Supporting Information

Highly Enantioselective Pd-Catalyzed Asymmetric Hydrogenation of Activated Imines

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Table of Contents.

General and Materials…….. S1

The preparation of imines (3, 5, 7)…… …… S2

General procedure for the synthesis of N-sulfonylimines (11) and the date of characterization for all new compounds…… …… S3-5

The procedure for asymmetric hydrogenation and preparation of Pd complex …… S5-6

The date of characterization for all products of hydrogenation reaction……. …… S6-10

The procedure for removing the Bn group of 12i and date of characterization for 13…S10-11

The experimental details of non linear effects…… S11

Reference ……. S12

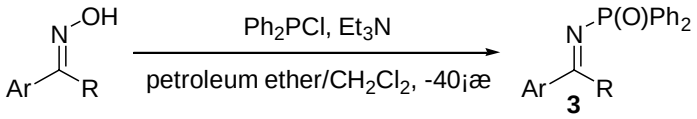
Copy of NMR and HRMS spectrum for all new compounds and products of hydrogenation reaction …… S13-142

Copy of HPLC for racemic and chiral compounds……..S143-202

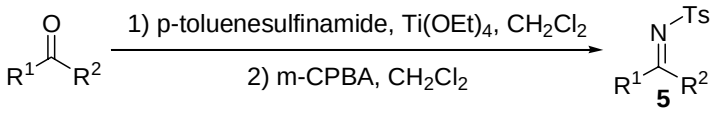
General: All reactions were carried out under an atmosphere of nitrogen using standard Schlenk techniques or in an nitrogen-filled glovebox, unless otherwise noted. ^{1}H NMR, ^{13}C NMR and ^{31}P NMR spectra were recorded on Bruker DRX-400 spectrometers. The chemical shifts for ^{1}H NMR were recorded in ppm downfield from tetramethylsilane (TMS) with the solvent resonance as the internal standard. The chemical shifts for ^{13}C NMR were recorded in ppm downfield using the central peak of deuterochloroform (77.23 ppm) as the internal standard. Coupling constants (*J*) are reported in Hz and refer to apparent peak multiplications. Optical rotations were measured with JASCO P-1010 polarimeter. Flash column chromatography was performed on silica gel (200-300 mesh). TLC analysis was performed using glass-backed plates coated with 0.2 mm silica.

Materials: Commericially available reagents were used throughout without further purification other than those detailed below. THF and Et_2O were distilled over sodium benzopheneone ketyl under nitrogen. Methylene chloride was distilled over calcium hydride. CF_3CH_2OH and acetone were stilled from anhydrous $CaSO_4$. The other solvent, which was on the asymmetric hydrogenation reactions, were purchased from Aldrich without further purification. SynPhos was prepared according to the literature.[1]

The preparation of imines

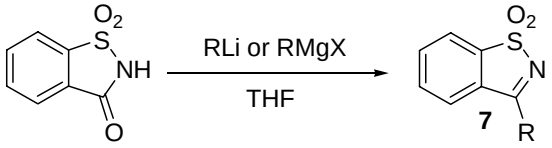


***N*-Diphenylphosphinyl imines (3):** It was prepared according to the literatures.[2] Imines **3** all are known compounds.[3] Representative spectroscopic dates are following: ***N*-(1-Phenylethylidene)-diphenylphosphinamide (3a)**: White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.97 (d, *J* = 2.0 Hz, 3H), 7.43-7.50 (m, 9H), 7.98-8.00 (m, 4H), 8.08-9.10 (m, 2H).



General procedure for the synthesis of *N*-tosyl imines (5): It was prepared according to the modified procedures reported in the literature.[4] To a Schlenck flask equipped with a condenser were charged with the corresponding ketone (5 mmol), racemic p-toluenesulfinamide (1.552 g, 10 mmol) and $Ti(OEt)_4$ (3.2 mL, 15 mmol) in 50 mL CH_2Cl_2. The solution was heated under reflux for 2-4 days and monitored by TLC. 20 mL CH_3OH and a few drops of $NaHCO_3$ were added. Then the solution was filtered through anhydrous Na_2SO_4 and washed with EtOAc. The solvent was removed in vacuo and the crude product was purified by column chromatography using petroleum ether and EtOAc to obtain the corresponding p-tolylsulfinimine.

In a dried flask, to a stirred solution of the corresponding p-tolylsulfinimine in CH_2Cl_2 was added dry *m*-CPBA (monitored by TLC) at room temperature (the reaction can be carried out in the air without special handling). When the reaction was completed, the solution was concentrated in vacuo. The residue was dissolved in Et_2O, washed with saturated solution of $NaHCO_3$ twice, dried over anhydrous Na_2SO_4, and concentrated to give a residue which was quickly purified by column chromatography using petroleum ether and EtOAc to give the corresponding *N*-tosyl imines (**5**)[4,5] (>90% purity). Representative spectroscopic dates are following: **(E)-1-Phenyl-N-tosylethanimine (5a):** White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.45 (s, 3H), 2.99 (s, 3H), 7.35 (d, *J* = 8.2 Hz, 2H), 7.39-7.43 (m, 2H), 7.53 (t, *J* = 7.4 Hz, 1H), 7.89-7.94 (m, 4H).

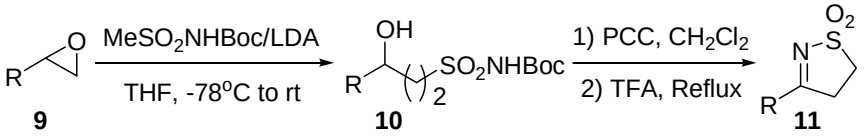


N-Sulfonylimines (7): It was prepared from the saccharin according to the literatures.[6]

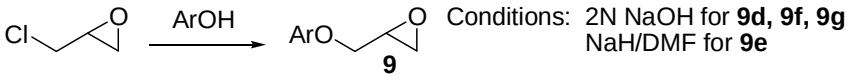
3-Methyl-1,2-benzisothiazole 1,1-Dioxide (7a):[6a] White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.68 (s, 3H), 7.69-7.79 (m, 3H), 7.91-7.93 (m, 1H).

3-Butyl-1,2-benzisothiazole 1,1-Dioxide (7b):[6c] White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.99 (t, *J* = 7.3 Hz, 3H), 1.49-1.54 (m, 2H), 1.84-1.91 (m, 2H), 2.96-2.99 (m, 2H), 7.70-7.75 (m, 3H), 7.90-7.92 (m, 1H).

3-Benzyl-1,2-benzisothiazole 1,1-Dioxide (7c):[6b] White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 4.30 (s, 2H), 7.30-7.32 (m, 1H), 7.35-7.36 (m, 4H), 7.58-7.70 (m, 3H), 7.89 (d, *J* = 7.4 Hz, 1H).



General procedure for the synthesis of N-sulfonylimines (11): N-Sulfonylimines **11** were prepared from corresponding substituted oxiranes **9** according to the procedures reported in the literature.[7] The known compounds oxiranes **9d, 9f, 9g** were synthesized according to the literature.[8] $MeSO_2NHBoc$ was synthesized from $MeSO_2NH_2$ and $(Boc)O_2$ according to the literature.[9] PCC was synthesized from pyridine and CrO_3 according to the literature.[10]



[(4-Trifluoromethyl-phenoxy)methyl]oxirane (9e): To a solution of 4-trifluoromethylphenol (4.053 g, 25 mmol) in dry DMF (50 ml) was added NaH (1.000g, 25 mmol, 60% dispersion in mineral oil) and the reaction mixture was stirred for 30 min at rt. After the epichlorohydrin was added, the reaction was stirred for 5h at 30 ^oC. The water (100 ml) was added, and the mixture was extracted with ether (40 ml × 3). The combined organic layer was washed with 1 N NaOH (80 ml × 1) and dried with anhydrous Na_2SO_4. Evaporation of solvent and purification of the residue by column chromatography (petroleum ether/EtOAc = 20:1) gave **9e** as a colorless oil (2.294 g, 42%). ^1H NMR (400 MHz, $CDCl_3$): δ = 2.76-2.78 (m, 1H), 2.91-2.93 (m, 1H), 3.35-3.39 (m, 1H), 3.96 (dd, *J* = 5.8, 11.0 Hz, 1H), 4.30 (dd, *J* = 2.8, 10.8 Hz, 1H), 6.98 (d, *J* = 8.8 Hz, 2H), 7.54 (d, *J* = 8.8 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 44.7, 50.1, 69.1, 114.8, 123.6 (q, *J* = 32 Hz), 124.6 (q, *J* = 269 Hz), 127.1 (d, *J* = 3 Hz), 161.1; HRMS Calculated for $C_{10}H_9O_2F_3$ (M^+) 218.0555, found: 218.0553.

***tert*-Butyl-N-[(3-hydroxynonyl)-sulfonyl]-carbamate (10c):** Yellow oil, ^1H NMR (400 MHz, $CDCl_3$): δ = 0.87-0.90 (m, 3H), 1.28-1.35 (m, 7H), 1.47-1.49 (m, 3H), 1.51 (s, 9H), 1.86-1.90 (m, 1H), 2.03-2.06 (m, 1H), 3.52-3.60 (m, 2H), 3.75-3.77 (m, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 14.1, 22.6, 25.5, 28.0, 29.2, 30.5, 31.8, 37.4, 49.9, 69.9, 84.3, 150.0; HRMS Calculated for $C_{10}H_{20}NO_4S$ $[M - C_4H_9O]^+$ 250.1113, found: 250.1122.

***tert*-Butyl-N-[(3-hydroxy-4-phenoxy-butyl)-sulfonyl]-carbamate (10d):** Yellow oil, Yield: 86%, ^1H NMR (400 MHz, $CDCl_3$): δ = 1.51 (s, 9H), 2.09-2.17 (m, 2H), 3.61-3.71 (m, 2H), 3.89 (dd, *J* = 6.6, 9.3 Hz, 1H), 4.01 (dd, *J* = 3.6, 9.4 Hz, 1H), 4.16-4.18 (m, 1H), 6.90 (d, *J* = 8.4 Hz, 2H), 6.98 (t, *J* = 7.3 Hz, 1H), 7.27-7.32 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 27.2, 28.0, 49.7, 68.2, 71.4, 84.5, 114.7, 121.5, 129.7, 150.1, 158.4; HRMS Calculated for $C_{15}H_{23}NO_6S$ (M^+) 345.1246, found: 345.1250.

***tert*-Butyl-N-[(3-hydroxy-4-(4-trifluoromethyl-phenoxy)-butyl)-sulfonyl]-carbamate (10e):** White solid, Yield: 79%, ^1H NMR (400 MHz, $CDCl_3$): δ = 1.50 (s, 9H), 2.09-2.19 (m, 2H), 3.63-3.70 (m, 2H), 3.95 (dd, *J* = 6.5, 9.3 Hz, 1H), 4.03 (dd, *J* = 3.7, 9.4 Hz, 1H), 4.19-4.21 (m, 1H), 6.96 (d, *J* = 8.7 Hz, 2H), 7.55 (d, *J* = 8.7 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 27.2, 28.1, 49.9, 68.1,71.8, 84.8, 114.7, 123.8 (q, *J* = 33 Hz), 124.5 (q, *J* = 270 Hz), 127.2 (d, *J* = 3 Hz), 150.0,160.9; HRMS Calculated for $C_{16}H_{22}NO_6F_3NaS$ $[M + Na]^+$ 436.1018, found: 436.1031.

***tert*-Butyl-N-[(3-hydroxy-4-(4-methyl-phenoxy)-butyl)-sulfonyl]-carbamate (10f):** Yellow oil, Yield: 54%, ^1H NMR (400 MHz, $CDCl_3$): δ = 1.50 (s, 9H), 2.05-2.14 (m, 2H), 2.28 (s, 3H), 2.71 (br, 1H), 3.59-3.69 (m, 1H), 3.86 (dd, *J* = 6.6, 9.4 Hz, 1H), 3.96 (dd, *J* = 3.7, 9.4 Hz, 1H), 4.11-4.13 (m,

1H), 6.78-6.81 (m, 2H), 7.08 (d, *J* = 8.4 Hz, 2H), 7.55 (br, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 20.7, 27.2, 28.1, 49.9, 68.3, 71.8, 84.7, 114.7, 130.2, 130.9, 150.0, 156.3; HRMS Calculated for $C_{16}H_{25}NO_6S$ (M^+) 359.1403, found: 359.1405.

***tert*-Butyl-N-[(3-hydroxy-4-(2-methyl-phenoxy)-butyl)-sulfonyl]-carbamate (10g):** Yellow oil, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.49 (s, 9H), 2.07-2.19 (m, 2H), 2.22 (s, 3H), 3.60-3.69 (m, 2H), 3.88-3.92 (m, 1H), 3.96-4.16 (m, 1H), 4.16-4.18 (m, 2H), 6.79 (d, *J* = 7.9 Hz, 1H), 6.87-6.90 (m, 1H), 7.12-7.16 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 16.4, 27.3, 28.1, 49.9, 68.4, 71.5, 84.6, 111.4, 121.3, 126.9, 127.1, 131.0, 150.0, 156.4; HRMS Calculated for $C_{16}H_{25}NO_6S$ (M^+) 359.1403, found: 359.1412.

***tert*-Butyl-N-[(3-hydroxy-4-(naphthalen-2-yloxy)-butyl)-sulfonyl]-carbamate (10h):** White solid, Yield: 75%, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.51 (s, 9H), 2.14-2.21 (m, 2H), 2.54 (d, *J* = 4.6 Hz, 1H), 3.65-3.74 (m, 2H), 4.02 (dd, *J* = 6.7, 9.3 Hz, 1H), 4.13 (dd, *J* = 3.5, 9.4 Hz, 1H), 4.23-4.24 (m, 1H), 7.09-7.16 (m, 3H), 7.34-7.38 (m, 1H), 7.44-7.47 (m, 1H), 7.72-7.78 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 27.3, 28.2, 50.1, 68.3, 71.7, 84.8, 107.3, 118.7, 124.2, 126.8, 127.0, 127.9, 129.5, 129.9, 134.6, 149.8, 156.4; HRMS Calculated for $C_{19}H_{25}NO_6S$ (M^+) 395.1403, found: 395.1410.

***tert*-Butyl-N-[(3-hydroxy-4-(benzyloxy)-butyl)-sulfonyl]-carbamate (10i):** Yellow oil, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.48 (s, 9H), 1.92-2.00 (m, 2H), 2.85 (br, 1H), 3.37 (dd, *J* = 6.8, 9.5 Hz, 1H), 3.48-3.53 (m, 2H), 3.55-3.58 (m, 1H), 3.93-3.94 (m, 1H), 4.54 (s, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 27.2, 28.1, 49.8, 68.5, 73.6, 84.4, 128.0, 128.1, 128.7, 137.7, 150.1.

3-Phenyl-4,5-dihydro-isothiazole 1,1-Dioxide (11a):[7] White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.43-3.47 (m, 2H), 3.66-3.70 (m, 2H), 7.51-7.55 (m, 2H), 7.64-7.68 (m, 1H), 8.02-8.04 (m, 2H).

3-Methyl-4,5-dihydro-isothiazole 1,1-Dioxide (11b):[7] White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.34 (s, 3H), 3.19-3.23 (m, 2H), 3.25-3.29 (m, 2H).

3-*n*-Hexyl-4,5-dihydro-isothiazole 1,1-Dioxide (11c): White solid, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.88-0.91 (m, 3H), 1.31-1.38 (m, 6H), 1.70-1.74 (m, 2H), 2.53-2.57 (m, 2H), 3.17-3.20 (m, 2H), 3.23-3.26 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 14.2, 22.6, 25.5, 28.9, 31.5, 35.8, 36.9, 44.2, 185.5; HRMS Calculated for $C_7H_{12}NO_2S$ [M - C_2H_5]$^+$ 174.0589, found: 174.0585.

3-(Phenoxy-methyl)-4,5-dihydro-isothiazole 1,1-Dioxide (11d): White solid, Yield: 60%, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.27-3.31 (m, 2H), 3.39-3.43 (m, 2H), 4.99 (s, 2H), 6.92 (d, *J* = 8.5 Hz, 2H), 7.05 (t, *J* = 7.4 Hz, 1H), 7.32-7.36 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 34.3, 43.6, 67.7, 114.6, 122.7, 130.2, 157.4, 182.1; HRMS Calculated for $C_{10}H_{11}NO_3S$ (M^+) 225.0460, found: 225.0460.

3-[(4-Trifluoromethyl-phenoxy)methyl]-4,5-dihydro-isothiazole 1,1-Dioxide (11e): White solid, Yield: 65%, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.30-3.34 (m, 2H), 3.40-3.43 (m, 2H), 5.04 (s, 2H), 7.01 (d, *J* = 8.5 Hz, 2H), 7.61 (d, *J* = 8.5 Hz, 2H); ^{13}C NMR (100 MHz, d-DMSO): δ = 33.9, 43.6, 67.2, 115.2, 115.8, 121.8, 122.1, 123.1, 125.8, 127.0, 160.3, 182.8; HRMS Calculated for $C_{11}H_{10}NO_3SF_3$ (M^+) 293.0333, found: 293.0335.

3-[(4-Methyl-phenoxy)methyl]-4,5-dihydro-isothiazole 1,1-Dioxide (11f): White solid, Yield: 54%, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.30 (s, 3H), 3.26-3.29 (m, 2H), 3.37-3.41 (m, 2H), 4.96 (s, 2H), 6.80-6.82 (m, 2H), 7.12 (d, *J* = 8.4 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 20.7, 34.3, 43.6, 67.8, 114.5, 130.6, 132.1, 155.4, 182.5; HRMS (EI) Calculated for $C_{11}H_{13}NO_3S$: 239.0616, found: 239.0620.

3-[(2-Methyl-phenoxy)methyl]-4,5-dihydro-isothiazole 1,1-Dioxide (11g): White solid, ^{1}H

NMR (400 MHz, $CDCl_3$): δ = 2.27 (s, 3H), 3.27-3.31 (m, 2H), 3.42-3.45 (m, 2H), 4.99 (s, 2H), 6.77 (d, *J* = 8.5 Hz, 1H), 6.94-6.97 (m, 1H), 7.16-7.20 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 16.4, 34.4, 43.6, 67.7, 111.0, 122.3, 126.9, 127.4, 131.5,155.5, 182.4; HRMS Calculated for $C_{11}H_{13}NO_3S$ (M^+) 239.0616, found: 239.0619.

3-[(Naphthalen-2-yloxy)methyl]-4,5-dihydro-isothiazole 1,1-Dioxide (11h): Gray solid, Yield: 54%, ^1H NMR (400 MHz, $CDCl_3$): δ = 3.28-3.31 (m, 2H), 3.43-3.46 (m, 2H), 5.11 (s, 2H), 7.13 (d, *J* = 2.5 Hz, 1H), 7.18 (dd, *J* = 2.6, 8.9 Hz, 1H), 7.40-7.42 (m, 1H), 7.47-7.51 (m, 1H), 7.75-7.82 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 34.4, 43.7, 67.7, 107.3, 118.2, 124.9, 127.2, 127.3, 127.9, 129.8, 130.5, 134.4, 155.3, 182.0; HRMS Calculated for $C_{14}H_{13}NO_3S$ (M^+) 275.0616, found: 275.0618.

3-(Benzyloxy-methyl)-4,5-dihydro-isothiazole 1,1-Dioxide (11i): Yellowish solid, ^1H NMR (400 MHz, $CDCl_3$): δ = 3.19-3.23 (m, 2H), 3.26-3.30 (m, 2H), 4.42 (s, 2H), 4.62 (s, 2H), 7.32-7.40 (m, 5H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 34.3, 43.6, 69.6, 74.0, 128.2, 128.6, 128.9, 136.6, 183.3; HRMS Calculated for $C_{11}H_{13}NO$ $[M - SO_2]^+$ 175.0997, found: 175.1008.

Typical procedure for asymmetric hydrogenation of imines: (*S*)-SegPhos (2.9 mg, 0.0048 mmol) and $Pd(CF_3CO_2)_2$ (1.3 mg, 0.004 mmol) were placed in a dried Schlenk tube under nitrogen atmosphere, and degassed anhydrous acetone was added. The mixture was stirred at r.t. for 1 h. The solvent was removed under vacuum to give the catalyst. This catalyst was taken into a glove box filled with nitrogen and dissolved in dry TFE. To the mixture of imine (0.2 mmol) and 4A MS (50 mg if it was added) was added this catalyst solution, and then the mixture was transferred to an autoclave. The autoclave was stirred under directed condition (oil bath temperature was showed if it was heated). After release of the hydrogen, the autoclave was opened and the reaction mixture was evaporated. Conversion was directly determined by ^1H NMR spectroscopy. The enantiomeric excess was determined by HPLC after purification on silica gel using petroleum ether and EtOAc. Observingly, containing 1% Et_3N should be utilized, otherwise the remains on silica gel resulted in lower isolated yield for purification of *N*-(diphenylphosphinyl)amines. The absolute configuration was determined by comparison of rotation sign with literature data or by analogue.

A large scale experiments on the asymmetric hydrogenation of 11d (SCHEME 2 in text): (*S*)-SegPhos (60.4 mg, 0.099 mmol) and $Pd(CF_3CO_2)_2$ (29.9 mg, 0.09 mmol) were placed in a dried Schlenk tube under nitrogen atmosphere, and degassed anhydrous acetone (8 ml) was added. The mixture was stirred at r.t. for 2 h. The solvent was removed under vacuum to give the catalyst. This catalyst was taken into a glove box filled with nitrogen and dissolved in dry TFE (16 ml). To the mixture of **11d** (1.014 g, 4.5 mmol) was added this catalyst solution, and then the mixture was transferred to an autoclave. The autoclave was stirred at rt for 20 h. After release of the hydrogen, the autoclave was opened and the reaction mixture was evaporated. The residue was purified by flash column chromatography (petroleum ether / EtOAc: 1/1) to give **12d** (1.013 g, yield 99%, 93% ee). The obtained **12d** was recrystallized from 10 ml $EtOH/H_2O$ (3/2, V/V) to give the white solid (738 mg, yield 72%, >99% ee).

Racemates of aryl glycine **2f** were prepared by the reduction of the corresponding imines under 1 atm H_2 with 5% Pd/C at rt for 20 min. Racemates of *N*-(diphenylphosphinyl)amines **4** were prepared by the reduction of the corresponding imines using $NaBH_4$ in THF. Racemates of **2a,** *N*-tosylamines **6** and sultams **8, 12, 14** were prepared by the reduction of the corresponding imines using $NaBH_4$ in MeOH.

Preparation of complex $PdCl_2$-(S)-SYNPHOS:[11] $PdCl_2(CH_3CN)_2$ (77.8 mg, 0.3 mmol) was suspended in 5 mL of benzene. (S)-SYNPHOS (287 mg, 0.45mmol) was added and the mixture was stirred at room temperature. The yellow precipitate was collected by filtration and washed with Et_2O, and dried in vacuo: yield of $[Pd((S)\text{- SYNPHOS})][Cl]_2$ 242 mg (99%).

Preparation of complex $Pd(OTf)_2$-(S)-SYNPHOS:[12] The orange powder $[Pd((S)\text{-SYNPHOS})][Cl]_2$ (0.210 g, 0.257 mmol) was placed into a Schlenk flask equipped with a stirbar and dissolved in CH_2Cl_2 (16 mL). Then, 0.159 g (0.620 mmol) of AgOTf was added, and the resulting solution was stirred under nitrogen for 20 h at room temperature. The precipitate was filtered, and the filtrate was reduced in volume to about 3 mL in vacuo. Then 5 ul (0.334 mmol) of distilled water was added, followed by the addition 12 mL of Et_2O. The yellow precipitate was collected by filtration and washed with Et_2O and was dried in vacuo: yield of $[Pd((S)\text{-SYNPHOS})(H_2O)][OTf]_2$ 254 mg (93%).

4-Methoxy-N-(1-phenylethyl)benzenamine (2a):[13] Yellow oil, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.50 (d, *J* = 6.8 Hz, 3H), 3.69 (s, 3H), 4.40-4.42 (m, 1H), 6.46-6.48 (m, 2H), 6.68-6.70 (m, 2H), 7.22-7.25 (m, 1H), 7.29-7.37 (m, 4H); HPLC (Chiralcel OD-H column, hexane/*i*PrOH 97/3, 1.0 mL min^{-1}, 254 nm): t_1 = 10.3 min (R), t_2 = 11.4 min (S).

Ethyl 2-(4-methoxyphenylamino)-2-phenylacetate (2f):[14] Yellow oil, ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.20 (t, *J* = 7.2 Hz, 3H), 3.70 (s, 3H), 4.10-4.26 (m, 2H), 5.00 (s, 1H), 6.55 (d, *J* = 8.8 Hz, 2H), 6.72 (d, *J* = 8.8 Hz, 2H), 7.28-7.36 (m, 3H), 7.48-7.50 (m, 2H); HPLC (Chiralcel OJ-H column, hexane/*i*PrOH 70/30, 1.0 mL min^{-1}, 254 nm): t_1 = 21.2 min, t_2 = 24.1 min.

N-(1-Phenyl-ethyl)-diphenylphosphinamide (4a):[2,3] White solid, 95% *ee* (R), $[\alpha]^{26}_D$= +38.3 (*c* 0.54, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.58 (d, *J* = 6.7 Hz, 3H), 3.17 (dd, *J* = 5.9, 9.1 Hz, 1H), 4.36-4.43 (m, 1H), 7.26-7.45 (m, 11H), 7.80-7.85 (m, 2H), 7.89-7.93 (m, 2H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 12.9 min (R), t_2 = 24.4 min (S).

N-[1-(4-Methylphenyl)ethyl]-diphenylphosphinamide (4b):[3] White solid, 97% *ee* (S), $[\alpha]^8_D$= -66.5 (*c* 1.08, MeOH); R_f = 0.22 (PE/EtOAc, 2:1); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.56 (d, *J* = 6.8 Hz, 3H), 2.34 (s, 3H), 3.14-3.17 (m, 1H), 4.32-4.39 (m, 1H), 7.15 (dd, *J* = 8.0, 20.4 Hz, 4H), 7.37-7.48 (m, 6H), 7.81-7.91 (m, 4H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 11.4 min (R), t_2 = 15.8 min (S).

N-[1-(4-Methoxylphenyl)ethyl]-diphenylphosphinamide (4c):[3] White solid, 96% *ee* (S), $[\alpha]^8_D$= -66.4 (*c* 1.30, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.55 (d, *J* = 6.7 Hz, 3H), 3.12 (dd, *J* = 5.9, 9.4 Hz, 1H), 3.80 (s, 3H), 4.31-4.41 (m, 1H), 6.85 (d, *J* = 8.7Hz, 2H), 7.21 (d, *J* = 8.7 Hz, 2H), 7.37-7.48 (m, 6H), 7.81-7.91 (m, 4H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 15.9 min (R), t_2 = 26.8 min (S).

N-[1-(4-Fluorophenyl)ethyl]-diphenylphosphinamide (4d):[3] White solid, 94% *ee* (S), $[\alpha]^8_D$= -41.9 (*c* 1.04, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.55 (d, *J* = 6.8 Hz, 3H), 3.11 (dd, *J* = 5.9, 9.2 Hz, 1H), 4.35-4.42 (m, 1H), 6.98 (t, *J* = 8.7 Hz, 2H), 7.23-7.25 (m, 2H), 7.36-7.37 (m, 2H), 7.44-7.46 (m, 4H), 7.78-7.81 (m, 2H), 7.88-7.92 (m, 2H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 10.0 min (R), t_2 = 27.0 min (S).

N-[1-(4-Chlorophenyl)ethyl]-diphenylphosphinamide (4e):[3] White solid, 94% *ee* (S), $[\alpha]^8_D$= -73.4 (*c* 1.14, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.55 (d, *J* = 6.8 Hz, 3H), 3.17 (dd, *J*

= 5.7, 9.5 Hz, 1H), 4.33-4.40 (m, 1H), 7.24 (dd, *J* = 8.5, 23.0 Hz, 4H), 7.37-7.47 (m, 6H), 7.79 (dd, *J* = 7.0, 12.0, 2H), 7.90 (dd, *J* = 6.9, 11.9 Hz, 2H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 11.4 min (R), t_2 = 26.3 min (S).

N-[1-(3-Methoxylphenyl)ethyl]-diphenylphosphinamide (4f):[3] White solid, 96% *ee* (S), $[\alpha]^8_D$= -52.1 (*c* 1.32, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.57 (d, *J* = 6.8 Hz, 3H), 3.22 (dd, *J* = 5.9, 9.5 Hz, 1H), 3.78 (s, 3H), 4.31-4.39 (m, 1H), 6.82-6.88 (m, 3H), 7.21-7.23 (m, 1H), 7.36-7.47 (m, 6H), 7.80-7.93 (m, 4H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 14.5 min (R), t_2 = 29.4 min (S).

N-[1-(3-Methoxylphenyl)ethyl]-diphenylphosphinamide (4g):[3] White solid, 99% *ee* (S), $[\alpha]^8_D$= -22.1 (*c* 1.13, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.50 (d, *J* = 6.8 Hz, 3H), 3.69 (s, 3H), 3.87 (dd, *J* = 8.0, 10.5 Hz, 1H), 4.36-4.43 (m, 1H), 6.78-6.82 (m, 2H), 6.97 (s, 1H), 7.19 (t, *J* = 7.7 Hz, 1H), 7.33-7.38 (m, 6H), 7.72 (dd, *J* = 7.3, 11.9 Hz, 2H), 7.79 (dd, *J* = 7.1, 11.8 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 25.1, 49.6, 55.4, 111.2, 121.0, 128.3 (d, *J* = 7.0 Hz), 128.5, 131.7, 131.8, 128.1 (d, *J* = 108.6 Hz), 131.7, 131.8, 132.0 (d, *J* = 9.3 Hz), 132.8 (d, *J* = 9.4 Hz), 133.0, 133.1, 133.8 (d, *J* = 119.7 Hz), 157.0; ^{31}P NMR (162 MHz, $CDCl_3$): δ = 22.9; HRMS Calculated for $C_{21}H_{22}NO_2P$ (M+1) 352.1461, found 352.1451; HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 11.9 min (*R*), t_2 = 21.3 min (S).

N-(1-Naphthalen-1-yl-ethyl)-diphenylphosphinamide (4h):[2] White solid; ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.70 (d, *J* = 6.7 Hz, 3H), 3.35-3.38 (m, 1H), 5.23-5.25 (m, 1H), 7.26-7.27 (m, 2H), 7.41-7.51 (m, 7H), 7.62 (m, 1H), 7.74-7.78 (m, 3H), 7.86-7.93 (m, 4H).

N-(1-Naphthalen-2-yl-ethyl)-diphenylphosphinamide (4i):[2,3] White solid, 93% *ee* (S), $[\alpha]^8_D$= -77.8 (*c* 1.02, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.66 (d, *J* = 6.7 Hz, 3H), 3.27-3.31 (m, 1H), 4.51-4.61 (m, 1H), 7.32-7.33 (m, 2H), 7.43-7.48 (m, 7H), 7.65 (s, 1H), 7.80-7.83 (m, 5H), 7.93 (m, 2H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 21.6 min (R), t_2 = 27.7 min (S).

N-(1-Furylethyl)-diphenylphosphinamide (4j):[3] White solid, 87% *ee* (S), $[\alpha]^8_D$= -42.1 (*c* 0.60, CH_2Cl_2); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.60 (d, *J* = 6.8 Hz, 3H), 3.19 (dd, *J* = 6.6, 10.3 Hz, 1H), 4.38-4.44 (m, 1H), 6.13 (d, *J* = 3.2 Hz, 1H), 6.28 (dd, *J* = 1.9, 3.2 Hz, 1H), 7.35 (m, 1H), 7.42-7.49 (m, 6H), 7.87-7.95 (m, 4H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 12.1 min (R), t_2 = 17.0 min (S).

N-(1-Phenyl-propyl)-diphenylphosphinamide (4k):[3] White solid, 87% *ee* (S), $[\alpha]^8_D$= -38.5 (*c* 1.26, MeOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.79 (t, J = 7.4 Hz, 3H), 1.80-1.89 (m, 1H), 1.97-2.04 (m, 1H), 3.25 (dd, *J* = 6.4, 9.4 Hz, 1H), 4.08-4.11 (m, 1H), 7.14-7.16 (m, 2H), 7.23-7.33 (m, 5H), 7.42-7.44 (m, 4H), 7.73-7.87 (m, 4H); HPLC (Chiralpak AS-H column, hexane/*i*PrOH 80/20, 1.0 mL min^{-1}, 254 nm): t_1 = 9.6 min (R), t_2 = 17.7 min (S).

1-Phenyl-N-tosylethanamine (6a):[5] White solid, 96% *ee* (*S*), $[\alpha]^{15}_D$ = -63.7 (*c* 0.95, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.43 (d, *J* = 6.8 Hz, 3H), 2.39 (s, 3H), 4.44-4.48 (m, 1H), 4.77 (d, *J* = 6.7 Hz, 1H) 7.09-7.11 (m, 2H), 7.17-7.21 (m, 5H), 7.62 (d, *J* = 8.2 Hz, 2H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 1.0 mL min^{-1}, 254nm): t_1 = 6.4 min (*R*), t_2 = 7.4 min (*S*).

1-(4-Fluorophenyl)-N-tosylethanamine (6b):[5] White solid, 96% *ee* (*S*), $[\alpha]^{15}_D$ = -58.2 (*c* 1.02, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.39 (d, *J* = 6.9 Hz, 3H), 2.39 (s, 3H), 4.42-4.49 (m, 1H), 4.90 (d, *J* = 6.6 Hz, 1H), 6.87 (t, *J* = 8.7 Hz, 2H), 7.05-7.09 (m, 2H), 7.19 (d, *J* = 8.1 Hz, 2H), 7.60 (d, *J* = 8.2 Hz, 2H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 1.0 mL min^{-1}, 254nm): t_1 = 6.3 min (*R*), t_2 = 6.9 min (*S*).

1-(4-Methoxyphenyl)-N-tosylethanamine (6c):[5] White solid, 97% *ee* (*S*), $[\alpha]^{15}_{D}$ = -65.3 (*c* 0.75, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.40 (d, *J* = 6.8 Hz, 3H), 2.39 (s, 3H), 3.76 (s, 3H), 4.38-4.44 (m, 1H), 4.77 (br, 1H), 6.71-6.74 (m, 2H), 7.00-7.03 (m, 2H), 7.20 (d, *J* = 8.0 Hz, 2H), 7.62 (d, *J* = 8.0 Hz, 2H); HPLC (Chiralcel OJ-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 22.5 min (*S*), t_2 = 26.6 min (*R*).

1-(3-Methoxyphenyl)-N-tosylethanamine (6d):[5] Colorless oil, 93% *ee* (*S*), $[\alpha]^{15}_{D}$ = -46.5 (*c* 1.02, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.41 (d, *J* = 6.8 Hz, 3H), 2.38 (s, 3H), 3.69 (s, 3H), 4.39-4.46 (m, 1H), 4.98 (d, *J* = 6.9 Hz, 1H), 6.58 (t, *J* = 1.9 Hz, 1H), 6.69-6.72 (m, 2H), 7.11 (t, *J* = 7.9 Hz, 1H), 7.18 (d, *J* = 8.1 Hz, 2H), 7.62 (d, *J* = 8.2 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 21.7, 23.7, 53.8, 55.3, 111.9, 113.2, 118.6, 127.3, 129.6, 129.8, 137.8, 143.3, 143.8, 159.8; HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 9.2 min (*R*), t_2 = 10.2 min (*S*).

1-(2-Methoxyphenyl)-N-tosylethanamine (6e):[15] White solid, 94% *ee* (*S*), $[\alpha]^{15}_{D}$ = -33.8 (*c* 0.90, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.45 (d, *J* = 7.0 Hz, 3H), 2.31 (s, 3H), 3.70 (s, 3H), 4.50-4.58 (m, 1H), 5.50 (d, *J* = 9.5 Hz, 1H), 6.61 (t, *J* = 8.2 Hz, 1H), 6.73 (t, *J* = 7.4 Hz, 1H), 6.91 (dd, *J* = 1.5, 7.5 Hz, 1H), 7.03 (d, *J* = 8.1 Hz, 2H), 7.06-7.11 (m, 1H), 7.49 (d, *J* = 8.2 Hz, 2H); HPLC (Chiralcel OJ-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 13.6 min (*S*), t_2 = 15.5 min (*R*).

1-(Naphthalen-2-yl)-N-tosylethanamine (6f):[5] White solid, 95% *ee* (*S*), $[\alpha]^{15}_{D}$ = -53.8 (*c* 1.10, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.51 (d, *J* = 6.8 Hz, 3H), 2.24 (s, 3H), 4.60-4.67 (m, 1H), 4.90-4.95 (m, 1H), 7.03 (d, *J* = 8.1 Hz, 2H), 7.20 (dd, *J* = 1.6, 7.7 Hz, 1H), 7.43-7.46 (m, 3H), 7.57 (d, *J* = 8.2 Hz, 2H), 7.65-7.67 (m, 2H), 7.73-7.75 (m, 1H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 10.2 min (*R*), t_2 = 11.9 min (*S*).

1-Phenyl-N-tosylpropan-1-amine (6g):[5] White solid, 88% *ee* (*S*), $[\alpha]^{15}_{D}$ = -43.3 (*c* 0.70, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.78 (t, *J* = 7.4 Hz, 3H), 1.68-1.85 (m, 2H), 2.36 (s, 3H), 4.19 (q, *J* = 7.2 Hz, 1H), 4.76 (d, *J* = 6.5 Hz, 1H), 6.99-7.01 (m, 2H), 7.11 (d, *J* = 8.1 Hz, 2H), 7.14-7.16 (m, 3H), 7.53 (d, *J* = 8.2 Hz, 2H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 6.8 min (*R*), t_2 = 7.9 min (*S*).

3,3-Dimethyl-N-tosylbutan-2-amine (6h):[5] White solid, 91% *ee* (*S*), $[\alpha]^{15}_{D}$ = -28.5 (*c* 0.92, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.82 (s, 9H), 0.89 (d, *J* = 6.8 Hz, 3H), 2.43 (s, 3H), 3.02-3.09 (m, 1H), 4.12 (d, *J* = 9.6 Hz, 1H), 7.30 (d, *J* = 8.2 Hz, 2H), 7.76 (d, *J* = 8.2 Hz, 2H); HPLC (Chiralpak AS-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 8.6 min (*S*), t_2 = 11.5 min (*R*).

3-Methyl-1,2-benzisothiazoline 1,1-Dioxide (8a):[6a, 6c] White solid, 91% *ee* (*R*), $[\alpha]^{15}_{D}$ = 23.7 (*c* 0.90, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.62 (d, *J* = 6.6 Hz, 3H), 4.77 (br, 1H), 4.78-4.81 (m, 1H), 7.40 (d, *J* = 7.8 Hz, 1H), 7.53 (t, *J* = 7.5 Hz, 1H), 7.62-7.66 (m, 1H), 7.78 (d, *J* = 7.8 Hz, 1H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 12.4 min (*S*), t_2 = 15.2 min (*R*).

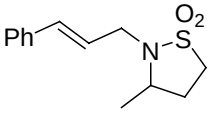
3-Butyl-1,2-benzisothiazoline 1,1-Dioxide (8b):[6c] White solid, 90% *ee* (*R*), $[\alpha]^{15}_{D}$ = 46.6 (*c* 1.12, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.92 (t, *J* = 7.2 Hz, 3H), 1.36-1.48 (m, 4H), 1.75-1.78 (m, 1H), 1.97-1.99 (m, 1H), 4.67-4.72 (m, 1H), 4.95 (br, 1H), 7.39 (d, *J* = 7.6 Hz, 1H), 7.52 (t, *J* = 7.4 Hz, 1H), 7.62(t, *J* = 7.6 Hz, 1H), 7.77 (d, *J* = 7.6 Hz, 1H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 9.2 min (*S*), t_2 = 16.1 min (*R*).

3-Benzyl-1,2-benzisothiazoline 1,1-Dioxide (8c):[6b, 6c] White solid, 88% *ee* (*R*), $[\alpha]^{15}_{D}$ = 42.3 (*c*

1.00, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.01 (dd, *J* = 9.6, 13.8 Hz, 1H), 3.28 (dd, *J* = 4.8, 13.8 Hz, 1H), 4.64 (d, *J* = 3.4 Hz, 1H), 4.86-4.91 (m, 1H), 7.27-7.37 (m, 6H), 7.55-7.62 (m, 2H), 7.80 (d, *J* = 7.6 Hz, 1H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 15.0 min (*S*), t_2 = 19.2 min (*R*).

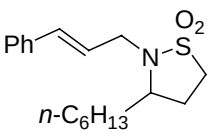
3-Phenyl-1,2-thiazolidine 1,1-Dioxide (12a):[16] White solid, 79% *ee* (*S*), $[\alpha]^{15}_D$ = -30.8 (*c* 0.46, EtOH); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.39-2.41 (m, 1H), 2.75-2.78 (m, 1H), 3.17-3.25 (m, 1H), 3.33-3.38 (m, 1H), 4.60 (br, 1H), 4.71-4.76 (m, 1H), 7.32-7.42 (m, 5H); HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 20.9 min (*S*), t_2 = 25.0 min (*R*).

3-Methyl-1,2-thiazolidine 1,1-Dioxide (12b): Colorless oil, 88% *ee* (*R*), $[\alpha]^{30}_D$ = 0.4 (*c* 0.60, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.34 (d, *J* = 6.3 Hz, 3H), 2.03-2.08 (m, 1H), 2.52-2.54 (m, 1H), 3.10-3.18 (m, 1H), 3.21-3.27 (m, 1H), 3.72-3.76 (m, 1H), 4.13 (br, 1H) ; ^{13}C NMR (100 MHz, $CDCl_3$): δ = 21.5, 32.0, 48.6, 51.1; HRMS Calculated for $C_4H_9NO_2S$ (M^+) 135.0354, found 135.0350. Ee of this product was determined by the analysis of products derived by the cinnamyl bromine.



N-Cinnamyl-3-Methyl-1,2-thiazolidine 1,1-Dioxide: To a solution of **12b** in THF was added sodium hydride (60% dispersion in mineral oil) at 0^{o}C. After the reaction mixture was stirred for 30 min at rt, the cinnamyl bromine (2 equiv.) was introduced. To accelerate the reaction, tetrabutylammonium bromide (TBAB) as PTC was added, and then the reaction was stirred overnight. The water was added, and the mixture was extracted with ether. The organic extracts were dried over Na_2SO_4 and concentrated. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc) to give a colorless oil: 88% *ee* (*R*), ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.26-1.29 (m, 3H), 1.97-2.03 (m, 1H), 2.42-2.44 (m, 1H), 3.04-3.08 (m, 1H), 3.24-3.27 (m, 1H), 3.49-3.52 (m, 1H), 3.79-3.85 (m, 1H), 3.95-3.99 (m, 1H), 6.21-6.28 (m, 1H), 6.59 (d, *J* = 15.9 Hz, 1H), 7.23-7.27 (m, 1H), 7.30-7.34 (m, 2H), 7.37-7.39 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 20.1, 27.5, 45.1, 46.8, 53.2, 124.5, 126.7, 128.2, 128.8, 134.2, 136.4; HRMS Calculated for $C_{13}H_{17}NO_2S$ (M^+) 251.0980, found 251.0973; HPLC (Chiralcel OJ-H column, iPrOH/hexane 30/70, 0.8 mL min^{-1}, 254nm): t_1 = 19.1 min (*S*), t_2 = 25.9 min (*R*).

3-Hexyl-1,2-thiazolidine 1,1-Dioxide (12c):[16b] White solid, 90% *ee* (*R*), $[\alpha]^{27}_D$ = 8.7 (*c* 1.02, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.85-0.89 (m, 3H), 1.27-1.39 (m, 8H), 1.51-1.63 (m, 2H), 2.02-2.10 (m, 1H), 2.46-2.52 (m, 1H), 3.05-3.13 (m, 1H), 3.17-3.23 (m, 1H), 3.53-3.59 (m, 1H), 4.36 (br, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 14.2, 22.7, 26.2, 29.1, 30.1, 31.8, 36.1, 48.2, 55.5; HRMS Calculated for $C_9H_{19}NO_2S$ (M^+) 205.1137, found: 205.1139. Ee of this product was determined by the analysis of products derived by the cinnamyl bromine.



N-Cinnamyl-3-Hexyl-1,2-thiazolidine 1,1-Dioxide: It was prepared in similar methods of **12b.** Colorless oil, 90% *ee* (*R*), $[\alpha]^{30}_D$ = -6.3 (*c* 1.06, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.84-0.87 (m, 3H), 1.26-1.37 (m, 8H), 1.46-1.49 (m, 1H), 1.73-1.79 (m, 1H), 2.01-2.08 (m, 1H), 2.37-2.43 (m, 1H), 2.96-3.04 (m, 1H), 3.20-3.27 (m, 1H), 3.37-3.41 (m, 1H), 3.82 (dd, *J* = 8.1, 15.8 Hz, 1H), 3.98 (dd, *J* = 5.4, 15.8 Hz, 1H), 6.20-6.27 (m, 1H), 6.58 (d, *J* = 15.8 Hz, 1H), 7.23-7.27 (m, 1H), 7.30-7.39 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 14.2, 22.7, 24.4, 25.0, 29.3, 31.8, 33.6, 45.8, 46.8, 57.2, 124.5, 126.7, 128.1, 128.8, 134.3, 136.4; HRMS Calculated for $C_{18}H_{27}NO_2S$ (M^+) 321.1763, found: 321.1762; HPLC (Chiralcel OJ-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1},

254nm): t_1 = 11.8 min (*S*), t_2 = 15.4 min (*R*).

3-Phenoxy-methyl-1,2-thiazolidine 1,1-Dioxide (12d): White solid, 92% *ee* (*S*), $[\alpha]^{30}_D$ = 14.1 (*c* 1.12, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.35-2.38 (m, 1H), 2.59-2.61 (m, 1H), 3.15-3.26 (m, 2H), 3.99-4.07 (m, 3H), 4.74 (br, 1H), 6.79 (d, *J* = 7.9 Hz, 2H), 7.00 (t, *J* = 7.4 Hz, 1H), 7.28-7.33 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 25.9, 47.5, 53.3, 69.6, 114.7, 121.9, 129.8, 158.1; HRMS Calculated for $C_{10}H_{13}NO_3S$ (M^+) 227.0616, found: 227.0619; HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 25.2 min (*R*), t_2 = 37.4 min (*S*).

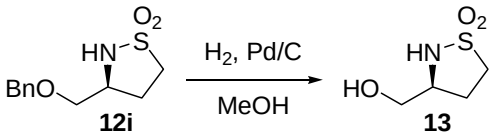
3-[(4-Trifluoromethyl-phenoxy)methyl]-1,2-thiazolidine 1,1-Dioxide (12e): White solid, 93% *ee* (*S*), $[\alpha]^{27}_D$ = 11.1 (*c* 1.04, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.35-2.38 (m, 1H), 2.64-2.66 (m, 1H), 3.14-3.21 (m, 1H), 3.26-3.30 (m, 1H), 4.05-4.11 (m, 3H), 4.75 (d, *J* = 4.9 Hz, 1H), 6.97 (d, *J* = 8.7 Hz, 2H), 7.57 (d, *J* = 8.7 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 25.7, 47.4, 53.1, 70.1, 114.7, 124.1 (q, *J* = 32 Hz), 124.4 (q, *J* = 270 Hz), 127.3 (d, *J* = 3 Hz), 160.6; HRMS Calculated for $C_{11}H_{12}NO_3SF_3$ (M^+) 295.0490, found: 295.0497; HPLC (Chiralcel OJ-H column, iPrOH/hexane 30/70, 0.8 mL min^{-1}, 254nm): t_1 = 17.6 min (*R*), t_2 = 19.6 min (*S*).

3-[(4-Methyl-phenoxy)methyl]-1,2-thiazolidine 1,1-Dioxide (12f): White solid, 91% *ee* (*S*), $[\alpha]^{27}_D$ = 11.1 (*c* 0.93, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.29 (s, 3H), 2.34-2.37 (m, 1H), 2.57-2.60 (m, 1H), 3.15-3.25 (m, 2H), 3.97-4.04 (m, 3H), 4.70 (d, *J* = 4.7 Hz, 1H), 6.77-6.80 (m, 2H), 7.09 (d, *J* = 8.5 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 20.7, 34.3, 43.6, 67.8, 114.5, 130.6, 132.1, 155.4, 182.5; HRMS Calculated for $C_{11}H_{15}NO_3S$ (M^+) 241.0773, found: 241.0772; HPLC (Chiralcel OJ-H column, iPrOH/hexane 30/70, 0.8 mL min^{-1}, 254nm): t_1 = 24.8 min (*R*), t_2 = 26.4 min (*S*).

3-[(2-Methyl-phenoxy)methyl]-1,2-thiazolidine 1,1-Dioxide (12g): White solid, 92% *ee* (*S*), $[\alpha]^{27}_D$ = 13.8 (*c* 1.14, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.22 (s, 3H), 2.34-2.41 (m, 1H), 2.60-2.64 (m, 1H), 3.14-3.28 (m, 2H), 4.01-4.03 (m, 3H), 4.82 (br, 1H), 6.78 (d, *J* = 8.4 Hz, 1H), 6.88-6.92 (m, 1H), 7.13-7.17 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 16.4, 25.9, 47.4, 53.4, 69.8, 111.2, 121.5, 126.9, 127.1, 131.1, 156.2; HRMS Calculated for $C_{11}H_{15}NO_3S$ (M^+) 241.0773, found: 241.0781; HPLC (Chiralcel OD-H column, iPrOH/hexane 30/70, 0.8 mL min^{-1}, 254nm): t_1 = 14.1 min (*R*), t_2 = 17.1 min (*S*).

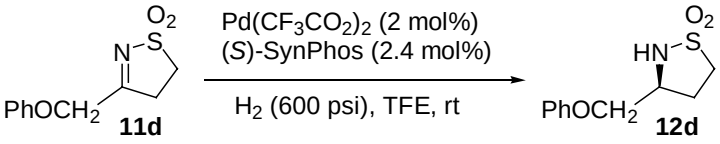
3-[(Naphthalen-2-yloxy)methyl]-1,2-thiazolidine 1,1-Dioxide (12h): White solid, 90% *ee* (*S*), $[\alpha]^{27}_D$ = 1.9 (*c* 0.99, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.35-2.40 (m, 1H), 2.59-2.63 (m, 1H), 3.15-3.21 (m, 1H), 3.24-3.28 (m, 1H), 4.04-4.07 (m, 1H), 4.10-4.15 (m, 2H), 4.83 (d, *J* = 5.9 Hz, 1H), 7.12-7.14 (m, 2H), 7.35-7.38 (m, 1H), 7.44-7.47 (m, 1H), 7.71-7.78 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 25.9, 47.5, 53.3, 69.8, 107.2, 118.5, 124.3, 126.8, 127.0, 127.9, 129.5, 129.9, 134.5, 156.0; HRMS Calculated for $C_{14}H_{15}NO_3S$ (M^+) 277.0773, found: 277.0778; HPLC (Chiralcel OD-H column, iPrOH/hexane 30/70, 0.8 mL min^{-1}, 254nm): t_1 = 35.1 min (*S*), t_2 = 40.7 min (*R*).

3-(Benzyloxy-methyl)-1,2-thiazolidine 1,1-Dioxide (12i): Colorless oil, 86% *ee* (*S*), $[\alpha]^{30}_D$ = 10.5 (*c* 1.12, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.19-2.25 (m, 1H), 2.43-2.47 (m, 1H), 3.10-3.16 (m, 2H), 3.49-3.52 (m, 1H), 3.57-3.60 (m, 1H), 3.77-3.78 (m, 1H), 4.55 (s, 2H), 4.64 (d, *J* = 5.2 Hz, 1H), 7.30-7.38 (m, 5H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 26.1, 47.6, 53.9, 71.6, 73.6, 128.0, 128.2, 128.8, 137.5; HRMS Calculated for $C_{11}H_{15}NO_3S$ (M^+) 241.0773, found: 241.0782; HPLC (Chiralcel OD-H column, iPrOH/hexane 20/80, 0.8 mL min^{-1}, 254nm): t_1 = 19.2 min (*R*), t_2 = 24.6 min (*S*).



3-Hydroxymethyl-1,2-thiazolidine 1,1-Dioxide (13): To a solution of (S)-**12i** (52mg, 0.22mmol, 86% *ee*) in MeOH (2 ml) was added 5% Pd/C (104 mg, 50% H_2O) (the reaction can be carried out in the air without special handling). The mixture was transferred to an autoclave, was stirred under 10 atm of hydrogen at rt for 4h. After release of the hydrogen, the autoclave was opened and the reaction mixture was passed on a short silica gel column. The solvent was removedand gave **13** as a colorless oil (31 mg, 95%). 86% *ee* (*S*), $[\alpha]^{29}_{D}$ = 12.8 (*c* 0.75, $CHCl_3$); ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.25-2.35 (m, 1H), 2.37 (br, 1H), 2.45-2.53(m, 1H), 3.09-3.16 (m, 1H), 3.22-3.28 (m, 1H), 3.61-3.66 (m, 1H)∟3.76-3.81 (m, 2H), 4.77 (br, 1H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 25.0, 47.9, 55.7, 64.6; HRMS Calculated for $C_4H_9NO_3SNa$ $[M + Na]^+$ 174.0201, found: 174.0209.

The experimental details of non linear effects:

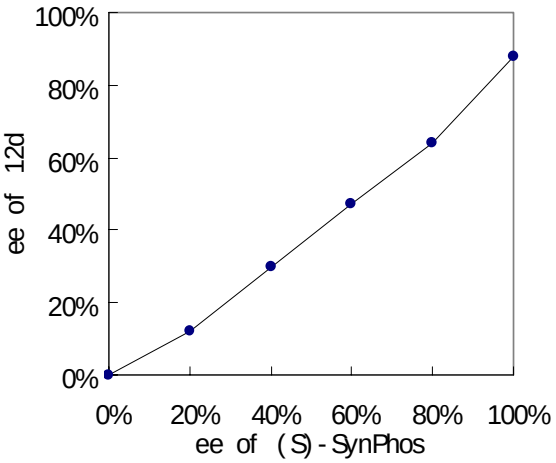


(S)-SynPhos solution(3.8 mg/2.0 ml): 19.0 mg (S)-SynPhos in 10.0 ml acetone

(R)-SynPhos solution (3.8 mg/2.0 ml): 9.5 mg (R)-SynPhos in 5.0 ml acetone

Preparation of catalyst: X ml (S)-SynPhos solution and Y ml (R)-SynPhos solution were placed in a dried Schlenk tube under nitrogen atmosphere, and stirred for a few minutes. Then $Pd(CF_3CO_2)_2$ (1.7 mg, 0.005 mmol) was added and the mixture was stirred at rt for 1h. The solvent was removed under vacuum to give the corresponding catalyst.

Entry	*(S)-SynPhos ee*	*X / Y*	***12d** ee*
1	100%	-	88%
2	80%	1.80 / 0.20	64%
3	60%	1.60 / 0.40	47%
4	40%	1.40 / 0.60	30%
5	20%	1.20 / 0.80	12%
Conversion all are >95%			



12d ee (Y axis) versus ligand ee (X axis)
for the hydrogenation reaction of **11d** using (S)-SynPhos as ligand

Reference

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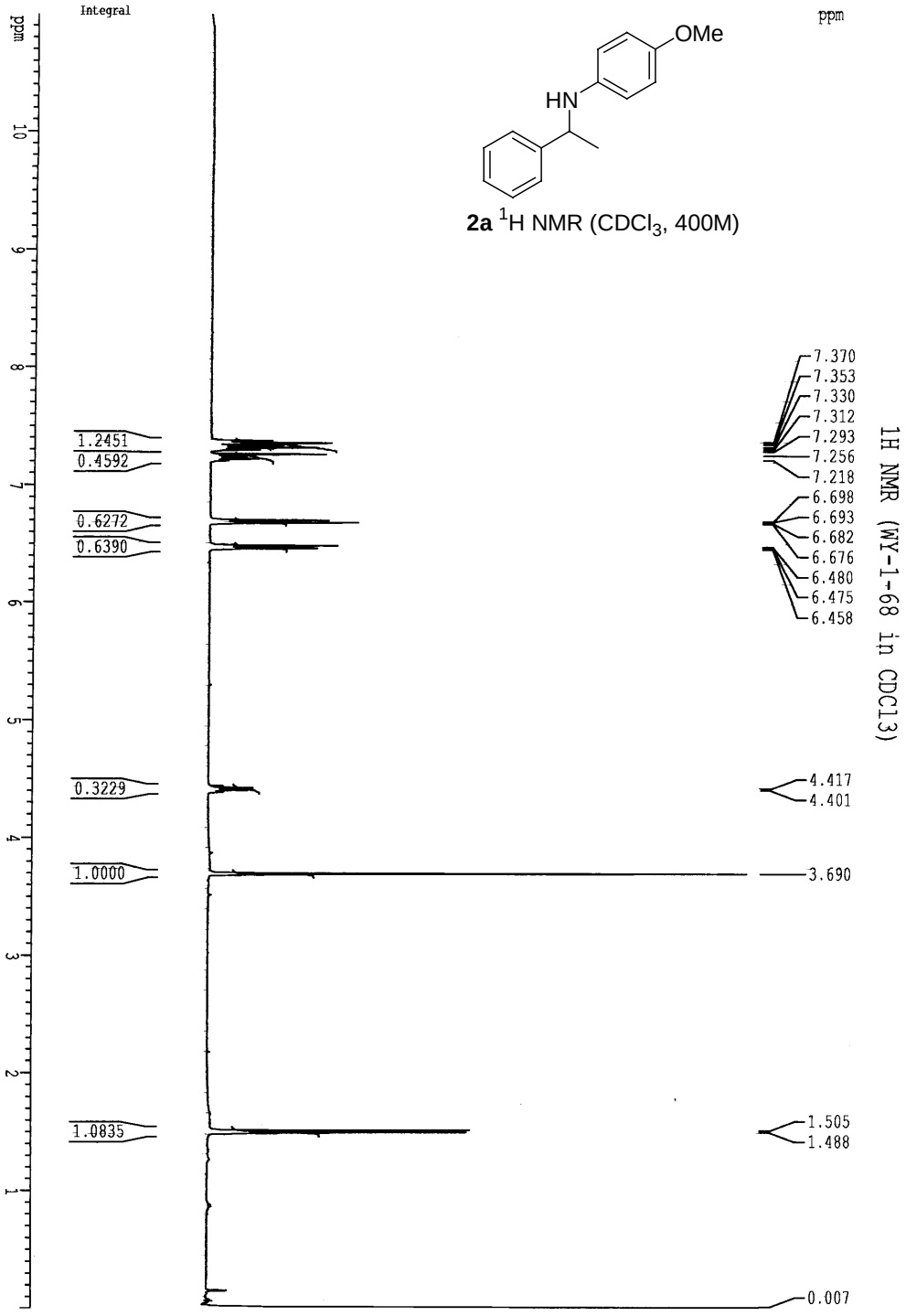
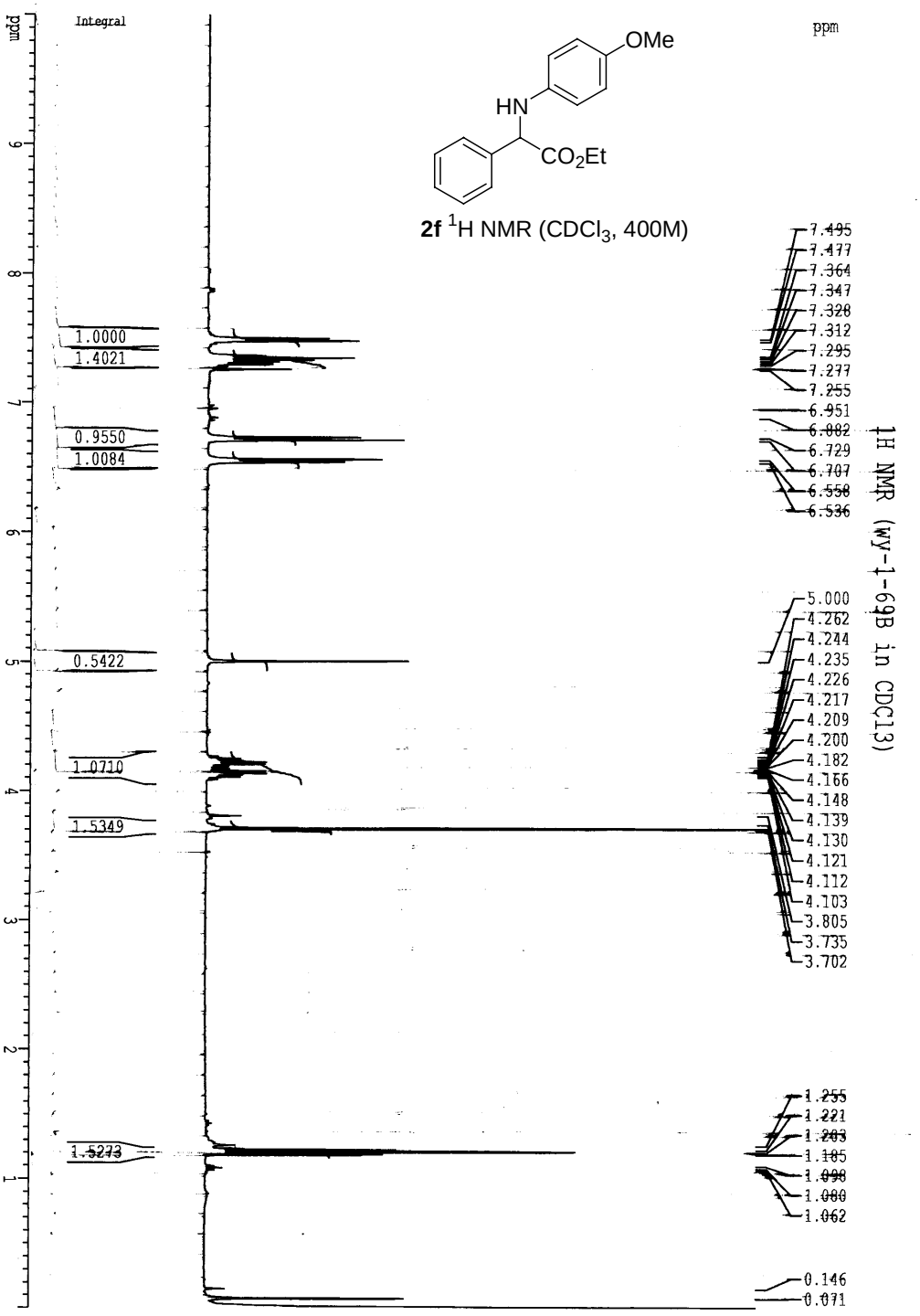


2a ^{1}H NMR ($CDCl_3$, 400M)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OMe
HN
CO2Et
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1.5349
1.5273
7.495
7.477
7.364
7.347
7.328
7.312
7.295
7.277
7.255
6.951
6.882
6.729
6.707
6.558
6.536
5.000
4.262
4.244
4.235
4.226
4.217
4.209
4.200
4.182
4.166
4.148
4.139
4.130
4.121
4.112
4.103
3.805
3.735
3.702
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1.221
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1.185
1.098
1.080
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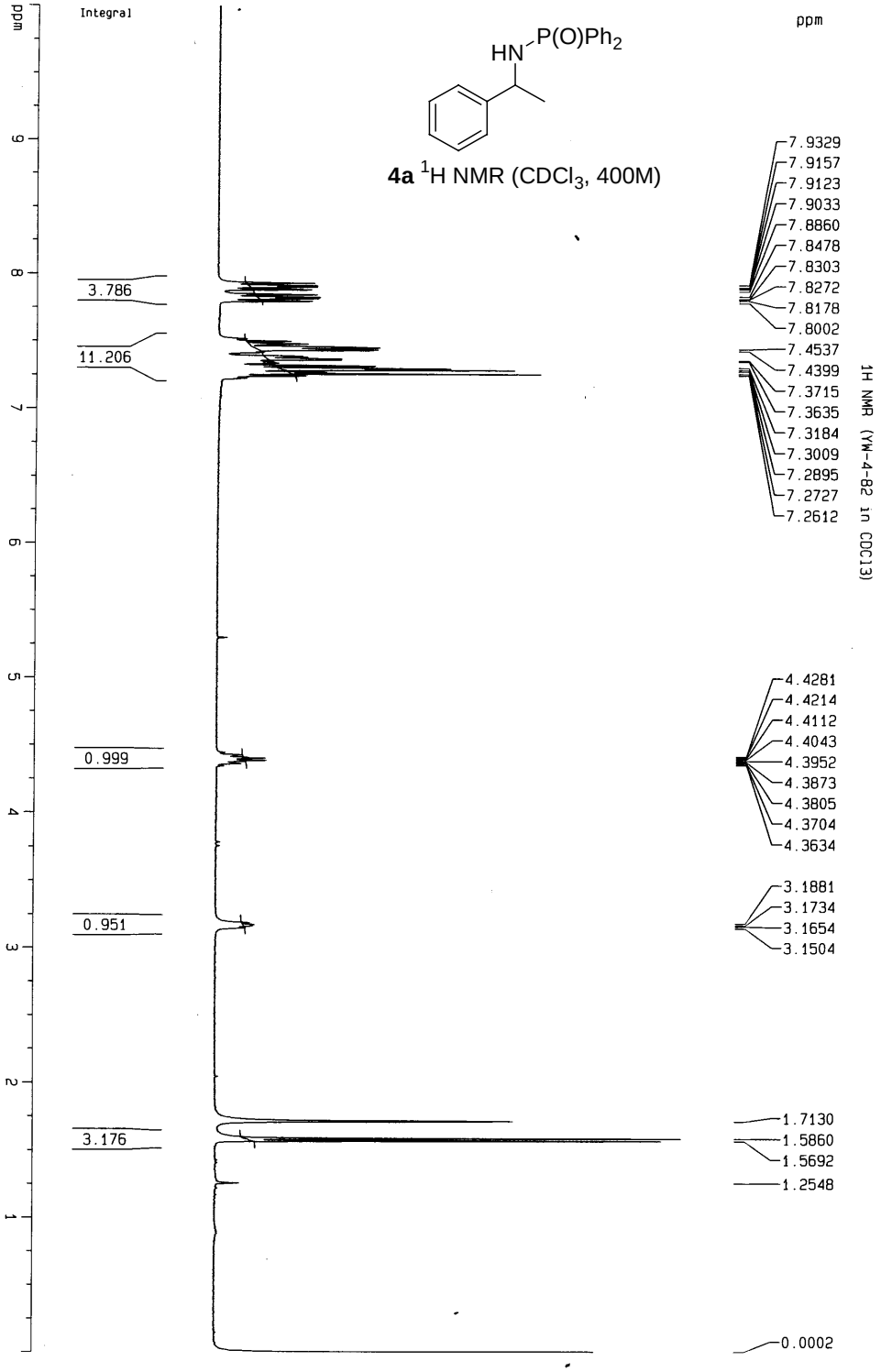
0.071
1H NMR (wy-1-69B in CDCl3)


Integral
ppm
HN
P(O)Ph2
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0.999
0.951
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7.9157
7.9123
7.9033
7.8860
7.8478
7.8303
7.8272
7.8178
7.8002
7.4537
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7.3715
7.3635
7.3184
7.3009
7.2895
7.2727
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4.4214
4.4112
4.4043
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4.3704
4.3634
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3.1734
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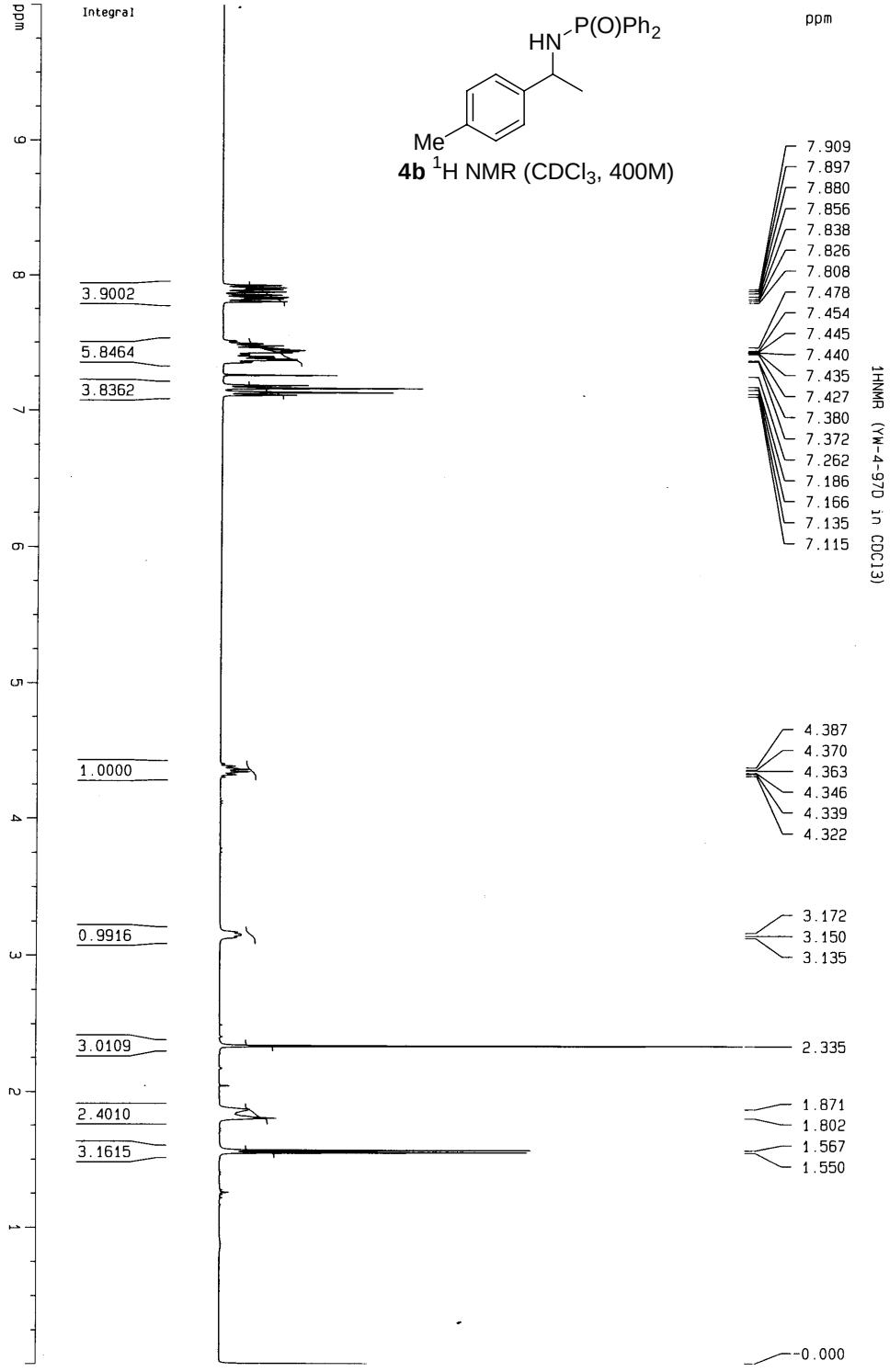
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P(O)Ph2
Me
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3.0109
2.4010
3.1615
7.909
7.897
7.880
7.856
7.838
7.826
7.808
7.478
7.454
7.445
7.440
7.435
7.427
7.380
7.372
7.262
7.186
7.166
7.135
7.115
4.387
4.370
4.363
4.346
4.339
4.322
3.172
3.150
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2.335
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1.802
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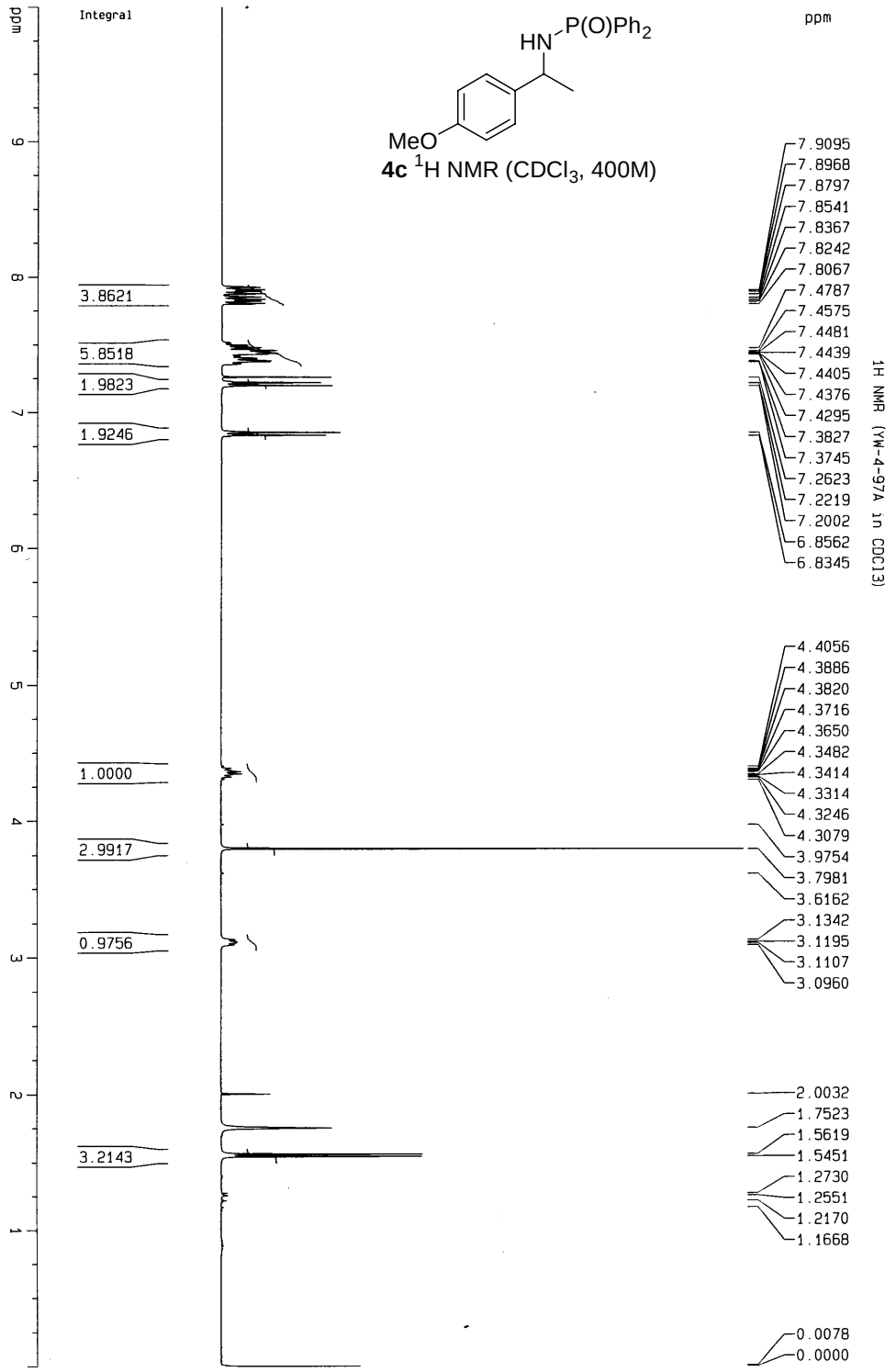
0.000
1HNMR (YW-4-97D in CDCl3)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ppm
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MeO
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7.8541
7.8367
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4.3820
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4.3314
4.3246
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3.9754
3.7981
3.6162
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3.0960
2.0032
1.7523
1.5619
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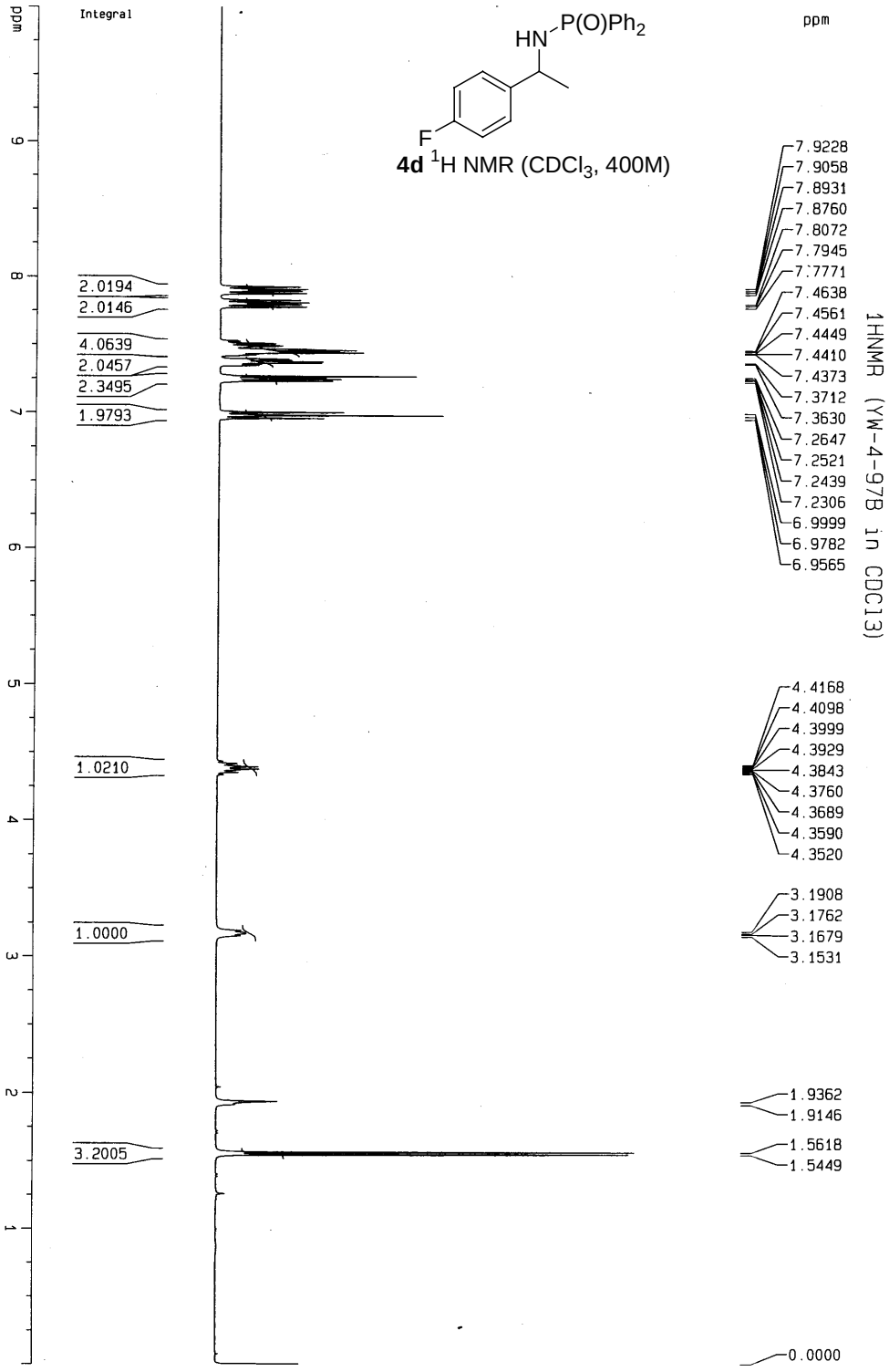
0.0000
1H NMR (YW-4-97A in CDCl3)


Integral
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P(O)Ph2
F
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1.0210
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7.9058
7.8931
7.8760
7.8072
7.7945
7.7771
7.4638
7.4561
7.4449
7.4410
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7.3712
7.3630
7.2647
7.2521
7.2439
7.2306
6.9999
6.9782
6.9565
4.4168
4.4098
4.3999
4.3929
4.3843
4.3760
4.3689
4.3590
4.3520
3.1908
3.1762
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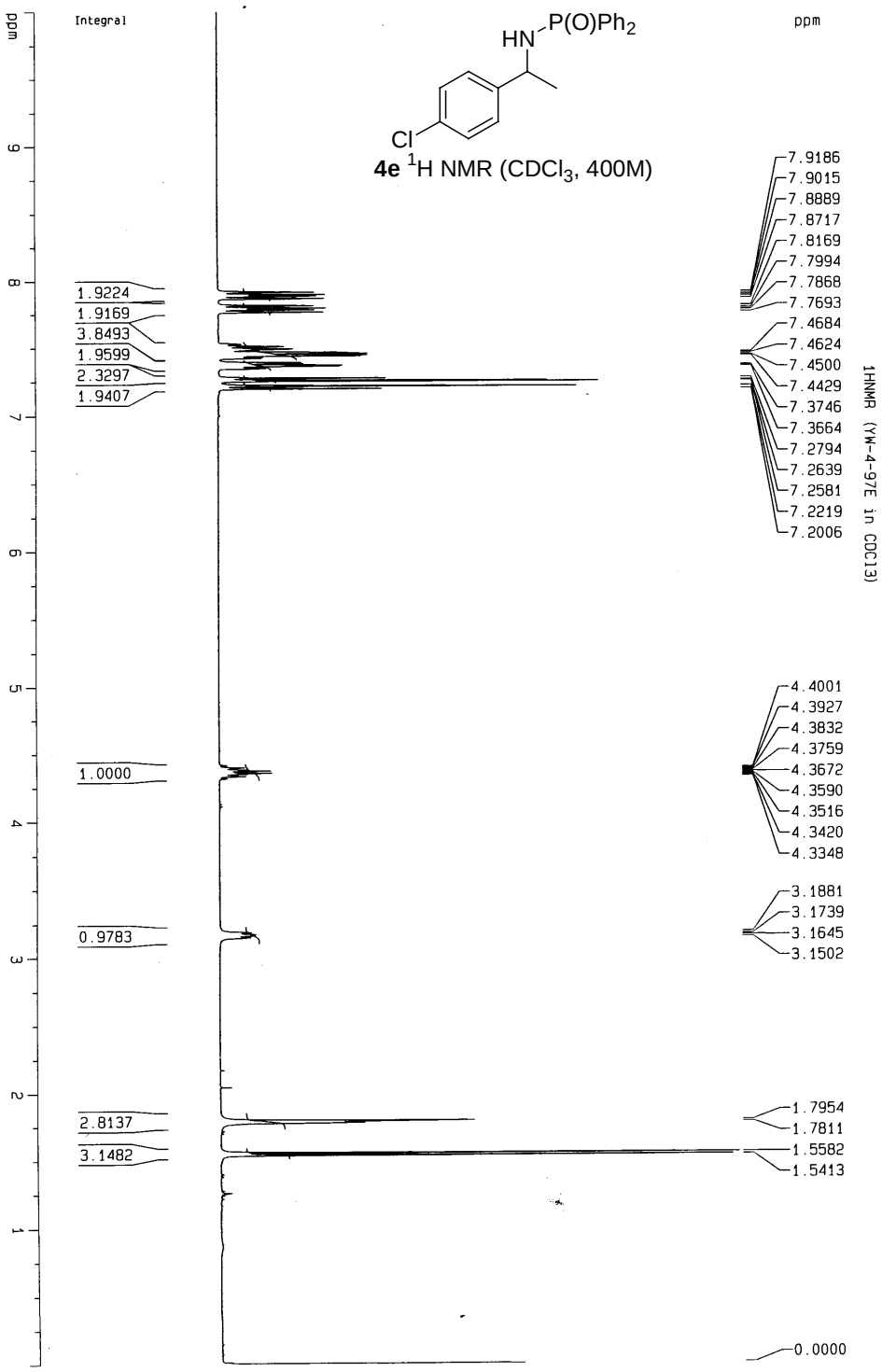
1.5449
0.0000
1HNMR (YW-4-97B in CDCl3)


Integral
ppm
HN
P(O)Ph2
Cl
4e 1H NMR (CDCl3, 400M)
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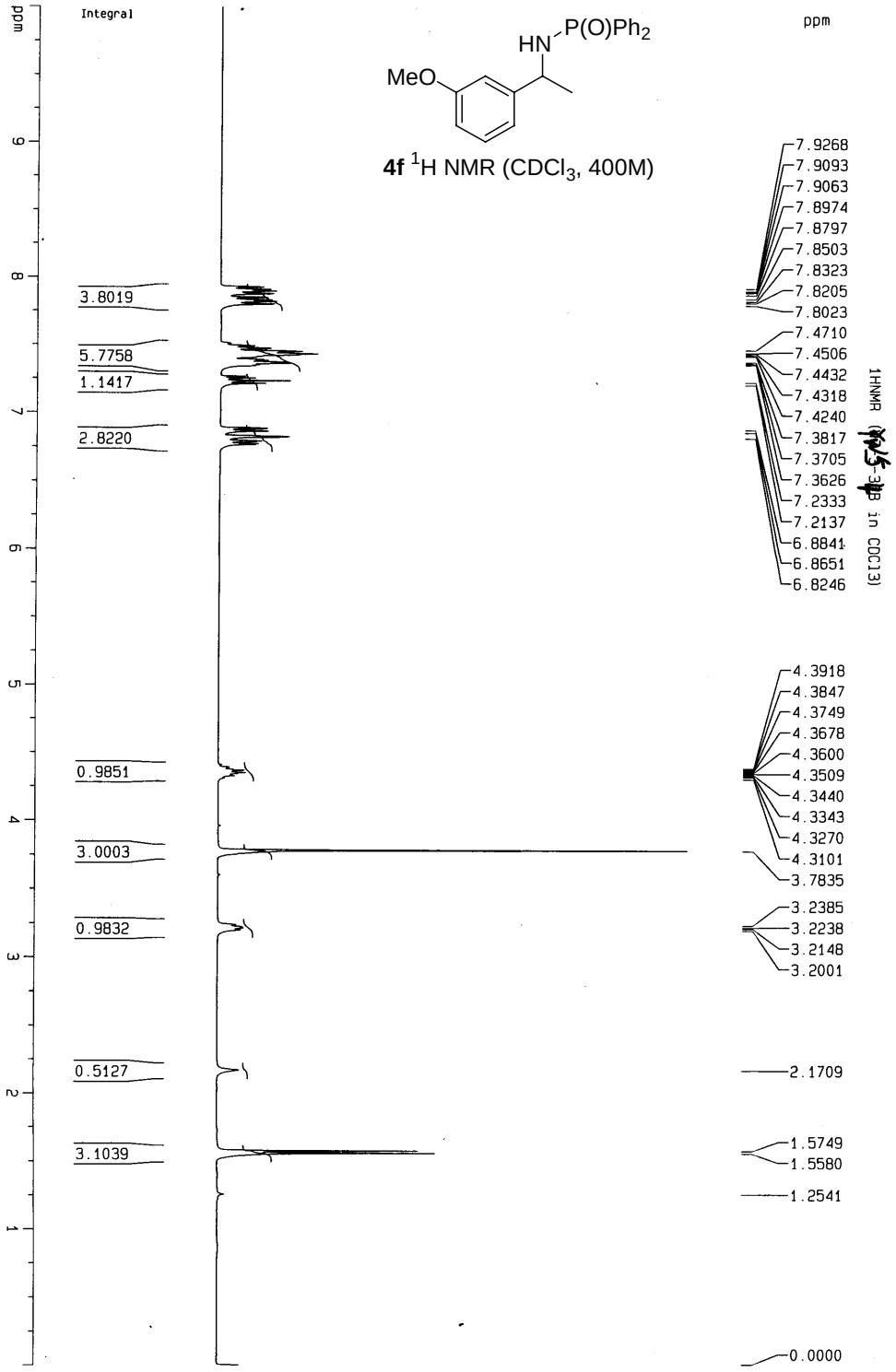
1HNMR (YW-4-97E in CDCl3)


Integral
ppm
HN
P(O)Ph2
MeO
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0.9832
0.5127
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7.9093
7.9063
7.8974
7.8797
7.8503
7.8323
7.8205
7.8023
7.4710
7.4506
7.4432
7.4318
7.4240
7.3817
7.3705
7.3626
7.2333
7.2137
6.8841
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6.8246
4.3918
4.3847
4.3749
4.3678
4.3600
4.3509
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4.3343
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4.3101
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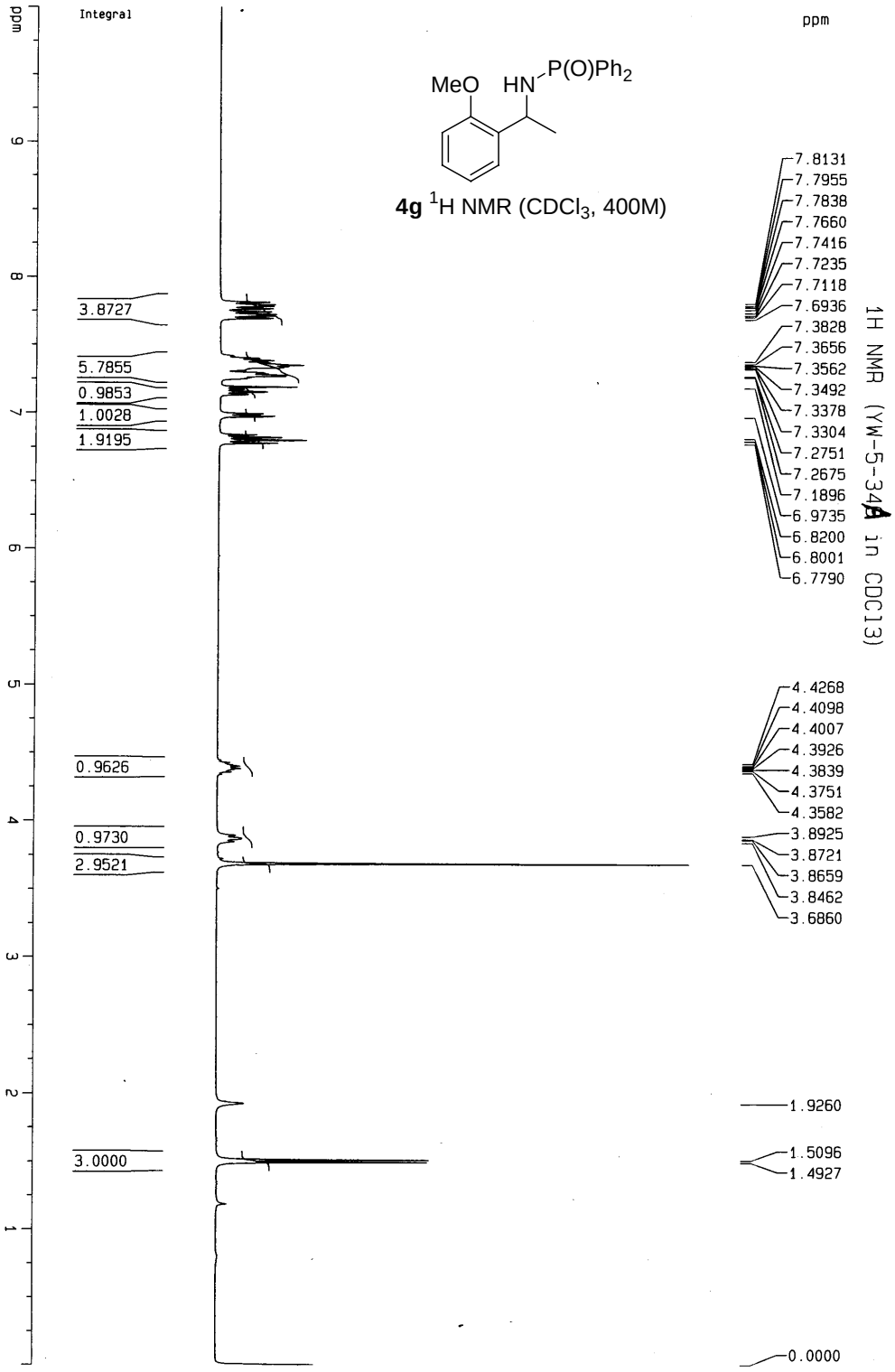
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3.0000
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7.7955
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7.7416
7.7235
7.7118
7.6936
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7.3656
7.3562
7.3492
7.3378
7.3304
7.2751
7.2675
7.1896
6.9735
6.8200
6.8001
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4.4098
4.4007
4.3926
4.3839
4.3751
4.3582
3.8925
3.8721
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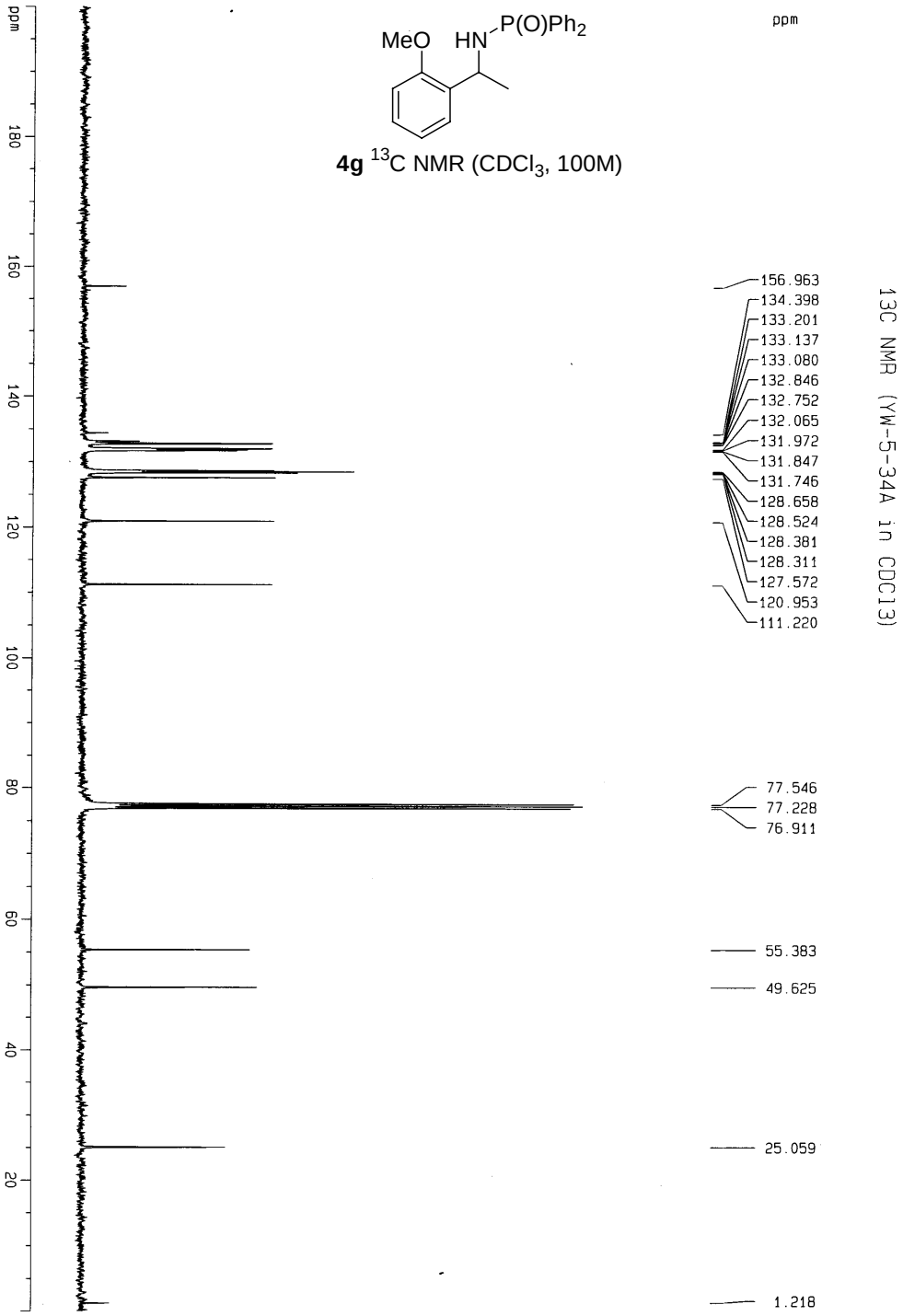
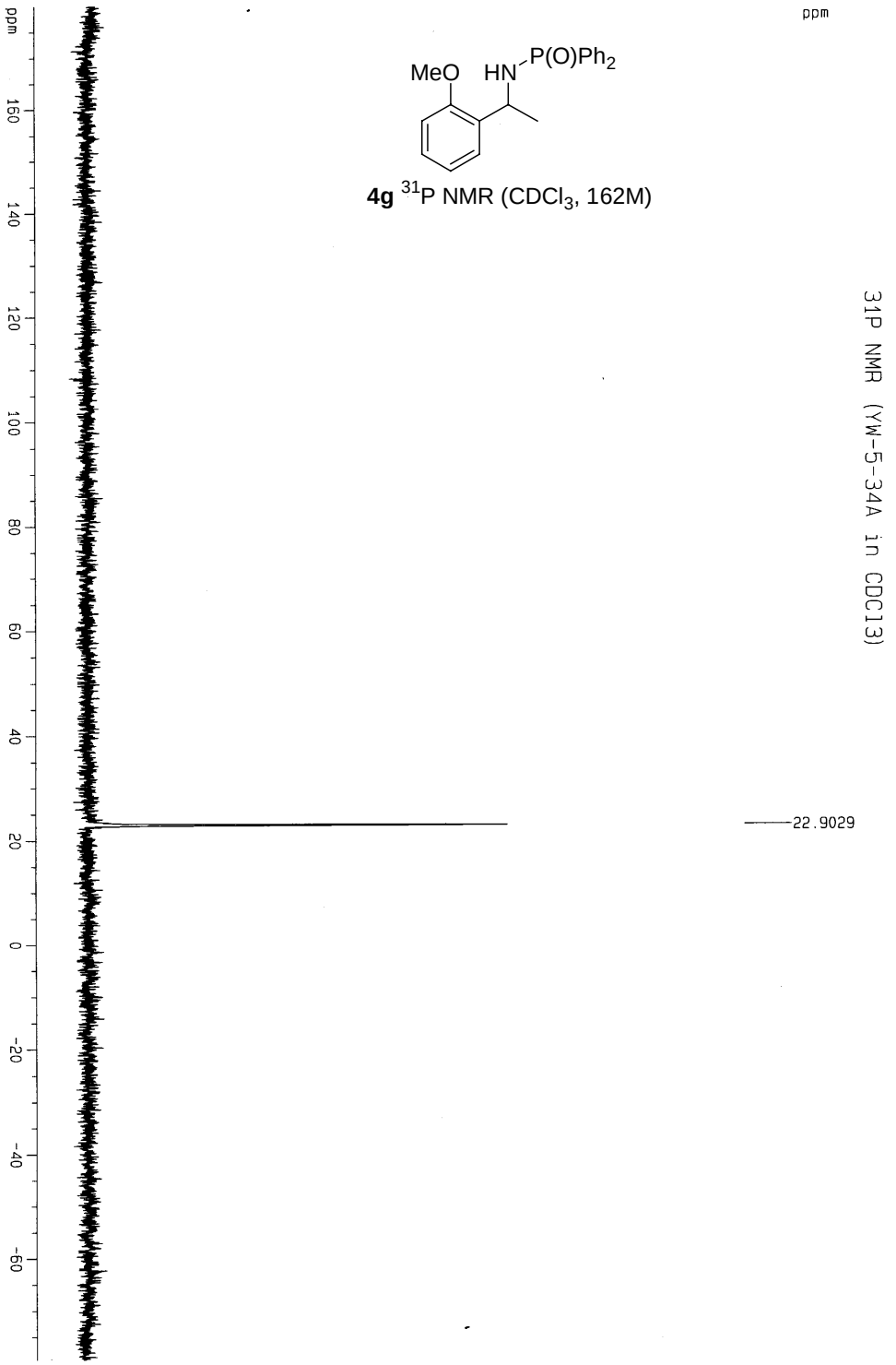
1H NMR (YW-5-34A in CDCl3)

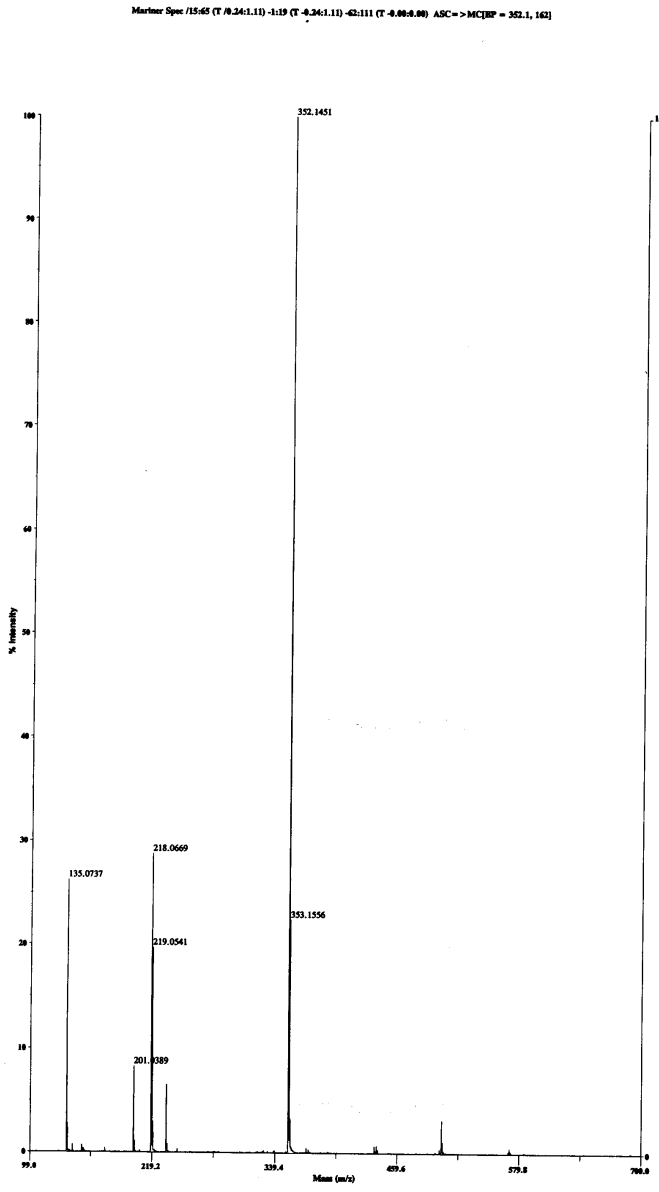


4g ^{13}C NMR ($CDCl_3$, 100M)



4g ^{31}P NMR ($CDCl_3$, 162M)

Applied Biosystems Mariner System 5303



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Curtain Gas	ON
Nebulizer Gas	ON
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Calibration Constant B	68.020555
TDC Deadtime	10
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Spray Tip Potential	4988.67
SCIEX Heater	300.05
--> API Interface Settings <--	
Nozzle Potential	90.09
Skimmer 1 Potential	10.01
Quadrupole DC Potential	6.01
Deflection Voltage	0.29
Einzel Lens Potential	-25.00
Quadrupole RF Voltage	999.76
Quadrupole Temperature	140.01
Nozzle Temperature	140.01
--> Analyzer Settings <--	
Push Pulse Potential	499.97
Pull Pulse Potential	198.94
Pull Bias Potential	10.00
Acceleration Potential	3999.94
Reflector Potential	1549.99
Detector Voltage	1750.06
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Ion Count Threshold	0.00
First Mass	100.00
Last Mass	700.00
Accumulate Spectra	OFF
Standby at End of Acquisition	OFF
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--> System Settings <--	
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Syringe Pump Mode	Disabled
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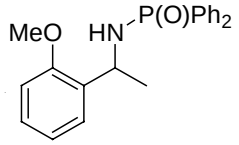

4g HRMS

Acquired: Nov 07 09:05:00 2005
Mariner Mass Spectrum
E:\WF2\WYQ\05-11-07\YW-5-34A-001.dat

Printed: 13:27, November 08, 2005

File Name: YW-5-34A-001

Trace: Mariner Spec /15:65 (T /0.24:1.11) -1:19 (T -0.24:1.11) -62:111 (T -0.00:0.00) ASC=>MC[B

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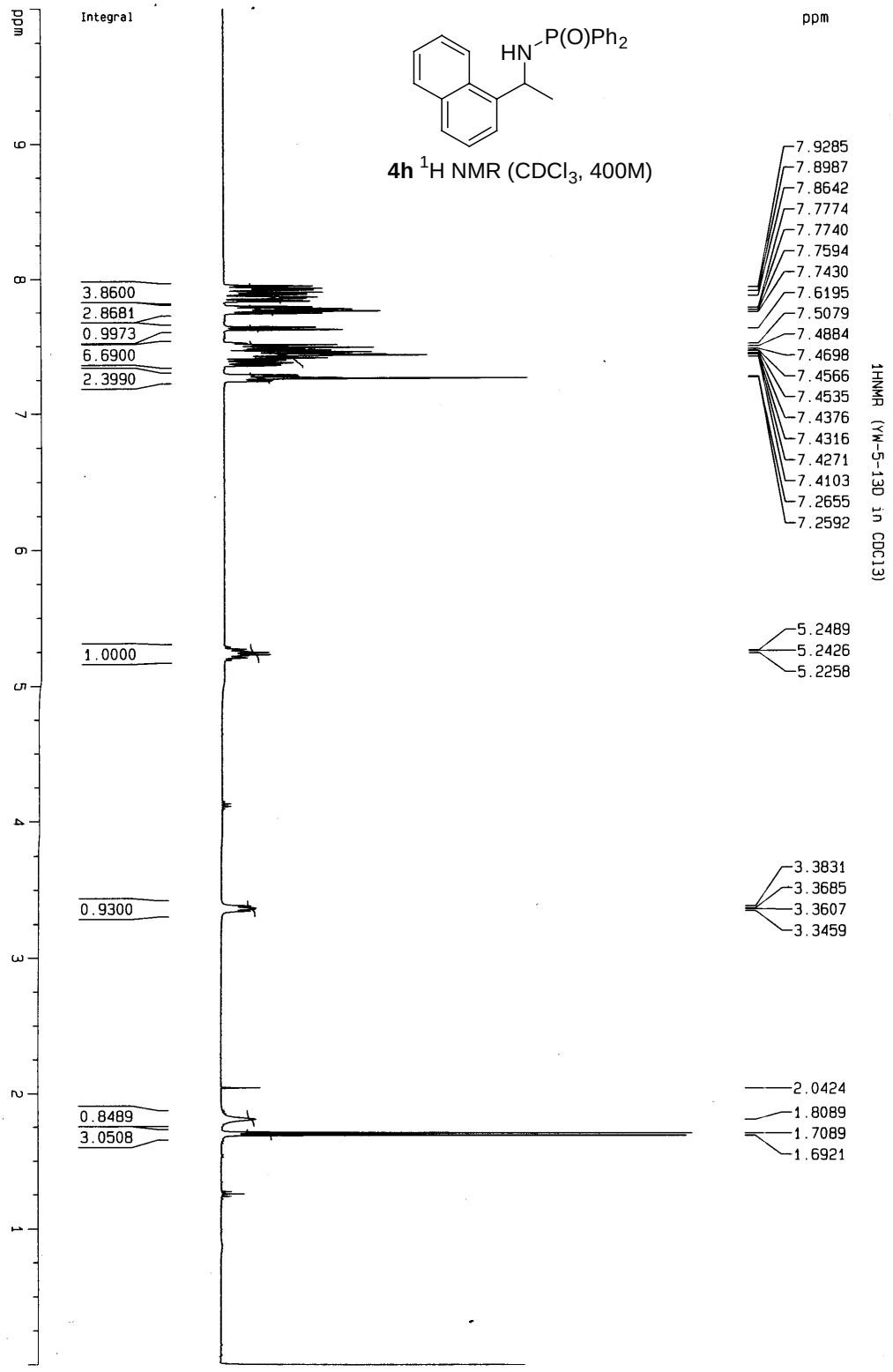
2	352.14512	352.14609	-0.97402	-2.76597	11.50	C21 H23 N O2 P
3	352.14512	352.14391	1.20879	3.43265	5.50	C2 H15 N19 O P
4	352.14512	352.14660	-1.47660	-4.19315	4.50	C6 H19 N13 O3 P
5	352.14512	352.14341	1.71137	4.85983	12.50	C17 H19 N7 P
6	352.14512	352.14257	2.54610	7.23026	0.50	C H19 N15 O5 P
7	352.14512	352.14207	3.04868	8.65744	7.50	C16 H23 N3 O4 P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1.0000
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7.8987
7.8642
7.7774
7.7740
7.7594
7.7430
7.6195
7.5079
7.4884
7.4698
7.4566
7.4535
7.4376
7.4316
7.4271
7.4103
7.2655
7.2592
5.2489
5.2426
5.2258
3.3831
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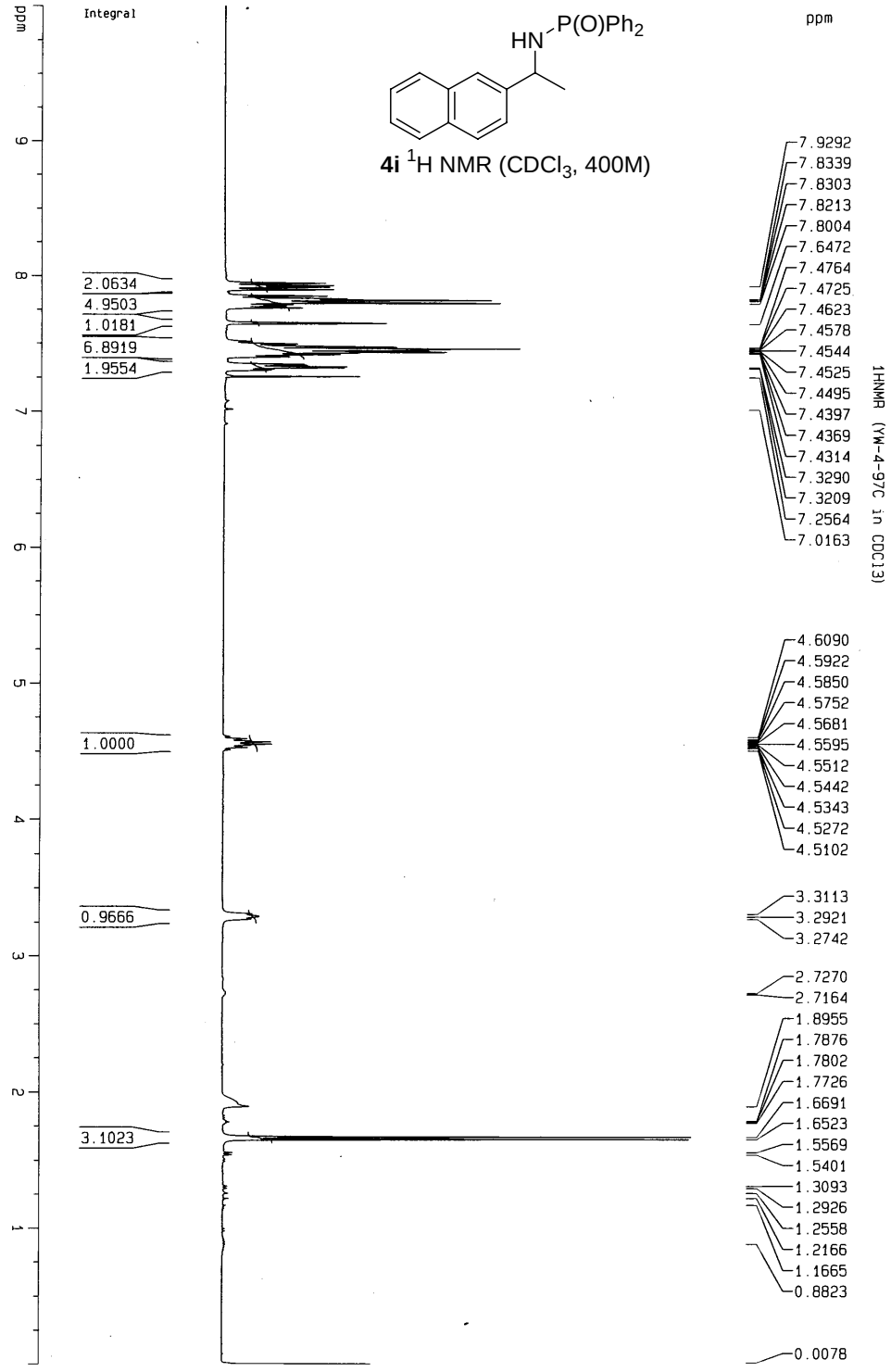
1.7089
1.6921
1HNMR (YW-5-13D in CDCl3)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7.8213
7.8004
7.6472
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7.4725
7.4623
7.4578
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4.5681
4.5595
4.5512
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4.5272
4.5102
3.3113
3.2921
3.2742
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1.7876
1.7802
1.7726
1.6691
1.6523
1.5569
1.5401
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1.2558
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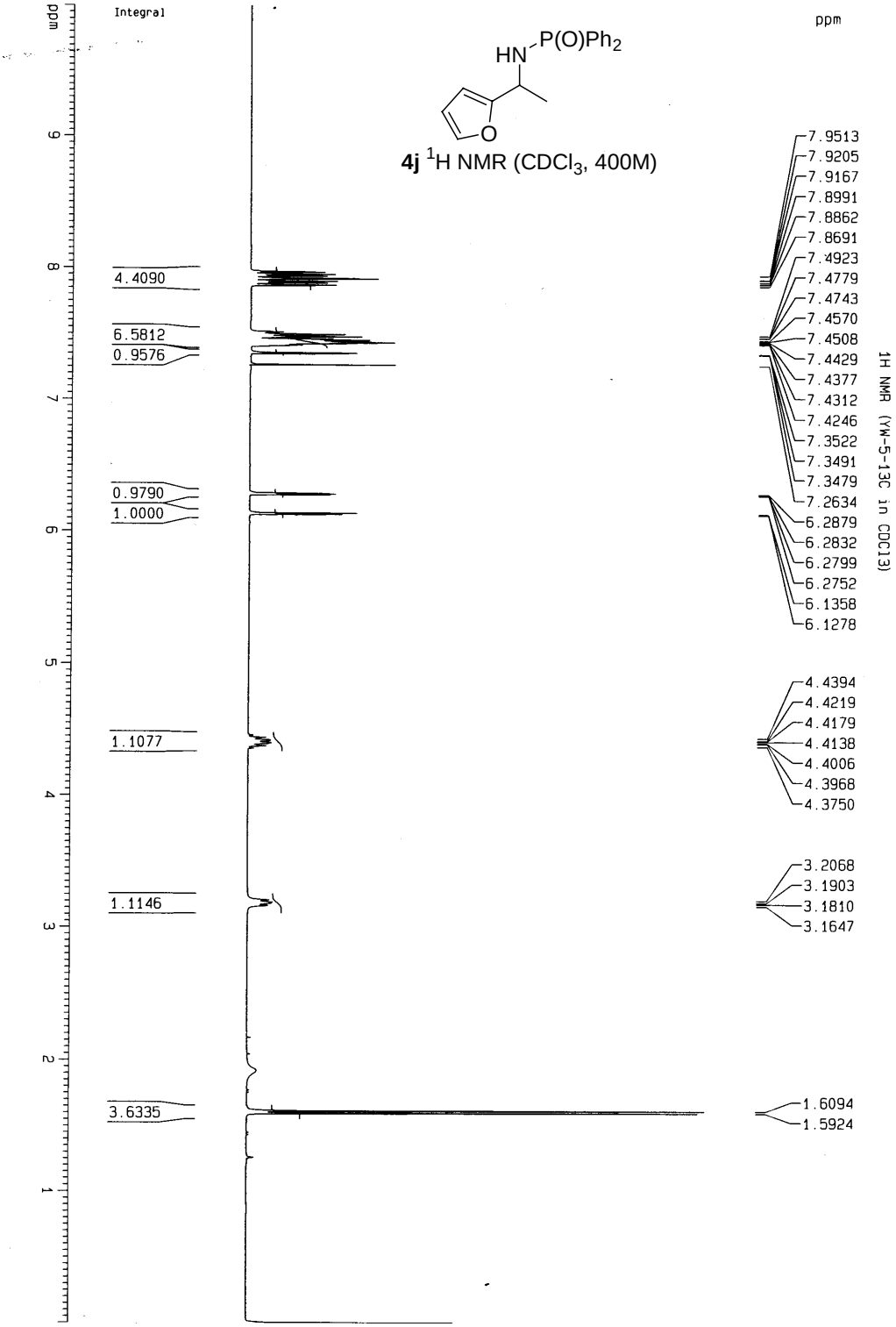
1HNMR (YW-4-97C in CDCl3)


Integral
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P(O)Ph2
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7.9205
7.9167
7.8991
7.8862
7.8691
7.4923
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7.4743
7.4570
7.4508
7.4429
7.4377
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7.3491
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6.2799
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6.1278
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4.4219
4.4179
4.4138
4.4006
4.3968
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3.1647
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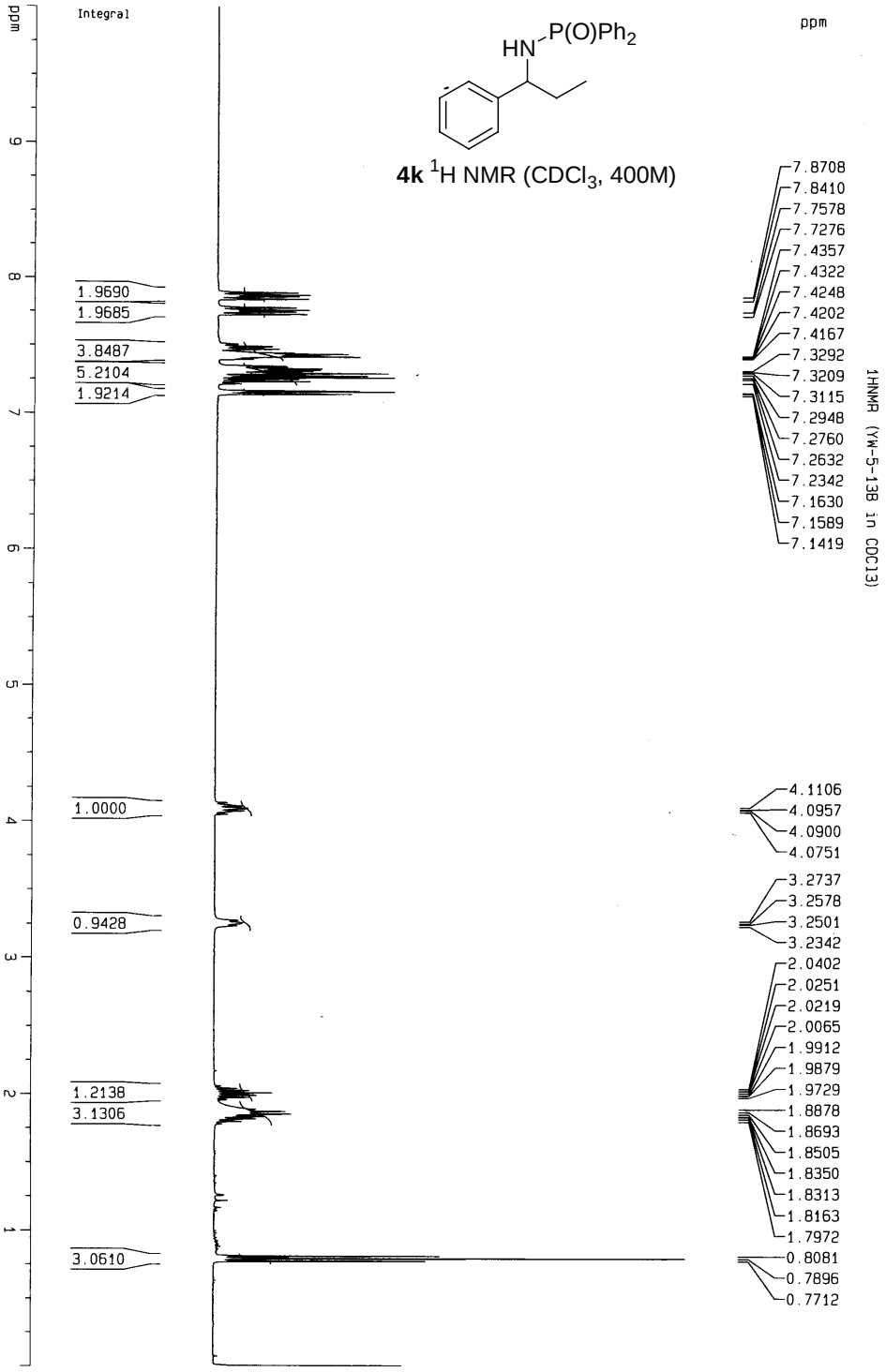
1.5924
1H NMR (YW-5-13C in CDCl3)


Integral
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P(O)Ph2
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1.2138
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3.0610
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7.3292
7.3209
7.3115
7.2948
7.2760
7.2632
7.2342
7.1630
7.1589
7.1419
4.1106
4.0957
4.0900
4.0751
3.2737
3.2578
3.2501
3.2342
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2.0251
2.0219
2.0065
1.9912
1.9879
1.9729
1.8878
1.8693
1.8505
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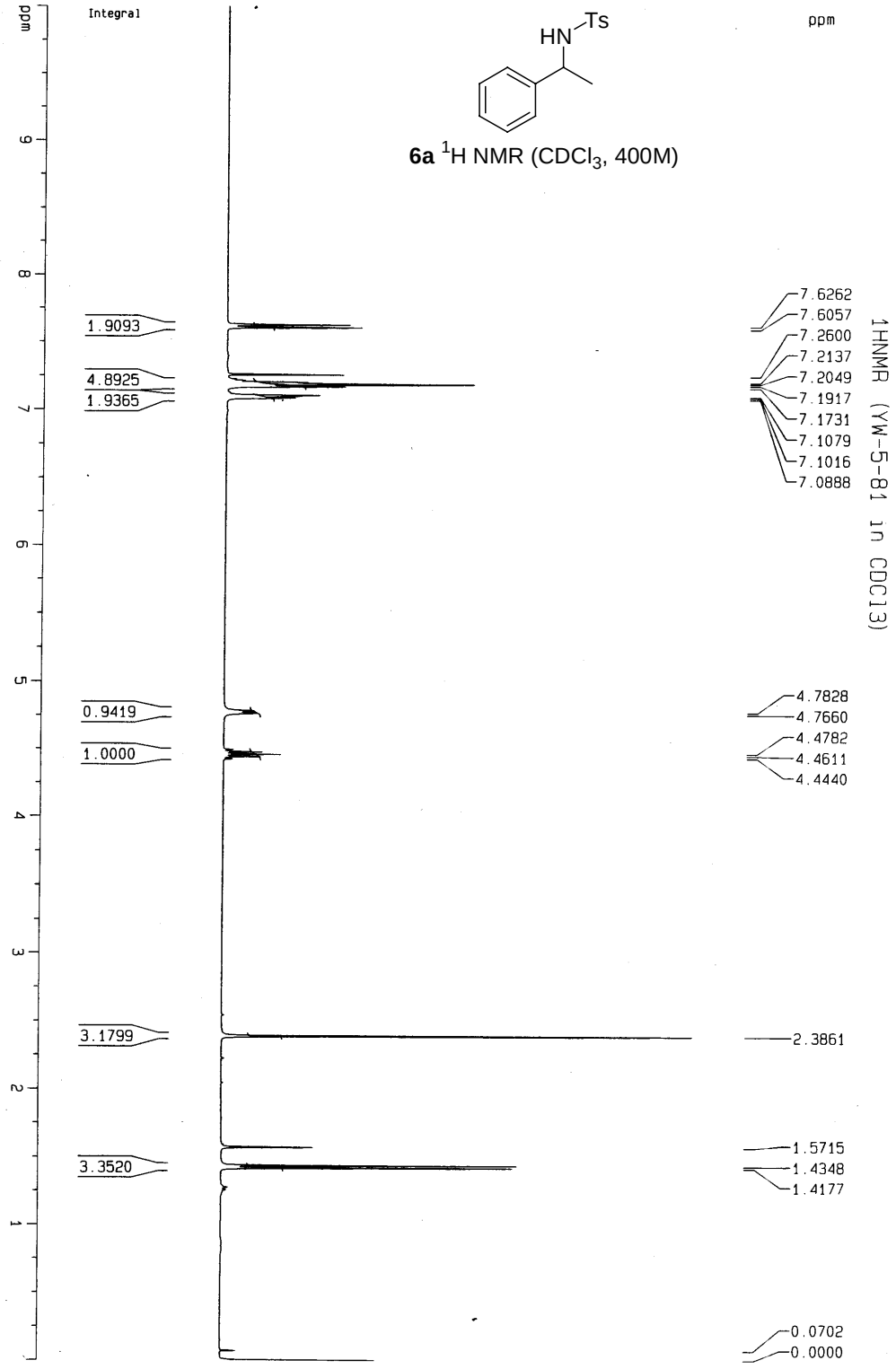
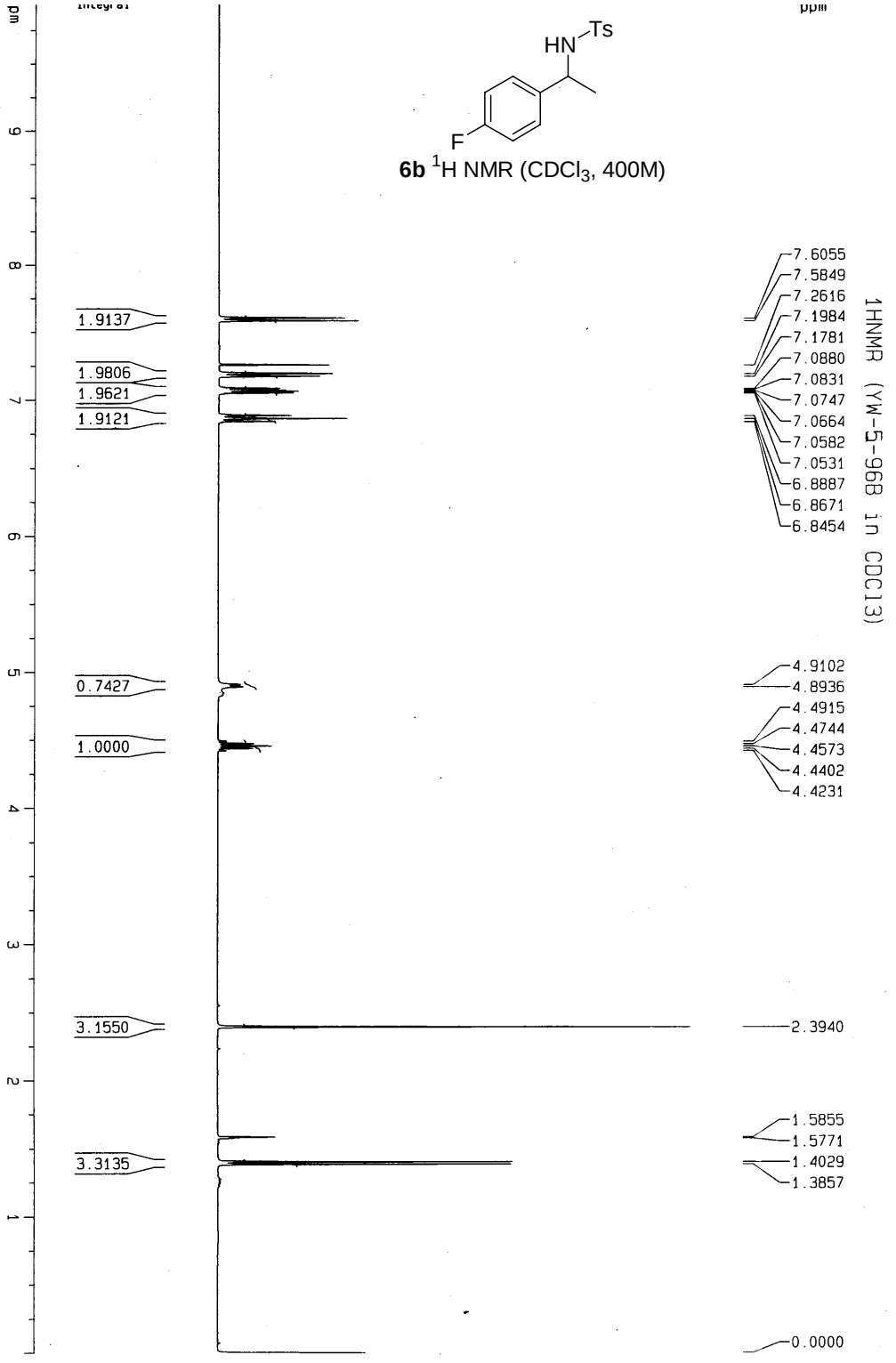
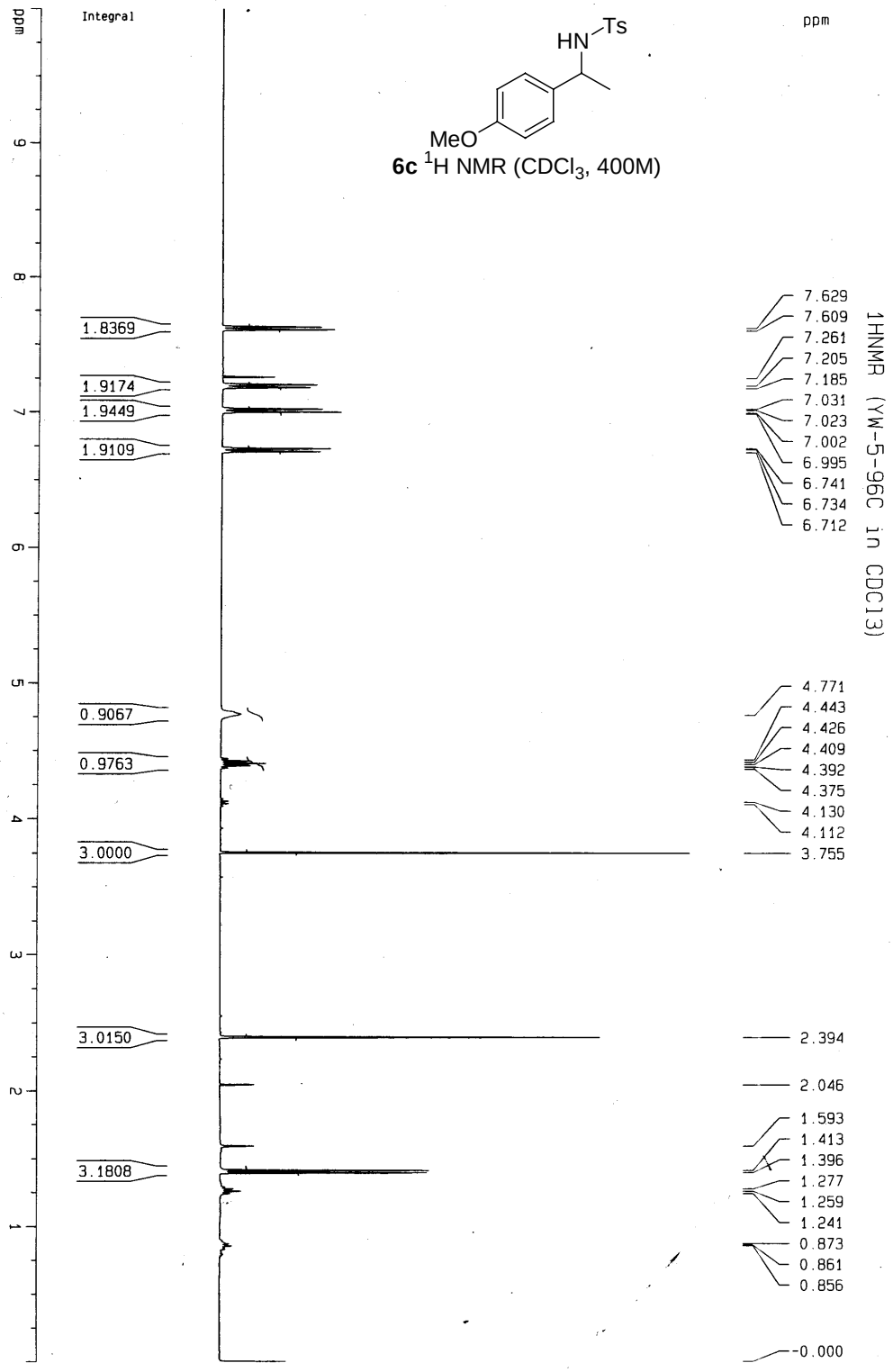
0.7712
1HNMR (YM-5-13B in CDCl3)



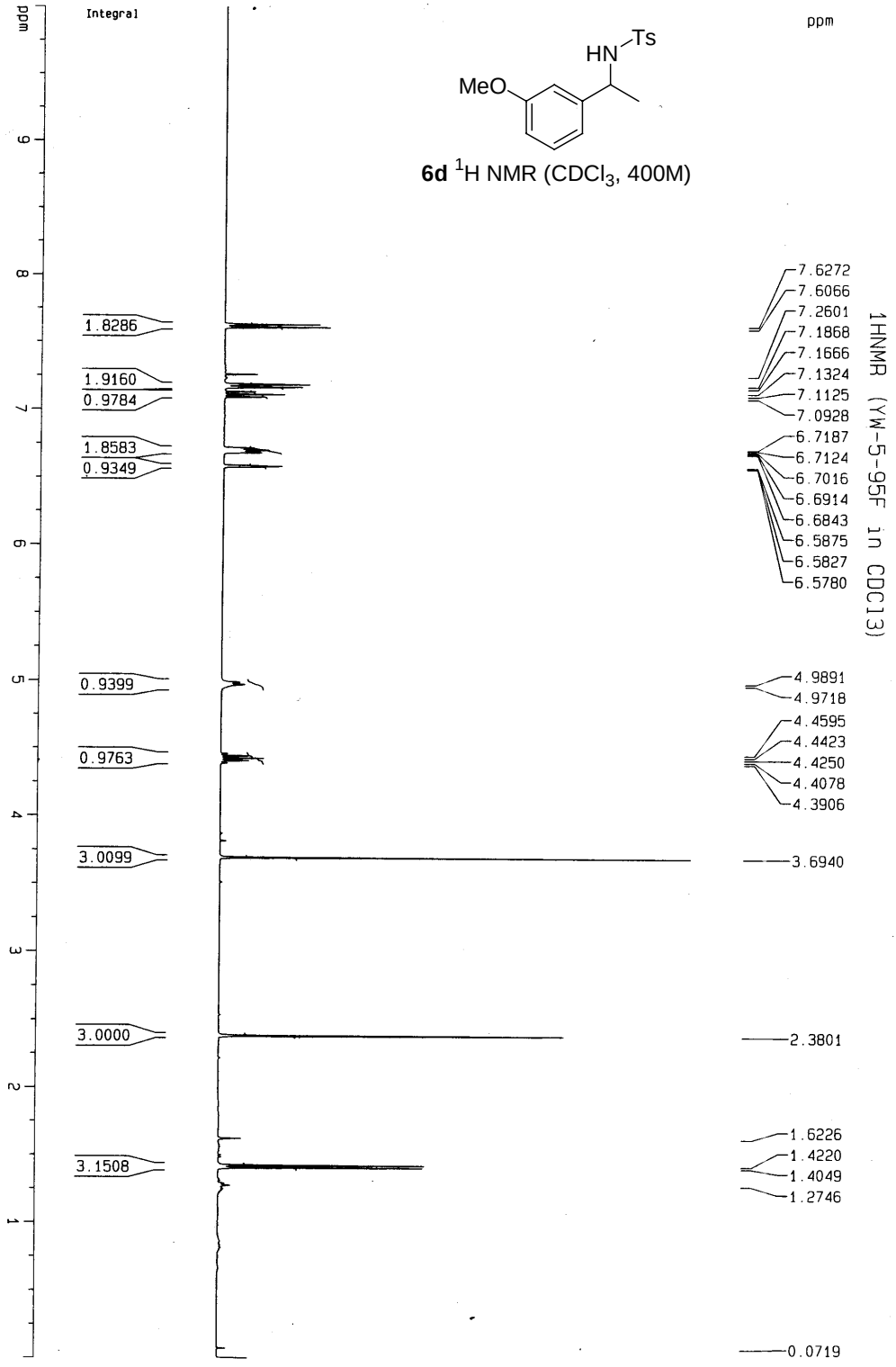
6a ^{1}H NMR ($CDCl_3$, 400M)



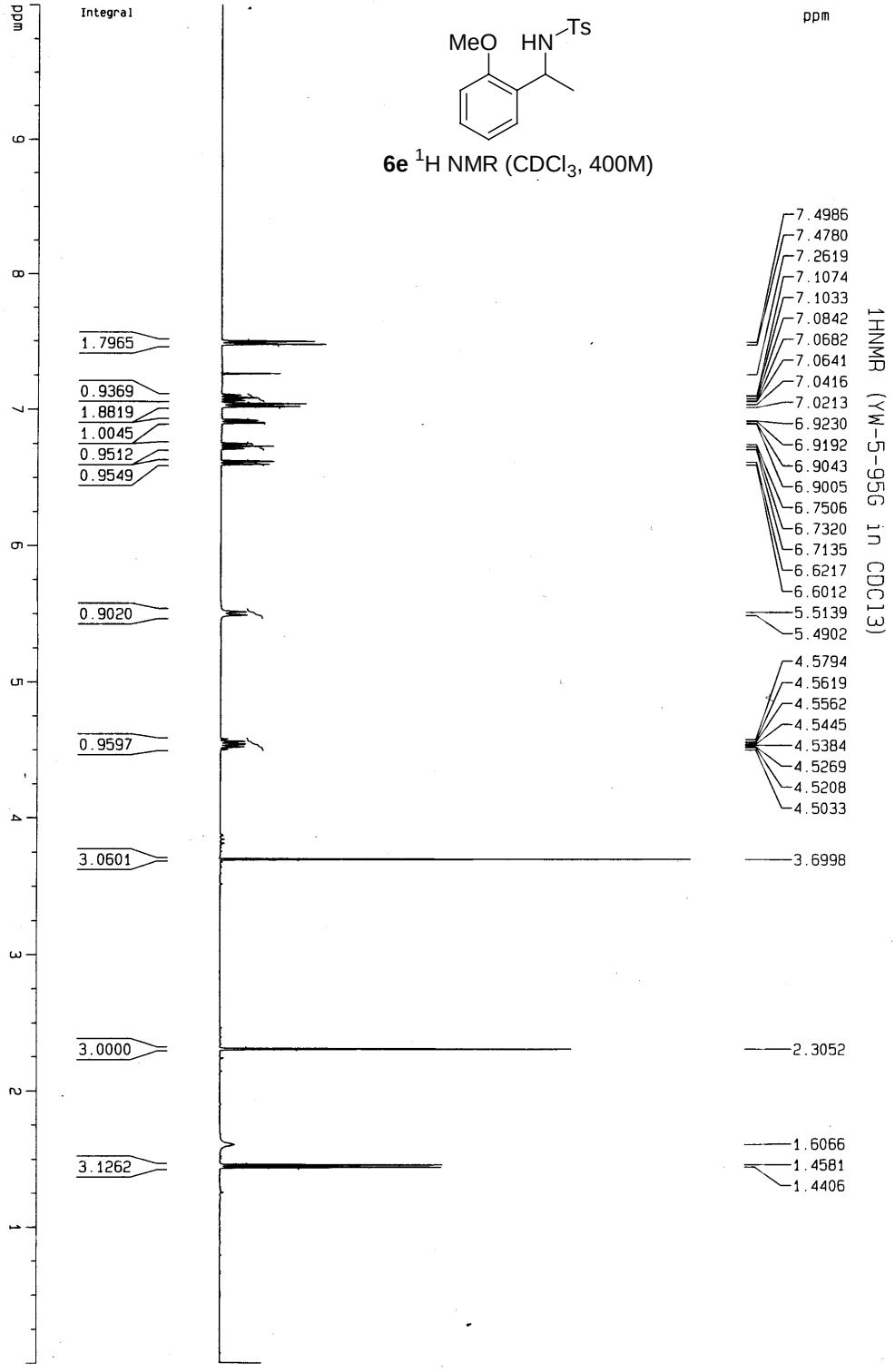
6b ^{1}H NMR ($CDCl_3$, 400M)



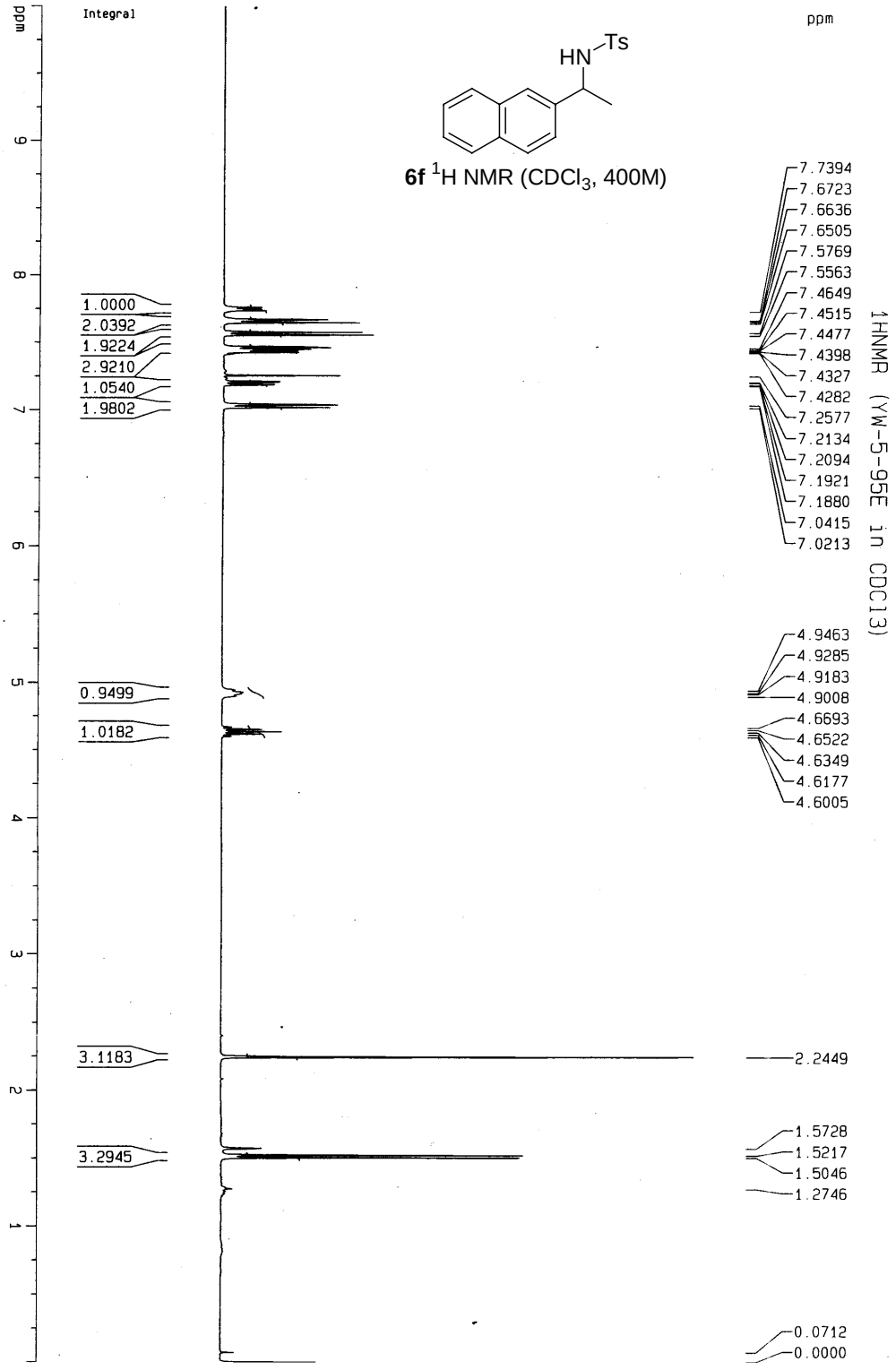
6c ^{1}H NMR ($CDCl_3$, 400M)



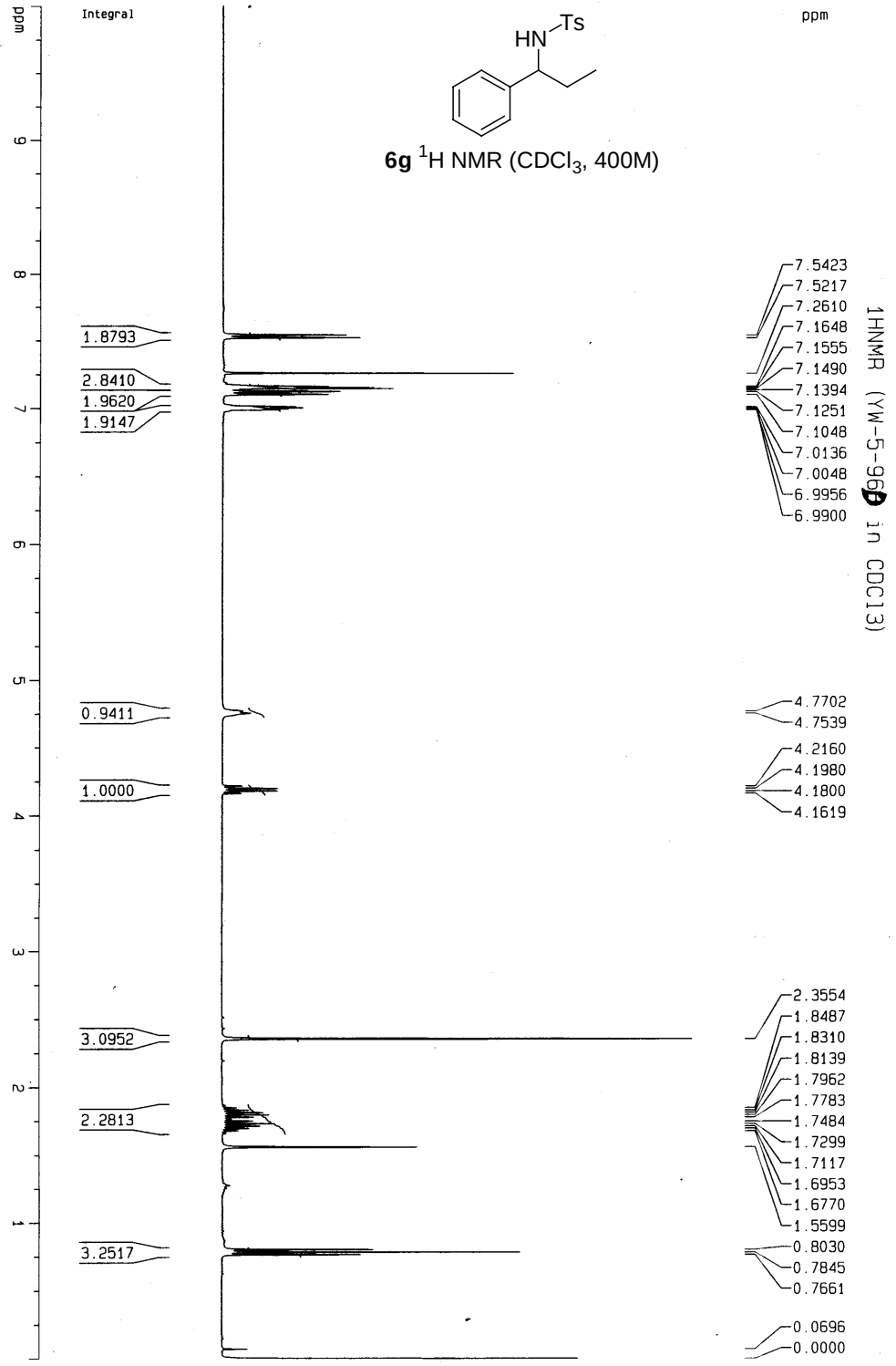
6d ^{1}H NMR ($CDCl_3$, 400M)



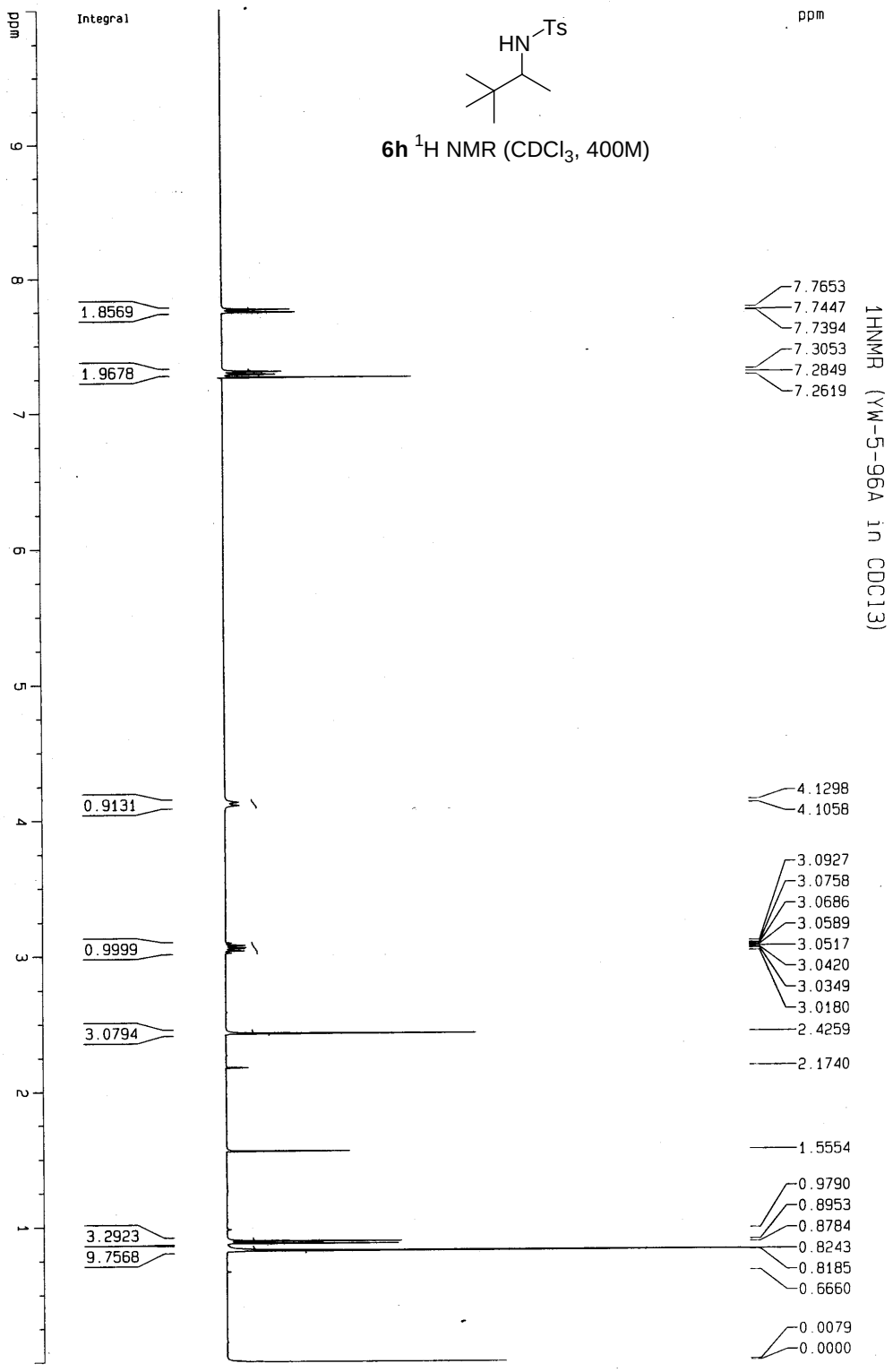
6e ^{1}H NMR ($CDCl_3$, 400M)



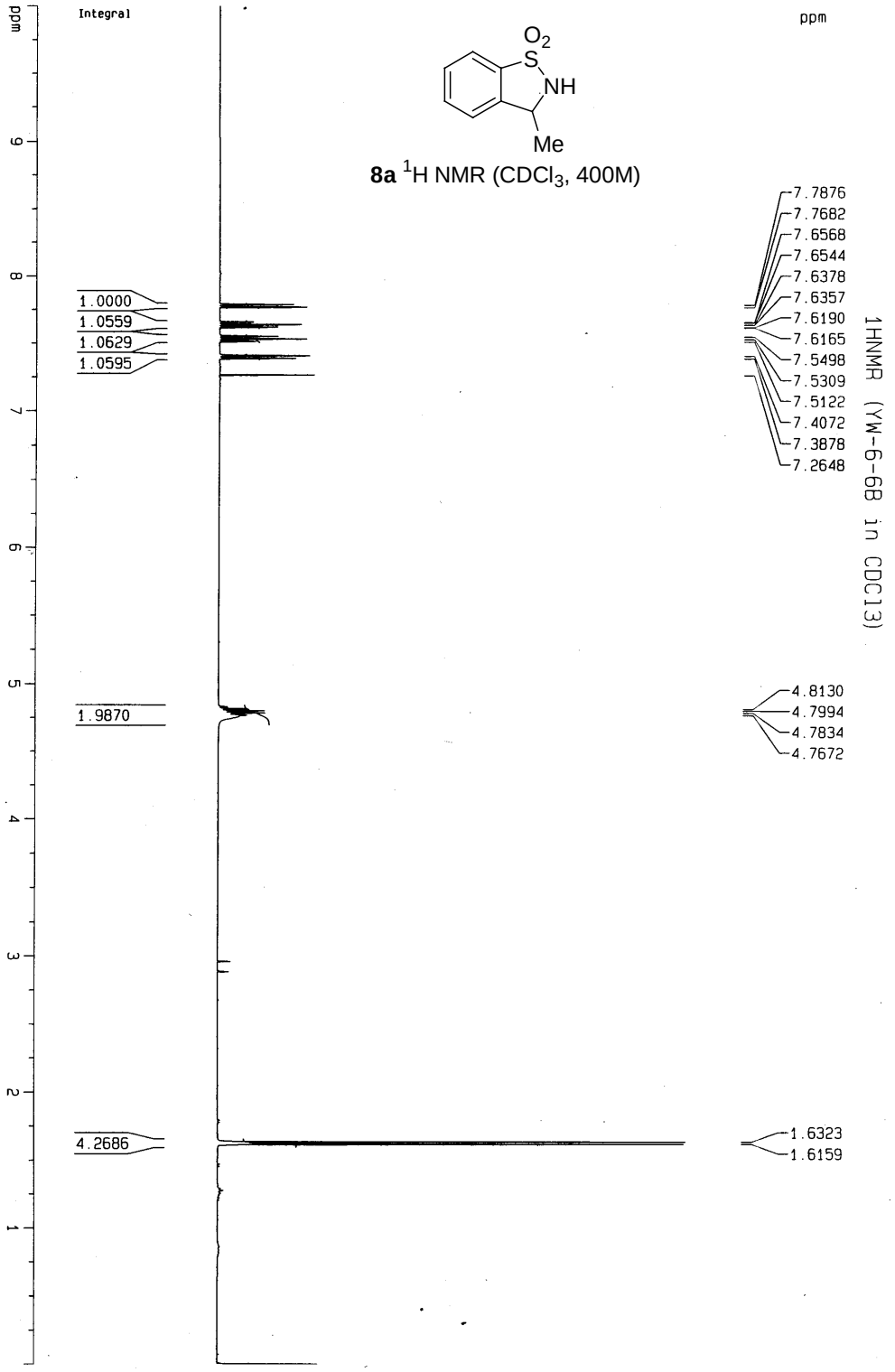
6f ^{1}H NMR ($CDCl_3$, 400M)



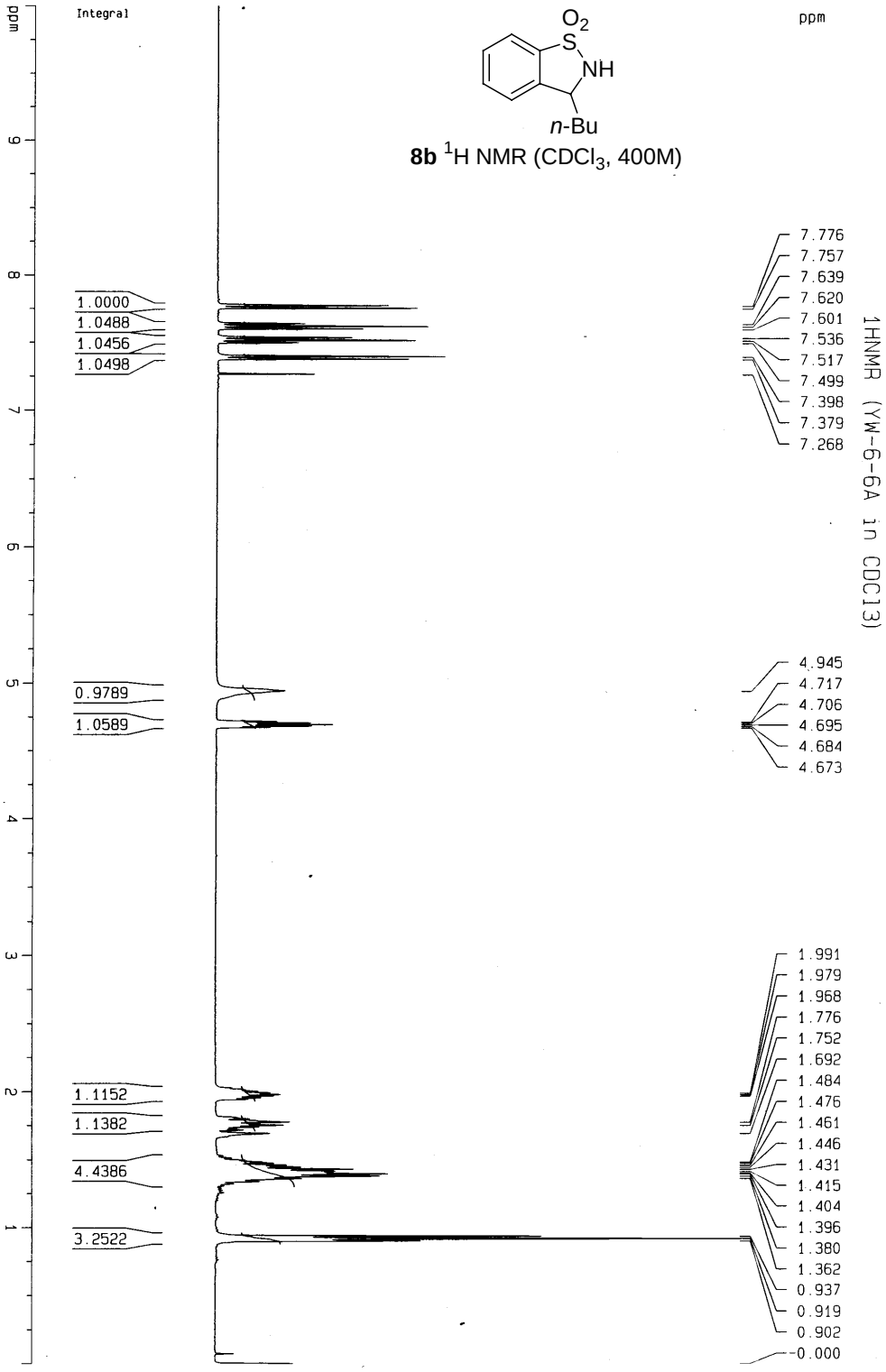
6g ^{1}H NMR ($CDCl_3$, 400M)



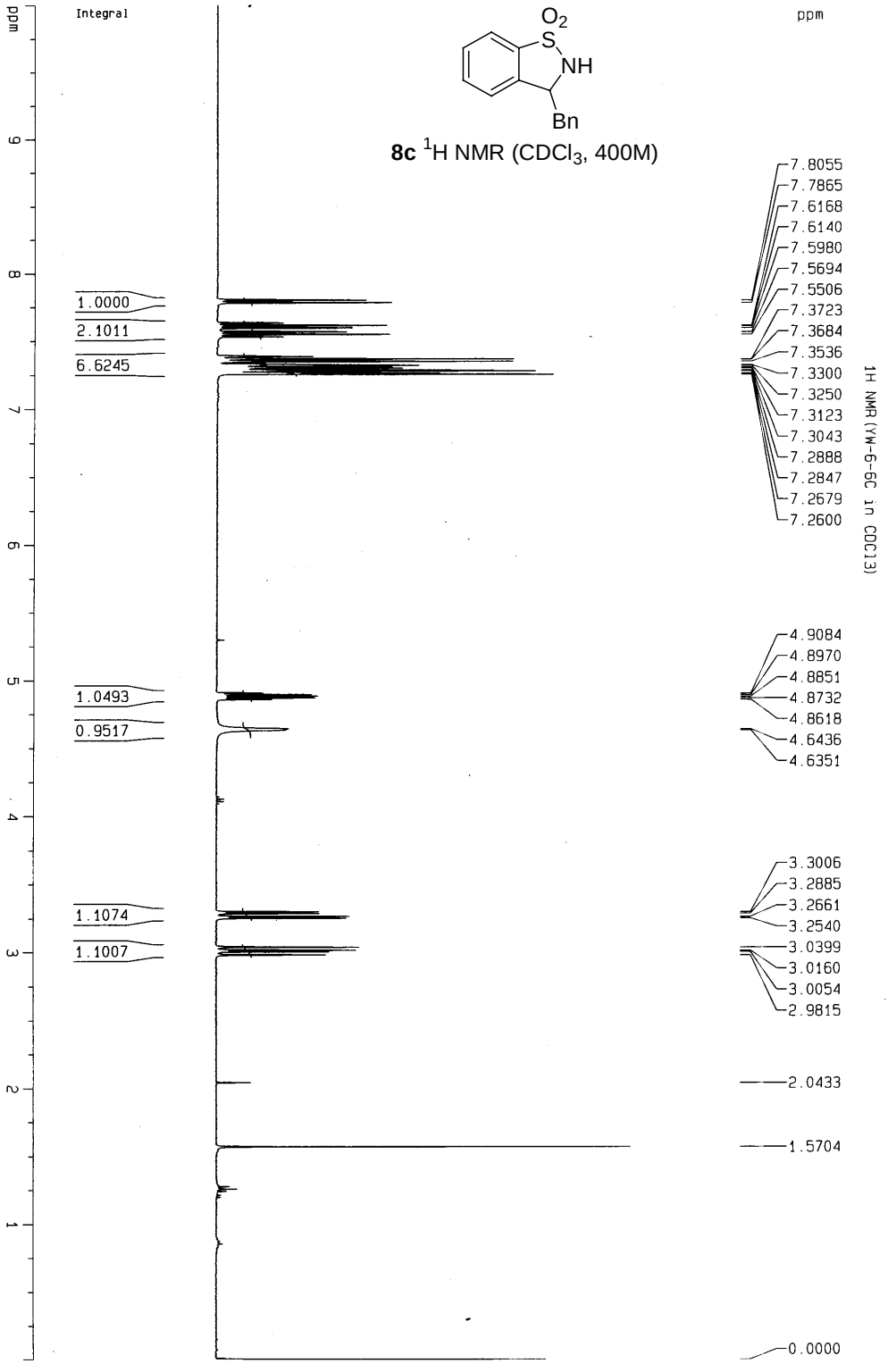
6h ^{1}H NMR ($CDCl_3$, 400M)



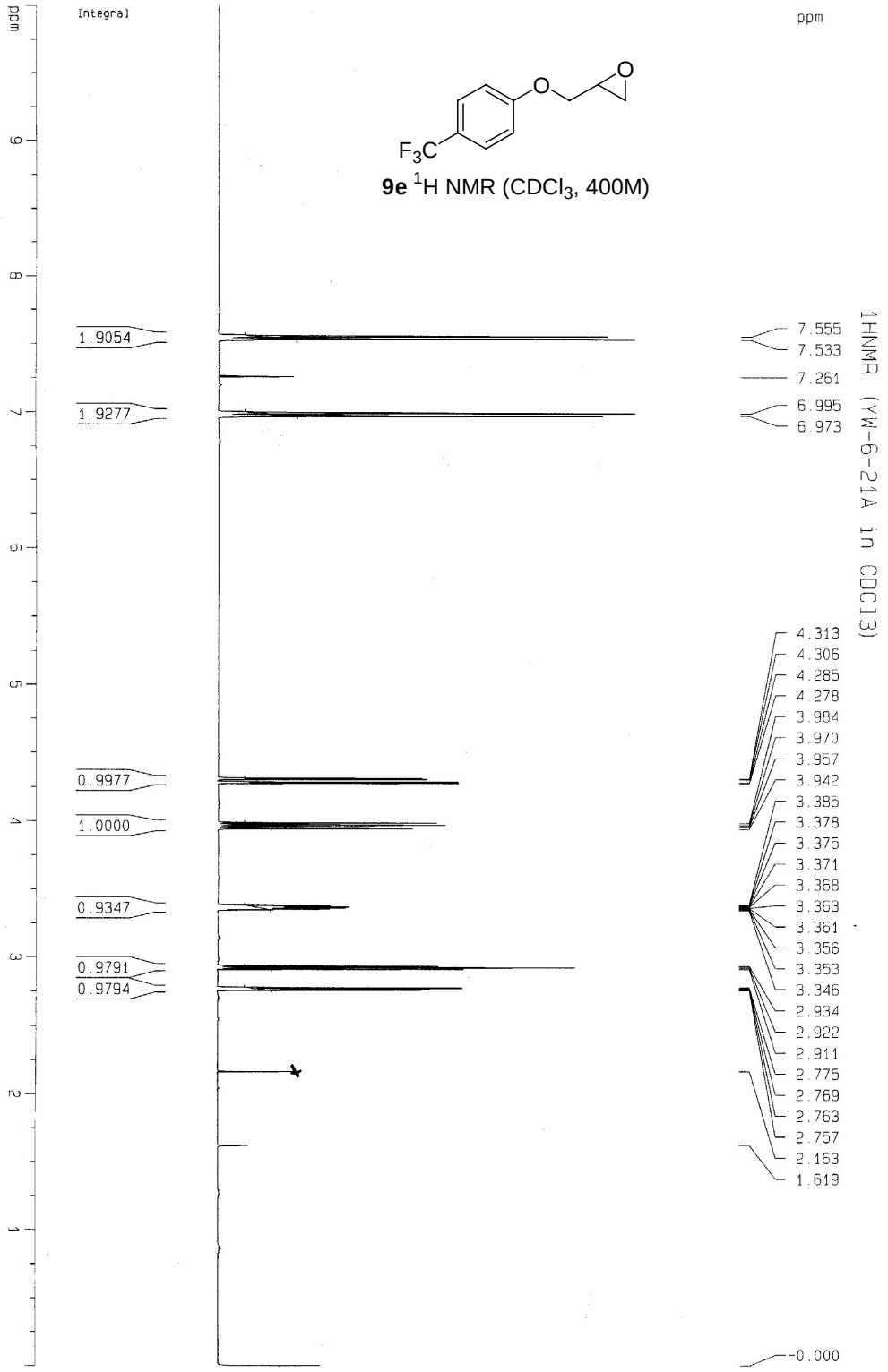
8a ^{1}H NMR ($CDCl_3$, 400M)



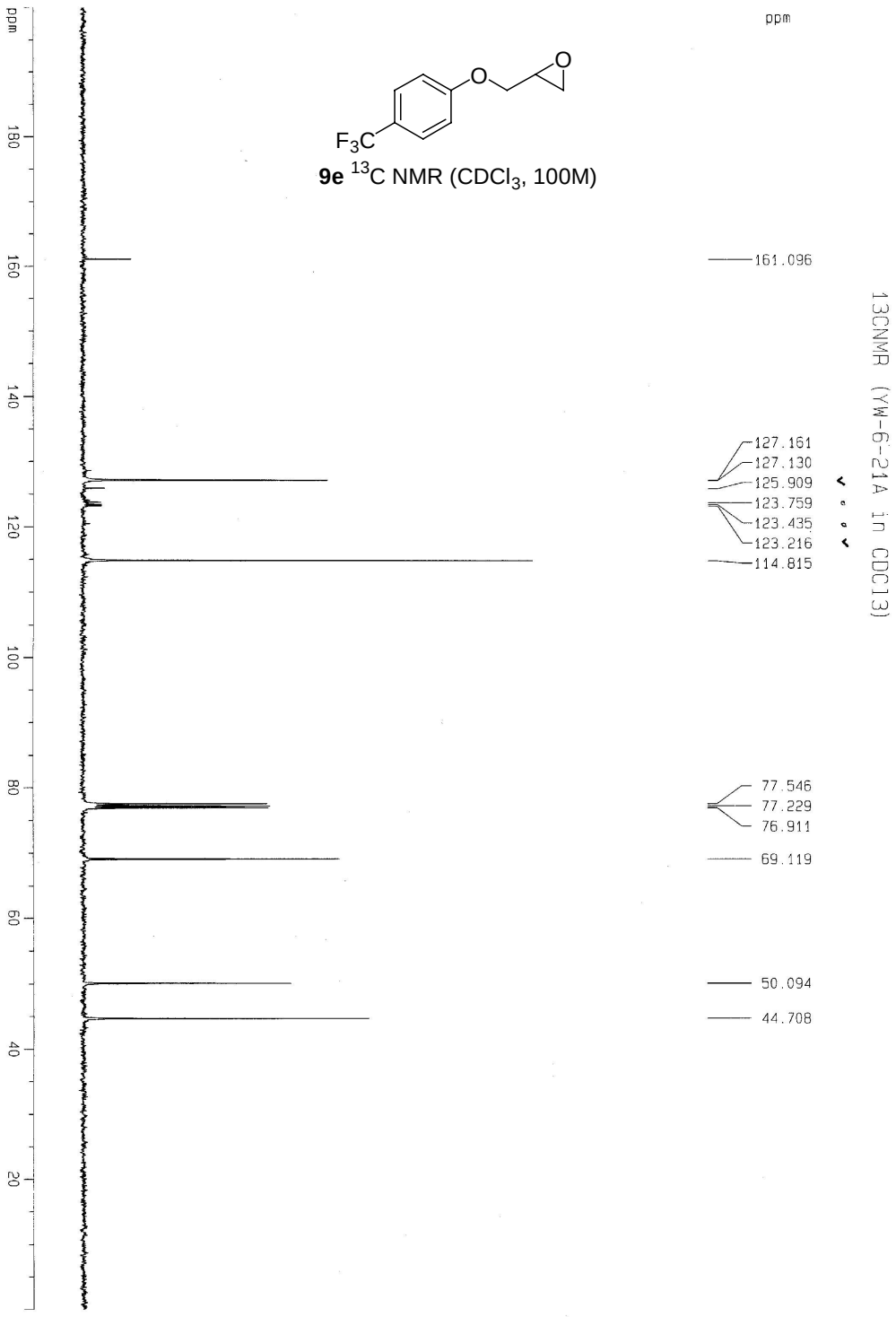
8b ^{1}H NMR ($CDCl_3$, 400M)



8c ^{1}H NMR ($CDCl_3$, 400M)



9e ^{1}H NMR ($CDCl_3$, 400M)

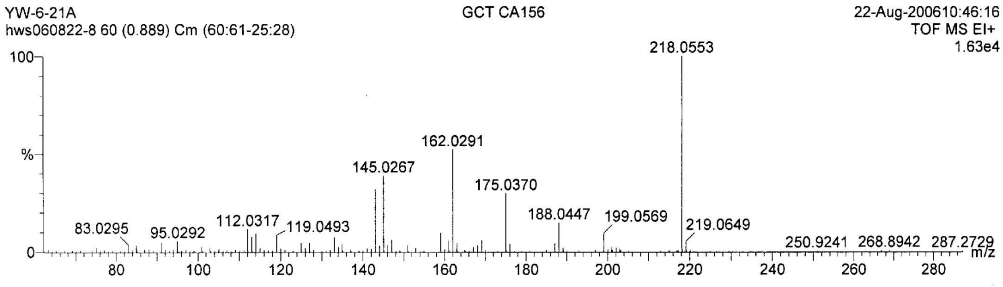


9e ^{13}C NMR ($CDCl_3$, 100M)

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
76 formula(e) evaluated with 6 results within limits (up to 50 closest results for each mass)



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Maximum:		5.0	5.0	50.0		
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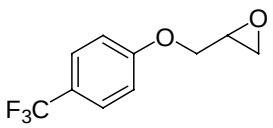
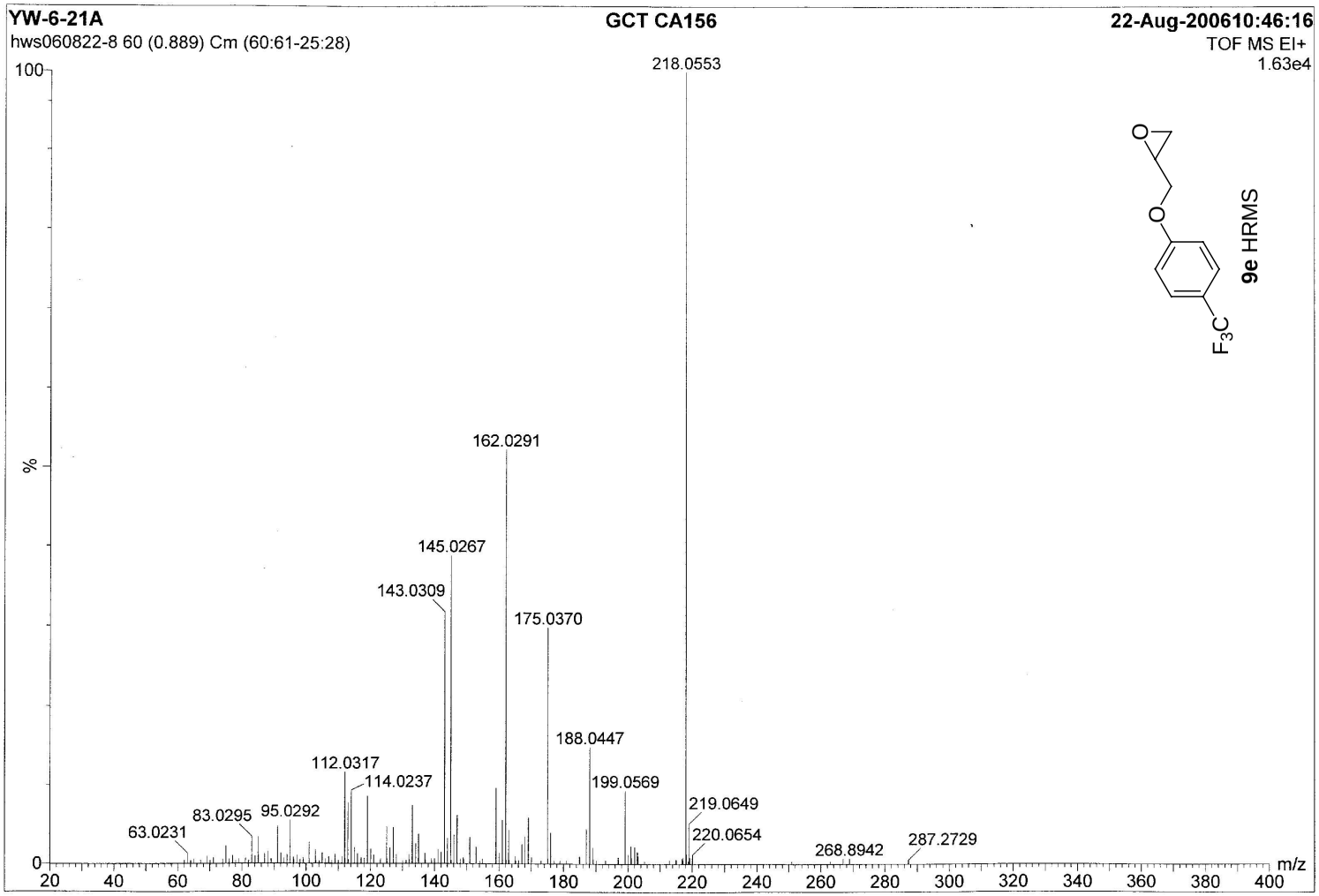
	218.0543	1.0	4.5	9.0	5	C13 H8 O F2
	218.0566	-1.3	-6.0	1.0	1	C7 H10 O3 F4
	218.0532	2.1	9.7	13.0	6	C16 H7 F
	218.0579	-2.6	-12.0	8.0	4	C12 H10 O4
	218.0591	-3.8	-17.2	4.0	2	C9 H11 O5 F



9e HRMS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%
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188.0447
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114.0237
199.0569
219.0649
220.0654
83.0295
95.0292
63.0231
268.8942
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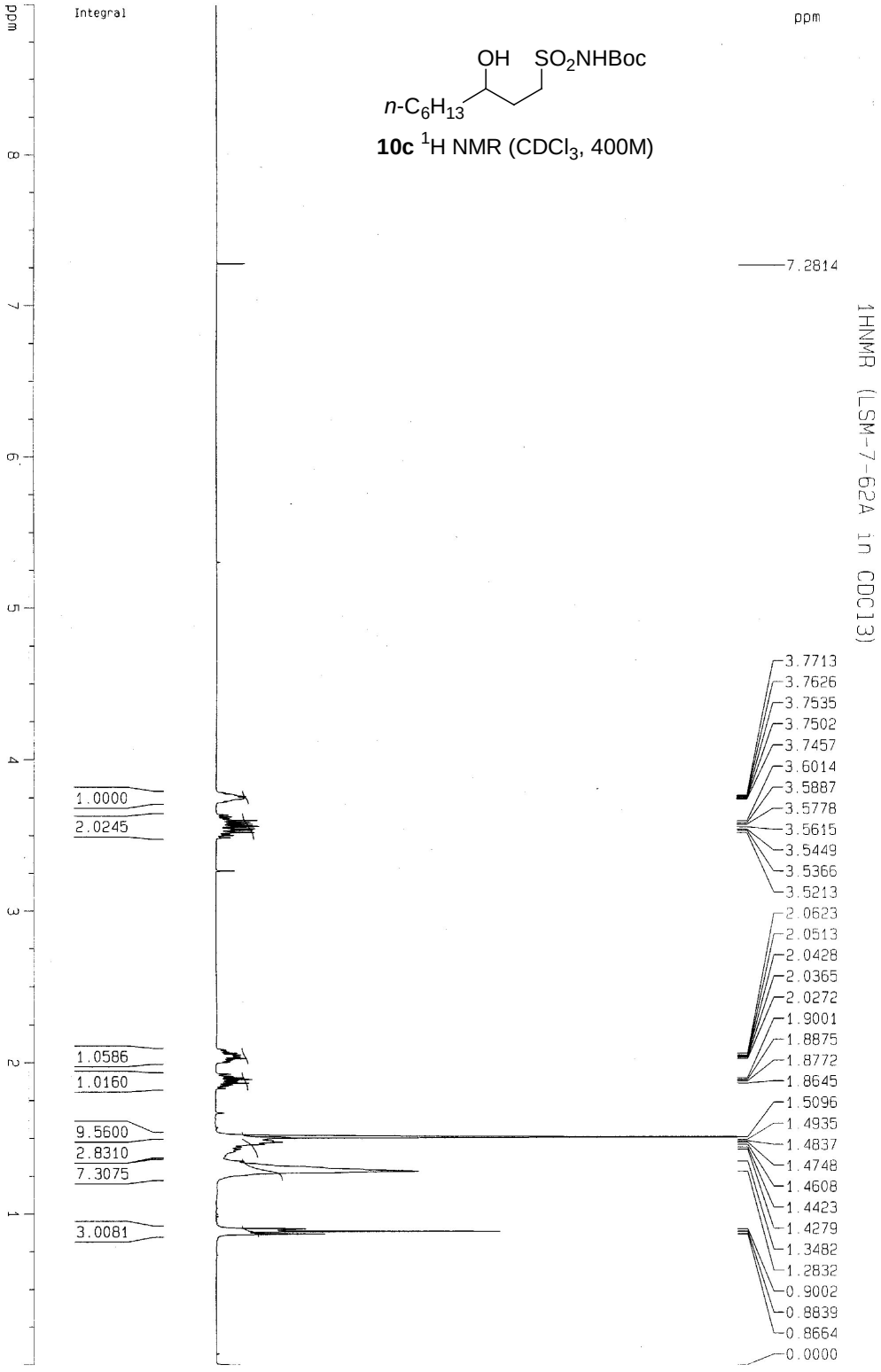
m/z
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
O
O
F3C
9e HRMS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10c 1H NMR (CDCl3, 400M)
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1HNMR (LSM-7-62A in CDCl3)
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3.7502
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3.5887
3.5778
3.5615
3.5449
3.5366
3.5213
2.0623
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2.0428
2.0365
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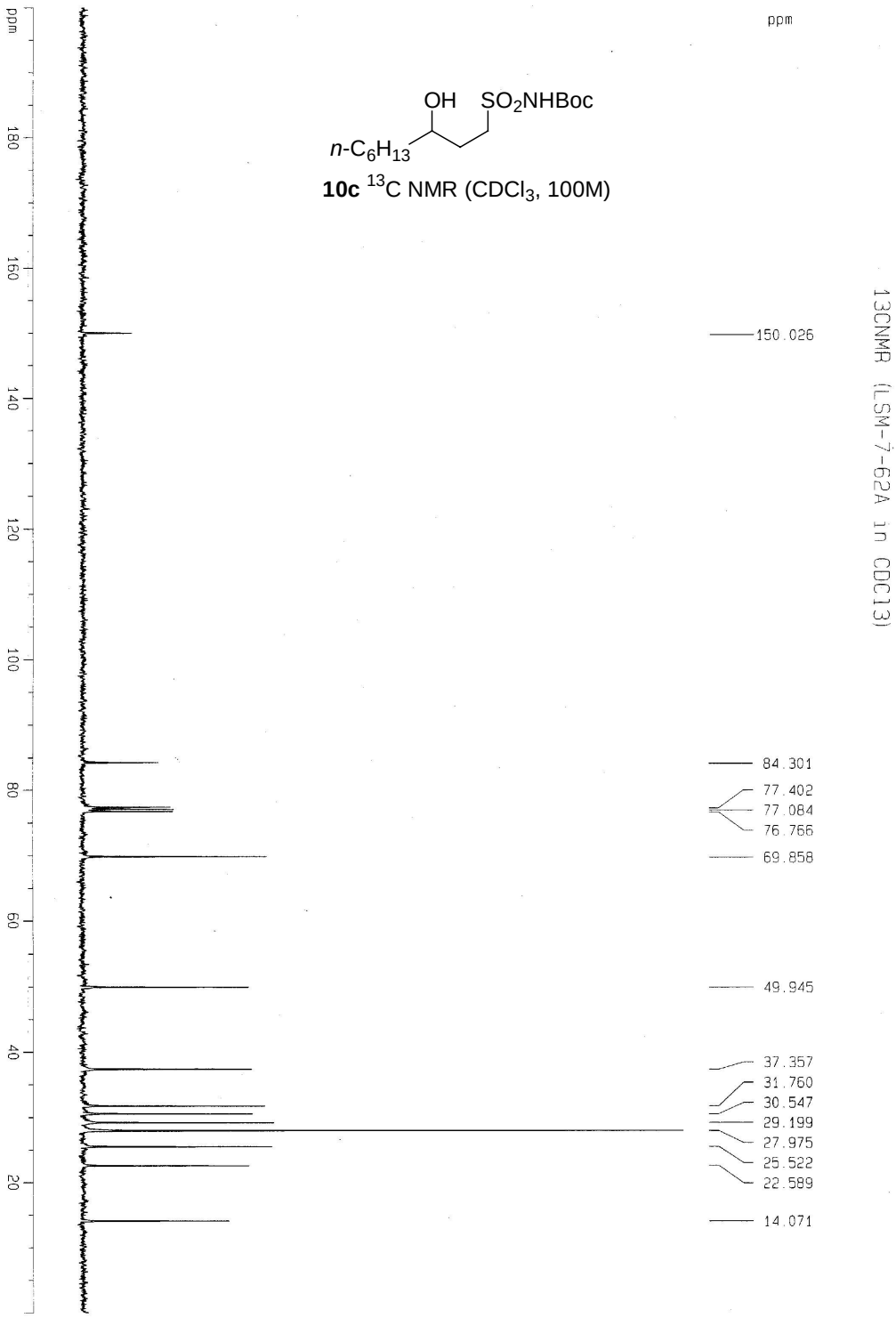
3.0081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10c 13C NMR (CDCl3, 100M)
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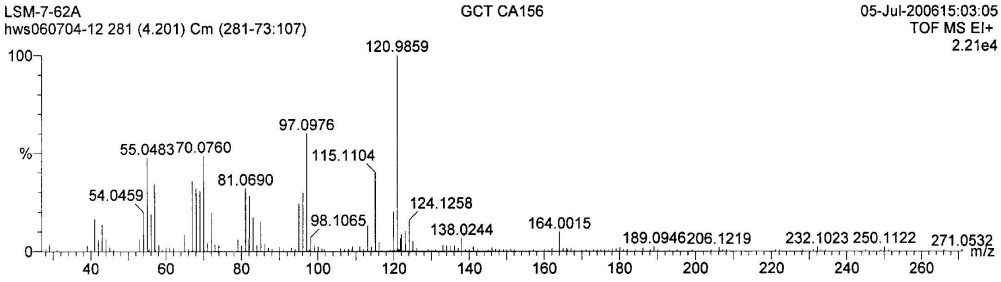
84.301
77.402
77.084
76.766
69.858
49.945
37.357
31.760
30.547
29.199
27.975
25.522
22.589
14.071
13CNMR (LSM-7-62A in CDCl3)

Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
264 formula(e) evaluated with 4 results within limits (up to 50 closest results for each mass)



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Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
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	250.1106	1.6	6.3	11.0	2	C16 H14 N2 O
	250.1140	-1.8	-7.1	6.0	3	C13 H18 N2 O S
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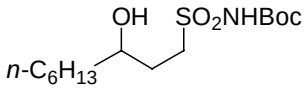
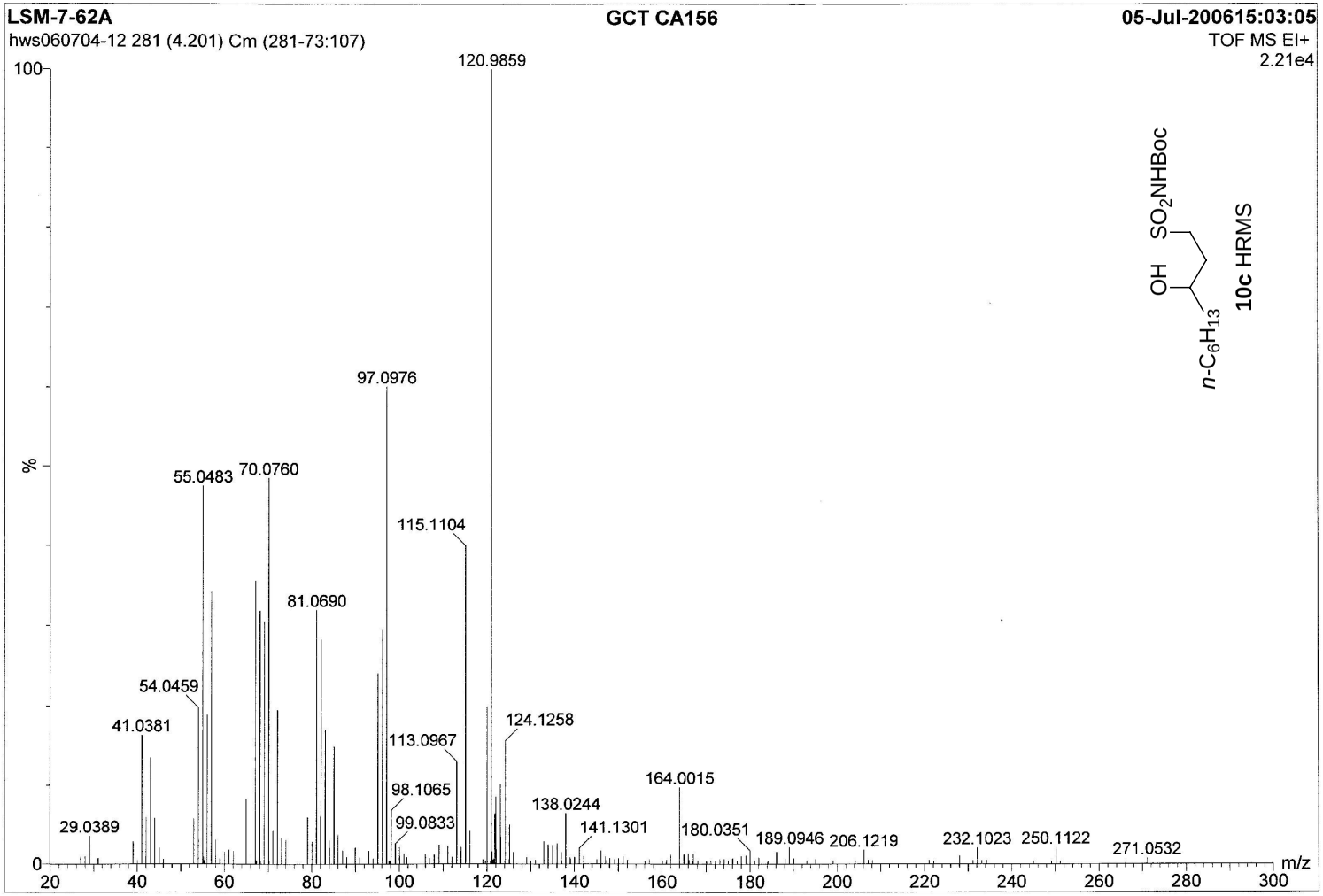


10c HRMS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GCT CA156
05-Jul-200615:03:05
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41.0381
124.1258
113.0967
164.0015
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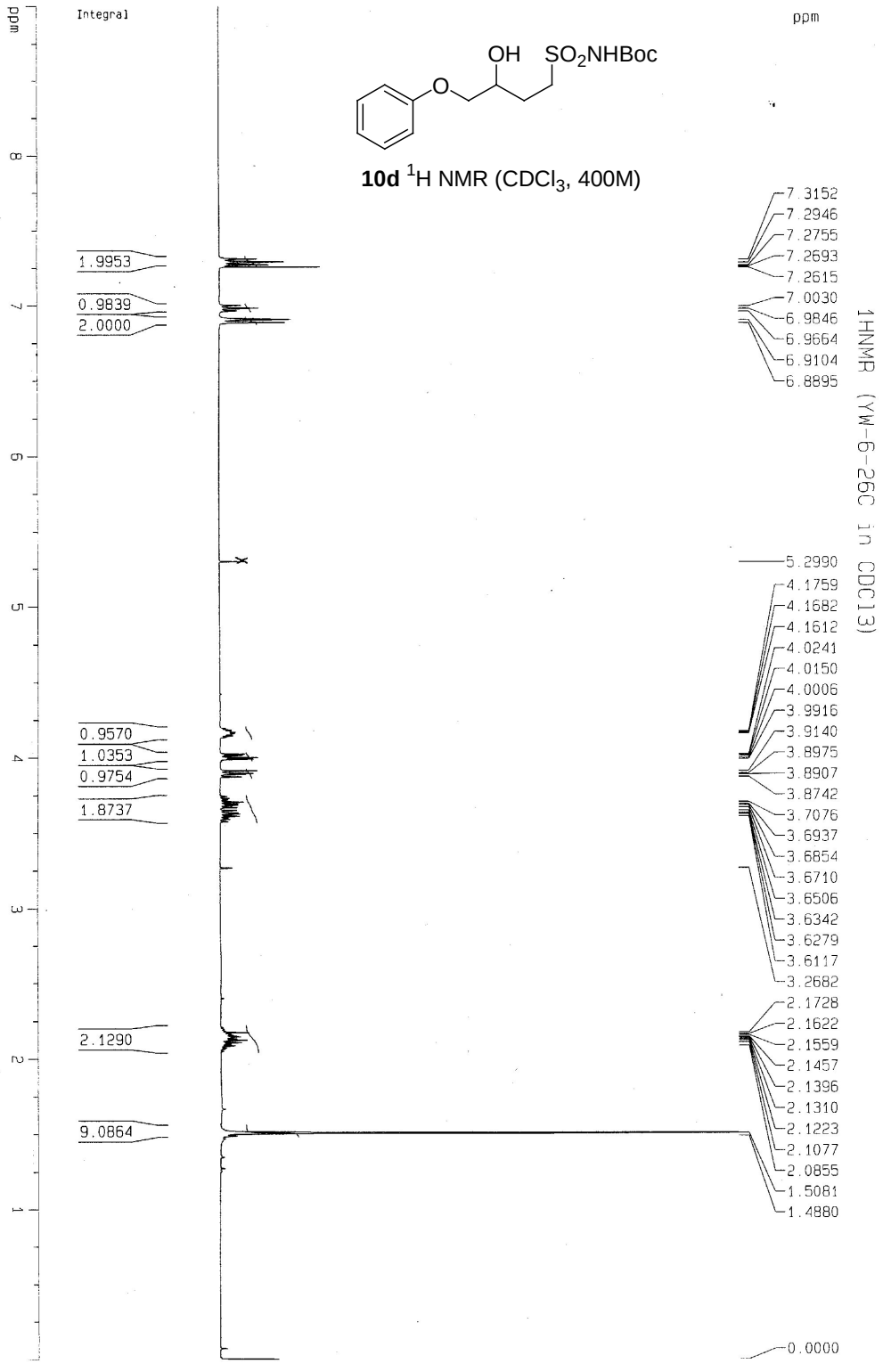
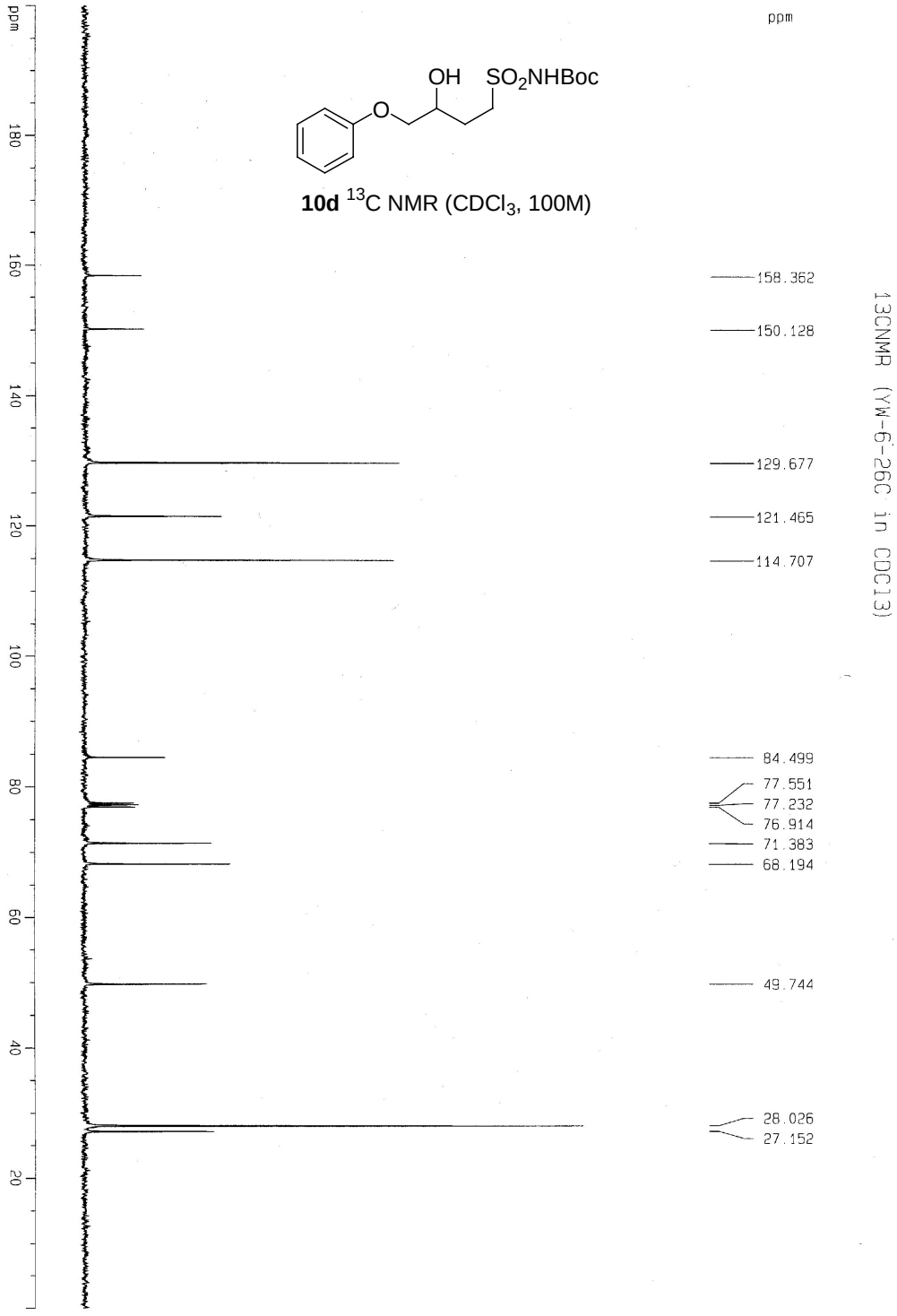
141.1301
180.0351
189.0946
206.1219
232.1023
250.1122
271.0532
m/z
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
OH
SO2NHBoc
n-C6H13
10c HRMS

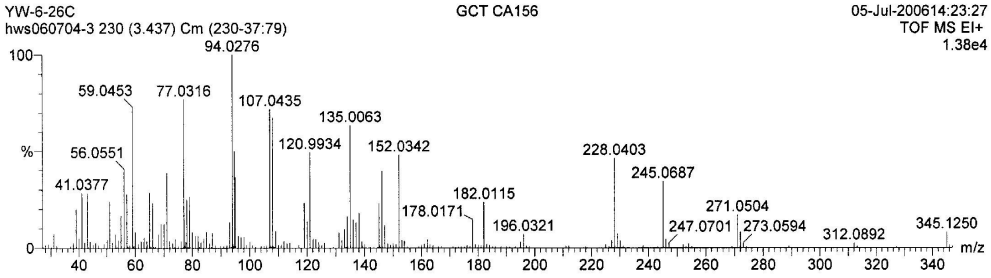

Integral
ppm
OH
SO2NHBoc
O
10d 1H NMR (CDCl3, 400M)
1.9953
0.9839
2.0000
0.9570
1.0353
0.9754
1.8737
2.1290
9.0864
7.3152
7.2946
7.2755
7.2693
7.2615
7.0030
6.9846
6.9664
6.9104
6.8895
5.2990
4.1759
4.1682
4.1612
4.0241
4.0150
4.0006
3.9916
3.9140
3.8975
3.8907
3.8742
3.7076
3.6937
3.6854
3.6710
3.6506
3.6342
3.6279
3.6117
3.2682
2.1728
2.1622
2.1559
2.1457
2.1396
2.1310
2.1223
2.1077
2.0855
1.5081
1.4880
0.0000
1HNMR (YW-6-26C in CDCl3)


ppm
OH
SO2NHBoc
O
10d 13C NMR (CDCl3, 100M)
158.362
150.128
129.677
121.465
114.707
84.499
77.551
77.232
76.914
71.383
68.194
49.744
28.026
27.152
13CNMR (YW-6-26C in CDCl3)

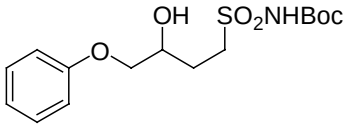
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

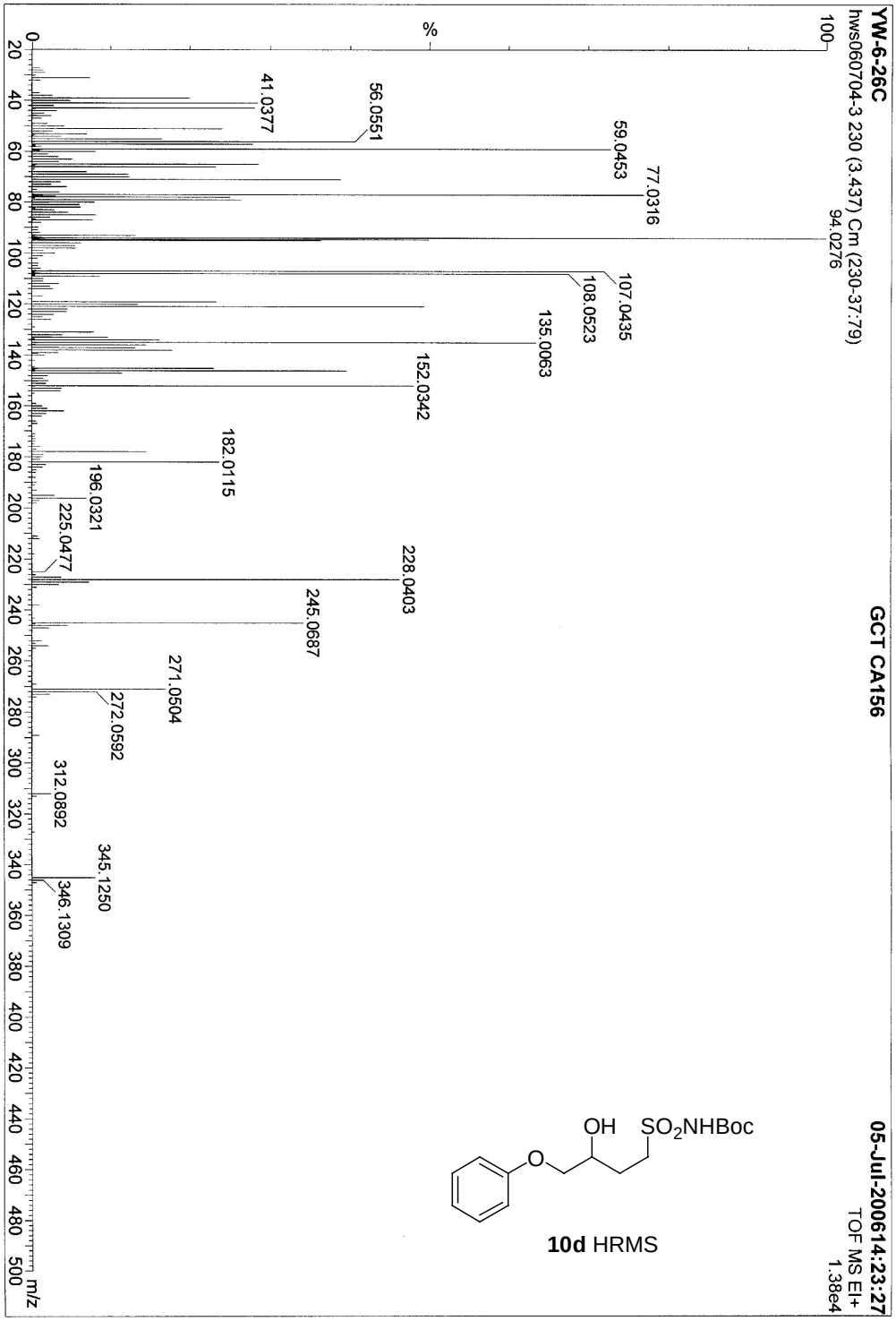
Monoisotopic Mass, Odd and Even Electron Ions
168 formula(e) evaluated with 9 results within limits (up to 50 closest results for each mass)



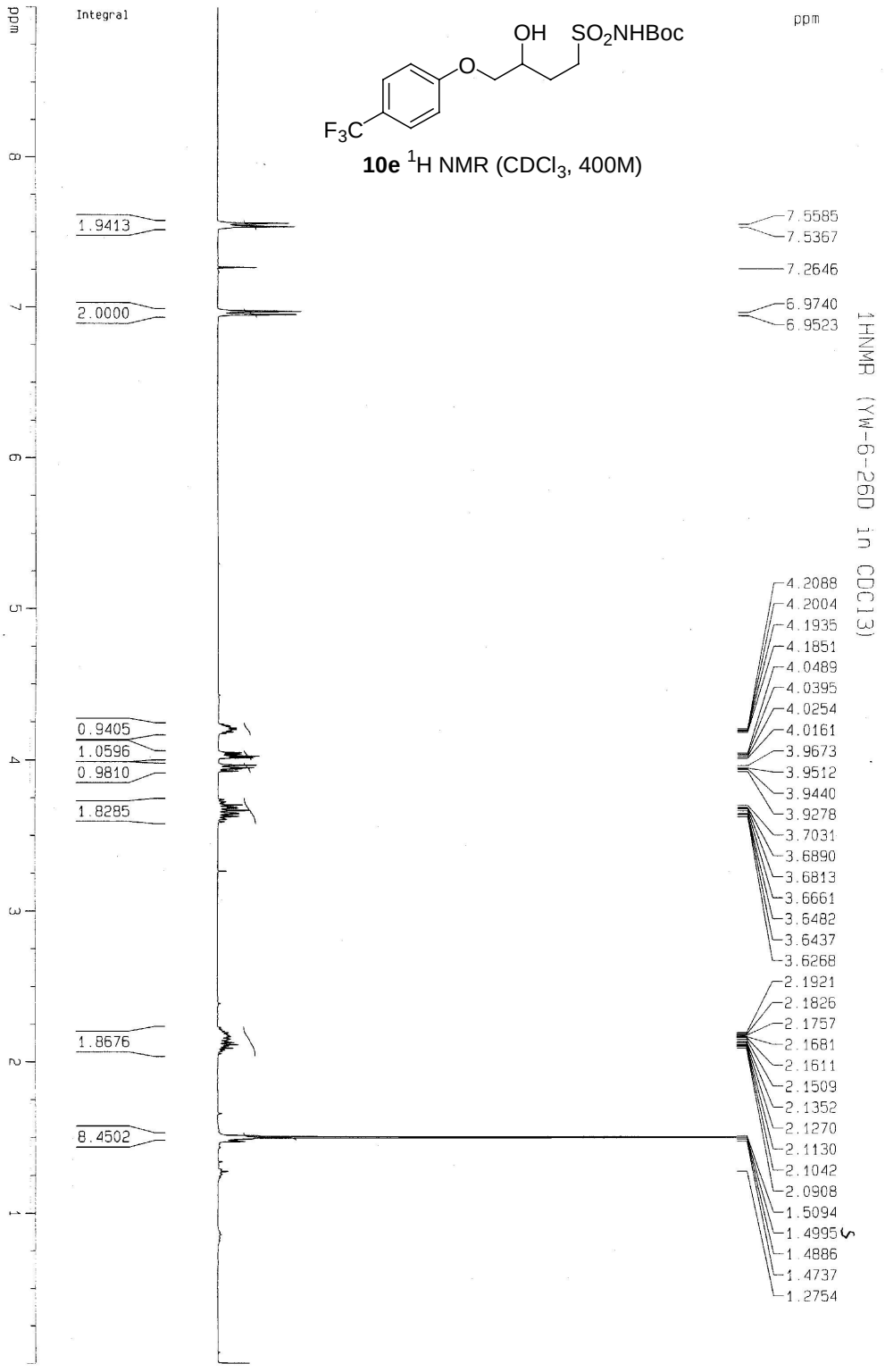
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
345.1250	345.1246	0.4	1.1	5.0	1	C15 H23 N O6 S
	345.1239	1.1	3.1	14.5	6	C21 H17 N2 O3
	345.1266	-1.6	-4.6	19.0	8	C24 H15 N3
	345.1273	-2.3	-6.6	9.5	4	C18 H21 N2 O3 S
	345.1279	-2.9	-8.5	18.5	9	C26 H17 O
	345.1212	3.8	10.9	10.0	5	C18 H19 N O6
	345.1206	4.4	12.8	1.0	2	C10 H23 N3 O8 S
	345.1298	-4.8	-13.9	5.5	3	C14 H21 N2 O8
	345.1300	-5.0	-14.4	14.0	7	C21 H19 N3 S

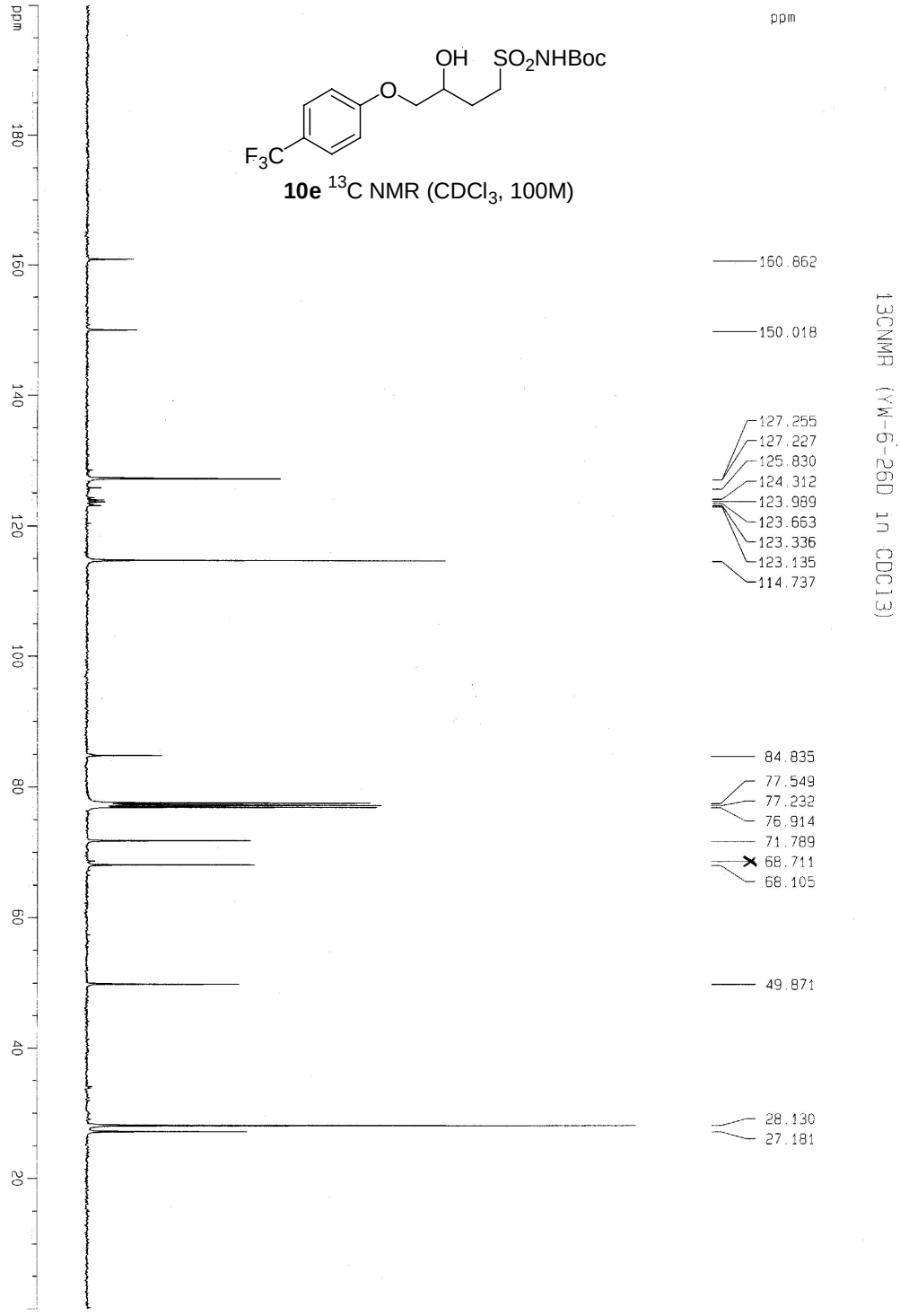


10d HRMS


YW-6-26C
hws060704-3 230 (3.437) Cm (230-37:79)
GCT CA156
05-Jul-200614:23:27
TOF MS EI+
1.38e4
%
m/z
41.0377
56.0551
59.0453
77.0316
94.0276
107.0435
108.0523
135.0063
152.0342
182.0115
196.0321
225.0477
228.0403
245.0687
271.0504
272.0592
312.0892
345.1250
346.1309
OH
SO2NHBoc
O

10d HRMS


Integral
ppm
OH
SO2NHBoc
O
F3C
10e 1H NMR (CDCl3, 400M)
1.9413
2.0000
0.9405
1.0596
0.9810
1.8285
1.8676
8.4502
7.5585
7.5367
7.2646
6.9740
6.9523
4.2088
4.2004
4.1935
4.1851
4.0489
4.0395
4.0254
4.0161
3.9673
3.9512
3.9440
3.9278
3.7031
3.6890
3.6813
3.6661
3.6482
3.6437
3.6268
2.1921
2.1826
2.1757
2.1681
2.1611
2.1509
2.1352
2.1270
2.1130
2.1042
2.0908
1.5094
1.4995
1.4886
1.4737
1.2754
1HNMR (YW-6-26D in CDCl3)

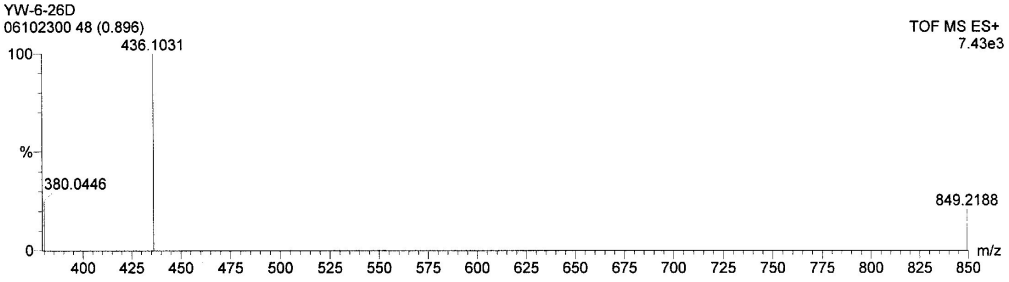

ppm
OH
SO2NHBoc
O
F3C
10e 13C NMR (CDCl3, 100M)
160.862
150.018
127.255
127.227
125.830
124.312
123.989
123.663
123.336
123.135
114.737
84.835
77.549
77.232
76.914
71.789
68.711
68.105
49.871
28.130
27.181
13CNMR (YW-6-26D in CDCl3)

Elemental Composition Report **Page 1**

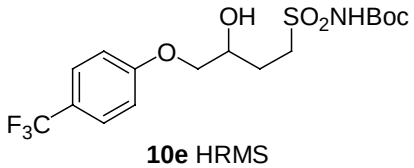
Single Mass Analysis
Tolerance = 5.0 PPM / DBE: min = -1.5, max = 100.0
Selected filters: None

Monoisotopic Mass, Even Electron Ions
6 formula(e) evaluated with 2 results within limits (up to 10 closest results for each mass)
Elements Used:
C: 0-50 H: 0-60 N: 1-1 O: 6-6 F: 3-3 Na: 0-1 S: 1-1

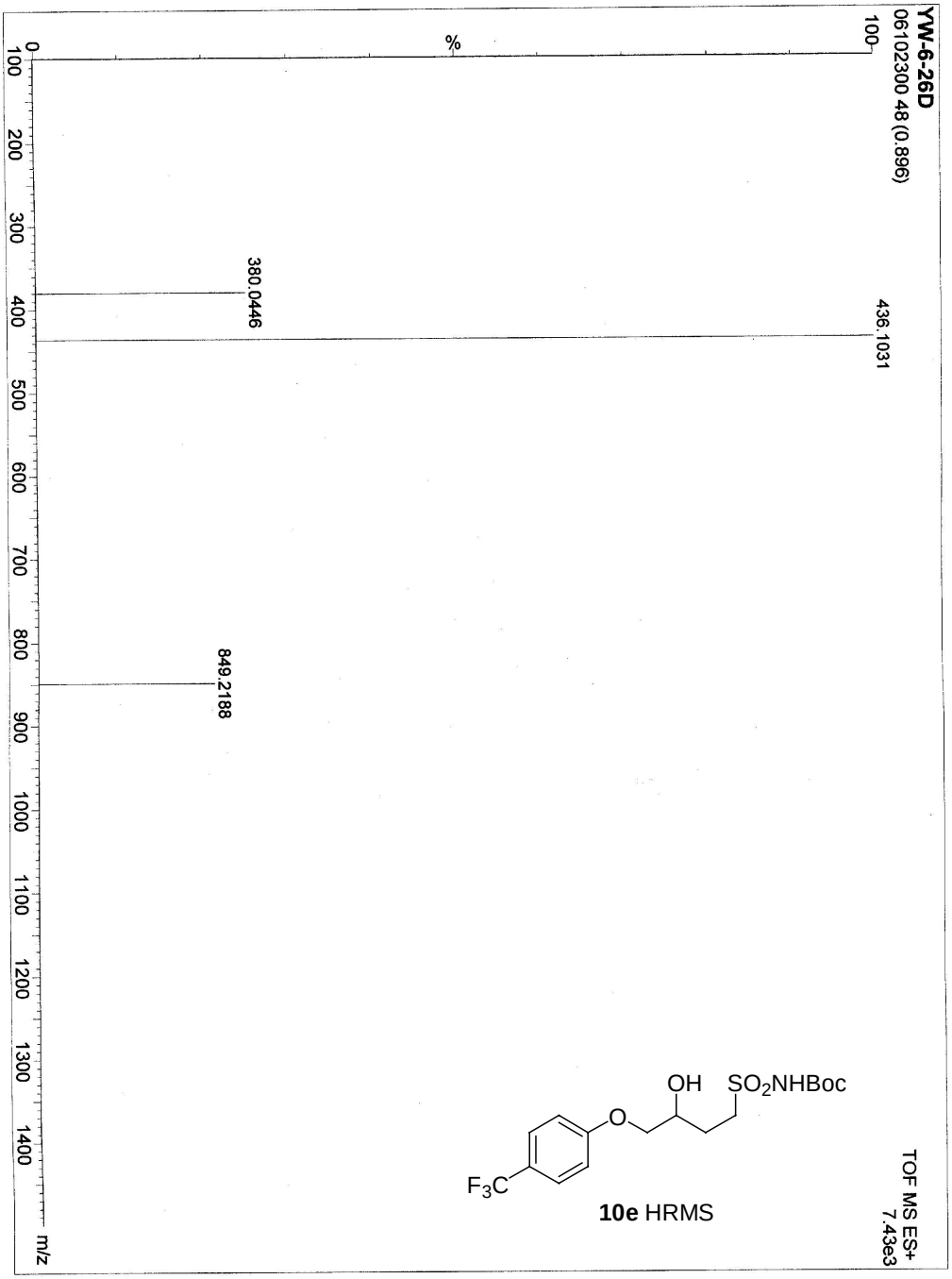
YW-6-26D
06102300 48 (0.896)

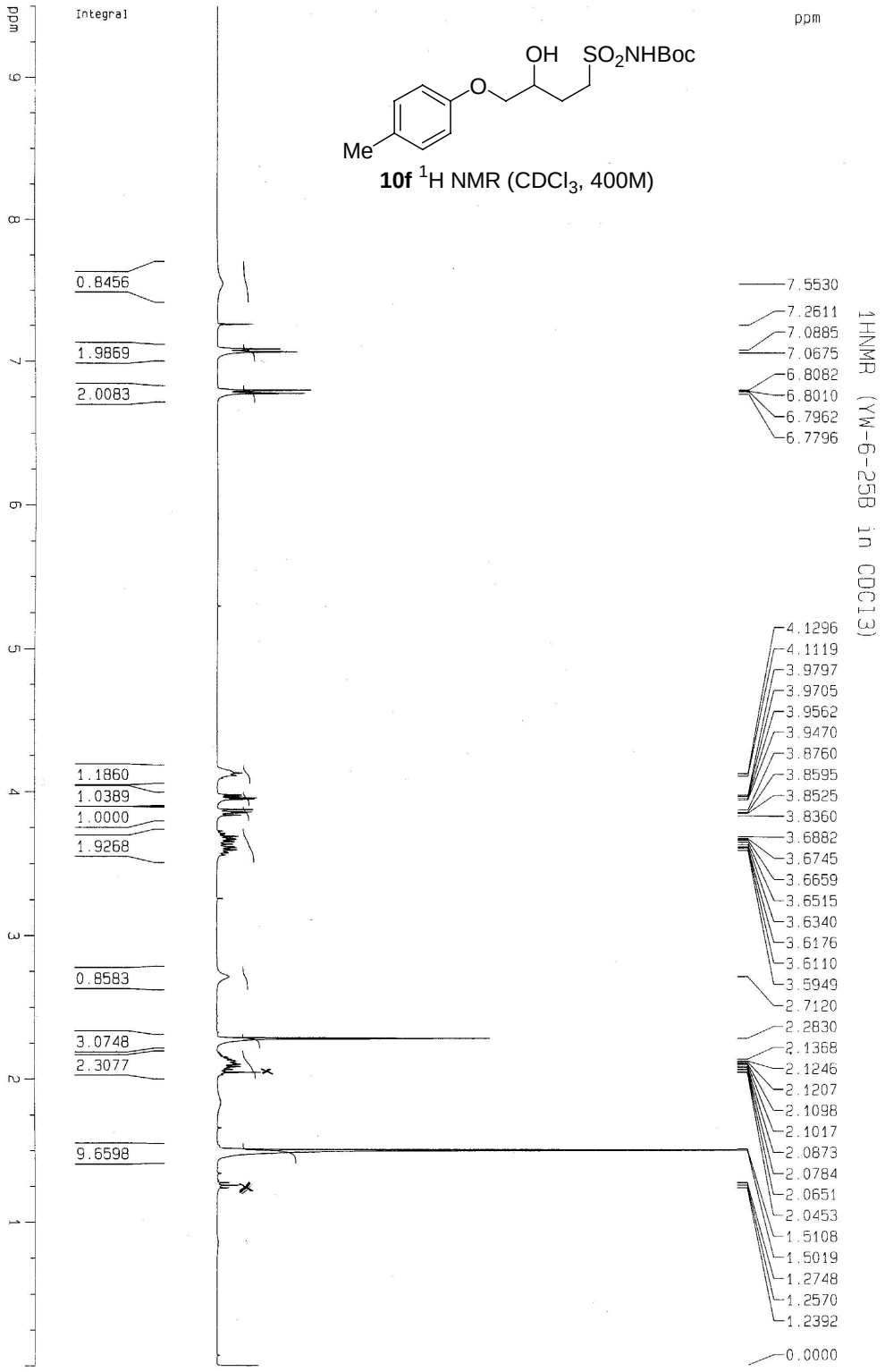


Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula
Minimum:				-1.5		
Maximum:		5.0	5.0	100.0		
436.1031	436.1042	-1.1	-2.5	7.5	5549726.0	C18 H21 N O6 F3 S
	436.1018	1.3	3.0	4.5	5549723.0	C16 H22 N O6 F3 Na S ✓

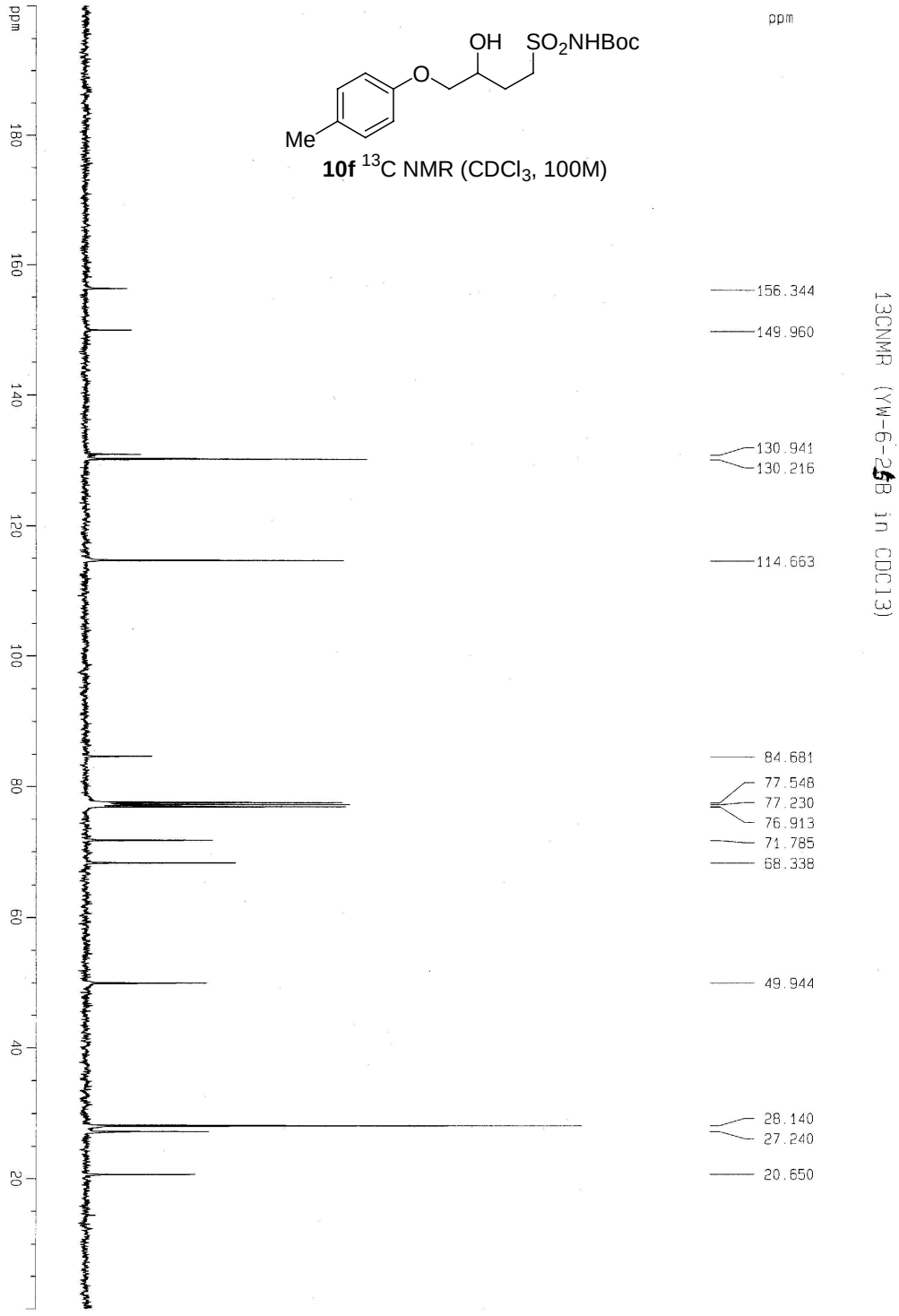


10e HRMS


YW-6-26D
06102300 48 (0.896)
100
%
0
380.0446
436.1031
849.2188
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
m/z
OH
SO2NHBoc
O
F3C
10e HRMS
TOF MS ES+
7.43e3



10f ^{1}H NMR ($CDCl_3$, 400M)

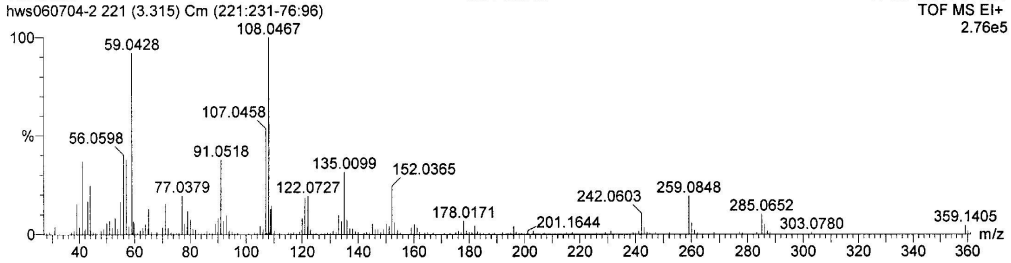

OH
SO2NHBoc
O
Me
10f 13C NMR (CDCl3, 100M)
ppm
156.344
149.960
130.941
130.216
114.663
84.681
77.548
77.230
76.913
71.785
68.338
49.944
28.140
27.240
20.650
13CNMR (YW-6-2B in CDCl3)

Elemental Composition Report **Page 1**

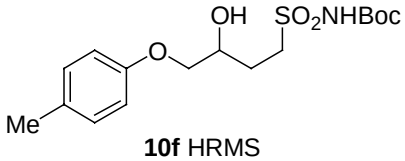
Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
288 formula(e) evaluated with 9 results within limits (up to 50 closest results for each mass)

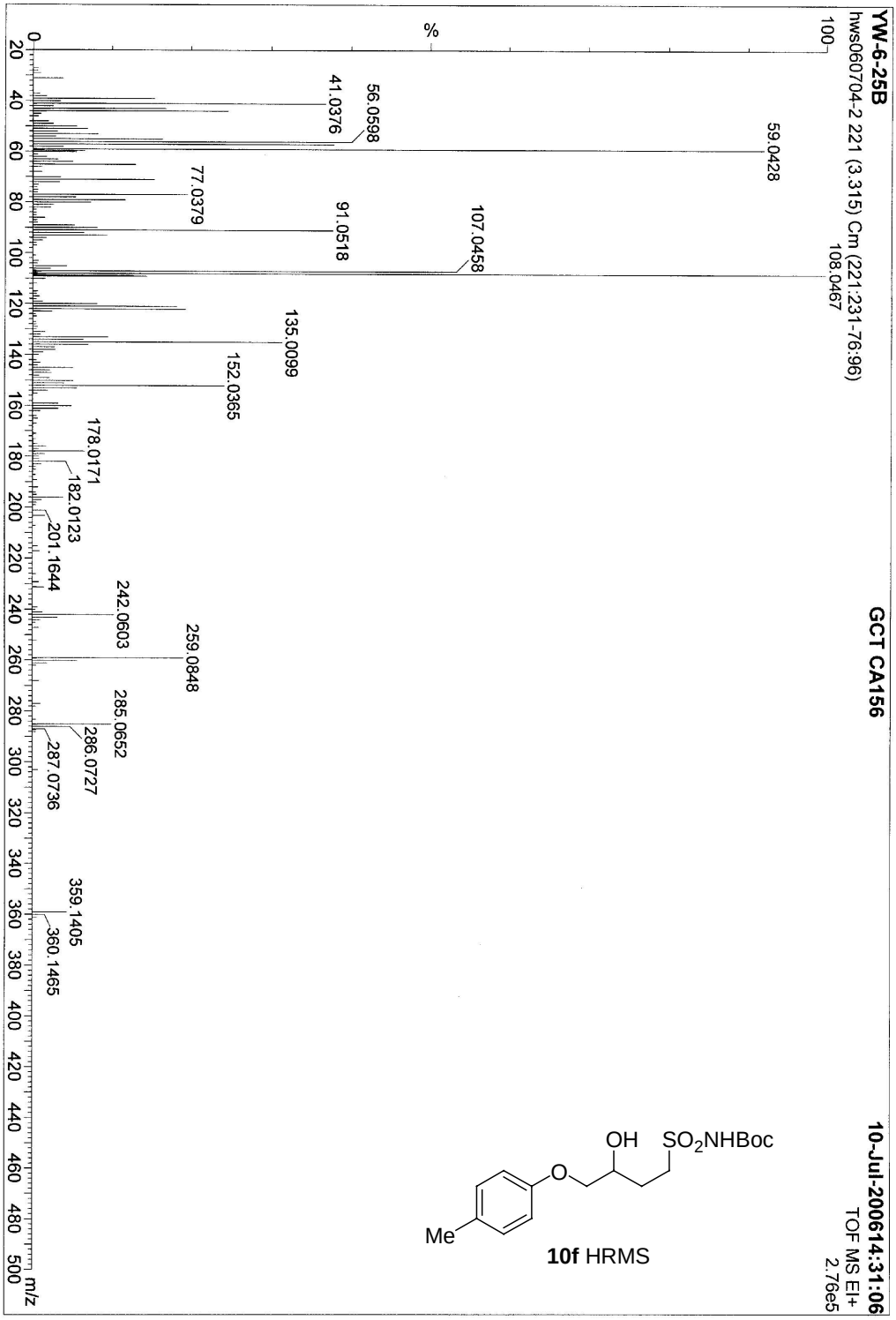
YW-6-25B
hws060704-2 221 (3.315) Cm (221:231-76:96)
GCT CA156
10-Jul-200614:31:06
TOF MS EI+
2.76e5



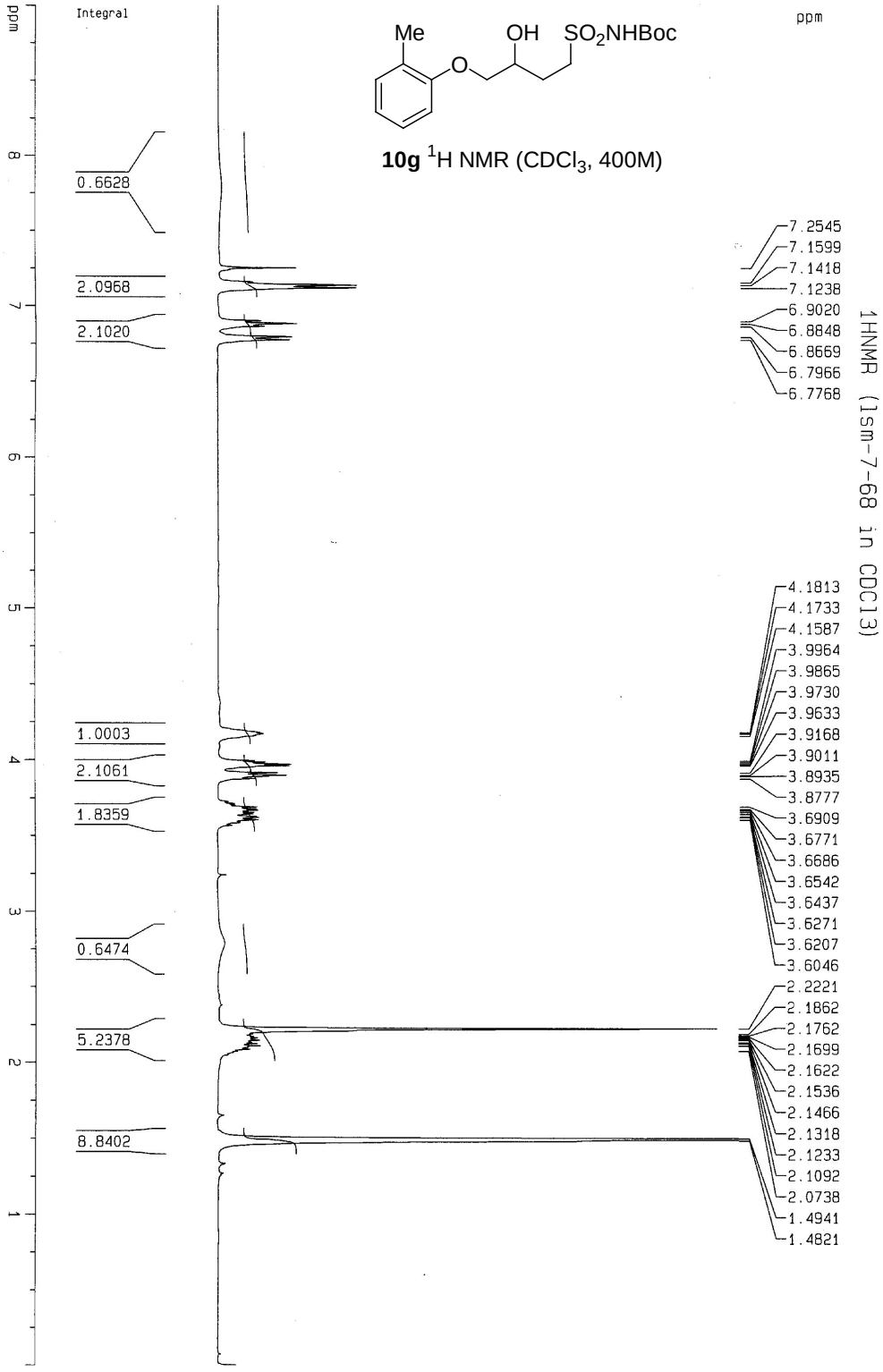
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
359.1405	359.1403	0.2	0.7	5.0	7	C16 H25 N O6 S
	359.1411	-0.6	-1.8	4.0	5	C17 H29 N O S3
	359.1396	0.9	2.6	14.5	3	C22 H19 N2 O3
	359.1429	-2.4	-6.8	9.5	4	C19 H23 N2 O3 S
	359.1378	2.7	7.6	9.0	2	C20 H25 N O S2
	359.1436	-3.1	-8.6	18.5	1	C27 H19 O
	359.1436	-3.1	-8.7	0.0	8	C13 H29 N O6 S2
	359.1369	3.6	10.1	10.0	6	C19 H21 N O6
	359.1454	-4.9	-13.8	5.5	9	C15 H23 N2 O8

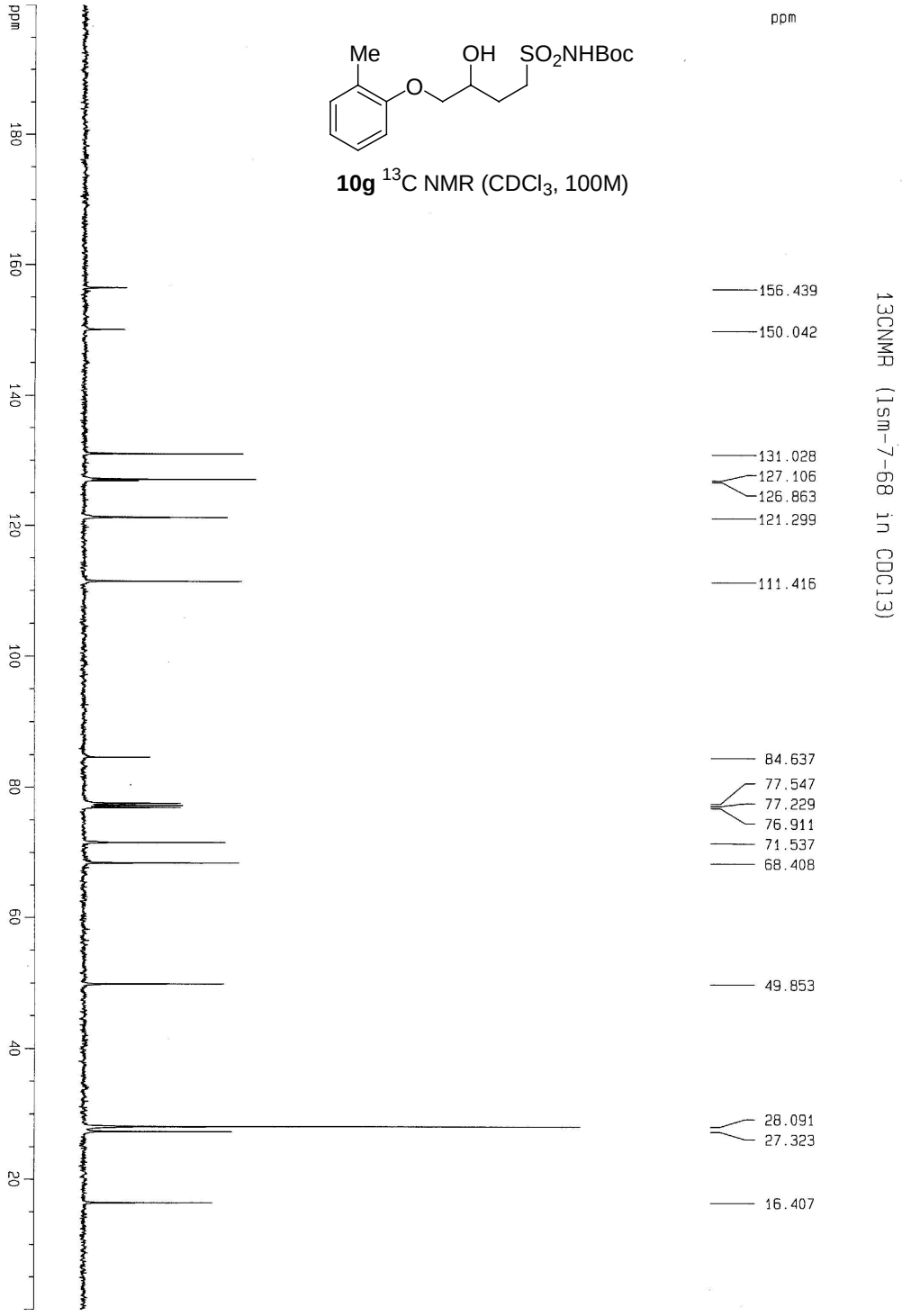


10f HRMS


YW-6-25B
hws060704-2 221 (3.315) Cm (221:231-76:96)
GCT CA156
10-Jul-200614:31:06
TOF MS EI+
2.76e5
%
m/z
59.0428
108.0467
107.0458
56.0598
41.0376
91.0518
77.0379
135.0099
152.0365
178.0171
182.0123
201.1644
242.0603
259.0848
285.0652
286.0727
287.0736
359.1405
360.1465
OH
SO2NHBoc
O
Me

10f HRMS


Me
OH
SO2NHBoc
O
10g 1H NMR (CDCl3, 400M)
Integral
ppm
0.6628
2.0968
2.1020
1.0003
2.1061
1.8359
0.6474
5.2378
8.8402
7.2545
7.1599
7.1418
7.1238
6.9020
6.8848
6.8669
6.7966
6.7768
4.1813
4.1733
4.1587
3.9964
3.9865
3.9730
3.9633
3.9168
3.9011
3.8935
3.8777
3.6909
3.6771
3.6686
3.6542
3.6437
3.6271
3.6207
3.6046
2.2221
2.1862
2.1762
2.1699
2.1622
2.1536
2.1466
2.1318
2.1233
2.1092
2.0738
1.4941
1.4821
1HNMR (1sm-7-68 in CDCl3)

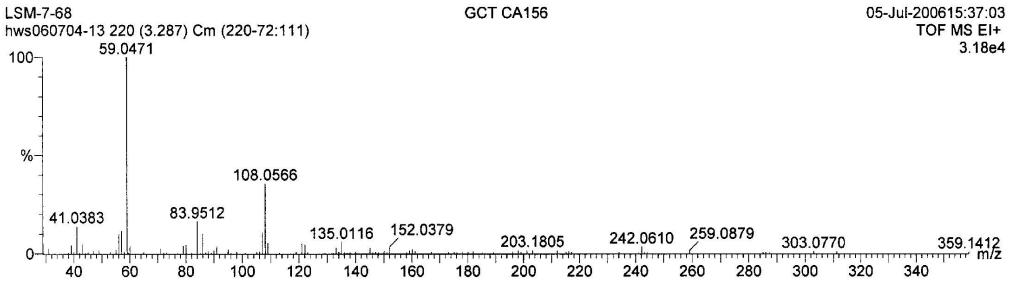


10g ^{13}C NMR ($CDCl_3$, 100M)

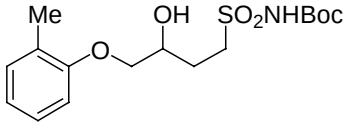
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

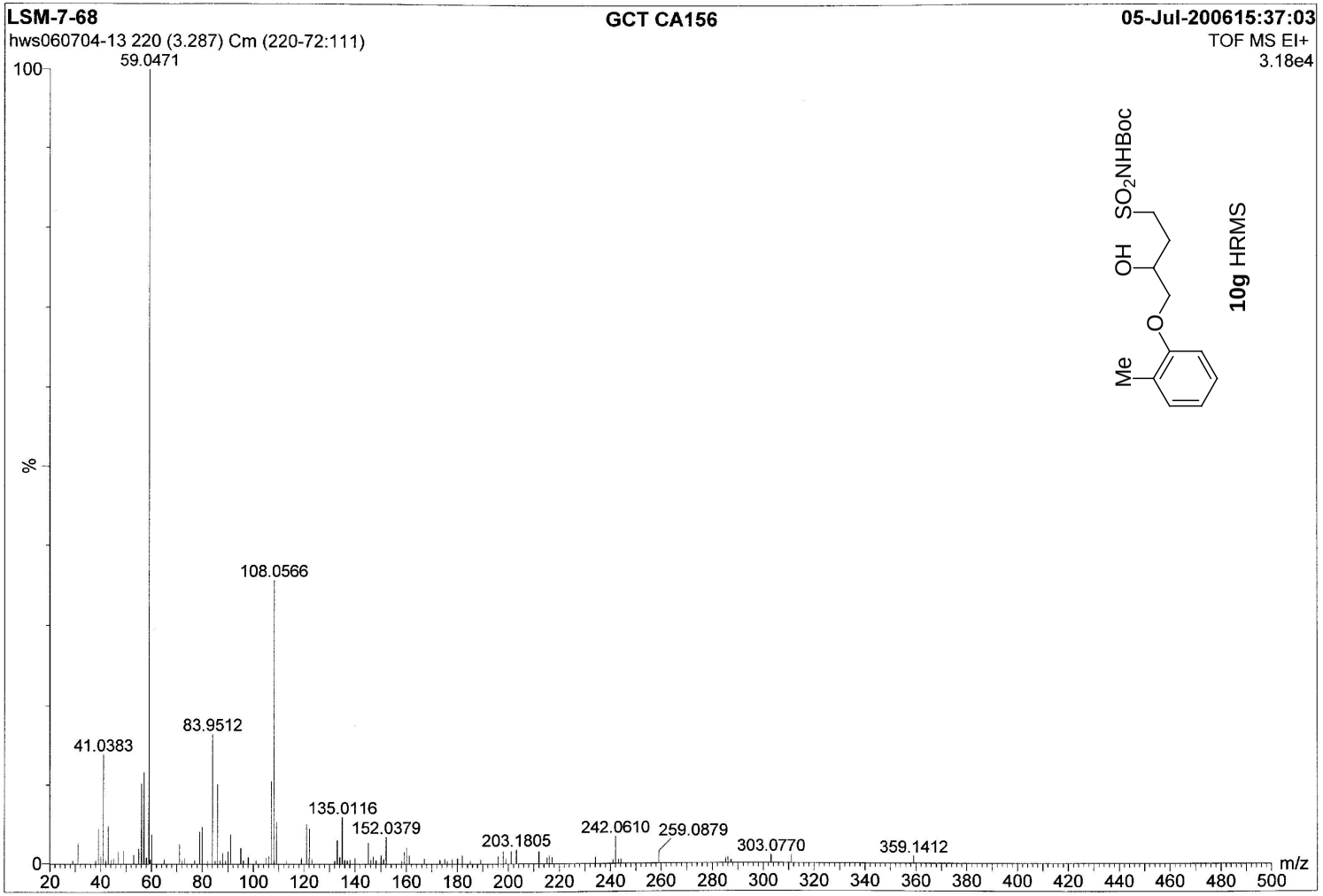
Monoisotopic Mass, Odd and Even Electron Ions
82 formula(e) evaluated with 3 results within limits (up to 50 closest results for each mass)

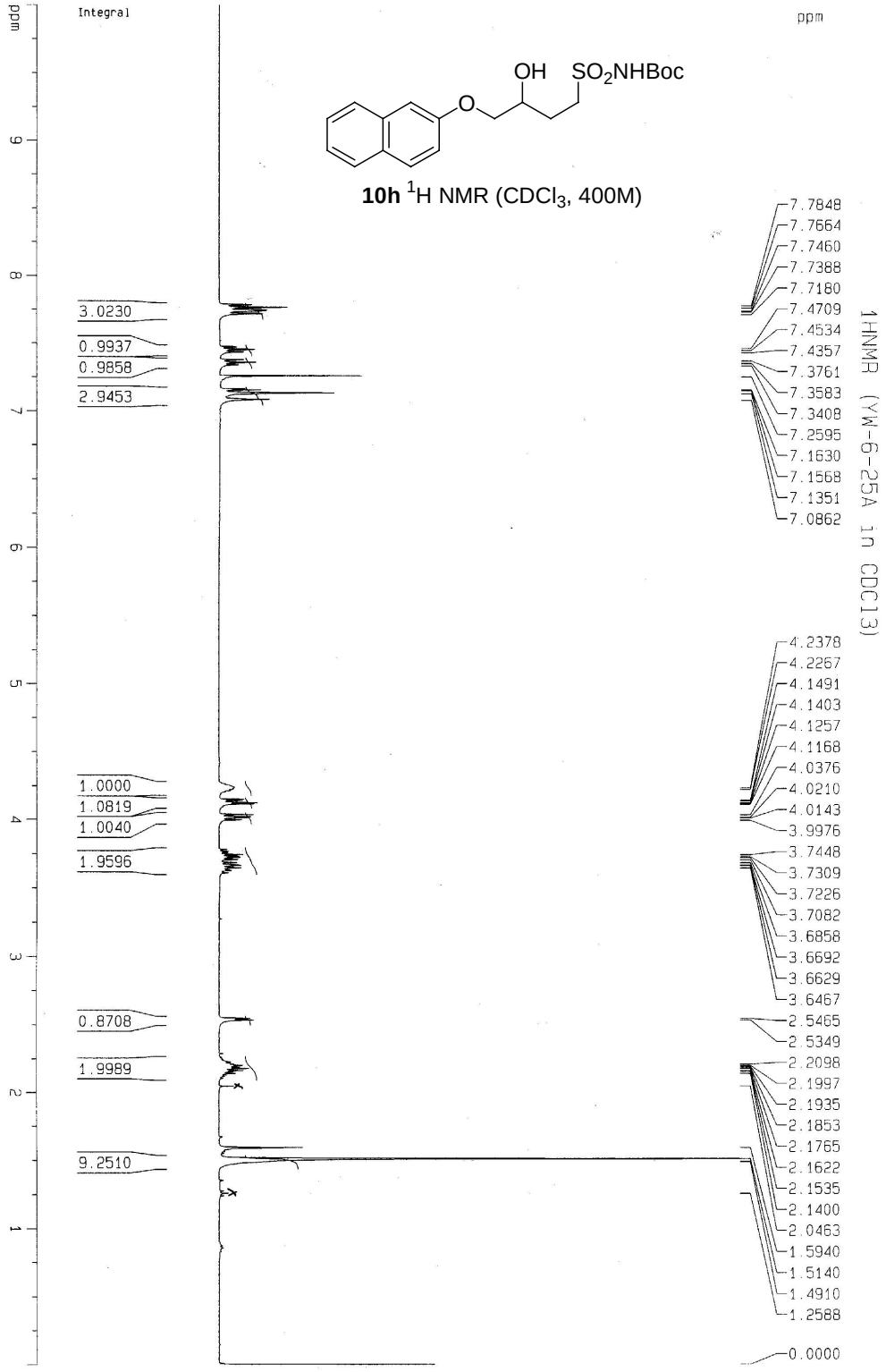


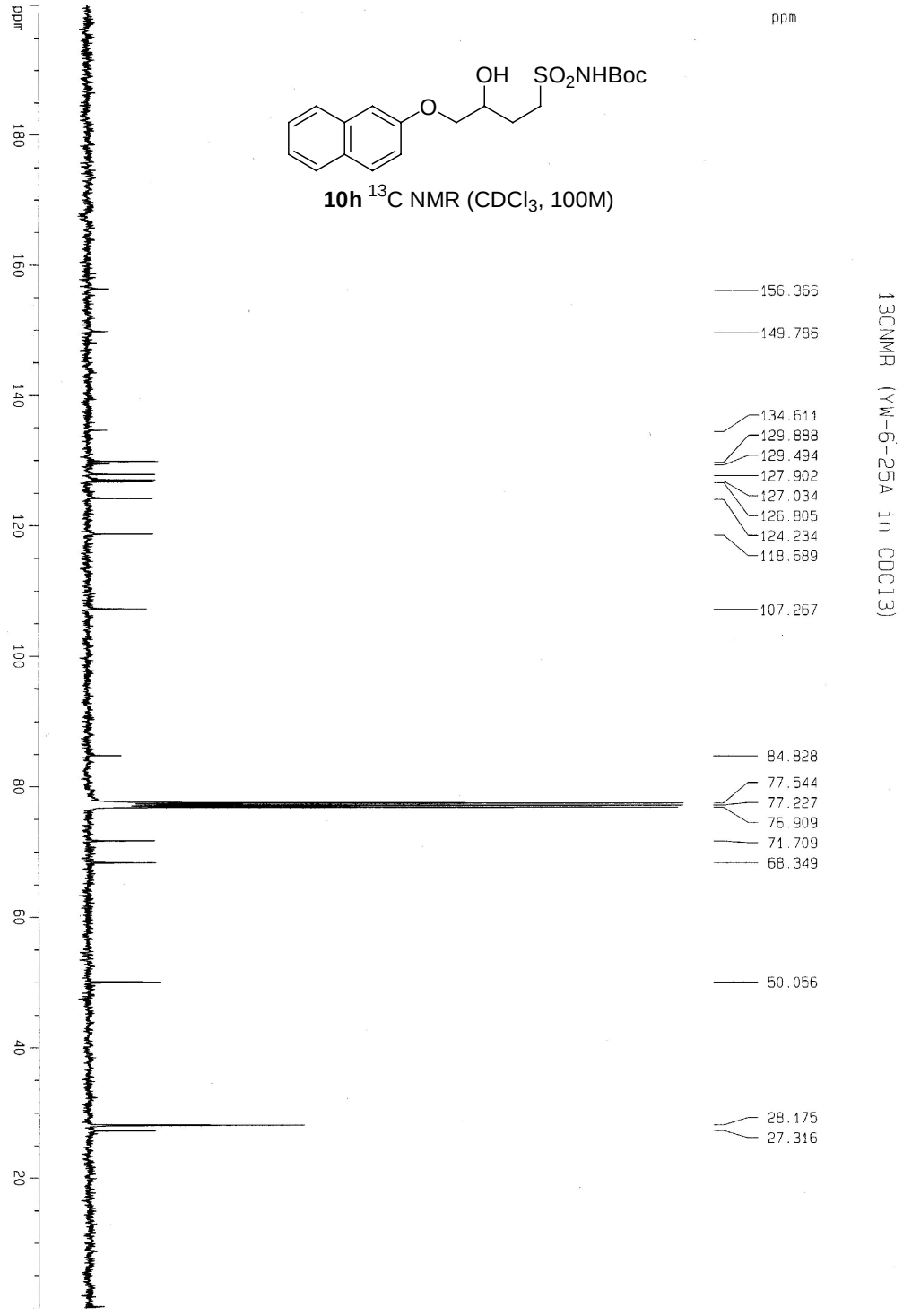
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
359.1412	359.1403	0.9	2.6	5.0	1	C16 H25 N O6 S
	359.1436	-2.4	-6.7	18.5	3	C27 H19 O
	359.1369	4.3	12.0	10.0	2	C19 H21 N O6



10g HRMS


LSM-7-68
GCT CA156
05-Jul-200615:37:03
hws060704-13 220 (3.287) Cm (220-72:111)
TOF MS EI+
3.18e4
100
%
0
59.0471
108.0566
83.9512
41.0383
135.0116
152.0379
203.1805
242.0610
259.0879
303.0770
359.1412
m/z
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500
SO2NHBoc
OH
O
Me
10g HRMS


OH
SO2NHBoc
O
10h 1H NMR (CDCl3, 400M)
Integral
ppm
3.0230
0.9937
0.9858
2.9453
1.0000
1.0819
1.0040
1.9596
0.8708
1.9989
9.2510
7.7848
7.7664
7.7460
7.7388
7.7180
7.4709
7.4534
7.4357
7.3761
7.3583
7.3408
7.2595
7.1630
7.1568
7.1351
7.0862
4.2378
4.2267
4.1491
4.1403
4.1257
4.1168
4.0376
4.0210
4.0143
3.9976
3.7448
3.7309
3.7226
3.7082
3.6858
3.6692
3.6629
3.6467
2.5465
2.5349
2.2098
2.1997
2.1935
2.1853
2.1765
2.1622
2.1535
2.1400
2.0463
1.5940
1.5140
1.4910
1.2588
0.0000
1HNMR (YW-6-25A in CDCl3)



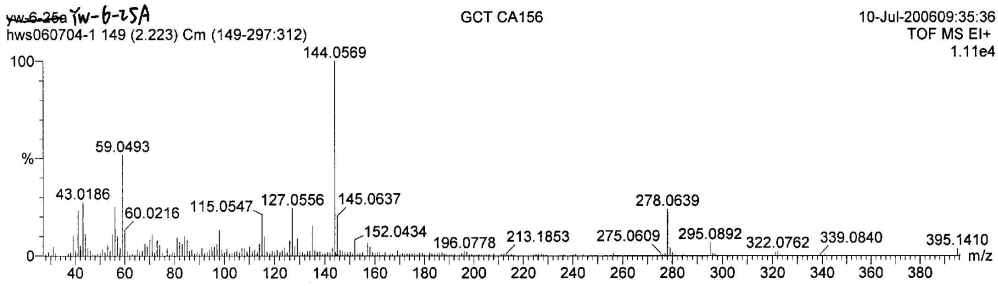
10h ^{13}C NMR ($CDCl_3$, 100M)

Elemental Composition Report **Page 1**

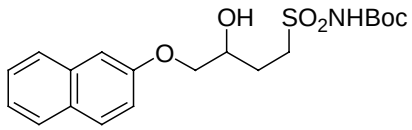
Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
116 formula(e) evaluated with 4 results within limits (up to 50 closest results for each mass)

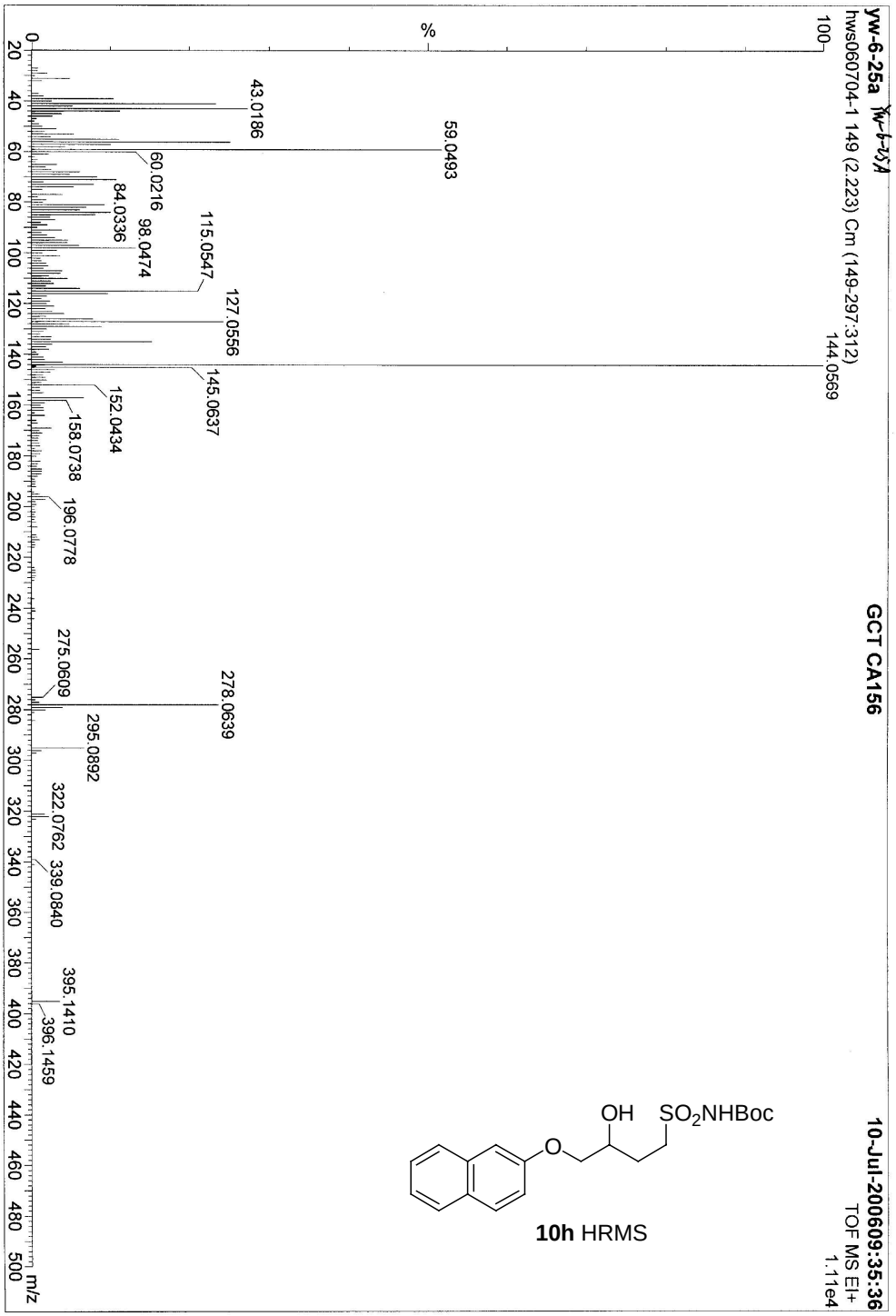
~~yw-6-256~~ YW-6-25A
hws060704-1 149 (2.223) Cm (149-297:312)



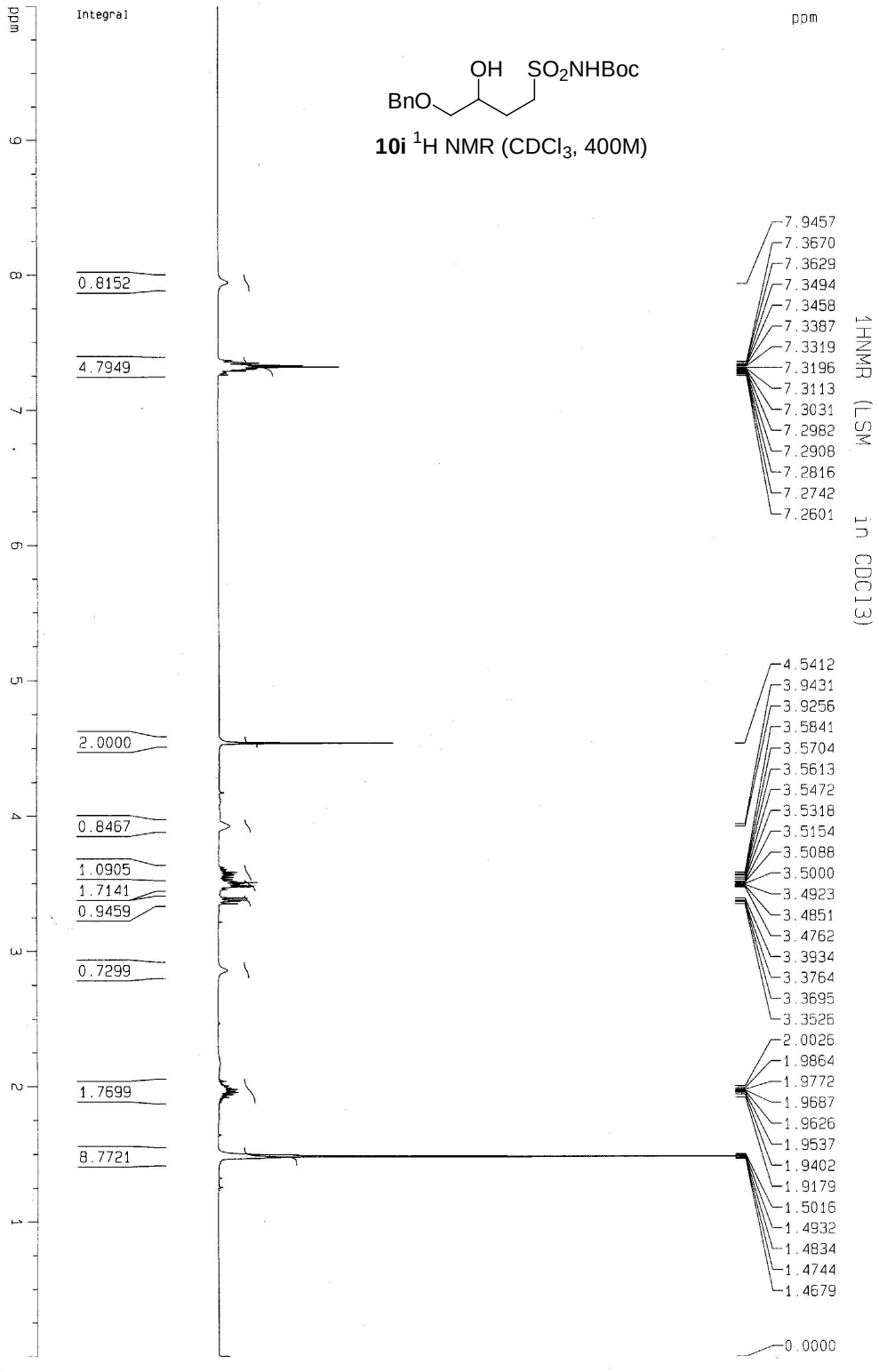
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
395.1410	395.1403	0.7	1.9	8.0	3	C19 H25 N O6 S
	395.1389	2.1	5.3	8.5	2	C17 H23 N4 O5 S
	395.1454	-4.4	-11.2	8.5	1	C18 H23 N2 O8
	395.1362	4.8	12.1	4.0	4	C14 H25 N3 O8 S

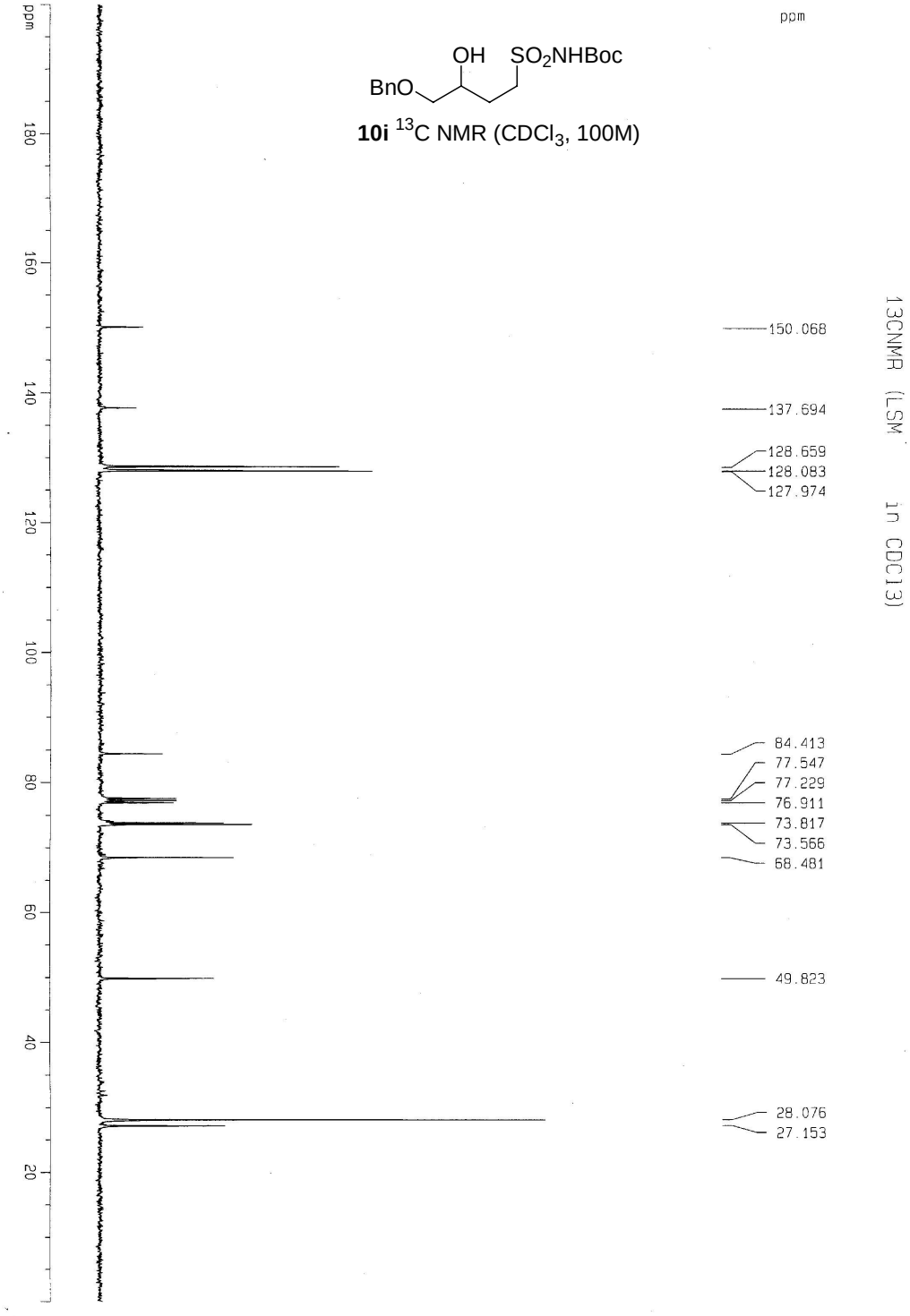


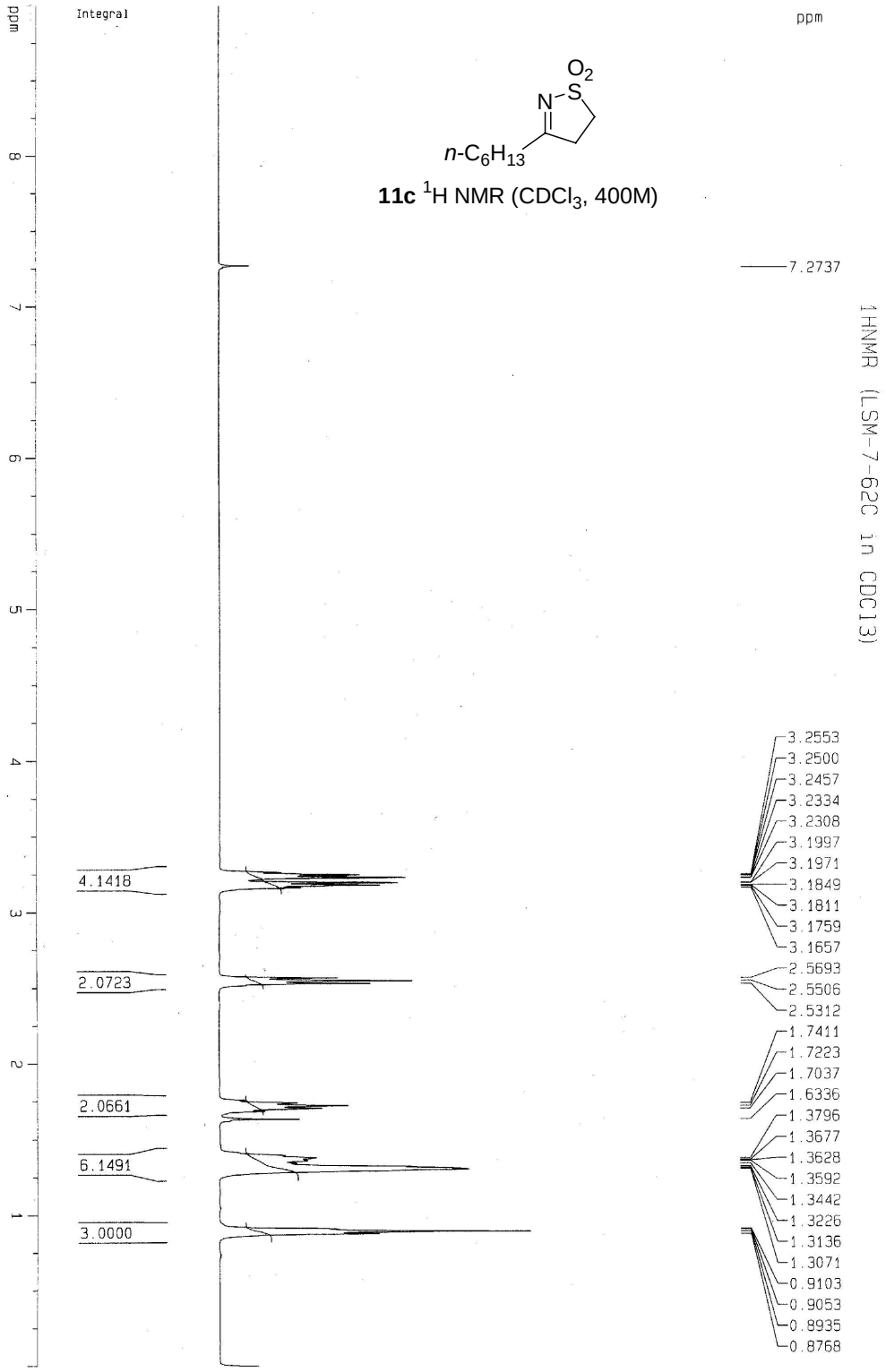
10h HRMS


yw-6-25a
hws060704-1 149 (2.223) Cm (149-297:312)
GCT CA156
10-Jul-200609:35:36
TOF MS EI+
1.11e4
%
m/z
144.0569
59.0493
43.0186
60.0216
84.0336
98.0474
115.0547
127.0556
145.0637
152.0434
158.0738
196.0778
275.0609
278.0639
295.0892
322.0762
339.0840
395.1410
396.1459
OH
SO2NHBoc
O

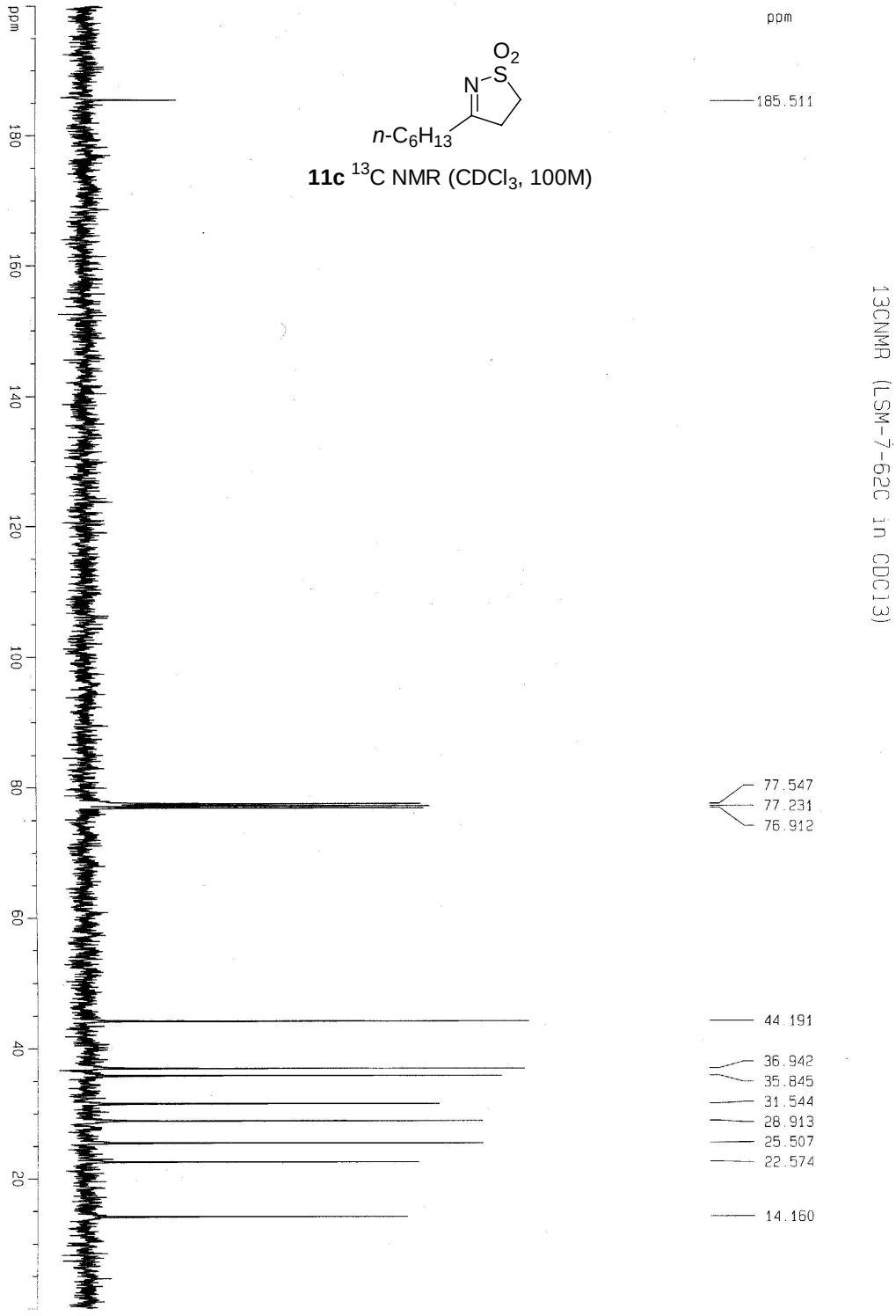
10h HRMS


Integral
ppm
OH
SO2NHBoc
BnO
10i 1H NMR (CDCl3, 400M)
0.8152
4.7949
2.0000
0.8467
1.0905
1.7141
0.9459
0.7299
1.7699
8.7721
7.9457
7.3670
7.3629
7.3494
7.3458
7.3387
7.3319
7.3196
7.3113
7.3031
7.2982
7.2908
7.2816
7.2742
7.2601
4.5412
3.9431
3.9256
3.5841
3.5704
3.5613
3.5472
3.5318
3.5154
3.5088
3.5000
3.4923
3.4851
3.4762
3.3934
3.3764
3.3695
3.3526
2.0026
1.9864
1.9772
1.9687
1.9626
1.9537
1.9402
1.9179
1.5016
1.4932
1.4834
1.4744
1.4679
0.0000
1HNMR (LSM in CDCl3)


OH
SO2NHBoc
BnO
10i 13C NMR (CDCl3, 100M)
ppm
180
160
140
120
100
80
60
40
20
150.068
137.694
128.659
128.083
127.974
84.413
77.547
77.229
76.911
73.817
73.566
68.481
49.823
28.076
27.153
13CNMR (LSM in CDCl3)



11c ^{1}H NMR ($CDCl_3$, 400M)

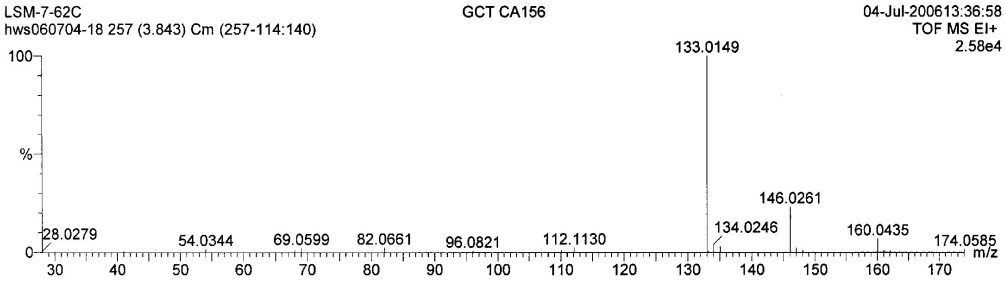


11c ^{13}C NMR ($CDCl_3$, 100M)

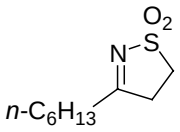
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

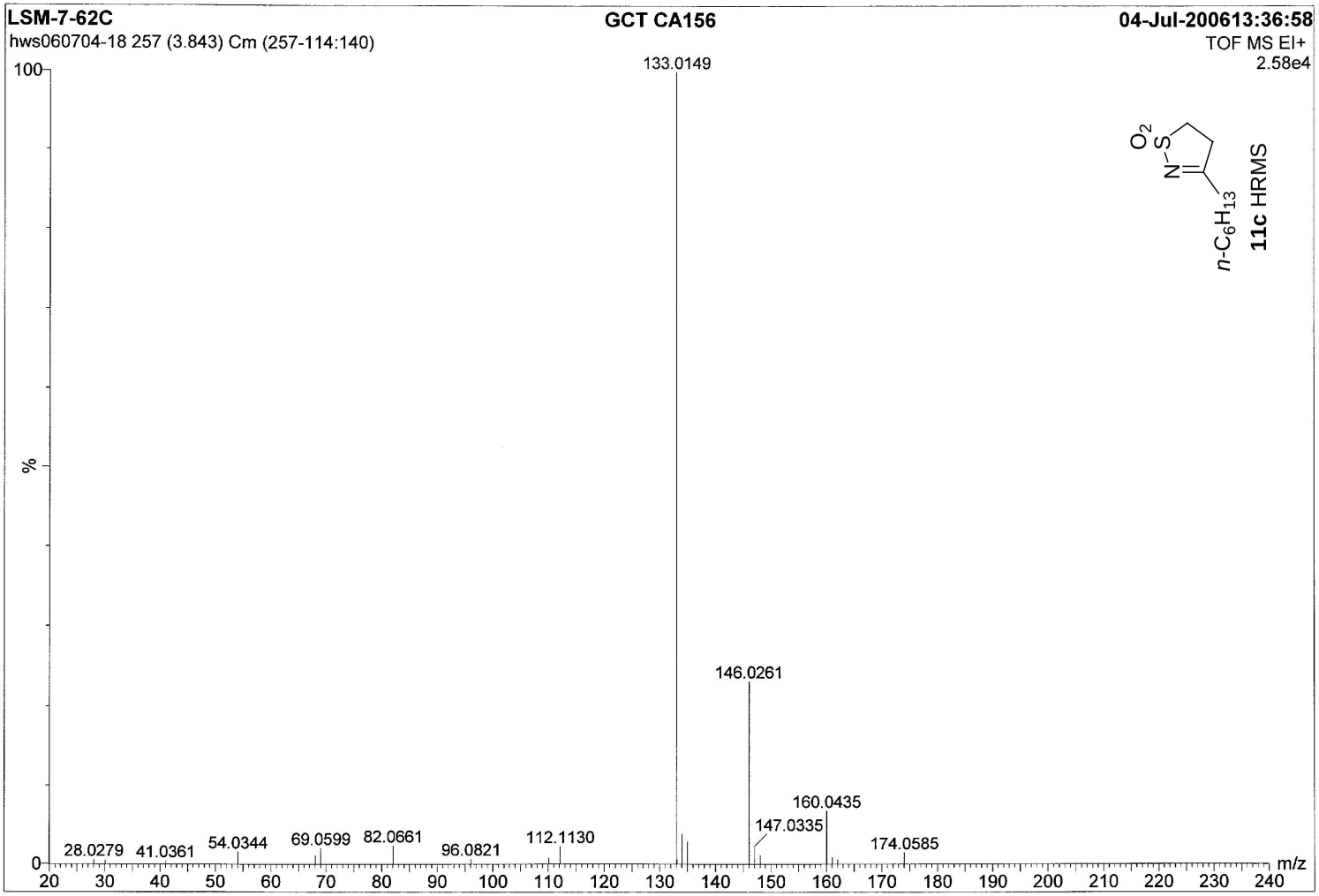
Monoisotopic Mass, Odd and Even Electron Ions
170 formula(e) evaluated with 4 results within limits (up to 50 closest results for each mass)

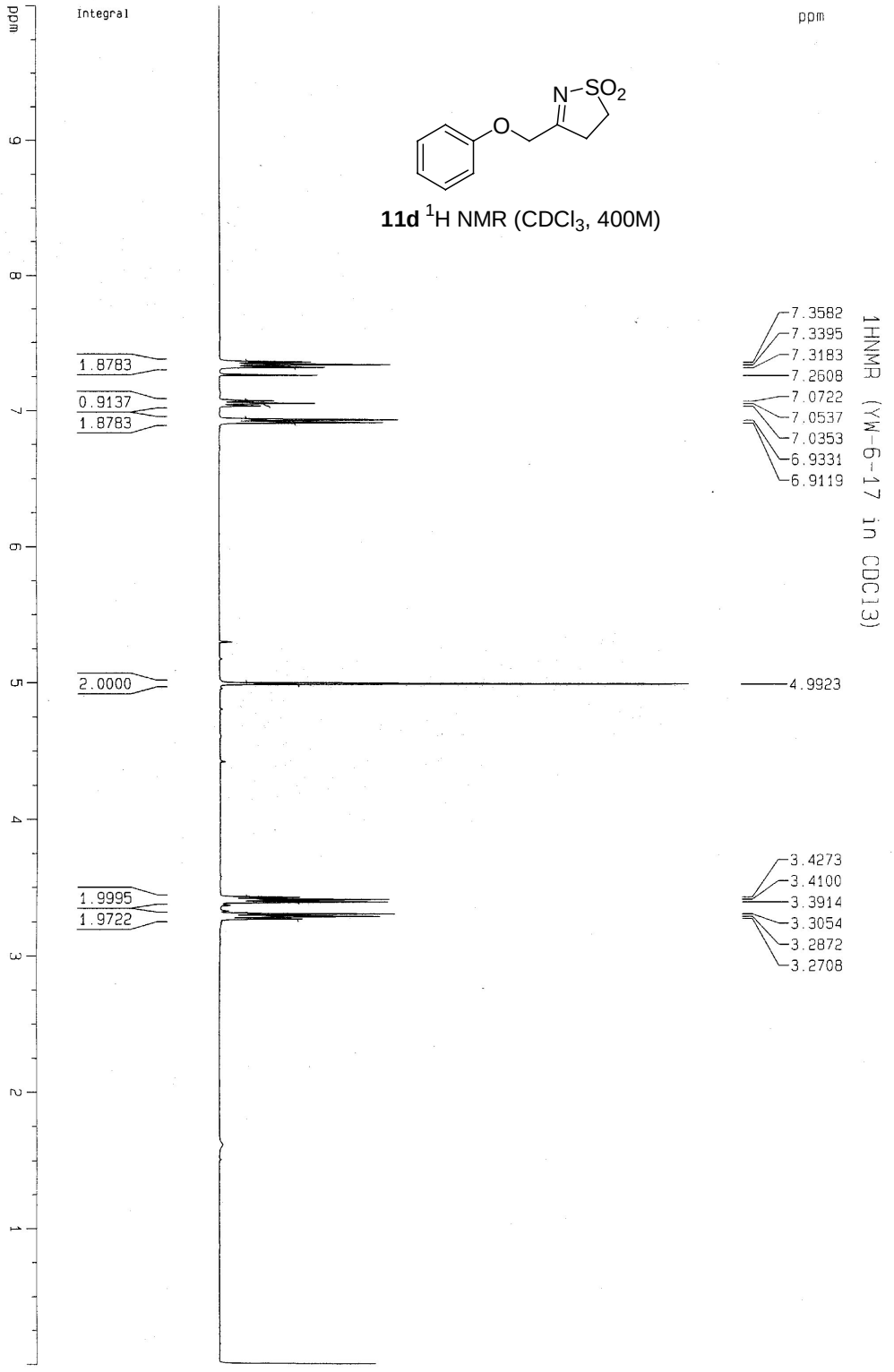


Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
174.0585	174.0589	-0.4	-2.2	2.5	2	C7 H12 N O2 S
	174.0555	3.0	17.2	7.5	3	C10 H8 N O2
	174.0549	3.6	21.0	-1.5	1	C2 H12 N3 O4 S
	174.0537	4.8	27.6	2.0	4	C8 H14 S2

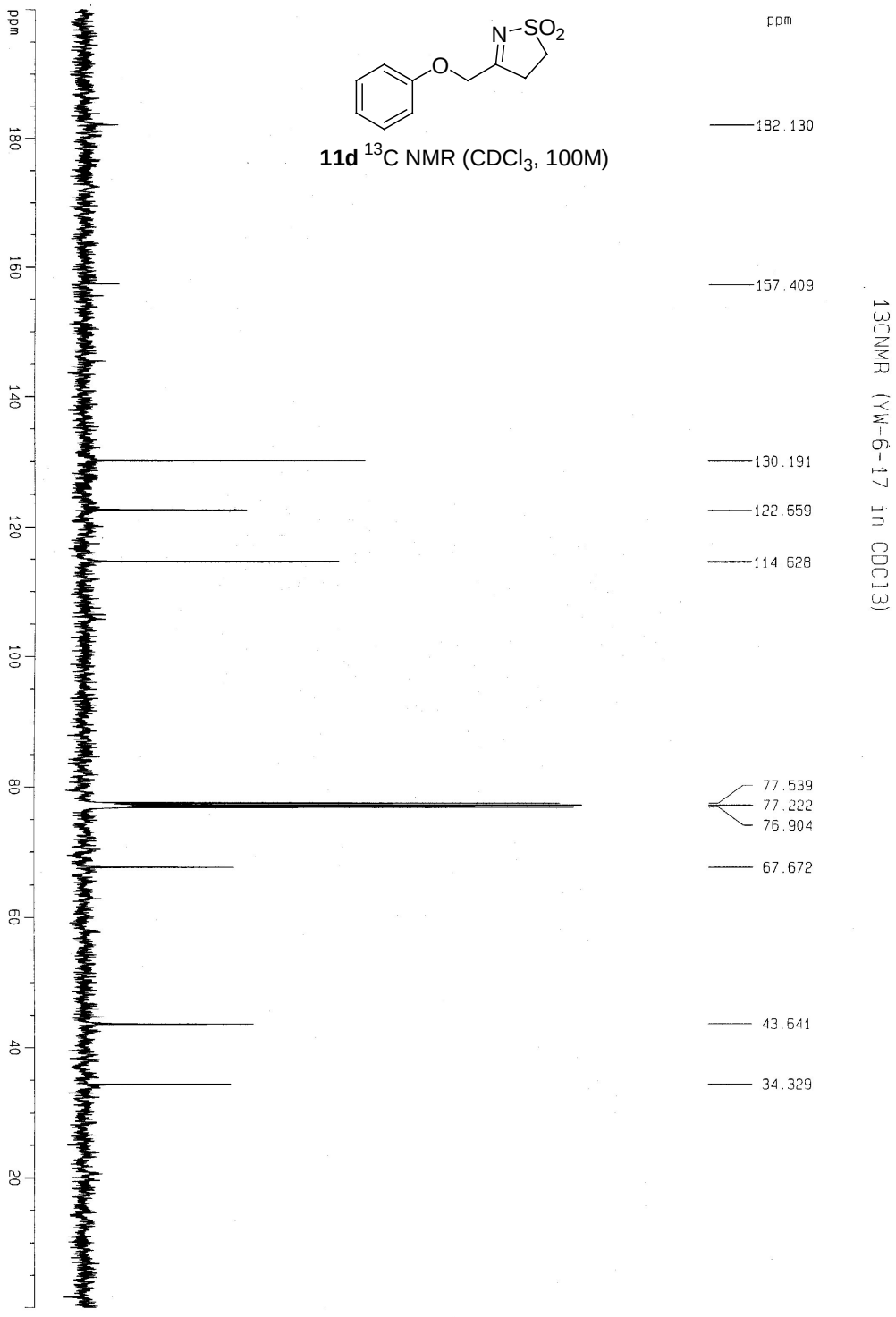


11c HRMS


LSM-7-62C
hws060704-18 257 (3.843) Cm (257-114:140)
GCT CA156
04-Jul-200613:36:58
TOF MS EI+
2.58e4
100
%
0
133.0149
146.0261
160.0435
147.0335
174.0585
28.0279
41.0361
54.0344
69.0599
82.0661
96.0821
112.1130
m/z
20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240
O2
S
N
n-C6H13
11c HRMS



11d ^{1}H NMR ($CDCl_3$, 400M)

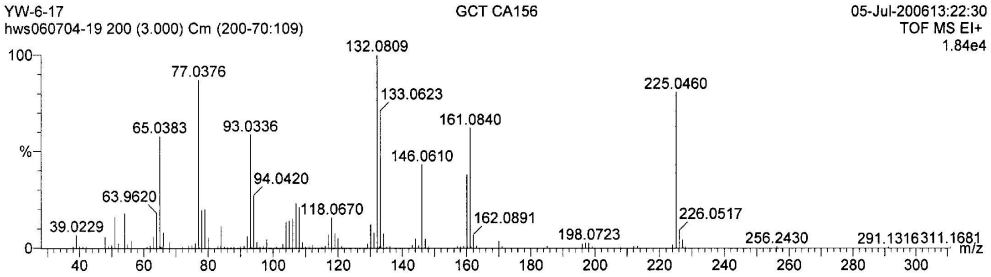


11d ^{13}C NMR ($CDCl_3$, 100M)

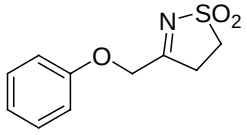
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

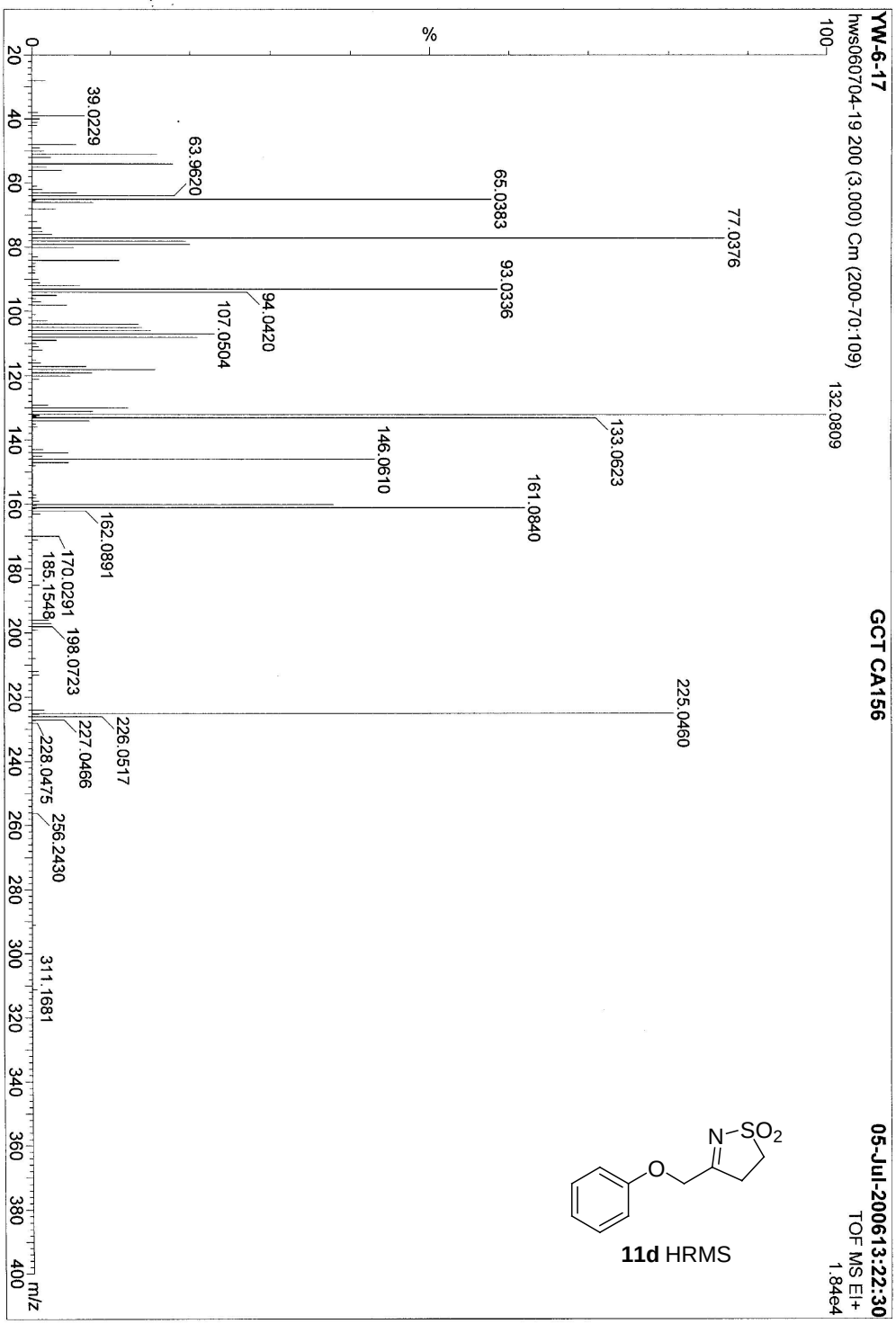
Monoisotopic Mass, Odd and Even Electron Ions
169 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)



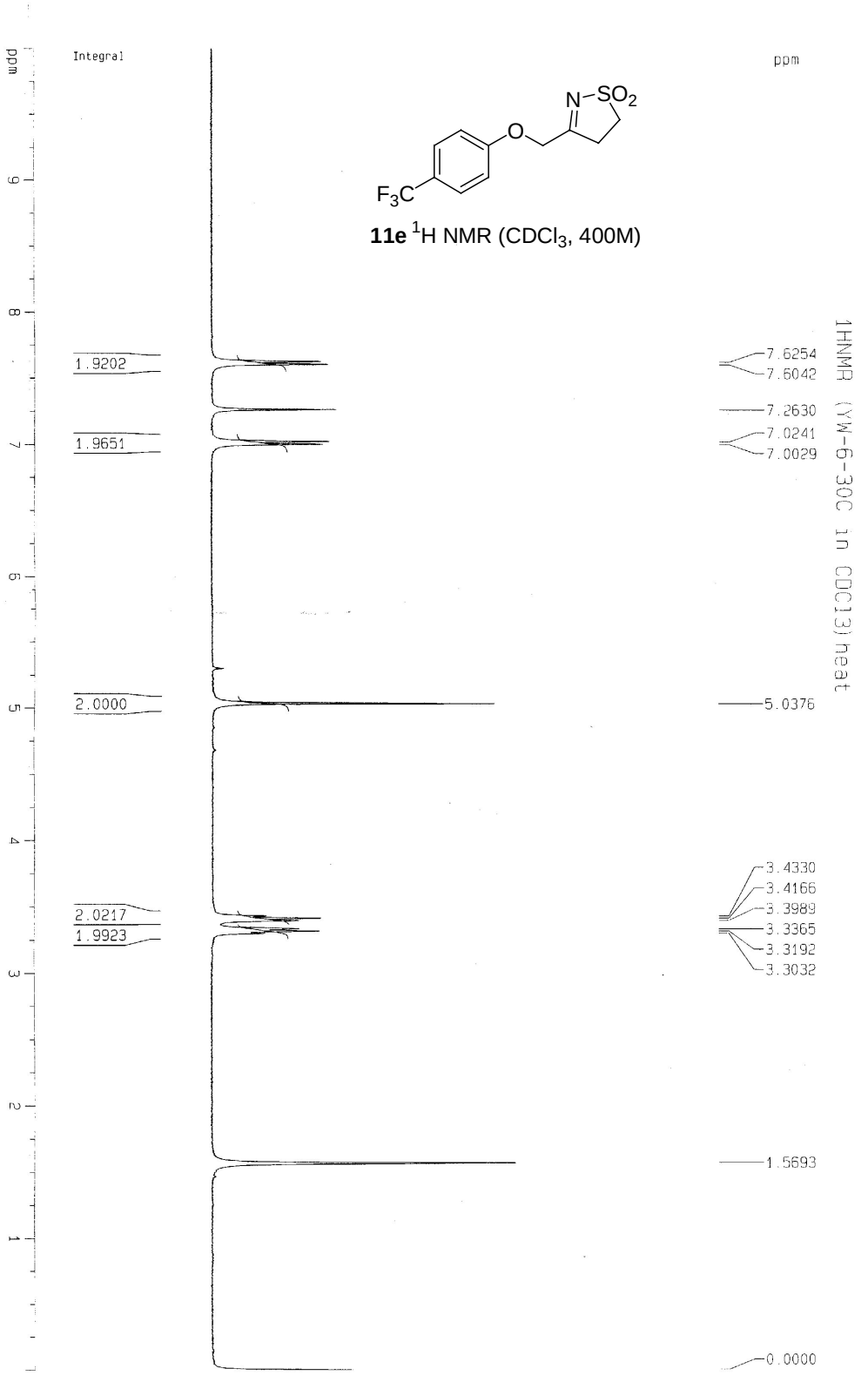
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
225.0460	225.0460	0.0	0.2	6.0	1	C10 H11 N O3 S
	225.0453	0.7	3.2	15.5	5	C16 H5 N2
	225.0442	1.8	8.2	0.5	7	C8 H17 O S3
	225.0486	-2.6	-11.8	10.5	3	C13 H9 N2 S
	225.0428	3.2	14.2	1.0	6	C6 H15 N3 S3
	225.0493	-3.3	-14.8	1.0	2	C7 H15 N O3 S2
	225.0426	3.4	15.1	11.0	4	C13 H7 N O3



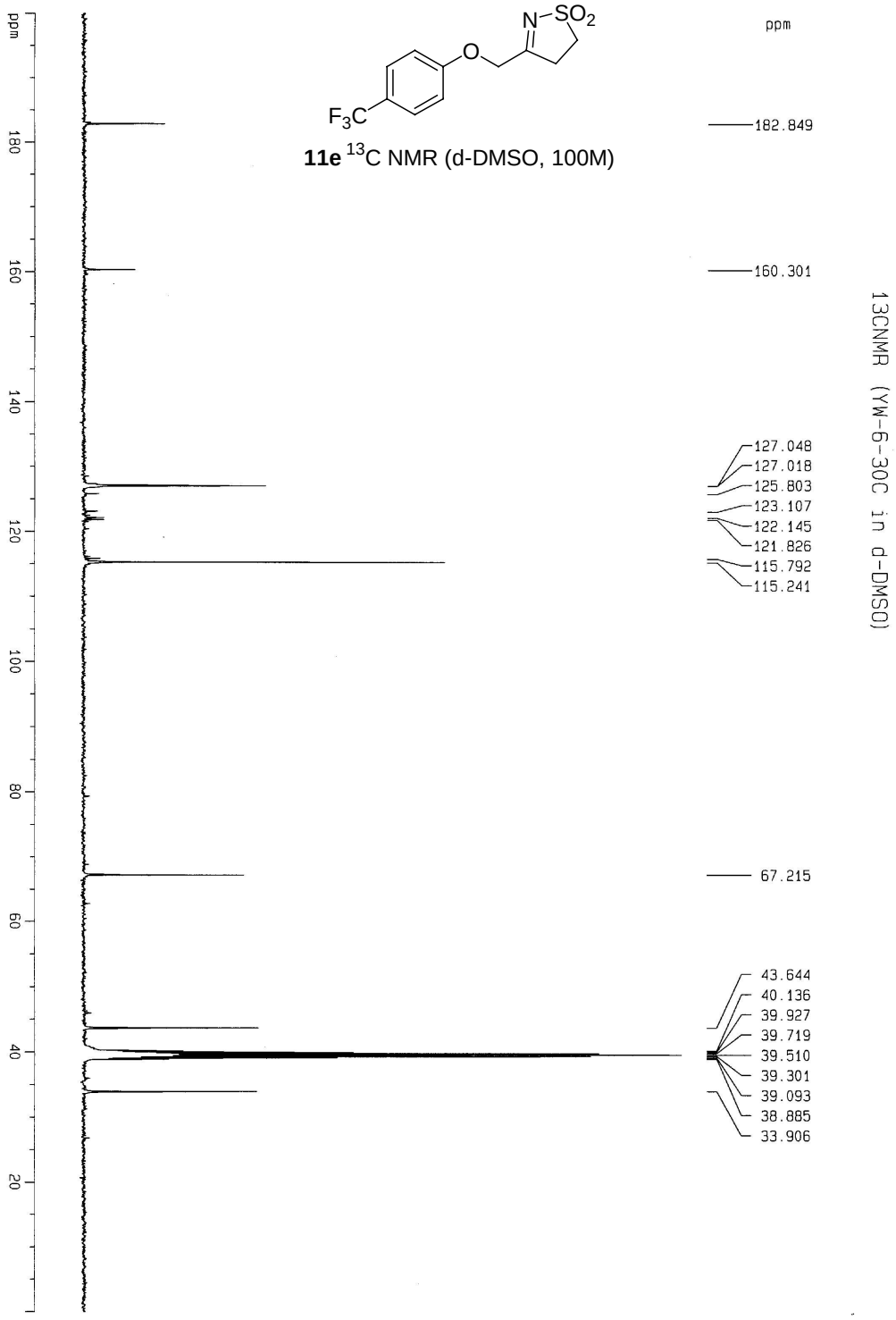
11d HRMS


YW-6-17
hws060704-19 200 (3.000) Cm (200-70:109)
GCT CA156
05-Jul-200613:22:30
TOF MS EI+
1.84e4
%
m/z
39.0229
63.9620
65.0383
77.0376
93.0336
94.0420
107.0504
132.0809
133.0623
146.0610
161.0840
162.0891
170.0291
185.1548
198.0723
225.0460
226.0517
227.0466
228.0475
256.2430
311.1681
N
SO2
O

11d HRMS



11e ^{1}H NMR ($CDCl_3$, 400M)

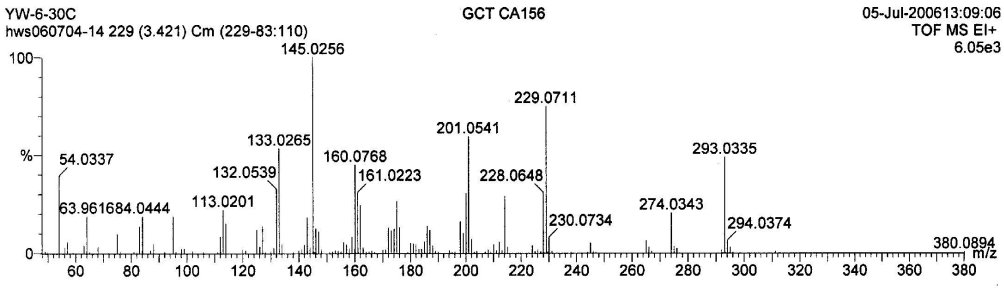


11e ^{13}C NMR (d-DMSO, 100M)

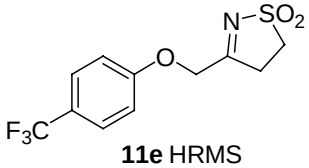
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

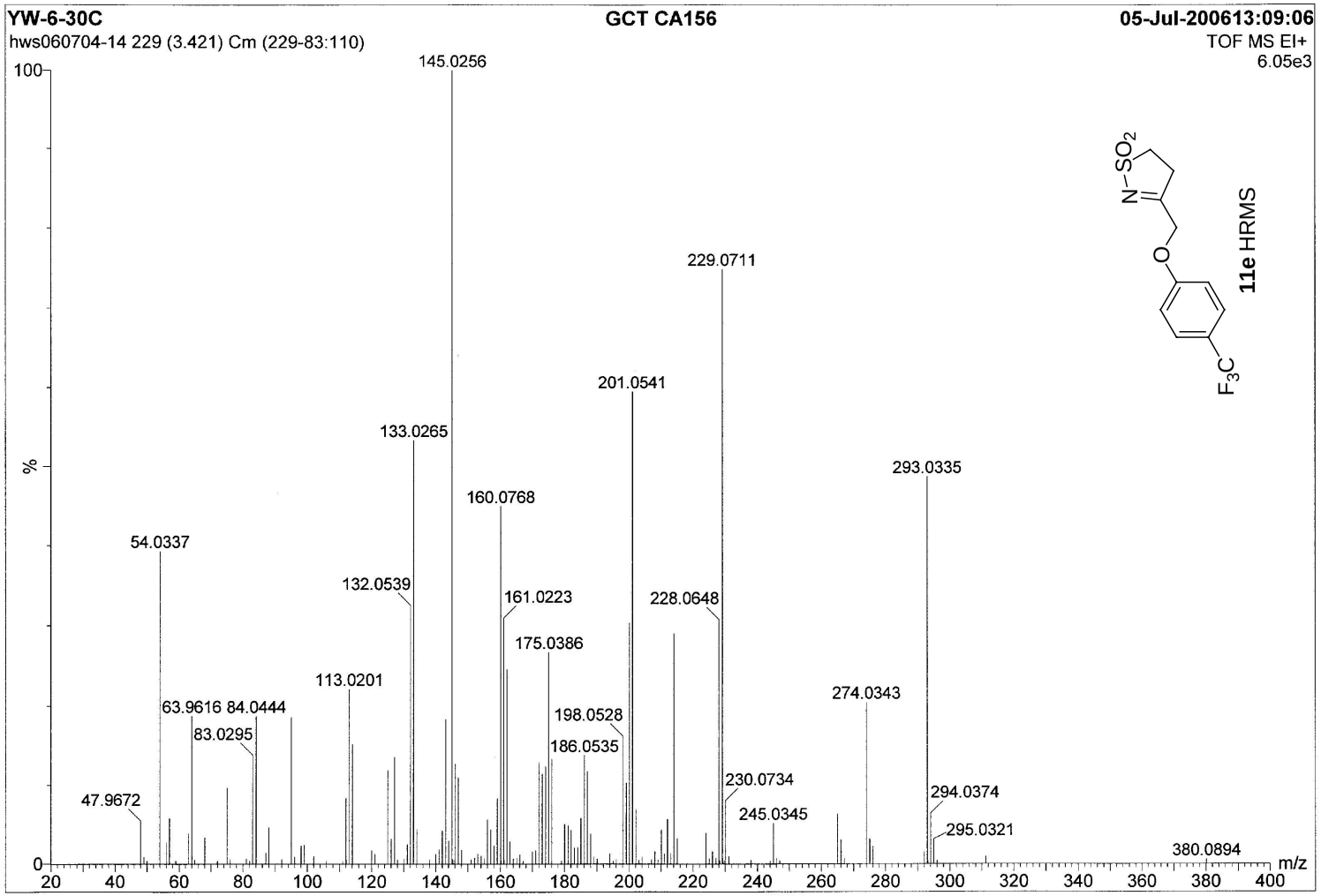
Monoisotopic Mass, Odd and Even Electron Ions
277 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)



Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
293.0335	293.0333	0.2	0.5	6.0	1	C11 H10 N O3 S F3
	293.0322	1.3	4.4	10.0	3	C14 H9 N O2 S F2
	293.0311	2.4	8.3	14.0	5	C17 H8 N O S F
	293.0300	3.5	12.0	11.0	4	C14 H6 N O3 F3
	293.0299	3.6	12.2	18.0	7	C20 H7 N S
	293.0298	3.7	12.8	7.0	2	C12 H8 N S F5
	293.0288	4.7	15.9	15.0	6	C17 H5 N O2 F2



11e HRMS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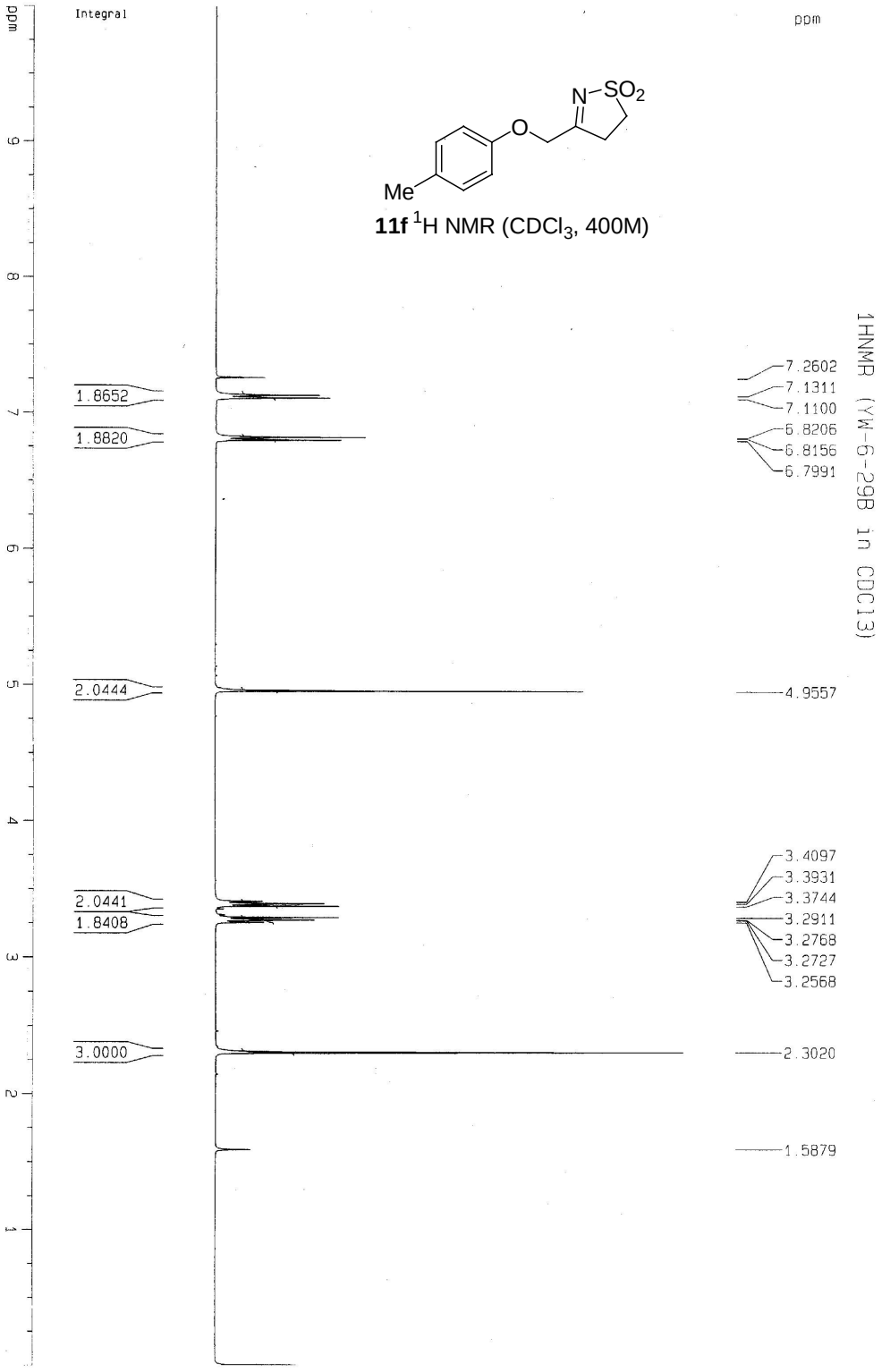
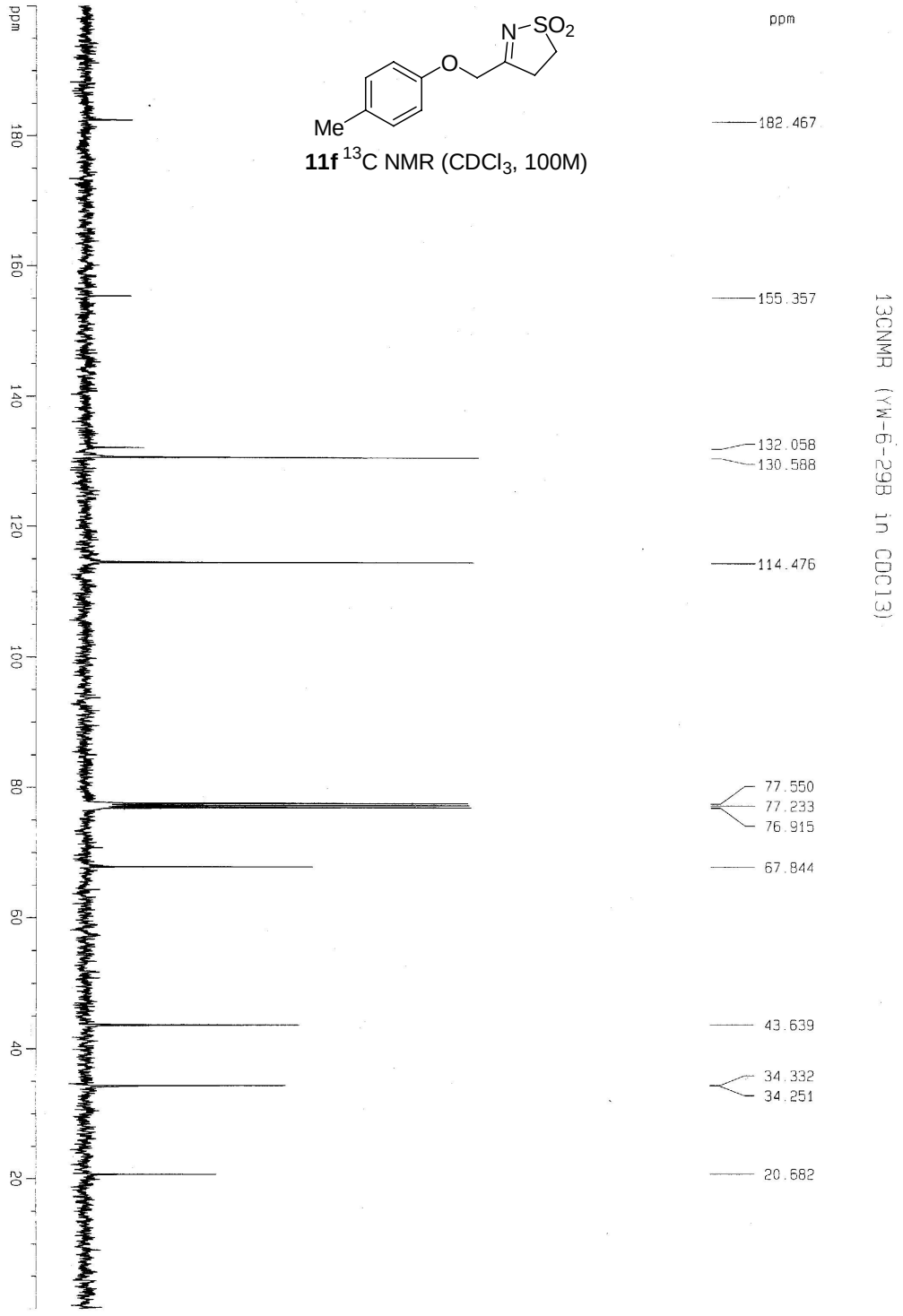
GCT CA156
05-Jul-200613:09:06
hws060704-14 229 (3.421) Cm (229-83:110)
TOF MS EI+
6.05e3
100
%
0
145.0256
229.0711
201.0541
133.0265
293.0335
160.0768
54.0337
132.0539
161.0223
228.0648
175.0386
113.0201
274.0343
63.9616 84.0444
198.0528
83.0295
186.0535
230.0734
47.9672
294.0374
245.0345
295.0321
380.0894
m/z
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
N–SO2
O
F3C
11e HRMS



11f ^{1}H NMR ($CDCl_3$, 400M)

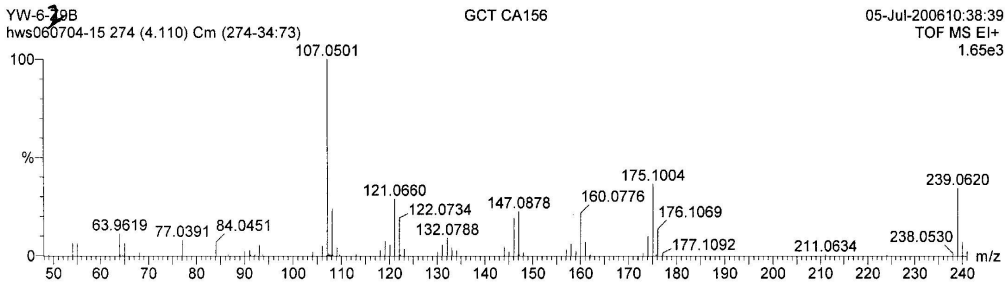


11f ^{13}C NMR ($CDCl_3$, 100M)

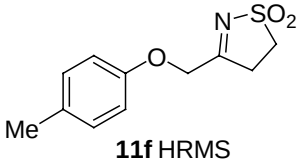
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

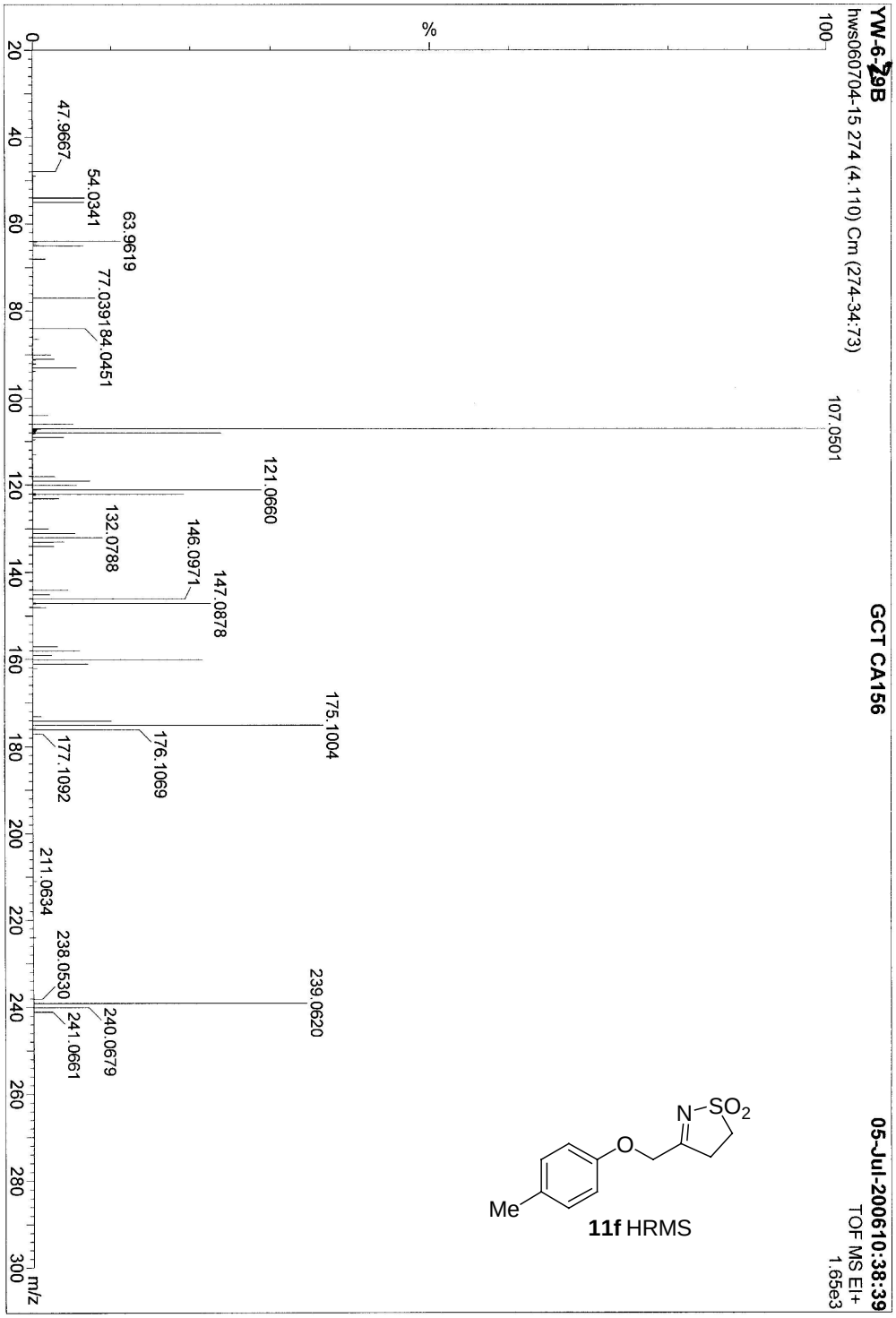
Monoisotopic Mass, Odd and Even Electron Ions
177 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)



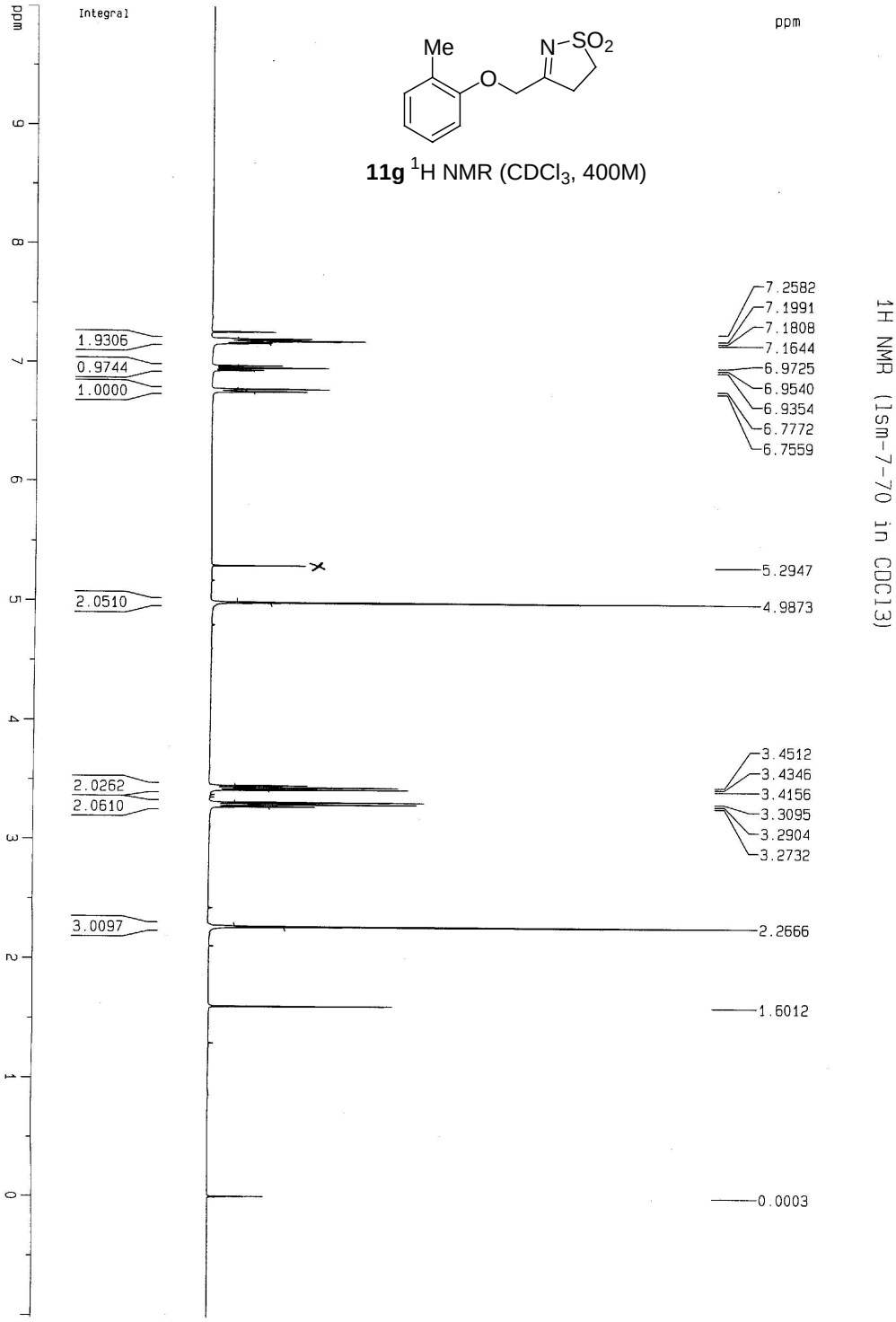
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
239.0620	239.0616	0.4	1.6	6.0	4	C11 H13 N O3 S ✓
	239.0609	1.1	4.5	15.5	2	C17 H7 N2
	239.0598	2.2	9.2	0.5	6	C9 H19 O S3
	239.0643	-2.3	-9.6	10.5	1	C14 H11 N2 S
	239.0650	-3.0	-12.5	1.0	5	C8 H17 N O3 S2
	239.0585	3.5	14.8	1.0	7	C7 H17 N3 S3
	239.0582	3.8	15.7	11.0	3	C14 H9 N O3



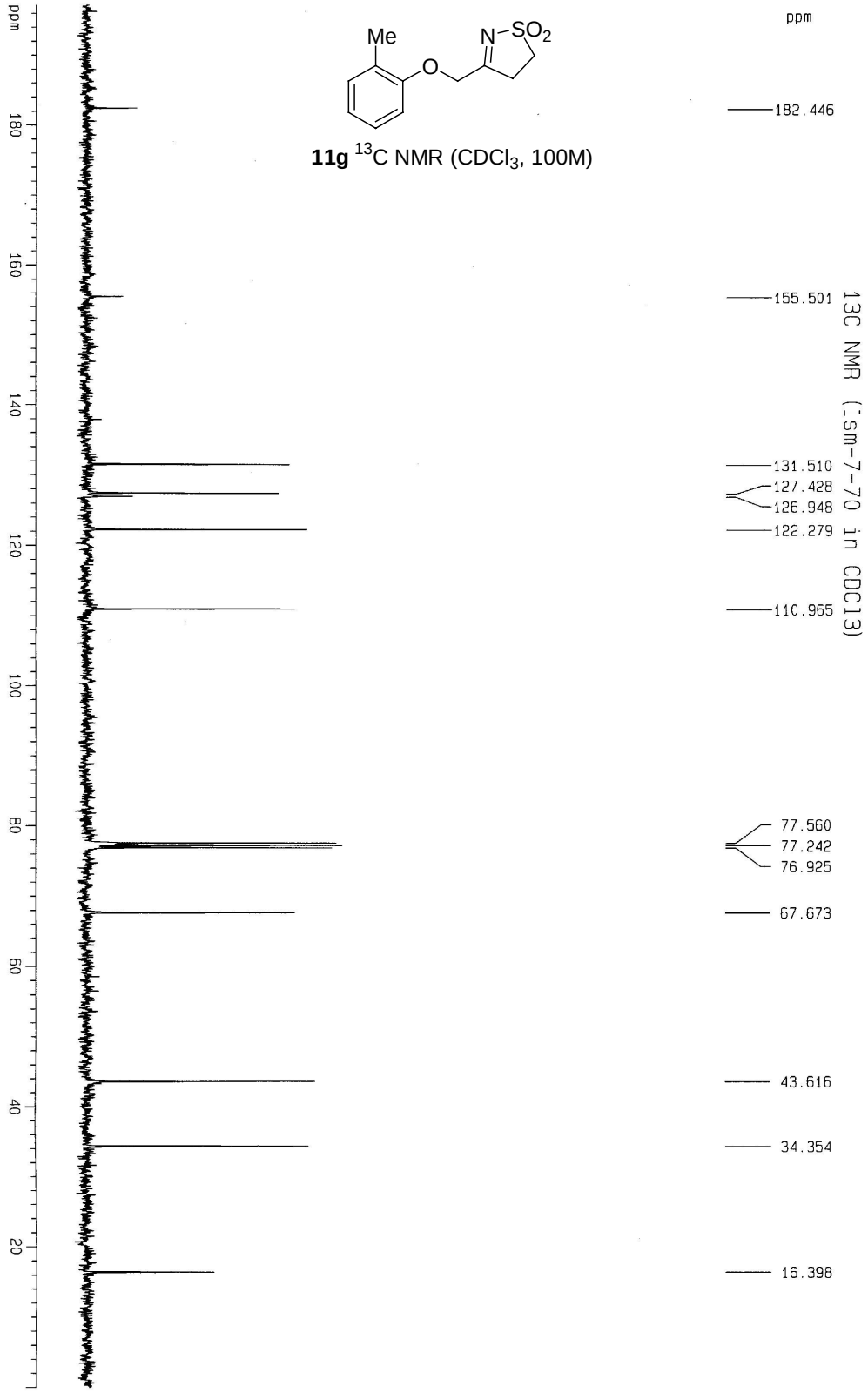
11f HRMS


YW-6-29B
hws060704-15 274 (4.110) Cm (274-34:73)
GCT CA156
05-Jul-200610:38:39
TOF MS EI+
1.65e3
%
m/z
47.9667
54.0341
63.9619
77.0391
84.0451
107.0501
121.0660
132.0788
146.0971
147.0878
175.1004
176.1069
177.1092
211.0634
238.0530
239.0620
240.0679
241.0661
N
SO2
O
Me

11f HRMS



11g ^{1}H NMR ($CDCl_3$, 400M)

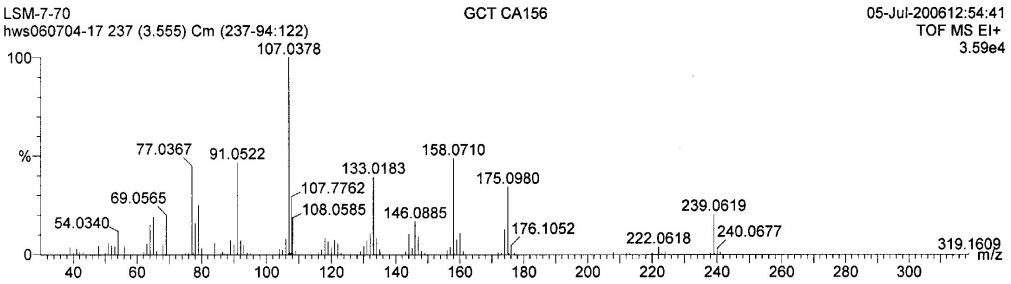


11g ^{13}C NMR ($CDCl_3$, 100M)

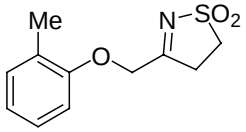
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

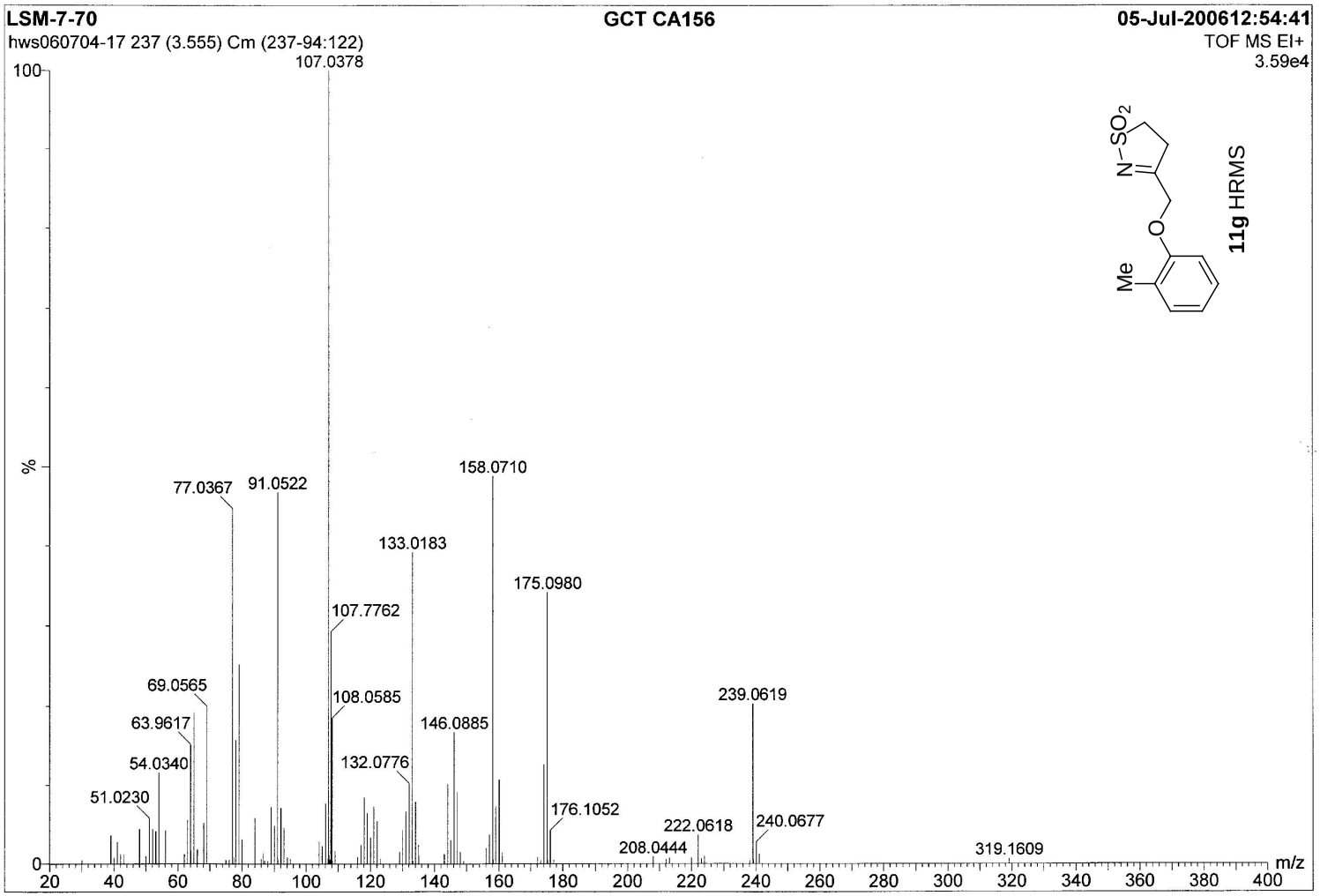
Monoisotopic Mass, Odd and Even Electron Ions
177 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)

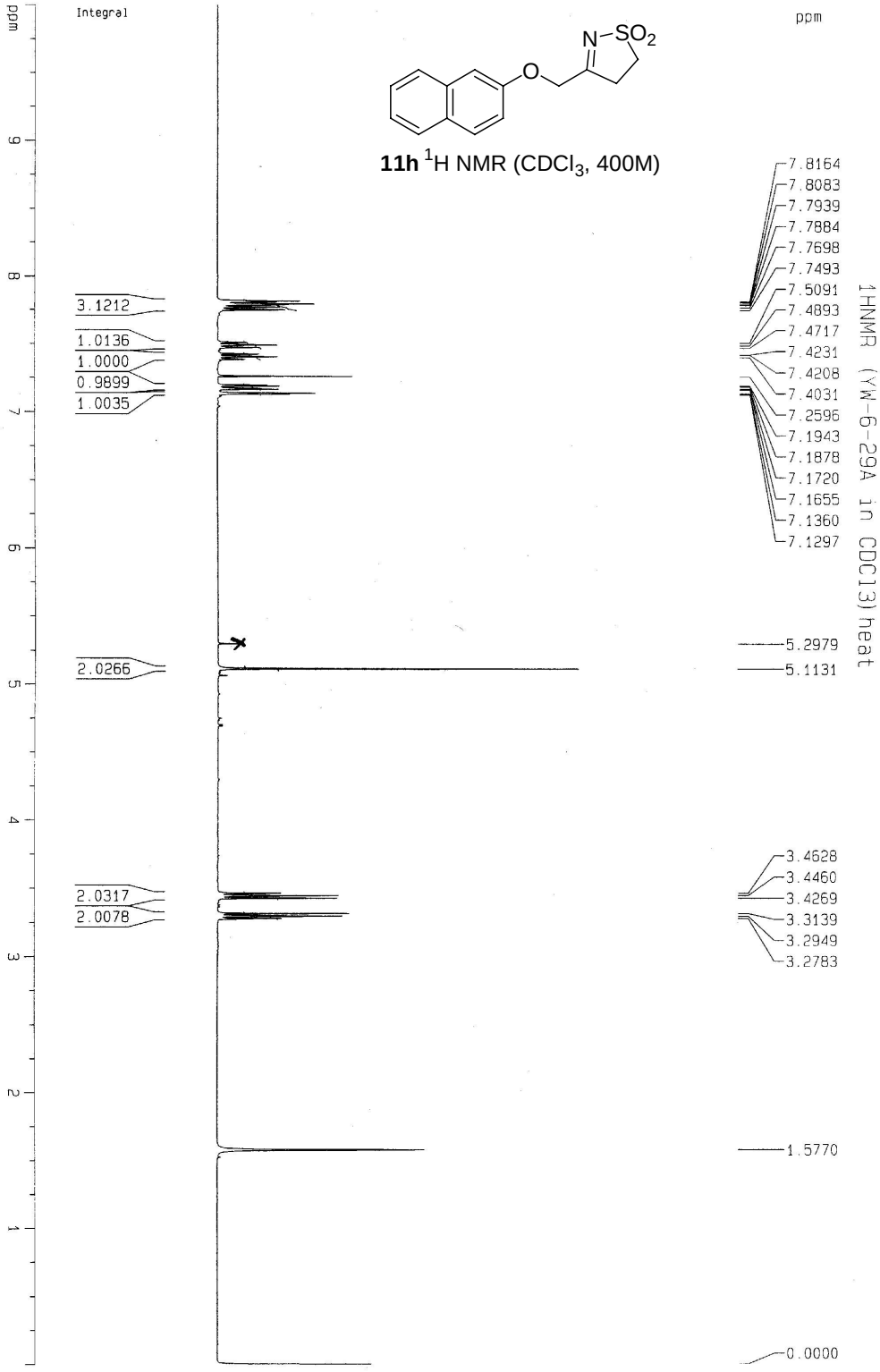


Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
239.0619	239.0616	0.3	1.2	6.0	1	C11 H13 N O3 S
	239.0609	1.0	4.1	15.5	5	C17 H7 N2
	239.0598	2.1	8.8	0.5	7	C9 H19 O S3
	239.0643	-2.4	-10.0	10.5	2	C14 H11 N2 S
	239.0650	-3.1	-12.9	1.0	3	C8 H17 N O3 S2
	239.0585	3.4	14.4	1.0	6	C7 H17 N3 S3
	239.0582	3.7	15.3	11.0	4	C14 H9 N O3

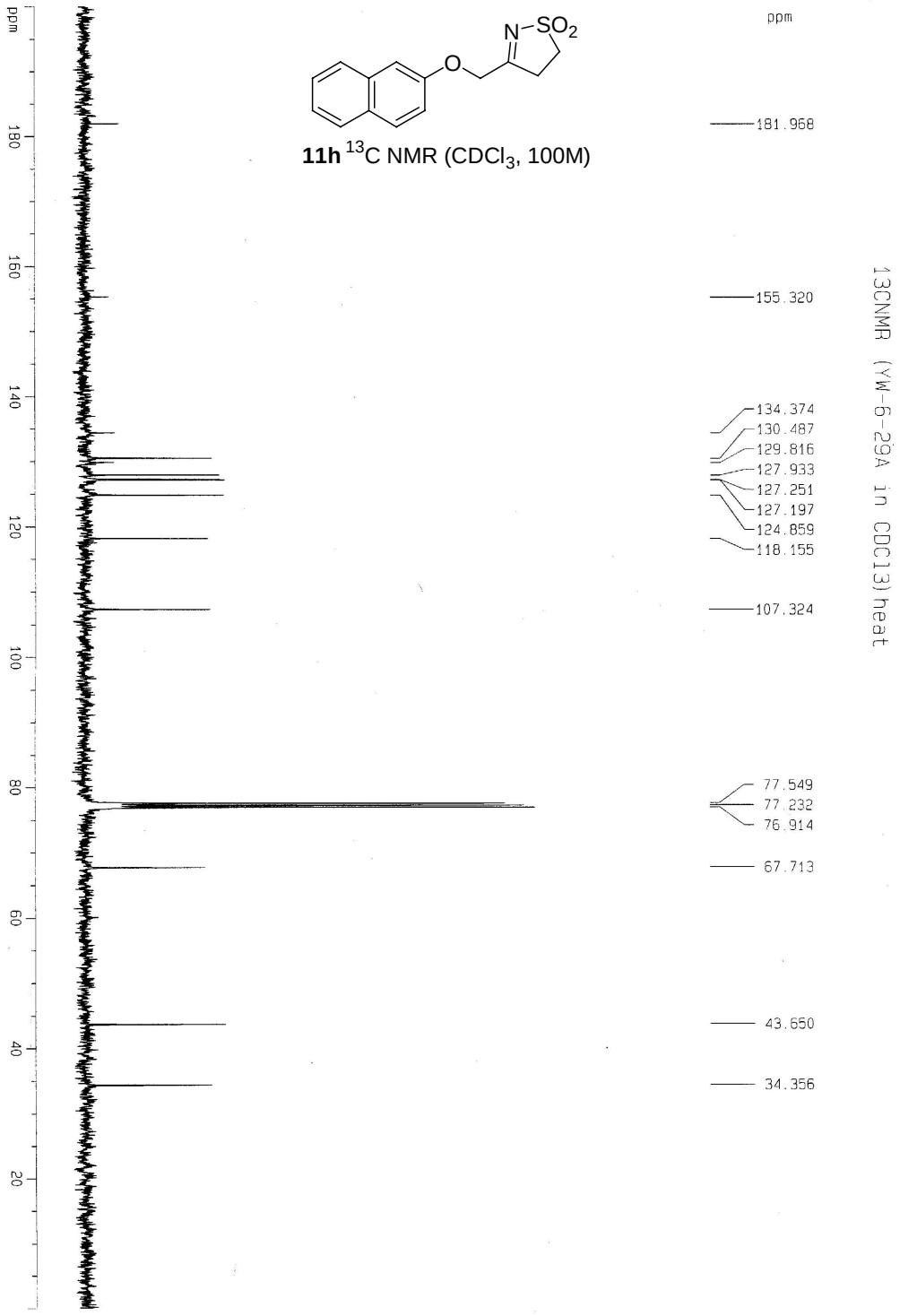


11g HRMS


LSM-7-70
GCT CA156
05-Jul-200612:54:41
hws060704-17 237 (3.555) Cm (237-94:122)
TOF MS EI+
3.59e4
11g HRMS
Me
O
N
SO2
%
m/z
107.0378
77.0367
91.0522
158.0710
133.0183
175.0980
107.7762
69.0565
108.0585
239.0619
63.9617
146.0885
54.0340
132.0776
51.0230
176.1052
222.0618
240.0677
208.0444
319.1609



11h ^{1}H NMR ($CDCl_3$, 400M)

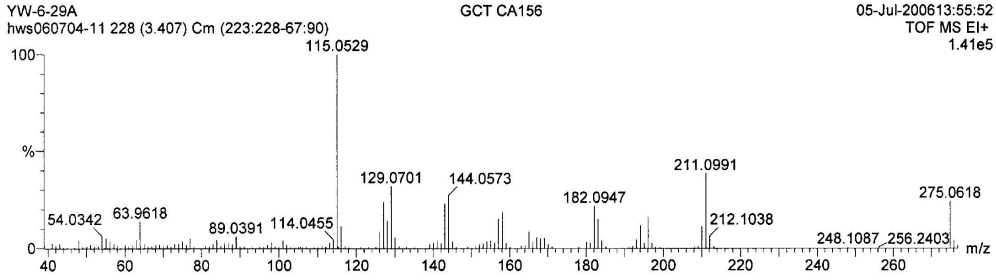


11h ^{13}C NMR ($CDCl_3$, 100M)

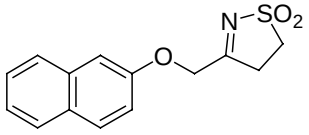
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

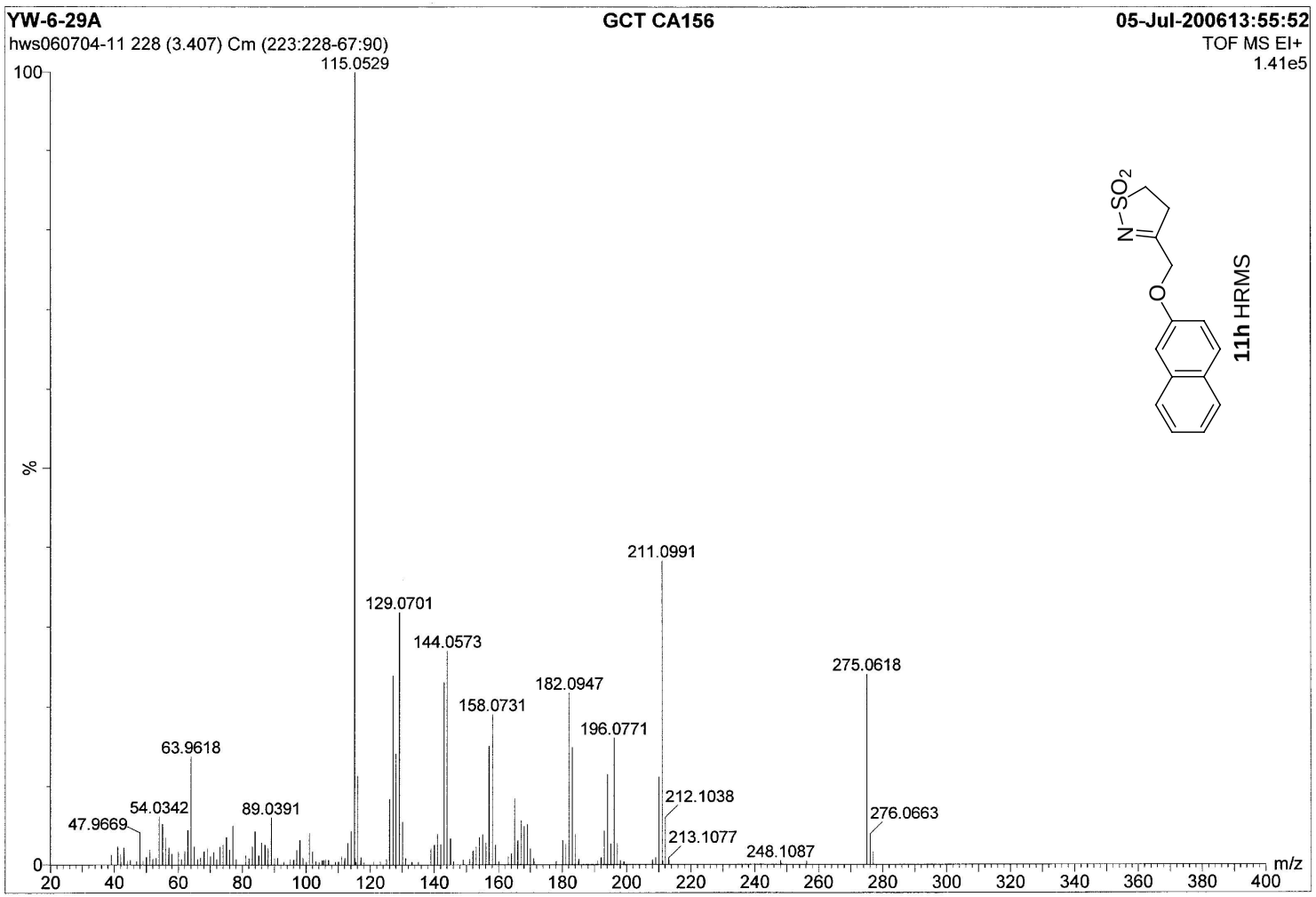
Monoisotopic Mass, Odd and Even Electron Ions
197 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)

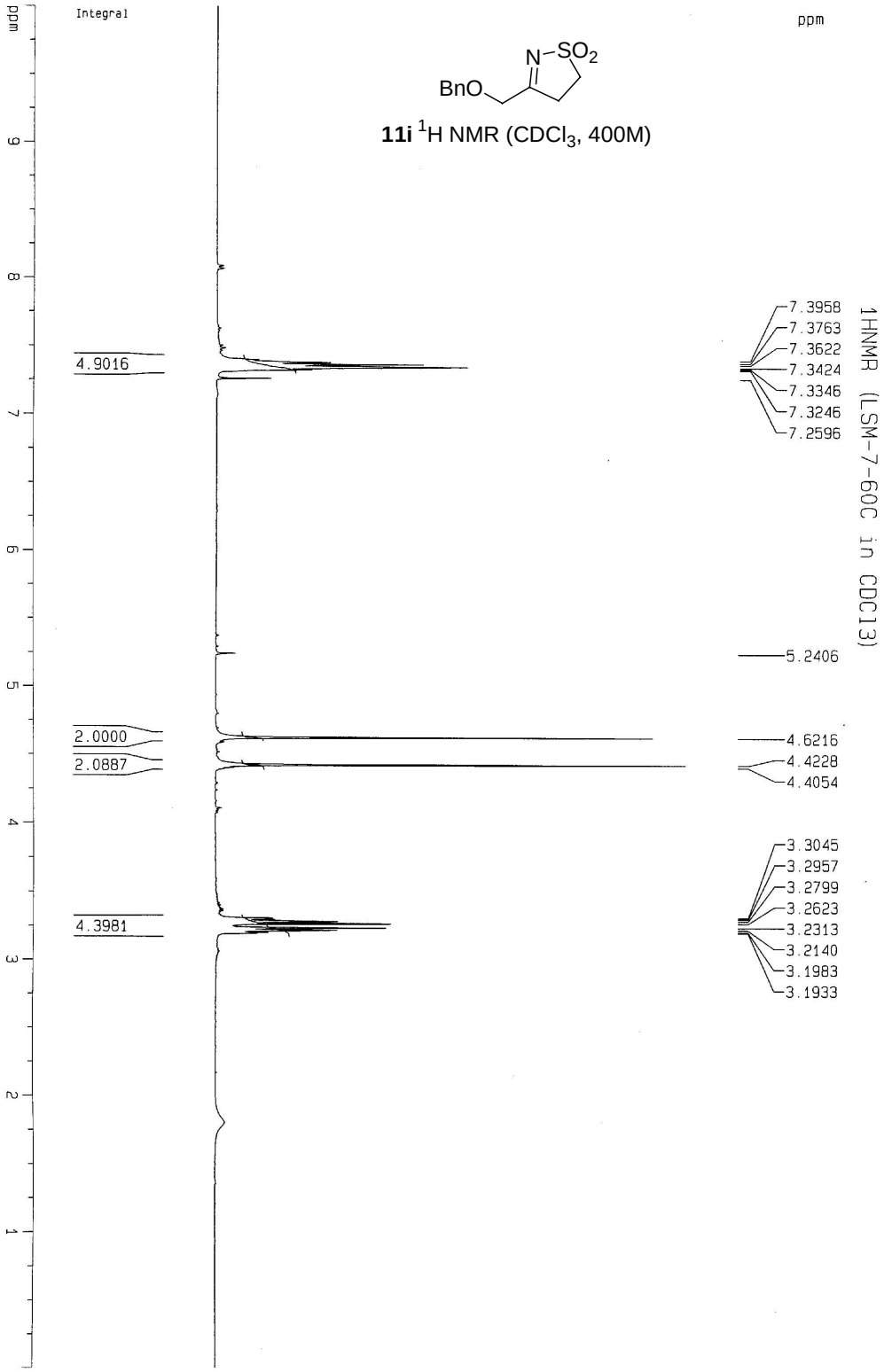


Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
275.0618	275.0616	0.2	0.7	9.0	1	C14 H13 N O3 S
	275.0609	0.9	3.2	18.5	6	C20 H7 N2
	275.0598	2.0	7.3	3.5	7	C12 H19 O S3
	275.0643	-2.5	-9.1	13.5	3	C17 H11 N2 S
	275.0650	-3.2	-11.6	4.0	2	C11 H17 N O3 S2
	275.0585	3.3	12.1	4.0	5	C10 H17 N3 S3
	275.0582	3.6	12.9	14.0	4	C17 H9 N O3

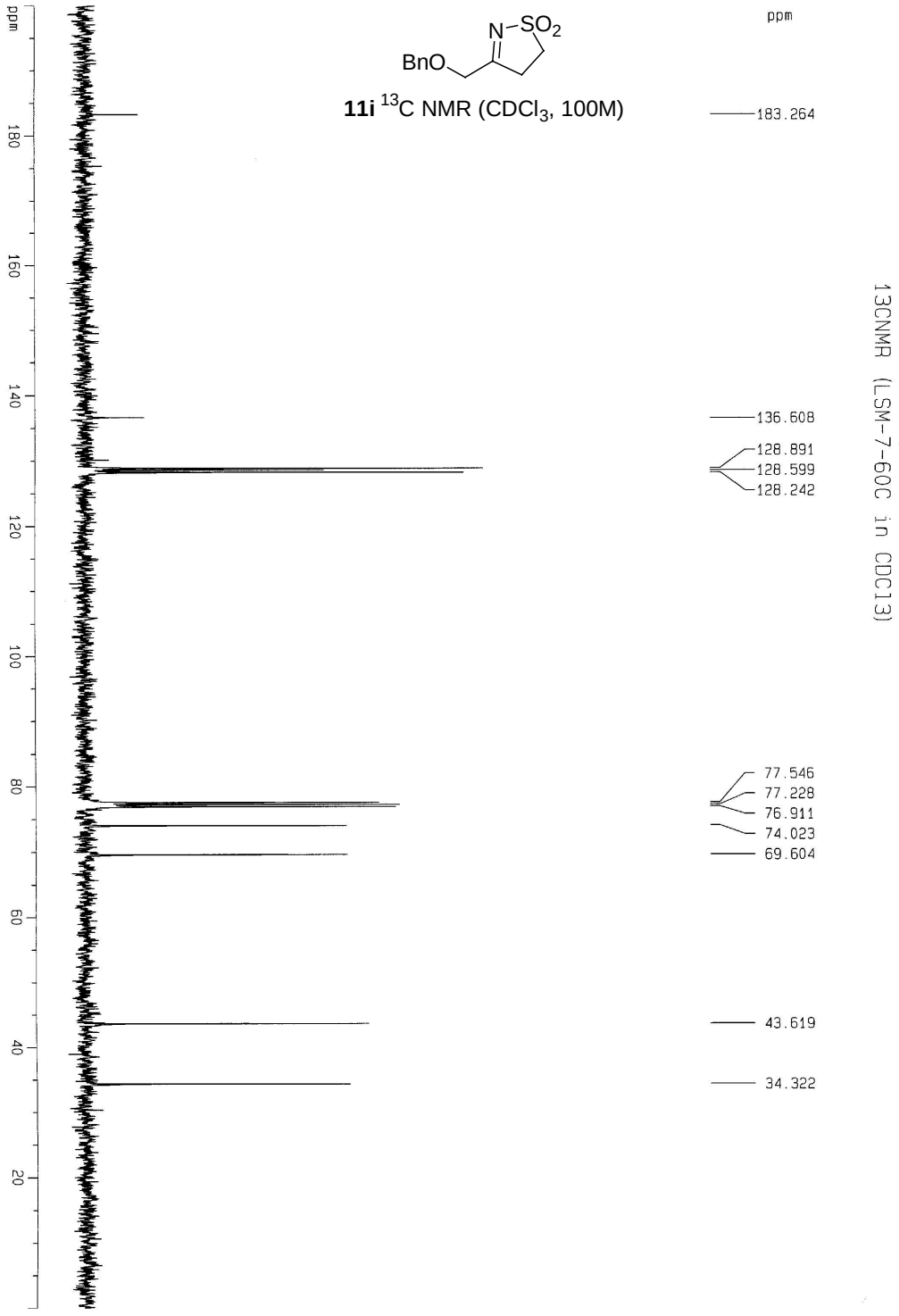


11h HRMS


YW-6-29A
GCT CA156
05-Jul-200613:55:52
hws060704-11 228 (3.407) Cm (223:228-67:90)
TOF MS EI+
1.41e5
100
%
0
115.0529
211.0991
129.0701
144.0573
275.0618
182.0947
158.0731
196.0771
63.9618
212.1038
54.0342
89.0391
276.0663
47.9669
213.1077
248.1087
m/z
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
N
SO2
O
11h HRMS



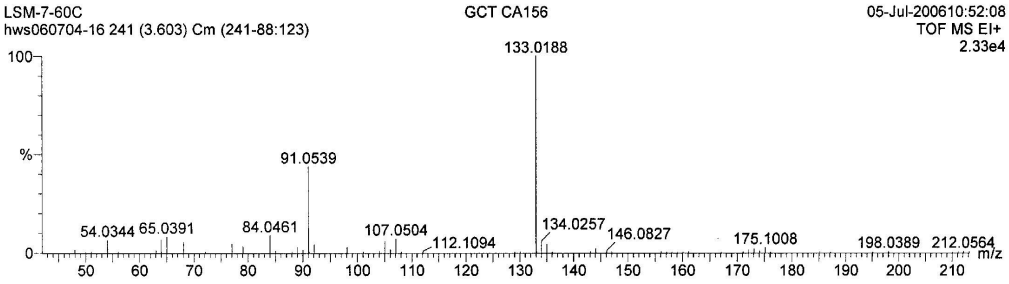
11i ^{1}H NMR ($CDCl_3$, 400M)


N–SO2
BnO
11i 13C NMR (CDCl3, 100M)
ppm
183.264
136.608
128.891
128.599
128.242
77.546
77.228
76.911
74.023
69.604
43.619
34.322
ppm
180
160
140
120
100
80
60
40
20
13CNMR (LSM-7-60C in CDCl3)

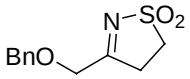
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

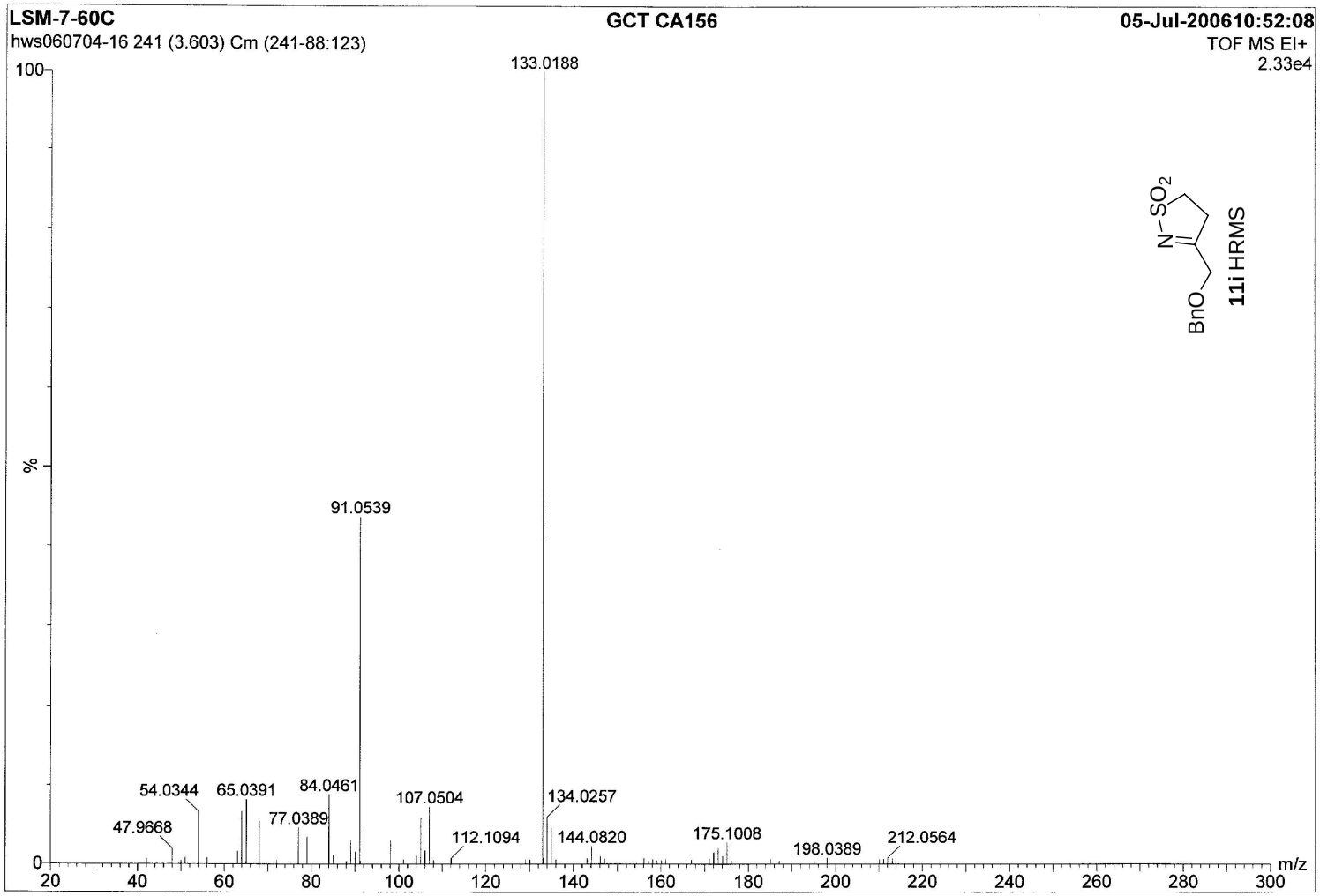
Monoisotopic Mass, Odd and Even Electron Ions
178 formula(e) evaluated with 3 results within limits (up to 50 closest results for each mass)

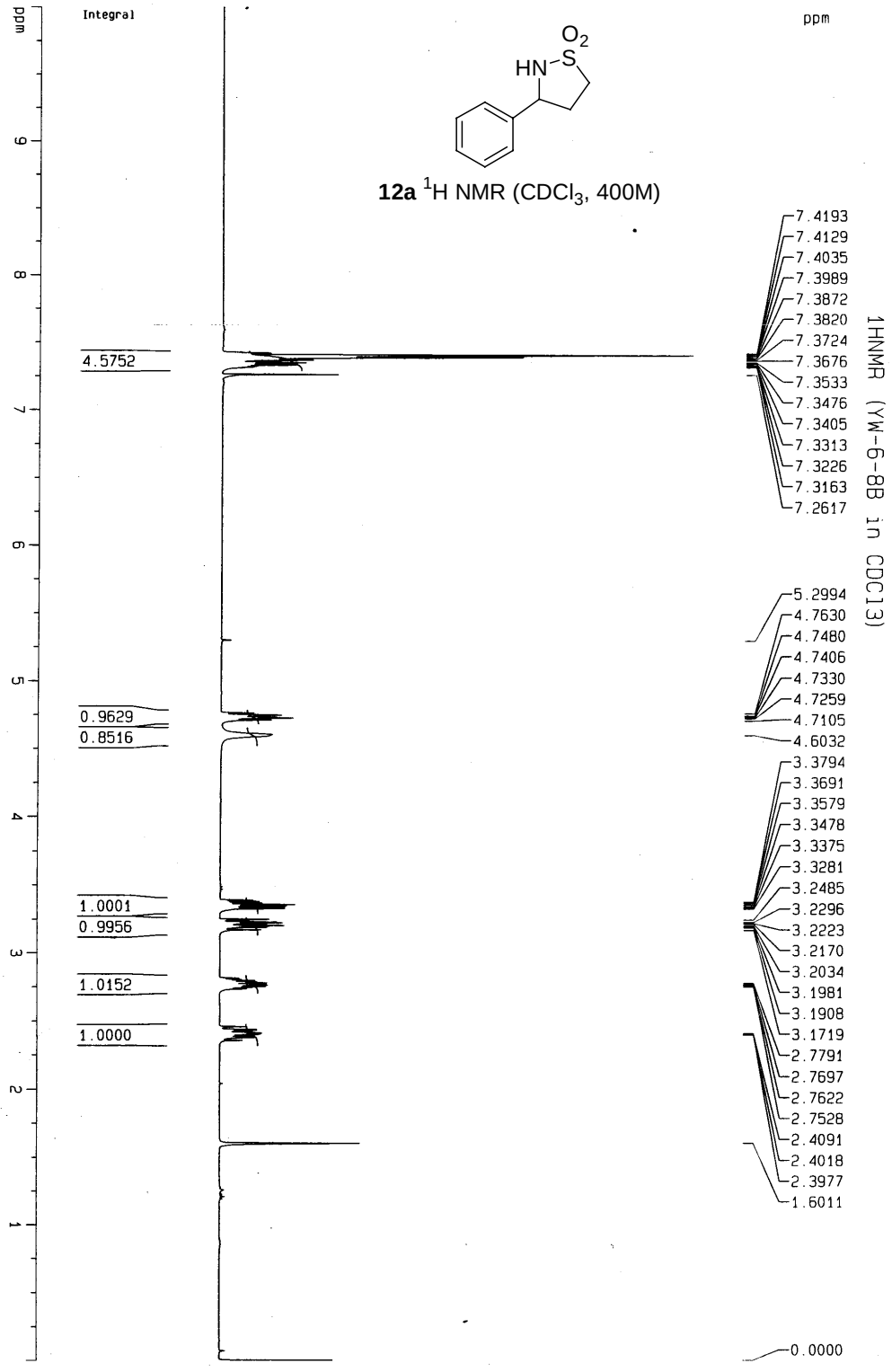


Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
175.1008	175.0997	1.1	6.2	6.0	1	C11 H13 N O
	175.1031	-2.3	-13.1	1.0	3	C8 H17 N O S
	175.0970	3.8	21.5	1.5	2	C8 H15 O4

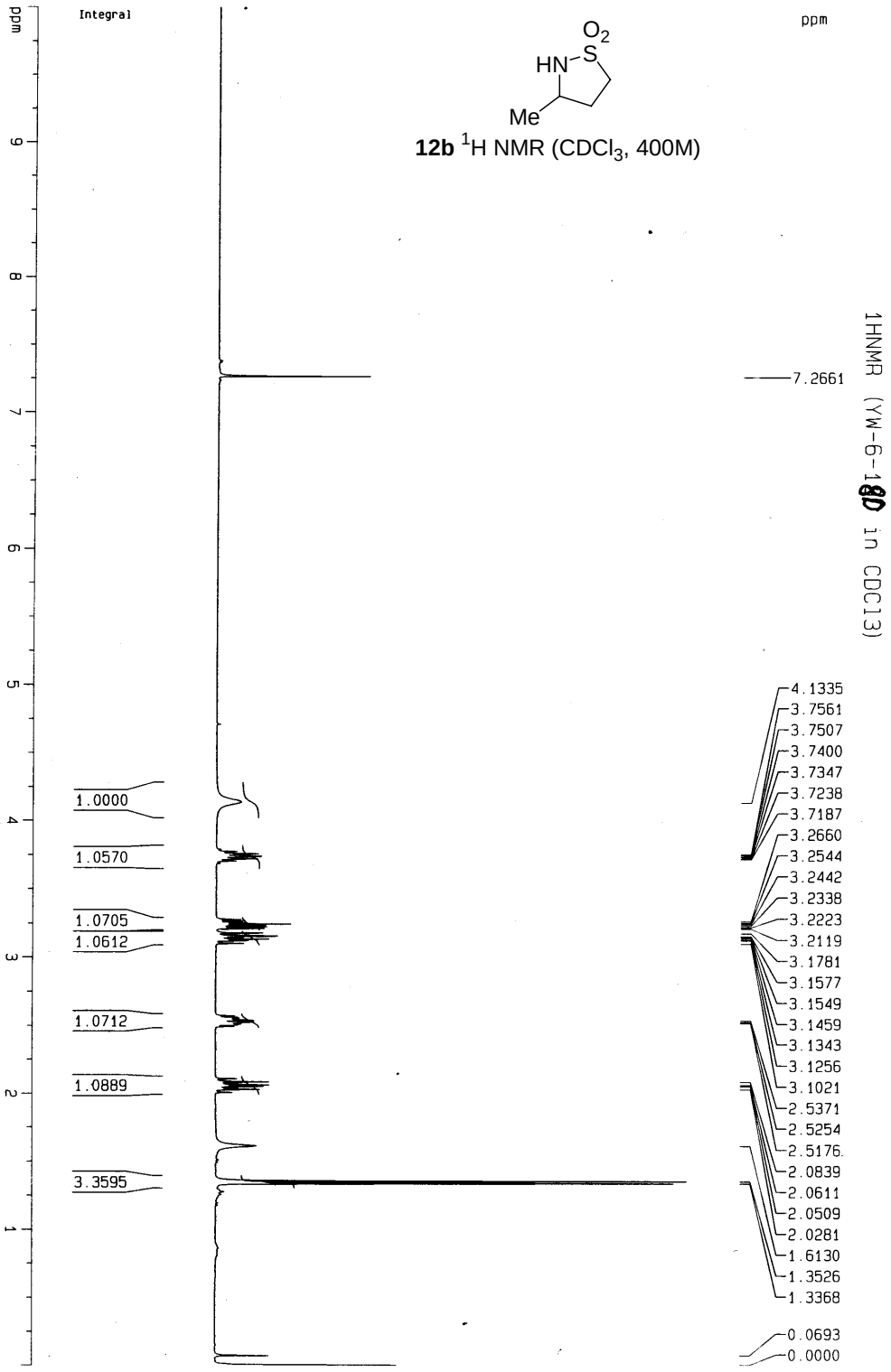


11i HRMS

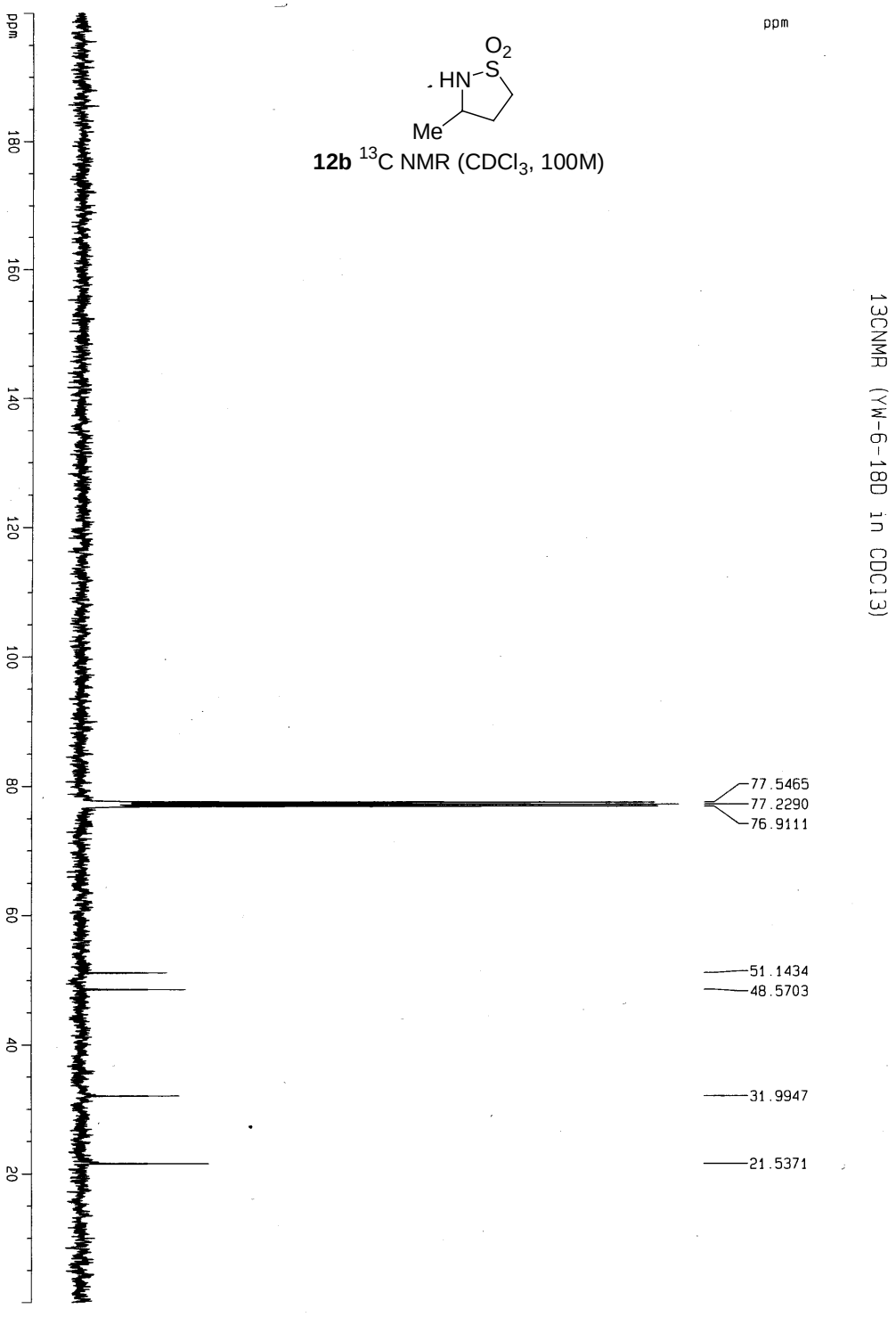

LSM-7-60C
GCT CA156
05-Jul-200610:52:08
hws060704-16 241 (3.603) Cm (241-88:123)
TOF MS EI+
2.33e4
133.0188
91.0539
54.0344
65.0391
84.0461
107.0504
134.0257
47.9668
77.0389
112.1094
144.0820
175.1008
198.0389
212.0564
%
m/z
11i HRMS



12a ^{1}H NMR ($CDCl_3$, 400M)



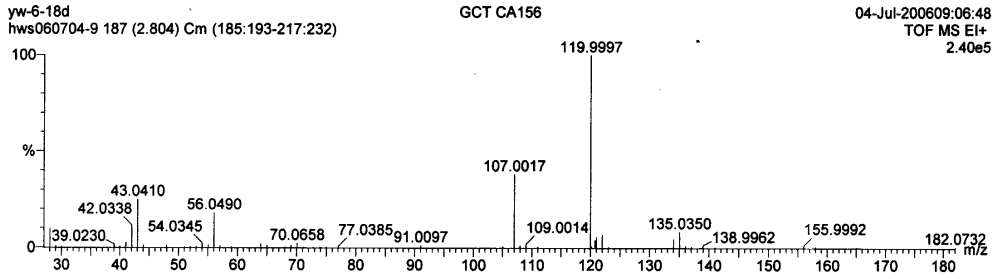
12b ^{1}H NMR ($CDCl_3$, 400M)


ppm
O2
HN
S
Me
12b 13C NMR (CDCl3, 100M)
13CNMR (YW-6-18D in CDCl3)
77.5465
77.2290
76.9111
51.1434
48.5703
31.9947
21.5371

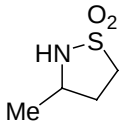
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

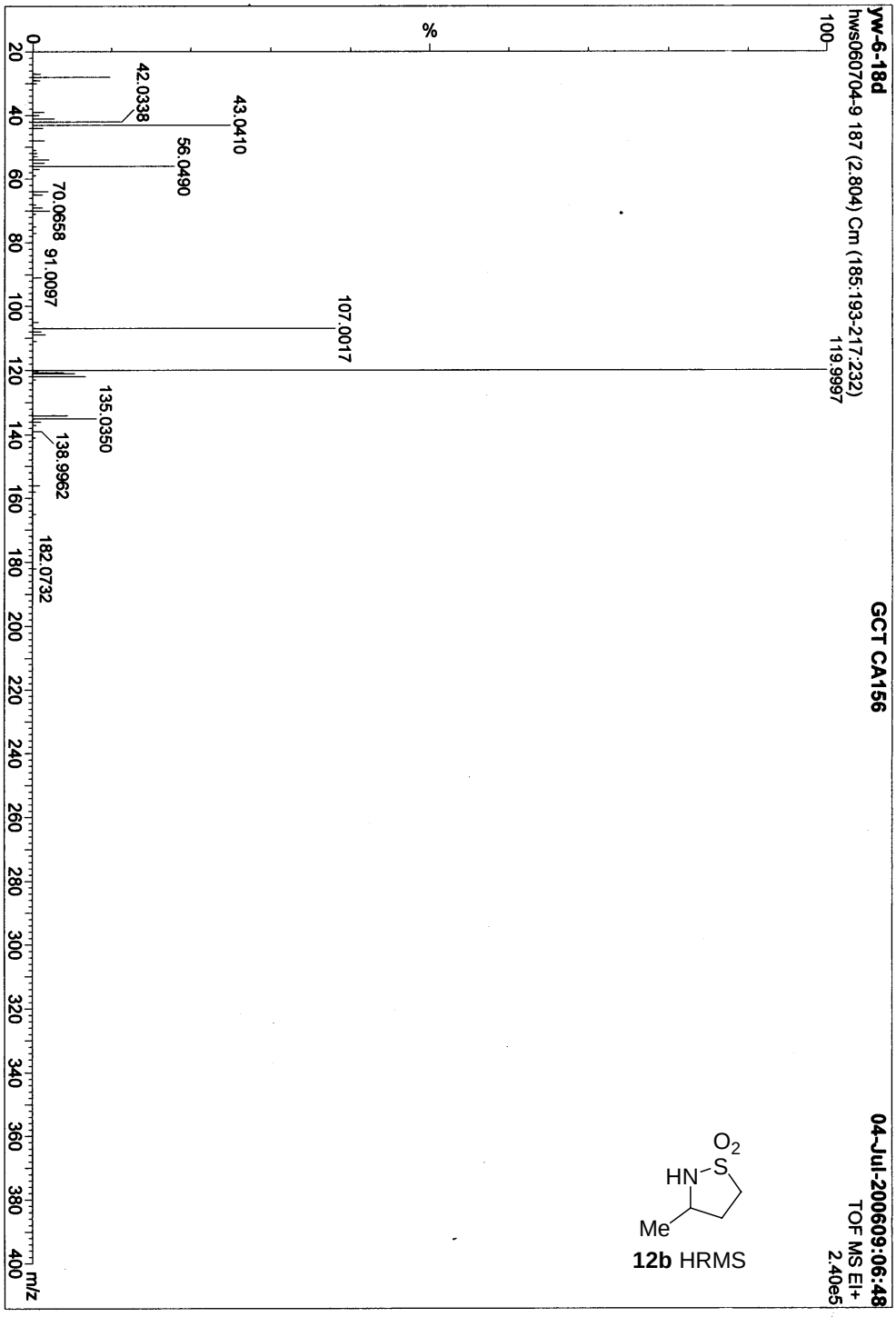
Monoisotopic Mass, Odd and Even Electron Ions
157 formula(e) evaluated with 6 results within limits (up to 50 closest results for each mass)

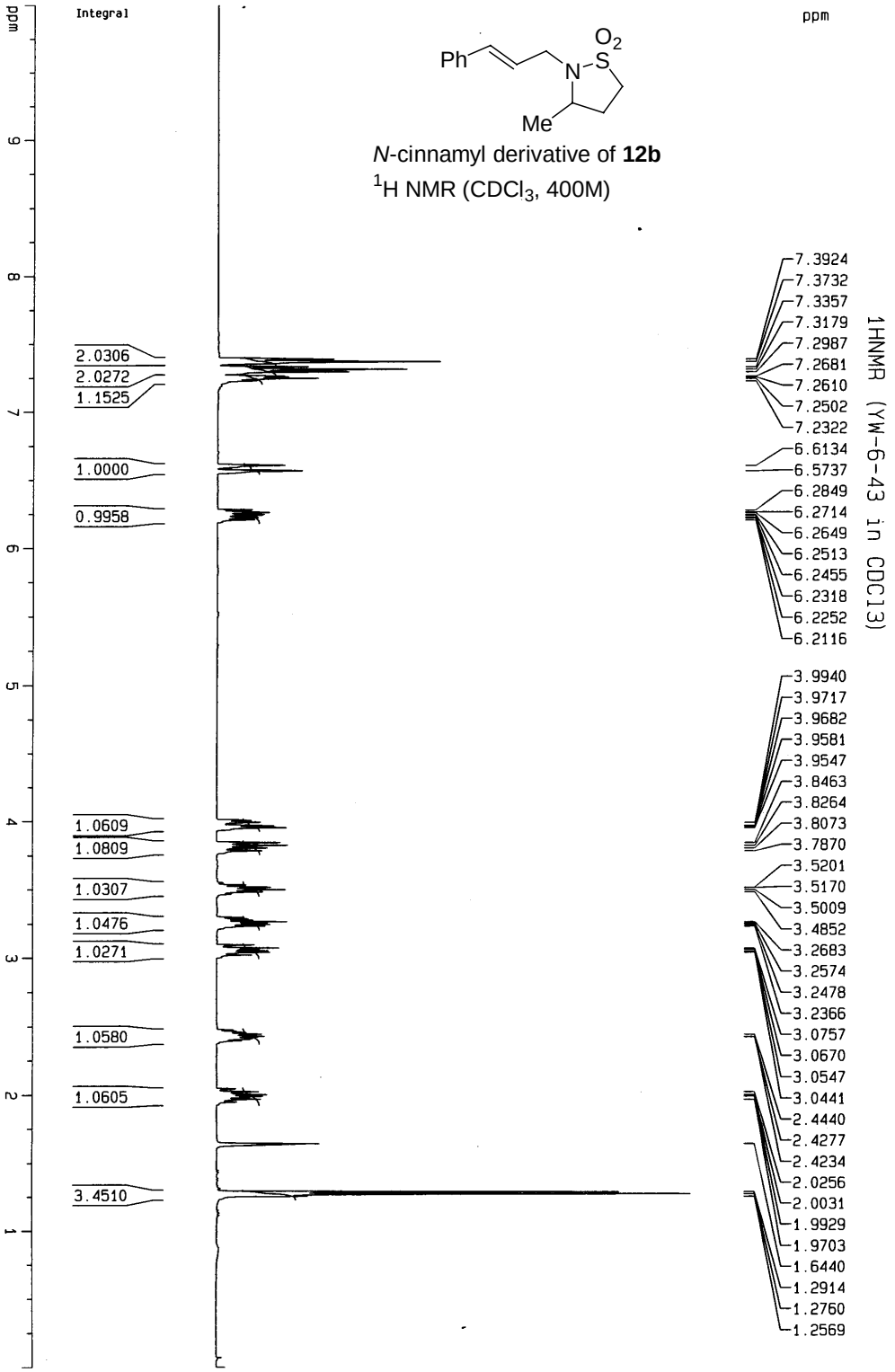


Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
135.0350	135.0354	-0.4	-3.0	1.0	2	C4 H9 N O2 S ✓
	135.0341	0.9	7.0	1.5	5	C2 H7 N4 O S
	135.0320	3.0	22.0	6.0	3	C7 H5 N O2
	135.0392	-4.2	-31.4	2.0	6	C H5 N5 O3
	135.0307	4.3	31.9	6.5	4	C5 H3 N4 O
	135.0302	4.8	35.4	0.5	1	C5 H11 S2



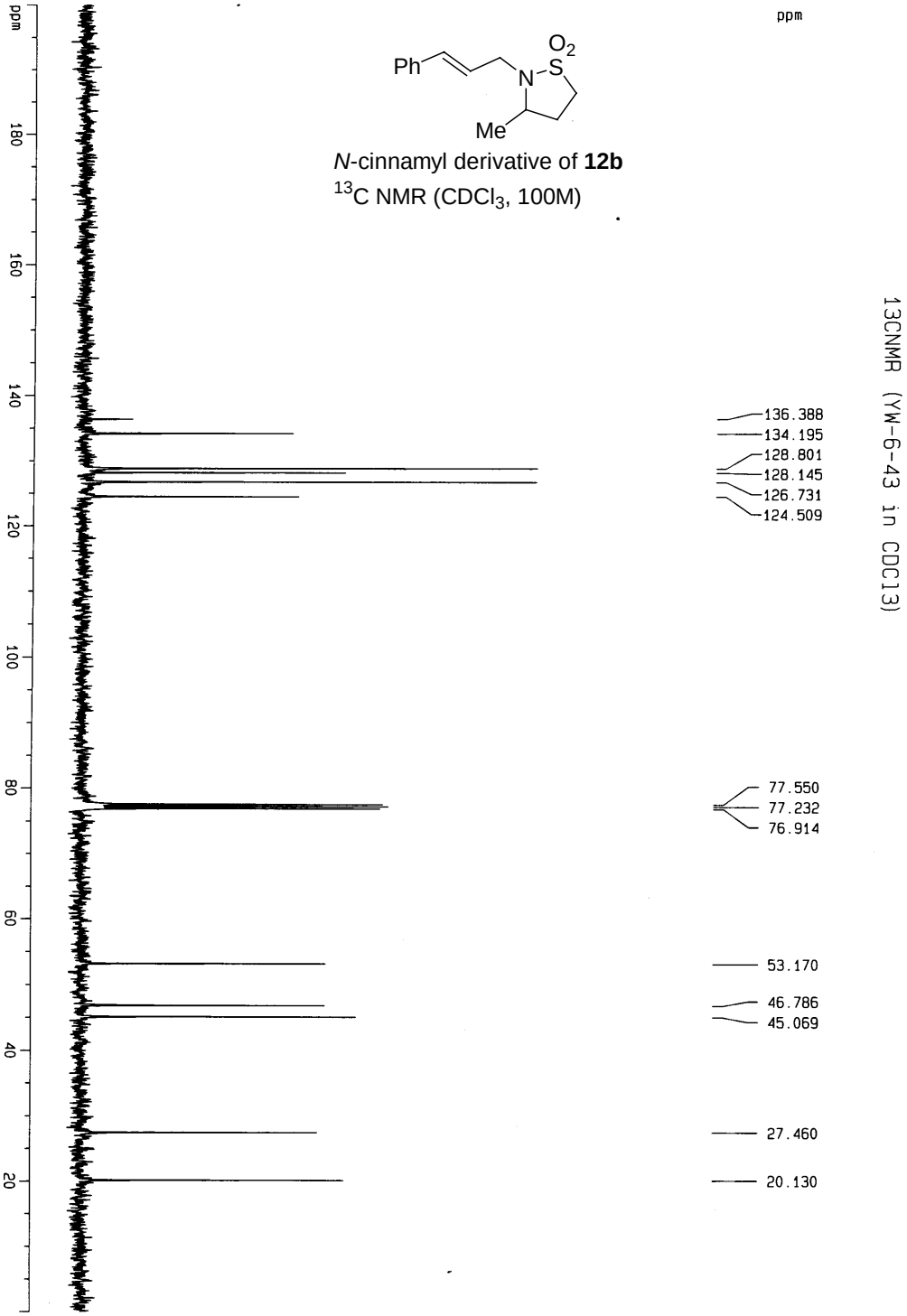
12b HRMS


yw-6-18d
hws060704-9 187 (2.804) Cm (185:193-217:232)
GCT CA156
04-Jul-200609:06:48
TOF MS EI+
2.40e5
100
%
0
119.9997
107.0017
43.0410
42.0338
56.0490
70.0658
91.0097
135.0350
138.9962
182.0732
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
m/z
O2
HN
S
Me
12b HRMS



N-cinnamyl derivative of **12b**

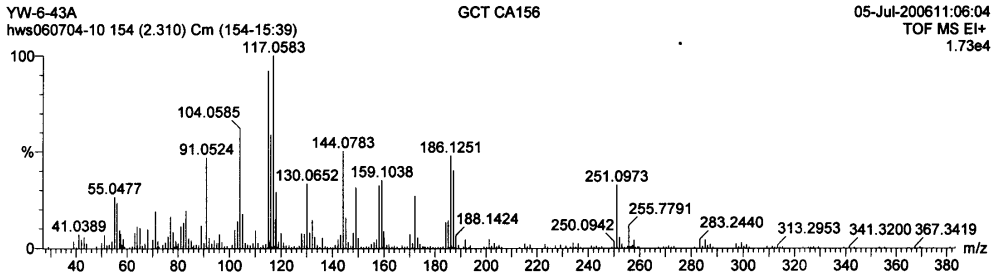
^{1}H NMR ($CDCl_3$, 400M)


ppm
180
160
140
120
100
80
60
40
20
Ph
N
S
O2
Me
N-cinnamyl derivative of 12b
13C NMR (CDCl3, 100M)
ppm
136.388
134.195
128.801
128.145
126.731
124.509
77.550
77.232
76.914
53.170
46.786
45.069
27.460
20.130
13CNMR (YW-6-43 in CDCl3)

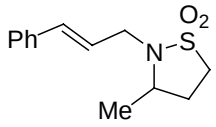
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

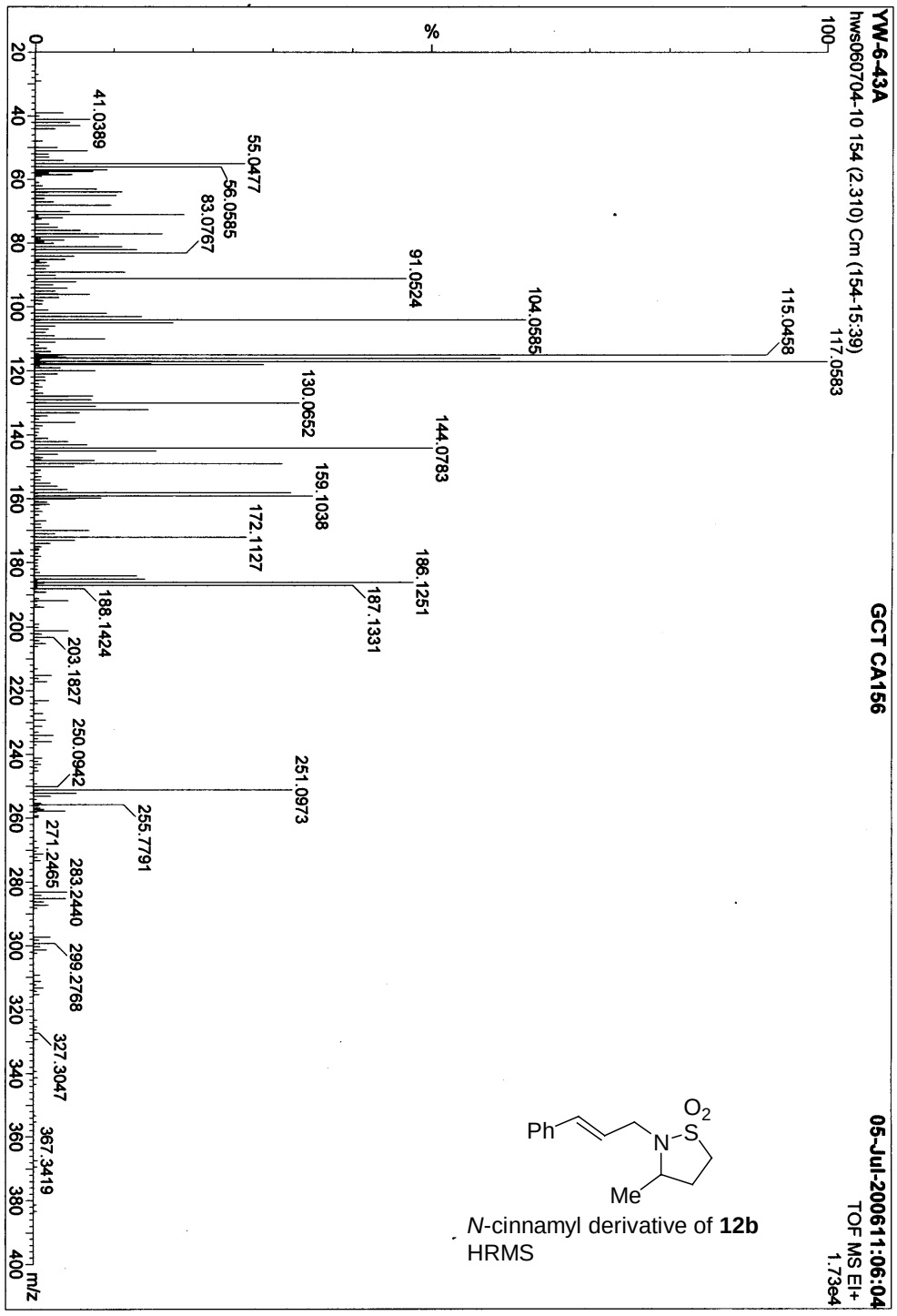
Monoisotopic Mass, Odd and Even Electron Ions
184 formula(e) evaluated with 5 results within limits (up to 50 closest results for each mass)



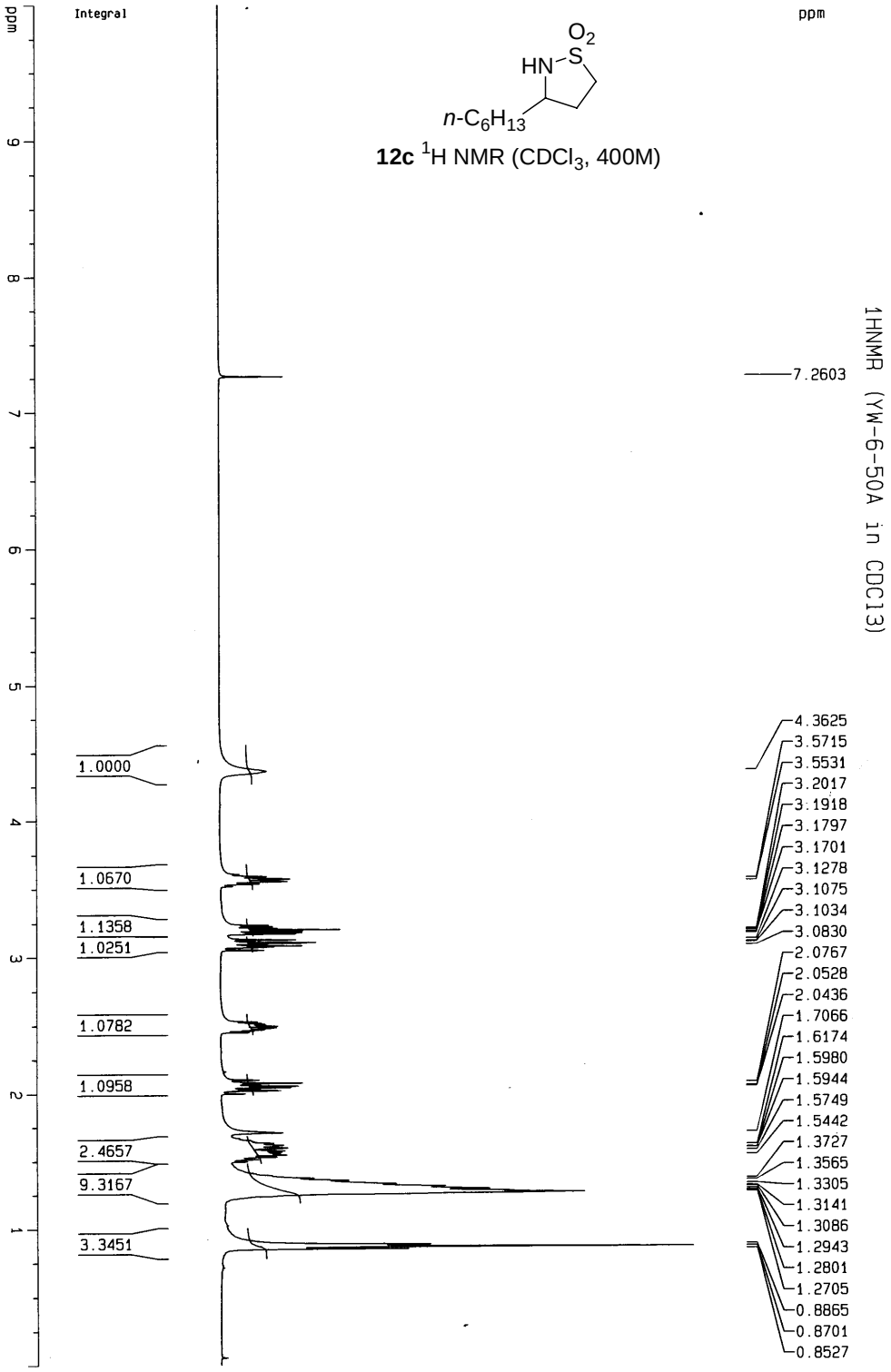
Minimum:				-1.5						
Maximum:		5.0	5.0	50.0						
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula				
251.0973	251.0980	-0.7	-2.8	6.0	1	C13	H17	N	O2	S
	251.0962	1.1	4.4	0.5	5	C11	H23	S3		
	251.0946	2.7	10.6	11.0	4	C16	H13	N	O2	
	251.1014	-4.1	-16.2	1.0	3	C10	H21	N	O2	S2
	251.0928	4.5	17.8	5.5	2	C14	H19	S2		



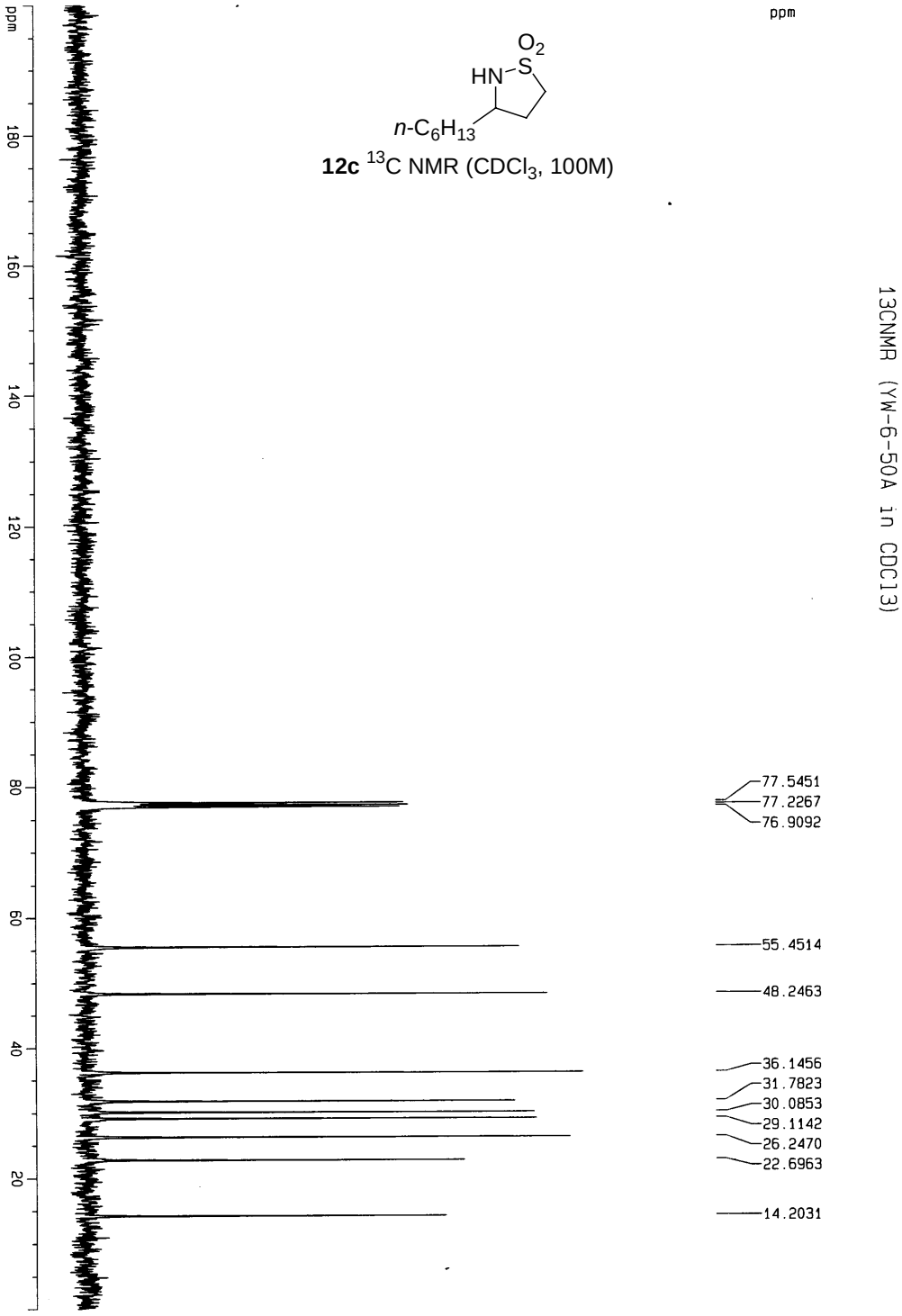
N-cinnamyl derivative of **12b**
HRMS



N-cinnamyl derivative of **12b**
HRMS



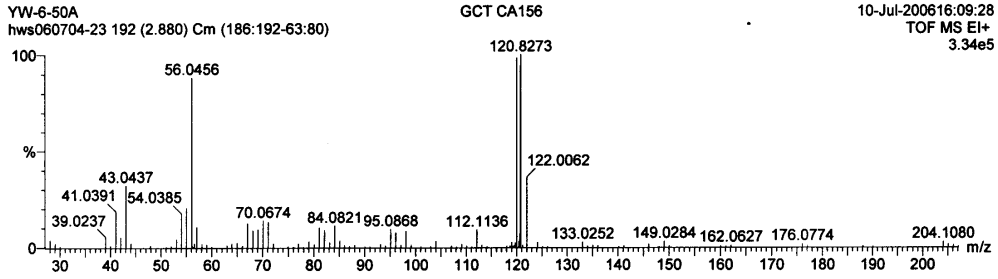
12c ^{1}H NMR ($CDCl_3$, 400M)


ppm
O2
HN
S
n-C6H13
12c 13C NMR (CDCl3, 100M)
13CNMR (YW-6-50A in CDCl3)
ppm
180
160
140
120
100
80
60
40
20
77.5451
77.2267
76.9092
55.4514
48.2463
36.1456
31.7823
30.0853
29.1142
26.2470
22.6963
14.2031

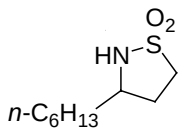
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

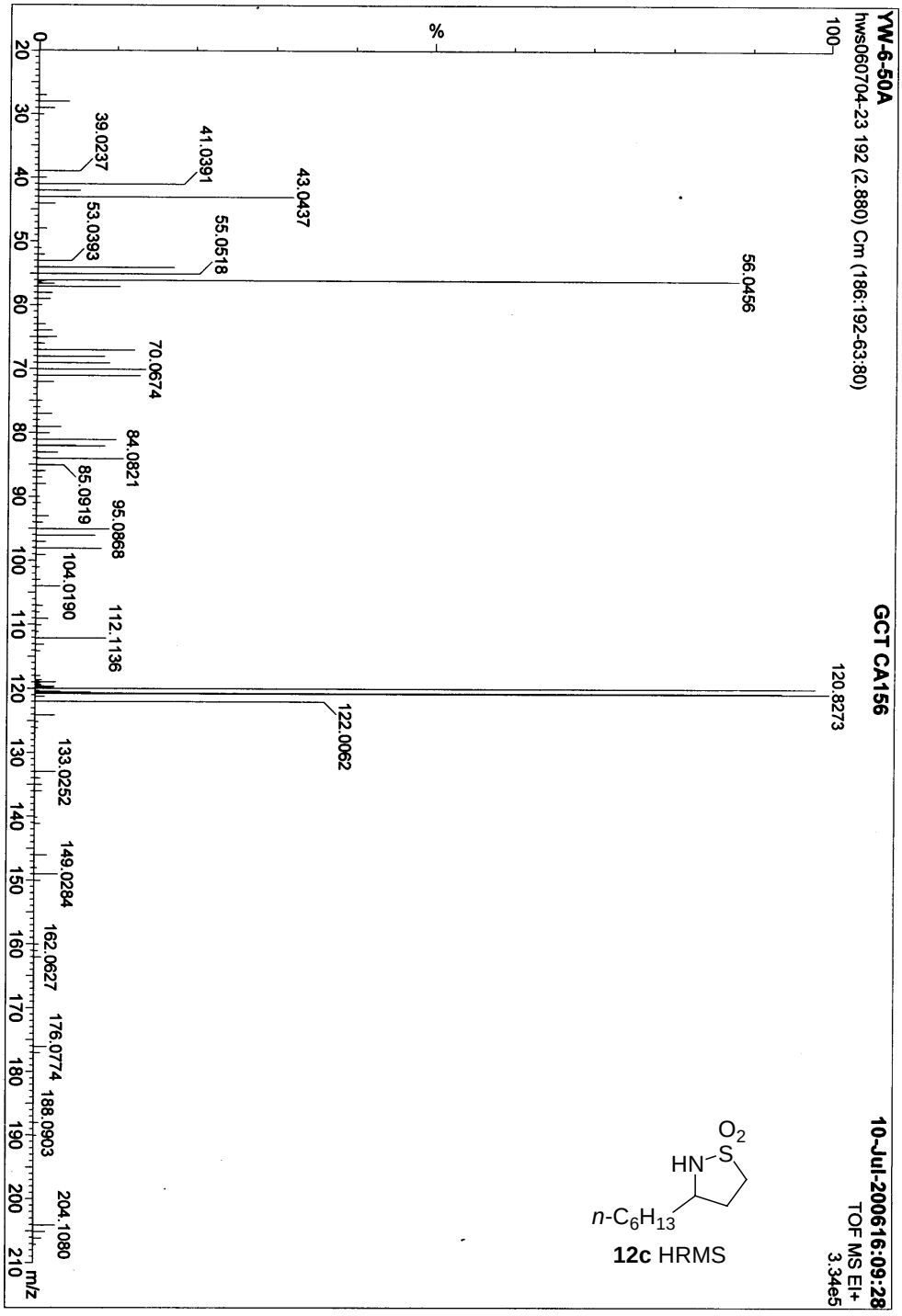
Monoisotopic Mass, Odd and Even Electron Ions
202 formula(e) evaluated with 3 results within limits (up to 50 closest results for each mass)



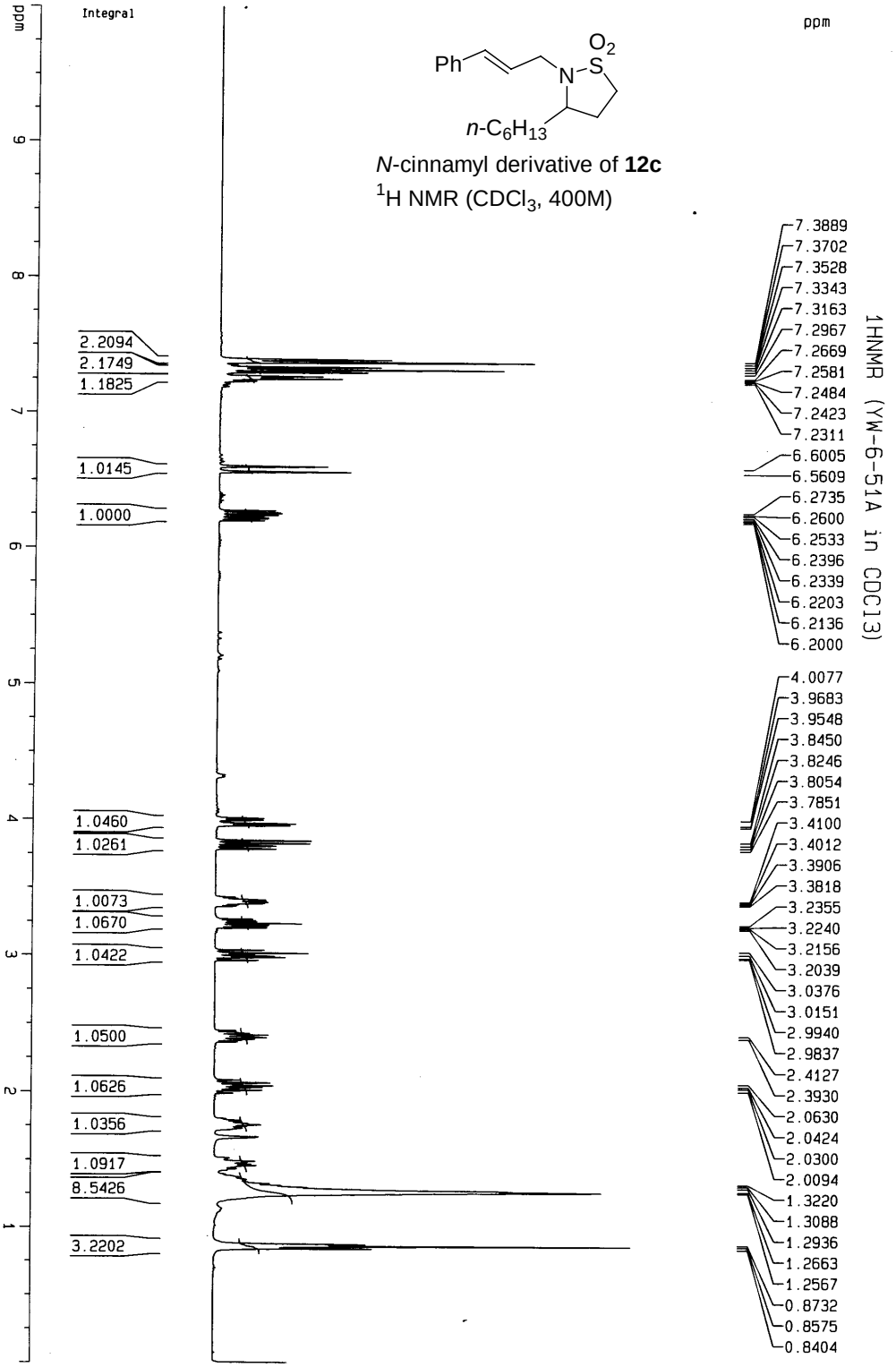
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
205.1139	205.1137	0.2	1.2	1.0	1	C9 H19 N O2 S
	205.1103	3.6	17.7	6.0	2	C12 H15 N O2
	205.1188	-4.9	-24.0	1.5	3	C8 H17 N2 O4

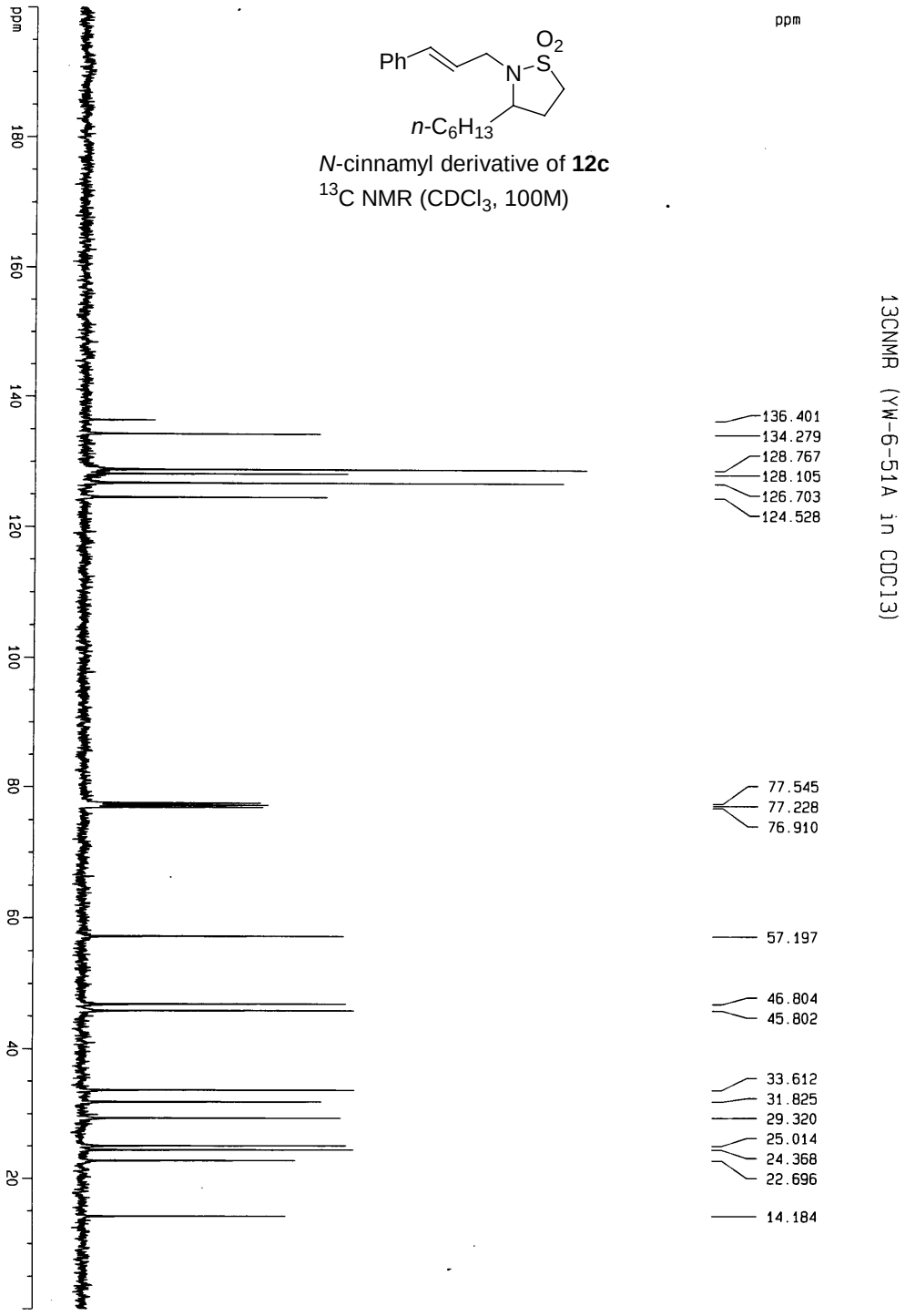


12c HRMS


YW-6-50A
hws060704-23 192 (2.880) Cm (186:192-63:80)
GCT CA156
10-Jul-200616:09:28
TOF MS EI+
3.34e5
%
100
0
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
m/z
39.0237
41.0391
43.0437
53.0393
55.0518
56.0456
70.0674
84.0821
85.0919
95.0868
104.0190
112.1136
120.8273
122.0062
133.0252
149.0284
162.0627
176.0774
188.0903
204.1080
O2
HN
S
n-C6H13

12c HRMS


Integral
ppm
Ph
N
S
O2
n-C6H13
N-cinnamyl derivative of 12c
1H NMR (CDCl3, 400M)
2.2094
2.1749
1.1825
1.0145
1.0000
1.0460
1.0261
1.0073
1.0670
1.0422
1.0500
1.0626
1.0356
1.0917
8.5426
3.2202
7.3889
7.3702
7.3528
7.3343
7.3163
7.2967
7.2669
7.2581
7.2484
7.2423
7.2311
6.6005
6.5609
6.2735
6.2600
6.2533
6.2396
6.2339
6.2203
6.2136
6.2000
4.0077
3.9683
3.9548
3.8450
3.8246
3.8054
3.7851
3.4100
3.4012
3.3906
3.3818
3.2355
3.2240
3.2156
3.2039
3.0376
3.0151
2.9940
2.9837
2.4127
2.3930
2.0630
2.0424
2.0300
2.0094
1.3220
1.3088
1.2936
1.2663
1.2567
0.8732
0.8575
0.8404
1HNMR (YW-6-51A in CDCl3)



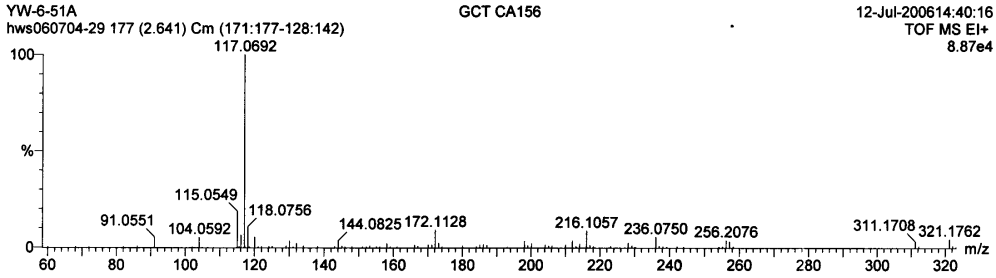
N-cinnamyl derivative of **12c**

^{13}C NMR ($CDCl_3$, 100M)

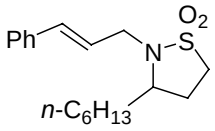
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

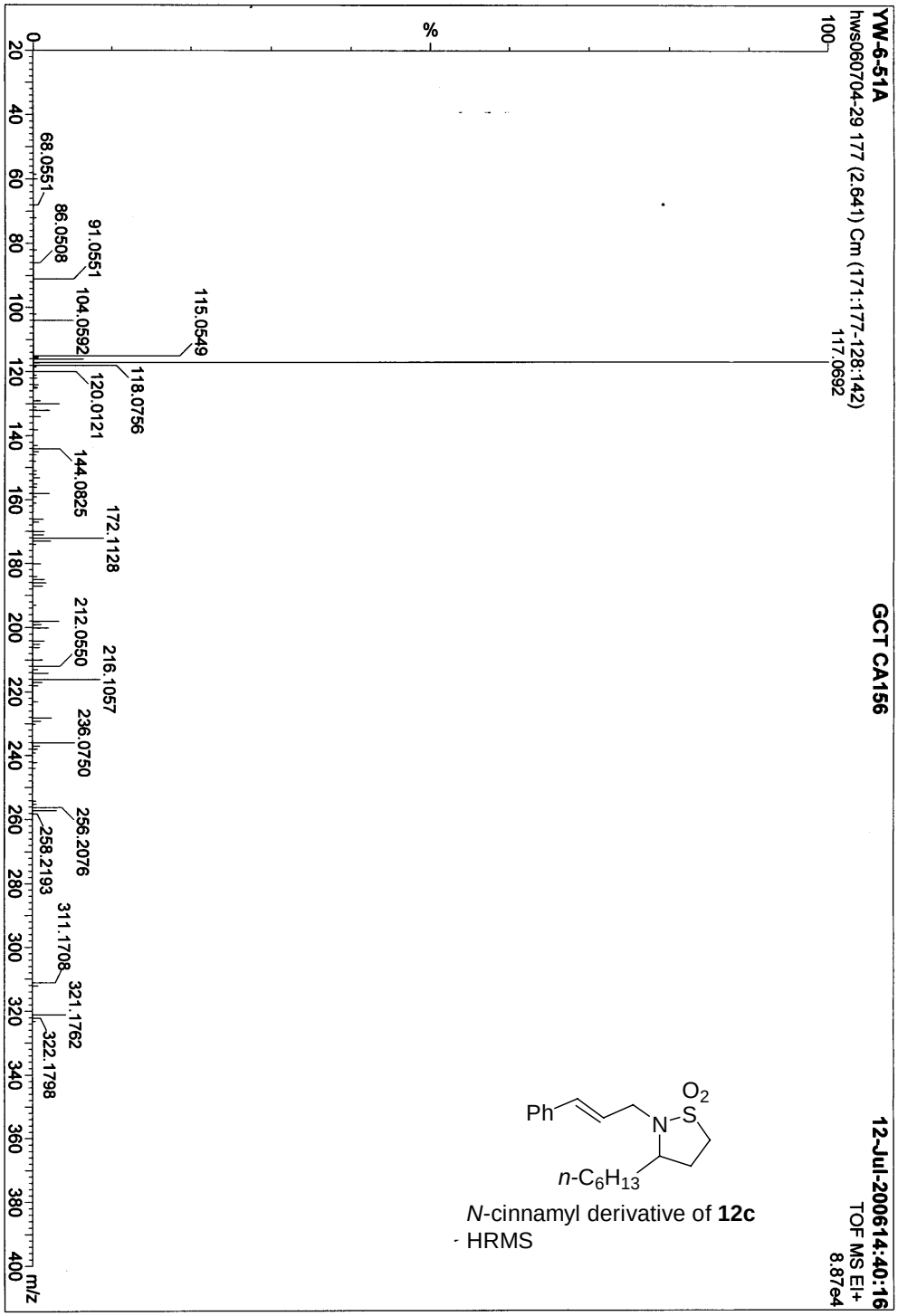
Monoisotopic Mass, Odd and Even Electron Ions
256 formula(e) evaluated with 4 results within limits (up to 50 closest results for each mass)



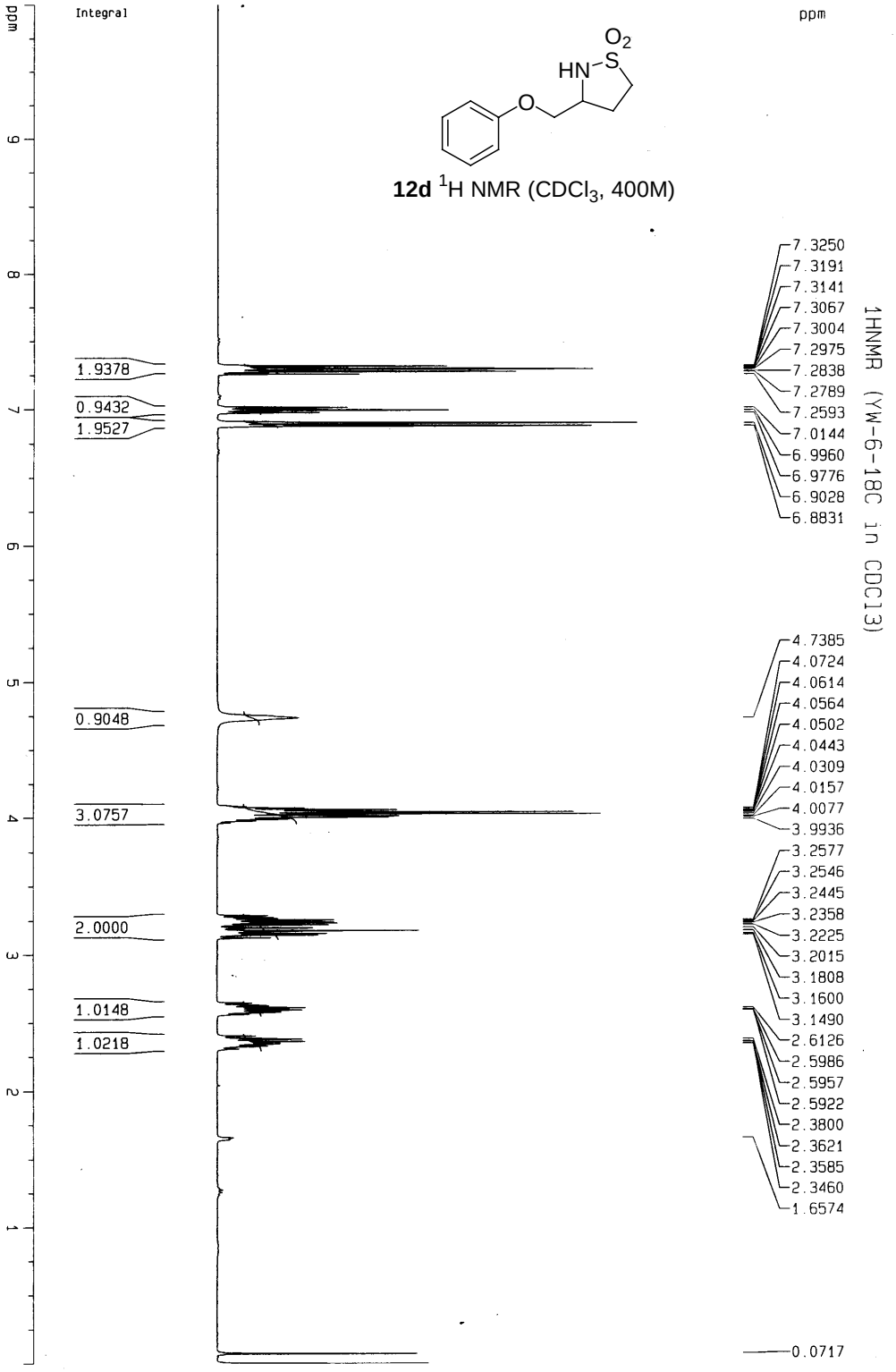
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
321.1762	321.1763	-0.1	-0.2	6.0	1	C18 H27 N O2 S
	321.1736	2.6	8.2	1.5	2	C15 H29 O5 S
	321.1729	3.3	10.3	11.0	4	C21 H23 N O2
	321.1722	4.0	12.4	2.0	3	C13 H27 N3 O4 S



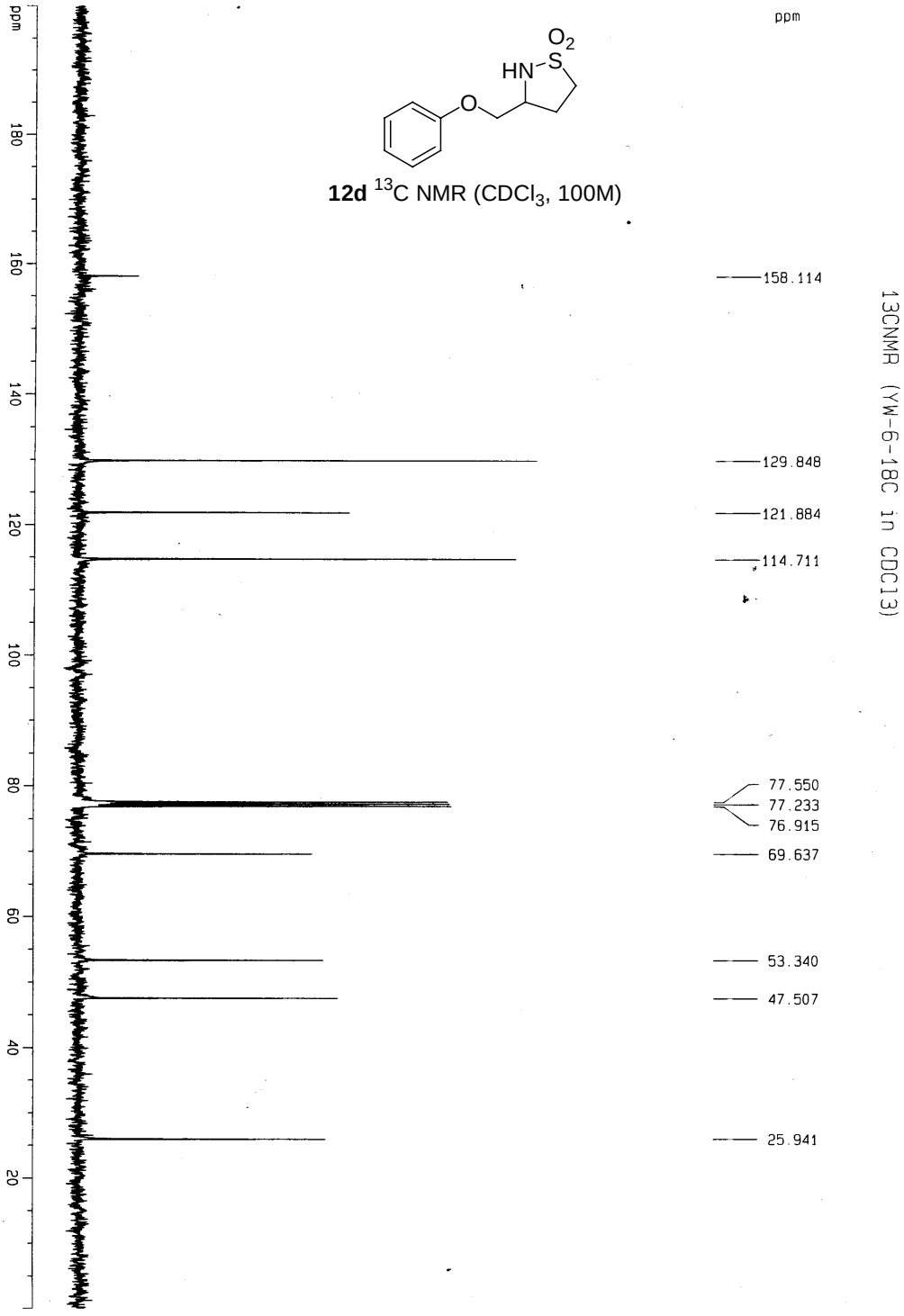
N-cinnamyl derivative of **12c**
HRMS



N-cinnamyl derivative of **12c**
- HRMS



12d ^{1}H NMR ($CDCl_3$, 400M)

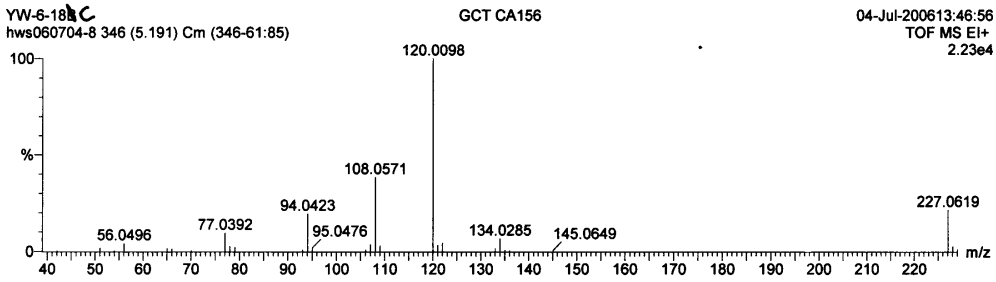


12d ^{13}C NMR ($CDCl_3$, 100M)

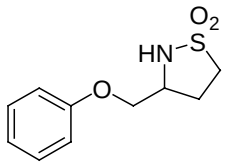
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

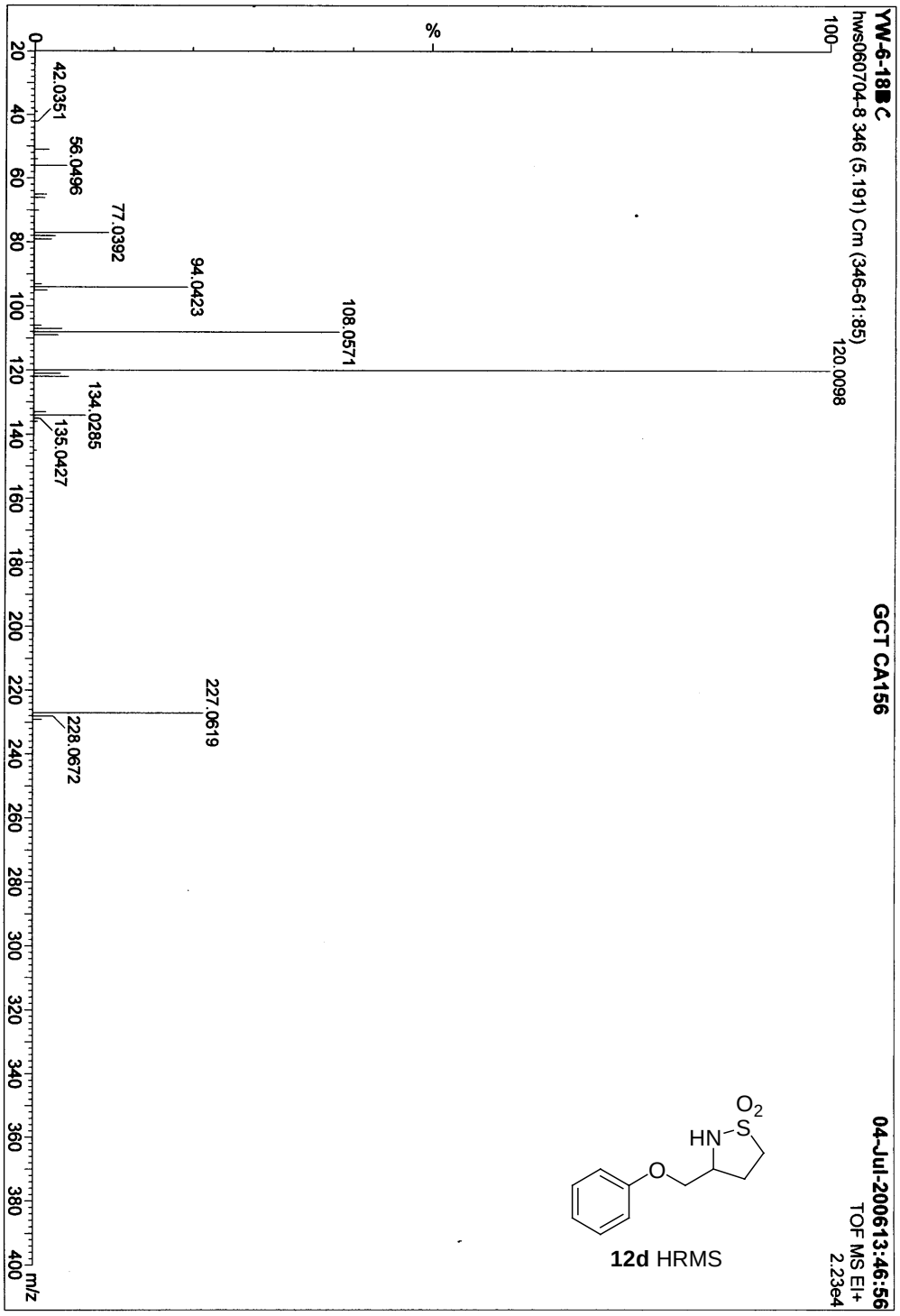
Monoisotopic Mass, Odd and Even Electron Ions
171 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)



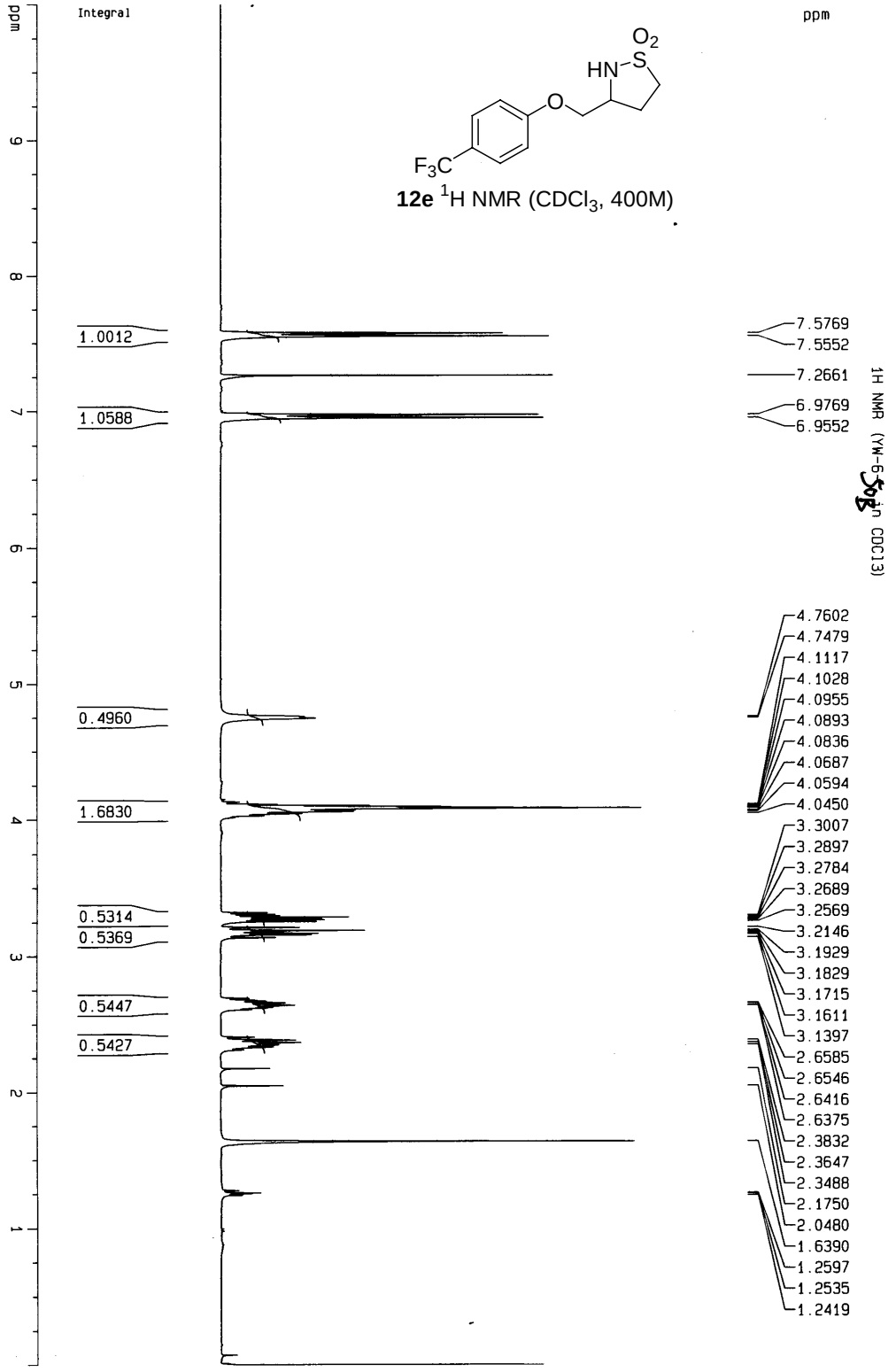
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
227.0619	227.0616	0.3	1.3	5.0	1	C10 H13 N O3 S
	227.0609	1.0	4.3	14.5	5	C16 H7 N2
	227.0598	2.1	9.2	-0.5	7	C8 H19 O S3
	227.0643	-2.4	-10.5	9.5	2	C13 H11 N2 S
	227.0650	-3.1	-13.6	0.0	4	C7 H17 N O3 S2
	227.0585	3.4	15.1	0.0	6	C6 H17 N3 S3
	227.0582	3.7	16.1	10.0	3	C13 H9 N O3



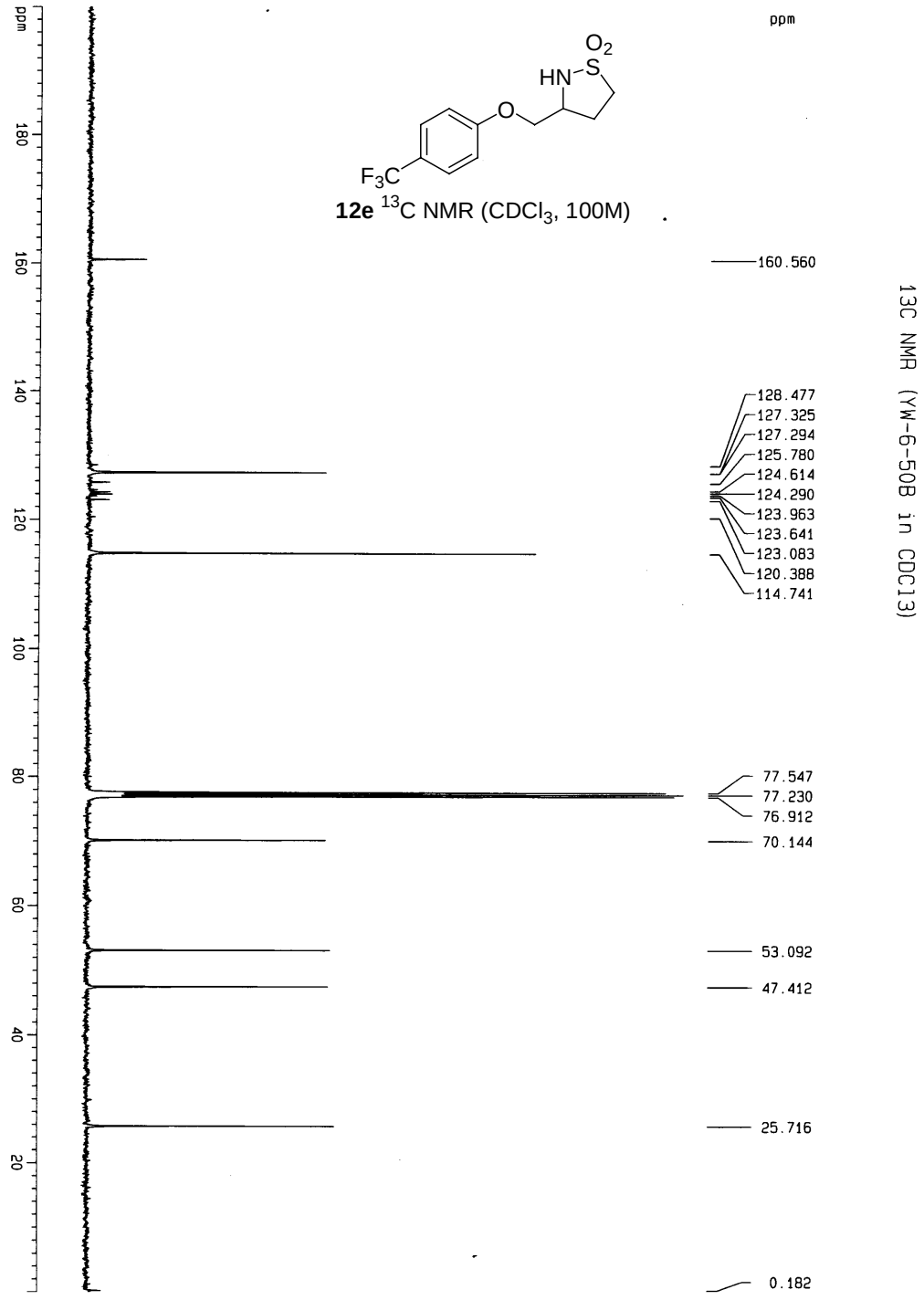
12d HRMS


YW-6-18B C
hws060704-8 346 (5.191) Cm (346-61:85)
GCT CA156
04-Jul-200613:46:56
TOF MS EI+
2.23e4
100
%
0
120.0098
108.0571
94.0423
77.0392
56.0496
42.0351
134.0285
135.0427
227.0619
228.0672
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
m/z
O2
HN
S
O

12d HRMS



12e ^{1}H NMR ($CDCl_3$, 400M)

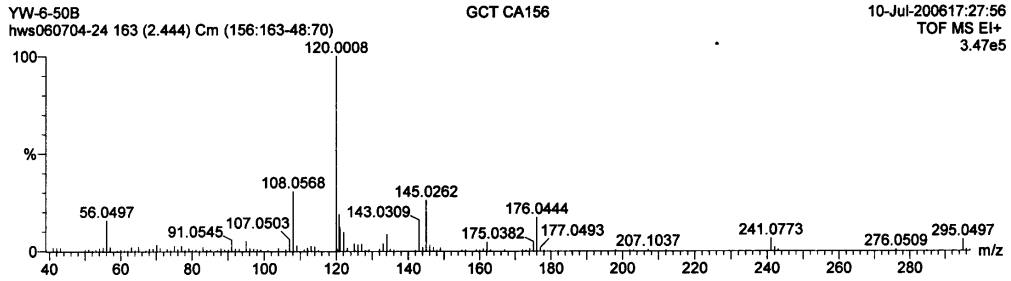


12e ^{13}C NMR ($CDCl_3$, 100M)

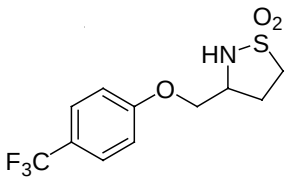
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

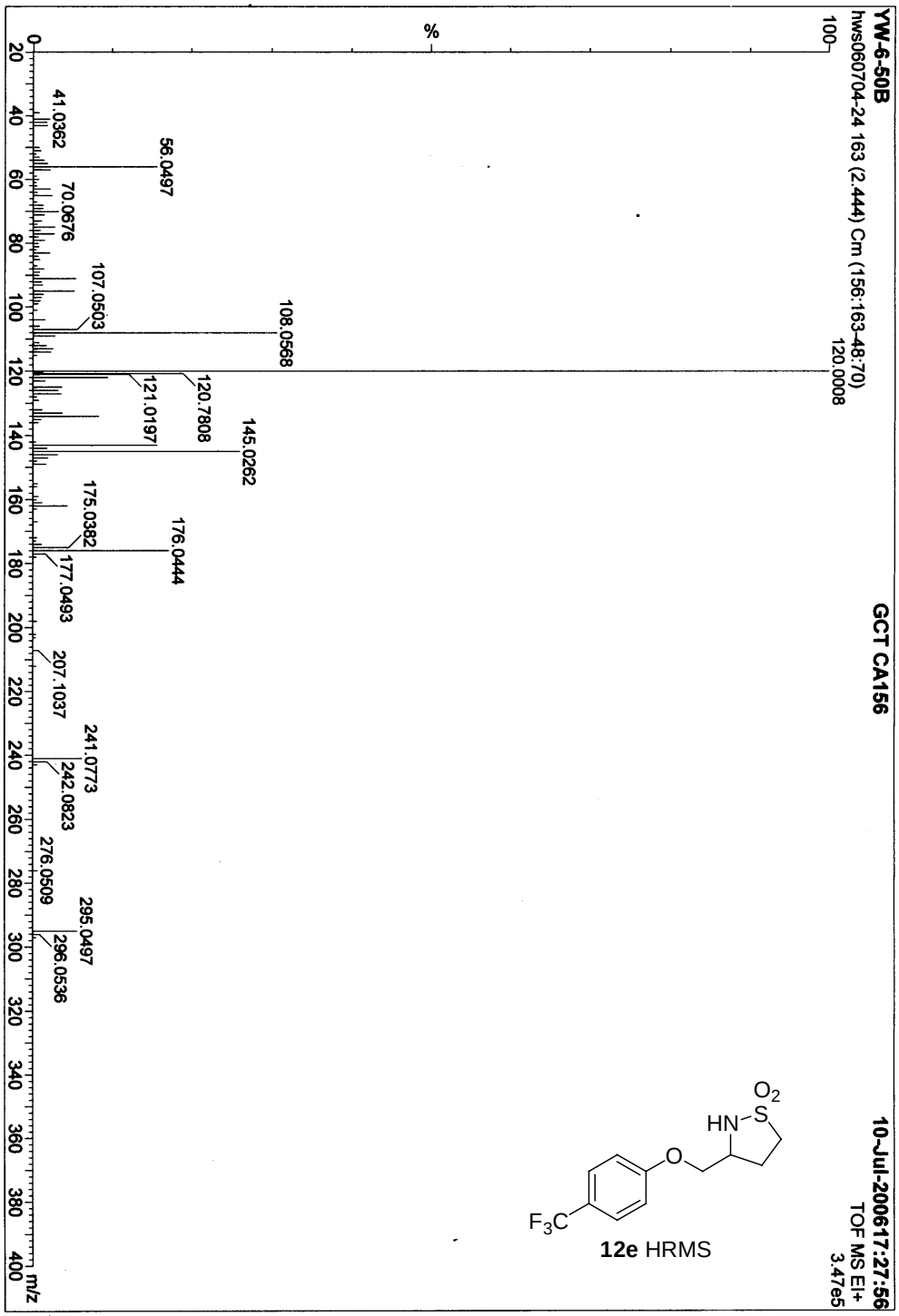
Monoisotopic Mass, Odd and Even Electron Ions
169 formula(e) evaluated with 3 results within limits (up to 50 closest results for each mass)



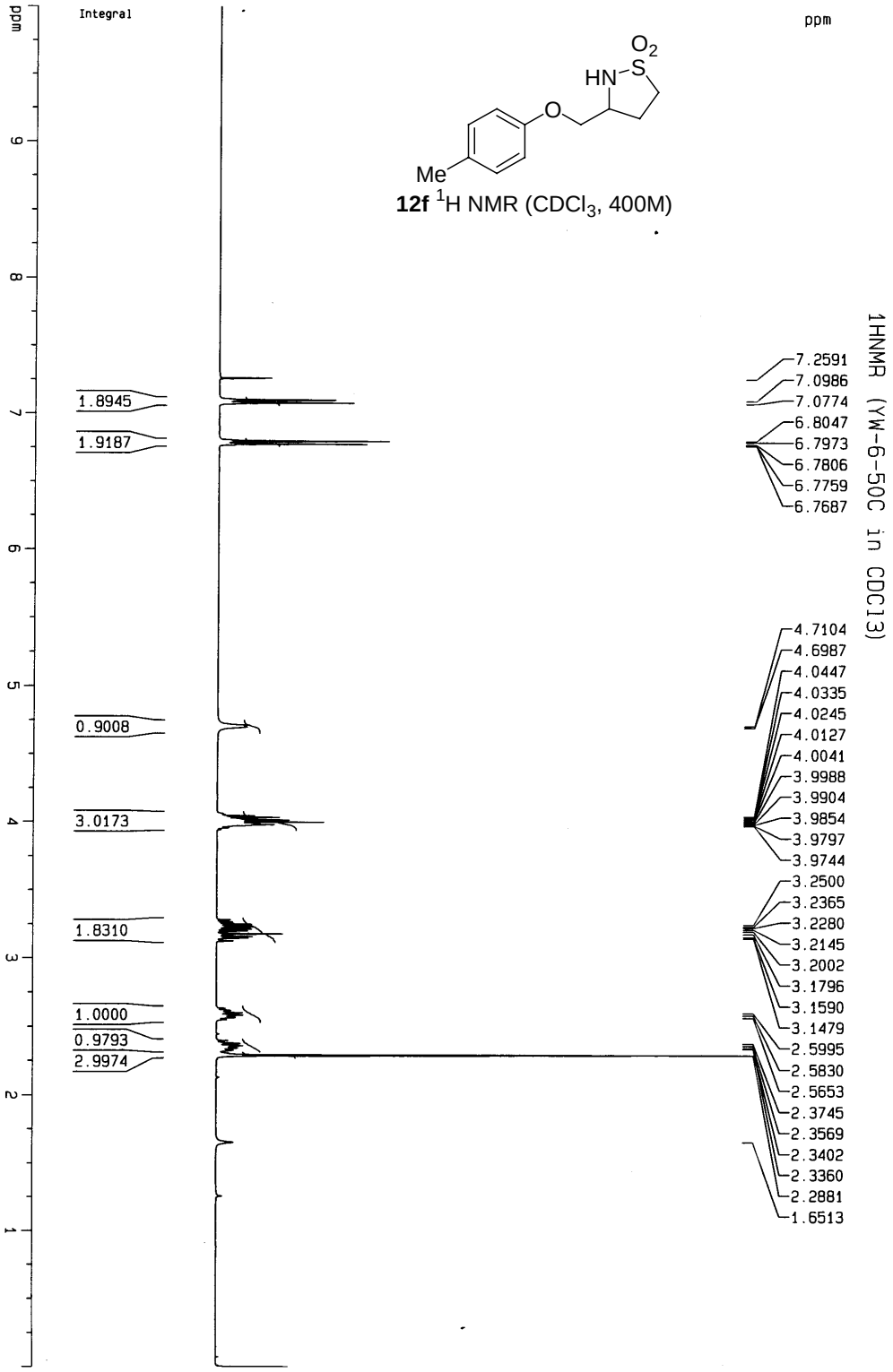
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
295.0497	295.0490	0.7	2.4	5.0	1	C11 H12 N O3 S F3
	295.0512	-1.5	-5.2	4.0	2	C11 H15 N O2 S2 F2
	295.0530	-3.3	-11.3	9.5	3	C13 H9 N2 O4 F2



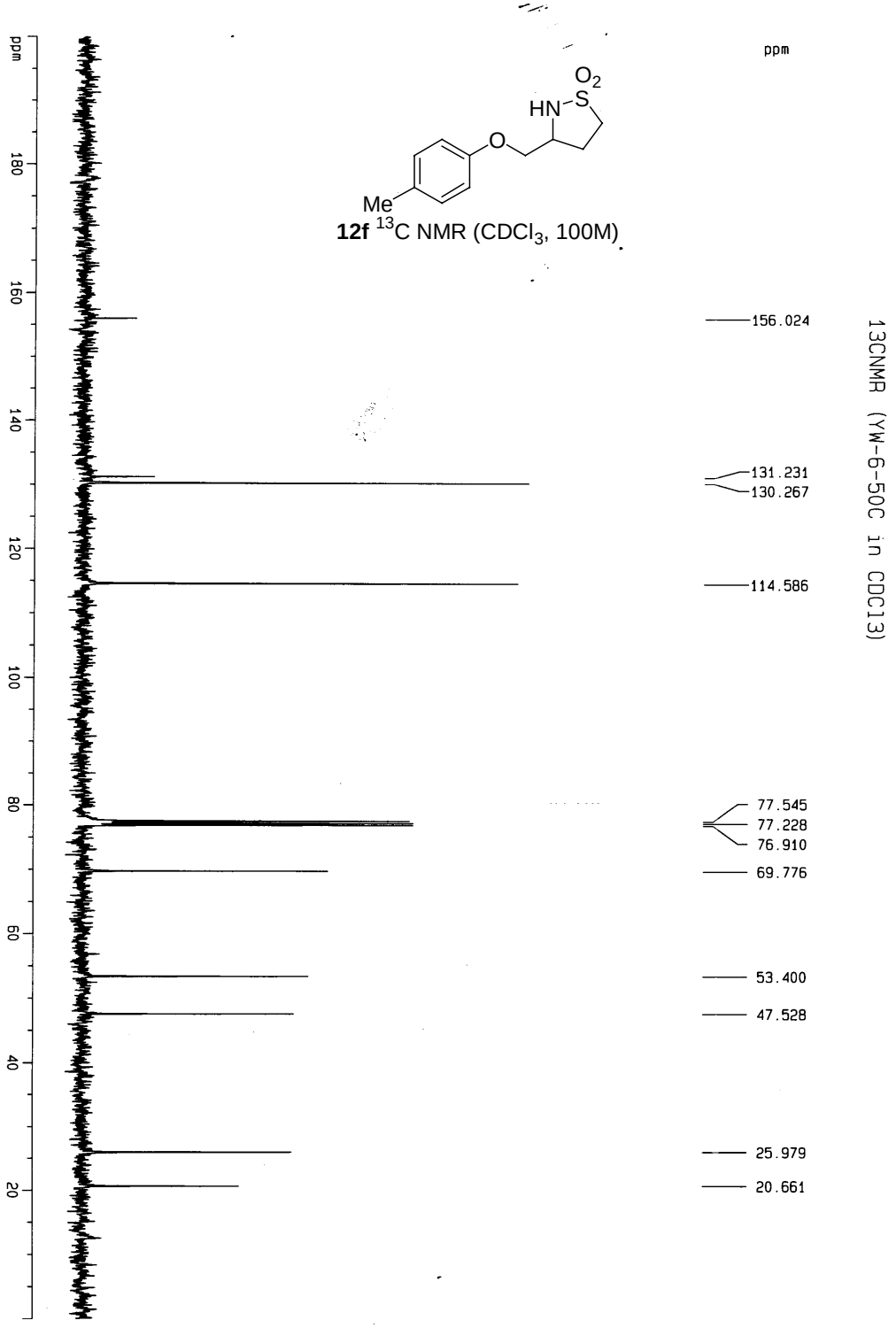
12e HRMS


YW-6-50B
hws060704-24 163 (2.444) Cm (156:163-48:70)
GCT CA156
10-Jul-200617:27:56
TOF MS EI+
3.47e5
%
100
0
120.0008
108.0568
56.0497
145.0262
176.0444
41.0362
70.0676
107.0503
120.7808
121.0197
175.0382
177.0493
207.1037
241.0773
242.0823
276.0509
295.0497
296.0536
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
m/z
HN
S
O2
O
F3C

12e HRMS



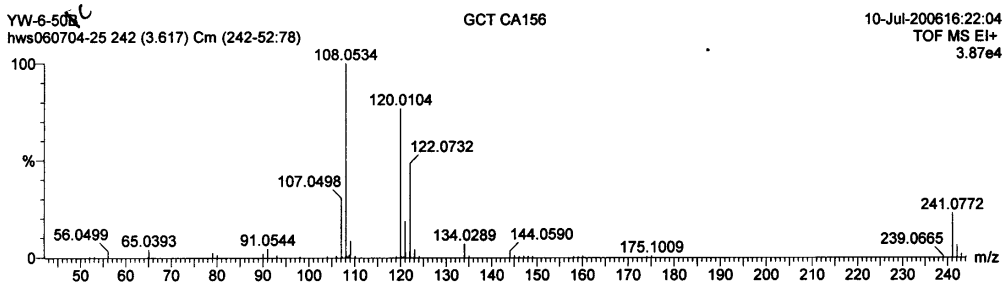
12f ^{1}H NMR ($CDCl_3$, 400M)


ppm
180
160
140
120
100
80
60
40
20
O2
HN
S
O
Me
12f 13C NMR (CDCl3, 100M)
156.024
131.231
130.267
114.586
77.545
77.228
76.910
69.776
53.400
47.528
25.979
20.661
13CNMR (YW-6-50C in CDCl3)

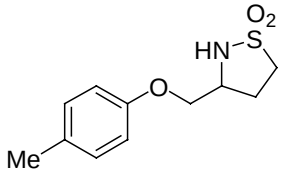
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

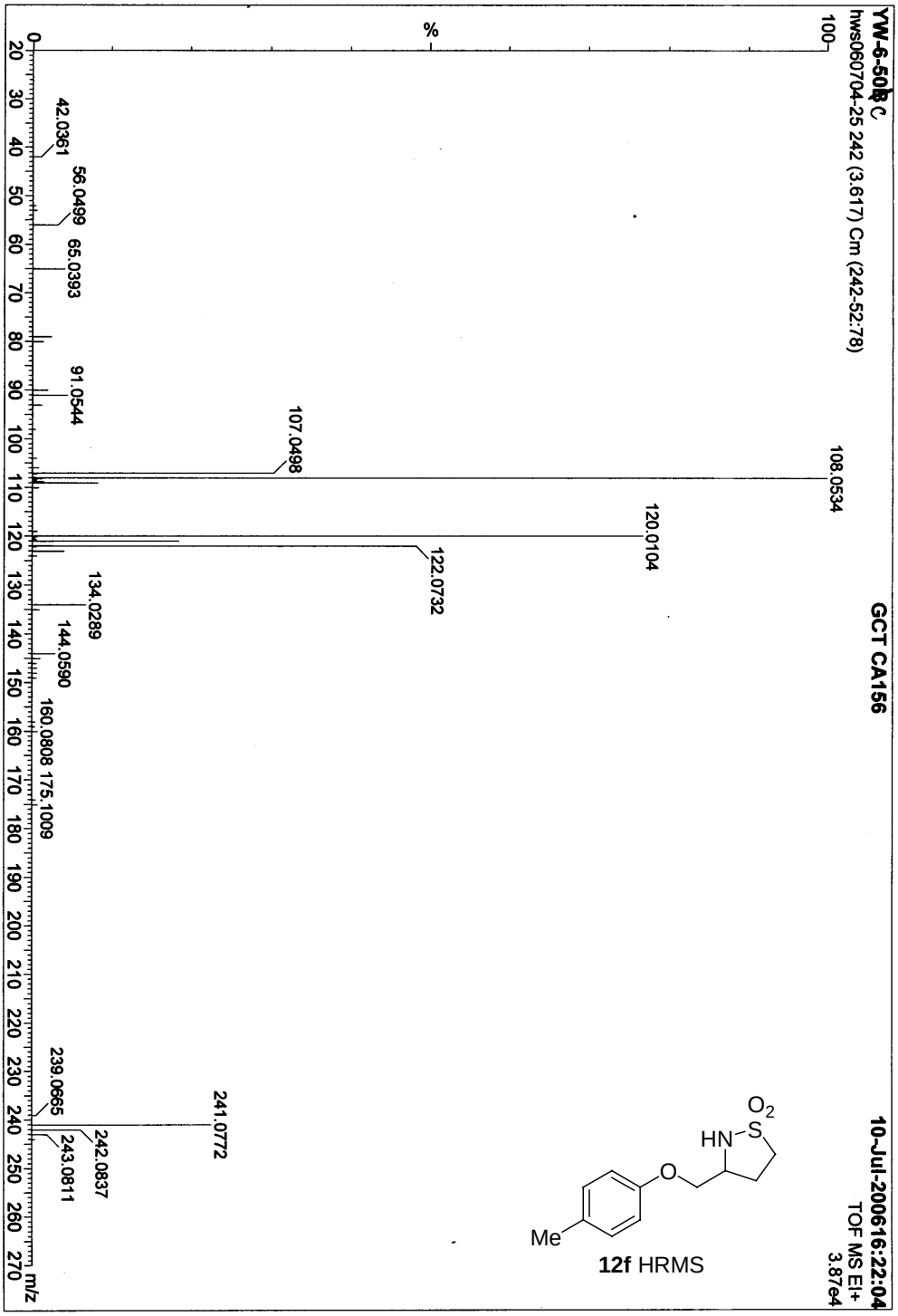
Monoisotopic Mass, Odd and Even Electron Ions
133 formula(e) evaluated with 6 results within limits (up to 50 closest results for each mass)



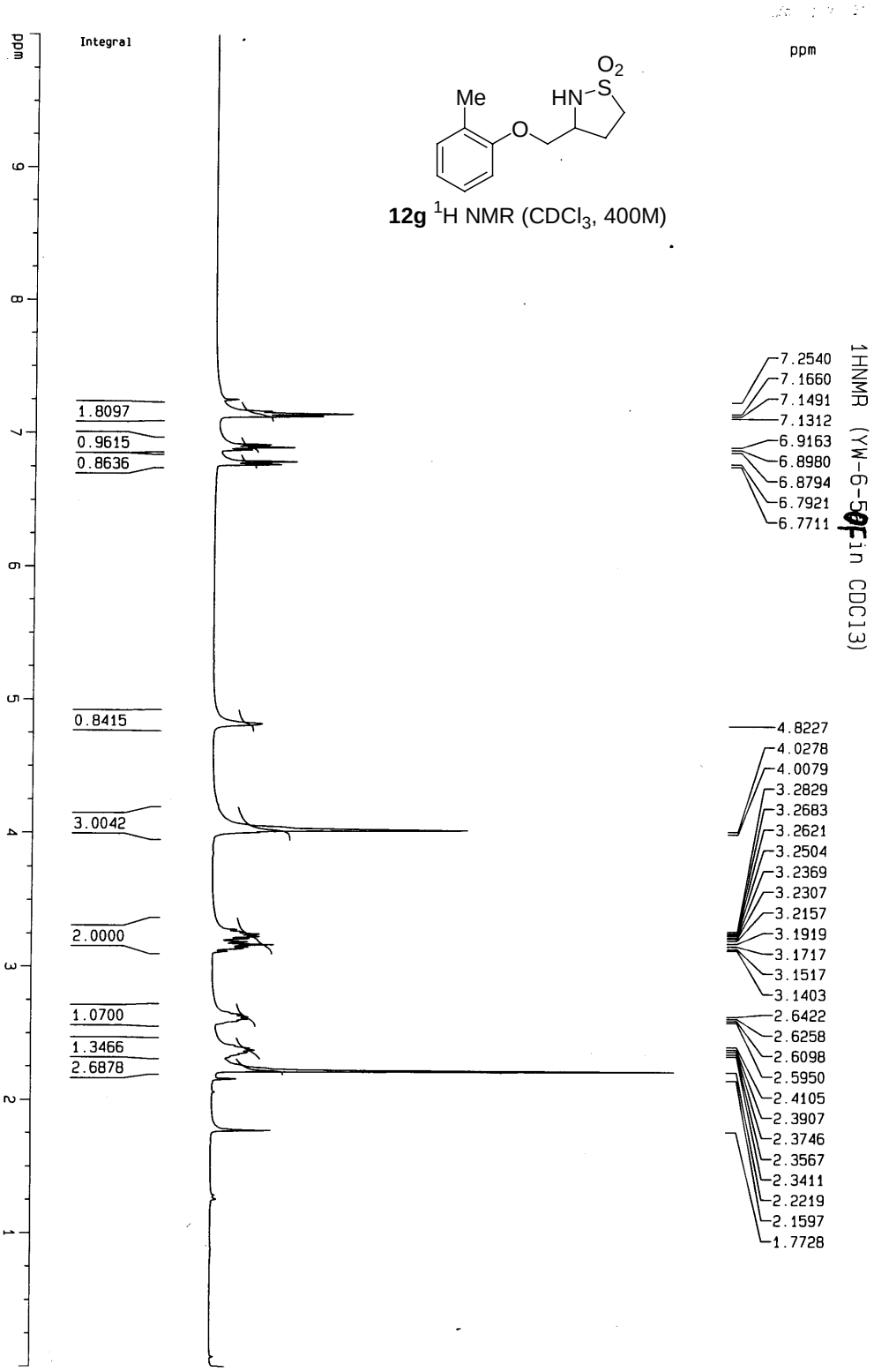
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
241.0772	241.0773	-0.1	-0.3	5.0	4	C11 H15 N O3 S
	241.0766	0.6	2.6	14.5	1	C17 H9 N2
	241.0798	-2.6	-10.6	1.0	6	C7 H15 N O8
	241.0746	2.6	10.8	0.5	5	C8 H17 O6 S
	241.0799	-2.7	-11.4	9.5	2	C14 H13 N2 S
	241.0739	3.3	13.7	10.0	3	C14 H11 N O3



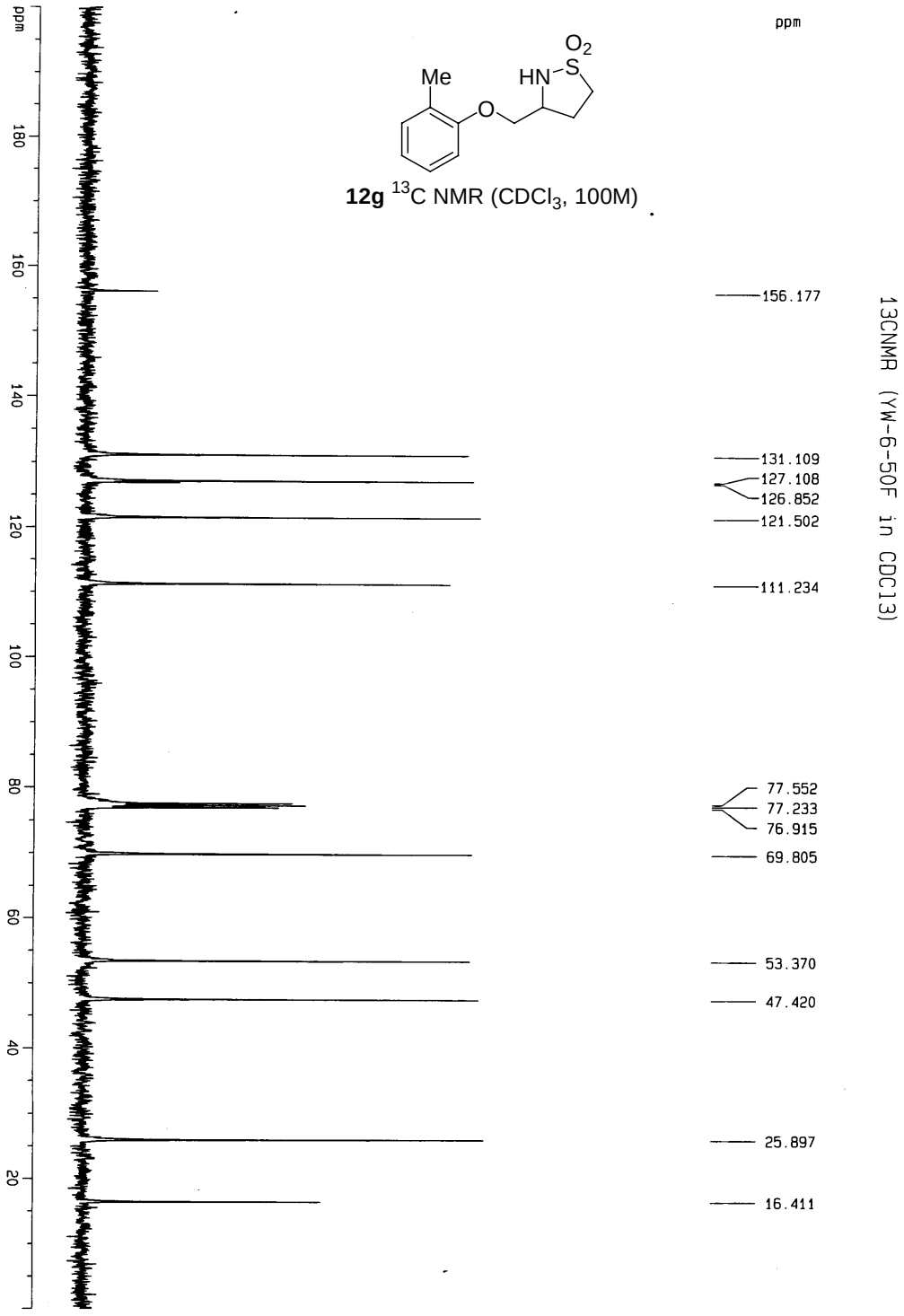
12f HRMS


YW-6-50B C
hws060704-25 242 (3.617) Cm (242-52:78)
GCT CA156
10-Jul-200616:22:04
TOF MS EI+
3.87e4
%
100
0
42.0361
56.0499
65.0393
91.0544
107.0498
108.0534
120.0104
122.0732
134.0289
144.0590
160.0808
175.1009
239.0665
241.0772
242.0837
243.0811
m/z
O2
HN
S
O
Me

12f HRMS



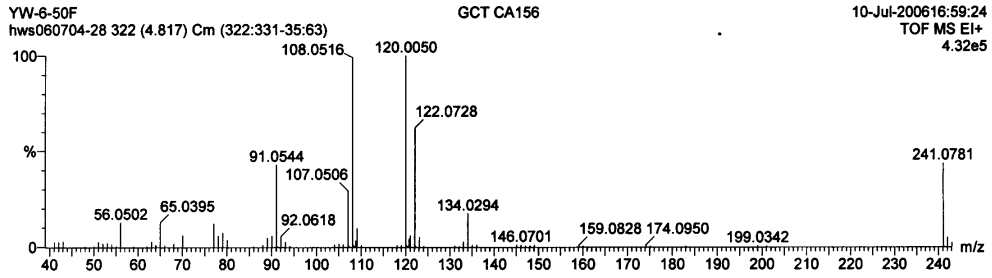
12g ^{1}H NMR ($CDCl_3$, 400M)



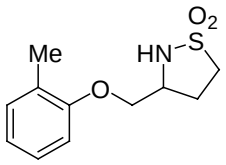
12g ^{13}C NMR ($CDCl_3$, 100M)

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

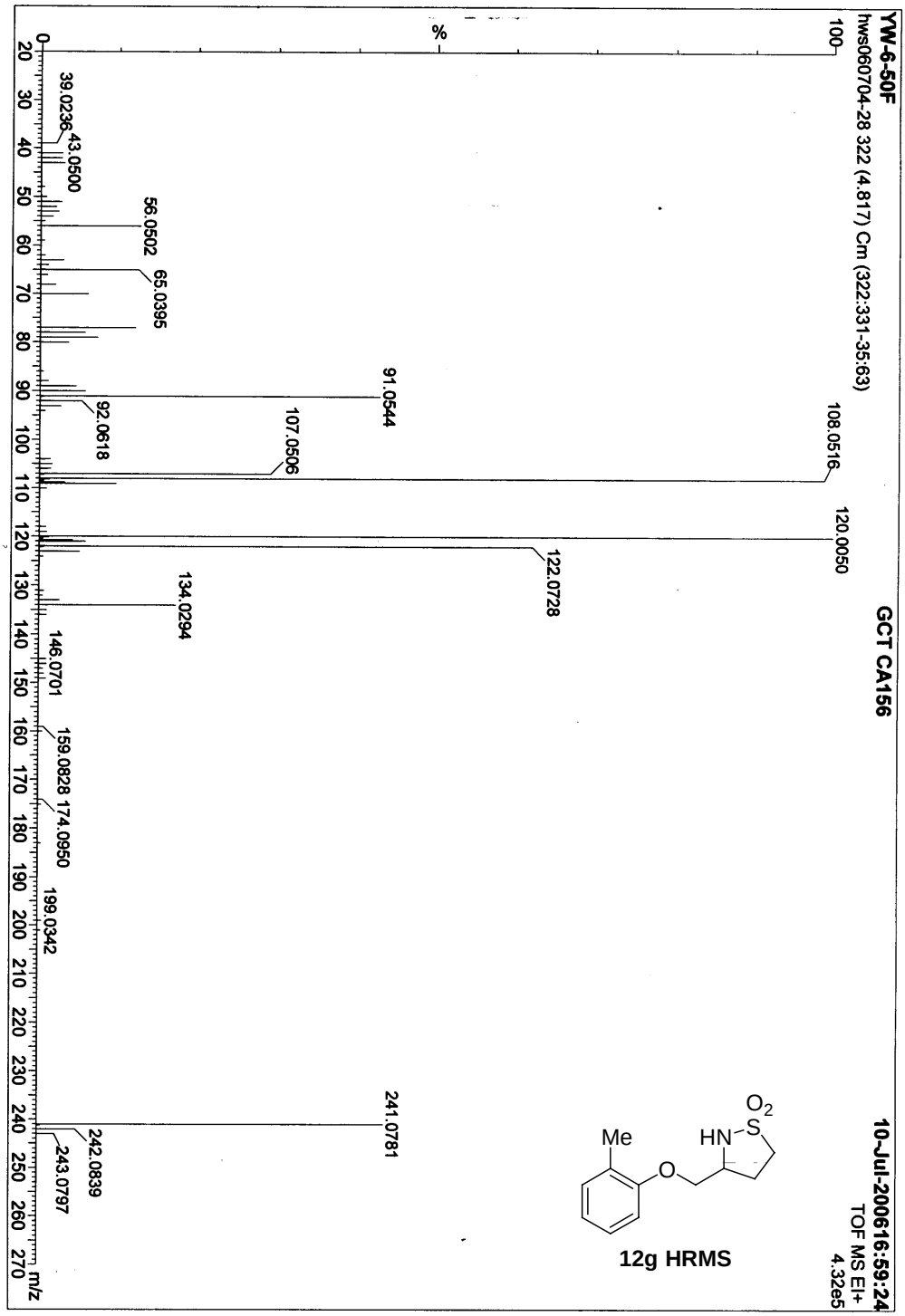
Monoisotopic Mass, Odd and Even Electron Ions
160 formula(e) evaluated with 6 results within limits (up to 50 closest results for each mass)



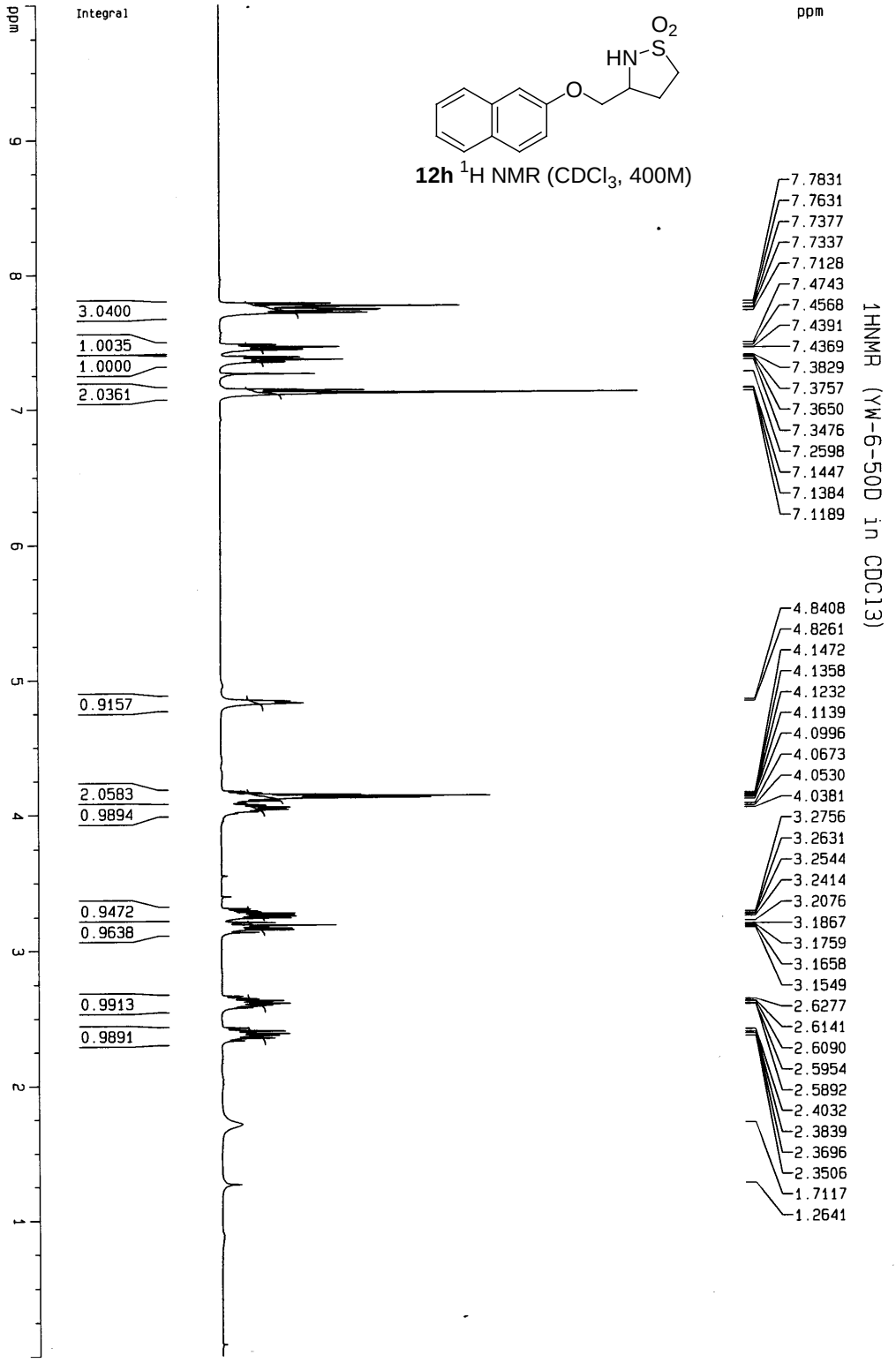
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
241.0781	241.0773	0.8	3.5	5.0	2	C11 H15 N O3 S ✓
	241.0766	1.5	6.3	14.5	6	C17 H9 N2
	241.0799	-1.8	-7.7	9.5	5	C14 H13 N2 S
	241.0739	4.2	17.4	10.0	4	C14 H11 N O3
	241.0824	-4.3	-18.0	5.5	3	C10 H13 N2 O5
	241.0732	4.9	20.1	1.0	1	C6 H15 N3 O5 S

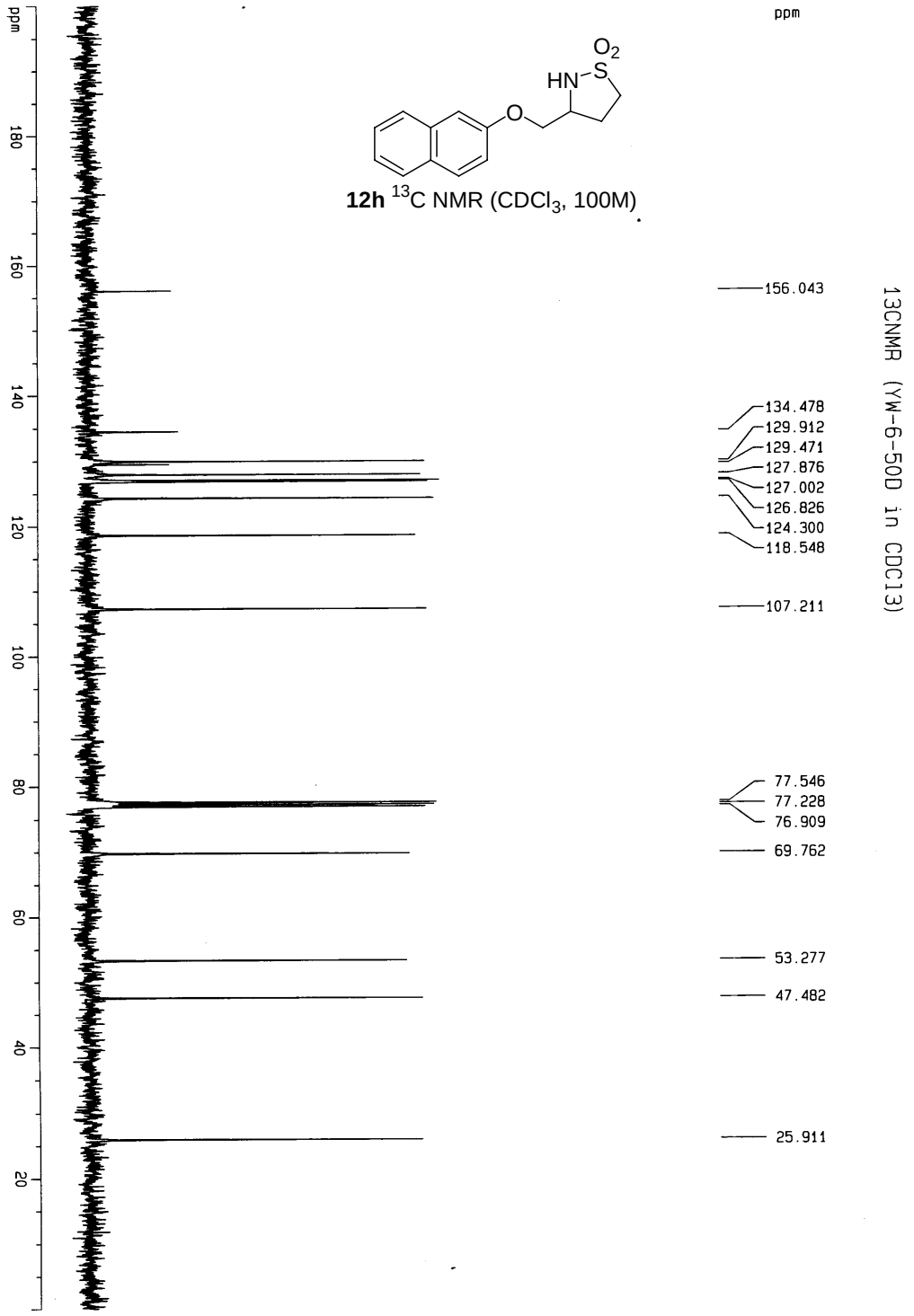


12g HRMS


YW-6-50F
hws060704-28 322 (4.817) Cm (322:331-35:63)
GCT CA156
10-Jul-200616:59:24
TOF MS EI+
4.32e5
%
100
0
39.0236
43.0500
56.0502
65.0395
91.0544
92.0618
107.0506
108.0516
120.0050
122.0728
134.0294
146.0701
159.0828
174.0950
199.0342
241.0781
242.0839
243.0797
20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270
m/z
Me
HN
S
O2
O

12g HRMS


Integral
ppm
3.0400
1.0035
1.0000
2.0361
0.9157
2.0583
0.9894
0.9472
0.9638
0.9913
0.9891
O2
HN
S
O
12h 1H NMR (CDCl3, 400M)
7.7831
7.7631
7.7377
7.7337
7.7128
7.4743
7.4568
7.4391
7.4369
7.3829
7.3757
7.3650
7.3476
7.2598
7.1447
7.1384
7.1189
4.8408
4.8261
4.1472
4.1358
4.1232
4.1139
4.0996
4.0673
4.0530
4.0381
3.2756
3.2631
3.2544
3.2414
3.2076
3.1867
3.1759
3.1658
3.1549
2.6277
2.6141
2.6090
2.5954
2.5892
2.4032
2.3839
2.3696
2.3506
1.7117
1.2641
1HNMR (YW-6-50D in CDCl3)

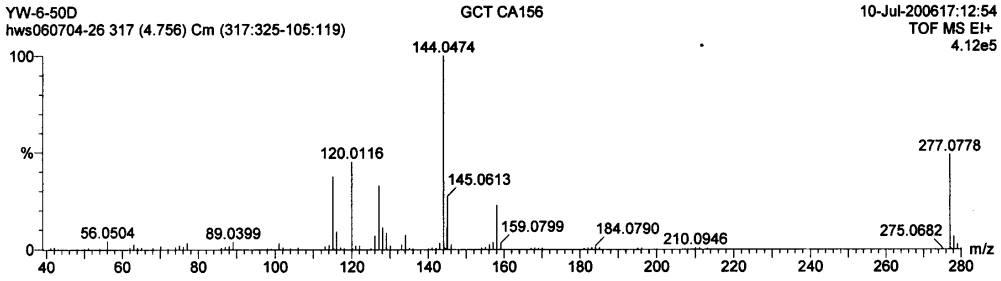


12h ^{13}C NMR ($CDCl_3$, 100M)

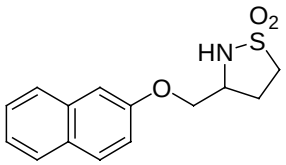
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

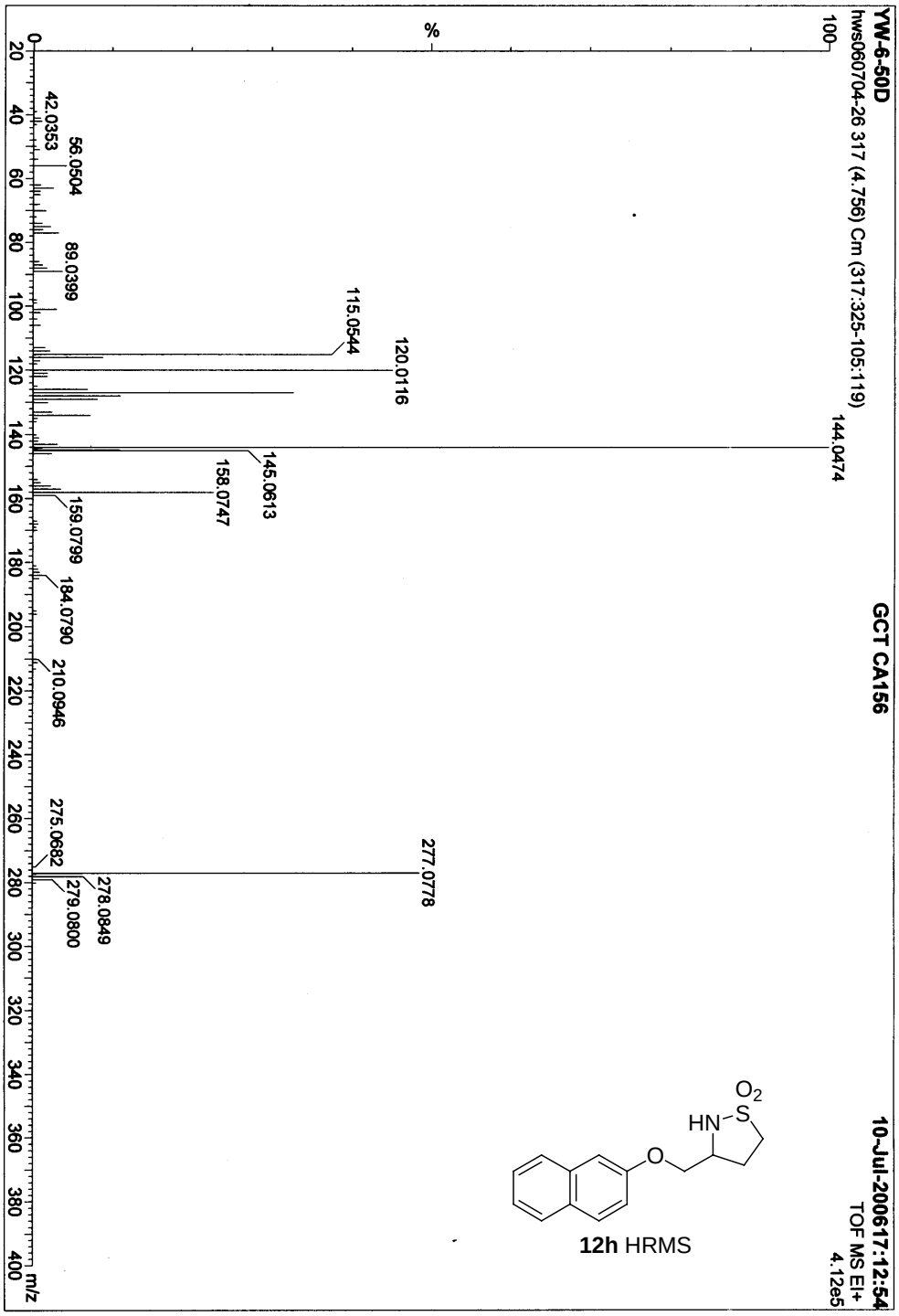
Monoisotopic Mass, Odd and Even Electron Ions
160 formula(e) evaluated with 6 results within limits (up to 50 closest results for each mass)



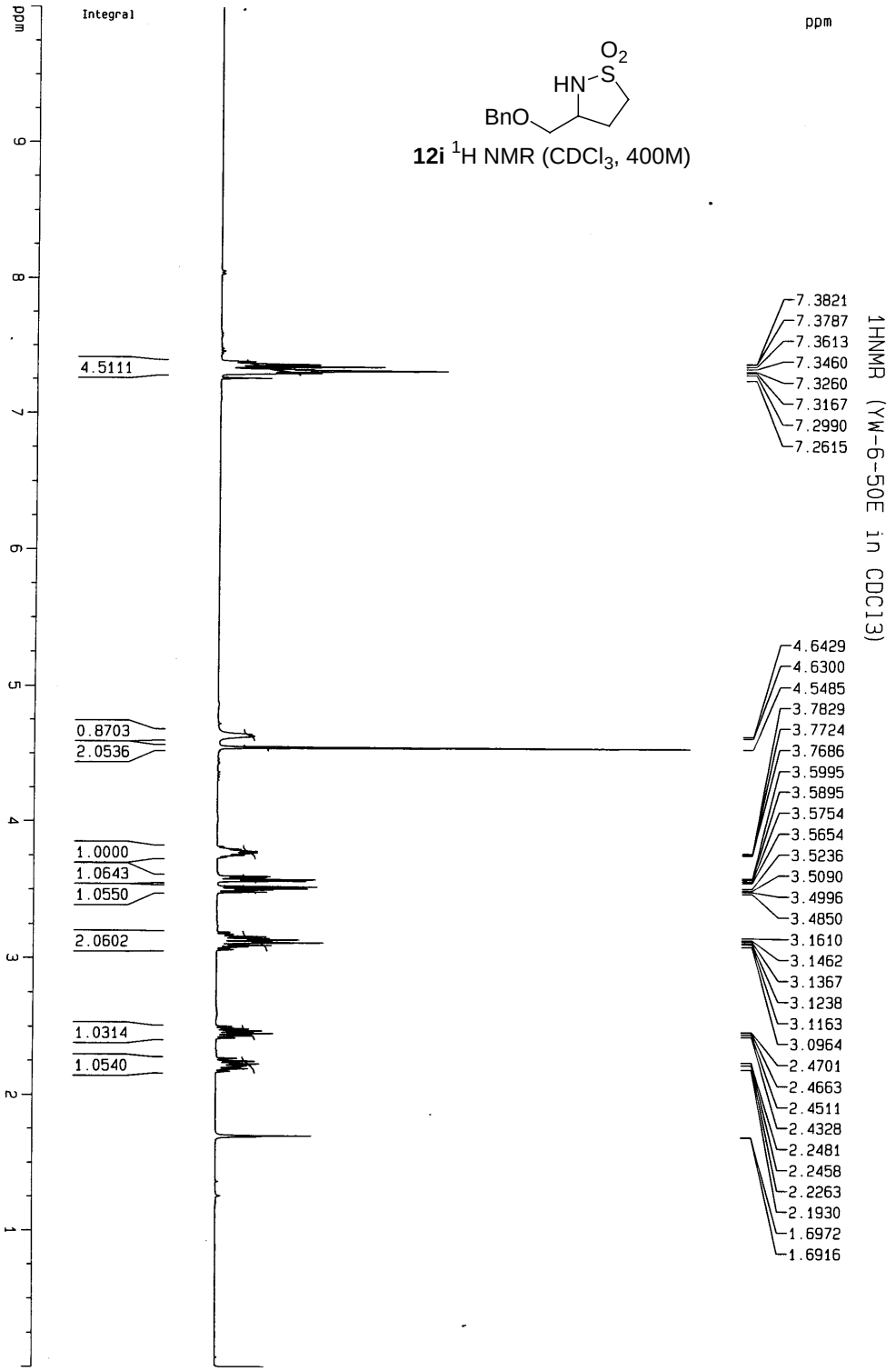
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
277.0778	277.0773	0.5	1.9	8.0	3	C14 H15 N O3 S
	277.0766	1.2	4.4	17.5	6	C20 H9 N2
	277.0799	-2.1	-7.7	12.5	5	C17 H13 N2 S
	277.0739	3.9	14.1	13.0	4	C17 H11 N O3
	277.0732	4.6	16.4	4.0	1	C9 H15 N3 O5 S
	277.0824	-4.6	-16.8	8.5	2	C13 H13 N2 O5



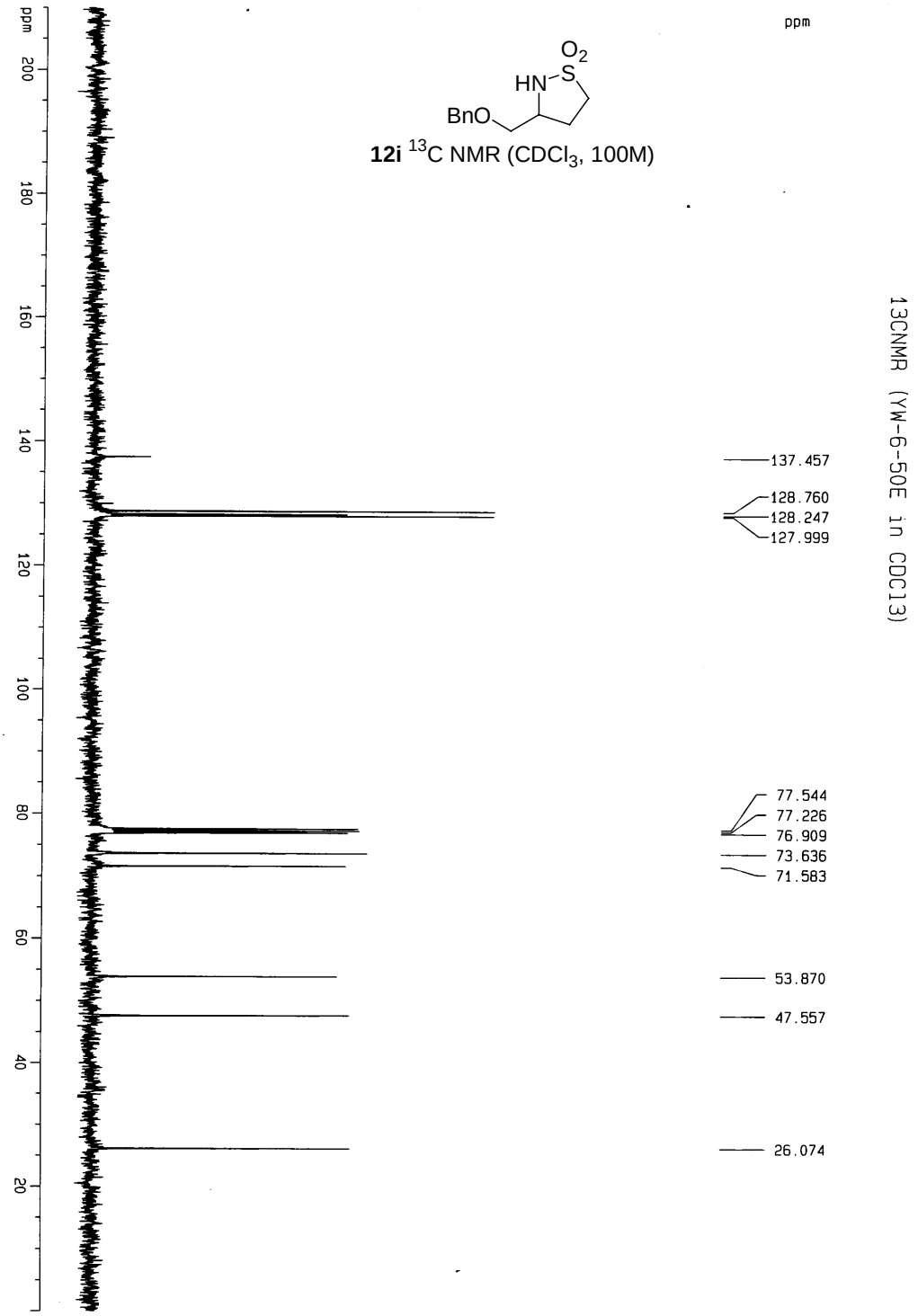
12h HRMS


YW-6-50D
hws060704-26 317 (4.756) Cm (317:325-105:119)
GCT CA156
10-Jul-200617:12:54
TOF MS EI+
4.12e5
100
%
0
144.0474
115.0544
120.0116
145.0613
158.0747
159.0799
184.0790
210.0946
275.0682
277.0778
278.0849
279.0800
42.0353
56.0504
89.0399
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 m/z
O2
HN
S
O

12h HRMS



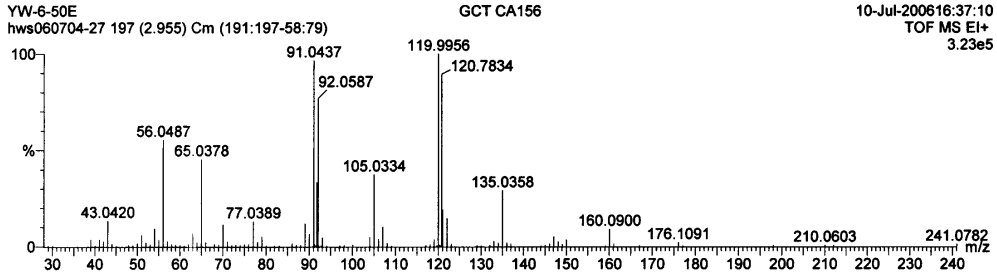
12i ^{1}H NMR ($CDCl_3$, 400M)


ppm
200
180
160
140
120
100
80
60
40
20
O2
HN
S
BnO
12i 13C NMR (CDCl3, 100M)
ppm
137.457
128.760
128.247
127.999
77.544
77.226
76.909
73.636
71.583
53.870
47.557
26.074
13CNMR (YW-6-50E in CDCl3)

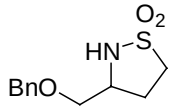
Elemental Composition Report **Page 1**

Single Mass Analysis
Tolerance = 5.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

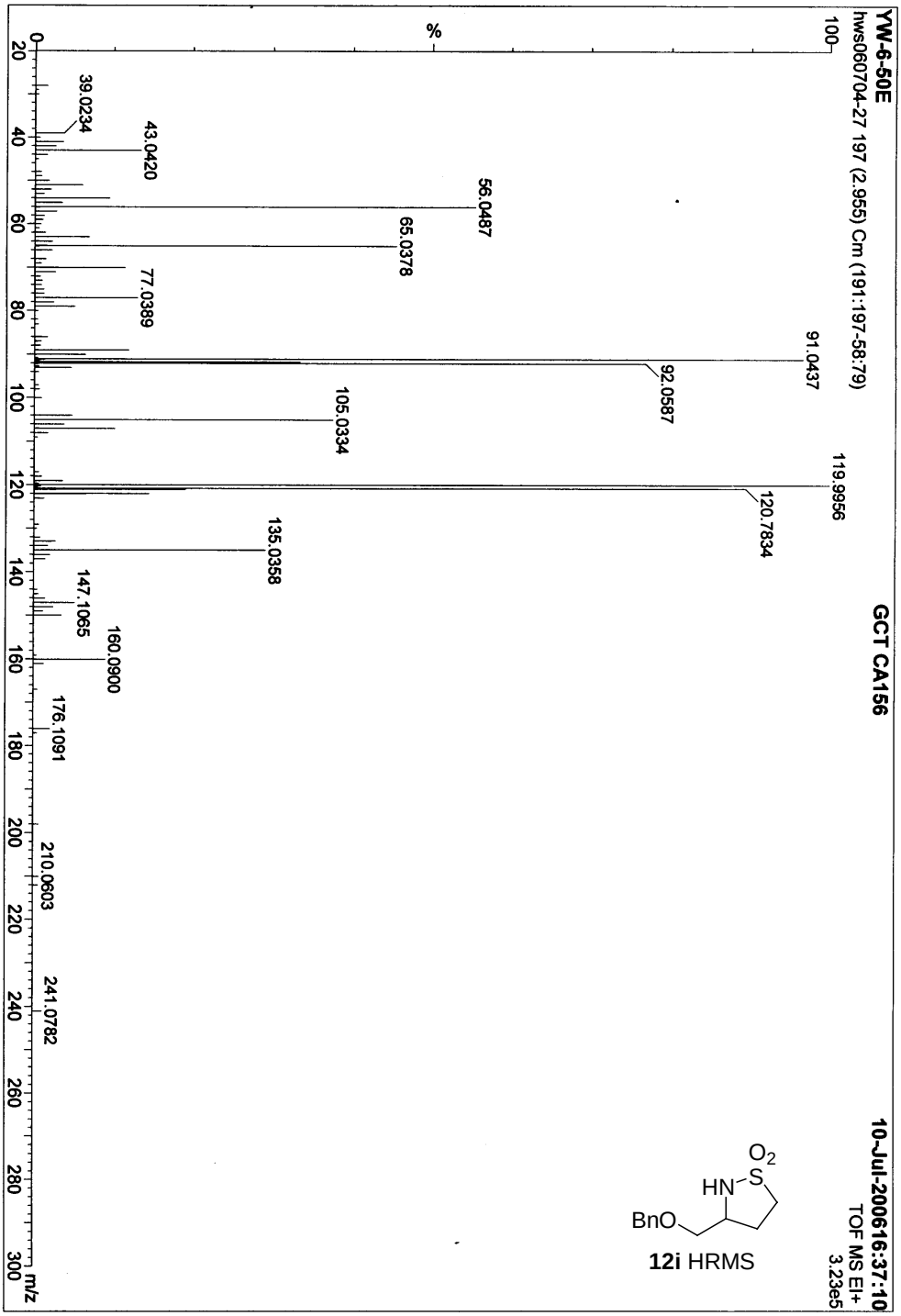
Monoisotopic Mass, Odd and Even Electron Ions
133 formula(e) evaluated with 7 results within limits (up to 50 closest results for each mass)

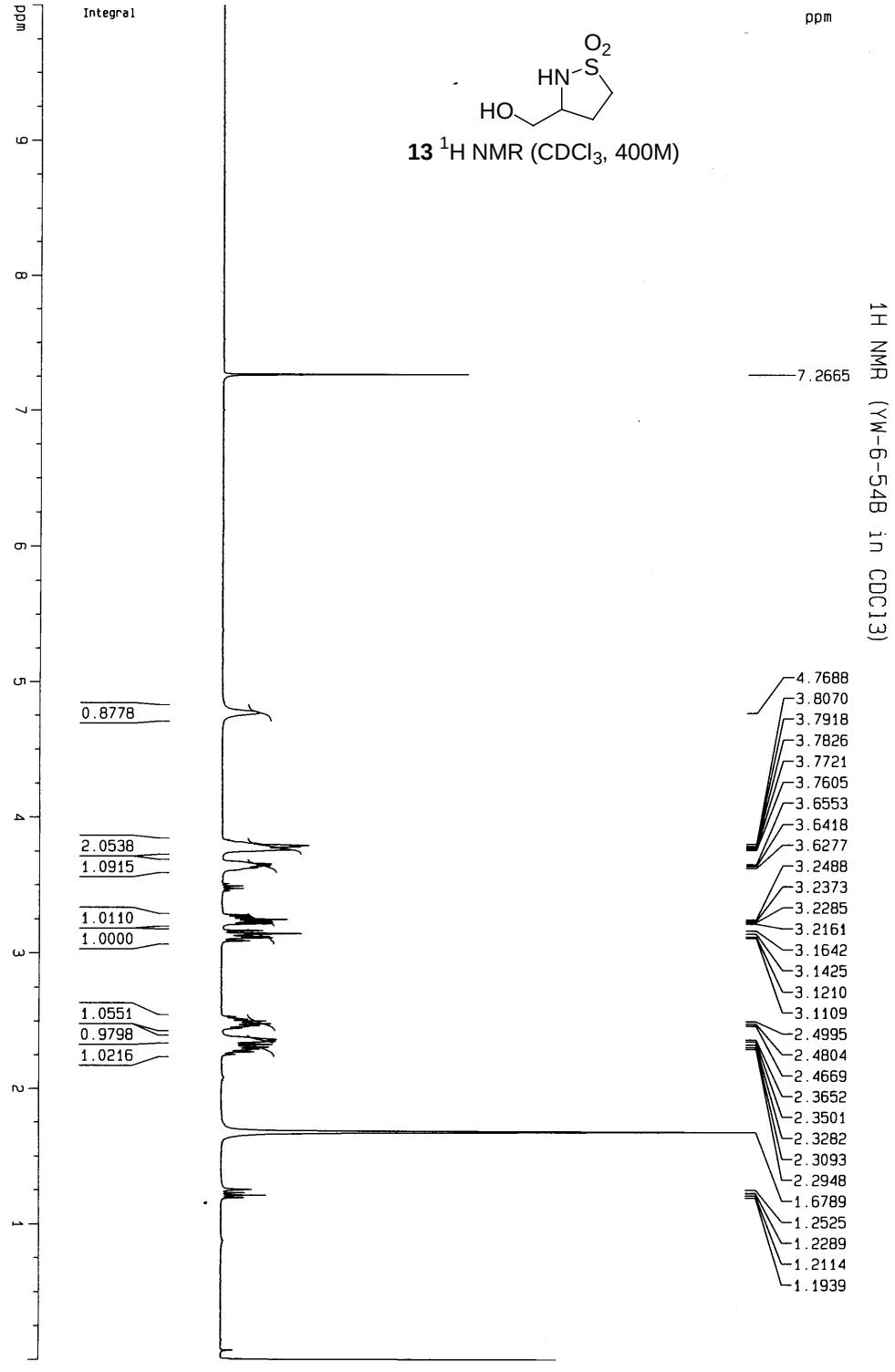


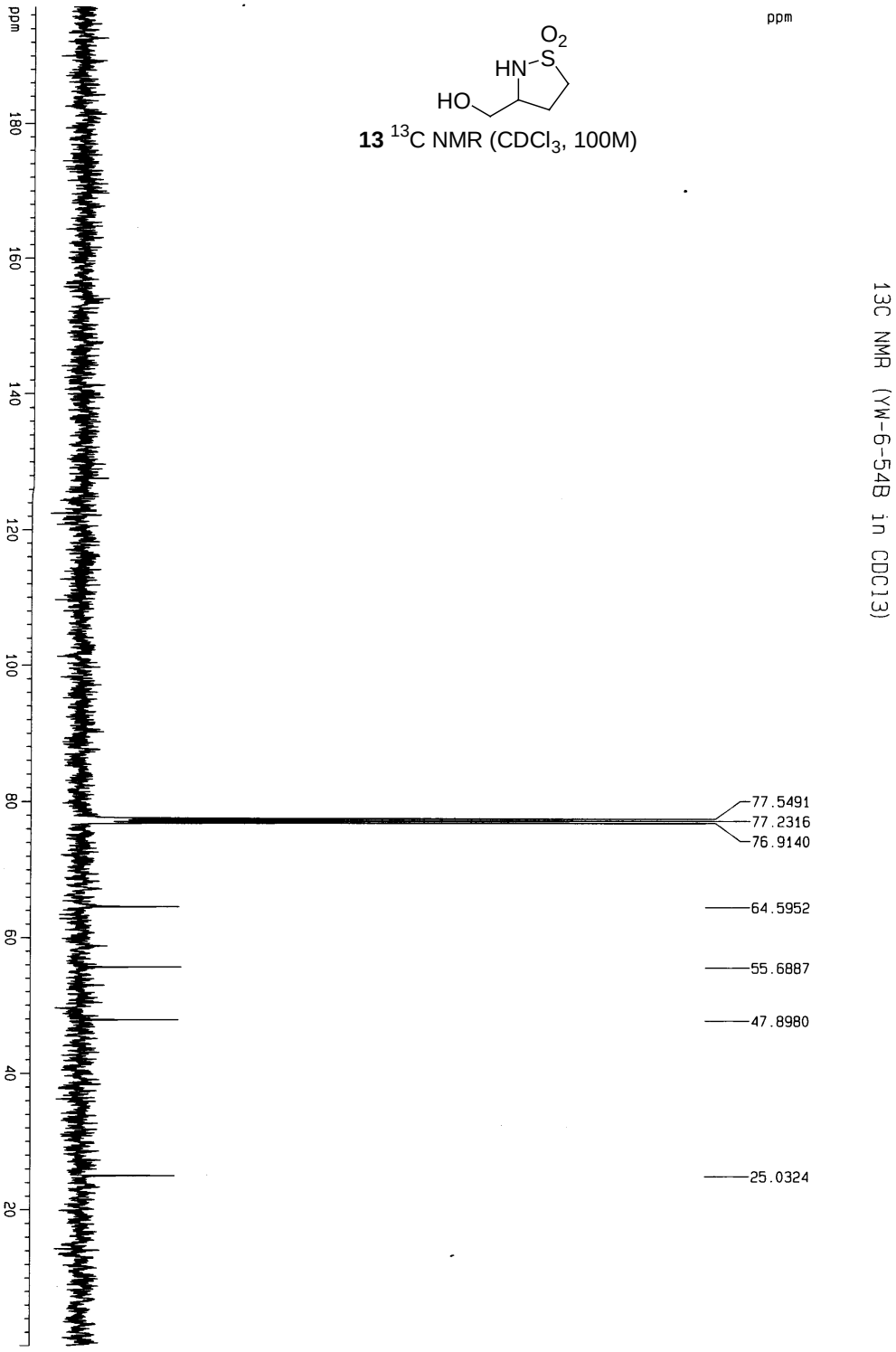
Minimum:				-1.5		
Maximum:		5.0	5.0	50.0		
Mass	Calc. Mass	mDa	PPM	DBE	Score	Formula
241.0782	241.0773	0.9	3.9	5.0	4	C11 H15 N O3 S
	241.0798	-1.6	-6.5	1.0	1	C7 H15 N O8
	241.0766	1.6	6.7	14.5	7	C17 H9 N2
	241.0799	-1.7	-7.2	9.5	6	C14 H13 N2 S
	241.0746	3.6	15.0	0.5	2	C8 H17 O6 S
	241.0824	-4.2	-17.6	5.5	3	C10 H13 N2 O5
	241.0739	4.3	17.9	10.0	5	C14 H11 N O3



12i HRMS


YW-6-50E
hws060704-27 197 (2.955) Cm (191:197-58:79)
GCT CA156
10-Jul-200616:37:10
TOF MS EI+
3.23e5
%
m/z
39.0234
43.0420
56.0487
65.0378
77.0389
91.0437
92.0587
105.0334
119.9956
120.7834
135.0358
147.1065
160.0900
176.1091
210.0603
241.0782
O2
HN
S
BnO
12i HRMS


Integral
ppm
O2
HN
S
HO
13 1H NMR (CDCl3, 400M)
1H NMR (YW-6-54B in CDCl3)
7.2665
4.7688
3.8070
3.7918
3.7826
3.7721
3.7605
3.6553
3.6418
3.6277
3.2488
3.2373
3.2285
3.2161
3.1642
3.1425
3.1210
3.1109
2.4995
2.4804
2.4669
2.3652
2.3501
2.3282
2.3093
2.2948
1.6789
1.2525
1.2289
1.2114
1.1939
0.8778
2.0538
1.0915
1.0110
1.0000
1.0551
0.9798
1.0216



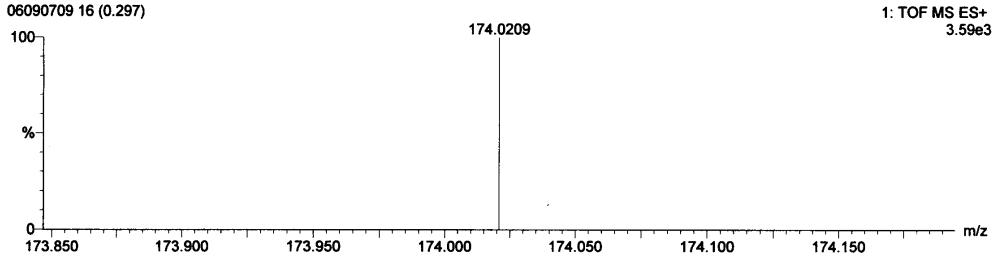
13 ^{13}C NMR ($CDCl_3$, 100M)

Elemental Composition Report **Page 1**

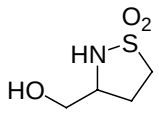
Single Mass Analysis
Tolerance = 50.0 PPM / DBE: min = -1.5, max = 50.0
Selected filters: None

Monoisotopic Mass, Even Electron Ions
3 formula(e) evaluated with 2 results within limits (up to 6 closest results for each mass)
Elements Used:
C: 0-50 H: 0-100 N: 1-1 O: 3-3 Na: 0-1 S: 1-1 Ru: 0-1

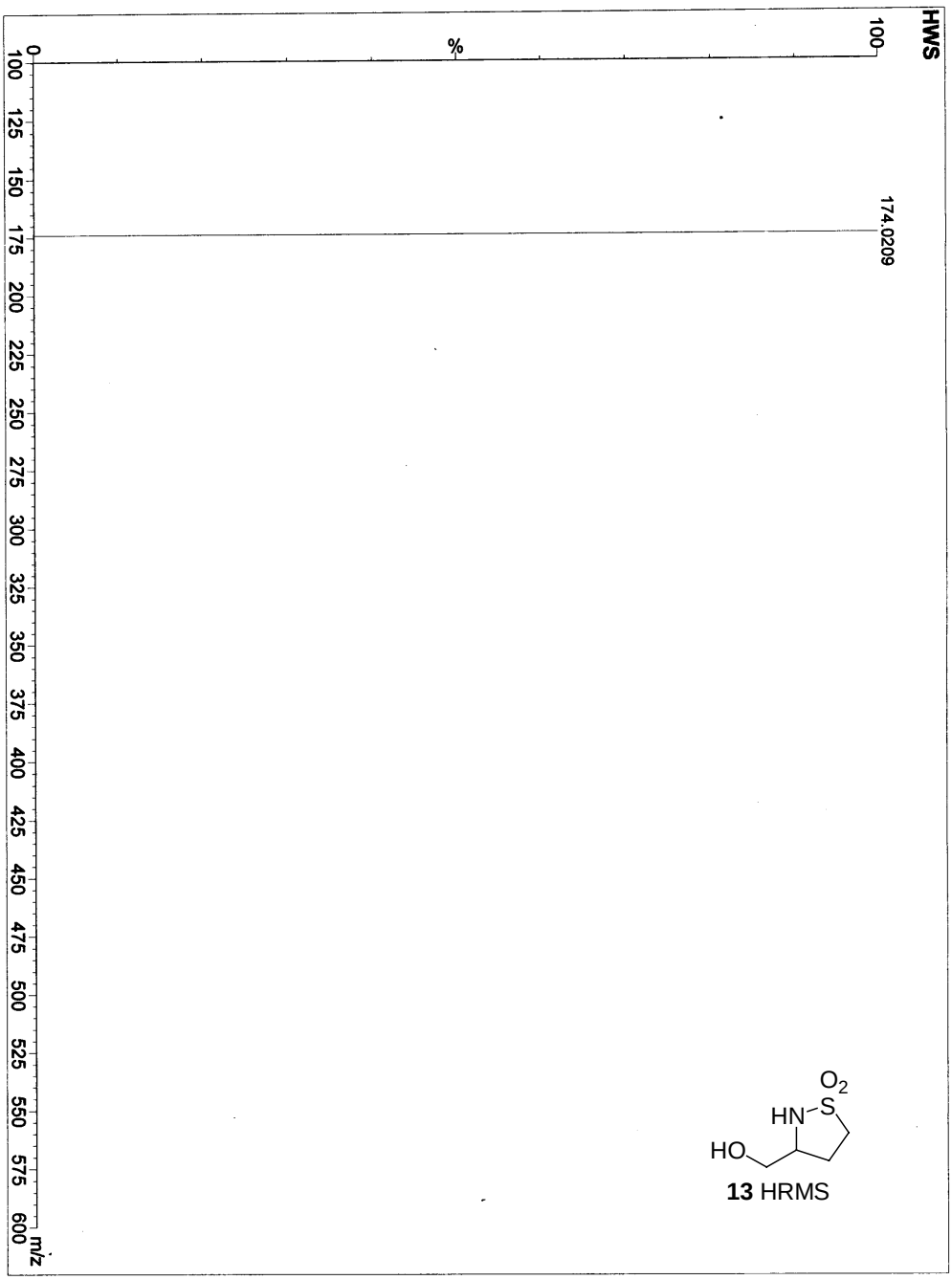
HWS
06090709 16 (0.297)



Minimum:				-1.5							
Maximum:		5.0	50.0	50.0							
Mass	Calc. Mass	mDa	PPM	DBE	i-FIT	Formula					
174.0209	174.0201	0.8	4.6	0.5	5547724.5	C4	H9	N	O3	Na	S
	174.0225	-1.6	-9.2	3.5	5547755.0	C6	H8	N	O3	S	



13 HRMS


HWS
%
100
0
174.0209
100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600
m/z
O2
HN
S
HO

13 HRMS

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002723.D Sample Name: YW-4-82

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 6/30/2005 10:58:00 AM
Sample Name     : YW-4-82                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\1218.M
Last changed    : 6/30/2005 10:34:45 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:27:03 PM by WANG
                  (modified after loading)
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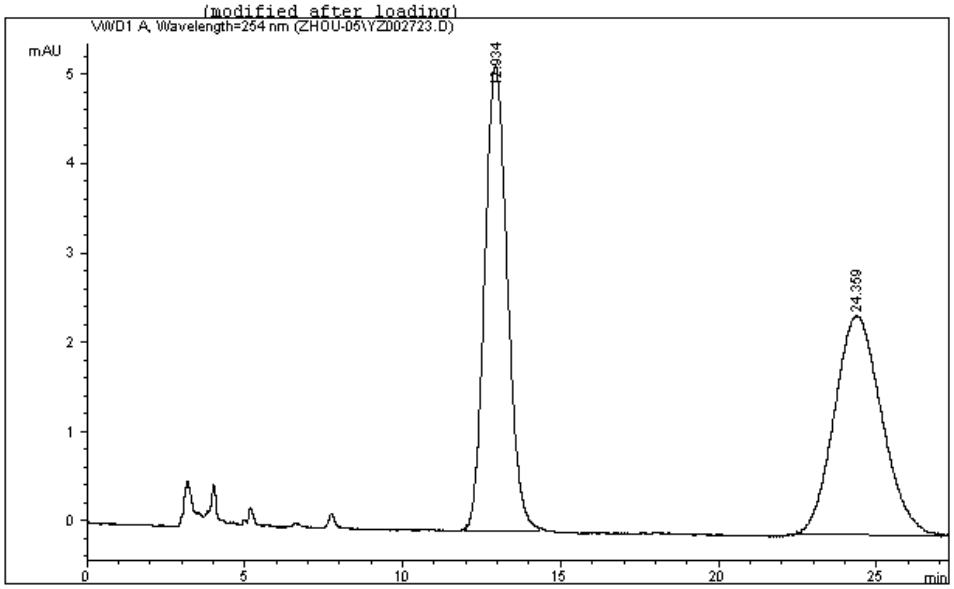



```
==========================================================================
                          Area Percent Report
==========================================================================

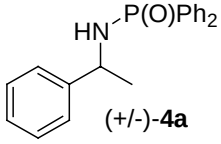
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  12.934 BB    0.7502  259.02747    5.19862  50.3319
   2  24.359 BB    1.2275  255.61096    2.44679  49.6681

Totals :                   514.63843    7.64541

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```



(+/-)-**4a**

Instrument 1 3/17/2007 2:27:24 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002749.D Sample Name: YW-4-86G

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 7/5/2005 1:11:38 PM
Sample Name     : YW-4-86G                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\1218.M
Last changed    : 7/5/2005 1:09:04 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:32:23 PM by WANG
                  (modified after loading)
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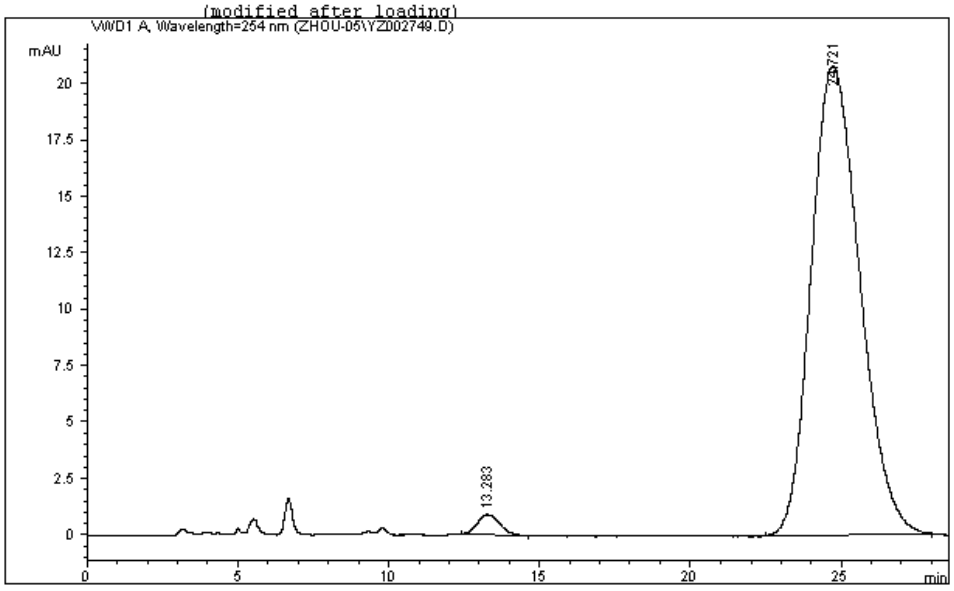
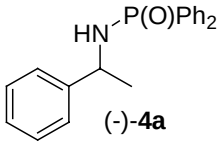



```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.283 BB    0.7359   47.85308 9.18627e-1   2.0064
   2  24.721 BB    1.7307 2337.20752   20.79379  97.9936

Totals :                  2385.06060   21.71241

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



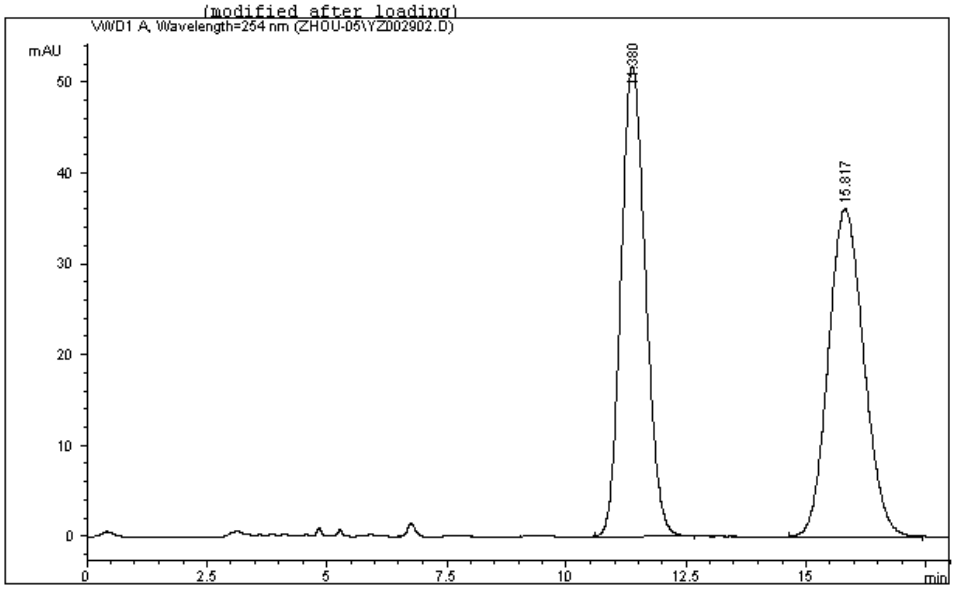
(-)-**4a**

Instrument 1 3/17/2007 2:32:36 PM WANG Page 1 of 1

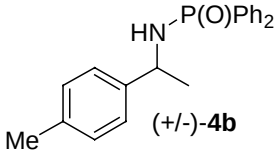
Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002902.D Sample Name: YW-4-97D

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/10/2005 6:30:56 PM
Sample Name     : YW-4-97D                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/10/2005 6:15:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:36:25 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.380 BB    0.5551 1845.19421   51.83478  49.9053
   2  15.817 BB    0.8060 1852.19739   36.05809  50.0947

Totals :                  3697.39160   87.89287

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



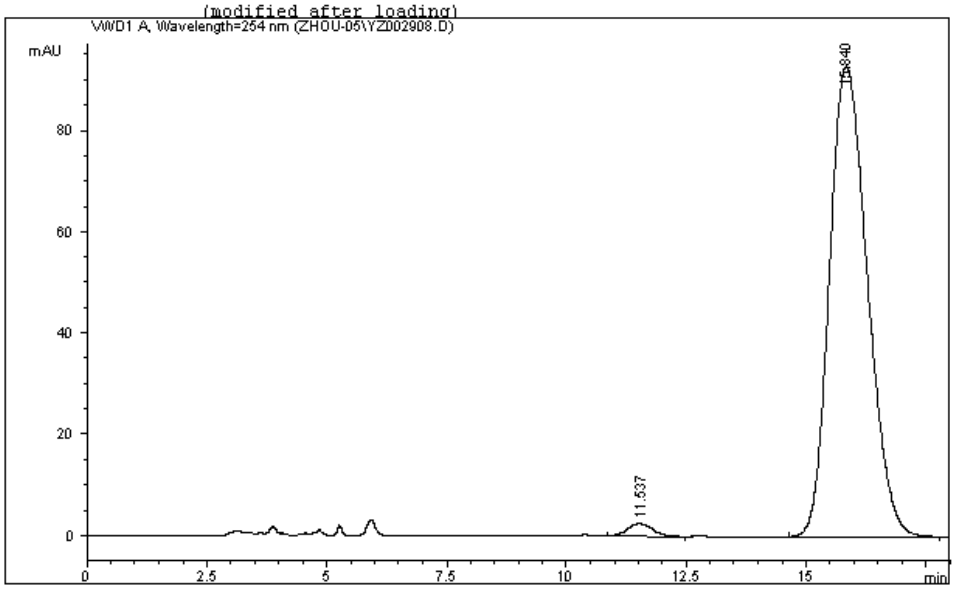
(+/-)-**4b**

Instrument 1 3/17/2007 2:36:27 PM WANG Page 1 of 1

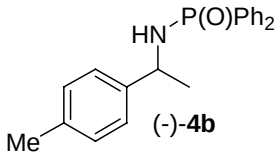
Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002908.D Sample Name: YW-5-24D1

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/13/2005 11:02:49 AM
Sample Name     : YW-5-24D1                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:38:44 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.537 VP    0.5299   90.07155    2.50669   1.7378
   2  15.840 BB    0.8636 5092.92090   92.92493  98.2622

Totals :                  5182.99245   95.43161

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



(-)-**4b**

Instrument 1 3/17/2007 2:38:55 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002914.D Sample Name: YW-4-97A (R)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/13/2005 2:34:53 PM
Sample Name     : YW-4-97A (R)                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:42:21 PM by WANG
                  (modified after loading)
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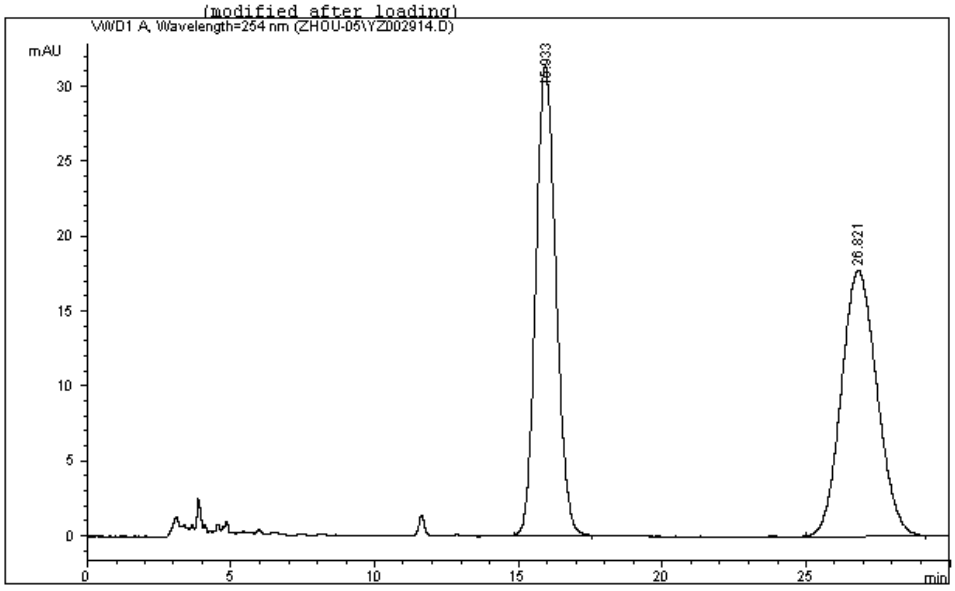



```
==========================================================================
                          Area Percent Report
==========================================================================

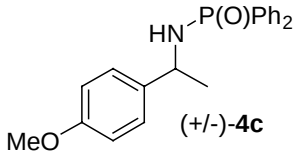
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  15.933 BB    0.7559 1521.54089   31.32866  49.8915
   2  26.821 BB    1.2335 1528.16040   17.71493  50.1085

Totals :                  3049.70129   49.04359

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```

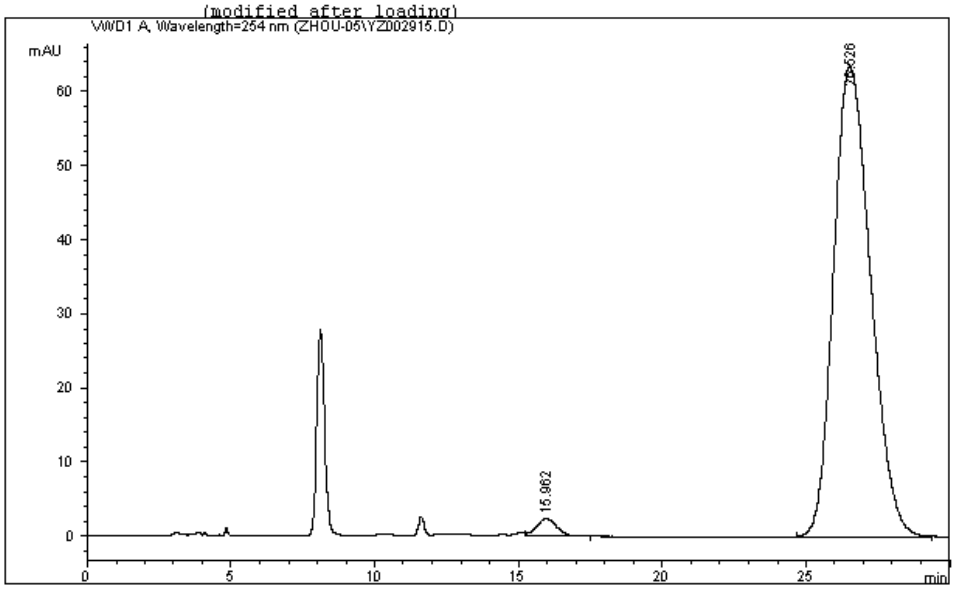


(+/-)-**4c**

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002915.D Sample Name: YW-5-24C

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
======================================================================
Injection Date  : 10/13/2005 3:08:34 PM
Sample Name     : YW-5-24C                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:45:47 PM by WANG
                  (modified after loading)
```




```
======================================================================
                        Area Percent Report
======================================================================

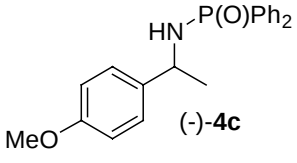
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  15.962 VB    0.6415  116.41483    2.40046   2.0077
   2  26.526 BB    1.3731 5682.07422   63.49569  97.9923

Totals :                  5798.48905   65.89615

 Results obtained with enhanced integrator!
======================================================================
                        *** End of Report ***
```



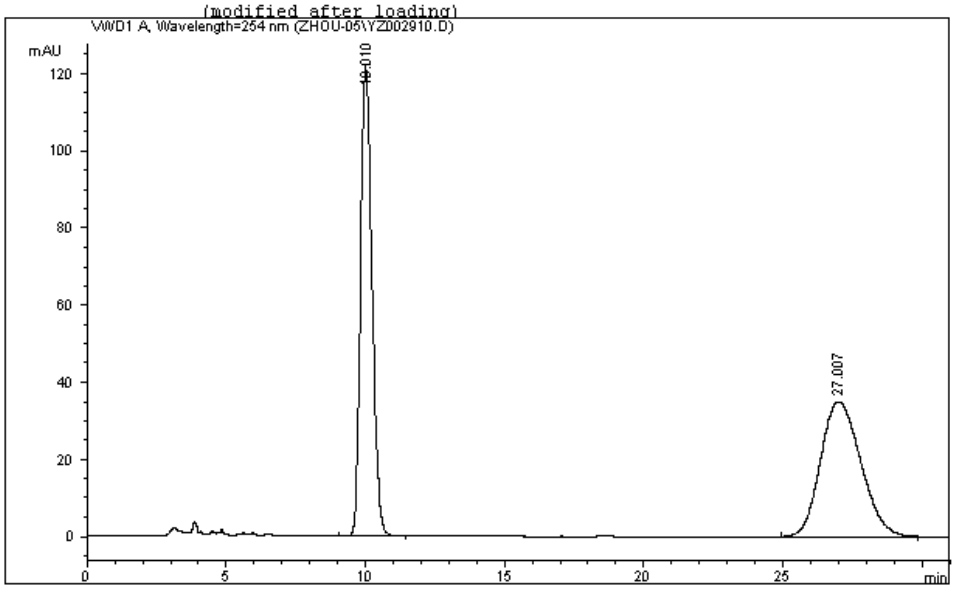
(-)-**4c**

Instrument 1 3/17/2007 2:45:49 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002910.D Sample Name: YW-5-97B(R)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/13/2005 12:10:24 PM
Sample Name     : YW-5-97B(R)                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:48:37 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

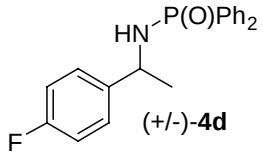
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.010 VB    0.4440 3481.85571  121.87478  49.8379
   2  27.007 BB    1.5190 3504.50293   35.04414  50.1621

Totals :                  6986.35864  156.91892

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



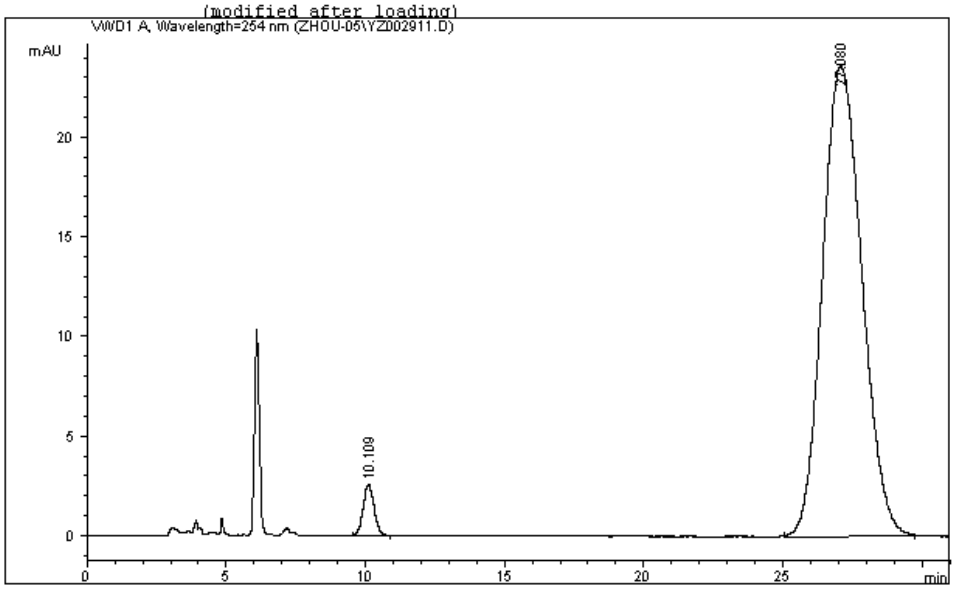
(+/-)-**4d**

Instrument 1 3/17/2007 2:48:40 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002911.D Sample Name: YW-5-24A

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/13/2005 12:47:13 PM
Sample Name     : YW-5-24A                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:50:12 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

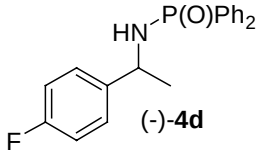
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.109 BB    0.4194   70.66367    2.54989   2.9579
   2  27.080 BB    1.4812 2318.32373   23.59510  97.0421

Totals :                  2388.98740   26.14499

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



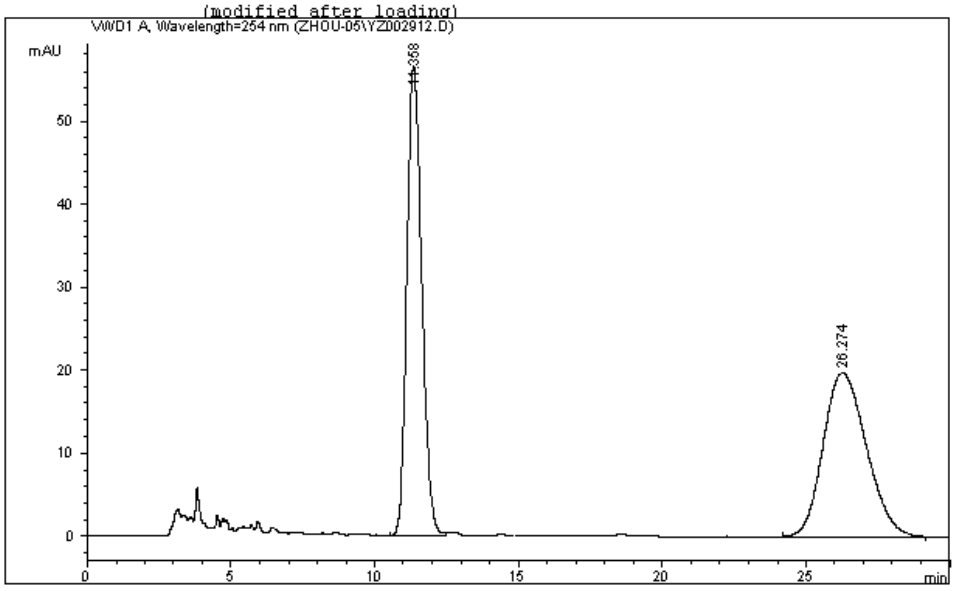
(-)-**4d**

Instrument 1 3/17/2007 2:50:14 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002912.D Sample Name: YW-4-97E

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/13/2005 1:26:38 PM
Sample Name     : YW-4-97E                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:52:32 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

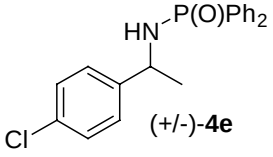
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.358 VV    0.5631 2040.68872   56.63113  49.8679
   2  26.274 BB    1.5376 2051.50244   19.70881  50.1321

Totals :                  4092.19116   76.33994

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+/-)-**4e**

Instrument 1 3/17/2007 2:52:45 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002913.D Sample Name: YW-4-24B

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/13/2005 2:02:42 PM
Sample Name     : YW-4-24B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/13/2005 10:50:33 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:53:50 PM by WANG
                  (modified after loading)
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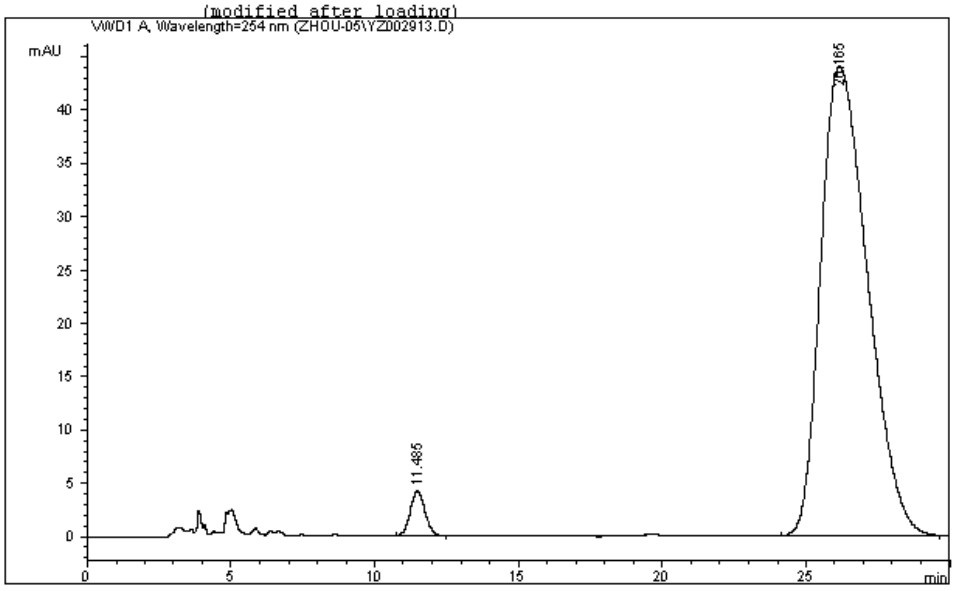
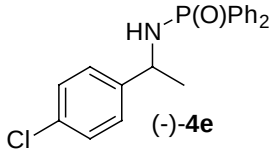



```
==================================================================
                      Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.485 BB    0.5449  147.36015    4.21348   2.8673
   2  26.165 BB    1.6942 4992.05811   44.07416  97.1327

Totals :                  5139.41826   48.28764

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



(-)-**4e**

Instrument 1 3/17/2007 2:53:53 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002933.D Sample Name: YW-5-34B (rac)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/26/2005 4:51:01 PM
Sample Name     : YW-5-34B (rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/26/2005 2:29:12 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:06:25 PM by WANG
                  (modified after loading)
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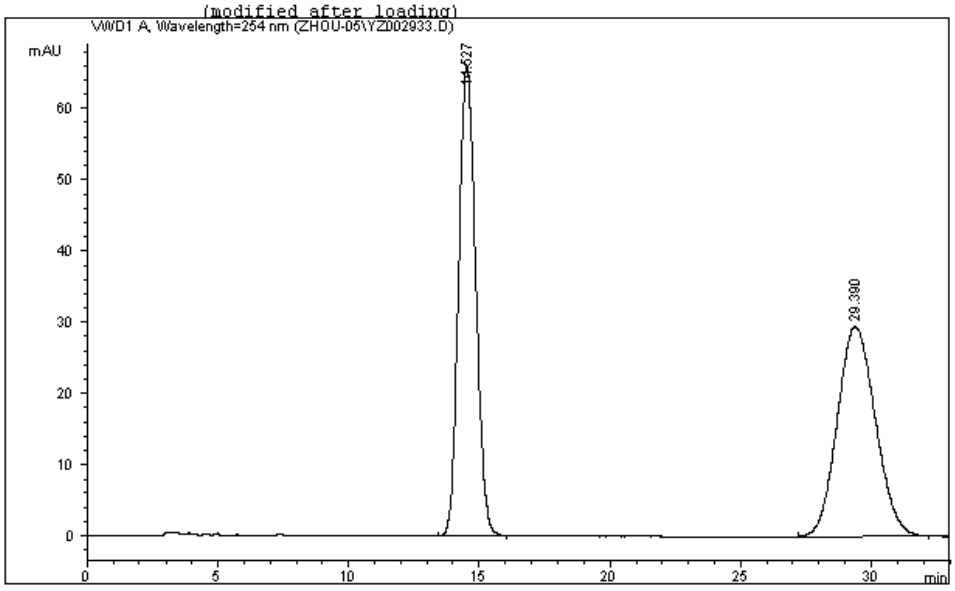



```
==================================================================
                      Area Percent Report
==================================================================

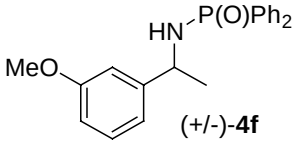
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.527 BB    0.7073 2976.57129   65.92709  49.9330
   2  29.390 BB    1.5132 2984.55542   29.40462  50.0670

Totals :                  5961.12671   95.33170

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



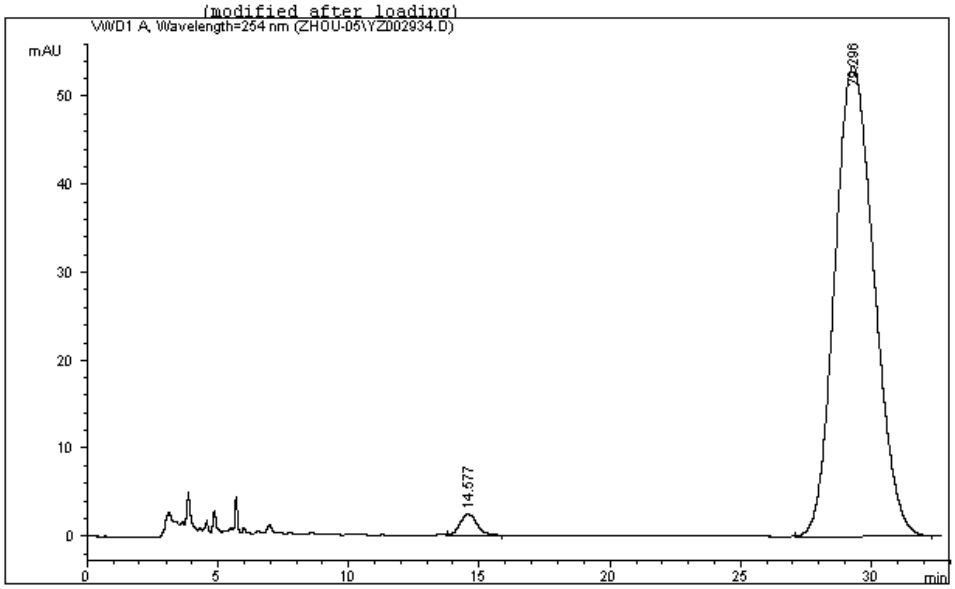
(+/-)-**4f**

Instrument 1 3/17/2007 3:07:02 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002934.D Sample Name: YW-5-33B

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/26/2005 5:26:15 PM
Sample Name     : YW-5-33B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/26/2005 2:29:12 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:08:48 PM by WANG
                  (modified after loading)
```




```
==================================================================
                      Area Percent Report
==================================================================

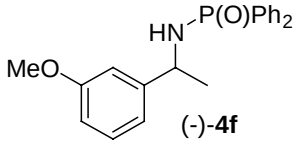
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.577 VB    0.6499  112.85377    2.49540   1.9825
   2  29.296 BB    1.5787 5579.54443   53.46116  98.0175

Totals :                  5692.39820   55.95655

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



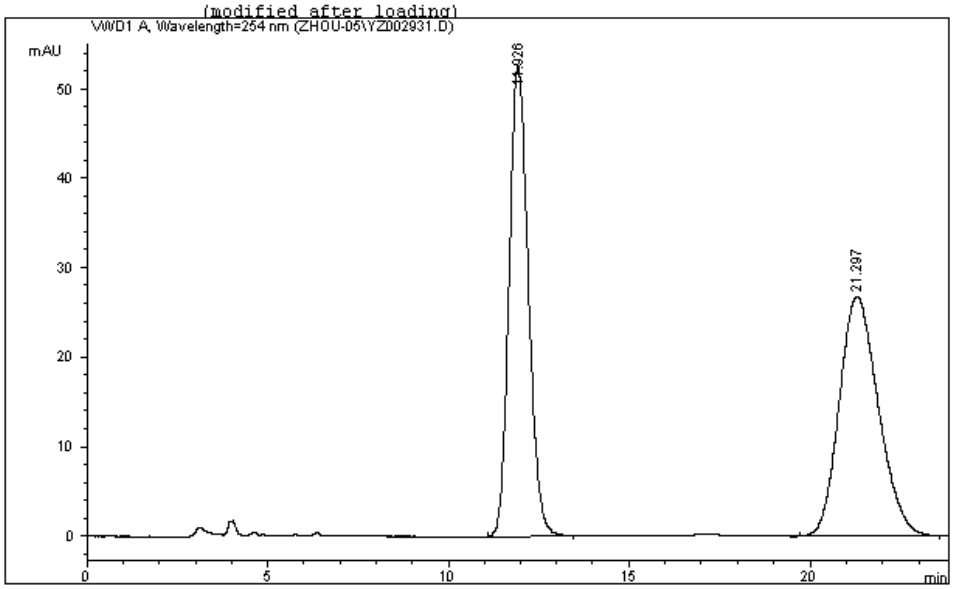
(-)-**4f**

Instrument 1 3/17/2007 3:09:00 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002931.D Sample Name: YW-5-34A (rac)

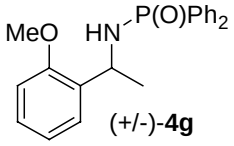
AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/26/2005 4:00:11 PM
Sample Name     : YW-5-34A (rac)                  Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/26/2005 2:29:12 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:11:17 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```



(+/-)-**4g**

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	11.926	BB	0.5792	1954.48108	52.58539	49.2083
2	21.297	BB	1.1426	2017.37024	26.81904	50.7917
Totals :				3971.85132	79.40443	

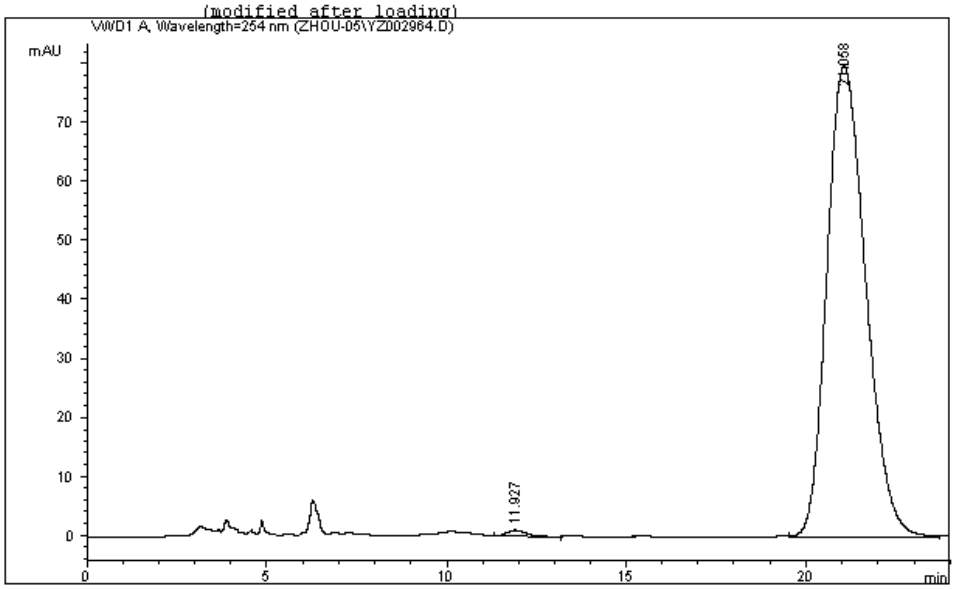
Results obtained with enhanced integrator!

```
==========================================================================
                          *** End of Report ***
```

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002964.D Sample Name: YW-5-35C

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/31/2005 2:04:56 PM
Sample Name     : YW-5-35C                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/31/2005 1:01:29 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:20:06 PM by WANG
                  (modified after loading)
```




```
==================================================================
                      Area Percent Report
==================================================================

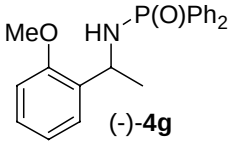
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.927 VB    0.5530   35.34591 9.90919e-1   0.5884
   2  21.058 BB    1.1763 5971.27979   79.75770  99.4116

Totals :                  6006.62569   80.74862

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



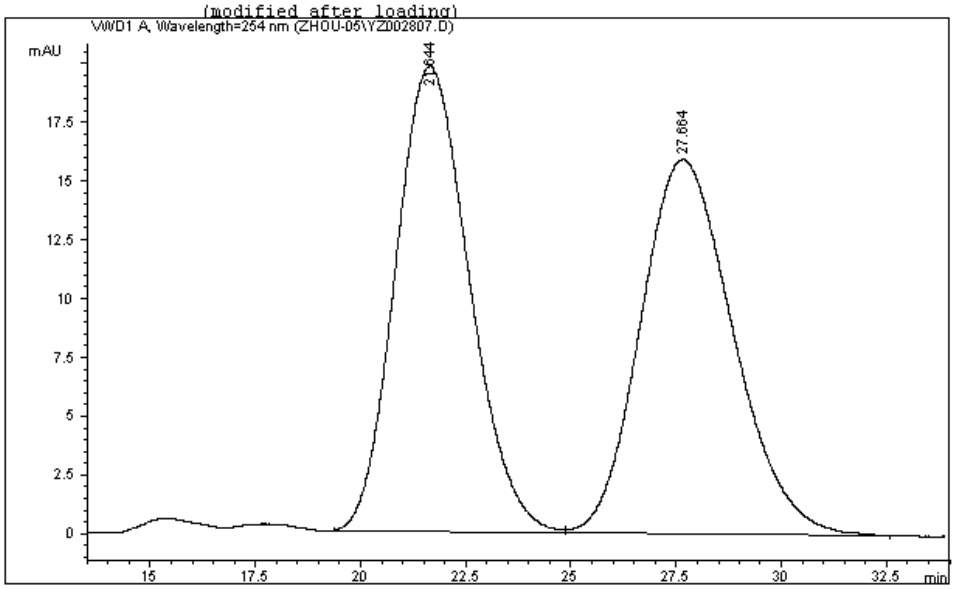
(-)-**4g**

Instrument 1 3/17/2007 3:20:18 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002807.D Sample Name: YW-4-97C(R)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 8/22/2005 12:29:37 PM
Sample Name     : YW-4-97C(R)                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\1218.M
Last changed    : 8/22/2005 12:02:45 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:27:19 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                        Area Percent Report
==========================================================================

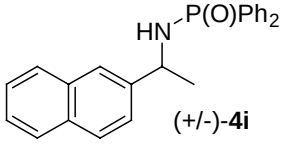
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  21.644 PV    1.8698 2411.74243   19.79539  49.7607
   2  27.664 VB    2.2733 2434.94092   15.92320  50.2393

Totals :                  4846.68335   35.71859

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```

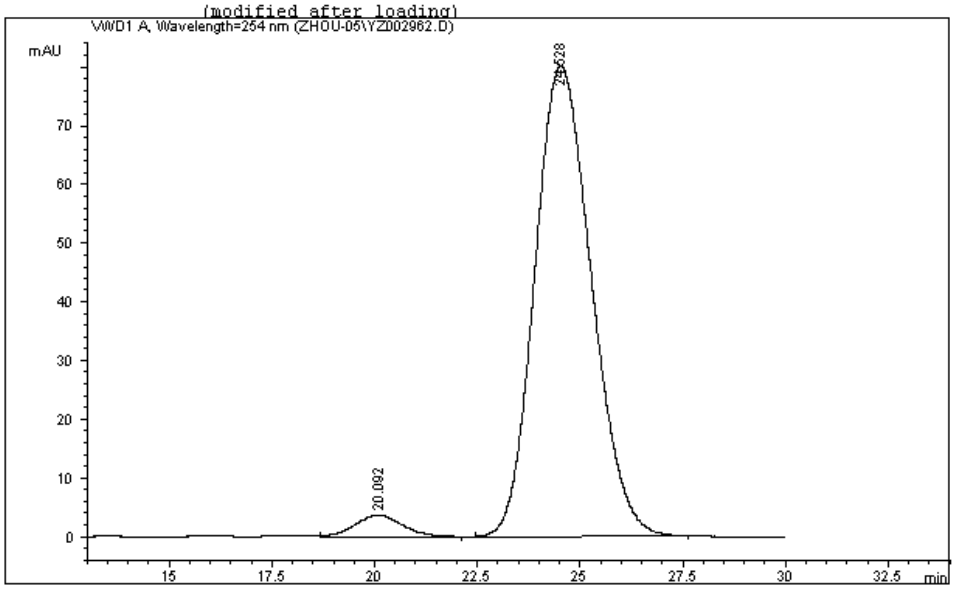


(+/-)-**4i**

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002962.D Sample Name: YW-5-35A

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 10/31/2005 1:11:13 PM
Sample Name     : YW-5-35A                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/31/2005 1:01:29 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:30:38 PM by WANG
                  (modified after loading)
```




```
==================================================================
                      Area Percent Report
==================================================================

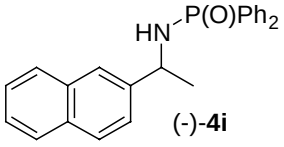
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  20.092 BP    1.1470  283.04578    3.57874   3.5599
   2  24.528 BB    1.5042 7667.83936   80.09455  96.4401

Totals :                  7950.88513   83.67329

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



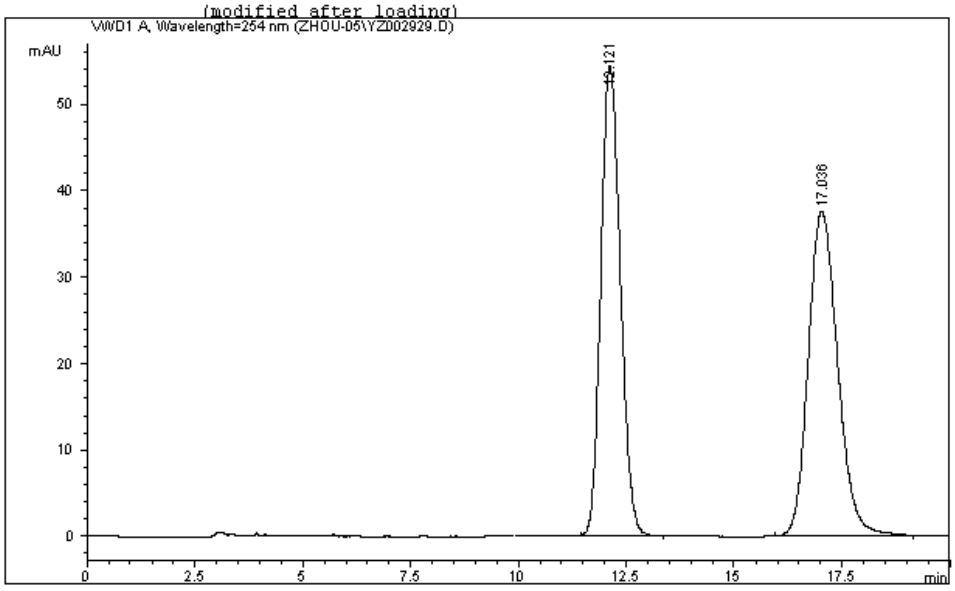
(-)-**4i**

Instrument 1 3/17/2007 3:30:41 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002929.D Sample Name: YW-5-13C (Rac)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/26/2005 3:17:03 PM
Sample Name     : YW-5-13C (Rac)                  Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/26/2005 2:29:12 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:33:36 PM by WANG
                  (modified after loading)
```

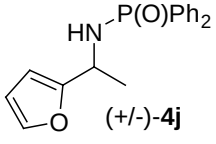



```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm
```

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	12.121	BB	0.4919	1710.08606	54.40273	48.9747
2	17.036	BB	0.7390	1781.69153	37.61357	51.0253
Totals :				3491.77759	92.01630	



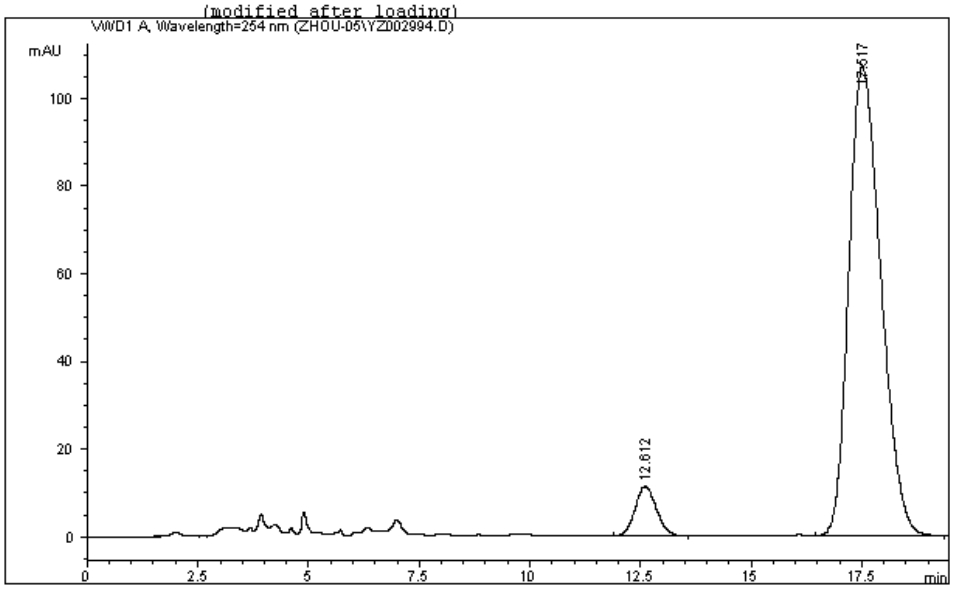
(+/-)-**4j**

```
 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002994.D Sample Name: YW-5-35C'

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 11/4/2005 3:02:12 PM
Sample Name     : YW-5-35C'                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 11/4/2005 2:53:15 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:35:12 PM by WANG
                  (modified after loading)
```




```
==================================================================
                      Area Percent Report
==================================================================

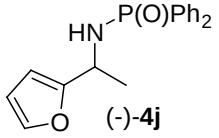
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  12.612 BB    0.5179  375.07715   11.31128   6.4890
   2  17.517 VP    0.7920 5405.14014  107.21246  93.5110

Totals :                  5780.21729  118.52373

 Results obtained with enhanced integrator!
==================================================================
                      *** End of Report ***
```



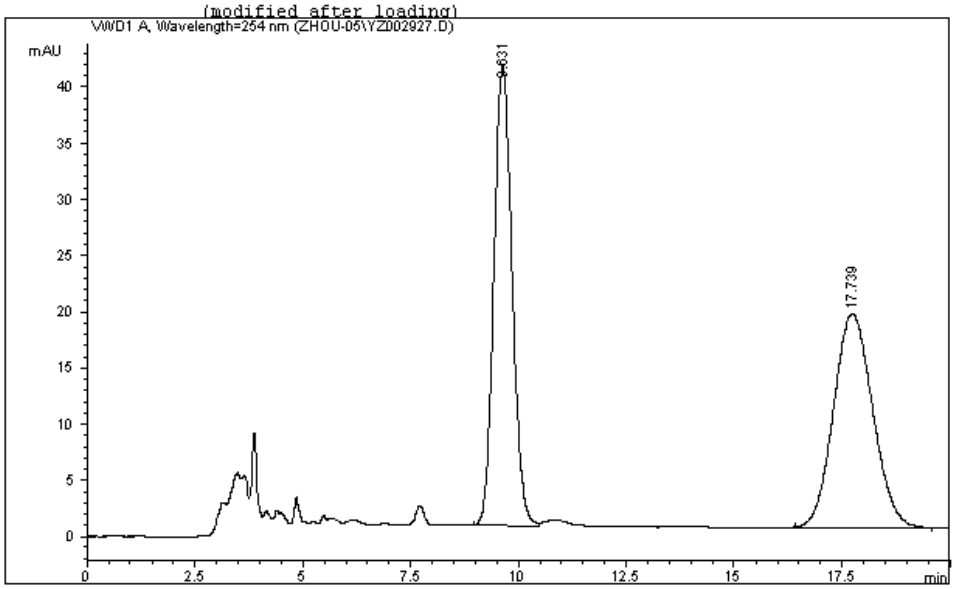
(-)-**4j**

Instrument 1 3/17/2007 3:35:14 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002927.D Sample Name: YW-5-13B (rac)

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/26/2005 2:32:07 PM
Sample Name     : YW-5-13B (rac)                  Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/26/2005 2:29:12 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:37:54 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                        Area Percent Report
==========================================================================

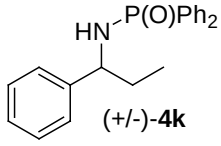
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.631 BV    0.4591 1200.96887   40.88993  49.9180
   2  17.739 BB    0.9872 1204.91602   19.07910  50.0820

Totals :                  2405.88489   59.96903

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```



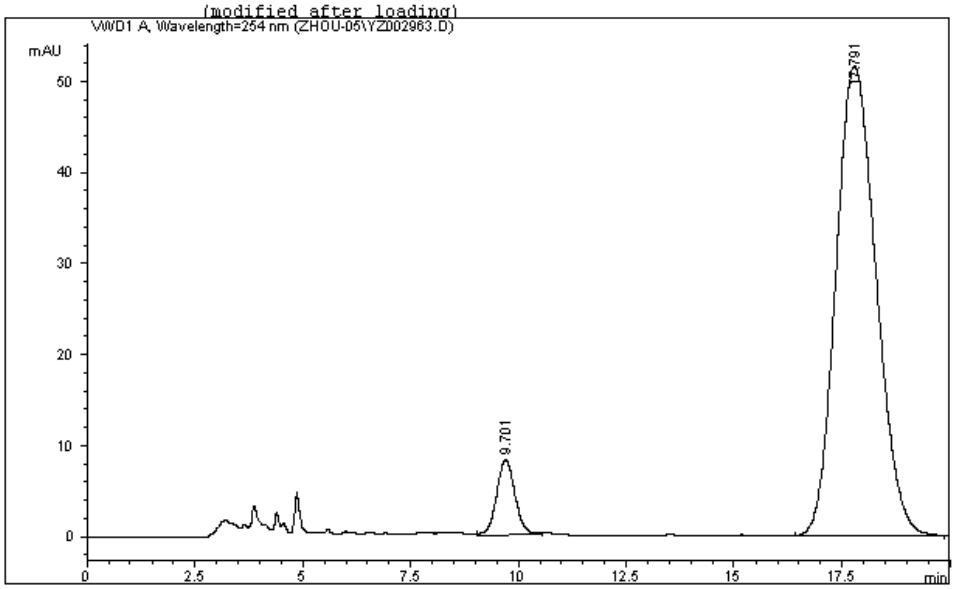
(+/-)-**4k**

Instrument 1 3/17/2007 3:37:58 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-05\YZ002963.D Sample Name: YW-5-35B

AS-H, H/i-PrOH=80/20, 1.0 mL/min

```
==========================================================================
Injection Date  : 10/31/2005 1:42:59 PM
Sample Name     : YW-5-35B                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 10/31/2005 1:01:29 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 3:39:51 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                        Area Percent Report
==========================================================================

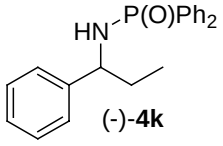
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.701 VB    0.4612  246.53015    8.27263   6.8870
   2  17.791 BP    1.0042 3333.09790   51.58763  93.1130

Totals :                  3579.62805   59.86026

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```



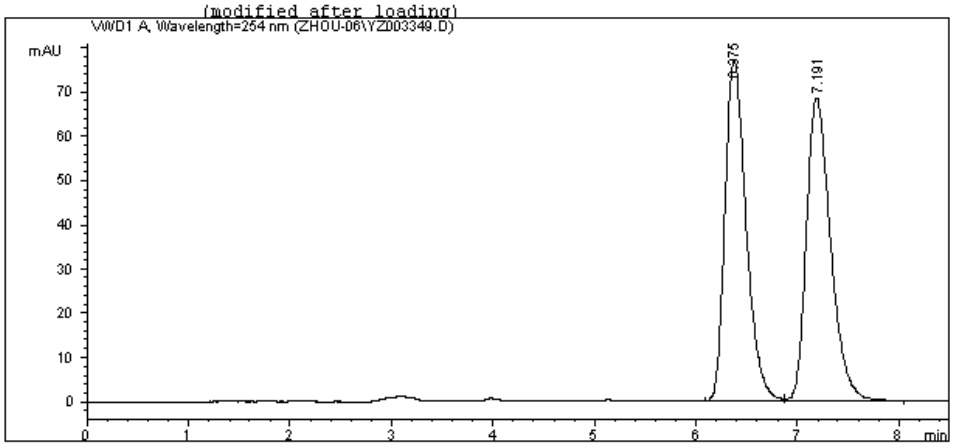
(-)-**4k**

Instrument 1 3/17/2007 3:39:54 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003349.D Sample Name: YW-5-81(R)

OD-H, H/i-PrOH=80/20, 1.0 mL/min, 30 C

```
==================================================================
Injection Date  : 3/1/2006 1:11:30 PM
Sample Name     : YW-5-81(R)                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/1/2006 1:02:42 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:08:49 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

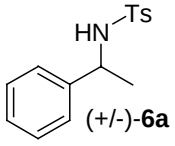
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.375 BV    0.2218 1120.57275   77.18097  49.7116
   2   7.191 VB    0.2572 1133.57434   68.47545  50.2884

Totals :                  2254.14709  145.65642

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



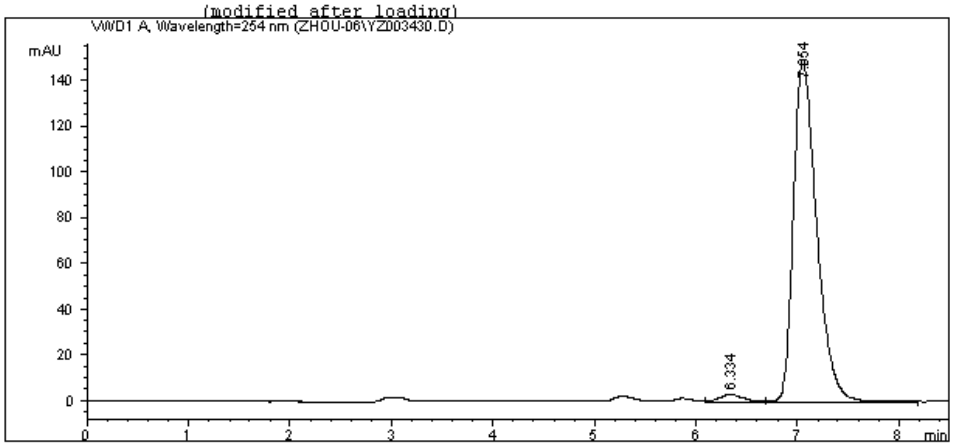
(+/-)-**6a**

Instrument 1 3/16/2007 3:08:52 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003430.D Sample Name: YW-5-88D

OD-H, H/i-PrOH=80/20, 1.0 mL/min, 30 C

```
==================================================================
Injection Date  : 3/13/2006 3:26:10 PM
Sample Name     : YW-5-88D                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/13/2006 2:56:59 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:10:48 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

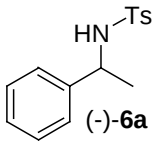
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.334 VV    0.2293   46.35477    3.05814   1.9151
   2   7.054 VB    0.2436 2374.18164  149.43149  98.0849

Totals :                  2420.53642  152.48963

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



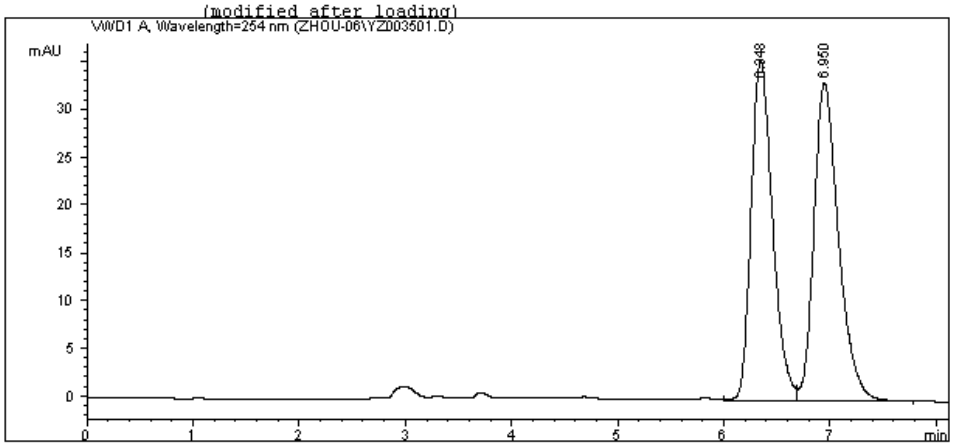
(-)-**6a**

Instrument 1 3/16/2007 3:10:50 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003501.D Sample Name: YW-5-96B

OD-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 3/29/2006 9:33:58 AM
Sample Name     : YW-5-96B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:19:55 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:14:44 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

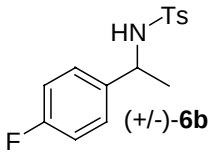
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.348 VV    0.2161  499.80969   35.62480  48.2076
   2   6.950 VB    0.2468  536.97687   33.23259  51.7924

Totals :                  1036.78656   68.85738

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



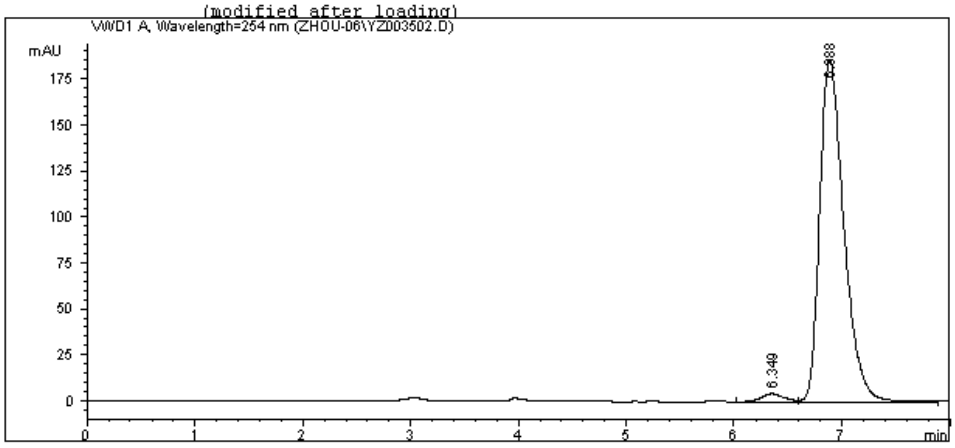
(+/-)-**6b**

Instrument 1 3/16/2007 3:14:45 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003502.D Sample Name: YW-5-100A

OD-H, H/i-PrOH=80/20, 1.0 mL/min

```
==================================================================
Injection Date  : 3/29/2006 9:43:38 AM
Sample Name     : YW-5-100A                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:19:55 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:16:39 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

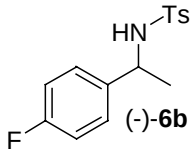
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.349 VV    0.2185   56.43050    4.03472   1.9274
   2   6.888 VB    0.2387 2871.39478  185.58707  98.0726

Totals :                  2927.82528  189.62179

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```

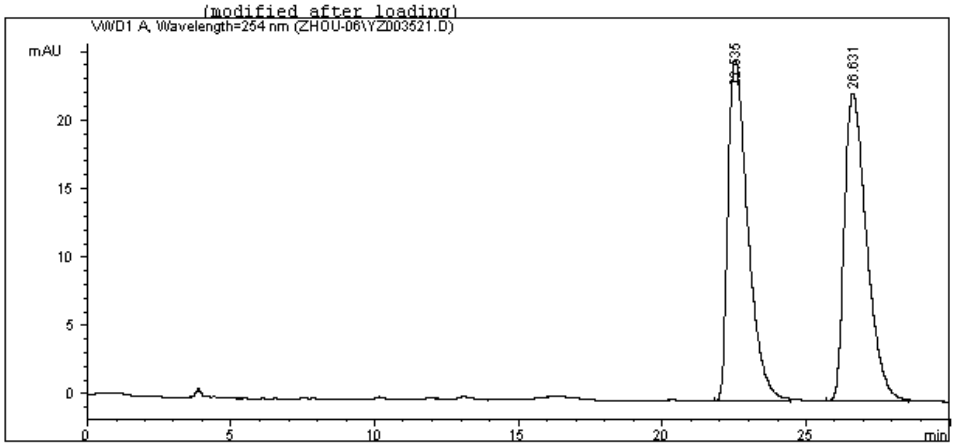


(-)-**6b**

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003521.D Sample Name: YW-5-96C

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 3:59:40 PM
Sample Name     : YW-5-96C                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 3:11:32 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:19:16 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

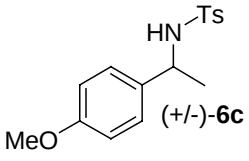
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  22.535 PB    0.7391 1198.26562   24.89736  49.8554
   2  26.631 PB    0.8244 1205.21875   22.44757  50.1446

Totals :                  2403.48438   47.34493

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



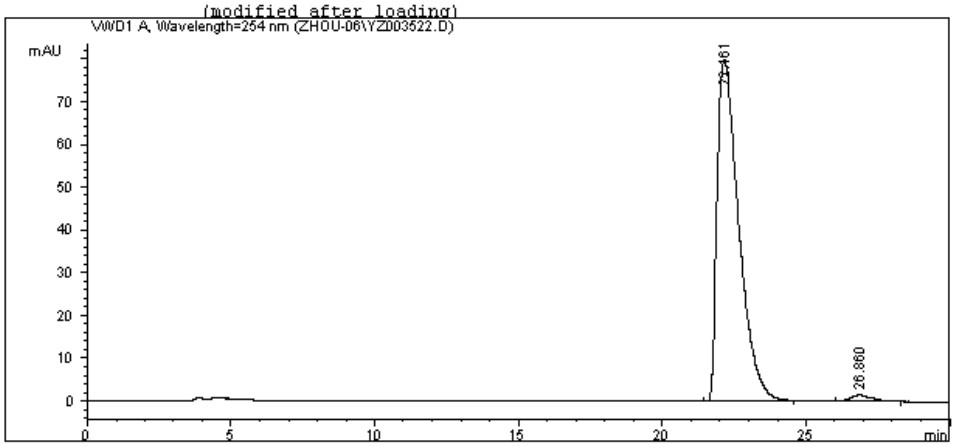
(+/-)-**6c**

Instrument 1 3/16/2007 3:19:18 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003522.D Sample Name: YW-5-100E

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 4:46:35 PM
Sample Name     : YW-5-100E                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 3:11:32 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:20:47 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

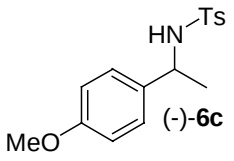
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  22.161 PB    0.7964 4175.28662   79.85734  98.3234
   2  26.860 PB    0.7325   71.19698    1.38782   1.6766

Totals :                  4246.48360   81.24516

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```

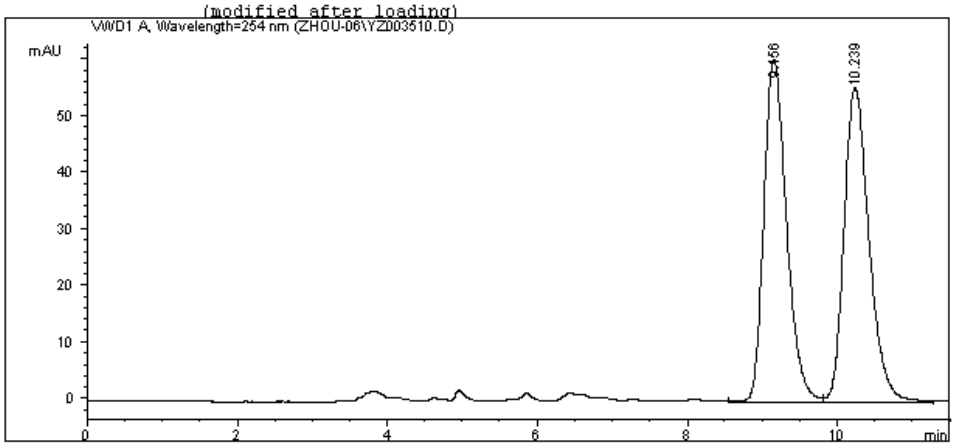


Instrument 1 3/16/2007 3:20:48 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003510.D Sample Name: YW-5-95F

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 11:31:27 AM
Sample Name     : YW-5-95F                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:22:44 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

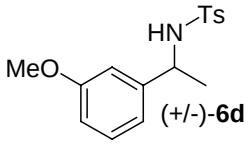
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.156 VV    0.3223 1260.81689   60.35989  49.6566
   2  10.239 VB    0.3506 1278.25659   55.42448  50.3434

Totals :                  2539.07349  115.78438

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



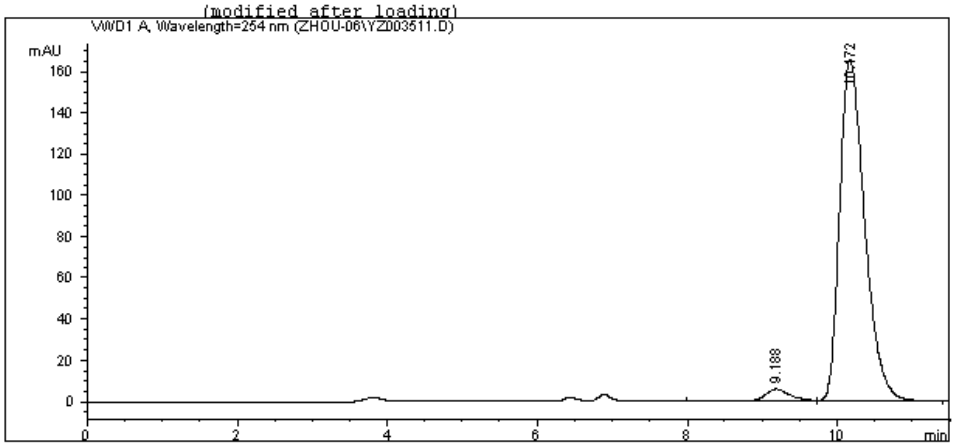
(+/-)-**6d**

Instrument 1 3/16/2007 3:22:48 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003511.D Sample Name: YW-5-101F

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 11:58:50 AM
Sample Name     : YW-5-101F                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:27:42 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

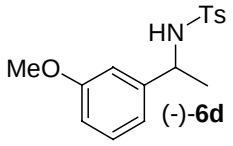
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.188 BV    0.3591  137.12688    5.70313   3.4453
   2  10.172 VB    0.3583 3842.95239  165.49844  96.5547

Totals :                  3980.07927  171.20157

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



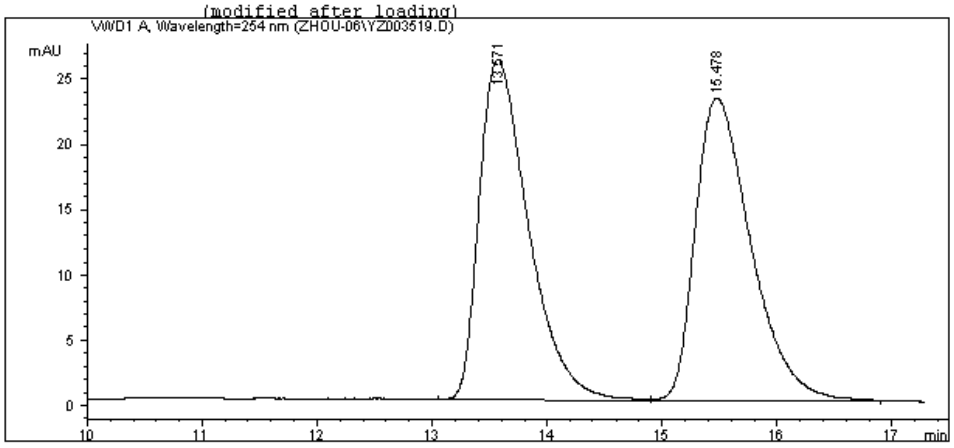
(-)-**6d**

Instrument 1 3/16/2007 3:27:44 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003519.D Sample Name: YW-5-95G

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 3/29/2006 3:20:43 PM
Sample Name     : YW-5-95G                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 3:11:32 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:31:54 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

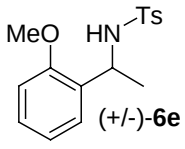
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.571 PB    0.4540  773.40662   26.05674  49.8715
   2  15.478 BB    0.5136  777.39154   23.17719  50.1285

Totals :                  1550.79816   49.23392

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



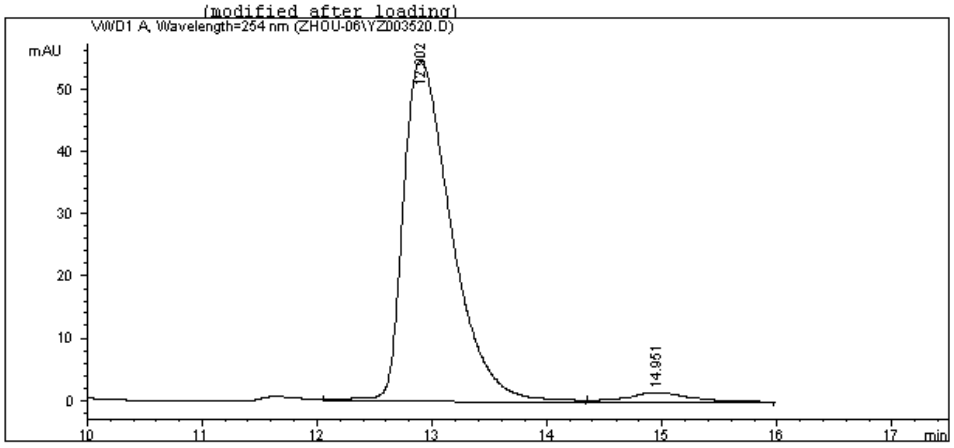
(+/-)-**6e**

Instrument 1 3/16/2007 3:31:56 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003520.D Sample Name: YW-5-100D

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 3:40:00 PM
Sample Name     : YW-5-100D                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 3:11:32 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:33:37 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

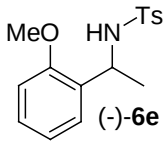
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  12.902 VB    0.4432 1588.65857   54.78148  97.0101
   2  14.951 BPA   0.5337   48.96273    1.36904   2.9899

Totals :                  1637.62130   56.15051

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



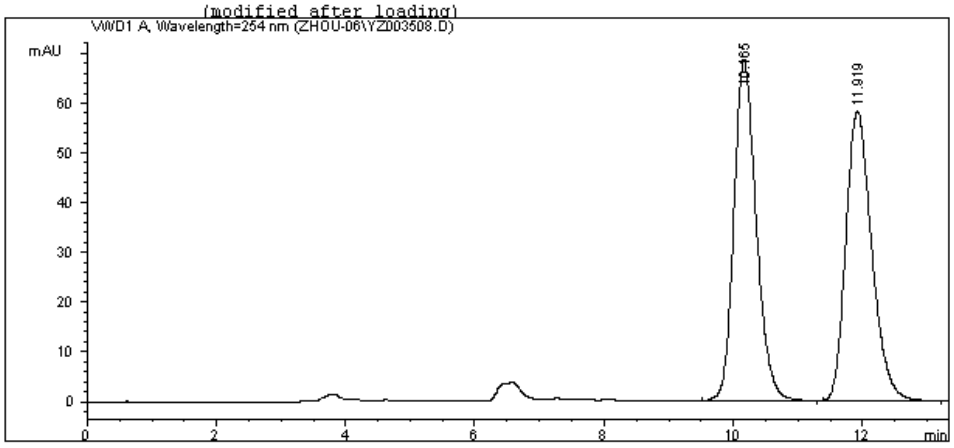
(-)-**6e**

Instrument 1 3/16/2007 3:33:39 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003508.D Sample Name: YW-5-95E

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 3/29/2006 11:02:42 AM
Sample Name     : YW-5-95E                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:35:42 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

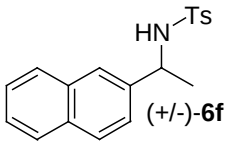
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.165 BB    0.3723 1659.18335   68.62624  50.4859
   2  11.919 BB    0.4368 1627.24438   58.21444  49.5141

Totals :                  3286.42773  126.84068

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```

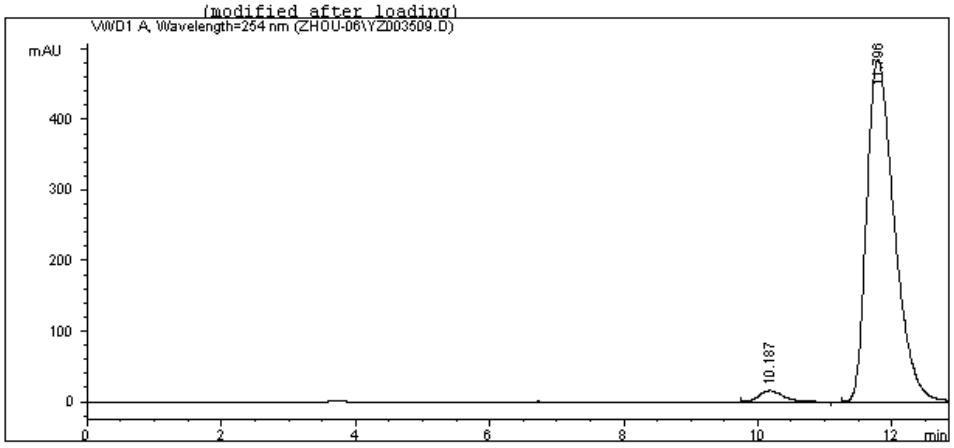


(+/-)-**6f**

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003509.D Sample Name: YW-5-101G

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 11:17:18 AM
Sample Name     : YW-5-101G                    Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:37:06 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

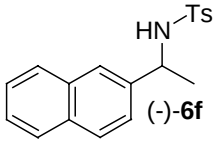
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.187 BB    0.3664  360.56650   15.23486   2.5492
   2  11.796 BBA   0.4427 1.37837e4   484.34830  97.4508

Totals :                  1.41443e4   499.58316

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



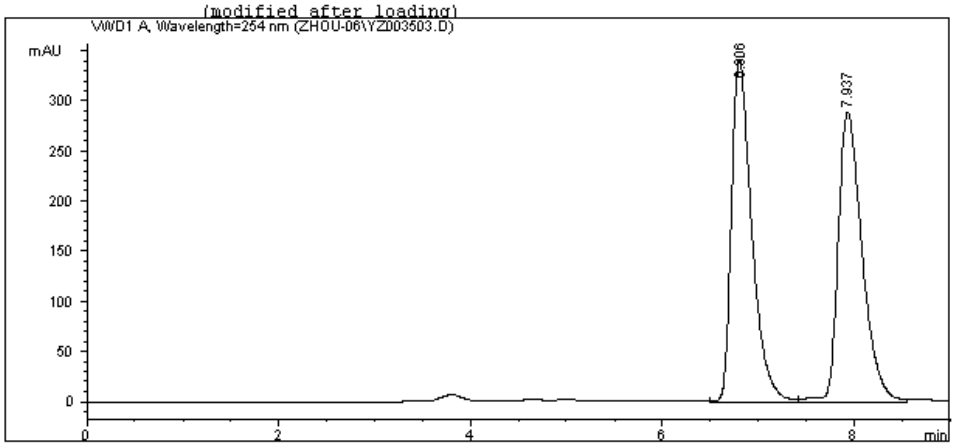
(-)-**6f**

Instrument 1 3/16/2007 3:37:08 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003503.D Sample Name: YW-5-96D (RAC)

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 3/29/2006 9:57:05 AM
Sample Name     : YW-5-96D (RAC)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:41:48 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

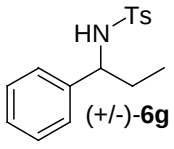
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.806 VV    0.2279 5037.74316  340.58072  50.2262
   2   7.937 VV    0.2660 4992.36279  288.46042  49.7738

Totals :                  1.00301e4   629.04114

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



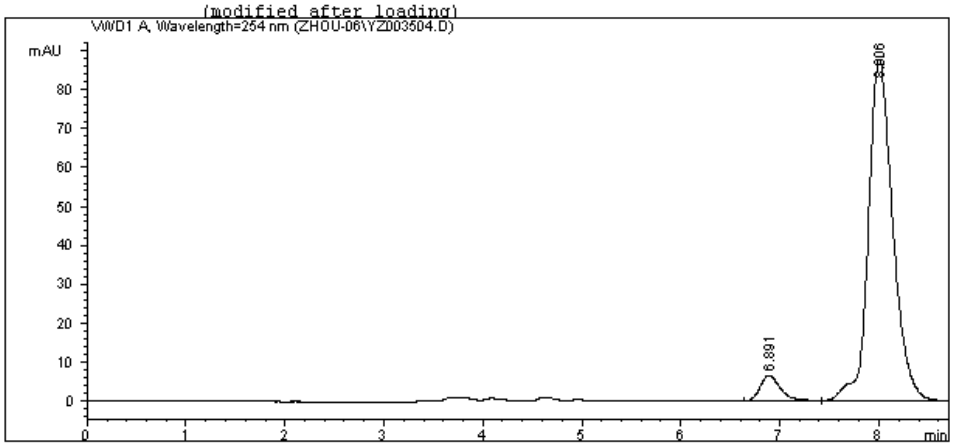
(+/-)-**6g**

Instrument 1 3/16/2007 3:41:50 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003504.D Sample Name: YW-5-100B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 3/29/2006 10:09:34 AM
Sample Name     : YW-5-100B                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 9:54:53 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:43:06 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

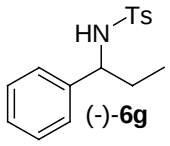
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   6.891 BV    0.2198   93.10982    6.49129   5.8365
   2   8.006 VBA   0.2611 1502.19995   87.62940  94.1635

Totals :                  1595.30977   94.12069

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



(-)-**6g**

Instrument 1 3/16/2007 3:43:09 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003514.D Sample Name: YW-5-96A

AS-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 3/29/2006 1:32:13 PM
Sample Name     : YW-5-96A                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 1:16:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:18:08 PM by WANG
                  (modified after loading)
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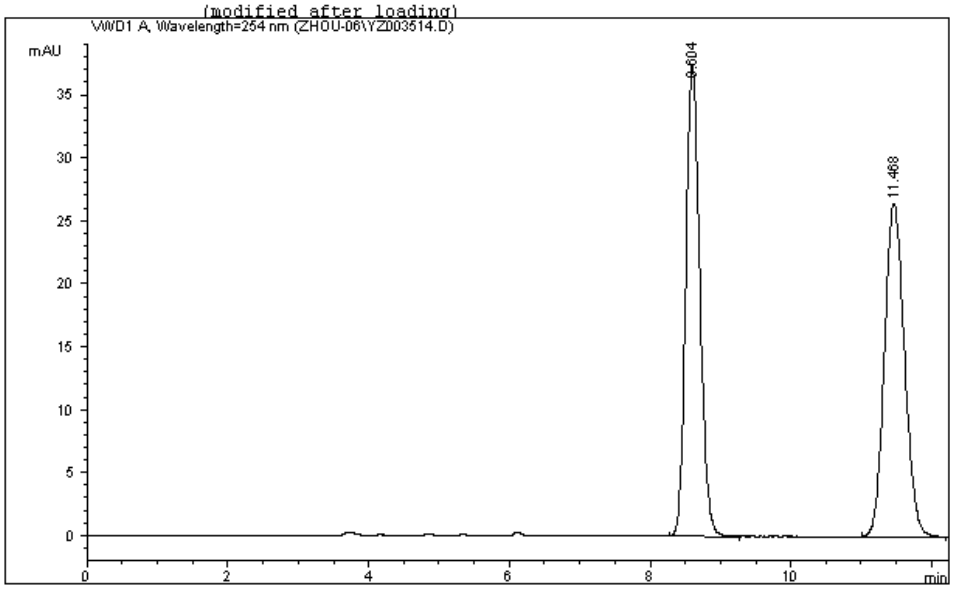
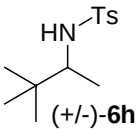



```
==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   8.604 BP    0.2177  519.31989   37.32191  49.9344
   2  11.468 BB    0.3083  520.68365   26.45123  50.0656

Totals :                  1040.00354   63.77314

 Results obtained with enhanced integrator!
==========================================================================
                        *** End of Report ***
```



(+/-)-**6h**

Instrument 1 3/17/2007 2:18:11 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003515.D Sample Name: YW-5-100C

AS-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 3/29/2006 1:45:46 PM
Sample Name     : YW-5-100C                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/29/2006 1:16:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/17/2007 2:23:05 PM by WANG
                  (modified after loading)
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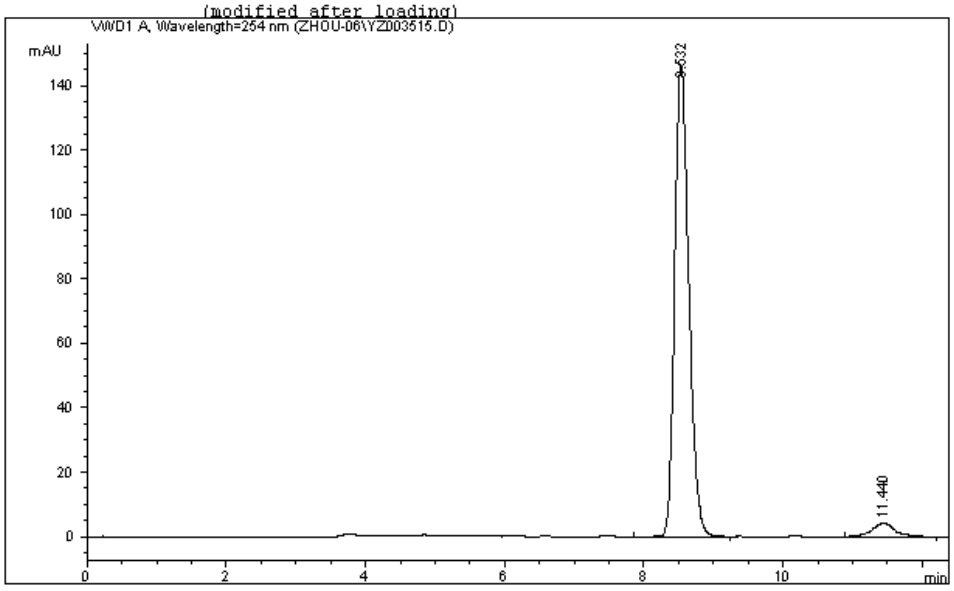



```
==========================================================================
                          Area Percent Report
==========================================================================

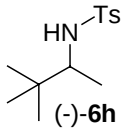
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   8.532 BV    0.2218 2082.24219  145.95624  95.7373
   2  11.440 BP    0.3284   92.71068    4.18370   4.2627

Totals :                  2174.95287  150.13994

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



(-)-**6h**

Instrument 1 3/17/2007 2:23:08 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003562.D Sample Name: YW-6-6B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/5/2006 1:35:54 PM
Sample Name     : YW-6-6B                       Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/5/2006 1:24:06 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 1:45:31 PM by WANG
                  (modified after loading)
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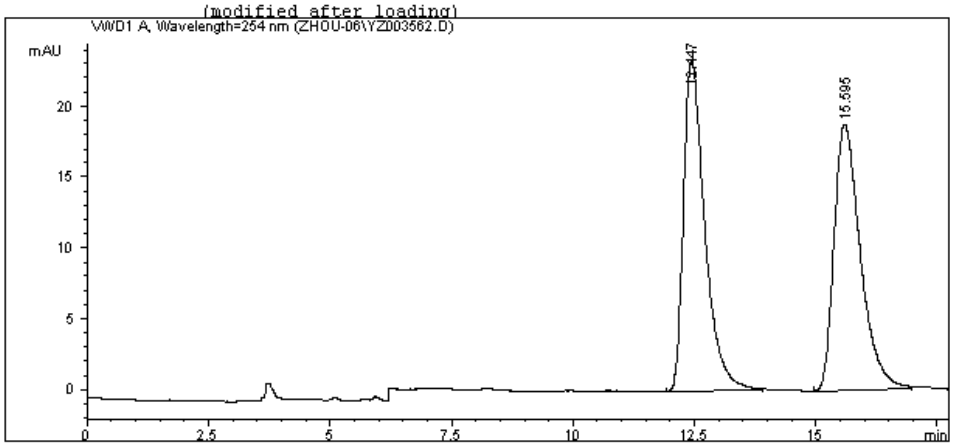
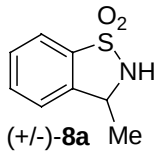



```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  12.447 BB    0.4619  715.44495   23.37840  50.3614
   2  15.595 PB    0.5725  705.17621   18.75995  49.6386

Totals :                  1420.62115   42.13836

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+/-)-**8a**

Instrument 1 3/16/2007 1:45:33 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003572.D Sample Name: YW-6-10B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/7/2006 11:11:14 AM
Sample Name     : YW-6-10B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/7/2006 10:31:58 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 1:50:32 PM by WANG
                  (modified after loading)
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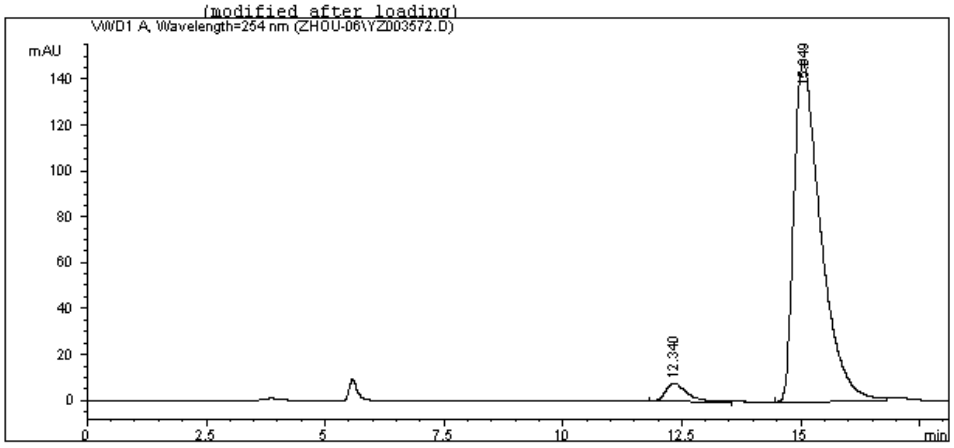



```
==================================================================
                        Area Percent Report
==================================================================

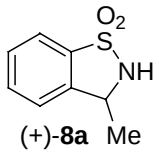
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  12.340 BB    0.4642  239.94913    7.79078   3.9517
   2  15.049 PB    0.5910 5832.17041  148.86668  96.0483

Totals :                  6072.11954  156.65746

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



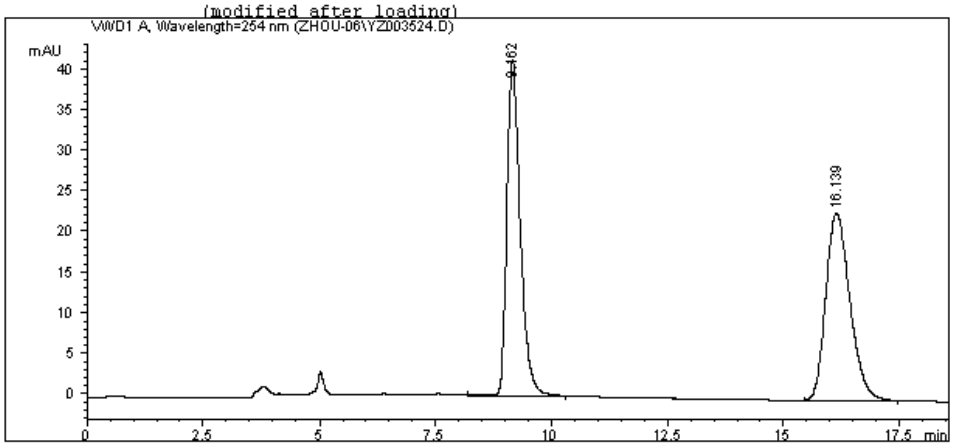
(+)-**8a** Me

Instrument 1 3/16/2007 1:50:51 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003524.D Sample Name: YW-6-6A

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/1/2006 2:16:42 PM
Sample Name     : YW-6-6A                       Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/1/2006 2:12:47 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 1:53:59 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

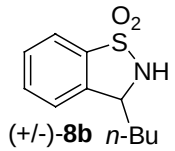
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.162 BB    0.3149  849.97687   41.45655  50.5110
   2  16.139 BB    0.5608  832.77966   23.07854  49.4890

Totals :                  1682.75653   64.53509

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+/-)-**8b** *n*-Bu

Instrument 1 3/16/2007 1:54:07 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003592.D Sample Name: YW-6-12A

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/9/2006 2:15:35 PM
Sample Name     : YW-6-12A                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/9/2006 12:39:43 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:13:30 PM by WANG
                  (modified after loading)
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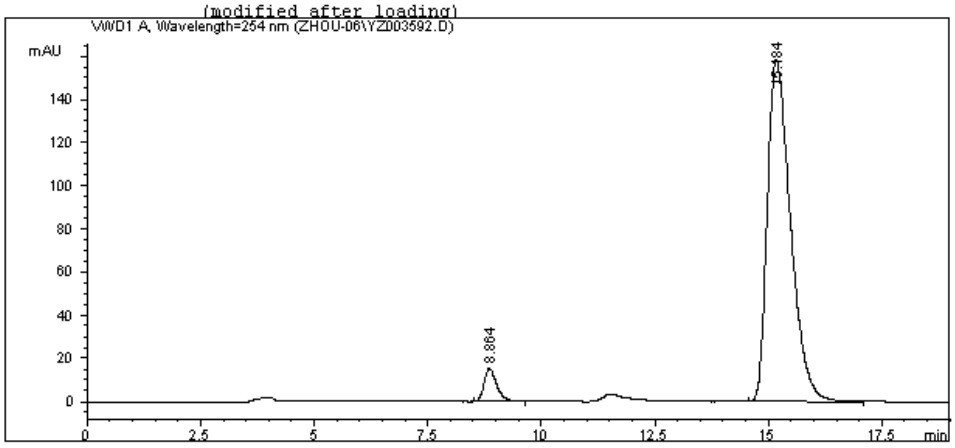
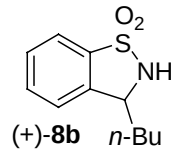



```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   8.864 BB    0.2900  285.43027   15.12822   4.8708
   2  15.184 BB    0.5391 5574.61816  158.25935  95.1292

Totals :                  5860.04843  173.38757

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+)-**8b** *n*-Bu

Instrument 1 3/16/2007 2:13:33 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003564.D Sample Name: YW-6-6C

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/5/2006 2:21:43 PM
Sample Name     : YW-6-6C                       Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/5/2006 1:24:06 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 1:56:34 PM by WANG
                  (modified after loading)
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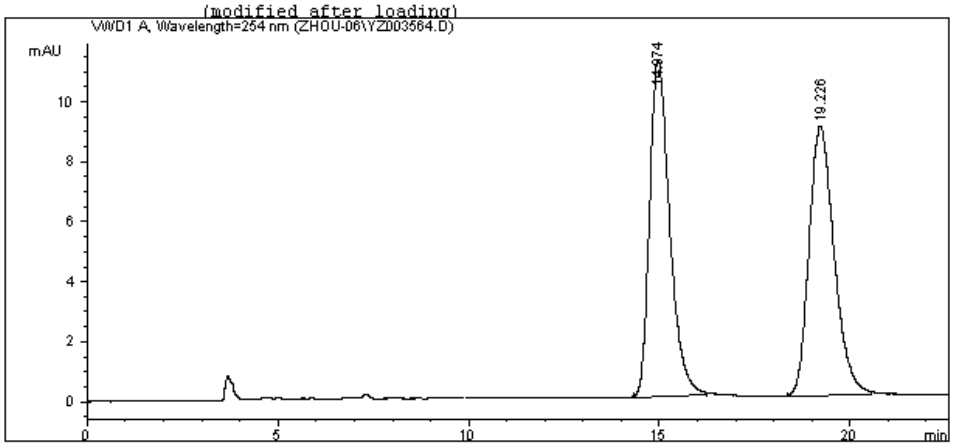



```
==================================================================
                        Area Percent Report
==================================================================

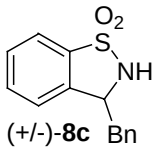
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.974 BB    0.5594  408.93265   11.21417  50.0401
   2  19.226 PB    0.7017  408.27661    8.94015  49.9599

Totals :                  817.20926   20.15431

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



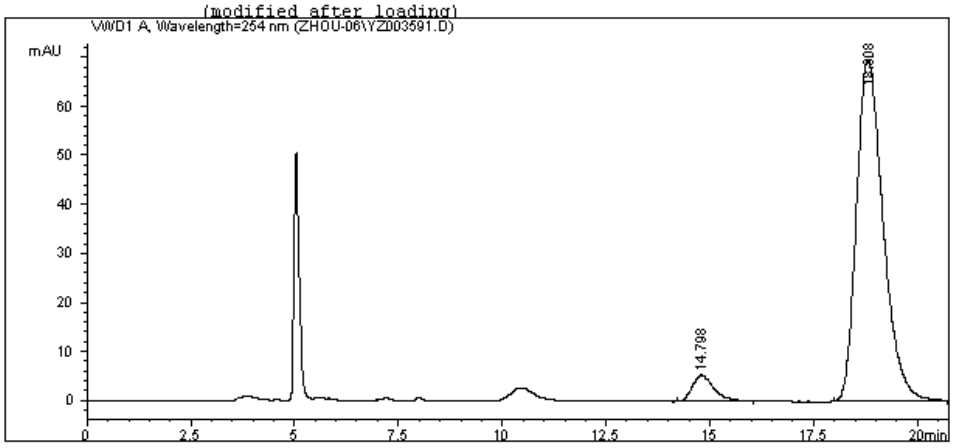
(+/-)-**8c**

Instrument 1 3/16/2007 1:56:37 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003591.D Sample Name: YW-6-12B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/9/2006 1:23:58 PM
Sample Name     : YW-6-12B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/9/2006 12:39:43 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:03:35 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

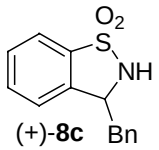
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.798 BB    0.5523  190.89229    5.25060   5.7927
   2  18.808 BB    0.6893 3104.48486   69.59767  94.2073

Totals :                  3295.37715   74.84827

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



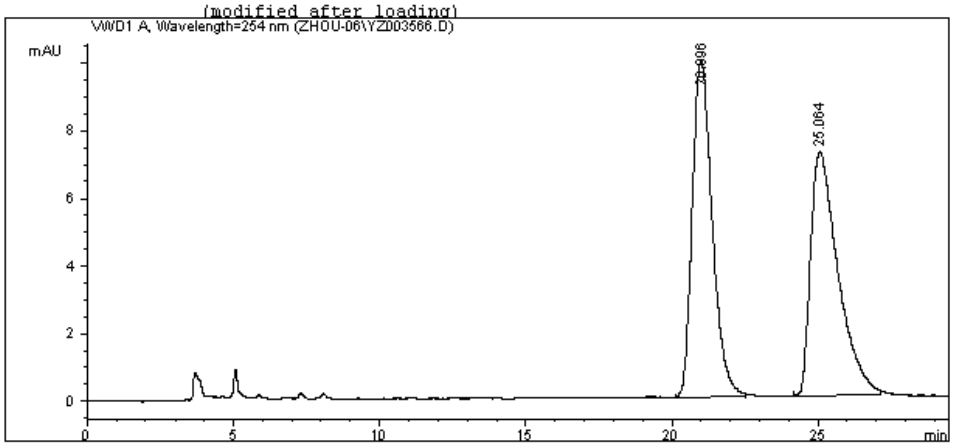
(+)-**8c**

Instrument 1 3/16/2007 2:03:38 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003566.D Sample Name: YW-6-8B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/5/2006 3:16:21 PM
Sample Name     : YW-6-8B                       Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/5/2006 1:24:06 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:07:36 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

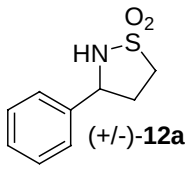
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  20.996 PB    0.7243  469.91309    9.97624  50.0892
   2  25.064 BB    0.9616  468.23874    7.20923  49.9108

Totals :                  938.15182   17.18546

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+/-)-**12a**

Instrument 1 3/16/2007 2:07:43 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003575.D Sample Name: YW-6-9B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/7/2006 1:15:03 PM
Sample Name     : YW-6-9B                       Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/7/2006 10:31:58 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:09:33 PM by WANG
                  (modified after loading)
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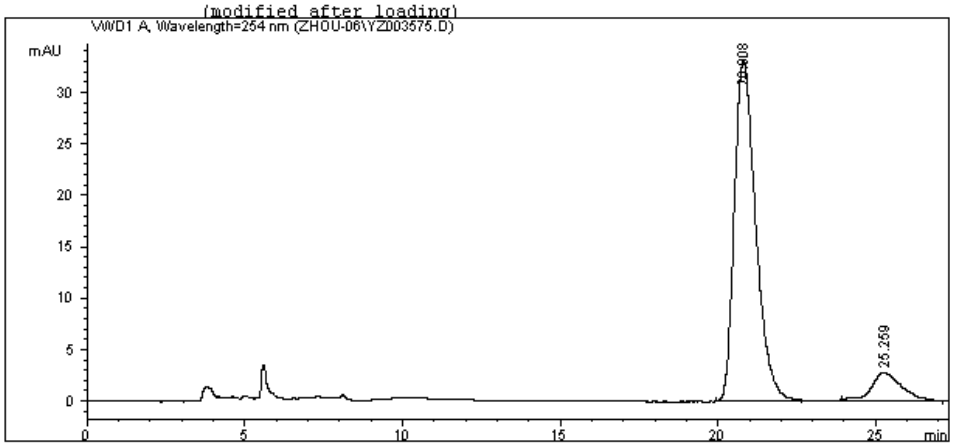
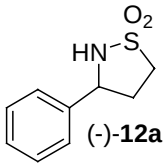



```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  20.808 PB    0.7281 1566.21411   33.19257  89.5141
   2  25.259 BB    0.9725  183.46997    2.74329  10.4859

Totals :                  1749.68408   35.93586

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



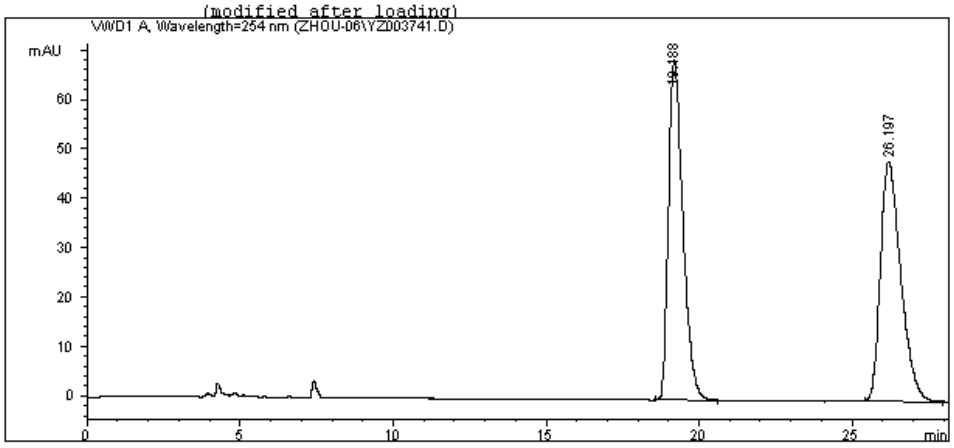
(-)-**12a**

Instrument 1 3/16/2007 2:09:37 PM WANG Page 1 of 1

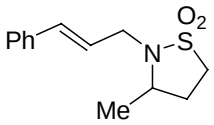
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003741.D Sample Name: YW-6-43 (Rac)

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 11:46:12 AM
Sample Name     : YW-6-43 (Rac)                  Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 11:32:48 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:15:53 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  19.188 BB    0.4998 2263.55518   68.89561  50.4368
   2  26.197 BB    0.6994 2224.35083   48.38231  49.5632

Totals :                  4487.90601  117.27793

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



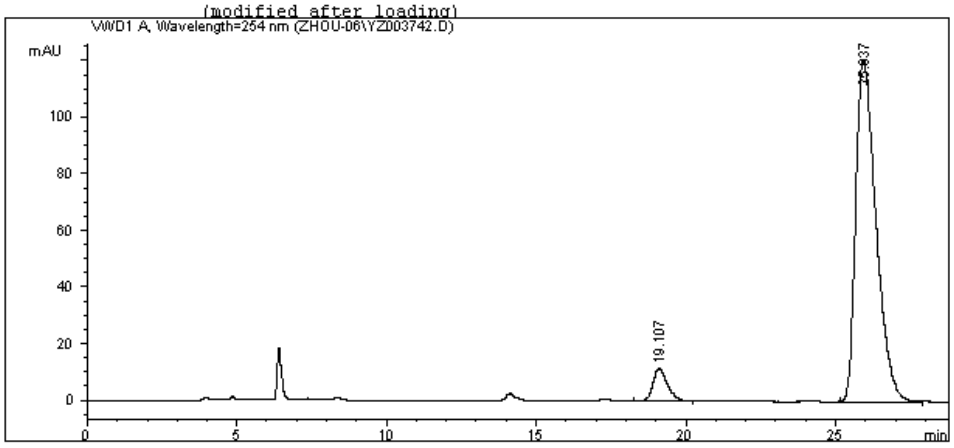
N-cinnamyl derivative of (+/-)-**12b**

Instrument 1 3/16/2007 2:16:01 PM WANG Page 1 of 1

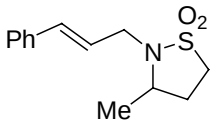
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003742.D Sample Name: YW-6-43B

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 12:16:31 PM
Sample Name     : YW-6-43B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 11:32:48 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:17:32 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  19.107 BB    0.5112  378.25891   11.34838   6.2252
   2  25.937 BB    0.7254 5697.99609  120.71808  93.7748

Totals :                  6076.25500  132.06646

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



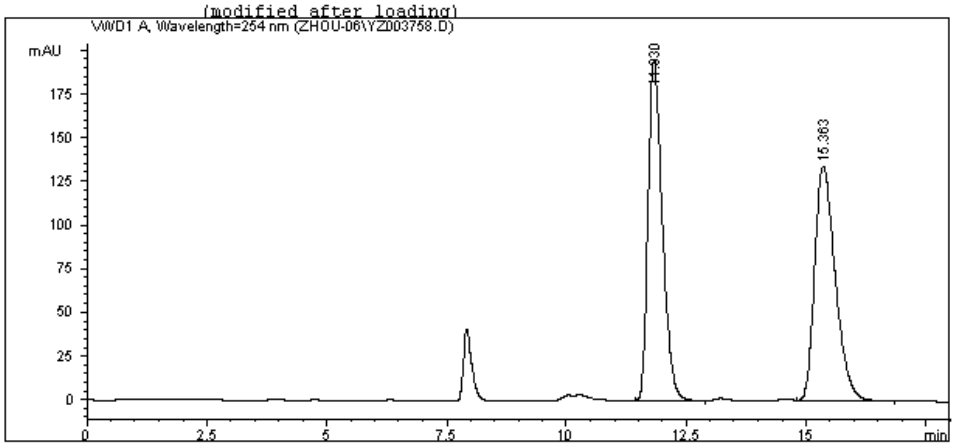
N-cinnamyl derivative of (+)-**12b**

Instrument 1 3/16/2007 2:17:37 PM WANG Page 1 of 1

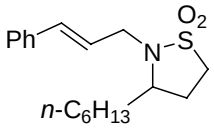
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003758.D Sample Name: YW-6-51A

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 7/13/2006 1:28:08 PM
Sample Name     : YW-6-51A                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/13/2006 1:12:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:21:07 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.830 BV    0.3171 4038.39185  195.16432  50.0857
   2  15.363 VB    0.4601 4024.56958  134.37082  49.9143

Totals :                  8062.96143  329.53514

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



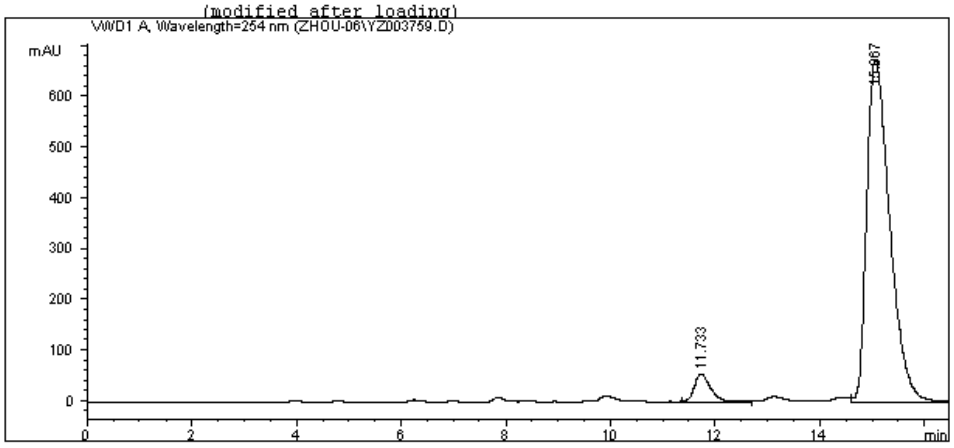
N-cinnamyl derivative of (+/-)-**12c**

Instrument 1 3/16/2007 2:21:10 PM WANG Page 1 of 1

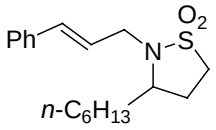
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003759.D Sample Name: YW-6-51B

OJ-H, H/i-PrOH=80/20, 0.8 mL/min

```
==========================================================================
Injection Date  : 7/13/2006 2:06:47 PM
Sample Name     : YW-6-51B                        Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/13/2006 1:12:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:22:53 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.733 BV    0.3187 1112.91919   53.42842   5.1675
   2  15.067 VBA   0.4707 2.04239e4   672.66504  94.8325

Totals :                  2.15368e4   726.09346

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



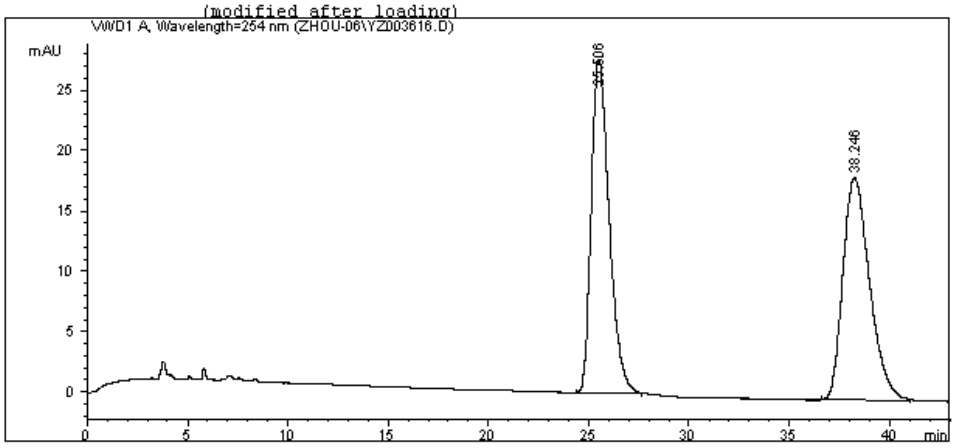
N-cinnamyl derivative of (+)-**12c**

Instrument 1 3/16/2007 2:22:58 PM WANG Page 1 of 1

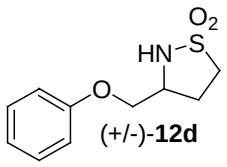
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003616.D Sample Name: YW-6-18C

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/17/2006 11:01:50 AM
Sample Name     : YW-6-18C                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/17/2006 10:54:16 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:27:55 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  25.506 BB    0.9621 1711.61926   27.60909  50.0715
   2  38.246 BB    1.4073 1706.72778   18.41705  49.9285

Totals :                  3418.34705   46.02613

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



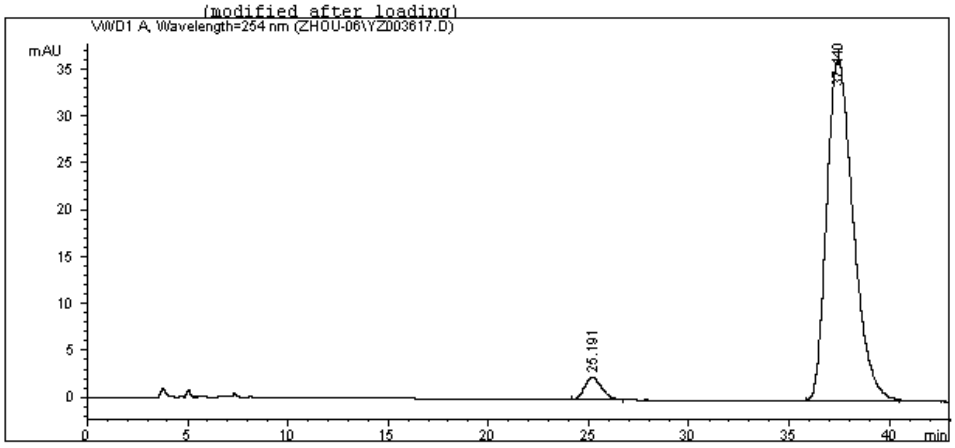
(+/-)-**12d**

Instrument 1 3/16/2007 2:28:08 PM WANG Page 1 of 1

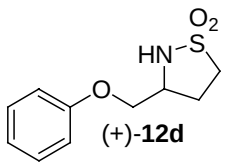
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003617.D Sample Name: YW-6-18B

OD-H, H/i-PrOH=80/20, 0.8 mL/min

```
==================================================================
Injection Date  : 4/17/2006 12:01:55 PM
Sample Name     : YW-6-18B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 4/17/2006 10:54:16 AM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:30:37 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  25.191 BB    0.8568  141.01810    2.38142   4.0627
   2  37.440 BB    1.4149 3330.03369   36.36259  95.9373

Totals :                  3471.05179   38.74401

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```

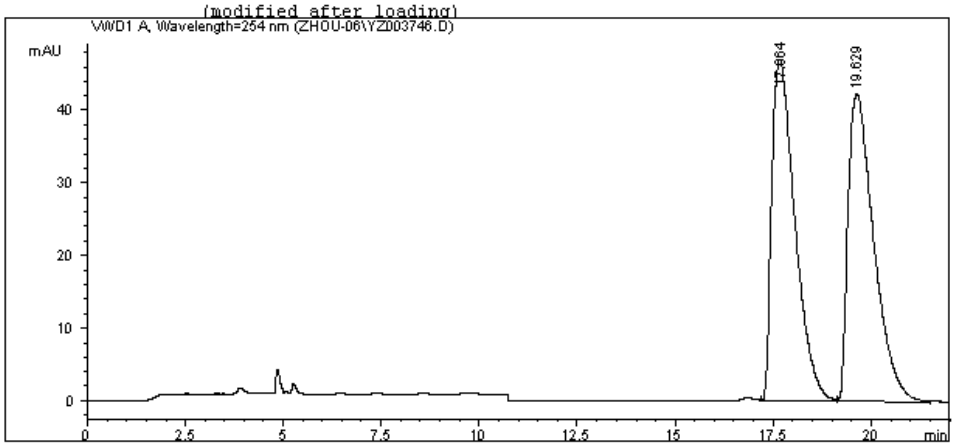


(+)-**12d**

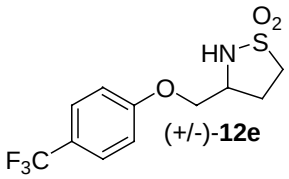
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003746.D Sample Name: YW-6-50B (Rac)

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 2:26:23 PM
Sample Name     : YW-6-50B (Rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 2:22:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:36:59 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  17.664 VV    0.6370 1934.69971   47.04451  49.9238
   2  19.629 VB    0.7033 1940.60510   42.36807  50.0762

Totals :                  3875.30481   89.41258

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



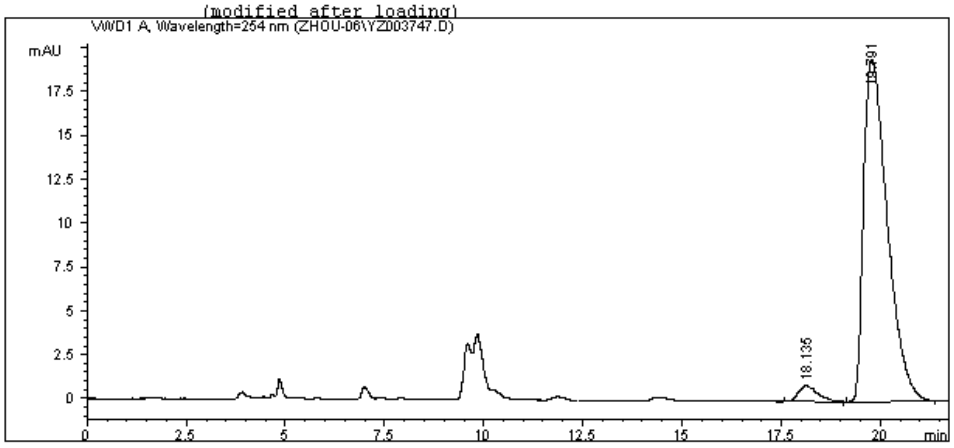
(+/-)-**12e**

Instrument 1 3/16/2007 2:37:02 PM WANG Page 1 of 1

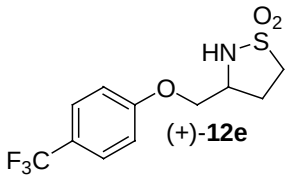
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003747.D Sample Name: YW-6-47B

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 2:50:43 PM
Sample Name     : YW-6-47B                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 2:22:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:40:03 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  18.135 PB    0.4899   29.38421 8.76986e-1   3.4992
   2  19.791 PB    0.6427  810.35278   19.47526  96.5008

Totals :                   839.73699   20.35225

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



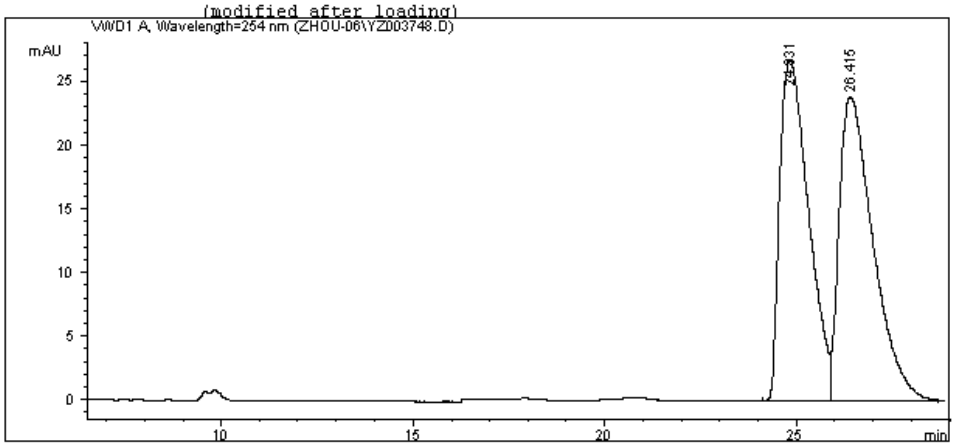
(+)-**12e**

Instrument 1 3/16/2007 2:40:05 PM WANG Page 1 of 1

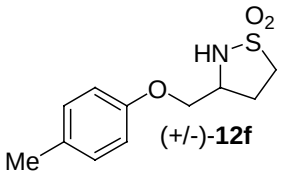
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003748.D Sample Name: YW-6-50C (Rac)

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 3:13:43 PM
Sample Name     : YW-6-50C (Rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 2:22:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:43:32 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  24.831 PV    0.8153 1396.73535   26.77727  48.7882
   2  26.415 VB    0.9205 1466.12158   23.86879  51.2118

Totals :                  2862.85693   50.64606

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



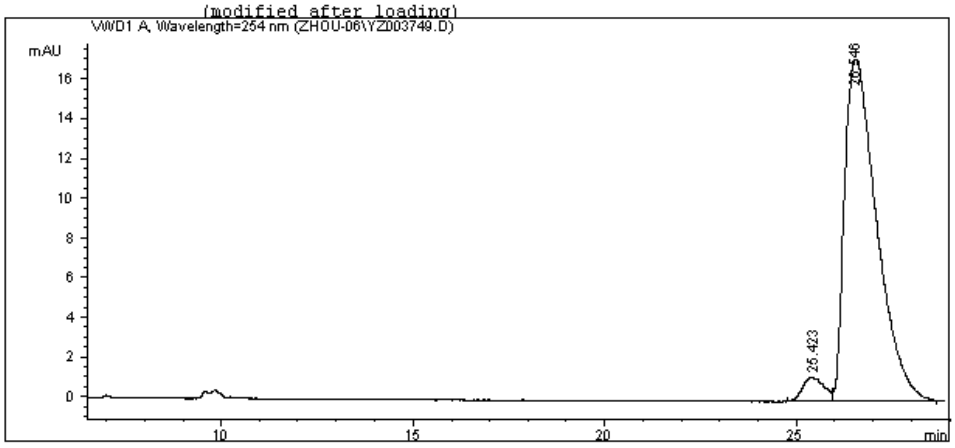
(+/-)-**12f**

Instrument 1 3/16/2007 2:43:34 PM WANG Page 1 of 1

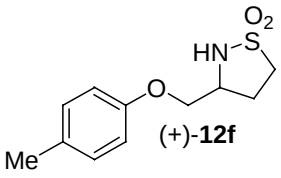
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003749.D Sample Name: YW-6-47C

OJ-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/6/2006 3:43:53 PM
Sample Name     : YW-6-47C                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/6/2006 2:22:55 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:43:34 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  25.423 BV    0.5692   46.07248    1.19504   4.3867
   2  26.546 VB    0.9006 1004.20148   17.17409  95.6133

Totals :                  1050.27396   18.36913

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```

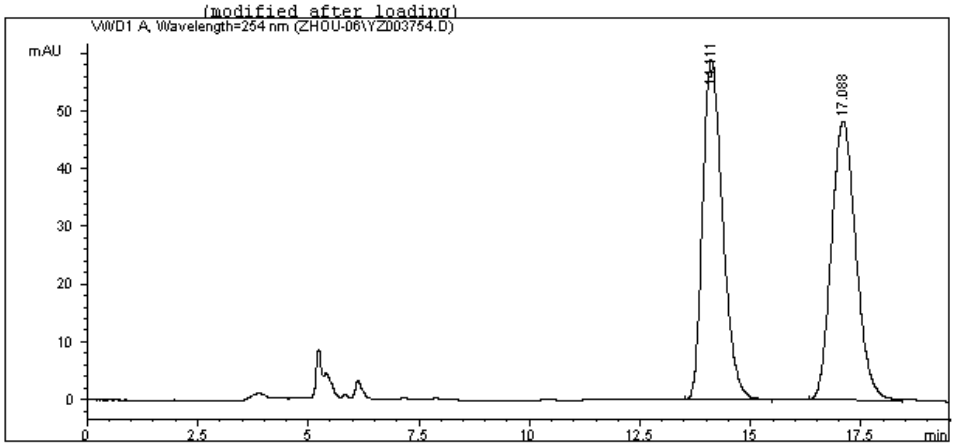


(+)-**12f**

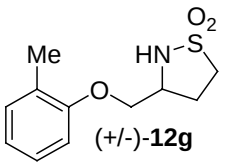
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003754.D Sample Name: YW-6-50F (Rac)

OD-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/11/2006 3:34:33 PM
Sample Name     : YW-6-50F (Rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/11/2006 1:18:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:50:20 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.111 BB    0.4854 1847.09766   58.87426  49.1066
   2  17.088 BB    0.6006 1859.88745   48.31248  49.4466
   3  35.151 BBA   1.0001   54.42259 6.61846e-1   1.4469

Totals :                  3761.40770  107.84859

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+/-)-**12g**

Instrument 1 3/16/2007 2:50:22 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003755.D Sample Name: YW-6-48F

OD-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/11/2006 4:12:47 PM
Sample Name     : YW-6-48F                      Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/11/2006 1:18:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:51:41 PM by WANG
                  (modified after loading)
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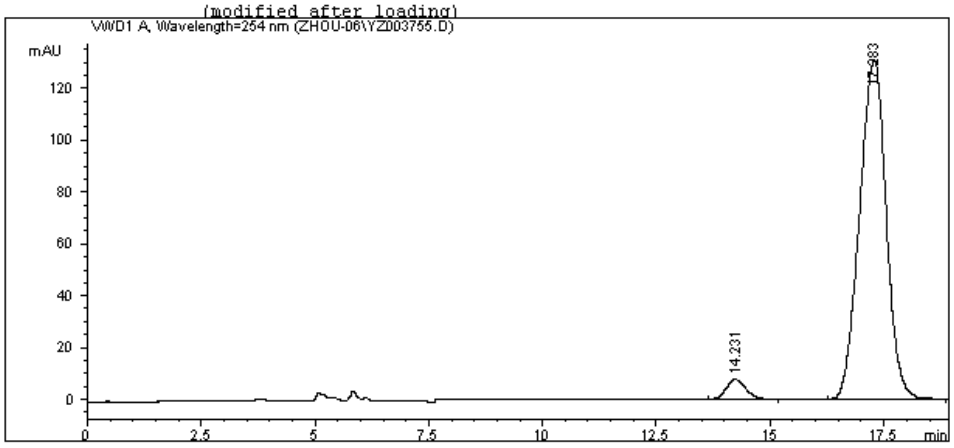



```
==================================================================
                        Area Percent Report
==================================================================

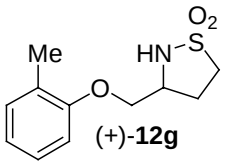
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.231 PP    0.4824  234.07085    7.58334   4.2043
   2  17.283 BB    0.6383 5333.40479  130.92397  95.7957

Totals :                  5567.47563  138.50730

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```

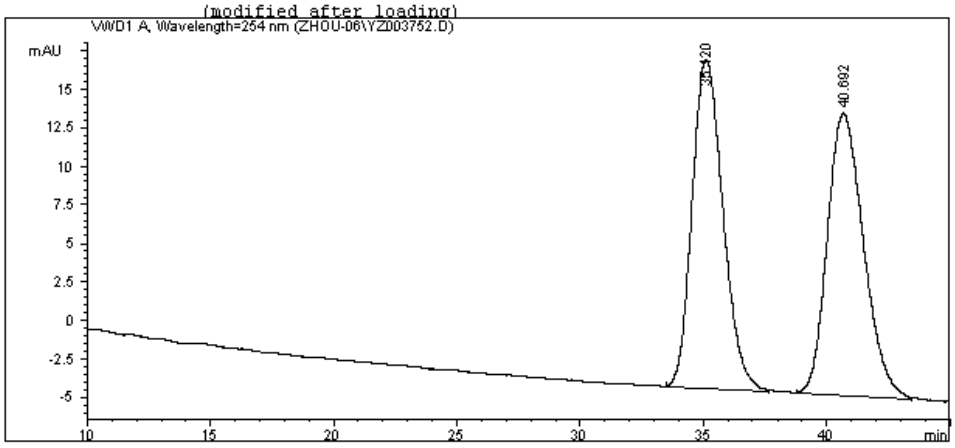


(+)-**12g**

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003752.D Sample Name: YW-6-50D (Rac)

OD-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/11/2006 1:37:25 PM
Sample Name     : YW-6-50D (Rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/11/2006 1:18:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:57:03 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

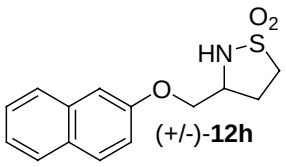
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  35.120 BB    1.3417 1848.57117   21.29718  49.8600
   2  40.692 BB    1.5549 1858.94934   18.25644  50.1400

Totals :                  3707.52051   39.55362

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



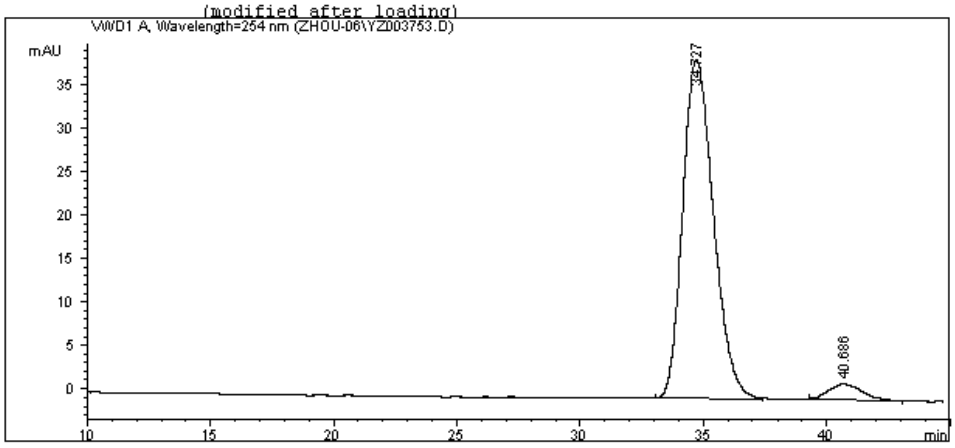
(+/-)-**12h**

Instrument 1 3/16/2007 2:57:05 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003753.D Sample Name: YW-6-47D (Rac)

OD-H, H/i-PrOH=70/30, 0.8 mL/min

```
==================================================================
Injection Date  : 7/11/2006 2:48:27 PM
Sample Name     : YW-6-47D (Rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/11/2006 1:18:10 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 2:59:27 PM by WANG
                  (modified after loading)
```




```
==================================================================
                        Area Percent Report
==================================================================

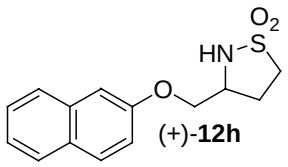
Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  34.727 BB    1.3496 3392.05444   38.99852  95.1871
   2  40.686 BP    1.1878  171.51202    1.78070   4.8129

Totals :                  3563.56647   40.77922

 Results obtained with enhanced integrator!
==================================================================
                        *** End of Report ***
```



(+)-**12h**

Instrument 1 3/16/2007 2:59:28 PM WANG Page 1 of 1

Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003762.D Sample Name: YW-6-50E (rac)

OD-H, H/i-PrOH=80/20, 0.8 mL/min, 215 NM

```
===================================================================
Injection Date  : 7/13/2006 3:19:47 PM
Sample Name     : YW-6-50E (rac)                 Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/13/2006 3:12:23 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:03:06 PM by WANG
                  (modified after loading)
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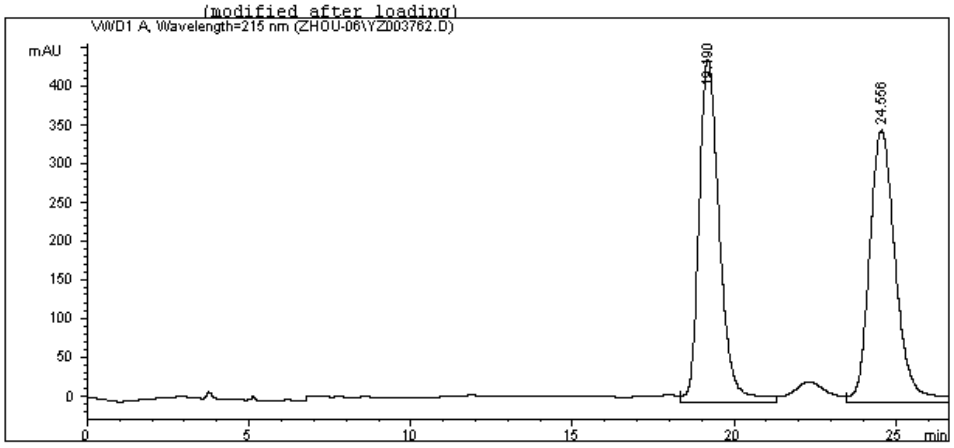
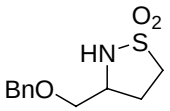



```
===================================================================
                        Area Percent Report
===================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=215 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  19.190 VV    0.6720 1.92497e4   441.26428  49.8956
   2  24.556 VBA   0.8531 1.93303e4   350.48999  50.1044

Totals :                  3.85800e4   791.75427

 Results obtained with enhanced integrator!
===================================================================
                        *** End of Report ***
```



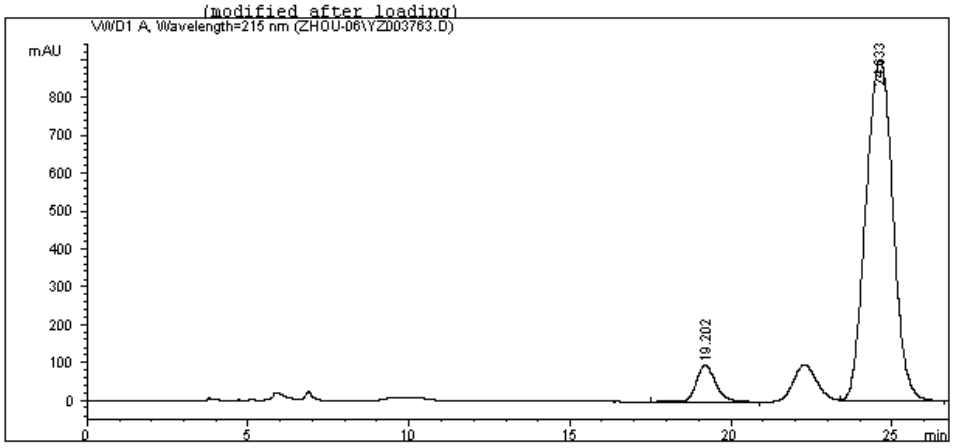
(+/-)-**12i**

Instrument 1 3/16/2007 3:03:09 PM WANG Page 1 of 1

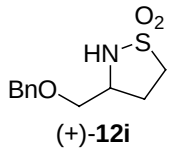
Data File C:\HPCHEM\1\DATA\ZHOU-06\YZ003763.D Sample Name: YW-6-53B

OD-H, H/i-PrOH=80/20, 0.8 mL/min, 215 NM

```
==========================================================================
Injection Date  : 7/13/2006 3:47:46 PM
Sample Name     : YW-6-53B                          Location : Vial 1
Acq. Operator   : WANG
Acq. Method     : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 7/13/2006 3:12:23 PM by WANG
                  (modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\2012.M
Last changed    : 3/16/2007 3:05:23 PM by WANG
                  (modified after loading)
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000

Signal 1: VWD1 A, Wavelength=215 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  19.202 BP    0.6342 3852.97437   94.24521   6.8212
   2  24.633 VP    0.9382 5.2632le4   900.45215  93.1788

Totals :                  5.6485le4   994.69736

 Results obtained with enhanced integrator!
==========================================================================
                          *** End of Report ***
```



(+)-**12i**

Instrument 1 3/16/2007 3:05:26 PM WANG Page 1 of 1