Supporting Information

Further Studies of Intramolecular Michael Reactions of Nitrosoalkenes for Construction of Functionalized Bridged Ring Systems

Praveen Kumar, Puhui Li, Ilia Korboukh, Tony L. Wang,

Hemant Yennawar[#] and Steven M. Weinreb[*]

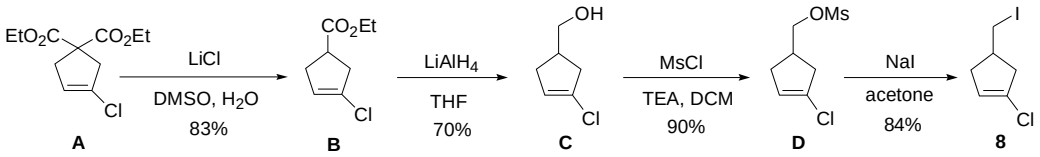
Department of Chemistry, The Pennsylvania State University

University Park, Pennsylvania 16802, United States

E-Mail: smw@chem.psu.edu

Table of Contents

Scheme 1. Preparation of Iodoalkene 8

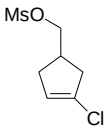


3-Chlorocyclopent-3-ene-carboxylic Acid Ethyl Ester (B). To a stirred solution of diester **A** (242 mg, 0.98 mmol) and water (0.05 mL) in DMSO (5 mL) was added LiCl (91 mg, 2.15 mmol). The reaction mixture was heated at reflux for 6 h, and then cooled to rt. Saturated aqueous NH_4Cl was added and the aqueous phase was extracted with ether. The combined organic layers were dried over Na_2SO_4. The solvent was removed under reduced pressure, and the residue was purified by flash chromatography (15% ether/pentane) to afford the ester **B** as a clear oil (143 mg, 83%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.53-5.50 (m, 1H), 4.09 (q, *J* = 7.1 Hz, 2H), 3.22-3.11 (m, 1H), 2.86-2.78 (m, 1H), 2.72-2.65 (m, 1H), 2.63-2.58 (m, 2H), 1.19 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 175.0, 130.7, 124.9, 61.1, 41.4, 40.5, 35.2, 14.5; HRMS-EI $[M]^+$ calcd for $C_8H_{11}ClO_2$, 174.0448; found, 174.0452.

(3-Chlorocyclopent-3-enyl)-methanol (C). To a stirred suspension of $LiAlH_4$ (56 mg, 1.47 mmol) in THF (5 mL) at 0 °C was added dropwise ester **B** (143 mg, 0.82 mmol) in ether (5 mL). The mixture was stirred for 1 h at rt, and then diluted with ethyl acetate. The mixture was poured into 1 M HCl solution. Saturated aqueous NH_4Cl and EtOAc were added. The organic layer was dried over Na_2SO_4 and the solvent was removed under reduced pressure. The residue was purified by flash chromatography (50% ether/pentane) to afford the alcohol **C** as a colorless oil (76 mg, 70%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.54-5.51 (m, 1H), 3.50 (d, *J* = 6.3 Hz,

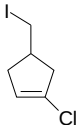
2H), 2.64-2.42 (m, 3H), 2.28-2.23 (m, 1H), 2.11-2.04 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 131.5, 125.6, 66.8, 40.6, 39.2, 34.5; HRMS-EI $[M]^+$ calcd for C_6H_9ClO, 132.0342; found, 132.0337.

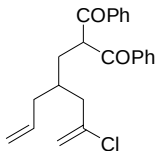
Methanesulfonic Acid 3-Chlorocyclopent-3-enyl Methyl Ester (D).



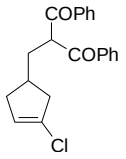
To a solution of alcohol **C** (71 mg, 0.53 mmol) in dichloromethane (5 mL) at 0 °C was added portionwise triethylamine (0.21 mL, 1.59 mmol) and mesyl chloride (0.11 mL, 1.59 mmol). The reaction mixture was stirred at 0 °C for 30 min, and then at rt for 3 h. The organic phase was diluted with dichloromethane and washed consecutively with brine, 1 M aqueous $KHSO_4$, brine, 5% aqueous $NaHCO_3$, brine, and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (50% ether/pentane) affording the mesylate **D** as a colorless oil (106 mg, 94%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.55-5.52 (m, 1H), 4.08 (dd, *J* = 2.2, 6.9 Hz, 2H), 2.96 (s, 3H), 2.80-2.61 (m, 2H), 2.57-2.47 (m, 1H), 2.34-2.26 (m, 1H), 2.17-2.09 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 131.3, 125.4, 72.6, 40.4, 37.9, 36.5, 34.5; LRMS-ES $[M + Na]^+$ calcd for $C_7H_{11}ClNaO_3S$, 233.0; found, 233.0.

1-Chloro-4-iodomethylcyclopentene (8). To a solution of mesylate **D** (108 mg, 0.51 mmol) in acetone (5 mL) was added sodium iodide (384 mg, 2.55 mmol) and the mixture was stirred at reflux for 12 h. The solvent was then removed under reduced pressure and the residue was purified by flash chromatography (pentane) to produce the iodide **8** as a clear oil (104 mg, 84%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.48-5.46 (m, 1H), 3.09 (d, *J* = 6.6 Hz, 2H), 2.60-2.38 (m, 3H), 2.20-2.13 (m, 1H), 2.02-1.93 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 131.1, 125.6, 44.7, 39.9, 39.0, 13.6; HRMS-EI $[M]^+$ calcd for C_6H_8ClI, 241.9359; found, 241.9368.



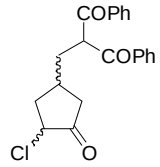
2-(2-Allyl-4-chloropent-4-enyl)-1,3-diphenylpropane-1,3-dione (15a). 

To a stirred solution of 1,3-Diphenyl-propane-1,3-dione (238 mg, 1.06 mmol) in acetonitrile (10 mL) was added Verkade's base (230 mg, 1.06 mmol), and the mixture was stirred for 30 min at rt. Iodide **14** (261 mg, 0.96 mmol) was then added and the mixture was stirred for 72 h at rt. The solvent was removed under reduced pressure, and the residue was purified by flash chromatography (13% ether/hexanes) to afford the diene **15a** as a pale yellow oil (182 mg, 51%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.82-7.75 (m, 4H), 7.36-7.20 (m, 6H), 5.61-5.48 (m, 1H), 5.17 (t, *J* = 6.4 Hz, 1H), 4.98-4.83 (m, 4H), 2.22-2.03 (m, 2H), 2.01-1.80 (m, 5H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 196.3, 196.2, 141.5, 136.4, 136.3, 135.9, 133.9, 132.9, 129.3, 129.1, 129.0, 127.6, 117.9, 114.7, 55.8, 44.3, 38.1, 34.4, 33.2; HRMS-ES $[M + H]^+$ calcd for $C_{23}H_{24}ClO_2$, 367.1465; found, 367.1470.

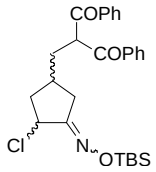
2-(3-Chlorocyclopent-3-enylmethyl)-1,3-diphenylpropane-1,3-dione (16a). 

A flame dried 250 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15a** (172 mg, 0.47 mmol) and benzene (120 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (40 mg, 0.047 mmol) in 2 mL of benzene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 65 °C for 2-3 days until TLC showed the reaction was complete. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (17% ether/hexanes) to afford the vinyl chloride **16a** as a yellow oil (100 mg, 63%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.93-7.87 (m, 4H), 7.53-7.47 (m, 2H), 7.41-7.36 (m, 4H), 5.52-5.50 (m, 1H), 5.14 (t, *J* = 6.7 Hz, 1H), 2.62-

2.01 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 196.0, 136.3, 136.3, 134.0, 131.5, 129.3, 129.0, 125.8, 56.3, 43.8, 38.1, 36.3, 36.1; HRMS-ES $[M + H]^+$ calcd for $C_{21}H_{20}ClO_2$, 339.1152; found, 339.1177.



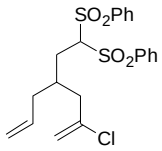
2-(3-Chloro-4-oxocyclopentylmethyl)-1,3-diphenylpropane-1,3-dione (17a). To a solution of vinyl chloride **16a** (92 mg, 0.27 mmol), acetone (2.5 mL) and glacial acetic acid (1 mL) at 0 °C was added dropwise sodium hypochlorite (0.23 mL of 10% solution, 0.27 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (50% ether/hexanes) affording the α-chloroketone **17a** as a white solid (38 mg, 40%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.88 (d, *J* = 7.7 Hz, 4H), 7.54-7.36 (m, 6H), 5.15 (t, *J* = 6.5 Hz, 1H), 4.06 (d, *J* = 5.6 Hz, 1H), 2.70-2.53 (m, 1H), 2.33-1.78 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.7, 195.7, 195.6, 136.0, 135.9, 134.3, 134.2, 129.5, 129.4, 129.4, 129.0, 129.0, 57.5, 56.3, 42.7, 40.2, 34.6, 33.0; HRMS-ES $[M + H]^+$ calcd for $C_{21}H_{20}ClO_3$, 355.1101; found, 355.1096.



2-(3-Chloro-*tert*-butyldimethylsilyloxyiminocyclopentylmethyl)-1,3-diphenylpropane-1,3-dione (18a). To a solution of α-chloroketone **17a** (23 mg, 0.065 mmol) in dichloromethane (3 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (10 mg, 0.065 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 24 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the

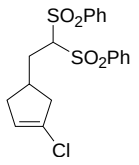
residue was purified by flash chromatography (25% ether/hexanes) to afford the α-chloroketoxime **18a** as a colorless oil (19 mg, 61%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 7.84-7.76 (m, 4H), 7.46-7.27 (m, 6H), 5.08 (q, *J* = 6.5 Hz, 1H), 4.84-4.61 (m, 1H), 2.78-2.64 (m, 1H), 2.53-2.39 (m, 1H), 2.28-1.88 (m, 4H), 1.72-1.55 (m, 1H), 0.82-0.68 (m, 9H), 0.02-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 196.0, 195.8, 195.8, 195.6, 167.3, 166.1, 136.2, 136.2, 136.1, 136.0, 134.1, 134.1, 134.1, 129.4, 129.4, 129.0, 129.0, 128.9, 59.1, 56.8, 56.4, 51.5, 43.0, 42.6, 35.4, 35.2, 34.6, 34.6, 34.2, 32.8, 26.3, 26.3, 18.4, 18.4, -4.8, -4.8; HRMS-ES $[M + H]^+$ calcd for $C_{27}H_{35}ClNO_3Si$, 484.2075; found, 484.2066.

2-(2-Allyl-4-chloropent-4-enyl)-1,1-bis-benzenesulfonylmethane (15b). To a stirred suspension of sodium hydride (60% dispersion in mineral oil, 18 mg, 0.44 mmol) in DMF (1 mL) at 0 °C was dropwise added a solution of bis-benzenesulfonyl methane (137 mg, 0.44 mmol) in DMF (1 mL). After stirring the mixture for 30 min at 0 °C, a solution of iodide **14** (100 mg, 0.37 mmol) in DMF (1 mL) was added. The resulting mixture was warmed to rt and stirred for 72 h. Saturated aqueous NH_4Cl and ethyl acetate were added. The organic layer was separated and the aqueous layer was extracted with ethyl acetate. The combined organic layer was washed with water and brine. The organic layer was dried over Na_2SO_4 and the solvent was removed under reduced pressure. The residue was purified by flash chromatography (25% ethyl acetate/hexanes) to afford the diene **15b** as a colorless oil (113 mg, 70%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.90-7.84 (m, 4H), 7.63-7.55 (m, 2H), 7.48 (t, *J* = 7.1 Hz, 4H), 5.62-5.48 (m, 1H), 5.08 (d, *J* = 18.9 Hz, 2H), 4.99-4.92 (m, 2H), 4.54 (t, *J* = 5.3 Hz, 1H), 2.26-1.88 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 140.6, 138.3, 137.6, 135.1, 135.0,



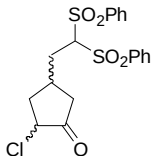
130.2, 129.9, 129.5, 129.5, 118.6, 115.3, 81.7, 43.9, 37.5, 33.5, 29.6; HRMS-ES [M + NH_4]$^+$ calcd for $C_{21}H_{27}ClNO_4S_2$, 456.1070; found, 456.1067.

4-(2,2-Bis-benzenesulfonylethyl)-2-chlorocyclopentene (16b). A



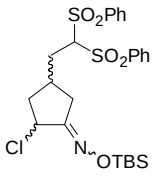
flame dried 100 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15b** (129 mg, 0.29 mmol) and benzene (60 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (25 mg, 0.029 mmol) in 2 mL of benzene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 65 °C for 2-3 days until TLC showed the reaction was complete. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) to afford the vinyl chloride **16b** as a pale yellow oil (61 mg, 51%). ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.93-7.79 (m, 4H), 7.67-7.57 (m, 2H), 7.51 (t, *J* = 7.6 Hz, 4H), 5.47-5.44 (m, 1H), 4.25 (t, *J* = 5.6 Hz, 1H), 2.73-2.39 (m, 2H), 2.20-2.11 (m, 3H), 2.02-1.81 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 138.0, 137.9, 135.2, 135.1, 131.1, 130.0, 130.0, 129.6, 129.6, 129.5, 129.4, 125.3, 82.8, 43.1, 37.3, 35.7, 32.0; HRMS-ES [M + NH_4]$^+$ calcd for $C_{19}H_{23}ClNO_4S_2$, 428.0757; found, 428.0740.

4-(2,2-Bis-benzenesulfonylethyl)-2-chlorocyclopentanone (17b).



To a solution of vinyl chloride **16b** (51 mg, 0.124 mmol), acetone (2.5 mL) and glacial acetic acid (1 mL) at 0 °C was added dropwise sodium hypochlorite (0.11 mL of 10% solution, 0.124 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under

reduced pressure and the residue was purified by flash chromatography (30% ethyl acetate/hexanes) affording the α-chloroketone **17b** as a colorless oil (21 mg, 40%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 8.03-7.83 (m, 4H), 7.72-7.62 (m, 2H), 7.56-7.51 (m, 4H), 4.30 (t, *J* = 5.5 Hz, 1H), 4.02 (d, *J* = 6.9 Hz, 1H), 2.76-2.00 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.0, 208.5, 137.7, 137.7, 136.0, 135.9, 135.4, 135.1, 132.3, 132.2, 130.1, 130.0, 129.9, 129.7, 129.6, 129.4, 129.3, 82.3, 82.2, 57.2, 56.6, 43.8, 41.7, 41.1, 39.4, 32.5, 31.0, 30.7; HRMS-ES $[M + NH_4]^+$ calcd for $C_{19}H_{23}ClNO_5S_2$, 444.0706; found, 444.0699.

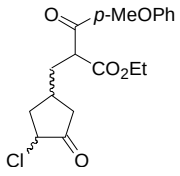


4-(2,2-Bis-benzenesulfonylethyl)-2-chlorocyclopentanone-*tert*-butyldimethylsilyloxyoxime (18b). To a solution of α-chloroketone **17b** (19.7 mg, 0.046 mmol) in dichloromethane (3 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (15 mg, 0.092 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 19 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) to afford the α-chloroketoxime **18b** as a colorless oil (15.6 mg, 61%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 7.92-7.77 (m, 4H), 7.62-7.54 (m, 2H), 7.44 (t, *J* = 7.4 Hz, 4H), 4.88-4.44 (m, 1H), 4.23-4.17 (m, 1H), 2.84-2.40 (m, 2H), 2.20-1.71 (m, 3H), 1.52-1.40 (m, 2H), 0.79-0.67 (m, 9H), 0.01-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 166.3, 165.2, 137.9, 137.9, 137.8, 135.8, 135.2, 132.4, 132.2, 130.0, 130.0, 130.0, 129.7, 129.4, 129.2, 82.7, 58.7, 51.1, 42.4, 41.9, 34.7, 34.5, 34.2, 34.1, 32.2, 32.0, 30.9, 30.6, 30.1, 26.4, 26.3, 18.5, 18.4, 18.3, -4.8, -4.8.

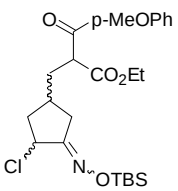
4-Allyl-6-chloro-2-(4-methoxybenzoyl)-hept-6-enoic Acid Ethyl Ester (15c). To a stirred solution of 3-(4-methoxyphenyl)-3-oxo-propionic acid ethyl ester (57 mg, 0.26 mmol) in acetonitrile (3 mL) was added Verkade's base (56 mg, 0.26 mmol), and the mixture was stirred for 30 min at 0 °C . Iodide **14** (70 mg, 0.26 mmol) was then added and the mixture was stirred for 7 h at 0 °C. The solvent was removed under reduced pressure, and the residue was purified by flash chromatography (20% ether/hexanes) to afford the diene **15c** as a colorless oil (65 mg, 68%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.99-7.95 (m, 2H), 6.92 (d, *J* = 8.4 Hz, 2H), 5.81-5.65 (m, 1H), 5.19-5.12 (m, 2H), 5.08-5.00 (m, 2H), 4.43-4.38 (m, 1H), 4.12 (q, *J* = 7.1 Hz, 2H), 3.84 (s, 3H), 2.39-1.83 (m, 7H), 1.15 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 193.9, 193.8, 170.7, 170.6, 164.5, 141.7, 141.6, 136.0, 131.6, 129.7, 118.1, 118.0, 114.8, 114.5, 62.0, 62.0, 56.1, 52.5, 52.4, 44.4, 44.2, 38.0, 37.8, 33.9, 33.7, 33.0, 32.8, 14.6; HRMS-ES $[M + H]^+$ calcd for $C_{20}H_{26}ClO_4$, 365.1520; found, 365.1524.

2-(3-Chlorocyclopent-3-enylmethyl)-3-(4-methoxyphenyl)-3-oxopropionic Acid Ethyl Ester (16c). A flame dried 250 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15c** (300 mg, 0.82 mmol) and benzene (200 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (70 mg, 0.082 mmol) in 2 mL of benzene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 65 °C for 72 h. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (30% ether/hexanes) to afford the vinyl chloride **16c** as a pale yellow oil

(216 mg, 78%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.92-7.88 (m, 2H), 6.90-6.86 (m, 2H), 5.51-5.50 (m, 1H), 4.23-4.17 (m, 1H), 4.07 (q, *J* = 7.1 Hz, 2H), 3.81 (s, 3H), 2.55-1.97 (m, 7H), 1.10 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 193.2, 193.2, 170.0, 164.0, 131.2, 131.1, 129.3, 129.2, 125.5, 125.5, 114.1, 61.5, 55.6, 52.6, 52.5, 43.4, 37.7, 37.7, 35.6, 35.3, 35.3, 14.1; HRMS-ES $[M + H]^+$ calcd for $C_{18}H_{22}ClO_4$, 337.1207; found, 337.1208.



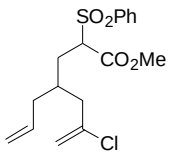
2-(3-Chloro-4-oxocyclopentylmethyl)-3-(4-methoxyphenyl)-3-oxopropionic Acid Ethyl Ester (17c). To a solution of vinyl chloride **16c** (168 mg, 0.49 mmol), acetone (2.5 mL) and glacial acetic acid (1 mL) at 0 °C was added dropwise sodium hypochlorite (0.42 mL of 10% solution, 0.49 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (60% ether/hexanes) affording the α-chloroketone **17c** as a colorless oil (101 mg, 57%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.98-7.85 (m, 2H), 6.92-6.86 (m, 2H), 4.32-4.20 (m, 1H), 4.16-3.96 (m, 3H), 3.81 (s, 3H), 2.75-1.83 (m, 7H), 1.18-1.08 (m, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.9, 209.9, 193.0, 192.9, 170.1, 164.5, 131.4, 129.3, 129.2, 114.5, 114.4, 62.1, 57.5, 56.0, 52.8, 52.7, 42.5, 42.5, 40.1, 40.1, 34.4, 32.4, 32.4, 14.4; HRMS-ES $[M + H]^+$ calcd for $C_{18}H_{22}ClO_5$, 353.1156; found, 353.1151.



2-(3-Chloro-4-*tert*-butyldimethylsilyloxyiminocyclopentylmethyl)-3-(4-methoxyphenyl)-3-oxopropionic Acid Ethyl Ester (18c). To a solution

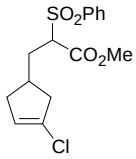
of α-chloroketone **17c** (15.5 mg, 0.044 mmol) in dichloromethane (3 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (6.5 mg, 0.044 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 5 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (50% ether/hexanes) to afford the α-chloroketoxime **18c** as a colorless oil (10.5 mg, 50%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 7.86-7.82 (m, 2H), 6.82-6.75 (m, 2H), 4.84-4.61 (m, 1H), 4.18-4.11 (m, 1H), 4.04-3.95 (m, 2H), 3.73 (s, 3H), 2.78-2.58 (m, 1H), 2.37-2.32 (m, 1H), 2.13-1.81 (m, 4H), 1.65-1.52 (m, 1H), 1.06-1.01 (m, 3H), 0.82-0.70 (m, 9H), 0.01-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 193.3, 193.1, 193.1, 170.2, 170.2, 170.1, 167.5, 167.5, 166.2, 164.3, 164.3, 131.4, 129.4, 129.3, 129.3, 114.3, 61.9, 59.2, 55.9, 53.2, 53.1, 51.5, 42.9, 42.9, 35.2, 34.2, 33.9, 33.9, 32.6, 26.6, 26.3, 26.3, 26.0, 18.4, 18.4, 14.4, -4.8, -4.9; HRMS-ES $[M + H]^+$ calcd for $C_{24}H_{37}ClNO_5Si$, 482.2130; found, 482.2110.

4-Allyl-2-benzenesulfonyl-6-chlorohept-6-enoic Acid Methyl Ester (15d). To a stirred suspension of sodium hydride (60% dispersion in mineral oil, 70 mg, 1.73 mmol) in DMF (8 mL) at 0 °C was dropwise added a solution of benzenesulfonyl acetic acid methyl ester (0.27 mL, 1.44 mmol) in DMF (2 mL). After stirring the mixture for 30 min at 0 °C, a solution of iodide **14** (468 mg, 1.73 mmol) in DMF (1 mL) was added. The resulting mixture was warmed to rt and stirred for 24 h. Saturated aqueous NH_4Cl and ethyl acetate were added. The organic layer was separated and the aqueous layer was extracted with ethyl acetate. The combined organic layer was washed with water and brine. The organic layer was dried

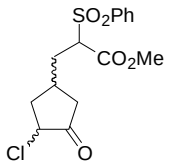


over Na_2SO_4 and the solvent was removed under reduced pressure. The residue was purified by flash chromatography (20% ethyl acetate/hexanes) to afford the diene **15d** as a colorless oil (420 mg, 77%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.85 (d, *J* = 7.6 Hz, 2H), 7.68 (t, *J* = 7.3 Hz, 1H), 7.56 (t, *J* = 7.6 Hz, 2H), 5.70-5.54 (m, 1H), 5.13 (d, *J* = 18.3 Hz, 2H), 5.04-4.93 (m, 2H), 4.12-4.06 (m, 1H), 3.64 (d, *J* = 6.3 Hz, 3H), 2.38-1.82 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 165.1, 164.9, 139.1, 138.9, 135.9, 135.8, 133.4, 133.2, 132.9, 128.0, 127.9, 117.0, 116.7, 113.6, 113.5, 67.6, 51.8, 51.8, 42.3, 41.7, 36.3, 34.9, 31.8, 31.4, 28.9, 28.3; HRMS-ES $[M + NH_4]^+$ calcd for $C_{17}H_{25}ClNO_4S$, 374.1193; found, 374.1188.

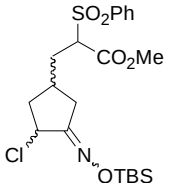
2-Benzenesulfonyl-3-(3-chlorocyclopent-3-enyl)-propionic Acid Methyl Ester (16d). A flame dried 250 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15d** (148 mg, 0.41 mmol) and toluene (100 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (35 mg, 0.041 mmol) in 2 mL of toluene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 85 °C for 20 h. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) to afford the vinyl chloride **16d** as a pale yellow oil (100 mg, 74%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.87 (d, *J* = 7.7 Hz, 2H), 7.70 (t, *J* = 6.8 Hz, 1H), 7.58 (t, *J* = 7.6 Hz, 2H), 5.57-5.55 (m, 1H), 4.06-3.90 (m, 1H), 3.66 (s, 3H), 2.62-1.91 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 166.4, 136.8, 136.8, 134.4, 131.1, 130.7, 129.3, 129.3, 129.1, 125.3, 124.9, 69.7, 69.6, 53.1, 43.2, 42.5, 37.6, 36.8, 35.1, 32.7; HRMS-ES $[M + NH_4]^+$ calcd for $C_{15}H_{21}ClNO_4S$, 346.0880; found, 346.0889.



2-Benzenesulfonyl-3-(3-chloro-4-oxocyclopentyl)-propionic Acid Methyl Ester (17d). To a solution of vinyl chloride **16d** (64 mg, 0.19 mmol), acetone (2.5 mL) and glacial acetic acid (1 mL) at 0 °C was added dropwise sodium hypochlorite (0.17 mL of 10% solution, 0.19 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) affording the α-chloroketone **17d** as a colorless oil (50 mg, 75%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.80 (d, *J* = 7.4 Hz, 2H), 7.65 (t, *J* = 7.4 Hz, 1H), 7.53 (t, *J* = 7.6 Hz, 2H), 4.05 (d, *J* = 5.9 Hz, 1H), 3.97-3.85 (m, 1H), 3.59 (s, 3H), 2.59-1.76 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.8, 208.5, 166.5, 166.5, 137.0, 136.9, 135.0, 129.7, 129.6, 69.8, 69.7, 57.3, 57.0, 53.7, 53.6, 53.5, 42.0, 41.7, 39.9, 39.6, 32.1, 32.0, 32.0, 31.9; HRMS-ES $[M + NH_4]^+$ calcd for $C_{15}H_{21}ClNO_5S$, 362.0829; found, 362.0828.

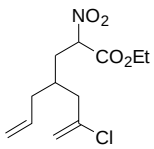


2-Benzenesulfonyl-3-(3-chloro-4-*tert*-butyldimethylsilyloxyiminocyclopentyl)-propionic Acid Methyl Ester (18d). To a solution of α-chloroketone **17d** (30 mg, 0.087 mmol) in dichloromethane (3 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (27 mg, 0.174 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 24 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (20% ethyl acetate/hexanes) to afford the α-chloroketoxime **18d** as a

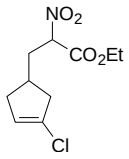


colorless oil (28 mg, 68%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 7.72 (d, *J* = 7.7 Hz, 2H), 7.56 (t, *J* = 7.4 Hz, 1H), 7.44 (t, *J* = 7.6 Hz, 2H), 4.83-4.61 (m, 1H), 3.98-3.77 (m, 1H), 3.53 (s, 3H), 2.73-2.51 (m, 1H), 2.39-2.19 (m, 1H), 2.09-1.81 (m, 4H), 1.59-1.51 (m, 1H), 0.84-0.67 (m, 9H), 0.01-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 165.4, 165.4, 165.3, 165.2, 164.9, 135.7, 135.6, 133.5, 128.4, 128.3, 128.3, 128.2, 128.2, 68.8, 68.8, 57.6, 57.3, 52.3, 52.2, 41.4, 41.1, 33.5, 32.2, 32.1, 30.9, 30.7, 30.6, 30.2, 25.0, 24.9, 24.9, 17.1, 17.0, 17.0, -6.2; HRMS-ES $[M + H]^+$ calcd for $C_{21}H_{33}ClNO_5SSi$, 474.1537; found, 474.1553.

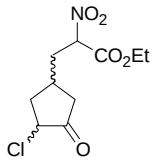
4-Allyl-6-chloro-2-nitrohept-6-enoic Acid Ethyl Ester (15e). To a



stirred solution of tetrabutyl ammonium hydroxide (1.71 g, 2.64 mmol) in dichloromethane (2.5 mL) was slowly added nitroacetic acid ethyl ester (0.3 mL, 2.64 mmol), and the mixture was stirred at rt for 10 min. A solution of iodide **14** (783 mg, 2.90 mmol) in dichloromethane (0.5 mL) was then added in one portion and the mixture was stirred at rt for 72 h. The organic layer was separated and the aqueous layer was extracted with dichloromethane. The combined organic layer was washed with brine and dried over $MgSO_4$. The solvent was removed under reduced pressure, and the residue was purified by flash chromatography (7% ethyl acetate/hexanes) to afford the diene **15e** as an oil (217 mg, 30%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 5.72-5.60 (m, 1H), 5.23-4.93 (m, 5H), 4.22 (q, *J* = 7.1 Hz, 2H), 2.39-1.95 (m, 6H), 1.91-1.81 (m, 1H), 1.24 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 164.9, 164.9, 140.5, 140.4, 134.8, 134.6, 118.8, 118.6, 115.4, 115.2, 86.6, 86.5, 63.5, 43.7, 43.5, 37.6, 36.8, 33.8, 33.7, 32.2, 32.0, 14.2; HRMS-ES $[M+NH_4]^+$ calcd for $C_{12}H_{22}ClN_2O_4$, 293.1268; found, 293.1281.

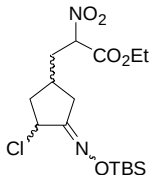
3-(3-Chlorocyclopent-3-enyl)-2-nitropropionic Acid Ethyl Ester (16e). 

A flame dried 100 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15e** (70 mg, 0.25 mmol) and toluene (60 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (44 mg, 0.05 mmol) in 2 mL of toluene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 95 °C for 19 h. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (9% ethyl acetate/hexanes) to afford the vinyl chloride **16e** as a pale yellow oil (37 mg, 59%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 5.62-5.53 (m, 1H), 5.12-5.01 (m, 1H), 4.22 (q, *J* = 7.1 Hz, 2H), 2.54-1.97 (m, 7H), 1.24 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 164.8, 164.8, 131.6, 131.2, 125.8, 125.4, 87.5, 87.3, 63.7, 63.6, 43.6, 43.1, 37.9, 37.4, 36.8, 36.7, 34.4, 34.4, 14.4.

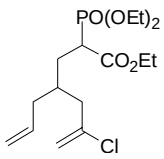
3-(3-Chloro-4-oxocyclopentyl)-2-nitropropionic Acid Ethyl Ester (17e). 

To a solution of vinyl chloride **16e** (32 mg, 0.13 mmol), acetone (2.5 mL) and glacial acetic acid (1 mL) at 0 °C was added dropwise sodium hypochlorite (0.12 mL of 10% solution, 0.13 mmol) via syringe. The reaction mixture was stirred at 0 °C for 20 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) affording the α-chloroketone **17e** as a colorless oil (14 mg, 41%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 5.12-5.06 (m, 1H), 4.36-4.19 (m, 2H),

4.08 (d, *J* = 5.5 Hz, 1H), 2.74-1.82 (m, 7H), 1.25 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.4, 208.3, 164.3, 87.0, 86.7, 63.9, 63.8, 57.1, 56.9, 41.8, 41.6, 39.7, 39.5, 35.6, 35.5, 31.0, 14.5, 14.3; HRMS-ES $[M + NH_4]^+$ calcd for $C_{10}H_{18}ClN_2O_5$, 281.0904; found, 281.0893.

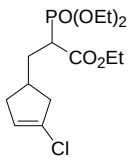


3-(3-Chloro-4-*tert*-butyldimethylsilyloxyiminocyclopentyl)-2-nitropropionic Acid Ethyl Ester (18e). To a solution of α-chloroketone **17e** (12.0 mg, 0.046 mmol) in dichloromethane (2 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (8.2 mg, 0.055 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 22 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (15% ethyl acetate/hexanes) to afford the α-chloroketoxime **18e** as a colorless oil (12.4 mg, 70%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 5.05-4.94 (m, 1H), 4.85-4.61 (m, 1H), 4.23-4.11 (m, 2H), 2.82-2.53 (m, 1H), 2.36-2.23 (m, 2H), 2.15-2.00 (m, 2H), 1.96-1.85 (m, 1H), 1.66-1.56 (m, 1H), 1.15 (t, *J* = 7.1 Hz, 3H), 0.82-0.66 (m, 9H), 0.01-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 166.2, 164.5, 87.4, 87.1, 63.7, 58.8, 58.6, 51.1, 42.5, 42.4, 42.0, 35.5, 35.4, 35.2, 34.7, 32.9, 32.4, 32.3, 32.2, 32.1, 26.6, 26.3, 26.3, 18.5, 14.3, -4.8; HRMS-ES $[M + H]^+$ calcd for $C_{16}H_{30}ClN_2O_5Si$, 393.1613; found, 393.1614.



4-Allyl-6-chloro-2-(diethoxyphosphoryl)-hept-6-enoic Acid Ethyl Ester (15f). To a stirred suspension of sodium hydride (60% dispersion in mineral oil, 50 mg, 1.25 mmol) in DMF (2 mL) at 0 °C was dropwise added a solution of diethoxyphosphoryl acetic acid ethyl ester (0.26 mL, 1.25

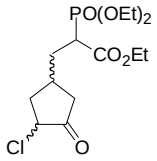
mmol) in DMF (2 mL). After stirring for 1 h at rt, reaction mixture was re-cooled to 0 °C and a solution of iodide **14** (405 mg, 1.5 mmol) in DMF (1 mL) was added. The resulting mixture was then heated at 55 °C for 13 h. Saturated aqueous NH_4Cl and ethyl acetate were added. The organic layer was separated and the aqueous layer was extracted with ethyl acetate. The combined organic layer was washed with water and brine. The organic layer was dried over $MgSO_4$ and the solvent was removed under reduced pressure. The residue was purified by flash chromatography (50% ethyl acetate/hexanes) to afford the diene **15f** as a colorless oil (236 mg, 52%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 5.68-5.53 (m, 1H), 5.07 (d, *J* = 16.0 Hz, 2H), 4.97-4.82 (m, 2H), 4.35-3.80 (m, 6H), 3.04-2.90 (m, 1H), 2.29-1.56 (m, 7H), 1.23-1.11 (m, 9H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 169.4, 169.4, 169.2, 169.1, 141.2, 141.1, 135.6, 135.0, 118.0, 117.7, 114.6, 114.4, 63.1, 63.0, 62.9, 61.8, 61.7, 44.7, 44.6, 43.8, 43.1, 42.9, 42.9, 37.7, 36.1, 34.2, 34.0, 33.8, 33.6, 30.7, 30.6, 30.2, 30.1, 16.7, 16.6, 14.4; HRMS-ES $[M+H]^+$ calcd for $C_{16}H_{29}ClO_5P$, 367.1441; found, 367.1431.



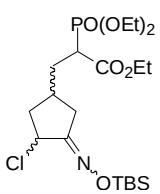
3-(3-Chlorocyclopent-3-enyl)-2-(diethoxyphosphoryl)-propionic Acid Ethyl Ester (16f). A flame dried 250 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15f** (197 mg, 0.54 mmol) and toluene (120 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (46 mg, 0.054 mmol) in 2 mL of toluene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 85 °C for 20 h. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (50% ethyl acetate/hexanes) to afford the vinyl chloride **16f** as a yellow oil (100 mg,

55%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 5.64-5.55 (m, 1H), 4.23-4.07 (m, 6H), 2.99-2.87 (m, 1H), 2.62-1.86 (m, 7H), 1.33-1.22 (m, 9H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 169.0, 169.0, 131.1, 130.7, 125.4, 125.0, 62.8, 62.7, 62.7, 62.6, 61.4, 45.3, 45.1, 44.8, 43.8, 43.5, 43.4, 43.3, 43.2, 42.5, 37.6, 36.7, 36.2, 36.0, 33.1, 33.0, 33.0, 32.9, 16.3, 16.3, 16.2, 16.2, 14.0; HRMS-ES $[M+H]^+$ calcd for $C_{14}H_{25}ClO_5P$, 339.1128; found, 339.1128.

3-(3-Chloro-4-oxocyclopentyl)-2-(diethoxyphosphoryl)-propionic Acid Ethyl Ester (17f). To a solution of vinyl chloride **16f** (70 mg, 0.21 mmol), acetone (3.5 mL) and glacial acetic acid (1.4 mL) at 0 °C was added dropwise sodium hypochlorite (0.19 mL of 10% solution, 0.21 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over Na_2SO_4. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (75% ethyl acetate/hexanes) affording the α-chloroketone **17f** as a colorless oil (31 mg, 43%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 4.60-4.24 (m, 7H), 3.23-3.15 (m, 1H), 2.88-2.02 (m, 7H), 1.58-1.44 (m, 9H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.3, 209.0, 208.9, 208.6, 168.8, 168.8, 168.7, 168.7, 63.0, 62.9, 62.8, 61.7, 57.2, 56.9, 45.0, 43.2, 41.9, 41.5, 39.4, 39.0, 32.8, 32.6, 32.6, 32.4, 32.0, 16.4, 16.3, 16.3, 16.2, 14.0; HRMS-ES $[M+H]^+$ calcd for $C_{14}H_{25}ClO_6P$, 355.1077; found, 355.1072.

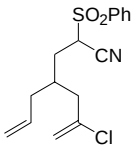


3-(3-Chloro-4-*tert*-butyldimethylsilyloxyiminocyclopentyl)-2-(diethoxyphosphoryl)-propionic Acid Ethyl Ester (18f). To a solution of α-chloroketone **17f** (25.0 mg, 0.07 mmol) in dichloromethane (3 mL) were



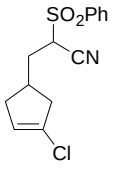
added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (24.0 mg, 0.14 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 21 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (75% ethyl acetate/hexanes) to afford the α-chloroketoxime **18f** as a colorless oil (25.5 mg, 75%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 5.10-4.58 (m, 1H), 4.31-4.09 (m, 6H), 3.04-2.79 (m, 2H), 2.52-2.49 (m, 1H), 2.27-2.12 (m, 2H), 2.06-1.84 (m, 2H), 1.74-1.63 (m, 1H), 1.35-1.24 (m, 9H), 0.97-0.84 (m, 9H), 0.17-0.13 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 169.1, 168.9, 167.1, 166.7, 63.0, 62.8, 62.7, 61.6, 58.9, 58.6, 45.6, 43.8, 42.3, 42.0, 34.3, 34.1, 32.1, 31.8, 26.0, 25.9, 25.9, 18.1, 18.0, 16.4, 16.3, 14.1, -5.2, -5.2; HRMS-ES $[M + H]^+$ calcd for $C_{20}H_{40}ClNO_6PSi$, 484.2051; found, 484.2039.

4-Allyl-2-benzenesulfonyl-6-chlorohept-6-enenitrile (15g). To a stirred suspension of sodium hydride (60% dispersion in mineral oil, 43 mg, 1.07 mmol) in THF (2 mL) at 50 °C was dropwise added a solution of benzenesulfonyl acetonitrile (157 mg, 0.85 mmol) in THF (2 mL). After stirring the mixture for 15 min at 50 °C, a solution of iodide **14** (252 mg, 0.93 mmol) in THF (1 mL) was added in one portion. The resulting mixture was then heated at reflux for 19 h. Saturated aqueous NH_4Cl and ethyl acetate were added. The organic layer was separated and the aqueous layer was extracted with ethyl acetate. The combined organic layer was washed with water and brine. The organic layer was dried over Na_2SO_4 and the solvent was removed under reduced pressure. The residue was purified by flash chromatography (20% ethyl acetate/hexanes) to afford the diene **15g** as a colorless oil (214 mg, 78%). ^{1}H



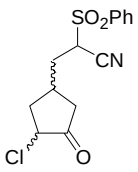
NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.83 (d, *J* = 7.5 Hz, 2H), 7.61 (t, *J* = 7.4 Hz, 1H), 7.48 (t, *J* = 7.7 Hz, 2H), 5.61-5.46 (m, 1H), 5.08-4.84 (m, 4H), 3.97-3.91 (m, 1H), 2.32-1.73 (m, 7H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 140.2, 140.1, 135.8, 134.7, 134.3, 130.0, 130.0, 130.0, 119.2, 118.9, 115.8, 115.5, 114.5, 114.2, 56.1, 43.8, 43.3, 38.1, 36.6, 33.2, 33.0, 30.4, 30.0; HRMS-ES $[M + NH_4]^+$ calcd for $C_{16}H_{22}ClN_2O_2S$, 341.1091; found, 341.1089.

2-Benzenesulfonyl-3-(3-chlorocyclopent-3-enyl)-propionitrile (16g).



A flame dried 250 mL two-necked flask equipped with a magnetic stirring bar and a condenser was charged with diene **15g** (214 mg, 0.66 mmol) and toluene (150 mL). The solution was deaerated by bubbling argon through the mixture for 2 h. The second-generation Grubbs catalyst (112 mg, 0.132 mmol) in 2 mL of toluene was added and the argon bubbling was continued for an additional 30 min. The mixture was heated and stirred at 95 °C for 19 h. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (20% ethyl acetate/hexanes) to afford the vinyl chloride **16g** as a pale yellow oil (74 mg, 38%). ^1H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.95 (d, *J* = 7.7 Hz, 2H), 7.72 (t, *J* = 7.4 Hz, 1H), 7.59 (t, *J* = 7.7 Hz, 2H), 5.64-5.52 (m, 1H), 3.90-3.79 (m, 1H), 2.74-2.49 (m, 3H), 2.28-1.89 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 135.8, 135.8, 135.7, 131.6, 130.9, 130.1, 130.1, 130.0, 125.7, 125.0, 114.3, 56.8, 56.6, 43.7, 42.8, 38.1, 37.1, 35.2, 35.1, 32.9, 32.9; HRMS-ES $[M + NH_4]^+$ calcd for $C_{14}H_{18}ClN_2O_2S$, 313.0778; found, 313.0776.

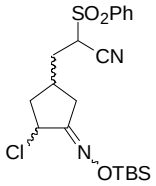
2-Benzenesulfonyl-3-(3-chloro-4-oxocyclopentyl)-propionitrile (17g).



To a solution of vinyl chloride **16g** (27.8 mg, 0.094 mmol), acetone (1.8 mL) and glacial acetic acid (0.7 mL) at 0 °C was added dropwise sodium

hypochlorite (0.086 mL of 10% solution, 0.094 mmol) via syringe. The reaction mixture was stirred at 0 °C for 30 min and quenched by addition of saturated aqueous $NaHCO_3$ solution. The mixture was then extracted with dichloromethane. The combined organic layers were washed with brine and dried over $MgSO_4$. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (25% ethyl acetate/hexanes) affording the α-chloroketone **17g** as a colorless oil (16.4 mg, 56%). ^{1}H NMR (300 MHz, $CDCl_3$, diastereomer mixture) δ 7.96 (d, *J* = 7.2 Hz, 2H), 7.74 (t, *J* = 6.8 Hz, 1H), 7.61 (t, *J* = 7.6 Hz, 2H), 4.10 (d, *J* = 5.3 Hz, 1H), 3.94-3.81 (m, 1H), 2.80-2.62 (m, 2H), 2.40-2.20 (m, 2H), 2.17-1.81 (m, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.0, 207.7, 136.0, 135.5, 135.5, 130.2, 130.1, 128.3, 114.1, 58.5, 57.1, 56.7, 56.6, 56.2, 55.9, 42.0, 41.9, 41.4, 41.3, 39.9, 39.8, 39.4, 39.2, 32.5, 32.4, 32.0, 31.9, 31.9, 31.1, 31.0; HRMS-ES $[M + NH_4]^+$ calcd for $C_{14}H_{18}ClN_2O_3S$, 329.0727; found, 329.0728.

2-Benzenesulfonyl-3-(3-chloro-4-*tert*-butyldimethylsilyloxyiminocyclopentyl)-propionitrile (18g). To a solution of α-chloroketone **17g** (34.0 mg, 0.11 mmol) in dichloromethane (3 mL) were added *O*-(*tert*-butyldimethylsilyl)-hydroxylamine (34.0 mg, 0.22 mmol), 4Å molecular sieves (crushed), and a catalytic amount of PPTS. The mixture was stirred at rt for 21 h and then filtered through a pad of Celite. The solvent was removed under reduced pressure and the residue was purified by flash chromatography (20% ethyl acetate/hexanes) to afford the α-chloroketoxime **18g** as a colorless oil (20.0 mg, 42%). ^{1}H NMR (300 MHz, $CDCl_3$, complex mixture of diastereomers including oxime geometric isomers) δ 7.86 (d, *J* = 7.6 Hz, 2H), 7.64 (t, *J* = 7.4 Hz, 1H), 7.51 (t, *J* = 7.6 Hz, 2H), 4.95-4.50 (m, 1H), 3.82-3.62 (m, 1H), 2.88-2.38 (m, 2H), 2.24-1.82 (m, 4H), 1.71-



1.57 (m, 1H), 0.77-0.69 (m, 9H), 0.01-0.00 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 166.1, 165.7, 164.9, 164.6, 135.9, 135.6, 130.1, 130.1, 130.1, 114.2, 58.7, 58.4, 56.9, 56.9, 56.6, 42.8, 42.2, 34.6, 33.8, 33.4, 33.4, 32.5, 31.9, 31.8, 26.4, 26.3, 26.3, 18.5, 18.4, -4.8, -4.8; HRMS-ES $[M + H]^+$ calcd for $C_{20}H_{30}ClN_2O_3SSi$, 441.1435; found, 441.1452.

Figure 1: Ortep Diagram of X-ray Diffraction Structure of 22b.

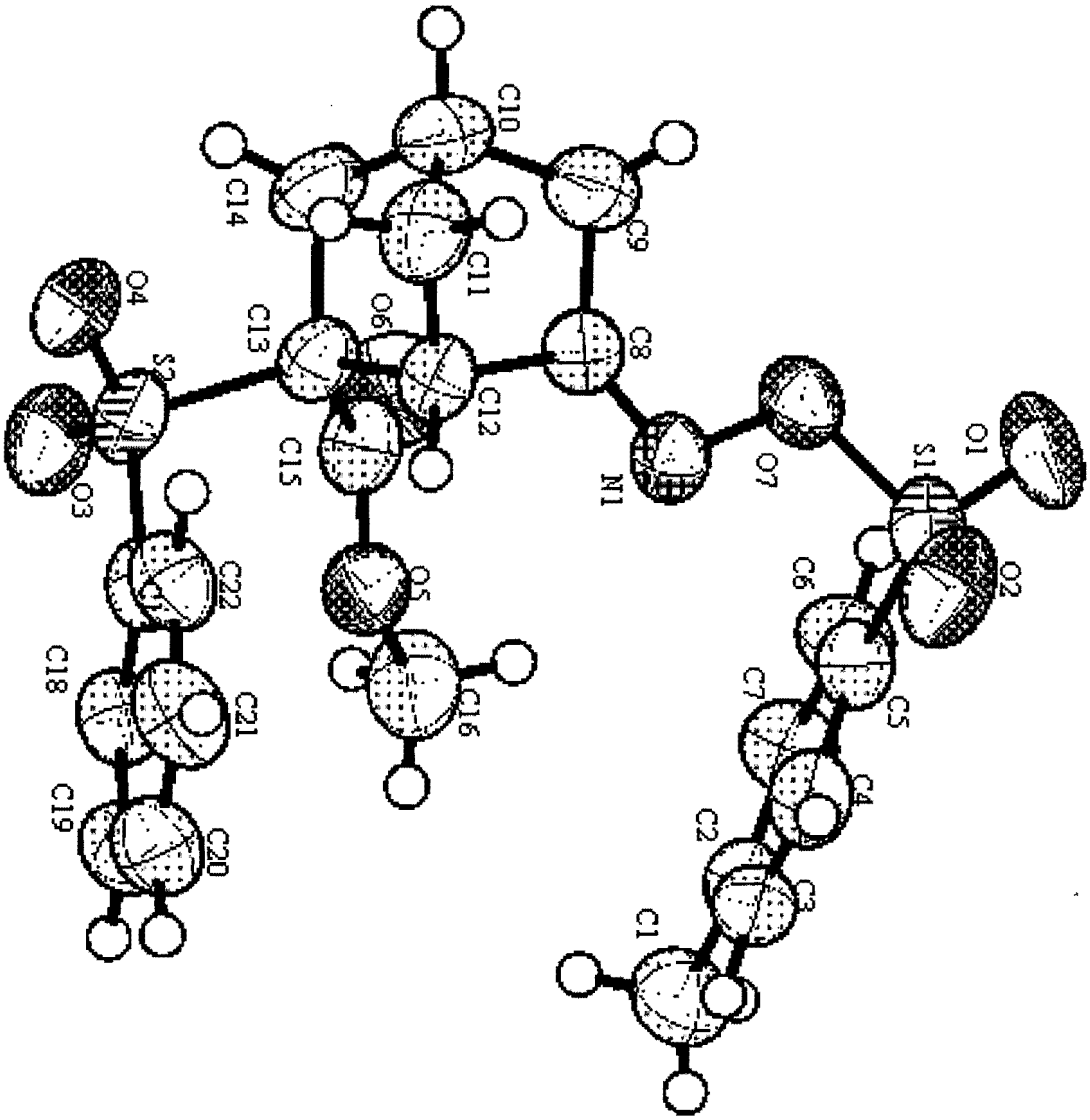


Figure 2: Ortep Diagram of X-ray Diffraction Structure of 39.

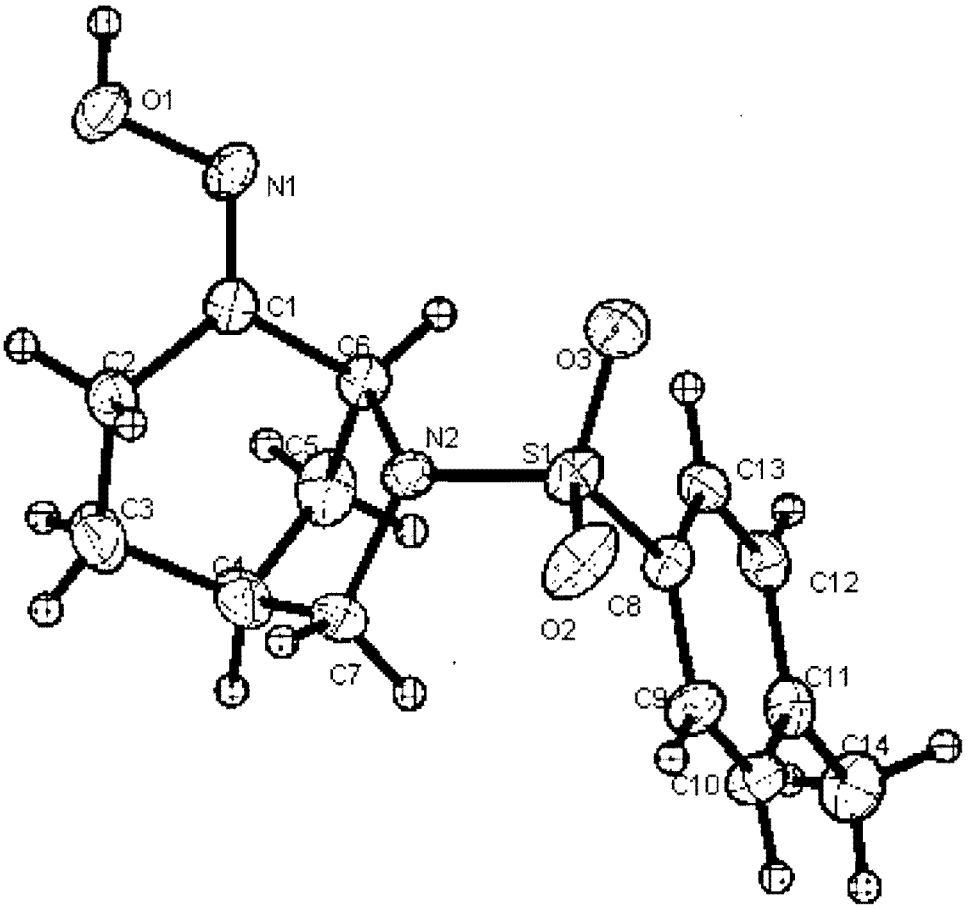
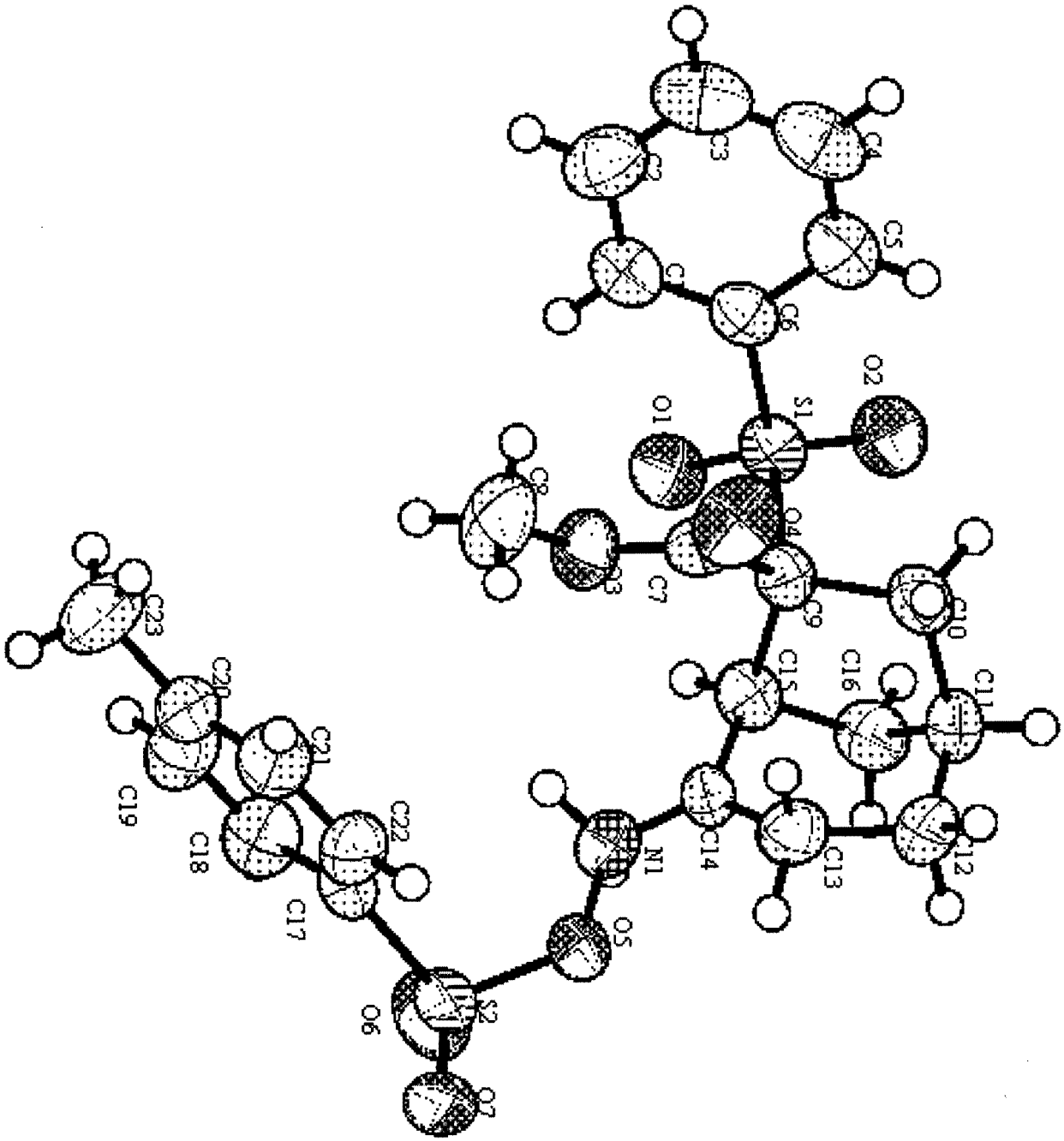
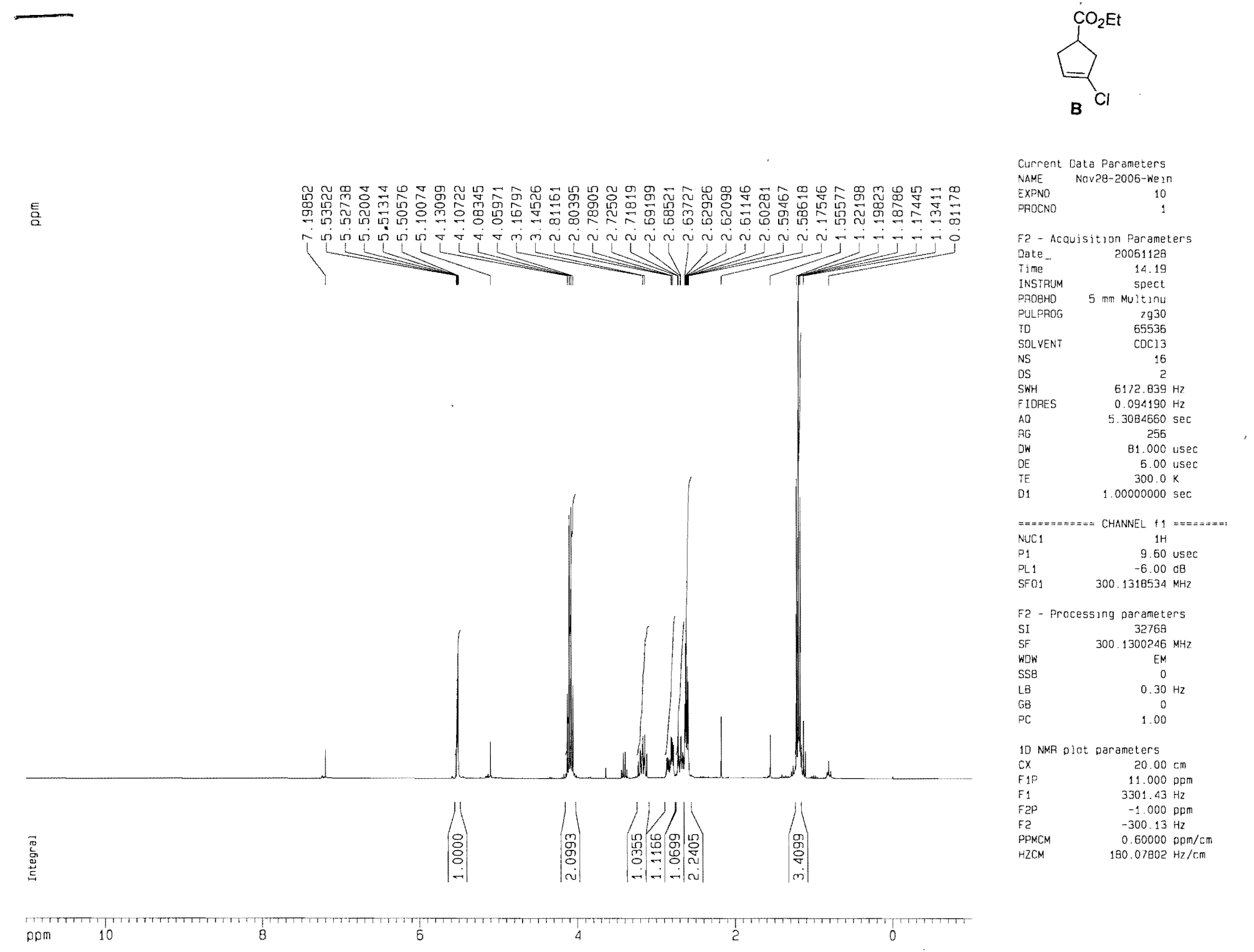


Figure 3: Ortep Diagram of X-ray Diffraction Structure of 33b.





Current Data Parameters

NAME	Nov28-2006-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20061128
Time	14.19
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	256
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

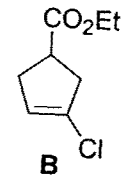
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

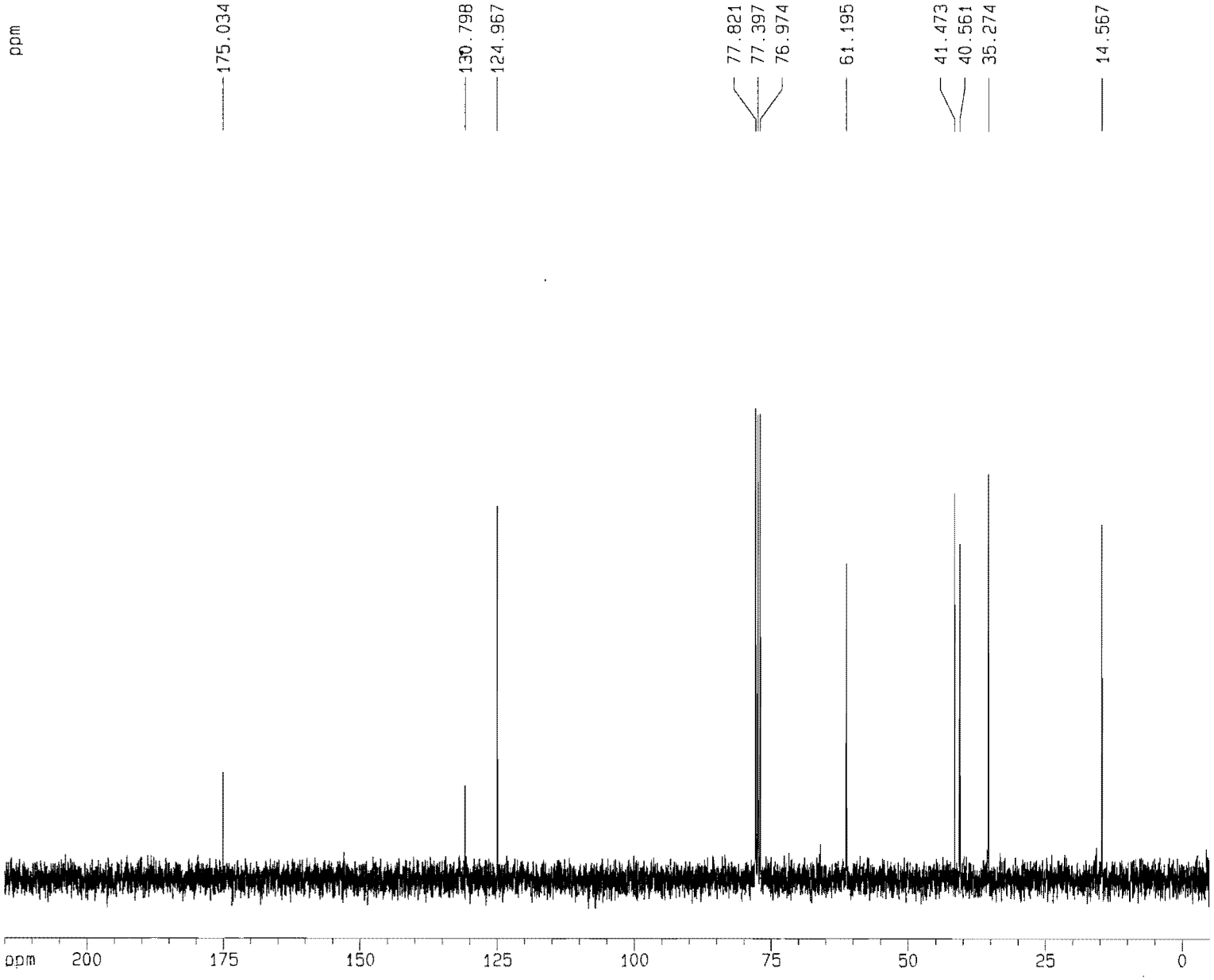
SI	32768
SF	300.1300246 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

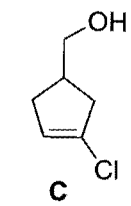
CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm



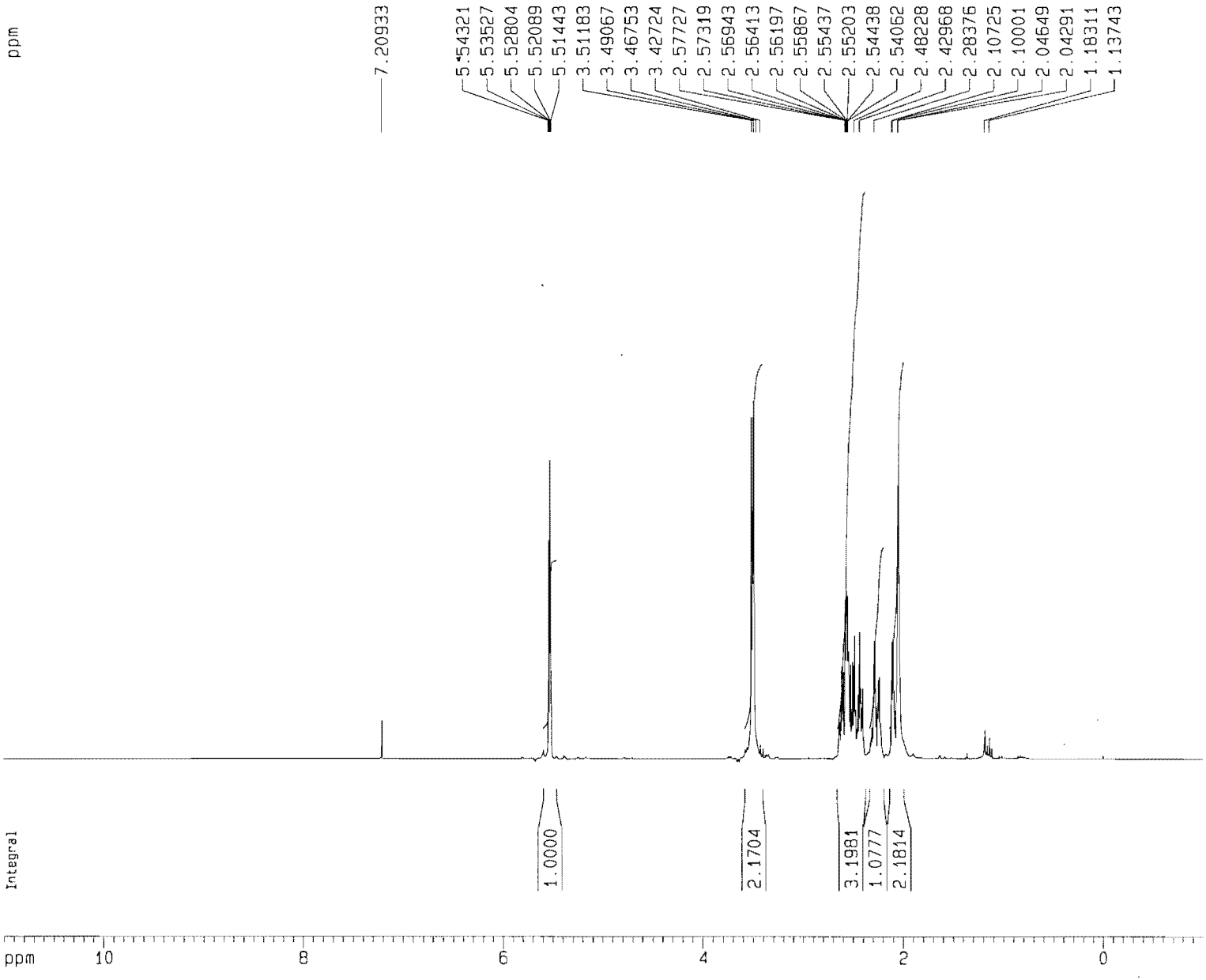
B




```
Current Data Parameters
NAME      Nov28-2006-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061128
Time                14.25
INSTRUM             spect
PROBHD     5 mm Multinu
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    90
DS                     4
SWH           18832.393 Hz
FIDRES         0.287360 Hz
AQ             1.7400308 sec
RG                 16384
DW               26.550 usec
DE                6.00 usec
TE               300.0 K
D1             2.00000000 sec
d11            0.03000000 sec
d12            0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1               11.80 usec
PL1               0.00 dB
SFO1         75.4760200 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          110.00 usec
PL2               0.00 dB
PL12             17.50 dB
PL13             17.50 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF           75.4677190 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P              215.000 ppm
F1               16225.56 Hz
F2P               -5.000 ppm
F2               -377.34 Hz
PPMCM           11.00000 ppm/cm
HZCM          B30.14490 Hz/cm
```



c



Current Data Parameters

NAME	Dec03-2006-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20061203
Time	11.45
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	181
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

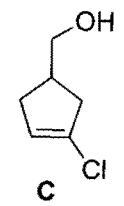
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

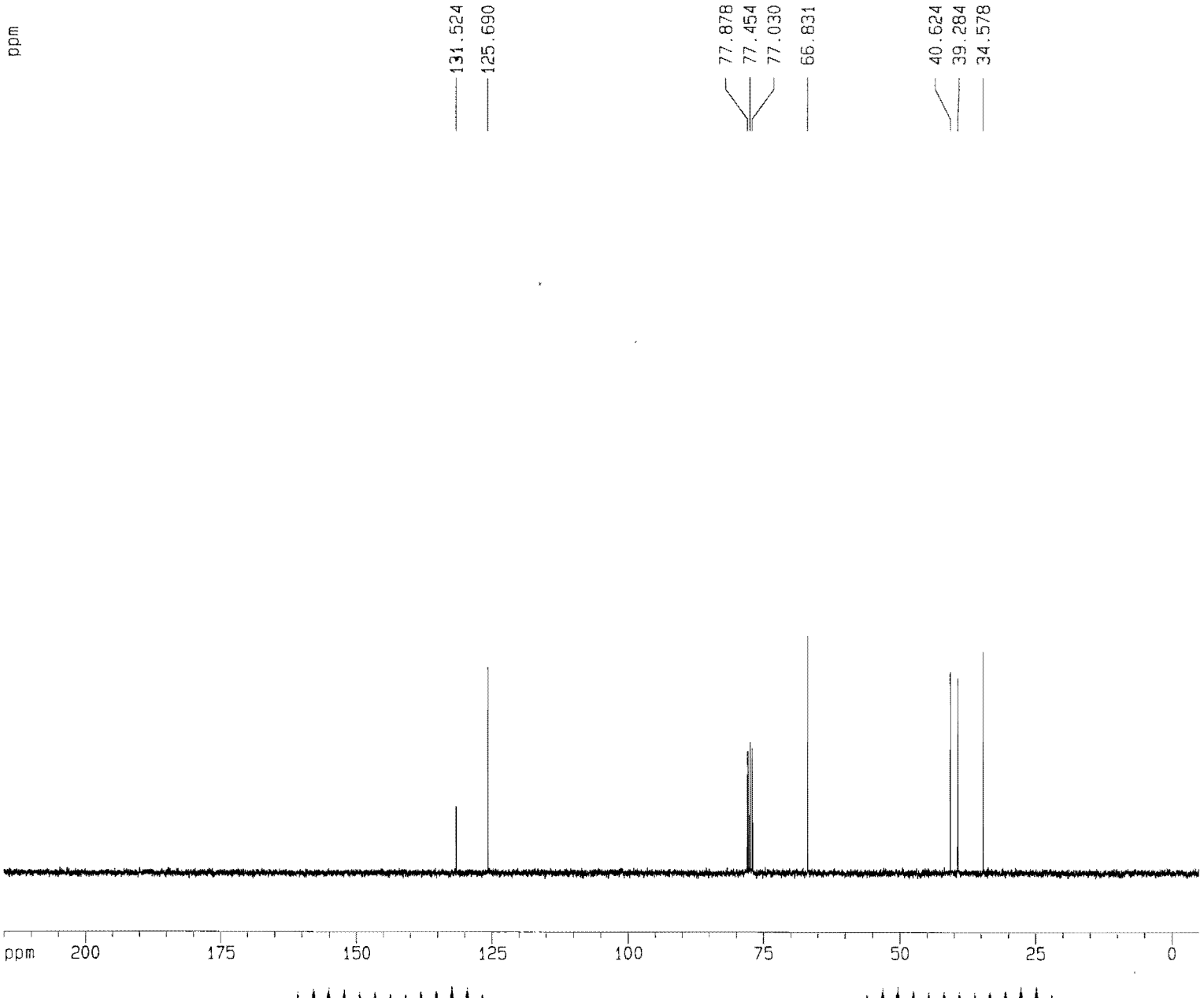
SI	32768
SF	300.1300215 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm



c



Current Data Parameters
NAME Dec03-2006-Wein
EXPNO 11
PROCNO 1

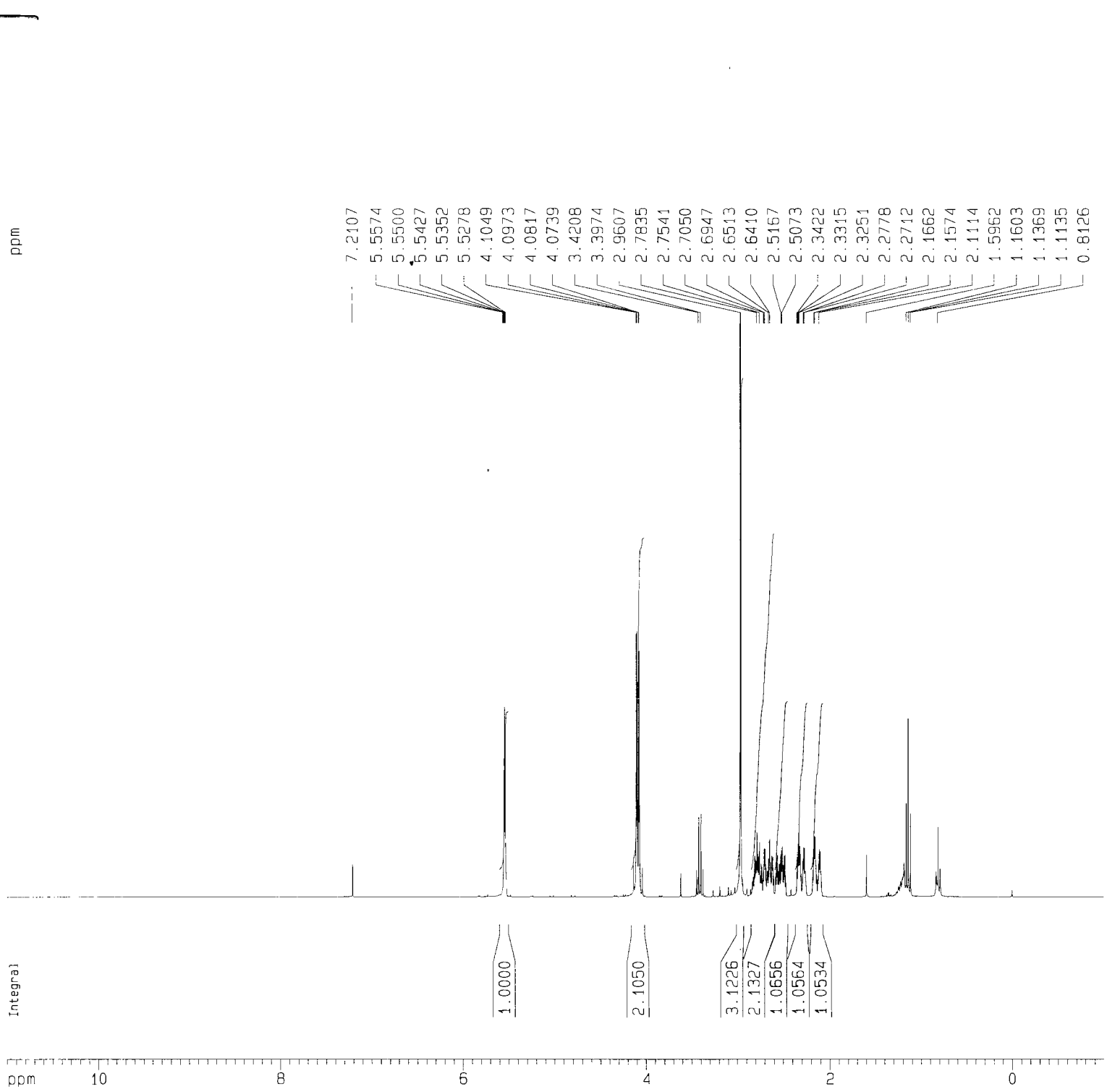
F2 - Acquisition Parameters
Date_ 20061203
Time 11.55
INSTRUM spect
PROBHD 5 mm Multinu
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 131
DS 4
SWH 18832.393 Hz
FIDRES 0.287360 Hz
AQ 1.7400308 sec
RG 13004
DW 26.550 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
d12 0.00002000 sec

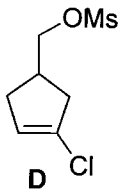
========== CHANNEL f1 ==========
NUC1 13C
P1 11.80 usec
PL1 0.00 dB
SFO1 75.4760200 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 110.00 usec
PL2 0.00 dB
PL12 17.50 dB
PL13 17.50 dB
SFO2 300.1312005 MHz

F2 - Processing parameters
SI 32768
SF 75.4677190 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16225.56 Hz
F2P -5.000 ppm
F2 -377.34 Hz
PPMCM 11.00000 ppm/cm
HZCM 830.14490 Hz/cm





D

Current Data Parameters

NAME	Dec05-2006-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20061205
Time	17.25
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5 3084660 sec
RG	128
DW	81 000 usec
DE	6.00 usec
TE	300.0 K
D1	1 00000000 sec

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

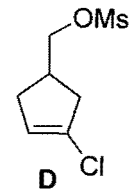
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

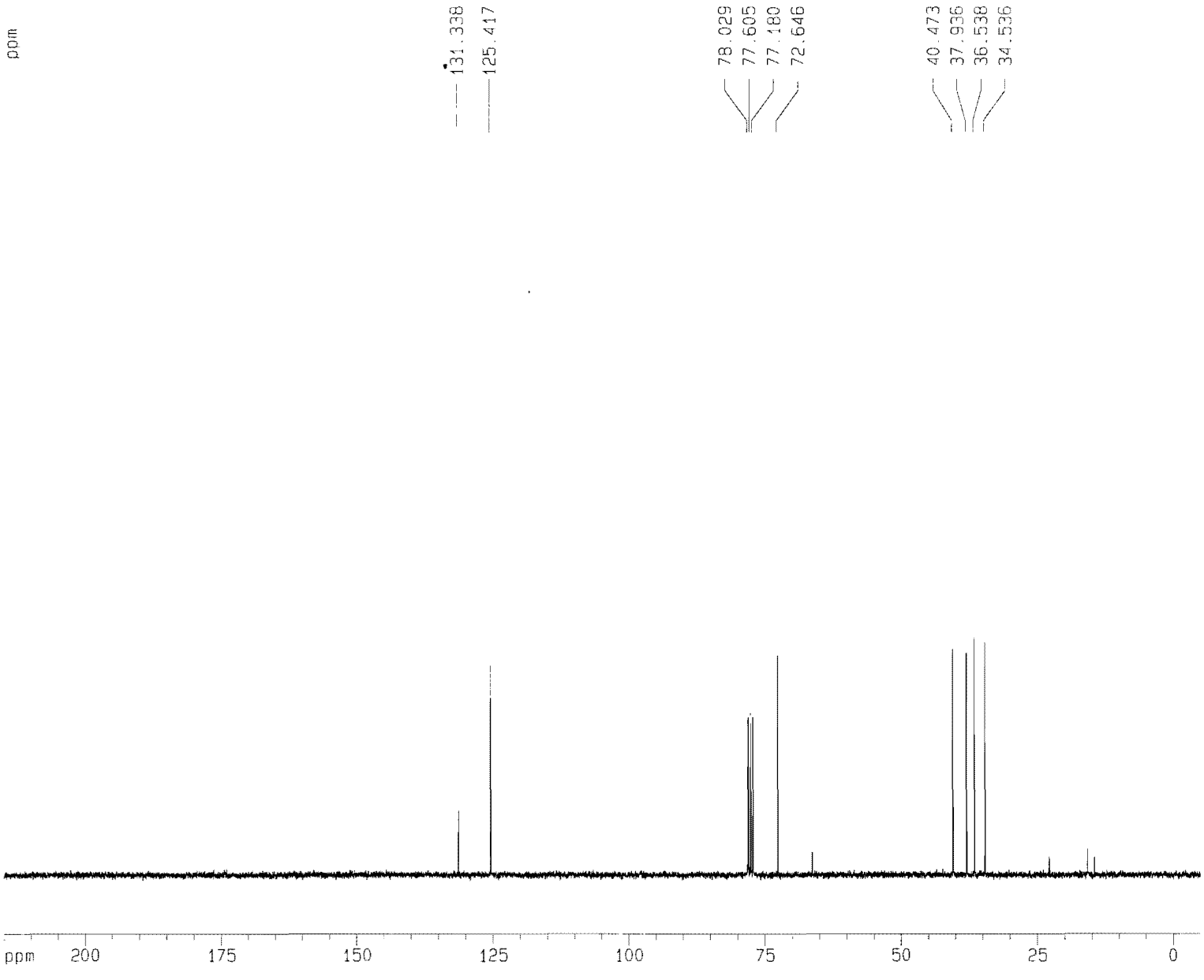
SI	32768
SF	299.8700247 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

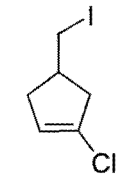
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



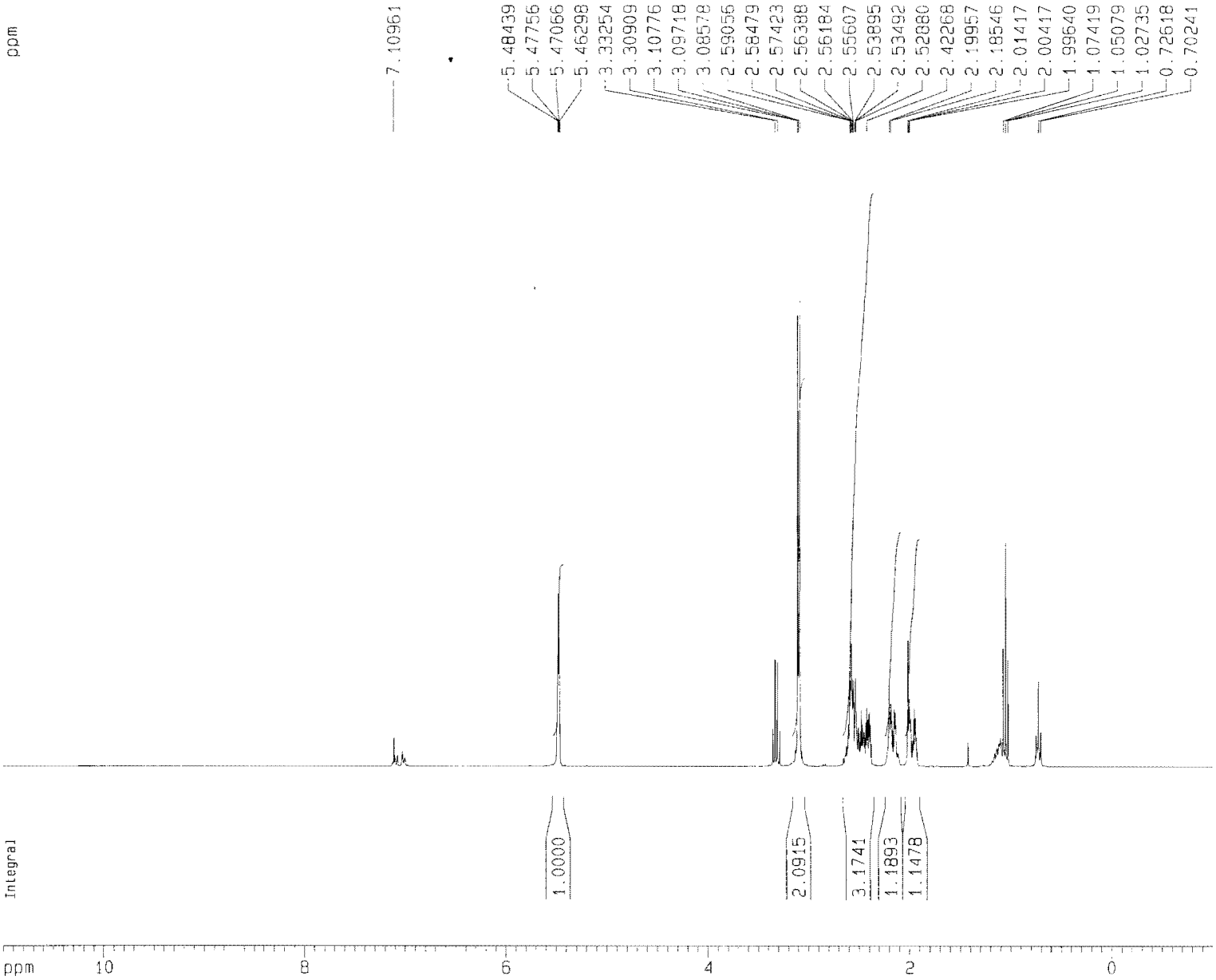
D



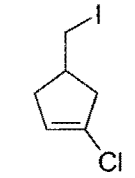

```
Current Data Parameters
NAME      Dec05-2006-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061205
Time                17.34
INSTRUM             spect
PROBHD    5 mm CNP 1H/1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    129
DS                      4
SWH           18796.992 Hz
FIDRES         0.286819 Hz
AQ             1.7433076 sec
RG                   2048
DW              26.600 usec
DE               6.00 usec
TE              300.0 K
D1             2.00000000 sec
D11            0.03000000 sec
D12            0.00002000 sec

============ CHANNEL f1 ===========
NUC1                  13C
P1               5.40 usec
PL1              -6.00 dB
SFO1          75.4106357 MHz

============ CHANNEL f2 ===========
CPDPRG2          waltz16
NUC2                  1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                  32768
SF            75.4023326 MHz
WDW                    EM
SSB                     0
LB                1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1              16211.50 Hz
F2P              -5.000 ppm
F2                -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42572 Hz/cm
```



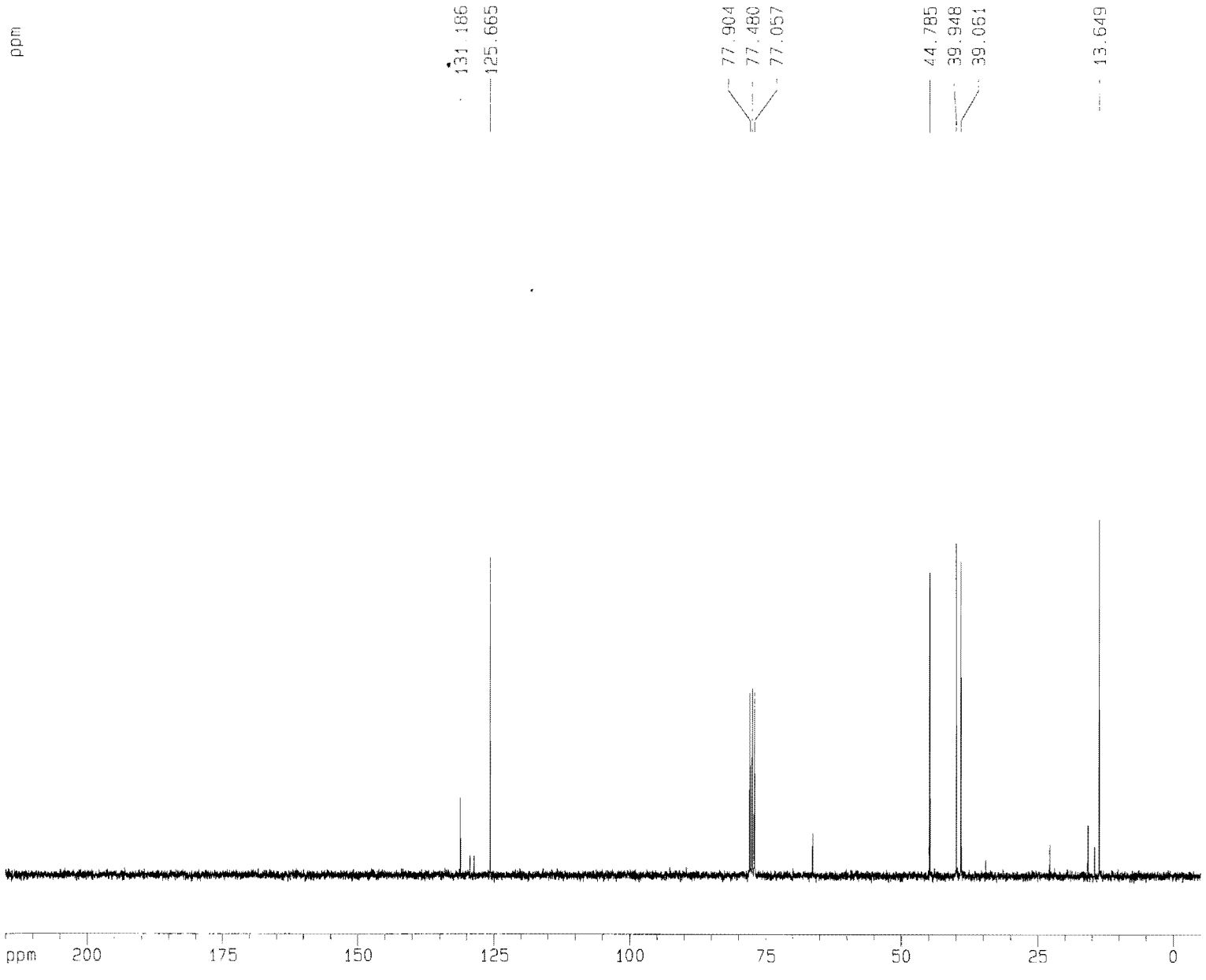
8



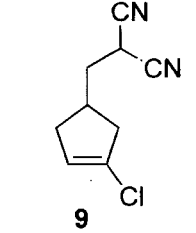

```
Current Data Parameters
NAME      Dec08-2006-Wein
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20061208
Time               12.08
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ              5.3084660 sec
RG                   128
DW                81.000 usec
DE                 6.00 usec
TE                300.0 K
D1             1.00000000 sec

============ CHANNEL f1 =========
NUC1                  1H
P1                 11.70 usec
PL1                 0.00 dB
SFO1         299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700550 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
F1P                11.000 ppm
F1               3298.57 Hz
F2P                -1.000 ppm
F2               -299.87 Hz
PPMCM           0.60000 ppm/cm
HZCM          179.92203 Hz/cm
```



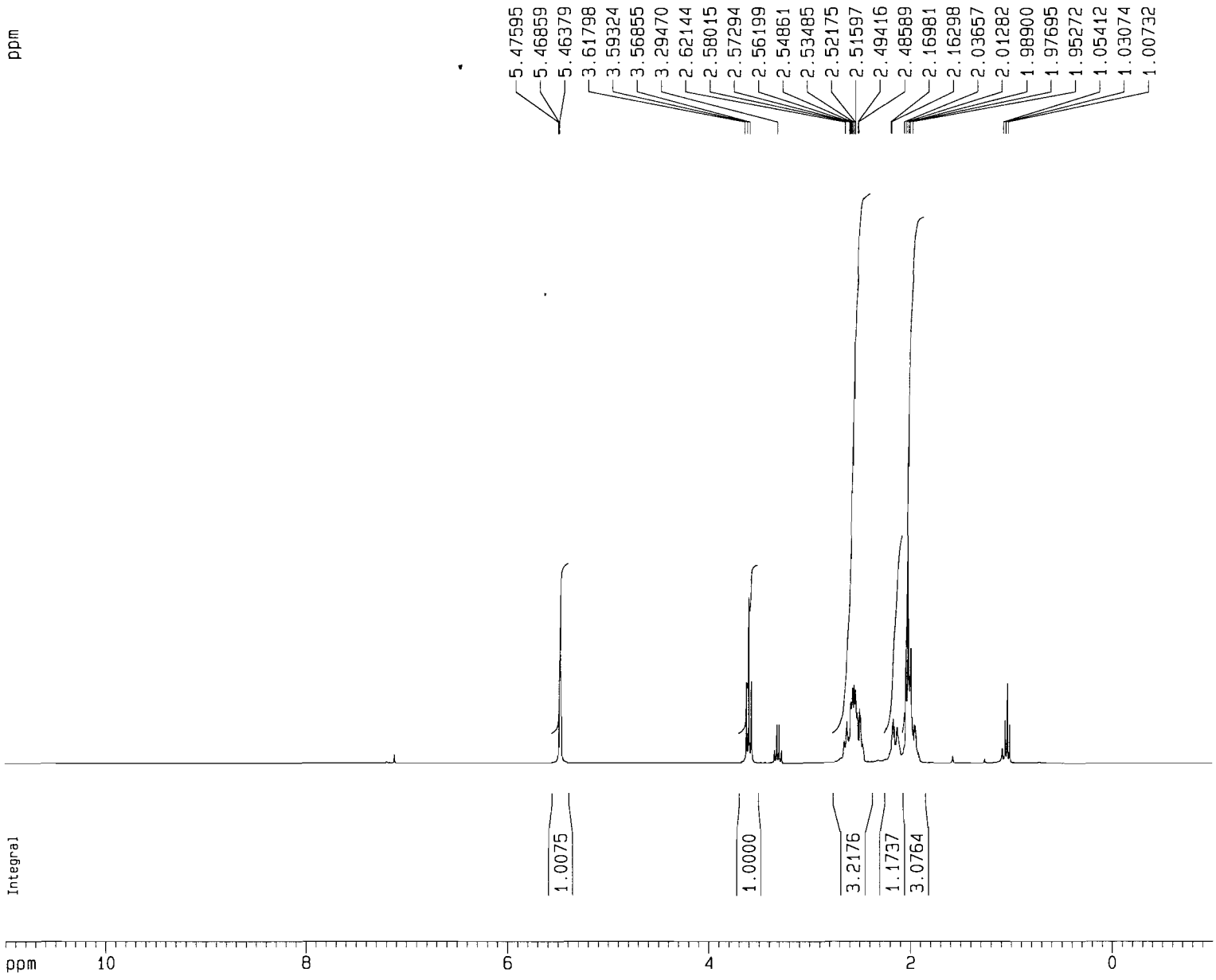
8




```
Current Data Parameters
NAME      Dec06-2006-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061206
Time              12.16
INSTRUM           spect
PROBHD    5 mm QNP 1H/1
PULPROG           zgpg30
TD                65536
SOLVENT           CDCl3
NS                  110
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 4096
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ===========
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ===========
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023410 MHz
WDW                   EM
SSB                    0
LB                1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1              16211.50 Hz
F2P               -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```



9



Current Data Parameters

NAME	Sep23-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20070923
Time	11.28
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	57
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

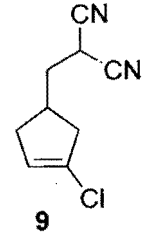
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

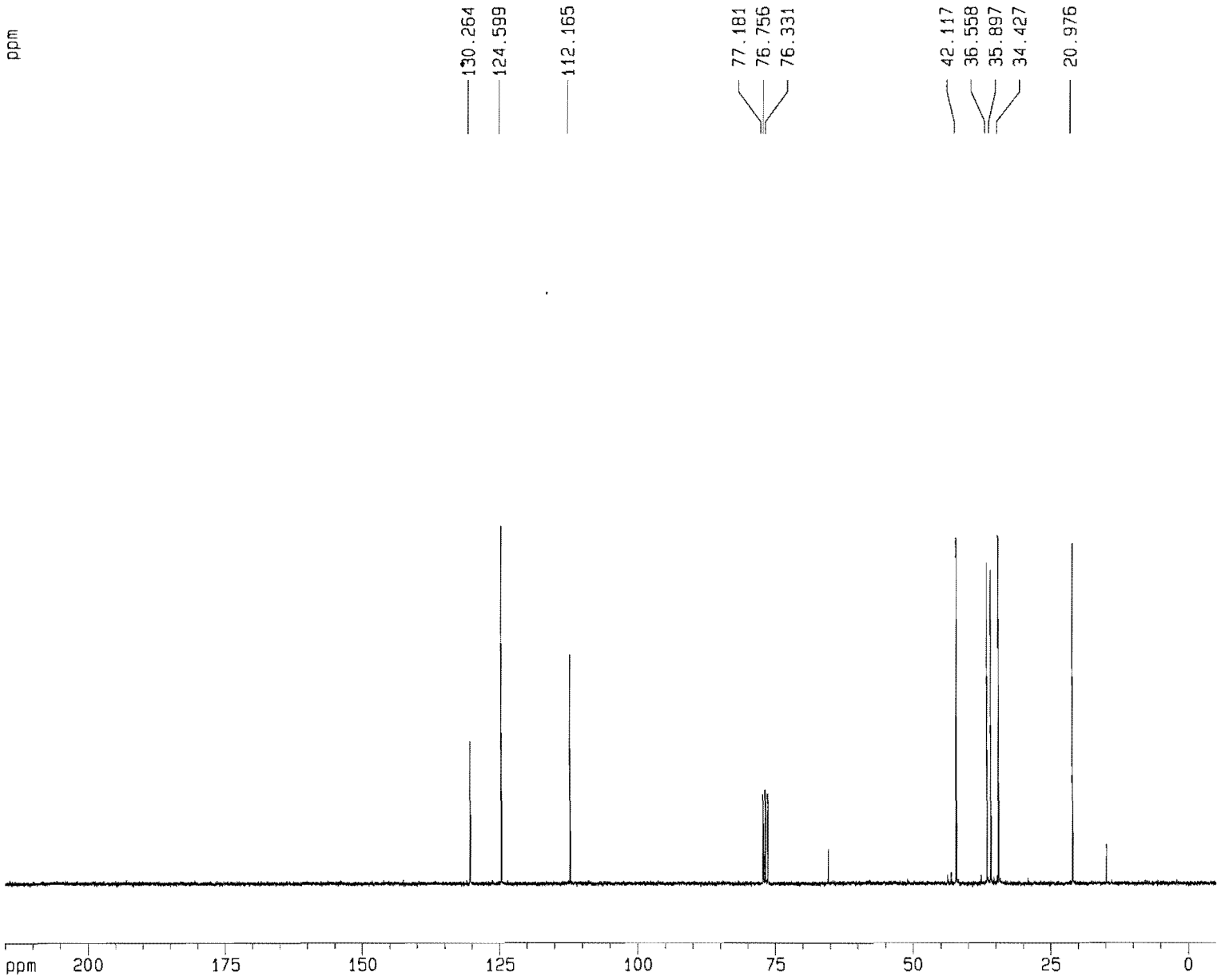
SI	32768
SF	299.8700541 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

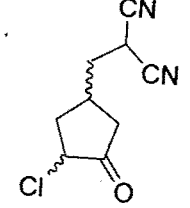
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm



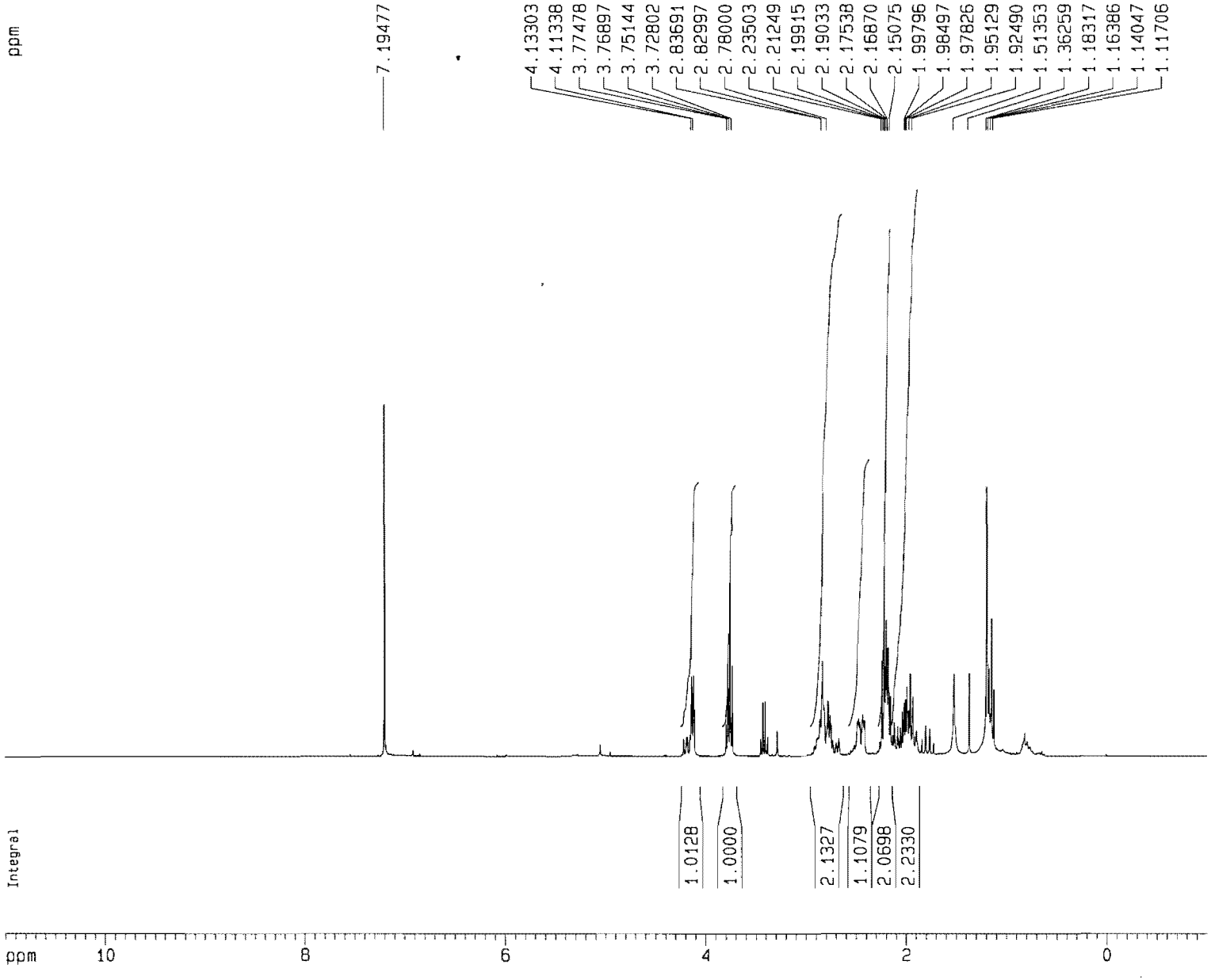
9




```
Current Data Parameters
NAME      Sep23-2007-Wein
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_           20070923
Time               11.37
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  122
OS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                1824.6
DW                26.600 usec
DE                 6.00 usec
TE                300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1          75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2                0.00 dB
PL12               20.00 dB
PL13               20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF            75.4024082 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               215.000 ppm
F1              16211.52 Hz
F2P                -5.000 ppm
F2               -377.01 Hz
PPMCM           11.00000 ppm/cm
HZCM          829.42645 Hz/cm
```



10



Current Data Parameters

NAME	Sep24-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20070924
Time	20.04
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	645.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

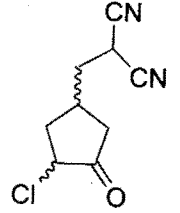
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

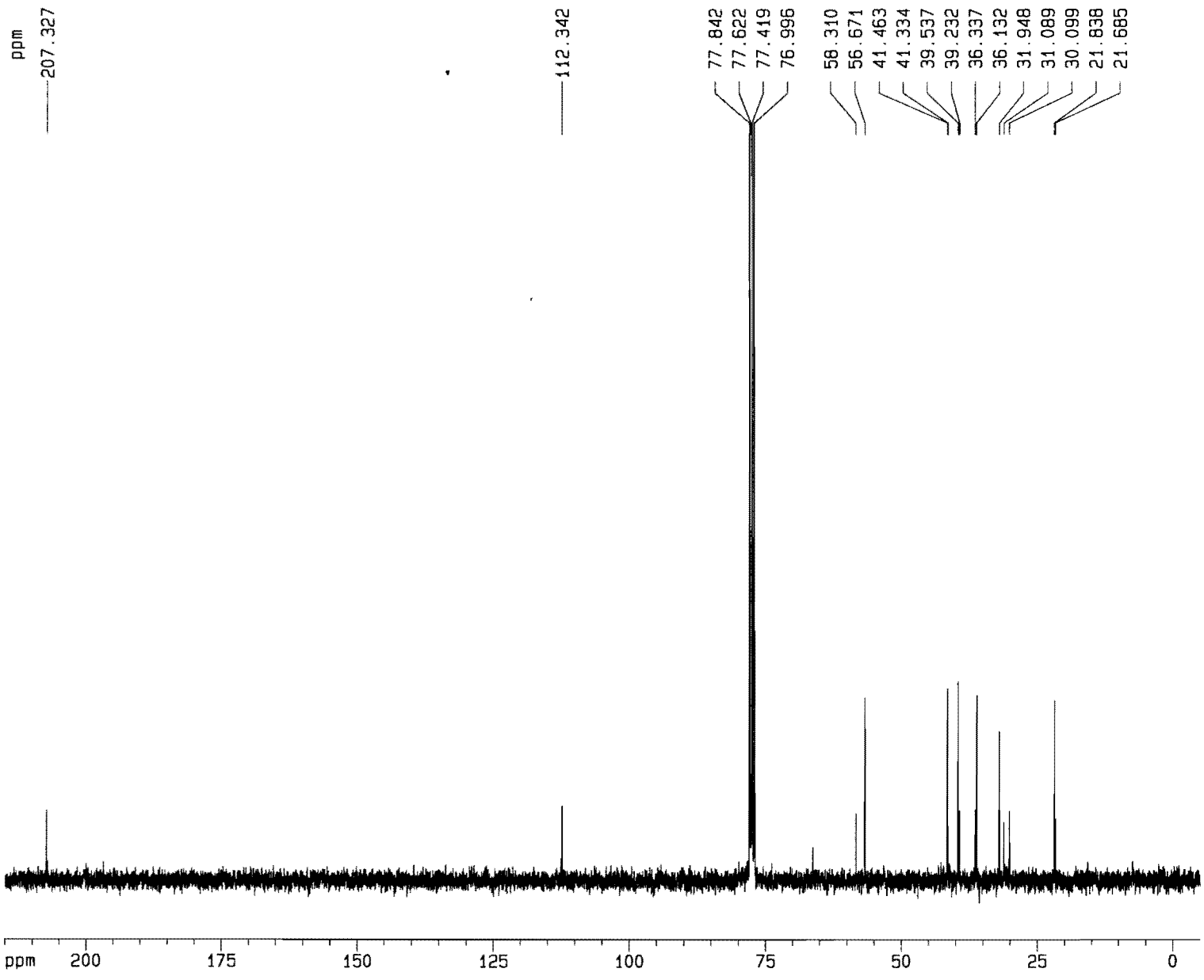
SI	32768
SF	299.8700295 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



10



Current Data Parameters
NAME Sep24-2007-Wein
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters

Date_	20070924
Time	21.08
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1745
DS	4
SWH	18832.393 Hz
FIDRES	0.287360 Hz
AQ	1.7400308 sec
RG	16384
DW	26.550 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
d11	0.03000000 sec
d12	0.00002000 sec

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

NUC1	13C
P1	11.80 usec
PL1	0.00 dB
SFO1	75.4760200 MHz

========== CHANNEL f2 ==========

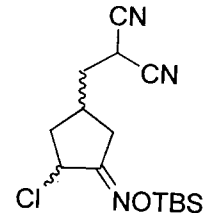
CPDPRG2	waltz16
NUC2	1H
PCPD2	110.00 usec
PL2	0.00 dB
PL12	17.50 dB
PL13	17.50 dB
SFO2	300.1312005 MHz

F2 - Processing parameters

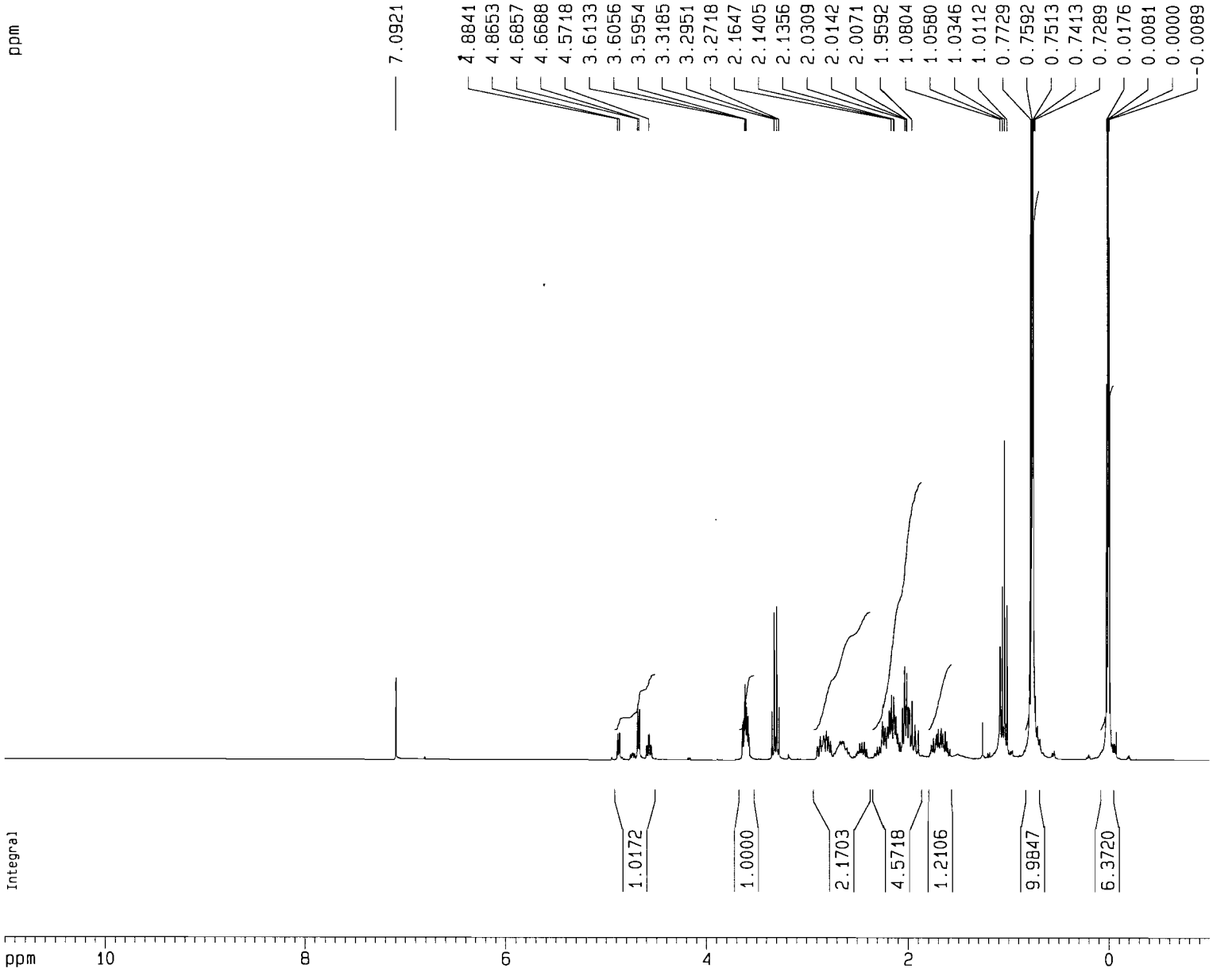
SI	32768
SF	75.4677190 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16225.56 Hz
F2P	-5.000 ppm
F2	-377.34 Hz
PPMCM	11.00000 ppm/cm
HZCM	830.14490 Hz/cm



11



Current Data Parameters

NAME	Oct03-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20071003
Time	18.25
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	101.6
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

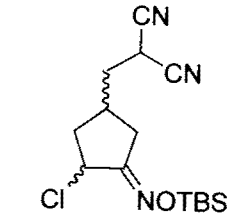
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

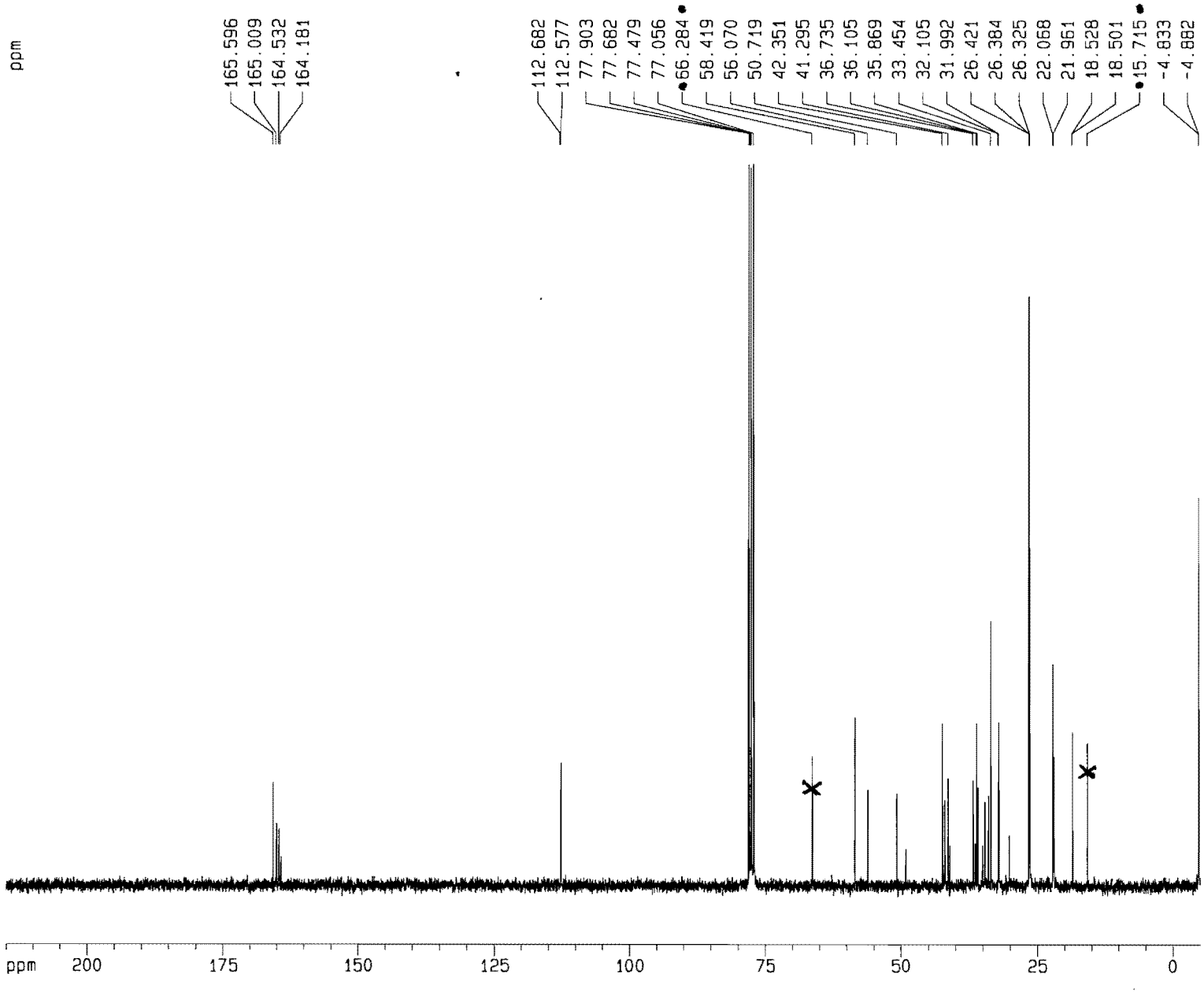
SI	32768
SF	299.8700603 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

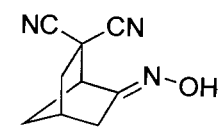
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm



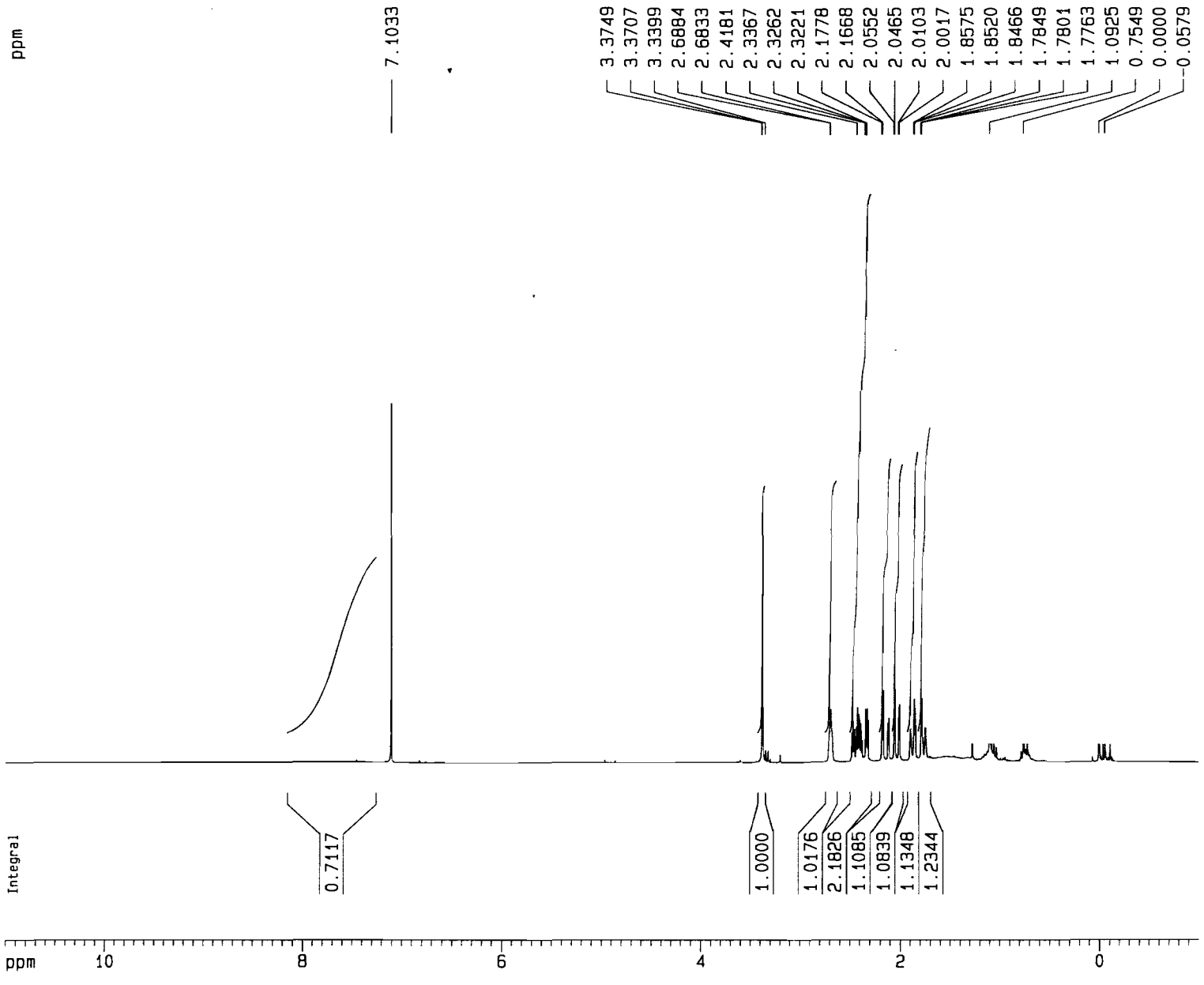
11




```
Current Data Parameters
NAME      Oct03-2007-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20071003
Time               18.49
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   770
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                  2048
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023410 MHz
WDW                   EM
SSB                    0
LB                1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1             16211.50 Hz
F2P               -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```



13



Current Data Parameters

NAME	Sep27-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20070927
Time	23.34
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	52
DS	0
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	574.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec

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

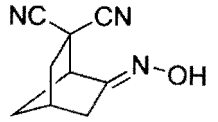
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

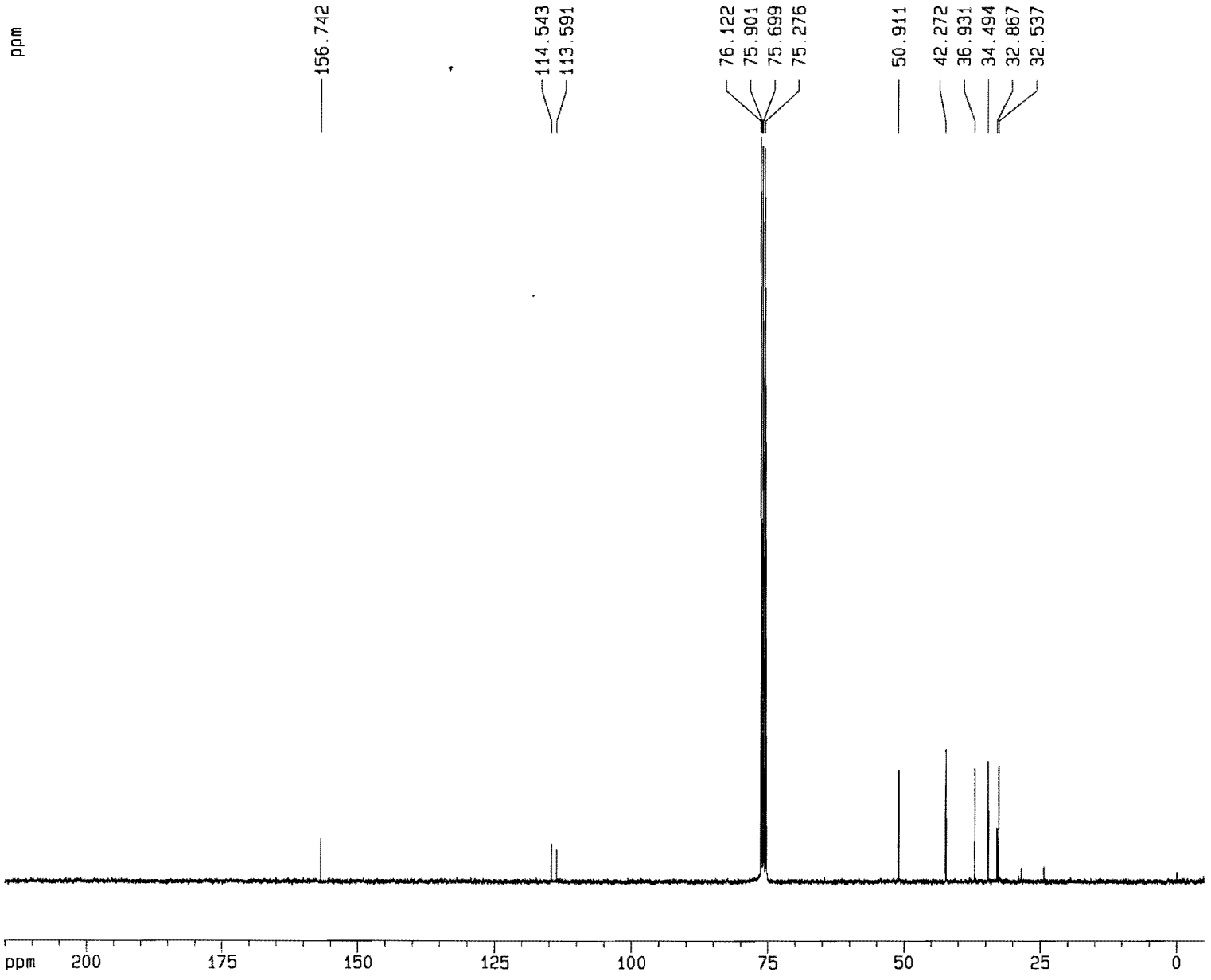
SI	32768
SF	300.1300534 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

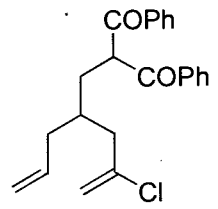
CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07803 Hz/cm



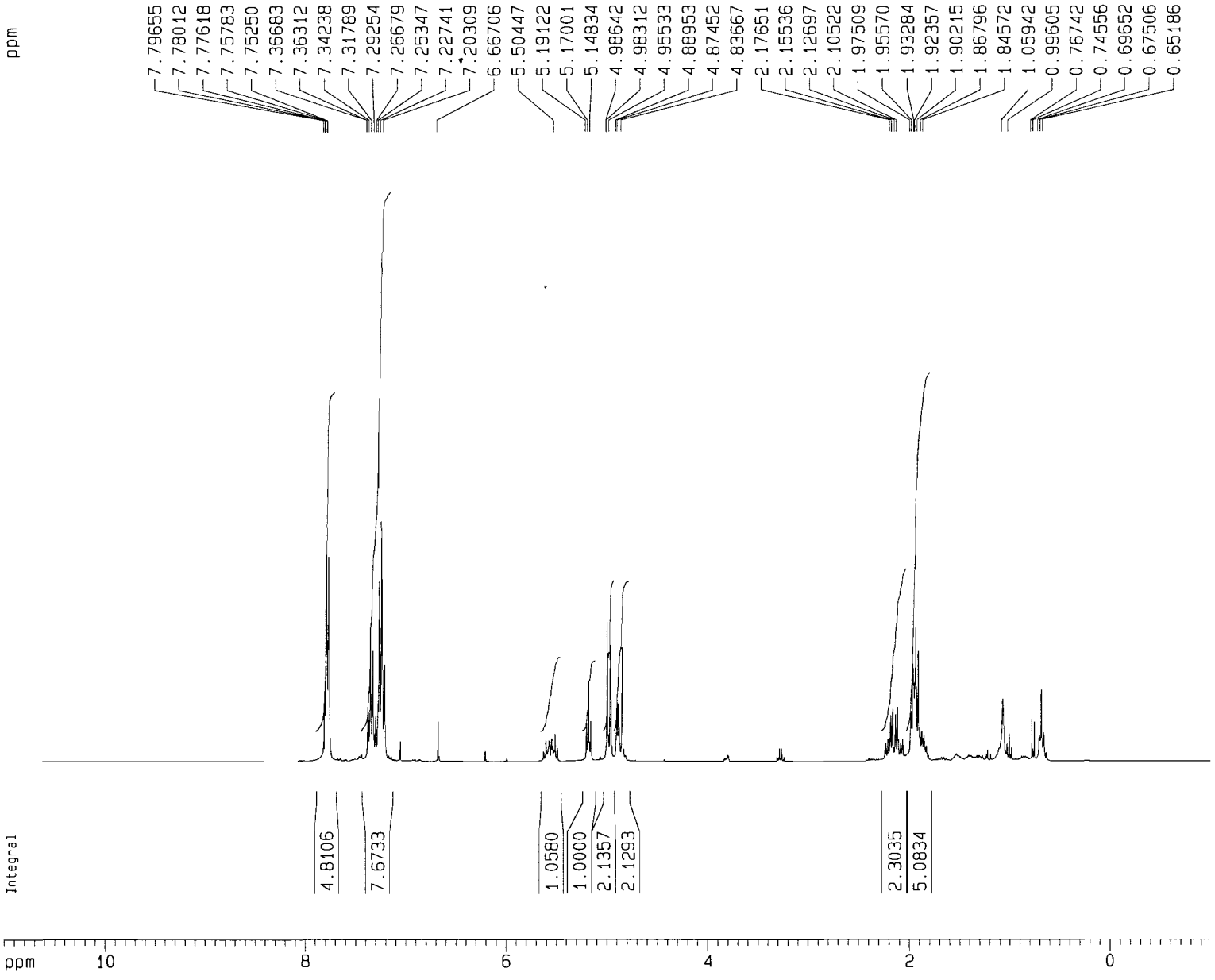
13




```
Current Data Parameters
NAME      Sep27-2007-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20070928
Time                0.01
INSTRUM            spect
PROBHD     5 mm Multinu
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 8532
DS                    4
SWH           18832.393 Hz
FIDRES         0.287360 Hz
AQ             1.7400308 sec
RG                16384
DW               26.550 usec
DE                6.00 usec
TE                300.0 K
D1             2.00000000 sec
d11            0.03000000 sec
d12            0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                11.80 usec
PL1                0.00 dB
SFO1          75.4760200 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           110.00 usec
PL2                0.00 dB
PL12               17.50 dB
PL13               17.50 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF           75.4678482 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               215.000 ppm
F1               16225.59 Hz
F2P                -5.000 ppm
F2                -377.34 Hz
PPMCM             11.00000 ppm/cm
HZCM             830.14636 Hz/cm
```



15a



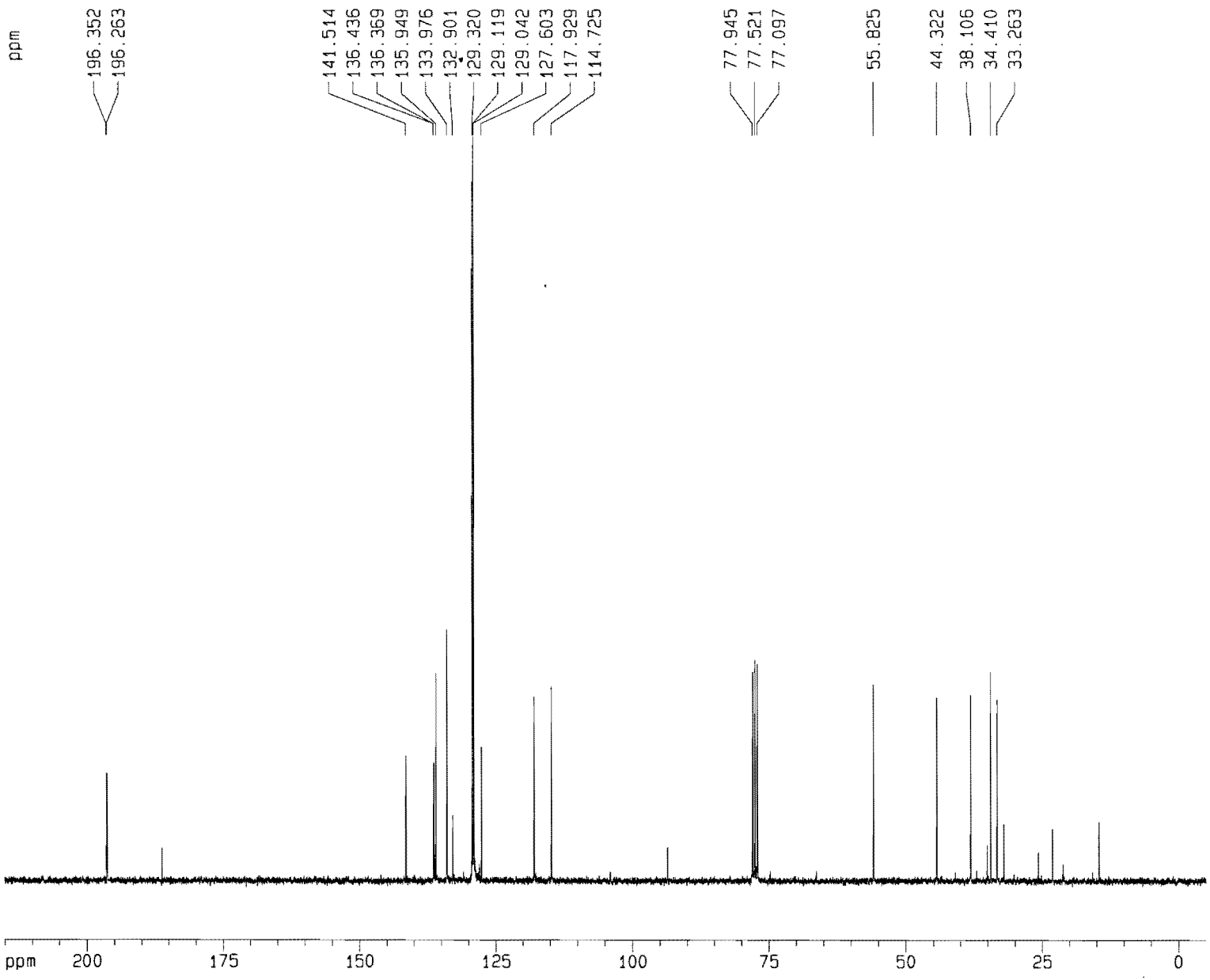
Current Data Parameters
NAME Nov04-2007-Wein
EXPND 10
PRDCNO 1

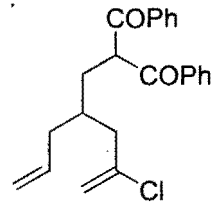
F2 - Acquisition Parameters
Date_ 20071104
Time 16.22
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 80.6
OW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec

========== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz

F2 - Processing parameters
SI 32768
SF 299.8700737 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92206 Hz/cm





15a

Current Data Parameters

NAME	Nov04-2007-Wein
EXPNO	11
PROCNO	1

F2 - Acquisition Parameters

Date_	20071104
Time	16.32
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	166
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	512
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

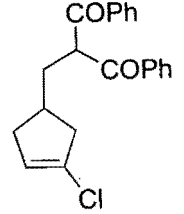
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

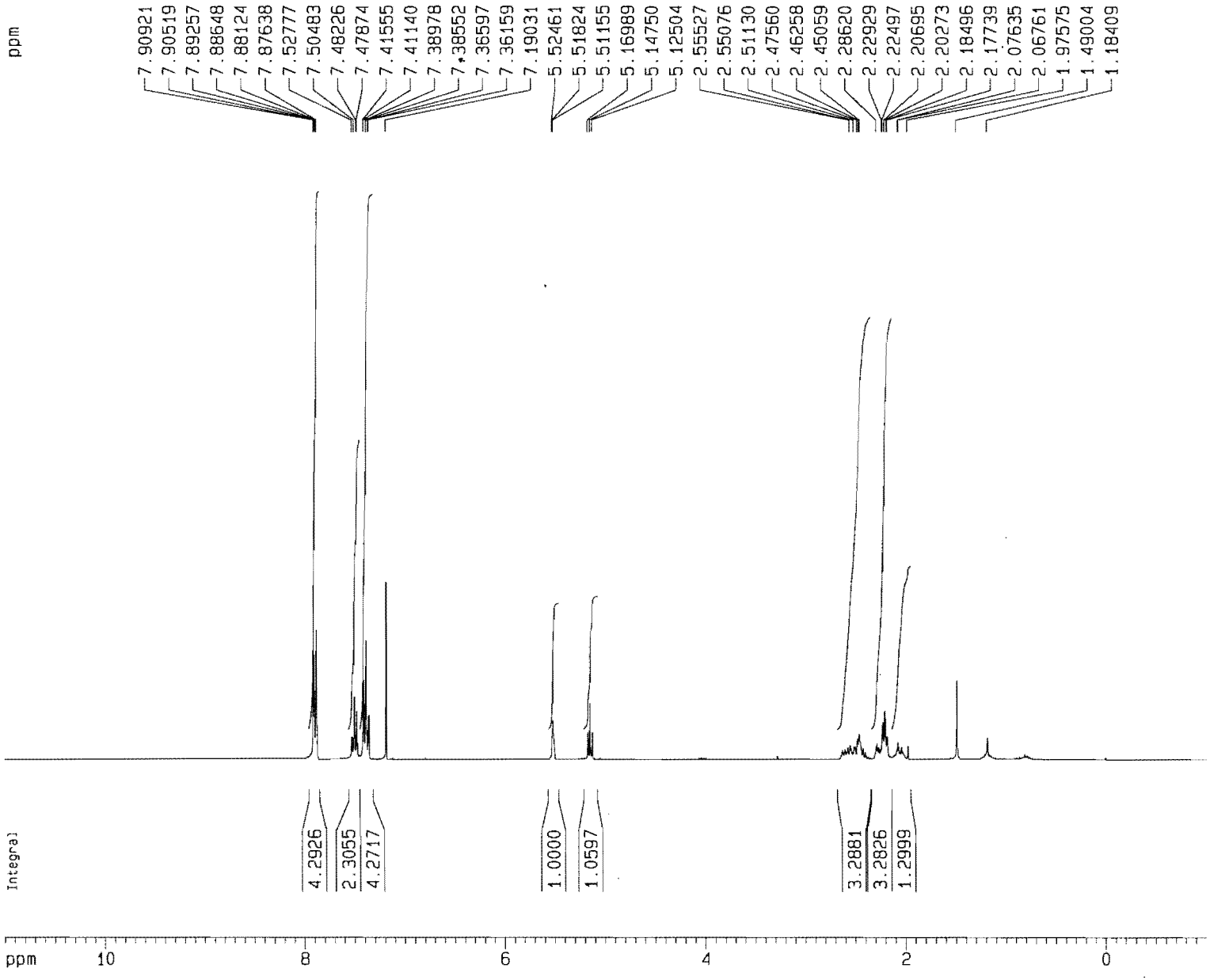
SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm



16a



Current Data Parameters

NAME	Nov21-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101121
Time	13.27
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIORES	0.094190 Hz
AQ	5.3084660 sec
RG	724.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

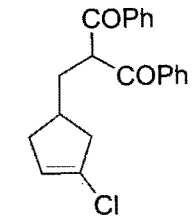
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

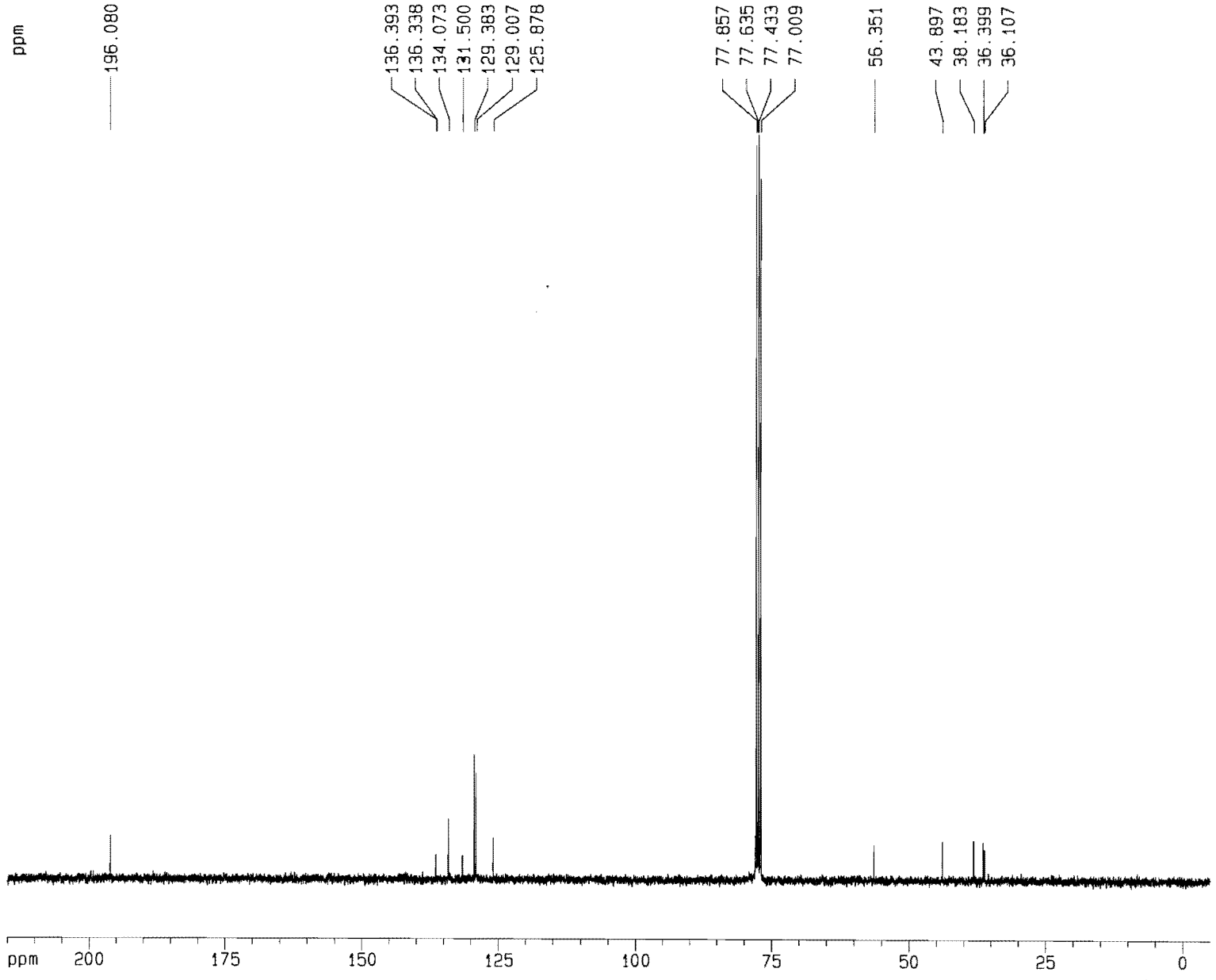
SI	32768
SF	299.8700310 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

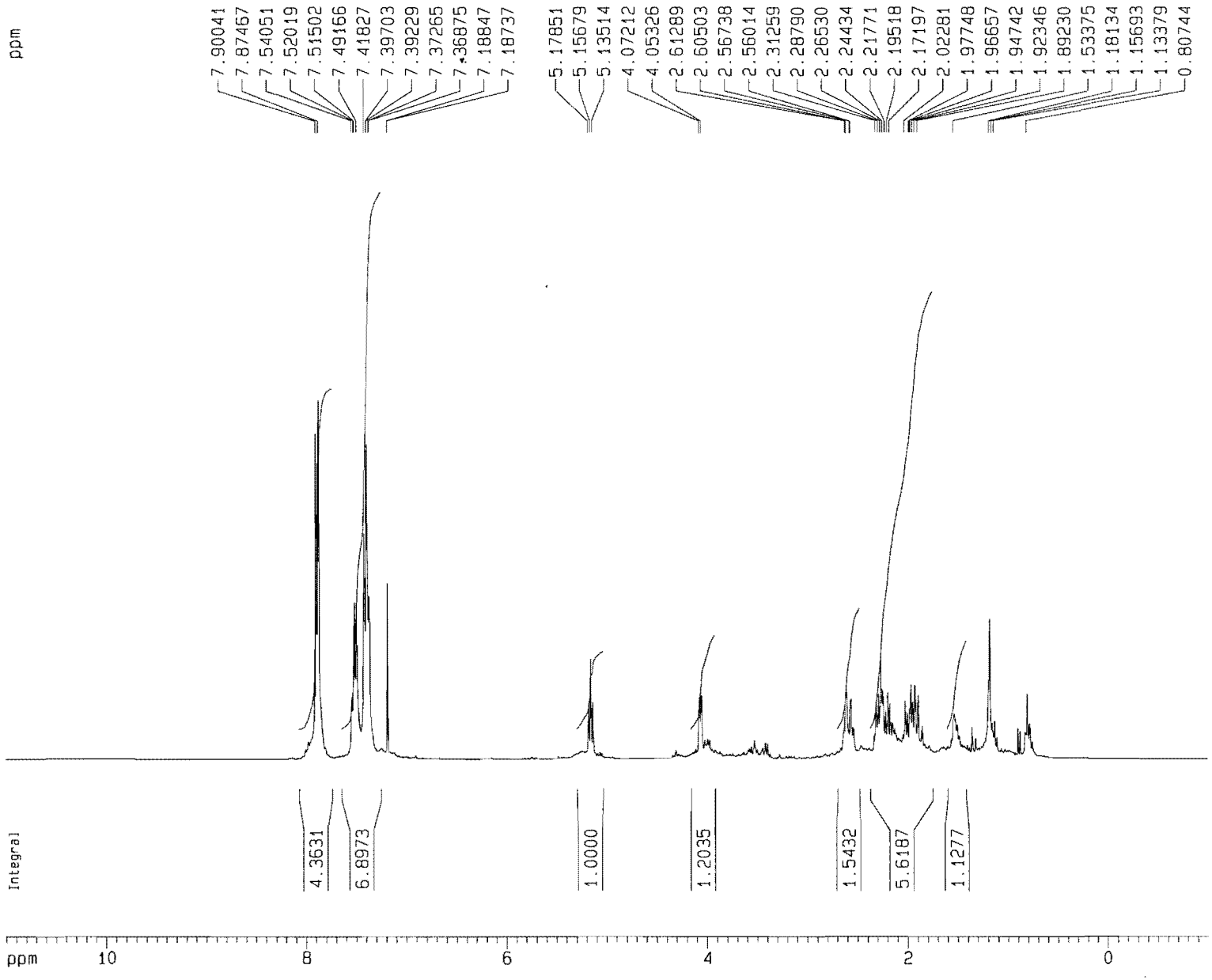
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

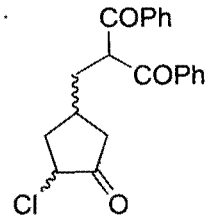


16a




```
Current Data Parameters
NAME      Nov21-2010-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101121
Time               14.26
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2615
DS                    4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 4096
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023410 MHz
WDW                   EM
SSB                    0
LB                1.00 Hz
GB                     0
PC                1.40

1D NMR plot parameters
CX               20.00 cm
F1P             215.000 ppm
F1             16211.50 Hz
F2P             -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```





17a

Current Data Parameters

NAME	Nov11-2007-Wein
EXPNO	10
PRDCNO	1

F2 - Acquisition Parameters

Date_	20071111
Time	23.48
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	256
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

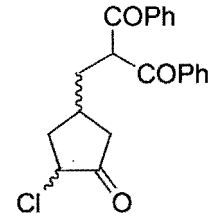
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

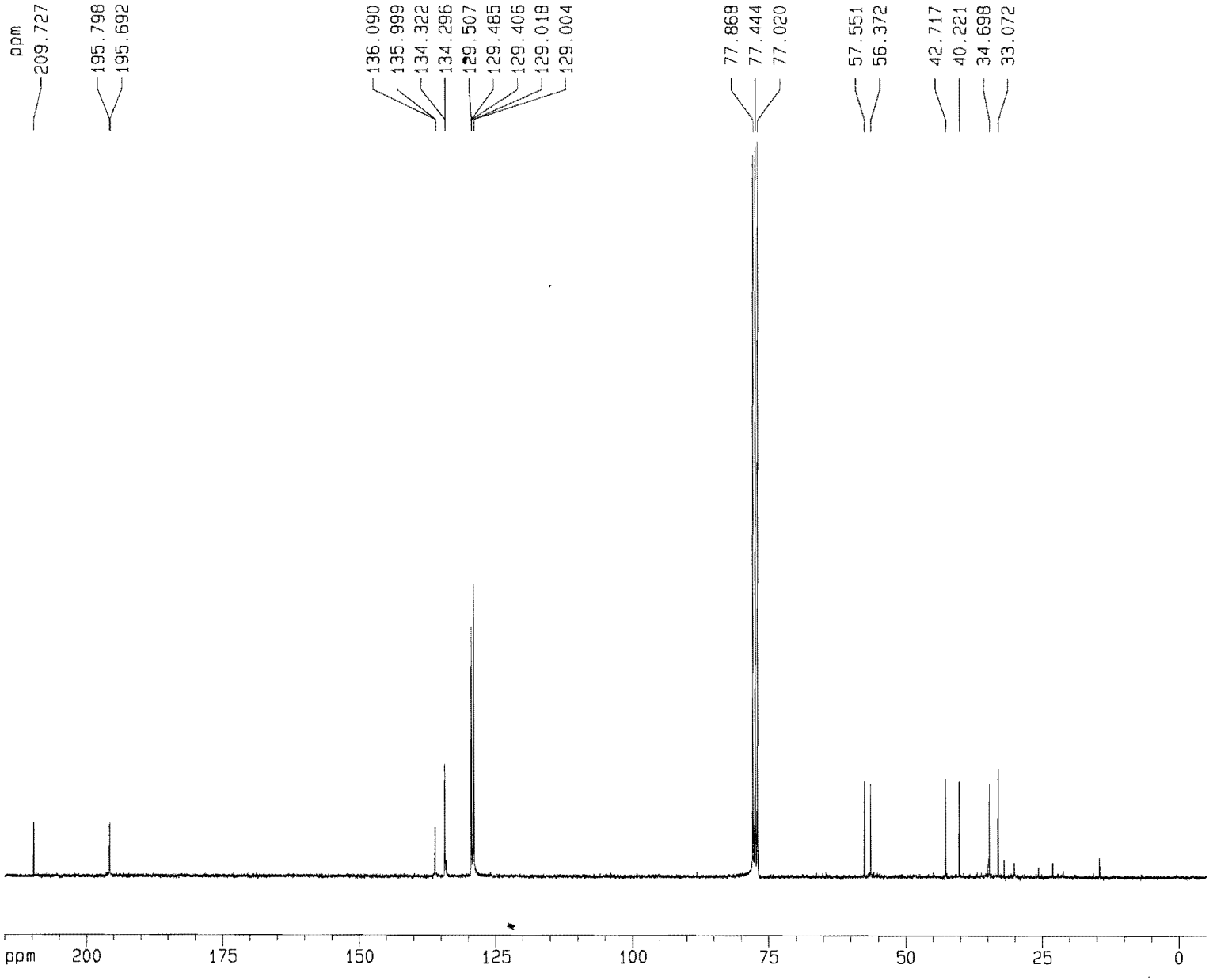
SI	32768
SF	299.8700318 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



17a



Current Data Parameters

NAME	Nov11-2007-Wein
EXPNO	12
PROCNO	1

F2 - Acquisition Parameters

Date_	20071112
Time	9.36
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	9093
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	512
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

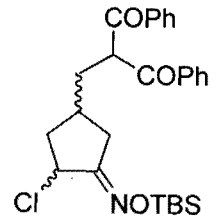
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

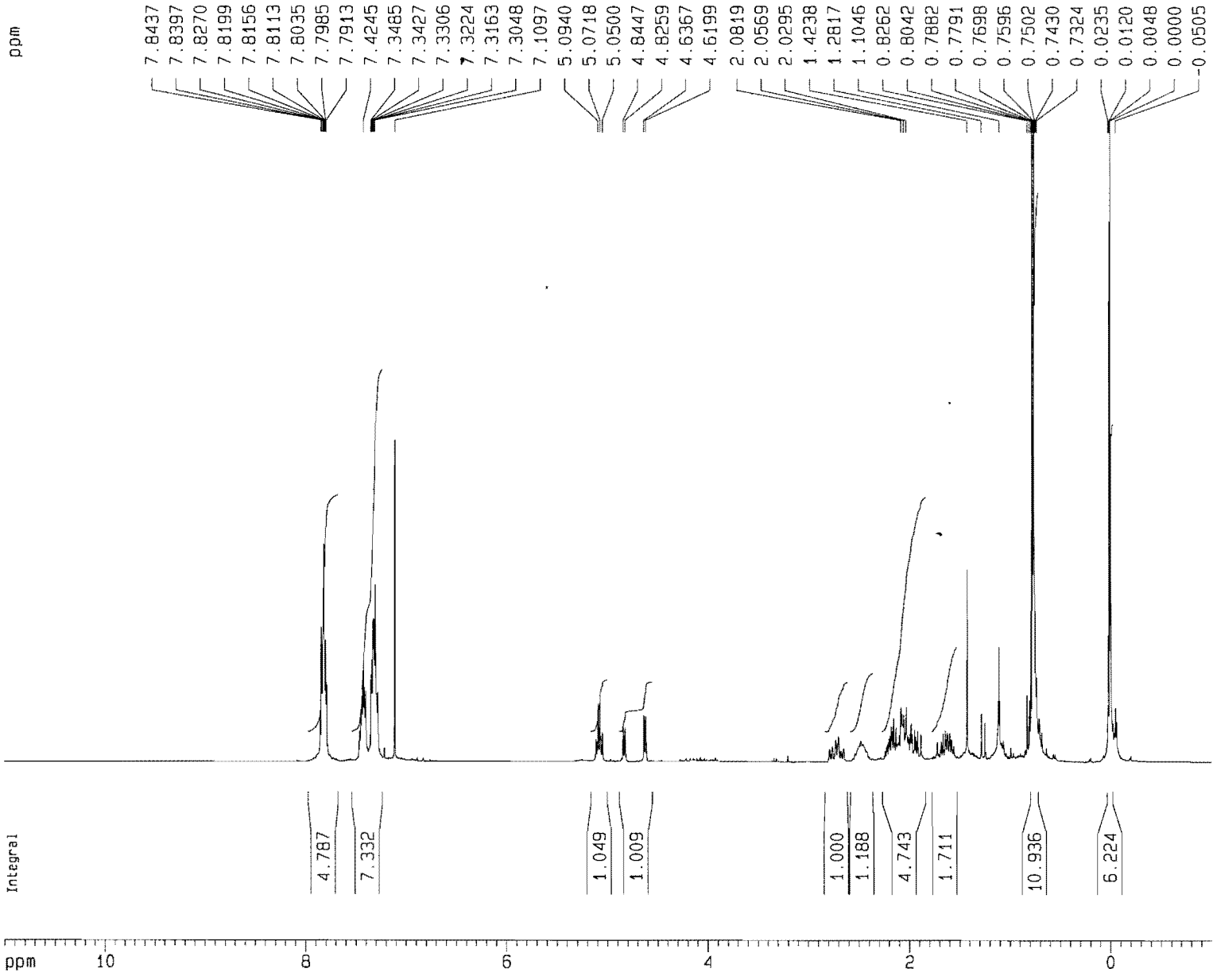
SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm



18a



Current Data Parameters

NAME	Nov13-2007-Wein
EXPNO	30
PROCNO	1

F2 - Acquisition Parameters

Date_	20071113
Time	14.20
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	256
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

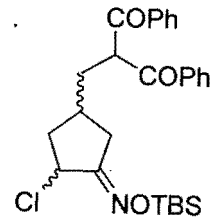
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

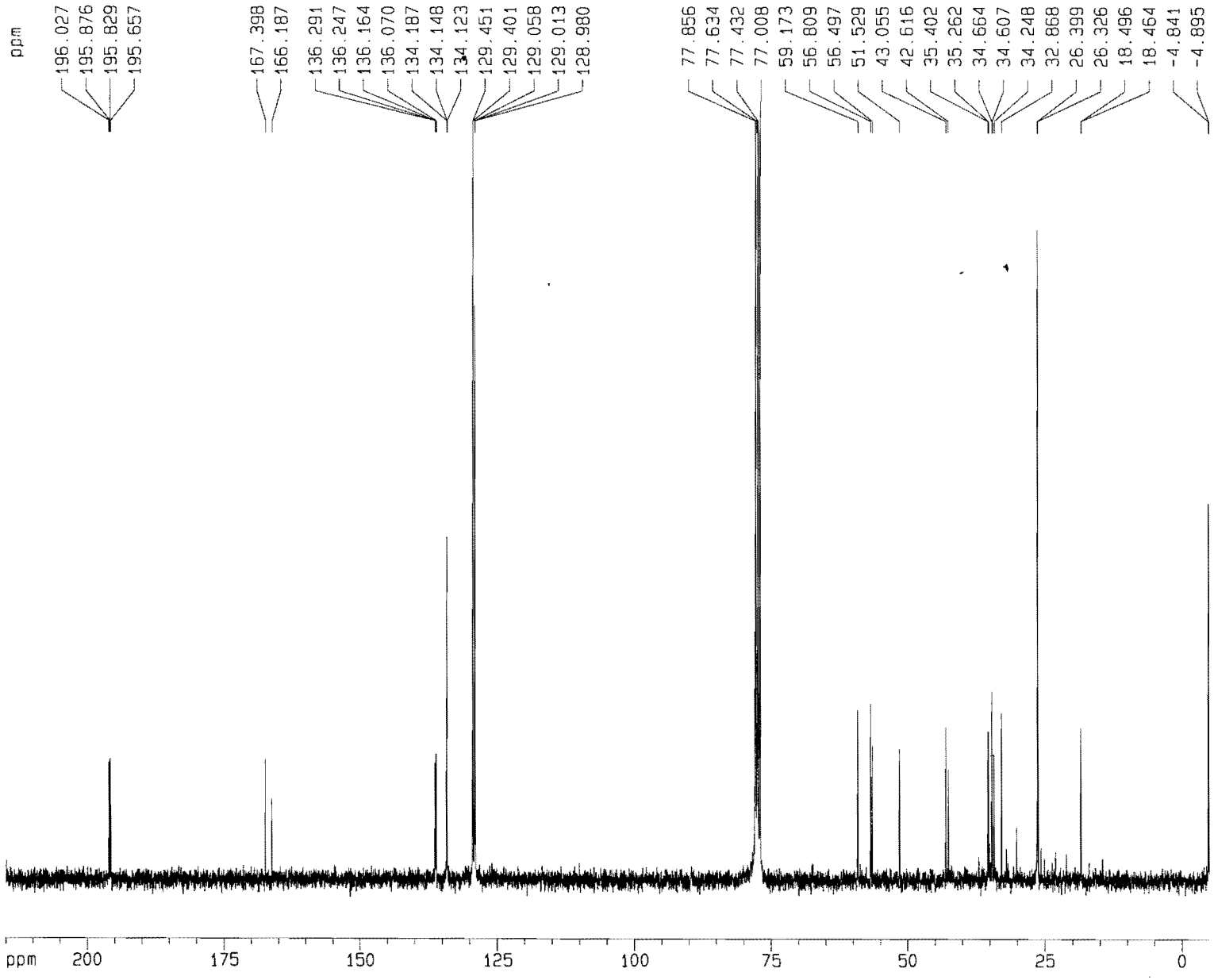
SI	32768
SF	299.8700550 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

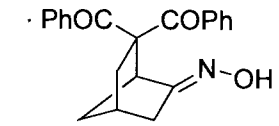
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm



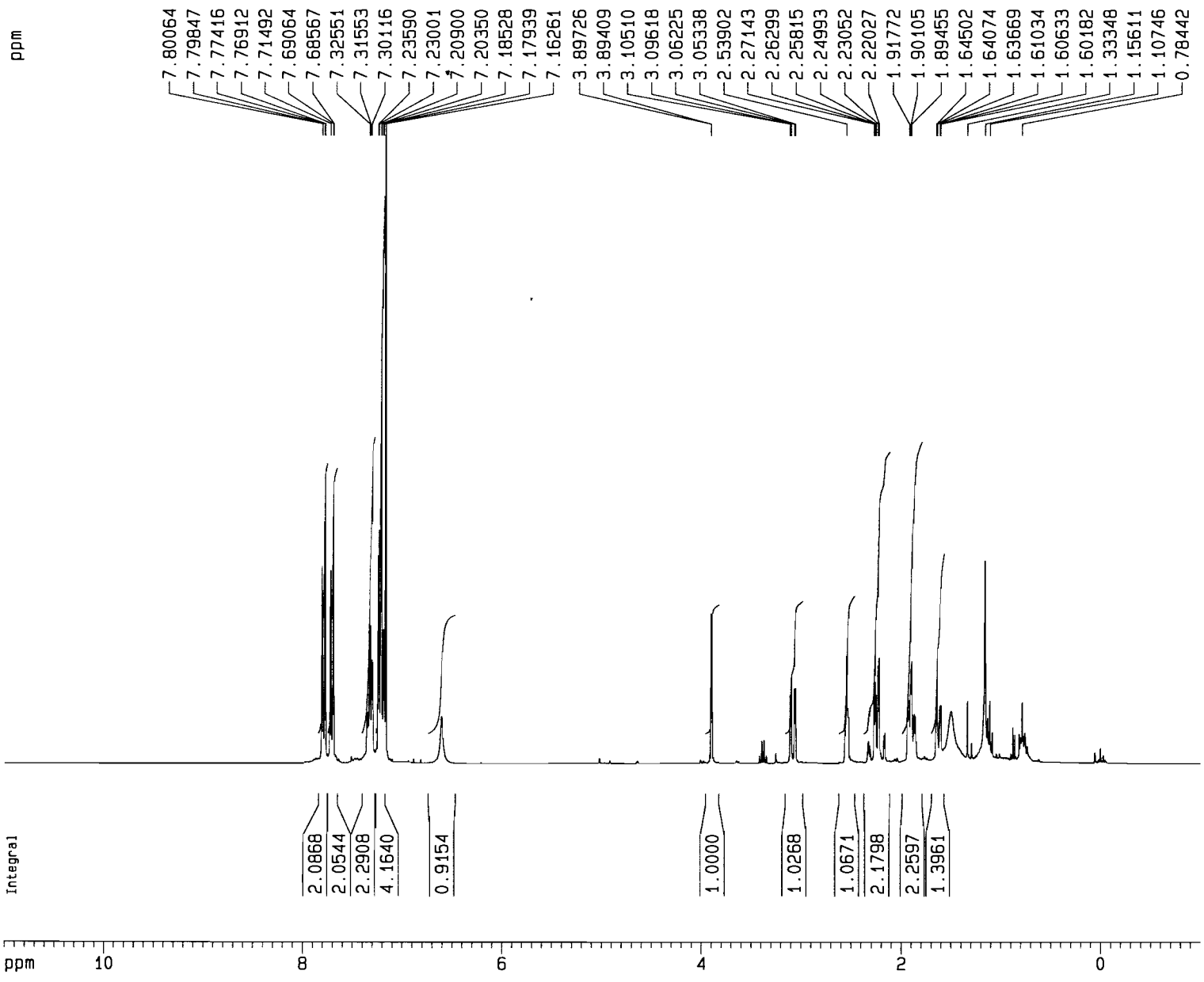
18a




```
Current Data Parameters
NAME      Nov13-2007-Wein
EXPNO               40
PROCNO               1

F2 - Acquisition Parameters
Date_           20071113
Time              22.30
INSTRUM           spect
PROBHD    5 mm QNP 1H/1
PULPROG         zgpg30
TD               65536
SOLVENT          CDCl3
NS                5096
DS                   4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ           1.7433076 sec
RG                2048
DW              26.600 usec
DE               6.00 usec
TE              300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1               13C
P1               5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2        waltz16
NUC2               1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                EM
SSB                 0
LB               1.00 Hz
GB                  0
PC                1.40

1D NMR plot parameters
CX               20.00 cm
F1P             215.000 ppm
F1            16211.50 Hz
F2P              -5.000 ppm
F2             -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM         829.42578 Hz/cm
```



19



Current Data Parameters

NAME	Nov14-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20071114
Time	18.25
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	218
DS	0
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	645.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec

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

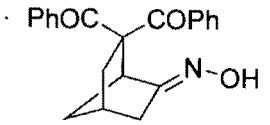
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

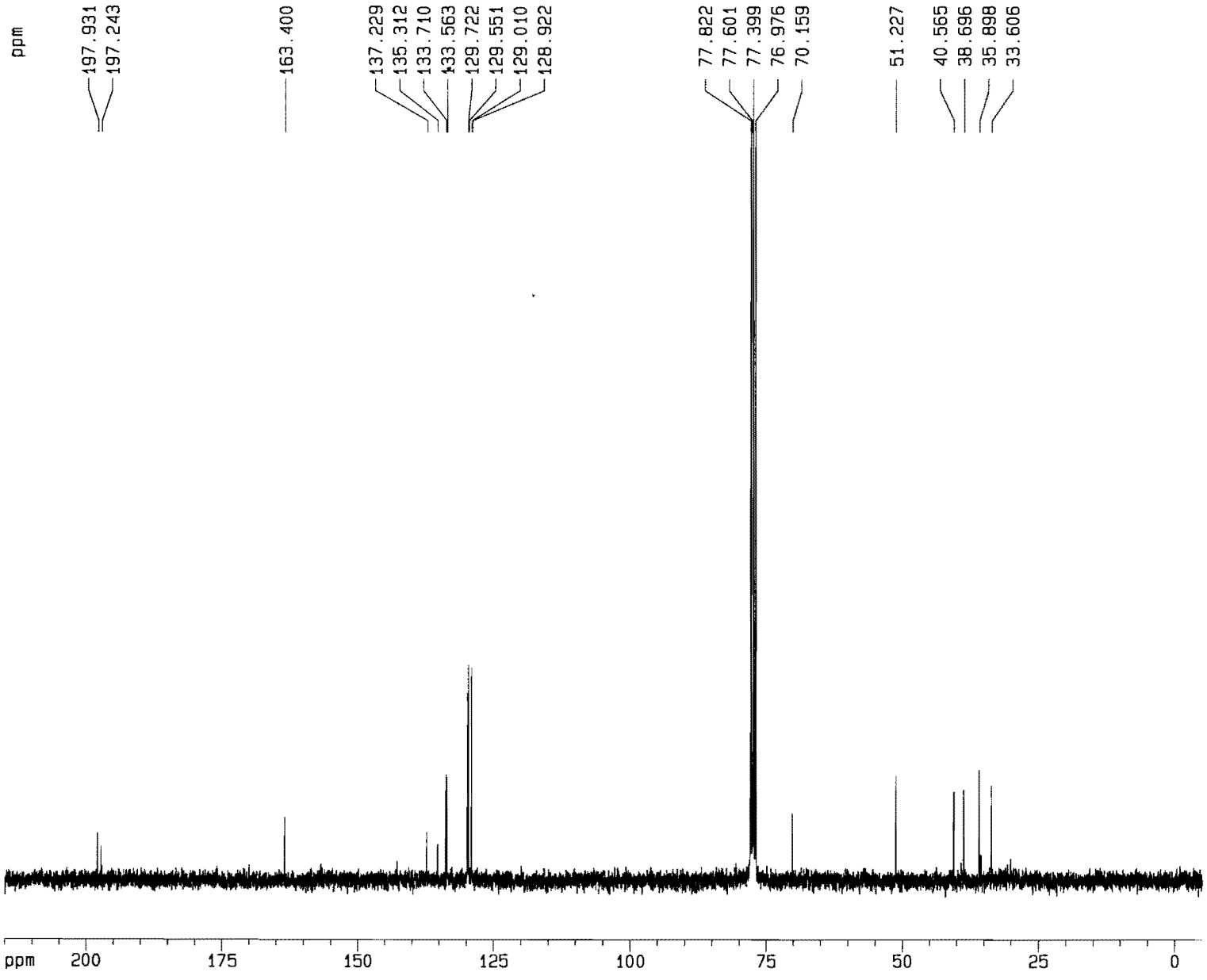
SI	32768
SF	300.1300356 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

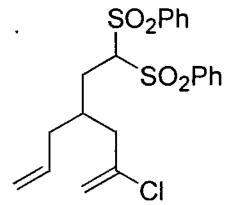
CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm



19

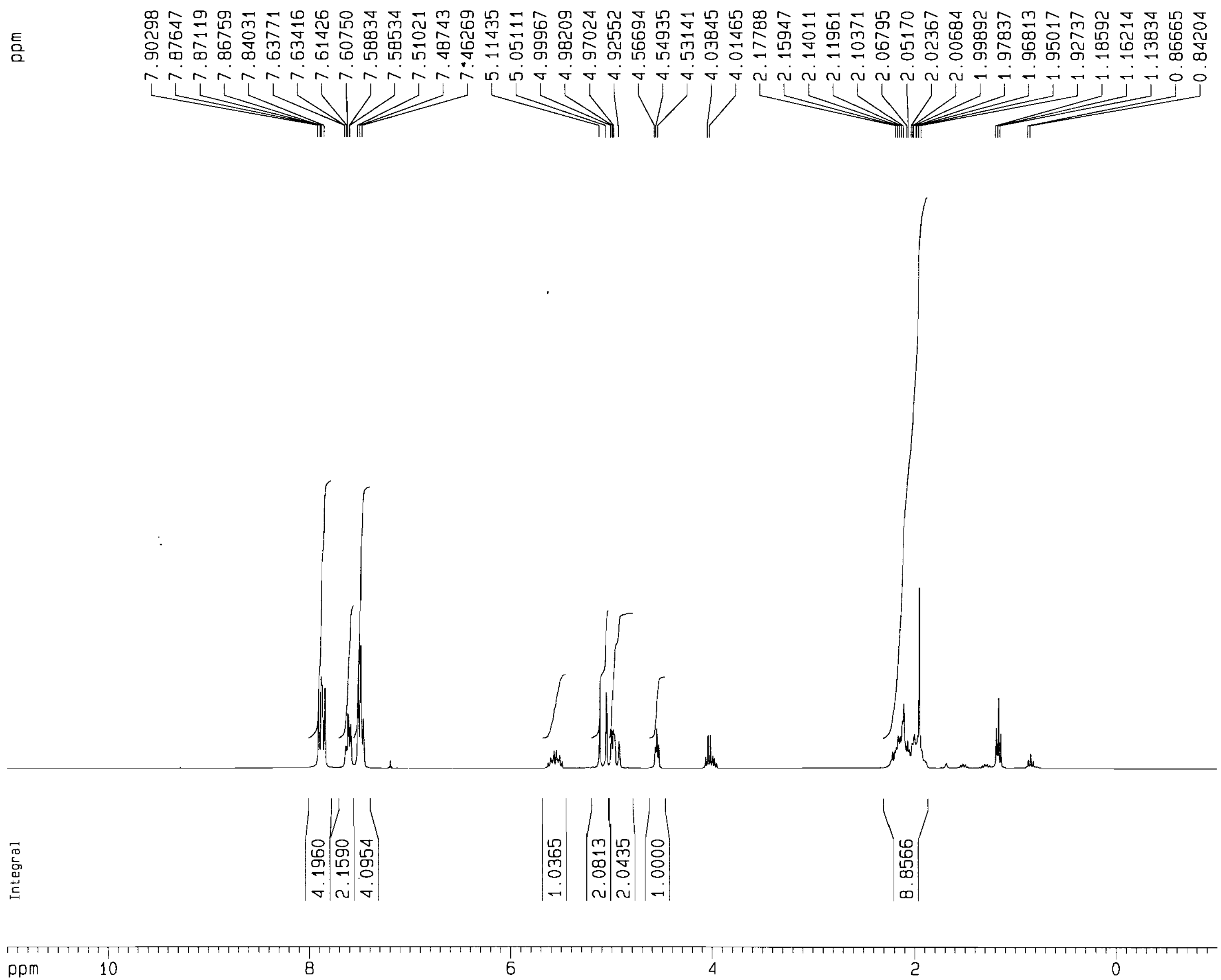


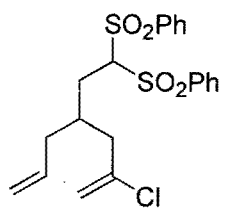

```
Current Data Parameters
NAME      Nov14-2007-Wein
EXPNO                  12
PROCNO                  1

F2 - Acquisition Parameters
Date_           20071114
Time               20.16
INSTRUM            spect
PROBHD     5 mm Multinu
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2339
DS                    4
SWH           18832.393 Hz
FIDRES         0.287360 Hz
AQ             1.7400308 sec
RG                16384
DW               26.550 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1               11.80 usec
PL1               0.00 dB
SFO1         75.4760200 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          110.00 usec
PL2               0.00 dB
PL12             17.50 dB
PL13             17.50 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF           75.4677190 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               215.000 ppm
F1              16225.56 Hz
F2P               -5.000 ppm
F2               -377.34 Hz
PPMCM           11.00000 ppm/cm
HZCM           830.14490 Hz/cm
```



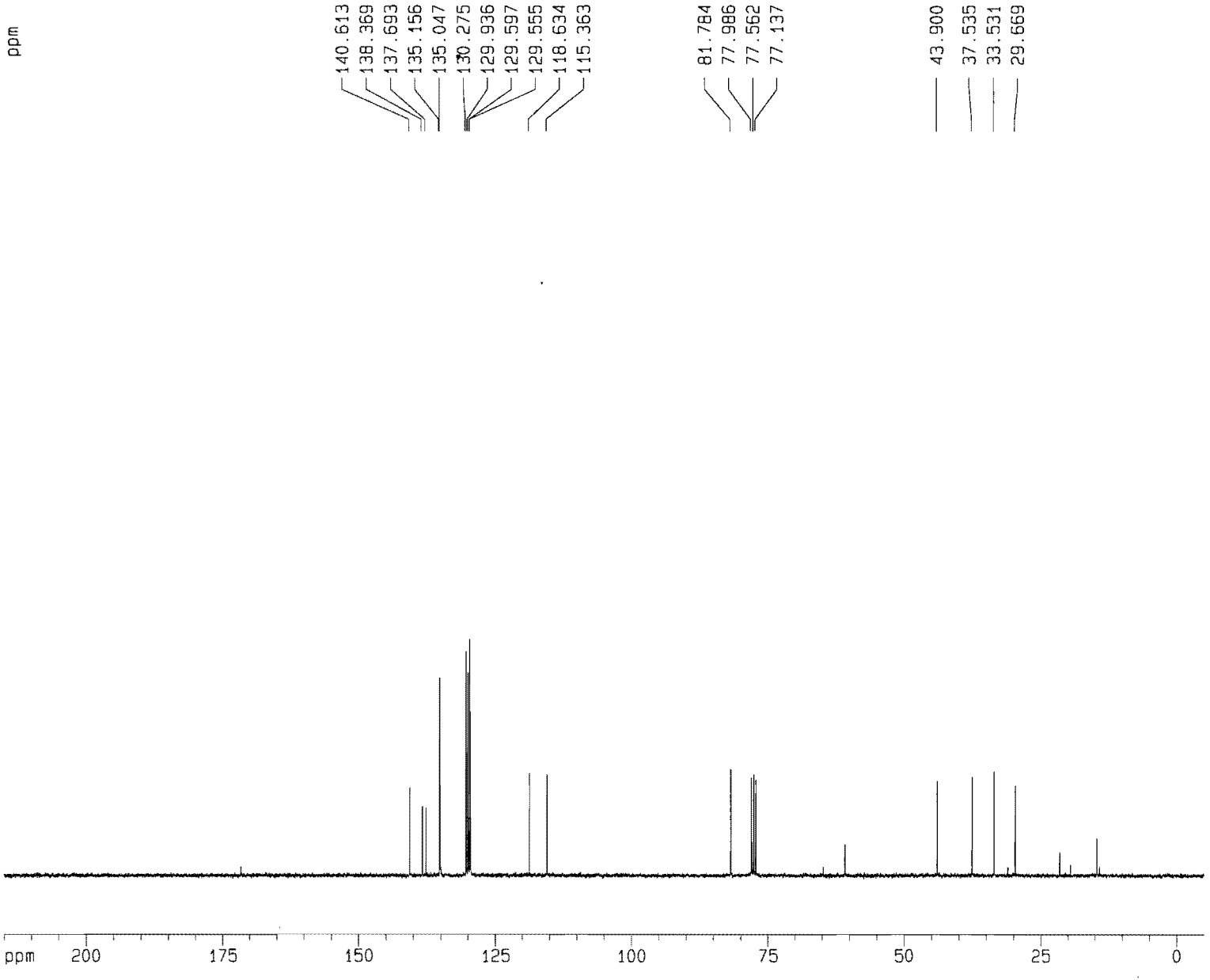
15b

```
Current Data Parameters
NAME        Jul08-2010-Wein
EXPNO                    20
PROCNO                    1

F2 - Acquisition Parameters
Date_              20100708
Time                  17.11
INSTRUM               spect
PROBHD     5 mm QNP 1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                       64
DW               81.000 usec
DE                 6.00 usec
TE                  300.0 K
D1           1.00000000 sec

============ CHANNEL f1 ========
NUC1                     1H
P1                11.70 usec
PL1                  0.00 dB
SFO1         299.8718518 MHz

F2 - Processing parameters
SI                    32768
SF           299.8700302 MHz
WDW                      EM
SSB                       0
LB                  0.30 Hz
GB                        0
PC                     1.00

1D NMR plot parameters
CX                 20.00 cm
F1P              11.000 ppm
F1               3298.57 Hz
F2P              -1.000 ppm
F2               -299.87 Hz
PPMCM        0.60000 ppm/cm
HZCM       179.92201 Hz/cm
```

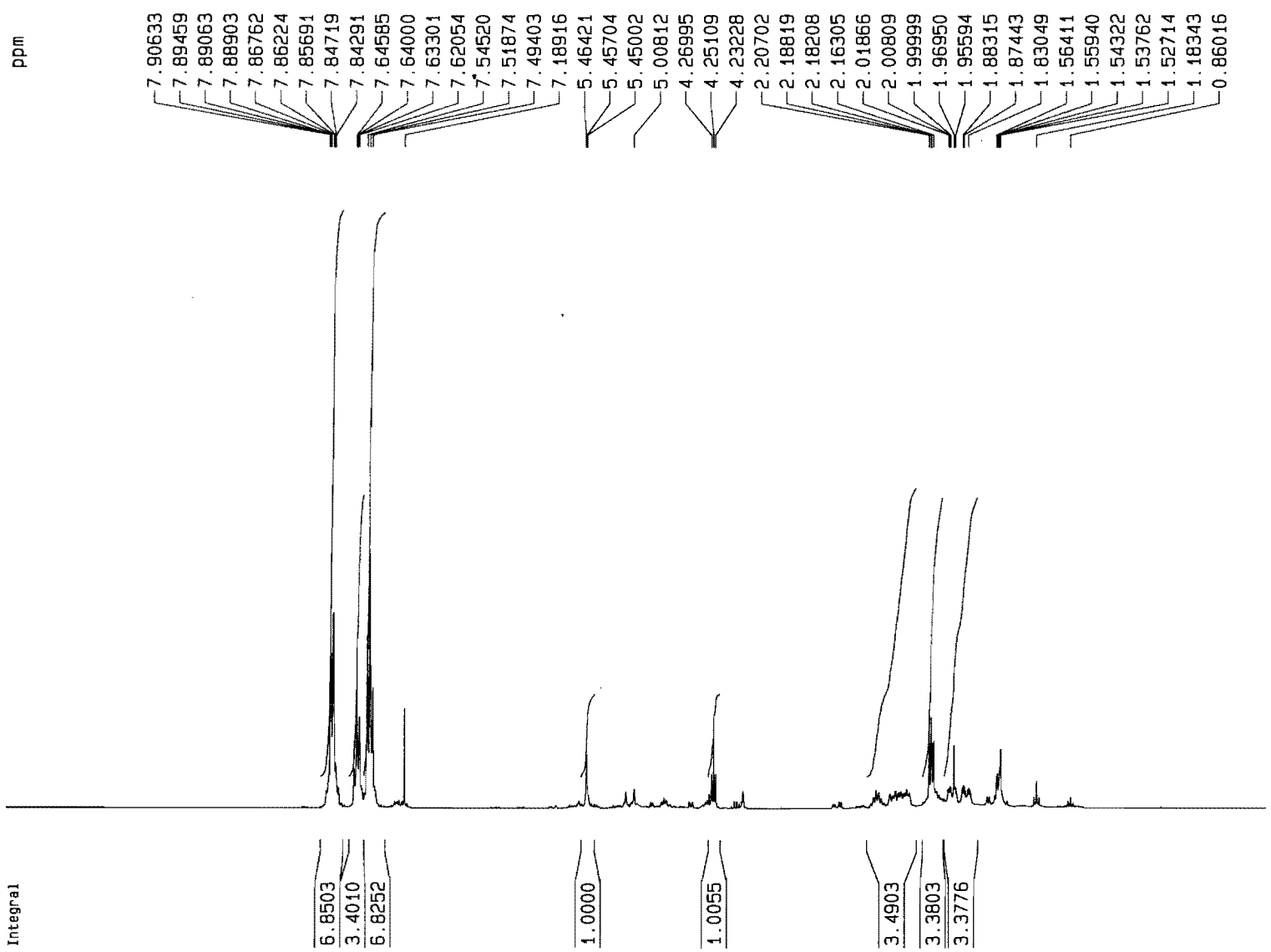


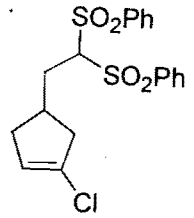


15b




```
Current Data Parameters
NAME      Jul08-2010-Wein
EXPNO                  21
PROCNO                  1

F2 - Acquisition Parameters
Date_           20100708
Time               17.20
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   135
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                  4096
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023410 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1             16211.50 Hz
F2P               -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```





16b

Current Data Parameters

NAME	Jul12-2010-Wein
EXPNO	21
PROCNO	1

F2 - Acquisition Parameters

Date_	20100712
Time	17.24
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	322.5
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

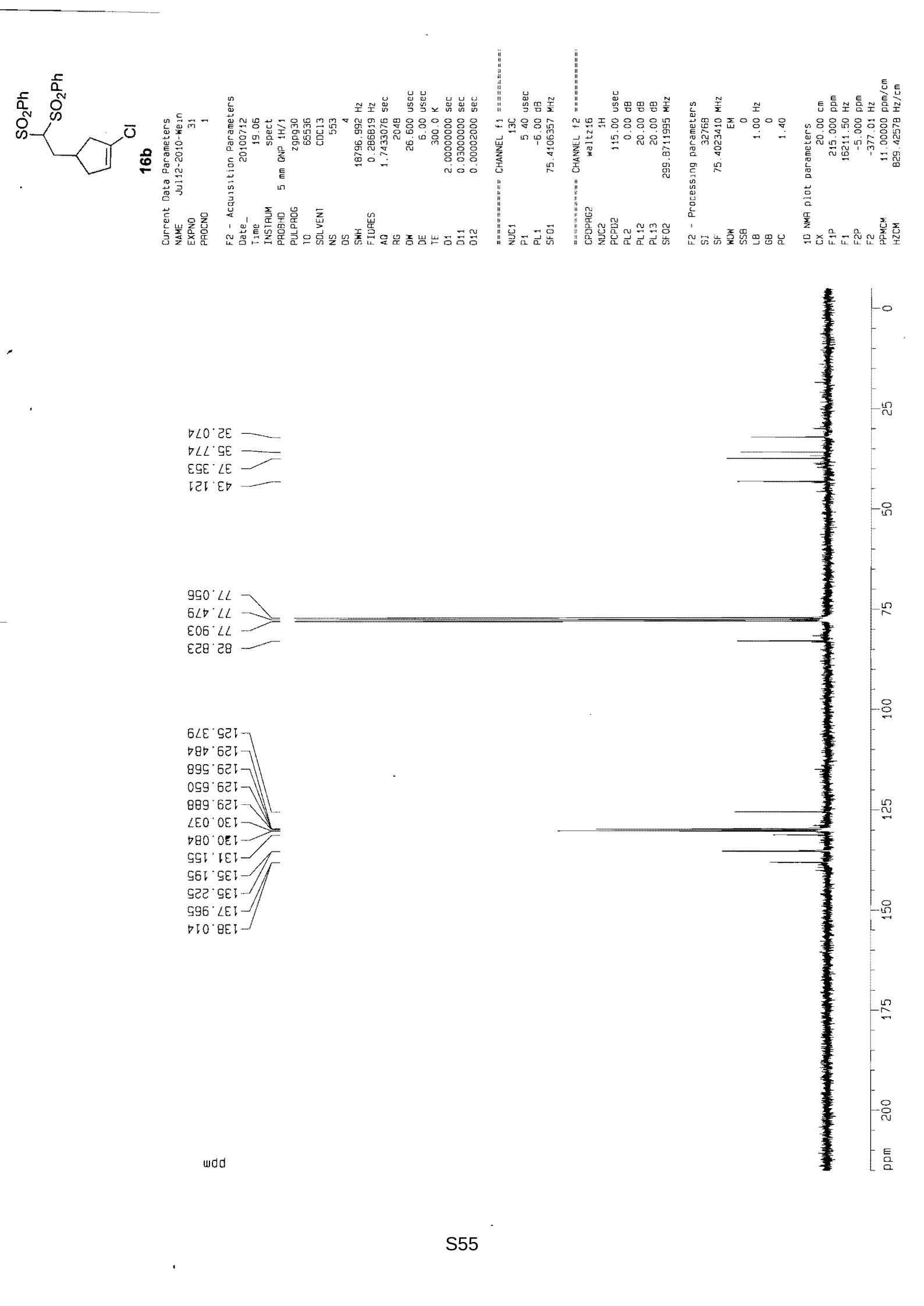
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

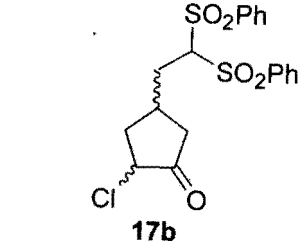
F2 - Processing parameters

SI	32768
SF	300.1300275 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

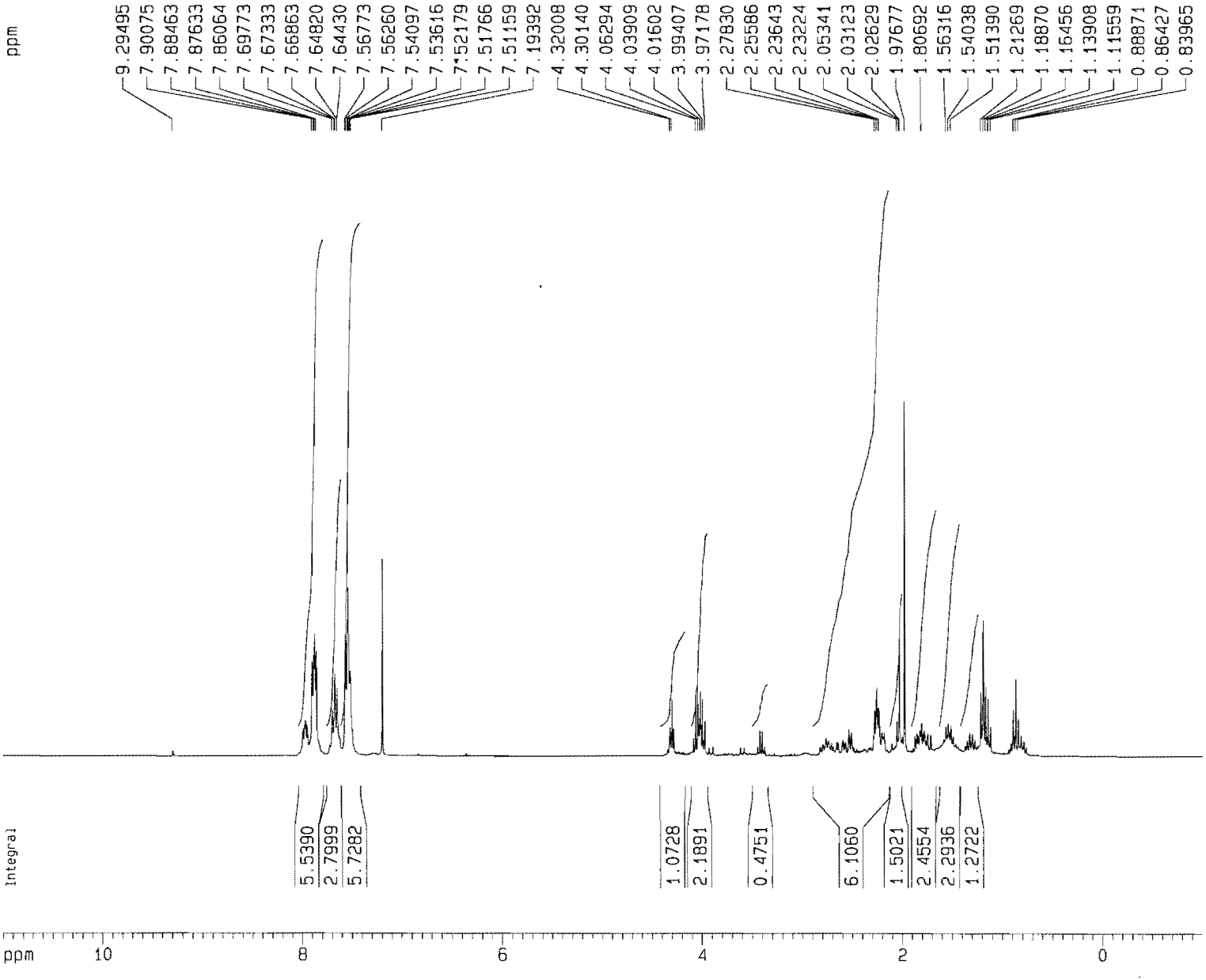
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm


16b
Current Data Parameters
NAME Jul12-2010-Wein
EXPNO 31
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100712
Time 19.06
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 553
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SF01 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SF02 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
32.074
35.774
37.353
43.121
77.056
77.479
77.903
82.823
125.379
129.484
129.568
129.650
129.688
130.037
130.084
131.155
135.195
135.225
137.965
138.014
ppm
200
175
150
125
100
75
50
25
0



17b



Current Data Parameters

NAME	Jul13-2010-Wein
EXPNO	50
PROCNO	1

F2 - Acquisition Parameters

Date_	20100713
Time	19.18
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	406.4
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

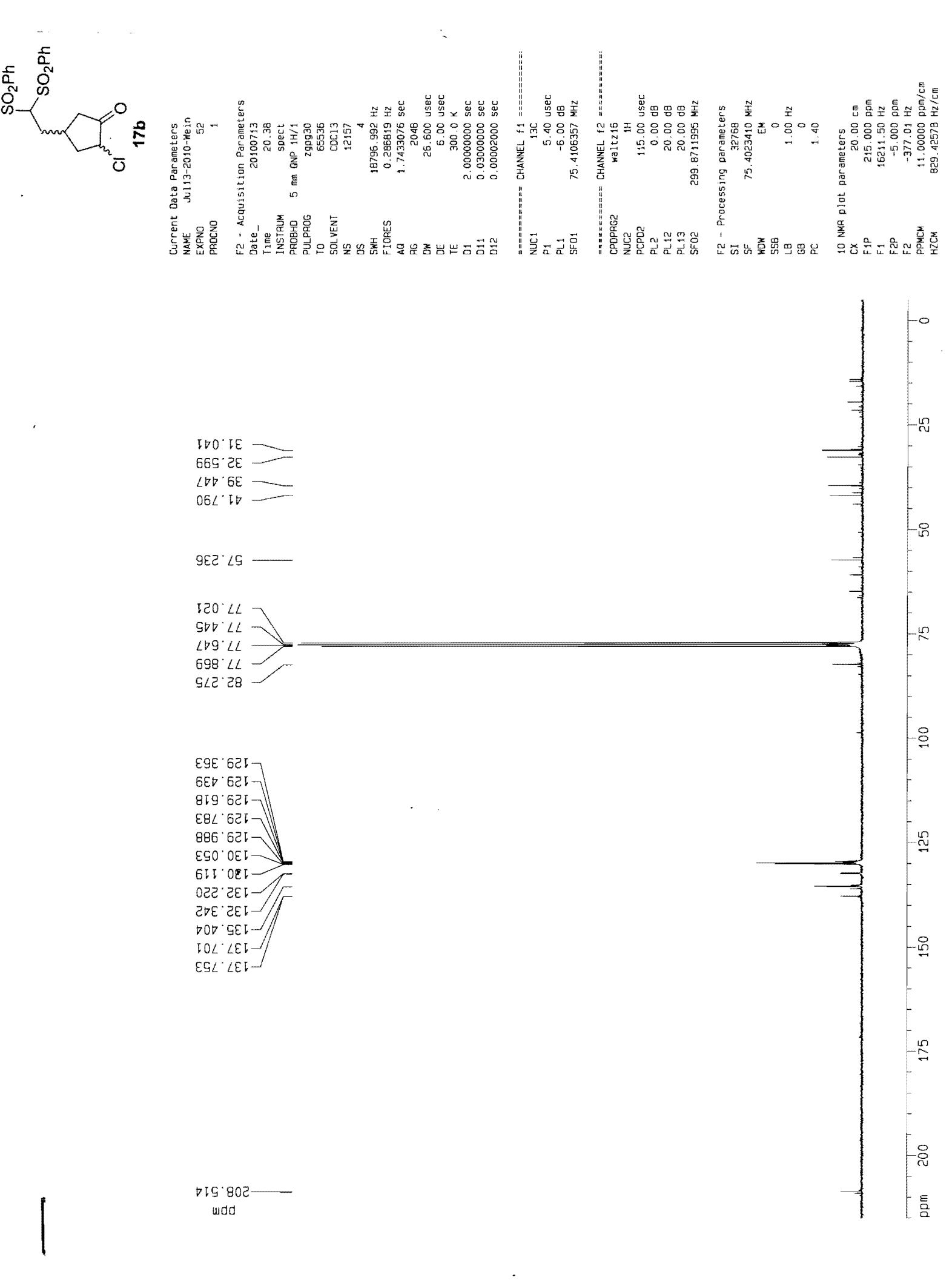
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

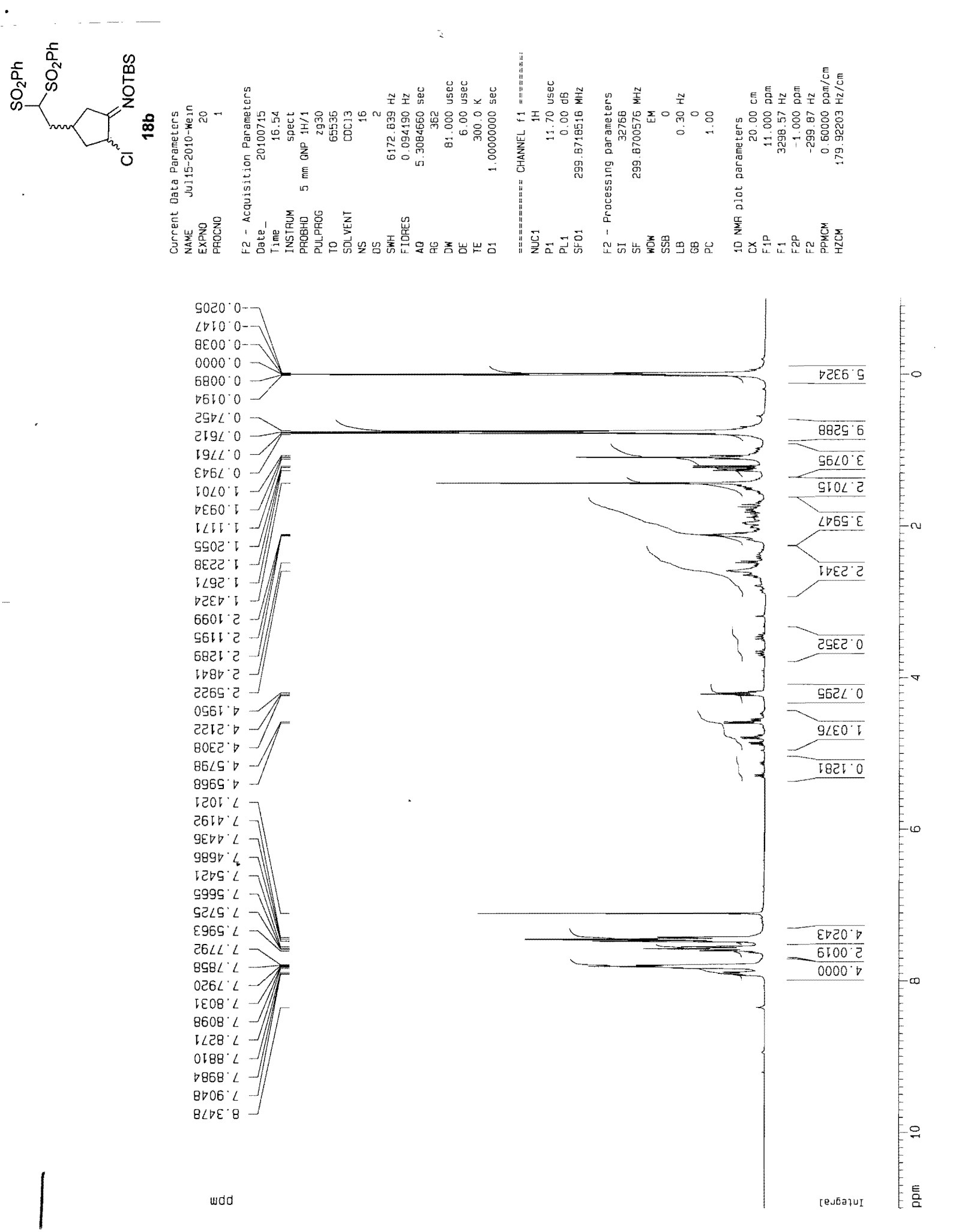
F2 - Processing parameters

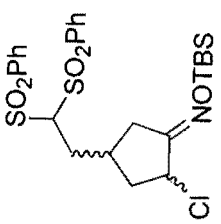
SI	32768
SF	299.8700298 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

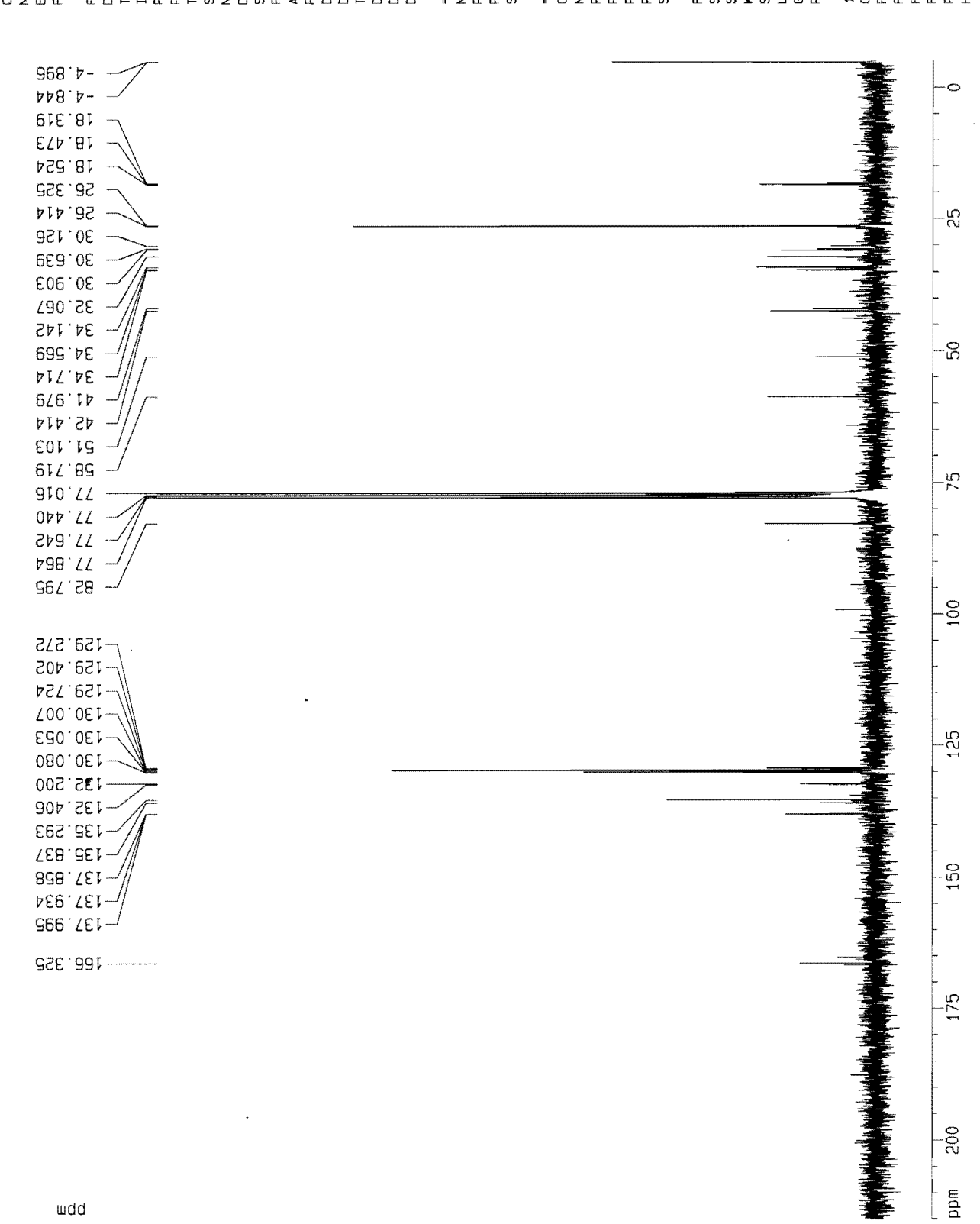
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

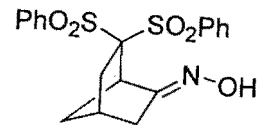

SO2Ph
SO2Ph
O
Cl
17b
Current Data Parameters
NAME Jul13-2010-Wein
EXPNO 52
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100713
Time 20.38
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 12157
DS 4
SWH 18796.992 Hz
FIDRES 0.286619 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
208.514
137.753
137.701
135.404
132.342
132.220
130.119
130.053
129.988
129.783
129.618
129.439
129.363
82.275
77.869
77.647
77.445
77.021
57.236
41.790
39.447
32.599
31.041
ppm
200
175
150
125
100
75
50
25
0


SO2Ph
SO2Ph
NOTBS
Cl
18b
Current Data Parameters
NAME Jul15-2010-Wein
EXPNO 20
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100715
Time 16.54
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 362
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700576 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92203 Hz/cm
0.0205
0.0147
0.0038
0.0000
0.0089
0.0194
0.7452
0.7612
0.7761
0.7943
1.0701
1.0934
1.1171
1.2055
1.2238
1.2671
1.4324
2.1099
2.1195
2.1289
2.4841
2.5922
4.1950
4.2122
4.2308
4.5798
4.5968
7.1021
7.4192
7.4436
7.4686
7.5421
7.5665
7.5725
7.5963
7.7792
7.7858
7.7920
7.8031
7.8098
7.8271
7.8810
7.8984
7.9048
8.3478
ppm
5.9324
9.5288
3.0795
2.7015
3.5947
2.2341
0.2352
0.7295
1.0376
0.1281
4.0243
2.0019
4.0000
Integral
ppm
10
8
6
4
2
0

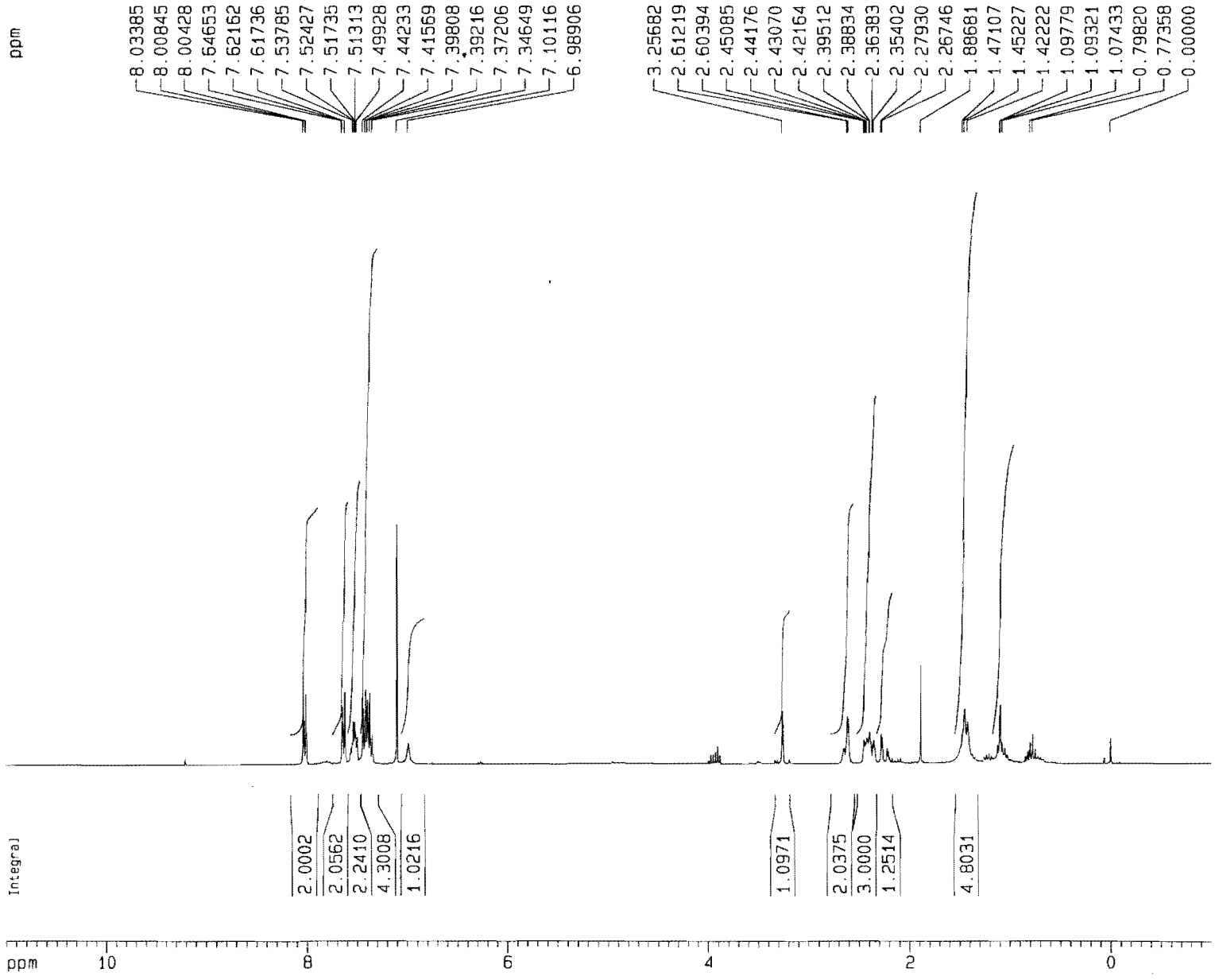

SO2Ph
SO2Ph
NOTBS
Cl

18b


Current Data Parameters
NAME Jul15-2010-Wein
EXPNO 22
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100715
Time 17.19
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2130
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 1024
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
-4.896
-4.844
18.319
18.473
18.524
26.325
26.414
30.126
30.639
30.903
32.067
34.142
34.569
34.714
41.979
42.414
51.103
58.719
77.016
77.440
77.642
77.864
82.795
129.272
129.402
129.724
130.007
130.053
130.080
132.200
132.406
135.293
135.837
137.858
137.934
137.995
166.325
ppm
200
175
150
125
100
75
50
25
0



20



Current Data Parameters

NAME	Jul16-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100716
Time	18.21
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	36
DS	0
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	724.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec

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

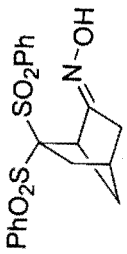
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

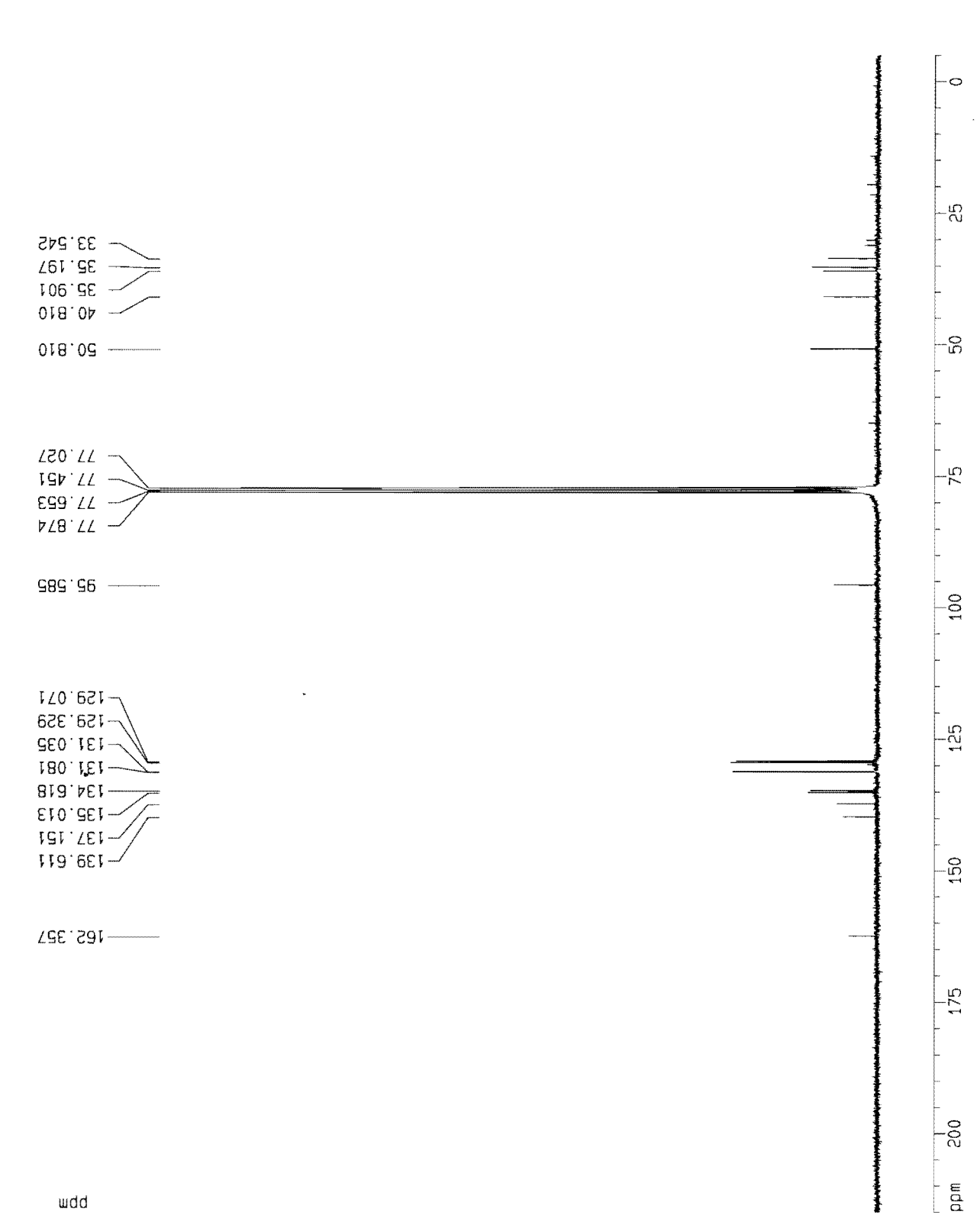
SI	32768
SF	299.8700576 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

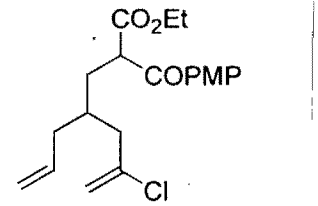
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm

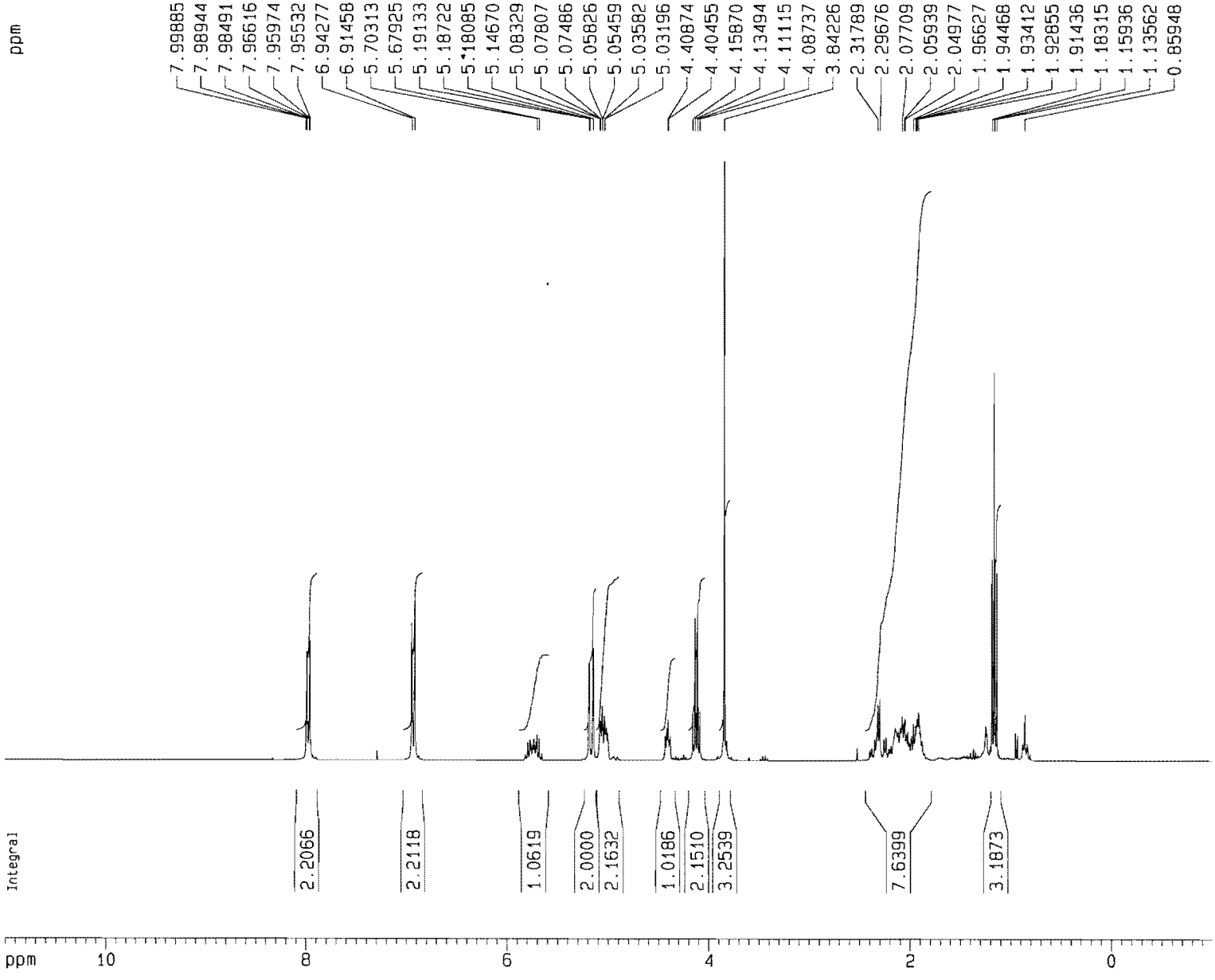

PhO2S
SO2Ph
N-OH

20


Current Data Parameters
NAME Jul16-2010-Wein
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100716
Time 18.47
INSTRUM spect
PROBHD 5 mm BNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1378
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 1024
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.75
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
33.542
35.197
35.901
40.810
50.810
77.027
77.451
77.653
77.874
95.585
129.071
129.329
131.035
131.081
134.618
135.013
137.151
139.611
162.357
ppm
0
25
50
75
100
125
150
175
200



15c



Current Data Parameters

NAME	Oct18-2007-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20071018
Time	14.08
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	35.9
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

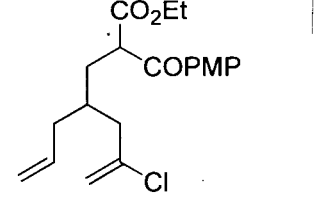
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

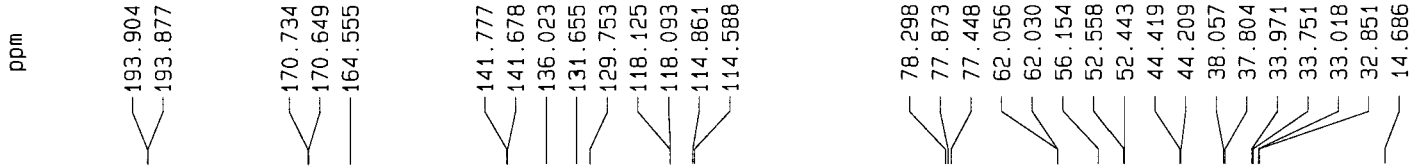
SI	32768
SF	299.8700000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

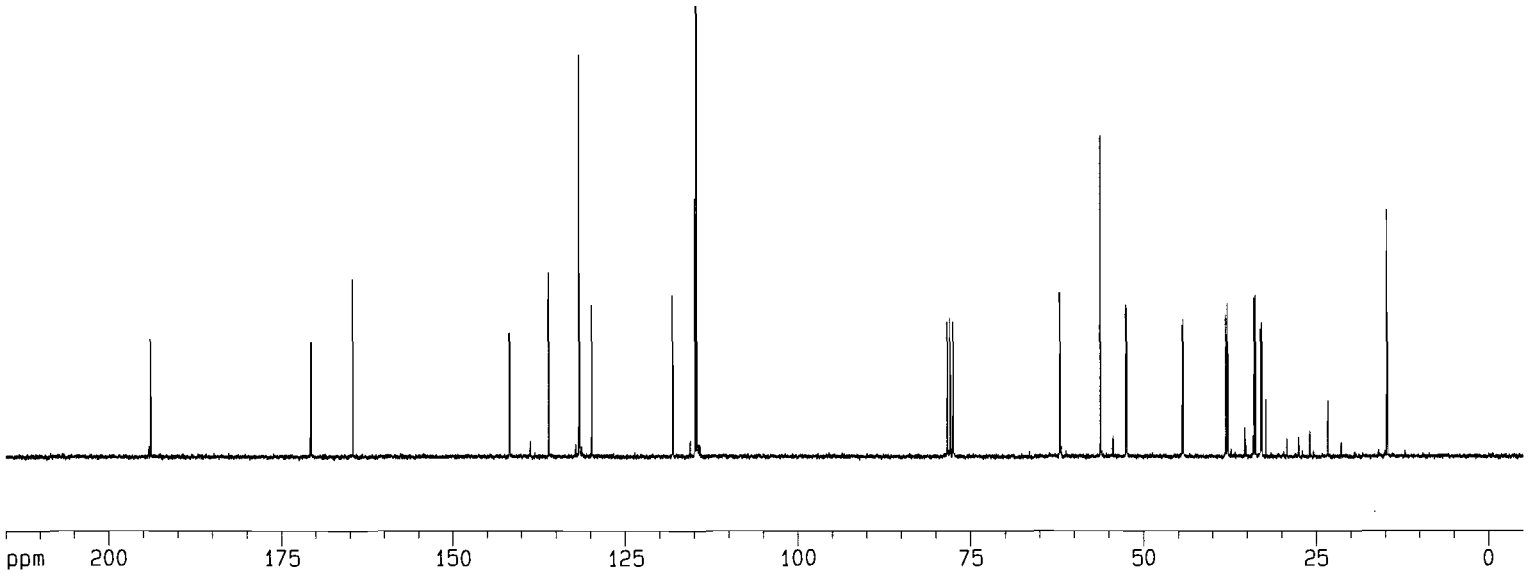
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92200 Hz/cm

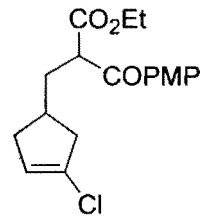


15c

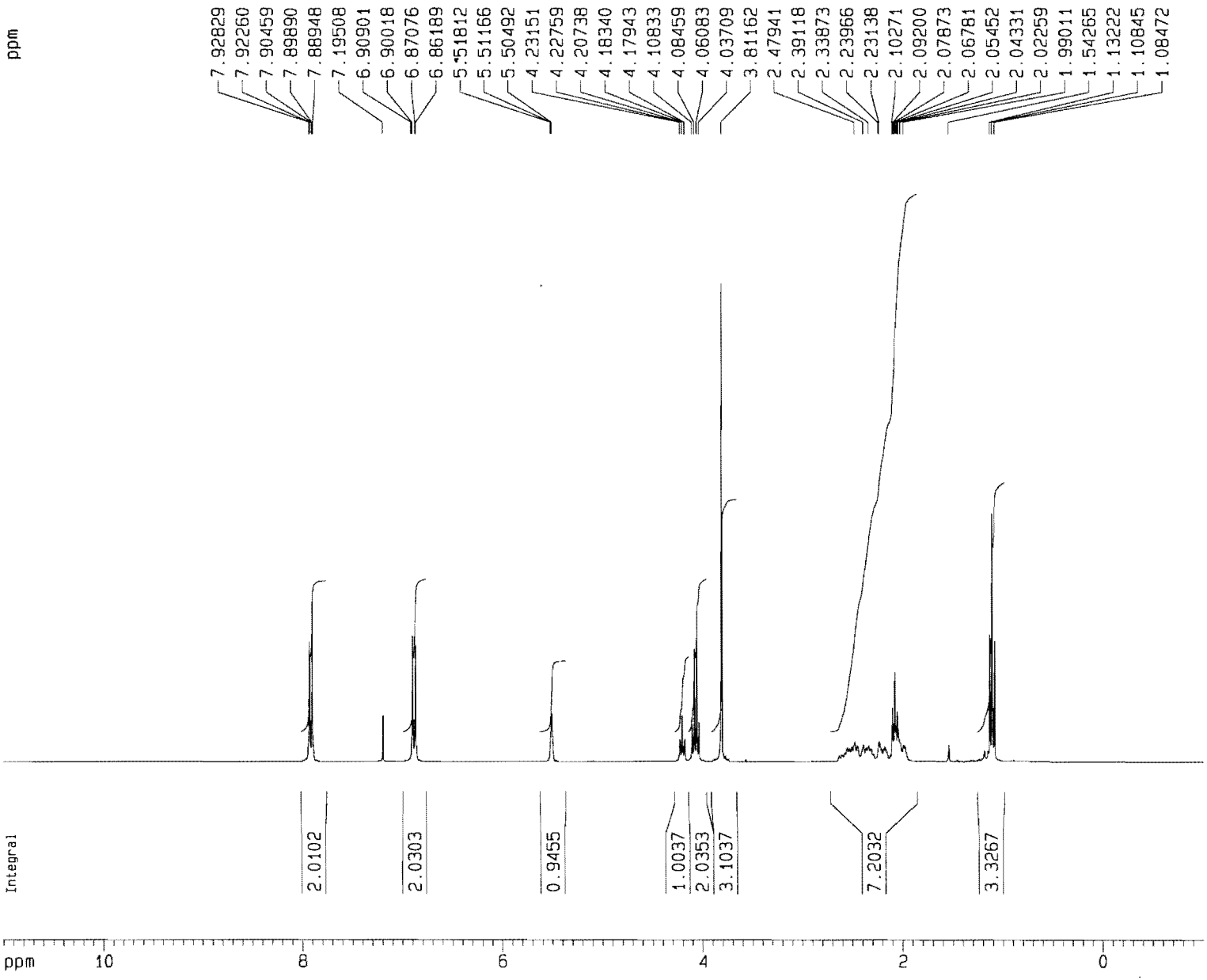





```
Current Data Parameters
NAME      Oct18-2007-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20071018
Time                14.21
INSTRUM             spect
PROBHD     5 mm GNP 1H/1
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   180
DS                     4
SWH           18796.992 Hz
FIDRES         0.286819 Hz
AQ            1.7433076 sec
RG                  4096
DW                26.600 usec
DE                 6.00 usec
TE                300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2                0.00 dB
PL12              20.00 dB
PL13              20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023191 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P              215.000 ppm
F1              16211.50 Hz
F2P               -5.000 ppm
F2               -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42554 Hz/cm
```



16c



Current Data Parameters

NAME	Dec03-2010-Wein
EXPNO	10
PROCND	1

F2 - Acquisition Parameters

Date_	20101203
Time	19.34
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	322.5
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

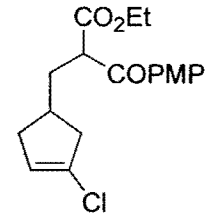
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

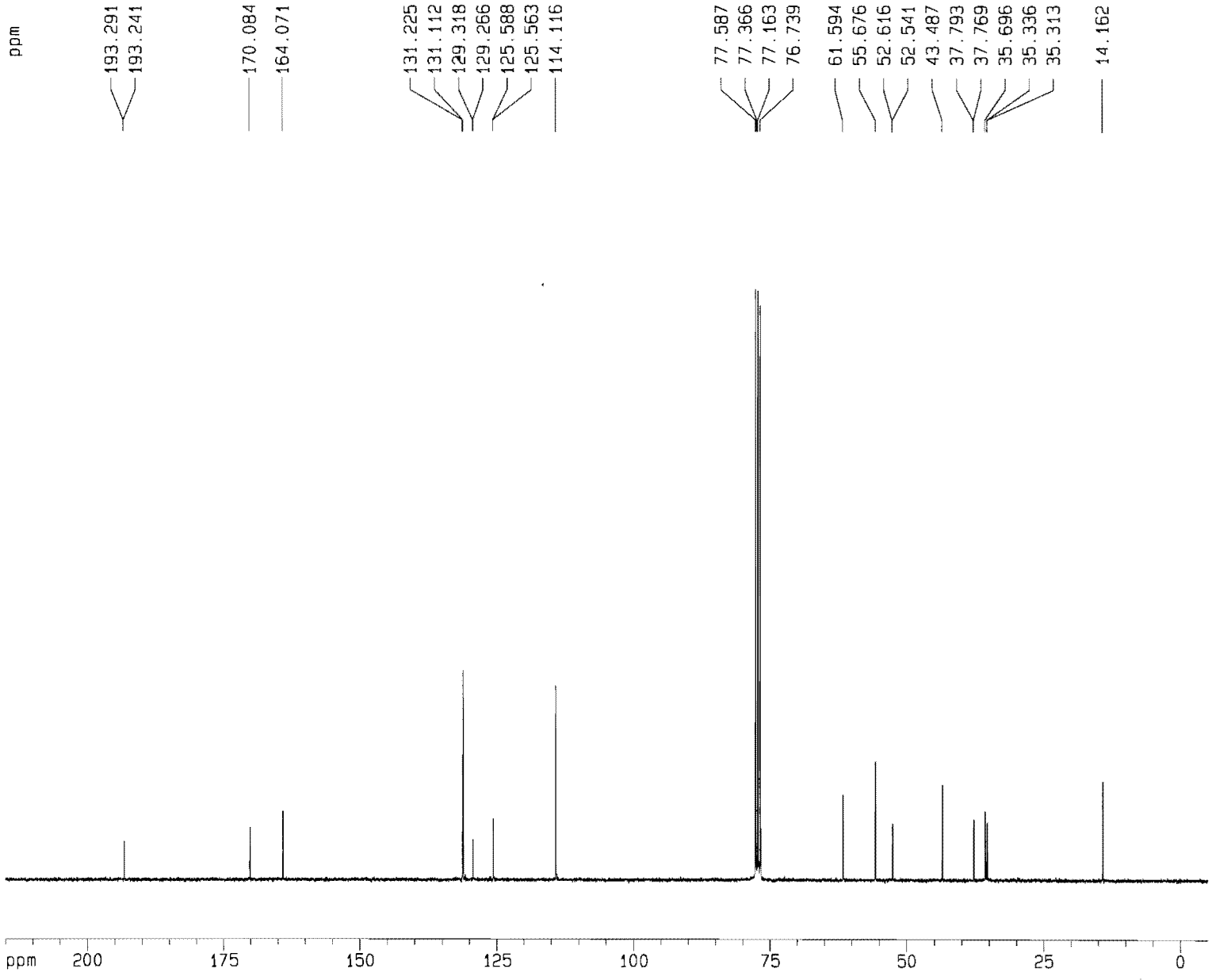
SI	32768
SF	299.8700294 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

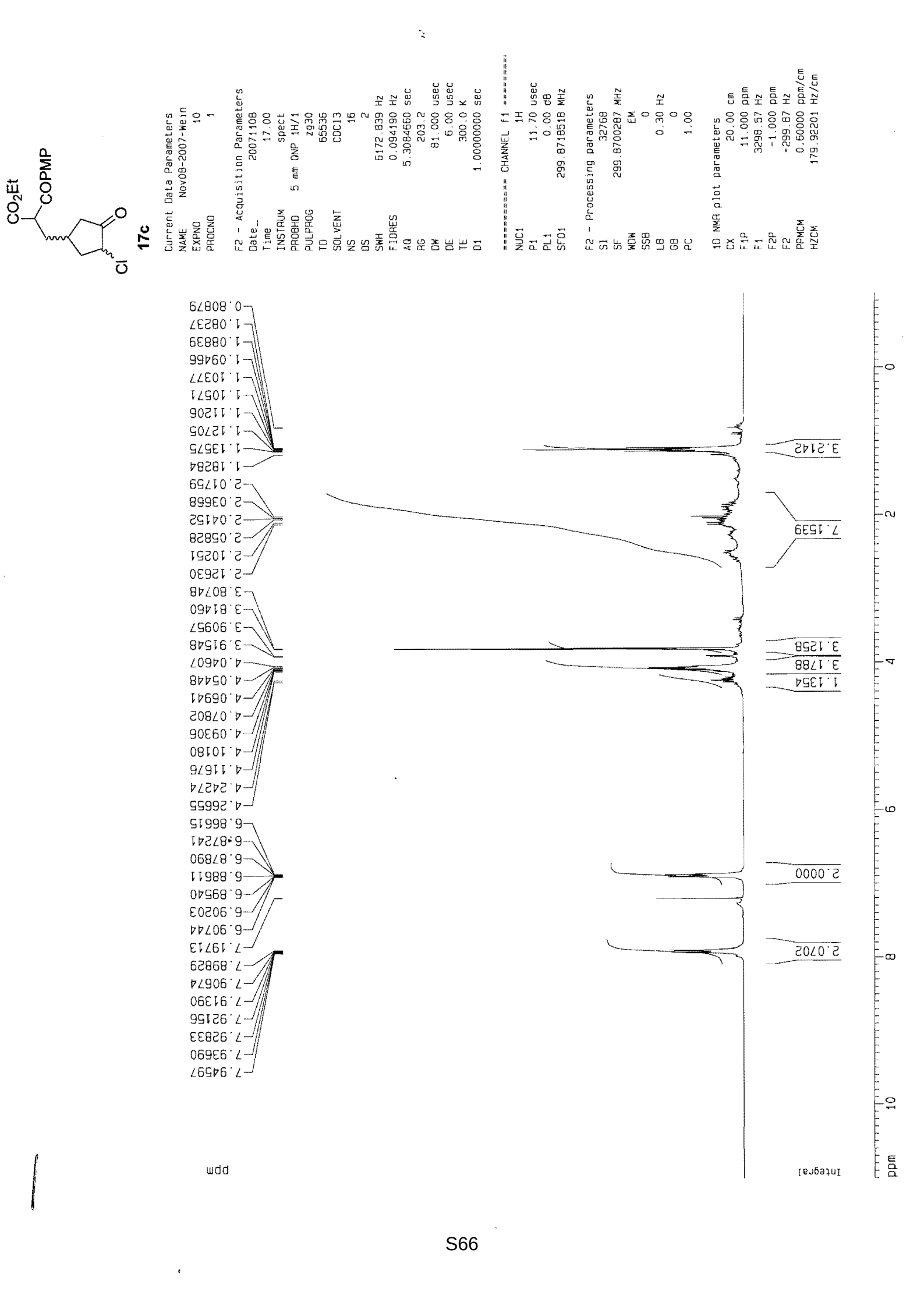
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

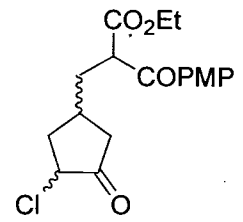


16c

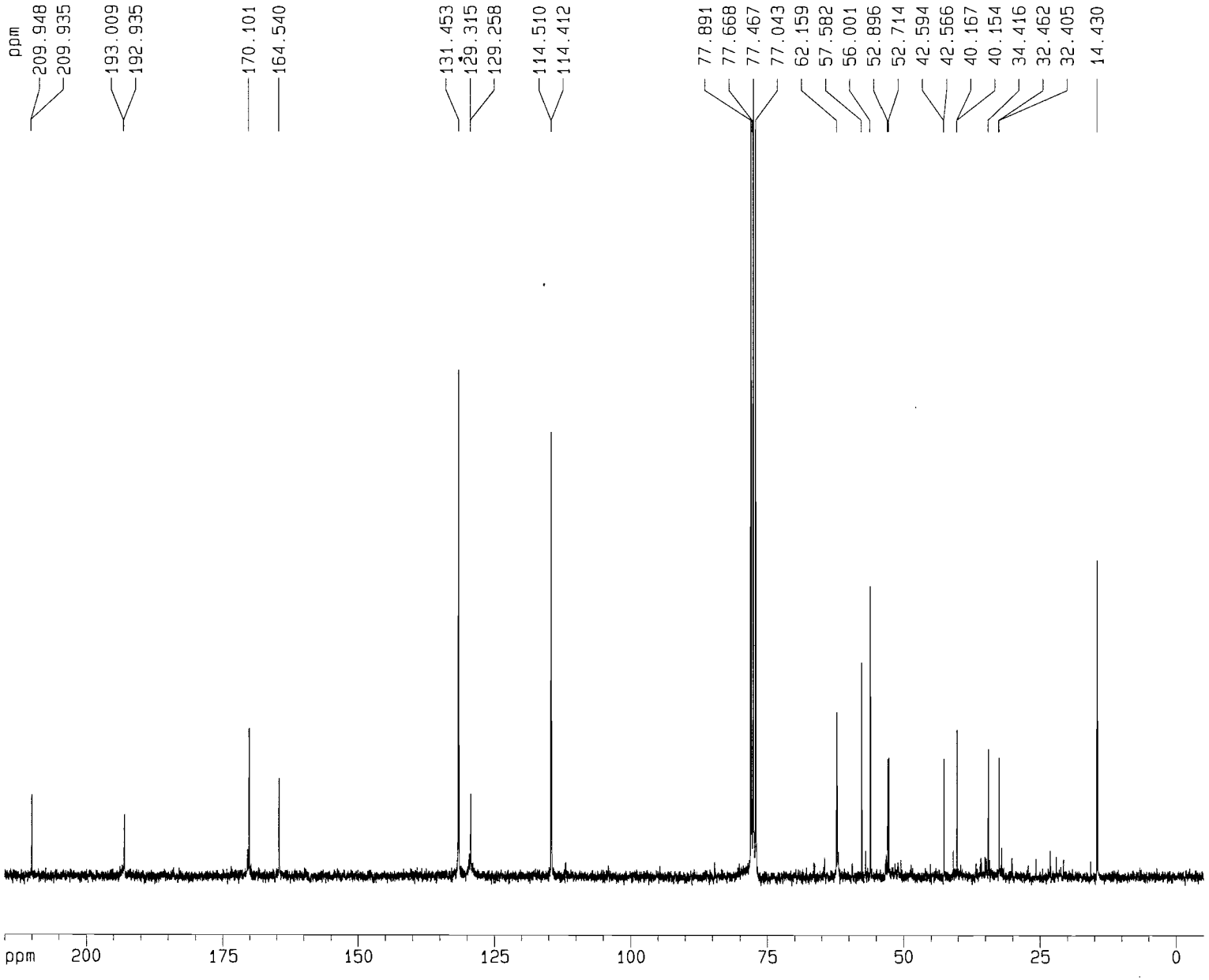



```
Current Data Parameters
NAME      Dec03-2010-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101203
Time               20.37
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                12867
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 8192
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023620 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1              16211.51 Hz
F2P              -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42596 Hz/cm
```


CO2Et
COPMP
O
Cl
17c
Current Data Parameters
NAME NovO8-2007-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071108
Time 17.00
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084650 sec
RG 203.2
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700287 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92201 Hz/cm
7.94597
7.93690
7.92833
7.92156
7.91390
7.90674
7.89829
7.19713
6.90744
6.90203
6.89540
6.88611
6.87890
6.87241
6.86615
4.26655
4.24274
4.11676
4.10180
4.09306
4.07802
4.06941
4.05448
4.04607
3.91548
3.90957
3.81460
3.80748
2.12630
2.10251
2.05828
2.04152
2.03668
2.01759
1.82884
1.13575
1.12705
1.11206
1.10571
1.10377
1.09466
1.08839
1.08237
0.80879
3.2142
7.1539
3.1258
3.1788
1.1354
2.0000
2.0702
ppm
Integral



17c



Current Data Parameters

NAME	Nov08-2007-Wein
EXPNO	12
PROCNO	1

F2 - Acquisition Parameters

Date_	20071108
Time	17.23
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	4314
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	4096
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

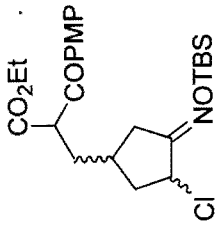
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

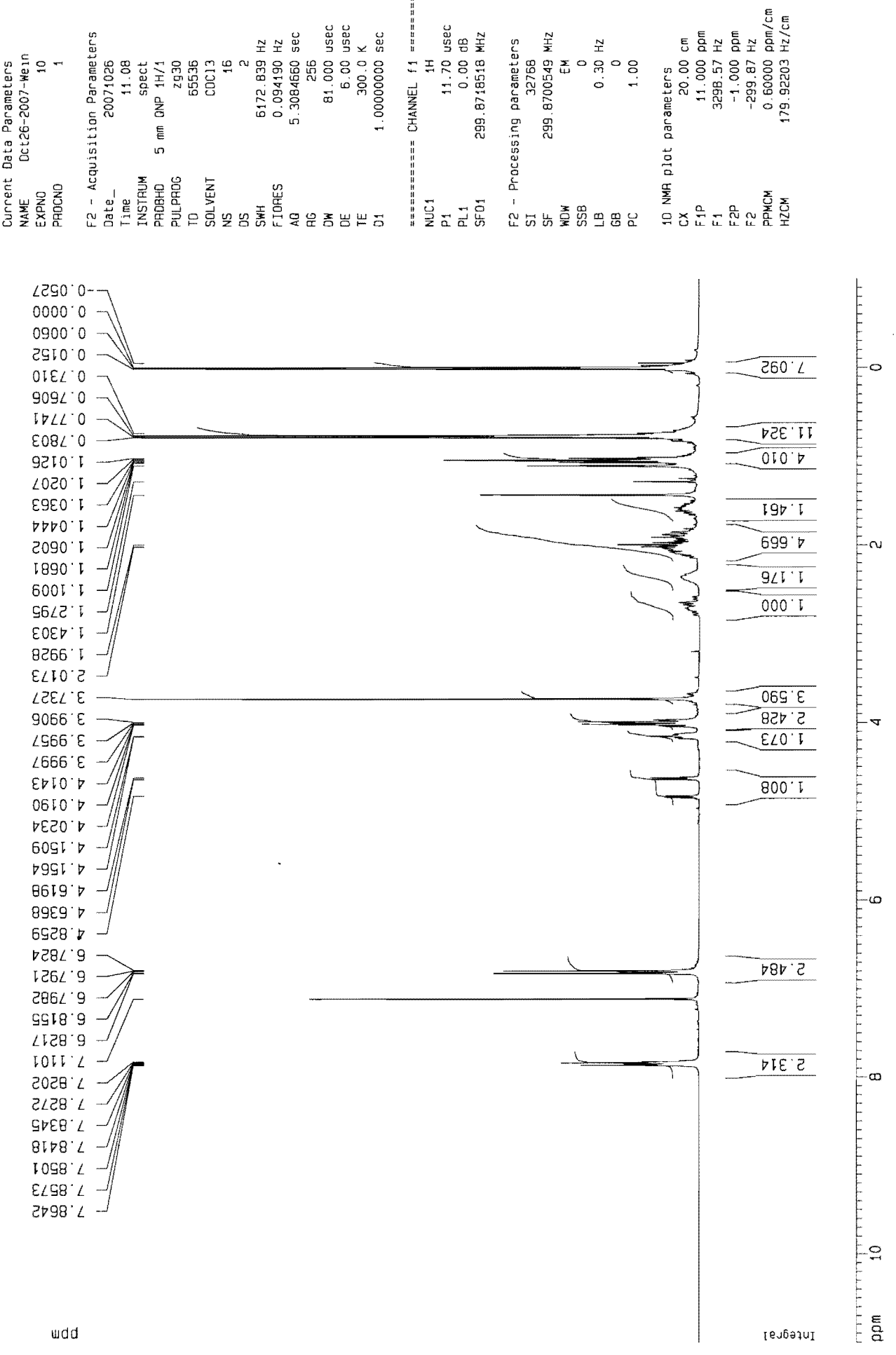
SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

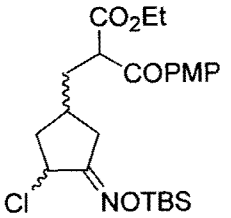
1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm

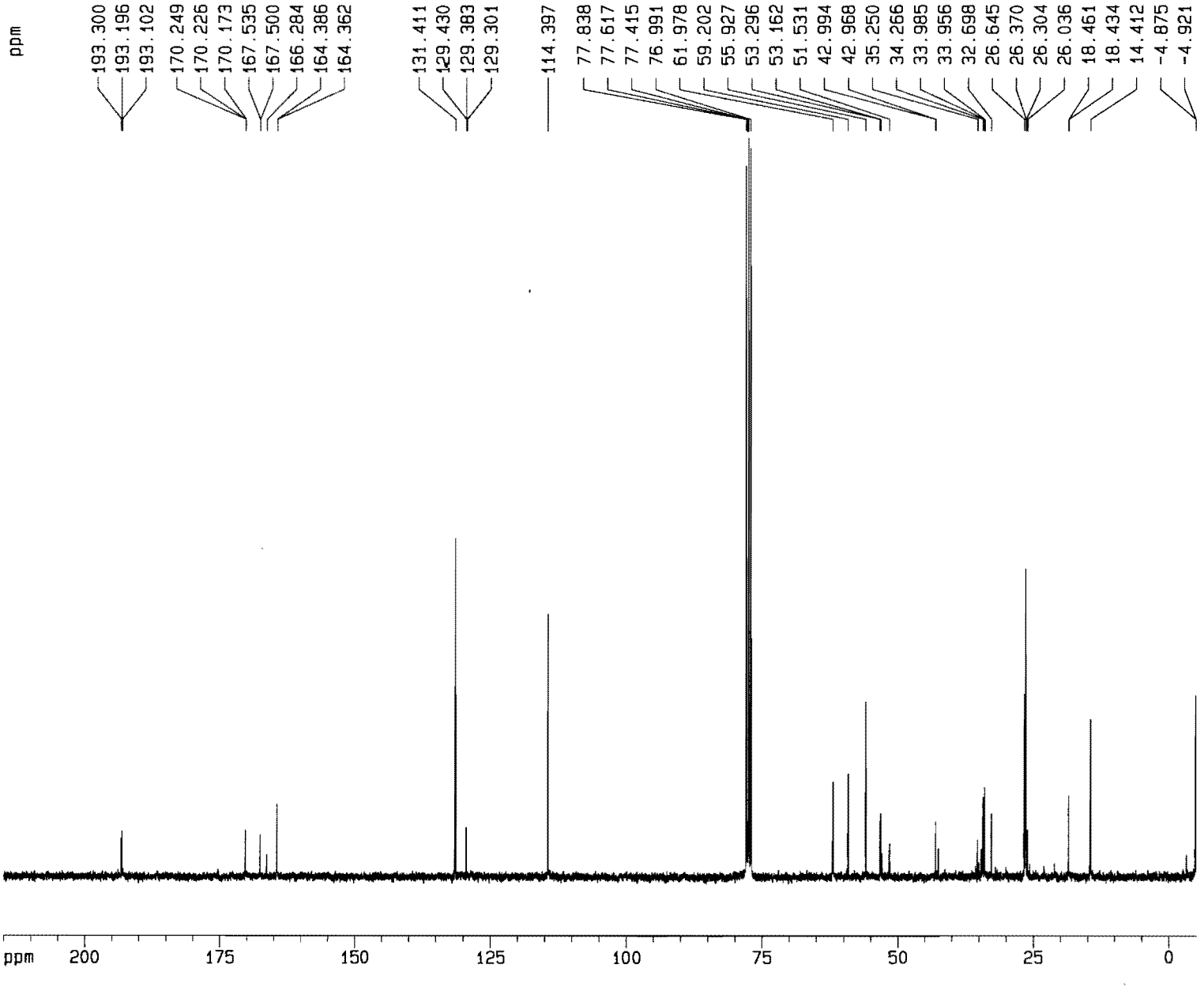

CO2Et
COPMP
NOTBS
Cl

18c


Current Data Parameters
NAME Oct26-2007-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20071026
Time 11.08
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 256
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SF01 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700549 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92203 Hz/cm
7.092
11.324
4.010
1.461
4.669
1.176
1.000
3.590
2.428
1.073
1.008
2.484
2.314
Integral
ppm



18c



Current Data Parameters

NAME	Nov19-2007-Wein
EXPNO	12
PROCNO	1

F2 - Acquisition Parameters

Date_	20071119
Time	17.51
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	2602
DS	4
SWH	18832.393 Hz
FIDRES	0.287360 Hz
AQ	1.7400308 sec
RG	11585.2
DW	26.550 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
d11	0.03000000 sec
d12	0.00002000 sec

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

NUC1	13C
P1	11.80 usec
PL1	0.00 dB
SFO1	75.4760200 MHz

========== CHANNEL f2 ==========

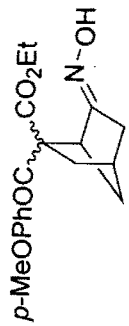
CPDPRG2	waltz16
NUC2	1H
PCPD2	110.00 usec
PL2	0.00 dB
PL12	17.50 dB
PL13	17.50 dB
SFO2	300.1312005 MHz

F2 - Processing parameters

SI	32768
SF	75.4677190 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

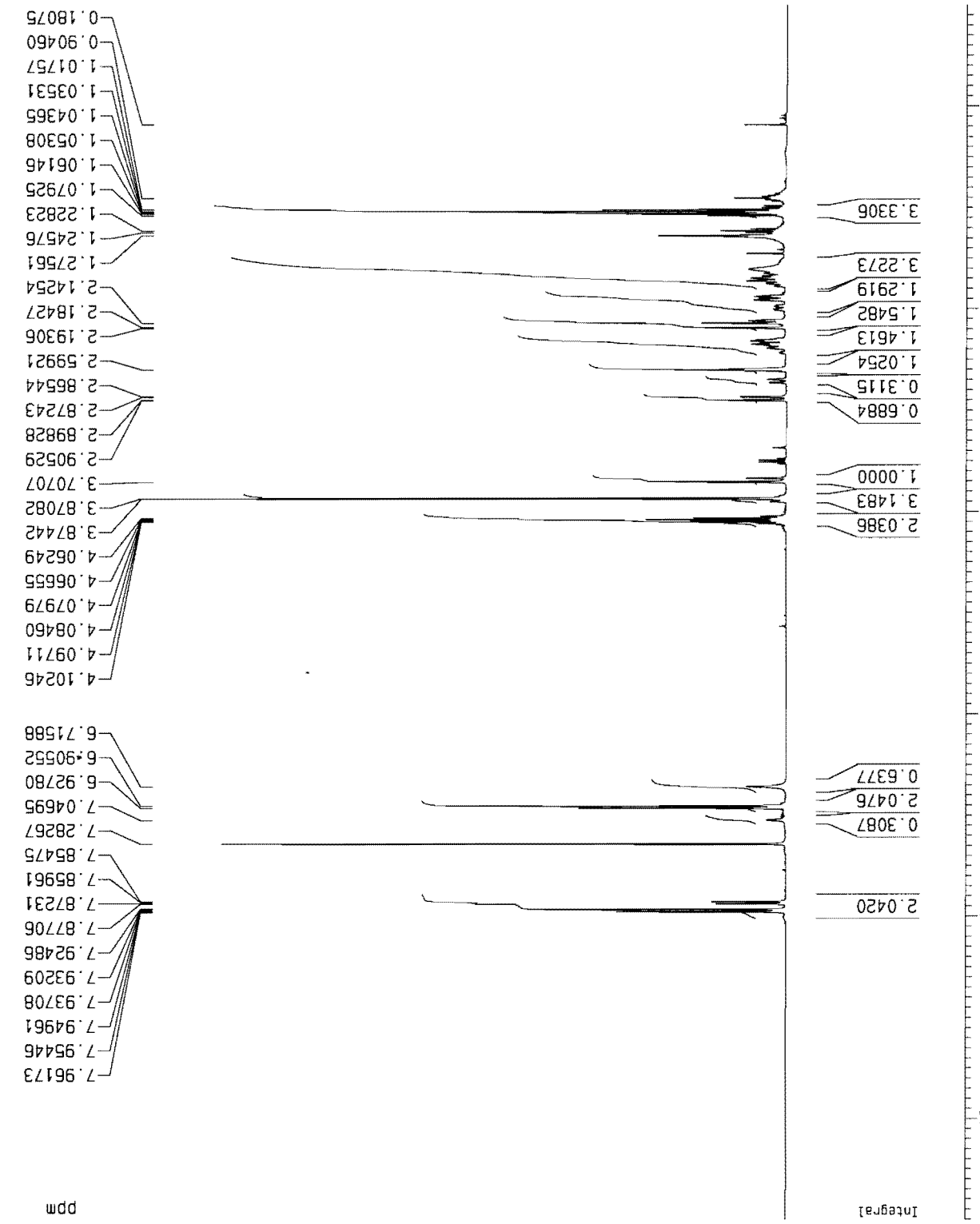
1D NMR plot parameters

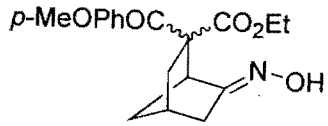
CX	20.00 cm
F1P	215.000 ppm
F1	16225.56 Hz
F2P	-5.000 ppm
F2	-377.34 Hz
PPMCM	11.00000 ppm/cm
HZCM	830.14490 Hz/cm



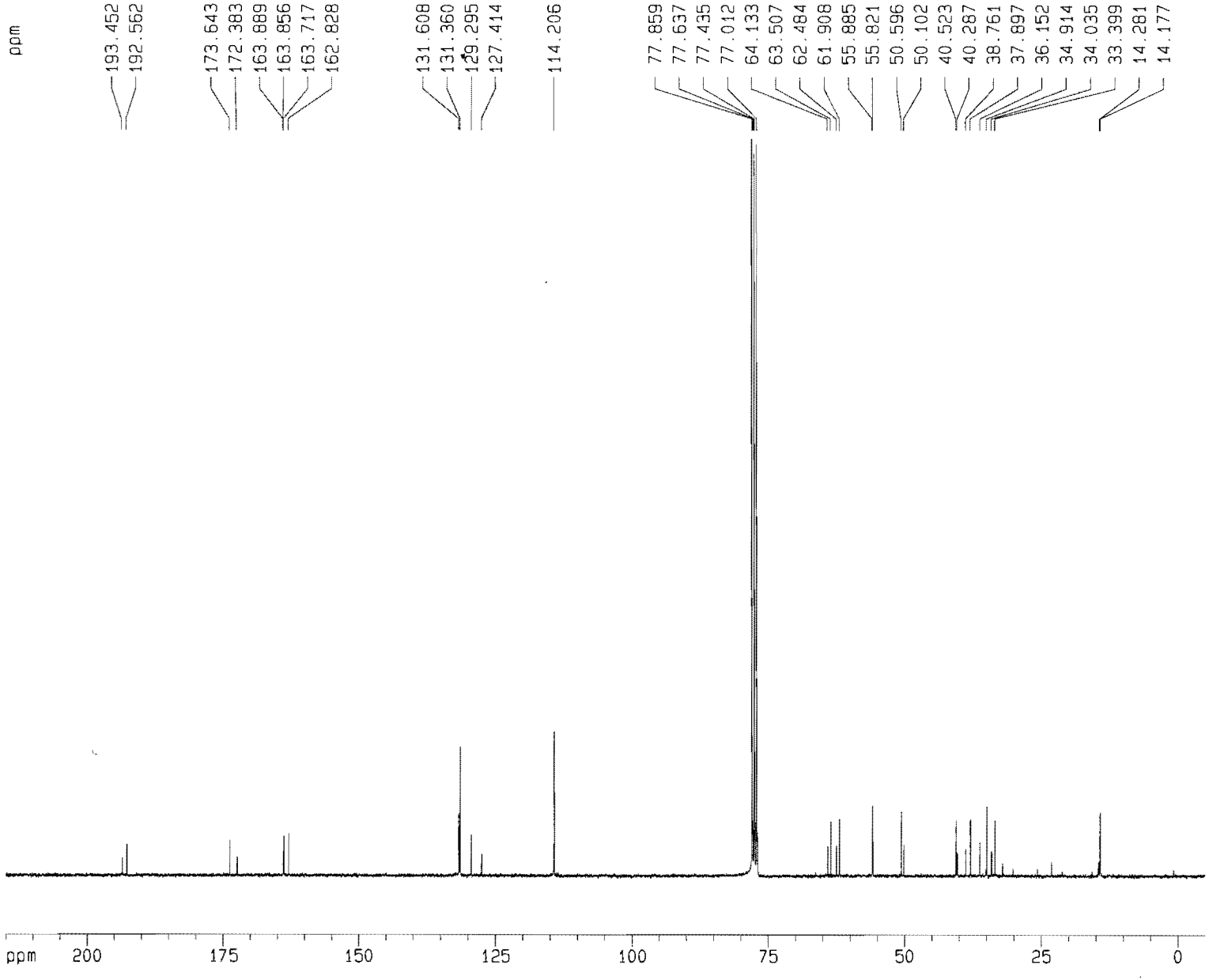
25

```
Current Data Parameters
NAME          PKII-38
EXPNO               1
PROCNO              1

F2 - Acquisition Parameters
Date_        20071029
Time            21.29
INSTRUM          spect
PROBHD   5 mm BBI 1H-B
PULPROG          zg30
TD              65536
SOLVENT         CDCl3
NS                500
DS                  2
SWH          8278.146 Hz
FIDRES       0.126314 Hz
AQ           3.9584243 sec
RG                512
DW            60.400 usec
DE             6.00 usec
TE             300.0 K
D1          1.00000000 sec

========== CHANNEL f1 ========
NUC1              1H
P1             6.45 usec
PL1            0.00 dB
SFO1     400.1324710 MHz

F2 - Processing parameters
SI               32768
SF       400.1300000 MHz
WDW                 EM
SSB                  0
LB            0.30 Hz
GB                   0
PC                1.00

1D NMR plot parameters
CX            20.00 cm
F1P           11.000 ppm
F1          4401.43 Hz
F2P           -1.000 ppm
F2          -400.13 Hz
PPMCM         0.60000 ppm/cm
HZCM        240.07800 Hz/cm
```





25



Current Data Parameters

NAME	Nov26-2007-Wein
EXPNO	12
PROCNO	1

F2 - Acquisition Parameters

Date_	20071126
Time	22.43
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	10744
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	2048
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

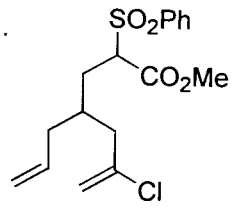
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

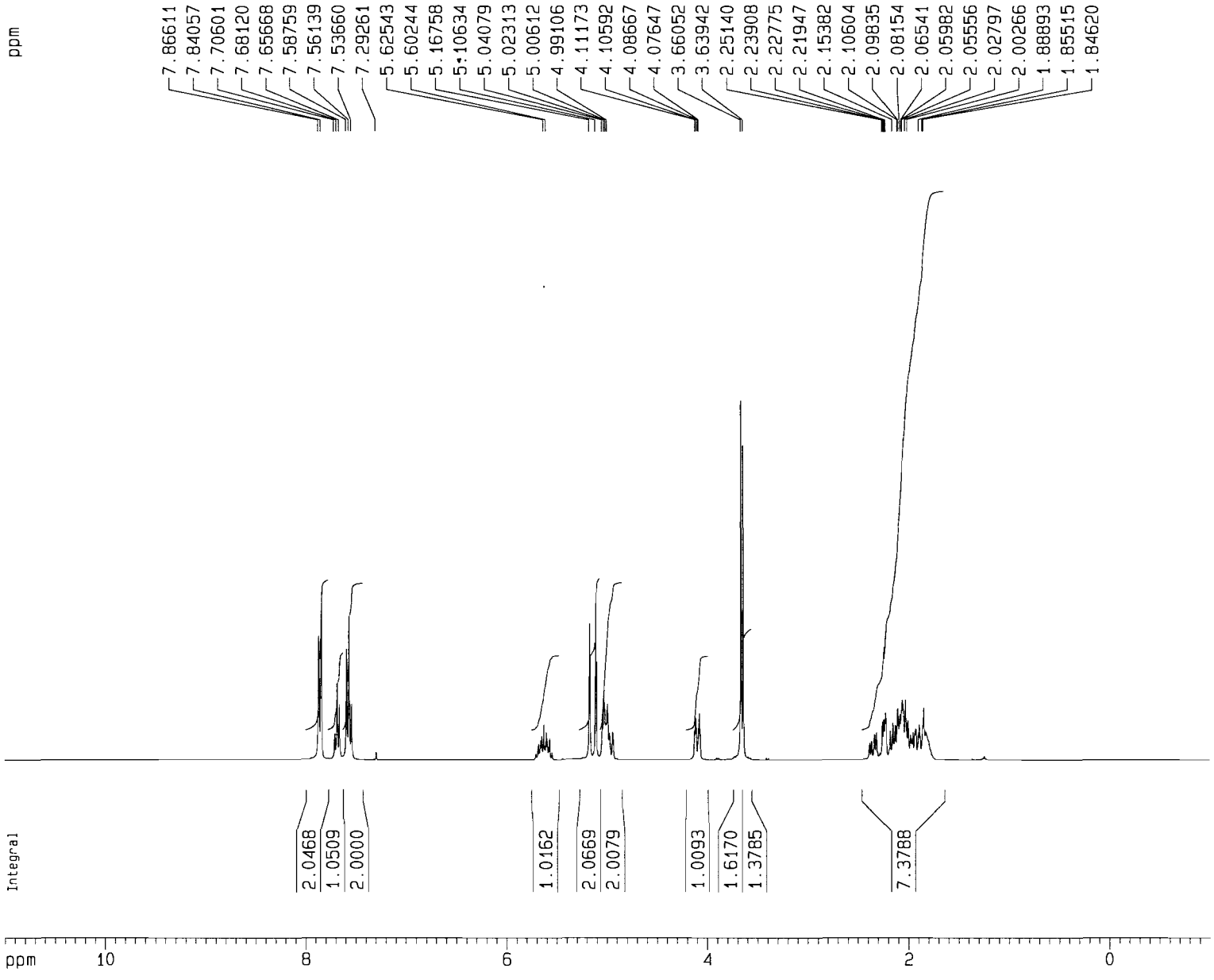
SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm



15d



Current Data Parameters

NAME	Jun25-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100625
Time	17.27
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIORES	0.094190 Hz
AQ	5.3084660 sec
RG	45.3
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

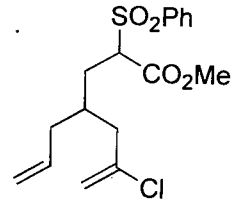
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

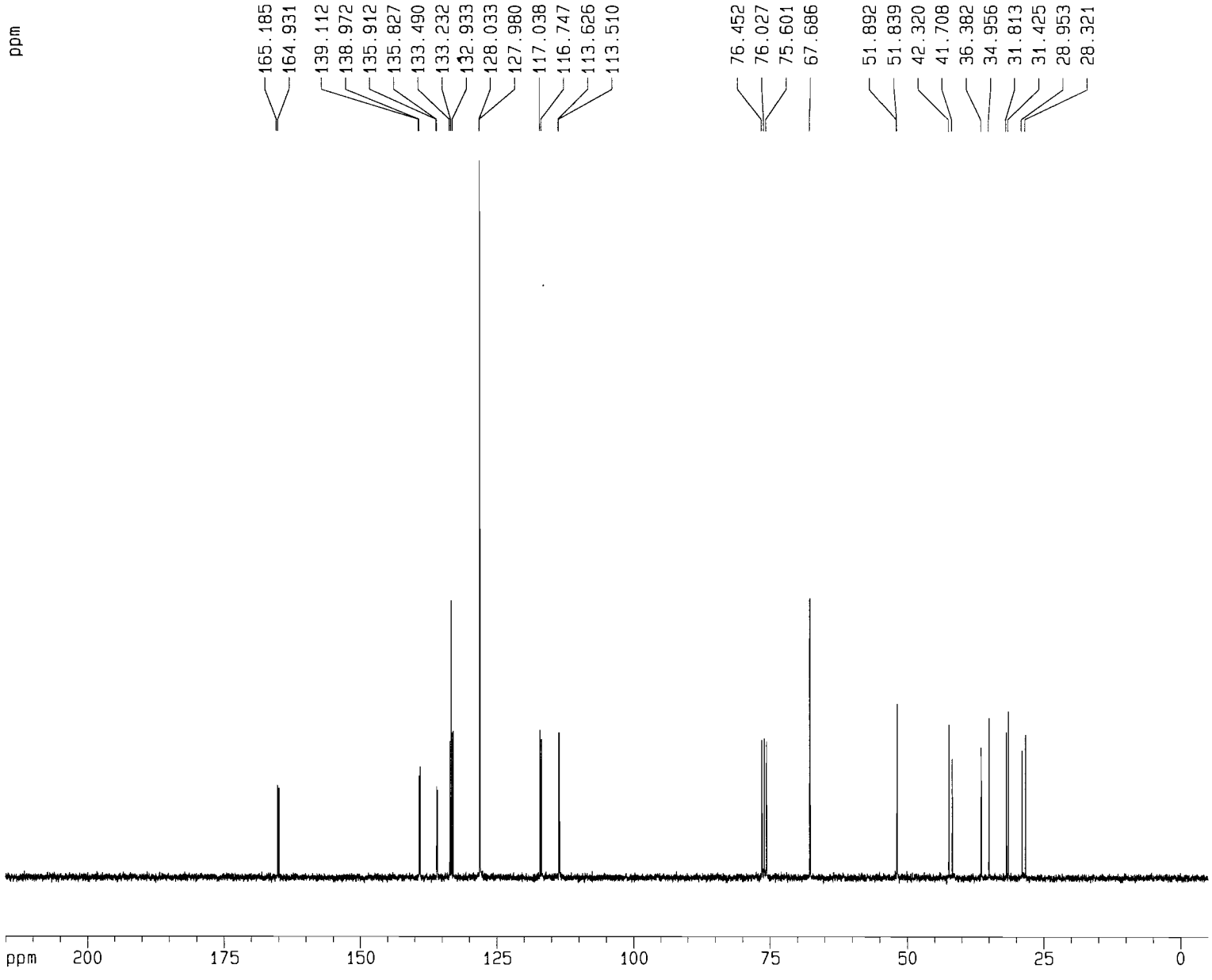
SI	32768
SF	299.8700000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92200 Hz/cm



15d



Current Data Parameters

NAME	Jun25-2010-Wein
EXPNO	11
PROCNO	1

F2 - Acquisition Parameters

Date_	20100625
Time	17.35
INSTRUM	spect
PROBHD	5 mm GNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	74
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	1024
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

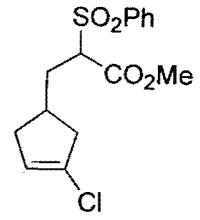
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

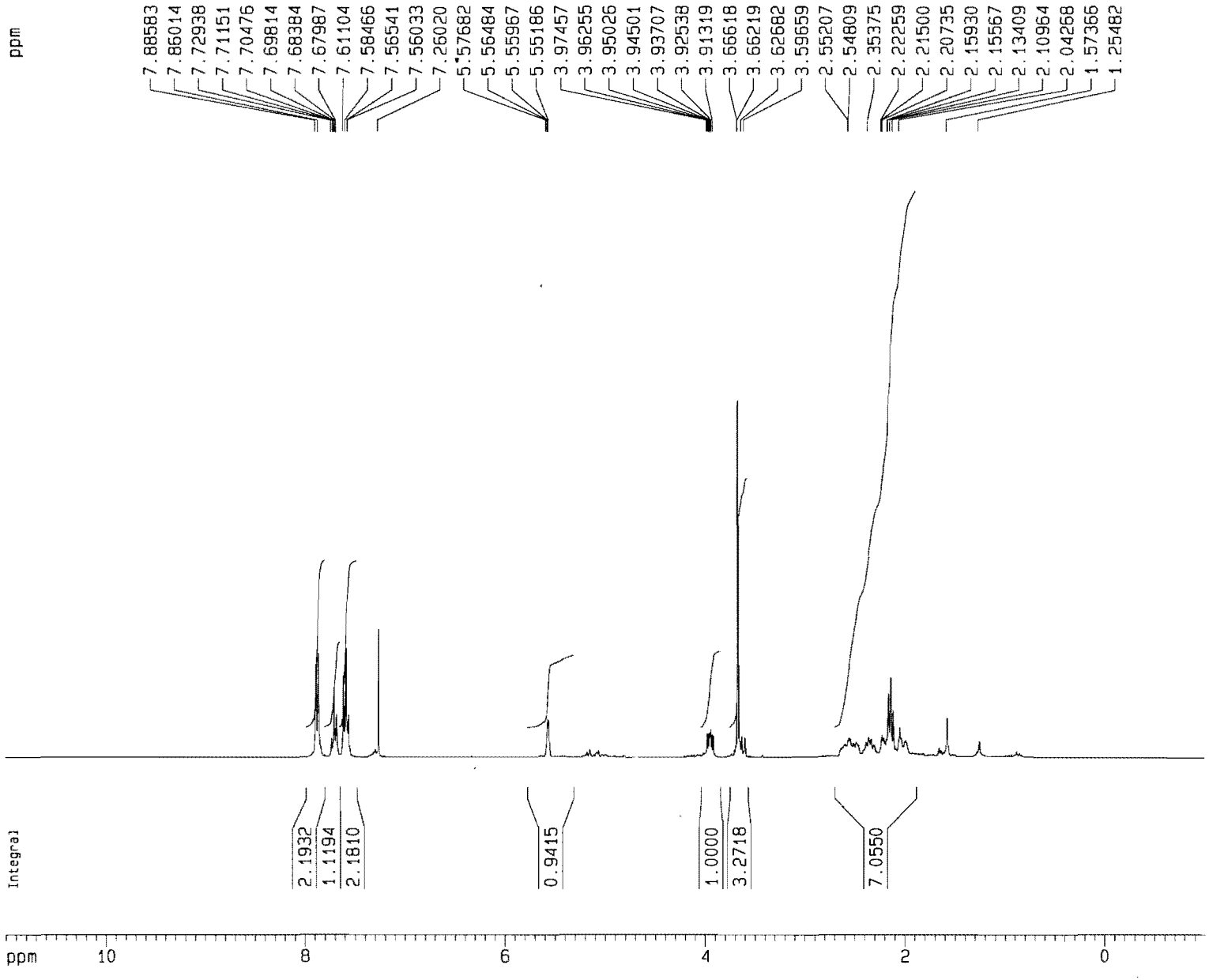
SI	32768
SF	75.4024598 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.53 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42706 Hz/cm



16d



Current Data Parameters

NAME	Oct16-2010-Wein
EXPNO	20
PROCNO	1

F2 - Acquisition Parameters

Date_	20101016
Time	17.35
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	456.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

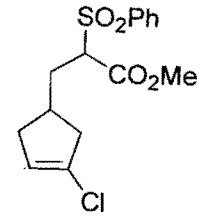
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

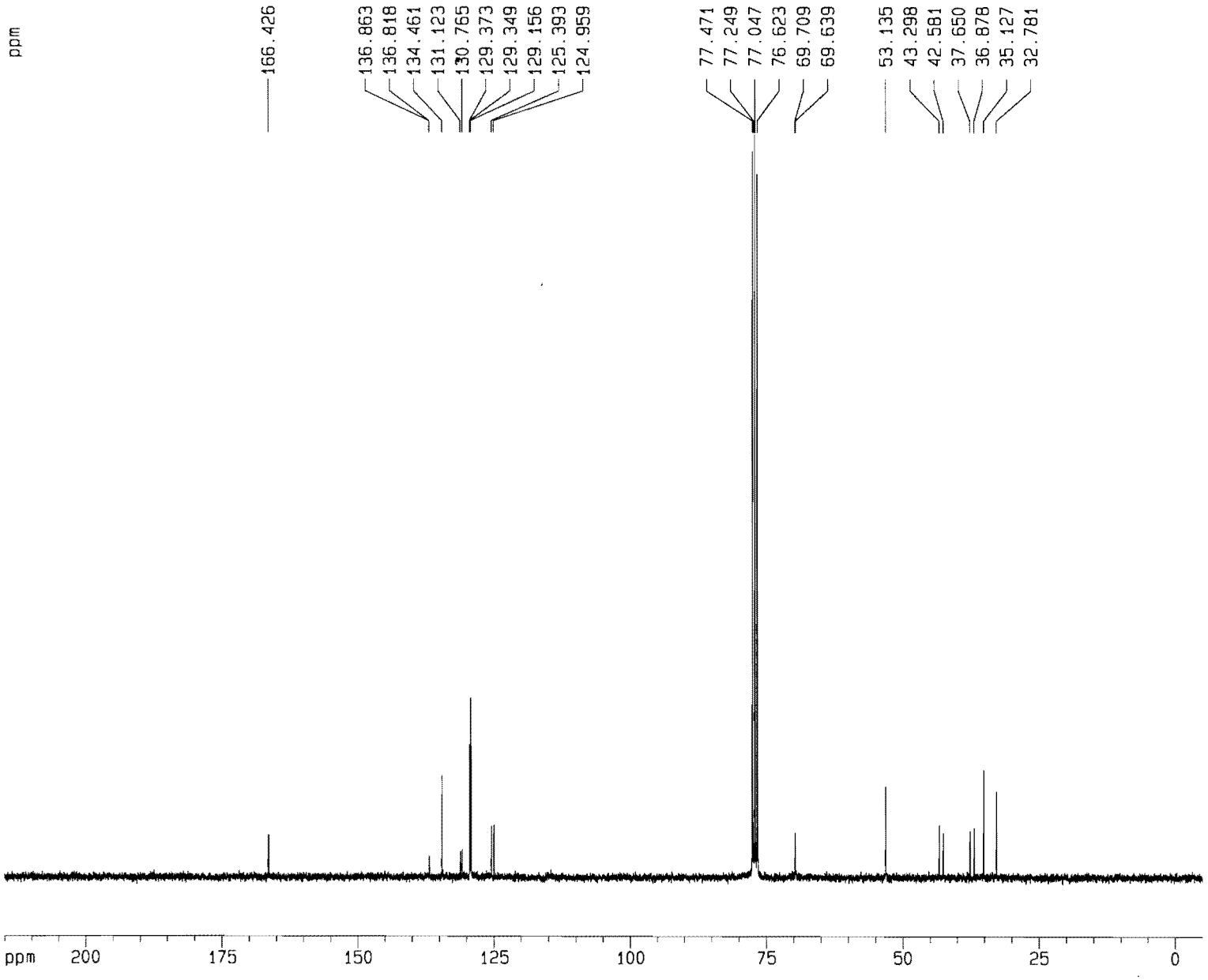
SI	32768
SF	299.8700099 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

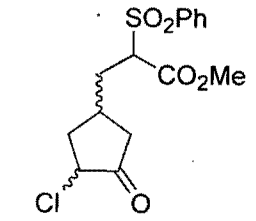
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92200 Hz/cm



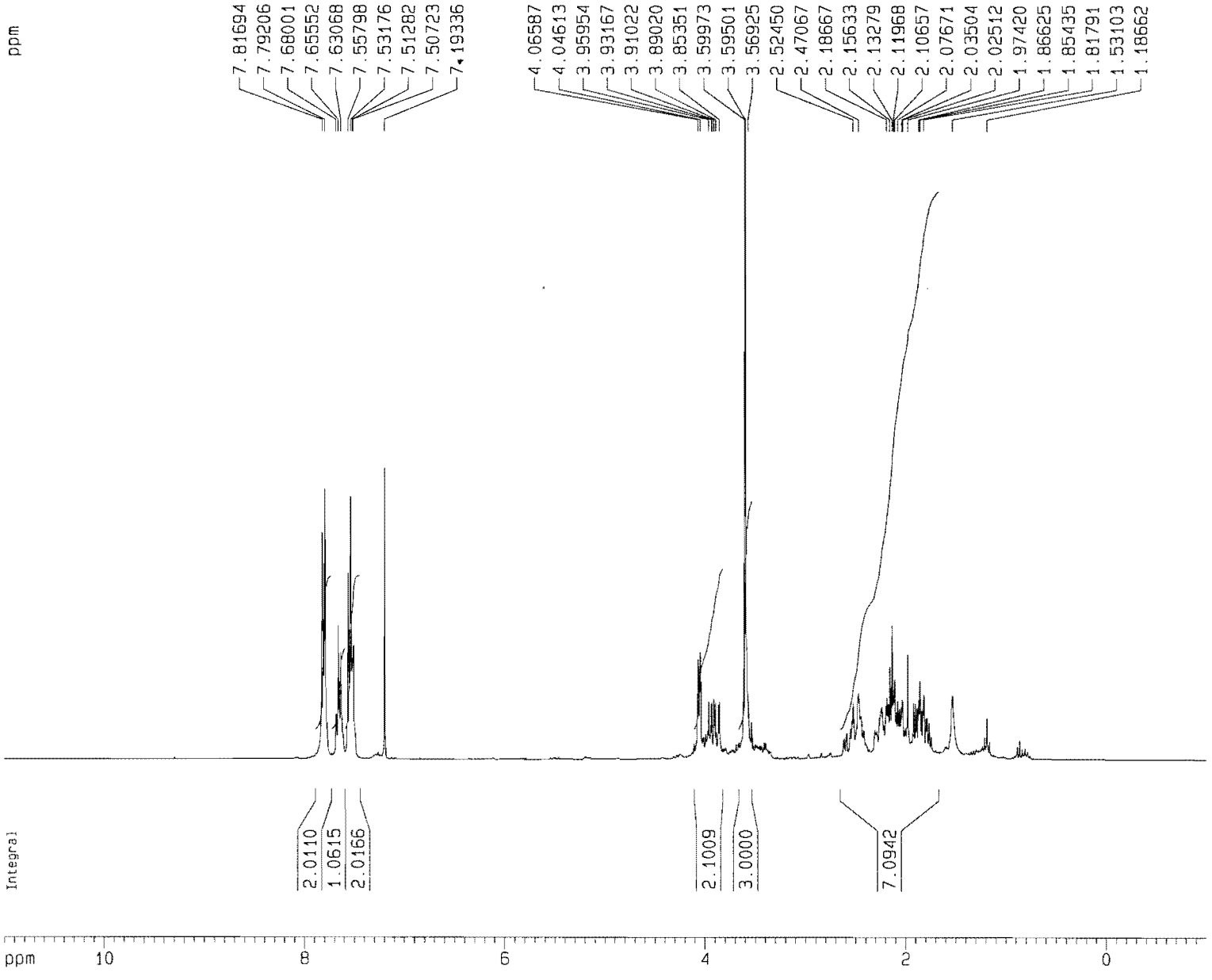
16d



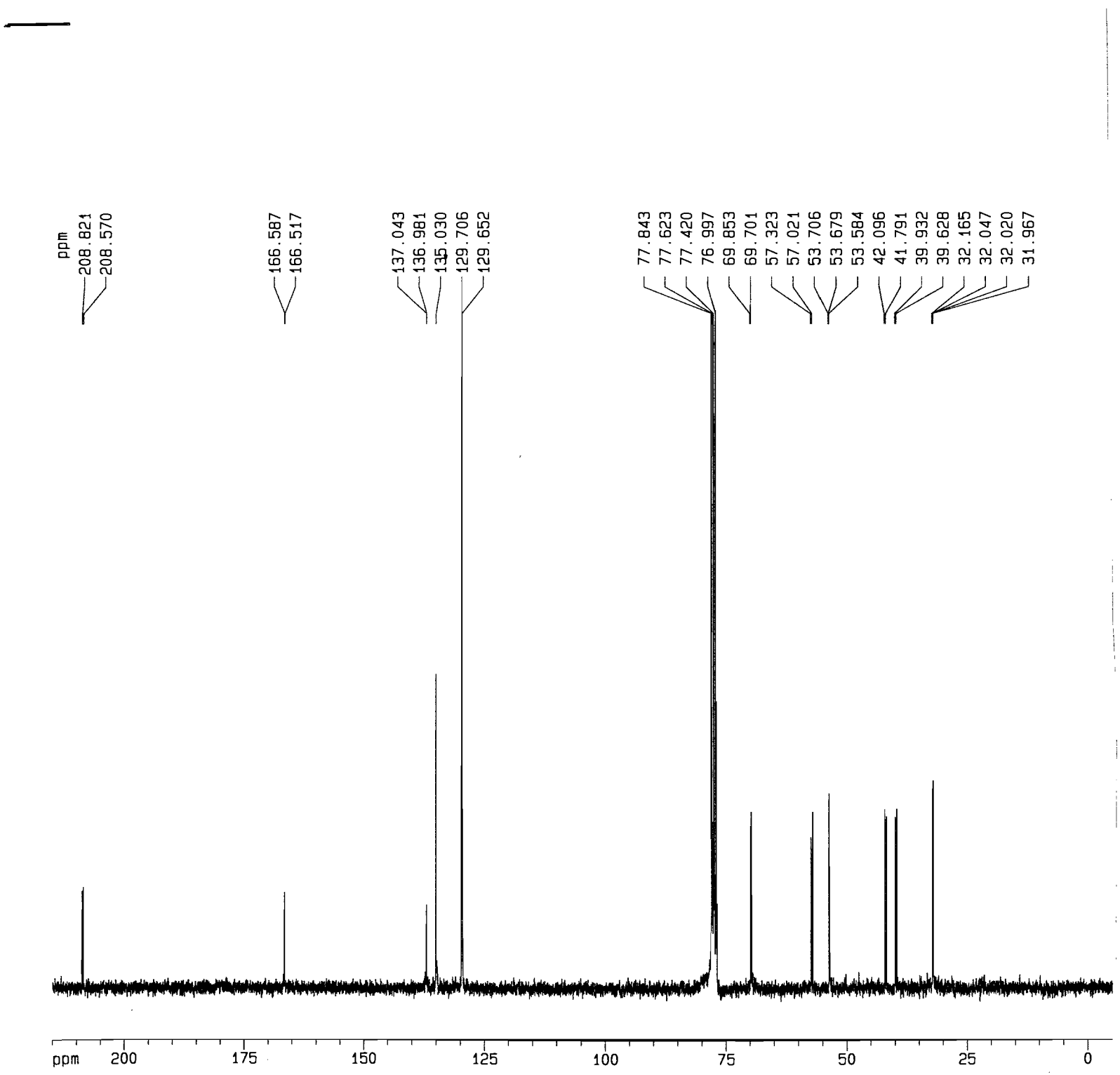

```
Current Data Parameters
NAME      Oct16-2010-Wein
EXPNO                 22
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101016
Time               18.36
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1760
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                  1024
DW              26.600 usec
DE               6.00 usec
TE              300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1               5.40 usec
PL1              -6.00 dB
SFO1        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2       299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023707 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               215.000 ppm
F1              16211.51 Hz
F2P                -5.000 ppm
F2               -377.01 Hz
PPMCM           11.00000 ppm/cm
HZCM          829.42615 Hz/cm
```

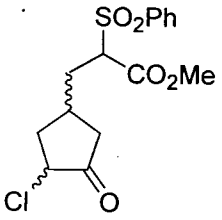


17d




```
Current Data Parameters
NAME      Jun30-2010-Wein
EXPNO                 30
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100630
Time               17.31
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ              5.3084660 sec
RG                   362
DW                81.000 usec
DE                 6.00 usec
TE                300.0 K
D1             1.00000000 sec

============ CHANNEL f1 =========
NUC1                  1H
P1                 11.70 usec
PL1                 0.00 dB
SFO1          299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700299 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
F1P                11.000 ppm
F1                 3298.57 Hz
F2P                -1.000 ppm
F2                 -299.87 Hz
PPMCM           0.60000 ppm/cm
HZCM          179.92201 Hz/cm
```





17d

Current Data Parameters

NAME	Jun30-2010-Wein
EXPNO	30
PROCNO	1

F2 - Acquisition Parameters

Date_	20100630
Time	19.14
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	13525
DS	4
SWH	18832.393 Hz
FIDRES	0.287360 Hz
AQ	1.7400308 sec
RG	11585.2
DW	26.550 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
d11	0.03000000 sec
d12	0.00002000 sec

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

NUC1	13C
P1	11.80 usec
PL1	0.00 dB
SFO1	75.4760200 MHz

========== CHANNEL f2 ==========

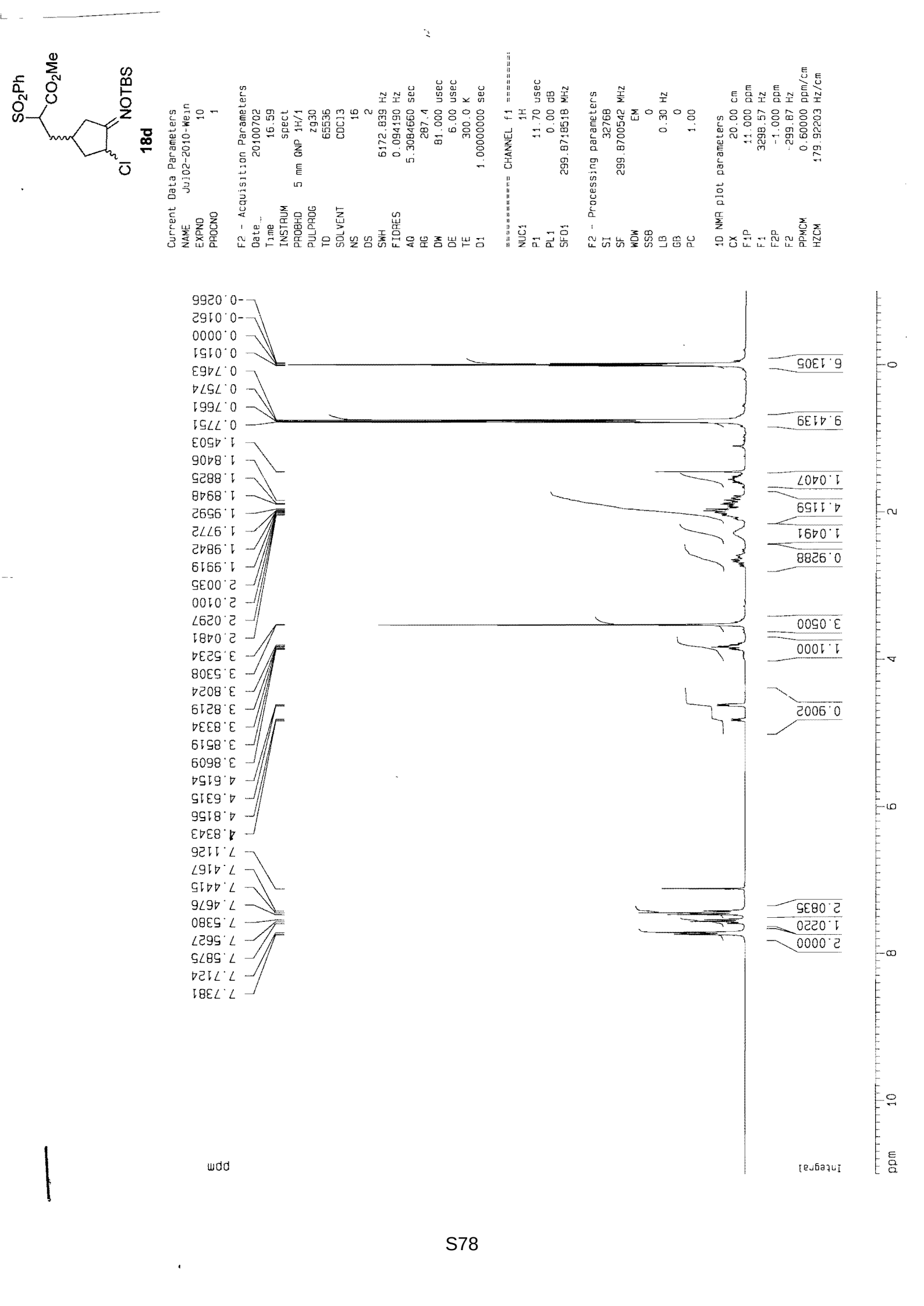
CPDPRG2	waltz16
NUC2	1H
PCPD2	110.00 usec
PL2	0.00 dB
PL12	17.50 dB
PL13	17.50 dB
SFO2	300.1312005 MHz

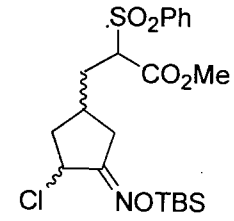
F2 - Processing parameters

SI	32768
SF	75.4677190 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

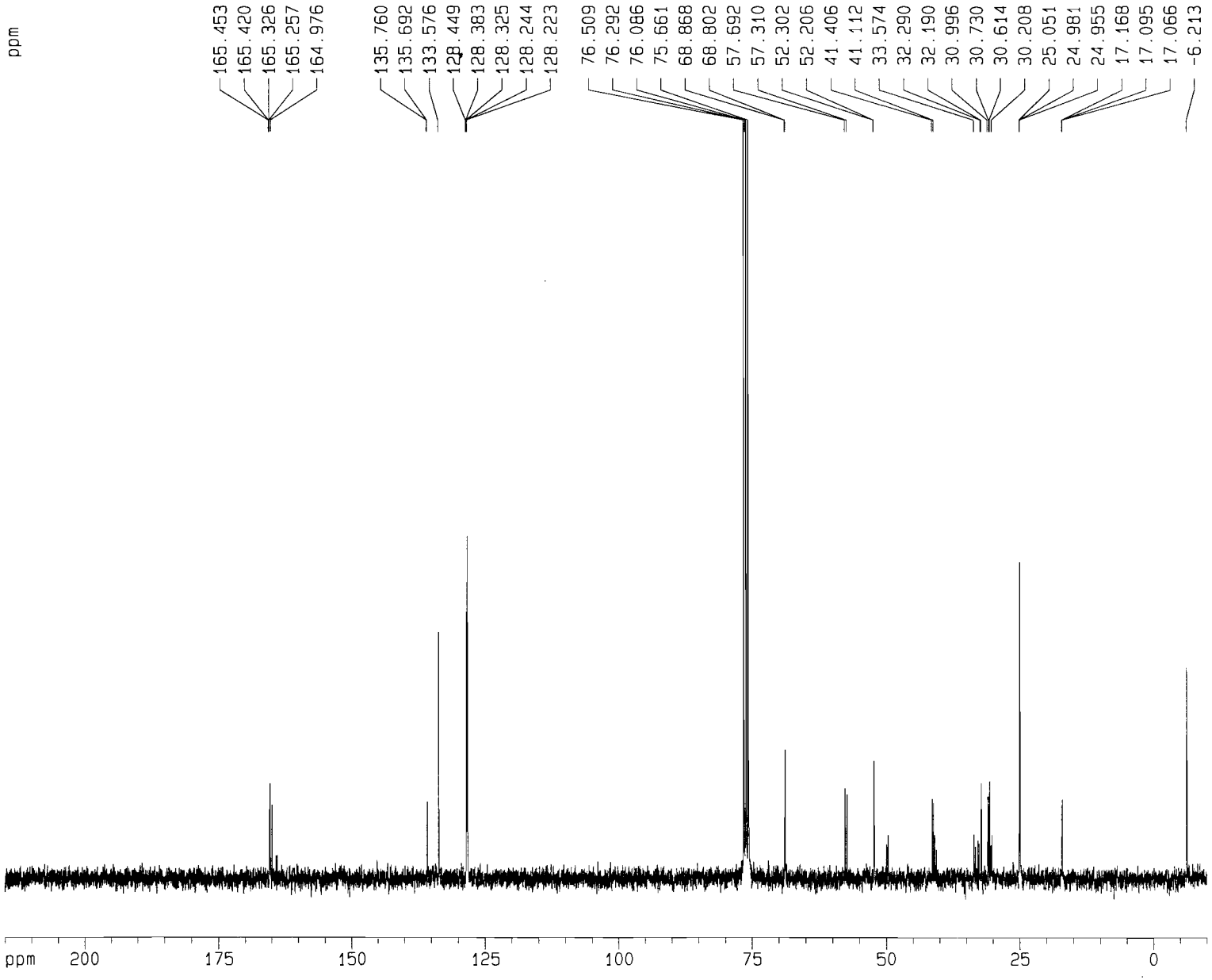
1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16225.56 Hz
F2P	-5.000 ppm
F2	-377.34 Hz
PPMCM	11.00000 ppm/cm
HZCM	830.14490 Hz/cm


SO2Ph
CO2Me
NOTBS
Cl
18d
Current Data Parameters
NAME Jul02-2010-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100702
Time 16.59
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 287.4
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700542 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92203 Hz/cm
-0.0266
-0.0162
0.0000
0.0151
0.7463
0.7574
0.7661
0.7751
1.4503
1.8406
1.8825
1.8948
1.9592
1.9772
1.9842
1.9919
2.0035
2.0100
2.0297
2.0481
3.5234
3.5308
3.8024
3.8219
3.8334
3.8519
3.8609
4.6154
4.6315
4.8156
4.8343
7.1126
7.4167
7.4415
7.4676
7.5380
7.5627
7.5875
7.7124
7.7381
6.1305
9.4139
1.0407
4.1159
1.0491
0.9288
3.0500
1.1000
0.9002
2.0835
1.0220
2.0000
ppm
Integral



18d



Current Data Parameters

NAME	Jul02-2010-Wein
EXPNO	12
PROCNO	1

F2 - Acquisition Parameters

Date_	20100702
Time	17.49
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	8192
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

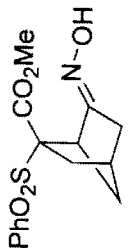
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

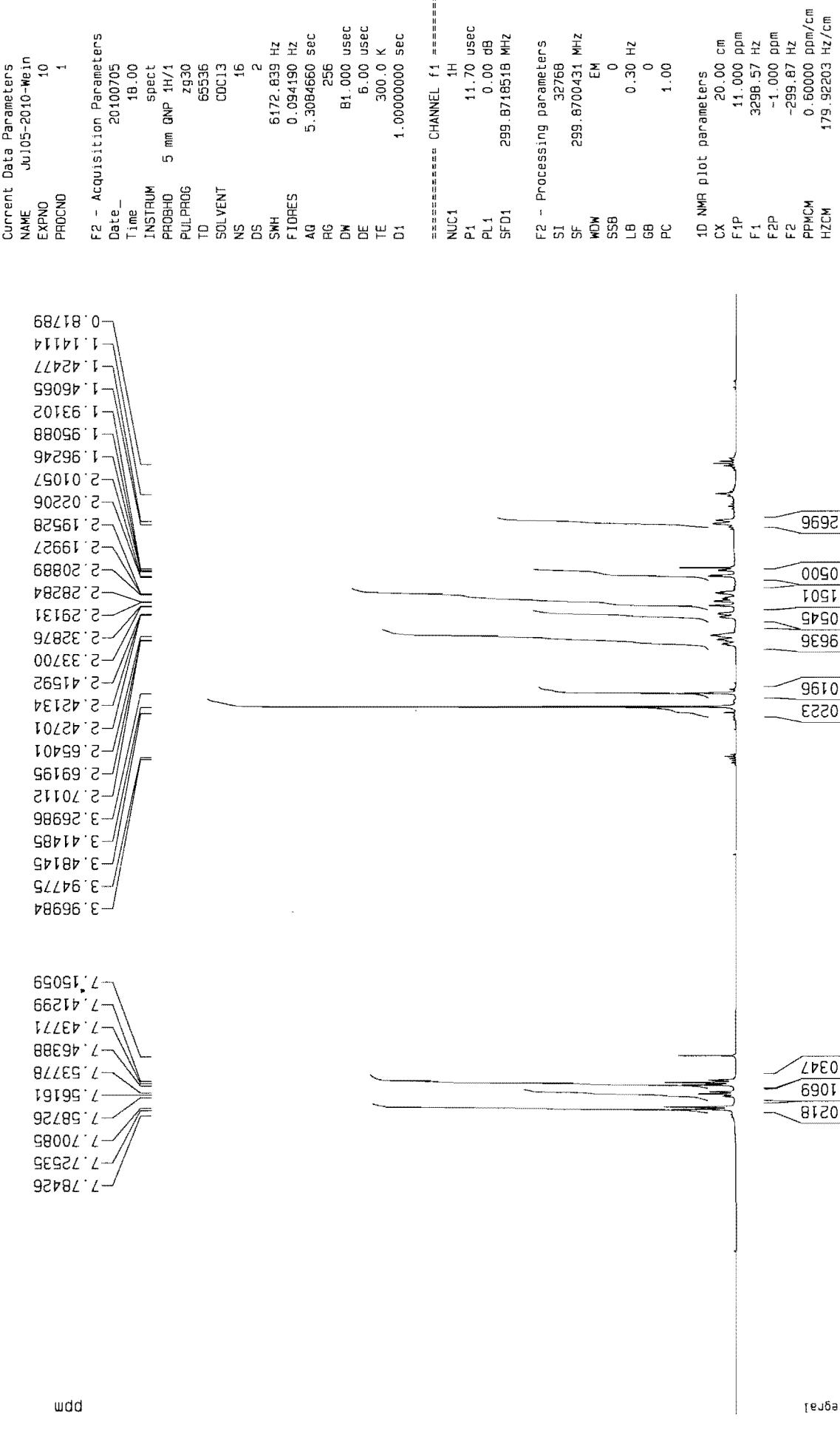
SI	32768
SF	75.4024435 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

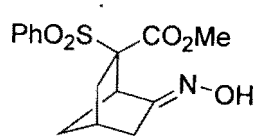
1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.52 Hz
F2P	-10.000 ppm
F2	-754.03 Hz
PPMCM	11.25000 ppm/cm
HZCM	848.27747 Hz/cm

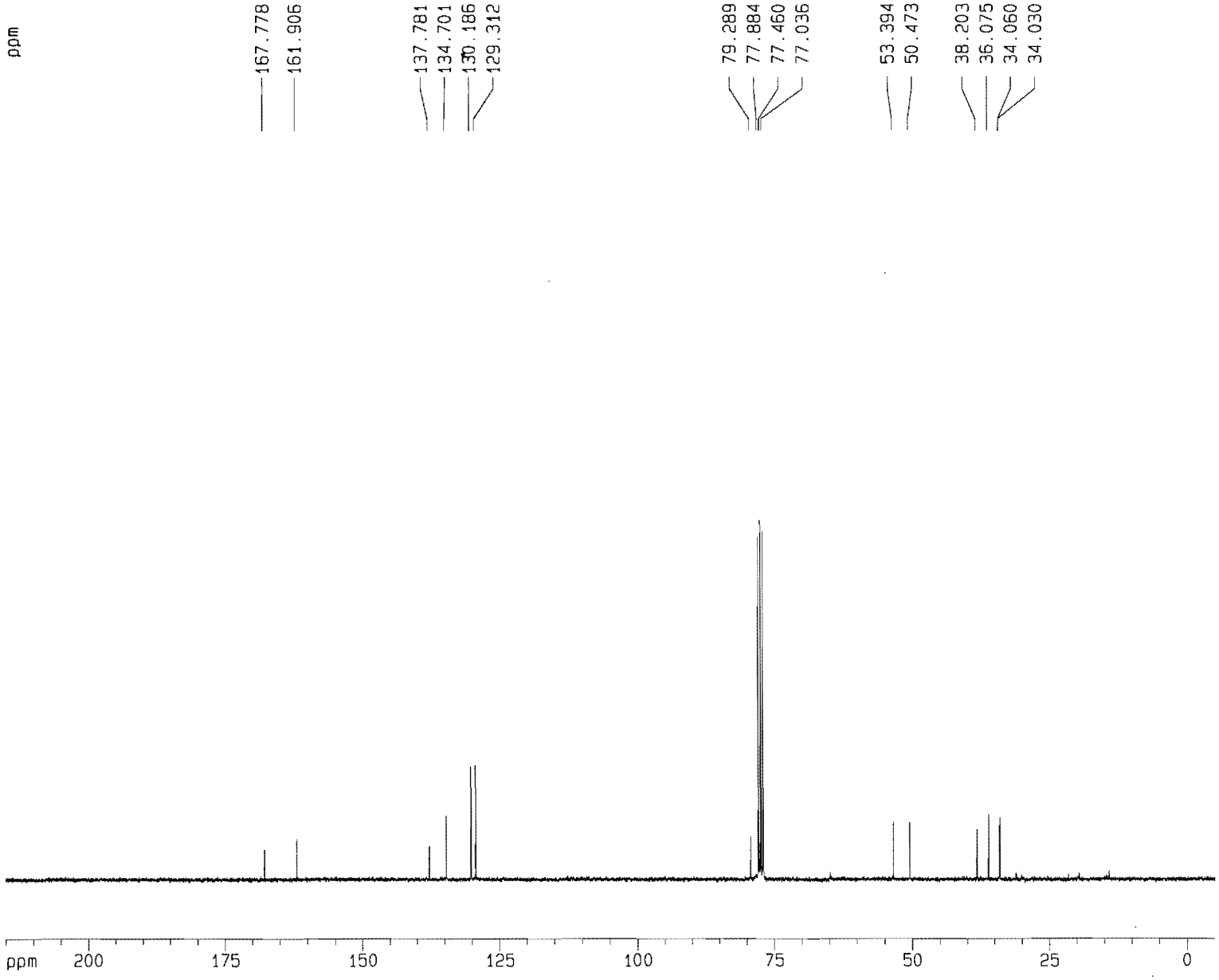

PhO2S
CO2Me
N-OH

22a

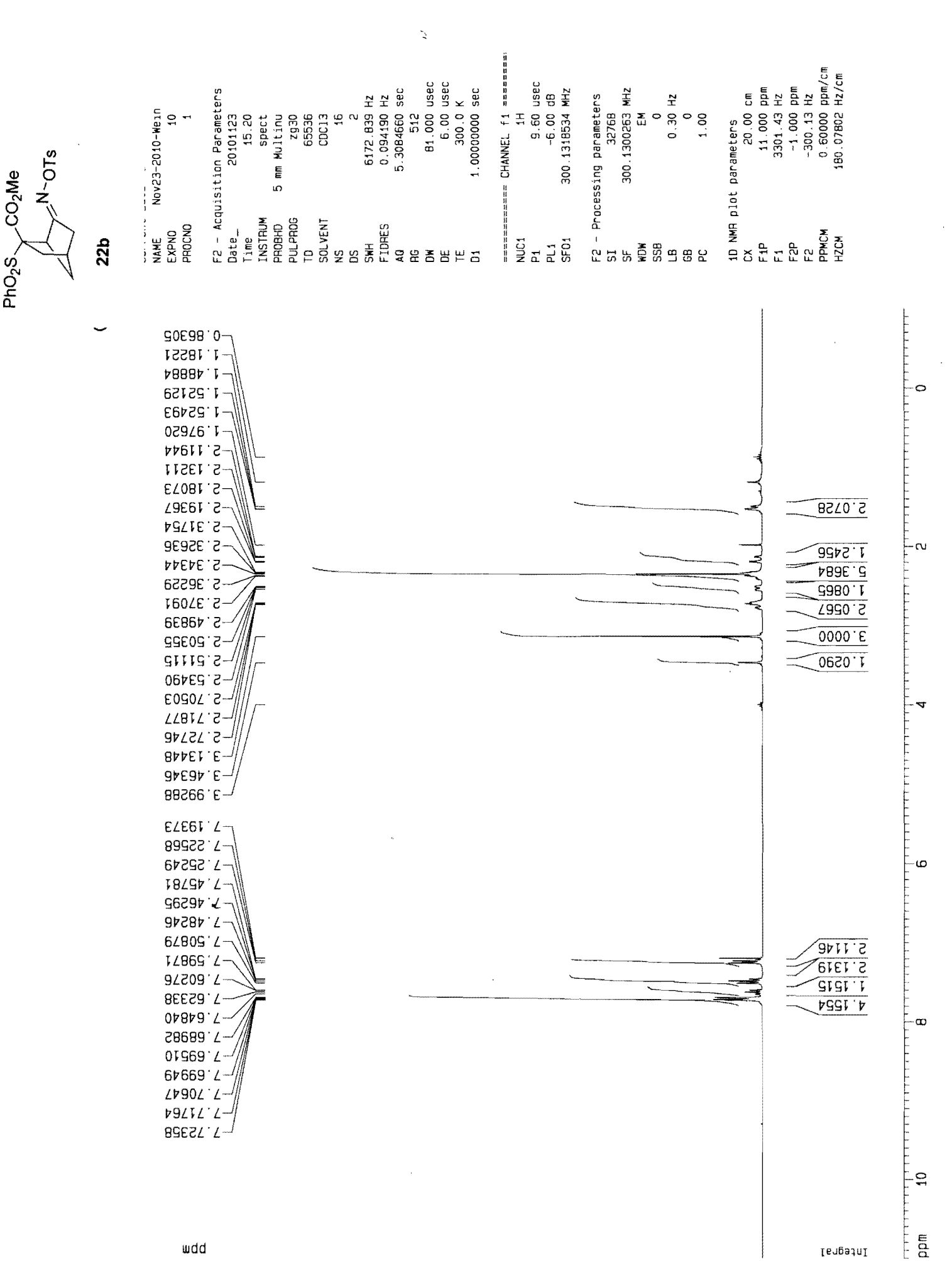

Current Data Parameters
NAME Ju105-2010-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100705
Time 18.00
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 256
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700431 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92203 Hz/cm
7.78426
7.72535
7.70085
7.58726
7.56161
7.53778
7.46388
7.43771
7.41299
7.15059
3.96984
3.94775
3.48145
3.41485
3.26986
2.70112
2.69195
2.65401
2.42701
2.42134
2.41592
2.33700
2.32876
2.29131
2.28284
2.20889
2.19927
2.19528
2.02206
2.01057
1.96246
1.95088
1.93102
1.46065
1.42477
1.41114
0.81789
1.2696
1.0500
2.1501
1.0545
1.9636
1.0196
3.0223
2.0347
1.1069
2.0218
Integral
ppm
0
2
4
6
8
10
ppm

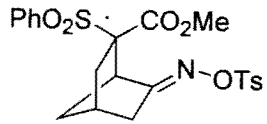


22a

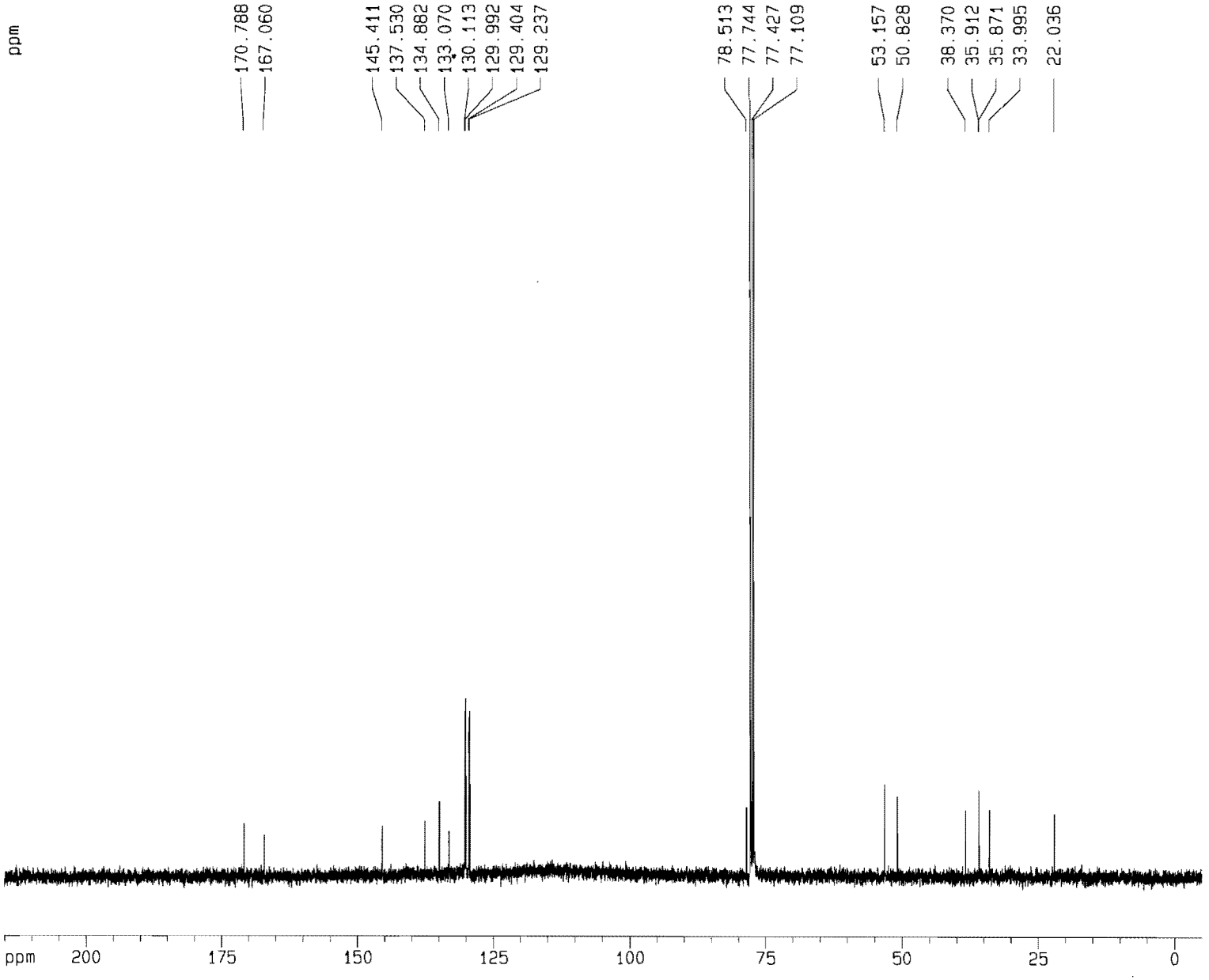



```
Current Data Parameters
NAME      Jul05-2010-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100705
Time               19.00
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1621
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                  512
DW                26.600 usec
DE                 6.00 usec
TE                300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1          75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2             115.00 usec
PL2                0.00 dB
PL12              20.00 dB
PL13              20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF            75.4023410 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               215.000 ppm
F1              16211.50 Hz
F2P                -5.000 ppm
F2               -377.01 Hz
PPMCM           11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```


PhO2S
CO2Me
N-OTs
22b
NAME Nov23-2010-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101123
Time 15.20
INSTRUM spect
PROBHD 5 mm Multinu
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 512
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
CHANNEL f1
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz
F2 - Processing parameters
SI 32768
SF 300.1300263 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3301.43 Hz
F2P -1.000 ppm
F2 -300.13 Hz
PPMCM 0.60000 ppm/cm
HZCM 180.07802 Hz/cm
7.7358
7.7176
7.7064
7.6994
7.6951
7.6898
7.6484
7.6233
7.6027
7.5987
7.5087
7.4824
7.4629
7.4578
7.2524
7.2256
7.1937
3.9928
3.4634
3.1344
2.7274
2.7187
2.7050
2.5349
2.5111
2.5035
2.4983
2.3709
2.3622
2.3434
2.3263
2.3175
2.1936
2.1807
2.1321
2.1194
1.9762
1.5249
1.5212
1.4888
1.1822
0.8630
4.1554
1.1515
2.1319
2.1146
1.0290
3.0000
2.0567
1.0865
5.3684
1.2456
2.0728
ppm
Integral

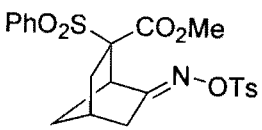


22b

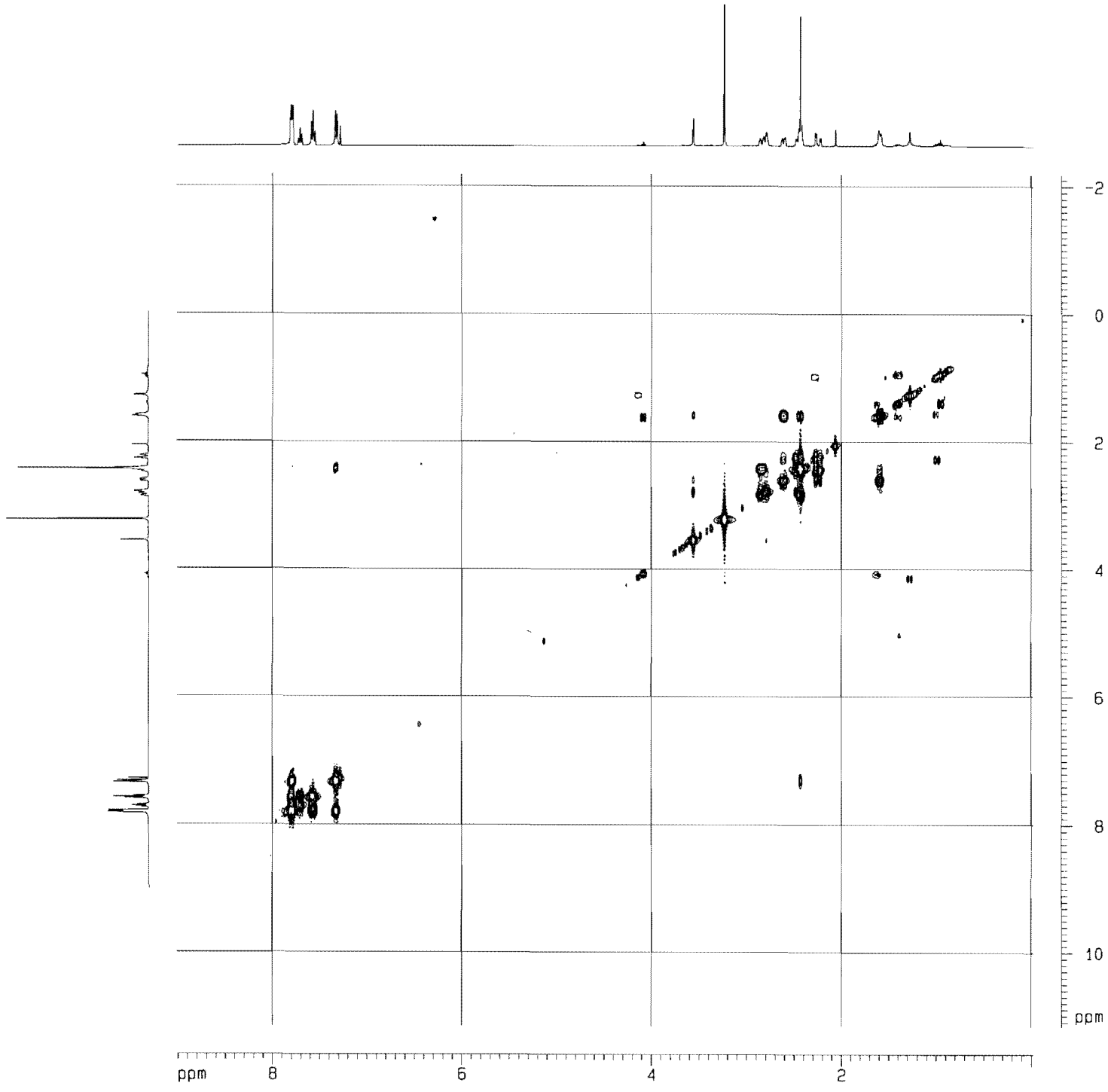


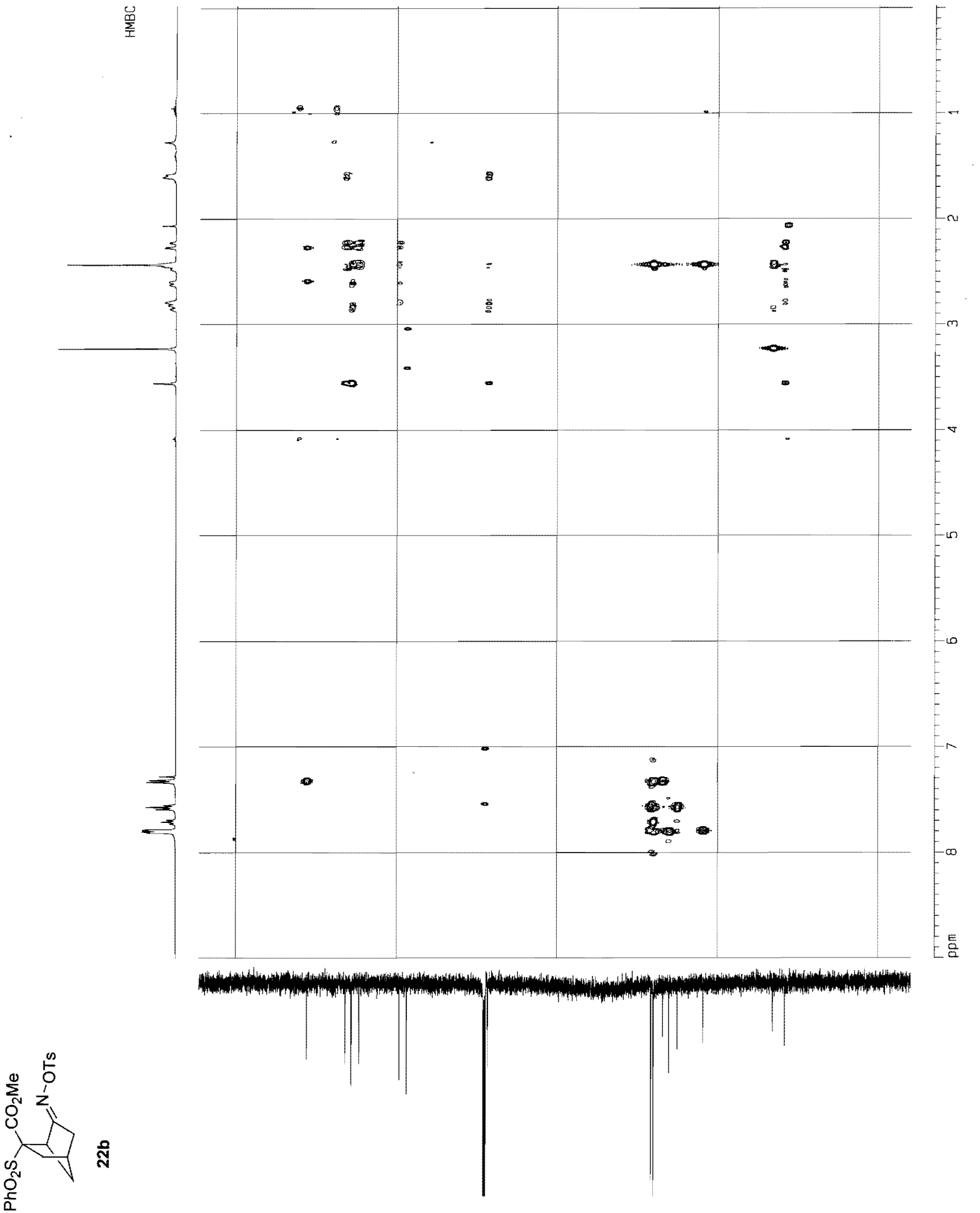

```
Current Data Parameters
NAME        pxk911112310
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101123
Time               17.55
INSTRUM            spect
PROBHD     5 mm BBI 1H-B
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1024
DS                    4
SWH          25125.629 Hz
FIDRES        0.383387 Hz
AQ            1.3042154 sec
RG                16384
DW             19.900 usec
DE              6.00 usec
TE              300.0 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1             16.35 usec
PL1             -6.00 dB
SFO1       100.6237959 MHz

============ CHANNEL f2 ============
CPDPRG2        waltz16
NUC2                1H
PCPD2          114.00 usec
PL2             0.00 dB
PL12           24.00 dB
PL13           24.00 dB
SFO2       400.1316005 MHz

F2 - Processing parameters
SI                32768
SF         100.6127290 MHz
WDW                EM
SSB                 0
LB              1.00 Hz
GB                  0
PC               1.40

1D NMR plot parameters
CX              20.00 cm
F1P           215.000 ppm
F1          21631.74 Hz
F2P            -5.000 ppm
F2           -503.06 Hz
PPMCM        11.00000 ppm/cm
HZCM       1106.73999 Hz/cm
```

COSY

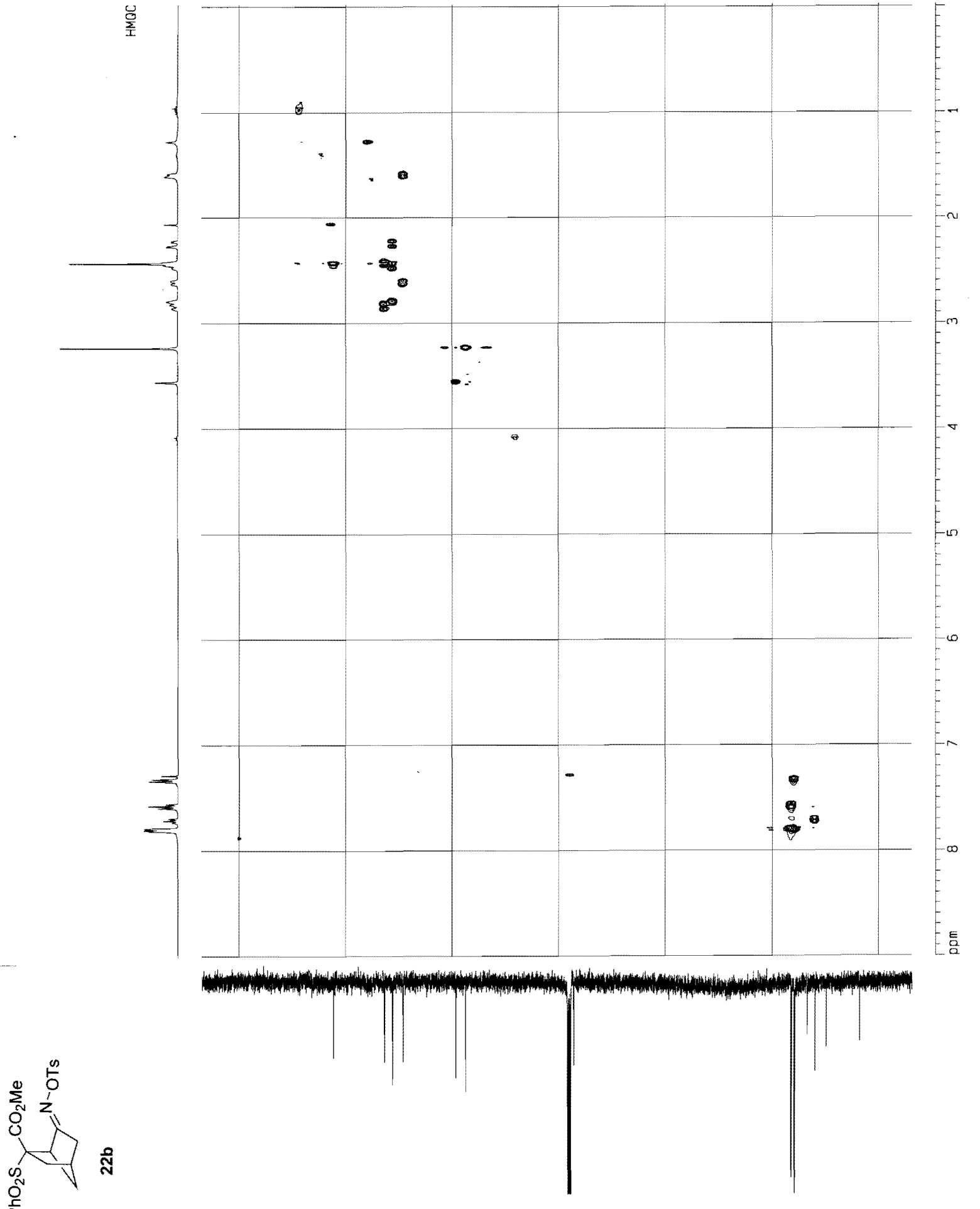


22b

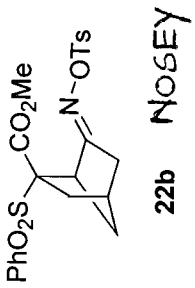




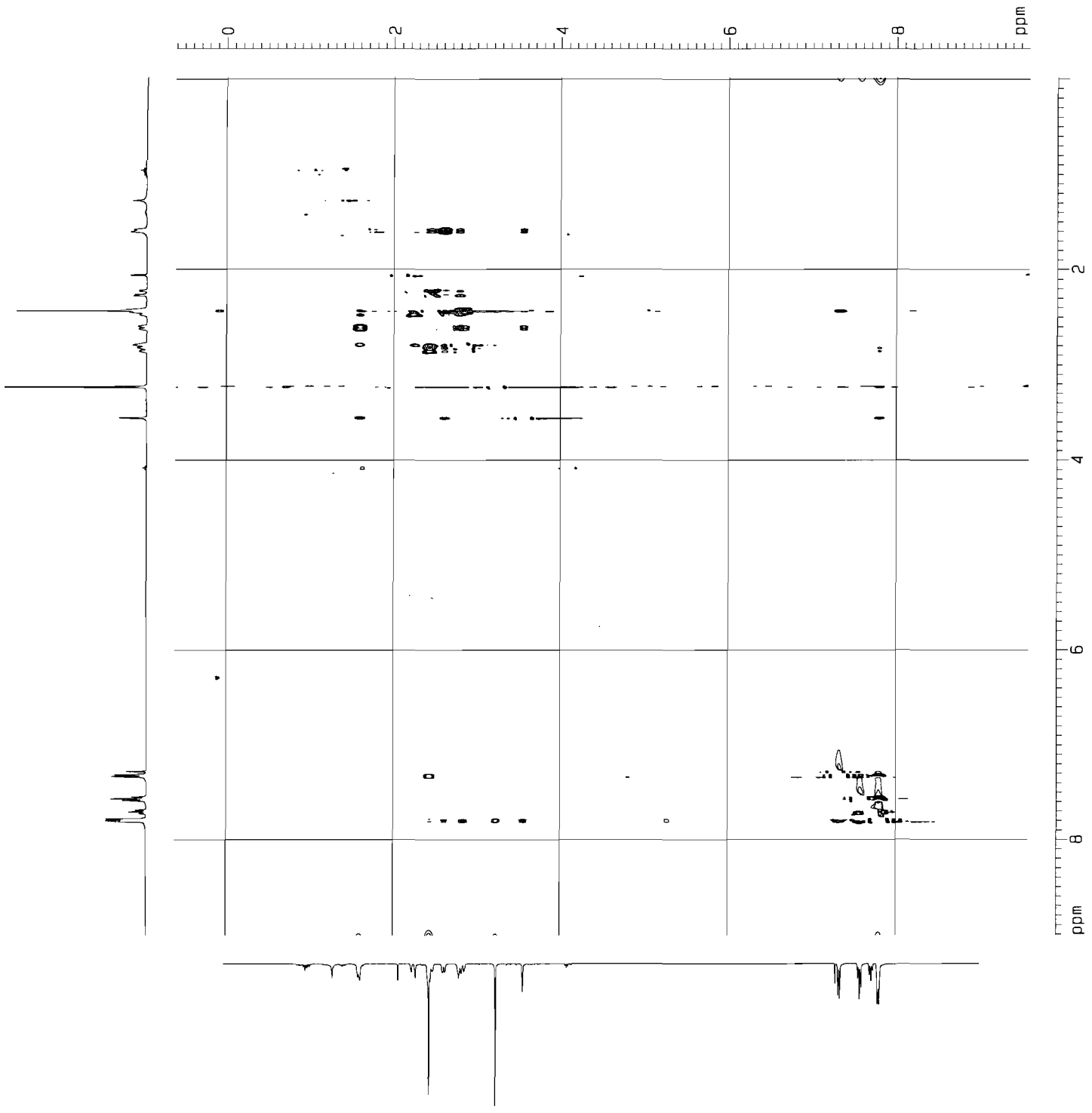
22b

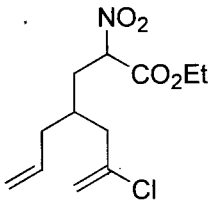


22b

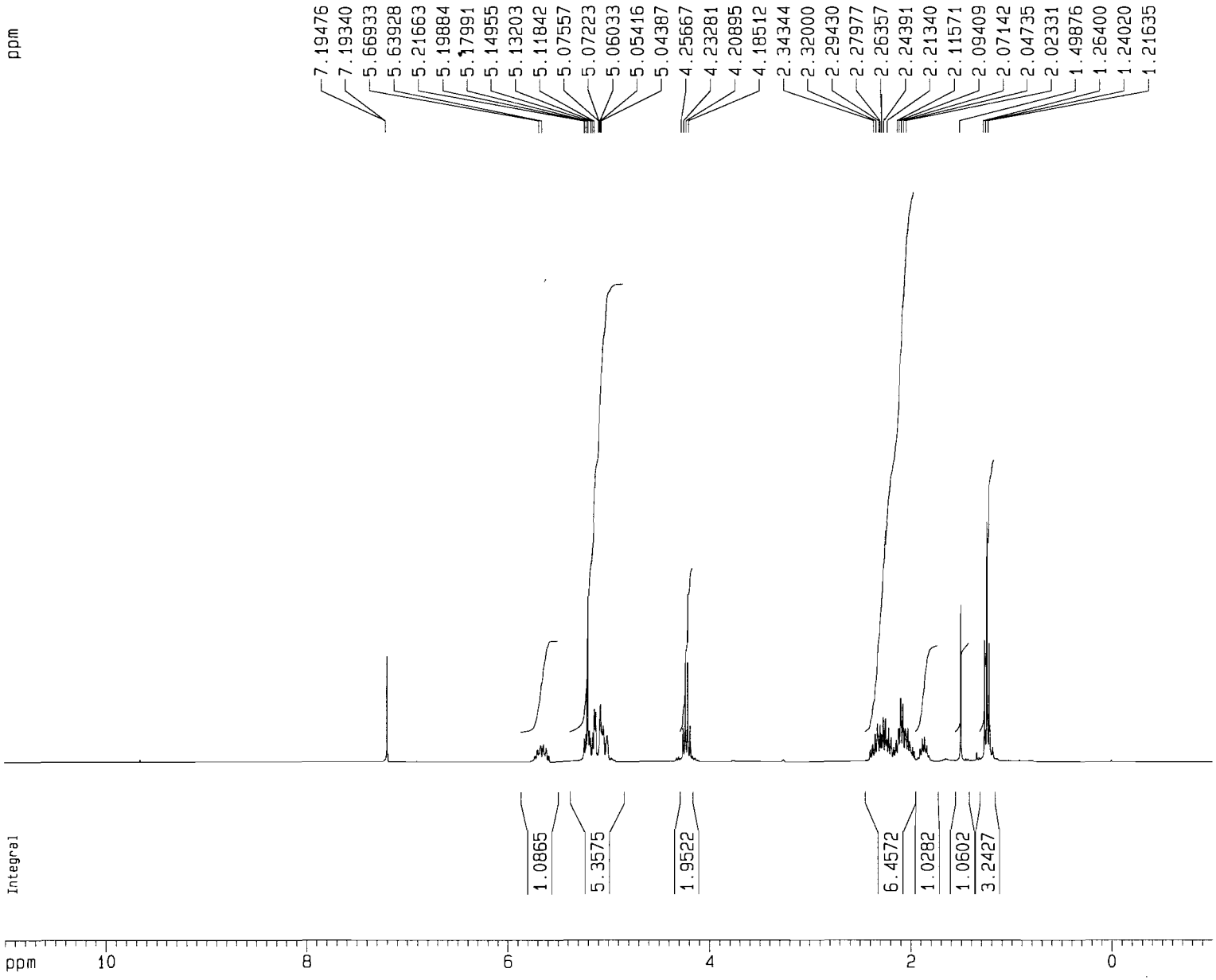


22b NOSEY

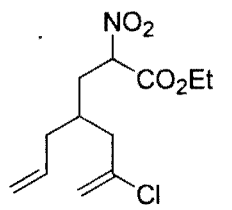




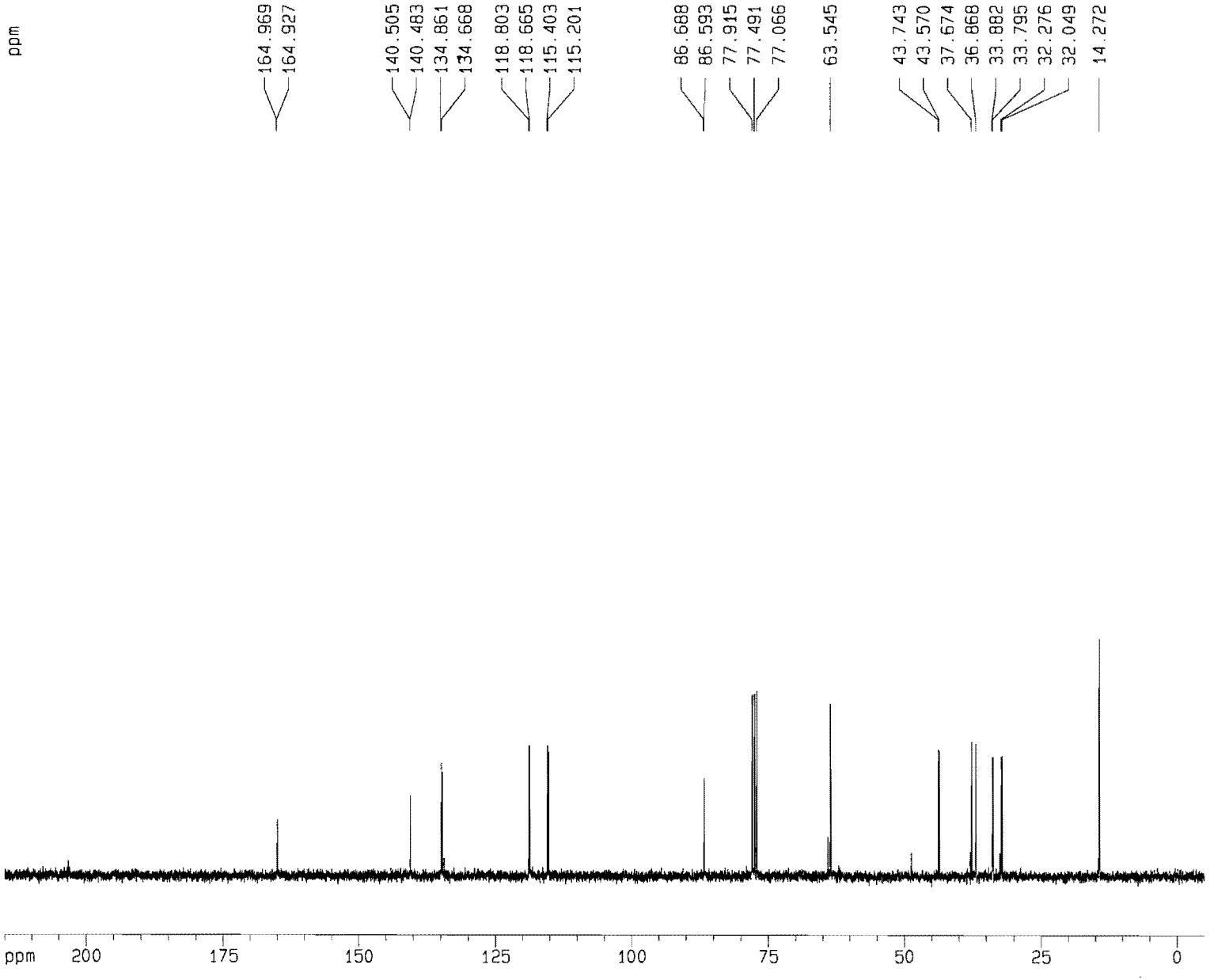
15e



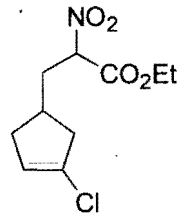

```
Current Data Parameters
NAME      Jun20-2010-Wein
EXPNO                 20
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100620
Time               18.21
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ            5.3084660 sec
RG                406.4
DW               81.000 usec
DE                6.00 usec
TE               300.0 K
D1            1.00000000 sec

============ CHANNEL f1 ========
NUC1                  1H
P1                11.70 usec
PL1                0.00 dB
SFO1        299.8718518 MHz

F2 - Processing parameters
SI                32768
SF          299.8700299 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
F1P               11.000 ppm
F1              3298.57 Hz
F2P               -1.000 ppm
F2              -299.87 Hz
PPMCM          0.60000 ppm/cm
HZCM          179.92201 Hz/cm
```



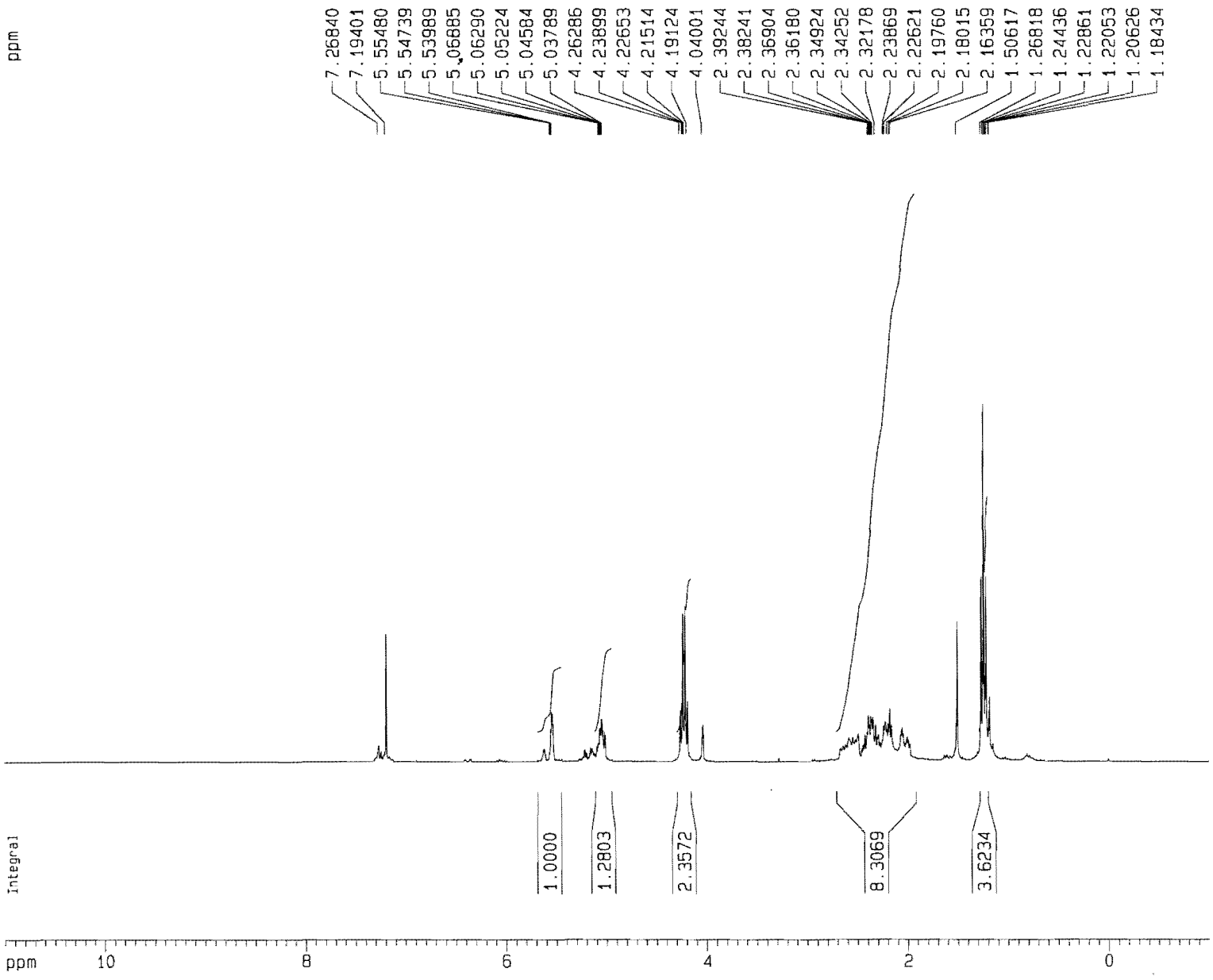
15e




```
Current Data Parameters
NAME      Jun21-2010-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100621
Time                11.27
INSTRUM             spect
PROBHD    5 mm QNP 1H/1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     68
DS                      4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                   2048
DW              26.600 usec
DE               6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                  13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1          75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2           waltz16
NUC2                  1H
PCPD2            115.00 usec
PL2                0.00 dB
PL12              20.00 dB
PL13              20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                  32768
SF            75.4023410 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
F1P                215.000 ppm
F1               16211.50 Hz
F2P                -5.000 ppm
F2               -377.01 Hz
PPMCM           11.00000 ppm/cm
HZCM           829.42578 Hz/cm
```



16e



Current Data Parameters

NAME	Jul10-2010-Wein
EXPNO	50
PROCNO	1

F2 - Acquisition Parameters

Date_	20100710
Time	18.18
INSTRUM	spect
PROBHD	5 mm GNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	406.4
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

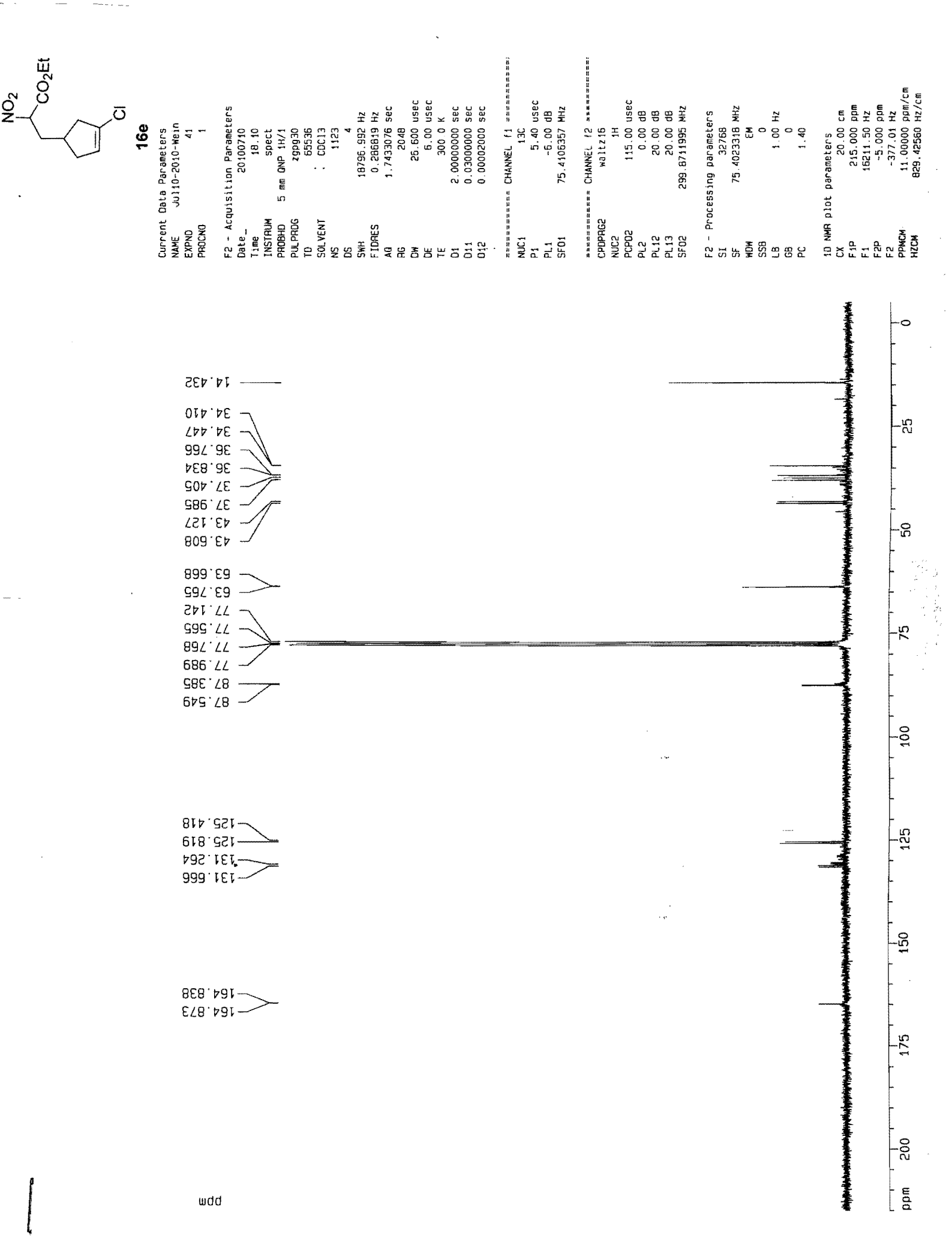
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

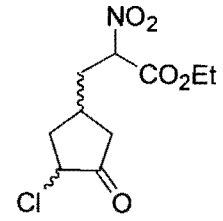
F2 - Processing parameters

SI	32768
SF	299.8700297 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

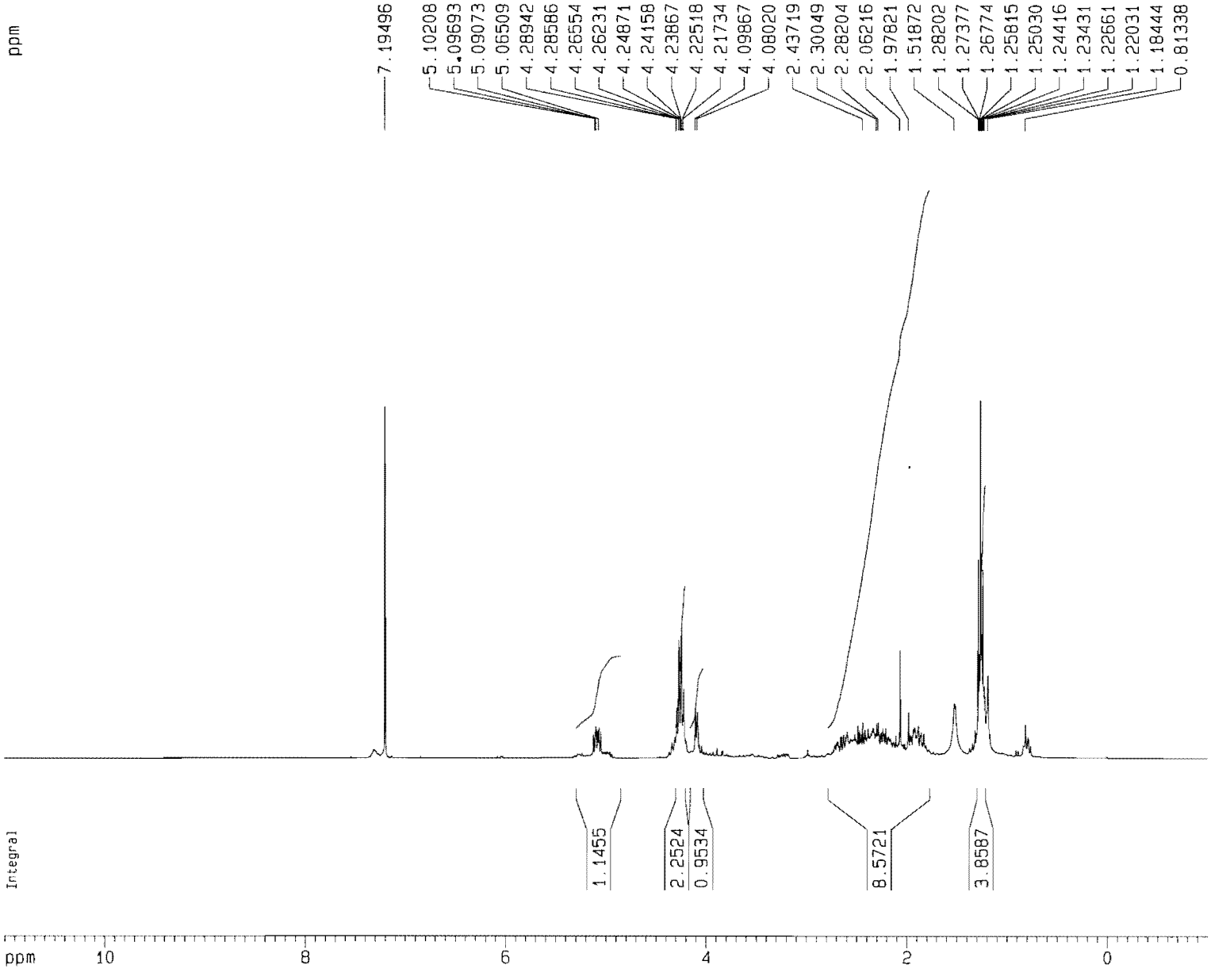
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

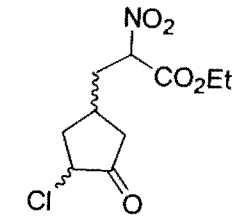

NO2
CO2Et
Cl
16e
Current Data Parameters
NAME Ju110-2010-Wein
EXPNO 41
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100710
Time 18.10
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1123
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023318 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42560 Hz/cm
14.432
34.410
34.447
36.766
36.834
37.405
37.985
43.127
43.608
63.668
63.765
77.142
77.565
77.768
77.989
87.385
87.549
125.418
125.819
131.264
131.666
164.838
164.873
ppm
0
25
50
75
100
125
150
175
200
ppm



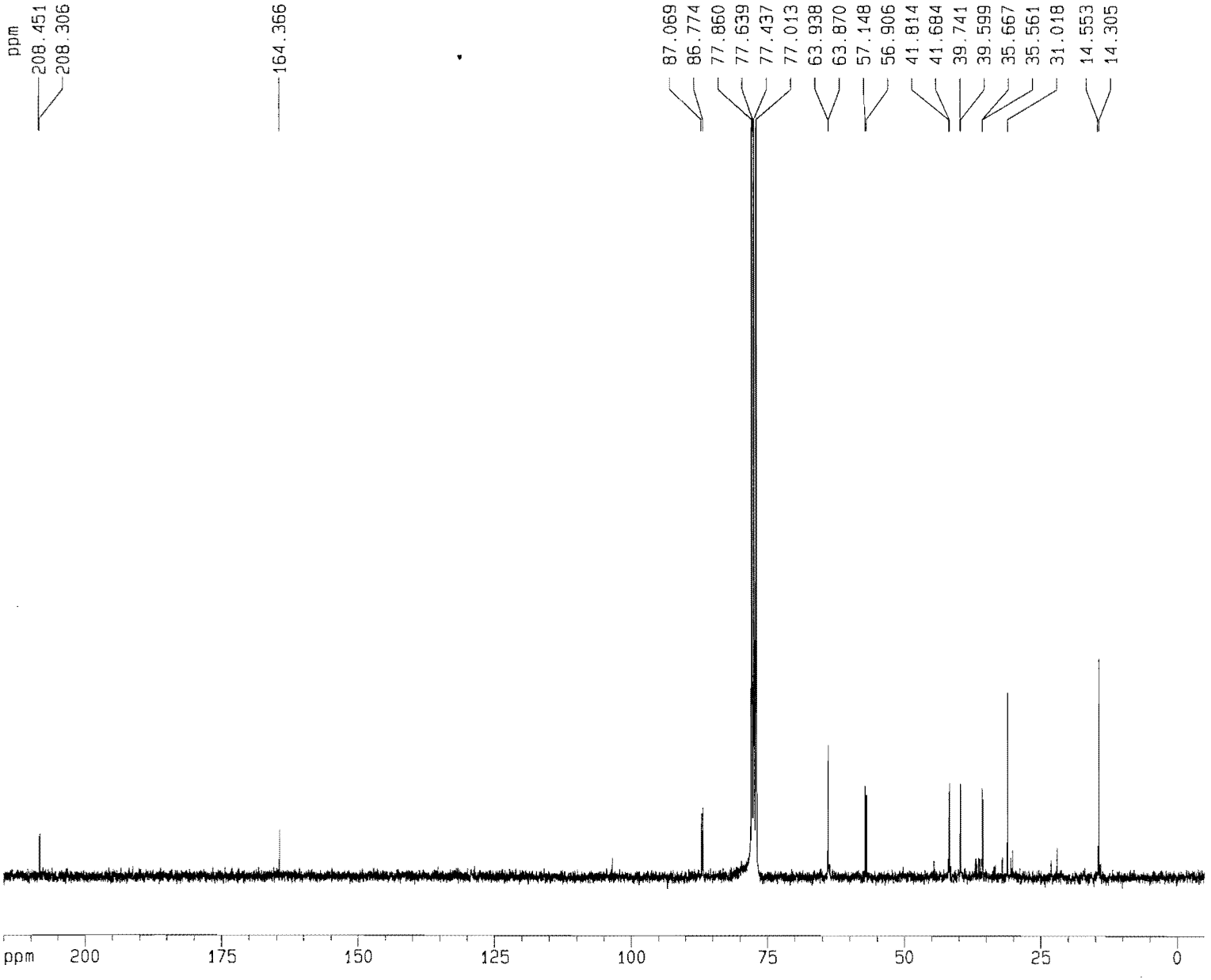
17e




```
Current Data Parameters
NAME      Jul11-2010-Wein
EXPNO                  20
PROCNO                  1

F2 - Acquisition Parameters
Date_           20100711
Time               15.21
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ            5.3084660 sec
RG                574.7
DW               81.000 usec
DE                6.00 usec
TE               300.0 K
D1            1.00000000 sec

============ CHANNEL f1 ========
NUC1                  1H
P1                11.70 usec
PL1                0.00 dB
SFO1         299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700296 MHz
WDW                   EM
SSB                    0
LB                0.30 Hz
GB                     0
PC                 1.00

1D NMR plot parameters
CX                20.00 cm
F1P              11.000 ppm
F1              3298.57 Hz
F2P              -1.000 ppm
F2              -299.87 Hz
PPMCM          0.60000 ppm/cm
HZCM         179.92201 Hz/cm
```



17e



Current Data Parameters
NAME Jul11-2010-Wein
EXPNO 22
PROCNO 1

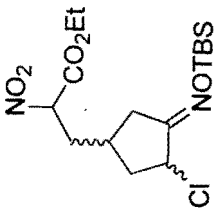
F2 - Acquisition Parameters
Date_ 20100711
Time 16.59
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 15972
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 4096
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

========== CHANNEL f1 ==========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SF01 75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SF02 299.8711995 MHz

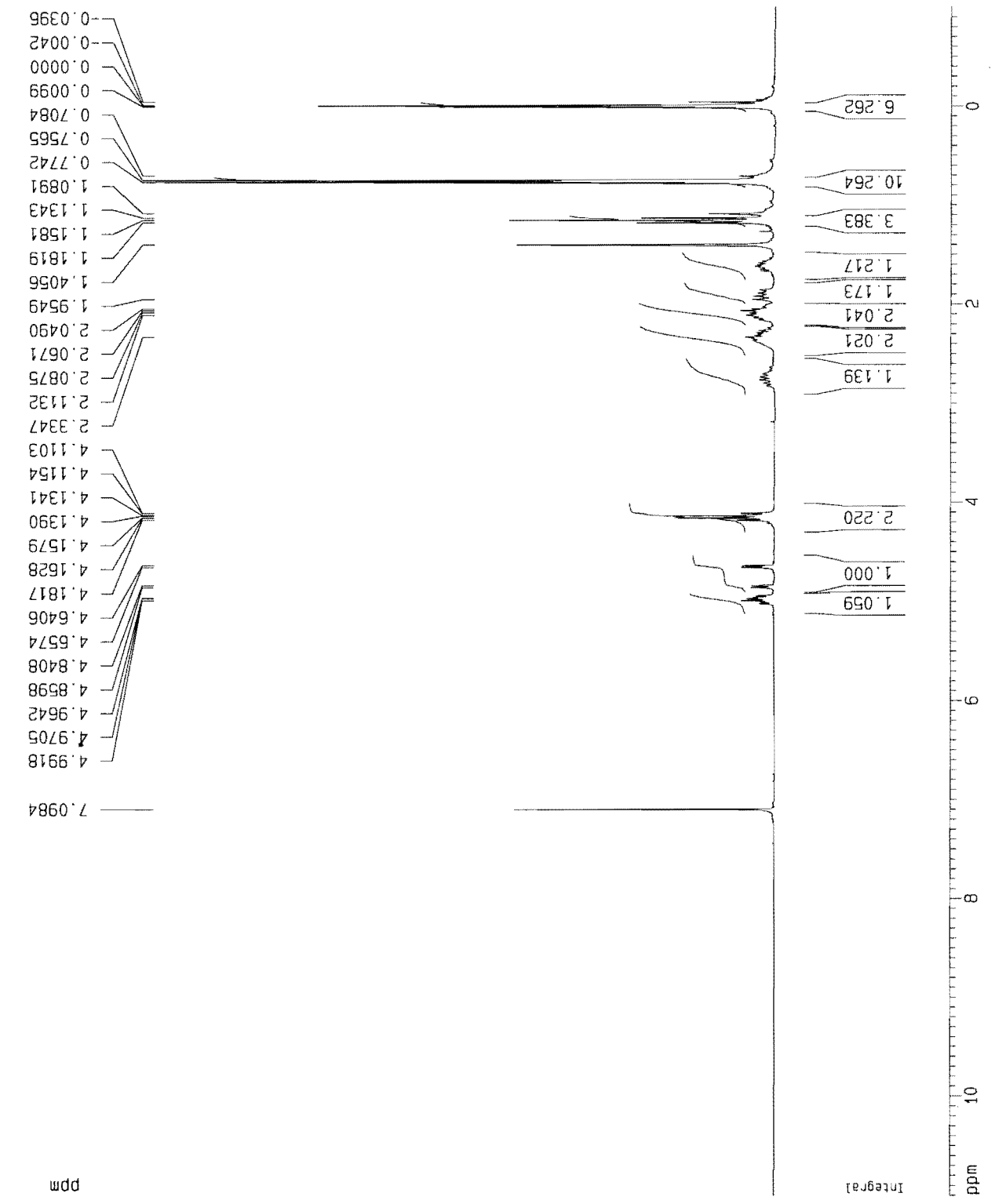
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

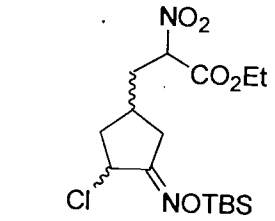
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm



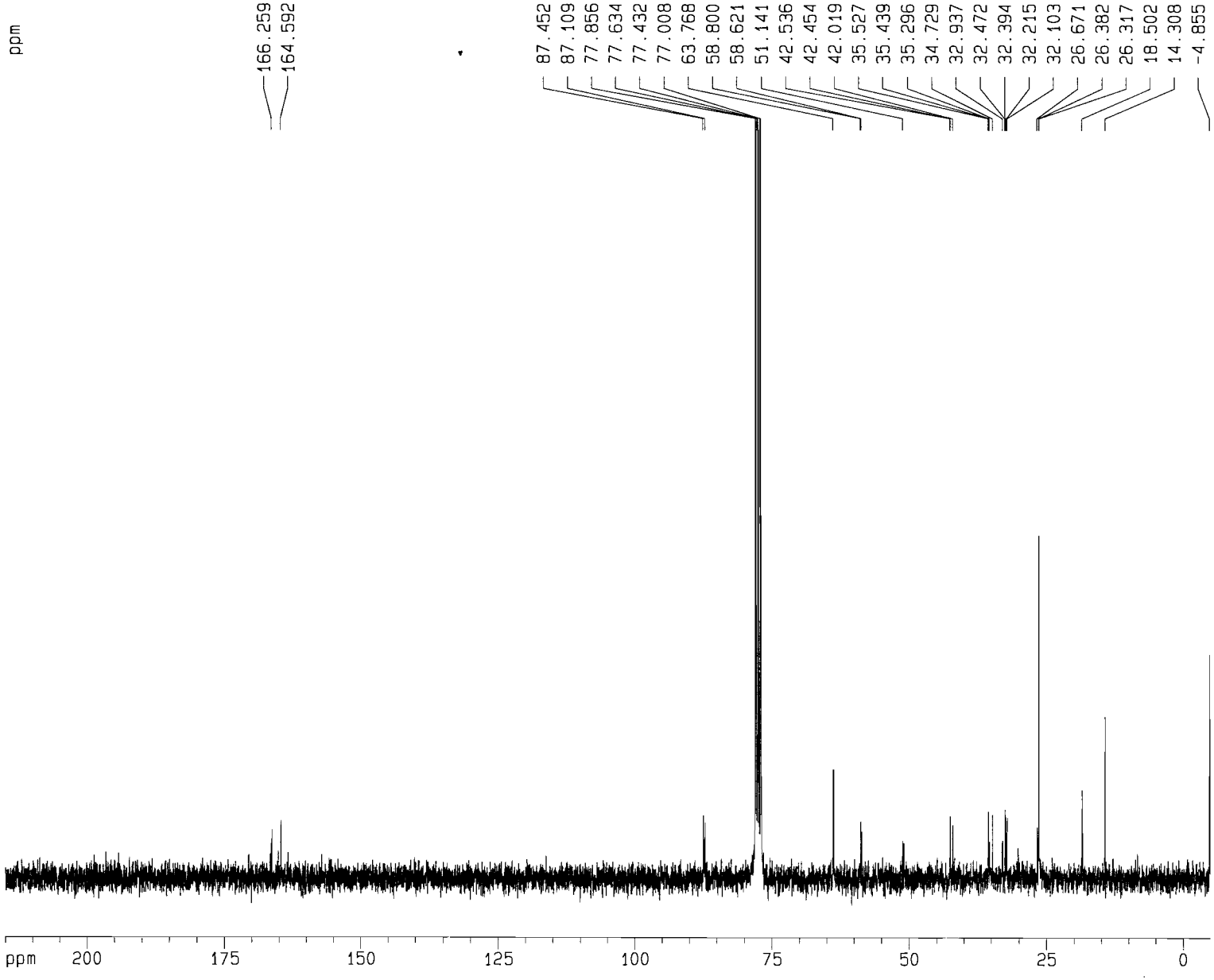
18e

```
Current Data Parameters
NAME      Jul13-2010-Wein
EXPNO                 20
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100713
Time               12.34
INSTRUM             spect
PROBHD   5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ            5.3084660 sec
RG                   512
DW              81.000 usec
DE               6.00 usec
TE                300.0 K
D1            1.00000000 sec

========== CHANNEL f1 ========
NUC1                  1H
P1                11.70 usec
PL1                0.00 dB
SFO1         299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700586 MHz
WDW                   EM
SSB                    0
LB              0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                20.00 cm
F1P               11.000 ppm
F1              3298.57 Hz
F2P              -1.000 ppm
F2               -299.87 Hz
PPMCM         0.60000 ppm/cm
HZCM          179.92203 Hz/cm
```

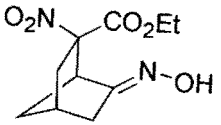




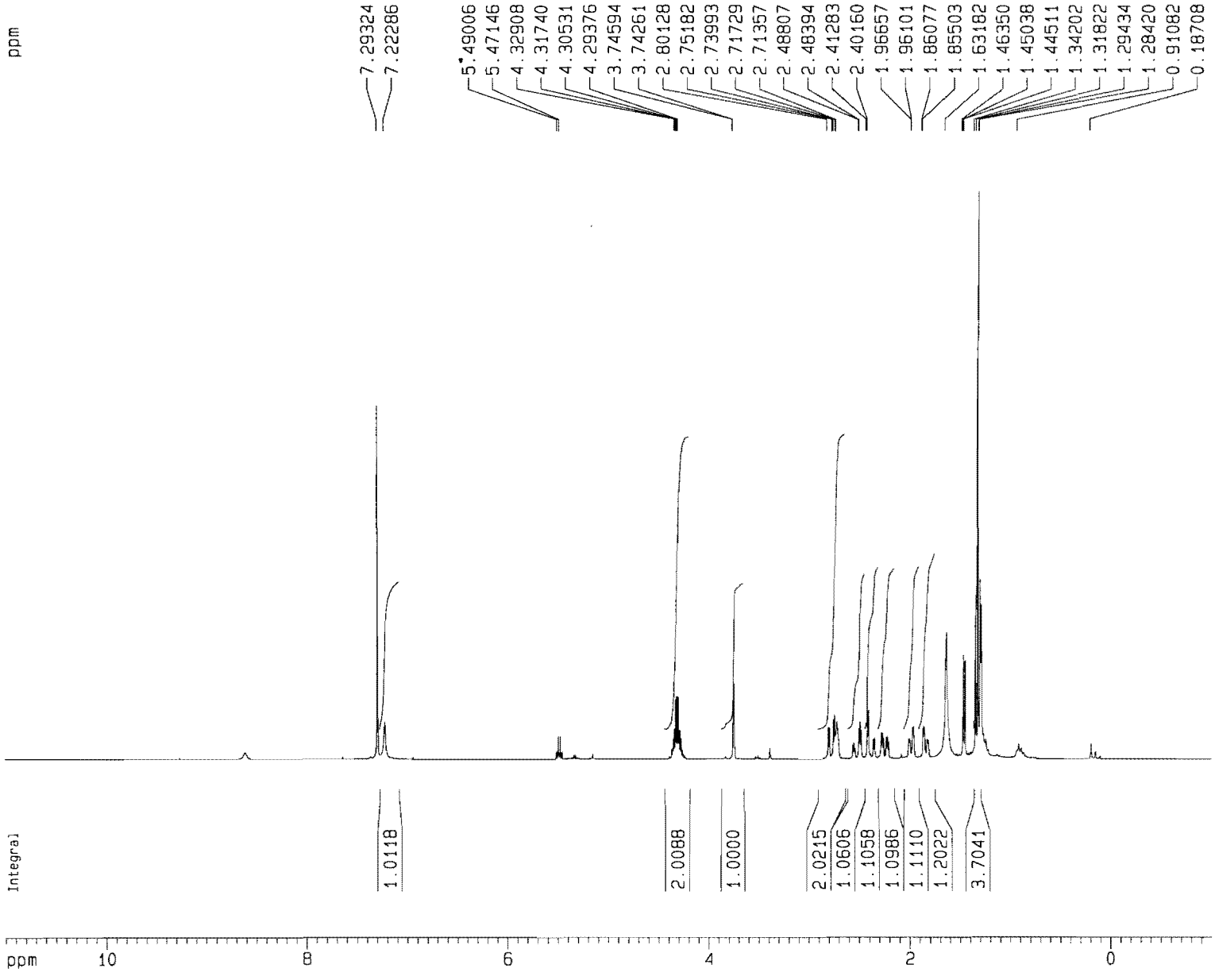
18e




```
Current Data Parameters
NAME      Jul13-2010-Wein
EXPNO                  40
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100713
Time                16.02
INSTRUM             spect
PROBHD     5 mm QNP 1H/1
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  2321
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ           1.7433076 sec
RG                  1024
DW             26.600 usec
DE              6.00 usec
TE              300.0 K
D1          2.00000000 sec
D11         0.03000000 sec
D12         0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1              5.40 usec
PL1            -6.00 dB
SFO1       75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2        waltz16
NUC2                1H
PCPD2          115.00 usec
PL2             0.00 dB
PL12           20.00 dB
PL13           20.00 dB
SFO2      299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF         75.4023410 MHz
WDW                   EM
SSB                    0
LB              1.00 Hz
GB                     0
PC              1.40

1D NMR plot parameters
CX             20.00 cm
F1P           215.000 ppm
F1          16211.50 Hz
F2P            -5.000 ppm
F2           -377.01 Hz
PPMCM        11.00000 ppm/cm
HZCM        829.42578 Hz/cm
```



24a



EXPNO	20
PROCNO	1

F2 - Acquisition Parameters

Date_	20100714
Time	16.36
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	62
DS	0
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	1024
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec

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

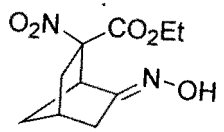
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

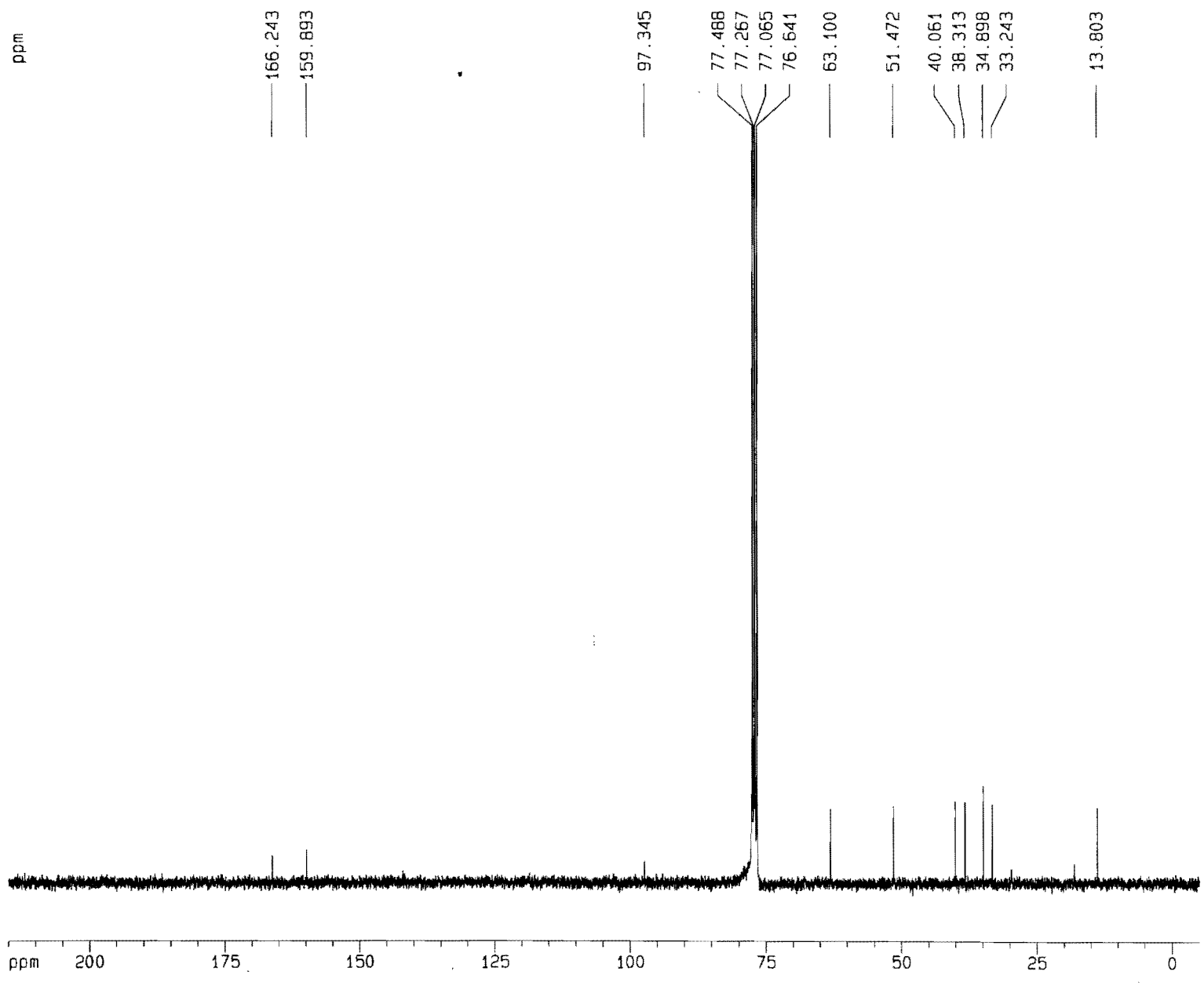
SI	32768
SF	299.8700000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

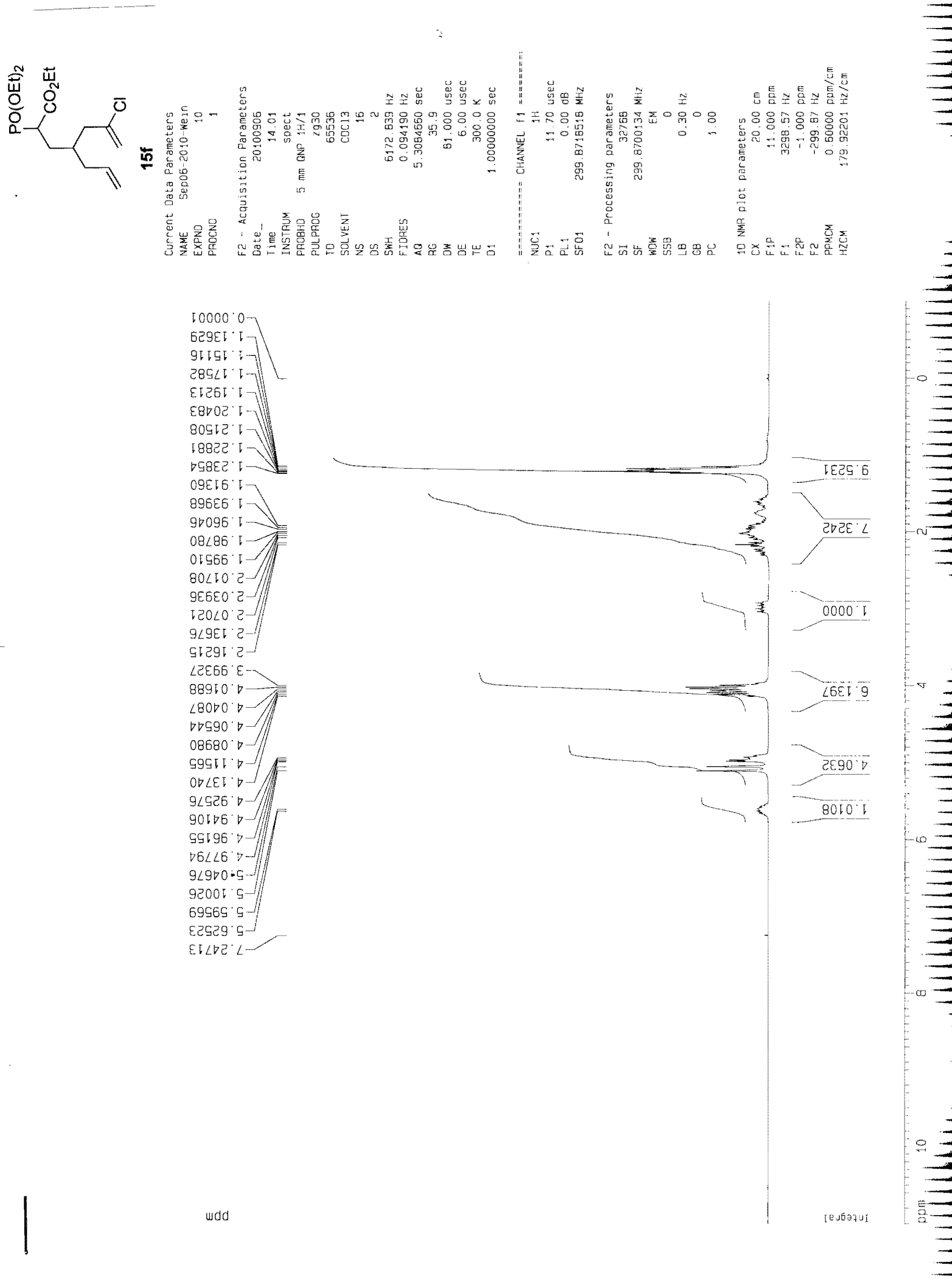
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92200 Hz/cm

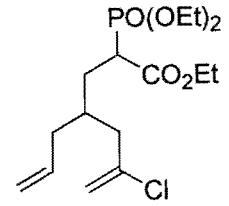


24a




```
Current Data Parameters
NAME      Oct31-2010-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_           20101031
Time               17.57
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                13620
DS                    4
SWH           16796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 1024
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023684 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1              16211.51 Hz
F2P               -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42603 Hz/cm
```

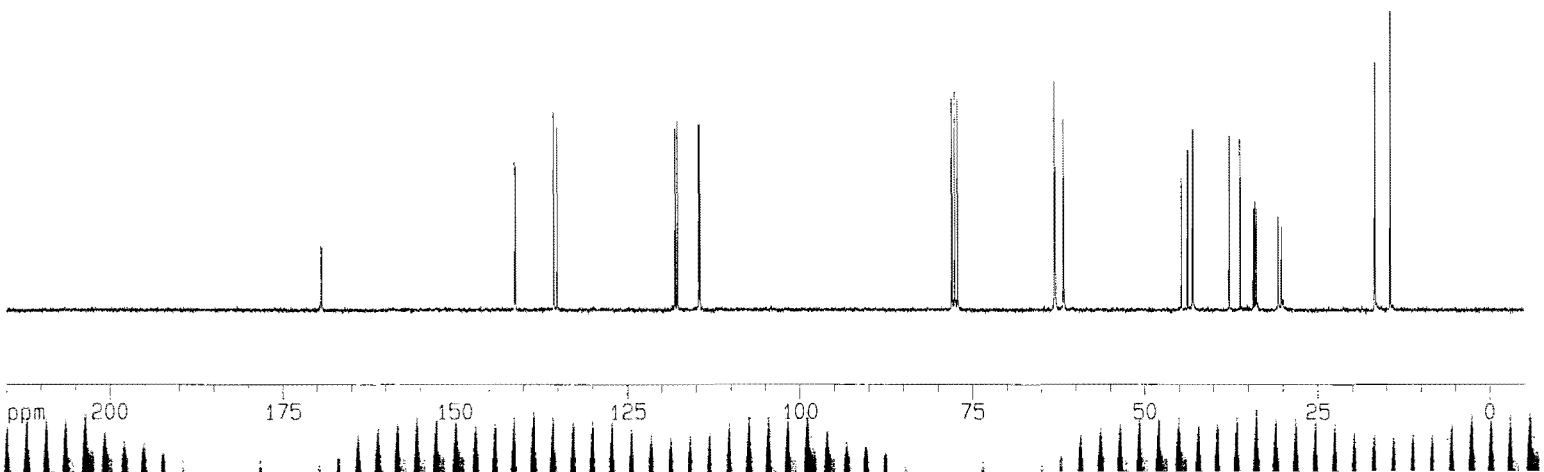

PO(OEt)2
CO2Et
Cl
15f
Current Data Parameters
NAME Sep06-2010-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100906
Time 14.01
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 35.9
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700134 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92201 Hz/cm
9.5231
7.3242
1.0000
6.1397
4.0632
1.0108
7.24713
5.62523
5.59569
5.10026
5.04676
4.97794
4.96155
4.94106
4.92576
4.13740
4.11565
4.08980
4.06544
4.04087
4.01688
3.99327
2.16215
2.13676
2.07021
2.03936
2.01708
1.99510
1.98780
1.96046
1.93968
1.91360
1.23854
1.22881
1.21508
1.20483
1.19213
1.17582
1.15116
1.13629
0.00001
ppm
Integral



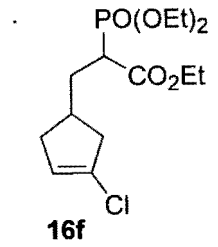
15f

ppm

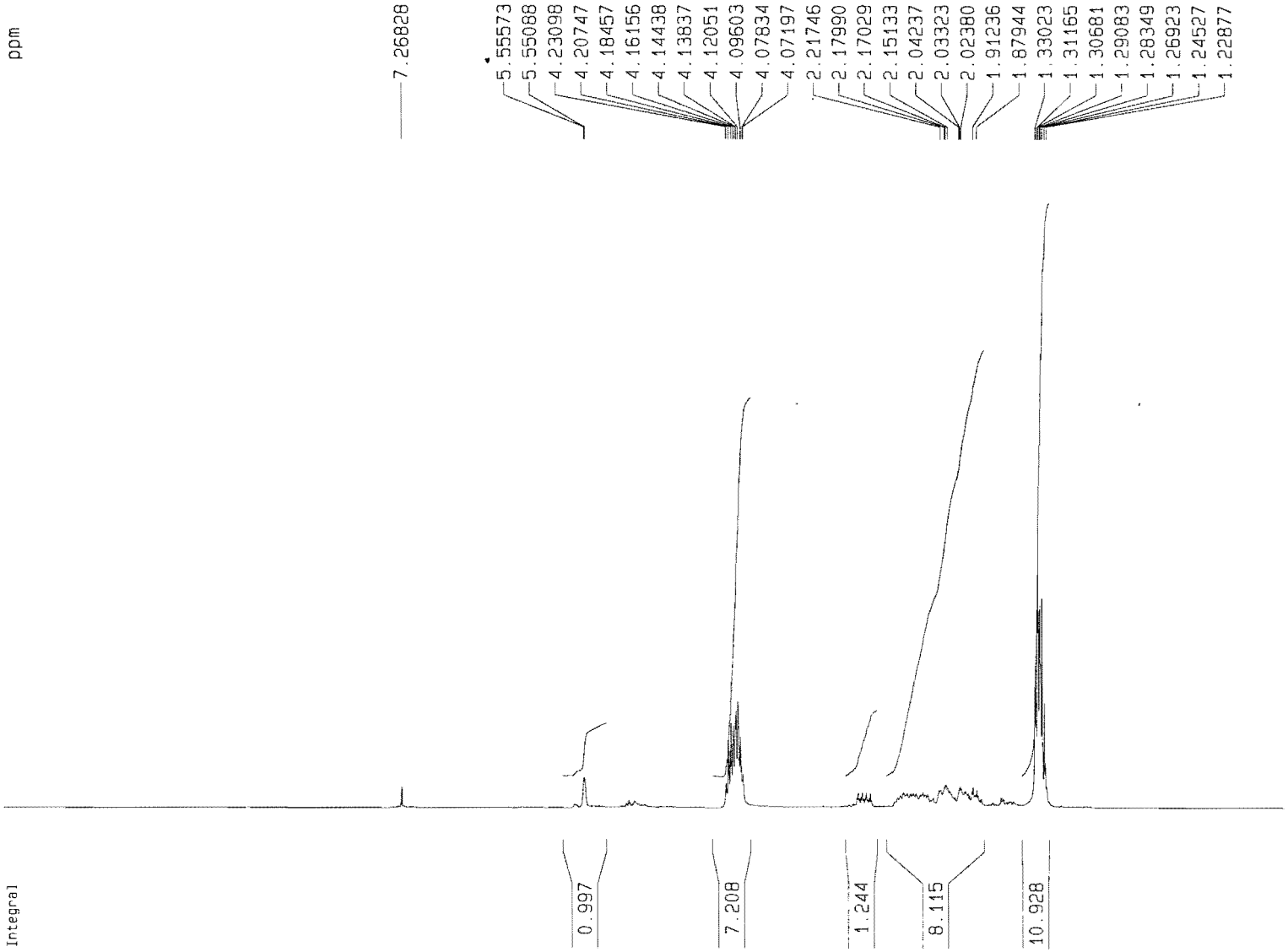
169.468 169.401 169.256 169.189 141.267 141.128 135.600 135.062 118.063 117.732 114.622 114.466 78.002 77.576 77.151 63.166 63.077 62.968 61.804 61.763 44.710 44.698 43.842 43.119 42.976 42.956 37.761 36.186 34.256 34.076 33.862 33.667 30.747 30.684 16.718 16.644 14.450



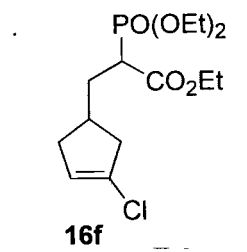

```
Current Data Parameters
NAME      Sep06-2010-Wein
EXPNO                 12
PROCND                 1

F2 - Acquisition Parameters
Date_           20100906
Time               14.13
INSTRUM            spect
PROBHD     5 mm DNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   520
DS                     4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                  1024
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

========== CHANNEL f1 ==========
NUC1                13C
P1                 5.40 usec
PL1               -6.00 dB
SFO1          75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF            75.4023410 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              215.000 ppm
F1             16211.50 Hz
F2P               -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM           829.42578 Hz/cm
```



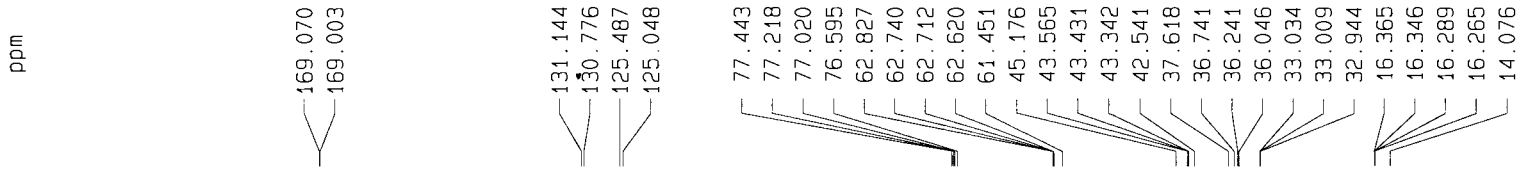
16f

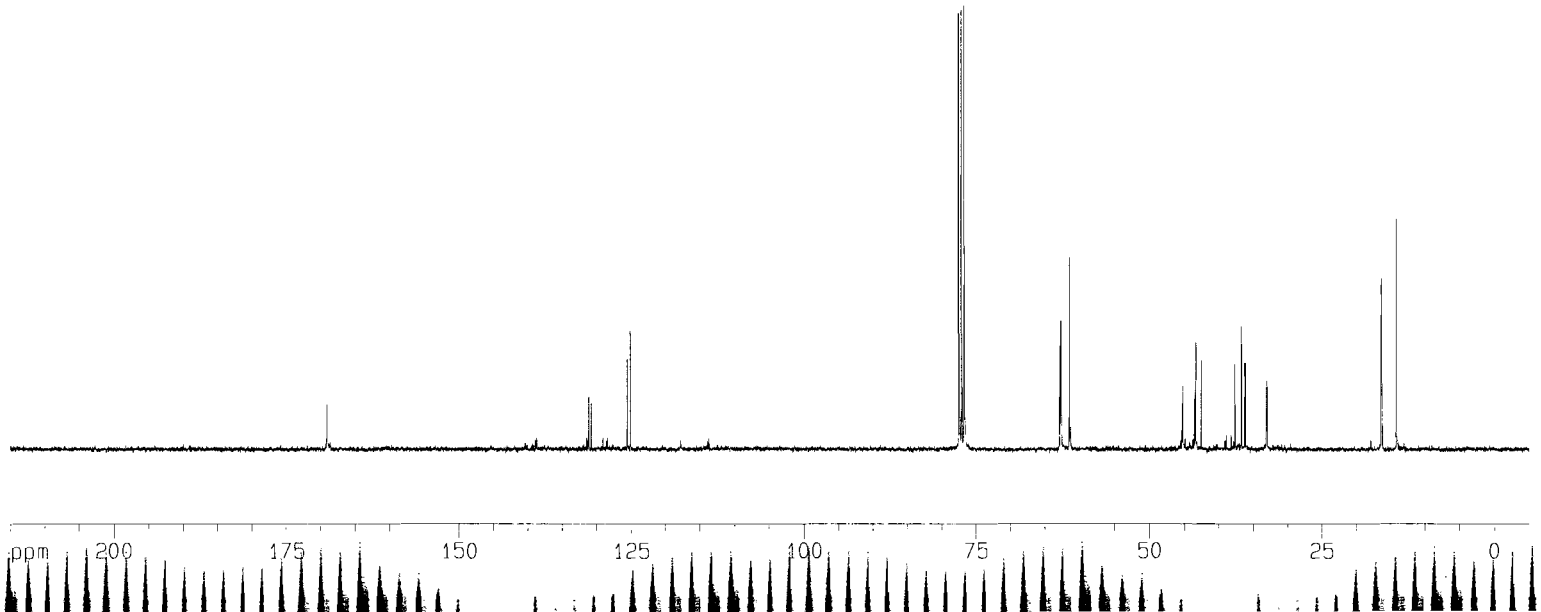



```
Current Data Parameters
NAME      Sep09-2010-Wein
EXPNO                  90
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100909
Time                18.15
INSTRUM             spect
PROBHD     5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ              5.3084660 sec
RG                  90.5
DW                81.000 usec
DE                 6.00 usec
TE                300.0 K
D1             1.00000000 sec

============ CHANNEL f1 ========
NUC1                   1H
P1                 11.70 usec
PL1                 0.00 dB
SFO1          299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700071 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
F1P               11.000 ppm
F1                3298.57 Hz
F2P               -1.000 ppm
F2               -299.87 Hz
PPMCM          0.60000 ppm/cm
HZCM          179.92200 Hz/cm
```



16f

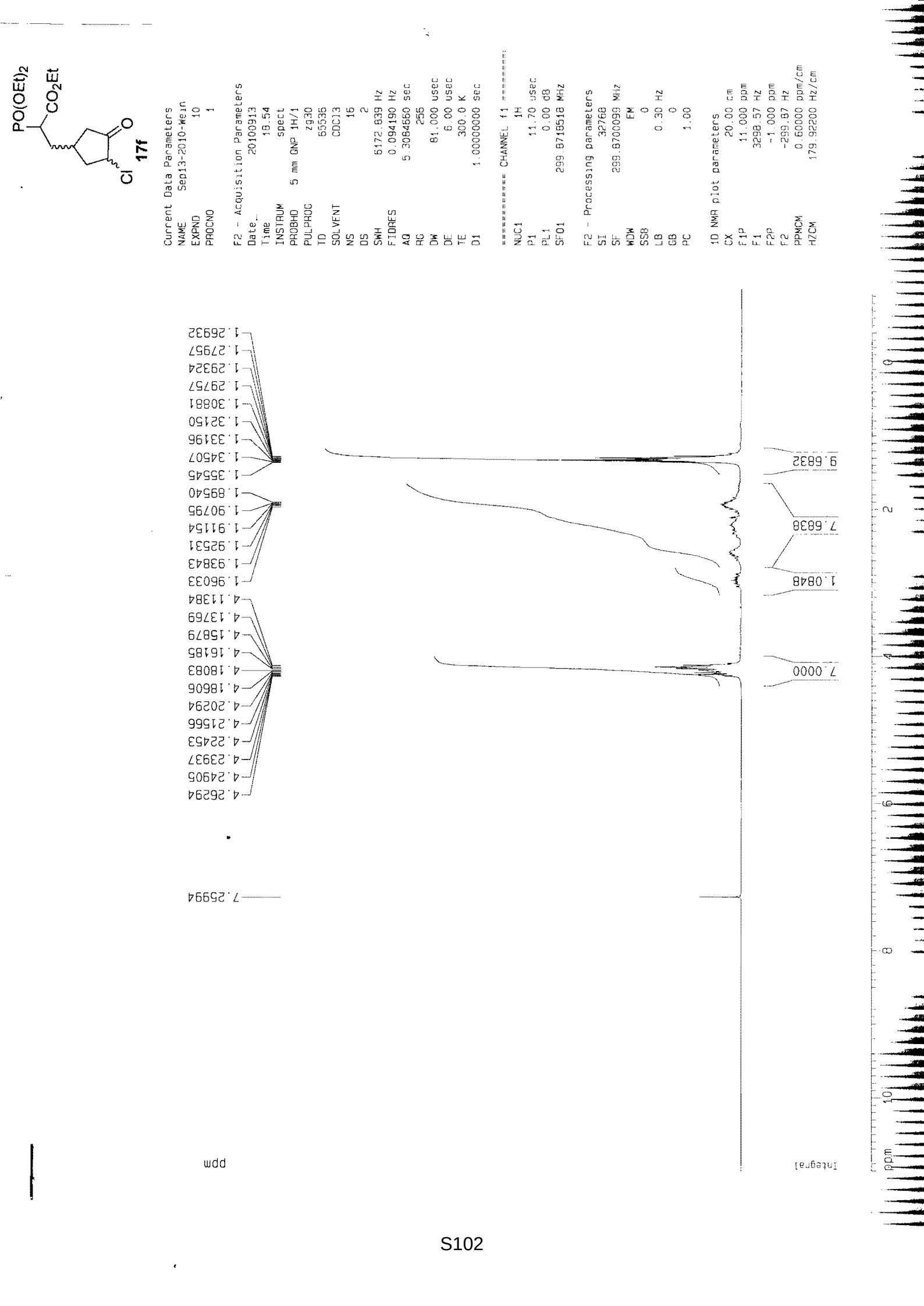





```
Current Data Parameters
NAME      Sep09-2010-Wein
EXPNO                 92
PROCND                 1

F2 - Acquisition Parameters
Date_           20100909
Time               20.03
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                  1532
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ           1.7433076 sec
RG                  1024
DW             26.600 usec
DE              6.00 usec
TE             300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1              5.40 usec
PL1            -6.00 dB
SF01        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2         115.00 usec
PL2             0.00 dB
PL12           20.00 dB
PL13           20.00 dB
SF02       299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023758 MHz
WDW                   EM
SSB                    0
LB              1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX              20.00 cm
F1P            215.000 ppm
F1           16211.51 Hz
F2P             -5.000 ppm
F2            -377.01 Hz
PPMCM        11.00000 ppm/cm
HZCM       829.42615 Hz/cm
```

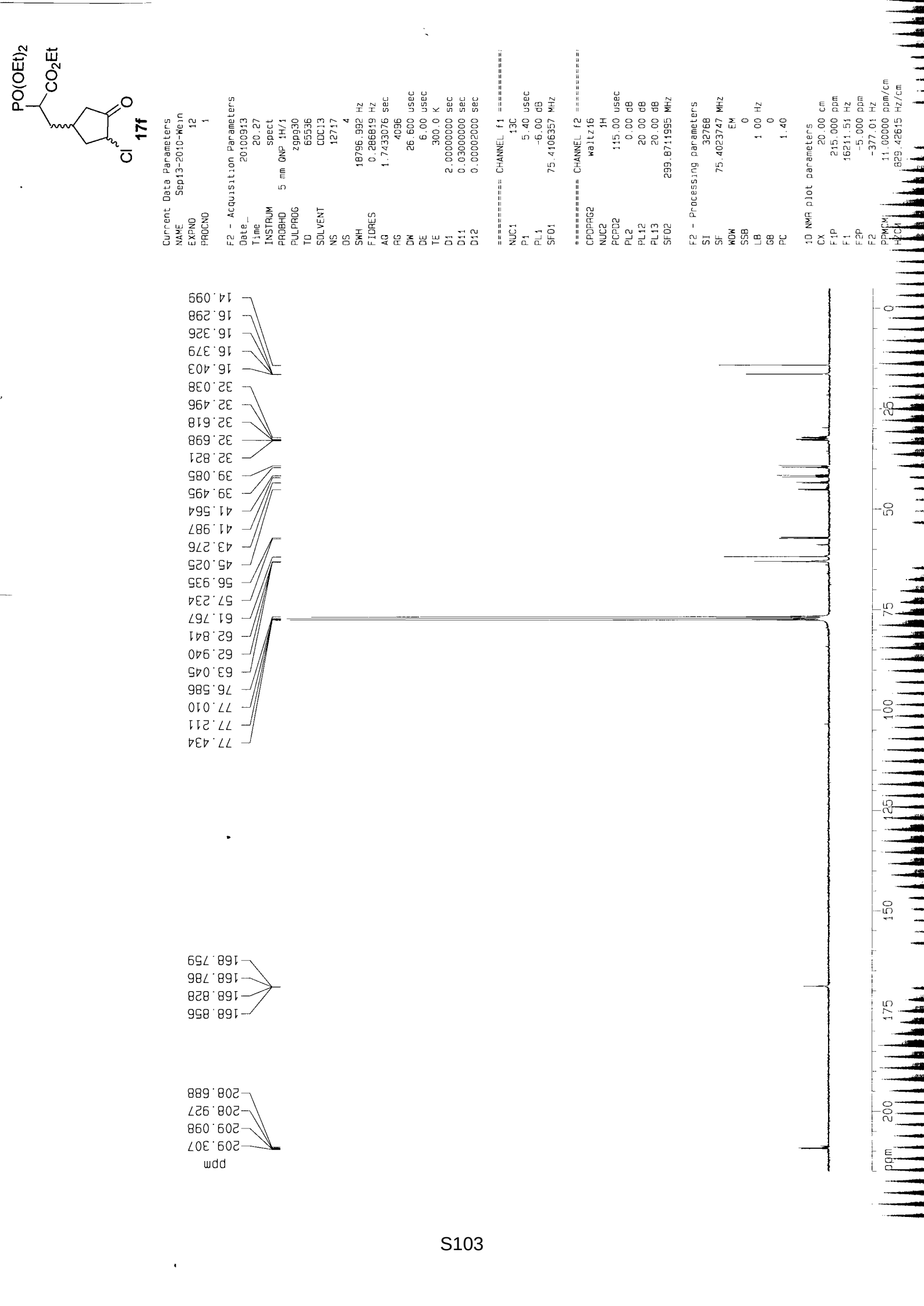
PO(OEt)2
CO2Et
O
Cl

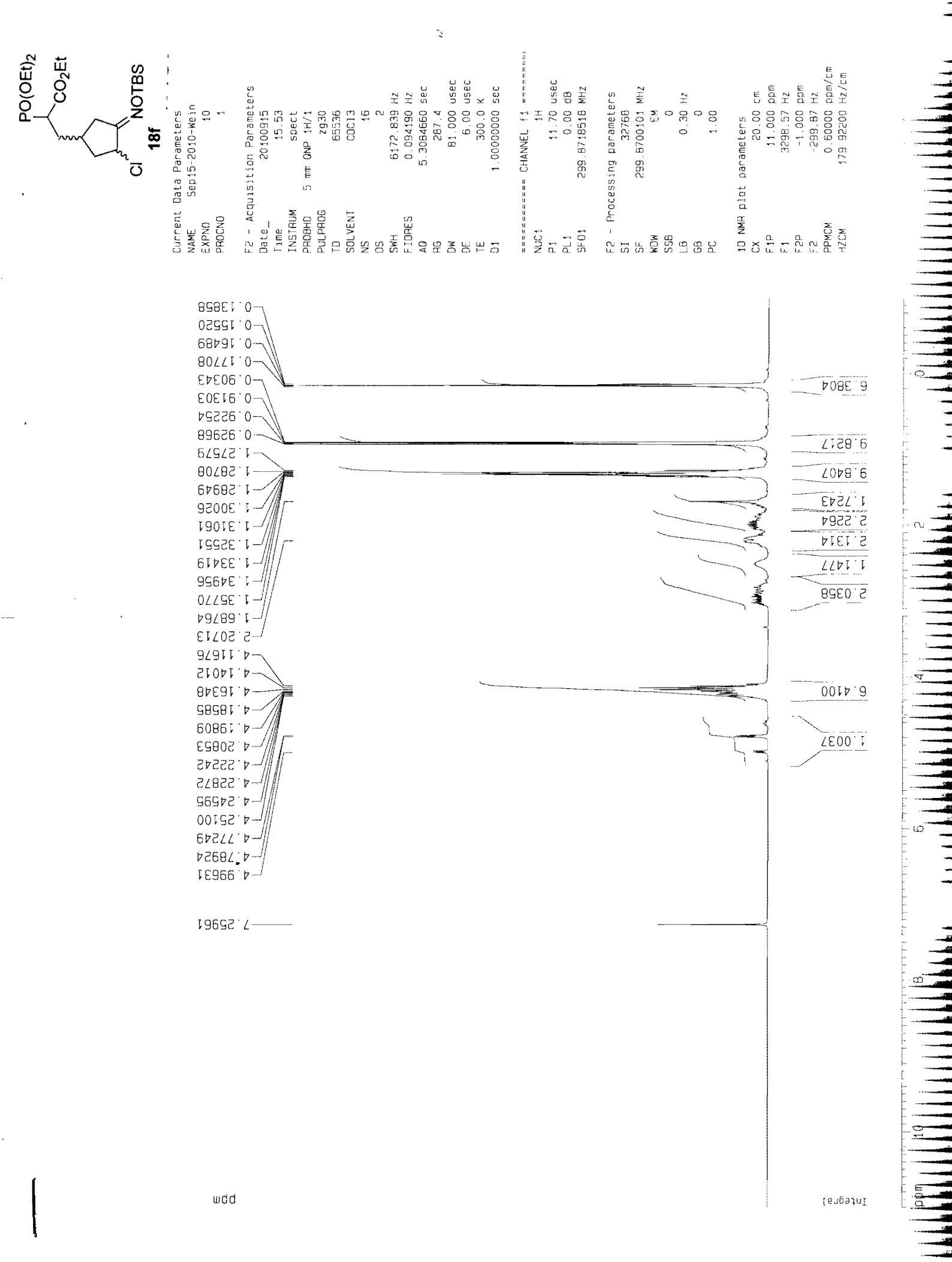
17f

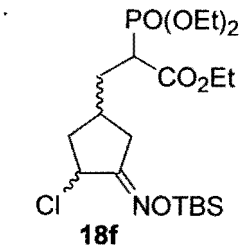

Current Data Parameters
NAME Sep13-2010-wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100913
Time 18.54
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 256
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700099 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92200 Hz/cm
9.6832
7.6838
1.0848
7.0000
7.2599
4.2629
4.2490
4.2393
4.2253
4.2156
4.2029
4.1860
4.1808
4.1618
4.1587
4.1376
4.1138
1.9603
1.9384
1.9253
1.9115
1.9079
1.8954
1.3554
1.3450
1.3319
1.3215
1.3088
1.2975
1.2932
1.2795
1.2693
ppm
Integral

PO(OEt)2
CO2Et
O
Cl

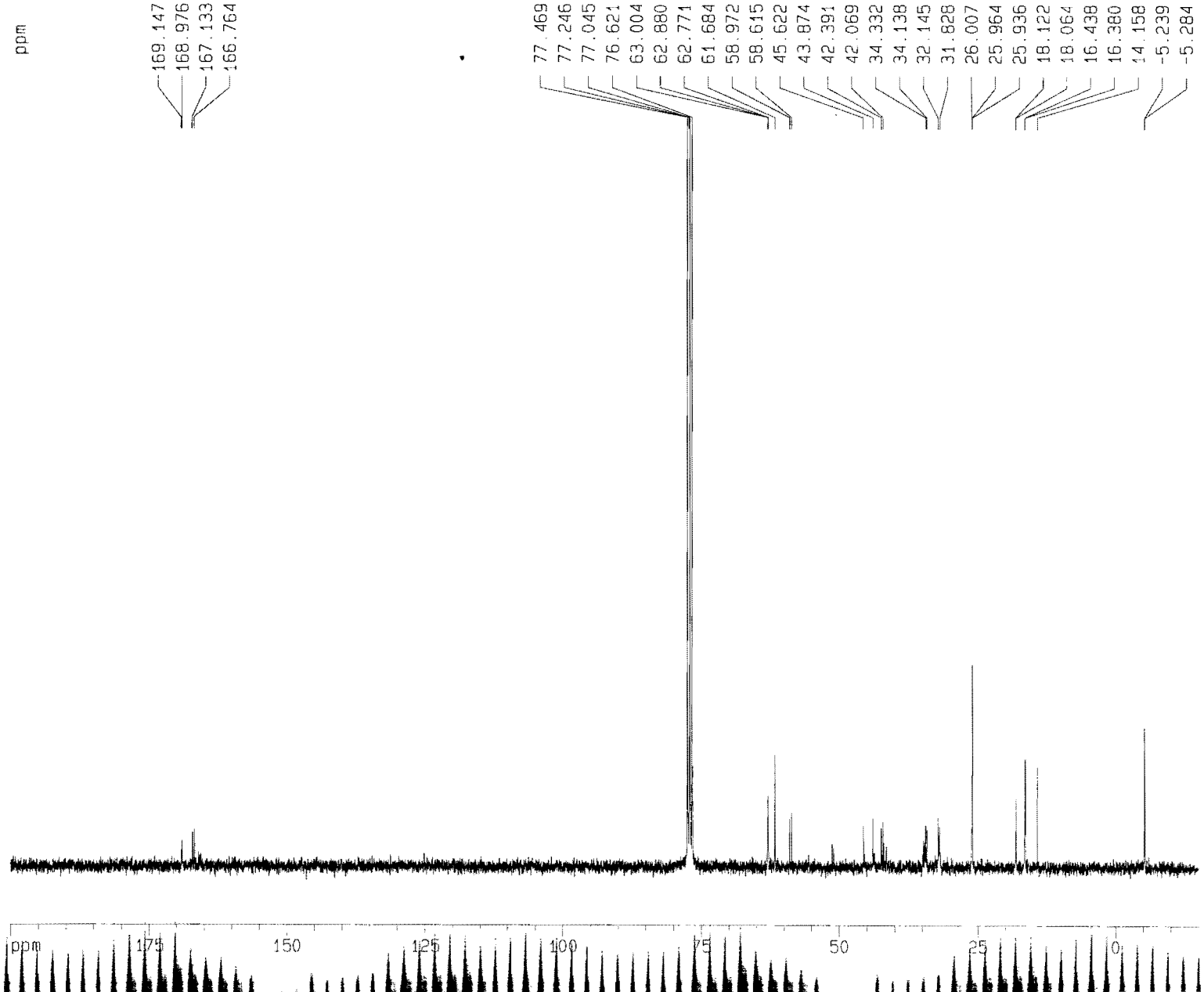
17f


Current Data Parameters
NAME Sep13-2010-Wein
EXPNO 12
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100913
Time 20.27
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 12717
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 4096
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023747 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.51 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42615 Hz/cm
77.434
77.211
77.010
76.586
63.045
62.940
62.841
61.767
57.234
56.935
45.025
43.276
41.987
41.564
39.495
39.085
32.821
32.698
32.618
32.496
32.038
16.403
16.379
16.326
16.298
14.099
168.856
168.828
168.786
168.759
209.307
209.098
208.927
208.688
ppm
200
175
150
125
100
75
50
25
0

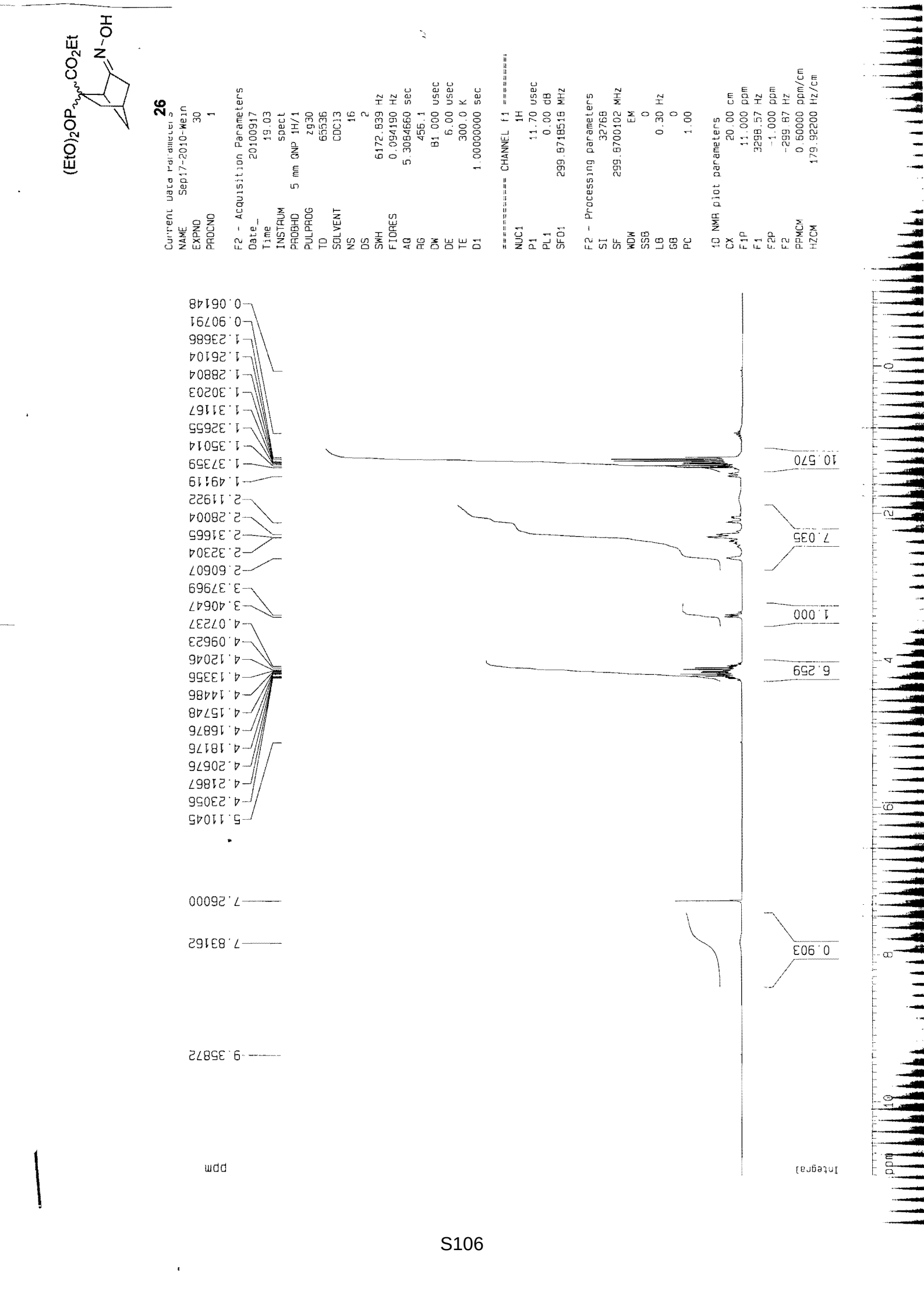

PO(OEt)2
CO2Et
NOTBS
Cl
18f
Current Data Parameters
NAME Sep15-2010-wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100915
Time 15.53
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 287.4
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718518 MHz
F2 - Processing parameters
SI 32768
SF 299.8700101 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92200 Hz/cm
0.13858
0.15520
0.16489
0.17708
0.90343
0.91303
0.92254
0.92968
1.27579
1.28708
1.28949
1.30026
1.31061
1.32551
1.33419
1.34956
1.35770
1.68764
2.20713
4.11676
4.14012
4.16348
4.18585
4.19809
4.20853
4.22242
4.22872
4.24595
4.25100
4.77249
4.78924
4.99631
7.25961
6.3804
9.8217
9.8407
1.7243
2.2264
2.1314
1.1477
2.0358
6.4100
1.0037
ppm
Integral

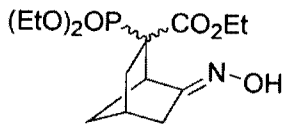


18f

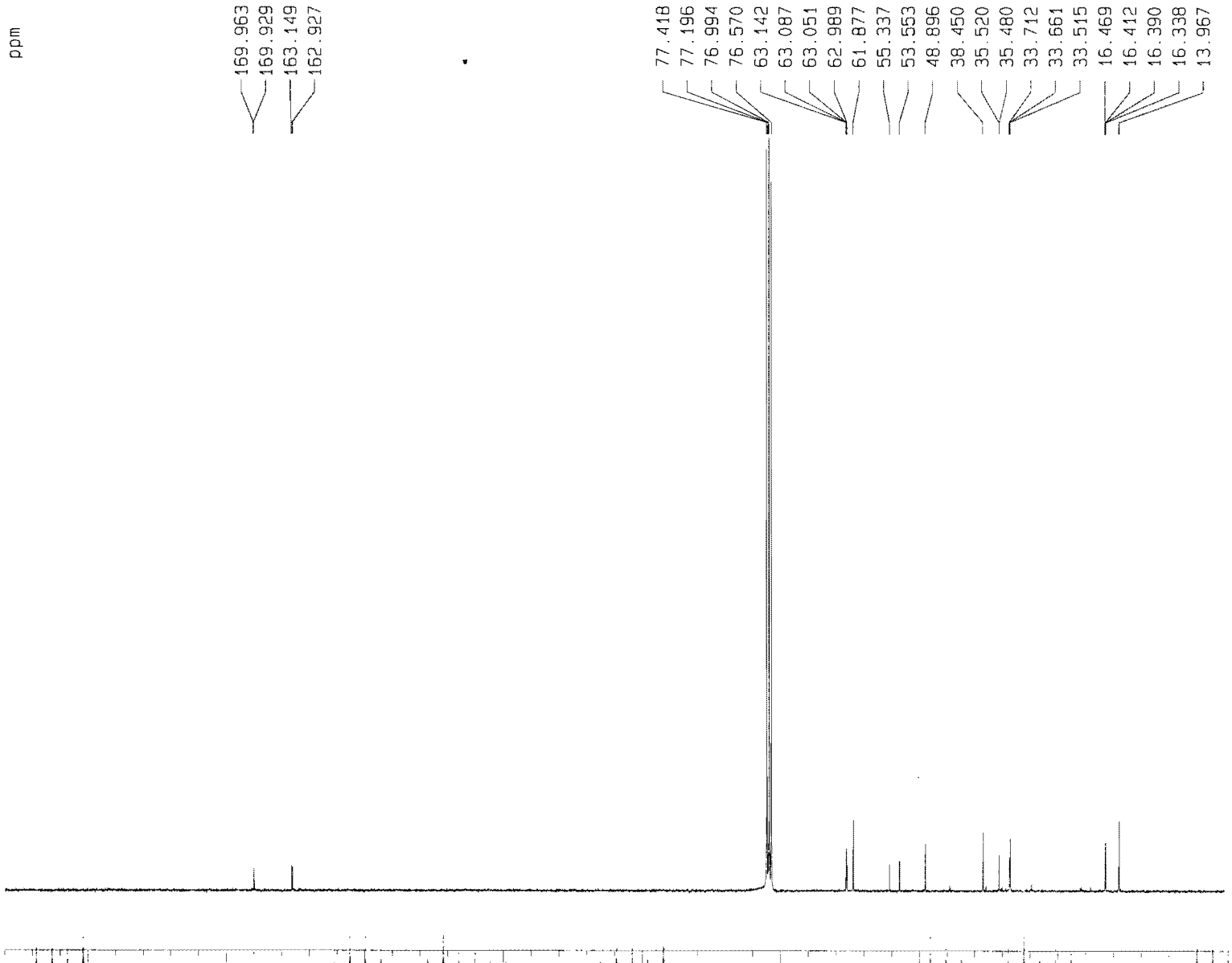



```
Current Data Parameters
NAME      Sep15-2010-Wein
EXPNO              12
PROCNO             1

F2 - Acquisition Parameters
Date_          20100915
Time             16.54
INSTRUM          spect
PROBHD    5 mm QNP 1H/1
PULPROG        zgpg30
TD             65536
SOLVENT          CDCl3
NS               1674
DS                  4
SWH        18796.992 Hz
FIDRES      0.286819 Hz
AQ          1.7433076 sec
RG               1024
DW            26.600 usec
DE             6.00 usec
TE            300.0 K
D1         2.00000000 sec
D11        0.03000000 sec
D12        0.00002000 sec

============ CHANNEL f1 ============
NUC1              13C
P1              5.40 usec
PL1            -6.00 dB
SFO1       75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2        waltz16
NUC2              1H
PCPD2         115.00 usec
PL2             0.00 dB
PL12           20.00 dB
PL13           20.00 dB
SFO2      299.8711995 MHz

F2 - Processing parameters
SI               32768
SF         75.4023707 MHz
WDW                EM
SSB                0
LB              1.00 Hz
GB                 0
PC              1.40

1D NMR plot parameters
CX              20.00 cm
F1P            200.000 ppm
F1            15080.47 Hz
F2P           -15.000 ppm
F2            -1131.04 Hz
PPMCM          10.75000 ppm/cm
HZCM          810.57550 Hz/cm
```

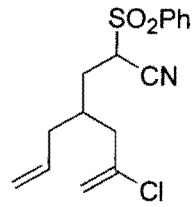

(EtO)2OP
CO2Et
N-OH
26
Current Data Parameters
NAME Sep17-2010-Wein
EXPNO 30
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100917
Time 19.03
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 456.1
DW B1 000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
CHANNEL f1
NUC1 1H
P1 11.70 usec
PL1 0.00 dB
SFO1 299.8718516 MHz
F2 - Processing parameters
SI 32768
SF 299.8700102 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3298.57 Hz
F2P -1.000 ppm
F2 -299.87 Hz
PPMCM 0.60000 ppm/cm
HZCM 179.92200 Hz/cm
0.06148
0.90791
1.23686
1.26104
1.28804
1.30203
1.31167
1.32655
1.35014
1.37359
1.49119
2.11922
2.28004
2.31665
2.32304
2.60607
3.37969
3.40647
4.07237
4.09623
4.12046
4.13356
4.14486
4.15748
4.16876
4.18176
4.20676
4.21867
4.23056
5.11045
7.26000
7.83162
9.35872
10.570
7.035
1.000
6.259
0.903
ppm
Integral



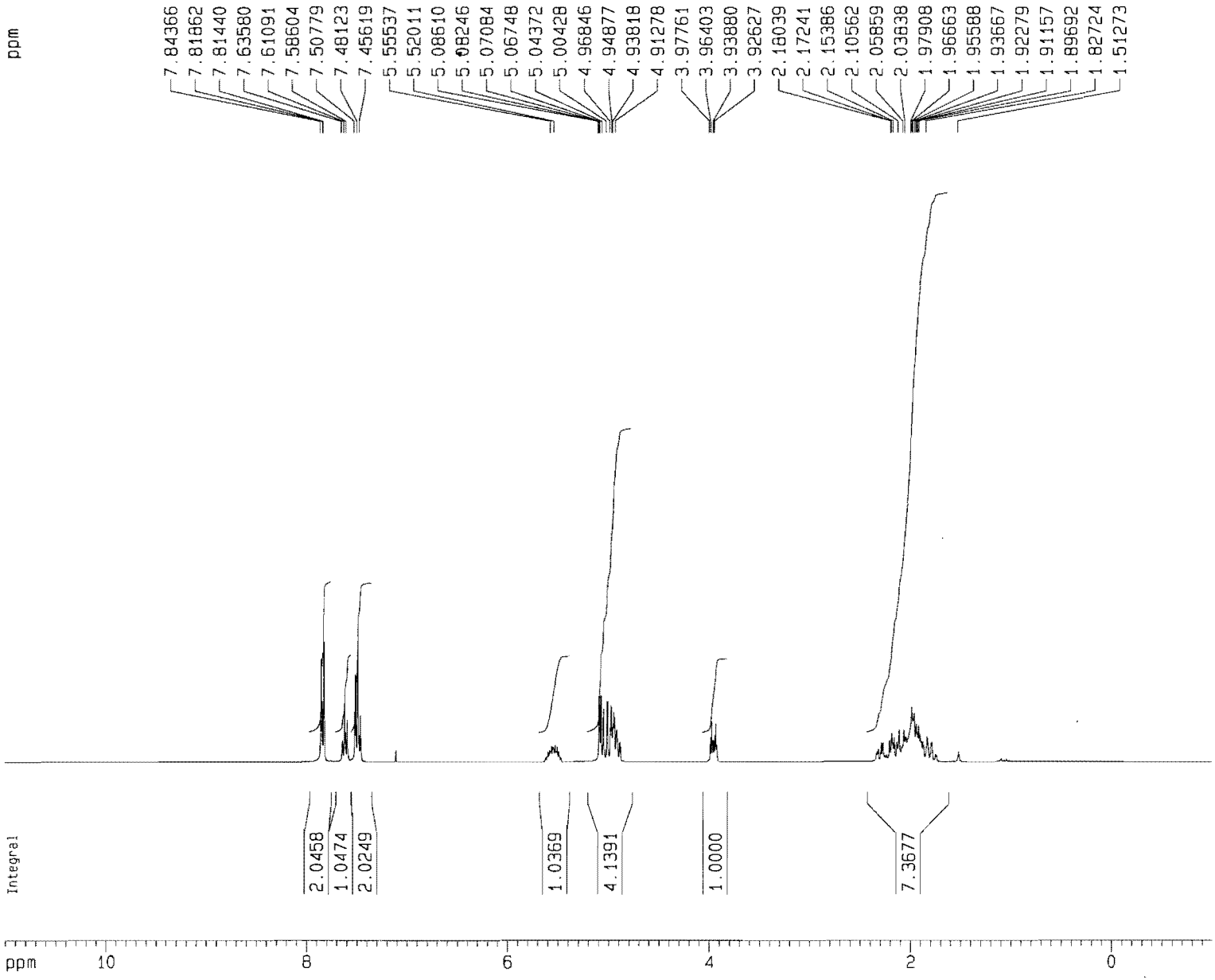
26



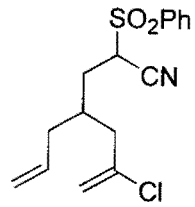
NAME	Sep17-2010-Wein
EXPNO	32
PROCNO	1
F2 - Acquisition Parameters	
Date_	20100917
Time	20.06
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	14782
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	1024
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec
========== CHANNEL f1 ==========	
NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz
========== CHANNEL f2 ==========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz
F2 - Processing parameters	
SI	32768
SF	75.4023747 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40
1D NMR plot parameters	
CX	20.00 cm
F1P	215.000 ppm
F1	16211.51 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42615 Hz/cm



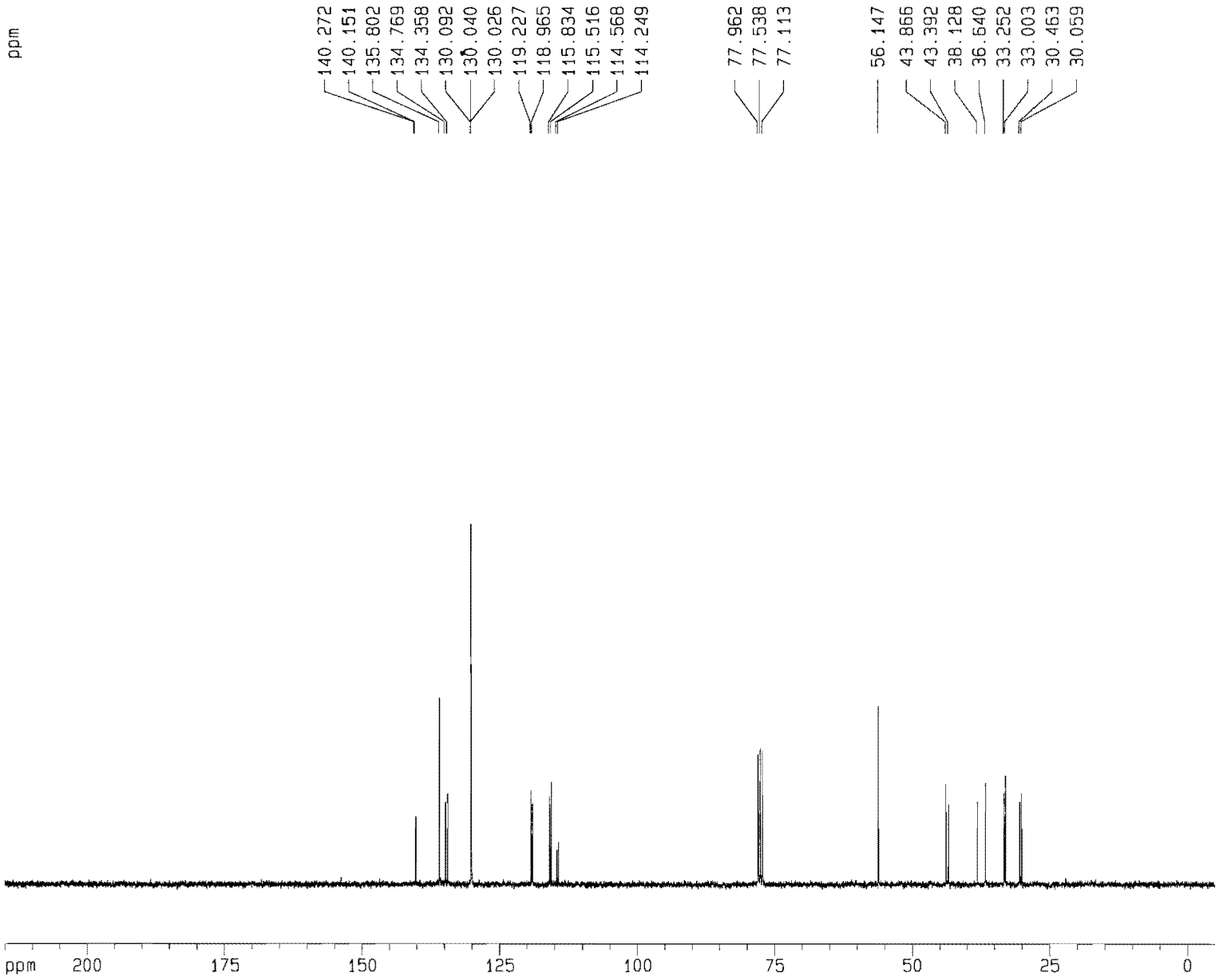
15g



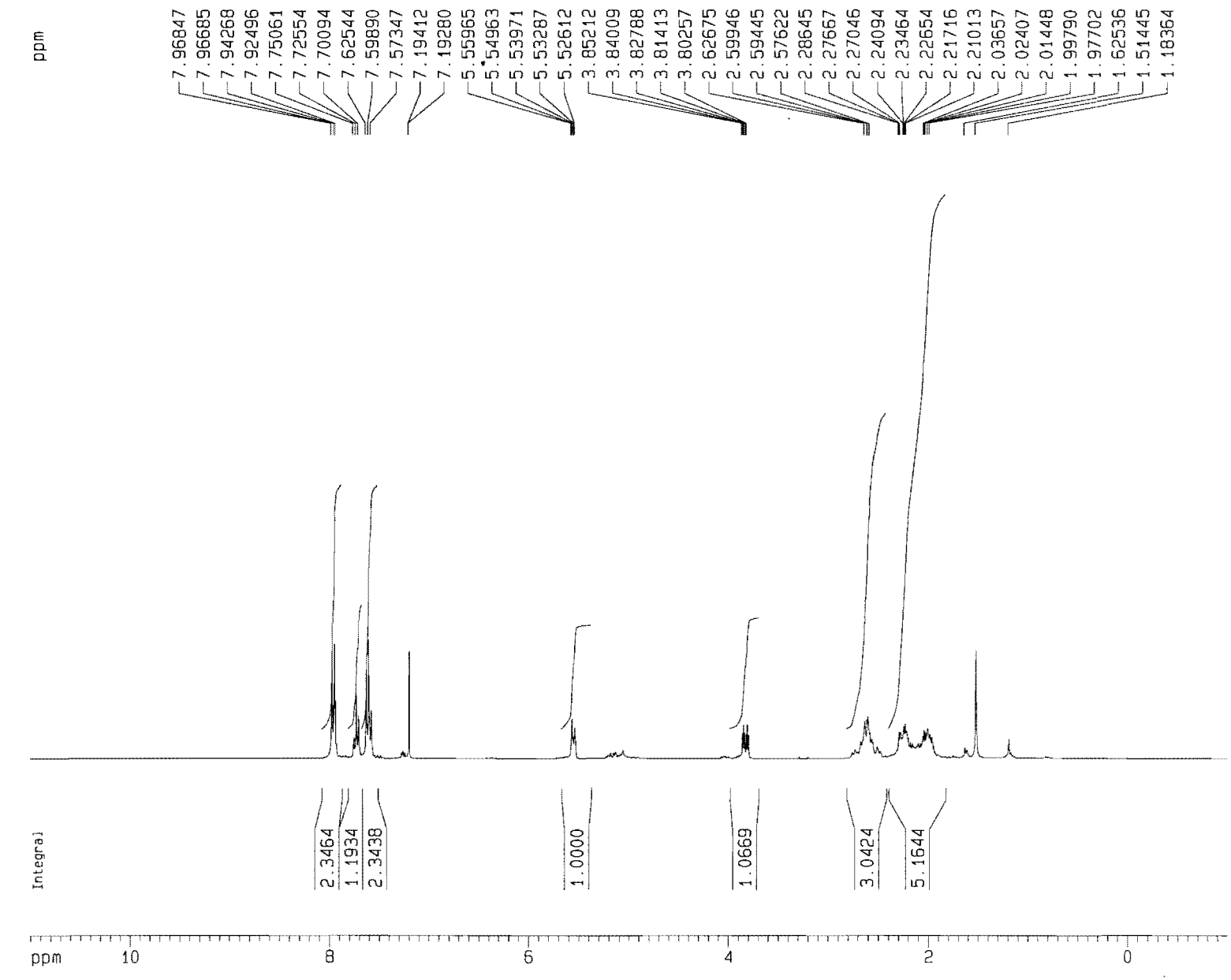

```
Current Data Parameters
NAME      Jul21-2010-Wein
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100721
Time                13.48
INSTRUM             spect
PROBHD    5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ              5.3084660 sec
RG                  71.8
DW                81.000 usec
DE                 6.00 usec
TE                300.0 K
D1             1.00000000 sec

============ CHANNEL f1 ========
NUC1                   1H
P1                 11.70 usec
PL1                 0.00 dB
SFO1          299.8718518 MHz

F2 - Processing parameters
SI                     32768
SF            299.8700567 MHz
WDW                    EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
F1P                11.000 ppm
F1               3298.57 Hz
F2P                -1.000 ppm
F2               -299.87 Hz
PPMCM           0.60000 ppm/cm
HZCM          179.92203 Hz/cm
```

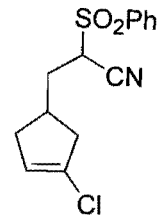


15g



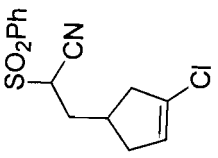

```
Current Data Parameters
NAME      Jul21-2010-Wein
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_            20100721
Time                13.57
INSTRUM             spect
PROBHD    5 mm QNP 1H/1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     93
DS                      4
SWH             18796.992 Hz
FIDRES          0.286819 Hz
AQ              1.7433076 sec
RG                   4096
DW                 26.600 usec
DE                  6.00 usec
TE                 300.0 K
D1              2.00000000 sec
D11             0.03000000 sec
D12             0.00002000 sec

============ CHANNEL f1 ============
NUC1                  13C
P1                  5.40 usec
PL1                -6.00 dB
SFO1          75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2          waltz16
NUC2                  1H
PCPD2             115.00 usec
PL2                 0.00 dB
PL12               20.00 dB
PL13               20.00 dB
SFO2         299.8711995 MHz

F2 - Processing parameters
SI                   32768
SF            75.4023410 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40

1D NMR plot parameters
CX                  20.00 cm
F1P               215.000 ppm
F1                16211.50 Hz
F2P                -5.000 ppm
F2                 -377.01 Hz
PPMCM             11.00000 ppm/cm
HZCM             829.42578 Hz/cm
```



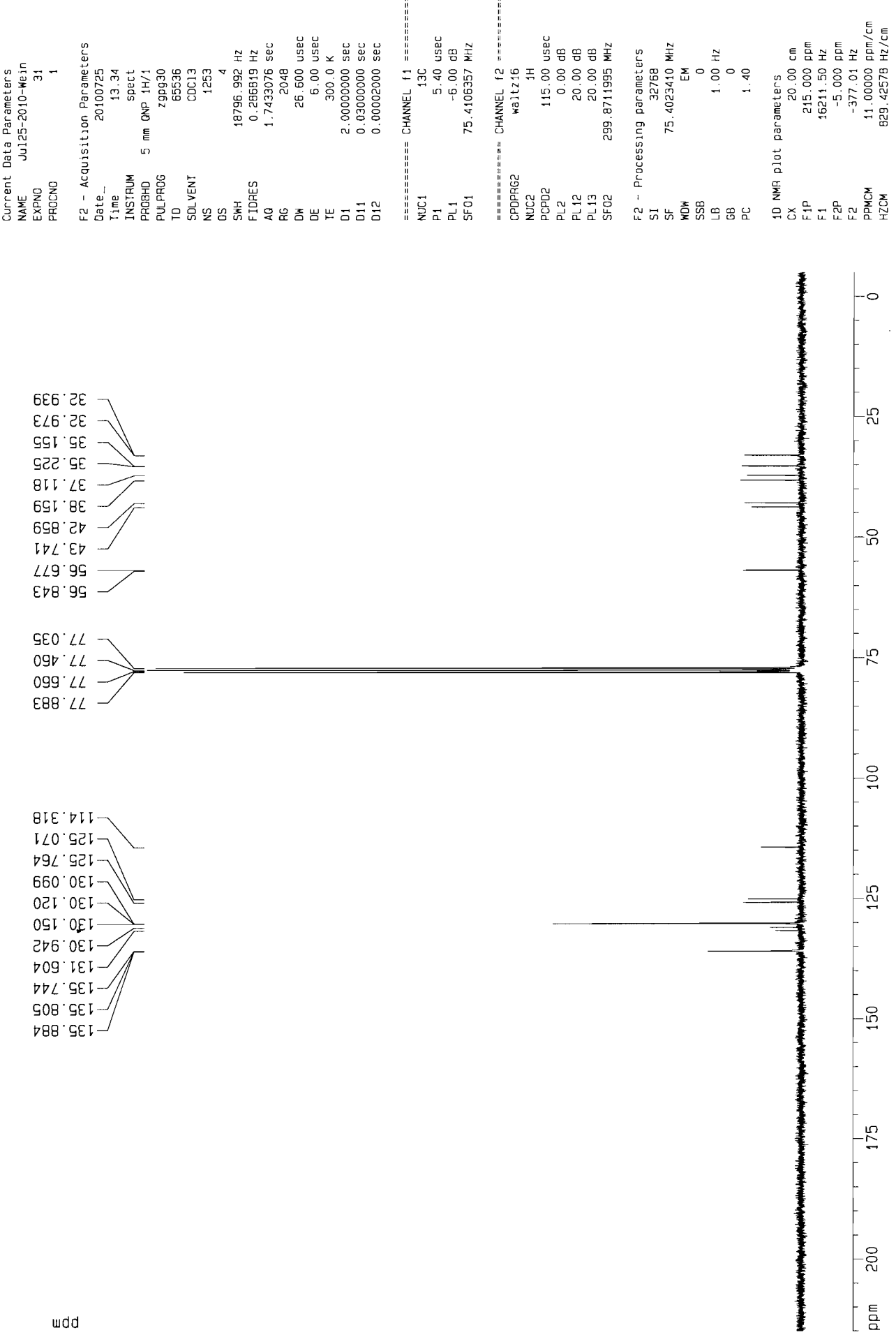


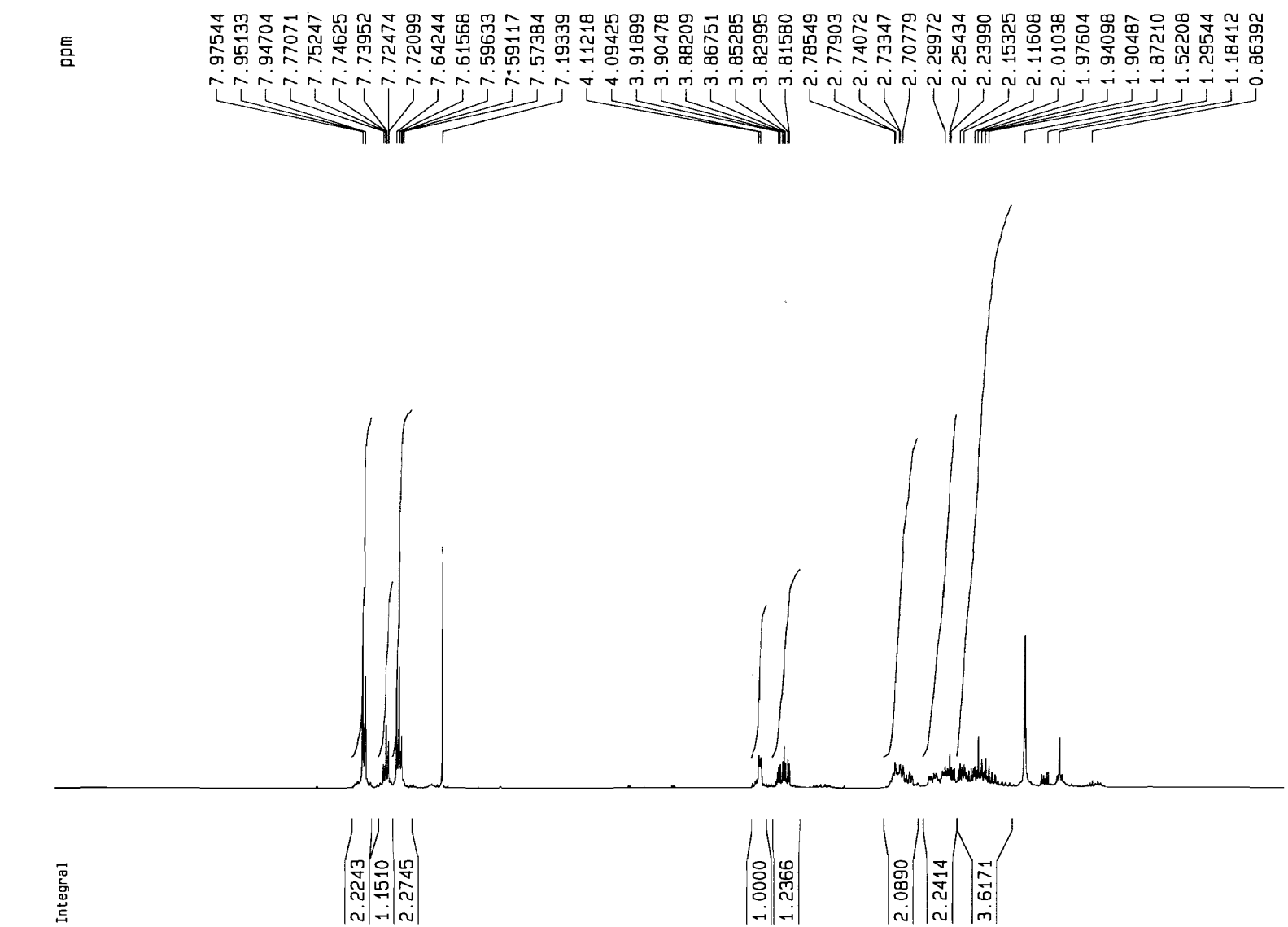
16g

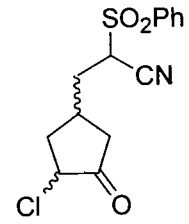
```
Current Data Parameters
NAME      Jul25-2010-Wein
EXPND                  10
PROCND                  1

F2 - Acquisition Parameters
Date_            20100725
Time                12.14
INSTRUM             spect
PROBHD     5 mm QNP 1H/1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ              5.3084660 sec
RG                406.4
DW               81.000 usec
DE                6.00 usec
TE               300.0 K
D1              1.00000000 sec

============ CHANNEL f1 ========
NUC1                   1H
P1                 11.70 usec
PL1                 0.00 dB
SFO1          299.8718518 MHz

F2 - Processing parameters
SI                  32768
SF            299.8700301 MHz
WDW                    EM
SSB                     0
LB                 0.30 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                 20.00 cm
F1P               11.000 ppm
F1               3298.57 Hz
F2P               -1.000 ppm
F2              -299.87 Hz
PPMCM           0.60000 ppm/cm
HZCM          179.92201 Hz/cm
```


SO2Ph
CN
Cl

16g


Current Data Parameters
NAME Jul25-2010-Wein
EXPNO 31
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100725
Time 13.34
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1253
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
========== CHANNEL f1 ==========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
32.939
32.973
35.155
35.225
37.118
38.159
42.859
43.741
56.677
56.843
77.035
77.460
77.660
77.883
114.318
125.071
125.764
130.099
130.120
130.150
130.942
131.604
135.744
135.805
135.884
ppm
0
25
50
75
100
125
150
175
200
ppm





17g

Current Data Parameters

NAME	Jul28-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100728
Time	18.13
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	512
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

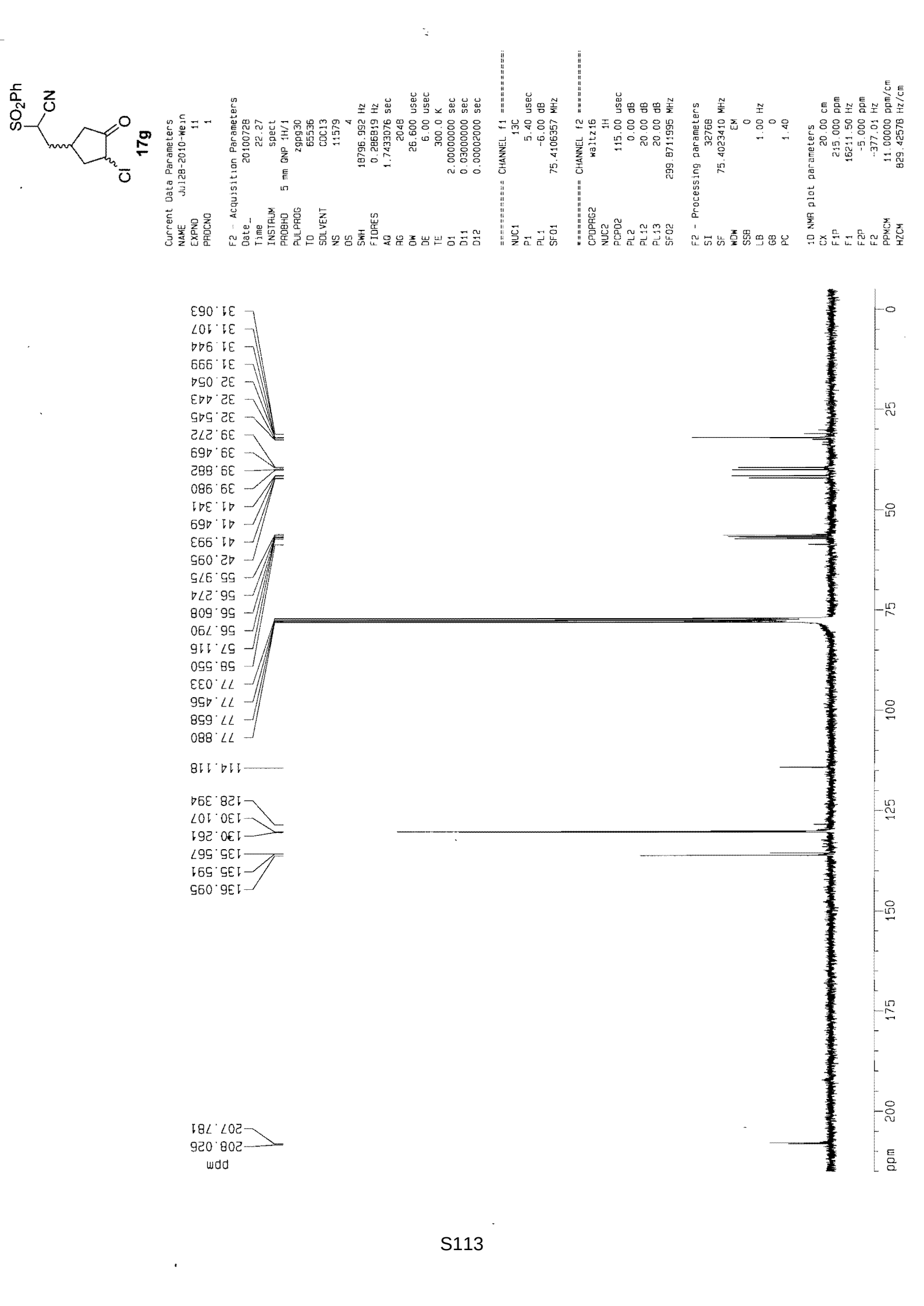
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

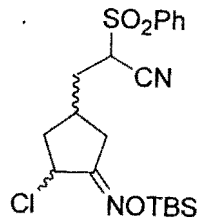
F2 - Processing parameters

SI	32768
SF	300.1300263 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

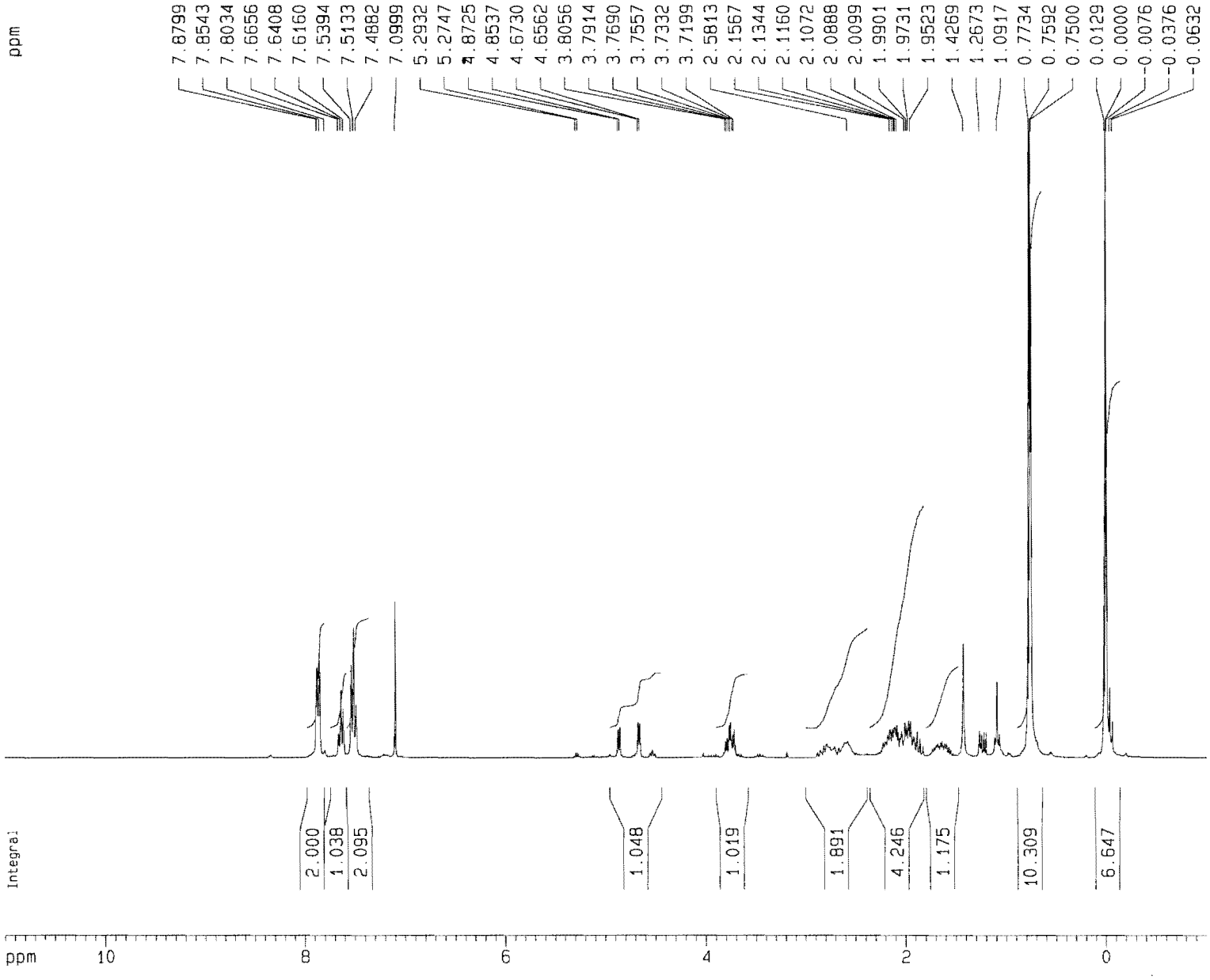
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm


SO2Ph
CN
O
Cl
17g
Current Data Parameters
NAME Jul28-2010-Wein
EXPNO 11
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100728
Time 22.27
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 11579
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
31.063
31.107
31.944
31.999
32.054
32.443
32.545
39.272
39.469
39.882
39.980
41.341
41.469
41.993
42.095
55.975
56.274
56.608
56.790
57.116
58.550
77.033
77.456
77.658
77.880
114.118
128.394
130.107
130.261
135.567
135.591
136.095
207.781
208.026
ppm
0
25
50
75
100
125
150
175
200
ppm



18g



Current Data Parameters

NAME	Jul30-2010-Wein
EXPNO	20
PROCND	1

F2 - Acquisition Parameters

Date_	20100730
Time	16.08
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	287.4
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

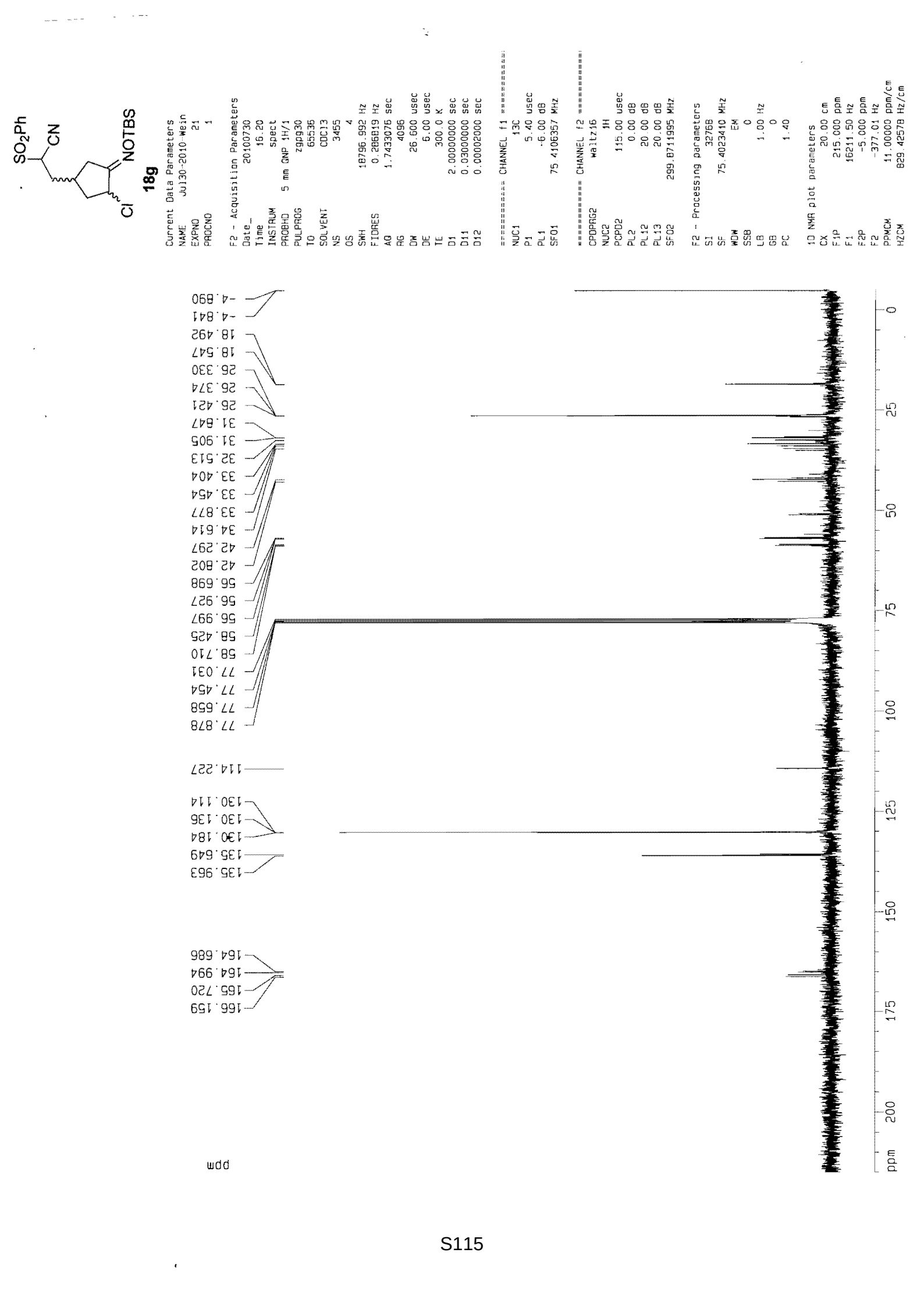
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

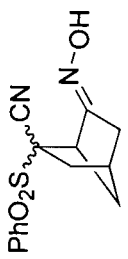
F2 - Processing parameters

SI	32768
SF	299.8700579 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

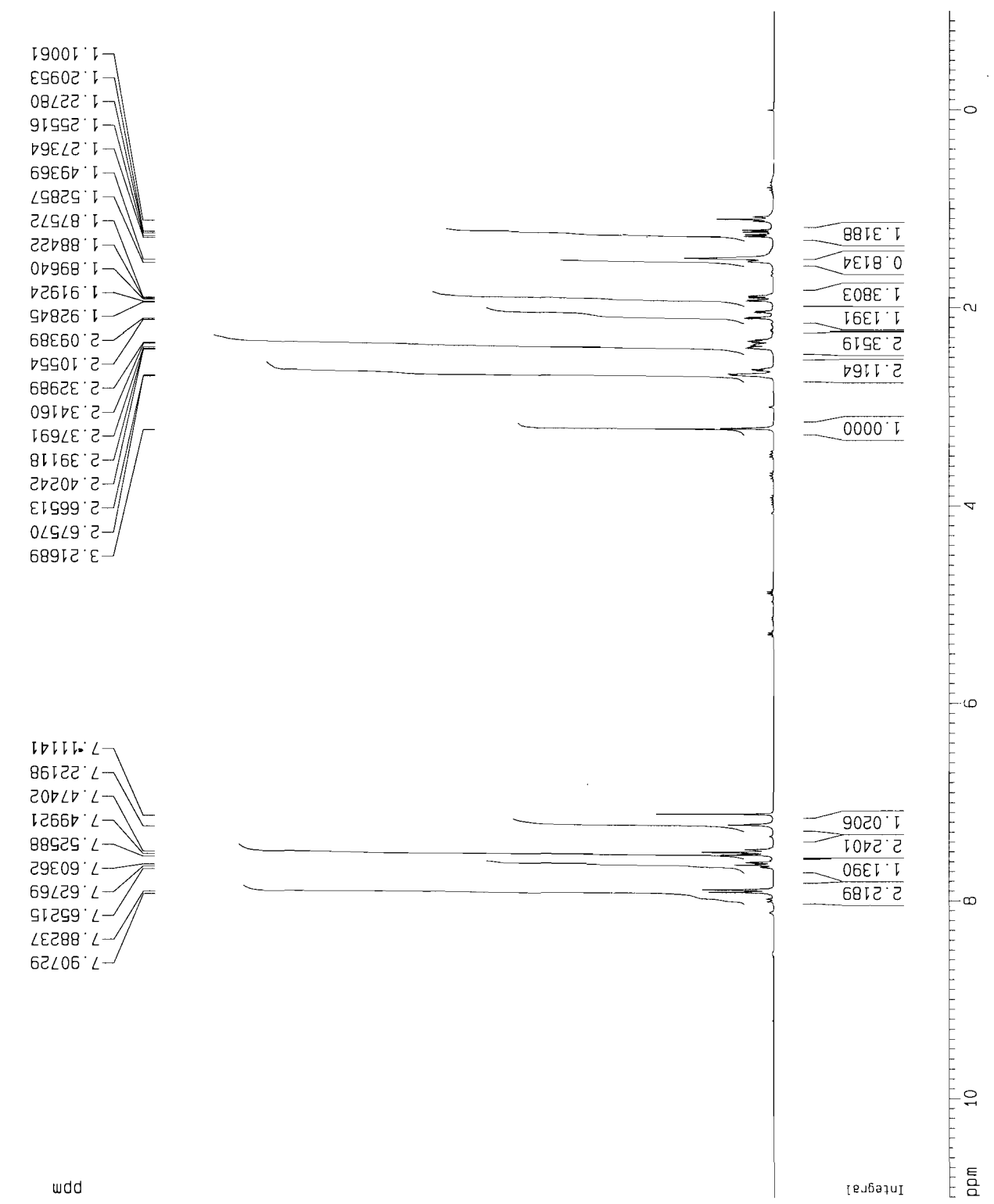
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm

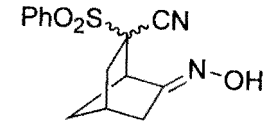

SO2Ph
CN
NOTBS
Cl
18g
Current Data Parameters
NAME JJ130-2010-Wein
EXPNO 21
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100730
Time 16.20
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 3455
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 4096
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 215.000 ppm
F1 16211.50 Hz
F2P -5.000 ppm
F2 -377.01 Hz
PPMCM 11.00000 ppm/cm
HZCM 829.42578 Hz/cm
-4.890
-4.841
18.492
18.547
26.330
26.374
26.421
31.847
31.905
32.513
33.404
33.454
33.877
34.614
42.297
42.802
56.698
56.927
56.997
58.425
58.710
77.031
77.454
77.658
77.878
114.227
130.114
130.136
130.184
135.649
135.963
164.686
164.994
165.720
166.159
ppm
0
25
50
75
100
125
150
175
200



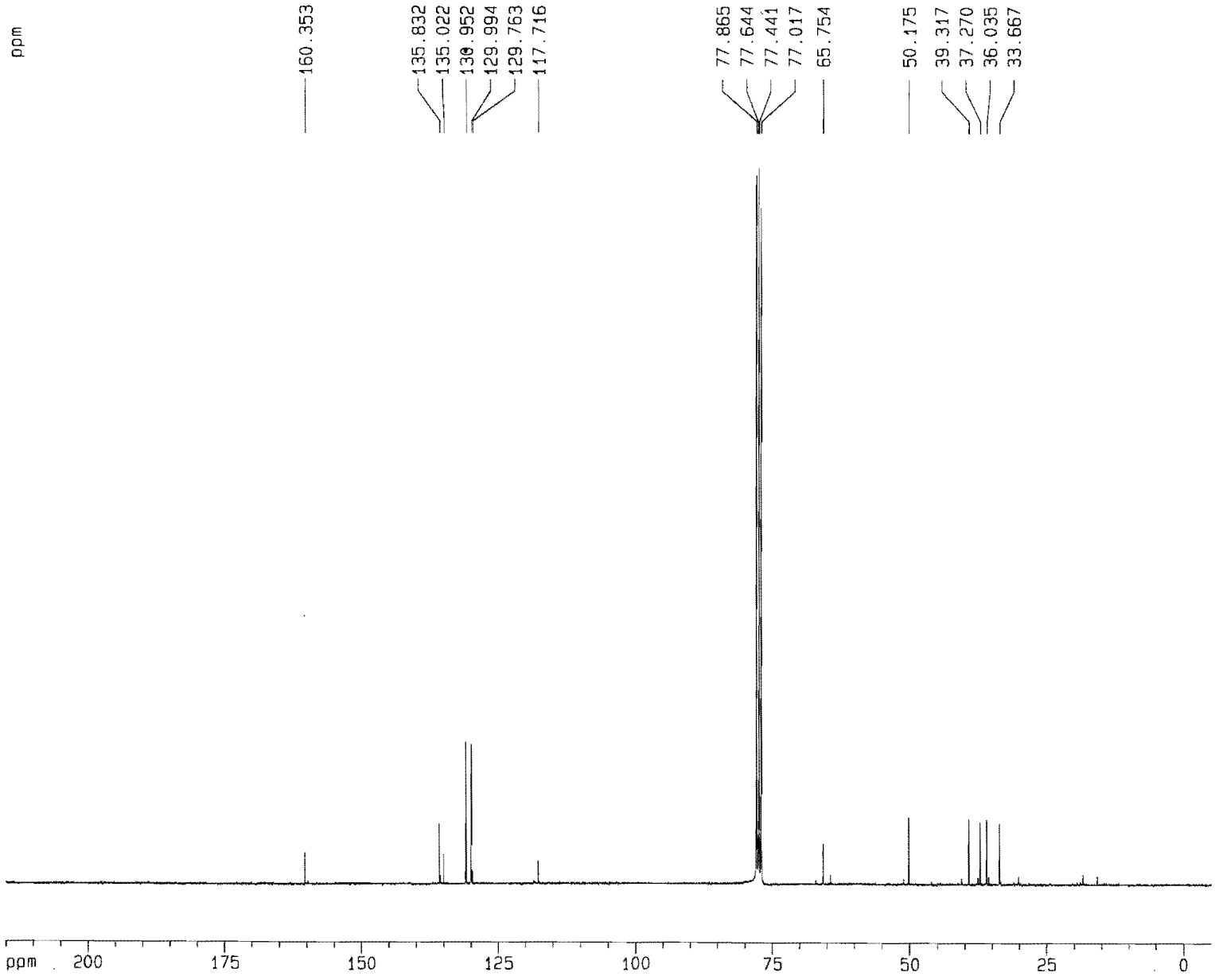
27

```
Current Data Parameters
NAME      Aug01-2010-Wein
EXPNO              10
PROCNO              1

F2 - Acquisition Parameters
Date_          20100801
Time              11.20
INSTRUM           spect
PROBHD   5 mm QNP 1H/1
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  41
DS                   0
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ            5.3084660 sec
RG                574.7
DW               81.000 usec
DE                6.00 usec
TE                300.0 K
D1            2.00000000 sec

========== CHANNEL f1 =========
NUC1                1H
P1              11.70 usec
PL1              0.00 dB
SFO1        299.8718518 MHz

F2 - Processing parameters
SI                 32768
SF          299.8700545 MHz
WDW                   EM
SSB                    0
LB              0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX              20.00 cm
F1P             11.000 ppm
F1            3298.57 Hz
F2P            -1.000 ppm
F2             -299.87 Hz
PPMCM         0.60000 ppm/cm
HZCM          179.92203 Hz/cm
```

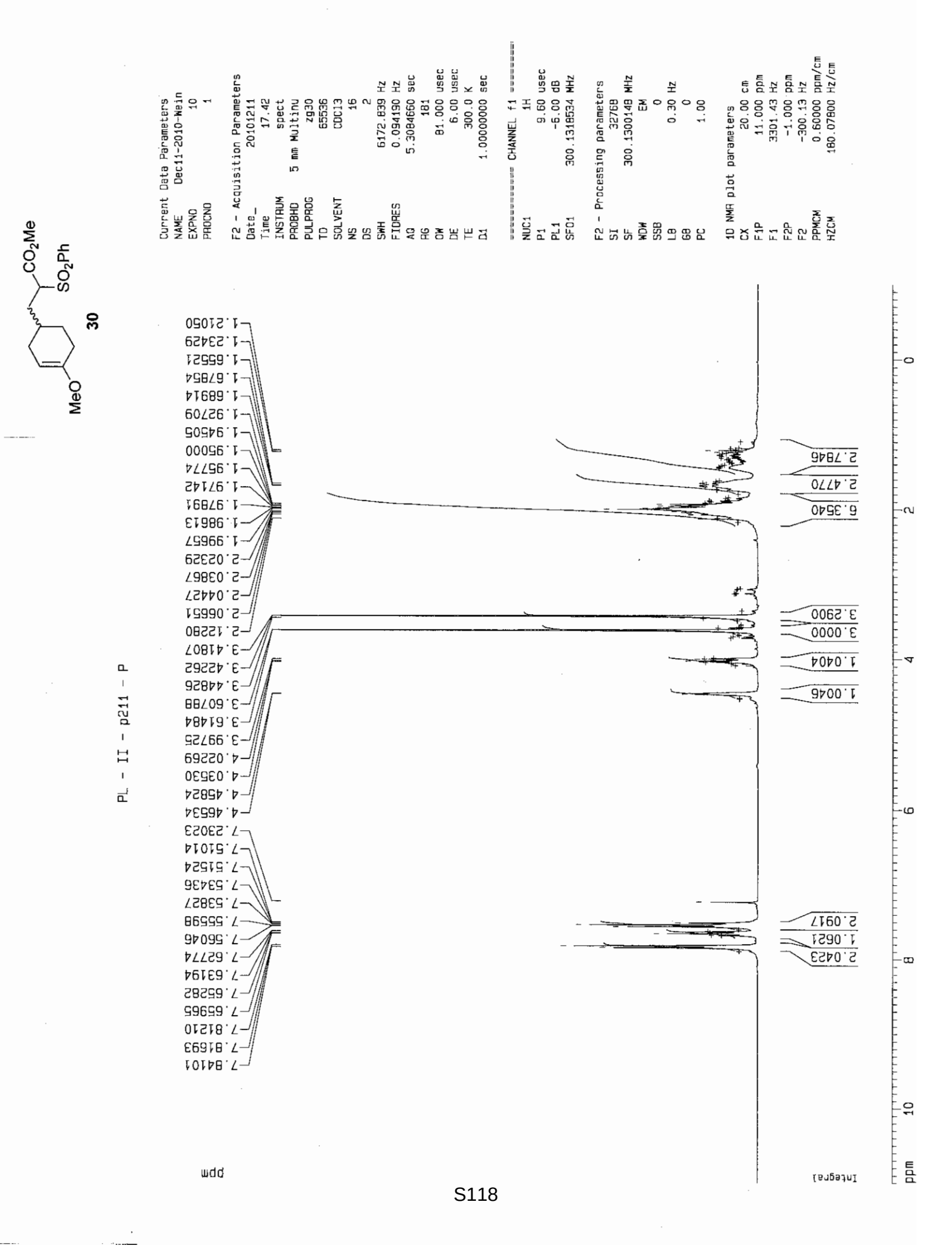


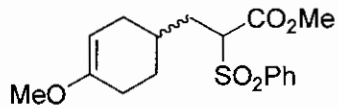


27



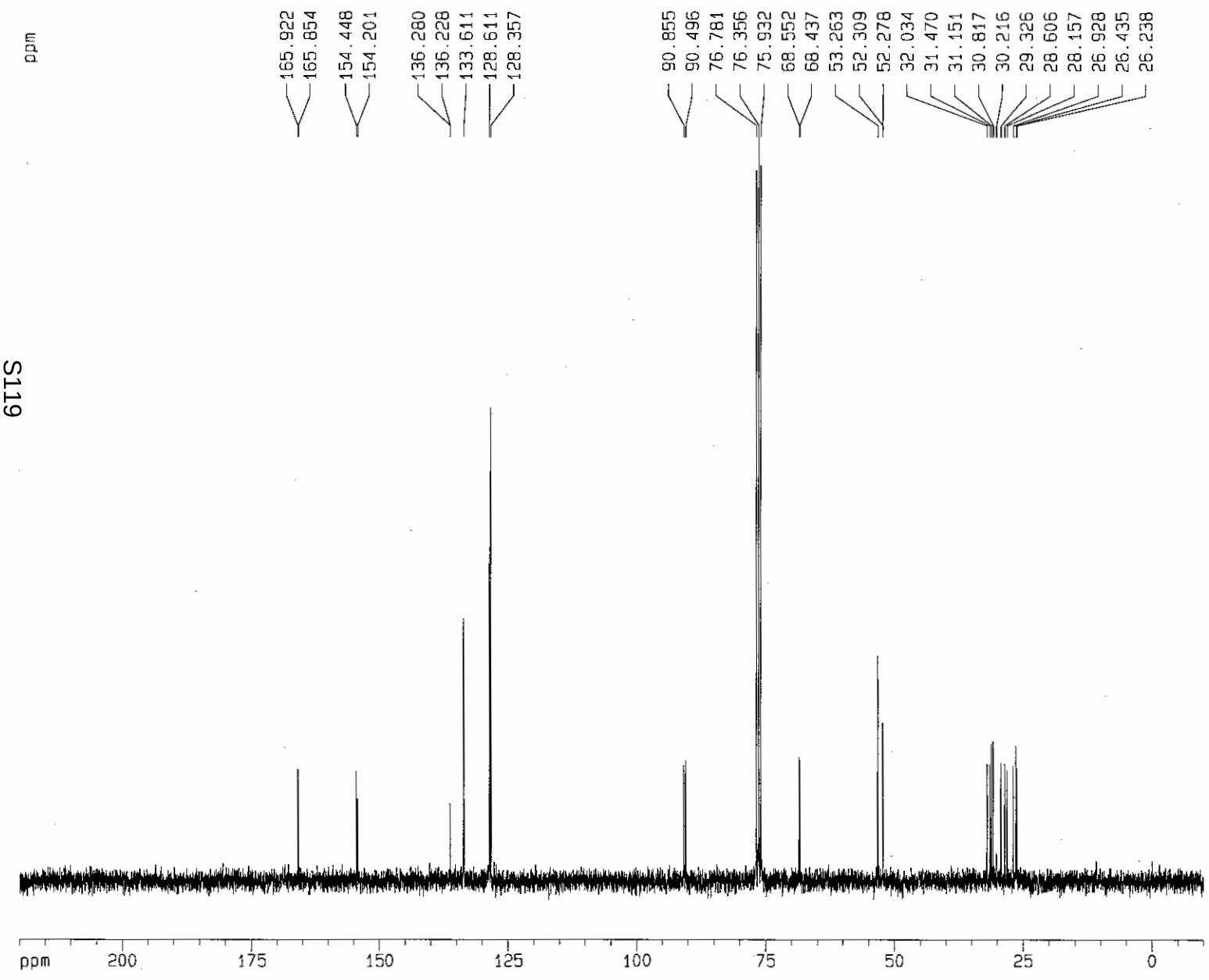

```
Current Data Parameters
NAME      Aug01-2010-Wein
EXPNO                 12
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100801
Time               13.01
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                20174
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG               3649.1
DW              26.600 usec
DE               6.00 usec
TE              300.0 K
D1           2.00000000 sec
D11          0.03000000 sec
D12          0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1               5.40 usec
PL1             -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX               20.00 cm
F1P             215.000 ppm
F1             16211.50 Hz
F2P             -5.000 ppm
F2              -377.01 Hz
PPMCM          11.00000 ppm/cm
HZCM          829.42578 Hz/cm
```


CO2Me
SO2Ph
MeO
30
Current Data Parameters
NAME Dec11-2010-Wein
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101211
Time 17.42
INSTRUM spect
PROBHD 5 mm Multinu
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 181
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
SFO1 300.1318534 MHz
F2 - Processing parameters
SI 32768
SF 300.1300148 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 20.00 cm
F1P 11.000 ppm
F1 3301.43 Hz
F2P -1.000 ppm
F2 -300.13 Hz
PPMCM 0.60000 ppm/cm
HZCM 180.07800 Hz/cm
PL - II - p211 - P
ppm
Integral
7.84101
7.81693
7.81210
7.65965
7.65282
7.63194
7.62774
7.60046
7.55598
7.53827
7.53436
7.51524
7.51014
7.23023
4.46534
4.45824
4.03530
4.02269
3.99725
3.61484
3.60788
3.44826
3.42262
3.41807
2.12280
2.06651
2.04427
2.03867
2.02329
1.99657
1.98613
1.97891
1.97142
1.95774
1.95000
1.94505
1.92709
1.89814
1.67854
1.65521
1.23429
1.21050
2.0423
1.0621
2.0917
1.0046
1.0404
3.0000
3.2900
5.3540
2.4770
2.7846
ppm
0
2
4
6
8
10

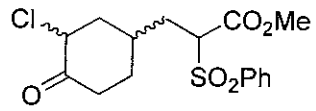


30

PL - II - p205 - P

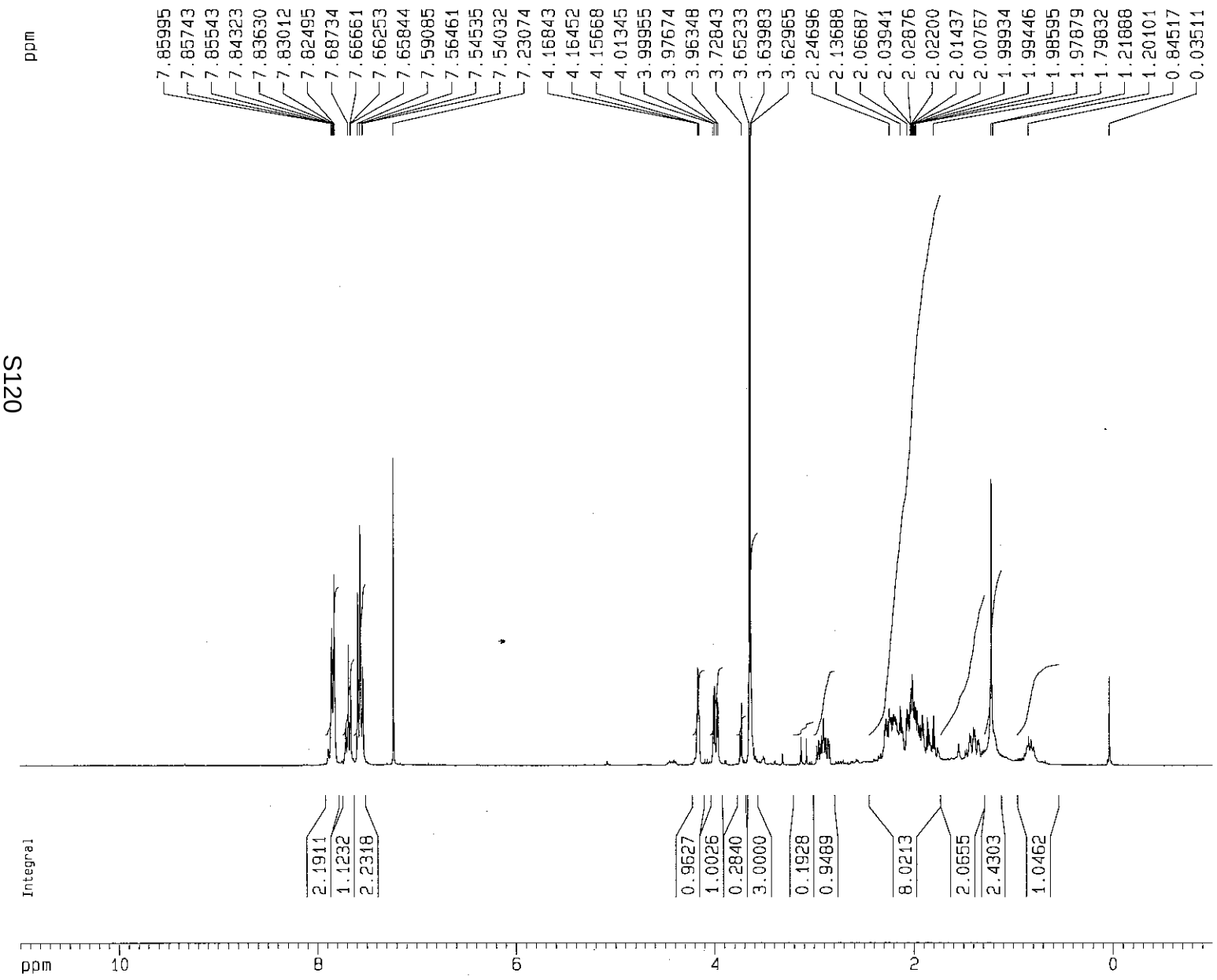



```
Current Data Parameters
NAME      Dec04-2010-Wein
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101204
Time               16.06
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  450
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 8192
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4024255 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              220.000 ppm
F1              16588.53 Hz
F2P             -10.000 ppm
F2               -754.03 Hz
PPMCM          11.50000 ppm/cm
HZCM          867.12793 Hz/cm
```



31

PL - II - p212 - P



S120

Current Data Parameters

NAME	Dec14-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101214
Time	12.54
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	362
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

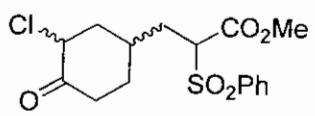
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700189 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

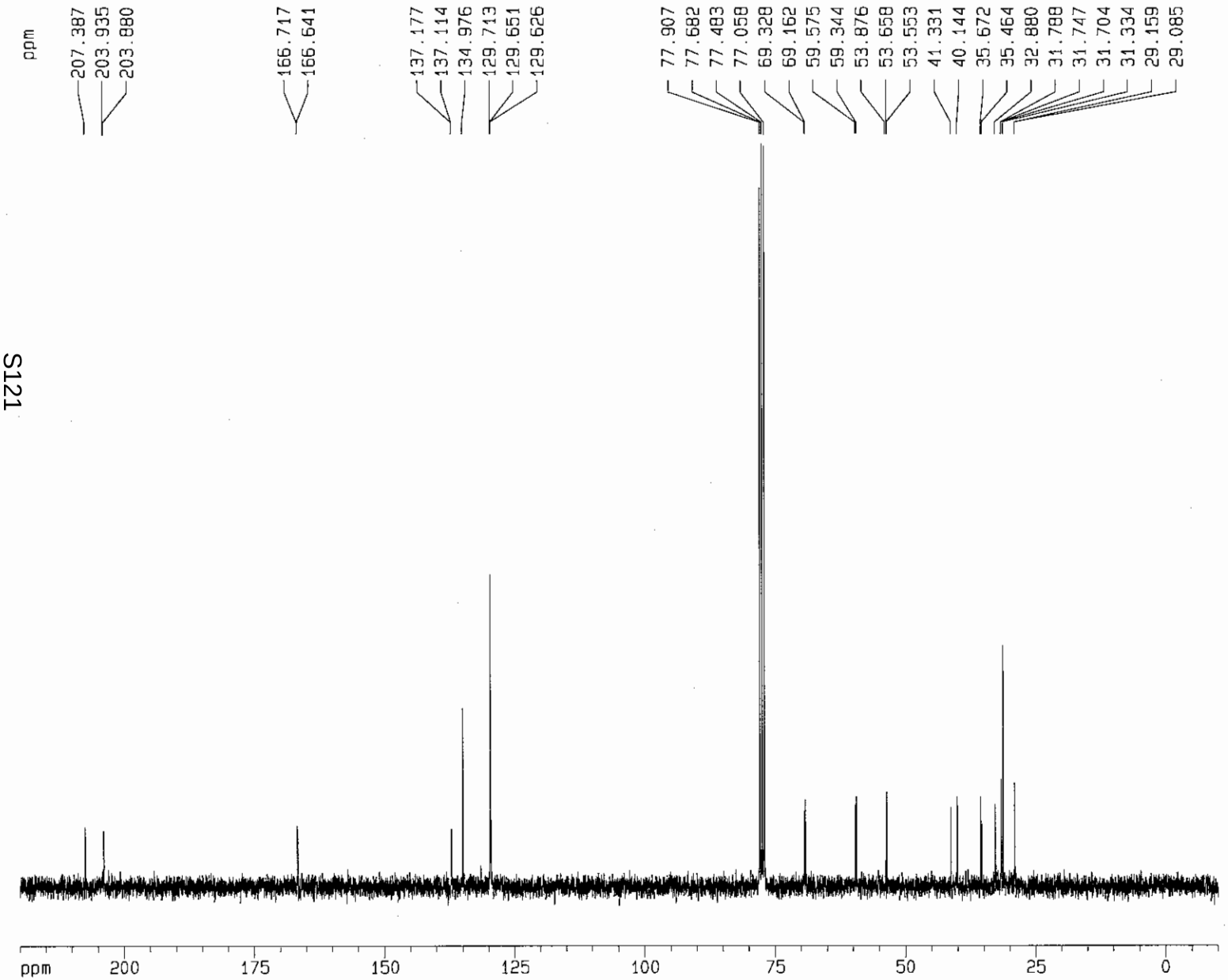
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

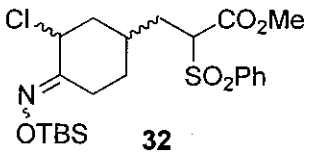


31

PL - II - p206 - P(mix)

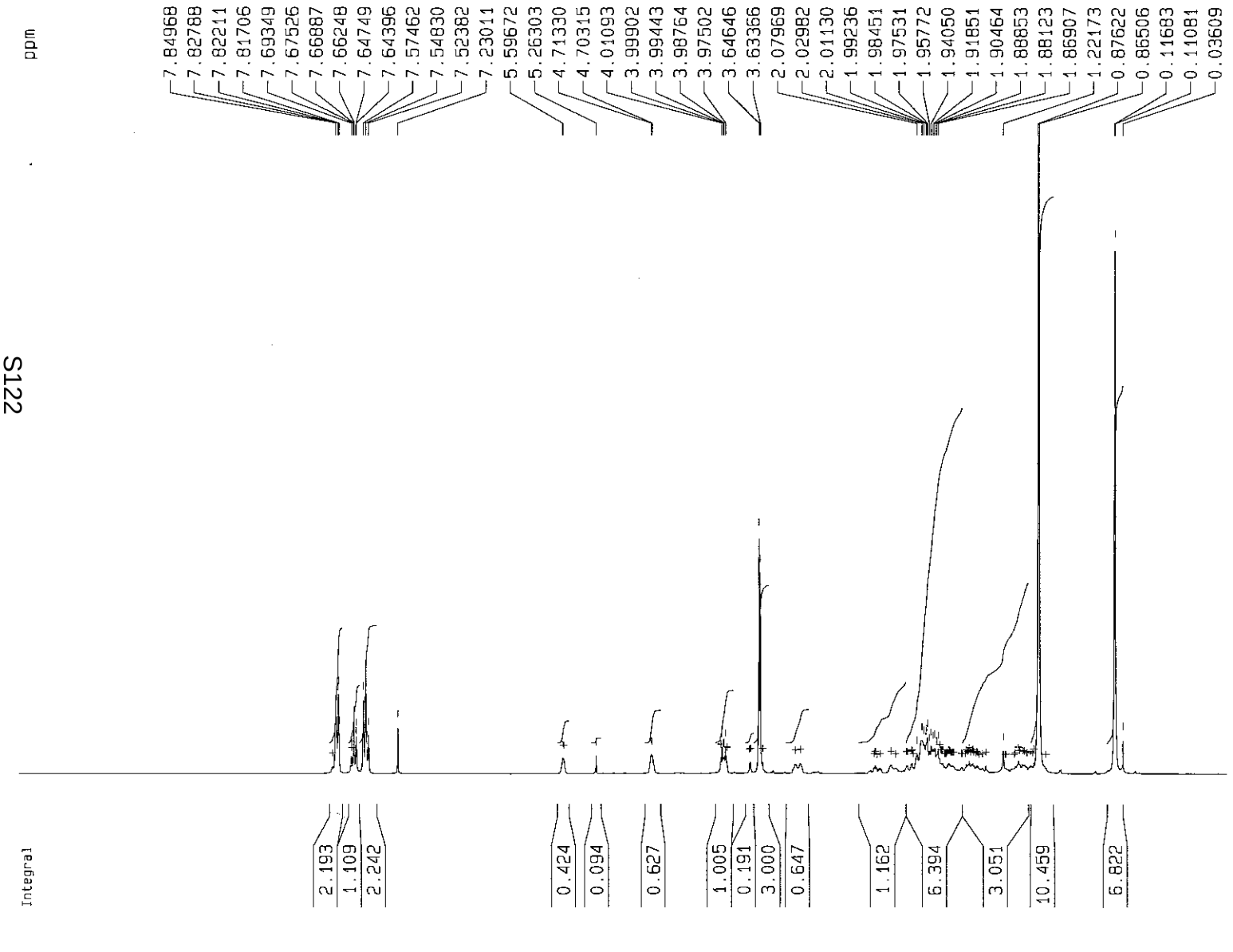



```
Current Data Parameters
NAME      Dec04-2010-Wein
EXPNO                 21
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101204
Time               17.12
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   541
DS                     4
SWH          18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433075 sec
RG                  8192
DW             26.600 usec
DE              6.00 usec
TE             300.0 K
D1          2.00000000 sec
D11         0.03000000 sec
D12         0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1              5.40 usec
PL1             -6.00 dB
SF01        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            20.00 dB
PL13            20.00 dB
SF02       299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023410 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
F1P               220.000 ppm
F1              16588.51 Hz
F2P               -10.000 ppm
F2               -754.02 Hz
PPMCM           11.50000 ppm/cm
HZCM          867.12695 Hz/cm
```



32

PL - II - p207 - P



S122

Current Data Parameters

NAME	Dec07-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101207
Time	14.53
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	143.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

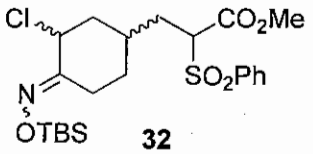
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700189 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

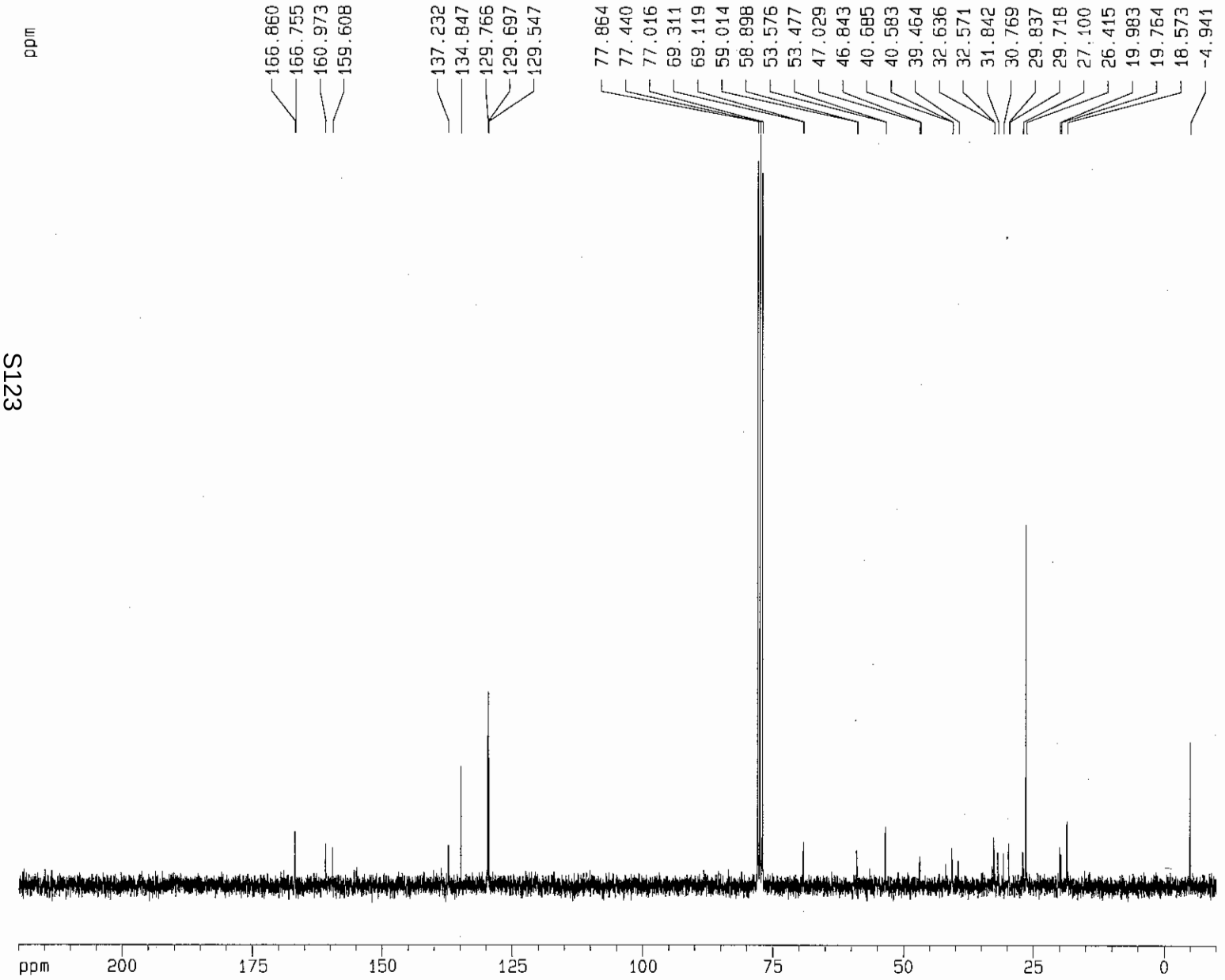
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

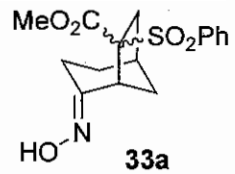


32

PL - II - p207 - P

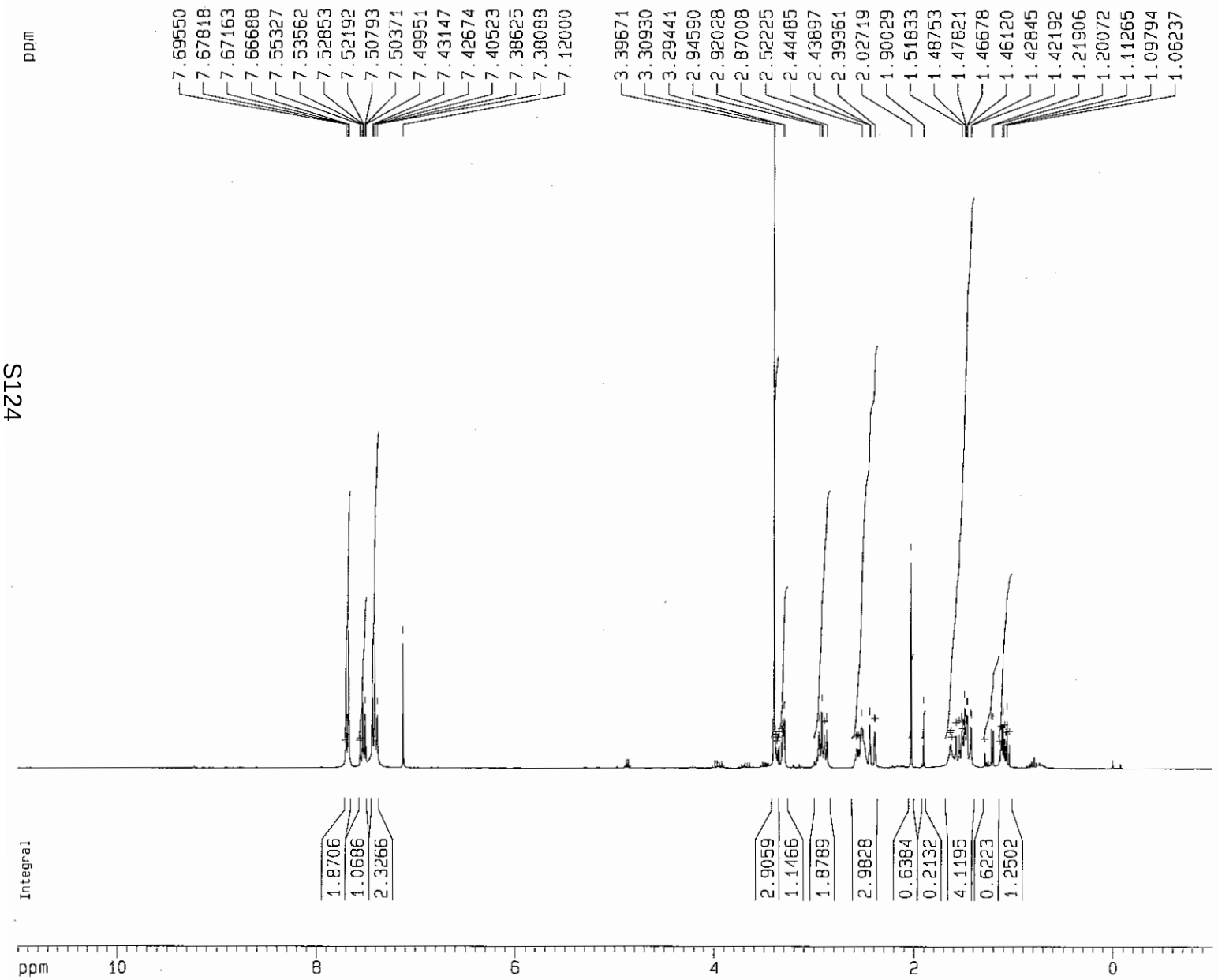



```
Current Data Parameters
NAME      Dec07-2010-Wein
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_           20101207
Time               14.59
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  620
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 8192
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF          75.4023410 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              220.000 ppm
F1              16588.51 Hz
F2P              -10.000 ppm
F2               -754.02 Hz
PPMCM            11.50000 ppm/cm
HZCM           867.12695 Hz/cm
```



33a

PL - II - p208 - P



Current Data Parameters

NAME	Dec08-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101208
Time	17.43
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	322.5
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

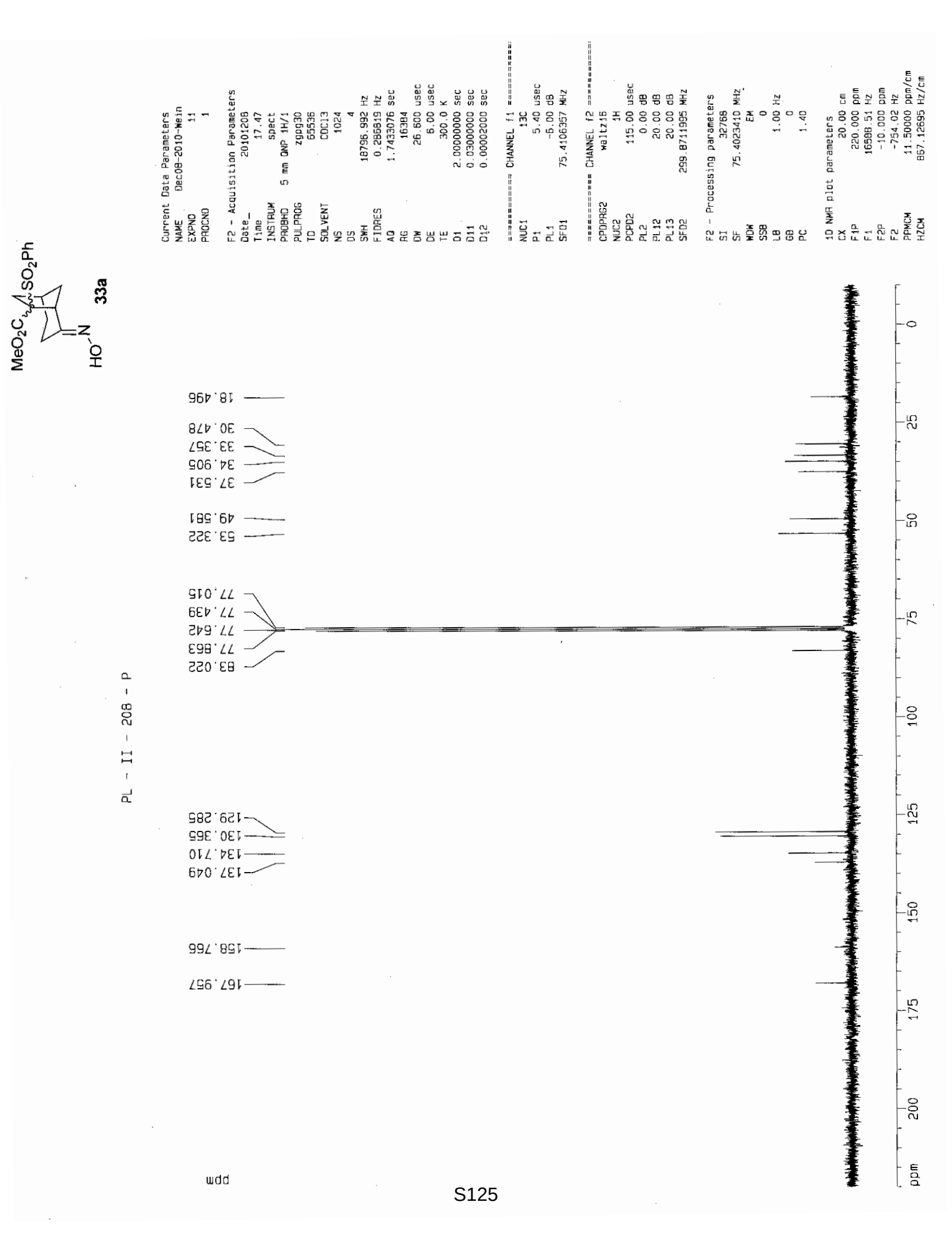
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

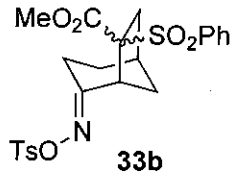
F2 - Processing parameters

SI	32768
SF	299.8700521 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

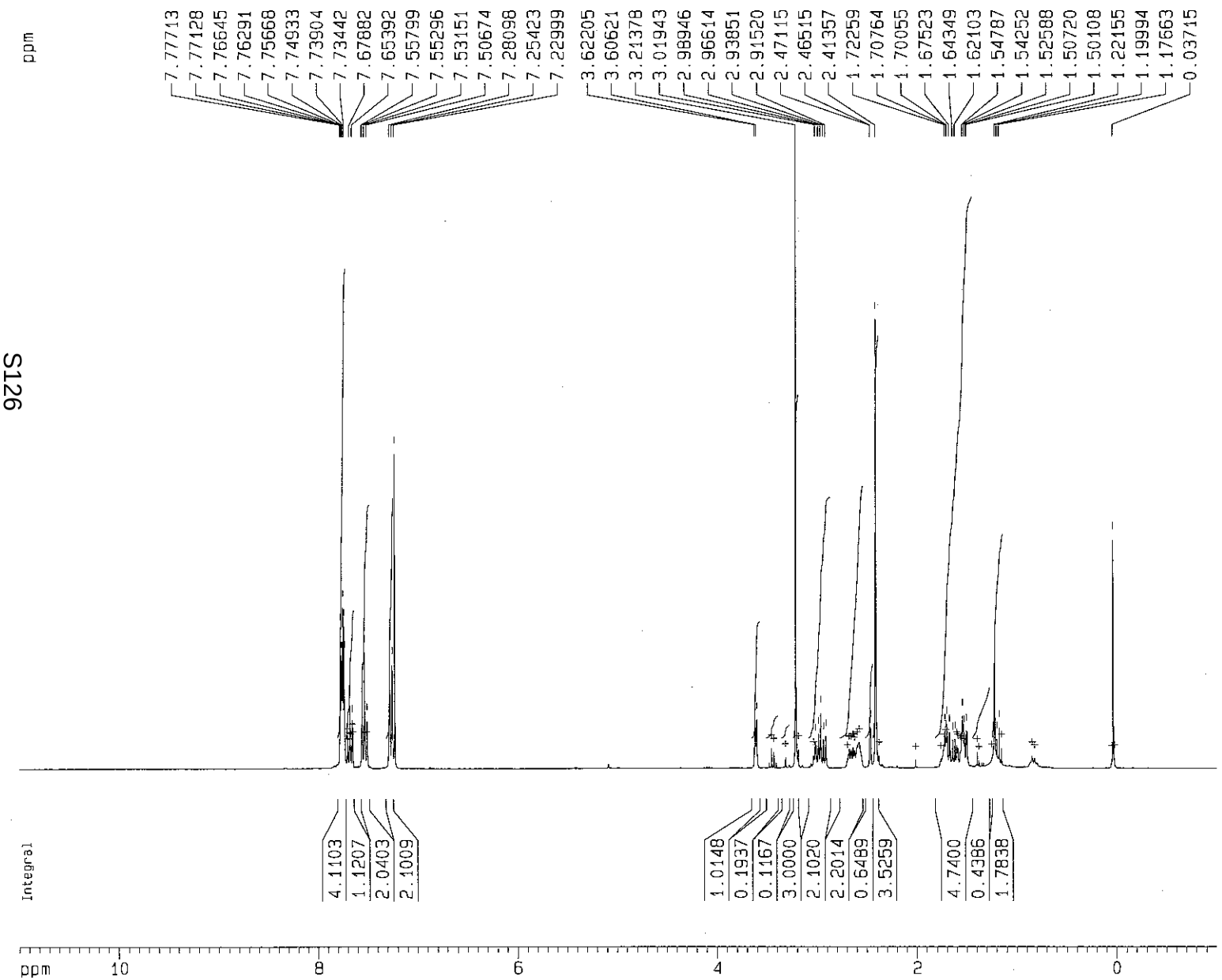
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92203 Hz/cm


MeO2C
SO2Ph
HO
N
33a
PL - II - 208 - P
ppm
18.496
30.478
33.357
34.905
37.531
49.581
53.322
77.015
77.439
77.642
77.863
83.022
129.285
130.365
134.710
137.049
158.766
167.957
Current Data Parameters
NAME DecO8-2010-Wein
EXPNO 11
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101208
Time 17.47
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 16384
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec
CHANNEL f1
NUC1 13C
P1 5.40 usec
PL1 -5.00 dB
SFO1 75.4106357 MHz
CHANNEL f2
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz
F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 20.00 cm
F1P 220.000 ppm
F1 16588.51 Hz
F2P -10.000 ppm
F2 -754.02 Hz
PPMCM 11.50000 ppm/cm
HZCM 867.12695 Hz/cm
ppm
200
175
150
125
100
75
50
25
0



33b

PL - II - p209 - P



S126

Current Data Parameters

NAME	Dec09-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101209
Time	17.44
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIORES	0.094190 Hz
AQ	5.3084660 sec
RG	645.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

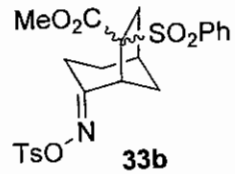
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700191 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

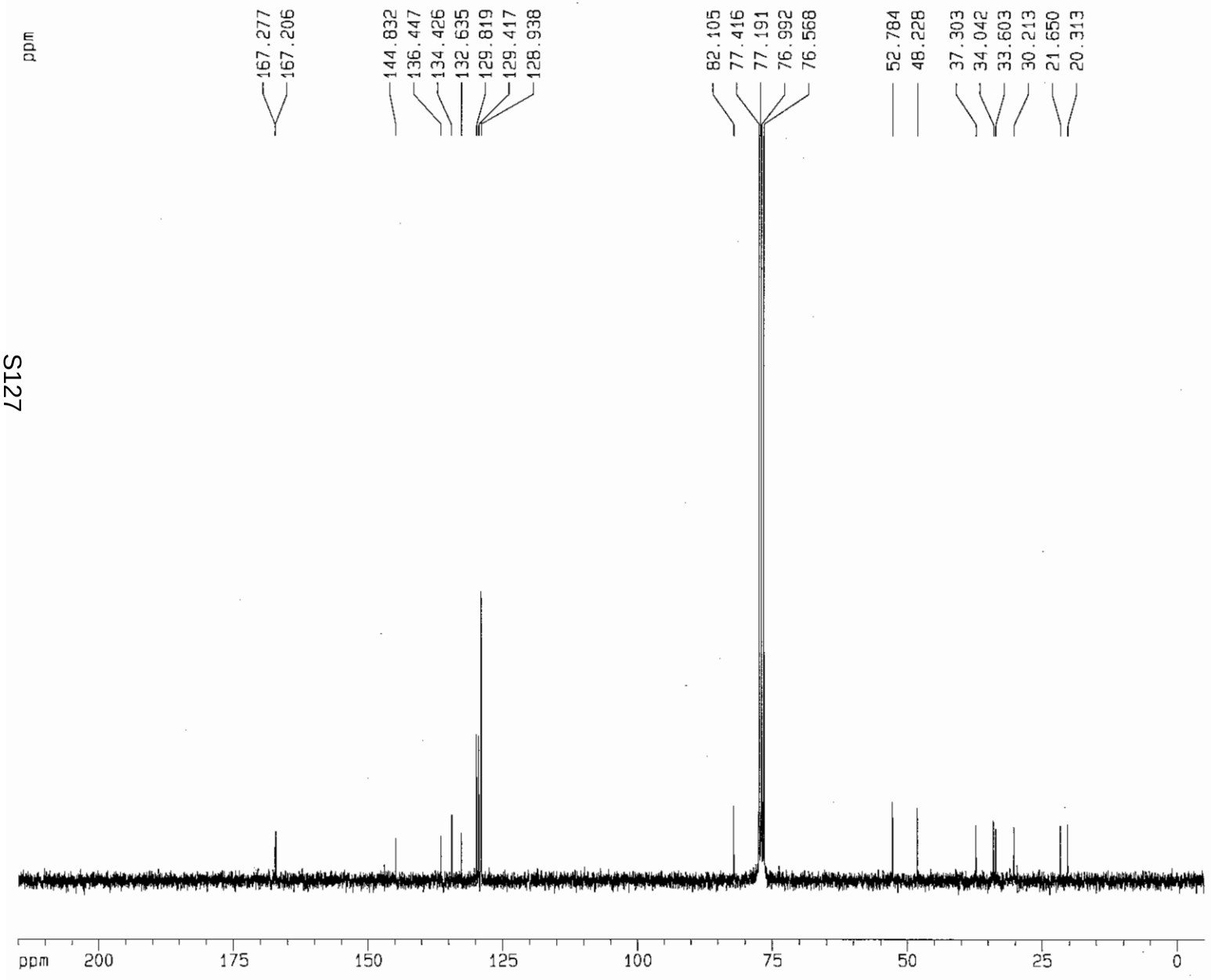
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



33b

Puhui_Tosylate



Current Data Parameters

NAME	Dec10-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20101210
Time	10.33
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	3682
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	16384
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SF01	75.4106357 MHz

========== CHANNEL f2 ==========

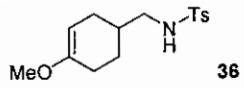
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SF02	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023741 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

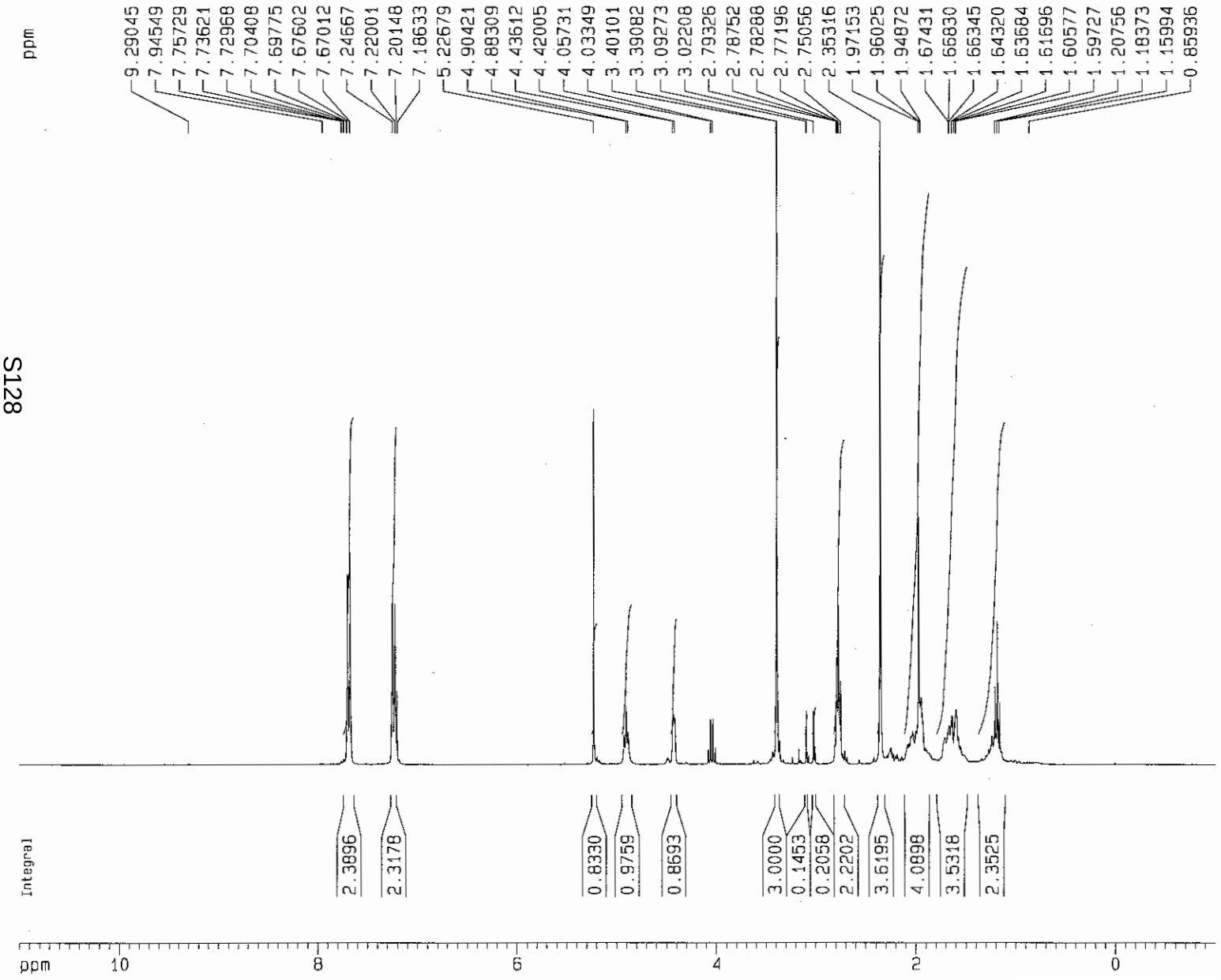
1D NMR plot parameters

CX	20.00 cm
F1P	215.000 ppm
F1	16211.51 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42615 Hz/cm



36

PL - II - p83 - P



S128

Current Data Parameters

NAME	Jun29-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100629
Time	16.24
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	128
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

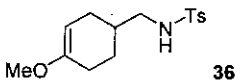
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SF01	299.8718518 MHz

F2 - Processing parameters

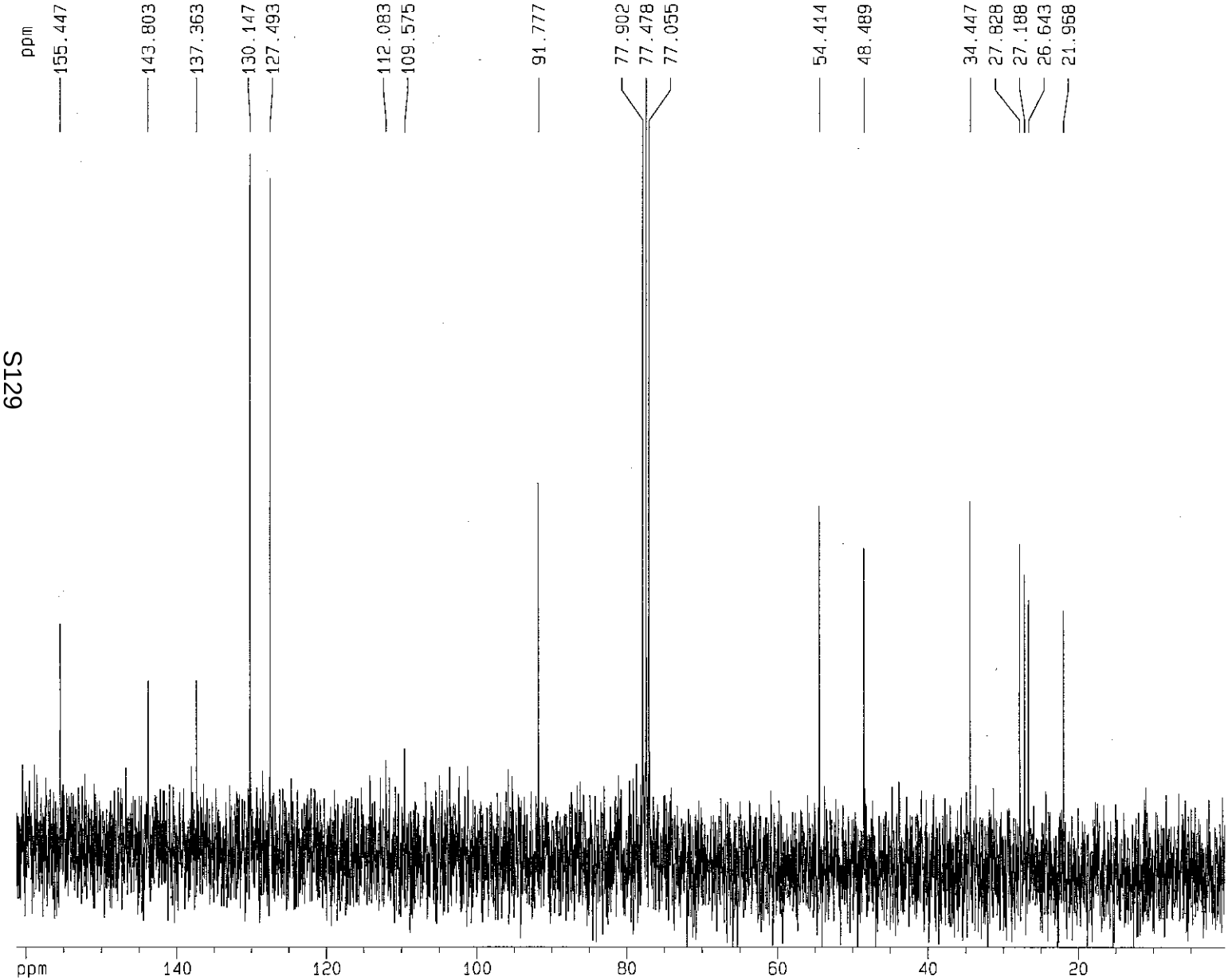
SI	32768
SF	299.8700275 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



36



Current Data Parameters

NAME	TW1-48c13
EXPNO	36201
PROCNO	1

F2 - Acquisition Parameters

Date_	20090702
Time	17.26
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	1024
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	1024
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

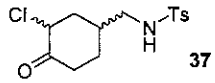
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

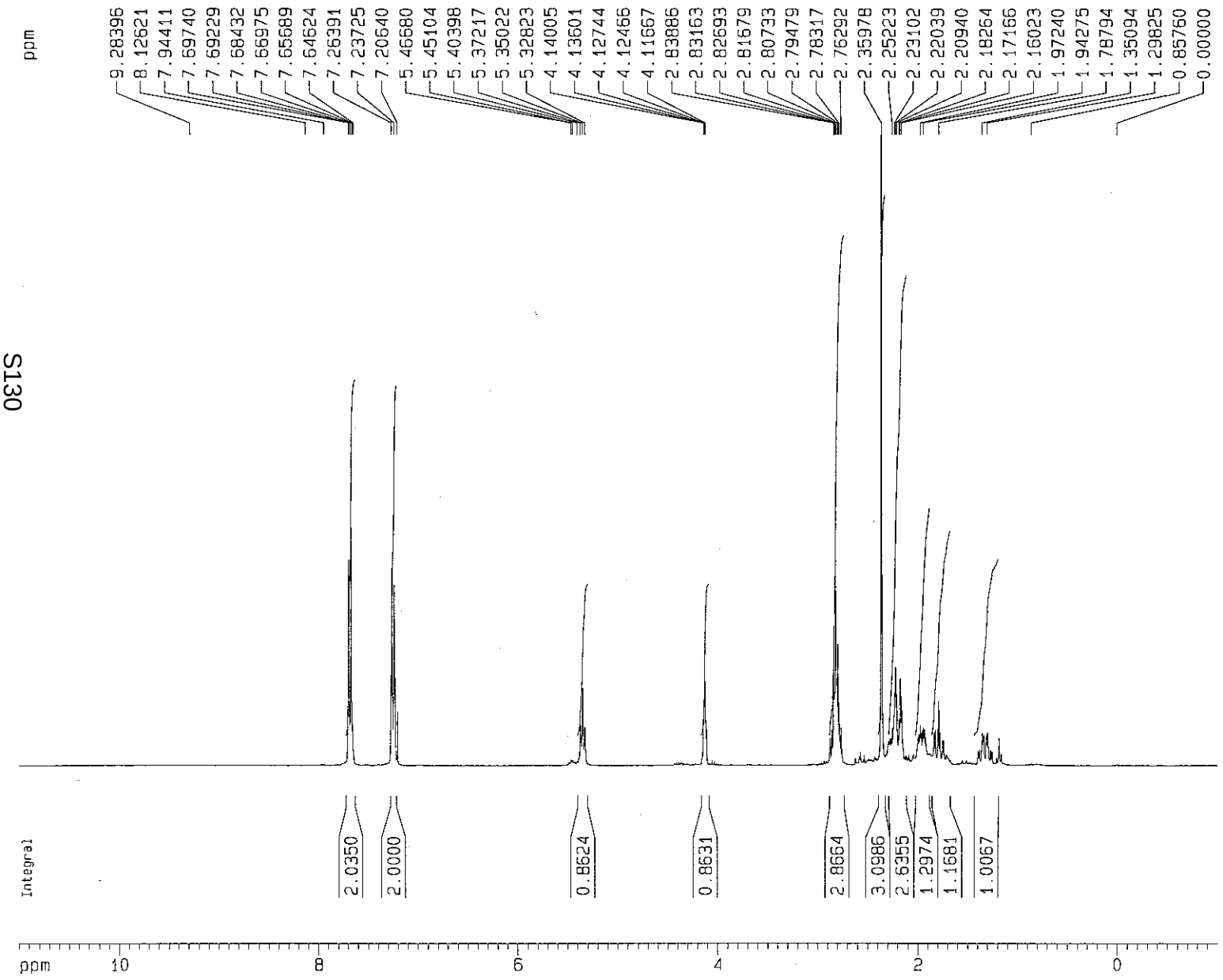
1D NMR plot parameters

CX	20.00 cm
F1P	161.310 ppm
F1	12163.12 Hz
F2P	0.565 ppm
F2	42.64 Hz
PPMCM	8.03720 ppm/cm
HZCM	606.02399 Hz/cm



37 less polar

PL - II - p87 - P



Current Data Parameters

NAME	Jul06-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100706
Time	13.12
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIORES	0.094190 Hz
AQ	5.3084660 sec
RG	114
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

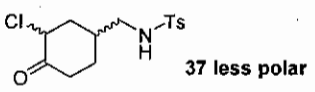
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700259 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

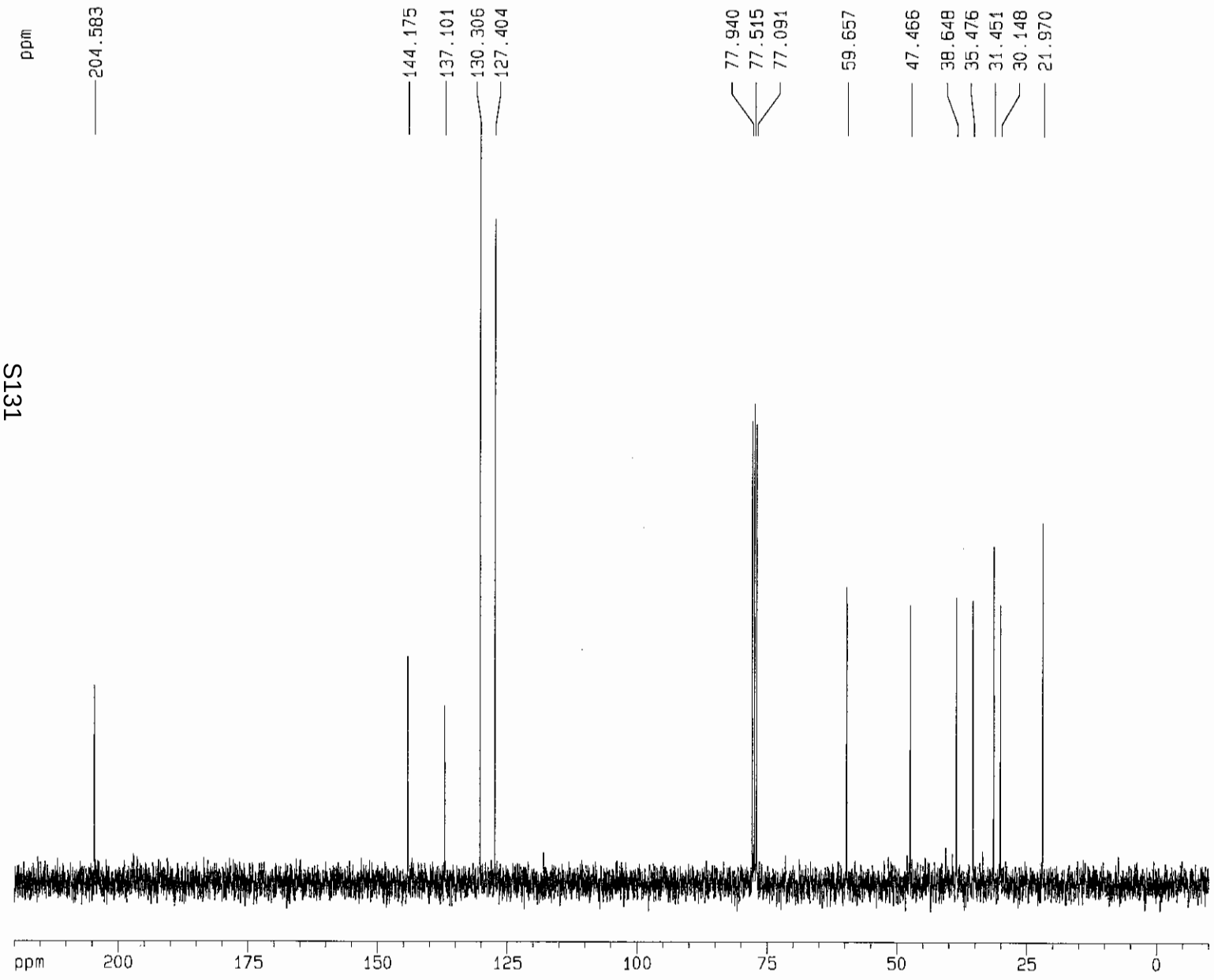
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



37 less polar

PL - II - p87 - P



Current Data Parameters

NAME	Jul06-2010-Wein
EXPNO	11
PROCNO	1

F2 - Acquisition Parameters

Date_	20100706
Time	13.15
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	31
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	2048
DW	26.600 usec
DE	6.00 usec
TE	300.0 K
D1	2.00000000 sec
D11	0.03000000 sec
D12	0.00002000 sec

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

NUC1	13C
P1	5.40 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

========== CHANNEL f2 ==========

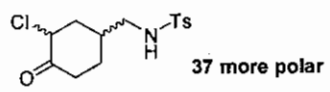
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	20.00 dB
PL13	20.00 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

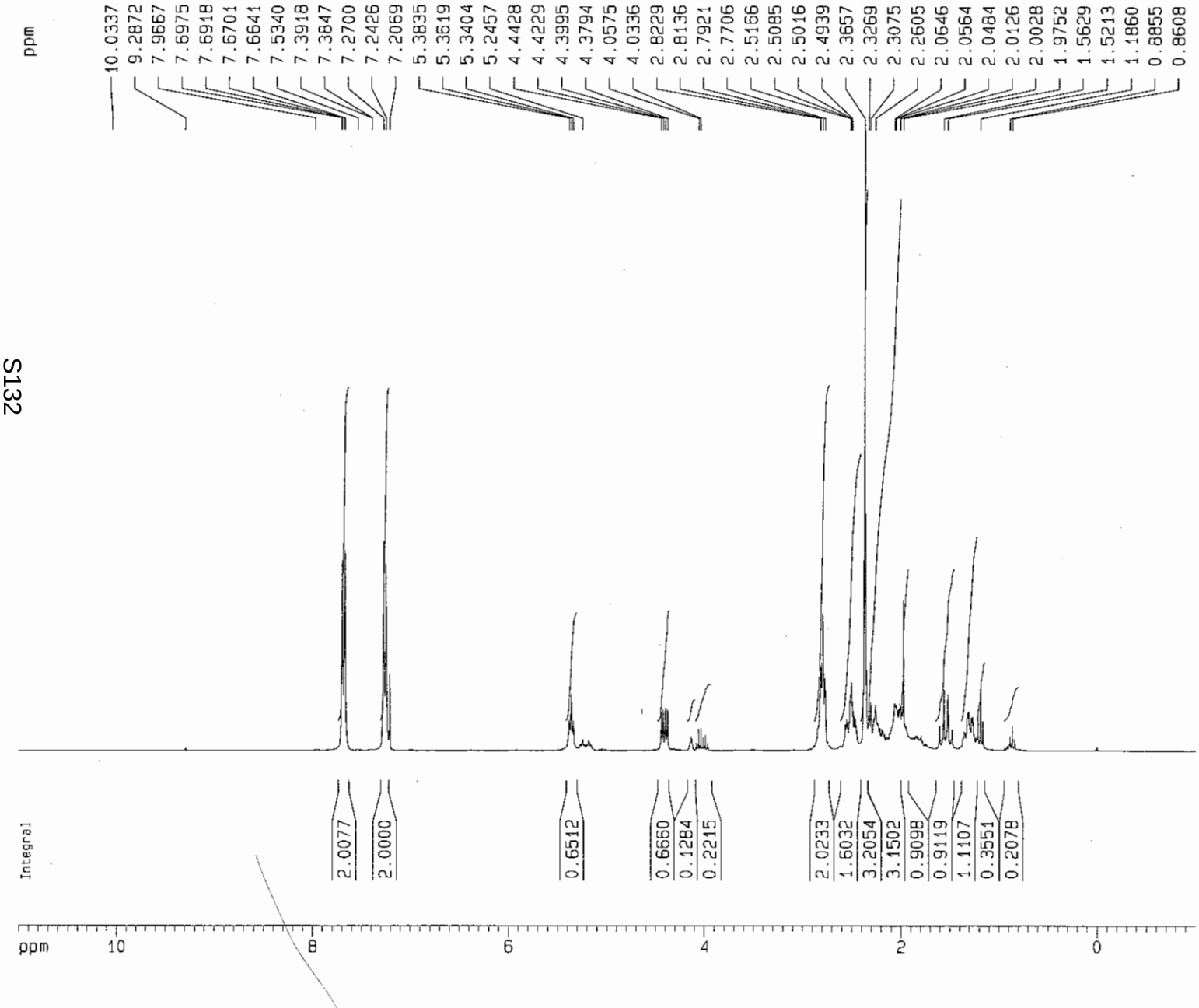
1D NMR plot parameters

CX	20.00 cm
F1P	220.000 ppm
F1	16588.51 Hz
F2P	-10.000 ppm
F2	-754.02 Hz
PPMCM	11.50000 ppm/cm
HZCM	867.12695 Hz/cm



37 more polar

PL - II - p88 - P(3)



Current Data Parameters

NAME	Jul10-2010-Wein
EXPNO	30
PROCNO	1

F2 - Acquisition Parameters

Date_	20100710
Time	16.24
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	143.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

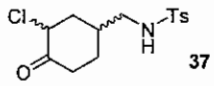
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700257 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

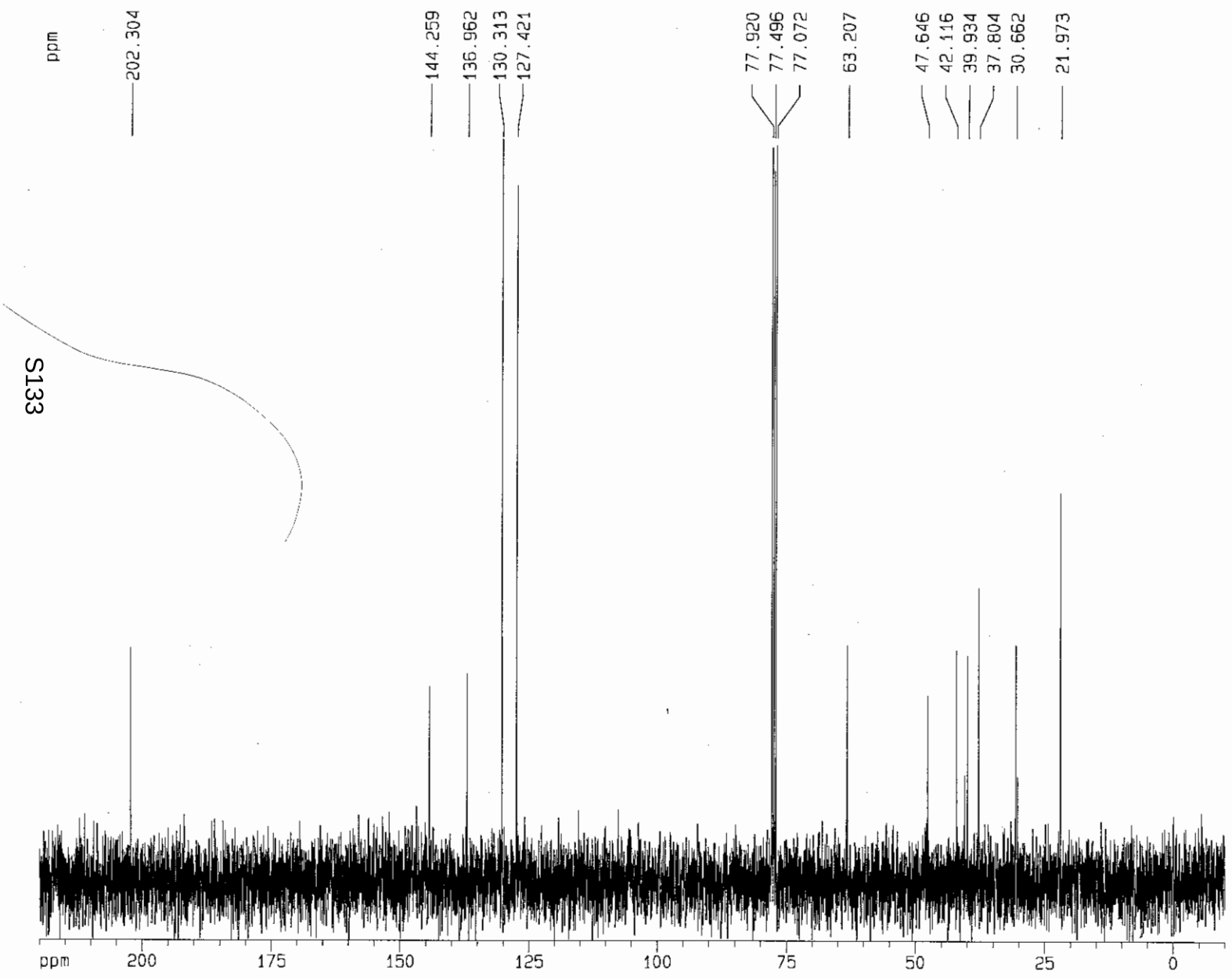
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm

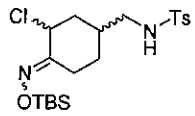


37 more polar

PL - II - p88 - P (3)

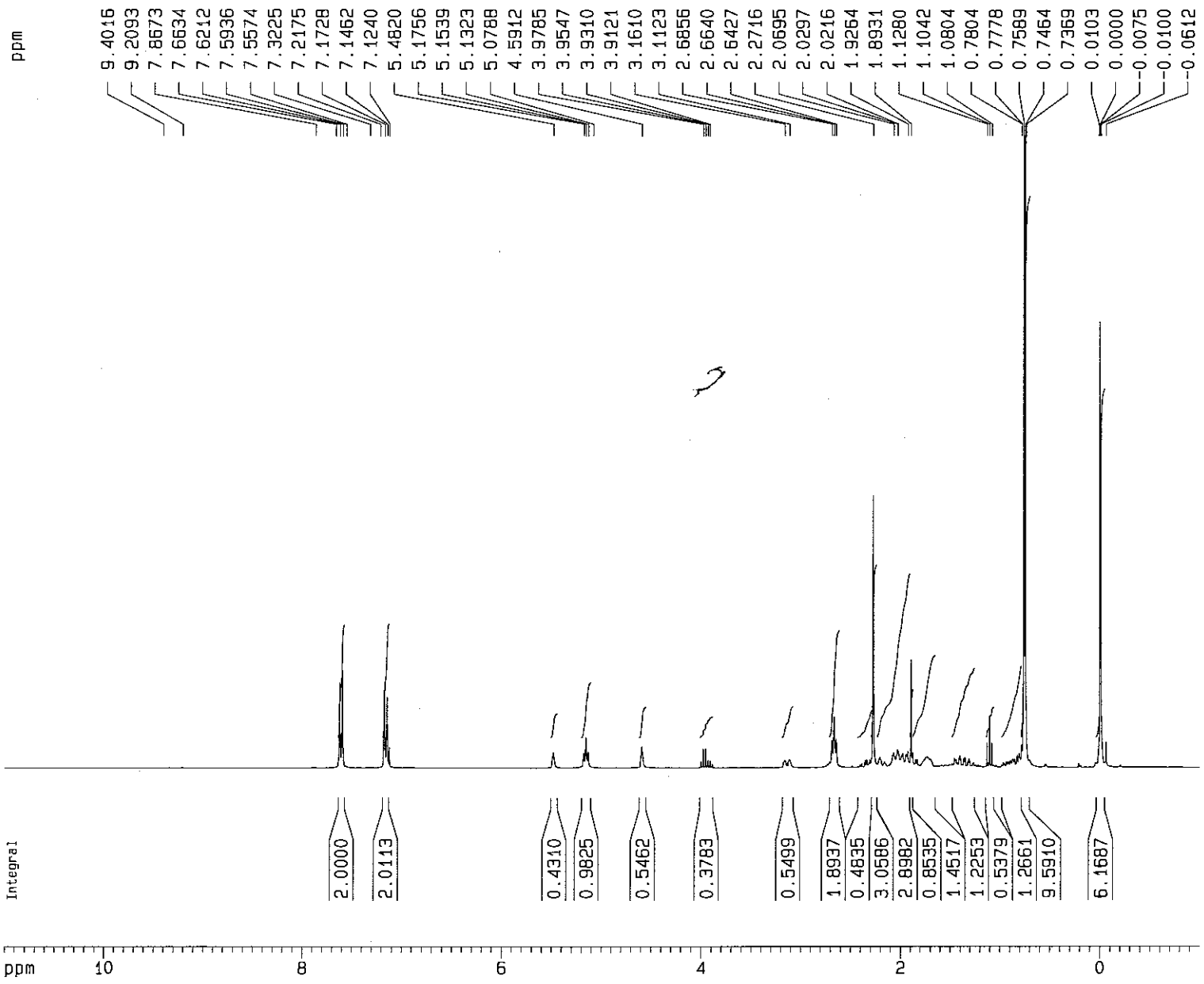



```
Current Data Parameters
NAME      Jul10-2010-Wein
EXPNO                 34
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100710
Time              16.41
INSTRUM           spect
PROBHD    5 mm QNP 1H/1
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                   15
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 4096
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX               20.00 cm
F1P             220.000 ppm
F1             16588.51 Hz
F2P             -10.000 ppm
F2              -754.02 Hz
PPMCM          11.50000 ppm/cm
HZCM          867.12695 Hz/cm
```



38

PL - II - p93 - P



Current Data Parameters

NAME	Jul14-2010-Wein
EXPNO	20
PROCNO	1

F2 - Acquisition Parameters

Date_	20100714
Time	21.27
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	80.6
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

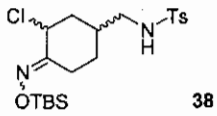
NUC1	1H
P1	9.60 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

SI	32768
SF	300.1300470 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

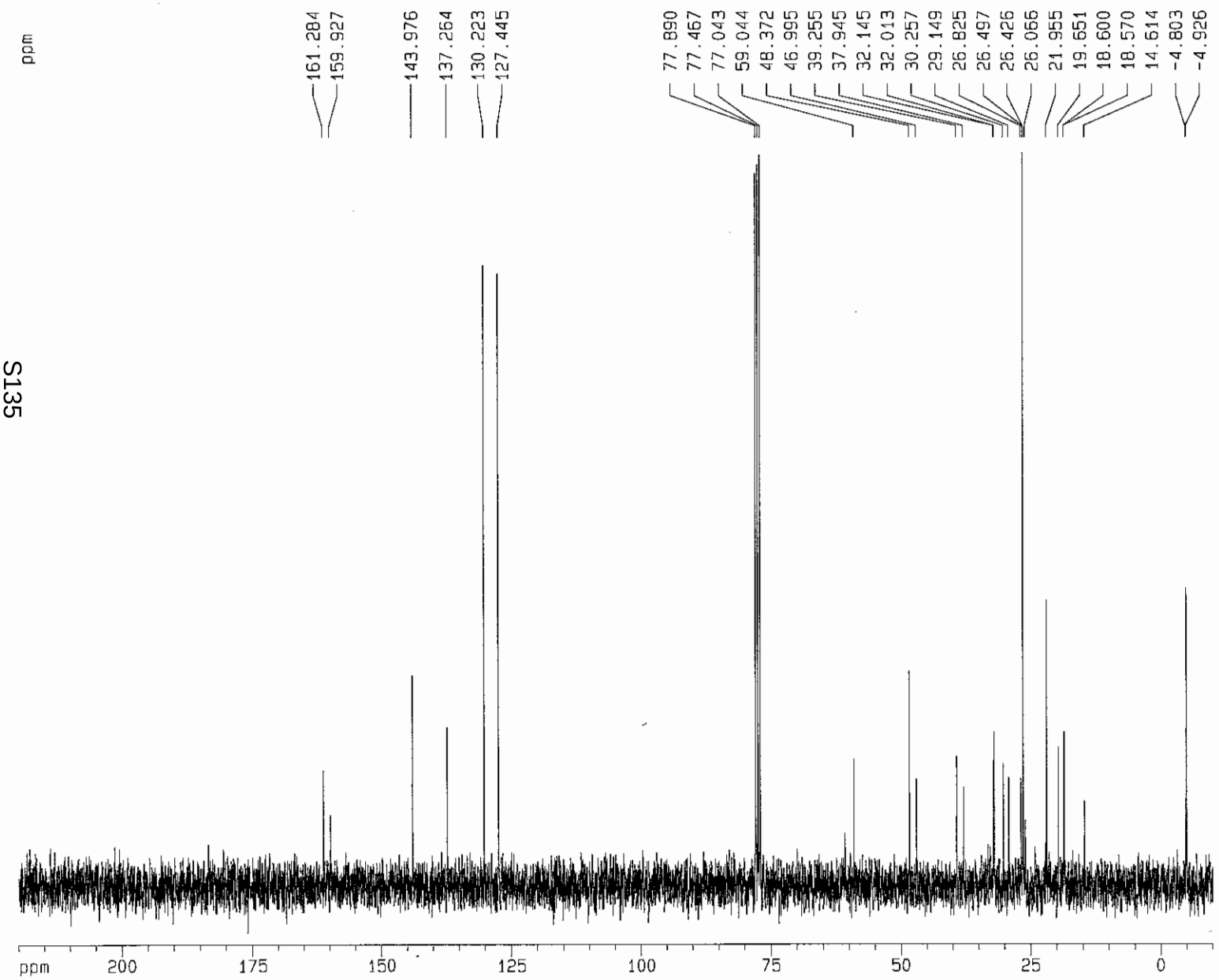
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3301.43 Hz
F2P	-1.000 ppm
F2	-300.13 Hz
PPMCM	0.60000 ppm/cm
HZCM	180.07802 Hz/cm

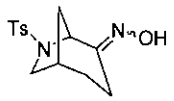


38

PL - II - p89 - P (2)



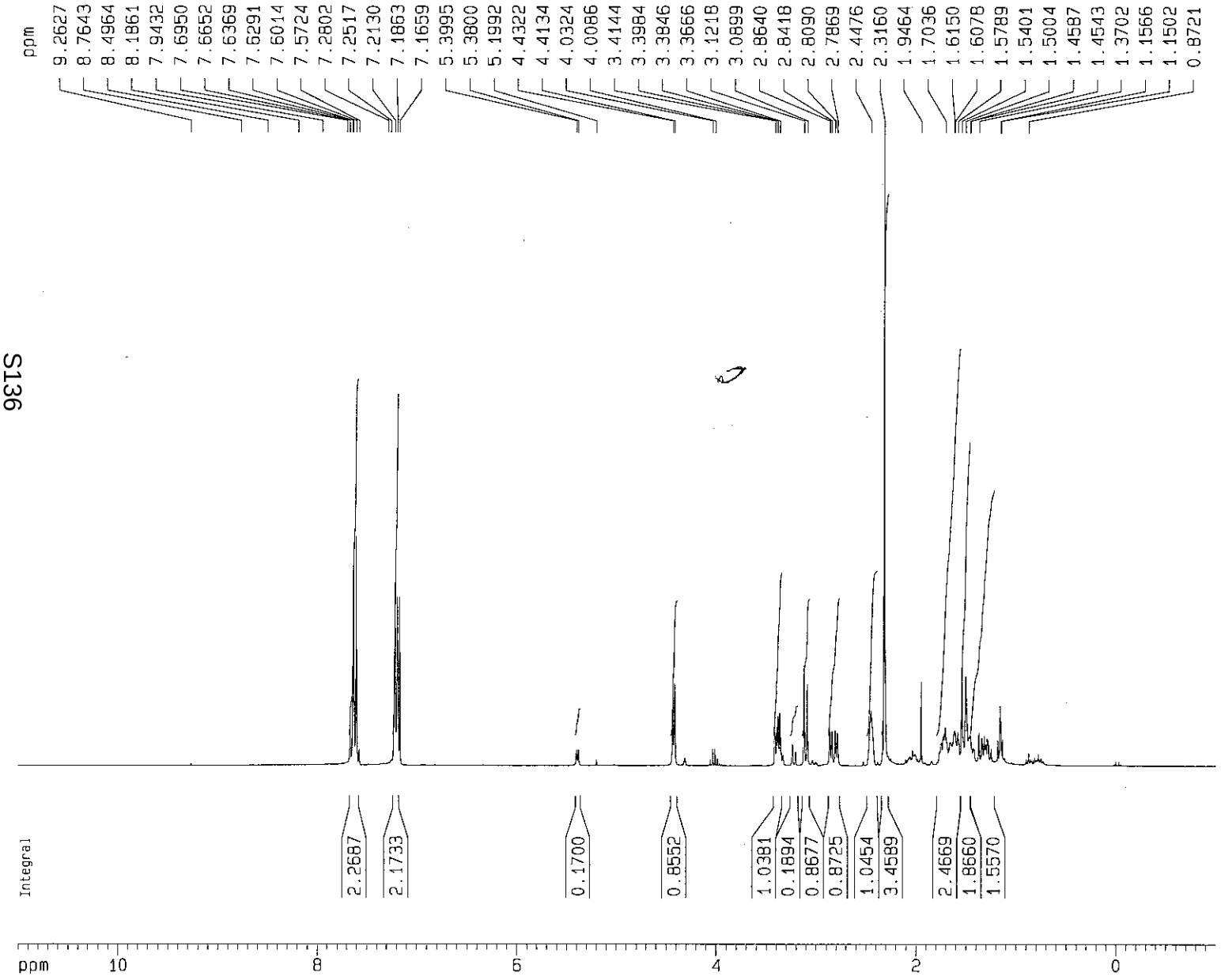

```
Current Data Parameters
NAME      Jul09-2010-Wein
EXPNO                 11
PROCNO                 1

F2 - Acquisition Parameters
Date_           20100709
Time               11.36
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   61
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                 4096
DW               26.600 usec
DE                6.00 usec
TE               300.0 K
D1            2.00000000 sec
D11           0.03000000 sec
D12           0.00002000 sec

============ CHANNEL f1 ============
NUC1                13C
P1                5.40 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             20.00 dB
PL13             20.00 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              220.000 ppm
F1              16588.51 Hz
F2P             -10.000 ppm
F2               -754.02 Hz
PPMCM          11.50000 ppm/cm
HZCM          867.12695 Hz/cm
```



39

PL - II - p94 - P

S136



Current Data Parameters

NAME	Jul15-2010-Wein
EXPNO	30
PROCNO	1

F2 - Acquisition Parameters

Date_	20100715
Time	21.12
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	203.2
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

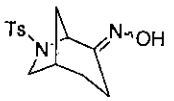
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700382 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

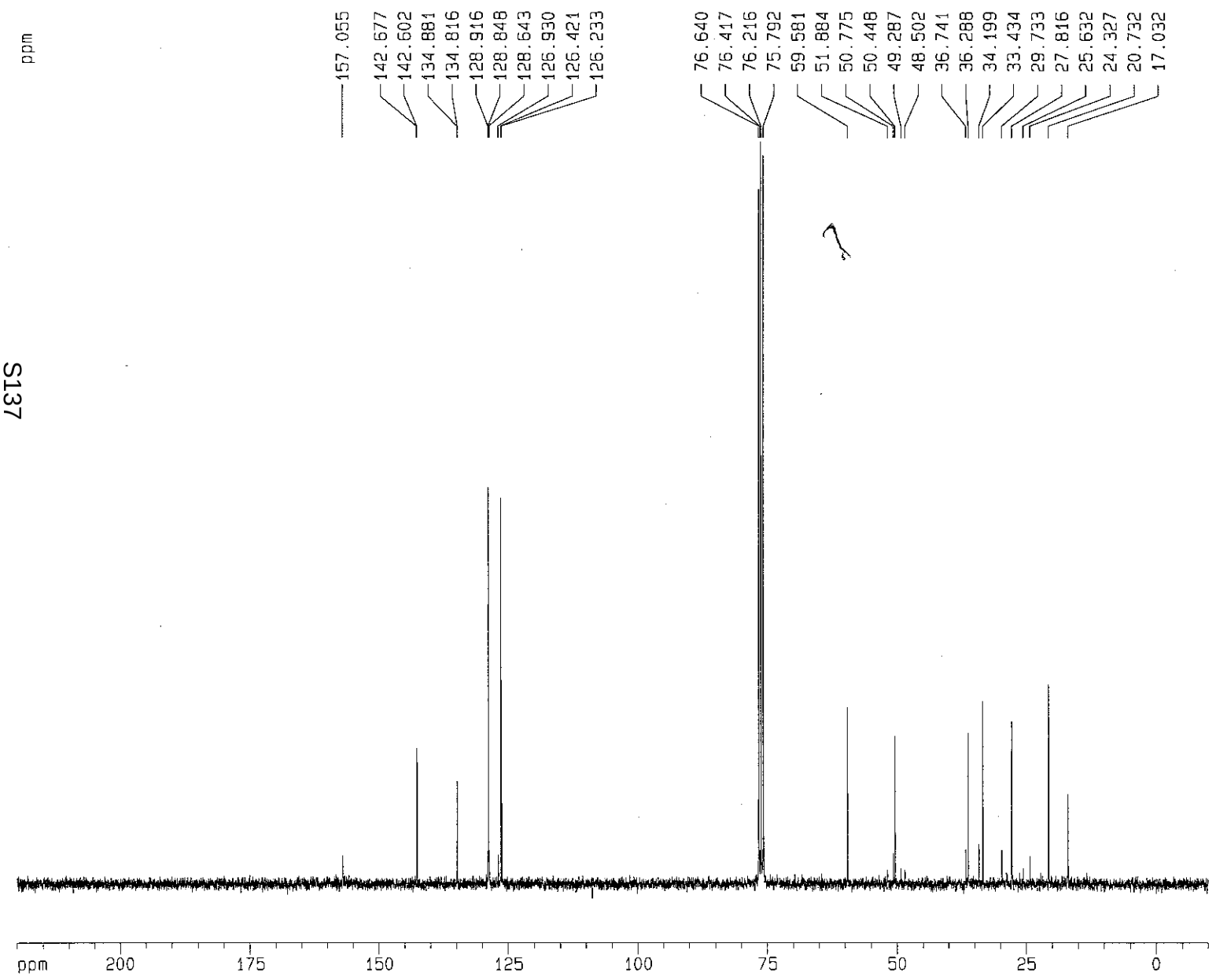
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



39

PL - II - p94 - P



S137

Current Data Parameters
NAME Jul15-2010-Wein
EXPNO 31
PROCNO 1

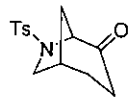
F2 - Acquisition Parameters
Date_ 20100715
Time 22.08
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPRDG zgpg30
TD 65536
SOLVENT CDCl3
NS 875
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 2048
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

========== CHANNEL f1 ==========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz

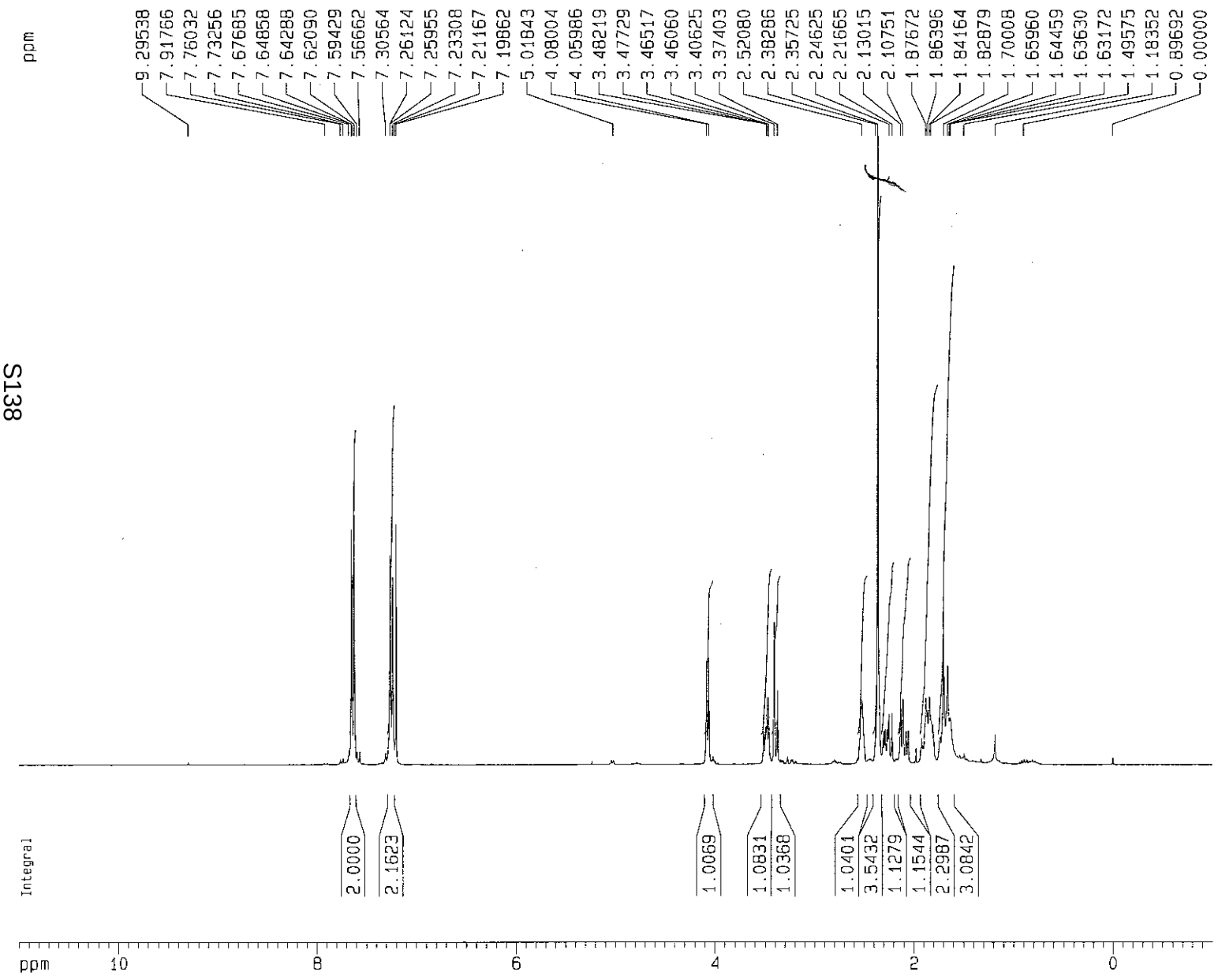
F2 - Processing parameters
SI 32768
SF 75.4024348 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 20.00 cm
F1P 220.000 ppm
F1 16588.54 Hz
F2P -10.000 ppm
F2 -754.03 Hz
PPMCM 11.50000 ppm/cm
HZCM 867.12799 Hz/cm



40

PL - II - p95 - P



S138

Current Data Parameters

NAME	Jul19-2010-Wein
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20100719
Time	11.21
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	362
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

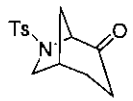
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700283 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

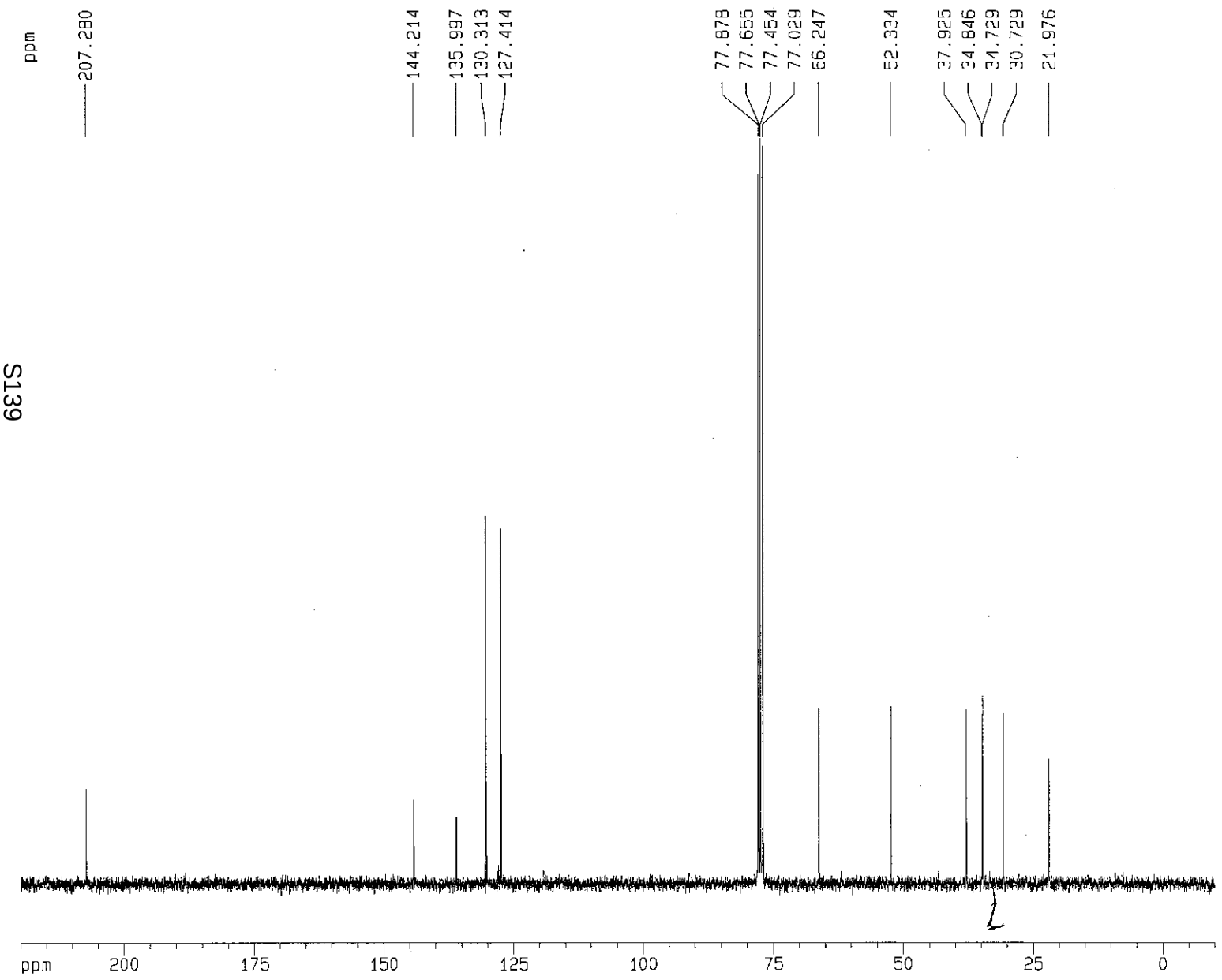
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-1.000 ppm
F2	-299.87 Hz
PPMCM	0.60000 ppm/cm
HZCM	179.92201 Hz/cm



40

PL - II - p95 - P



Current Data Parameters
NAME Jul19-2010-Wain
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100719
Time 12.06
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 721
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 4096
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

========== CHANNEL f1 ==========
NUC1 13C
P1 5.40 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 20.00 dB
PL13 20.00 dB
SFO2 299.8711995 MHz

F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters
CX 20.00 cm
F1P 220.000 ppm
F1 16588.51 Hz
F2P -10.000 ppm
F2 -754.02 Hz
PPMCM 11.50000 ppm/cm
HZCM 867.12695 Hz/cm