Supporting Information for

Rhodium catalyzed asymmetric hydrogenation of 2-pyridine ketones

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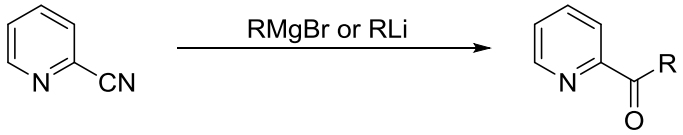
Contents

Experimental Section

General Information Unless otherwise noted, all reagents and solvents were purchased from commercial suppliers and used without further purification. NMR spectra were recorded on Bruker ADVANCE III (400 MHz) spectrometers for ^{1}H NMR and ^{13}C NMR. $CDCl_3$ was the solvent used for the NMR analysis, with tetramethylsilane as the internal standard. Chemical shifts were reported upfield to TMS (0.00 ppm) for ^{1}H NMR and relative to $CDCl_3$ (77.0 ppm) for ^{13}C NMR. Optical rotation was determined using a Perkin Elmer 343 polarimeter. HPLC analysis was conducted on an Agilent 1260 Series instrument. Column Chromatography was performed with silica gel Merck 60 (300-400 mesh). All new products were further characterized by HRMS. A positive ion mass spectrum of sample was acquired on a Thermo LTQ-FT mass spectrometer with an electrospray ionization source.

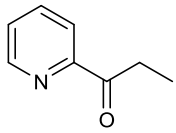
General procedure for the Synthesis of compound 1b – 1p



A solution of the appropriate bromide derivatives (12.0 mmol, 1.20 equiv) in 20 mL of THF was treated with magnesium (20.4 mmol, 1.02 equiv) and 10 mg I_2. After the formation of the Grignard reagent, the solution was cooled to room temperature, and added into the solution of a solution of the 2-Cyanopyridine (10 mmol, 1 equiv) in THF (15 mL) at 0 ℃ dropwise. When TLC showed no more starting material, the reaction was quenched by addition of a solution of saturated NH_4Cl. The organic layer was separated and extracted twice with CH_2Cl_2 . After evaporation, the organic layer was redissolved in Et_2O (80.0 mL) and 6 M HCl (10.0 mL) was added. After 30 min, the organic layer was separated, and the aqueous layer was basified with saturated $NaHCO_3$ and then extracted three times with CH_2Cl_2. The combined organic layers were dried over Na_2SO_4 and evaporated in vacuo. The residue was purified by column chromatography with petroleum ether and ethyl acetate.[1]

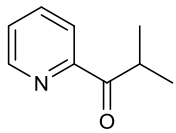
NMR and HRMS Data of compound 1b – 1p

1-(pyridin-2-yl)propan-1-one (**1b**):



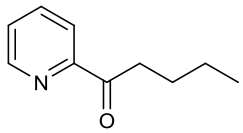
Compound **1b** was isolated in 81% yield (1.09 g). Colorless oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.53 - 8.54 (m, 1H), 7.89 (dt, J = 8.0, 1.2Hz, 1H), 7.67 - 7.72 (m, 1H), 7.31 - 7.35 (m, 1H), 3.07 - 3.14 (m, 2H), 1.06 - 1.10 (m, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 202.3, 153.2, 148.8, 136.7, 126.9, 121.5, 30.9, 7.8.

2-methyl-1-(pyridin-2-yl)propan-1-one (**1c**):



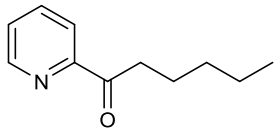
Compound **1c** was isolated in 80% yield (1.20 g). Colorless oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz,$CDCl_3$) δ 8.65 - 8.66 (m, 1H), 8.02 (d, J = 8.2Hz, 1H), 7.78 - 7.83 (m, 1H), 7.41 - 7.45 (m, 1H), 4.08 (td, J = 6.8, 2.4Hz, 1H), 1.18 (dd, J = 6.8, 2.4Hz, 6H); ^{13}C NMR (101MHz, $CDCl_3$) δ 205.6, 152.8, 148.8, 136.9, 126.9, 122.4, 34.2, 18.6.

1-(pyridin-2-yl)pentan-1-one (**1d**):



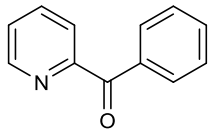
Compound **1d** was isolated in 85% yield (1.38 g). Colorless oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz,$CDCl_3$) δ 8.67 - 8.69 (m, 1H), 8.04 (dd, J = 7.6, 1.2Hz, 1H), 7.83 (td, J = 7.6, 1.6Hz, 1H), 7.45 - 7.48 (m, 1H), 3.22 (t, J = 7.2Hz, 2H), 1.68 - 1.74 (m, 2H), 1.40 - 1.45 (m, 2H), 0.96 (t, J = 7.6 Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 202.2, 153.5, 148.9, 136.9, 127.0, 121.8, 37.4, 26.1, 22.5, 14.0.

1-(pyridin-2-yl)hexan-1-one (**1e**):



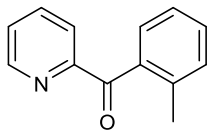
Compound **1e** was isolated in 75% yield (1.33 g). Colorless oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.67 (d, J = 4.8Hz, 1H), 8.00 (d, J = 8.0Hz, 1H), 7.82 (td, J = 7.6, 1.2Hz, 1H), 7.43 - 7.46 (m, 1H), 3.20 (t, J = 7.6Hz, 2H), 1.69 - 1.76 (m, 2H), 1.35 - 1.40 (m, 4H), 0.89 (t, J = 7.2Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 202.2, 153.5, 148.7, 136.8, 127.0, 121.7, 37.7, 31.5, 23.6, 22.5, 14.0.

phenyl(pyridin-2-yl)methanone (**1f**):



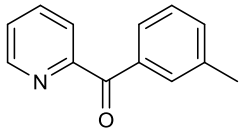
Compound **1f** was isolated in 82% yield (1.50 g). Light yellow solid; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.75 (d, J = 4.8Hz, 1H), 8.08 (dd, J = 8.4, 7.2Hz, 3H), 7.93 (td, J = 7.6, 1.6Hz, 1H), 7.62 (t, J = 7.2Hz, 1H), 7.52 (t, J = 7.2Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 194.0, 155.1, 148.6, 137.1, 136.2, 133.0, 131.0, 128.2, 126.2, 124.7.

pyridin-2-yl(o-tolyl)methanone (**1g**):



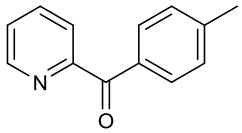
Compound **1g** was isolated in 85% yield (1.67 g). Light yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (d, J = 7.6Hz, 1H), 7.91 (td, J = 7.6, 1.6Hz, 1H), 7.45-7.50 (m, 3H), 7.28 - 7.43 (m, 2H), 2.41 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 197.5, 155.0, 149.2, 137.9, 137.4, 137.0, 131.2, 131.0, 130.0, 126.5, 125.1, 124.2, 20.5.

pyridin-2-yl(m-tolyl)methanone (**1h**):



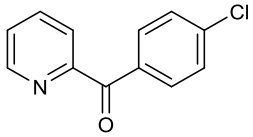
Compound **1h** was isolated in 89% yield (1.75 g). Yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.74 (d, J = 4.8Hz, 1H), 8.04 (dd, J = 7.6, 0.8Hz, 1H), 7.92 (td, J = 8.0, 1.6Hz, 1H), 7.85 (d, J = 7.6Hz, 2H), 7.49 - 7.52 (m, 1H), 7.37 - 7.44 (m, 2H), 2.44 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 194.3, 155.2, 148.6, 138.0, 137.1, 136.3, 133.8, 131.3, 128.3, 128.1, 126.1, 124.6, 21.4.

pyridin-2-yl(p-tolyl)methanone (**1i**):



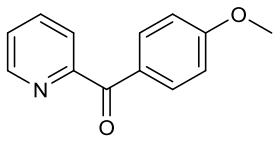
Compound **1i** was isolated in 87% yield (1.71 g). Light yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J=3.6Hz, 1H), 7.98 - 8.04 (m, 3H), 7.87 -7.93 (m, 1H), 7.47 - 7.51 (m, 1H), 7.30 (d, J = 8.4Hz, 2H), 2.44 (d, J = 3.2Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 193.6, 155.4, 148.5, 143.8, 137.0, 133.6, 131.2, 128.9, 126.1, 124.6, 21.8.

(4-chlorophenyl)(pyridin-2-yl)methanone (**1j**):



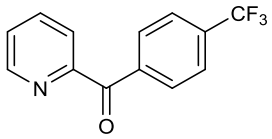
Compound **1j** was isolated in 78% yield (1.69 g). Light yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.75 (d, J = 4.8Hz, 1H), 8.10 (dd, J = 6.8, 4.0Hz, 3H), 7.95 (t, J = 8.0Hz, 1H), 7.52 - 7.56 (m, 1H), 7.49 (d, J = 8.4Hz, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 192.5, 154.6, 148.5, 139.4, 137.3, 134.5, 132.5, 128.5, 126.5, 124.7.

(4-methoxyphenyl)(pyridin-2-yl)methanone (**1k**):



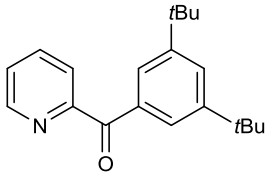
Compound **1k** was isolated in 90% yield (1.92 g). White solid; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J = 4.8Hz, 1H), 8.14 (dd, J = 7.2, 2.0Hz, 2H), 8.01 (d, J = 7.2Hz, 1H), 7.91 (td, J = 6.0, 1.6Hz, 1H), 7.47 - 7.51 (m, 1H), 7.00 (dd, J = 7.2, 2.0Hz, 2H), 3.90 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 192.4, 163.6, 155.7, 148.4, 137.1, 133.5, 128.9, 125.9, 124.6, 113.5, 55.5, 125.1, 124.7.

pyridin-2-yl(4-trifluoromethyl)phenyl)methanone (**1l**):



Compound **1l** was isolated in 92% yield (2.33 g). Yellow solid; Purified by flash chromatography (PE:EA=10:1);.^{1}H NMR (400 MHz, $CDCl_3$) δ 8.74 (d, J = 4.8Hz, 1H), 8.19 (d, J = 8.0Hz, 2H), 8.13 (dd, J = 7.6, 0.8Hz, 1H), 7.94 (t, J = 7.6Hz, 1H), 7.75 (d, J = 8.0Hz, 2H), 7.53 (t, J = 6.0Hz, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 192.7, 154.1, 148.6, 139.3, 137.3, 133.8, 131.2, 126.8, 122.4.

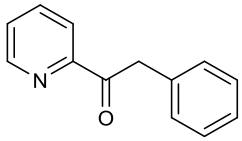
(3,5-di-tert-butylphenyl)(pyridin-2-yl)methanone (**1m**):



Compound **1m** was isolated in 83% yield (2.45 g). Light yellow solid; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.75 - 8.76 (m,1H), 8.05 (dd, J = 7.6Hz, 1H), 7.88 - 7.94 (m, 3H), 7.71 (t, J = 1.6Hz, 1H), 7.50 - 7.51 (m, 1H), 1.38 (s, 18H); ^{13}C NMR (101MHz, $CDCl_3$) δ 195.0, 155.6, 150.6, 148.6,

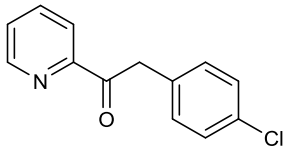
137.0, 135.8, 127.4, 126.0, 125.4, 124.6, 35.0, 31.4.

2-phenyl-1-(pyridin-2-yl)ethan-1-one (**1n**):



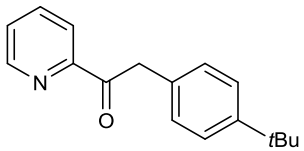
Compound **1n** was isolated in 75% yield (1.48 g). Colorless oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.76 (d, J = 4.8Hz, 1H), 8.09 (dd, J = 8.0, 0.8Hz, 1H), 7.84 (td, J = 7.6, 1.2Hz, 1H), 7.50 (dd, J = 7.6, 5.2Hz, 1H), 7.34 - 7.40 (m, 4H), 7.28 (t, J = 6.4Hz, 1H), 4.61 (s, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 199.2, 153.1, 149.0, 137.0, 134.8, 130.0, 128.5, 127.2, 126.7, 122.4, 44.0.

2-(4-chlorophenyl)-1-(pyridin-2-yl)ethan-1-one (**1o**):



Compound **1o** was isolated in 73% yield (1.69 g). Light yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.74 (dq, J = 4.4, 0.8Hz, 1H), 8.07 (dt, J = 8.0, 0.8Hz, 1H), 7.85 (td, J = 7.6, 1.6Hz, 1H), 7.50 (ddd, J = 7.6, 4.8, 1.2Hz, 1H), 7.28 - 7.32 (m, 4H), 4.55 (s, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 198.7, 152.8, 149.0, 137.0, 133.3, 132.6, 131.4, 128.6, 127.4, 122.4, 43.4.

2-(4-(tert-butyl)phenyl)-1-(pyridin-2-yl)ethan-1-one (**1p**):



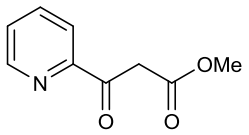
Compound **1p** was isolated in 80% yield (2.04 g). Light yellow solid; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.76 (dd, J = 4.8, 0.8Hz, 1H), 8.09 (dd, J = 7.6, 0.8Hz, 1H), 7.86 (t, J = 7.6Hz, 1H), 7.49 - 7.52 (m, 1H), 7.38 (d, J = 8.0Hz, 2H), 7.30 (d, J = 8.0Hz, 2H), 4.56 (s, 2H), 1.33 (s, 9H); ^{13}C NMR

(101MHz, $CDCl_3$) δ 199.3, 153.2, 149.4, 148.9, 137.0, 131.6, 129.6, 127.2, 125.4, 122.4, 60.4, 43.4, 34.4, 31.4, 21.1, 14.2.

General procedure for the Synthesis of 1q

To a suspension of ketone (20 mmol) in THF (80 mL) was added NaH (40 mmol, 60%). After the reaction mixture was stirred at 0 ℃ for about 1 h, the ester was added dropwise at the same temperature. Then the mixture was stirred at room temperature until TLC indicated the total consumption of the ketone. The reaction mixture was poured into ice-water (100 mL), acidified with aqueous HCl (3 M) to pH 2~3 and extracted with EtOAc 3 times. The combined organic layer was dried over Na_2SO_4 and evaporated under reduced pressure and purification by flash column chromatography (SiO_2) afforded the desired product.[4]

methyl-3-oxo-3(pyridin-2-yl)propanoate (**1q**):



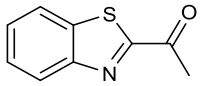
Compound **1q** was isolated in 86% yield (3.08 g). Light yellow oil; Purified by flash chromatography (PE:EA=10:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.63 - 8.64 (m, 1H), 8.03 (d, J = 8.0Hz, 1H), 7.81-7.85 (m, 1H), 7.45 - 7.49 (m, 1H), 4.18 (d, J = 3.2Hz, 2H), 3.70 (d, J = 3.2Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 194.5, 168.7, 152.4, 149.1, 137.0, 127.6, 122.1, 52.2, 44.5.

General procedure for the Synthesis of 1u

A stirred solution (0.5 M) of benzothiazole in dry THF under nitrogen was cooled to -78 ℃ and nBuLi (1.1 equiv, 5.5 mmol, 2.3M in hexane) was added dropwise. The resulted mixture were kept for 1 h under -78 ℃, after that, the N,N-dimethylacetamide (1 equiv, 5 mmol) was added to the stirred solution at -78 ℃ and the mixture was continuously stirred for 1 h. After removing the cold bath, the mixture was stirred for additional 10 min and then hydrolyzed with concd hydrochloric acid (1 mL). The acidic solution was continuously stirred until the temperature reached room

temperature. The mixture was poured into same amount of water and the aqueous mixture was extracted with ethyl acetrate 3 times. The combined organic solution was dried with Na_2SO_4. Purification by flash column chromatography affored the desired product.[2]

1-(benzo[d]thiazol-2-yl)ethan-1-one (**1u**):

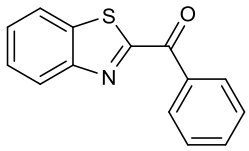


Compound **1u** was isolated in 58% yield (1.02 g). White solid; Purified by flash chromatography (PE:EA=5:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.22 (d,J = 8.0Hz,1H), 8.01 (d, J = 7.6Hz, H), 7.55 – 7.63 (m, 2H), 2.87 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 193.2, 166.5, 153.6, 137.4, 127.7, 127.0, 125.5, 122.5, 26.2.

General procedure for the Synthesis of 1v

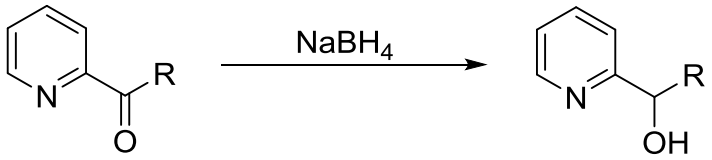
DMAP (183 mg, 30 mol%) weighed in a sealable tube. The tube was sealed and flushed with a stream of dry N_2 . MeCN (10 mL) was added, followed by Et_3N (15 mmol, 3 equiv). Azole (5 mmol, 1 equiv) and aroyl chloride (10 mmol, 2 equiv) were added dropwise to the reaction mixture, and stirred for 24 h at 80 ℃. The mixture was then cooled to r.t., diluted with EtOAc and sat. aq $NaHCO_3$, and extracted with EtOAc (2 ×). Combined organic layers were washed with brine, dried over $MgSO_4$ and concentrated in vacuo. Purification by flash column chromatography afforded the desired product.[3]

benzo[d]thiazol-2-yl(phenyl)methanone (**1v**):



Compound **1v** was isolated in 60% yield (1.44 g). Light yellow solid; Purified by flash chromatography (PE:EA=5:1); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.58 – 8.61 (m, 2H), 8.28 – 8.30 (m, 1H), 8.05 – 8.07 (m, 1H), 7.71 (tt, J = 7.2, 1.6Hz, 1H), 7.57 – 7.65 (m, 4H); ^{13}C NMR (101MHz, $CDCl_3$) δ 185.4, 167.1, 153.9, 137.0, 135.0, 134.0, 131.3, 128.5, 127.7, 127.0, 125.8, 122.2.

General procedure for the synthesis of racemic alcohols:

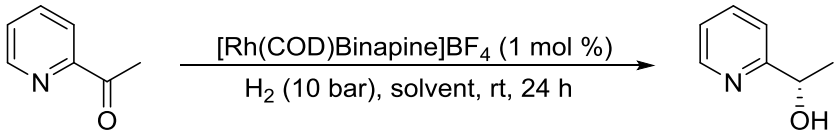


The corresponding ketones (0.1 mmol) was dissolved in 5 mL MeOH, and the $NaBH_4$ solid (0.2 mmol) was added slowly. The mixture was stirred until the ketones disappeared. After that, 5 mL H_2O was added slowly. Then the residue was extracted 3 times with ethyl acetate, and the combined organic layer was dried over Na_2SO_4 and evaporated in vacuo. The product was used without further purification.

General procedure for the rhodium catalyzed asymmetric hydrogenation of 2-pyridine ketones:

Ketones (0.2 mmol) were adden into a vial with stirbar in a glovebox, 2 mg [Rh(COD)Binapine]BF_4 (1 mol%) was added. Then 2 mL CH_2Cl_2 was added by a syringe. After that, the vials were transferred to an autoclave which was pressurized with hydrogen gas (8 atm) and depressurized three times before 8 atm of H_2 was set, and the reaction mixtures were stirred at room temperature for 24 h. After 24 h, the hydrogen gas was released slowly and carefully, the solution was then concentrated and passed through a short column of silica gel to remove the metal complex. The *ee* values of all compounds were determined by HPLC on a chiral stationary phase.

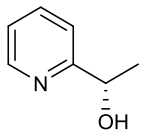
solvents screening for the [Rh(COD)Binapine]BF_4 catalyzed asymmetric hydrogenation of 2-acetyl pyridine.[a]



entry	solvent	conversion[a] (%)	**ee**[b] (%)
1	CH_2Cl_2	>99	>99
2	MeOH	>99	97
3	CH_2Cl_2/MeOH (1/1)	>99	98

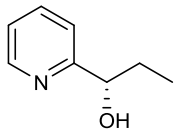
[a] Determined by ^{1}H NMR. [b] Determined by HPLC analysis using a chiral stationary phase.

(S)-1-(pyridin-2-yl)than-1-ol (**2a**):



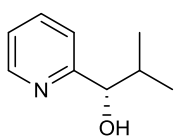
light yellow oil, 99% yield (12.2 mg), 99% ee, $[\alpha]_D^{20}$ = 61.500 (c = 1.0g/100mL, CH_3CH_2OH);^{1}H NMR (400 MHz, $CDCl_3$) δ 8.53 (d, J = 4.8Hz, 1H), 7.70 (td, J = 8.0, 2.0Hz, 1H), 7.30 (d, J = 7.6Hz, 1H), 7.19 – 7.22 (m, 1H), 4.90 (dd, J = 12.8, 6.4Hz, 1H), 4.53 (s,1H), 1.51 (d, J = 6.8Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 163.1, 148.1, 136.8, 122.2, 119.8, 68.9, 24.3; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 0.3 mL min^{-1}, 254 nm), t_S= 31.8 min (major), t_R = 35.1 min (minor).

(S)-1-(pyridine-2yl)propan-1-ol (**2b**):



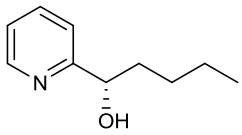
light yellow oil, 99% yield (13.5 mg), 91% ee. $[\alpha]_D^{20}$ = 91.300 (c = 1.0g/100mL, CH_3CH_2OH); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.51 (d, J = 4.8Hz, 1H), 7.67 (td, J = 7.6, 1.2Hz, 1H), 7.28 (d, J = 8.0Hz, 1.0H), 7.16 - 7.19 (m, 1H), 4.68 (dd, J = 6.4, 5.2Hz, 1H), 4.48 (s, 1H), 1.84 - 1.89 (m, 1H), 1.67 - 1.76 (m, 1H), 0.93 (t, J = 7.6Hz, 3H);^{13}C NMR (101MHz, $CDCl_3$) δ 162.2, 148.1, 136.6, 122.2, 120.4, 74.0, 31.2, 9.5; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 0.3 mL min^{-1}, 254 nm), t_S= 26.8 min (major), t_R = 28.9 min (minor).

(S)-2-methyl-1-(pyridine-2-yl)propan-1-ol (**2c**):



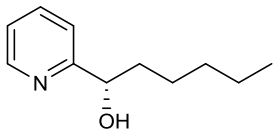
light yellow oil, 99% yield (15.0 mg), 84% ee. $[\alpha]_D^{20}$ = 38.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.57 (d, J = 4.8Hz, 1H),7.70 (td, J = 7.6, 1.6Hz, 1H), 7.20 - 7.27(m, 2H), 4.58 (d, J = 4.4Hz, 1H), 4.26 (s, 1H), 2.01 - 2.09 (m, 1H), 1.04 (d, J = 7.2Hz, 3H), 0.81 (d, J = 6.8Hz, 1H); ^{13}C NMR (101MHz,$CDCl_3$) δ 161.2, 148.0, 136.4, 122.2, 121.0, 77.1, 35.2, 19.5, 16.0; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 97/3, 0.3 mL min^{-1}, 254 nm), t_S = 34.9 min (major), t_R = 38.6 min (minor).

(S)-1-(pyridine-2-yl)pentan-1-ol (**2d**):



light yellow oil, 99% yield (16.1 mg), 90% ee, $[\alpha]_D^{20}$ = 85.200 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400MHz, $CDCl_3$) δ 8.56 (d, J = 4.8Hz, 1H), 7.70 (td, J = 7.6, 1.6Hz, 1H), 7.23 (d, J = 8.4Hz, 1H), 7.22 (td, J = 5.6, 0.8Hz, 1H), 4.76 (dd, J = 7.6, 4.4Hz, 1H), 4.23 (s, 1H), 1.81 - 1.85 (m, 1H), 1.70 - 1.74 (m, 1H), 1.38 - 1.45 (m, 4H), 0.92 (t, J = 7.2Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 162.3, 148.2, 136.6, 122.2, 120.3, 72.8, 38.4, 27.4, 22.7, 14.1; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 0.3 mL min^{-1}, 254 nm), t_S= 23.3 min (major), t_R = 25.1 min (minor).

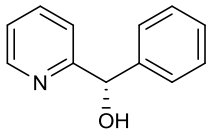
(S)-1-(pyridine-2-yl)hexan-1-ol (**2e**):



light yellow oil, 99% yield (17.5 mg), 90% ee, $[\alpha]_D^{20}$ = 43.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.49 (d, 4.0Hz, 1H), 7.65 (td, J = 7.6, 1.6Hz, 1H), 7.27 (d, J = 8.0Hz, 1H), 7.15 (td, J = 6.0, 0.8Hz, 1H), 4.72 (dd, J = 7.6, 4.4Hz, 1H), 4.53 (s, 1H), 1.76 - 1.82 (m, 1H), 1.66 - 1.72 (m, 1H), 1.34 - 1.42 (m, 2H), 1.22 - 1.32 (m, 4H), 0.79 - 0.87 (m, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 162.7, 148.1, 136.6, 122.1, 120.3, 73.0, 38.5, 31.8, 25.0, 22.6, 14.0; HPLC (Chiralcel OD-H column,

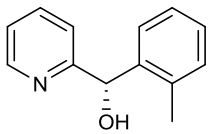
hexane/i-PrOH: 95/5, 0.3 mL min^{-1}, 254 nm), t_S = 22.3 min (major), t_R = 24.1 min (minor).

(S)-phenyl(pyridin-2-yl)methanol (**2f**):



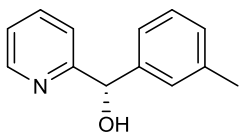
White solid, 99% yield (18.1 mg), 99% ee, $[\alpha]_D^{20}$ = 3.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.60 (d, J = 4.8Hz, 1H), 7.65 (td, J = 7.6, 1.6Hz, 1H), 7.35 - 7.43 (m, 4H), 7.23 (dd, J = 6.8, 4.8Hz, 1H), 7.17 (dd, J = 7.6, 0.4Hz, 1H), 5.78 (s, 1H), 5.35 (s, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 160.8, 147.8, 143.2, 136.9, 128.6, 127.9, 127.1, 122.5, 121.4, 74.9; HPLC (Chiralcel AD-H column, hexane/i-PrOH: 92/8, 0.7 mL min^{-1}, 220 nm), t_S = 18.1 min (major), t_R= 23.2 min (minor).

(S)-pyridin-2-yl(o-tolyl)methanol (**2g**):



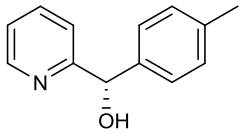
White solid, 99% yield (19.3 mg), 99% ee, $[\alpha]_D^{20}$ = 0.300 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.61 (d, J = 4.8Hz, 1H), 7.63 (td, J = 7.6, 1.6Hz, 1H), 7.28 (d, J = 8.0Hz, 1H), 7.18 - 7.25 (m, 4H), 7.06 (d, J = 8.0Hz, 1H), 6.01 (s, 1H), 5.30 (s, 1H), 2.37 (s,3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 160.9, 147.8, 140.7, 136.9, 136.3, 130.9, 128.1, 127.9, 126.2, 122.4, 121.3, 72.9, 19.5; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 21.0 min (major), t_R= 28.9 min (minor).

(S)-pyridin-2-yl(m-tolyl)methanol (**2h**):



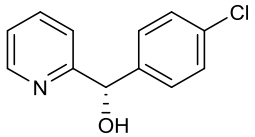
White solid, 99% yield (19.5 mg), 99% ee, $[\alpha]_D^{20}$ = 34.500 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.60 (d, J = 4.8Hz, 1H),7.65 (t, J = 7.6Hz, 1H), 7.18 -7.29(m, 5H), 7.12 (d, J = 7.2Hz, 1H), 5.75 (s, 1H), 5.33 (s, 1H), 2.36 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 160.9, 147.8, 143.2, 138.3, 136.8, 128.6, 128.5, 127.7, 124.2, 122.4, 121.4, 75.0, 21.5; HPLC (Chiralcel AD-H column, hexane/i-PrOH: 92/8, 0.7 mL min^{-1}, 220 nm), t_S = 16.5 min (major), t_R = 24.0 min (minor).

(S)-pyridin-2-yl(p-tolyl)methanol (**2i**):



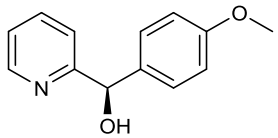
White solid, 99% yield (19.1 mg), 99% ee, $[\alpha]_D^{20}$ = 33.600 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.59 (d, J = 4.8Hz, 1H), 7.64 (td, J = 7.6, 1.6Hz, 1H), 7.28 - 7.30 (m, 2H), 7.17 - 7.23 (m, 4H), 5.76 (s, 1H), 5.30 (s, 1H), 2.36 (s, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 161.1, 147.8, 140.3, 137.5, 136.8, 129.3, 127.0, 122.4, 121.3, 74.8, 21.2; HPLC (Chiralcel AD-H column, hexane/i-PrOH: 92/8, 0.7 mL min^{-1}, 220 nm), t_S = 18.0 min (major), t_R = 21.7 min (minor).

(S)-(4-chlorophenyl)(pyridin-2-yl)methanol (**2j**):



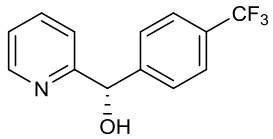
Light yelloew oil, 99% yield (21.4 mg), 99% ee, $[\alpha]_D^{20}$ = 44.100 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.59 (d, J = 4.8Hz, 1H), 7.66 (td, J = 7.6, 1.6Hz, 1H), 7.29 - 7.37 (m, 4H), 7.24 (dd, J = 7.6, 4.8Hz, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 160.3, 147.9, 141.7, 137.0, 133.6, 128.8, 128.4, 122.7, 121.3, 74.3; HPLC (Chiralcel AD-H column, hexane/i-PrOH: 92/8, 0.7 mL min^{-1}, 220 nm), t_S = 17.3 min (major), t_R = 23.0 min (minor).

(R)-(4-methoxyphenyl)(pyridine-2-yl)methanol (**2k**):



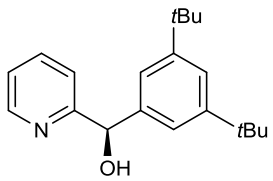
White solid, 99% yield (21.1 mg), 99% ee, $[\alpha]_D^{20}$ = -23.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.59 (d, J = 4.4Hz, 1H), 7.64 (td, J = 8.0, 2.0Hz, 1H), 7.29 - 7.33 (m, 2H), 7.22 (dd, J = 6.8, 4.8Hz, 1H), 7.16 (d, J = 8.0Hz, 1H), 6.90 (dt, J = 8.8, 2.0Hz, 2H), 5.74 (s, 1H), 5.28 (s, 1H), 3.82 (s, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 161.2, 159.3, 147.8, 136.8, 135.5, 128.4, 122.4, 121.3, 114.0, 74.5, 55.3; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 24.2 min (minor), t_R = 27.7 min (major).

(S)-pyridin-2-yl(4-(trifluoromethyl)phenyl)methanol (**2l**):



White solid, 99% yield (24.8 mg), 99% ee, $[\alpha]_D^{20}$ = 25.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.61 (d, J = 4.8Hz, 1H), 7.67 (td, J = 7.6, 1.6Hz, 1H), 7.58 (dd, J = 31.2, 8.4Hz, 4H), 7.25 - 7.28 (m, 1H), 7.18 (d, J = 8.0Hz, 1H), 5.84 (s, 1H), 5.44 (s, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 159.9, 148.1, 147.1, 137.1, 127.3, 125.6, 125.5, 122.8, 121.3, 74.4; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 95/5, 0.5 mL min^{-1}, 254 nm), t_S = 22.7 min (major), t_R = 24.7 min (minor).

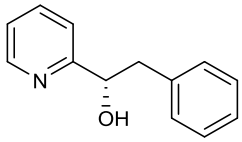
(R)-(3,5-di-tert-butylphenyl)(pyridin-2-yl)methanol (**2m**):



White solid, 99% yield (29.1 mg), 99% ee, $[\alpha]_D^{20}$ = -5.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.61 (d, J = 4.8Hz, 1H), 7.65 (td, J = 7.2,

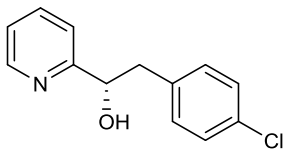
2.0Hz, 1H), 7.37 (t, J = 2.0Hz, 1H), 7.19 - 7.24 (m, 4H), 5.78 (s, 1H), 1.33 (s, 18H); ^{13}C NMR (101MHz. $CDCl_3$) δ 161.1, 150.9, 147.7, 142.2, 136.8, 122.3, 122.0, 121.5, 121.4, 34.9, 31.5; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_R = 5.5 min (major), t_S = 6.6 min (minor).

(S)-2-phenyl-1-(pyridin-2-yl)ethan-1-ol (**2n**):



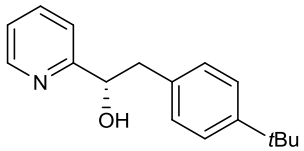
Colorless oil, 99% yield (19.5 mg), 92% ee, $[\alpha]_D^{20}$ = 72.500 (c = 1.0g/100mL, CH_3CH_2OH); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.57 (d, J = 4.8Hz, 1H), 7.66 (td, J = 7.6, 1.6Hz, 1H), 7.22 - 7.33 (m, 4H), 7.15 - 7.21 (m, 3H), 5.01 (dd, J = 12.8, 5.6Hz, 1H), 4.01 (dd, J = 5.6Hz, 1H), 3.10 (ddd, J = 35.6, 13.6, 4.2Hz, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 161.2, 148.4, 137.8, 136.5, 129.6, 128.4, 126.5, 122.5, 120.8, 74.1, 45.2; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_R = 15.4 min, t_S = 20.4 min (major).

(S)-2-(4-chlorophenyl)-1-(pyridin-2-yl)ethan-1-ol (**2o**):



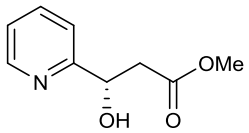
Colorless oil, 99% yield (23.0 mg), 80% ee, $[\alpha]_D^{20}$ = 42.000 (c = 0.1g/100mL, CH_3CH_2OH); ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.60 (d, J = 4.8Hz, 1H), 7.68 (td, J = 7.6, 1.6Hz, 1H), 7.22 - 7.27 (m, 3H), 7.16 (dd, J = 7.6Hz, 1H), 7.10 (d, J = 8.0Hz, 2H), 4.11 (d, J = 4.4Hz, 1H), 3.07 (dq, J = 39.2, 5.2Hz, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 160.7, 148.4, 136.6, 136.2, 132.3, 131.0, 128.4, 122.6, 120.7, 73.6, 44.4; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 14.5 min (major), t_R = 15.8 min (minor).

(S)-2-(4-(tert-butyl)phenyl)-1-(pyridin-2-yl)ethan-1-ol (**2p**):



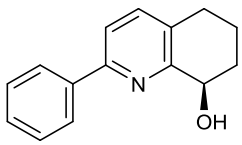
Colorless oil, 99% yield (25.1 mg), 96% ee, $[\alpha]_D^{20}$ = 39.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.59 (dd, J = 5.6, 2.0Hz, 1H), 7.68 (td, J = 7.6, 2.0Hz, 1H), 7.35 (dd, J = 6.4, 1.2Hz, 2H), 7.22 - 7.25 (m, 2H), 7.17 (d, J = 8.0Hz, 2H), 4.98 - 5.00 (m, 1H), 3.89 (d, J = 4.4Hz, 1H), 3.13 (dd, J = 13.6, 4.4Hz, 1H), 2.98 (dd, J = 13.6, 4.4H, 1H), 1.34 (s, 9H); ^{13}C NMR (101MHz, $CDCl_3$) δ 161.5, 149.3, 148.4, 136.5, 134.8, 129.2, 125.4, 122.4, 120.7, 74.2, 44.7, 34.4, 31.4; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 97/3, 0.3 mL min^{-1}, 254 nm), t_S = 38.6 min (major), t_R = 40.4 min (minor).

(S)-methyl-3-hydroxy-3-(pyridin-2-yl)propanoate (**2q**):



Colorless oil, 99% yield (17.8 mg), 97% ee, $[\alpha]_D^{20}$ =89.500 (c = 1.0g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.55 (d, J = 4.0Hz, 1H), 7.72 (td, J = 7.6, 1.2Hz, 1H), 7.43 (d, J = 7.6Hz, 1H), 7.23 (t, J = 6.0Hz, 1H), 5.20 (d, J = 4.8Hz, 1H), 4.43 (s, 1H), 3.73 (s, 3H), 2.93 (dd, J = 16.0, 4.0Hz, 1H),2.78 (dd, J = 12.0, 8.8Hz, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 172.4, 160.7, 148.5, 136.9, 122.6, 120.3, 70.0, 51.9, 42.4; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 21.2 min (major), t_R = 23.5min (minor).

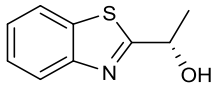
(R)-2-phenyl-5,6,7,8-tetrahydroquinolin-8-ol (**2r**):



White solid, 99% yield (22.2 mg), 99% ee, $[\alpha]_D^{20}$ = -38.000 (c = 0.1g/100mL, CH_3CH_2OH); ^1H NMR (400 MHz, $CDCl_3$) δ 8.01 - 8.04 (m, 2H), 7.61 (d, J = 8.0Hz, 1H), 7.48 -7.53 (m, 3H), 7.42 - 7.46 (m, 1H), 4.75 - 4.79 (m, 1H), 4.37 (s, 1H), 2.87 -

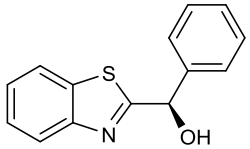
2.91 (m, 2H), 2.38 -2.43 (m, 1H), 2.05 -2.09 (m, 1H), 1.83 - 1.89 (m, 2H); ^{13}C NMR (101MHz, $CDCl_3$) δ 157.7, 154.2, 138.9, 137.7, 129.9, 128.9, 128.7, 126.7, 119.2, 69.2, 30.7, 28.0, 19.7; HPLC (Chiralcel OD-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 11.4 min (minor), t_R = 13.4 min (major).

(S)-1-(benzo[d]thiazol-2-yl)ethan-1-ol (**2u**):



Compound 2u was isolated in 83% yield (14.7 mg), White solid, 92% ee, Purified by flash chromatography (PE:EA=2:1); $[\alpha]_D^{20}$ = 20.750 (c = 0.4g/100mL, CH_3CH_2OH);^{1}H NMR (400 MHz, $CDCl_3$) δ 8.00 (d,J = 8.0Hz,1H), 7.90 (d,J = 8.0Hz, 1H), 7.51 (t, J = 7.6Hz, 1H), 7.40 (t, J = 7.6Hz, 1H), 5.28 (q, J = 6.4Hz, 1H), 3.65 (s, 1H), 1.74 (d, J = 6.4Hz, 3H); ^{13}C NMR (101MHz, $CDCl_3$) δ 176.9, 152.9, 134.9, 126.1, 125.0, 122.9, 121.9, 68.6, 24.1. HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 95/5, 1.0 mL min^{-1}, 254 nm), t_S = 19.3 min (major), t_R = 20.4 min (minor).

(R)-benzo[d]thiazol-2-yl(phenyl)methanol (**2v**):



Light yellow solid, 99% yield (23.5 mg), 99% ee, $[\alpha]_D^{20}$ = -13.500 (c = 0.4g/100mL, CH_3CH_2OH); ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.99 (d, J = 8.0Hz, 1H), 7.86 (d, J = 8.0Hz, 1H), 7.55 (d, J = 6.8Hz, 2H), 7.48 (t, J = 8.0Hz, 1H), 7.34 – 7.43 (m, 4H), 6.71 (s, 1H), 4.25 (s, 1H); ^{13}C NMR (101MHz, $CDCl_3$) δ 175.1, 152.6, 140.9, 135.2, 128.9, 128.7, 126.8, 126.2, 125.2, 123.1, 121.8, 74.4; HPLC (Chiralcel OJ-H column, hexane/i-PrOH: 90/10, 1.0 mL min^{-1}, 254 nm), t_R = 18.5 min (major), t_S = 22.6 min (minor).

References

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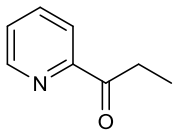
[2] Hidenori Chikashita, Megumi Ishibaba, Keiji Ori, K. Itoh, *Bull. Chem. Soc. Jap.* **1988**, *61*, 3637-3648.

[3] C. Hoarau, P. Lassalas, F. Marsais, *Synlett* **2013**, *24*, 2233-2240.

[4] Y. Yuan, W. Hou, D. Zhang-Negrerie, K. Zhao, Y. Du, *Org Lett* **2014**, *16*, 5410-5413.



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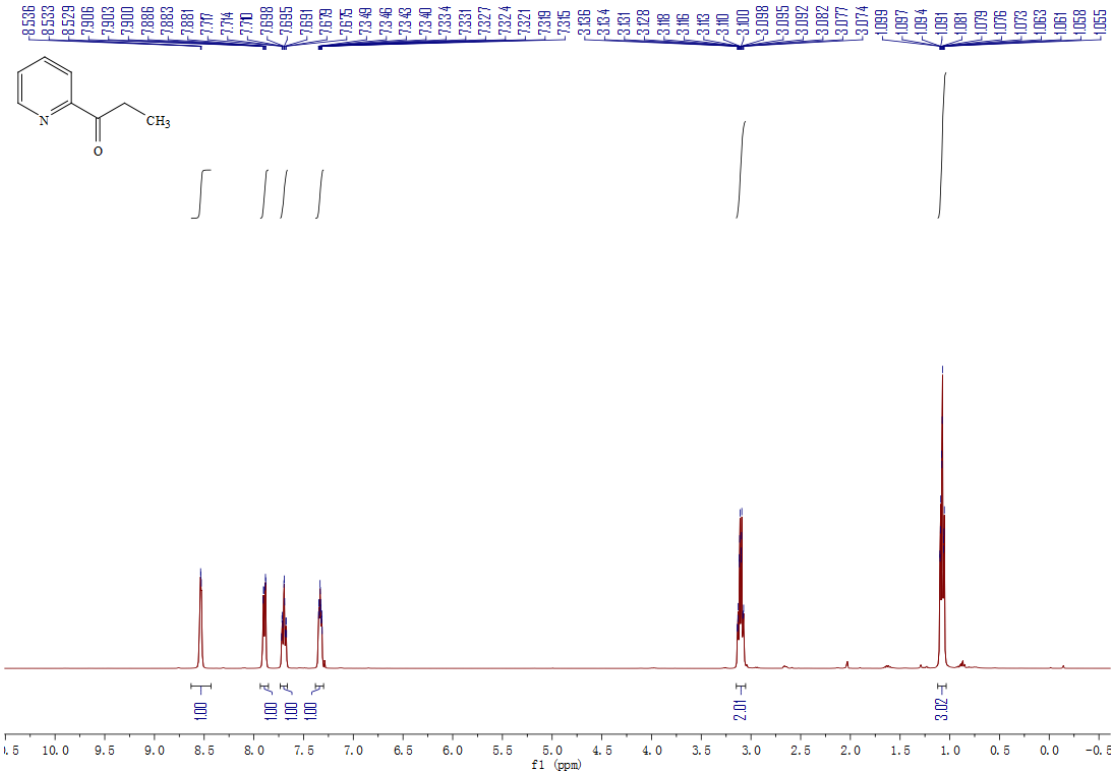

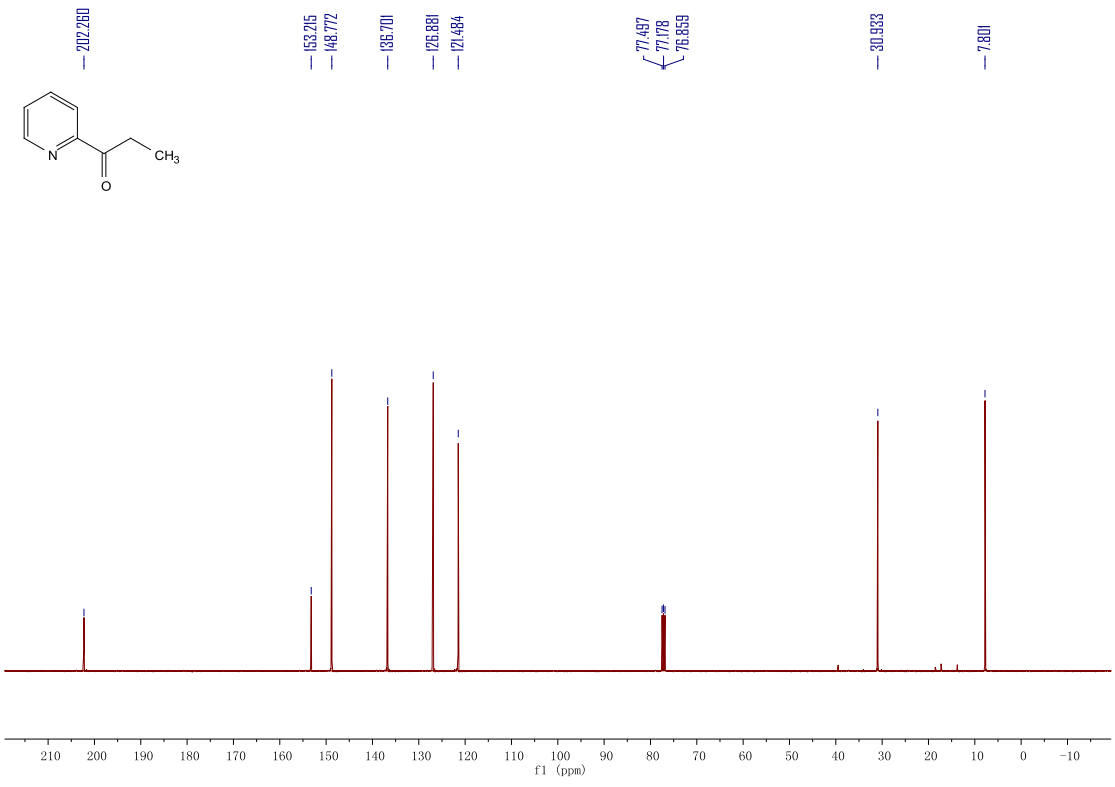

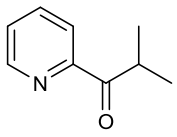

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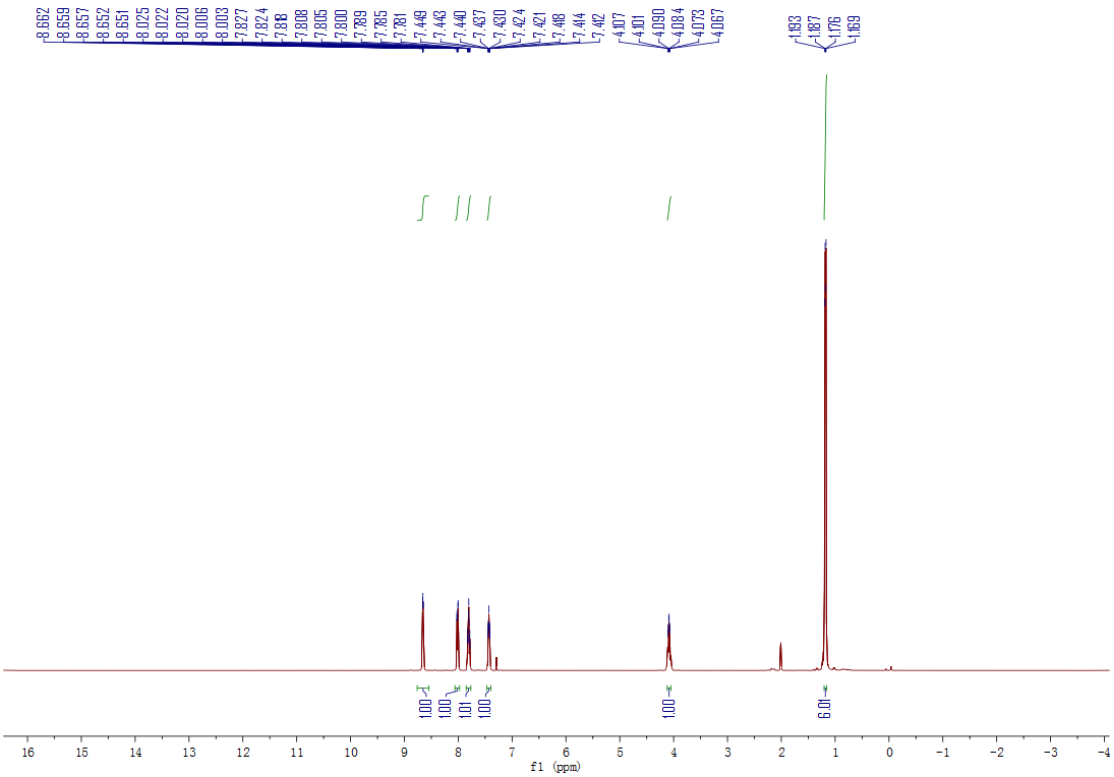
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7.800
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7.785
7.781
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7.443
7.440
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7.421
7.418
7.414
7.412
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4.101
4.090
4.084
4.073
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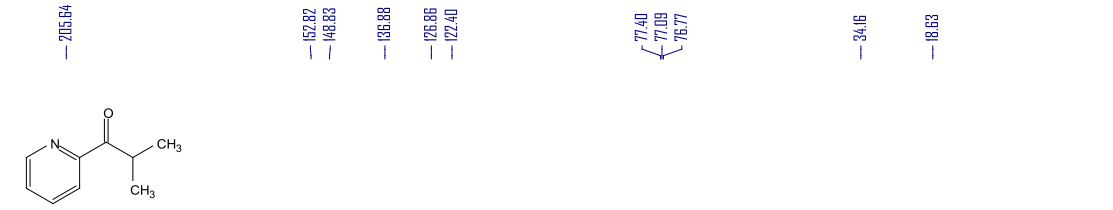
f1 (ppm)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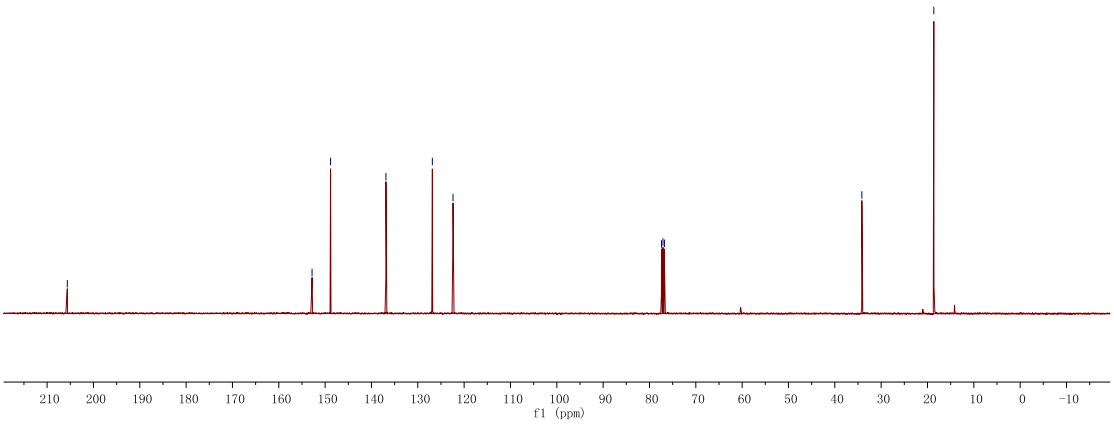
18.63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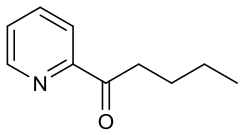

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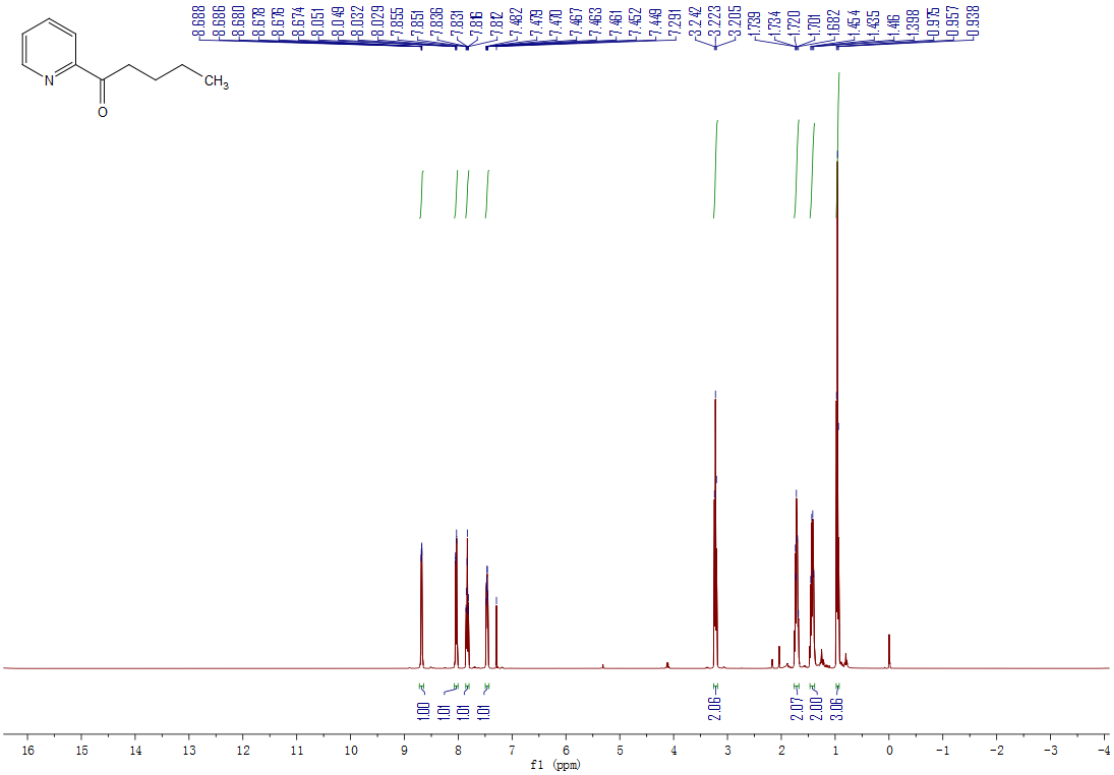
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7.816
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7.478
7.470
7.467
7.463
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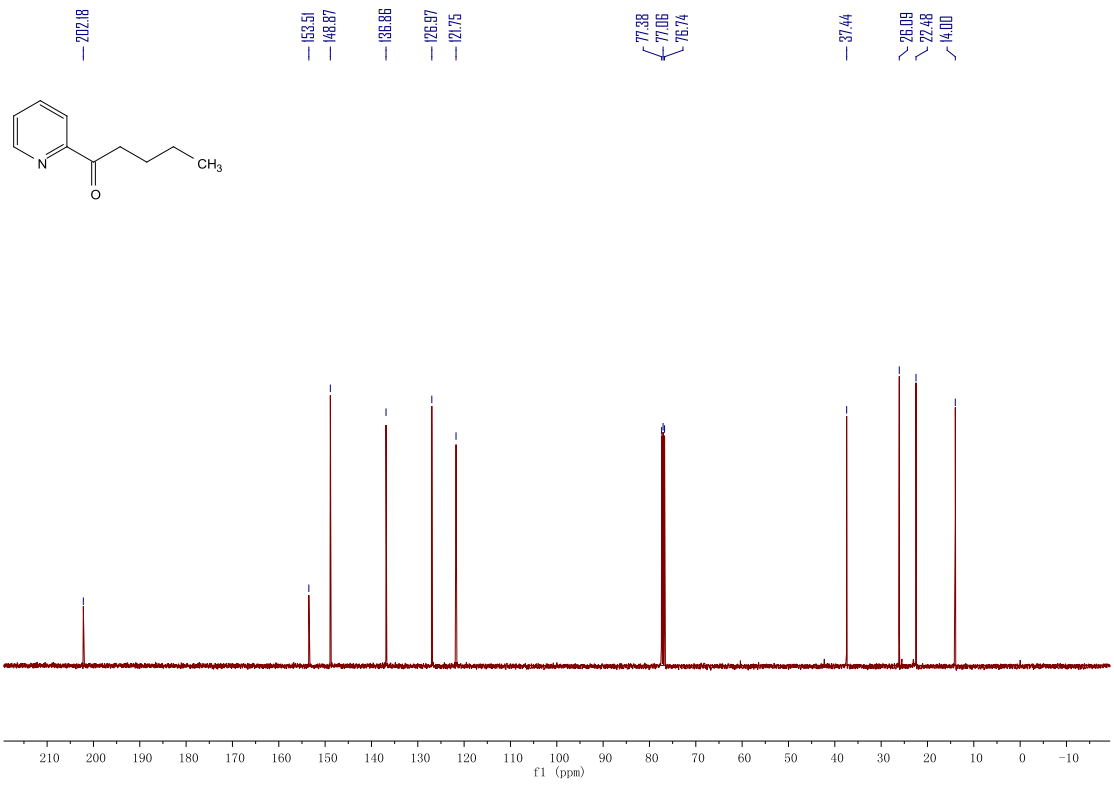
2.07
2.00
3.06
f1 (ppm)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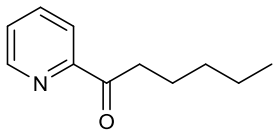
f1 (ppm)



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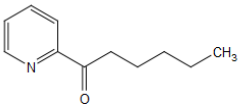

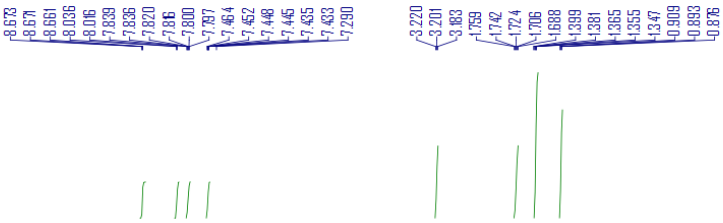
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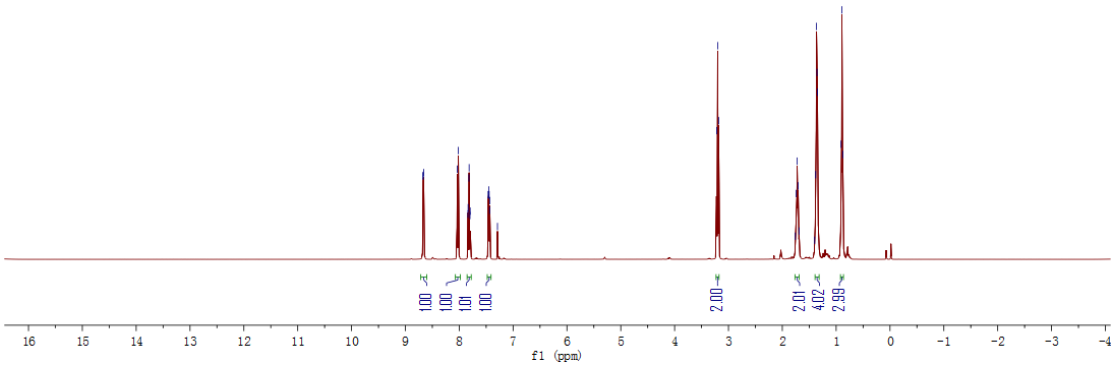
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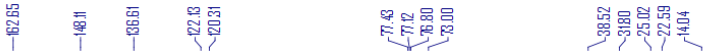
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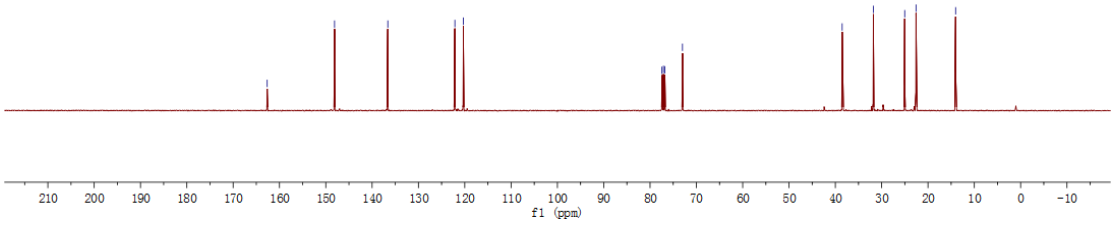
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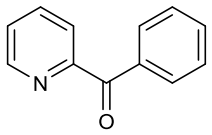

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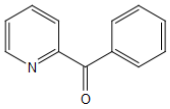

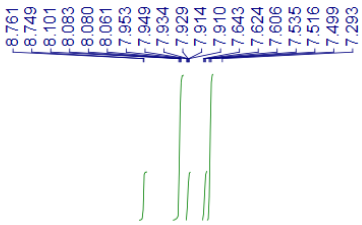
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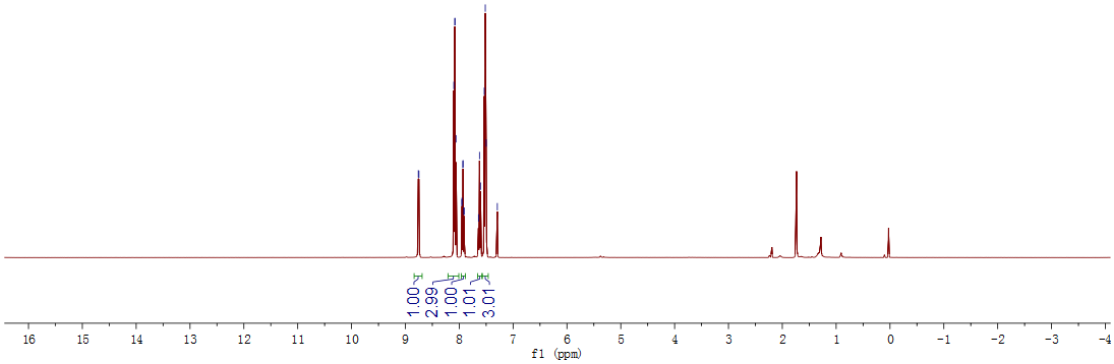
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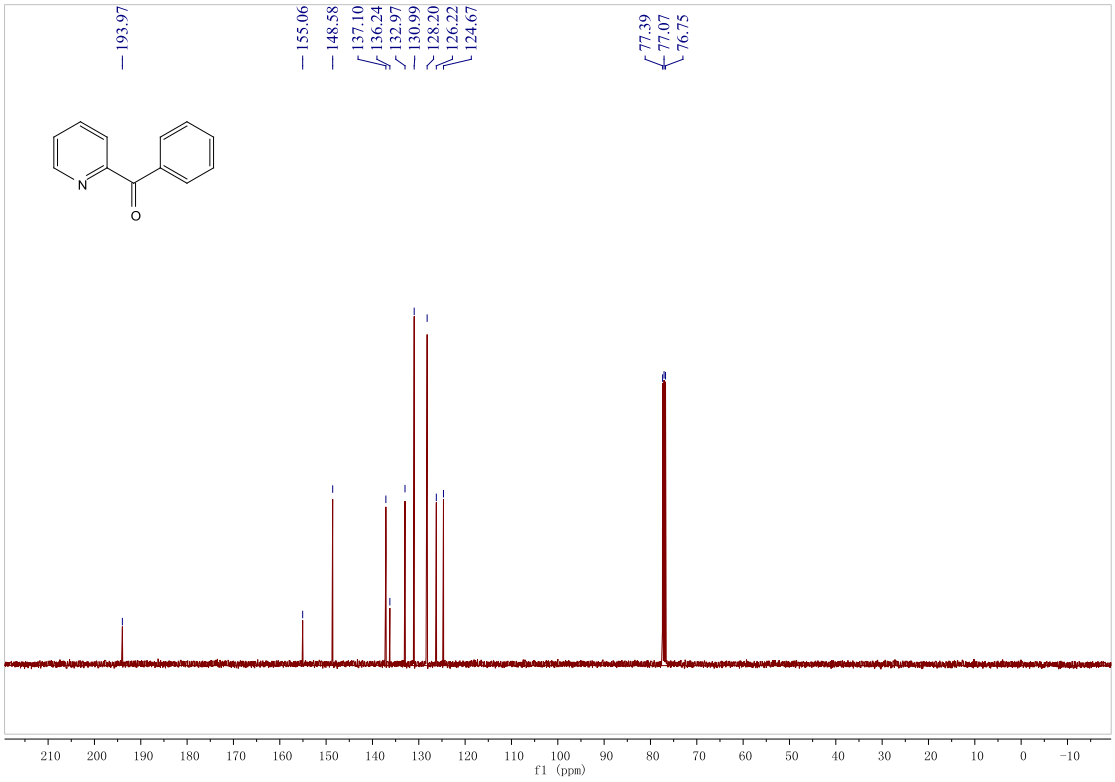
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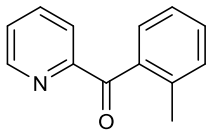
f1 (ppm)



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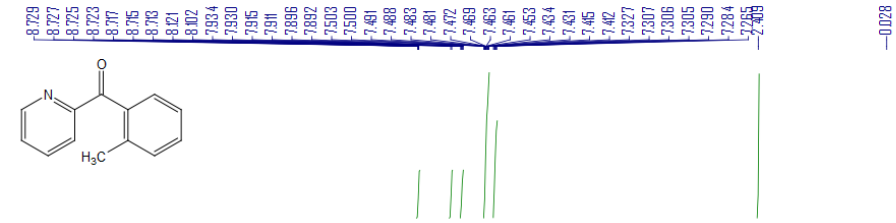
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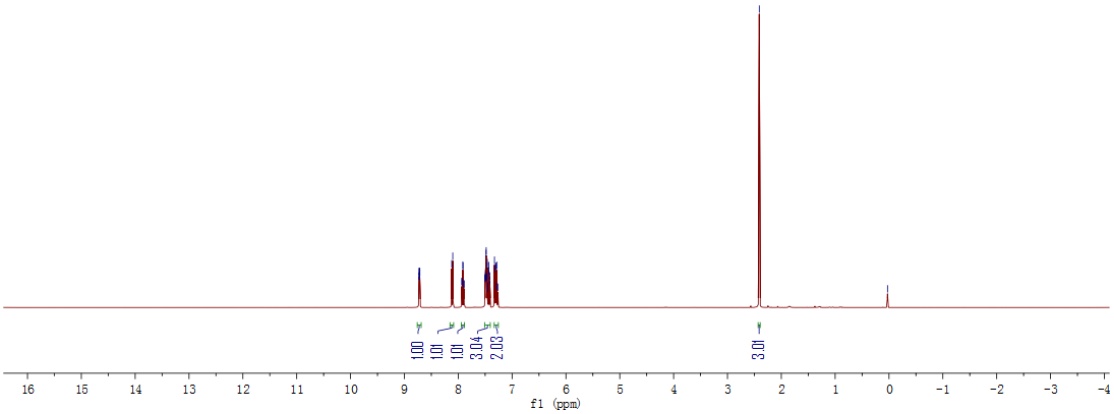
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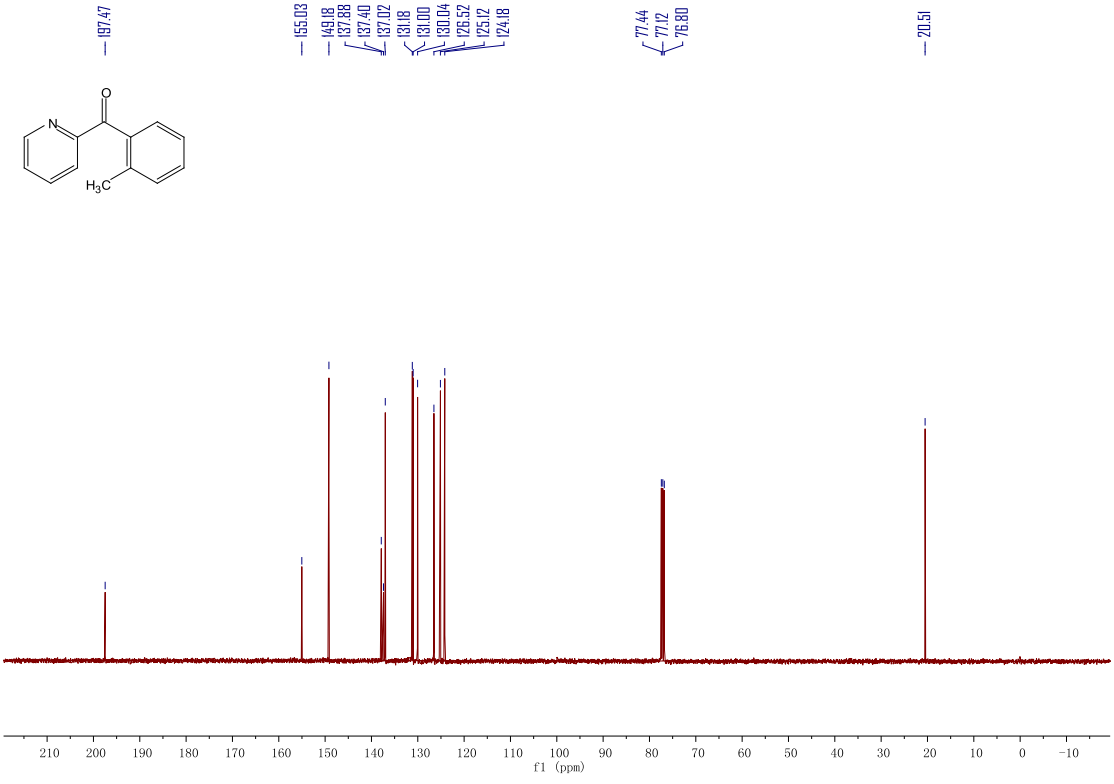
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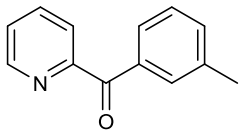

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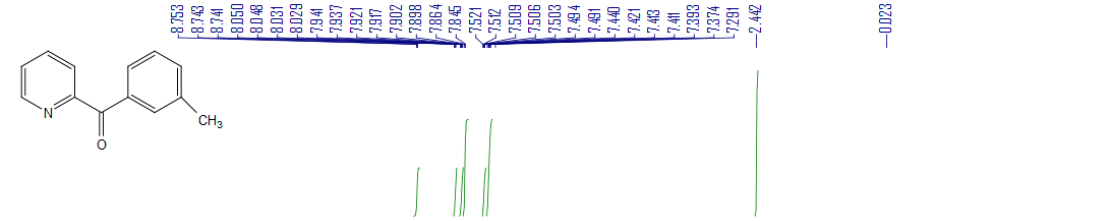
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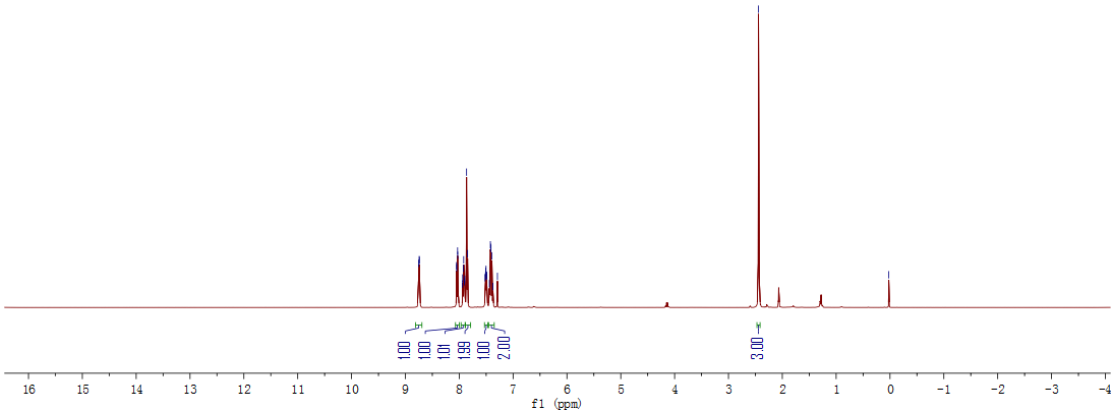
O
CH3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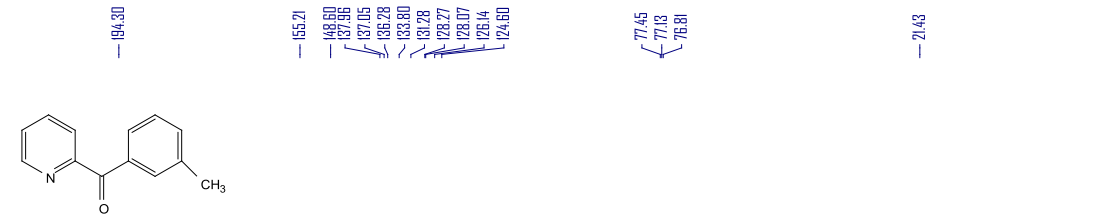
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O
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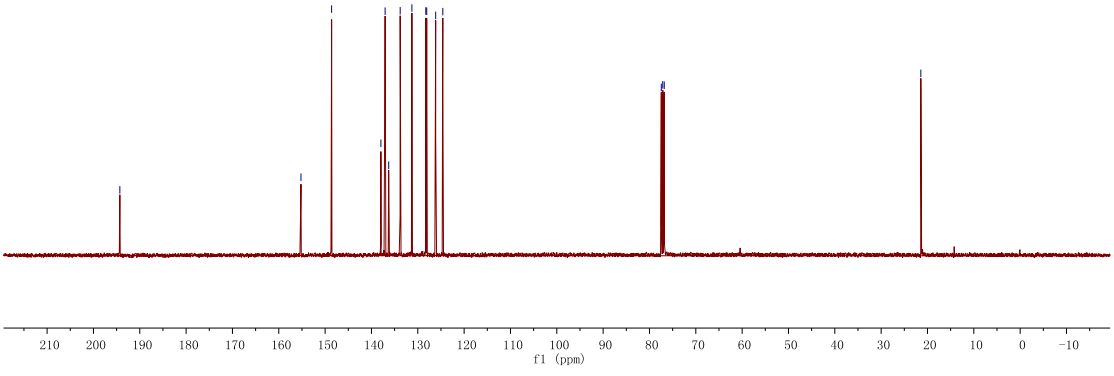
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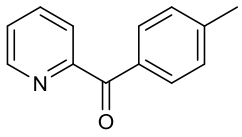

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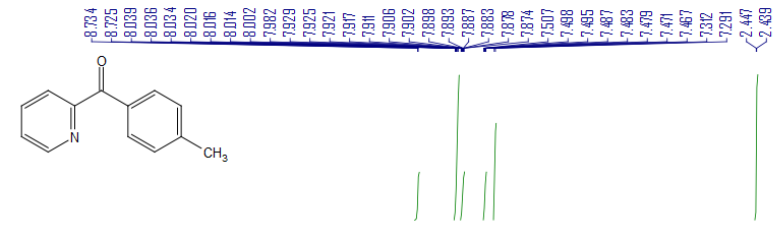
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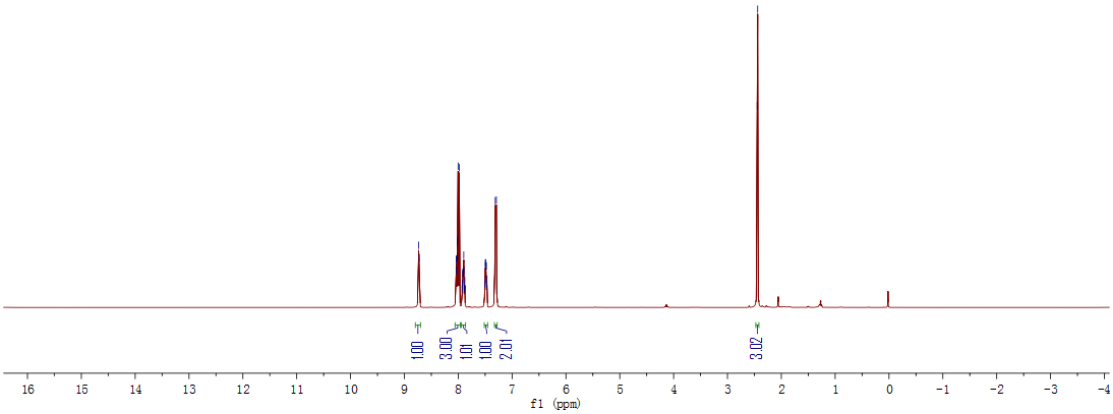
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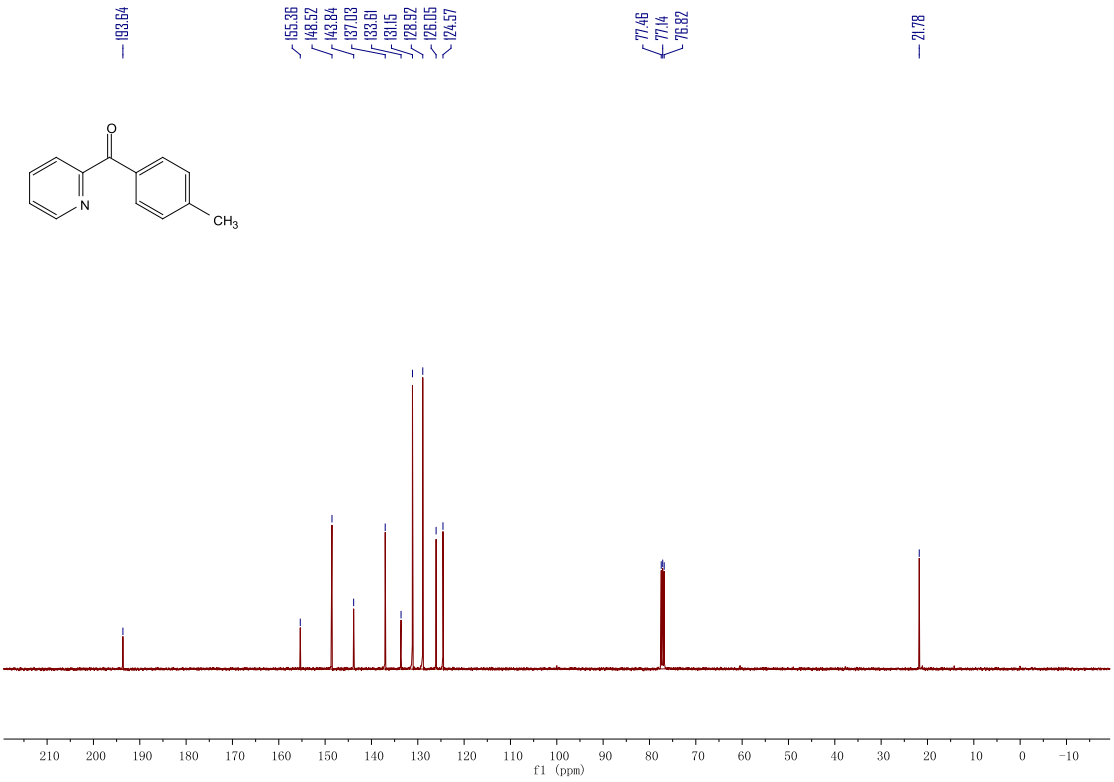
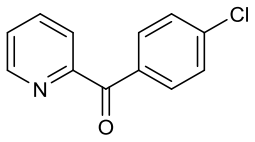
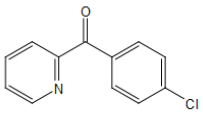
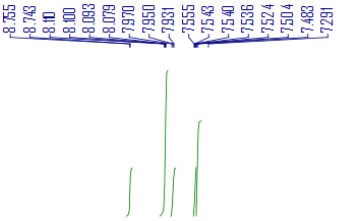
3.02
f1 (ppm)

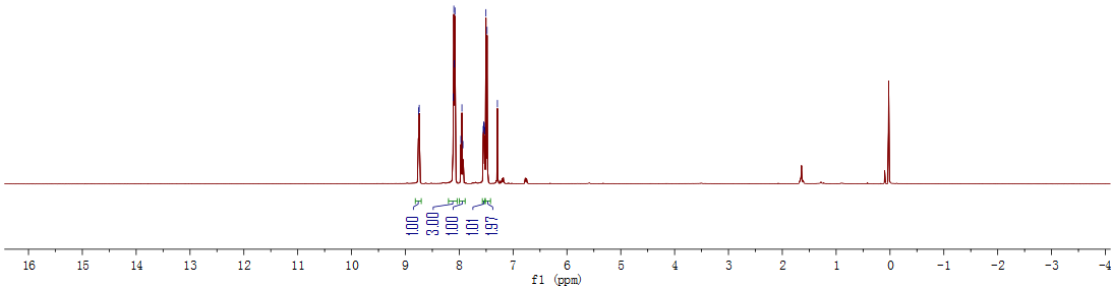

193.64
155.38
148.52
143.84
137.03
133.61
131.15
128.92
126.05
124.57
77.46
77.14
76.82
21.78
f1 (ppm)


Cl
N
O

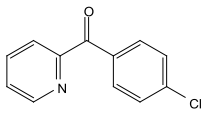
1j

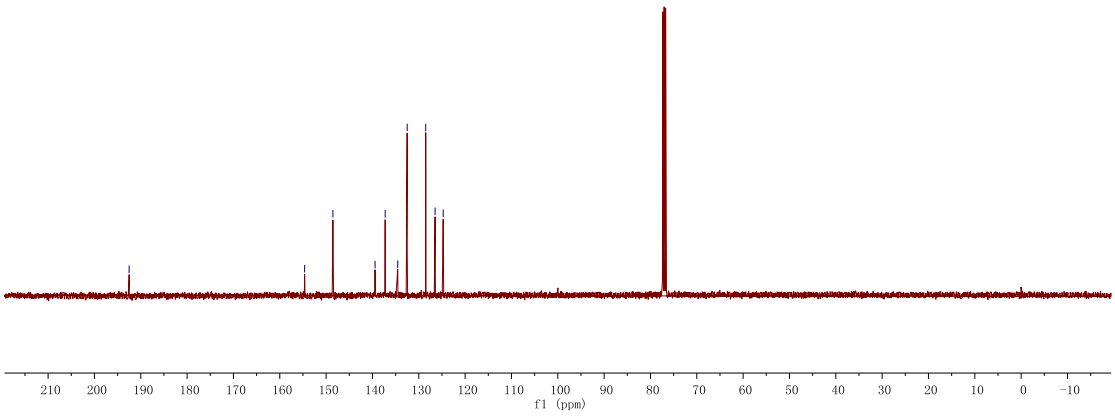

O
N
Cl

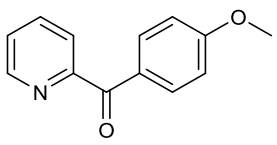

8.755
8.743
8.110
8.100
8.093
8.079
7.970
7.950
7.931
7.555
7.543
7.540
7.536
7.524
7.504
7.483
7.291


1.00
3.00
1.00
1.01
1.97
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 -2 -3 -4
f1 (ppm)

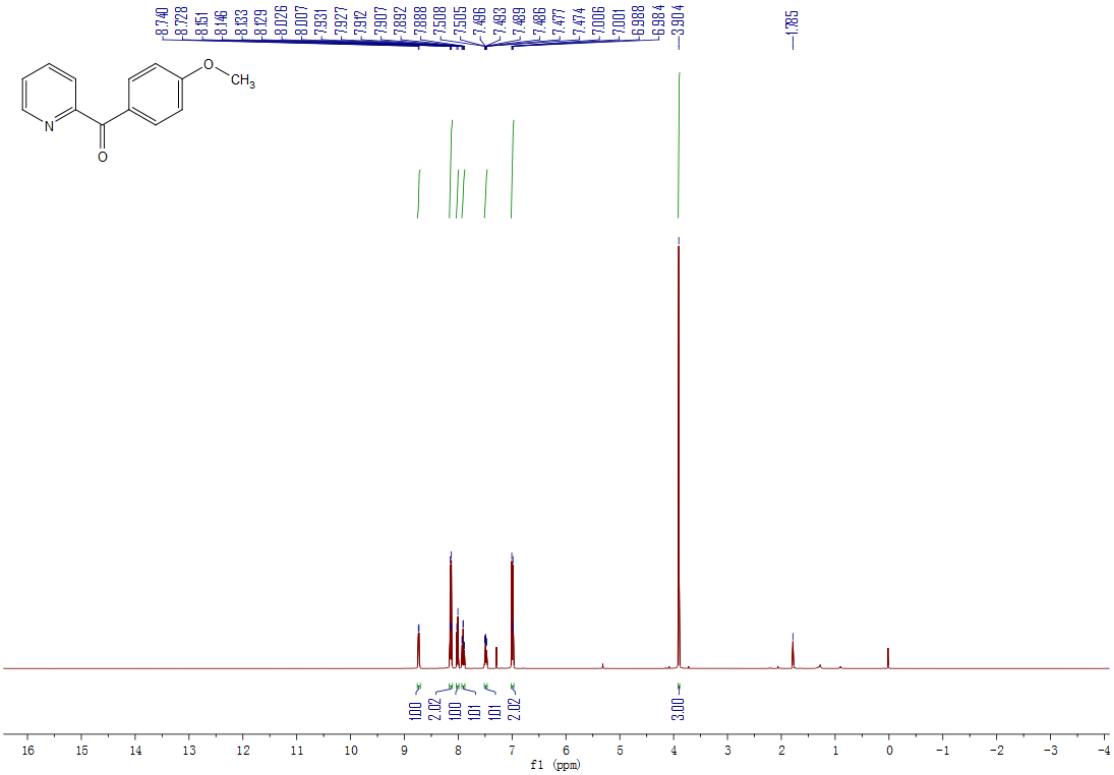

192.51
154.64
148.54
139.44
137.25
134.54
132.51
128.50
126.48
124.73

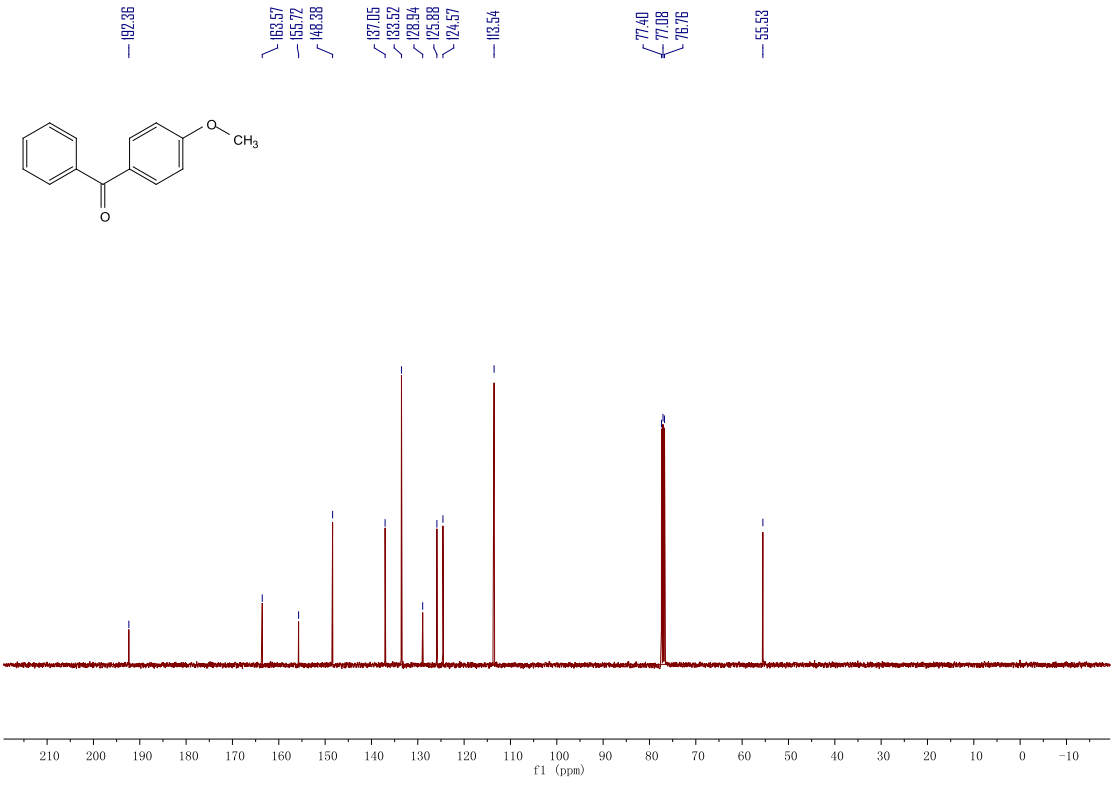

O
N
Cl

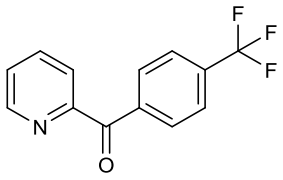

210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)



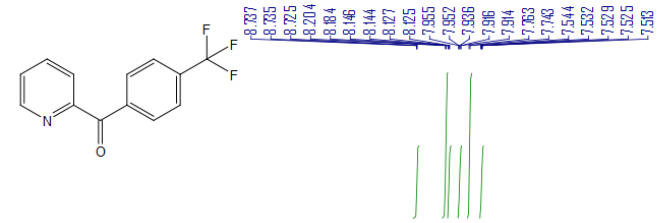
1k

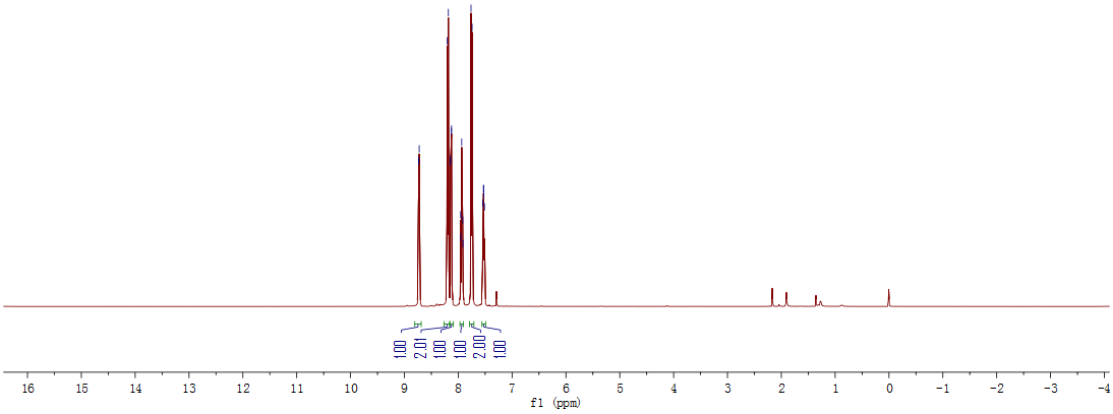

8.740
8.728
8.651
8.146
8.033
8.029
8.026
8.007
7.931
7.927
7.912
7.907
7.892
7.888
7.508
7.505
7.496
7.493
7.489
7.486
7.477
7.474
7.006
7.001
6.988
6.984
3.904
1.785
1.00
2.02
1.00
1.01
1.01
2.02
3.00
f1 (ppm)

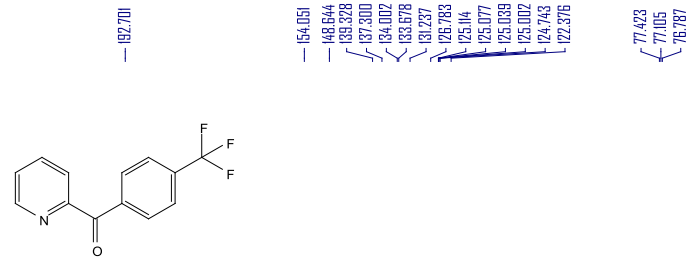

192.36
163.57
155.72
148.38
137.05
133.52
128.94
125.88
124.57
113.54
77.40
77.08
76.76
55.53
f1 (ppm)

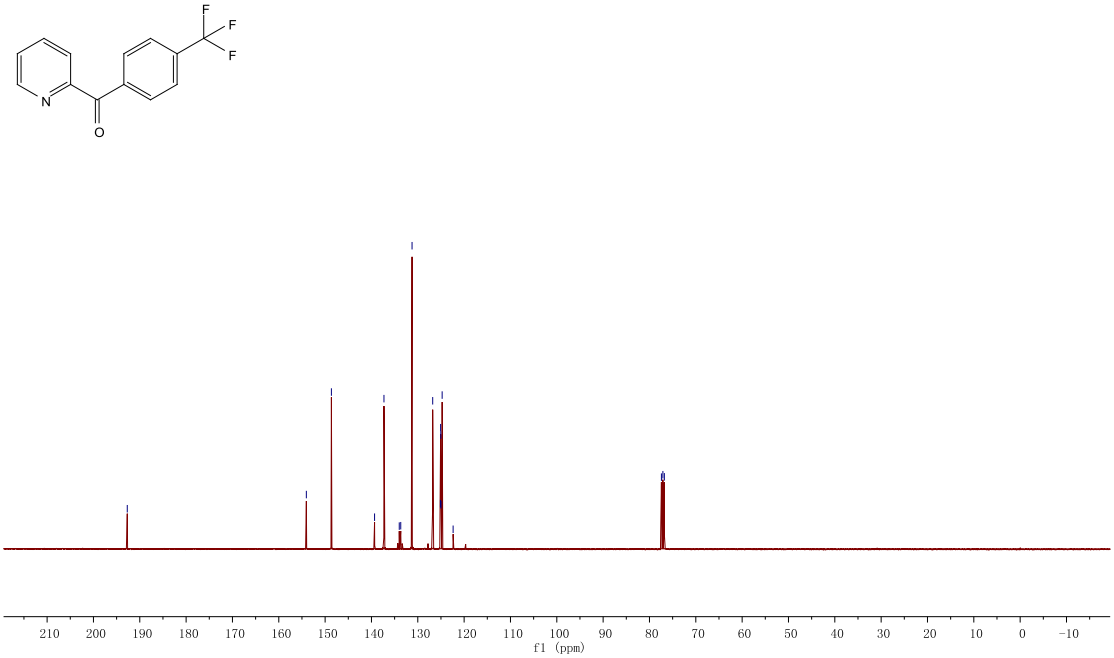


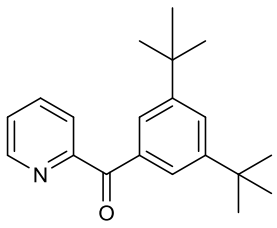
1l


8.737
8.735
8.725
8.204
8.184
8.146
8.144
8.127
8.125
7.955
7.952
7.936
7.916
7.914
7.763
7.743
7.544
7.532
7.529
7.525
7.513

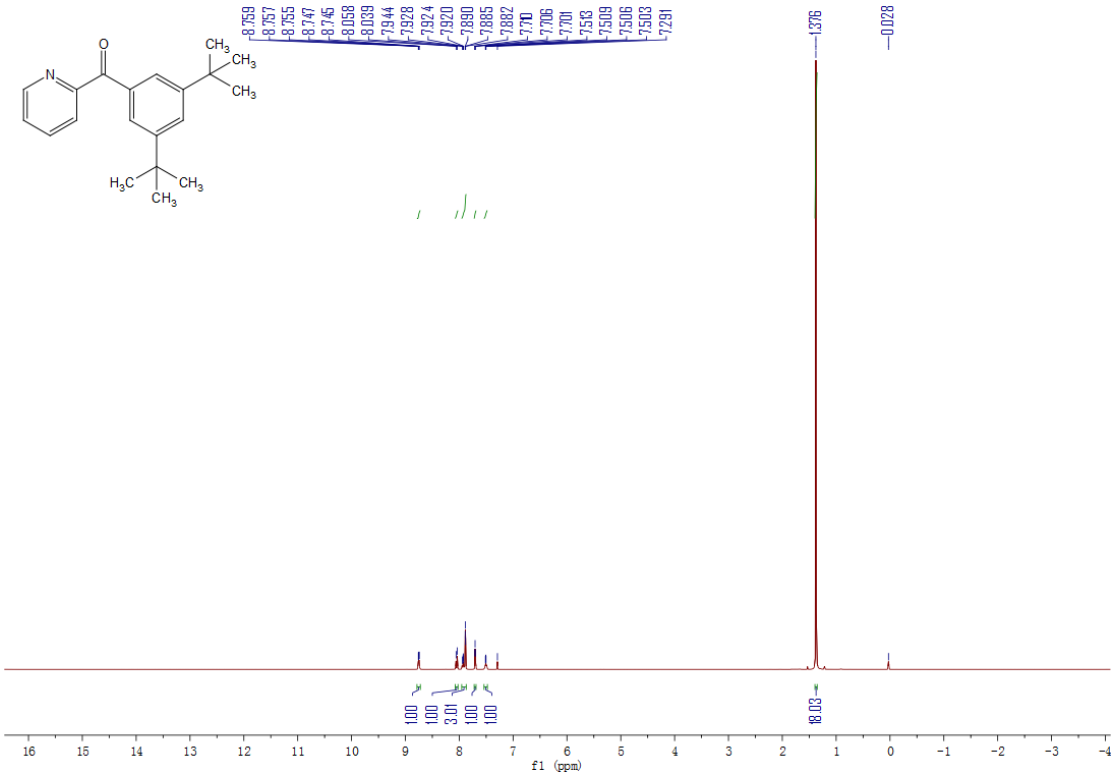

1.00
2.01
1.00
1.00
2.00
1.00
f1 (ppm)

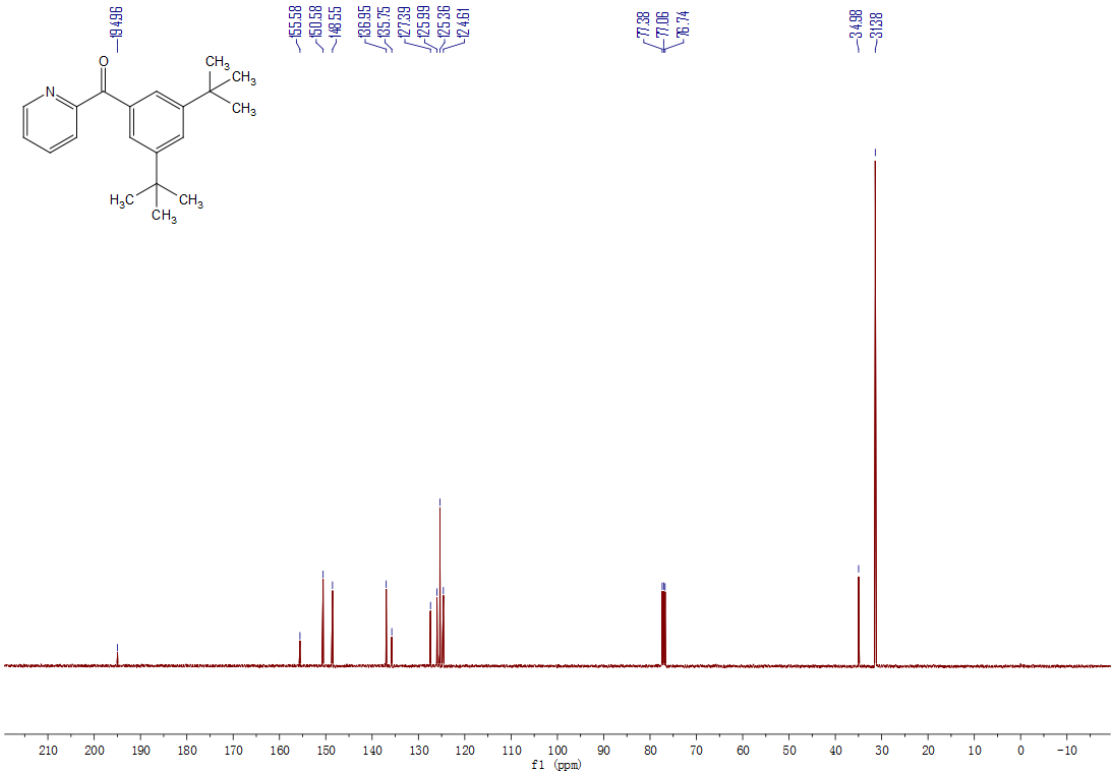

192.701
154.051
148.644
139.928
137.300
134.002
133.678
131.237
126.783
125.114
125.077
125.039
125.002
124.743
122.376
77.423
77.105
76.787

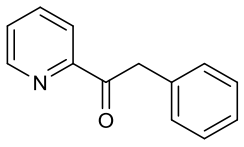

f1 (ppm)



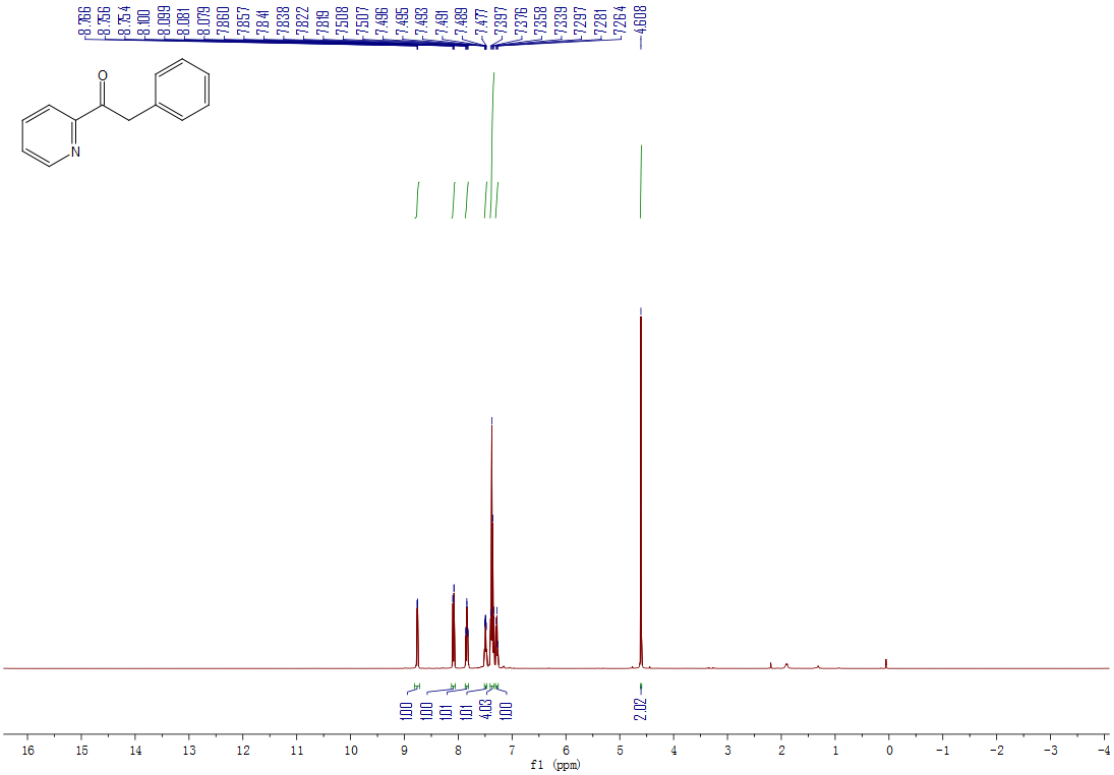
1m

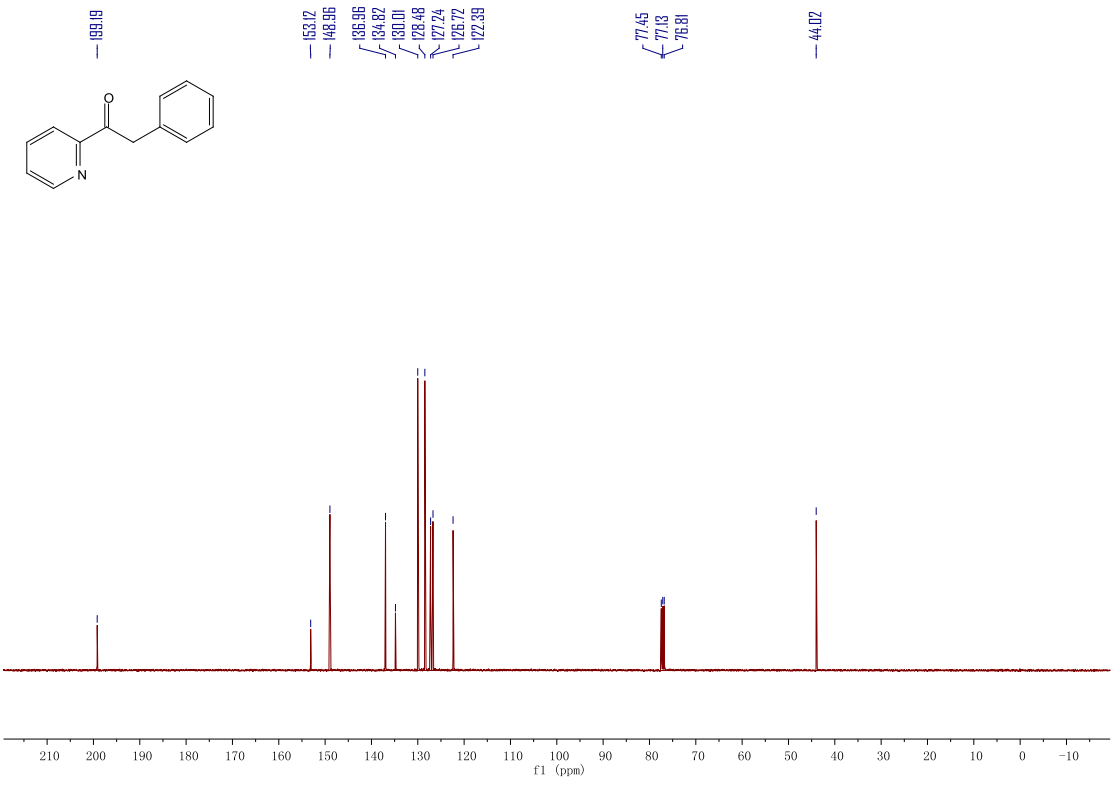

8.759
8.757
8.755
8.747
8.745
8.058
8.039
7.944
7.928
7.924
7.920
7.890
7.885
7.882
7.710
7.706
7.701
7.513
7.509
7.506
7.503
7.291
1.376
0.028
1.00
1.00
3.01
1.00
1.00
18.03
f1 (ppm)

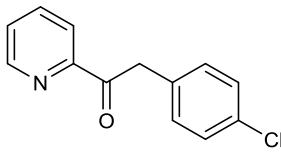

19.496
155.58
150.58
148.55
136.95
135.75
127.39
125.99
125.38
124.61
77.38
77.06
76.74
34.98
31.38
f1 (ppm)



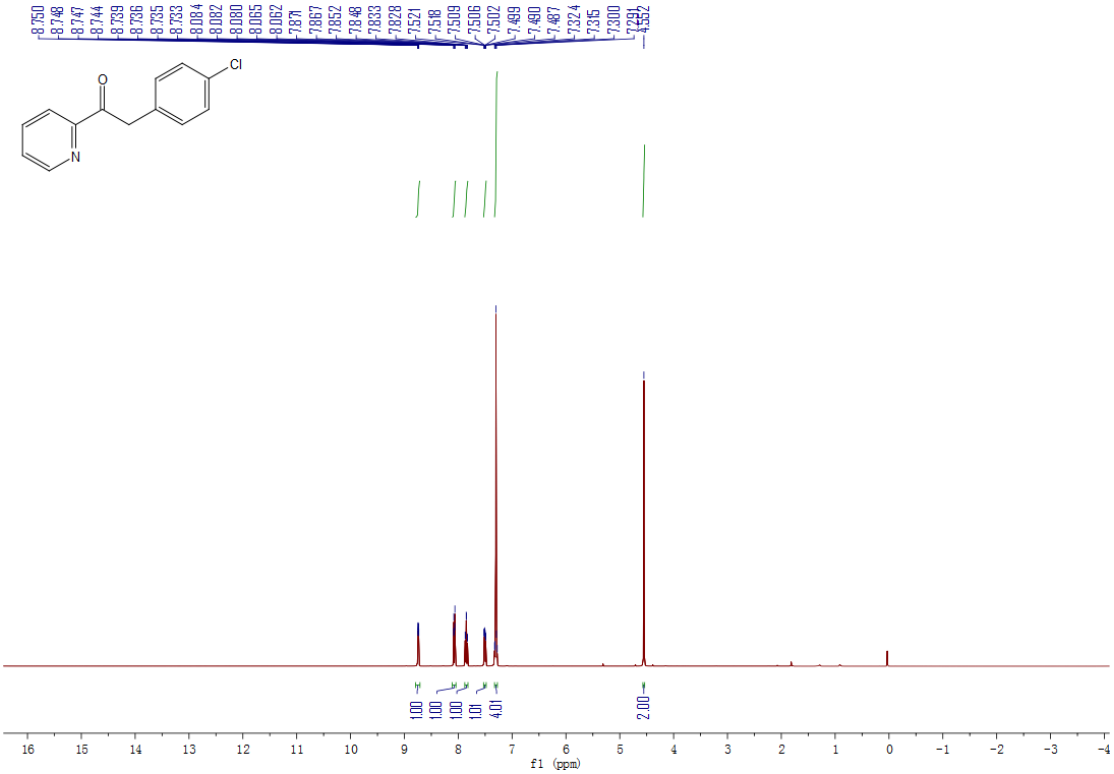
1n

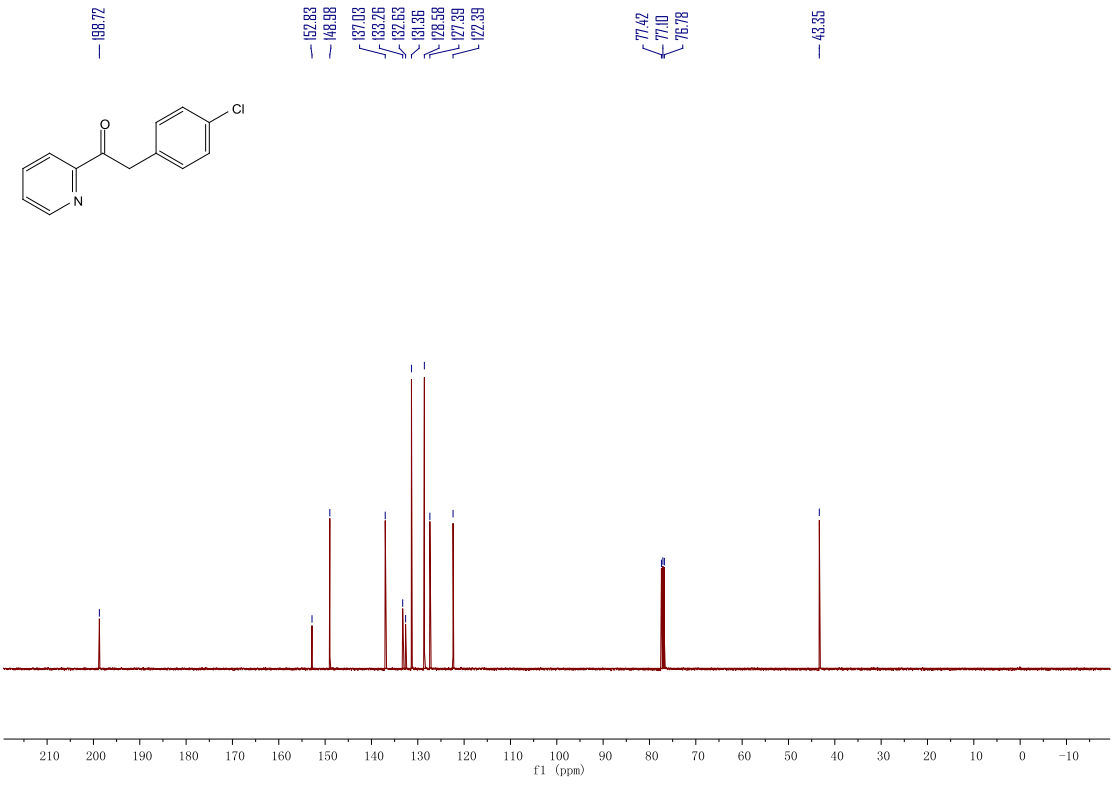

8.766
8.756
8.754
8.100
8.099
8.081
8.079
7.860
7.857
7.844
7.838
7.822
7.819
7.508
7.507
7.496
7.495
7.493
7.491
7.489
7.477
7.397
7.376
7.358
7.339
7.297
7.281
7.264
4.608
1.00
1.00
1.01
1.01
4.03
1.00
2.02
f1 (ppm)

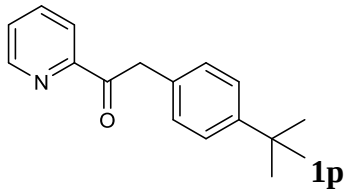

199.19
153.12
148.96
136.96
134.82
130.01
128.48
127.24
126.72
122.39
77.45
77.13
76.81
44.02
f1 (ppm)


N
O
Cl

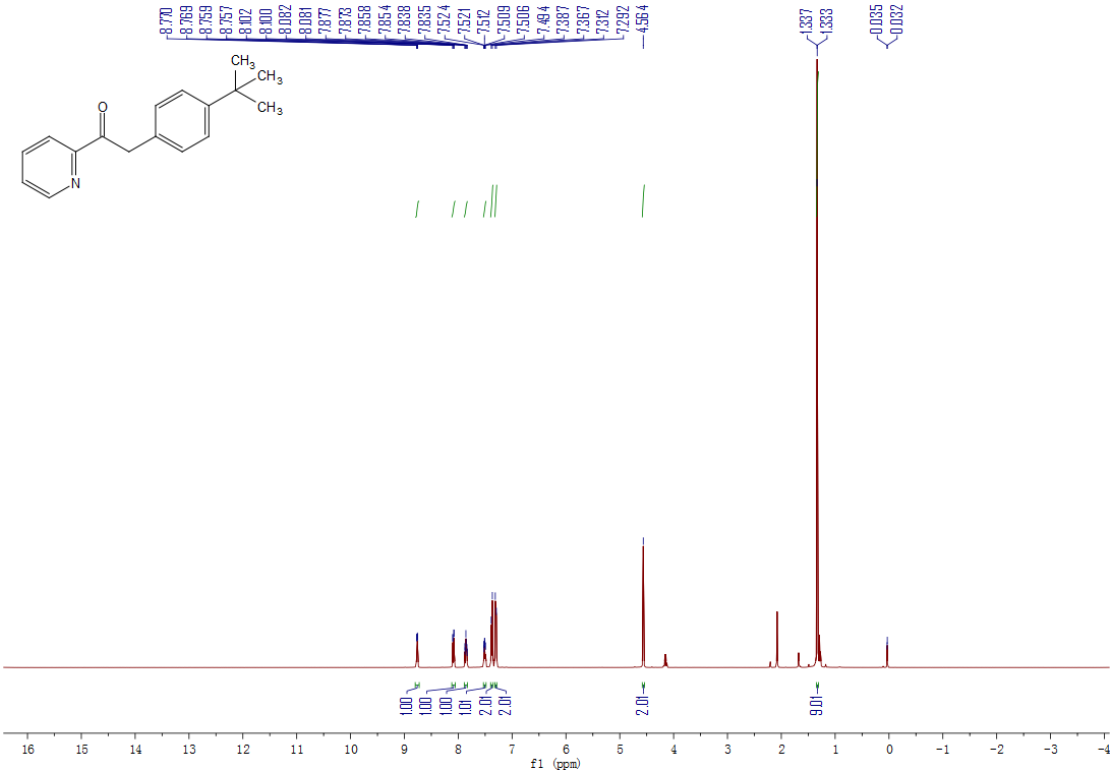
1o

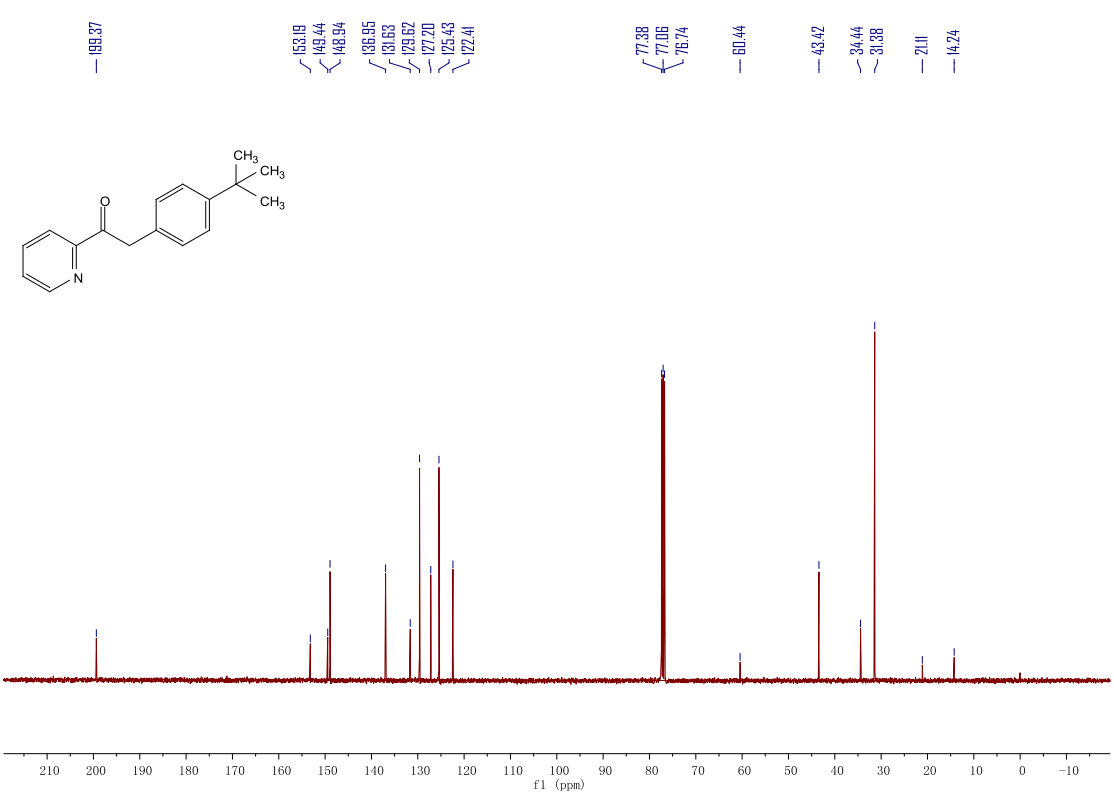

8.750
8.748
8.747
8.744
8.739
8.736
8.735
8.733
8.084
8.082
8.080
8.065
8.062
7.871
7.867
7.852
7.848
7.833
7.828
7.521
7.518
7.509
7.506
7.502
7.489
7.490
7.487
7.324
7.315
7.300
7.291
4.552
O
Cl
N
1.00
1.00
1.00
1.01
4.01
2.00
f1 (ppm)

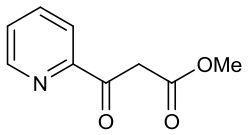

198.72
152.83
148.98
137.03
133.26
132.63
131.36
128.58
127.39
122.39
77.42
77.10
76.78
43.35
O
Cl
N
f1 (ppm)



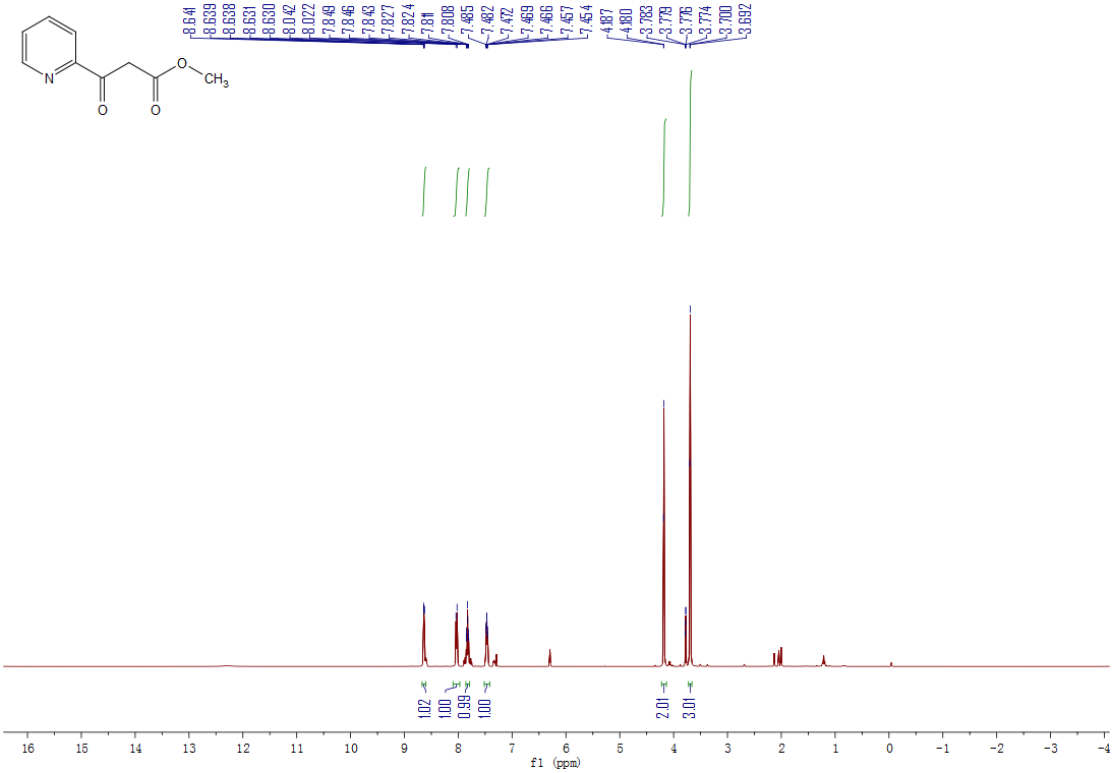
1p


8.770
8.769
8.759
8.757
8.602
8.600
8.082
8.081
7.877
7.873
7.858
7.854
7.838
7.835
7.524
7.521
7.512
7.509
7.506
7.494
7.387
7.367
7.312
7.292
4.564
1.337
1.333
0.035
0.032
1.00
1.00
1.00
1.01
2.04
2.01
2.01
9.01
f1 (ppm)

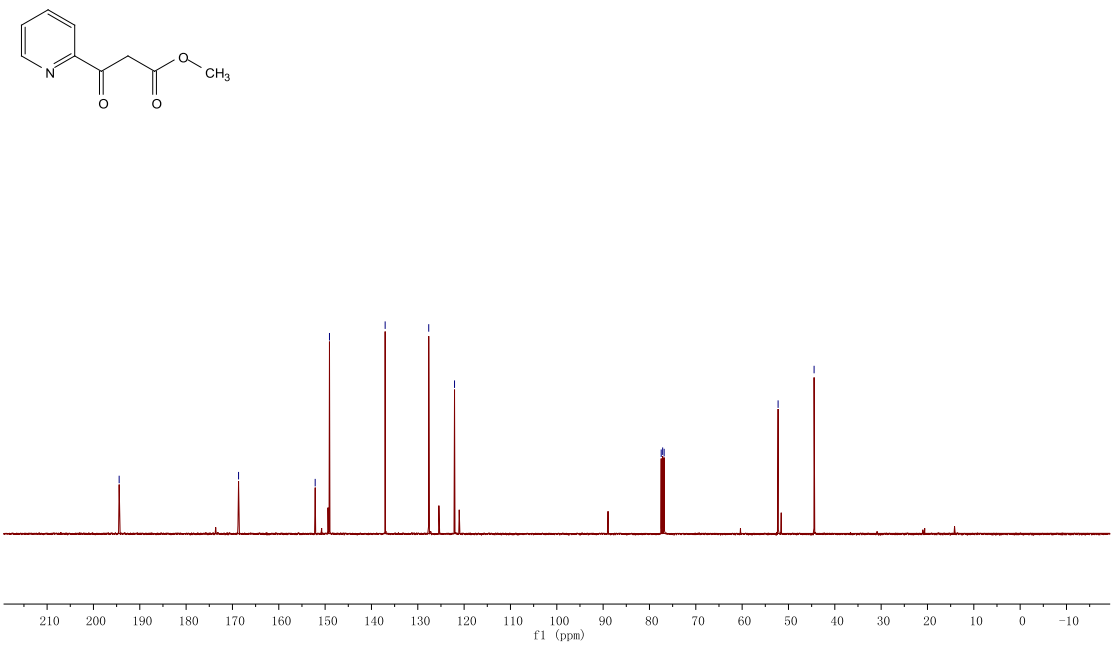

199.37
153.19
149.44
148.94
136.95
131.63
129.62
127.20
125.43
122.41
77.38
77.06
76.74
60.44
43.42
34.44
31.38
21.11
14.24
f1 (ppm)

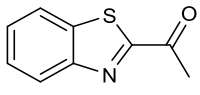

OMe
N
O
O

1q

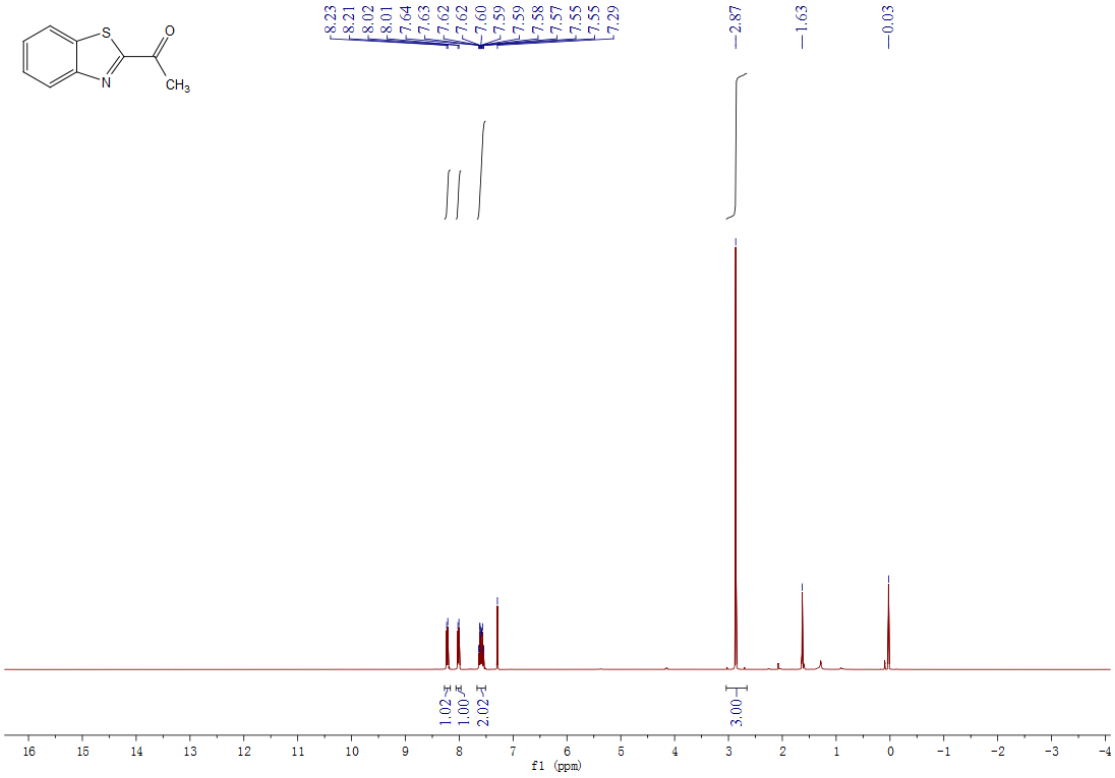

8.641
8.639
8.638
8.631
8.630
8.042
8.022
7.849
7.846
7.843
7.827
7.824
7.811
7.808
7.485
7.482
7.472
7.469
7.466
7.457
7.454
4.887
4.880
3.783
3.779
3.776
3.774
3.700
3.692
1.02
1.00
0.99
1.00
2.01
3.01
f1 (ppm)

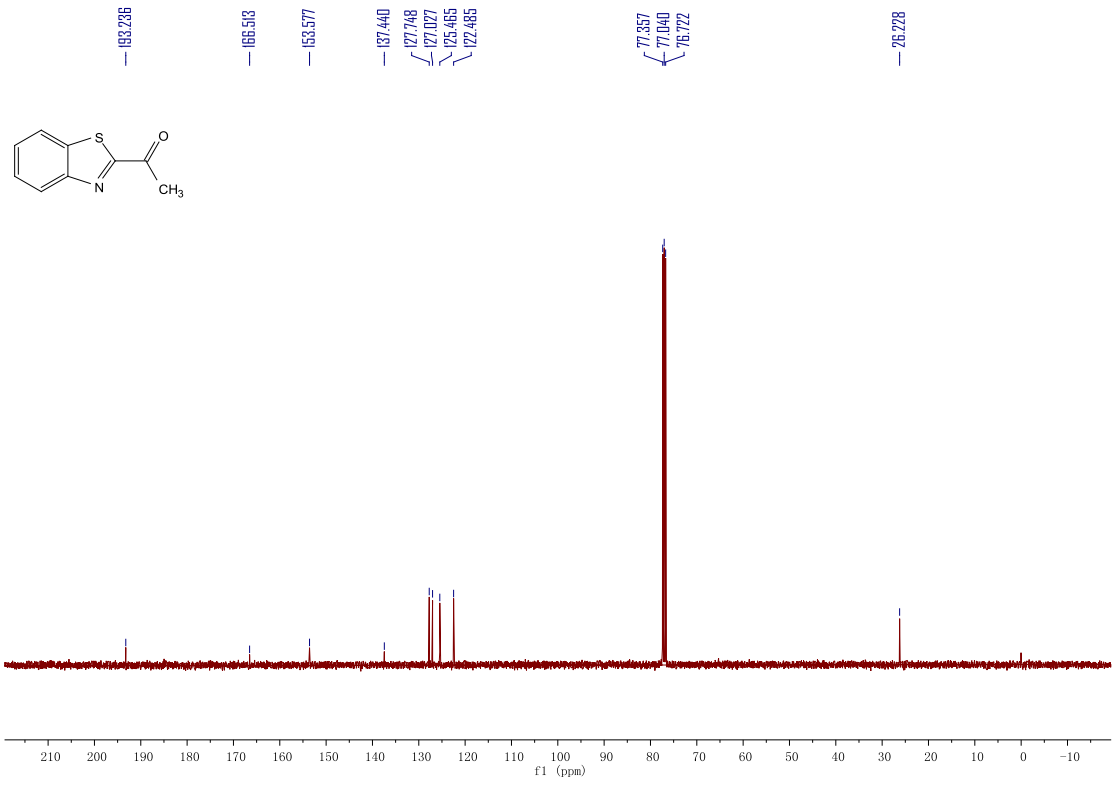

194.45
168.68
152.14
149.06
137.04
127.64
122.07
77.47
77.15
76.83
52.24
44.47

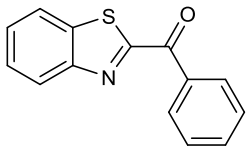

f1 (ppm)



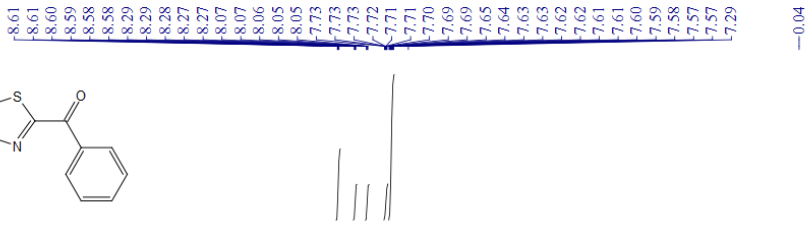
1u

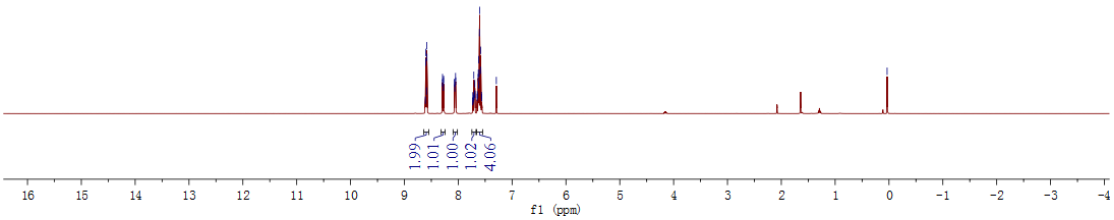

8.23
8.21
8.02
8.01
7.64
7.63
7.62
7.62
7.60
7.59
7.59
7.59
7.58
7.57
7.55
7.55
7.29
2.87
1.63
0.03
1.02
1.00
2.02
3.00
f1 (ppm)


193.236
166.513
153.577
137.440
127.748
127.027
125.465
122.485
77.357
77.040
76.722
26.228
f1 (ppm)

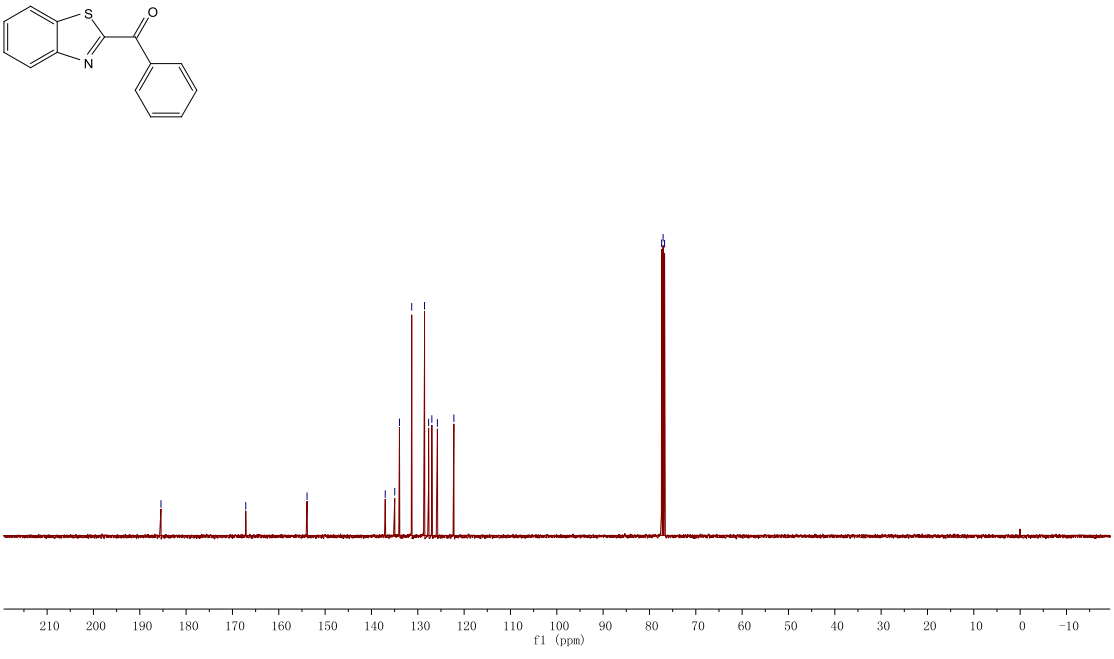


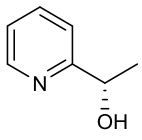
1v


8.61
8.61
8.60
8.59
8.58
8.58
8.29
8.29
8.28
8.27
8.27
8.07
8.06
8.05
8.05
7.73
7.73
7.73
7.72
7.71
7.71
7.70
7.69
7.69
7.65
7.64
7.63
7.63
7.62
7.62
7.61
7.61
7.60
7.59
7.58
7.57
7.57
7.29
-0.04

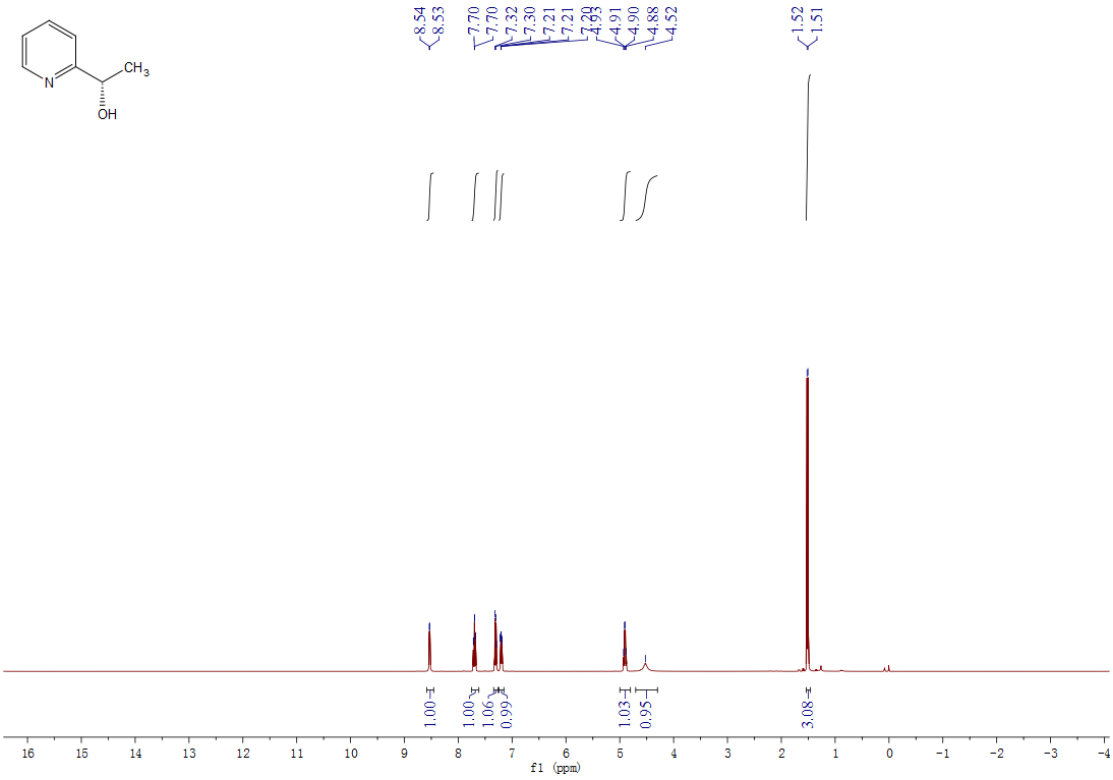

1.99
1.01
1.00
1.02
4.06
f1 (ppm)

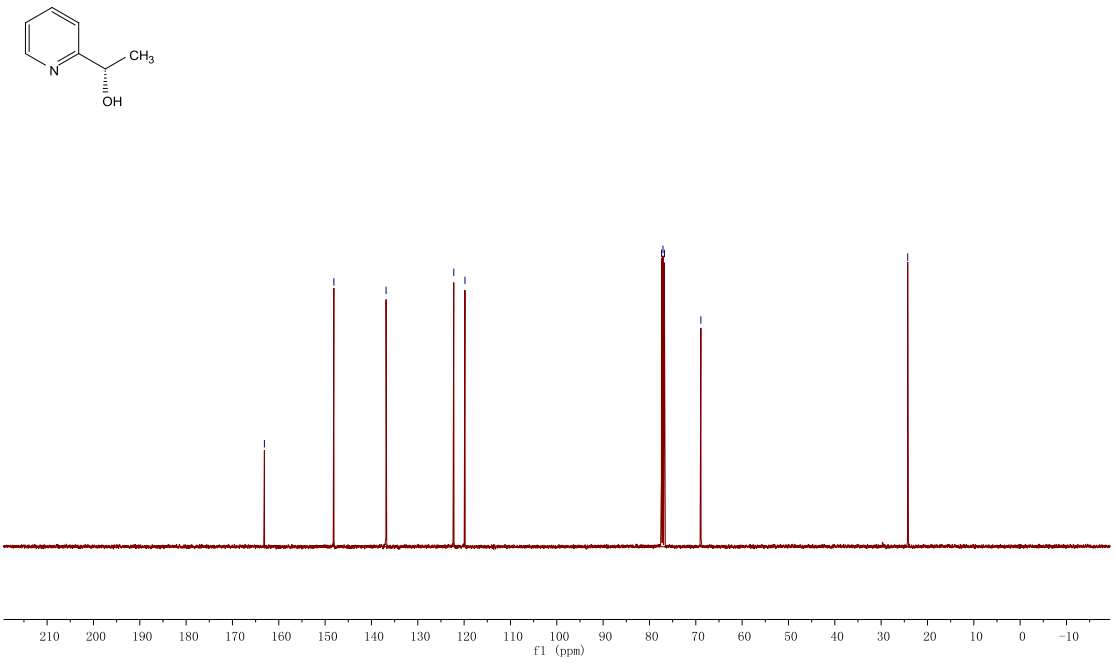

185.427
167.129
153.899
137.025
134.976
133.954
131.309
128.549
127.666
126.968
125.765
122.212
77.378
77.060
76.743

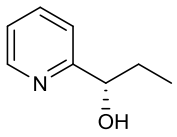

f1 (ppm)


N
OH

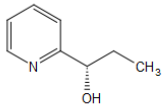
2a

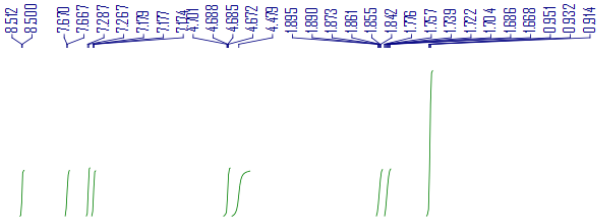

CH3
N
OH
8.54
8.53
7.70
7.70
7.32
7.30
7.21
7.21
7.20
4.93
4.91
4.90
4.88
4.52
1.52
1.51
1.00
1.00
1.06
0.99
1.03
0.95
3.08
f1 (ppm)

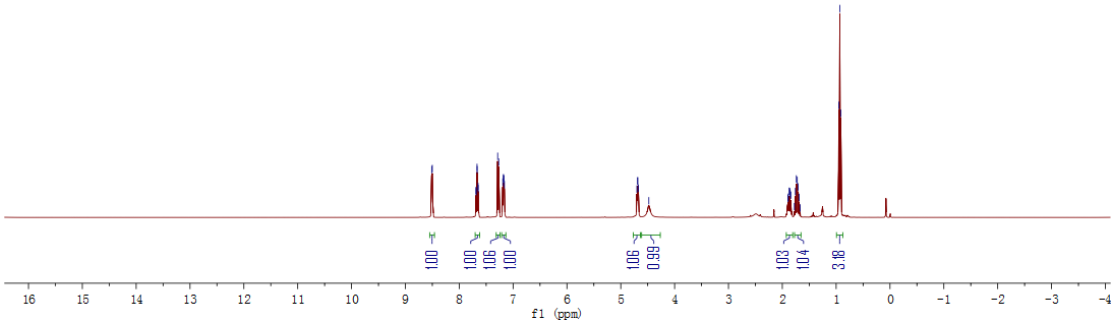

CH3
N
OH
153.104
148.111
136.842
122.236
119.820
77.400
77.082
76.764
68.903
24.266
f1 (ppm)

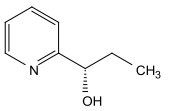


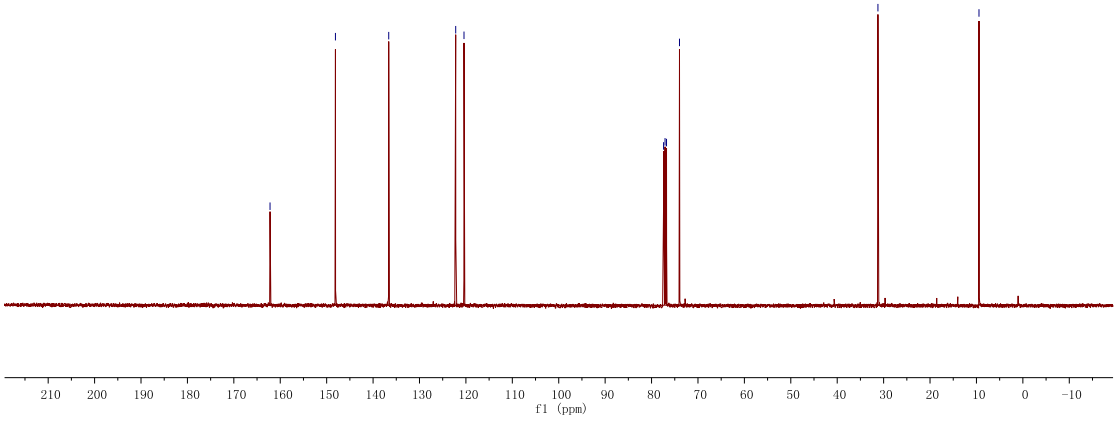
2b

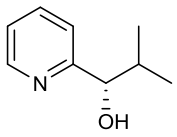



8.512
8.500
7.670
7.667
7.287
7.267
7.179
7.177
7.174
7.171
4.700
4.688
4.685
4.672
4.479
1.895
1.880
1.873
1.861
1.855
1.842
1.776
1.757
1.739
1.722
1.704
1.688
1.668
0.951
0.932
0.914


1.00
1.00
1.06
1.00
1.06
0.99
1.03
1.04
3.18
f1 (ppm)

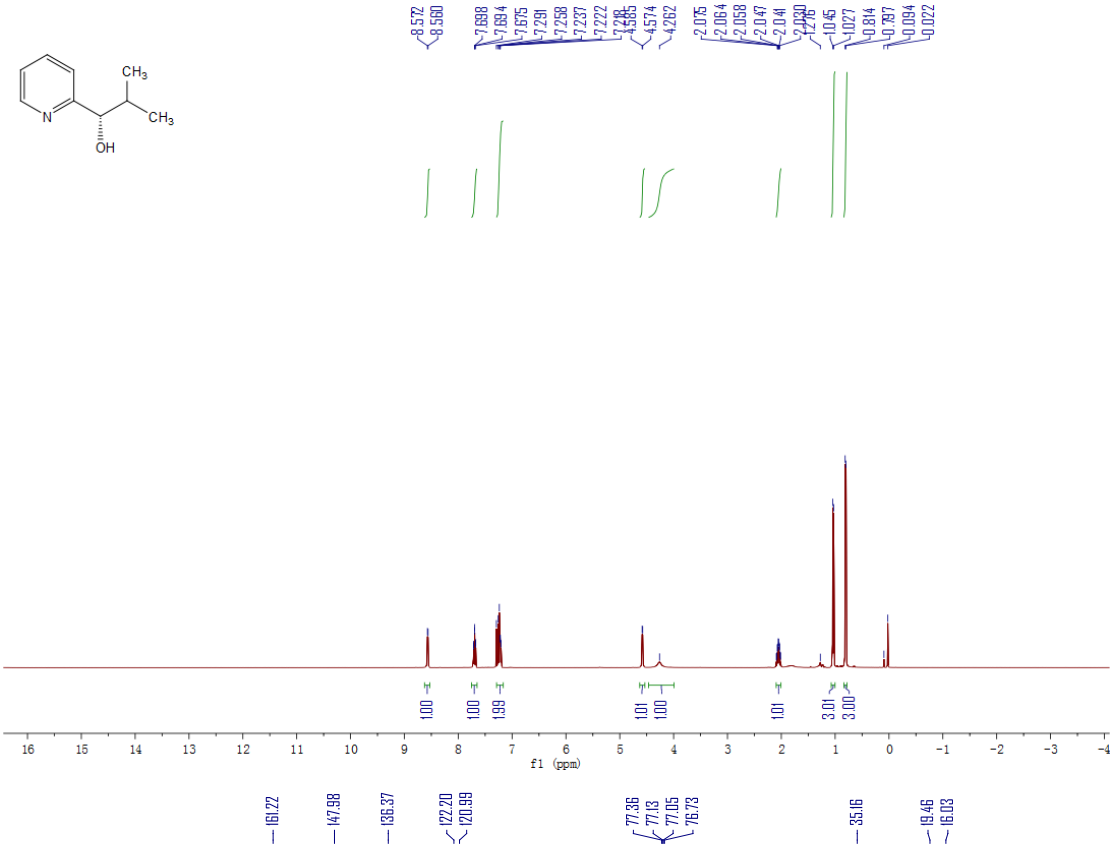


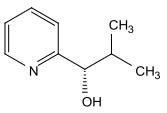

162.20
148.11
136.63
122.20
120.41
77.41
77.09
76.78
73.98
31.23
9.45
f1 (ppm)

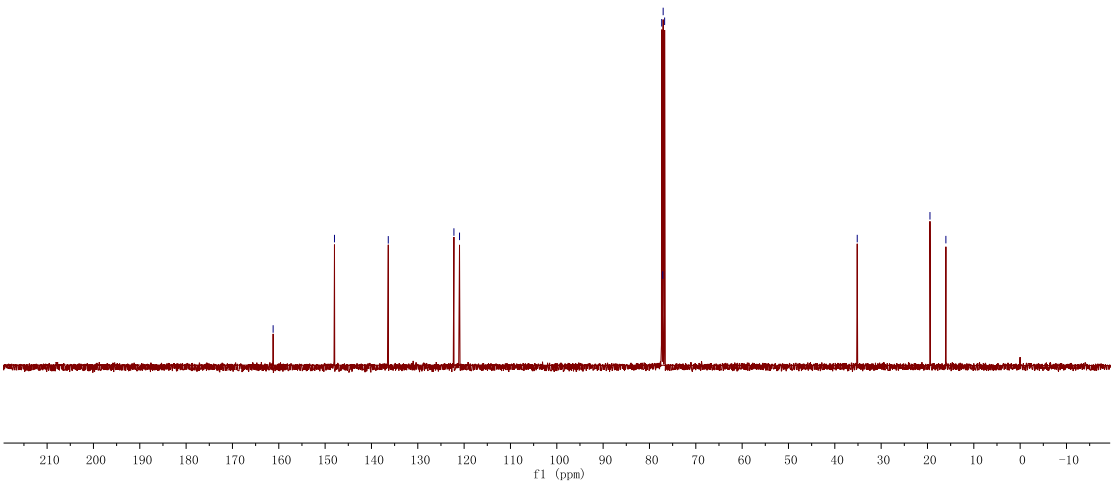

N
OH

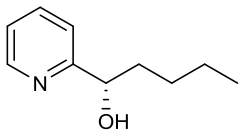
2c

CH3
CH3
N
OH

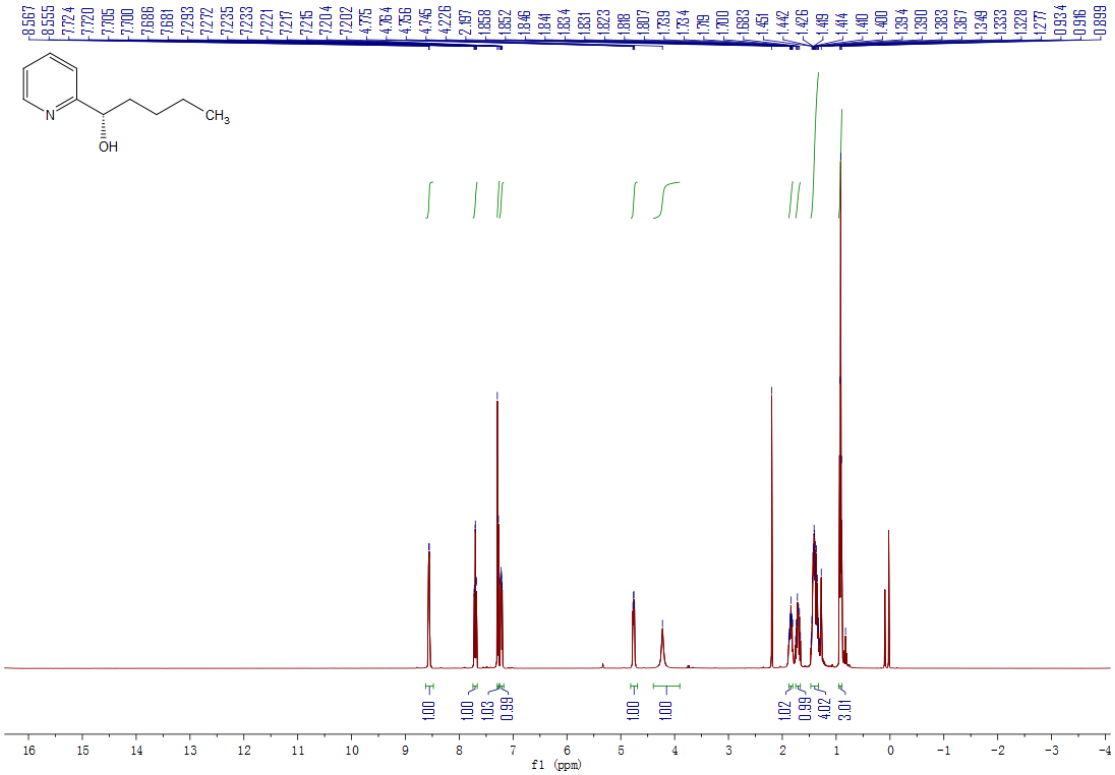

8.572
8.560
7.698
7.694
7.675
7.291
7.258
7.237
7.222
4.574
4.562
2.075
2.064
2.058
2.047
2.041
1.045
1.027
0.814
0.787
0.094
0.022
1.00
1.00
1.99
1.01
1.00
1.01
3.01
3.00
f1 (ppm)
161.22
147.98
136.37
122.20
120.99
77.36
77.13
77.05
76.73
35.16
19.46
16.03

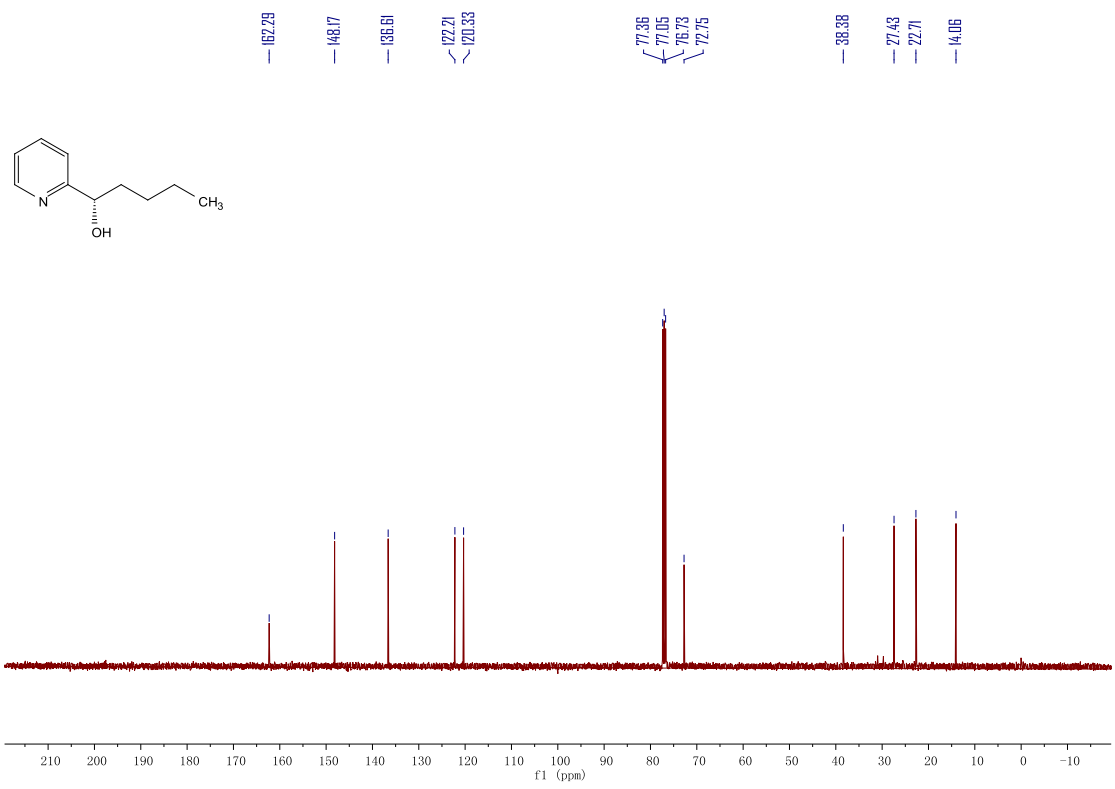

CH3
CH3
N
OH

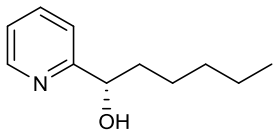

f1 (ppm)


N
OH

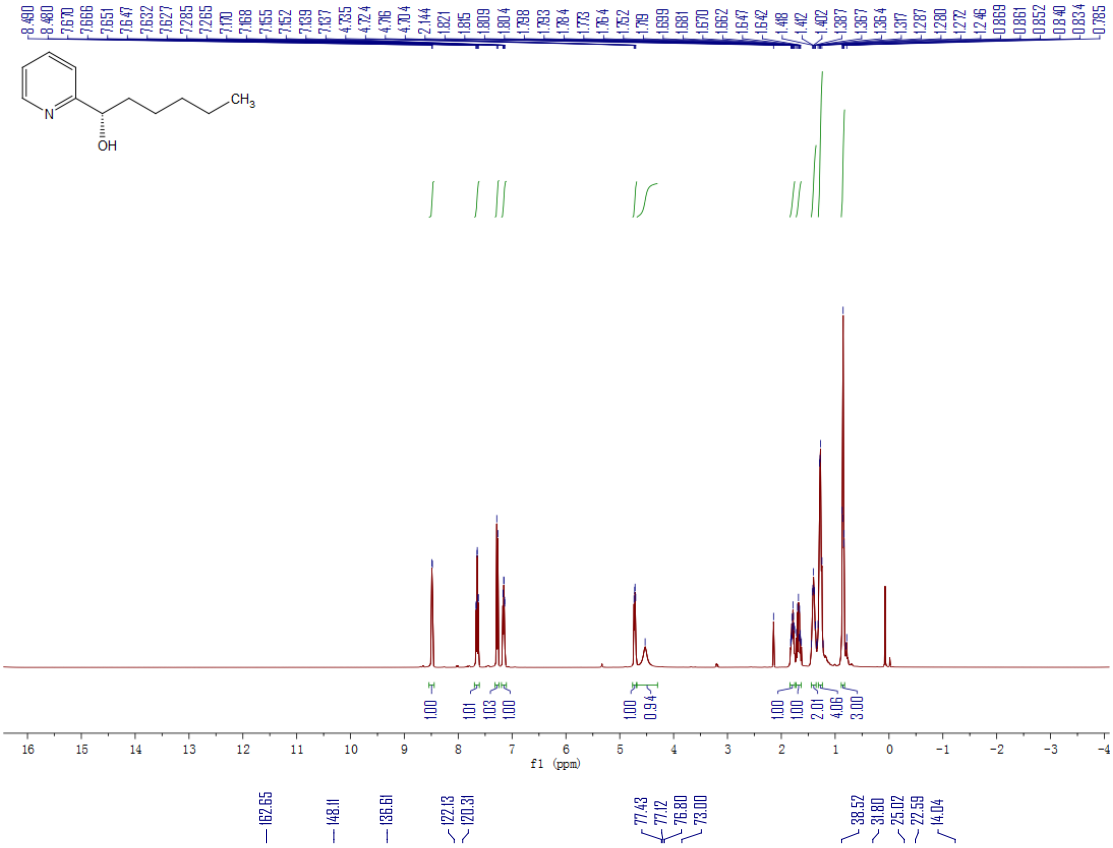
2d

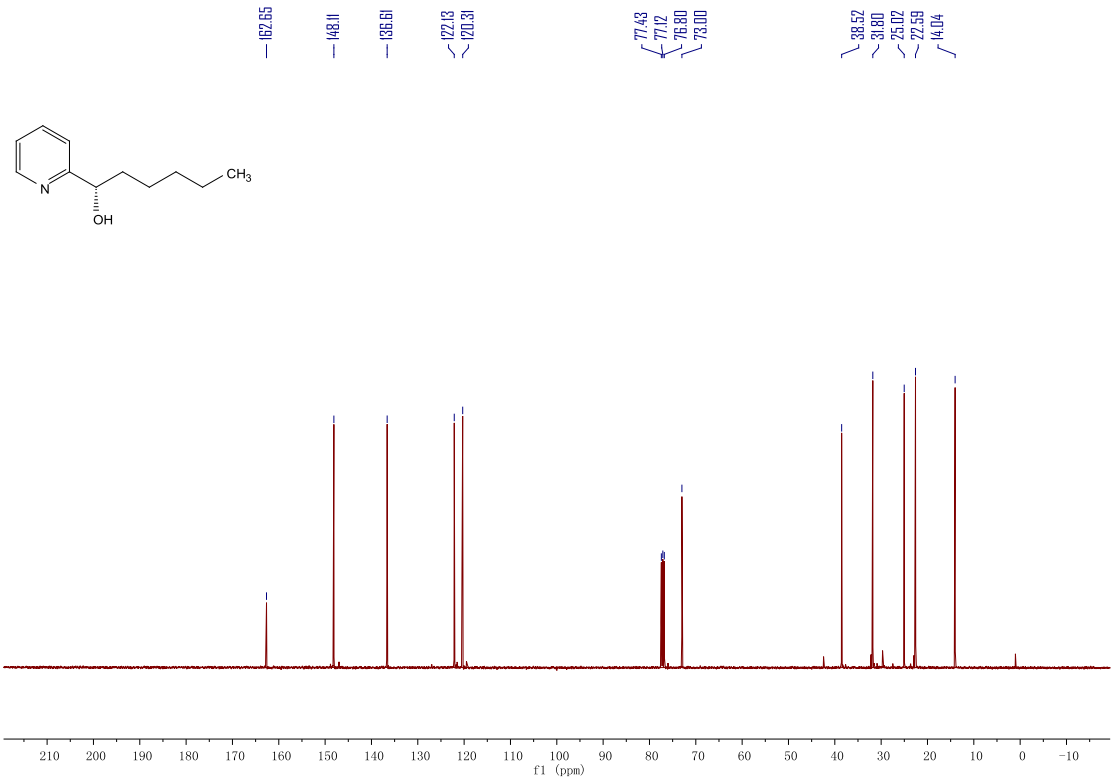

8.567
8.555
7.724
7.720
7.705
7.700
7.686
7.681
7.293
7.272
7.235
7.233
7.221
7.217
7.215
7.204
7.202
4.775
4.764
4.756
4.745
4.226
2.197
1.858
1.852
1.846
1.844
1.834
1.831
1.823
1.818
1.807
1.739
1.724
1.719
1.700
1.683
1.451
1.442
1.426
1.419
1.414
1.410
1.400
1.394
1.390
1.383
1.367
1.349
1.333
1.328
1.277
0.934
0.916
0.899
N
OH
CH3
1.00
1.00
1.03
0.99
1.00
1.00
1.02
0.99
4.02
3.01
f1 (ppm)

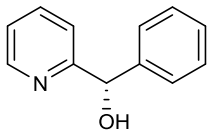

162.29
148.17
136.61
122.21
120.33
77.36
77.05
76.73
72.75
38.38
27.43
22.71
14.06
N
OH
CH3
f1 (ppm)


N
OH

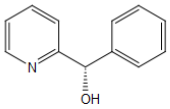
2e

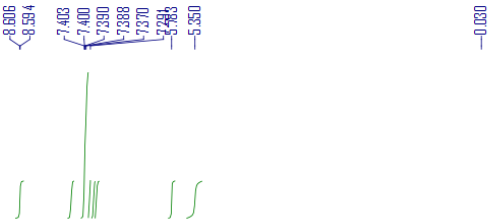

8.490
8.480
7.670
7.666
7.651
7.647
7.632
7.627
7.285
7.265
7.170
7.168
7.155
7.152
7.139
7.137
4.735
4.724
4.716
4.704
2.144
1.821
1.815
1.809
1.804
1.798
1.793
1.784
1.773
1.764
1.752
1.709
1.689
1.681
1.670
1.662
1.647
1.642
1.448
1.442
1.402
1.387
1.367
1.364
1.317
1.287
1.280
1.272
1.246
0.869
0.861
0.852
0.840
0.834
0.785
CH3
N
OH
1.00
1.01
1.03
1.00
1.00
0.94
1.00
1.00
2.01
4.06
3.00
f1 (ppm)

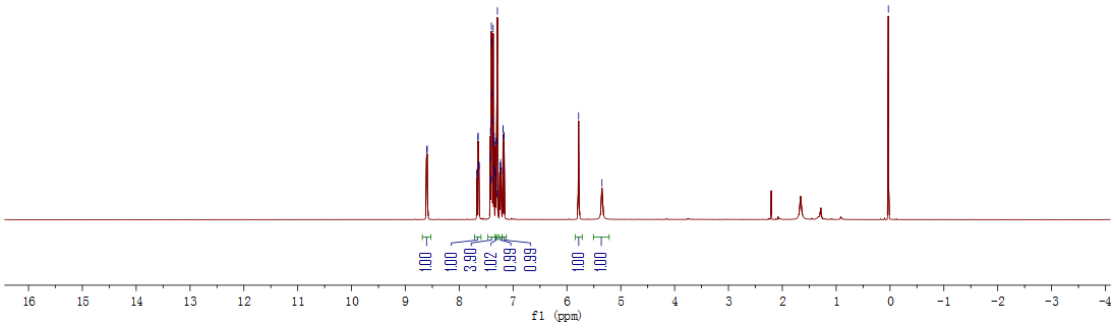

162.65
148.11
136.61
122.13
120.31
77.43
77.12
76.80
73.00
38.52
31.80
25.02
22.59
14.04
CH3
N
OH
f1 (ppm)

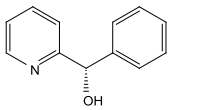


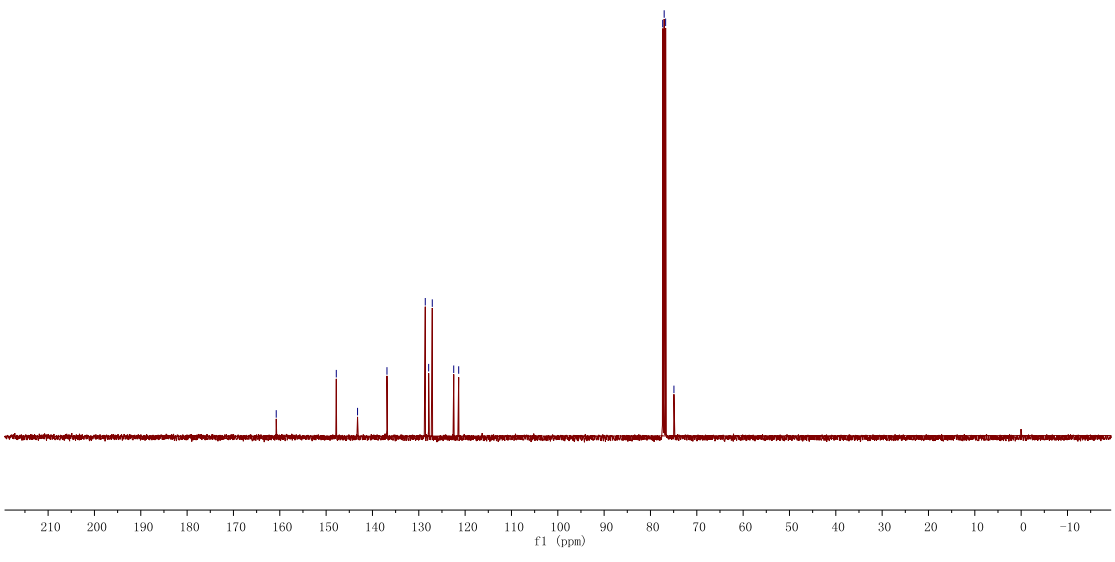
2f

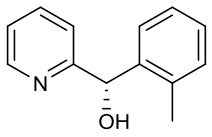



8.606
8.594
7.403
7.400
7.390
7.388
7.370
5.963
5.950
0.030


1.00
1.00
3.90
1.02
0.99
0.99
1.00
1.00
f1 (ppm)

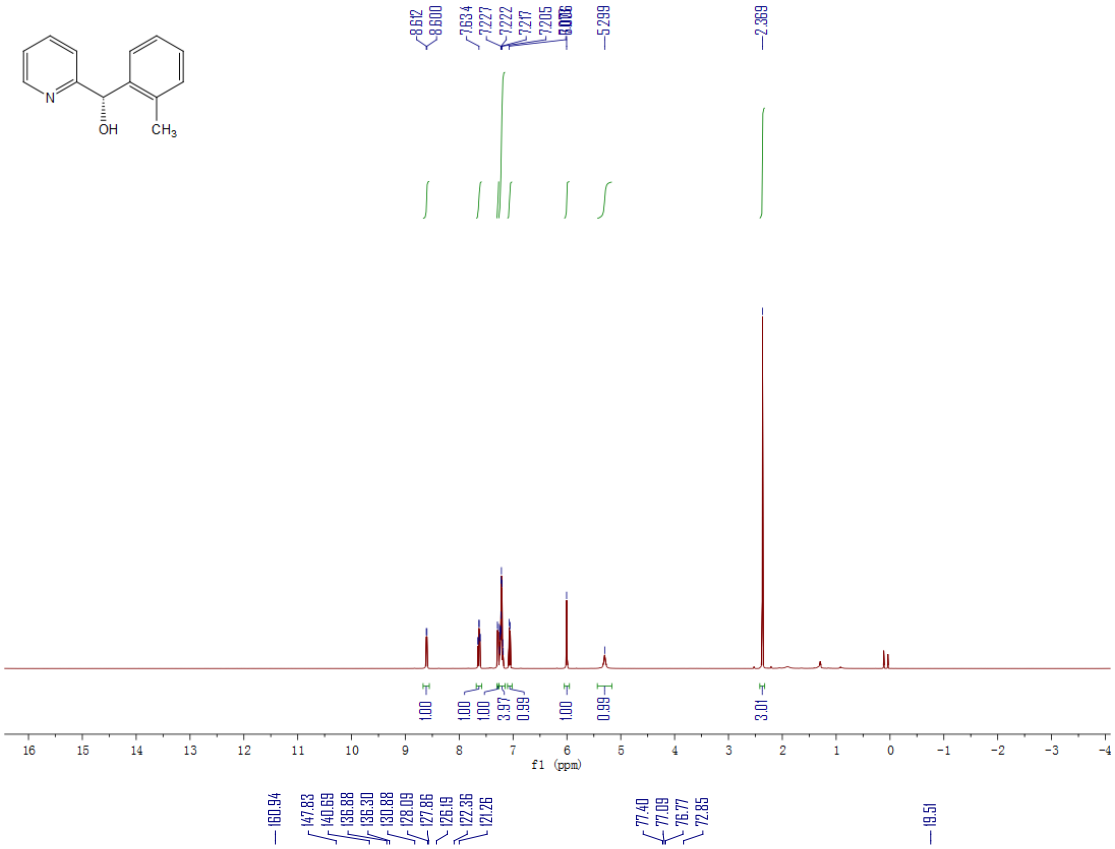



160.786
147.806
143.219
136.869
128.604
127.868
127.091
122.460
121.390
77.360
77.043
76.725
74.937
f1 (ppm)

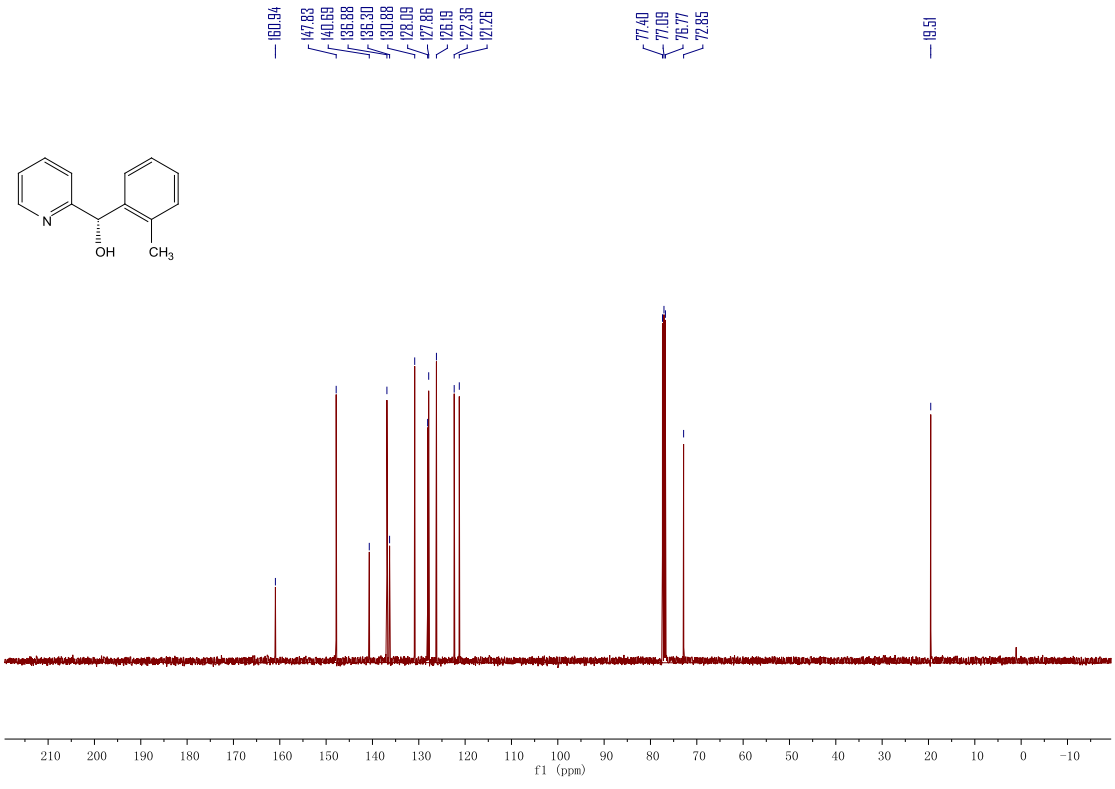

N
OH

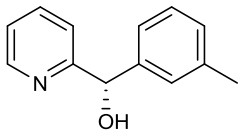
2g

N
OH
CH3


8.612
8.600
7.634
7.227
7.222
7.217
7.205
5.299
2.369
1.00
1.00
1.00
3.97
0.99
1.00
0.99
3.01
f1 (ppm)

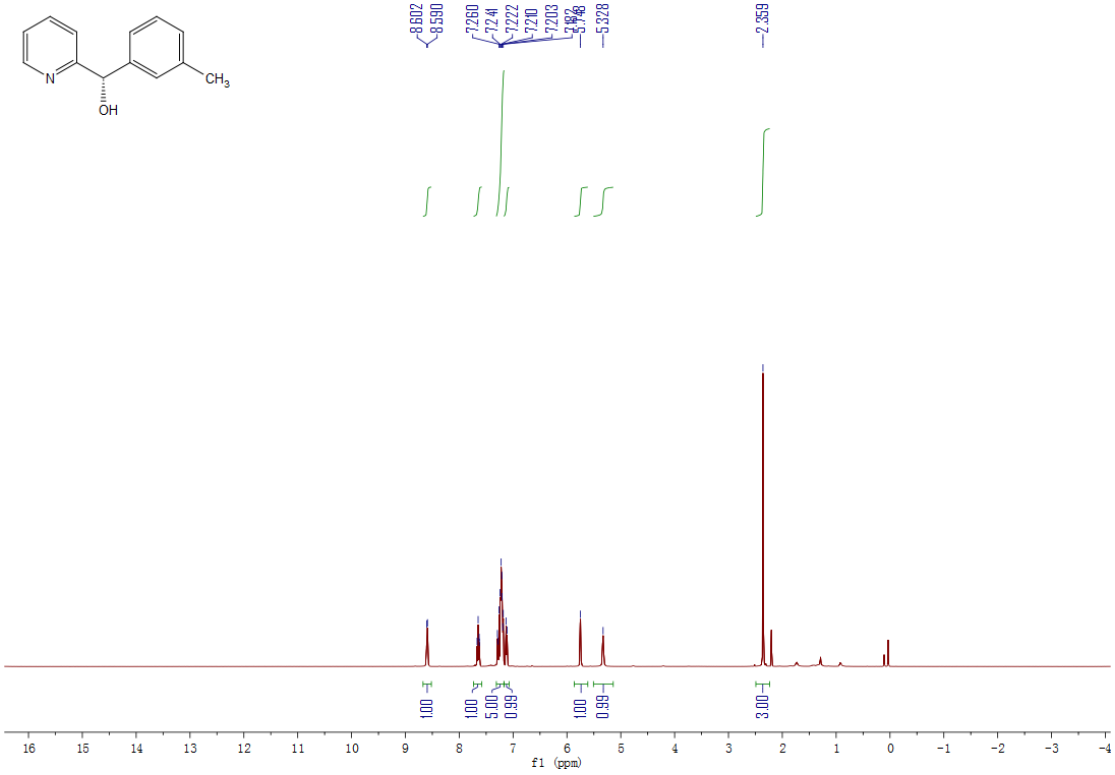
N
OH
CH3


160.94
147.83
140.69
136.88
136.30
130.88
128.09
127.86
126.19
122.36
121.26
77.40
77.09
76.77
72.85
19.51
f1 (ppm)

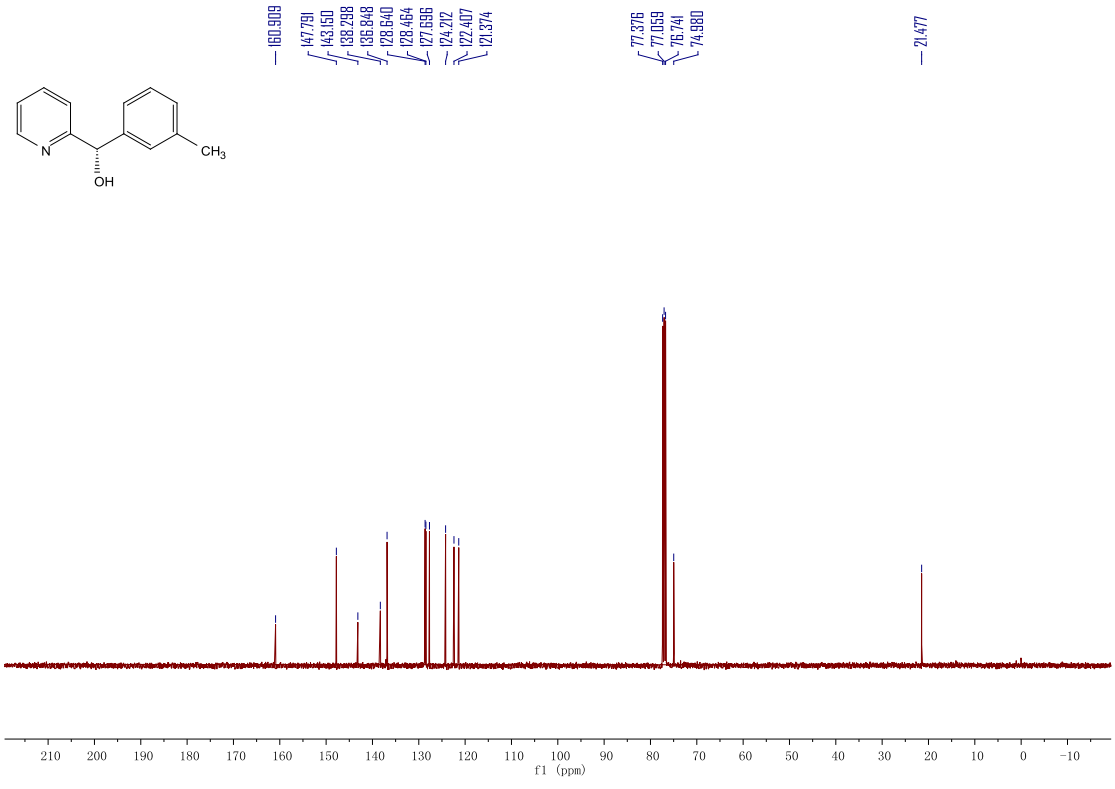

N
OH

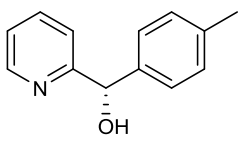
2h

N
CH3
OH

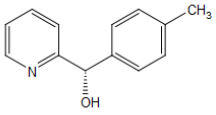

8.602
8.590
7.260
7.241
7.222
7.210
7.203
5.328
2.359
1.00
1.00
5.00
0.99
1.00
0.99
3.00
f1 (ppm)

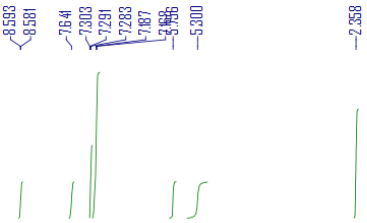
N
CH3
OH

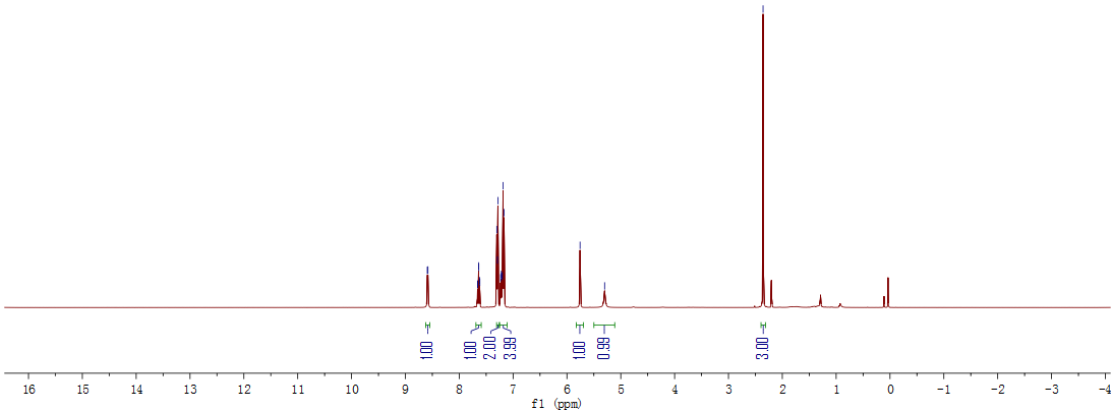

160.909
147.791
143.150
138.298
136.848
128.840
128.464
127.696
124.212
122.407
121.374
77.376
77.059
76.741
74.980
21.477
f1 (ppm)

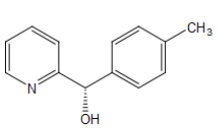


2i

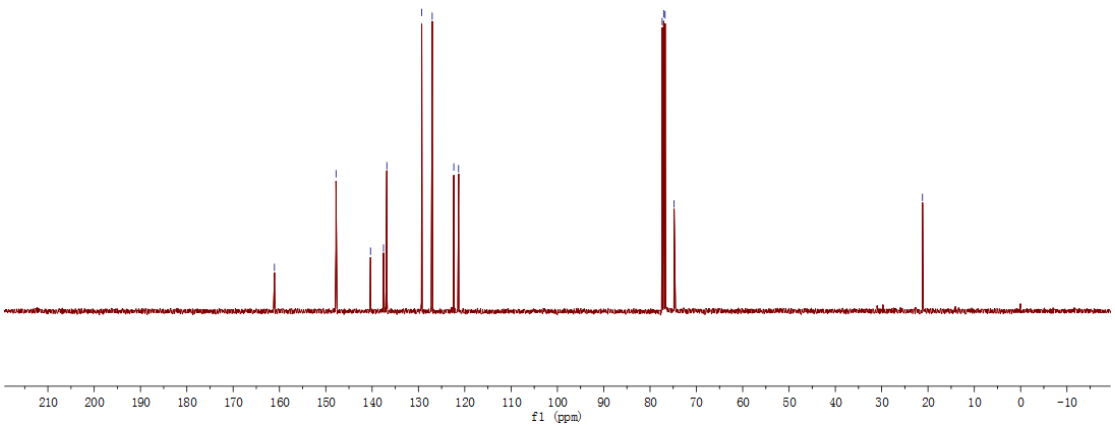


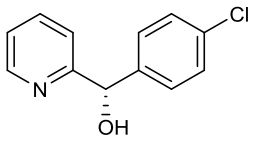

8.593
8.581
7.654
7.303
7.291
7.283
7.187
5.300
2.358


1.00
1.00
2.00
3.99
1.00
0.99
3.00
f1 (ppm)

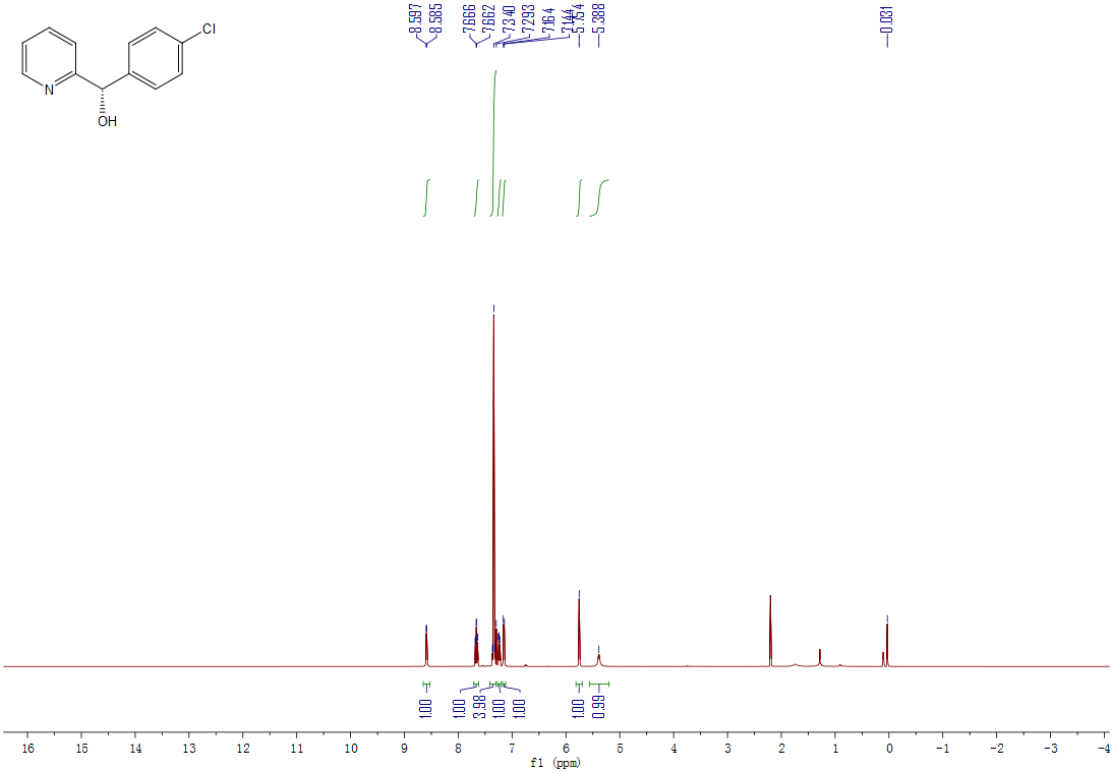


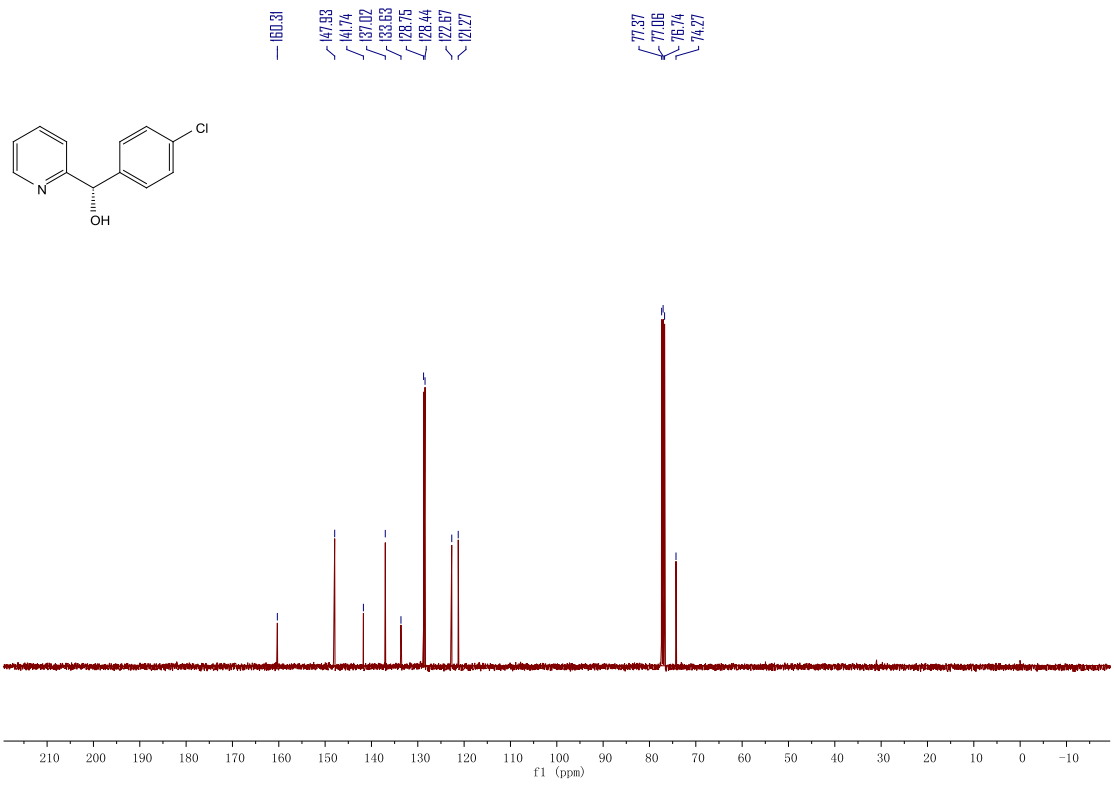

161.08
147.78
140.34
137.54
136.83
129.28
127.02
122.36
121.33
77.38
77.06
76.75
74.80
21.19

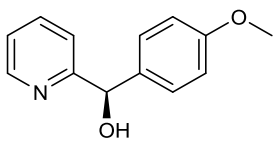

f1 (ppm)


Cl
N
OH

2j

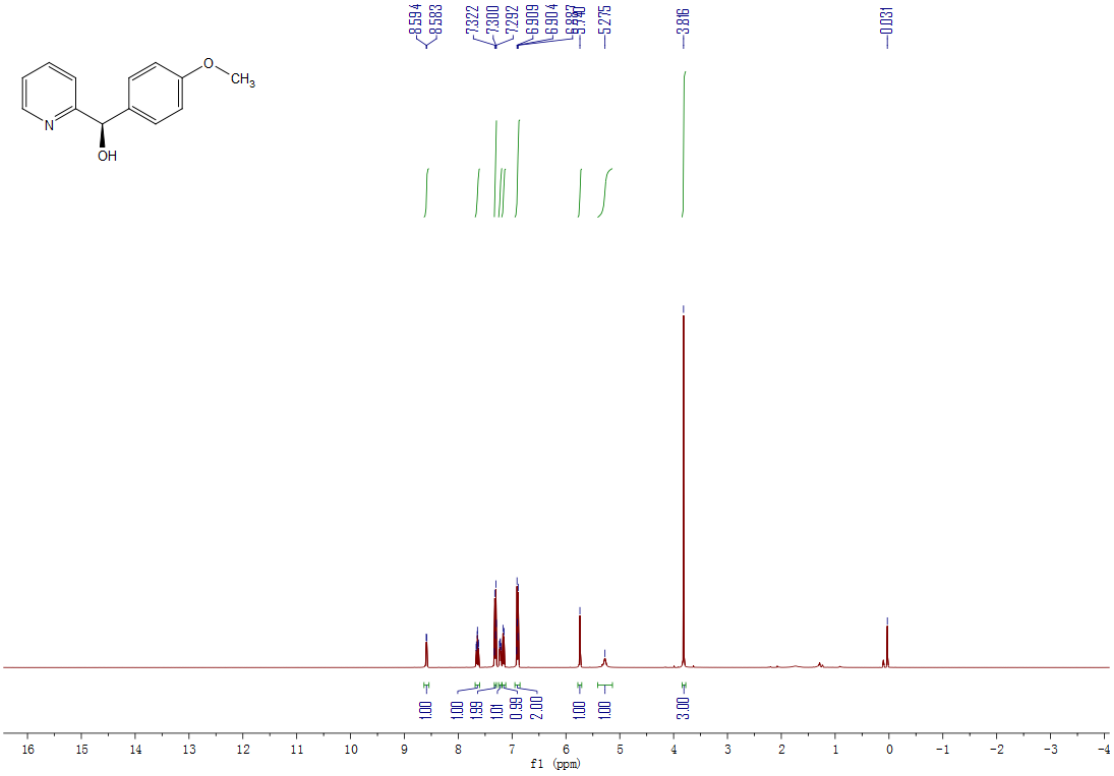

8.597
8.585
7.666
7.662
7.340
7.293
7.164
7.144
5.764
5.388
0.031
1.00
1.00
3.98
1.00
1.00
1.00
0.99
f1 (ppm)


160.31
147.93
141.74
137.02
133.63
128.75
128.44
122.67
121.27
77.37
77.06
76.74
74.27
f1 (ppm)

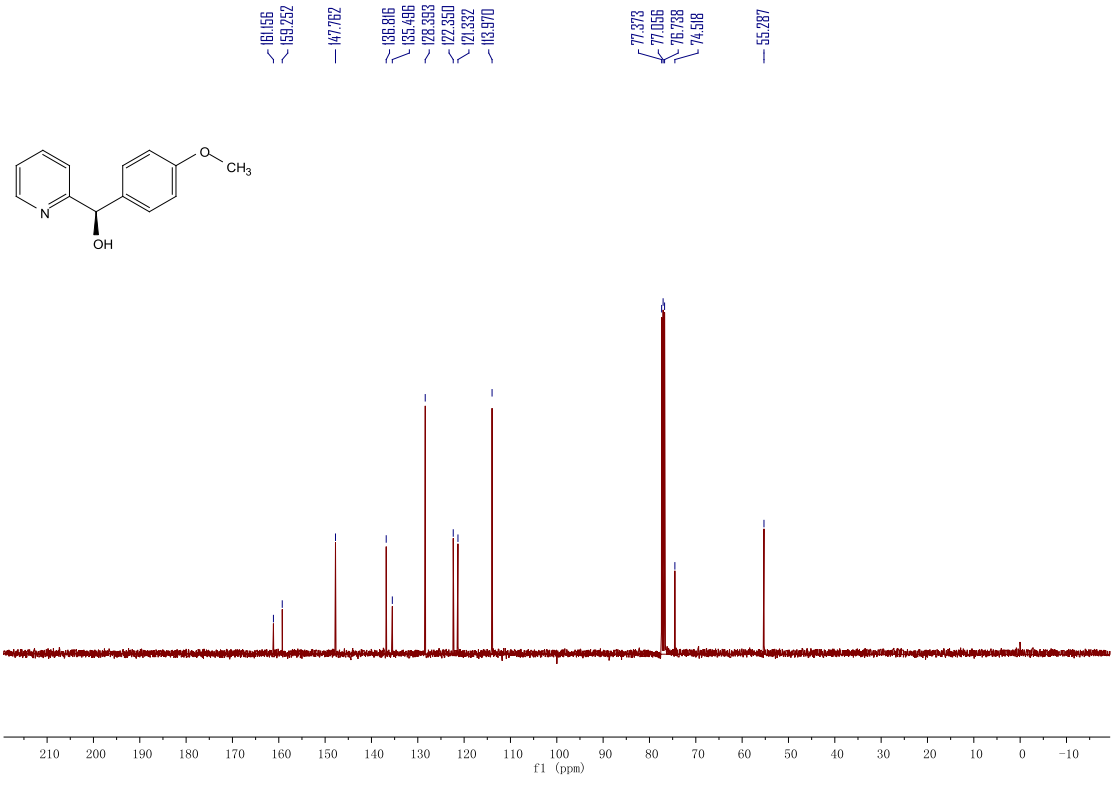

O
N
OH

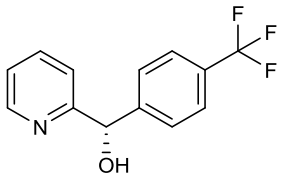
2k

O
CH3
N
OH

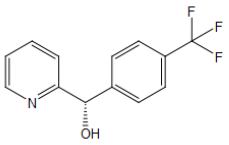

8.594
8.583
7.322
7.300
7.292
6.909
6.904
5.275
3.816
0.031
1.00
1.00
1.99
1.01
0.99
2.00
1.00
1.00
3.00
f1 (ppm)

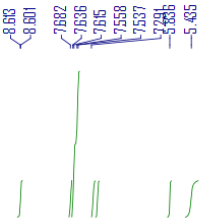
O
CH3
N
OH

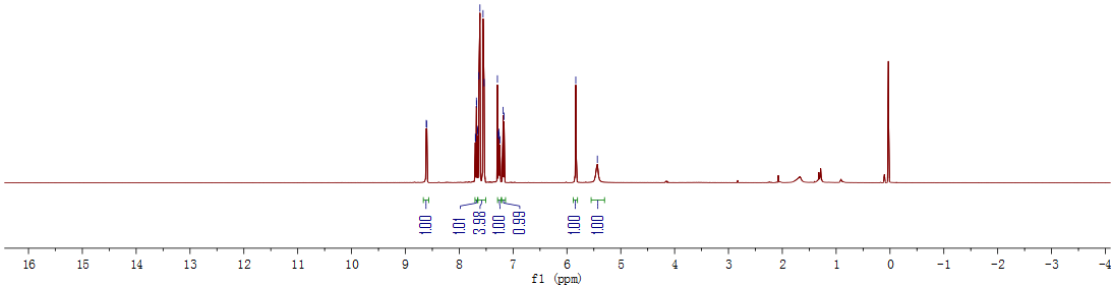

161.156
159.252
147.762
136.816
135.496
128.393
122.350
121.332
113.970
77.373
77.056
76.738
74.518
55.287
f1 (ppm)


F
F
F
N
OH

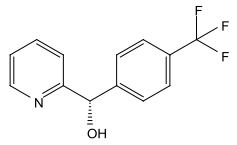
2l

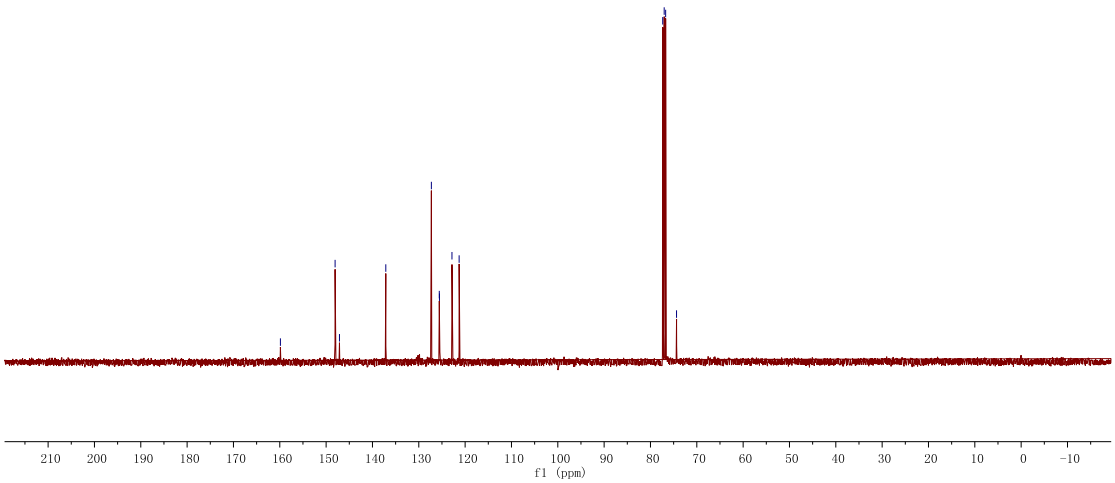

F
F
F
N
OH

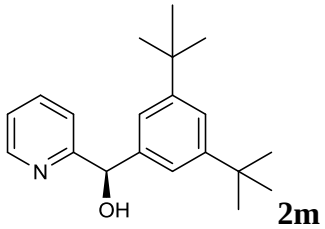

8.613
8.601
7.682
7.636
7.615
7.558
7.537
5.436
5.435


1.00
1.01
3.98
1.00
0.99
1.00
1.00
f1 (ppm)


159.86
148.06
147.12
137.12
127.28
125.58
125.54
122.84
121.29
77.38
77.04
76.72
74.37

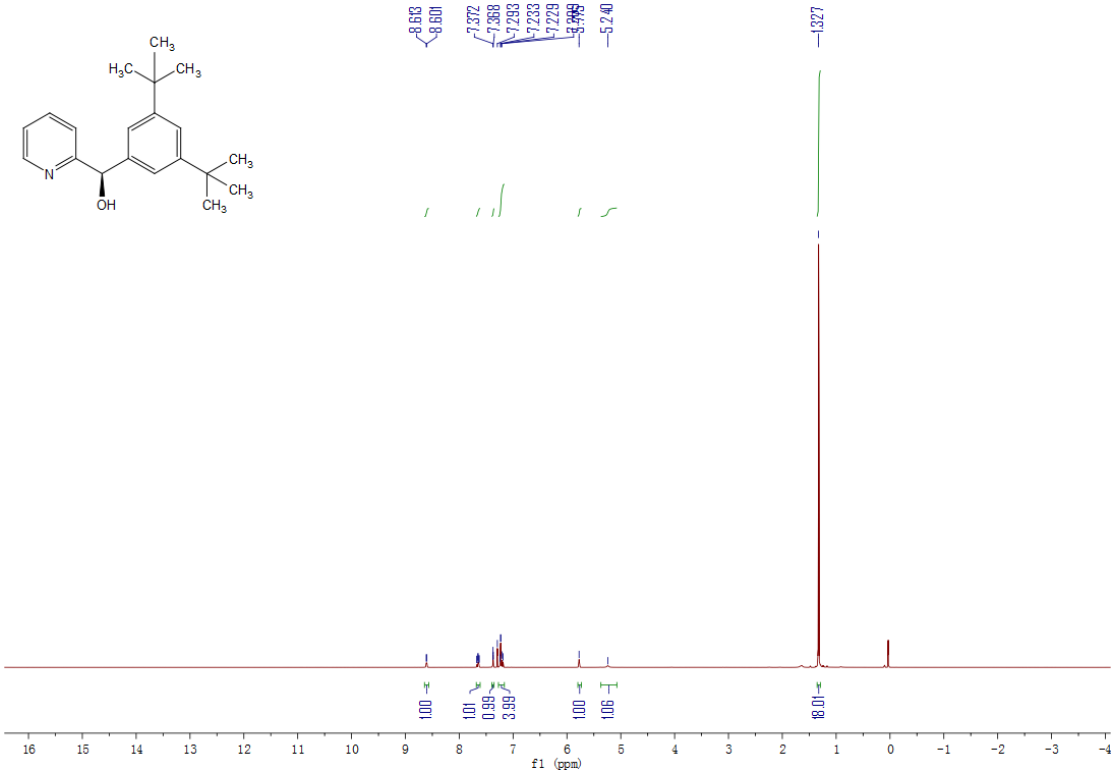

F
F
F
N
OH


f1 (ppm)

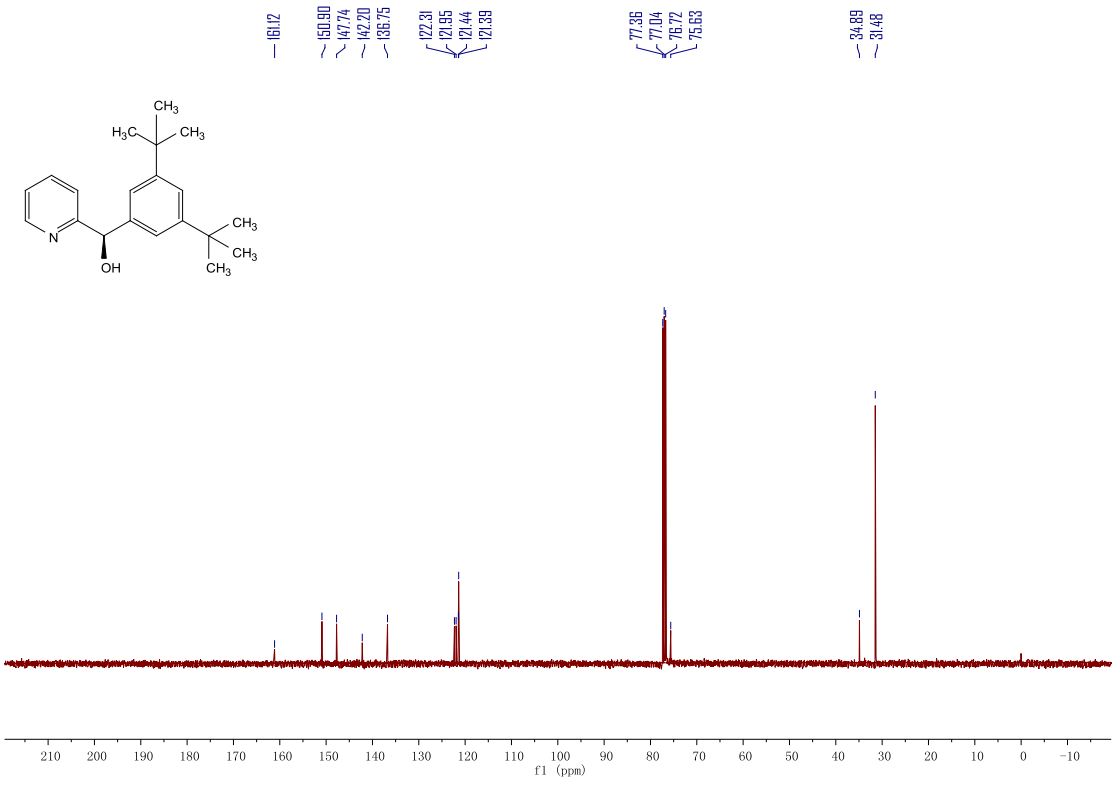

N
OH

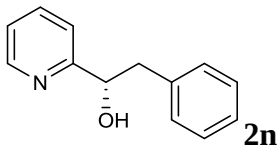
2m

CH3
H3C
CH3
N
OH
CH3
CH3
CH3

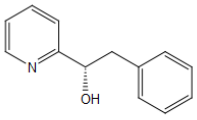

8.613
8.601
7.372
7.368
7.293
7.233
7.229
5.240
1.327
1.00
1.01
0.99
3.99
1.00
1.06
18.01
f1 (ppm)

CH3
H3C
CH3
N
OH
CH3
CH3
CH3

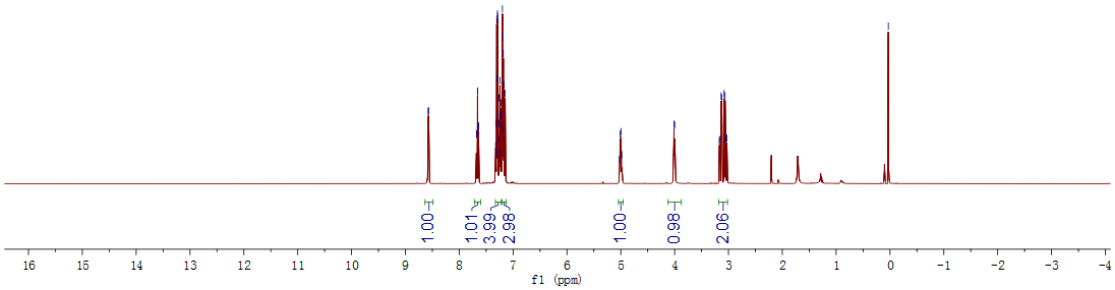

161.12
150.90
147.74
142.20
136.75
122.31
121.95
121.44
121.39
77.36
77.04
76.72
75.63
34.93
31.48
f1 (ppm)

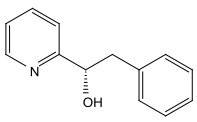

N
OH

2n

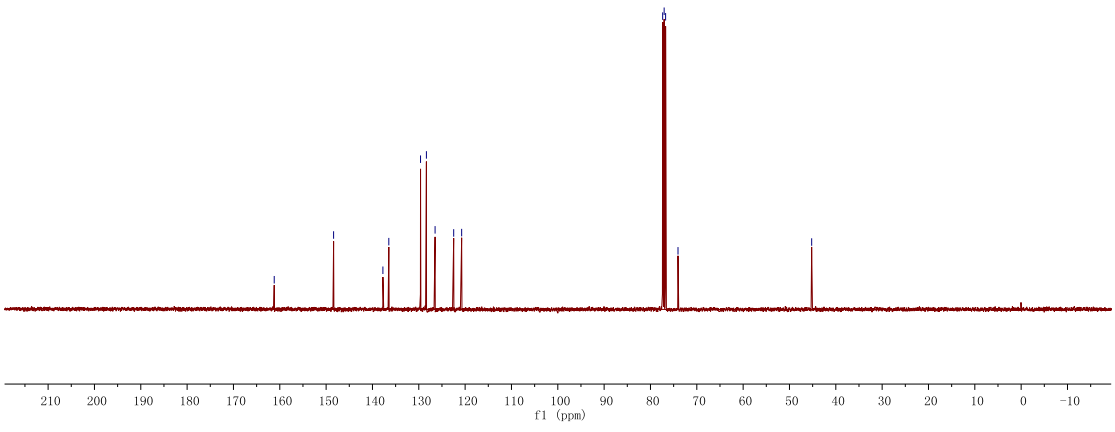

N
OH

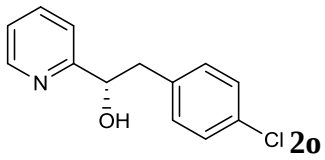

8.579
8.567
7.304
7.300
7.291
7.285
7.202
7.198
5.027
5.013
4.995
4.981
4.013
3.999
3.171
3.158
3.137
3.124
3.082
3.063
3.048
3.029
0.031


1.00
1.01
3.99
2.98
1.00
0.98
2.06
f1 (ppm)

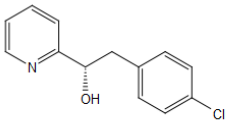

N
OH


161.20
148.39
137.75
136.47
129.62
128.36
126.48
122.47
120.75
77.37
77.05
76.73
74.06
45.21


f1 (ppm)


N
OH
Cl

2o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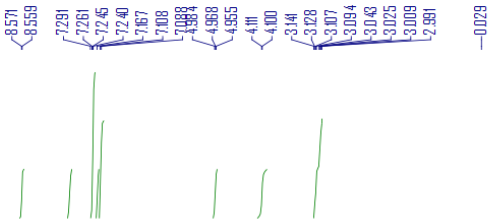
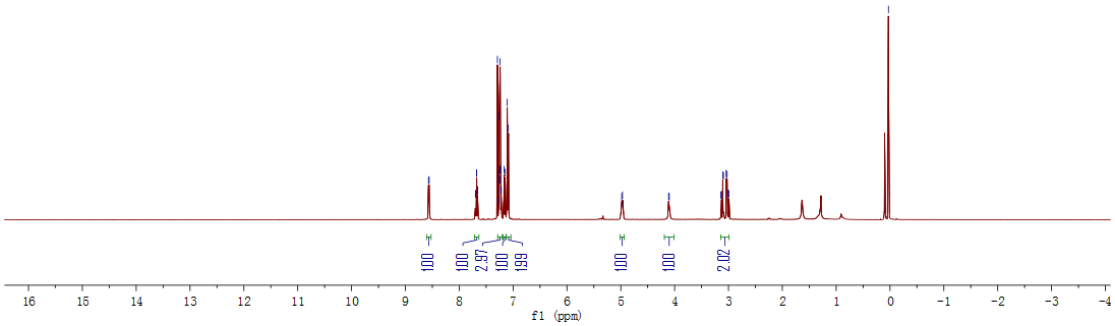
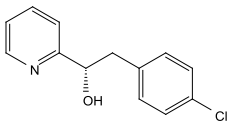
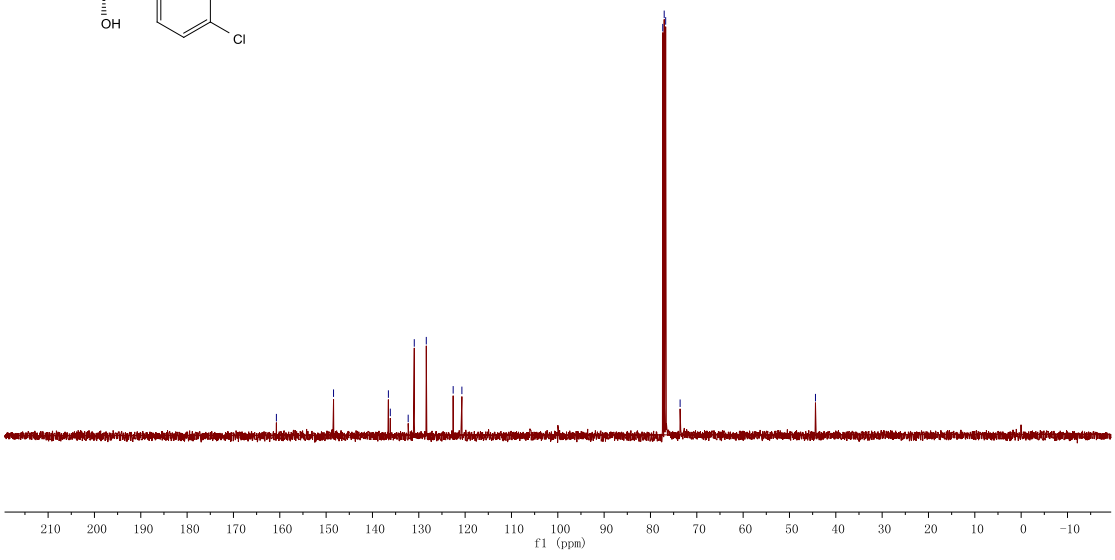
OH
Cl

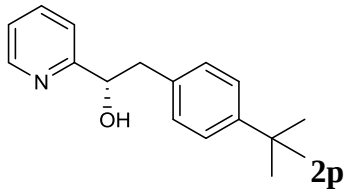

8.571
8.559
7.291
7.261
7.245
7.240
7.167
7.108
7.088
4.968
4.955
4.111
4.100
3.144
3.128
3.107
3.094
3.043
3.025
3.009
2.991
0.029


1.00
1.00
2.97
1.00
1.99
1.00
1.00
2.02
f1 (ppm)

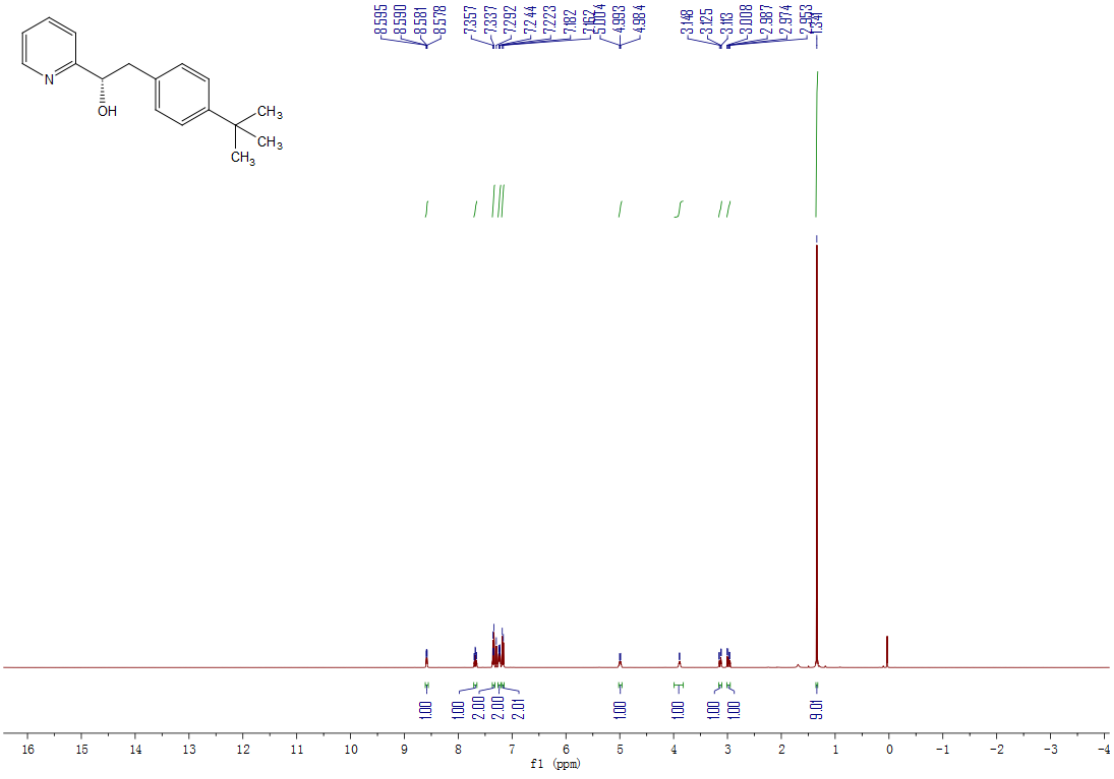

160.73
148.40
138.56
136.15
132.29
130.98
128.38
122.58
120.70
77.35
77.04
76.72
73.60
44.33

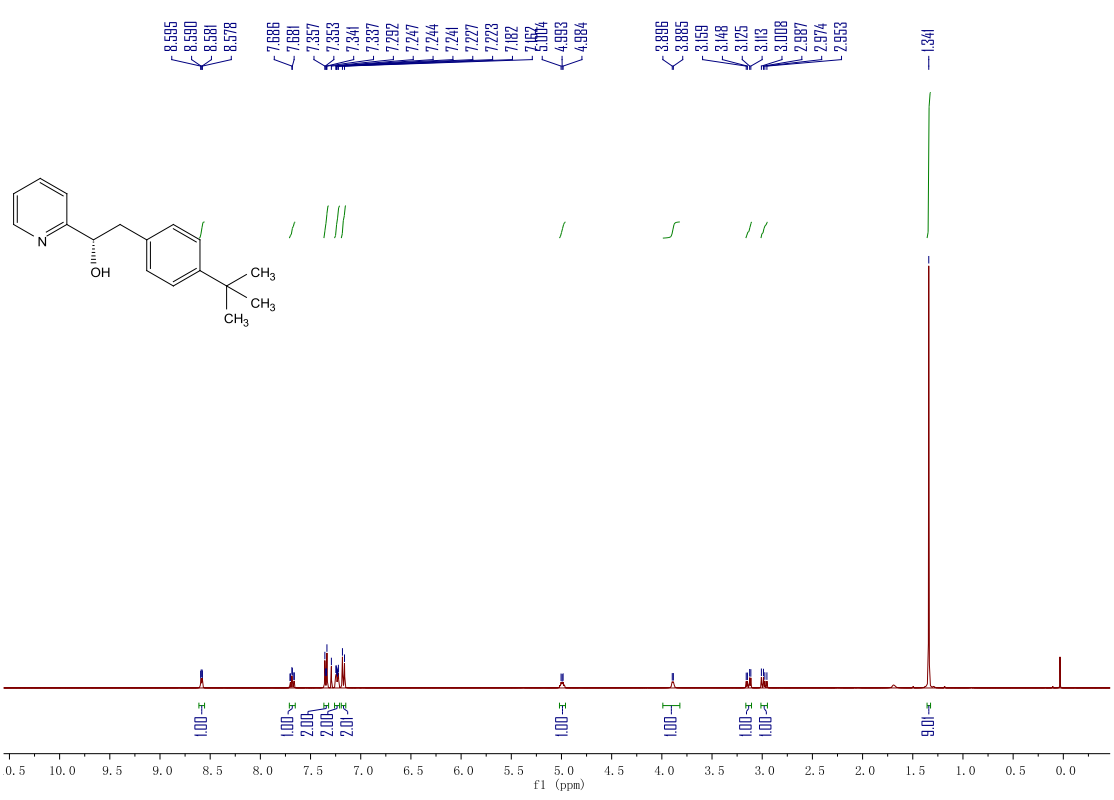

N
OH
Cl

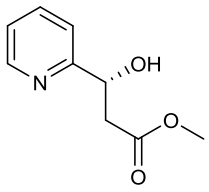

f1 (ppm)


N
OH

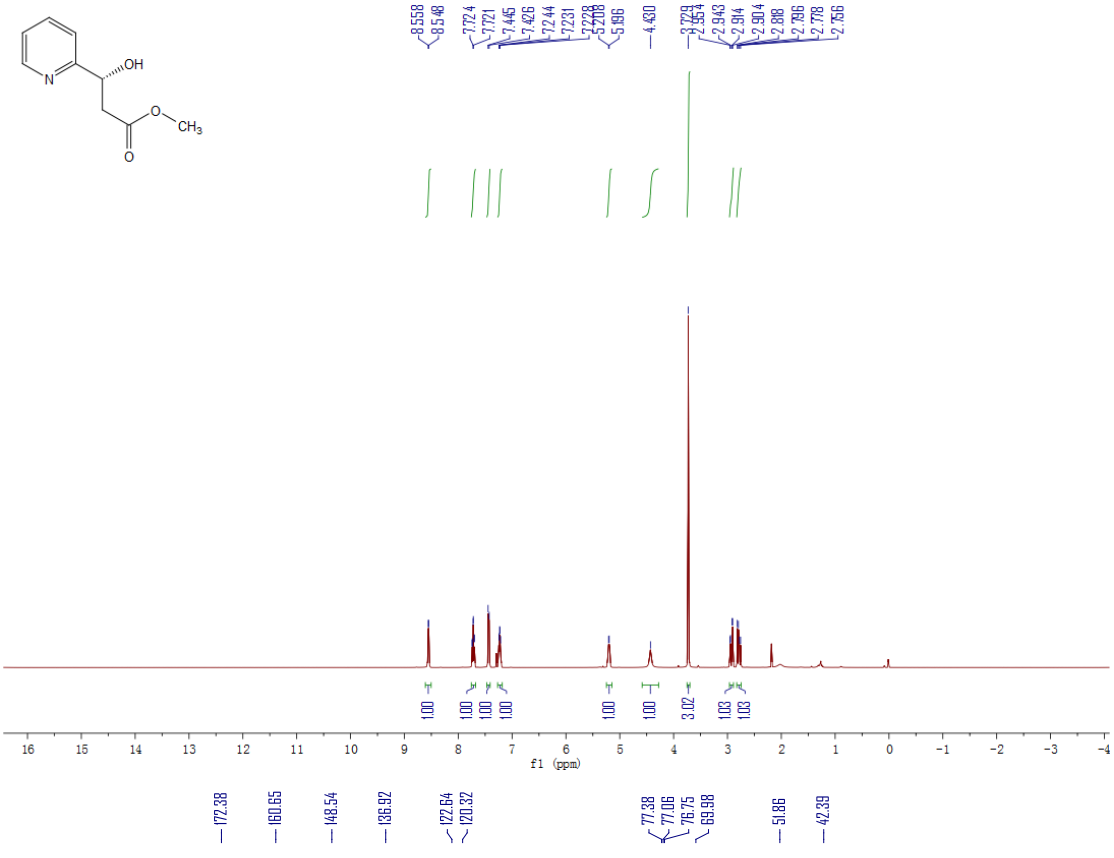
2p

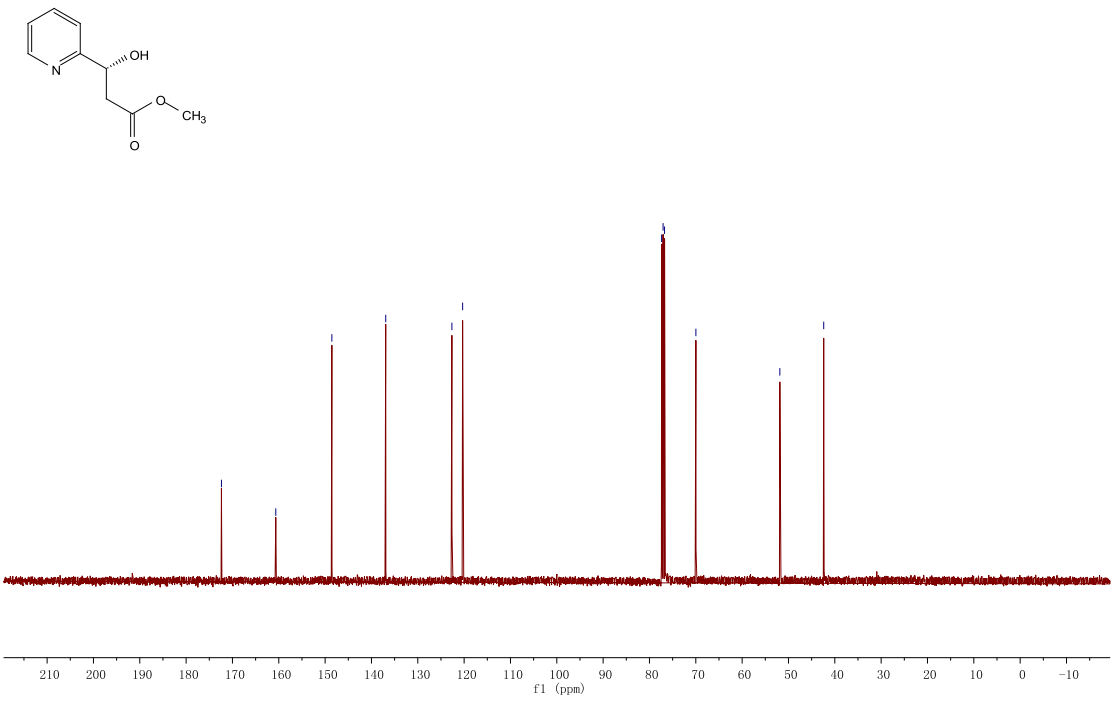

8.595
8.590
8.581
8.578
7.357
7.337
7.292
7.244
7.223
7.182
5.004
4.993
4.984
3.148
3.125
3.113
3.008
2.987
2.974
2.953
1.341
1.00
1.00
2.00
2.00
2.01
1.00
1.00
1.00
1.00
9.01
f1 (ppm)

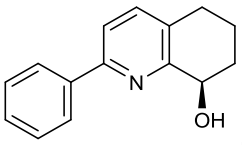

8.595
8.590
8.581
8.578
7.686
7.681
7.357
7.353
7.344
7.337
7.292
7.247
7.244
7.241
7.227
7.223
7.182
5.004
4.993
4.984
3.896
3.885
3.159
3.148
3.125
3.113
3.008
2.987
2.974
2.953
1.341
1.00
1.00
2.00
2.00
2.01
1.00
1.00
1.00
1.00
9.01
f1 (ppm)


OH
N
O
O

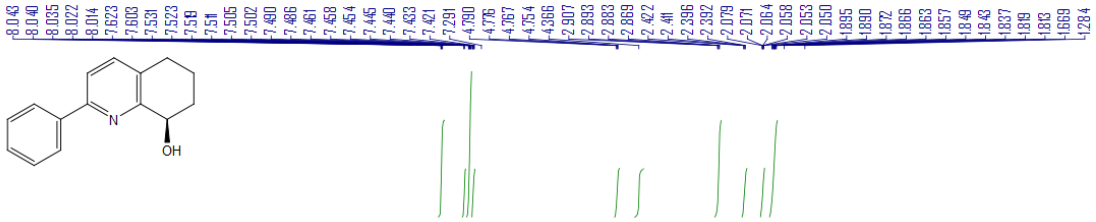
2q

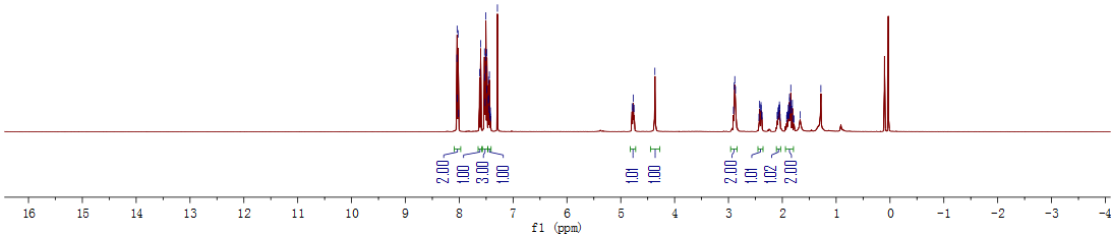

8.558
8.548
7.724
7.721
7.445
7.426
7.244
7.231
5.986
4.430
3.729
2.943
2.914
2.904
2.888
2.796
2.778
2.766
1.00
1.00
1.00
1.00
1.00
1.00
3.02
1.03
1.03
f1 (ppm)


172.38
160.65
148.54
136.92
122.64
120.32
77.38
77.06
76.75
69.98
51.86
42.39
f1 (ppm)


N
OH

2r

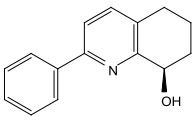

8.043
8.040
8.035
8.022
8.014
7.623
7.603
7.531
7.523
7.518
7.514
7.505
7.502
7.490
7.486
7.461
7.458
7.454
7.445
7.440
7.433
7.421
7.291
4.780
4.776
4.767
4.754
4.366
2.907
2.893
2.883
2.869
2.422
2.411
2.396
2.392
2.079
2.071
2.064
2.058
2.053
2.050
1.895
1.890
1.872
1.866
1.863
1.857
1.849
1.843
1.837
1.819
1.813
1.669
1.284

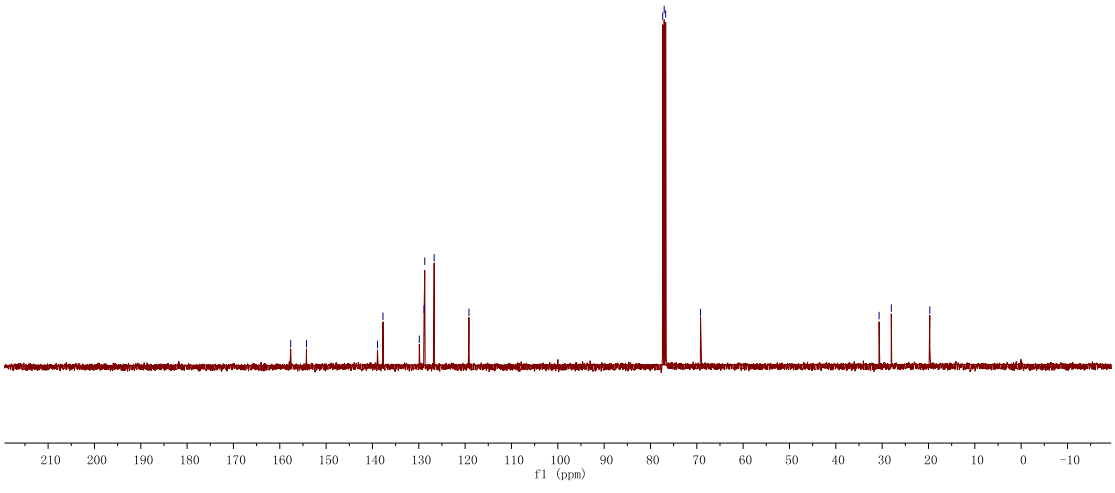

2.00
1.00
3.00
1.00
1.01
1.00
2.00
1.01
1.02
2.00
f1 (ppm)

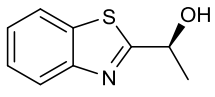

157.65
154.23
138.91
137.73
129.89
128.87
128.71
126.68
119.18


77.36
77.04
76.72
69.19

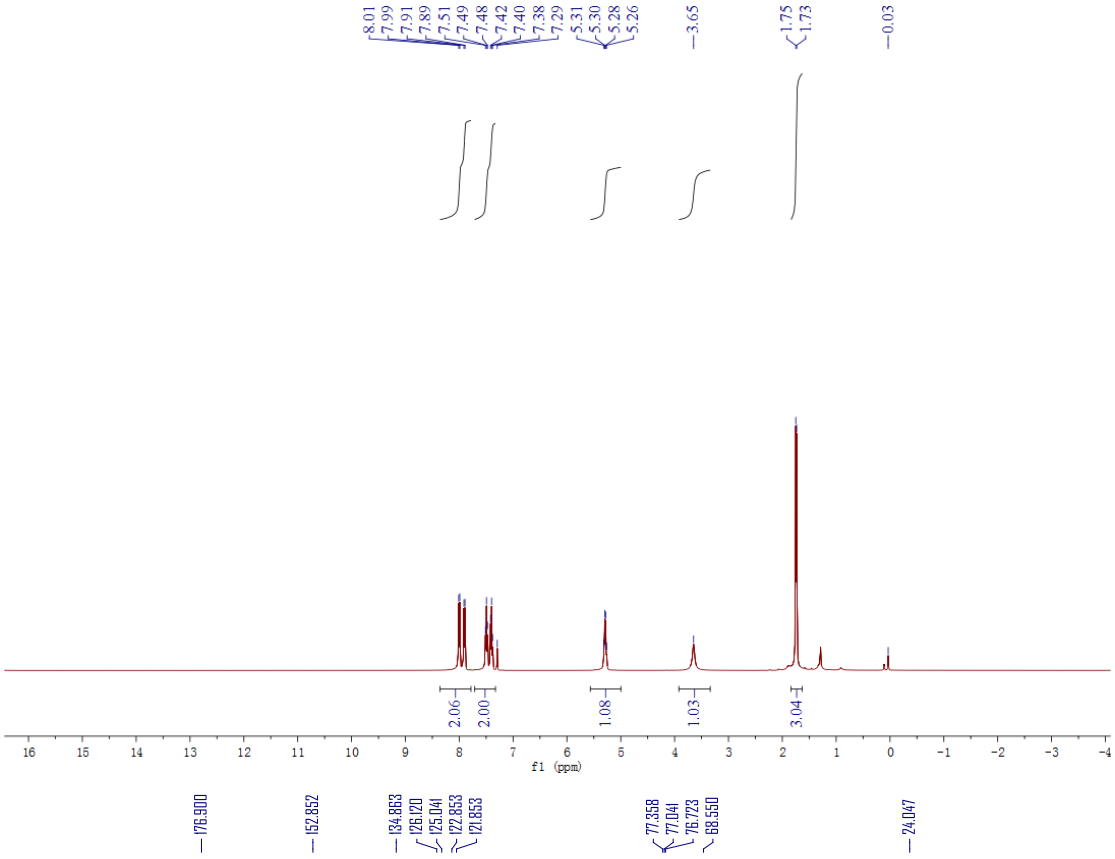
30.66
28.02
19.71


N
OH


f1 (ppm)


S
OH
N

2u


8.01
7.99
7.91
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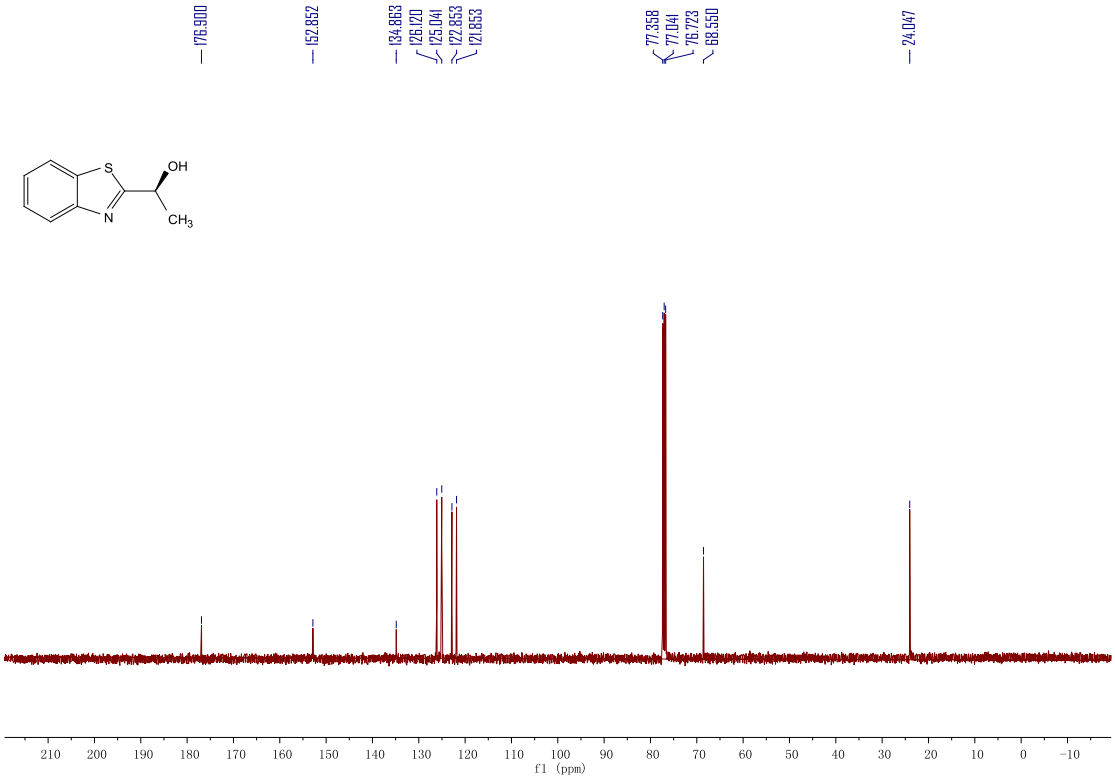
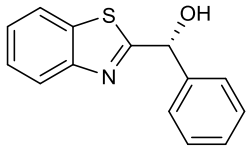
7.51
7.49
7.48
7.42
7.40
7.38
7.29
5.31
5.30
5.28
5.26
3.65
1.75
1.73
0.03
2.06
2.00
1.08
1.03
3.04
f1 (ppm)


176.900
152.852
134.863
126.120
125.044
122.853
121.853
77.358
77.041
76.723
68.550
24.047
f1 (ppm)


S
OH
N

2v


S
OH
N
8.00
7.98
7.87
7.85
7.56
7.55
7.50
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7.41
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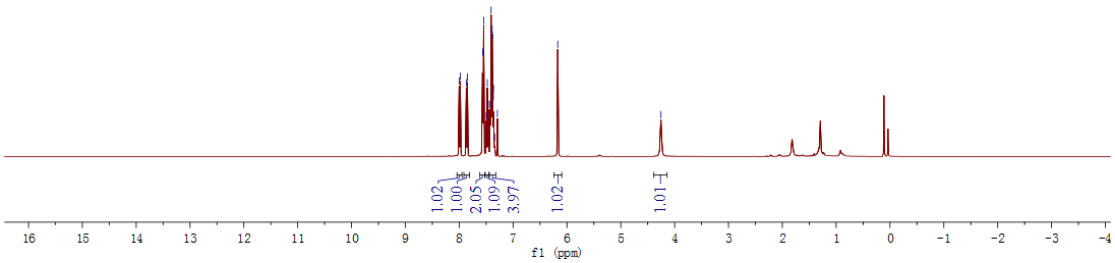
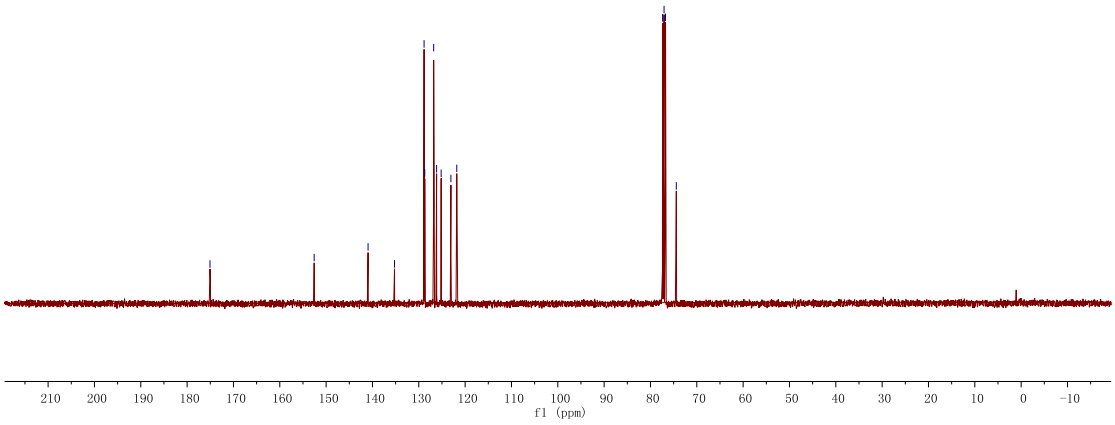
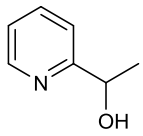
7.38
7.37
7.36
7.34
7.29
6.17
4.25


1.02
1.00
2.05
1.09
3.97
1.02
1.01
f1 (ppm)


175.062
152.579
140.948
135.240
128.859
128.710
126.787
126.155
125.174
123.069
121.804
77.383
77.065
76.748
74.423

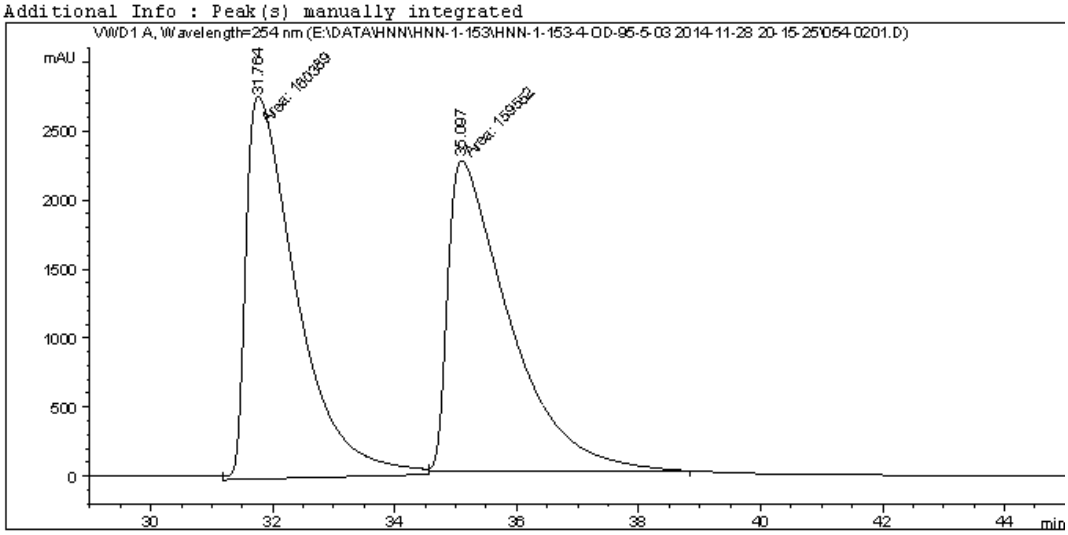
S
OH
N


f1 (ppm)

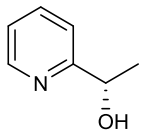


Data File E:\DATA\HNN\HNN-1-153\HNN-1-153-4-OD-95-5-03 2014-11-28 20-15-25\054-0201.D
Sample Name: HNN-1-153-4-OD-03

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                  Location : Vial 54
    Injection Date  : 11/28/2014 8:32:00 PM              Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-153\HNN-1-153-4-OD-95-5-03 2014-11-28 20-15-25\VWD-ODH
                      (1-2)-95-5-0.3ML-254NM-45MIN.M
    Last changed    : 11/28/2014 8:15:26 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-153\HNN-1-153-4-OD-95-5-03 2014-11-28 20-15-25\VWD-ODH
                      (1-2)-95-5-0.3ML-254NM-45MIN.M (Sequence Method)
    Last changed    : 3/27/2015 7:30:31 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



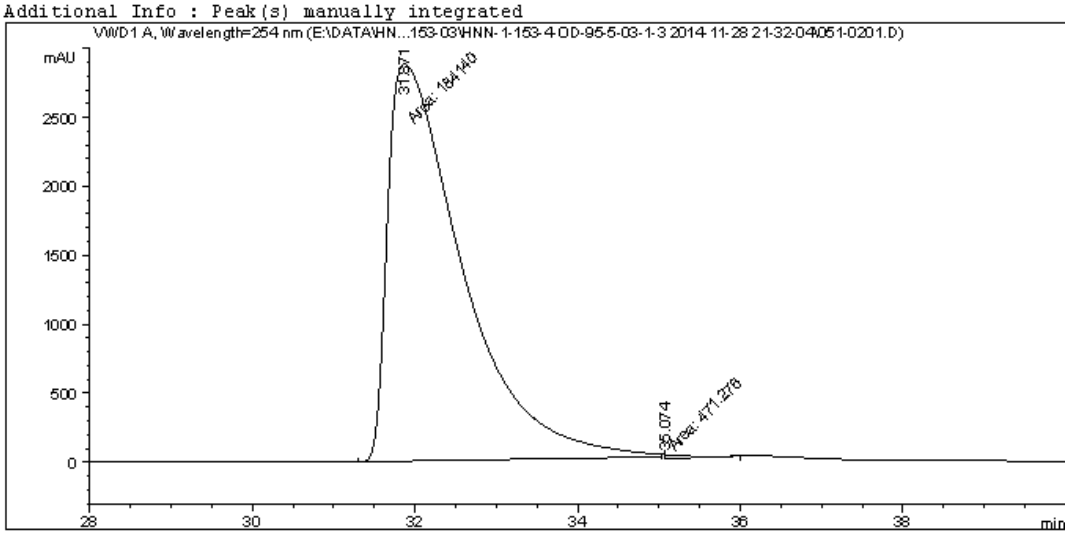

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  31.764 MM    0.9657 1.60389e5  2768.18604  50.1307
       2  35.097 MM    1.1789 1.59552e5  2255.67725  49.8693

    Totals :                  3.19941e5  5023.86328

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



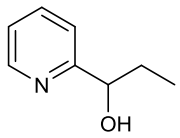
2a

Data File E:\DATA\HN...-1-153-03\HNN-1-153-4-OD-95-5-03-1-3 2014-11-28 21-32-04\051-0201.D
Sample Name: HNN-1-153-1

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 51
    Injection Date  : 11/28/2014 9:48:42 PM                Inj :   1
                                                     Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-153-03\HNN-1-153-4-OD-95-5-03-1-3 2014-11-28 21-32-04
                      \VWD-ODH(1-2)-95-5-0.3ML-254NM-45MIN.M
    Last changed    : 11/28/2014 9:32:04 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-153-03\HNN-1-153-4-OD-95-5-03-1-3 2014-11-28 21-32-04
                      \VWD-ODH(1-2)-95-5-0.3ML-254NM-45MIN.M (Sequence Method)
    Last changed    : 3/27/2015 7:46:38 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

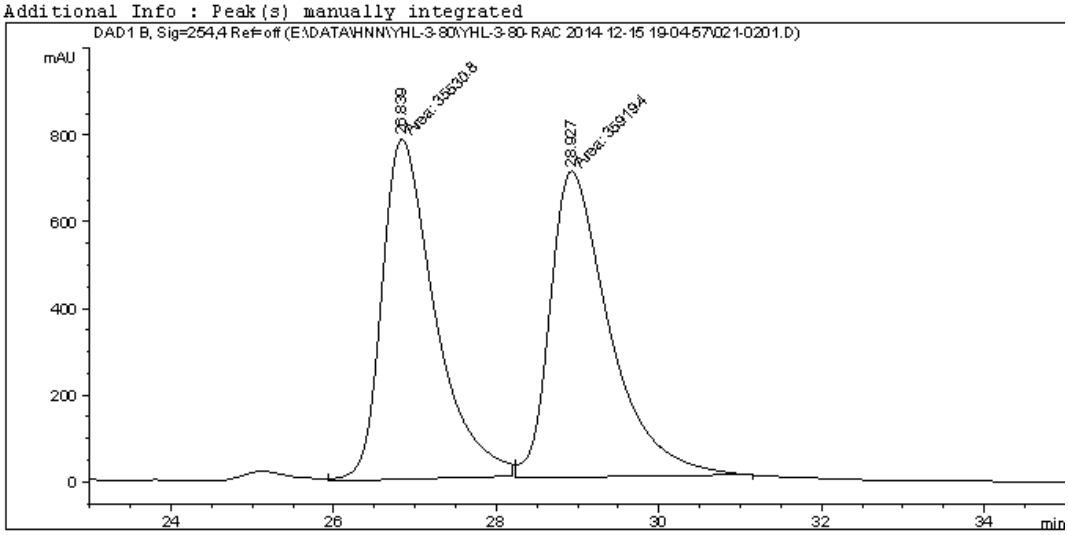



```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  31.871 MM    1.0676 1.84140e5  2874.65601  99.7447
       2  35.074 MM    0.2785  471.27634   28.20363   0.2553

    Totals :                  1.84612e5  2902.85964

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

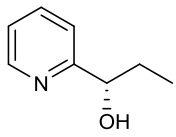


Data File E:\DATA\HNN\YHL-3-80\YHL-3-80-RAC 2014-12-15 19-04-57\021-0201.D
Sample Name: YHL-3-80-1-RAC

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 21
    Injection Date  : 12/15/2014 7:21:48 PM              Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80\YHL-3-80-RAC 2014-12-15 19-04-57\DAD-0D-95-05-03-
                      254NM-50MIN.M
    Last changed    : 12/15/2014 7:04:58 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80\YHL-3-80-RAC 2014-12-15 19-04-57\DAD-0D-95-05-03-
                      254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:22:20 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



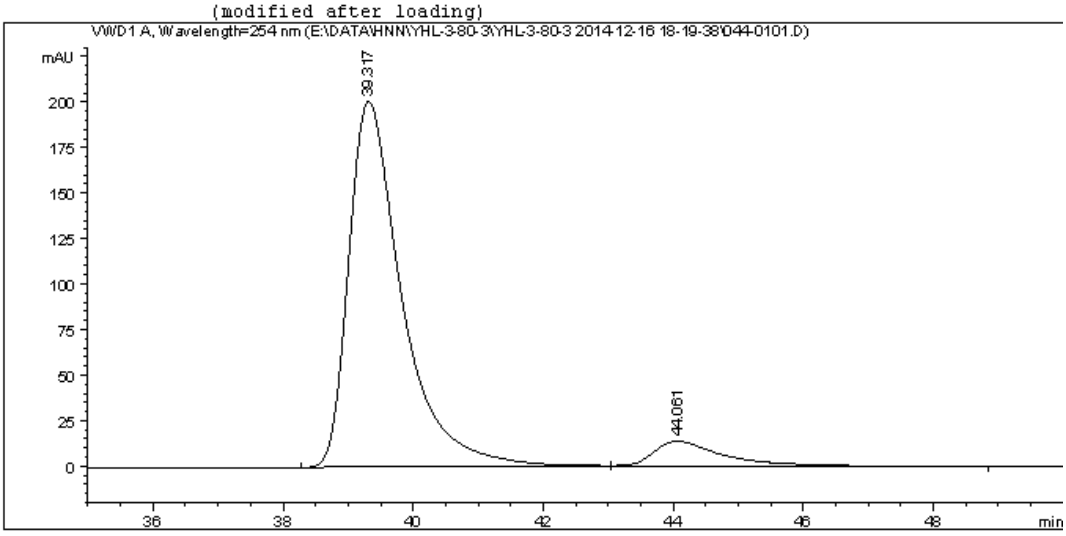

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  26.839 MM    0.7550 3.55308e4   784.34320  49.7281
       2  28.927 MM    0.8485 3.59194e4   705.58496  50.2719

    Totals :                  7.14502e4  1489.92816

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



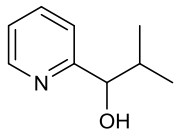
2b

Data File E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\044-0101.D
Sample Name: YHL-3-80-3

```
    ==================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 44
    Injection Date  : 12/16/2014 6:20:20 PM               Inj :   1
                                                   Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M
    Last changed    : 12/16/2014 6:19:38 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:11:59 PM by SYSTEM
                      (modified after loading)
```

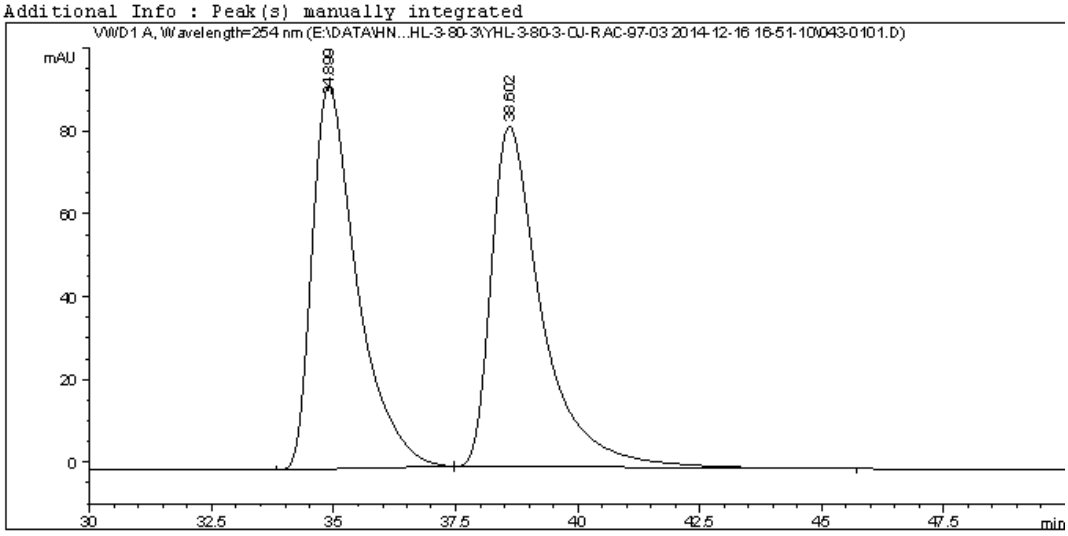



```
    ==================================================================
                          Area Percent Report
    ==================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  39.317 BB    0.8461 1.13616e4   200.80908  91.9358
       2  44.061 BB    1.0551  996.59125   13.50260   8.0642

    Totals :                  1.2358le4   214.31169


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

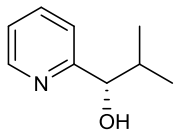


Data File E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3-0J-RAC-97-03 2014-12-16 16-51-10\043-0101.D
Sample Name: YHL-3-80-3-0J-RAC

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 43
    Injection Date  : 12/16/2014 4:51:51 PM               Inj :   1
                                                   Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3-0J-RAC-97-03 2014-12-16 16-51-10\VWD-
                      0JH(1-6)-97-03-03ML-254NM-50MIN.M
    Last changed    : 12/16/2014 4:51:10 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3-0J-RAC-97-03 2014-12-16 16-51-10\VWD-
                      0JH(1-6)-97-03-03ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:13:11 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



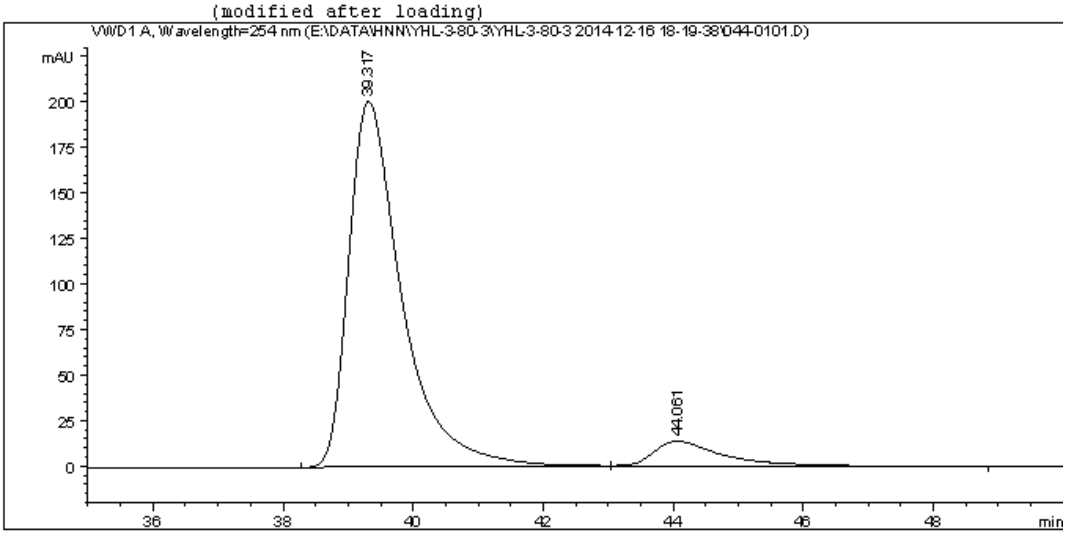

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  34.899 BB    0.9528 5918.68115   92.34528  49.8787
       2  38.602 BB    1.0712 5947.47119   82.19308  50.1213

    Totals :                  1.18662e4   174.53837

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



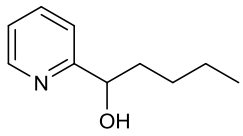
2c

Data File E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\044-0101.D
Sample Name: YHL-3-80-3

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                  Location : Vial 44
    Injection Date  : 12/16/2014 6:20:20 PM              Inj :   1
                                                   Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M
    Last changed    : 12/16/2014 6:19:38 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80-3\YHL-3-80-3 2014-12-16 18-19-38\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:11:59 PM by SYSTEM
                      (modified after loading)
```

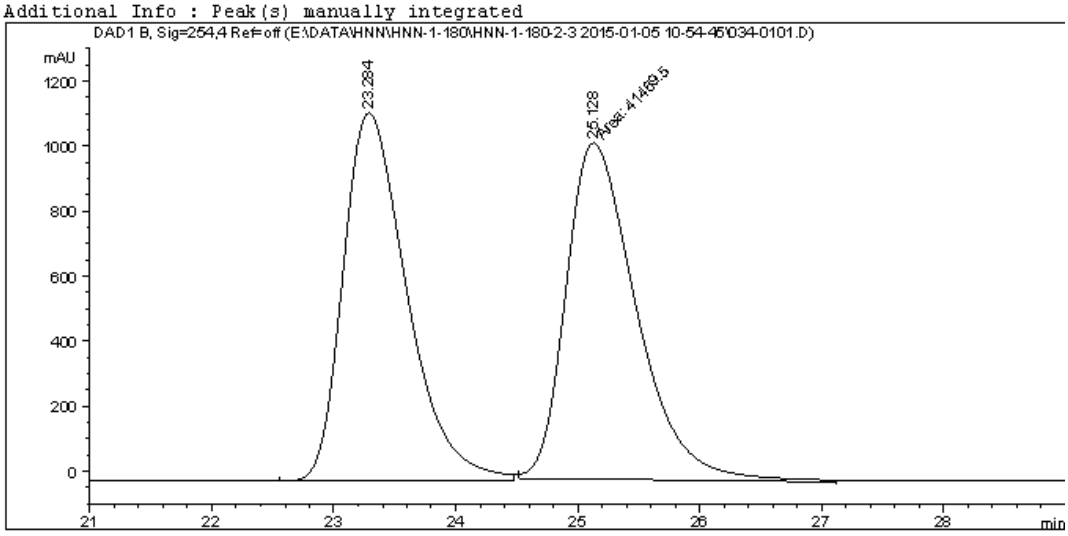



```
    ======================================================================
                           Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  39.317 BB    0.8461 1.13616e4   200.80908  91.9358
       2  44.061 BB    1.0551  996.59125   13.50260   8.0642

    Totals :                  1.2358le4   214.31169


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

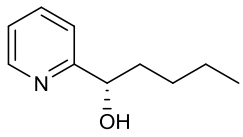


Data File E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\034-0101.D
Sample Name: HNN-1-180-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 34
    Injection Date  : 1/5/2015 10:55:36 AM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\DAD-0D-95-05-03-
                      254NM-40MIN.M
    Last changed    : 1/5/2015 10:54:45 AM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\DAD-0D-95-05-03-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:30:52 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



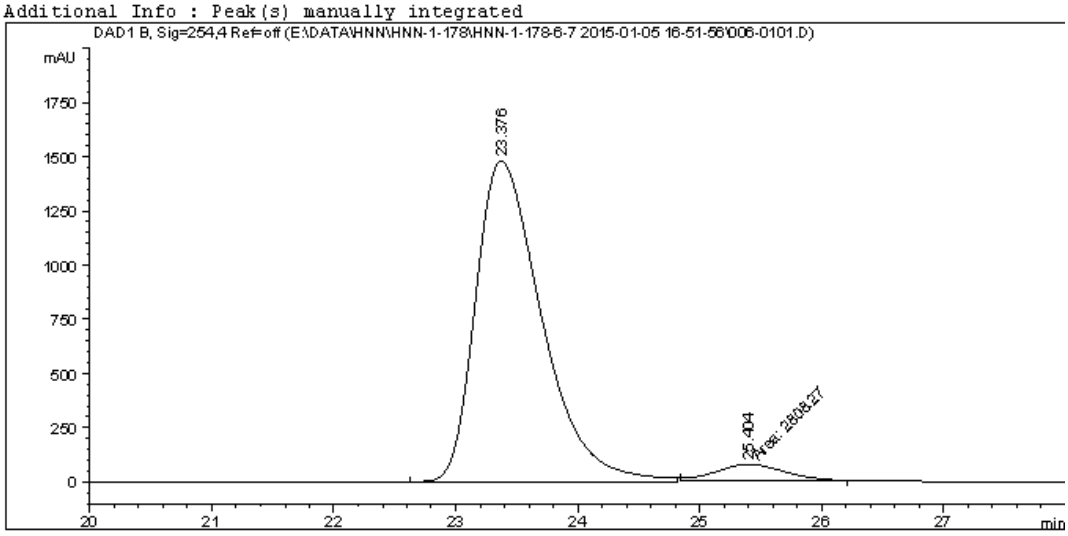

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  23.284 VV    0.5608 4.12417e4  1132.58838  49.8623
       2  25.128 MM    0.6687 4.14695e4  1033.60925  50.1377

    Totals :                  8.27112e4  2166.19763

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



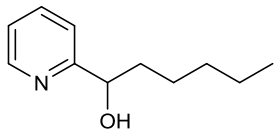
2d

Data File E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\006-0101.D
Sample Name: HNN-1-178-6

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 6
    Injection Date  : 1/5/2015 4:52:48 PM              Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\DAD-0D-95-05-03-
                      254NM-40MIN.M
    Last changed    : 1/5/2015 4:51:56 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\DAD-0D-95-05-03-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:27:05 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

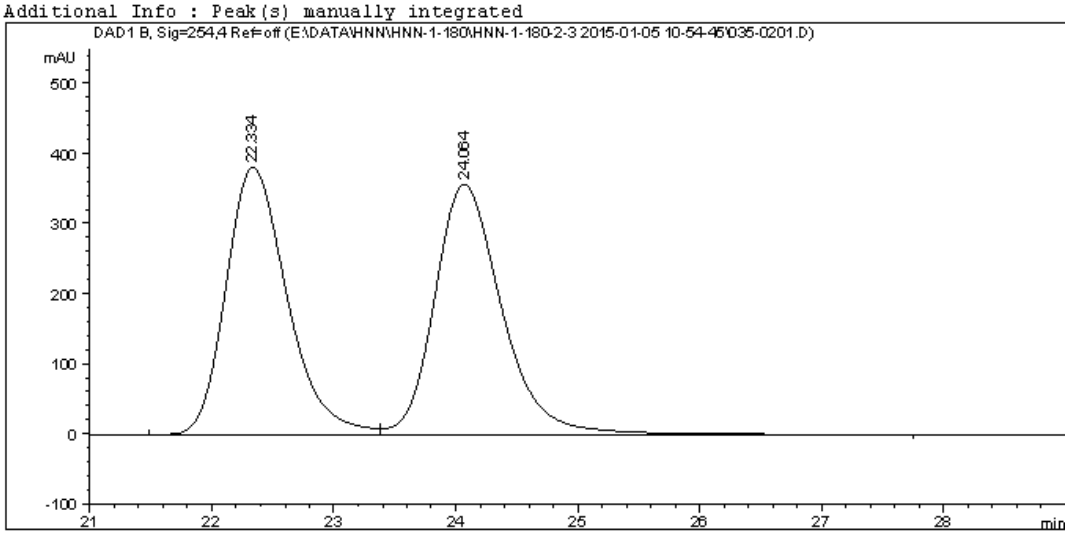



```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  23.376 BV    0.5793 5.5747le4  1480.34985  95.2041
       2  25.404 MM    0.6359 2808.27197   73.59798   4.7959

    Totals :                  5.85554e4  1553.94783

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

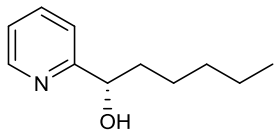


Data File E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\035-0201.D
Sample Name: HNN-1-180-3

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 35
    Injection Date  : 1/5/2015 11:36:29 AM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\DAD-0D-95-05-03-
                      254NM-40MIN.M
    Last changed    : 1/5/2015 10:54:45 AM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-180-2-3 2015-01-05 10-54-45\DAD-0D-95-05-03-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:31:22 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



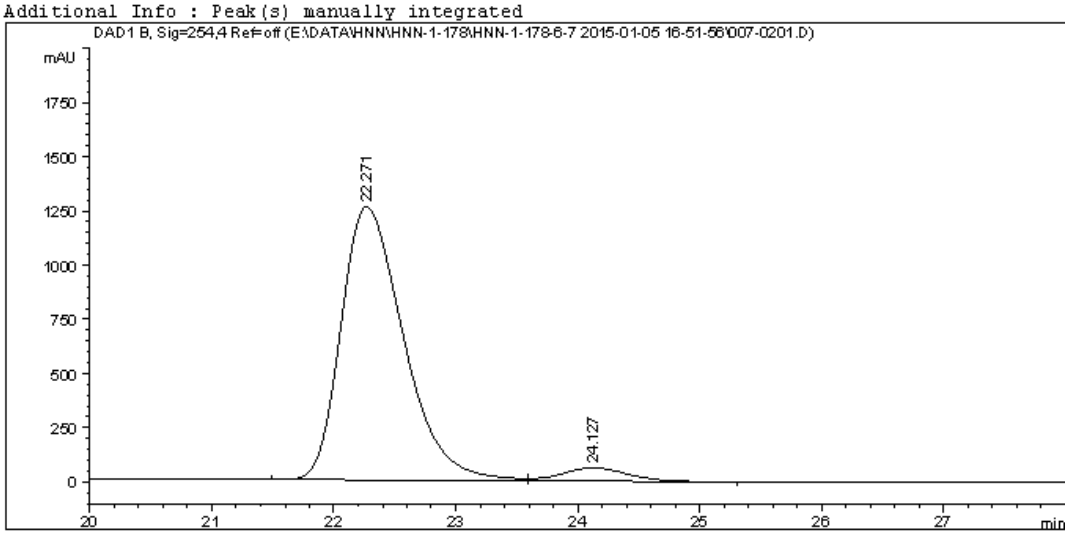

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  22.334 BV    0.5365 1.32906e4   381.44104  49.2744
       2  24.064 VB    0.5887 1.36820e4   357.30292  50.7256

    Totals :                  2.69726e4   738.74396

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



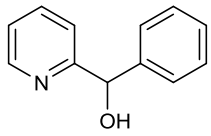
2e

Data File E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\007-0201.D
Sample Name: HNN-1-178-7

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 7
    Injection Date  : 1/5/2015 5:33:41 PM                  Inj :   1
                                                     Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\DAD-0D-95-05-03-
                      254NM-40MIN.M
    Last changed    : 1/5/2015 4:51:56 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-178\HNN-1-178-6-7 2015-01-05 16-51-56\DAD-0D-95-05-03-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:29:18 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

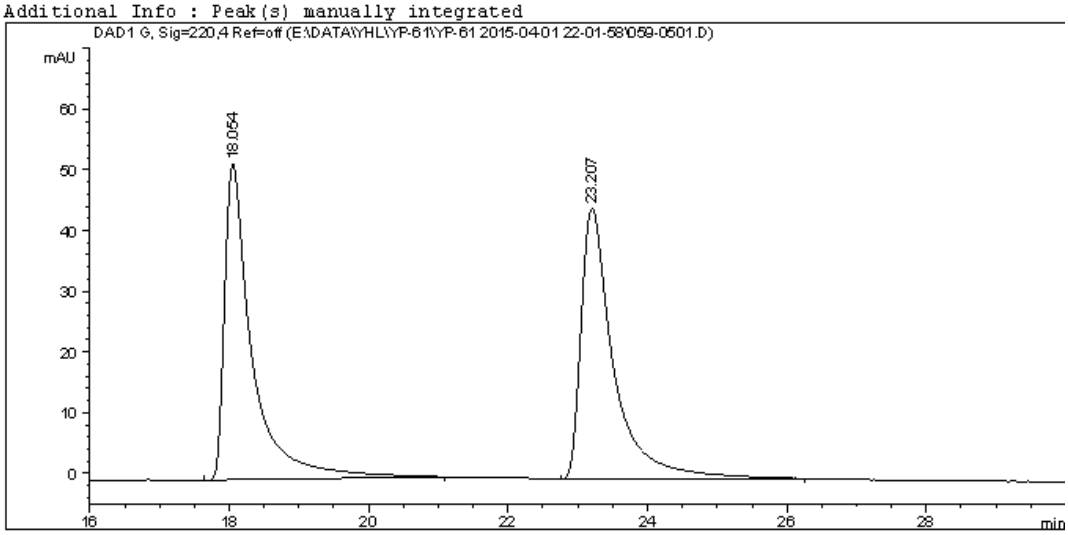



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  22.271 BV    0.5488 4.48167e4  1260.48145  95.1324
       2  24.127 VB    0.5770 2293.10498   61.21550   4.8676

    Totals :                  4.71098e4  1321.69695

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

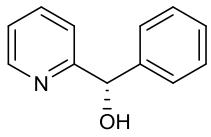


Data File E:\DATA\YHL\YP-61\YP-61 2015-04-01 22-01-58\059-0501.D
Sample Name: YHL-YP-61-3

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   5
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 59
    Injection Date  : 4/1/2015 11:38:31 PM               Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YP-61\YP-61 2015-04-01 22-01-58\DAD-ADH-92-8-0.7ML-30MIN(1-2
                      ).M
    Last changed    : 4/1/2015 10:01:59 PM by SYSTEM
    Analysis Method : E:\DATA\YHL\YP-61\YP-61 2015-04-01 22-01-58\DAD-ADH-92-8-0.7ML-30MIN(1-2
                      ).M (Sequence Method)
    Last changed    : 4/3/2015 5:04:09 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



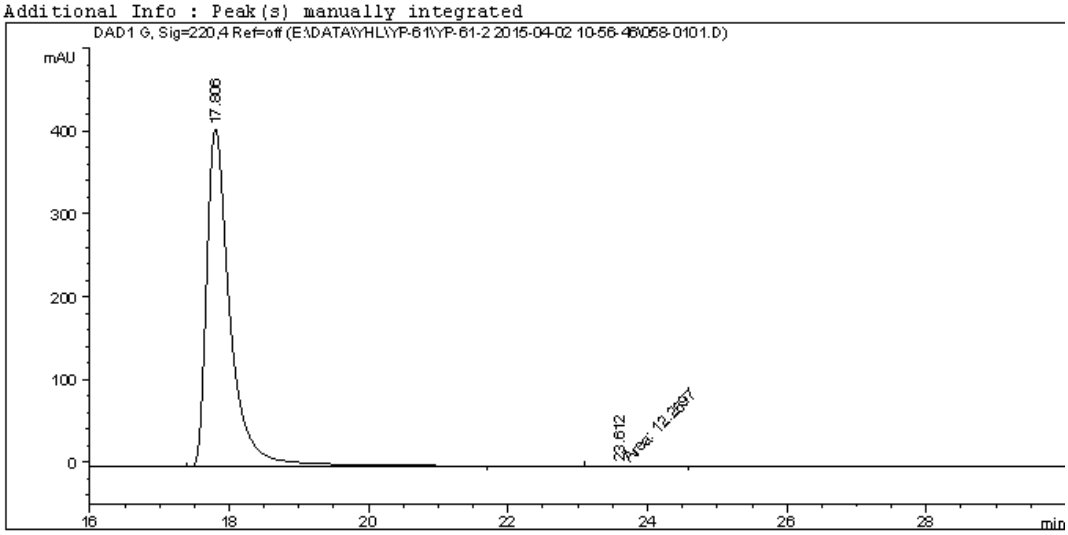

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.054 BB    0.3961 1434.77039   51.96707  49.7711
       2  23.207 BB    0.4793 1447.96814   44.53493  50.2289

    Totals :                  2882.73853   96.50200

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



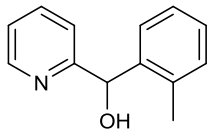
2f

Data File E:\DATA\YHL\YP-61\YP-61-2 2015-04-02 10-56-46\058-0101.D
Sample Name: YHL-YP-61-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 58
    Injection Date  : 4/2/2015 10:57:36 AM                 Inj :   1
                                                     Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YP-61\YP-61-2 2015-04-02 10-56-46\DAD-ADH-92-8-0.7ML-30MIN(1
                      -2).M
    Last changed    : 4/2/2015 10:56:46 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YP-61\YP-61-2 2015-04-02 10-56-46\DAD-ADH-92-8-0.7ML-30MIN(1
                      -2).M (Sequence Method)
    Last changed    : 4/3/2015 5:07:05 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

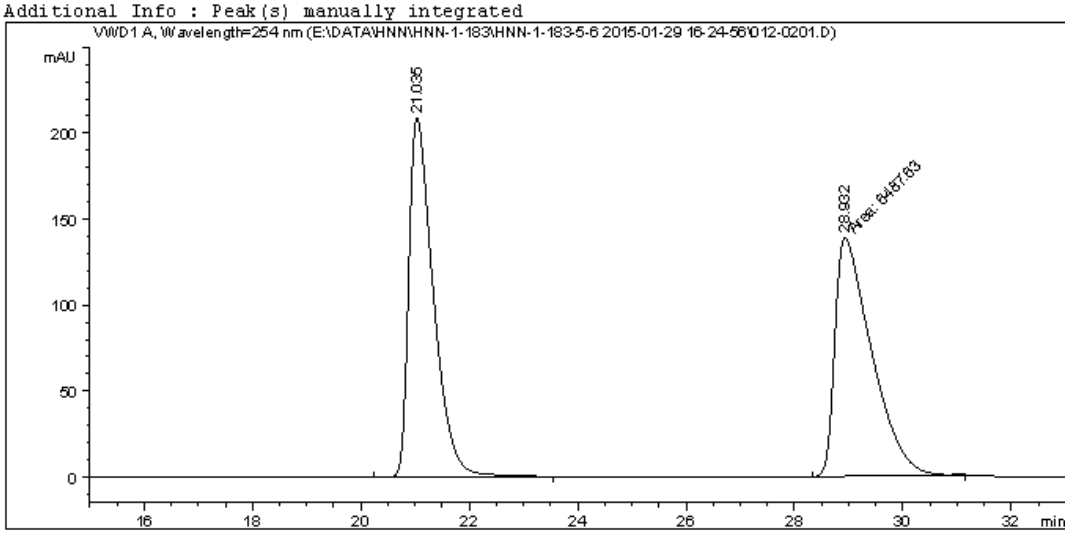



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  17.806 BB    0.3459 9491.85840  407.25763  99.8709
       2  23.612 MM    0.9235   12.26975 2.21442e-1   0.1291

    Totals :                  9504.12815  407.47907

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

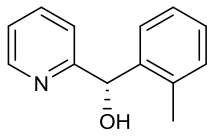


Data File E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\012-0201.D
Sample Name: HNN-1-183-6

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                  Location : Vial 12
    Injection Date  : 1/29/2015 5:01:23 PM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\VWD-0JH(1-6)-95-
                      05-10ML-254NM-35MIN.M
    Last changed    : 1/29/2015 5:37:31 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\VWD-0JH(1-6)-95-
                      05-10ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:11:16 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



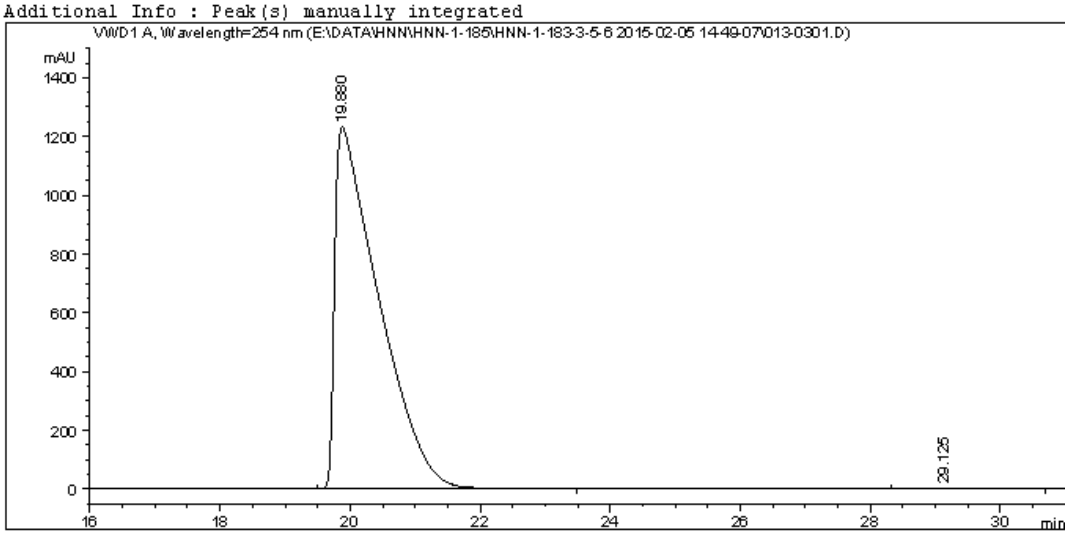

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  21.035 BB    0.4763 6587.81787  208.67139  50.3831
       2  28.932 MM    0.7774 6487.62646  139.09029  49.6169

    Totals :                  1.30754e4   347.76167

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



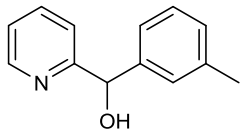
2g

Data File E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\013-0301.D
Sample Name: hnn-1-183-6

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   3
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 13
    Injection Date  : 2/5/2015 4:01:18 PM                  Inj :   1
                                                     Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-10ML-254NM-35MIN.M
    Last changed    : 2/5/2015 2:49:07 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-10ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:16:26 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

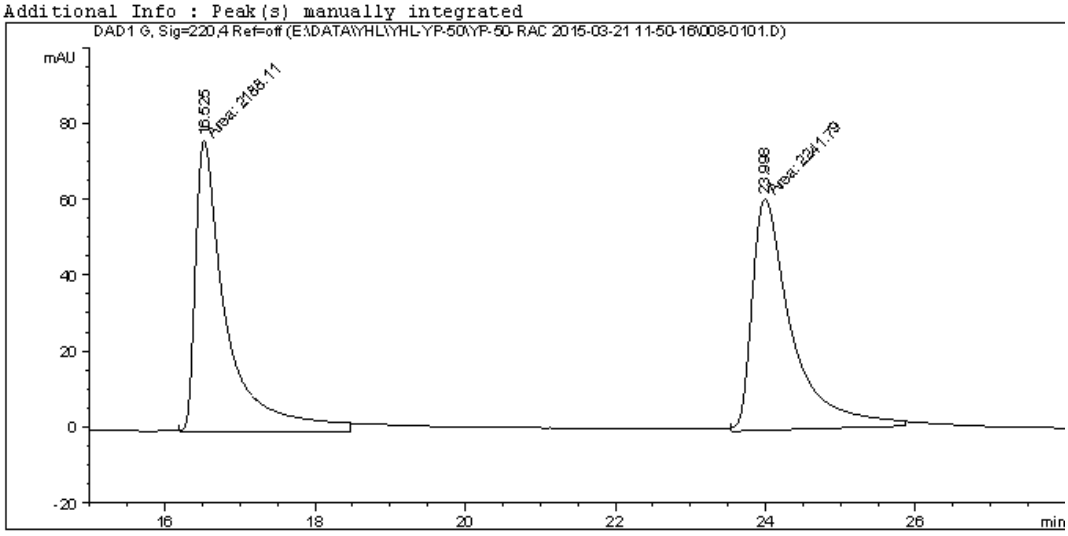



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  19.880 VB    0.6563 5.78798e4  1231.62219  99.7660
       2  29.125 BB    0.6086  135.75958    3.28204   0.2340

    Totals :                  5.80155e4  1234.90423

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

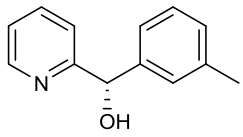


Data File E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\008-0101.D
Sample Name: YP-50-1-RAC

```
    ========================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 8
    Injection Date  : 3/21/2015 11:51:08 AM                Inj :   1
                                                     Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M
    Last changed    : 3/21/2015 11:50:16 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M (Sequence Method)
    Last changed    : 3/23/2015 9:26:42 AM by SYSTEM
    Additional Info : Peak(s) manually integrated
```



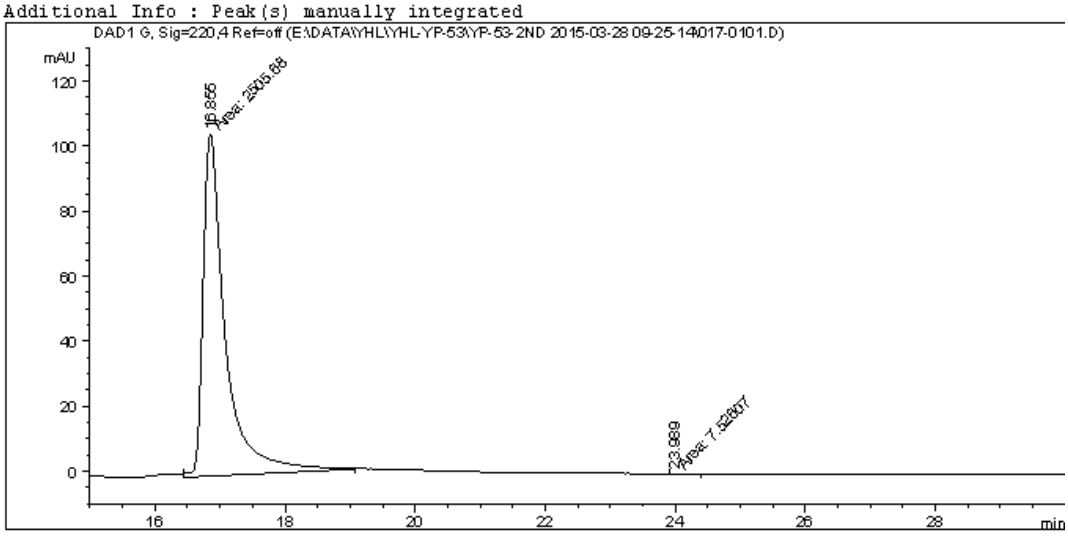

```
    ========================================================================
                            Area Percent Report
    ========================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  16.525 MM    0.4764 2188.11499   76.54733  49.3942
       2  23.998 MM    0.6130 2241.79028   60.94809  50.6058

    Totals :                  4429.90527  137.49543

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



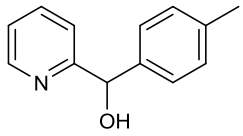
2h

Data File E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\017-0101.D
Sample Name: YP-53-1

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 17
    Injection Date  : 3/28/2015 9:26:04 AM               Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M
    Last changed    : 3/28/2015 9:25:14 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M (Sequence Method)
    Last changed    : 3/28/2015 10:06:39 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

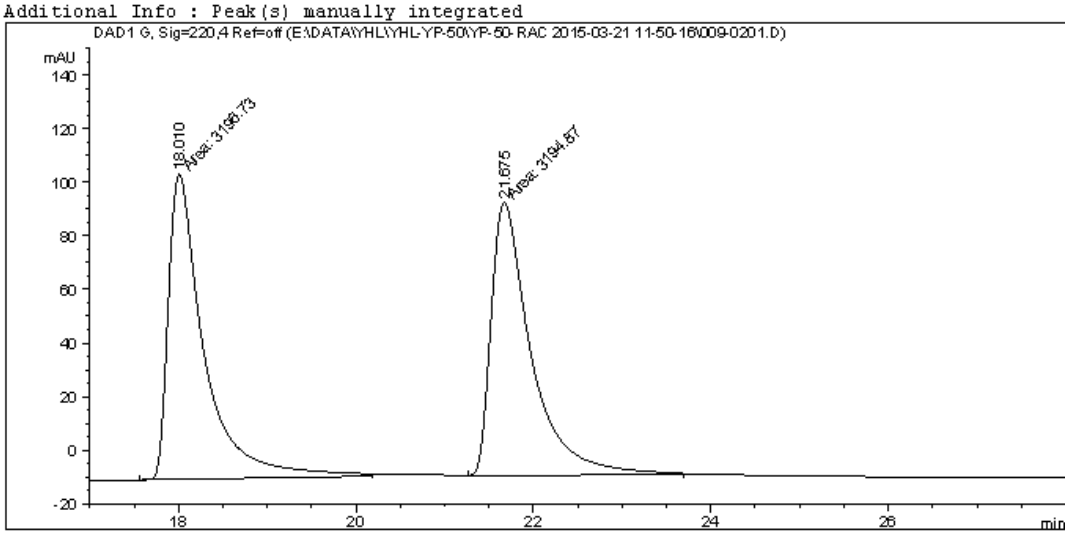



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  16.855 MM    0.3976 2505.67944  105.02229  99.7005
       2  23.989 MM    0.4286    7.52607 2.92632e-1   0.2995

    Totals :                  2513.20551  105.31493

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

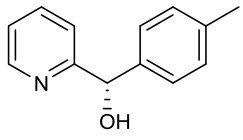


Data File E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\009-0201.D
Sample Name: YP-50-2-RAC

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 9
    Injection Date  : 3/21/2015 12:22:01 PM              Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M
    Last changed    : 3/21/2015 11:50:16 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-50\YP-50-RAC 2015-03-21 11-50-16\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M (Sequence Method)
    Last changed    : 3/27/2015 9:33:38 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



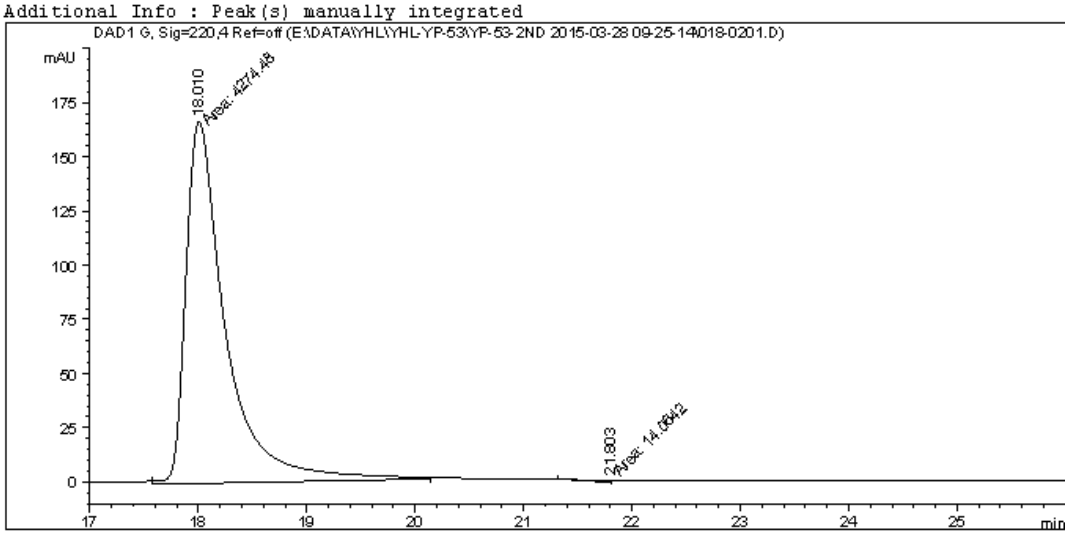

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.010 MM    0.4678 3196.73193  113.88120  50.0146
       2  21.675 MM    0.5230 3194.86768  101.81676  49.9854

    Totals :                  6391.59961  215.69795

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



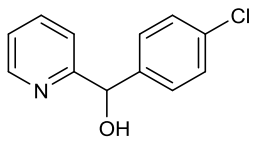
2i

Data File E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\018-0201.D
Sample Name: YP-53-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 18
    Injection Date  : 3/28/2015 9:56:56 AM                 Inj :   1
                                                     Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M
    Last changed    : 3/28/2015 9:25:14 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M (Sequence Method)
    Last changed    : 3/28/2015 10:30:10 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

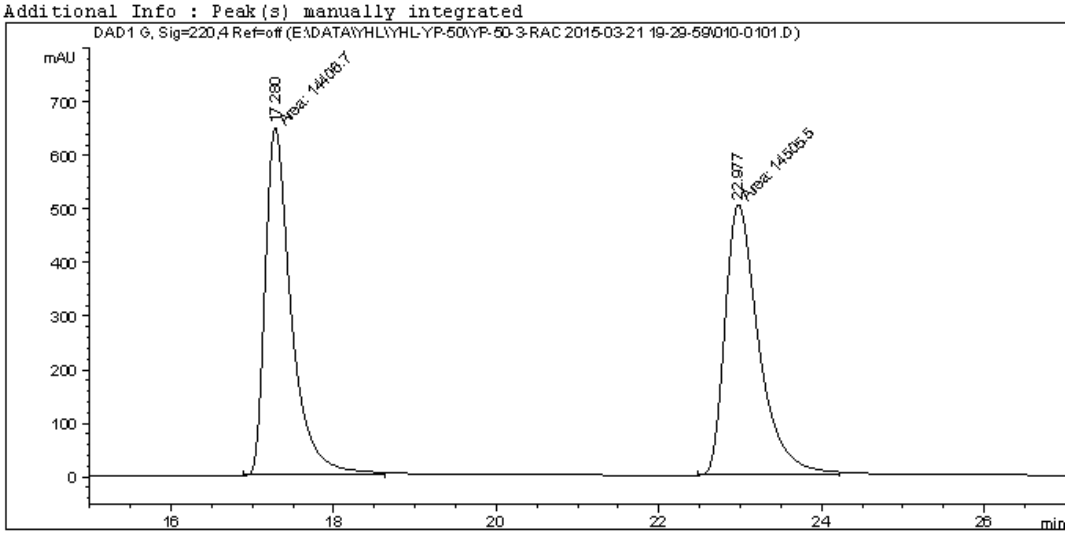



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.010 MM    0.4265 4274.48145  167.04932  99.6721
       2  21.803 MM    0.2007   14.06423    1.16797   0.3279

    Totals :                  4288.54568  168.21728

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

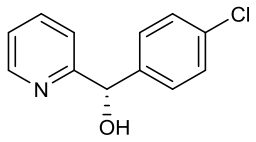


Data File E:\DATA\YHL\YHL-YP-50\YP-50-3-RAC 2015-03-21 19-29-59\010-0101.D
Sample Name: YP-50-3-RAC-AD

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                   Location : Vial 10
    Injection Date  : 3/21/2015 7:30:51 PM               Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-50\YP-50-3-RAC 2015-03-21 19-29-59\DAD-ADH-92-8-0.7ML
                      -30MIN(1-2).M
    Last changed    : 3/21/2015 7:29:59 PM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-50\YP-50-3-RAC 2015-03-21 19-29-59\DAD-ADH-92-8-0.7ML
                      -30MIN(1-2).M (Sequence Method)
    Last changed    : 3/27/2015 9:30:50 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



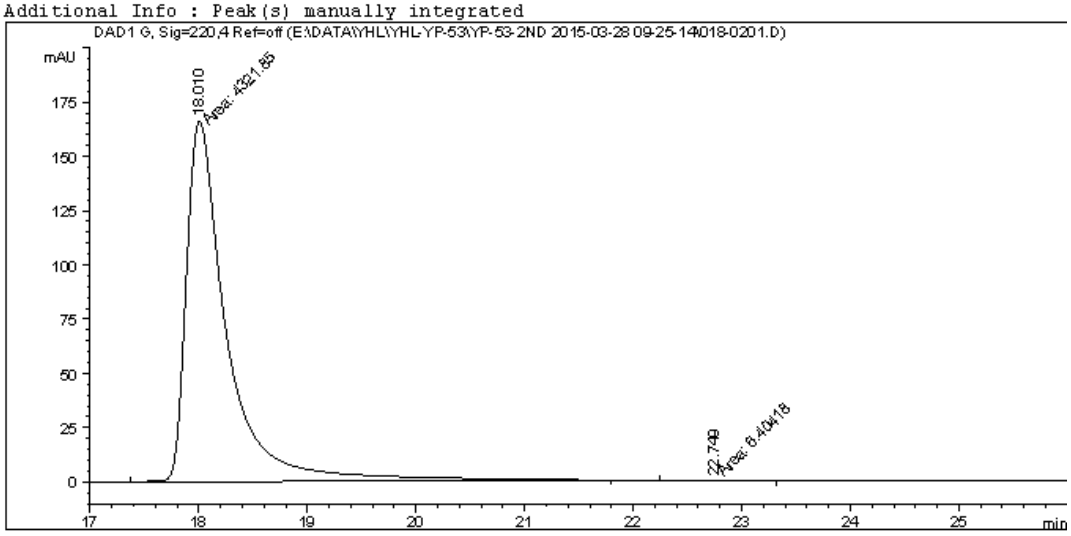

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  17.280 MM    0.3710 1.44067e4   647.18884  49.8292
       2  22.977 MM    0.4798 1.45055e4   503.88760  50.1708

    Totals :                  2.89123e4  1151.07645

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



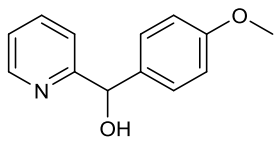
2j

Data File E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\018-0201.D
Sample Name: YP-53-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                   Location : Vial 18
    Injection Date  : 3/28/2015 9:56:56 AM                Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M
    Last changed    : 3/28/2015 9:25:14 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YHL-YP-53\YP-53-2ND 2015-03-28 09-25-14\DAD-ADH-92-8-0.7ML-
                      30MIN(1-2).M (Sequence Method)
    Last changed    : 4/24/2015 6:54:19 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

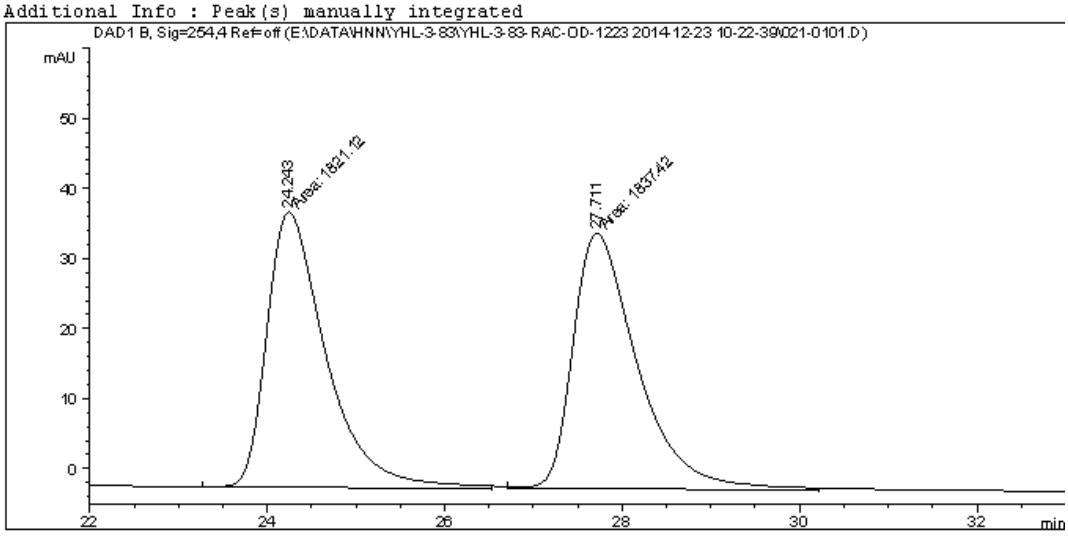



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 G, Sig=220,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.010 MM    0.4333 4321.85107  166.25296  99.8520
       2  22.749 MM    0.8656    6.40418 1.23304e-1   0.1480

    Totals :                  4328.25525  166.37626

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

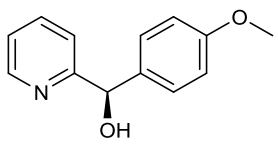


Data File E:\DATA\HNN\YHL-3-83\YHL-3-83-RAC-OD-1223 2014-12-23 10-22-39\021-0101.D
Sample Name: yhl-3-83-rac

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                   Location : Vial 21
    Injection Date  : 12/23/2014 10:23:29 AM              Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-83\YHL-3-83-RAC-OD-1223 2014-12-23 10-22-39\DAD-OD-95-
                      05-10-254NM-50MIN.M
    Last changed    : 12/23/2014 10:22:39 AM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-83\YHL-3-83-RAC-OD-1223 2014-12-23 10-22-39\DAD-OD-95-
                      05-10-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:40:48 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



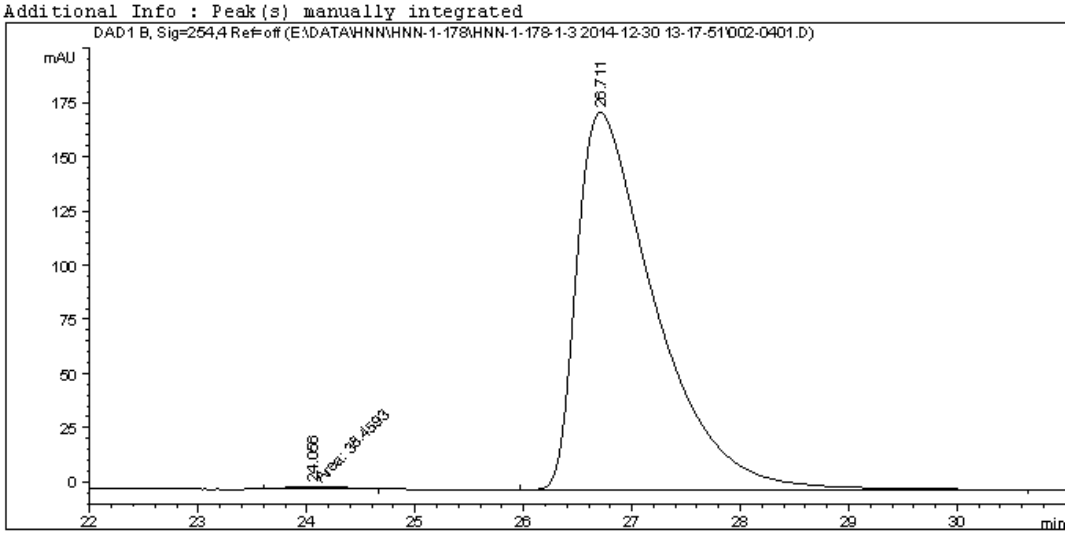

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  24.243 MM    0.7730 1821.12085   39.26750  49.7773
       2  27.711 MM    0.8395 1837.41724   36.47995  50.2227

    Totals :                  3658.53809   75.74745

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



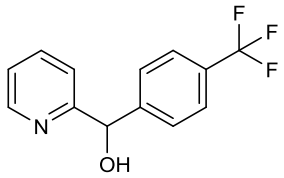
2k

Data File E:\DATA\HNN\HNN-1-178\HNN-1-178-1-3 2014-12-30 13-17-51\002-0401.D
Sample Name: HNN-1-178-3

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   4
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 2
    Injection Date  : 12/30/2014 2:26:38 PM                Inj :   1
                                                     Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-178\HNN-1-178-1-3 2014-12-30 13-17-51\DAD-0D-95-05-10-
                      254NM-40MIN.M
    Last changed    : 12/30/2014 1:17:52 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-178\HNN-1-178-1-3 2014-12-30 13-17-51\DAD-0D-95-05-10-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:34:07 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

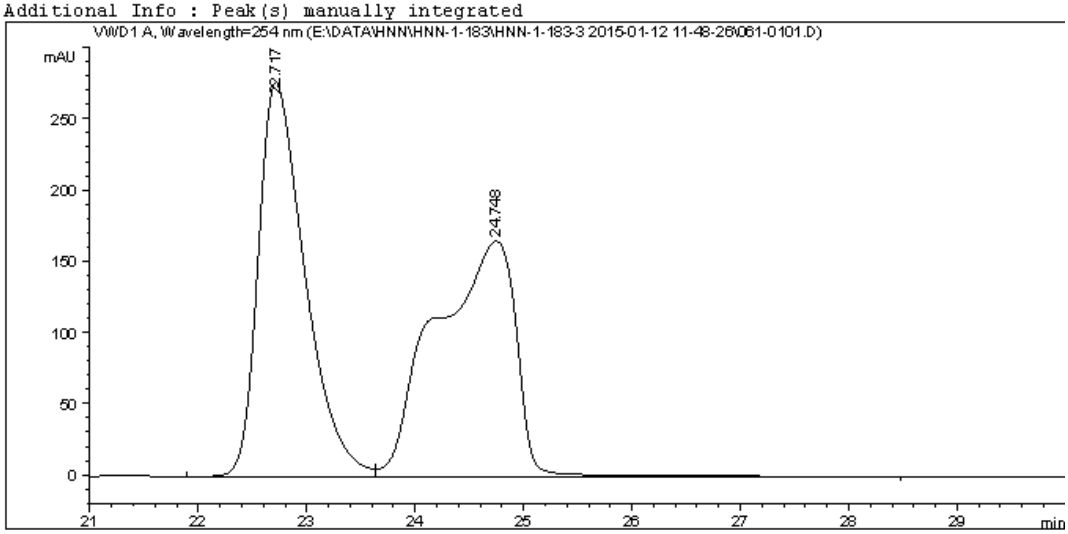



```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  24.056 MM    0.5616   38.45930    1.14130   0.4381
       2  26.711 BB    0.7438 8739.91992  174.05185  99.5619

    Totals :                  8778.37922  175.19315

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

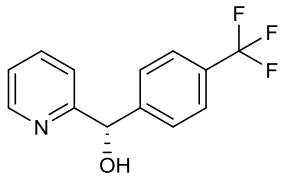


Data File E:\DATA\HNN\HNN-1-183\HNN-1-183-3 2015-01-12 11-48-26\061-0101.D
Sample Name: hnn-1-183-3

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                  Location : Vial 61
    Injection Date  : 1/12/2015 11:49:07 AM              Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-183\HNN-1-183-3 2015-01-12 11-48-26\VWD-0JH(1-6)-95-05
                      -05ML-254NM-35MIN.M
    Last changed    : 1/12/2015 11:48:26 AM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-183\HNN-1-183-3 2015-01-12 11-48-26\VWD-0JH(1-6)-95-05
                      -05ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:05:55 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



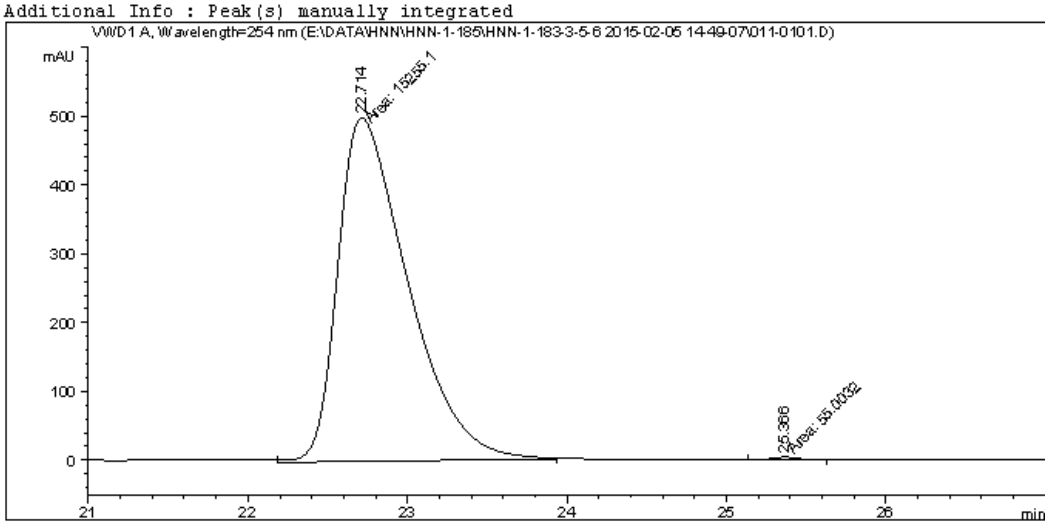

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  22.717 BV    0.4526 8271.05664  276.84335  49.3609
       2  24.748 VB    0.7124 8485.22168  165.44411  50.6391

    Totals :                  1.67563e4   442.28746


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



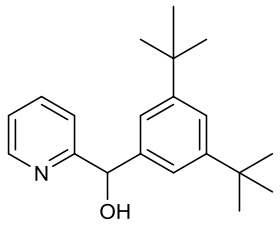
2l

Data File E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\011-0101.D
Sample Name: hnn-1-185-3

```
    ====================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 11
    Injection Date  : 2/5/2015 2:49:48 PM                   Inj :   1
                                                    Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-05ML-254NM-35MIN.M
    Last changed    : 2/5/2015 2:49:07 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-05ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 4/24/2015 6:49:23 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

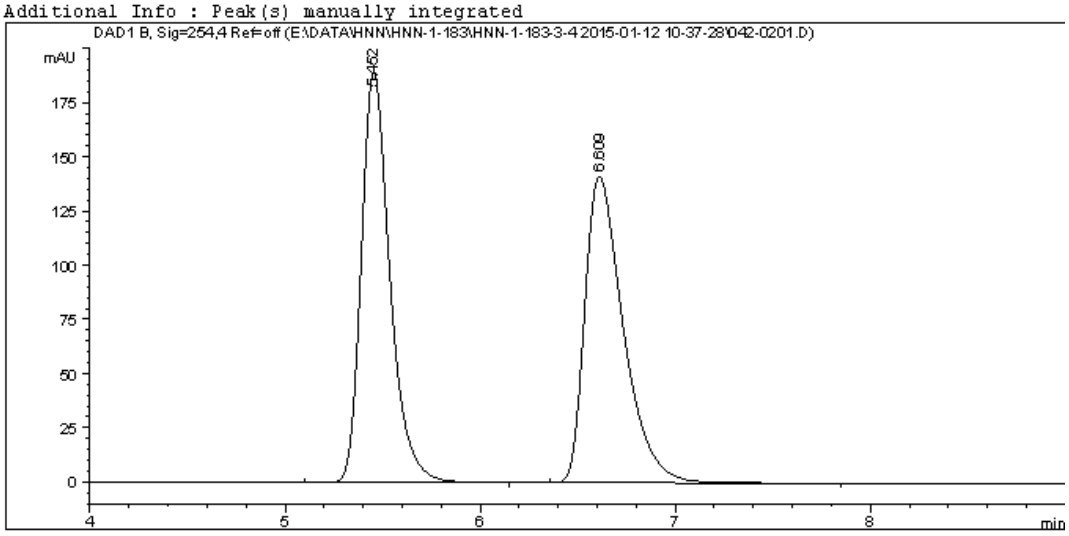



```
    ====================================================================
                            Area Percent Report
    ====================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  22.714 MM    0.5092 1.52551e4   499.34778  99.6407
       2  25.366 MM    0.2065   55.00323    4.43835   0.3593

    Totals :                  1.53101e4   503.78613


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

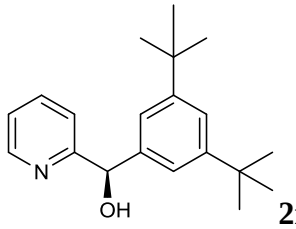


Data File E:\DATA\HNN\HNN-1-183\HNN-1-183-3-4 2015-01-12 10-37-28\042-0201.D
Sample Name: hnn-1-183-4

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 42
    Injection Date  : 1/12/2015 11:19:12 AM              Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-183\HNN-1-183-3-4 2015-01-12 10-37-28\DAD-0D-95-05-10-
                      254NM-40MIN.M
    Last changed    : 1/12/2015 10:37:28 AM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-183\HNN-1-183-3-4 2015-01-12 10-37-28\DAD-0D-95-05-10-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:07:21 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



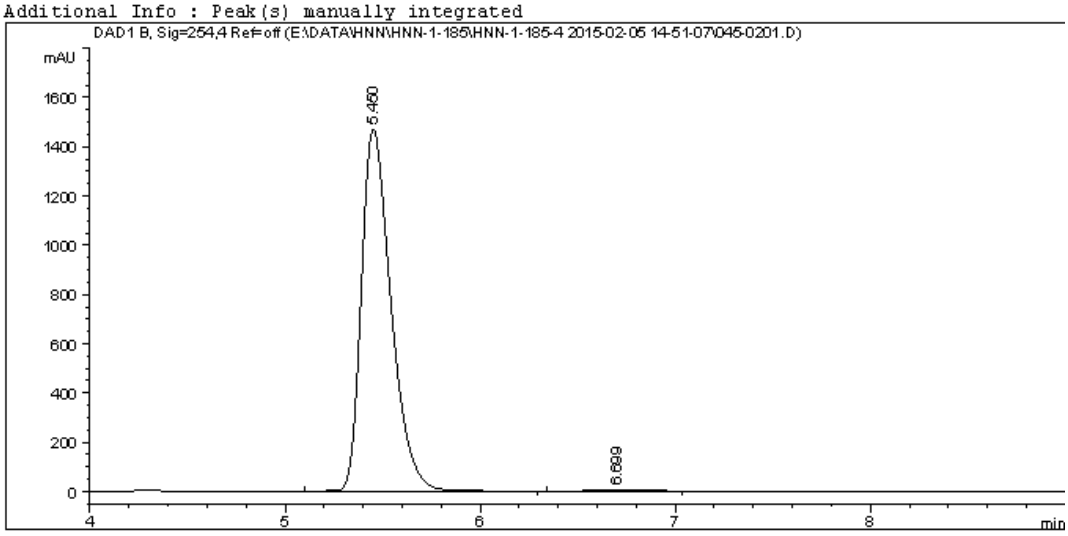

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1   5.452 BB    0.1549 1934.22168  189.86028  50.0156
       2   6.609 BB    0.2095 1933.01587  141.38390  49.9844

    Totals :                   3867.23755  331.24417

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



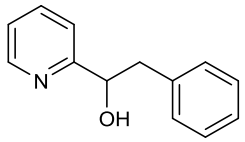
2m

Data File E:\DATA\HNN\HNN-1-185\HNN-1-185-4 2015-02-05 14-51-07\045-0201.D
Sample Name: hnn-1-185-4

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 45
    Injection Date  : 2/5/2015 3:03:00 PM                Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-185\HNN-1-185-4 2015-02-05 14-51-07\DAD-0D(1-6)-95-05-
                      10-254NM-15MIN.M
    Last changed    : 2/5/2015 2:51:07 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-185\HNN-1-185-4 2015-02-05 14-51-07\DAD-0D(1-6)-95-05-
                      10-254NM-15MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:08:45 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

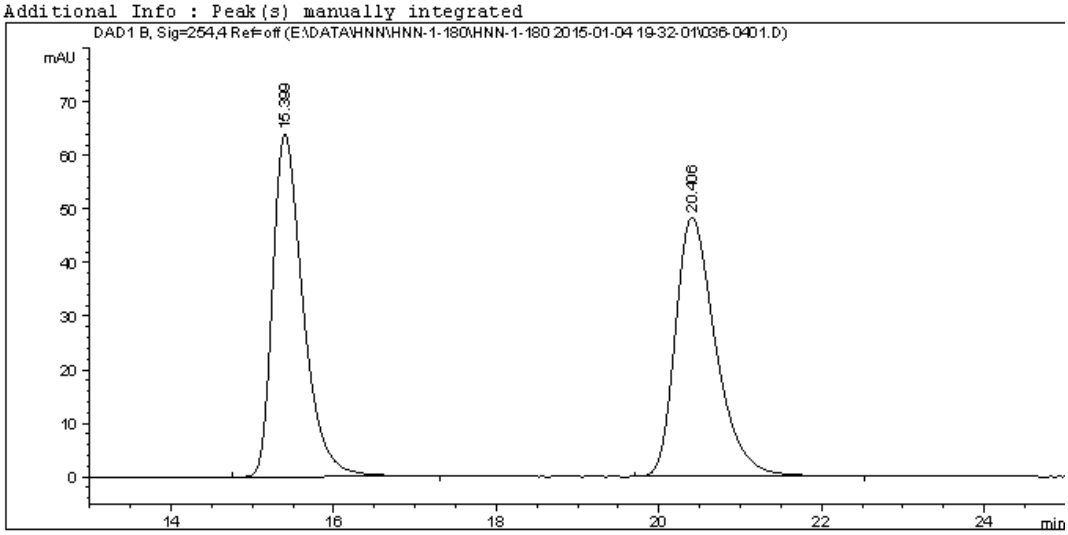



```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1   5.450 BB    0.1607 1.54769e4  1471.31909  99.5075
       2   6.699 BB    0.2007   76.60837    5.85280   0.4925

    Totals :                  1.55535e4  1477.17190

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

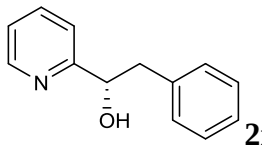


Data File E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\036-0401.D
Sample Name: HNN-1-180-4

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   4
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 36
    Injection Date  : 1/4/2015 9:05:45 PM                Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\DAD-0D-95-05-10-
                      254NM-40MIN.M
    Last changed    : 1/4/2015 7:32:01 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\DAD-0D-95-05-10-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:51:53 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



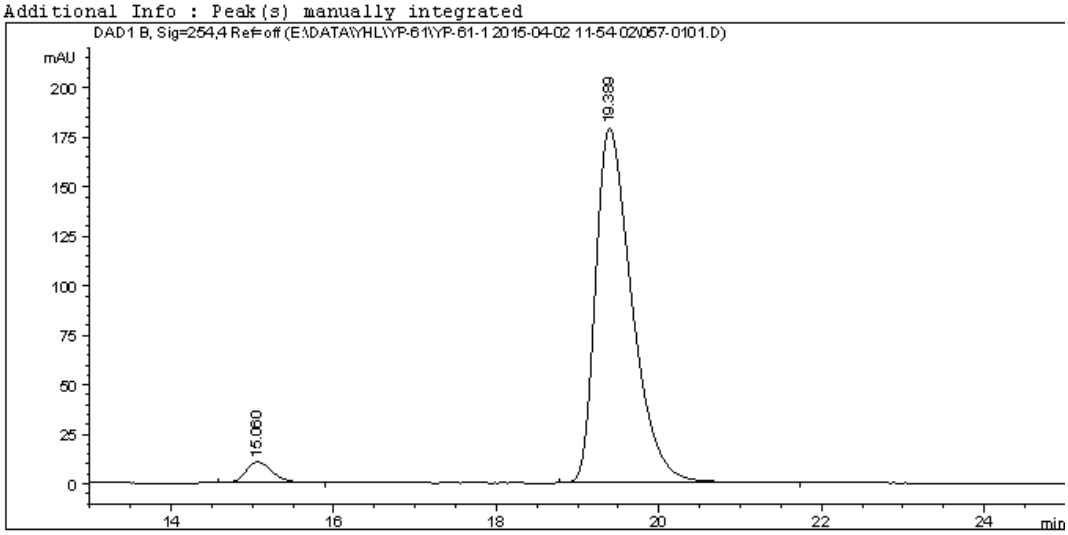

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  15.399 BB    0.3936 1665.25745   63.99953  49.9445
       2  20.406 BB    0.5260 1668.95544   48.43932  50.0555

    Totals :                  3334.21289  112.43885

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



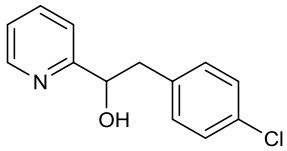
2n

Data File E:\DATA\YHL\YP-61\YP-61-1 2015-04-02 11-54-02\057-0101.D
Sample Name: YHL-YP-61-1

```
    ========================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 57
    Injection Date  : 4/2/2015 11:54:53 AM               Inj :   1
                                                   Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\YHL\YP-61\YP-61-1 2015-04-02 11-54-02\DAD-0D-95-05-10-254NM-
                      30MIN.M
    Last changed    : 4/2/2015 11:54:02 AM by SYSTEM
    Analysis Method : E:\DATA\YHL\YP-61\YP-61-1 2015-04-02 11-54-02\DAD-0D-95-05-10-254NM-
                      30MIN.M (Sequence Method)
    Last changed    : 4/3/2015 5:02:56 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

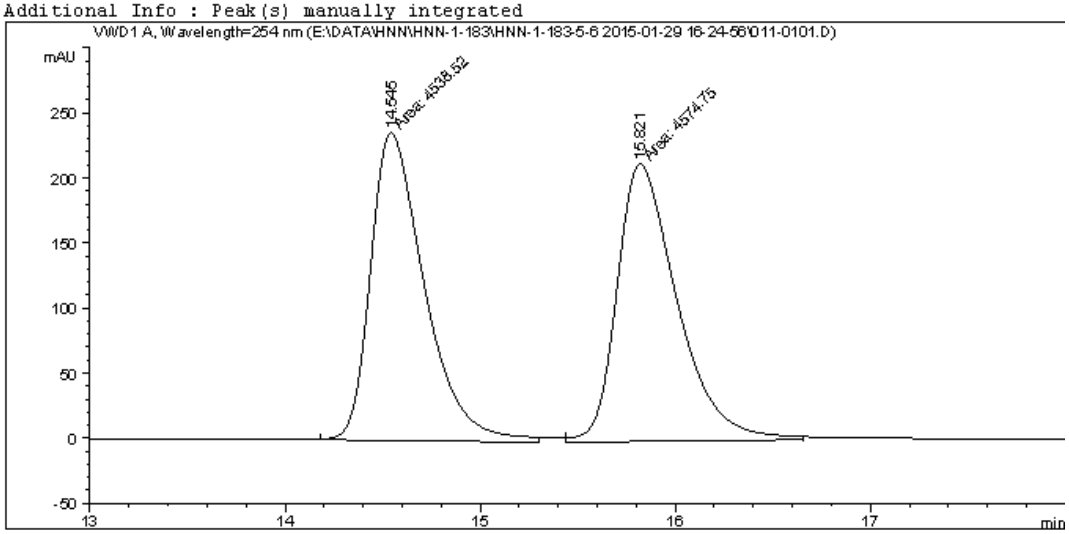



```
    ========================================================================
                              Area Percent Report
    ========================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  15.060 BB    0.3487  241.06236   10.54551   4.1479
       2  19.389 BB    0.4769 5570.59375  179.07620  95.8521

    Totals :                  5811.65611  189.62171

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

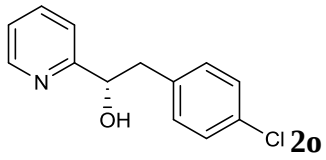


Data File E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\011-0101.D
Sample Name: HNN-1-183-5

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 11
    Injection Date  : 1/29/2015 4:25:38 PM               Inj :   1
                                                    Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\VWD-0JH(1-6)-95-
                      05-10ML-254NM-35MIN.M
    Last changed    : 1/29/2015 4:24:56 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-183\HNN-1-183-5-6 2015-01-29 16-24-56\VWD-0JH(1-6)-95-
                      05-10ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:24:21 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



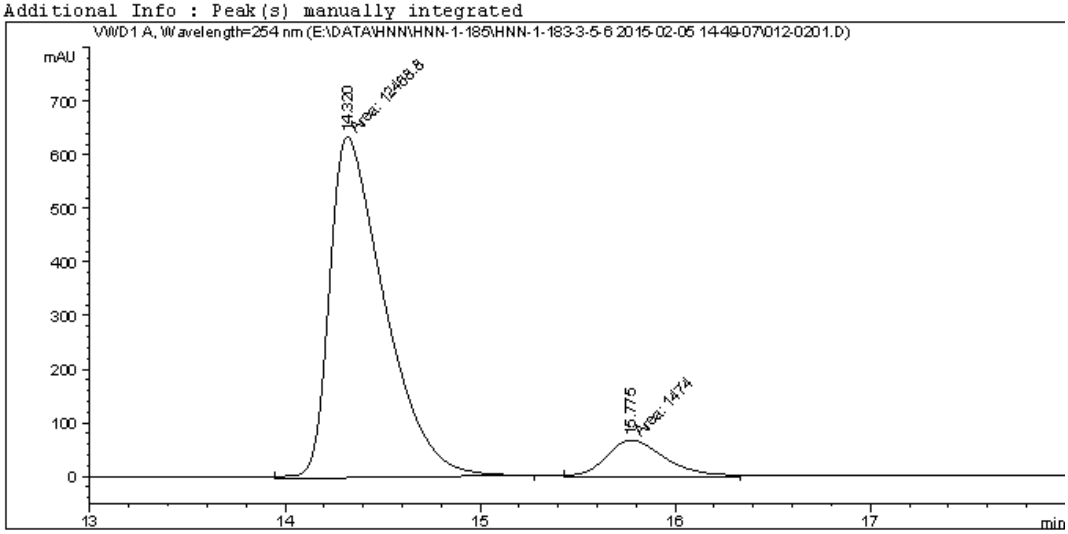

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  14.545 MM    0.3203 4538.52148  236.17903  49.8012
       2  15.821 MM    0.3579 4574.74707  213.05133  50.1988

    Totals :                  9113.26855  449.23036

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



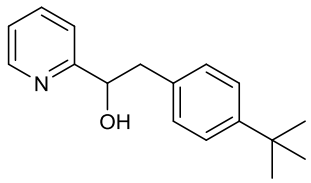
2o

Data File E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\012-0201.D
Sample Name: hnn-1-185-5

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 12
    Injection Date  : 2/5/2015 3:25:35 PM                 Inj :   1
                                                    Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-10ML-254NM-35MIN.M
    Last changed    : 2/5/2015 2:49:07 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-185\HNN-1-183-3-5-6 2015-02-05 14-49-07\VWD-0JH(1-6)-
                      95-05-10ML-254NM-35MIN.M (Sequence Method)
    Last changed    : 3/27/2015 9:18:04 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

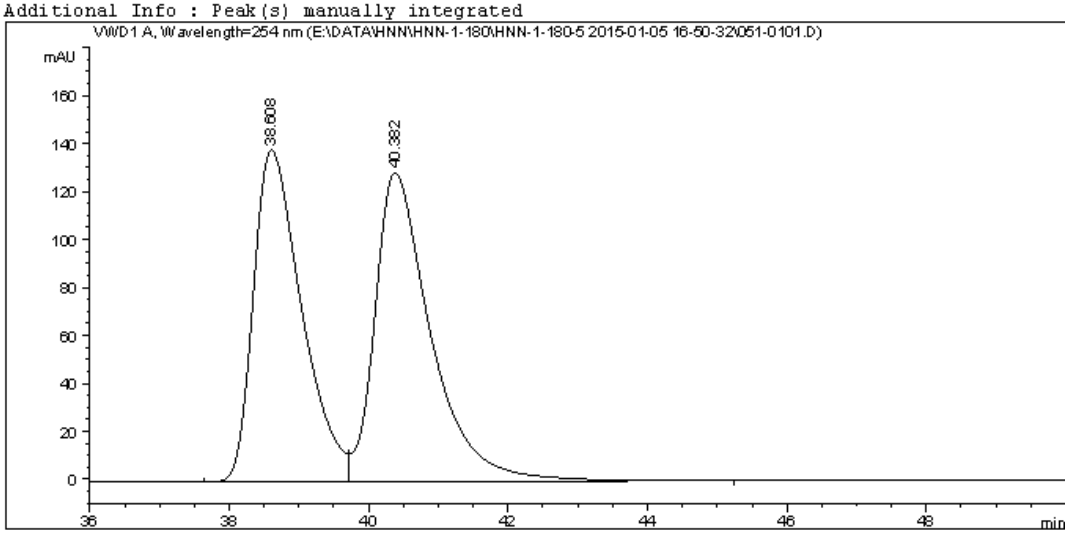



```
    ======================================================================
                           Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  14.320 MM    0.3268 1.24688e4   635.88556  89.4282
       2  15.775 MM    0.3583 1473.99756   68.57142  10.5718

    Totals :                  1.39427e4   704.45698


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

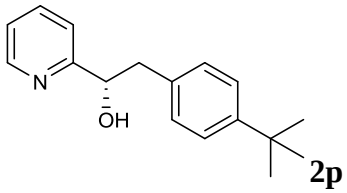


Data File E:\DATA\HNN\HNN-1-180\HNN-1-180-5 2015-01-05 16-50-32\051-0101.D
Sample Name: HNN-1-180-5

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 51
    Injection Date  : 1/5/2015 4:51:11 PM                  Inj :   1
                                                    Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-180-5 2015-01-05 16-50-32\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M
    Last changed    : 1/5/2015 4:50:32 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-180-5 2015-01-05 16-50-32\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:45:17 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



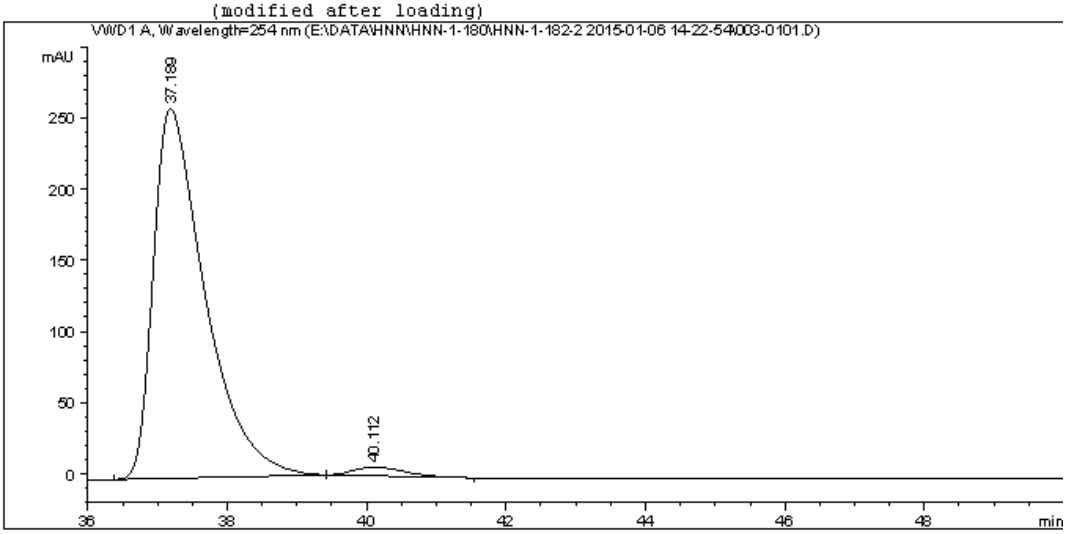

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  38.608 BV    0.7230 6642.69482  138.40056  48.0971
       2  40.382 VB    0.8249 7168.30664  128.88420  51.9029

    Totals :                  1.38110e4   267.28476


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



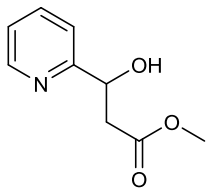
2p

Data File E:\DATA\HNN\HNN-1-180\HNN-1-182-2 2015-01-06 14-22-54\003-0101.D
Sample Name: HNN-1-182-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                    Location : Vial 3
    Injection Date  : 1/6/2015 2:23:34 PM                  Inj :   1
                                                   Inj Volume : 2.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-182-2 2015-01-06 14-22-54\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M
    Last changed    : 1/6/2015 2:22:54 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-182-2 2015-01-06 14-22-54\VWD-0JH(1-6)-97-03
                      -03ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:47:14 PM by SYSTEM
                      (modified after loading)
```

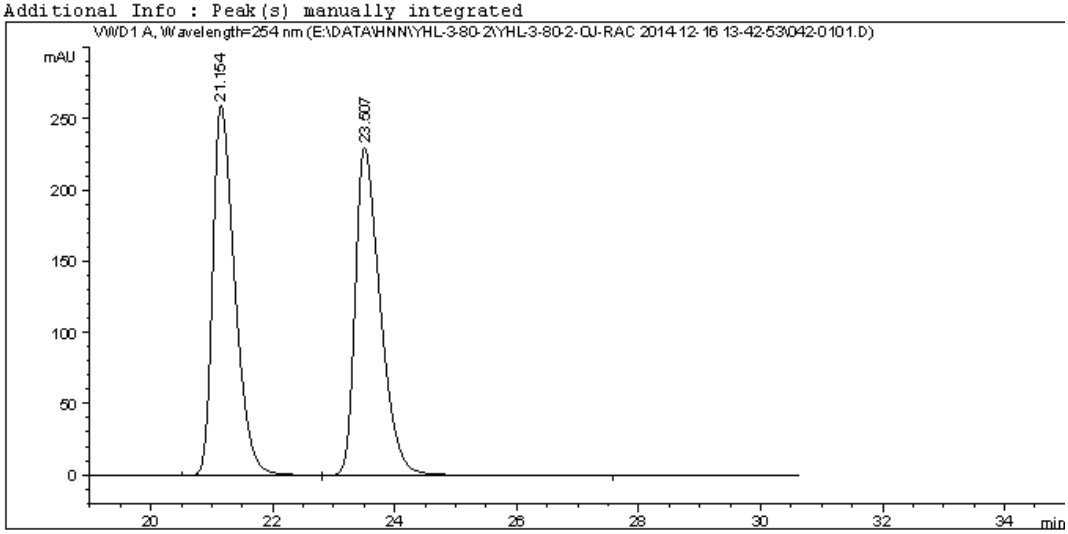



```
    ======================================================================
                           Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  37.189 BB    0.7591 1.33497e4   259.55002  97.7432
       2  40.112 BB    0.7567  308.23688    6.18191   2.2568

    Totals :                  1.36579e4   265.73193


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

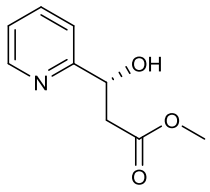


Data File E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2-0J-RAC 2014-12-16 13-42-53\042-0101.D
Sample Name: YHL-3-80-2-0J-RAC

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 42
    Injection Date  : 12/16/2014 1:43:35 PM               Inj :   1
                                                  Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2-0J-RAC 2014-12-16 13-42-53\VWD-0JH(1-6
                      )-95-05-10ML-254NM-50MIN.M
    Last changed    : 12/16/2014 1:42:53 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2-0J-RAC 2014-12-16 13-42-53\VWD-0JH(1-6
                      )-95-05-10ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:04:36 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



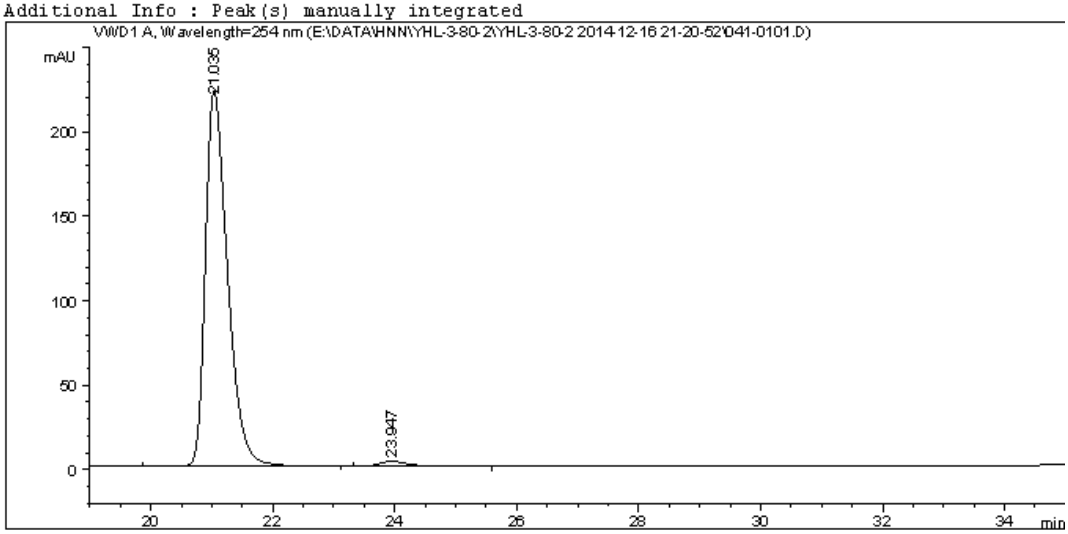

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  21.154 BB    0.3841 6565.34375  259.58633  49.8087
       2  23.507 BB    0.4348 6615.76855  230.54553  50.1913

    Totals :                  1.3181le4   490.13187


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



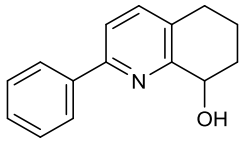
2q

Data File E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2 2014-12-16 21-20-52\041-0101.D
Sample Name: YHL-3-80-2

```
    ====================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 41
    Injection Date  : 12/16/2014 9:21:32 PM               Inj :   1
                                                  Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2 2014-12-16 21-20-52\VWD-0JH(1-6)-95-05
                      -10ML-254NM-50MIN.M
    Last changed    : 12/16/2014 9:20:52 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\YHL-3-80-2\YHL-3-80-2 2014-12-16 21-20-52\VWD-0JH(1-6)-95-05
                      -10ML-254NM-50MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:08:42 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

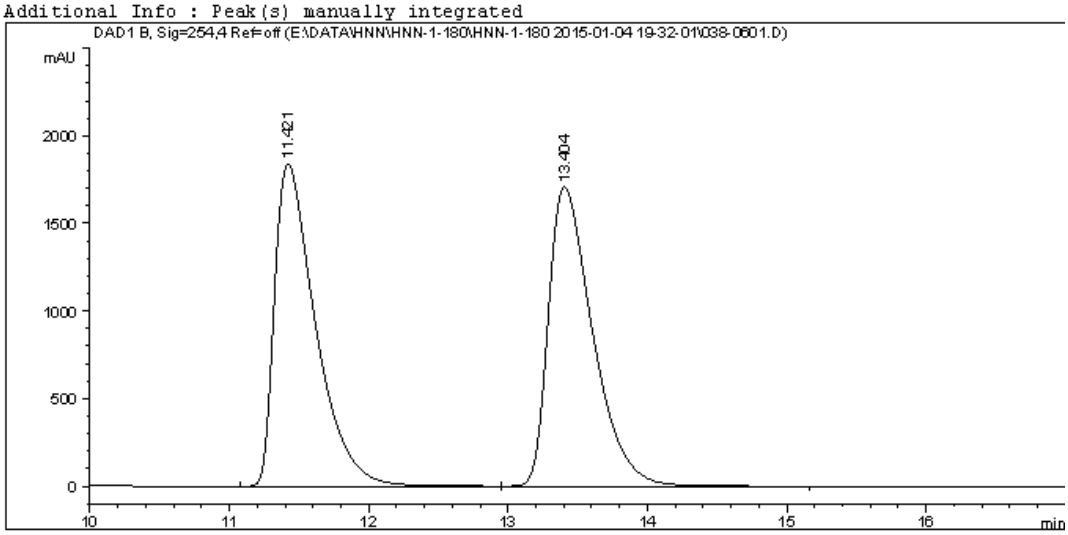



```
    ====================================================================
                            Area Percent Report
    ====================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  21.035 BB    0.3819 5588.35498  222.62787  98.4894
       2  23.947 BB    0.4725   85.71278    2.67718   1.5106

    Totals :                  5674.06776  225.30505


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

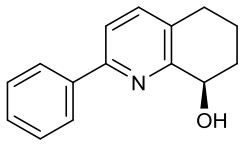


Data File E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\038-0601.D
Sample Name: HNN-1-180-6

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   6
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 38
    Injection Date  : 1/4/2015 10:27:32 PM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\DAD-0D-95-05-10-
                      254NM-40MIN.M
    Last changed    : 1/4/2015 7:32:01 PM by SYSTEM
    Analysis Method : E:\DATA\HNN\HNN-1-180\HNN-1-180 2015-01-04 19-32-01\DAD-0D-95-05-10-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:55:41 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



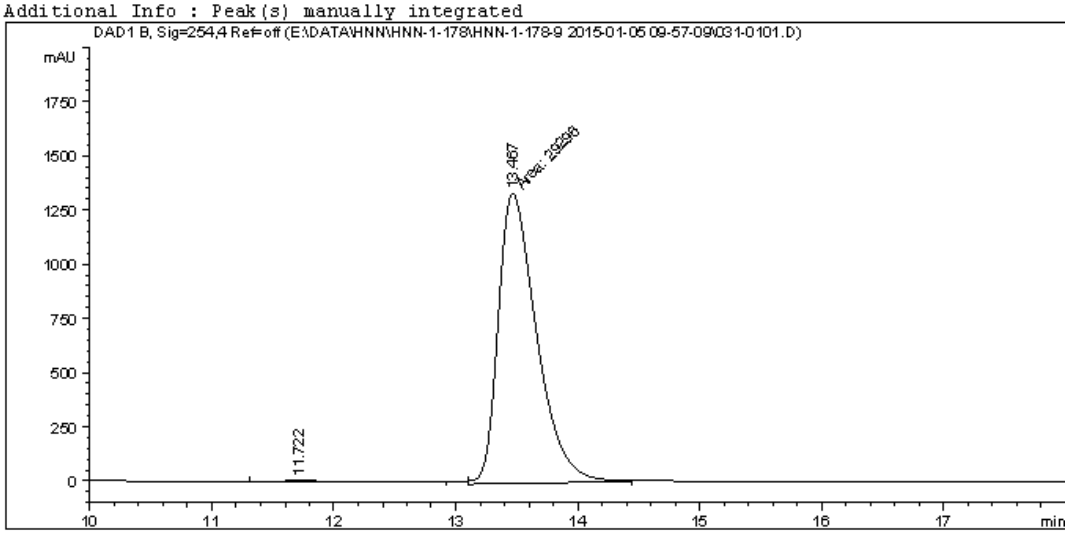

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  11.421 BB    0.3055 3.75302e4  1843.64734  49.9496
       2  13.404 BB    0.3348 3.76059e4  1708.43213  50.0504

    Totals :                  7.51362e4  3552.07947

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



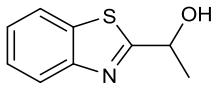
2r

Data File E:\DATA\HNN\HNN-1-178\HNN-1-178-9 2015-01-05 09-57-09\031-0101.D
Sample Name: HNN-1-178-9

```
    ========================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-DAD                    Location : Vial 31
    Injection Date  : 1/5/2015 9:58:04 AM                 Inj :   1
                                                    Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\HNN\HNN-1-178\HNN-1-178-9 2015-01-05 09-57-09\DAD-0D-95-05-10-
                      254NM-40MIN.M
    Last changed    : 1/5/2015 9:58:22 AM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\HNN\HNN-1-178\HNN-1-178-9 2015-01-05 09-57-09\DAD-0D-95-05-10-
                      254NM-40MIN.M (Sequence Method)
    Last changed    : 3/27/2015 8:57:53 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

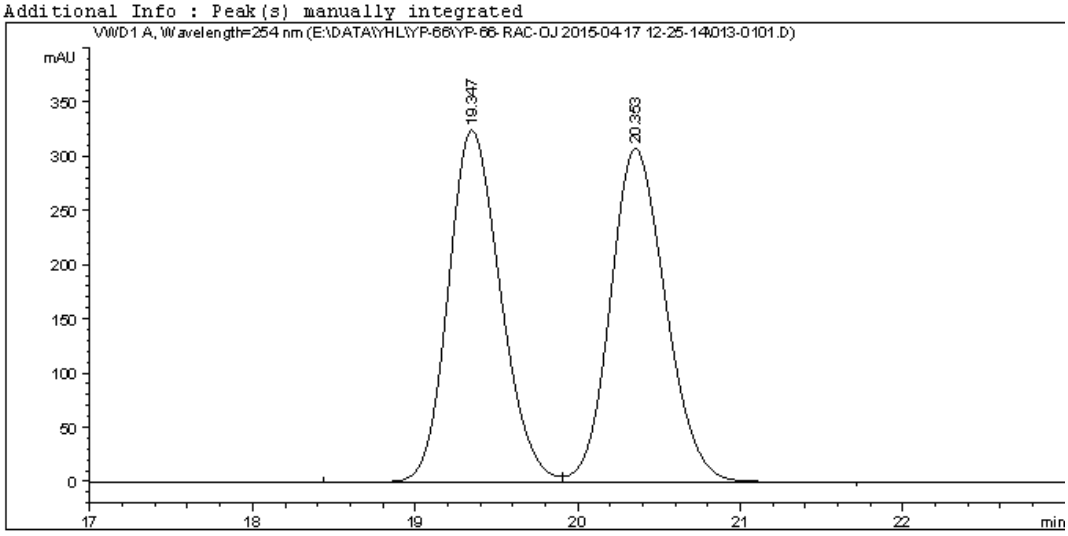



```
    ========================================================================
                            Area Percent Report
    ========================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  11.722 VB    0.3215   42.54405    1.95832   0.1450
       2  13.467 MM    0.3651 2.92960e4  1337.17993  99.8550

    Totals :                  2.93386e4  1339.13825

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


1260HPLC-DAD 3/27/2015 8:58:13 PM SYSTEM                    Page 1 of 1
```

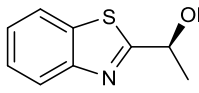


Data File E:\DATA\YHL\YP-66\YP-66-RAC-OJ 2015-04-17 12-25-14\013-0101.D
Sample Name: YP-66-RAC-OJ

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 13
    Injection Date  : 4/17/2015 12:25:55 PM              Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YP-66\YP-66-RAC-OJ 2015-04-17 12-25-14\VWD-OJH-95-5-10ML-
                      40MIN(1-6)-254NM.M
    Last changed    : 4/17/2015 12:47:10 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YHL\YP-66\YP-66-RAC-OJ 2015-04-17 12-25-14\VWD-OJH-95-5-10ML-
                      40MIN(1-6)-254NM.M (Sequence Method)
    Last changed    : 4/24/2015 2:14:51 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



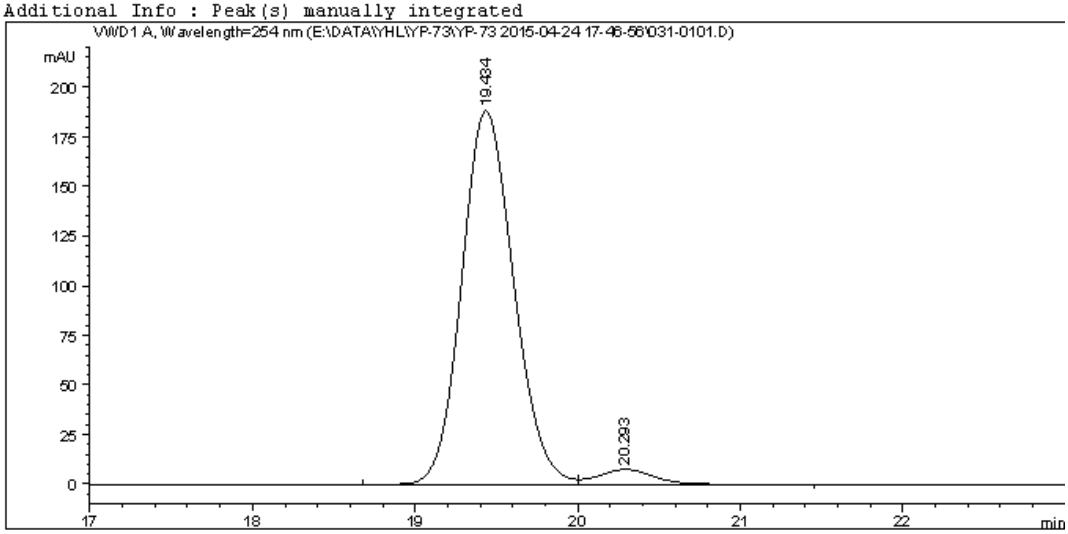

```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  19.347 BV    0.3449 7229.51611  324.57602  49.9403
       2  20.353 VB    0.3639 7246.79688  307.54221  50.0597

    Totals :                  1.44763e4   632.11823

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



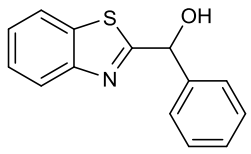
2u

Data File E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\031-0101.D
Sample Name: YP-73-1

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 31
    Injection Date  : 4/24/2015 5:47:41 PM                  Inj :   1
                                                    Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\VWD-0JH-95-5-10ML-30MIN(1-6)
                      -254NM.M
    Last changed    : 4/24/2015 5:46:56 PM by SYSTEM
    Analysis Method : E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\VWD-0JH-95-5-10ML-30MIN(1-6)
                      -254NM.M (Sequence Method)
    Last changed    : 4/24/2015 7:02:45 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

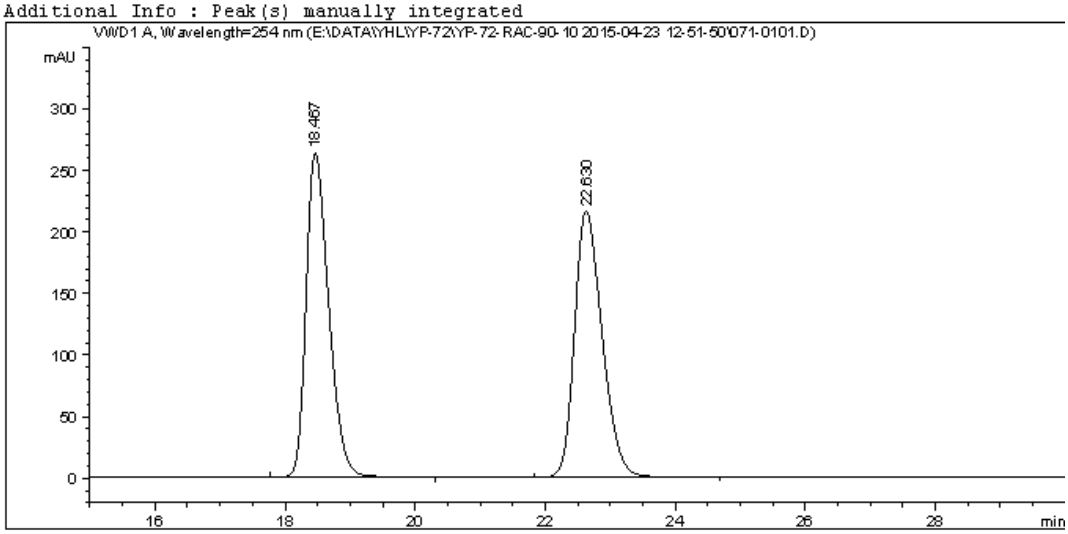



```
    ======================================================================
                              Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  19.434 BV    0.3455 4189.56006  188.34077  95.9204
       2  20.293 VB    0.3653  178.18649    7.49576   4.0796

    Totals :                  4367.74655  195.83653


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

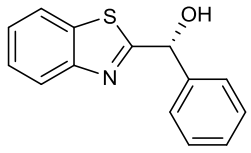


Data File E:\DATA\YHL\YP-72\YP-72-RAC-90-10 2015-04-23 12-51-50\071-0101.D
Sample Name: yp-72-rac

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 71
    Injection Date  : 4/23/2015 12:53:00 PM               Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YP-72\YP-72-RAC-90-10 2015-04-23 12-51-50\VWD-0JH-90-10-10ML
                      -30MIN(1-6)-254NM.M
    Last changed    : 4/23/2015 1:27:02 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YHL\YP-72\YP-72-RAC-90-10 2015-04-23 12-51-50\VWD-0JH-90-10-10ML
                      -30MIN(1-6)-254NM.M (Sequence Method)
    Last changed    : 4/23/2015 1:45:18 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```



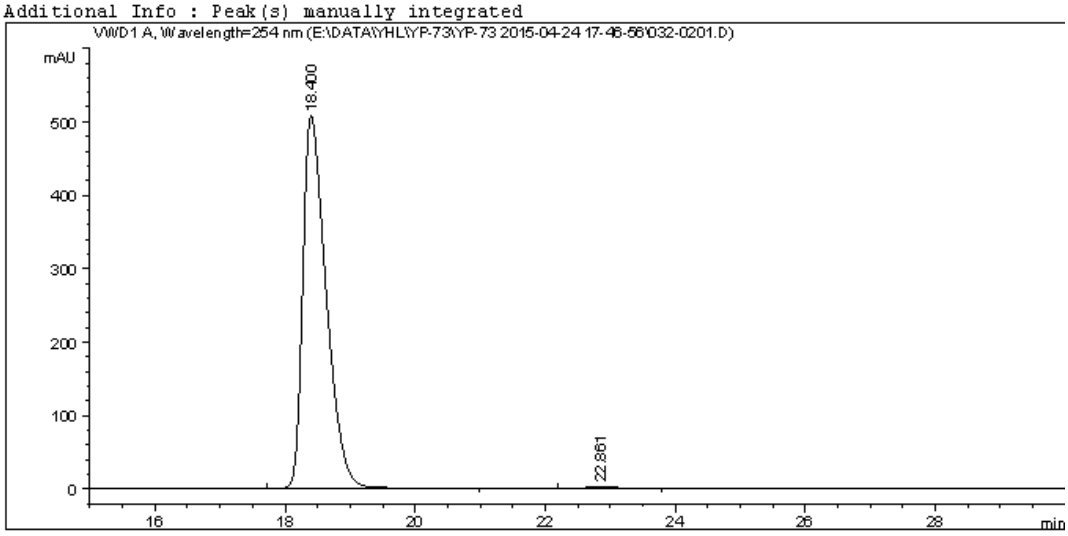

```
    ======================================================================
                            Area Percent Report
    ======================================================================

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.467 BB    0.3707 6333.29785  263.24326  50.0032
       2  22.630 BB    0.4520 6332.49365  216.02158  49.9968

    Totals :                  1.26658e4   479.26483

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



2v

Data File E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\032-0201.D
Sample Name: YP-73-2

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 32
    Injection Date  : 4/24/2015 6:18:29 PM                Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\VWD-0JH-90-10-10ML-30MIN(1-6
                      )-254NM.M
    Last changed    : 4/24/2015 5:46:56 PM by SYSTEM
    Analysis Method : E:\DATA\YHL\YP-73\YP-73 2015-04-24 17-46-56\VWD-0JH-90-10-10ML-30MIN(1-6
                      )-254NM.M (Sequence Method)
    Last changed    : 4/24/2015 7:00:34 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```




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

    Sorted By             :      Signal
    Multiplier            :      1.0000
    Dilution              :      1.0000
    Do not use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=254 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  18.400 BB    0.3795 1.26175e4   506.71078  99.5559
       2  22.861 BB    0.4359   56.28454    1.95511   0.4441

    Totals :                  1.26738e4   508.66589

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