Electronic Supplementary Material (ESI) for RSC Advances

Supporting Information

Oxidative rearrangement of indoles to oxindoles

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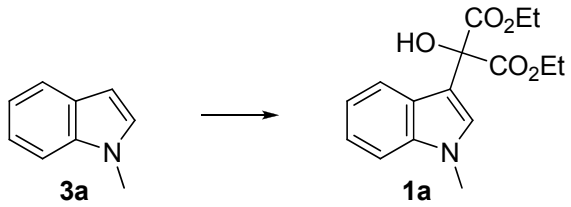
Contents

General. ^{1}H NMR spectra were recorded at 400 MHz. Chemical shifts are reported in ppm from tetramethylsilane with the solvent resonance as the internal standard ($CDCl_3$: 7.26 ppm). Data are reported as follows: chemical shift, integration, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, br = broad, m = multiplet), and coupling constants (Hz). ^{13}C NMR were recorded at 100 MHz with complete proton decoupling. Chemical shifts are reported in ppm from tetramethylsilane with the solvent as the internal standard ($CDCl_3$: 77.4 ppm). Mass spectrometry (m/z) was performed in ESI mode, with only molecular ions being reported. Infrared (IR) spectra ν_{max} are reported in cm^{-1}. Bands are characterized as broad (br), strong (s), medium (m) and weak (w). All purchased reagents were used as received without further purification. THF was pre-dried with 3Å molecular sieves then distilled from sodium benzophenone ketyl. All reactions were performed in oven dried glassware.

Synthesis of diethyl 2-hydroxy-2-(1-methyl-1*H*-indol-3-yl)malonate, 1a.[1]



3a **1a**

1-Methyl-1*H*-indole **3a** (1.07 g, 8.2 mmol) and diethyl ketomalonate (1.26 mL, 8.2 mmol) were refluxed in toluene (67 mL) for 16 hours open to air. The solvent was removed *in vacuo* to furnish the desired product **1a** as a red solid (2.36 g, 95%).

IR (neat): 1754 (w), 1722 (s), 1276 (m), 1217 (s), 1063 (m), 1017 (m), 732 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.74 (1H, d, *J* = 8.5 Hz), 7.40 (1H, s), 7.34 (1H, d, *J* = 8.5 Hz), 7.26 (1H, t, *J* = 7.6 Hz), 7.14 (1H, t, *J* = 7.6 Hz), 4.27-4.40 (5H, m), 3.80 (3H, s), 1.32 (6H, t, *J* = 7.6 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 170.4 (2C), 137.3, 128.5, 125.9, 121.9, 121.0, 119.6, 110.3, 109.4, 77.6, 62.8 (2C), 33.0, 14.0 (2C).

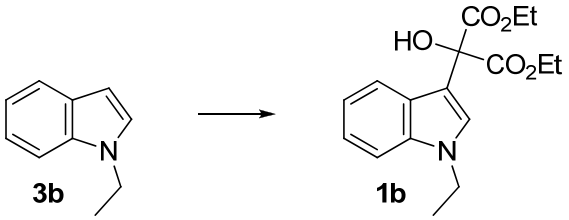
MS: m/z (M+23) 328.1

HRMS: m/z calc'd for $C_{16}H_{19}NaNO_5$ 328.1155, found 328.1146

[1] Pindur, U.; Kim, M.-H. *Arch. Pharm.* **1992**, *325*, 353.

Melting point: 77-79 °C (lit. 78 °C)[1]

Synthesis of diethyl 2-(1-ethyl-1*H*-indol-3-yl)-2-hydroxymalonate, 1b.



1-Ethyl-1*H*-indole **3b** (100 mg, 0.69 mmol) and diethyl ketomalonate (0.11 mL, 0.69 mmol) were refluxed in toluene (5.5 mL) for 16 hours. The solvent was removed *in vacuo* and the mixture was purified by flash chromatography on silica gel (20:1 petroleum ether 40-60 °C/ethyl acetate). The product **1b** was isolated as a brown/red oil (195 mg, 89%).

IR (neat): 1749 (m), 1723 (s), 1463 (m), 1273 (s), 1213 (s), 1189 (s), 1139 (m), 1093 (m), 1055 (m), 1008 (s), 745 (s) cm^{-1}

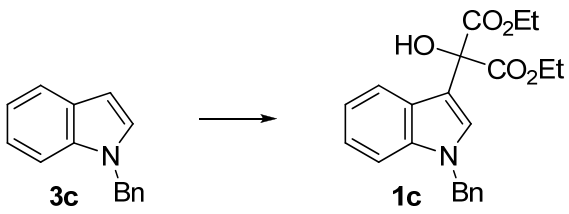
^1H NMR (400 MHz, $CDCl_3$): δ 7.74 (1H, d, *J* = 8.2 Hz), 7.46 (1H, s), 7.35 (1H, d, *J* = 8.2 Hz), 7.23 (1H, t, *J* = 8.0 Hz), 7.12 (1H, t, *J* = 7.5), 4.26-4.42 (5H, m), 4.15 (2H, q, *J* = 7.0), 1.48 (3H, t, *J* = 7.0), 1.30 (6H, t, *J* = 7.0 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 170.6 (2C), 136.7, 127.1, 126.3, 122.0, 121.5, 119.8, 110.6, 109.8, 78.0, 63.1 (2C), 41.4, 15.6, 14.3 (2C).

MS: m/z (M+23) 342.1

HRMS: m/z calc'd for $C_{17}H_{21}NaNO_5$ 342.1312, found 342.1312

Synthesis of diethyl 2-(1-benzyl-1*H*-indol-3-yl)-2-hydroxymalonate, 1c.



1-Benzyl-1*H*-indole **3c** (2.53 g, 12 mmol) and diethyl ketomalonate (1.89 mL, 12 mmol) were refluxed in toluene (100 mL) for 16 hours. The solvent was removed *in vacuo* and the

mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **1c** was isolated as a red solid (2.37 g, 51%).

IR (neat): 1722 (s), 1469 (w), 1238 (s), 1215 (m), 1090 (m), 1028 (m), 749 (m), 734 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.79 (1H, dd, *J* = 7.2, 1.1 Hz), 7.48 (1H, s), 7.22-7.33 (4H, m), 7.11-7.22 (4H, m), 5.27 (2H, s), 4.43 (1H, s), 4.23-4.41 (4H, m), 1.29 (6H, t, *J* = 7.1 Hz).

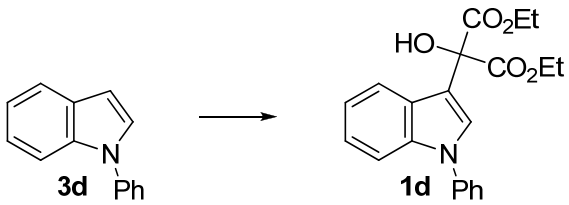
^{13}C NMR (100 MHz, $CDCl_3$): δ 170.4 (2C), 137.2, 137.1, 129.0 (2C), 128.3, 127.9, 127.2 (2C), 126.50, 122.3, 121.5, 120.1, 111.2, 110.2, 78.0, 63.1 (2C), 50.5, 14.3 (2C).

MS: m/z (M+23) 404.1

HRMS: m/z calc'd for $C_{22}H_{23}NaNO_5$ 404.1468, found 404.1534

Melting point: 68-71 ^{o}C

Synthesis of diethyl 2-hydroxy-2-(1-phenyl-1*H*-indol-3-yl)malonate, 1d.



1-Phenyl-1*H*-indole **3d** (319 mg, 1.7 mmol) and diethyl ketomalonate (0.26 mL, 1.7 mmol) were refluxed in toluene (14 mL) for 16 hours. The solvent was removed *in vacuo* and the mixture was purified by flash chromatography on silica gel (20:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **1d** was isolated as a yellow oil (258 mg, 43%).

IR (neat): 1731 (s), 1596 (w), 1500 (s), 1457 (m), 1205 (s), 1019 (m), 741 (s), 697 (s) cm^{-1}

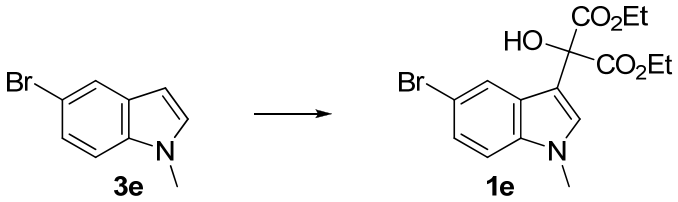
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.76-7.81 (1H, d, *J* = 7.5 Hz), 7.65 (1H, s), 7.48-7.55 (5H, m), 7.34-7.40 (1H, m), 7.14-7.25 (2H, m), 4.24-4.44 (5H, m), 1.31 (6H, t, *J* = 7.1 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 170.4 (2C), 139.6, 136.9, 129.9 (2C), 128.0, 127.1, 127.0, 124.9 (2C), 123.0, 121.7, 120.9, 113.2, 111.0, 77.9, 63.3 (2C), 14.4 (2C).

MS: m/z (M+23) 390.1

HRMS: m/z calc'd for $C_{21}H_{21}NaNO_5$ 390.1303, found 390.1312

Synthesis of diethyl 2-(5-bromo-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate, 1e.



5-Bromo-1-methyl-1*H*-indole **3e** (200 mg, 0.95 mmol) and diethyl ketomalonate (0.15 mL, 0.95 mmol) were refluxed in toluene (7.8 mL) for 16 hours. The solvent was removed *in vacuo* and the mixture was purified by flash chromatography on silica gel (3:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **1e** was isolated as an orange/brown solid (174 mg, 53%).

IR (neat): 1749 (m), 1720 (s), 1474 (m), 1274 (m), 1216 (m), 1196 (s), 1136 (s), 1107 (s), 1048 (s), 1016 (s), 781 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.88 (1H, d, *J* = 1.8 Hz), 7.36 (1H, s), 7.26-7.31 (1H, m), 7.14 (1H, d, *J* = 8.7 Hz), 4.22-4.40 (5H, m), 3.71 (3H, s), 1.30 (6H, t, *J* = 7.2 Hz).

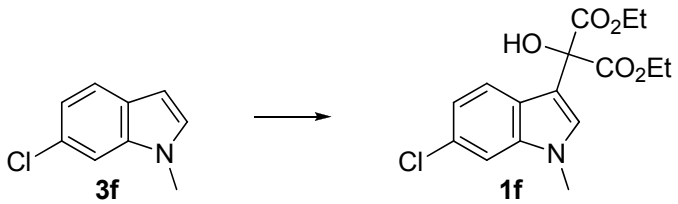
^{13}C NMR (100 MHz, $CDCl_3$): δ 170.3 (2C), 136.3, 129.9, 127.7, 125.0, 124.2, 113.4, 111.2, 110.2, 77.8, 63.3 (2C), 33.4, 14.3 (2C).

MS: m/z (M+23) 406.0

HRMS: m/z calc'd for $C_{16}H_{18}BrNaNO_5$ 406.0261, found 406.0262

Melting point: 109-111 ^{o}C

Synthesis of diethyl 2-(6-chloro-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate, 1f.



6-Chloro-1-methyl-1*H*-indole **3f** (200 mg, 1.2 mmol) and diethyl ketomalonate (0.19 mL, 1.2 mmol) were refluxed in toluene (9.7 mL) for 16 hours. The solvent was removed *in vacuo* and the mixture was purified by flash chromatography on silica gel (20:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **1f** was isolated as a brown solid (321 mg, 78%).

IR (neat): 1723 (s), 1217 (m), 1190 (s), 1111 (m), 1063 (s), 1019 (s), 928 (s), 802 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.63 (1H, d, *J* = 8.6 Hz), 7.35 (1H, s), 7.26-7.29 (1H, m), 7.07 (1H, dd, *J* = 8.6, 1.8 Hz), 4.39 (1H, br), 4.21-4.36 (4H, m), 3.69 (3H, s), 1.27 (6H, t, *J* = 7.1 Hz).

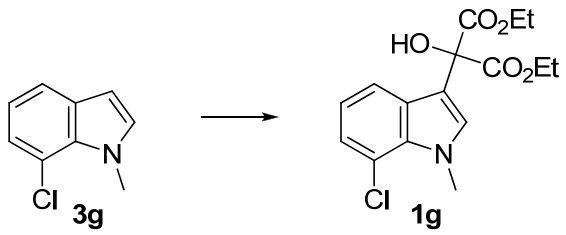
^{13}C NMR (100 MHz, $CDCl_3$): δ 170.4 (2C), 138.1, 129.5, 128.3, 124.8, 122.5, 120.7, 111.0, 109.8, 77.8, 63.3 (2C), 33.4, 14.4 (2C).

MS: m/z (M+23) 362.1

HRMS: m/z calc'd for $C_{16}H_{18}ClNaNO_5$ 362.0733, found 362.0766

Melting point: 86-89 ^{o}C

Synthesis of diethyl 2-(7-chloro-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate, 1g.



7-Chloro-1-methyl-1*H*-indole **3g** (100 mg, 0.60 mmol) and diethyl ketomalonate (0.09 mL, 0.60 mmol) were refluxed in toluene (4.8 mL) for 16 hours. The solvent was removed *in vacuo*, to furnish the desired product **1g** as a yellow oil (201 mg, 98%).

IR (neat): 1726 (s), 1246 (m), 1211 (s), 1193 (s), 1072 (s), 1037 (m), 854 (w), 782 (m), 734 (m) cm^{-1}

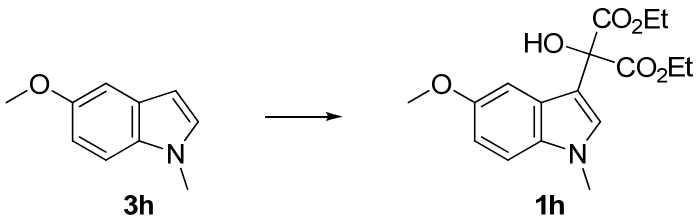
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.55-7.60 (1H, m), 7.31 (1H, s), 7.14 (1H, d, *J* = 7.6 Hz), 6.97 (1H, t, *J* = 7.8 Hz), 4.21-4.39 (5H, m), 4.12 (3H, s), 1.27 (6H, t, *J* = 7.1 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 170.0 (2C), 132.7, 131.3, 129.0, 123.5, 120.5, 119.9, 117.1, 110.4, 63.0 (2C), 37.1, 31.0, 14.1 (2C).

MS: m/z (M+23) 362.1

HRMS: m/z calc'd for $C_{16}H_{18}NaNO_5$ 362.0766, found 362.0780

Synthesis of diethyl 2-hydroxy-2-(5-methoxy-1-methyl-1H-indol-3-yl)malonate, 1h.



5-Methoxy-1-methyl-1*H*-indole **3h** (400 mg, 2.5 mmol), cerium(III) chloride heptahydrate (475 mg, 2.7 mmol) and diethyl ketomalonate (0.42 mL, 2.7 mmol) were dissolved in CH_2Cl_2 (8 mL) and stirred at room temperature for 6 hours. The reaction mixture was quenched by addition of saturated aqueous ammonium chloride solution and extracted with CH_2Cl_2. The organic layer was dried over $MgSO_4$, filtered and concentrated *in vacuo.* The mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **1h** was isolated as a pale yellow oil (0.79 g, 95%).

IR (neat): 1732 (s), 1490 (m),1219 (s) cm^{-1}

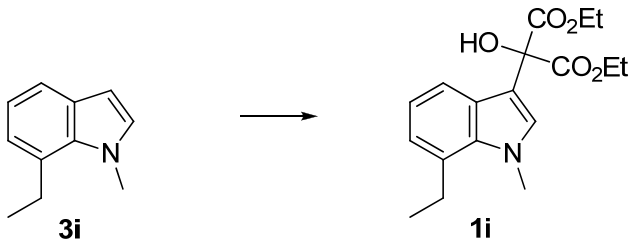
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.32 (1H, s), 7.17 (1H, d, *J* = 9.2 Hz), 7.16 (1H, d, *J* = 2.0 Hz), 6.88 (1H, dd, *J* = 8.8, 2.5 Hz), 4.22-4.39 (5H, m), 3.83 (3H, s), 3.72 (3H, s), 1.29 (6H, t, *J* = 7.1 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 170.6 (2C), 154.3, 133.0, 129.2, 126.5, 112.6, 110.5, 110.0, 103.0, 78.0, 63.1 (2C), 56.0, 33.4, 14.4 (2C).

MS: m/z (M+23) 358.1

HRMS: m/z calc'd for $C_{17}H_{21}NaNO_6$ 358.1261, found 358.1261

Synthesis of diethyl 2-(7-ethyl-1-methyl-1H-indol-3-yl)-2-hydroxymalonate 1i



3i **1i**

7-Ethyl-1-methyl-1*H*-indole **3i** (100 mg, 0.63 mmol), cerium(III) chloride heptahydrate (234 mg, 0.63 mmol) and diethyl ketomalonate (0.11 mL, 0.69 mmol) were dissolved in CH_2Cl_2 (2 mL) and stirred at room temperature for 6 hours. The reaction mixture was quenched by addition of saturated aqueous ammonium chloride solution and extracted with CH_2Cl_2. The organic layer was dried over $MgSO_4$, filtered and concentrated *in vacuo.* The mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 ^oC/ethyl acetate). The product **1i** was isolated as a dark red solid (0.16 g, 74%).

IR (neat): 3485 (br), 1754 (s), 1728 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 7.52 (1H, dd, J = 7.7, 1.2 Hz), 7.26 (1H, s), 7.06-6.95 (2H, m), 4.42-4.20 (5H, m), 4.01 (3H, s), 3.10 (2H, q, J = 7.5 Hz), 1.40-1.23 (9H, m).

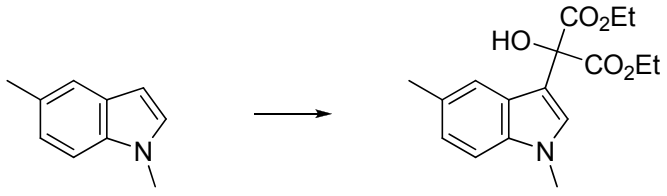
^{13}C NMR (100 MHz, $CDCl_3$): δ 170.6 (2C), 135.6, 130.7, 128.2, 127.6, 123.2, 120.3, 119.2, 110.4, 77.9, 63.1 (2C), 37.4, 25.7, 17.0, 14.4 (2C).

MS: m/z (M+23) 356.1

HRMS: m/z calc'd for $C_{18}H_{23}NaNO_5$ 356.1468, found 356.1452

Melting point: 65-68 ^oC

Synthesis of diethyl 2-(1,5-dimethyl-1H-indol-3-yl)-2-hydroxymalonate 1j



3j **1j**

5-Methyl-1-methyl-1*H*-indole **3j** (400 mg, 2.75 mmol), cerium(III) chloride heptahydrate (1.0 g, 2.75 mmol) and diethyl ketomalonate (0.46 mL, 3.0 mmol) were dissolved in CH_2Cl_2

(6 mL) and stirred at room temperature for 6 hours. The reaction mixture was quenched by addition of saturated aqueous ammonium chloride solution and extracted with CH_2Cl_2. The organic layer was dried over $MgSO_4$, filtered and concentrated *in vacuo.* The mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 ^oC/ethyl acetate). The product **1j** was isolated as a red solid (0.60 g, 69%).

IR (neat): 3467 (br), 1753 (s), 1720 (s), 1190 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 7.48 (1H, br), 7.31 (1H, s), 7.18 (1H, d, *J* = 8.4 Hz), 7.05 (1H, dd, *J* = 8.4, 1.3 Hz), 4.41-4.22 (5H, m), 3.74 (3H, s), 2.44 (3H, s), 1.30 (6H, t, *J* = 7.1 Hz).

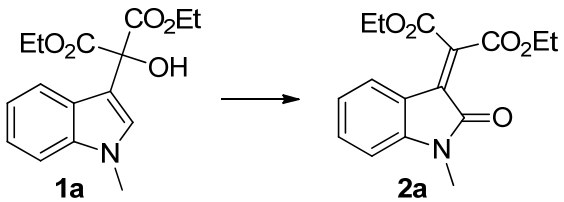
^{13}C NMR (100 MHz, $CDCl_3$): δ 170.6 (2C), 136.1, 129.2, 128.8, 126.4, 123.9, 120.9, 110.0, 109.4, 78.0, 63.1 (2C), 33.3, 21.9, 14.3 (2C).

MS: m/z (M+23) 342.1

HRMS: m/z calc'd for $C_{17}H_{21}NaNO_5$ 342.1312, found 342.1311

Melting point: 83-85 ^oC

Representative procedure for the oxidative rearrangement: Preparation of diethyl 2-(1-methyl-2-oxoindolin-3-ylidene)malonate, 2a.



Iodine (83 mg, 0.33 mmol) in dry THF (0.9 mL) was added *via* cannula to a mixture of silver trifluoroacetate (87 mg, 0.39 mmol) and diethyl 2-hydroxy-2-(1-methyl-1*H*-indol-3-yl)malonate **1a** (100 mg, 0.33 mmol) in dry THF (1.8 mL) at room temperature under nitrogen. The reaction mixture was stirred for 16 hours, then quenched with saturated sodium thiosulfate solution and extracted with EtOAc. The combined organic fractions were dried over magnesium sulfate, filtered and concentrated. The resulting mixture was purified by flash chromatography on silica gel (9:1 petroleum ether 40-60 ^oC/ethyl acetate). The product **2a** was isolated as a red solid (60 mg, 61%).

IR (neat): 1730 (s), 1709 (s), 1599 (m), 1469 (m), 1375 (m), 1238 (s), 1079 (s), 1013 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.40 (1H, d, *J* = 7.8 Hz), 7.38 (1H, t, *J* = 7.8 Hz), 7.04 (1H, t, *J* = 7.8 Hz), 6.80 (1H, d, *J* = 7.8 Hz), 4.44 (2H, q, *J* = 7.1 Hz), 4.37 (2H, q, *J* = 7.1 Hz), 3.19 (3H, s), 1.38 (3H, t, *J* = 7.1 Hz), 1.36 (3H, t, *J* = 7.1 Hz).

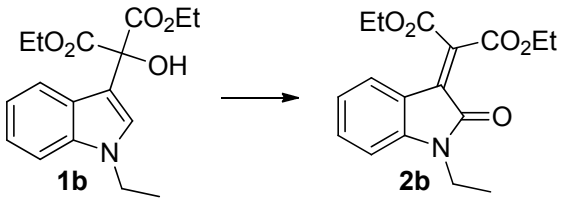
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.5, 165.9, 163.3, 146.4, 134.8, 133.5, 129.9, 129.3, 123.3, 119.5, 108.7, 62.7, 62.6, 26.5, 14.3, 14.2.

MS: m/z (M+23) 326.1

HRMS: m/z calc'd for $C_{16}H_{17}NaNO_5$ 326.0999, found 326.0996

Melting point: 112-115 ^oC

Diethyl 2-(1-ethyl-2-oxoindolin-3-ylidene)malonate, 2b.



Prepared according to the representative procedure using iodine (40 mg, 0.16 mmol), THF (0.42 mL), silver trifluoroacetate (42 mg, 0.19 mmol) and diethyl 2-(1-ethyl-1*H*-indol-3-yl)-2-hydroxymalonate **1b** (50 mg, 0.16 mmol) in THF (0.84 mL). Purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 ^oC/ethyl acetate). The product **2b** was isolated as an orange solid (21 mg, 42%).

IR (neat): 1707 (s), 1602 (m), 1470 (m), 1362 (m), 1242 (s), 1224 (s), 1183 (s), 1091 (m), 1077 (s), 753 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.37 (1H, d, *J* = 7.8 Hz), 7.36 (1H, td, *J* = 7.8, 1.2 Hz), 7.01 (1H, td, *J* = 7.8, 1.0 Hz), 6.78 (1H, d, *J* = 7.8 Hz), 4.43 (2H, q, *J* = 7.2 Hz), 4.36 (2H, q, *J* = 7.1 Hz), 3.73 (2H, q, *J* = 7.2 Hz), 1.37 (3H, t, *J* = 7.1 Hz), 1.35 (3H, t, *J* = 7.2 Hz), 1.24 (3H, t, *J* = 7.2 Hz).

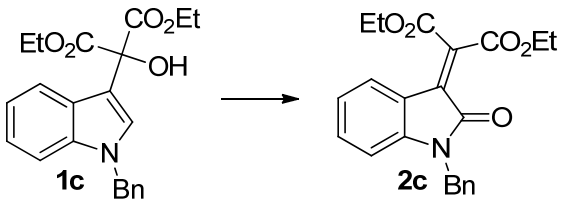
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.0, 165.9, 163.3, 145.5, 134.9, 133.3, 129.7, 129.3, 123.0. 119.7, 108.8, 62.6, 62.5, 35.0, 14.3, 14.2, 12.9.

MS: m/z (M+23) 340.1

HRMS: m/z calc'd for $C_{17}H_{19}NaNO_5$ 340.1155, found 340.1154

Melting point: 78-80 °C

Diethyl 2-(1-benzyl-2-oxoindolin-3-ylidene)malonate, 2c.



Prepared according to the representative procedure using iodine (33 mg, 0.13 mmol), THF (0.38 mL), silver trifluoroacetate (35 mg, 0.16 mmol) and diethyl 2-(-1-benzyl-1*H*-indol-3-yl)-2-hydroxymalonate **1c** (50 mg, 0.13 mmol) in THF (0.76 mL). Purified by flash chromatography on silica gel (9:1 petroleum ether 40-60 °C/ethyl acetate). The product **2c** was isolated as an orange solid (31 mg, 62%).

IR (neat): 1716 (s), 1604 (m), 1469 (m), 1245 (s), 1182 (m), 1093 (m) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.41 (1H, d, *J* = 7.6 Hz), 7.25-7.38 (6H, m), 7.03 (1H, td, *J* = 7.8, 0.8 Hz), 6.69 (1H, d, *J* = 7.8 Hz), 4.92 (2H, s), 4.49 (2H, q, *J* = 7.2 Hz), 4.41 (2H, q, *J* = 7.1 Hz), 1.42 (3H, t, *J* = 7.2 Hz), 1.40 (3H, t, *J* = 7.1 Hz).

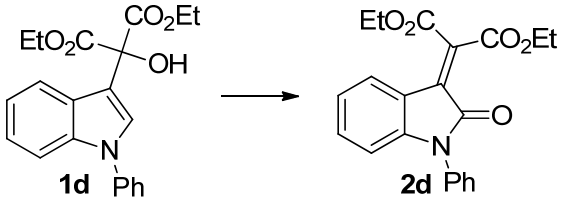
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.4, 165.8, 163.3, 145.5, 135.5, 134.6, 133.3, 130.1, 129.2 (2C), 129.1, 128.1, 127.6 (2C), 123.3, 119.6, 109.7, 62.7, 62.6, 44.1,14.4, 14.3.

MS: m/z (M+23) 402.1

HRMS: m/z calc'd for $C_{22}H_{21}NO_5Na$ 402.1312 , found 402.1322

Melting point: 93-96 °C

Diethyl 2-(2-oxo-1-phenylindolin-3-ylidene)malonate, 2d.



Prepared according to the representative procedure using iodine (35 mg, 0.14 mmol), THF (0.37 mL), silver trifluoroacetate (36 mg, 0.16 mmol) and diethyl 2-hydroxy-2-(1-phenyl-1*H*-indol-3-yl)malonate **1d** (50 mg, 0.14 mmol) in THF (0.74 mL). Purified by flash chromatography on silica gel (9:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **2d** was isolated as a yellow solid (17 mg, 34%).

IR (neat): 1731 (m), 1710 (s), 1601 (m), 1462 (m), 1375 (m), 1243 (s), 1188 (m), 1084 (s), 759 (s), 751 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 8.45 (1H, dd, *J* = 7.9, 0.7 Hz), 7.51 (2H, t, J = 7.9 Hz), 7.36-7.44 (3H, m), 7.30 (1H, td, *J* = 7.7, 1.2 Hz), 7.08 (1H, td, *J* = 7.9, 1.0 Hz), 6.75 (1H, d, *J* = 7.9 Hz), 4.36-4.44 (4H, m), 1.38 (3H, t, *J* = 7.1), 1.35 (3H, t, *J* = 7.1).

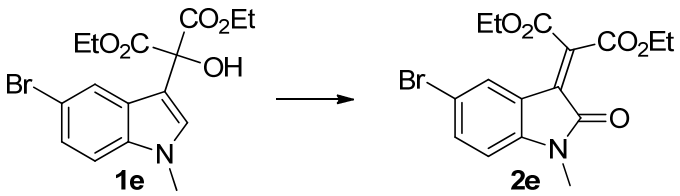
^{13}C NMR (100 MHz, $CDCl_3$): δ 165.8, 165.7, 163.3, 146.4, 134.5, 133.8, 133.3, 130.3, 130.1 (2C), 129.3, 128.8, 127.0 (2C), 123.7, 119.5, 110.0, 62.7, 62.6, 14.4, 14.3.

MS: m/z (M+23) 388.1

HRMS: m/z calc'd for $C_{21}H_{19}NaNO_5$ 388.1155, found 388.1145

Melting point: 98-101 ^{o}C

Diethyl 2-(5-bromo-1-methyl-2-oxoindolin-3-ylidene)malonate, 2e.



Prepared according to the representative procedure using iodine (31 mg, 0.12 mmol), THF (0.30 mL), silver trifluoroacetate (32 mg, 0.15 mmol) and diethyl 2-(5-bromo-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate **1e** (47 mg, 0.12 mmol) in THF (0.60 mL). Purified by flash chromatography on silica gel (3:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **2e** was isolated as a red solid (24 mg, 51%).

IR (neat): 1738 (m), 1723 (m), 1706 (s), 1598 (m), 1472 (m), 1364 (m), 1240 (s), 1175 (s), 1080 (s), 1020 (s), 838 (s) cm^{-1}

^{1}H NMR (400MHz, $CDCl_3$): δ 8.59 (1H, s), 7.50 (1H, dd, *J* = 7.8, 1.7 Hz), 6.67 (1H, d, *J* = 8.8 Hz), 4.48 (2H, q, *J* = 8.2 Hz), 4.40 (2H, q, *J* = 7.8 Hz), 3.18 (3H, s), 1.39 (6H, m).

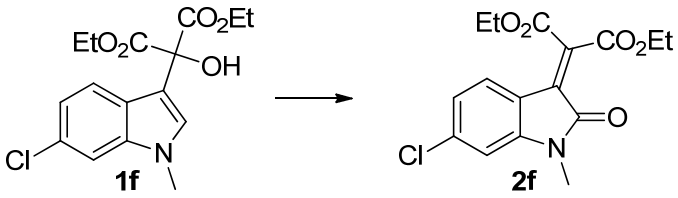
^{13}C NMR (100 MHz, $CDCl_3$): δ 165.6, 165.0, 162.7, 144.9, 135.6, 133.3, 131.8, 130.8, 120.7, 115.6, 109.7, 62.6, 62.4, 26.2, 14.0, 13.9.

MS: m/z (M+23) 406.0

HRMS: m/z calc'd for $C_{16}H_{16}BrNaNO_5$ 406.0084, found 406.0020

Melting point: 117-121 °C

Diethyl 2-(6-chloro-1-methyl-2-oxoindolin-3-ylidene)malonate, 2f.



Prepared according to the representative procedure using iodine (37 mg, 0.15 mmol), THF (0.39 mL), silver trifluoroacetate (39 mg, 0.18 mmol) and diethyl 2-(6-chloro-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate **1f** (50 mg, 0.15 mmol) in THF (0.78 mL). Purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 °C/ethyl acetate). The product **2f** was isolated as a yellow solid (23 mg, 45%).

IR (neat): 1728 (s), 1709 (s), 1597 (s), 1375 (w), 1254 (s), 1233 (s), 1179 (s), 1065 (s), 1019 (m) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 8.39 (1H, d, *J* = 8.4 Hz), 7.00 (1H, dd, *J* = 8.4, 2.0 Hz), 6.78 (1H, d, *J* = 1.9 Hz), 4.43 (2H, q, *J* = 7.1), 4.35 (2H, q, *J* = 7.1 Hz), 3.18 (3H, s), 1.38 (3H, t, *J* = 7.2 Hz), 1.35 (3H, t, *J* = 7.2 Hz).

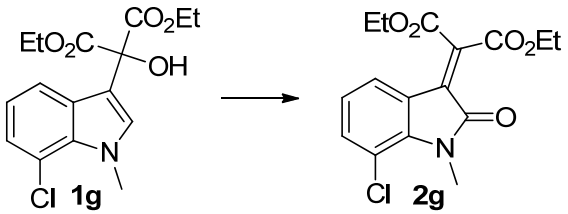
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.4, 165.6, 163.2, 147.4, 139.4, 133.8, 130.5, 130.1, 123.2, 117.9, 109.4, 62.8, 62.6, 26.6, 14.3, 14.2.

MS: m/z (M+23) 360.1

HRMS: m/z calc'd for $C_{16}H_{18}ClNaNO_5$ 360.0609, found 360.0590

Melting point: 138-140 °C

Diethyl 2-(7-chloro-1-methyl-2-oxoindolin-3-ylidene)malonate, 2g.



Prepared according to the representative procedure using iodine (37 mg, 0.15 mmol), THF (0.39 mL), silver trifluoroacetate (39 mg, 0.18 mmol) and diethyl 2-(7-chloro-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate **1g** (50 mg, 0.15 mmol) in THF (0.78 mL). Purified by flash chromatography on silica gel (9:1 petroleum ether 40-60 ^{o}C/ethyl acetate). The product **2g** was isolated as an orange solid (17 mg, 34%).

IR (neat): 1734 (m), 1712 (s), 1596 (m), 1454 (m), 1368 (m), 1247 (s), 1209 (s), 1181 (s), 1135 (s), 1077 (s), 1054 (s), 1018 (m), 724 (s) cm^{-1}

^{1}H NMR (400 MHz, $CDCl_3$): δ 8.31 (1H, dd, *J* = 7.8, 1.1 Hz), 7.30 (1H, dd, *J* = 8.2, 1.1 Hz), 6.95 (1H, t, *J* = 8.0 Hz), 4.44 (2H, q, *J* = 7.1 Hz), 4.37 (2H, q, *J* = 7.1 Hz), 3.58 (3H, s), 1.38 (3H, t, *J* = 7.2 Hz), 1.36 (3H, t, *J* = 7.2 Hz).

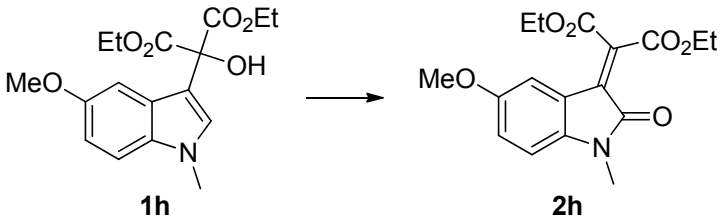
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.7, 165.5, 163.1, 142.0, 135.4, 133.1, 131.0, 127.5, 123.8, 122.2, 116.2, 62.9, 62.7, 30.2, 14.3, 14.2.

MS: m/z (M+23) 360.1

HRMS: m/z calc'd for $C_{16}H_{16}ClNaNO_5$ 360.0609, found 360.0625

Melting point: 93-95 ^{o}C

Diethyl 2-(5-methoxy-1-methyl-2-oxoindolin-3-ylidene)malonate, 2h



Iodine (76 mg, 0.30 mmol) in dry THF (0.9 mL) was added *via* cannula to a mixture of silver trifluoroacetate (87 mg, 0.39 mmol) and diethyl 2-hydroxy-2-(5-methoxy-1-methyl-

1H-indol-3-yl)malonate **1h** (100 mg, 0.30 mmol) in dry THF (1.8 mL) at 0 °C under nitrogen. The reaction mixture was stirred for 16 hours, then quenched with saturated sodium thiosulfate solution and extracted with EtOAc. The combined organic fractions were dried over magnesium sulfate, filtered and concentrated. The resulting mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 °C/ethyl acetate). The product **2h** was isolated as a dark red solid (66 mg, 68%).

IR (neat): 1728 (s), 1707 (s), 1481 (m), 1215 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.11 (1H, d, *J* = 2.7 Hz), 6.93 (1H, dd, *J* = 8.5, 2.5 Hz), 6.67 (1H, d, *J* = 8.7 Hz), 4.43 (2H, q, *J* = 7.2 Hz), 4.36 (2H, q, *J* = 7.0 Hz), 3.81 (3H, s), 3.15 (3H, s), 1.38 (3H, t, *J* = 7.0 Hz), 1.35 (3H, t, *J* = 7.2 Hz).

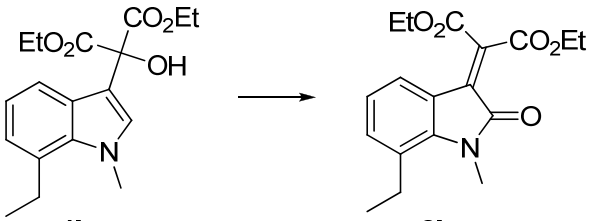
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.3, 165.8, 163.2, 156.1, 140.3, 135.3, 130.1, 120.2, 118.9, 115.5, 109.0, 62.7, 62.5, 56.3, 26.5, 14.3 (2C).

MS: m/z (M+23) 356.1

HRMS: m/z calc'd for $C_{17}H_{19}NaNO_6$ 356.1105, found 356.1105

Melting point: 85-88 °C

Diethyl 2-(7-ethyl-1-methyl-2-oxoindolin-3-ylidene)malonate, 2i



1i **2i**

Iodine (76 mg, 0.30 mmol) in dry THF (0.9 mL) was added *via* cannula to a mixture of silver trifluoroacetate (87 mg, 0.39 mmol) and diethyl 2-(7-ethyl-1-methyl-1H-indol-3-yl)-2-hydroxymalonate **1i** (100 mg, 0.30 mmol) in dry THF (1.8 mL) at 0 °C under nitrogen. The reaction mixture was stirred for 16 hours, then quenched with saturated sodium thiosulfate solution and extracted with EtOAc. The combined organic fractions were dried over magnesium sulfate, filtered and concentrated. The resulting mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 °C/ethyl acetate). The product **2i** was isolated as a red solid (58 mg, 58%).

IR (neat): 1732 (s), 1709 (s), 1446 (m), 1252 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.20 (1H, dd, *J* = 7.8, 1.0 Hz), 7.16 (1H, d, *J* = 7.7 Hz), 6.95 (1H, t, *J* = 7.8 Hz), 4.44 (2H, q, *J* = 7.2 Hz), 4.36 (2H, q, *J* = 7.1 Hz), 3.47 (3H, s), 2.86 (2H, q, *J* = 7.5 Hz), 1.38 (3H, t, *J* = 7.1 Hz), 1.35 (3H, t, *J* = 7.2 Hz), 1.25 (3H, t, *J* = 7.6 Hz).

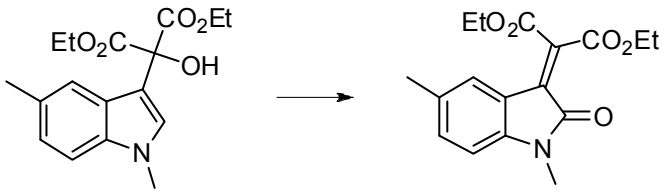
^{13}C NMR (100 MHz, $CDCl_3$): δ 167.4, 165.9, 163.4, 143.4, 135.9, 134.1, 129.4, 126.9, 126.6, 123.2, 120.4, 62.6, 62.5, 29.9, 25.2, 17.0, 14.3 (2C).

MS: m/z (M+23) 354.1

HRMS: m/z calc'd for $C_{18}H_{21}NaNO_5$ 354.1312, found 354.1304

Melting point: 61-63 °C

Diethyl 2-(1,5-dimethyl-2-oxoindolin-3-ylidene)malonate, 2j



1j **2j**

Iodine (76 mg, 0.30 mmol) in dry THF (0.9 mL) was added *via* cannula to a mixture of silver trifluoroacetate (87 mg, 0.39 mmol) and diethyl 2-(1,5-dimethyl-1H-indol-3-yl)-2-hydroxymalonate **1j** (96 mg, 0.30 mmol) in dry THF (1.8 mL) at 0 °C under nitrogen. The reaction mixture was stirred for 16 hours, then quenched with saturated sodium thiosulfate solution and extracted with EtOAc. The combined organic fractions were dried over magnesium sulfate, filtered and concentrated. The resulting mixture was purified by flash chromatography on silica gel (5:1 petroleum ether 40-60 °C/ethyl acetate). The product **2j** was isolated as a red solid (50 mg, 53%).

IR (neat): 1738 (m), 1716 (s), 1245 (s), 1066 (s) cm^{-1}

^1H NMR (400 MHz, $CDCl_3$): δ 8.20 (1H, s), 7.17 (1H, d, *J* = 7.9 Hz), 6.65 (1H, t, *J* = 8.0 Hz), 4.43 (2H, q, *J* = 7.2 Hz), 4.36 (2H, q, *J* = 7.1 Hz), 3.15 (3H, s), 2.32 (3H, s), 1.38 (3H, t, *J* = 7.1 Hz), 1.36 (3H, t, *J* = 7.2 Hz).

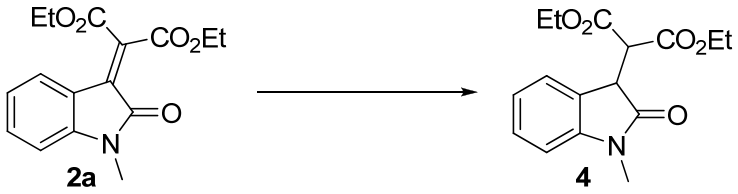
^{13}C NMR (100 MHz, $CDCl_3$): δ 166.4, 165.9, 163.4, 144.2, 135.1, 133.8, 132.6, 129.8, 129.5, 119.4, 108.4, 62.6, 62.4, 26.4, 21.5, 14.3 (2C).

MS: m/z (M+23) 340.1

HRMS: m/z calc'd for $C_{17}H_{19}NaNO_5$ 340.1155, found 340.1143

Melting point: 142-144 ^{o}C

Synthesis of diethyl 2-(1-methyl-2-oxoindolin-3-yl)malonate, 4



Sodium borohydride (7.2 mg, 0.19 mmol) was added to ethyl 3-(2-ethoxy-2-oxoacetyl) 1-methyl-1*H*-pyrrolo[2,3-*b*]pyridine-2-carboxylate **2a** (29 mg, 0.096 mmol) in MeOH (2 mL) and stirred at room temperature. The reaction was stirred until completion was indicated by TLC analysis. Then it was quenched with saturated ammonium chloride solution and extracted with ethyl acetate. After drying over $MgSO_4$, filtration and concentration, the product **4** was isolated as a red liquid (21 mg, 71%).

IR (neat): 1720 (s), 1612 (s), 1353 (s), 752 (s) cm^{-1}

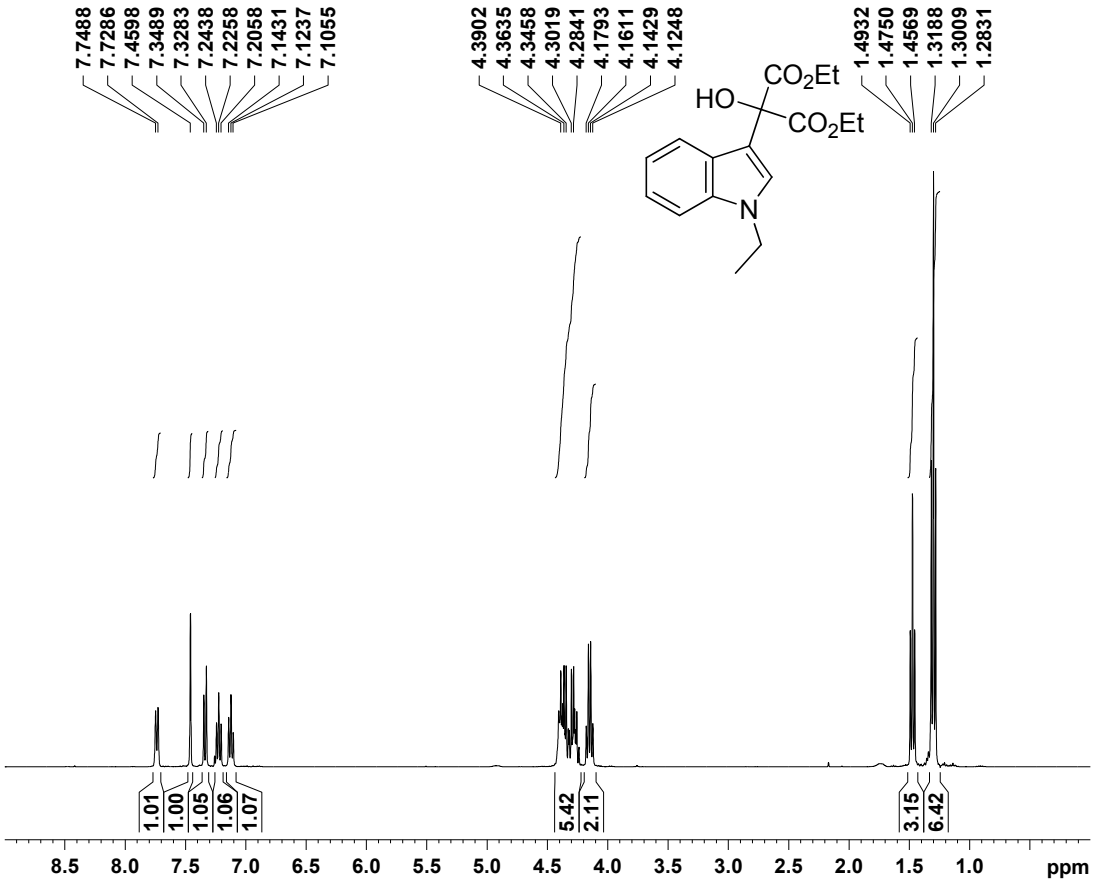
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.39 (1H, d, *J* = 7.4 Hz), 7.25-7.32 (1H, m), 7.02 (1H, td, *J* = 7.6, 0.76 Hz), 6.82 (1H, *J* = 7.8 Hz), 4.22-4.32 (2H, m), 4.21 (1H, d, *J* = 3.6 Hz), 3.92-4.03 (3H, m), 3.23 (3H, s), 1.28 (3H, t, *J* = 7.1 Hz), 0.98 (3H, t, *J* = 7.2 Hz).

^{13}C NMR (100 MHz, $CDCl_3$): δ 175.7, 168.5, 167.3, 145.1, 129.0, 125.9, 125.3, 122.9, 108.3, 62.3, 62.0, 52.7, 45.0, 26.8, 14.4, 14.1.

MS: m/z (M+23) 328.1

HRMS: m/z calc'd for $C_{16}H_{19}NaNO_5$ 328.3155, found 328.1156

NMR spectra for diethyl 2-(1-ethyl-1*H*-indol-3-yl)-2-hydroxymalonate 1b

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PROCNO                     1

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PL1                  -3.00 dB
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F2 - Processing parameters
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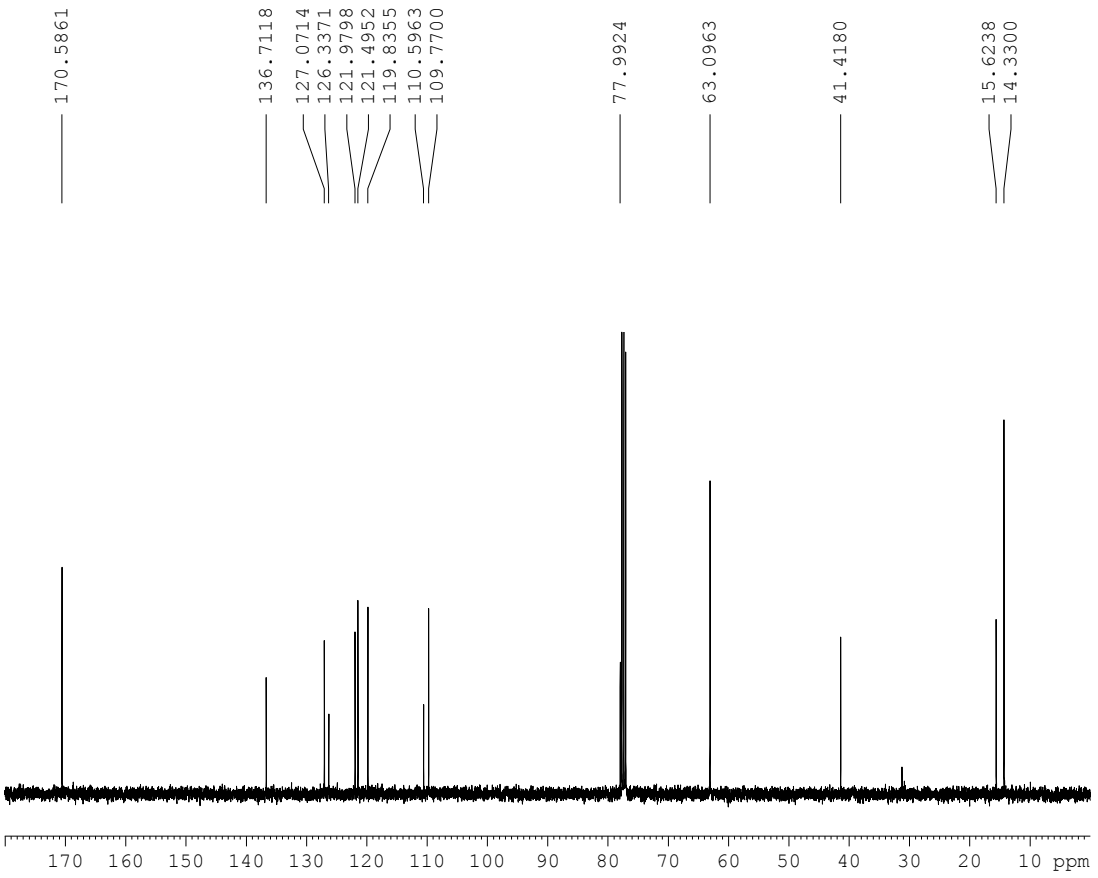


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PROCNO                     1

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TD                    65536
SOLVENT               CDCl3
NS                      256
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RG                     6502
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TE                   292.6 K
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TD0                        8

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PL1                  -3.00 dB
SFO1           100.6228298 MHz

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PL2                  -3.00 dB
PL12                 18.00 dB
PL13                 18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF             100.6127399 MHz
WDW                      EM
SSB                       0
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GB                        0
PC                     1.40
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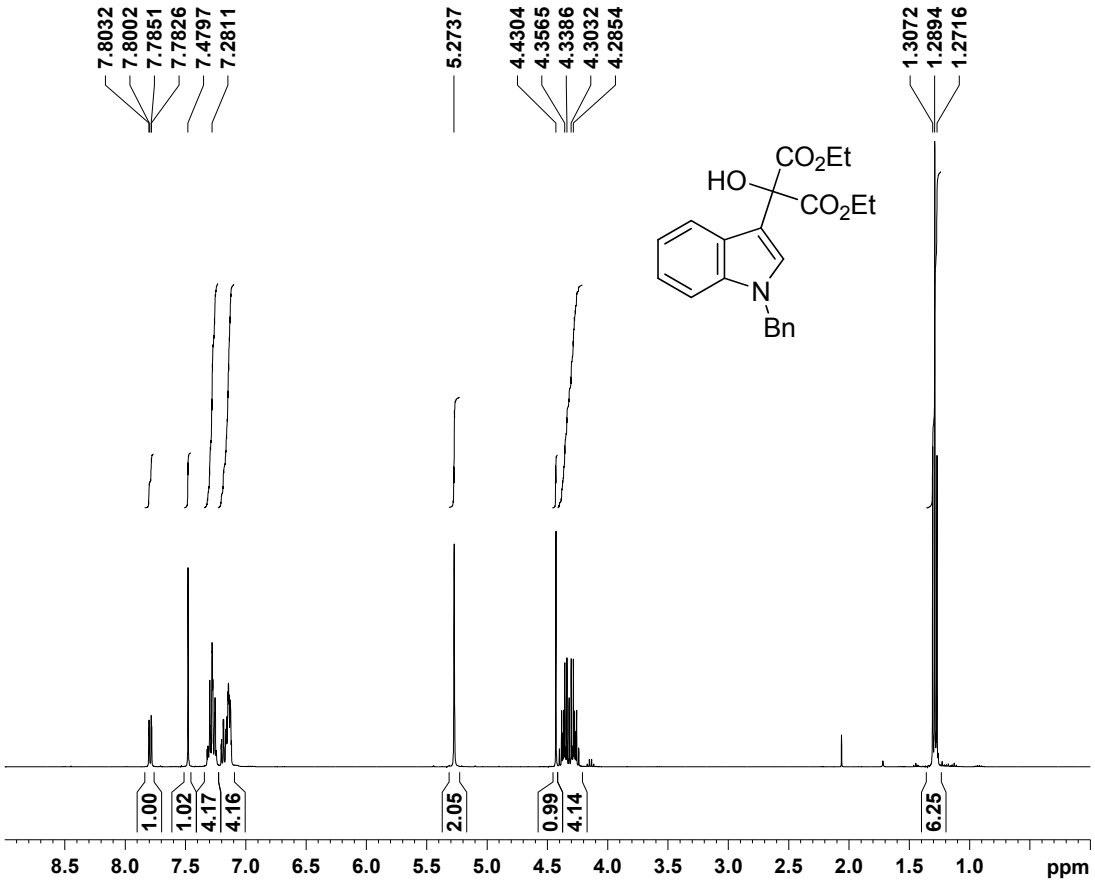
NMR spectra for diethyl 2-(1-benzyl-1*H*-indol-3-yl)-2-hydroxymalonate 1c

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PROCNO                    1

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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                   290.4 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
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PL1                  -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
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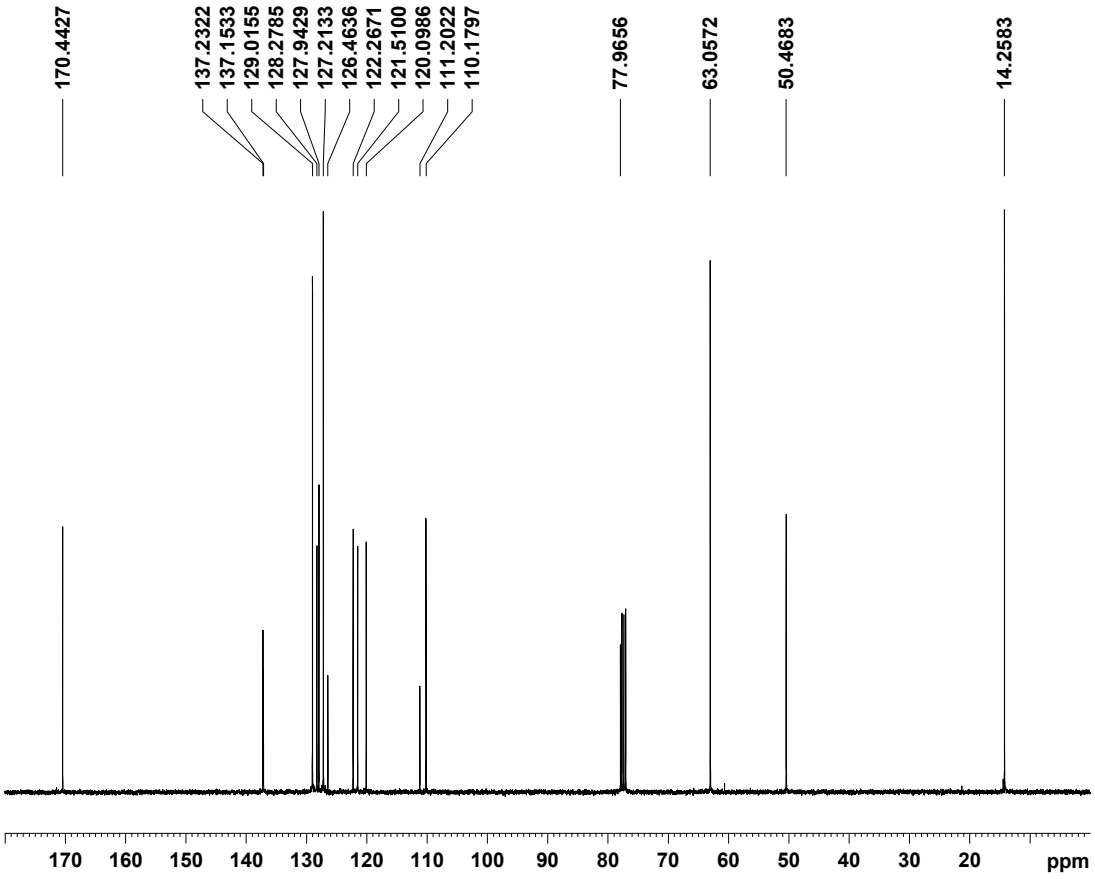


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PROCNO                    1

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TD                    65536
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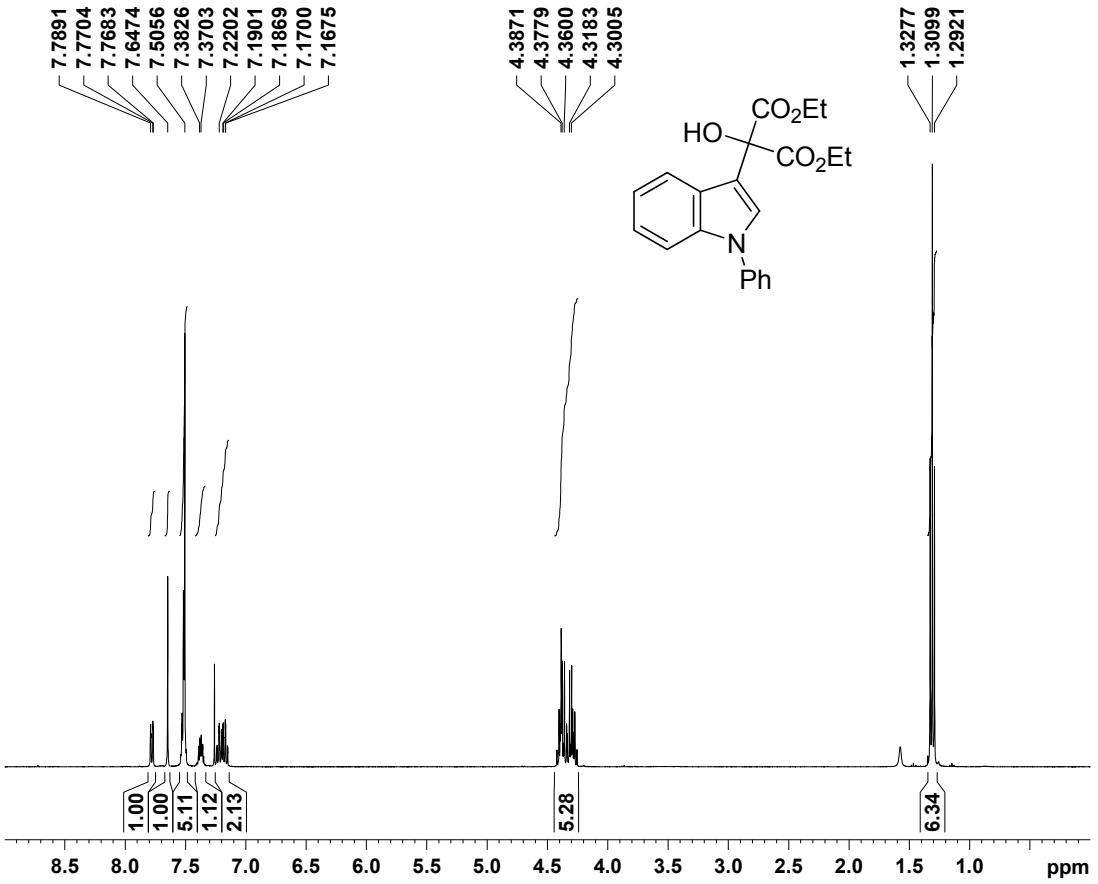
NS                      128
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   290.7 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                       8

======== CHANNEL f1 ========
NUC1                    13C
P1                    9.70 usec
PL1                  -3.00 dB
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                84.00 usec
PL2                  -3.00 dB
PL12                 16.08 dB
PL13                 18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                    32768
SF             100.6127499 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

NMR spectra for diethyl 2-hydroxy-2-(1-phenyl-1*H*-indol-3-yl)malonate 1d

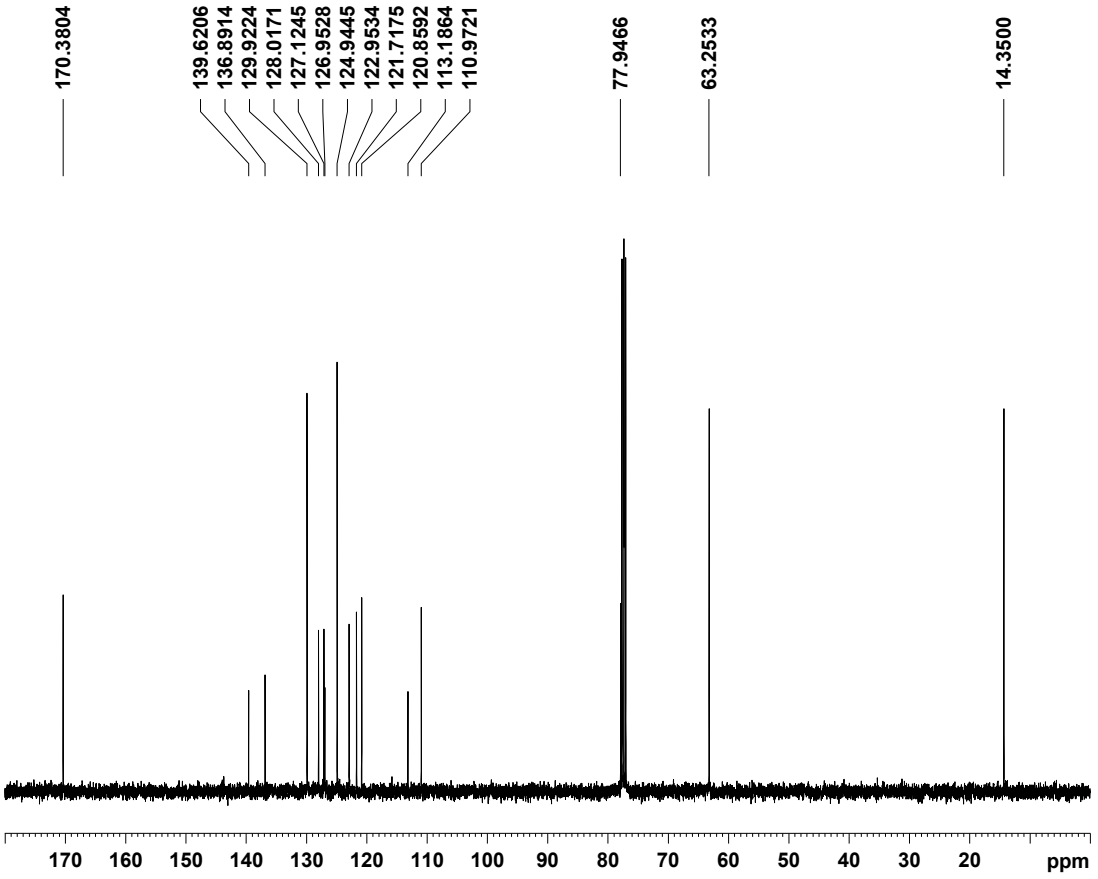



```
Current Data Parameters
NAME                  KM-242_3
EXPNO                        5
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20100701
Time                     10.15
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                 zg30
TD                       65536
SOLVENT                  CDCl3
NS                          16
DS                           2
SWH                   8278.146 Hz
FIDRES                0.126314 Hz
AQ                    3.9584243 sec
RG                       406.4
DW                      60.400 usec
DE                       6.00 usec
TE                      293.3 K
D1                 1.00000000 sec
TD0                          1

======== CHANNEL f1 ========
NUC1                        1H
P1                       8.40 usec
PL1                     -3.00 dB
SFO1               400.1324710 MHz

F2 - Processing parameters
SI                       32768
SF                 400.1300096 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```




```
Current Data Parameters
NAME                  KM-242_4
EXPNO                        2
PROCNO                       1

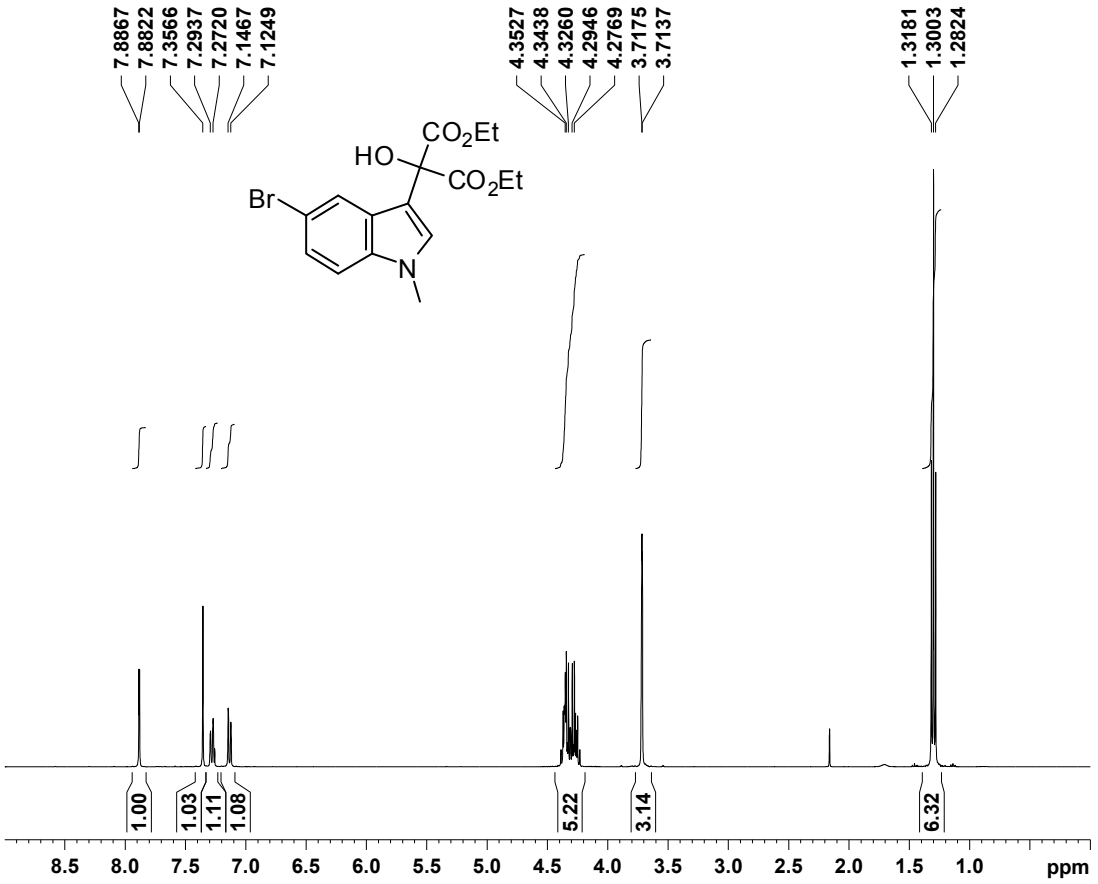
F2 - Acquisition Parameters
Date_                 20100825
Time                     14.59
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG               zgpg30
TD                       65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                  23980.814 Hz
FIDRES                0.365918 Hz
AQ                    1.3664756 sec
RG                       16384
DW                      20.850 usec
DE                       6.00 usec
TE                      293.7 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                          8

======== CHANNEL f1 ========
NUC1                        13C
P1                       9.70 usec
PL1                     -3.00 dB
SFO1               100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                        1H
PCPD2                   84.00 usec
PL2                     -3.00 dB
PL12                    18.00 dB
PL13                    18.00 dB
SFO2               400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF                 100.6127407 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

NMR spectra for diethyl 2-(5-bromo-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate 1e

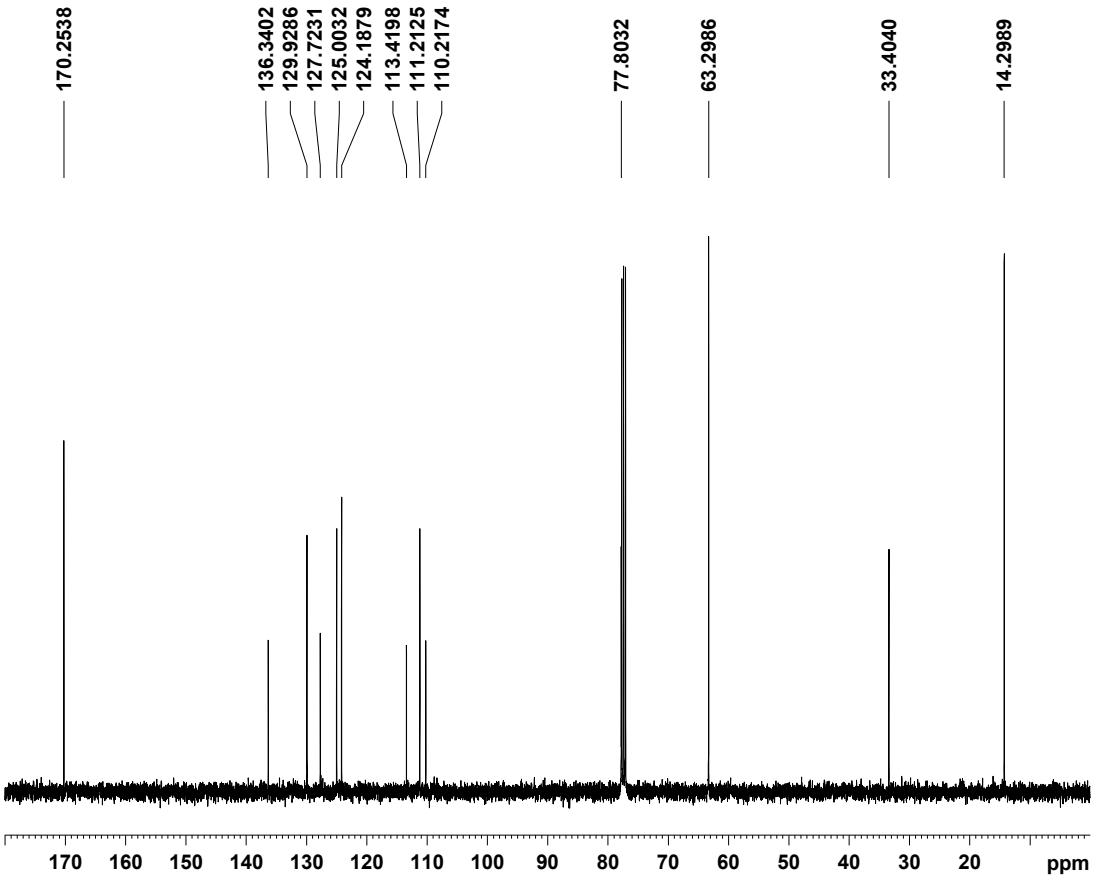



```
Current Data Parameters
NAME                  KM-282
EXPNO                      5
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100819
Time                  10.54
INSTRUM               dpx400
PROBHD    5 mm QNP  1H/1
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                   293.2 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1            400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF                400.1300099 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```




```
Current Data Parameters
NAME                  KM-282
EXPNO                      6
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100819
Time                  10.57
INSTRUM               dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   293.5 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

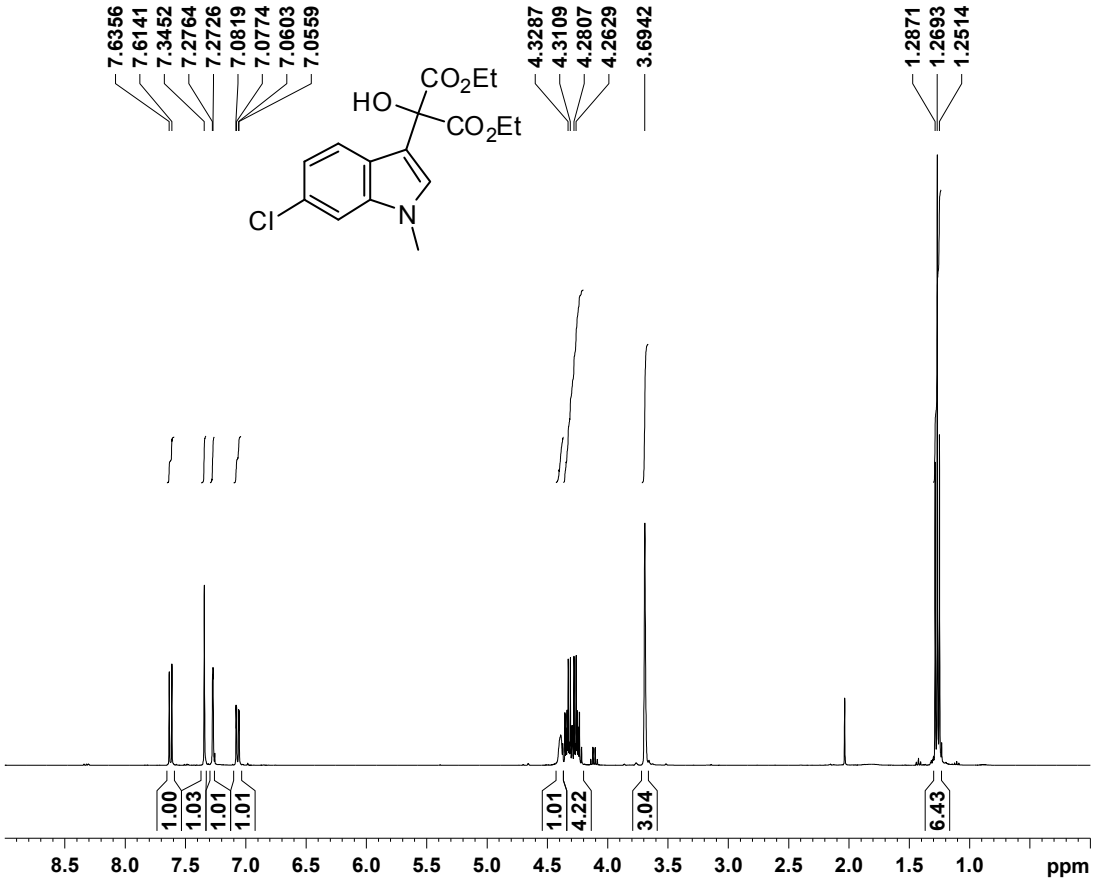
======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1            100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  18.00 dB
PL13                  18.00 dB
SFO2            400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF                100.6127405 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

NMR spectra for diethyl 2-(6-chloro-1-methyl-1*H*-indol-3-yl)-2-hydroxymalonate

1f

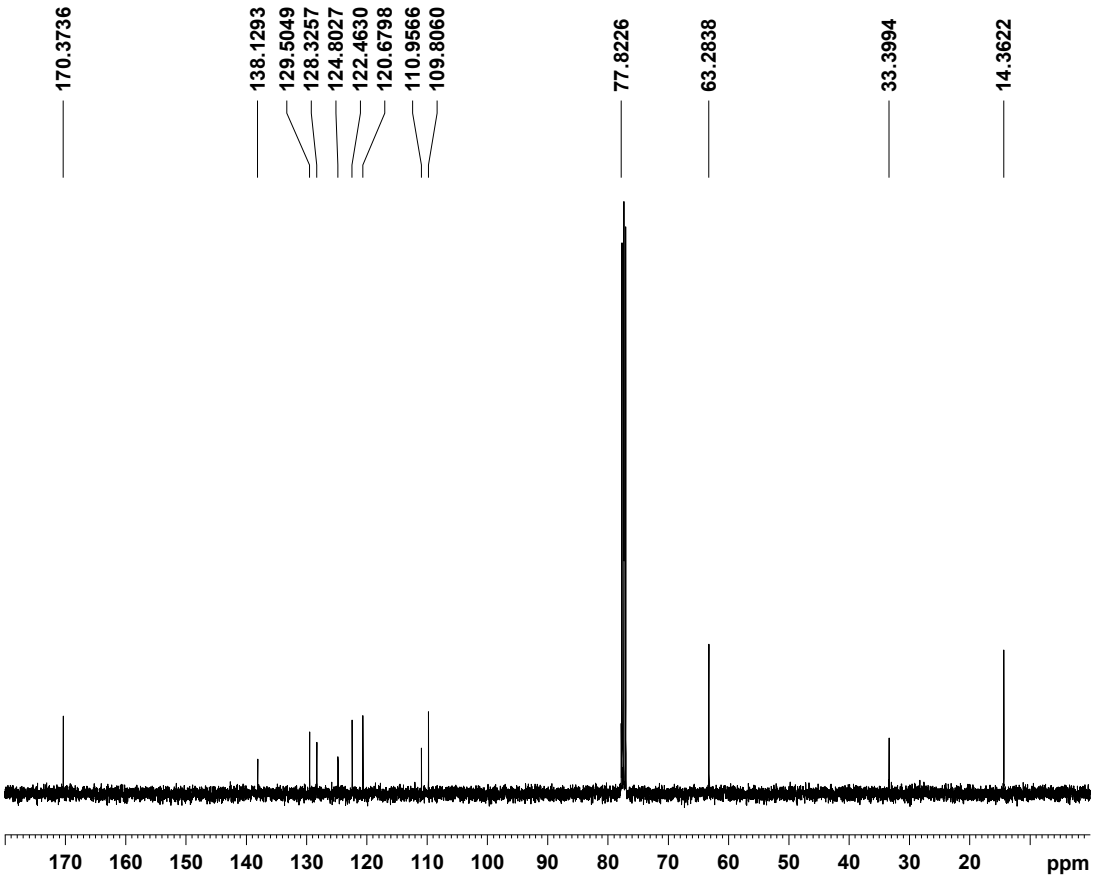



```
Current Data Parameters
NAME                  KM-261
EXPNO                      8
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100727
Time                  11.31
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
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                  293.4 K
D1             1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                   8.40 usec
PL1                 -3.00 dB
SFO1          400.1324710 MHz

F2 - Processing parameters
SI                   32768
SF            400.1300099 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                  KM-261
EXPNO                      9
PROCNO                     1

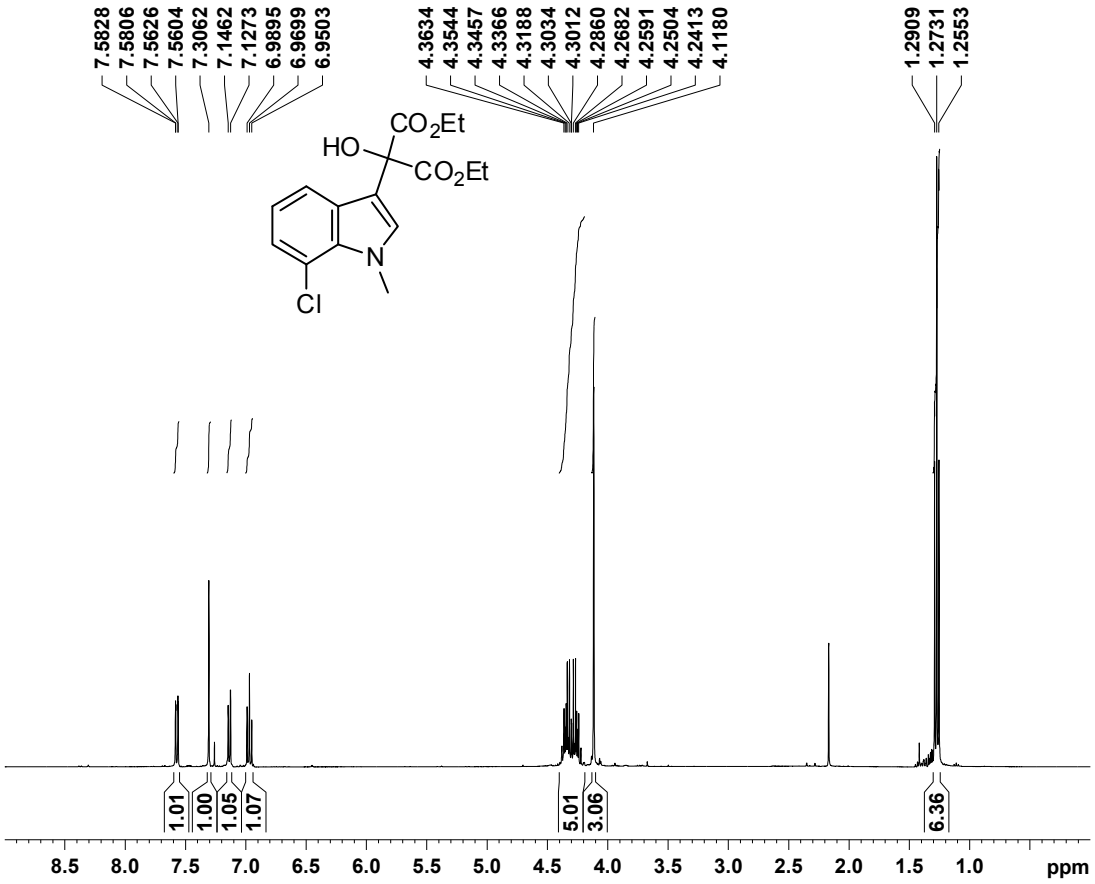
F2 - Acquisition Parameters
Date_              20100728
Time                  10.23
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG           zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     256
DS                       4
SWH              23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                    9195.2
DW                  20.850 usec
DE                   6.00 usec
TE                  293.5 K
D1             2.00000000 sec
d11            0.03000000 sec
DELTA          1.89999998 sec
TD0                      8

======== CHANNEL f1 ========
NUC1                   13C
P1                   9.70 usec
PL1                 -3.00 dB
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                84.00 usec
PL2                 -3.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          400.1316005 MHz

F2 - Processing parameters
SI                   32768
SF            100.6127347 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

NMR spectra for diethyl 2-(7-chloro-1-methyl-1H-indol-3-yl)-2-hydroxymalonate 1g

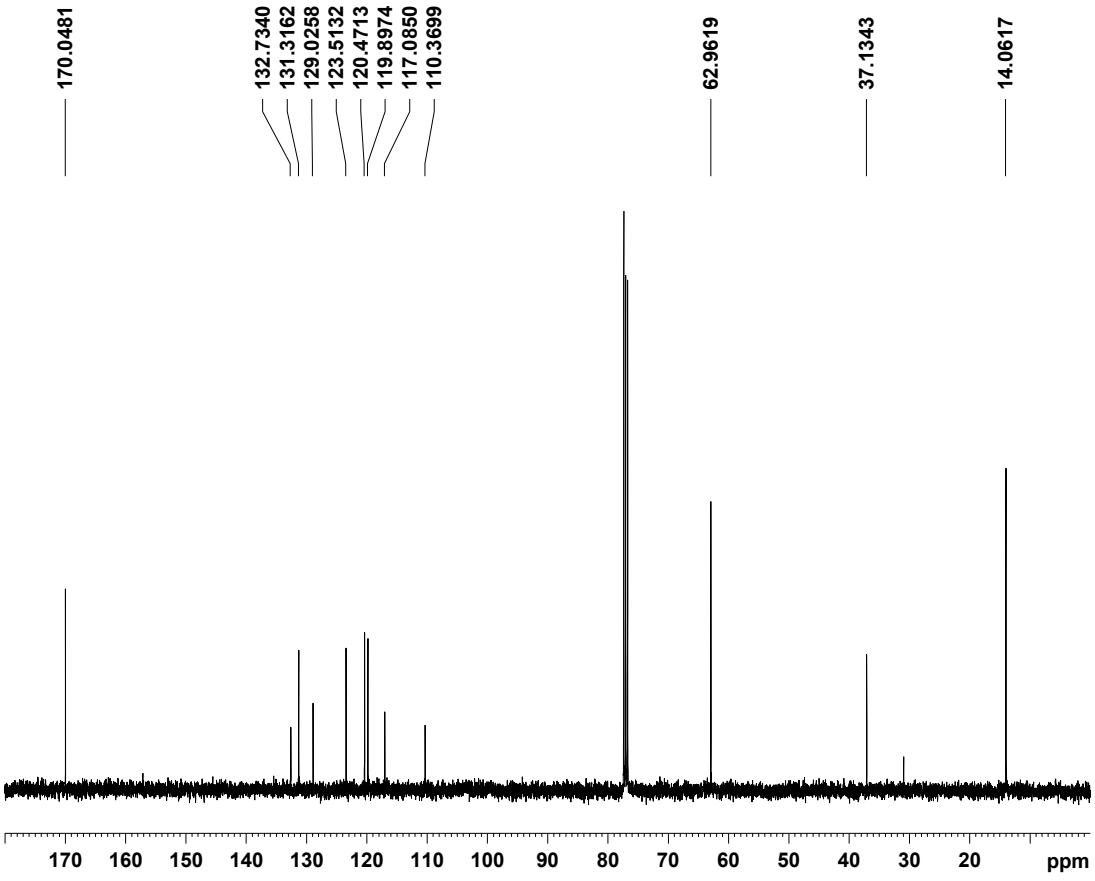



```
Current Data Parameters
NAME                  KM-304
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100827
Time                   9.35
INSTRUM               dpx400
PROBHD    5 mm QNP  1H/1
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                   292.3 K
D1              1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
SI                     32768
SF             400.1300096 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```




```
Current Data Parameters
NAME                  KM-304
EXPNO                      3
PROCNO                     1

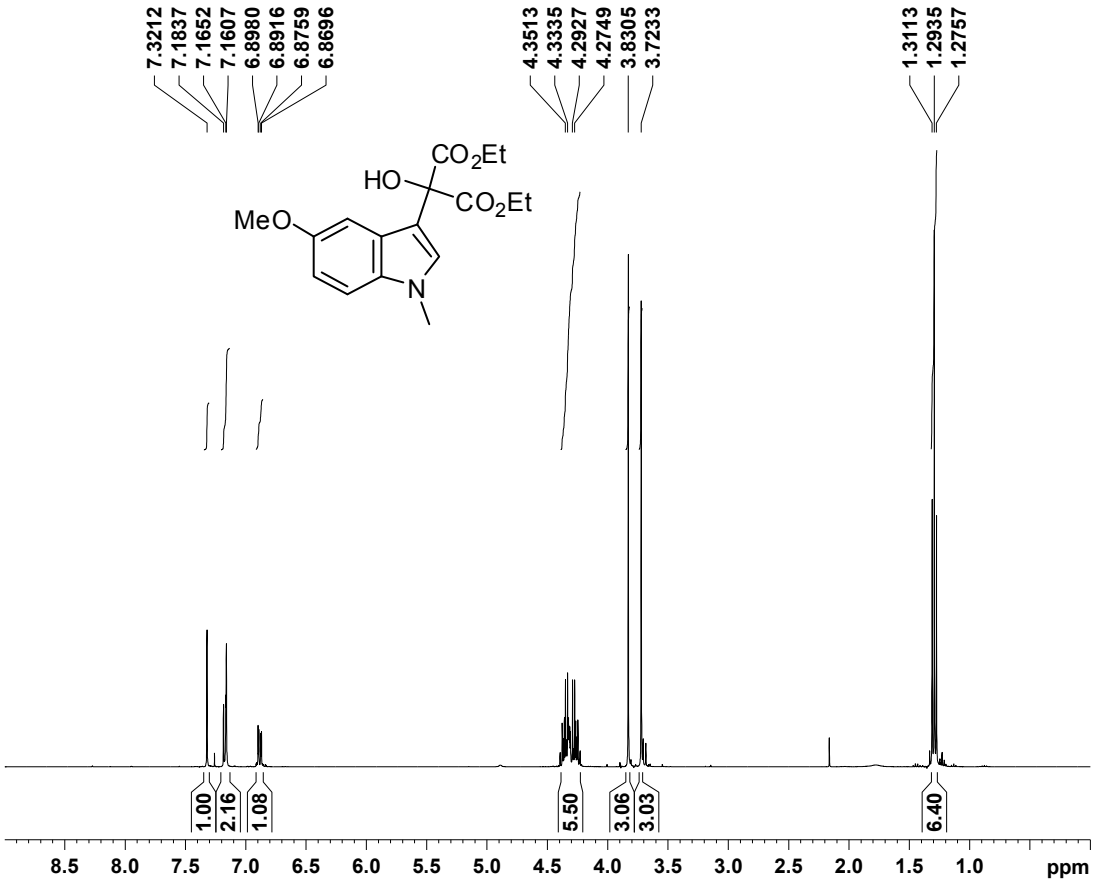
F2 - Acquisition Parameters
Date_              20100827
Time                   9.37
INSTRUM               dpx400
PROBHD    5 mm QNP  1H/1
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   292.5 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                      13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  18.00 dB
PL13                  18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                     32768
SF             100.6127690 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

NMR spectra for diethyl 2-hydroxy-2-(5-methoxy-1-methyl-1H-indol-3-yl)malonate 1h

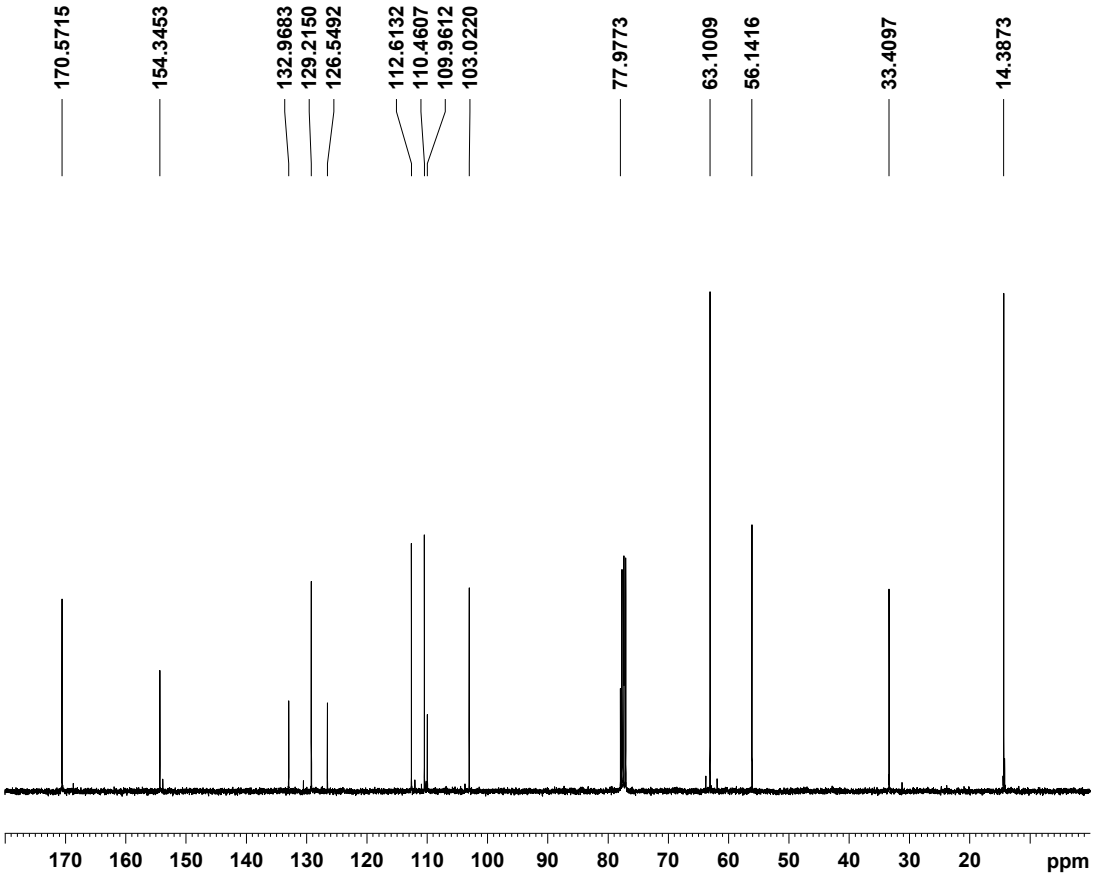



```
Current Data Parameters
NAME                  WM-459
EXPNO                      1
PROCNO                     1

F2 - Acquisition Parameters
Date_              20111024
Time                  10.59
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9584243 sec
RG                    101.6
DW                   60.400 usec
DE                    6.00 usec
TE                   293.1 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                      8.40 usec
PL1                    -3.00 dB
SFO1             400.1324710 MHz

F2 - Processing parameters
SI                       32768
SF                400.1300099 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```




```
Current Data Parameters
NAME                  WM-459
EXPNO                      2
PROCNO                     1

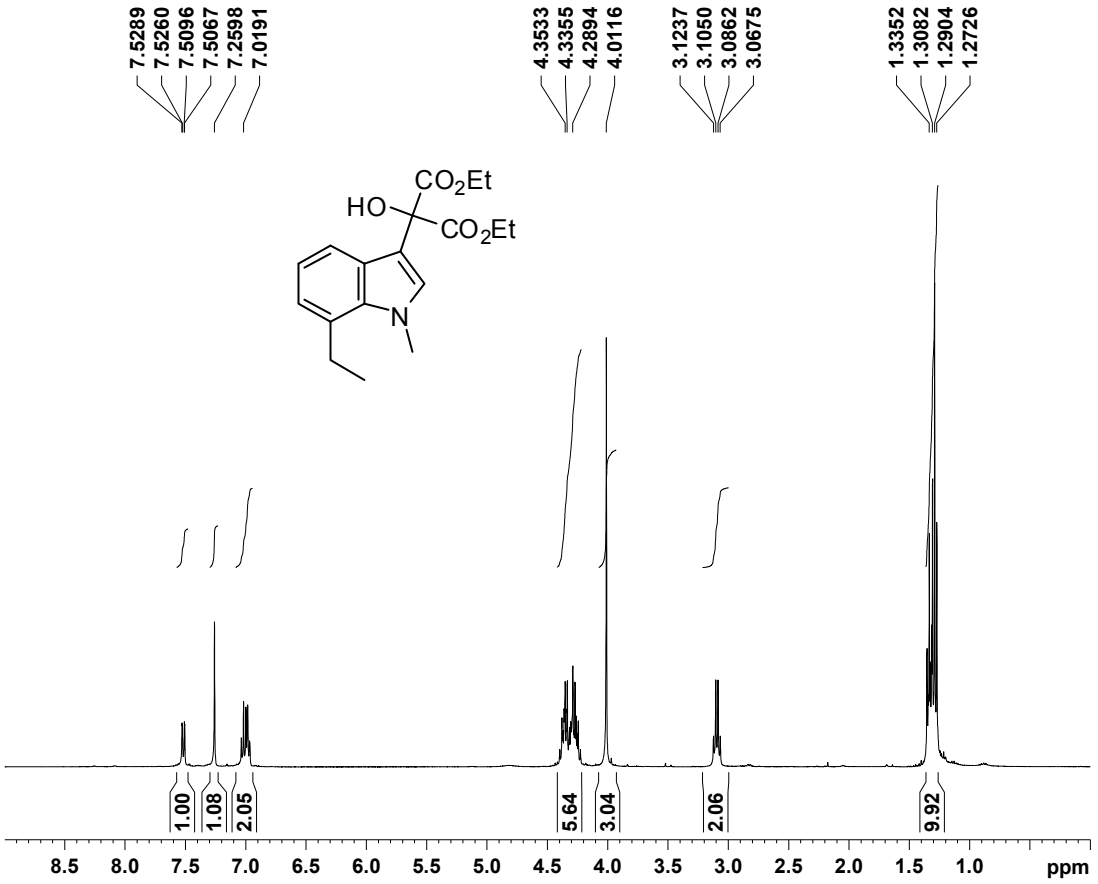
F2 - Acquisition Parameters
Date_              20111021
Time                  12.23
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     256
DS                       4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                    6502
DW                   20.850 usec
DE                    6.00 usec
TE                   293.5 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                      13C
P1                      9.70 usec
PL1                    -3.00 dB
SFO1             100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2               waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                    -3.00 dB
PL12                   16.08 dB
PL13                   18.00 dB
SFO2             400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF                100.6127391 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

NMR spectra for diethyl 2-(7-ethyl-1-methyl-1H-indol-3-yl)-2-hydroxymalonate 1i

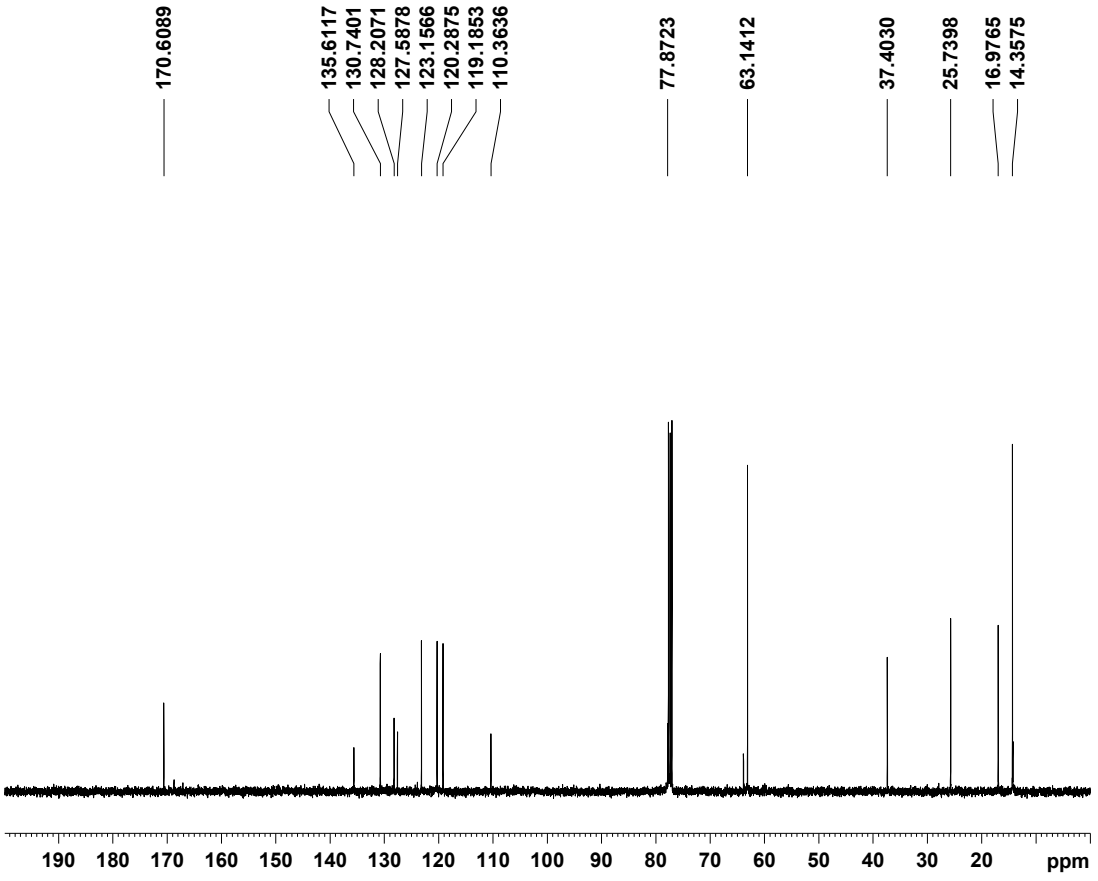



```
Current Data Parameters
NAME                  WM JM-10
EXPNO                        3
PROCNO                       1

F2 - Acquisition Parameters
Date_              20111020
Time                   11.49
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                 zg30
TD                     65536
SOLVENT                CDCl3
NS                        16
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                     293.0 K
D1                 1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                       1H
P1                       8.40 usec
PL1                     -3.00 dB
SFO1              400.1324710 MHz

F2 - Processing parameters
SI                       32768
SF                400.1300089 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```




```
Current Data Parameters
NAME                  WM JM-10
EXPNO                        4
PROCNO                       1

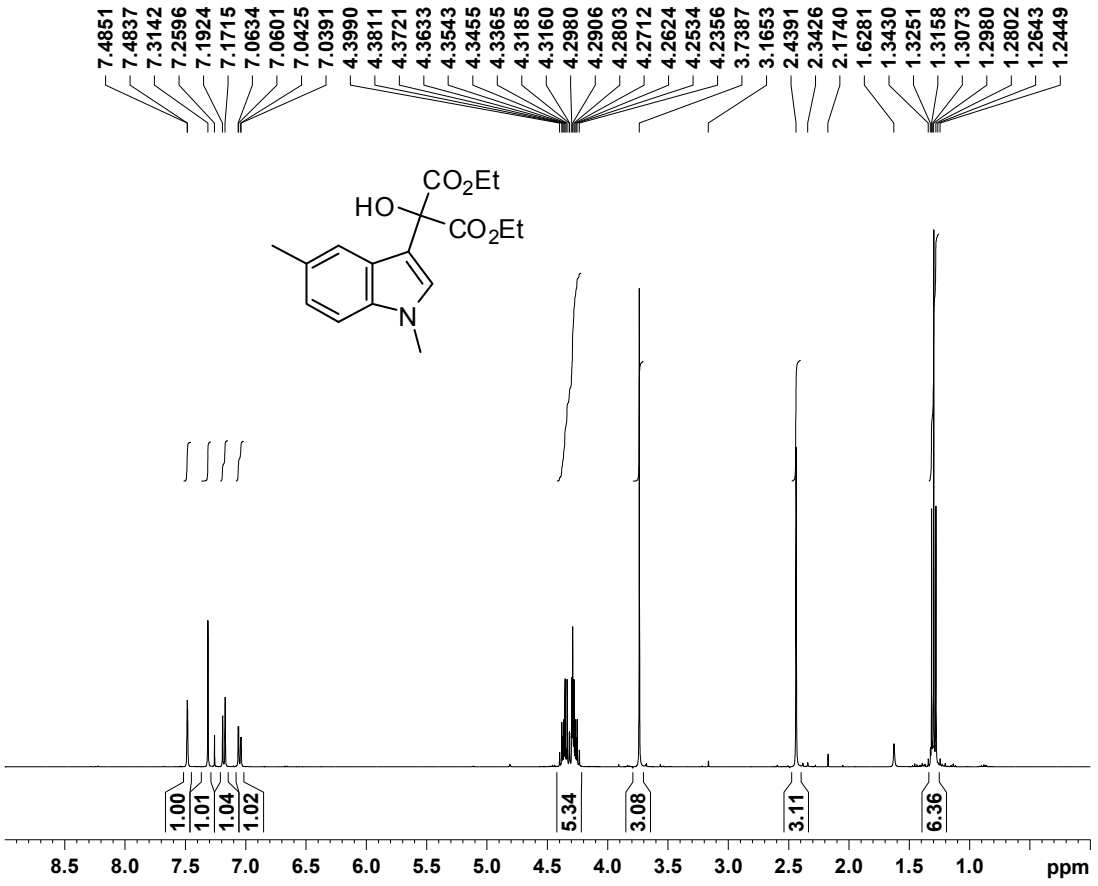
F2 - Acquisition Parameters
Date_              20111020
Time                   11.52
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       256
DS                         4
SWH                23980.814 Hz
FIDRES              0.365918 Hz
AQ                  1.3664756 sec
RG                      10321.3
DW                     20.850 usec
DE                      6.00 usec
TE                     293.3 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.70 usec
PL1                     -3.00 dB
SFO1              100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   84.00 usec
PL2                     -3.00 dB
PL12                    16.08 dB
PL13                    18.00 dB
SFO2              400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF                100.6127365 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

NMR spectra for diethyl 2-(1,5-dimethyl-1H-indol-3-yl)-2-hydroxymalonate 1j

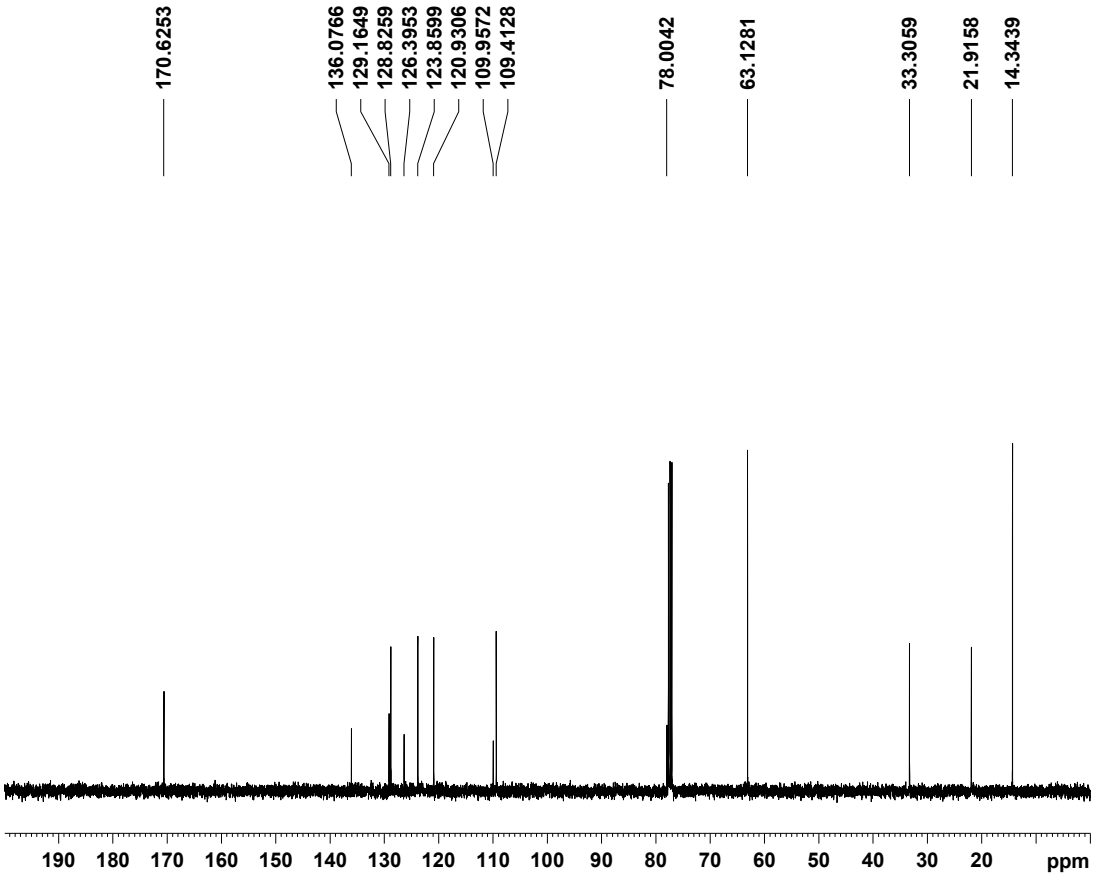



```
Current Data Parameters
NAME                  WM-461
EXPNO                      3
PROCNO                     1

F2 - Acquisition Parameters
Date_              20110921
Time                  15.54
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
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                   292.7 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1            400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF                400.1300097 MHz
WDW                        EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```




```
Current Data Parameters
NAME                  WM-461
EXPNO                      4
PROCNO                     1

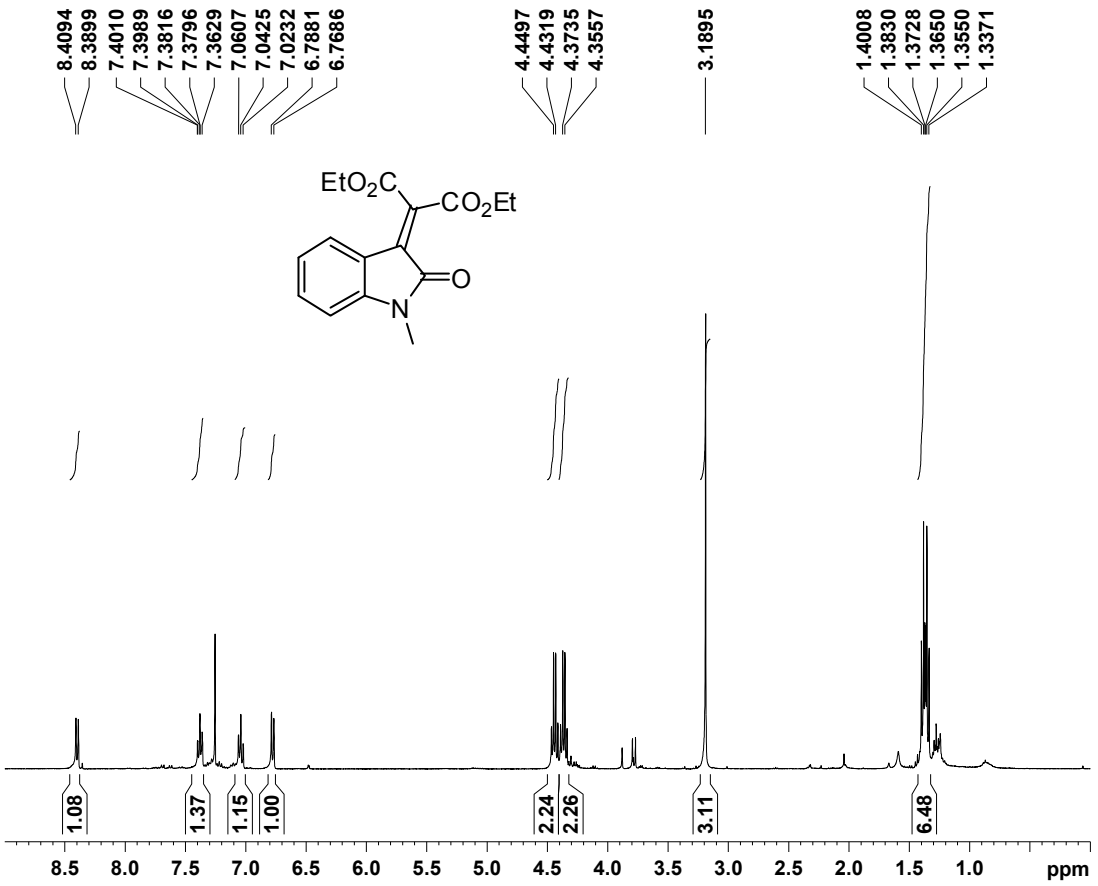
F2 - Acquisition Parameters
Date_              20110921
Time                  15.57
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                       32
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   293.0 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                      13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1            100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  16.08 dB
PL13                  18.00 dB
SFO2            400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF                100.6127364 MHz
WDW                        EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

NMR spectra for diethyl 2-(1-methyl-2-oxoindolin-3-ylidene)malonate 2a

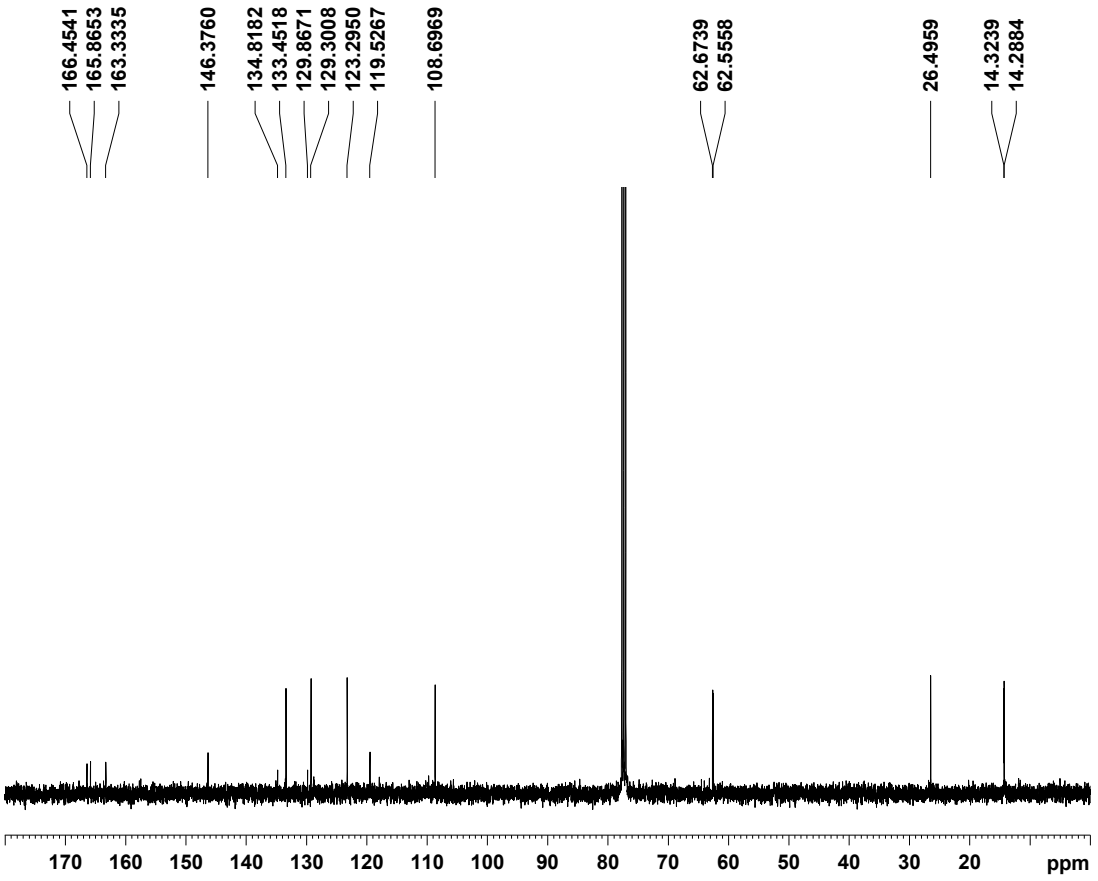



```
Current Data Parameters
NAME                  KM-88
EXPNO                     4
PROCNO                    1

F2 - Acquisition Parameters
Date_              20100125
Time                  11.17
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG               zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9584243 sec
RG                    456.1
DW                   60.400 usec
DE                    6.00 usec
TE                   289.0 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    8.40 usec
PL1                  -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF               400.1300111 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```




```
Current Data Parameters
NAME                  KM-88
EXPNO                     5
PROCNO                    1

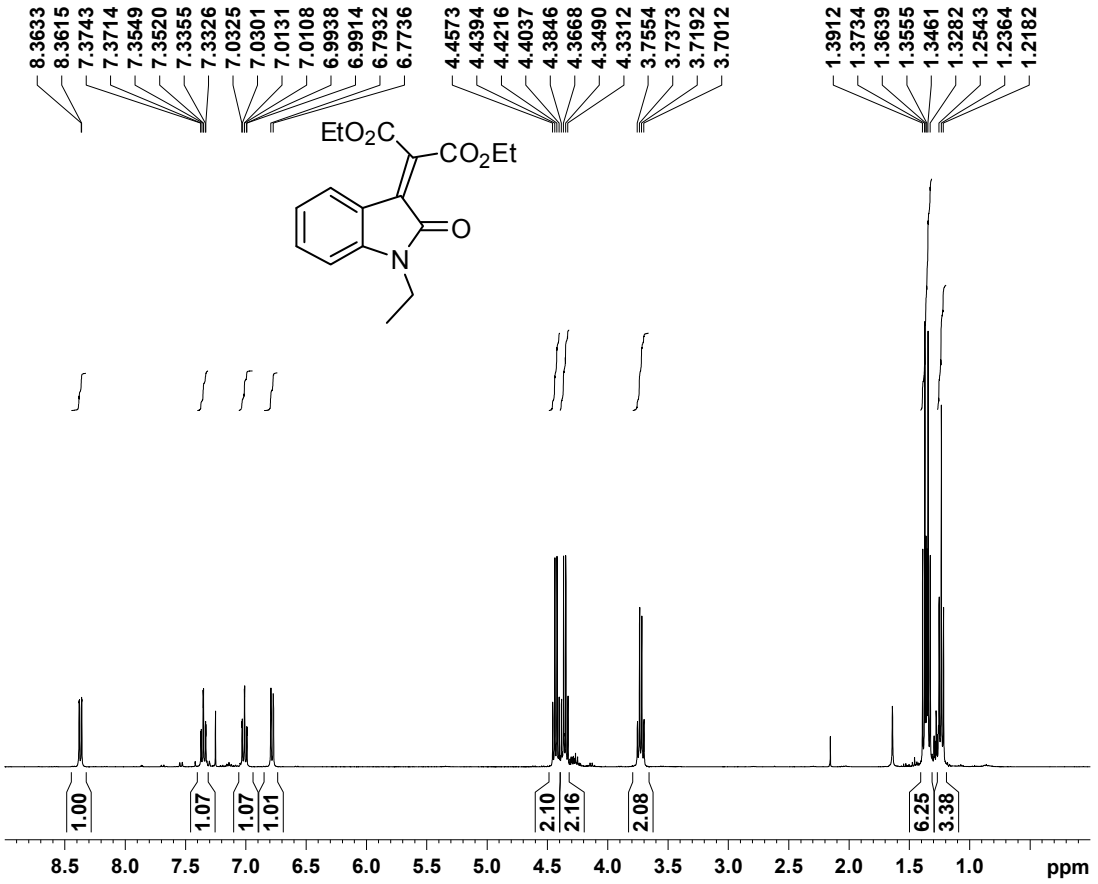
F2 - Acquisition Parameters
Date_              20100125
Time                  11.20
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG             zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     256
DS                       4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   289.2 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                       8

======== CHANNEL f1 ========
NUC1                    13C
P1                    9.70 usec
PL1                  -3.00 dB
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                84.00 usec
PL2                  -3.00 dB
PL12                 18.00 dB
PL13                 18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                    32768
SF               100.6127349 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

NMR spectra for diethyl 2-(1-ethyl-2-oxoindolin-3-ylidene)malonate 2b

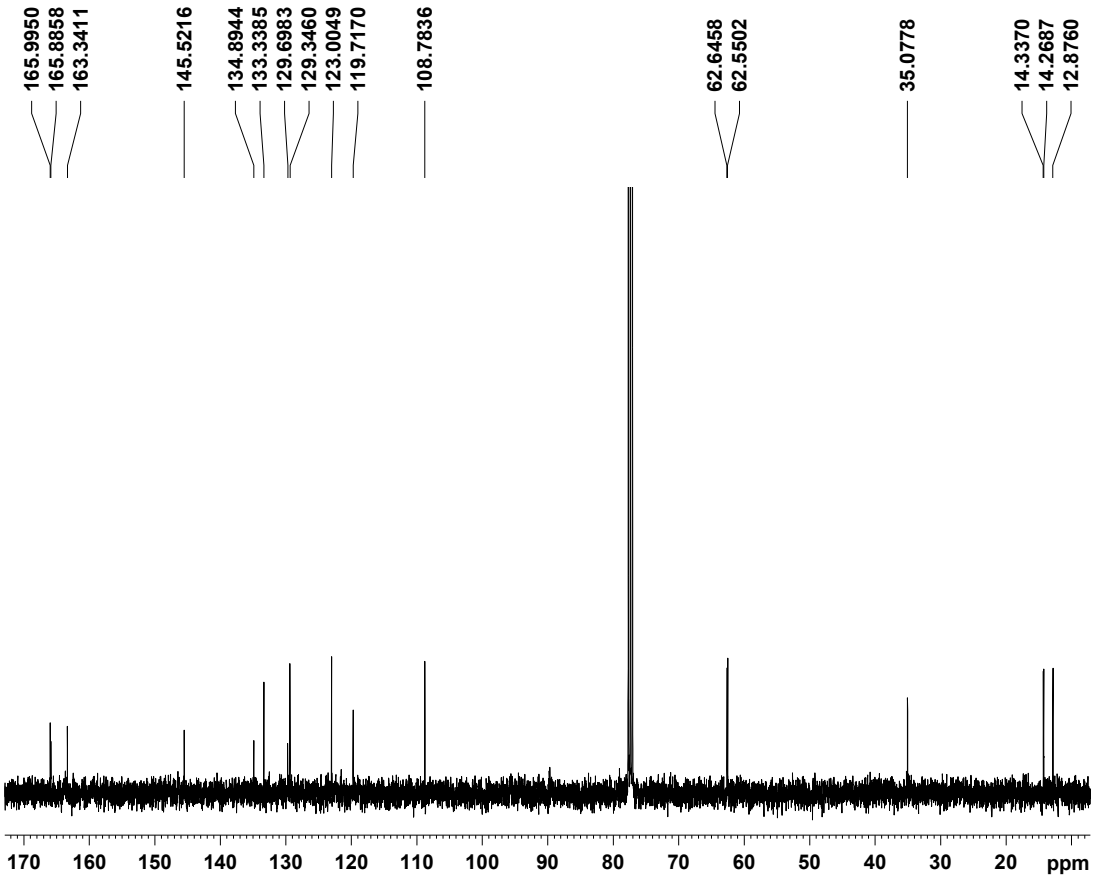



```
Current Data Parameters
NAME                  KM-287_2
EXPNO                        3
PROCNO                       1

F2 - Acquisition Parameters
Date_              20100818
Time                    12.39
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                 zg30
TD                     65536
SOLVENT                CDCl3
NS                        16
DS                         2
SWH                 8278.146 Hz
FIDRES              0.126314 Hz
AQ                  3.9584243 sec
RG                      161.3
DW                     60.400 usec
DE                      6.00 usec
TE                     293.5 K
D1                 1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                      8.40 usec
PL1                    -3.00 dB
SFO1             400.1324710 MHz

F2 - Processing parameters
SI                       32768
SF                400.1300123 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```




```
Current Data Parameters
NAME                  KM-287_2
EXPNO                        5
PROCNO                       1

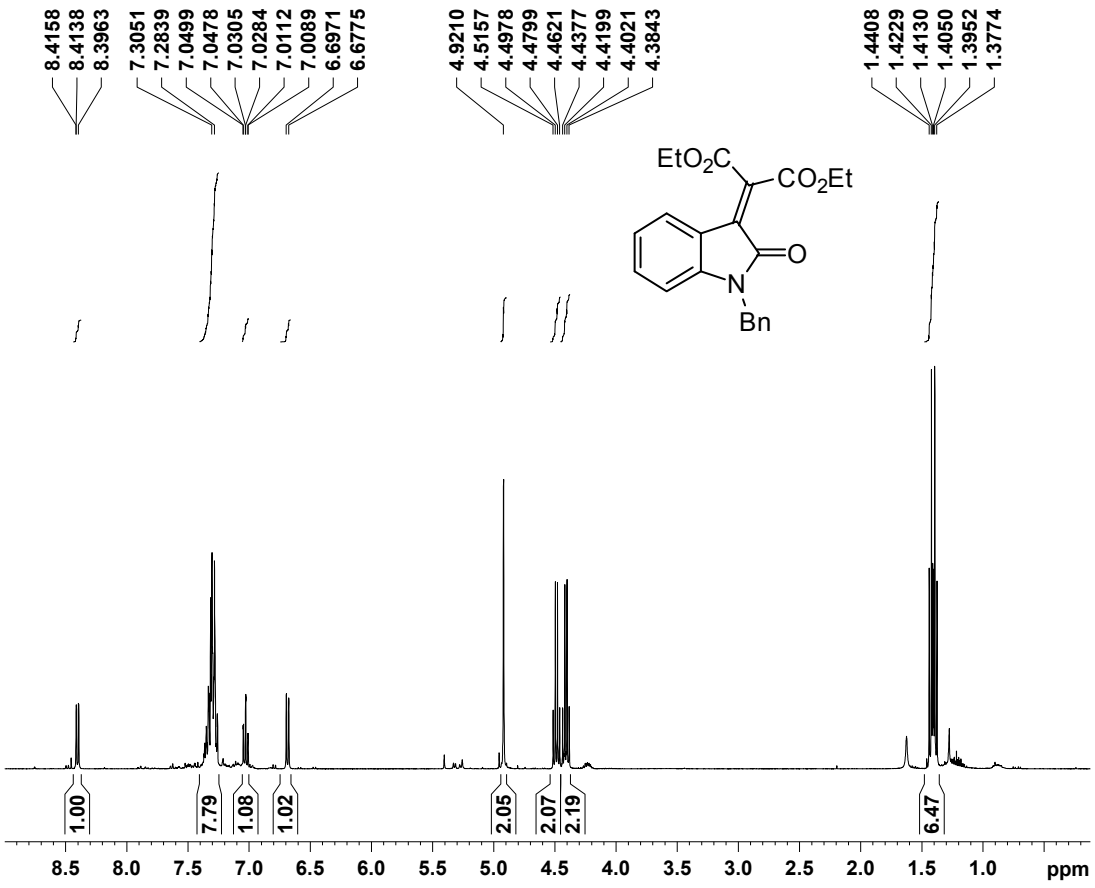
F2 - Acquisition Parameters
Date_              20100825
Time                    15.38
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG               zgpg30
TD                     65536
SOLVENT                CDCl3
NS                       256
DS                         4
SWH                23980.814 Hz
FIDRES              0.365918 Hz
AQ                  1.3664756 sec
RG                      11585.2
DW                     20.850 usec
DE                      6.00 usec
TE                     293.9 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                      9.70 usec
PL1                    -3.00 dB
SFO1             100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                      1H
PCPD2                  84.00 usec
PL2                    -3.00 dB
PL12                   18.00 dB
PL13                   18.00 dB
SFO2             400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF                100.6127341 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

NMR spectra for diethyl 2-(1-benzyl-2-oxoindolin-3-ylidene)malonate 2c

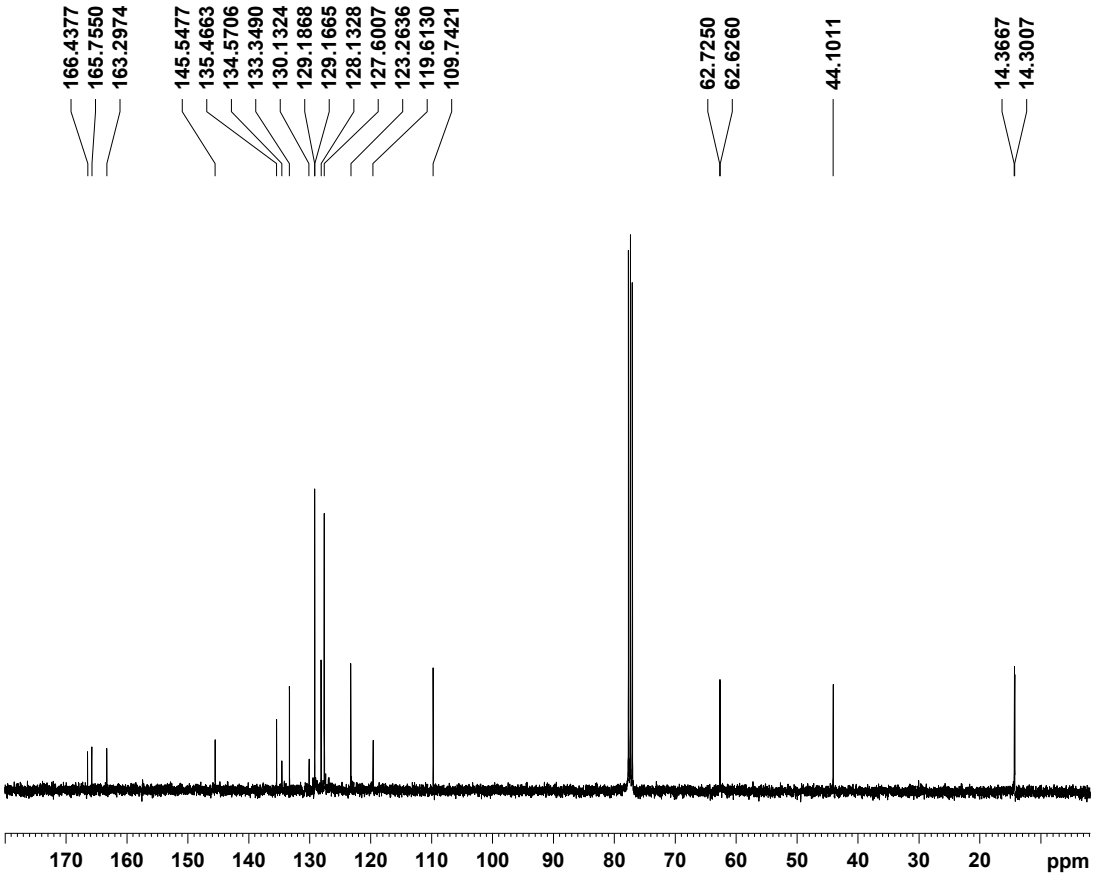



```
Current Data Parameters
NAME                  km-32
EXPNO                     3
PROCNO                    1

F2 - Acquisition Parameters
Date_              20091028
Time                  9.10
INSTRUM             dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
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                   292.1 K
D1              1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    8.40 usec
PL1                  -3.00 dB
SFO1          400.1324710 MHz

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




```
Current Data Parameters
NAME                  km-32
EXPNO                     4
PROCNO                    1

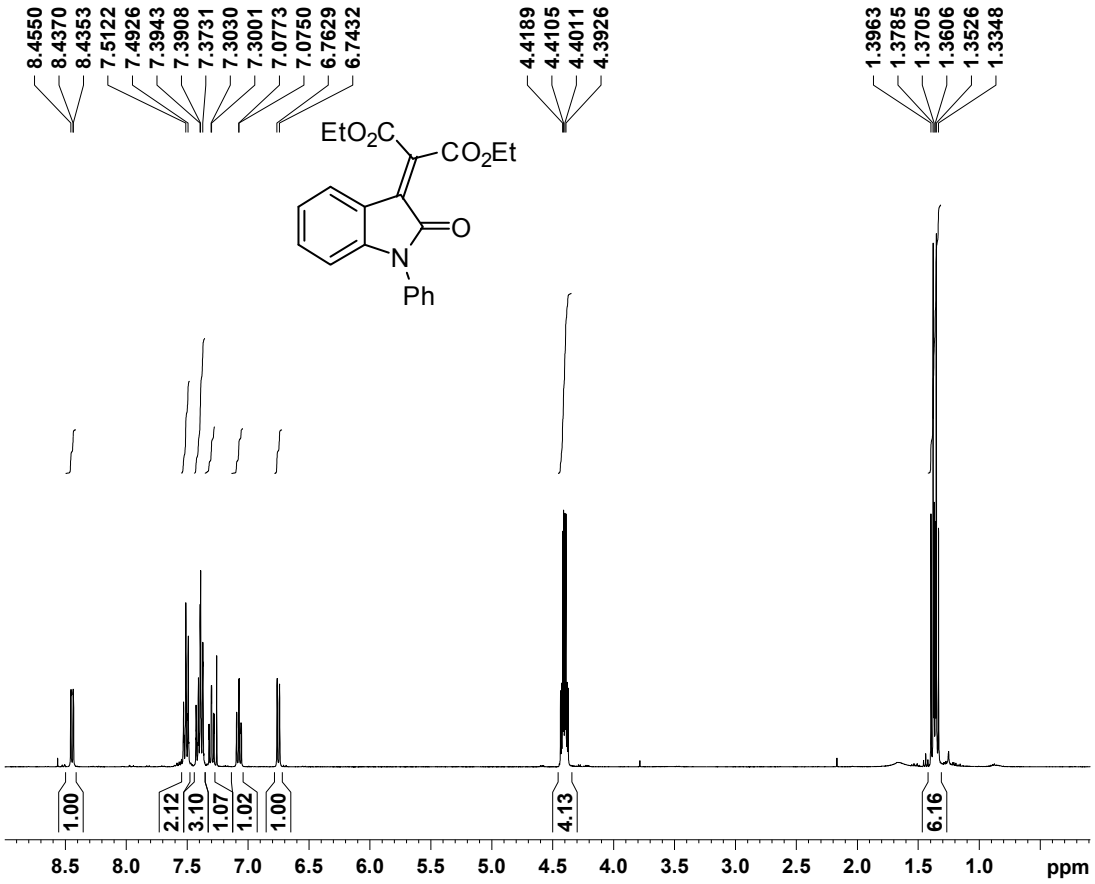
F2 - Acquisition Parameters
Date_              20091028
Time                  9.13
INSTRUM             dpx400
PROBHD    5 mm QNP  1H/1
PULPROG            zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   292.4 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                       8

======== CHANNEL f1 ========
NUC1                    13C
P1                    9.70 usec
PL1                  -3.00 dB
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2             waltz16
NUC2                     1H
PCPD2                84.00 usec
PL2                  -3.00 dB
PL12                 18.00 dB
PL13                 18.00 dB
SFO2          400.1316005 MHz

F2 - Processing parameters
SI                    32768
SF              100.6127347 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

NMR spectra for diethyl 2-(2-oxo-1-phenylindolin-3-ylidene)malonate 2d

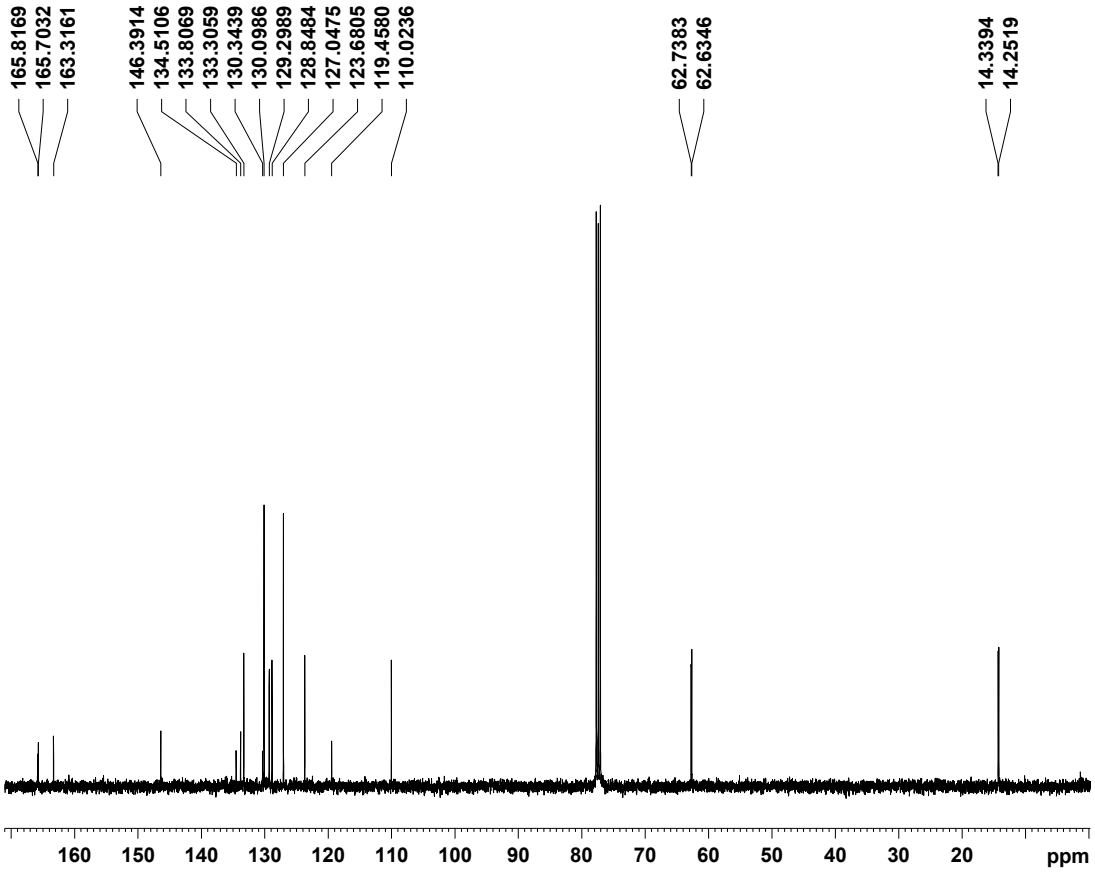



```
Current Data Parameters
NAME                  KM-247
EXPNO                      5
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100713
Time                  15.11
INSTRUM               dpx400
PROBHD   5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                        16
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                   294.6 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1            400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF                400.1300100 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```




```
Current Data Parameters
NAME                  KM-247
EXPNO                     15
PROCNO                     1

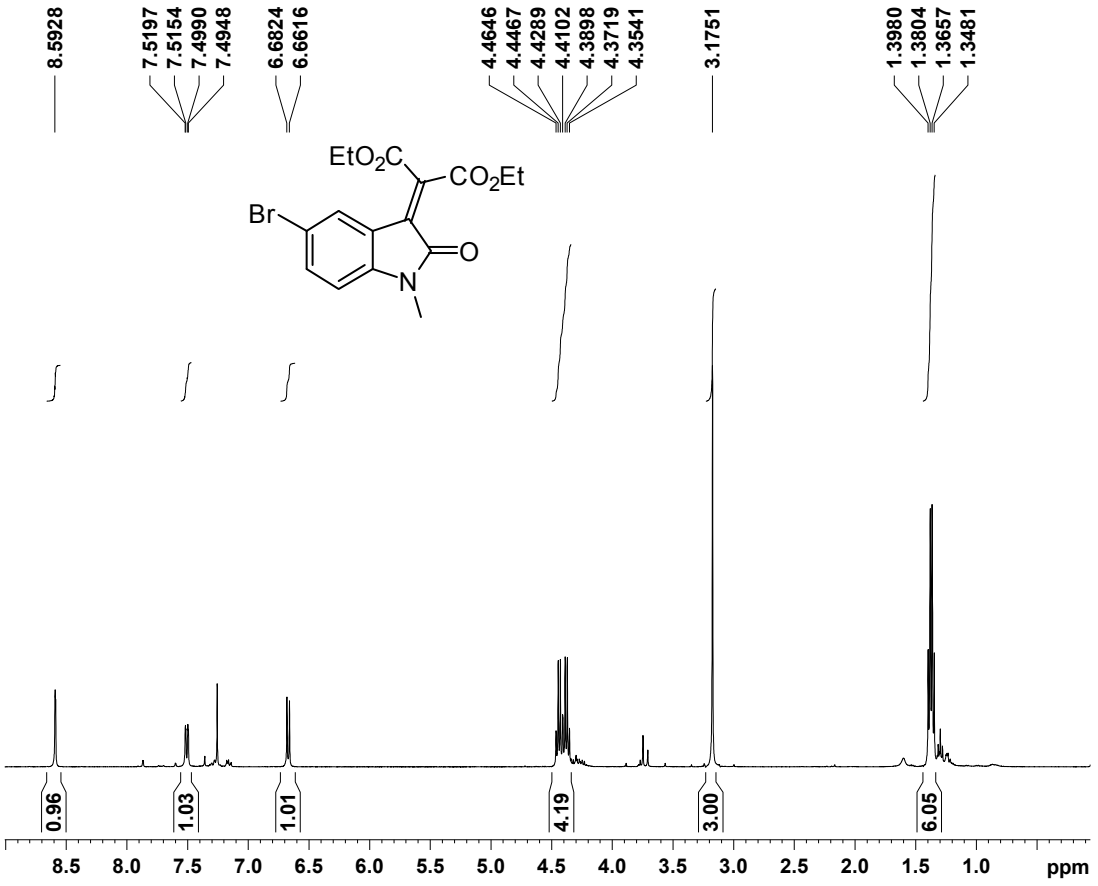
F2 - Acquisition Parameters
Date_              20110427
Time                   9.50
INSTRUM               dpx400
PROBHD   5 mm QNP  1H/1
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                       256
DS                         4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                    13004
DW                   20.850 usec
DE                    6.00 usec
TE                   290.7 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1            100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  16.08 dB
PL13                  18.00 dB
SFO2            400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF                100.6127358 MHz
WDW                       EM
SSB                        0
LB                     1.00 Hz
GB                         0
PC                      1.40
```

NMR spectra for diethyl 2-(5-bromo-1-methyl-2-oxoindolin-3-ylidene)malonate 2e

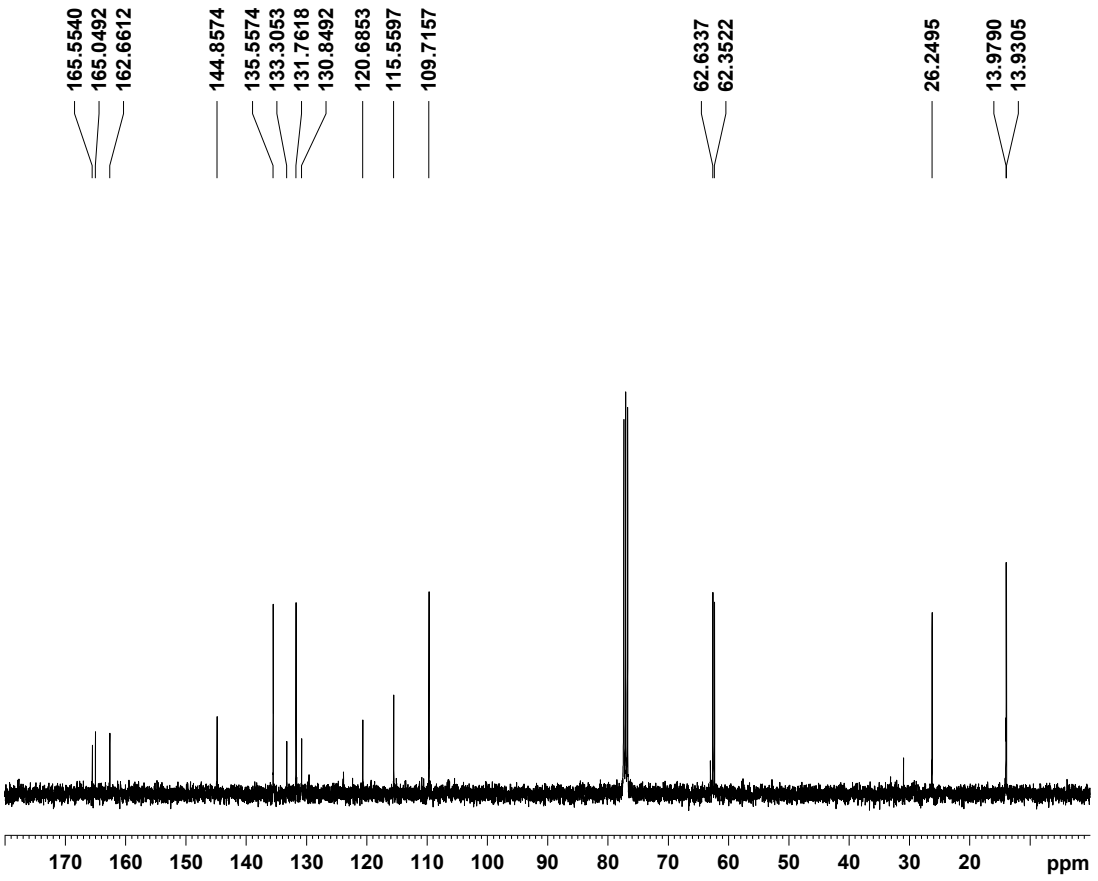



```
Current Data Parameters
NAME                  KM-150
EXPNO                      8
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100510
Time                  10.38
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
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                   290.2 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1            400.1324710 MHz

F2 - Processing parameters
SI                       32768
SF                400.1300106 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```




```
Current Data Parameters
NAME                  KM-150
EXPNO                      5
PROCNO                     1

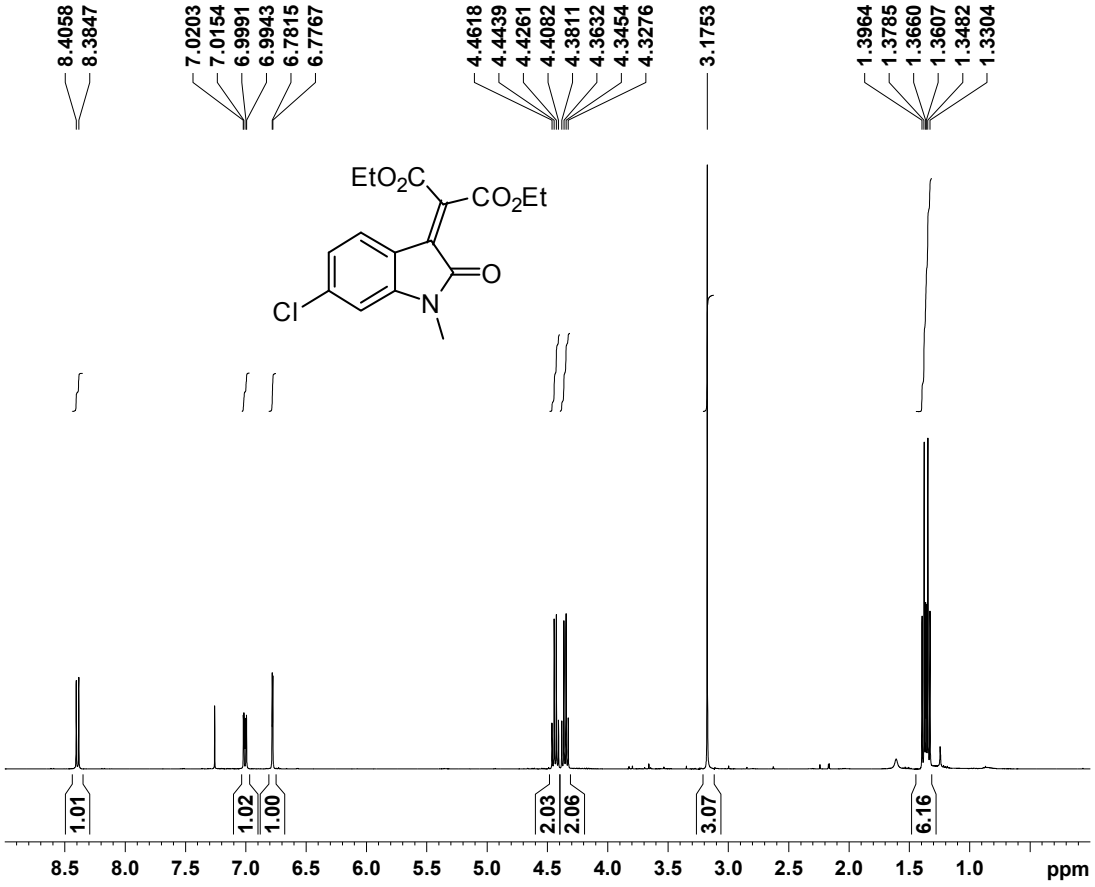
F2 - Acquisition Parameters
Date_              20100421
Time                  12.16
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                     160
DS                       4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                  18390.4
DW                   20.850 usec
DE                    6.00 usec
TE                   290.1 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1            100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  18.00 dB
PL13                  18.00 dB
SFO2            400.1316005 MHz

F2 - Processing parameters
SI                       32768
SF                100.6127690 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

NMR spectra for diethyl 2-(6-chloro-1-methyl-2-oxoindolin-3-ylidene)malonate 2f

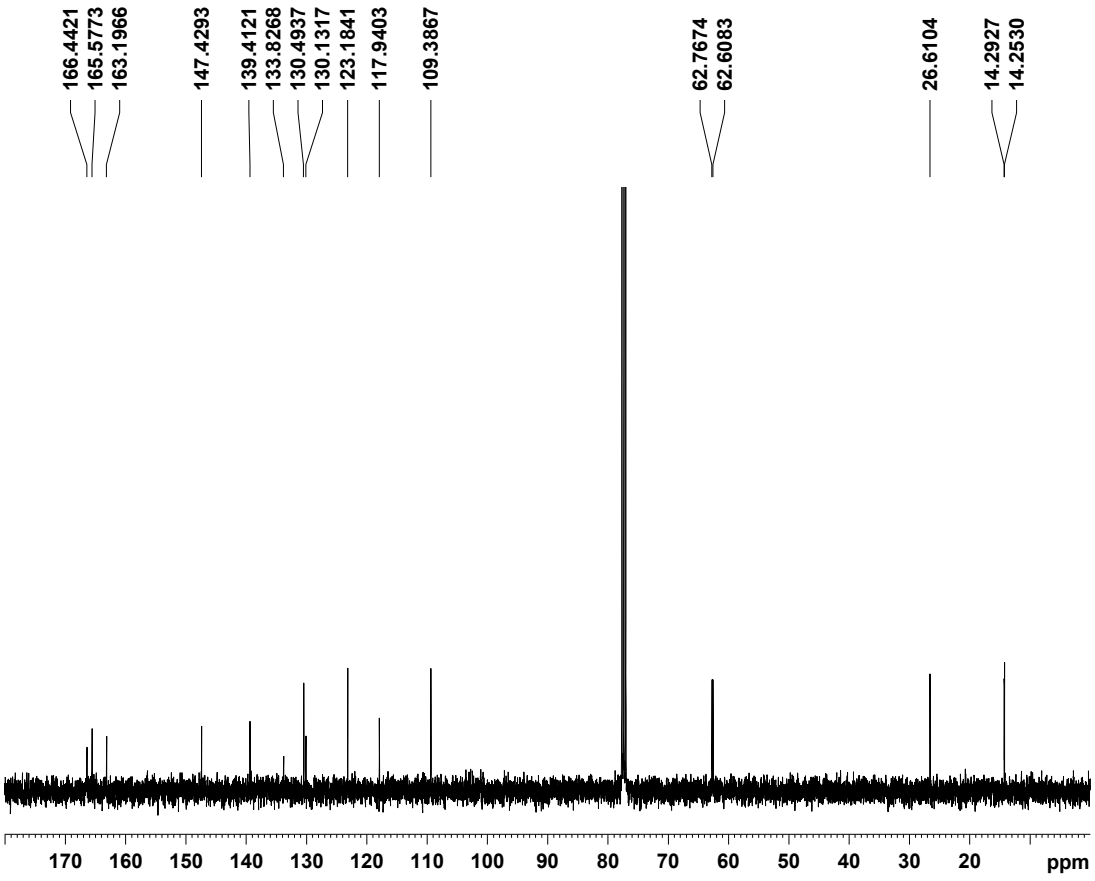



```
Current Data Parameters
NAME                 KM-267
EXPNO                     7
PROCNO                    1

F2 - Acquisition Parameters
Date_             20100729
Time                 12.11
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zg30
TD                  65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               8278.146 Hz
FIDRES           0.126314 Hz
AQ                3.9584243 sec
RG                   228.1
DW                  60.400 usec
DE                   6.00 usec
TE                  293.4 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    1H
P1                    8.40 usec
PL1                  -3.00 dB
SFO1          400.1324710 MHz

F2 - Processing parameters
SI                      32768
SF            400.1300103 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```




```
Current Data Parameters
NAME                 KM-267
EXPNO                     8
PROCNO                    1

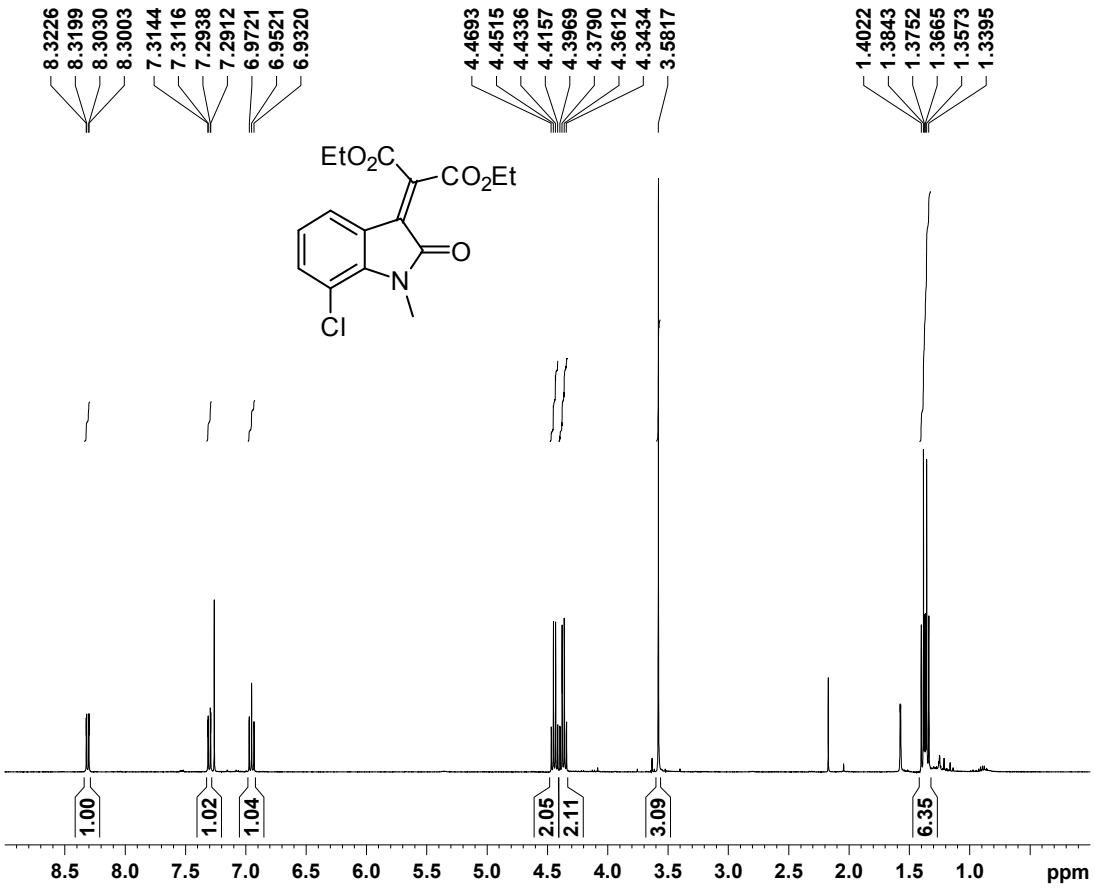
F2 - Acquisition Parameters
Date_             20100729
Time                 12.14
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG            zgpg30
TD                  65536
SOLVENT              CDCl3
NS                     256
DS                       4
SWH              23980.814 Hz
FIDRES           0.365918 Hz
AQ                1.3664756 sec
RG                    6502
DW                  20.850 usec
DE                   6.00 usec
TE                  293.6 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                       8

======== CHANNEL f1 ========
NUC1                   13C
P1                    9.70 usec
PL1                  -3.00 dB
SFO1          100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                    1H
PCPD2                84.00 usec
PL2                  -3.00 dB
PL12                 18.00 dB
PL13                 18.00 dB
SFO2          400.1316005 MHz

F2 - Processing parameters
SI                      32768
SF            100.6127346 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40
```

NMR spectra for diethyl 2-(7-chloro-1-methyl-2-oxoindolin-3-ylidene)malonate 2g

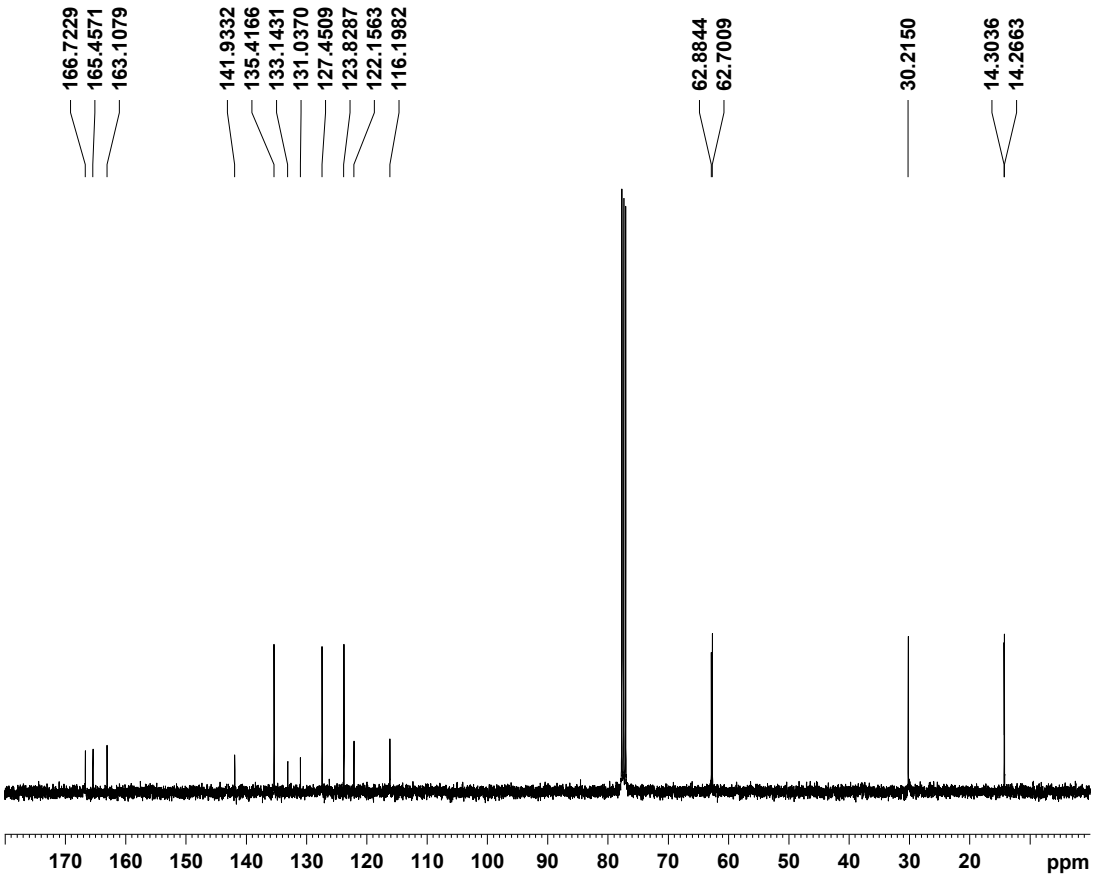



```
Current Data Parameters
NAME                  KM-308
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20100826
Time_                 15.28
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9584243 sec
RG                    574.7
DW                   60.400 usec
DE                    6.00 usec
TE                   292.9 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF                400.1300090 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```




```
Current Data Parameters
NAME                  KM-310
EXPNO                     11
PROCNO                     1

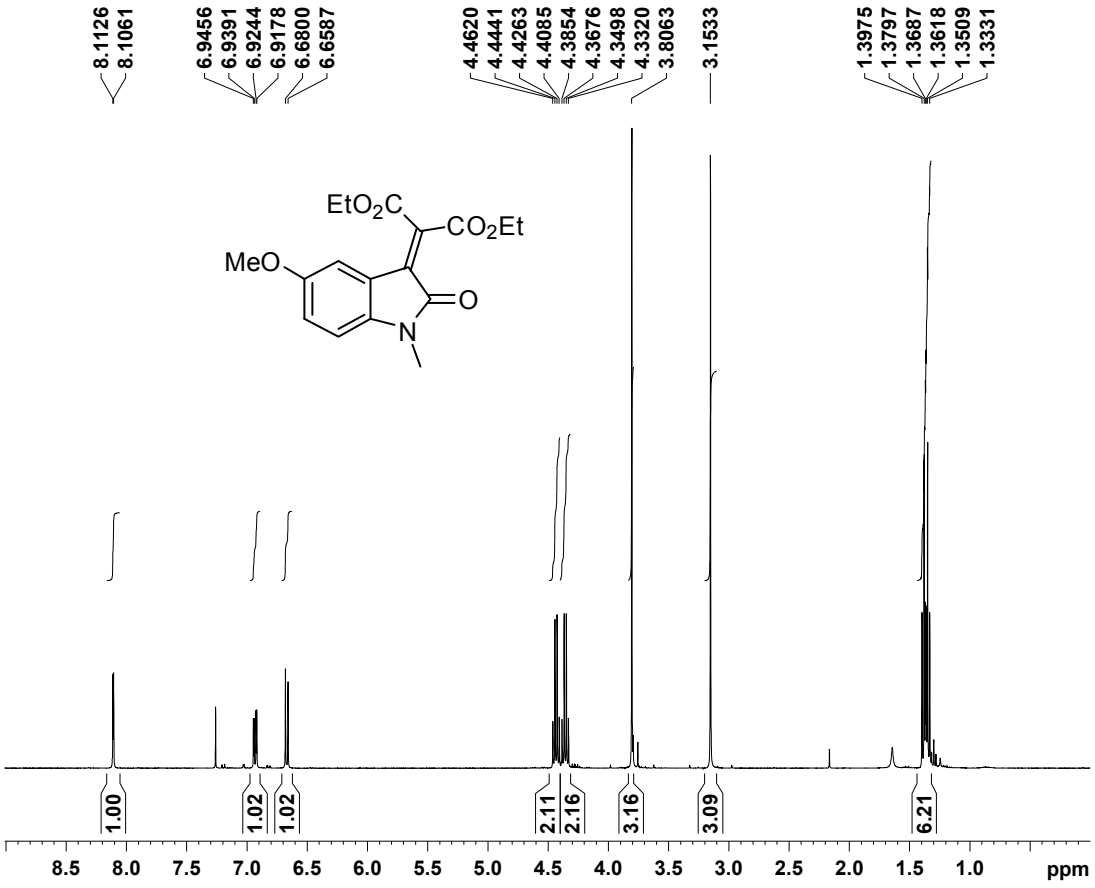
F2 - Acquisition Parameters
Date_              20110613
Time_                 15.23
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   292.1 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  16.08 dB
PL13                  18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF                100.6127334 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```

NMR spectra for diethyl 2-(5-methoxy-1-methyl-2-oxoindolin-3-ylidene)malonate 2h

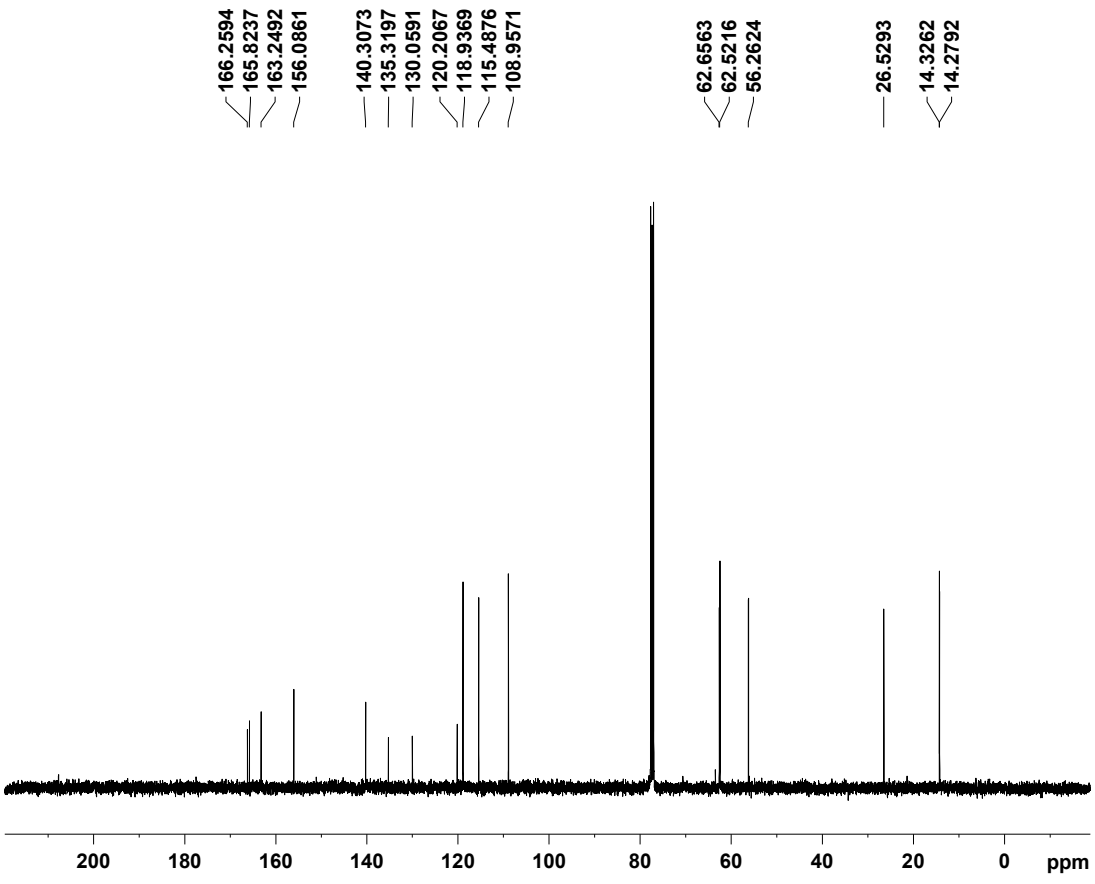



```
Current Data Parameters
NAME                  WM-466
EXPNO                      5
PROCNO                     1

F2 - Acquisition Parameters
Date_              20111007
Time                   9.20
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9583745 sec
RG                    203.2
DW                   60.400 usec
DE                    6.00 usec
TE                   293.1 K
D1                1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                    8.40 usec
PL1                  -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
SI                    32768
SF               400.1300096 MHz
WDW                      EM
SSB          0
LB                    0.30 Hz
GB           0
PC                    1.00
```

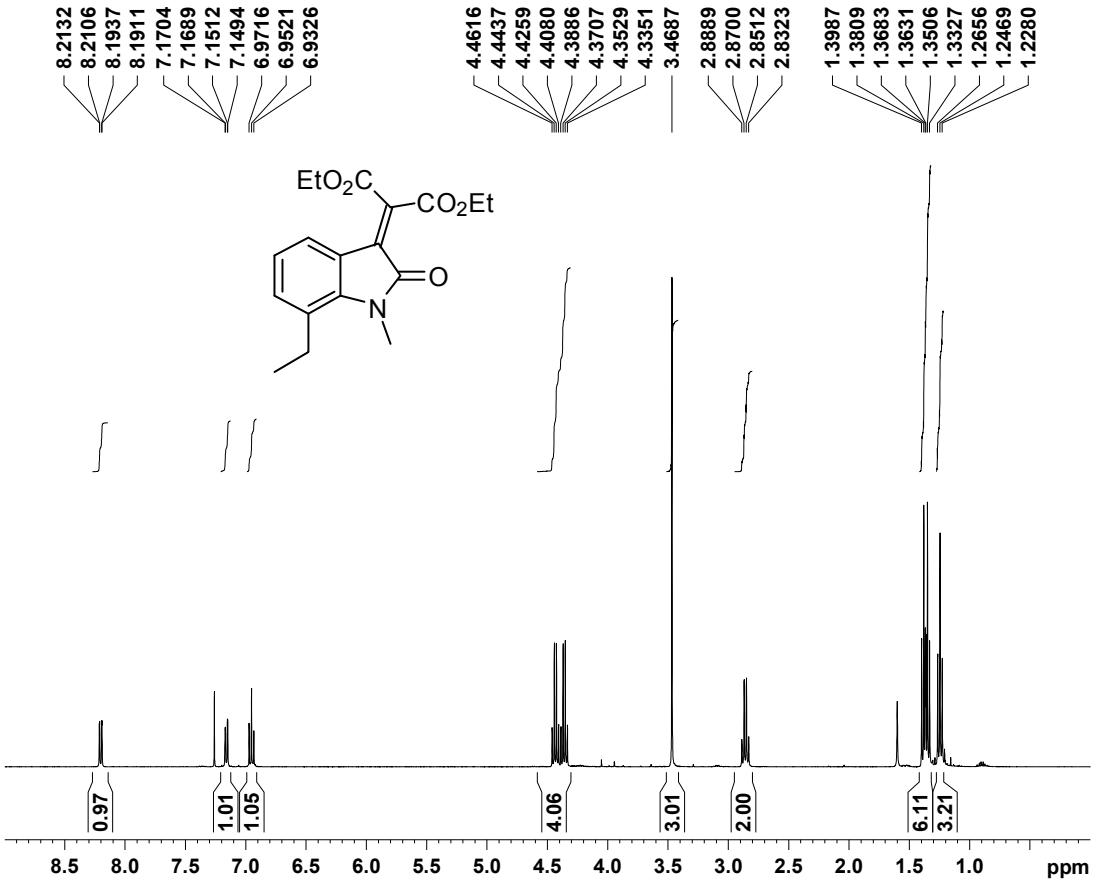



```
Current Data Parameters
NAME                  WM-466
EXPNO                      6
PROCNO                     1

F2 - Acquisition Parameters
Date_              20111007
Time                   9.23
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG             zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664256 sec
RG                     6502
DW                   20.850 usec
DE                    6.00 usec
TE                   293.5 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                       8
SFO1           100.6228298 MHz
NUC1                    13C
P1                    9.70 usec
PLW1             -1.00000000 W
SFO2           400.1316005 MHz
NUC2                     1H
CPDPRG[2           waltz16
PCPD2                84.00 usec
PLW2             -1.00000000 W
PLW12            -1.00000000 W
PLW13            -1.00000000 W

F2 - Processing parameters
SI                    32768
SF               100.6127338 MHz
WDW                      EM
SSB          0
LB                    1.00 Hz
GB           0
PC                    1.40
```

NMR spectra for diethyl 2-(7-ethyl-1-methyl-2-oxoindolin-3-ylidene)malonate 2i

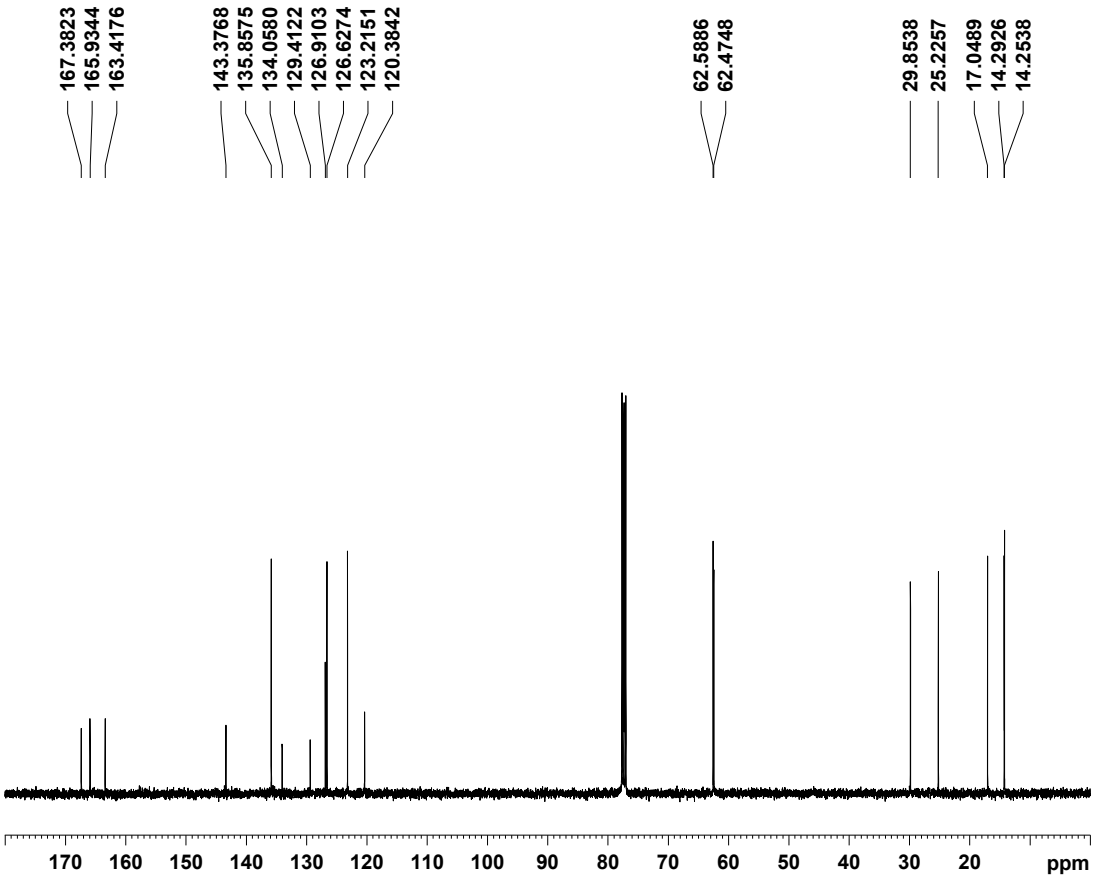



```
Current Data Parameters
NAME                  WM-465
EXPNO                      2
PROCNO                     1

F2 - Acquisition Parameters
Date_              20111004
Time                  13.51
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9584243 sec
RG                      256
DW                   60.400 usec
DE                    6.00 usec
TE                   293.3 K
D1                1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1            400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF                400.1300098 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```




```
Current Data Parameters
NAME                  WM-468
EXPNO                      5
PROCNO                     1

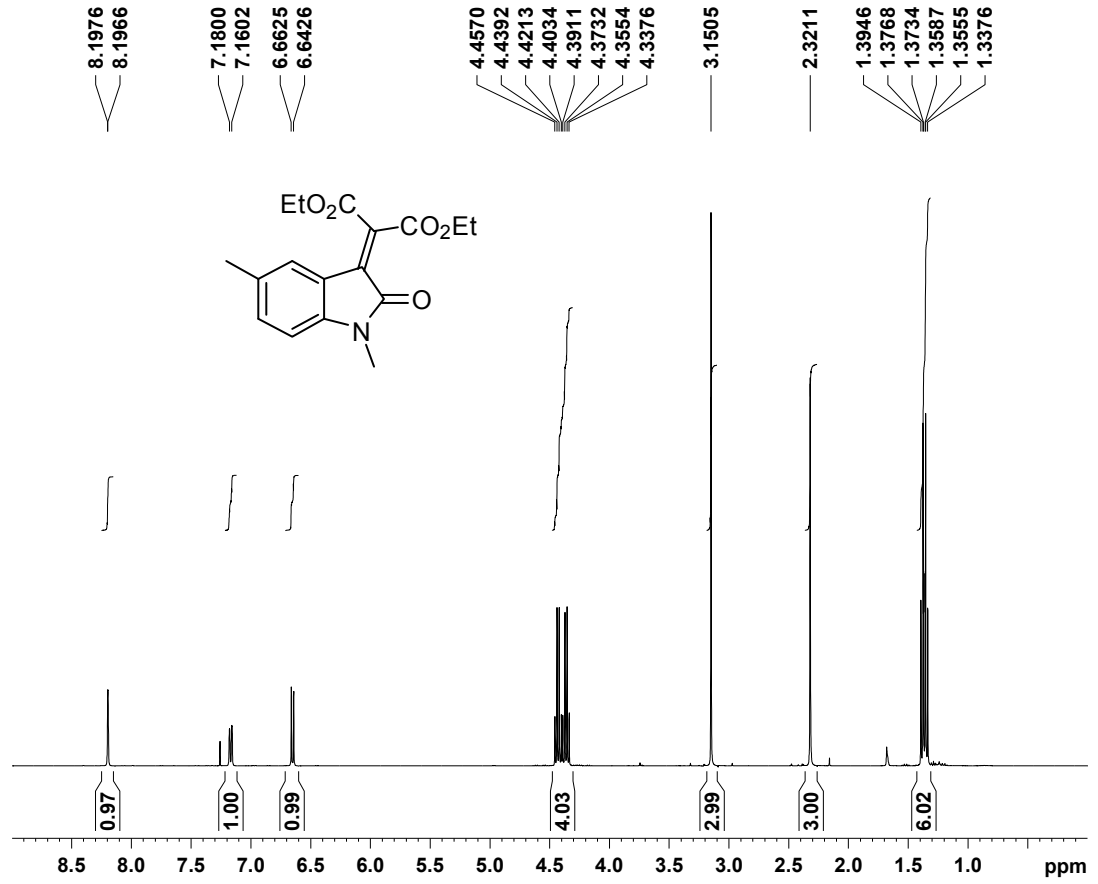
F2 - Acquisition Parameters
Date_              20111018
Time                  11.00
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                      6502
DW                   20.850 usec
DE                    6.00 usec
TE                   293.6 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1            100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  16.08 dB
PL13                  18.00 dB
SFO2            400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF                100.6127366 MHz
WDW                       EM
SSB                        0
LB                     1.00 Hz
GB                         0
PC                      1.40
```

NMR spectra for diethyl 2-(1,5-dimethyl-2-oxoindolin-3-ylidene)malonate 2j

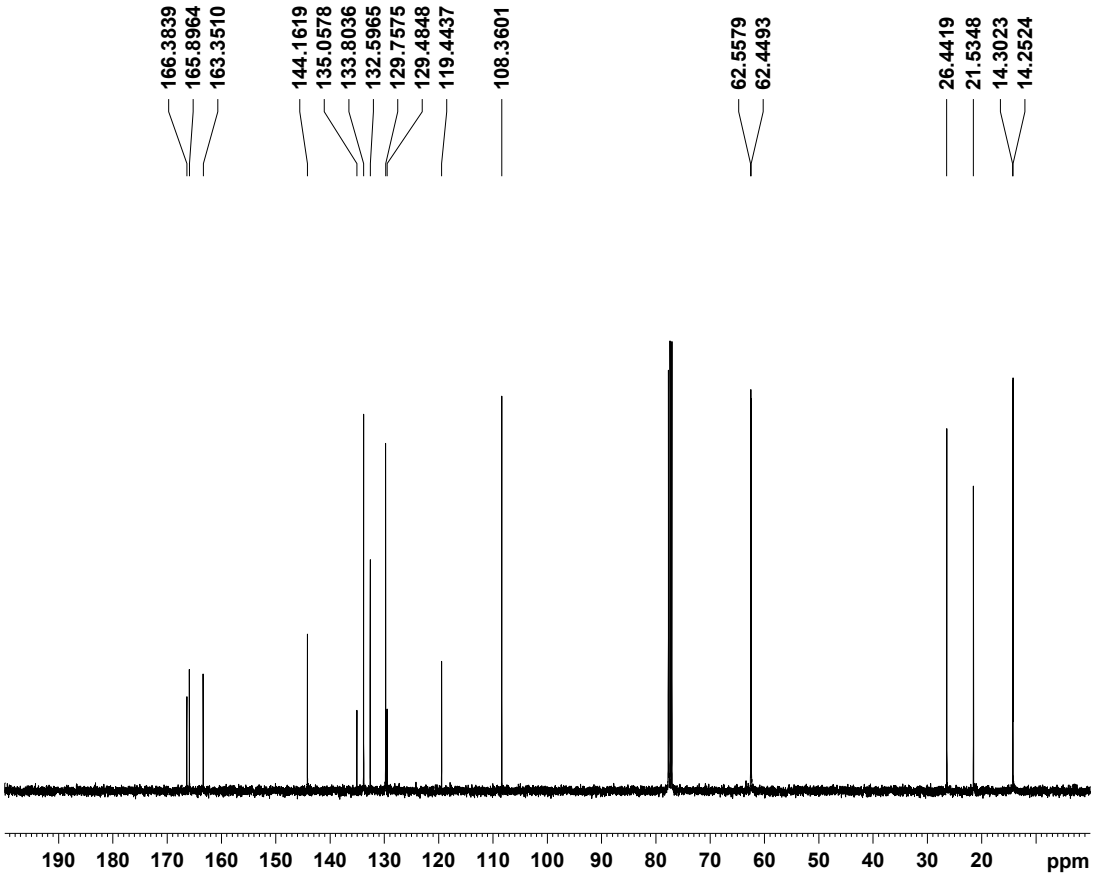



```
Current Data Parameters
NAME                  WM-467
EXPNO                      7
PROCNO                     1

F2 - Acquisition Parameters
Date_              20111013
Time                  10.25
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8278.146 Hz
FIDRES            0.126314 Hz
AQ                3.9584243 sec
RG                      128
DW                   60.400 usec
DE                    6.00 usec
TE                   292.9 K
D1              1.00000000 sec
TD0                        1

======== CHANNEL f1 ========
NUC1                      1H
P1                     8.40 usec
PL1                   -3.00 dB
SFO1           400.1324710 MHz

F2 - Processing parameters
SI                        32768
SF              400.1300098 MHz
WDW                          EM
SSB                           0
LB                         0.30 Hz
GB                            0
PC                         1.00
```




```
Current Data Parameters
NAME                  WM-467
EXPNO                      6
PROCNO                     1

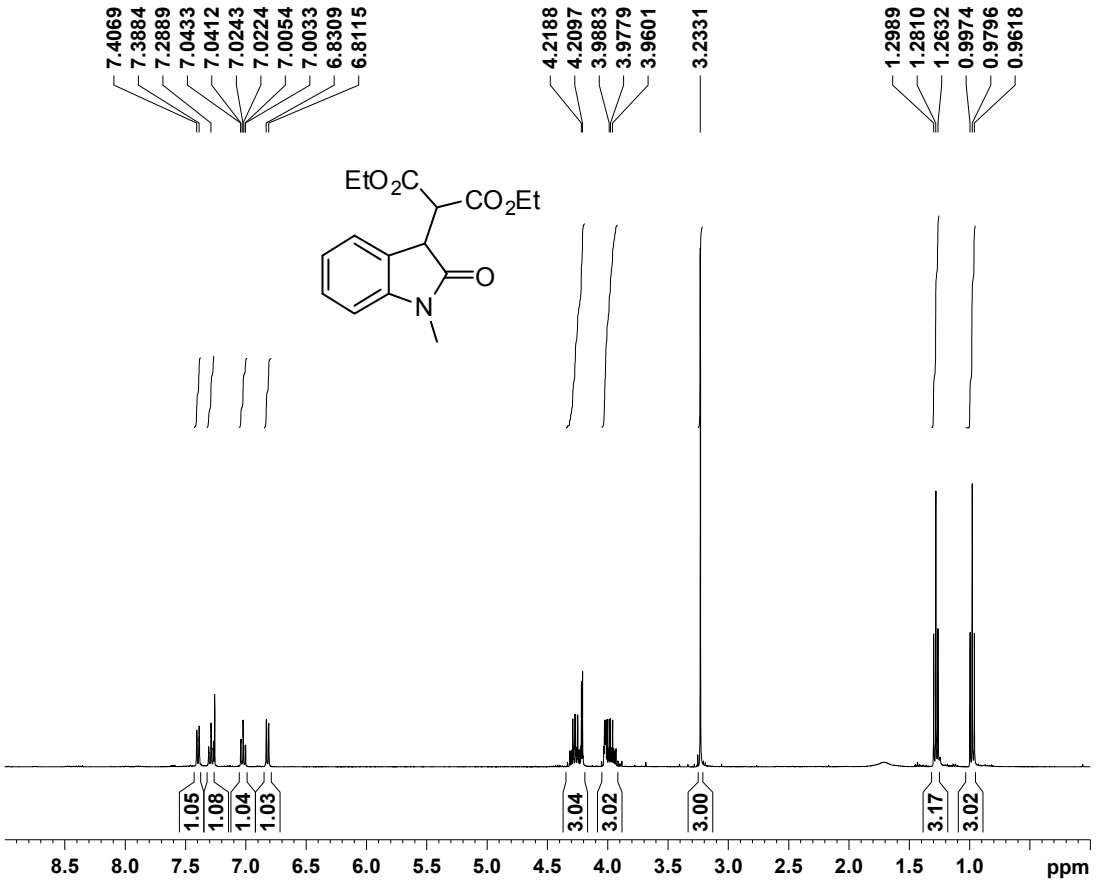
F2 - Acquisition Parameters
Date_              20111012
Time                  10.50
INSTRUM              dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                    65536
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               23980.814 Hz
FIDRES            0.365918 Hz
AQ                1.3664756 sec
RG                     13004
DW                   20.850 usec
DE                    6.00 usec
TE                   293.3 K
D1              2.00000000 sec
d11             0.03000000 sec
DELTA           1.89999998 sec
TD0                        8

======== CHANNEL f1 ========
NUC1                     13C
P1                     9.70 usec
PL1                   -3.00 dB
SFO1           100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                      1H
PCPD2                 84.00 usec
PL2                   -3.00 dB
PL12                  16.08 dB
PL13                  18.00 dB
SFO2           400.1316005 MHz

F2 - Processing parameters
SI                        32768
SF              100.6127368 MHz
WDW                          EM
SSB                           0
LB                         1.00 Hz
GB                            0
PC                         1.40
```

NMR spectra for diethyl 2-(1-methyl-2-oxoindolin-3-yl)malonate 4

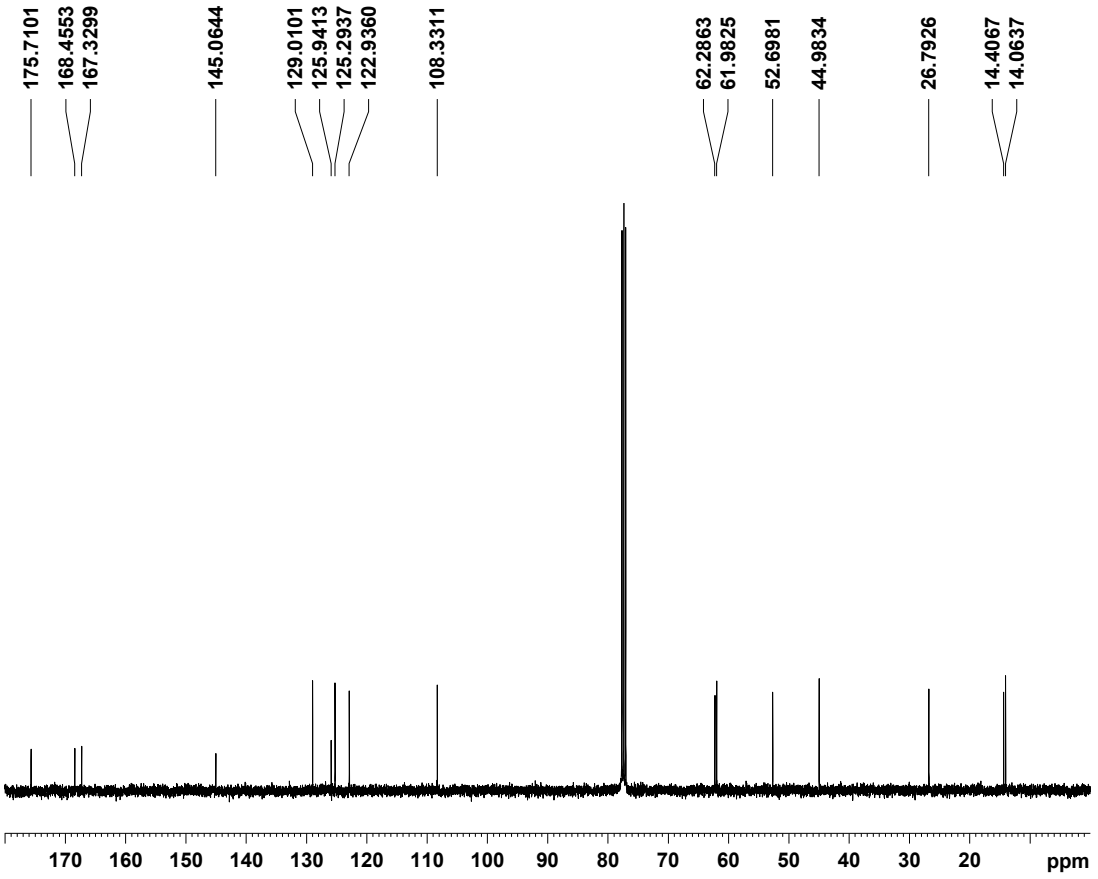



```
Current Data Parameters
NAME                  ARM-912
EXPNO                      16
PROCNO                      1

F2 - Acquisition Parameters
Date_                20110613
Time                    10.10
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
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                      291.7 K
D1                   1.00000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                       1H
P1                       8.40 usec
PL1                     -3.00 dB
SFO1              400.1324710 MHz

F2 - Processing parameters
SI                      32768
SF                400.1300100 MHz
WDW                        EM
SSB                         0
LB                       0.30 Hz
GB                          0
PC                       1.00
```




```
Current Data Parameters
NAME                  ARM-912
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_                20110613
Time                    11.00
INSTRUM                dpx400
PROBHD    5 mm QNP  1H/1
PULPROG              zgpg30
TD                     65536
SOLVENT                CDCl3
NS                        256
DS                          4
SWH                 23980.814 Hz
FIDRES               0.365918 Hz
AQ                   1.3664756 sec
RG                       6502
DW                      20.850 usec
DE                       6.00 usec
TE                      292.0 K
D1                   2.00000000 sec
d11                  0.03000000 sec
DELTA                1.89999998 sec
TD0                         8

======== CHANNEL f1 ========
NUC1                      13C
P1                       9.70 usec
PL1                     -3.00 dB
SFO1              100.6228298 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                   84.00 usec
PL2                     -3.00 dB
PL12                    16.08 dB
PL13                    18.00 dB
SFO2              400.1316005 MHz

F2 - Processing parameters
SI                      32768
SF                100.6127338 MHz
WDW                        EM
SSB                         0
LB                       1.00 Hz
GB                          0
PC                       1.40
```