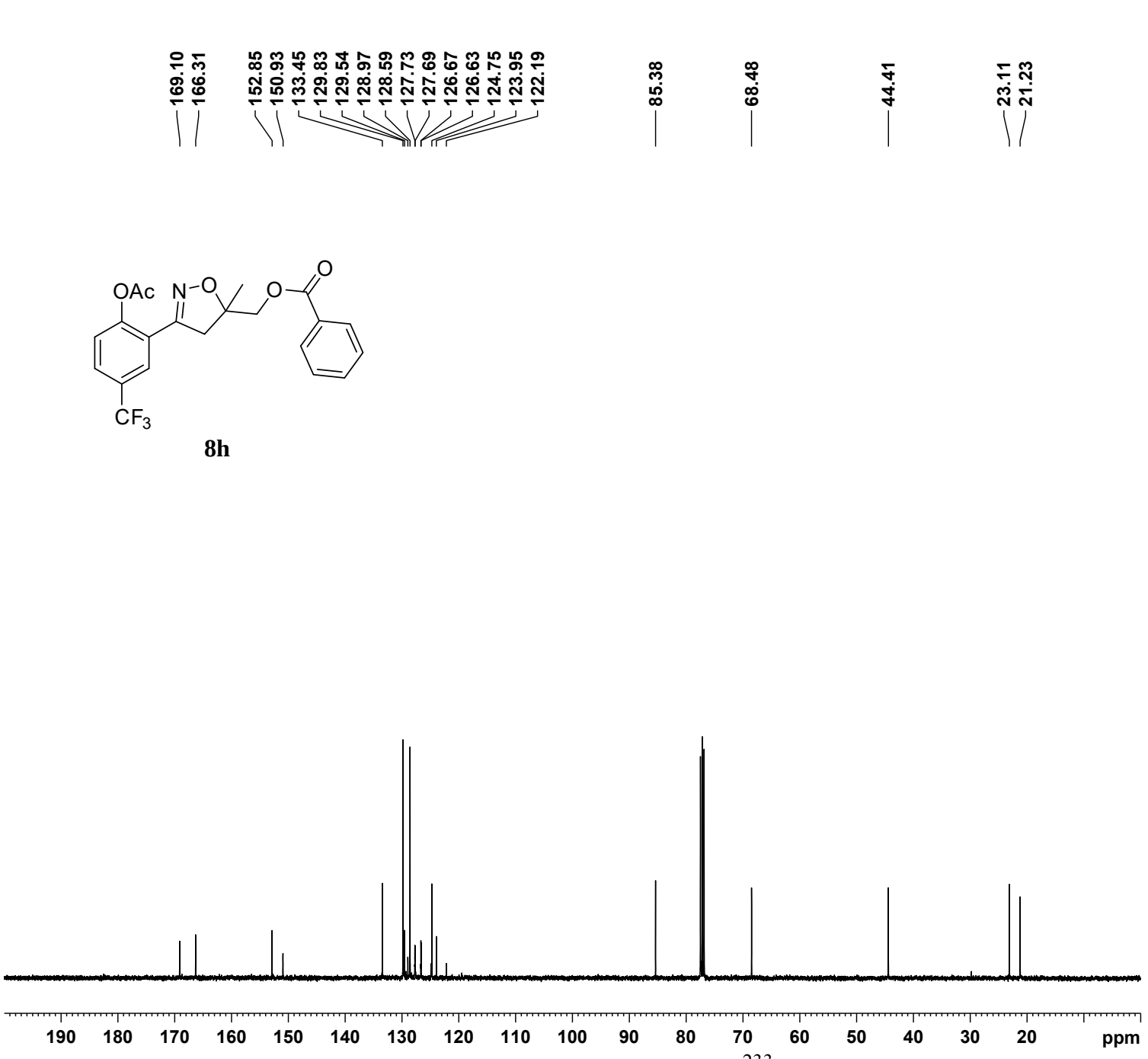


8h

NAME CWG160216-4-pure
EXPNO 1
PROCNO 1
Date_ 20160219
Time 15.24
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9846387 sec
RG 80.6
DW 60.800 usec
DE 6.50 usec
TE 297.3 K
D1 1.00000000 sec
TD0 1

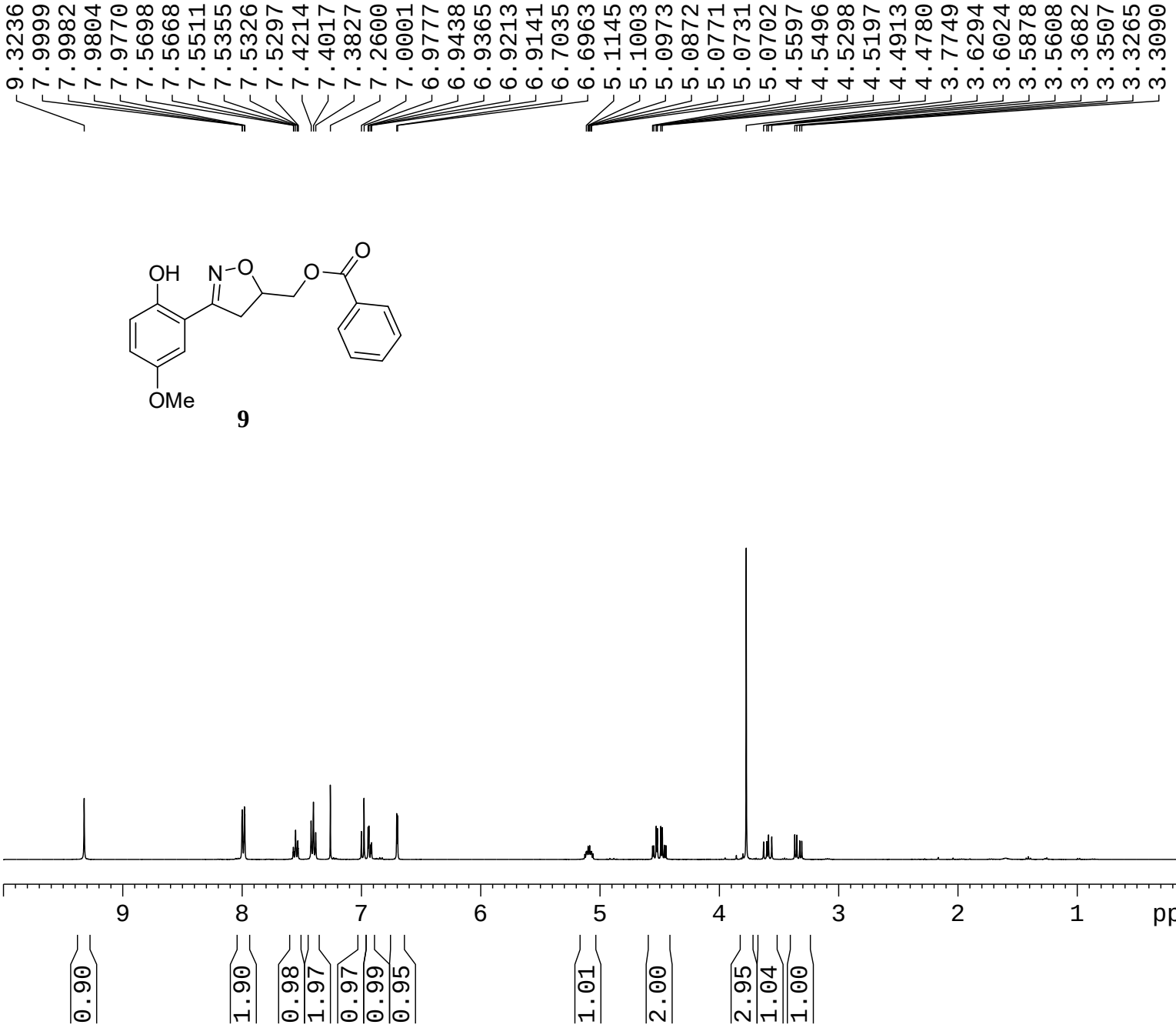
======== CHANNEL f1 ========
NUC1 1H
P1 13.80 usec
PL1 -1.00 dB
PL1W 13.18669796 W
SFO1 400.1724712 MHz
SI 32768
SF 400.1700030 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





8h

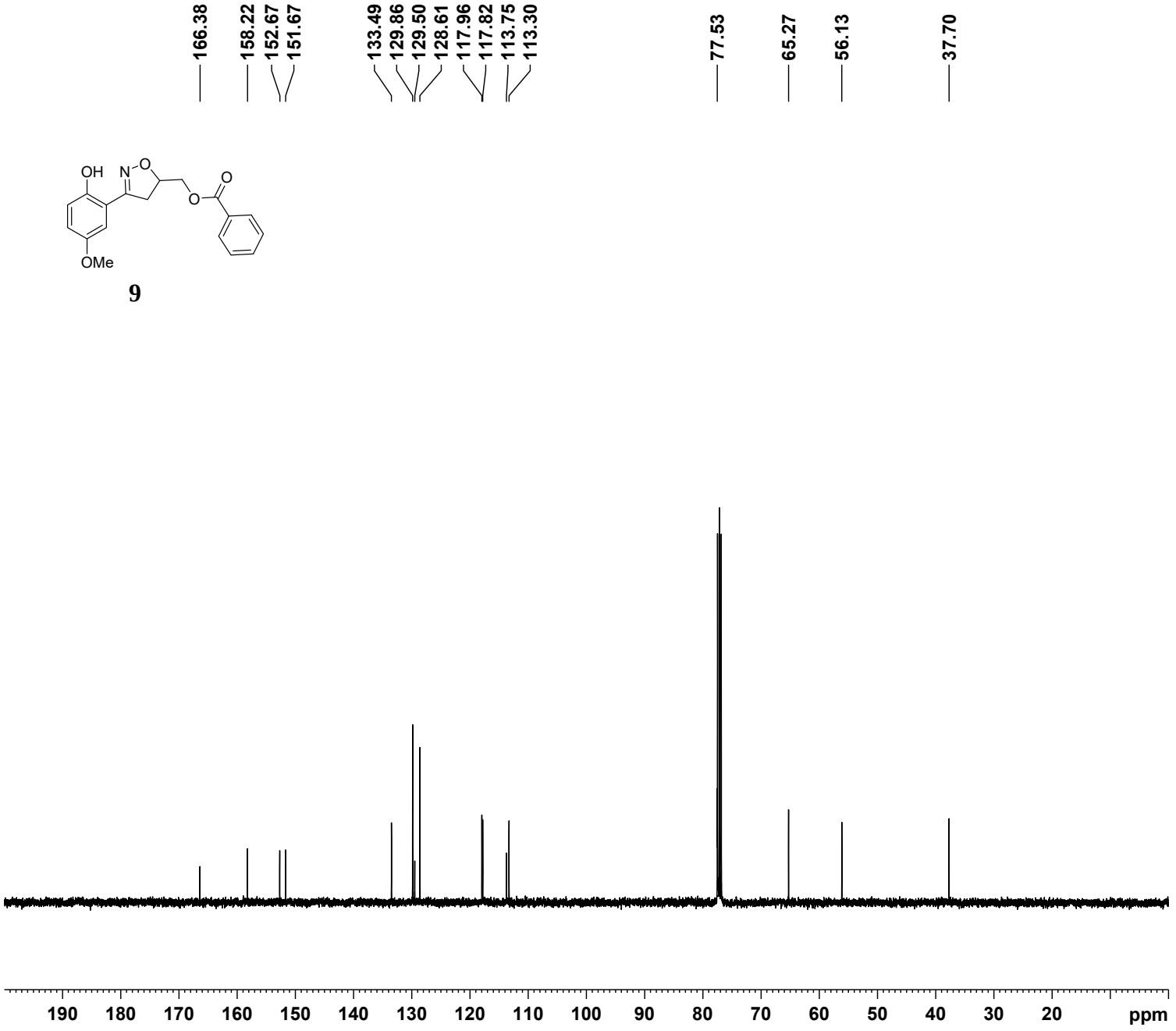
```
NAME        CWG160216-4-pure-C13
EXPNO                          1
PROCNO                         1
Date_                   20160219
Time                       15.29
INSTRUM                    spect
PROBHD    5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           242
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                     1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        297.7 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1               100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2               400.1716007 MHz
SI                         32768
SF                 100.6228142 MHz
WDW                           EM
SSB                            0
LB                         1.00 Hz
GB                             0
PC                         1.40
```



NAME	CWG160501-1
EXPNO	1
PROCNO	1
Date_	20160502
Time	10.35
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	144
DW	60.800 usec
DE	6.50 usec
TE	298.9 K
D1	1.00000000 sec
TD0	1

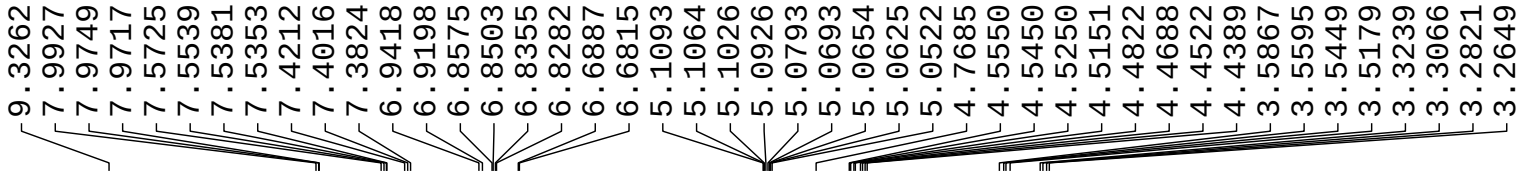
======== CHANNEL f1 ========

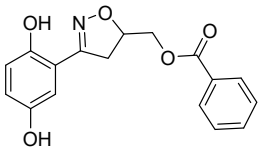
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700033 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



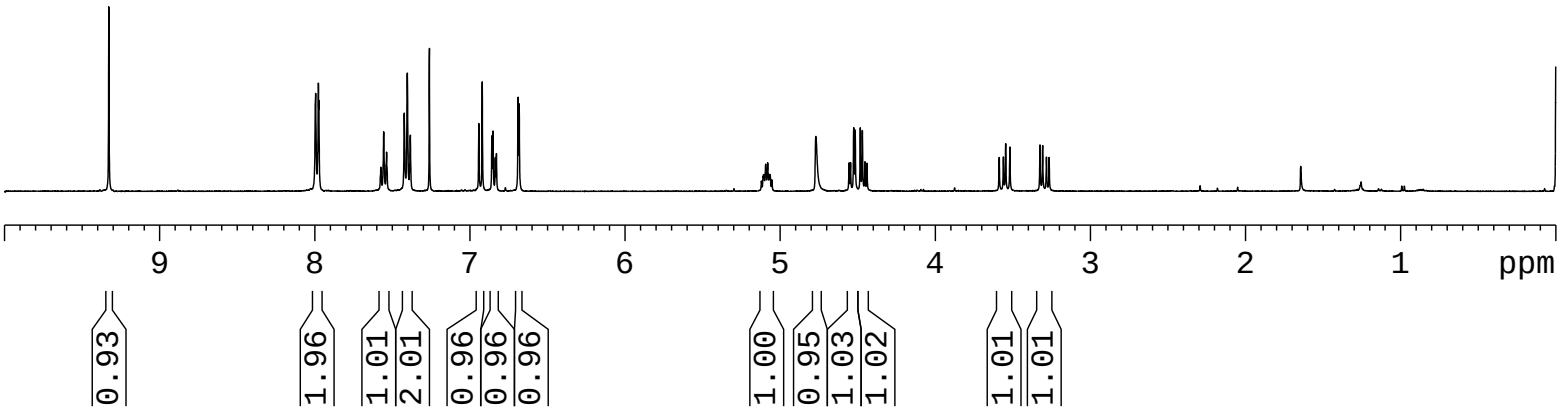
9

```
NAME        CWG1600501-1-C13
EXPNO                     1
PROCNO                    1
Date_              20160502
Time                 10.41
INSTRUM              spect
PROBHD    5 mm PABBO BB-
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     179
DS                       4
SWH             24038.461 Hz
FIDRES           0.366798 Hz
AQ               1.3631988 sec
RG                     203
DW                20.800 usec
DE                 6.50 usec
TE                 299.8 K
D1              2.00000000 sec
D11             0.03000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                   13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                 32768
SF          100.6228121 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

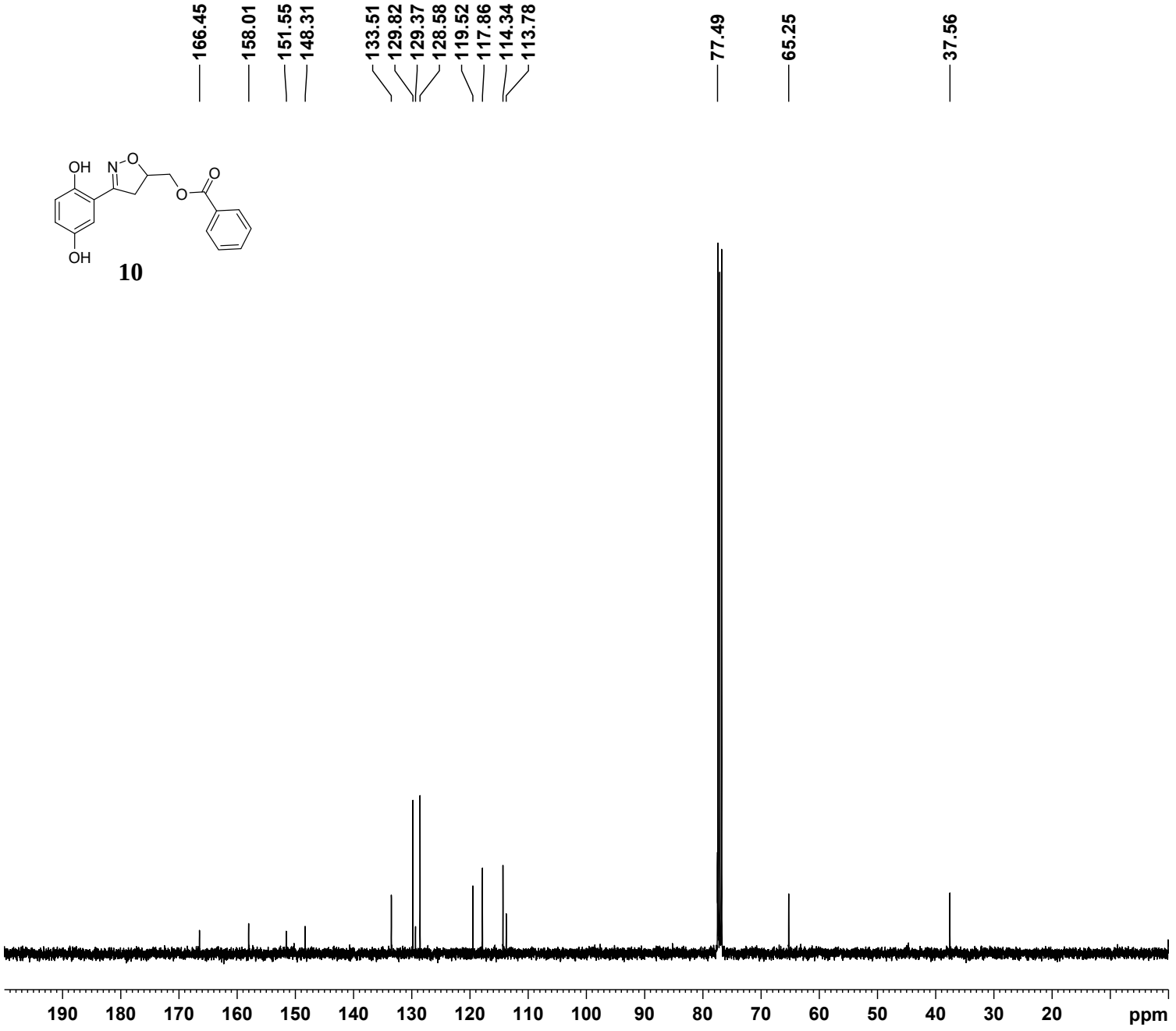




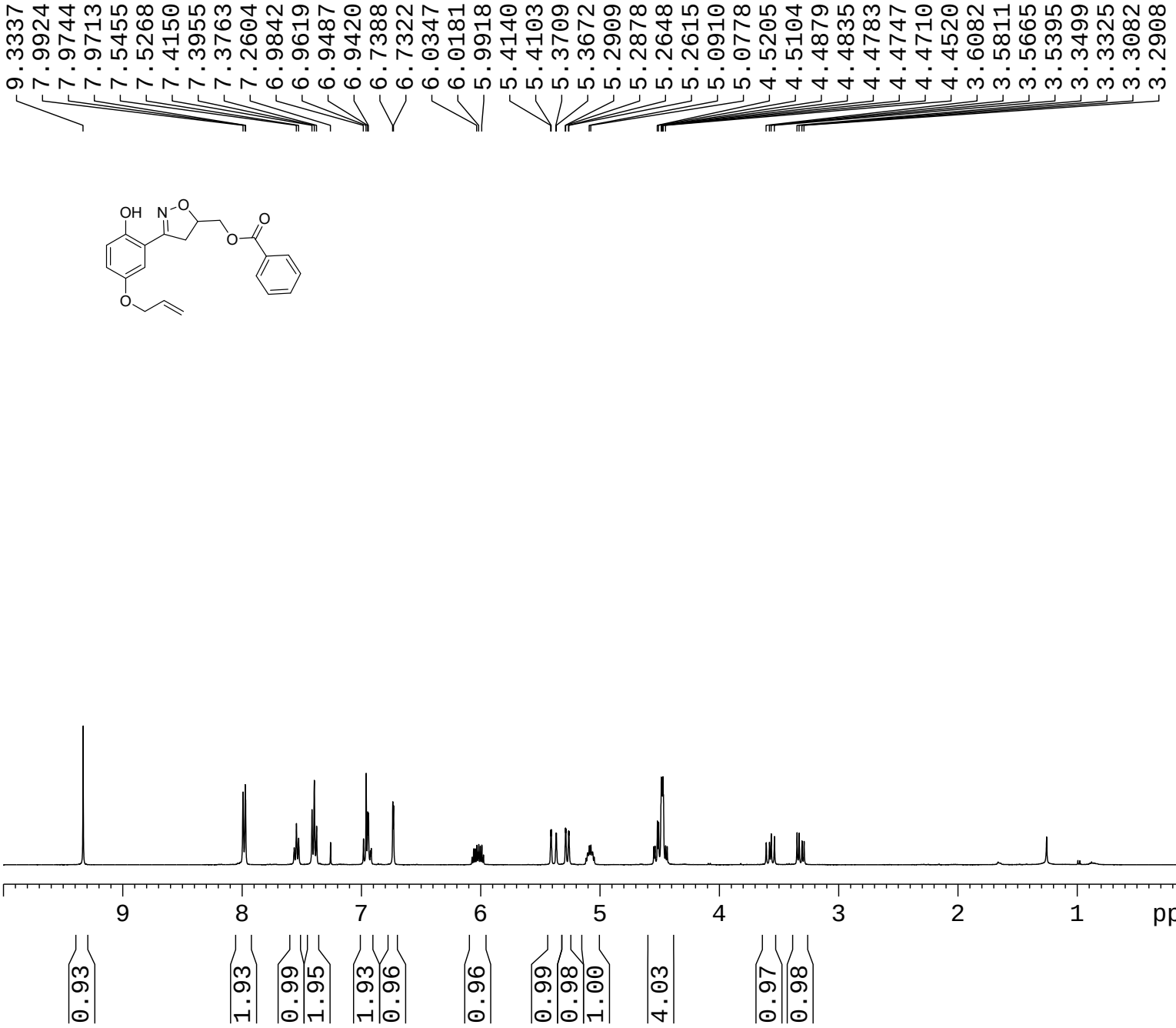
10



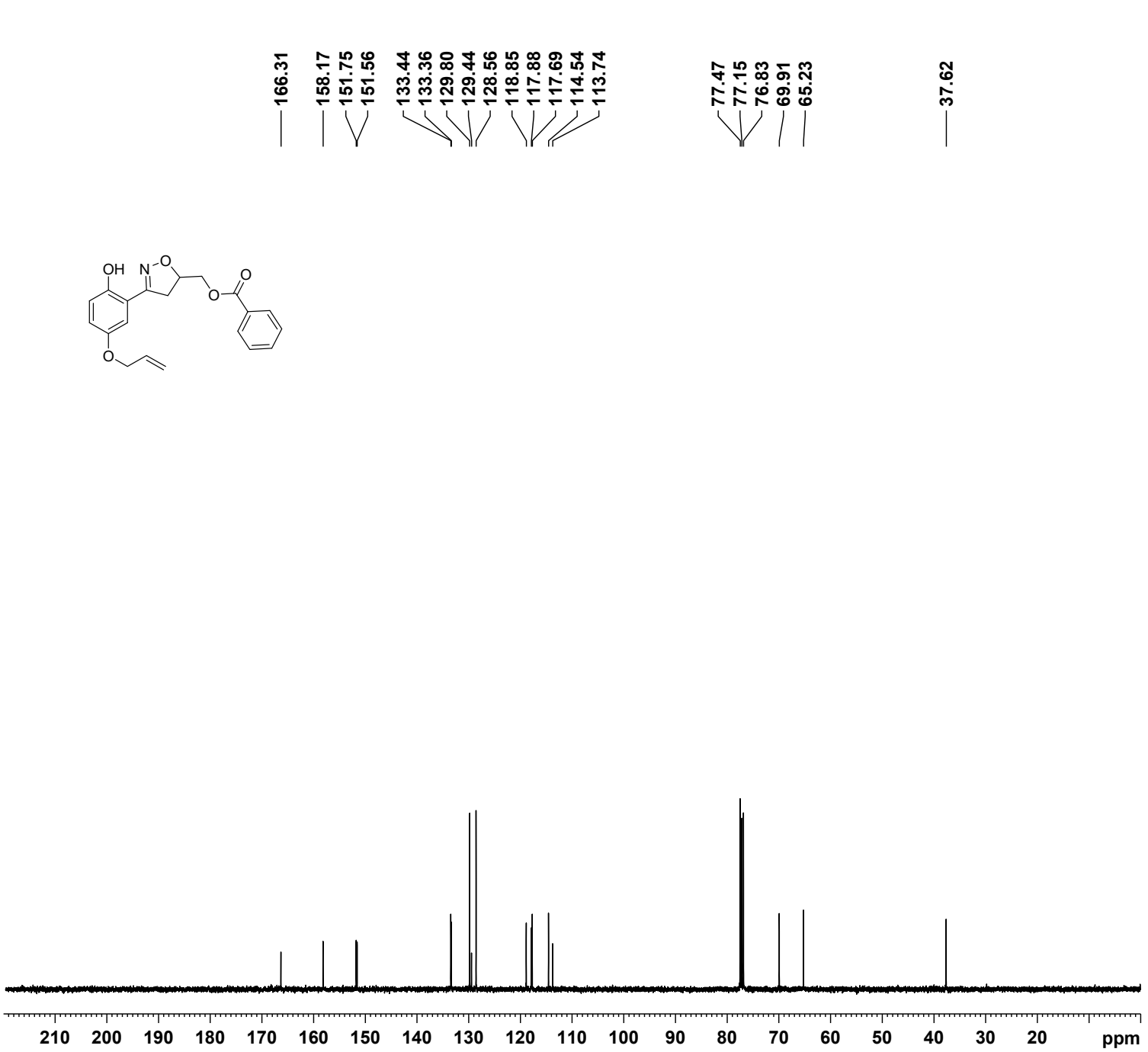
NAME	CWG160511-2-pure
EXPNO	1
PROCNO	1
Date_	20160513
Time	20.32
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	203
DW	60.800 usec
DE	6.50 usec
TE	296.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700031 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



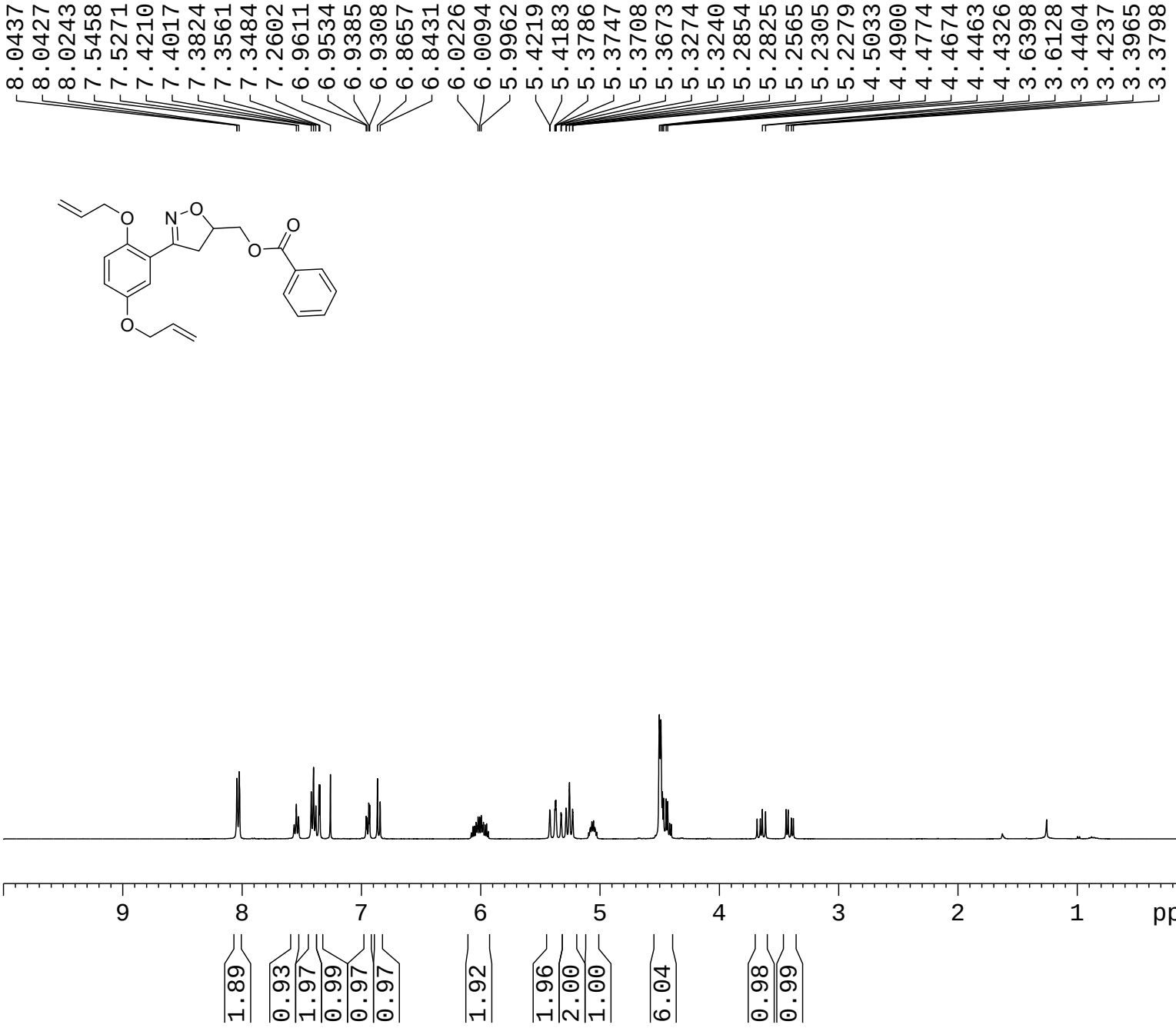

```
NAME      CWG160511-2-pure-C13-1
EXPNO                          1
PROCNO                         1
Date_                   20160513
Time                       21.04
INSTRUM                    spect
PROBHD   5 mm PABBO BB-
PULPROG                   zgpg30
TD                         65536
SOLVENT                    CDCl3
NS                           356
DS                             4
SWH                    24038.461 Hz
FIDRES                  0.366798 Hz
AQ                      1.3631988 sec
RG                           203
DW                        20.800 usec
DE                         6.50 usec
TE                        297.1 K
D1                   2.00000000 sec
D11                  0.03000000 sec
TD0                            1

======== CHANNEL f1 ========
NUC1                         13C
P1                         8.50 usec
PL1                       -2.00 dB
PL1W                57.32743073 W
SFO1                100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                         1H
PCPD2                     80.00 usec
PL2                       -1.00 dB
PL12                      14.26 dB
PL13                      14.46 dB
PL2W                13.18669796 W
PL12W                0.39276794 W
PL13W                0.37509048 W
SFO2                400.1716007 MHz
SI                       32768
SF                  100.6228172 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```




```
NAME          CWG160512-1-x
EXPNO                     1
PROCNO                    1
Date_              20160513
Time                  10.57
INSTRUM               spect
PROBHD    5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8223.685 Hz
FIDRES             0.125483 Hz
AQ                 3.9846387 sec
RG                      90.5
DW                    60.800 usec
DE                     6.50 usec
TE                    297.7 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                      1H
P1                    13.80 usec
PL1                   -1.00 dB
PL1W           13.18669796 W
SFO1           400.1724712 MHz
SI                     32768
SF             400.1700036 MHz
WDW                       EM
SSB                        0
LB                     0.30 Hz
GB                         0
PC                      1.00
```




```
NAME      CWG160512-1-x-C13
EXPNO                    1
PROCNO                   1
Date_             20160513
Time                 11.01
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   100
DS                     4
SWH           24038.461 Hz
FIDRES         0.366798 Hz
AQ             1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                297.8 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W        57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W        13.18669796 W
PL12W        0.39276794 W
PL13W        0.37509048 W
SFO2        400.1716007 MHz
SI                32768
SF          100.6228172 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

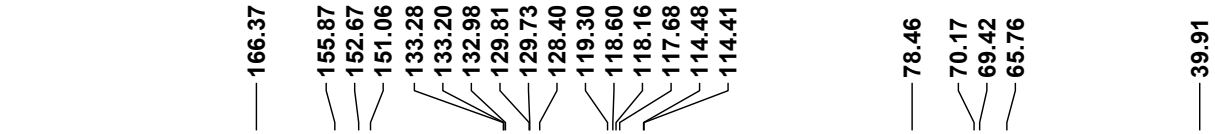


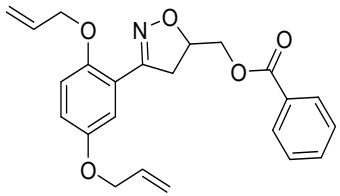
BRUKER

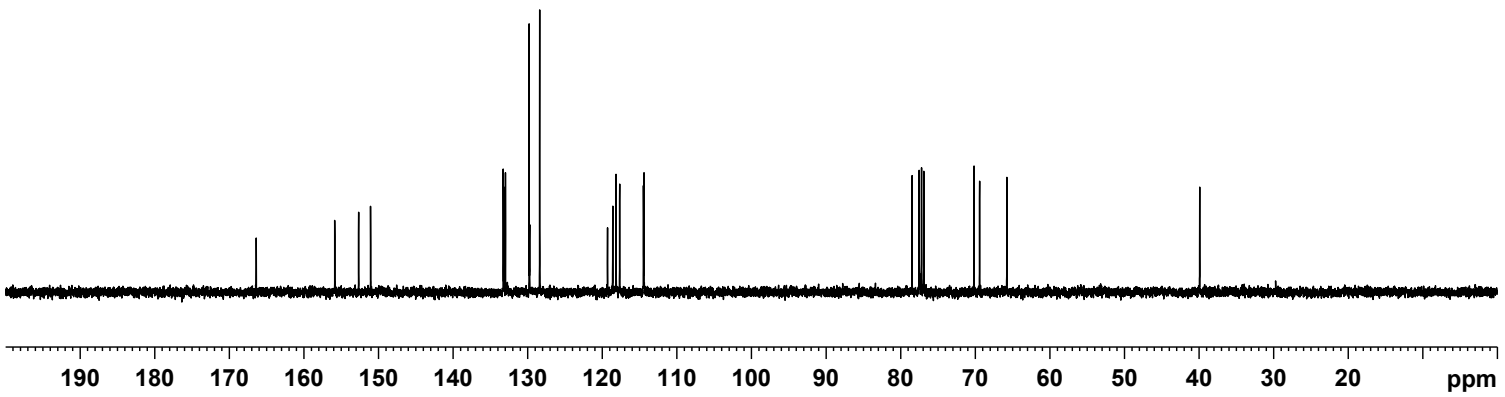
NAME	CWG160512-1-s
EXPNO	1
PROCNO	1
Date_	20160513
Time	11.12
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	144
DW	60.800 usec
DE	6.50 usec
TE	297.9 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========

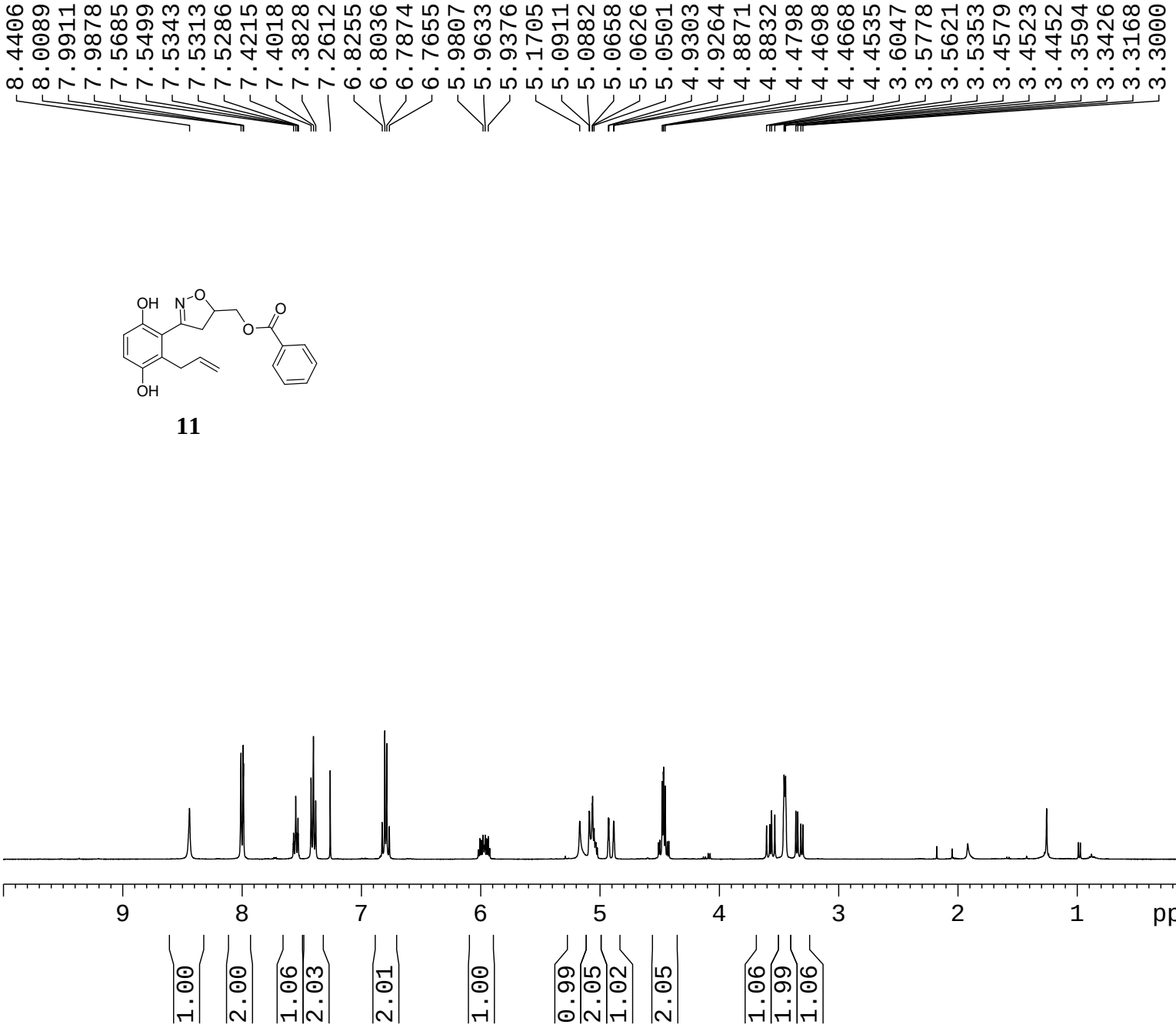
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700031 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00







NAME	FLFCWG-C13
EXPNO	1
PROCNO	1
Date_	20160517
Time	21.04
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	12
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631988 sec
RG	203
DW	20.800 usec
DE	6.50 usec
TE	297.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	8.50 usec
PL1	-2.00 dB
PL1W	57.32743073 W
SFO1	100.6328888 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	-1.00 dB
PL12	14.26 dB
PL13	14.46 dB
PL2W	13.18669796 W
PL12W	0.39276794 W
PL13W	0.37509048 W
SFO2	400.1716007 MHz
SI	32768
SF	100.6228224 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



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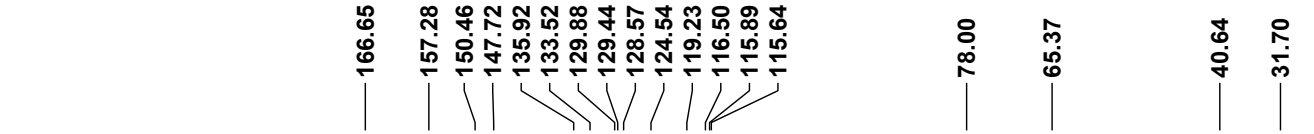
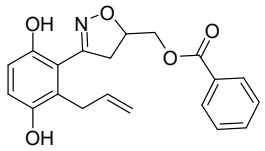
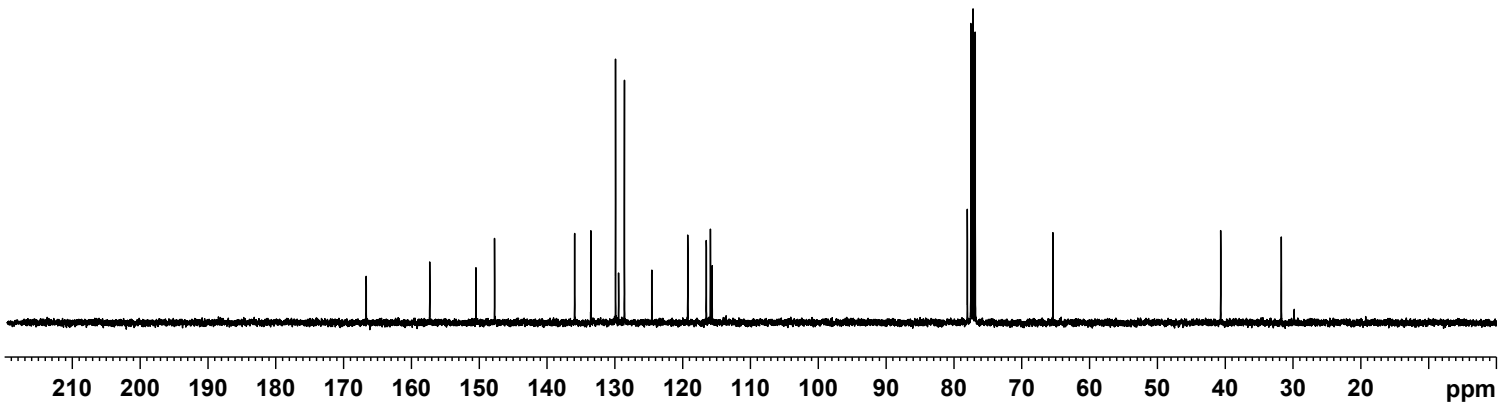
NAME	CWG160514-1-X
EXPNO	1
PROCNO	1
Date_	20160514
Time	13.14
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8223.685 Hz
FIDRES	0.125483 Hz
AQ	3.9846387 sec
RG	114
DW	60.800 usec
DE	6.50 usec
TE	297.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.80 usec
PL1	-1.00 dB
PL1W	13.18669796 W
SFO1	400.1724712 MHz
SI	32768
SF	400.1700030 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





11




```
NAME      CWG160514-1-X-C13
EXPNO                    1
PROCNO                   1
Date_             20160514
Time                 13.20
INSTRUM              spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   184
DS                     4
SWH            24038.461 Hz
FIDRES          0.366798 Hz
AQ              1.3631988 sec
RG                   203
DW                20.800 usec
DE                 6.50 usec
TE                297.3 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                  8.50 usec
PL1                -2.00 dB
PL1W         57.32743073 W
SFO1        100.6328888 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              80.00 usec
PL2                -1.00 dB
PL12               14.26 dB
PL13               14.46 dB
PL2W         13.18669796 W
PL12W         0.39276794 W
PL13W         0.37509048 W
SFO2        400.1716007 MHz
SI                32768
SF          100.6228151 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```