Supporting Information

Vinylogous Nicholas Reactions in the Synthesis of Bi- and Tricyclic Cycloheptynedicobalt Complexes

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Table of Contents

[(3,5-Dimethoxyphenyl)ethynyl]trimethylsilane (7'd)

To a mixture of $Pd(PPh_3)_4$ (0.6131 g, 0.531 mmol, 3 mol%) and CuI (0.1684 g, 0.884 mmol, 5 mol%) was added a solution of 1-bromo-3,5-dimethoxybenzene (3.8393 g, 17.684 mmol) in THF (12 mL), followed by trimethylsilylacetylene (5.0 mL, 35 mmol). Triethylamine (118 mL) was added and the mixture stirred for 20 h. The mixture was filtered through Celite® and subjected to a conventional extractive workup (Et_2O). Following flash chromatography (15:1 hexanes:Et_2O), compound **7'd** was isolated as a colourless solid (3.6129 g, 15.433 mmol, 87%), mp. 62-63 ^oC (lit., 61-65 ^oC[1]), and which was characterized as spectroscopically identical to reported values.[1]

2-(Phenylethynyl)cyclohex-1-enecarbaldehyde (9b)

Compound **9b** was synthesized from phenylacetylene (0.2773 g, 2.717 mmol) and 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**)[2] (0.7134 g, 4.076 mmol) according to General Procedure A at a reaction temperature of 80 ^oC using an oil bath. The product was isolated using preparative TLC (25:1 hexanes:Et_2O) as a yellow oil (0.4687 g, 2.231 mmol, 82%). ^{1}H-NMR (500 MHz, $CDCl_3$): 10.32 (s, 1H), 7.47-7.49 (m, 2H), 7.35-7.37 (m, 3H), 2.52 (t, 2H, J = 6.1), 2.31 (t, 2H, J = 6.2), 1.66-1.75 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 193.0, 142.7, 140.1, 131.8, 129.2, 128.6, 122.4, 98.7, 86.4, 32.5, 22.2, 22.0, 21.2; IR (KBr): 2934, 2835, 2199, 1673, 1604, 1223; HRMS: m/e for $C_{15}H_{14}O$ calculated 210.1045 (M^+), found 210.1045.

2-[(3,4-Dimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9d)

Compound **7c**[3] (0.8136 g, 5.020 mmol) was subjected to Sonogashira conditions according to General Procedure A with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (1.4306 g, 7.5302

mmol). Compound **9d** was isolated as a yellow oil (1.0838 g, 4.0122 mmol, 80%) via flash chromatography (10:1 hexanes:Et_2O), and was characterized as spectroscopically identical to reported values.[4]

2-[(3,5-Dimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9f)

Compound **7'd** (0.8926 g, 3.813 mmol) was subjected to a tandem desilylation/Sonogashira reaction according to General Procedure B with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (1.0866 g, 5.7192 mmol). The coupled product (**9f**) was isolated as a yellow oil (0.9252 g, 3.425 mmol, 90%) following flash chromatography (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 10.30 (s, 1H), 6.60 (d, 2H, J = 2.2), 6.47 (t, 1H, J = 2.1), 3.78 (s, 6H), 2.50 (t, 2H, J = 6.1), 2.29 (t, 2H, J = 6.1), 1.64-1.73 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 192.9, 160.7, 142.9, 139.9, 123.6, 109.5, 102.6, 98.6, 85.8, 55.6, 32.4, 22.2, 22.0, 21.1; IR (KBr): 3001, 2937, 2838, 2197, 1672, 1594, 1421, 1208; HRMS: m/e for $C_{17}H_{18}O_3$ calculated 270.1256 (M^+), found 270.1251.

2-[(2,5-Dimethoxyphenyl)ethynyl]cyclopent-1-enecarbaldehyde (9g)

Compound **7e**[5] (0.6523 g, 4.025 mmol) was subjected to Sonogashira chemistry according to General Procedure A with 2-bromocyclopent-1-ene-1-carbaldehyde (**8a**) (1.0567 g, 6.0373 mmol). Product **9g** was isolated as a cream-coloured solid (0.8184 g, 3.196 mmol, 79%) following flash chromatography (10:1 hexanes:Et_2O). mp. 109-110 ^{o}C; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.21 (s, 1H), 6.97 (d, 1H, J = 3.0), 6.92 (dd, 1H, J = 9.0, J = 3.1), 6.83 (d, 1H, J = 9.1), 3.85 (s, 3H), 3.78 (s, 3H), 2.82 (t, 2H, J = 7.8), 2.66 (t, 2H, J = 7.8), 2.01 (apparent pentet, 2H, J = 7.8); ^{13}C-NMR (75 MHz, $CDCl_3$): 189.6, 155.1, 153.3, 148.1, 143.5, 117.9, 117.3, 112.1, 111.8, 97.4, 87.5, 56.5, 56.0, 38.9, 29.7, 22.4; IR (KBr): 2960, 2834, 2193, 1667, 1500, 1238; HRMS: m/e for $C_{16}H_{16}O_3$ calculated 256.256.1099 (M^+), found 256.1087.

5-Iodo-1-isopropyl-2,3-dimethoxybenzene

2-(2,3-Dimethoxyphenyl)propan-2-ol[6] (5.5598 g, 28.332 mmol), I_2 (4.3145 g, 16.999 mmol) and (diacetoxyiodo)benzene (10.0383 g, 31.166 mmol) were ground together using a mortar and pestle for 30 min, and left for 72 h. The mixture was dissolved in a mixture of CH_2Cl_2 and $Na_2S_2O_3$ (aq, sat) and given a conventional extractive workup. Following Kugelrohr distillation at 0.1 Torr, the crude iodinated and dehydrated 5-iodo-1,2-dimethoxy-3-(prop-1-en-2-yl)benzene was dissolved in methanol (150 mL) along with Wilkinson's catalyst (0.5700 g, 0.6161 mmol). H_2 was bubbled through the solution, which was stirring at room temperature. Starting material

consumption was complete after 1.5 days, as assessed by ^{1}H-NMR spectroscopy. The solvent was removed under reduced pressure, and Kugelrohr distillation at 0.1 Torr afforded 5-Iodo-1-isopropyl-2,3-dimethoxybenzene as a pale yellow oil (7.4897 g, 24.475 mmol, 86%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.16 (d, 1H, J = 1.8), 7.04 (d, 1H, J = 1.8), 3.84 (s, 3H), 3.80 (s, 3H), 3.29 (septet, 1H, J = 7.1), 1.20 (d, 6H, J = 7.1); ^{13}C-NMR (125 MHz, $CDCl_3$): 153.4, 146.4, 144.7, 127.8, 119.1, 87.3, 61.0, 56.0, 26.7, 23.4; IR (KBr): 2962, 2870, 2004, 1568, 1479, 1291, 1218; HRMS: m/e for $C_{11}H_{15}IO_2$ calculated 306.0117 (M^+), found 306.0122.

[(3-Isopropyl-4,5-dimethoxyphenyl)ethynyl]trimethylsilane

[(3-Isopropyl-4,5-dimethoxyphenyl)ethynyl]trimethylsilane was synthesized from 5-iodo-1-isopropyl-2,3-dimethoxybenzene (2.2563 g, 7.3732 mmol) and trimethylsilylacetylene (2.1 mL, 15 mmol) according to General Procedure A at room temperature, with the exception that THF as solvent was substituted for DMF. The target compound was isolated by flash chromatography (10:1 hexanes:Et_2O) as a pale yellow oil (2.0005 g, 7.2441 mmol, 98%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.00 (d, 1H, J = 1.8), 6.87 (d, 1H, J = 1.8), 3.86 (s, 3H), 3.82 (s, 3H), 3.32 (septet, 1H, J = 6.9), 1.21 (d, 6H, J = 6.94), 0.27 (s, 9H); ^{13}C-NMR (125 MHz, $CDCl_3$): 152.2, 147.2, 142.5, 122.8, 118.9, 113.2, 105.5, 92.6, 61.0, 55.8, 26.8, 23.3, 0.08; IR (KBr): 2962, 2152, 1573, 1484, 1317, 1250; HRMS: m/e for $C_{16}H_{24}O_2Si$ calculated 276.1546 (M^+), found 276.1542.

5-Ethynyl-1-isopropyl-2,3-dimethoxybenzene (7h)

[(3-Isopropyl-4,5-dimethoxyphenyl)ethynyl]trimethylsilane (2.0005 g, 7.2441 mmol) was subjected to desilylation according to General Procedure H. The product was isolated via flash chromatography (10:1 hexanes:Et_2O) as a pale yellow oil (1.3196 g, 6.4650 mmol, 89%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.03 (d, 1H, J = 1.8), 6.89 (d, 1H, J = 1.9), 3.85 (s, 3H), 3.83 (s, 3H), 3.33 (septet, 1H, J = 6.9), 3.03 (s, 1H), 1.21 (d, 6H, J = 6.9); ^{13}C-NMR (125 MHz, $CDCl_3$): 152.3, 147.4, 142.6, 123.0, 117.4, 113.4, 84.1, 75.9, 61.0, 55.8, 26.7, 23.3; IR (KBr): 3286, 2962, 2830, 2107, 1577, 1316, 1224; HRMS: m/e for $C_{13}H_{16}O_2$ calculated 204.1150 (M^+), found 204.1145.

2-[(2,5-Dimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9h)

Compound **7e** (0.7563 g, 4.666 mmol) was subjected to Sonogashira chemistry according to General Procedure A with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (1.3299 g, 6.9998 mmol). Product **9h** was isolated as a pale yellow solid (1.0691 g, 3.9578 mmol, 85%) following flash chromatography (10:1 hexanes:Et_2O). mp. 75-76 ^oC; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.38

(s, 1H), 6.96 (d, 1H, J = 3.0), 6.90 (dd, 1H, J = 9.0, J = 3.0), 6.83 (d, 1H, J = 9.0), 3.85 (s, 3H), 3.78 (s, 3H), 2.54 (t, 2H, J = 5.8), 2.31 (t, 2H, J = 5.9), 1.66-1.75 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 193.7, 155.0, 153.3, 142.6, 140.2, 117.8, 116.8, 112.1, 95.1, 90.6, 56.5, 55.9, 32.3, 22.2, 22.0, 21.2; IR (KBr): 2999, 2937, 2834, 2195, 1670, 1499, 1226, 1214; HRMS: m/e for $C_{17}H_{18}O_3$ calculated 270.1256 (M), found 270.1250.

2-[(2,5-Dimethoxyphenyl)ethynyl]cyclohept-1-enecarbaldehyde (9i)

Compound **7e** (0.3400 g, 2.098 mmol) was subjected to Sonogashira chemistry according to General Procedure A with 2-bromocyclohept-1-ene-1-carbaldehyde (**8c**)[2] (0.6390 g, 3.147 mmol). Product **9i** was isolated as a yellow oil (0.4406 g, 1.551 mmol, 74%) following preparative TLC (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 10.34 (s, 1H), 6.94 (d, 1H, J = 3.0), 6.88 (dd, 1H, J = 8.9, J = 3.1), 6.80 (d, 1H, J = 9.1), 3.83 (s, 3H), 3.76 (s, 3H), 2.69-2.72 (m, 2H), 2.52-2.54 (m, 2H), 1.81 (apparent pentet, 2H, J = 5.9), 1.68 (apparent pentet, 2H, J = 5.7), 1.46 (apparent pentet, 2H, J = 6.0); ^{13}C-NMR (125 MHz, $CDCl_3$): 193.0, 154.9, 153.2, 148.2, 145.9, 117.6, 116.9, 112.0, 111.9, 96.8, 92.0, 56.4, 55.8, 37.4, 32.3, 25.8, 24.3; IR (KBr): 2999, 2922, 2852, 2188, 1667, 1499, 1221; HRMS: m/e for $C_{18}H_{20}O_3$ calculated 284.1412 (M^+), found 284.1412.

2-[(2,3,4-Trimethoxyphenyl)ethynyl]cyclopent-1-enecarbaldehyde (9j)

Compound **7f**[7] (0.9223 g, 4.802 mmol) was subjected to Sonogashira coupling with 2-bromocyclopent-1-ene-1-carbaldehyde (**8a**) (1.2606 g, 7.2025 mmol) according to General Procedure A. Flash chromatography (2:1 hexanes:Et_2O) afforded the product (**9j**) as a pale yellow solid (1.1881 g, 4.1524 mmol, 86%). mp. 74-76 ^{o}C; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.19 (s, 1H), 7.17 (d, 1H, J = 9.0), 6.66 (d, 1H, J = 9.0), 3.98 (s, 3H), 3.89 (s, 3H), 3.88 (s, 3H), 2.81 (t, 2H, J = 7.9), 2.66 (t, 2H, J = 7.9), 2.01 (apparent pentet, 2H, J = 7.9); ^{13}C-NMR (75 MHz, $CDCl_3$): 189.2, 155.6, 155.3, 147.3, 143.8, 142.4, 128.5, 109.4, 107.6, 97.6, 86.4, 61.5, 61.2, 56.2, 39.0, 29.7, 22.3; IR (KBr): 2942, 2841, 2191, 1668, 1496, 1295; HRMS: m/e for $C_{17}H_{18}O_4$ calculated 286.1205 (M^+), found 286.1214.

2-[(2,3,4-Trimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9k)

Compound **7f** (1.2647 g, 6.5843 mmol) was subjected to Sonogashira conditions with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (1.8764 g, 9.8764 mmol) according to General Procedure A. Coupled product **9k** was isolated via flash chromatography (2:1 hexanes:Et_2O) for the last purification step. The product was obtained as a yellow solid (1.6237 g, 5.4099 mmol,

82%). mp. 119-120 °C; ^{1}H-NMR (300 MHz, $CDCl_3$): 10.32 (s, 1H), 7.12 (d, 1H, J = 8.7), 6.63 (d, 1H, J = 8.7), 3.95 (s, 3H), 3.86 (s, 3H), 3.85 (s, 3H), 2.51 (m, 2H), 2.28 (m, 2H), 1.62-1.74 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 193.3, 155.2, 155.1, 142.3, 142.0, 140.5, 128.2, 109.6, 107.6, 95.3, 89.3, 61.5, 61.2, 56.2, 32.4, 22.2, 22.0, 21.2; IR (KBr): 2937, 2190, 1668, 1494, 1276; HRMS: m/e for $C_{18}H_{20}O_4$ calculated 300.1362 (M^+), found 300.1355.

2-[(3,4,5-Trimethoxyphenyl)ethynyl]cyclopent-1-enecarbaldehyde (9l)

Compound **7g**[8] (0.2514 g, 1.309 mmol) was subjected to General Procedure A with 2-bromocyclopent-1-ene-1-carbaldehyde (**8a**) (0.3436 g, 1.963 mmol). Preparative TLC (2:1 hexanes:Et_2O) afforded the product as a yellow solid (0.3109 g, 1.087 mmol, 83%). mp. 131-133 °C; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.15 (s, 1H), 6.71 (s, 2H), 3.85 (s, 9H), 2.79 (t, 2H, J = 7.8), 2.64 (t, 2H, J = 7.8), 1.99 (apparent pentet, 2H, J = 7.9); ^{13}C-NMR (125 MHz, $CDCl_3$): 189.0, 153.3, 148.0, 143.3, 139.9, 117.0, 109.2, 101.0, 82.6, 61.1, 56.3, 39.0, 29.7, 22.3; IR (KBr): 2941, 2834, 2192, 1661, 1239; HRMS: m/e for $C_{17}H_{18}O_4$ calculated 286.1205 (M^+), found 286.1206.

2-[(3,4,5-Trimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9m)

Compound **7g** (0.3386 g, 1.763 mmol) was subjected to General Procedure A with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (0.5024 g, 2.644 mmol). Preparative TLC (2:1 hexanes:Et_2O) was used to isolate **9m** as a cream-coloured solid (0.4510 g, 1.503 mmol, 85%). mp. 121-123 °C; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.31 (s, 1H), 6.70 (s, 2H), 3.87 (s, 9H), 2.52 (t, 2H, J = 5.9), 2.31 (t, 2H, J = 5.9), 1.67-1.74 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 193.0, 153.3, 142.6, 140.2, 139.6, 117.4, 109.0, 98.8, 85.6, 61.1, 56.3, 32.5, 22.2, 22.0, 21.2; IR (KBr): 2933, 2195, 1664, 1238; HRMS: m/e for $C_{18}H_{20}O_4$ calculated 300.1362 (M^+), found 300.1361.

2-[(3,4,5-Trimethoxyphenyl)ethynyl]cyclohept-1-enecarbaldehyde (9n)

Compound **7g** (0.2422 g, 1.261 mmol) was subjected to General Procedure A with 2-bromocyclohept-1-ene-1-carbaldehyde (**8c**) (0.3841 g, 1.891 mmol). Preparative TLC (2:1 hexanes:Et_2O) isolated the product as a cream-coloured solid (0.3408 g, 1.085 mmol, 86%). mp. 115-116 °C; ^{1}H-NMR (500 MHz, $CDCl_3$): 10.29 (s, 1H), 6.70 (s, 2H), 3.87 (s, 9H), 2.69-2.71 (m, 2H), 2.53-2.55 (m, 2H), 1.83 (apparent pentet, 2H, J = 5.2), 1.68 (apparent pentet, 2H, J = 5.3), 1.47 (apparent pentet, 2H, J = 5.3); ^{13}C-NMR (75 MHz, $CDCl_3$): 192.4, 153.3, 148.3, 145.9, 139.8, 117.4, 109.0, 100.6, 87.0, 68.1, 61.1, 56.3, 37.6, 32.3, 25.9, 24.4; IR (KBr): 2924, 2850, 2185, 1668, 1575, 1503, 1238; HRMS: m/e for $C_{19}H_{22}O_4$ calculated 314.1518 (M^+), found

314.1526.

2-[(3-Isopropyl-4,5-dimethoxyphenyl)ethynyl]cyclohex-1-enecarbaldehyde (9o)

Compound **7h** (1.3196 g, 6.4650 mmol) was subjected to Sonogashira conditions according to General Procedure A with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (1.8424 g, 9.6975 mmol). Compound **9o** was isolated via flash chromatography (10:1 hexanes:Et_2O) as a yellow oil (1.7456 g, 5.5918 mmol, 86%). ^{1}H-NMR (500 MHz, $CDCl_3$): 10.31 (s, 1H), 6.97 (d, 1H, J = 1.7), 6.83 (d, 1H, J = 1.7), 3.84 (s, 3H), 3.82 (s, 3H), 3.31 (septet, 1H, J = 7.0), 2.50 (t, 2H, J = 6.1), 2.28 (t, 2H, J = 6.1), 1.63-1.72 (m, 4H), 1.19 (d, 6H, J = 7.1); ^{13}C-NMR (125 MHz, $CDCl_3$): 193.0, 152.4, 147.7, 142.8, 142.2, 140.3, 122.6, 117.6, 112.8, 99.2, 85.2, 61.0, 55.8, 32.4, 26.8, 23.3, 22.1, 21.9, 21.1; IR (KBr): 2936, 2868, 2192, 1673, 1484, 1323, 1226; HRMS: m/e for $C_{20}H_{24}O_3$ calculated 312.1725 (M^+), found 312.1727.

2-(Thiophen-3-ylethynyl)cyclohex-1-enecarbaldehyde (9p)

3-(Trimethylsilylethynyl)thiophene[9] (**7'i**) (0.3651 g, 2.028 mmol) was subjected to General Procedure B with 2-bromocyclohex-1-ene-1-carbaldehyde (**8b**) (0.5779 g, 3.042 mmol). The reaction flask was placed in an oil bath set to 75 ^{o}C for the overnight (20 h) portion of the reaction. The product (**9p**) (0.3511 g, 1.625 mmol, 80%) was isolated via preparative TLC (15:1 hexanes:Et_2O) as a yellow oil. ^{1}H-NMR (500 MHz, $CDCl_3$): 10.29 (s, 1H), 7.53 (d, 1H, J = 2.1), 7.32 (dd, 1H, J = 5.0, J = 3.1), 7.15 (d, 1H, J = 5.4), 2.51 (t, 2H, J = 6.1), 2.31 (t, 2H, J = 6.2), 1.66-1.75 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 193.0, 142.6, 140.1, 129.8, 129.7, 125.9, 121.5, 93.8, 86.1, 32.4, 22.2, 22.0, 21.2; IR (KBr): 3320, 3106, 2936, 2861, 2834, 2201, 1668, 1596; HRMS: m/e for $C_{13}H_{12}OS$ calculated 216.0609 (M^+), found 216.0616.

[2-(Phenylethynyl)cyclohex-1-enyl]methyl acetate (10b)

Compound **9b** (0.4687 g, 2.231 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10b** was isolated via preparative TLC (15:1 hexanes:Et_2O) as a yellow oil (0.4889 g, 1.924 mmol, 86%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.43-7.45 (m, 2H), 7.29-7.33 (m, 3H), 4.90 (s, 2H), 2.31 (m, 2H), 2.18 (m, 2H), 2.10 (s, 3H), 1.66-1.71 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.3, 139.1, 131.6, 128.4, 128.2, 123.5, 120.1, 93.2, 88.2, 66.7, 30.3, 27.2, 22.3, 22.1, 21.1; IR (KBr): 3058, 2934, 2861, 1740, 1228; HRMS: m/e for $C_{17}H_{18}O_2$ calculated 254.1307 (M^+), found 254.1302.

[2-((3,4-Dimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10d)

Compound **9d** (1.0838 g, 4.0122 mmol) was subjected to General Procedure C. The product **10d**

was isolated via flash chromatography (5:1 hexanes:Et_2O), as a pale yellow oil (1.1207 g, 3.5674 mmol, 89%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.03 (dd, 1H, J = 8.2, J = 1.9), 6.93 (d, 1H, J = 1.9), 6.79 (d, 1H, J = 8.3), 4.89 (s, 2H), 3.88 (s, 6H), 2.29 (m, 2H), 2.16 (m, 2H), 2.08 (s, 3H), 1.63-1.70 (m, 4H); ^{13}C-NMR (125 MHz, $CDCl_3$): 171.2, 149.3, 148.6, 138.4, 124.7, 120.1, 115.7, 114.1, 111.0, 93.2, 86.7, 66.6, 56.0, 55.9, 30.3, 27.0, 22.2, 22.0, 21.0; IR (KBr): 2934, 2837, 1737, 1514, 1247; HRMS: m/e for $C_{19}H_{22}O_4$ calculated 314.1518 (M^+), found 314.1513.

[2-((3,5-Dimethoxyphenyl)ethynyl)cyclopent-1-enyl]methyl acetate (10e)

Compound **9e** (1.0474 g, 4.0896 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10e** was isolated as a yellow oil (1.0852 g, 3.6157 mmol, 88%) following flash chromatography (5:1 hexanes:Et_2O). ^{1}H-NMR (300 MHz, $CDCl_3$): 6.58 (d, 2H, J = 2.3), 6.41 (t, 1H, J = 2.3), 4.86 (s, 2H), 3.76 (s, 6H), 2.60 (t, 2H, J = 7.5), 2.49 (t, 2H, J = 7.5), 2.07 (s, 3H), 1.93 (apparent pentet, 2H, J = 7.57); ^{13}C-NMR (75 MHz, $CDCl_3$): 170.9, 160.6, 145.0, 124.6, 122.7, 109.2, 101.8, 94.9, 84.2, 61.9, 55.4, 37.0, 34.2, 22.4, 20.8; IR (KBr): 3002, 2842, 2202, 1741, 1595, 1420, 1231; HRMS: m/e for $C_{18}H_{20}O_4$ calculated 300.1362 (M^+), found 300.1357.

[2-((3,5-Dimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10f)

Compound **9f** (0.9252 g, 3.425 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10f** was isolated as a yellow oil (0.9761 g, 3.107 mmol, 91%) following flash chromatography (5:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.58 (d, 2H, J = 2.3), 6.42 (t, 1H, J = 2.3), 4.88 (s, 2H), 3.78 (s, 6H), 2.30 (m, 2H), 2.16 (m, 2H), 2.09 (s, 3H), 1.64-1.70 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.2, 160.6, 139.4, 124.8, 119.9, 109.2, 101.7, 93.2, 87.8, 66.6, 55.5, 30.2, 27.1, 22.2, 22.0, 21.0; IR (KBr): 3001, 2936, 2840, 2201, 1739, 1590, 1420, 1233; HRMS: m/e for $C_{19}H_{22}O_4$ calculated 314.1518 (M^+), found 314.1519.

[2-((2,5-Dimethoxyphenyl)ethynyl)cyclopent-1-enyl]methyl acetate (10g)

Compound **9g** (0.8184 g, 3.196 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10g** was isolated as a colourless solid (0.8595 g, 2.864 mmol, 90%) following flash chromatography (7:1 hexanes:Et_2O). mp. 63-65 ^oC; ^{1}H-NMR (500 MHz, $CDCl_3$): 6.95 (d, 1H, J = 2.7), 6.84 (dd, 1H, J = 8.9, J = 2.8), 6.80 (d, 1H, J = 9.0), 4.92 (s, 2H), 3.84 (s, 3H), 3.77 (s, 3H), 2.64 (t, 2H, J = 7.8), 2.51 (t, 2H, J = 8.0), 2.09 (s, 3H), 1.96 (apparent pentet, 2H, J = 7.8); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.3, 154.5, 153.3, 145.0, 123.2, 117.8, 115.8, 113.1, 112.1, 91.2, 88.9, 62.2, 56.5, 55.9, 37.0, 34.2, 22.6, 21.0; IR (KBr): 3002, 2960,

2834, 1746, 1504, 1228; HRMS: m/e for $C_{18}H_{20}O_4$ calculated 300.1362 (M^+), found 300.1340.

[2-(2,5-Dimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10h)

Compound **9h** (0.6059 g, 2.243 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10h** was isolated as a yellow solid (0.6362 g, 2.025 mmol, 90%) following preparative TLC (7:1 hexanes:Et_2O). mp. 54-56 ^oC; ^{1}H-NMR (500 MHz, $CDCl_3$): 6.94 (d, 1H, J = 2.9), 6.82 (dd, 1H, J = 9.0, J = 2.9), 6.79 (d, 1H, J = 9.0), 4.95 (s, 2H), 3.84 (s, 3H), 3.77 (s, 3H), 2.33 (m, 2H), 2.17 (m, 2H), 2.09 (s, 3H), 1.64-1.70 (m, 4H); ^{13}C-NMR (125 MHz, $CDCl_3$): 171.2, 154.2, 153.2, 139.1, 120.1, 117.6, 115.5, 113.2, 112.0, 92.4, 89.2, 66.8, 56.4, 55.8, 30.0, 27.0, 22.2, 22.0, 21.0; IR (KBr): 2935, 2835, 1737, 1500, 1234; HRMS: m/e for $C_{19}H_{22}O_4$ calculated 314.1518 (M^+), found 314.1526.

[2-((2,5-Dimethoxyphenyl)ethynyl)cyclohept-1-enyl]methyl acetate (10i)

Compound **9i** (0.4406 g, 1.551 mmol) was subjected to reduction and acetylation according to General Procedure C. Product **10i** was isolated as a pale yellow oil (0.4327 g, 1.318 mmol, 85%) following preparative TLC (7:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.92 (d, 1H, J = 2.7), 6.80 (dd, 1H, J = 8.5, J = 2.5), 6.77 (d, 1H, J = 9.0), 4.96 (s, 2H), 3.82 (s, 3H), 3.75 (s, 3H), 2.49-2.51 (m, 2H), 2.30-2.32 (m, 2H), 2.08 (s, 3H), 1.78 (apparent pentet, 2H, J = 5.8), 1.61 (apparent pentet, 2H, J = 5.4), 1.52 (apparent pentet, 2H, J = 5.5); ^{13}C-NMR (125 MHz, $CDCl_3$): 171.2, 154.1, 153.2, 145.2, 126.0, 117.4, 115.4, 113.3, 111.8, 94.0, 90.0, 68.1, 56.3, 55.8, 34.7, 32.4, 31.3, 26.2, 26.1, 21.1; IR (KBr): 2919, 2850, 1739, 1498, 1228; HRMS: m/e for $C_{20}H_{24}O_4$ calculated 328.1675 (M^+), found 328.1683.

[2-((2,3,4-Trimethoxyphenyl)ethynyl)cyclopent-1-enyl]methyl acetate (10j)

Compound **9j** (1.1881 g, 4.1524 mmol) was treated according to General Procedure C. Flash chromatography (2:1 hexanes:Et_2O) afforded **10j** as a pale yellow oil (1.2573 g, 3.8083 mmol, 92%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.10 (d, 1H, J = 8.9), 6.60 (d, 1H, J = 8.9), 4.88 (s, 2H), 3.95 (s, 3H), 3.85 (s, 6H), 2.60 (t, 2H, J = 7.8), 2.49 (t, 2H, J = 7.9), 2.07 (s, 3H), 1.94 (apparent pentet, 2H, J = 7.8); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.1, 154.7, 154.4, 144.1, 143.0, 128.0, 123.5, 110.6, 107.4, 91.0, 87.4, 62.1, 61.3, 61.2, 56.2, 37.0, 34.1, 22.5, 21.0; IR (KBr): 2940, 2841, 2199, 1739, 1490, 1226; HRMS: m/e for $C_{19}H_{22}O_5$ calculated 330.1467 (M^+), found 330.1468.

[2-((2,3,4-Trimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10k)

Compound **9k** (0.8787 g, 2.928 mmol) was reacted according to General Procedure C. Product

10k was isolated as a yellow oil (0.8956 g, 2.600 mmol, 89%) via flash chromatography (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.10 (d, 1H, J = 8.8), 6.61 (d, 1H, J = 8.9), 4.93 (s, 2H), 3.96 (s, 3H), 3.87 (s, 6H), 2.32 (m, 2H), 2.17 (m, 2H), 2.09 (s, 3H), 1.65-1.70 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.3, 154.7, 154.3, 142.3, 138.4, 127.9, 120.4, 110.8, 107.4, 91.0, 89.2, 66.8, 61.3, 61.2, 56.2, 30.3, 27.1, 22.3, 22.1, 21.1; IR (KBr): 2940, 2839, 2196, 1746, 1494, 1234; HRMS: m/e for $C_{20}H_{24}O_5$ calculated 344.0624 (M^+), found 344.0627.

1-[2-((2,3,4-Trimethoxyphenyl)ethynyl)cyclohex-1-enyl]ethyl acetate (10kk)

Compound **9k** (0.7450 g, 2.482 mmol) was subjected to General Procedure C, where DIBAL-H was substituted with MeLi (1.6 M in Et_2O, 3.1 mL, 5.0 mmol). The product (**10kk**) was isolated as a yellow/orange oil (0.7888 g, 2.202 mmol, 89%) following flash chromatography (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.12 (d, 1H, J = 8.6), 6.60 (d, 1H, J = 8.7), 6.13 (q, 1H, J = 6.5), 3.98 (s, 3H), 3.86 (s, 3H), 3.85 (s, 3H), 2.27 (m, 2H), 2.15 (m, 2H), 2.04 (s, 3H), 1.62-1.69 (m, 4H), 1.36 (d, 3H, J = 6.6); ^{13}C-NMR (75 MHz, $CDCl_3$): 170.2, 154.6, 154.2, 143.2, 142.3, 128.0, 117.0, 111.0, 107.4, 91.0, 89.7, 72.7, 61.4, 61.2, 56.2, 30.1, 23.4, 22.4, 22.1, 21.4, 18.8; IR (KBr): 2935, 2839, 2194, 1737, 1593, 1494, 1243; HRMS: m/e for $C_{21}H_{26}O_5$ calculated 358.1780 (M^+), found 358.1777.

[2-((3,4,5-Trimethoxyphenyl)ethynyl)cyclopent-1-enyl]methyl acetate (10l)

Compound **9l** (0.3099 g, 1.083 mmol) was subjected to General Procedure C. The product compound (**10l**) was isolated as a yellow oil (0.3093 g, 0.9368 mmol, 89%) via preparative TLC (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.64 (s, 2H), 4.84 (s, 2H), 3.82 (s, 6H), 3.81 (s, 3H), 2.58 (t, 2H, J = 7.7), 2.47 (t, 2H, J = 7.8), 2.05 (s, 3H), 1.92 (apparent pentet, 2H, J = 7.7); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.0, 153.1, 144.7, 138.8, 122.8, 118.8, 108.0, 95.0, 83.8, 62.0, 61.0, 56.2, 37.1, 34.2, 22.4, 20.9; IR (KBr): 2940, 1741, 1503, 1234; HRMS: m/e for $C_{19}H_{22}O_5$ calculated 330.1467 (M^+), found 330.1464.

[2-((3,4,5-Trimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10m)

Compound **9m** (0.1994 g, 0.6644 mmol) was subjected to General Procedure C. The product compound (**10m**) was isolated as a yellow oil (0.2003 g, 0.5820 mmol, 88%) using preparative TLC (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.66 (s, 2H), 4.89 (s, 2H), 3.85 (s, 6H), 3.84 (s, 3H), 2.30 (m, 2H), 2.17 (m, 2H), 2.09 (s, 3H), 1.64-1.70 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.2, 153.2, 139.2, 138.8, 120.0, 118.6, 108.8, 93.3, 87.3, 66.7, 61.1, 56.3, 30.3, 27.2, 22.3, 22.1, 21.1; IR (KBr): 2938, 1737, 1576, 1504, 1237; HRMS: m/e for $C_{20}H_{24}O_5$ calculated

344.1624 (M^+), found 344.1631.

Phenyl[2-((3,4,5-trimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10mm)

Compound **9m** (0.2516 g, 0.8383 mmol) was subjected to General Procedure C, where DIBAL-H was substituted with PhMgBr (1.0 M in THF, 1.7mL, 1.7 mmol). The product **10mm** was isolated as a yellow oil (0.2826 g, 0.6725 mmol, 80%) following preparative TLC (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.43 (apparent d, 2H, J = 7.2), 7.37 (apparent t, 2H, J = 7.6), 7.29-7.32 (m, 1H), 7.27 (s, 1H), 6.77 (s, 2H), 3.90 (s, 6H), 3.89 (s, 3H), 2.33-2.41 (m, 2H), 2.22 (s, 3H), 1.92-1.98 (m, 2H), 1.55-1.73 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 169.8, 153.2, 142.6, 139.5, 138.8, 128.4, 127.5, 125.7, 119.1, 118.7, 108.8, 93.5, 88.2, 76.3, 61.1, 56.3, 30.2, 23.8, 22.2, 22.0, 21.3; IR (KBr): 3062, 3004, 2939, 2839, 2197, 1731, 1574, 1505, 1411, 1234; HRMS: m/e for $C_{26}H_{28}O_5$ calculated 420.1937 (M^+), found 420.1950.

[2-((3,4,5-Trimethoxyphenyl)ethynyl)cyclohept-1-enyl]methyl acetate (10n)

Compound **9n** (0.3408 g, 1.085 mmol) was subjected to General Procedure C. The product compound (**10n**) was isolated as a yellow oil (0.3498 g, 0.9766 mmol, 90%) via preparative TLC (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.66 (s, 2H), 4.90 (s, 2H), 3.86 (s, 6H), 3.85 (s, 3H), 2.48-2.50 (m, 2H), 2.31-2.33 (m, 2H), 2.10 (s, 3H), 1.79 (apparent pentet, 2H, J = 5.8), 1.61 (apparent pentet, 2H, J = 5.4), 1.53 (apparent pentet, 2H, J = 5.5); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.3, 153.4, 145.1, 138.8, 125.9, 118.7, 108.7, 94.0, 88.8, 68.0, 61.1, 56.3, 34.9, 32.4, 31.4, 26.3, 26.1, 21.1; IR (KBr): 2959, 2929, 2858, 1730, 1576, 1464, 1275; HRMS: m/e for $C_{21}H_{26}O_5$ calculated 358.1780 (M^+), found 358.1776.

[2-((3-Isopropyl-4,5-dimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate (10o)

Compound **9o** (1.7456 g, 5.5918 mmol) was subjected to General Procedure C. Product **10o** was purified via flash chromatography (5:1 hexanes:Et_2O) as a pale yellow oil (1.7960 g, 5.0421 mmol, 90%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.93 (d, 1H, J = 1.5), 6.82 (d, 1H, J = 1.5), 4.89 (s, 2H), 3.84 (s, 3H), 3.81 (s, 3H), 3.30 (septet, 1H, J = 7.0), 2.30 (m, 2H), 2.16 (s, 3H), 2.08 (m, 2H), 1.64-1.70 (m, 4H), 1.20 (d, 6H, J = 7.0); ^{13}C-NMR (125 MHz, $CDCl_3$): 171.2, 152.3, 146.8, 142.5, 138.6, 122.1, 120.0, 118.8, 112.7, 93.4, 86.9, 66.6, 61.0, 55.8, 30.3, 27.0, 26.8, 23.4, 22.2, 22.0, 21.0; IR (KBr): 2935, 2869, 2836, 2198, 1739, 1573, 1484, 1341, 1273; HR m/e for $C_{22}H_{28}O_4$ calculated 356.1988 (M^+), found 356.1990.

[2-(Thiophen-3-ylethynyl)cyclohex-1-enyl]methyl acetate (10p)

Compound **9p** (0.3511 g, 1.625 mmol) was subjected to reduction and acetylation according to

General Procedure C. The product (**10p**) was isolated as a yellow oil (0.3957 g, 1.521 mmol, 94%) via preparative TLC (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.42 (d, 1H, J = 2.2), 7.27 (dd, 1H, J = 4.8, J = 2.9), 7.11 (d, 1H, J = 5.0), 4.88 (s, 2H), 2.30 (m, 2H), 2.17 (m, 2H), 2.10 (s, 3H), 1.65-1.68 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 171.3, 139.0, 129.9, 128.3, 125.4, 122.5, 120.0, 88.2, 87.7, 66.7, 30.2, 27.1, 22.2, 22.1, 21.1; IR (KBr): 3108, 2934, 2860, 2205, 1738, 1233; HR-MS: m/e for $C_{15}H_{16}O_2S$ calculated 260.0871 (M^+), found 260.0876.

Hexacarbonyl[μ-η^4(2-(phenylethynyl)cyclohex-1-enyl]methyl acetate)]dicobalt (1b)

Compound **10b** (0.4889 g, 1.924 mmol) was subjected to complexation procedures according to General Procedure D. Product **1b** was isolated as a dark brown solid (0.9272 g, 1.717 mmol, 89%) following flash chromatography (15:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.41 (apparent d, 2H, J = 7.1), 7.30-7.36 (m, 3H), 4.53 (s, 2H), 2.40 (t, 2H, J = 6.1), 2.14 (t, 2H, J = 6.2), 1.95 (s, 3H), 1.72-1.80 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.6, 170.8, 138.7, 133.4, 132.1, 129.3, 128.8, 127.8, 93.7, 91.7, 65.3, 33.3, 28.5, 23.4, 22.2, 20.9; IR (KBr): 2935, 2861, 2088, 2047, 2016, 1743, 1233; HRMS: m/e for $C_{23}H_{18}Co_2O_8$ calculated 483.9767 (M-2CO$^+$), found 483.9759.

Hexacarbonyl[μ-η^4(2-((3,4-dimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)]dicobalt (1d)

Compound **10d** (1.1207 g, 3.5674 mmol) was complexed according to General Procedure D. After washing the column of silica with 100% hexanes to remove excess, uncomplexed $Co_2(CO)_8$, the product **1d** was eluted using 5:1 hexanes:Et_2O, and isolated as a dark brown solid (2.0001 g, 3.3336 mmol, 93%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.04 (dd, 1H, J = 8.3, J = 2.0), 6.92 (d, 1H, J = 2.0), 6.84 (d, 1H, J = 8.4), 4.61 (s, 2H), 3.92 (s, 3H), 3.89 (s, 3H), 2.40 (t, 2H, J = 6.2), 2.14 (t, 2H, J = 6.0), 1.98 (s, 3H), 1.72-1.81 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.6, 170.8, 149.0, 148.9, 133.4, 132.0, 130.7, 122.1, 112.5, 111.4, 94.0, 91.4, 65.3, 56.0, 55.9, 33.4, 28.3, 23.4, 22.2, 20.7; IR (KBr): 2935, 2834, 2086, 2045, 2014, 1742, 1509, 1228; HRMS: m/e for $C_{25}H_{22}Co_2O_{10}$ calculated 571.9928 (M-CO$^+$), found 571.9925.

Hexacarbonyl[μ-η^4(2-((3,5-dimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)] dicobalt (1f)

Compound **10f** (0.9761 g, 3.107 mmol) was subjected to complexation according to General Procedure D. The complexed compound (**1f**) was isolated via flash chromatography (5:1 hexanes:Et_2O) following removal of excess, uncomplexed $Co_2(CO)_8$ with 100% hexanes. The

product was isolated as a dark brown solid (1.7135 g, 2.8559 mmol, 92%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.57 (d, 2H, J = 2.2), 6.41 (t, 1H, J = 2.2), 4.58 (s, 2H), 3.81 (s, 6H), 2.39 (t, 2H, J = 5.9), 2.13 (t, 2H, J = 5.9), 1.98 (s, 3H), 1.70-1.80 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.7, 170.8, 160.8, 140.8, 133.6, 131.9, 107.8, 99.6, 93.8, 91.6, 65.2, 55.4, 33.3, 28.5, 23.4, 22.2, 20.7; IR (KBr): 2937, 2836, 2089, 2012, 1740, 1590, 1421, 1234; HRMS: m/e for $C_{25}H_{22}Co_2O_{10}$ calculated 543.9979 ($M-2CO^+$), found 543.9975.

Hexacarbonyl[μ-η^4(2-((2,5-dimethoxyphenyl)ethynyl)cyclopent-1-enyl)methyl acetate)]dicobalt (1g)

Compound **10g** (0.8595 g, 2.864 mmol) was subjected to complexation according to General Procedure D. The complexed compound **1g** was isolated using flash chromatography (7:1 hexanes:Et_2O) following removal of excess, uncomplexed $Co_2(CO)_8$ with 100% hexanes. The product was isolated as a dark brown solid (1.5256 g, 2.6035 mmol, 91%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.05 (d, 1H, J = 3.0), 6.87 (dd, 1H, J = 8.8, J = 3.1), 6.77 (d, 1H, J = 9.0), 4.59 (s, 2H), 3.80 (s, 3H), 3.74 (s, 3H), 2.76 (t, 2H, J = 7.8), 2.54 (t, 2H, J = 7.8), 2.0 (apparent pentet, 2H, J = 7.9), 1.98 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.8, 170.9, 153.6, 150.6, 137.7, 137.0, 127.3, 117.3, 113.7, 110.5, 89.0, 88.0, 61.2, 55.8, 54.6, 39.8, 36.2, 22.1, 20.8; IR (KBr): 2959, 2835, 2087, 2047, 2014, 1746, 1494, 1223; HRMS: m/e for $C_{24}H_{20}Co_2O_{10}$ calculated 529.9822 ($M-2CO^+$), found 529.9818.

Hexacarbonyl[μ-η^4(2-(2,5-dimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)] dicobalt (1h)

Compound **10h** (0.6362 g, 2.025 mmol) was subjected to complexation according to General Procedure D. The complexed compound (**1h**) was eluted via flash chromatography (7:1 hexanes:Et_2O) following removal of excess, uncomplexed $Co_2(CO)_8$ with 100% hexanes. The product was isolated as a dark brown solid (1.0050 g, 1.6750 mmol, 83%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.03 (d, 1H, J = 2.9), 6.85 (dd, 1H, J = 8.8, J = 3.0), 6.74 (d, 1H, J = 8.9), 4.50 (s, 2H), 3.80 (s, 3H), 3.72 (s, 3H), 2.37 (m, 2H), 2.11 (m, 2H), 1.95 (s, 3H), 1.70-1.75 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 171.0, 153.6, 150.3, 133.2, 132.5, 127.7, 117.4, 113.6, 110.4, 95.0, 89.9, 65.1, 55.8, 54.6, 33.1, 28.3, 23.5, 22.4, 20.9; IR (KBr): 2938, 2834, 2086, 2049, 2016, 1740, 1490, 1228; HR-MS: m/e for $C_{25}H_{22}Co_2O_{10}$ calculated 543.9979 ($M-2CO^+$), found 543.9979.

Hexacarbonyl[μ-η^4(2-((2,5-dimethoxyphenyl)ethynyl)cyclohept-1-enyl)methyl

acetate)]dicobalt (1i)

Compound **10i** (0.4327 g, 1.318 mmol) was subjected to complexation according to General Procedure D. The complexed compound (**1i**) was isolated via flash chromatography (5:1 hexanes:Et_2O) following removal of excess, uncomplexed $Co_2(CO)_8$ with 100% hexanes. The product was isolated as a dark brown-green solid (0.6867 g, 1.118 mmol, 85%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.01 (d, 1H, J = 3.0), 6.86 (dd, 1H, J = 8.9, J = 3.1), 6.75 (d, 1H, J = 8.9), 4.52 (s, 2H), 3.81 (s, 3H), 3.74 (s, 3H), 2.60-2.62 (m, 2H), 2.30-2.32 (m, 2H), 1.95 (s, 3H), 1.82 (apparent pentet, 2H, J = 5.8), 1.54-1.63 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 171.0, 153.6, 150.2, 139.2, 138.8, 127.8, 117.3, 113.6, 110.3, 96.0, 91.1, 65.7, 55.8, 54.6, 37.6, 32.7, 32.5, 26.7, 26.4, 21.0; IR (KBr): 2926, 2852, 2085, 2058, 2013, 1742, 1486, 1222; HRMS: m/e for $C_{26}H_{24}Co_2O_{10}$ calculated 558.0106 (M-2CO$^+$), found 558.0117.

Hexacarbonyl[μ-η^4(2-((2,3,4-trimethoxyphenyl)ethynyl)cyclopent-1-enyl)methyl acetate)]dicobalt (1j)

Compound **10j** (1.0012 g, 3.0326 mmol) was subjected to complexation according to General Procedure D. After washing excess, uncomplexed $Co_2(CO)_8$ off a column of silica, the product (**1j**) was eluted using 2:1 hexanes:Et_2O as a dark brown solid (1.6176 g, 2.6260 mmol, 87%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.16 (d, 1H, J = 8.8), 6.64 (d, 1H, J = 8.9), 4.65 (s, 2H), 3.96 (s, 3H), 3.90 (s, 3H), 3.85 (s, 3H), 2.76 (t, 2H, J = 7.8), 2.56 (t, 2H, J = 7.8), 2.00 (apparent pentet, 2H, J = 7.8), 1.99 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 171.0, 154.4, 151.0, 141.1, 138.0, 136.5, 126.6, 122.9, 106.6, 89.7, 87.5, 61.3, 60.9, 60.2, 56.1, 40.2, 36.2, 22.1, 20.8; IR (KBr): 2944, 2844, 2086, 2045, 2014, 1742, 1486, 1231; HRMS: m/e for $C_{25}H_{22}Co_2O_{11}$ calculated 448.0131 (M-6CO$^+$), found 448.0139.

Hexacarbonyl[μ-η^4(2-((2,3,4-trimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)]dicobalt (1k)

Compound **10k** (0.8956 g, 2.600 mmol) was subjected to complexation according to General Procedure D. The complexed product (**1k**) was isolated as a dark green solid (1.5445 g, 2.4516 mmol, 94%) following flash chromatography (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.14 (d, 1H, J = 9.0), 6.64 (d, 1H, J = 9.0), 4.53 (s, 2H), 3.95 (s, 3H), 3.90 (s, 3H), 3.84 (s, 3H), 2.39 (t, 2H, J = 6.0), 2.13 (t, 2H, J = 6.1), 1.94 (s, 3H), 1.71-1.77 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.1, 170.9, 154.4, 150.5, 140.8, 132.8, 132.4, 126.6, 123.0, 106.4, 94.4, 90.3, 65.3, 60.9, 60.0, 56.0, 33.3, 28.3, 23.5, 22.4, 20.8; IR (KBr): 2940, 2838, 2084, 2044, 2012, 1742,

1486, 1229; HRMS: m/e for $C_{26}H_{24}Co_2O_{11}$ calculated 462.0288 ($M-6CO^+$), found 462.0298.

Hexacarbonyl[μ-η^4-(1-[2-((2,3,4-trimethoxyphenyl)ethynyl)cyclohex-1-enyl]ethyl acetate)]dicobalt l (1kk)

Compound **10kk** (0.7888 g, 2.202 mmol) was subjected to complexation according to General Procedure D. Compound **1kk** (1.2896 g, 2.0024 mmol, 91%) was isolated as a dark green solid following flash chromatography (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.11 (d, 1H, J = 8.7), 6.64 (d, 1H, J = 8.7), 6.14 (q, 1H, J = 6.3), 3.96 (s, 3H), 3.90 (s, 3H), 3.83 (s, 3H), 2.15-2.33 (m, 4H), 1.93 (s, 3H), 1.60-1.75 (m, 4H), 1.26 (d, 3H, J = 6.3); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.1, 170.0, 154.2, 150.2, 140.9, 137.4, 130.2, 126.6, 123.6, 106.3, 93.2, 92.8, 70.6, 60.9, 60.0, 56.0, 33.0, 24.5, 23.6, 22.4, 21.3, 18.3; IR (KBr): 2938, 2839, 2084, 2046, 2016, 1737, 1485, 1241; HRMS: m/e for $C_{27}H_{26}Co_2O_{11}$ calculated 588.0241 ($M-2CO^+$), found 588.0226.

Hexacarbonyl[μ-η^4-(2-((3,4,5-trimethoxyphenyl)ethynyl)cyclopent-1-enyl)methyl acetate)]dicobalt (1l)

Compound **10l** (0.3093 g, 0.9368 mmol) was complexed using General Procedure D to afford product **1l** (0.5156 g, 0.8370 mmol, 89%) as a dark brown solid following flash chromatography (1:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.71 (s, 2H), 4.72 (s, 2H), 3.90 (s, 3H), 3.88 (s, 6H), 2.81 (t, 2H, J = 7.8), 2.56 (t, 2H, J = 7.9), 2.04 (apparent pentet, 2H, J = 7.8), 2.02 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.5, 170.7, 153.3, 138.0, 137.7, 136.9, 133.7, 106.5, 93.4, 84.4, 61.2, 61.0, 56.2, 39.9, 36.2, 21.8, 20.7; IR (KBr): 2940, 2088, 2050, 2020, 1743, 1576, 1230; HRMS: m/e for $C_{25}H_{22}Co_2O_{11}$ calculated 559.9928 ($M-2CO^+$), found 559.9924.

Hexacarbonyl[μ-η^4-(2-((3,4,5-trimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)]dicobalt (1m)

Compound **10m** (0.2003 g, 0.5820 mmol) was complexed using General Procedure D to afford product **1m** (0.3162 g, 0.5019 mmol, 86%) as a dark brown solid following flash chromatography (1:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.65 (s, 2H), 4.62 (s, 2H), 3.89 (s, 3H), 3.87 (s, 6H), 2.39 (t, 2H, J = 6.1), 2.13 (t, 2H, J = 6.1), 1.98 (s, 3H), 1.72-1.81 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.4, 170.8, 153.2, 137.9, 134.0, 133.6, 131.8, 106.7, 94.1, 91.5, 65.3, 61.0, 56.2, 33.4, 28.3, 23.4, 22.2, 20.8; IR (KBr): 2938, 2087, 2048, 2020, 1742, 1232; HRMS: m/e for $C_{26}H_{24}Co_2O_{11}$ calculated 574.0084 ($M-2CO^+$), found 574.0071.

Hexacarbonyl[μ-η^4-(phenyl[2-((3,4,5-trimethoxyphenyl)ethynyl)cyclohex-1-enyl]methyl acetate)] dicobalt (1mm)

Compound **10mm** (0.2826 g, 0.6725 mmol) was complexed using General Procedure D to afford product **1mm** (0.4118 g, 0.5833 mmol, 87%) as a dark brown solid following flash chromatography (1:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.18-7.20 (m, 3H), 6.94 (s, 1H), 6.87-6.89 (m, 2H), 6.36 (s, 2H), 3.85 (s, 3H), 3.70 (s, 6H), 2.48-2.50 (m, 2H), 2.09 (s, 3H), 2.00-2.05 (m, 2H), 1.60-1.88 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.7, 169.8, 152.4, 137.9, 137.0, 136.3, 135.0, 131.3, 128.2, 127.6, 126.7, 107.2, 98.0, 92.1, 75.2, 60.9, 55.8, 33.0, 26.1, 23.4, 22.4, 21.1; IR (KBr): 3001, 2938, 2860, 2835, 2091, 2047, 2034, 1738, 1578, 1407, 1235; HRMS: m/e for $C_{32}H_{28}Co_2O_{11}$ calculated 538.0601 (M-6CO$^+$), found 538.0601.

Hexacarbonyl[μ-η^4-(2-((3,4,5-trimethoxyphenyl)ethynyl)cyclohept-1-enyl)methyl acetate)]dicobalt (1n)

Compound **10n** (0.3498 g, 0.9766 mmol) was complexed using General Procedure D to afford product **1n** (0.5788 g, 0.8987 mmol, 92%) as a dark green solid following flash chromatography (1:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.64 (s, 2H), 4.69 (s, 2H), 3.89 (s, 3H), 3.86 (s, 6H), 2.62-2.64 (m, 2H), 2.33-2.35 (m, 2H), 1.99 (s, 3H), 1.83 (apparent pentet, 2H, J = 6.0), 1.62 (apparent pentet, 2H, J = 5.4), 1.55 (apparent pentet, 2H, J = 5.42); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.4, 170.9, 153.2, 139.5, 138.9, 137.9, 134.2, 106.6, 95.8, 91.8, 65.7, 61.0, 56.2, 37.5, 32.9, 32.3, 27.1, 26.2, 20.7; IR (KBr): 2928, 2853, 2087, 2049, 1742, 1577, 1501, 1408, 1231; HRMS: m/e for $C_{27}H_{26}Co_2O_{11}$ calculated 588.0241 (M-2CO$^+$), found 588.0234.

Hexacarbonyl[μ-η^4-(2-((3-isopropyl-4,5-dimethoxyphenyl)ethynyl)cyclohex-1-enyl)methyl acetate)] dicobalt (1o)

Compound **10o** (1.7960 g, 5.0421 mmol) was complexed according to General Procedure D. After washing the column of silica with 100% hexanes to remove excess, uncomplexed $Co_2(CO)_8$, the product (**1o**) was eluted using 5:1 hexanes:Et_2O, and isolated as a dark brown solid (2.8905 g, 4.5021 mmol, 89%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.92 (d, 1H, J = 1.8), 6.80 (d, 1H, J = 1.8), 4.66 (s, 2H), 3.86 (s, 3H), 3.86 (s, 3H), 3.34 (septet, 1H, J = 7.1), 2.40 (t, 2H, J = 6.0), 2.13 (t, 2H, J = 6.2), 1.98 (s, 3H), 1.70-1.80 (m, 4H), 1.22 (d, 6H, J = 7.1); ^{13}C-NMR (75 MHz, $CDCl_3$); 199.7, 170.8, 152.5, 146.1, 142.7, 133.8, 133.5, 131.8, 119.9, 110.8, 94.5, 91.3, 65.2, 61.0, 55.8, 33.4, 28.3, 26.9, 23.5, 23.4, 22.2, 20.8; IR (KBr): 2962, 2936, 2869, 2834, 2086, 2048, 2019, 1743, 1464, 1308, 1230; HRMS: m/e for $C_{28}H_{28}Co_2O_{10}$ calculated 558.0499 (M-3CO$^+$), found 558.0486.

[2-(Thiophen-3-ylethynyl)cyclohex-1-enyl]methyl acetate dicobalt hexacarbonyl (1p)

Compound **10p** (0.3957 g, 1.521 mmol) was subjected to complexation procedures according to General Procedure D. The product (**1p**) was isolated as a dark brown solid (0.7527 g, 1.379 mmol, 91%) via flash chromatography (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.32-7.34 (m, 2H), 7.06 (dd, 1H, J = 4.6, J = 1.7), 4.57 (s, 2H), 2.38 (t, 2H, J = 6.0), 2.14 (t, 2H, J = 6.1), 1.99 (s, 3H), 1.69-1.80 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.5, 170.8, 139.1, 133.6, 132.0, 128.5, 126.4, 123.7, 91.2, 87.3, 65.3, 33.2, 28.6, 23.3, 22.2, 20.9; IR (KBr): 2936, 2862, 2088, 2049, 2020, 1742, 1231; HRMS: m/e for $C_{21}H_{16}Co_2O_8S$ calculated 461.9382 ($M\text{-}3CO^+$), found 461.9398.

Hexacarbonyl[μ-η^4-((10,11-η:10,11-η)-2,3,4,5-tetrahydro-7,8-dimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)] dicobalt (2d) and Hexacarbonyl[μ-η^4-((10,11-η:10,11-η)-2,3,4,5-tetrahydro-6,7-dimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)] dicobalt (2d')

Compound **1d** (1.0023 g, 1.6705 mmol) was reacted according to General Procedure E, using BF_3-OEt_2 (635 μL, 5.01 mmol) as the Lewis acid. The product was obtained as a pair of regioisomers, with **2d** (0.7280 g, 1.348 mmol, 81%) as the major product, and **2d'** (0.0823 g, 0.152 mmol, 9%) as the minor product. Both were isolated as maroon solids. The major product, **2d**, eluted as the first band upon purification via flash chromatography (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.14 (s, 1H), 6.64 (s, 1H), 3.92 (s, 6H), 3.20 (s, 2H), 2.37 (t, 2H, J = 6.2), 2.29 (t, 2H, J = 6.0), 1.68-1.79 (m, 4H); ^{13}C-NMR (125 MHz, $CDCl_3$): 200.1, 149.2, 148.4, 136.3, 130.5, 129.7, 114.6, 112.3, 95.1, 90.5, 56.0, 42.6, 33.8, 30.5, 23.1, 22.7; IR (KBr): 2935, 2084, 2043, 2012, 1505, 1265; HRMS: m/e for $C_{23}H_{18}Co_2O_8$ calculated 511.9716 ($M\text{-}CO^+$), found 511.9711.

Compound **2d'** eluted as the second band in the chromatography purification sequence. The two products had a combined yield of 90%, and a ratio of 8.8:1 para attack:ortho attack (i.e., major:minor (**2d**:**2d'**)). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.39 (d, 1H, J = 8.6), 6.87 (d, 1H, J = 8.7), 3.90 (s, 3H), 3.84 (s, 3H), 3.34 (s, 2H), 2.31-2.36 (m, 4H), 1.67-1.79 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.2, 153.4, 145.7, 136.3, 131.2, 131.1, 130.9, 128.2, 110.9, 95.2, 90.4, 61.4, 55.9, 33.8, 33.2, 30.6, 23.1, 22.8; IR (KBr): 2962, 2917, 2849, 2085, 2048, 2017, 1463, 1283; HRMS: m/e for $C_{23}H_{18}Co_2O_8$ calculated 539.9666 (M^+), found 539.9672.

Hexacarbonyl[μ-η^4-(9,10-didehydro-5,8-dimethoxy-1,2,3,4-tetrahydrobenzo[f]azulene)]dicobalt (2g)

Compound **1g** (0.0502 g, 0.0857 mmol) was reacted according to General Procedure E using

BF_3-OEt_2 (32 μL, 0.26 mmol) and at -40 °C. Starting material consumption was complete after 2 h, as assessed by TLC analysis. The cyclized product **2g** was isolated by flash chromatography (15:1 hexanes:Et_2O) as a maroon solid (0.0028 g, 0.0053 mmol, 6%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.90 (½ABq, 1H, J = 9.0), 6.74 (½ABq, 1H, J = 9.0), 3.86 (s, 3H), 3.80 (s, 3H), 3.58 (s, 2H), 2.71 (t, 2H, J = 7.5), 2.52 (t, 2H, J = 7.7), 2.04 (apparent pentet, 2H, J = 7.6); IR (KBr): 2919, 2850, 2086, 2048, 2024, 1650, 1464, 1263; HRMS: m/e for $C_{22}H_{16}Co_2O_8$ calculated 469.9611 ($M-2CO^+$), found 469.9628.

Hexacarbonyl[μ-η^4-((11,12-η:11,12-η)-11,12-didehydro-5,6,7,8,9,10-hexahydro-1,4-dimethoxybenzo[*b*]heptalene)] dicobalt (2i)

Compound **1i** (0.2234 g, 0.3638 mmol) was reacted according to General Procedure E using BF_3-OEt_2 (138 μL, 1.09 mmol). Starting material consumption was complete after 1 h, as assessed by TLC analysis. The cyclized product (**2i**) was isolated by flash chromatography (15:1 hexanes:Et_2O) as a maroon solid (0.1687 g, 0.3045 mmol, 85%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.92 (d, 1H, J = 9.0), 6.74 (d, 1H, J = 9.0), 3.86 (s, 3H), 3.82 (s, 3H), 3.40 (s, 2H), 2.52-2.56 (m, 4H), 1.78 (apparent pentet, 2H, J = 6.0), 1.56-1.67 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.6, 153.8, 150.2, 141.7, 136.8, 127.1, 126.7, 112.3, 108.5, 97.7, 85.5, 56.8, 54.6, 38.6, 35.6, 34.7, 31.4, 26.2; IR (KBr): 2965, 2919, 2849, 2085, 2051, 2029, 1466, 1261; HRMS: m/e for $C_{24}H_{20}Co_2O_8$ calculated 553.9822 (M^+), found 553.9802.

Hexacarbonyl[μ–η^4-(9,10-dehydro1,2,3,4-tetrahydro-6,7,8-trimethoxybenzo[f]azulene)]dicobalt (2j)

Compound **1j** (1.2170 g, 1.9757 mmol) was subjected to General Procedure E, using $SnCl_4$ (69 μL, 5.9 mmol). Starting material consumption was complete in 1 h, as monitored by TLC. Flash chromatography on neutralized silica (20:1 hexanes:Et_2O) afforded the product as a maroon solid (0.0903 g, 0.162 mmol, 8%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.42 (s, 1H), 4.05 (s, 3H), 3.89 (s, 3H), 3.84 (s, 3H), 3.41 (s, 2H), 2.71 (t, 2H, J = 7.8), 2.54 (t, 2H, J = 7.8), 2.05 (apparent pentet, 2H, J = 7.7); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.3, 154.7, 153.9, 141.1, 139.8, 136.2, 131.3, 123.3, 108.6, 89.6, 84.5, 60.8, 60.2, 56.0, 38.8, 38.0, 35.5, 22.6; IR (ATR): 2931, 2850, 2083, 2025, 2009, 1993, 1588, 1487, 1319, 1120; HRMS: m/e for $C_{23}H_{18}Co_2O_9$ calculated 499.9716 ($M-2CO^+$), found 499.9699.

Hexacarbonyl[μ–η^4-(10,11-didehydro-2,3,4,5-tetrahydro-7,8,9-trimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)]dicobalt (2k)

Compound **1k** (0.8100 g, 1.286 mmol) was subjected to General Procedure E, using $SnCl_4$ (90 µL, 7.7 mmol). Starting material consumption was complete in 1 h, as assessed by TLC analysis. The cyclized product **2k** (0.2865 g, 0.5026 mmol, 39%) was isolated as a maroon solid following flash chromatography using neutralized silica (20:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.48 (s, 1H), 4.04 (s, 3H), 3.90 (s, 3H), 3.85 (s, 3H), 3.18 (s, 2H), 2.35 (t, 2H, J = 6.3), 2.28 (t, 2H, J = 6.2), 1.67-1.78 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.5, 154.3, 153.9, 141.2, 135.3, 133.1, 131.3, 123.2, 108.1, 96.7, 84.8, 60.8, 60.2, 56.0, 43.4, 33.6, 30.6, 23.1, 22.8; IR (ATR): 2932, 2855, 2086, 2044, 1992, 1586, 1484, 1326; HRMS: m/e for $C_{24}H_{20}Co_2O_9$ calculated 513.9873 (M-2CO$^+$), found 513.9852.

Hexacarbonyl[µ–η^4-(10,11-didehydro-2,3,4,5-tetrahydro-7,8,9-trimethoxy-5-methyl-1*H*-dibenzo[*a,d*]cycloheptene)]dicobalt (2kk)

Compound **1kk** (0.8530 g, 1.324 mmol) was subjected to General Procedure E, using $SnCl_4$ (46 µL, 4.0 mmol). After 1 h reaction time, starting material consumption was complete. The cyclized product (**2kk**) was isolated as a maroon solid (0.3018 g, 0.5168 mmol, 39%) following flash chromatography (20:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.44 (s, 1H), 4.07 (s, 3H), 3.90 (s, 3H), 3.86 (s, 3H), 3.25 (q, 1H, J = 7.7), 2.16-2.46 (m, 4H), 1.75 (m, 4H), 1.26-1.3 (m, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.6, 154.5, 154.3, 140.7, 139.1, 137.7, 129.3, 121.9, 106.5, 95.3, 83.8, 60.8, 60.1, 56.0, 47.4, 31.0, 23.2, 22.8, 19.5; IR (ATR): 2930, 2859, 2081, 2038, 1993, 1586, 1486, 1319, 1259; HRMS: m/e for $C_{25}H_{22}Co_2O_9$ calculated 555.9979 (M-CO$^+$), found 555.9996.

Hexacarbonyl[µ-η^4-(9,10-didehydro-1,2,3,4-tetrahydro-5,6,7-trimethoxybenz[*f*]azulene)] dicobalt (2l)

Compound **1l** (0.4123 g, 0.6693 mmol) was cyclized according to General Procedure E with BF_3-OEt_2 (254 µL, 2.01 mmol) as Lewis acid. Starting material consumption was complete within 30 minutes, as assessed by TLC analysis. The cyclized product **2l** (0.3159 g, 0.5682 mmol, 85%) was isolated via flash chromatography (5:1 hexanes:Et_2O) as a dark maroon solid. ^{1}H-NMR (500 MHz, $CDCl_3$): 6.99 (s, 1H), 3.92 (s, 3H), 3.89 (s, 3H), 3.84 (s, 3H), 3.48 (s, 2H), 2.71 (t, 2H, J = 7.5), 2.56 (t, 2H, J = 7.4), 2.06 (apparent pentet, 2H, J = 7.6); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 152.4, 150.9, 143.0, 141.6, 135.3, 133.5, 121.6, 122.3, 91.0, 88.0, 61.3, 60.9, 56.0, 39.3, 35.5, 27.5, 22.7; IR (KBr): 2938, 2086, 2048, 2018, 1118; HRMS: m/e for $C_{23}H_{18}Co_2O_9$ calculated 527.9666 (M-CO$^+$), found 527.9654.

Hexacarbonyl[μ-η^4-(10,11-didehydro-2,3,4,5-tetrahydro-6,7,8-trimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)] dicobalt (2m)

Compound **1m** (0.3033 g, 0.4814 mmol) was cyclized according to General Procedure E with BF_3-OEt_2 (183 μL, 1.44 mmol) as Lewis acid. Starting material consumption was complete within 30 minutes, as assessed by TLC analysis. The cyclized product (**2m)** (0.2368 g, 0.4154 mmol, 86%) was isolated via flash chromatography (5:1 hexanes:Et_2O) as a dark maroon solid. ^{1}H-NMR (500 MHz, $CDCl_3$): 6.98 (s, 1H), 3.92 (s, 3H), 3.89 (s, 3H), 3.88 (s, 3H), 3.25 (s, 2H), 2.32-2.36 (m, 4H), 1.69-1.78 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.1, 152.5, 150.5, 143.0, 137.1, 133.8, 130.9, 123.4, 111.1, 95.3, 90.5, 61.7, 60.9, 56.1, 33.8, 32.9, 30.5, 23.1, 22.8; IR (KBr): 2936, 2085, 2045, 2016, 1591, 1127; HRMS: m/e for $C_{24}H_{20}Co_2O_9$ calculated 541.9822 (M-CO^+), found 541.9821.

Hexacarbonyl[μ-η^4-(1,2,3-trimethoxy-5-(-2-(6-(phenylmethylene)-1-cyclohexen-1-yl)ethynyl)benzene)]dicobalt (11c) and Hexacarbonyl[μ-η^4-(10,11,-didehydro-2,3,4,5-tetrahydro-6,7,8-trimethoxy-5-phenyl-1*H*-dibenzo[*a,d*]cycloheptene)]dicobalt (2mm)

Compound **1mm** (0.1300 g, 0.1841 mmol) was reacted according to General Procedure E using BF_3-OEt_2 (70 μL, 0.55 mmol). Starting material consumption was complete after 1 h, as assessed by TLC analysis. The cyclized product (**2mm**) was separated from its elimination isomer (**11c**) by flash chromatography (10:1 hexanes:Et_2O). The elimination product came off the column as the second band, and was isolated as a green solid (0.0546 g, 0.0845 mmol, 46%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.26 (apparent t, 2H, J = 7.7), 7.16 (apparent t, 1H, J = 7.3), 7.03 (d, 2H, J = 7.9), 6.82 (s, 2H), 6.67 (t, 1H, J = 4.6), 6.49 (s, 1H), 3.91 (s, 3H), 3.81 (s, 6H), 2.77 (t, 2H, J = 6.4), 2.42 (apparent q, 2H, J = 5.7), 1.81 (apparent pentet, 2H, J = 6.3); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 153.2, 137.9, 137.7, 137.3, 136.2, 134.0, 133.8, 129.2, 128.2, 127.9, 126.6, 107.6, 95.8, 93.8, 61.0, 56.1, 27.6, 27.4, 22.7; IR (KBr): 3000, 2937, 2835, 2083, 2046, 2032, 1574, 1498, 1409, 1322, 1232; HRMS: m/e for $C_{30}H_{24}Co_2O_9$ calculated 562.0237 (M-3CO^+), found 562.0231.

The cyclized product came off the column first, and was isolated as a maroon solid (0.0406 g, 0.0628 mmol, 34%). The combined yield was 80%, and a ratio of cyclized:elimination of 1:1.3 was determined. ^{1}H-NMR (500 MHz, $CDCl_3$): 7.05-7.15 (m, 4H), 6.90 (apparent d, 2H, J = 7.6), 5.32 (s, 1H), 3.98 (s, 3H), 3.92 (s, 3H), 3.87 (s, 3H), 2.37-2.68 (m, 4H), 1.71-1.94 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.8, 152.8, 151.6, 142.9, 141.0, 138.4, 132.8, 131.5, 128.5, 126.9,

126.4, 125.1, 112.3, 91.7, 87.7, 61.8, 60.9, 55.8, 47.6, 35.9, 31.5, 23.5, 22.9; IR (KBr): 2928, 2858, 2084, 2027, 2015, 1638, 1448, 1242; HRMS: m/e for $C_{30}H_{24}Co_2O_9$ calculated 562.0237 ($M\text{-}3CO^+$), found 562.0240.

Alternatively, **1mm** (0.2081 g , 0.2947mol) was reacted according to General Procedure E using $SnCl_4$ (103 μL, 0.884 mmol). Starting material consumption was complete after 1 h, as assessed by TLC analysis. Cyclized product **2mm** (0.1509 g, 79% yield) was isolated following flash chromatography (10:1 hexanes:Et_2O).

Hexacarbonyl[μ-η^4-(11,12-didehydro-5,6,7,8,9,10-hexahydro-2,3,4-trimethoxybenzo[*b*]heptalene)]dicobalt (2n)

Compound **1n** (0.4989 g, 0.7747 mmol) was cyclized according to General Procedure E with BF_3-OEt_2 (294 μL, 2.32 mmol) as Lewis acid. Starting material consumption was complete within 30 minutes, as assessed by TLC analysis. The cyclized product (**2n**) (0.3804 g, 0.6514 mmol, 84%) was isolated via flash chromatography (5:1 hexanes:Et_2O) as a maroon solid. ^{1}H-NMR (500 MHz, $CDCl_3$): 6.97 (s, 1H), 3.92 (s, 3H), 3.89 (s, 3H), 3.87 (s, 3H), 3.32 (s, 2H), 2.54-2.58 (m, 4H), 1.78 (apparent pentet, 2H, J = 5.8), 1.59-1.67 (m, 4H); ^{13}C-NMR (75 MHz, $CDCl_3$): 200.2, 152.5, 150.3, 142.9, 136.4, 133.6, 123.4, 110.8, 97.2, 91.0, 61.8, 61.0, 56.1, 39.1, 35.5, 35.0, 31.7, 26.3; IR (KBr): 2918, 2850, 2085, 2046, 2016, 1590, 1480, 1328; HRMS: m/e for $C_{25}H_{22}Co_2O_9$ calculated 528.0029 ($M\text{-}2CO^+$), found 528.0030.

Hexacarbonyl[μ–η^4-(10,11-didehydro-2,3,4,5-tetrahydro-6-isopropyl-7,8-dimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)]dicobalt (2o) and Hexacarbonyl[μ–η^4-(10,11-didehydro-2,3,4,5-tetrahydro-8-isopropyl-6,7-dimethoxy-1*H*-dibenzo[*a,d*]cycloheptene)]dicobalt (2o')

Compound **1o** (0.2042 g, 0.3180 mmol) was reacted according to General Procedure E, using $SnCl_4$ (111 μL, 0.954 mmol). Starting material consumption was complete after 1 h. The product was obtained as a pair of regioisomers, **2o** (0.1361 g, 0.2338 mmol, 74%) and **2o'** (0.0098 g, 0.0168 mmol, 5%). The two regioisomers were separable by flash chromatography on neutralized silica (25:1 hexanes:Et_2O). The major product, **2o**, eluted as the first band, and was isolated as a maroon solid. ^{1}H-NMR (500 MHz, $CDCl_3$): 7.09 (s, 1H), 3.88 (s, 6H), 3.47-3.53 (m, 1H), 3.15 (s, 2H), 2.33-2.37 (m, 4H), 1.69-1.80 (m, 4H), 1.40 (d, 6H, J = 7.2); NOE (500 MHz, $CDCl_3$): Irradiation at δ 3.15 resonance gave enhancement of the δ 1.40 resonance; ^{13}C-NMR (75 MHz, $CDCl_3$): 200.3, 151.9, 149.0, 138.8, 138.0, 133.7, 131.2, 128.1, 113.9, 95.7, 92.1, 60.8, 55.7, 36.7, 33.0, 30.2, 29.0, 23.1, 22.8, 20.3; IR (ATR): 2955, 2931, 2871, 2083,

2042, 2006, 1586, 1459, 1307, 1241; HRMS: m/e for $C_{26}H_{24}Co_2O_8$ calculated 526.0237 (M-2CO$^+$), found 526.0241.

Product compound **2o'** came off the column as the second band, and was isolated as a maroon solid. The combined yield was 79%, with a ratio of 13.9:1 major:minor (**2o**:**2o'**). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.28 (s, 1H), 3.90 (s, 3H), 3.85 (s, 3H), 3.30 (septet, 1H, J = 7.2), 3.28 (s, 2H), 2.30-2.36 (m, 4H), 1.67-1.79 (m, 4H), 1.24 (d, 6H, J = 7.0); ^{13}C-NMR (125 MHz, $CDCl_3$): 200.1, 151.0, 149.5, 141.5, 136.6, 133.8, 131.0, 128.3, 125.2, 95.0, 90.6, 61.0, 60.6, 33.7, 33.0, 30.5, 26.9, 23.4, 23.0, 22.7; IR (ATR): 2961, 2920, 2849, 2084, 2043, 2010, 1407, 1306, 1226; HRMS: m/e for $C_{26}H_{24}Co_2O_8$ calculated 554.0186 (M-CO$^+$), found 554.0197.

Hexacarbonyl[μ–η^4-((6-Methylenecyclohex-1-enyl)ethynyl)benzene]dicobalt (11b)

Compound **1b** (0.1068 g, 0.1978 mmol) was subjected to General Procedure E using BF_3-OEt_2 (75 μL, 0.59 mmol). Starting material consumption was complete within 2 h, as determined by TLC analysis. Product **11b** was isolated as a dark brown-green solid (0.0494 g, 0.103 mmol, 52%) following flash chromatography with 100% hexanes. ^{1}H-NMR (500 MHz, $CDCl_3$): 7.48 (apparent d, 2H, J = 7.1), 7.28-7.36 (m, 3H), 6.51 (t, 1H, J = 4.2), 4.85 (s, 1H), 4.73 (s, 1H), 2.48 (t, 2H, J = 6.4), 2.35 (apparent q, 2H, J = 5.7), 1.83 (apparent pentet, 2H, J = 6.3); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 140.5, 138.5, 136.8, 135.2, 130.2, 128.7, 127.8, 112.9, 94.9, 93.6, 32.9, 29.8, 27.7, 22.9; IR (KBr): 2940, 2828, 2087, 2047, 2015, 1633; HRMS: m/e for $C_{21}H_{14}Co_2O_6$ calculated 479.9454 (M$^+$), found 479.9465.

2-[(Trimethylsilyl)ethynyl]cyclohex-1-enecarbaldehyde (12a)

2-Bromocyclohex-1-ene-1-carbaldehyde (**8b**) (2.5314 g, 13.466 mmol) was subjected to General Procedure A with trimethylsilylacetylene (2.6453 g, 26.932 mmol), and with THF in place of DMF. Compound **12a** was isolated as a yellow oil (2.3527 g, 11.415 mmol, 85%) via flash chromatography (20:1 hexanes:Et_2O). The material was spectroscopically identical to reported values.[10]

2-[(Trimethylsilyl)ethynyl]cyclohept-1-enecarbaldehyde (12b)

2-Bromocyclohept-1-ene-1-carbaldehyde (**8c)** (0.5512 g, 2.729 mmol) was subjected to General Procedure A with trimethylsilylacetylene (0.5360 g, 5.457 mmol), and with THF in place of DMF. Compound **12b** was isolated as a yellow oil (0.5393 g, 2.450 mmol, 90%) via preparative TLC (20:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 10.13 (s, 1H), 2.53-2.55 (m, 2H), 2.42-2.44 (m, 2H), 1.74 (apparent pentet, 2H, J = 5.8), 1.58 (apparent pentet, 2H, J = 5.6), 1.38

(apparent pentent, 2H, J = 5.6), 0.17 (s, 9H); ^{13}C-NMR (125 MHz, $CDCl_3$): 192.4, 148.3, 145.4, 106.3, 102.7, 37.2, 32.2, 25.6, 25.5, 24.1, -0.27; IR (KBr): 2958, 2925, 2853, 2133, 1675, 1449, 1251; HRMS: m/e for $C_{13}H_{20}OSi$ calculated 220.1283 (M^+), found 220.1274.

[2-((Trimethylsilyl)ethynyl)cyclohept-1-enyl]methyl acetate (13b)

Compound **12b** (0.5340 g, 2.426 mmol) was subjected to General Procedure C. The product was isolated as a yellow oil (0.6001 g, 2.272 mmol, 94%) via radial chromatography (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, C_6D_6): 4.99 (s, 2H), 2.28-2.30 (m, 2H), 2.06-2.09 (m, 2H), 1.65 (s, 3H), 1.45 (apparent pentet, 2H, J = 5.9), 1.26-1.35 (m, 4H), 0.16 (s, 9H); ^{13}C-NMR (125 MHz, C_6D_6): 169.6, 146.5, 125.6, 105.7, 98.3, 67.3, 34.4, 32.1, 30.9, 25.9, 25.8, 20.0, -0.27; IR (ATR): 2922, 2851, 2136, 1740, 1375, 1226; HRMS: m/e for $C_{15}H_{24}O_2Si$ calculated 264.1546 (M^+), found 264.1547.

(2-Ethynylcyclohept-1-enyl)methyl acetate (14b)

Compound **13b** (0.6001 g, 2.272 mmol) was desilylated according to General Procedure F except that the reaction was kept at 0 ^{o}C over 1.5 h. Compound **14b** was isolated as a yellow oil (0.3601 g, 1.874 mmol, 82%) following radial chromatogrpahy (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, C_6D_6): 4.95 (s, 2H), 2.94 (s, 1H), 2.23-2.26 (m, 2H), 2.04-2.06 (m, 2H), 1.66 (s, 3H), 1.44 (apparent pentet, 2H, J = 5.8), 1.25-1.34 (m, 4H); ^{13}C-NMR (125 MHz, C_6D_6): 169.8, 146.7, 124.7, 83.7, 82.0, 67.2, 34.4, 32.0, 30.8, 25.8, 25.7, 20.0; IR (ATR): 3282, 2922, 2850, 1736, 1376, 1227; HRMS: m/e for $C_{12}H_{16}O_2$ calculated 192.1150 (M^+), found 192.1142.

[2-(3-((Trimethylsilyl)methyl)but-3-en-1-ynyl)cyclohept-1-enyl]methyl acetate (15b)

Compound **14b** (0.3601 g, 1.874 mmol) was subjected to Sonogashira conditions according to General Procedure A with 2-bromo-3-(trimethylsilyl)-1-propene (0.6118 g, 3.186 mmol). The coupled compound (**15b**) was isolated as a yellow oil (0.5127 g, 1.685 mmol, 90%) via preparative TLC (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, C_6D_6): 5.28 (d, 1H, J = 2.2), 4.96 (s, 2H), 4.92-4.93 (m, 1H), 2.31-2.33 (m, 2H), 2.10-2.12 (m, 2H), 1.68 (s, 3H), 1.66 (d, 2H, J = 1.0), 1.50 (apparent pentet, 2H, J = 5.8), 1.38 (apparent pentet, 2H, J = 5.6), 1.32 (apparent pentet, 2H, J = 5.7), 0.08 (s, 9H); ^{13}C-NMR (75 MHz, C_6D_6): 169.7, 144.8, 129.2, 125.9, 118.4, 96.4, 89.0, 67.5, 34.7, 32.2, 31.1, 28.1, 26.0, 26.0, 20.2, -1.8; IR (ATR): 2921, 2850, 1739, 1374, 1246; HRMS: m/e for $C_{18}H_{28}O_2Si$ calculated 304.1859 (M^+), found 304.1872.

Hexacarbonyl[μ-η^4-(2-(3-((trimethylsilyl)methyl)but-3-en-1-ynyl)cyclohept-1-enyl)methyl acetate)]dicobalt (3b)

Compound **15b** (0.5127 g, 1.685 mmol) was complexed using General Procedure G to afford complexed product **3b** (0.9250 g, 1.568 mmol, 93%) as a dark green solid, which eluted off a flash chromatographic column of neutralized silica using 10:1 hexanes:Et_2O after all the excess, uncomplexed $Co_2(CO)_8$ had been washed off with 100% hexanes. ^{1}H-NMR (500 MHz, C_6D_6): 5.40 (s, 1H), 5.15 (s, 1H), 4.94 (s, 2H), 2.50-2.52 (m, 2H), 2.14-2.16 (m, 2H), 1.84 (s, 2H), 1.71 (s, 3H), 1.49-1.55 (m, 4H), 1.36 (apparent pentet, 2H, J = 5.4), 0.09 (s, 9H); ^{13}C-NMR (75 MHz, C_6D_6): 200.0, 169.8, 144.3, 139.3, 138.5, 115.9, 101.6, 94.4, 65.5, 37.5, 32.6, 32.1, 27.0, 26.9, 25.9, 20.1, -1.1; IR (KBr): 2926, 2854, 2087, 2049, 2020, 1743, 1229; HRMS: m/e for $C_{24}H_{28}Co_2O_8Si$ calculated 422.0523 (M^+-6CO), found 422.0512.

Hexacarbonyl[μ-η^4-(9,10-dehydro-1,2,3,4,5,6,7,8-octahydro-8-methyleneheptalene)]dicobalt (4b)

Compound **3b** (0.6755 g, 1.145 mmol) was treated according to General Procedure H. Starting material consumption was complete within 20 minutes, as assessed by TLC. The cyclized product (**4b**) was isolated as a maroon solid (0.4346 g, 0.9490 mmol, 83%), using 100% hexanes for flash chromatography on neutralized silica. ^{1}H-NMR (500 MHz, C_6D_6): 5.60 (s, 1H), 5.21 (s, 1H), 2.45-2.47 (m, 2H), 2.30-2.32 (m, 2H), 2.15-2.18 (m, 2H), 1.99-2.01 (m, 2H), 1.45-1.58 (m, 4H), 1.28 (apparent pentet, 2H, J = 5.7); ^{13}C-NMR (75 MHz, C_6D_6): 200.3, 147.6, 147.0, 133.9, 118.4, 95.4, 90.0, 39.2, 38.4, 34.7, 33.8, 32.2, 26.5, 26.1; IR (KBr): 2924, 2851, 2086, 2046, 2016, 1598, 1432, 1213; HRMS: m/e for $C_{19}H_{16}Co_2O_6$ calculated 457.9611 (M^+), found 457.9631.

2-[(3-Methoxyphenyl)ethynyl] benzaldehyde (18a)

3-Iodoanisole (1.5271 g, 6.5275 mmol) and 2-ethynylbenzaldehyde[11] (0.5659 g, 4.352 mmol), were subjected to reaction via General Procedure A. Flash chromatography (25:1 hexanes:Et_2O) afforded the product **18a** as a yellow oil (0.8583 g, 3.646 mmol, 84%), which was characterized as spectroscopically identical to reported values.[12]

2-[(3,5-Dimethoxyphenyl)ethynyl]benzaldehyde (18b)

Compound 2-ethynylbenzaldehyde (0.6020 g, 4.629 mmol) was subjected to General Procedure A along with 1-bromo-3,5-dimethoxybenzene (1.4997 g, 6.9439 mmol), with the modification that $Pd(PPh_3)_2Cl_2$ (0.0975 g, 0.139 mmol, 3 mol%) was used as catalyst instead of $Pd(PPh_3)_4$, and the reaction flask was placed in an oil bath set to a temperature of 60 ^{o}C instead of room temperature for overnight (20 h). The product **18b** was isolated using flash chromatography

(10:1 hexanes:Et_2O) as a yellow solid (0.9732 g, 3.657 mmol, 79%), mp. 75-77 ^oC (lit. mp. 76-77 ^oC[13]), and which was characterized as spectroscopically identical to reported values.[13]

2-[(3,5-Dimethoxyphenyl)ethynyl]benzyl acetate (19b)

Compound **19b** was synthesized according to General Procedure C from **18b** (0.9732 g, 3.657 mmol). The product was isolated as a pale yellow oil (0.9656 g, 3.114 mmol, 85%) via flash chromatography (7:1 hexanes:Et_2O). ^{1}H-NMR (300 MHz, $CDCl_3$): 7.55-7.58 (m, 1H), 7.40-7.43 (m, 1H), 7.28-7.37 (m, 2H), 6.71 (dd, 2H, J = 2.4, J = 0.5), 6.48 (t, 1H, J = 2.3), 5.36 (s, 2H), 3.79 (s, 6H), 2.12 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 170.8, 160.7, 137.6, 132.3, 128.6, 128.5, 128.2, 124.3, 122.6, 109.4, 102.1, 94.5, 86.2, 64.8, 55.4, 21.0; IR (ATR): 2953, 2836, 1742, 1585, 1355, 1233; HRMS: m/e for $C_{19}H_{18}O_4$ calculated 310.1205 (M^+), found 310.1205.

Hexacarbonyl[μ-η^4-(2-(3,5-dimethoxyphenyl)ethynyl)benzyl acetate)]dicobalt (5b)

Compound **19b** (0.9656 g, 3.114 mmol) was complexed using General Procedure D to afford product **5b** (1.7463 g, 2.9302 mmol, 94%) as a dark brown solid. The product was eluted from a column of silica using 7:1 hexanes:Et_2O. ^{1}H-NMR (500 MHz, $CDCl_3$): 7.67 (dd, 1H, J = 7.3, J = 1.85), 7.42 (dd, 1H, J = 7.6, J = 1.7), 7.33-7.40 (m, 2H), 6.63 (d, 2H, J = 2.2), 6.47 (t, 1H, J = 2.3), 5.16 (s, 2H), 3.80 (s, 6H), 2.05 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 1992.1, 170.5, 160.9, 140.7, 136.0, 134.6, 132.4, 129.6, 128.8, 128.4, 107.6, 100.0, 95.3, 89.0, 63.6, 55.4, 20.8; IR (ATR): 2940, 2839, 2085, 2032, 2000, 1737, 1586, 1421, 1241; HRMS: m/e for $C_{25}H_{18}Co_2O_{10}$ calculated 483.9767 ($M-4CO^+$), found 483.9752.

3-[(3,5-Dimethoxyphenyl)ethynyl]furan-2-carbaldehyde (18d)

[(3,5-Dimethoxyphenyl)ethynyl]trimethylsilane (**7'd**) (0.9212 g, 3.935 mmol) was subjected to tandem desilylation/Sonogashira chemistry according to General Procedure B with 3-bromo-2-formylfuran (1.1977 g, 6.8861 mmol) and $Pd(PPh_3)_2Cl_2$ (0.0828 g, 0.118 mmol, 3 mol%) as the catalyst, with the exception that the mixture was warmed to rt. The product (**18d**) was isolated with flash chromatography (7:1 hexanes:Et_2O) as a light yellow solid (0.8263 g, 3.227 mmol, 82%). mp. 88-88.5 ^oC; ^{1}H-NMR (500 MHz, $CDCl_3$): 9.85 (d, 1H, J = 0.8), 7.64 (dd, 1H, J = 1.8, J = 0.8), 6.68 (d, 2H, J = 2.3), 6.66 (d, 1H, J = 1.8), 6.50 (t, 1H, J = 2.3), 3.79 (s, 6H); ^{13}C-NMR (125 MHz, $CDCl_3$): 176.1, 160.6, 152.8, 147.6, 123.1, 119.4, 115.2, 109.5, 102.7, 97.4, 77.8, 55.5; IR (ATR): 2940, 2832, 2219, 1669, 1586, 1424, 1208; HRMS: m/e for $C_{15}H_{12}O_4$ calculated 256.0736 (M^+), found 256.0731.

[3-((3,5-Dimethoxyphenyl)ethynyl)furan-2-yl]methyl acetate (19d)

Compound **18d** (0.8263 g, 3.227 mmol) was treated according to General Procedure C. The product (**19d**) was isolated using flash chromatography (5:1 hexanes:Et_2O) as a colourless solid (0.8552 g, 2.850 mmol, 88%). mp. 58.5-60 ^oC; ^{1}H-NMR (500 MHz, $CDCl_3$): 7.39 (d, 1H, J = 1.9), 6.66 (d, 2H, J = 2.3), 6.50 (d, 1H, J = 1.8), 6.46 (t, 1H, J = 2.2), 5.20 (s, 2H), 3.78 (s, 6H), 2.10 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$): 170.5, 160.6, 152.2, 143.1, 124.1, 113.1, 109.2, 108.0, 101.9, 93.4, 79.3, 56.6, 55.4, 20.8; IR (KBr): 3125, 2941, 2840, 2218, 1745, 1590, 1156; HRMS: m/e for $C_{17}H_{16}O_5$ calculated 300.0998 (M^+), found 300.0998.

Hexacarbonyl[μ-η^4-(3-((3,5-dimethoxyphenyl)ethynyl)furan-2-yl)methyl acetate)]dicobalt (5d)

Compound **19d** (0.8552 g, 2.850 mmol) was complexed according to General Procedure D. The complexed product **5d** was isolated using flash chromatography (5:1 hexanes:Et_2O) after washing the column with 100% hexanes to remove any excess, uncomplexed $Co_2(CO)_8$. The product (1.5958 g, 2.7235 mmol, 96%) was a dark brown solid in appearance. ^{1}H-NMR (500 MHz, $CDCl_3$): 7.46 (d, 1H, J = 2.0), 6.68 (d, 2H, J = 2.2), 6.56 (d, 1H, J = 1.9), 6.46 (t, 1H, J = 2.3), 5.08 (s, 2H), 3.81 (s, 6H), 2.04 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$): 198.9, 170.5, 160.9, 146.8, 143.4, 140.0, 122.7, 112.9, 107.4, 100.0, 92.9, 79.3, 56.6, 55.4, 20.5; IR (KBr): 2972, 2941, 2089, 2049, 2028, 2008, 1994, 1743, 1587, 1225; HRMS: m/e for $C_{23}H_{16}Co_2O_{11}$ calculated 529.9458 (M^+), found 529.9470.

Hexacarbonyl[μ-η^4-(10,11-dehydro-2,4-dimethoxy-5*H*-dibenzo[*a*,*d*]cycloheptene)]dicobalt (6b)

Compound **6b** was synthesized according to General Procedure E from starting material **5b** (0.2052 g, 0.3443 mmol), using $SnCl_4$ (121 μL, 1.03 mmol). The reaction was allowed warm to rt and starting material consumption was complete in 15 h, as monitored by TLC. The product was recovered as a dark maroon solid (0.0938 g, 0.175 mmol, 51%) using flash chromatography (10:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.68-7.71 (m, 1H), 7.31-7.38 (m, 3H), 6.87 (d, 1H, J = 2.5), 6.54 (d, 1H, J = 2.5), 3.94 (s, 2H), 3.90 (s, 3H), 3.86 (s, 3H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.6, 159.6, 157.2, 139.4, 138.1, 137.6, 132.0, 129.8, 128.6, 127.5, 118.4, 108.3, 99.1, 91.6, 90.9, 56.1, 55.4, 31.8; IR (ATR): 2938, 2840, 2090, 2052, 1996, 1572, 1138; HRMS: m/e for $C_{23}H_{14}Co_2O_8$ calculated 479.9454 (M-2CO$^+$), found 479.9455.

Hexacarbonyl[μ-η^4-(4,5-dehydro-7,9-dimethoxy-10*H*-benzo[5,6]cyclohepta[1,2-*b*] furan)]dicobalt (6d)

Compound **5d** (0.1582 g, 0.2700 mmol) was treated according to General Procedure E, using $SnCl_4$ (95 μL, 0.81 mmol). Starting material consumption was complete in 2 h, as monitored by TLC. The product **6d** was isolated using flash chromatography (neutralized silica, 15:1 hexanes:Et_2O) as a maroon solid (0.0232 g, 0.0441 mmol, 17%). ^{1}H-NMR (500 MHz, $CDCl_3$): 7.38 (d, 1H, J = 1.4), 6.86 (d, 1H, J = 2.2), 6.60 (d, 1H, J = 1.4), 6.50 (d, 1H, J = 2.2), 4.14 (s, 2H), 3.87 (s, 3H), 3.85 (s, 3H); ^{13}C-NMR (125 MHz, $CDCl_3$): 199.3, 159.5, 157.3, 150.1, 142.5, 139.3, 118.0, 114.5, 111.9, 109.9, 98.9, 91.6, 81.5, 55.9, 55.3, 25.4; IR (ATR): 2928, 2836, 2086, 2016, 1995, 1561, 1318, 1141; HRMS: m/e for $C_{21}H_{12}Co_2O_9$ calculated 469.9247 ($M\text{-}2CO^+$), found 469.9245.

2,3,4,4a,5,10,11,11a-Octahydro-7,8-dimethoxy-1*H*-dibenzo[*a,d*]cycloheptene (20)

To a stirred solution of compound **2d** (0.5101 g, 0.9446 mmol), dissolved in degassed 1,2-dichloroethane (14.4 mL), was added bis(trimethylsilyl)acetylene (429 μL , 1.89 mmol) and triethylsilane (754 μL, 4.72 mmol). The reaction was placed in an oil bath set at 65 ^{o}C, and allowed to stir for 6 h under a nitrogen atmosphere. The oil bath was removed, and the solution allowed to cool to room temperature, at which point, trifluoroacetic acid (3.6 mL) was added. After stirring for an additional 12 h, the mixture was dissolved in Et_2O (75 mL) and extracted with dH_2O (3 x 75 mL). The organic fraction was dried over $MgSO_4$, filtered, and the solvent removed under reduced pressure. Preparative TLC (15:1 hexanes:Et_2O) afforded compound **20** as a colourless solid of inseparable diastereomers (1:1) (0.1980 g, 0.7610 mmol, 81%). ^{1}H-NMR (500 MHz, $CDCl_3$): 6.66 (s, 1H), 6.65 (s, 1H), 6.64 (s, 1H), 6.60 (s, 1H), 3.86 (s, 9H), 3.85 (s, 3H), 2.86 (apparent t, 1H, J = 13.1), 2.76 (dd, 1H, J = 10.4, J = 14.0), 2.69 (m, 1H), 2.61 (dd, 1H, J = 14.0, J = 6.7), 2.32 (d, 1H, J = 14.0), 0.89-1.96 (m, 27H); ^{13}C-NMR (125 MHz, $CDCl_3$): 146.6, 146.5, 146.5, 146.4, 135.4, 135.1, 134.3, 113.9, 113.1, 112.6, 112.5, 56.1, 56.0, 55.9, 48.5, 44.0, 43.8, 38.1, 36.4, 35.9, 35.4, 35.0, 26.8, 26.4; IR (KBr): 2919, 2851, 1516, 1449, 1271; HRMS: m/e for $C_{17}H_{24}O_2$ calculated 260.1776 (M^+), found 260.1775.

6,6-Dimethyl-7,8-dihydro-4*H*-benzo[*d*][1,3]dioxin-5(6*H*)-one (23)

A stirred solution of diisopropylamine (2.7 mL, 19 mmol) in THF (27.1 mL) was cooled to -78 ^{o}C. ^{n}BuLi (2.5 M in hexanes, 6.8 mL 17 mmol) was added dropwise, and the solution allowed to stir for 30 minutes to generate LDA. Following the 0.5 h, dioxinone **24**,[14] (2.0906 g, 13.570 mmol) dissolved in THF (13.6 mL), was added to the reaction flask dropwise over 5 minutes. This solution was allowed to stir for 1 h at -78 ^{o}C. MeI (3.8522 g, 27.140 mmol), dissolved in

THF (7.7 mL), was added to the reaction following the hour, and stirring continued at -78 ^{o}C for 1 h. The reaction was warmed to -30 ^{o}C over 30 minutes, and stirred at this temperature for a further hour. It was then warmed to 0 ^{o}C and stirred for 3 h. At this point, NH_4Cl (aq, sat) was added, and subjected to a conventional extractive workup (Et_2O). This provided the monomethylated product in a sufficiently pure state for further use as a yellow oil (1.8475 g, 10.992 mmol, 81%). This product was verified by ^{1}H- and ^{13}C-NMR spectroscopy, and found to be identical to reported values.[14]

This monomethylated compound, without further purification, was then resubjected to the identical procedure to generate the *gem*-dimethyl product (**23**) (1.9012 g, 10.441 mmol, 95%), which was isolated as a viscous pale yellow oil following flash chromatography (2:1 hexanes:Et_2O). ^{1}H-NMR (500 MHz, $CDCl_3$): 5.11 (s, 2H), 4.39 (t, 2H, J = 1.9), 2.40-2.44 (m, 2H), 1.81 (t, 2H, J = 6.4), 1.10 (s, 6H); ^{13}C-NMR (125 MHz, $CDCl_3$): 201.2, 168.2, 109.7, 91.3, 63.2, 40.1, 34.3, 24.8, 24.4; IR (ATR): 2961, 2928, 2865, 1630, 1392, 1236; HRMS: m/e for $C_{10}H_{14}O_3$ calculated 182.0943 (M^+), found 182.0944.

2-(Hydroxymethyl)-4,4-dimethyl-3-[(trimethylsilyl)ethynyl]cyclohex-2-enone (25)

Compound **25** was synthesized according to methods adapted from Majetich and Grove,[14] and Brummond and Gao.[15] In a round bottom flask, (trimethylsilyl)acetylene (1.7652 g, 17.972 mmol) was dissolved in THF (30 mL). The reaction flask was cooled to -78 ^{o}C, at which point, ^{n}BuLi (2.5 M in hexanes, 5.4 mL, 13 mmol) was added dropwise into the stirred solution, and allowed to stir for 30 minutes. After the 30 minutes, the reaction mixture was allowed to warm to 0 ^{o}C, at which point **23** (1.6363 g, 8.9860 mmol), dissolved in THF (9.0 mL), was added dropwise into the reaction flask, and the solution allowed to stir for 1 h. The reaction was allowed to warm to room temperature and proceed for another 6 h. NH_4Cl (aq, sat) was added, and the mixture subjected to a conventional extractive workup (Et_2O). The viscous yellow oil was then dissolved in THF (38.0 mL), and 3 M HCl (1.3 mL) was added dropwise into the flask. This reaction was allowed to stir for 1 h at room temperature, after which $NaHCO_3$ (aq, sat) was added. Following a conventional extractive workup (Et_2O), flash chromatography (1:1 hexanes:Et_2O) afforded **25** (1.8928 g, 7.5670 mmol, 84%) as a pale yellow oil. ^{1}H-NMR (500 MHz, $CDCl_3$): 4.44 (d, 2H, J = 6.7), 3.04 (t, 1H, J = 6.8), 2.44 (t, 2H, J = 6.9), 1.82 (t, 2H, J = 6.9), 1.21 (s, 6H), 0.18 (s, 9H); ^{13}C-NMR (125 MHz, $CDCl_3$): 199.7, 148.1, 139.2, 113.0, 99.8, 60.6, 35.8, 35.4, 34.2, 27.4, -0.41; IR (KBr): 3474, 2963, 2930, 2902, 2869, 2137, 1664, 1581,

1356, 1251; HRMS: m/e for $C_{14}H_{22}O_2Si$ calculated 250.1389 (M^+), found 250.1387.

3-Ethynyl-2-(hydroxymethyl)-4,4-dimethylcyclohex-2-enone (26)

Compound **25** (1.8928 g, 7.5670 mmol) was desilylated according to General Procedure F except that the reaction was complete within 30 minutes at 0 ^oC. The desilylated product (**26**) was isolated as a colourless solid (1.1875 g, 6.67 mmol, 88%) following flash chromatography (1:1 hexanes:Et_2O). mp. 83-84.5 ^oC; ^1H-NMR (500 MHz, $CDCl_3$): 4.39 (s, 2H), 3.82 (s, 1H), 3.04 (s, 1H), 2.43 (t, 2H, J = 6.9), 1.81 (t, 2H, J = 6.9), 1.19 (s, 6H); ^{13}C-NMR (75 MHz, $CDCl_3$): 199.9, 147.4, 140.4, 93.6, 73.9, 60.0, 35.9, 35.4, 34.2, 27.3; IR (ATR): 3395, 3201, 2956, 2930, 2895, 2867, 2080, 1644, 1574, 1360, 1196; HRMS: m/e for $C_{11}H_{14}O_2$ calculated 178.0994 (M^+), found 178.0994.

2-(Hydroxymethyl)-3-[(3-isopropyl-4-methoxyphenyl)ethynyl]-4,4-dimethylcyclohex-2-enone (28)

To a mixture of $Pd(PPh_3)_4$ (0.1008 g, 0.08723 mmol, 5 mol%) and CuI (0.0266 g, 0.140 mmol, 8 mol%) was added a solution of **27**[16] (0.7225 g, 2.618 mmol) dissolved in dry DMF (2.9 mL), followed by a solution of **26** (0.3108 g, 1.745 mmol) in dry DMF (2.9 mL). Diisopropylamine (11.6 mL), which had been degassed for 1.5 h, was then added to the reaction. The reaction mixture was allowed to stir for 48 h under a nitrogen atmosphere and at room temperature. The mixture was then filtered through Celite®, and subjected to a conventional extractive workup (Et_2O). Preparative TLC (1:1 hexanes:Et_2O) afforded **28** as a viscous yellow oil (0.3983 g, 1.221 mmol, 70%). ^1H-NMR (500 MHz, $CDCl_3$): 7.30-7.34 (m, 2H), 6.80 (d, 1H, J = 8.4), 4.61 (d, 2H, J = 6.7), 3.84 (s, 3H), 3.28 (septet, 1H, J = 6.9), 3.16 (t, 1H, J = 6.8), 2.52 (t, 2H, J = 6.8), 1.91 (t, 2H, J = 6.8), 1.34 (s, 6H), 1.20 (d, 6H, J = 6.9); ^{13}C-NMR (125 MHz, $CDCl_3$): 199.7, 158.2, 149.3, 137.6, 131.1, 129.8, 113.9, 110.4, 107.8, 84.1, 60.9, 55.4, 36.0, 35.8, 34.3, 27.7, 26.7, 22.4; IR (ATR): 3453, 2961, 2929, 2869, 2839, 2183, 1648, 1493, 1245; HRMS: m/e for $C_{21}H_{26}O_3$ calculated 326.1882 (M^+), found 326.1882.

[2-((3-Isopropyl-4-methoxyphenyl)ethynyl)-3,3-dimethyl-6-oxocyclohex-1-enyl]methyl acetate (29)

Compound **28** (0.3983 g, 1.221 mmol) was dissolved in dry THF (14.1 mL), and the solution was cooled to a temperature of -78 ^oC. Pyridine (3.0 mL, 37 mmol) was added to the reaction, followed by acetic anhydride (5.8 mL, 61 mmol) and DMAP (0.7459 g, 6.105 mmol). The reaction was allowed to warm to room temperature under a nitrogen atmosphere over the course

of 4 h, at which point TLC analysis showed complete starting material consumption. Following the addition NH_4Cl (aq, sat), the mixture was subjected to a conventional extractive workup (Et_2O). Preparative TLC (1:1 hexanes:Et_2O) afforded compound **29** as an off-white solid (0.4240 g, 1.152 mmol, 94%). mp. 123.5-124.5 ^oC; ^1H-NMR (500 MHz, $CDCl_3$): 7.30-7.32 (m, 2H), 6.78 (d, 1H, J = 8.3), 5.00 (s, 2H), 3.80 (s, 3H), 3.25 (septet, 1H, J = 6.9), 2.51 (t, 2H, J = 6.8), 1.99 (s, 3H), 1.90 (t, 2H, J = 6.8), 1.33 (s, 6H), 1.18 (d, 6H, J = 7.0); ^{13}C-NMR (75 MHz, $CDCl_3$): 196.3, 170.8, 158.4, 153.1, 137.6, 134.0, 131.4, 130.1, 113.8, 110.4, 108.7, 84.3, 59.7, 55.5, 36.1, 36.0, 34.1, 27.8, 26.7, 22.4, 21.0; IR (ATR): 2956, 2938, 2868, 2181, 1725, 1668, 1248; HRMS: m/e for $C_{23}H_{28}O_4$ calculated 368.1988 (M^+), found 368.1998.

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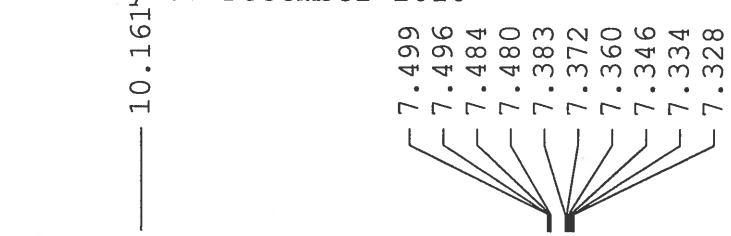
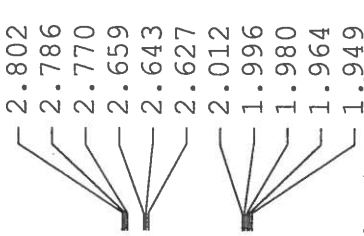
Phenyl-CC-Cylopentenecarbaldehyde
Experiment 5
Topspin 500
Tuesday 07 December 2010



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PULPROG         zgesgp
TD               32768
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DS                   2
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RG                22.6
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DE               6.50 usec
TE              294.2 K
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SP1               35.19 dB
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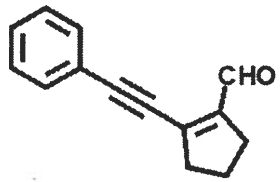

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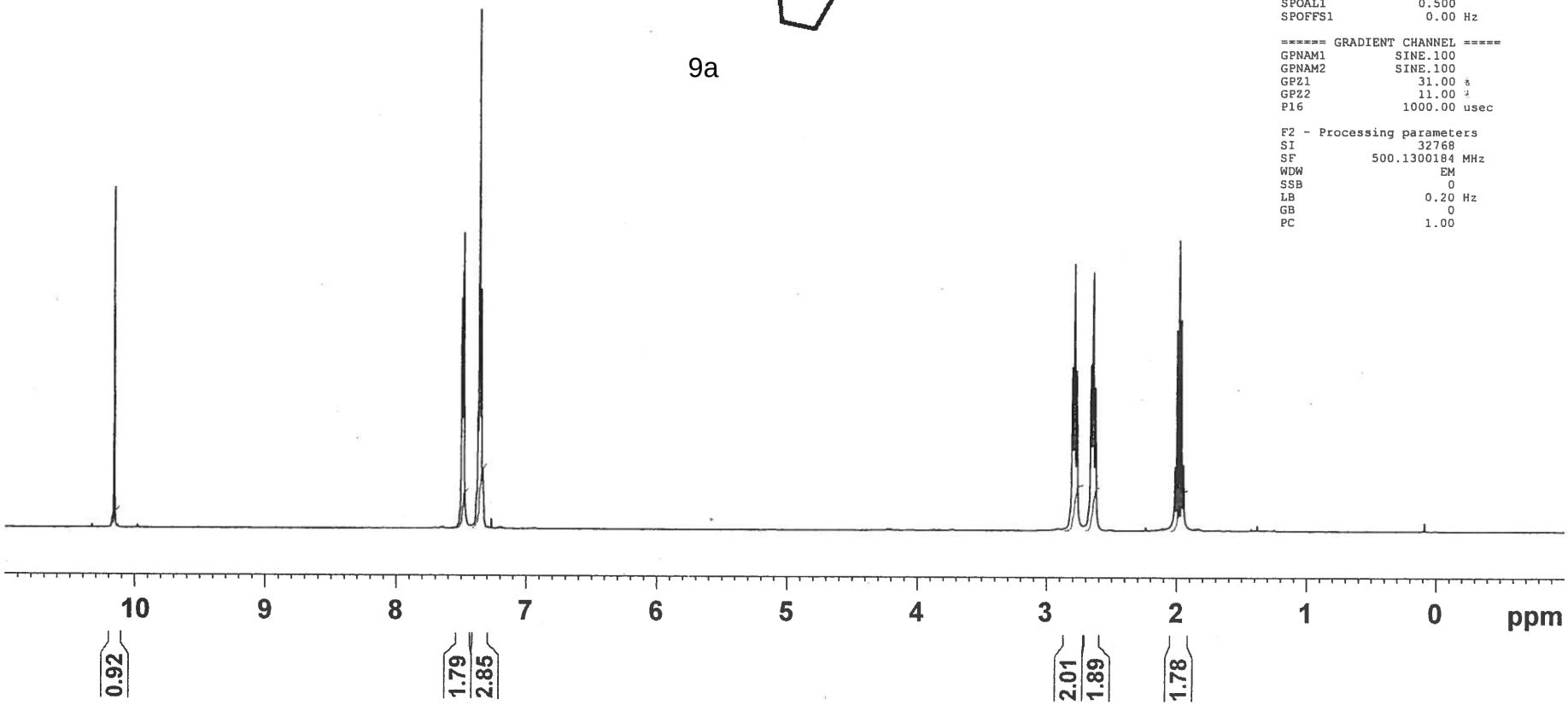

Phenyl-CC-Cyclopentenecarbaldehyde 13C
Experiment 2
Ultra 300
Thursday 02 September 2010

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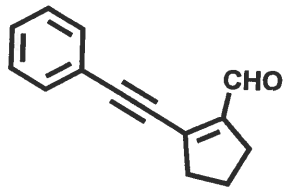

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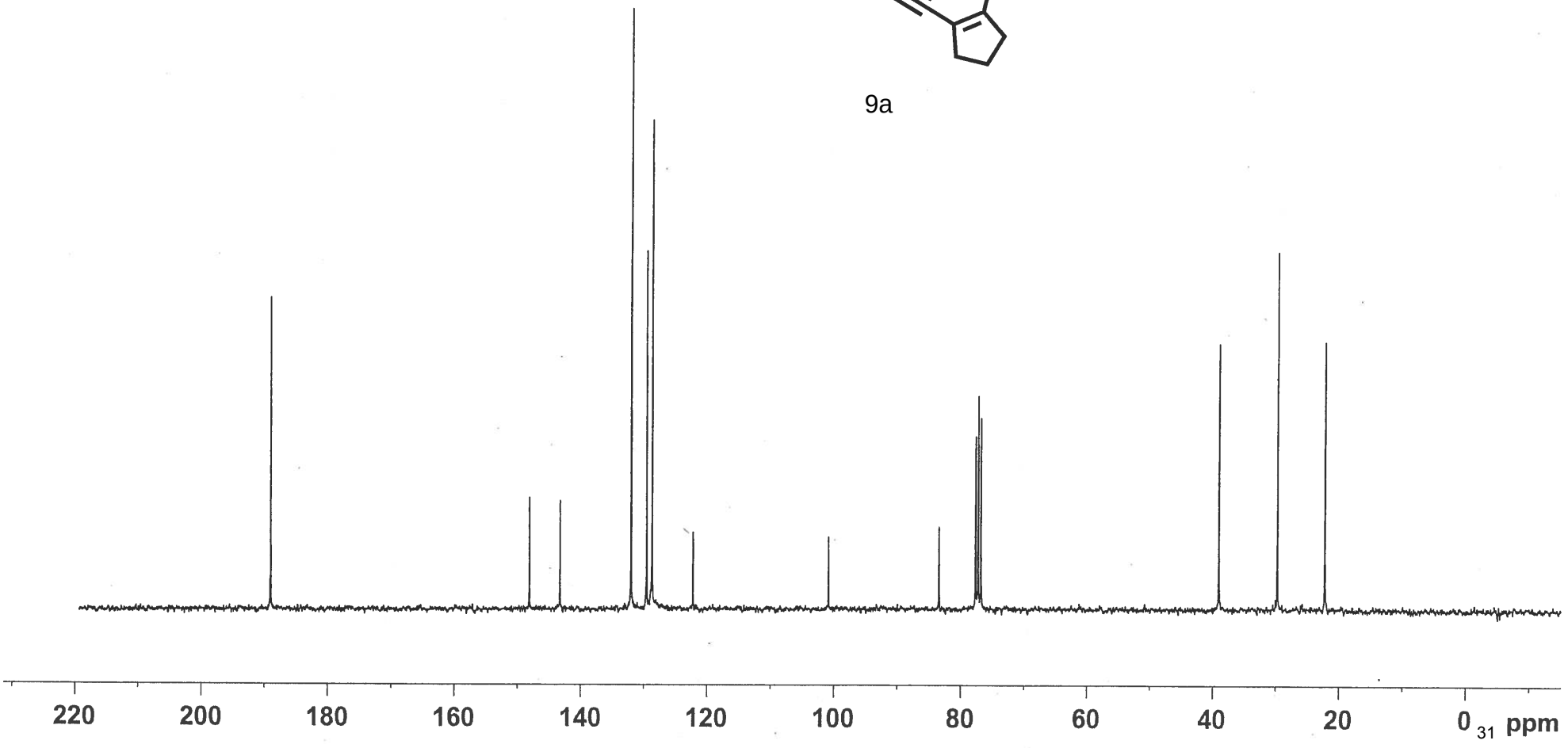

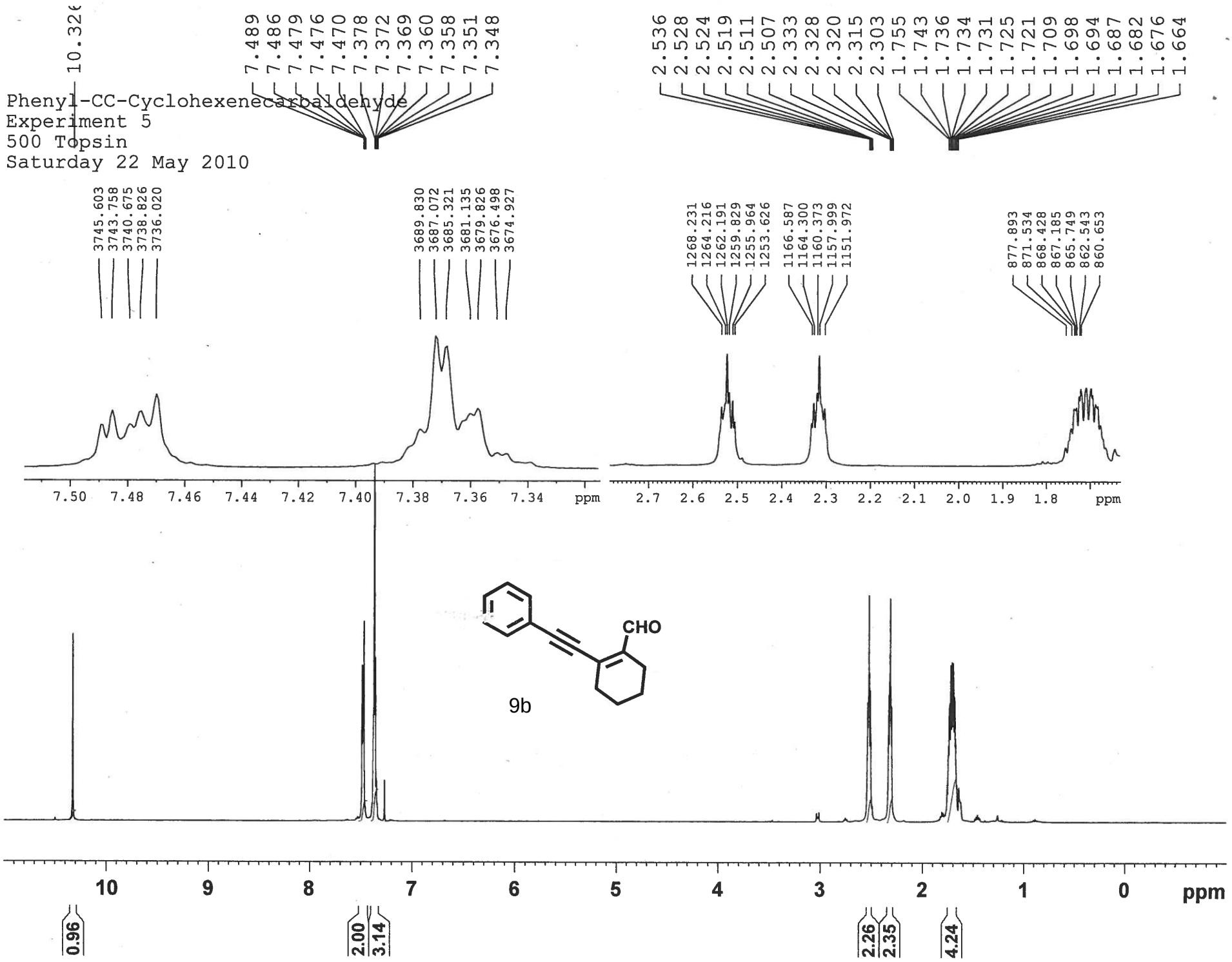
Phenyl-CC-Cyclohexenecarbaldehyde
Experiment 5
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Saturday 22 May 2010
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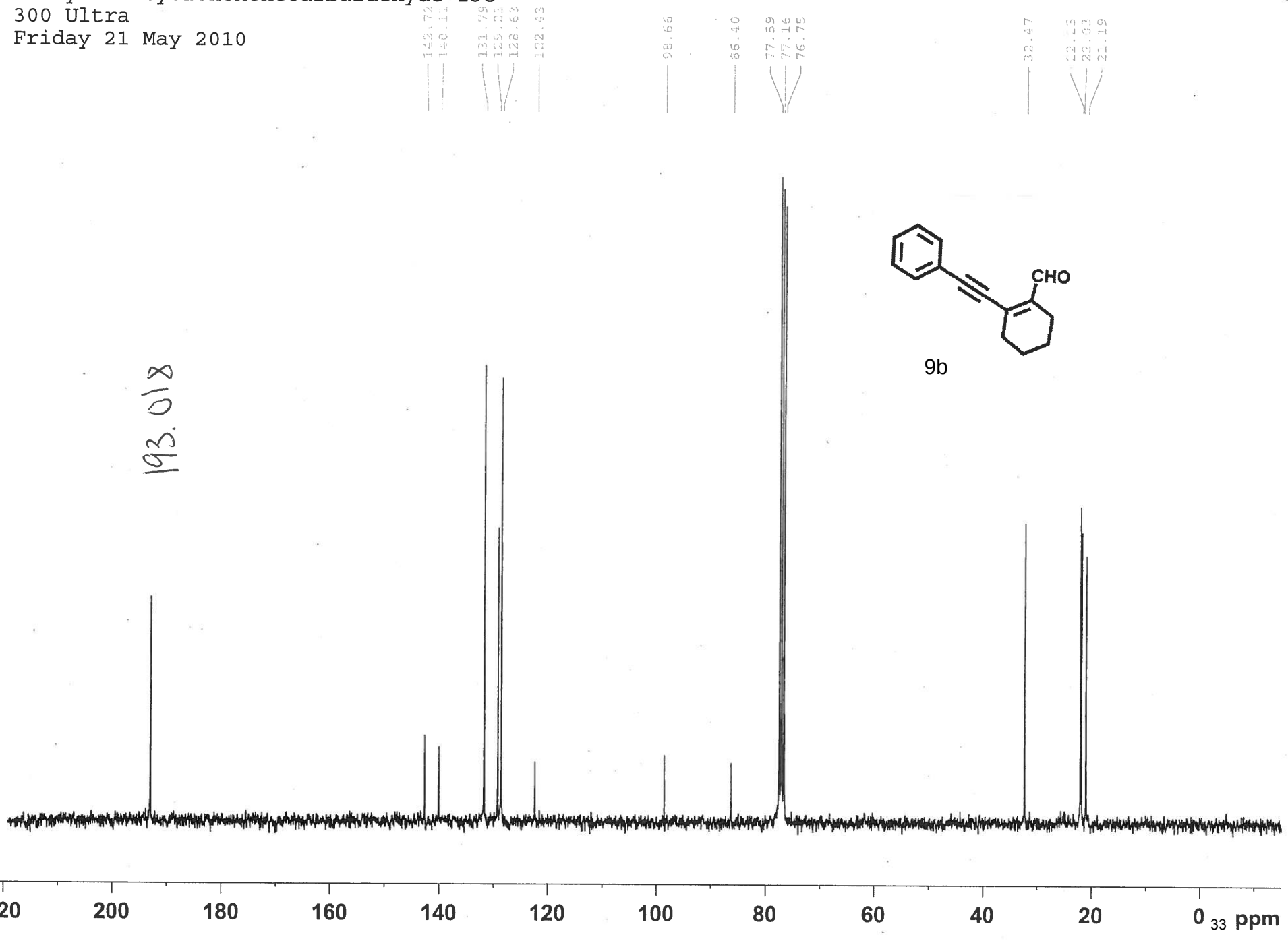
Phenyl-CC-Cyclohexenecarbaldehyde 13C
300 Ultra
Friday 21 May 2010



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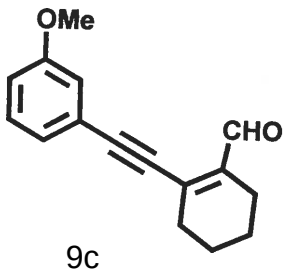

9c

Anisole-3-CC-Cyclohexene Sonogoshira 13C Analysis
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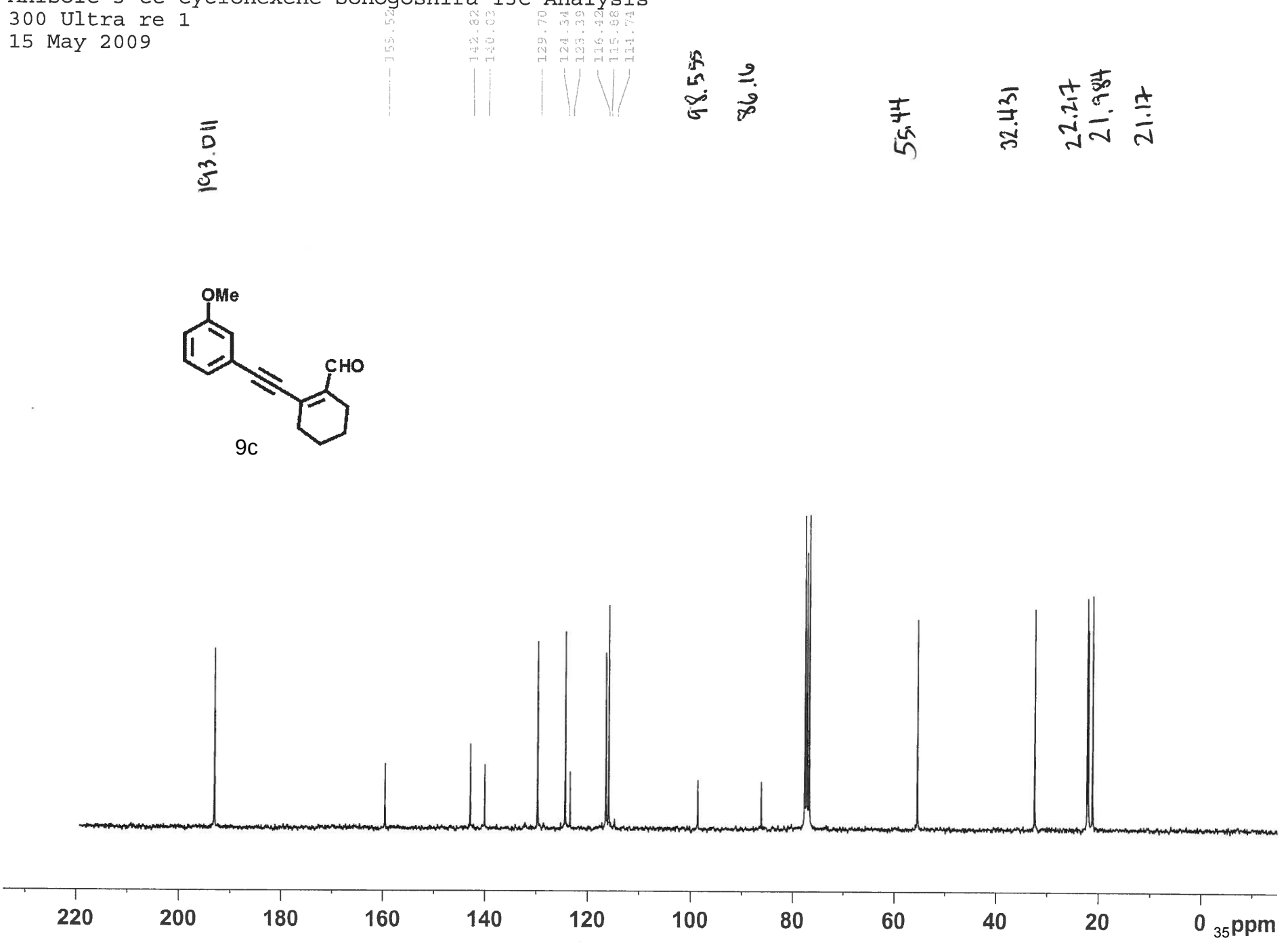
15 May 2009



Dimethoxy-1,2-Cyclohexenealdehyde-4
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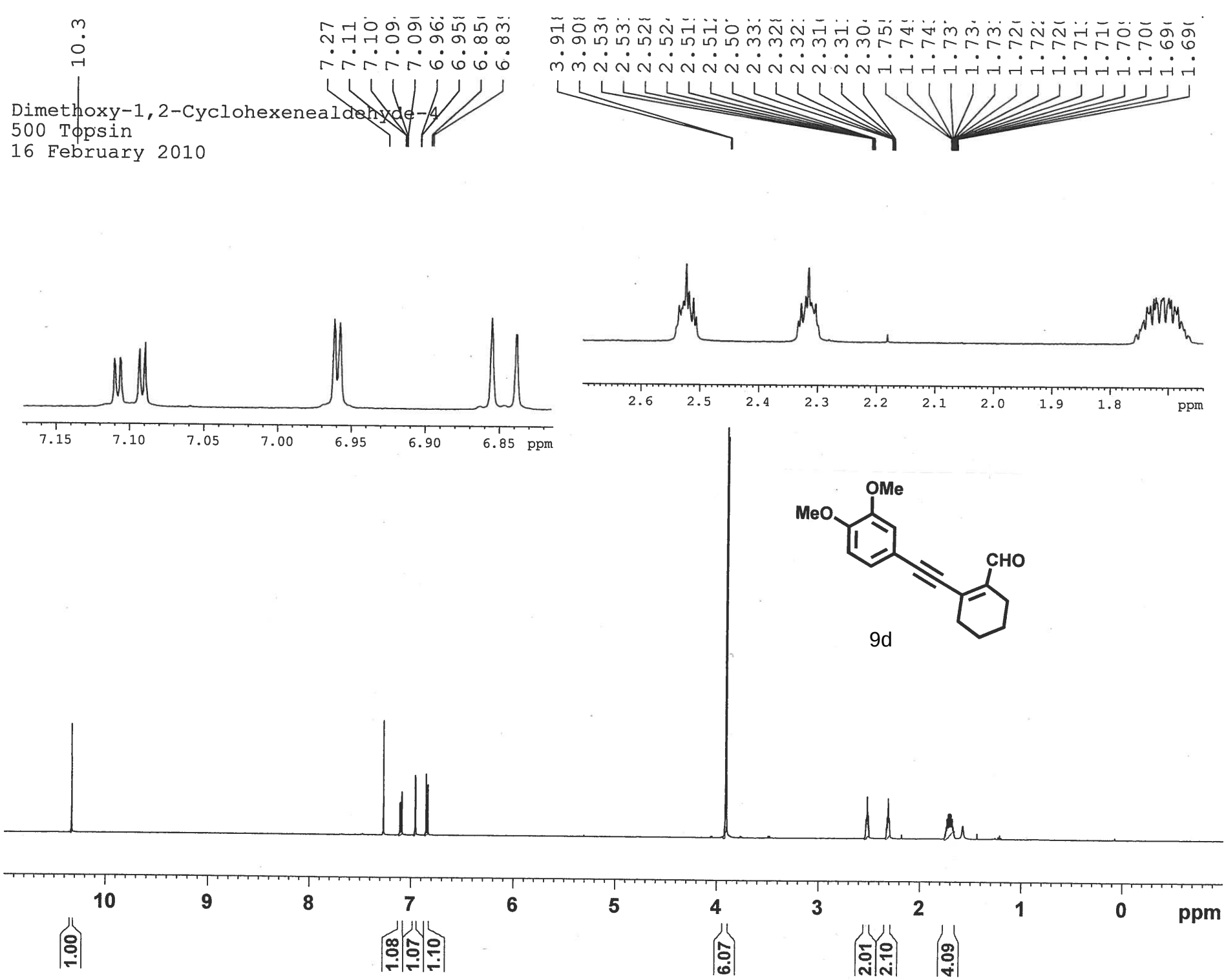
16 February 2010



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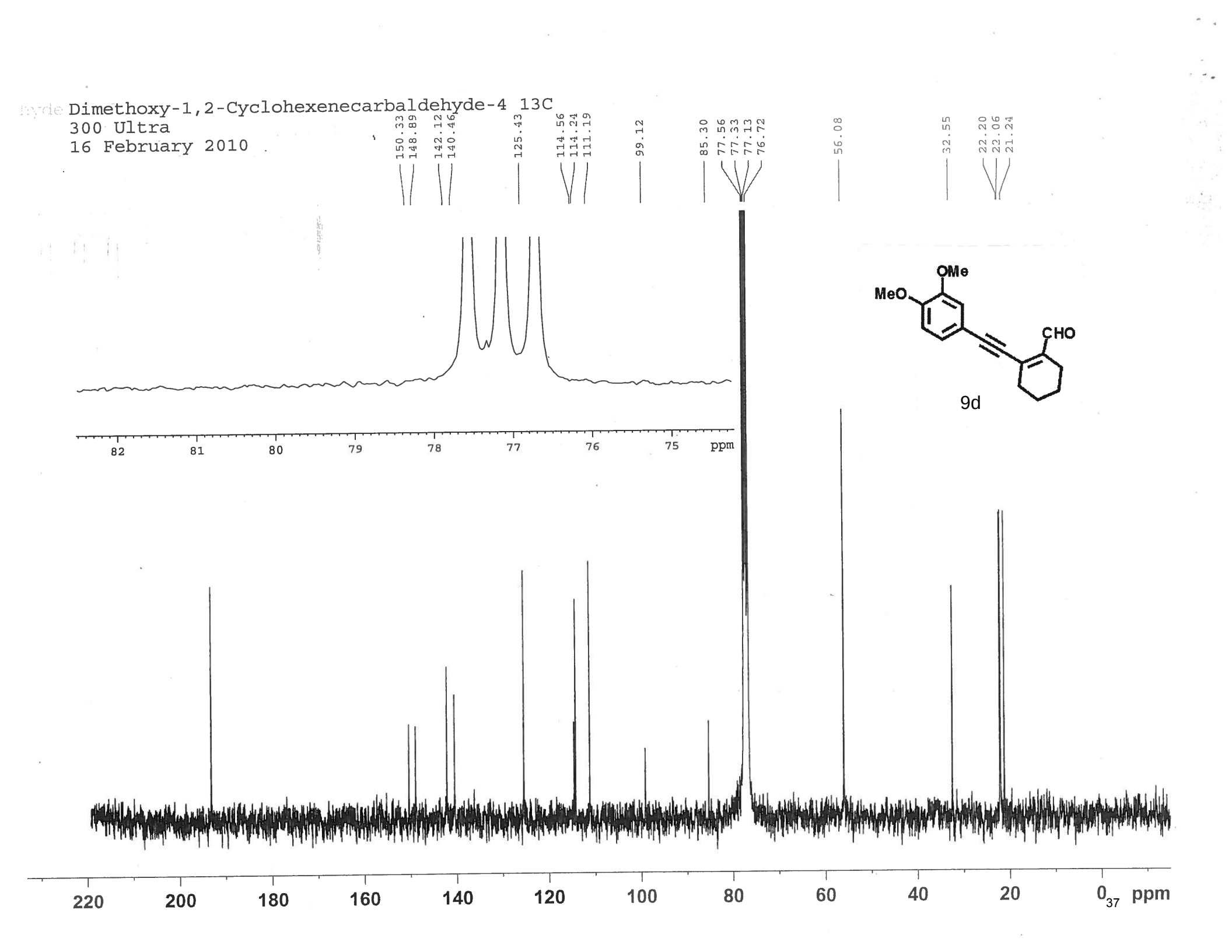
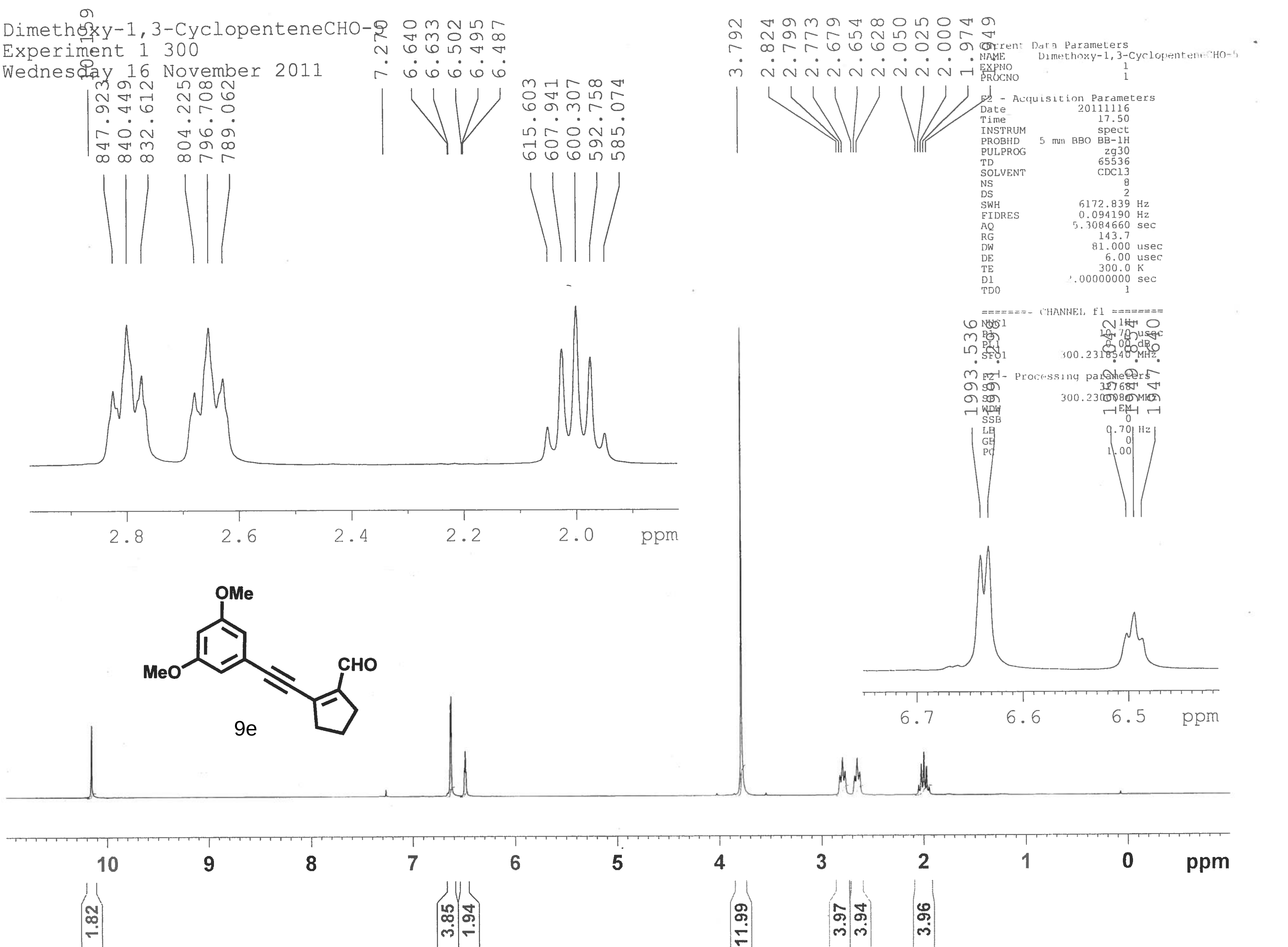
16 February 2010

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Wednesday 16 November 2011
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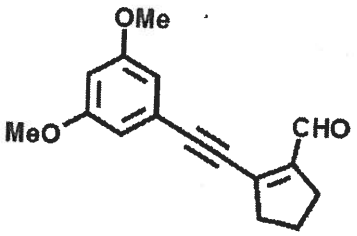
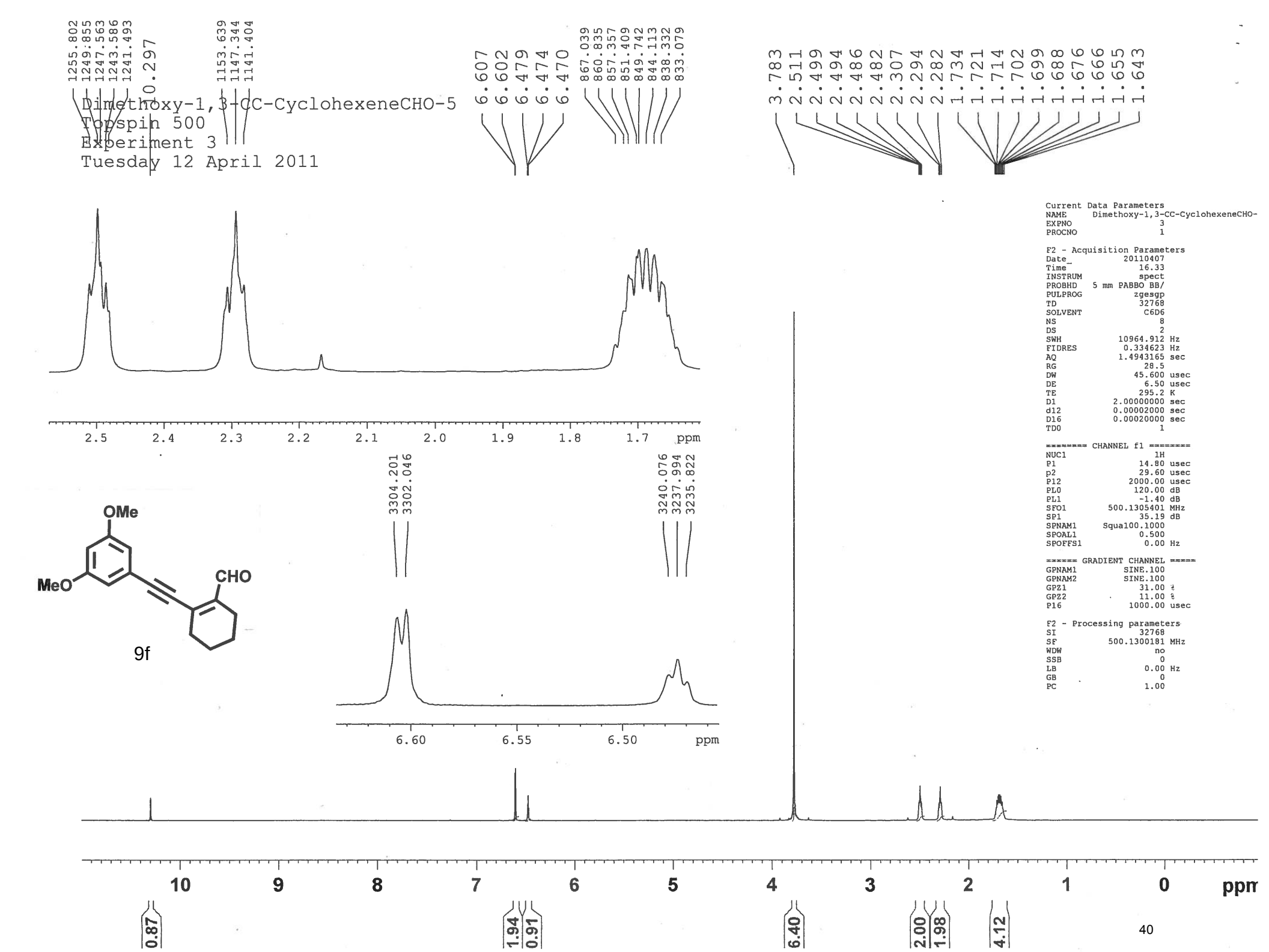
F2 - Processing parameters
SI 32768
SF 300.2300080 MHz
WDW EM
SSB 0
LB 0.70 Hz
GB 0
PC 1.00
2.8
2.6
2.4
2.2
2.0
ppm
6.7
6.6
6.5
ppm
OMe
MeO
CHO
9e
10
9
8
7
6
5
4
3
2
1
0
ppm
1.82
3.85
1.94
11.99
3.97
3.94
3.96

Dimethoxy-1,3-CyclopenteneCHO-5 13C
Experiment 1 300
Wednesday 16 November 2011

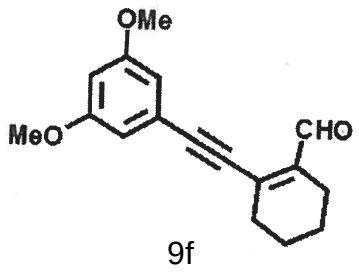


9e


```
Current Data Parameters
NAME      Dimethoxy-1,3-CyclopenteneCHO-5 13C
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20111116
Time               17.12
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                16384
SOLVENT           CDCl3
NS                  181
DS                    4
SWH           17985.611 Hz
FIDRES         1.097755 Hz
AQ            0.4555252 sec
RG               9195.2
DW              27.800 usec
DE               6.00 usec
TE              300.0 K
D1           1.00000000 sec
d11          0.03000000 sec
DELTA        0.89995998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                15.90 usec
PL1                0.00 dB
SFO1         75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             70.00 usec
PL2                0.00 dB
PL12              16.31 dB
PL13              19.31 dB
SFO2        300.2323000 MHz

F2 - Processing parameters
SI                16384
SF          75.4928917 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

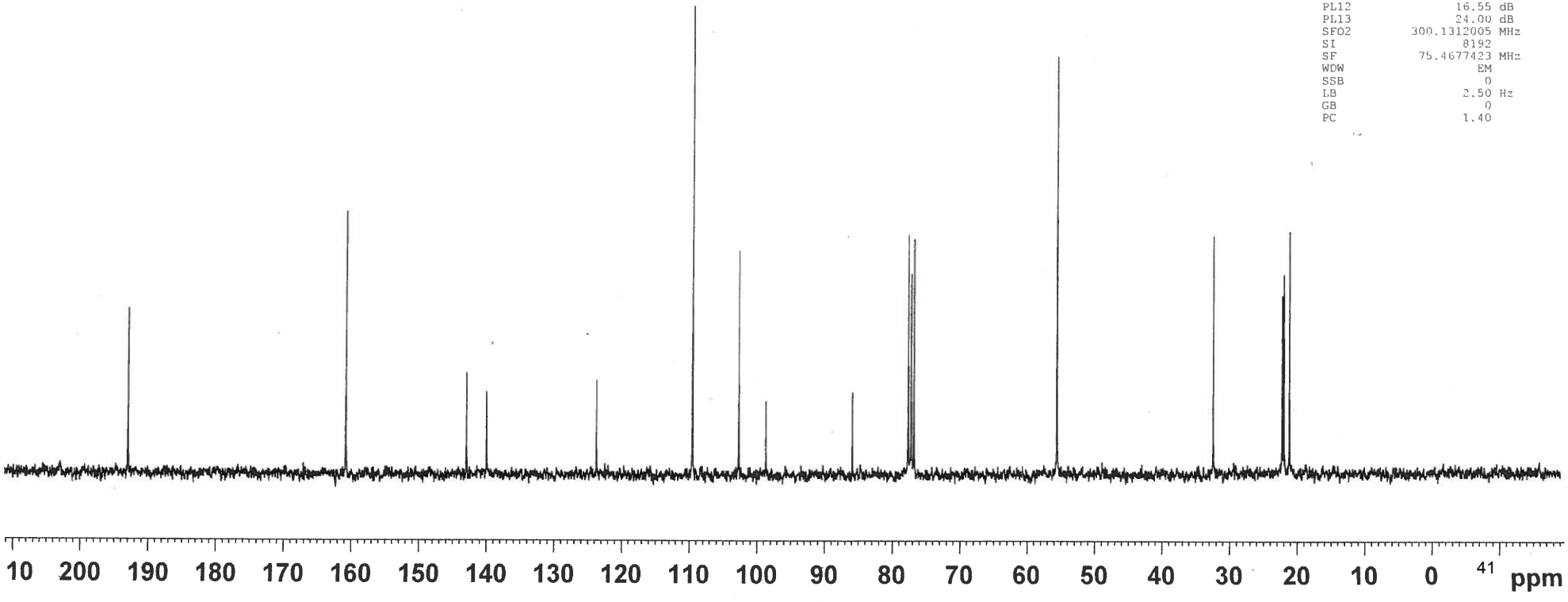

Dimethoxy-1,3-CC-CyclohexeneCHO-5
Topspin 500
Experiment 3
Tuesday 12 April 2011
1255.802
1249.855
1247.563
1243.586
1241.493
10.297
1153.639
1147.344
1141.404
6.607
6.602
6.479
6.474
6.470
867.039
860.835
857.357
851.409
849.742
844.113
838.332
833.079
3.783
2.511
2.499
2.494
2.486
2.482
2.307
2.294
2.282
1.734
1.721
1.714
1.702
1.699
1.688
1.676
1.666
1.655
1.643
3304.201
3302.046
3240.076
3237.994
3235.822
OMe
MeO
CHO
9f
Current Data Parameters
NAME Dimethoxy-1,3-CC-CyclohexeneCHO-
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110407
Time 16.33
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 28.5
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305401 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300181 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
0.87
1.94
0.91
6.40
2.00
1.98
4.12
ppm

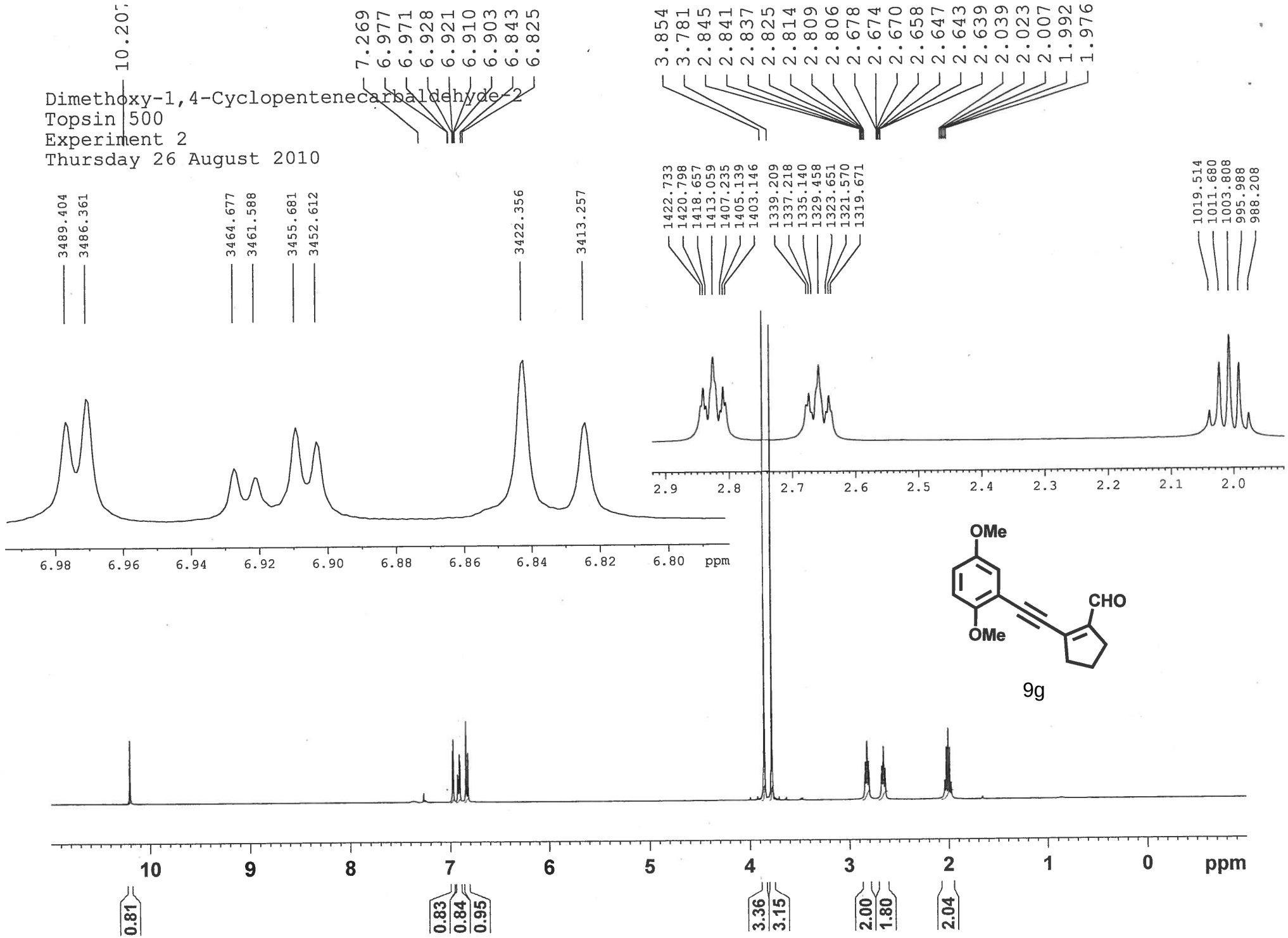
ıethoxy-1,3-CC-CyclohexeneCHO-5
sin 300 Ultra
sday 12 April 2011
eriment 3



9f

NAME	Dimethoxy-1,3-CC-CyclohexeneCHO-5
EXPNO	3
PROCNO	1
Date_	20110412
Time	16.21
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	264
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	296.8 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40

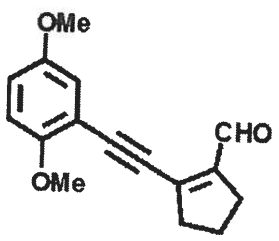



Dimethoxy-1,4-Cyclopentenecarbaldehyde-2
Topsin 500
Experiment 2
Thursday 26 August 2010
10.207
7.269
6.977
6.971
6.928
6.921
6.910
6.903
6.843
6.825
3.854
3.781
2.845
2.841
2.837
2.825
2.814
2.809
2.806
2.678
2.674
2.670
2.658
2.647
2.643
2.639
2.039
2.023
2.007
1.992
1.976
3489.404
3486.361
3464.677
3461.588
3455.681
3452.612
3422.356
3413.257
1422.733
1420.798
1418.657
1413.059
1407.235
1405.139
1403.146
1339.209
1337.218
1335.140
1329.458
1323.651
1321.570
1319.671
1019.514
1011.680
1003.808
995.988
988.208
6.98
6.96
6.94
6.92
6.90
6.88
6.86
6.84
6.82
6.80
ppm
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2.0
OMe
OMe
CHO
9g
10
9
8
7
6
5
4
3
2
1
0
ppm
0.81
0.83
0.84
0.95
3.36
3.15
2.00
1.80
2.04

Dimethoxy-1,4-CC-Cyclopentenecarbaldehyde-2 13C
Ultra 300, Experiment 2
Thursday 26 August 2010

189.64

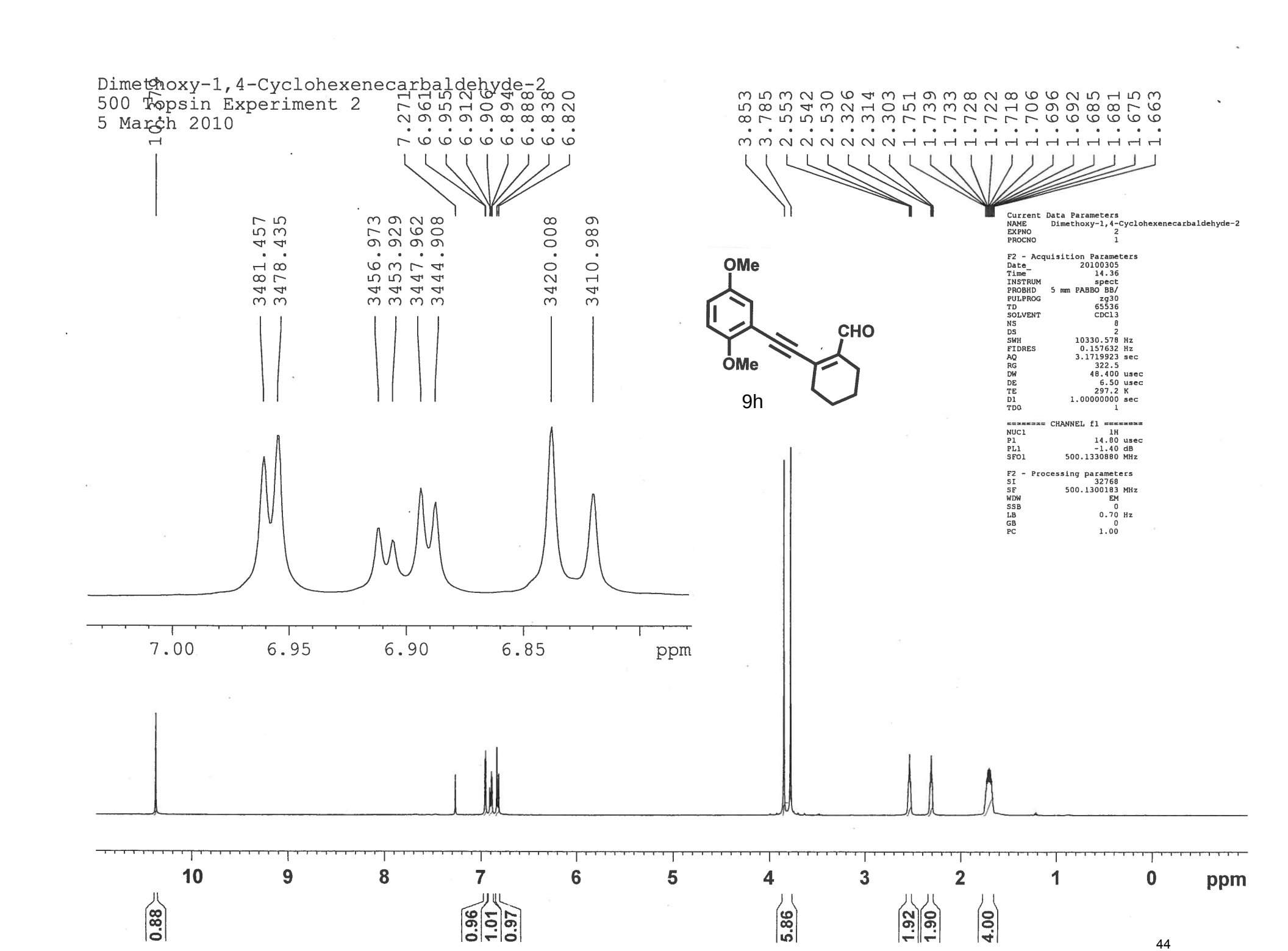
155.09
153.29
148.06
143.54
117.92
117.27
112.12
111.78
97.37
87.53
77.59
77.16
76.74
56.50
55.56
38.91
29.71
22.35



9g

220 200 180 160 140 120 100 80 60 40 20 0 ppm
43

Dimethoxy-1,4-Cyclohexenecarbaldehyde-2
500 Topsin Experiment 2
5 March 2010



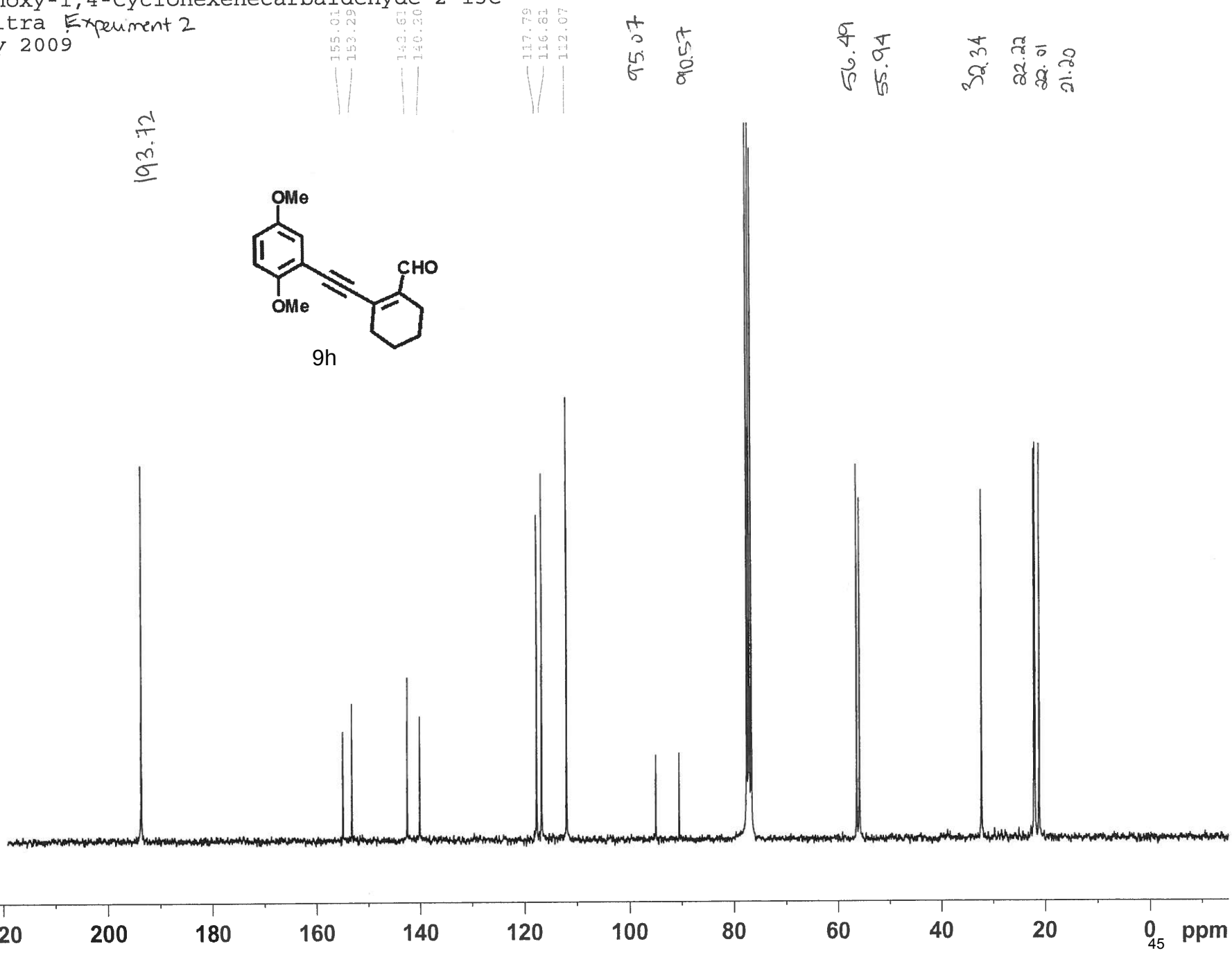
Current Data Parameters
NAME Dimethoxy-1,4-Cyclohexenecarbaldehyde-2
EXPNO 2
PROCNO 1

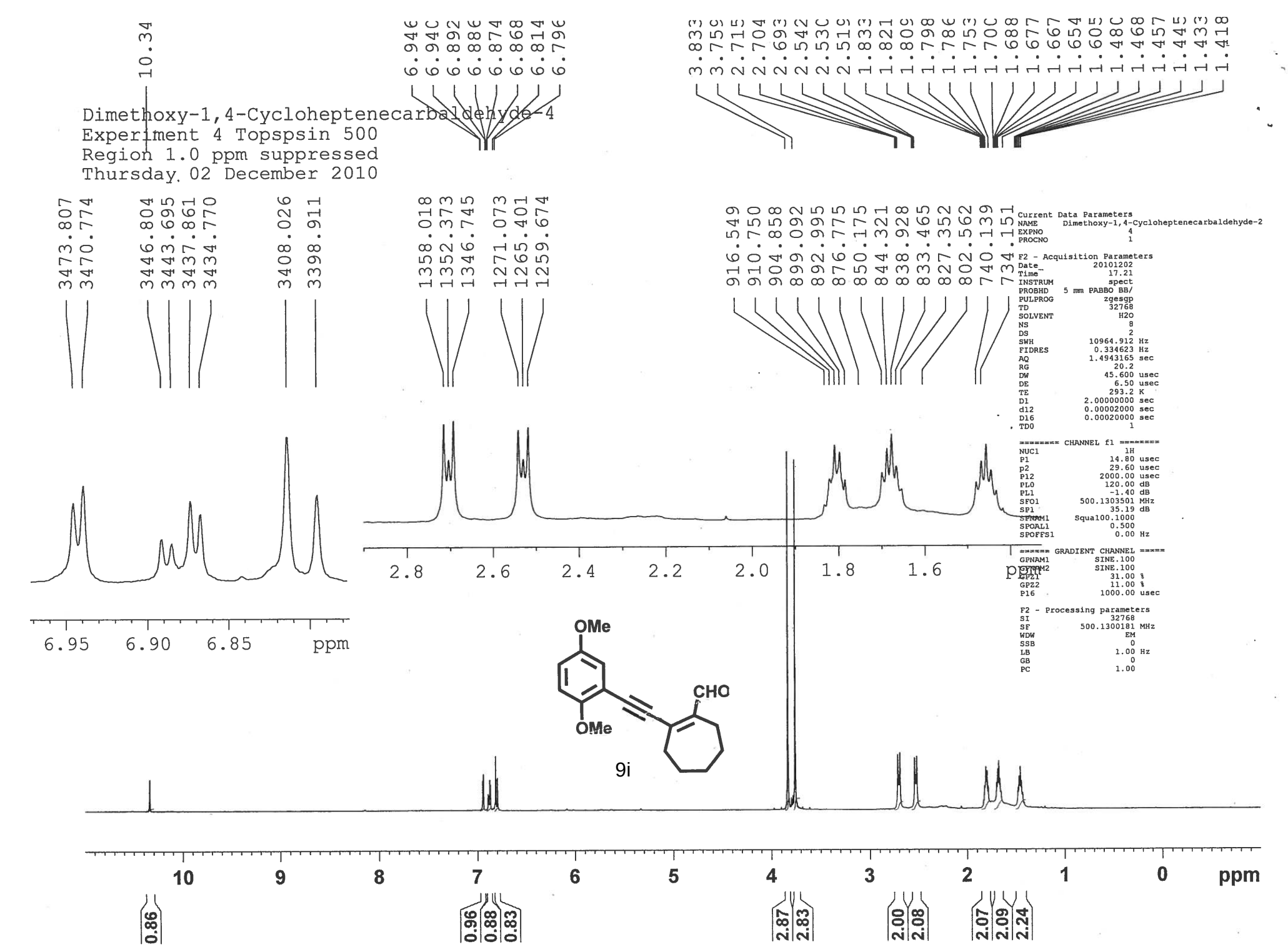
F2 - Acquisition Parameters
Date_ 20100305
Time 14.36
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 322.5
DW 48.400 usec
DE 6.50 usec
TE 297.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
PL1 -1.40 dB
SFO1 500.1330880 MHz

F2 - Processing parameters
SI 32768
SF 500.1300183 MHz
WDW EM
SSB 0
LB 0.70 Hz
GB 0
PC 1.00

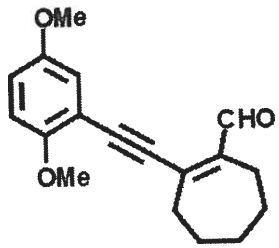
Dimethoxy-1,4-Cyclohexenecarbaldehyde-2 13C
300 Ultra Experiment 2
23 May 2009




Dimethoxy-1,4-Cycloheptenecarbaldehyde-4
Experiment 4 Topspspin 500
Region 1.0 ppm suppressed
Thursday, 02 December 2010
10.34
6.946
6.940
6.892
6.886
6.874
6.868
6.814
6.796
3.833
3.759
2.715
2.704
2.693
2.542
2.530
2.519
1.833
1.821
1.809
1.798
1.786
1.753
1.700
1.688
1.677
1.667
1.654
1.605
1.480
1.468
1.457
1.445
1.433
1.418
3473.807
3470.774
3446.804
3443.695
3437.861
3434.770
3408.026
3398.911
1358.018
1352.373
1346.745
1271.073
1265.401
1259.674
916.549
910.750
904.858
899.092
892.995
876.775
850.175
844.321
838.928
833.465
827.352
802.562
740.139
734.151
Current Data Parameters
NAME Dimethoxy-1,4-Cycloheptenecarbaldehyde-2
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101202
Time 17.21
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 20.2
DW 45.600 usec
DE 6.50 usec
TE 293.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1303501 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300181 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
OMe
OMe
CHO
9i
6.95
6.90
6.85
ppm
2.8
2.6
2.4
2.2
2.0
1.8
1.6
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
0.86
0.96
0.88
0.83
2.87
2.83
2.00
2.08
2.07
2.09
2.24

Dimethoxy-1,4-Cycloheptenecarbaldehyde-2
Experiment 6 Topspin 500 13C
Thursday 02 December 2010

193.04
154.94
153.18
148.18
145.92
117.59
116.86
112.02
111.92
96.80
91.99
77.38
77.12
76.87
56.36
55.83
37.42
32.31
25.78
24.26



9i

Current Data Parameters
NAME Dimethoxy-1,4-Cycloheptenecarbaldehyde-2
EXPNO 6
PROCNO 1

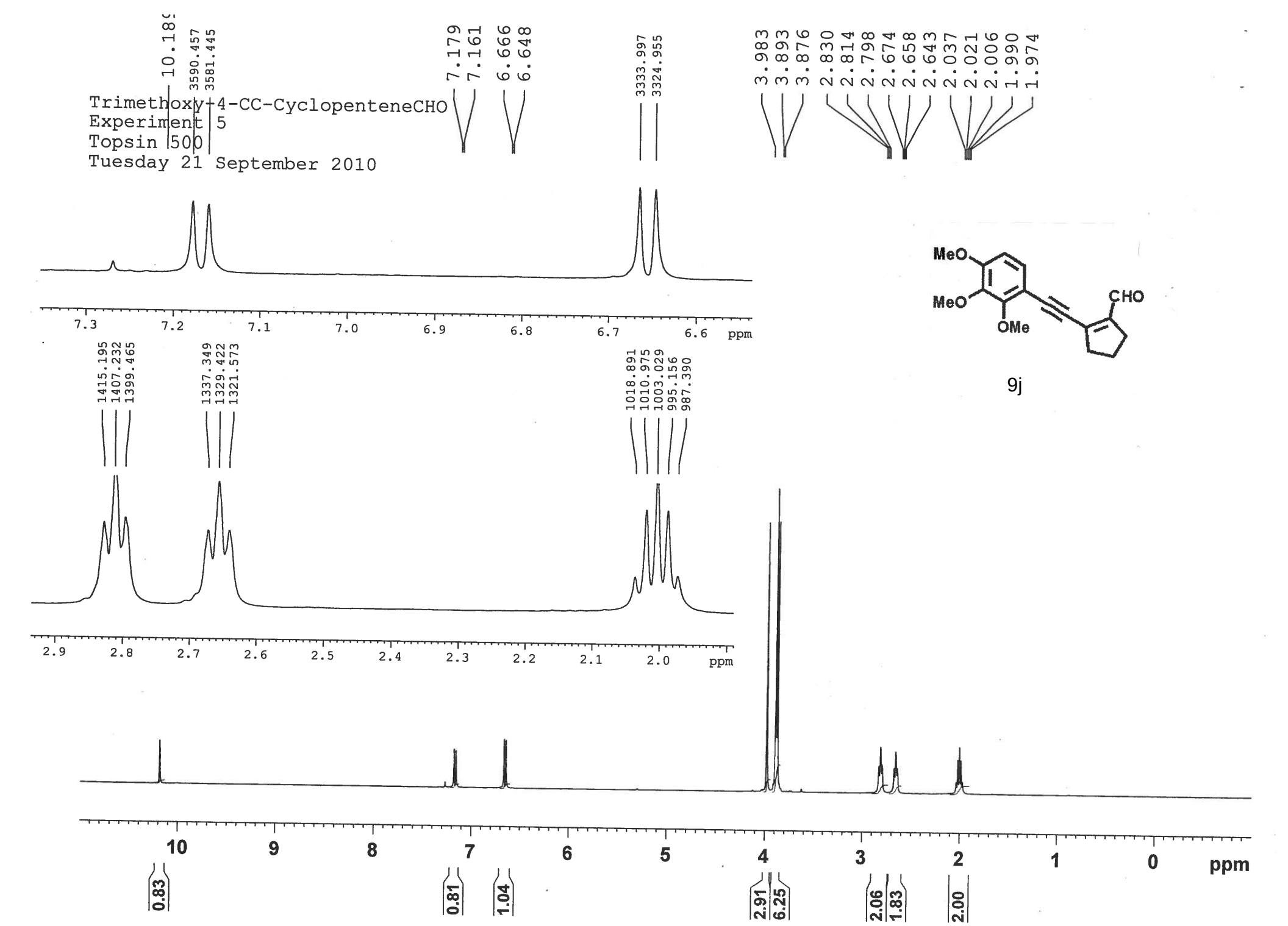
F2 - Acquisition Parameters
Date_ 20101202
Time 18.02
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 25
DS 4
SWH 30030.029 Hz
FIDRES 1.832888 Hz
AQ 0.2728436 sec
RG 1625.5
DW 16.650 usec
DE 6.50 usec
TE 294.2 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.50 usec
PL1 -0.70 dB
SFO1 125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 -1.20 dB
PL12 12.30 dB
PL13 15.30 dB
SFO2 500.1325010 MHz

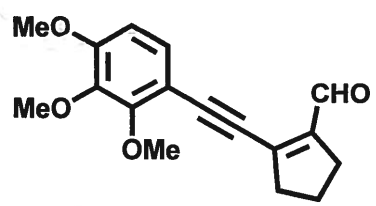
F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40

200 180 160 140 120 100 80 60 40 20 0 ppm


Trimethoxy+4-CC-CyclopenteneCHO
Experiment 5
Topsin 500
Tuesday 21 September 2010
10.185
3590.457
3581.445
7.179
7.161
6.666
6.648
3333.997
3324.955
3.983
3.893
3.876
2.830
2.814
2.798
2.674
2.658
2.643
2.037
2.021
2.006
1.990
1.974
1415.195
1407.232
1399.465
1337.349
1329.422
1321.573
1018.891
1010.975
1003.029
995.156
987.390
MeO
MeO
OMe
CHO
9j
ppm
0.83
0.81
1.04
2.91
6.25
2.06
1.83
2.00

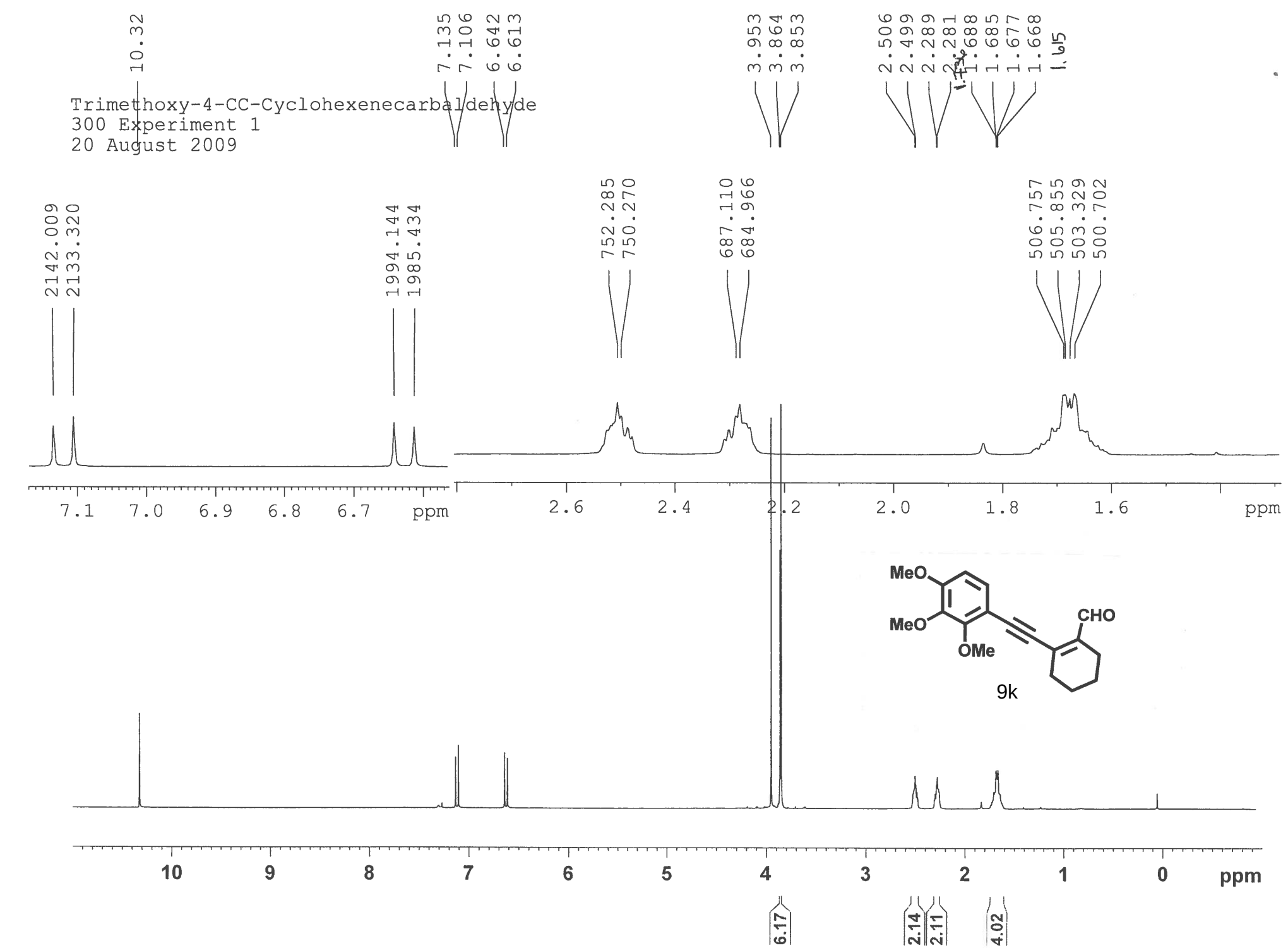
Trimethoxy-4-cyclopenteneCHO Sonogoshira 13C
Experiment 3
Ultra 300
Tuesday 21 September 2010

189.23



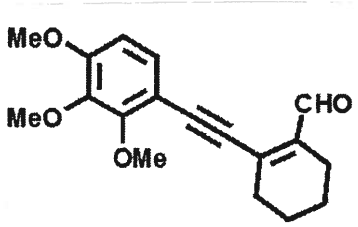
9j

220 200 180 160 140 120 100 80 60 40 20 0 ppm

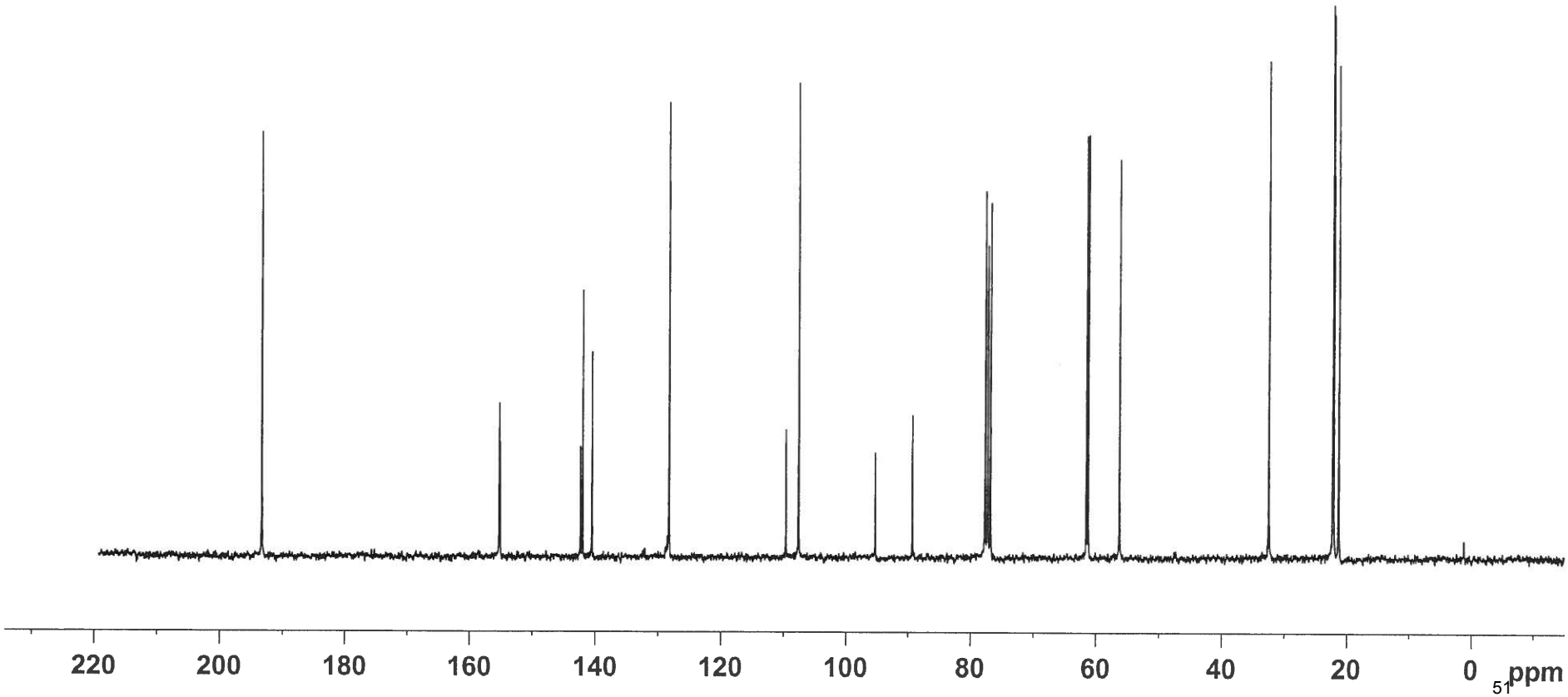

Trimethoxy-4-CC-Cyclohexenecarbaldehyde
300 Experiment 1
20 August 2009
10.32
7.135
7.106
6.642
6.613
3.953
3.864
3.853
2.506
2.499
2.289
2.281
1.688
1.685
1.677
1.668
2142.009
2133.320
1994.144
1985.434
752.285
750.270
687.110
684.966
506.757
505.855
503.329
500.702
7.1
7.0
6.9
6.8
6.7
ppm
2.6
2.4
2.2
2.0
1.8
1.6
ppm
MeO
MeO
OMe
CHO
9k
10
9
8
7
6
5
4
3
2
1
0
ppm
6.17
2.14
2.11
4.02

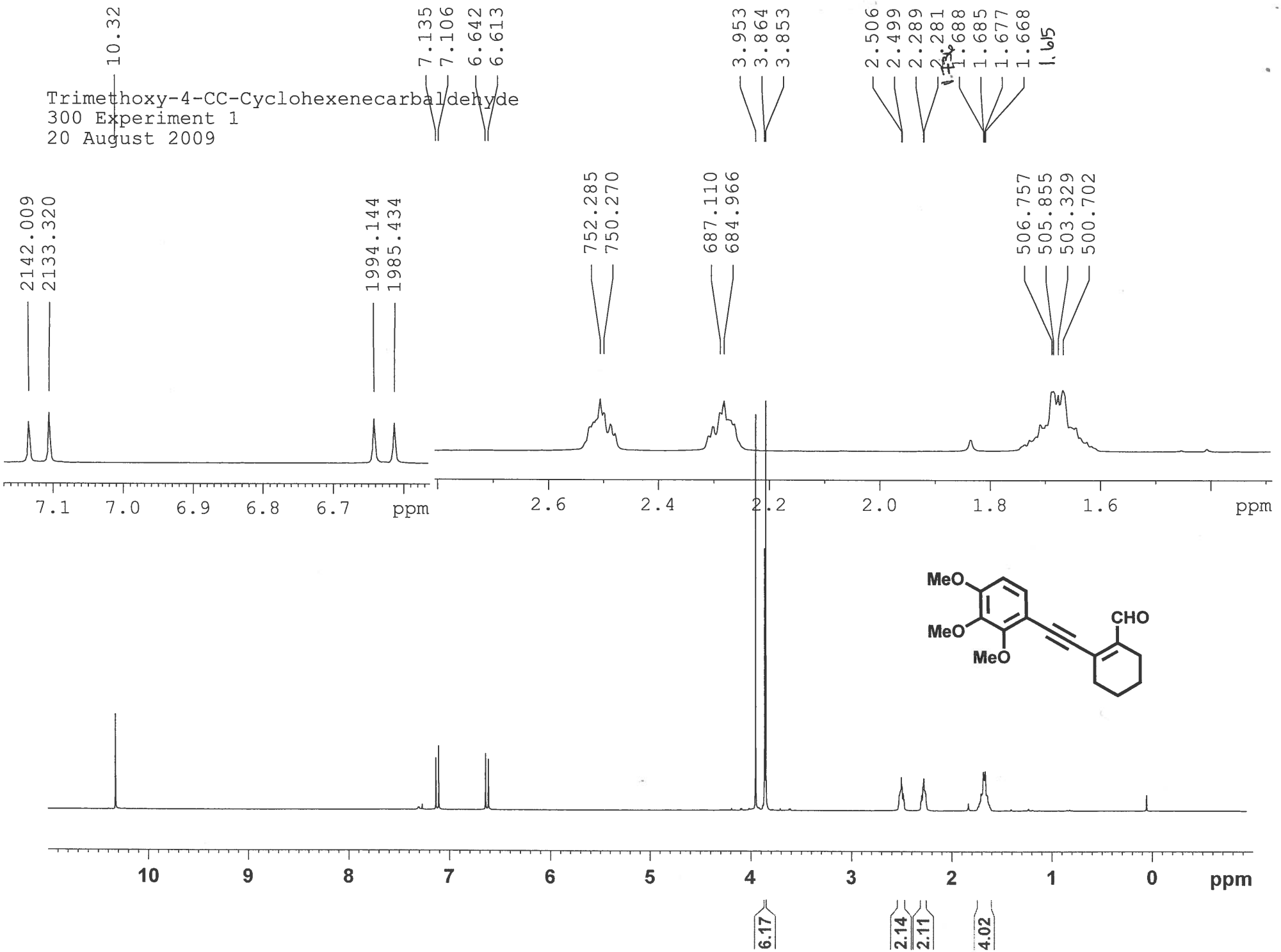
Trimethoxybenzene-4-CC-Cyclohexenecarbaldehyde 13C
300 Ultra Experiment 2 (1557 scans)
24 August 2009

155.45
155.00
142.32
141.97
140.50
128.53
128.24
109.60
107.55
95.27
89.29
77.65
77.23
76.81
61.48
61.19
56.26
32.42
22.17
21.93



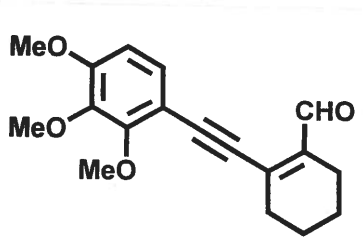
9k

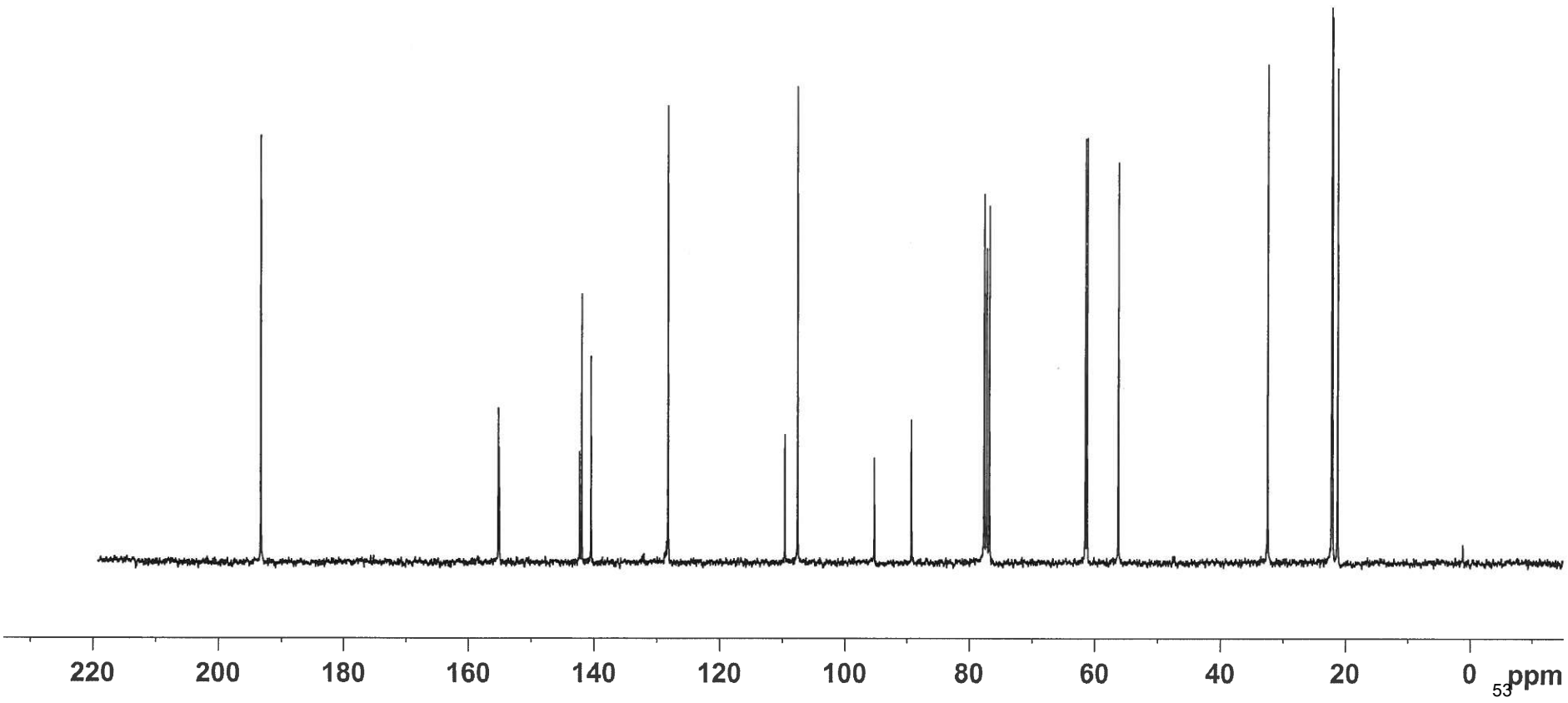



Trimethoxy-4-CC-Cyclohexenecarbaldehyde
300 Experiment 1
20 August 2009
10.32
7.135
7.106
6.642
6.613
3.953
3.864
3.853
2.506
2.499
2.289
2.281
1.688
1.685
1.677
1.668
2142.009
2133.320
1994.144
1985.434
752.285
750.270
687.110
684.966
506.757
505.855
503.329
500.702
7.1
7.0
6.9
6.8
6.7
ppm
2.6
2.4
2.2
2.0
1.8
1.6
ppm
MeO
MeO
MeO
CHO
10
9
8
7
6
5
4
3
2
1
0
ppm
6.17
2.14
2.11
4.02

Trimethoxybenzene-4-CC-Cyclohexenecarbaldehyde 13C
300 Ultra Experiment 2 (1557 scans)
24 August 2009

155.45
155.00
142.32
141.97
140.50
128.53
128.24
109.60
107.56
95.27
89.29
77.65
77.23
76.81
61.48
61.19
56.20
32.42
22.17
22.03
21.22





Trimethoxy-5-CC-CyclopenteneCHO
Experiment 2 Topspin 500
Friday 07 October 2011

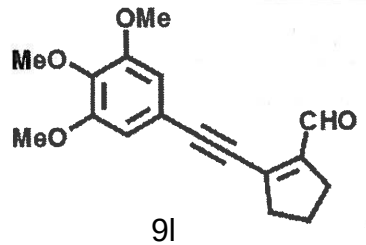
10.153

6.710

3.854 2.802 2.797 2.786 2.775 2.770 2.767 2.658 2.654 2.650 2.639 2.627 2.623 2.020 2.004 1.988 1.972 1.957

1401.210 1399.093 1393.479 1387.600 1385.555 1383.663 1329.494 1327.564 1325.514 1319.865 1314.003 1312.039

1010.142 1002.256 994.310 986.459 978.648



9l

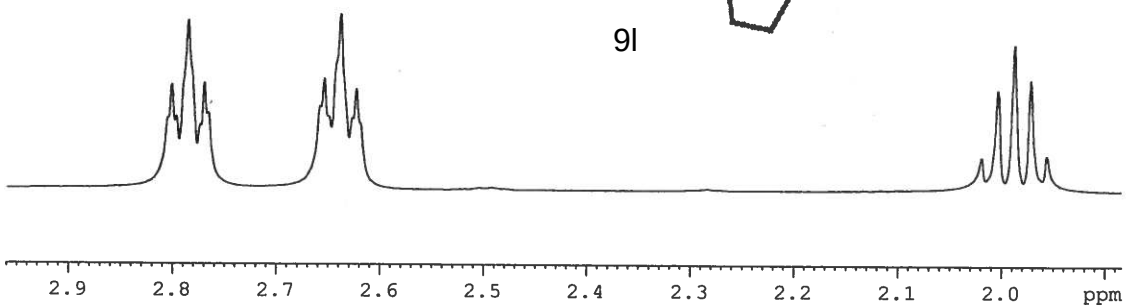
Current Data Parameters
NAME Trimethoxy-5-CC-CyclopenteneCHO
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20111007
Time 12.24
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 32
DW 45.600 usec
DE 6.50 usec
TE 297.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

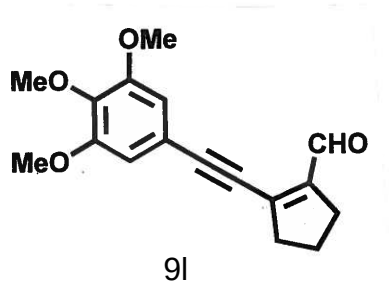
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305001 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300196 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00

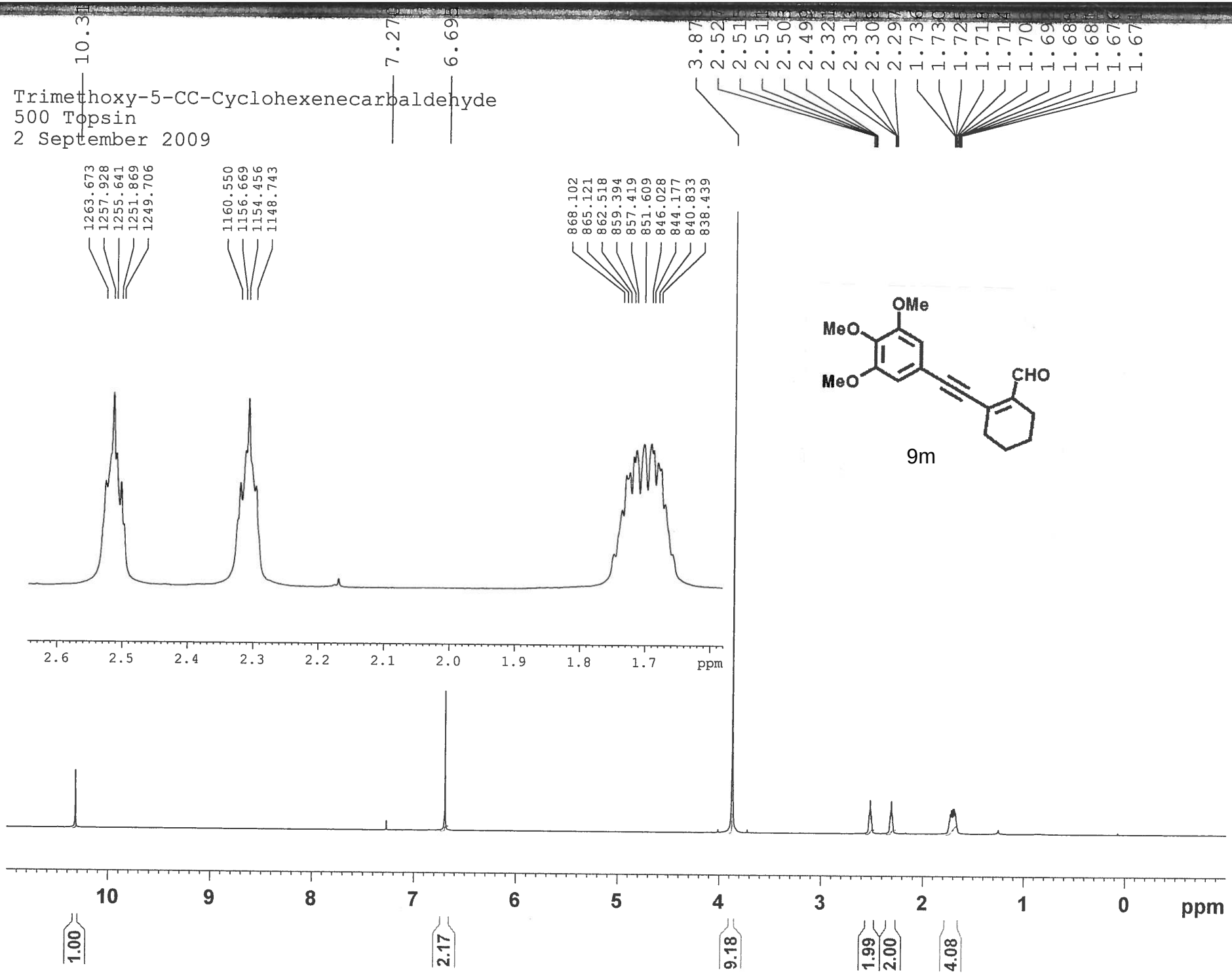


Trimethoxy-5-Cyclopentene Sonogoshira 13
300 Ultra
Experiment 1
17 March 2009

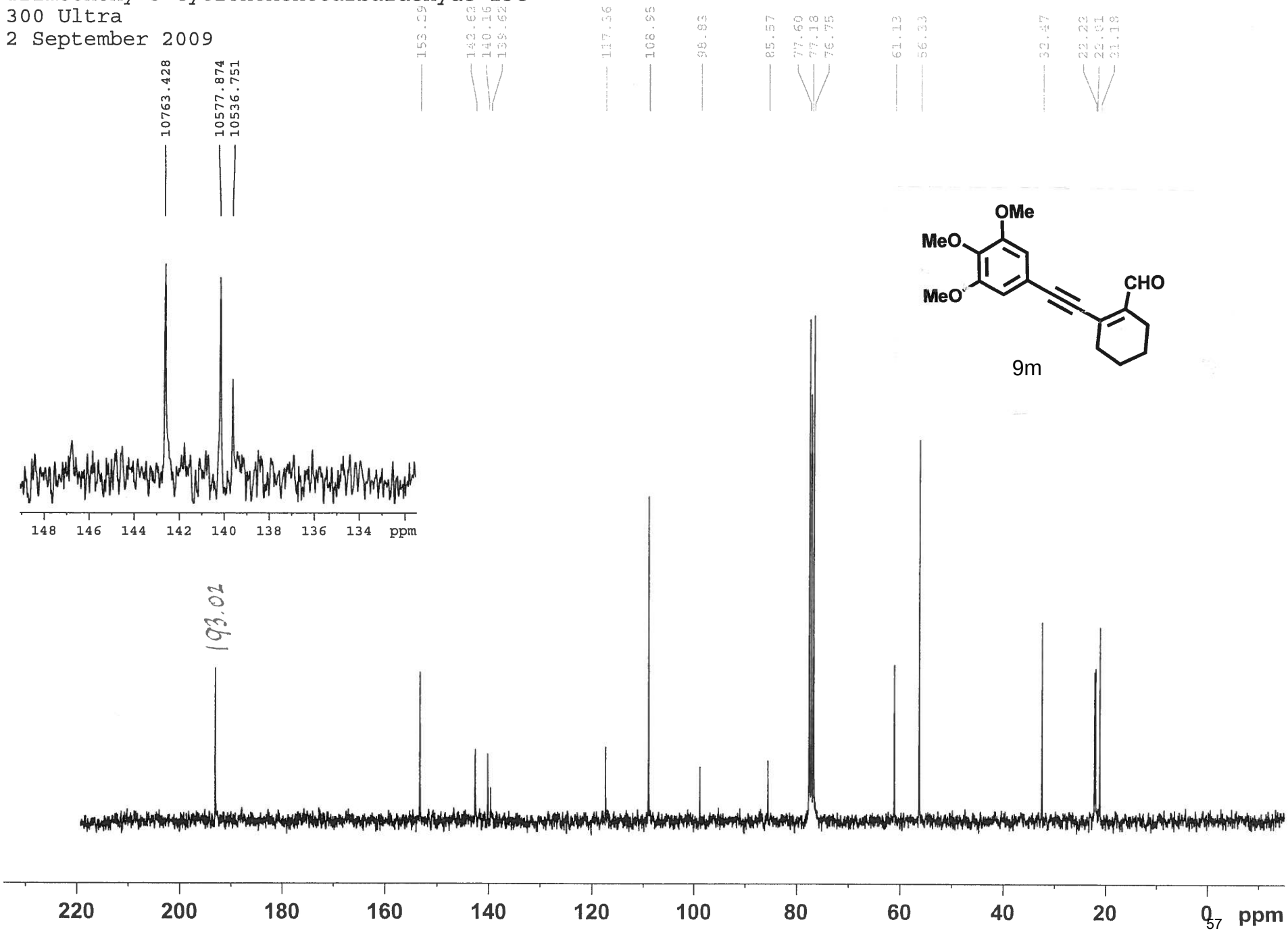


9l

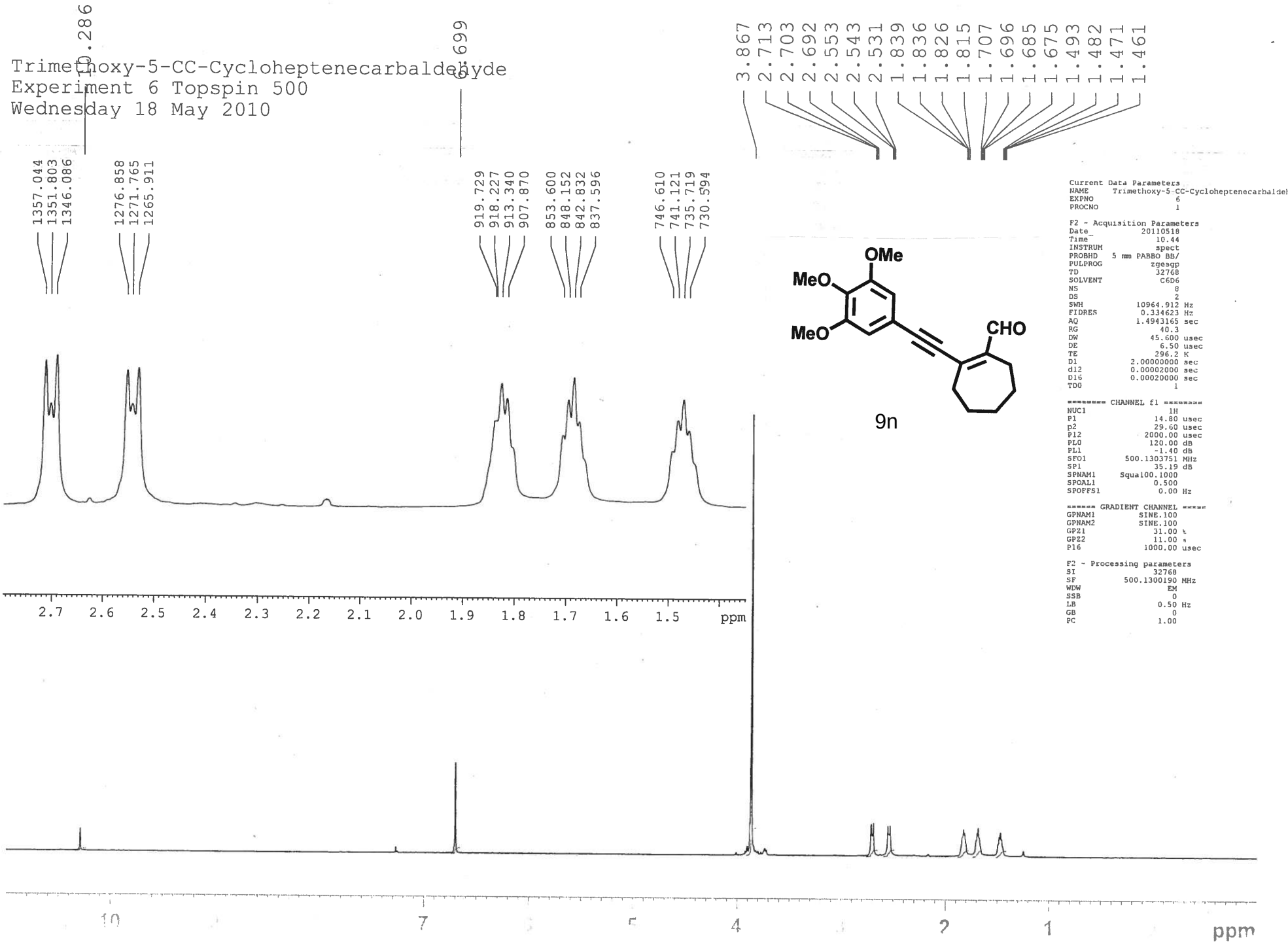
Trimethoxy-5-CC-Cyclohexenecarbaldehyde
500 Topsin
2 September 2009



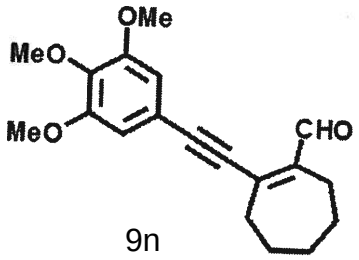
Trimethoxy-5-Cyclohexenecarbaldehyde 13C
300 Ultra
2 September 2009



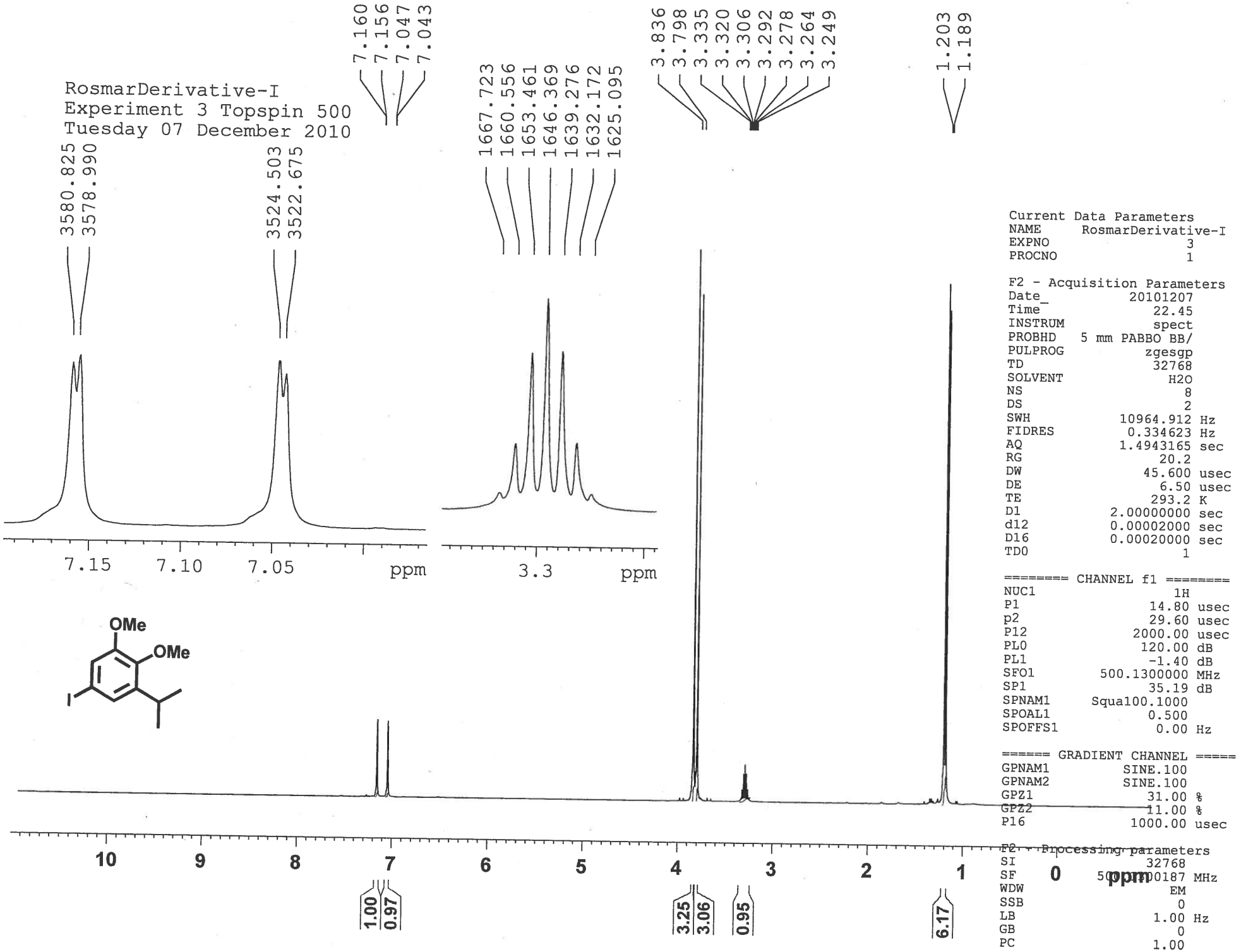
9m


Trimethoxy-5-CC-Cycloheptenecarbaldehyde
Experiment 6 Topspin 500
Wednesday 18 May 2010
10.286
9.699
3.867
2.713
2.703
2.692
2.553
2.543
2.531
1.839
1.836
1.826
1.815
1.707
1.696
1.685
1.675
1.493
1.482
1.471
1.461
1357.044
1351.803
1346.086
1276.858
1271.765
1265.911
919.729
918.227
913.340
907.870
853.600
848.152
842.832
837.596
746.610
741.121
735.719
730.594
OMe
MeO
MeO
CHO
9n
Current Data Parameters
NAME Trimethoxy-5-CC-Cycloheptenecarbaldehy
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110518
Time 10.44
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 40.3
DW 45.600 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1303751 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300190 MHz
WDW EM
SSB 0
LB 0.50 Hz
GB 0
PC 1.00
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 ppm
10 7 4 2 1 ppm

imethoxy-55-CC-Cycloheptenecarbaldehyde 13C
pspsin 300
periment 1
dnesday 18 May 2011



9n



Current Data Parameters

NAME	RosmarDerivative-I
EXPNO	3
PROCNO	1

F2 - Acquisition Parameters

Date_	20101207
Time	22.45
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	H2O
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4943165 sec
RG	20.2
DW	45.600 usec
DE	6.50 usec
TE	293.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1300000 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

======= GRADIENT CHANNEL =====

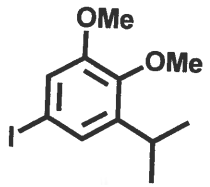
GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

SI	32768
SF	500.0000187 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.00

RosmarDerivative-I
Experiment 4 13C
Topspin 500
Tuesday 07 December 2010

153.39
146.40
144.71
127.84
119.06
87.33
60.95
55.98
26.71
23.41



Current Data Parameters

NAME	RosmarDerivative-I
EXPNO	4
PROCNO	1

F2 - Acquisition Parameters

Date_	20101207
Time	22.54
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	85
DS	4
SWH	30030.029 Hz
FIDRES	1.832888 Hz
AQ	0.2728603 sec
RG	1625.5
DW	16.650 usec
DE	6.50 usec
TE	295.2 K
D1	1.00000000 sec
d11	0.03000000 sec
DELTA	0.89999998 sec
TD0	1

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

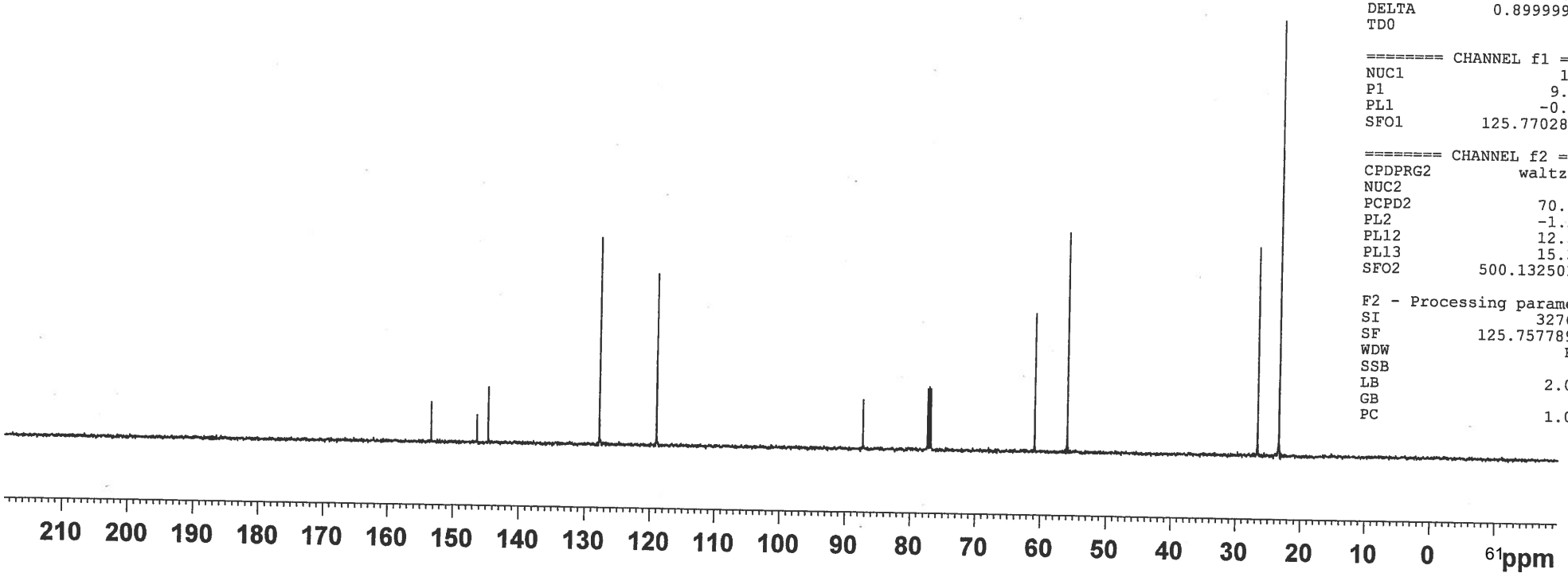
NUC1	13C
P1	9.50 usec
PL1	-0.70 dB
SFO1	125.7702890 MHz

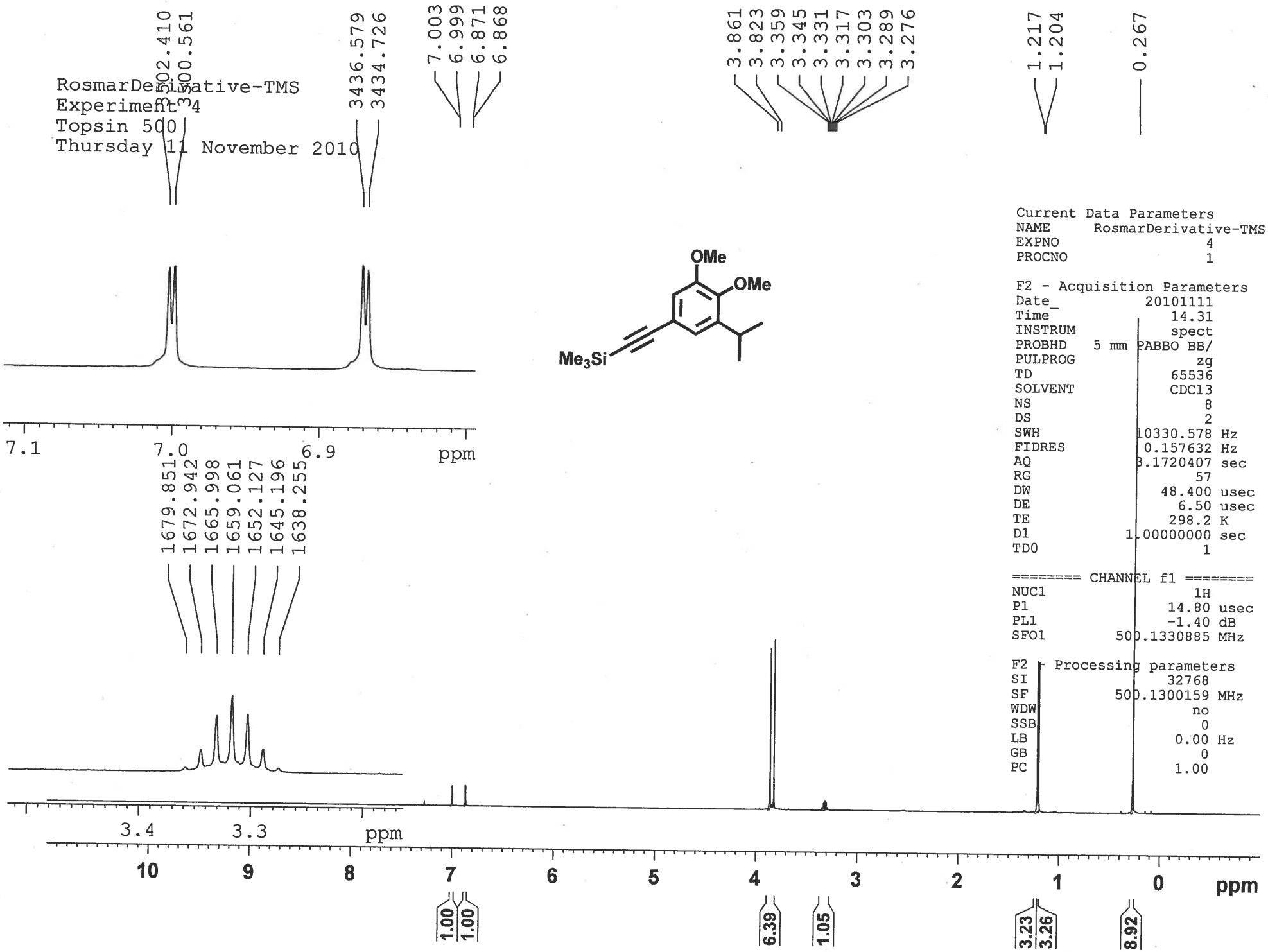
======== CHANNEL f2 ========

CPDPRG2	waltz16
NUC2	1H
PCPD2	70.00 usec
PL2	-1.20 dB
PL12	12.30 dB
PL13	15.30 dB
SFO2	500.1325010 MHz

F2 - Processing parameters

SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	2.00 Hz
GB	0
PC	1.00




RosmarDerivative-TMS
Experiment 4
Topsin 500
Thursday 11 November 2010
3436.579
3434.726
7.003
6.999
6.871
6.868
3.861
3.823
3.359
3.345
3.331
3.317
3.303
3.289
3.276
1.217
1.204
0.267
OMe
OMe
Me3Si
1679.851
1672.942
1665.998
1659.061
1652.127
1645.196
1638.255
7.1
7.0
6.9
ppm
3.4
3.3
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.00
6.39
1.05
3.23
3.26
8.92
Current Data Parameters
NAME RosmarDerivative-TMS
EXPNO 4
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101111
Time 14.31
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1720407 sec
RG 57
DW 48.400 usec
DE 6.50 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
PL1 -1.40 dB
SFO1 500.1330885 MHz
F2 - Processing parameters
SI 32768
SF 500.1300159 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

RosmarDerivative-TMS
Experiment 5 -13C
Topsin 500
Thursday 11 November 2010

152.21
147.20
142.51
122.84
118.38
115.25
105.53
92.62
77.30
77.04
76.79
60.99
55.76
26.75
23.34
0.06

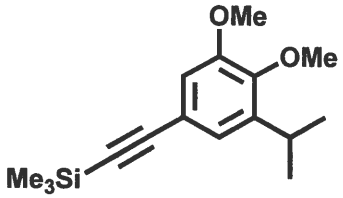
Current Data Parameters
NAME RosmarDerivative-TMS
EXPNO 5
PROCNO 1

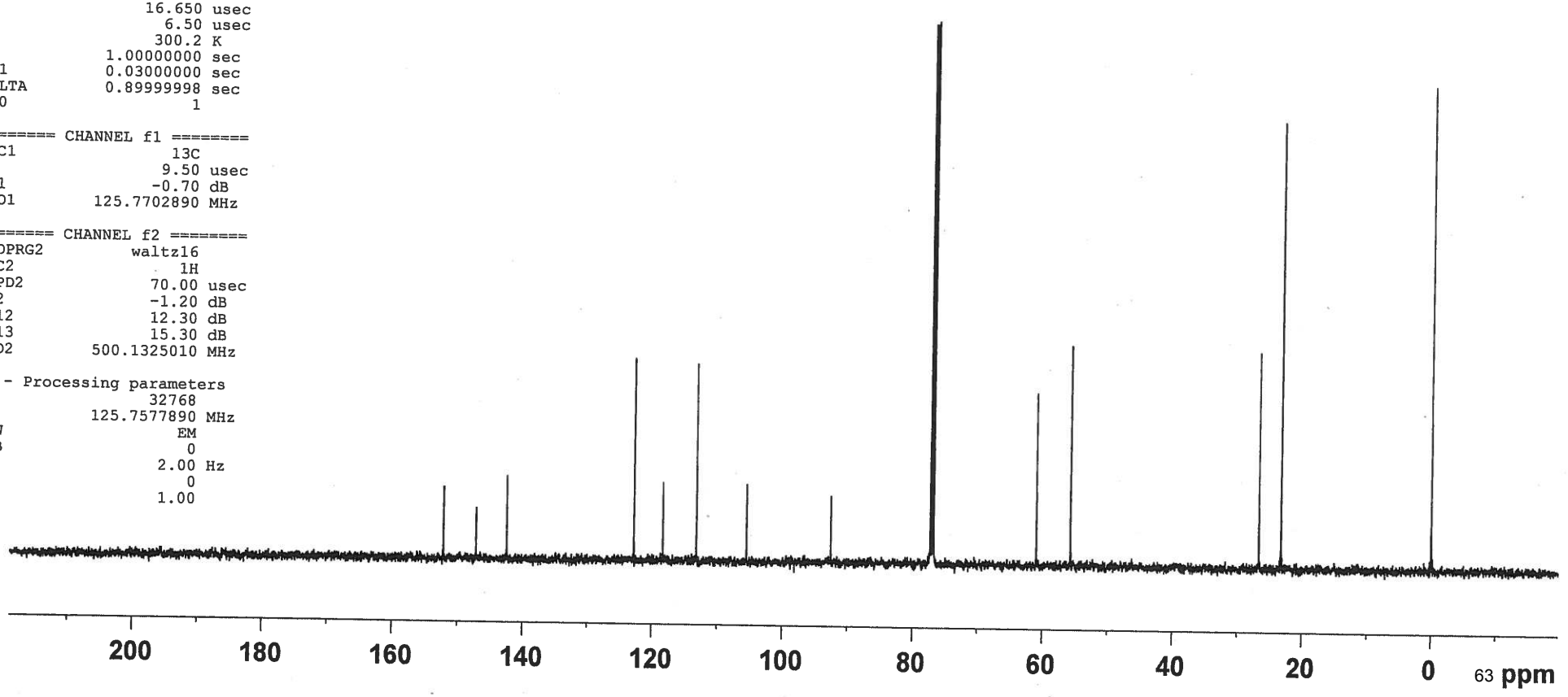
F2 - Acquisition Parameters
Date_ 20101111
Time 17.39
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 633
DS 4
SWH 30030.029 Hz
FIDRES 1.832888 Hz
AQ 0.2728603 sec
RG 3251
DW 16.650 usec
DE 6.50 usec
TE 300.2 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.50 usec
PL1 -0.70 dB
SFO1 125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 -1.20 dB
PL12 12.30 dB
PL13 15.30 dB
SFO2 500.1325010 MHz

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.00





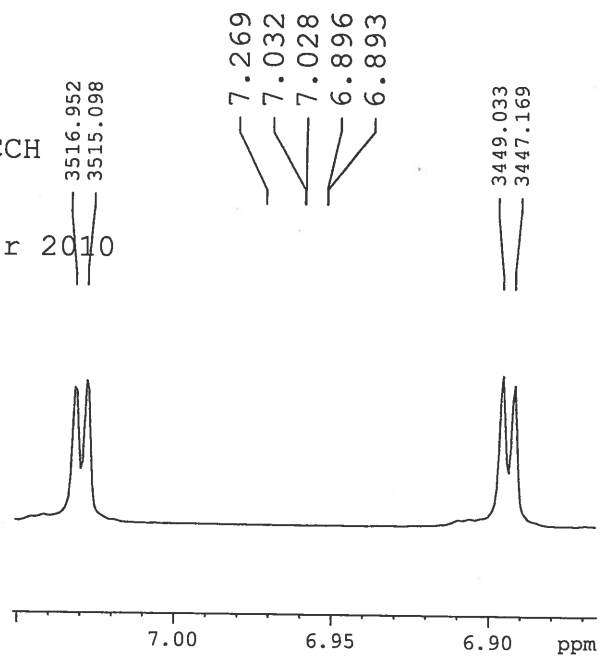
RosmarDerivative-CCH
Experiment 1
Tospin 500
Tuesday 16 November 2010

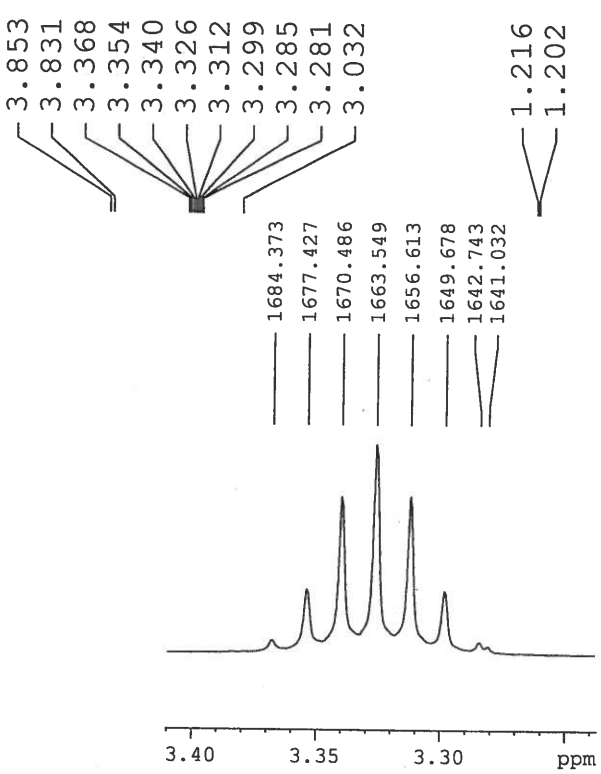
Current Data Parameters
NAME RosmarDerivative-CCH
EXPNO 1
PROCNO 1

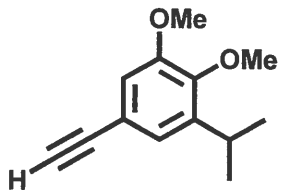
F2 - Acquisition Parameters
Date_ 20101116
Time 22.28
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT C6D6
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1720407 sec
RG 20.2
DW 48.400 usec
DE 6.50 usec
TE 295.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 15.00 usec
PL1 0.50 dB
SFO1 500.1330880 MHz

F2 - Processing parameters
SI 32768
SF 500.1300186 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00







RosmarDerivative-CCH
Experiment 3 13C
Topsin 500
Tuesday 16 November 2010

152.31
149.36
142.65

122.06
117.36
115.35

94.06

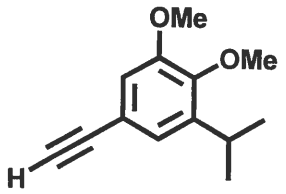
77.32

60.97

26.73
23.34

Current Data Parameters
NAME RosmarDerivative-CCH
EXPNO 3
PROCNO 1

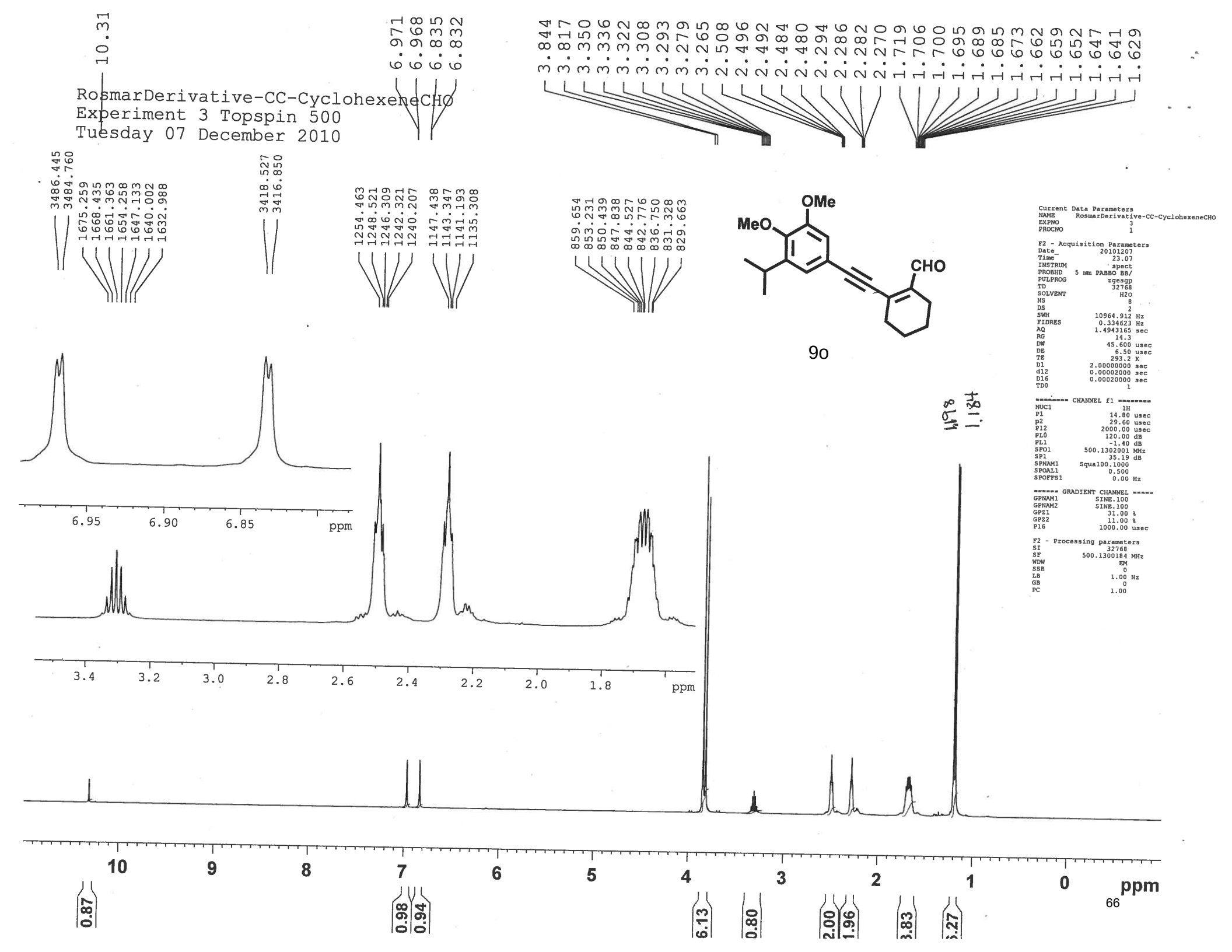
F2 - Acquisition Parameters
Date_ 20101116
Time 23.47
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 207
DS 4
SWH 30030.029 Hz
FIDRES 1.832888 Hz
AQ 0.2728603 sec
RG 2298.8
DW 16.650 usec
DE 6.50 usec
TE 297.2 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1



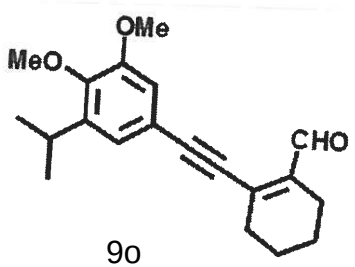
======== CHANNEL f1 ========
NUC1 13C
P1 9.50 usec
PL1 -0.70 dB
SFO1 125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 -1.20 dB
PL12 12.30 dB
PL13 15.30 dB
SFO2 500.1325010 MHz

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40


RosmarDerivative-CC-CyclohexeneCHO
Experiment 3 Topspin 500
Tuesday 07 December 2010
10.31
6.971
6.968
6.835
6.832
3.844
3.817
3.350
3.336
3.322
3.308
3.293
3.279
3.265
2.508
2.496
2.492
2.484
2.480
2.294
2.286
2.282
2.270
1.719
1.706
1.700
1.695
1.689
1.685
1.673
1.662
1.659
1.652
1.647
1.641
1.629
3486.445
3484.760
1675.259
1668.435
1661.363
1654.258
1647.133
1640.002
1632.988
3418.527
3416.850
1254.463
1248.521
1246.309
1242.321
1240.207
1147.438
1143.347
1141.193
1135.308
859.654
853.231
850.439
847.838
844.527
842.776
836.750
831.328
829.663
OMe
MeO
CHO
9o
Current Data Parameters
NAME RosmarDerivative-CC-CyclohexeneCHO
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20101207
Time 23.07
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 14.3
DW 45.600 usec
DE 6.50 usec
TE 293.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1302001 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300184 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
6.95
6.90
6.85
ppm
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
ppm
8.198
1.184
10
9
8
7
6
5
4
3
2
1
0
ppm
0.87
0.98
0.94
6.13
0.80
2.00
1.96
3.83
3.27

RosmarDerivative-CC-CyclohexeneCHO
Experiment 4 13C
Topspin 500
Tuesday 07 December 2010



9o

152.45
147.65
142.84
142.21
140.30
122.56
117.58
112.78
99.15
95.23
60.98
55.60
32.41
28.78
23.61
22.46
21.93
21.11

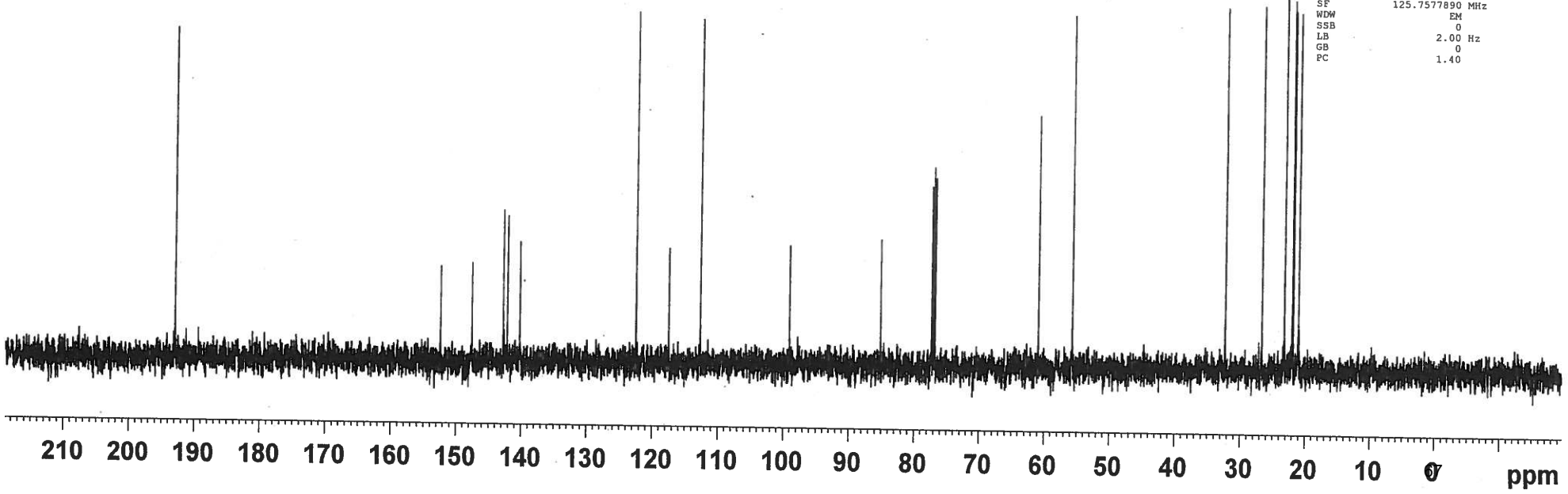
Current Data Parameters
NAME RosmarDerivative-CC-Cyclohexene(
EXPNO 4
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101207
Time 23.36
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 8
DS 4
SWH 30030.029 Hz
FIDRES 1.832888 Hz
AQ 0.2728603 sec
RG 1149.4
DW 16.650 usec
DE 6.50 usec
TE 294.2 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1

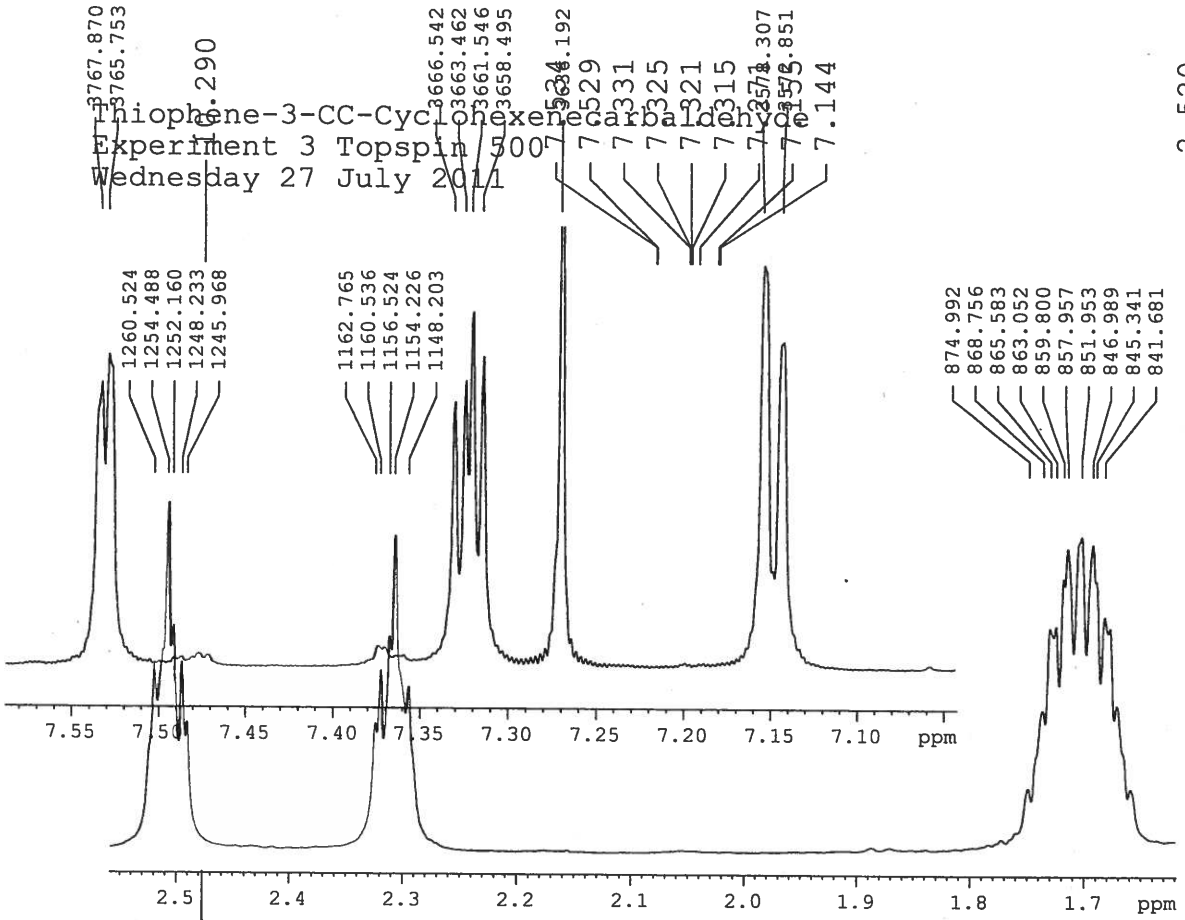
======== CHANNEL f1 ========
NUC1 13C
P1 9.50 usec
PL1 -0.70 dB
SFO1 125.7702890 MHz

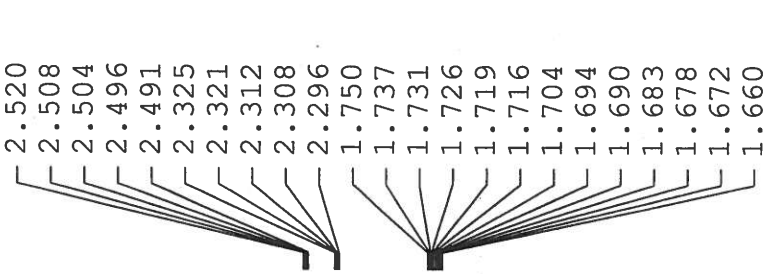
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 -1.20 dB
PL12 12.30 dB
PL13 15.30 dB
SFO2 500.1325010 MHz

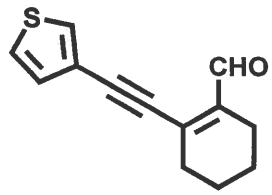
F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40



Thiophene-3-CC-Cyclohexenecarbaldehyde
Experiment 3 Topspin/500
Wednesday 27 July 2011







9p

Current Data Parameters
NAME Thiophene-3-CC-Cyclohexenecarbaldehyde
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_	20110727
Time	11.54
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	C6D6
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4943165 sec
RG	362
DW	45.600 usec
DE	6.50 usec
TE	295.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

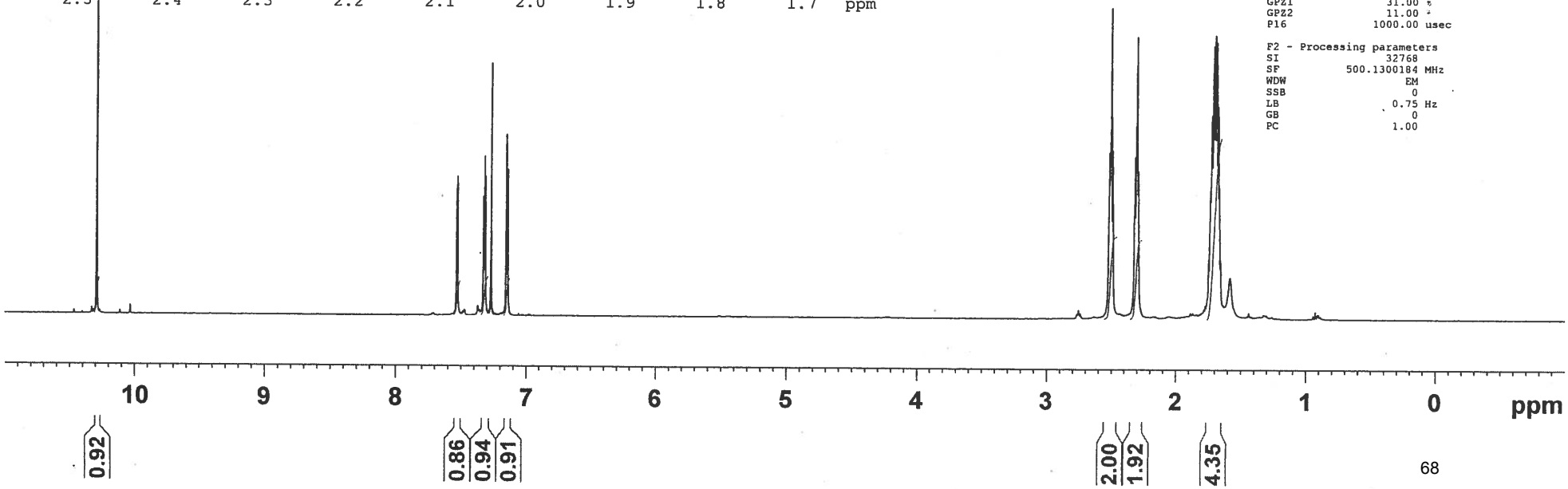
NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1318505 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

====== GRADIENT CHANNEL =====

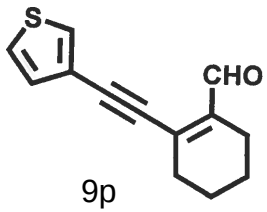
GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

SI	32768
SF	500.1300184 MHz
WDW	EM
SSB	0
LB	0.75 Hz
GB	0
PC	1.00



iophene-3-CC-Cyclohexenecarbaldehyde
periment 2
pspin 300 Ultra
esday 26 July 2011



9p

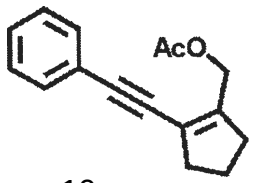
NAME	Thiophene-3-CC-Cyclohexenecarbaldehyde
EXPNO	2
PROCNO	1
Date_	20110726
Time	16.58
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	1317
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555152 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.5 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40

Phenyl-CC-CyclopenteneOAc
Experiment 2
Topsin 500
Wednesday 15 September 2010

7.463 7.454 7.447 7.444 7.332 7.324 7.320 7.314 7.310 7.269

4.889

2.645 2.629 2.614 2.535 2.520 2.503 2.097 1.998 1.982 1.966 1.951 1.936



10a

Current Data Parameters

NAME	Phenyl-CC-CyclopenteneOAc
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20100915
Time	14.02
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	H2O
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4942708 sec
RG	50.8
DW	45.600 usec
DE	6.50 usec
TE	294.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1306502 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

====== GRADIENT CHANNEL =====

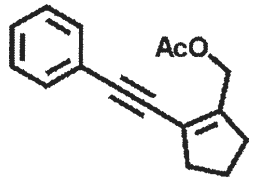
GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

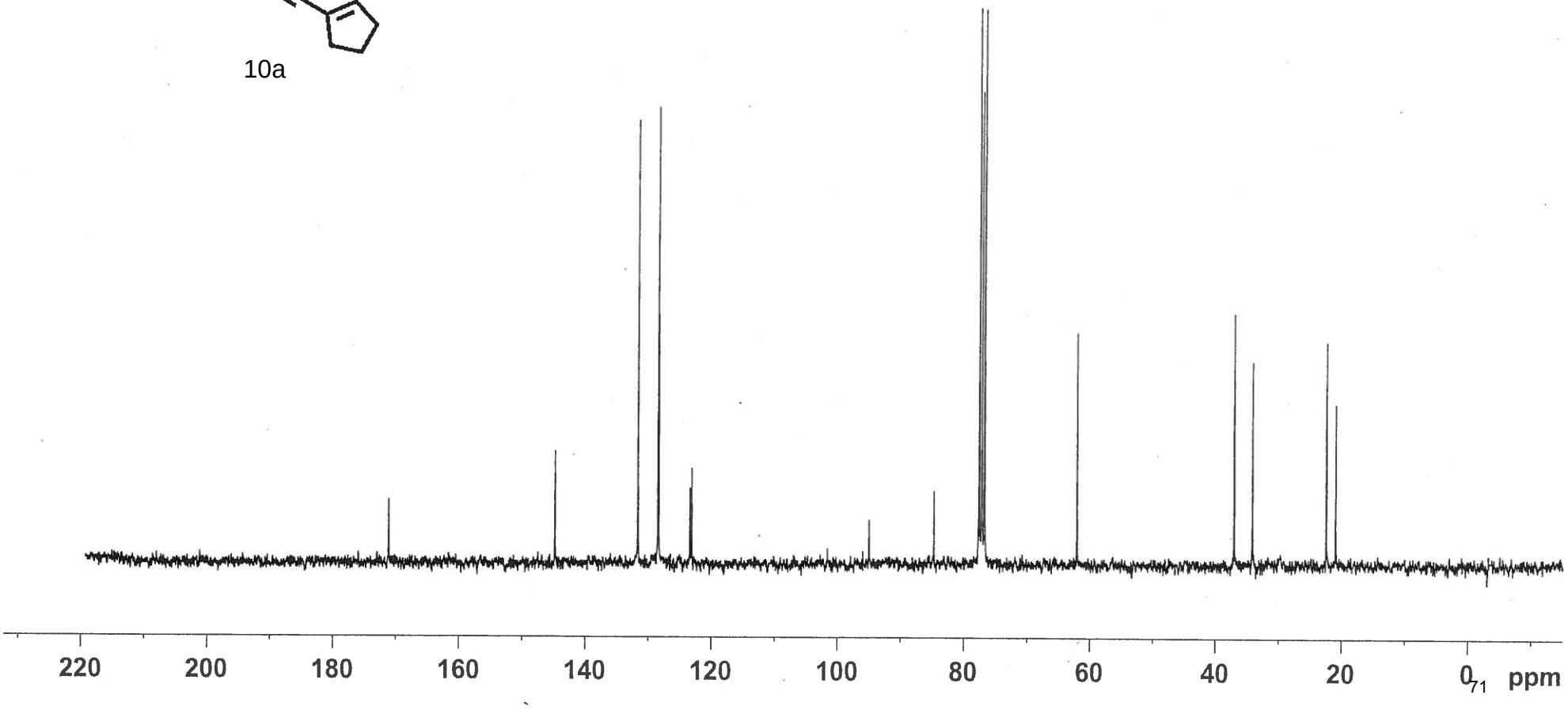
SI	32768
SF	500.1300187 MHz
WDW	EM
SSB	0
LB	0.20 Hz
GB	0
PC	1.00

Phenyl-CC-Cylcopentene methyl acetate 13C
Experiment 2
Ultra 300
Wednesday 15 September 2010

171.13
144.79
131.63
128.42
128.34
123.35
123.07
94.98
84.72
77.59
77.17
76.75
62.05
37.13
34.34
22.50
21.01



10a



Phenyl-CC-Cyclohexeneacetate
Experiment 2
500 Topsin
Tuesday 25 May 2010

7.446 7.441 7.436 7.430 7.427 7.334 7.331 7.325 7.322 7.315 7.310 7.304 7.301 7.297 7.295 7.292 7.270

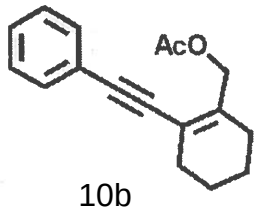
4.904

2.314 2.185 2.179 2.177 2.166 2.161 2.098 1.716 1.711 1.699 1.690 1.684 1.678 1.674 1.669 1.657

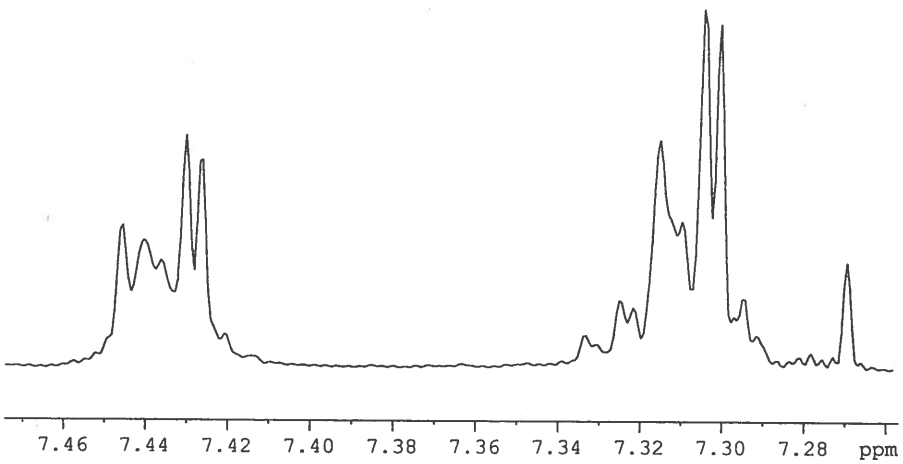
3723.975 3721.244 3719.167 3716.178 3714.330

3667.805 3666.458 3663.531 3661.918 3658.676 3655.941 3653.167 3651.316 3649.555 3648.427 3646.844

3635.871



10b



Current Data Parameters

NAME	Phenyl-CC-Cyclohexeneacetate
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20100525
Time	16.51
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	H2O
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4942708 sec
RG	203.2
DW	45.600 usec
DE	6.50 usec
TE	296.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1306252 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

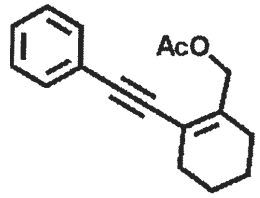
====== GRADIENT CHANNEL =====

GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

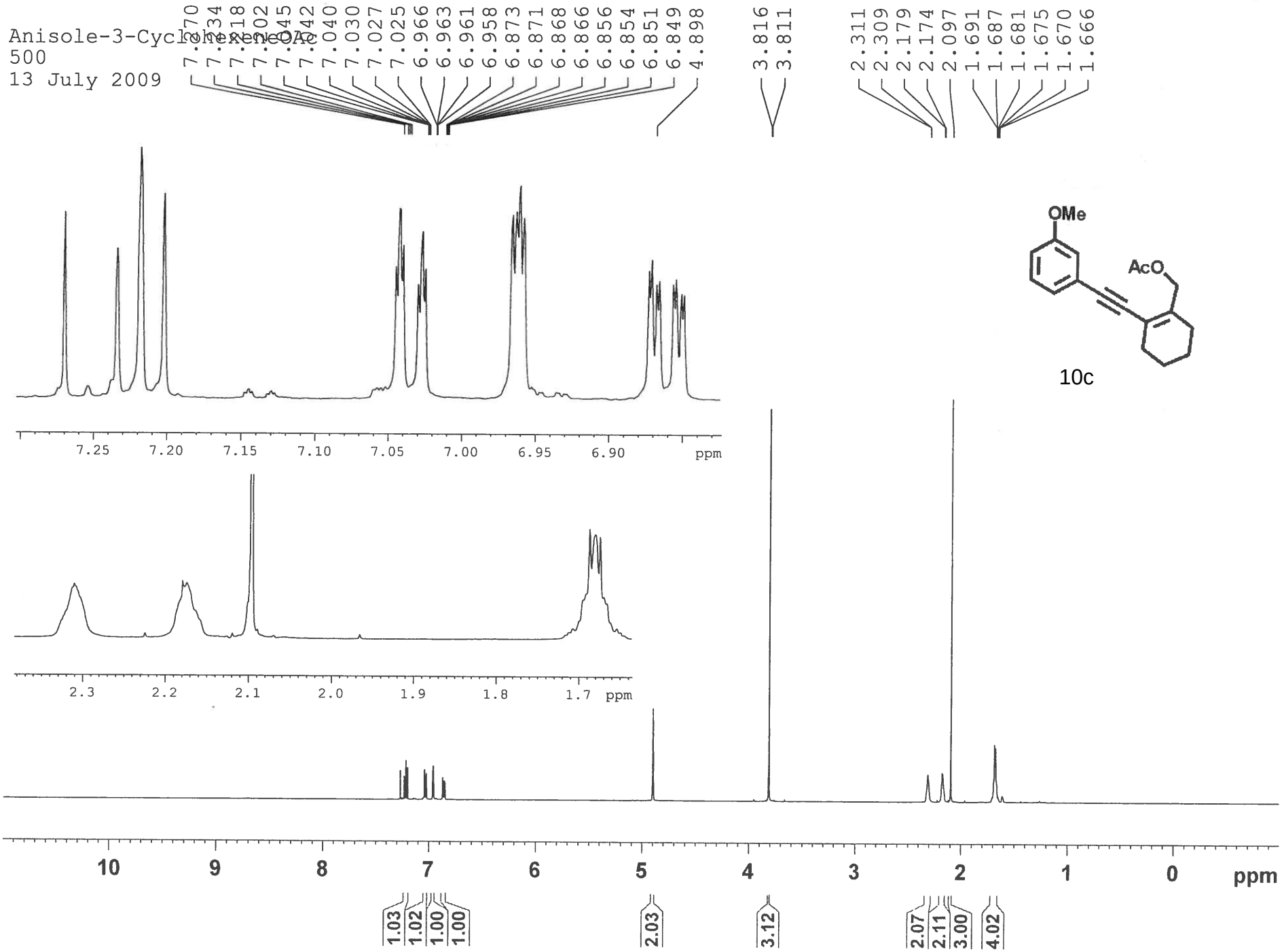
F2 - Processing parameters

SI	32768
SF	500.1300186 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

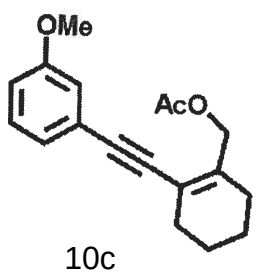
Phenyl-CC-Cyclohexeneacetate 13C
300 ULtra
Tuesday 25 May 2010



10b

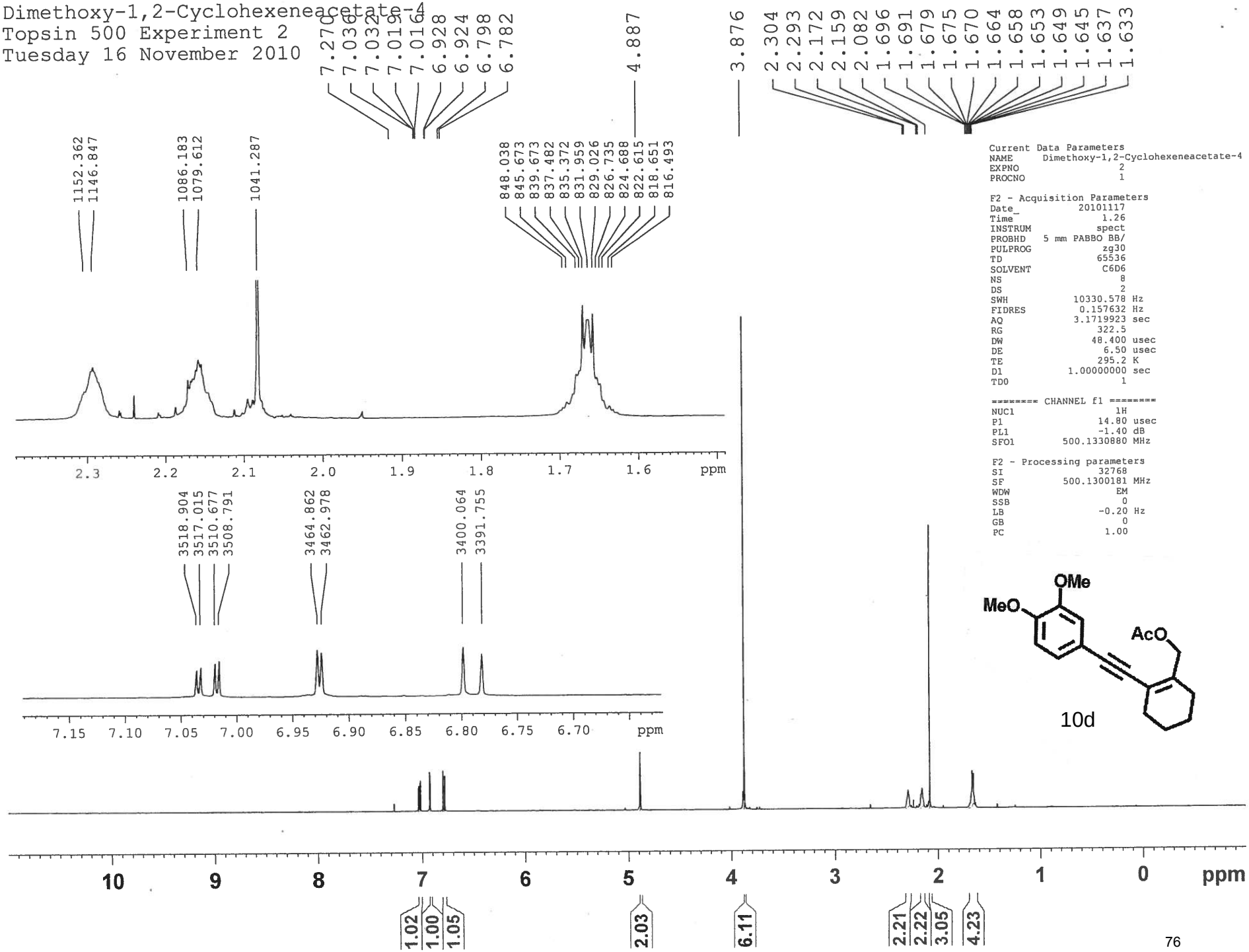

Anisole-3-CyclohexeneOAc
500
13 July 2009
7.370
7.334
7.318
7.302
7.045
7.042
7.040
7.030
7.027
7.025
6.966
6.963
6.961
6.958
6.873
6.871
6.868
6.866
6.856
6.854
6.851
6.849
4.898
3.816
3.811
2.311
2.309
2.179
2.174
2.097
1.691
1.687
1.681
1.675
1.670
1.666
OMe
AcO
10c
7.25
7.20
7.15
7.10
7.05
7.00
6.95
6.90
ppm
2.3
2.2
2.1
2.0
1.9
1.8
1.7
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
1.03
1.02
1.00
1.00
2.03
3.12
2.07
2.11
3.00
4.02

Anisole-3-CyclohexeneOAc 13C
300 Ultra
14 July 2009



10c

Dimethoxy-1,2-Cyclohexeneacetate-4
Topsin 500 Experiment 2
Tuesday 16 November 2010



Current Data Parameters
NAME Dimethoxy-1,2-Cyclohexeneacetate-4
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101117
Time 1.26
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT C6D6
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 322.5
DW 48.400 usec
DE 6.50 usec
TE 295.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
PL1 -1.40 dB
SFO1 500.1330880 MHz

F2 - Processing parameters
SI 32768
SF 500.1300181 MHz
WDW EM
SSB 0
LB -0.20 Hz
GB 0
PC 1.00

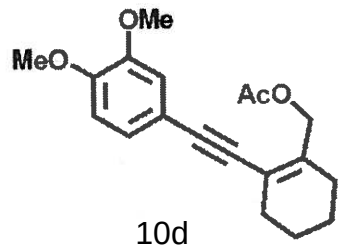
10d

Dimethoxy-1,2-Cyclohexeneacetate-4
Experiment 4 13C
Topspin 500
Tuesday 16 November 2010

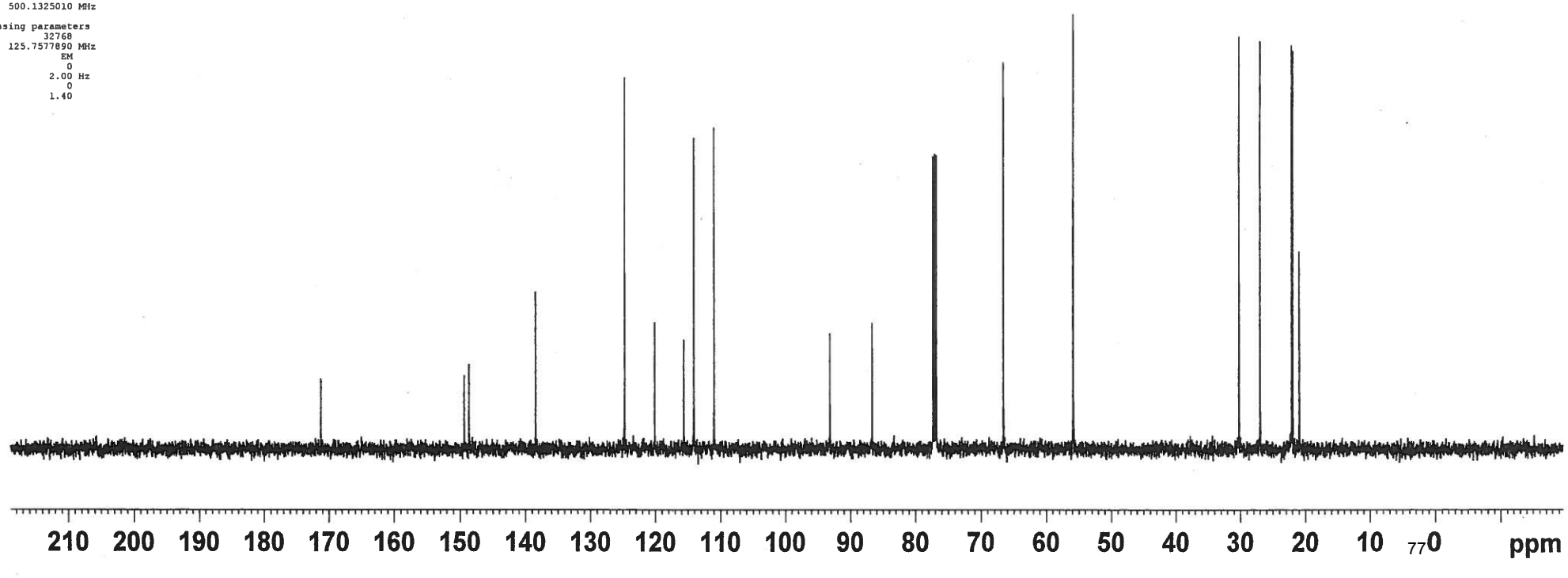
136.42
124.73
120.11
115.66
114.19
110.69
93.20
66.71
77.35
77.15
76.85
66.64
55.93
55.90
30.27
27.04
22.19
22.03
21.01

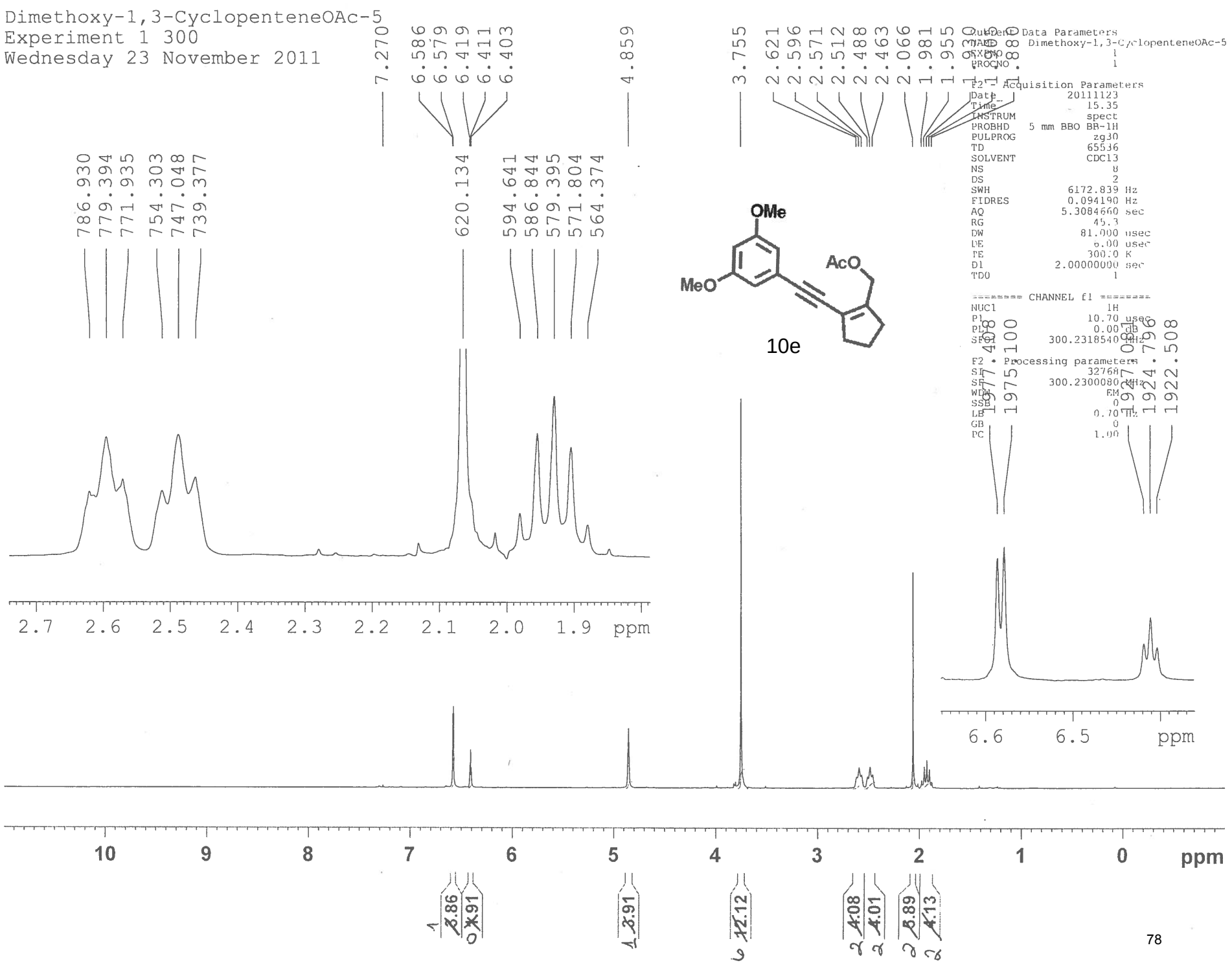
171.20
149.34
148.60

```
Current Data Parameters
NAME      Dimethoxy-1,2-Cyclohexeneacetate-4
EXPNO                 4
PROCNO                1

F2 - Acquisition Parameters
Date_          20101117
Time               3.19
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD                16384
SOLVENT           CDCl3
NS                  107
DS                    4
SWH           30030.029 Hz
FIDRES            1.832888 Hz
AQ              0.2728603 sec
RG                1625.5
DW               16.650 usec
DE                6.50 usec
TE                297.2 K
D1             1.00000000 sec
D11            0.03000000 sec
DELTA          0.89999998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.50 usec
PL1               -0.70 dB
SFO1         125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             70.00 usec
PL2               -1.20 dB
PL12              12.30 dB
PL13              15.30 dB
SFO2         500.1325010 MHz

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

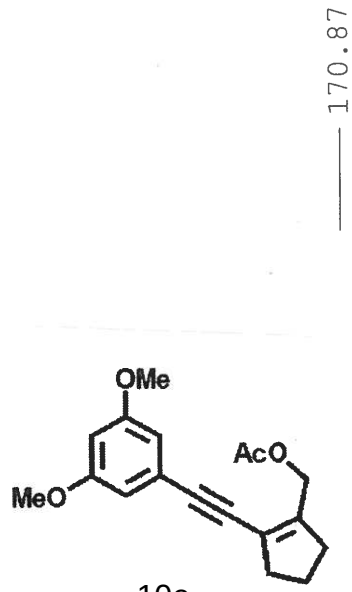


10d




Dimethoxy-1,3-CyclopenteneOAc-5
Experiment 1 300
Wednesday 23 November 2011
7.270
6.586
6.579
6.419
6.411
6.403
4.859
3.755
2.621
2.596
2.571
2.512
2.488
2.463
2.066
1.981
1.955
1.930
1.886
786.930
779.394
771.935
754.303
747.048
739.377
620.134
594.641
586.844
579.395
571.804
564.374
OMe
MeO
AcO
10e
Current Data Parameters
NAME Dimethoxy-1,3-CyclopenteneOAc-5
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date 20111123
Time 15.35
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 6172.839 Hz
FIDRES 0.094190 Hz
AQ 5.3084660 sec
RG 45.3
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.70 usec
PL1 0.00 dB
SFO1 300.2318540 MHz
F2 - Processing parameters
SI 32768
SF 300.2300080 MHz
WDW EM
SSB 0
LB 0.70 Hz
GB 0
PC 1.00
1977.408
1975.100
1927.098
1924.796
1922.508
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 ppm
6.6 6.5 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
1 3.86
1 0.91
1 3.91
6 12.12
2 4.08
2 4.01
2 3.89
2 4.13

Dimethoxty-1,3-CyclopenteneOAc-5 13C
Experiment 2 300
Wednesday 23 November 2011



10e

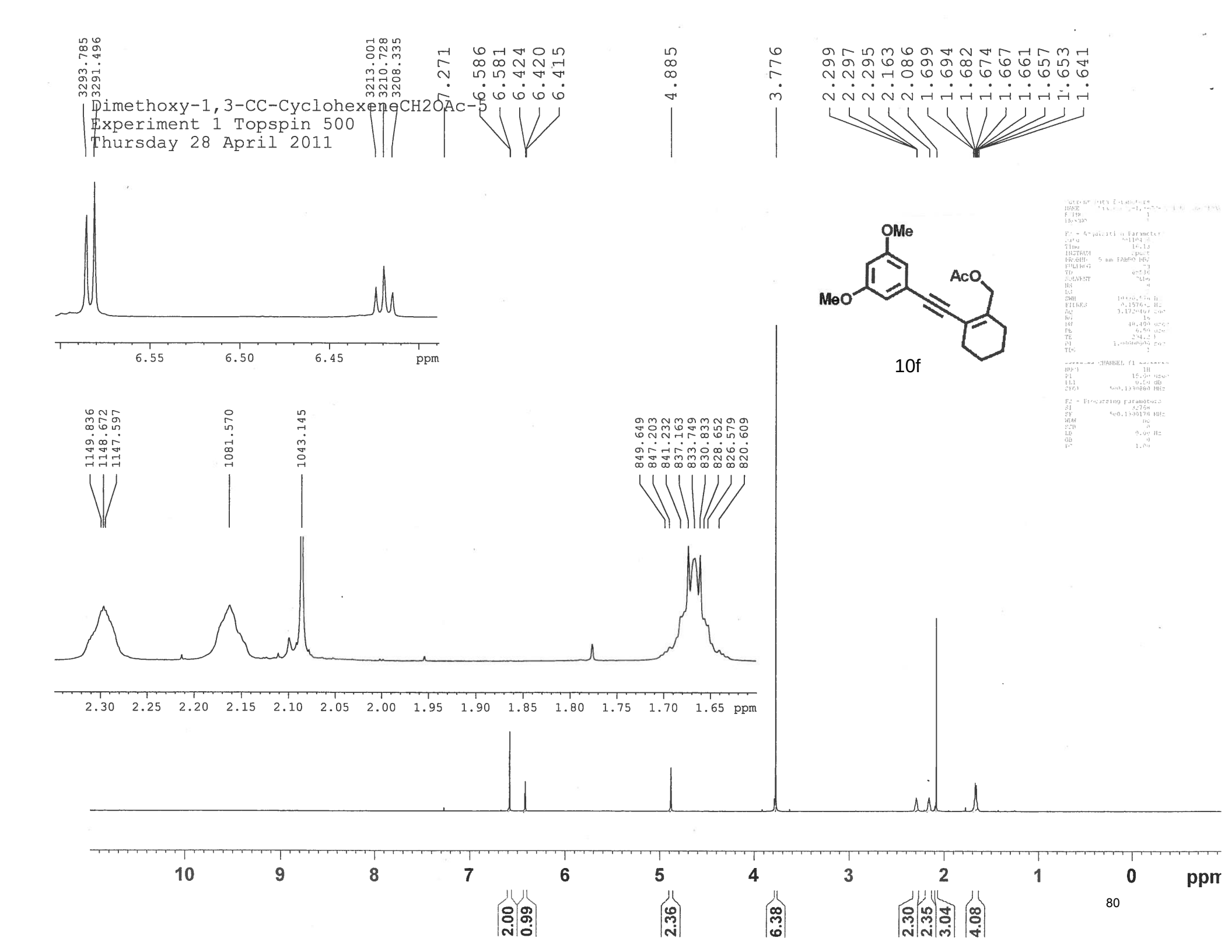
Current Data Parameters
NAME Dimethoxy-1,3-CyclopenteneOAc-5 13C
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20111123
Time 16.03
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 67
DS 4
SWH 17985.611 Hz
FIDRES 1.097755 Hz
AQ 0.4555252 sec
RG 3649.1
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1

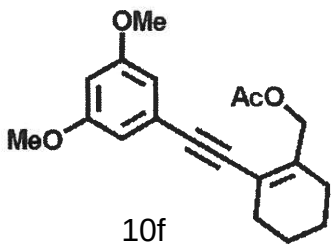
======== CHANNEL f1 ========
NUC1 13C
P1 15.90 usec
PL1 0.00 dB
SFO1 75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 16.31 dB
PL13 19.31 dB
SFO2 300.2323000 MHz

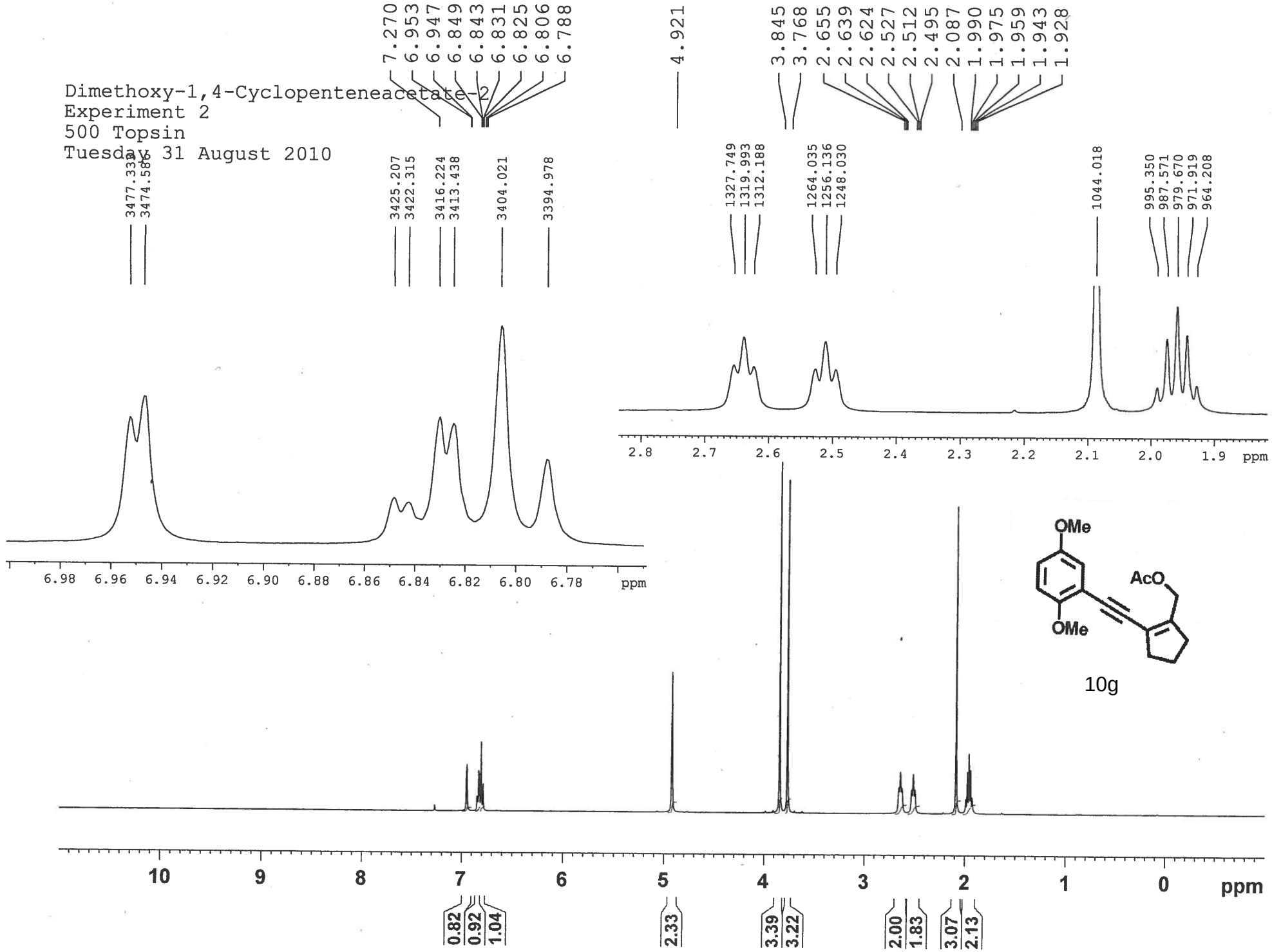
F2 - Processing parameters
SI 16384
SF 75.4928917 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40


Dimethoxy-1,3-CC-CyclohexeneCH2OAc-5
Experiment 1 Topspin 500
Thursday 28 April 2011
3293.785
3291.496
3213.001
3210.728
3208.335
7.271
6.586
6.581
6.424
6.420
6.415
4.885
3.776
2.299
2.297
2.295
2.163
2.086
1.699
1.694
1.682
1.674
1.667
1.661
1.657
1.653
1.641
OMe
MeO
AcO
10f
1149.836
1148.672
1147.597
1081.570
1043.145
849.649
847.203
841.232
837.163
833.749
830.833
828.652
826.579
820.609
6.55
6.50
6.45
ppm
2.30
2.25
2.20
2.15
2.10
2.05
2.00
1.95
1.90
1.85
1.80
1.75
1.70
1.65
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
2.00
0.99
2.36
6.38
2.30
2.35
3.04
4.08

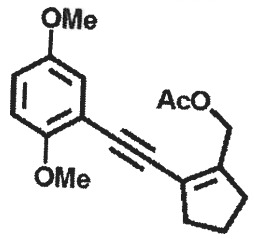
.methoxy-1,3-CC-CyclohexeneOAc-5
›pspin 300 Ultra
:iday 29 April 2011
:periment 1



10f


Dimethoxy-1,4-Cyclopenteneacetate-2
Experiment 2
500 Topsin
Tuesday 31 August 2010
7.270
6.953
6.947
6.849
6.843
6.831
6.825
6.806
6.788
4.921
3.845
3.768
2.655
2.639
2.624
2.527
2.512
2.495
2.087
1.990
1.975
1.959
1.943
1.928
3477.338
3474.586
3425.207
3422.315
3416.224
3413.438
3404.021
3394.978
1327.749
1319.993
1312.188
1264.035
1256.136
1248.030
1044.018
995.350
987.571
979.670
971.919
964.208
6.98 6.96 6.94 6.92 6.90 6.88 6.86 6.84 6.82 6.80 6.78 ppm
2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 ppm
OMe
AcO
OMe
10g
10 9 8 7 6 5 4 3 2 1 0 ppm
0.82
0.92
1.04
2.33
3.39
3.22
2.00
1.83
3.07
2.13

Dimethoxy-1,4-CC-Cyclopenteneacetate-2 13C
Ultra 300
Tuesday 31 August 2010

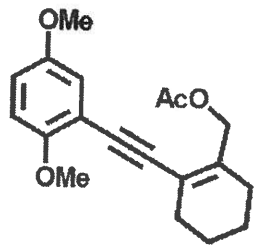


10g

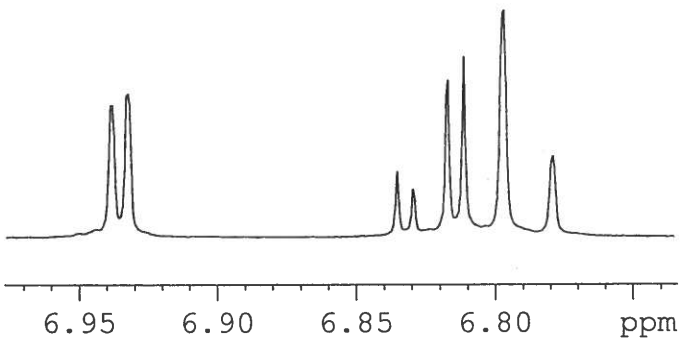
Dimethoxy-1,4-Cyclohexeneacetate-2
Experiment 2
Topspin 500
Tuesday 16 November 2010

7.267 6.939 6.933 6.836 6.830 6.818 6.812 6.797 6.779
4.951
3.837 3.767
2.328 2.173 2.088 1.702 1.690 1.686 1.681 1.674 1.669 1.664 1.660 1.656 1.648

3470.241 3467.349
3418.688 3415.787 3409.665 3406.732 3399.608 3390.651



10h



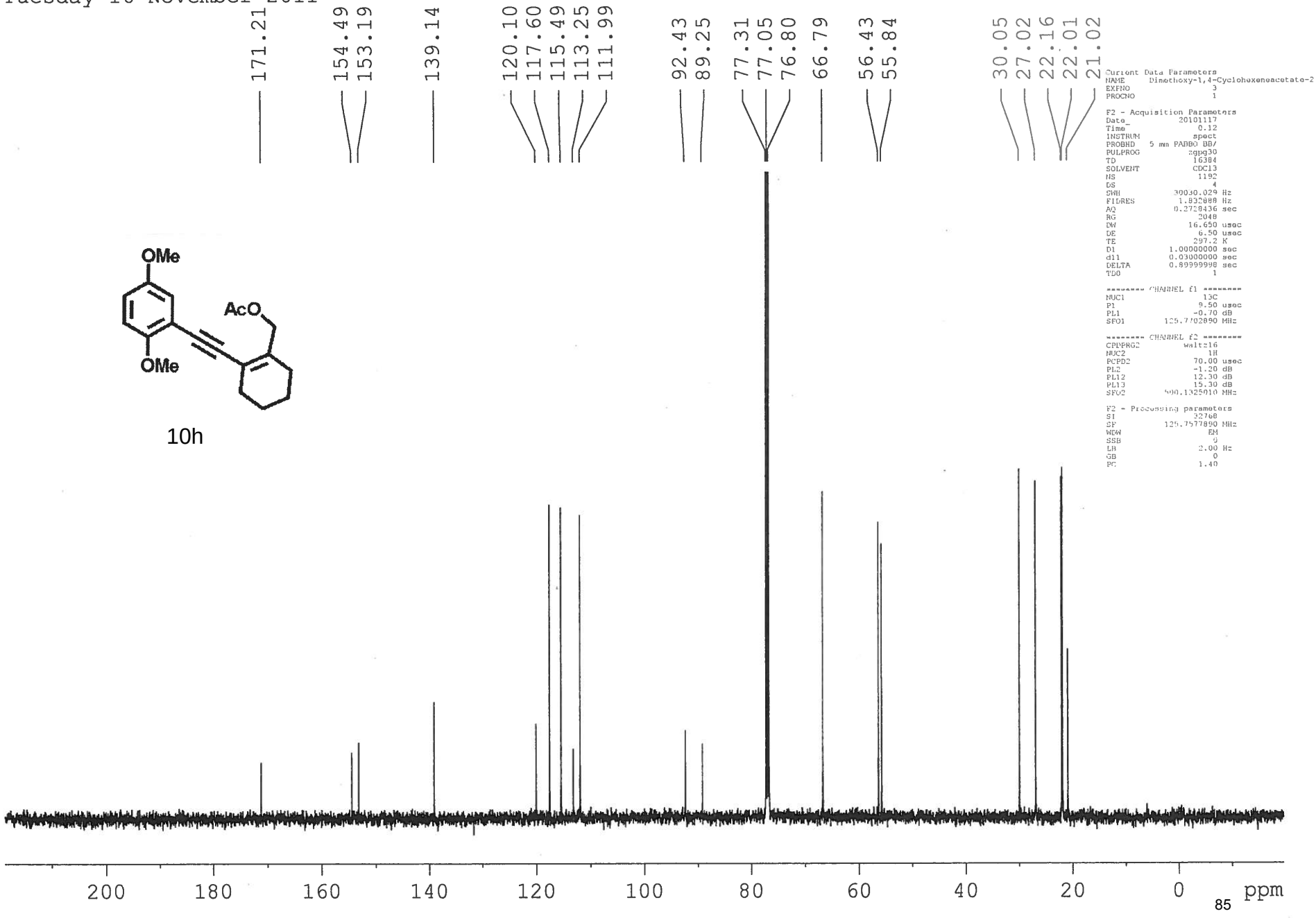
Current Data Parameters
NAME Dimethoxy-1,4-Cyclohexeneacetate-2
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101116
Time 23.54
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT C6D6
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 101.6
DW 48.400 usec
DE 6.50 usec
TE 295.2 K
D1 1.00000000 sec
TD0 1

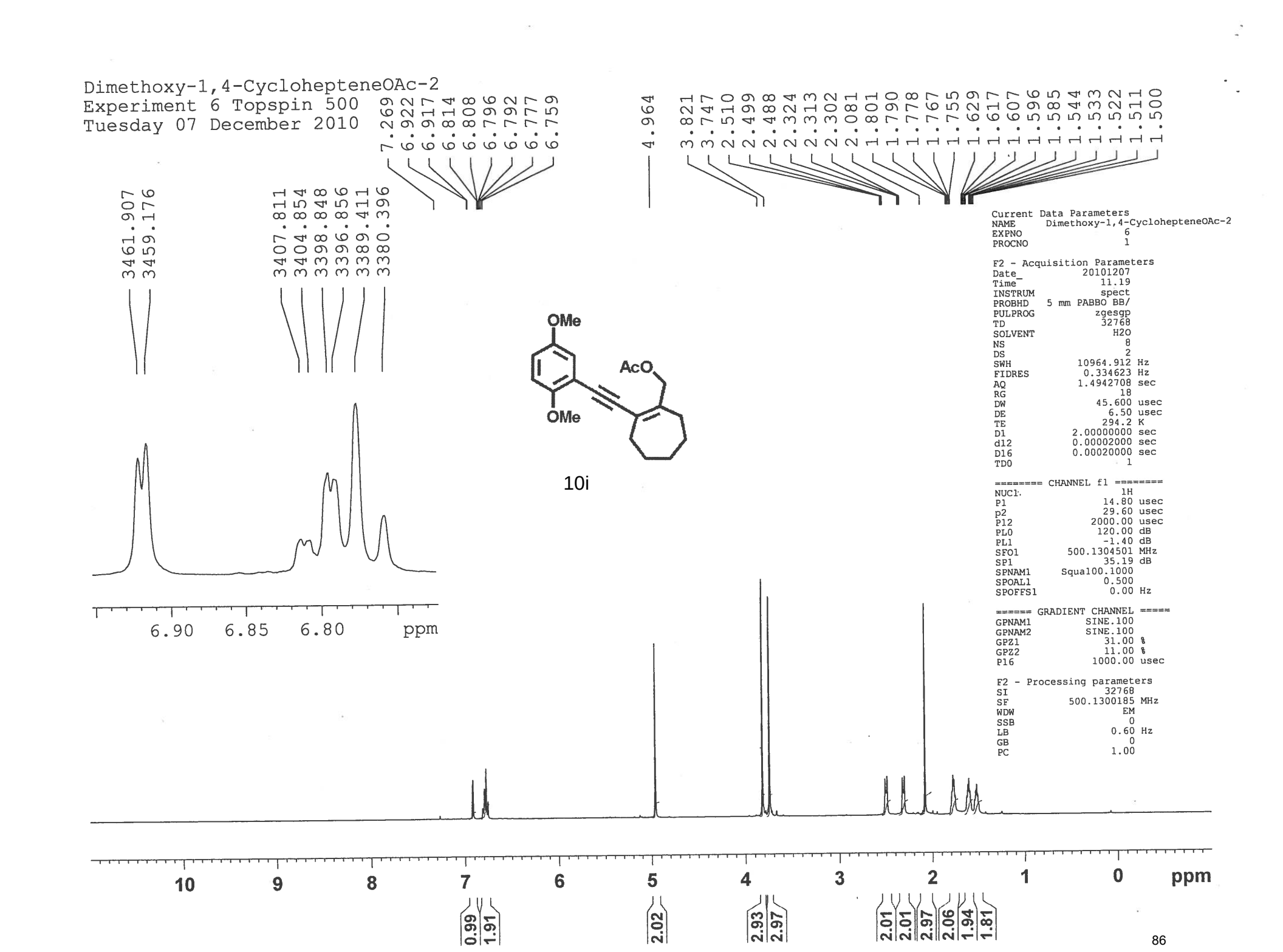
======== CHANNEL f1 ========
NUC1 1H
P1 15.00 usec
PL1 0.50 dB
SFO1 500.1330880 MHz

F2 - Processing parameters
SI 32768
SF 500.1300199 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

Dimethoxy-1,4-Cyclohexeneacetate-3
Experiment 3 13C
Topspin 500
Tuesday 16 November 2011



Dimethoxy-1,4-CycloheptenеOAc-2
Experiment 6 Topspin 500
Tuesday 07 December 2010



10i

Current Data Parameters
NAME Dimethoxy-1,4-CycloheptenеOAc-2
EXPNO 6
PROCNO 1

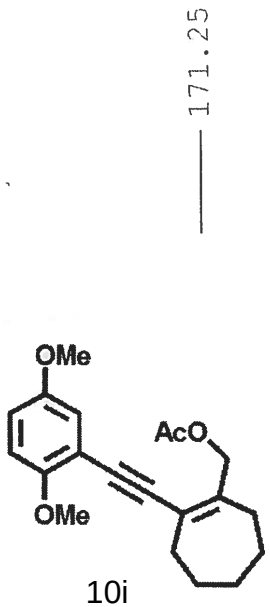
F2 - Acquisition Parameters
Date_ 20101207
Time 11.19
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 18
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1304501 MHz
SP1 35.19 dB
SPNAM1 Squal00.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300185 MHz
WDW EM
SSB 0
LB 0.60 Hz
GB 0
PC 1.00

Dimethoxy-1,4-CycloheptèneOAc-2
Experiment 7 13C Topspin 500
Tuesday 07 December 2010

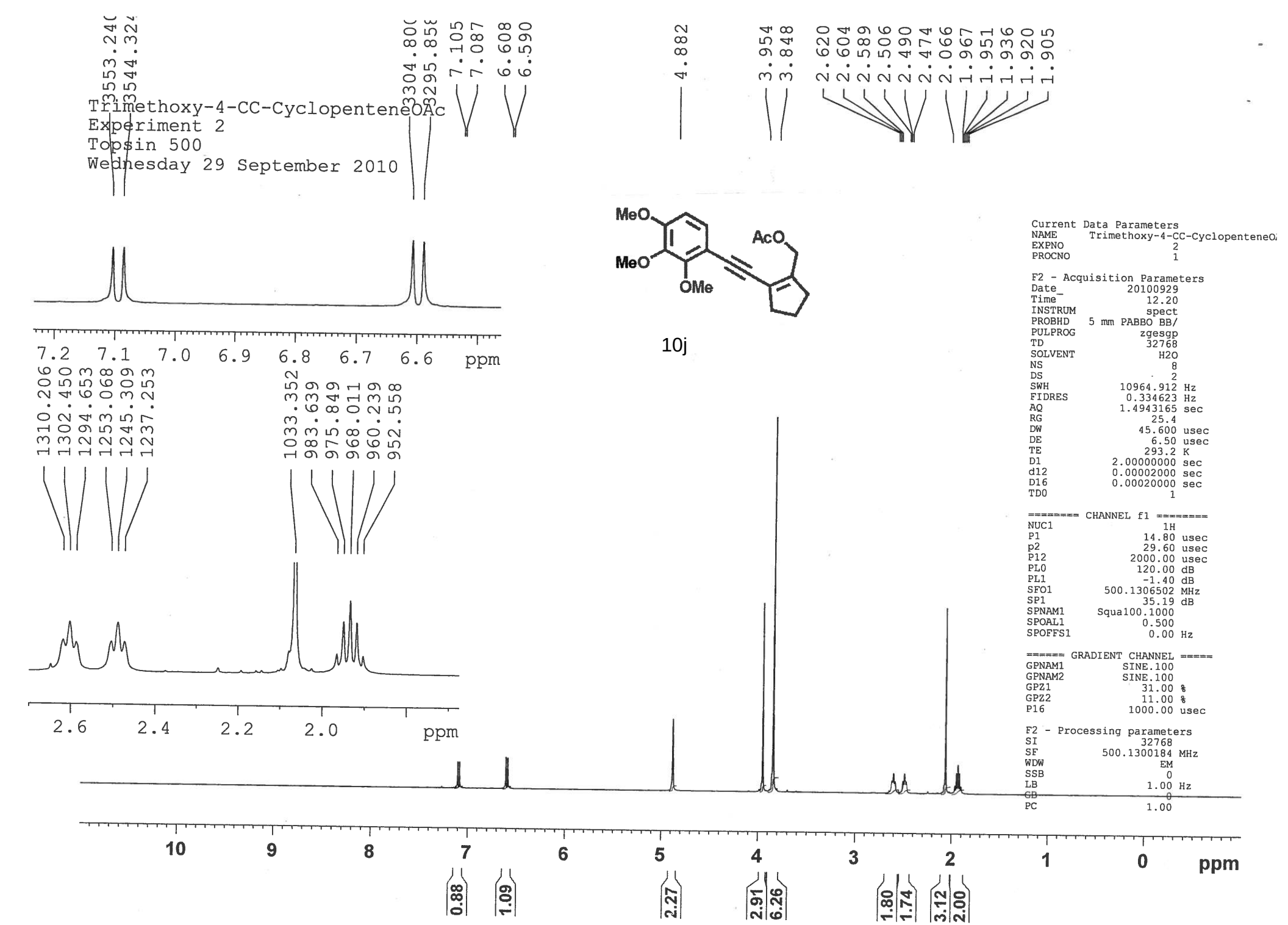


10i

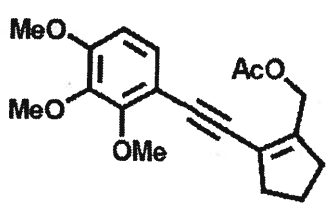
171.25
154.40
153.15
145.16
126.03
117.39
115.42
113.29
111.85
93.97
90.01
77.39
77.13
76.88
68.06
56.33
55.79
34.68
32.40
31.27
26.19
26.07
21.07

```
Current Data Parameters
NAME      Dimethoxy-1,4-CycloheptèneOAc-2
EXPNO                   7
PROCNO                  1

F2 - Acquisition Parameters
Date_              20101207
Time                  11.36
INSTRUM               spect
PROBHD   5 mm PABBO BB/
PULPROG             zgpg30
TD                   16384
SOLVENT              CDCl3
NS                      14
DS                       4
SWH              30030.029 Hz
FIDRES           1.832888 Hz
AQ               0.2728436 sec
RG                  1149.4
DW                 16.650 usec
DE                  6.50 usec
TE                 295.2 K
D1            1.00000000 sec
d11           0.03000000 sec
DELTA         0.89999998 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                  13C
P1                 9.50 usec
PL1               -0.70 dB
SFO1        125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2           waltz16
NUC2                  1H
PCPD2             70.00 usec
PL2               -1.20 dB
PL12               12.30 dB
PL13               15.30 dB
SFO2        500.1325010 MHz

F2 - Processing parameters
SI                   32768
SF          125.7577890 MHz
WDW                    EM
SSB                     0
LB                 2.00 Hz
GB                      0
PC                   1.40
```

200 180 160 140 120 100 80 60 40 20 0 ppm


Trimethoxy-4-CC-CyclopenteneOAc
Experiment 2
Topsin 500
Wednesday 29 September 2010
3553.240
3544.324
3304.800
3295.858
7.105
7.087
6.608
6.590
4.882
3.954
3.848
2.620
2.604
2.589
2.506
2.490
2.474
2.066
1.967
1.951
1.936
1.920
1.905
MeO
MeO
OMe
AcO
10j
7.2
7.1
7.0
6.9
6.8
6.7
6.6
ppm
1310.206
1302.450
1294.653
1253.068
1245.309
1237.253
1033.352
983.639
975.849
968.011
960.239
952.558
2.6
2.4
2.2
2.0
ppm
Current Data Parameters
NAME Trimethoxy-4-CC-CyclopenteneO
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20100929
Time 12.20
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 25.4
DW 45.600 usec
DE 6.50 usec
TE 293.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1306502 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300184 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
10
9
8
7
6
5
4
3
2
1
0
ppm
0.88
1.09
2.27
2.91
6.26
1.80
1.74
3.12
2.00

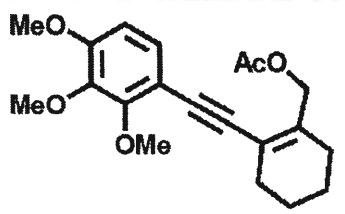
Trimethoxy-4-CyclopenteneOAc 13C
Ultra 300
Wednesday 29 September 2010



10j

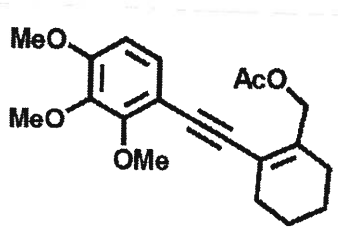

```
Current Data Parameters
NAME      Trimethoxy-4-CyclopenteneOAc
EXPNO                1
PROCNO               1

F2 - Acquisition Parameters
Date_          20100929
Time               13.08
INSTRUM            av300
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                16384
SOLVENT            C6D6
NS                 1382
DS                    4
SWH           17985.611 Hz
FIDRES         1.097755 Hz
AQ            0.4555252 sec
RG              20642.5
DW               27.800 usec
DE                6.00 usec
TE               300.0 K
D1           1.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                11.25 usec
PL1                0.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2           80.00 usec
PL2                0.00 dB
PL12              16.55 dB
PL13              24.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                  8192
SF           75.4677423 MHz
WDW                 EM
SSB                  0
LB                2.50 Hz
GB                   0
PC                1.40
```

Trimethoxy-4-CC-CyclohexeneOAc
Experiment 4 Topsin 500
Friday 30 July 2010



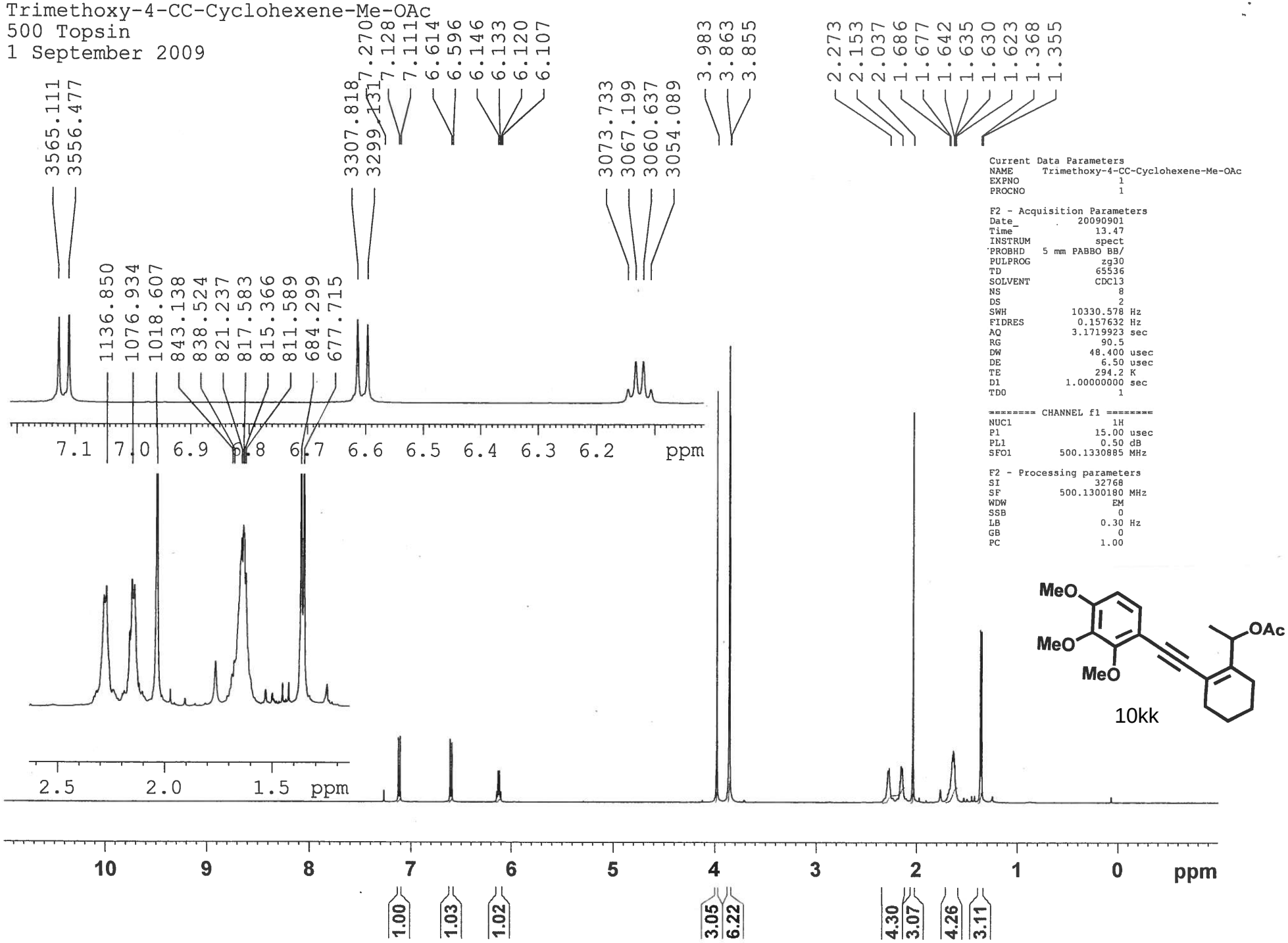
10k

Trimethoxybenzene-4-CC-CyclohexeneOAc 13C
Experiment 3
300 ULtra
Friday 30 July 2010



10k

Trimethoxy-4-CC-Cyclohexene-Me-OAc
500 Topsin
1 September 2009



Current Data Parameters
NAME Trimethoxy-4-CC-Cyclohexene-Me-OAc
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090901
Time 13.47
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 90.5
DW 48.400 usec
DE 6.50 usec
TE 294.2 K
D1 1.00000000 sec
TD0 1

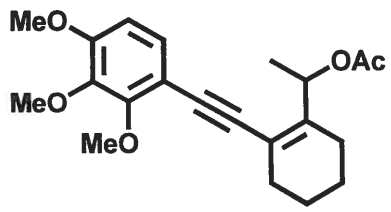
======== CHANNEL f1 ========
NUC1 1H
P1 15.00 usec
PL1 0.50 dB
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 32768
SF 500.1300180 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

10kk

Trimethoxybenzene-4-CC-Cyclohexene-Me-OAc 13C
300 Ultra
1 September 2009

170.25
154.15
154.15
143.17
142.29
127.58
116.98
111.02
107.41
90.98
89.73
77.62
77.19
76.77
72.58
61.39
61.32
56.16
30.09
29.42
22.37
22.14
21.42
18.77



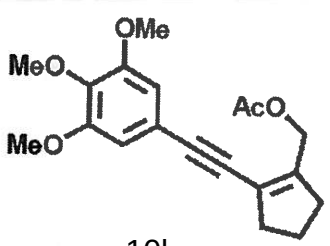
10kk

Trimethoxy-5-CC-CyclopenteneOAc
Experiment 2 Topspin 500
Thursday 13 October 2011

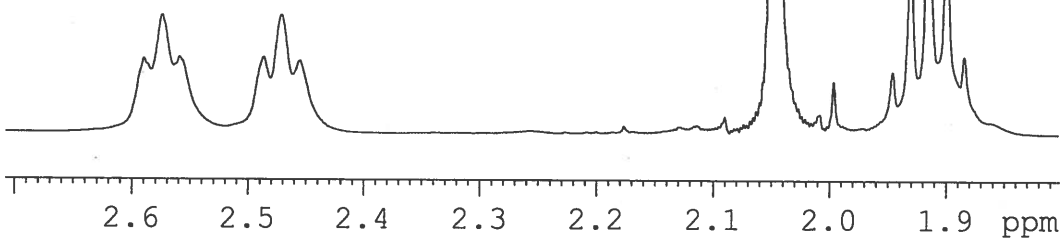
7.267 6.643 4.839

3.817 3.811 2.590 2.575 2.559 2.487 2.471 2.456 2.049 1.946 1.931 1.915 1.900 1.885

1295.413 1287.667 1280.090 1243.810 1236.040 1228.129 1024.816 973.343 965.562 957.904 950.215 942.626



10l



Current Data Parameters
NAME Trimethoxy-5-CC-CyclopenteneOAc
EXPNO 2
PROCNO 1

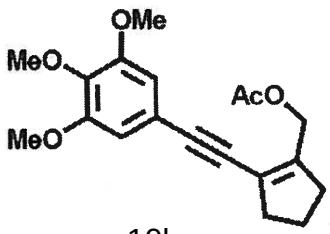
F2 - Acquisition Parameters
Date_ 20111013
Time 16.01
INSTRUM spect
PROBHD 5 mm Multinucl
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 20.2
DW 45.600 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305501 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

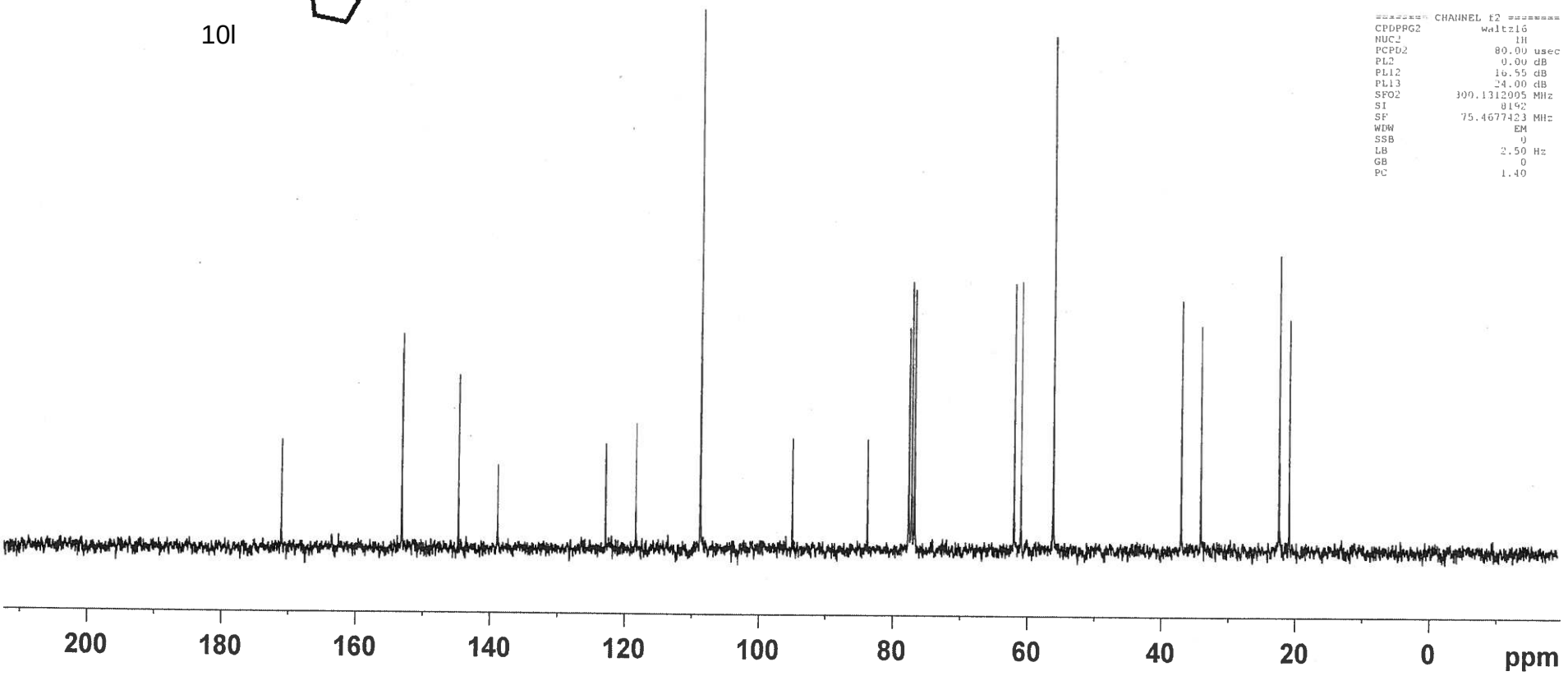
F2 - Processing parameters
SI 32768
SF 500.1300190 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00

imethoxy-5-CC-CyclopenteneOAc 13C
periment 1 Topspin Ultra 300
ursday 13 October 2011

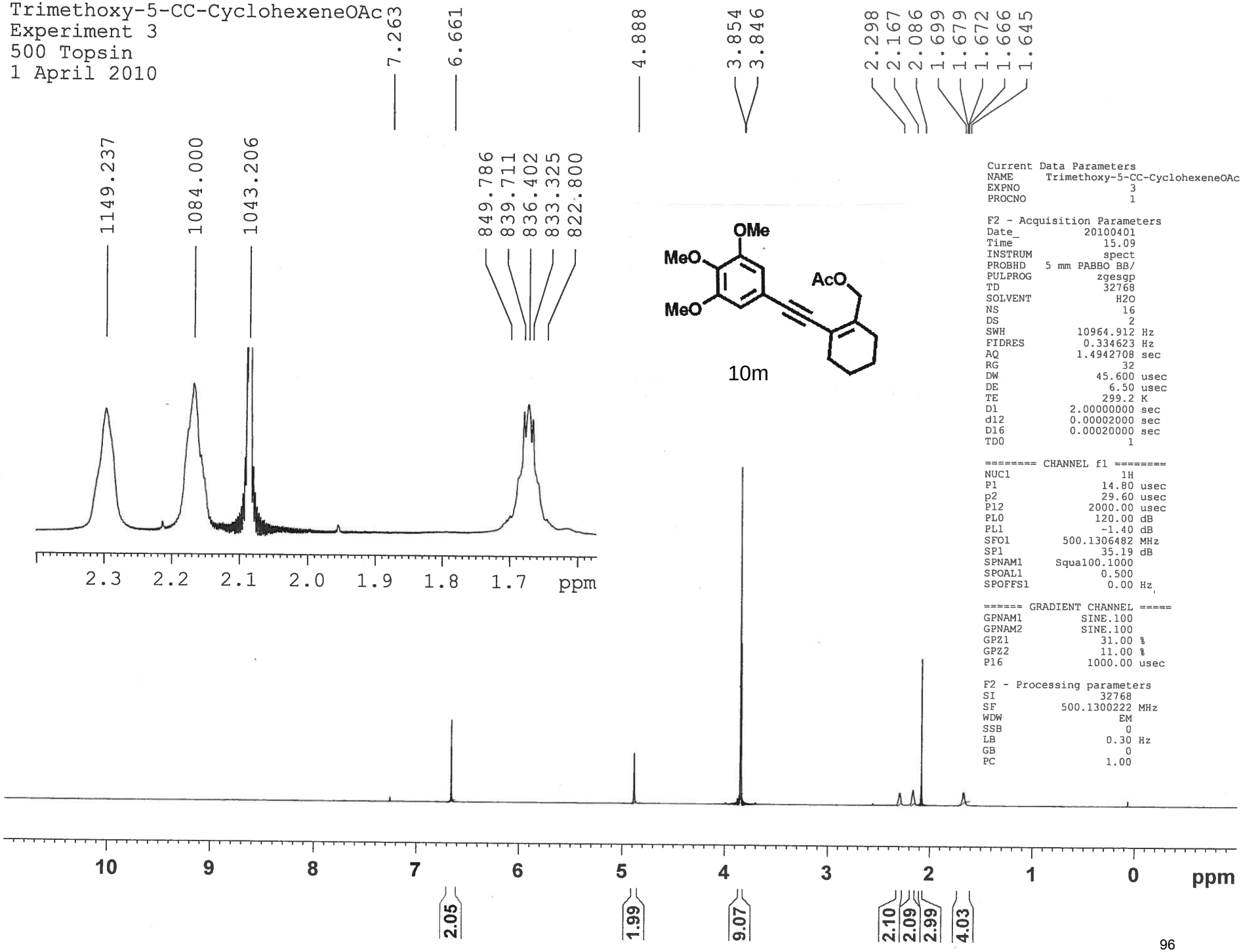


10l

NAME	Trimethoxy-5-CC-CyclopenteneOAc 13C
EXPNO	1
PROCNO	1
Date_	20111013
Time	16.22
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	130
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.9 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
========	CHANNEL f1 ========
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
========	CHANNEL f2 ========
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



Trimethoxy-5-CC-CyclohexeneOAc
Experiment 3
500 Topsin
1 April 2010



Current Data Parameters
NAME Trimethoxy-5-CC-CyclohexeneOAc
EXPNO 3
PROCNO 1

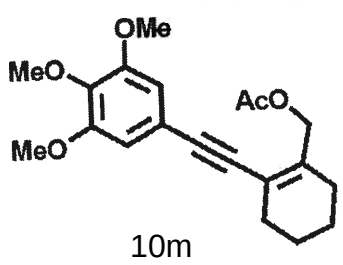
F2 - Acquisition Parameters
Date_ 20100401
Time 15.09
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 16
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 32
DW 45.600 usec
DE 6.50 usec
TE 299.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1306482 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

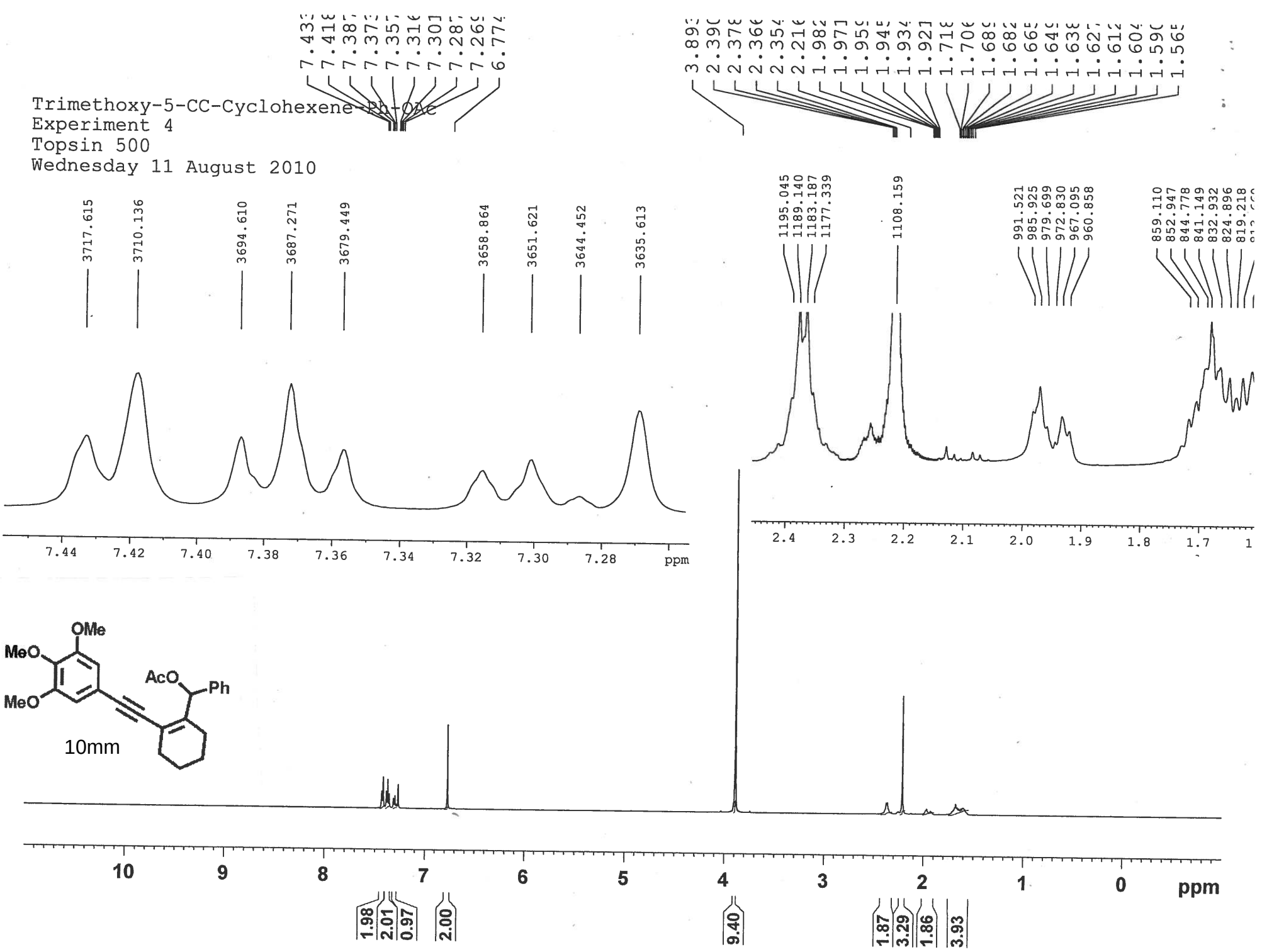
F2 - Processing parameters
SI 32768
SF 500.1300222 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Trimethoxy-5-CyclohexeneOac-13C
300 Ultra
Experiment 3
1 April 2010

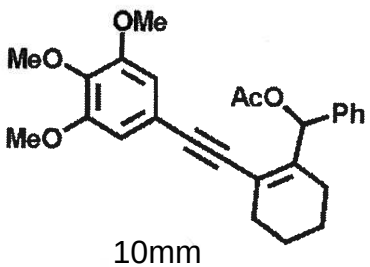


10m

Trimethoxy-5-CC-Cyclohexene-Ph-OAc
Experiment 4
Topsin 500
Wednesday 11 August 2010



Trimethoxy-5-CC-CyclohexeneOAc-Ph 13C
Ultra 300
Tuesday 10 August 2010

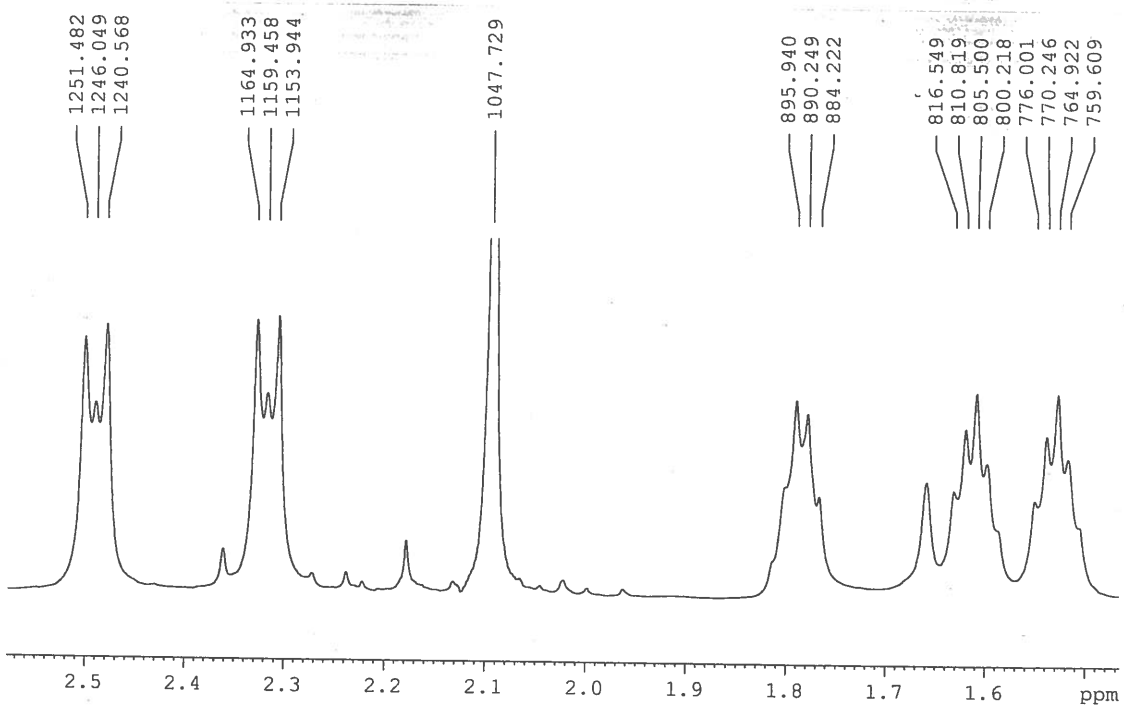


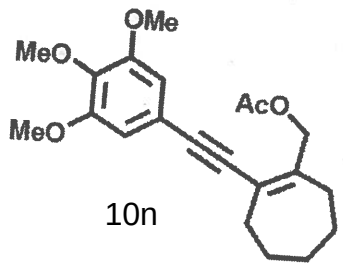
10mm

Trimethoxy-5-Cc-CycloheptenеOAc
Experiment 2 Topspin 500
Friday 20 May 2011

7.271 6.660 4.900 3.858 3.849 2.502 2.491 2.481 2.329 2.318 2.307 2.095 1.791 1.780 1.768 1.633 1.621 1.611 1.600 1.552 1.540 1.529 1.519

1251.482 1246.049 1240.568 1164.933 1159.458 1153.944 1047.729 895.940 890.249 884.222 816.549 810.819 805.500 800.218 776.001 770.246 764.922 759.609





10n

Current Data Parameters

NAME	Trimethoxy-5-CC-CycloheptenеOA
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20110520
Time	13.41
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	C6D6
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.315264 Hz
AQ	1.5860696 sec
RG	40.3
DW	48.400 usec
DE	6.50 usec
TE	294.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1302501 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

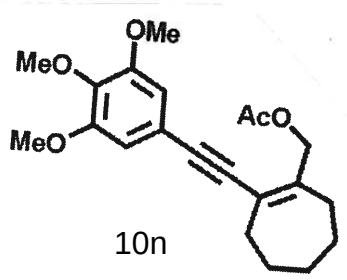
====== GRADIENT CHANNEL =====

GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

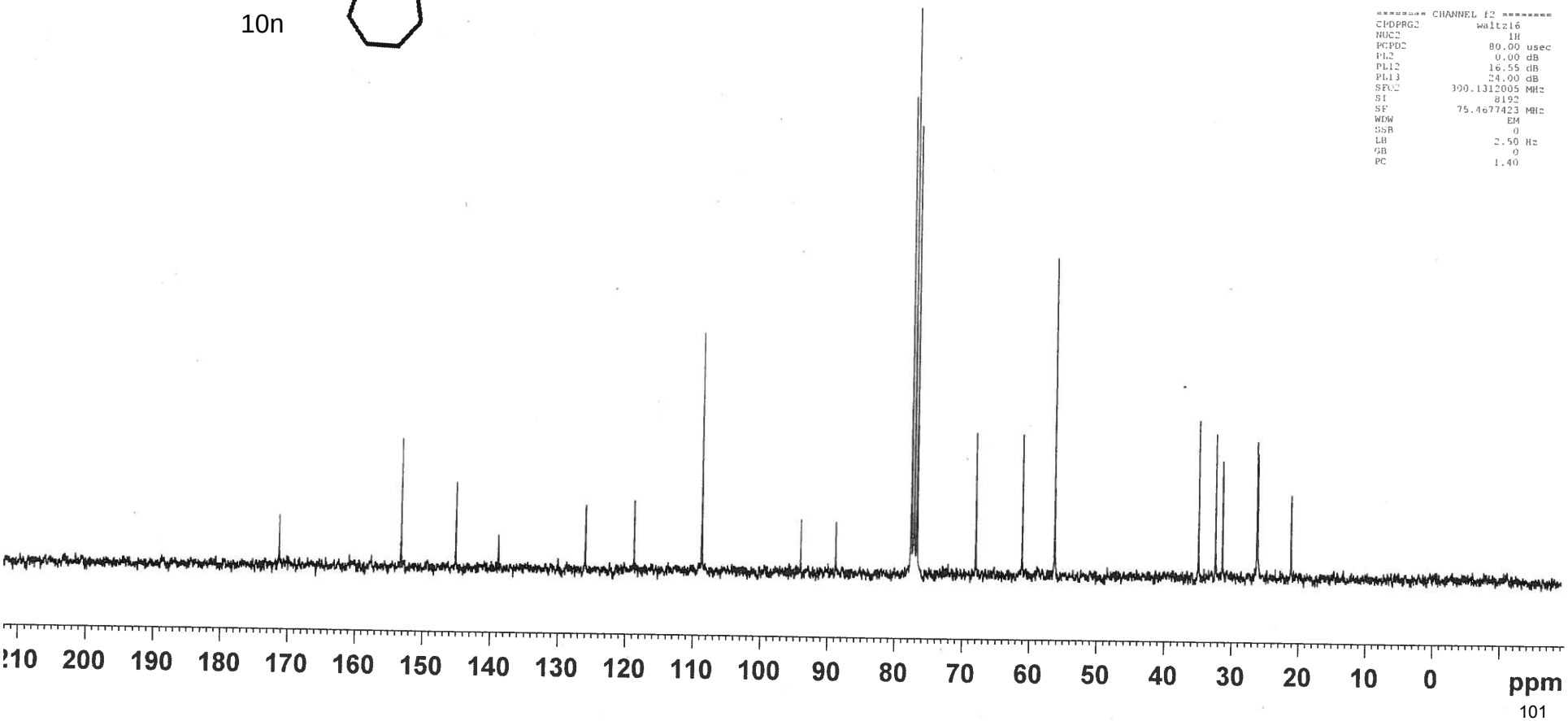
SI	32768
SF	500.1300182 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.00

:imethoxy-5-CC-CycloheptеneOAc 13C
:periment 1 Ultra Topspin 300
:iday 20 May 2011

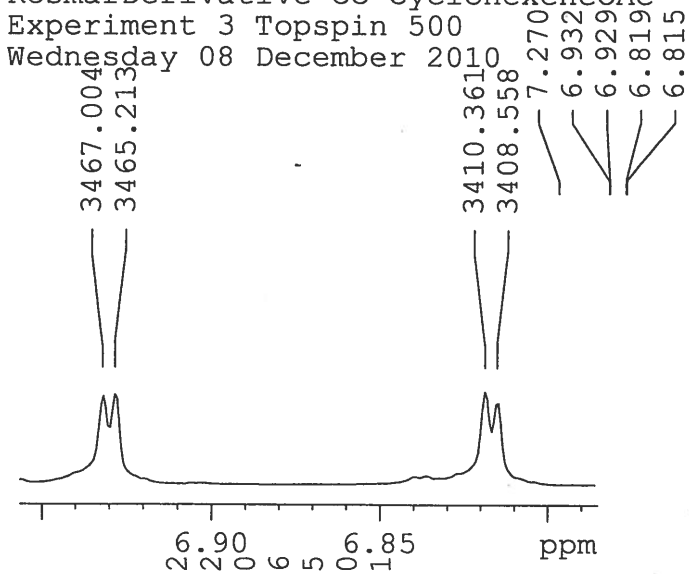


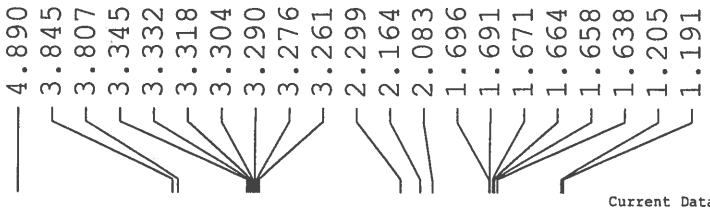
10n

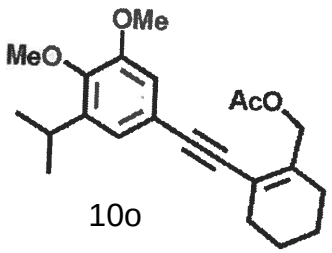
NAME	Trimethoxy-5-CC-CycloheptеneOAc 13C
EXPNO	1
PROCNO	1
Date_	20110520
Time	15.10
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	1159
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.9 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



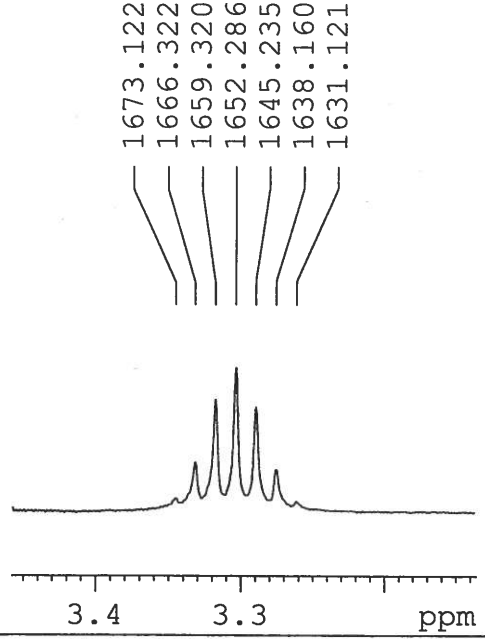
RosmarDerivative-CC-CyclohexeneOAc
Experiment 3 Topspin 500
Wednesday 08 December 2010







10o



Current Data Parameters
NAME RosmarDerivative-CC-CyclohexeneOAc
EXPNO 3
PROCNO 1

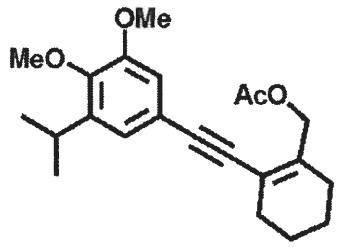
F2 - Acquisition Parameters
Date_ 20101209
Time 2.17
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 16
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1303001 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

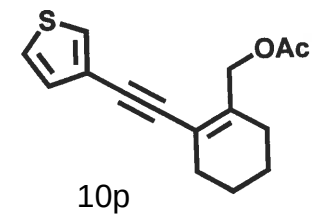
F2 - Processing parameters
SI 32768
SF 500.1300180 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00

RosmarDerivative-CC-CyclohexeneOAc
Experiment 4 13C
Topspin 500
Wednesday 08 December 2010



10o

Thiophene-3-CC-CyclohexeneOAc
Experiment 3 Topspin 500
Wednesday 10 August 2011



10p

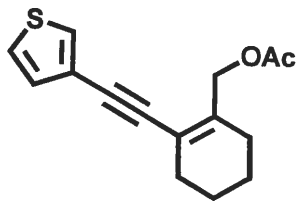
7.426
7.422
7.276
7.270
7.267
7.261
7.118
7.108
4.882
2.298
2.168
2.097
1.684
1.678
1.672
1.651

```
Current Data Parameters
NAME      Thiophene-3-CC-CyclohexeneOAc
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_          20110810
Time              11.40
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG        zgesgp
TD              32768
SOLVENT           C6D6
NS                   8
DS                   2
SWH          10964.912 Hz
FIDRES        0.334623 Hz
AQ           1.4942708 sec
RG                90.5
DW              45.600 usec
DE               6.50 usec
TE              295.2 K
D1          2.00000000 sec
d12         0.00002000 sec
D16         0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                14.80 usec
p2                29.60 usec
P12             2000.00 usec
PL0              120.00 dB
PL1               -1.40 dB
SFO1        500.1305501 MHz
SP1               35.19 dB
SPNAM1     Squa100.1000
SPOAL1           0.500
SPOFFS1          0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1         SINE.100
GPNAM2         SINE.100
GPZ1             31.00 %
GPZ2             11.00 %
P16            1000.00 usec

F2 - Processing parameters
SI                32768
SF          500.1300158 MHz
WDW                  EM
SSB                   0
LB                 0.90 Hz
GB                    0
PC                 1.00
```

10 9 8 7 6 5 4 3 2 1 0 ppm

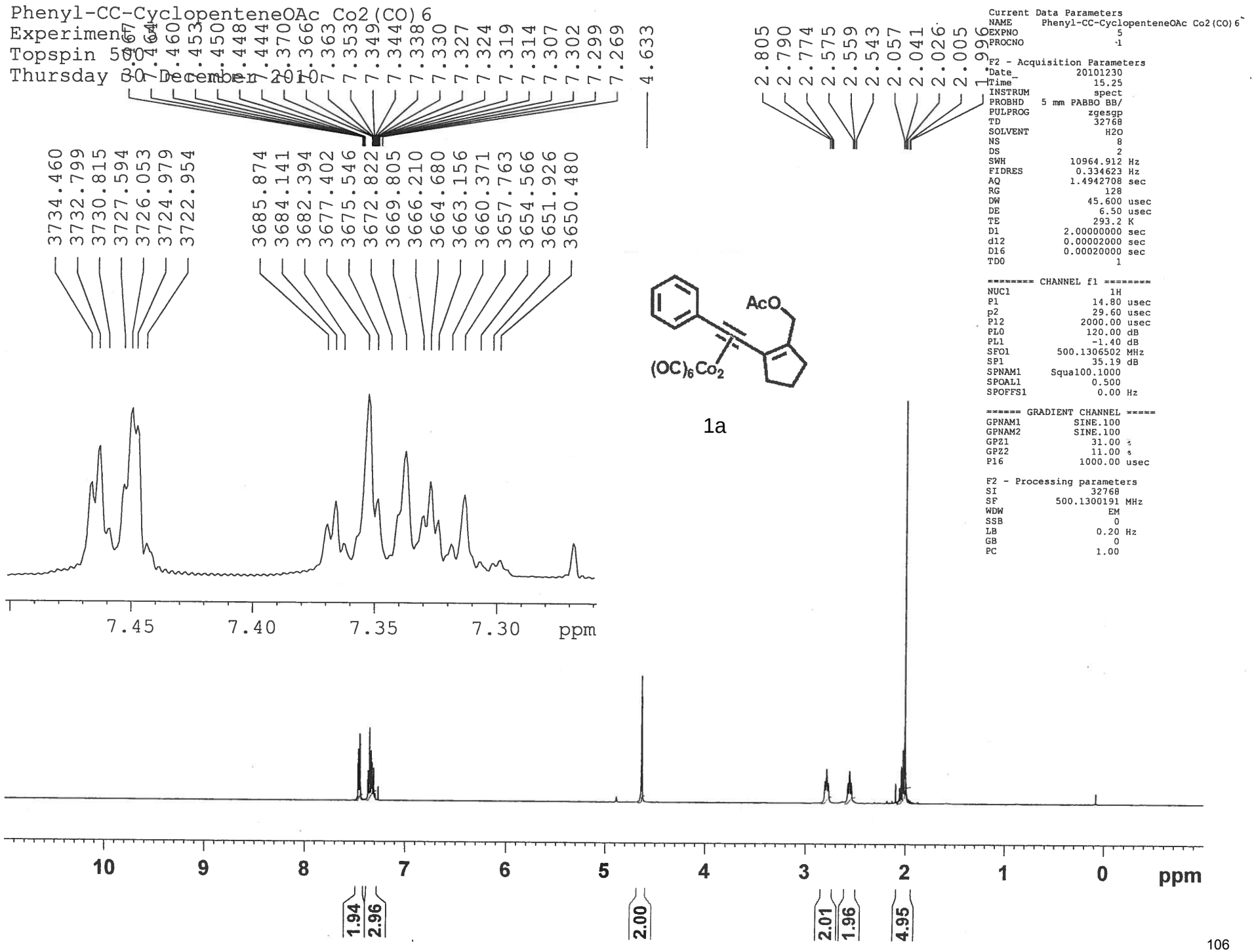
0.95 1.18 1.04 2.31 2.14 2.17 2.99 4.12

iophene-3-CC-CyclohexeneOAc
periment 1 Topspin 300 Ultra
dnesday 10 August 2011



10p

NAME	Thiophene-3-CC-CyclohexeneOAc
EXPNO	1
PROCNO	1
Date	20110810
Time	15.44
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	1290
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.4 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
========	CHANNEL f1 ========
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
========	CHANNEL f2 ========
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



Current Data Parameters

NAME	Phenyl-CC-CyclopenteneOAc Co2(CO)6
EXPNO	5
PROCNO	1

F2 - Acquisition Parameters

Date_	20101230
Time	15.25
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	H2O
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4942708 sec
RG	128
DW	45.600 usec
DE	6.50 usec
TE	293.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1306502 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

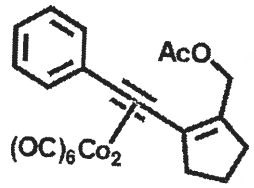
====== GRADIENT CHANNEL =====

GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

SI	32768
SF	500.1300191 MHz
WDW	EM
SSB	0
LB	0.20 Hz
GB	0
PC	1.00

Phenyl-CC-Cyclopentene methyl acetate Co2(CO)6 13C
Experiment 3 Ultra 300
Thursday 06 January 2011



1a

```
Current Data Parameters
NAME      Phenyl-CC-Cyclopentene methyl acetate Co2
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_          20110106
Time              10.46
INSTRUM           av300
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                16384
SOLVENT            C6D6
NS                 3697
DS                    4
SWH           17985.611 Hz
FIDRES         1.097755 Hz
AQ            0.4555252 sec
RG              20642.5
DW               27.800 usec
DE                6.00 usec
TE               300.0 K
D1            1.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                11.25 usec
PL1                0.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              16.55 dB
PL13              24.00 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 8192
SF           75.4677423 MHz
WDW                  EM
SSB                   0
LB                 2.50 Hz
GB                    0
PC                 1.40
```

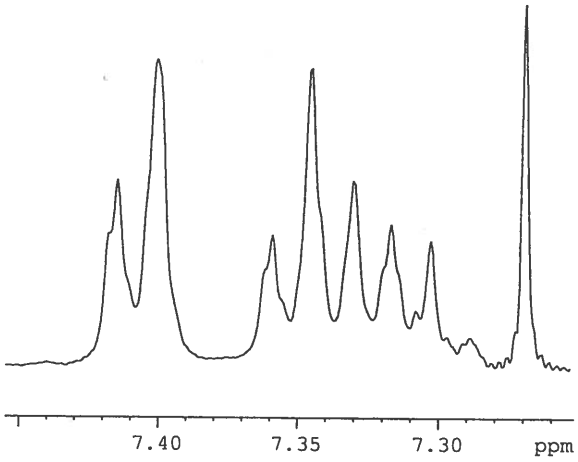
Phenyl-CC-Cyclohexeneacetate Co2(CO)6
500 Topsin
Experiment 2
Wednesday 05 May 2010

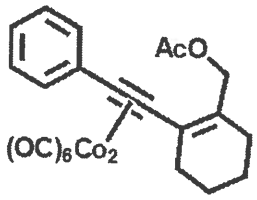
7.415 7.401 7.359 7.346 7.330 7.317 7.303 7.270

4.529

2.398 2.385 2.147 2.135 1.954 1.802 1.790 1.780 1.768 1.759 1.754 1.736 1.725

3708.412 3701.330 3680.561 3673.692 3666.069 3659.493 3652.470 3635.795





1b

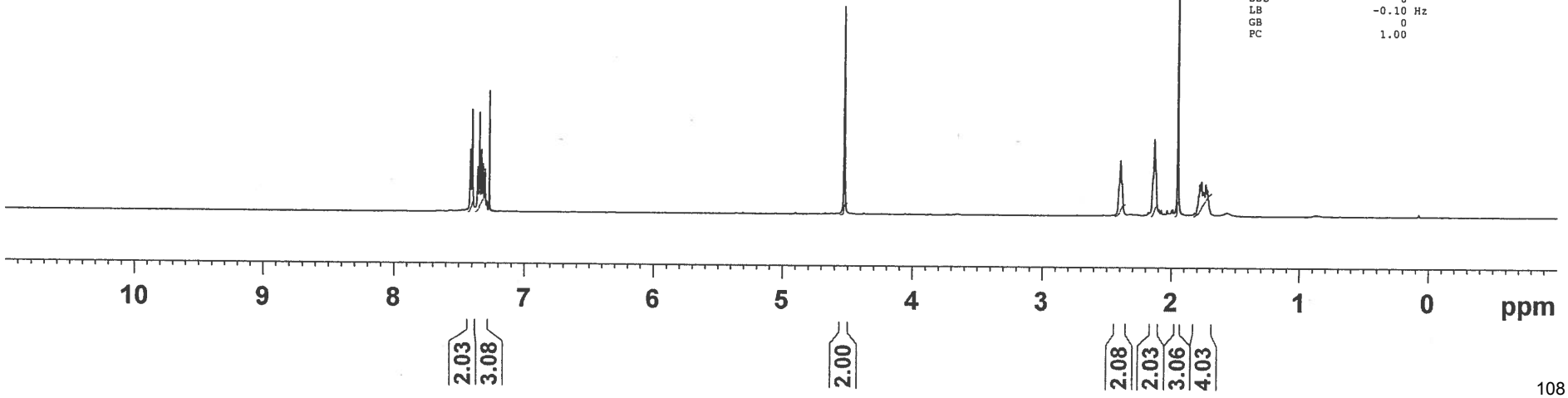
Current Data Parameters
NAME Phenyl-CC-Cyclohexeneacetate Co2(CO)6
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100505
Time 19.02
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 16
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 574.7
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

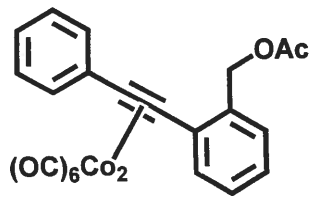
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1306502 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

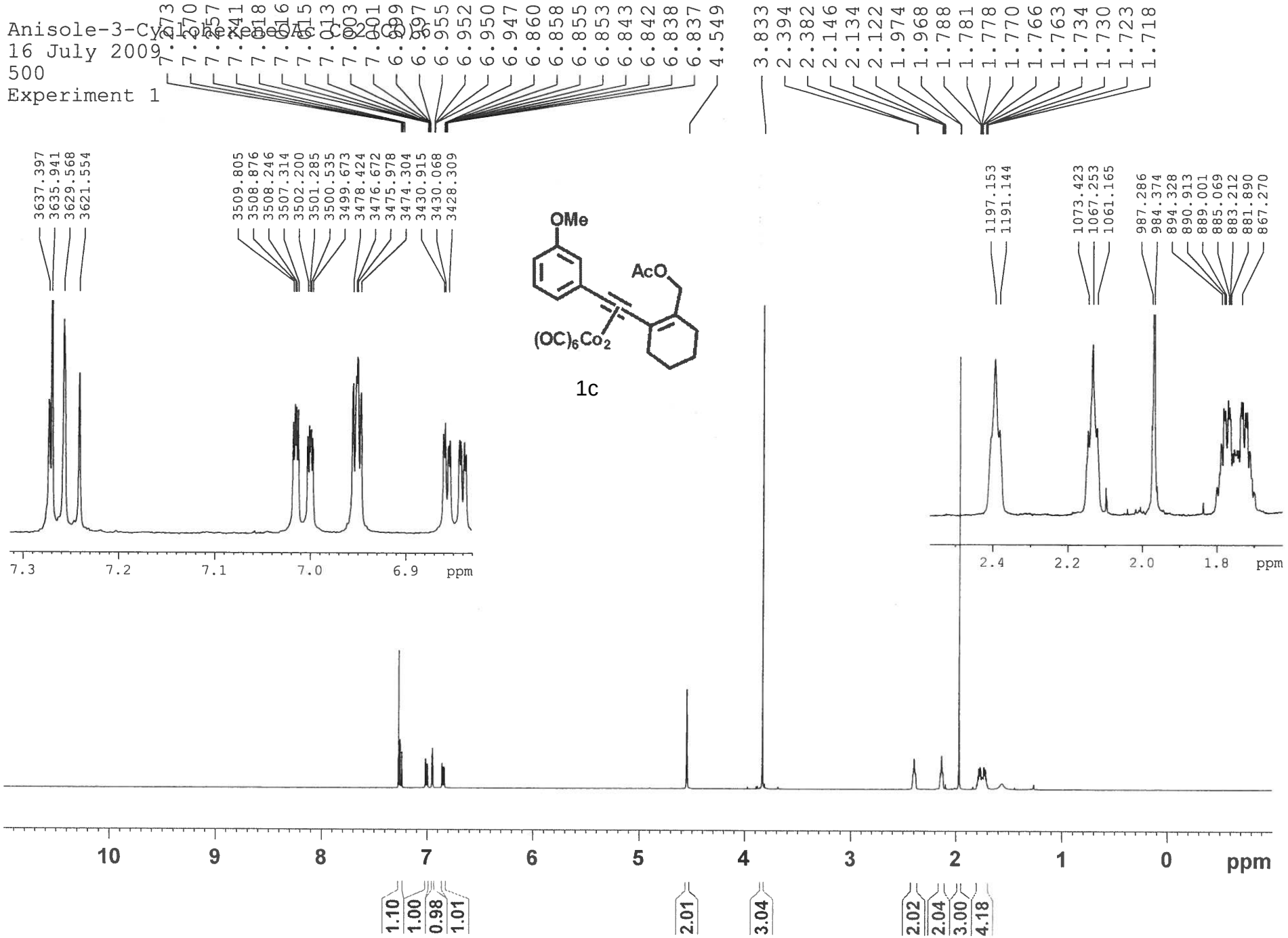
F2 - Processing parameters
SI 32768
SF 500.1300187 MHz
WDW EM
SSB 0
LB -0.10 Hz
GB 0
PC 1.00



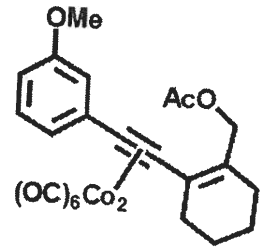
Phenyl-CC-Cyclohexeneacetate Co2(CO)6
300 Ultra
Experiment 1
Thursday 06 May 2010



1b

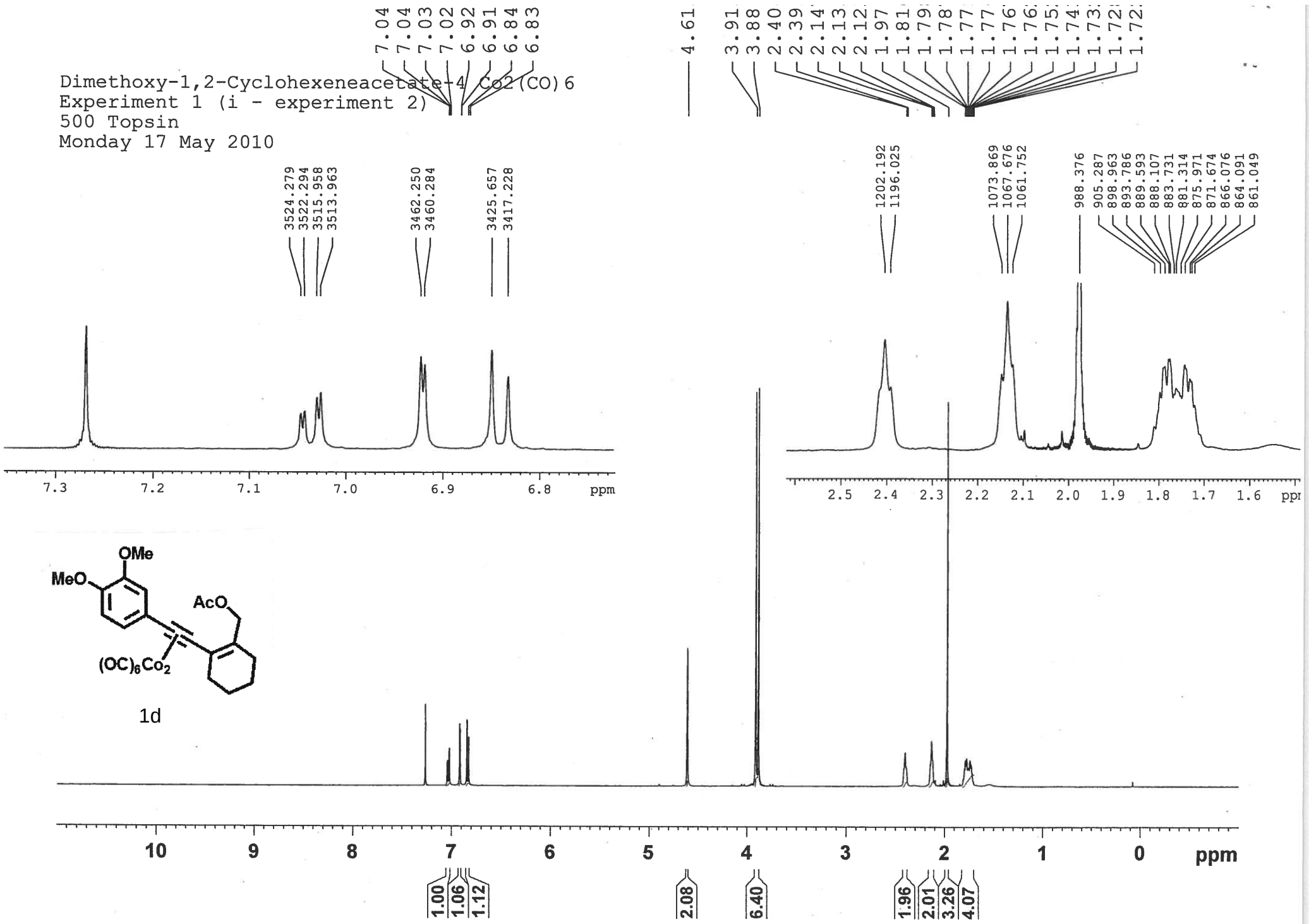

Anisole-3-Cyclohexene-OAc + Co2(CO)8
16 July 2009
500
Experiment 1
OMe
AcO
(OC)6Co2
1c
ppm
1.10
1.00
0.98
1.01
2.01
3.04
2.02
2.04
3.00
4.18

Anisole-3-CyclohexeneOAc Co2(CO)6 13C
Ultra 300 Experiment 2
16 July 2009

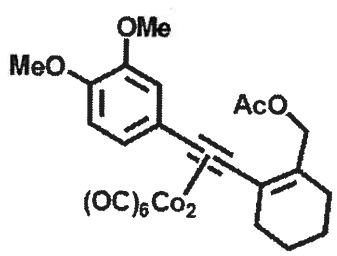


1c

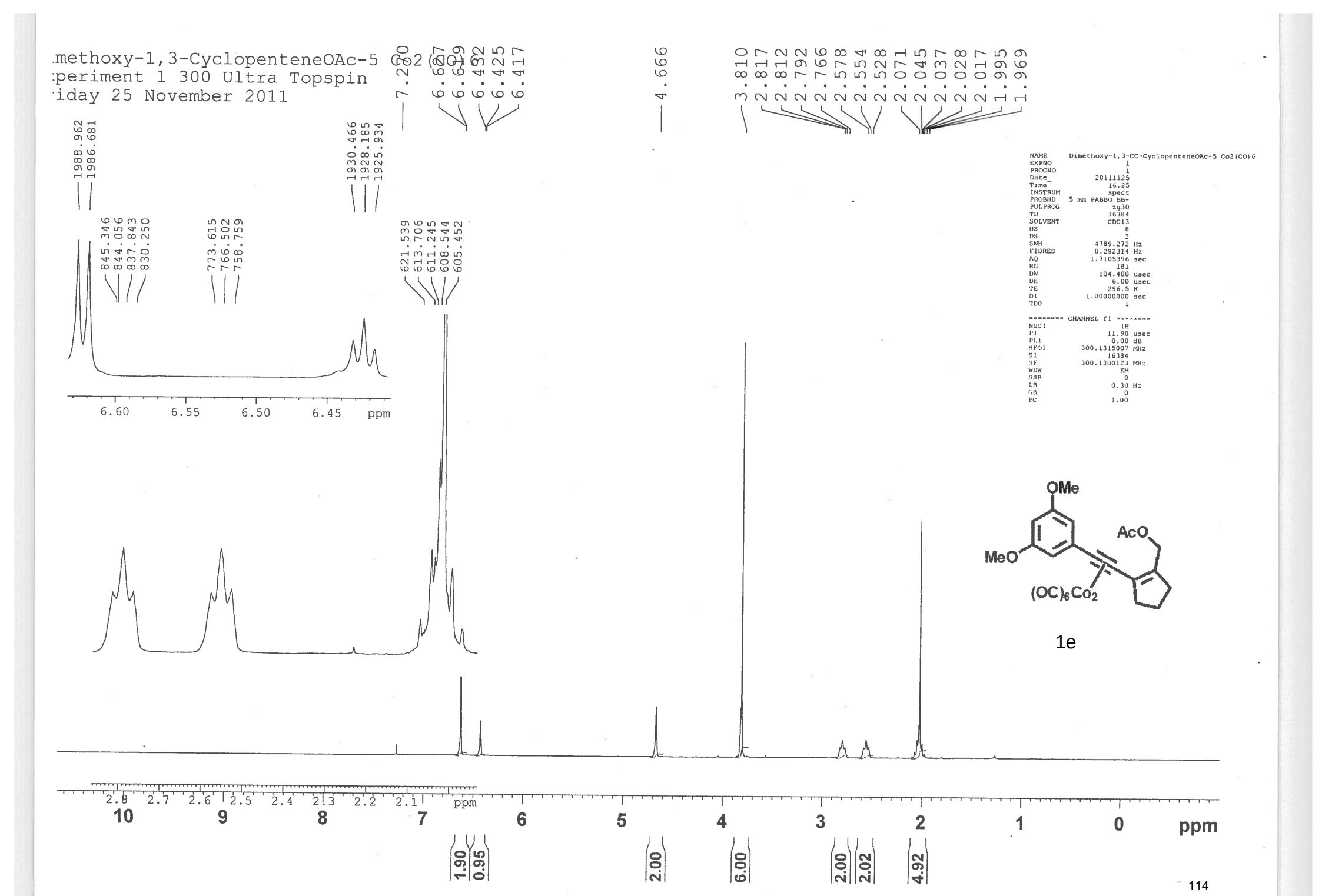
Dimethoxy-1,2-Cyclohexeneacetate-4 Co2(CO)6
Experiment 1 (i - experiment 2)
500 Topsin
Monday 17 May 2010



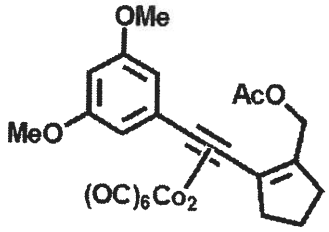
Dimethoxy-1,2-Cyclohexeneacetate-2 Co2(CO)6
Saturday 20 November 2010
300



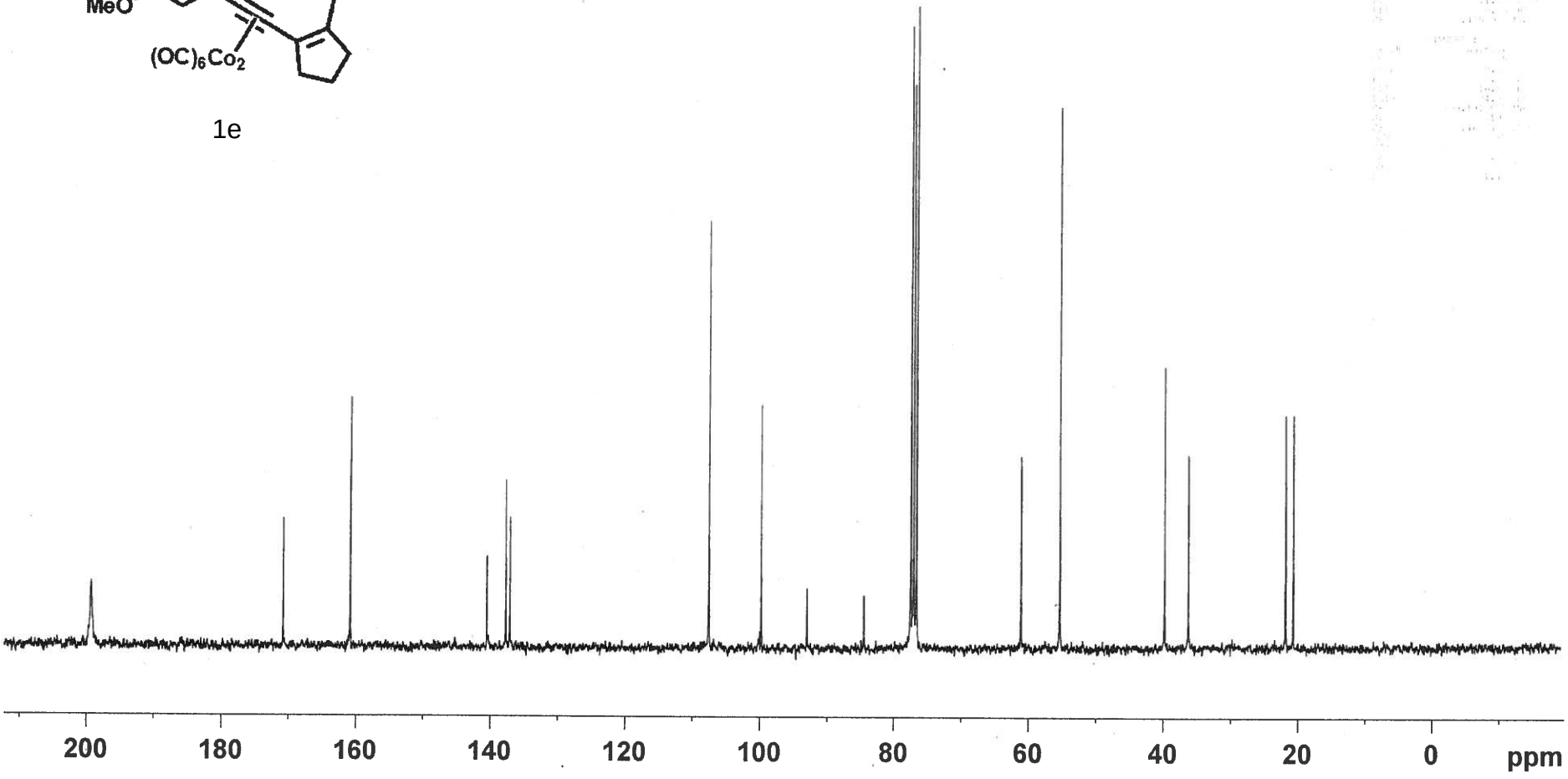
1d


.methoxy-1,3-CyclopenteneOAc-5
:periment 1 300 Ultra Topspin
·iday 25 November 2011
7.260
6.627
6.619
6.432
6.425
6.417
4.666
3.810
2.817
2.812
2.792
2.766
2.578
2.554
2.528
2.071
2.045
2.037
2.028
2.017
1.995
1.969
1988.962
1986.681
1930.466
1928.185
1925.934
845.346
844.056
837.843
830.250
773.615
766.502
758.759
621.539
613.706
611.245
608.544
605.452
6.60
6.55
6.50
6.45
ppm
NAME Dimethoxy-1,3-CC-CyclopenteneOAc-5 Co2(CO)6
EXPNO 1
PROCNO 1
Date_ 20111125
Time 16.25
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 2
SWH 4789.272 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 181
DW 104.400 usec
DE 6.00 usec
TE 296.5 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 0.00 dB
SFO1 300.1315007 MHz
SI 16384
SF 300.1300123 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
OMe
MeO
AcO
(OC)6Co2
1e
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
1.90
0.95
2.00
6.00
2.00
2.02
4.92

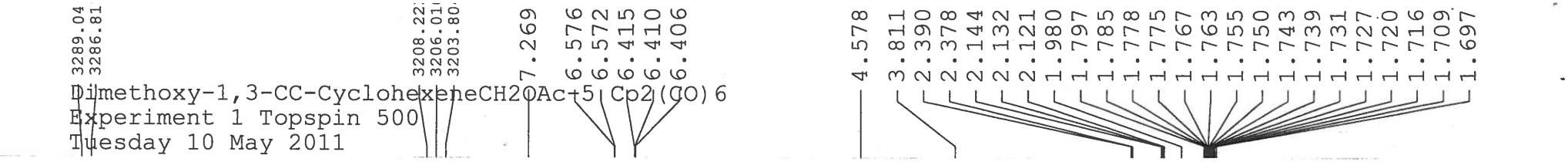
methoxy-1,3-CC-CyclopenteneOAc-5 Co2(CO)6 13C
periment 1 Ultra 300 Topspin
iday 25 November 2011

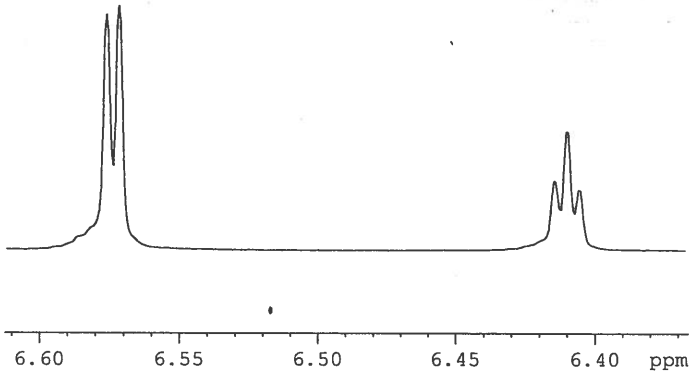


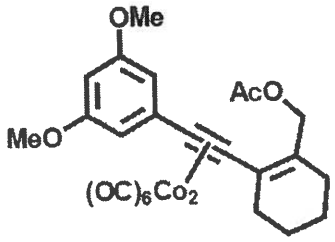
1e



Dimethoxy-1,3-CC-CyclohexeneCH2OAc+5 Co2(CO)6
Experiment 1 Topspin 500
Tuesday 10 May 2011







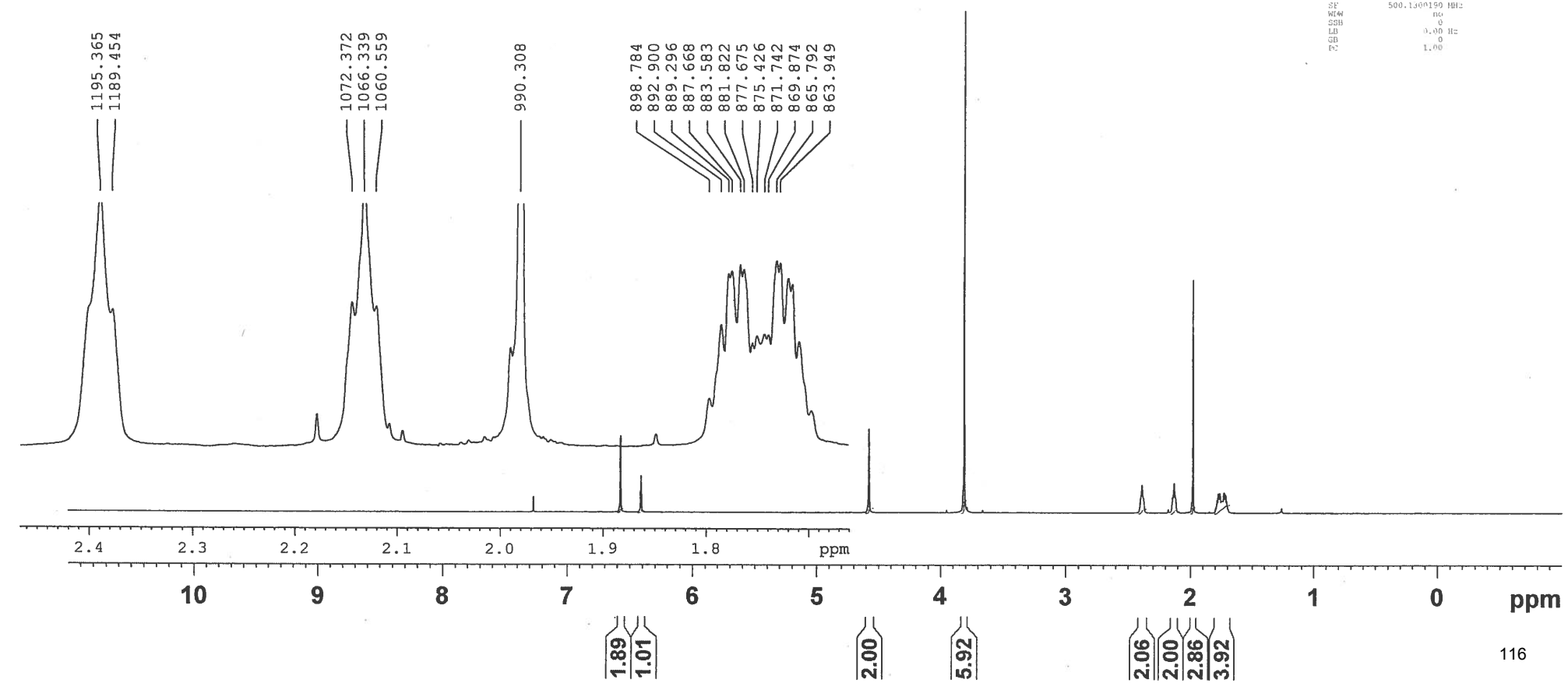
1f

Current Data Parameters
NAME Dimethoxy-1,3-CC-CyclohexeneCH2OAc+5 Co2(CO)6
EXPNO 1
PROCNO 1

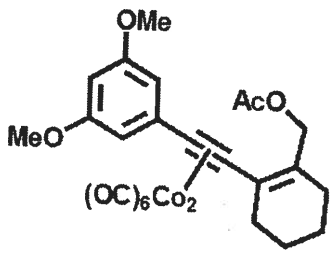
F2 - Acquisition Parameters
Date 20110510
Time 13.34
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT C6D6
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1720407 sec
RG 90.5
DW 48.400 usec
DE 6.50 usec
TE 297.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 15.00 usec
PL1 0.50 dB
SFO1 500.1330860 MHz

F2 - Processing parameters
SI 32768
SF 500.1300190 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

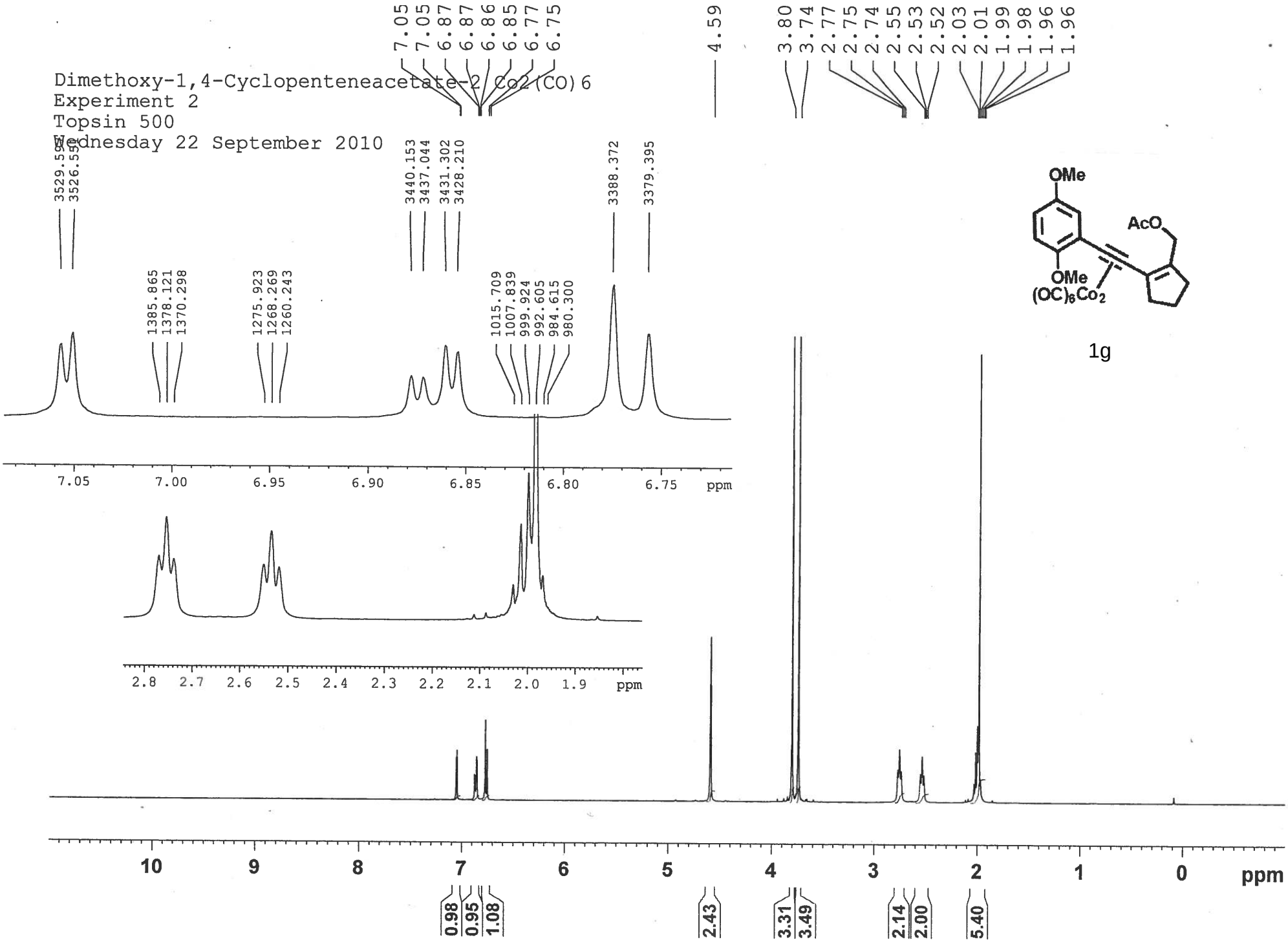


Dimethoxy-1,3-CC-CyclohexeneOAc-5 Co2(CO)6 13C
Topspin Ultra 300
Experiment 1
Thursday 05 May 2011



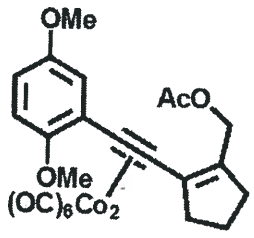
1f

Dimethoxy-1,4-Cyclopenteneacetate-2/ $Co_2(CO)_6$
Experiment 2
Topsin 500
Wednesday 22 September 2010

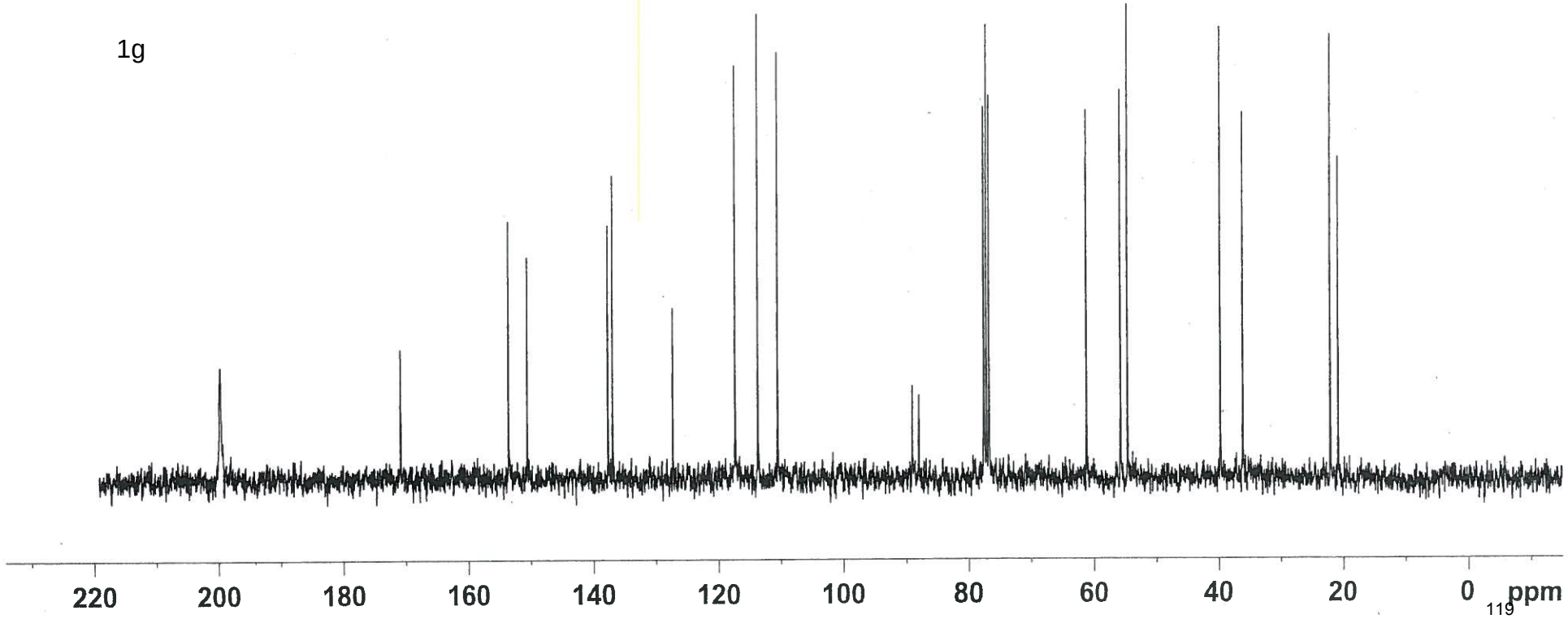


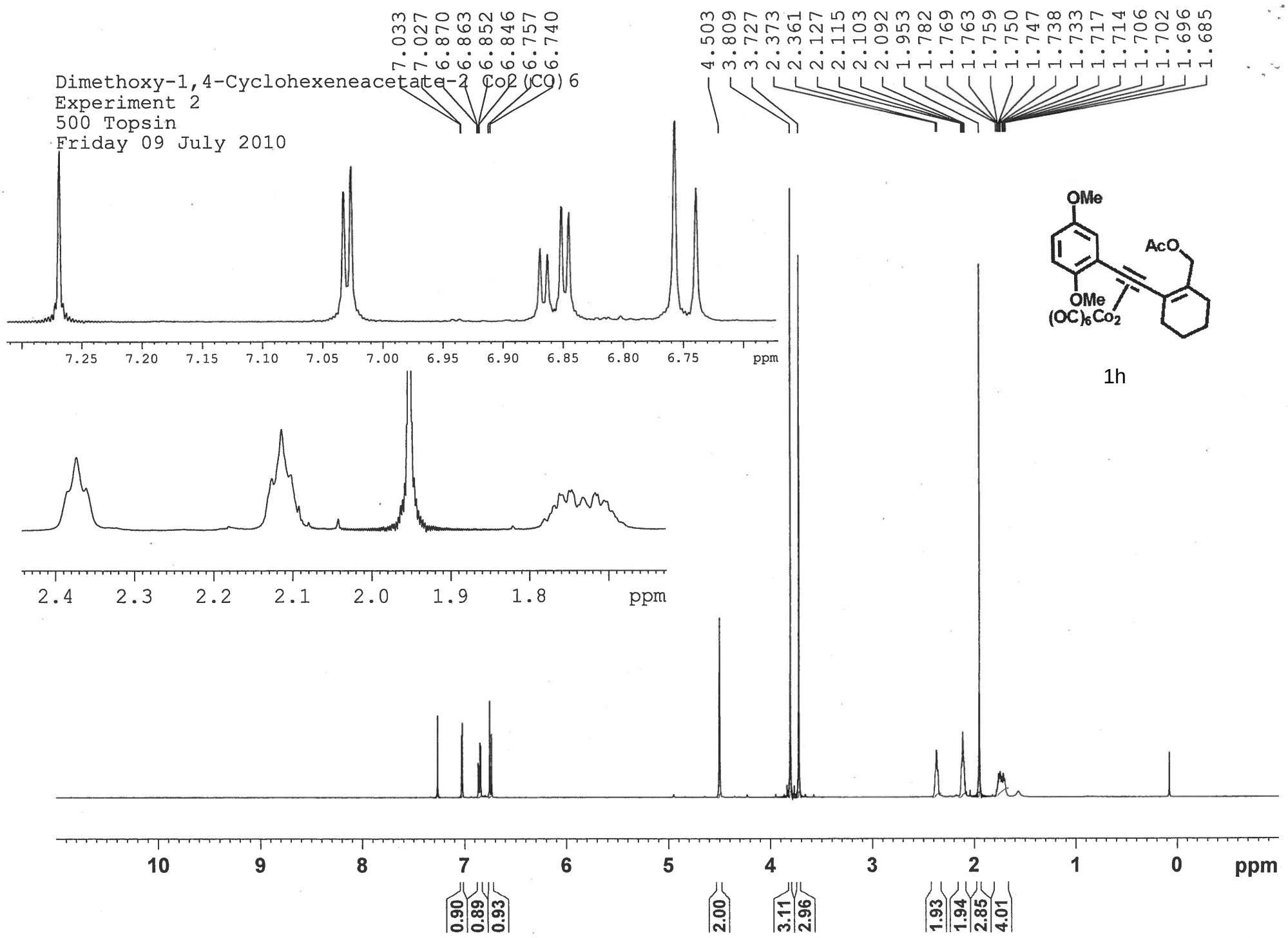
Dimethoxy-1,4-CC-cyclopenteneacetate-2 Co2(CO)6
Experiment 3
Ultra 300
Wednesday 22 September 2010

199.17



1g

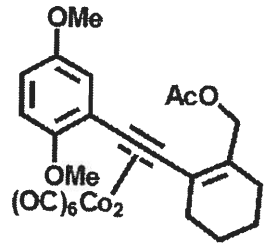



7.033
7.027
6.870
6.863
6.852
6.846
6.757
6.740
4.503
3.809
3.727
2.373
2.361
2.127
2.115
2.103
2.092
1.953
1.782
1.769
1.763
1.759
1.750
1.747
1.738
1.733
1.717
1.714
1.706
1.702
1.696
1.685
Dimethoxy-1,4-Cyclohexeneacetate-2 Co2(CO)6
Experiment 2
500 Topsin
Friday 09 July 2010
7.25 7.20 7.15 7.10 7.05 7.00 6.95 6.90 6.85 6.80 6.75 ppm
2.4 2.3 2.2 2.1 2.0 1.9 1.8 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
0.90 0.89 0.93 2.00 3.11 2.96 1.93 1.94 2.85 4.01
OMe
AcO
OMe
(OC)6Co2

1h

Dimethoxy-1,4-CyclohexeneOAc-2 Co2(CO)6 13C
Experiment 2
Ultra 300
Wednesday 14 July 2010

199.92



1h

Dimethoxy-1,4-CycloheptenеOAc-2 Co2(CO)6
Experiment 5 Topspsin 500
Thursday 06 January 2011

Current Data Parameters
NAME Dimethoxy-1,4-CycloheptenеOAc-2 Co2(CO)6
EXPNO 5
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110106
Time 10.55
INSTRUM apect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 40.3
DW 45.600 usec
DE 6.50 usec
TE 291.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305251 MHz
SP1 35.19 dB
SPNAM1 Squal00.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

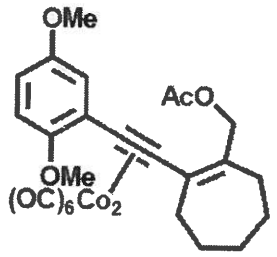
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300187 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

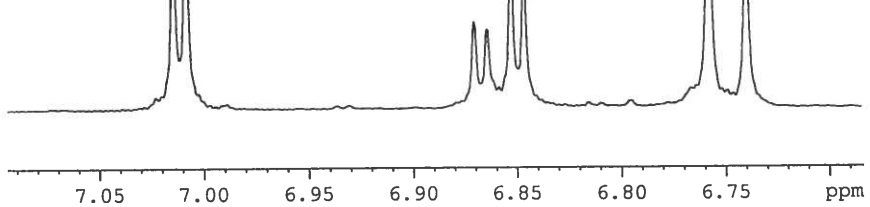
7.269 7.015 7.009 6.871 6.865 6.853 6.847 6.758 6.740

4.518 3.807 3.743 2.618 2.606 2.596 2.317 2.305 2.295 1.947 1.847 1.844 1.835 1.830 1.823 1.812 1.800 1.633 1.622 1.611 1.601 1.570 1.558 1.548 1.538

3508.267 3505.211 3436.278 3433.178 3427.408 3424.322 3379.979 3371.038

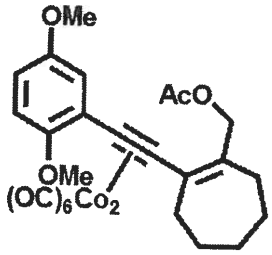


1i



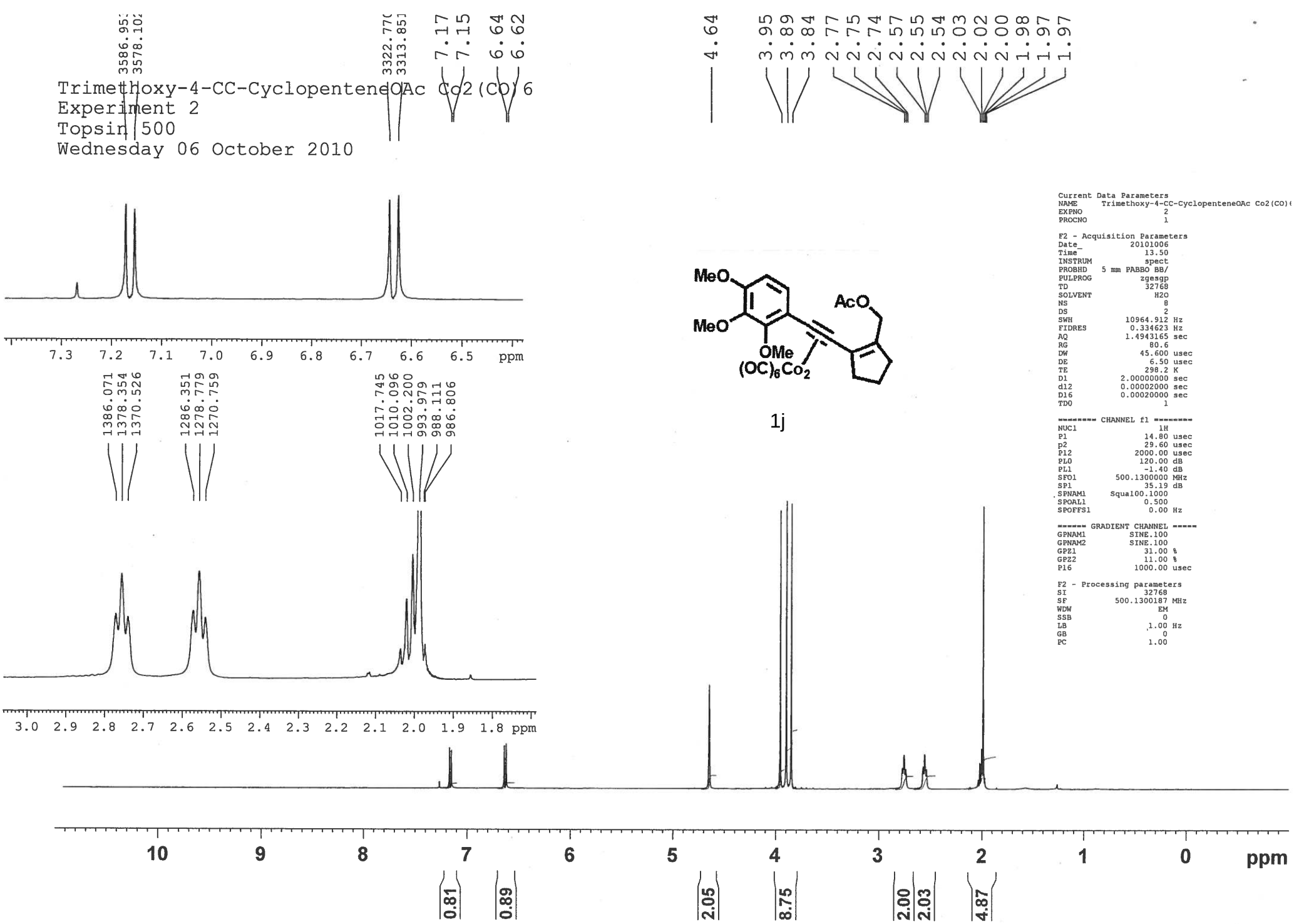
Dimethoxy-1,4-CC-Cycloheptenеacetate-2 Co2(CO)6 13C
Experiment 5 Ultra 300
Saturday 08 January 2011

199.92



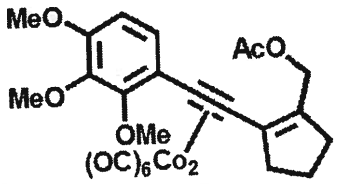
1i

Trimethoxy-4-CC-CyclopenteneOAc Co2(CO)6
Experiment 2
Topsin 500
Wednesday 06 October 2010



Trimethoxy-4-CyclopenteneOAc Co2(CO)6 ^{13}C
Ultra 300
Wednesday 06 October 2010

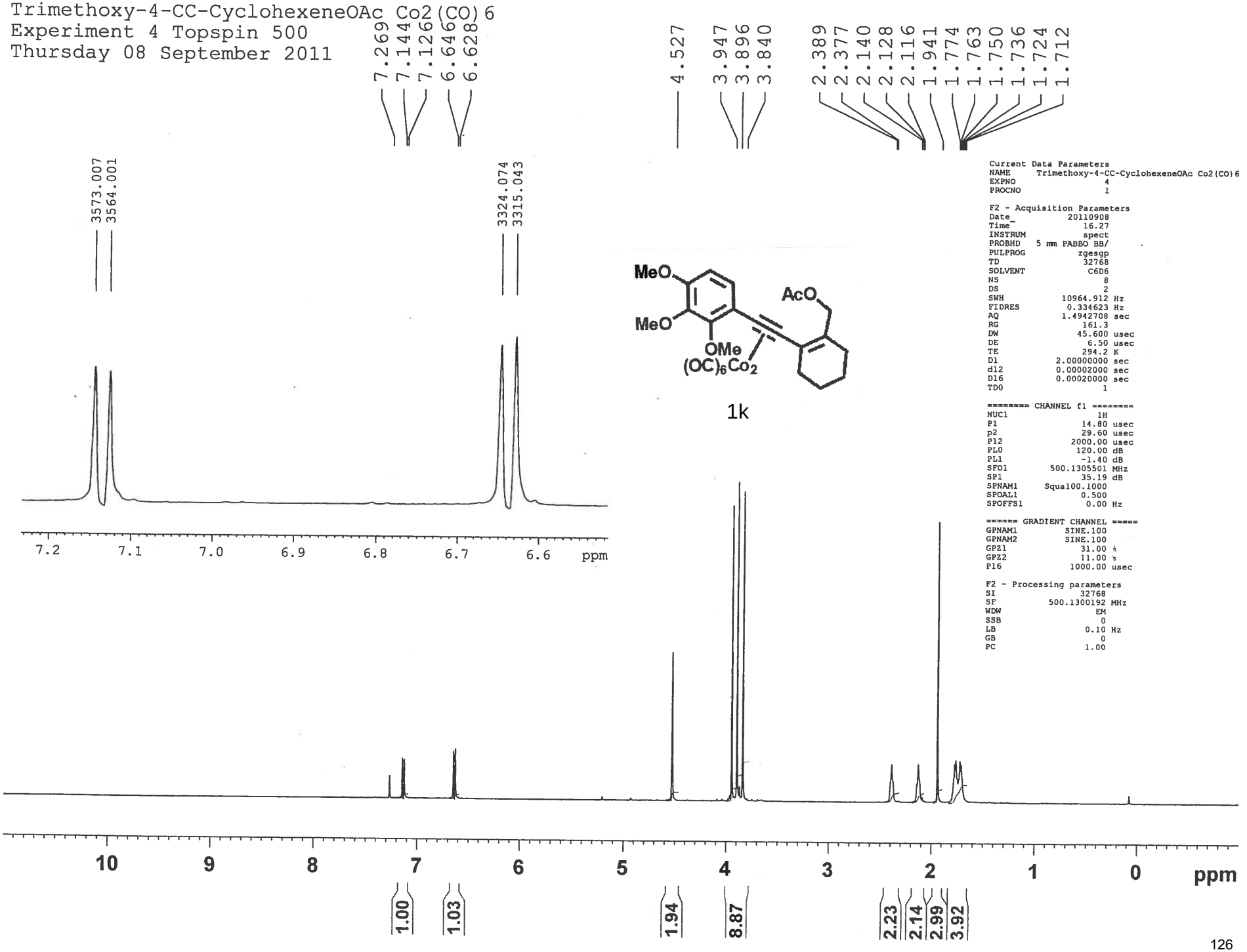
199.91



1j


```
Current Data Parameters
NAME      Trimethoxy-4-CyclopenteneOAc Co2(CO)6 1
EXPNO                1
PROCNO               1

F2 - Acquisition Parameters
Date_          20101006
Time               15.11
INSTRUM            av300
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                16384
SOLVENT            C6D6
NS                 3799
DS                    4
SWH           17985.611 Hz
FIDRES         1.097755 Hz
AQ             0.4555252 sec
RG                20642.5
DW                27.800 usec
DE                 6.00 usec
TE                300.0 K
D1             1.00000000 sec
d11            0.03000000 sec
d12            0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                11.25 usec
PL1                0.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2             80.00 usec
PL2                0.00 dB
PL12              16.55 dB
PL13              24.00 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 8192
SF           75.4677423 MHz
WDW                  EM
SSB                   0
LB                 2.50 Hz
GB                    0
PC                 1.40
```

Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6
Experiment 4 Topspin 500
Thursday 08 September 2011



Current Data Parameters
NAME Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6
EXPNO 4
PROCNO 1

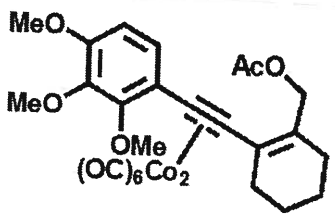
F2 - Acquisition Parameters
Date_ 20110908
Time 16.27
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 161.3
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305501 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

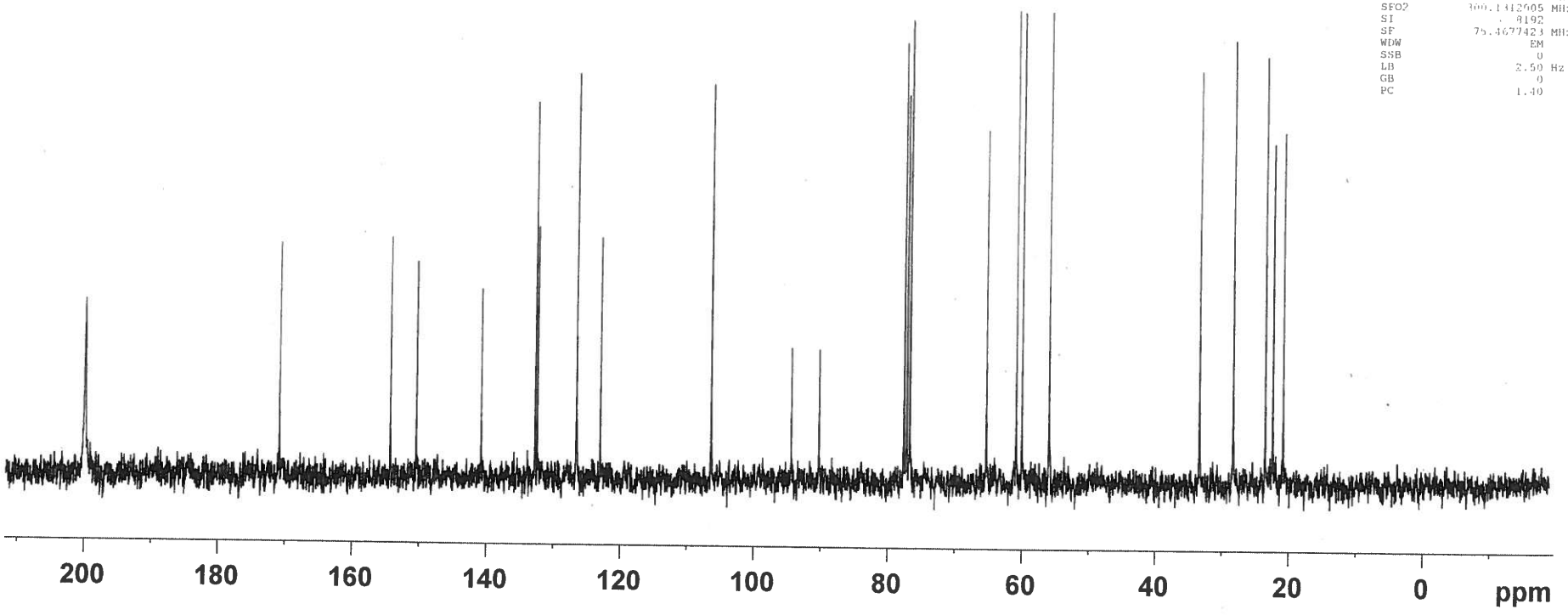
F2 - Processing parameters
SI 32768
SF 500.1300192 MHz
WDW EM
SSB 0
LB 0.10 Hz
GB 0
PC 1.00

imethoxy-4-CC-CyclohexeneOAc Co2(CO)6 13C
periment 3 Ultra 300 Topspin
esday 24 January 2012

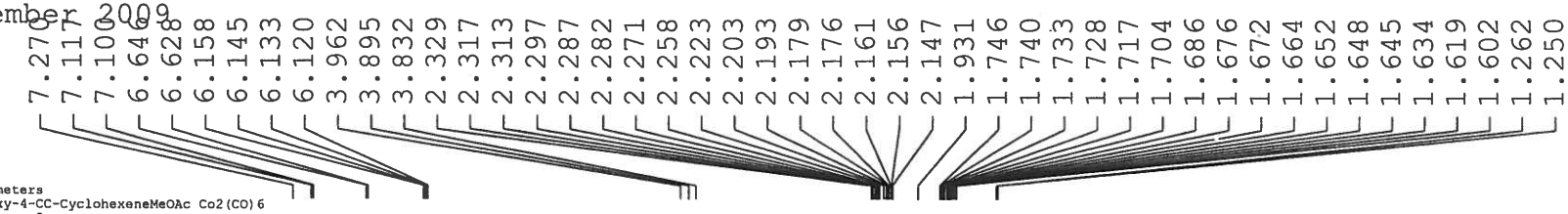


1k

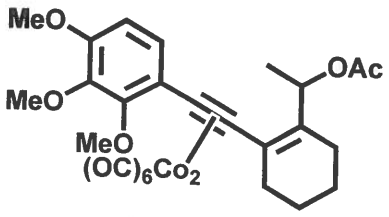
NAME	Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6 13C
EXPNO	3
PROCNO	1
Date_	20120124
Time	13.50
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	118
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	294.4 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



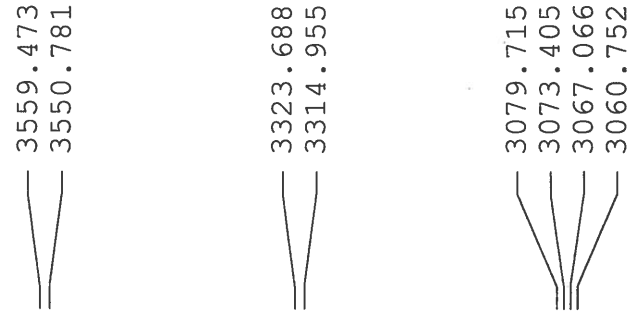
Trimethoxy-4-CC-CyclohexeneMeOAc Co2(CO)6
500 Topsin Experiment 2
11 September 2009

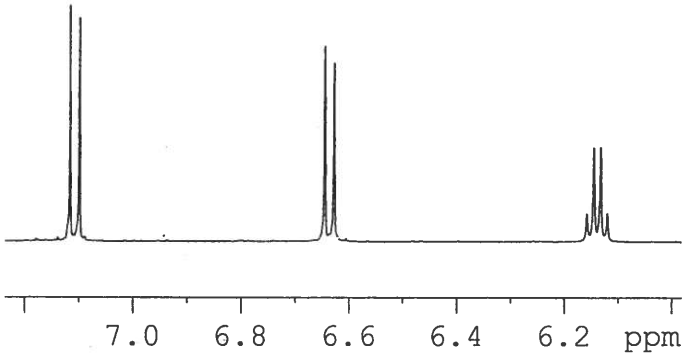



```
Current Data Parameters
NAME      Trimethoxy-4-CC-CyclohexeneMeOAc Co2(CO)6
EXPNO                2
PROCNO               1

F2 - Acquisition Parameters
Date_          20090911
Time_             14.16
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                   8
DS                   2
SWH          10330.578 Hz
FIDRES        0.157632 Hz
AQ            3.1719923 sec
RG                 114
DW              48.400 usec
DE               6.50 usec
TE              296.2 K
D1           1.00000000 sec
TD0                  1

======== CHANNEL f1 ========
NUC1                1H
P1              15.00 usec
PL1              0.50 dB
SFO1       500.1330885 MHz

F2 - Processing parameters
SI                32768
SF         500.1300192 MHz
WDW                  no
SSB                   0
LB               0.00 Hz
GB                    0
PC                 1.00
```

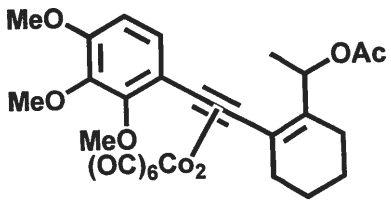


1kk

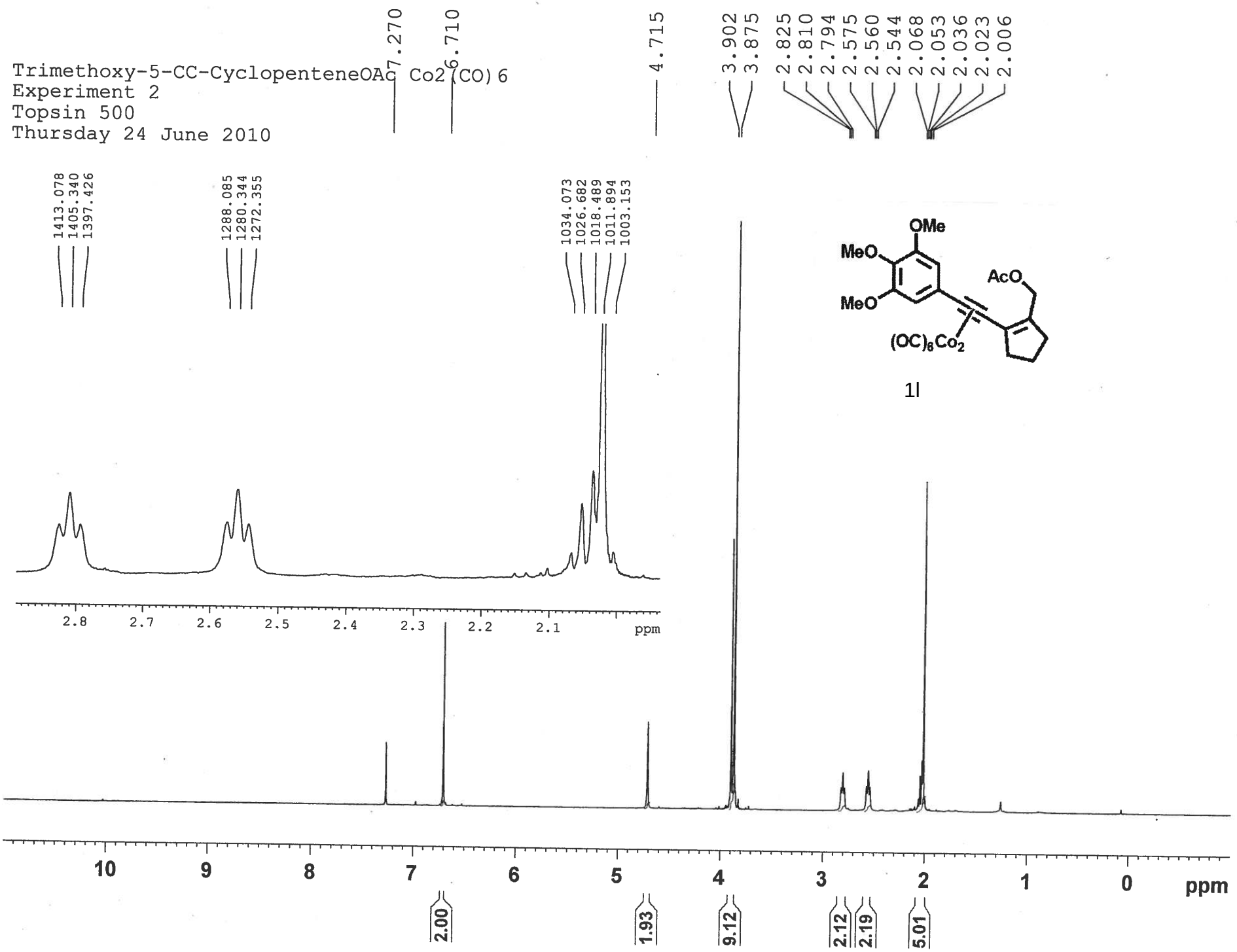




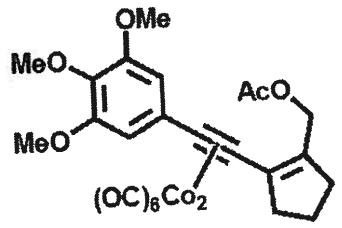
Trimethoxybenzene-4-CC-Cyclohexene-Me-OAc Co2(CO)6 ^{13}C
300 Ultra Experiment 2
13 September 2009



1kk

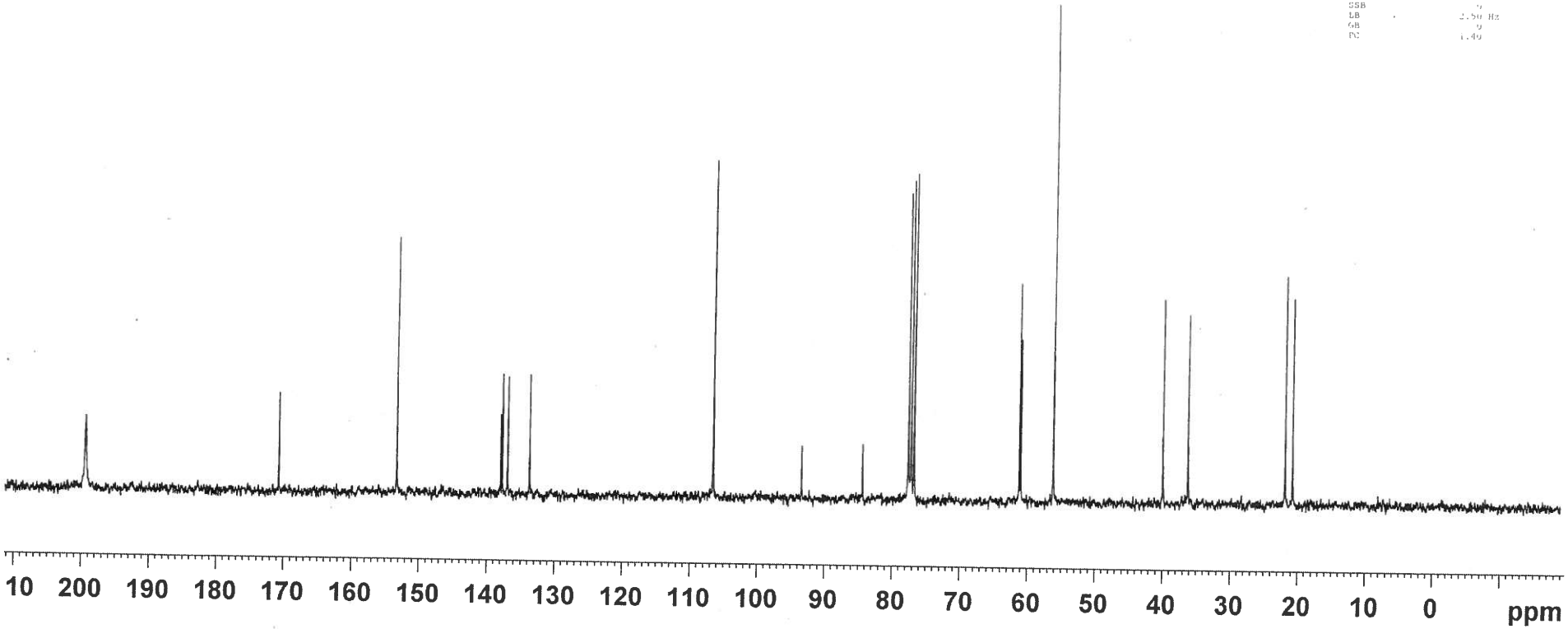

Trimethoxy-5-CC-CyclopenteneOAc Co2(CO)6
Experiment 2
Topsin 500
Thursday 24 June 2010
7.270
6.710
4.715
3.902
3.875
2.825
2.810
2.794
2.575
2.560
2.544
2.068
2.053
2.036
2.023
2.006
1413.078
1405.340
1397.426
1288.085
1280.344
1272.355
1034.073
1026.682
1018.489
1011.894
1003.153
OMe
MeO
MeO
AcO
(OC)6Co2
1l
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
2.00
1.93
9.12
2.12
2.19
5.01

imethoxy-5-CC-CyclopenteneOAc Co2(CO)6 13C
periment 2 Topspin Ultra 300
esday 18 October 2011

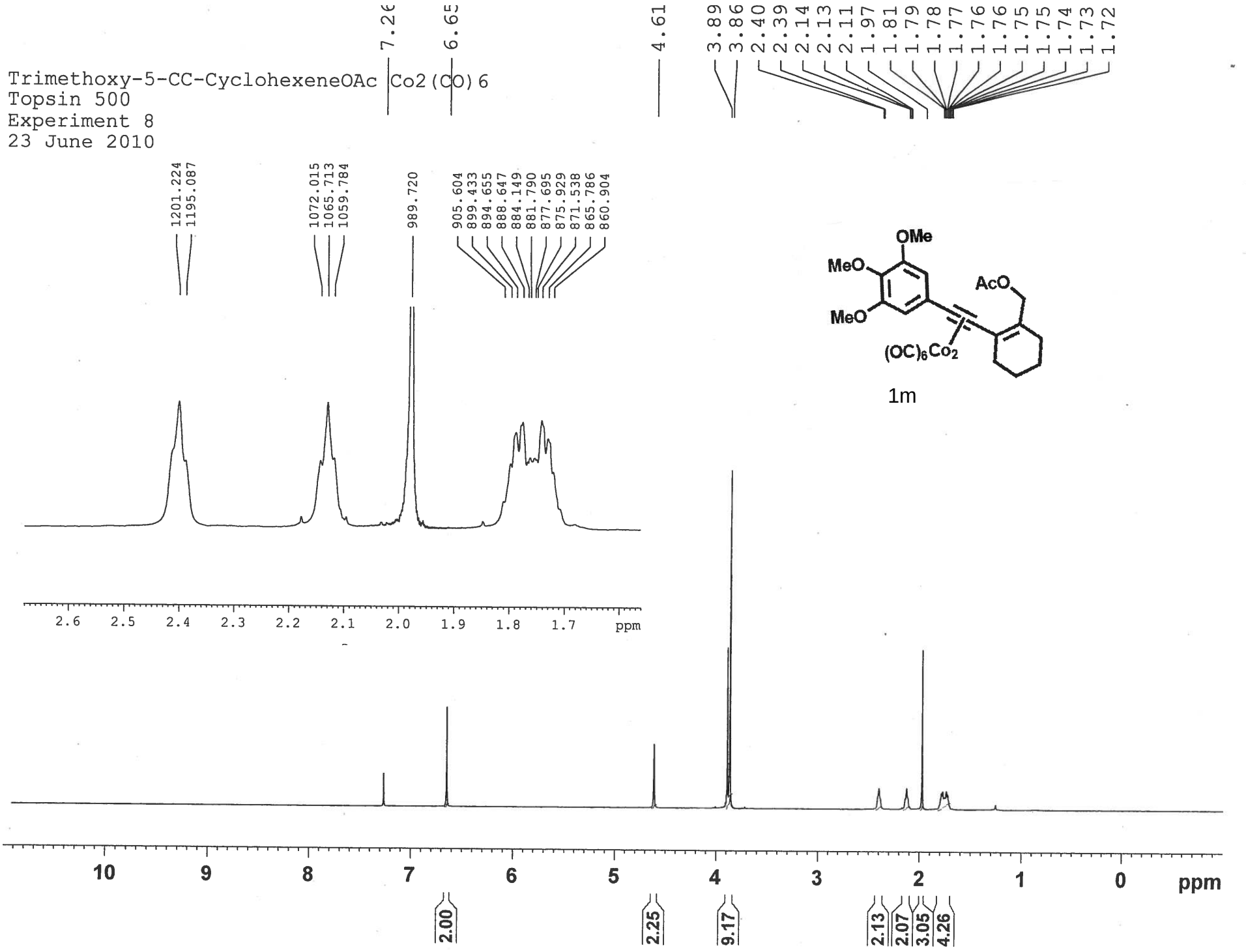


1l

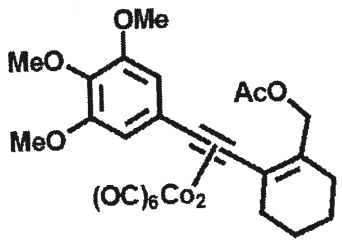
NAME	Trimethoxy-5-CC-CyclopenteneOAc Co2(CO)6 13C
EXPNO	2
PROCNO	1
Date_	20111018
Time	12.47
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	1e384
SOLVENT	CDCl3
NS	803
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	293.2 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752951 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	499.1312905 MHz
SI	8192
SF	75.4677433 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



Trimethoxy-5-CC-CyclohexeneOAc Co2(CO)6
Topsin 500
Experiment 8
23 June 2010

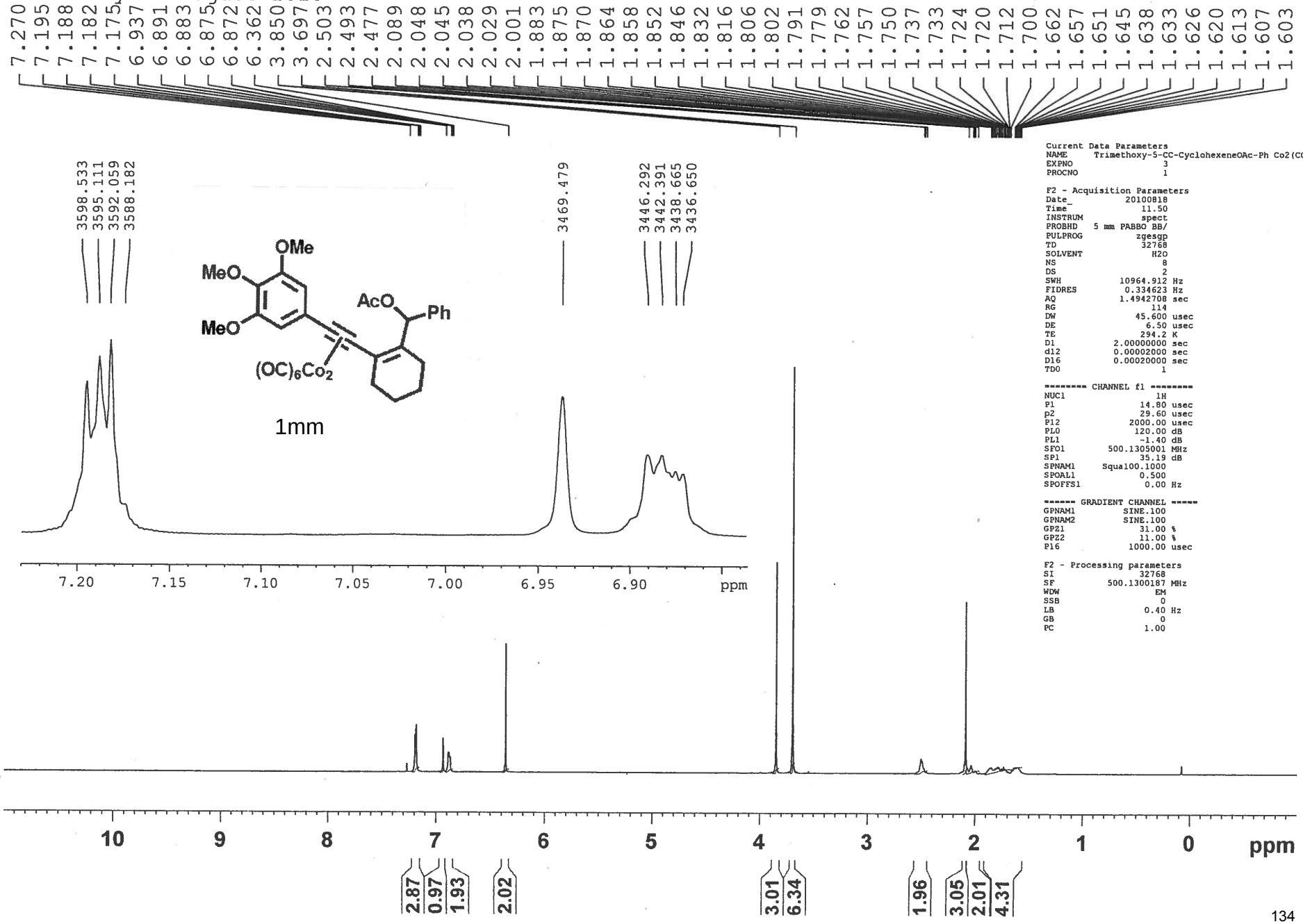


Trimethoxy-5-CyclohexeneOAc-Co2(CO)6-13C
Experiment 4
300 Ultra
24 June 2010



1m

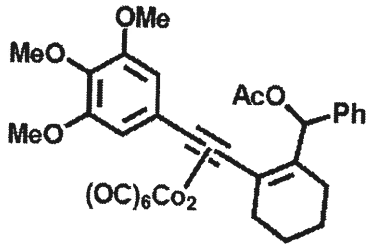
Trimethoxy-5-CC-CyclohexeneOAc-Ph Co2(CO)6
Experiment 3
Topsin 500
Wednesday 18 August 2010



Trimethoxy-5-CC-CyclohexeneOAc-Ph Co2(CO)6
Experiment 2
Ultra 300
Thursday 19 August 2010

199.74

169.85
152.38
137.93
137.00
136.28
134.97
131.32
128.24
127.57
126.69
107.18
97.98
92.08
77.57
77.14
76.72
75.20
60.89
55.84
32.96
26.14
25.37
22.35
21.11



1mm

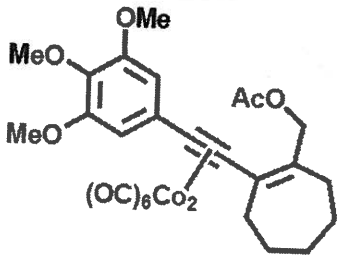
220 200 180 160 140 120 100 80 60 40 20 0 ppm

Trimethoxy-5-CC-CycloheptenеOAc Co2(CO)6
Topspin 500 Experiment 2
Wednesday 25 May 2011

7.271 6.635

4.692 3.888 3.862 2.643 2.631 2.621 2.351 2.340 2.329 1.989 1.856 1.843 1.832 1.820 1.808 1.644 1.632 1.622 1.612 1.575 1.564 1.553 1.543

1321.989 1316.033 1310.953 1175.799 1170.054 1164.710 994.832 928.166 921.644 916.045 910.333 904.192 822.166 816.402 811.259 806.110 787.877 782.033 776.810 771.613



1n

Current Data Parameters
NAME Trimethoxy-5-CC-CycloheptenеOAc Co2(CO)6
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters

Date_	20110525
Time	16.27
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgesgp
TD	32768
SOLVENT	C6D6
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4943165 sec
RG	45.3
DW	45.600 usec
DE	6.50 usec
TE	293.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1300000 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

====== GRADIENT CHANNEL =====

GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

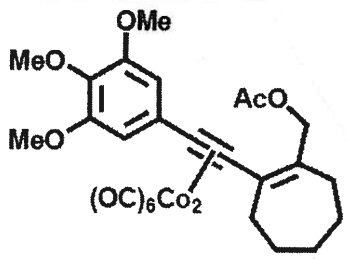
SI	32768
SF	500.1300183 MHz
WDW	EM
SSB	0
LB	0.50 Hz
GB	0
PC	1.00

2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 ppm

10 9 8 7 6 5 4 3 2 1 0 ppm

1.80 2.00 9.16 1.97 2.14 2.90 2.21 4.12

imethoxy-5-CC-CycloheptеneOAc Co2(CO)6
ɔeriment 2 Topspin ULtra 300
ırsday 26 May 2011

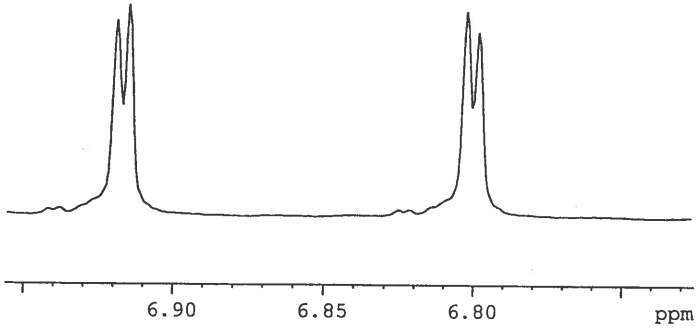


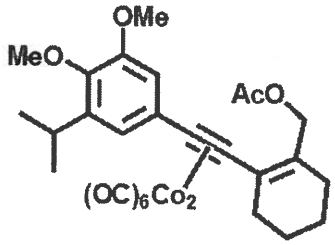
1n

RosmarDerivative-CC-CyclohexeneOAc Co2(CO)6
Experiment 5 TOpspin 500
Friday 07 January 2010

7.269 6.919 6.915 6.803 6.798 4.657 3.862 3.857 3.387 3.374 3.360 3.345 3.331 3.317 3.303 2.408 2.396 2.384 2.140 2.127 2.115 1.975 1.806 1.794 1.786 1.783 1.774 1.771 1.763 1.756 1.740 1.736 1.728 1.724 1.718 1.707 1.704 1.226 1.212

3460.374 3458.352 3402.110 3400.097





1o

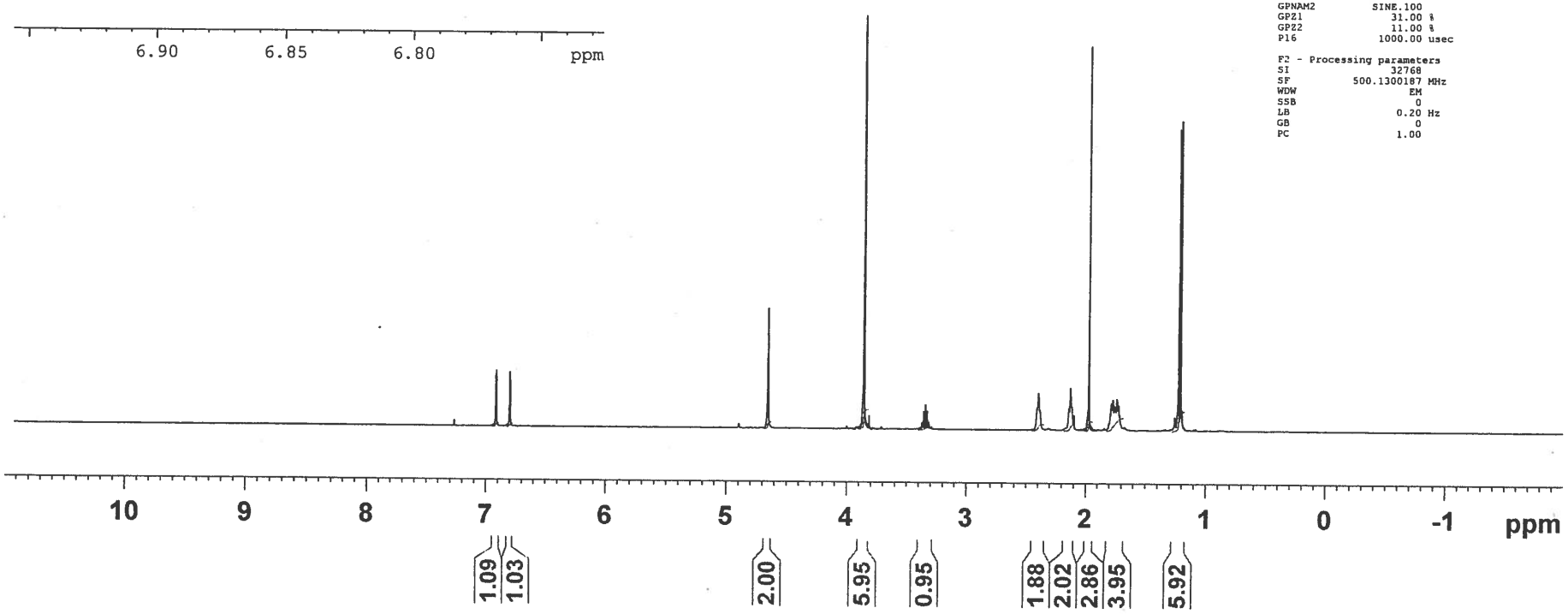
Current Data Parameters
NAME RosmarDerivative-CC-CyclohexeneOAc Co2(CO)6
EXPNO 5
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110107
Time 13.36
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 40.3
DW 45.600 usec
DE 6.50 usec
TE 290.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1300000 MHz
SP1 35.19 dB
SPNAM1 Squal00.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

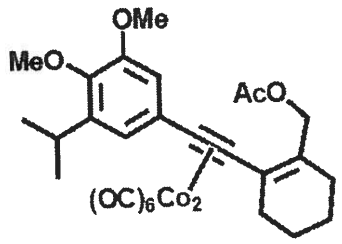
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300187 MHz
WDW EM
SSB 0
LB 0.20 Hz
GB 0
PC 1.00



RosmarDerivative -OAc Complexed 13C
Experiment 3 Ultra 300
Friday 08 January 2011

199.71



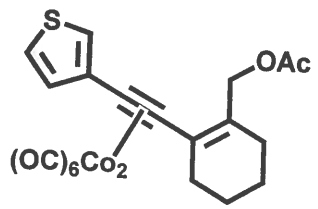
1o

```
Current Data Parameters
NAME      RosmarDerivative -OAc Complexed 13C
EXPNO                  3
PROCNO                 1

F2 - Acquisition Parameters
Date_           20110108
Time               2.42
INSTRUM           av300
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD               16384
SOLVENT            C6D6
NS                  726
DS                    4
SWH          17985.611 Hz
FIDRES        1.097755 Hz
AQ           0.4555252 sec
RG             20642.5
DW               27.800 usec
DE                6.00 usec
TE              300.0 K
D1           1.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                11.25 usec
PL1                0.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2            80.00 usec
PL2                0.00 dB
PL12              16.55 dB
PL13              24.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                  8192
SF           75.4677423 MHz
WDW                 EM
SSB                  0
LB                2.50 Hz
GB                   0
PC                1.40
```

Thiophene-3-CC-CyclohexeneOAc Co2(CO)6
Experiment 2 Topspin 500
Thursday 01 September 2011

7.338 7.331 7.329 7.324 7.322 7.271 7.068 7.064 7.058 7.055

4.574 2.396 2.384 2.372 2.149 2.136 2.125 1.992 1.795 1.789 1.783 1.776 1.773 1.765 1.762 1.753 1.748 1.743 1.741 1.736 1.728 1.724 1.716 1.713 1.706 1.694



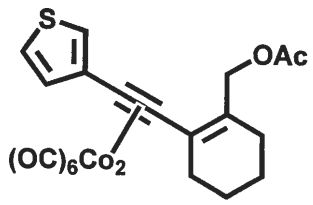
1p

```
Current Data Parameters
NAME      Thiophene-3-CC-CyclohexeneOAc Co2(CO)6
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20110901
Time              16.12
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG        zgesgp
TD              32768
SOLVENT           C6D6
NS                   8
DS                   2
SWH           10964.912 Hz
FIDRES         0.334623 Hz
AQ             1.4942708 sec
RG                456.1
DW               45.600 usec
DE                6.50 usec
TE               296.2 K
D1            2.00000000 sec
d12           0.00002000 sec
D16           0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                14.80 usec
p2                29.60 usec
P12             2000.00 usec
PL0              120.00 dB
PL1               -1.40 dB
SFO1         500.1306502 MHz
SP1               35.19 dB
SPNAM1      Squa100.1000
SPOAL1           0.500
SPOFFS1           0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1         SINE.100
GPNAM2         SINE.100
GPZ1             31.00 %
GPZ2             11.00 %
P16            1000.00 usec

F2 - Processing parameters
SI                32768
SF           500.1300186 MHz
WDW                  EM
SSB                   0
LB                 0.10 Hz
GB                    0
PC                 1.00
```

10 9 8 7 6 5 4 3 2 1 0 ppm

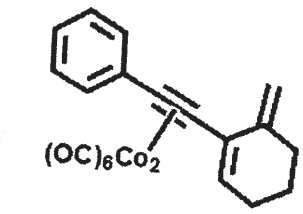
1.87 0.95 2.24 1.93 2.00 2.89 3.91

.iophene-3-CC-CyclohexeneOAc Co2(CO)6 13C
periment 4 Topspin ULtra 300
dnesday 14 September 2011



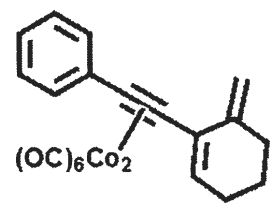
1p

Phenyl-CC-Cyclohexene Nicholas - Elimination Co2(CO)6
Thursday 23 September 2010
Topsin 500
Experiment 2



11b

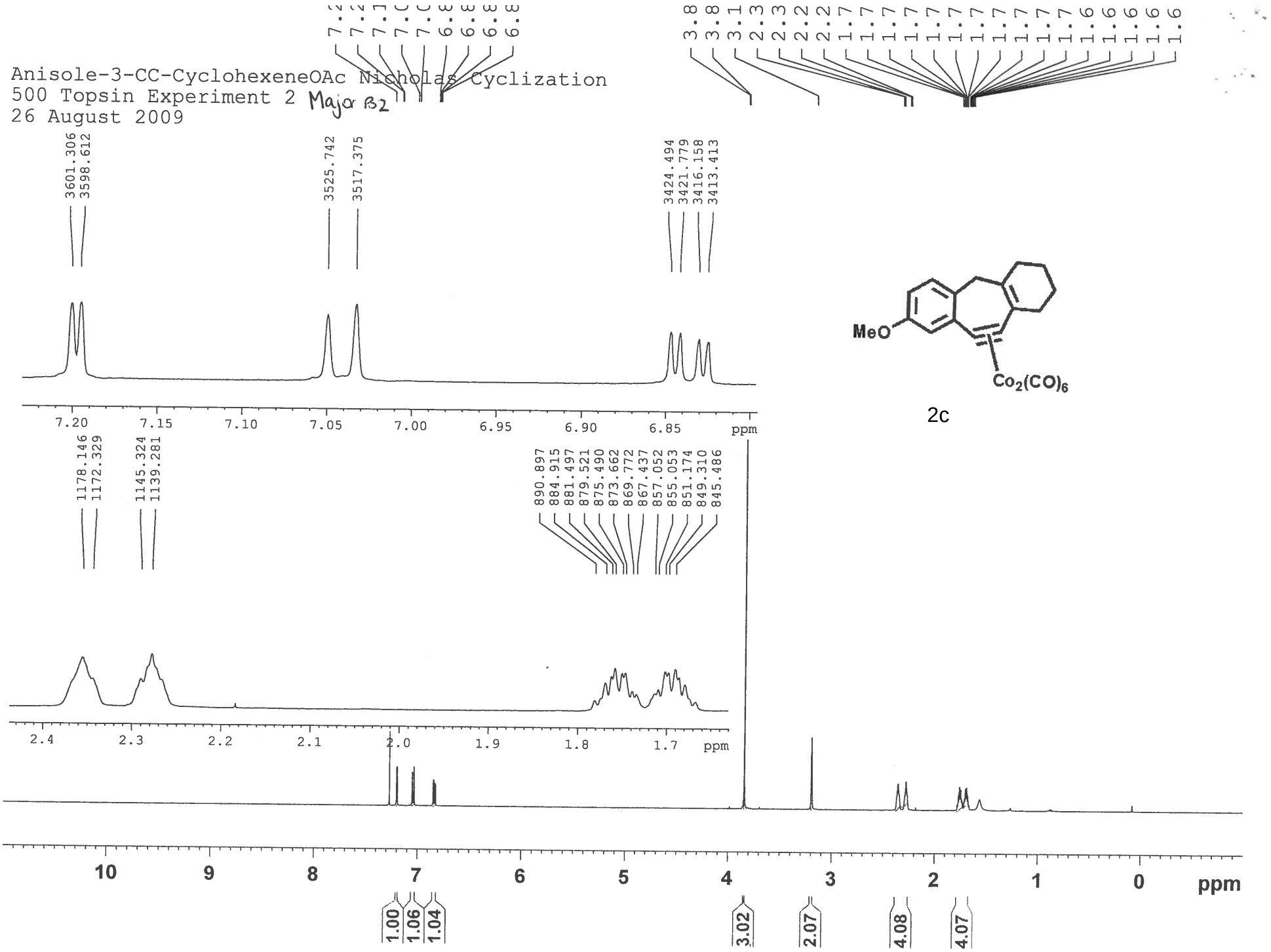
Phenyl-CC-Cyclohexene Nicholas - Elimination Co2(CO)6
Ultra 300
Thursday 23 September 2010
Experiment 2



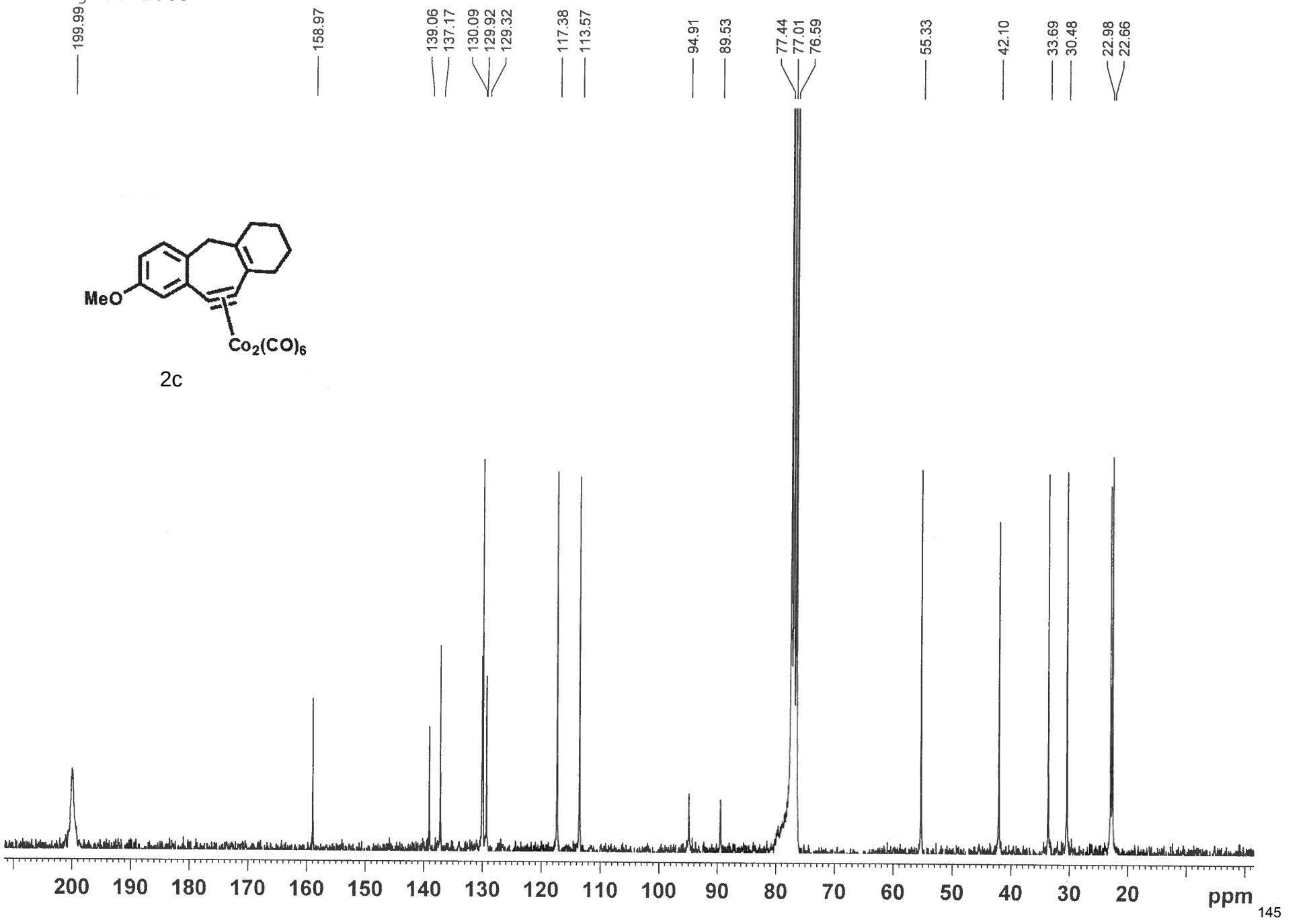
11b

RG 85

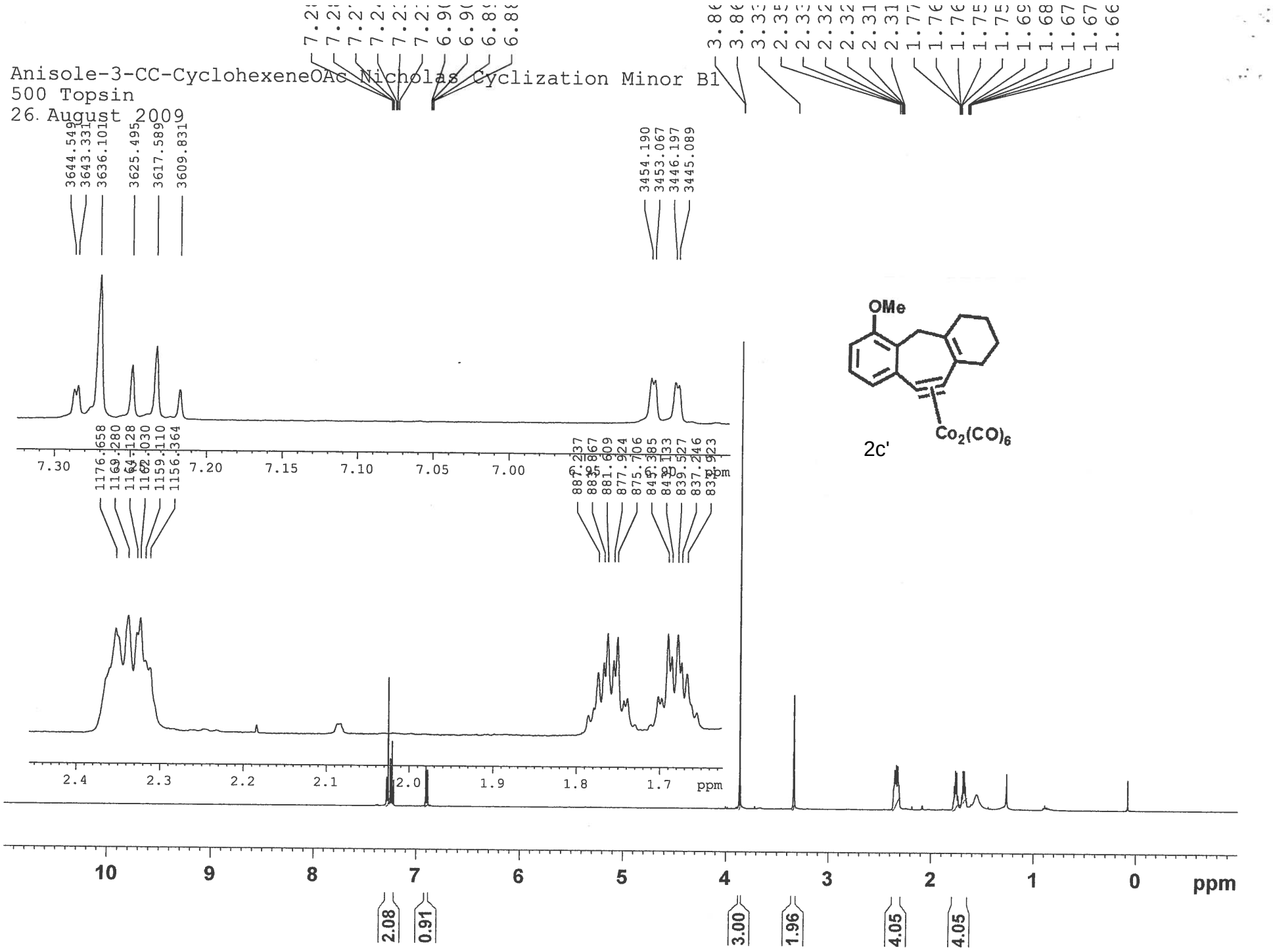
Anisole-3-CC-CyclohexeneOAc Nicholas Cyclization
500 Topsin Experiment 2 Major B2
26 August 2009



Anisole-3-CC-CyclohexeneOAc Cyclized Major B2 13C
300 Ultra Experiment 2
28 August 2009



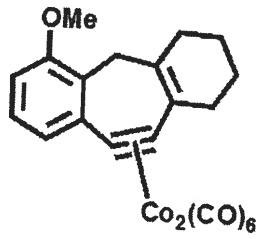
2c


Anisole-3-CC-CyclohexeneOAc Nicholas Cyclization Minor B1
500 Topsin
26. August 2009
OMe
$Co_2(CO)_6$
2c'
ppm
2.08
0.91
3.00
1.96
4.05
4.05

Anisole-3-CC-CyclohexeneOAc Cyclized Minor B1 13C
300 ULtra (in CDCl3)
29 August 2009

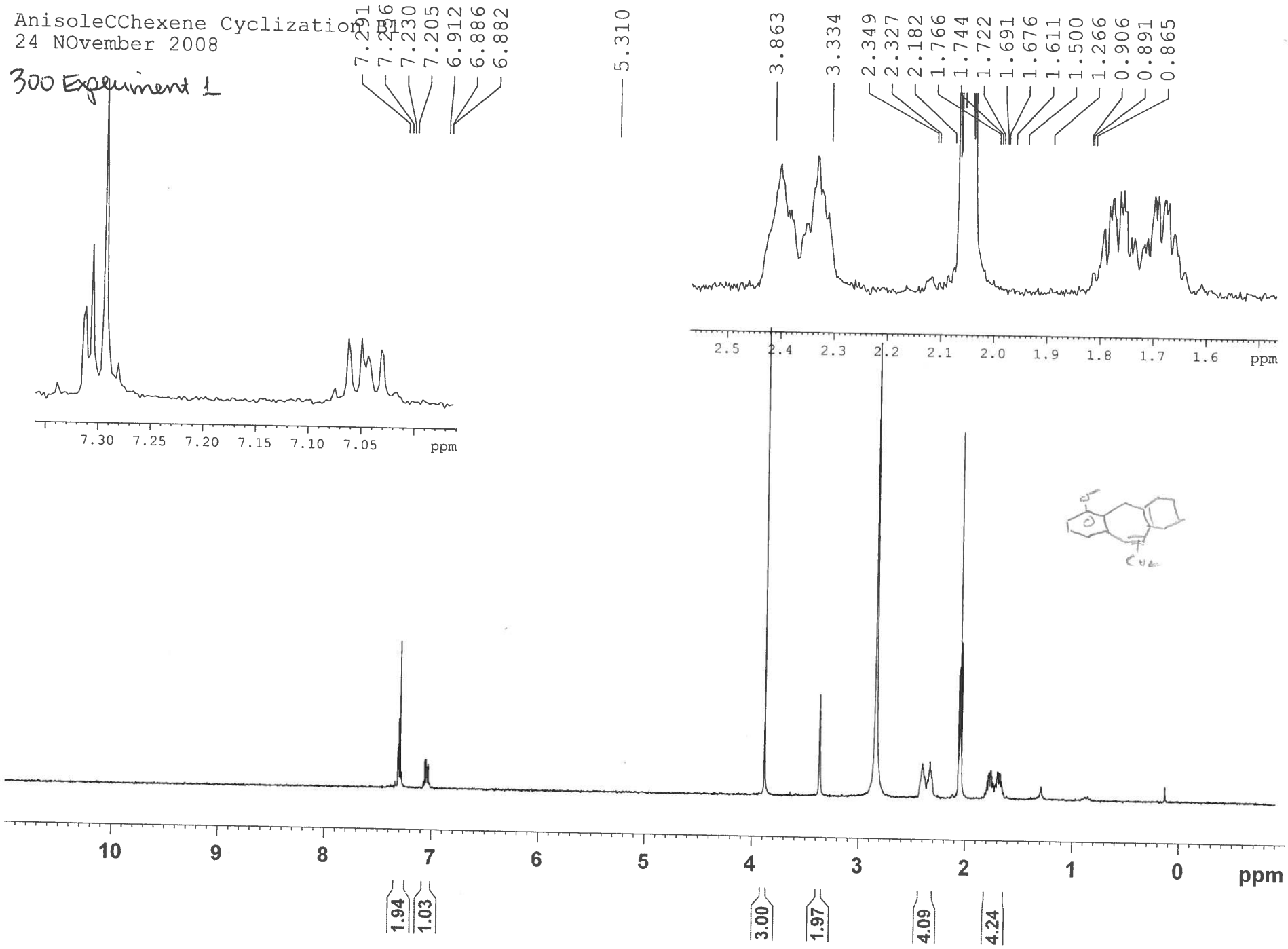
300.23

155.94
139.65
137.67
130.89
127.60
125.45
124.80
110.67
95.42
90.05
77.56
77.33
77.13
76.72
56.01
33.81
32.32
30.53
29.82
23.13
22.64

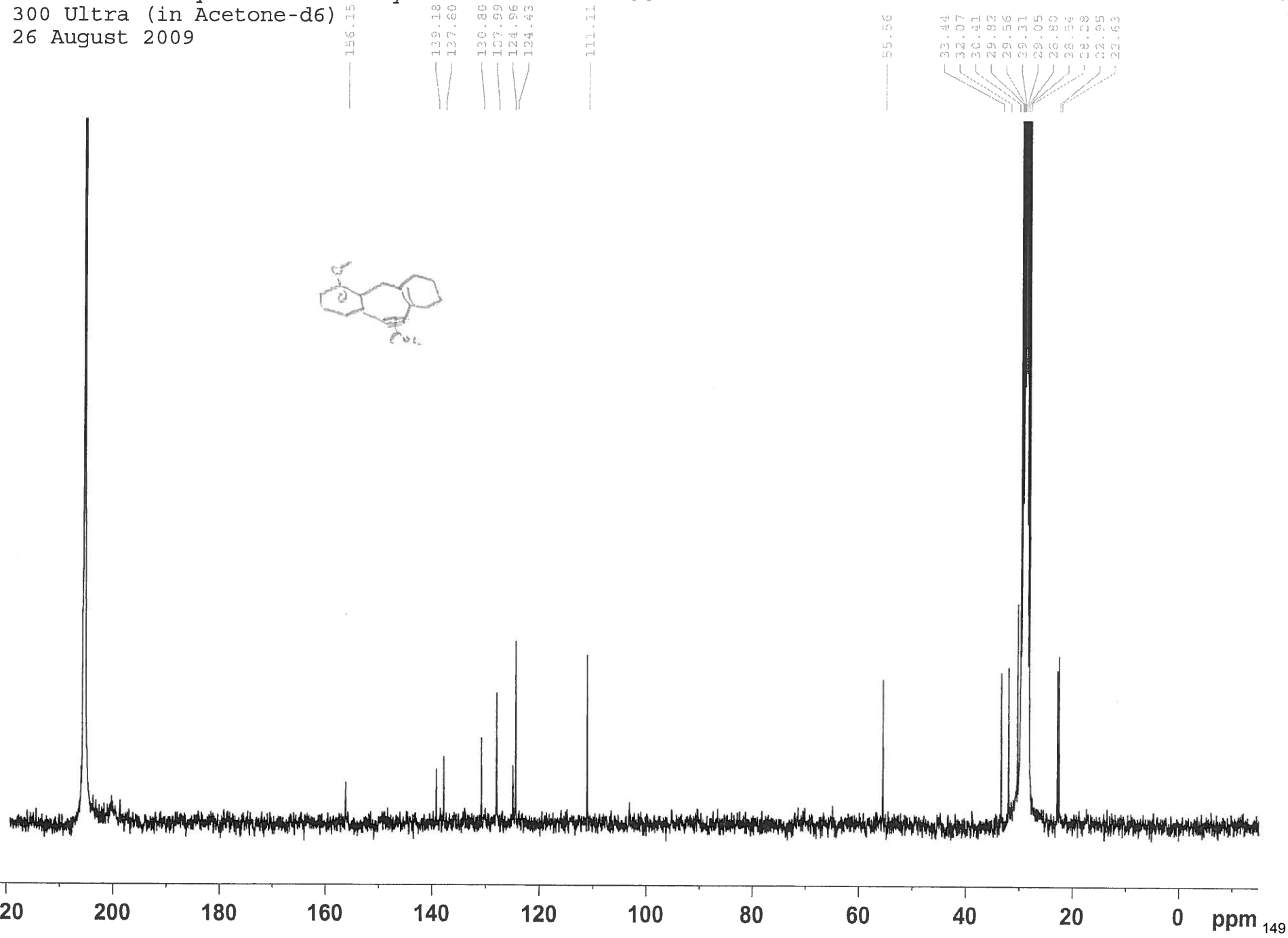


2c'

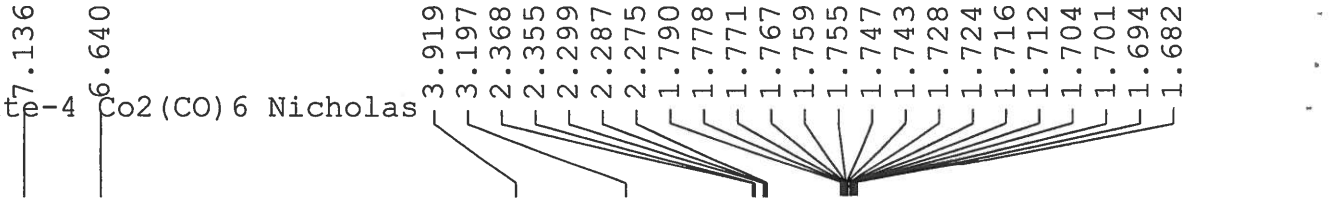
220 200 180 160 140 120 100 80 60 40 20 0 ppm

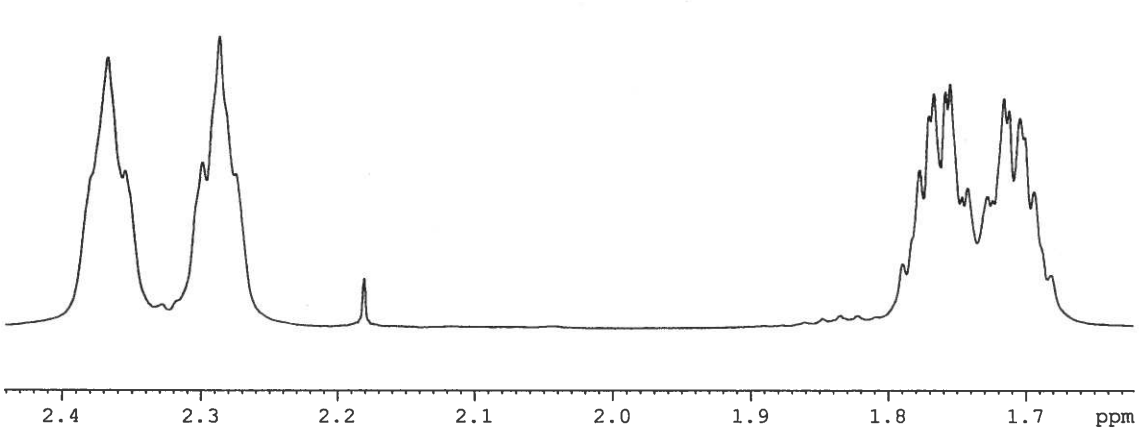

AnisoleCChexene Cyclization B1
24 NOvember 2008
300 Experiment 1
7.291
7.276
7.230
7.205
6.912
6.886
6.882
5.310
3.863
3.334
2.349
2.327
2.182
1.766
1.744
1.722
1.691
1.676
1.611
1.500
1.266
0.906
0.891
0.865
7.30 7.25 7.20 7.15 7.10 7.05 ppm
2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
1.94
1.03
3.00
1.97
4.09
4.24

Anisole-3-CC-CyclohexeneOAc Cyclized Minor-B1 13C
300 Ultra (in Acetone-d6)
26 August 2009



Dimethoxy-1,2-Cyclohexeneacetate-4 Co2(CO)6 Nicholas
Experiment 6 Topspin 500
Thursday 14 July 2011





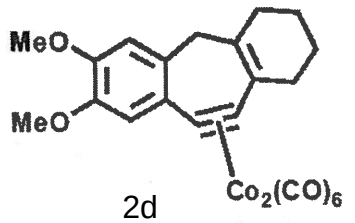
Current Data Parameters
NAME Dimethoxy-1,2-Cyclohexeneacetate-4 Co2(CO)6 Nicholas
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110714
Time 17.03
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 128
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305501 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

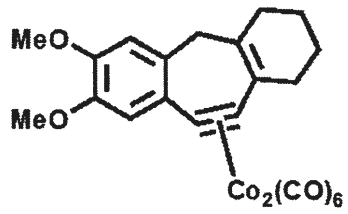
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300182 MHz
WDW EM
SSB 0
LB 0.50 Hz
GB 0
PC 1.00



2d

Dimethoxy-1,2-Cyclohexeneacetat-4 Co2(CO)6 Nicholas
Experiment 3 Topspin 500
Wednesday 09 February 2011



2d

Current Data Parameters
NAME Dimethoxy-1,2-Cyclohexeneacetate-4 Co2(CO)6 Nicholas
EXPNO 3
PROCNO 1

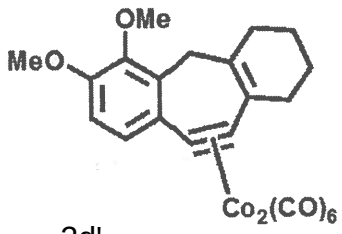
F2 - Acquisition Parameters
Date_ 20110209
Time 4.32
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 83
DS 4
SWH 62893.082 Hz
FIDRES 3.838689 Hz
AQ 0.1303107 sec
RG 1149.4
DW 7.950 usec
DE 6.50 usec
TE 293.2 K
D1 5.00000000 sec
d11 0.03000000 sec
DELTA 4.90000010 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 9.50 usec
PL1 -0.70 dB
SFO1 125.7577890 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 -1.20 dB
PL12 12.30 dB
PL13 15.30 dB
SFO2 500.1325010 MHz

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.40

Dimethoxy-1,2-CyclohexeneCyclized Minor
Experiment 2 Topspin 500 3.2
Thursday 11 April 2013



2d'

Current Data Parameters
NAME Dimethoxy-1,2-CyclohexeneCyclized Minor
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130411
Time 11.35
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 203.82
DW 45.333 usec
DE 6.50 usec
TE 293.6 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

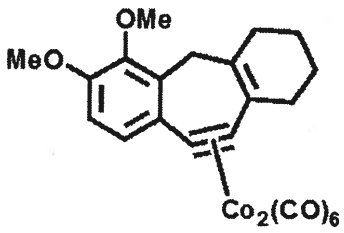
======== CHANNEL f1 ========
SFO1 500.1305751 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300077 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB
PC 1.00

Dimethoxy-1,2-CC-Cyclohexene-4-Cyclized Minor
Experiment 2
Topspin 300
Friday 12 April 2013

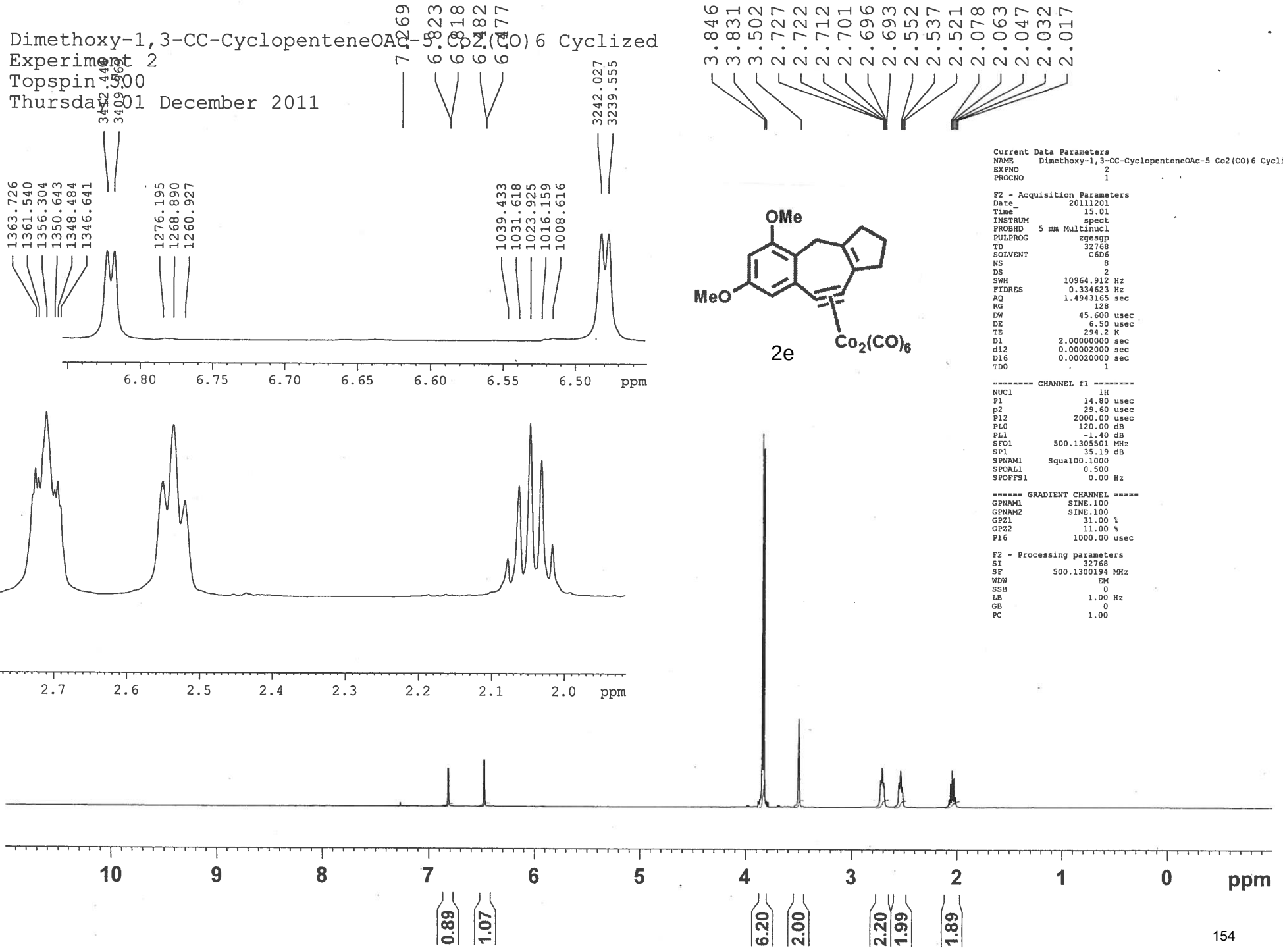
200.23
153.40
145.72
136.32
131.25
131.13
130.94
128.24
110.94
95.24
90.37
77.49
77.07
76.65
61.41
55.88
33.77
33.19
30.58
23.12
22.80



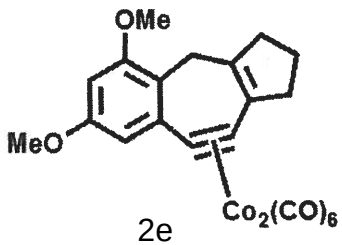
2d'

```
Current Data Parameters
NAME      Dimethoxy-1,2-CC-Cyclohexene-4 Cyclized Minor
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20110411
Time               12.23
INSTRUM            spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                30692
DS                    4
SWH           17985.611 Hz
FIDRES        0.548877 Hz
AQ            0.9110004 sec
RG                2896.3
DW               27.800 usec
DE                6.00 usec
TE                300.0 K
D1            1.20000005 sec
d11           0.03000000 sec
DELTA         1.10000002 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                14.00 usec
PL1                0.00 dB
SFO1          75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2             70.00 usec
PL2                0.00 dB
PL12              14.30 dB
PL13              19.31 dB
SFO2         300.2323000 MHz

F2 - Processing parameters
SI                32768
SF          75.4928917 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

200 180 160 140 120 100 80 60 40 20 0 -20 ppm

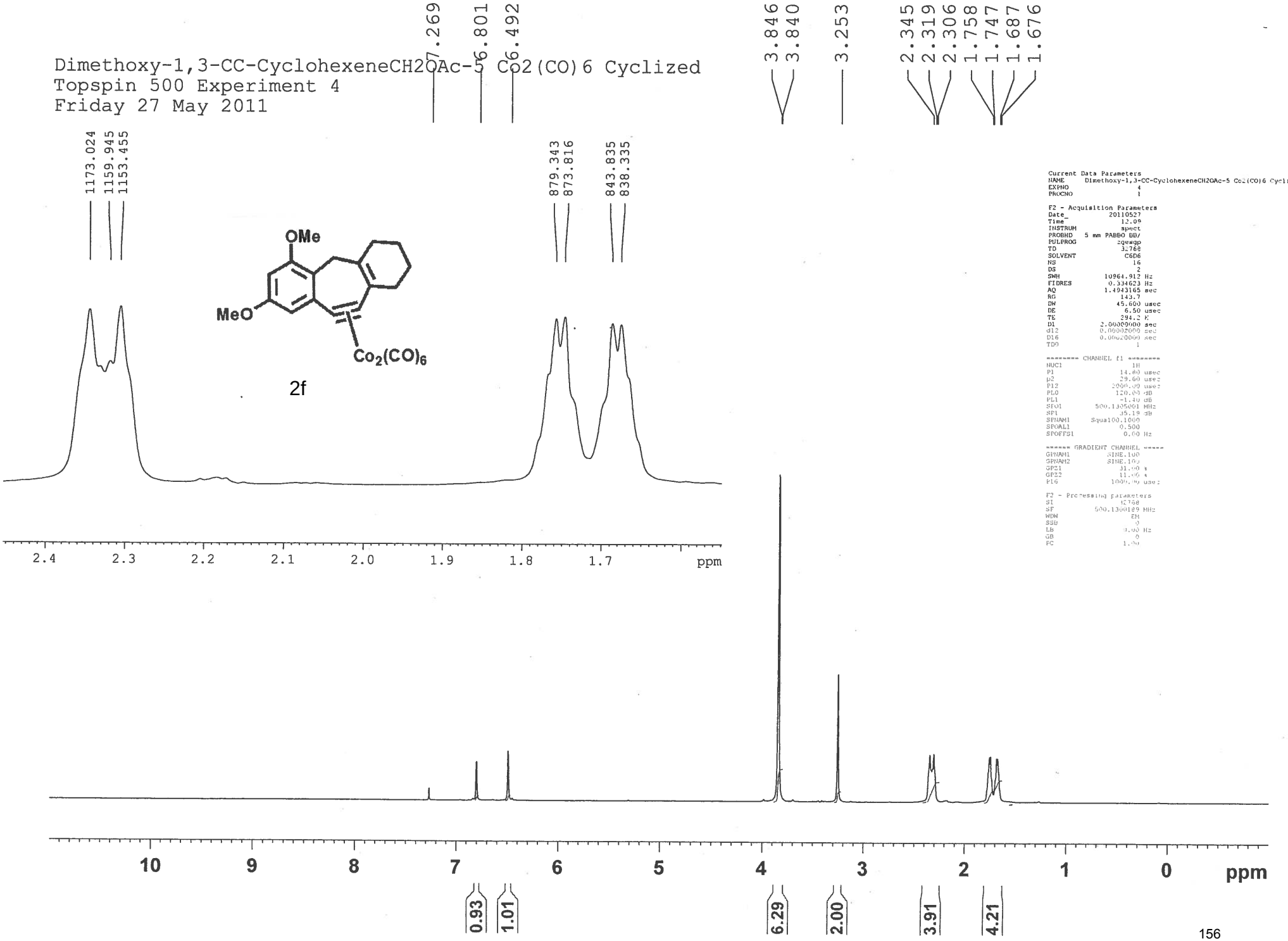

Dimethoxy-1,3-CC-CyclopenteneOAc-5 Co2(CO)6 Cyclized
Experiment 2
Topspin 3.00
Thursday 01 December 2011
7.269
6.823
6.818
6.482
6.477
3.846
3.831
3.502
2.727
2.722
2.712
2.701
2.696
2.693
2.552
2.537
2.521
2.078
2.063
2.047
2.032
2.017
3412.440
3409.566
3242.027
3239.555
1363.726
1361.540
1356.304
1350.643
1348.484
1346.641
1276.195
1268.890
1260.927
1039.433
1031.618
1023.925
1016.159
1008.616
OMe
MeO
Co2(CO)6
2e
Current Data Parameters
NAME Dimethoxy-1,3-CC-CyclopenteneOAc-5 Co2(CO)6 Cyclized
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20111201
Time 15.01
INSTRUM spect
PROBHD 5 mm Multinucl
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 128
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305501 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300194 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
6.80
6.75
6.70
6.65
6.60
6.55
6.50
ppm
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2.0
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
0.89
1.07
6.20
2.00
2.20
1.99
1.89

methoxy-1,3-CC-CyclopenteneOAc-5 Co2(CO)6 Cyclized 13C
periment 1 Topspin Ultra 300
nday 04 December 2011



2e

Dimethoxy-1,3-CC-CyclohexeneCH2OAc-5 Co2(CO)6 Cyclized
Topspin 500 Experiment 4
Friday 27 May 2011



Current Data Parameters
NAME Dimethoxy-1,3-CC-CyclohexeneCH2OAc-5 Co2(CO)6 Cycli
EXPNO 4
PROCNO 1

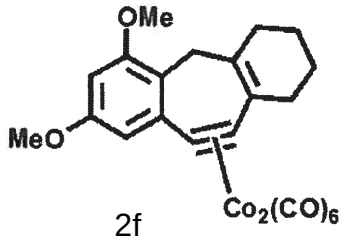
F2 - Acquisition Parameters
Date_ 20110527
Time 12.09
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpwgp
TD 32768
SOLVENT C6D6
NS 16
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 143.7
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305001 MHz
SF1 05.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.06 %
PL6 1000.00 usec

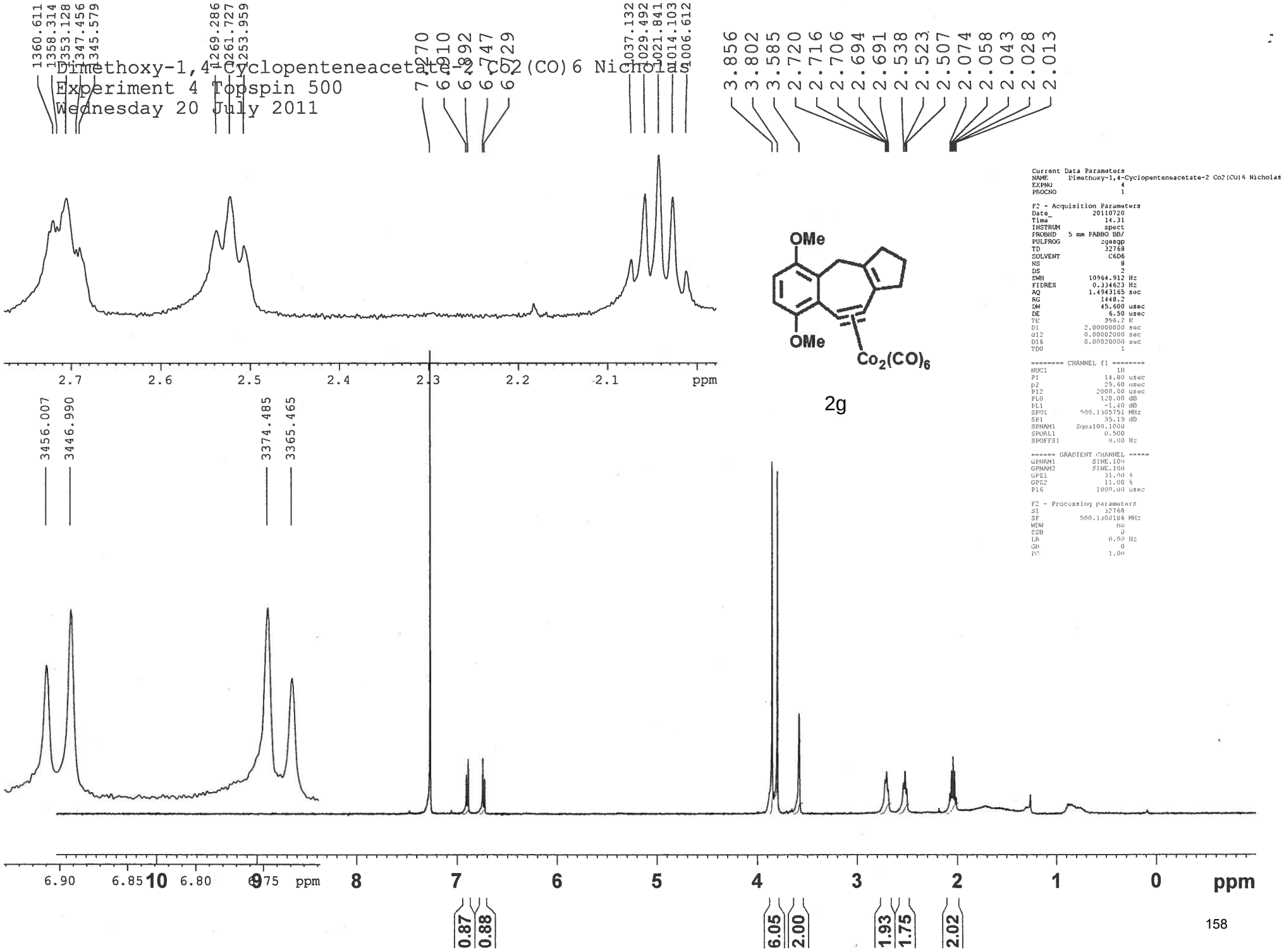
F2 - Processing parameters
SI 16768
SF 500.1300189 MHz
WDW EM
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

Dimethoxy-1,3-CC-CyclohexeneCH2OAc-5-Co2(CO)6 Cyclized
13C
Topspin 500 Experiment 5
Friday 27 May 2011



2f

Dimethoxy-1,4-Cyclopenteneacetate-2 Co2(CO)6 Nicholas
Experiment 4 Topspin 500
Wednesday 20 July 2011



Current Data Parameters
NAME Dimethoxy-1,4-Cyclopenteneacetate-2 Co2(CO)6 Nicholas
EXPNO 4
PROCNO 1

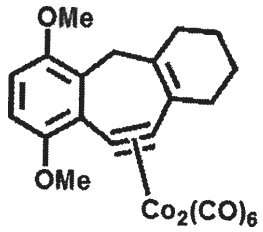
F2 - Acquisition Parameters
Date_ 20110720
Time 14.31
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 1448.2
DW 45.600 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305751 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

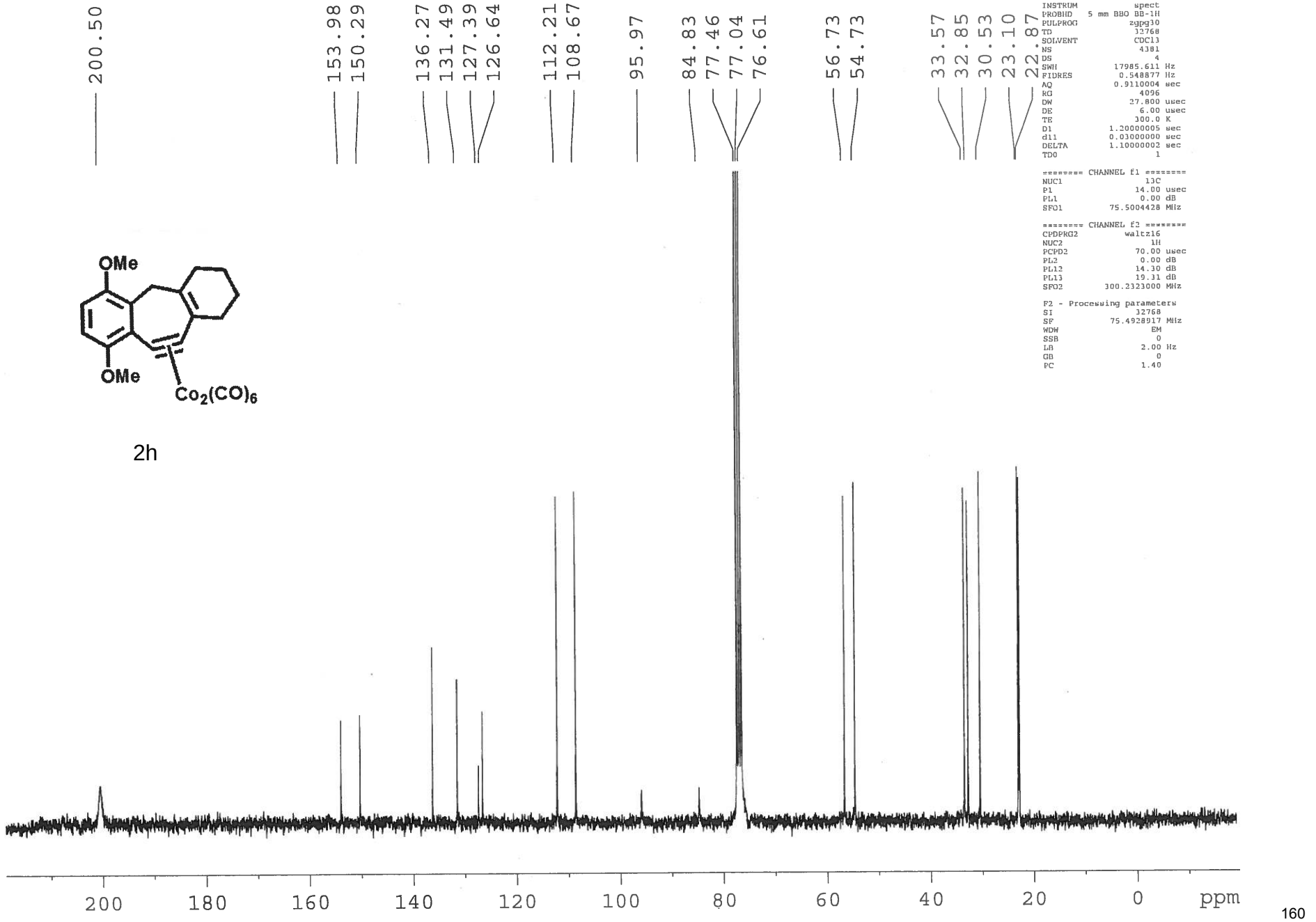
F2 - Processing parameters
SI 32768
SF 500.1300186 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00

Dimethoxy-1,4-CyclohexeneCyclized
Experiment 2 Topspin 500 V3.2
Tuesday 27 August 2013



2h

Dimethoxy-1,4-CyclohexeneOAc-2 Nicholas 13C
Experiment 2 Topspin 300
Tuesday 03 September 2013



2h

Current Data Parameters
NAME Dimethoxy-1,4-CyclohexeneOAc-2 Nicholas 13C
EXPNO 2
PROCNO 1

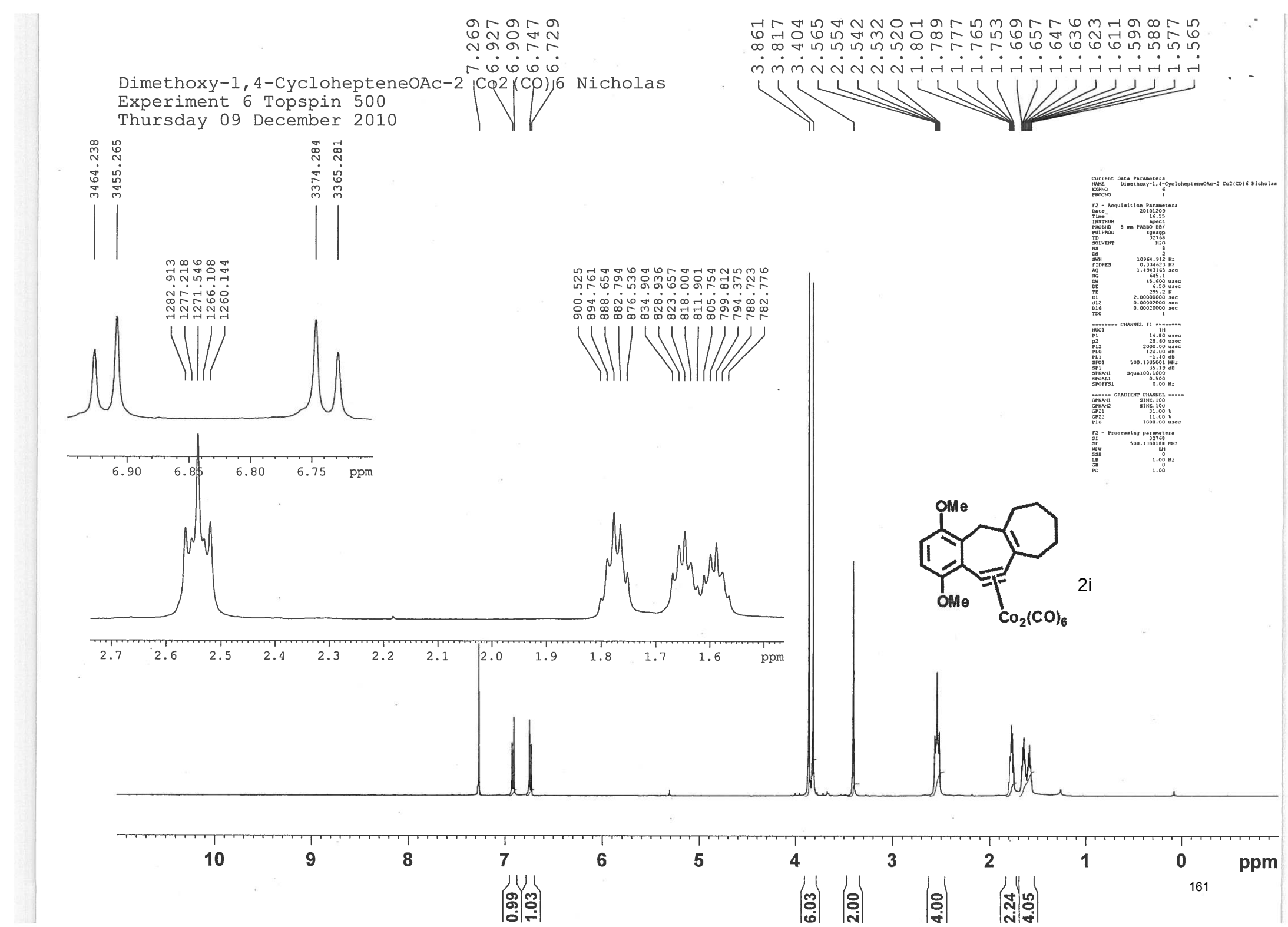
F2 - Acquisition Parameters
Date_ 20130903
Time 22.01
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 4381
DS 4
SWH 17985.611 Hz
FIDRES 0.548877 Hz
AQ 0.9110004 sec
RG 4096
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.20000005 sec
d11 0.03000000 sec
DELTA 1.10000002 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 14.00 usec
PL1 0.00 dB
SFO1 75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 14.30 dB
PL13 19.31 dB
SFO2 300.2323000 MHz

F2 - Processing parameters
SI 32768
SF 75.4928917 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40

Dimethoxy-1,4-CycloheptenеOAc-2 Co2(CO)6 Nicholas
Experiment 6 Topspin 500
Thursday 09 December 2010



Current Data Parameters
NAME Dimethoxy-1,4-CycloheptenеOAc-2 Co2(CO)6 Nicholas
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20101209
Time 16.55
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 645.1
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

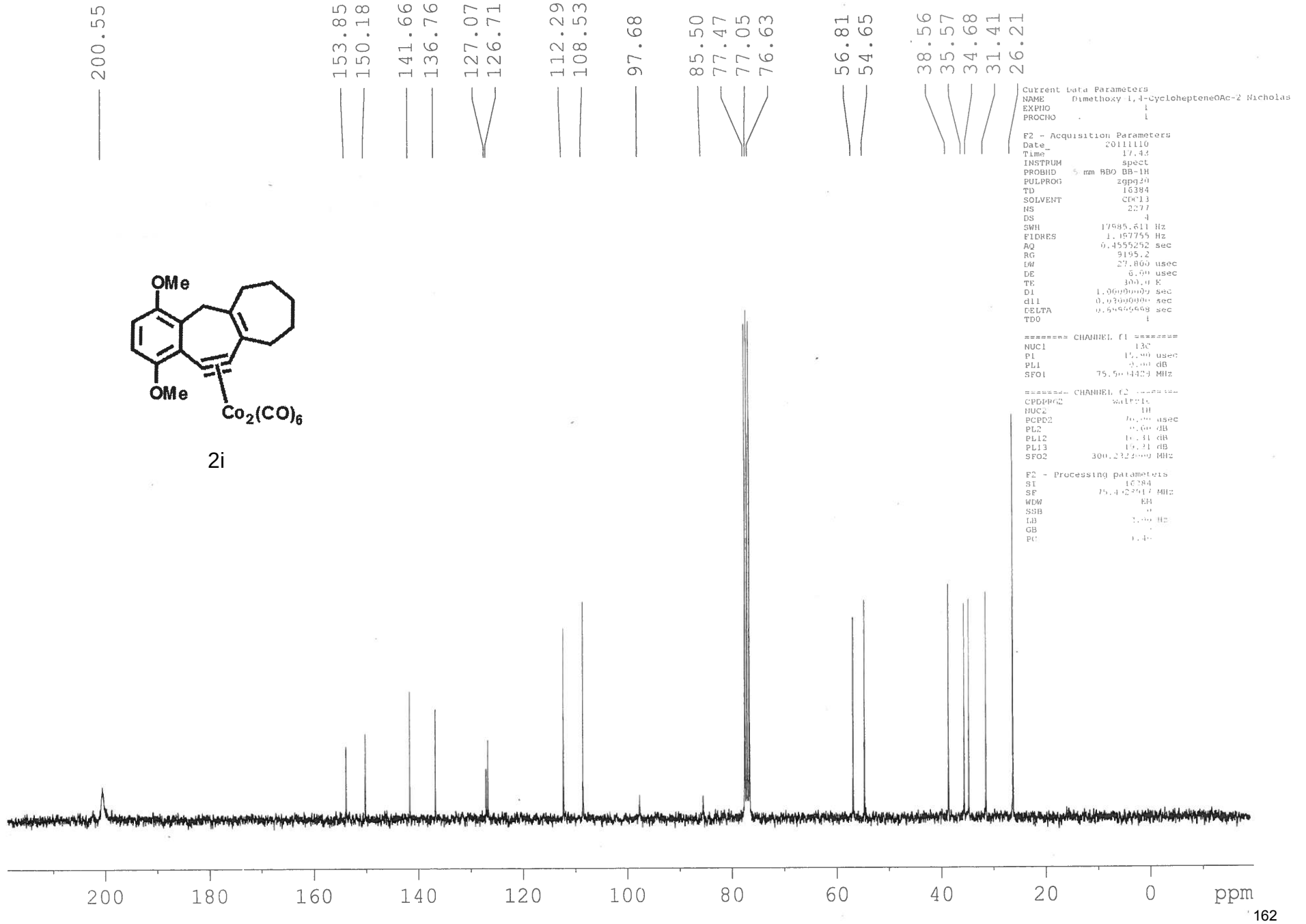
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305001 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPVAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300188 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00

2i

Dimethoxy-1,4-CycloheptenеOAc-2 Nicholas
Experiment 1 300
Thursday 10 November 2011



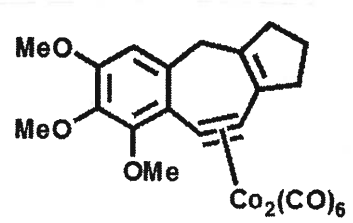
Trimethoxy-4-CC-CyclopenteneOAc Co2(CO)6
Topspin 500 Experiment 4 V3.2
Thursday 04 July 2013

7.270 6.417

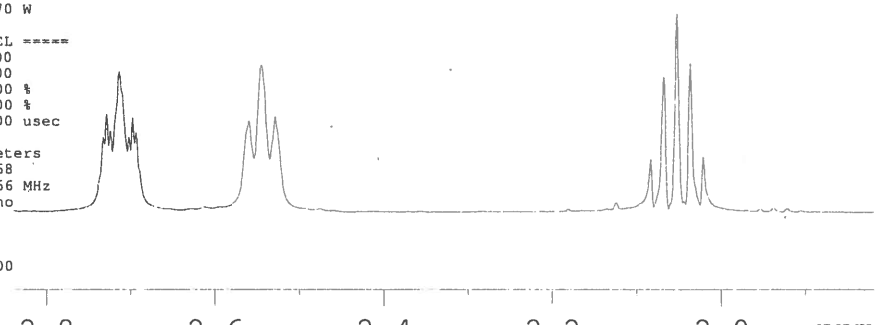
4.054 3.886 3.845 3.406 2.728 2.713 2.697 2.559 2.544 2.528 2.083 2.067 2.052 2.036 2.021

```
Current Data Parameters
NAME      Trimethoxy-4-CC-CyclopenteneOAc Co2(CO)6 Nicholas
EXPNO                 4
PROCNO                1

F2 - Acquisition Parameters
Date_           20130704
Time               16.57
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG         zgesgp
TD              32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            11029.412 Hz
FIDRES         0.336591 Hz
AQ             1.4854827 sec
RG                82.19
DW              45.333 usec
DE                6.50 usec
TE               295.4 K
D1           1.00000000 sec
D12          0.00002000 sec
D16          0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1300000 MHz
NUC1                 1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0      0 W
PLW1        12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1             0.500
SPOFFS1   0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1               31.00 %
GPZ2               11.00 %
P16              1000.00 usec

F2 - Processing parameters
SI                 32768
SF          500.1300066 MHz
WDW                   no
SSB       0
LB        0 Hz
GB        0
PC                  1.00
```

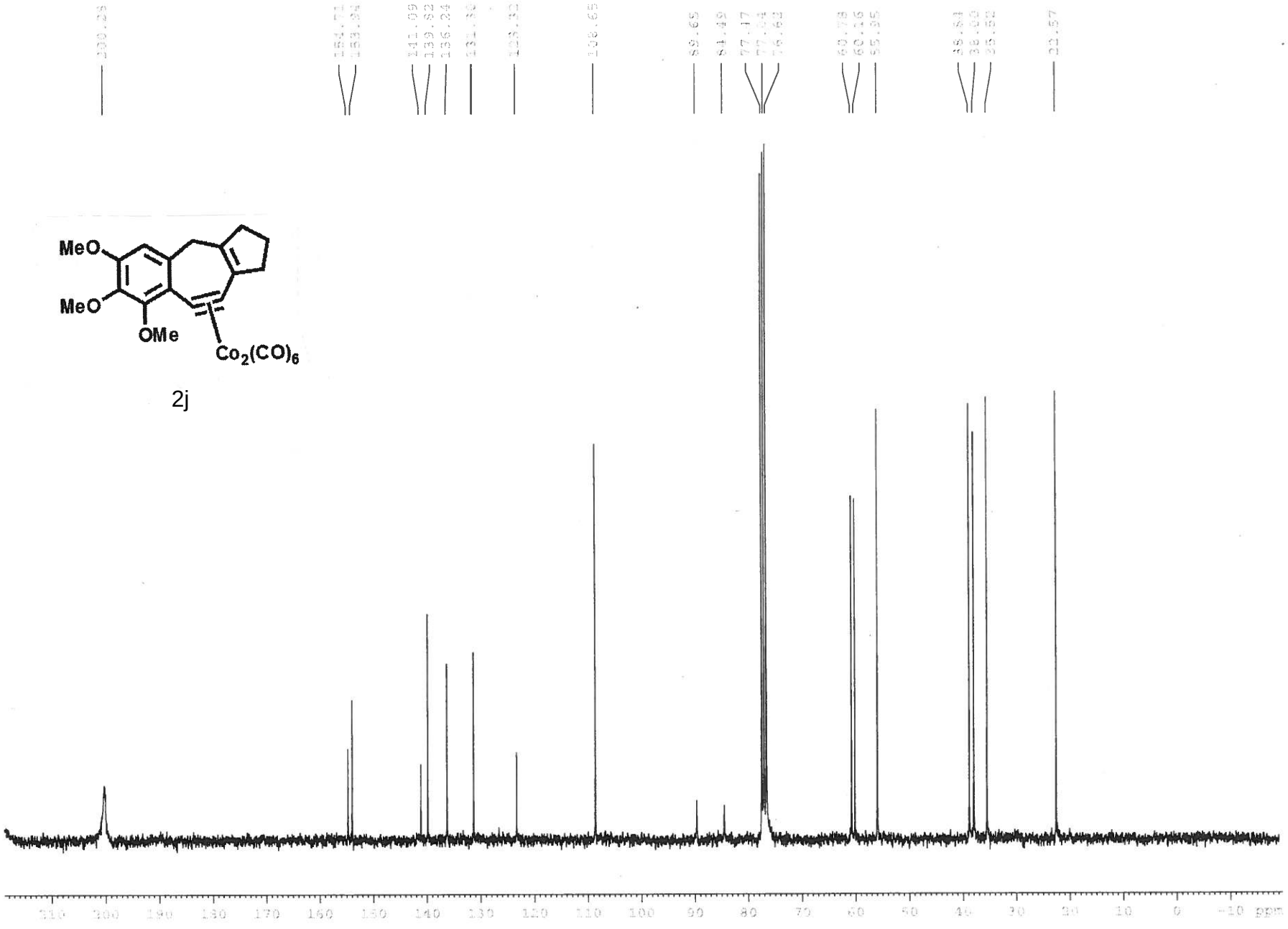
1364.55 1356.90 1349.05 1279.83 1272.33 1264.33 1041.82 1033.97 1026.27 1018.41 1010.86



2j



Trimethoxy-4-CC-CyclopenteneOAc Co2(CO)6 Cyclized 13C
Experiment 1 Topspin 300
Thursday 04 July 2013



Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6 Nicholas
Experiment 5
Topspin 500 V3.2
Thursday 11 July 2013

Current Data Parameters
NAME Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6 Nicholas
EXPNO 5
PROCNO 1

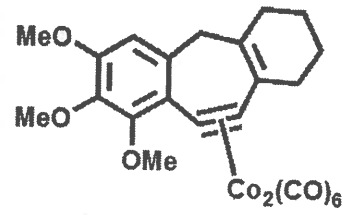
F2 - Acquisition Parameters
Date_ 20130711
Time 20.58
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 70.71
DW 45.333 usec
DE 6.50 usec
TE 294.2 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1306002 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300066 MHz
WDW EM
SSB 0
LB -0.80 Hz
GB 0
PC 1.00

7.269
6.478
4.045
3.900
3.852
3.177
2.347
2.334
2.289
2.277
1.783
1.770
1.759
1.751
1.748
1.739
1.735
1.710
1.702
1.691
1.680
1.668
1173.61
1167.30
1144.75
1138.60
891.48
885.23
879.93
875.48
874.13
869.93
867.53
855.12
851.17
845.67



2k

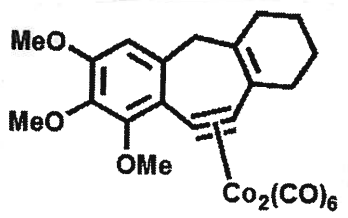
2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 ppm

11 10 9 8 7 6 5 4 3 2 1 0 ppm

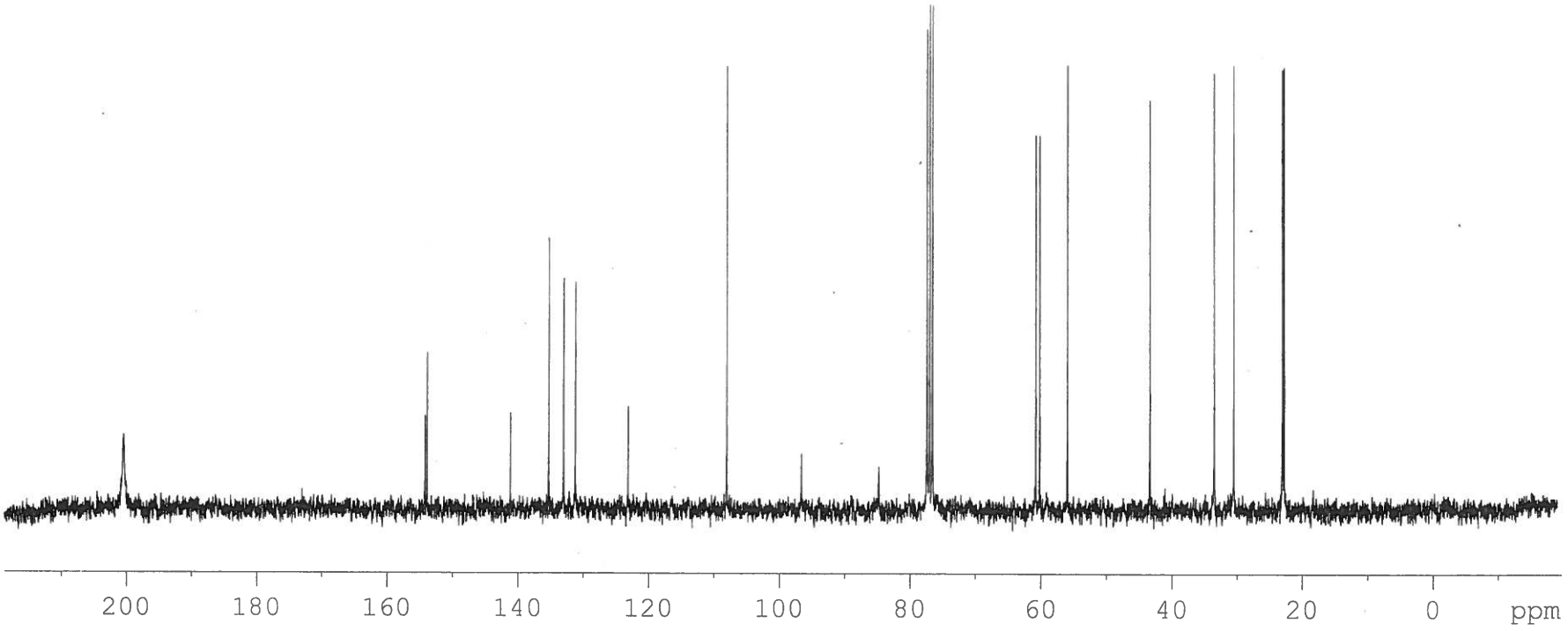
1.00 2.91 3.19 2.97 2.24 1.83 1.85 3.93

Trimethoxy-4-CC-CyclohexeneOAc Co2(CO)6 Cyclized 13C
Experiment 1 Topspin 300
Monday 08 July 2013

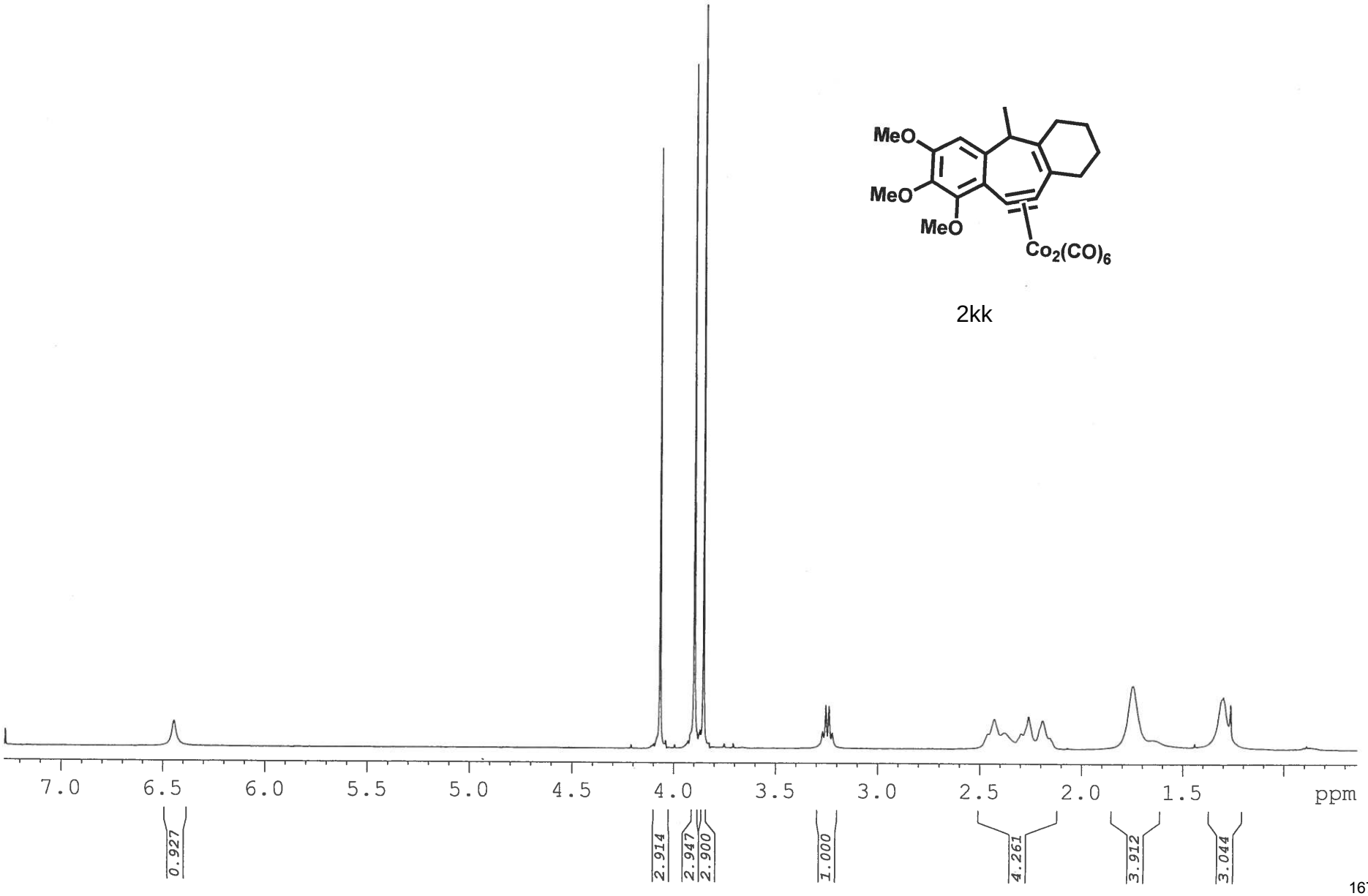
200.46
154.26
153.94
141.20
135.34
133.07
131.28
123.19
108.11
96.66
84.79
77.47
77.05
76.63
60.82
60.22
55.99
43.41
33.56
30.56
23.07
22.79



2k



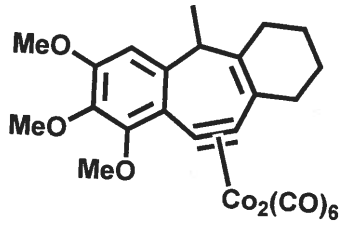
Trimethoxy-4-CC-CyclohexeneMeOAc Co2(CO)6 Nicholas
Experiment 2 Topspin 500 V3.2



2kk

carbon
standard 1D 13C experiment
DPX300

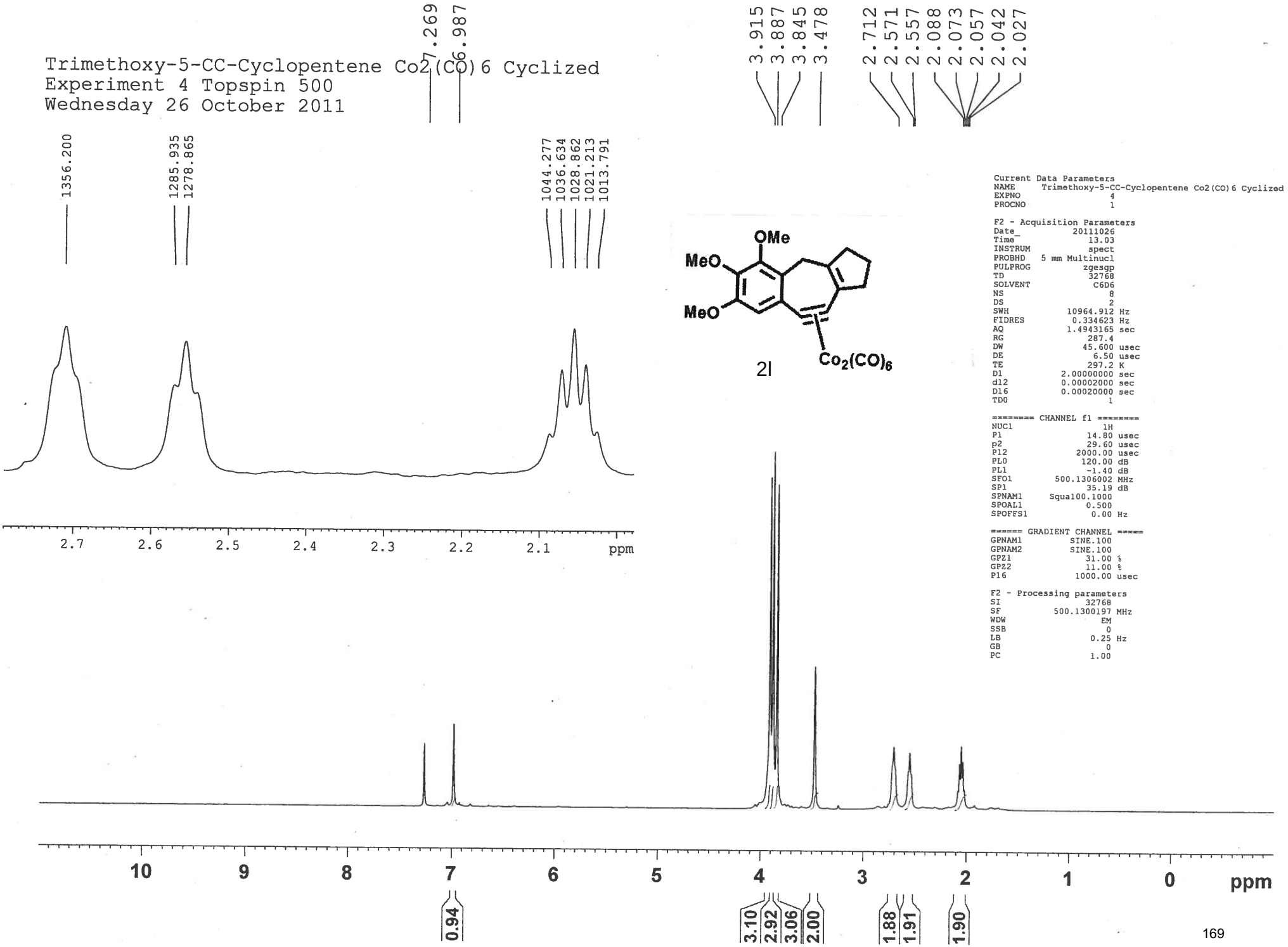
200.55
154.51
154.31
140.68
139.07
137.67
129.33
121.90
106.52
95.32
83.83
77.46
77.04
76.62
60.82
60.11
55.95
47.45
31.03
23.21
22.81
19.51



2kk

200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

Trimethoxy-5-CC-Cyclopentene Co2(CO)6 Cyclized
Experiment 4 Topspin 500
Wednesday 26 October 2011



Current Data Parameters

NAME	Trimethoxy-5-CC-Cyclopentene Co2(CO)6 Cyclized
EXPNO	4
PROCNO	1

F2 - Acquisition Parameters

Date_	20111026
Time	13.03
INSTRUM	spect
PROBHD	5 mm Multinucl
PULPROG	zgesgp
TD	32768
SOLVENT	C6D6
NS	8
DS	2
SWH	10964.912 Hz
FIDRES	0.334623 Hz
AQ	1.4943165 sec
RG	287.4
DW	45.600 usec
DE	6.50 usec
TE	297.2 K
D1	2.00000000 sec
d12	0.00002000 sec
D16	0.00020000 sec
TD0	1

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

NUC1	1H
P1	14.80 usec
p2	29.60 usec
P12	2000.00 usec
PL0	120.00 dB
PL1	-1.40 dB
SFO1	500.1306002 MHz
SP1	35.19 dB
SPNAM1	Squa100.1000
SPOAL1	0.500
SPOFFS1	0.00 Hz

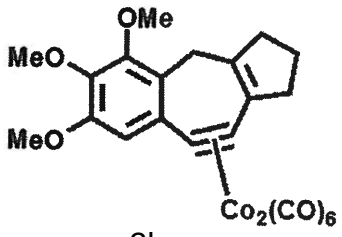
====== GRADIENT CHANNEL =====

GPNAM1	SINE.100
GPNAM2	SINE.100
GPZ1	31.00 %
GPZ2	11.00 %
P16	1000.00 usec

F2 - Processing parameters

SI	32768
SF	500.1300197 MHz
WDW	EM
SSB	0
LB	0.25 Hz
GB	0
PC	1.00

imethoxy-5-CC-CyclopenteneOAc Co2(CO)6 Cyclized 13C
periment 3 Ultra 300 Topspin
ursday 27 October 2011



2l

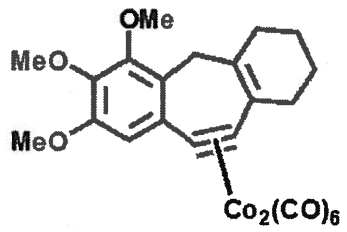
Trimethoxy-5-CC-CyclohexeneOAc Cyclized
Experiment 4 Topspin 500
Wednesday 12 October 2011

7.269
6.981

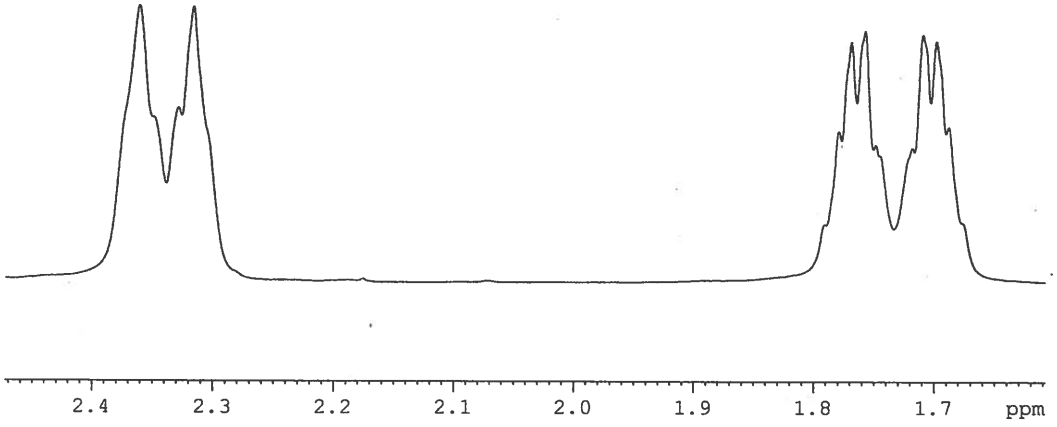
3.921
3.894
3.880
3.251
2.361
2.329
2.316
1.780
1.770
1.758
1.749
1.719
1.710
1.699
1.689

1180.778
1164.625
1158.449

890.173
885.030
879.309
874.921
859.664
855.319
849.718
844.628



2m



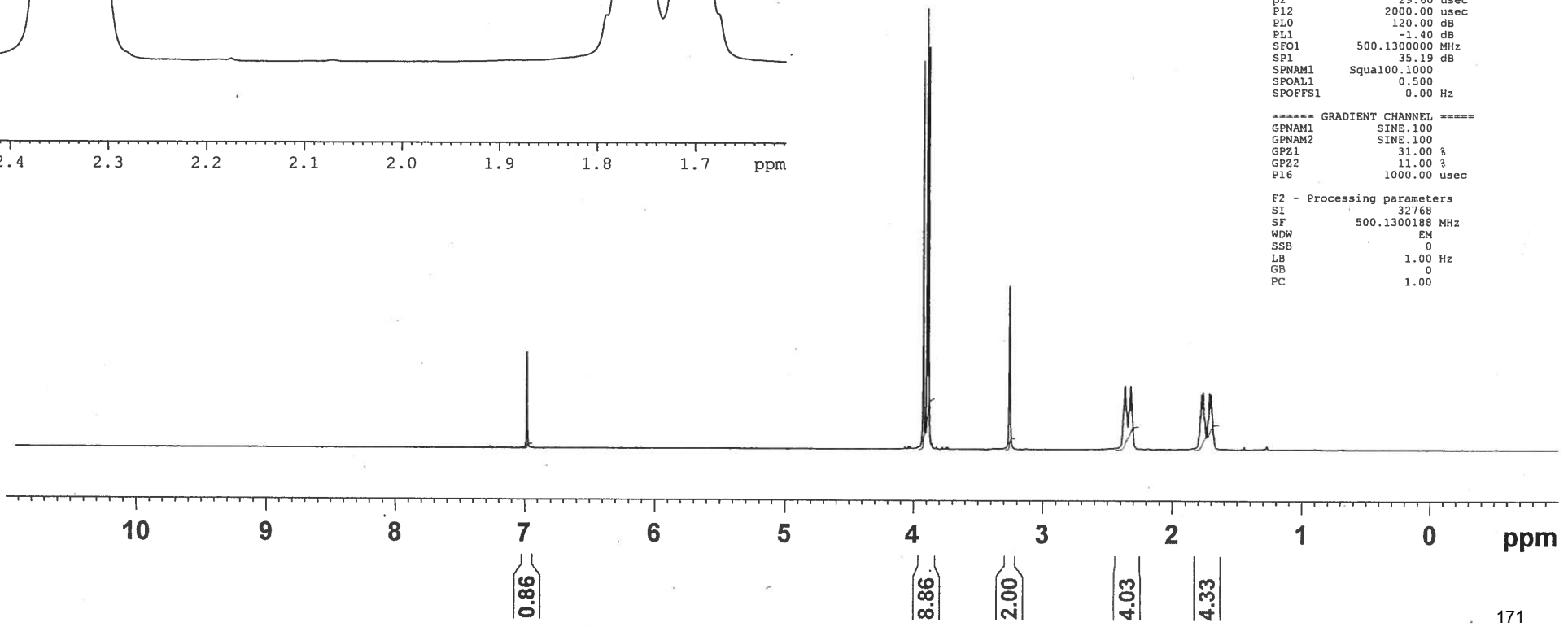
Current Data Parameters
NAME Trimethoxy-5-CC-CyclohexeneOAc Cyclized
EXPNO 4
PROCNO 1

F2 - Acquisition Parameters
Date_ 20111012
Time 13.04
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 35.9
DW 45.600 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

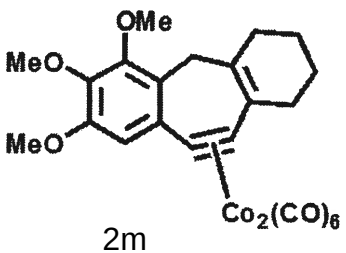
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1300000 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300188 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00



:imethoxy-5-CC-CyclohexeneOAc Nicholas 13C
:periment 1 Topspin Ultra 300
:dnesday 12 October 2011



2m

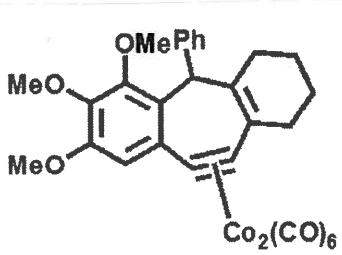
Trimethoxy-5-CC-CyclohexeneOAc-Ph Cyclized
Topspin 500 Experiment 6
Wednesday 28 September 2011

7.170 7.153 7.138 7.123 7.088 7.067 7.053 6.906 6.891

5.322

3.980 3.921 3.867 2.679 2.641 2.569 2.530 2.479 2.463 2.408 2.369 1.942 1.932 1.876 1.864 1.858 1.847 1.758 1.738 1.726 1.721 1.709

3577.556 3569.958 3562.404 3544.987 3534.412 3527.510 3453.983 3446.356



2mm

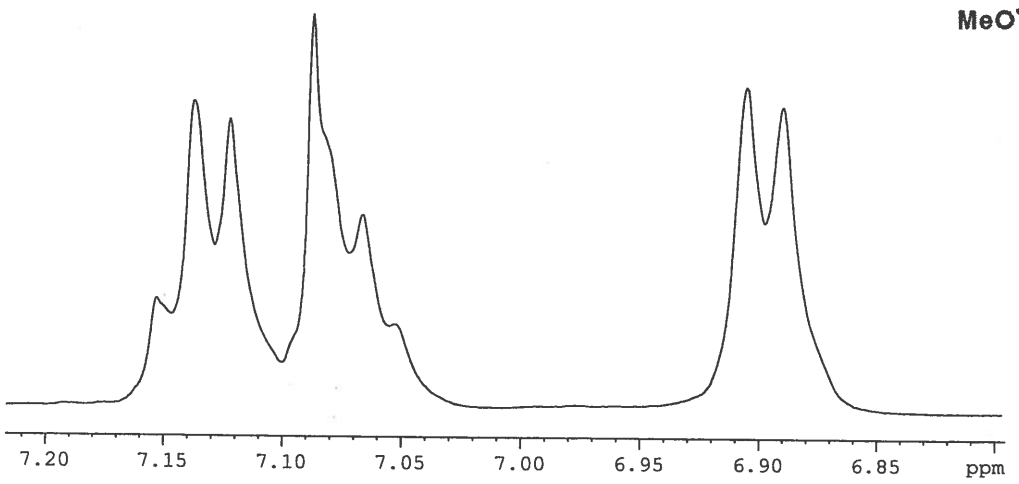
Current Data Parameters
NAME Trimethoxy-5-CC-CyclohexeneOAc-Ph Cyclized
EXPNO 6
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110928
Time 17.37
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 101.6
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

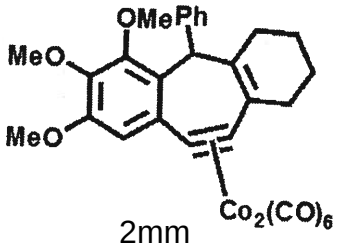
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305001 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300196 MHz
WDW EM
SSB 0
LB -0.10 Hz
GB 0
PC 1.00



imethoxy-5-CC-CyclohexeneOAc Nicholas 13C
periment 3 Topspin Ultra 300
ursday 29 September 2011



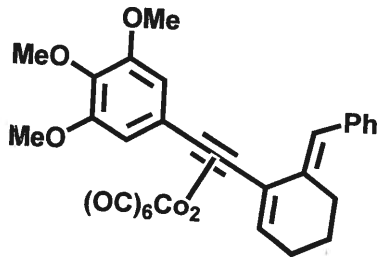
2mm

NAME	Trimethoxy-5-CC-CyclohexeneOAc Nicholas 13C
EXPNO	3
PROCNO	1
Date_	20110929
Time	12.12
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	1575
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.1 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40

Trimethoxy-5-CC-CyclohexeneOAc-Ph CyclizedElim
Experiment 2 Topspin 500
Tuesday 06 September 2011

7.271 7.256 7.240 7.177 7.163 7.148 7.035 7.019 6.824 6.675 6.666 6.657 6.488

3.910 3.811 2.779 2.767 2.754 2.434 2.423 2.412 2.400 1.838 1.825 1.813 1.800 1.787



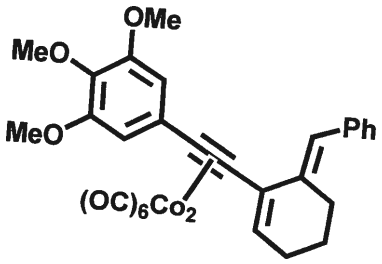
11mm

```
Current Data Parameters
NAME      Trimethoxy-5-CC-CyclohexeneOAc-Ph CyclizedElim
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20110906
Time              14.48
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgesgp
TD              32768
SOLVENT           C6D6
NS                    8
DS                    2
SWH           10964.912 Hz
FIDRES        0.334623 Hz
AQ            1.4943165 sec
RG                 45.3
DW               45.600 usec
DE                6.50 usec
TE                294.2 K
D1           2.00000000 sec
d12          0.00002000 sec
D16          0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                  1H
P1                14.80 usec
p2                29.60 usec
P12             2000.00 usec
PL0              120.00 dB
PL1               -1.40 dB
SFO1         500.1305001 MHz
SP1               35.19 dB
SPNAM1      Squa100.1000
SPOAL1           0.500
SPOFFS1           0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1          SINE.100
GPNAM2          SINE.100
GPZ1              31.00 %
GPZ2              11.00 %
P16             1000.00 usec

F2 - Processing parameters
SI                32768
SF          500.1300163 MHz
WDW                  EM
SSB                   0
LB                 0.25 Hz
GB                    0
PC                 1.00
```

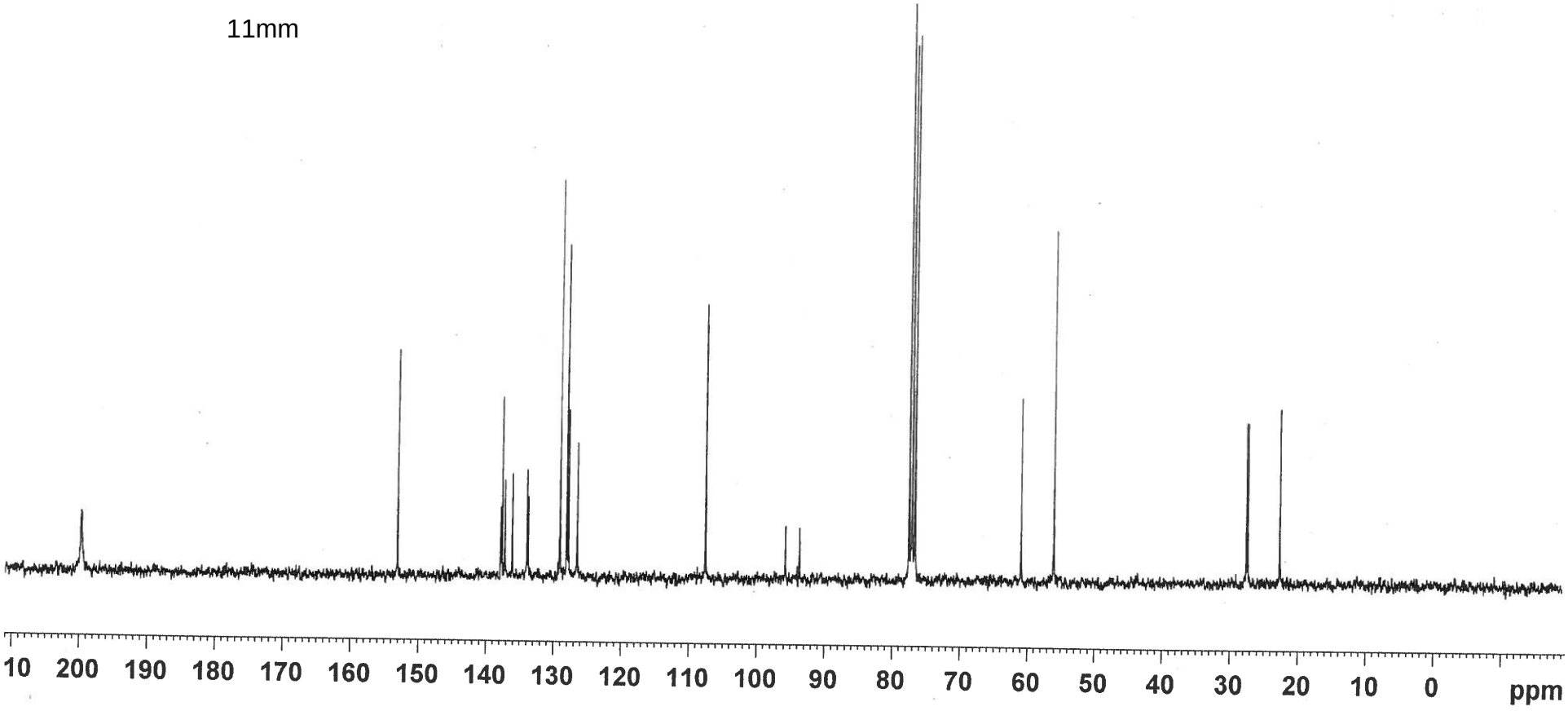
10 9 8 7 6 5 4 3 2 1 0 ppm

1.93 1.03 2.15 2.09 1.05 1.15 2.90 6.10 2.00 1.74 1.88

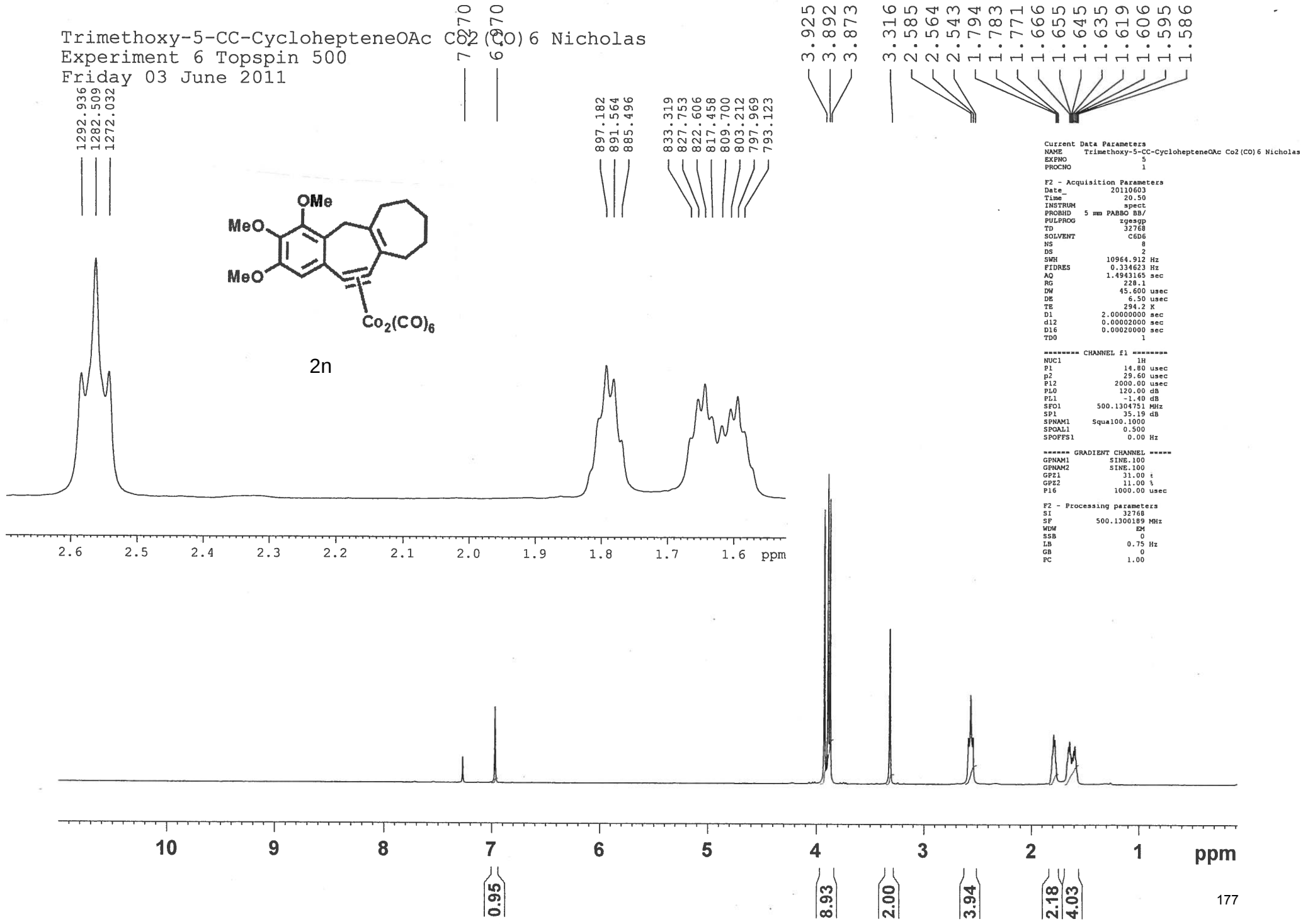
:imethoxy-5-CC-CyclohexeneOAc-Ph CyclizedElim 13C
<periment 5 Topspin Ultra 300
iursday 08 September 2011



11mm



Trimethoxy-5-CC-CycloheptenеOAc Co2(CO)6 Nicholas
Experiment 6 Topspin 500
Friday 03 June 2011



Current Data Parameters
NAME Trimethoxy-5-CC-CycloheptenеOAc Co2(CO)6 Nicholas
EXPNO 5
PROCNO 1

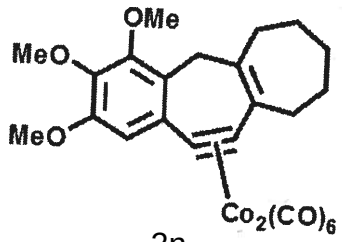
F2 - Acquisition Parameters
Date_ 20110603
Time 20.50
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 228.1
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1304751 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300189 MHz
WDW EM
SSB 0
LB 0.75 Hz
GB 0
PC 1.00

imethoxy-5-CC-CycloheptеneOAc Co2(CO)6 Cyclized 13C
periment 2 Topspin ULtra 300
esday 13 June 2011

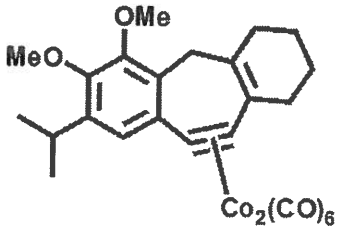


2n

```
NAME          Trimethoxy-5-CC-CycloheptеneOAc Co2(CO)6 Cyclized 13C
EXPNO                       2
PROCNO                      1
Date_              20110614
Time                   17.01
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG                zgpg30
TD                      16384
SOLVENT                CDCl3
NS                      22897
DS                          4
SWH               17985.611 Hz
FIDRES             1.097755 Hz
AQ                 0.4555252 sec
RG                   20642.5
DW                    27.800 usec
DE                     6.00 usec
TE                    294.5 K
D1                 1.00000000 sec
D11                0.03000000 sec
TD0                         1

======== CHANNEL f1 ========
NUC1                      13C
P1                      11.25 usec
PL1                      0.00 dB
SFO1              75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2                waltz16
NUC2                       1H
PCPD2                  80.00 usec
PL2                      0.00 dB
PL12                    16.55 dB
PL13                    24.00 dB
SFO2             300.1312005 MHz
SI                        8192
SF                75.4677423 MHz
WDW                       EM
SSB                        0
LB                      2.50 Hz
GB                         0
PC                      1.40
```

Dimethoxy-1,2-Isopropyl-CC-CyclohexeneOAc Cyclized Minor SnCl4
Experiment 2 Topspin 500 3.2
Wednesday 10 April 2013

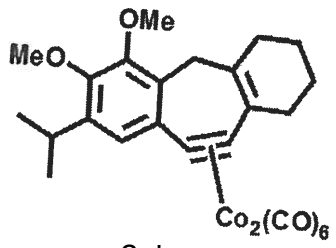
```
Current Data Parameters
NAME      Dimethoxy-1,2-Isopropyl-CC-CyclohexeneOAc Cyclized Minor SnCl4
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20130410
Time              16.59
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgesgp
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           11029.412 Hz
FIDRES         0.336591 Hz
AQ            1.4854827 sec
RG               203.82
DW               45.333 usec
DE                6.50 usec
TE                294.0 K
D1           1.00000000 sec
D12          0.00002000 sec
D16          0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1300000 MHz
NUC1                1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0     0 W
PLW1       12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1            0.500
SPOFFS1  0 Hz
SPW1         0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1              31.00 %
GPZ2              11.00 %
P16             1000.00 usec

F2 - Processing parameters
SI                32768
SF          500.1300076 MHz
WDW                  no
SSB      0
LB       0 Hz
GB       0
PC                1.00
```



2o'

Dimethoxy-1,2-Isopropyl-CC-CyclohexeneOAc-Nicholas Minor SnCl4 13C
Experiment 2 Topspin 500 V3.2
Saturday 22 June 2013

200.124
150.971
149.522
141.479
136.584
133.833
131.039
128.296
125.251
95.047
90.564
77.262
77.008
76.754
60.998
60.645
33.743
32.968
30.480
26.881
23.440
23.049
22.723

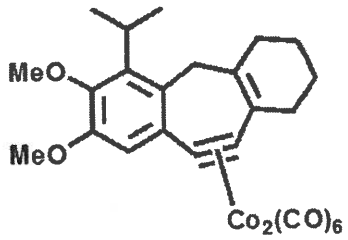


2o'

200 180 160 140 120 100 80 60 40 20 0 ppm

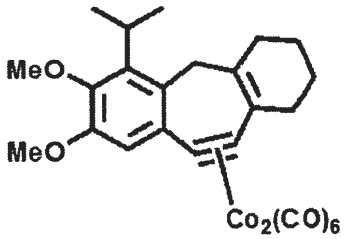
Dimethoxy-1,2-Isopropyl-CC-CyclohexeneOAc Cyclized Major SnCl4
Experiment 2 Topspin 500 3.1
Wednesday 10 April 2013

```
Current Data Parameters
NAME      Dimethoxy-1,2-Isopropyl-CC-CyclohexeneOAc Cyclized Major SnCl4
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20130410
Time              16.24
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgesgp
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           11029.412 Hz
FIDRES         0.336591 Hz
AQ            1.4854827 sec
RG                82.19
DW               45.333 usec
DE                6.50 usec
TE               294.0 K
D1           1.00000000 sec
D12          0.00002000 sec
D16          0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1302001 MHz
NUC1               1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0      0 W
PLW1        12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1            0.500
SPOFFS1   0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1              31.00 %
GPZ2              11.00 %
P16             1000.00 usec

F2 - Processing parameters
SI                32768
SF           500.1300075 MHz
WDW                  no
SSB       0
LB        0 Hz
GB        0
PC                 1.00
```

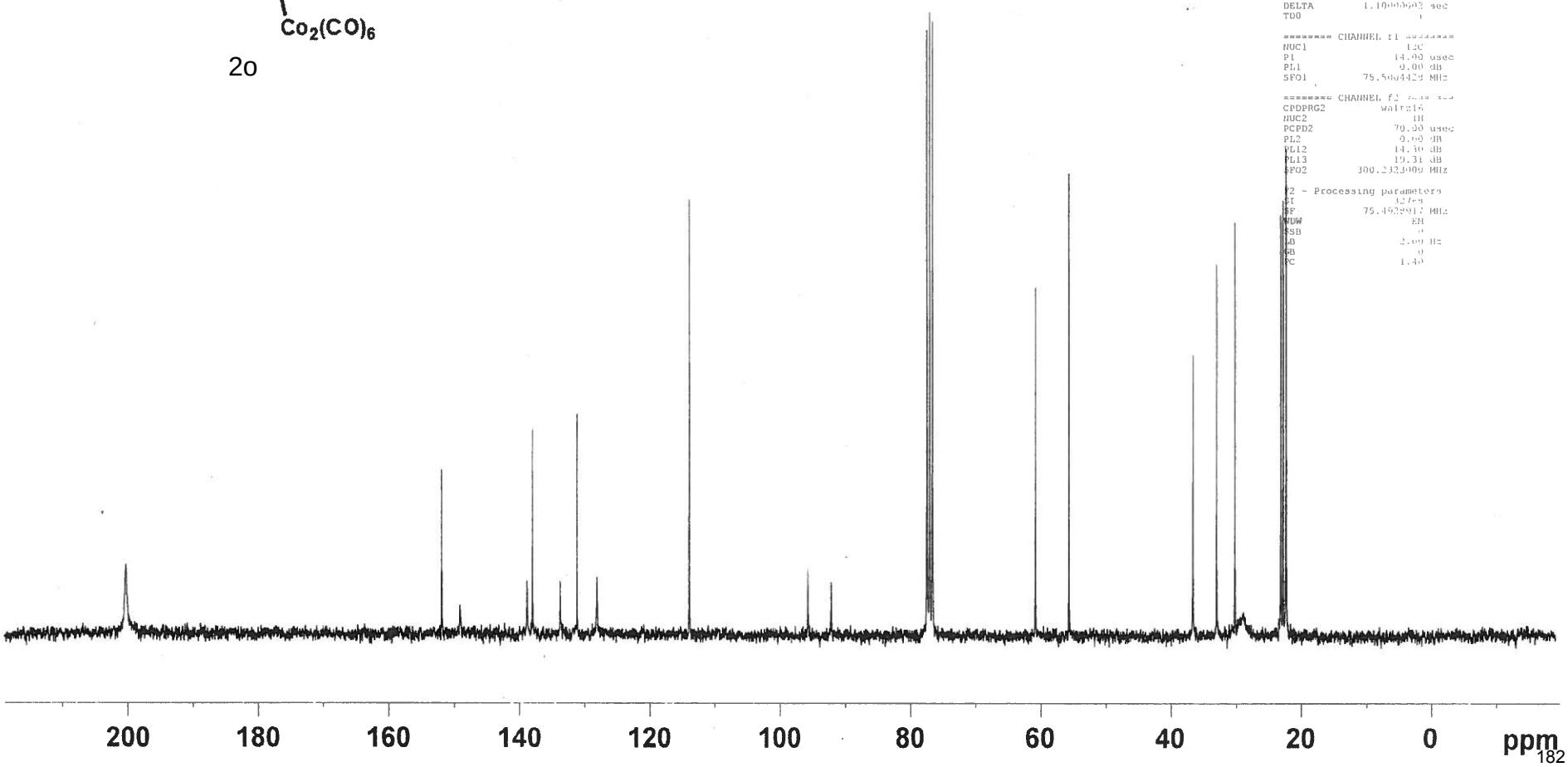


2o

RosmarDerivative Cyclized Major SnCl4 13C
Topspin 300
Wednesday 10 April 2013



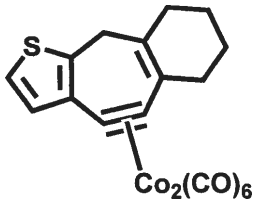
2o



Thiophene-3-CC-CyclohexeneOAc Cyclized Co2(CO)6
Experiment 2 Topspin 500
Wednesday 21 September 2011

7.270 7.207 7.197 7.158 7.147

3.431 2.415 2.404 2.391 2.209 2.196 2.184 1.792 1.780 1.773 1.769 1.760 1.757 1.744 1.730 1.727 1.719 1.715 1.709 1.696



2p

Current Data Parameters
NAME Thiophene-3-CC-CyclohexeneOAc Cyclized Co2(CO)6
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date 20110921
Time 13.58
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpwgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4942708 sec
RG 101.6
DW 45.600 usec
DE 6.50 usec
TE 295.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1305251 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz

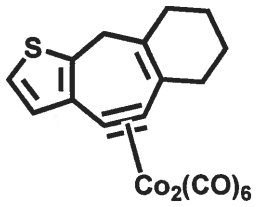
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300188 MHz
WDW EM
SSB 0
LB -0.50 Hz
GB 0
PC 1.00

10 9 8 7 6 5 4 3 2 1 0 ppm

0.83 0.82 2.01 1.88 1.78 4.35

iophene-3-CC-CyclohexeneOAc Cyclized Co2(CO)6 13C
periment 1 Topspin ULtra 300
dnesday 21 September 2011



2p

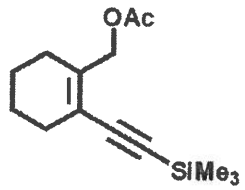
```
NAME        Thiophene-3-CC-CyclohexeneOAc Cyclized Co2(CO)6 1
EXPNO                     1
PROCNO                    1
Date_              20110921
Time                  18.19
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                    16384
SOLVENT               CDCl3
NS                     3141
DS                        4
SWH               17985.611 Hz
FIDRES             1.097755 Hz
AQ                 0.4555252 sec
RG                   20642.5
DW                   27.800 usec
DE                    6.00 usec
TE                   295.6 K
D1                1.00000000 sec
D11               0.03000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                    13C
P1                    11.25 usec
PL1                    0.00 dB
SFO1             75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2              waltz16
NUC2                    1H
PCPD2                 80.00 usec
PL2                    0.00 dB
PL12                  16.55 dB
PL13                  24.00 dB
SFO2            300.1312005 MHz
SI                      8192
SF               75.4677423 MHz
WDW                     EM
SSB                      0
LB                    2.50 Hz
GB                       0
PC                    1.40
```

CyclohexeneOAc-CC-TMS
Experiment 2 Topspin 500 3.1
Friday 23 November 2012

7.154
4.937
2.092 2.080 2.068 1.923 1.911 1.898 1.660 1.332 1.326 1.321 1.319 1.313 1.308 1.302 1.298 1.289 1.286 1.279 1.277 1.274 1.267 1.262

1046.372 1040.070 1034.219
961.550 955.648 949.347
830.166
666.373 663.022 660.572 659.922 656.921 654.120 650.919 649.169 644.768 643.267 639.416 638.666 637.016 633.615 630.914 628.013 624.862 621.912

0.1537



13a

2.15 2.10 2.05 2.00 1.95 1.90 1.85 1.80 1.75 1.70 1.65 1.60 1.55 1.50 1.45 1.40 1.35 1.30 1.25 ppm

10 9 8 7 6 5 4 3 2 1 0 ppm

2.00 2.08 2.31 3.02 4.30 9.06

Current Data Parameters
NAME CyclohexeneOAc-CC-TMS
EXPNO 2
PROCNO 1

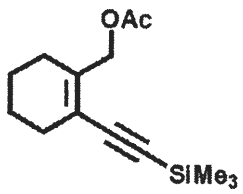
F2 - Acquisition Parameters
Date_ 20121123
Time 21.19
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 11.5
DW 45.333 usec
DE 6.50 usec
TE 293.3 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1317505 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300000 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00

clohexeneOAc-2-CC-TMS 13C
periment 1 Ultra Topspin 300
iday 23 November 2012

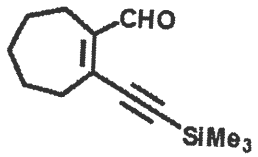


13a

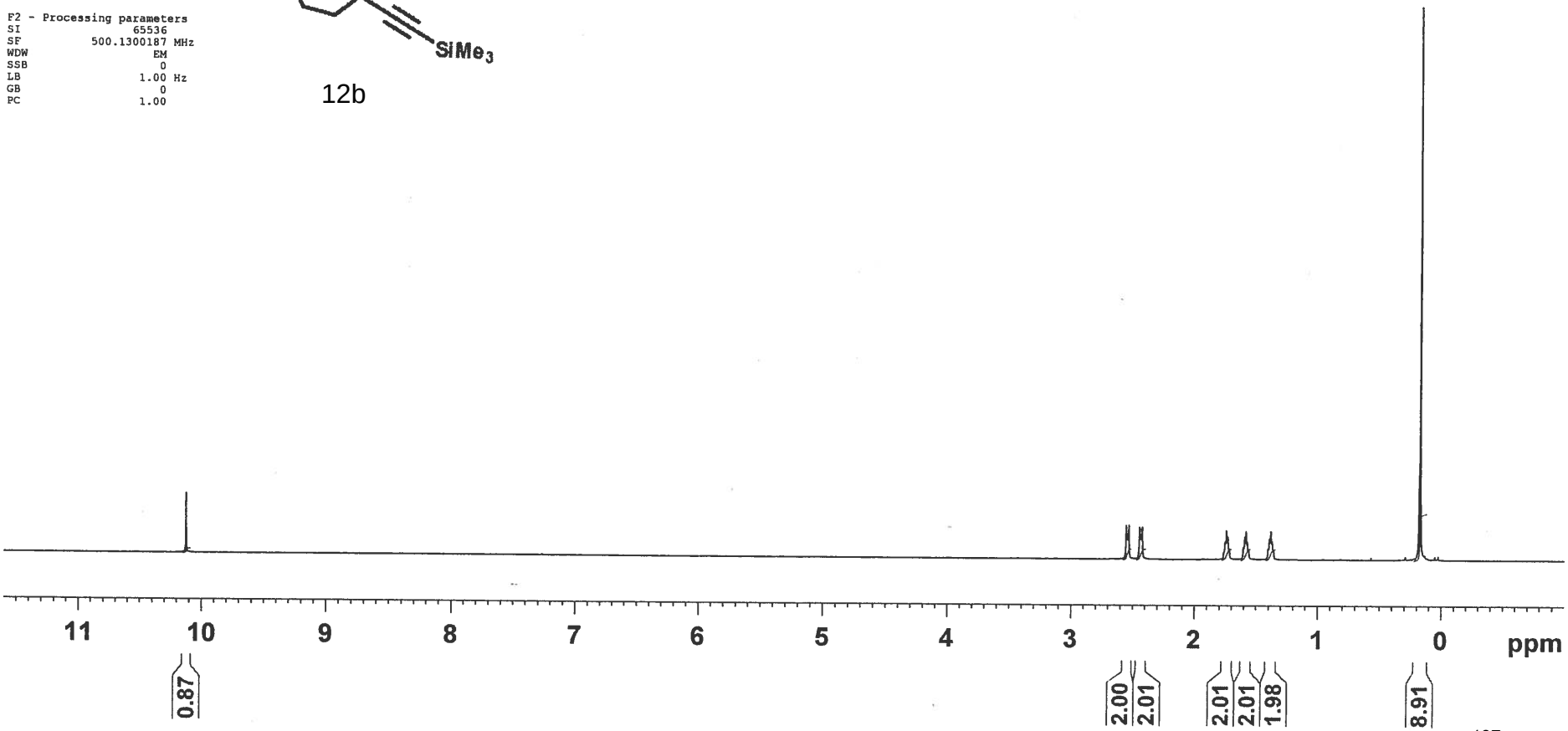
NAME	CyclohexeneOAc-2-CC-TMS 13C
EXPNO	1
PROCNO	1
Date_	20121123
Time	17.24
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	C6D6
NS	111
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.0 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40

Cycloheptenecarbaldehyde-TMSacetylene-2
Experiment 1
Topspin 500
Thursday 16 February 2012

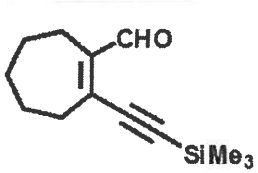
```
Current Data Parameters
NAME      Cycloheptenecarbaldehyde-TMSacetylene-2
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20120216
Time               15.47
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG               zg
TD                 65536
SOLVENT             MeOD
NS                     8
DS                     2
SWH           10330.578 Hz
FIDRES         0.157632 Hz
AQ            3.1719923 sec
RG                  10.1
DW                48.400 usec
DE                 6.50 usec
TE                294.2 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                10.00 usec
PL1                0.00 dB
SFO1        500.1330880 MHz

F2 - Processing parameters
SI                 65536
SF          500.1300187 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.00
```



12b



Cycloheptenecarbaldehyde-TMSacetylene-2 13C
Experiment 1 Topspin 500
Thursday 16 February 2012

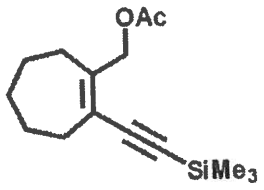


12b


```
Current Data Parameters
NAME      Cycloheptenecarbaldehyde-TMSacetylene-2 13C
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20120216
Time              15.52
INSTRUM           spect
PROBHD    5 mm PABBO BB/
PULPROG         zgpg30
TD              16384
SOLVENT           CDCl3
NS                   26
DS                    4
SWH           30030.029 Hz
FIDRES         1.832888 Hz
AQ             0.2728603 sec
RG                1625.5
DW                16.650 usec
DE                 6.50 usec
TE                294.2 K
D1            1.00000000 sec
d11           0.03000000 sec
DELTA         0.89999998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.50 usec
PL1                -0.70 dB
SFO1        125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2              70.00 usec
PL2                -1.20 dB
PL12               12.30 dB
PL13               15.30 dB
SFO2        500.1325010 MHz

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

CycloheptenеOAc-CC-TMS
Experiment 2 Topspin 500 3.1
Tuesday 20 November 2012

```
Current Data Parameters
NAME      CycloheptenеOAc-CC-TMS
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20121120
Time              12.13
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgesgp
TD                32768
SOLVENT            C6D6
NS                   16
DS                    2
SWH           11029.412 Hz
FIDRES         0.336591 Hz
AQ             1.4854827 sec
RG                12.73
DW               45.333 usec
DE                6.50 usec
TE               295.5 K
D1           1.00000000 sec
D12          0.00002000 sec
D16          0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1330008 MHz
NUC1                1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0     0 W
PLW1        12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1             0.500
SPOFFS1  0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1              31.00 %
GPZ2              11.00 %
P16             1000.00 usec

F2 - Processing parameters
SI                32768
SF          500.1300000 MHz
WDW                 EM
SSB       0
LB                 0.40 Hz
GB        0
PC                 1.00
```



13b

CycloheptheneOAc-CC-TMS 13C
Experiment 1 Topspin 500 3.1
Tuesday 20 November 2012

Current Data Parameters
NAME CycloheptheneOAc-CC-TMS 13C
EXPNO 2
PROCNO 1

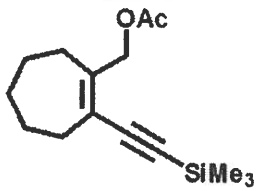
F2 - Acquisition Parameters
Date_ 20121120
Time 12.25
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT C6D6
NS 5
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 203.82
DW 16.800 usec
DE 6.50 usec
TE 296.4 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 125.7703637 MHz
NUC1 13C
P1 9.50 usec
PLW1 66.48200226 W

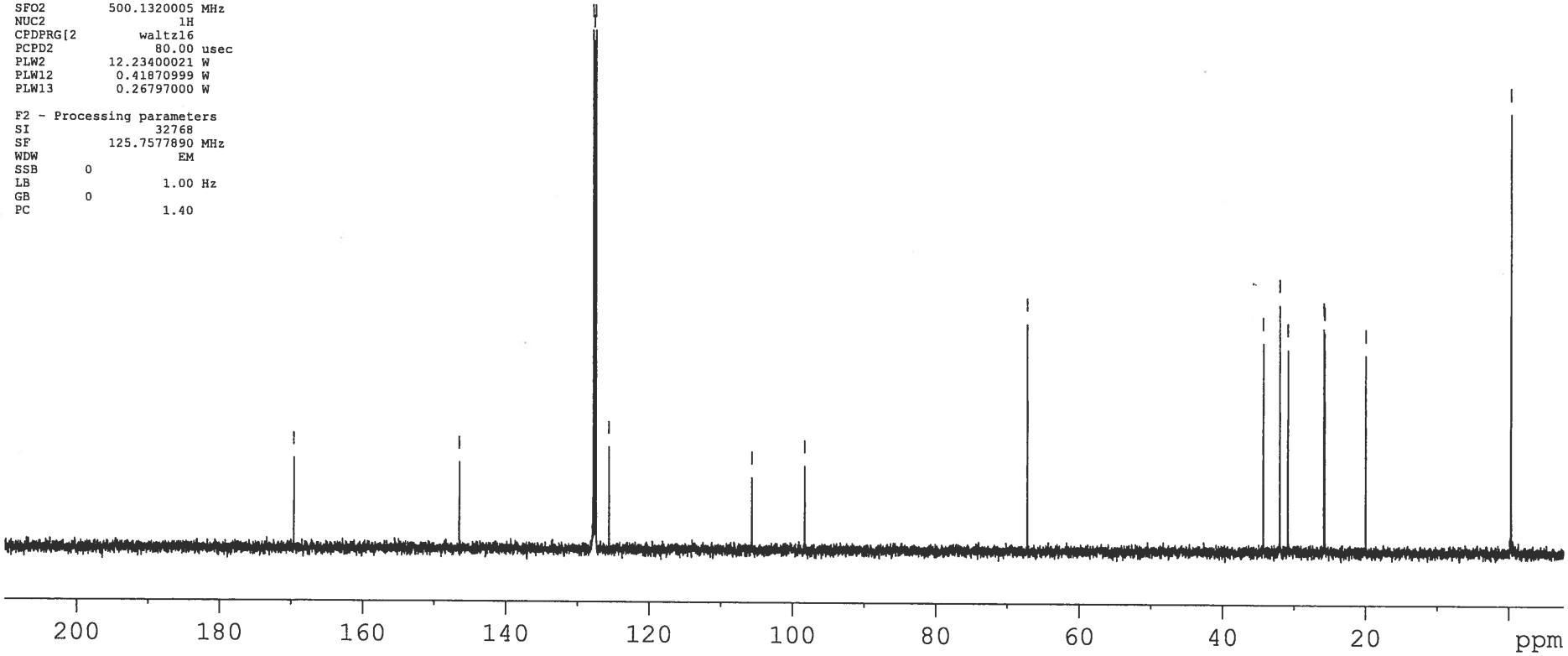
======== CHANNEL f2 ========
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 12.23400021 W
PLW12 0.41870999 W
PLW13 0.26797000 W

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

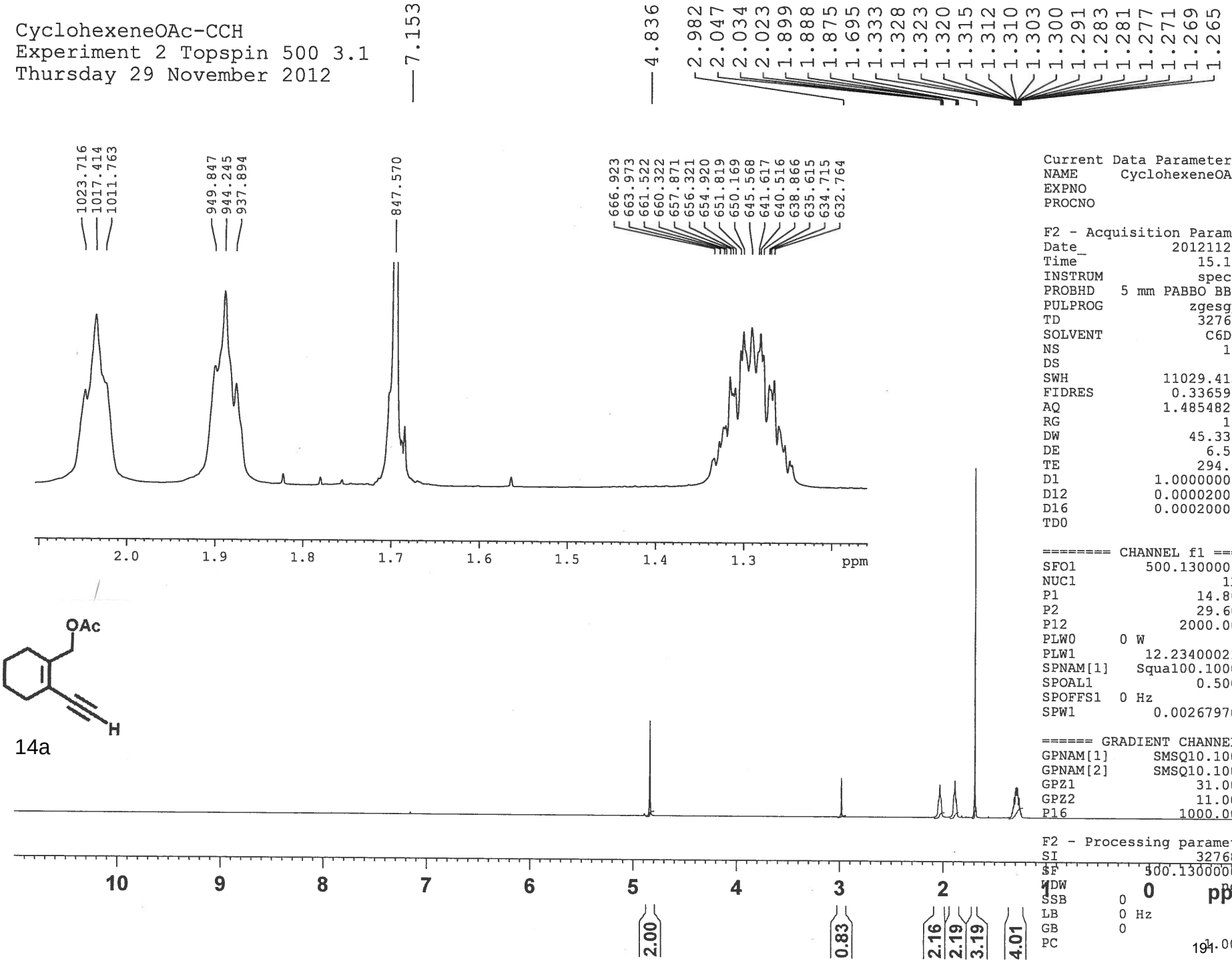
169.604
146.460
127.852
127.659
127.467
125.642
105.692
98.320
67.257
34.380
32.062
30.920
25.901
25.779
20.037
0.269



13b



CyclohexeneOAc-CCH
Experiment 2 Topspin 500 3.1
Thursday 29 November 2012



Current Data Parameters
NAME CyclohexeneOAc-CCH
EXPNO 2
PROCNO 1

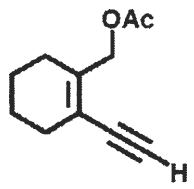
F2 - Acquisition Parameters
Date_ 20121129
Time 15.19
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 10
DW 45.333 usec
DE 6.50 usec
TE 294.6 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1300000 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

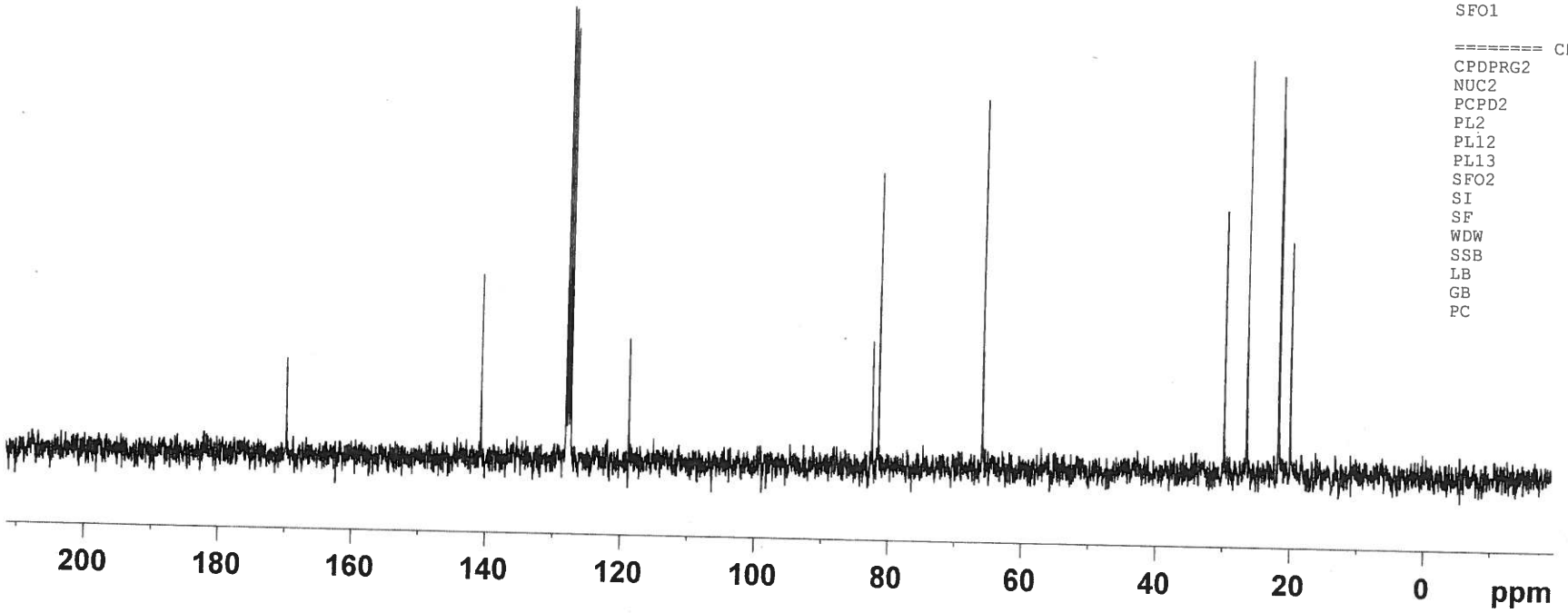
F2 - Processing parameters
SI 32768
SF 500.1300000 MHz
WDW PO
SSB 0
LB 0 Hz
GB 0
PC 1.00

yclohexeneOAc-2-CCH
xperiment 1
:ra 300 Topspin
iursday 29 November 2012



14a

NAME	CyclohexeneOAc-2-CCH 13C
EXPNO	1
PROCNO	1
Date_	20121129
Time	16.33
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	C6D6
NS	16
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.5 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40



CycloheptenеOAc-CCH
Experiment 1
Topspin 500 3.1
Wednesday 28 November 2012

Current Data Parameters

NAME	CycloheptenеOAc-CCH
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

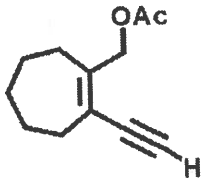
Date_	20121128
Time	15.27
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	C6D6
NS	8
DS	2
SWH	10000.000 Hz
FIDRES	0.152588 Hz
AQ	3.2767999 sec
RG	27.82
DW	50.000 usec
DE	6.50 usec
TE	294.2 K
D1	1.00000000 sec
TD0	1

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

SFO1	500.1330885 MHz
NUC1	1H
P1	14.80 usec
PLW1	12.23400021 W

F2 - Processing parameters

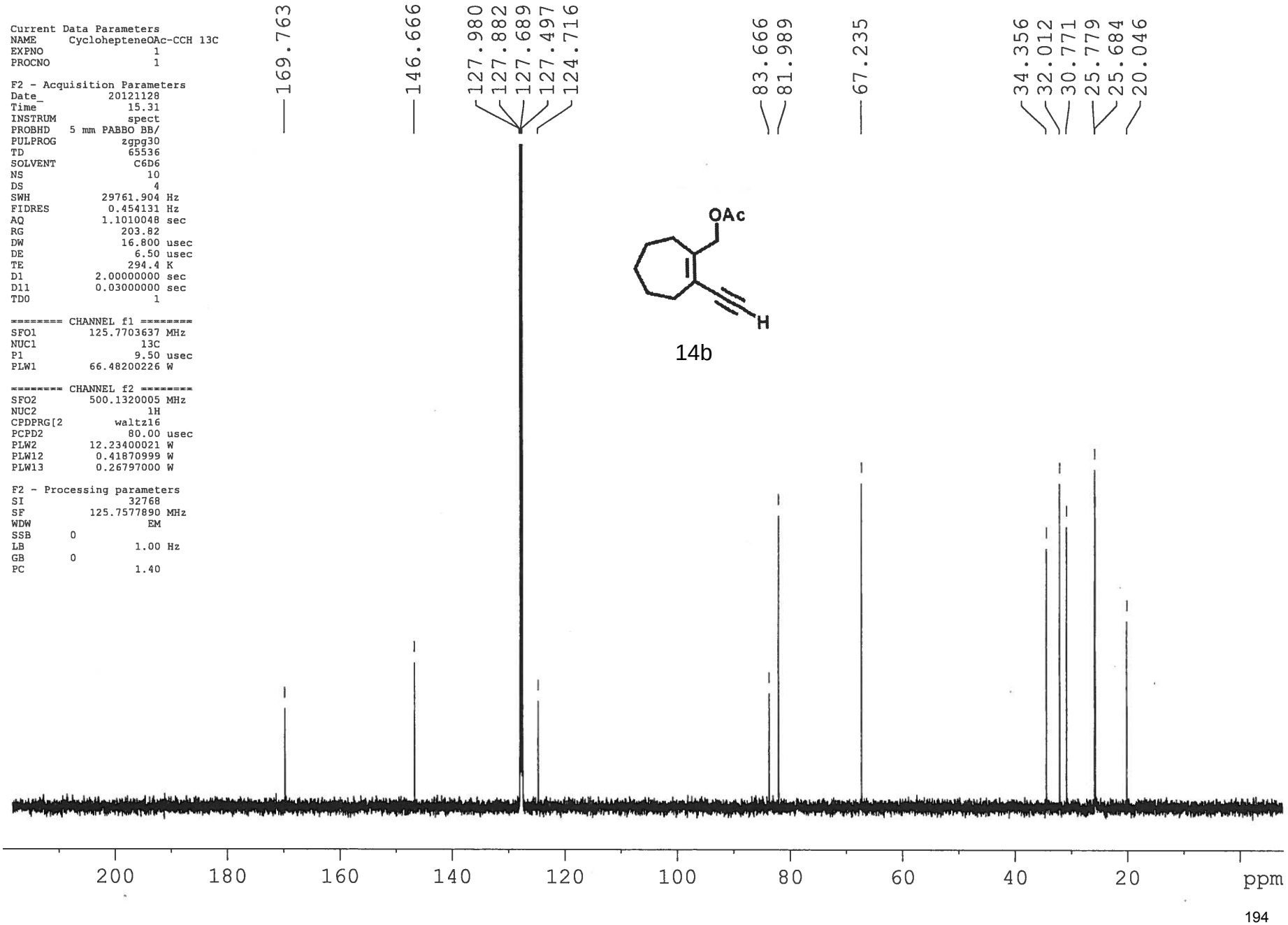
SI	65536
SF	500.1299981 MHz
WDW	EM
SSB	0
LB	0.50 Hz
GB	0
PC	1.00



14b

CycloheptheneOAc-CCH 13C
Experiment 1
Topspin 500 3.1
Wednesday 28 November 2012

```
Current Data Parameters
NAME      CycloheptheneOAc-CCH 13C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20121128
Time              15.31
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT             C6D6
NS                    10
DS                     4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ             1.1010048 sec
RG                203.82
DW                16.800 usec
DE                 6.50 usec
TE                294.4 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                 9.50 usec
PLW1         66.48200226 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2         12.23400021 W
PLW12         0.41870999 W
PLW13         0.26797000 W

F2 - Processing parameters
SI                 32768
SF          125.7577890 MHz
WDW                   EM
SSB       0
LB                 1.00 Hz
GB        0
PC                 1.40
```



14b

Cyclohexenecarbaldehyde-2-SonogashiraOAc
Experiment 1
Topspin 500
Tuesday 07 February 2012

Current Data Parameters
NAME Cyclohexenecarbaldehyde-2-SonogashiraOAc
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20120207
Time 14.20
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT MeOD
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 12.7
DW 48.400 usec
DE 6.50 usec
TE 293.2 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 500.1330880 MHz

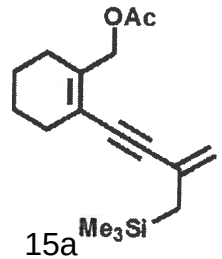
F2 - Processing parameters
SI 65536
SF 500.1300196 MHz
WDW EM
SSB 0
LB 0.40 Hz
GB 0
PC 1.00

7.269

5.147 5.143 4.982 4.980 4.978 4.771

2.185 2.100 2.090 2.049 1.665 1.648 1.619 1.613 1.607 1.595 1.583

0.045



15a

2574.113 2572.100

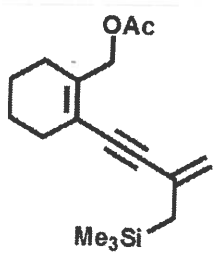
2491.681 2490.805 2489.856

5.15 5.10 5.05 5.00 4.95 ppm

10 9 8 7 6 5 4 3 2 1 0 ppm

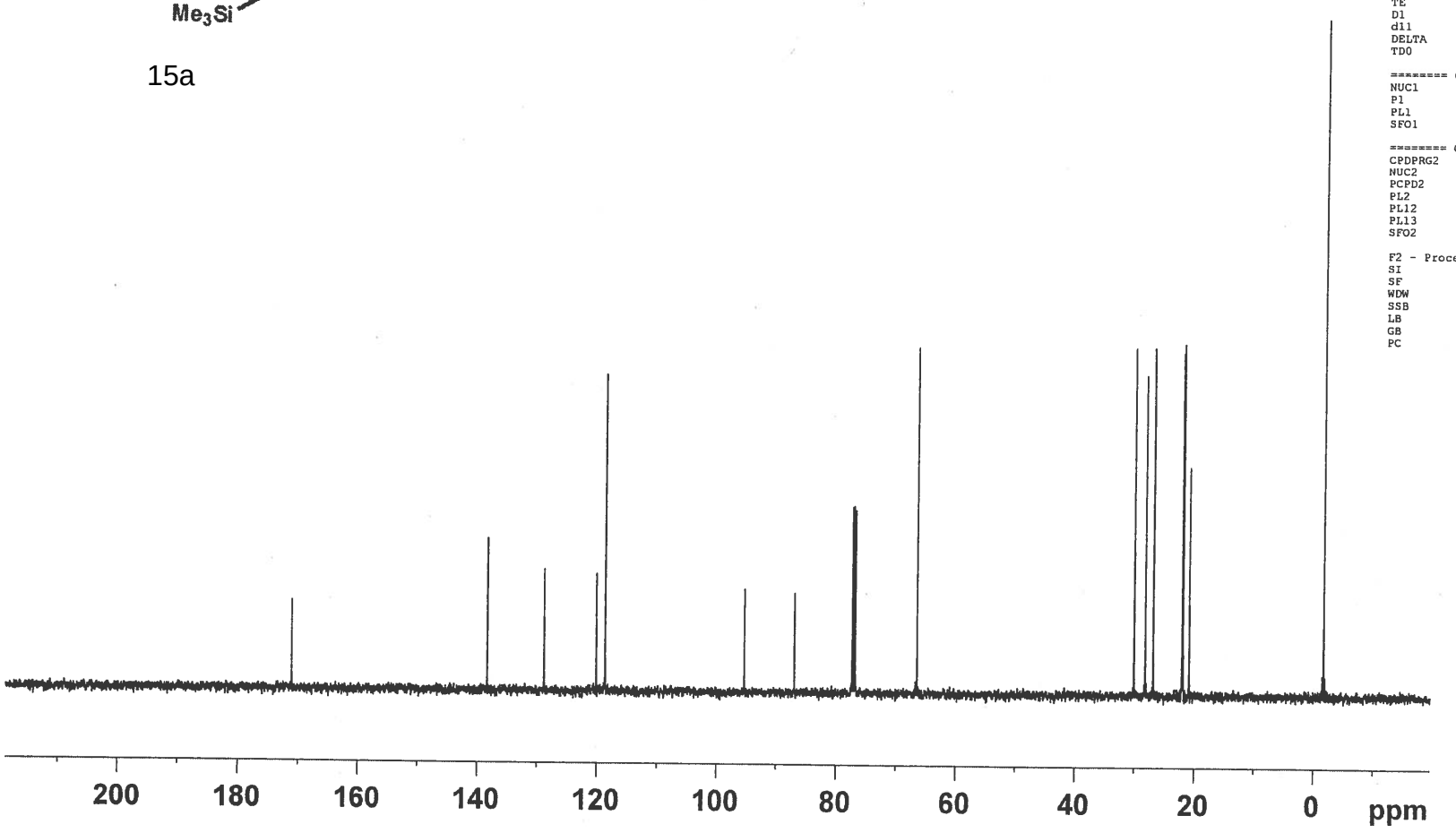
1.01 1.03 2.11 2.14 2.14 3.04 2.05 4.18 9.05

Cyclohexenecarbaldehyde-2-SonogashiraOAc 13C
Experiment 1
Topspin 500
Tuesday 07 February 2012

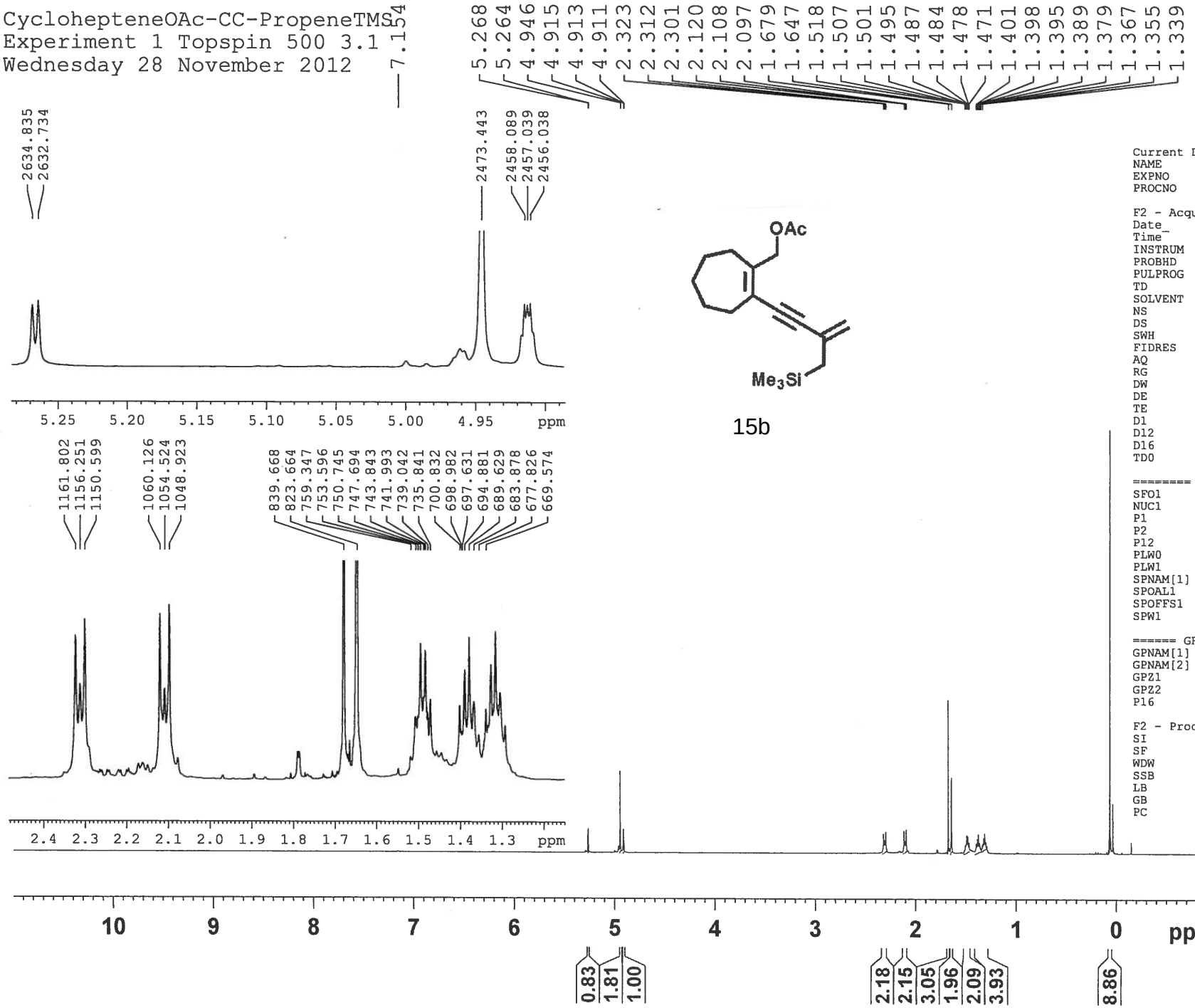


15a

```
Current Data Parameters
NAME      Cyclohexenecarbaldehyde-2-SonogashiraOAc 13C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20120207
Time              14.25
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD              16384
SOLVENT           CDCl3
NS                   47
DS                    4
SWH           30030.029 Hz
FIDRES         1.832888 Hz
AQ             0.2728603 sec
RG                2580.3
DW              16.650 usec
DE               6.50 usec
TE              294.2 K
D1           1.00000000 sec
d11          0.03000000 sec
DELTA        0.89999998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                9.50 usec
PL1              -0.70 dB
SFO1       125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2            70.00 usec
PL2              -1.20 dB
PL12             12.30 dB
PL13             15.30 dB
SFO2       500.1325010 MHz

F2 - Processing parameters
SI                32768
SF         125.7577890 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```



CycloheptenеOAc-CC-PropeneTMS
Experiment 1 Topspin 500 3.1
Wednesday 28 November 2012



Current Data Parameters
NAME CycloheptenеOAc-CC-PropeneTMS
EXPNO 1
PROCNO 1

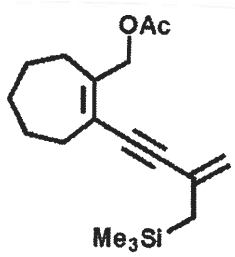
F2 - Acquisition Parameters
Date_ 20121128
Time 15.02
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 11.5
DW 45.333 usec
DE 6.50 usec
TE 294.2 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1329258 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1300000 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00

ycloheptene-2-CC-buteneTMS 13C
ɔpspin 300 Utlra
‹periment 2
ıesday 11 December 2012



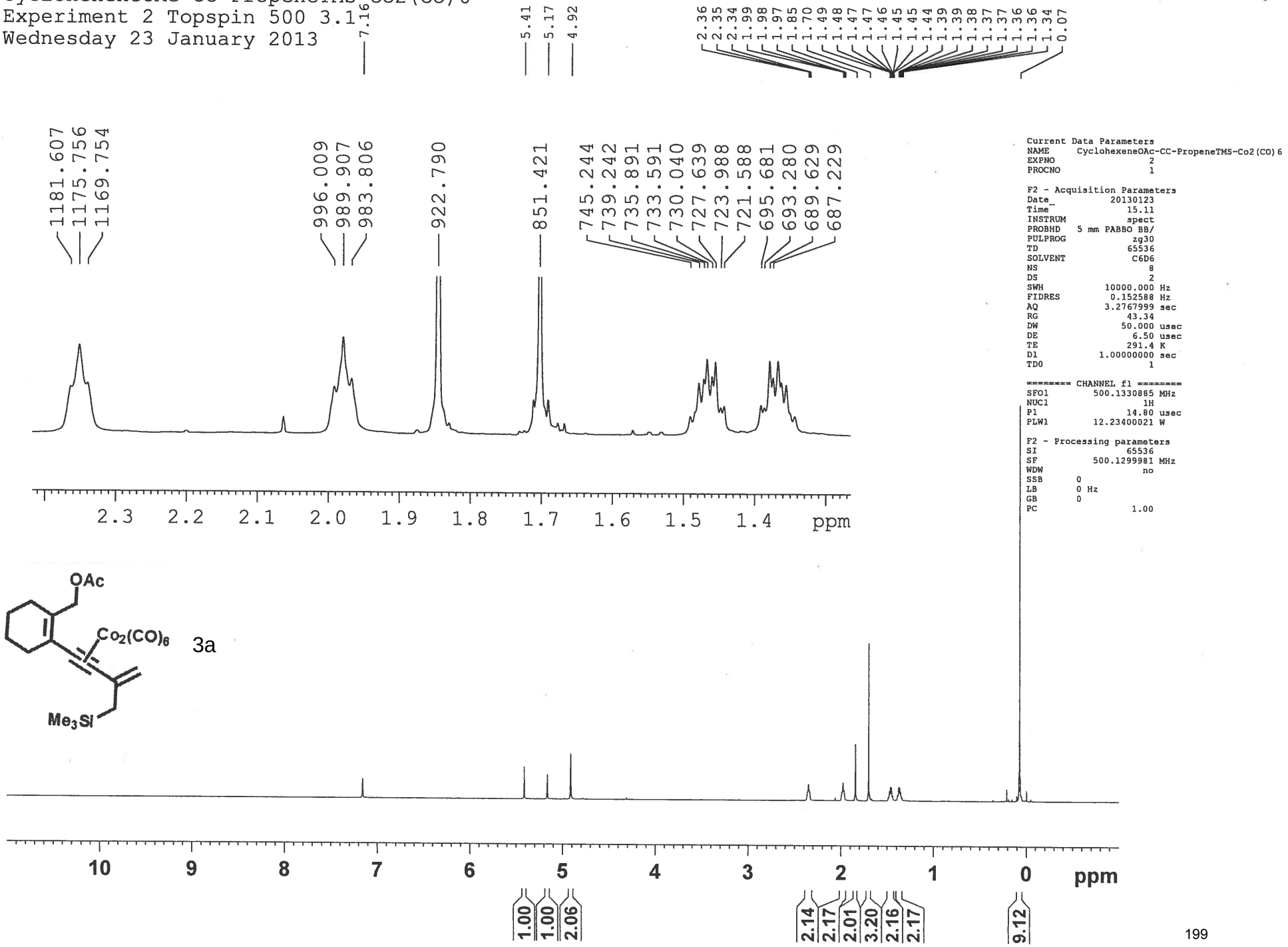
15b

NAME Cycloheptene-2-CC-buteneTMS 13C
EXPNO 2
PROCNO 1
Date_ 20121211
Time 11.51
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 16384
SOLVENT C6D6
NS 126
DS 4
SWH 17985.611 Hz
FIDRES 1.097755 Hz
AQ 0.4555252 sec
RG 20642.5
DW 27.800 usec
DE 6.00 usec
TE 294.9 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 11.25 usec
PL1 0.00 dB
SFO1 75.4752953 MHz

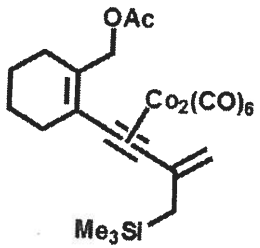
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 16.55 dB
PL13 24.00 dB
SFO2 300.1312005 MHz
SI 8192
SF 75.4677423 MHz
WDW EM
SSB 0
LB 2.50 Hz
GB 0
PC 1.40

CyclohexeneOAc-CC-PropeneTMS-Co2(CO)6
Experiment 2 Topspin 500 3.1
Wednesday 23 January 2013

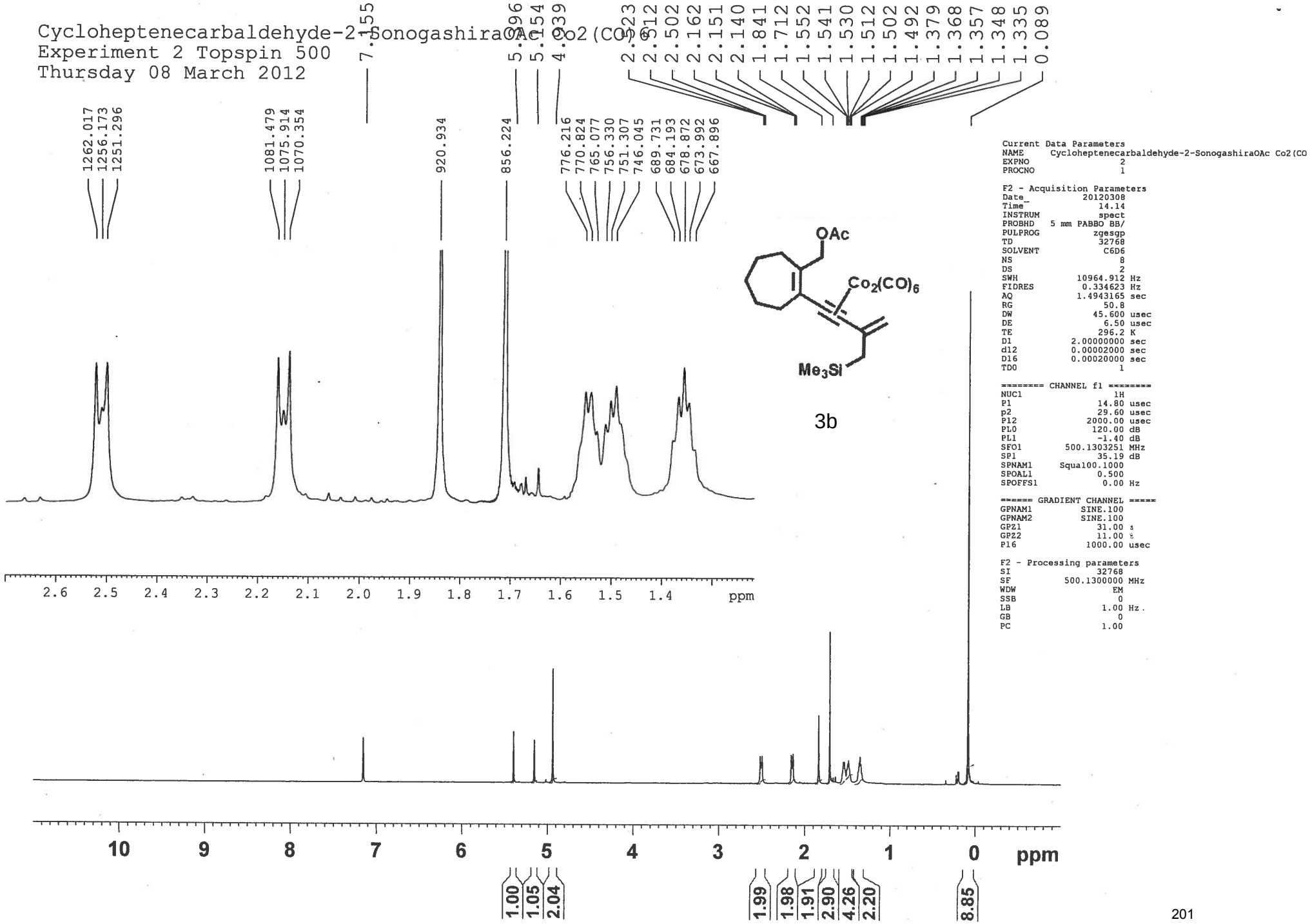



```
Current Data Parameters
NAME      CyclohexeneOAc-CC-PropeneTMS-Co2(CO)6
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20130123
Time              15.11
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG           zg30
TD                65536
SOLVENT           C6D6
NS                    8
DS                    2
SWH           10000.000 Hz
FIDRES            0.152588 Hz
AQ            3.2767999 sec
RG                43.34
DW                50.000 usec
DE                 6.50 usec
TE                291.4 K
D1            1.00000000 sec
TD0                   1

========== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                  1H
P1                14.80 usec
PLW1          12.23400021 W

F2 - Processing parameters
SI                65536
SF            500.1299981 MHz
WDW                   no
SSB       0
LB        0 Hz
GB        0
PC                1.00
```

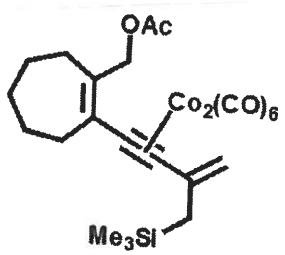
CyclohexeneOAc-2-CC-buteneTMS Co2(CO)6 13C
Topspin 300
Experiment 2
Wednesday 23 January 2013



3a


Cycloheptenecarbaldehyde-2-SonogashiraOAc Co2(CO)6
Experiment 2 Topspin 500
Thursday 08 March 2012
7.155
5.396
5.154
4.939
2.523
2.512
2.502
2.162
2.151
2.140
1.841
1.712
1.552
1.541
1.530
1.512
1.502
1.492
1.379
1.368
1.357
1.348
1.335
0.089
1262.017
1256.173
1251.296
1081.479
1075.914
1070.354
920.934
856.224
776.216
770.824
765.077
756.330
751.307
746.045
689.731
684.193
678.872
673.992
667.896
OAc
Co2(CO)6
Me3Si
3b
Current Data Parameters
NAME Cycloheptenecarbaldehyde-2-SonogashiraOAc Co2(CO
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120308
Time 14.14
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 50.8
DW 45.600 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1303251 MHz
SP1 35.19 dB
SPNAM1 Squal00.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
====== GRADIENT CHANNEL =====
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00
GPZ2 11.00
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300000 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
1.00
1.05
2.04
1.99
1.98
1.91
2.90
4.26
2.20
8.85

:loheptenеOAc-2-CC-buteneTMS Co2(CO)6 13C
)eriment 2
:ra 300 Topspin
.day 09 March 2012



3b

```
NAME          CycloheptеneOAc-2-CC-buteneTMS Co2(CO)6 13C
EXPNO                   2
PROCNO                  1
Date_          20120309
Time                11.11
INSTRUM             spect
PROBHD     5 mm PABBO BB-
PULPROG          zgpg30
TD                  16384
SOLVENT               C6D6
NS                    1995
DS                       4
SWH           17985.611 Hz
FIDRES         1.097755 Hz
AQ             0.4555252 sec
RG                18390.4
DW                 27.800 usec
DE                  6.00 usec
TE                 295.8 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                     1

======== CHANNEL f1 ========
NUC1                   13C
P1                   11.25 usec
PL1                   0.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG[2]          waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                   0.00 dB
PL12                 16.55 dB
PL13                 24.00 dB
SFO2          300.1313005 MHz
SI                     4192
SF            75.4677423 MHz
WDW                    EM
SSB                     0
LB                   2.50 Hz
GB                      0
PC                   1.40
```

CyclohexeneCycloheptynemethylene
Thursday 04 April 2013
Topspin 300
Experiment 4

Current Data Parameters

NAME	CyclohexeneCycloheptynemethylene
EXPNO	4
PROCNO	1

F2 - Acquisition Parameters

Date_	20130404
Time	20.52
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zg30
TD	32768
SOLVENT	CDCl3
NS	8
DS	2
SWH	6172.839 Hz
FIDRES	0.188380 Hz
AQ	2.6542580 sec
RG	287.4
DW	81.000 usec
DE	6.00 usec
TE	300.0 K
D1	1.00000000 sec
TD0	1

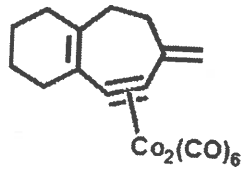
======== CHANNEL f1 ========

NUC1	1H
P1	13.50 usec
PL1	0.00 dB
SFO1	300.2315011 MHz

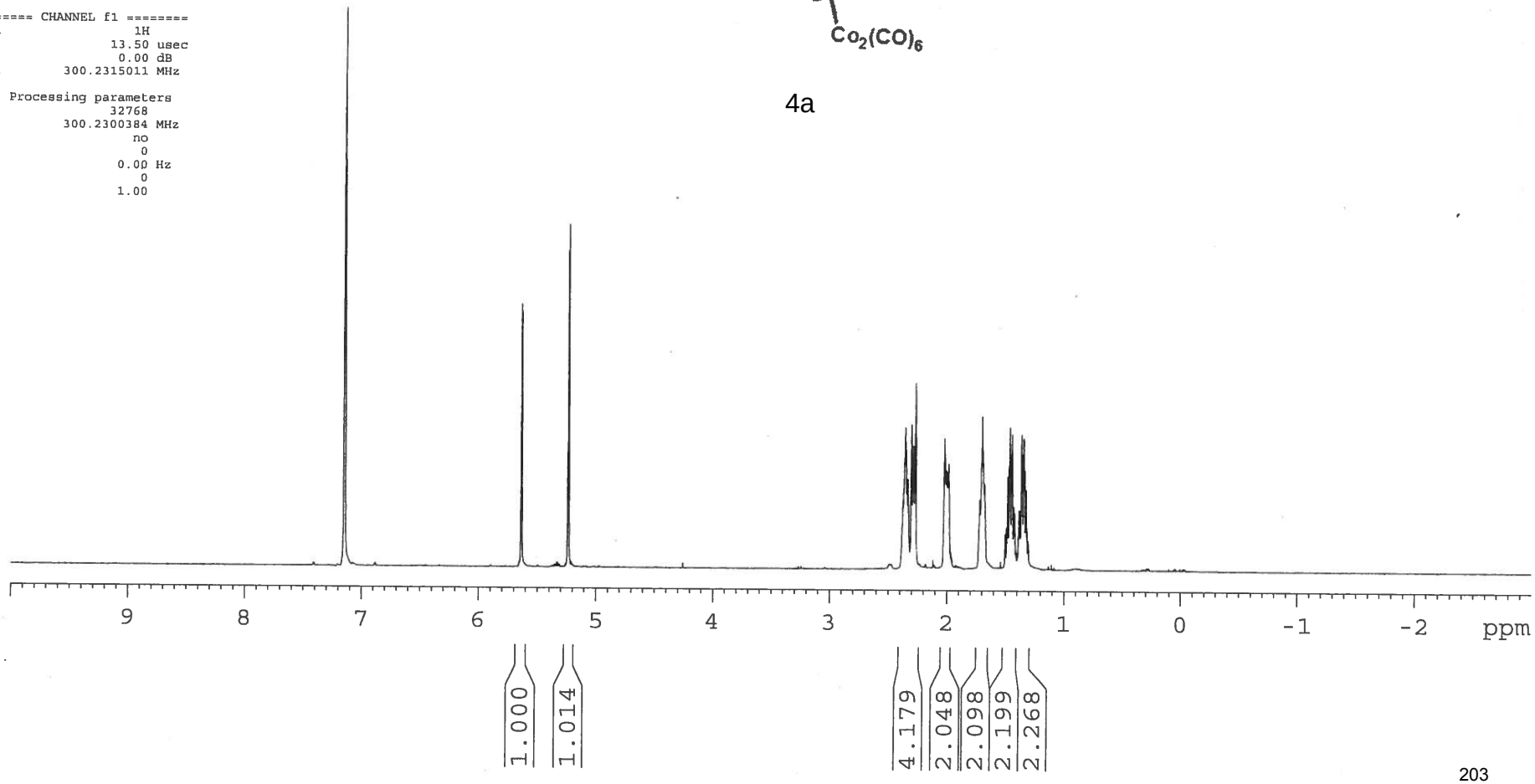
F2 - Processing parameters

SI	32768
SF	300.2300384 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

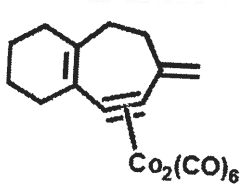
7.149 5.640 5.637 5.635 5.244 5.240 5.236 5.231 2.383 2.377 2.370 2.363 2.356 2.350 2.343 2.336 2.330 2.305 2.302 2.297 2.296 2.293 2.288 2.286 2.282 2.280 2.277 2.276 2.272 2.269 2.266 2.023 2.007 2.003 1.996 1.990 1.987 1.721 1.708 1.700 1.697 1.692 1.684 1.680 1.502 1.492 1.483 1.472 1.464 1.452 1.445 1.431 1.424 1.419 1.392 1.385 1.379 1.365 1.358 1.346 1.339 1.328 1.318 1.309 1.305



4a

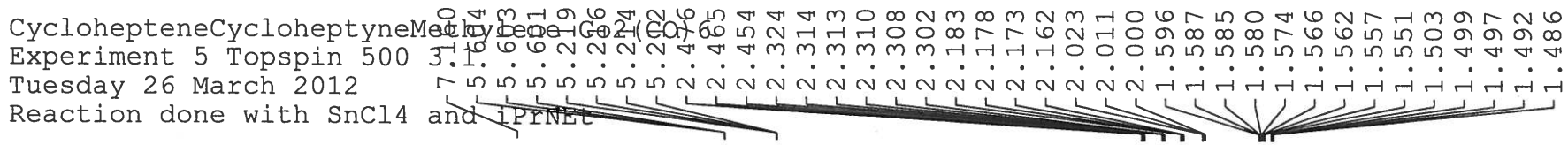


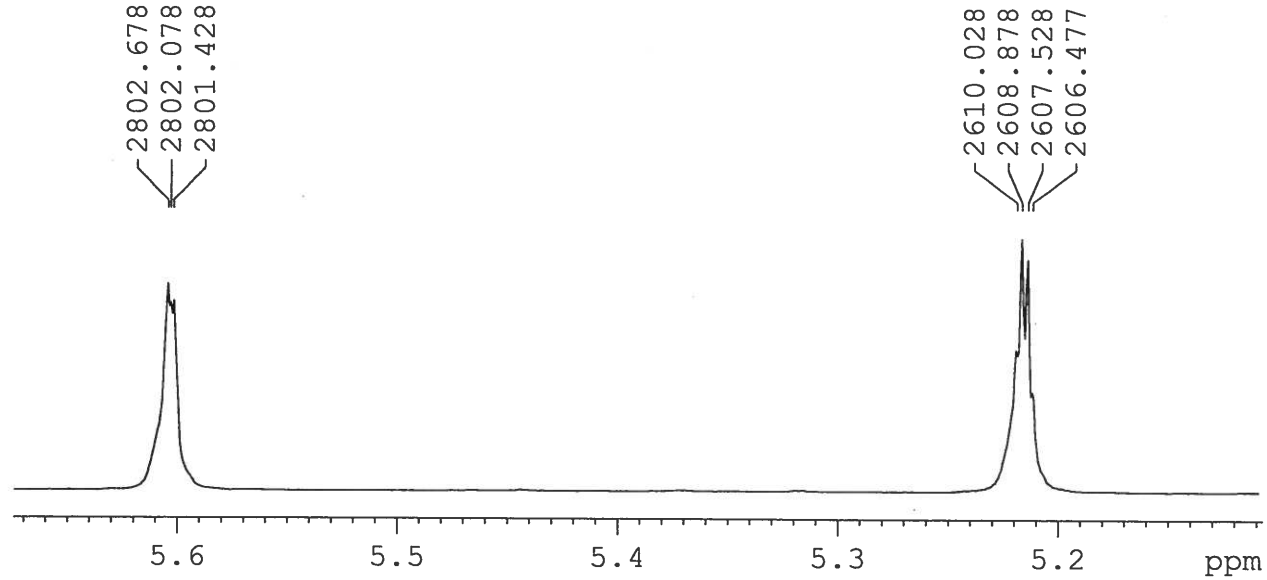
CyclohexeneCycloheptynemethylene 13C
Experiment 1 Topspin 300
12 March 2012
Reaction with SnCl4 and Diisopropylethylamine



4a

CycloheptenCycloheptyneMethylene Co2(CO)6
Experiment 5 Topspin 500 3.1
Tuesday 26 March 2012
Reaction done with SnCl4 and iPrNEt





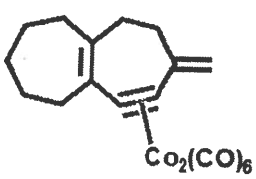
Current Data Parameters
NAME CycloheptenCycloheptyneMethylene Co2(CO)6
EXPNO 5
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130326
Time 16.15
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT C6D6
NS 16
DS 2
SWH 11029.412 Hz
FIDRES 0.336591 Hz
AQ 1.4854827 sec
RG 31.67
DW 45.333 usec
DE 6.50 usec
TE 293.9 K
D1 1.00000000 sec
D12 0.00002000 sec
D16 0.00020000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1298500 MHz
NUC1 1H
P1 14.80 usec
P2 29.60 usec
P12 2000.00 usec
PLW0 0 W
PLW1 12.23400021 W
SPNAM[1] Squa100.1000
SPOAL1 0.500
SPOFFS1 0 Hz
SPW1 0.00267970 W

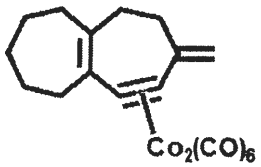
====== GRADIENT CHANNEL =====
GPNAM[1] SMSQ10.100
GPNAM[2] SMSQ10.100
GP21 31.00 %
GP22 11.00 %
P16 1000.00 usec

F2 - Processing parameters
SI 32768
SF 500.1299967 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



4b

CycloheptenеCycloheptynemethylene 13C
Experiment 3 Topspin 300
Tuesday 26 March 2013
Reaction done with SnCl4 and iPrNEt



4b

Current Data Parameters
NAME Cycloheptene Cycloheptynemethylene 13C
EXPNO 3
PROCNO 1

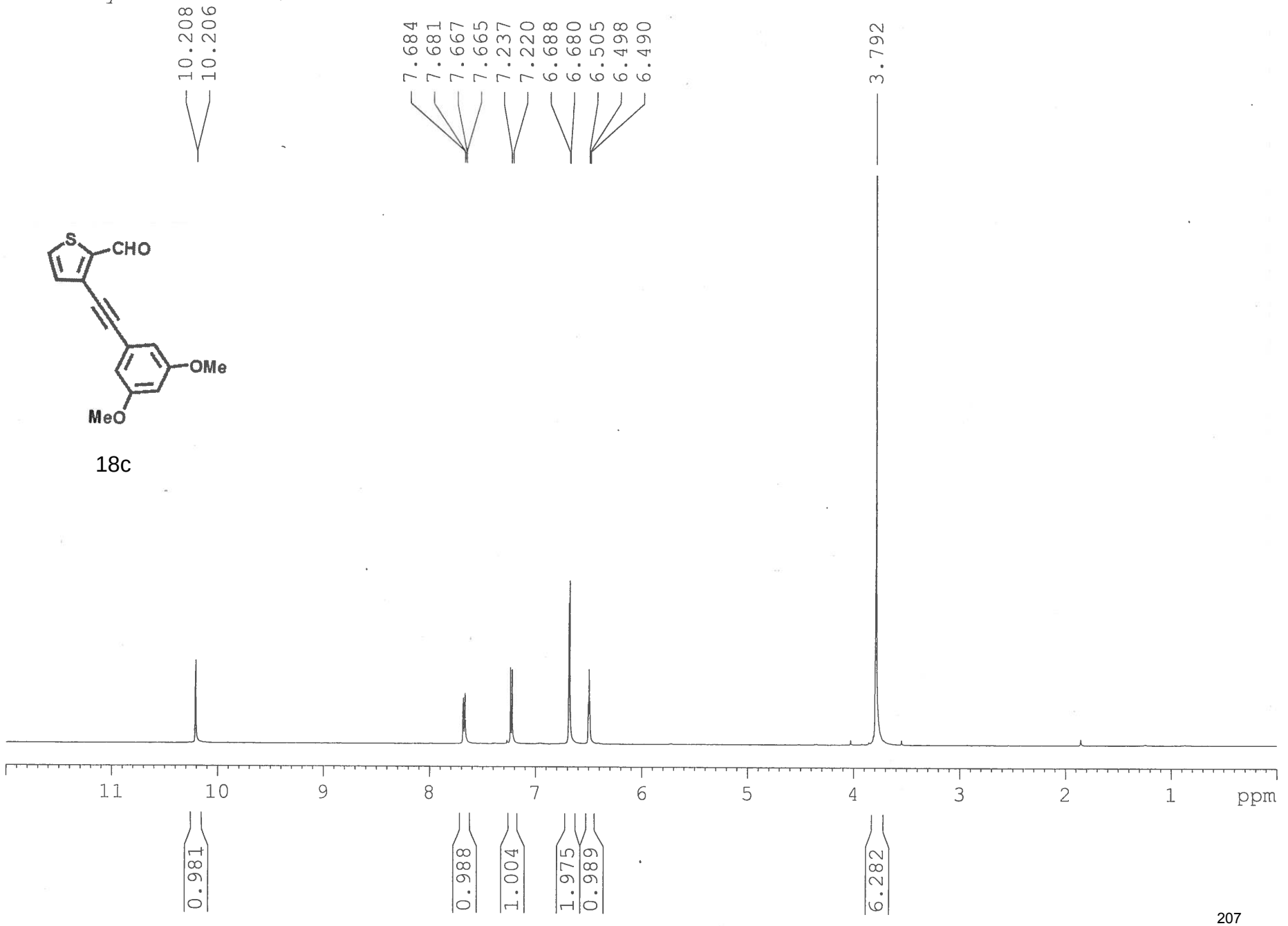
F2 - Acquisition Parameters
Date_ [illegible]
Time 14.[illegible]
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 37768
SOLVENT CDCl3
NS [illegible]35
DS 4
SWH 17[illegible].611 Hz
FIDRES 0.[illegible]48477 Hz
AQ 0.9119994 sec
RG 18[illegible].5
DW [illegible].999 usec
DE [illegible].00 usec
TE [illegible]06.0 K
D1 1.[illegible] sec
d11 0.[illegible] sec
DELTA 1.[illegible] sec
TD0 1

======== CHANNEL f1 [illegible]
NUC1 1[illegible]
P1 [illegible] usec
PL1 [illegible] dB
SFO1 [illegible] MHz

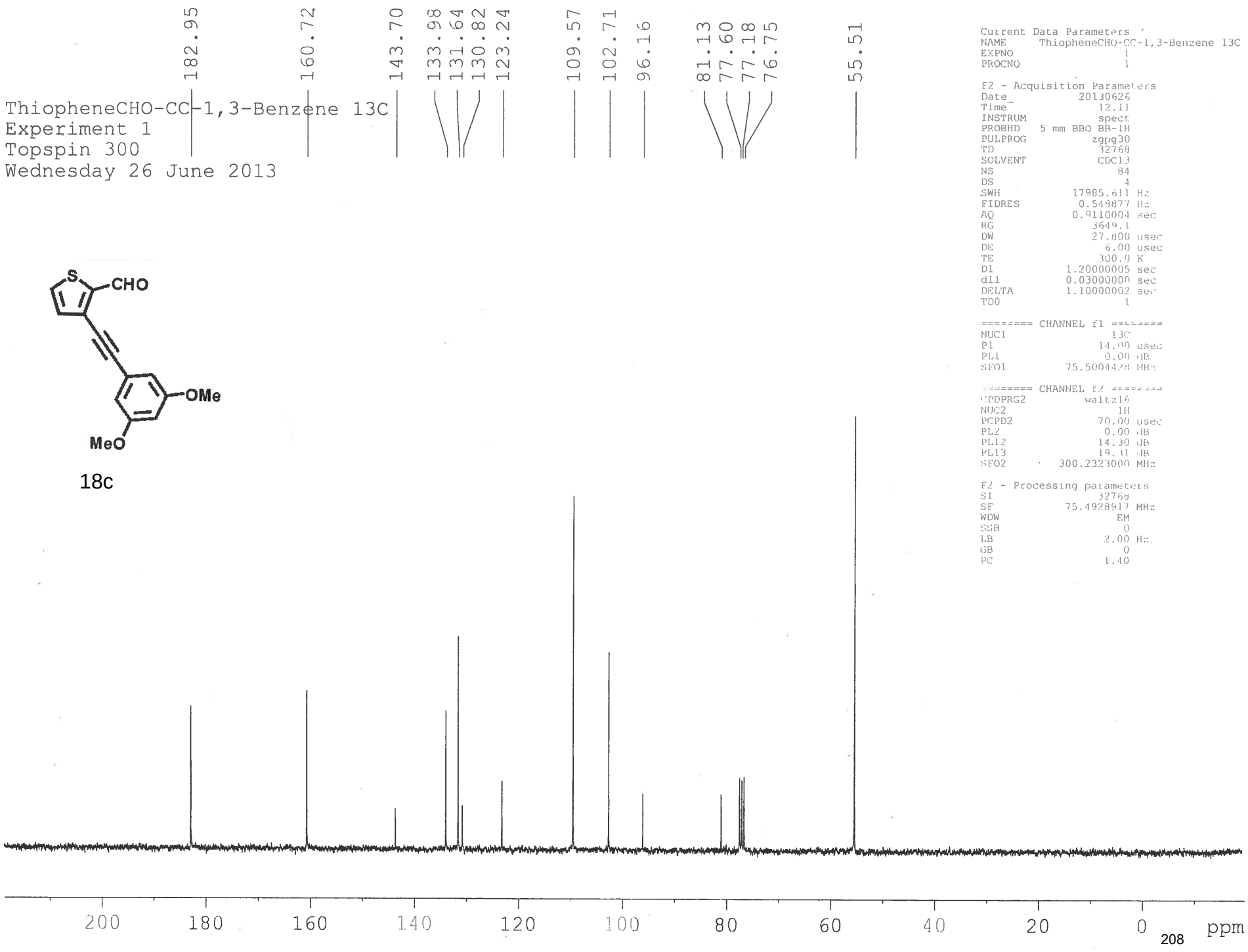
======== CHANNEL f2 [illegible]
CPDPRG2 [illegible]
NUC2 1H
PCPD2 [illegible] usec
PL2 [illegible] dB
PL12 14.[illegible] dB
PL13 [illegible] dB
SFO2 [illegible] MHz

F2 - Processing parameters
SI [illegible]
SF [illegible] MHz
WDW EM
SSB 0
LB [illegible].00 Hz
GB 0
PC 1.40

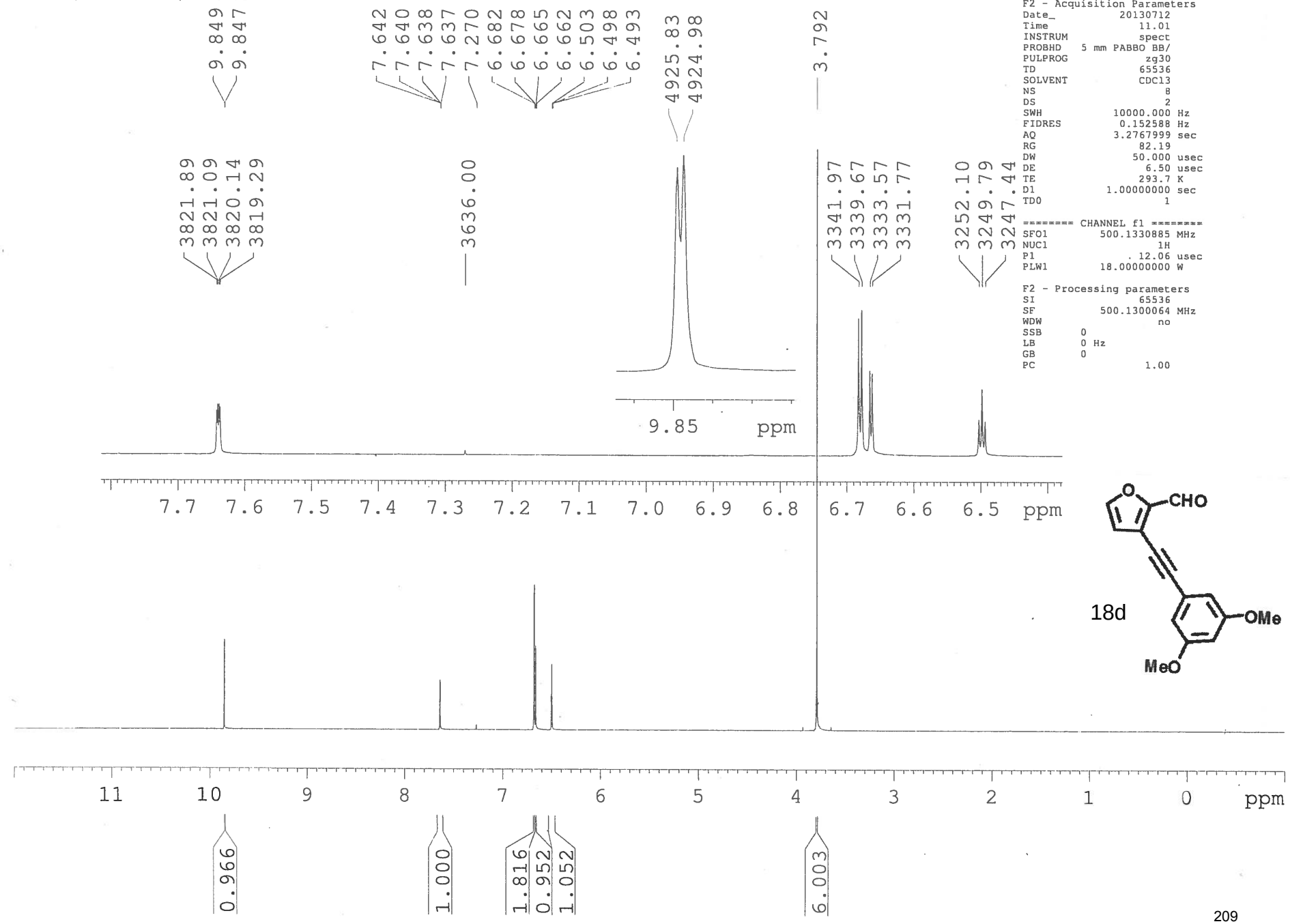
ThiopheneCHO-CC-1,3-Benzene
Experiment 1 Topspin 300
Wednesday 26 June 2013



18c


182.95
160.72
143.70
133.98
131.64
130.82
123.24
109.57
102.71
96.16
81.13
77.60
77.18
76.75
55.51
ThiopheneCHO-CC-1,3-Benzene 13C
Experiment 1
Topspin 300
Wednesday 26 June 2013
S
CHO
OMe
MeO
18c
Current Data Parameters
NAME ThiopheneCHO-CC-1,3-Benzene 13C
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date 20130626
Time 12.11
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 84
DS 4
SWH 17985.611 Hz
FIDRES 0.549877 Hz
AQ 0.9110004 sec
RG 3649.1
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.20000005 sec
d11 0.03000000 sec
DELTA 1.10000002 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 14.00 usec
PL1 0.00 dB
SFO1 75.5004428 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 14.30 dB
PL13 19.31 dB
SFO2 300.2323000 MHz
F2 - Processing parameters
SI 32768
SF 75.4928917 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40
200
180
160
140
120
100
80
60
40
20
0
ppm

FuranCHO-CC-1,3-Dimethoxybenzene
Experiment 1 Topspin 500 V3.2
Friday 12 July 2013



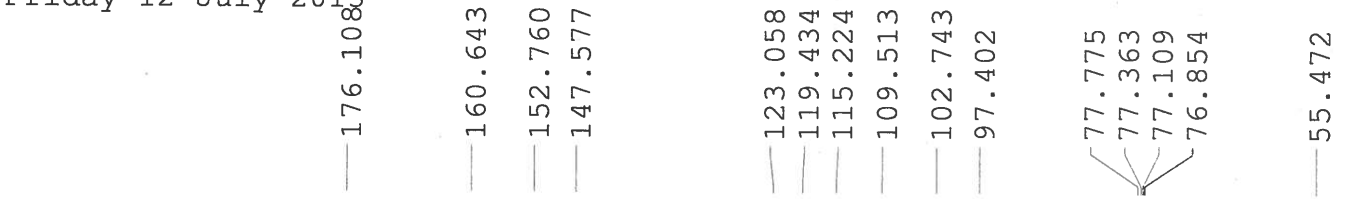
Current Data Parameters
NAME FuranCHO-CC-1,3-Dimethoxybenzene
EXPNO 1
PROCNO 1

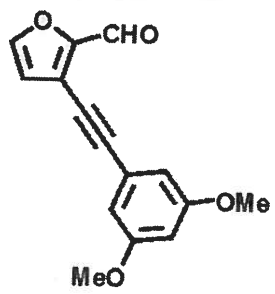
F2 - Acquisition Parameters
Date_ 20130712
Time 11.01
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 82.19
DW 50.000 usec
DE 6.50 usec
TE 293.7 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 12.06 usec
PLW1 18.00000000 W

F2 - Processing parameters
SI 65536
SF 500.1300064 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00

FuranCHO-CC-1,3-Dimethoxybenzene 13C
Experiment 1 Topspin 500 V3.2
Friday 12 July 2013



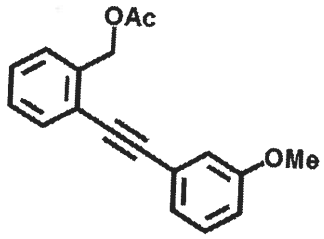


18d

```
Current Data Parameters
NAME      FuranCHO-CC-1,3-Dimethoxybenzene 13C
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20130712
Time              11.09
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                   72
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ             1.1010048 sec
RG                203.82
DW              16.800 usec
DE               6.50 usec
TE              293.7 K
D1             2.00000000 sec
D11            0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                9.50 usec
PLW1        66.48200226 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        12.23400021 W
PLW12        0.28826001 W
PLW13        0.18449000 W

F2 - Processing parameters
SI                 32768
SF           125.7577890 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

BenzaldOAc-CC-Anisole
Experiment 1
Topspin 500 V3.2
Monday 17 June 2013

7.586
7.583
7.449
7.446
7.434
7.432
7.370
7.367
7.355
7.352
7.341
7.336
7.325
7.322
7.310
7.307
7.291
7.275
7.270
7.259
7.188
7.185
7.183
7.173
7.170
7.168
7.123
7.120
7.118
7.115
6.936
6.934
6.930
6.929
6.919
6.917
6.914
6.912
5.400
3.813
2.132



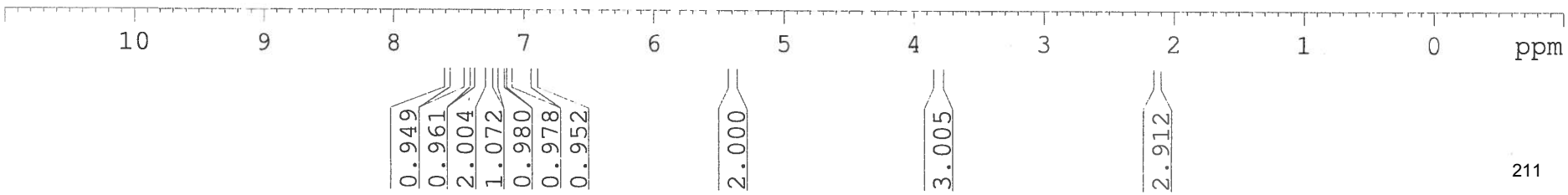
19a

Current Data Parameters
NAME BenzaldOAc-CC-Anisole
EXPNO 1
PROCNO 1

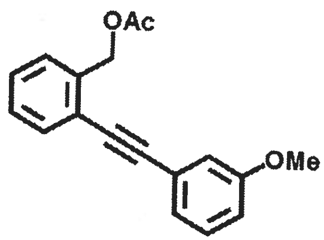
F2 - Acquisition Parameters
Date_ 20130617
Time 20.17
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 17.29
DW 50.000 usec
DE 6.50 usec
TE 294.9 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 12.06 usec
PLW1 18.00000000 W

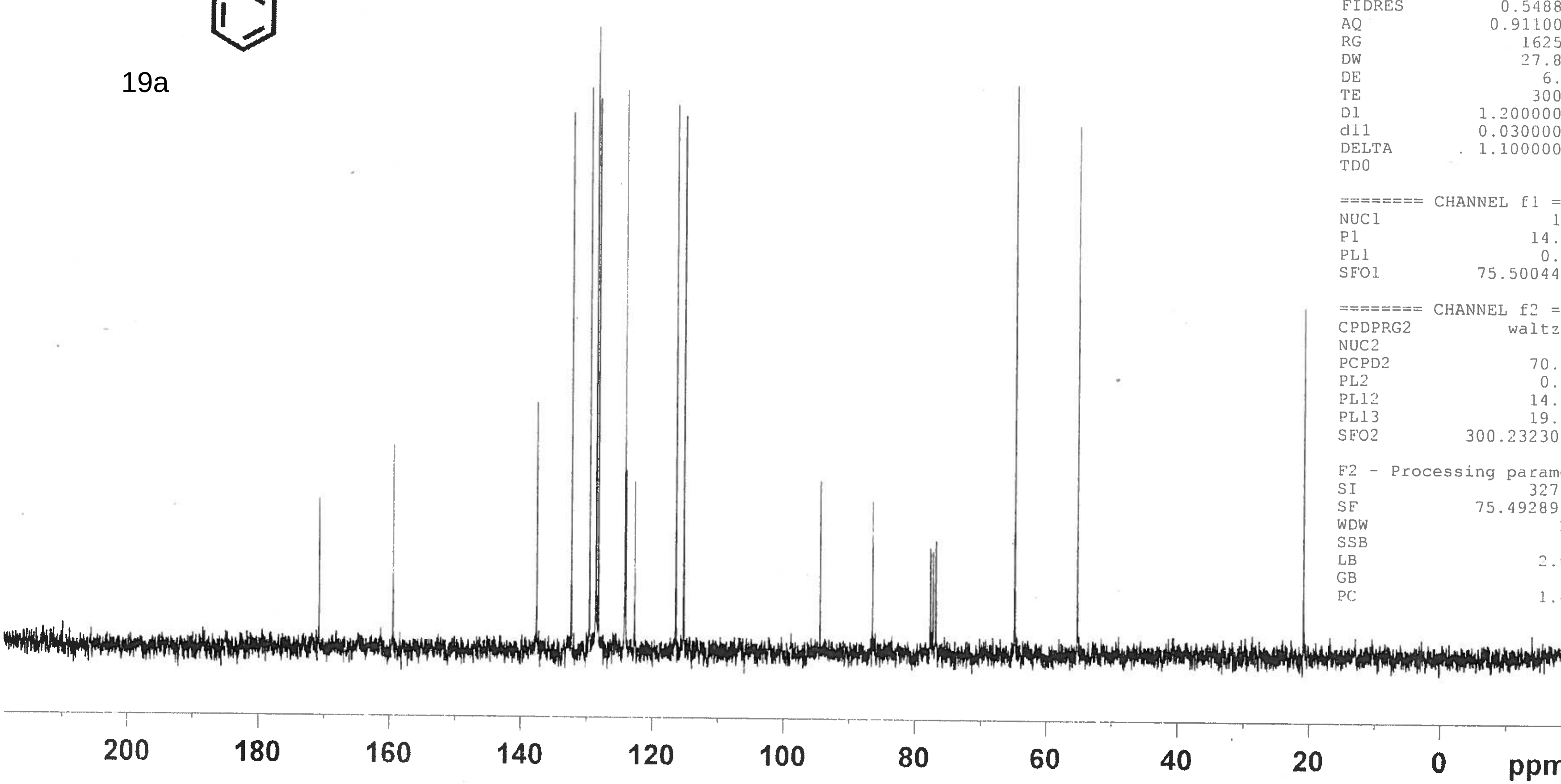
F2 - Processing parameters
SI 65536
SF 500.1300054 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



BenzaldeOAc-CC-Anisole 13C
Topspin 300 V1.3
Experiment 1
Saturday 15 June 2013



19a



Current Data Parameters

NAME	BenzaldeOAc-CC-Anisole 13C
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

Date_	20130615
Time	13.04
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zgpg30
TD	32768
SOLVENT	CDCl3
NS	13
DS	4
SWH	17985.611 Hz
FIDRES	0.548877 Hz
AQ	0.9110004 sec
RG	1625.5
DW	27.800 usec
DE	6.00 usec
TE	300.0 K
D1	1.20000005 sec
d11	0.03000000 sec
DELTA	1.10000002 sec
TD0	1

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

NUC1	13C
P1	14.00 usec
PL1	0.00 dB
SFO1	75.5004428 MHz

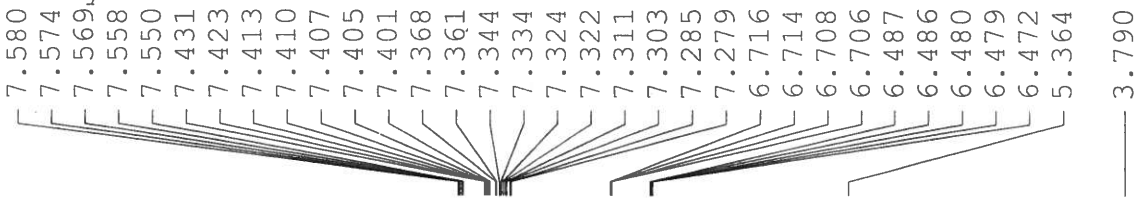
======== CHANNEL f2 ========

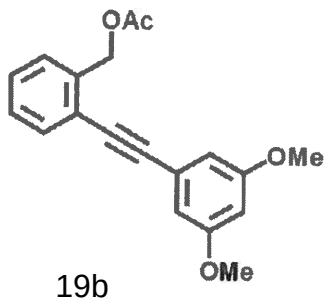
CPDPRG2	waltz16
NUC2	1H
PCPD2	70.00 usec
PL2	0.00 dB
PL12	14.30 dB
PL13	19.31 dB
SFO2	300.2323000 MHz

F2 - Processing parameters

SI	32768
SF	75.4928917 MHz
WDW	EM
SSB	0
LB	2.00 Hz
GB	0
PC	1.40

BenzaldeOAc-CC-1,3-Benzene
Experiment 1 Topspin 300
Wednesday 26 June 2013





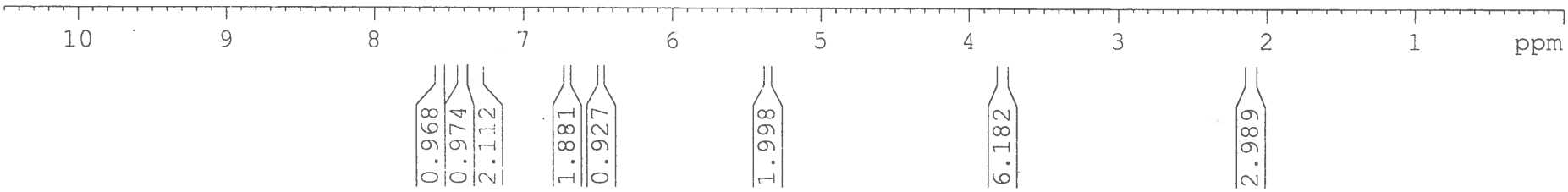
19b

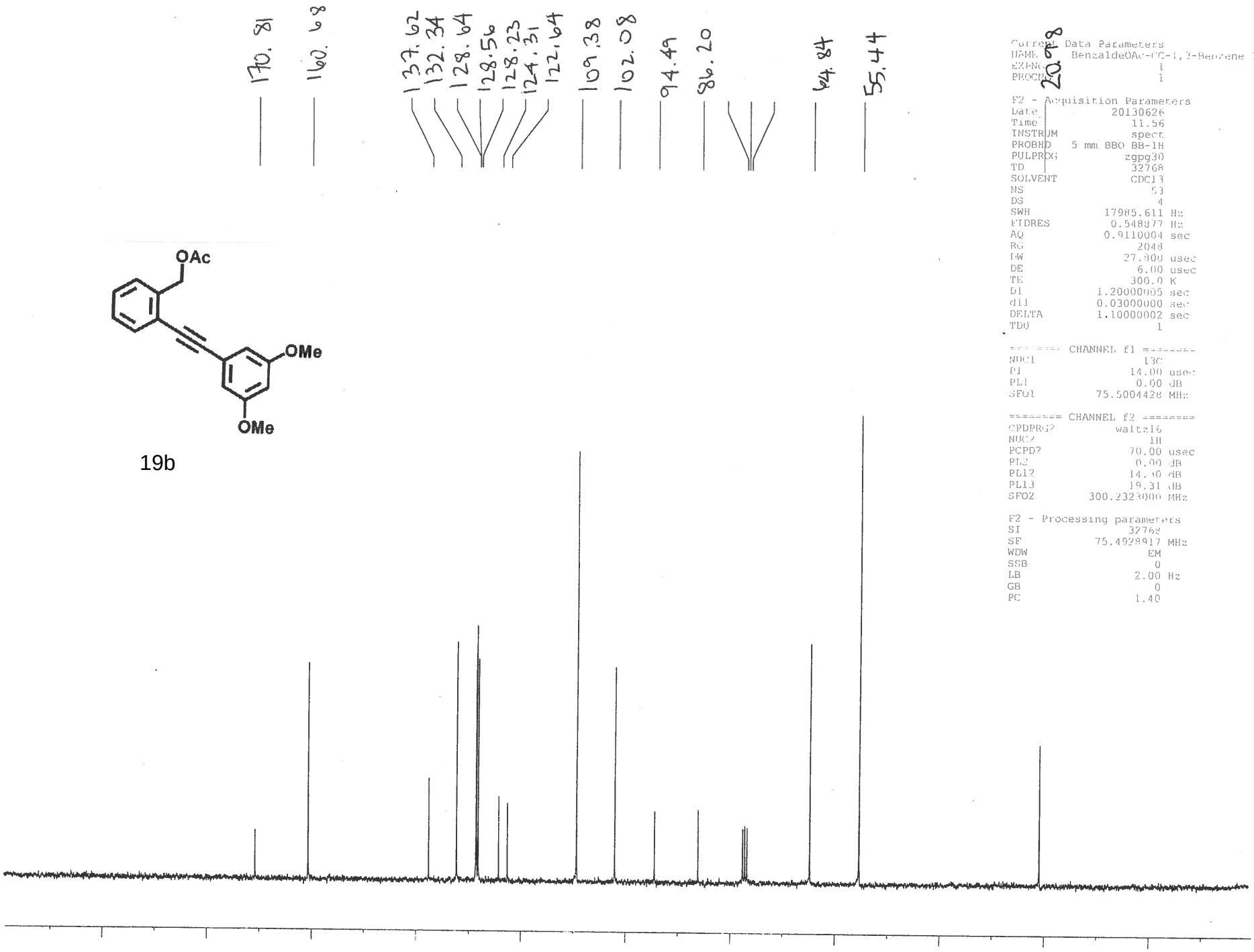
Current Data Parameters
NAME Benzal-OAc-CC-1,3-Benzene
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130626
Time 11.46
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 2
SWH 6172.839 Hz
FIDRES 0.188380 Hz
AQ 2.6542580 sec
RG 45.3
DW 81.000 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 13.50 usec
PL1 0.00 dB
SFO1 300.2315011 MHz

F2 - Processing parameters
SI 32768
SF 300.3000115 MHz
WDW EM
SSB 0
LB 0.02 Hz
GB 0
PC 1.00




170.81
160.68
137.62
132.34
128.64
128.56
128.23
124.31
122.64
109.38
102.08
94.49
86.20
64.84
55.44
20.98
OAc
OMe
OMe
19b
Current Data Parameters
NAME BenzaldeOAc-CC-1,3-Benzene 13C
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130626
Time 11.56
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 93
DS 4
SWH 17985.611 Hz
FIDRES 0.548877 Hz
AQ 0.9110004 sec
RG 2048
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.20000005 sec
d11 0.03000000 sec
DELTA 1.10000002 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 14.00 usec
PL1 0.00 dB
SFO1 75.5004428 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 14.40 dB
PL13 19.31 dB
SFO2 300.2323000 MHz
F2 - Processing parameters
SI 32768
SF 75.4928917 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40

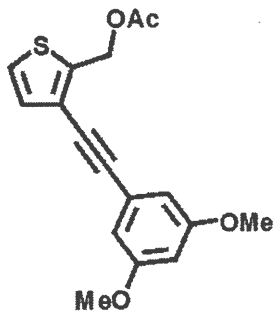
ThiopheneOAc-1,3-Dimethoxybenzene
Experiment 1 Topspin 500 V3.2
Friday 28 June 2013

Current Data Parameters
NAME ThiopheneOAc-CC-1,3-Dimethoxybenzene
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130628
Time 13.56
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 70.71
DW 50.000 usec
DE 6.50 usec
TE 294.8 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 12.06 usec
PLW1 18.00000000 W

F2 - Processing parameters
SI 65536
SF 500.1300053 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00

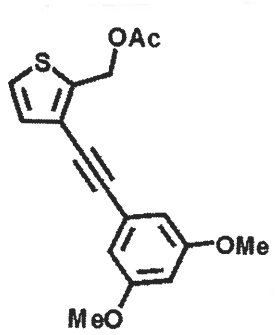


19c

ThiopheneOAc-CC-1,3-Dimethoxybenzene
Topspin 500 V3.2 Experiment 1
Friday 28 June 2013

170.718
160.580
140.512
129.664
125.784
124.196
122.356
109.330
101.945
92.924
82.257
77.346
77.092
76.838
59.403
55.451
20.895

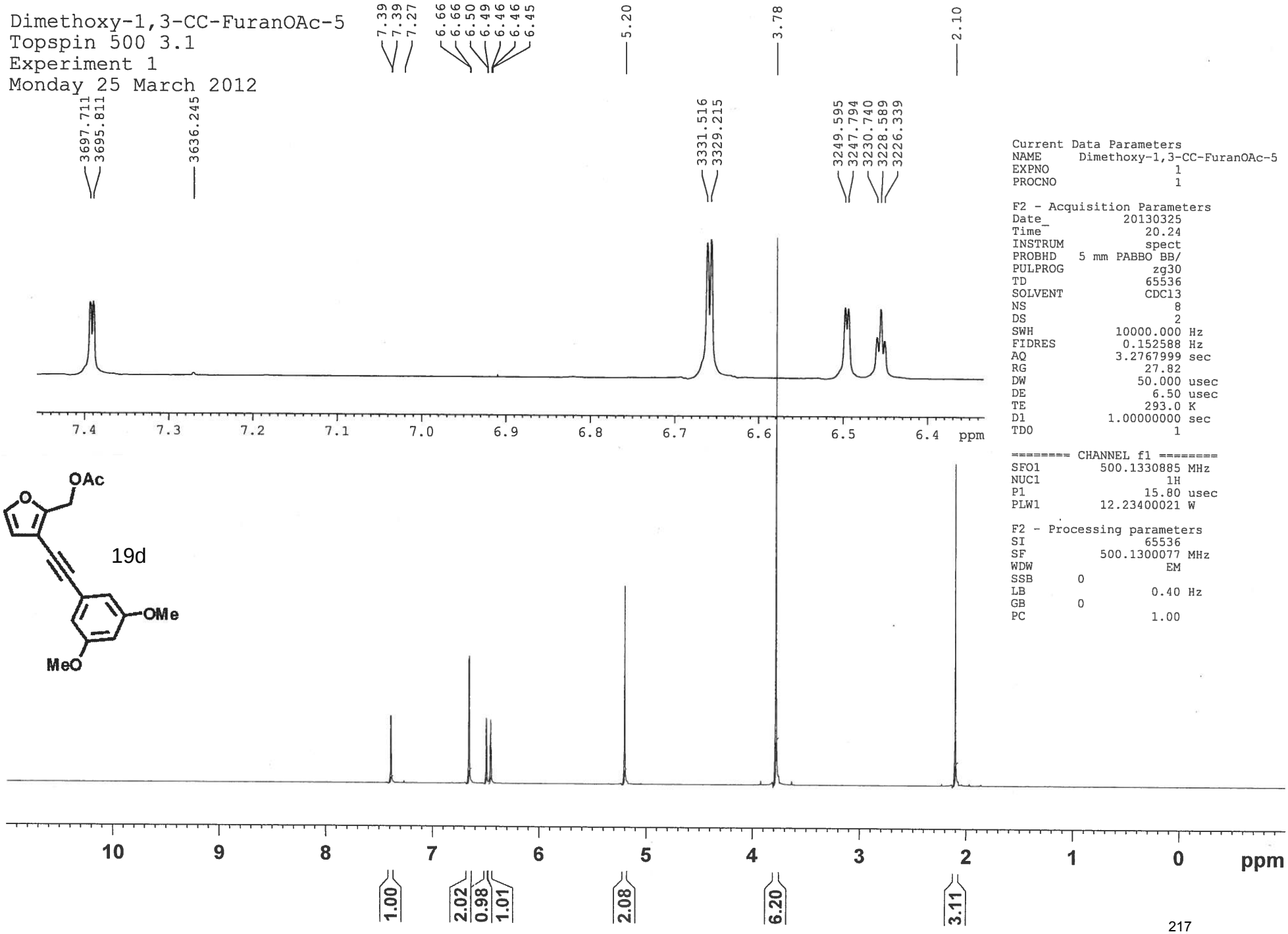
```
Current Data Parameters
NAME      ThiopheneOAc-CC-1,3-Dimethoxybenzene 13C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130628
Time               14.03
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   63
DS                    4
SWH            29761.904 Hz
FIDRES         0.454131 Hz
AQ             1.1010048 sec
RG                203.82
DW                16.800 usec
DE                 6.50 usec
TE                295.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                13C
P1                 9.50 usec
PLW1         66.48200226 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2         12.23400021 W
PLW12         0.28826001 W
PLW13         0.18449000 W

F2 - Processing parameters
SI                 32768
SF           125.7577890 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```



19c

200 180 160 140 120 100 80 60 40 20 0 ppm

Dimethoxy-1,3-CC-FuranOAc-5
Topspin 500 3.1
Experiment 1
Monday 25 March 2012



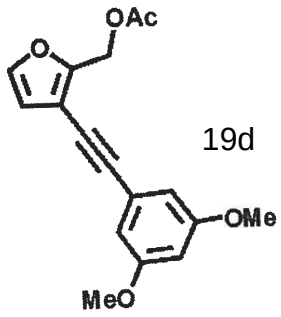
Current Data Parameters
NAME Dimethoxy-1,3-CC-FuranOAc-5
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130325
Time 20.24
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 27.82
DW 50.000 usec
DE 6.50 usec
TE 293.0 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 15.80 usec
PLW1 12.23400021 W

F2 - Processing parameters
SI 65536
SF 500.1300077 MHz
WDW EM
SSB 0
LB 0.40 Hz
GB 0
PC 1.00

nethoxy-1,3-CC-FuranOAc-5 13C
ɔspin 500 3.1
ɔeriment 1
ıday 25 March 2013



Current Data Parameters
NAME Dimethoxy-1,3-CC-FuranOAc-5 13C
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130325
Time 20.38
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 13
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 203.82
DW 16.800 usec
DE 6.50 usec
TE 293.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 125.7703637 MHz
NUC1 13C
P1 9.50 usec
PLW1 66.48200226 W

======== CHANNEL f2 ========
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 12.23400021 W
PLW12 0.47720000 W
PLW13 0.30541000 W

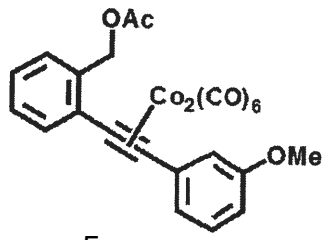
F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

200 180 160 140 120 100 80 60 40 20 0 ppm

BenzaldOAc-CC-Anisole Co2(CO)6
Experiment 1
Topspin 500 V3.2
Tuesday 18 June 2013

7.438
7.435
7.424
7.423
7.421
7.401
7.399
7.386
7.384
7.372
7.369
7.366
7.354
7.351
7.339
7.337
7.316
7.301
7.300
7.284
7.271
7.270
7.081
7.079
7.078
7.076
7.066
7.064
7.063
7.061
7.020
7.017
7.015
7.012
6.919
6.918
6.914
6.913
6.903
6.901
6.898
6.896
5.133
3.828
2.036

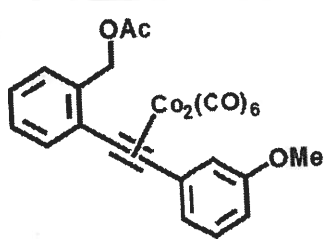
7.680
7.678
7.677
7.666
7.662



5a

BenzaldOAc-CC-Anisole Co2(CO)6 13C
Topspin 500 V3.2
Tuesday 18 June 2013

199.093 170.487 159.761 139.987 136.086 134.495 132.421 129.924 129.638 128.829 128.392 121.823 114.959 113.355 94.999 88.884 77.314 77.059 76.806 63.602 55.233 20.808



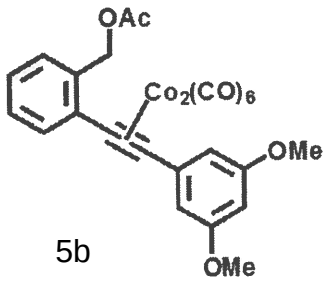
5a


```
Current Data Parameters
NAME      BenzaldOAc-CC-Anisole Co2(CO)6 13C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130618
Time              23.07
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   96
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ            1.1010048 sec
RG               203.82
DW               16.800 usec
DE                6.50 usec
TE               294.0 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1               13C
P1                9.50 usec
PLW1        66.48200226 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2               1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        12.23400021 W
PLW12        0.28826001 W
PLW13        0.18449000 W

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

BenzaldOAc-CC-1,3-dimethoxybenzene Co2(CO)6
Experiment 1 Topspin 500 V3.2
Thursday 27 June 2013

7.682 7.679 7.678 7.667 7.663 7.434 7.431 7.420 7.419 7.416 7.415 7.395 7.392 7.381 7.378 7.366 7.363 7.360 7.349 7.345 7.334 7.330 7.270 6.634 6.630 6.476 6.472 6.467 5.157 3.801 2.046

```
Current Data Parameters
NAME      BenzaldOAc-CC-1,3-dimethoxybenzene Co2(CO)6
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130627
Time               15.34
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     2
SWH            10000.000 Hz
FIDRES             0.152588 Hz
AQ             3.2767999 sec
RG                 43.34
DW                 50.000 usec
DE                  6.50 usec
TE                296.4 K
D1             1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                1H
P1                 12.06 usec
PLW1         18.00000000 W

F2 - Processing parameters
SI                 65536
SF            500.1300065 MHz
WDW                   no
SSB       0
LB        0 Hz
GB        0
PC                  1.00
```

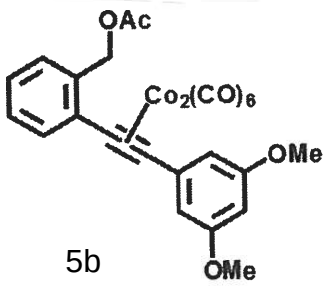


5b

11 10 9 8 7 6 5 4 3 2 1 0 ppm

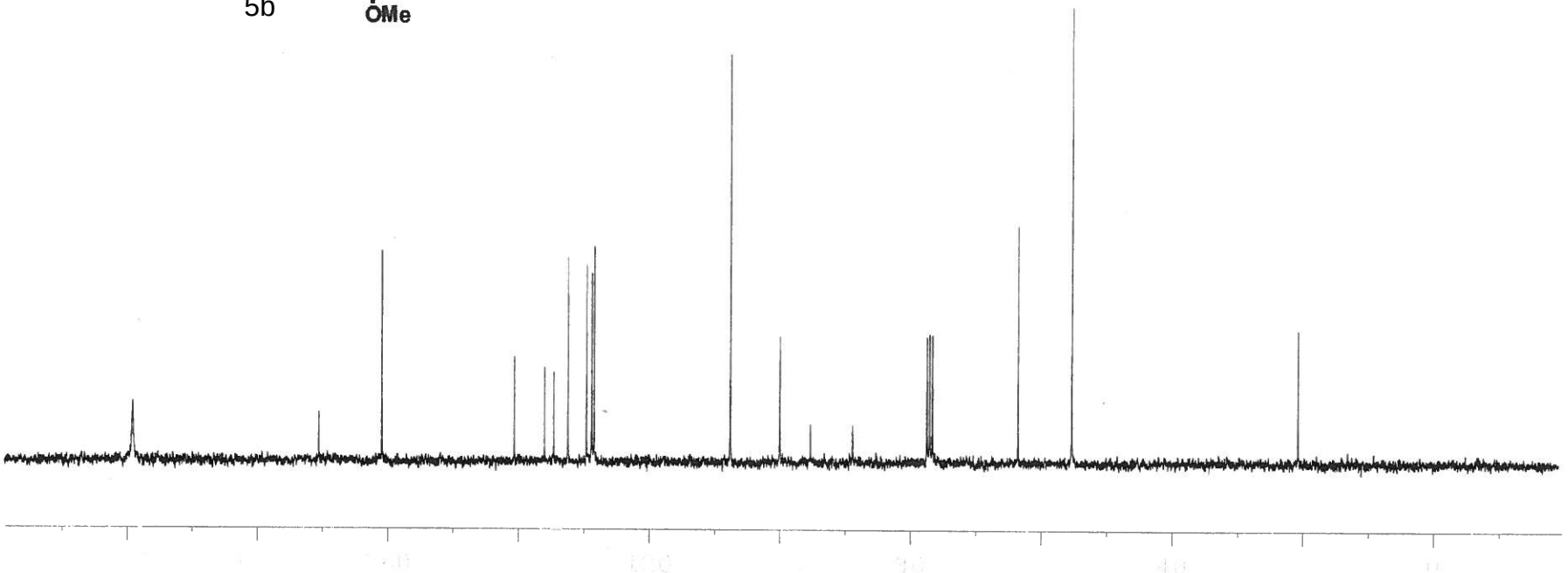
0.990 0.994 2.162 1.997 1.000 2.014 6.076 3.102

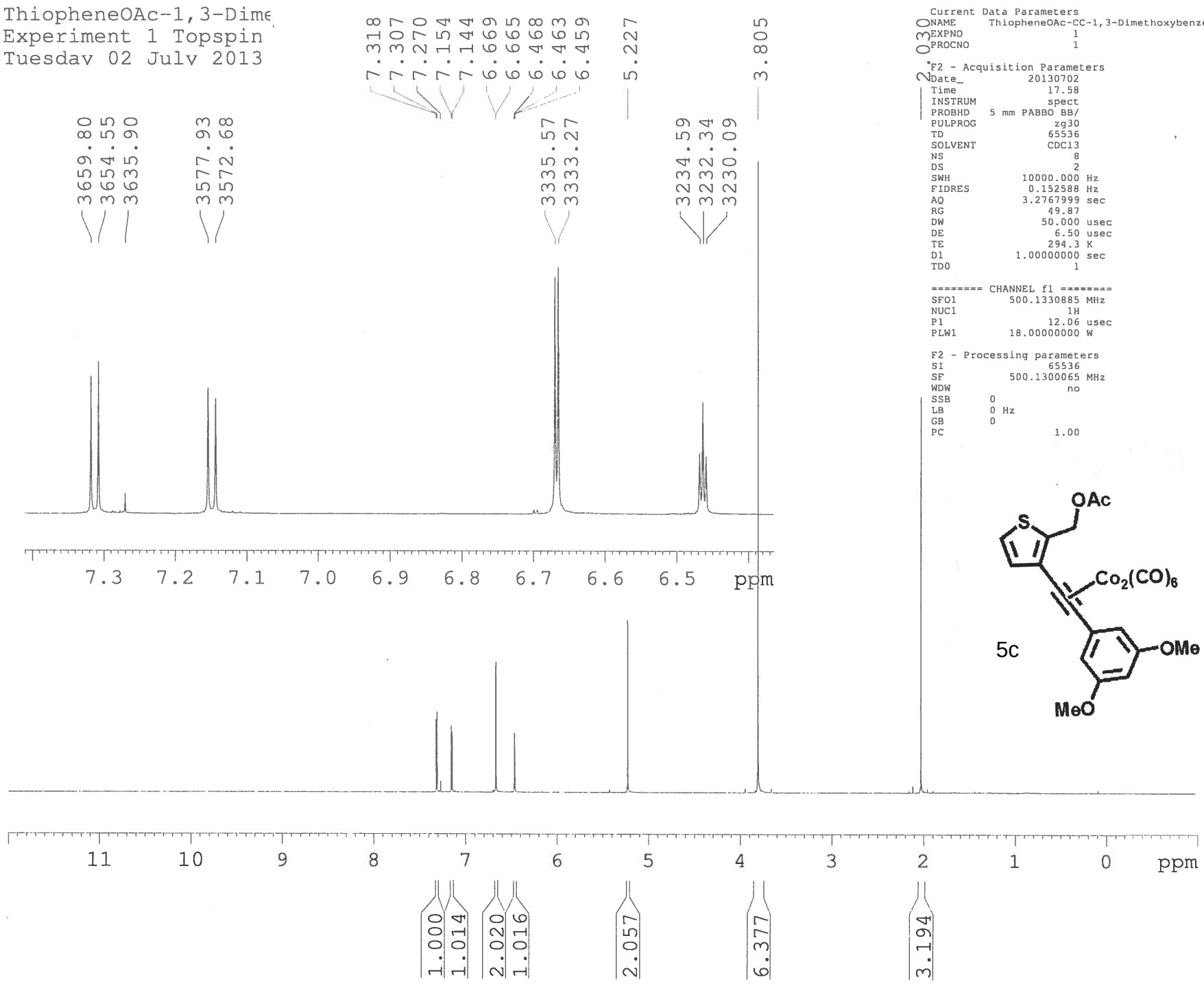
BenzaldeOAc-CC-1,3-Benzene Co2(CO)6 13C
Topspin 300
Experiment 1
Thursday 27 June 2013



5b

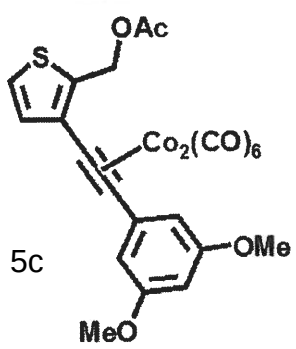
```
Current Data Parameters
NAME      BenzaldeOAc-CC-1,3-Benzene Co2(CO)6 13C
EXPNO                  1
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130627
Time              17.52
INSTRUM           spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                  104
DS                    4
SWH           17985.611 Hz
FIDRES        0.548877 Hz
AQ            0.9110004 sec
RG                 2048
DW               27.800 usec
DE                6.00 usec
TE                300.0 K
D1            1.20000005 sec
d11           0.03000000 sec
DELTA         1.10000002 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                14.00 usec
PL1                0.00 dB
SFO1          75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             70.00 usec
PL2                0.00 dB
PL12              14.30 dB
PL13              19.31 dB
SFO2         300.2323000 MHz

F2 - Processing parameters
SI                32768
SF          75.4928917 MHz
WDW                  EM
SSB                   0
LB                2.00 Hz
GB                    0
PC                1.40
```




ThiopheneOAc-1,3-Dime
Experiment 1 Topspin
Tuesday 02 July 2013
7.318
7.307
7.270
7.154
7.144
6.669
6.665
6.468
6.463
6.459
5.227
3.805
3659.80
3654.55
3635.90
3577.93
3572.68
3335.57
3333.27
3234.59
3232.34
3230.09
7.3
7.2
7.1
7.0
6.9
6.8
6.7
6.6
6.5
ppm
11
10
9
8
7
6
5
4
3
2
1
0
ppm
1.000
1.014
2.020
1.016
2.057
6.377
3.194
Current Data Parameters
NAME ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20130702
Time 17.58
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 49.87
DW 50.000 usec
DE 6.50 usec
TE 294.3 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 12.06 usec
PLW1 18.00000000 W
F2 - Processing parameters
SI 65536
SF 500.1300065 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OAc
S
Co2(CO)6
OMe
MeO
5c

ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6
Experiment 1 Topspin 500 V3.2
Tuesday 02 July 2013

199.016 170.520 160.878 140.323 136.513 134.912 130.539 126.072 107.492 99.935 93.267 82.351 77.316 77.061 76.807 58.589 55.340 20.654

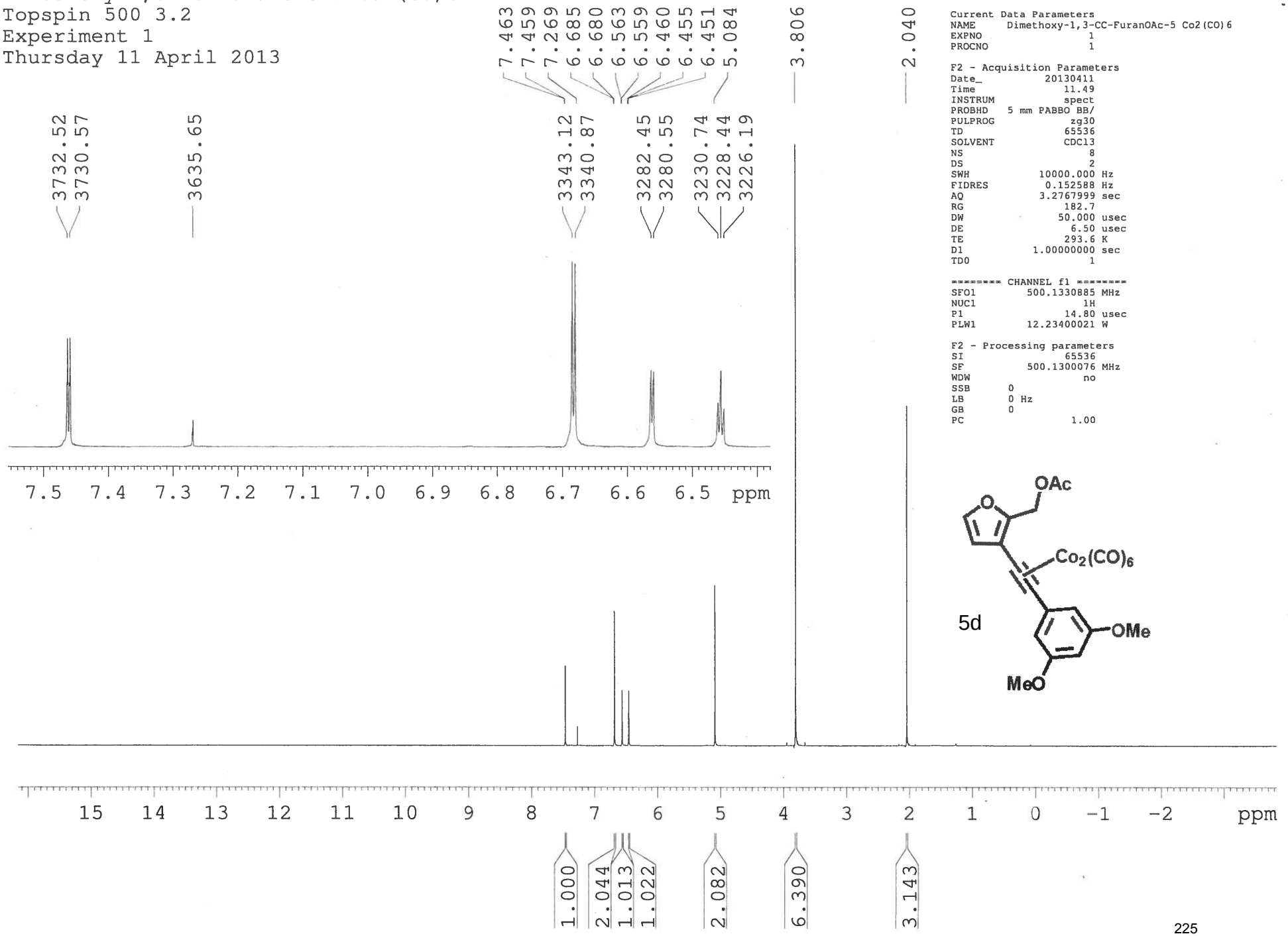


5c

```
Current Data Parameters
NAME      ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6 13C
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20130702
Time              18.06
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                  107
DS                    4
SWH           29761.904 Hz
FIDRES        0.454131 Hz
AQ            1.1010048 sec
RG                203.82
DW                16.800 usec
DE                 6.50 usec
TE                294.4 K
D1           2.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                 9.50 usec
PLW1        66.48200226 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        12.23400021 W
PLW12        0.28826001 W
PLW13        0.18449000 W

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                 EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

200 180 160 140 120 100 80 60 40 20 0 ppm

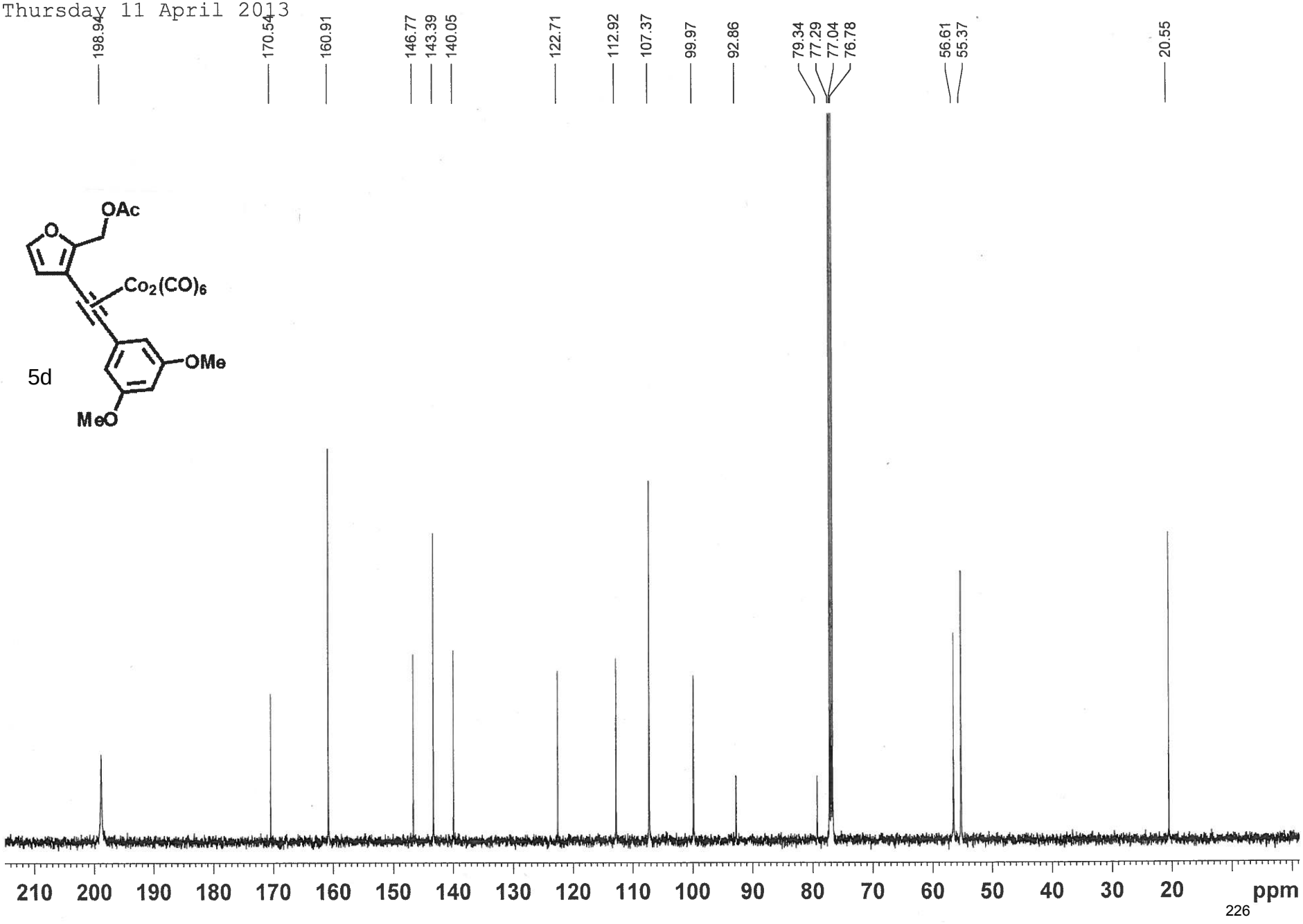
Dimethoxy-1,3-CC-FuranOAc-5 Co2(CO)6
Topspin 500 3.2
Experiment 1
Thursday 11 April 2013



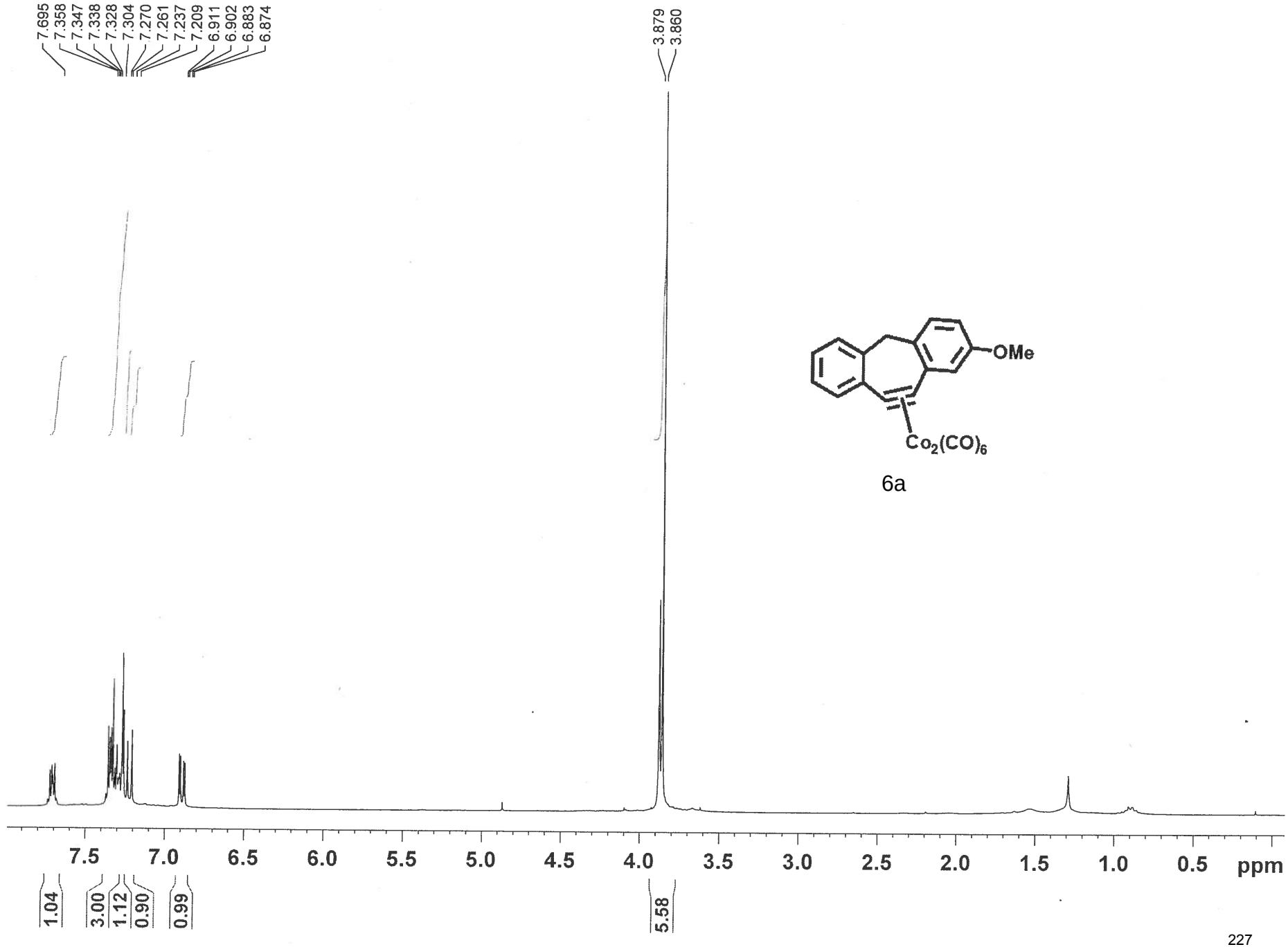

```
Current Data Parameters
NAME      Dimethoxy-1,3-CC-FuranOAc-5 Co2(CO)6
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_           20130411
Time              11.49
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    8
DS                    2
SWH           10000.000 Hz
FIDRES            0.152588 Hz
AQ             3.2767999 sec
RG                182.7
DW              50.000 usec
DE               6.50 usec
TE              293.6 K
D1            1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                1H
P1                14.80 usec
PLW1         12.23400021 W

F2 - Processing parameters
SI                65536
SF           500.1300076 MHz
WDW                  no
SSB       0
LB        0 Hz
GB        0
PC                 1.00
```


5d

Dimethoxy-1,3-CC-FuranOAc-5 Co2(CO)6 13C
Topspin 500 3.2
Experiment 1
Thursday 11 April 2013

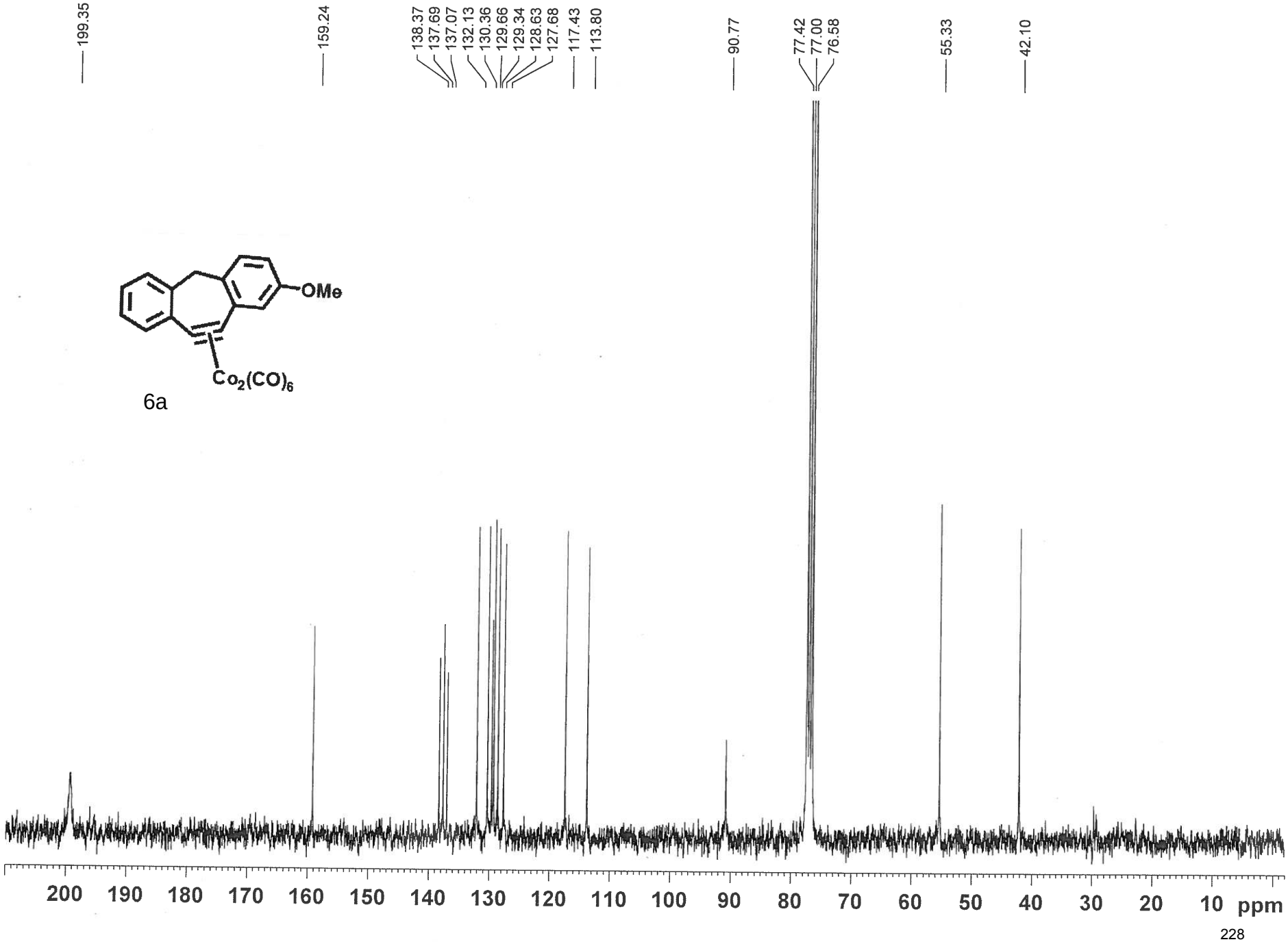


iik.140 4, 1h, MeOPh cycliz - benzyl spacer, major, 7/3/15



6a

iik.140 5, 13C, MeOPh cycliza, benzyl spacer, major, 7/3/15

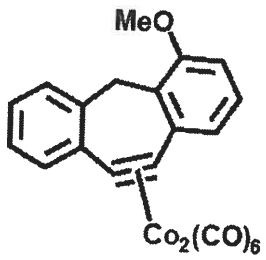


6a

BenzaldeOAc-CC-Anisole Nicholas Cyclization Minor
Experiment 2
Topspin 500 V3.2
Thursday 27 June 2013

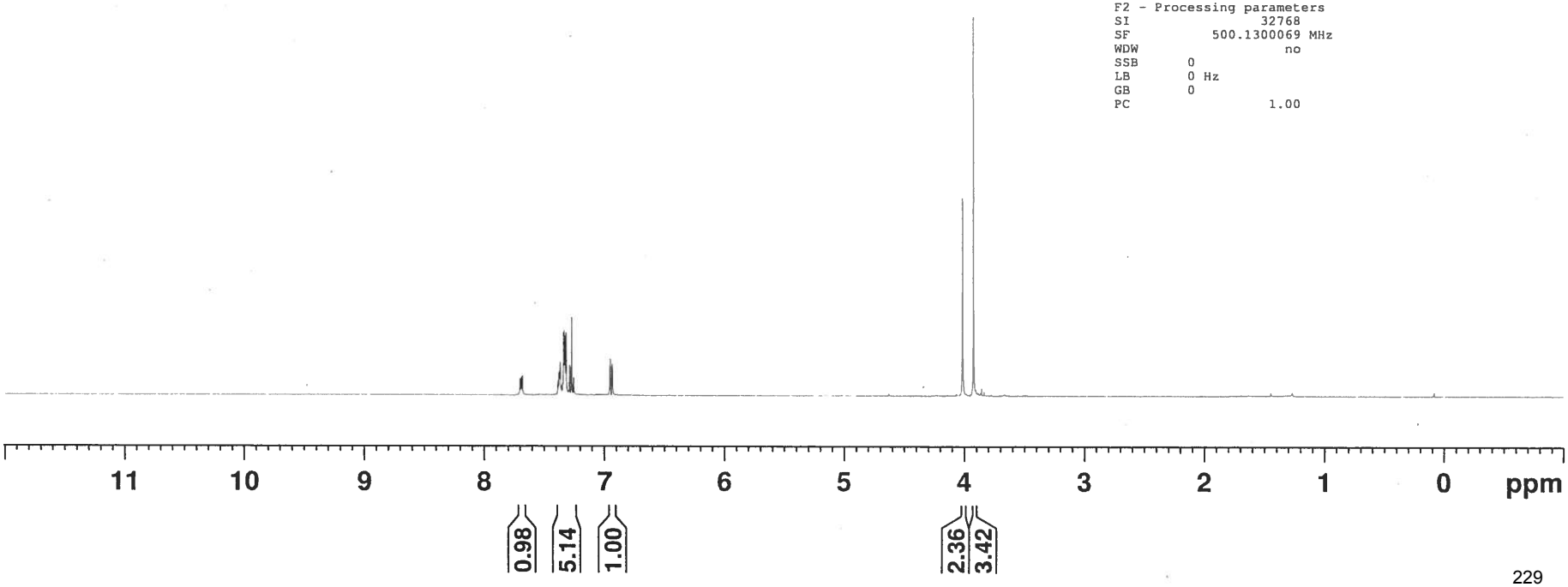
7.700 7.692 7.689 7.681 7.383 7.374 7.371 7.365 7.358 7.344 7.337 7.330 7.325 7.317 7.315 7.286 7.270 7.254 6.949 6.932

4.010 3.919



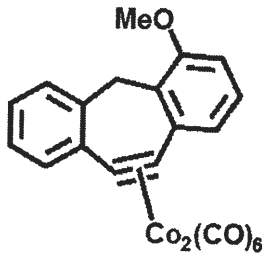
6a'

```
Current Data Parameters
NAME      BenzaldeOAc-CC-Anisole Nicholas Cyclization Minor
EXPNO                  2
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130627
Time              12.58
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgesgp
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           11029.412 Hz
FIDRES         0.336591 Hz
AQ             1.4854827 sec
RG                203.82
DW                45.333 usec
DE                 6.50 usec
TE                296.2 K
D1            1.00000000 sec
D12           0.00002000 sec
D16           0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1305001 MHz
NUC1                 1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0      0 W
PLW1       12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1             0.500
SPOFFS1   0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1              31.00 %
GPZ2              11.00 %
P16             1000.00 usec

F2 - Processing parameters
SI                32768
SF           500.1300069 MHz
WDW                  no
SSB       0
LB        0 Hz
GB        0
PC                 1.00
```



BenzaldOAc-CC-Anisole Co2(CO)6 Cyclized Minor 13C
Topspin 300 Experiment 2
Wednesday 03 July 2013

199.55
156.33
138.82
137.76
137.69
131.92
129.87
128.59
127.94
127.61
125.66
124.63
111.08
91.21
90.83
77.45
77.03
76.61
56.12
32.22



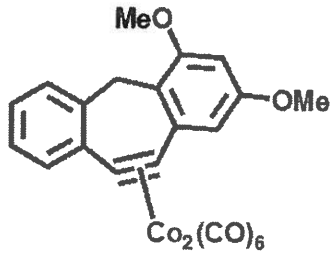
6a'


```
Current Data Parameters
NAME      BenzaldeOAc-CC-Anisole Co2(CO)6 Cyclized Minor 13C
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20130703
Time              22.19
INSTRUM           spect
PROBHD   5 mm BBO BB-1H
PULPROG          zgpg30
TD                32768
SOLVENT           CDCl3
NS                29449
DS                    4
SWH           17985.611 Hz
FIDRES         0.548877 Hz
AQ             0.9110004 sec
RG                 2048
DW               27.800 usec
DE                6.00 usec
TE              300.0 K
D1             1.20000005 sec
d11            0.03000000 sec
DELTA          1.10000002 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                13C
P1                14.00 usec
PL1                0.00 dB
SFO1         75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                1H
PCPD2             70.00 usec
PL2                0.00 dB
PL12              14.30 dB
PL13              19.31 dB
SFO2         300.2323000 MHz

F2 - Processing parameters
SI                32768
SF           75.4928917 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

BenzaldeOAc-1,3-Dimethoxybenzene Nicholas Cyclization
Experiment 2 Topspin 500 V3.2
Tuesday 02 July 2013

7.713 7.711 7.704 7.697 7.693 7.686 7.678 7.375 7.368 7.364 7.362 7.357 7.348 7.340 7.333 7.328 7.322 7.314 7.270 6.868 6.863 6.545 6.540

3.944 3.904 3.865

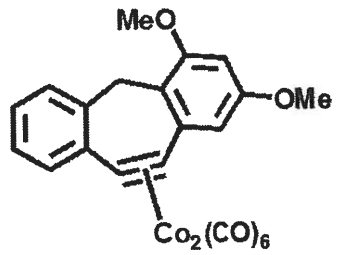


6b

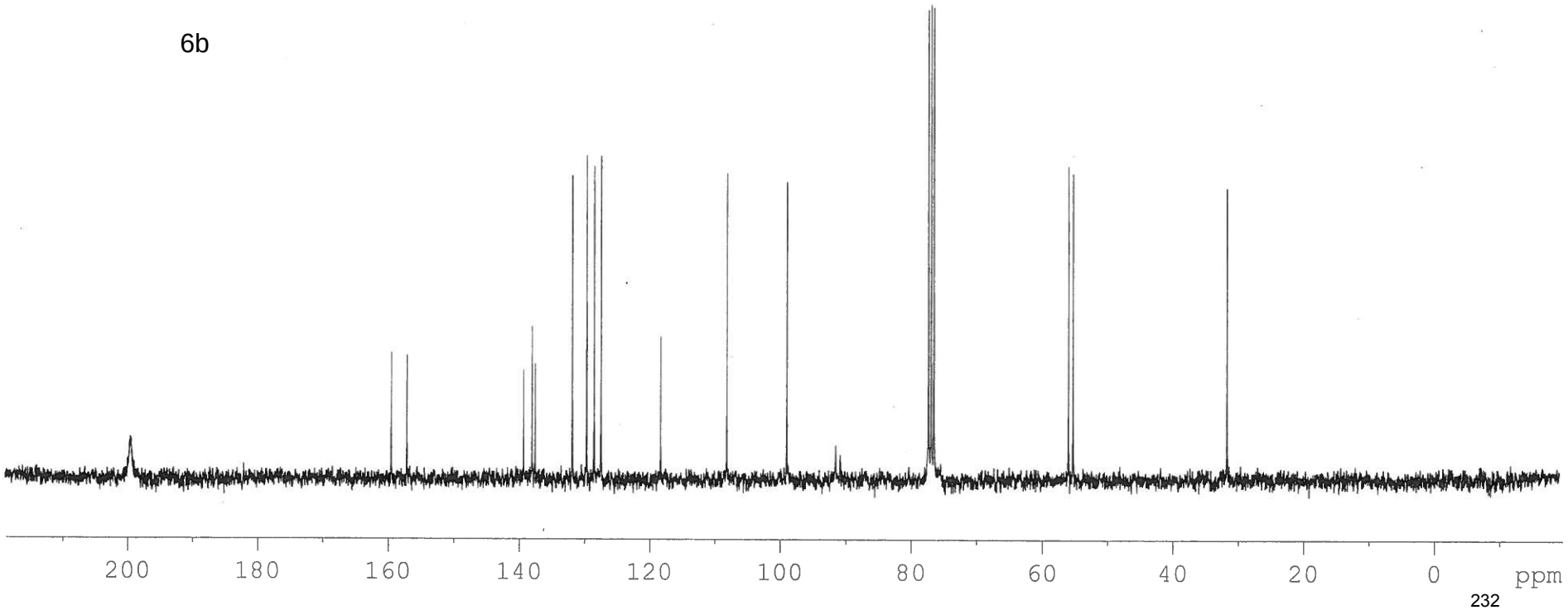
```
Current Data Parameters
NAME      BenzaldeOAc-CC-1,3-Dimethoxybenzene Nicholas Cyclization
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_           20130702
Time              18.20
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG           zgesgp
TD                32768
SOLVENT           CDCl3
NS                   16
DS                    2
SWH           11029.412 Hz
FIDRES         0.336591 Hz
AQ             1.4854827 sec
RG                108.72
DW                45.333 usec
DE                 6.50 usec
TE                294.4 K
D1            1.00000000 sec
D12           0.00002000 sec
D16           0.00020000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         500.1301000 MHz
NUC1                 1H
P1                14.80 usec
P2                29.60 usec
P12             2000.00 usec
PLW0      0 W
PLW1       12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1             0.500
SPOFFS1   0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]      SMSQ10.100
GPNAM[2]      SMSQ10.100
GPZ1               31.00 %
GPZ2               11.00 %
P16              1000.00 usec

F2 - Processing parameters
SI                 32768
SF           500.1300065 MHz
WDW                  EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

BenzaldeOAc-CC-1,3-Dimethoxybenzene Co2(CO)6 Cyclized 13C
Experiment 2 Topspin 300 V1.3
Tuesday 02 July 2013

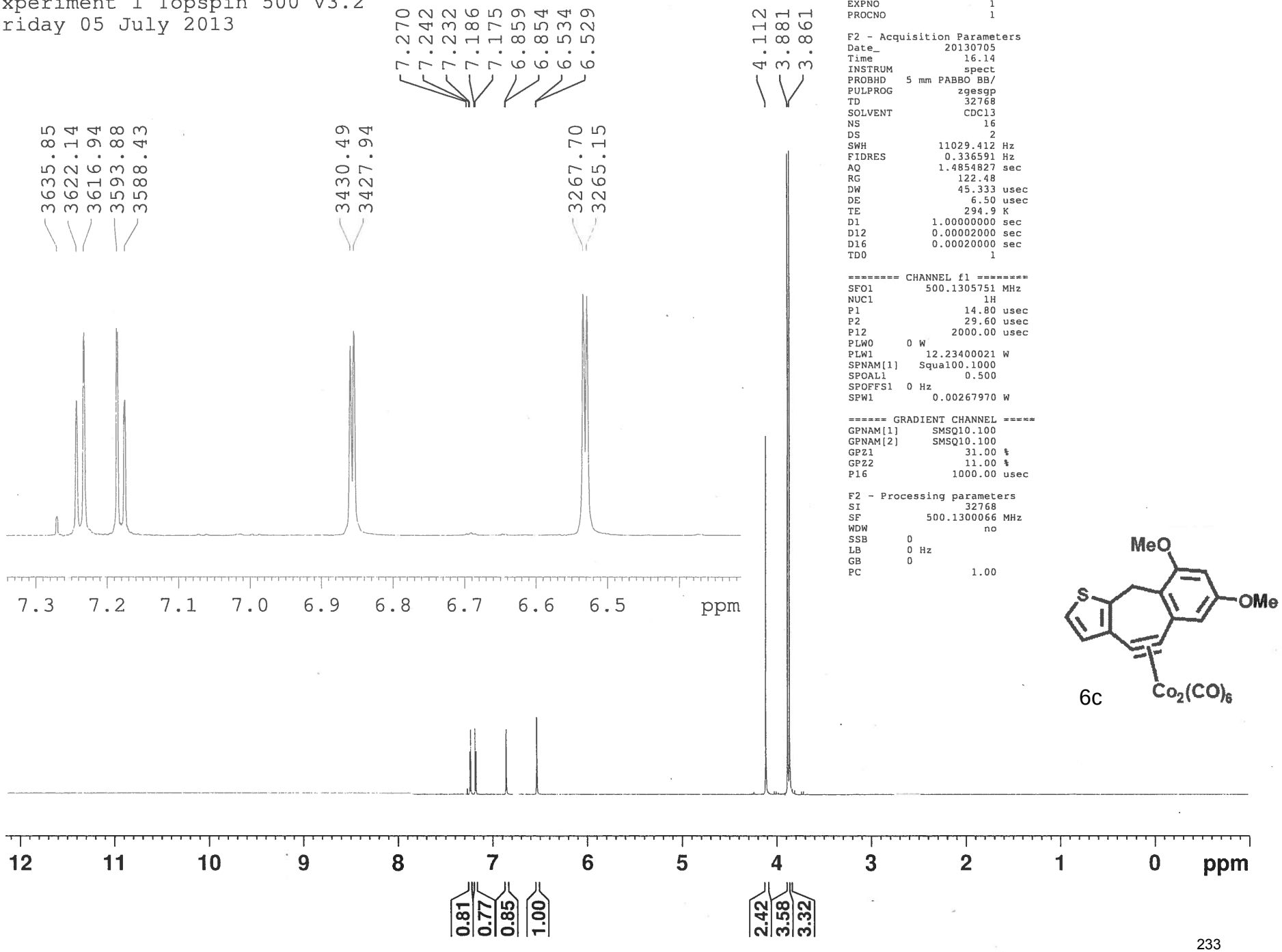
199.56
159.60
157.22
139.38
138.11
137.63
131.96
129.76
128.60
127.54
118.40
108.26
99.09
91.61
90.90
77.47
77.05
76.63
56.10
55.40
31.81



6b



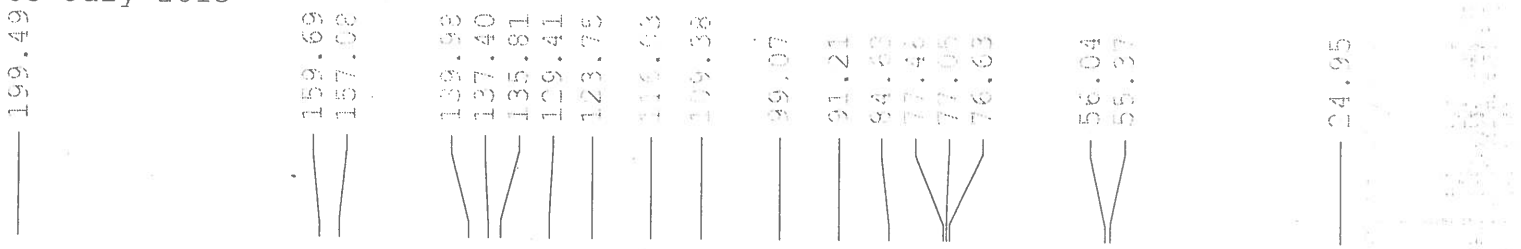
ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6 Cyclized
Experiment 1 Topspin 500 V3.2
Friday 05 July 2013

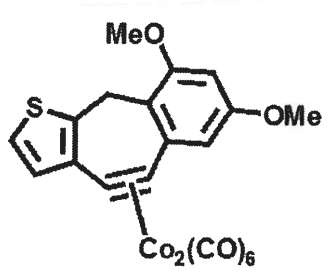



```
Current Data Parameters
NAME      ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6 Cyclized
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20130705
Time                16.14
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zgesgp
TD                  32768
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             11029.412 Hz
FIDRES          0.336591 Hz
AQ              1.4854827 sec
RG                 122.48
DW                 45.333 usec
DE                   6.50 usec
TE                  294.9 K
D1            1.00000000 sec
D12           0.00002000 sec
D16           0.00020000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          500.1305751 MHz
NUC1                   1H
P1                  14.80 usec
P2                  29.60 usec
P12               2000.00 usec
PLW0      0 W
PLW1        12.23400021 W
SPNAM[1]   Squa100.1000
SPOAL1              0.500
SPOFFS1   0 Hz
SPW1          0.00267970 W

====== GRADIENT CHANNEL =====
GPNAM[1]       SMSQ10.100
GPNAM[2]       SMSQ10.100
GPZ1                31.00 %
GPZ2                11.00 %
P16               1000.00 usec

F2 - Processing parameters
SI                  32768
SF            500.1300066 MHz
WDW                    no
SSB       0
LB        0 Hz
GB        0
PC                  1.00
```


6c

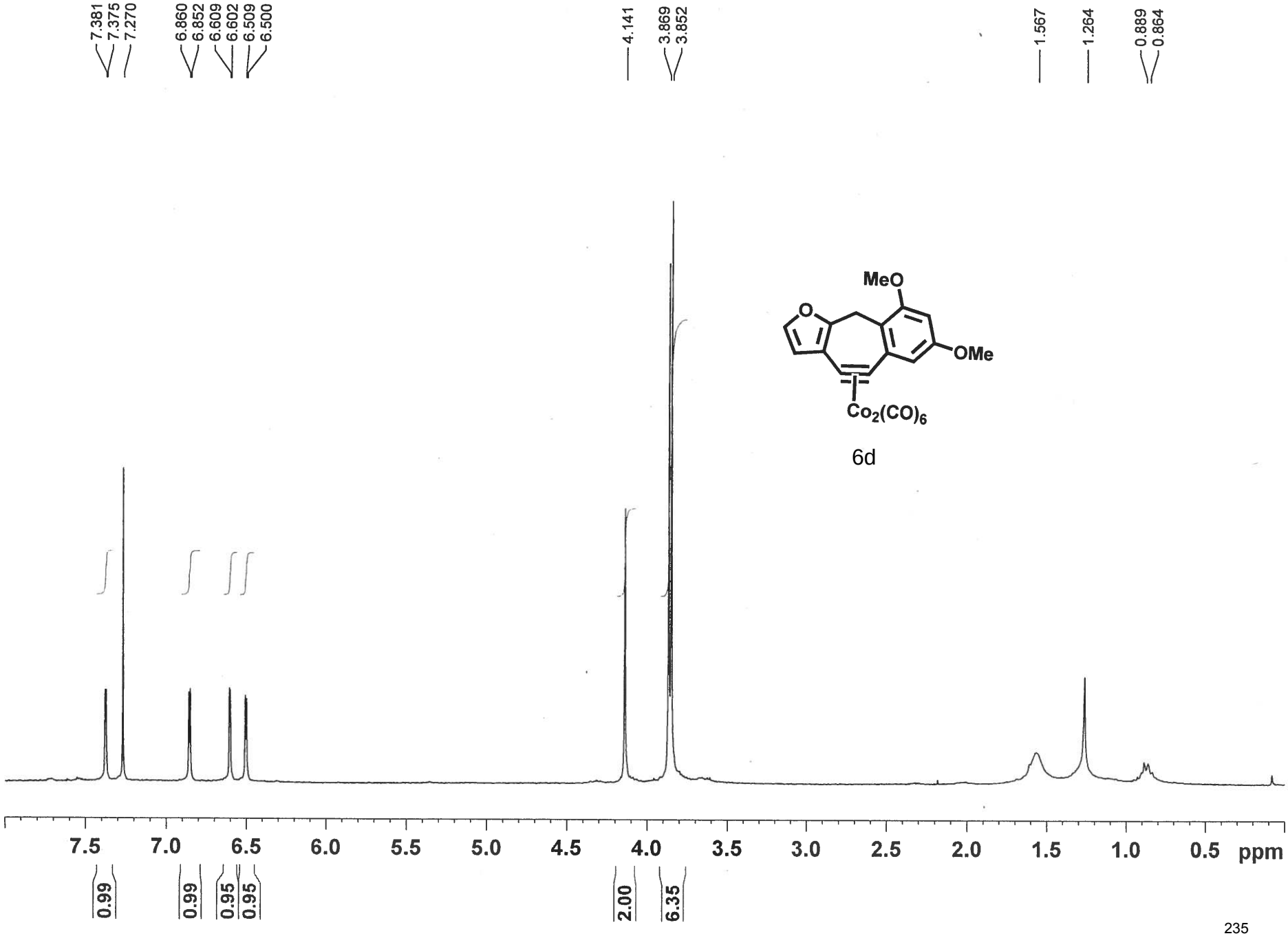
ThiopheneOAc-CC-1,3-Dimethoxybenzene Co2(CO)6 Cyclized 13C
Topspin 300 Experiment 1
Friday 05 July 2013





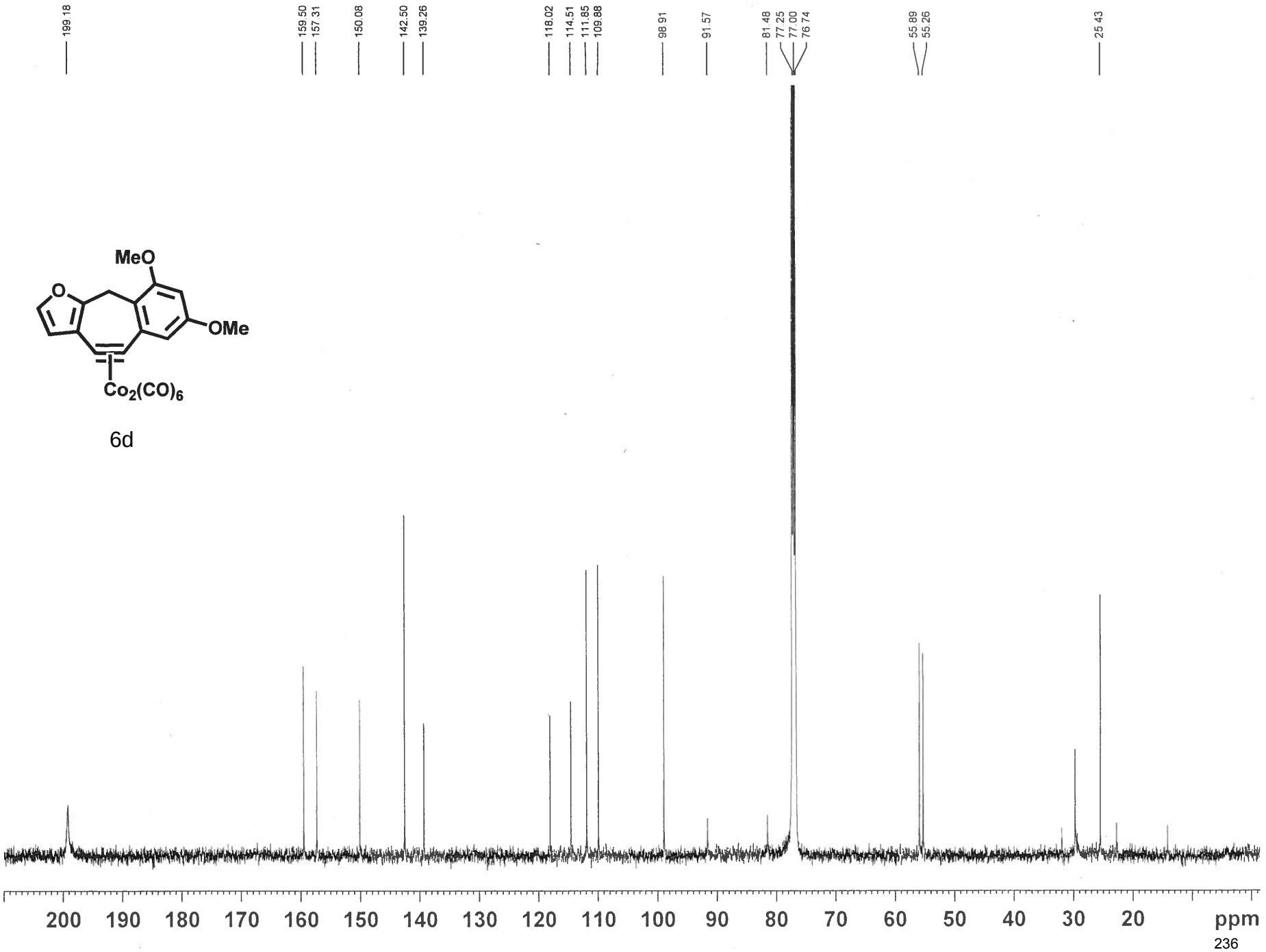
6c

iik.120 4, 1H, furan cycliz prod, aft chrom, 7/9/15

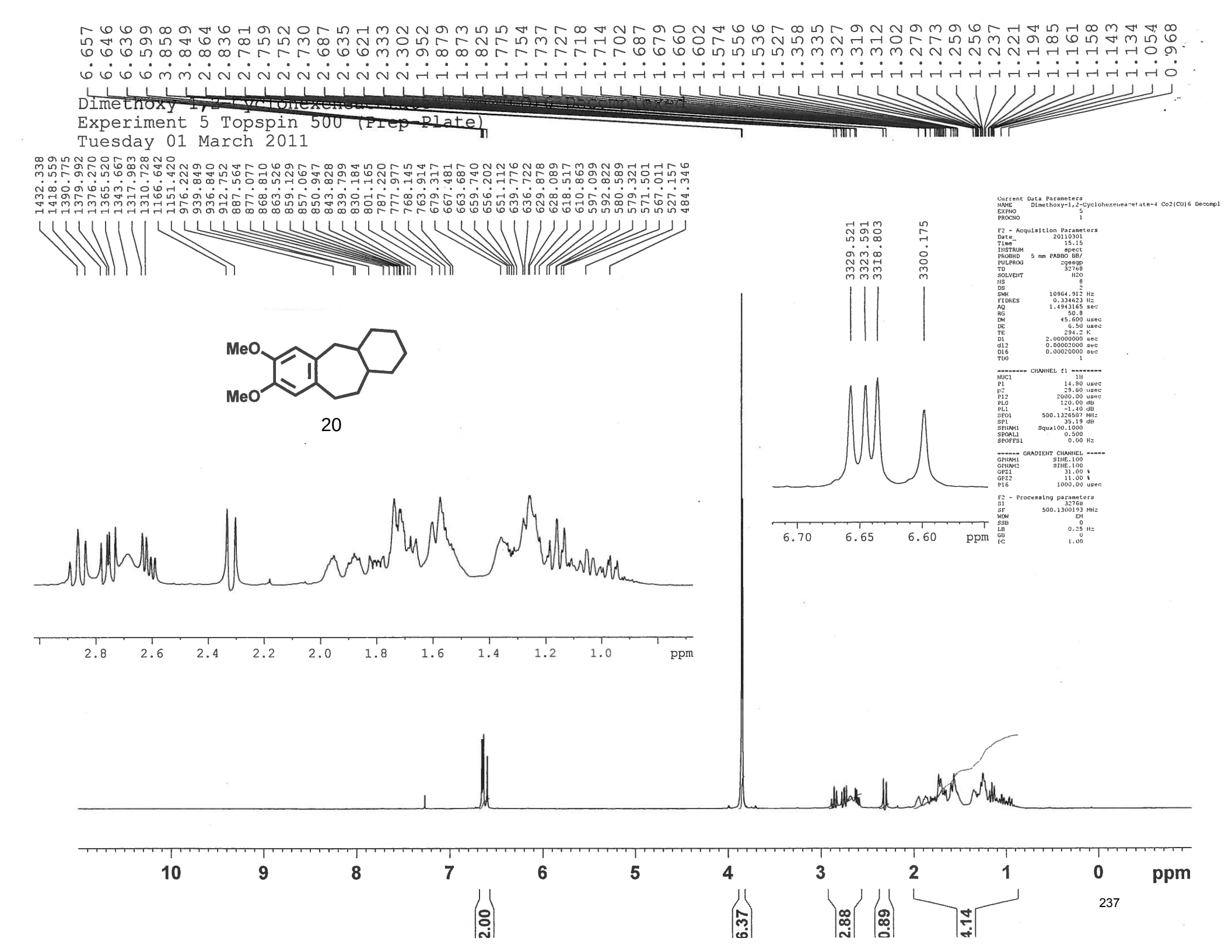


6d

iik.120 6, 13C, isabelle's furan adduct, 500 NMR, 7/10/15



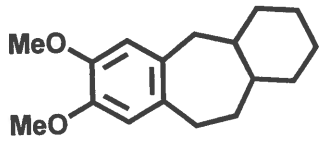
6d


6.657 6.646 6.636 6.599 3.858 3.849 2.864 2.836 2.781 2.759 2.752 2.730 2.687 2.635 2.621 2.333 2.302 1.952 1.879 1.873 1.825 1.775 1.754 1.737 1.727 1.718 1.714 1.702 1.687 1.679 1.660 1.602 1.574 1.556 1.536 1.527 1.358 1.335 1.327 1.319 1.312 1.302 1.279 1.273 1.259 1.256 1.237 1.221 1.194 1.185 1.161 1.158 1.143 1.134 1.054 0.968
Dimethoxy 1,2 Cyclohexenebenzoate
Experiment 5 Topspin 500 (Prep Plate)
Tuesday 01 March 2011
1432.338 1418.559 1390.775 1379.992 1376.270 1365.520 1343.667 1317.983 1310.728 1166.642 1151.420 976.222 939.849 936.840 912.752 887.564 877.077 868.810 863.526 859.129 857.067 850.947 843.828 839.799 830.184 801.165 787.220 777.977 768.145 763.914 679.317 667.481 663.687 659.740 656.202 651.112 639.776 636.722 629.878 628.089 618.517 610.863 597.099 592.822 580.589 579.321 571.501 567.011 527.157 484.346
3329.521 3323.591 3318.803 3300.175
MeO MeO
20
Current Data Parameters
NAME Dimethoxy-1,2-Cyclohexenebenzoate-4 Co2(CO)6 Decompl
EXPNO 5
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110301
Time 15.15
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgesgp
TD 32768
SOLVENT H2O
NS 8
DS 2
SWH 10964.912 Hz
FIDRES 0.334623 Hz
AQ 1.4943165 sec
RG 50.8
DW 45.600 usec
DE 6.50 usec
TE 294.2 K
D1 2.00000000 sec
d12 0.00002000 sec
D16 0.00020000 sec
TD0 1
CHANNEL f1
NUC1 1H
P1 14.80 usec
p2 29.60 usec
P12 2000.00 usec
PL0 120.00 dB
PL1 -1.40 dB
SFO1 500.1326507 MHz
SP1 35.19 dB
SPNAM1 Squa100.1000
SPOAL1 0.500
SPOFFS1 0.00 Hz
GRADIENT CHANNEL
GPNAM1 SINE.100
GPNAM2 SINE.100
GPZ1 31.00 %
GPZ2 11.00 %
P16 1000.00 usec
F2 - Processing parameters
SI 32768
SF 500.1300193 MHz
WDW EM
SSB 0
LB 0.25 Hz
GB 0
PC 1.00
6.70 6.65 6.60 ppm
2.8 2.6 2.4 2.2 2.0 1.8 1.6 1.4 1.2 1.0 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
2.00 6.37 2.88 0.89 4.14

TricyclicFrameworkDecomplexed-FullyReduced 13C
Topspin 500 3.1
Experiment 3
Friday 20 July 2012

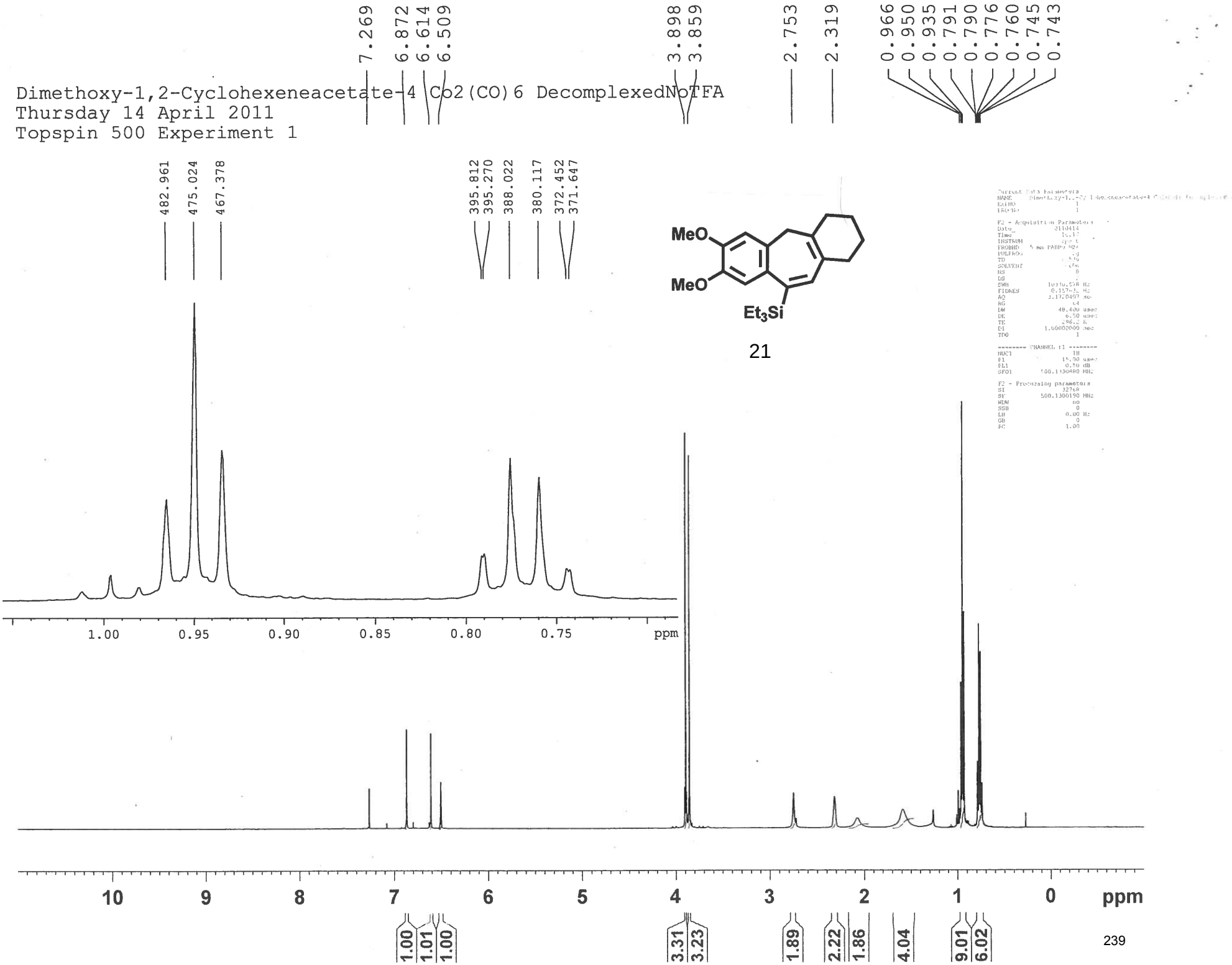
146.601 146.541 146.527 146.400 135.391 135.133 134.279 113.863 113.149 112.614 112.488 77.495 77.239 76.985 56.033 55.982 55.926 48.515 43.950 43.763 38.103 36.424 35.861 35.432 34.972 26.796 26.435

```
Current Data Parameters
NAME      TricyclicFrameworkDecomplexed-FullyReduced 13C
EXPNO                 3
PROCNO                1

F2 - Acquisition Parameters
Date_          20120720
Time              12.28
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                   23
DS                    4
SWH           29761.904 Hz
FIDRES         0.454131 Hz
AQ             1.1010048 sec
RG                203.82
DW                16.800 usec
DE                 6.50 usec
TE                295.4 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        125.7703637 MHz
NUC1                13C
P1                 9.50 usec
PLW1        66.48200226 W

======== CHANNEL f2 ========
SFO2        500.1320005 MHz
NUC2                1H
CPDPRG[2        waltz16
PCPD2             80.00 usec
PLW2        12.23400021 W
PLW12        0.41870999 W
PLW13        0.26797000 W

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
```

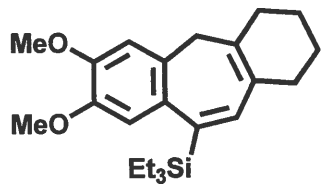


20

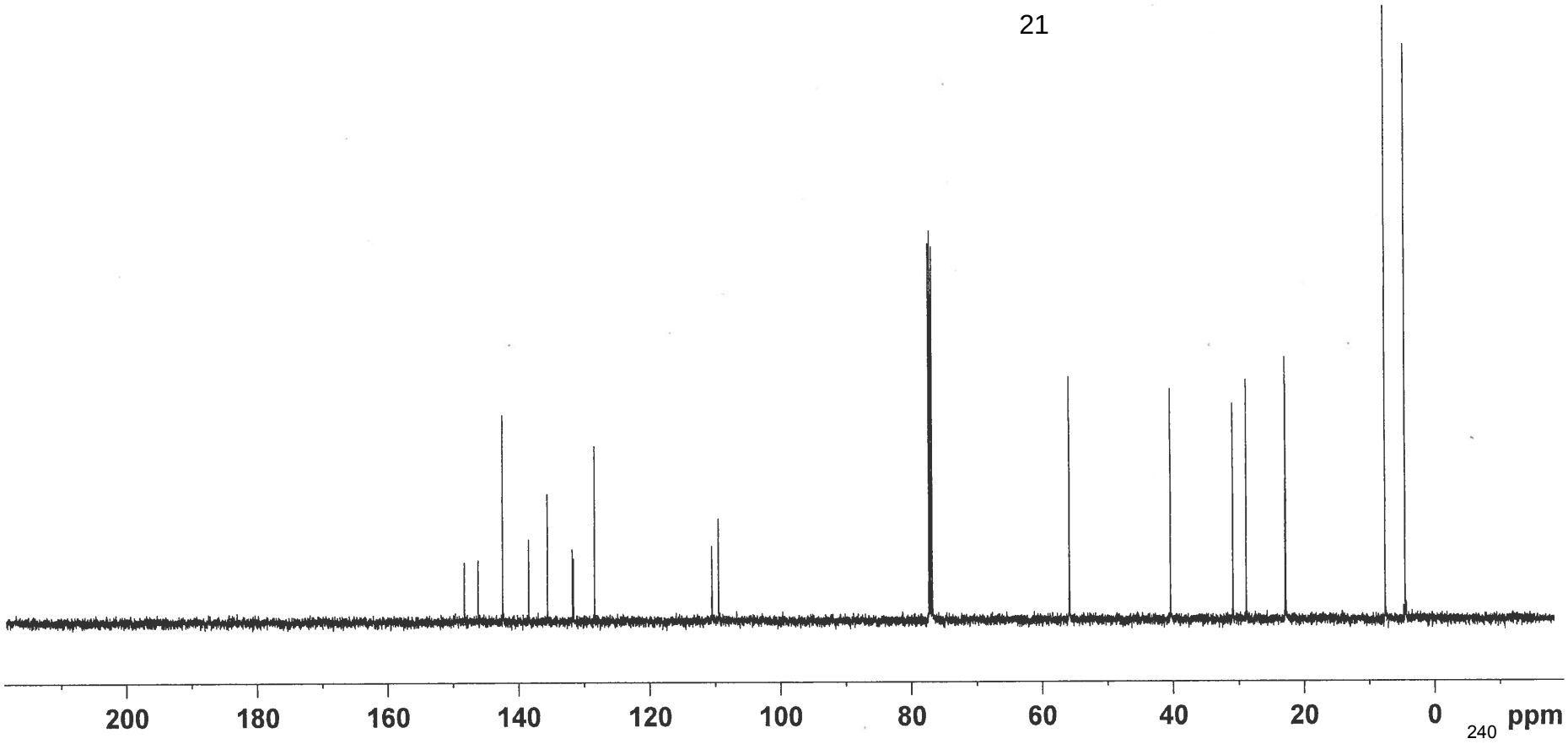
Dimethoxy-1,2-Cyclohexeneacetate-4 Co2(CO)6 DecomplexedNoTFA
Thursday 14 April 2011
Topspin 500 Experiment 1

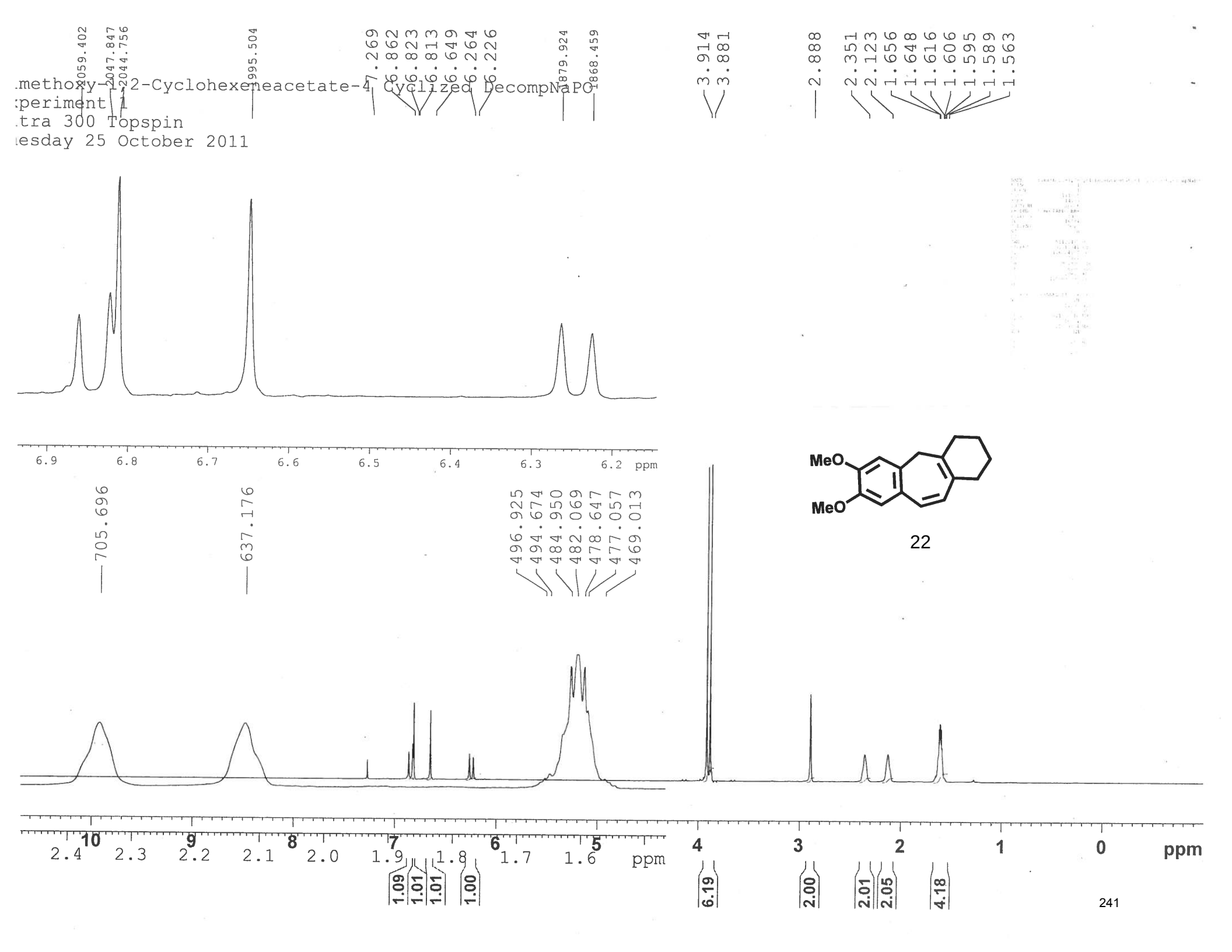


TricyclicFrameworkDecomplexed-SiEt3
Topspin 500 3.1
Thursday 05 July 2012
Experiment 1

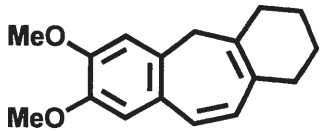


21




.methoxy-1-2-Cyclohexeneacetate-4 Cyclized DecompNaPO
:periment 1
.tra 300 Topspin
iesday 25 October 2011
MeO
MeO
22
241

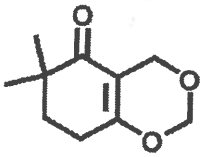
.methoxy-1,2-Cyclohexeneacetate-4 Cyclized DecompNaPO
:periment 2
.tra 300 Topspin
iesday 25 October 2011



22

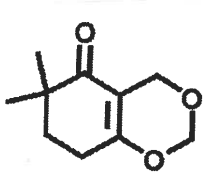
Dioxane bicycle
Monday 22 July 2013
Experiment 1 Topspin 500 V3.2

```
Current Data Parameters
NAME      Dioxane bicycle
EXPNO                   1
PROCNO                  1

F2 - Acquisition Parameters
Date_            20130722
Time                21.43
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     2
SWH            10000.000 Hz
FIDRES             0.152588 Hz
AQ              3.2767999 sec
RG                 43.34
DW                50.000 usec
DE                 6.50 usec
TE                294.7 K
D1             1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                   1H
P1                  12.06 usec
PLW1          18.00000000 W

F2 - Processing parameters
SI                 65536
SF            500.1300064 MHz
WDW                   EM
SSB       0
LB                  0.20 Hz
GB        0
PC                  1.00
```



23

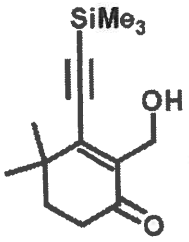
Dioxane Bicycle 13C
Topspin 500 V3.2
Experiment 1
Monday 22 July 2013



23


```
Current Data Parameters
NAME      Dioxane bicycle 13C
EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_              20130722
Time                 21.58
INSTRUM              spect
PROBHD    5 mm PABBO BB/
PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    11
DS                     4
SWH            29761.904 Hz
FIDRES          0.454131 Hz
AQ              1.1010048 sec
RG                 203.82
DW                 16.800 usec
DE                  6.50 usec
TE                 295.2 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7703637 MHz
NUC1                  13C
P1                   9.50 usec
PLW1         66.48200226 W

======== CHANNEL f2 ========
SFO2         500.1320005 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               80.00 usec
PLW2         12.23400021 W
PLW12         0.28826001 W
PLW13         0.18449000 W

F2 - Processing parameters
SI                  32768
SF           125.7577890 MHz
WDW                    EM
SSB       0
LB                   1.00 Hz
GB        0
PC                   1.40
```

Dioxane + 3M HCl
Topspin 500
Experiment 1
Monday 20 August 2012



25

Current Data Parameters
NAME Dioxane + 3M HCl
EXPNO 1
PROCNO 1

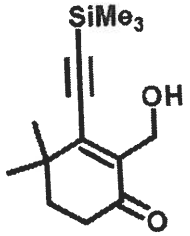
F2 - Acquisition Parameters
Date_ 20120820
Time 18.30
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 27.82
DW 50.000 usec
DE 6.50 usec
TE 295.0 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.23400021 W

F2 - Processing parameters
SI 65536
SF 500.1300085 MHz
WDW EM
SSB 0
LB 0.25 Hz
GB 0
PC 1.00

Dioxane + 3M HCl 13C
Topspin 500
Experiment 1
Monday 20 August 2012

199.714 148.059 139.227 113.046 99.822 77.387 77.131 76.877 60.605 35.805 35.349 34.185 27.396 -0.412

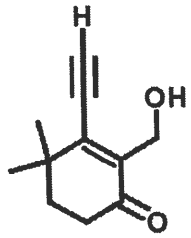


25

Current Data Parameters

NAME	Dioxane + 3M HCl 13C
EXPNO	1
PROCNO	1
F2 - Acquisition Parameters	
Date_	20120820
Time	18.43
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	13
DS	4
SWH	29761.904 Hz
FIDRES	0.454131 Hz
AQ	1.1010048 sec
RG	203.82
DW	16.800 usec
DE	6.50 usec
TE	295.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	125.7703637 MHz
NUC1	13C
P1	9.50 usec
PLW1	66.48200226 W
======== CHANNEL f2 ========	
SFO2	500.1320005 MHz
NUC2	1H
CPDPRG[2	waltz16
PCPD2	80.00 usec
PLW2	12.23400021 W
PLW12	0.41870999 W
PLW13	0.26797000 W
F2 - Processing parameters	
SI	32768
SF	125.7577890 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

Dioxane + 3M HCl -CCH
Experiment 1 Topspin 3.1
Thursday 25 October 2012



26

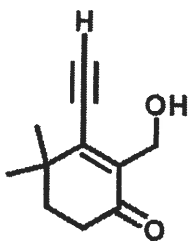
Current Data Parameters
NAME Dioxane + 3M HCl -CCH
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20121025
Time 11.09
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 27.82
DW 50.000 usec
DE 6.50 usec
TE 295.8 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.23400021 W

F2 - Processing parameters
SI 65536
SF 500.1300084 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00

Dioxane + 3M HCl -CCH 13C
25 October 2012
Experiment 1 Topspin 300



26

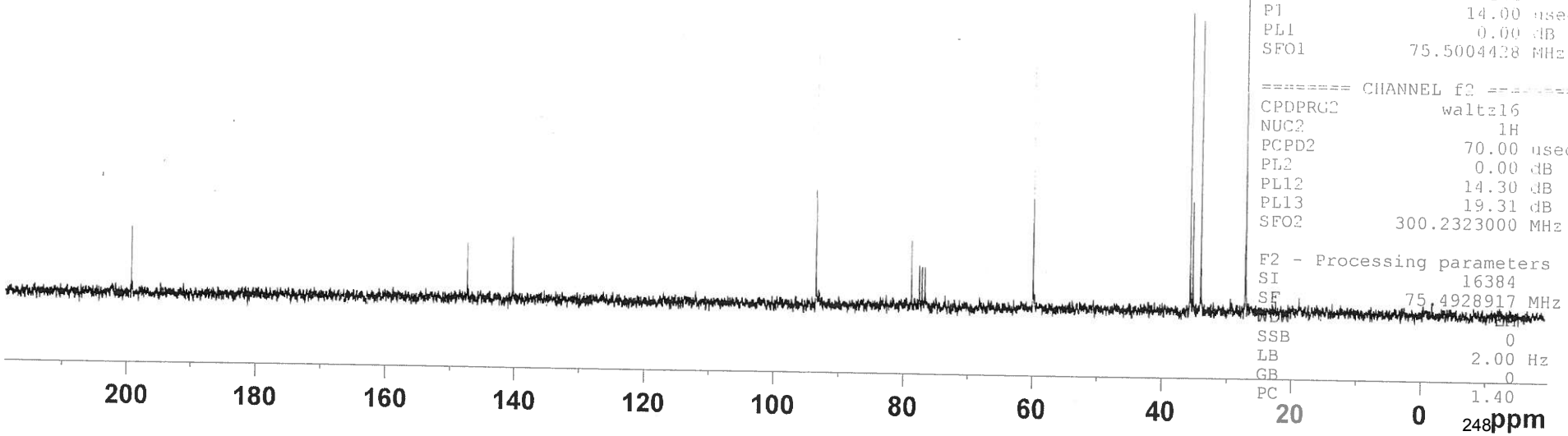
Current Data Parameters
NAME Dioxane + 3M HCl -CCH13
EXPNO 1
PROCNO 1

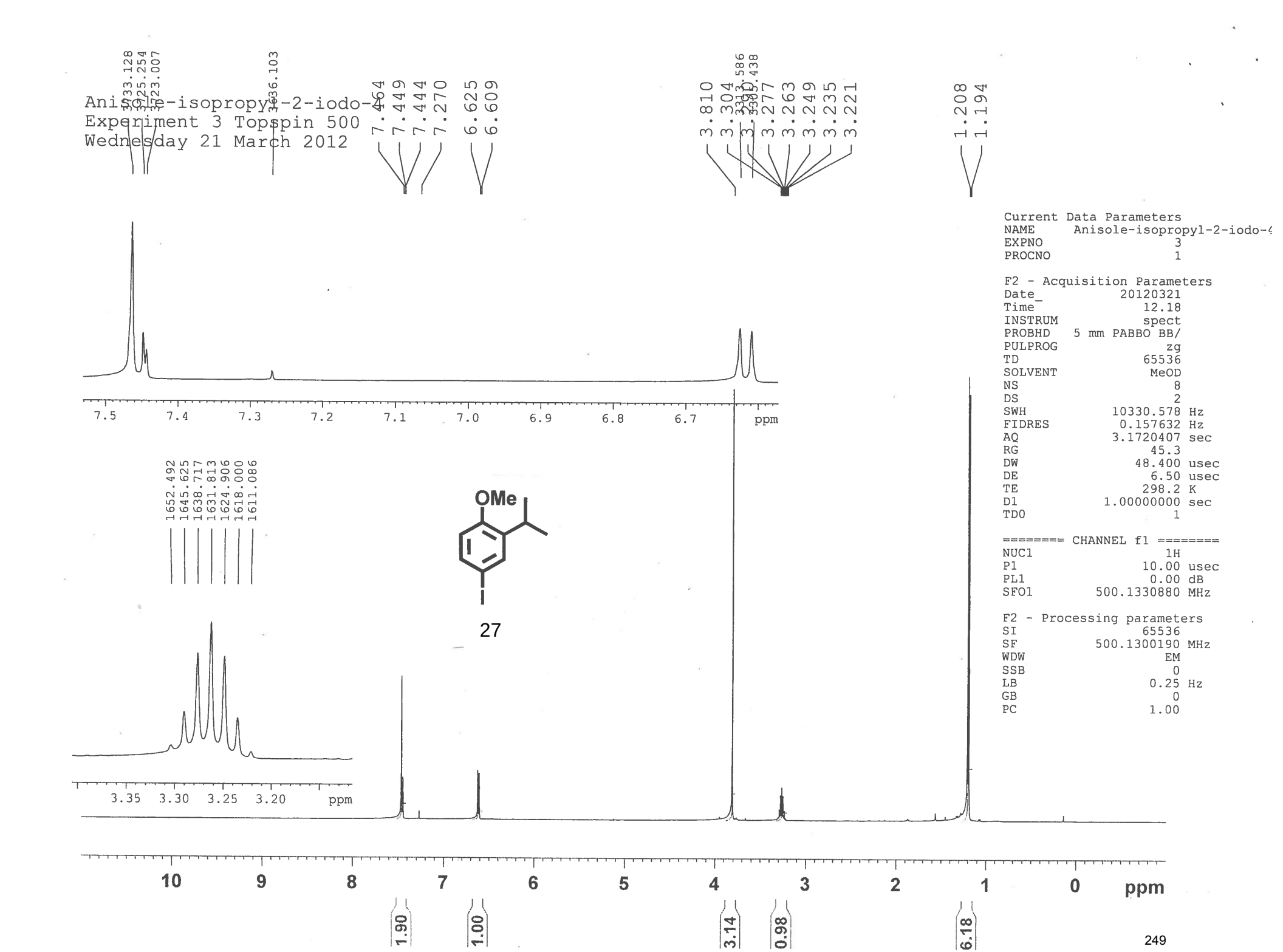
F2 - Acquisition Parameters
Date_ 20121025
Time 15.45
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 16
DS 4
SWH 17985.611 Hz
FIDRES 1.097755 Hz
AQ 0.4555252 sec
RG 3251
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
d11 0.03000000 sec
DELTA 0.89999998 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 14.00 usec
PL1 0.00 dB
SFO1 75.5004428 MHz

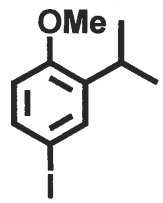
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 14.30 dB
PL13 19.31 dB
SFO2 300.2323000 MHz

F2 - Processing parameters
SI 16384
SF 75.4928917 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40

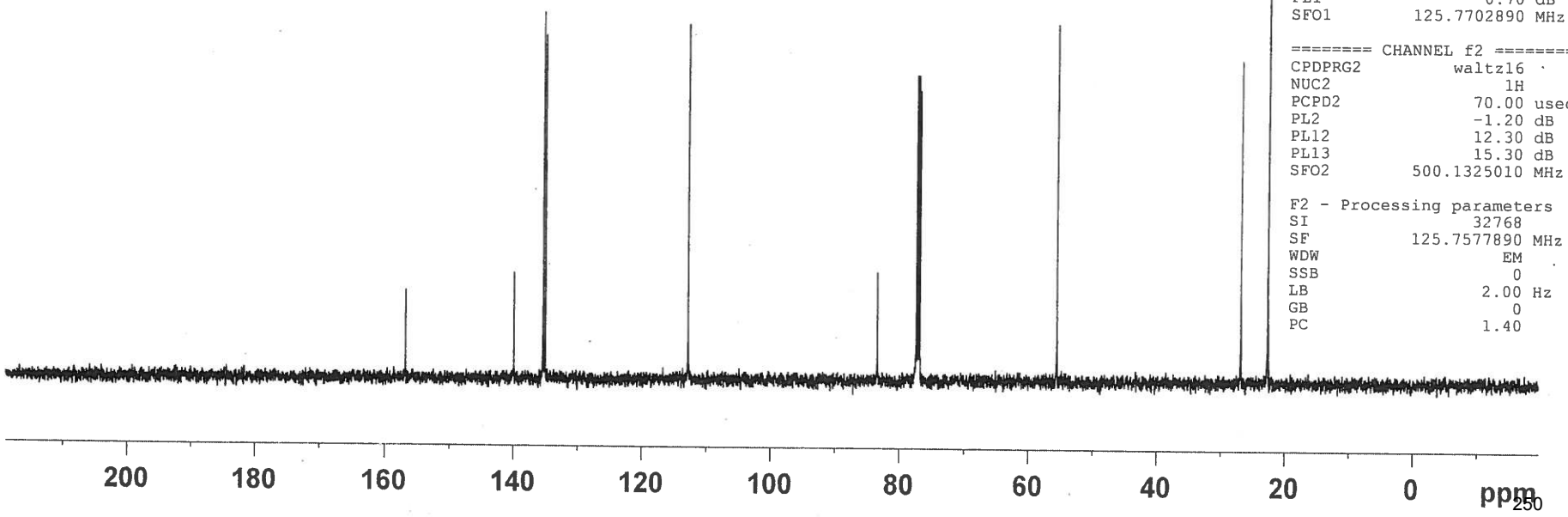



Anisole-isopropyl-2-iodo-4
Experiment 3 Topspin 500
Wednesday 21 March 2012
7.464
7.449
7.444
7.270
6.625
6.609
3.810
3.304
3.277
3.263
3.249
3.235
3.221
1.208
1.194
OMe
27
Current Data Parameters
NAME Anisole-isopropyl-2-iodo-4
EXPNO 3
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120321
Time 12.18
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg
TD 65536
SOLVENT MeOD
NS 8
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1720407 sec
RG 45.3
DW 48.400 usec
DE 6.50 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 0.00 dB
SFO1 500.1330880 MHz
F2 - Processing parameters
SI 65536
SF 500.1300190 MHz
WDW EM
SSB 0
LB 0.25 Hz
GB 0
PC 1.00
1.90
1.00
3.14
0.98
6.18
ppm

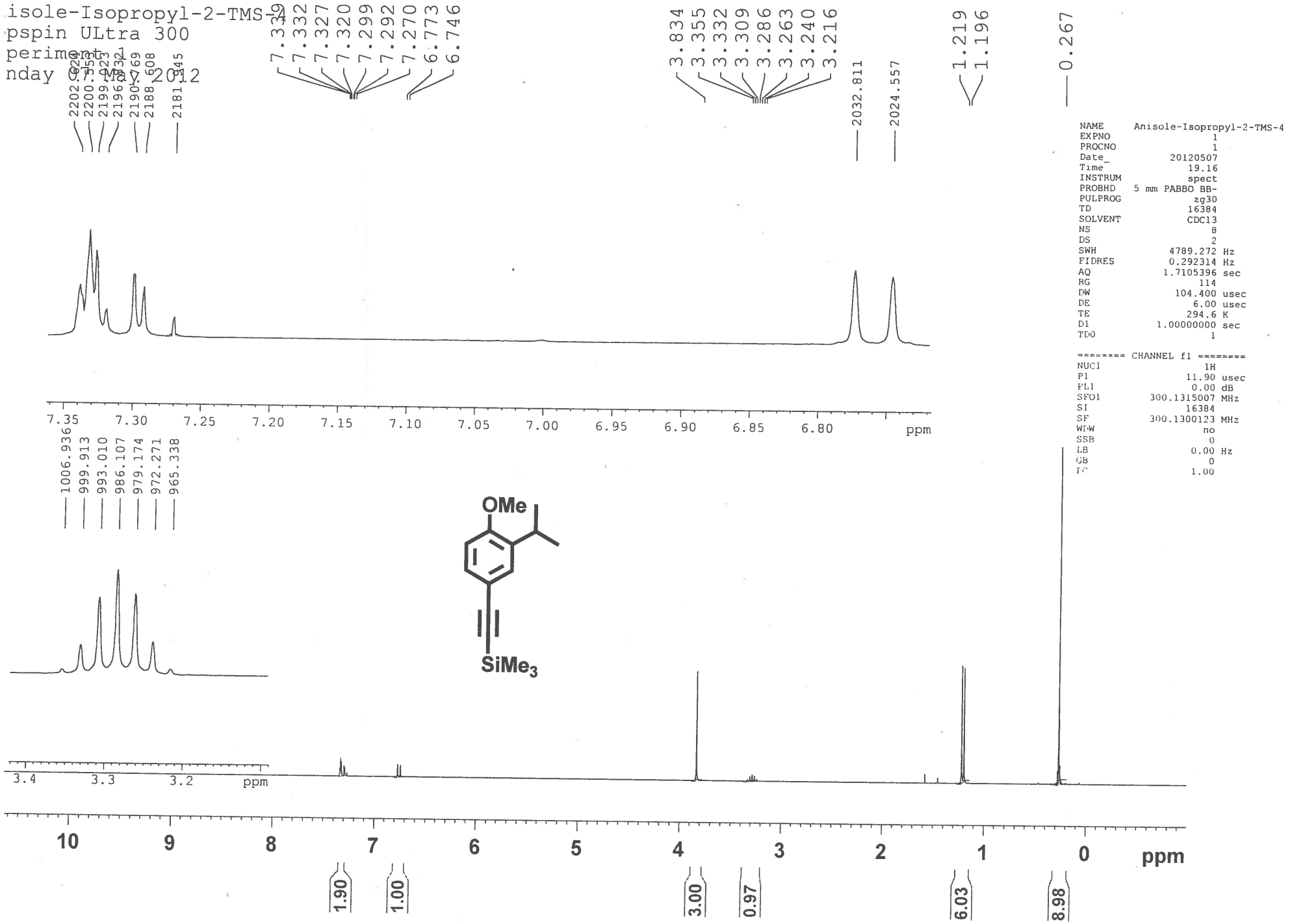
Anisole-isopropyl-2-iodo-4 13C
Experiment 2 Topspin 500
Wednesday 21 March 2012



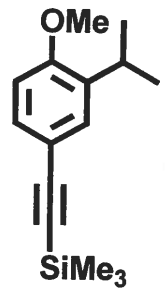
27



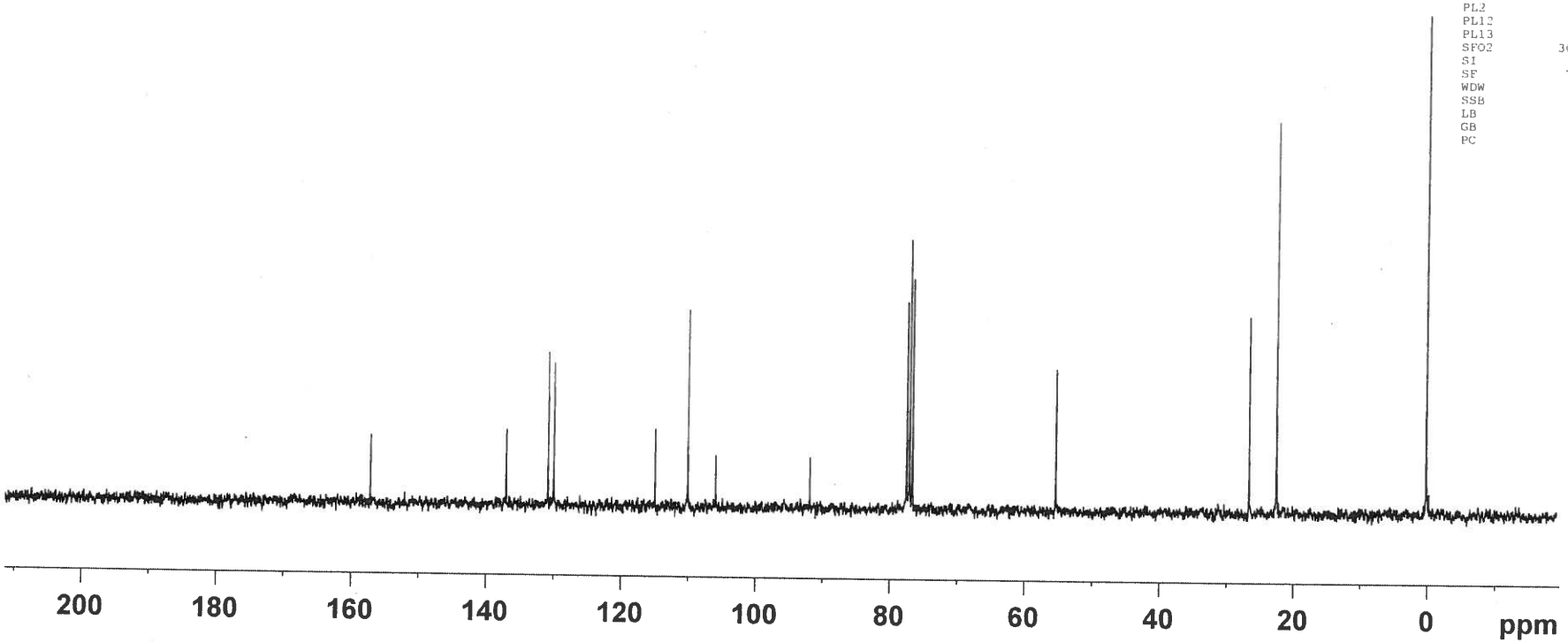

```
Current Data Parameters
NAME      Anisole-isopropyl-2-iodo-4 13C
EXPNO                 2
PROCNO                1

F2 - Acquisition Parameters
Date_          20120321
Time              13.15
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG         zgpg30
TD              16384
SOLVENT           CDCl3
NS                  167
DS                    4
SWH           30030.029 Hz
FIDRES         1.832888 Hz
AQ             0.2728603 sec
RG                 1024
DW               16.650 usec
DE                6.50 usec
TE               300.2 K
D1            1.00000000 sec
d11           0.03000000 sec
DELTA         0.89999998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.50 usec
PL1               -0.70 dB
SFO1        125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             70.00 usec
PL2               -1.20 dB
PL12              12.30 dB
PL13              15.30 dB
SFO2        500.1325010 MHz

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

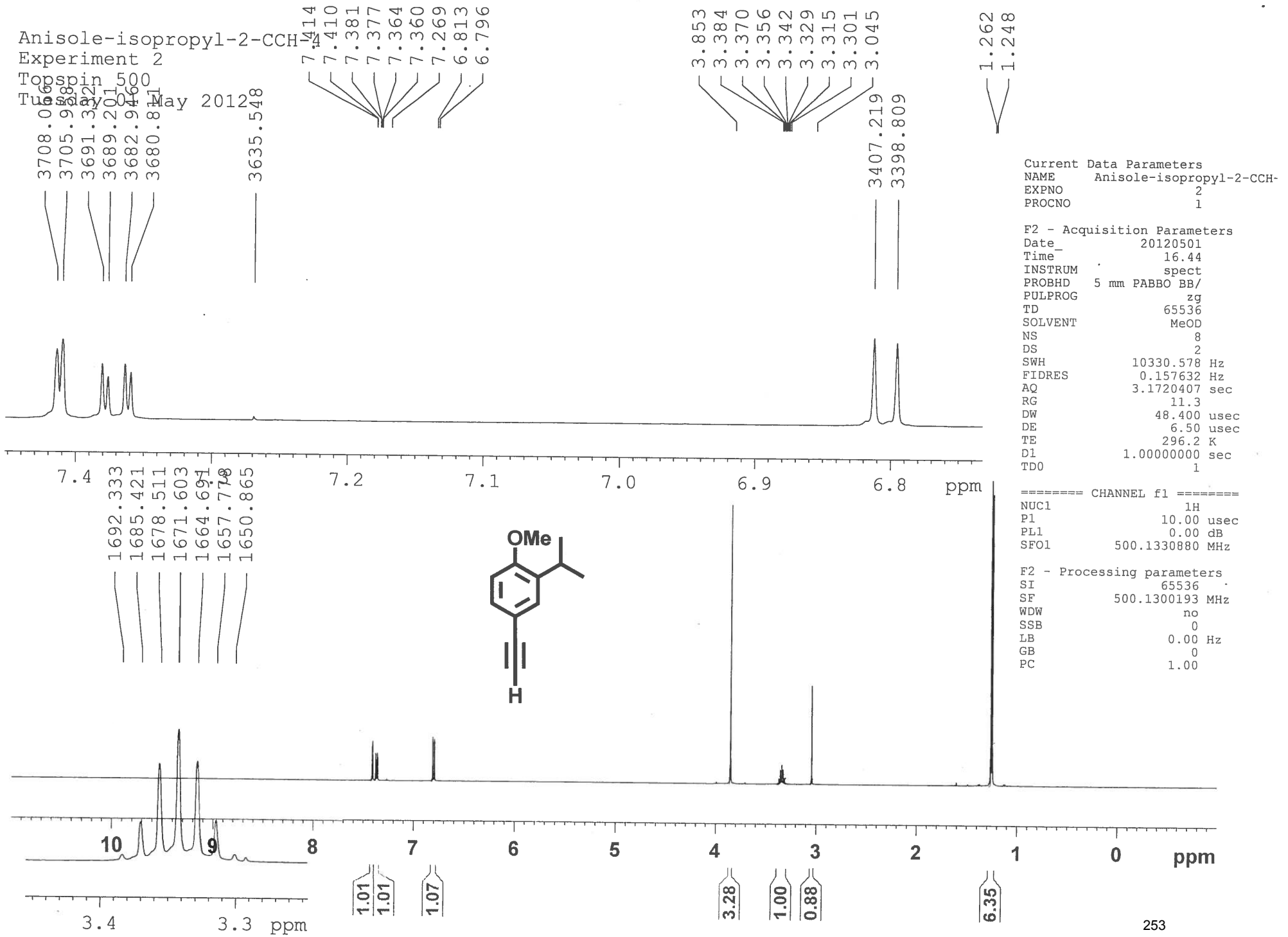

isole-Isopropyl-2-TMS-4
pspin ULtra 300
periment 1
nday 07 May 2012
7.339
7.332
7.327
7.320
7.299
7.292
7.270
6.773
6.746
3.834
3.355
3.332
3.309
3.286
3.263
3.240
3.216
2032.811
2024.557
1.219
1.196
0.267
NAME Anisole-Isopropyl-2-TMS-4
EXPNO 1
PROCNO 1
Date_ 20120507
Time 19.16
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 16384
SOLVENT CDCl3
NS 8
DS 2
SWH 4789.272 Hz
FIDRES 0.292314 Hz
AQ 1.7105396 sec
RG 114
DW 104.400 usec
DE 6.00 usec
TE 294.6 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 11.90 usec
PL1 0.00 dB
SFO1 300.1315007 MHz
SI 16384
SF 300.1300123 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 1.00
7.35 7.30 7.25 7.20 7.15 7.10 7.05 7.00 6.95 6.90 6.85 6.80 ppm
1006.936
999.913
993.010
986.107
979.174
972.271
965.338
OMe
SiMe3
3.4 3.3 3.2 ppm
10 9 8 7 6 5 4 3 2 1 0 ppm
1.90
1.00
3.00
0.97
6.03
8.98

ıisole-Isopropyl-2-TMS-4 13C
›pspin Ultra 300
:periment 1
›nday 07 May 2012



NAME	Anisole-Isopropyl-2-TMS-4 13C
EXPNO	1
PROCNO	1
Date_	20120507
Time	19.55
INSTRUM	spect
PROBHD	5 mm PABBO BB-
PULPROG	zgpg30
TD	16384
SOLVENT	CDCl3
NS	262
DS	4
SWH	17985.611 Hz
FIDRES	1.097755 Hz
AQ	0.4555252 sec
RG	20642.5
DW	27.800 usec
DE	6.00 usec
TE	295.0 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	11.25 usec
PL1	0.00 dB
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	16.55 dB
PL13	24.00 dB
SFO2	300.1312005 MHz
SI	8192
SF	75.4677423 MHz
WDW	EM
SSB	0
LB	2.50 Hz
GB	0
PC	1.40





Current Data Parameters

NAME	Anisole-isopropyl-2-CCH-
EXPNO	2
PROCNO	1

F2 - Acquisition Parameters

Date_	20120501
Time	16.44
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg
TD	65536
SOLVENT	MeOD
NS	8
DS	2
SWH	10330.578 Hz
FIDRES	0.157632 Hz
AQ	3.1720407 sec
RG	11.3
DW	48.400 usec
DE	6.50 usec
TE	296.2 K
D1	1.00000000 sec
TD0	1

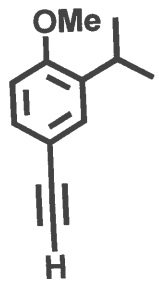
======== CHANNEL f1 ========

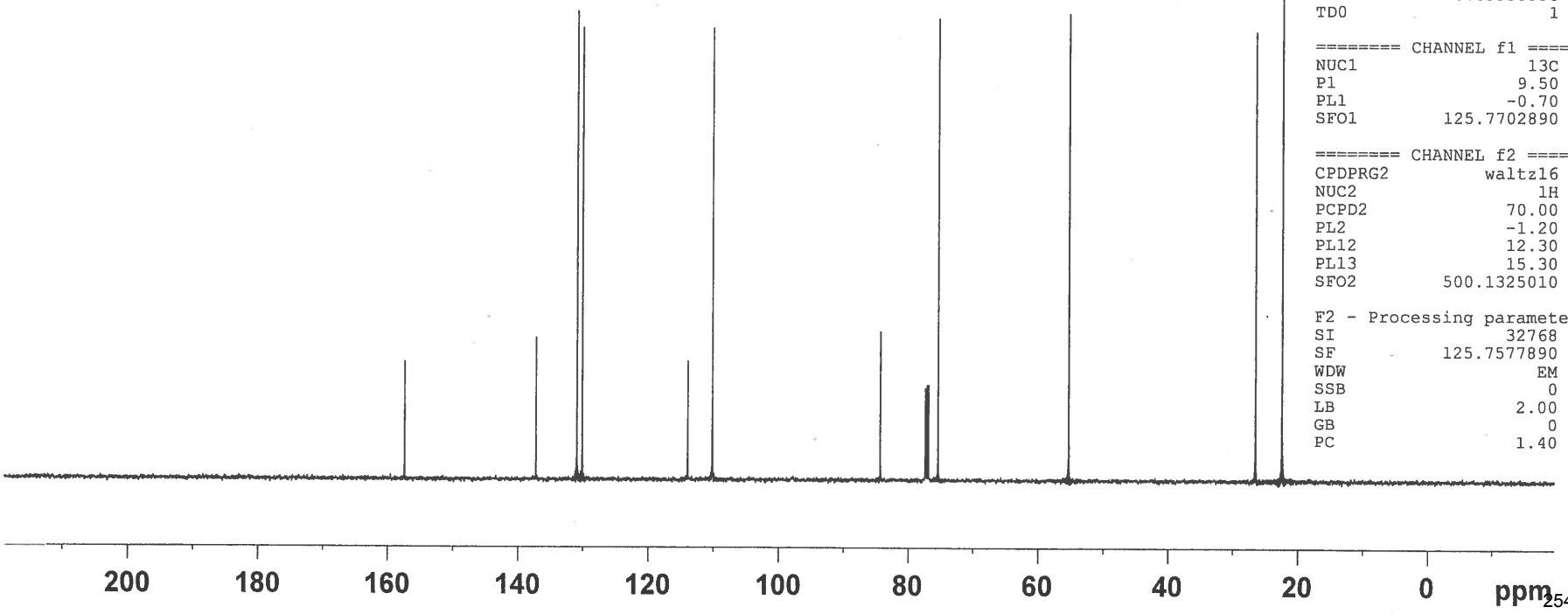
NUC1	1H
P1	10.00 usec
PL1	0.00 dB
SFO1	500.1330880 MHz

F2 - Processing parameters

SI	65536
SF	500.1300193 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	1.00

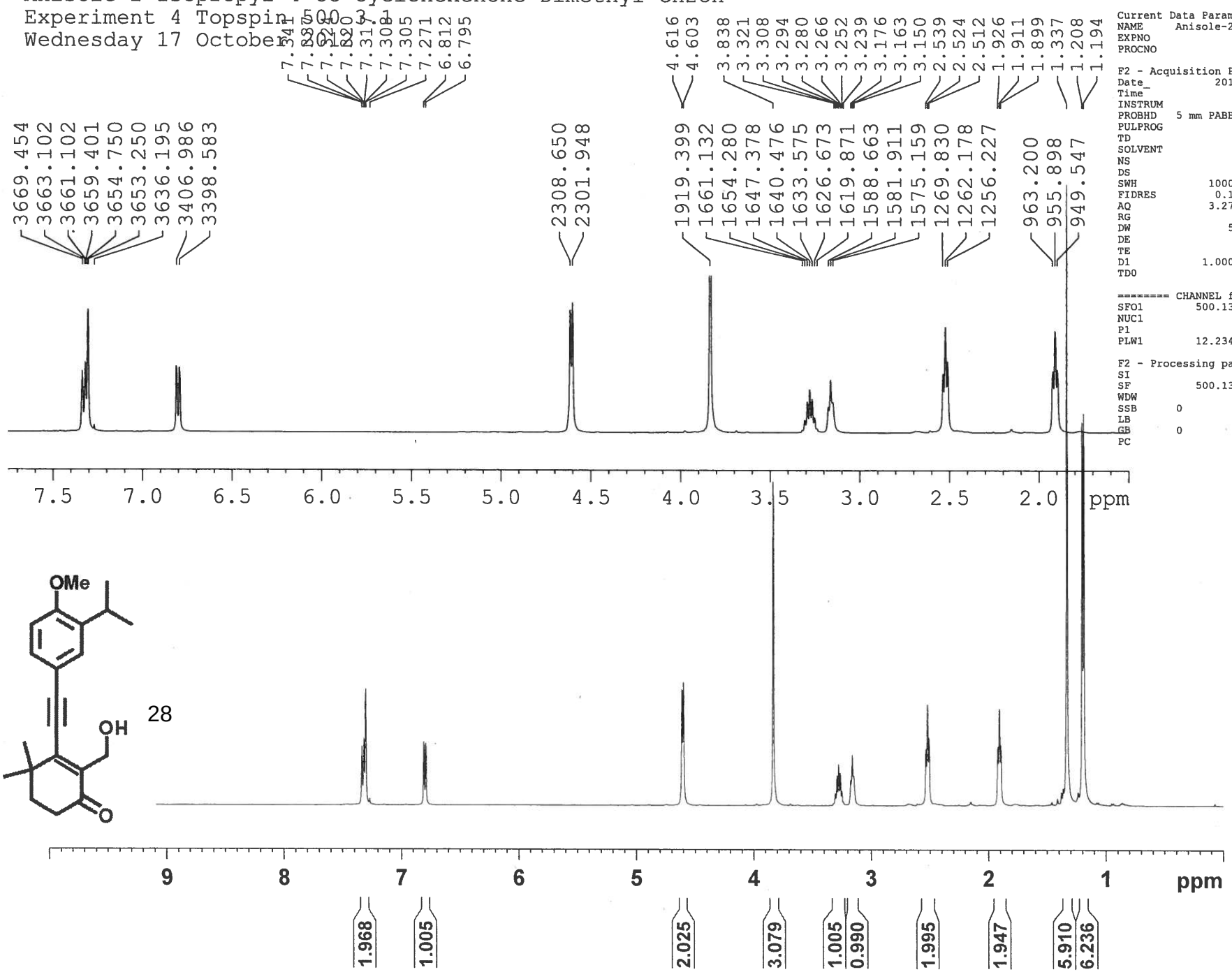
Anisole-isopropyl-2-CCH-4 13C
Experiment 1
Topspin 500
Tuesday 01 May 2012






```
Current Data Parameters
NAME      Anisole-isopropyl-2-CCH-4 13C
EXPNO                 1
PROCNO                1

F2 - Acquisition Parameters
Date_          20120501
Time               16.53
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                16384
SOLVENT           CDCl3
NS                   77
DS                    4
SWH           30030.029 Hz
FIDRES         1.832888 Hz
AQ             0.2728603 sec
RG                 4096
DW               16.650 usec
DE                6.50 usec
TE                297.2 K
D1           1.00000000 sec
d11          0.03000000 sec
DELTA        0.89999998 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.50 usec
PL1               -0.70 dB
SFO1        125.7702890 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2             70.00 usec
PL2               -1.20 dB
PL12              12.30 dB
PL13              15.30 dB
SFO2        500.1325010 MHz

F2 - Processing parameters
SI                32768
SF          125.7577890 MHz
WDW                  EM
SSB                   0
LB                 2.00 Hz
GB                    0
PC                 1.40
```

Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OH
Experiment 4 Topspin 500 3 1
Wednesday 17 October




```
Current Data Parameters
NAME      Anisole-2-Isopropyl-4-CC-Cyclohex
EXPNO                 4
PROCNO                1

F2 - Acquisition Parameters
Date_          20121017
Time              10.51
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                   8
DS                   2
SWH          10000.000 Hz
FIDRES           0.152588 Hz
AQ            3.2767999 sec
RG                27.82
DW               50.000 usec
DE                6.50 usec
TE               294.7 K
D1           1.00000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1         500.1330885 MHz
NUC1                 1H
P1                14.80 usec
PLW1        12.23400021 W

F2 - Processing parameters
SI                65536
SF           500.1300083 MHz
WDW                  EM
SSB       0
LB                1.25 Hz
GB        0
PC                1.00
```

Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OH 13C
Experiment 2 Topspin 500 3.1
Wednesday 17 October 2012

199.66
158.16
149.29
137.57
131.14
129.80
113.86
110.36
107.81
84.11
77.40
77.14
76.89
60.93
55.44
35.97
35.79
34.26
27.71
26.69
22.42

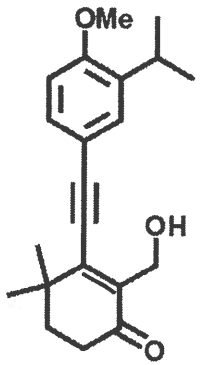
Current Data Parameters
NAME Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OH 13C
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20121017
Time 11.07
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 15
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 203.82
DW 16.800 usec
DE 6.50 usec
TE 295.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

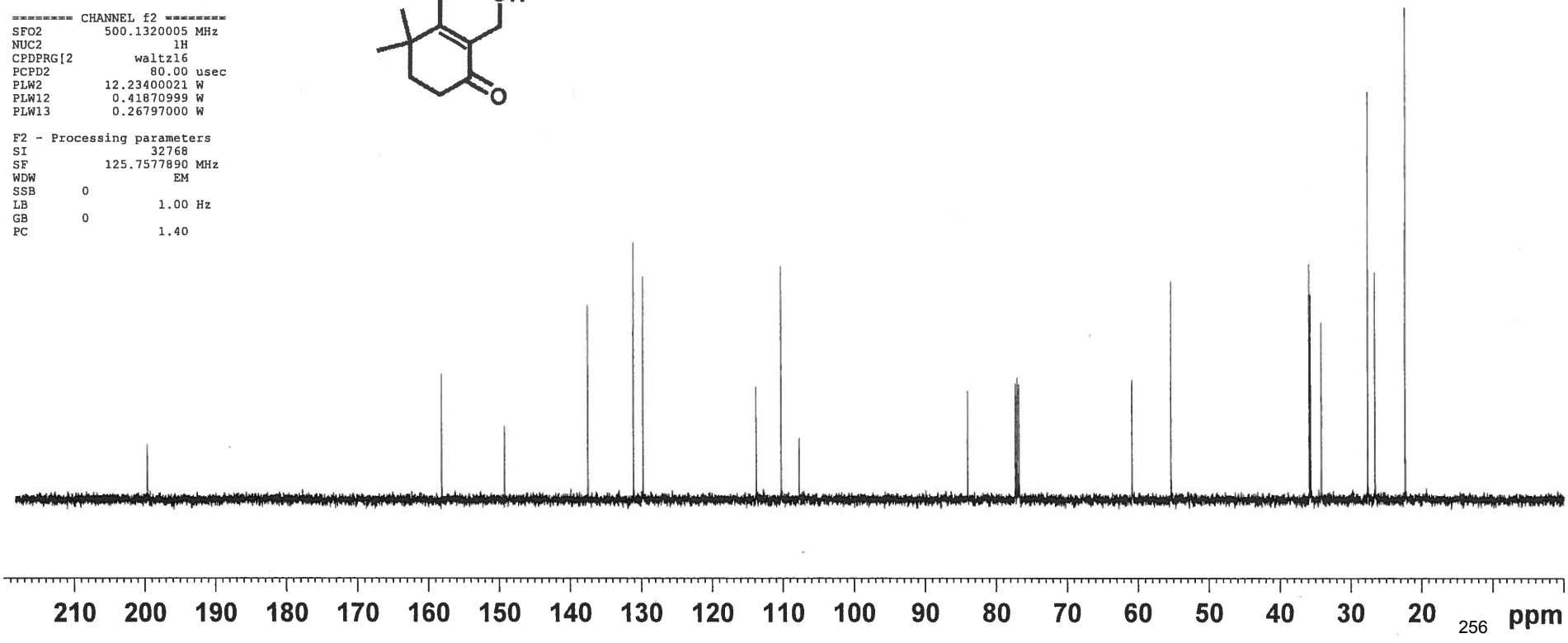
======== CHANNEL f1 ========
SFO1 125.7703637 MHz
NUC1 13C
P1 9.50 usec
PLW1 66.48200226 W

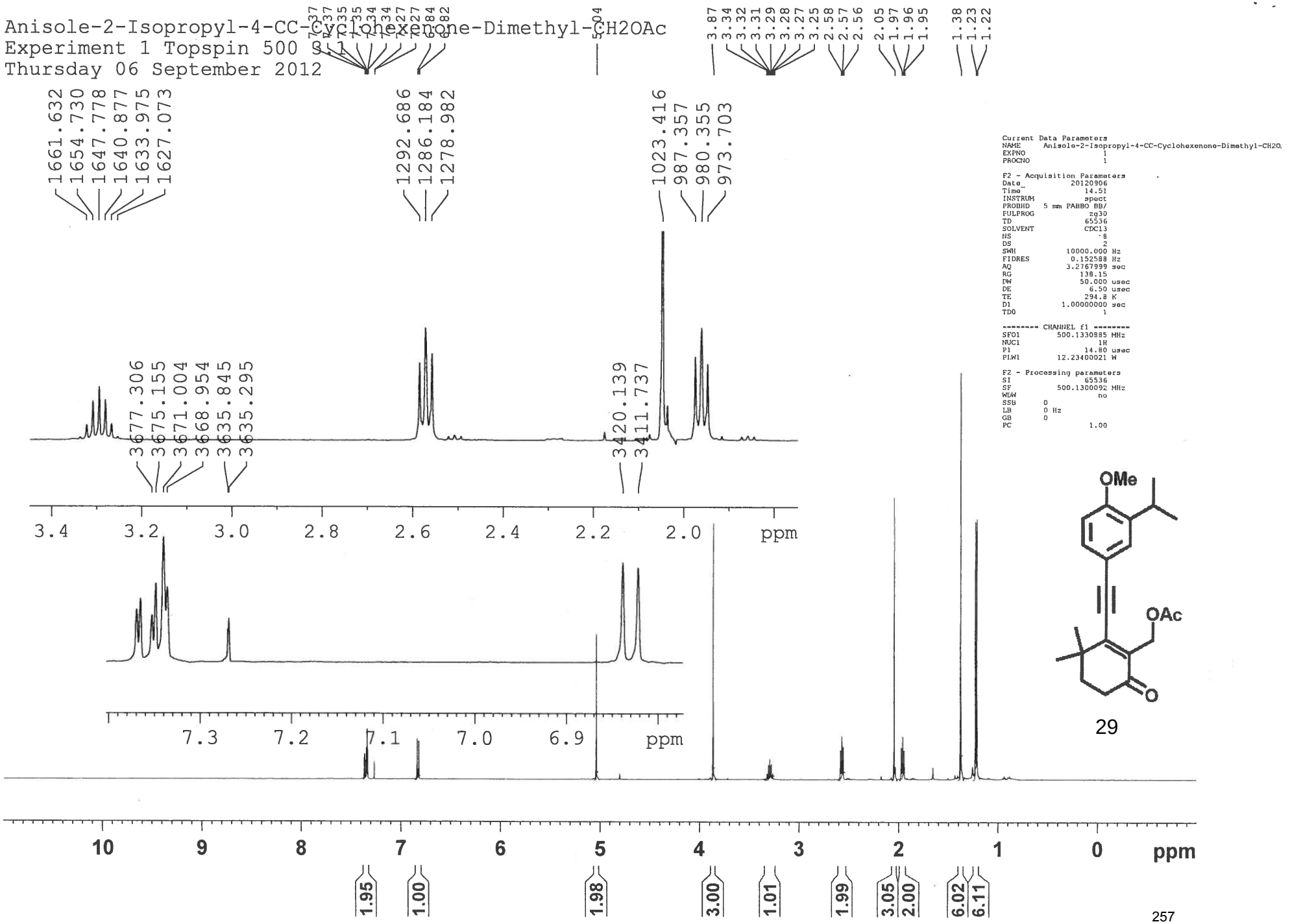
======== CHANNEL f2 ========
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 12.23400021 W
PLW12 0.41870999 W
PLW13 0.26797000 W

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



28




Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OAc
Experiment 1 Topspin 500 S1
Thursday 06 September 2012
1661.632
1654.730
1647.778
1640.877
1633.975
1627.073
1292.686
1286.184
1278.982
1023.416
987.357
980.355
973.703
3677.306
3675.155
3671.004
3668.954
3635.845
3635.295
3420.139
3411.737
3.87
3.34
3.32
3.31
3.29
3.28
3.27
3.25
2.58
2.57
2.56
2.05
1.97
1.96
1.95
1.38
1.23
1.22
Current Data Parameters
NAME Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2O
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20120906
Time 14.51
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 8
DS 2
SWH 10000.000 Hz
FIDRES 0.152588 Hz
AQ 3.2767999 sec
RG 138.15
DW 50.000 usec
DE 6.50 usec
TE 294.8 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
SFO1 500.1330885 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.23400021 W
F2 - Processing parameters
SI 65536
SF 500.1300092 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00
OMe
OAc
O
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
ppm
7.3
7.2
7.1
7.0
6.9
ppm
10
9
8
7
6
5
4
3
2
1
0
ppm
1.95
1.00
1.98
3.00
1.01
1.99
3.05
2.00
6.02
6.11

29

Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OAc 13C
Experiment 2 Topspin 500 3.1
Thursday 25 October 2012

199.21
170.79
158.29
153.00
137.57
133.90
131.35
130.06
113.69
110.39
108.68
84.28
77.46
77.21
76.95
59.66
55.40
36.02
35.96
34.06
27.77
26.65
22.38
20.94

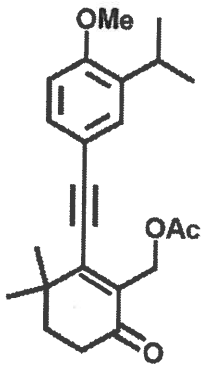
Current Data Parameters
NAME Anisole-2-Isopropyl-4-CC-Cyclohexenone-Dimethyl-CH2OAc 13C
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20121025
Time 15.18
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 12
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 203.82
DW 16.800 usec
DE 6.50 usec
TE 298.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

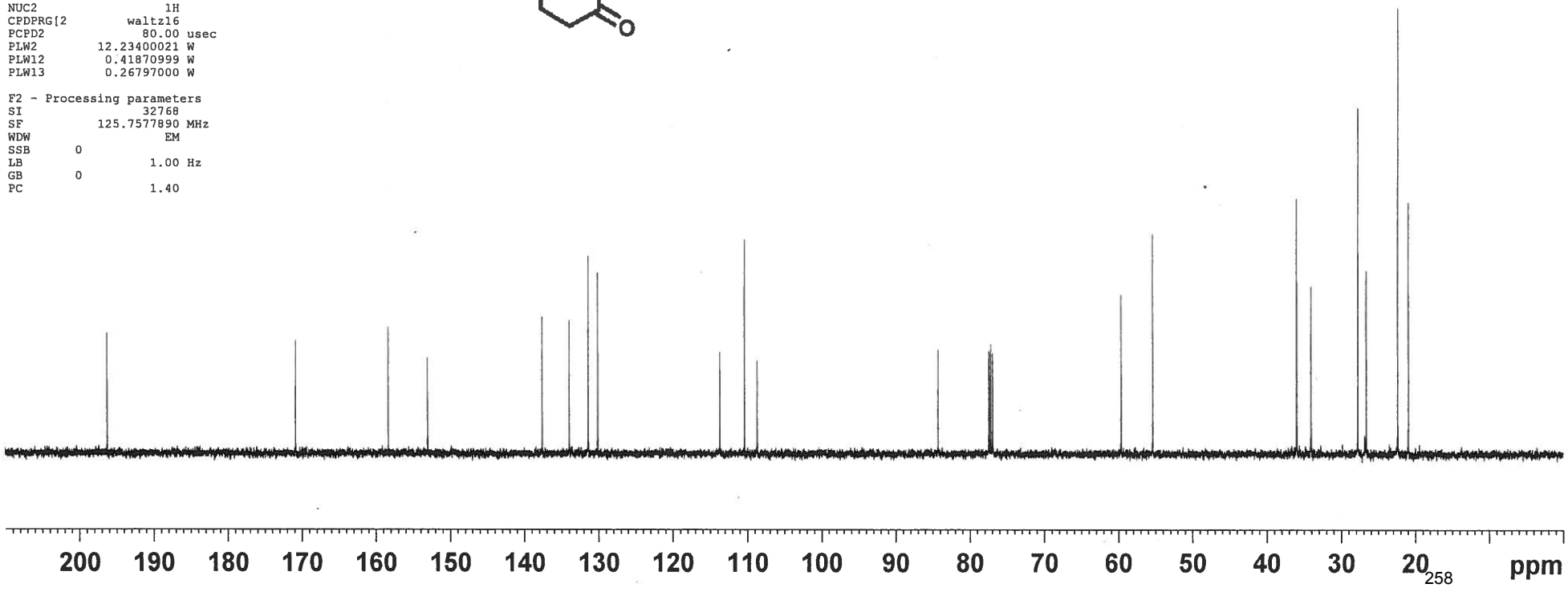
======== CHANNEL f1 ========
SFO1 125.7703637 MHz
NUC1 13C
P1 9.50 usec
PLW1 66.48200226 W

======== CHANNEL f2 ========
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 12.23400021 W
PLW12 0.41870999 W
PLW13 0.26797000 W

F2 - Processing parameters
SI 32768
SF 125.7577890 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

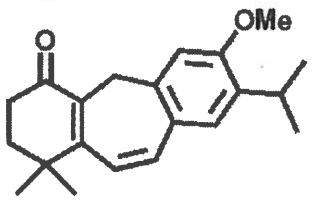


29



Pisiferin Decomplexed Na2HPO4
Experiment 6 Topspin 500 V3.2
in CD2Cl2

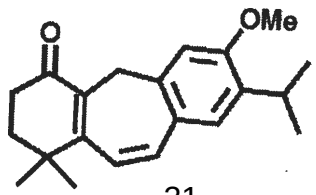
```
Current Data Parameters
NAME      Pisiferin Decomplexed Na2HPO4
EXPNO                  6
PROCNO                 1

F2 - Acquisition Parameters
Date_           20130829
Time               16.46
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 65536
SOLVENT           CD2Cl2
NS                     8
DS                     2
SWH            10000.000 Hz
FIDRES         0.152588 Hz
AQ             3.2767999 sec
RG                 100.2
DW                50.000 usec
DE                 6.50 usec
TE                296.0 K
D1            1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          500.1330885 MHz
NUC1                  1H
P1                 12.06 usec
PLW1          18.00000000 W

F2 - Processing parameters
SI                 65536
SF            500.1300189 MHz
WDW                   EM
SSB       0
LB                 0.35 Hz
GB        0
PC                 1.00
```



31

Pisiferin Decomplexed Na2HPO4 13C
Experiment 3 Topspin 300
Thursday 29 August 2013
In CD2Cl2

196.29
158.79
155.87
138.37
137.07
134.57
128.26
126.04
125.85
109.28
55.50
54.11
53.75
53.39
53.03
52.67
37.21
34.83
34.41
30.49
27.55
26.57
22.39



31

Current Data Parameters
NAME Pisiferin Decomplexed Na2HPO4 13C
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20130829
Time 20.44
INSTRUM spect
PROBHD 5 mm BBO BB-1H
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 1035
DS 4
SWH 17985.611 Hz
FIDRES 0.548877 Hz
AQ 0.9110004 sec
RG 5160.6
DW 27.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.20000005 sec
d11 0.03000000 sec
DELTA 1.10000002 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 14.00 usec
PL1 0.00 dB
SFO1 75.5004428 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 70.00 usec
PL2 0.00 dB
PL12 14.30 dB
PL13 19.41 dB
SFO2 300.2323000 MHz

F2 - Processing parameters
SI 32768
SF 75.4928017 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.00

200 180 160 140 120 100 80 60 40 20 0 ppm