Highly Efficient Syntheses of Azetidines, Pyrrolidines and Indolines via Palladium Catalyzed Intramolecular Amination of C(sp^3) and C(sp^2)−H Bonds at γ and δ Positions

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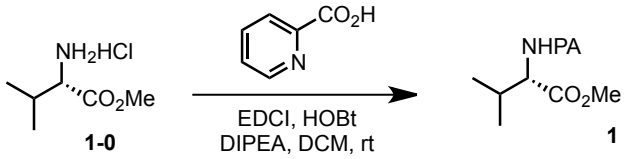
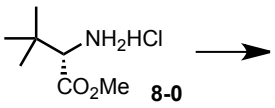
1. **Reagents**: All commercial materials were used as received unless otherwise noted. The following solvents were obtained from a JC Meyer solvent dispensing system and used without further purification: THF, DMF, DCM and toluene. Flash chromatography was performed using 230-400 mesh SiliaFlash 60® silica gel (Silicycle Inc.). $PhI(OAc)_2$ (98%, Aldrich), $Pd(OAc)_2$ (98%, Aldrich), AcOH (99.7%, Mallinckrodt Chemicals) were used in the Pd-catalyzed reactions.

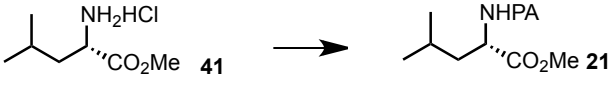
2. **Instruments**: NMR spectra were recorded on Bruker CDPX-300, DPX-300, DRX-400 instruments and calibrated using residual solvent peaks as internal reference. Multiplicities are recorded as: s = singlet, d = doublet, t = triplet, dd = doublet of doublets, td = triplet of doublets, br s = broad singlet, m = multiplet. High resolution ESI mass experiments were operated on a Waters LCT Premier instrument.

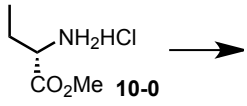
3. **General procedure A** for the preparation of picolinamide substrates **1, 8, 10, 16, 18, 21, 24, 26, 30, 35, 37, 44**.

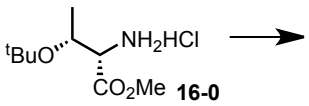
General procedure **A:**

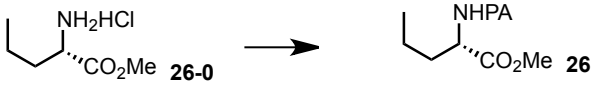


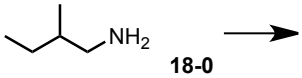


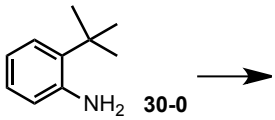


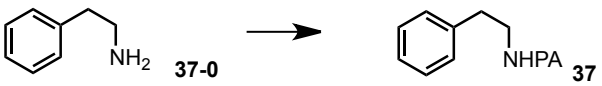








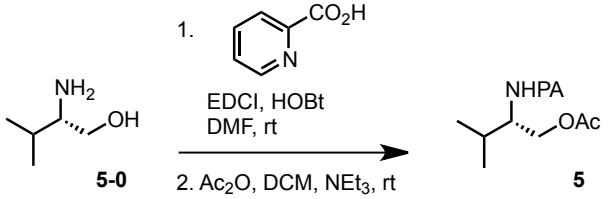




A mixture of amine (1.0 eq), picolinic acid (1.1 eq), EDCI (1.1 eq), HOBt·H_2O (1.1 eq), and DIPEA (3.0 eq) in anhydrous DCM (0.2 M) was stirred at rt overnight. Water was added and the mixture was extracted with DCM. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The resulting residue was purified by silica gel flash chromatography to give the desired picolinamide product.

4. **General procedure B** for the preparation of picolinamide substrates **5, 13, 28**.

General procedure **B:**



A mixture of amino alcohol (1.0 eq), picolinic acid (1.0 eq), EDCI (1.1 eq), and HOBt·H_2O (1.1 eq) in anhydrous DMF (0.2 M) was stirred at room temperature overnight. Water was added and the mixture was extracted with ethyl acetate. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The resulting residue was dissolved in DCM; Ac_2O (2.0 eq) and Et_3N (2.0 eq) were added to the resulting solution. After stirring at rt for 8 hours, the solvent was removed and the residue was purified by silica gel flash chromatography to give the desired picolinamide product.

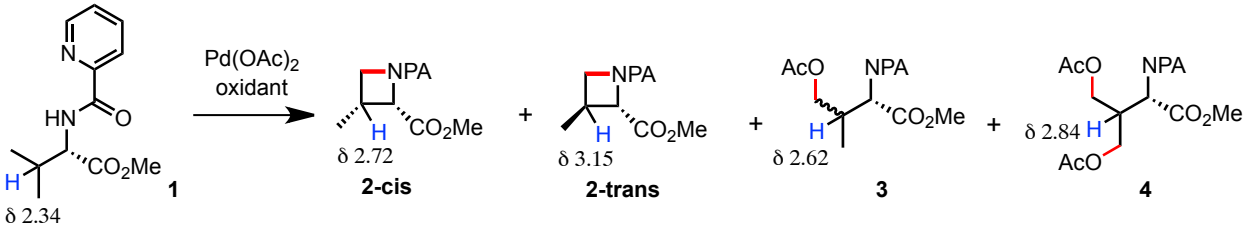
5. **General procedure C:** Synthesis of azetidines via Pd-catalyzed intramolecular amination of γ-C(sp^3)–H bonds.
A mixture of picolinamide substrate (0.2 mmol, 1.0 eq), $Pd(OAc)_2$ (2.2 mg, 0.01 mmol, 0.05 eq), $PhI(OAc)_2$ (161 mg, 0.5 mmol, 2.5 eq), and AcOH (23 μL, 0.4 mmol, 2.0 eq) in anhydrous toluene (2 mL) in a 10 mL glass vial (purged with Ar, sealed with PTFE cap) was heated at 110 ^oC for 24 hours. The reaction mixture was cooled to rt, and concentrated *in vacuo*. The resulting residue was purified by silica gel flash chromatography to give the cyclized azetidine product.

6. **General procedure D:** Synthesis of pyrrolidines via Pd-catalyzed intramolecular amination of δ-C(sp^3)–H bonds**.**
A mixture of picolinamide (0.2 mmol, 1.0 eq), $Pd(OAc)_2$ (2.2 mg, 0.01 mmol, 0.05 eq), $PhI(OAc)_2$ (161 mg, 0.5 mmol, 2.5 eq), AcOH (115 μL, 2.0 mmol, 10.0 eq) in anhydrous toluene (2 mL) in a 10 mL glass vial (purged with Ar, sealed with PTFE cap) was heated at 110 ^oC for 24 hours. The reaction mixture was cooled to rt, and concentrated *in vacuo*. The resulting residue was purified by silica gel flash chromatography to give the cyclized pyrrolidine product.

7. **General procedure E:** Synthesis of indolines via Pd-catalyzed intramolecular amination of δ-C(sp^2)–H bonds**.**
A mixture of picolinamide (0.4 mmol, 1.0 eq), $Pd(OAc)_2$ (1.8 mg, 0.008 mmol, 0.02 eq), $PhI(OAc)_2$ (322 mg, 1.0 mmol, 2.5 eq), and toluene (4 mL) in a 10 mL glass vial (purged with Ar, sealed with PTFE cap) was heated at 60 ^oC for 24 hours. The reaction mixture was cooled to rt,

and concentrated *in vacuo*. The resulting residue was purified by silica gel flash chromatography to give the cyclized product.

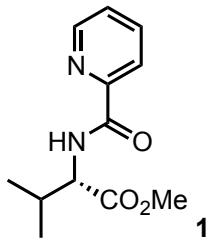
8. **^{1}H-NMR assay** for the screening reactions of substrate **1**.



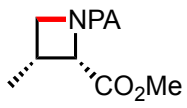
The screening reactions of substrate **1** were carried out following the general procedure **C** under the conditions specified in Table 1 in a 10 mL glass vial (purged with different gas, sealed with PTFE cap) (0.2 mmol scale). The reaction mixture was then cooled to rt, diluted with $CHCl_3$, filtered through a short celite pad, and concentrated *in vacuo*. The resulting residue was dissolved in 0.5 mL of $CDCl_3$ and 0.2 mmol of $Cl_2CHCHCl_2$ was added as an internal standard. The distributions of compounds **1**, **2**(cis and trans isomers), **3**, **4** were analyzed based on the distinct chemical shifts of β-Hs of different products in ^{1}H-NMR of the resulting mixture. More than 2 experiments were performed for each condition.

9. **Characterization** of compounds **1-45**:

All the azetidine and pyrrolidine products show two sets of rotamer signals in ^{1}H and ^{13}C-NMR spectra at rt. The ratio of these two sets of signal changes in different solvent such as $CDCl_3$ and DMSO-d_6.

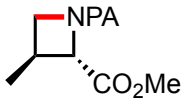


Compound **1** was prepared following the standard coupling procedure A in 90% yield. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.61 (m, 2H), 8.20 (d, J = 7.8 Hz, 1H), 7.87 (m, 1H), 7.48 (m, 1H), 4.78 (dd, J = 5.1, 9.1 Hz, 1H), 3.79 (s, 3H), 2.37 (m, 1H), 1.05 (d, J = 2.1 Hz, 3H), 1.03 (d, J = 2.1 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 172.35, 164.42, 149.67, 148.55, 137.59, 126.67, 122.48, 57.58, 52.33, 31.70, 19.38, 18.14; HRMS Calcd for $C_{12}H_{17}N_2O_3$ [M+H$^+$]: 237.1239; Found: 237.1218.



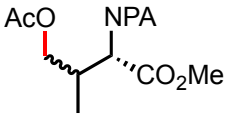
Compound **2**-cis isomer was isolated in 74% yield following the general procedure C with 2.5 mol% of $Pd(OAc)_2$. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 2.5/1) δ 8.57 (d, J = 4.6 Hz, 0.28H), 8.43 (m, 0.72H), 8.14 (m, 1H), 7.80 (m, 1H), 7.37 (m, 1H), 5.08 (d, J = 4.9 Hz, 0.72H), 4.94 (dd, J = 9.3, 8.9 Hz, 0.28H), 4.51 (d, J =4.9 Hz, 0.28H), 4.42 (m, 0.72H), 4.29 (dd, J = 5.4, 10.0 Hz, 0.28H), 3.78 (s, 0.86H), 3.77 (m, 0.72H), 3.64 (s, 2.14H), 2.76 (m, 1H), 1.41 (m, 3H);

^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.47, 170.96, 164.92, 164.50, 151.47, 151.28, 148.06, 147.42, 136.87, 136.68, 125.49, 125.41, 123.97, 123.53, 72.28, 66.57, 60.37, 54.05, 52.25, 51.94, 30.75, 30.52, 19.43, 19.19; HRMS Calcd for $C_{12}H_{15}N_2O_3$ [M+H$^+$]: 235.1083; Found: 235.1090.



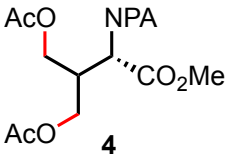
2-trans

Compound **2**-trans isomer was isolated in 12% yield following the general procedure C with 2.5 mol% of $Pd(OAc)_2$. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 2.5/1) δ 8.58 (d, J = 4.0 Hz, 0.31H), 8.46 (m, 0.78H), 8.17 (m, 1H), 7.83 (m, 1H), 7.39 (m, 1H), 5.62 (dd, J = 0.8, 9.2 Hz, 0.77H), 5.05 (d, J = 9.5 Hz, 0.29H), 4.85 (dd, J = 8.4, 10.0 Hz, 0.29H), 4.40 (m, 0.29H), 4.34 (dd, J = 8.6, 9.8 Hz, 0.75H), 3.91 (m, 0.76H), 3.81 (s, 0.8H), 3.64 (s, 2.2H), 3.22 (m, 1H), 1.19 (m, 1H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 170.59, 164.91, 151.90, 148.52, 147.98, 137.30, 137.16, 125.92, 125.80, 124.47, 124.04, 70.26, 64.39, 54.95, 52.35, 52.03, 31.38, 28.83, 28.46, 15.54, 15.20; HRMS Calcd for $C_{12}H_{15}N_2O_3$ [M+H$^+$]: 235.1083; Found: 235.1064.



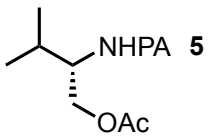
3

Compound **3** as diastereomeric mixture was isolated in 2% yield following the general procedure C with 2.5 mol% of $Pd(OAc)_2$. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.62 (m, 1H), 8.21 (m, 1H), 7.90 (m, 1H), 7.49 (m, 1H), 4.96 (m, 1H), 4.20 (m, 2H), 3.80 (s, 3H), 2.65 (m, 1H), 2.19 (m, 3H), 1.11 (m, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 172.17, 172.02, 171.24, 164.86, 149.71, 148.71, 137.78, 126.88, 122.81, 66.03, 54.88, 53.80, 52.93, 52.82, 36.10, 35.93, 31.38, 21.35, 21.28, 14.48, 12.66; HRMS Calcd for $C_{14}H_{19}N_2O_5$ [M+H$^+$]: 295.1294; Found: 295.1291.



4

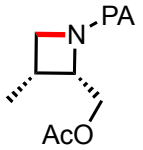
Compound **4** was isolated in 8% yield following the general procedure C with 2.5 mol% of $Pd(OAc)_2$. ^{1}H NMR ($CDCl_3$, 300 MHz): δ 8.58 (m, 1H), 8.18 (d, J = 7.8 Hz, 1H), 7.86 (m, 1H), 7.48 (m, 1H), 5.14 (dd, J = 4.2, 9.1 Hz, 1H), 4.33 (dd, J = 5.9, 11.7 Hz, 1H), 4.21 (m, 3H), 3.79 (s, 3H), 2.86 (m, 1H), 2.14 (s, 3H), 2.08 (s, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz): δ 171.52, 171.10, 170.97, 164.88, 149.48, 148.69, 137.84, 127.02, 122.87, 62.34, 62.24, 53.12, 51.77, 40.25, 21.23, 21.20; HRMS Calcd for $C_{16}H_{21}N_2O_7$ [M+H$^+$]: 253.1349; Found: 253.1347.



5

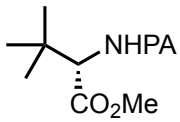
Compound **5** was prepared following the standard procedure B in 40% yield. ^{1}H NMR ($CDCl_3$, 400 MHz): δ 8.56 (m, 1H), 8.20 (d, J = 7.8 Hz, 1H), 8.12 (d, J = 8.2 Hz, 1H), 7.86 (td, J = 7.7, 1.6 Hz, 1H), 7.44 (m, 1H), 4.28 (m, 3H), 2.04 (s, 3H), 2.01 (m, 1H), 1.02 (d, J = 4.0 Hz, 3H), 1.00 (d, J = 4.0 Hz, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz): δ 171.31, 164.55, 150.08, 148.46, 137.71,

126.57, 122.67, 64.97, 53.65, 29.99, 21.20, 19.85, 18.84; HRMS Calcd for $C_{13}H_{19}N_2O_3$ [M+H$^+$]: 251.1396; Found: 251.1388.



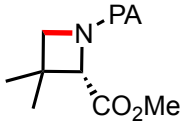
6

Compound **6** was prepared in 82% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1.3:1) δ 8.55 (d, *J* = 4.7 Hz, 2.3H), 8.07 (d, *J* = 7.9 Hz, 2.3H), 7.80 (td, *J* = 7.7, 1.8 Hz, 2.3H), 7.35 (m, 2.3H), 4.81 (m, 2.3H), 4.55-4.20 (m, 6.9H), 4.08 (dd, *J* = 5.5, 10.2 Hz, 1.3H), 3.68 (dd, *J* = 4.6, 10.2 Hz, 1H), 2.59 (m, 2.3H), 2.07 (s, 3.9H), 2.00 (s, 3H), 1.32 (d, *J* = 7.0 Hz, 3H), 1.24 (d, *J* = 6.9 Hz, 3.9H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.30, 171.23, 166.39, 166.11, 152.26, 152.13, 148.48, 148.46, 137.30, 137.16, 125.92, 125.78, 124.39, 124.19, 71.02, 67.17, 65.53, 64.09, 60.33, 54.17, 29.21, 28.59, 21.28, 21.19, 19.56, 19.19; HRMS Calcd for $C_{13}H_{17}N_2O_3$ [M+H$^+$]: 249.1239; Found: 249.1221.



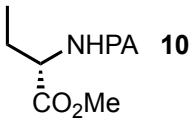
8

Compound **8** was prepared in 63% yield following the standard coupling procedure **A**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.66 (s, 1H), 8.63 (d, *J* = 4.6 Hz, 1H), 8.21 (d, *J* = 7.8 Hz, 1H), 7.89 (t, *J* = 7.7 Hz, 1H), 7.48 (m, 1H), 4.69 (d, *J* = 9.8Hz, 1H), 3.78 (s, 3H), 1.10 (s, 9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 172.02, 164.29, 149.76, 148.62, 137.64, 126.69, 122.62, 60.62, 52.10, 35.33, 26.69; HRMS Calcd for $C_{13}H_{19}N_2O_3$ [M+H$^+$]: 251.1396; Found: 251.1384.



9

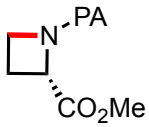
Compound **9** was prepared in 91% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 400 MHz, ratio of rotamers: 1:0.36): δ 8.56 (d, *J* = 4.8 Hz, 0.36H), 8.43 (m, 1H), 8.16 (m, 1.36H), 7.80 (m, 1.36H), 7.36 (dd, *J* = 4.9, 7.4 Hz, 0.36H), 7.30 (m, 1H), 5.18 (s, 1H), 4.60 (s, 0.36H), 4.50 (d, *J* = 9.7 Hz, 0.36H), 4.38 (d, *J* = 9.8 Hz, 0.36H), 3.97 (d, *J* = 9.6 Hz, 1H), 3.87 (d, *J* = 9.5 Hz, 1H), 3.78 (s, 1.08H), 3.62 (s, 3H), 1.46 (s, 3H), 1.43 (s, 1.08H), 1.19 (s, 1.08H), 1.16 (s, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 170.58, 169.78, 165.45, 165.17, 151.97, 151.86, 148.46, 147.89, 137.27, 137.12, 125.92, 125.81, 124.37, 123.96, 75.84, 69.99, 66.39, 60.34, 52.23, 51.96, 36.34, 36.02, 28.66, 28.40, 23.03, 22.73; HRMS Calcd for $C_{13}H_{17}N_2O_3$ [M+H$^+$]: 249.1239; Found: 249.1234.



10

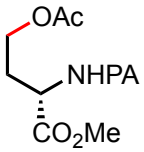
Compound **10** was prepared in 84% yield following the standard procedure **A**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.58 (m, 1H), 8.49 (d, *J* = 6.8 Hz, 1H), 8.17 (d, *J* = 7.8 Hz, 1H), 7.86 (td, *J* = 7.7, 1.7 Hz, 1H), 7.45 (m, 1H), 4.79 (m, 1H), 3.76 (s, 3H), 2.06-1.97 (m, 1H), 1.95-1.81 (m, 1H), 1.01 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 172.87, 164.43, 149.75, 148.59, 137.63,

126.70, 122.56, 53.74, 52.61, 26.09, 10.10; HRMS Calcd for $C_{11}H_{15}N_2O_3$ [M+H$^+$]: 223.1083; Found: 223.1069.



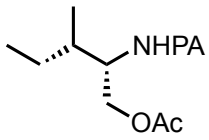
11

Compound **11** was prepared in 25% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 2.5:1) δ 8.59 (d, *J* = 4.4 Hz, 0.4H), 8.45 (d, *J* = 4.6 Hz, 1H), 8.16 (m, 1.4H), 7.83 (m, 1.4H), 7.40 (m, 1.4H), 5.55 (dd, *J* = 5.4, 9.3 Hz, 1H), 4.99 (dd, *J* = 5.4, 9.4 Hz, 0.4H), 4.88 (m, 0.4H), 4.76 (m, 0.4H), 4.38 (m, 1H), 4.24 (m, 1H), 3.81 (s, 1.2H), 3.67 (s, 3H), 2.76 (m, 1.4H), 2.36 (m, 1.4H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 172.33, 171.86, 165.14, 164.78, 151.84, 151.67, 148.57, 147.92, 137.36, 137.17, 125.98, 125.90, 124.39, 123.94, 65.96, 60.34, 54.07, 52.77, 52.45, 47.76, 22.09, 21.83; HRMS Calcd for $C_{11}H_{13}N_2O_3$ [M+H$^+$]: 221.0926; Found: 221.0924.



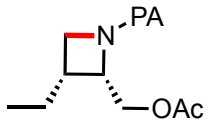
12

Compound **12** was prepared in 70% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.65 (d, *J* = 7.8 Hz, 1H), 8.58 (d, *J* = 4.7 Hz, 1H), 8.17 (d, *J* = 7.8 Hz, 1H), 7.86 (t, *J* = 7.7 Hz, 1H), 7.45 (t, *J* = 6.5 Hz, 1H), 4.94 (m, 1H), 4.26 (m, 2H), 3.78 (s, 3H), 2.38 (m, 1H), 2.26 (m, 1H), 2.05 (s, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 172.34, 171.10, 164.57, 149.53, 148.63, 137.74, 126.90, 122.66, 61.06, 52.91, 50.33, 31.32, 21.18; HRMS Calcd for $C_{13}H_{17}N_2O_5$ [M+H$^+$]: 281.1137; Found: 281.1116.



13

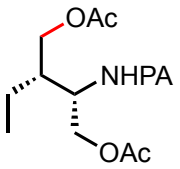
Compound **13** was prepared in 32% yield using the standard procedure **B**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.56 (m, 1H), 8.20 (td, *J* = 1.0, 7.9 Hz, 1H), 8.13 (d, *J* = 6.1 Hz, 1H), 7.86 (td, *J* = 7.7, 1.7 Hz, 1H), 7.44 (m, 1H), 4.30 (m, 3H), 2.03 (s, 3H), 1.81 (m, 1H), 1.64 (m, 1H), 1.29 (m, 1H), 0.99 (d, *J* = 6.8 Hz, 3H), 0.94 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 171.31, 164.41, 150.09, 148.44, 137.68, 126.53, 122.63, 64.79, 52.61, 36.53, 25.72, 21.19, 15.87, 11.67; HRMS Calcd for $C_{14}H_{21}N_2O_3$ [M+H$^+$]: 265.1552; Found: 265.1547.



14

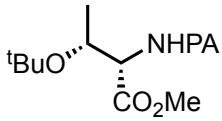
Compound **14** was isolated in 70% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1.3:1) δ 8.56 (m, 2.3H), 8.07 (m, 2.3H), 7.82 (td, *J* = 7.7, 1.7 Hz, 2.3H), 7.37 (m, 2.3H), 5.33 (m, 1H), 4.84 (m, 1.3H), 4.65-4.47 (m, 4.9H), 4.37-4.24 (m, 3.3H), 3.84 (t, *J* = 8.3 Hz, 1H), 2.93-2.72 (m, 2.3H), 2.07 (s, 3.9H), 1.96 (s, 3H), 1.75-1.56 (m, 4.6H), 0.92 (m, 6.9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 170.99, 170.84, 166.25, 165.85, 152.33, 152.27,

148.54, 148.42, 137.27, 137.17, 125.86, 125.76, 124.30, 124.22, 66.17, 63.01, 61.88, 61.77, 59.72, 54.04, 35.70, 35.51, 22.20, 22.12, 21.38, 21.23, 12.14, 12.10; HRMS Calcd for $C_{14}H_{19}N_2O_3$ [M+H$^+$]: 263.1396; Found: 263.1396.



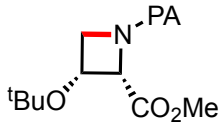
15

Compound **15** was isolated in 8% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.56 (m, 1H), 8.36 (d, *J* = 9.5 Hz, 1H), 8.20 (d, *J* = 7.8 Hz, 1H), 7.88 (td, *J* = 7.7, 7.7 Hz, 1H), 7.46 (m, 1H), 4.61 (m, 1H), 4.27 (d, *J* = 5.4 Hz, 2H), 4.22 (m, 1H), 4.12 (m, 1H), 2.11 (s, 3H), 2.05 (s, 3H), 2.02 (m, 1H), 1.63 (m, 1H), 1.47 (m, 1H), 1.03 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.41, 171.36, 164.45, 150.00, 148.51, 137.86, 126.75, 122.82, 64.46, 64.26, 49.55, 41.61, 21.38, 21.30, 21.25, 12.29; HRMS Calcd for $C_{16}H_{23}N_2O_5$ [M+H$^+$]: 323.1607; Found: 323.1605.



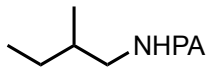
16

Compound **16** was prepared in 95% yield following the standard procedure **A**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.68 (d, *J* = 9.0 Hz, 1H), 8.62 (d, *J* = 4.7 Hz, 1H), 8.17 (d, *J* = 7.8 Hz, 1H), 7.85 (td, *J* = 7.7, 1.2 Hz, 1H), 7.44 (m, 1H), 4.71 (d, *J* = 9.4 Hz, 1H), 4.35 (m, 1H), 3.73 (s, 3H), 1.23 (d, *J* = 6.3 Hz, 3H), 1.17 (s, 9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 171.57, 165.18, 149.92, 148.79, 137.53, 126.65, 122.67, 74.48, 68.05, 58.46, 52.56, 28.73, 21.31; HRMS Calcd for $C_{15}H_{23}N_2O_4$ [M+H$^+$]: 295.1658; Found: 295.1635.



17

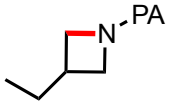
Compound **17** was isolated in 79% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 400 MHz, ratio of rotamers: 3:1) δ 8.57 (d, *J* = 4.6 Hz, 1H), 8.45 (d, *J* = 4.7 Hz, 3H), 8.14 (m, 4H), 7.80-7.75 (m, 4H), 7.36-7.29 (m, 4H), 5.64 (dd, *J* = 1.0, 7.5 Hz, 3H), 5.09 (d, *J* = 7.7 Hz, 1H), 4.98 (dd, *J* = 6.6, 10.0 Hz, 1H), 4.74 (m, 4H), 4.65 (m, 1H), 4.41 (dd, *J* = 7.1, 10.1 Hz, 3H), 4.21 (m, 3H), 3.79 (s, 3H), 3.65 (s, 9H), 1.17 (s, 36H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 169.22, 168.34, 165.10, 164.95, 151.90, 151.65, 148.49, 148.09, 137.26, 137.11, 125.93, 125.86, 124.31, 123.90, 75.51, 75.40, 73.99, 68.66, 64.27, 63.46, 63.07, 58.81, 52.26, 52.07, 31.28, 28.21; HRMS Calcd for $C_{15}H_{21}N_2O_4$ [M+H$^+$]: 293.1501; Found: 293.1484.



18

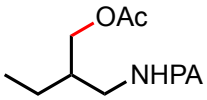
Compound **18** was prepared in 67% yield following the standard procedure **A**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.53 (d, *J* = 4.1 Hz, 1H), 8.20 (d, *J* = 7.8 Hz, 1H), 8.11 (s, 1H), 7.85 (td, *J* = 7.7, 5.2 Hz, 1H), 7.41 (dd, *J* = 5.2, 6.9 Hz, 1H), 3.44-3.23 (m, 2H), 1.72 (m, 1H), 1.51 (m, 1H), 1.26 (m, 1H), 0.96 (m, 6H);); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 164.23, 150.02, 147.93, 137.25, 125.95,

122.12, 44.96, 35.05, 27.00, 17.22, 11.28; HRMS Calcd for $C_{11}H_{17}N_2O$ [M+H$^+$]: 193.1341; Found: 193.1322.



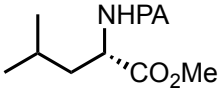
19

Compound **19** was isolated in 68% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 300 MHz, no rotamers observed) δ 8.58 (d, *J* = 4.4 Hz, 1H), 8.10 (d, *J* = 7.9 Hz, 1H), 7.82 (td, *J* = 7.7, 1.6 Hz, 1H), 7.37 (m, 1H), 4.78 (dd, *J* = 9.5, 10.7 Hz, 1H), 4.33 (m, 2H), 3.86 (dd, *J* = 5.6, 10.2 Hz, 1H), 2.61 (m, 1H), 1.71 (m, 2H), 0.93 (t, *J* = 7.3 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 165.18, 152.03, 147.90, 136.61, 125.03, 123.61, 59.81, 53.83, 31.48, 27.28, 11.06; HRMS Calcd for $C_{11}H_{15}N_2O$ [M+H$^+$]: 191.1184; Found: 191.1168.



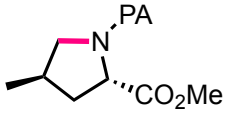
20

Compound **20** was isolated in 12% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.56 (m, 1H), 8.36 (s, 1H), 8.21 (dd, *J* = 0.7, 5.9 Hz, 1H), 7.88 (m, 1H), 7.45 (m, 1H), 4.24 (dd, *J* = 4.4, 11.3 Hz, 1H), 4.10 (dd, *J* = 4.9, 11.3 Hz, 1H), 3.64 (m, 1H), 3.48 (m, 1H), 2.12 (s, 3H), 1.97 (m, 1H), 1.50 (m, 2H), 1.03 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.20, 164.39, 148.02, 137.31, 126.08, 122.18, 65.52, 40.69, 39.65, 22.03, 20.89, 11.34; HRMS Calcd for $C_{13}H_{19}N_2O_3$ [M+H$^+$]: 251.1396; Found: 251.1380.



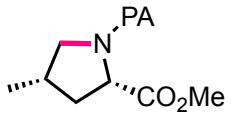
21

Compound **21** was prepared in 87% yield following the standard coupling procedure **A**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.58 (m, 1H), 8.36 (d, *J* = 7.6 Hz, 1H), 8.18 (d, *J* = 7.8 Hz, 1H), 7.85 (t, *J* = 7.7 Hz, 1H), 7.44 (m, 1H), 4.85 (m, 1H), 3.75 (s, 3H), 1.79-1.69 (m, 3H), 0.98 (t, *J* = 4.5 Hz, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 173.47, 164.45, 149.69, 148.56, 137.64, 126.71, 122.62, 52.58, 51.11, 41.89, 25.22, 23.20, 22.15; HRMS Calcd for $C_{13}H_{19}N_2O_3$ [M+H$^+$]: 251.1396; Found: 251.1383.



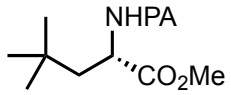
22-trans

Compound **22-trans** was isolated in 72% yield following the standard procedure **D**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1:0.86) δ 8.61 (dd, *J* = 1.0, 5.4 Hz, 0.86H), 8.47 (m, 1H), 8.07 (d, *J* = 7.9 Hz, 1H), 7.93 (d, *J* = 7.9 Hz, 0.86H), 7.83 (m, 1.86H), 7.39 (m, 1.86H), 5.18 (m, 1H), 4.75 (dd, *J* = 2.6, 8.8 Hz, 0.86H), 4.13 (m, 1.86H), 3.78 (s, 2.6H), 3.66 (s, 3H), 3.60 (dd, *J* = 9.0, 11.0 Hz, 0.86H), 3.36 (dd, *J* = 9.2, 11.9 Hz, 1H), 2.50 (m, 1.86H), 2.27 (m, 1H), 2.16 (m, 0.86H), 1.99 (m, 1.86H), 1.13 (d, *J* = 6.5 Hz, 3H), 1.07 (d, *J* = 6.6 Hz, 2.6H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.91, 173.10, 165.55, 165.74, 153.72, 152.93, 148.26, 147.49, 137.31, 137.23, 125.50, 124.99, 124.78, 62.53, 60.57, 56.91, 55.47, 52.63, 52.41, 39.82, 36.77, 33.31, 30.01, 17.62, 17.46; HRMS Calcd for $C_{13}H_{17}N_2O_3$ [M+H$^+$]: 249.1239; Found: 249.1232.



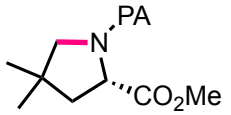
22-cis

Compound **22**-cis was isolated in 10% yield following the standard procedure **D**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1:1.4) δ 8.63 (d, *J* = 3.4 Hz, 1.4H), 8.47 (d, *J* = 4.6 Hz, 1H), 8.06 (d, *J* = 7.9 Hz, 1H), 7.92 (d, *J* = 7.7 Hz, 1.4H), 7.82 (m, 2.4H), 7.39 (m, 2.4H), 5.28 (t, *J* = 8.4 Hz, 1H), 4.66 (dd, *J* = 7.7, 9.8 Hz, 1.4H), 4.25 (m, 2.5H), 3.78 (s, 4.2H), 3.58 (m, 1.4H), 3.51 (s, 3H), 3.30 (t, *J* = 10.0 Hz, 1H), 2.62 (m, 2.4H), 2.37 (m, 2.4H), 1.74 (m, 2.4H), 1.14 (dd, *J* = 8.0, 6.7 Hz, 7.2H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.89, 173.11, 166.49, 165.92, 153.63, 153.35, 148.41, 147.43, 137.39, 137.21, 125.53, 125.40, 125.08, 124.84, 62.30, 61.09, 57.15, 55.72, 52.68, 52.31, 40.33, 37.30, 34.79, 31.53, 17.53, 17.01; HRMS Calcd for $C_{13}H_{17}N_2O_3$ [M+H$^+$]: 249.1239; Found: 249.1225.



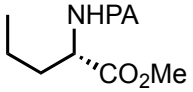
24

Compound **24** was prepared in 99% yield following the standard coupling procedure **A**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.57 (dd, *J* = 0.7, 4.1 Hz, 1H), 8.31 (d, *J* = 8.2 Hz, 1H), 8.18 (d, *J* = 7.8 Hz, 1H), 7.85 (td, *J* = 7.8, 1.6 Hz, 1H), 7.43 (m, 1H), 4.85 (m, 1H), 3.73 (s, 3H), 1.94 (m, 1H), 1.72 (m, 1H), 0.99 (s, 9H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 173.85, 164.16, 149.73, 148.61, 137.65, 126.71, 122.65, 52.69, 50.34, 46.38, 31.07, 29.94; HRMS Calcd for $C_{14}H_{21}N_2O_3$ [M+H$^+$]: 265.1552; Found: 265.1528.



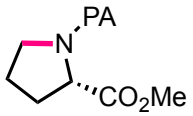
25

Compound **25** was isolated in 86% yield following the standard procedure **C**. ^{1}H NMR ($CDCl_3$, 400 MHz, ratio of rotamers: 1:1.3) δ 8.61 (d, *J* = 4.7 Hz, 1.3H), 8.45 (d, *J* = 4.7 Hz, 1H), 8.06 (d, *J* = 7.9 Hz, 1H), 7.93 (d, *J* = 7.9 Hz, 1.3H), 7.80 (m, 2.3H), 7.36 (m, 1.3H), 7.31 (m, 1H), 5.36 (t, *J* = 8.4 Hz, 1H), 4.73 (dd, *J* = 8.1, 9.5 Hz, 1.3H), 3.85 (m, 1H), 3.77 (m, 2.6H), 3.76 (s, 3.9H), 3.50 (s, 3H), 3.48 (d, *J* = 11.8 Hz, 1H), 2.24 (m, 1H), 2.11 (dd, *J* = 8.0, 12.5 Hz, 1.3H), 1.91 (m, 2.3H), 1.63 (m, 9.9H), 1.03 (s, 3.9H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.99, 173.13, 166.75, 166.09, 153.51, 153.26, 148.39, 147.39, 137.35, 137.18, 125.53, 125.39, 125.10, 124.90, 62.72, 61.76, 61.18, 60.35, 52.66, 52.31, 45.76, 42.55, 39.66, 36.40, 26.76, 26.34, 26.30, 26.11; HRMS Calcd for $C_{14}H_{19}N_2O_3$ [M+H$^+$]: 263.1396; Found: 263.1387.



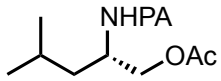
26

Compound **26** was prepared in 71% yield following the standard coupling method **A**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 8.57 (m, 1H), 8.44 (d, *J* = 10.4 Hz, 1H), 8.16 (d, *J* = 6.9 Hz, 1H), 7.84 (td, *J* = 7.7, 1.7 Hz, 1H), 7.43 (m, 1H), 4.81 (m, 1H), 3.74 (s, 3H), 1.96 (m, 2H), 1.46 (m, 1H), 0.95 (t, *J* = 7.3 Hz, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.11, 164.40, 149.70, 148.57, 137.64, 126.72, 122.57, 56.62, 52.39, 34.92, 19.09, 13.97; HRMS Calcd for $C_{12}H_{17}N_2O_3$ [M+H$^+$]: 237.1239; Found: 237.1230.



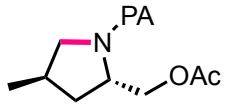
27

Compound **27** was isolated in 17% yield following the standard procedure **D**. ^{1}H NMR ($CDCl_3$, 400 MHz, ratio of rotamer: 1:0.8) δ 8.60 (m, 0.8H), 8.47 (m, 1H), 8.59 (dd, *J* = 0.9, 7.9 Hz, 1H), 7.92 (dd, *J* = 0.9, 7.9 Hz, 0.8H), 7.81 (m, 1.8H), 7.37 (m, 1.8H), 5.16 (m, 1H), 4.70 (m, 0.8H), 4.04-3.80 (m, 3.6H), 3.78 (s, 2.4H), 3.64 (s, 3H), 2.32-2.22 (m, 1.8H), 2.18-2.13 (m, 1H), 2.10-2.00 (m, 1.4H), 1.99-1.92 (m, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.84, 173.04, 166.60, 165.85, 153.71, 153.06, 148.27, 147.49, 137.29, 137.17, 125.47, 124.90, 124.71, 61.95, 60.46, 52.57, 52.36, 50.10, 48.64, 32.17, 29.23, 25.82, 22.35; HRMS Calcd for $C_{12}H_{15}N_2O_3$ [M+H$^+$]: 235.1083; Found: 235.1075.



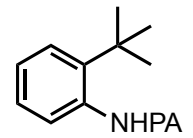
28

Compound **28** was prepared in 49% yield following the standard procedure **B**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.55 (d, *J* = 4.3 Hz, 1H), 8.20 (d, *J* = 7.8 Hz, 1H), 7.99 (d, *J* = 8.6 Hz, 1H), 7.86 (t, *J* = 7.7 Hz, 1H), 7.44 (t, *J* = 6.2 Hz, 1H), 4.98 (m, 1H), 4.17 (d, *J* = 4.8 Hz, 2H), 2.06 (s, 3H), 1.72 (m, 1H), 1.60 (m, 1H), 1.46 (m, 1H), 0.96 (d, *J* = 6.6 Hz, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 171.32, 164.33, 150.09, 148.43, 137.72, 126.57, 122.67, 66.88, 46.85, 41.05, 25.17, 23.46, 22.44, 21.20; HRMS Calcd for $C_{14}H_{21}N_2O_3$ [M+H$^+$]: 265.1552; Found: 265.1545.



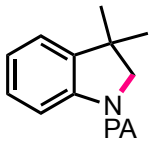
29

Compound **29** was prepared in 72% yield following the standard procedure **D**. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1:1.6) δ 8.58 (m, 2.6H), 7.86 (m, 5.2H), 7.35 (m, 2.6H), 5.15 (m, 1H), 4.62 (m, 1.6H), 4.35 (m, 3.2H), 4.05 (m, 2.6H), 3.94 (m, 2H), 3.33 (m, 2.6H), 2.50 (m, 2.6H), 2.06 (s, 4.8H), 2.02 (m, 2.6H), 1.87 (s, 3H), 1.81 (m, 2.6H), 1.13 (d, *J* = 6.5 Hz, 3H), 1.01 (d, *J* = 6.6 Hz, 4.8H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.34, 170.95, 167.52, 166.83, 154.70, 154.41, 148.41, 148.25, 137.34, 137.29, 125.27, 125.18, 124.74, 124.25, 65.87, 64.37, 57.41, 57.06, 56.68, 54.63, 37.65, 35.60, 32.64, 29.69, 21.38, 21.15, 18.73, 18.22; HRMS Calcd for $C_{14}H_{19}N_2O_3$ [M+H$^+$]: 263.1396; Found: 263.1371.



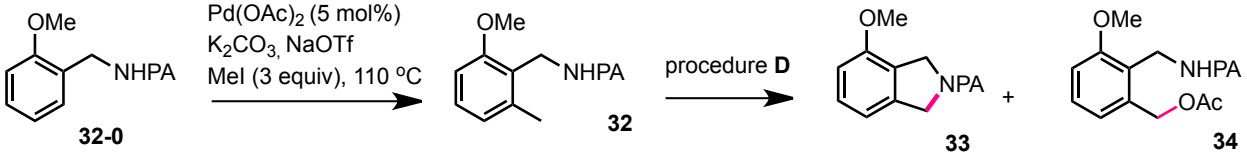
30

Compound **30** was prepared in 57% yield following the standard coupling procedure **A**. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 10.24 (s, 1H), 8.56 (d, *J* = 4.2 Hz, 1H), 8.25 (d, *J* = 7.8 Hz, 1H), 8.07 (d, *J* = 7.9 Hz, 1H), 7.84 (td, *J* = 7.7, 1.3 Hz, 1H), 7.41 (m, 2H), 7.23 (M, 1H), 7.09 (m, 1H), 1.42 (s, 9H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 161.74, 150.14, 148.12, 141.01, 137.63, 135.40, 126.78, 126.38, 126.29, 125.17, 124.96, 122.48, 34.48, 30.48; HRMS Calcd for $C_{16}H_{19}N_2O$ [M+H$^+$]: 255.1497; Found: 255.1475.



31

Compound **31** was isolated in 61% yield following the standard procedure **D** with 10 mol% of $Pd(OAc)_2$. ^1H NMR ($CDCl_3$, 300 MHz, no rotamers observed) δ 8.58 (d, J = 4.5 Hz, 1H), 8.23 (d, J = 8.1 Hz, 1H), 7.85 (m, 2H), 7.35(t, J = 5.2 Hz, 1H), 7.23 (m, 1H), 7.13 (m, 2H), 4.02 (s, 2H), 1.25 (s, 6H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 154.91, 148.46, 142.39, 141.85, 137.49, 128.01, 125.45, 125.09, 124.73, 122.29, 118.35, 65.46, 41.03, 28.61; HRMS Calcd for $C_{16}H_{17}N_2O$ [M+H$^+$]: 253.1341; Found: 253.1323.

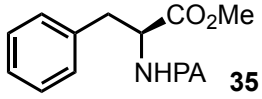


Compound **33**

Compound **32** was prepared from compound **32-0** based on the known procedure.[1] Compound **33** was isolated in 56% yield following the standard procedure **D**. ^1H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1:1.2) δ 8.67 (t, J = 4.7 Hz, 2.2H), 8.00 (m, 2.2H), 7.84 (m, 2.2H), 7.40 (dd, J = 5.0, 6.6 Hz, 2.2H), 7.29 (m, 2.2H), 6.93 (d, J = 7.5 Hz, 1.2H), 6.82 (d, J = 7.6 Hz, 1H), 6.77 (dd, J = 2.5, 8.1 Hz, 2.2H), 5.22 (s, 2H), 5.13 (s, 2.4H), 5.04 (s, 2.4H), 4.99 (s, 2H), 3.85 (s, 3H), 3.81 (s, 3.6H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 166.91, 166.57, 155.43, 155.06, 154.17, 148.57, 148.34, 139.74, 137.79, 137.32, 137.29, 129.65, 129.62, 126.01, 125.39, 125.34, 124.71, 124.46, 124.26, 115.20, 114.84, 109.12, 109.03, 55.78, 55.72, 55.61, 54.29, 53.36, 52.10; HRMS Calcd for $C_{15}H_{15}N_2O_2$ [M+H$^+$]: 255.1134; Found: 255.1116.

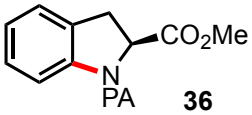
Compound **34**

Compound **34** was isolated in 30% yield following the standard procedure **D**. ^1H NMR ($CDCl_3$, 300 MHz) δ 8.50 (dd, J = 0.7, 3.9 Hz, 1H), 8.38 (s, 1H), 8.21 (d, J = 7.8 Hz, 1H), 7.84 (td, J = 7.7, 1.7 Hz, 1H), 7.40 (m, 1H), 7.31 (m, 1H), 7.02 (d, J = 7.4 Hz, 1H), 6.94 (d, J = 8.3 Hz, 1H), 5.35 (s, 2H), 4.77 (d, J = 5.9 Hz, 1H), 3.90 (s, 3H), 2.05 (s, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 171.12, 164.15, 158.91, 150.53, 148.43, 137.69, 136.37, 129.32, 126.43, 126.00, 122.92, 122.70, 111.46, 65.02, 56.24, 35.13, 21.44; HRMS Calcd for $C_{17}H_{19}N_2O_4$ [M+H$^+$]: 315.1345; Found: 315.1345.



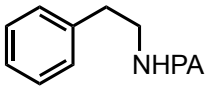
35

Compound **35** was prepared in 98% yield following the standard amide coupling procedure **A**. ^1H NMR ($CDCl_3$, 400 MHz) δ 8.55 (m, 1H), 8.49 (d, J = 8.0 Hz, 1H), 8.16 (d, J = 7.8 Hz, 1H), 7.85 (td, J = 7.7, 1.7 Hz, 1H), 7.43 (m, 1H), 7.30 (m, 3H), 7.20 (m, 2H), 5.10 (m, 1H), 3.72 (s, 3H), 3.29 (m, 2H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ172.18, 164.41, 149.63, 148.72, 137.69, 136.49, 129.68, 128.99, 127.48, 126.84, 122.62, 53.90, 52.73, 38.62; HRMS Calcd for $C_{16}H_{17}N_2O_3$ [M+H$^+$]: 285.1239; Found: 285.1226.



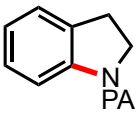
36

Compound **36** was isolated in 81% yield following the standard procedure **E**. ^{1}H NMR (DMSO-d_6, 300 MHz, no rotamers observed) δ 8.56 (d, *J* = 4.3 Hz, 1H), 8.28 (d, *J* = 8.2 Hz, 1H), 8.03 (m, 2H), 7.58 (m, 1H), 7.53 (m, 2H), 7.12 (t, *J* = 7.2 Hz, 1H), 5.67 (dd, *J* = 2.3, 10.9 Hz, 1H), 3.70 (m, 1H), 3.60 (s, 3H), 3.19 (dd, *J* = 2.3, 16.8 Hz, 1H); ^{13}C NMR (DMSO-d_6, 100 MHz) δ 173.05, 165.84, 153.40, 148.20, 144.26, 138.59, 130.66, 128.25, 128.11, 126.71, 125.51, 125.19, 118.00, 62.94, 52.95, 33.98; HRMS Calcd for $C_{16}H_{15}N_2O_3$ [M+H$^+$]: 283.1083; Found: 283.1063.



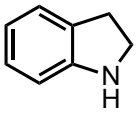
37

Compound **37** was prepared in 97% yield following the standard amide coupling procedure **A**. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.55 (m, 1H), ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.51 (d, *J* = 4.3 Hz, 1H), 8.21 (d, *J* = 7.8 Hz, 1H), 8.14 (s, 1H), 7.85 (td, *J* = 7.7, 1.5 Hz, 1H), 7.41 (m, 1H), 7.33 (m, 2H), 7.26 (m, 3H), 3.76 (dd, *J* = 6.8, 13.5 Hz, 2H), 2.97 (t, *J* = 7.3 Hz, 2H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 164.75, 150.30, 148.47, 139.39, 137.67, 129.17, 128.99, 126.85, 126.51, 122.51, 41.20, 36.30; HRMS Calcd for $C_{14}H_{15}N_2O$ [M+H$^+$]: 227.1184; Found: 227.1179.



38

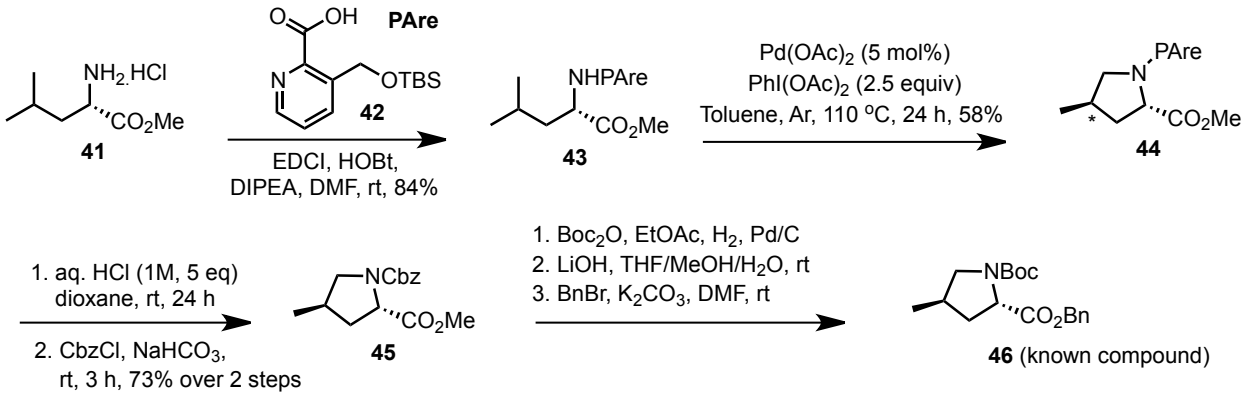
Compound **38** was isolated in 90% yield following the standard procedure **E**. ^{1}H NMR (DMSO-d_6, 300 MHz) δ 8.66 (d, *J* = 4.5 Hz, 1H), 8.17 (d, *J* = 7.8 Hz, 1H), 8.03 (td, *J* = 7.8, 1.6 Hz, 1H), 7.79 (d, *J* = 7.9 Hz, 1H), 7.58 (dd, *J* = 5.3, 6.9 Hz, 1H), 7.30 (m, 2H), 7.10 (m, 1H), 4.20 (t, *J* = 8.3 Hz, 2H), 3.13 (t, *J* = 8.3 Hz, 2H); ^{13}C NMR (DMSO-d_6, 75.5 MHz) δ 166.57, 155.07, 149.07, 143.78, 138.34, 133.39, 127.83, 126.13, 125.81, 125.01, 124.39, 117.77, 50.83, 28.82; HRMS Calcd for $C_{14}H_{13}N_2O$ [M+H$^+$]: 225.1028; Found: 225.1021.



39

Compound **38** (50 mg, 0.22 mmol, 1.0 eq) was dissolved in a mixture of THF/MeOH/H_2O (1/0.5/0.5 mL); NaOH (14 mg, 0.33 mmol, 1.5 eq) was then added. The mixture was heated to 50 ^{o}C and stirred for 24 hours. Water was added and the mixture was extracted with DCM. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The residue was purified by silica gel flash chromatography to give the desired product **39**[2] in 83% yield. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 7.15 (d, *J* = 7.2 Hz, 1H), 7.07 (m, 1H), 6.75 (m, 2H), 3.66 (s, 1H), 3.59 (t, *J* = 8.4 Hz, 2H), 3.08 (t, *J* = 8.3 Hz, 2H).

10. Application of the more easily removable PAre group.



Compound **43** was prepared in 84% yield using the standard amide coupling procedure **A** with compound **42**[3]. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.53 (d, *J* = 8.3 Hz, 1H), 8.45 (d, *J* = 3.8 Hz, 1H), 8.26 (d, *J* = 7.6 Hz, 1H), 7.48 (dd, *J* = 4.7, 7.8 Hz, 1H), 5.29 (s, 2H), 4.75 (m, 1H), 3.75 (s, 3H), 1.78 (m, 3H), 0.96 (s, 15H), 0.13 (s, 6H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 173.75, 165.85, 146.10, 144.47, 140.32, 135.66, 126.59, 62.06, 52.65, 50.99, 41.84, 26.38, 25.36, 23.24, 22.36, 18.74, -4.95; HRMS Calcd for $C_{20}H_{35}N_2O_4Si$ [M+H$^+$]: 395.2366; Found: 395.2357.

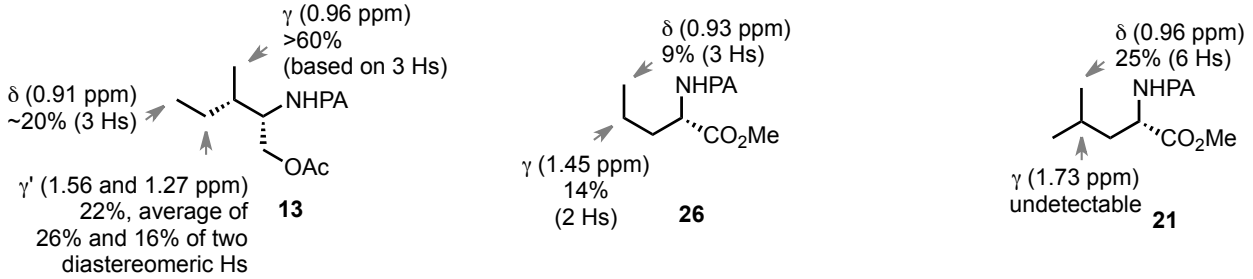
Compound **44-trans** (51%).
Compound **44-trans** was isolated in 51% yield following the standard procedure **D** without 10 equiv of AcOH. **44-cis** isomer was also obtained in 7% yield. ^{1}H NMR ($CDCl_3$, 300 MHz, ratio of rotamers: 1:1.8) δ 8.46 (d, *J* = 4.7 Hz, 1.8H), 8.34 (d, *J* = 4.7 Hz, 1H), 8.02 (d, *J* = 7.9 Hz, 2.8H), 7.37 (m, 2.8H), 5.04 (m, 5.6H), 4.81 (dd, *J* = 2.0, 8.5 Hz, 1H), 4.72 (dd, *J* = 2.1, 8.9 Hz, 1.8H), 4.07 (dd, *J* = 7.8, 11.8 Hz, 1H), 3.76 (s, 5.4H), 3.57 (m, 1.8H), 3.53 (s, 3H), 3.28 (m, 2.8H), 2.49 (m, 2.8H), 2.17 (m, 2.8H), 1.97 (m, 2.8H), 1.12 (d, *J* = 6.6 Hz, 3H), 1.00 (d, *J* = 6.6 Hz, 5.4H), 0.93 (s, 25.2H), 0.11 (d, *J* = 2.8 Hz, 16.8H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.43, 172.78, 166.97, 166.94, 151.01, 149.96, 147.10, 146.10, 138.10, 136.67, 135.42, 135.21, 124.95, 124.87, 61.50, 61.49, 61.23, 59.47, 55.77, 54.08, 52.71, 52.51, 39.41, 37.29, 32.94, 30.65, 26.35, 18.76, 18.74, 17.84, 17.31, -4.93, -4.99; HRMS Calcd for $C_{20}H_{33}N_2O_4Si$ [M+H$^+$]: 393.2210; Found: 393.2212.

Compound **45**.
Compound **44** (40 mg, 0.1 mmol, 1.0 eq) was dissolved in dioxane (2 mL), and aq. HCl (1 M) (0.5 mL, 0.5 mmol, 5.0 eq) was added. The mixture was stirred at rt for 24 hours. $NaHCO_3$ (84 mg, 1.0 mmol, 10.0 eq) and CbzCl (22 μL, 0.15 mmol, 1.5 eq) were added and the resulting mixture was stirred at rt for another 3 hours. Water was added and the mixture was extracted with DCM. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The residue was purified by silica gel flash chromatography to give product **45** in 73% yield. ^{1}H NMR ($CDCl_3$, 300 MHz) δ 7.37 (m, 5H), 5.20 (m, 2H), 4.45 (m, 1H), 3.82 (m, 1H), 3.73 (s, 1.5H), 3.58 (s, 1.5H), 3.07 (m, 1H), 2.46 (m, 1H), 2.13 (m, 1H), 1.91 (m, 1H), 1.06 (m, 3H); ^{13}C NMR ($CDCl_3$, 75.5 MHz) δ 173.68, 173.52, 155.29, 154.63, 137.12, 137.07, 128.89, 128.82, 128.40, 128.33, 128.30, 128.17, 67.45, 67.33, 59.78, 59.47, 54.07, 53.71, 52.68, 52.50, 38.92, 38.00, 32.49, 31.58, 17.74, 17.69;

Compound **46**[4]

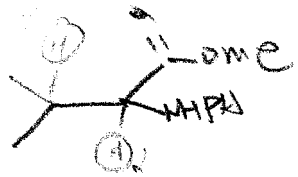
Compound **45** (21 mg, 0.076 mmol, 1.0 eq) was dissolved in ethyl acetate (1 mL), Boc_2O (20 mg, 0.091 mmol, 1.2eq) and Pd/C (2 mg) was added. The mixture was stirred under H_2 (1 atm.) at rt for 12 hours. The reaction mixture was filtered through a pad of celite; the filtrate was concentrated *in vacuo*. The residue was then dissolved in a mixture of THF/MeOH/H_2O (1/0.3/0.3 mL), and $LiOH.H_2O$ (6 mg, 0.15 mmol, 2.0 eq) was added. The resulting mixture was stirred at rt for 12 hours. aq. HCl (1 M) was added to pH = 2, then extracted with ethyl acetate. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The residue was dissolved in anhydrous DMF (1 mL), and treated with K_2CO_3 (21 mg, 0.15 mmol, 2.0 eq), BnBr (14 μL, 0.11 mmol, 1.5 eq) and KI (cat). After stirring at rt for 3 hours, water was added and the mixture was extracted with ethyl acetate. The combined organic layers was washed with water and brine, dried over anhydrous Na_2SO_4, and concentrated *in vacuo*. The residue was purified by silica gel flash chromatography to give product **46** in 62% yield. ^{1}H-NMR ($CDCl_3$, 300 MHz) δ 7.34 (m, 5H), 5.26 (m, 2H), 4.44 (dd, J = 2.1, 8.7 Hz, 0.4 H), 4.32 (dd, J = 2.8, 8.8 Hz, 0.6 H), 3.75 (m, 1H), 3.00 (m, 1H), 2.41 (m, 1H), 2.10 (m, 1H), 1.90 (m, 1H), 1.46 (s, 3.6H), 1.34 (s, 5.4H), 1.04 (m, 3H). HRMS Calcd for $C_{15}H_{20}NO_4$ [M+H$^+$]: 278.1392; Found: 278.1379.

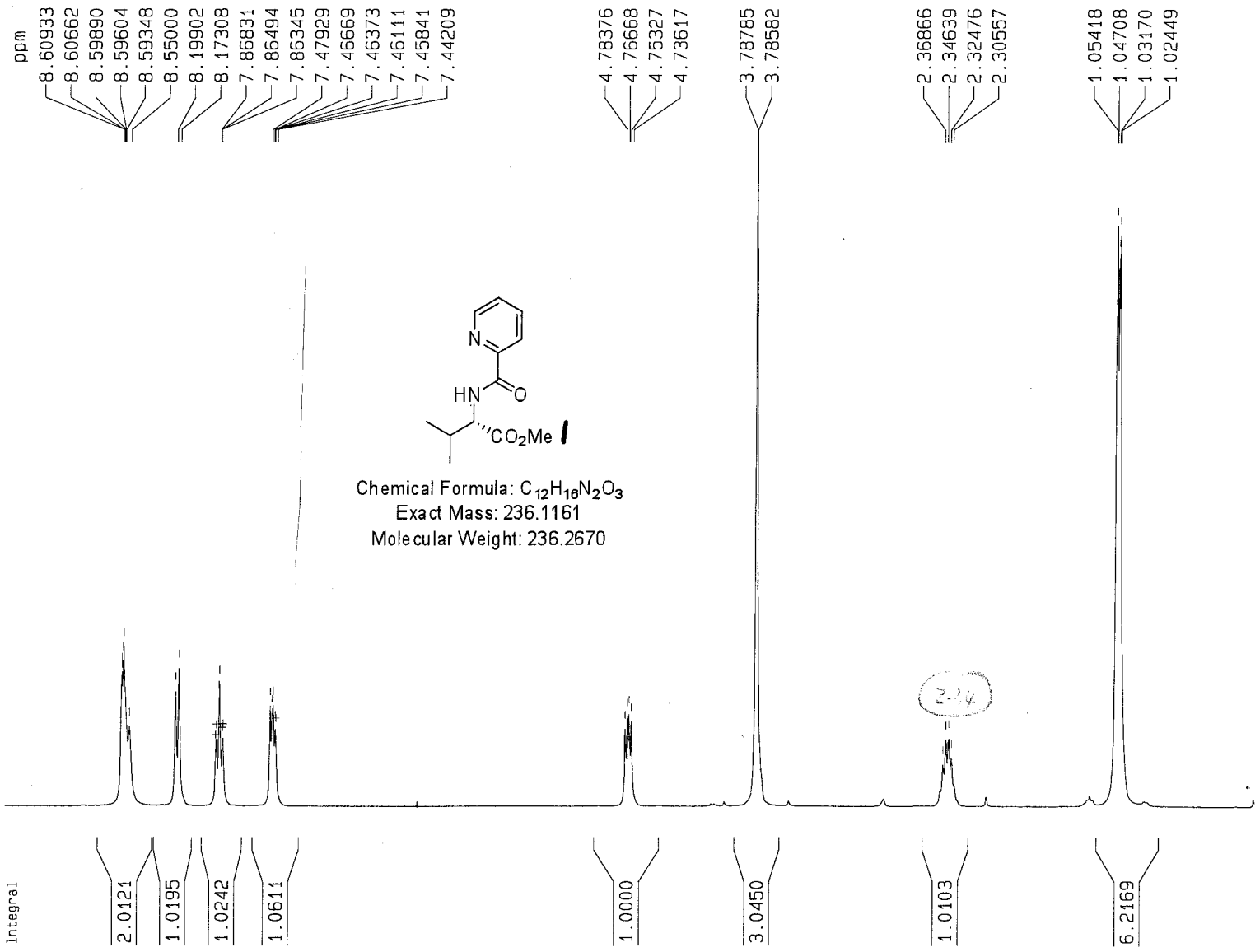
11. Substrate deuteration experiments.



General procedure F: Picolinamide substrate (0.1 mmol), $Pd(OAc)_2$ (2.2 mg, 0.01 mmol, 10 mol%), AcOD (1 mmol, 10 equiv) in anhydrous toluene (1 mL) in a 10 mL glass vial (purged with Ar, sealed with PTFE cap) was heated at 110 ^{o}C for 24 hours (No $PhI(OAc)_2$ was added). The reaction mixture was cooled to rt, and concentrated *in vacuo*. The resulting residue was purified by silica gel flash chromatography to give the deuterated product. The resulting compound was dissolved in $CDCl_3$ and analyzed by ^{1}H-NMR.

[1] Zhao, Y.; Chen, G. *Org. Lett.* **2011**, *13*, 4850-4853.
[2] Huang, Y.-B.; Yang, C.-T.; Yi, J.; Deng, X.-J.; Fu, Y.; Liu, L. *J. Org. Chem.* **2011**, 76, 800-810.
[3] He, G.; Chen, G. *Angew. Chem. Int. Ed.* **2011**, 50, 5192-5196.
[4] Xie, W.; Zou, B.; Pei, D.; Ma, D. *Org. Lett.* **2005**, 7, 2775-2777.





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PROCNO	1

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DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

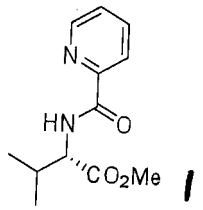
F2 - Processing parameters

SI	32768
SF	299.8699437 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

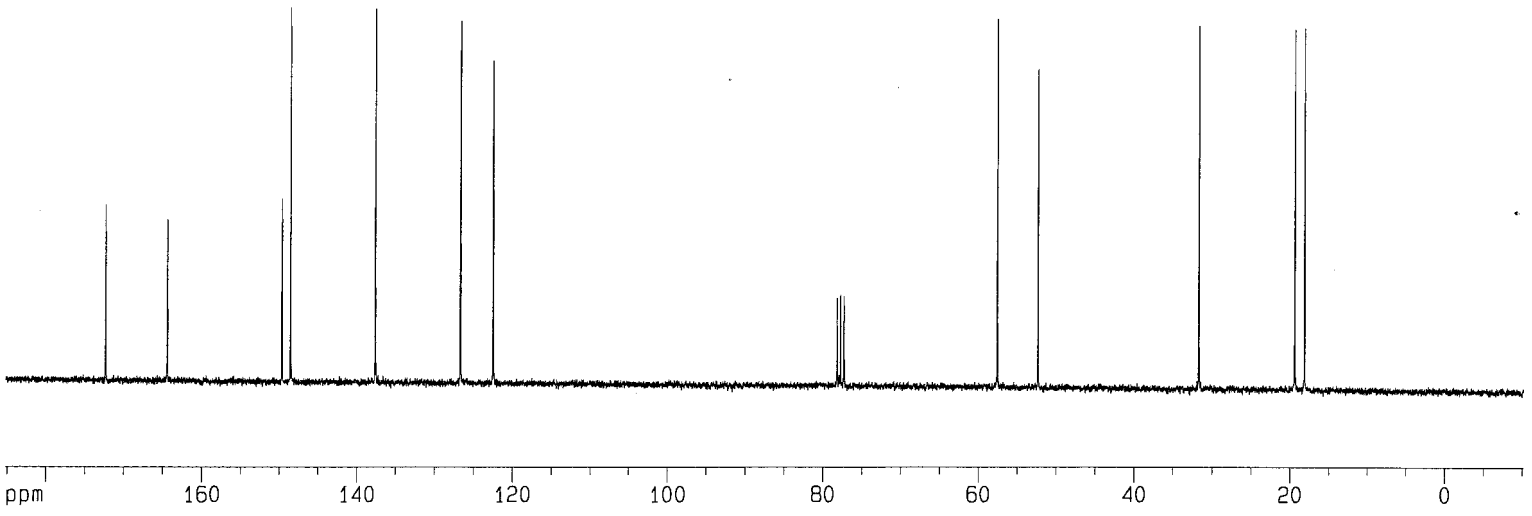
1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	0.47500 ppm/cm
HZCM	142.43822 Hz/cm

ppm 172.346 164.423 149.673 148.547 137.591 126.669 122.480 57.583 52.331 31.699 19.382 18.138



Chemical Formula: $C_{12}H_{16}N_2O_3$
Exact Mass: 236.1161
Molecular Weight: 236.2670



Current Data Parameters
NAME zys-3-130s-C
EXPNO 2903
PROCNO 1

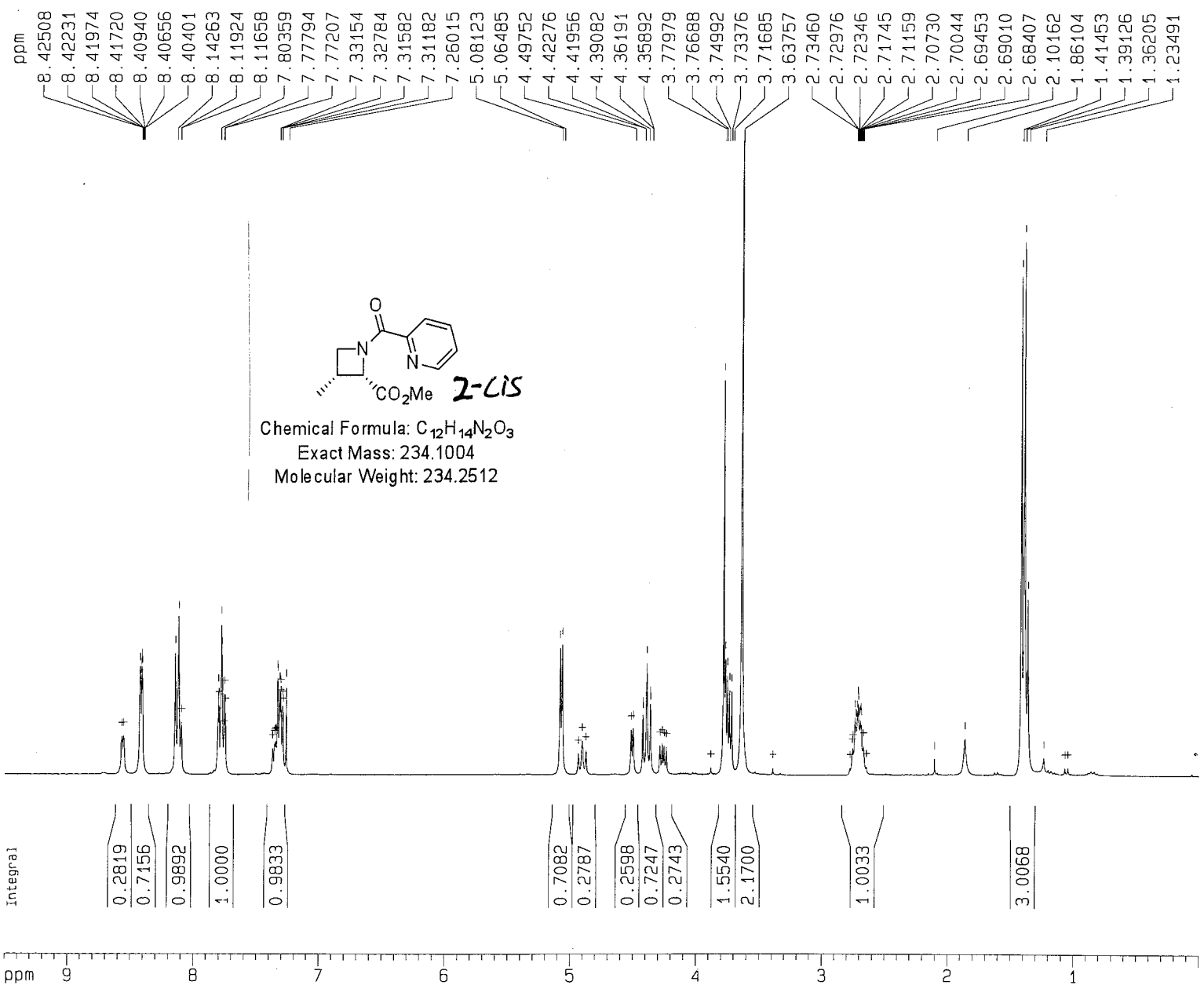
F2 - Acquisition Parameters
Date_ 20110906
Time 15.05
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 51
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 512
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

========== CHANNEL f1 ==========
NUC1 13C
P1 5.25 usec
PL1 -6.00 dB
SFO1 75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 19.70 dB
PL13 19.70 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 185.198 ppm
F1 13964.33 Hz
F2P -10.122 ppm
F2 -763.19 Hz
PPMCM 9.76595 ppm/cm
HZCM 736.37592 Hz/cm



Current Data Parameters

NAME	zys-3-II-1
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111015
Time	16.35
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	128
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 ========

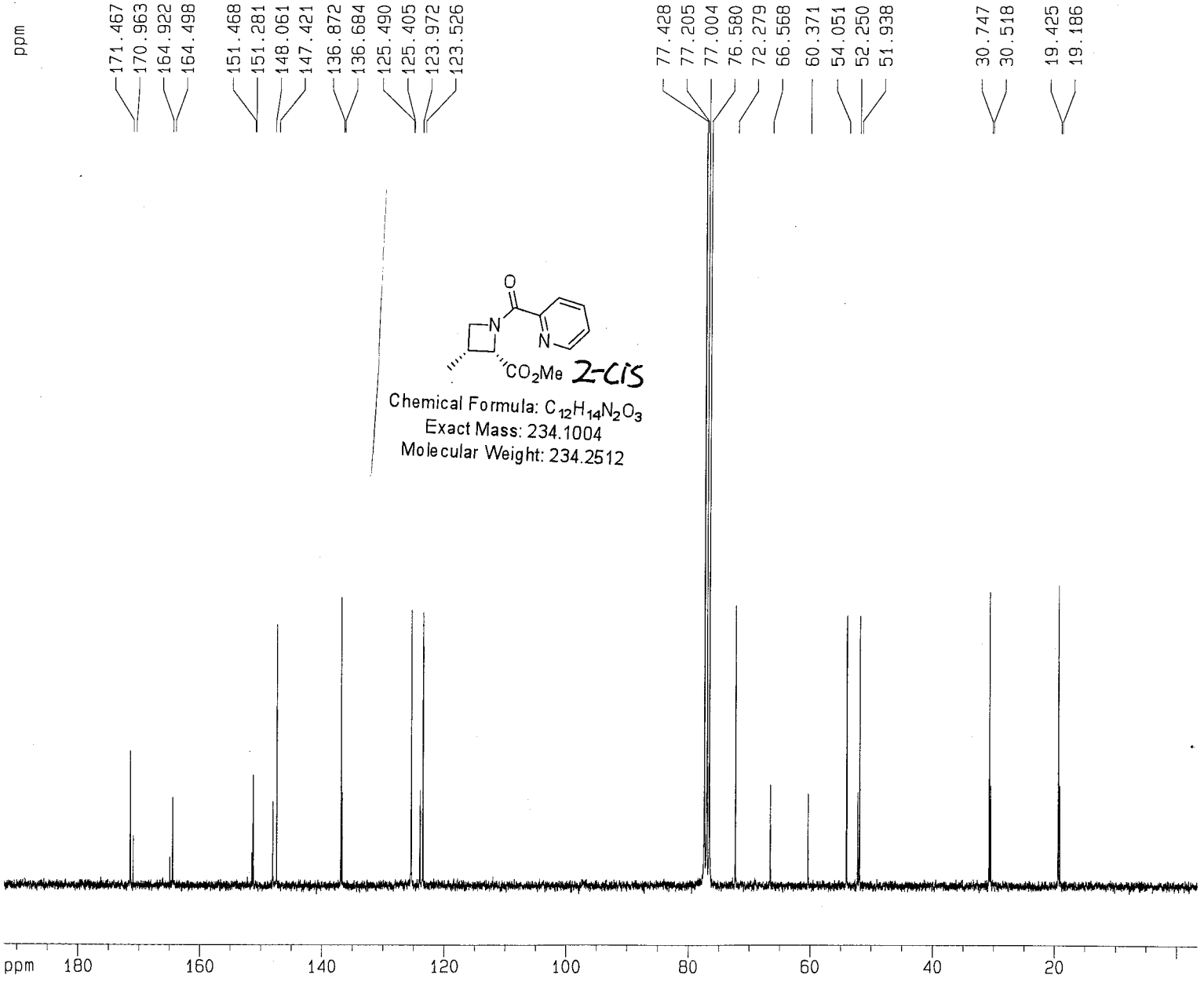
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700099 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

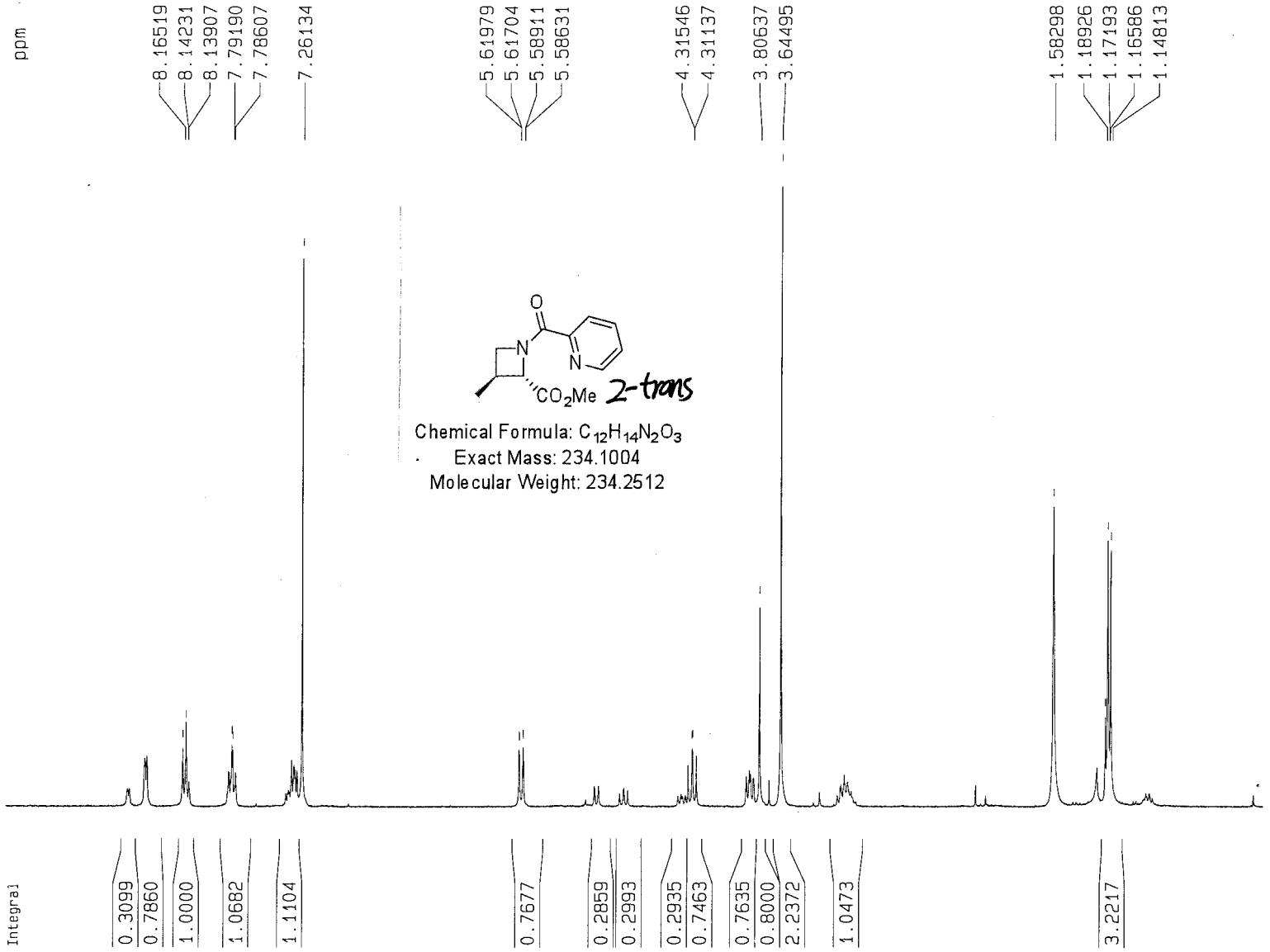
CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	0.47500 ppm/cm
HZCM	142.43825 Hz/cm



Chemical Formula: $C_{12}H_{14}N_2O_3$
Exact Mass: 234.1004
Molecular Weight: 234.2512

```
Current Data Parameters
NAME        zys-3-II-1-C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20111015
Time               20.19
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2727
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
AQ            1.7433076 sec
RG                456.1
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                5.25 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             19.70 dB
PL13             19.70 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023769 MHz
WDW                   EM
SSB                    0
LB                1.00 Hz
GB                     0
PC                 1.40

1D NMR plot parameters
CX               20.00 cm
F1P             192.092 ppm
F1             14484.23 Hz
F2P              -3.333 ppm
F2             -251.34 Hz
PPMCM          9.77129 ppm/cm
HZCM          736.77844 Hz/cm
```

II'



Current Data Parameters

NAME	zys-3-II-2
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111015
Time	17.12
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	256
DS	2
SWH	6172.839 Hz
FIDRES	0.094190 Hz
AQ	5.3084660 sec
RG	1625.5
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

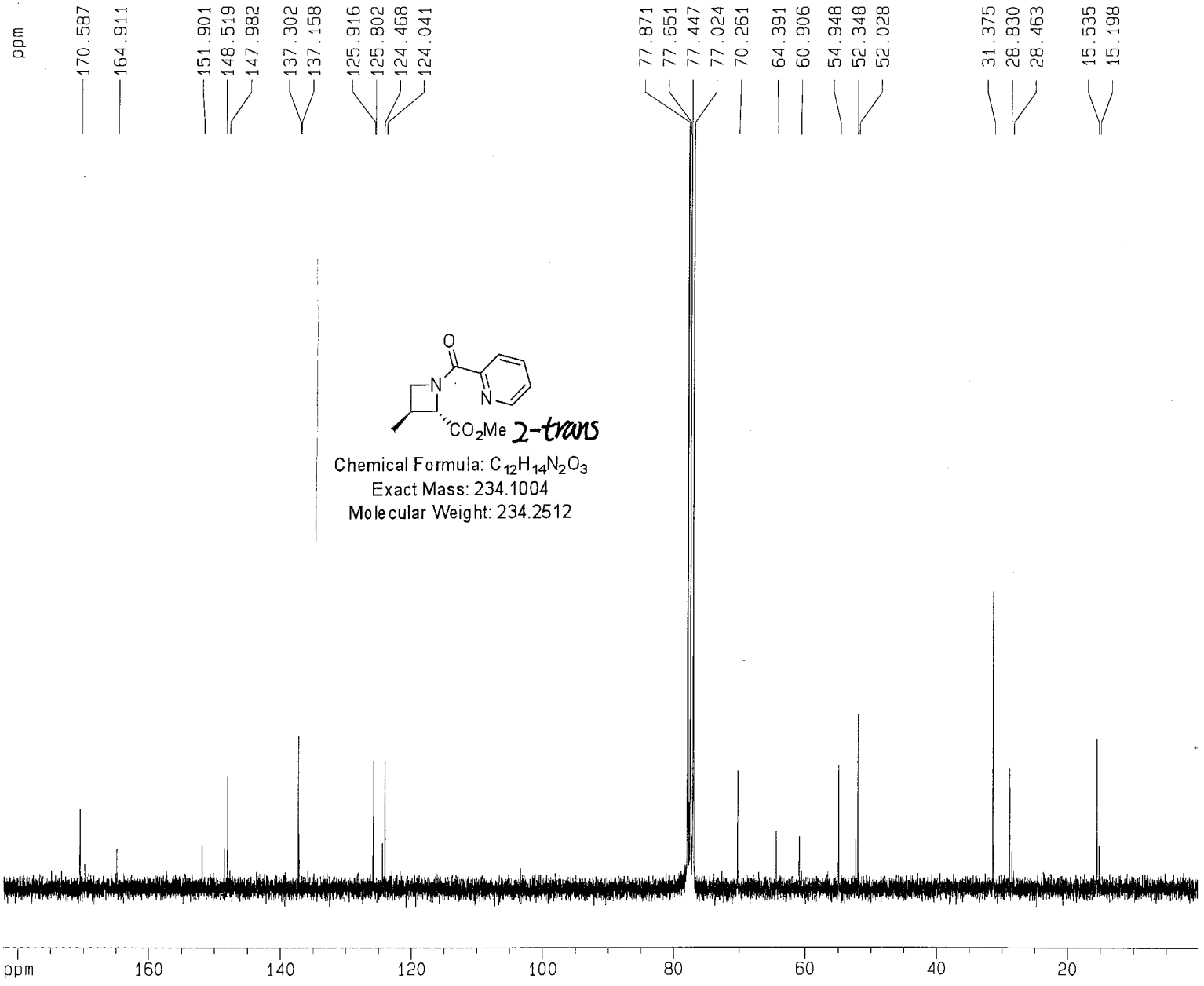
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700097 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	0.47500 ppm/cm
HZCM	142.43825 Hz/cm



2-trans

Chemical Formula: $C_{12}H_{14}N_2O_3$
Exact Mass: 234.1004
Molecular Weight: 234.2512

```
Current Data Parameters
NAME      zys-3-II-2-Car
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20111024
Time                1.21
INSTRUM            spect
PROBHD    5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                30720
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                5.25 usec
PL1              -6.00 dB
SFO1        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             19.70 dB
PL13             19.70 dB
SFO2       299.8711995 MHz

F2 - Processing parameters
SI                32768
SF          75.4023410 MHz
WDW                  no
SSB                   0
LB                0.00 Hz
GB                    0
PC                1.40

1D NMR plot parameters
CX               20.00 cm
F1P             182.178 ppm
F1             13736.66 Hz
F2P               0.142 ppm
F2               10.68 Hz
PPMCM          9.10183 ppm/cm
HZCM         686.29919 Hz/cm
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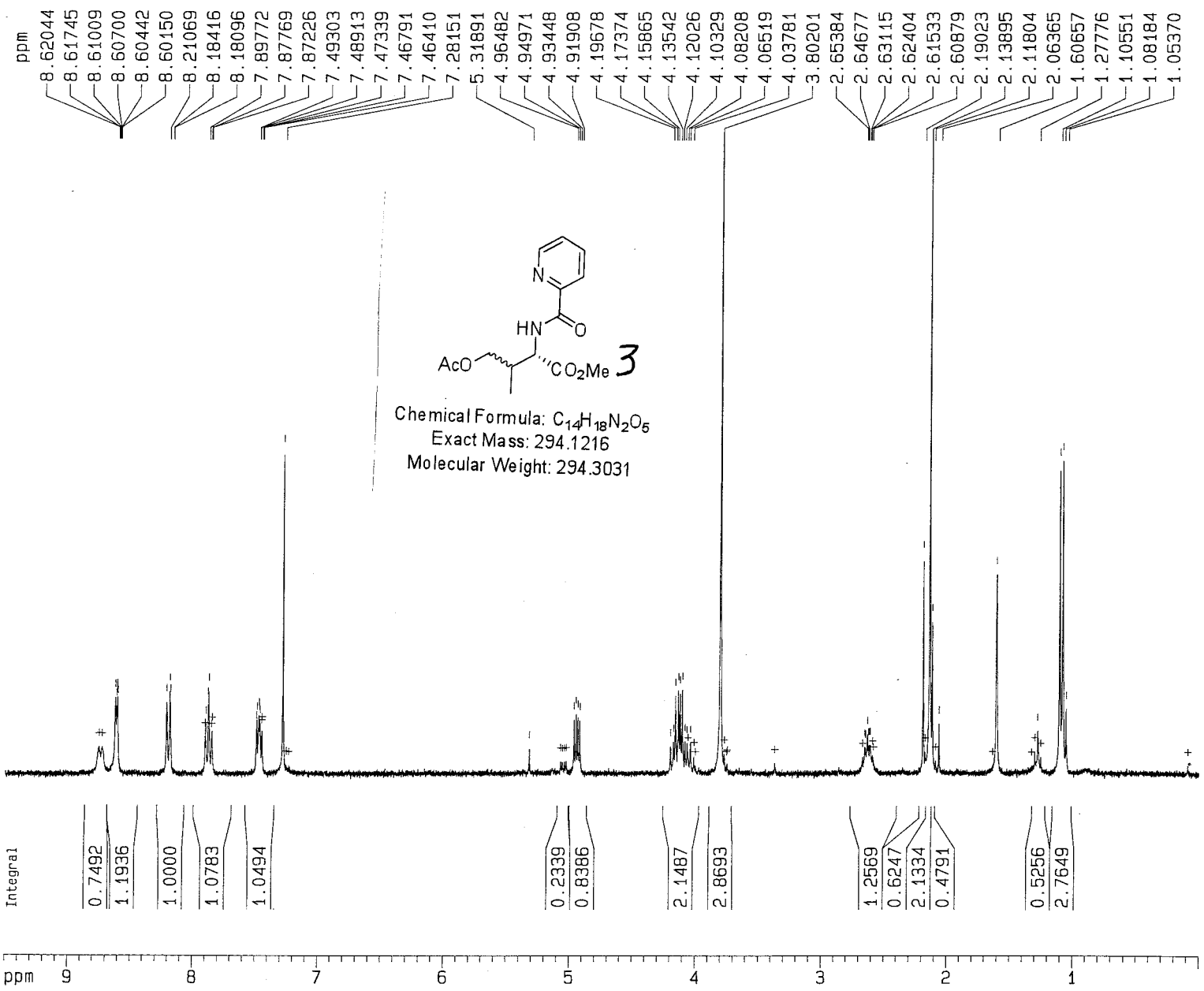


Current Data Parameters

NAME	zys-3-III
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111019
Time	10.01
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	574.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

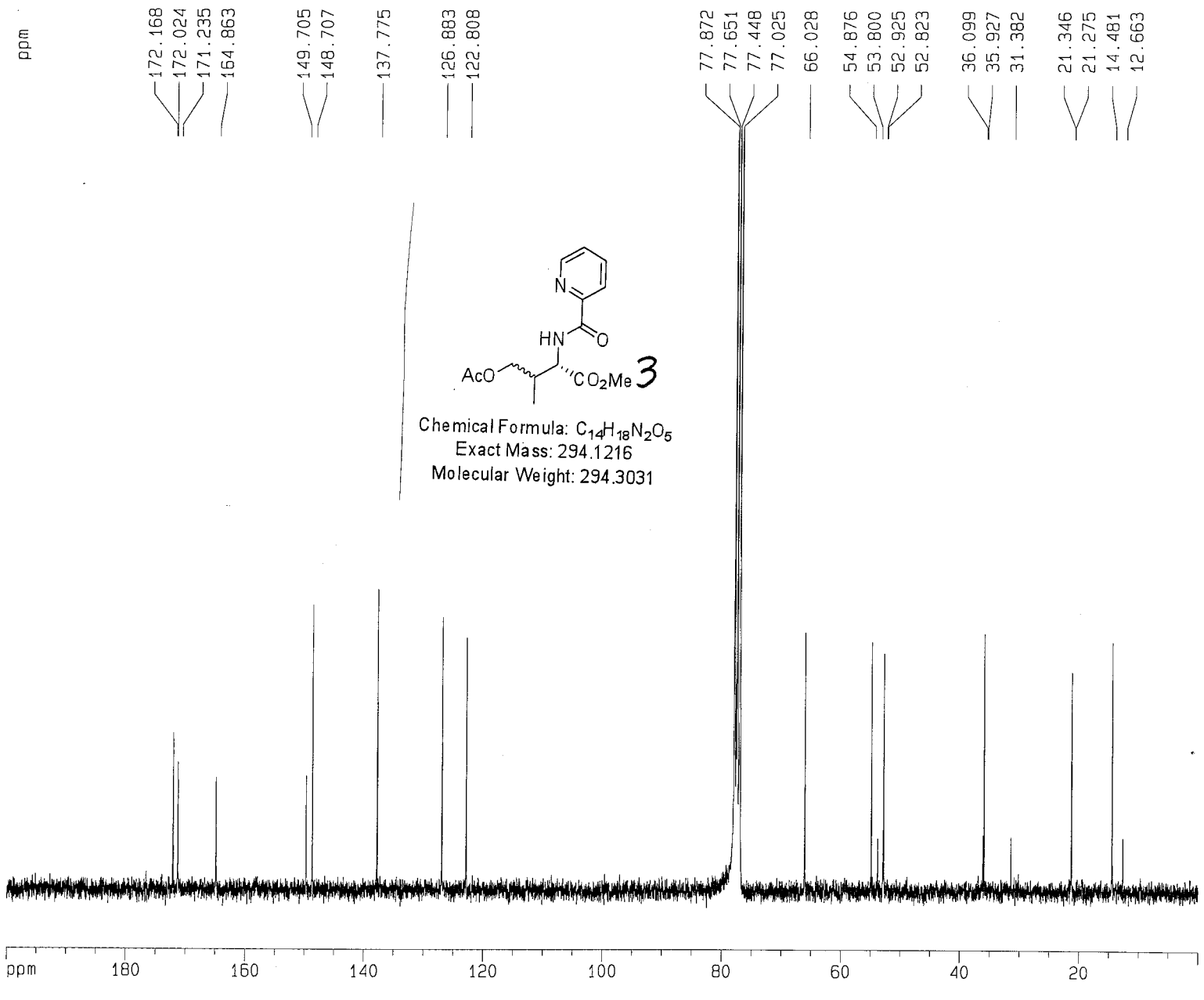
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

SI	32768
SF	300.1300000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	0.47500 ppm/cm
HZCM	142.56175 Hz/cm



3

Chemical Formula: $C_{14}H_{18}N_2O_5$
Exact Mass: 294.1216
Molecular Weight: 294.3031

Current Data Parameters

NAME	zys-3-III-C
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20111021
Time	13.46
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	17769
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

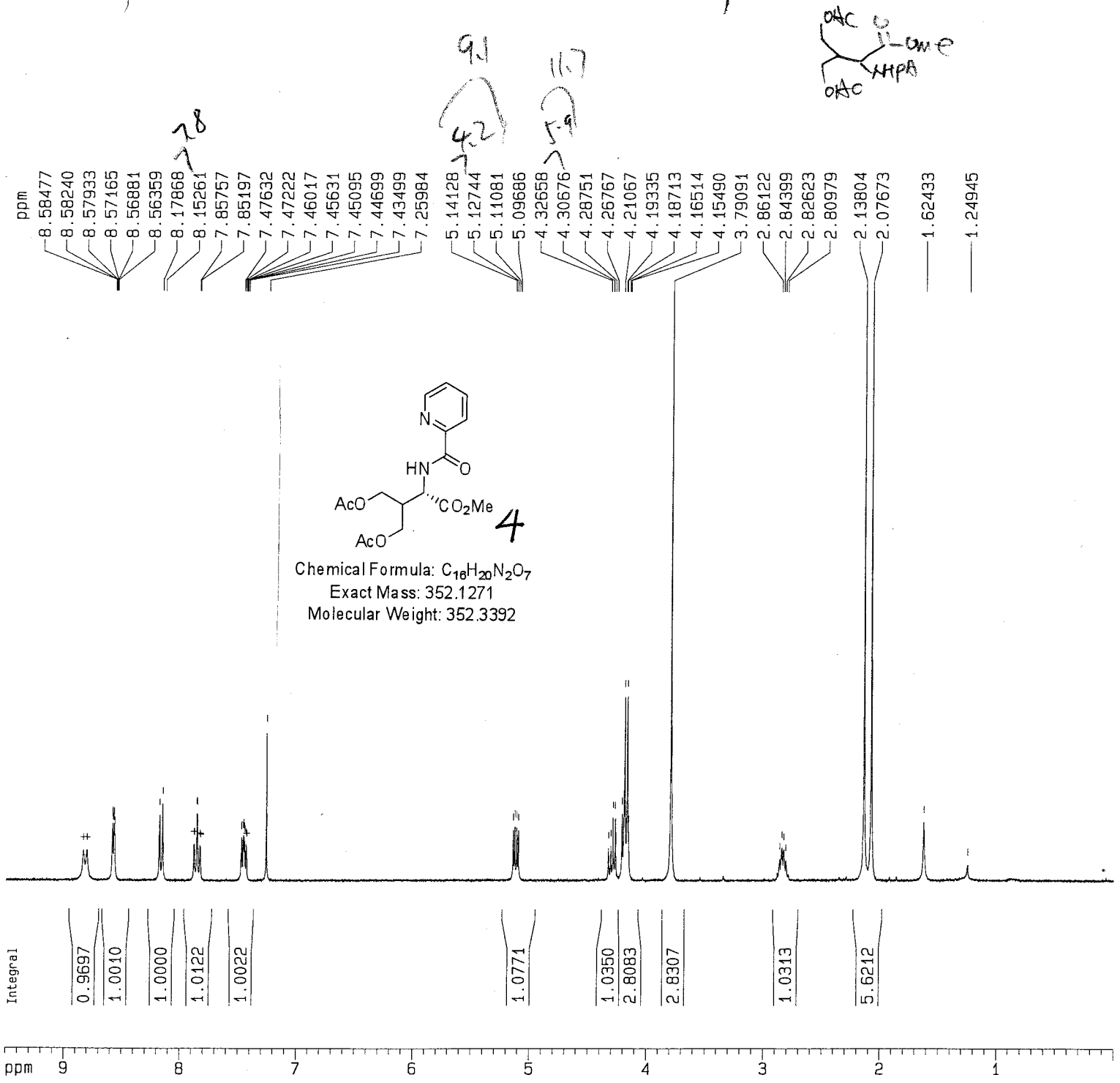
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

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	200.000 ppm
F1	15080.47 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	10.00000 ppm/cm
HZCM	754.02344 Hz/cm



4

Chemical Formula: $C_{16}H_{20}N_2O_7$
Exact Mass: 352.1271
Molecular Weight: 352.3392

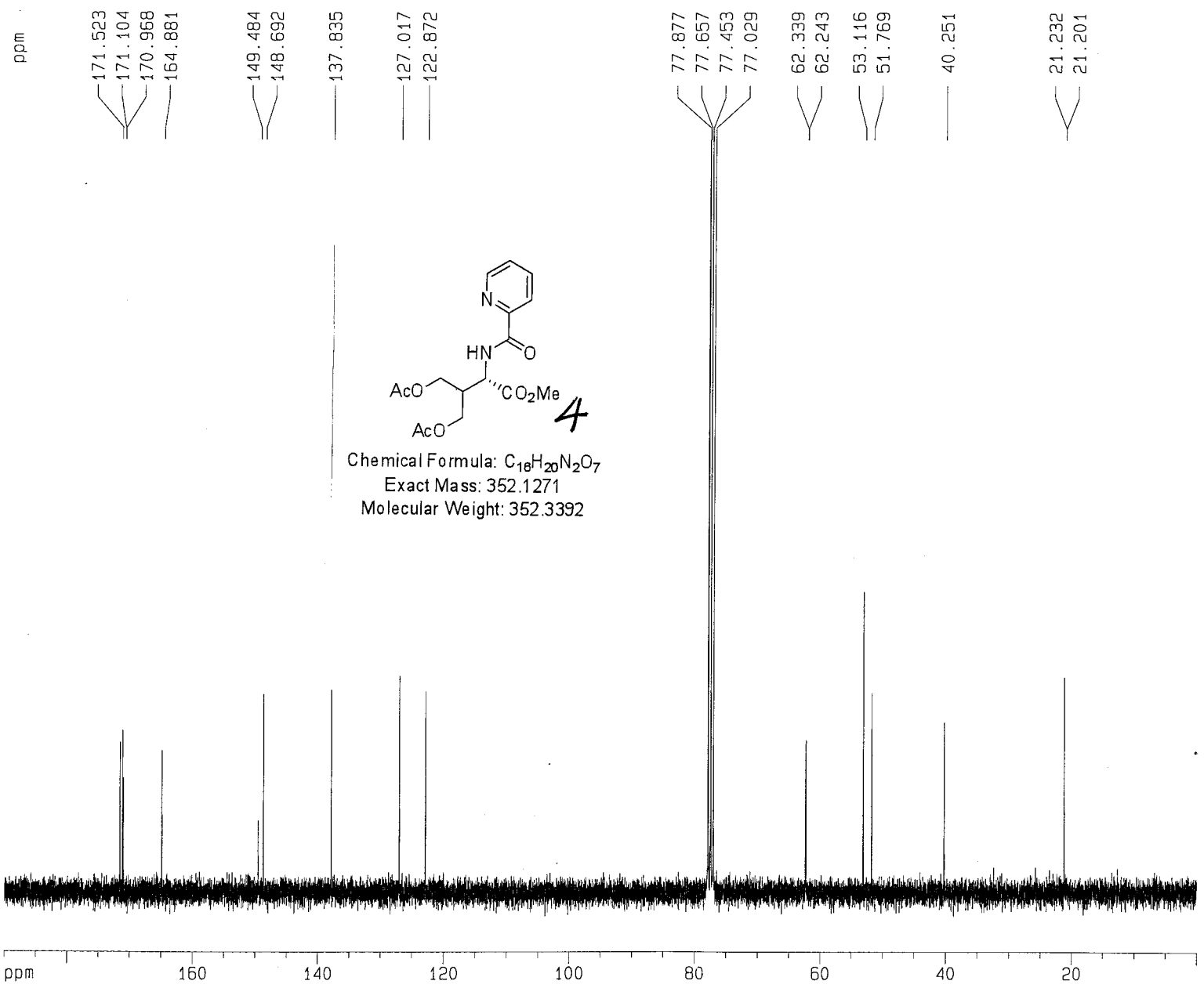
Current Data Parameters	
NAME	zys-3-IV
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters	
Date_	20111019
Time	10.10
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	574.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

========== CHANNEL f1 =========	
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters	
SI	32768
SF	300.1300064 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters	
CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	0.000 ppm
F2	0.00 Hz
PPMCM	0.47500 ppm/cm
HZCM	142.56175 Hz/cm

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Current Data Parameters
NAME          zys-3-IV-C
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_          20111020
Time              17.51
INSTRUM           spect
PROBHD    5 mm GNP 1H/1
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3072
DS                    4
SWH          18796.992 Hz
FIDRES         0.286819 Hz
AQ           1.7433076 sec
RG                456.1
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                5.25 usec
PL1              -6.00 dB
SFO1        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            19.70 dB
PL13            19.70 dB
SFO2       299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF          75.4023410 MHz
WDW                   no
SSB                    0
LB               0.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                20.00 cm
F1P              190.000 ppm
F1             14326.45 Hz
F2P              0.000 ppm
F2               0.00 Hz
PPMCM          9.50000 ppm/cm
HZCM         716.32227 Hz/cm
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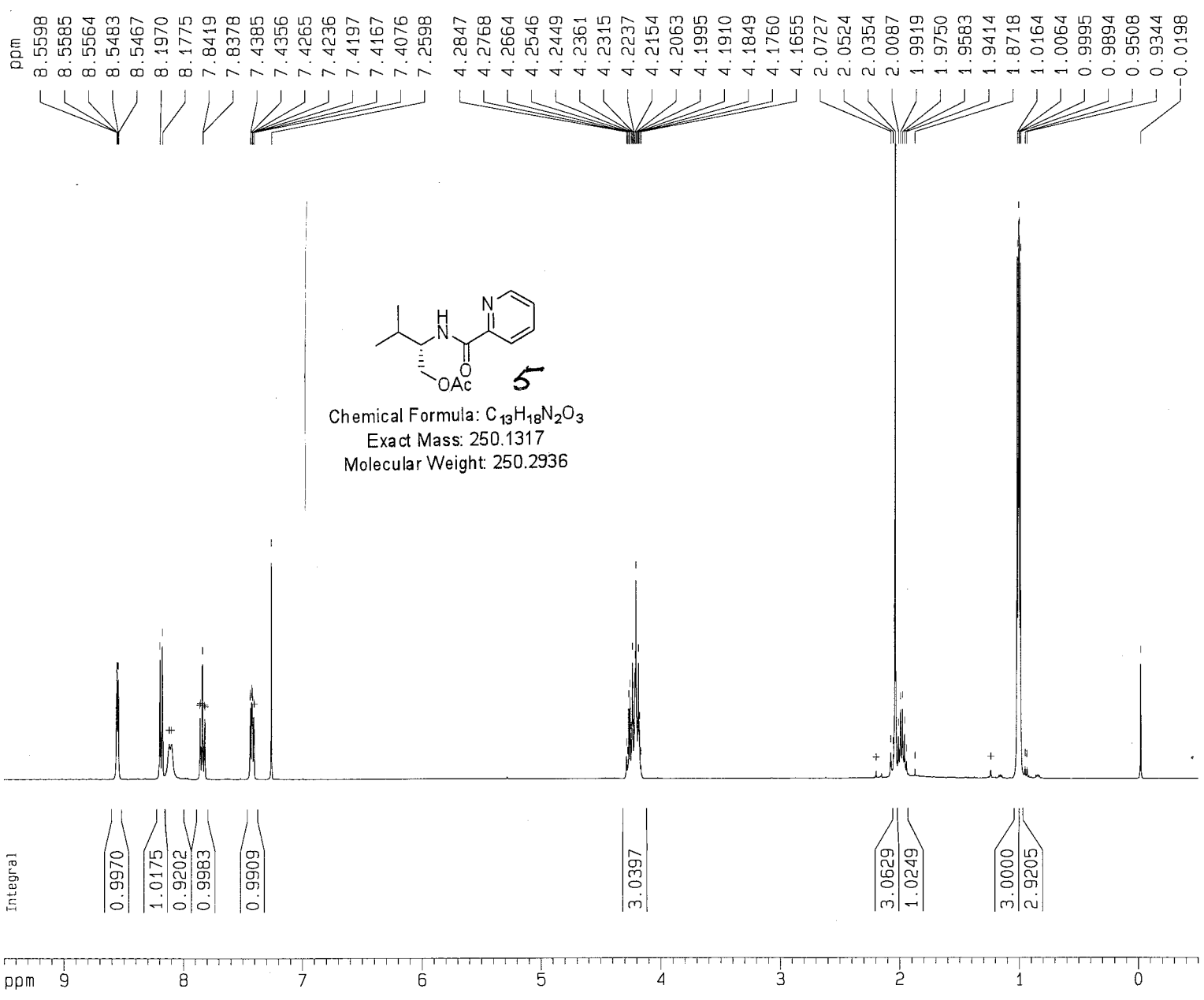


Current Data Parameters

NAME	0911hg3-100H
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110911
Time	14.27
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	64
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

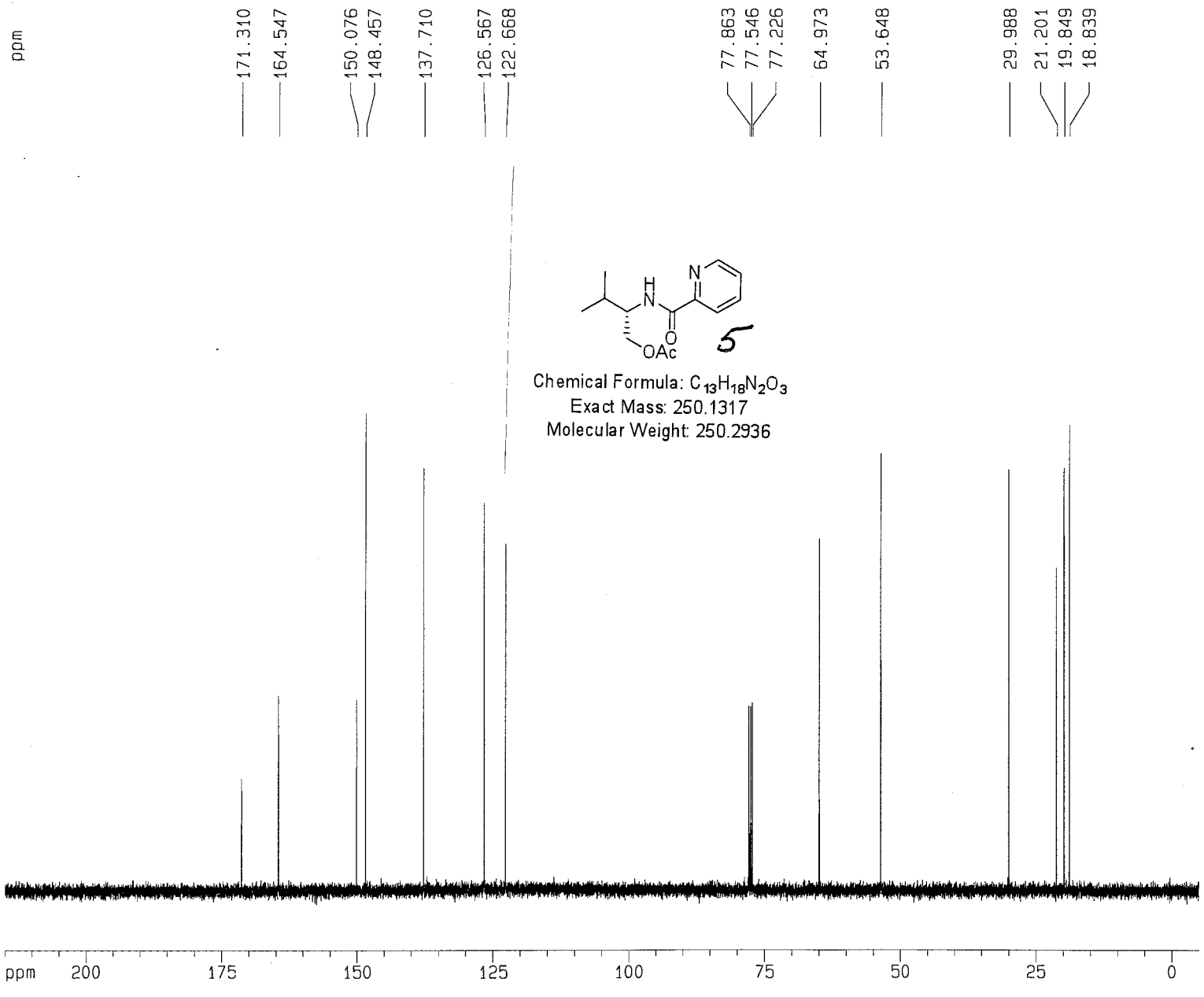
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300094 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	0930hg3-100C
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110930
Time	16.06
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	534
DS	4
SWH	25125.629 Hz
FIDRES	0.383387 Hz
AQ	1.3042164 sec
RG	14596.5
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 ==========

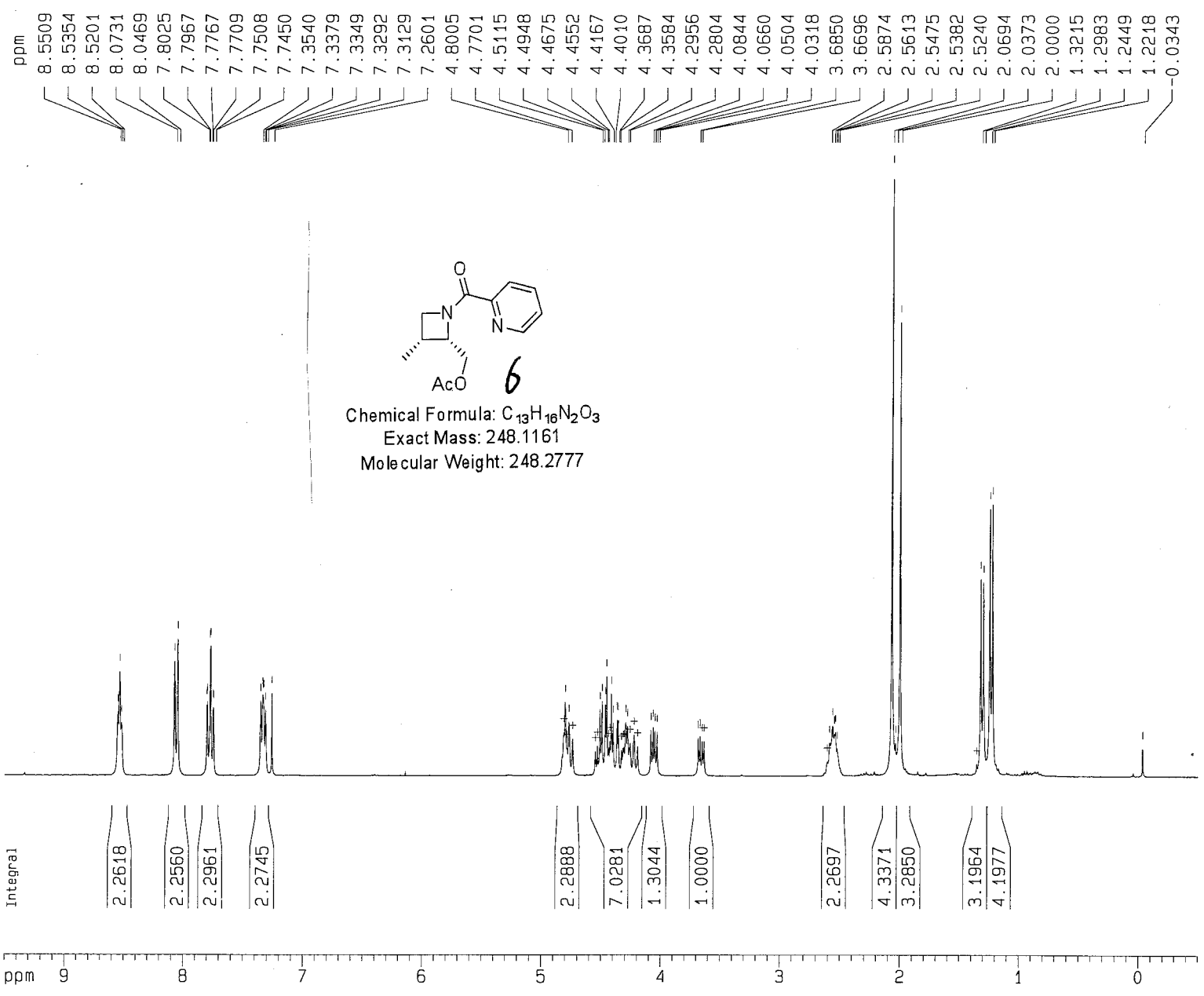
CPDPRG2	waltz16
NUC2	1H
PCPD2	114.00 usec
PL2	0.00 dB
PL12	24.00 dB
PL13	24.00 dB
SFO2	400.1316005 MHz

F2 - Processing parameters

SI	32768
SF	100.6127290 MHz
WDW	no
SSB	0
LB	0.00 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



Current Data Parameters

NAME	1026hg3-136-1
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20111026
Time	16.31
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	128
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

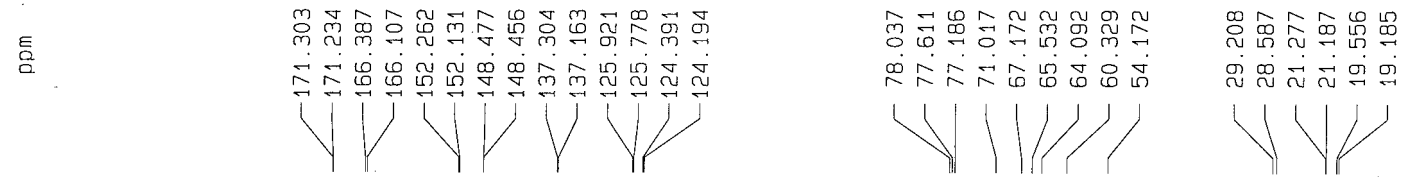
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

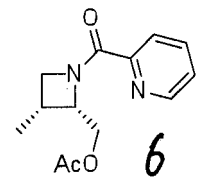
F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

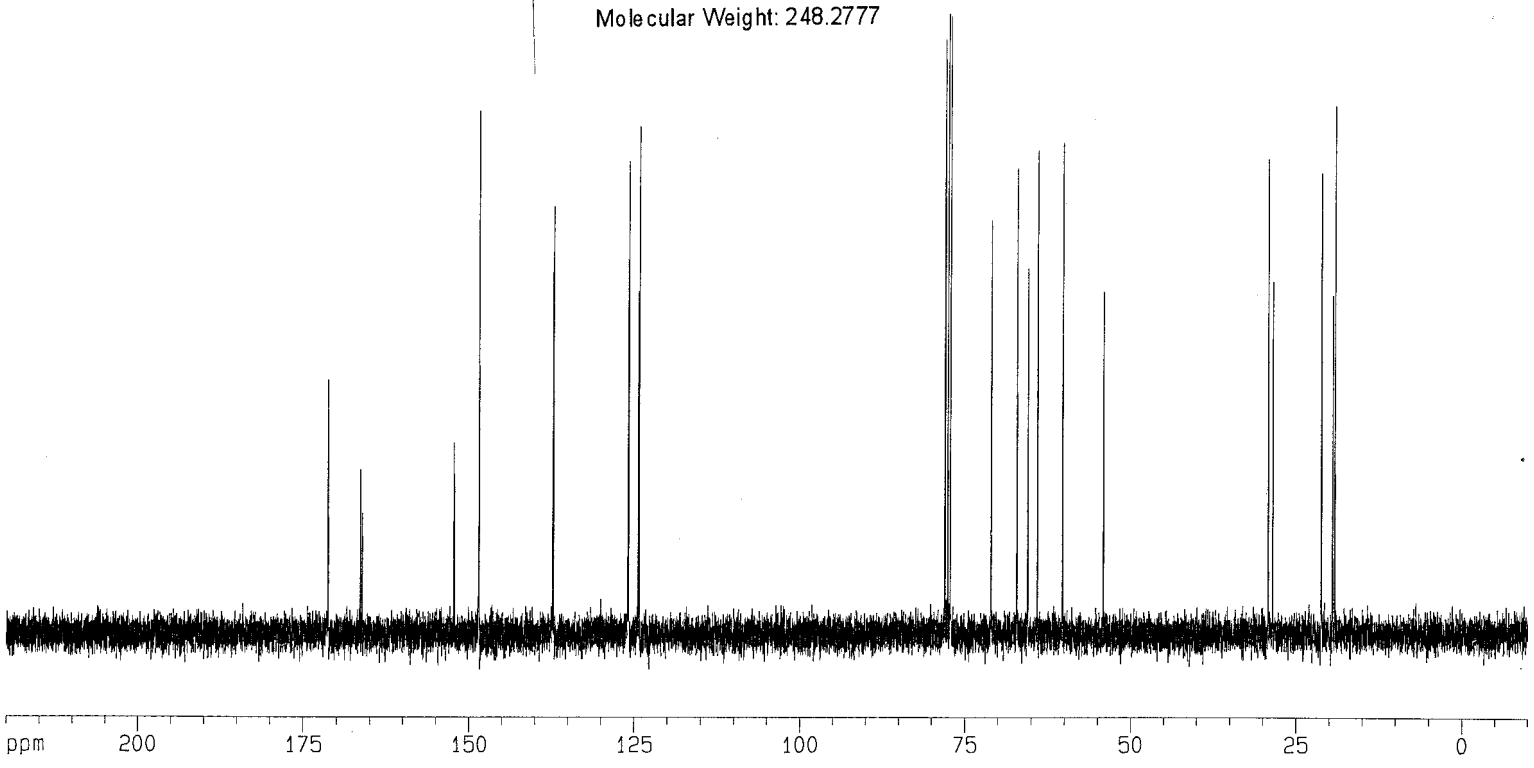
CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm





6

Chemical Formula: $C_{13}H_{16}N_2O_3$
Exact Mass: 248.1161
Molecular Weight: 248.2777



Current Data Parameters

NAME	1028hg3-136-1
EXPNO	350
PROCNO	1

F2 - Acquisition Parameters

Date_	20111028
Time	17.33
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

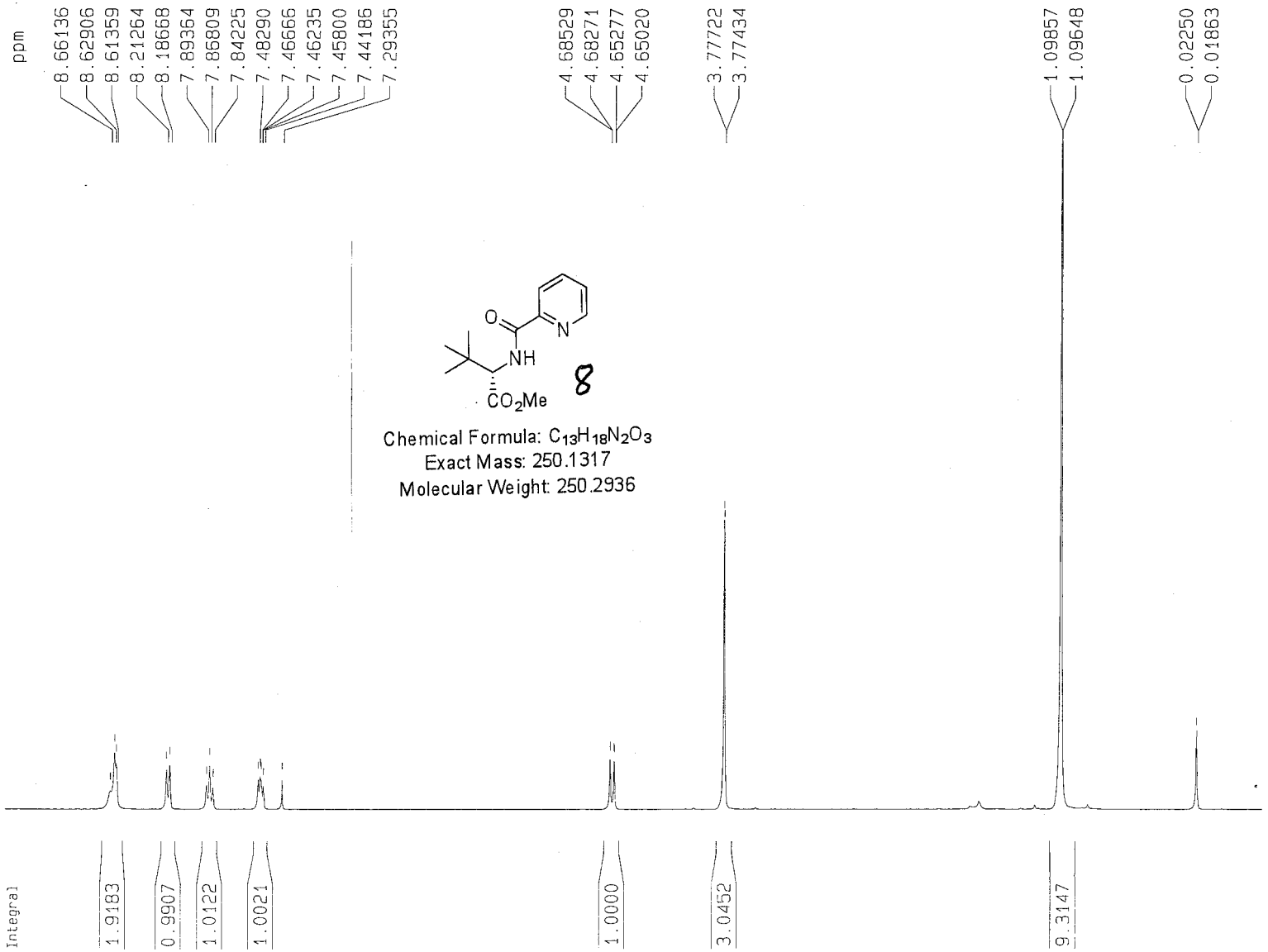
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

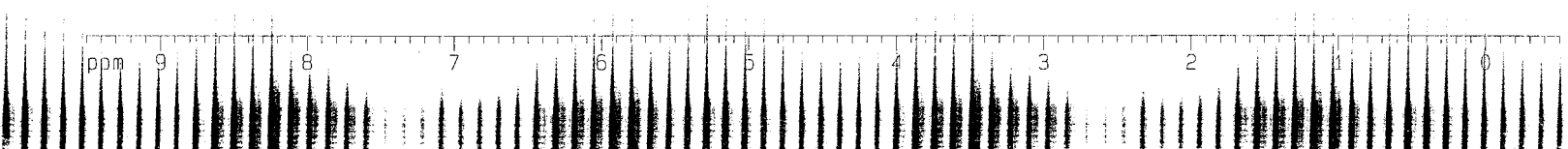
1D NMR plot parameters

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



8

Chemical Formula: $C_{13}H_{18}N_2O_3$
Exact Mass: 250.1317
Molecular Weight: 250.2936



Current Data Parameters

NAME	920hg1-257
EXPNO	3
PROCNO	1

F2 - Acquisition Parameters

Date_	20100920
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	322.5
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

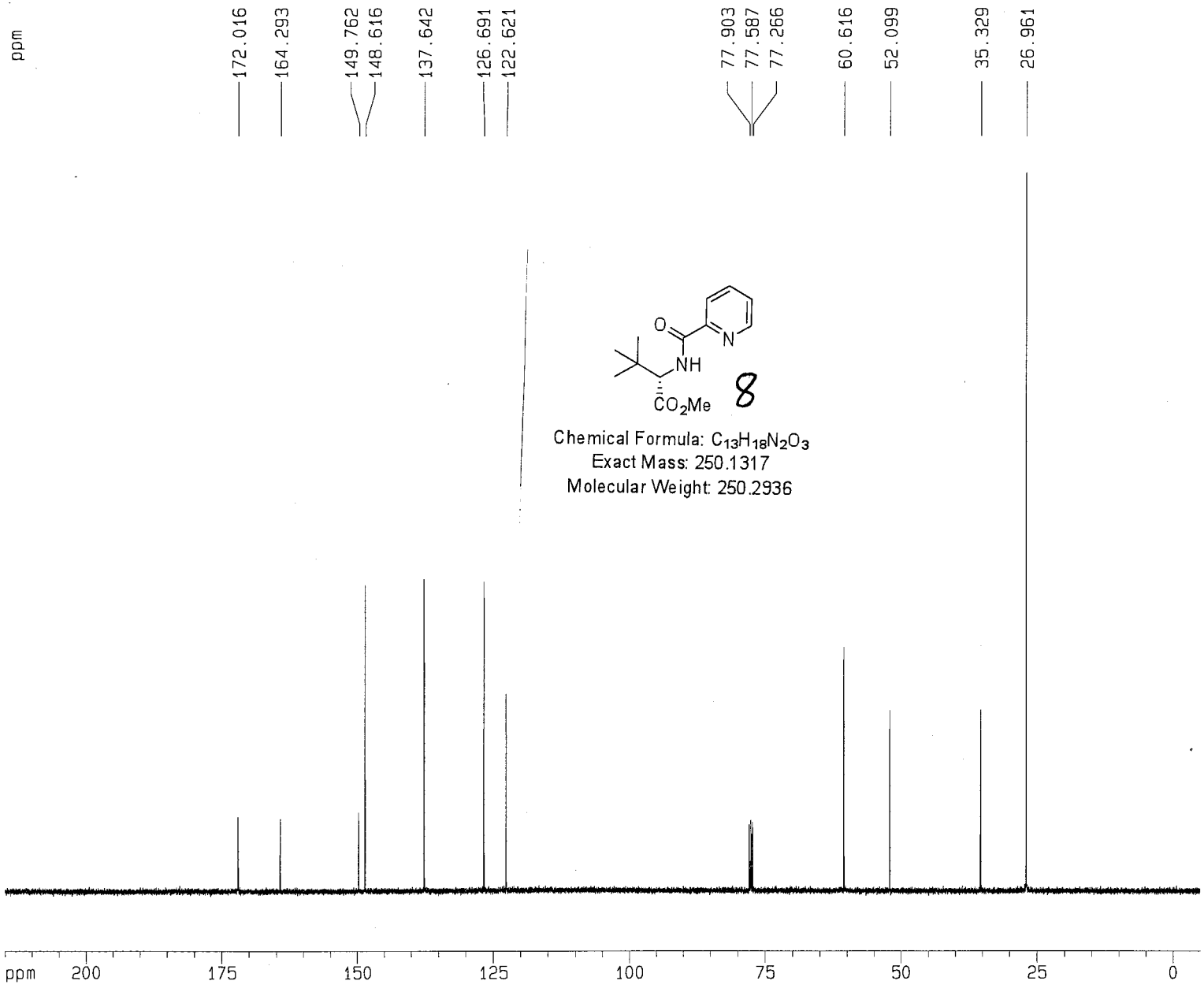
NUC1	1H
P1	11.70 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700000 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



8

Chemical Formula: $C_{13}H_{18}N_2O_3$
Exact Mass: 250.1317
Molecular Weight: 250.2936

```
Current Data Parameters
NAME        0930hg1-257C
EXPNO                  1
PROCNO                 1

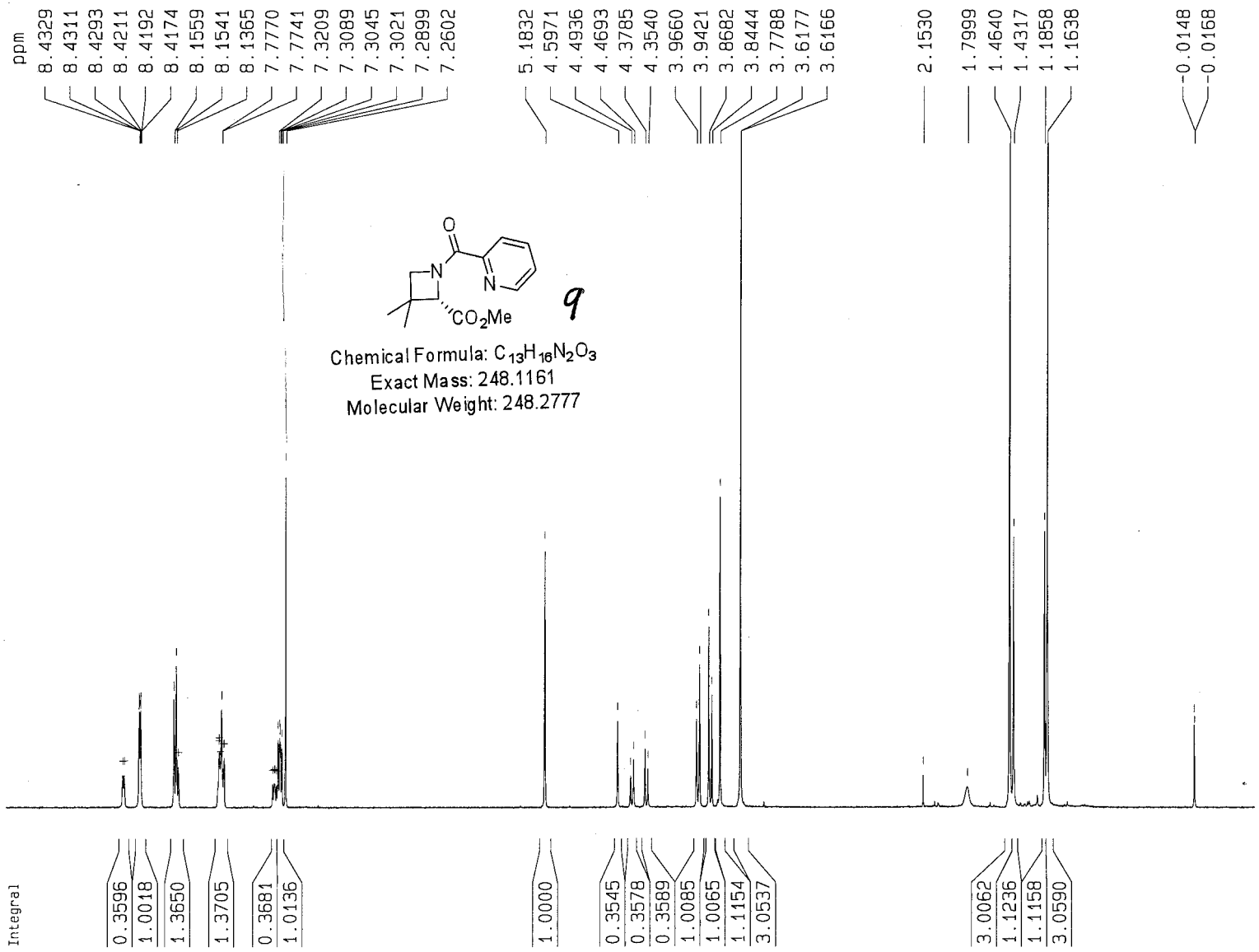
F2 - Acquisition Parameters
Date_           20110930
Time               17.17
INSTRUM            spect
PROBHD     5 mm BBI 1H-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  732
DS                    4
SWH           25125.629 Hz
FIDRES        0.383387 Hz
AQ            1.3042164 sec
RG               11585.2
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                   no
SSB                    0
LB                 0.00 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
```



9

Chemical Formula: $C_{13}H_{16}N_2O_3$
Exact Mass: 248.1161
Molecular Weight: 248.2777

Current Data Parameters

NAME	1004hg3-116-1H
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111004
Time	13.15
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	724.1
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

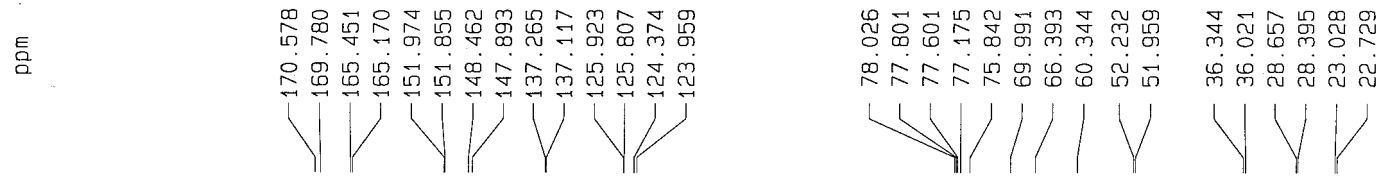
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

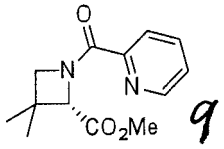
F2 - Processing parameters

SI	32768
SF	400.1300089 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

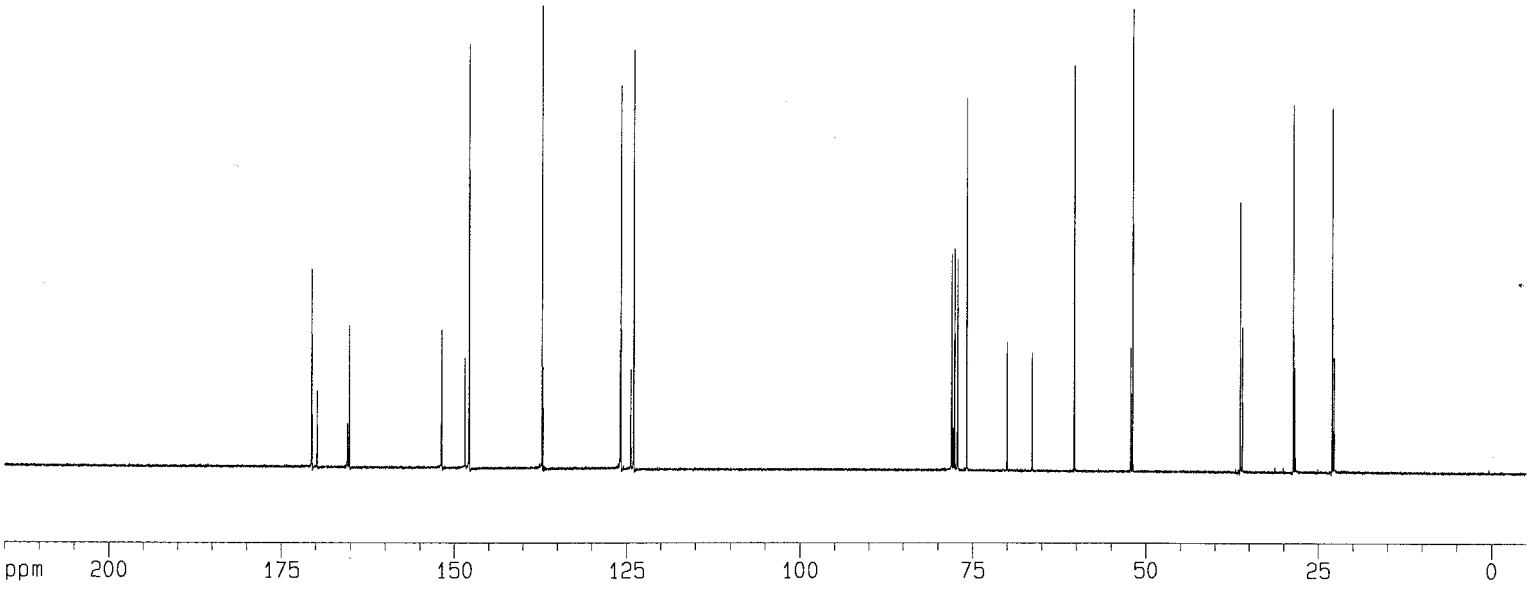
CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm





9

Chemical Formula: $C_{13}H_{16}N_2O_3$
Exact Mass: 248.1161
Molecular Weight: 248.2777



Current Data Parameters

NAME	1006hg3-116-1
EXPNO	3331
PROCNO	1

F2 - Acquisition Parameters

Date_	20111006
Time	19.38
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	11264
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

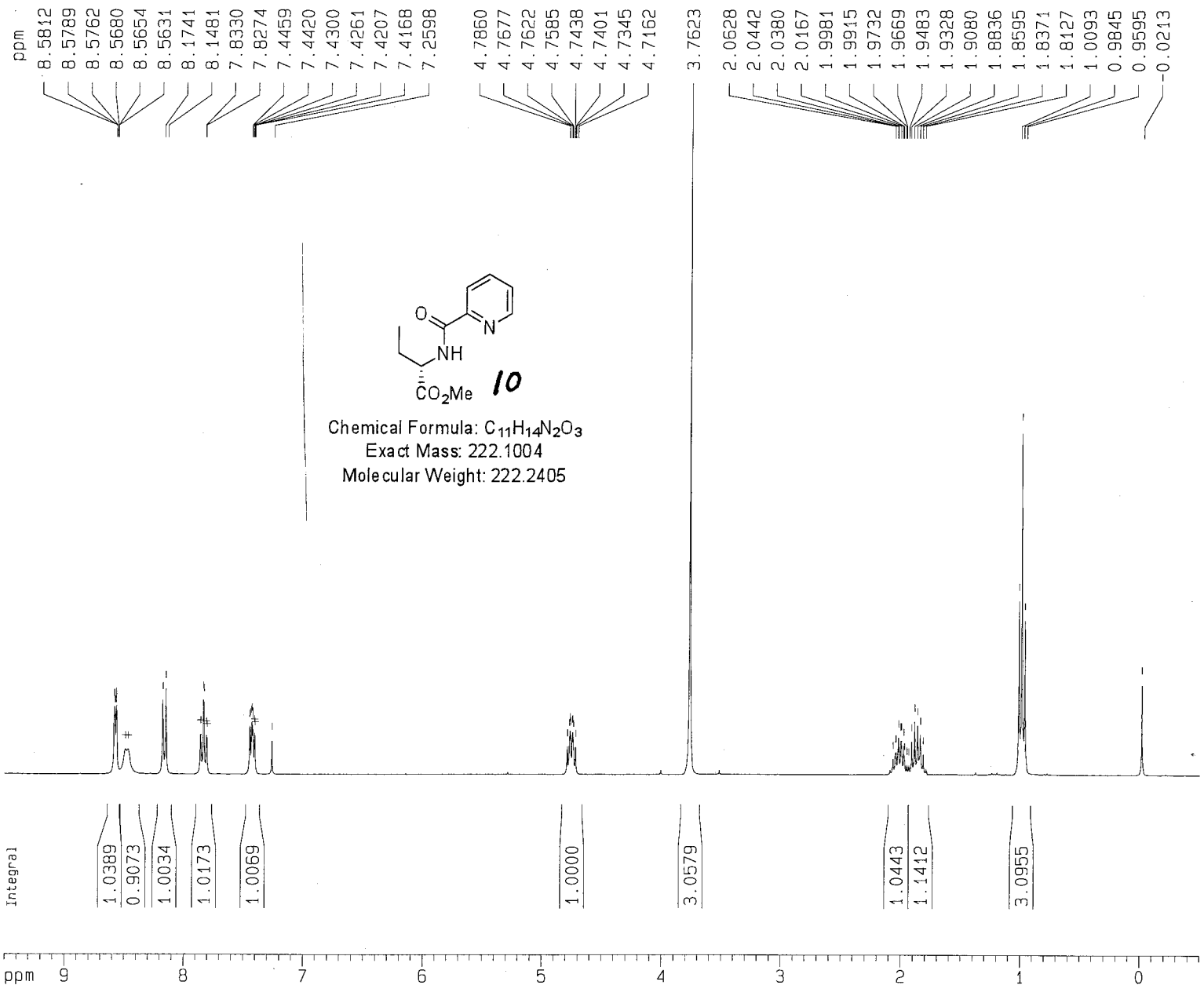
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



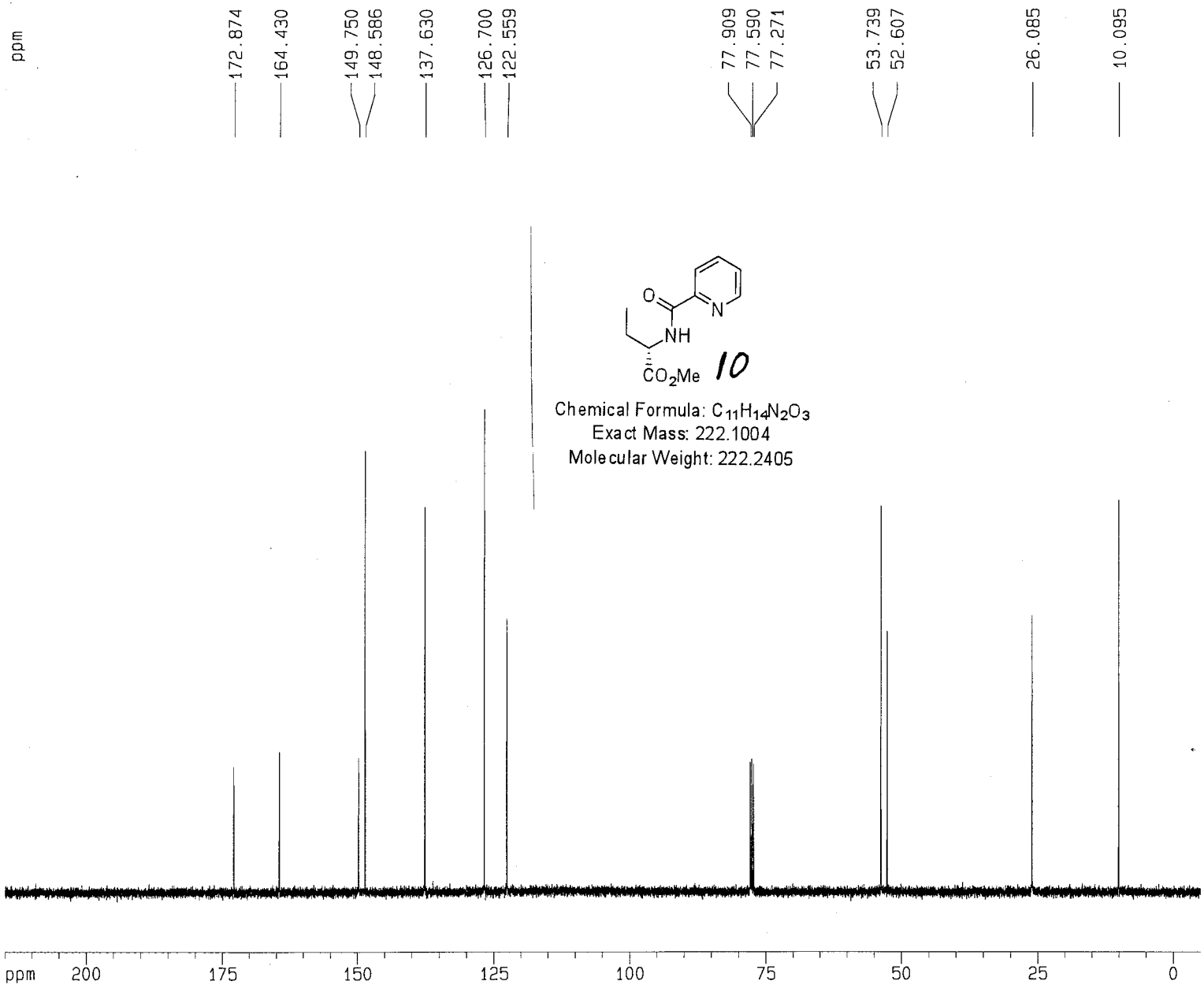

```
Current Data Parameters
NAME          0215hg2-109
EXPNO                  31
PROCNO                  1

F2 - Acquisition Parameters
Date_           20110215
Time               18.57
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                228.1
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           299.8700101 MHz
WDW                   no
SSB                    0
LB                  0.00 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 20.00 cm
F1P                9.500 ppm
F1              2848.76 Hz
F2P               -0.500 ppm
F2              -149.93 Hz
PPMCM          0.50000 ppm/cm
HZCM         149.93500 Hz/cm
```

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Current Data Parameters
NAME        0930hg2-109C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20110930
Time               17.31
INSTRUM            spect
PROBHD     5 mm BBI 1H-
PULPROG           zgpg30
TD                65536
SOLVENT           CDCl3
NS                  712
DS                    4
SWH           25125.629 Hz
FIDRES        0.383387 Hz
AQ            1.3042164 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                   no
SSB                    0
LB                 0.00 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
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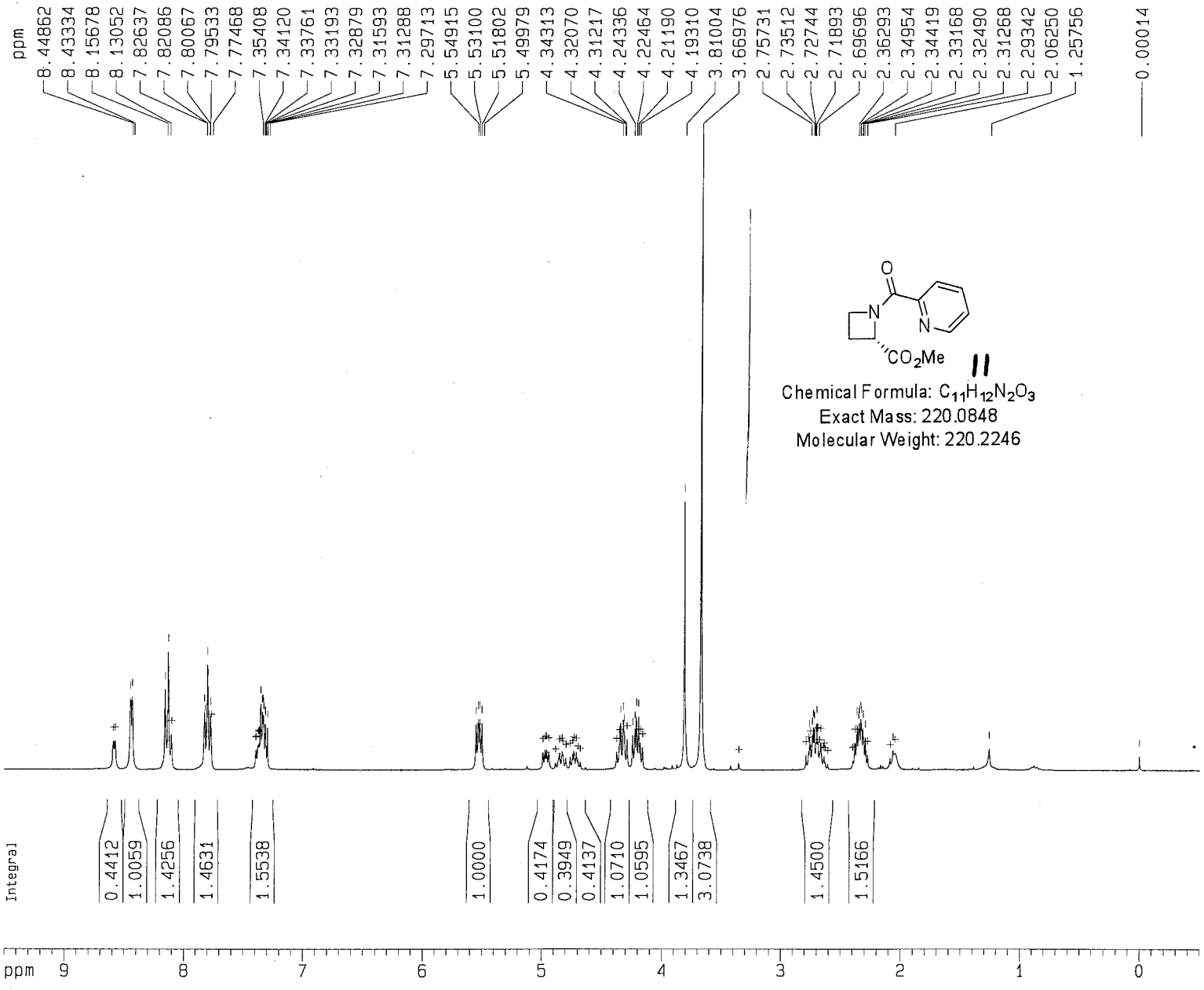


Current Data Parameters

NAME	1026hg3-134-2
EXPNO	3372
PROCNO	1

F2 - Acquisition Parameters

Date_	20111026
Time	12.07
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	181
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

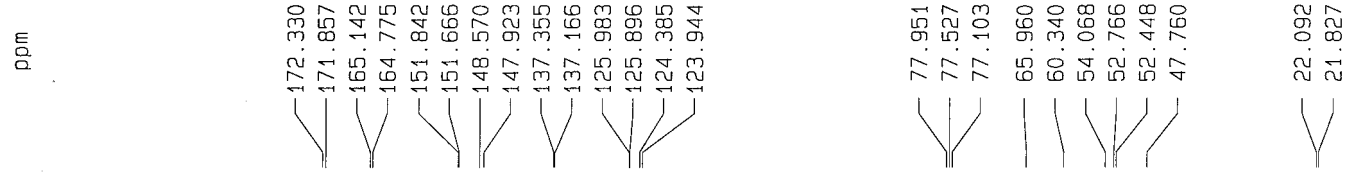
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

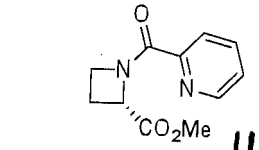
F2 - Processing parameters

SI	32768
SF	299.8699989 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

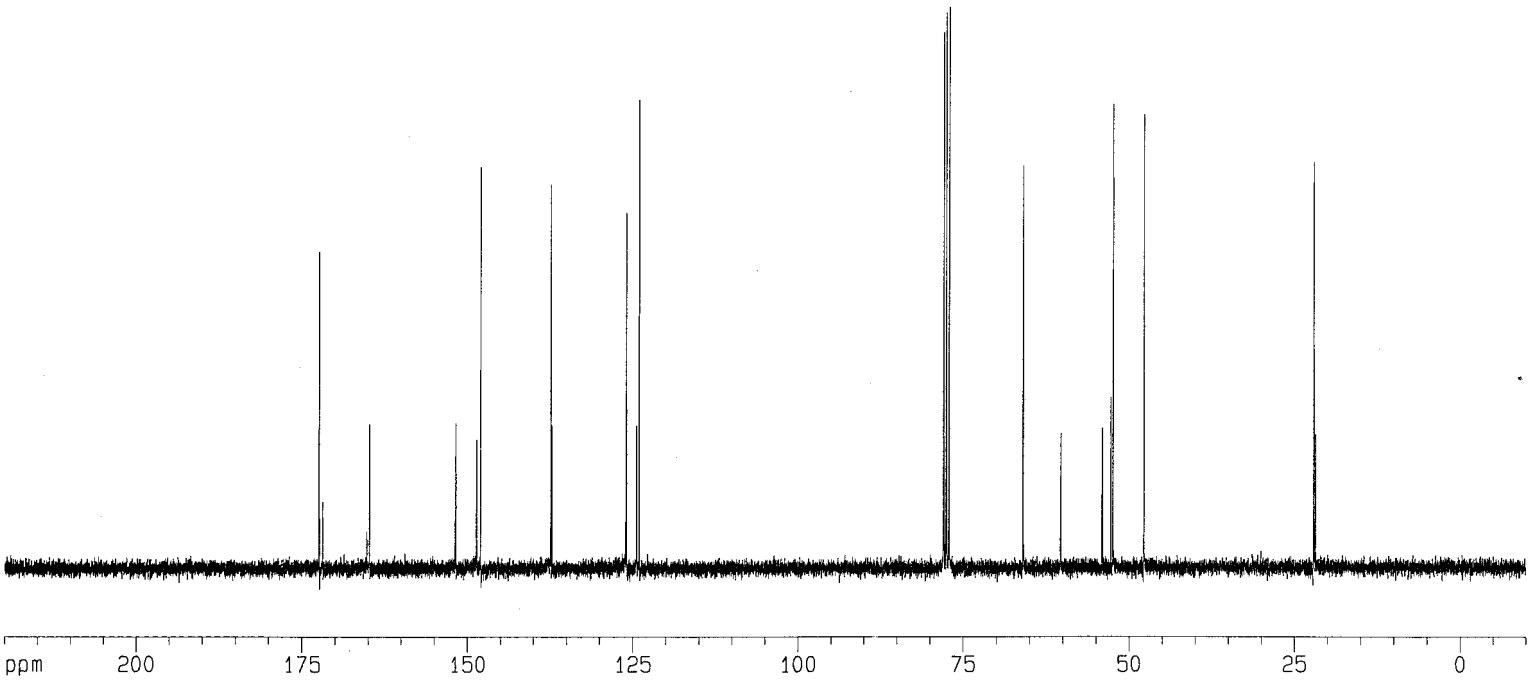
1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm





Chemical Formula: $C_{11}H_{12}N_2O_3$
Exact Mass: 220.0848
Molecular Weight: 220.2246




```
Current Data Parameters
NAME        1030hg3-134-2
EXPNO                 106
PROCNO                  1

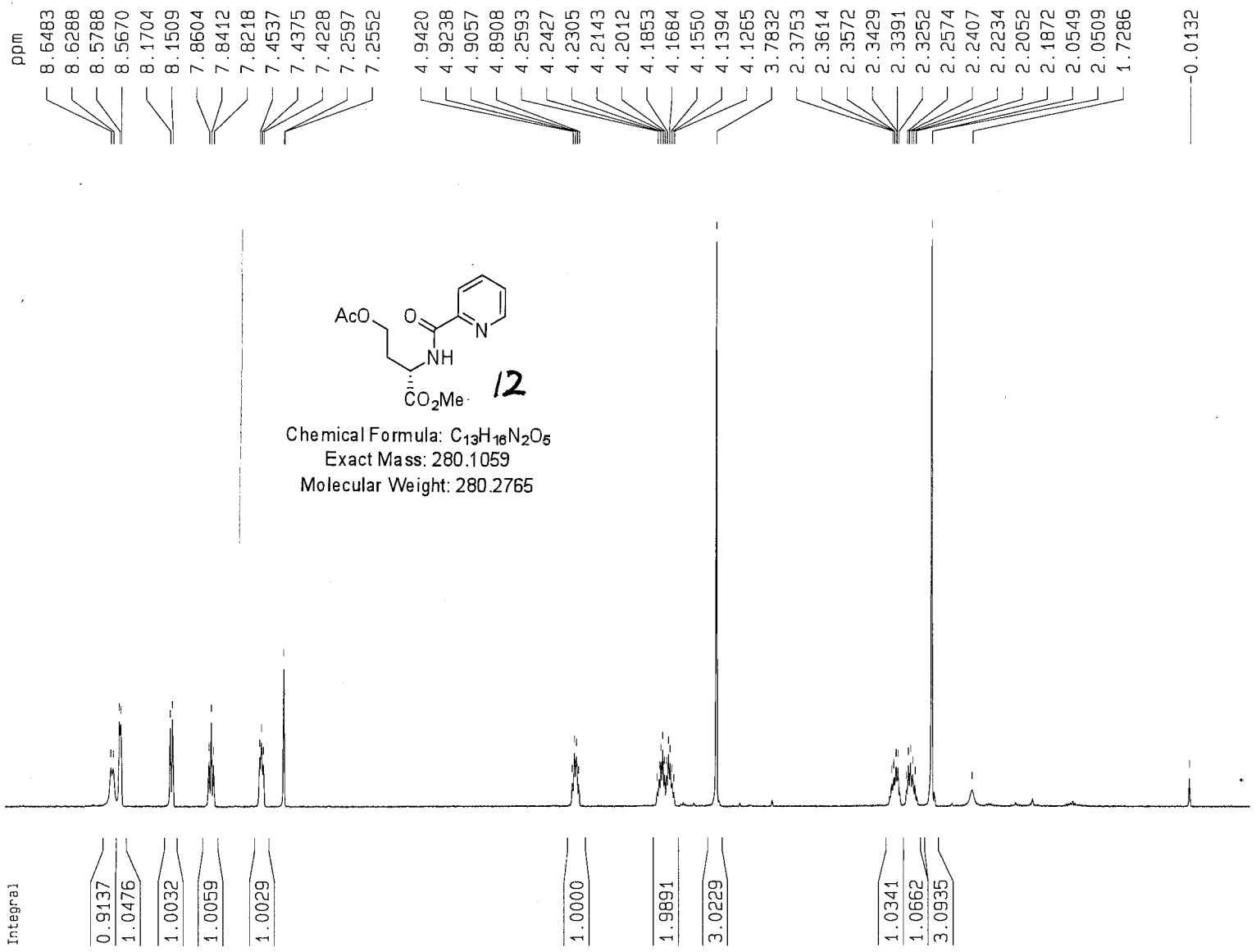
F2 - Acquisition Parameters
Date_           20111030
Time               20.02
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 1900
DS                    4
SWH           18796.992 Hz
FIDRES        0.286819 Hz
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                 5.25 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2             115.00 usec
PL2                0.00 dB
PL12              19.70 dB
PL13              19.70 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023410 MHz
WDW                   no
SSB                    0
LB                 0.00 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
```



Current Data Parameters

NAME	1025hg3-134-1
EXPNO	3492
PROCNO	1

F2 - Acquisition Parameters

Date_	20111025
Time	16.34
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	812.7
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

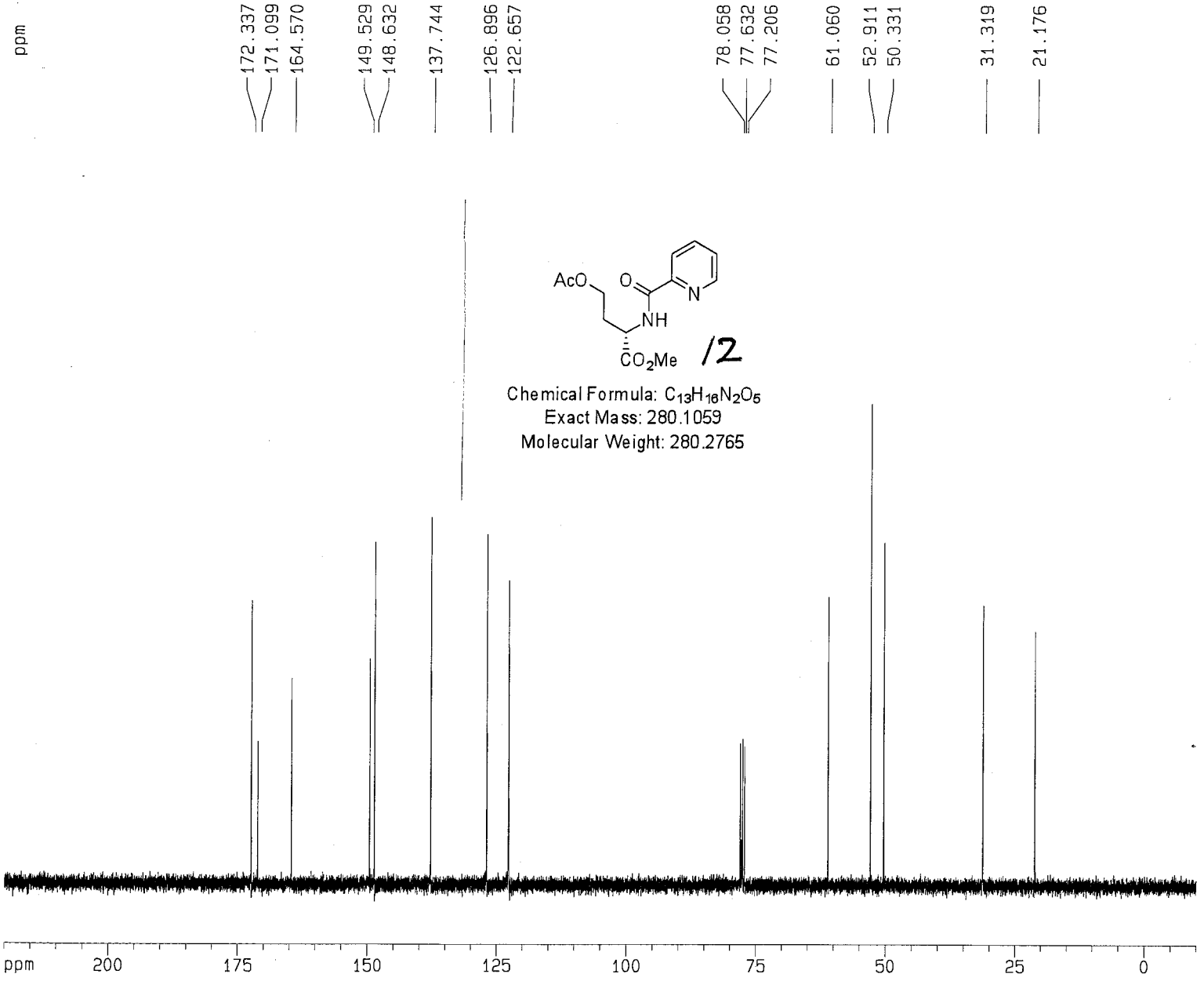
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300094 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters
NAME 1026hg3-134-1
EXPNO 1
PROCNO 1

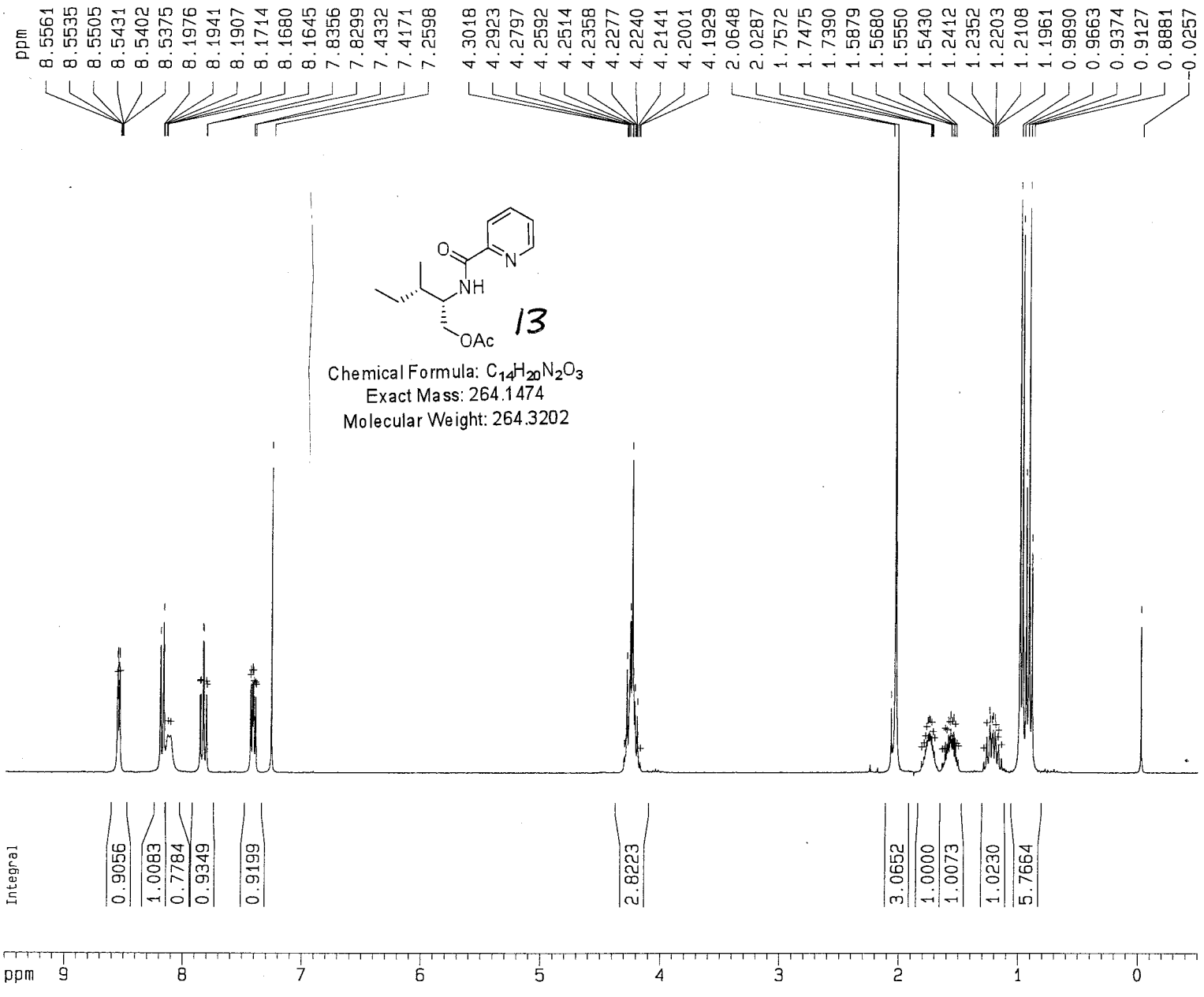
F2 - Acquisition Parameters
Date_ 20111026
Time 18.59
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 100
DS 4
SWH 18796.992 Hz
FIDRES 0.286819 Hz
AQ 1.7433076 sec
RG 1024
DW 26.600 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

========== CHANNEL f1 ==========
NUC1 13C
P1 5.25 usec
PL1 -6.00 dB
SF01 75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 115.00 usec
PL2 0.00 dB
PL12 19.70 dB
PL13 19.70 dB
SF02 299.8711995 MHz

F2 - Processing parameters
SI 32768
SF 75.4023410 MHz
WDW no
SSB 0
LB 0.00 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



Current Data Parameters

NAME	0727hg3-58
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110727
Time	14.29
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	228.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

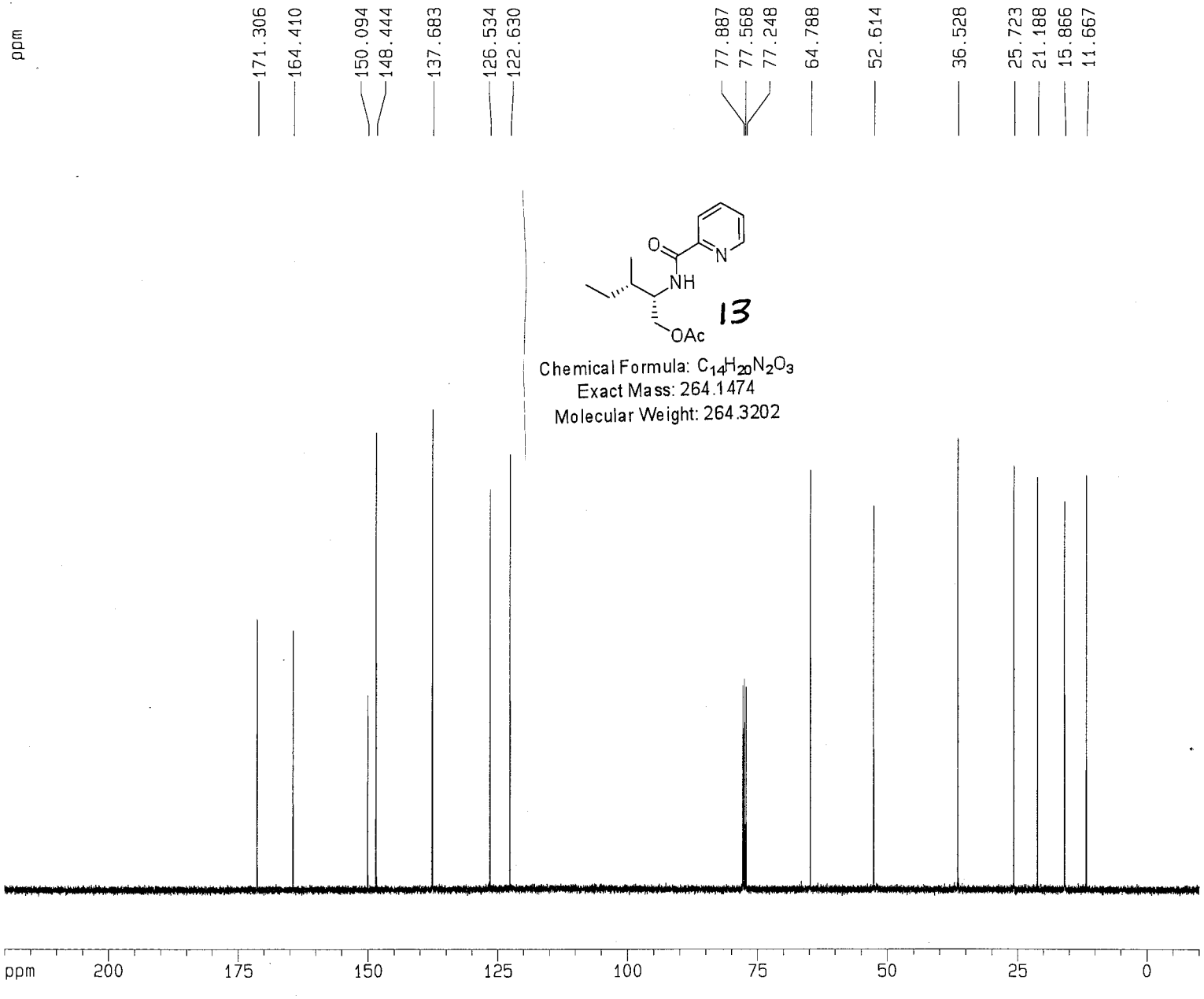
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

SI	32768
SF	300.1300064 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	-0.500 ppm
F2	-150.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	150.06500 Hz/cm




```
Current Data Parameters
NAME                  0929hg3-58
EXPNO                          6
PROCNO                         1

F2 - Acquisition Parameters
Date_                  20110929
Time                      17.37
INSTRUM                   spect
PROBHD      5 mm BBI 1H-
PULPROG                 zgpg30
TD                         65536
SOLVENT                  CDCl3
NS                           945
DS                             4
SWH                  25125.629 Hz
FIDRES               0.383387 Hz
AQ                   1.3042164 sec
RG                          8192
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                           no
SSB                            0
LB                         0.00 Hz
GB                             0
PC                          1.40

1D NMR plot parameters
CX                        20.00 cm
F1P                      220.000 ppm
F1                     22134.80 Hz
F2P                      -10.000 ppm
F2                     -1006.13 Hz
PPMCM                  11.50000 ppm/cm
HZCM                1157.04639 Hz/cm
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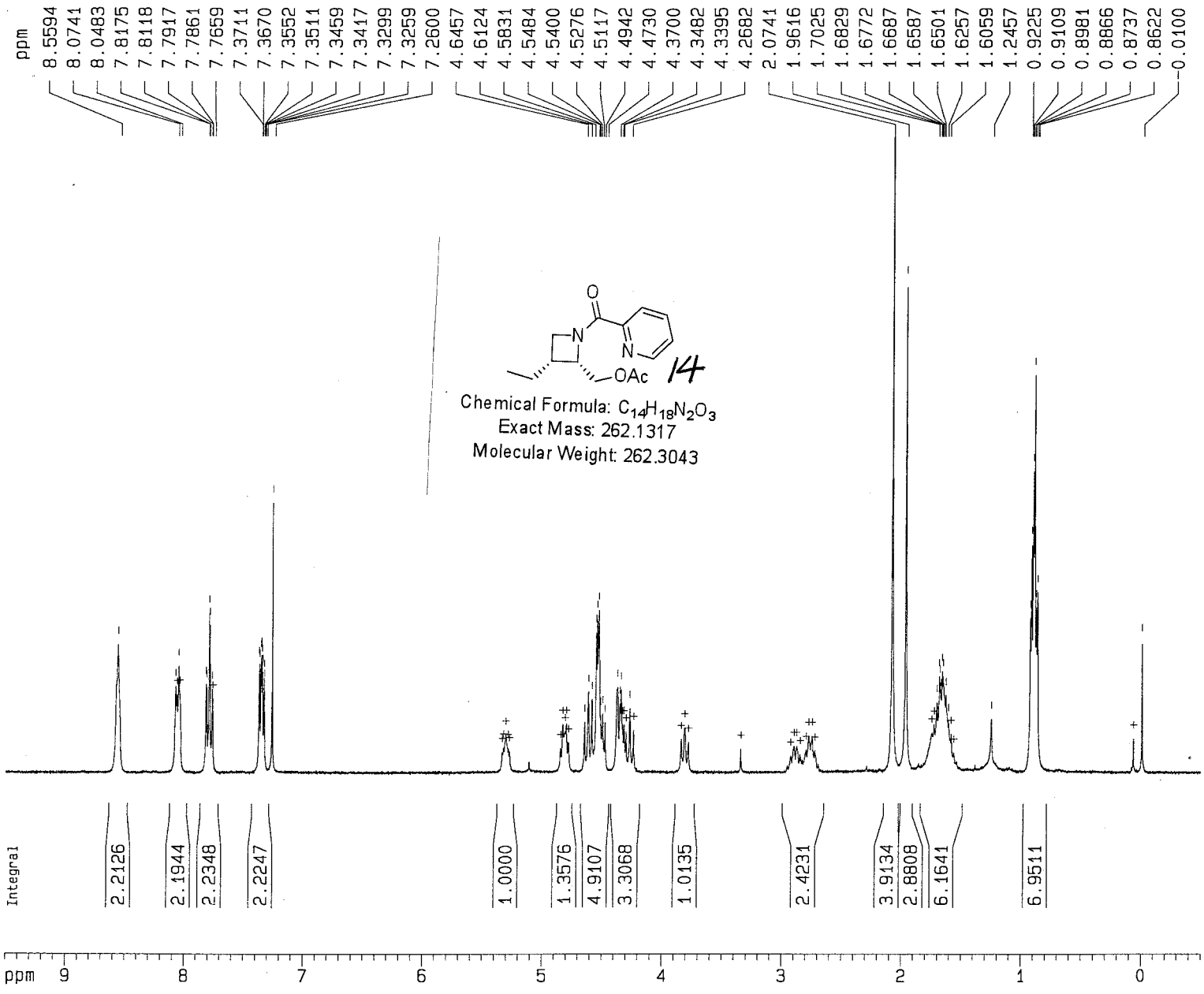


Current Data Parameters

NAME	1021hg3-129-2
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111021
Time	17.36
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	32
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 ========

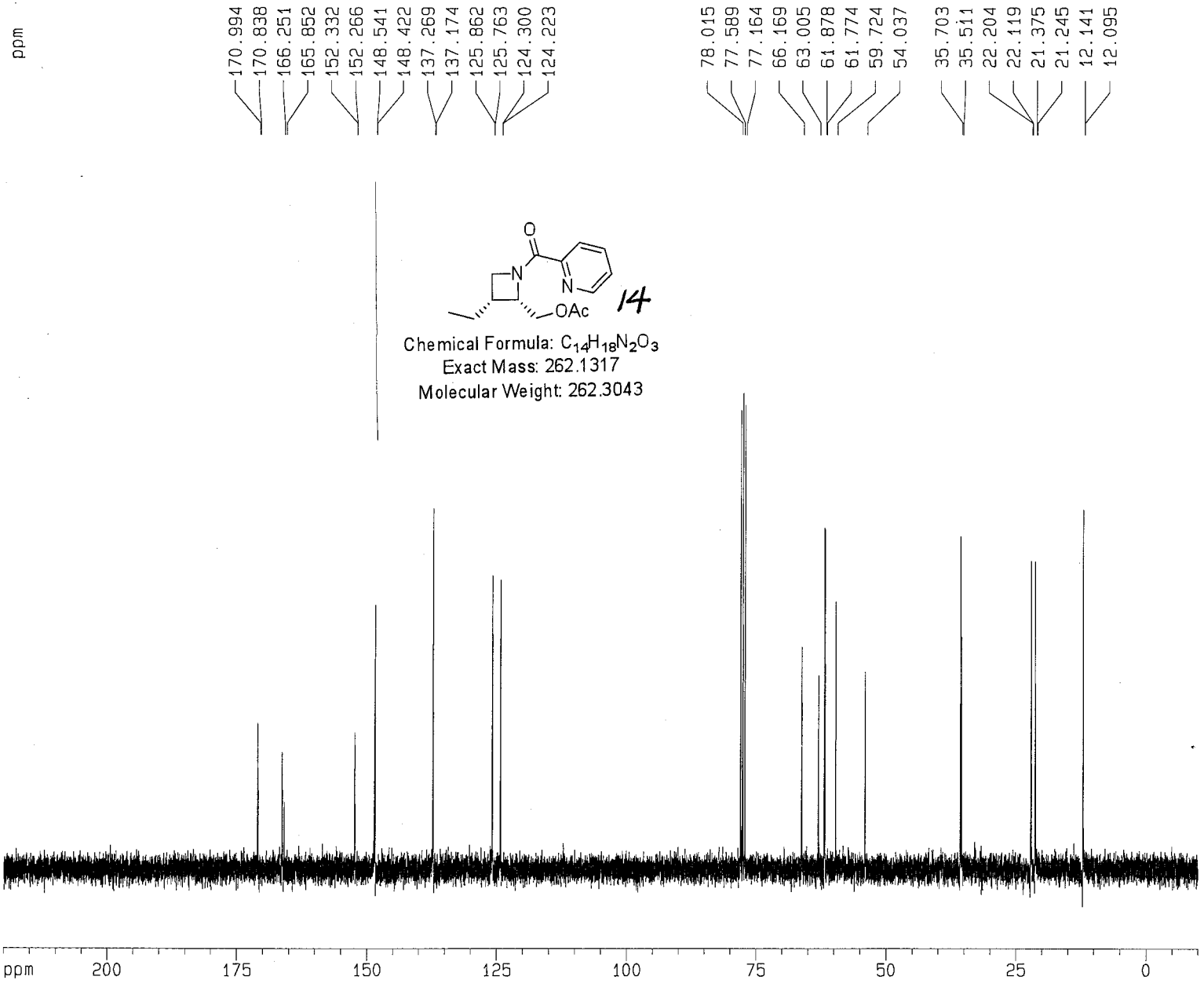
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

SI	32768
SF	300.1300062 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	-0.500 ppm
F2	-150.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	150.06500 Hz/cm



Current Data Parameters

NAME	1024hg3-129-2
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111024
Time	11.30
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	362
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

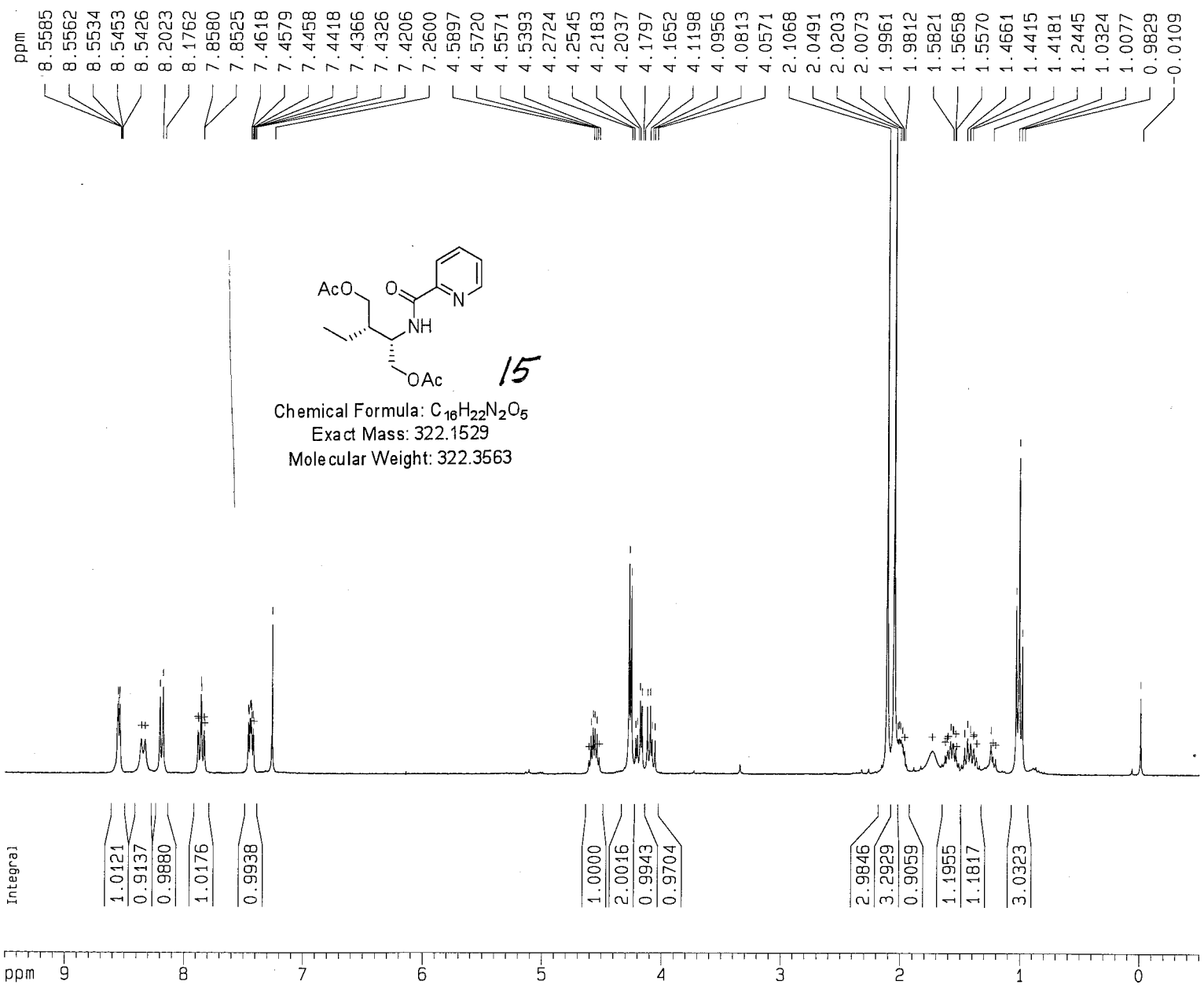
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



Current Data Parameters

NAME	1019hg3-129-1
EXPNO	4
PROCNO	1

F2 - Acquisition Parameters

Date_	20111019
Time	17.23
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	32
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 ========

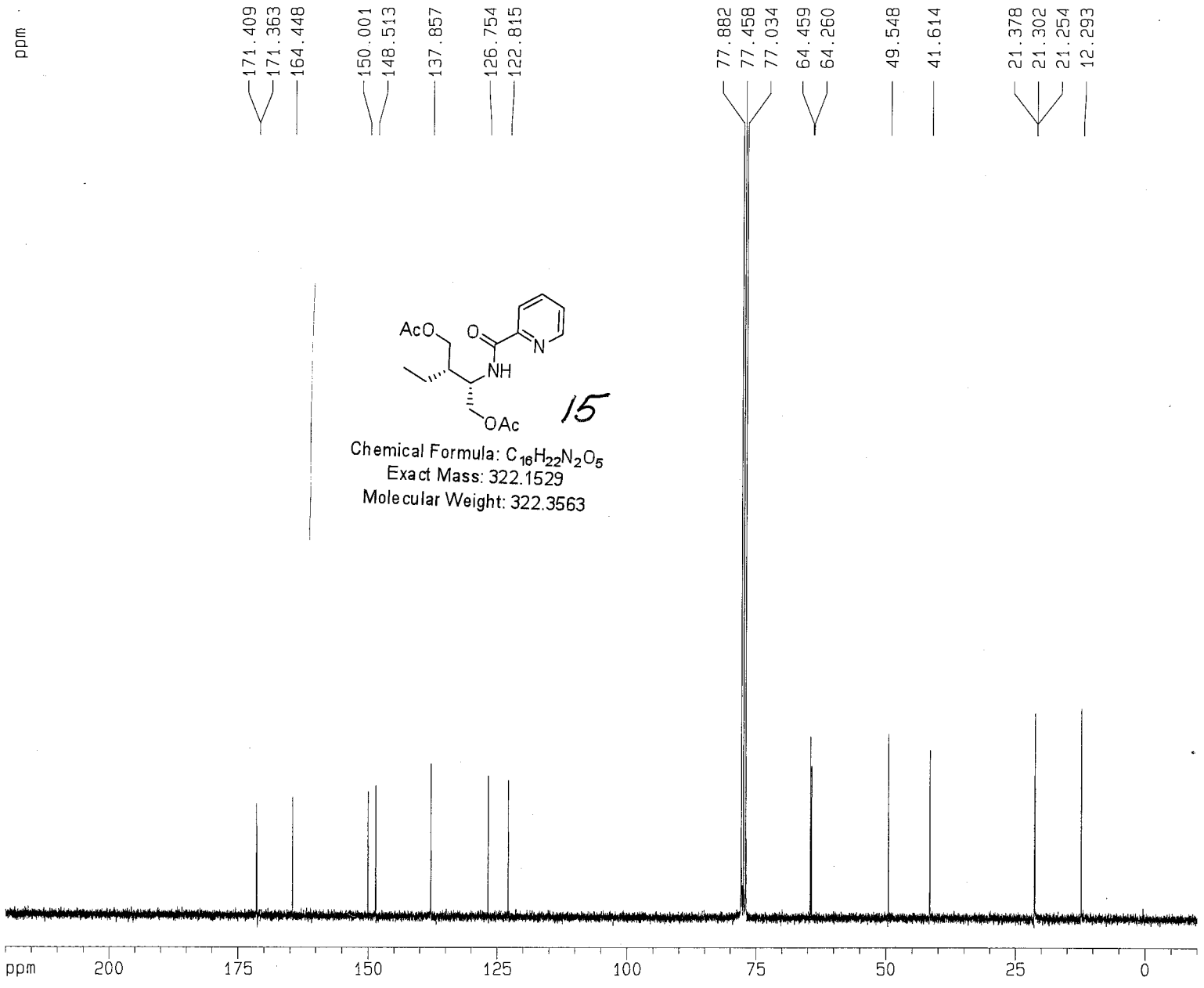
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700099 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



Current Data Parameters

NAME	1030hg3-129-1
EXPNO	106
PROCNO	1

F2 - Acquisition Parameters

Date_	20111030
Time	20.10
INSTRUM	spect
PROBHD	5 mm GNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	10240
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

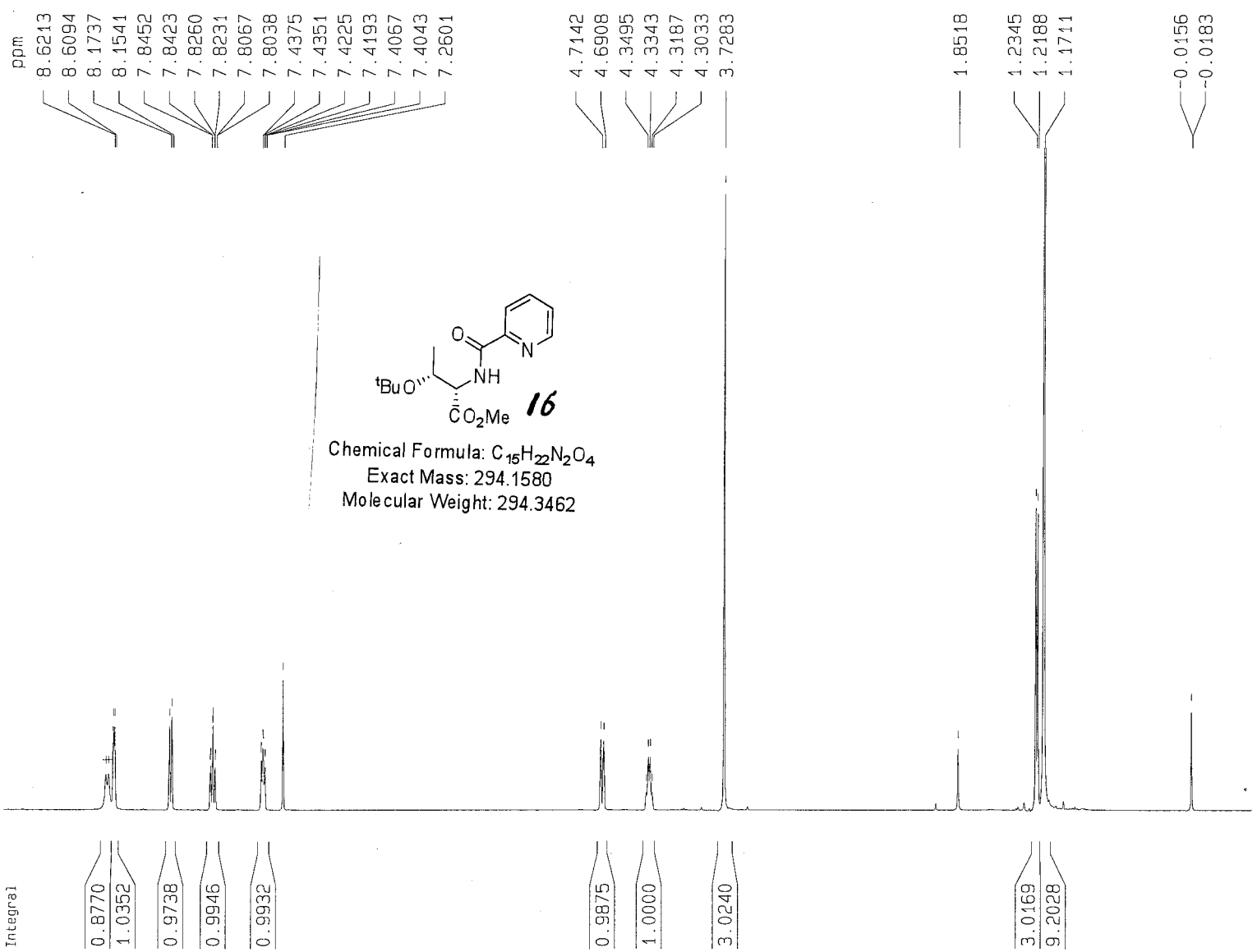
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



16

Chemical Formula: $C_{15}H_{22}N_2O_4$
Exact Mass: 294.1580
Molecular Weight: 294.3462

Current Data Parameters

NAME	0822hg3-87
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20110822
Time	14.15
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	50.8
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

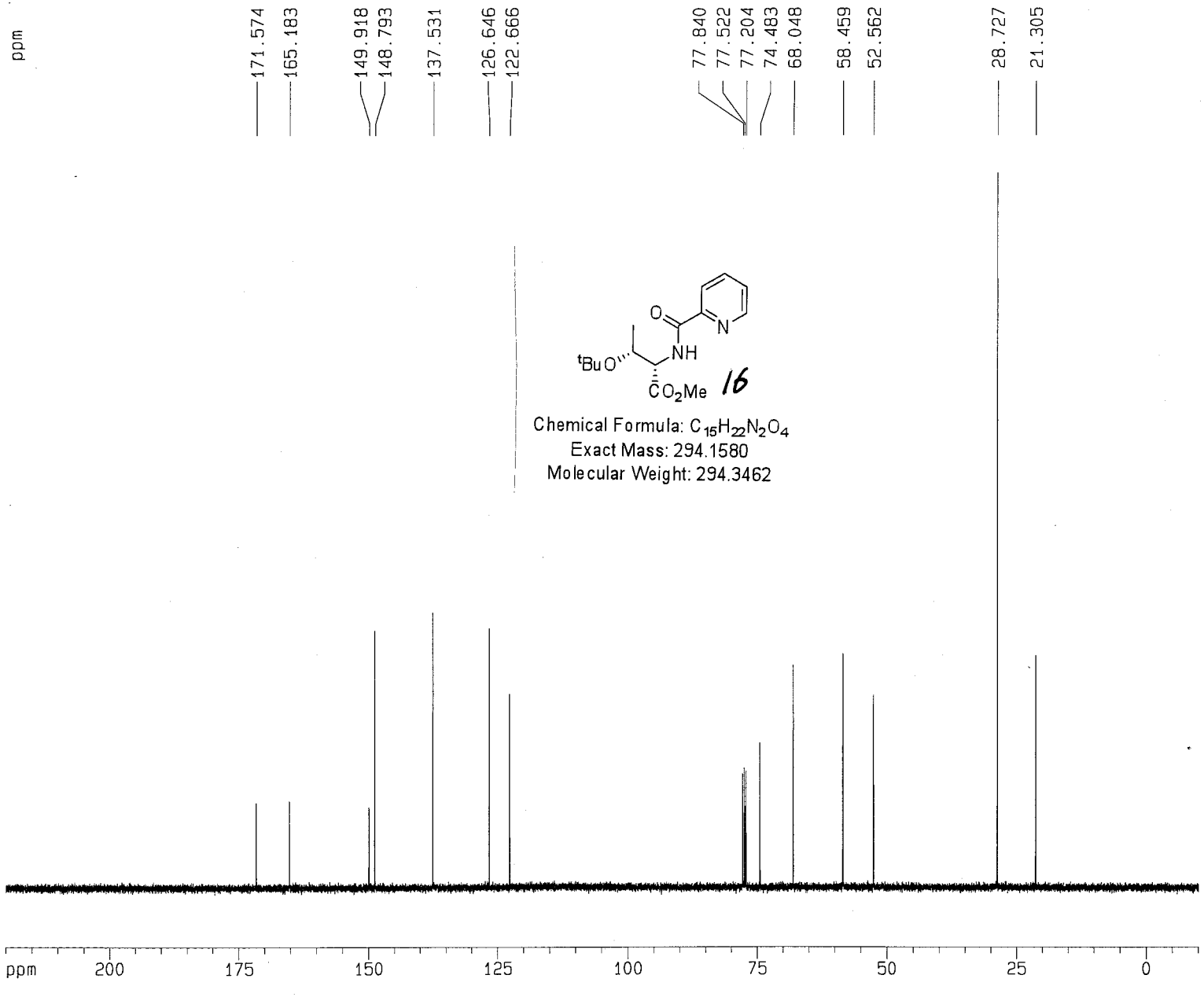
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300091 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	0928hg3-87
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20110928
Time	17.33
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	763
DS	4
SWH	25125.629 Hz
FIDRES	0.383387 Hz
AQ	1.3042164 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 ==========

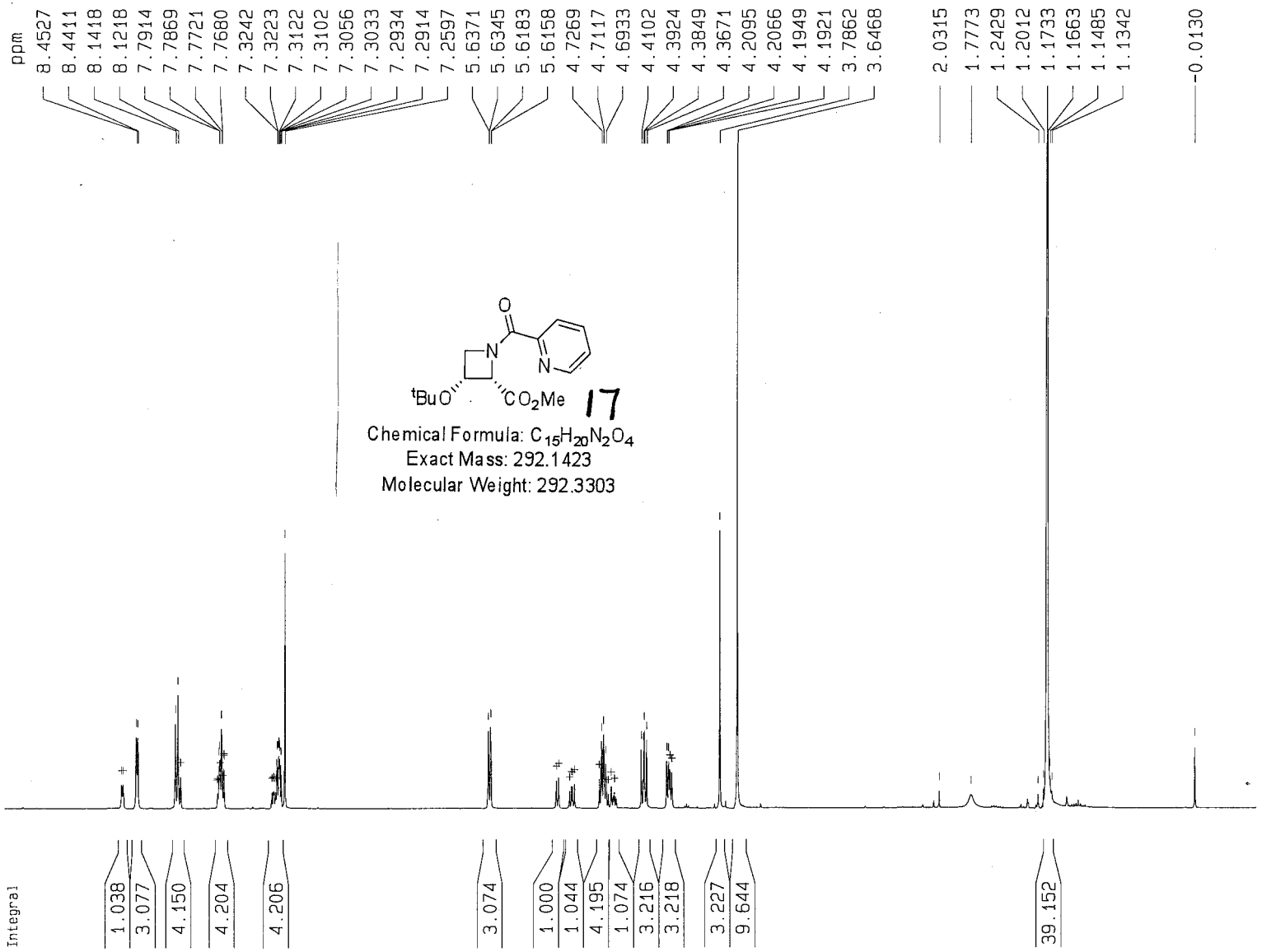
CPDPRG2	waltz16
NUC2	1H
PCPD2	114.00 usec
PL2	0.00 dB
PL12	24.00 dB
PL13	24.00 dB
SFO2	400.1316005 MHz

F2 - Processing parameters

SI	32768
SF	100.6127290 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	220.000 ppm
F1	22134.80 Hz
F2P	-10.000 ppm
F2	-1006.13 Hz
PPMCM	11.50000 ppm/cm
HZCM	1157.04639 Hz/cm



Current Data Parameters

NAME	1021hg3-135
EXPNO	3
PROCNO	1

F2 - Acquisition Parameters

Date_	20111021
Time	13.23
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	90.5
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

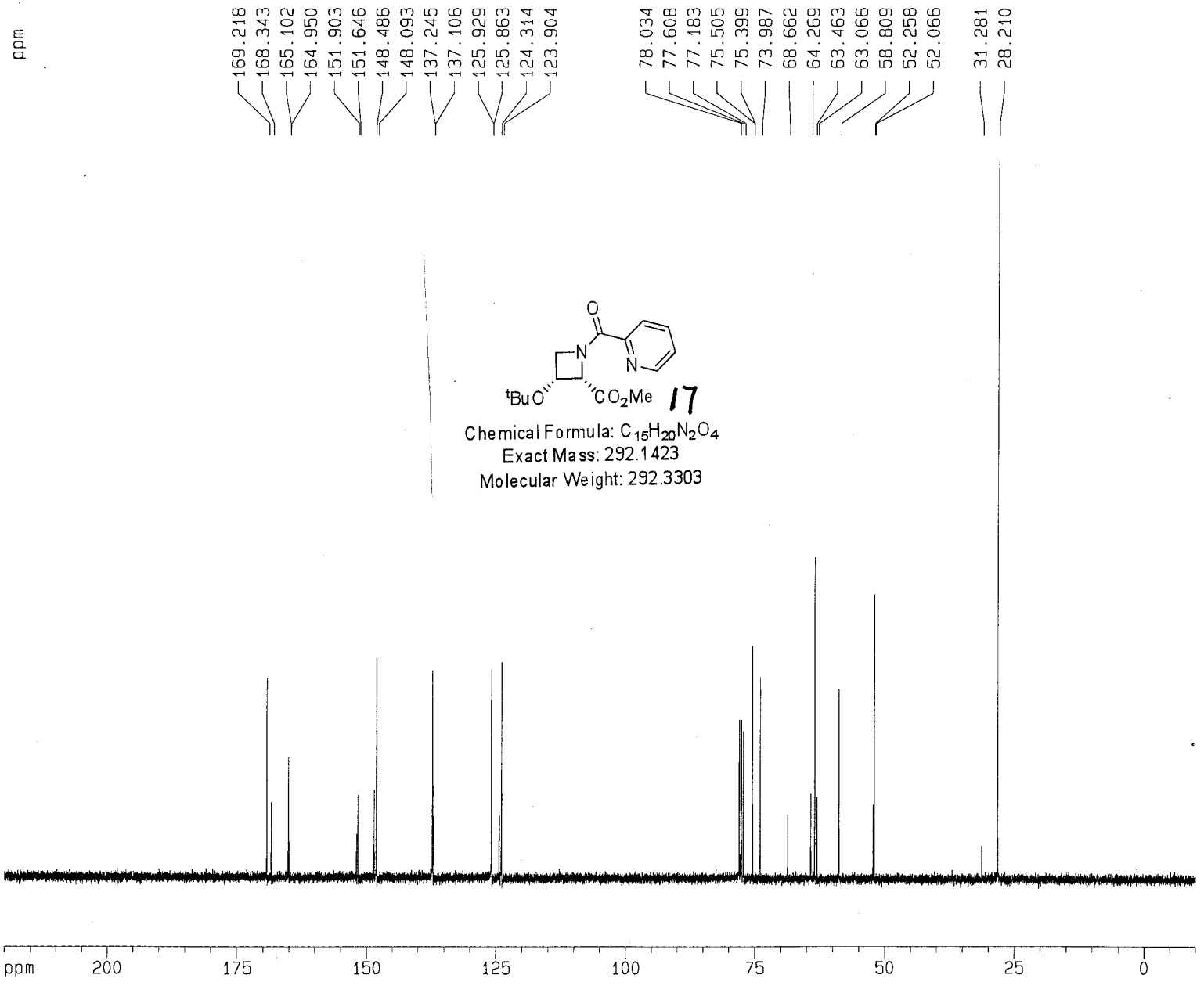
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300094 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	1027hg3-135
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111027
Time	19.46
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	371
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	456.1
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

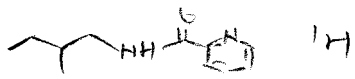
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

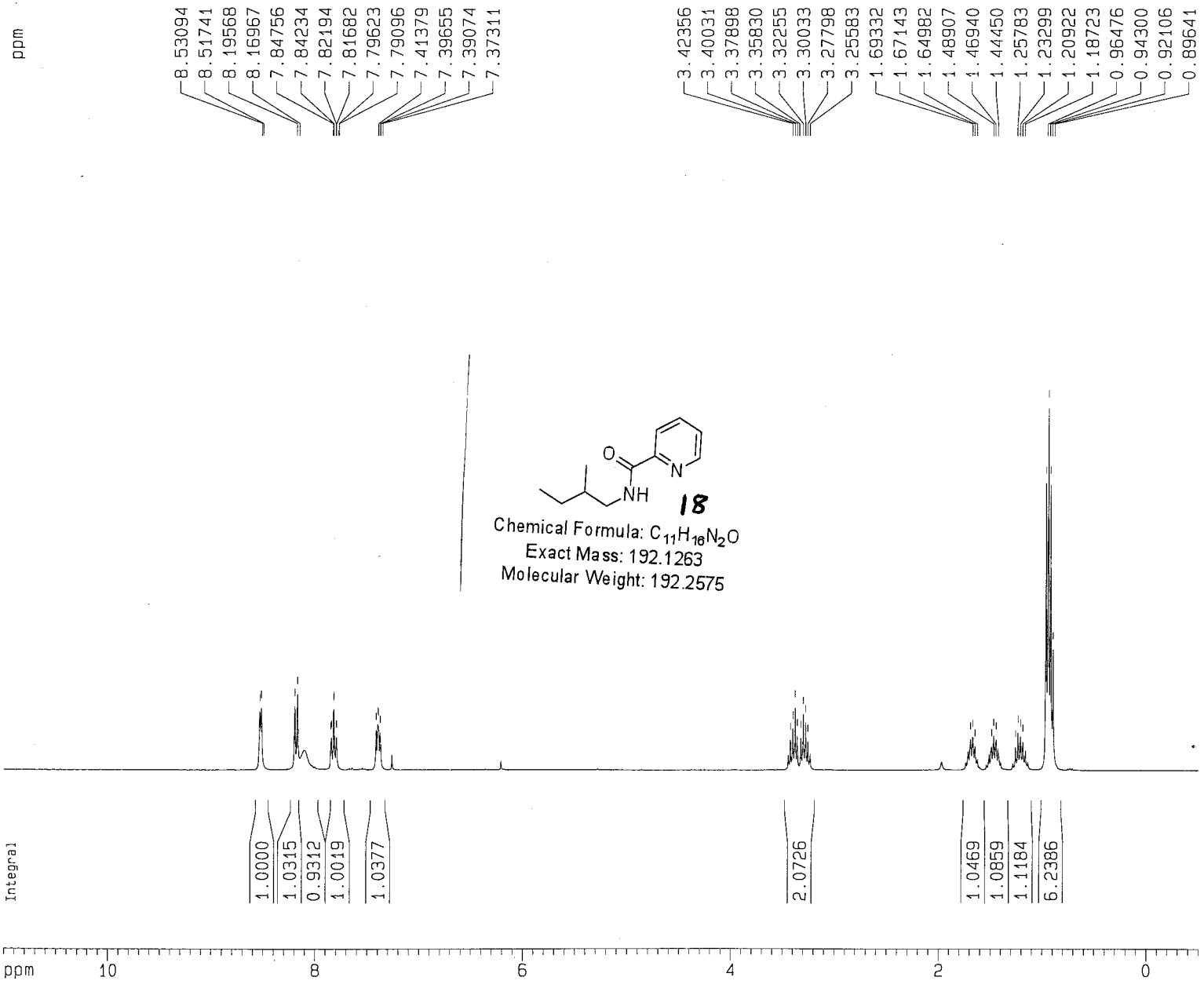
F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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





Current Data Parameters

NAME	zsysub2-h
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111031
Time	22.30
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 ========

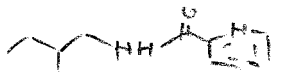
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.57500 ppm/cm
HZCM	172.42525 Hz/cm



ppm

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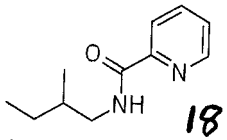
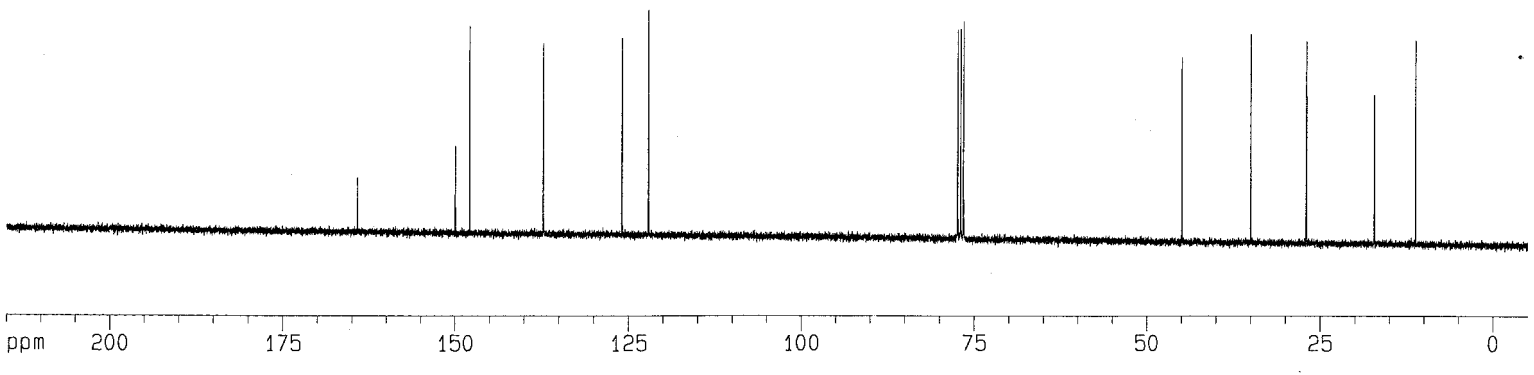
147.934
137.254
125.947
122.121
77.421
76.997
76.573
44.964
35.051
27.003
17.216
11.276



18

Chemical Formula: $C_{11}H_{16}N_2O$
Exact Mass: 192.1263
Molecular Weight: 192.2575



Current Data Parameters
NAME zsy-gang-sub2c
EXPNO 3482
PROCNO 1

F2 - Acquisition Parameters

Date_	20111031
Time	22.52
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	904
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

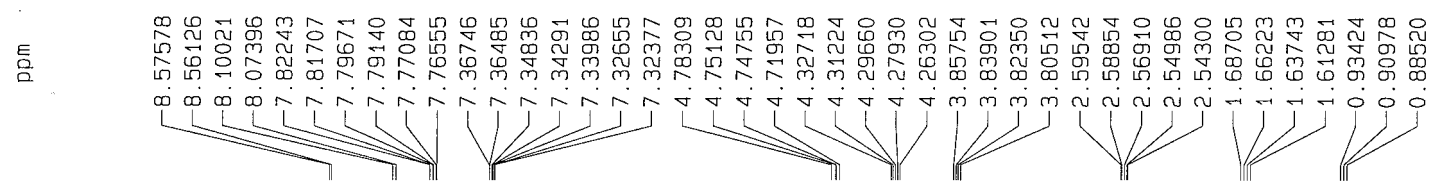
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

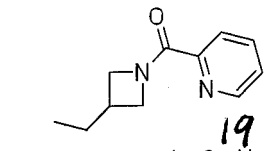
F2 - Processing parameters

SI	32768
SF	75.4023775 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

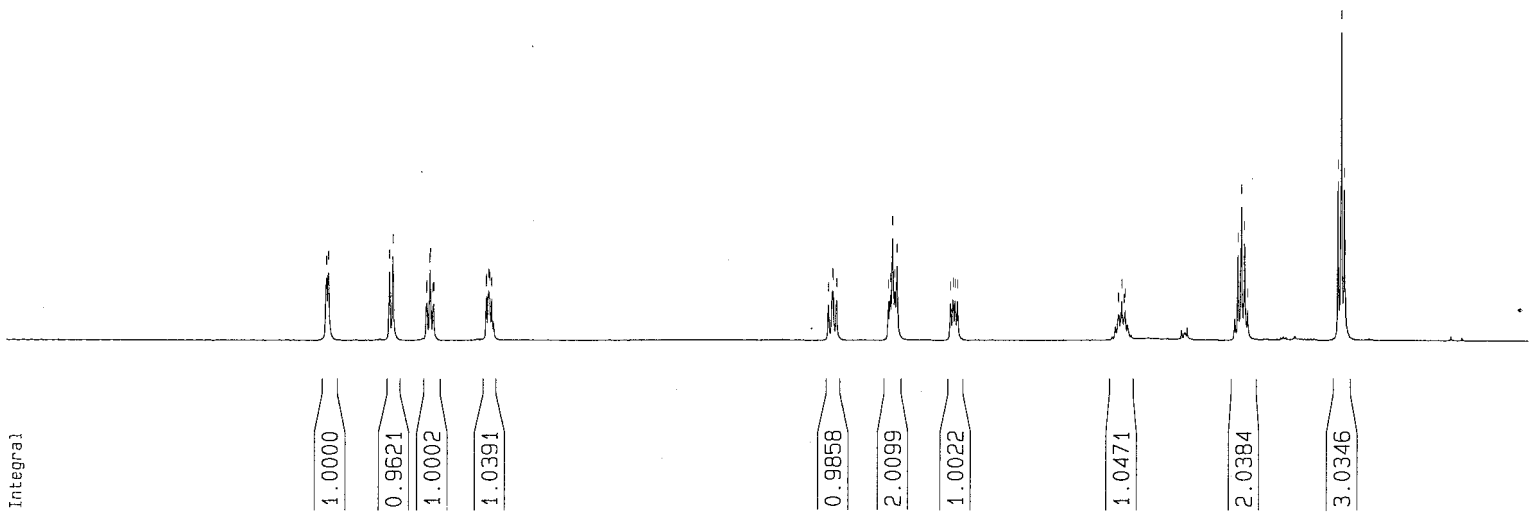
CX	20.00 cm
F1P	215.000 ppm
F1	16211.51 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42615 Hz/cm





19

Chemical Formula: $C_{11}H_{14}N_2O$
Exact Mass: 190.1106
Molecular Weight: 190.2417



Current Data Parameters

NAME	zsy-gang-bh
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111027
Time	23.21
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	101.6
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

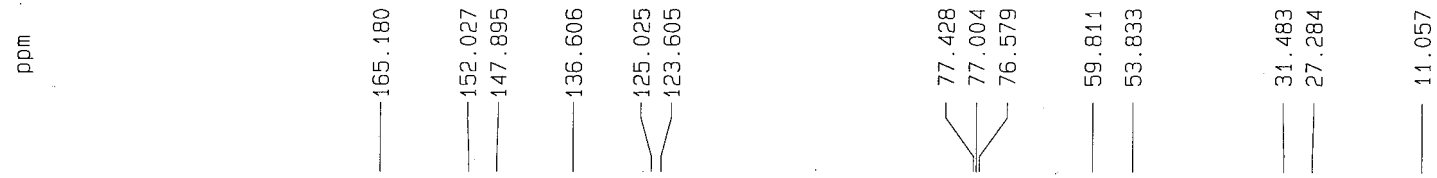
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

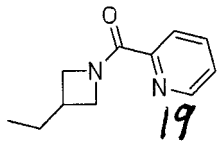
F2 - Processing parameters

SI	32768
SF	299.8699951 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

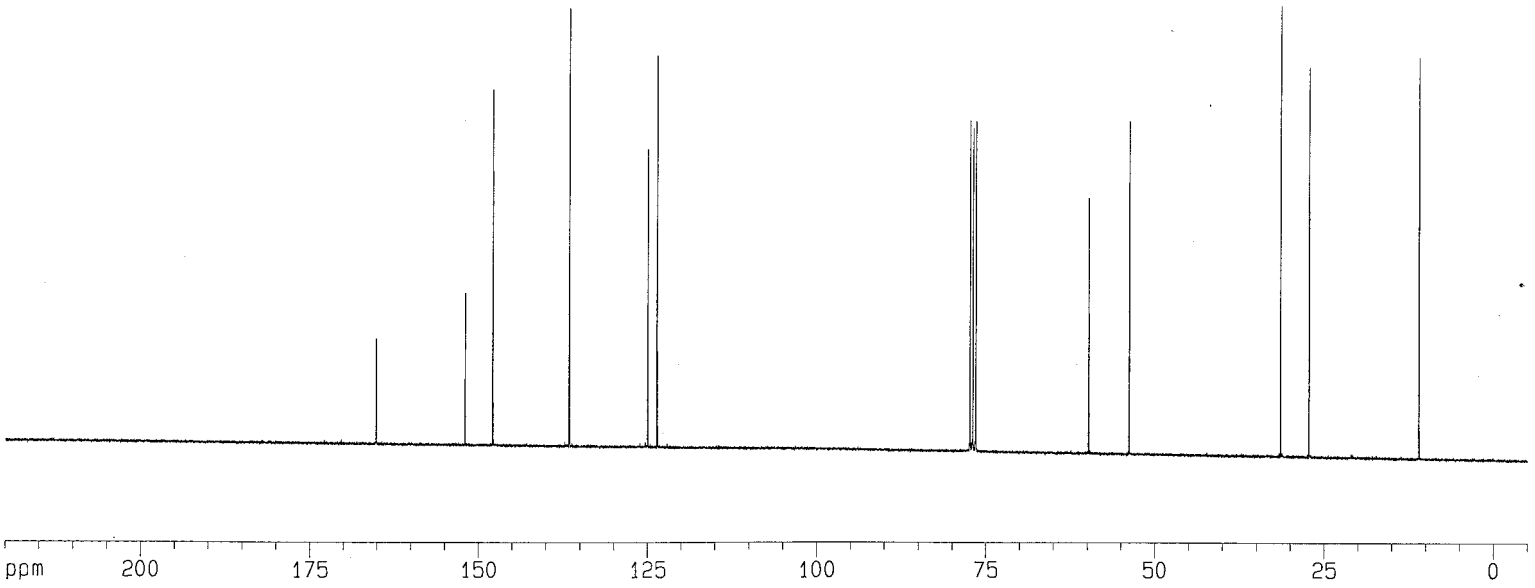
CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.57500 ppm/cm
HZCM	172.42525 Hz/cm





19

Chemical Formula: $C_{11}H_{14}N_2O$
Exact Mass: 190.1106
Molecular Weight: 190.2417



Current Data Parameters

NAME	zsy-gang-bc
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111027
Time	23.27
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	9924
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	406.4
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

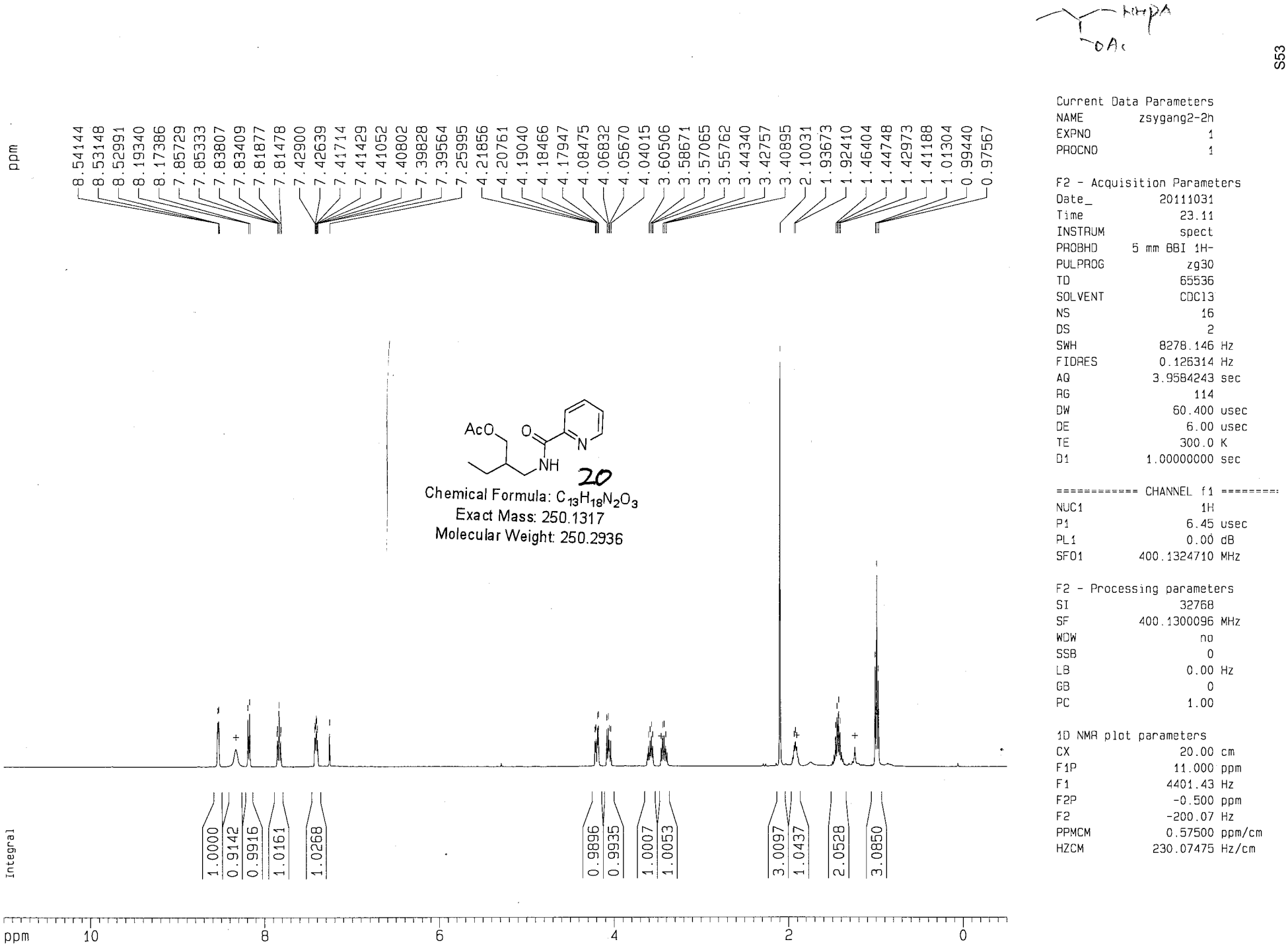
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023809 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	220.000 ppm
F1	16588.52 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.25000 ppm/cm
HZCM	848.27679 Hz/cm



NMPA
OAc

Current Data Parameters

NAME	zsygang2-2h
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111031
Time	23.11
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	114
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

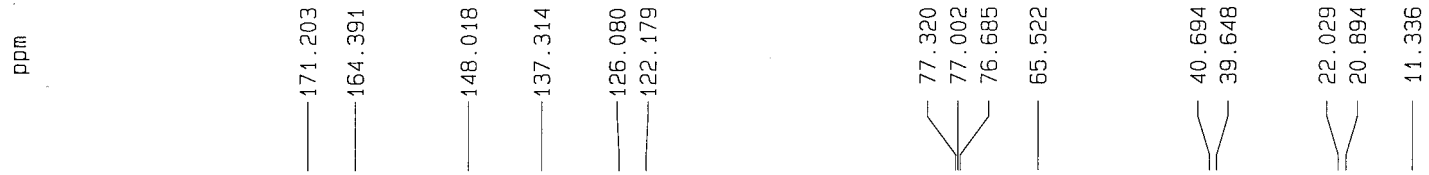
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

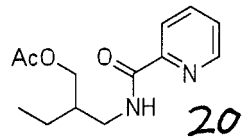
F2 - Processing parameters

SI	32768
SF	400.1300096 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

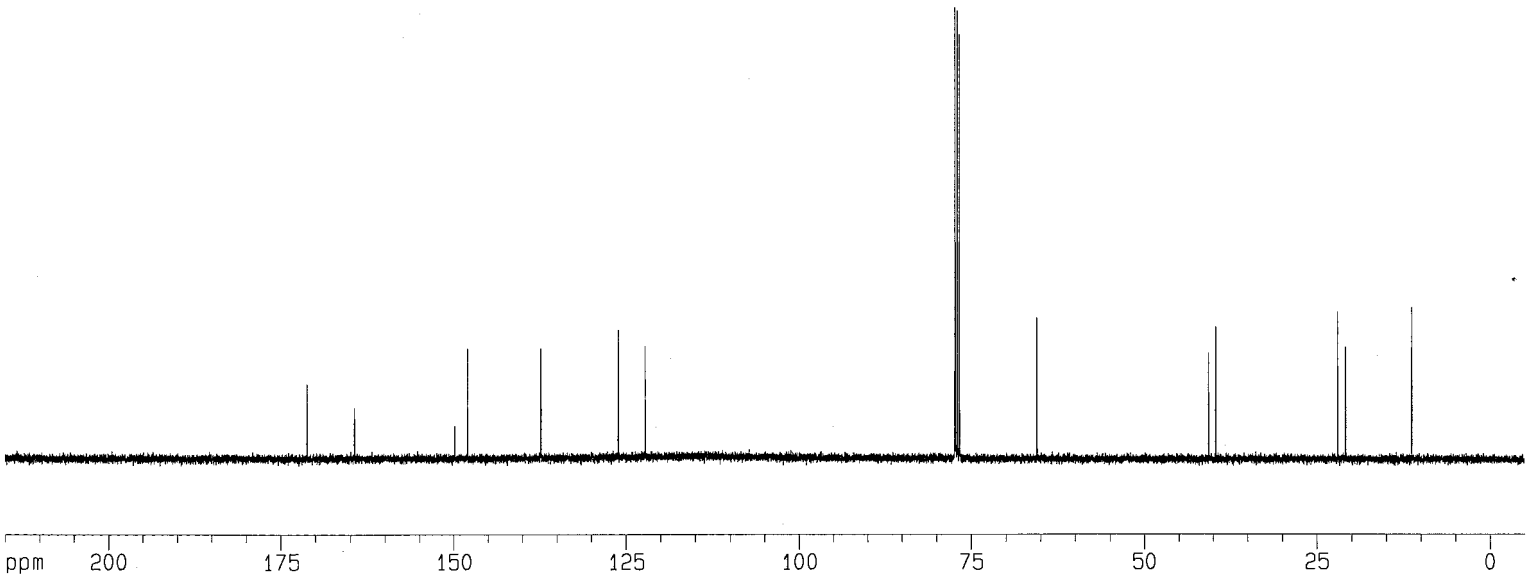
CX	20.00 cm
F1P	11.000 ppm
F1	4401.43 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.57500 ppm/cm
HZCM	230.07475 Hz/cm



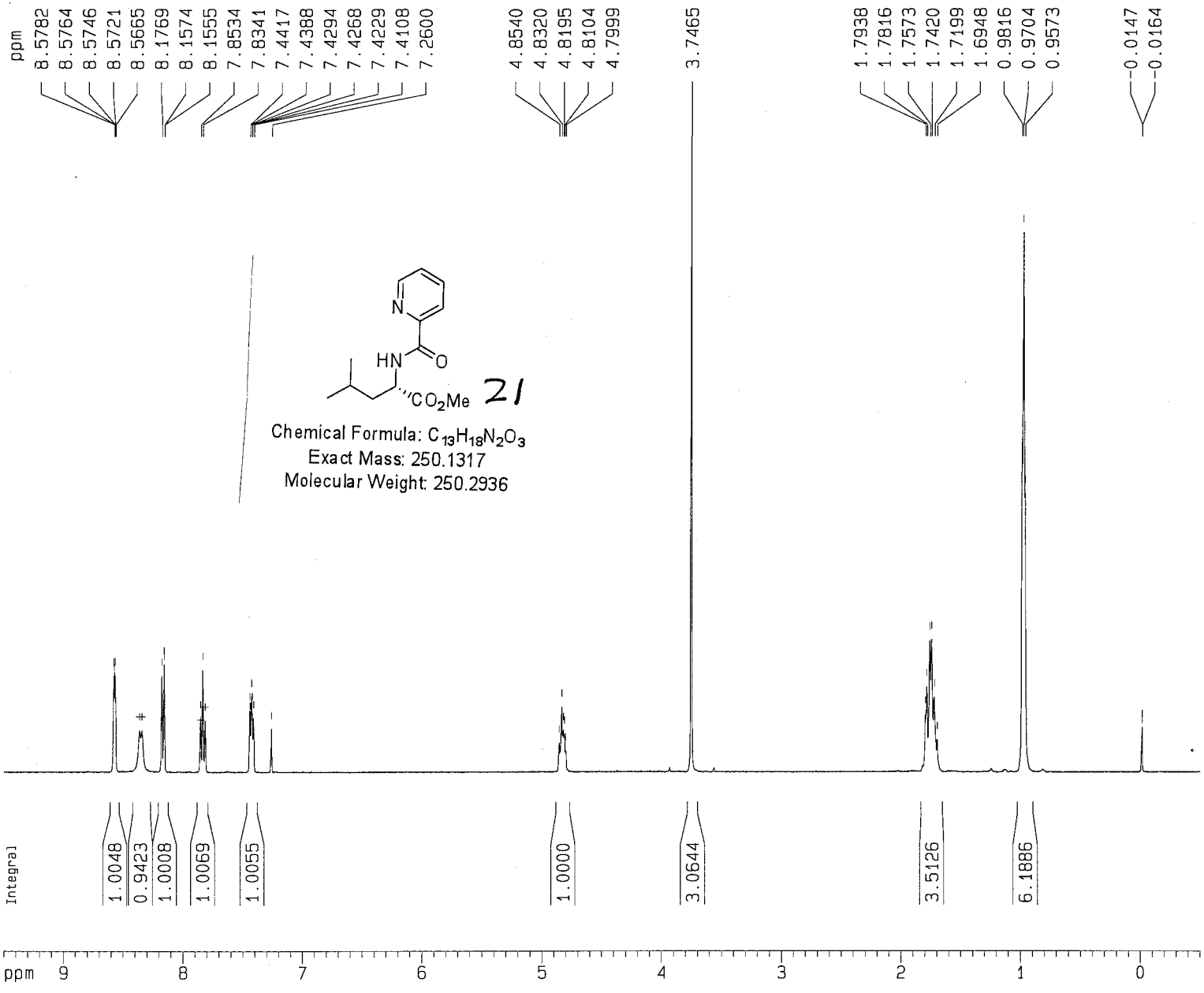


20

Chemical Formula: $C_{13}H_{18}N_2O_3$
Exact Mass: 250.1317
Molecular Weight: 250.2936




```
Current Data Parameters
NAME          zsygang2-2c
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_          20111031
Time              23.28
INSTRUM           spect
PROBHD     5 mm BBI 1H-
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 3997
DS                    4
SWH           25125.629 Hz
FIDRES         0.383387 Hz
AQ             1.3042164 sec
RG                 8192
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           100.6127723 MHz
WDW                  no
SSB                   0
LB                0.00 Hz
GB                    0
PC                1.40

1D NMR plot parameters
CX               20.00 cm
F1P             215.000 ppm
F1             21631.75 Hz
F2P             -5.000 ppm
F2              -503.06 Hz
PPMCM          11.00000 ppm/cm
HZCM         1106.74048 Hz/cm
```



Current Data Parameters

NAME	0928hg2-285H
EXPNO	10
PROCNO	1

F2 - Acquisition Parameters

Date_	20110928
Time	18.18
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	1
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	80.6
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

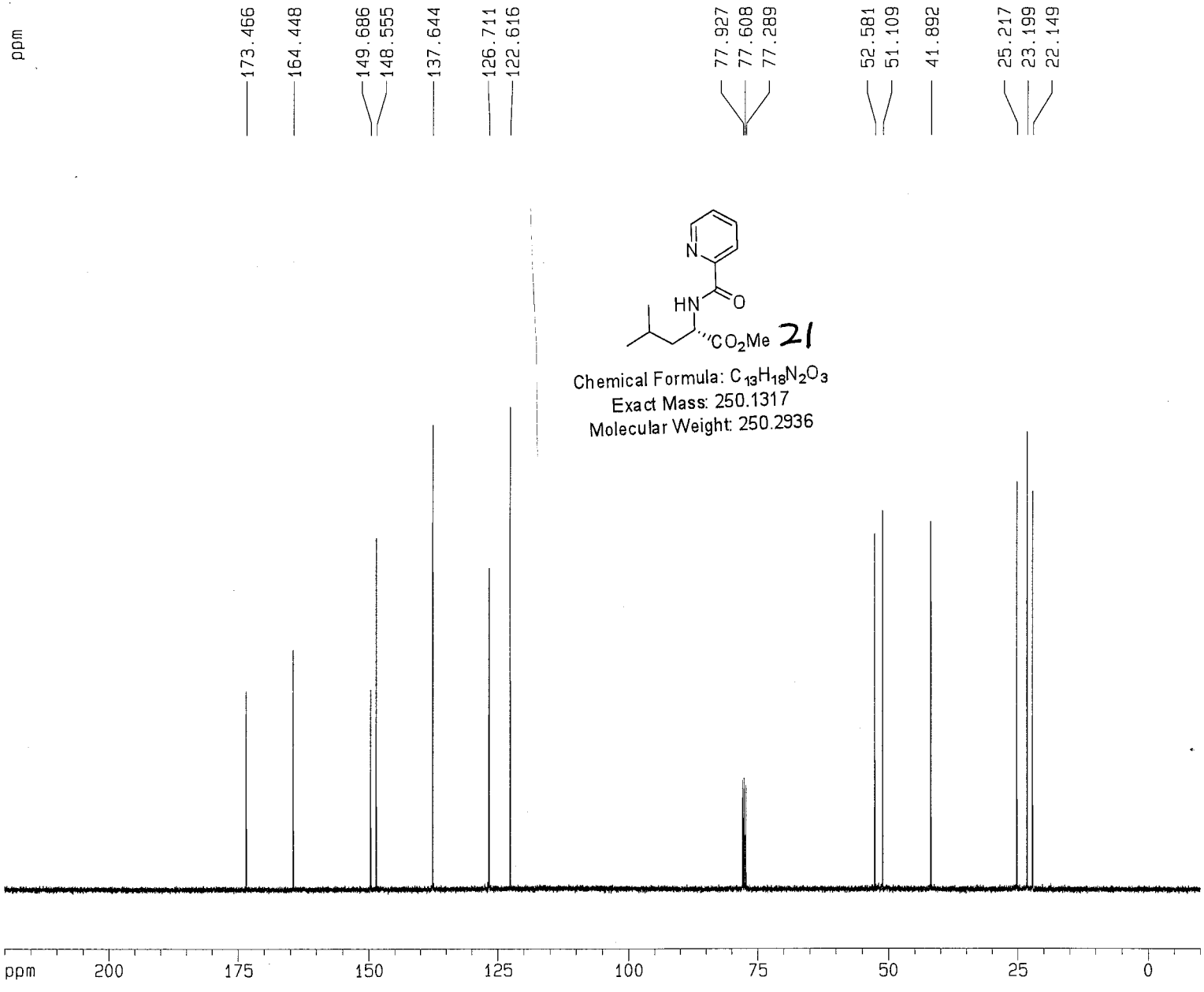
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

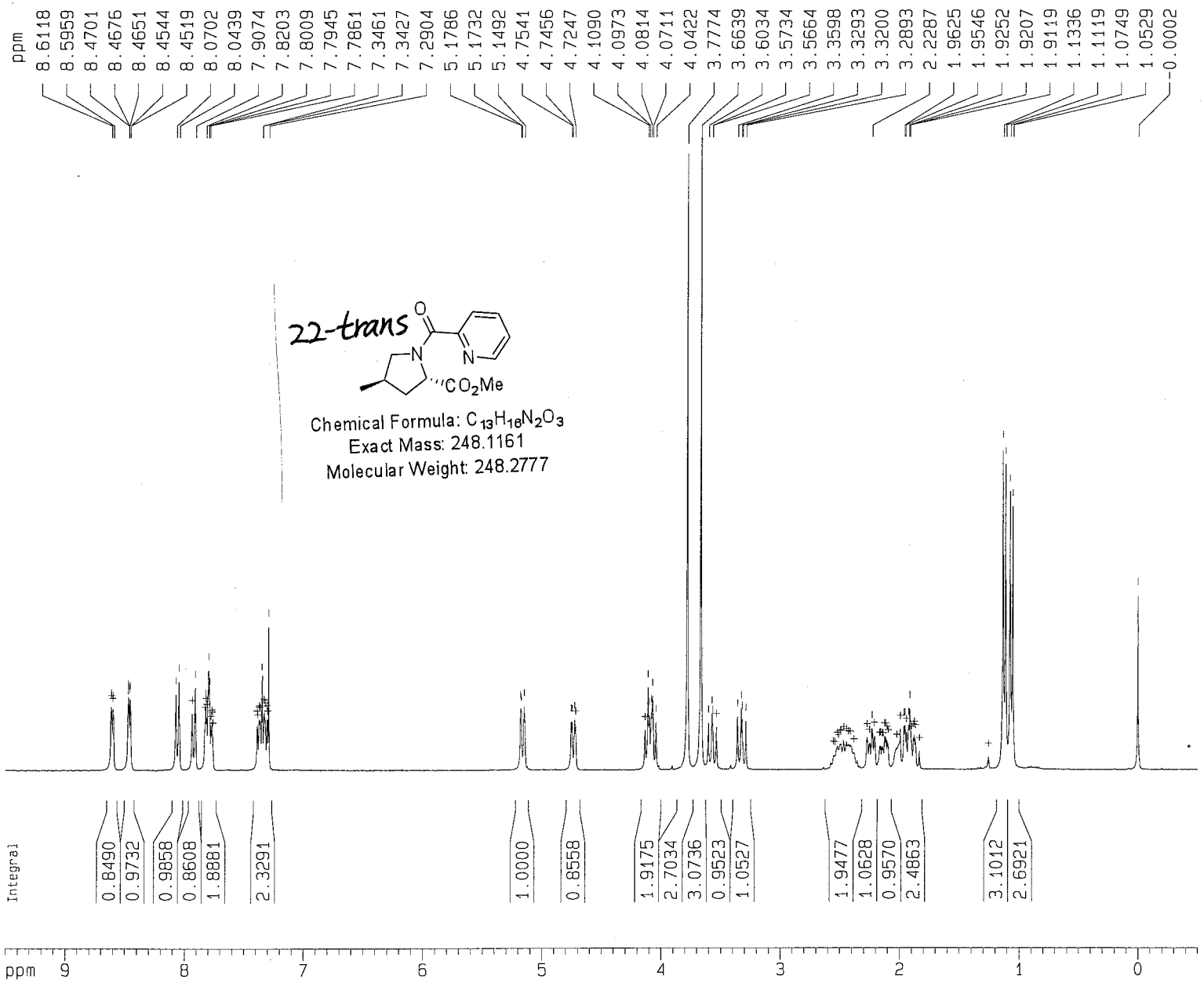
SI	32768
SF	400.1300086 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm




```
Current Data Parameters
NAME        0928hg2-285C
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20110928
Time               16.45
INSTRUM            spect
PROBHD     5 mm BBI 1H-
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   837
DS                     4
SWH           25125.629 Hz
FIDRES         0.383387 Hz
AQ             1.3042164 sec
RG                  8192
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                   no
SSB                    0
LB                 0.00 Hz
GB                     0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              220.000 ppm
F1             22134.80 Hz
F2P              -10.000 ppm
F2             -1006.13 Hz
PPMCM           11.50000 ppm/cm
HZCM         1157.04639 Hz/cm
```



Current Data Parameters

NAME	0525hg2-286A
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20110525
Time	18.14
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	181
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

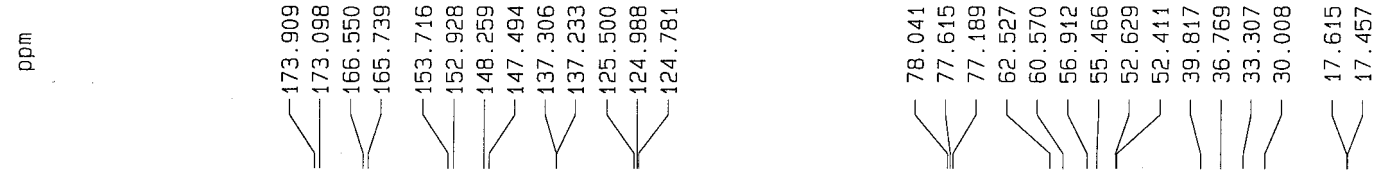
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

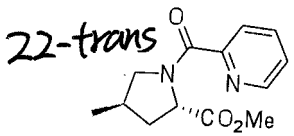
F2 - Processing parameters

SI	32768
SF	299.8700012 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

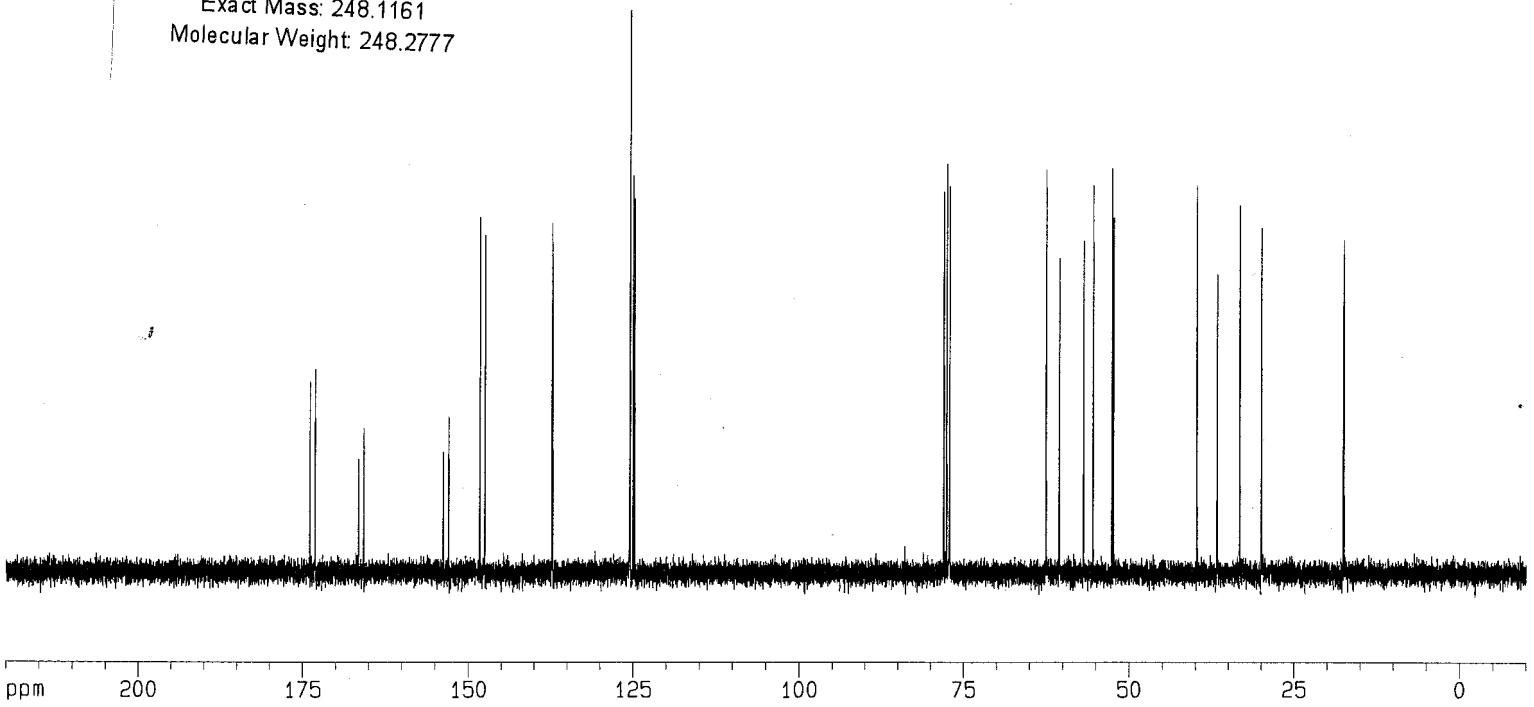
1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm

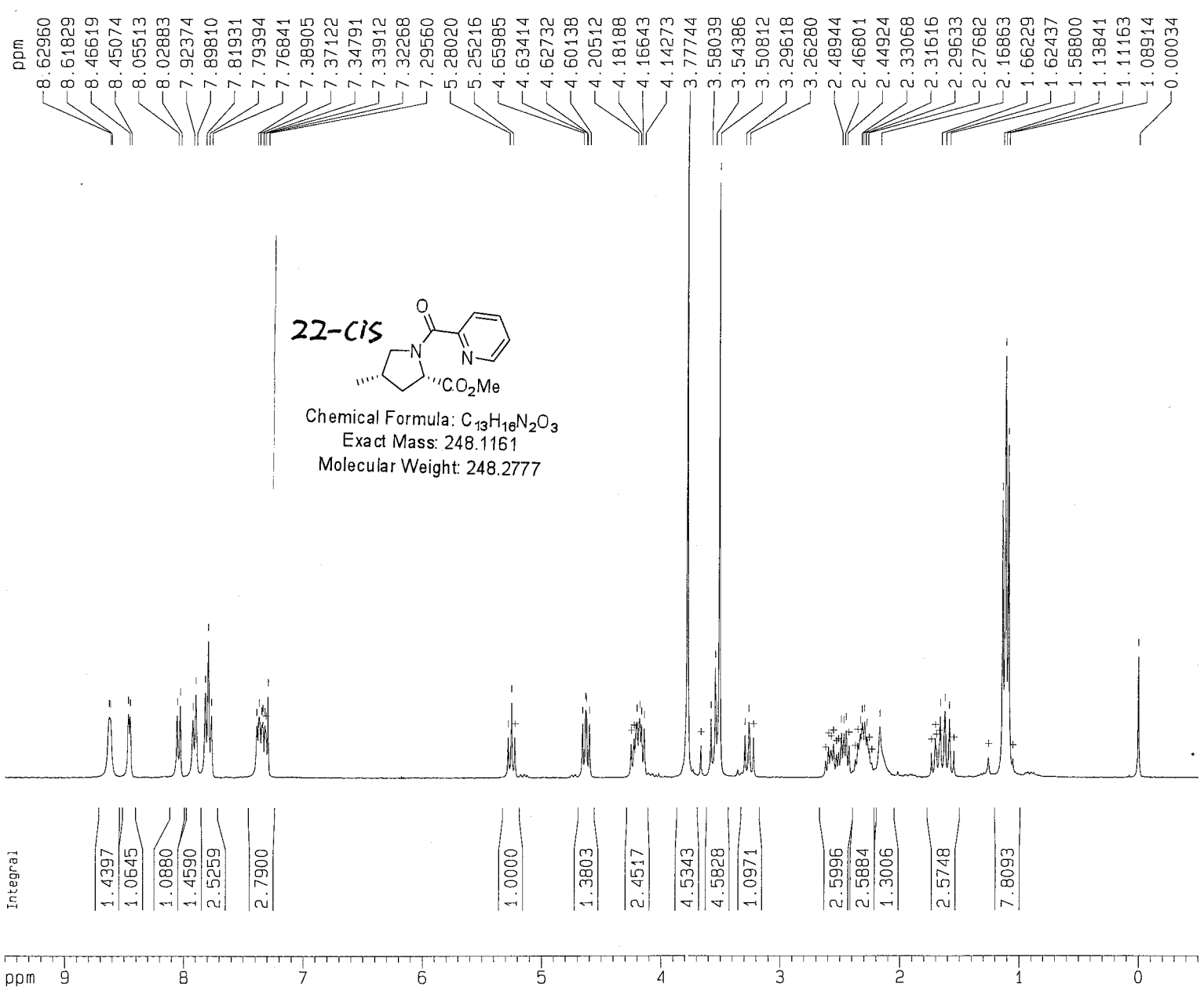




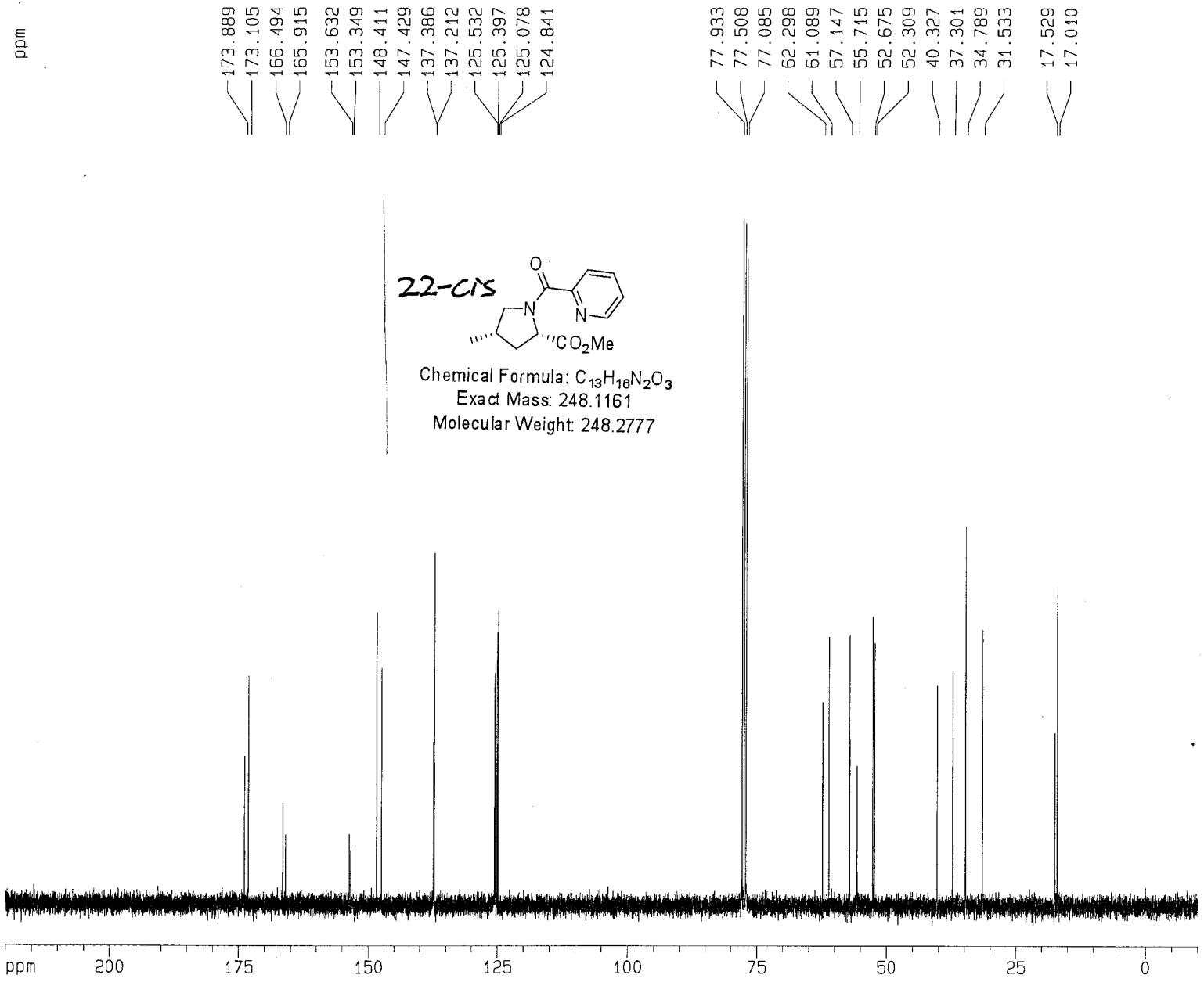
Chemical Formula: $C_{13}H_{16}N_2O_3$
Exact Mass: 248.1161
Molecular Weight: 248.2777




```
Current Data Parameters
NAME          1011hg2-286A
EXPNO                96601
PROCNO                   1

F2 - Acquisition Parameters
Date_              20111011
Time                  19.52
INSTRUM               spect
PROBHD     5 mm QNP 1H/1
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     253
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                    5.25 usec
PL1                  -6.00 dB
SFO1            75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2            waltz16
NUC2                   1H
PCPD2               115.00 usec
PL2                   0.00 dB
PL12                 19.70 dB
PL13                 19.70 dB
SFO2           299.8711995 MHz

F2 - Processing parameters
SI                     32768
SF              75.4023410 MHz
WDW                       no
SSB                        0
LB                    0.00 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
```




```
Current Data Parameters
NAME          0525hg2-2868
EXPNO                    2
PROCNO                   1

F2 - Acquisition Parameters
Date_              20110525
Time                  18.19
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                     181
DW                 81.000 usec
DE                  6.00 usec
TE                 300.0 K
D1                1.00000000 sec

============ CHANNEL f1 =========
NUC1                     1H
P1                   12.10 usec
PL1                   0.00 dB
SFO1          299.8718518 MHz

F2 - Processing parameters
SI                    32768
SF            299.8699997 MHz
WDW                      no
SSB                       0
LB                    0.00 Hz
GB                        0
PC                     1.00

1D NMR plot parameters
CX                   20.00 cm
F1P                   9.500 ppm
F1                 2848.76 Hz
F2P                  -0.500 ppm
F2                 -149.93 Hz
PPMCM             0.50000 ppm/cm
HZCM            149.93500 Hz/cm
```



Current Data Parameters

NAME	1025hg2-286B
EXPNO	11732
PROCNO	1

F2 - Acquisition Parameters

Date_	20111025
Time	19.11
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	919
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

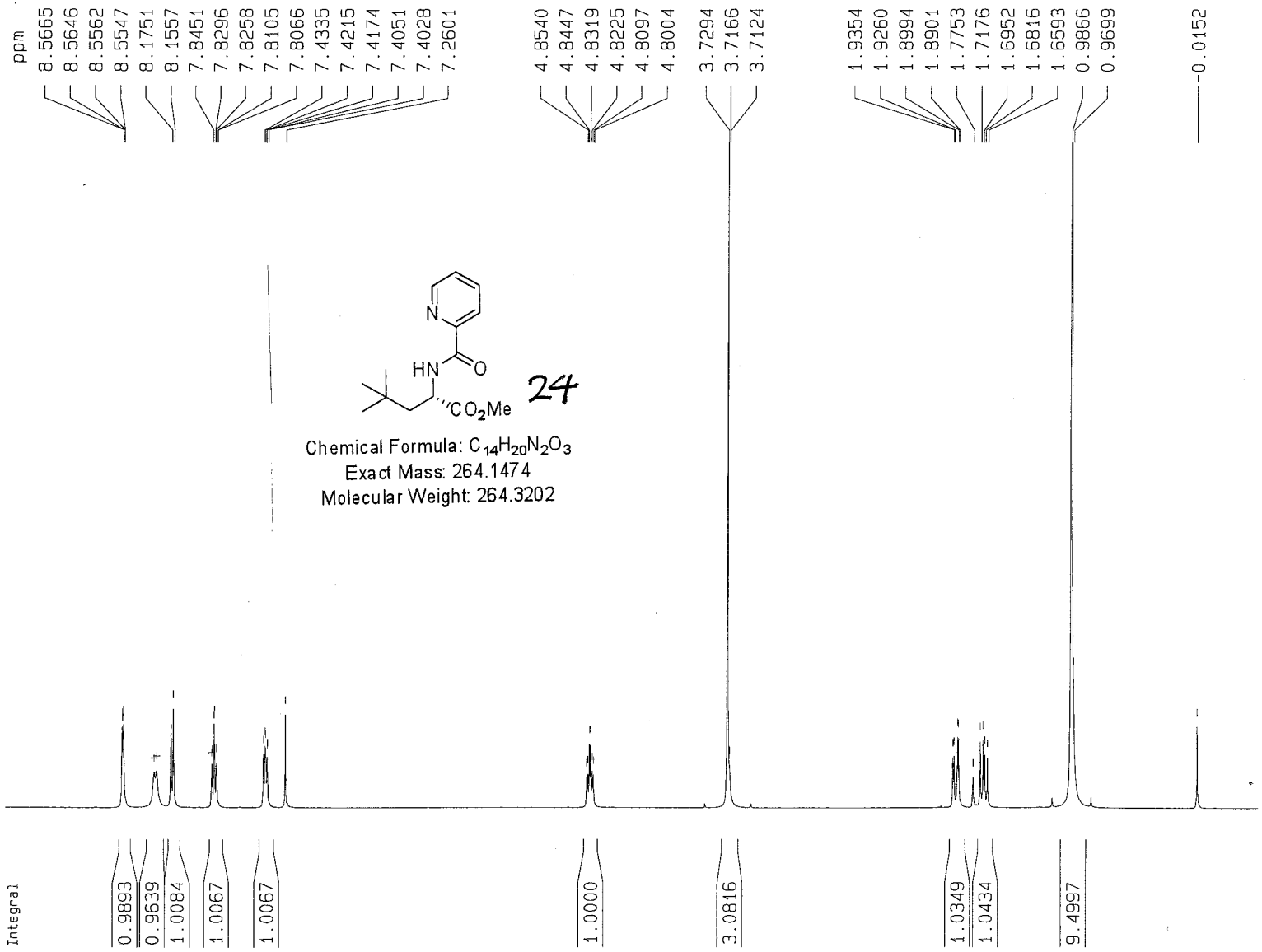
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

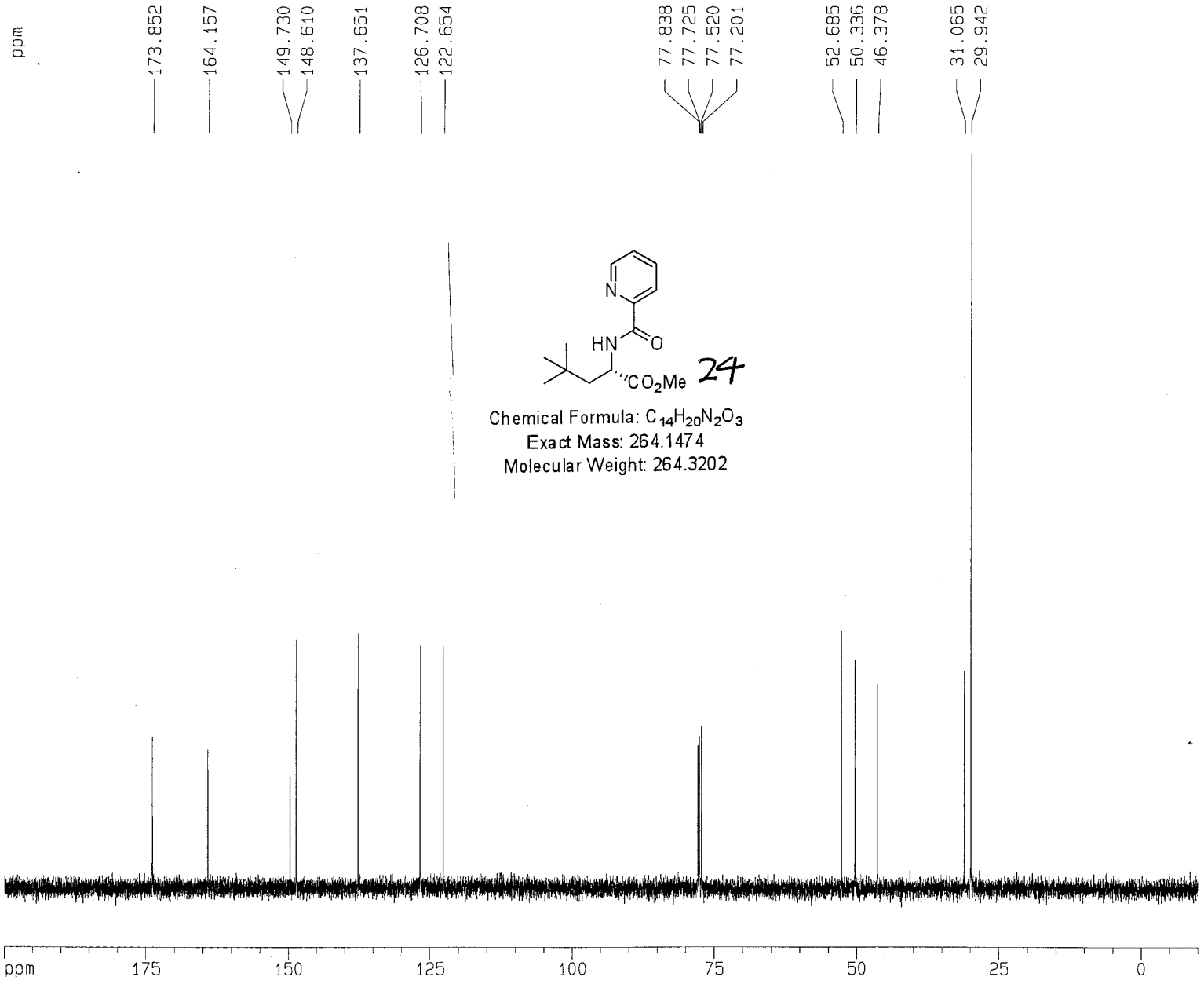
CX	20.00 cm
F1P	220.000 ppm
F1	16588.51 Hz
F2P	-10.000 ppm
F2	-754.02 Hz
PPMCM	11.50000 ppm/cm
HZCM	867.12695 Hz/cm



24

Chemical Formula: $C_{14}H_{20}N_2O_3$
Exact Mass: 264.1474
Molecular Weight: 264.3202

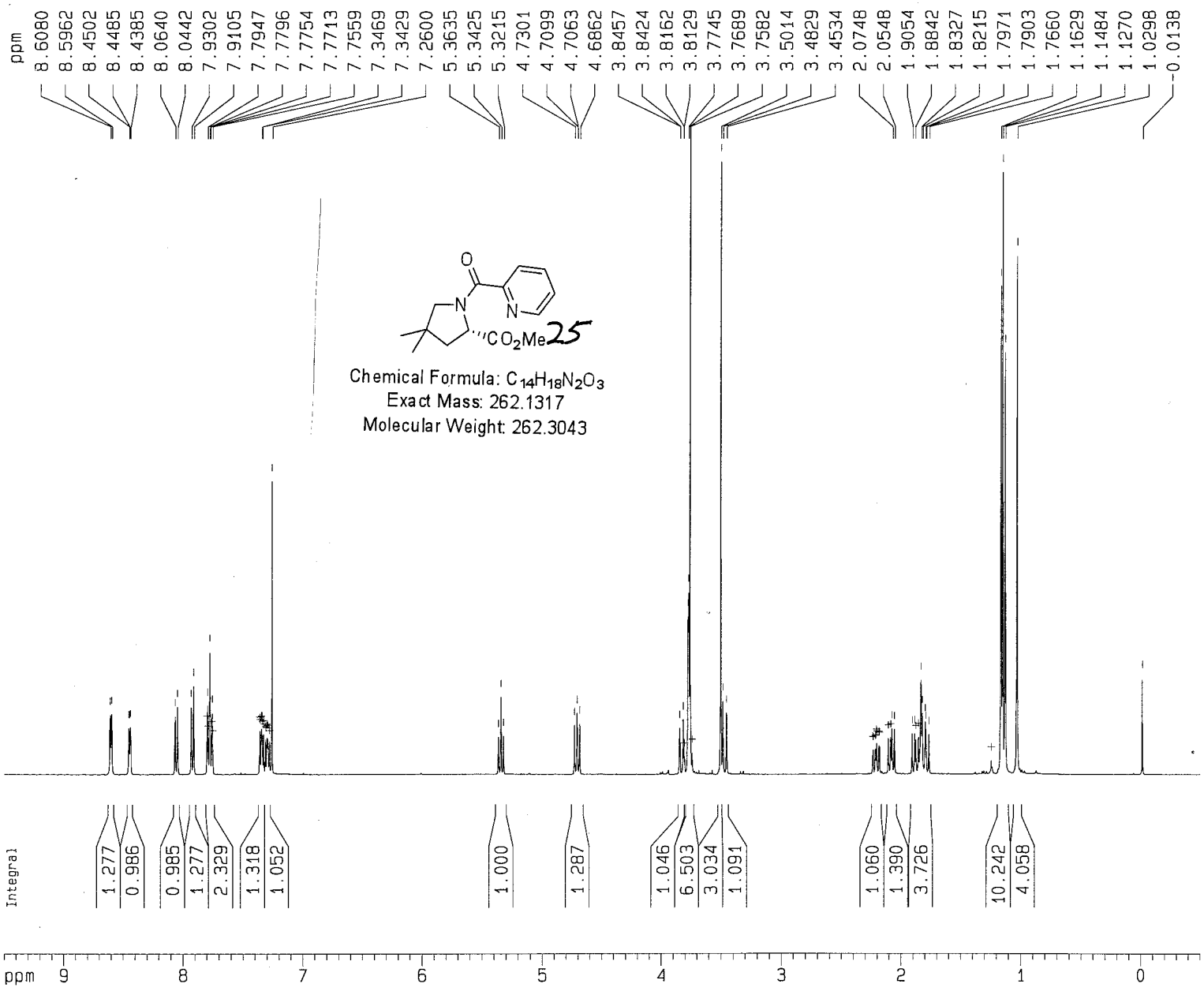
```
Current Data Parameters
NAME          0504hg2-260
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_          20110504
Time              18.33
INSTRUM           spect
PROBHD    5 mm BBI 1H-B
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH           8278.146 Hz
FIDRES        0.126314 Hz
AQ            3.9584243 sec
RG                71.8
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          400.1300084 MHz
WDW                 no
SSB                  0
LB               0.00 Hz
GB                   0
PC                1.00

1D NMR plot parameters
CX               20.00 cm
F1P               9.500 ppm
F1              3801.24 Hz
F2P              -0.500 ppm
F2             -200.07 Hz
PPMCM          0.50000 ppm/cm
HZCM         200.06500 Hz/cm
```



24

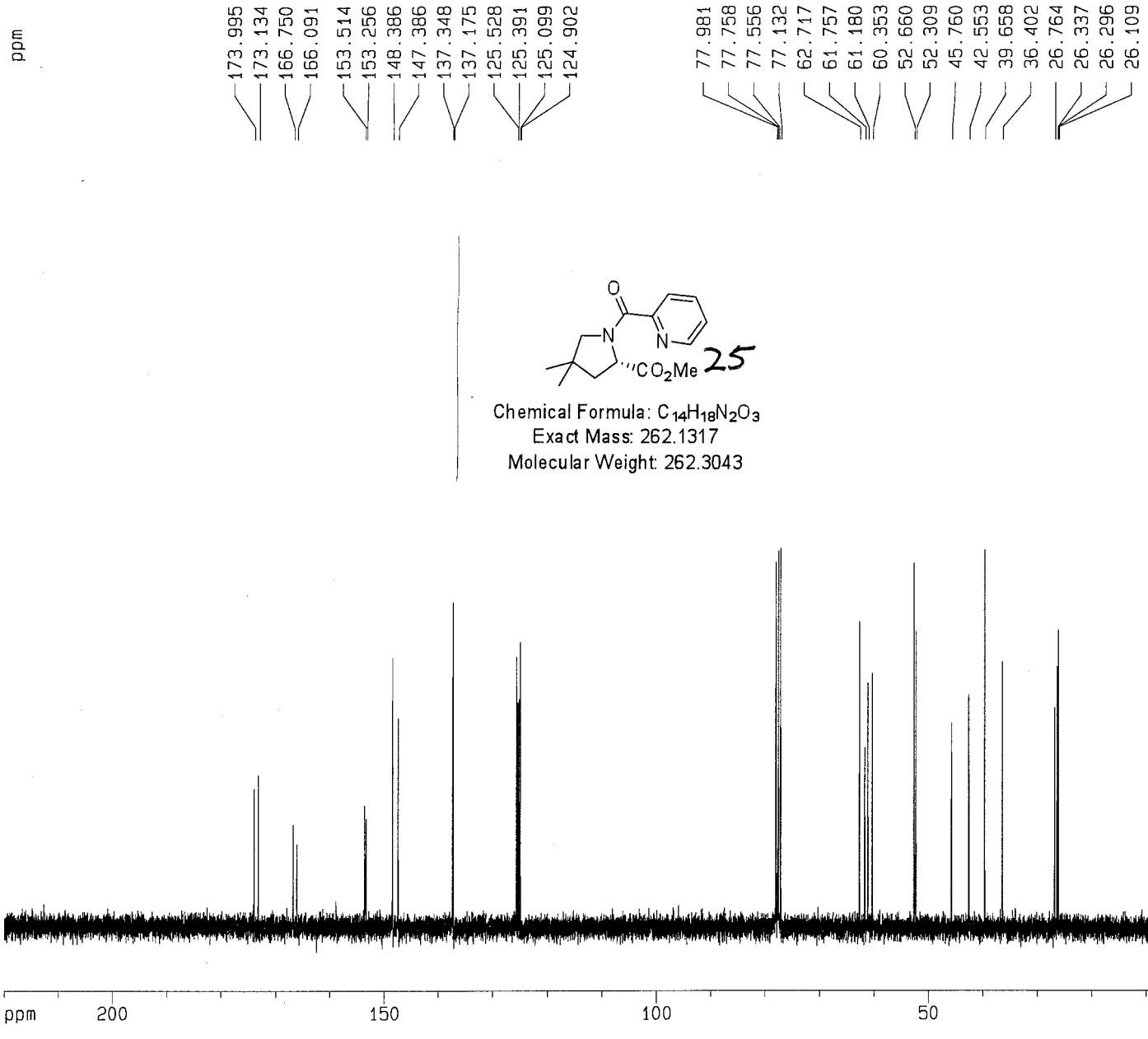
Chemical Formula: $C_{14}H_{20}N_2O_3$
Exact Mass: 264.1474
Molecular Weight: 264.3202

```
Current Data Parameters
NAME        0505hg2-260C
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20110505
Time               10.22
INSTRUM            spect
PROBHD     5 mm BBI 1H-B
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  201
DS                    4
SWH           25125.629 Hz
FIDRES        0.383387 Hz
AQ            1.3042164 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                   no
SSB                    0
LB                0.00 Hz
GB                     0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
F1P              200.000 ppm
F1             20122.55 Hz
F2P              -10.000 ppm
F2             -1006.13 Hz
PPMCM          10.50000 ppm/cm
HZCM         1056.43372 Hz/cm
```

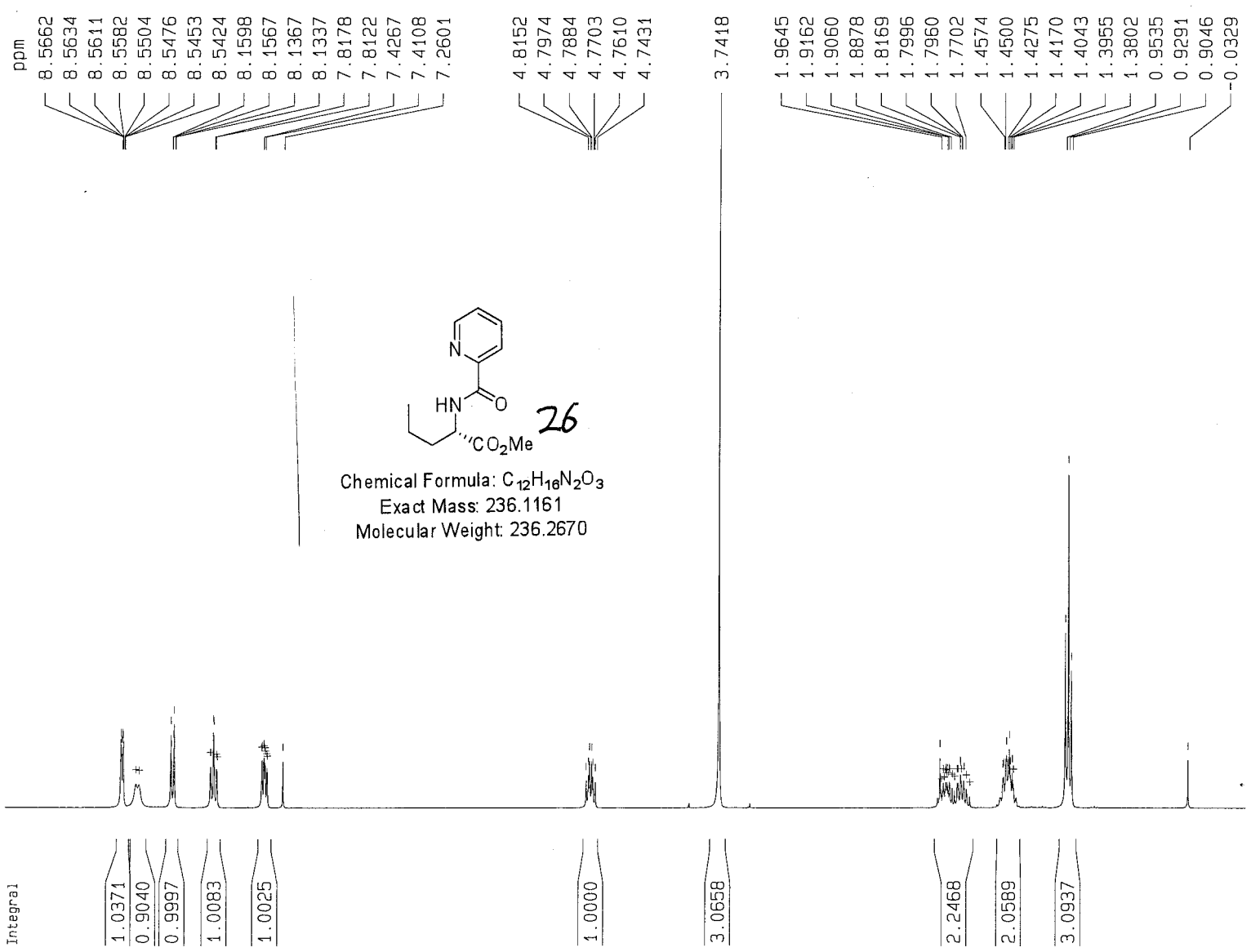


Chemical Formula: $C_{14}H_{18}N_2O_3$
Exact Mass: 262.1317
Molecular Weight: 262.3043

```
Current Data Parameters
NAME          1010hg3-122H
EXPNO                    6
PROCNO                   1

F2 - Acquisition Parameters
Date_             20111010
Time                 16.58
INSTRUM              spect
PROBHD     5 mm BBI 1H-
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     30
DS                      2
SWH             8278.146 Hz
FIDRES          0.126314 Hz
AQ              3.9584243 sec
RG                  143.7
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            400.1300091 MHz
WDW                     no
SSB                      0
LB                    0.00 Hz
GB                       0
PC                    1.00

1D NMR plot parameters
CX                   20.00 cm

F1                 3801.24 Hz
F2P                -0.500 ppm
F2                 -200.07 Hz
PPMCM             0.50000 ppm/cm
HZCM            200.06500 Hz/cm
```




```
Current Data Parameters
NAME        1011hg3-122C
EXPNO              96601
PROCNO                 1

F2 - Acquisition Parameters
Date_           20111011
Time               19.24
INSTRUM            spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  304
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                 5.25 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2                0.00 dB
PL12               19.70 dB
PL13               19.70 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                 32768
SF           75.4023410 MHz
WDW                   no
SSB                    0
LB                 0.00 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
```



26

Chemical Formula: $C_{12}H_{16}N_2O_3$
Exact Mass: 236.1161
Molecular Weight: 236.2670

Current Data Parameters

NAME	0516hg2-274H
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20110516
Time	13.39
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 ========

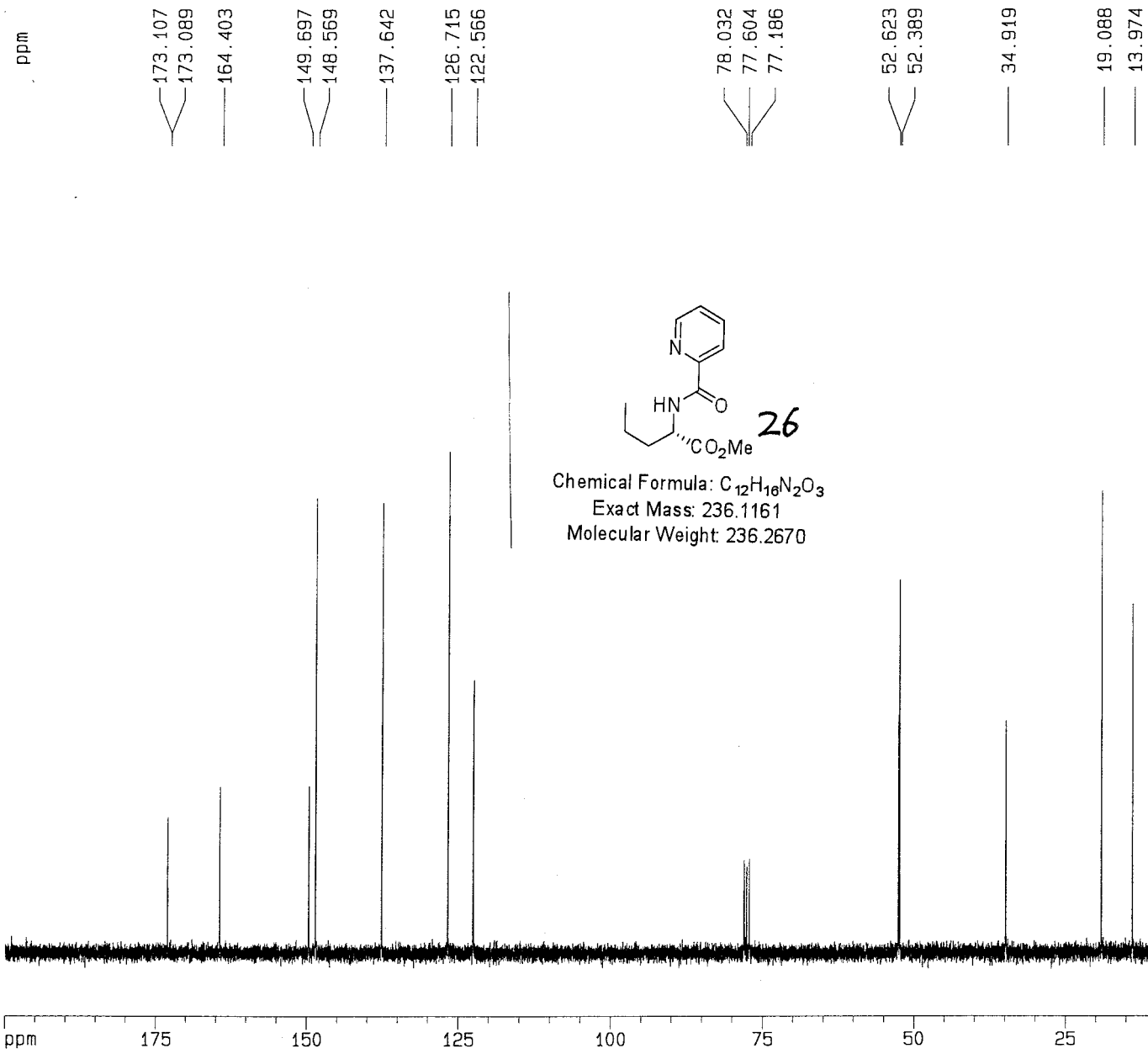
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



Current Data Parameters

NAME	0519hg2-274C
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110519
Time	19.15
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	201
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 ==========

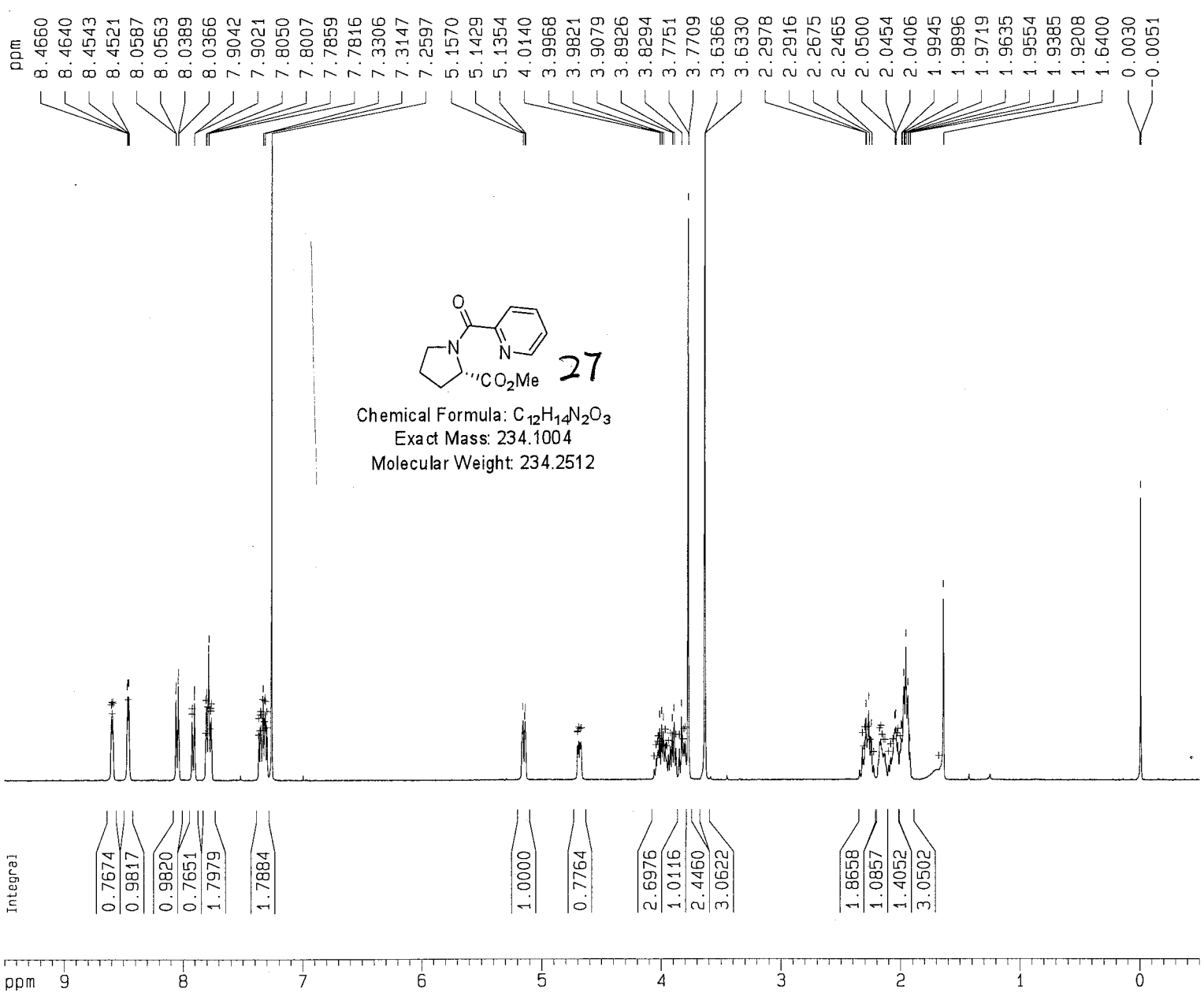
CPDPRG2	waltz16
NUC2	1H
PCPD2	110.00 usec
PL2	0.00 dB
PL12	17.50 dB
PL13	17.50 dB
SFO2	300.1312005 MHz

F2 - Processing parameters

SI	32768
SF	75.4677190 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	200.000 ppm
F1	15093.54 Hz
F2P	-10.000 ppm
F2	-754.68 Hz
PPMCM	10.50000 ppm/cm
HZCM	792.41107 Hz/cm



Current Data Parameters

NAME	1007hg3-97H
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111007
Time	19.42
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	203.2
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

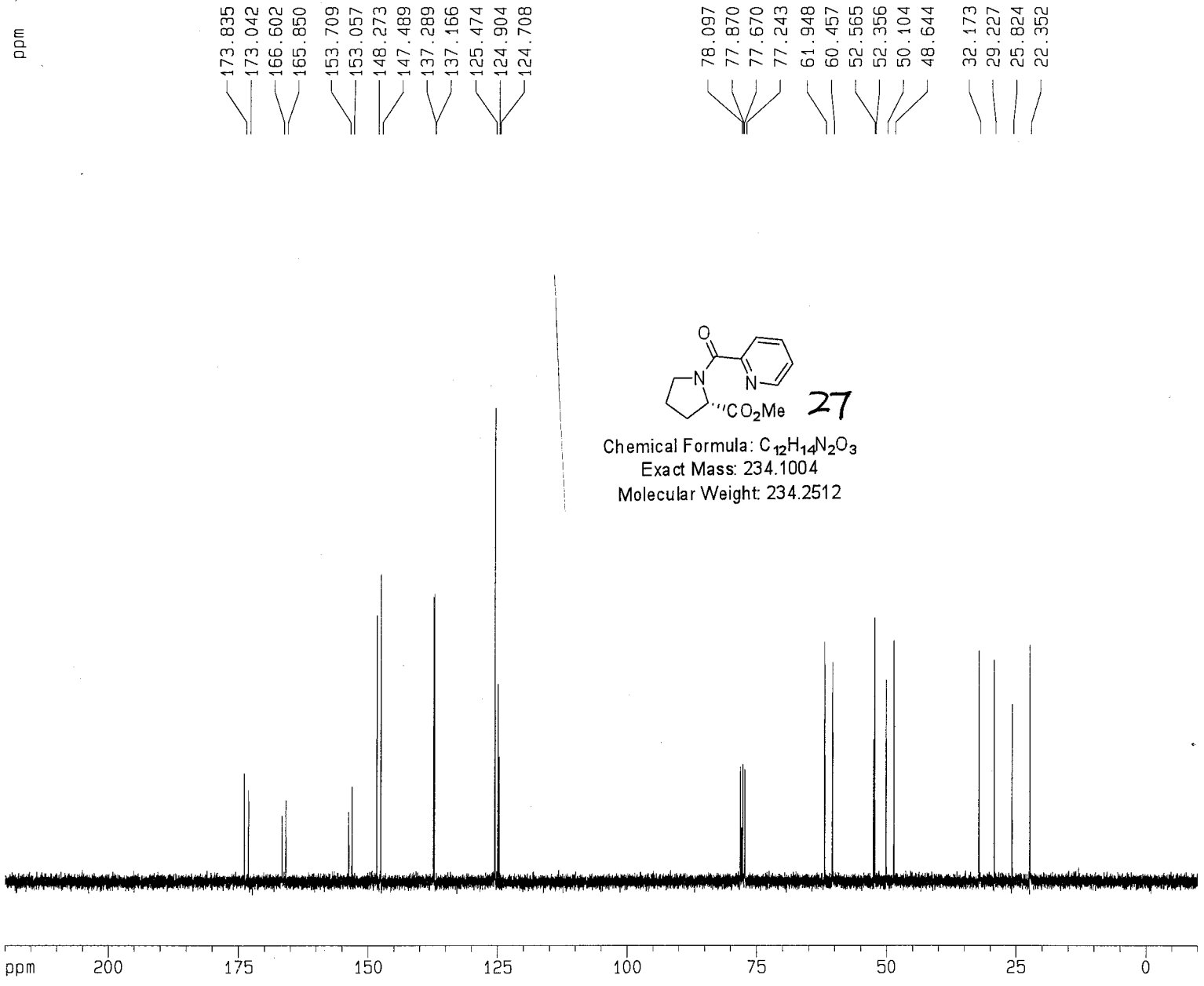
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SF	400.1300094 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	1009hg3-97C
EXPNO	334
PROCNO	1

F2 - Acquisition Parameters

Date_	20111009
Time	14.31
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	203
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	406.4
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

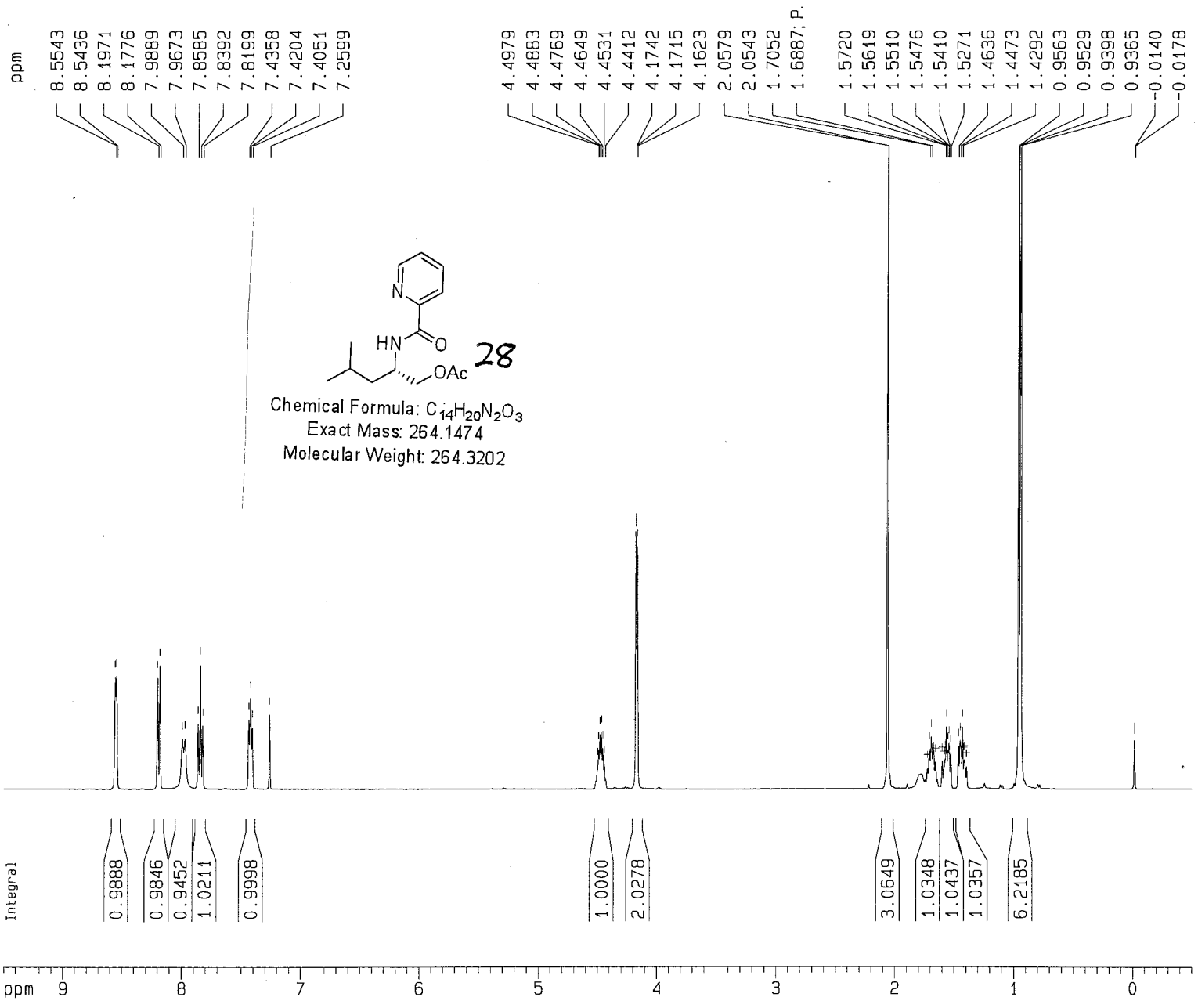
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



Current Data Parameters
NAME 0930hg3-101H
EXPNO 1
PROCNO 1

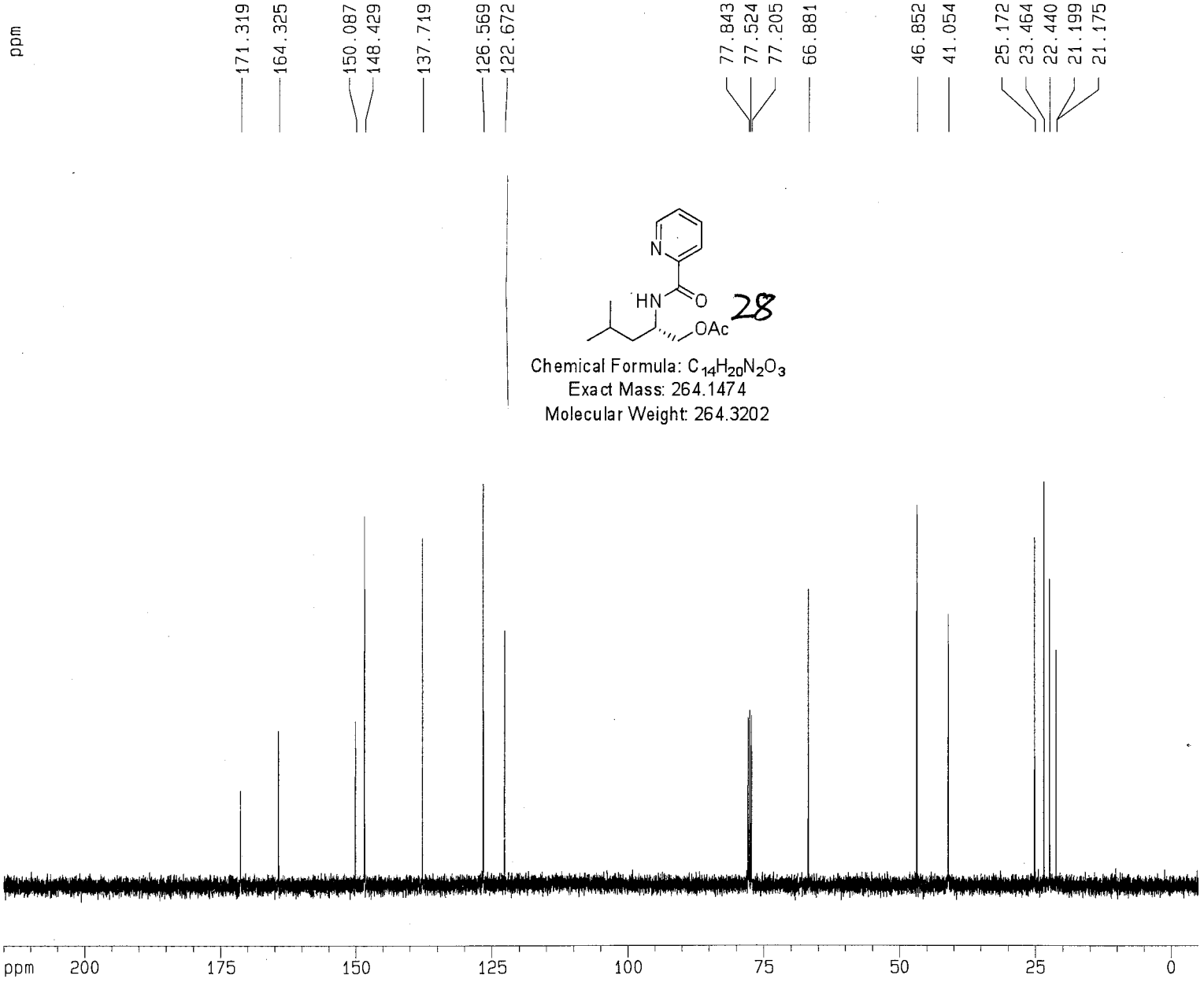
F2 - Acquisition Parameters
Date_ 20110930
Time 15.54

PROBHD 5 mm BBI 1H-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 64
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 400.1300091 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

1D NMR plot parameters
CX 20.00 cm
F1P 9.500 ppm
F1 3801.24 Hz
F2P -0.500 ppm
F2 -200.07 Hz
PPMCM 0.50000 ppm/cm
HZCM 200.06500 Hz/cm



Current Data Parameters

NAME	0929hg3-101C
EXPNO	6
PROCNO	1

F2 - Acquisition Parameters

Date_	20110929
Time	18.23
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	698
DS	4
SWH	25125.629 Hz
FIDRES	0.383387 Hz
AQ	1.3042164 sec
RG	6502
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 ==========

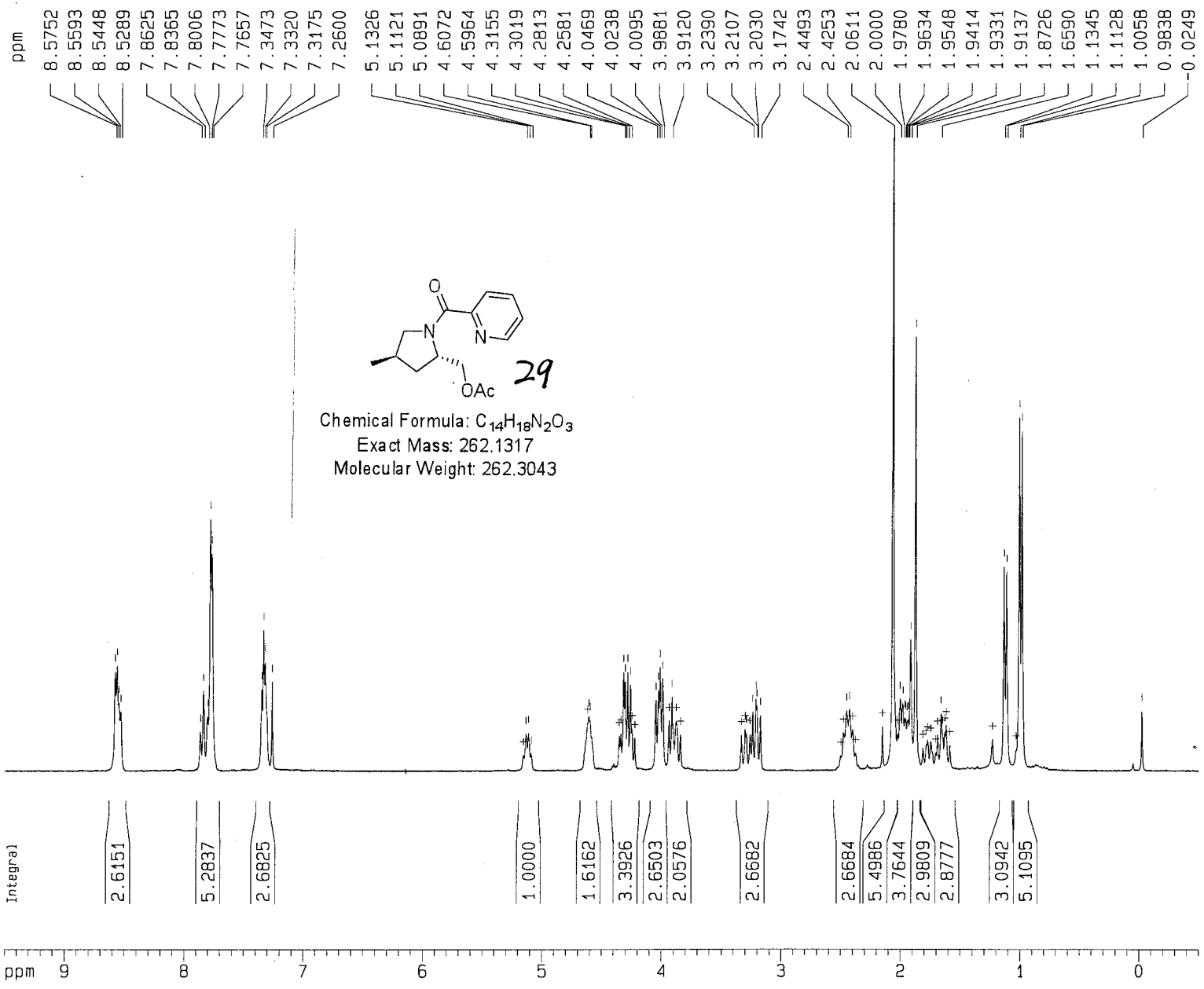
CPDPRG2	waltz16
NUC2	1H
PCPD2	114.00 usec
PL2	0.00 dB
PL12	24.00 dB
PL13	24.00 dB
SFO2	400.1316005 MHz

F2 - Processing parameters

SI	32768
SF	100.6127290 MHz
WDW	no
SSB	0
LB	0.00 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



Current Data Parameters

NAME	1011hg3-123H
EXPNO	96601
PROCNO	1

F2 - Acquisition Parameters

Date_	20111011
Time	19.17
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	181
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

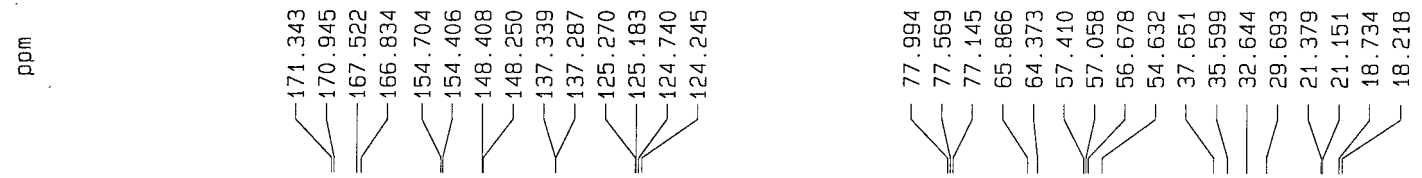
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

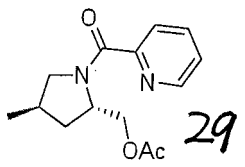
F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

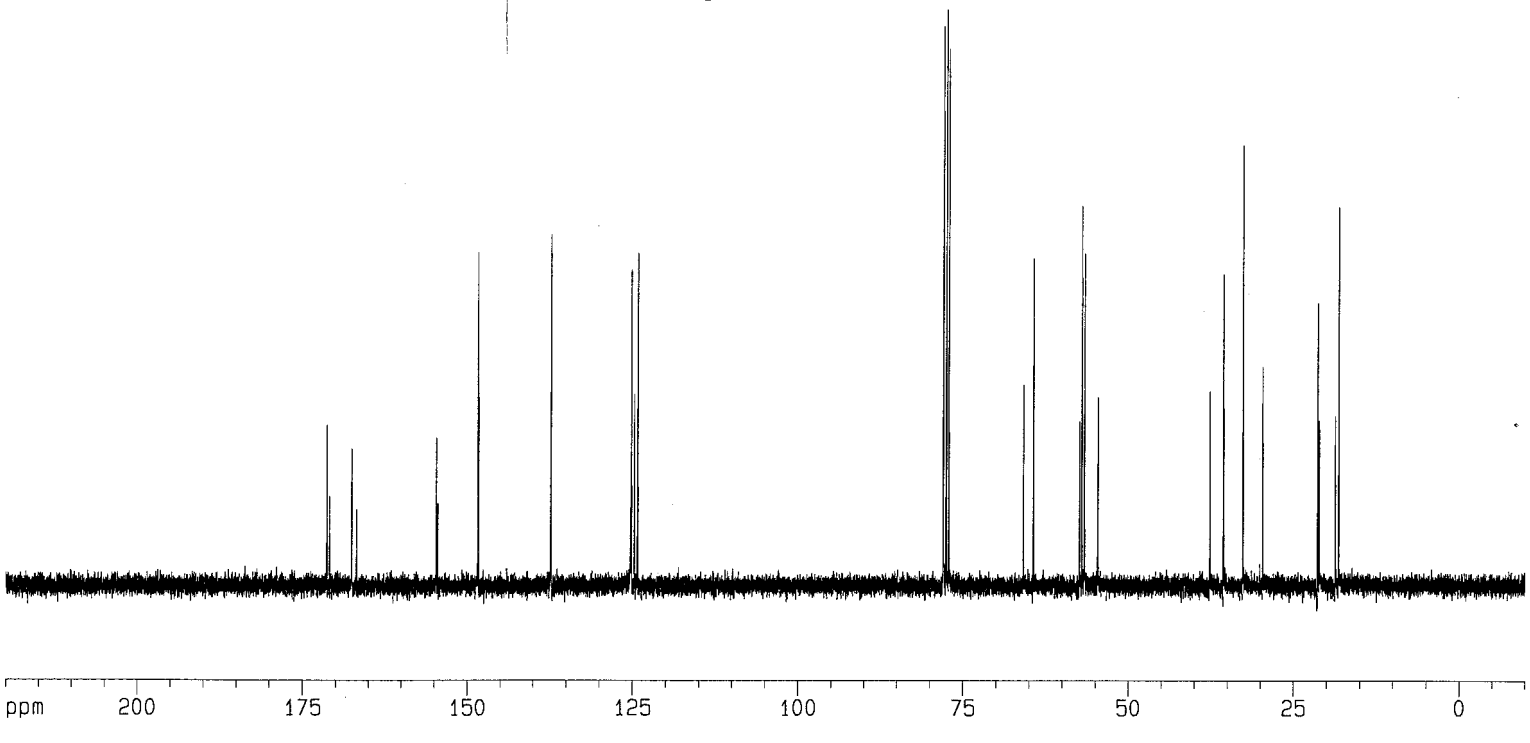
CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm





29

Chemical Formula: $C_{14}H_{18}N_2O_3$
Exact Mass: 262.1317
Molecular Weight: 262.3043

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Current Data Parameters
NAME          1011hg2-123C
EXPNO                96601
PROCNO                   1

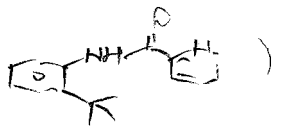
F2 - Acquisition Parameters
Date_              20111011
Time                 20.06
INSTRUM              spect
PROBHD     5 mm QNP 1H/1
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     701
DS                       4
SWH              18796.992 Hz
FIDRES           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

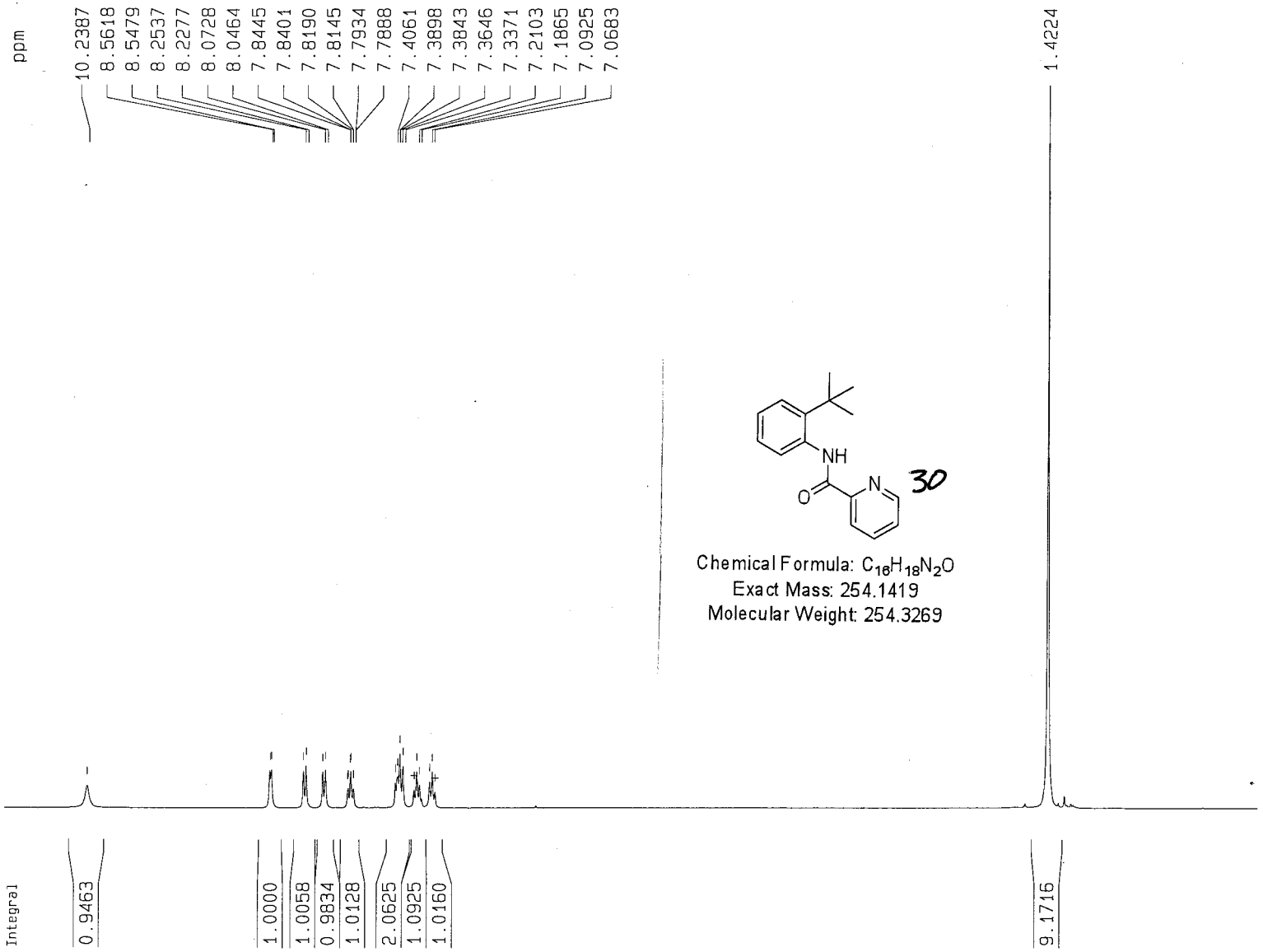
============ CHANNEL f1 ============
NUC1                   13C
P1                    5.25 usec
PL1                  -6.00 dB
SFO1           75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2          waltz16
NUC2                   1H
PCPD2               115.00 usec
PL2                   0.00 dB
PL12                 19.70 dB
PL13                 19.70 dB
SFO2          299.8711995 MHz

F2 - Processing parameters
SI                   32768
SF             75.4023410 MHz
WDW                     no
SSB                      0
LB                    0.00 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
```





Chemical Formula: $C_{16}H_{18}N_2O$
Exact Mass: 254.1419
Molecular Weight: 254.3269

Current Data Parameters

NAME	zsy-gang-sub1
EXPNO	3482
PROCNO	1

F2 - Acquisition Parameters

Date_	20111031
Time	20.24
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	101.6
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

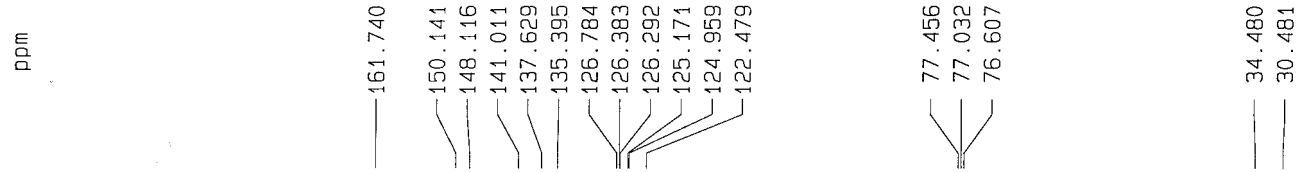
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

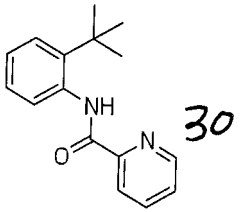
F2 - Processing parameters

SI	32768
SF	299.8700385 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

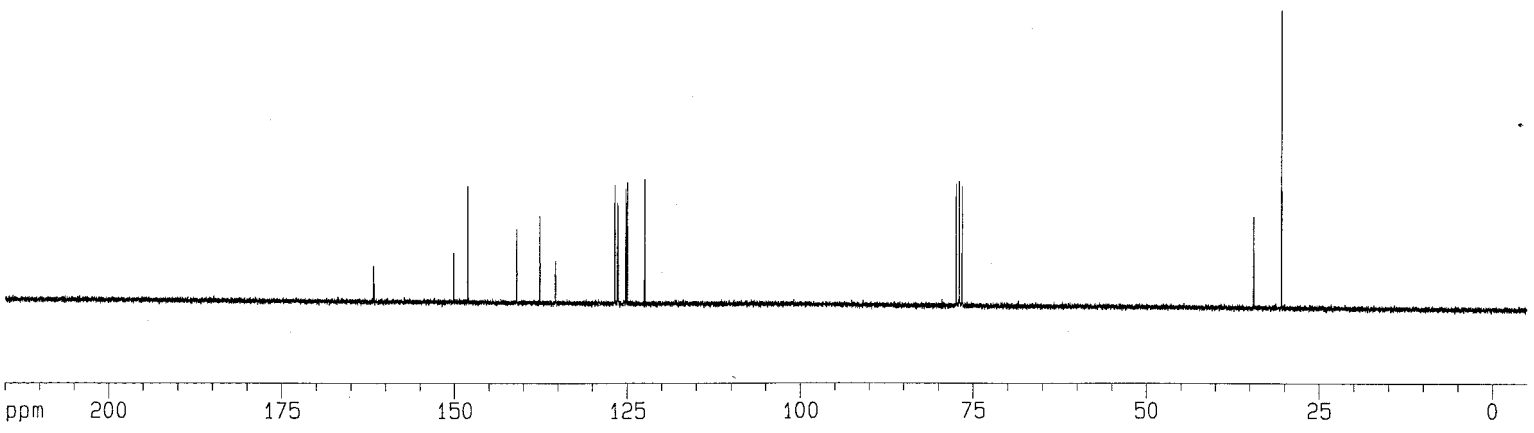
1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-0.500 ppm
F2	-149.94 Hz
PPMCM	0.57500 ppm/cm
HZCM	172.42526 Hz/cm





Chemical Formula: $C_{16}H_{18}N_2O$
Exact Mass: 254.1419
Molecular Weight: 254.3269




```
Current Data Parameters
NAME      zsy-gang-sub1c
EXPNO             3482
PROCNO               1

F2 - Acquisition Parameters
Date_         20111031
Time             20.59
INSTRUM          spect
PROBHD    5 mm QNP 1H/1
PULPROG        zgpg30
TD              65536
SOLVENT         CDCl3
NS                515
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                5.25 usec
PL1              -6.00 dB
SFO1        75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2        waltz16
NUC2               1H
PCPD2         115.00 usec
PL2              0.00 dB
PL12            19.70 dB
PL13            19.70 dB
SFO2       299.8711995 MHz

F2 - Processing parameters
SI                32768
SF          75.4023775 MHz
WDW                  no
SSB                   0
LB                0.00 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
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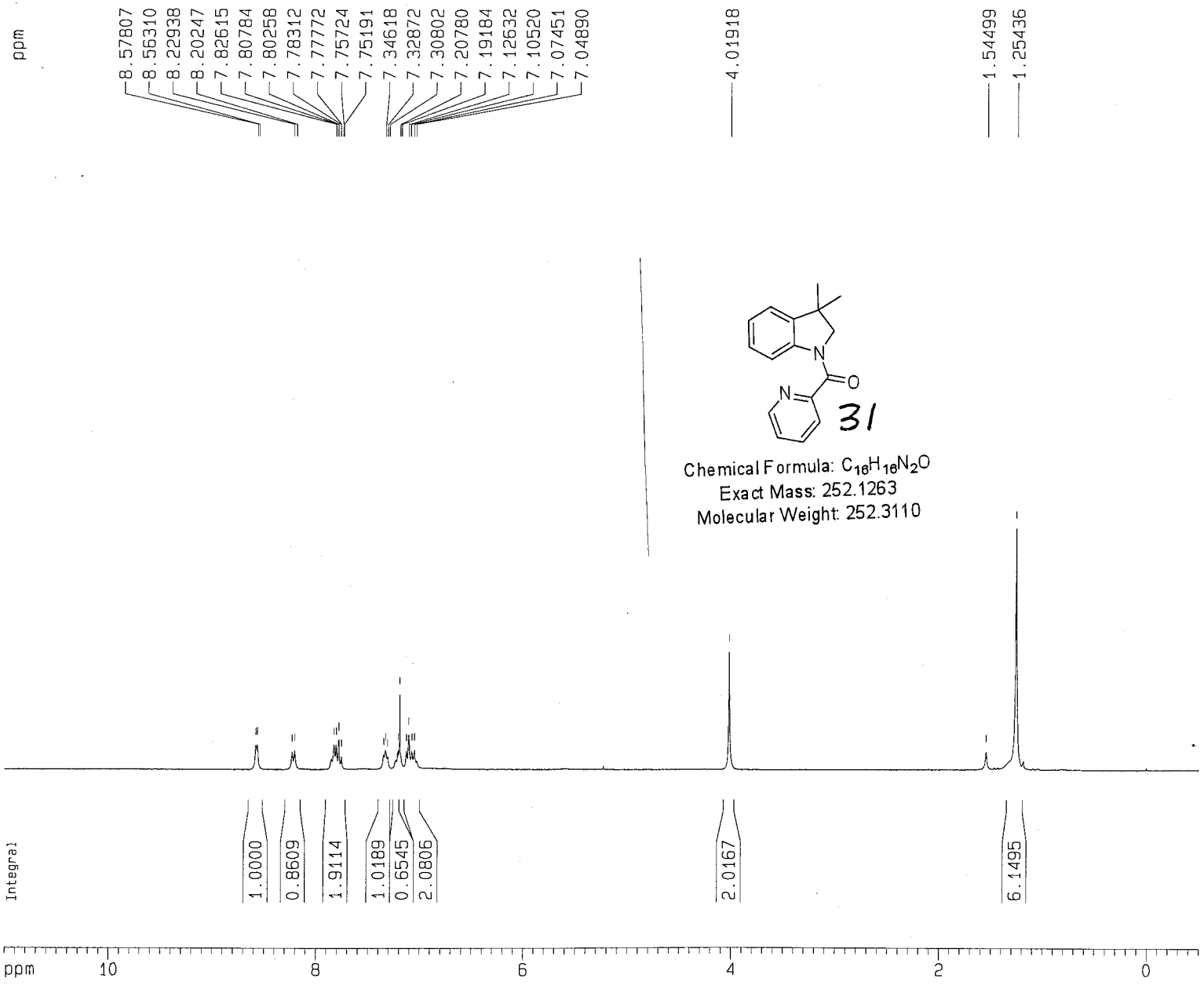


31

Chemical Formula: $C_{16}H_{16}N_2O$
Exact Mass: 252.1263
Molecular Weight: 252.3110

Current Data Parameters

NAME	zsy-gang-ah
EXPNO	3482
PROCNO	1

F2 - Acquisition Parameters

Date_	20111101
Time	0.31
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	724.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

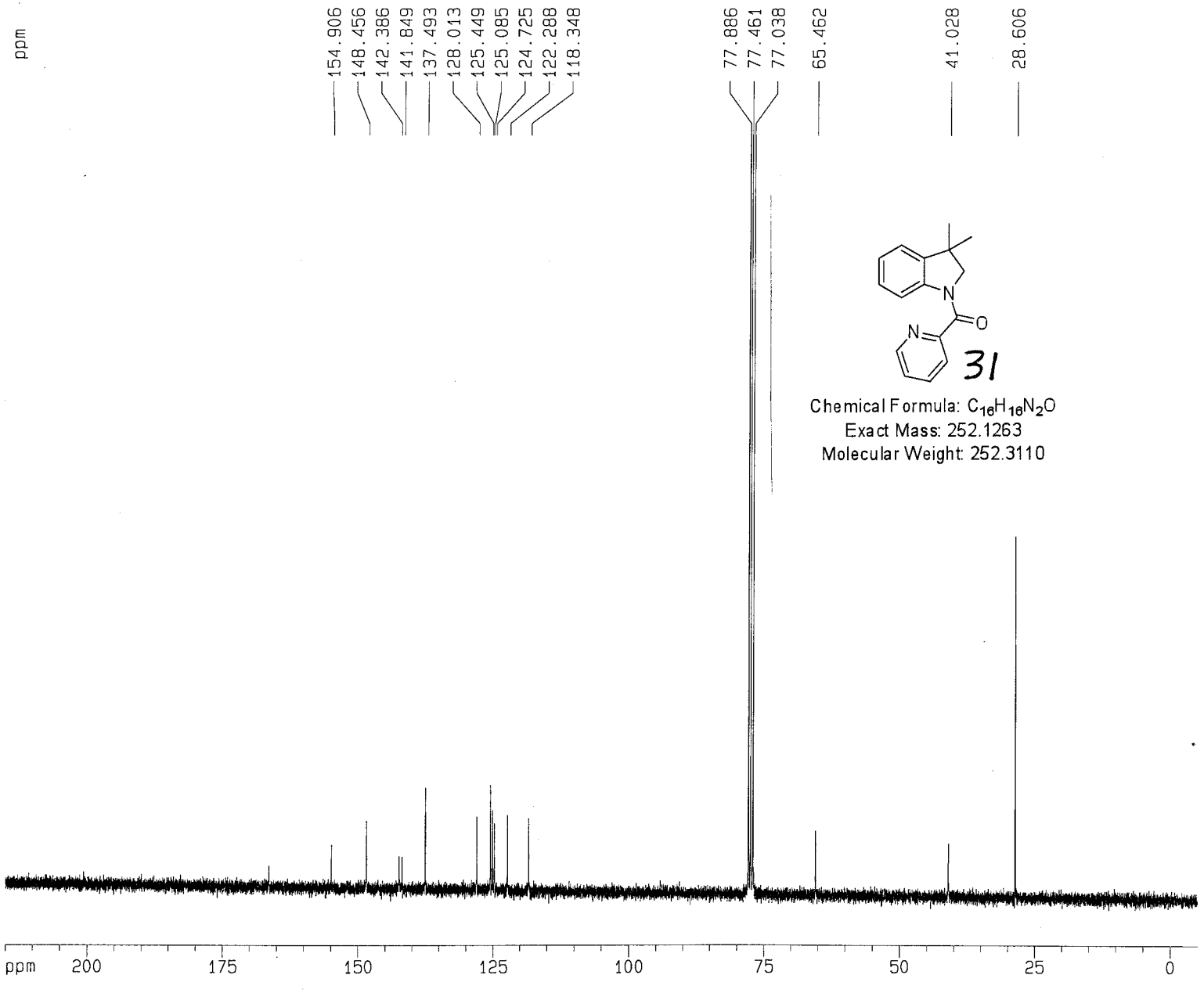
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700306 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	11.000 ppm
F1	3298.57 Hz
F2P	-0.500 ppm
F2	-149.94 Hz
PPMCM	0.57500 ppm/cm
HZCM	172.42526 Hz/cm



Current Data Parameters

NAME	zsy-gang-ahc
EXPNO	100401
PROCNO	1

F2 - Acquisition Parameters

Date_	20111102
Time	23.16
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	8428
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

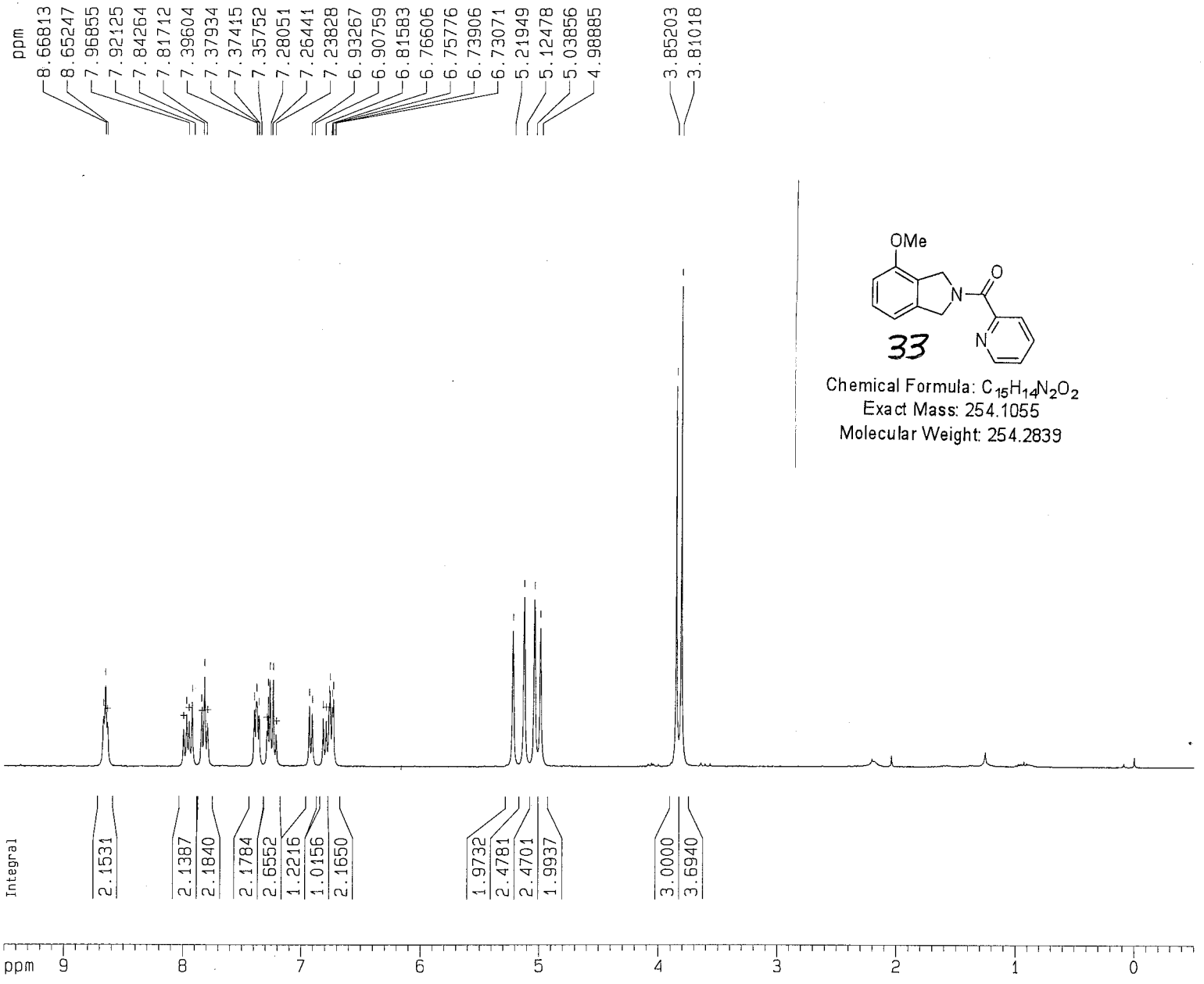
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



33

Chemical Formula: $C_{15}H_{14}N_2O_2$
Exact Mass: 254.1055
Molecular Weight: 254.2839

Current Data Parameters

NAME	1016hg3-130-1
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111016
Time	17.38
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	3
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 ========

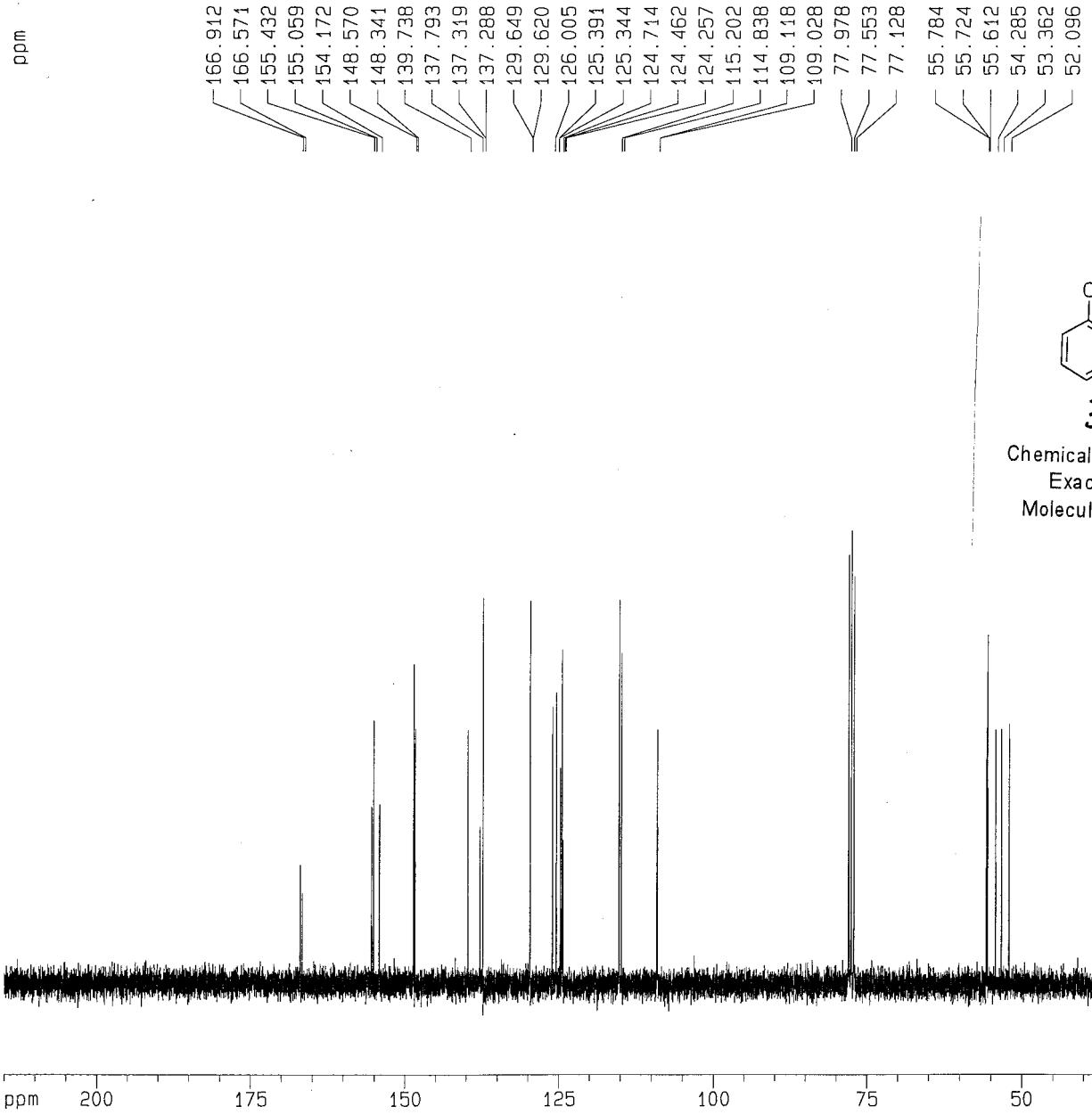
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700038 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



Current Data Parameters

NAME	1018hg3-130-1
EXPNO	178
PROCNO	1

F2 - Acquisition Parameters

Date_	20111018
Time	10.17
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	303
DS	4
SWH	18796.992 Hz
FIDRES	0.286819 Hz
AQ	1.7433076 sec
RG	406.4
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

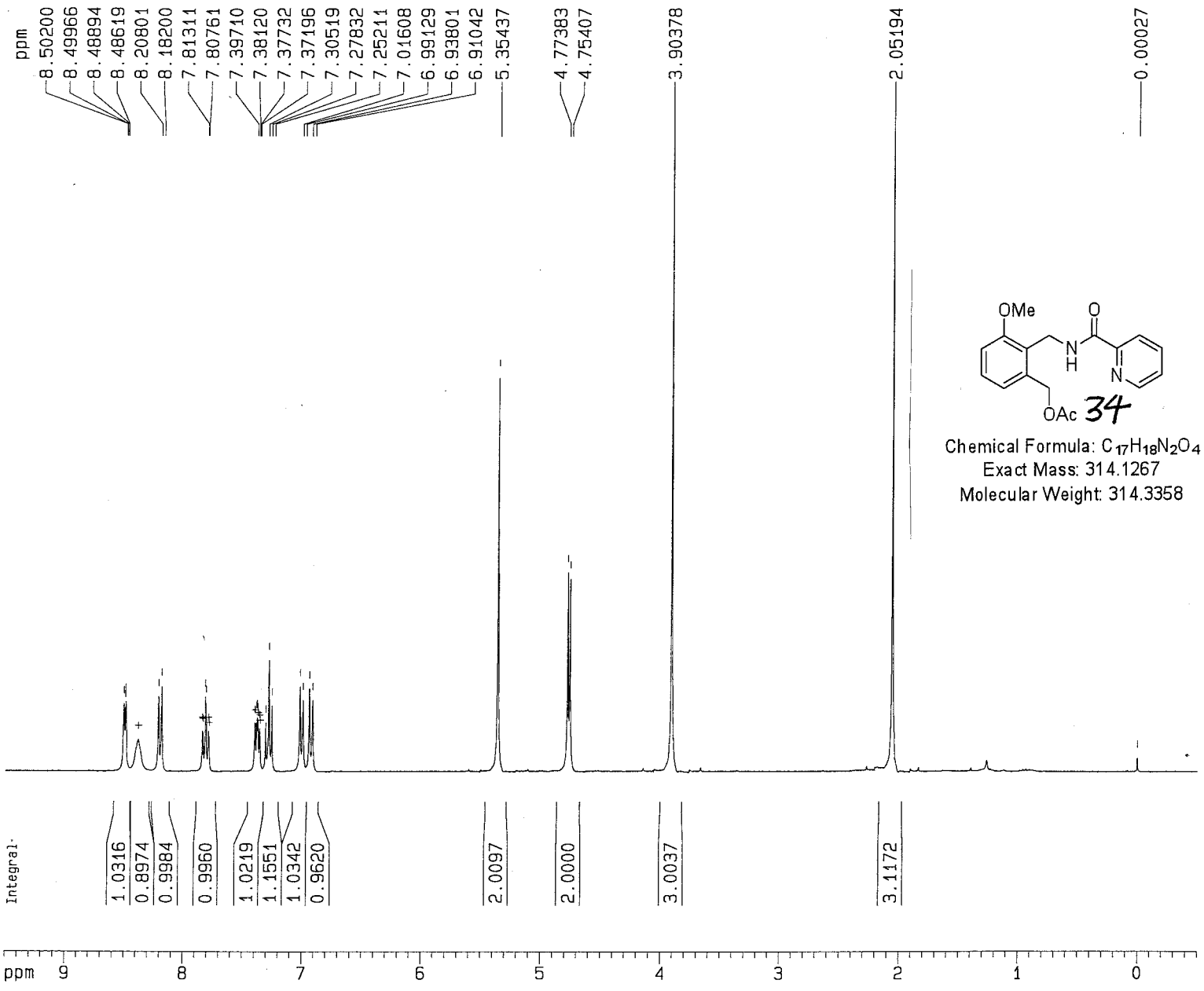
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



34

Chemical Formula: $C_{17}H_{18}N_2O_4$
Exact Mass: 314.1267
Molecular Weight: 314.3358

Current Data Parameters

NAME	1018hg3-133
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111018
Time	17.09
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	6
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 ========

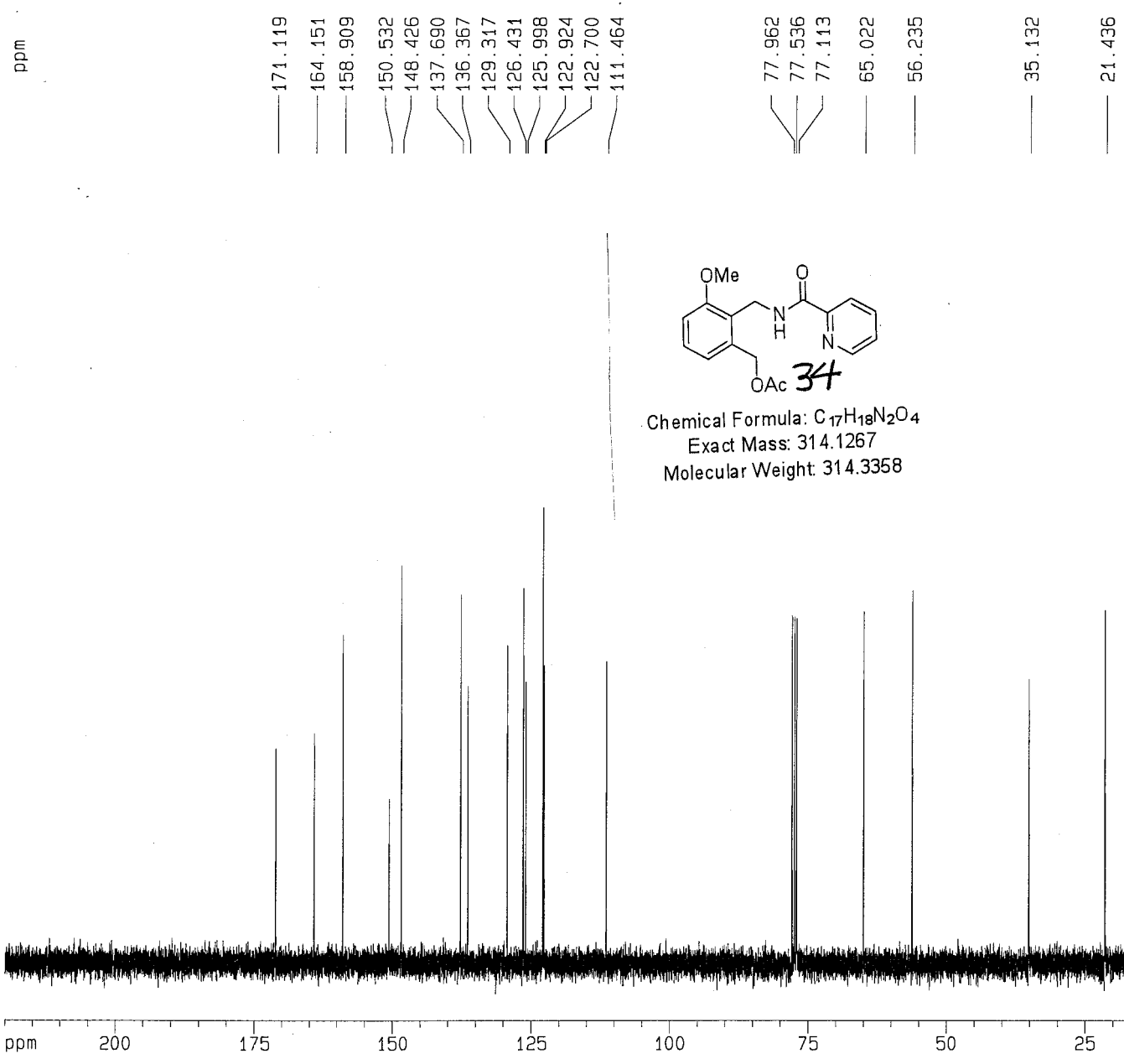
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SFO1	300.1318534 MHz

F2 - Processing parameters

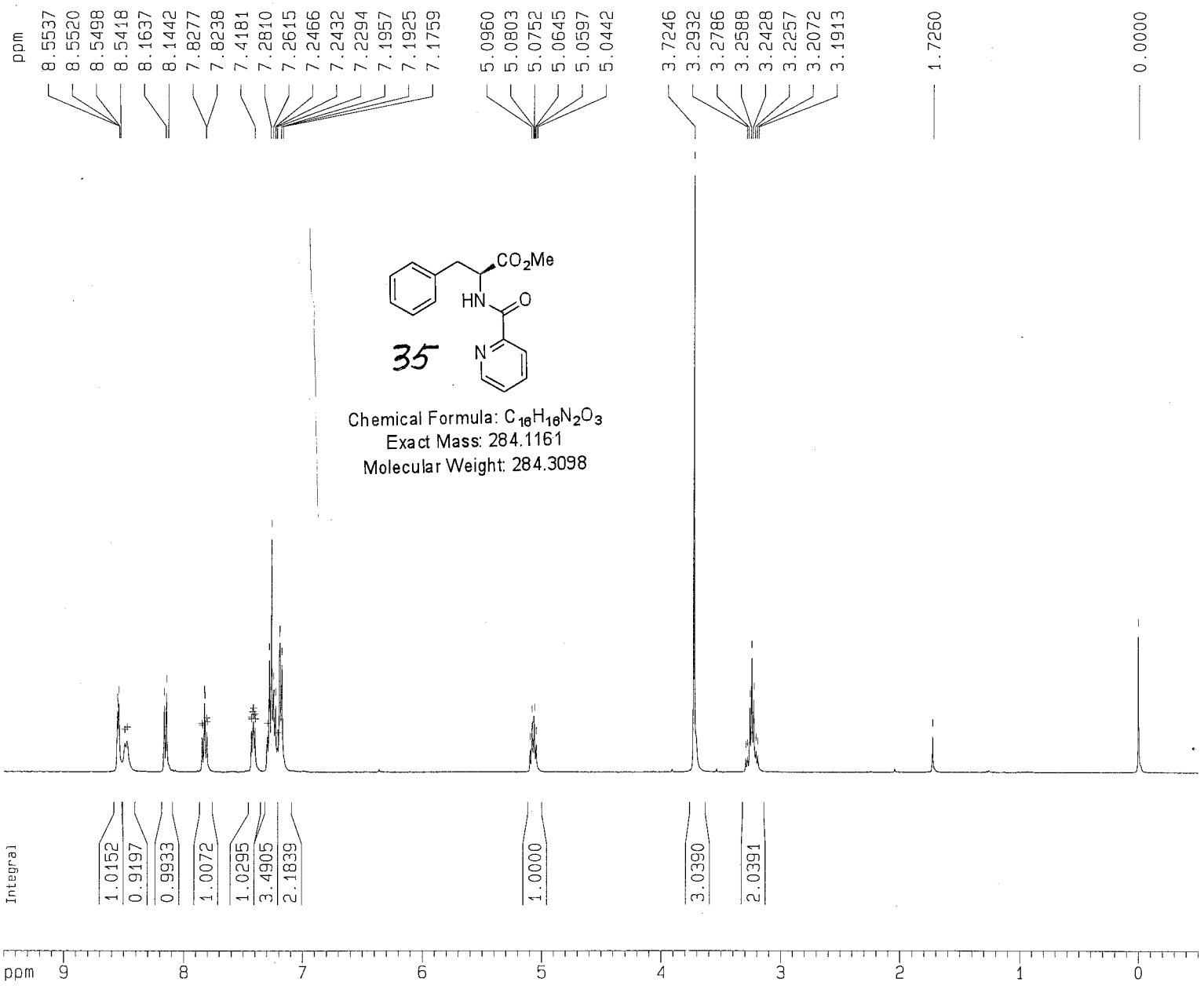
SI	32768
SF	300.1300016 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	-0.500 ppm
F2	-150.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	150.06500 Hz/cm




```
Current Data Parameters
NAME          1026hg3-133
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_          20111026
Time              18.45
INSTRUM           spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  206
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                 5.25 usec
PL1               -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2              0.00 dB
PL12            19.70 dB
PL13            19.70 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                  no
SSB                   0
LB                0.00 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
```



Current Data Parameters

NAME	0603hg3-3
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110603
Time	17.02
INSTRUM	spect
PROBHD	5 mm BBI 1H-B
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	645.1
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

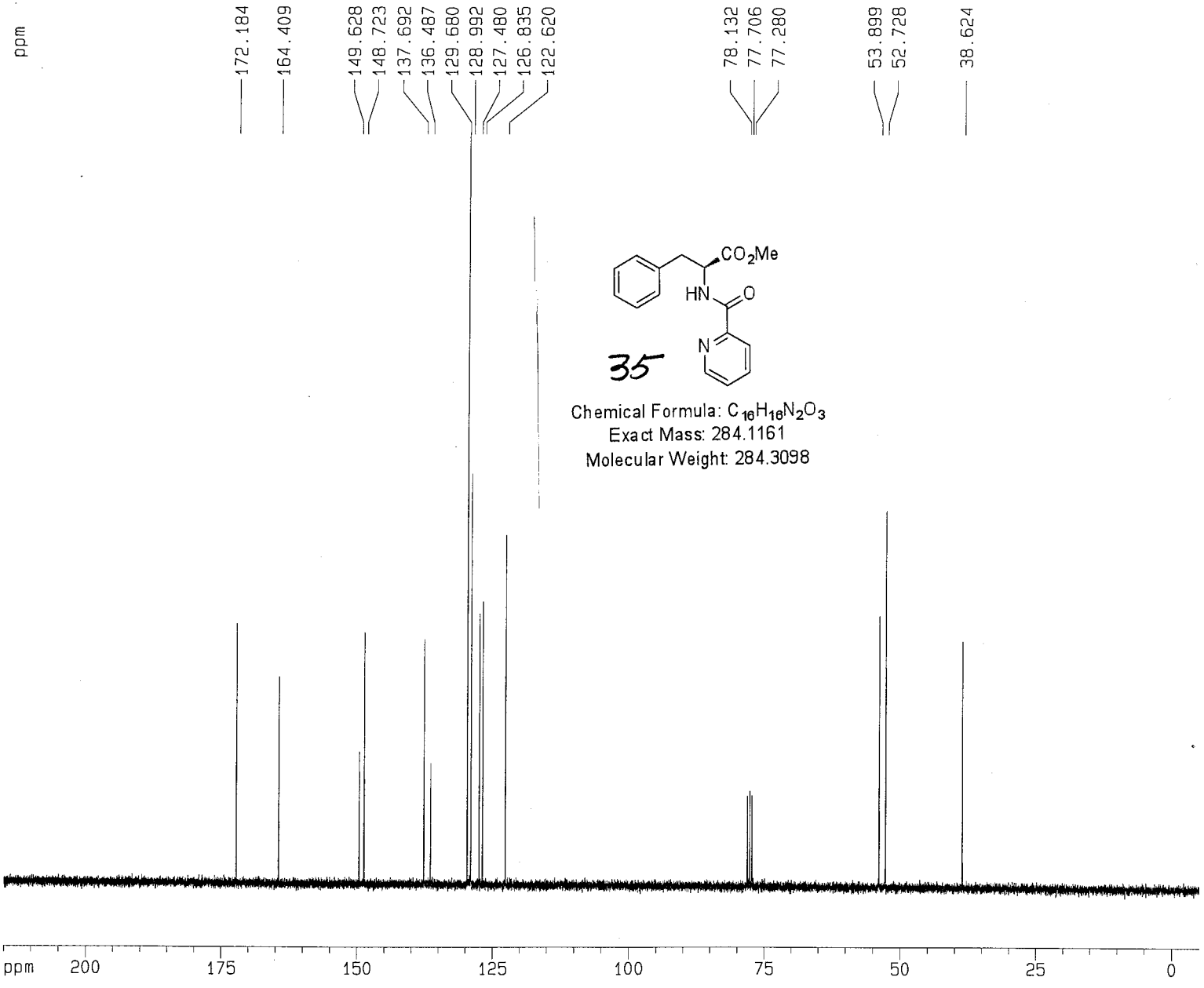
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300073 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	1103hg3-3
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111103
Time	14.29
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	101
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

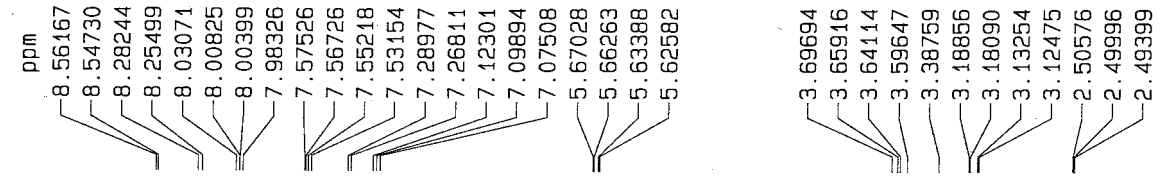
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

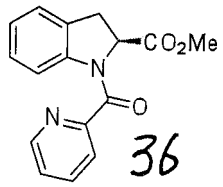
F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

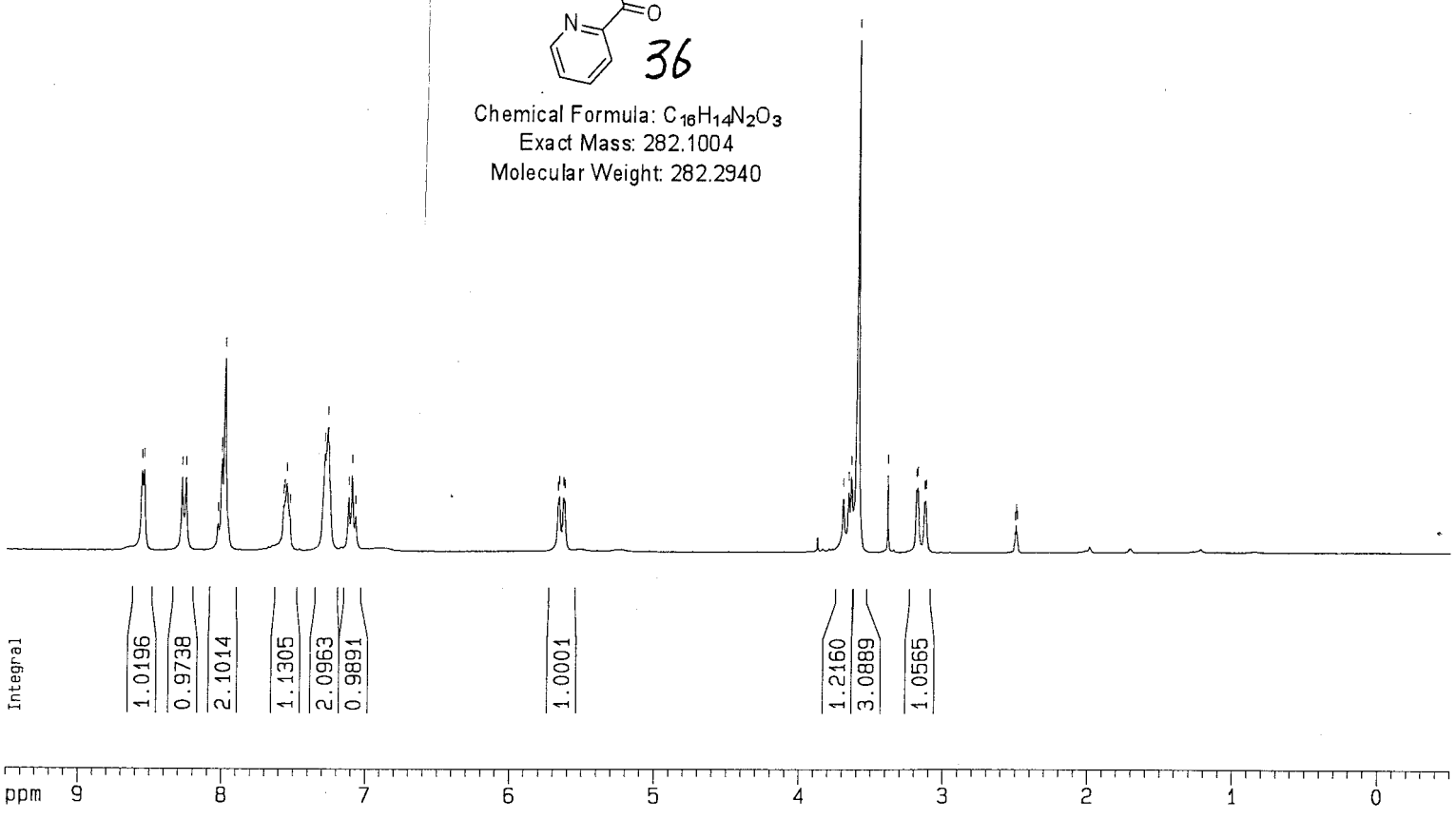
CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm





36

Chemical Formula: $C_{16}H_{14}N_2O_3$
Exact Mass: 282.1004
Molecular Weight: 282.2940



Current Data Parameters

NAME	1104hg3-142H
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20111104
Time	18.19
INSTRUM	spect
PROBHD	5 mm Multinu
PULPROG	zg30
TD	65536
SOLVENT	DMSO
NS	5
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 ========

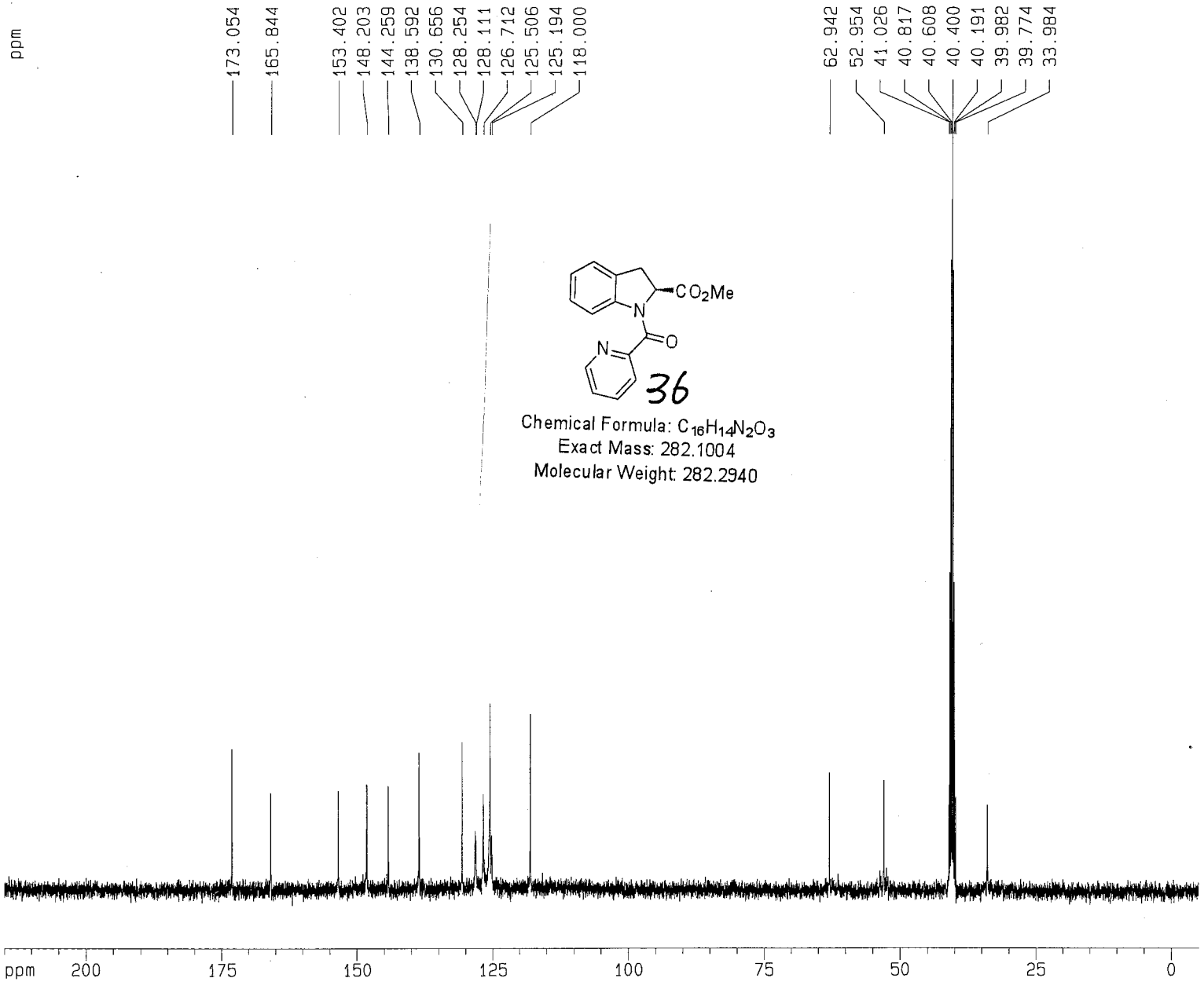
NUC1	1H
P1	10.10 usec
PL1	-6.00 dB
SF01	300.1318534 MHz

F2 - Processing parameters

SI	32768
SF	300.1300015 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2851.24 Hz
F2P	-0.500 ppm
F2	-150.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	150.06500 Hz/cm



36

Chemical Formula: $C_{16}H_{14}N_2O_3$
Exact Mass: 282.1004
Molecular Weight: 282.2940

Current Data Parameters

NAME	1105hg3-142C
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111105
Time	13.27
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	289
DS	4
SWH	25125.629 Hz
FIDRES	0.383387 Hz
AQ	1.3042164 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 ==========

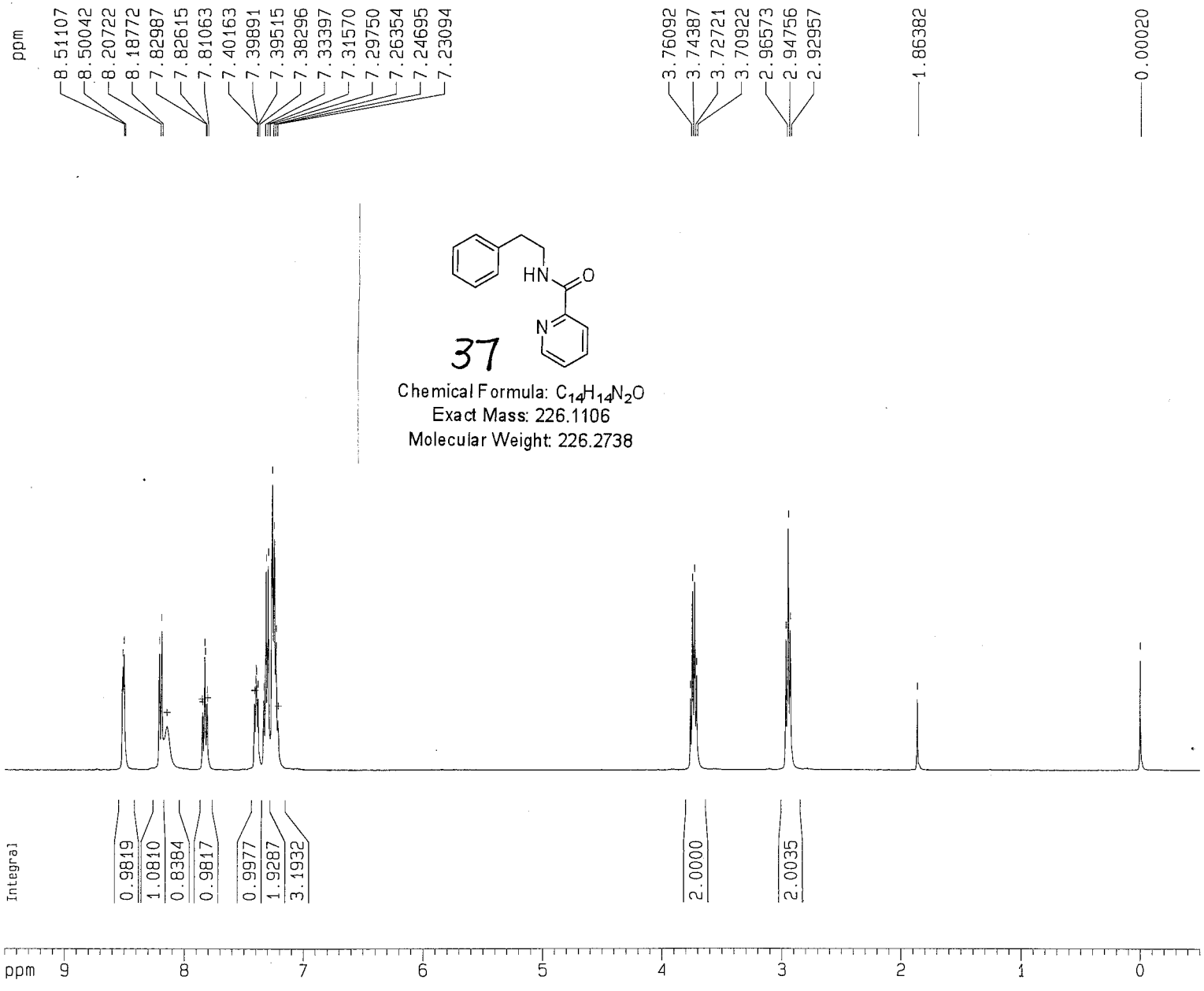
CPDPRG2	waltz16
NUC2	1H
PCPD2	114.00 usec
PL2	0.00 dB
PL12	24.00 dB
PL13	24.00 dB
SFO2	400.1316005 MHz

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



Current Data Parameters

NAME	0616hg2-256A
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20110616
Time	18.49
INSTRUM	spect
PROBHD	5 mm BBI 1H-B
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	322.5
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

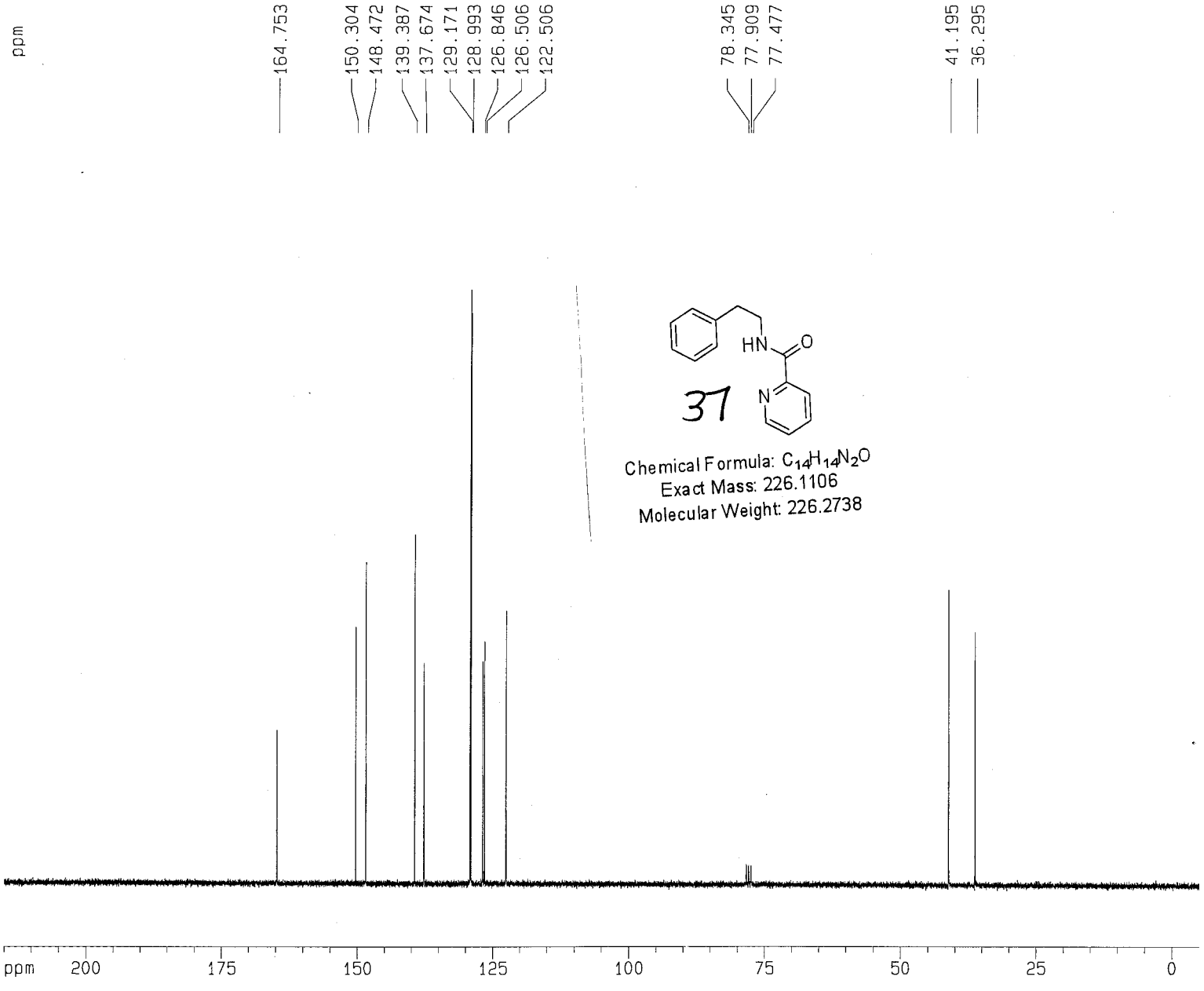
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300081 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	1028hg2-256A
EXPNO	350
PROCNO	1

F2 - Acquisition Parameters

Date_	20111028
Time	17.24
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	111
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

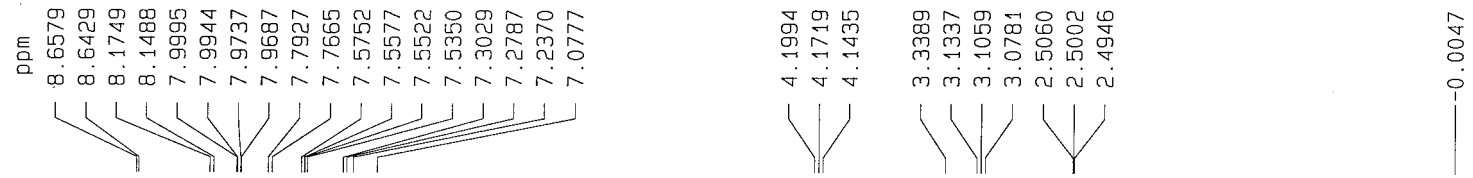
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

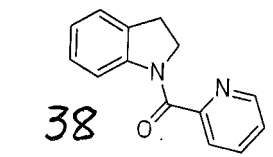
F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

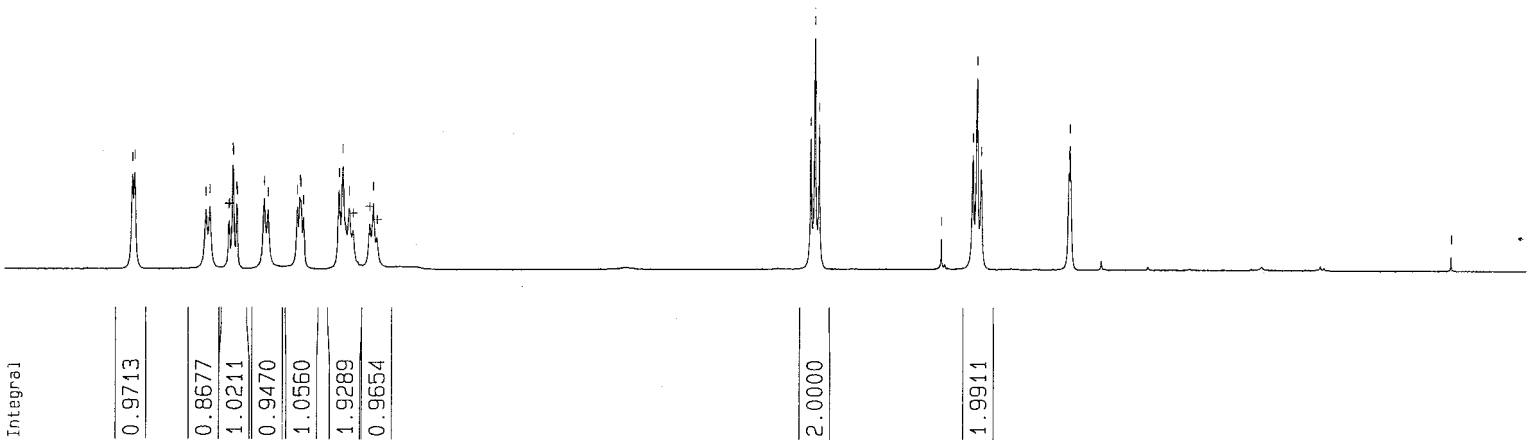
CX	20.00 cm
F1P	215.000 ppm
F1	16211.50 Hz
F2P	-5.000 ppm
F2	-377.01 Hz
PPMCM	11.00000 ppm/cm
HZCM	829.42578 Hz/cm





38

Chemical Formula: $C_{14}H_{12}N_2O$
Exact Mass: 224.0950
Molecular Weight: 224.2579



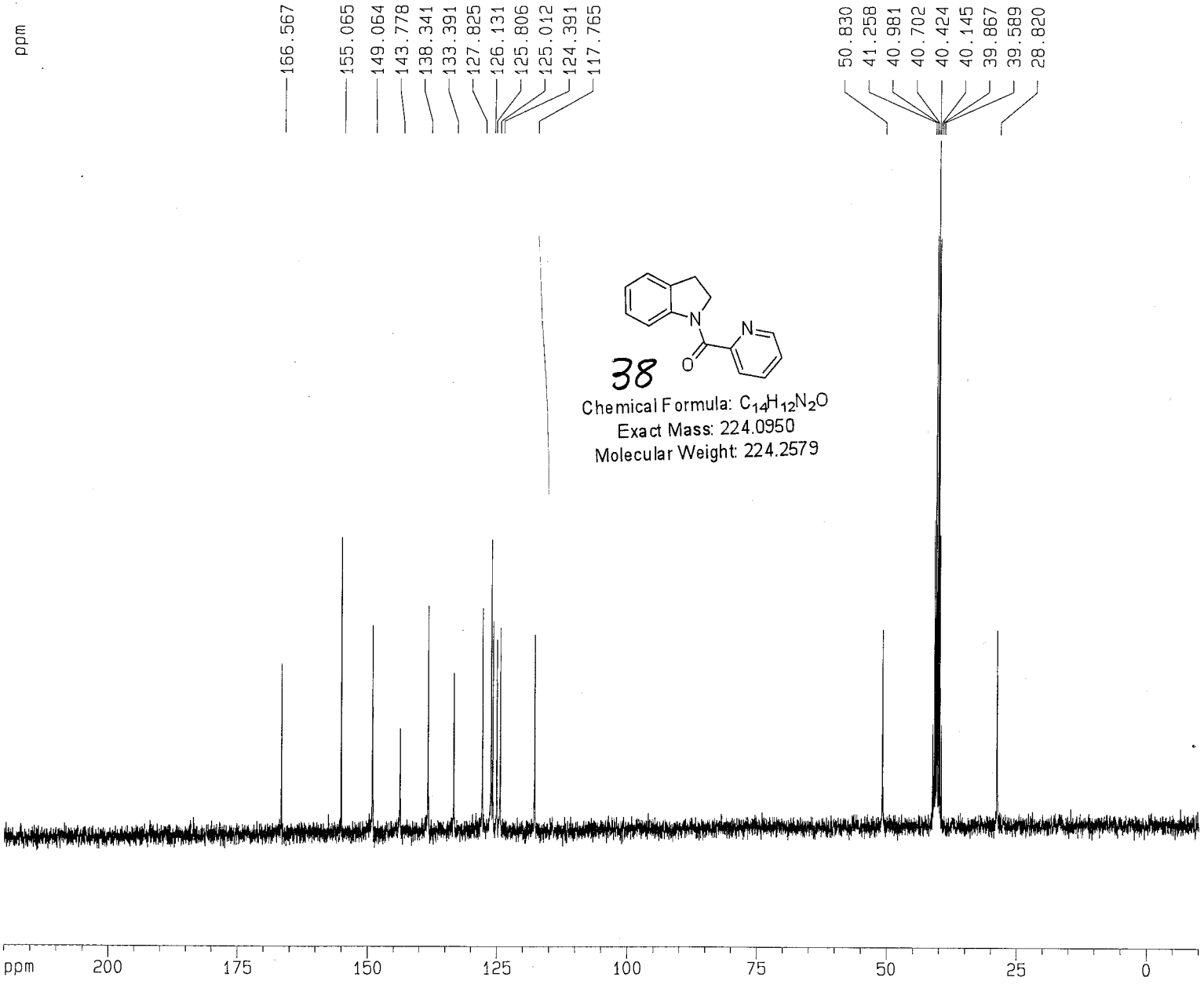
Current Data Parameters
NAME 1028hg3-137
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20111028
Time 15.09
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zg30
TD 65536
SOLVENT DMSO
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 12.10 usec
PL1 0.00 dB
SFO1 299.8718518 MHz

F2 - Processing parameters
SI 32768
SF 299.8700050 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

1D NMR plot parameters
CX 20.00 cm
F1P 9.500 ppm
F1 2848.76 Hz
F2P -0.500 ppm
F2 -149.93 Hz
PPMCM 0.50000 ppm/cm
HZCM 149.93500 Hz/cm




```
Current Data Parameters
NAME          1101hg3-137
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_          20111101
Time               9.50
INSTRUM           spect
PROBHD     5 mm QNP 1H/1
PULPROG          zgpg30
TD                65536
SOLVENT            DMSO
NS                   111
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                5.25 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

========== CHANNEL f2 ==========
CPDPRG2         waltz16
NUC2                1H
PCPD2          115.00 usec
PL2               0.00 dB
PL12             19.70 dB
PL13             19.70 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
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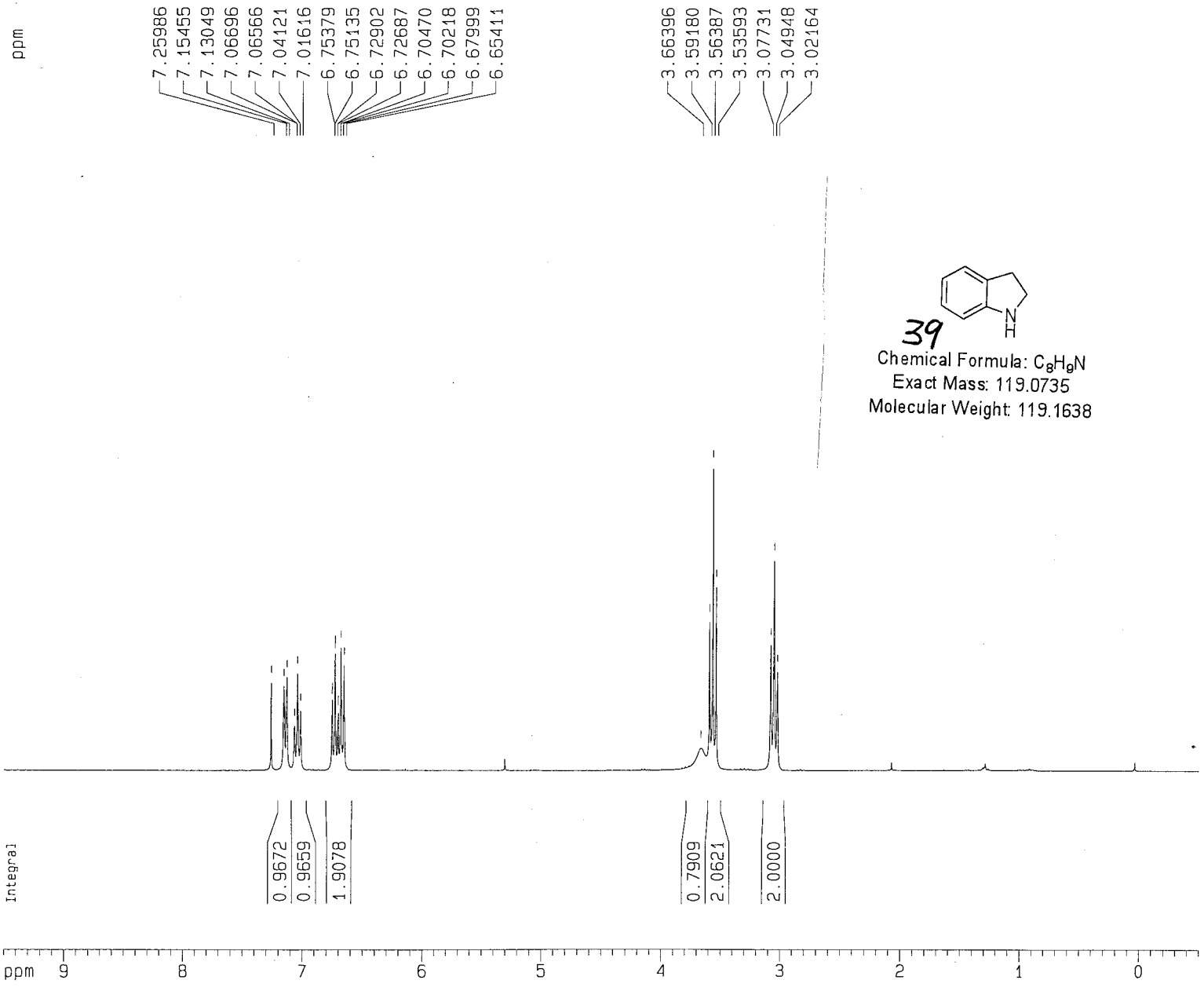


39

Chemical Formula: C_8H_9N
Exact Mass: 119.0735
Molecular Weight: 119.1638

Current Data Parameters

NAME	1030hg3-140
EXPNO	106
PROCNO	1

F2 - Acquisition Parameters

Date_	20111030
Time	17.58
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	161.3
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

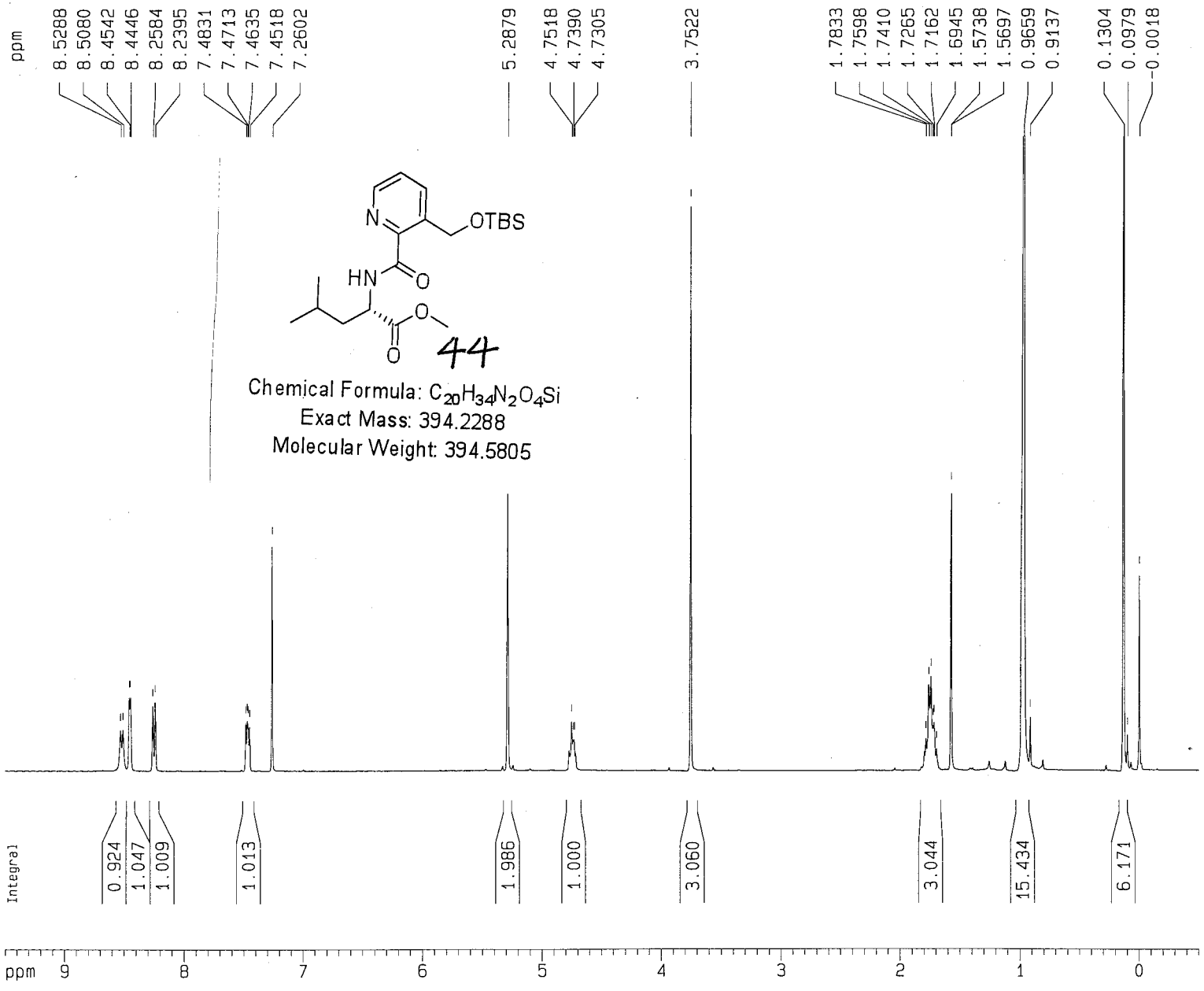
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



Current Data Parameters

NAME	0929hg3-112H
EXPNO	6
PROCNO	1

F2 - Acquisition Parameters

Date_	20110929
Time	18.29
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	65
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	287.4
DW	60.400 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

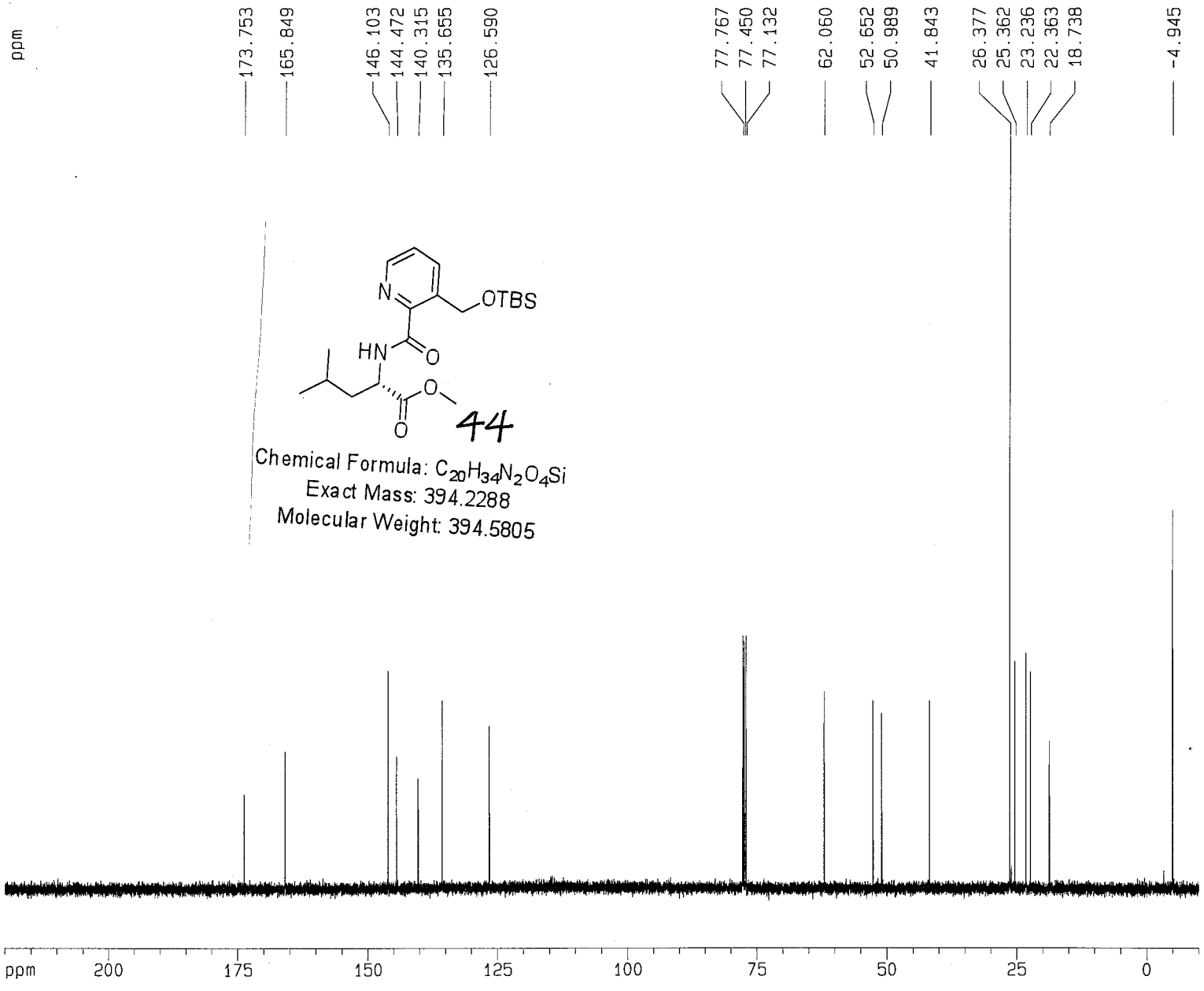
NUC1	1H
P1	6.45 usec
PL1	0.00 dB
SFO1	400.1324710 MHz

F2 - Processing parameters

SI	32768
SF	400.1300089 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	3801.24 Hz
F2P	-0.500 ppm
F2	-200.07 Hz
PPMCM	0.50000 ppm/cm
HZCM	200.06500 Hz/cm



Current Data Parameters

NAME	0929hg3-112C
EXPNO	6
PROCNO	1

F2 - Acquisition Parameters

Date_	20110929
Time	15.59
INSTRUM	spect
PROBHD	5 mm BBI 1H-
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	769
DS	4
SWH	25125.629 Hz
FIDRES	0.383387 Hz
AQ	1.3042164 sec
RG	8192
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 ==========

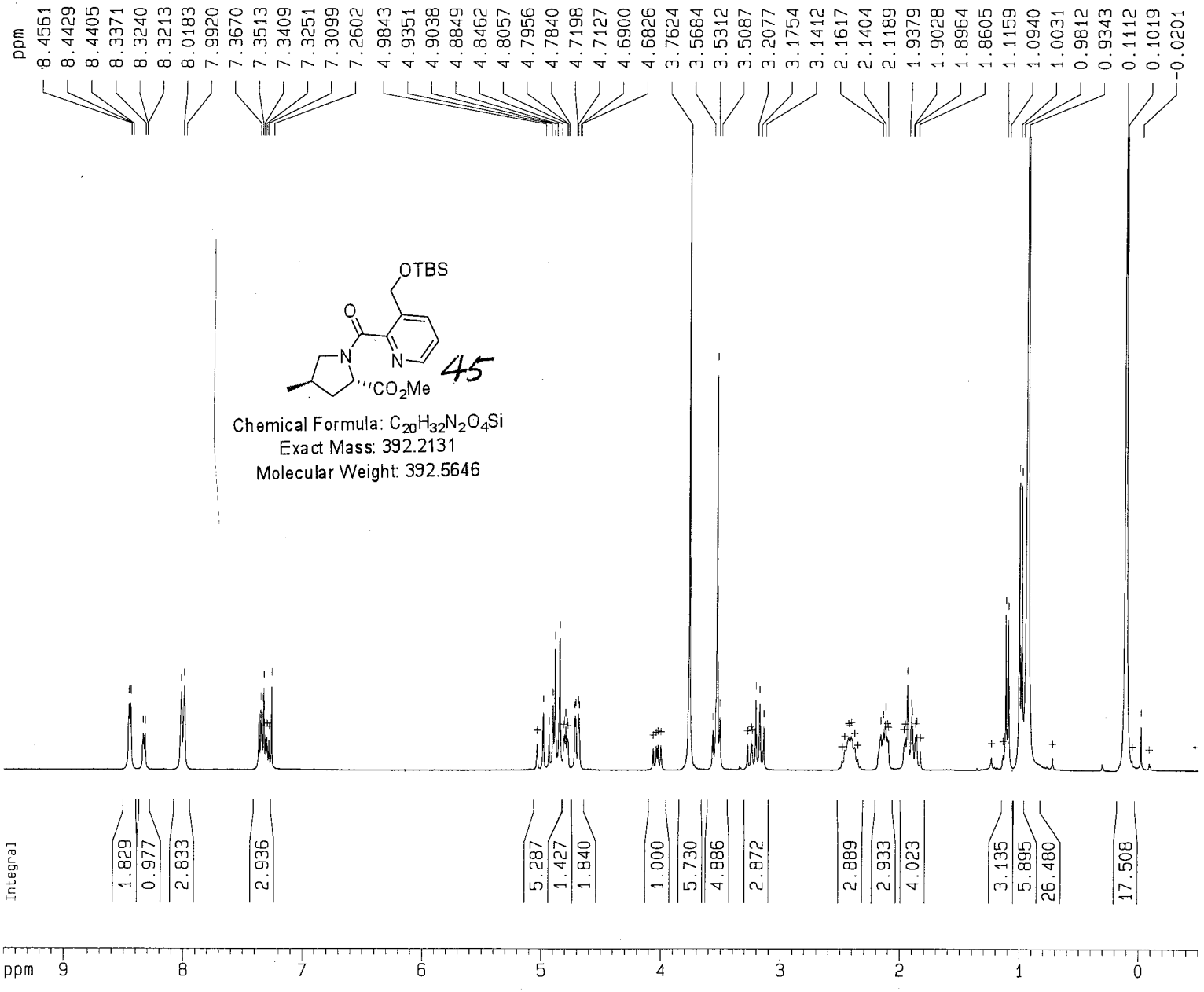
CPDPRG2	waltz16
NUC2	1H
PCPD2	114.00 usec
PL2	0.00 dB
PL12	24.00 dB
PL13	24.00 dB
SFO2	400.1316005 MHz

F2 - Processing parameters

SI	32768
SF	100.6127290 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.40

1D NMR plot parameters

CX	20.00 cm
F1P	220.000 ppm
F1	22134.80 Hz
F2P	-10.000 ppm
F2	-1006.13 Hz
PPMCM	11.50000 ppm/cm
HZCM	1157.04639 Hz/cm



Current Data Parameters

NAME	1007hg3-117-1
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20111007
Time	17.28
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	128
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

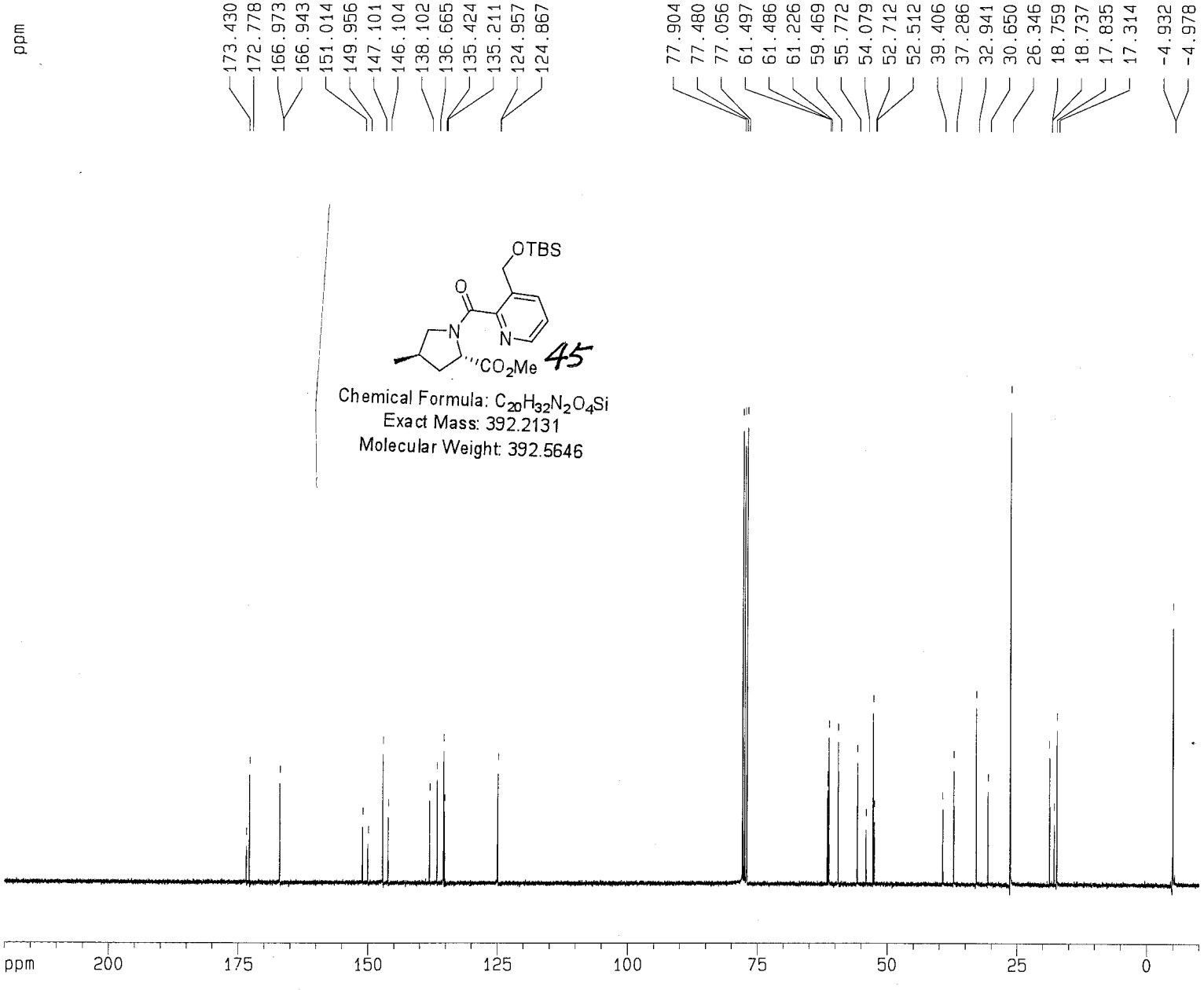
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700099 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm



3-117-1

Current Data Parameters

NAME	1009hg-C
EXPNO	334
PROCNO	1

F2 - Acquisition Parameters

Date_	20111010
Time	7.53
INSTRUM	spect
PROBHD	5 mm QNP 1H/1
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	12000
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	5.25 usec
PL1	-6.00 dB
SFO1	75.4106357 MHz

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

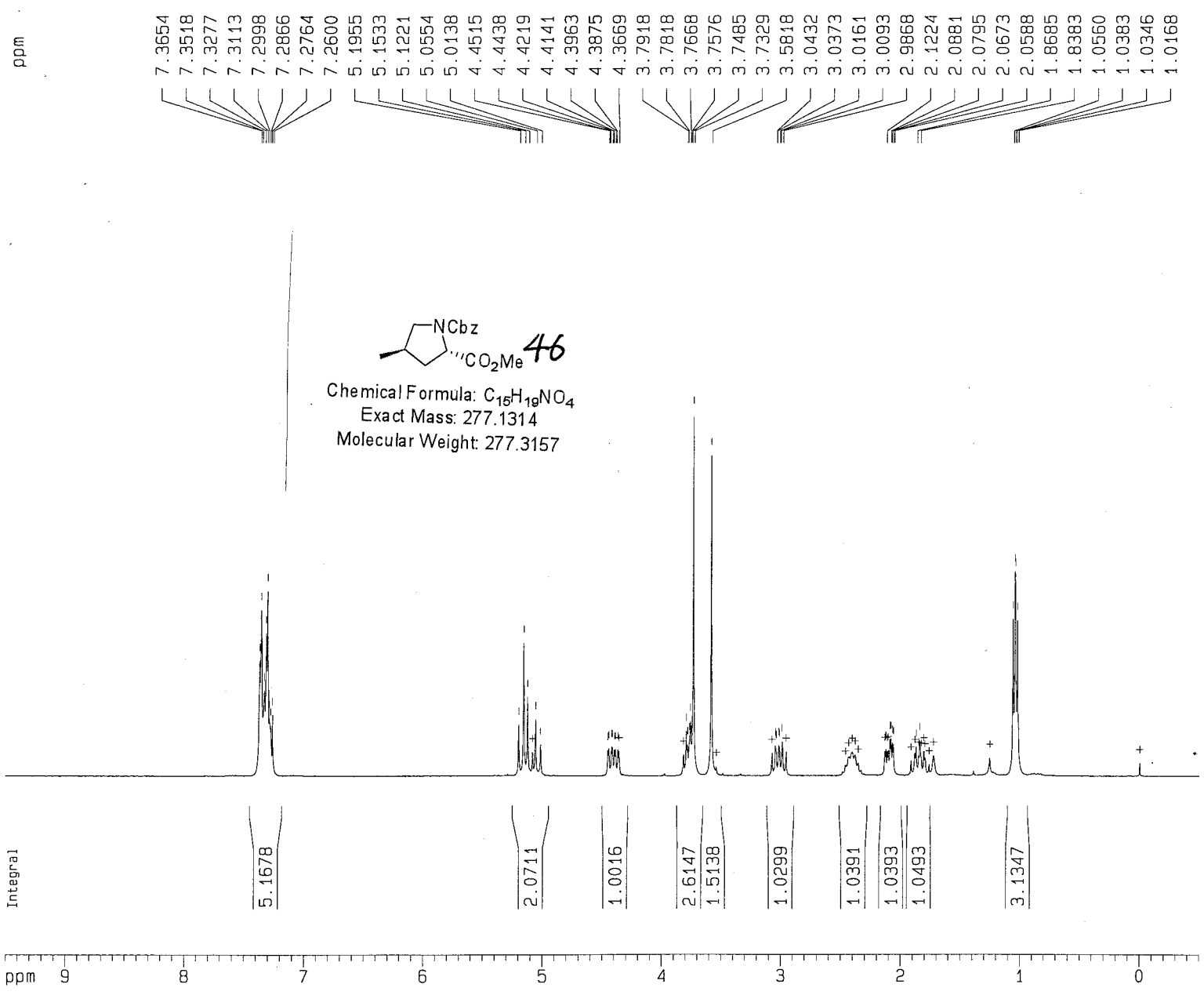
CPDPRG2	waltz16
NUC2	1H
PCPD2	115.00 usec
PL2	0.00 dB
PL12	19.70 dB
PL13	19.70 dB
SFO2	299.8711995 MHz

F2 - Processing parameters

SI	32768
SF	75.4023410 MHz
WDW	no
SSB	0
LB	0.00 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



Current Data Parameters

NAME	1103hg3-145-1
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111103
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	143.7
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

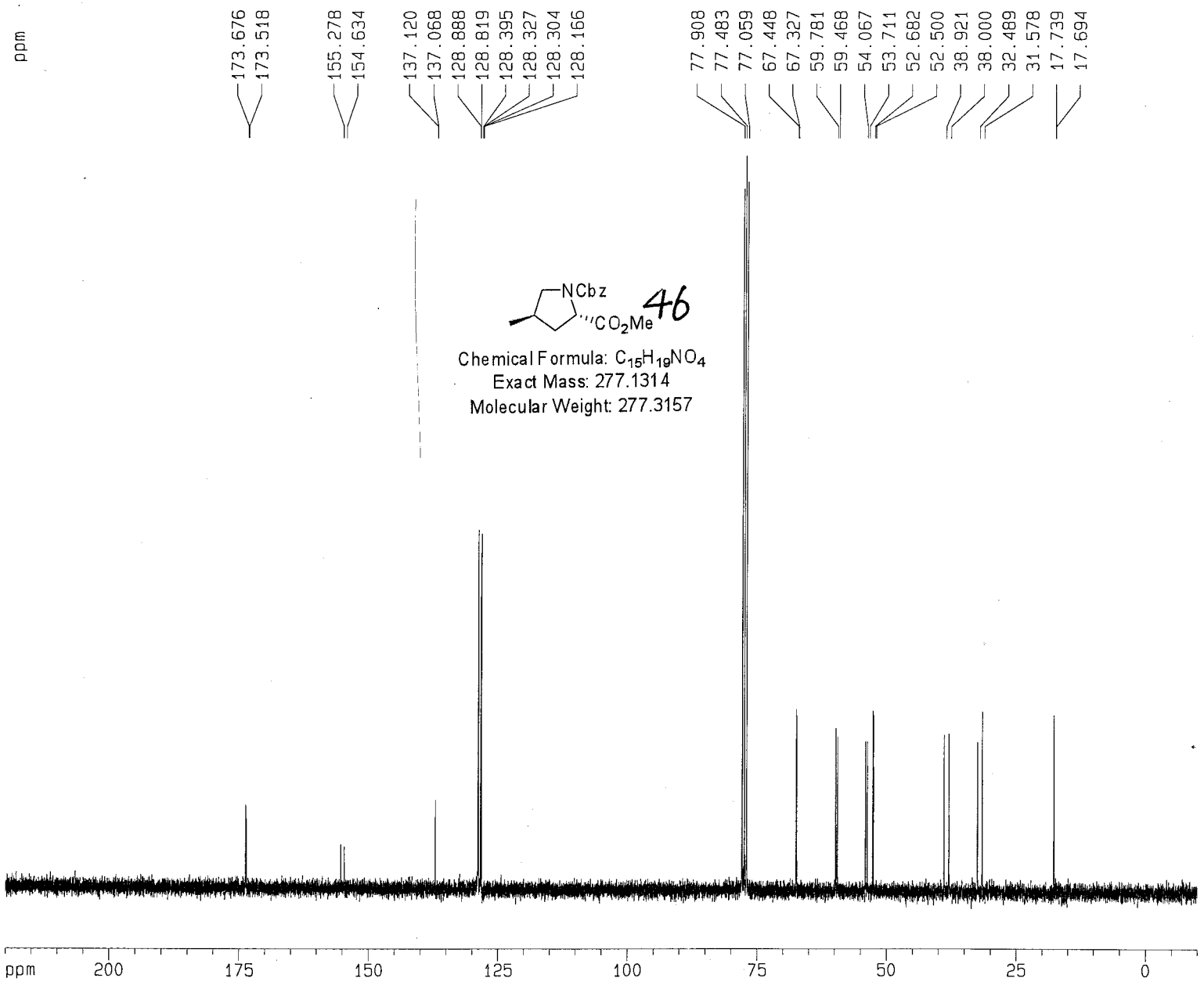
NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700101 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm

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Current Data Parameters
NAME      1103hg3-145-1C
EXPNO                1
PROCNO               1

F2 - Acquisition Parameters
Date_          20111103
Time              18.21
INSTRUM           spect
PROBHD    5 mm QNP 1H/1
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                 2099
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                5.25 usec
PL1              -6.00 dB
SFO1         75.4106357 MHz

============ CHANNEL f2 ============
CPDPRG2         waltz16
NUC2                1H
PCPD2           115.00 usec
PL2               0.00 dB
PL12             19.70 dB
PL13             19.70 dB
SFO2        299.8711995 MHz

F2 - Processing parameters
SI                32768
SF           75.4023410 MHz
WDW                  no
SSB                   0
LB                0.00 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
```

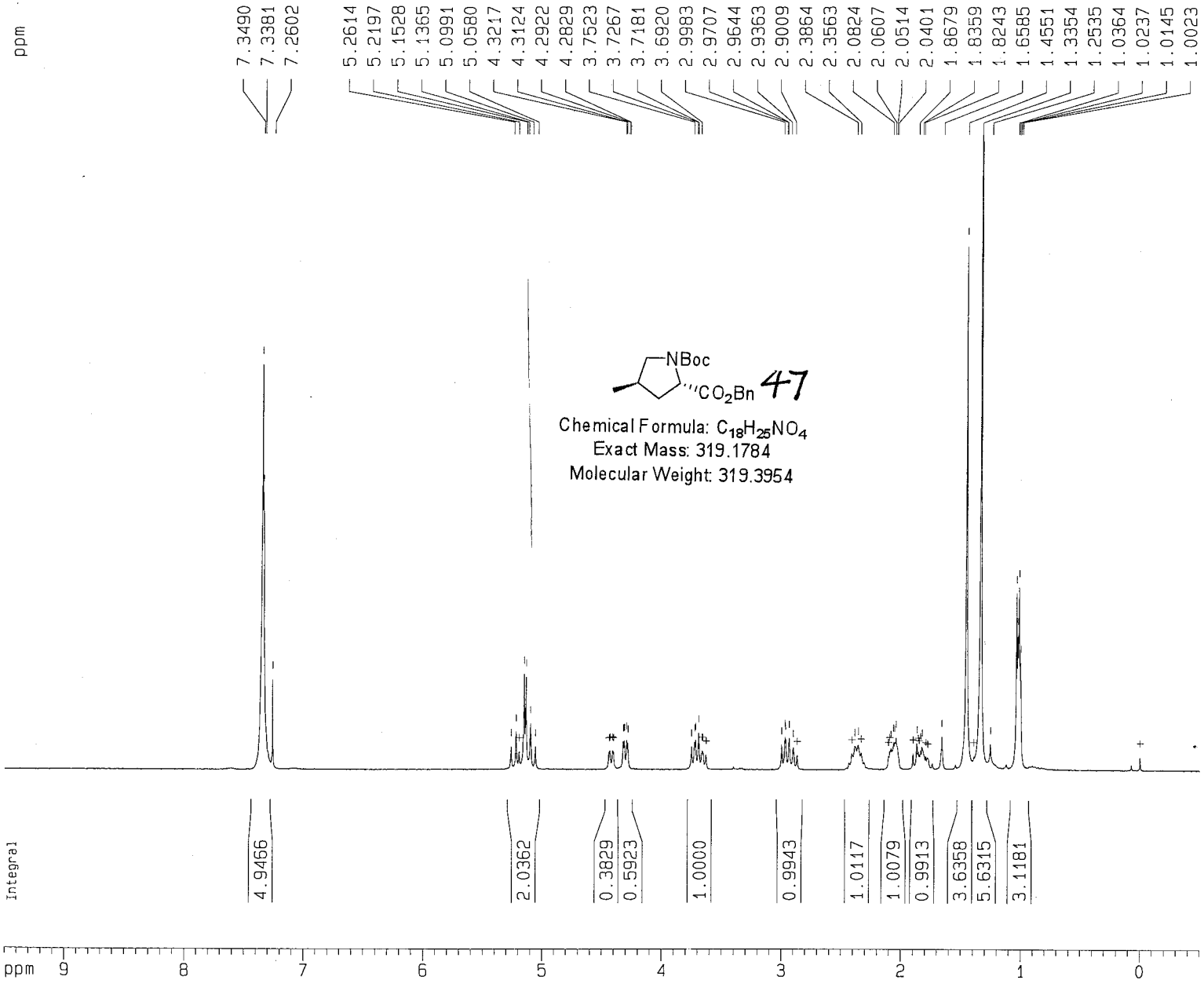

Current Data Parameters

NAME	1105hg3-147
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20111105
Time	18.24
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	228.1
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec

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

NUC1	1H
P1	12.10 usec
PL1	0.00 dB
SFO1	299.8718518 MHz

F2 - Processing parameters

SI	32768
SF	299.8700099 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

1D NMR plot parameters

CX	20.00 cm
F1P	9.500 ppm
F1	2848.76 Hz
F2P	-0.500 ppm
F2	-149.93 Hz
PPMCM	0.50000 ppm/cm
HZCM	149.93500 Hz/cm