Supporting Information

Palladium-catalyzed asymmetric coupling cyclization of terminal γ-allenols with aryl iodides

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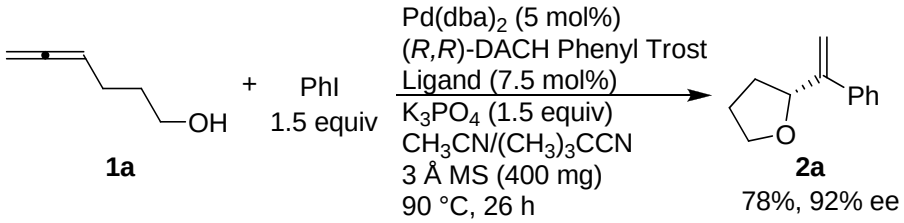
General Information. All reactions were carried out in oven dried Schlenk tubes. $Pd(dba)_2$ was purchased from Aladdin; (*R,R*)-DACH Phenyl Trost Ligand **L1** (98%) was purchased from Stream Chemicals and kept in glove box; (*S*)-tetrahydrofuran-2-carboxylic acid (97%) was purchased from Accela; K_3PO_4 was purchased from Acros and kept in glove box; 3 Å molecular sieves were purchased from Alfa Aesar and kept in glove box after activation (activated at 450 ^oC for 10 h in Muffle furnace; after cooling to 200 ^oC, transferred to the glove box to allow to cool to room temperature for use). CH_3CN, $(CH_3)_3CCN$, Et_3N, DMF and $CH_3(CH_2)_3CN$ were dried over CaH_2 and distilled freshly before use. 1,4-Dioxane and toluene were dried over sodium wire and distilled freshly before use. Other reagents were used without further treatment. All the temperatures are referred to the oil baths used.

Experimental details and analytical data

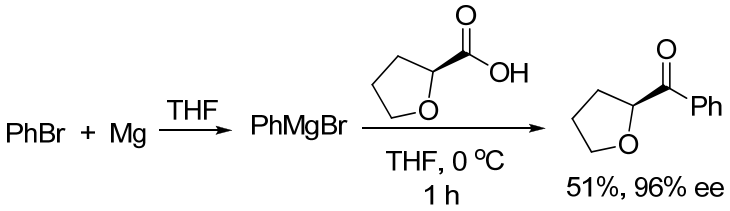
1. Preparation of (*R*)-2-(1-phenylvinyl)tetrahydrofuran 2a (xx-5-141)



Typical procedure I: To a dry Schlenk tube were added 4,5-hexadien-1-ol **1a** (98.2 mg, 1 mmol), freshly distilled CH_3CN (6 mL), and $(CH_3)_3CCN$ (4 mL). The solution was frozen with a liquid nitrogen bath, degassed for ten minutes and then thawed under argon. This cycle was repeated for three times. To another dry Schlenk tube were sequentially added K_3PO_4 (318.3 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.7 mg, 0.05 mmol), and (*R,R*)-DACH Phenyl Trost Ligand (51.9 mg, 0.075 mmol) in a glove box. This Schlenk tube was then taken out to the bench, which was followed by the addition of the above-mentioned degassed solution. The resulting mixture was then stirred at room temperature for 13 min, then frozen with a liquid nitrogen bath and iodobenzene (170 μL, d = 1.81 g/cm^3, 305.9 mg, 1.5 mmol) was added under argon. After repeating evacuating and refilling with argon for three times, the resulting mixture was stirred at 90 ^oC under the argon atmosphere with an

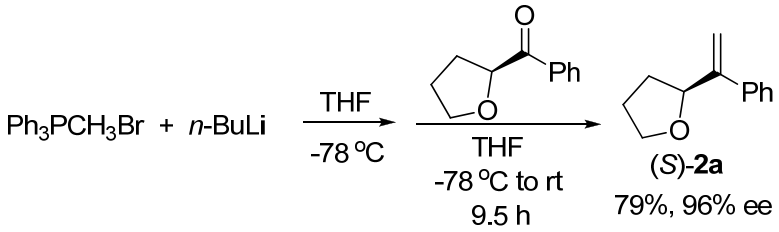
argon balloon. When the reaction was complete as monitored by TLC, it was filtered and washed with ethyl ether. The solvent was evaporated under vacuum, and the residue was purified by chromatography on silica gel (eluent: petroleum ether:ethyl ether = 20:1) to afford (*R*)-**2a** (136.0 mg, 78%) as an oil; 92% ee determined by HPLC analysis (AD-H column, rate = 0.8 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 5.3 min, t_R(major) = 6.6 min); $[\alpha]^{20}_D$ = -8.9 (*c* = 2.62, ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.50-7.22 (m, 5 H, Ar-H), 5.37 (s, 1 H, one proton form H_2C=C), 5.30 (s, 1 H, one proton form H_2C=C), 4.87 (t, *J* = 6.9 Hz, 1 H, CHO), 4.10-3.97 (m, 1 H, one proton from OCH_2), 3.95-3.82 (m, 1 H, one proton from OCH_2), 2.18-2.01 (m, 1 H, one proton from CH_2CH_2), 1.98-1.82 (m, 2 H, two protons from CH_2CH_2), 1.71-1.55 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 149.6, 139.9, 128.2, 127.4, 126.7, 111.6, 80.0, 68.4, 31.7, 25.5; IR (neat, cm^{-1}): 2975, 2867, 1631, 1494, 1443, 1060; MS (70 ev, EI) *m/z* (%): 174 (M^+, 100.00); HRMS Calcd for $C_{12}H_{14}O$ (M^+): 174.1045, Found: 174.1044.

The absolute configuration of the product **2a** was determined to be *R* by comparison of the t_R of the authentic (*S*)-**2a**, which was in situ prepared by the Wittig methylation of (*S*)-phenyl(tetrahydrofuran-2-yl)methanone[1] derived from the reaction between (*S*)-tetrahydrofuran-2-carboxylic acid and phenylmagnesium bromide.[2]



To a 100 mL 3-necked flask equipped with a condenser and an addition funnel were added magnesium turnings (1.0208 g, 42 mmol) and anhydrous THF (40 mL) under N_2. A solution of bromobenzene (5.4951 g, 35 mmol) in anhydrous THF (10 mL) was added through the addition funnel. The Grignard reaction was initiated with the addition of approximately 5 mL of the bromobenzene solution and a few crystal of iodine. The remaining bromobenzene solution was then added and the reaction was heated under reflux for 1 hour. Then it was cooled to 0 °C and a solution of (*S*)-tetrahydrofuran-2-carboxylic acid (1.1610 g, 10 mmol) in anhydrous THF (12.5

mL) was added in one portion with stirring. After 30 minutes at 0 °C, the reaction was warmed up to room temperature and quenched with aqueous hydrochloric acid (1 N, 10 mL). The organic layer was separated from the aqueous layer, which was extracted with ethyl ether (3 × 20 mL). The organic layer was washed with brine and dried over anhydrous magnesium sulfate. Filtration, evaporation and column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 5/1 to 3/1) afforded (*S*)-phenyl(tetrahydrofuran-2-yl)methanone (910.2 mg, 51%, 96% ee) (HPLC conditions: As-H column, rate = 0.7 mL/min, eluent: hexane/*i*-PrOH = 70:30, λ = 214 nm, t_R(major) = 7.2 min, t_R(minor) = 14.8 min); liquid; $[\alpha]^{20}_D$ = +1.4 (*c* = 1.07, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.04-7.90 (m, 2 H, Ar-H), 7.58-7.36 (m, 3 H, Ar-H), 5.29-5.16 (m, 1 H, OCH), 4.04-3.86 (m, 2 H, OCH_2), 2.33-2.17 (m, 1 H, one proton from CH_2CH_2), 2.14-2.00 (m, 1 H, one proton from CH_2CH_2), 1.99-1.84 (m, 2 H, two protons from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 198.5, 134.8, 133.1, 128.5, 128.4, 79.8, 69.2, 29.1, 25.4; IR (neat, cm^{-1}): 2976, 2952, 2873, 1689, 1597, 1580, 1449, 1226, 1178, 1100, 1058, 1003; MS (70 ev, EI) *m/z* (%): 176 (M^+, 0.50), 71 (100); Anal. Calcd for $C_{11}H_{12}O_2$: C, 74.98; H, 6.86. Found: C, 74.81; H, 6.91.



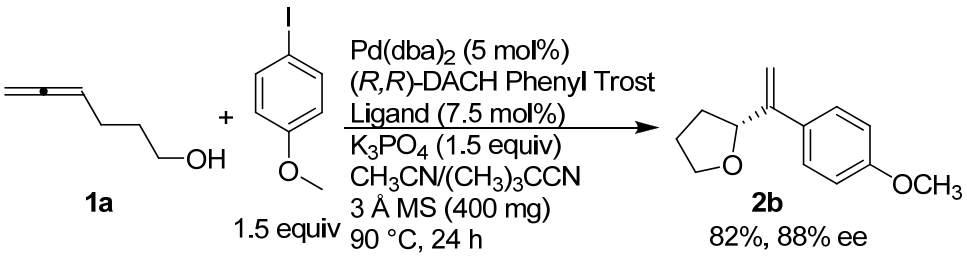
To a slurry of $(C_6H_5)_3PCH_3Br$ (625.9 mg, 1.8 mmol) in THF (8 mL) cooled to –78 °C was added *n*-C_4H_9Li (2.5 M in hexane, 0.72 mL, 1.8 mmol). The resulting mixture was stirred at this temperature for 10 min. To this bright yellow solution was added a solution of (*S*)-phenyl(tetrahydrofuran-2-yl)methanone (308.8 mg, 1.8 mmol) in THF (8 mL). After being stirred at room temperature for 9.5 h, the solution was quenched with an aqueous solution of hydrochloric acid (1 N, 10 mL). The organic layer was separated and the aqueous layer was extracted with ethyl ether (3 × 10 mL). The combined organic layer was washed with brine and dried over anhydrous magnesium sulfate. Filtration, evaporation and column chromatography on silica gel (eluent: petroleum ether/ethyl ether = 10/1) afforded (*S*)-**2a** (242.3 mg, 79%, 96% ee)

(HPLC conditions: AD-H column, rate = 0.8 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(major) = 5.5 min, t_R(minor) = 6.8 min); liquid; $[\alpha]^{20}_D$ = +8.5 (*c* = 2.52, ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.48-7.20 (m, 5 H, Ar-H), 5.36 (dd, *J* = 1.5, 1.2 Hz, one proton form H_2C=C), 5.29 (s, 1 H, one proton form H_2C=C), 4.85 (t, *J* = 6.9 Hz, 1 H, CHO), 4.01 (dt, *J* = 8.1, 6.6 Hz, 1 H, one proton from OCH_2), 3.87 (dt, *J* = 8.1, 6.9 Hz, 1 H, one proton from OCH_2), 2.13-1.98 (m, 1 H, one proton from CH_2CH_2), 1.98-1.83 (m, 2 H, two protons from CH_2CH_2), 1.70-1.55 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 149.5, 139.8, 128.2, 127.4, 126.6, 111.5, 79.9, 68.3, 31.6, 25.5; IR (neat, cm^{-1}): 2987, 2850, 2867, 1715, 1495, 1445, 1080, 1061, 1028; MS (70 ev, EI) *m/z* (%): 174 (M^+, 66.49), 71 (100); HRMS Calcd for $C_{12}H_{14}O$ (M^+): 174.1045, Found: 174.1044.

The following compounds **2b-2l** in Table 2 and Table 3 were prepared according to **Typical Procedure I**.

All the racemic products were also prepared according to this procedure in the absence of the chiral ligand and replacing $Pd(dba)_2$ with $Pd(PPh_3)_4$ in CH_3CN.

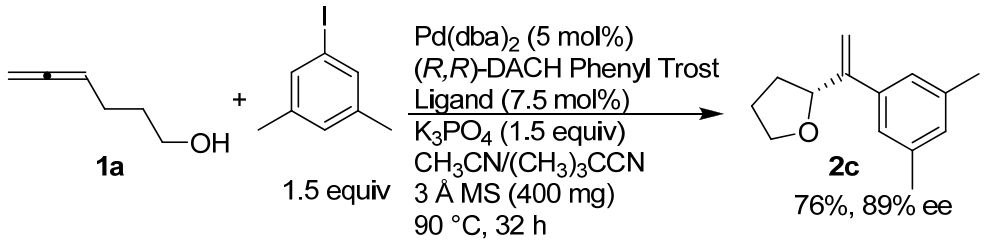
2. Preparation of (*R*)-2-(1-(4-methoxyphenyl)vinyl)tetrahydrofuran 2b (xx-6-20)



The reaction of **1a** (98.1 mg, 1.0 mmol)，CH_3CN (4.8 mL)，$(CH_3)_3CCN$ (3.2 mL), K_3PO_4 (318.4 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.7 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.8 mg, 0.075 mmol), and 1-iodo-4-methoxybenzene (351.1 mg, 1.5 mmol) afforded (*R*)-**2b** (167.9 mg, 82%, 88% ee) (eluent: petroleum ether/ethyl ether = 20/1 to 10/1) (HPLC conditions: AD-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 12.2 min, t_R(major) = 13.9 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38-7.28 (m, 2 H, Ar-H), 6.90-6.82 (m, 2 H, Ar-H), 5.29 (dd, *J* = 1.8, 1.5 Hz, 1 H, one proton from

H_2C=C), 5.24-5.22 (m, 1 H, one proton from H_2C=C), 4.83 (t, *J* = 6.9 Hz, 1 H, OCH), 4.02 (dt, *J* = 8.4, 6.6 Hz, 1 H, one proton from OCH_2), 3.88 (dt, *J* = 8.1, 7.0 Hz, 1 H, one proton from OCH_2), 3.81 (s, 3 H, CH_3), 2.15-2.02 (m, 1 H, one proton from CH_2CH_2), 1.96-1.85 (m, 2 H, two protons from CH_2CH_2), 1.71-1.57 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 159.0, 148.7, 132.2, 127.7, 113.5, 110.1, 80.0, 68.4, 55.1, 31.6, 25.5; IR (neat, cm^{-1}): 2973, 2869, 1608, 1510, 1461, 1245, 1179, 1106, 1061, 1032; MS (70 ev, EI) *m/z* (%): 204 (M^+, 36.16), 133 (100); HRMS Calcd for $C_{13}H_{16}O_2$ (M^+): 204.1150, Found: 204.1151.

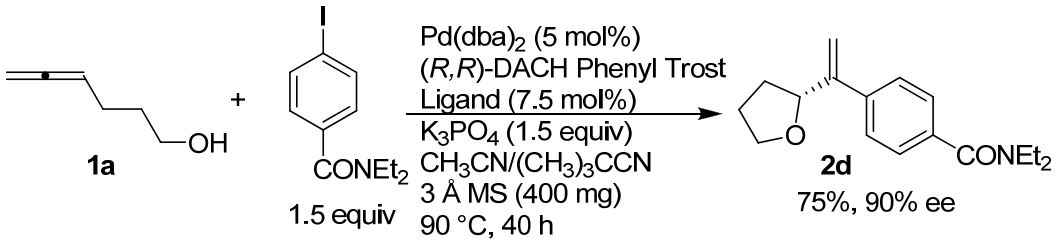
3. Preparation of (*R*)-2-(1-(3,5-dimethylphenyl)vinyl)tetrahydrofuran 2c (xx-6-96)



The reaction of **1a** (98.0 mg, 1.0 mmol)，CH_3CN (4.8 mL)，$(CH_3)_3CCN$ (3.2 mL), K_3PO_4 (318.3 mg, 1.5 mmol), 3 Å molecular sieve (400.1 mg), $Pd(dba)_2$ (28.8 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.9 mg, 0.075 mmol), and 1-iodo-3,5-dimethylbenzene (217 μL, d = 1.608 g/cm^3, 348.9 mg, 1.5 mmol) afforded (*R*)-**2c** (153.0 mg, 76%, 89% ee) (eluent: petroleum ether/ethyl ether = 30/1) (HPLC conditions: AD-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 7.5 min, t_R(major) = 9.0 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 6.99 (s, 2 H, Ar-H), 6.93 (s, 1 H, Ar-H), 5.32 (dd, *J* = 1.8, 1.5 Hz, 1 H, one proton from H_2C=), 5.26 (s, 1 H, one proton from H_2C=), 4.85 (t, *J* = 7.1 Hz, 1 H, OCH), 4.03 (dt, *J* = 8.1, 6.8 Hz, 1 H, one proton from OCH_2), 3.88 (dt, *J* = 8.1, 7.1 Hz, 1 H, one proton from OCH_2), 2.32 (s, 6 H, 2×CH_3), 2.15-2.02 (m, 1 H, one proton from CH_2CH_2), 1.97-1.85 (m, 2 H, two protons from CH_2CH_2), 1.71-1.57 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 149.8, 139.9, 137.5, 129.0, 124.5, 111.0, 80.0, 68.3, 31.7, 25.5, 21.3; IR (neat, cm^{-1}): 2974, 2948, 2917, 2865, 1598, 1459, 1068; MS (70 ev, EI) *m/z* (%): 202 (M^+, 76.16), 71 (100); HRMS Calcd

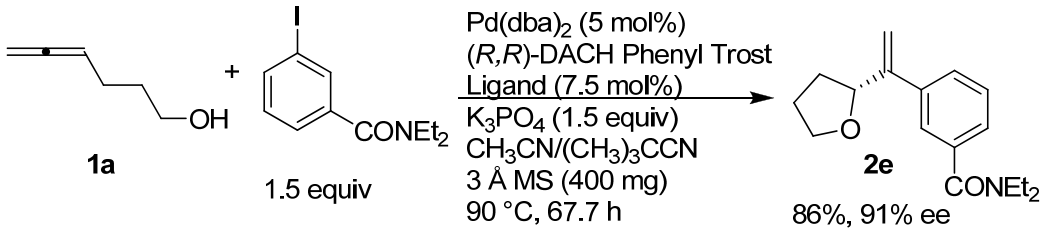
for $C_{14}H_{18}O$ (M^+): 202.1358, Found: 202.1359.

4. Preparation of (*R*)-2-(1-(4-*N*,*N*-diethylaminocarbonylphenyl)vinyl)tetrahydrofuran 2d (xx-6-43)



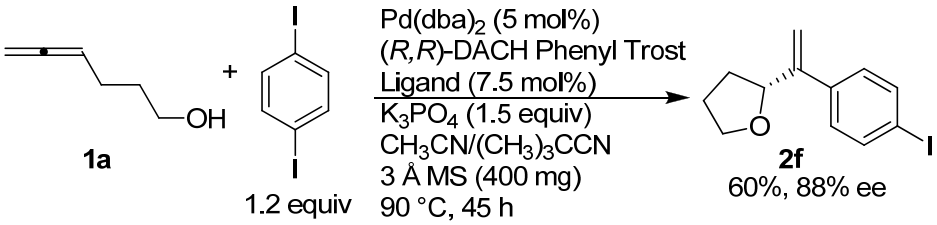
The reaction of **1d** (98.2 mg, 1.0 mmol)，CH_3CN (3.6 mL)，$(CH_3)_3CCN$ (2.4 mL), K_3PO_4 (318.5 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.7 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.8 mg, 0.075 mmol), and *N*,*N*-diethyl-4-iodobenzamide (454.8 mg, 1.5 mmol) afforded (*R*)-**2d** (205.0 mg, 75%, 90% ee) (eluent: petroleum ether/ethyl acetate = 3/1 to 2/1) (HPLC conditions: OJ-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 90:10, λ = 230 nm, t_R(major) = 14.4 min, t_R(minor) = 15.5 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.43-7.36 (m, 2 H, Ar-H), 7.35-7.27 (m, 2 H, Ar-H), 5.38 (dd, *J* = 1.8, 1.5 Hz, 1 H, one proton from H_2C=), 5.31 (s, 1 H, one proton from H_2C=), 4.82 (t, *J* = 7.1 Hz, 1 H, OCH), 4.00 (dt, *J* = 8.1, 6.6 Hz, 1 H, one proton from OCH_2), 3.86 (dt, *J* = 8.1, 6.9 Hz, 1 H, one proton from OCH_2), 3.70-3.10 (br, 4 H, 2×CH_2), 2.14-1.98 (m, 1 H, one proton from CH_2CH_2), 1.96-1.80 (m, 2 H, two protons from CH_2CH_2), 1.70-1.52 (m, 1 H, one proton from CH_2CH_2), 1.40-0.90 (br, 6 H, 2×CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 170.8, 148.6, 140.4, 136.0, 126.5, 126.1, 112.2, 79.7, 68.2, 43.1, 39.0, 31.4, 25.3, 13.9, 12.7; IR (neat, cm^{-1}): 2973, 2935, 2874, 1627, 1458, 1426, 1287, 1092, 1059, 1019; MS (70 ev, EI) *m/z* (%): 273 (M^+, 37.38), 201 (100); HRMS Calcd for $C_{17}H_{23}NO_2$ (M^+): 273.1729, Found: 273.1730.

5. Preparation of (*R*)-2-(1-(3-*N*,*N*-diethylaminocarbonylphenyl)vinyl)tetrahydrofuran 2e (xx-6-58)



The reaction of **1d** (98.0 mg, 1.0 mmol), CH_3CN (3.6 mL), $(CH_3)_3CCN$ (2.4 mL), K_3PO_4 (318.3 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.7 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.9 mg, 0.075 mmol), and *N*,*N*-diethyl-3-iodobenzamide (454.8 mg, 1.5 mmol) afforded (*R*)-**2e** (235.7 mg, 86%, 91% ee) (eluent: petroleum ether/ethyl acetate = 5/1 to 3/1) (HPLC conditions: OD-H column, rate = 1.0 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 214 nm, t_R(major) = 24.2 min, t_R(minor) = 25.9 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.45-7.25 (m, 4 H, Ar-H), 5.40 (s, 1 H, one proton from H_2C=), 5.32 (s, 1 H, one proton from H_2C=), 4.83 (t, *J* = 6.9 Hz, 1 H, OCH), 4.05-3.94 (m, 1 H, one proton from OCH_2), 3.94-3.82 (m, 1 H, one proton from OCH_2), 3.70-3.10 (br, 4 H, 2×CH_2), 2.15-2.00 (m, 1 H, one proton from CH_2CH_2), 1.98-1.80 (m, 2 H, two protons from CH_2CH_2), 1.70-1.56 (m, 1 H, one proton from CH_2CH_2), 1.40-0.96 (br, 6 H, 2×CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 171.0, 148.8, 139.9, 137.1, 128.2, 127.3, 125.2, 124.5, 112.3, 79.8, 68.3, 43.2, 39.1, 31.5, 25.4, 14.1, 12.8; IR (neat, cm^{-1}): 2973, 2946, 2871, 1629, 1458, 1432, 1381, 1283, 1220, 1098, 1062; MS (70 ev, EI) *m/z* (%): 273 (M^+, 31.34), 201 (100); HRMS Calcd for $C_{17}H_{23}NO_2$ (M^+): 273.1729, Found: 273.1728.

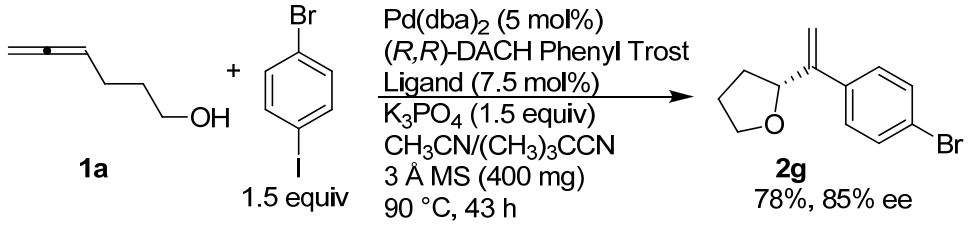
6. Preparation of (*R*)-2-(1-(4-iodophenyl)vinyl)tetrahydrofuran 2f (xx-6-40)



The reaction of **1d** (98.1 mg, 1.0 mmol), CH_3CN (2.4 mL), $(CH_3)_3CCN$ (1.6 mL), K_3PO_4 (318.5 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.8 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.7 mg, 0.075 mmol), and 1,4-diiodobenzene (395.8 mg, 1.2 mmol) afforded (*R*)-**2f** (179.3 mg, 60%, 88% ee)

(eluent: petroleum ether/ethyl ether = 40/1 to 20/1) (HPLC conditions: OJ-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 98:2, λ = 230 nm, t_R(major) = 13.4 min, t_R(minor) = 14.8 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.69-7.60 (m, 2 H, Ar-H), 7.17-7.09 (m, 2 H, Ar-H), 5.37 (dd, *J* = 1.2, 0.9 Hz, 1 H, one proton from H_2C=), 5.29 (dd, *J* = 1.2, 0.9 Hz, 1 H, one proton from H_2C=), 4.78 (t, *J* = 6.9 Hz, 1 H, OCH), 4.00 (dt, *J* = 8.1, 6.6 Hz, 1 H, one proton from OCH_2), 3.87 (dt, *J* = 8.1, 7.1 Hz, 1 H, one proton from OCH_2), 2.12-2.00 (m, 1 H, one proton from CH_2CH_2), 1.96-1.81 (m, 2 H, two protons from CH_2CH_2), 1.70-1.52 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 148.5, 139.3, 137.2, 128.6, 112.4, 93.0, 79.8, 68.4, 31.5, 25.5; IR (neat, cm^{-1}): 2973, 2947, 2865, 1484, 1385, 1178, 1065, 1054, 1004; MS (70 ev, EI) *m/z* (%): 300 (M^+, 34.41), 71 (100); HRMS Calcd for $C_{12}H_{13}OI$ (M^+): 300.0011, Found: 300.0012.

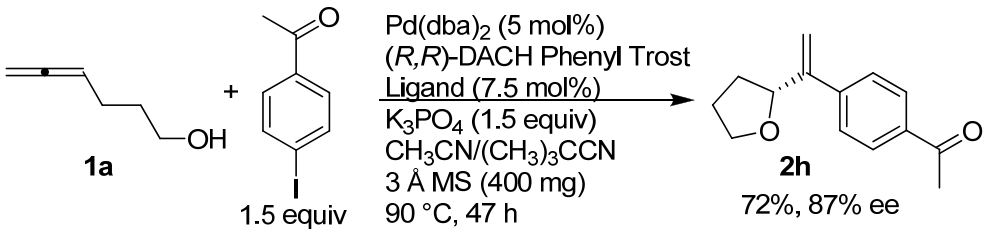
7. Preparation of (*R*)-2-(1-(4-bromophenyl)vinyl)tetrahydrofuran 2g (xx-6-34)



The reaction of **1a** (98.1 mg, 1.0 mmol)，CH_3CN (2.4 mL)，$(CH_3)_3CCN$ (1.6 mL), K_3PO_4 (318.3 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.8 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.9 mg, 0.075 mmol), and 1-bromo-4-iodobenzene (424.2 mg, 1.5 mmol) afforded (*R*)-**2g** (197.1 mg, 78%, 85% ee) (eluent: petroleum ether/ethyl acetate = 40/1 to 20/1) (HPLC conditions: OJ-H column, rate = 0.6 mL/min, eluent: hexane/*i*-PrOH = 98:2, λ = 214 nm, t_R(major) = 10.5 min, t_R(minor) = 11.9 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.54-7.38 (m, 2 H, Ar-H), 7.32-7.20 (m, 2 H, Ar-H), 5.42-5.34 (m, 1 H, one proton from H_2C=), 5.29 (s, 1 H, one proton from H_2C=), 4.79 (t, *J* = 6.8 Hz, 1 H, OCH), 4.06-3.94 (m, 1 H, one proton from OCH_2), 3.92-3.80 (m, 1 H, one proton from OCH_2), 2.16-2.00 (m, 1 H, one proton from CH_2CH_2), 1.99-1.75 (m, 2 H, two protons from CH_2CH_2), 1.68-1.52 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 148.4,

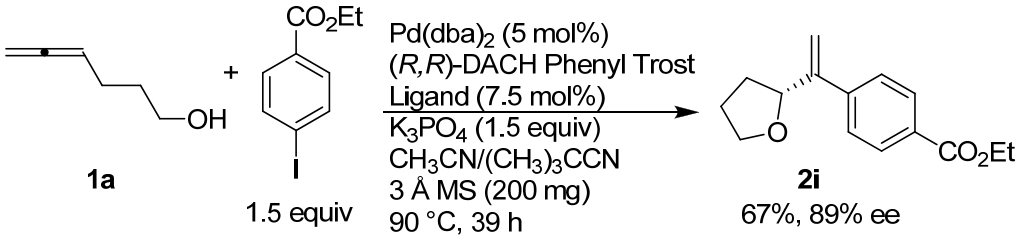
138.7, 131.3, 128.4, 121.4, 112.4, 79.9, 68.4, 31.5, 25.5; IR (neat, cm^{-1}): 2975, 2948, 2868, 1630, 1588, 1487, 1390, 1179, 1073, 1058, 1008; MS (70 ev, EI) *m/z* (%): 254 [M^+(^{81}Br), 12.86], 252 [M^+(^{79}Br), 13.32], 71 (100); HRMS Calcd for $C_{12}H_{13}O^{79}Br$ (M^+): 252.0150, Found: 252.0151.

8. Preparation of (*R*)-2-(1-(4-acetylphenyl)vinyl)tetrahydrofuran 2h (xx-6-25)



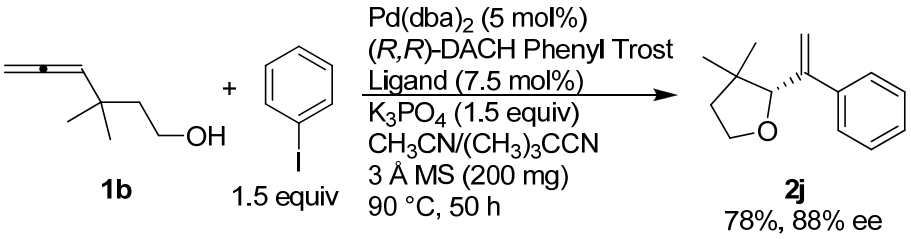
The reaction of **1d** (98.2 mg, 1.0 mmol), CH_3CN (3.6 mL), $(CH_3)_3CCN$ (2.4 mL), K_3PO_4 (318.5 mg, 1.5 mmol), 3 Å molecular sieve (400 mg), $Pd(dba)_2$ (28.7 mg, 0.050 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (51.9 mg, 0.075 mmol), and 1-(4-iodophenyl)ethanone (369.0 mg, 1.5 mmol) afforded (*R*)-**2h** (156.7 mg, 72%, 87% ee) (eluent: petroleum ether/ethyl acetate = 20/1 to 10/1) (HPLC conditions: AS-H column, rate = 1.0 mL/min, eluent: hexane/*i*-PrOH = 98:2, λ = 214 nm, t_R(minor) = 21.1 min, t_R(major) = 23.6 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.95-7.87 (m, 2 H, Ar-H), 7.52-7.43 (m, 2 H, Ar-H), 5.46 (dd, *J* = 1.5, 1.2 Hz, 1 H, one proton from H_2C=), 5.38 (s, 1 H, one proton from H_2C=), 4.85 (t, *J* = 6.9 Hz, 1 H, OCH), 4.01 (dt, *J* = 8.1, 6.6 Hz, 1 H, one proton from OCH_2), 3.88 (dt, *J* = 8.1, 7.1 Hz, 1 H, one proton from OCH_2), 2.59 (s, 3 H, CH_3), 2.16-2.02 (m, 1 H, one proton from CH_2CH_2), 1.98-1.84 (m, 2 H, two protons from CH_2CH_2), 1.68-1.53 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 197.6, 148.7, 144.6, 136.1, 128.3, 126.9, 113.6, 79.8, 68.4, 31.6, 26.5, 25.5; IR (neat, cm^{-1}): 2975, 2872, 1681, 1604, 1405, 1358, 1266, 1187, 1057; MS (70 ev, EI) *m/z* (%): 216 (M^+, 65.87), 71 (100); HRMS Calcd for $C_{14}H_{16}O_2$ (M^+): 216.1150, Found: 216.1151.

9. Preparation of (*R*)-2-(1-(4-ethoxycarbonylphenyl)vinyl)tetrahydrofuran 2i (xx-6-98)



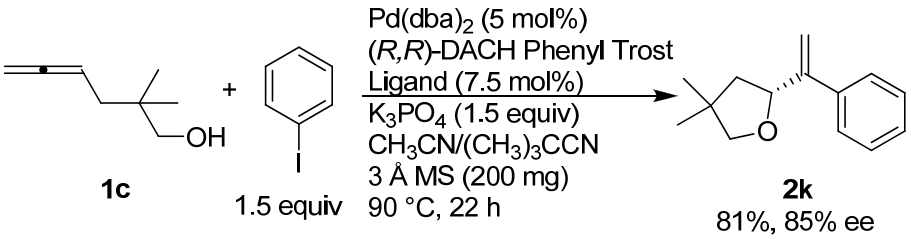
The reaction of **1a** (49.0 mg, 0.5 mmol)，CH_3CN (1.8 mL)，$(CH_3)_3CCN$ (1.2 mL), K_3PO_4 (159.1 mg, 0.75 mmol), 3 Å molecular sieve (200 mg), $Pd(dba)_2$ (14.4 mg, 0.025 mmol), (*R,R*)-DACH Phenyl Trost Ligand (25.8 mg, 0.0375 mmol), and ethyl 4-iodobenzoate (125 μL, d = 1.66 g/cm^3, 207.1 mg, 0.75 mmol) afforded the mixture of **2i** and dba (eluent: petroleum ether/ethyl acetate = 10:1), which couldn't be separated via column chromatography on silica gel. Then MeOH (3 mL) and $NaBH_4$ (3.0 mg, 0.08 mmol) were added and the resulting mixture was stirred at RT for half an hour. The solvent was evaporated under vacuum, and the residue was purified by chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 5:1) to afford (*R*)-**2i** (81.8 mg, 67%, 89% ee) (HPLC conditions: AS-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 98:2, λ = 230 nm, t_R(minor) = 15.9 min, t_R(major) = 19.0 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.04-7.94 (m, 2 H, Ar-H), 7.50-7.40 (m, 2 H, Ar-H), 5.45 (dd, *J* = 1.6, 1.6 Hz, 1 H, one proton from H_2C=), 5.38 (s, 1 H, one proton from H_2C=), 4.86 (t, *J* = 6.9 Hz, 1 H, OCH), 4.37 (q, *J* = 7.2 Hz, 2 H, $COOCH_2$), 4.02 (dt, *J* = 8.1, 6.6 Hz, 1 H, one proton from OCH_2), 3.93-3.83 (m, 1 H, one proton from OCH_2), 2.16-2.02 (m, 1 H, one proton from CH_2CH_2), 1.98-1.84 (m, 2 H, two protons from CH_2CH_2), 1.68-1.53 (m, 1 H, one proton from CH_2CH_2), 1.39 (t, *J* = 7.2 Hz, 3 H, CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 166.3, 148.7, 144.3, 129.43, 129.36, 126.6, 113.3, 79.7, 68.4, 60.8, 31.5, 25.5, 14.2; IR (neat, cm^{-1}): 2980, 2870, 1714, 1608, 1367, 1273, 1181, 1101, 1060, 1019; MS (70 ev, EI) *m/z* (%): 246 (M^+, 15.95), 71 (100); HRMS Calcd for $C_{15}H_{18}O_3$(M^+): 246.1256, Found: 246.1257.

10. Preparation of (*R*)-3,3-dimethyl-2-(1-phenylvinyl)tetrahydrofuran 2j (xx-6-99)



The reaction of **1b** (63.2 mg, 0.5 mmol), CH_3CN (1.2 mL), $(CH_3)_3CCN$ (0.8 mL), K_3PO_4 (159.2 mg, 0.75 mmol), 3 Å molecular sieve (200 mg), $Pd(dba)_2$ (14.4 mg, 0.025 mmol), (*R,R*)-DACH Phenyl Trost Ligand (25.8 mg, 0.0375 mmol), and iodobenzene (85 μL, d = 1.81 g/cm^3, 153.9 mg, 0.75 mmol) afforded (*R*)-**2j** (79.2 mg, 78%, 88% ee) (eluent: petroleum ether/ethyl ether = 30/1) (HPLC conditions: AD-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 7.7 min, t_R(major) = 12.7 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38-7.21 (m, 5 H, Ar-H), 5.39 (dd, *J* = 2.1, 1.5 Hz, 1 H, one proton from H_2C=), 5.25 (dd, *J* = 2.1, 0.9 Hz, 1 H, one proton from H_2C=), 4.59-4.55 (m, 1 H, OCH), 4.06-3.89 (m, 2 H, OCH_2), 1.91-1.72 (m, 2 H, CH_2), 0.80 (s, 3 H, CH_3), 0.76 (s, 3 H, CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 147.5, 141.2, 128.1, 127.3, 127.2, 113.5, 87.4, 65.5, 41.9, 41.4, 26.6, 22.7; IR (neat, cm^{-1}): 2961, 2933, 2871, 1632, 1574, 1494, 1464, 1386, 1163, 1113, 1064, 1030, 1004; MS (70 ev, EI) *m/z* (%): 202 (M^+, 75.38), 70 (100); HRMS Calcd for $C_{14}H_{18}O$ (M^+): 202.1358, Found: 202.1359.

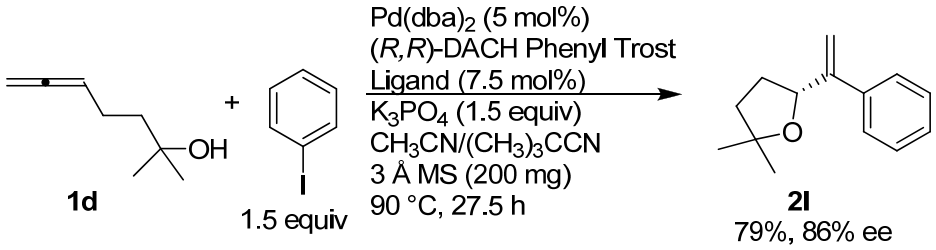
11. Preparation of (*R*)-4,4-dimethyl-2-(1-phenylvinyl)tetrahydrofuran 2k (xx-6-97)



The reaction of **1c** (62.8 mg, 0.5 mmol), CH_3CN (1.8 mL), $(CH_3)_3CCN$ (1.2 mL), K_3PO_4 (159.2 mg, 0.75 mmol), 3 Å molecular sieve (200 mg), $Pd(dba)_2$ (14.6 mg, 0.025 mmol), (*R,R*)-DACH Phenyl Trost Ligand (25.8 mg, 0.0375 mmol), and iodobenzene (85 μL, d = 1.81 g/cm^3, 153.9 mg, 0.75 mmol) afforded (*R*)-**2k** (82.0 mg, 81%, 85% ee) (eluent: petroleum ether/ethyl ether = 30/1) (HPLC conditions: AD-H

column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 8.0 min, t_R(major) = 9.5 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.41-7.21 (m, 5 H, Ar-H), 5.44 (dd, *J* = 1.5, 1.5 Hz, 1 H, one proton from H_2C=), 5.27 (dd, *J* = 1.2, 1.2 Hz, 1 H, one proton from H_2C=), 5.03-4.95 (m, 1 H, OCH), 3.65 (d, *J* = 7.8 Hz, 1 H, one proton from OCH_2), 3.61 (d, *J* = 8.4 Hz, 1 H, one proton from OCH_2), 1.92 (dd, *J* = 12.3, 7.2 Hz, 1 H, one proton from CH_2), 1.48 (dd, *J* = 12.2, 9.2 Hz, 1 H, one proton from CH_2), 1.14 (s, 3 H, CH_3), 1.06 (s, 3 H, CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 149.9, 139.9, 128.2, 127.4, 126.7, 110.9, 80.4, 80.1, 47.1, 39.9, 26.5, 26.2; IR (neat, cm^{-1}): 2957, 2869, 1495, 1465, 1368, 1285, 1059, 1028; MS (70 ev, EI) *m/z* (%): 202 (M^+, 50.07), 103 (100); HRMS Calcd for $C_{14}H_{18}O$ (M^+): 202.1358, Found: 202.1359.

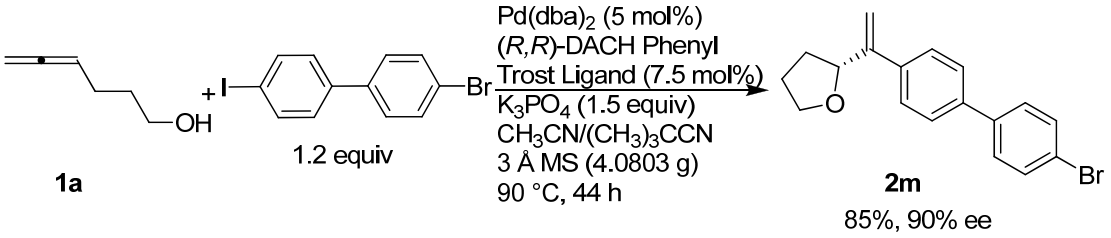
12. Preparation of (*R*)-2,2-dimethyl-5-(1-phenylvinyl)tetrahydrofuran 2l (xx-6-100)



The reaction of **1d** (63.3 mg, 0.5 mmol)，CH_3CN (2.0 mL)，$(CH_3)_3CCN$ (1.35 mL), K_3PO_4 (159.3 mg, 0.75 mmol), 3 Å molecular sieve (200 mg), $Pd(dba)_2$ (14.4 mg, 0.025 mmol), (*R,R*)-DACH Phenyl Trost Ligand (25.8 mg, 0.0375 mmol), and iodobenzene (85 μL, d = 1.81 g/cm^3, 153.9 mg, 0.75 mmol) afforded (*R*)-**2l** (80.5 mg, 79%, 86% ee) (eluent: petroleum ether/ethyl ether = 30/1) (HPLC conditions: AD-H column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 230 nm, t_R(minor) = 7.8 min, t_R(major) = 9.9 min); liquid; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.42-7.22 (m, 5 H, Ar-H), 5.45 (dd, *J* = 1.8, 1.5 Hz, 1 H, one proton from H_2C=), 5.30-5.25 (m, 1 H, one proton from H_2C=), 4.97-4.88 (m, 1 H, OCH), 2.23-2.10 (m, 1 H, one proton from CH_2CH_2), 1.82-1.63 (m, 3 H, three protons from CH_2CH_2), 1.35 (s, 3 H, CH_3), 1.32 (s, 3 H, CH_3); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 150.3, 140.2, 128.1, 127.3, 126.8, 111.5, 81.3, 79.6, 38.3, 32.6, 28.8, 28.0; IR (neat, cm^{-1}): 2969, 2869, 1495, 1459, 1379,

1248, 1147, 1075, 1051; MS (70 ev, EI) *m/z* (%): 202 (M^+, 66.02), 81 (100); HRMS Calcd for $C_{14}H_{18}O$ (M^+): 202.1358, Found: 202.1356.

13. One-Gram-Scale-Preparation of (*R*)-2-(1-(4'-bromobiphenyl-4-yl)vinyl)-tetrahydrofuran 2m (xx-6-86)

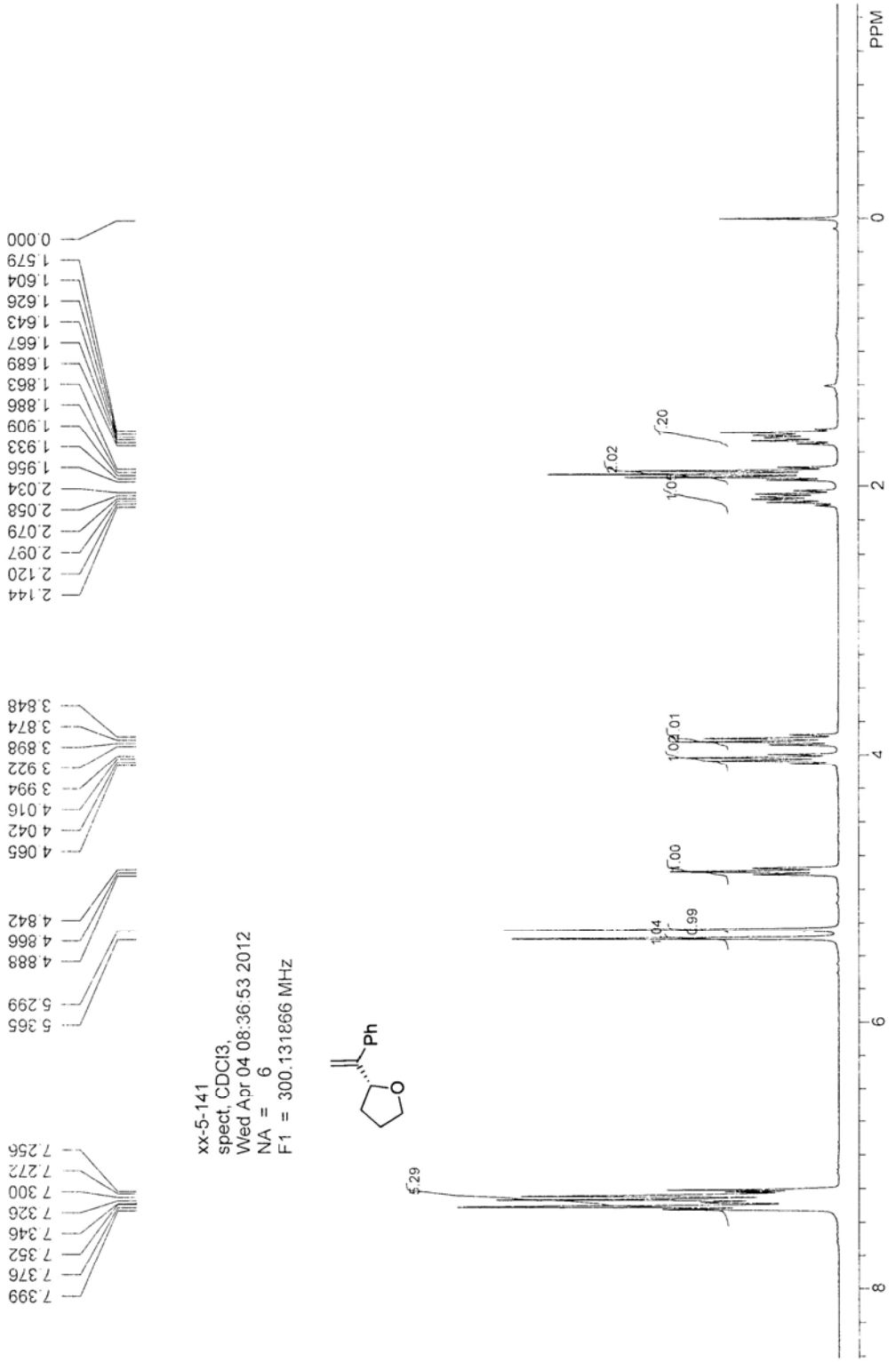


The reaction of **1a** (1.0013 g, 10.2 mmol), CH_3CN (37 mL), $(CH_3)_3CCN$ (25 mL), K_3PO_4 (3.2480 g, 15.3 mmol), 3 Å molecular sieve (4.0803 g), $Pd(dba)_2$ (293.2 mg, 0.51 mmol), (*R*,*R*)-DACH Phenyl Trost Ligand (528.2 mg, 0.765 mmol), and 4-bromo-4'-iodobiphenyl (4.3940 g, 12.2 mmol) afforded (*R*)-**2m** and dba (eluent: petroleum ether/ethyl acetate = 20:1 to 10:1), which couldn't be separated via column chromatography on silica gel. Then MeOH (25 mL) and $NaBH_4$ (100.0 mg, 2.6 mmol) were added and the resulting mixture was stirred at RT for half an hour. The solvent was evaporated under vacuum, and the residue was purified by chromatography on silica gel (eluent: petroleum ether/ethyl acetate = 10:1) to afford (*R*)-**2m** (2.8632 g, 85%, 90% ee) (HPLC conditions: IC column, rate = 0.5 mL/min, eluent: hexane/*i*-PrOH = 95:5, λ = 214 nm, t_R(minor) = 14.3 min, t_R(major) = 15.1 min); solid; melting point: 98 °C (petroleum/ethyl acetate); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.78-7.30 (m, 8 H, Ar-H), 5.40 (s, 1 H, one proton from H_2C=), 5.36 (s, 1 H, one proton from H_2C=), 4.88 (t, 1 H, *J* = 6.9 Hz, OCH), 4.12-3.98 (m, 1 H, one proton from OCH_2), 3.98-3.81 (m, 1 H, one proton from OCH_2), 2.20-2.02 (m, 1 H, one proton from CH_2CH_2), 2.00-1.84 (m, 2 H, two protons from CH_2CH_2), 1.72-1.57 (m, 1 H, one proton from CH_2CH_2); ^{13}C NMR (75.4 MHz, $CDCl_3$) δ 148.8, 139.5, 139.1, 138.9, 131.8, 128.4, 127.1, 126.6, 121.5, 111.8, 79.8, 68.4, 31.7, 25.5; IR (neat, cm^{-1}): 3037, 2951, 2861, 1479, 1191, 1107, 1061, 1035; MS (70 ev, EI) *m/z* (%): 330 (M^+(^{81}Br), 25.56), 328 (M^+(^{79}Br), 25.33), 71 (100); Anal. Calcd for $C_{18}H_{17}BrO$: C, 65.67; H, 5.20. Found: C, 65.70; H, 5.23.

References:

(1) Daniel J.; Lindsay A.; Jon T. *Org. Lett.* **2012**, *14*, 378 .

(2) Eric, J.; Jeffrey, A. *J. Heterocyclic Chem*. **1995**, *32*, 109.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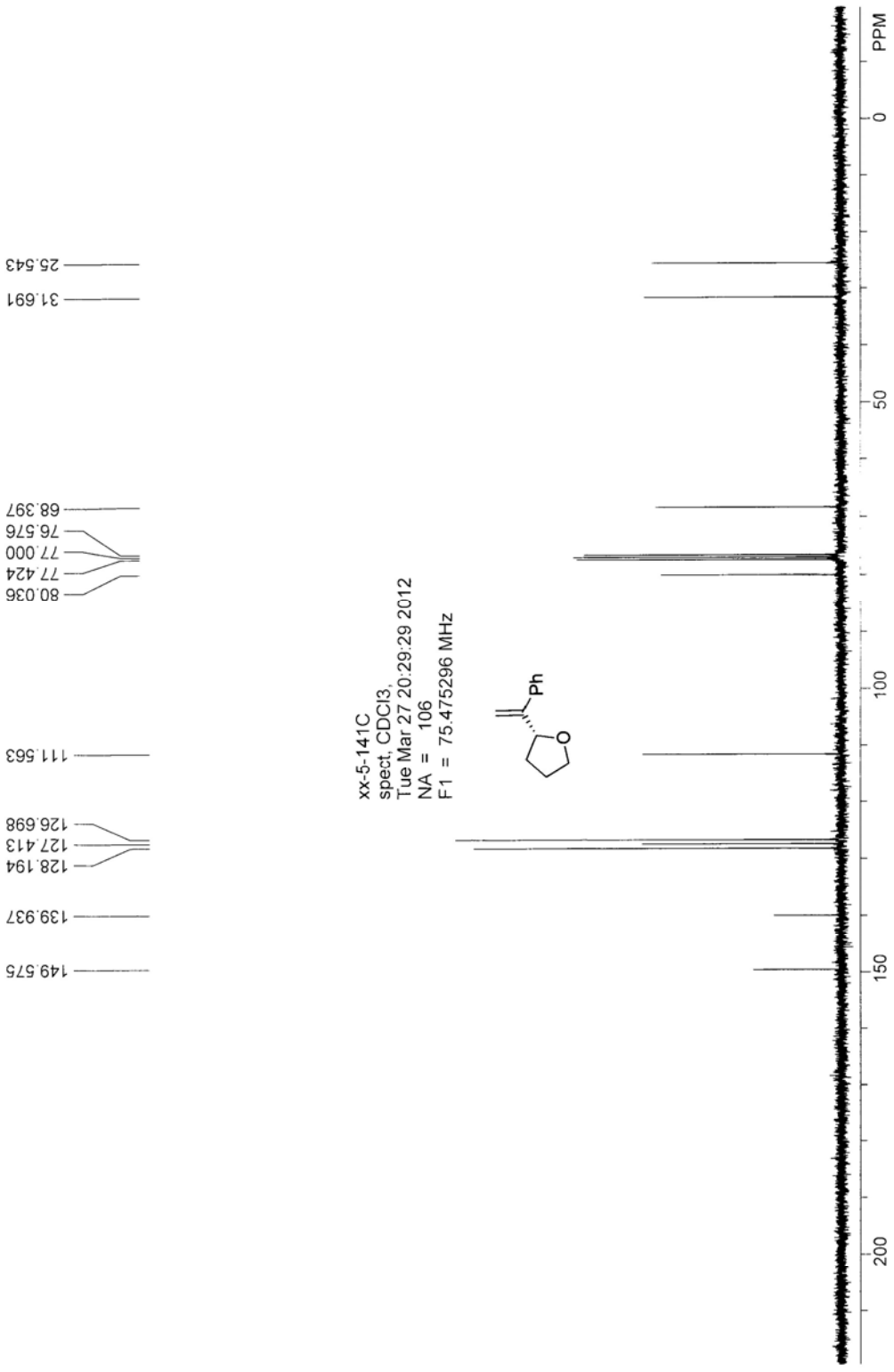
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Tue Mar 27 20:29:29 2012
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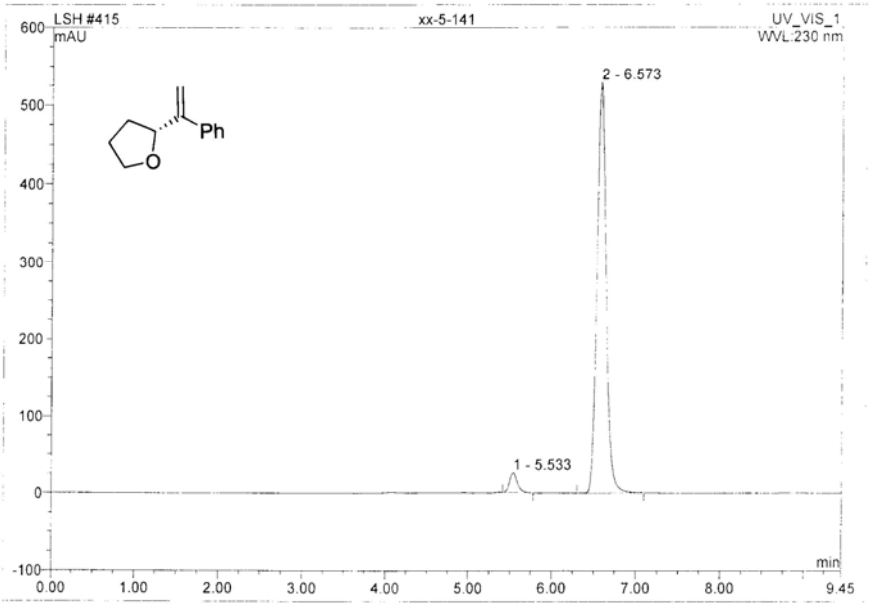

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Total:			554.284	69.715	100.00	0.000	

417 xx-5-30

AD-H-95-5-0.8-230

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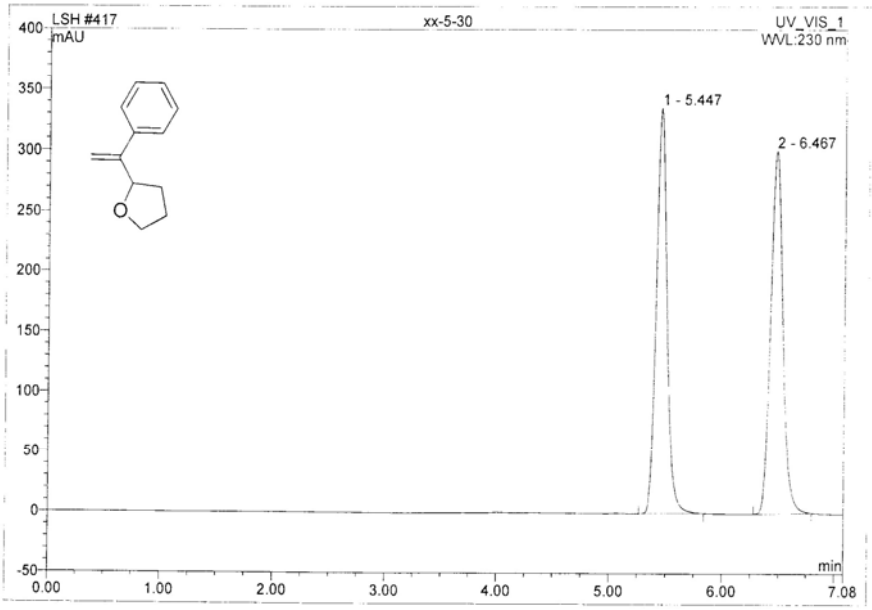

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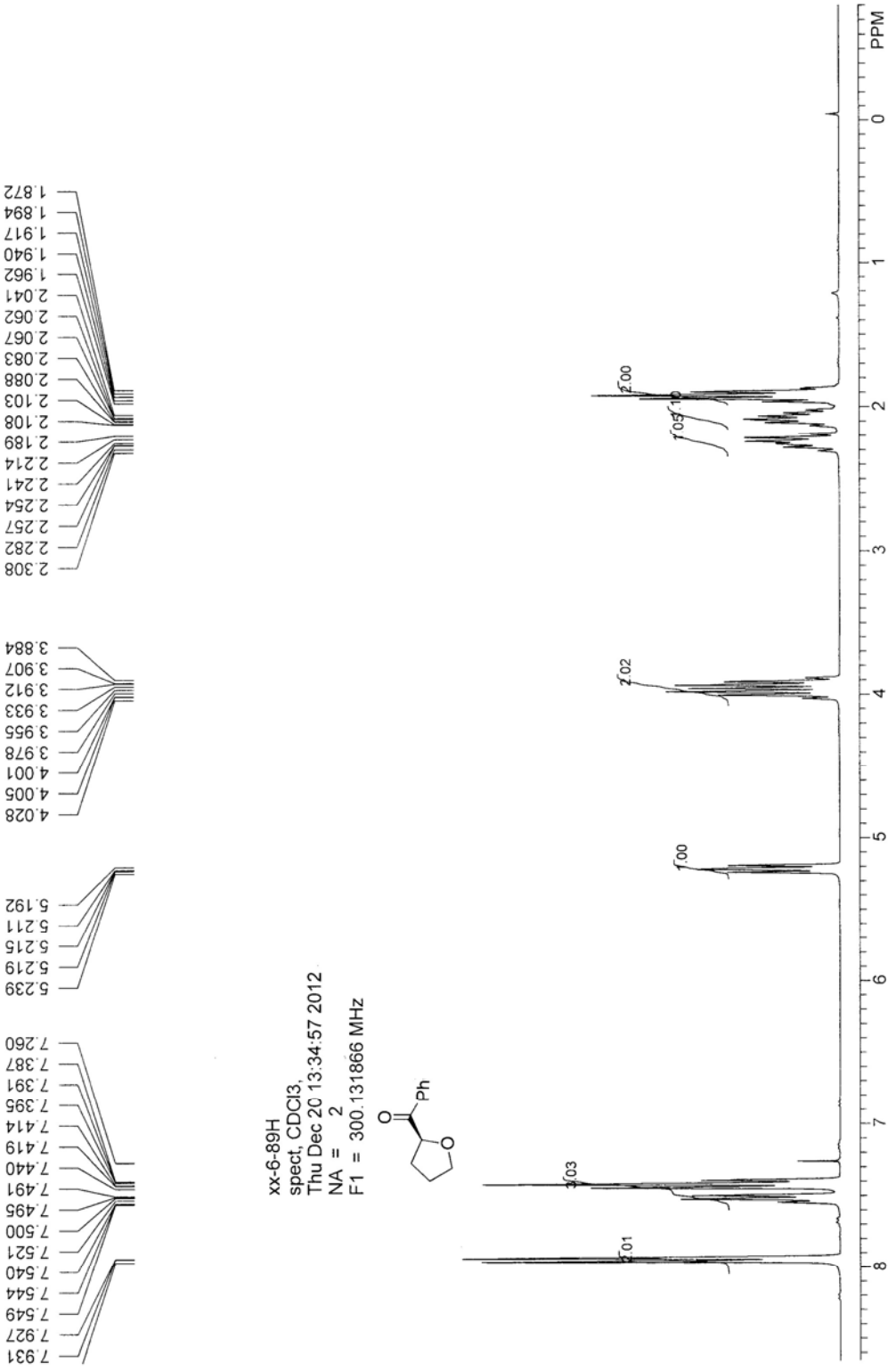
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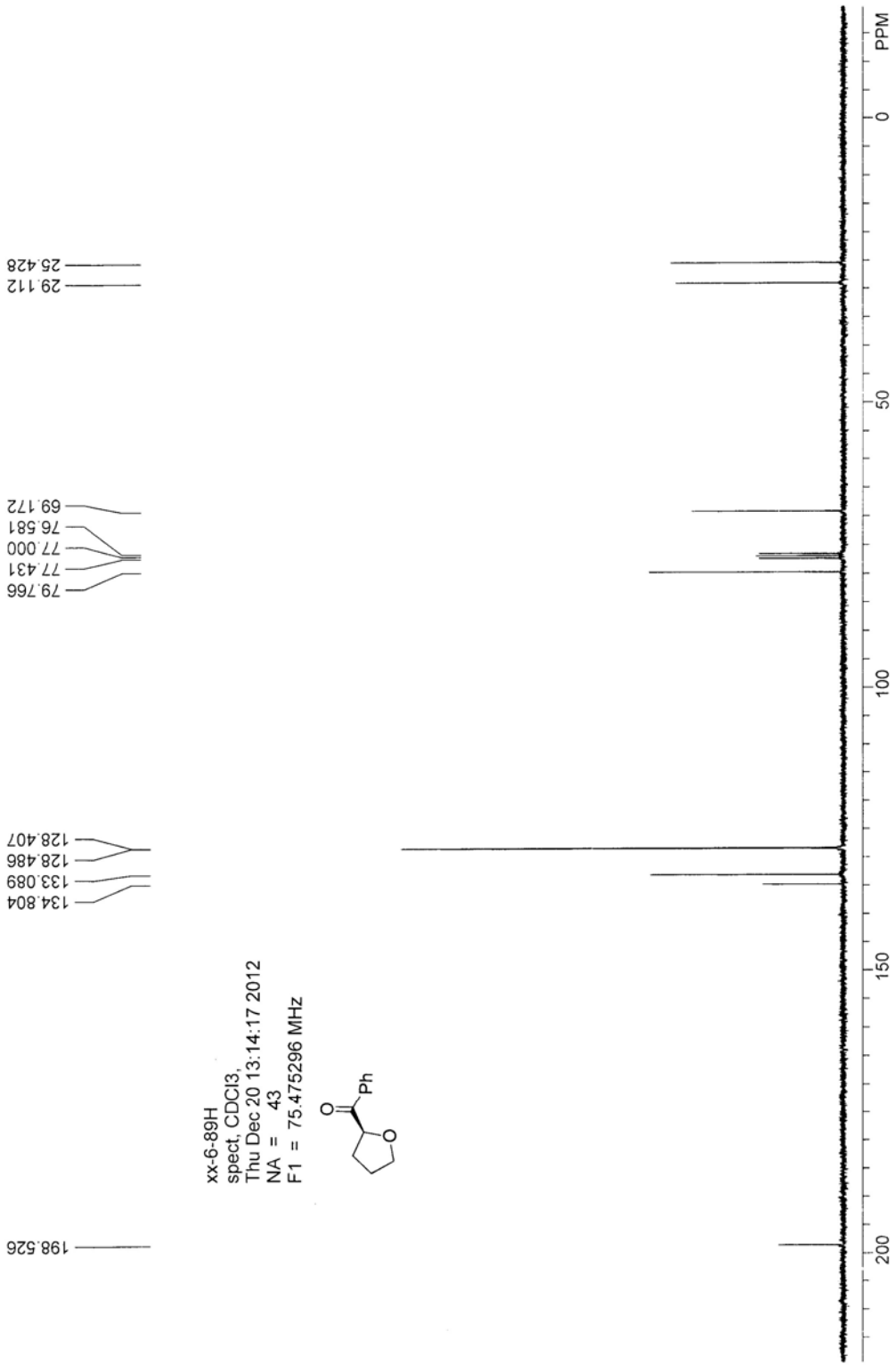
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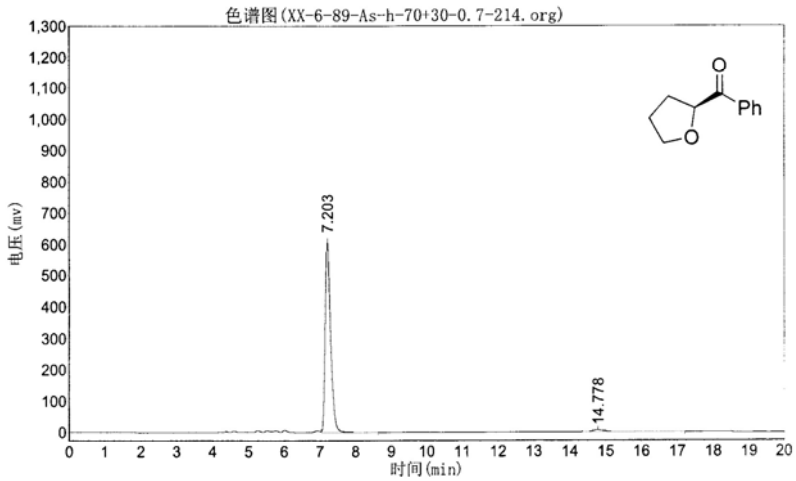
100
150
200

XX-6-89

实验时间：2012-12-25,14:18:02　　报告时间：2012-12-25,14:40:12
谱图文件:F:\slf\xiexi\2012-12-25\XX-6-89\新建文件夹\XX-6-89-As-h-70+30-0.7-214.org

实验内容简介：
As-h　　70:30
214nm　　0.7ml/min



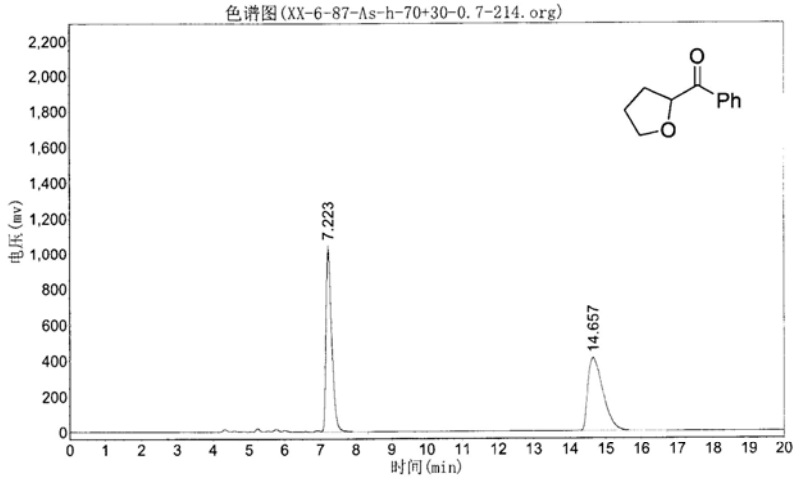
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		7.203	607788.063	6494072.500	97.8424
2		14.778	6294.112	143209.156	2.1576
总计			614082.174	6637281.656	100.0000

XX-6-87

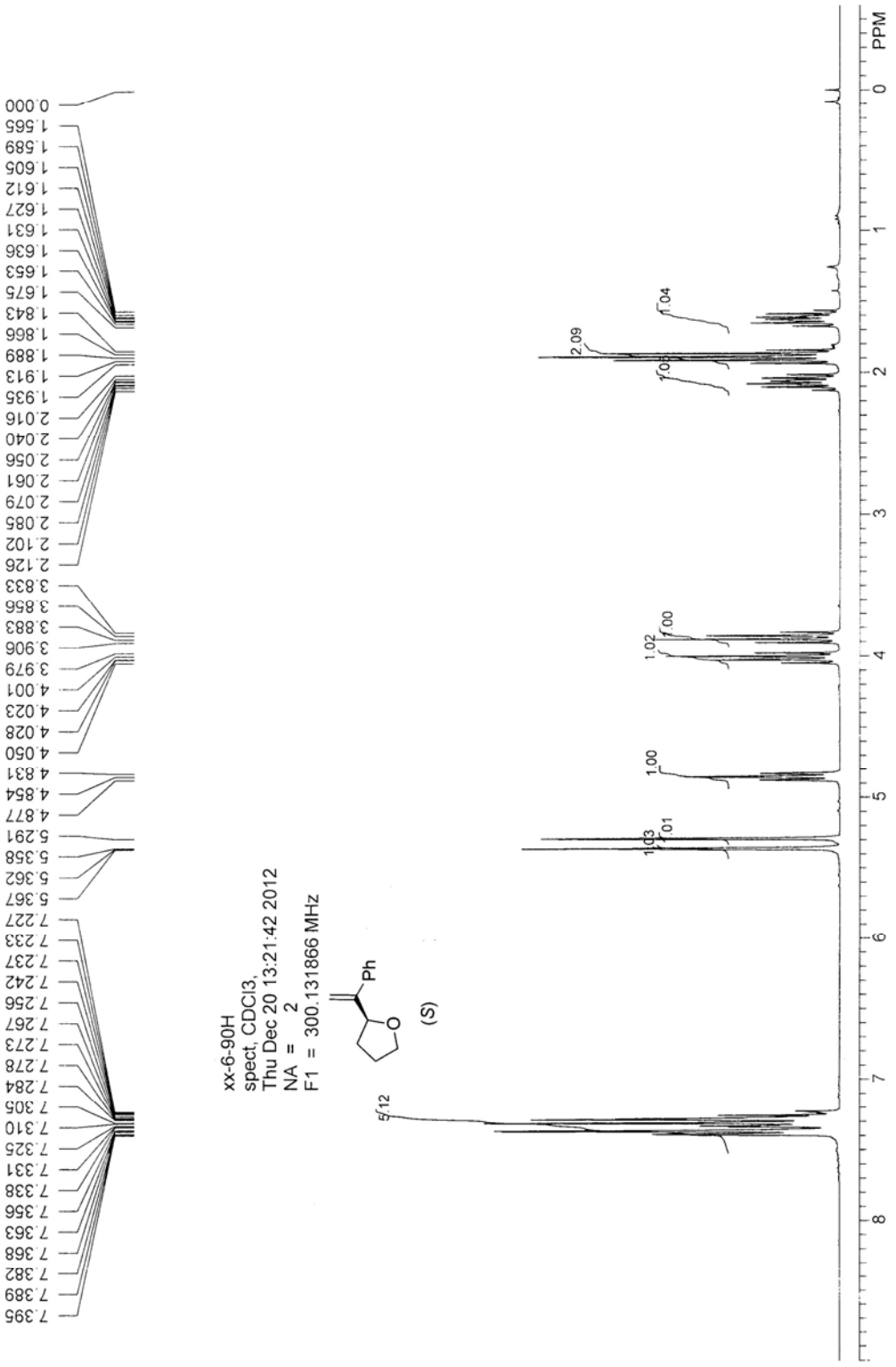
实验时间：2012-12-25, 13:04:08　　报告时间：2012-12-25, 14:19:49
谱图文件:F:\slf\xiexi\2012-12-25\新建文件夹\XX-6-87-As-h-70+30-0.7-214.org

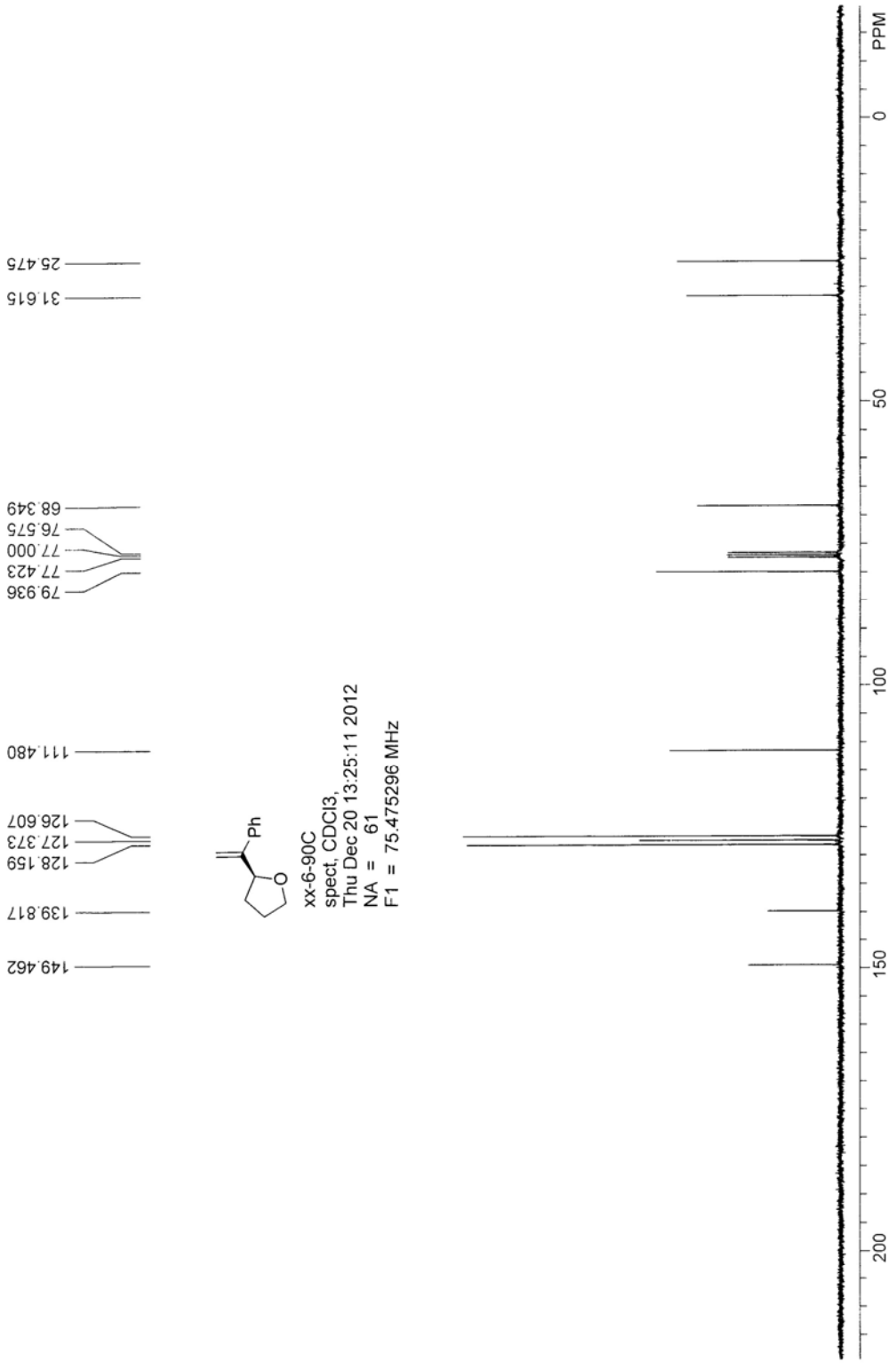
实验内容简介：
As-h　　70:30
214nm　　0.7ml/min



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		7.223	1023824.438	11555903.000	49.1567
2		14.657	409319.656	11952417.000	50.8433
总计			1433144.094	23508320.000	100.0000

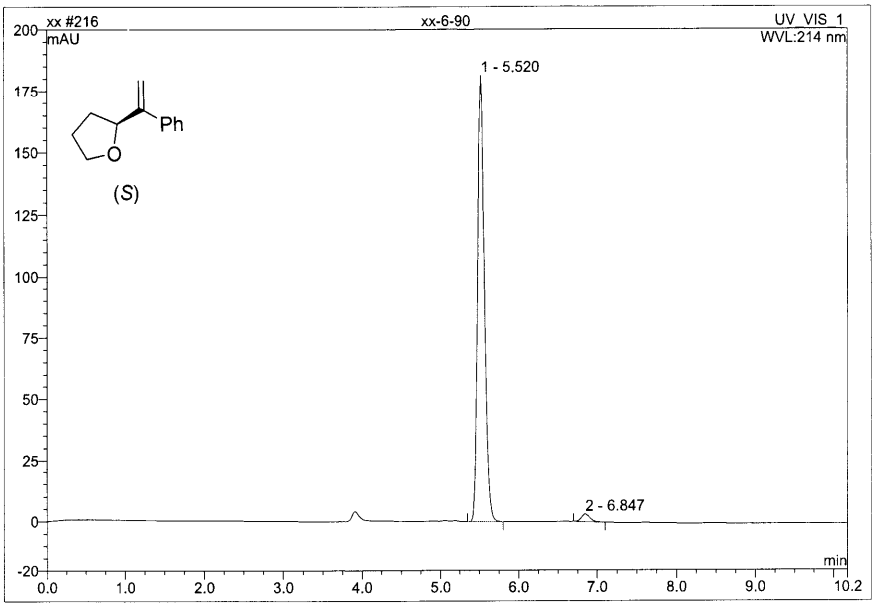

xx-6-90H
spect, CDCl3,
Thu Dec 20 13:21:42 2012
NA = 2
F1 = 300.131866 MHz
Ph
O
(S)
PPM
0.000
1.565
1.589
1.605
1.612
1.627
1.631
1.636
1.653
1.675
1.843
1.866
1.889
1.913
1.935
2.016
2.040
2.056
2.061
2.079
2.085
2.102
2.126
3.833
3.856
3.883
3.906
3.979
4.001
4.023
4.028
4.050
4.831
4.854
4.877
5.291
5.358
5.362
5.367
7.227
7.233
7.237
7.242
7.256
7.267
7.273
7.278
7.284
7.305
7.310
7.325
7.331
7.338
7.356
7.363
7.368
7.382
7.389
7.395
2.09
1.04
1.08
1.02
1.00
1.00
1.03
1.01
5.12


25.475
31.615
68.349
76.575
77.000
77.423
79.936
111.480
126.607
127.373
128.159
139.817
149.462
Ph
O
xx-6-90C
spect, CDCl3,
Thu Dec 20 13:25:11 2012
NA = 61
F1 = 75.475296 MHz
PPM
0
50
100
150
200

216 xx-6-90

AD-H-95-5-0.8-230

Sample Name:	**xx-6-90**	*Injection Volume:*	**20.0**
Vial Number:	**350**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-12-20 9:10**	*Sample Weight:*	**1.0000**
Run Time (min):	**10.18**	*Sample Amount:*	**1.0000**

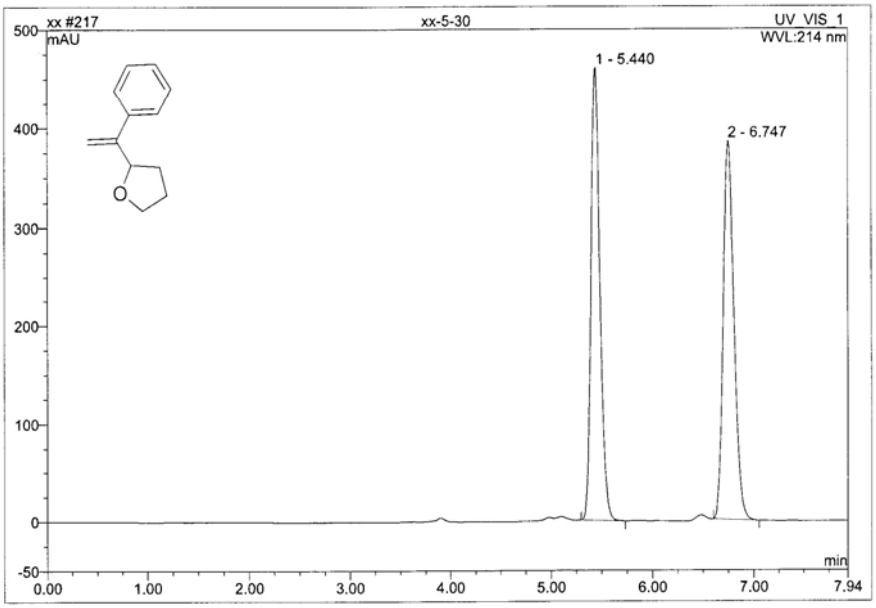


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	5.52	n.a.	181.700	18.336	97.98	n.a.	BMB
2	6.85	n.a.	3.135	0.378	2.02	n.a.	BMB
Total:			184.835	18.714	100.00	0.000	

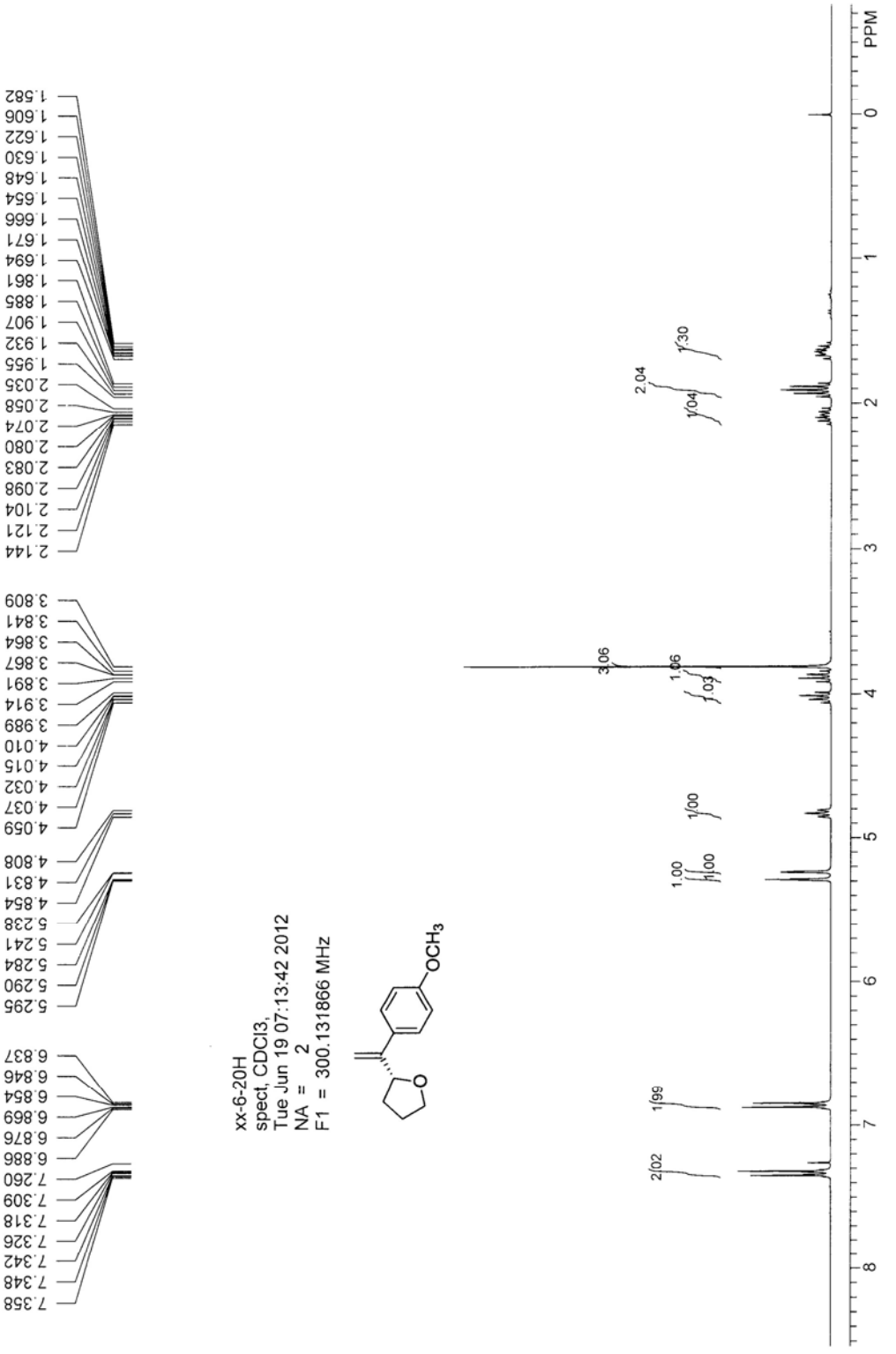
217 xx-5-30

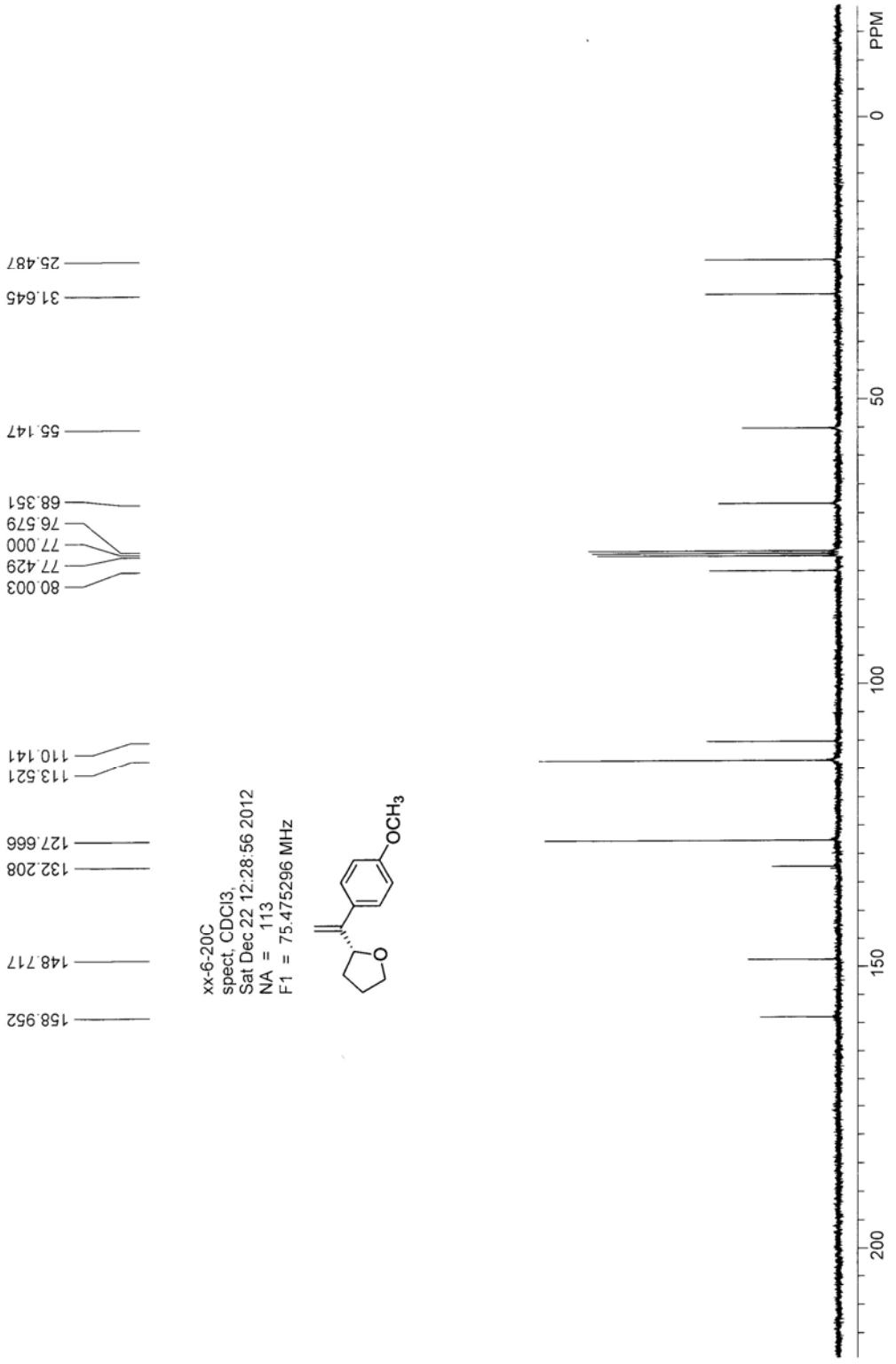
AD-H-95-5-0.8-230

Sample Name:	**xx-5-30**	*Injection Volume:*	**20.0**
Vial Number:	**351**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-12-20 9:21**	*Sample Weight:*	**1.0000**
Run Time (min):	**7.94**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	5.44	n.a.	460.444	47.093	49.94	n.a.	BMB
2	6.75	n.a.	385.432	47.208	50.06	n.a.	BMB
Total:			845.876	94.301	100.00	0.000	


xx-6-20H
spect, CDCl3,
Tue Jun 19 07:13:42 2012
NA = 2
F1 = 300.131866 MHz
OCH3
PPM


25.487
31.645
55.147
68.351
76.579
77.000
77.429
80.003
110.141
113.521
127.666
132.208
148.717
158.952
xx-6-20C
spect, CDCl3,
Sat Dec 22 12:28:56 2012
NA = 113
F1 = 75.475296 MHz
OCH3
O
PPM
0
50
100
150
200

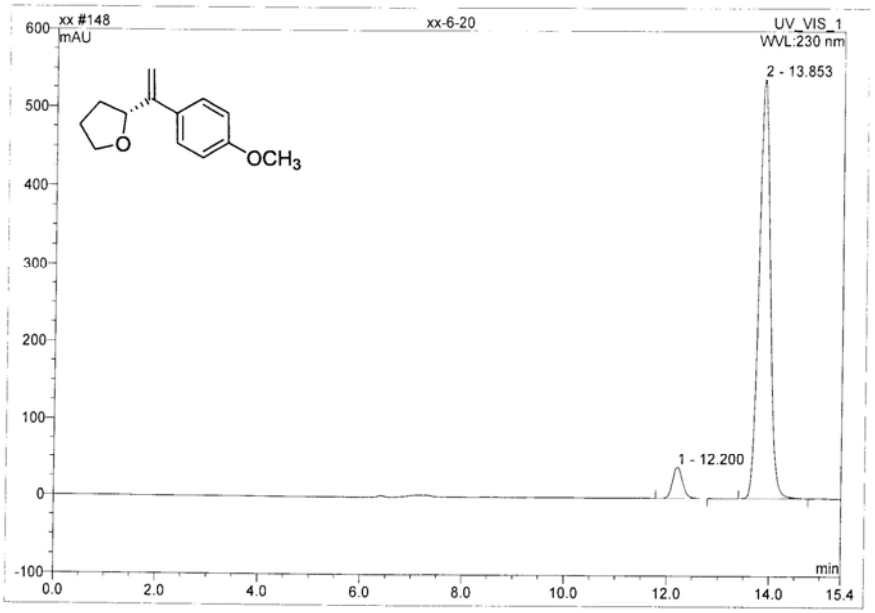
Operator:dell Timebase:U-3000 Sequence:xx

Page 1-1
2012-6-19 8:41 上午

148 xx-6-20

AD-H-95-5-0.5-230

Sample Name:	**xx-6-20**	*Injection Volume:*	**20.0**
Vial Number:	**282**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-6-18 23:28**	*Sample Weight:*	**1.0000**
Run Time (min):	**15.41**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	12.20	n.a.	40.454	9.025	6.20	n.a.	BMB
2	13.85	n.a.	539.533	136.533	93.80	n.a.	BMB
Total:			579.987	145.558	100.00	0.000	

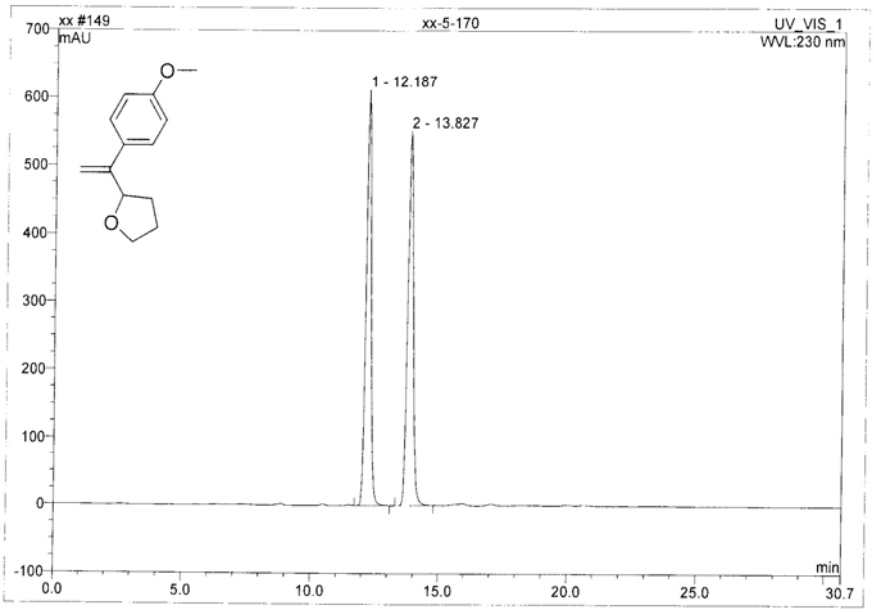
default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)

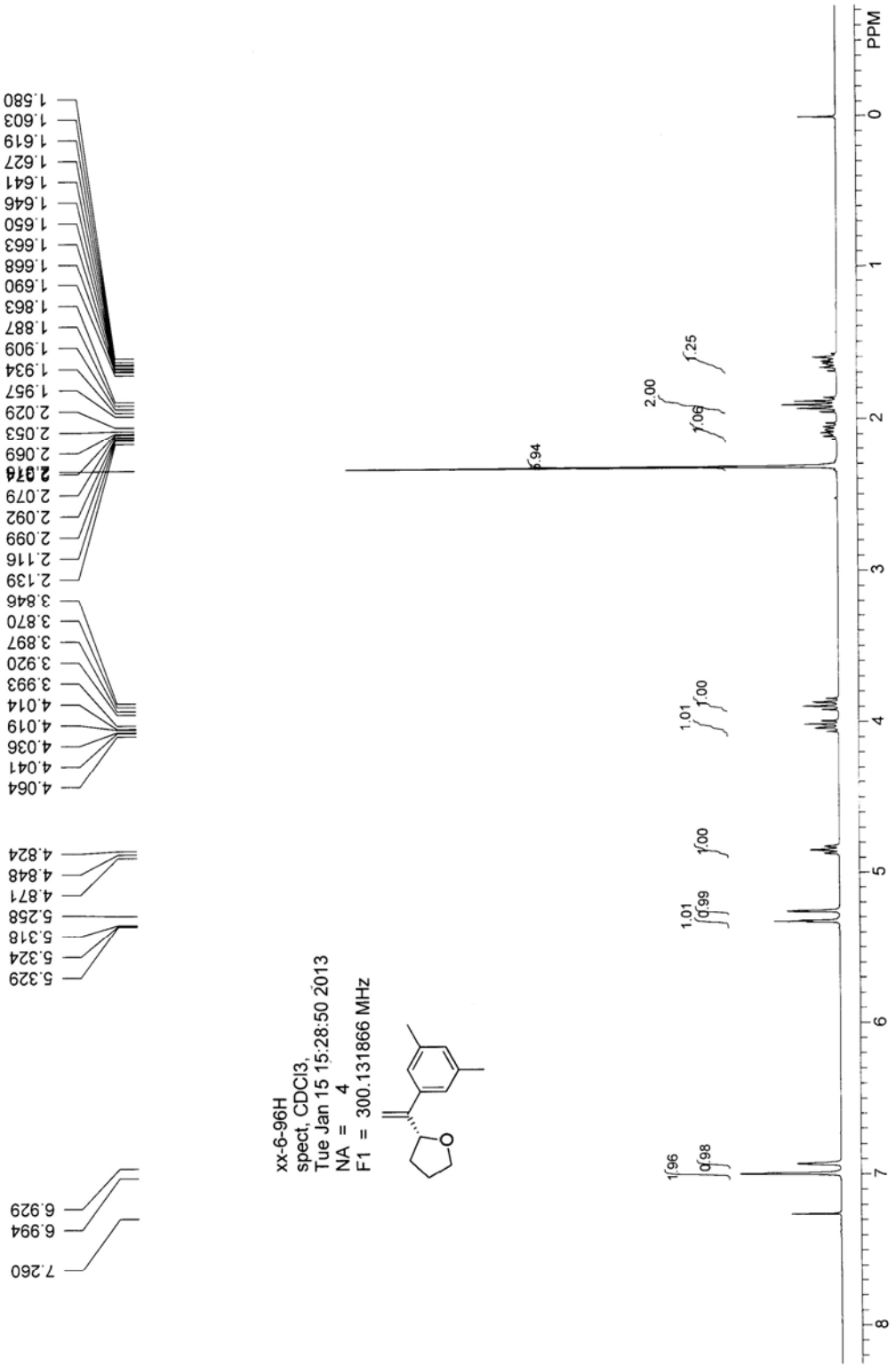
149 xx-5-170

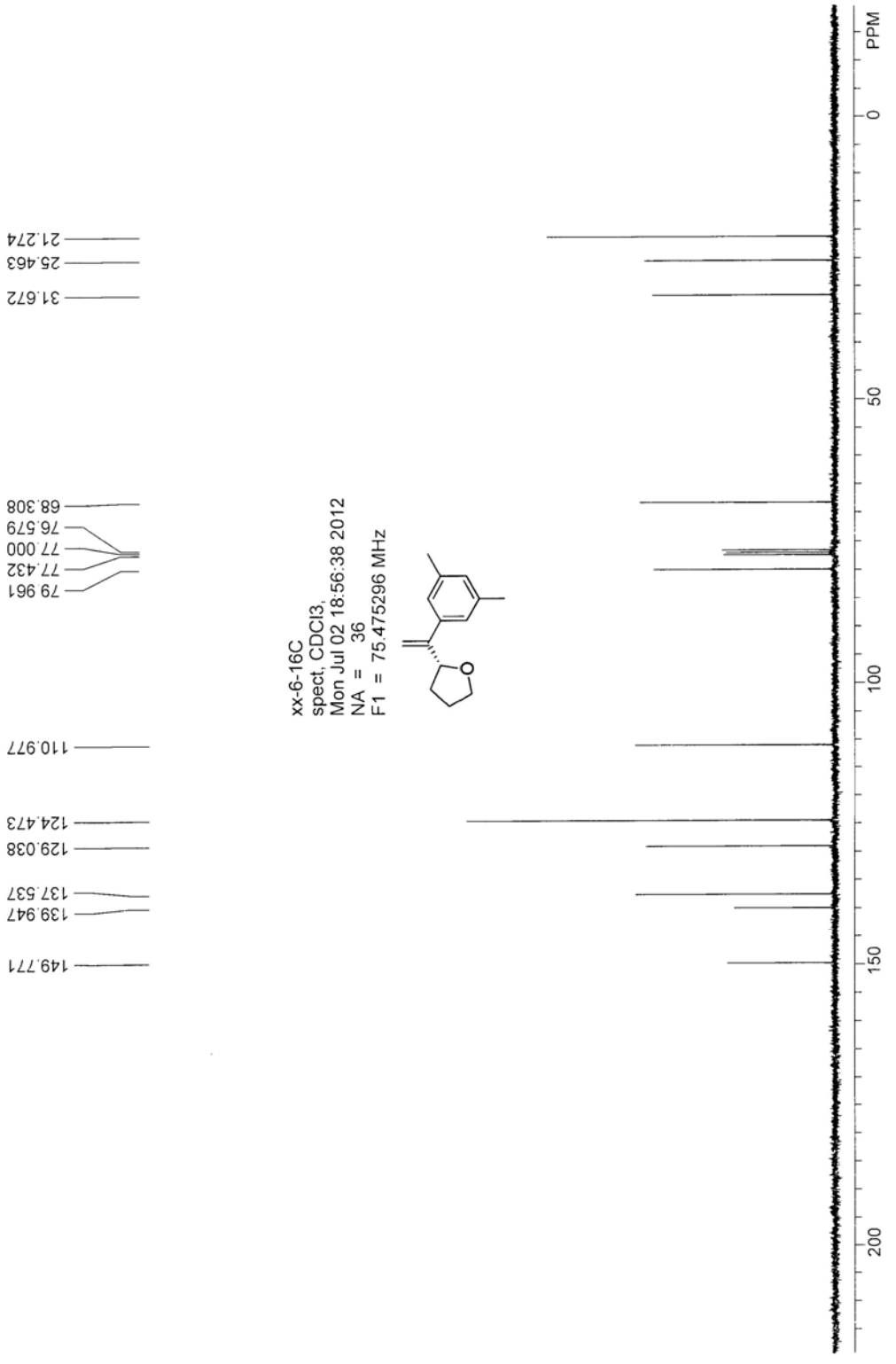
AD-H-95-5-0.5-230

Sample Name:	**xx-5-170**	*Injection Volume:*	**20.0**
Vial Number:	**283**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-6-18 23:44**	*Sample Weight:*	**1.0000**
Run Time (min):	**30.66**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	12.19	n.a.	613.214	139.691	49.80	n.a.	BMB
2	13.83	n.a.	552.193	140.787	50.20	n.a.	BMB
Total:			1165.407	280.478	100.00	0.000	

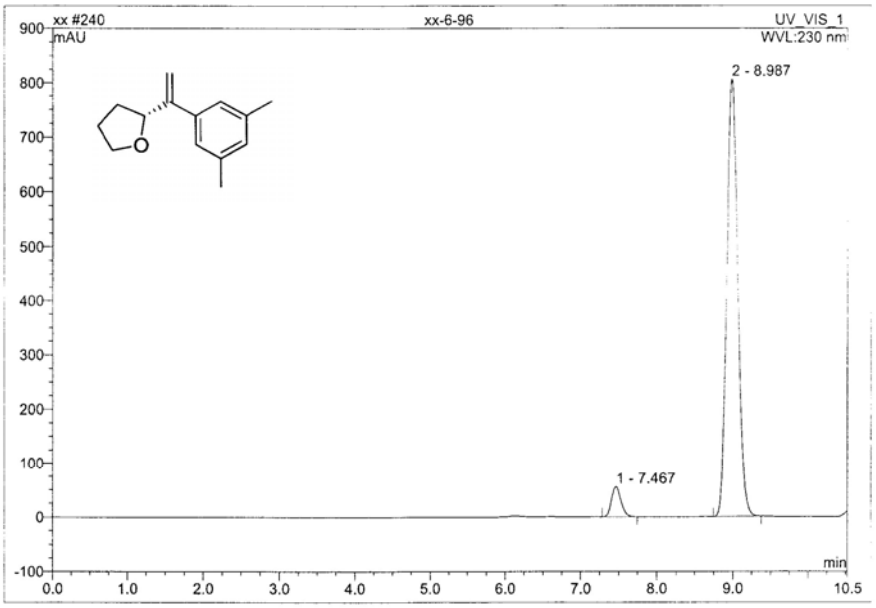

xx-6-96H
spect, CDCl3,
Tue Jan 15 15:28:50 2013
NA = 4
F1 = 300.131866 MHz
PPM
7.260
6.994
6.929
5.329
5.324
5.318
5.258
4.871
4.848
4.824
4.064
4.041
4.036
4.019
4.014
3.993
3.920
3.897
3.870
3.846
2.139
2.116
2.099
2.092
2.079
2.074
2.069
2.053
2.029
1.957
1.934
1.909
1.887
1.863
1.690
1.668
1.663
1.650
1.646
1.641
1.627
1.619
1.603
1.580
6.94
2.00
1.06
1.25
1.01
1.00
1.01
0.99
1.00
1.96
0.98


21.274
25.463
31.672
68.308
76.579
77.000
77.432
79.961
110.977
124.473
129.038
137.537
139.947
149.771
xx-6-16C
spect, CDCl3,
Mon Jul 02 18:56:38 2012
NA = 36
F1 = 75.475296 MHz
O
PPM
0
50
100
150
200

240 xx-6-96

AD-H-95-5-0.5-230

Sample Name:	**xx-6-96**	*Injection Volume:*	**20.0**
Vial Number:	**374**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-14 21:00**	*Sample Weight:*	**1.0000**
Run Time (min):	**10.53**	*Sample Amount:*	**1.0000**

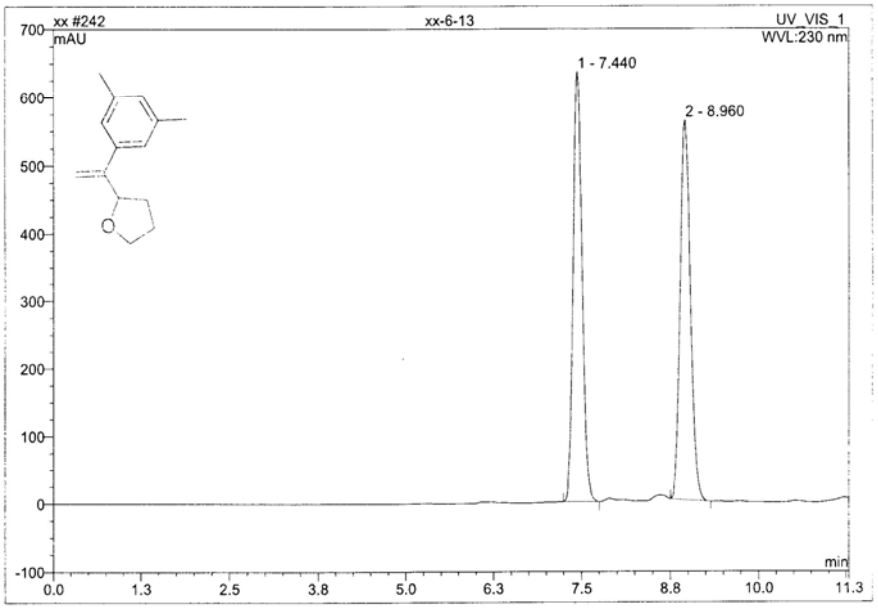


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.47	n.a.	55.294	7.821	5.49	n.a.	BMB
2	8.99	n.a.	806.216	134.644	94.51	n.a.	BMB
Total:			861.510	142.465	100.00	0.000	

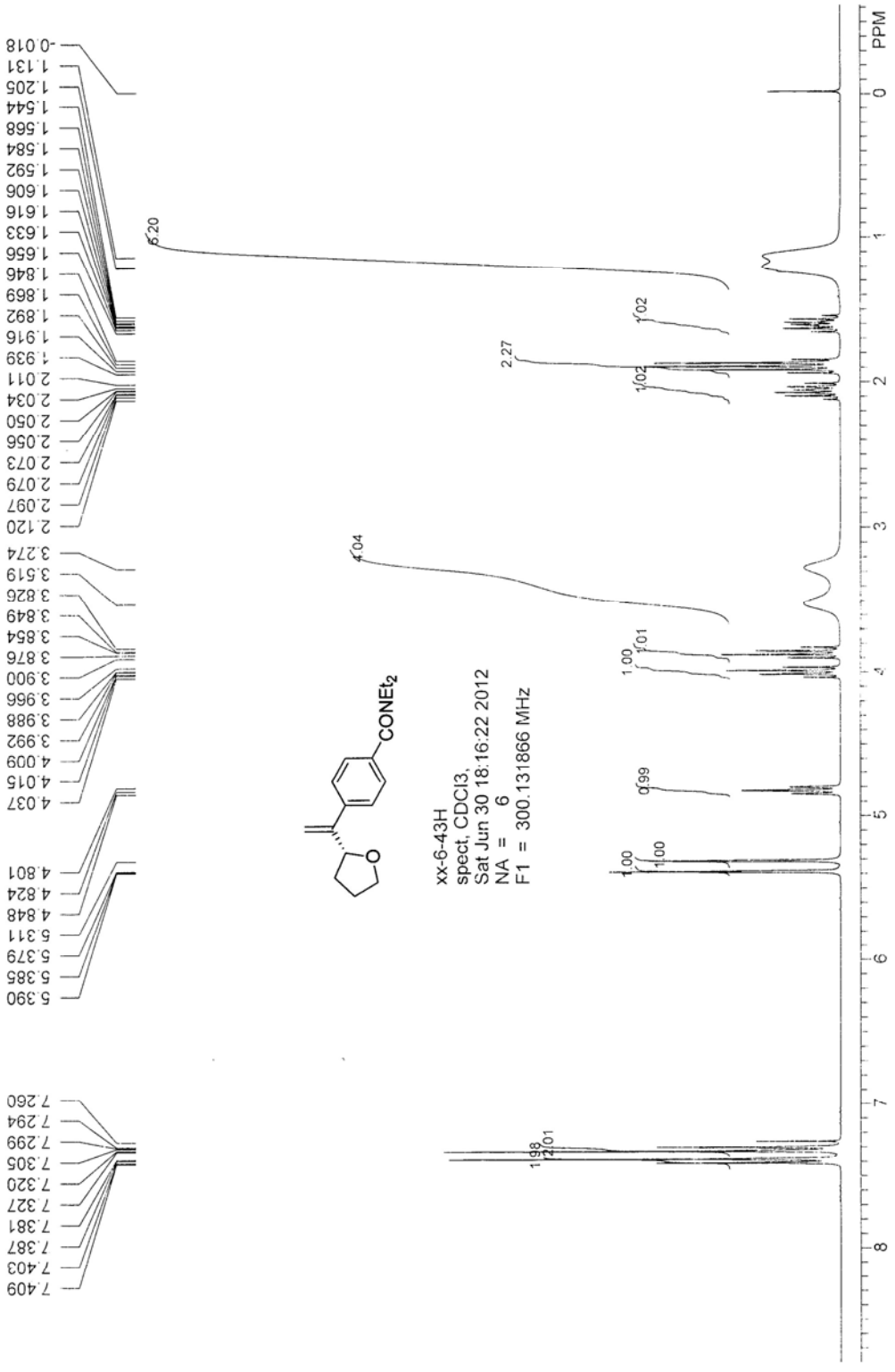
242 xx-6-13

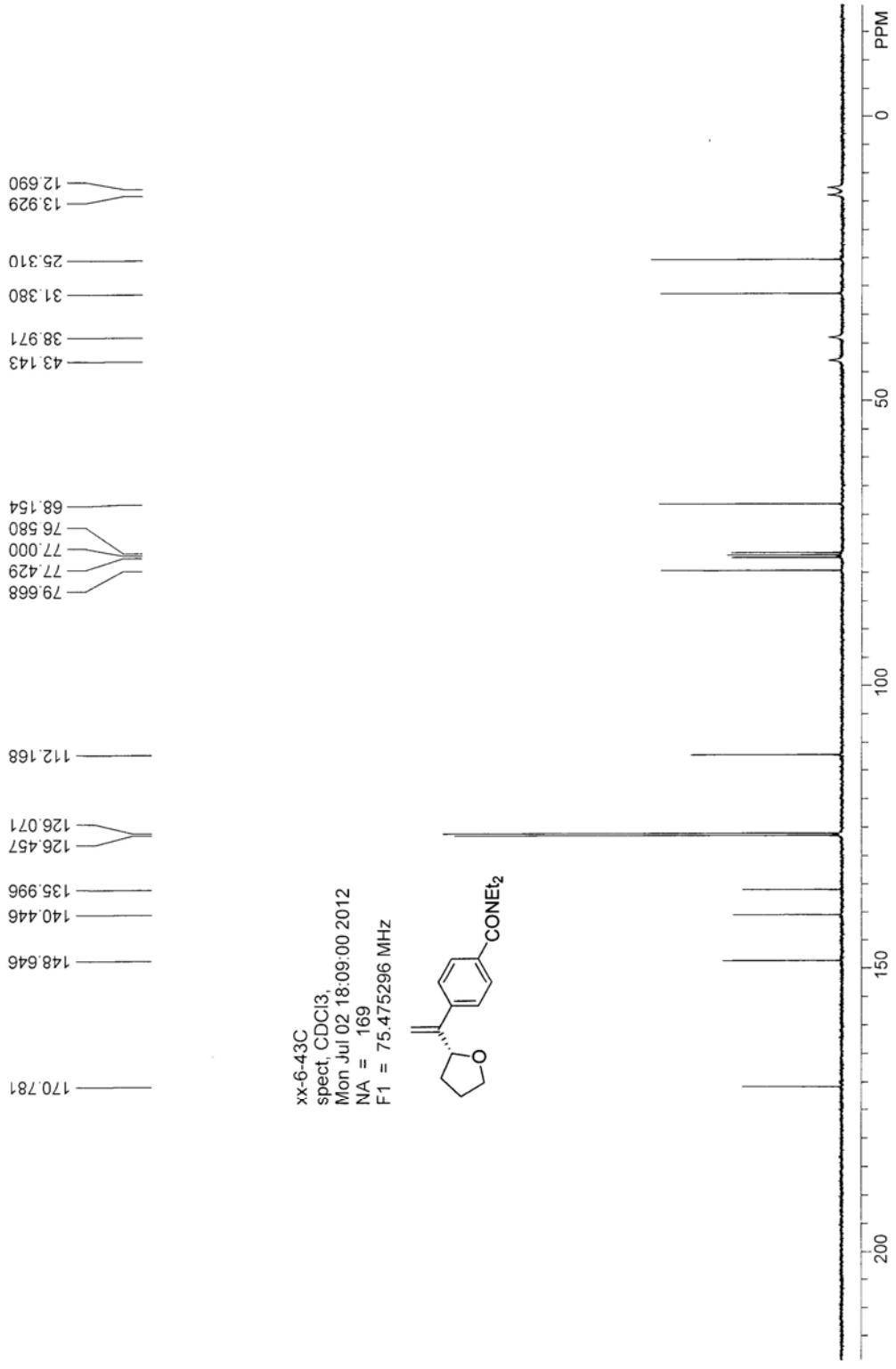
AD-H-95-5-0.5-230

Sample Name:	**xx-6-13**	*Injection Volume:*	**20.0**
Vial Number:	**376**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-14 21:26**	*Sample Weight:*	**1.0000**
Run Time (min):	**11.29**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.44	n.a.	635.382	92.898	49.51	n.a.	BMB
2	8.96	n.a.	561.231	94.738	50.49	n.a.	BMB
Total:			1196.614	187.636	100.00	0.000	

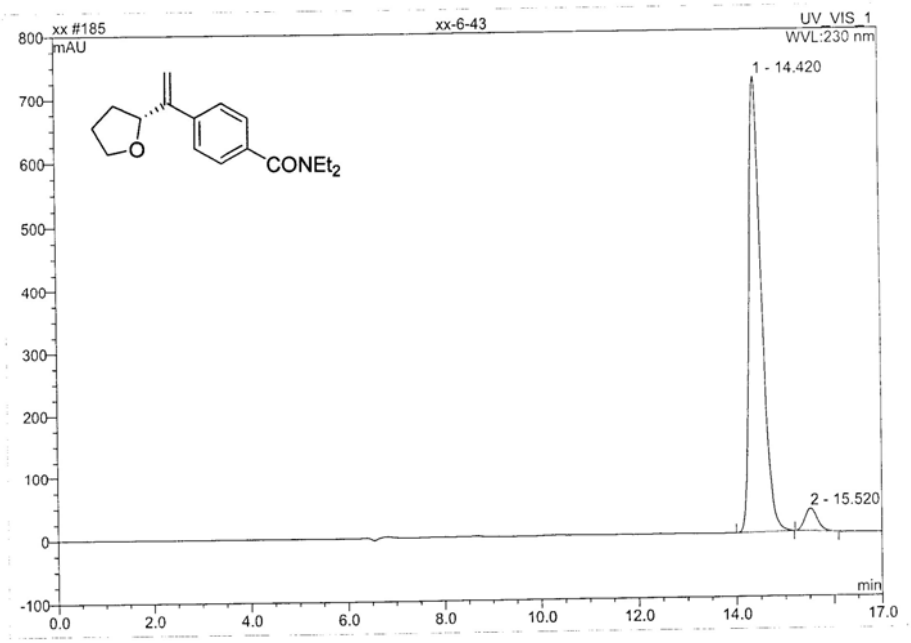

-0.018
1.131
1.205
1.544
1.568
1.584
1.592
1.606
1.616
1.633
1.656
1.846
1.869
1.892
1.916
1.939
2.011
2.034
2.050
2.056
2.073
2.079
2.097
2.120
3.274
3.519
3.826
3.849
3.854
3.876
3.900
3.966
3.988
3.992
4.009
4.015
4.037
4.801
4.824
4.848
5.311
5.379
5.385
5.390
7.260
7.294
7.299
7.305
7.320
7.327
7.381
7.387
7.403
7.409
6.20
4.04
2.27
1.02
1.02
1.00
1.01
0.99
1.00
1.00
1.98
2.01
CONEt2
O
xx-6-43H
spect, CDCl3,
Sat Jun 30 18:16:22 2012
NA = 6
F1 = 300.131866 MHz
PPM
0
1
2
3
4
5
6
7
8


12.690
13.929
25.310
31.380
38.971
43.143
68.154
76.580
77.000
77.429
79.668
112.168
126.071
126.457
135.996
140.446
148.646
170.781
xx-6-43C
spect, CDCl3,
Mon Jul 02 18:09:00 2012
NA = 169
F1 = 75.475296 MHz
CONEt2
O
PPM
0
50
100
150
200

185 xx-6-43

OJ-H-90-10-0.5-230

Sample Name:	**xx-6-43**	*Injection Volume:*	**20.0**
Vial Number:	**319**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-7-1 19:07**	*Sample Weight:*	**1.0000**
Run Time (min):	**16.99**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	14.42	n.a.	723.462	211.462	95.24	n.a.	BMB
2	15.52	n.a.	35.527	10.557	4.76	n.a.	BMB
Total:			758.989	222.019	100.00	0.000	

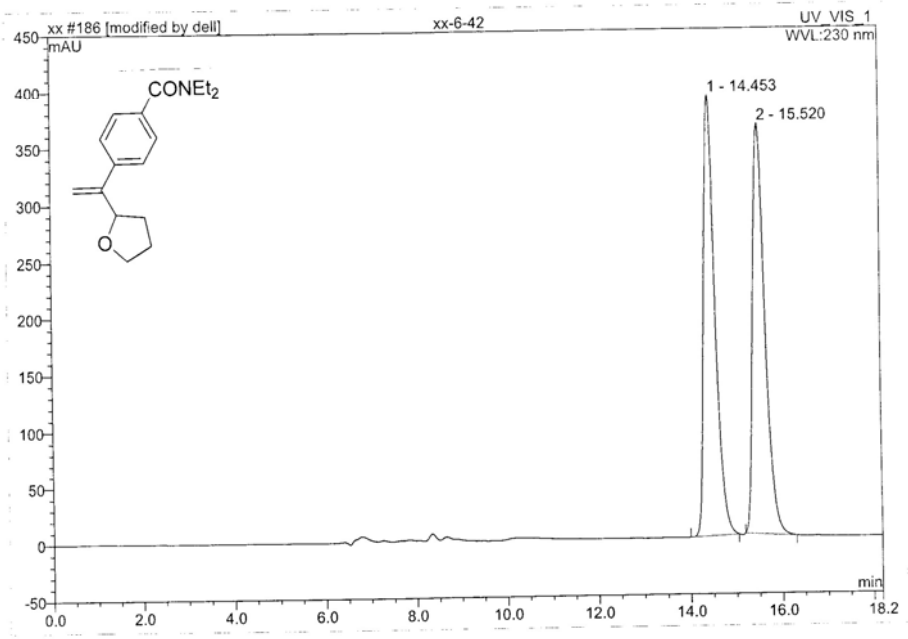
Operator:dell Timebase:U-3000 Sequence:xx

2012-7-1 8:47 下午

186 xx-6-42

OJ-H-90-10-0.5-230

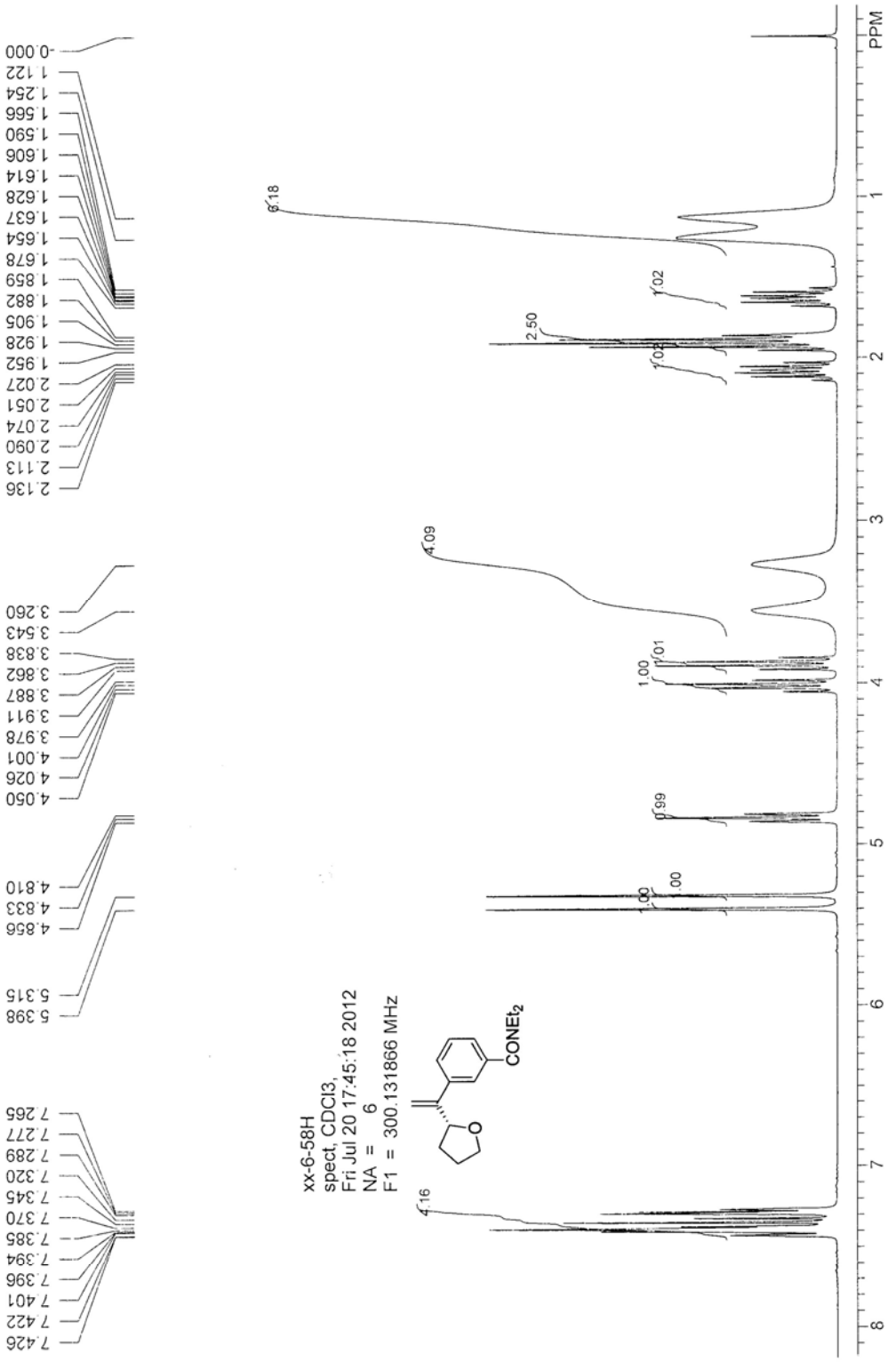
Sample Name:	**xx-6-42**	*Injection Volume:*	**20.0**
Vial Number:	**320**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-7-1 19:24**	*Sample Weight:*	**1.0000**
Run Time (min):	**18.19**	*Sample Amount:*	**1.0000**

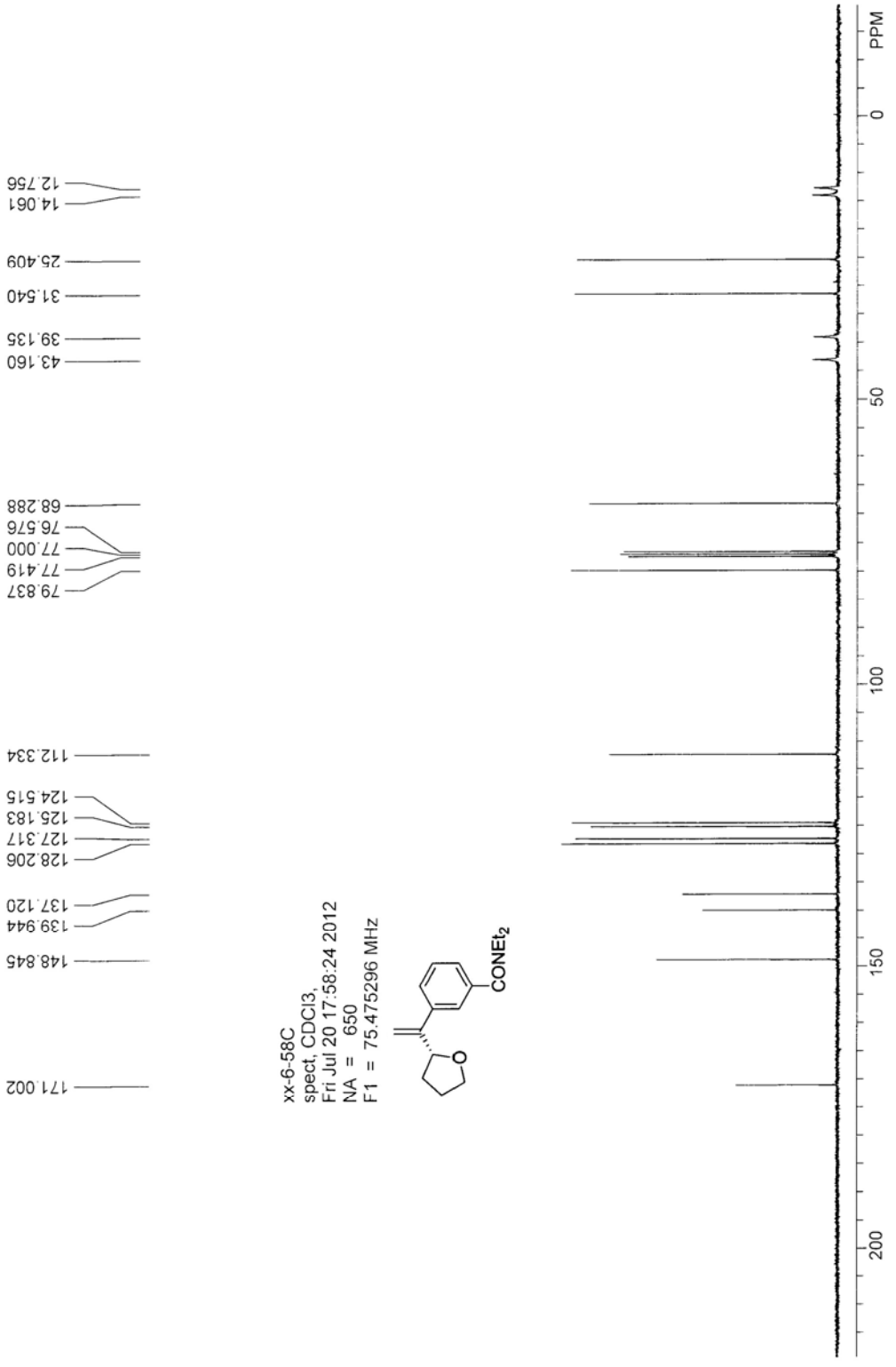


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	14.45	n.a.	389.630	112.154	50.12	n.a.	BMB*
2	15.52	n.a.	362.201	111.598	49.88	n.a.	BMB*
Total:			751.831	223.752	100.00	0.000	

default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)

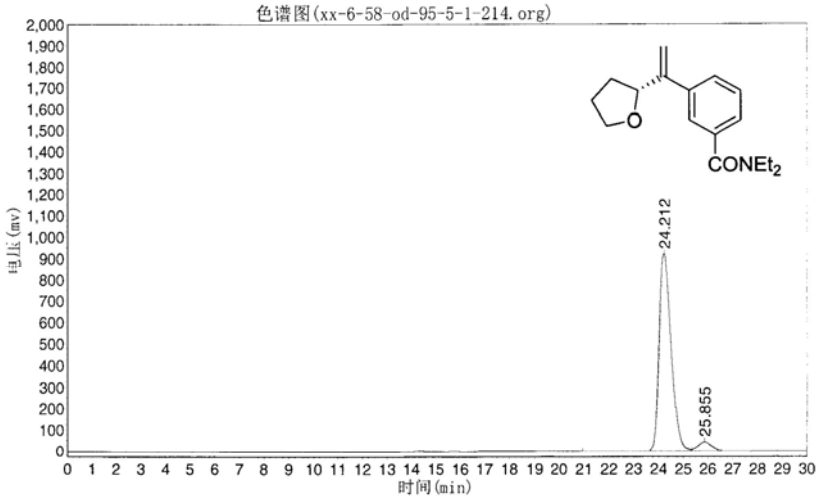

xx-6-58H
spect, CDCl3,
Fri Jul 20 17:45:18 2012
NA = 6
F1 = 300.131866 MHz
CONEt2
PPM


12.756
14.061
25.409
31.540
39.135
43.160
68.288
76.576
77.000
77.419
79.837
112.334
124.515
125.183
127.317
128.206
137.120
139.944
148.845
171.002
xx-6-58C
spect, CDCl3,
Fri Jul 20 17:58:24 2012
NA = 650
F1 = 75.475296 MHz
CONEt2
PPM
0
50
100
150
200

xx-6-58-od-h-95-5-1-214

实验时间：2012/7/17,13:18:23　　报告时间：2012/7/17,15:07:55
谱图文件:D:\zhuguangjiong\xx\20120717\xx-6-58-od-95-5-1-214.org

实验内容简介：
od-h　95/5
1ml/min 214nm



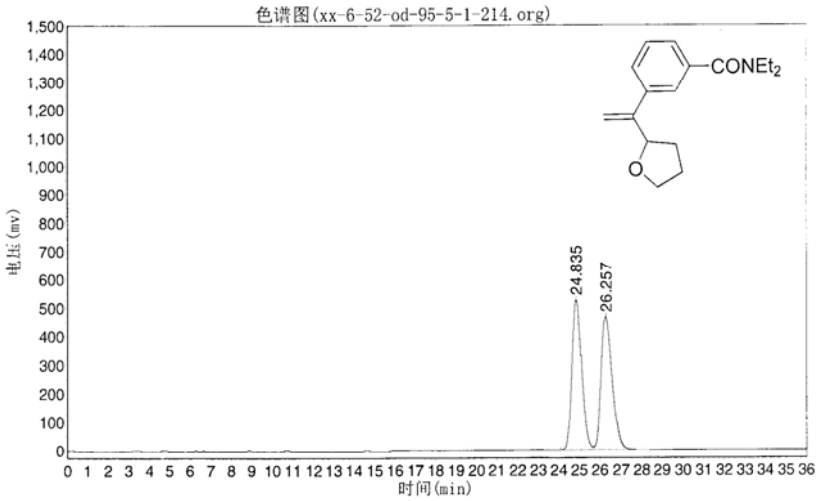
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		24.212	919309.313	30821372.000	95.4200
2		25.855	40718.965	1479367.375	4.5800
总计			960028.277	32300739.375	100.0000

xx-6-52-od-h-95-5-1-214

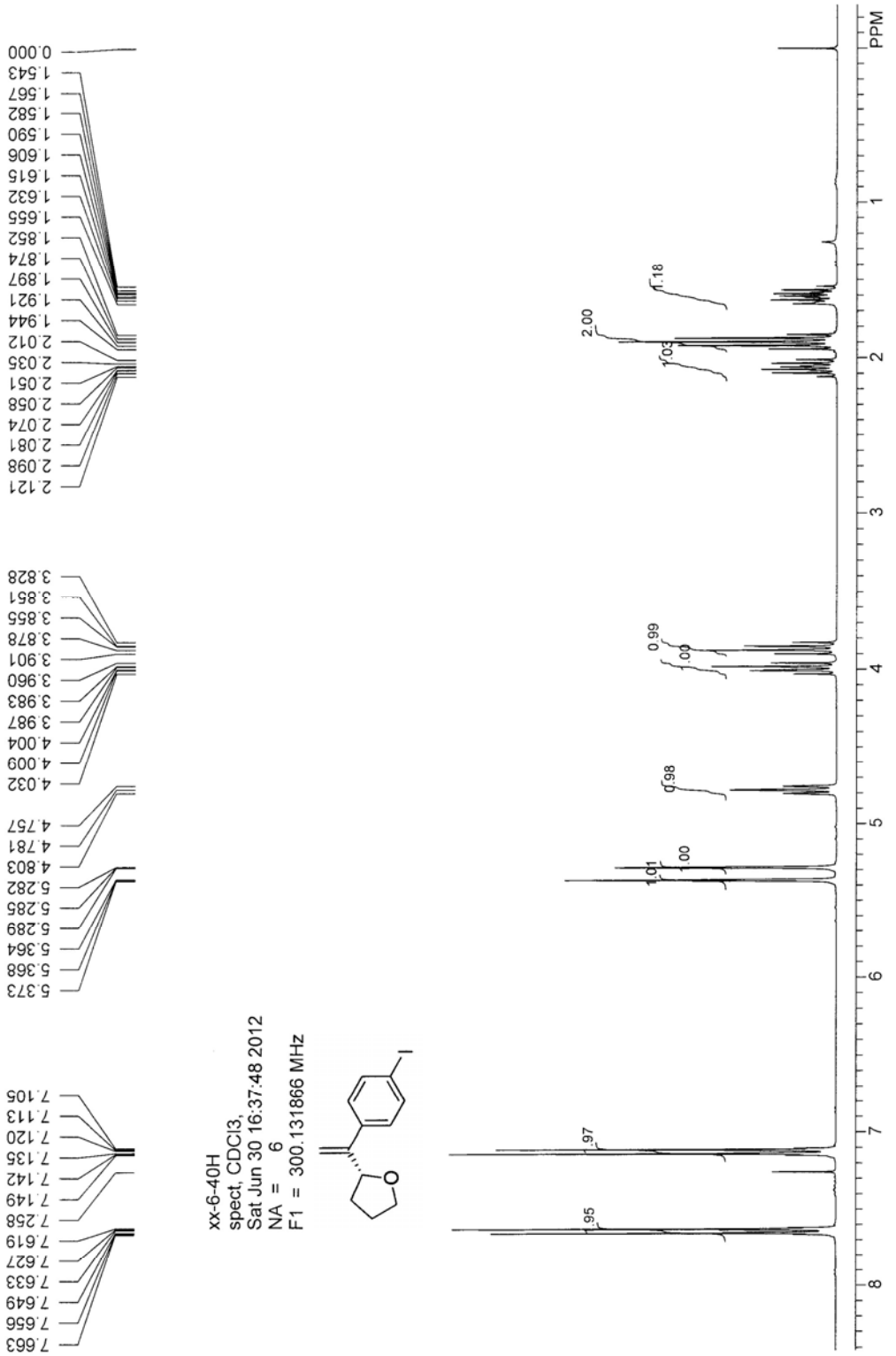
实验时间：2012/7/17,12:32:03　　报告时间：2012/7/17,15:06:39
谱图文件:D:\zhuguangjiong\xx\20120717\xx-6-52-od-95-5-1-214.org

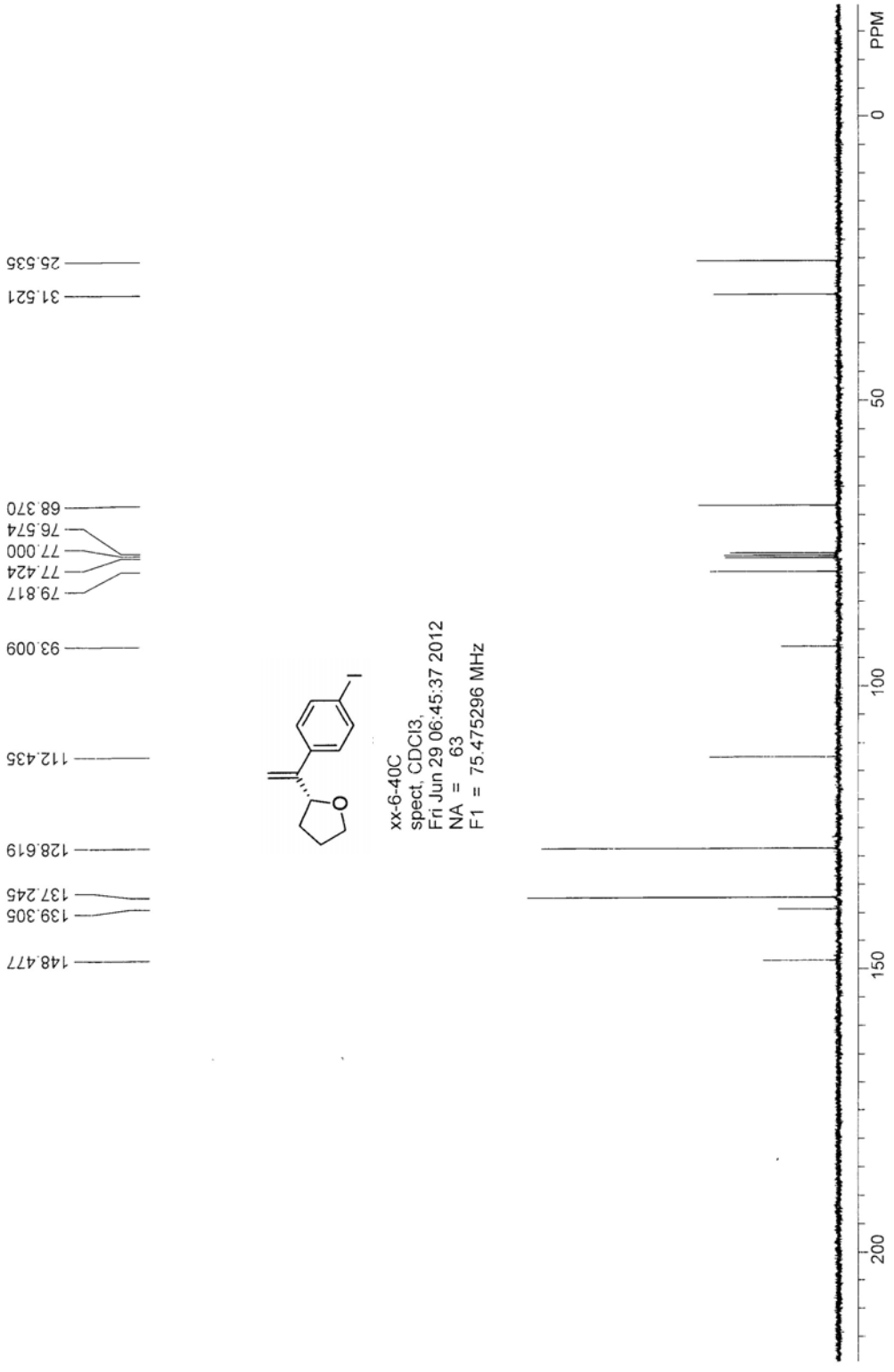
实验内容简介：
od-h　95/5
1ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		24.835	528172.000	17470038.000	49.9039
2		26.257	466627.875	17537294.000	50.0961
总计			994799.875	35007332.000	100.0000

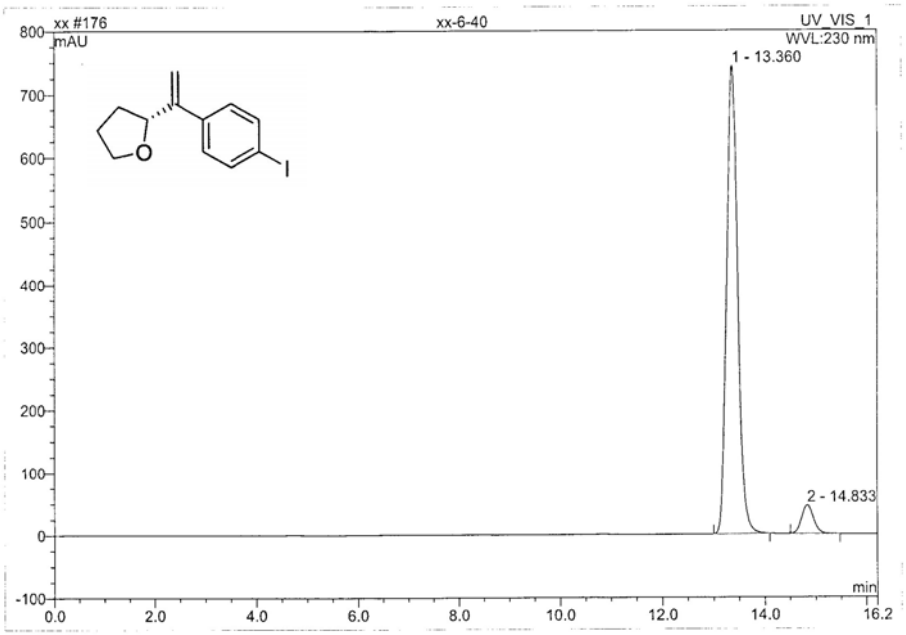

xx-6-40H
spect, CDCl3,
Sat Jun 30 16:37:48 2012
NA = 6
F1 = 300.131866 MHz
I
O
PPM
0.000
1.543
1.567
1.582
1.590
1.606
1.615
1.632
1.655
1.852
1.874
1.897
1.921
1.944
2.012
2.035
2.051
2.058
2.074
2.081
2.098
2.121
3.828
3.851
3.855
3.878
3.901
3.960
3.983
3.987
4.004
4.009
4.032
4.757
4.781
4.803
5.282
5.285
5.289
5.364
5.368
5.373
7.105
7.113
7.120
7.135
7.142
7.149
7.258
7.619
7.627
7.633
7.649
7.656
7.663
2.00
1.18
1.03
0.99
1.00
0.98
1.01
1.00
.97
.95


25.535
31.521
68.370
76.574
77.000
77.424
79.817
93.009
112.435
128.619
137.245
139.305
148.477
xx-6-40C
spect, CDCl3,
Fri Jun 29 06:45:37 2012
NA = 63
F1 = 75.475296 MHz
PPM
0
50
100
150
200

176 xx-6-40

OJ-H-98-2-0.5-230

Sample Name:	**xx-6-40**	*Injection Volume:*	**20.0**
Vial Number:	**310**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-6-30 19:45**	*Sample Weight:*	**1.0000**
Run Time (min):	**16.21**	*Sample Amount:*	**1.0000**

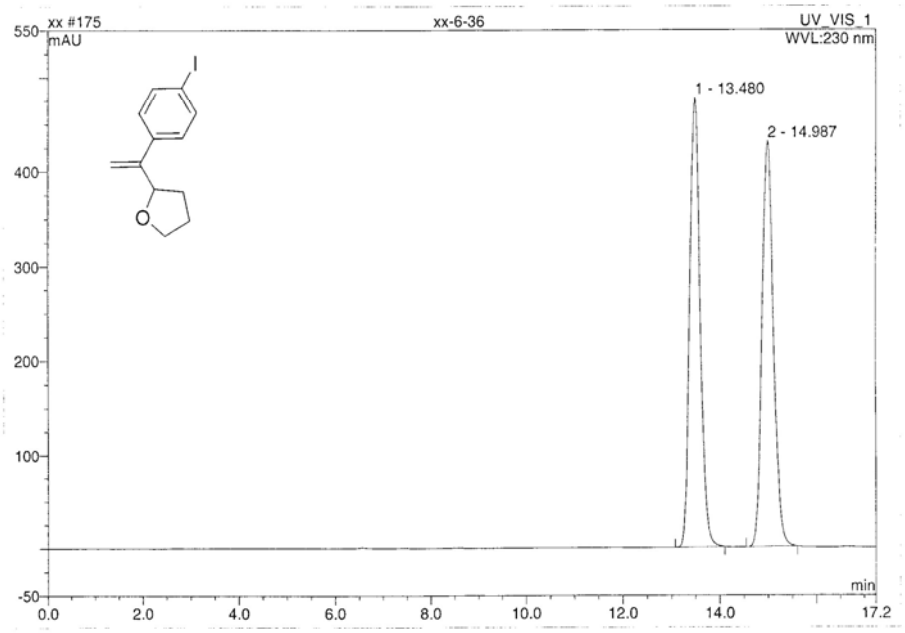


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	13.36	n.a.	742.529	186.322	93.90	n.a.	BMB
2	14.83	n.a.	45.100	12.098	6.10	n.a.	BMB
Total:			787.629	198.421	100.00	0.000	

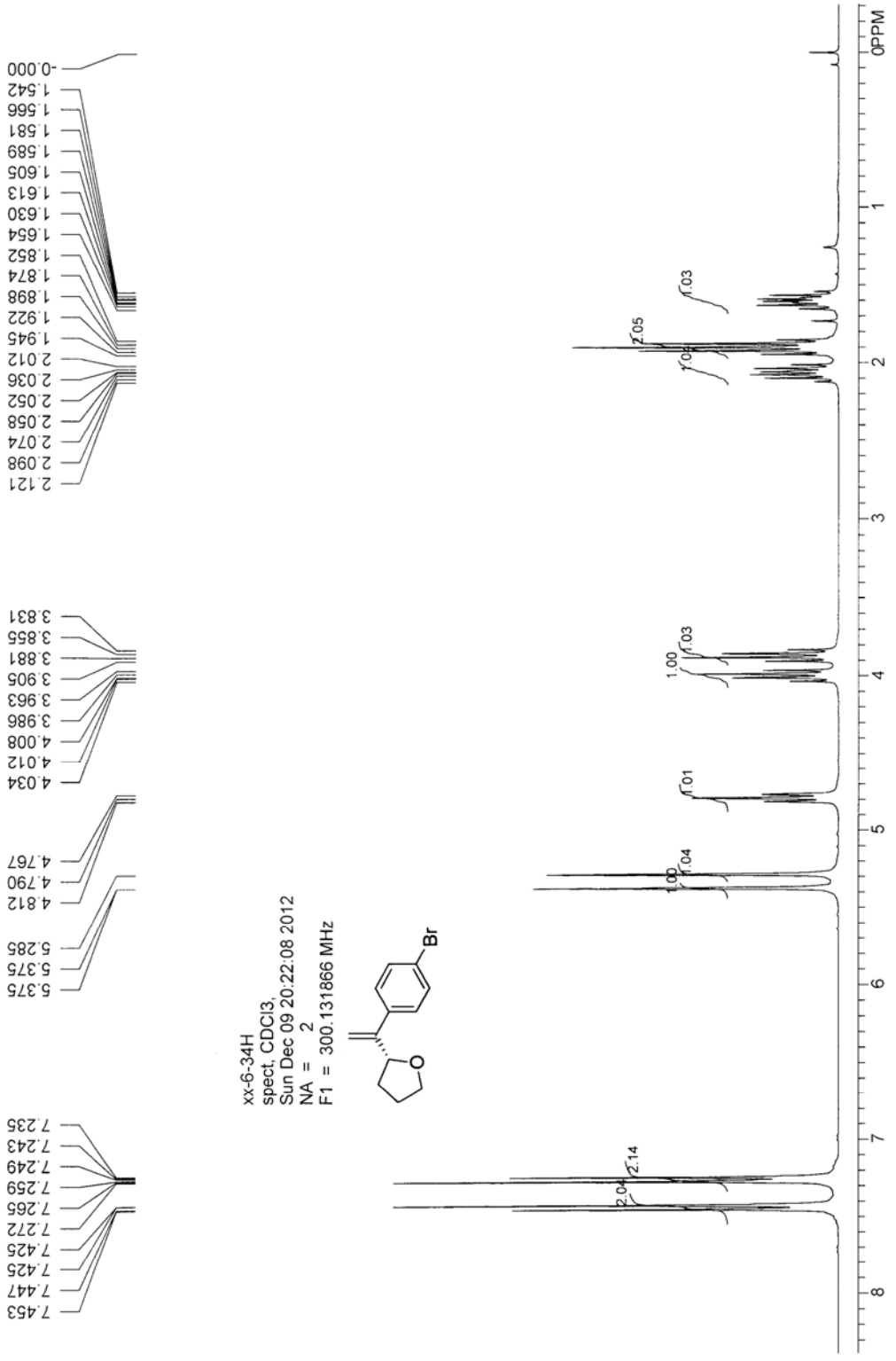
175 xx-6-36

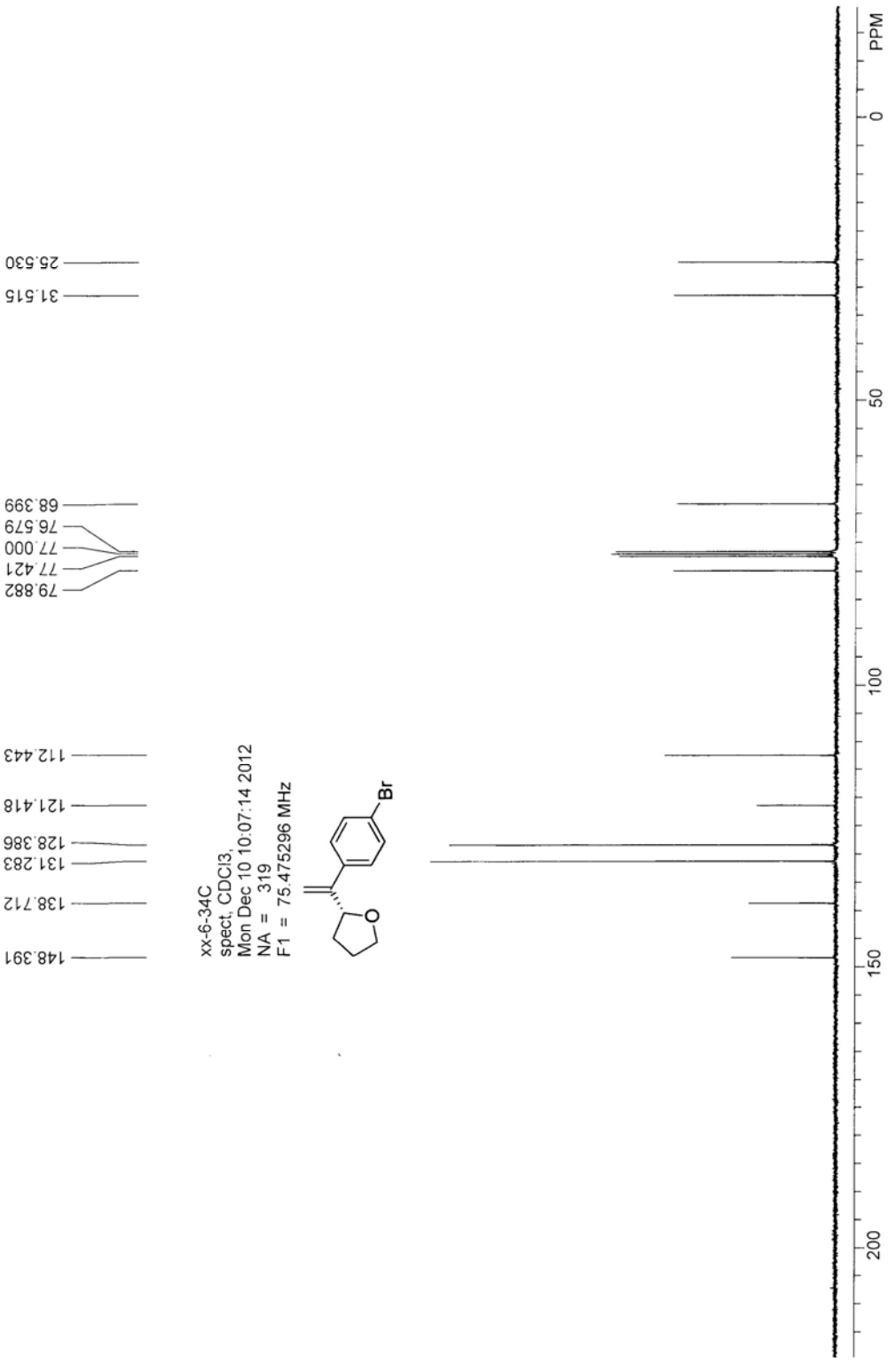
OJ-H-98-2-0.5-230

Sample Name:	**xx-6-36**	*Injection Volume:*	**20.0**
Vial Number:	**309**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-6-30 19:27**	*Sample Weight:*	**1.0000**
Run Time (min):	**17.24**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	13.48	n.a.	477.285	118.492	49.99	n.a.	BMB
2	14.99	n.a.	430.028	118.542	50.01	n.a.	BMB
Total:			907.313	237.035	100.00	0.000	

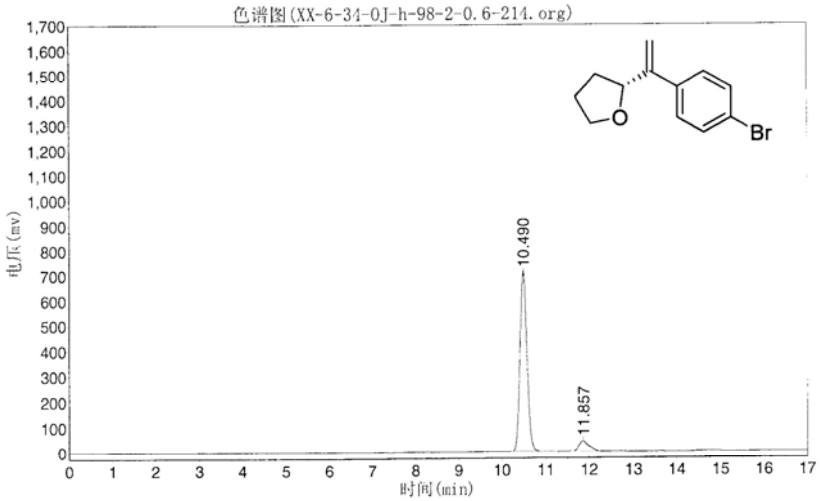

xx-6-34H
spect, CDCl3,
Sun Dec 09 20:22:08 2012
NA = 2
F1 = 300.131866 MHz
Br
O
PPM
0
1
2
3
4
5
6
7
8
2.14
2.04
1.04
1.00
1.01
1.03
1.00
1.03
2.05
1.03
-0.000
1.542
1.566
1.581
1.589
1.605
1.613
1.630
1.654
1.852
1.874
1.898
1.922
1.945
2.012
2.036
2.052
2.058
2.074
2.098
2.121
3.831
3.855
3.881
3.905
3.963
3.986
4.008
4.012
4.034
4.767
4.790
4.812
5.285
5.375
5.375
7.235
7.243
7.249
7.259
7.265
7.272
7.425
7.425
7.447
7.453


25.530
31.515
68.399
76.579
77.000
77.421
79.882
112.443
121.418
128.386
131.283
138.712
148.391
xx-6-34C
spect, CDCl3,
Mon Dec 10 10:07:14 2012
NA = 319
F1 = 75.475296 MHz
Br
O
PPM
0
50
100
150
200

xx-6-34

实验时间：2012-06-28,13:17:07　　报告时间：2012-06-28,13:20:28
谱图文件:F:\slf\xiexi\2012-06-28\XX-6-34\新建文件夹 (2)\XX-6-34-OJ-h-98-2-0.6-214.org

实验内容简介：
OJ-H　　98:2
214nm　　0.6ml/min



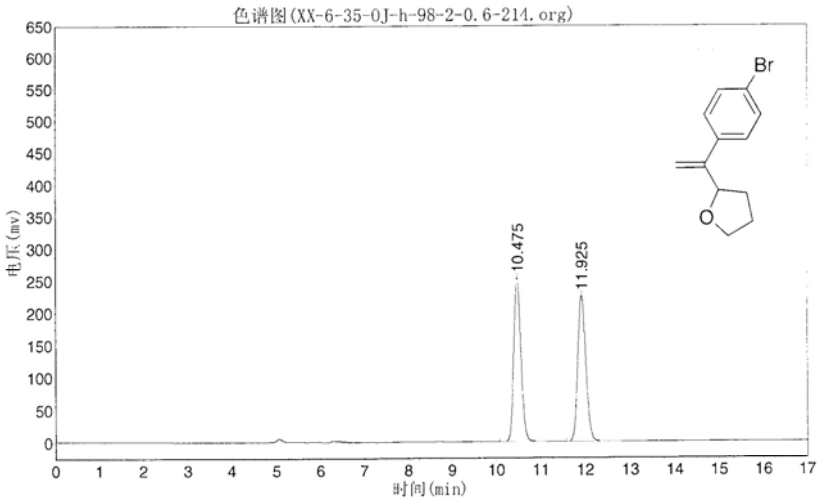
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		10.490	709267.063	7867080.500	92.4552
2		11.857	39949.730	641992.688	7.5448
总计			749216.793	8509073.188	100.0000

xx-6-35

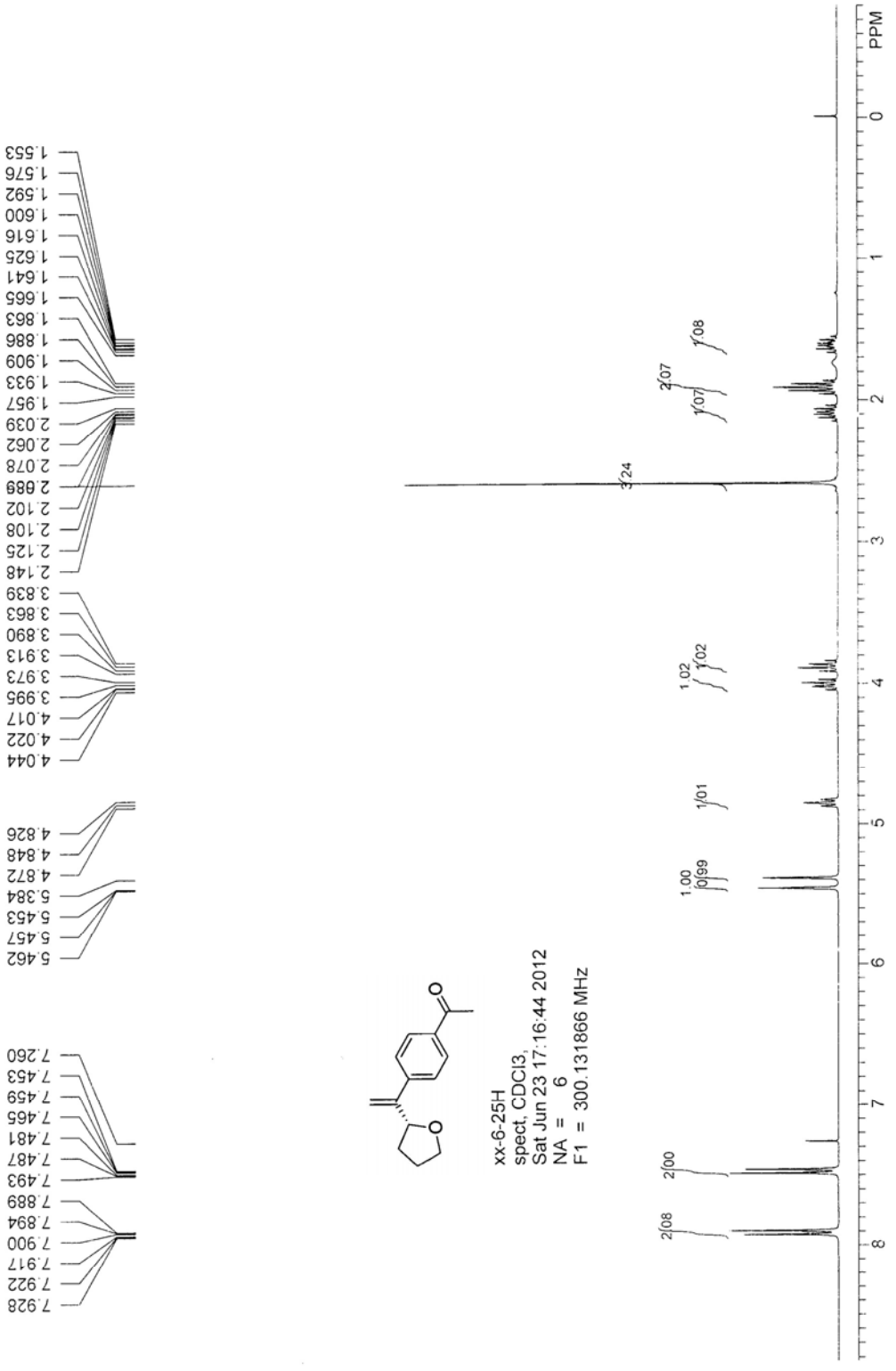
实验时间：2012-06-28,12:26:16　　报告时间：2012-06-28,12:27:30
谱图文件:F:\slf\xiexi\2012-06-28\XX-6-35\新建文件夹\XX-6-35-0J-h-98-2-0.6-214.org

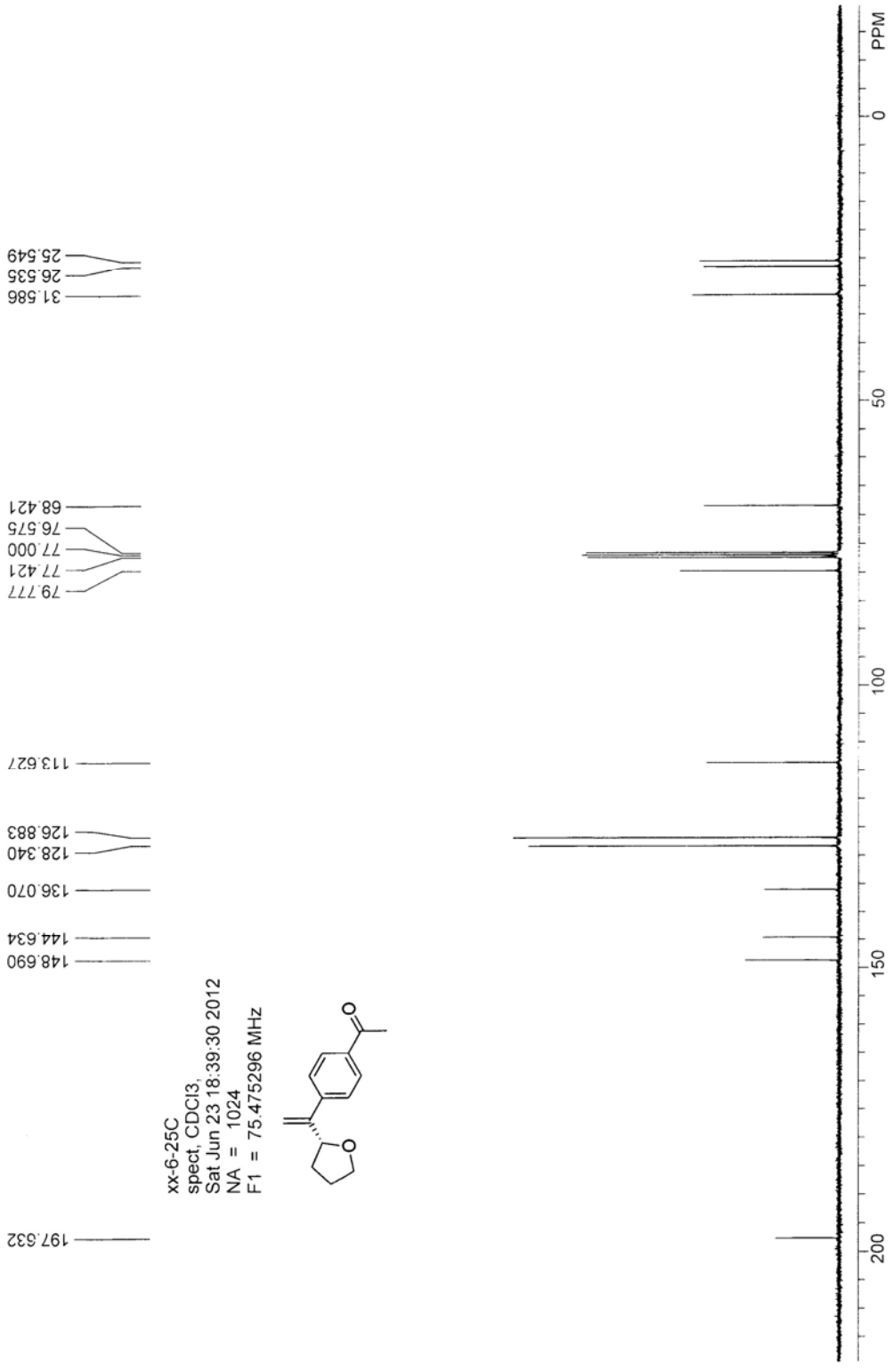
实验内容简介：
0J-H　　98:2
214nm　　0.6ml/min



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		10.475	253820.375	2833843.000	50.0083
2		11.925	225483.984	2832906.000	49.9917
总计			479304.359	5666749.000	100.0000

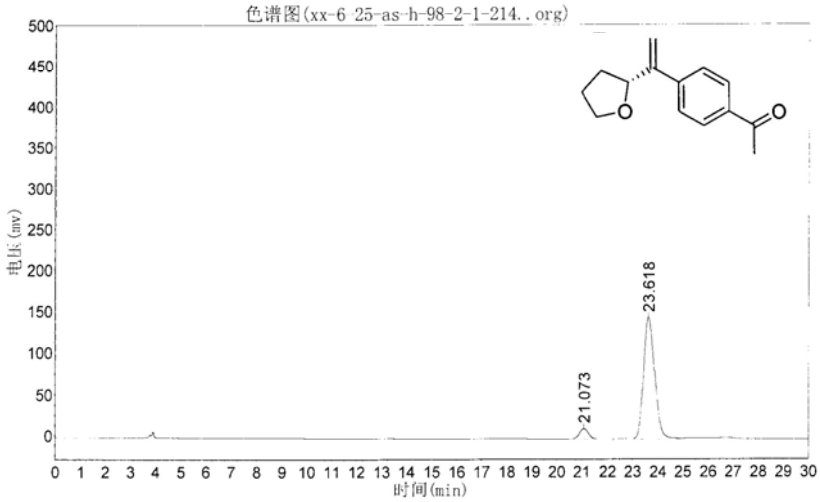

1.553
1.576
1.592
1.600
1.616
1.625
1.641
1.665
1.863
1.886
1.909
1.933
1.957
2.039
2.062
2.078
2.089
2.102
2.108
2.125
2.148
3.839
3.863
3.890
3.913
3.973
3.995
4.017
4.022
4.044
4.826
4.848
4.872
5.384
5.453
5.457
5.462
7.260
7.453
7.459
7.465
7.481
7.487
7.493
7.889
7.894
7.900
7.917
7.922
7.928
xx-6-25H
spect, CDCl3,
Sat Jun 23 17:16:44 2012
NA = 6
F1 = 300.131866 MHz
PPM


PPM
0
50
100
150
200
25.549
26.535
31.586
68.421
76.575
77.000
77.421
79.777
113.627
126.883
128.340
136.070
144.634
148.690
197.632
xx-6-25C
spect, CDCl3,
Sat Jun 23 18:39:30 2012
NA = 1024
F1 = 75.475296 MHz

xx-6-25-as-h-98-2-1-214

实验时间：2012-06-21,12:03:52　　报告时间：2012-06-21,13:07:25
谱图文件:D:\zhuguangjiong\xx\20120621\xx-6-25-as-h-98-2-1-214..org

实验内容简介:
as-h　98/2
1ml/min 214nm



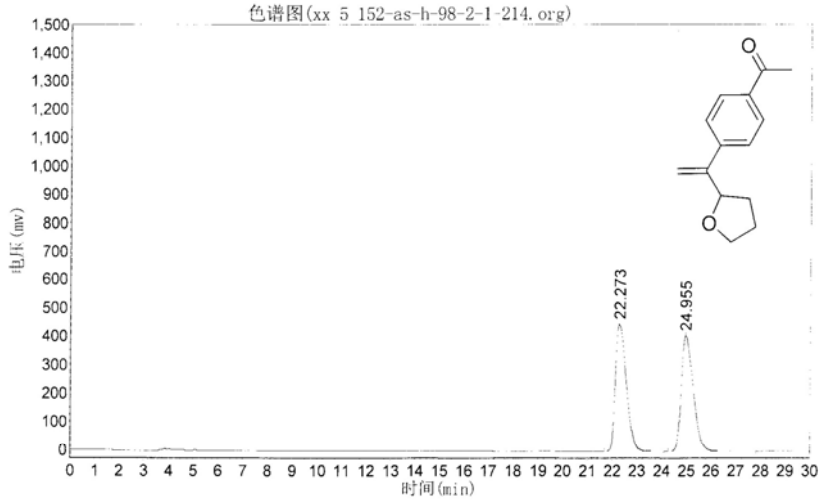
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		21.073	13010.264	321259.719	6.6044
2		23.618	146317.547	4543070.500	93.3956
总计			159327.811	4864330.219	100.0000

xx-5-152-as-h-98-2-1-214

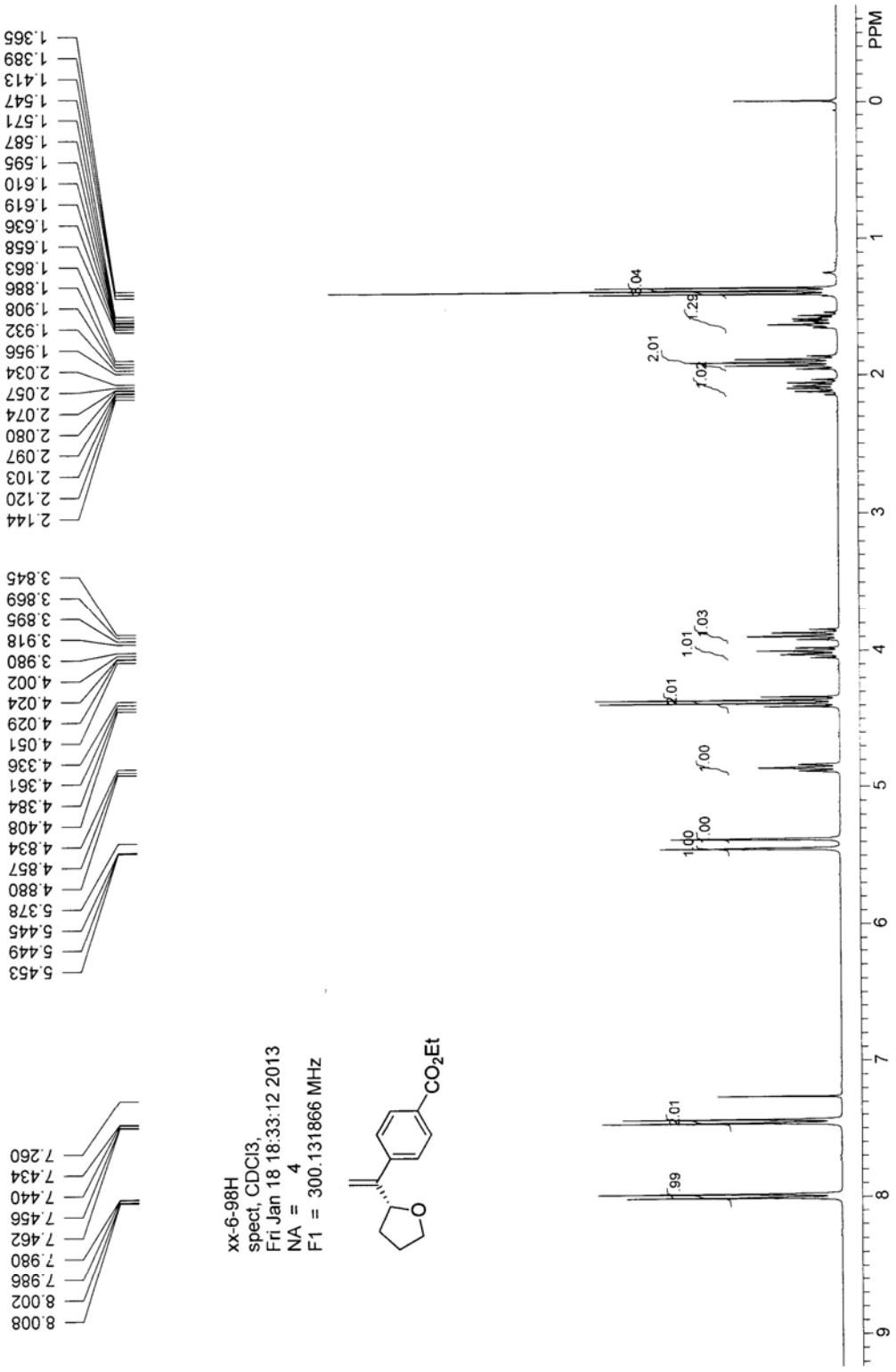
实验时间：2012-06 21,10:39:02　　报告时间：2012 06-21,12:50:58
谱图文件:D:\zhuguangjiong\xx\20120621\xx-5-152-as-h-98-2-1-214.org

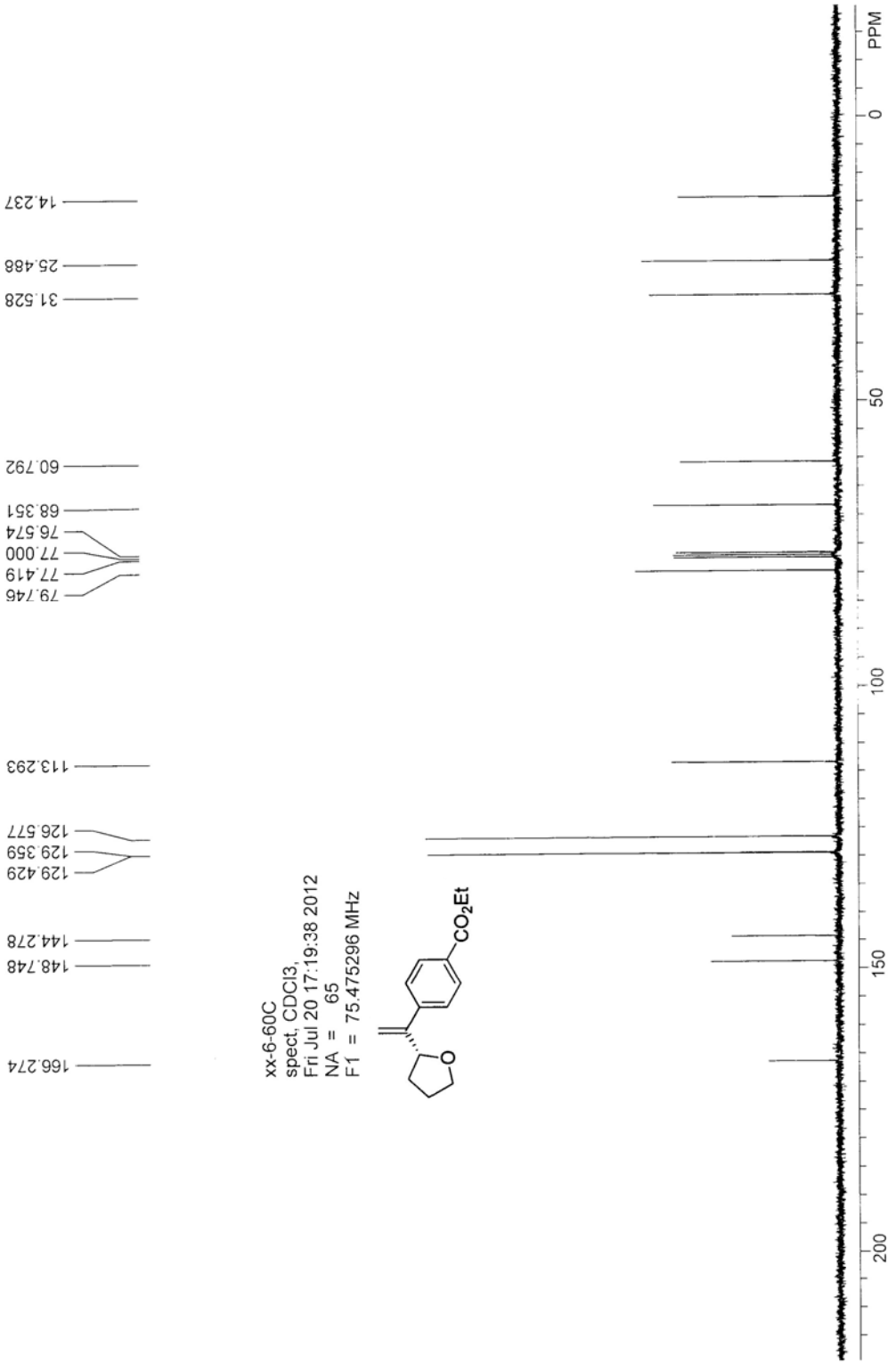
实验内容简介：
as-h　98/2
1ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		22.273	446157.281	13546459.000	50.0151
2		24.955	405394.844	13538300.000	49.9849
总计			851552.125	27084759.000	100.0000

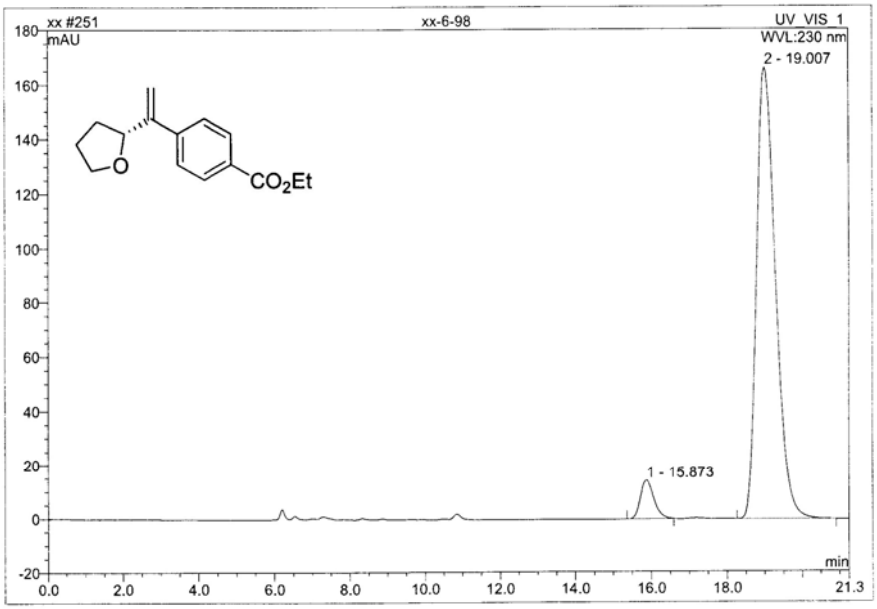

1.365
1.389
1.413
1.547
1.571
1.587
1.595
1.610
1.619
1.636
1.658
1.863
1.886
1.908
1.932
1.956
2.034
2.057
2.074
2.080
2.097
2.103
2.120
2.144
3.845
3.869
3.895
3.918
3.980
4.002
4.024
4.029
4.051
4.336
4.361
4.384
4.408
4.834
4.857
4.880
5.378
5.445
5.449
5.453
7.260
7.434
7.440
7.456
7.462
7.980
7.986
8.002
8.008
xx-6-98H
spect, CDCl3,
Fri Jan 18 18:33:12 2013
NA = 4
F1 = 300.131866 MHz
CO2Et
O
PPM
0
1
2
3
4
5
6
7
8
9
3.04
1.29
2.01
1.02
1.01
1.03
2.01
1.00
1.00
1.00
2.01
.99


14.237
25.488
31.528
60.792
68.351
76.574
77.000
77.419
79.746
113.293
126.577
129.359
129.429
144.278
148.748
166.274
xx-6-60C
spect, CDCl3,
Fri Jul 20 17:19:38 2012
NA = 65
F1 = 75.475296 MHz
CO2Et
O
PPM
0
50
100
150
200

251 xx-6-98

AS-H-98-2-0.5-230

Sample Name:	**xx-6-98**	*Injection Volume:*	**20.0**
Vial Number:	**385**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-18 14:14**	*Sample Weight:*	**1.0000**
Run Time (min):	**21.25**	*Sample Amount:*	**1.0000**

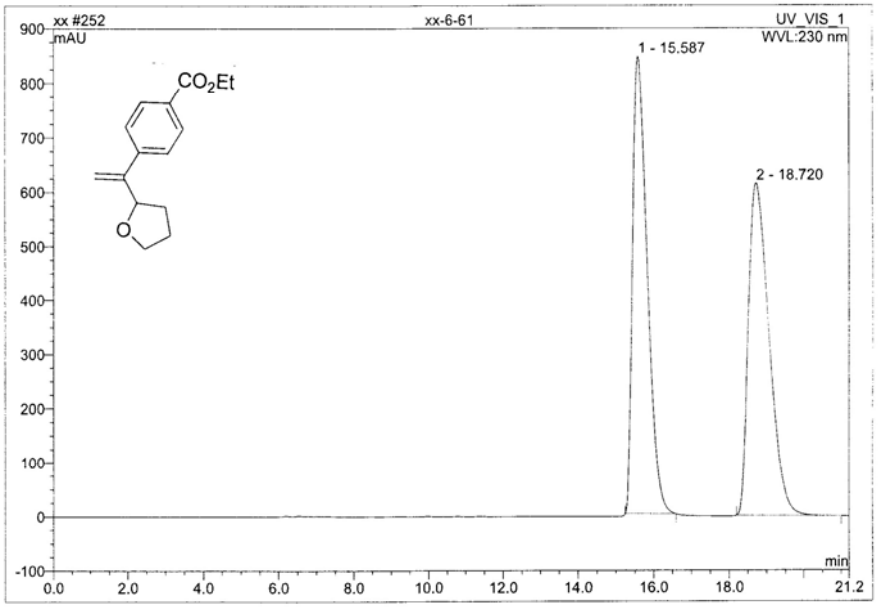


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	15.87	n.a.	14.276	5.831	5.65	n.a.	BMB
2	19.01	n.a.	166.523	97.442	94.35	n.a.	BMB
Total:			180.799	103.273	100.00	0.000	

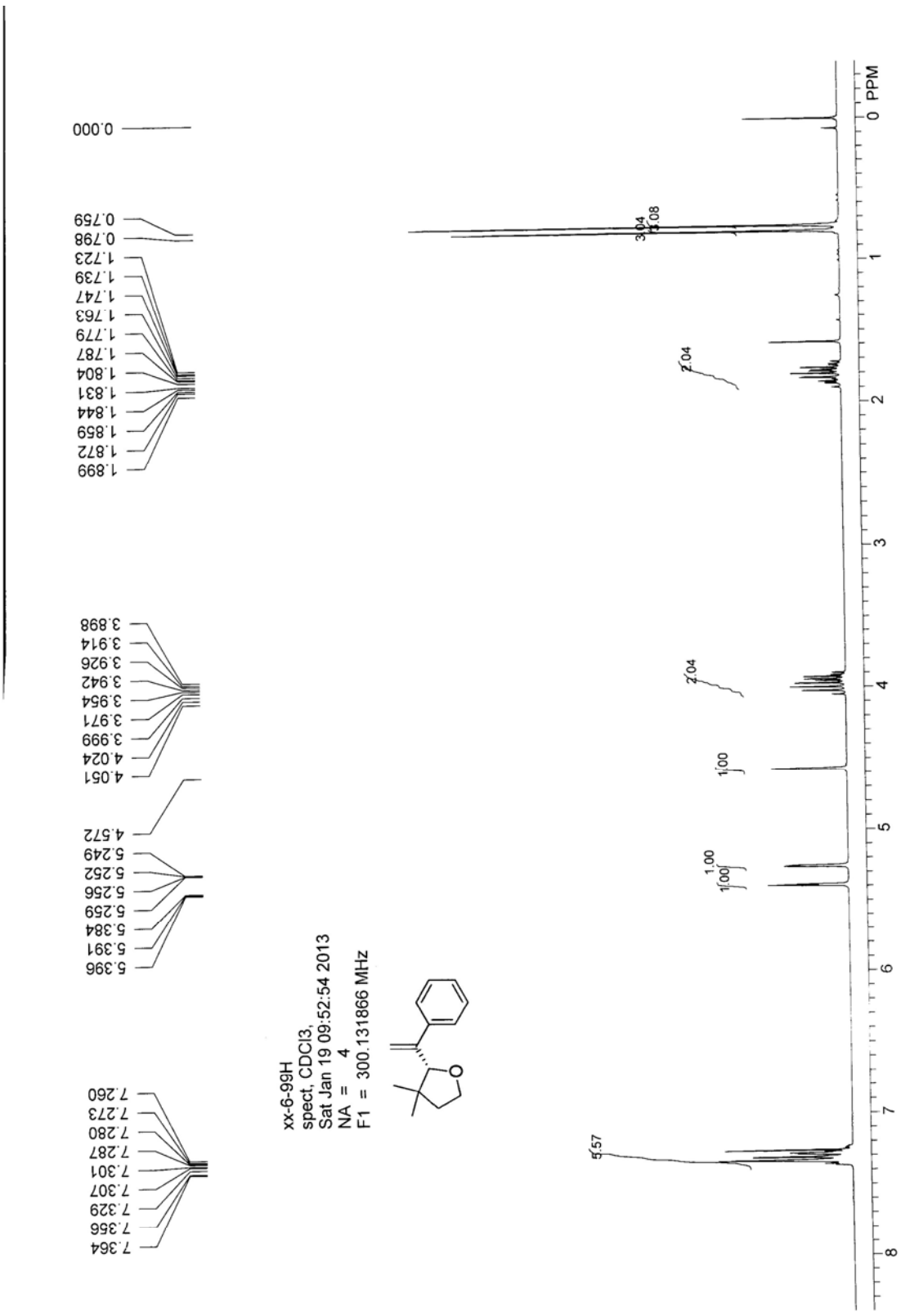
252 xx-6-61

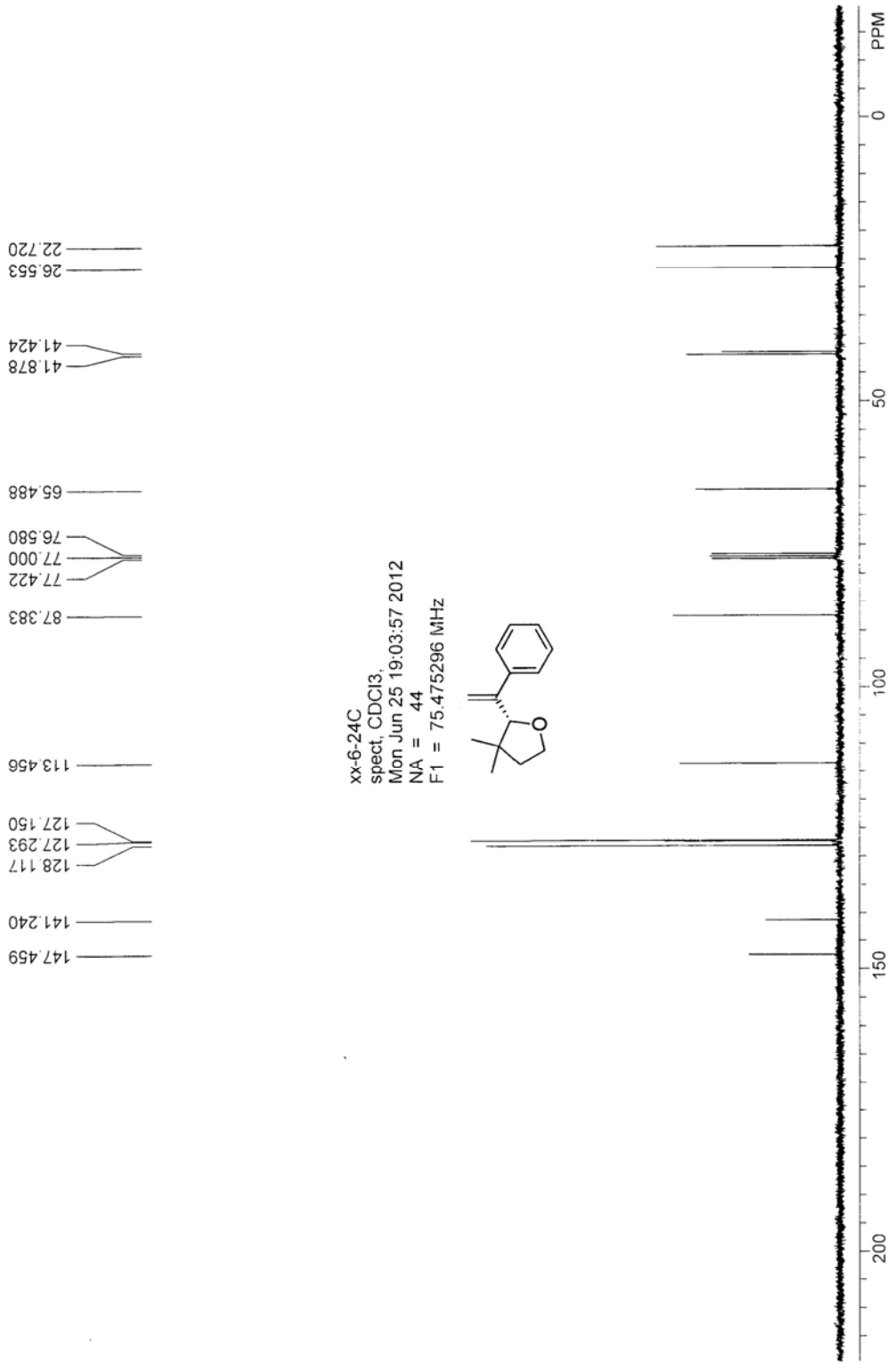
AS-H-98-2-0.5-230

Sample Name:	**xx-6-61**	*Injection Volume:*	**20.0**
Vial Number:	**386**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-18 14:36**	*Sample Weight:*	**1.0000**
Run Time (min):	**21.21**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	15.59	n.a.	844.202	379.464	49.24	n.a.	BMB
2	18.72	n.a.	614.462	391.202	50.76	n.a.	BMB
Total:			1458.664	770.665	100.00	0.000	

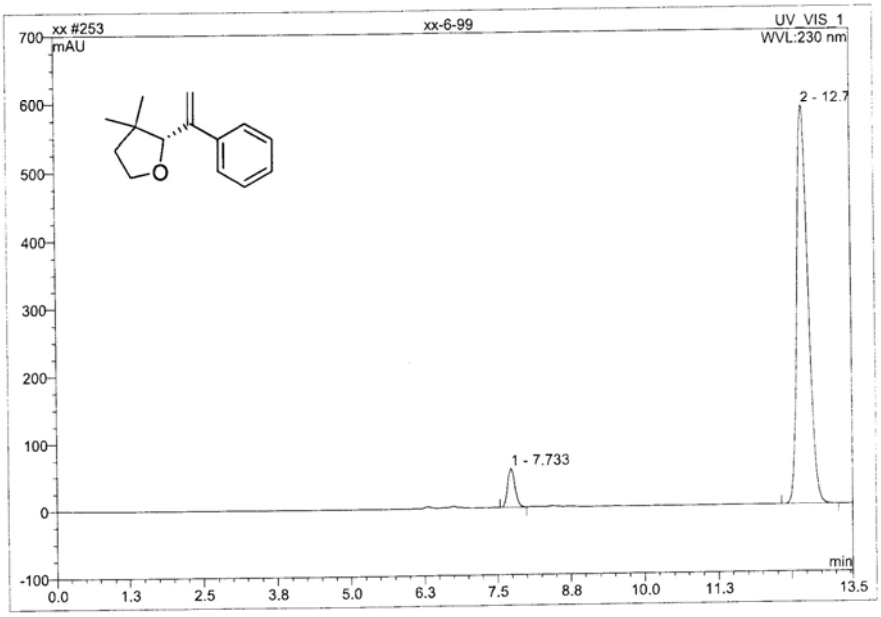

0.000
0.759
0.798
1.723
1.739
1.747
1.763
1.779
1.787
1.804
1.831
1.844
1.859
1.872
1.899
3.898
3.914
3.926
3.942
3.954
3.971
3.999
4.024
4.051
4.572
5.249
5.262
5.256
5.259
5.384
5.391
5.396
7.260
7.273
7.280
7.287
7.301
7.307
7.329
7.356
7.364
xx-6-99H
spect, CDCl3,
Sat Jan 19 09:52:54 2013
NA = 4
F1 = 300.131866 MHz
3.04
4.08
2.04
2.04
1.00
1.00
1.00
5.57
0 PPM


22.720
26.553
41.424
41.878
65.488
76.580
77.000
77.422
87.383
113.456
127.150
127.293
128.117
141.240
147.459
xx-6-24C
spect, CDCl3,
Mon Jun 25 19:03:57 2012
NA = 44
F1 = 75.475296 MHz
PPM
0
50
100
150
200

253 xx-6-99

AD-H-95-5-0.5-230

Sample Name:	**xx-6-99**	*Injection Volume:*	**20.0**
Vial Number:	**387**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-18 22:17**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.54**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.73	n.a.	58.386	8.239	5.95	n.a.	BMB
2	12.71	n.a.	587.951	130.235	94.05	n.a.	BMB
Total:			646.336	138.474	100.00	0.000	

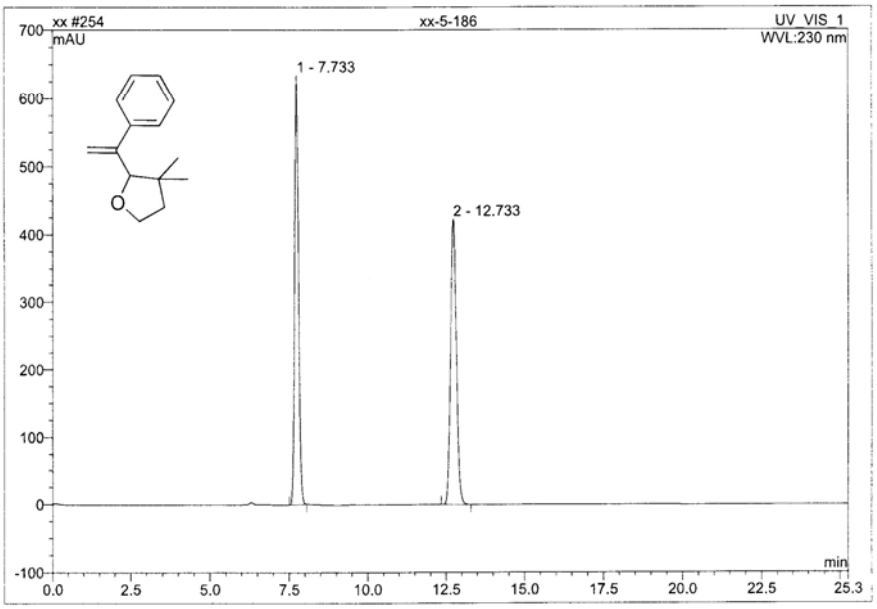
default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)

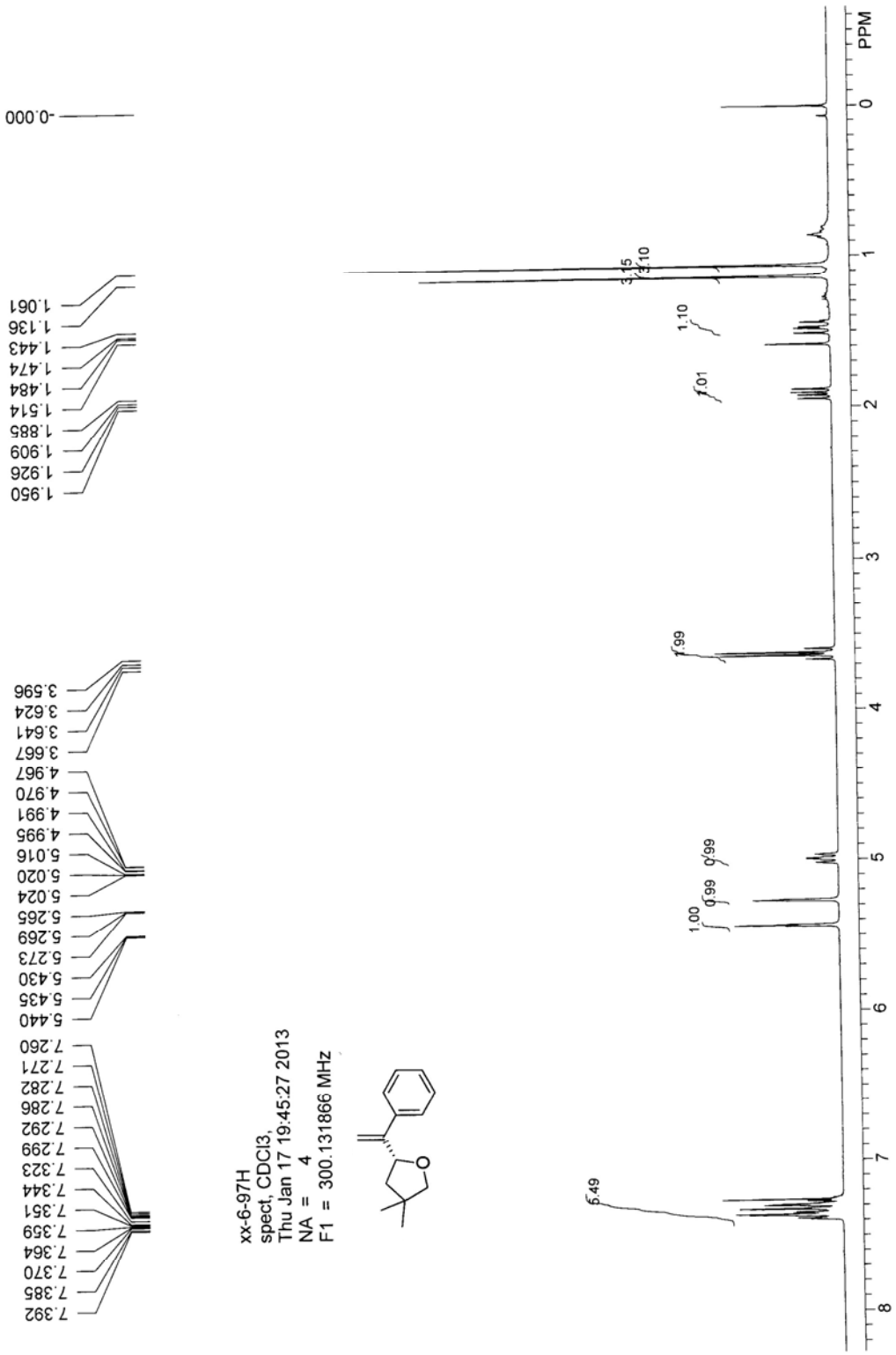
254 xx-5-186

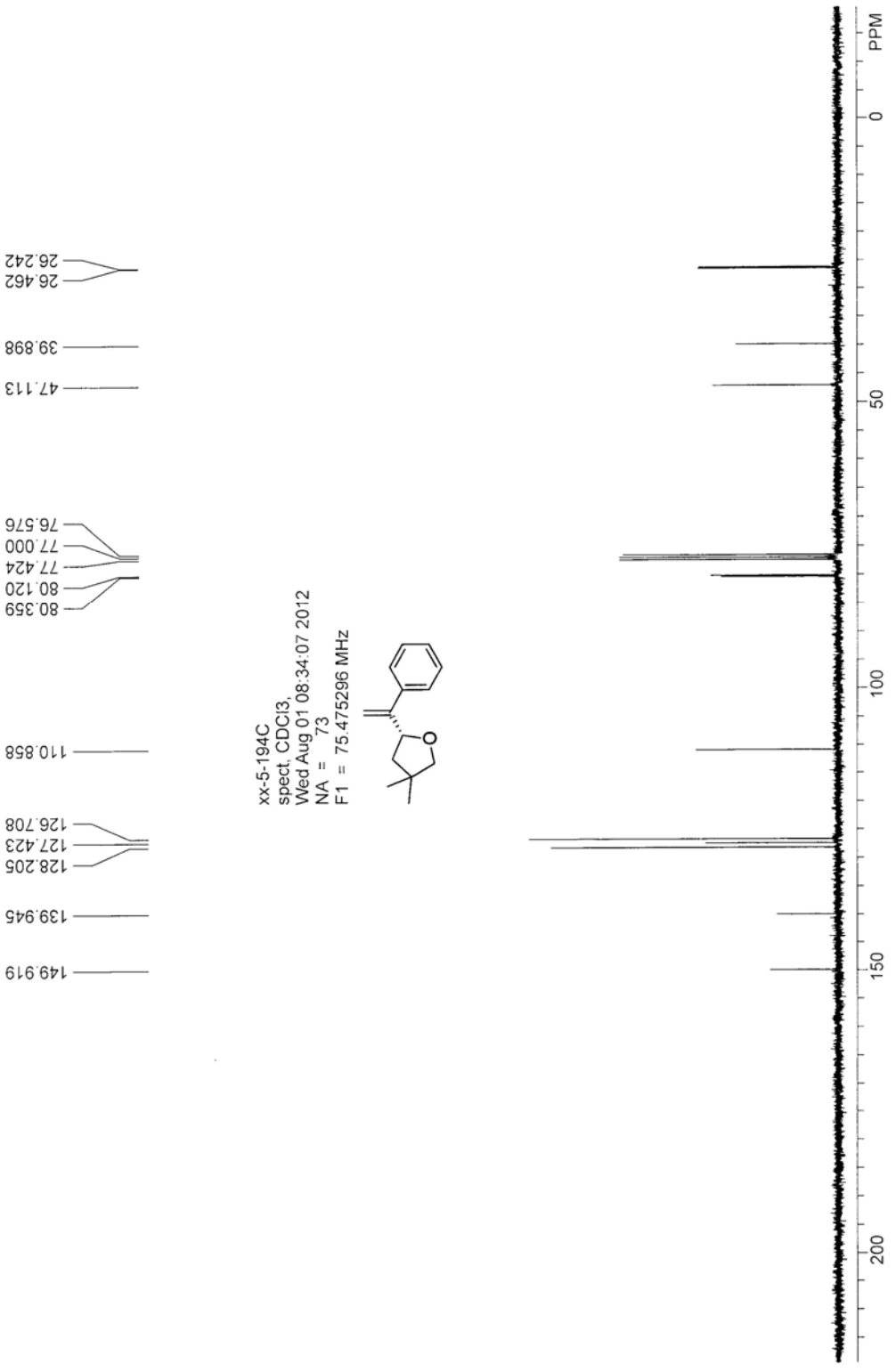
AD-H-95-5-0.5-230

Sample Name:	**xx-5-186**	*Injection Volume:*	**20.0**
Vial Number:	**388**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-18 22:30**	*Sample Weight:*	**1.0000**
Run Time (min):	**25.27**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.73	n.a.	634.642	91.349	49.45	n.a.	BMB
2	12.73	n.a.	423.268	93.378	50.55	n.a.	BMB
Total:			1057.910	184.727	100.00	0.000	

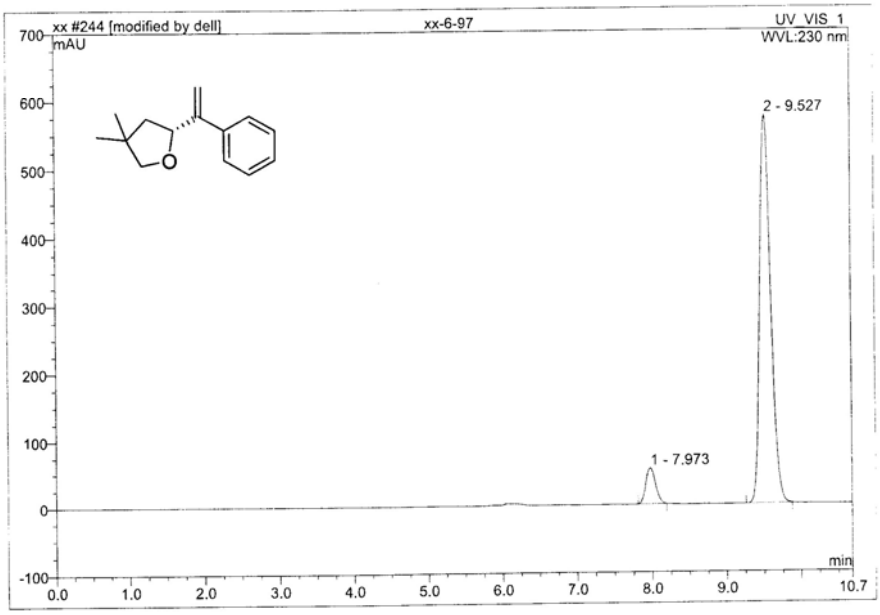

xx-6-97H
spect, CDCl3,
Thu Jan 17 19:45:27 2013
NA = 4
F1 = 300.131866 MHz
PPM
0
1
2
3
4
5
6
7
8
3.15
3.10
1.10
1.01
1.99
1.00
0.99
0.99
5.49
-0.000
1.061
1.136
1.443
1.474
1.484
1.514
1.885
1.909
1.926
1.950
3.596
3.624
3.641
3.667
4.967
4.970
4.991
4.995
5.016
5.020
5.024
5.265
5.269
5.273
5.430
5.435
5.440
7.260
7.271
7.282
7.286
7.292
7.299
7.323
7.344
7.351
7.359
7.364
7.370
7.385
7.392


26.242
26.462
39.898
47.113
76.576
77.000
77.424
80.120
80.359
110.858
126.708
127.423
128.205
139.945
149.919
xx-5-194C
spect, CDCl3,
Wed Aug 01 08:34:07 2012
NA = 73
F1 = 75.475296 MHz
PPM
0
50
100
150
200

244 xx-6-97

AD-H-95-5-0.5-230

Sample Name:	**xx-6-97**	*Injection Volume:*	**20.0**
Vial Number:	**378**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-16 15:27**	*Sample Weight:*	**1.0000**
Run Time (min):	**10.69**	*Sample Amount:*	**1.0000**

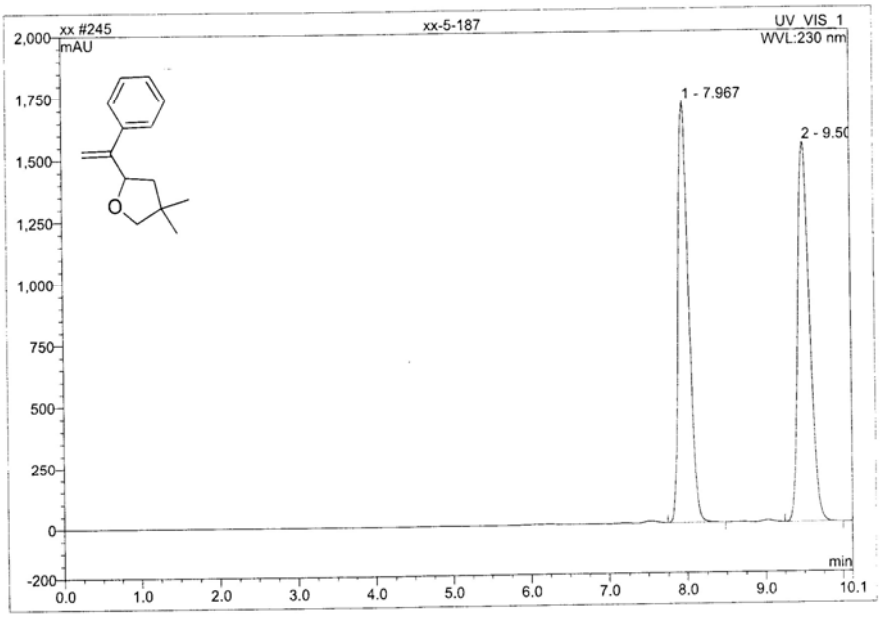


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.97	n.a.	54.792	8.028	7.51	n.a.	BMB*
2	9.53	n.a.	572.657	98.793	92.49	n.a.	BMB*
Total:			627.449	106.821	100.00	0.000	

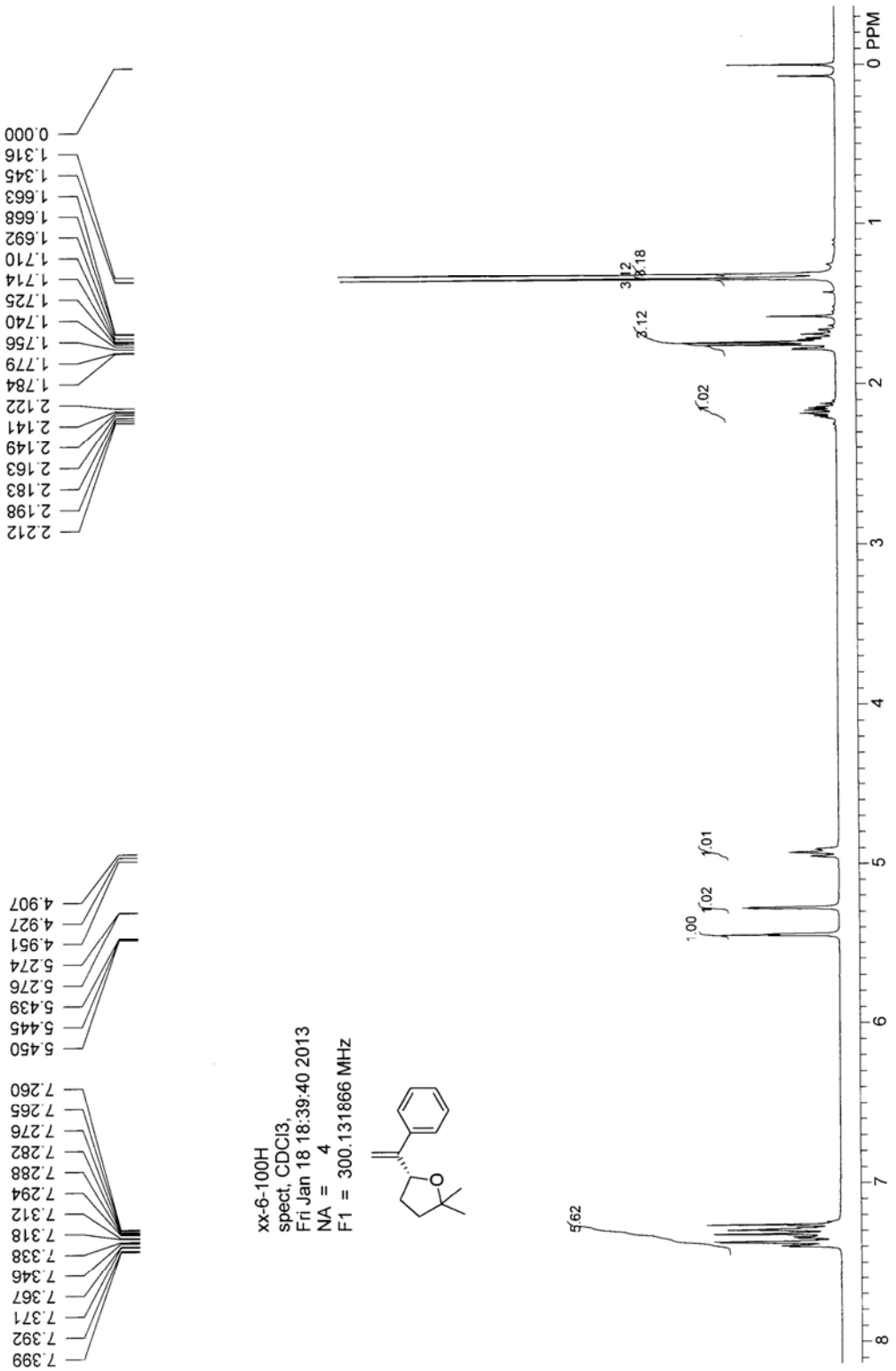
245 xx-5-187

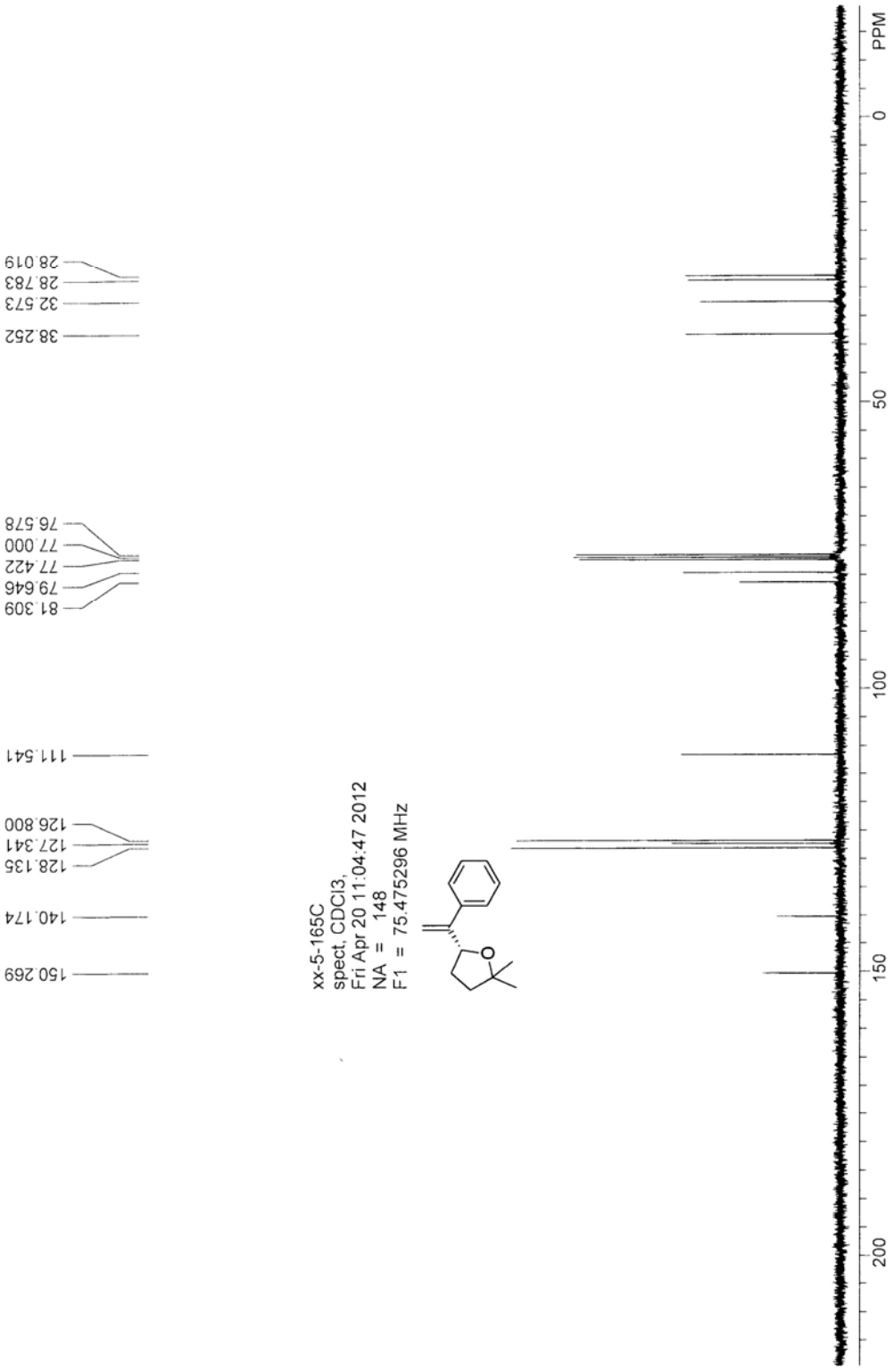
AD-H-95-5-0.5-230

Sample Name:	**xx-5-187**	*Injection Volume:*	**20.0**
Vial Number:	**379**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-16 15:39**	*Sample Weight:*	**1.0000**
Run Time (min):	**10.12**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.97	n.a.	1713.890	267.882	49.50	n.a.	BMB
2	9.51	n.a.	1544.236	273.298	50.50	n.a.	BMB
Total:			3258.126	541.180	100.00	0.000	


0.000
1.316
1.345
1.663
1.668
1.692
1.710
1.714
1.725
1.740
1.756
1.779
1.784
2.122
2.141
2.149
2.163
2.183
2.198
2.212
4.907
4.927
4.951
5.274
5.276
5.439
5.445
5.450
7.260
7.265
7.276
7.282
7.288
7.294
7.312
7.318
7.338
7.346
7.367
7.371
7.392
7.399
xx-6-100H
spect, CDCl3,
Fri Jan 18 18:39:40 2013
NA = 4
F1 = 300.131866 MHz
5.62
1.00
1.02
1.01
1.02
3.12
3.18
3.12
0 PPM


28.019
28.783
32.573
38.252
76.578
77.000
77.422
79.646
81.309
111.541
126.800
127.341
128.135
140.174
150.269
xx-5-165C
spect, CDCl3,
Fri Apr 20 11:04:47 2012
NA = 148
F1 = 75.475296 MHz
PPM
0
50
100
150
200

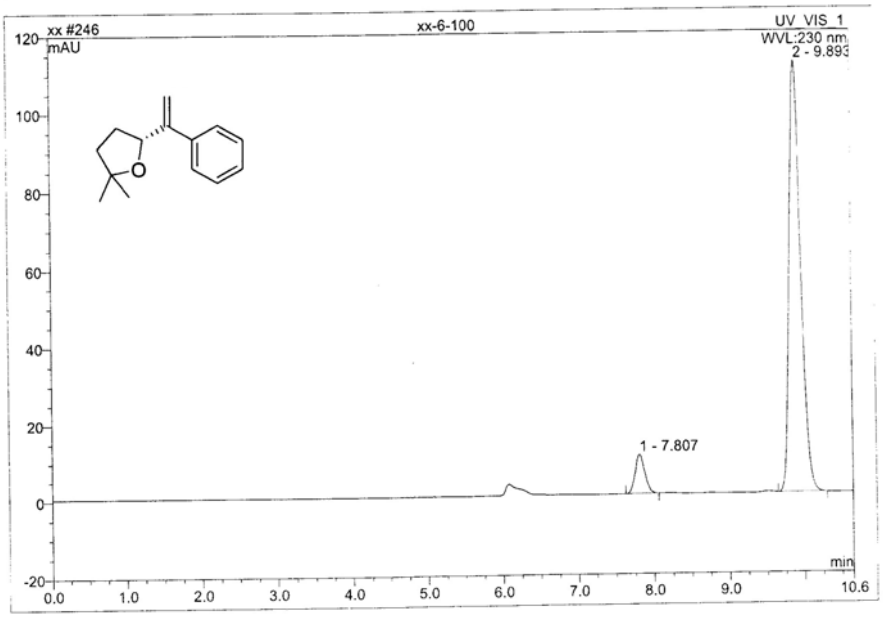
Operator:dell Timebase:U-3000 Sequence:xx

2013-1-17 11:37 下午

246 xx-6-100

AD-H-95-5-0.5-230

Sample Name:	**xx-6-100**	*Injection Volume:*	**20.0**
Vial Number:	**380**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-17 23:22**	*Sample Weight:*	**1.0000**
Run Time (min):	**10.65**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.81	n.a.	10.342	1.506	7.04	n.a.	BMB
2	9.89	n.a.	111.361	19.884	92.96	n.a.	BMB
Total:			121.703	21.391	100.00	0.000	

default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)

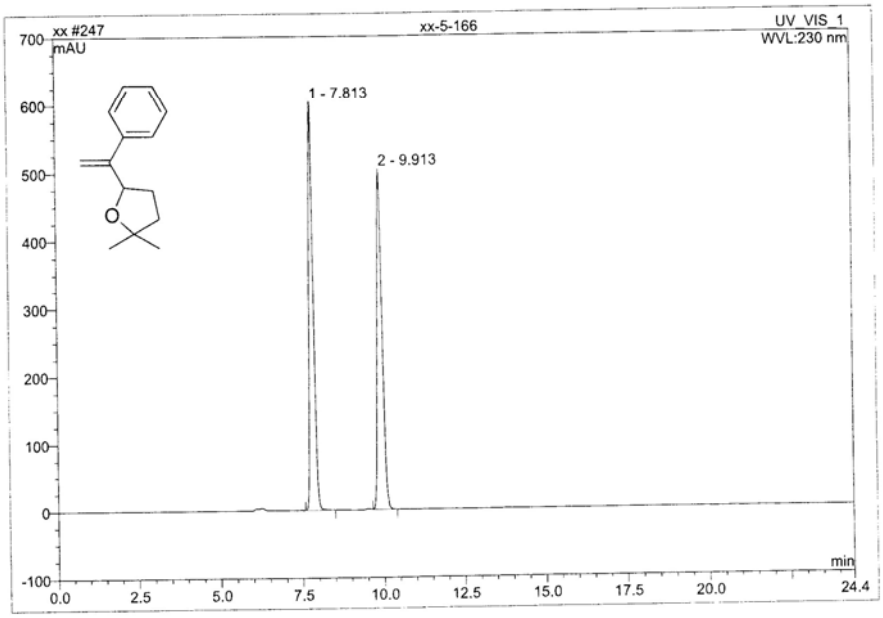
Operator:dell Timebase:U-3000 Sequence:xx

2013-1-18 9:37 下午

247 xx-5-166

AD-H-95-5-0.5-230

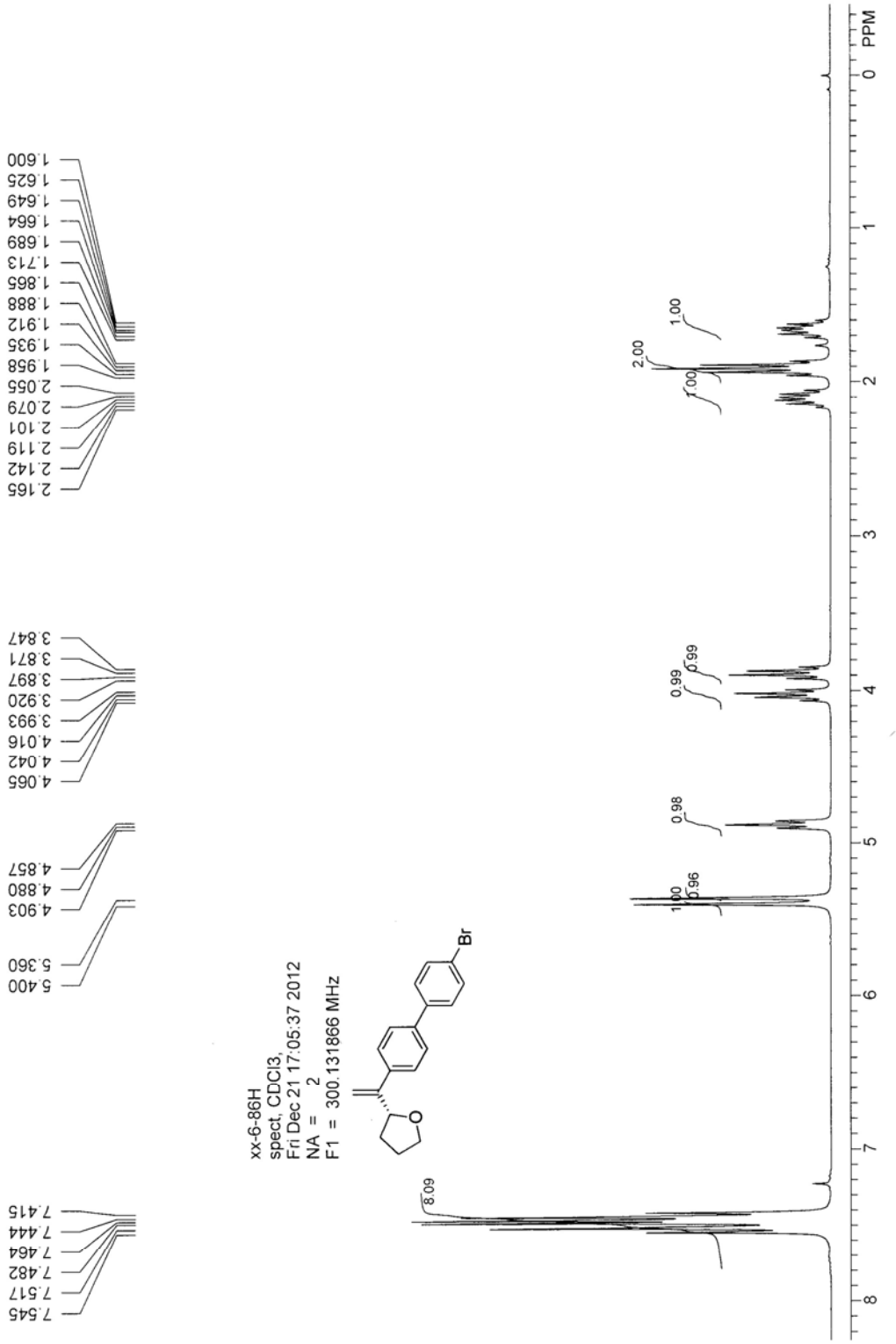
Sample Name:	**xx-5-166**	*Injection Volume:*	**20.0**
Vial Number:	**381**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**230**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-1-17 23:34**	*Sample Weight:*	**1.0000**
Run Time (min):	**24.44**	*Sample Amount:*	**1.0000**

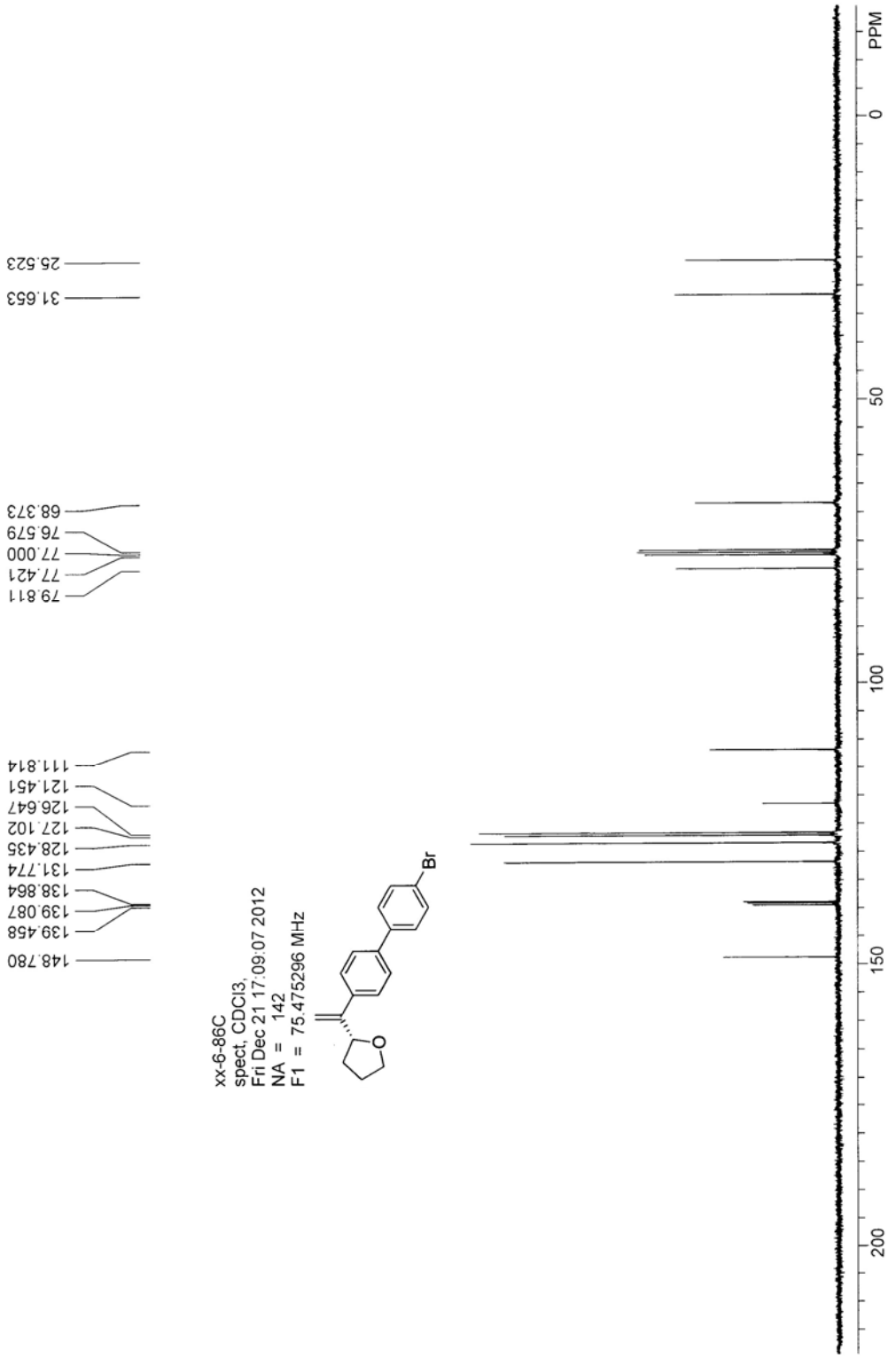


No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	7.81	n.a.	603.933	90.184	49.96	n.a.	BMB
2	9.91	n.a.	503.330	90.316	50.04	n.a.	BMB
Total:			1107.263	180.499	100.00	0.000	

default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)


xx-6-86H
spect, CDCl3,
Fri Dec 21 17:05:37 2012
NA = 2
F1 = 300.131866 MHz
Br
O
PPM
0
1
2
3
4
5
6
7
8
8.09
2.00
1.00
1.00
0.99
0.99
0.98
1.00
0.96
1.600
1.625
1.649
1.664
1.689
1.713
1.865
1.888
1.912
1.935
1.958
2.055
2.079
2.101
2.119
2.142
2.165
3.847
3.871
3.897
3.920
3.993
4.016
4.042
4.065
4.857
4.880
4.903
5.360
5.400
7.415
7.444
7.464
7.482
7.517
7.545


25.523
31.653
68.373
76.579
77.000
77.421
79.811
111.814
121.451
126.647
127.102
128.435
131.774
138.864
139.087
139.458
148.780
xx-6-86C
spect, CDCl3,
Fri Dec 21 17:09:07 2012
NA = 142
F1 = 75.475296 MHz
Br
O
PPM
0
50
100
150
200

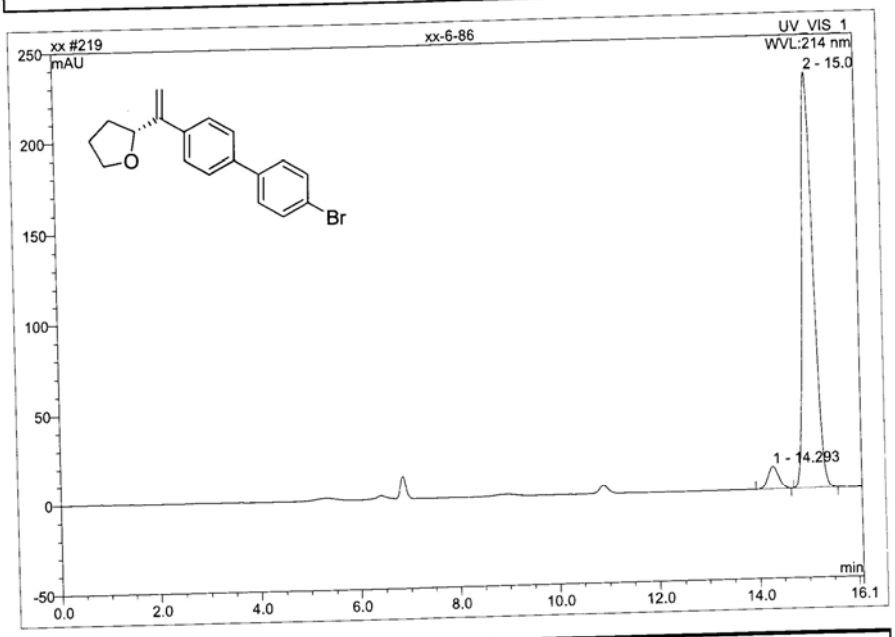
Operator:dell Timebase:U-3000 Sequence:xx

2012-12-20 9:25 下午

219 xx-6-86

IC -95-5-0.5-214

Sample Name:	**xx-6-86**	*Injection Volume:*	**20.0**
Vial Number:	**353**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-12-20 21:05**	*Sample Weight:*	**1.0000**
Run Time (min):	**16.09**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	14.29	n.a.	12.794	3.211	5.05	n.a.	BMB
2	15.07	n.a.	229.344	60.313	94.95	n.a.	BMB
Total:			242.138	63.524	100.00	0.000	

default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)

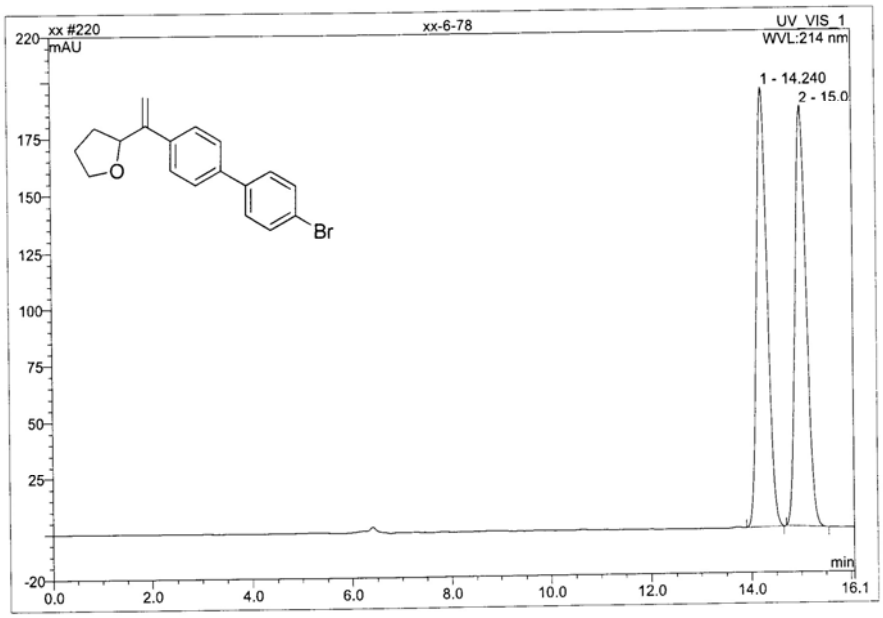
Operator:dell Timebase:U-3000 Sequence:xx

2012-12-20 9:40 下午

220 xx-6-78

IC -95-5-0.5-214

Sample Name:	**xx-6-78**	*Injection Volume:*	**20.0**
Vial Number:	**354**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**test**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2012-12-20 21:23**	*Sample Weight:*	**1.0000**
Run Time (min):	**16.07**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	14.24	n.a.	194.525	48.005	49.81	n.a.	BMB
2	15.02	n.a.	185.926	48.373	50.19	n.a.	BMB
Total:			380.451	96.378	100.00	0.000	

default/Integration

Chromeleon (c) Dionex 1996-2006
Version 6.80 SR5 Build 2413 (137116)