Supporting Information

Highly Enantioselective Ir/f-amphox-Catalyzed Hydrogenation of Ketoamides: Efficient Access to Chiral Hydroxy Amides

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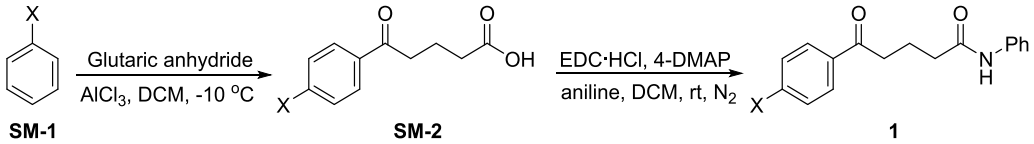
1. General remarks

All reactions and manipulations which are sensitive to moisture or air were performed in an argon-filled glovebox or using standard Schlenk techniques. Hydrogen gas (99.999%) was purchased from Shanghai Regulator Factory Co., Ltd. Anhydrous *i*-PrOH, EtOH, MeOH, DCM, EtOAc, toluene and $CHCl_3$ were purchased from J&K. Anhydrous THF, 1,4-dioxane was distilled from sodium benzophenone ketyl. Anhydrous $ClCH_2CH_2Cl$ were freshly distilled from calcium hydride. K_2CO_3, Cs_2CO_3, KOH, MeOK, *t*-BuONa and *t*-BuOK were purchased from J&K. $[Ir(COD)Cl]_2$ was prepared according to the literature.[1-2] ^1H, ^{13}C and ^{31}P NMR spectra were recorded with a Bruker ADVANCE III (400 MHz) spectrometer with $CDCl_3$ as the solvent and tetramethylsilane (TMS) as the internal standard. Chemical shifts are reported in parts per million (ppm, δ scale) downfield from TMS at 0.00 ppm and referenced to the $CDCl_3$ at 7.26 ppm (for ^1H NMR) or 77.0 ppm (for ^{13}C NMR). Data are reported as: multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet), coupling constant in hertz (Hz) and signal area integration in natural numbers. ^{13}C NMR and ^{31}P NMR analyses were run with decoupling. Optical rotations $[\alpha]_D$ were determined using a PERKIN ELMER polarimeter 343 instrument. HPLC analyses were performed using Daicel chiral column. A single crystal of (*R*)-**2i** was grown from its solution in ethyl acetate, which is suitable for X-ray diffraction analysis. The structure showed that the absolute configuration of **2i** is (*R*). The absolute configuration of other hydrogenation products were assigned by analogy. The absolute configuration of products **2m** and **2n** were assigned by the comparison of optical rotation datas according to literature.[3-4]

2. General procedure for the preparation of substrate compounds

Scheme S1. General procedure for the preparation of substrates route 1. [5-6]



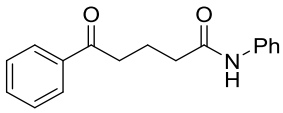
Step 1:

Under a nitrogen atmosphere, a mixture of anhydrous aluminum chloride (8.0 g, 60 mmol) in anhydrous dichloromethane (50 mL) was stirred and cooled to -10 ºC. A solution of glutaric anhydride (4.8 g, 42 mmol) and substituted benzene (**SM-1**, 40 mmol) was added dropwise to the cooled mixture with stirring. After 5h at -10 ℃, the reaction mixture was poured into ice-cooled 3.5 M HCl (100 mL), and the product was extracted into dichloromethane. The extract was washed with cold saturated aqueous sodium carbonate, and the aqueous layers were acidified and extracted with dichloromethane. The extract was washed with brine, dried over anhydrous sodium sulfate and evaporated in vacuo without further purification to give **SM-2** as white crystal.

Step 2:

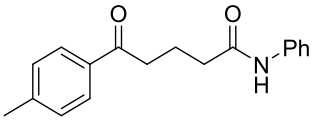
SM-2 (20 mmol) and aniline (1.95 g, 21 mmol) were resolved in 100 mL dry dichloromethane and cooled in ice-water bath protected by N_2 flushed, then 1-ethy-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC·HCl) (4.01 g, 21 mmol) and 4-dimethylaminopyridine (4-DMAP) (0.244 g, 2 mmol) were added; Ice-water bath was removed after adding. The mixture was stirred overnight. Wash the mixture with 1% HCl aqueous solution (x 3), saturated brine (x 1), 1 M $NaHCO_3$ (x 3) and saturated brine (x 1) respectively. The crude product was chromatographed on silica gel by 0-10% Ethyl acetate (EA) in DCM as eluent.

5-oxo-N,5-diphenylpentanamide (1a)



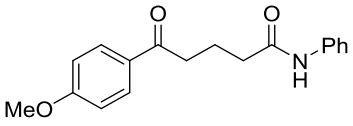
^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.02 (d, *J* = 7.5 Hz, 2H), 7.62 (t, *J* = 7.4 Hz, 1H), 7.57 (d, *J* = 7.7 Hz, 3H), 7.51 (t, *J* = 7.7 Hz, 2H), 7.36 (t, *J* = 7.8 Hz, 2H), 7.14 (t, *J* = 7.4 Hz, 1H), 3.18 (t, *J* = 6.7 Hz, 2H), 2.53 (t, *J* = 7.1 Hz, 2H), 2.25-2.20 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 200.26, 170.99, 137.99, 136.63, 133.33, 129.01, 128.70, 128.14, 124.22, 119.84, 37.31, 36.49, 20.13.

5-oxo-N-phenyl-5-(p-tolyl)pentanamide (1d)



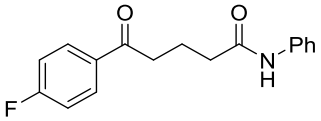
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.88 (d, *J* = 8.2 Hz, 2H), 7.58 (s, 1H), 7.53 (d, *J* = 7.8 Hz, 2H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.27-7.25 (m, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 3.10 (t, *J* = 6.7 Hz, 2H), 2.47 (t, *J* = 7.1 Hz, 2H), 2.41 (s, 3H), 2.21-2.14 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 199.94, 170.92, 144.18, 137.96, 134.17, 129.38, 129.01, 128.28, 124.20, 119.76, 37.11, 36.60, 21.70, 20.28.

5-(4-methoxyphenyl)-5-oxo-N-phenylpentanamide (1g)



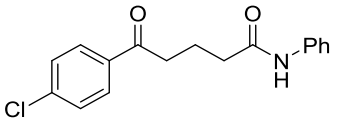
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.96 (d, *J* = 8.9 Hz, 2H), 7.62 (s, 1H), 7.54 (d, *J* = 7.8 Hz, 2H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 6.93 (d, *J* = 8.9 Hz, 2H), 3.87 (s, 3H), 3.08 (t, *J* = 6.7 Hz, 2H), 2.47 (t, *J* = 7.1 Hz, 2H), 2.20-2.13 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 198.89, 170.98, 163.65, 138.00, 130.48, 129.72, 129.01, 124.18, 119.76, 113.82, 55.53, 36.86, 36.62, 20.45.

5-(4-fluorophenyl)-5-oxo-N-phenylpentanamide (1h)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.09-7.91 (m, 2H), 7.56-7.52 (m, 3H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.13 (t, *J* = 8.7 Hz, 3H), 3.10 (t, *J* = 6.8 Hz, 2H), 2.49 (t, *J* = 7.1 Hz, 2H), 2.20-2.13 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 198.57, 170.87, 165.85 (d, *J* = 255.1 Hz), 137.91, 133.07 (d, *J* = 3.0 Hz), 130.80 (d, *J* = 9.4 Hz), 129.03, 124.29, 119.82, 115.79 (d, *J* = 21.9 Hz), 37.24, 36.38, 20.06.

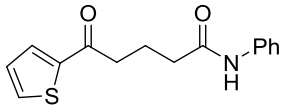
5-(4-chlorophenyl)-5-oxo-N-phenylpentanamide (1i)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.92 (d, *J* = 8.6 Hz, 2H), 7.52 (d, *J* = 7.8 Hz, 2H), 7.44 (d, *J* = 8.6 Hz, 3H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.11 (t, *J* = 7.4 Hz, 1H),

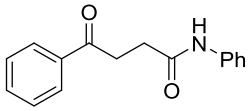
3.11 (t, *J* = 6.8 Hz, 2H), 2.49 (t, *J* = 7.0 Hz, 2H), 2.20-2.14 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 198.90, 170.75, 139.74, 137.86, 134.95, 129.56, 129.04, 129.01, 124.30, 119.78, 37.28, 36.35, 19.97.

5-oxo-N-phenyl-5-(thiophen-2-yl)pentanamide (1k)



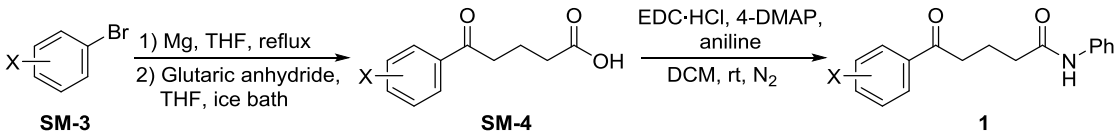
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 3.2 Hz, 1H), 7.65 (d, *J* = 4.9 Hz, 1H), 7.58 (s, 1H), 7.53 (d, *J* = 7.8 Hz, 2H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.16-7.08 (m, 3H), 3.07 (t, *J* = 6.8 Hz, 2H), 2.49 (t, *J* = 7.1 Hz, 2H), 2.22-2.15 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 193.35, 170.91, 143.99, 138.01, 134.02, 132.46, 128.99, 128.33, 124.21, 119.86, 37.93, 36.32, 20.55.

4-oxo-N,4-diphenylbutanamide (1o)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.00 (d, *J* = 7.2 Hz, 2H), 7.84 (s, 1H), 7.58 (t, *J* = 7.4 Hz, 1H), 7.52 (d, *J* = 7.9 Hz, 2H), 7.47 (t, *J* = 7.6 Hz, 2H), 7.30 (t, *J* = 7.9 Hz, 2H), 7.08 (t, *J* = 7.4 Hz, 1H), 3.46 (t, *J* = 6.4 Hz, 2H), 2.82 (t, *J* = 6.4 Hz, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 199.34, 170.52, 138.02, 136.36, 133.51, 128.96, 128.71, 128.16, 124.14, 119.78, 34.12, 31.40.

Scheme S2. General procedure for the preparation of substrates route 2. [6-7]



SM-3 **SM-4** **1**

Step 1:

1) A three-necked round bottom flask equipped with condenser was flame dried and cooled to room temperature. Into this flask was placed (1.46 g, 60 mmol) magnesium turnings, anhydrous THF (40 mL) and a chip of iodine. The mixture was heated to 70 ℃, then started to add the anhydrous THF solution of substituted bromophenyl (**SM-3**, 20 mmol) dropwise. When the solution in the flask started to

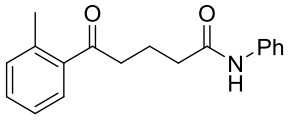
bubble and the colour of iodine started to fade, the flask was moved out of the oil bath and kept dropping. The mixture was heated to 70 ℃ and kept 2h. The solution was then cooled to room temperature and used directly.

2) To the solution of glutaric anhydride (2.4 g, 21 mmol) in THF under a N_2 atmosphere **SM-4** was added dropwise the corresponding Grignard reagent at 0 ℃. The solution was warmed to room temperature and stirred for a further 3 hours. The reaction was quenched with 10% HCl, and THF was removed under vacuum. The resulting aqueous solution was extracted with DCM. The combined organic layers were washed with brine, dried (Na_2SO_4) and evaporated under vacuum to give a white solid as a crude product **SM-4**.

Step 2:

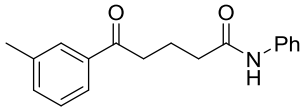
SM-4 (20 mmol) and aniline (1.95 g, 21 mmol) were resolved in 100 mL dry dichloromethane and cooled in ice-water bath protected by N_2 flushed, then 1-ethy-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC·HCl) (4.01 g, 21 mmol) and 4-dimethylaminopyridine (4-DMAP) (0.244 g, 2 mmol) were added; Ice-water bath was removed after adding. The mixture was stirred overnight. Wash the mixture with 1% HCl aqueous solution (x 3), saturated brine (x 1), 1 M $NaHCO_3$ (x 3) and saturated brine (x 1) respectively. The crude product was chromatographed on silica gel by 0-10% Ethyl acetate (EA) in DCM as eluent.

5-oxo-N-phenyl-5-(o-tolyl)pentanamide (1b)



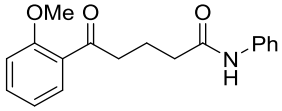
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.66 (d, *J* = 7.5 Hz, 1H), 7.64 (s, 1H), 7.53 (d, *J* = 7.8 Hz, 2H), 7.38 (t, *J* = 7.5 Hz, 1H), 7.31 (t, *J* = 7.9 Hz, 2H), 7.25 (t, *J* = 6.9 Hz, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 3.04 (t, *J* = 6.8 Hz, 2H), 2.50 (s, 3H), 2.47 (t, *J* = 7.2 Hz, 2H), 2.18-2.11 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 204.20, 170.91, 138.19, 137.94, 137.55, 132.08, 131.55, 129.02, 128.70, 125.83, 124.24, 119.81, 40.11, 36.59, 21.50, 20.28.

5-oxo-N-phenyl-5-(m-tolyl)pentanamide (1c)



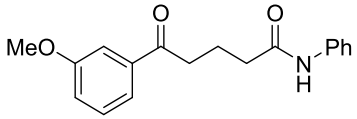
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.78 (s, 1H), 7.76 (s, 1H), 7.53 (d, *J* = 7.8 Hz, 3H), 7.41-7.29 (m, 4H), 7.10 (t, *J* = 7.4 Hz, 1H), 3.12 (t, *J* = 6.7 Hz, 2H), 2.48 (t, *J* = 7.1 Hz, 2H), 2.41 (s, 3H), 2.21-2.14 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 200.49, 170.92, 138.51, 137.96, 136.68, 134.10, 129.02, 128.66, 128.58, 125.37, 124.21, 119.77, 37.28, 36.55, 21.39, 20.19.

5-(2-methoxyphenyl)-5-oxo-N-phenylpentanamide (1e)



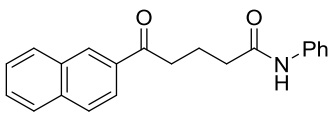
^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 7.7 Hz, 1H), 7.54 (d, *J* = 7.8 Hz, 2H), 7.47 (t, *J* = 7.8 Hz, 1H), 7.31 (t, *J* = 7.9 Hz, 2H), 7.09 (t, *J* = 7.4 Hz, 1H), 7.00 (dd, *J* = 11.0, 4.0 Hz, 1H), 6.96 (d, *J* = 8.4 Hz, 1H), 3.87 (s, 3H), 3.12 (t, *J* = 6.7 Hz, 2H), 2.45 (t, *J* = 7.3 Hz, 2H), 2.17-2.10 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 202.66, 171.22, 158.69, 138.09, 133.76, 130.27, 128.98, 128.00, 124.09, 120.68, 119.72, 111.61, 55.53, 42.38, 36.88, 20.40.

5-(3-methoxyphenyl)-5-oxo-N-phenylpentanamide (1f)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.57-7.48 (m, 5H), 7.37 (t, *J* = 7.9 Hz, 1H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.14 – 7.08 (m, 2H), 3.85 (s, 3H), 3.12 (t, *J* = 6.7 Hz, 2H), 2.48 (t, *J* = 7.1 Hz, 2H), 2.21-2.14 (m, *J* = 6.9 Hz, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 200.07, 170.94, 159.86, 138.00, 137.98, 129.71, 129.01, 124.22, 120.83, 119.81, 119.78, 112.26, 55.46, 37.42, 36.47, 20.19.

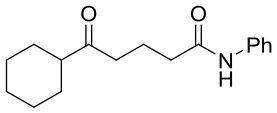
5-(naphthalen-2-yl)-5-oxo-N-phenylpentanamide (1j)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.50 (s, 1H), 8.04 (d, *J* = 8.6 Hz, 1H), 7.95 (d, *J* = 8.0 Hz, 1H), 7.88 (t, *J* = 8.2 Hz, 2H), 7.61 (t, *J* = 6.9 Hz, 1H), 7.55 (t, *J* = 6.9

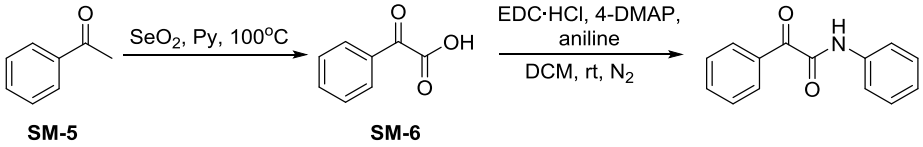
Hz, 4H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 3.28 (q, *J* = 6.7 Hz, 2H), 2.53 (t, *J* = 7.1 Hz, 2H), 2.28-2.21 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 200.17, 170.89, 137.94, 135.67, 133.97, 132.52, 130.00, 129.65, 129.04, 128.61, 128.57, 127.80, 126.87, 124.25, 123.75, 119.76, 37.28, 36.57, 20.30

5-cyclohexyl-5-hydroxy-N-phenylpentanamide (1l)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.58 (s, 1H), 7.52 (d, *J* = 7.8 Hz, 2H), 7.31 (t, *J* = 7.9 Hz, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 2.59 (t, *J* = 6.8 Hz, 2H), 2.37 (t, *J* = 7.2 Hz, 2H), 2.03-1.95 (m, 2H), 1.87-1.74 (m, 5H), 1.44-1.11 (m, 6H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 214.43, 170.91, 137.95, 129.01, 124.19, 119.73, 50.89, 39.21, 36.58, 33.97, 28.50, 25.81, 25.63, 24.96, 19.61.

Scheme S3. General procedure for the preparation of substrates route 3. [6, 8]



Step 1:

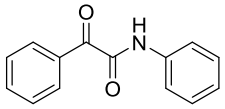
A mixture of acetophenone **SM-5** (4.8 g, 40 mmol) and selenium dioxide (6.7 g, 60 mmol) in dry pyridine (20 mL) was stirred at 100 °C under nitrogen atmosphere for 15 h and then cooled in an ice bath. After the disappearance of acetophenone **SM-5** detected by TLC, the mixture was filtrated and removing the organic solvent by evaporation. Then 2 M sodium hydroxide solution was added to the residue and some ethyl acetate followed. Subsequently 36–38% concentrated hydrochloric acid was put into the mixture dropwise and α-keto acid **SM-6** was separated out as a pale yellow oil in 78% yield.

Step 2:

SM-6 (20 mmol) and aniline (1.94 g, 21 mmol) were resolved in 100 mL dry dichloromethane and cooled in ice-water bath protected by N_2 flushed, then 1-ethy-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC·HCl) (4.01 g, 21 mmol)

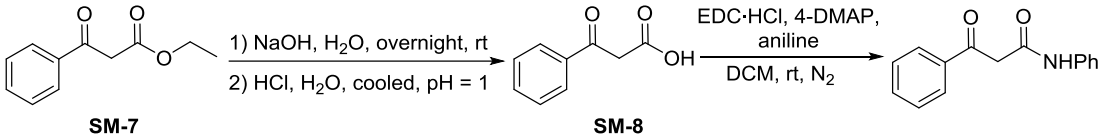
and 4-dimethylaminopyridine (4-DMAP) (0.244 g, 2 mmol) were added; Ice-water bath was removed after adding. The mixture was stirred overnight. Wash the mixture with 1% HCl aqueous solution (x 3), saturated brine (x 1), 1 M $NaHCO_3$ (x 3) and saturated brine (x 1) respectively. The crude product was chromatographed on silica gel by 0-10% Ethyl acetate (EA) in DCM as eluent.

2-oxo-N,2-diphenylacetamide (1m)



^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.95 (s, 1H), 8.42 (d, *J* = 7.2 Hz, 2H), 7.71 (d, *J* = 7.7 Hz, 2H), 7.66 (d, *J* = 7.4 Hz, 1H), 7.52 (t, *J* = 7.8 Hz, 2H), 7.41 (t, *J* = 8.0 Hz, 2H), 7.21 (t, *J* = 7.4 Hz, 1H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 187.46, 158.88, 136.64, 134.70, 133.08, 131.51, 129.28, 128.61, 125.35, 119.95.

Scheme S4. General procedure for the preparation of substrates route 4. [6, 9]



SM-7 **SM-8**

Step 1:

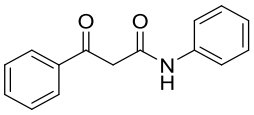
A 250 mL round-bottom flask was equipped with a magnetic stir bar and charged with ethyl 3-oxo-3-phenylpropanoate **SM-7** (80 mmol, 14 mL) and 80 mL NaOH (1 M) solution. After stirring overnight, the solution was poured into a separatory funnel and washed four times with 10 mL of DCM each. The aqueous layer was cooled in an ice bath and a 3 M solution of HCl was added until the solution was around pH ≈ 1. The 3-oxo-3-phenylpropanoic acid **SM-8** was obtained, which was used immediately without further purification. White solid, 62% yield (8.0 g).

Step 2:

SM-8 (20 mmol) and aniline (1.94 g, 21 mmol) were resolved in 100 mL dry dichloromethane and cooled in ice-water bath protected by N_2 flushed, then 1-ethy-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC·HCl) (4.01 g, 21 mmol) and 4-dimethylaminopyridine (4-DMAP) (0.244 g, 2 mmol) were added; Ice-water bath was removed after adding. The mixture was stirred overnight. Wash the mixture

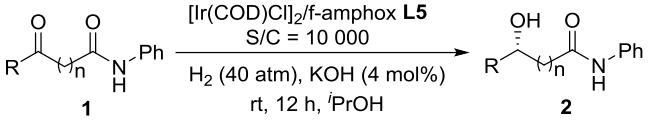
with 1% HCl aqueous solution (x 3), saturated brine (x 1), 1 M $NaHCO_3$ (x 3) and saturated brine (x 1) respectively. The crude product was chromatographed on silica gel by 0-10% Ethyl acetate (EA) in DCM as eluent.

3-oxo-N,3-diphenylpropanamide (1n)



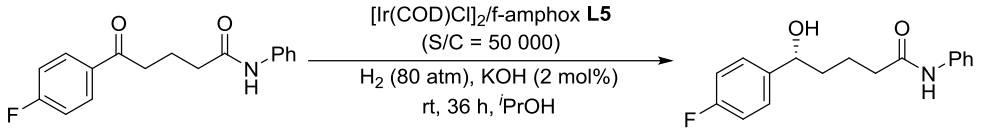
^{1}H NMR (400 MHz, Chloroform-*d*) δ 9.32 (s, 1H), 8.05 (d, *J* = 7.3 Hz, 2H), 7.65 (t, *J* = 7.4 Hz, 1H), 7.59 (d, *J* = 7.7 Hz, 2H), 7.53 (t, *J* = 7.7 Hz, 2H), 7.34 (t, *J* = 7.9 Hz, 2H), 7.13 (t, *J* = 7.4 Hz, 1H), 4.13 (s, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 196.49, 163.90, 137.57, 136.02, 134.42, 129.03, 129.01, 128.64, 124.61, 120.22, 45.55.

3. Asymmetric hydrogenation of ketoamides



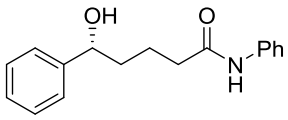
General procedure (S/C = 10 000): To a 4.0 mL vial was added the catalyst precursor $[Ir(COD)Cl]_2$ (1.4 mg, 2.0×10^{-3} mmol), ligand **L5** (2.4 mg, 4.2×10^{-3} mmol) and anhydrous ^{i}PrOH (2.0 mL) in the argon-filled glovebox. The mixture was stirred for 2.0 h at room temperature giving orange red solution. And then 0.2 mmol ketoamides, KOH (4 mol%) were added into a 5 mL hydrogenation vessel. 1.0 mL anhydrous ^{i}PrOH was added as solvent and a solution of Ir/f-amphox **L5** in anhydrous ^{i}PrOH (10.0 μL) was added via an injection port. Then the vessel was placed in an autoclave, closed it and moved it out from golvebox. The autoclave quickly purged with hydrogen gas for three times, then pressurized to 40 atm H_2. The reaction solution was stirred at room temperature until for 12 h, then released pressure carefully. The solution of reaction mixture was purified by a flash chromatography on a silical gel with ethyl acetate and the solvent was removed under reduced pressure. The ee value was determined by chiral HPLC analysis of the chiral amino alcohol directly.

Asymmetric hydrogenation of 5-(4-fluorophenyl)-5-oxo-N-phenylpentanamide (1h) at S/C = 50 000:



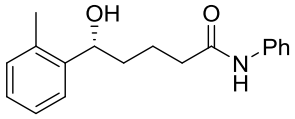
To a 4.0 mL vial was added the catalyst precursor $[Ir(COD)Cl]_2$ (1.4 mg, 2.0×10^{-3} mmol), ligand f-amphox **L5** (2.4 mg, 4.2×10^{-3} mmol) and anhydrous ^{i}PrOH (2.0 mL) in the argon-filled glovebox. The mixture was stirred for 2.0 h at 25 ^{o}C giving orange red solution. 5-(4-fluorophenyl)-5-oxo-N-phenylpentanamide (**1h**) (1 mmol, 286 mg) and KOH (0.02 mmol, 1.1 mg) were added into a 5 mL hydrogenation vessel. 1.0 mL anhydrous ^{i}PrOH was added as solvent and a solution of Ir/f-amphox **L5** in anhydrous ^{i}PrOH (10 μL, 2.0×10^{-3} mol/L) was added via an injection port. Then the vessel was placed in an autoclave, closed it and moved it out from golvebox. The autoclave was quickly purged with hydrogen gas for three times, then pressurized to 80 atm H_2. The reaction solution was stirred at room temperature (25 ^{o}C-30 ^{o}C) until for 36 h, then released pressure carefully. The solvent of the reaction mixture was removed under reduced pressure and the residue was purified by a flash chromatography on a silical gel with ethyl acetate as eluent to afford the chiral (*R*)-5-(4-fluorophenyl)-5-hydroxy-N-phenylpentanamide (**2h**), >99% conversion, >99% ee.

(*R*)-5-hydroxy-N,5-diphenylpentanamide (2a)



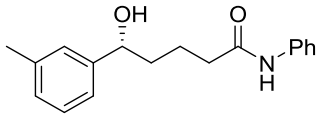
White solid, $[\alpha]_D^{20}$ = 25.7 (c = 1.0, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 ^{o}C, *n*-hexane: *i*-PrOH = 85:15; flow 1.0 mL/min; t_R (major) = 13.9 min, t_R (minor) = 12.3 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.53 (s, 1H), 7.49 (d, *J* = 7.9 Hz, 2H), 7.33 (d, *J* = 4.4 Hz, 4H), 7.32-7.26 (m, 3H), 7.09 (t, *J* = 7.4 Hz, 1H), 4.72 (s, 1H), 2.55 (d, *J* = 2.2 Hz, 1H), 2.39 (t, *J* = 6.7 Hz, 2H), 1.91-1.75 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.31, 144.52, 137.88, 129.02, 128.56, 127.66, 125.80, 124.25, 119.79, 74.33, 38.14, 37.26, 21.91.

(*R*)-5-hydroxy-N-phenyl-5-(o-tolyl)pentanamide (2b)



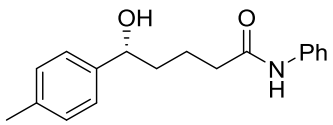
White solid, $[\alpha]_D^{20}$ = 39.4 (c = 1.0, $CHCl_3$), >99% conversion, 95% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (major) = 21.2 min, t_R (minor) = 22.5 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.52-7.46 (m, 4H), 7.31 (t, *J* = 7.9 Hz, 2H), 7.23 (t, *J* = 7.4 Hz, 1H), 7.17 (t, *J* = 6.6 Hz, 1H), 7.14-7.08 (m, 2H), 5.00 (s, 1H), 2.46-2.42 (m, 2H), 2.33 (s, 3H), 2.24 (s, 1H), 2.00-1.76 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.28, 142.68, 137.89, 134.27, 130.47, 129.03, 127.31, 126.38, 125.06, 124.25, 119.77, 70.60, 37.30, 36.94, 22.21, 19.10.

(*R*)-5-hydroxy-N-phenyl-5-(m-tolyl)pentanamide (2c)



White solid, $[\alpha]_D^{20}$ = 16.3 (c = 1.0, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 85:15; flow 1.0 mL/min; t_R (major) = 13.8 min, t_R (minor) = 10.7 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.52 (s, 1H), 7.49 (d, *J* = 7.8 Hz, 2H), 7.30 (t, *J* = 7.9 Hz, 2H), 7.22 (t, *J* = 7.5 Hz, 1H), 7.17-7.05 (m, 4H), 4.69 (s, 1H), 2.46 (s, 1H), 2.40 (t, *J* = 6.8 Hz, 2H), 2.34 (s, 3H), 1.87-1.75 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.39, 144.47, 138.17, 137.89, 128.96, 128.40, 128.34, 126.46, 124.19, 122.81, 119.78, 74.29, 38.09, 37.22, 21.96, 21.46.

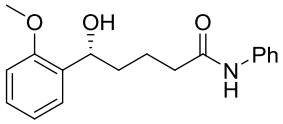
(*R*)-5-hydroxy-N-phenyl-5-(p-tolyl)pentanamide (2d)



White solid, $[\alpha]_D^{20}$ = 19.9 (c = 1.0, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AS-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (major) = 20.1 min, t_R (minor) = 22.4 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.53 (s, 1H), 7.42 (d, *J* = 7.8 Hz, 2H), 7.22 (t, *J* = 7.9 Hz, 2H), 7.15 (d, *J* = 8.0 Hz, 2H), 7.06 (d, *J* = 7.9 Hz, 2H), 7.01 (t, *J* = 7.4 Hz, 1H), 4.61 (t, *J* = 5.8 Hz, 1H), 2.47 (s, 1H), 2.31 (t, *J* = 6.5 Hz, 2H), 2.26 (s,

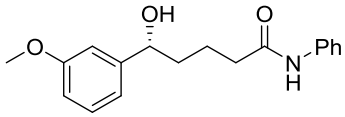
3H), 1.85-1.61 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.42, 141.49, 137.88, 137.25, 129.15, 128.92, 125.70, 124.15, 119.78, 74.09, 38.02, 37.19, 21.95, 21.08.

(*R*)-5-hydroxy-5-(2-methoxyphenyl)-N-phenylpentanamide (2e)



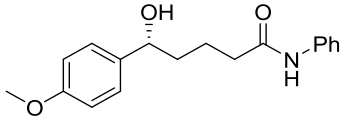
White solid, $[\alpha]_D^{20}$ = 17.9 (c = 2.5, $CHCl_3$), >99% conversion, 88% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20°C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (minor) = 44.2 min, t_R (major) = 56.1 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.64 (s, 1H), 7.50 (d, *J* = 7.8 Hz, 2H), 7.36-7.27 (m, 3H), 7.24-7.22 (m, 1H), 7.08 (t, *J* = 7.4 Hz, 1H), 6.95 (t, *J* = 7.5 Hz, 1H), 6.86 (d, *J* = 8.1 Hz, 1H), 4.95 (d, *J* = 4.9 Hz, 1H), 3.82 (s, 3H), 2.92 (d, *J* = 5.5 Hz, 1H), 2.44-2.40 (m, 2H), 1.92-1.80 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.56, 156.36, 138.05, 132.21, 128.97, 128.43, 126.76, 124.13, 120.84, 119.81, 110.51, 70.40, 55.31, 37.38, 36.15, 22.36.

(*R*)-5-hydroxy-5-(3-methoxyphenyl)-N-phenylpentanamide(2f)



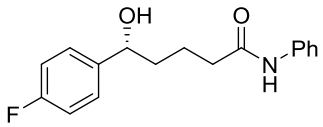
White solid, $[\alpha]_D^{20}$ = 20.1 (c = 1.0, $CHCl_3$), >99% conversion, 98% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (major) = 43.4 min, t_R (minor) = 35.1 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.60 (s, 1H), 7.49 (d, *J* = 7.9 Hz, 2H), 7.29 (t, *J* = 7.9 Hz, 2H), 7.23 (d, *J* = 8.1 Hz, 1H), 7.08 (t, *J* = 7.4 Hz, 1H), 6.95-6.85 (m, 2H), 6.81-6.79 (m, 1H), 4.69 (s, 1H), 3.78 (s, 3H), 2.70 (s, 1H), 2.38 (t, *J* = 6.7 Hz, 2H), 1.88-1.75 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.47, 159.75, 146.32, 137.91, 129.56, 129.00, 124.24, 119.84, 118.13, 112.97, 111.29, 74.15, 55.25, 38.11, 37.20, 21.91.

(*R*)-5-hydroxy-5-(4-methoxyphenyl)-N-phenylpentanamide (2g)



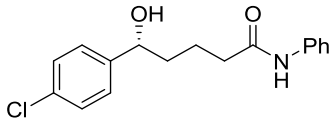
White solid, $[\alpha]_D^{20}$ = 76.0 (c = 0.2, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AS-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (major) = 40.2 min, t_R (minor) = 60.6 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.06 (s, 1H), 7.47 (d, *J* = 7.7 Hz, 2H), 7.28- 7.16 (m, 4H), 7.05 (t, *J* = 7.4 Hz, 1H), 6.87-6.75 (m, 2H), 4.58 (t, *J* = 5.8 Hz, 1H), 3.74 (s, 3H), 3.20 (s, 1H), 2.33-2.30 (m, 2H), 1.86-1.60 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.92, 158.92, 138.07, 136.75, 128.93, 127.11, 124.19, 120.00, 113.81, 73.71, 55.30, 38.12, 37.10, 22.06.

(*R*)-5-(4-fluorophenyl)-5-hydroxy-N-phenylpentanamide (2h)



White solid, $[\alpha]_D^{20}$ = 25.1 (c = 1.0, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 85:15; flow 0.5 mL/min; t_R (major) = 21.8 min, t_R (minor) = 20.3 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.68 (s, 1H), 7.48 (d, *J* = 7.8 Hz, 2H), 7.32-7.27 (m, 3H), 7.09 (t, *J* = 7.4 Hz, 1H), 6.99 (t, *J* = 8.7 Hz, 2H), 4.68 (t, *J* = 5.6 Hz, 1H), 2.96 (s, 1H), 2.38 (t, *J* = 6.5 Hz, 2H), 1.90-1.70 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.52, 162.12 (d, *J* = 245.3 Hz), 140.34 (d, *J* = 3.1 Hz), 137.86, 129.01, 127.43 (d, *J* = 8.0 Hz), 124.33, 119.89, 115.27 (d, *J* = 21.3 Hz), 73.48, 38.31, 37.06, 21.78.

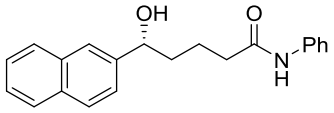
(*R*)-5-(4-chlorophenyl)-5-hydroxy-N-phenylpentanamide (2i)



White solid, $[\alpha]_D^{20}$ = 46.4 (c = 0.25, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AS-H column, 220 nm, 20 °C, *n*-hexane: *i*-PrOH = 95:5; flow 1.0 mL/min; t_R (major) = 72.5 min, t_R (minor) = 80.9 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.42 (d, *J* = 7.8 Hz, 2H), 7.37 (s, 1H), 7.30-7.20 (m, 6H), 7.03 (t, *J* = 7.4 Hz, 1H), 4.64 (t, *J* = 5.7 Hz, 1H), 2.61 (s, 1H), 2.34 (t, *J* = 6.6 Hz, 2H), 1.83-1.65 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.22,

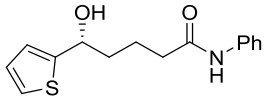
142.98, 137.73, 133.10, 128.99, 128.57, 127.14, 124.30, 119.76, 73.42, 38.19, 37.01, 21.56.

(*R*)-5-hydroxy-5-(naphthalen-2-yl)-N-phenylpentanamide (2j)



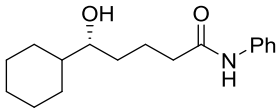
White solid, $[\alpha]_D^{20}$ = 24.4 (c = 0.8, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AS-H column, 220 nm, 20°C, *n*-hexane: *i*-PrOH = 95:5; flow 1.0 mL/min; t_R (major) = 29.4 min, t_R (minor) = 34.3 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.85-7.76 (m, 4H), 7.52-7.42 (m, 5H), 7.39 (s, 1H), 7.29 (t, *J* = 7.9 Hz, 4H), 7.09 (t, *J* = 7.4 Hz, 1H), 4.92-4.86 (m, 1H), 2.56 (s, 1H), 2.41 (t, *J* = 6.7 Hz, 2H), 1.97-1.80 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.27, 141.87, 137.85, 133.26, 132.98, 129.02, 128.40, 127.97, 127.71, 126.23, 125.90, 124.51, 124.26, 123.97, 119.78, 74.41, 38.02, 37.25, 21.87.

(*R*)-5-hydroxy-N-phenyl-5-(thiophen-2-yl)pentanamide (2k)



White solid, $[\alpha]_D^{20}$ = 12.6 (c = 0.9, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel OD-H column, 254 nm, 20°C, *n*-hexane: *i*-PrOH = 90:10; flow 1.0 mL/min; t_R (major) = 37.7 min, t_R (minor) = 34.8 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.50 (d, *J* = 7.8 Hz, 2H), 7.34 (s, 1H), 7.33-7.29 (m, 2H), 7.26-7.24 (m, 1H), 7.10 (t, *J* = 7.4 Hz, 1H), 6.98-6.95 (m, 2H), 5.03-4.95 (m, 1H), 2.54 (d, *J* = 3.8 Hz, 1H), 2.44 (t, *J* = 6.9 Hz, 2H), 2.04-1.77 (m, 4H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.23, 148.49, 137.83, 129.03, 126.73, 124.60, 124.31, 123.74, 119.84, 70.03, 38.40, 37.06, 21.72.

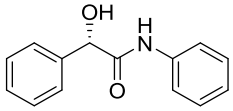
(*R*)-5-cyclohexyl-5-hydroxy-N-phenylpentanamide (2l)



White solid, $[\alpha]_D^{20}$ = 1.4 (c = 1.6, $CHCl_3$), >99% conversion, 77% ee. The enantiomeric excess was determined by HPLC on Chiracel OD-H column, 254 nm, 20

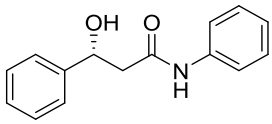
^{o}C, *n*-hexane: *i*-PrOH = 95:5; flow 0.7 mL/min; t_R (major) = 42.4 min, t_R (minor) = 47.1 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.58-7.49 (m, 3H), 7.32 (t, *J* = 7.9 Hz, 2H), 7.10 (t, *J* = 7.4 Hz, 1H), 3.41 (s, 1H), 2.45-2.41 (m, 2H), 1.94-1.80 (m, 3H), 1.80-1.73 (m, 3H), 1.67-1.50 (m, 3H), 1.38-0.96 (m, 7H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.61, 138.02, 128.99, 124.16, 119.80, 76.05, 43.79, 37.41, 32.96, 29.17, 27.86, 26.50, 26.30, 26.15, 22.15.

(*S*)-2-hydroxy-N,2-diphenylacetamide (2m)



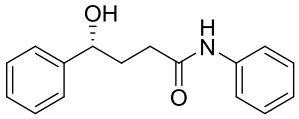
White solid, $[\alpha]_D^{20}$ = 17.8 (c = 0.9, acetone), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel OJ-H column, 220 nm, 20^{o}C, *n*-hexane: *i*-PrOH = 85:15; flow 1.0 mL/min; t_R (major) = 16.0 min, t_R (minor) = 14.1 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.16 (s, 1H), 7.52 (d, *J* = 7.8 Hz, 2H), 7.47 (d, *J* = 7.6 Hz, 2H), 7.43 – 7.35 (m, 3H), 7.31 (t, *J* = 7.9 Hz, 2H), 7.12 (t, *J* = 7.4 Hz, 1H), 5.17 (d, *J* = 2.9 Hz, 1H), 3.50 (d, *J* = 3.2 Hz, 1H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 170.04, 139.00, 137.05, 129.09, 129.00, 128.91, 126.90, 124.75, 119.82, 74.67.

(*R*)-3-hydroxy-N,3-diphenylpropanamide (2n)



White solid, $[\alpha]_D^{20}$ = 8.8 (c = 0.5, MeOH), 23% conversion, 90% ee. The enantiomeric excess was determined by HPLC on Chiracel OD-H column, 254 nm, 20 ^{o}C, *n*-hexane: *i*-PrOH = 95:5; flow 0.5 mL/min; t_R (major) = 85.9 min, t_R (minor) = 82.5 min. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.76 (s, 1H), 7.50 (d, *J* = 7.6 Hz, 2H), 7.40-7.34 (m, 7H), 7.13 (t, *J* = 7.4 Hz, 1H), 5.22 (d, *J* = 9.4 Hz, 1H), 3.58 (d, *J* = 2.8 Hz, 1H), 2.84-2.69 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 169.80, 142.72, 137.42, 129.05, 128.71, 127.99, 125.58, 124.60, 120.09, 71.04, 46.02.

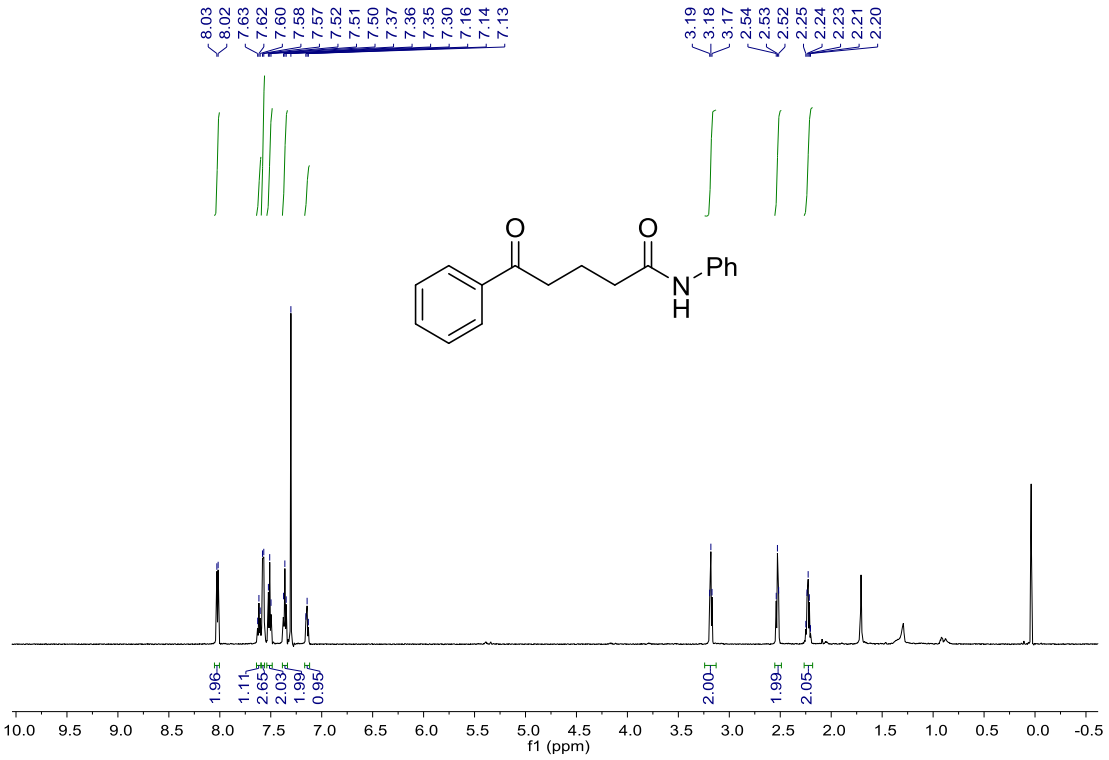
(*R*)-4-hydroxy-N,4-diphenylbutanamide (2o)

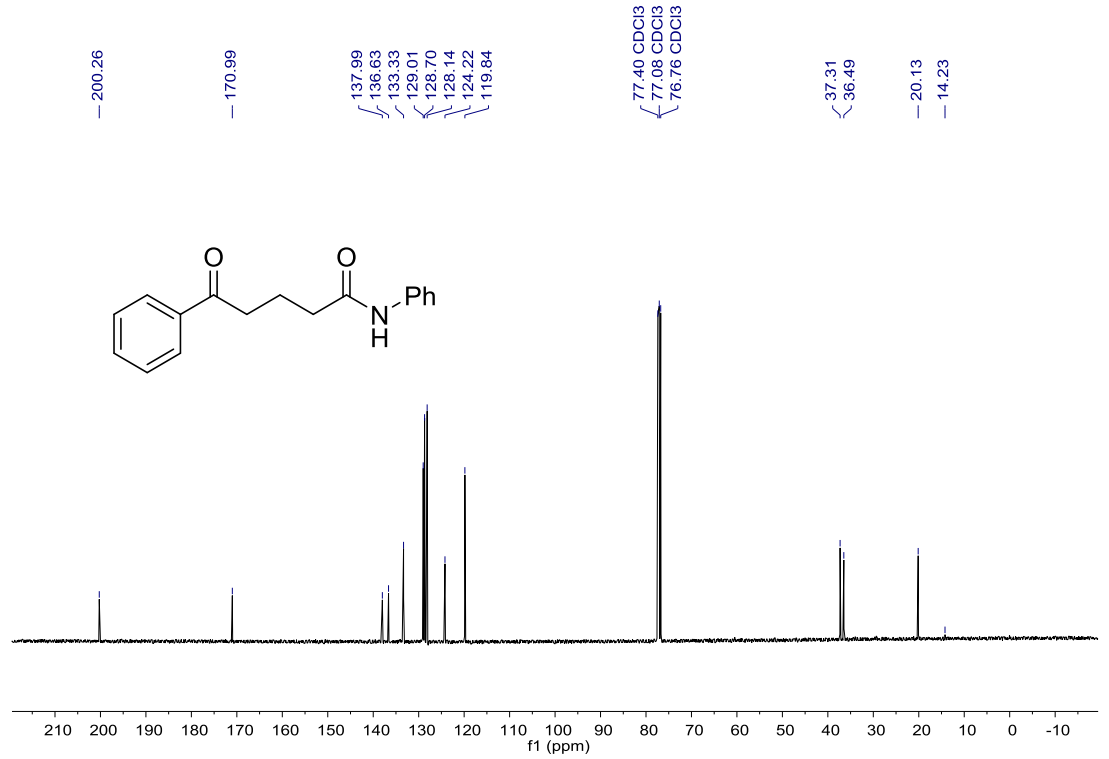


White solid, $[\alpha]_D^{20}$ = 61.5 (c = 1.0, $CHCl_3$), >99% conversion, >99% ee. The enantiomeric excess was determined by HPLC on Chiracel AD-H column, 220 nm, 20 ^oC, *n*-hexane: *i*-PrOH = 90:10; flow 0.5 mL/min; t_R (major) = 33.7 min, t_R (minor) = 30.0 min. ^1H NMR (400 MHz, Chloroform-*d*) δ 8.01 (s, 1H), 7.46 (d, *J* = 7.7 Hz, 2H), 7.31 (d, *J* = 4.4 Hz, 4H), 7.29-7.22 (m, 3H), 7.08 (t, *J* = 7.4 Hz, 1H), 4.76 (s, 1H), 3.81 (s, 1H), 2.47-2.43 (m, 2H), 2.10-2.04 (m, 2H). ^{13}C NMR (100 MHz, Chloroform-*d*) δ 171.90, 144.17, 137.80, 129.02, 128.53, 127.60, 125.75, 124.41, 120.00, 73.60, 34.20, 33.96.

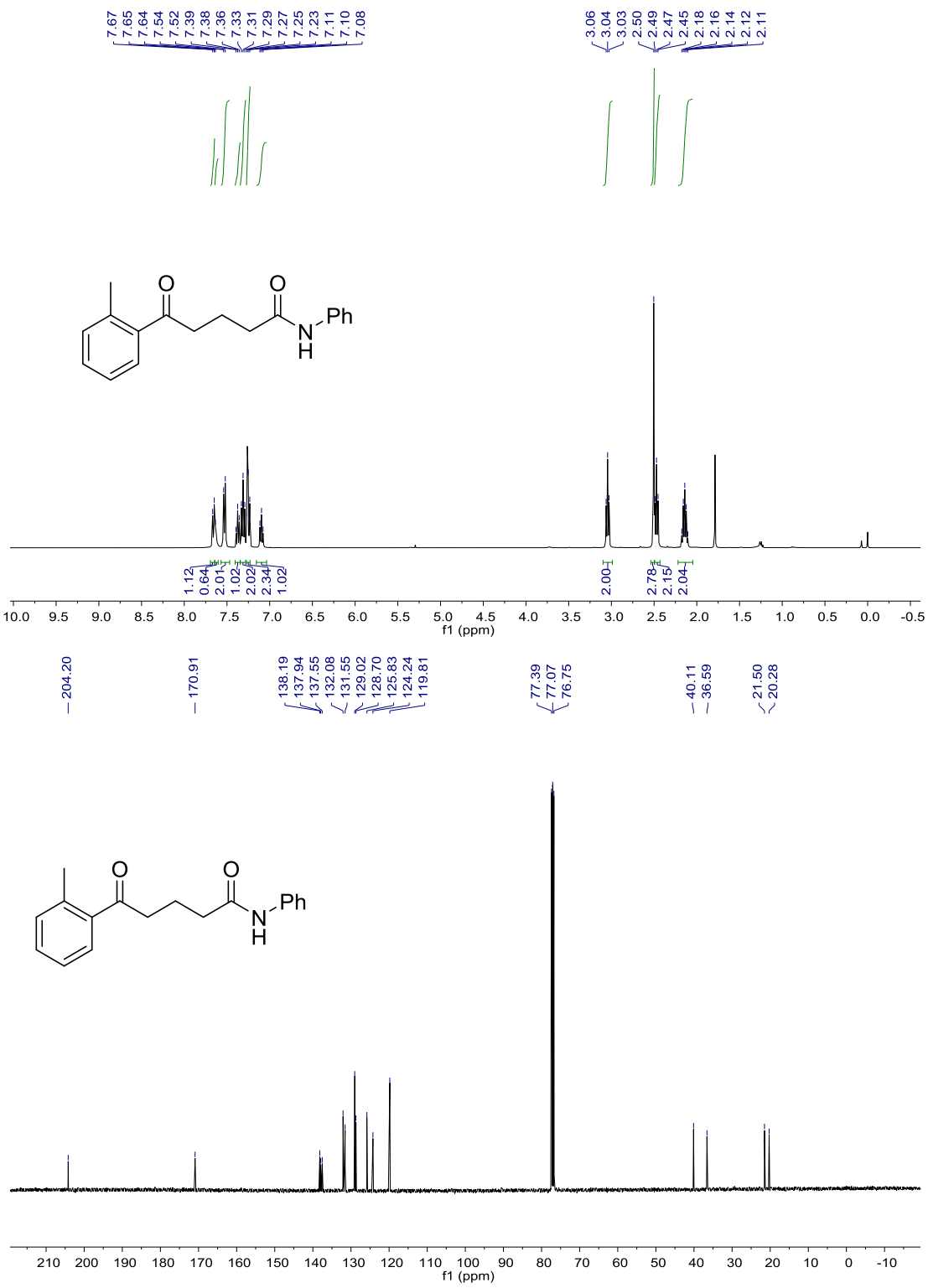
4. NMR spectra of substrate compounds

5-oxo-N,5-diphenylpentanamide (1a)

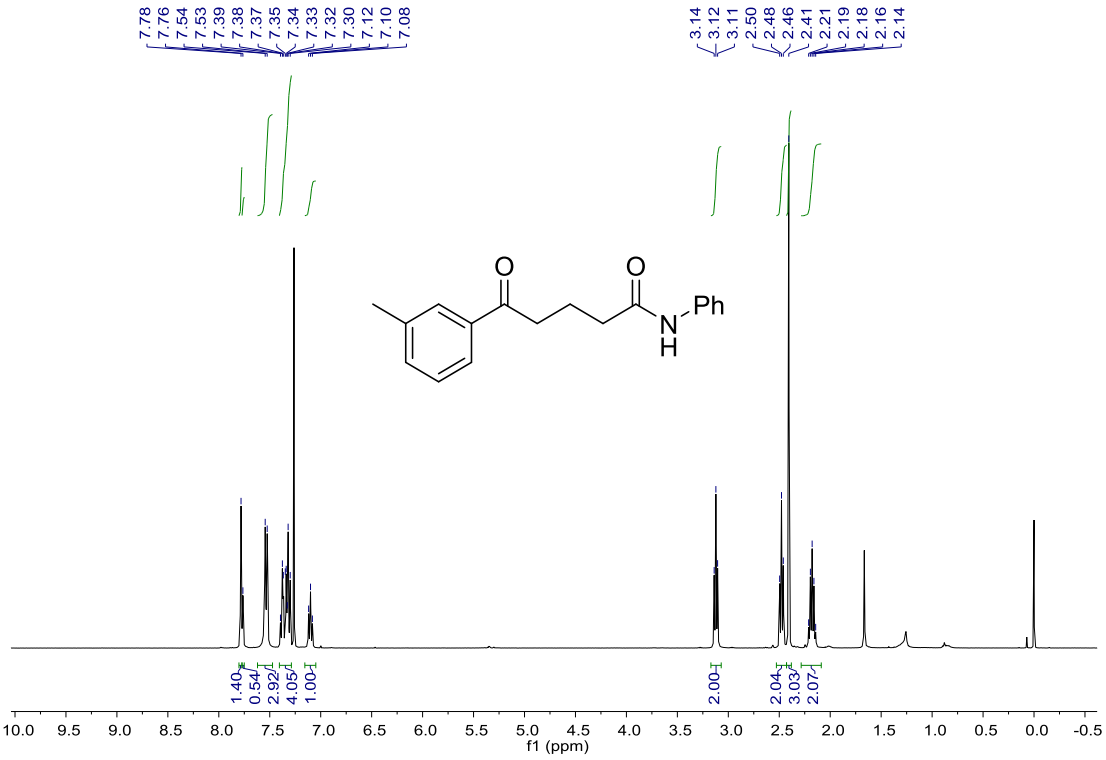


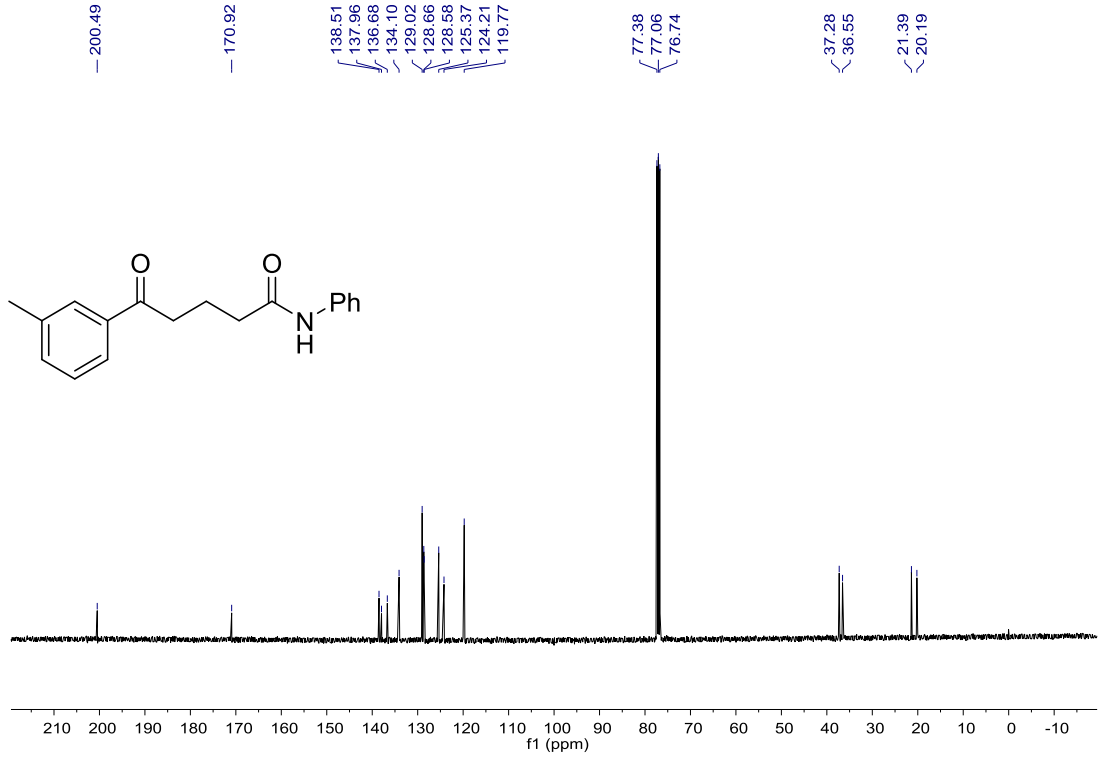


5-oxo-N-phenyl-5-(o-tolyl)pentanamide (1b)

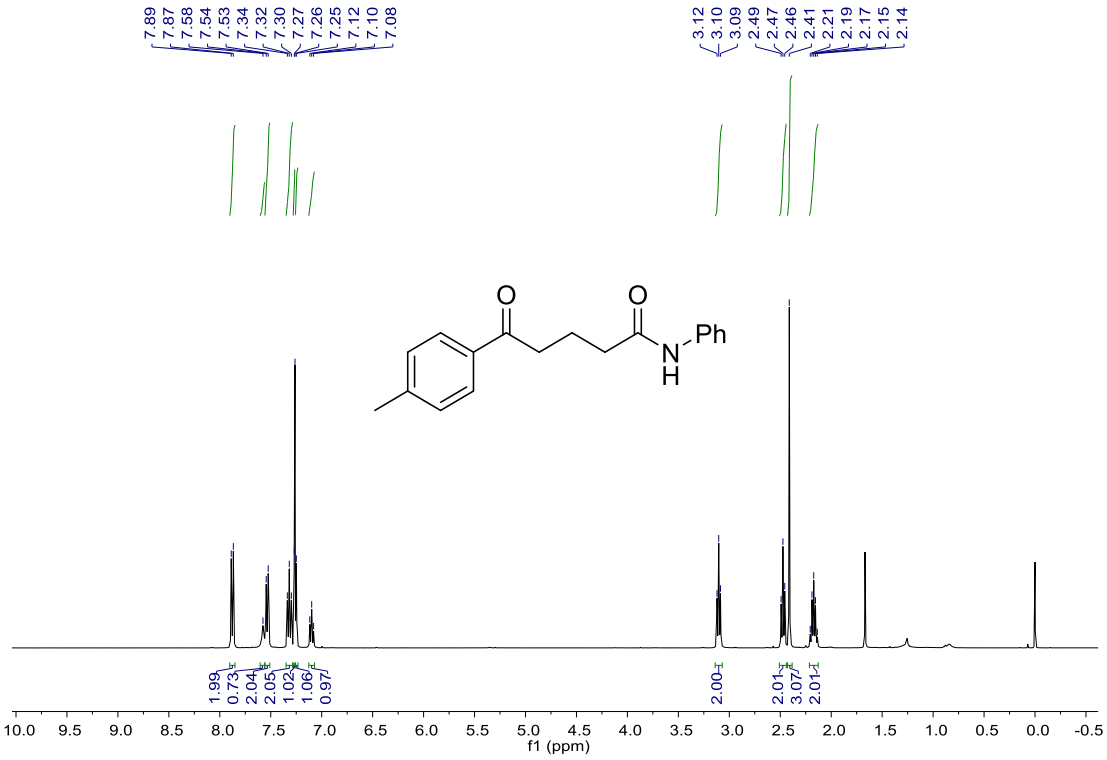


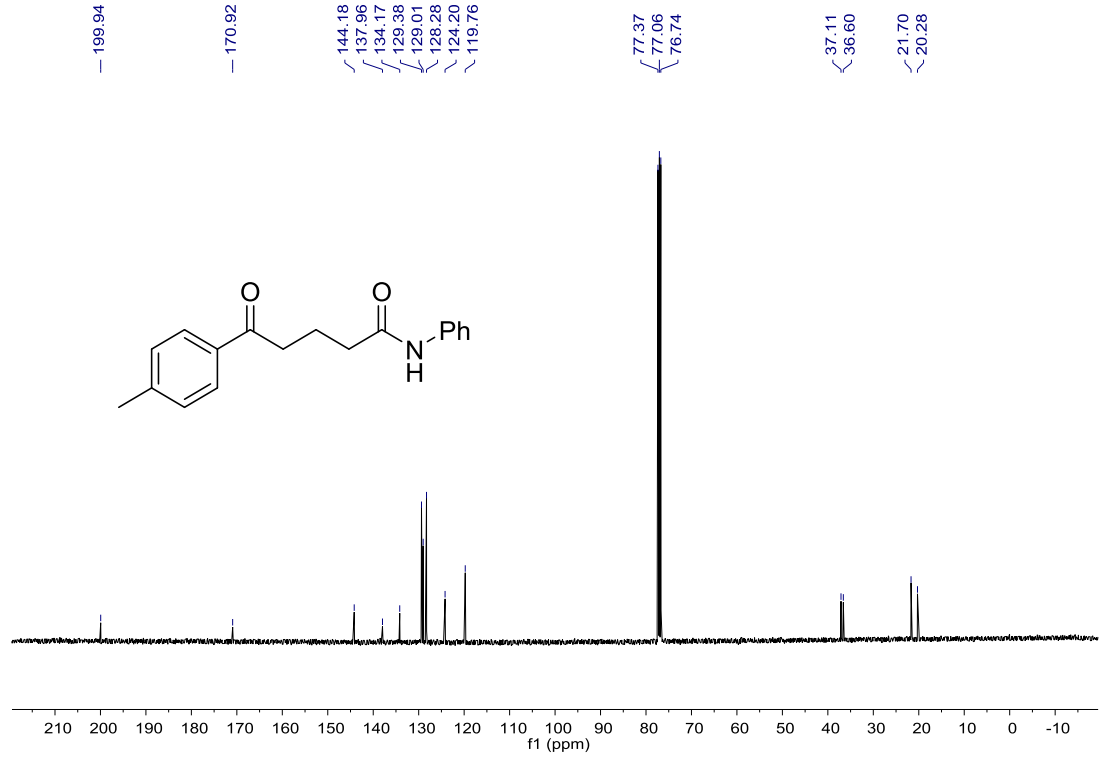
5-oxo-N-phenyl-5-(m-tolyl)pentanamide (1c)



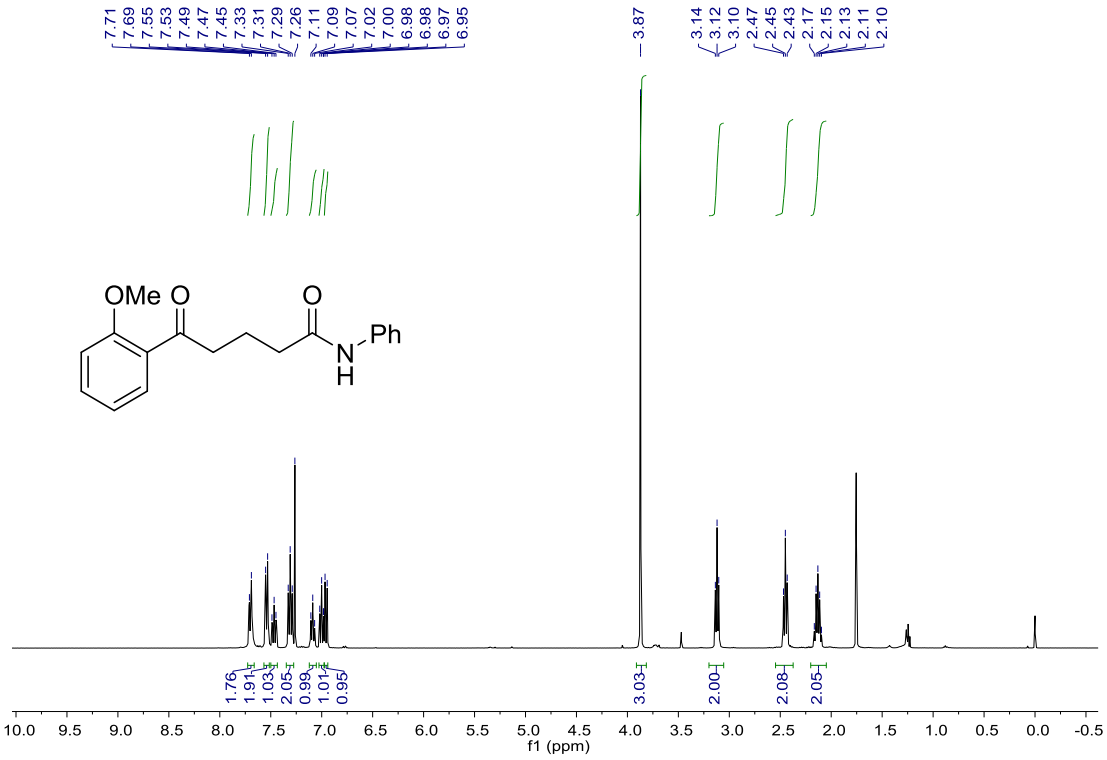


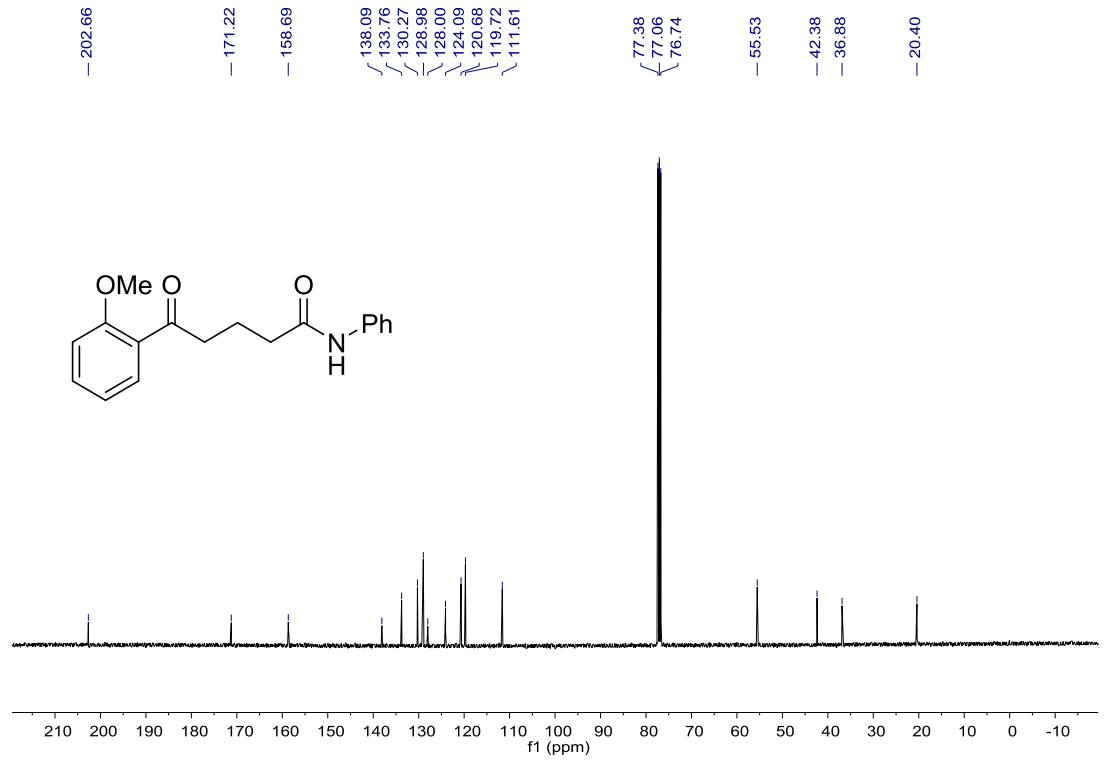
5-oxo-N-phenyl-5-(p-tolyl)pentanamide (1d)



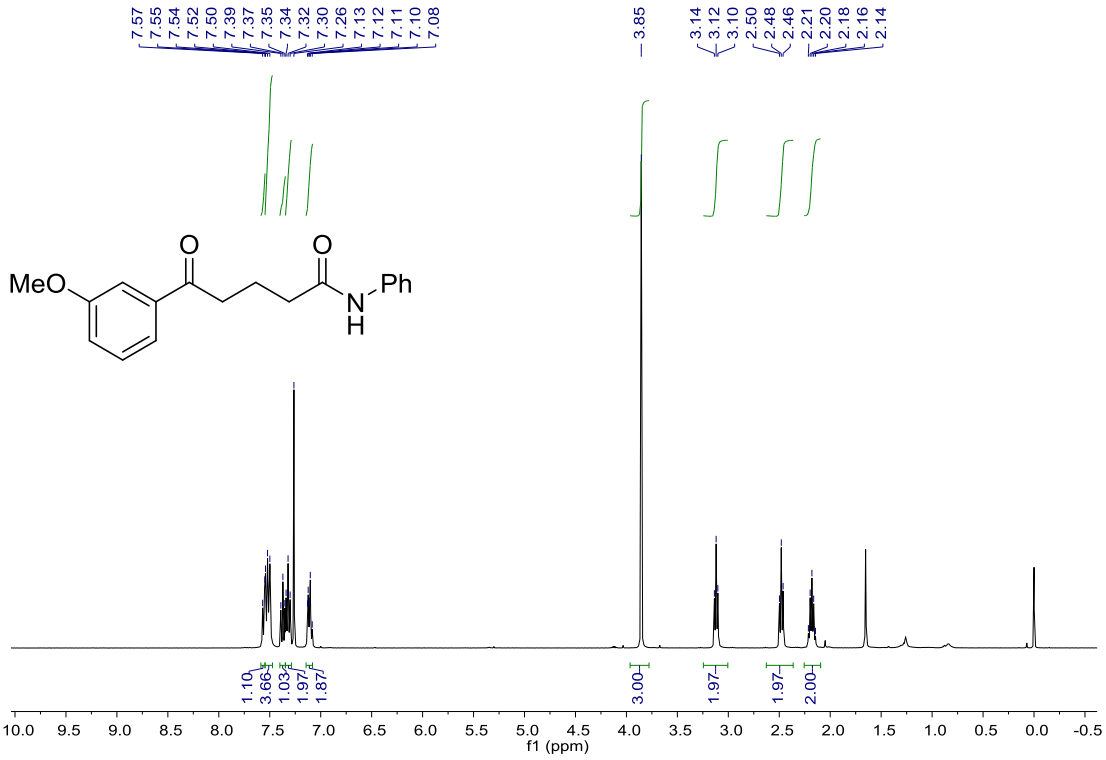


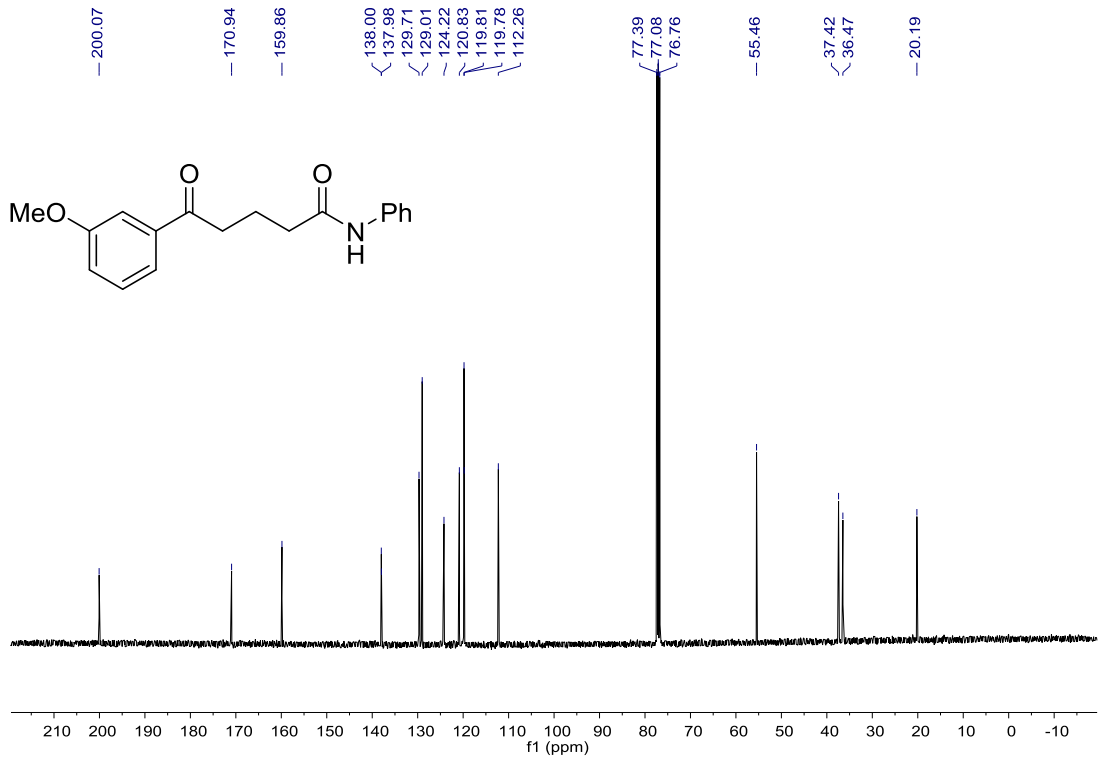
5-(2-methoxyphenyl)-5-oxo-N-phenylpentanamide (1e)



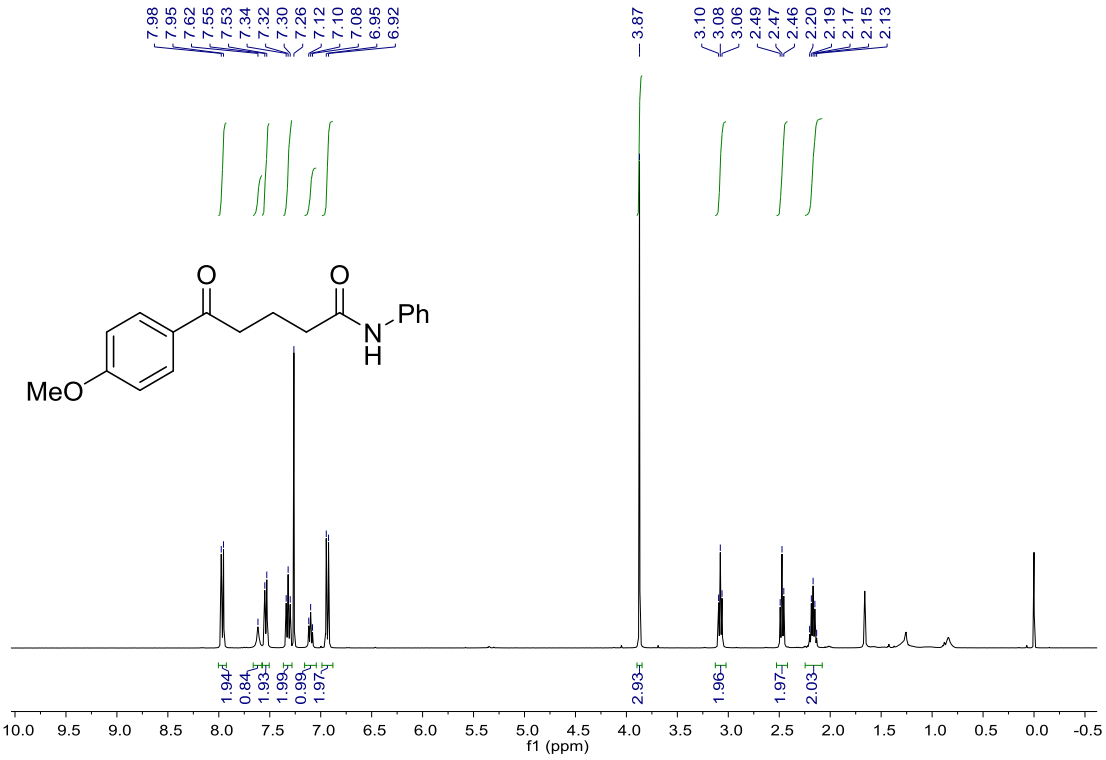


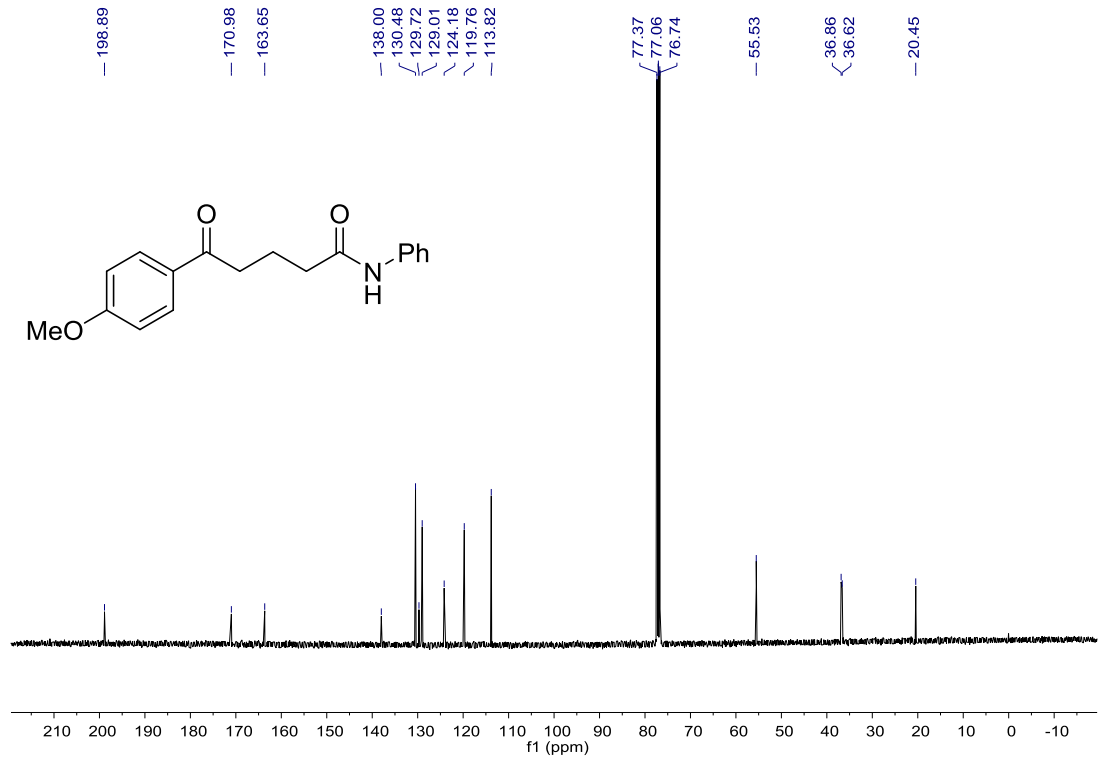
5-(3-methoxyphenyl)-5-oxo-N-phenylpentanamide (1f)



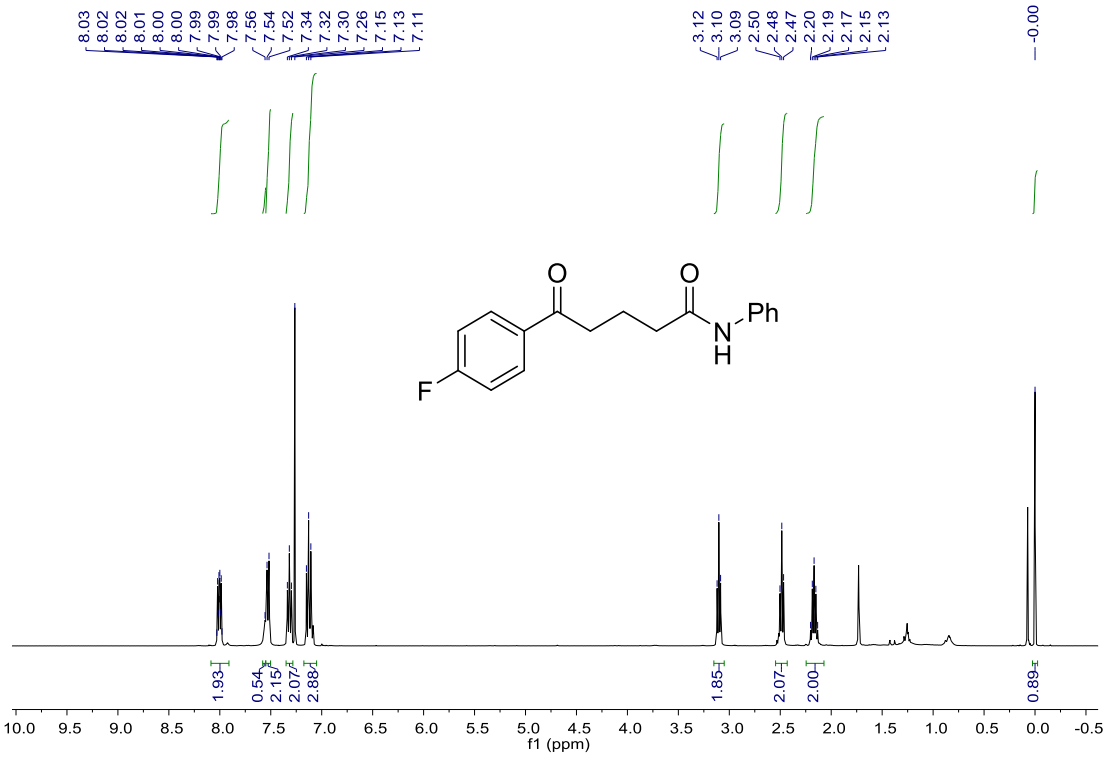


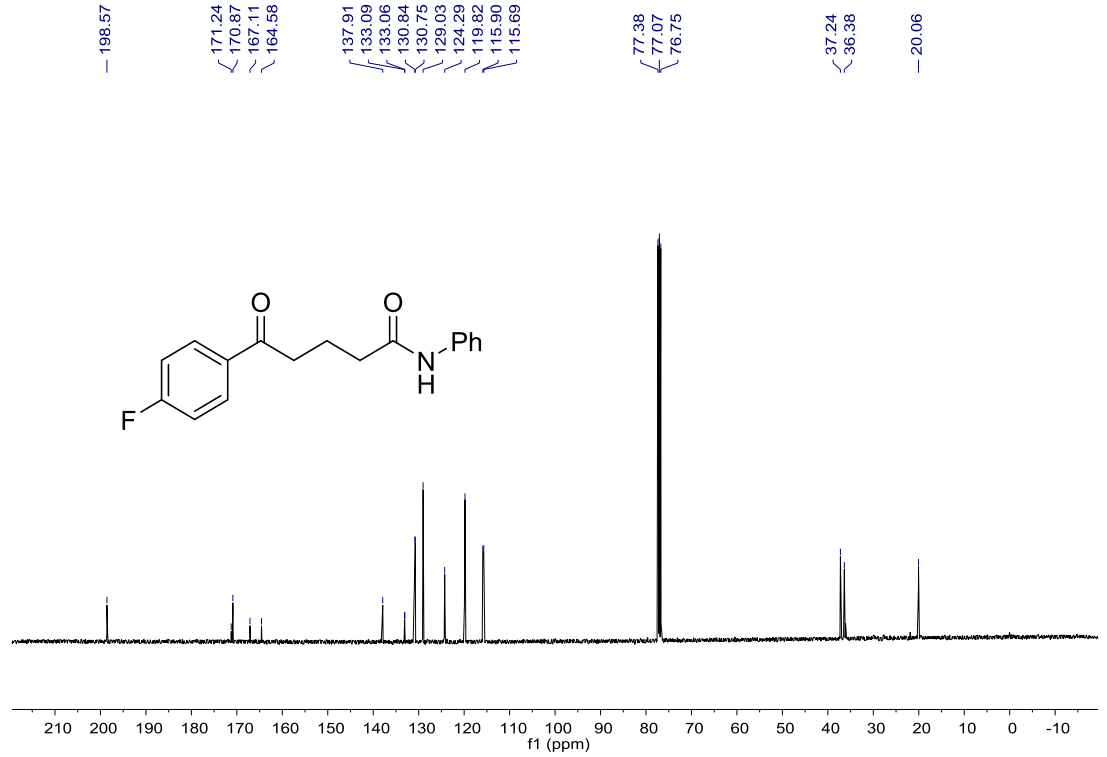
5-(4-methoxyphenyl)-5-oxo-N-phenylpentanamide (1g)



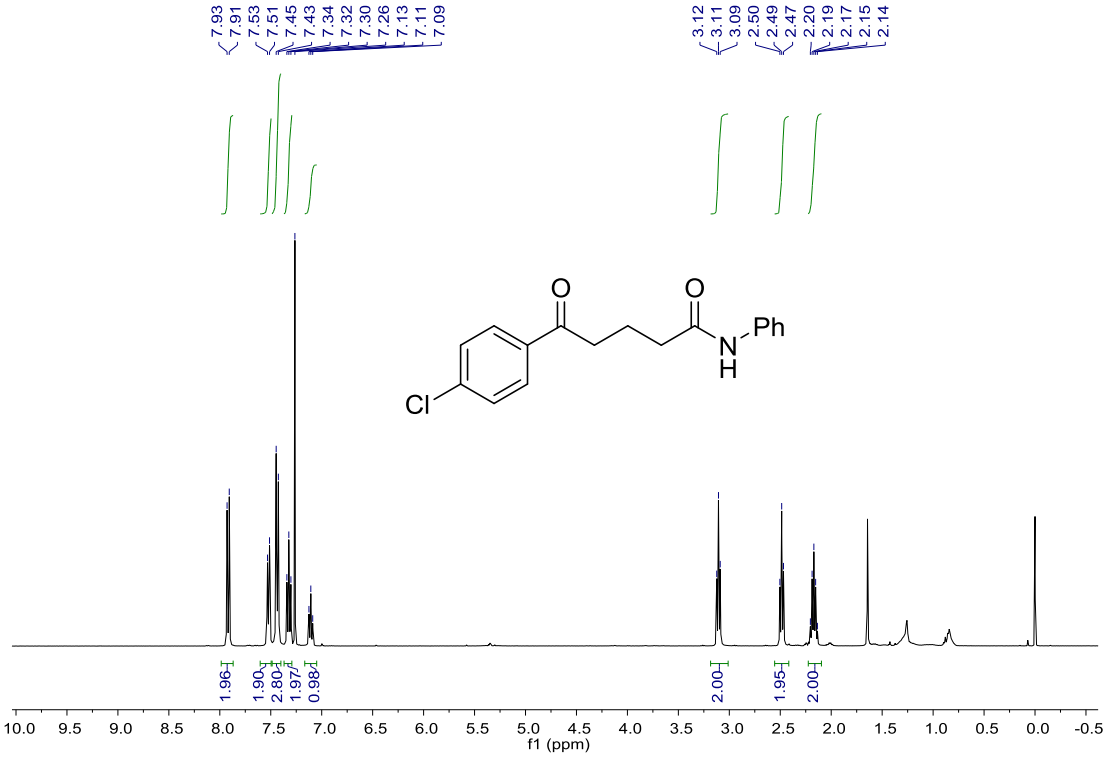


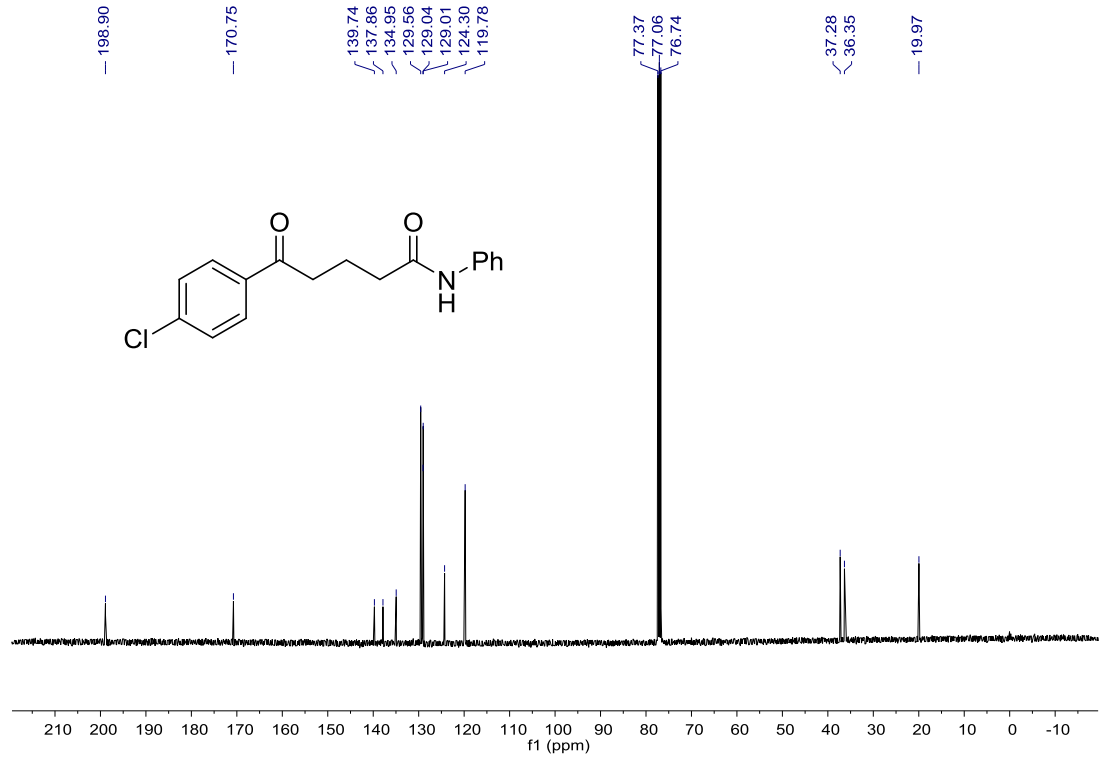
5-(4-fluorophenyl)-5-oxo-N-phenylpentanamide (1h)



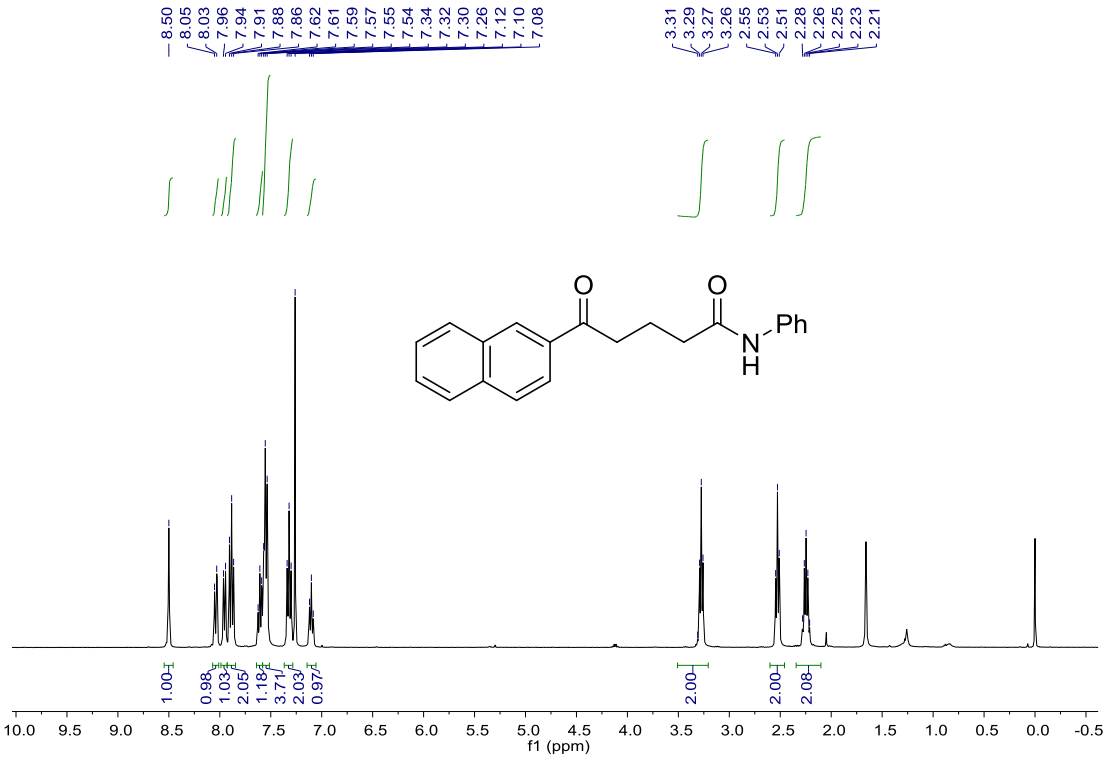


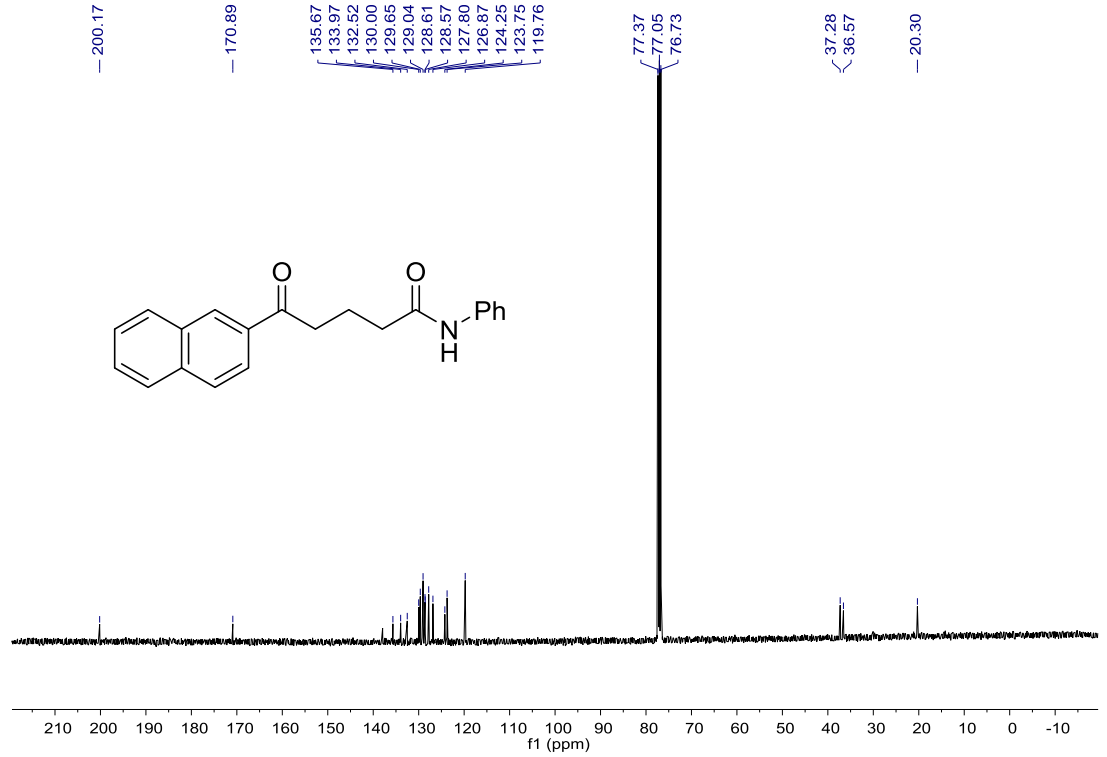
5-(4-chlorophenyl)-5-oxo-N-phenylpentanamide (1i)



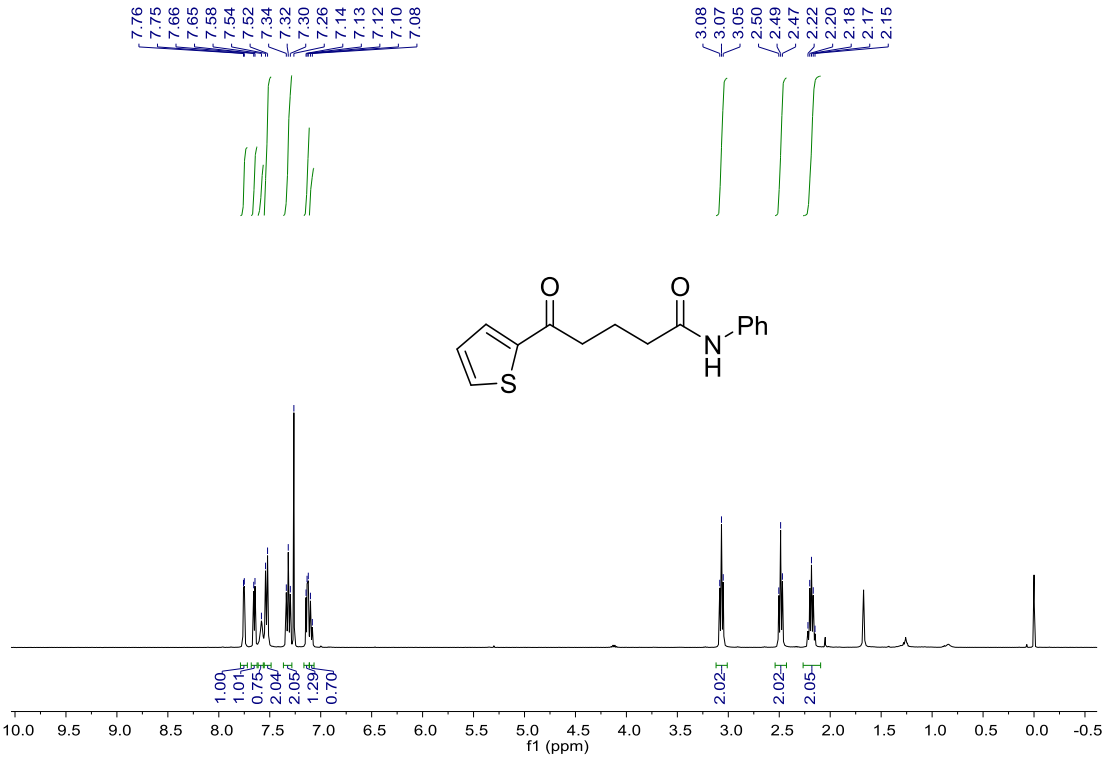


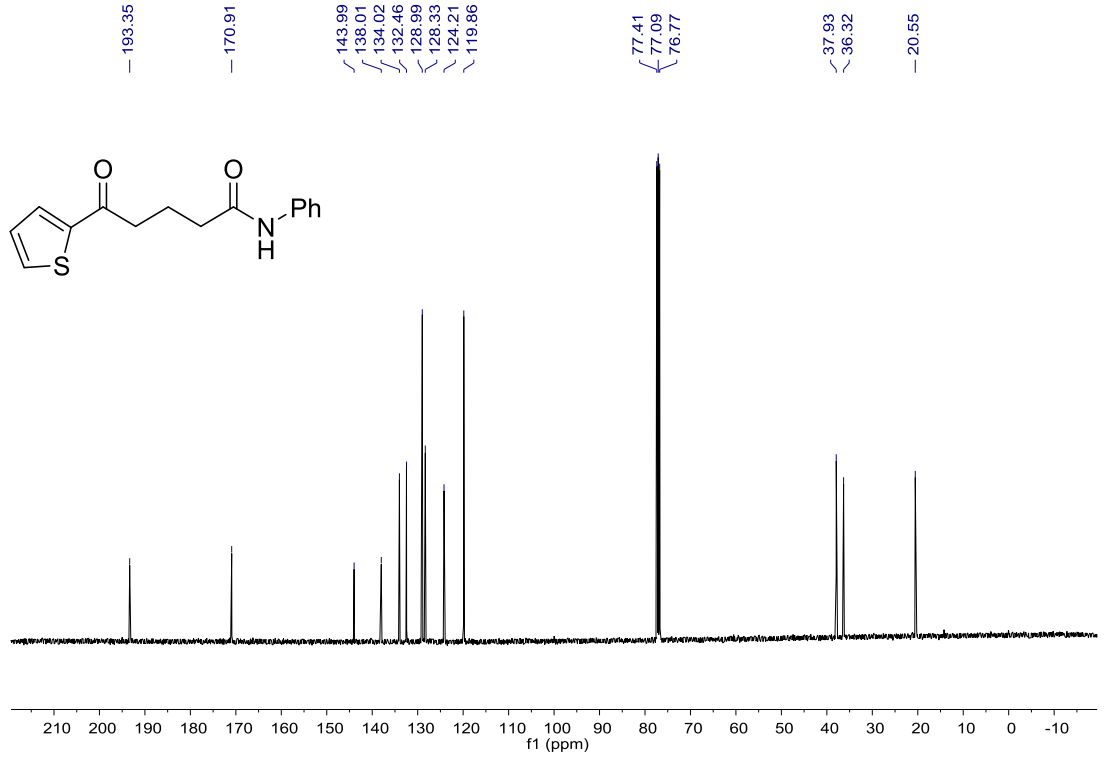
5-(naphthalen-2-yl)-5-oxo-N-phenylpentanamide (1j)



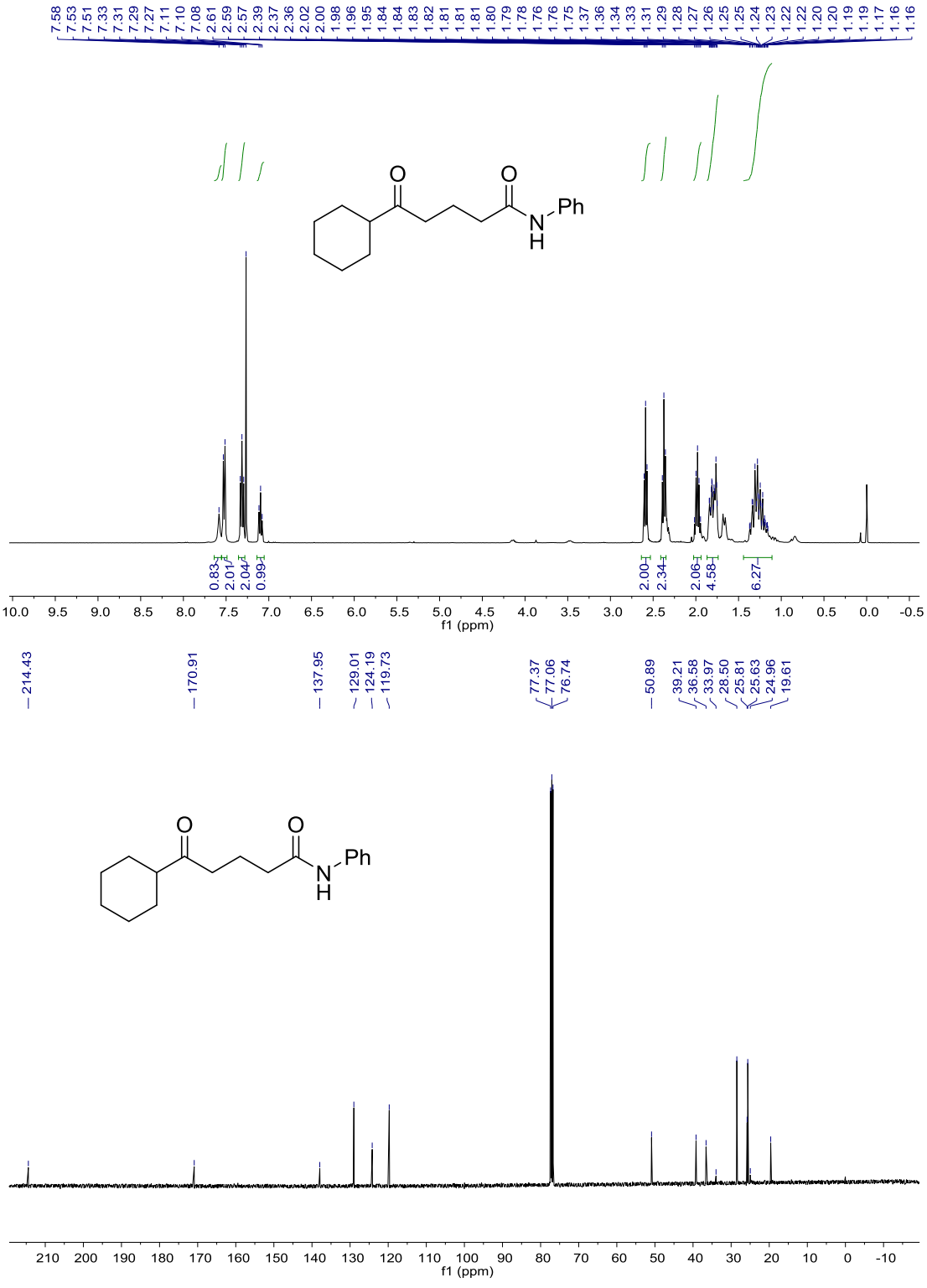


5-oxo-N-phenyl-5-(thiophen-2-yl)pentanamide (1k)

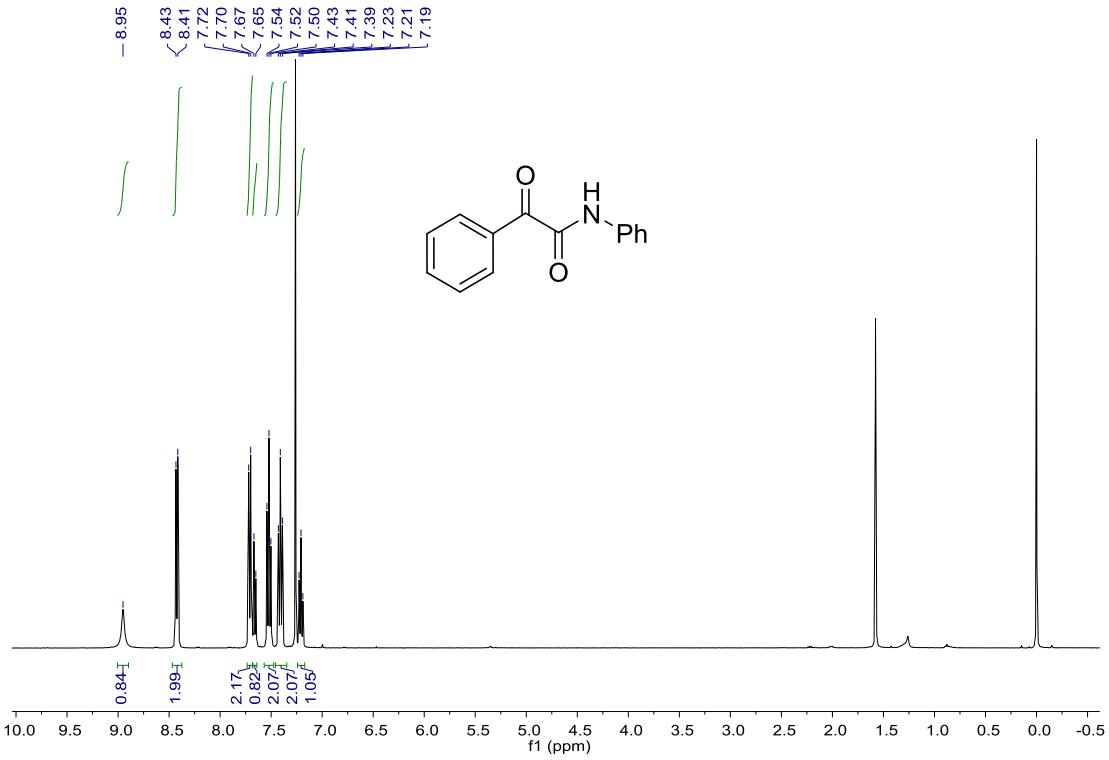


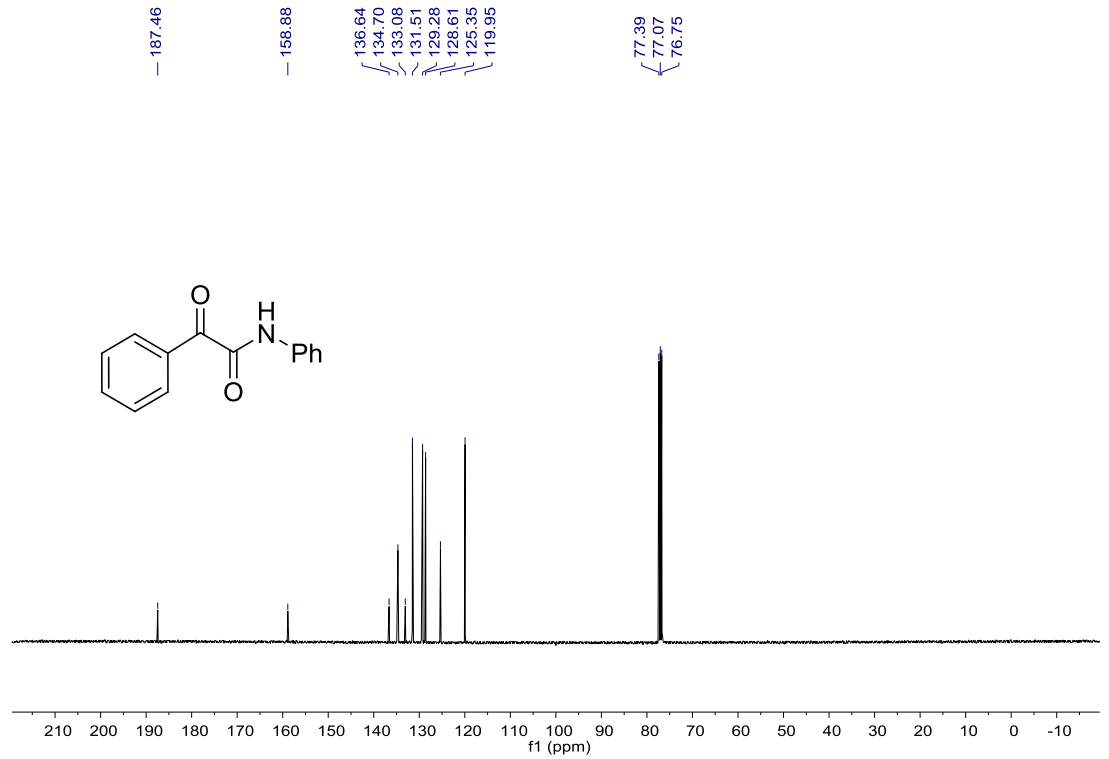


5-cyclohexyl-5-hydroxy-N-phenylpentanamide (1l)

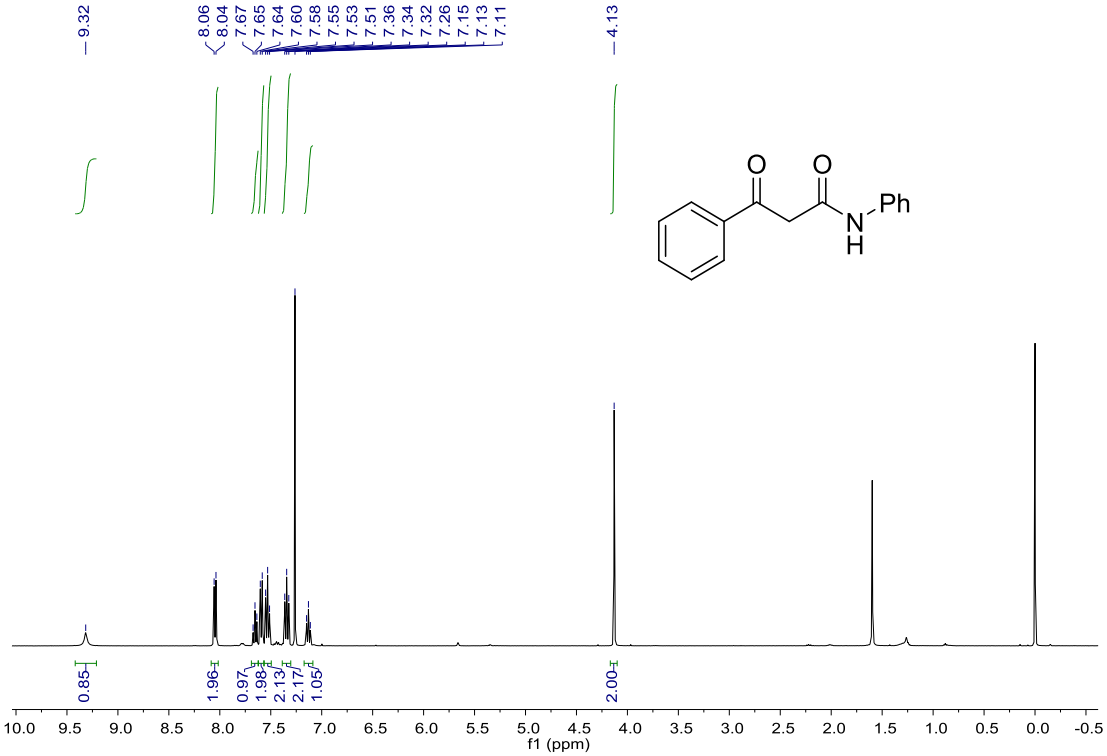


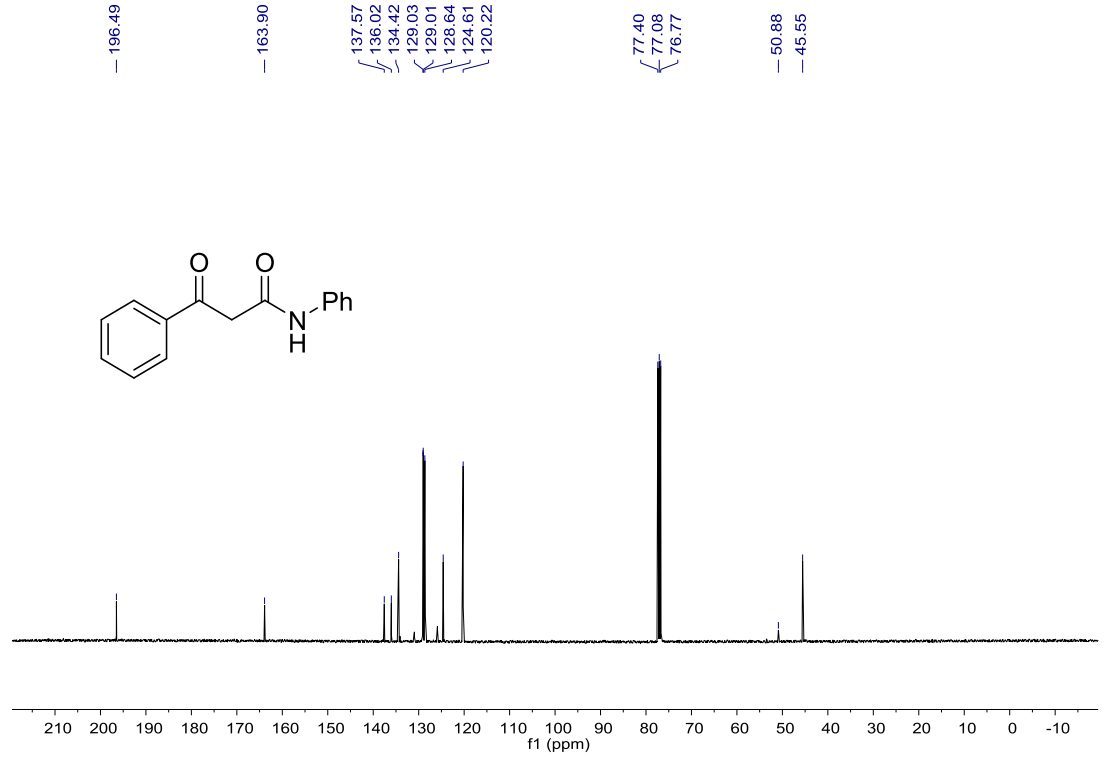
2-oxo-N,2-diphenylacetamide (1m)



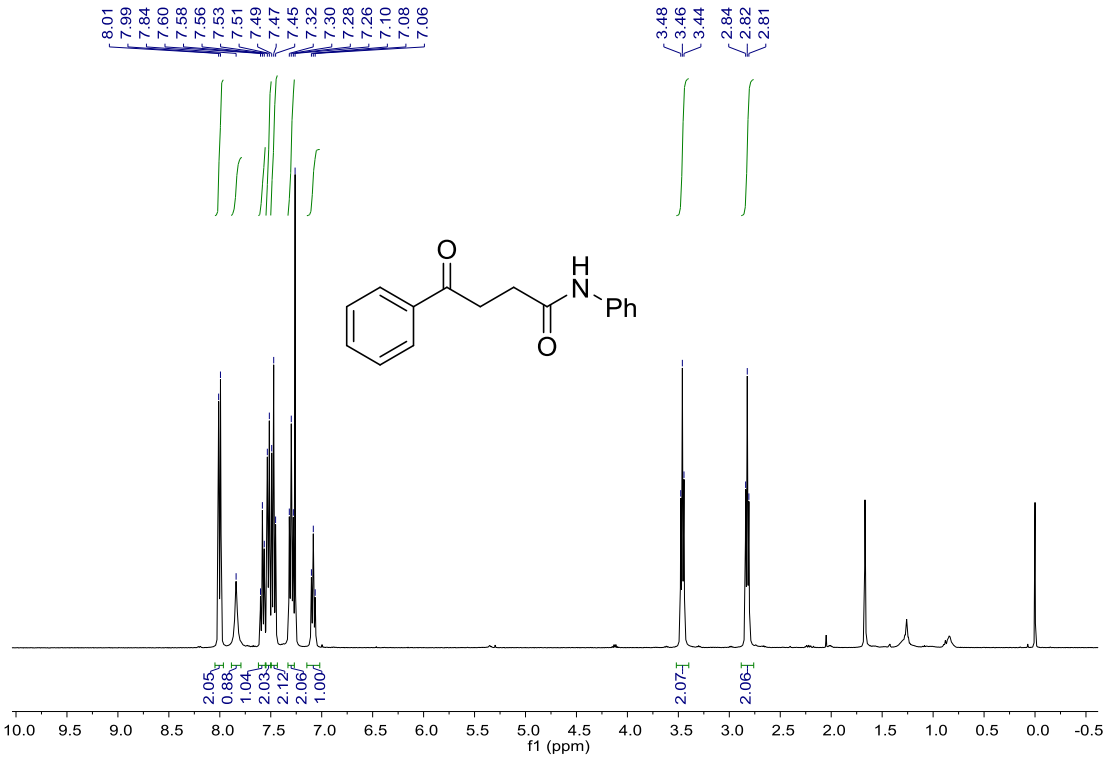


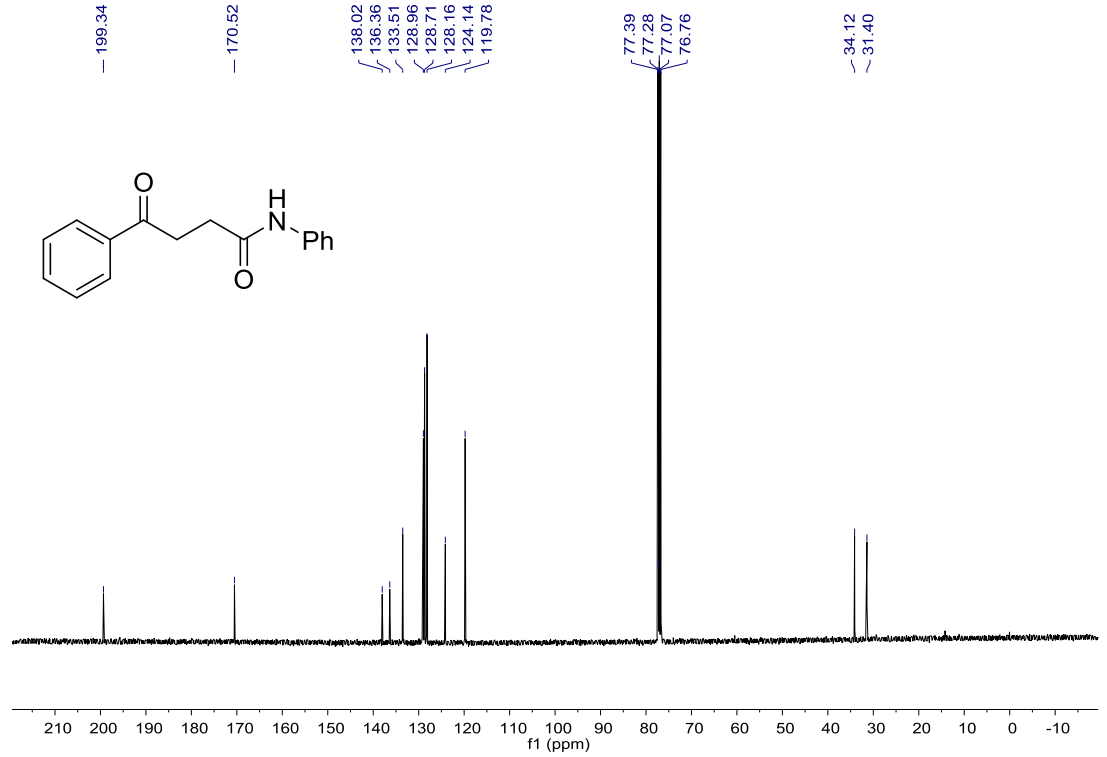
3-oxo-N,3-diphenylpropanamide (1n)





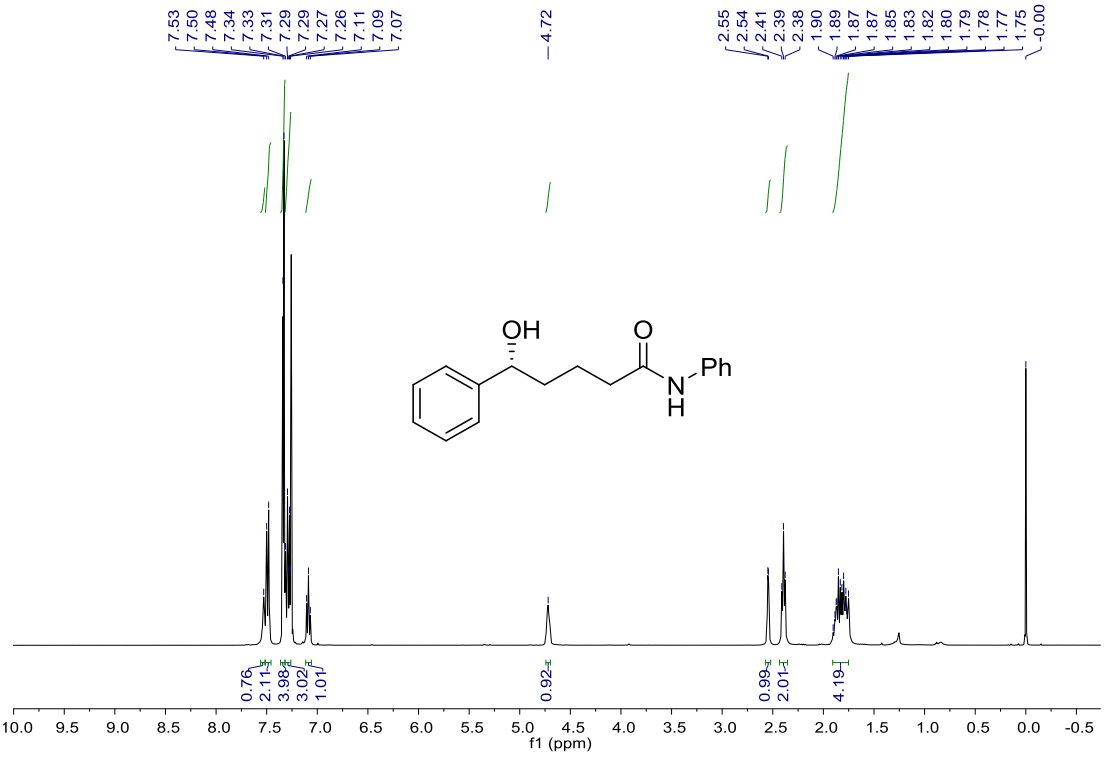
4-oxo-N,4-diphenylbutanamide (1o)

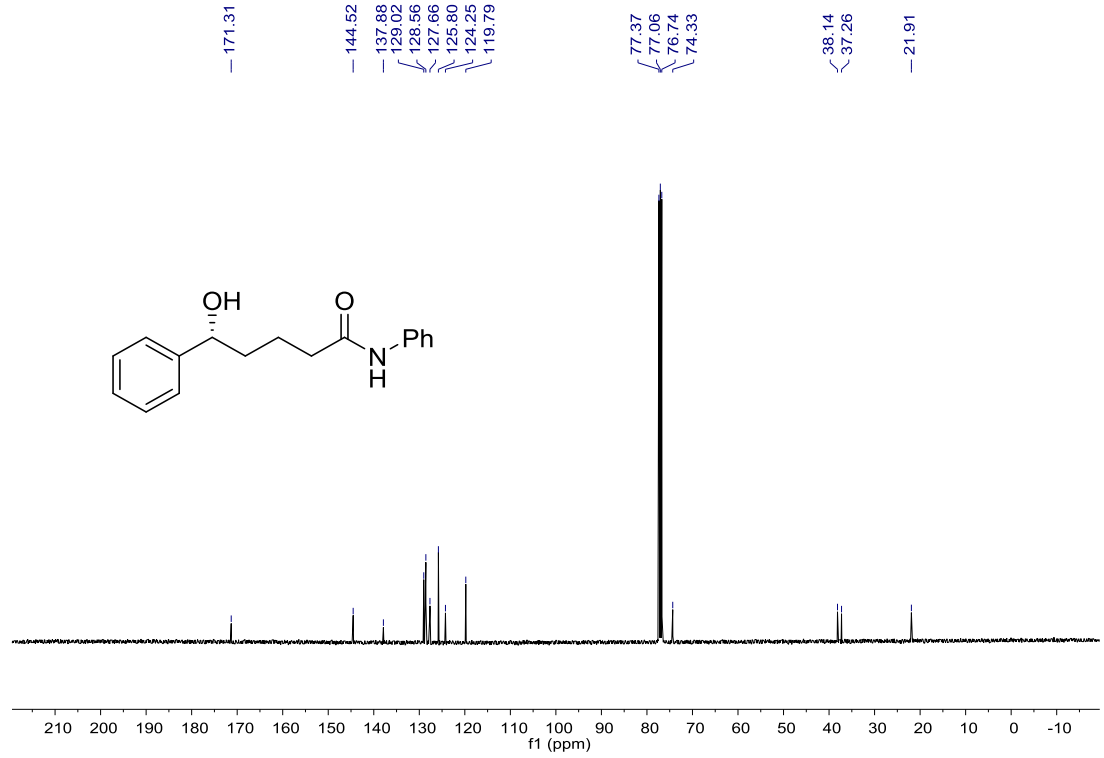




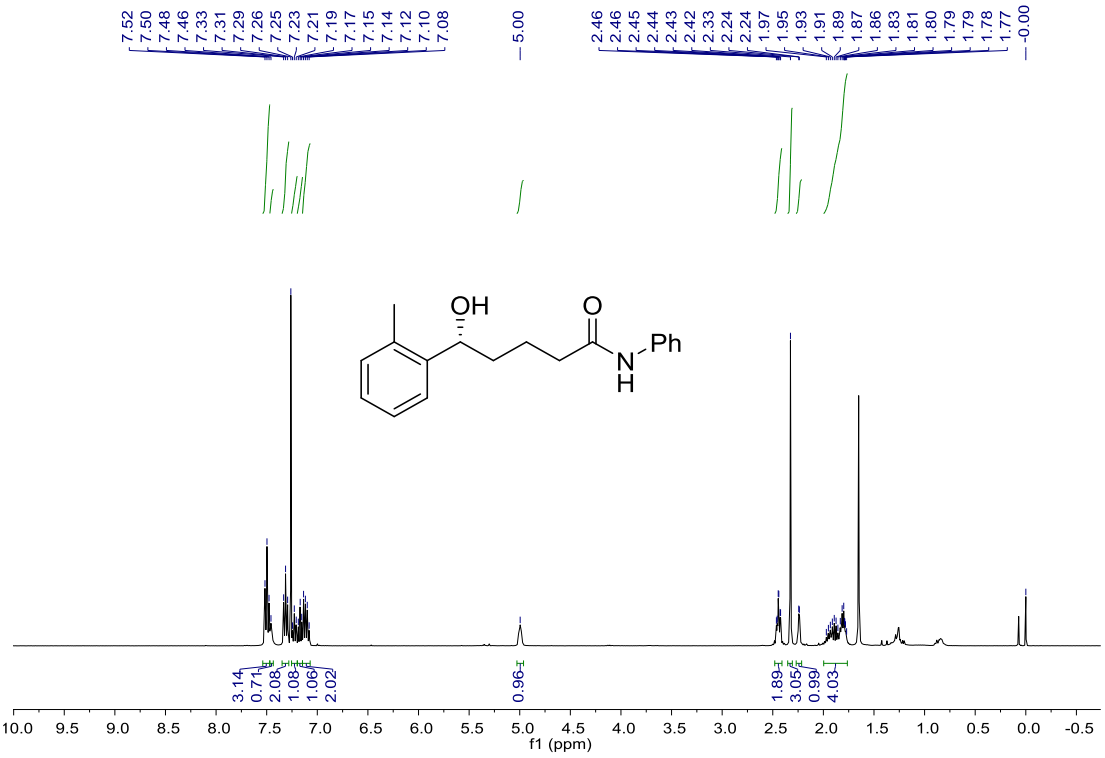
5. NMR spectra of products

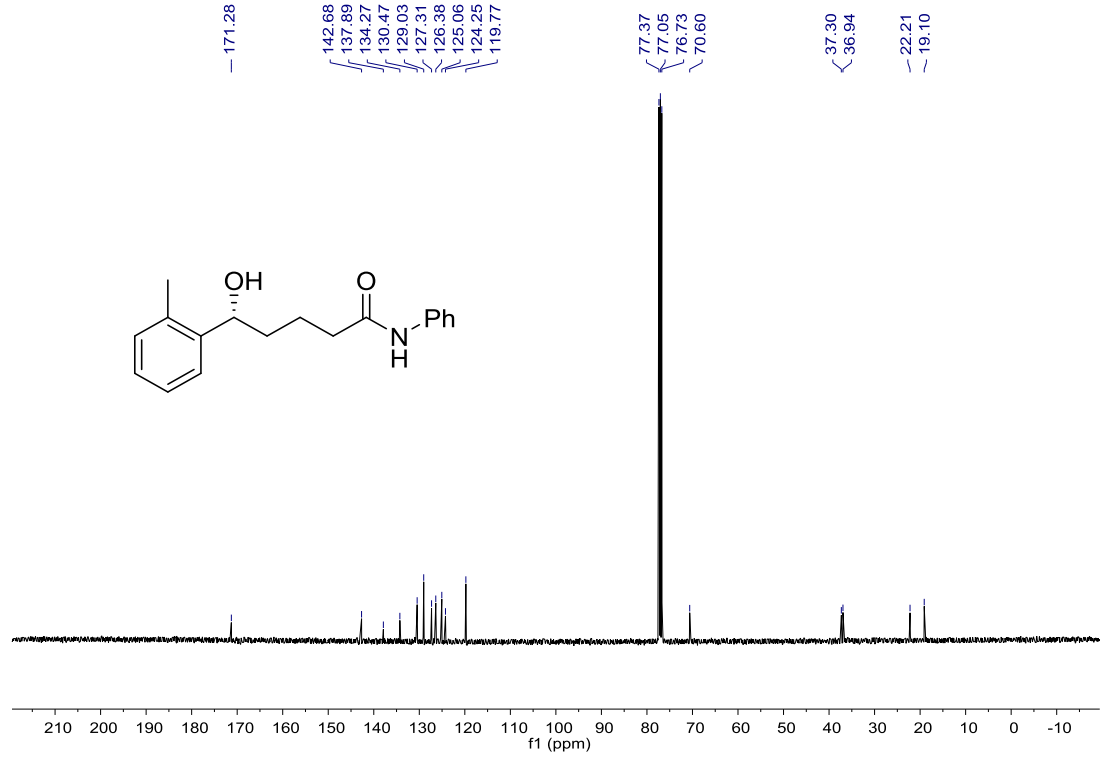
(*R*)-5-hydroxy-N,5-diphenylpentanamide (2a)



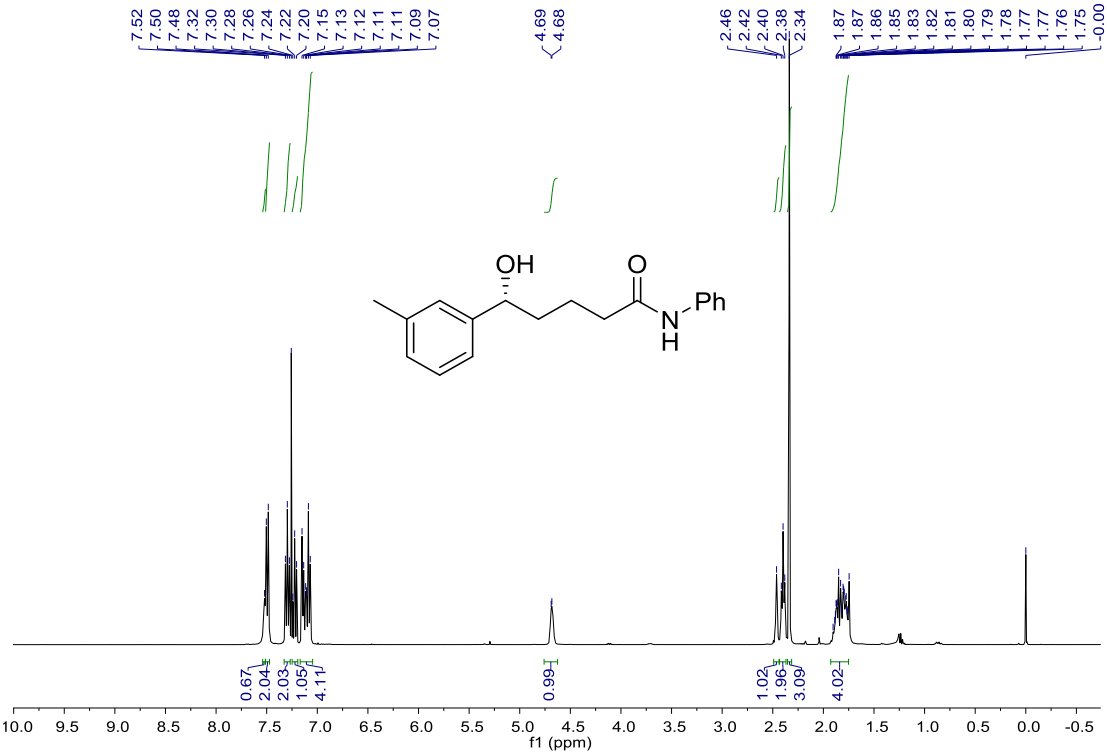


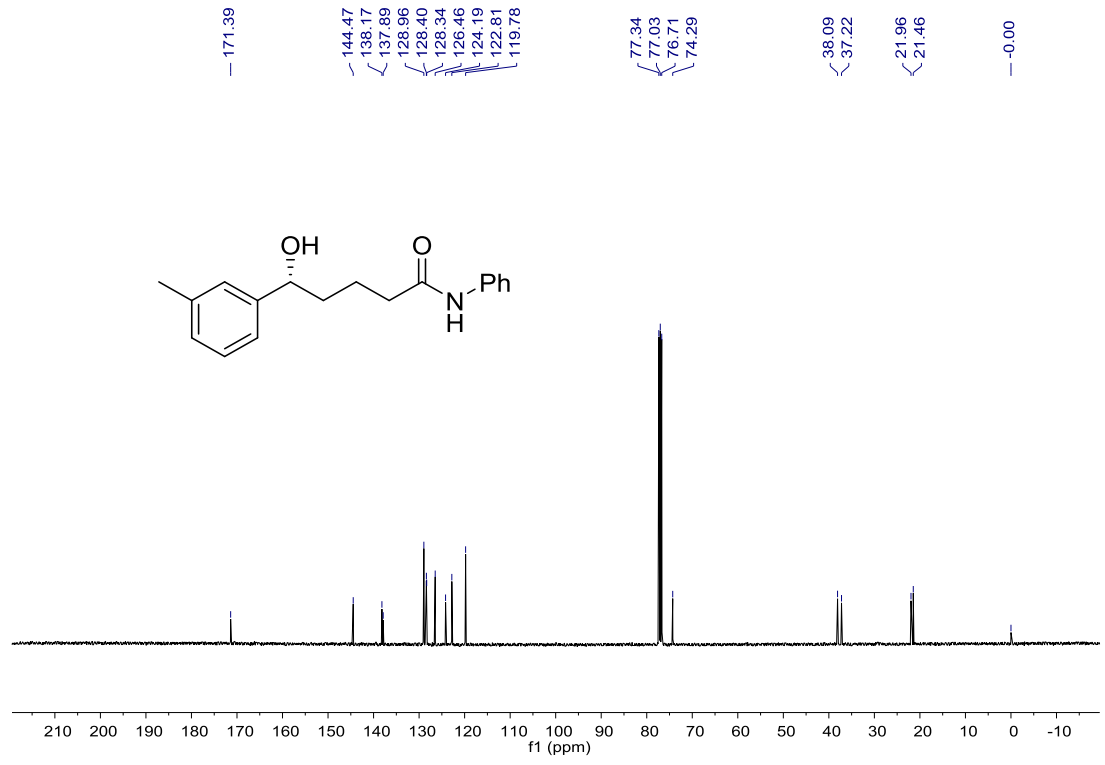
(*R*)-5-hydroxy-N-phenyl-5-(o-tolyl)pentanamide (2b)



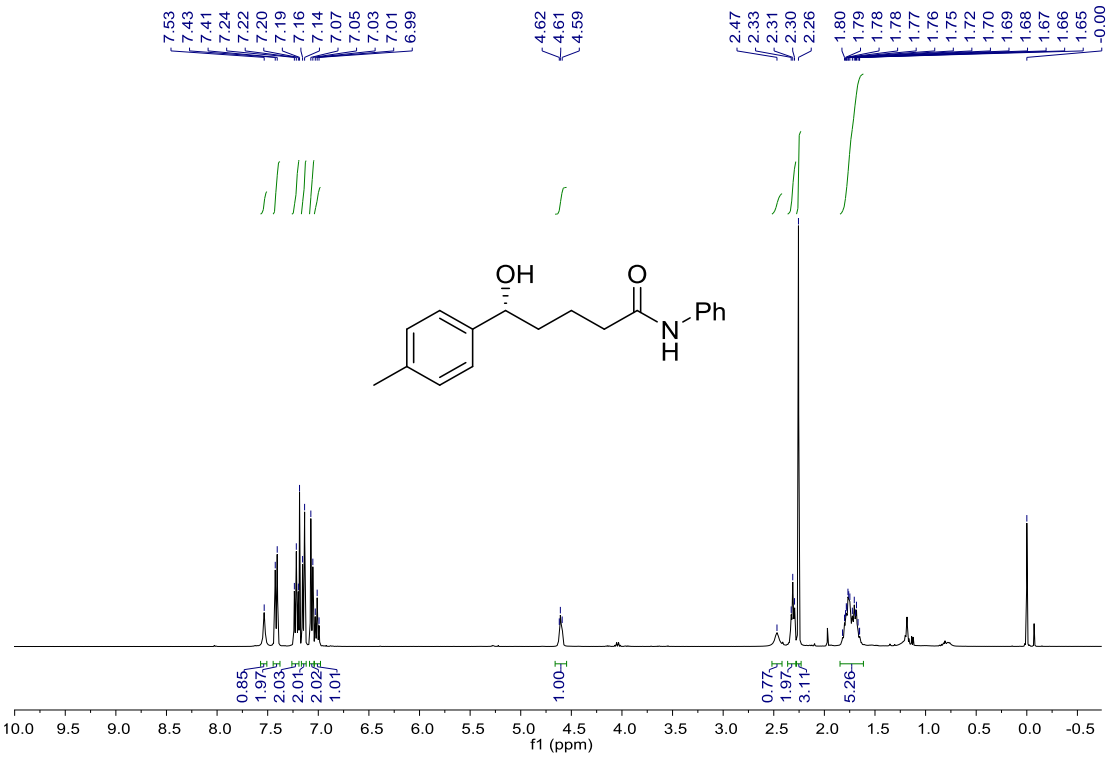


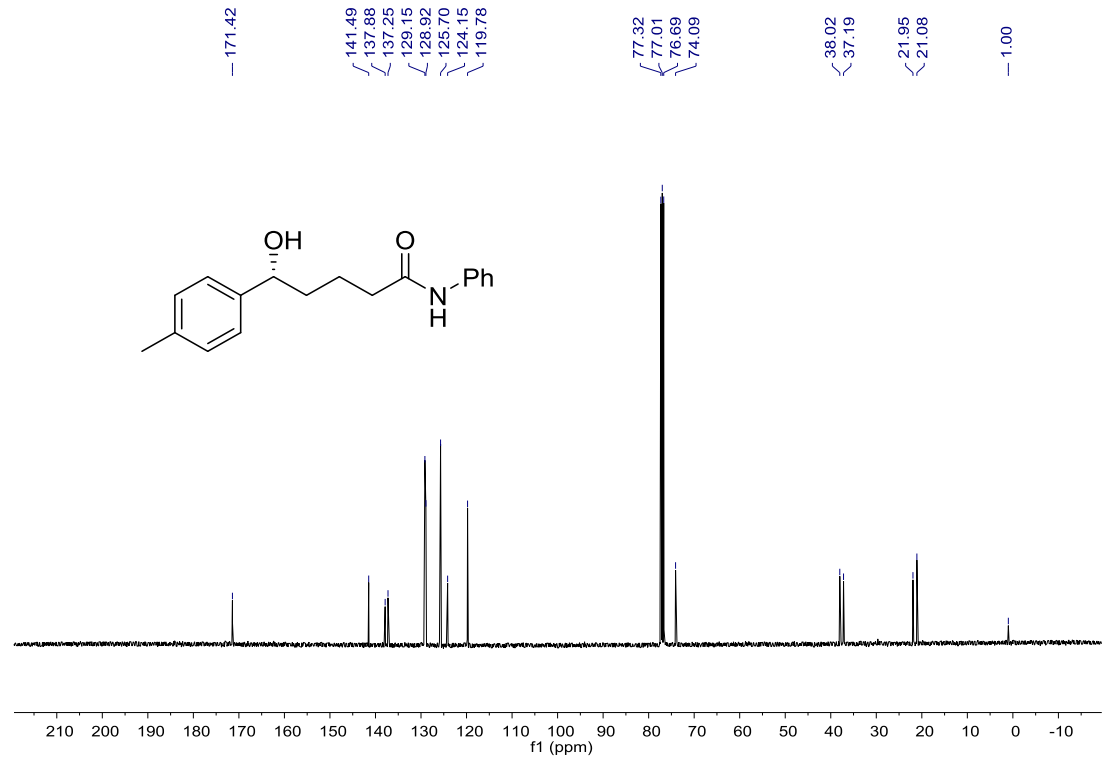
(*R*)-5-hydroxy-N-phenyl-5-(m-tolyl)pentanamide (2c)



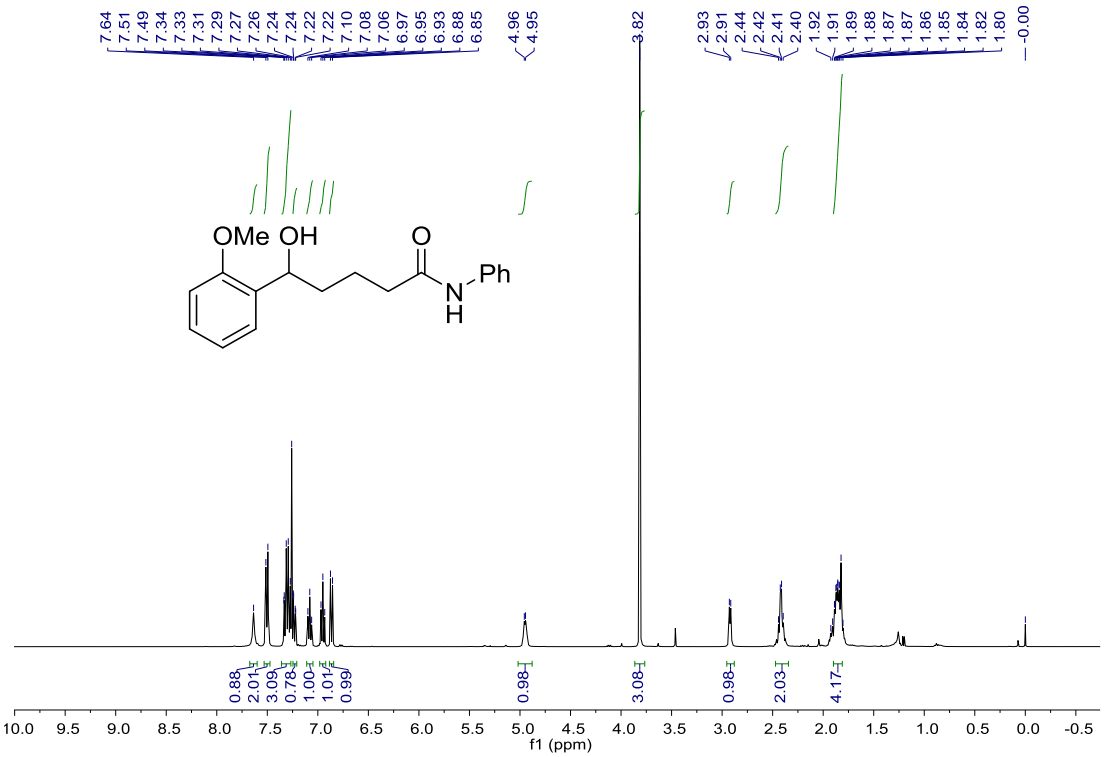


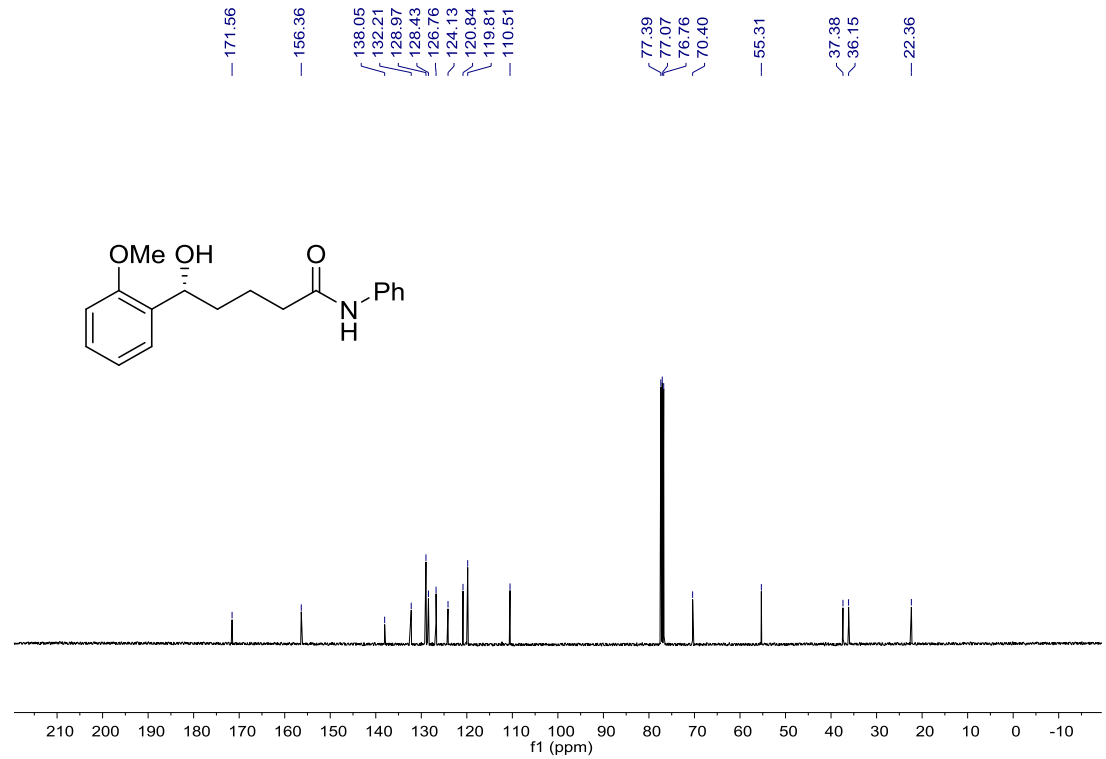
(*R*)-5-hydroxy-N-phenyl-5-(p-tolyl)pentanamide (2d)



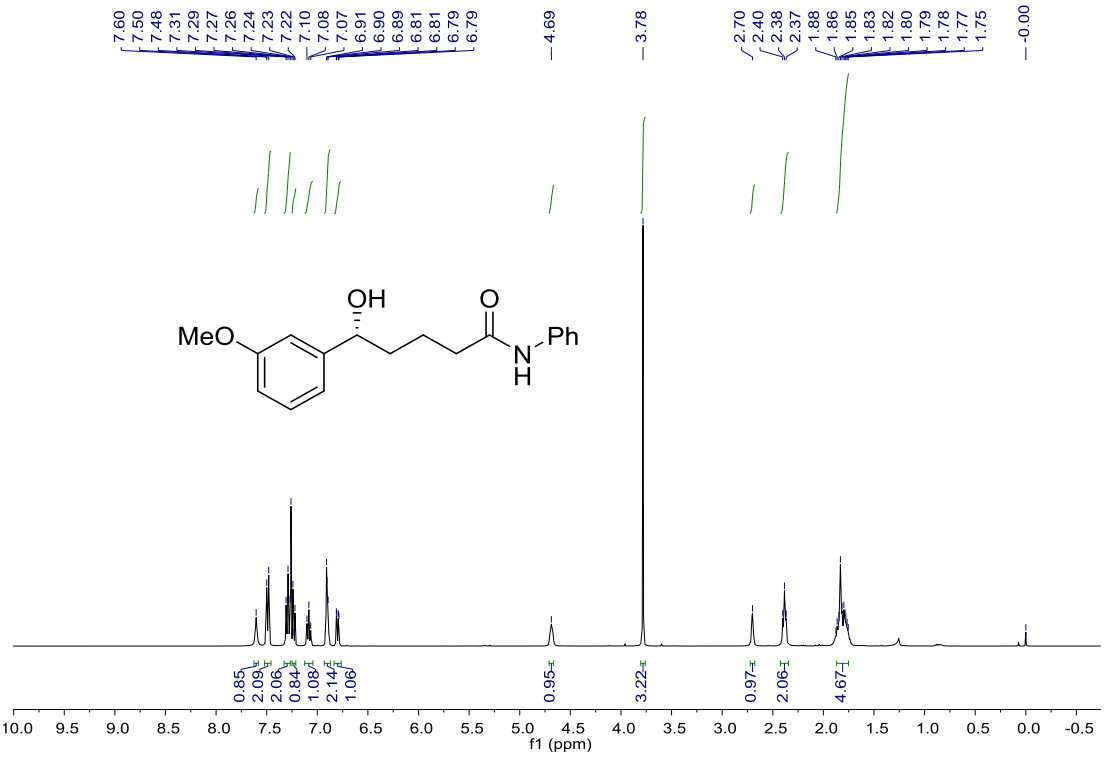


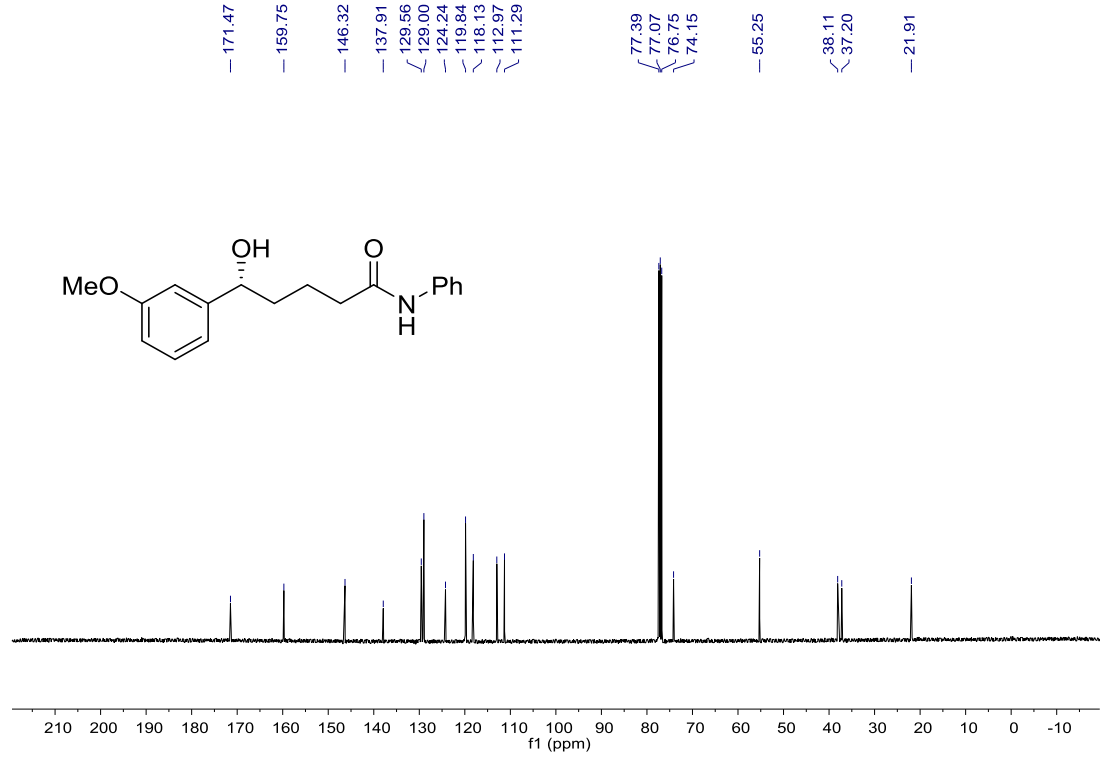
(*R*)-5-hydroxy-5-(2-methoxyphenyl)-N-phenylpentanamide (2e)



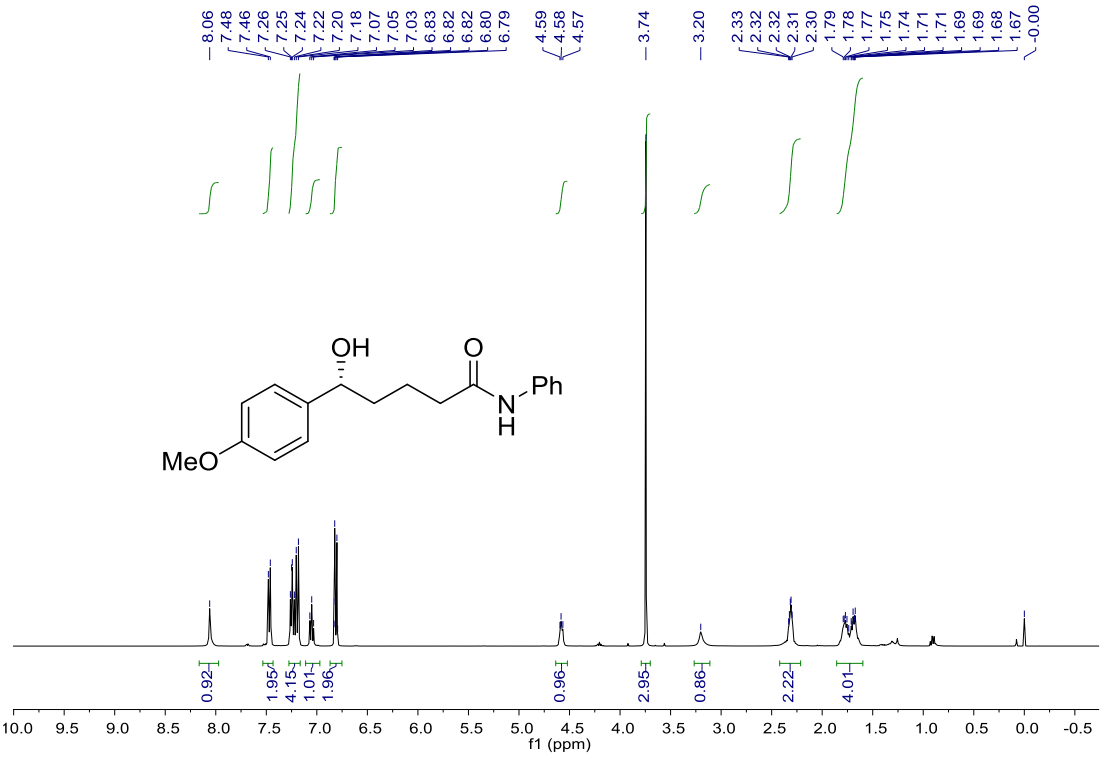


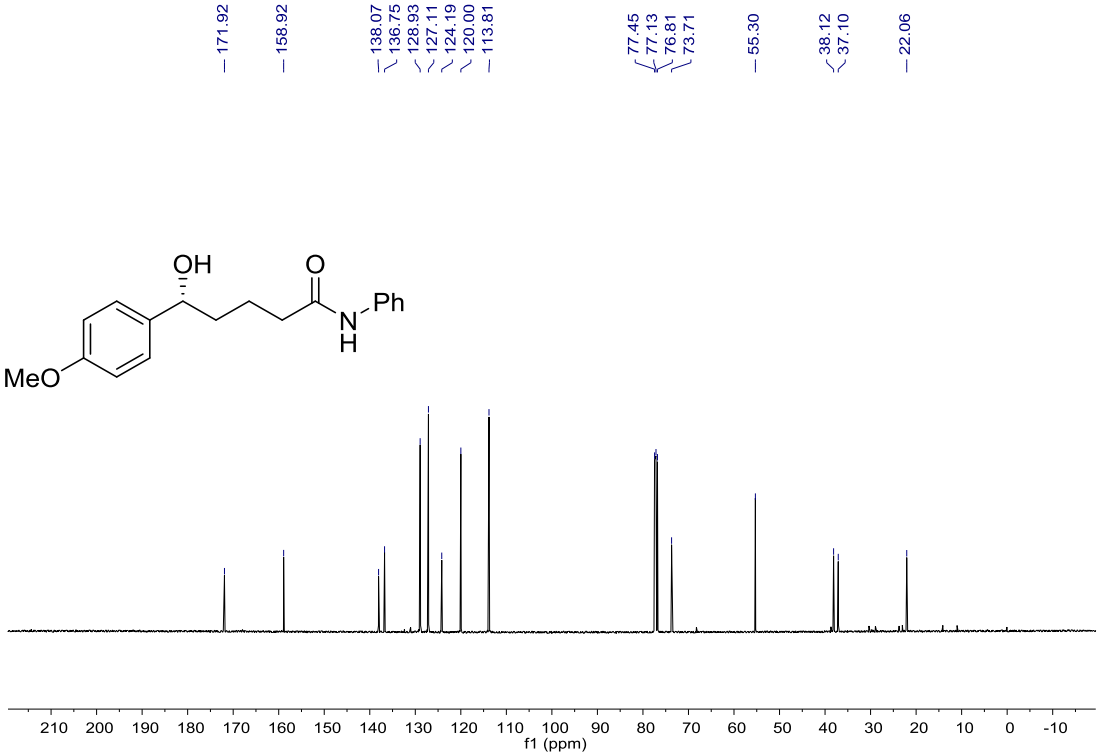
(*R*)-5-hydroxy-5-(3-methoxyphenyl)-N-phenylpentanamide (2f)



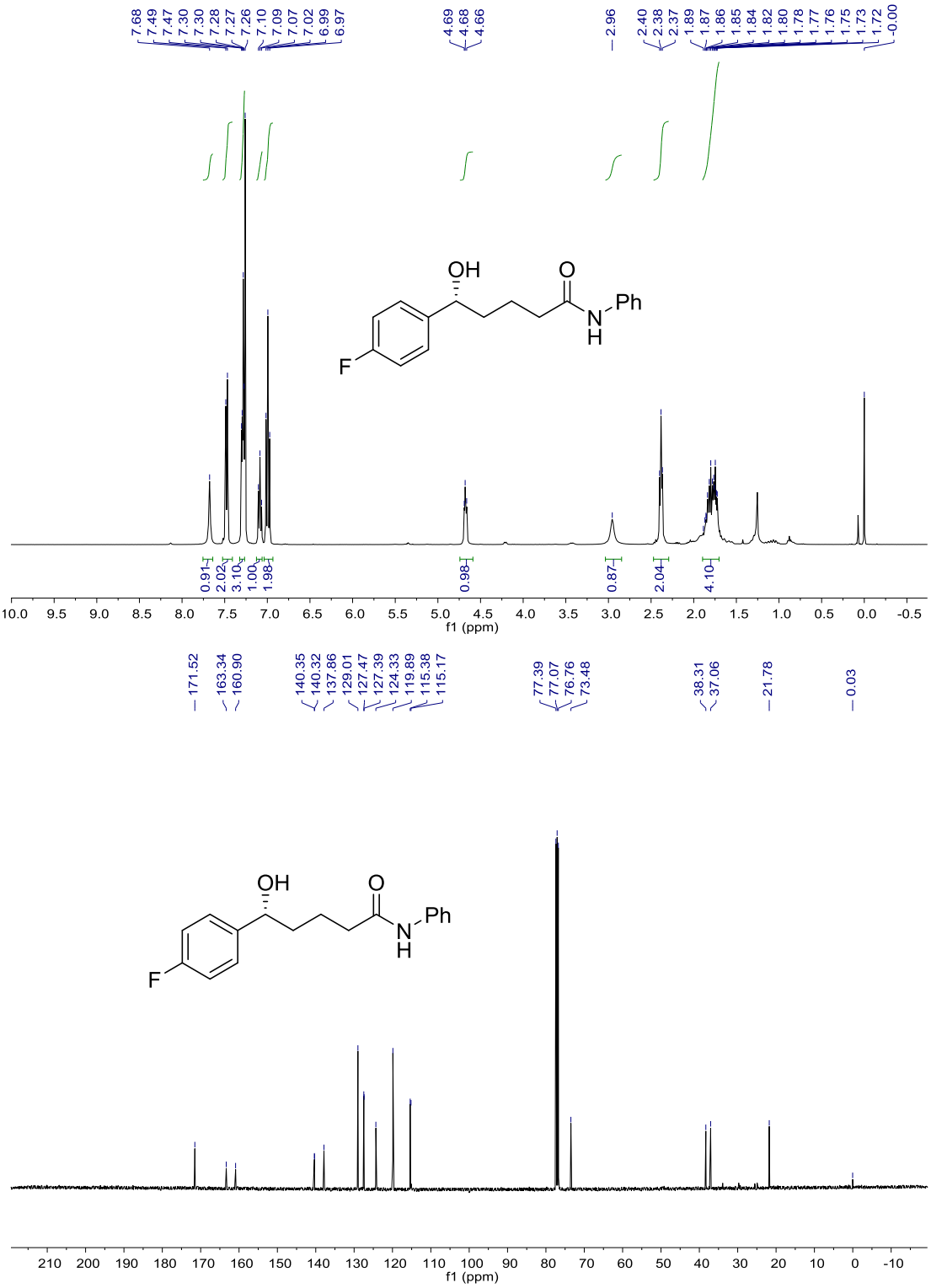


(*R*)-5-hydroxy-5-(4-methoxyphenyl)-N-phenylpentanamide (2g)

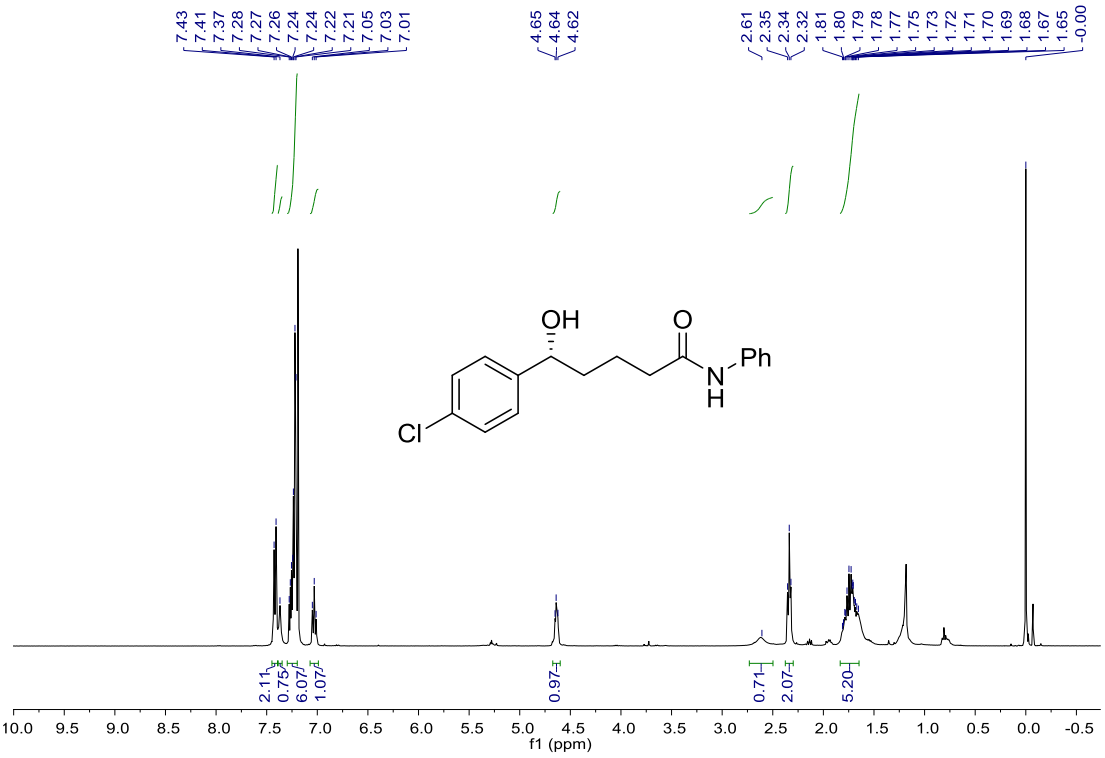


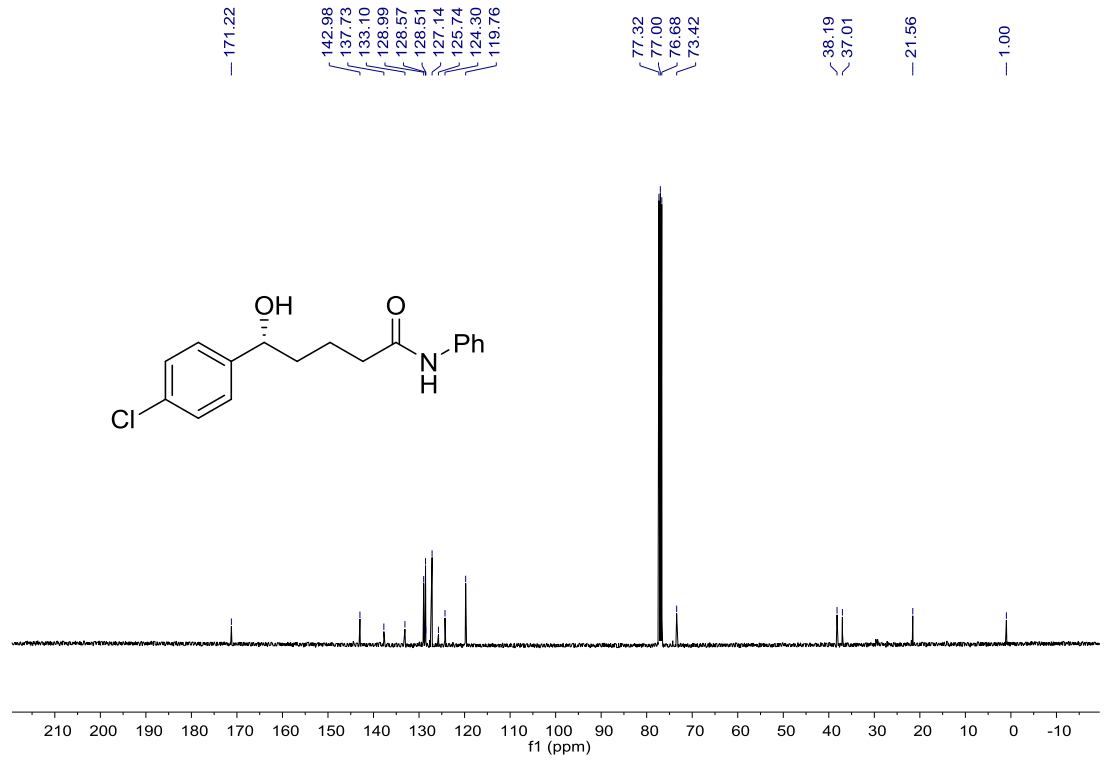


(*R*)-5-(4-fluorophenyl)-5-hydroxy-N-phenylpentanamide (2h)

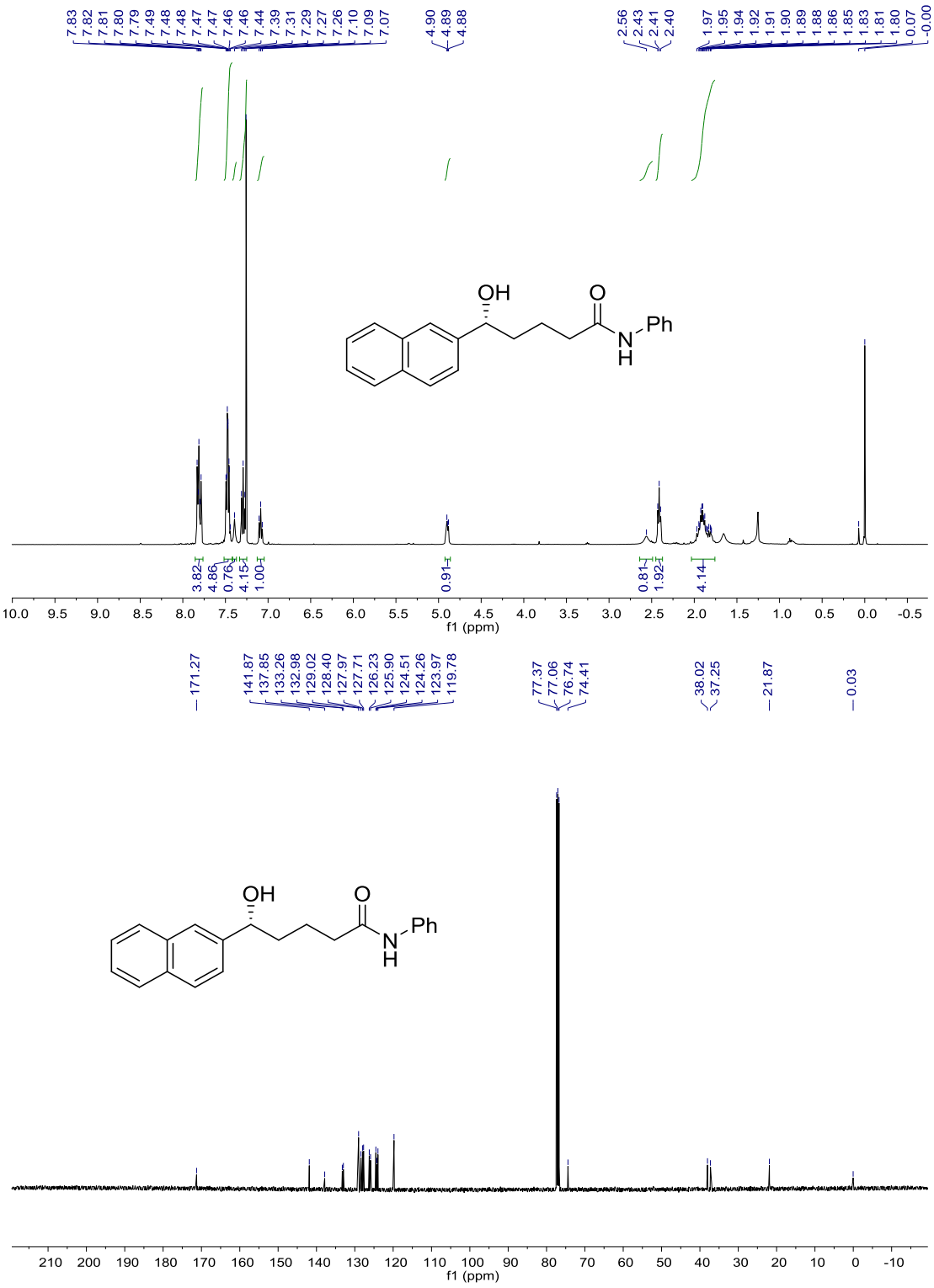


(*R*)-5-(4-chlorophenyl)-5-hydroxy-N-phenylpentanamide (2i)

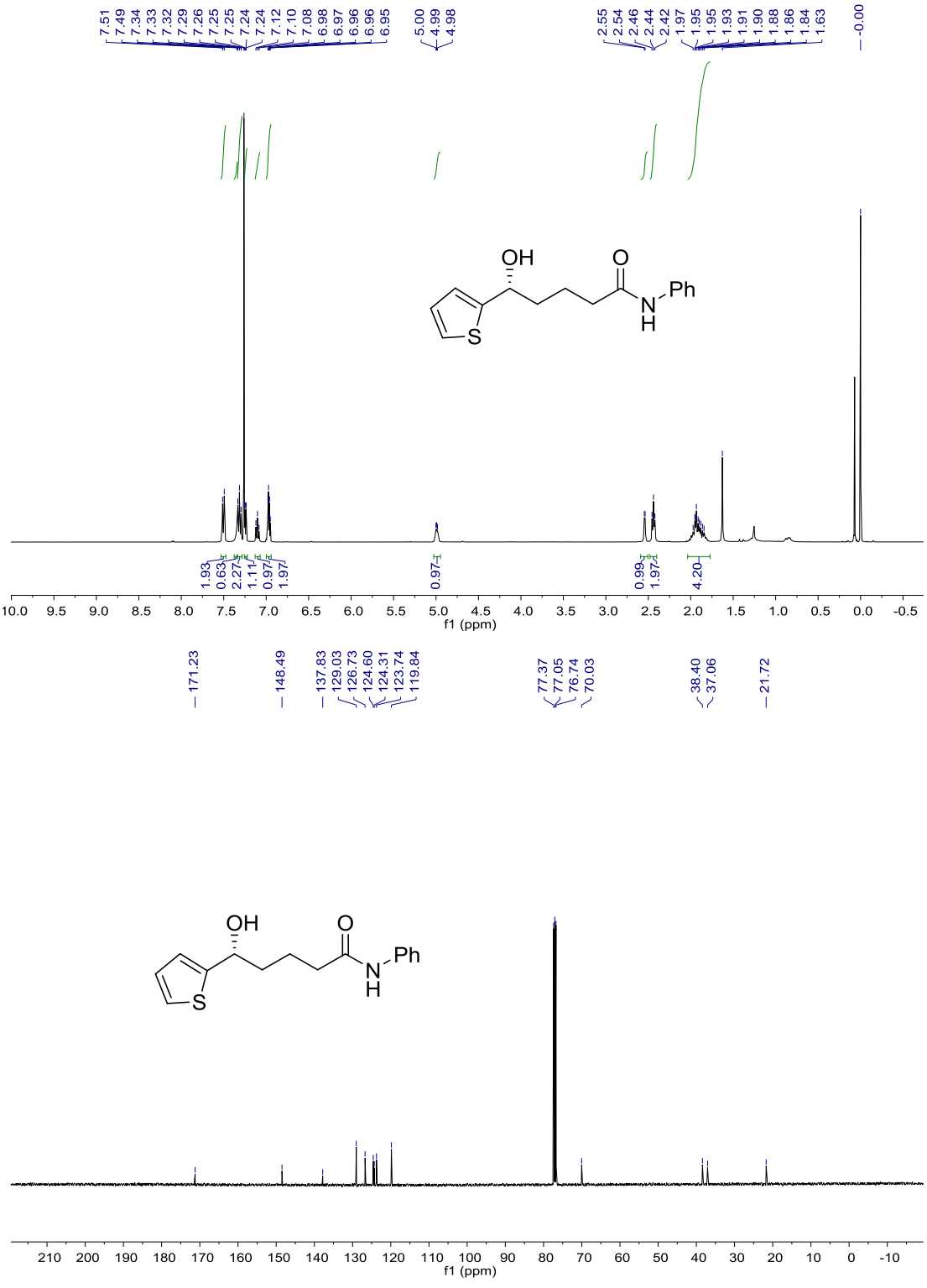




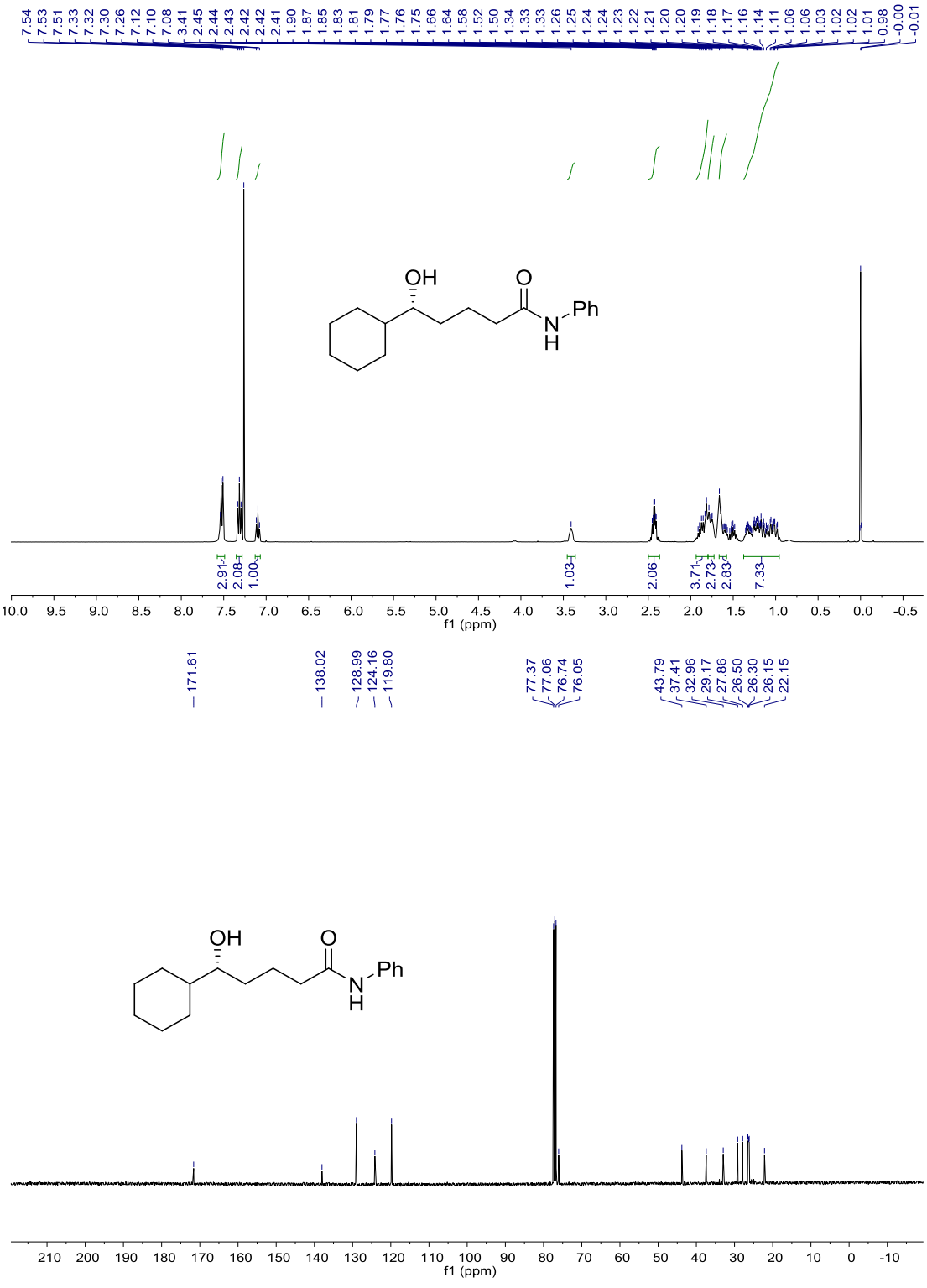
(*R*)-5-hydroxy-5-(naphthalen-2-yl)-N-phenylpentanamide (2j)



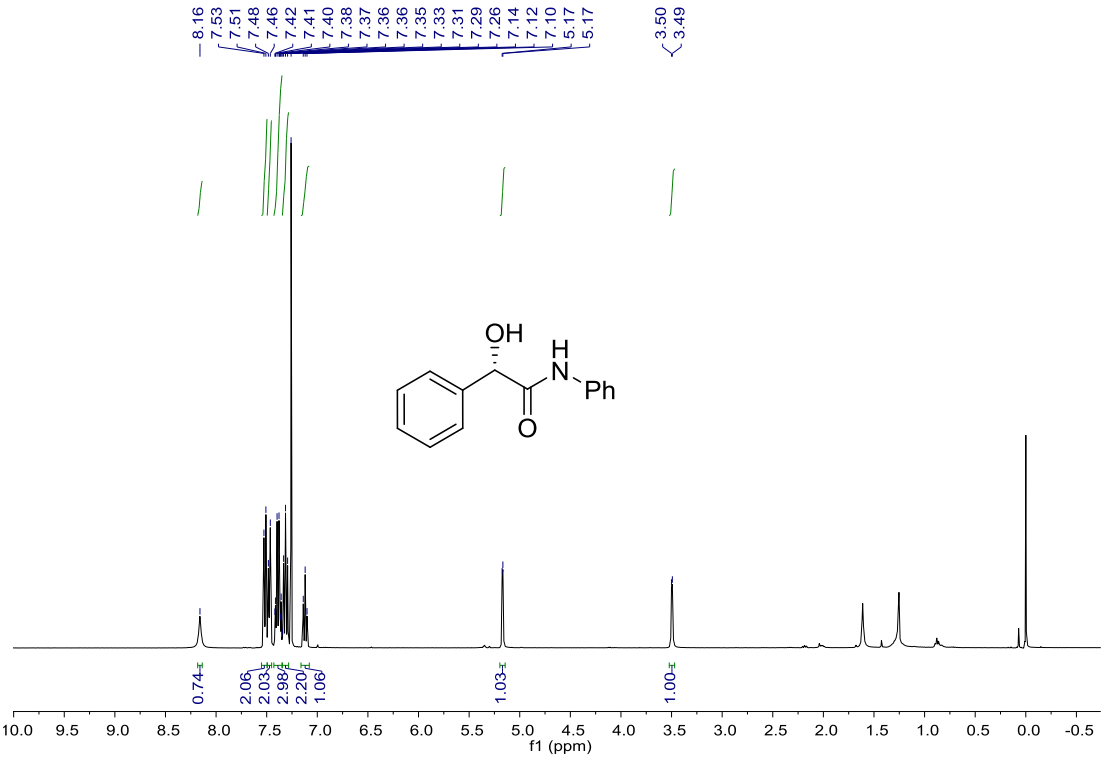
(*R*)-5-hydroxy-N-phenyl-5-(thiophen-2-yl)pentanamide (2k)

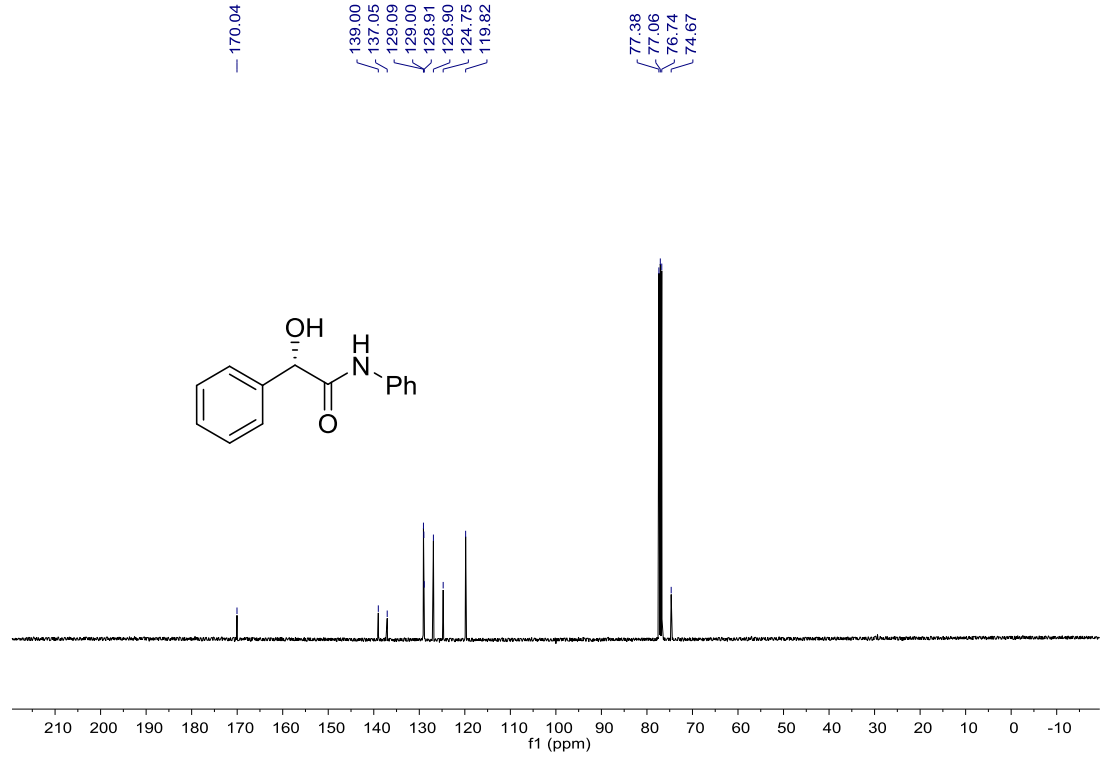


(*R*)-5-cyclohexyl-5-hydroxy-N-phenylpentanamide (2l)

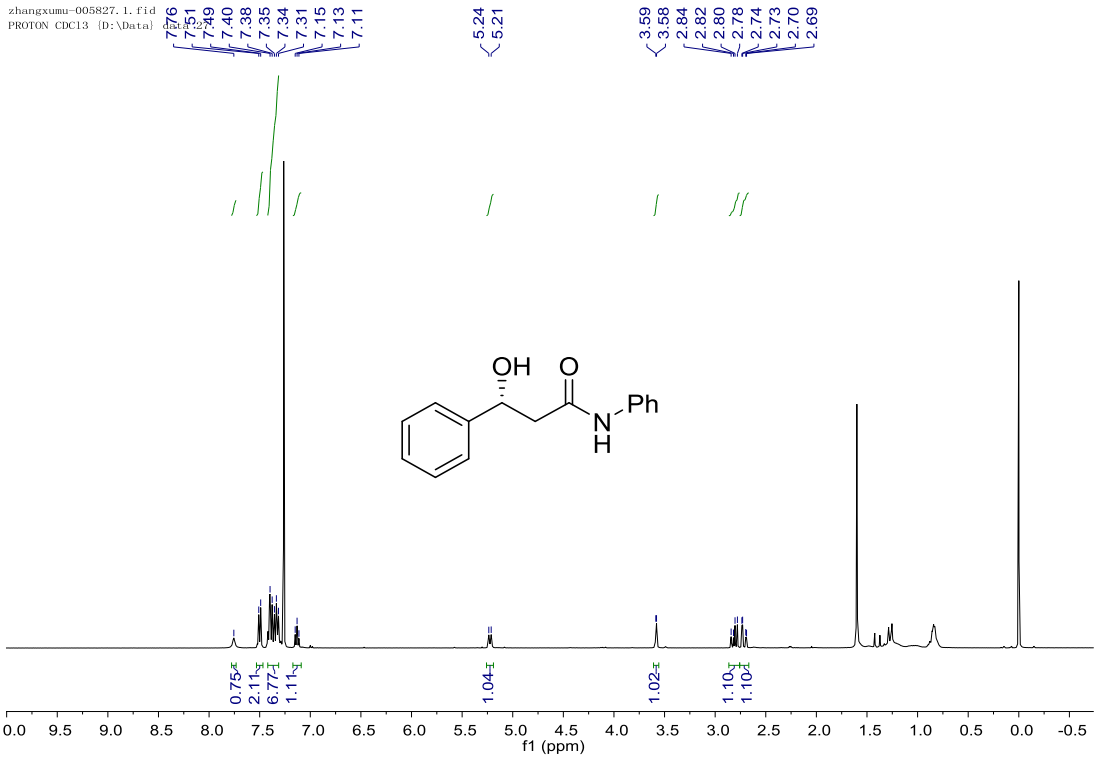


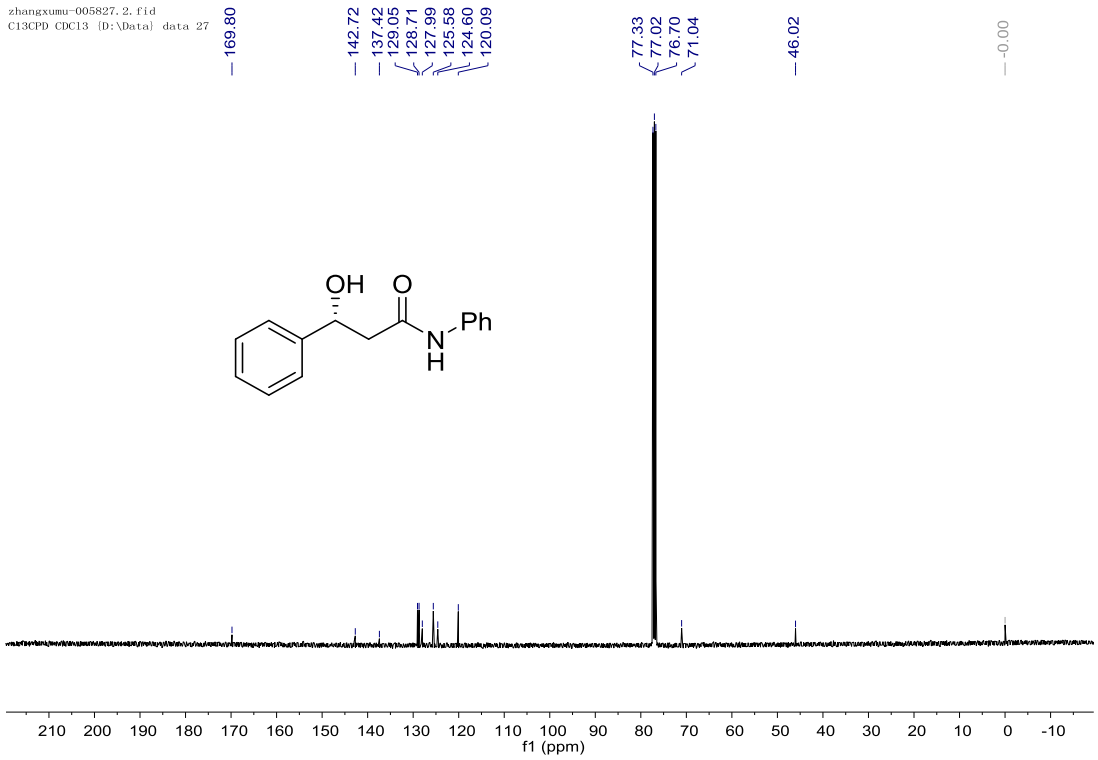
(*S*)-2-hydroxy-N,2-diphenylacetamide (2m)



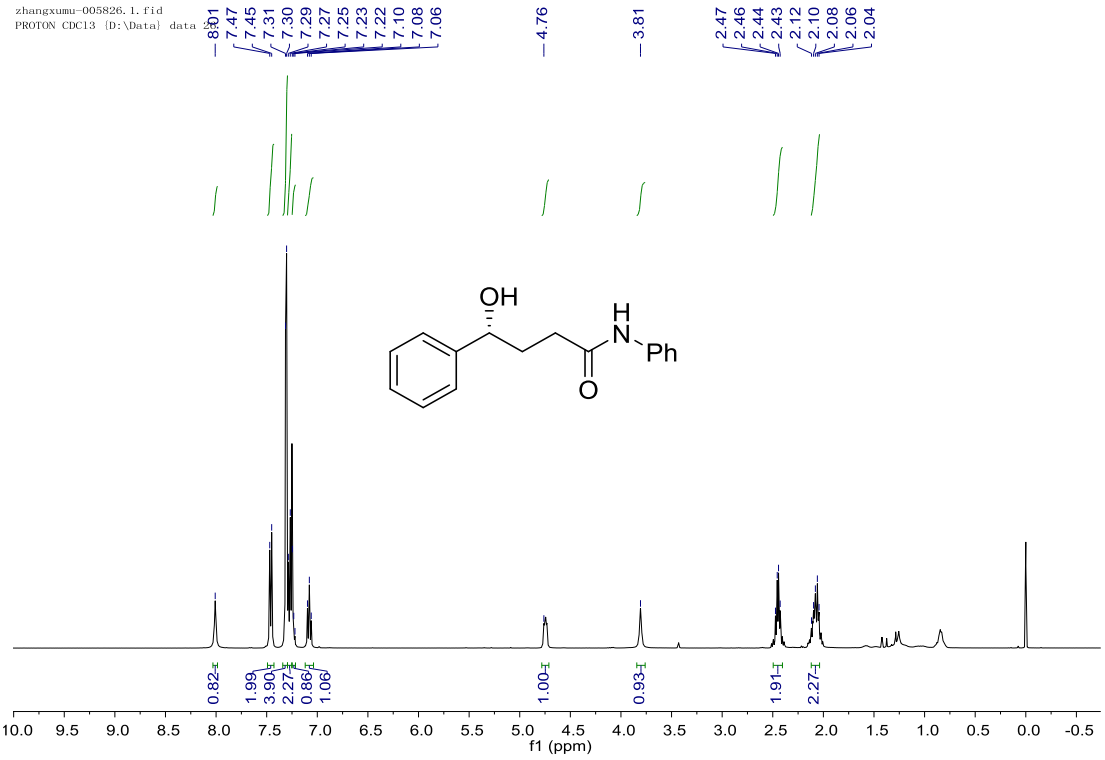


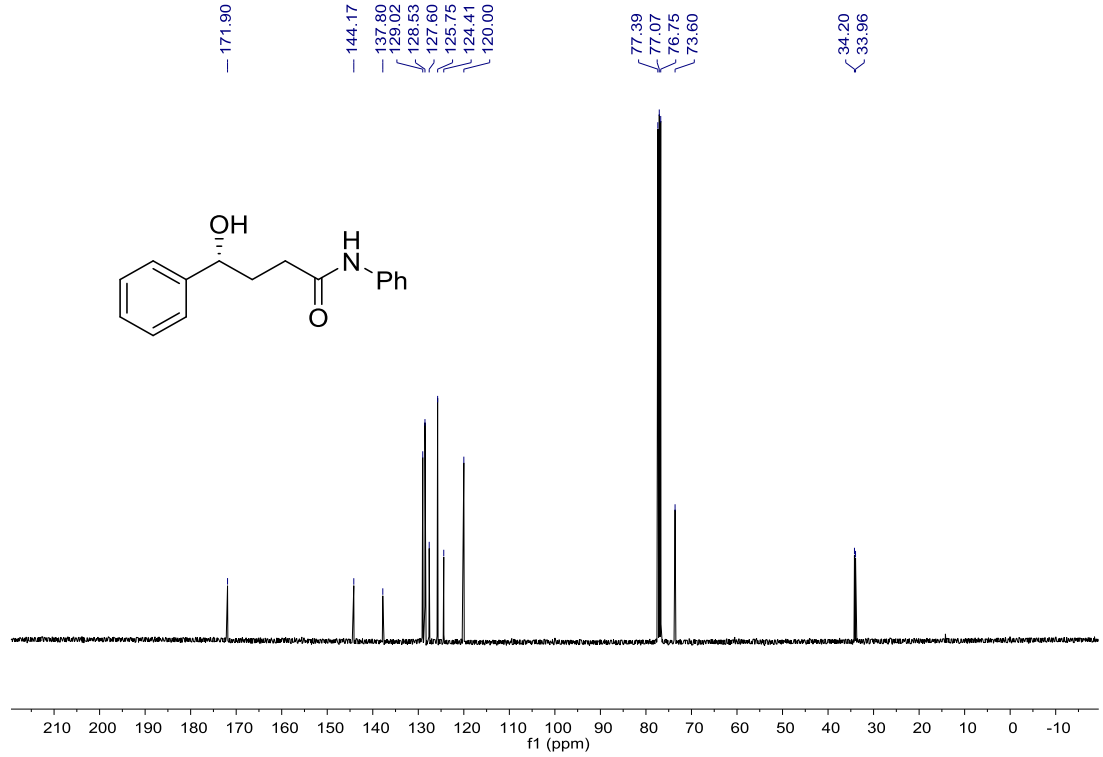
(*R*)-3-hydroxy-N,3-diphenylpropanamide (2n)





(*R*)-4-hydroxy-N,4-diphenylbutanamide (2o)

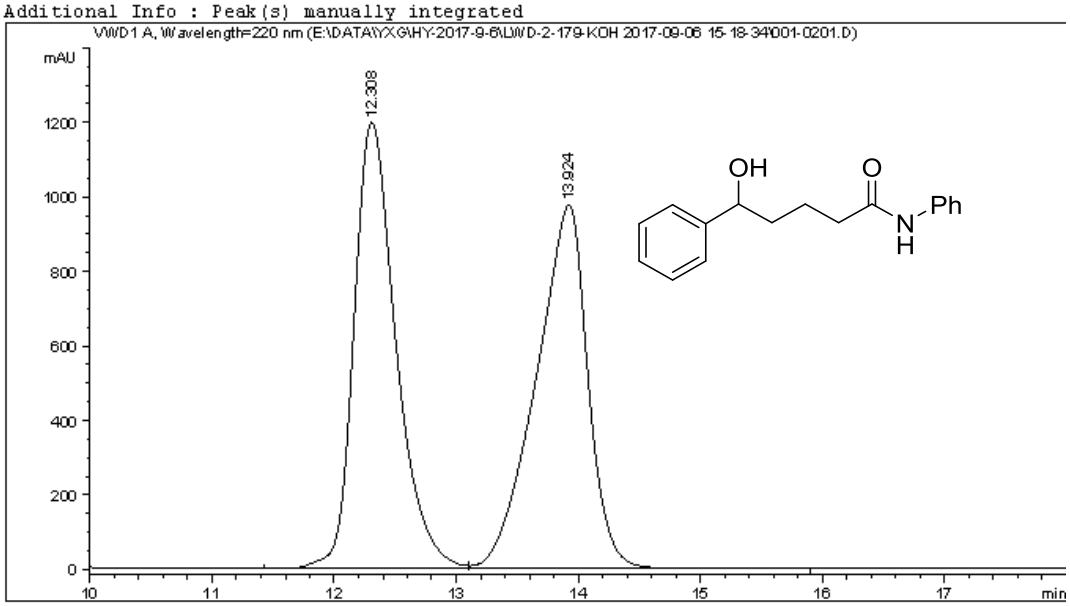




6. HPLC spectra

(*R*)-5-hydroxy-N,5-diphenylpentanamide (2a)

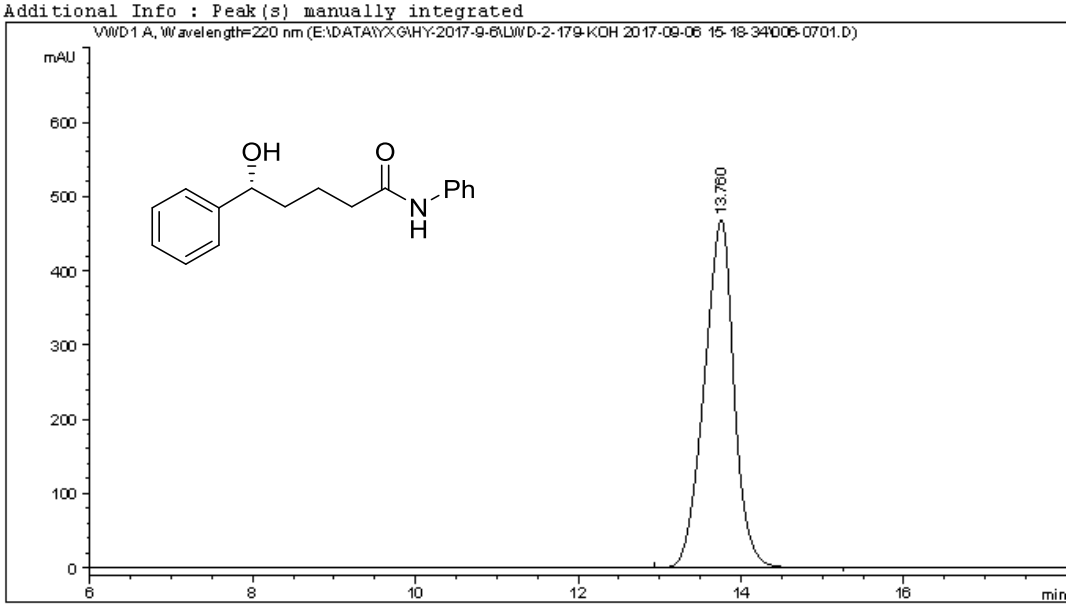
```
Data File E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\001-0201.D
Sample Name: RAC

    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                      Location : Vial 1
    Injection Date  : 9/6/2017 3:50:06 PM                    Inj :   1
                                                    Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\VWD-AD(1-2)-85
                      -15-1.0-5UL-220NM-60MIN.M
    Last changed    : 9/6/2017 4:12:40 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\VWD-AD(1-2)-85
                      -15-1.0-5UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:09:11 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  12.308 BV    0.3631 2.85638e4  1198.24341  49.8493
       2  13.924 VB    0.4242 2.87365e4   976.92010  50.1507

    Totals :                  5.73004e4  2175.16351


    ======================================================================

1260HPLC-VWD 3/8/2018 10:09:25 AM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\006-0701.D
Sample Name: iPrOH

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   7
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 6
    Injection Date  : 9/6/2017 5:40:47 PM                   Inj :   1
                                                    Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\VWD-AD(1-2)-85
                      -15-1.0-5UL-220NM-60MIN.M
    Last changed    : 9/6/2017 4:44:52 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-2017-9-6\LWD-2-179-KOH 2017-09-06 15-18-34\VWD-AD(1-2)-85
                      -15-1.0-5UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:16:07 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

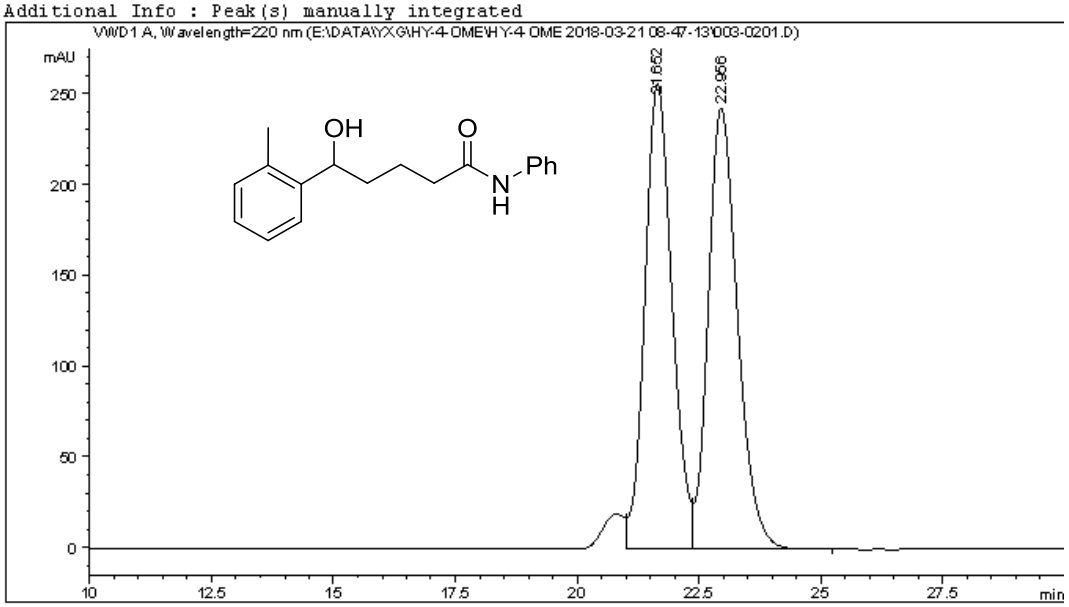



```
    ======================================================================
                            Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  13.760 BB    0.3813 1.18646e4   468.67468 100.0000

    Totals :                  1.18646e4   468.67468


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

(*R*)-5-hydroxy-N-phenyl-5-(o-tolyl)pentanamide (2b)

Data File E:\DATA\YXG\HY-4-OME\HY-4-OME 2018-03-21 08-47-13\003-0201.D
Sample Name: 2-me-rac

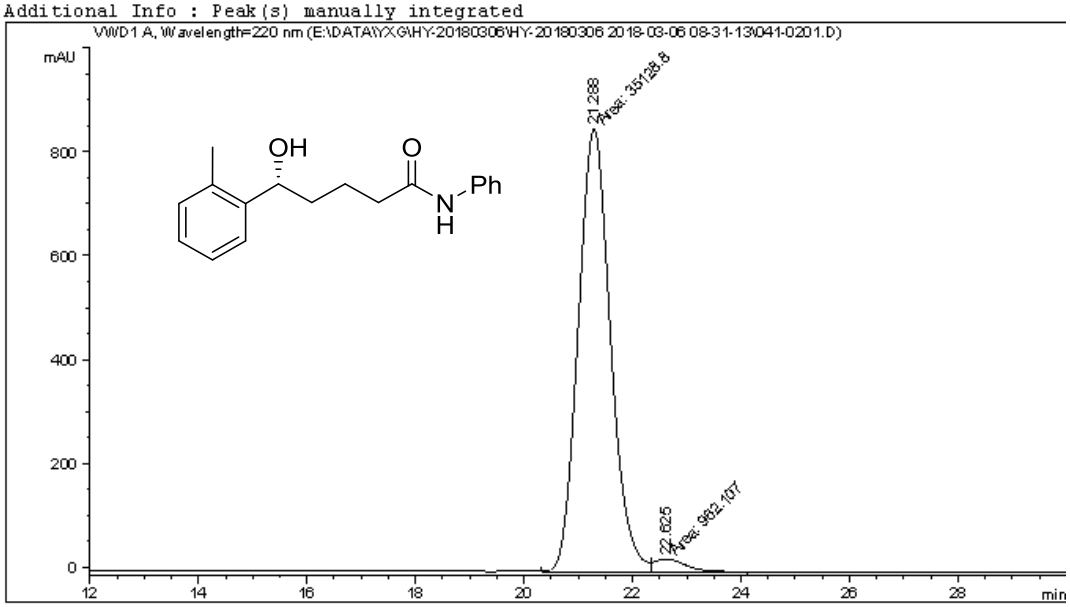
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 3
    Injection Date  : 3/21/2018 9:30:11 AM                 Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YXG\HY-4-OME\HY-4-OME 2018-03-21 08-47-13\VWD-AD(1-2)-90-10-1ML-
                      3UL-210NM-40MIN.M
    Last changed    : 3/21/2018 8:47:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-4-OME\HY-4-OME 2018-03-21 08-47-13\VWD-AD(1-2)-90-10-1ML-
                      3UL-210NM-40MIN.M (Sequence Method)
    Last changed    : 3/21/2018 2:06:11 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=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  21.652 VV    0.5986 9970.05957  255.88293  49.5089
       2  22.956 VB    0.6406 1.01678e4   242.79451  50.4911

    Totals :                  2.01379e4   498.67744


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

1260HPLC-VWD 3/21/2018 2:06:30 PM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\041-0201.D
Sample Name: HY-2-Me

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 41
    Injection Date  : 3/6/2018 8:42:49 AM                  Inj :   1
                                                     Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-3UL-210NM-40MIN.M
    Last changed    : 3/6/2018 8:31:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-3UL-210NM-40MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:42:43 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

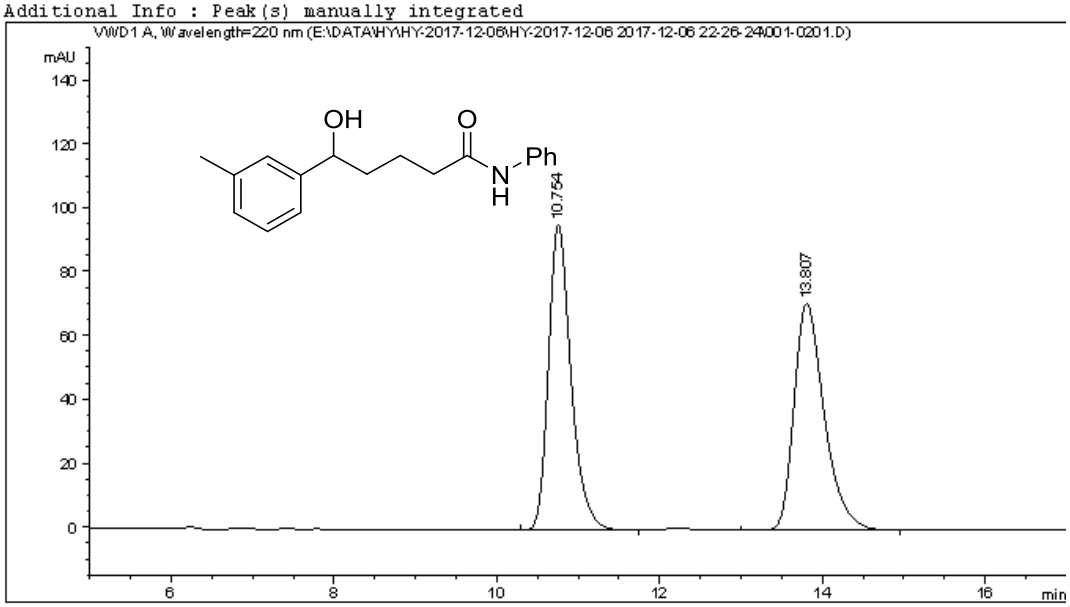



```
    ======================================================================
                              Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  21.288 MF    0.6874 3.51288e4   851.66882  97.3342
       2  22.625 FM    0.6569  962.10657   24.40915   2.6658

    Totals :                  3.60909e4   876.07797


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

(*R*)-5-hydroxy-N-phenyl-5-(m-tolyl)pentanamide (2c)

Data File E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\001-0201.D
Sample Name: HY-2017-12-06-3Me-RAC

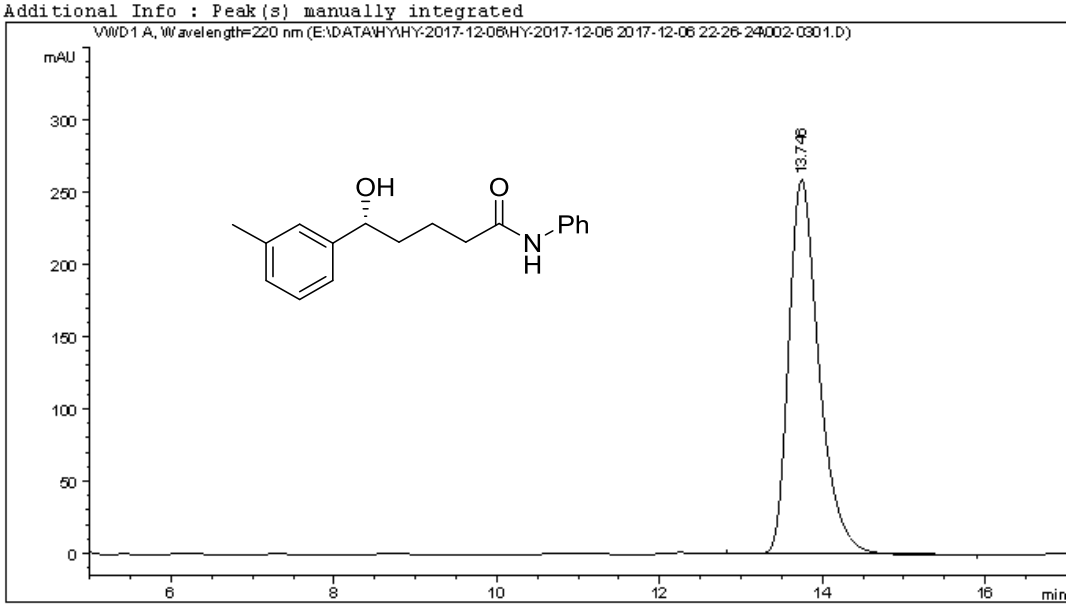
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 1
    Injection Date  : 12/6/2017 10:48:07 PM               Inj :   1
                                                    Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-1.0-1UL-220NM-40MIN.M
    Last changed    : 12/6/2017 10:26:25 PM by SYSTEM
    Analysis Method : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-1.0-1UL-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:30:18 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  10.754 BB    0.2921 1834.05481   95.48607  50.0238
       2  13.807 BB    0.3945 1832.30615   70.90994  49.9762

    Totals :                  3666.36096  166.39601

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

1260HPLC-VWD 3/4/2018 11:30:26 AM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\002-0301.D
Sample Name: HY-2017-12-06-3Me-EE

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 2
    Injection Date  : 12/6/2017 11:28:48 PM              Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-1.0-1UL-220NM-40MIN.M
    Last changed    : 12/6/2017 10:26:25 PM by SYSTEM
    Analysis Method : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-1.0-1UL-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:32:04 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

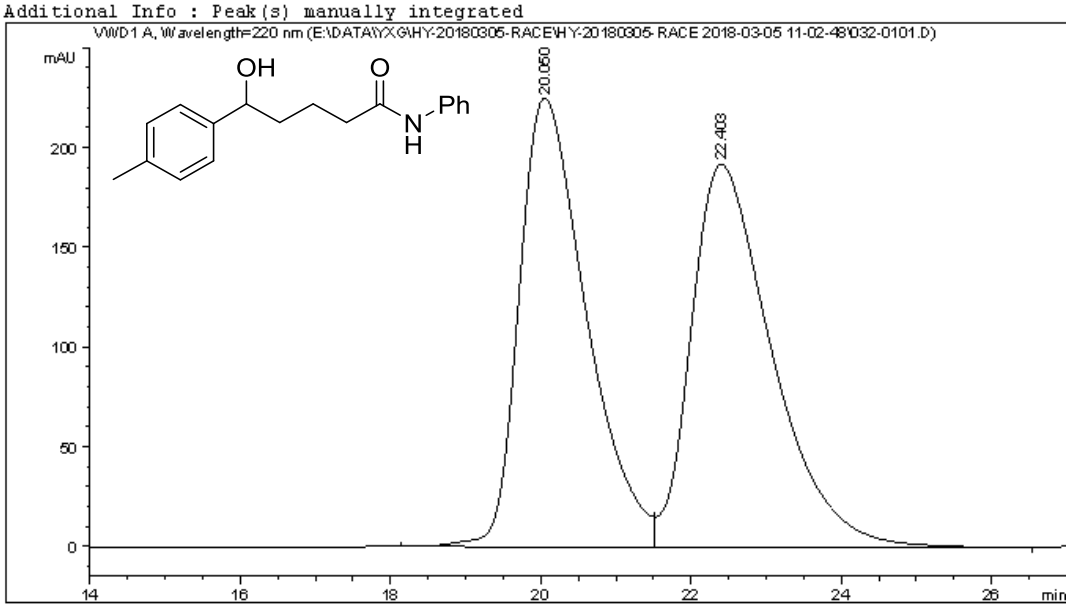



```
    ======================================================================
                            Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  13.746 BB    0.3931 6691.59375  259.28629 100.0000

    Totals :                  6691.59375  259.28629

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

(*R*)-5-hydroxy-N-phenyl-5-(p-tolyl)pentanamide (2d)

Data File E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 11-02-48\032-0101.D
Sample Name: HY-4-Me-RACE

```
======================================================================
Acq. Operator   : SYSTEM                          Seq. Line :   1
Acq. Instrument : 1260HPLC-VWD                    Location : Vial 32
Injection Date  : 3/5/2018 11:03:34 AM               Inj :   1
                                                 Inj Volume : 3.000 µl
Acq. Method     : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 11-02-48\DAD-AS
                  (1-6)-90-10-1ML-3UL-220NM-60MIN.M
Last changed    : 3/5/2018 11:26:15 AM by SYSTEM
                  (modified after loading)
Analysis Method : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 11-02-48\DAD-AS
                  (1-6)-90-10-1ML-3UL-220NM-60MIN.M (Sequence Method)
Last changed    : 3/19/2018 8:41:28 PM by SYSTEM
                  (modified after loading)
Additional Info : Peak(s) manually integrated
```

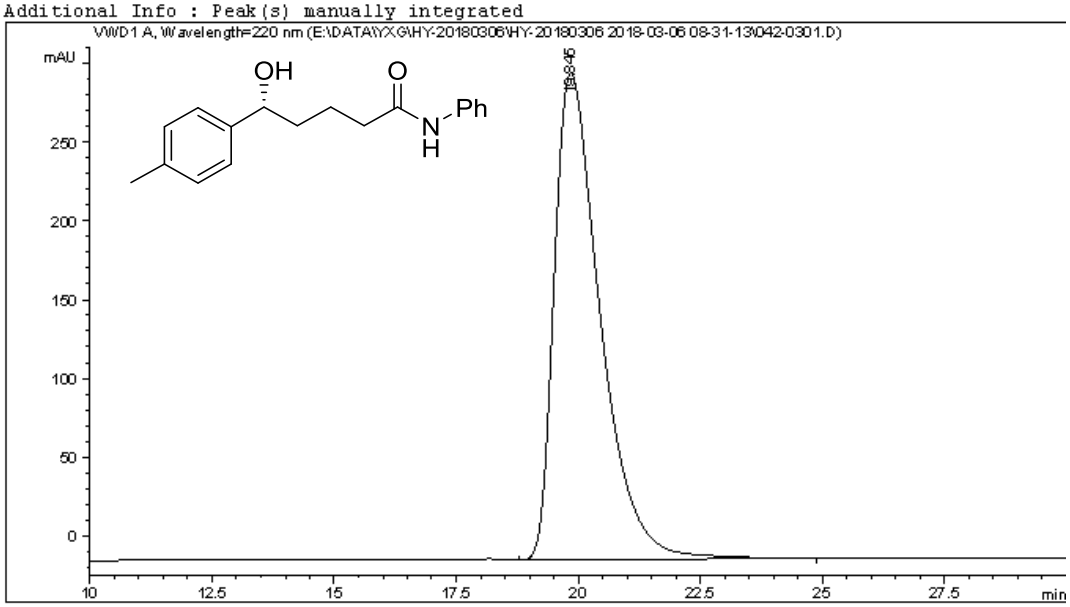



```
======================================================================
                        Area Percent Report
======================================================================

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


Signal 1: VWD1 A, Wavelength=220 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  20.050 BV    0.9438 1.39227e4   225.03658  49.3087
   2  22.403 VB    1.1303 1.43130e4   191.87627  50.6913

Totals :                  2.82357e4   416.91284

======================================================================
```

1260HPLC-VWD 3/19/2018 8:41:36 PM SYSTEM Page 1 of 1

Data File E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\042-0301.D
Sample Name: HY-4-Me

```
    ====================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 42
    Injection Date  : 3/6/2018 9:23:38 AM                 Inj :   1
                                                  Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AS(1-6)-90-
                      10-1ML-3UL-220NM-40MIN.M
    Last changed    : 3/6/2018 8:31:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AS(1-6)-90-
                      10-1ML-3UL-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:45:45 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

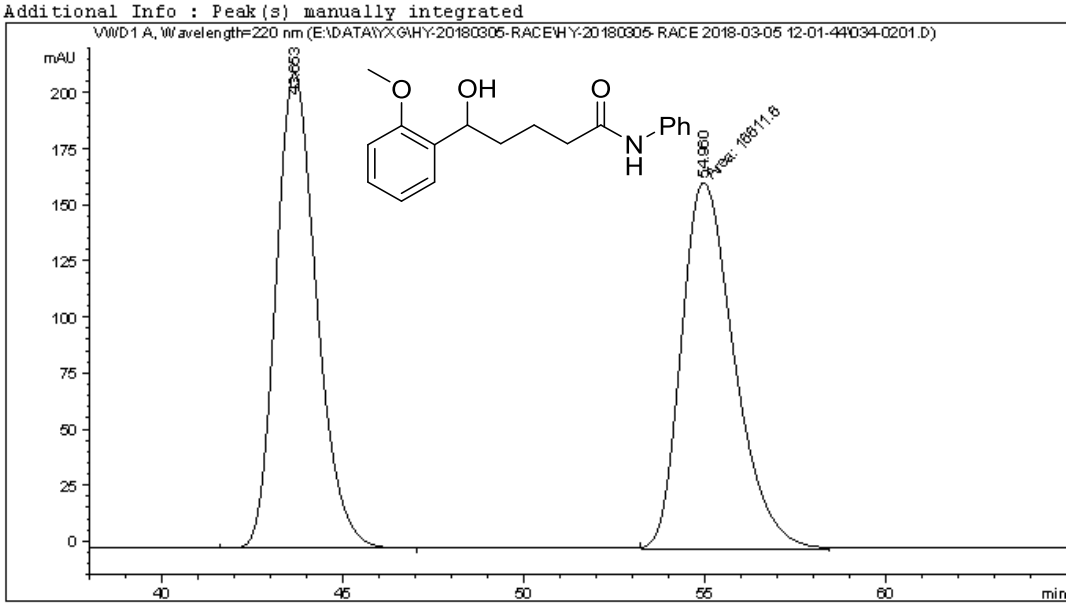



```
    ====================================================================
                           Area Percent Report
    ====================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  19.845 BB    0.9927 2.02177e4   309.24850 100.0000

    Totals :                  2.02177e4   309.24850


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

(*R*)-5-hydroxy-5-(2-methoxyphenyl)-N-phenylpentanamide (2e)

Data File E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\034-0201.D
Sample Name: HY-2-OMe RACE

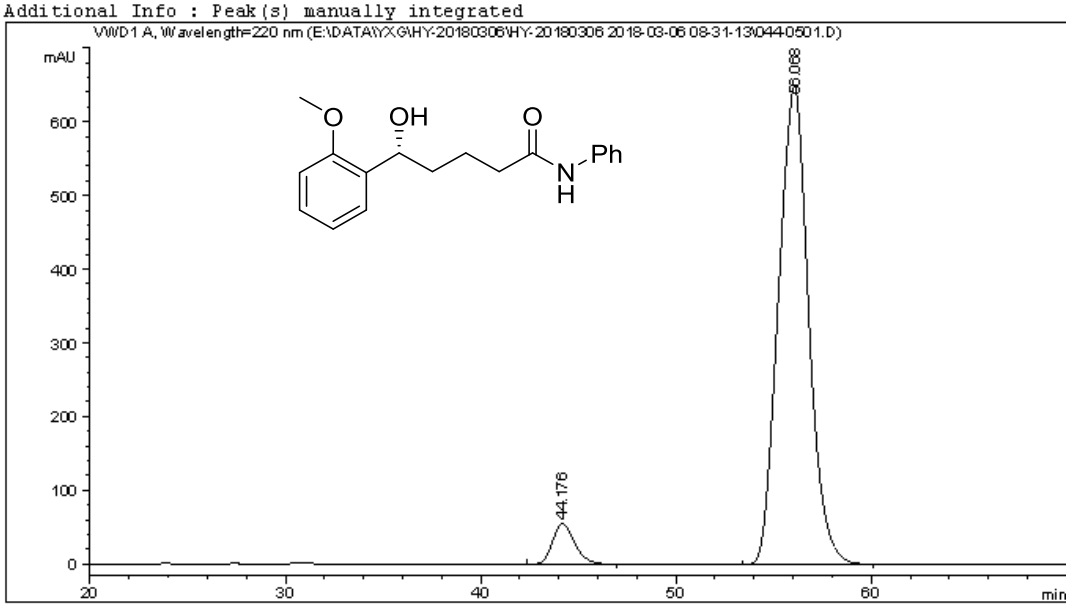
```
=====================================================================
Acq. Operator   : SYSTEM                          Seq. Line :   2
Acq. Instrument : 1260HPLC-VWD                     Location : Vial 34
Injection Date  : 3/5/2018 1:38:28 PM                 Inj :   1
                                                  Inj Volume : 5.000 µl
Acq. Method     : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\VWD-AD
                  (1-2)-90-10-1.0ML-3UL-220NM-60MIN.M
Last changed    : 3/5/2018 2:37:01 PM by SYSTEM
                  (modified after loading)
Analysis Method : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\VWD-AD
                  (1-2)-90-10-1.0ML-3UL-220NM-60MIN.M (Sequence Method)
Last changed    : 3/8/2018 10:00:17 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: VWD1 A, Wavelength=220 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  43.653 BB    1.1906 1.65428e4   211.93987  49.8962
   2  54.960 MM    1.6947 1.66116e4   163.36815  50.1038

Totals :                  3.31544e4   375.30801

=====================================================================
```

Data File E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\044-0501.D
Sample Name: HY-2-OMe

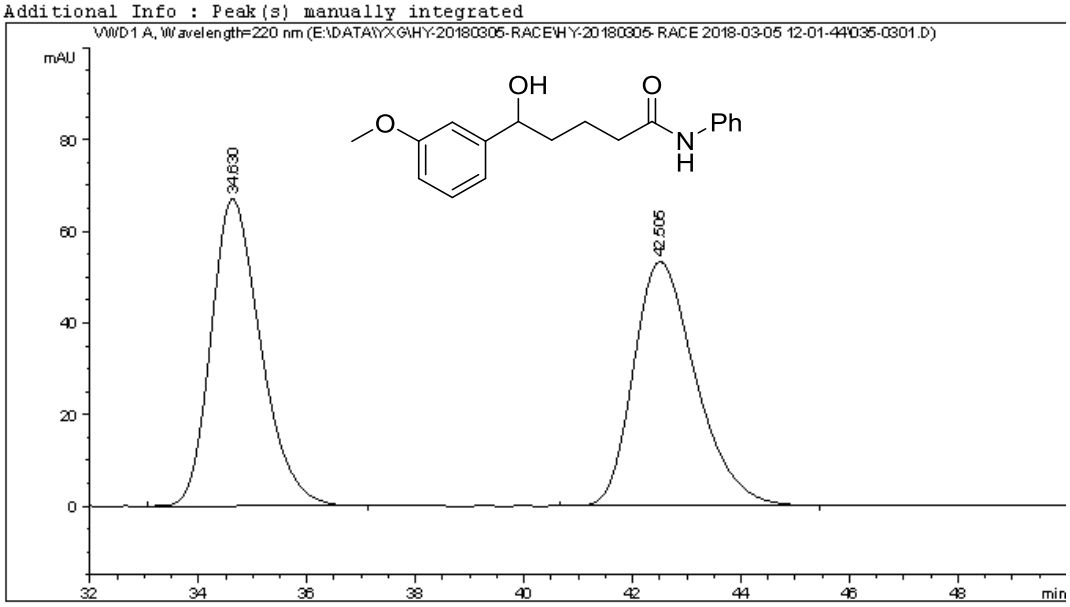
```
    ==================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   5
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 44
    Injection Date  : 3/6/2018 11:45:21 AM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-5UL-220NM-75MIN.M
    Last changed    : 3/6/2018 8:31:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-5UL-220NM-75MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:50:59 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  44.176 BB    1.2124 4331.05273   54.54423   5.8762
       2  56.068 BB    1.6010 6.93737e4   648.03125  94.1238

    Totals :                  7.37048e4   702.57548


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

(*R*)-5-hydroxy-5-(3-methoxyphenyl)-N-phenylpentanamide (2f)

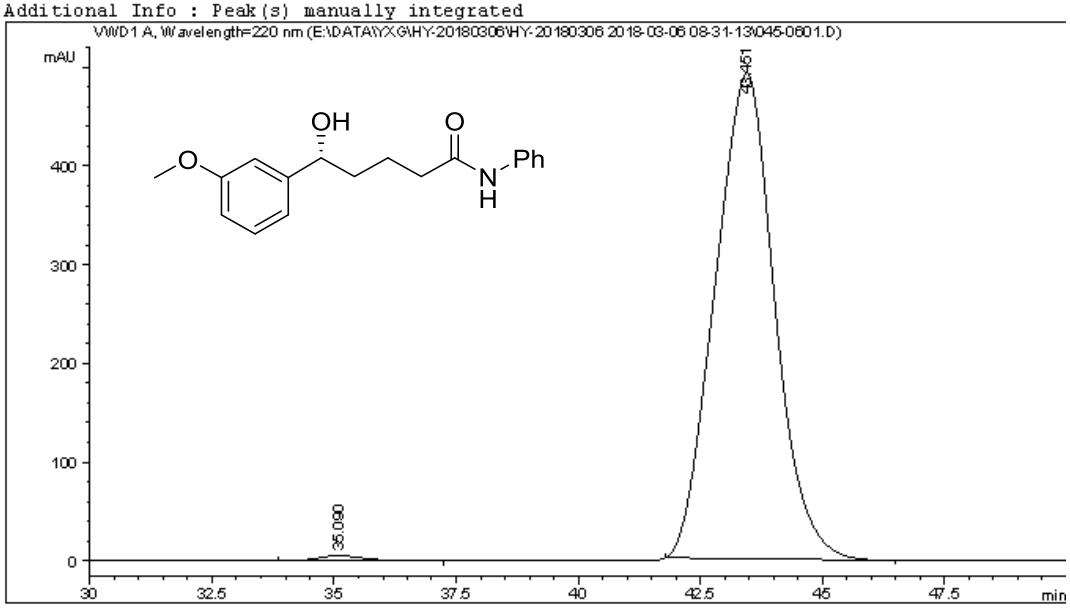
```
Data File E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\035-0301.D
Sample Name: HY-3-OMe-RACE

    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   3
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 35
    Injection Date  : 3/5/2018 2:44:16 PM                  Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\VWD-AD
                      (1-2)-90-10-1.0ML-3UL-220NM-60MIN.M
    Last changed    : 3/5/2018 3:33:51 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\VWD-AD
                      (1-2)-90-10-1.0ML-3UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 9:57:50 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  34.630 BB    0.9675 4264.64502   67.01236  50.0685
       2  42.505 BB    1.2125 4252.97168   53.26817  49.9315

    Totals :                  8517.61670  120.28053

    ======================================================================

1260HPLC-VWD 3/8/2018 9:58:03 AM SYSTEM                       Page 1 of 1
```

Data File E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\045-0601.D
Sample Name: HY-3-OMe

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   6
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 45
    Injection Date  : 3/6/2018 1:01:11 PM                   Inj :   1
                                                    Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-5UL-220NM-60MIN.M
    Last changed    : 3/6/2018 8:31:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AD(1-2)-90-
                      10-1ML-5UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/15/2018 3:30:54 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

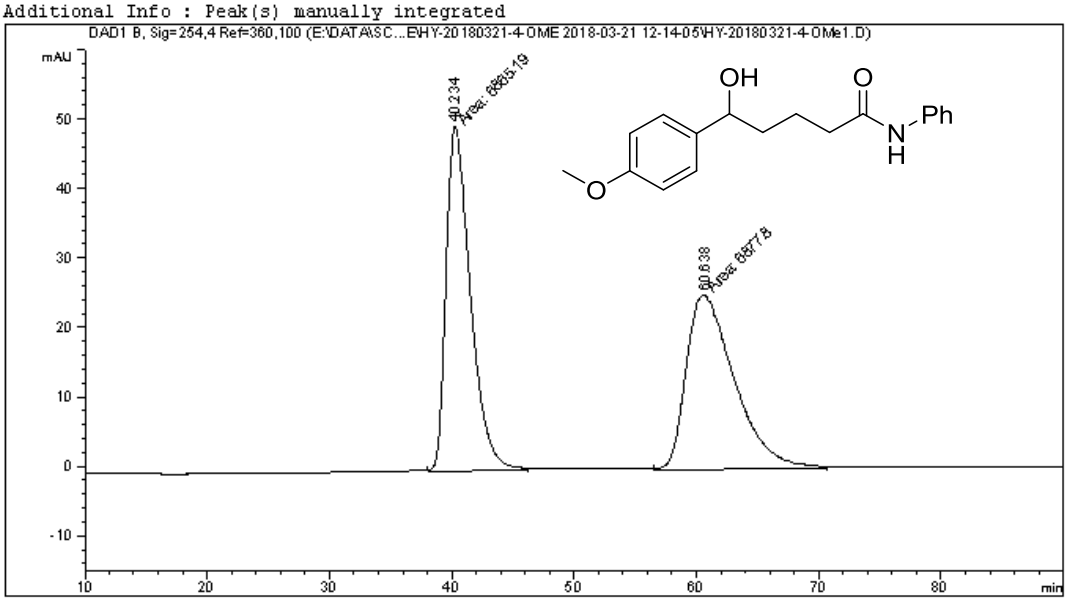



```
    ======================================================================
                              Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  35.090 BB    0.9146  343.49542    5.28935   0.8160
       2  43.451 BB    1.2260 4.17513e4   492.03580  99.1840

    Totals :                  4.20948e4   497.32515


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

(*R*)-5-hydroxy-5-(4-methoxyphenyl)-N-phenylpentanamide (2g)

Data File E:\DATA\SC...21-4-OME\HY-20180321-4-OME 2018-03-21 12-14-05\HY-20180321-4-OMe1.D
Sample Name: HY-20180321-4-OMe-RAC

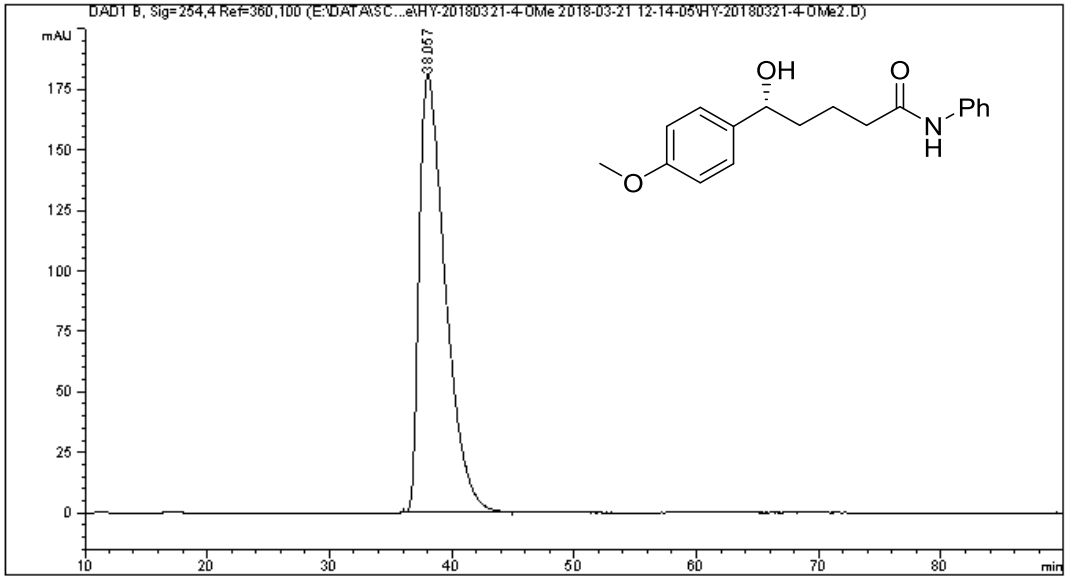
```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   2
    Acq. Instrument : 1260                           Location :   23
    Injection Date  : 3/21/2018 12:32:15 PM              Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\SC\ZHANG-HY-20180321-4-OMe\HY-20180321-4-OMe 2018-03-21 12-14-05\SC
                      -1-ASH-90-10-DAD--90MIN-1ML.M
    Last changed    : 3/21/2018 12:14:05 PM by SYSTEM
    Analysis Method : E:\DATA\SC\ZHANG-HY-20180321-4-OMe\HY-20180321-4-OMe 2018-03-21 12-14-05\SC
                      -1-ASH-90-10-DAD--90MIN-1ML.M (Sequence Method)
    Last changed    : 3/21/2018 3:18:01 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=360,100

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  40.234 MM    2.3063 6865.19482   49.61203  49.9542
       2  60.638 MM    4.5591 6877.79639   25.14311  50.0458

    Totals :                  1.37430e4    74.75514
```

Data File E:\DATA\SC...21-4-OMe\HY-20180321-4-OMe 2018-03-21 12-14-05\HY-20180321-4-OMe2.D
Sample Name: HY-20180321-4-OMe-OPT

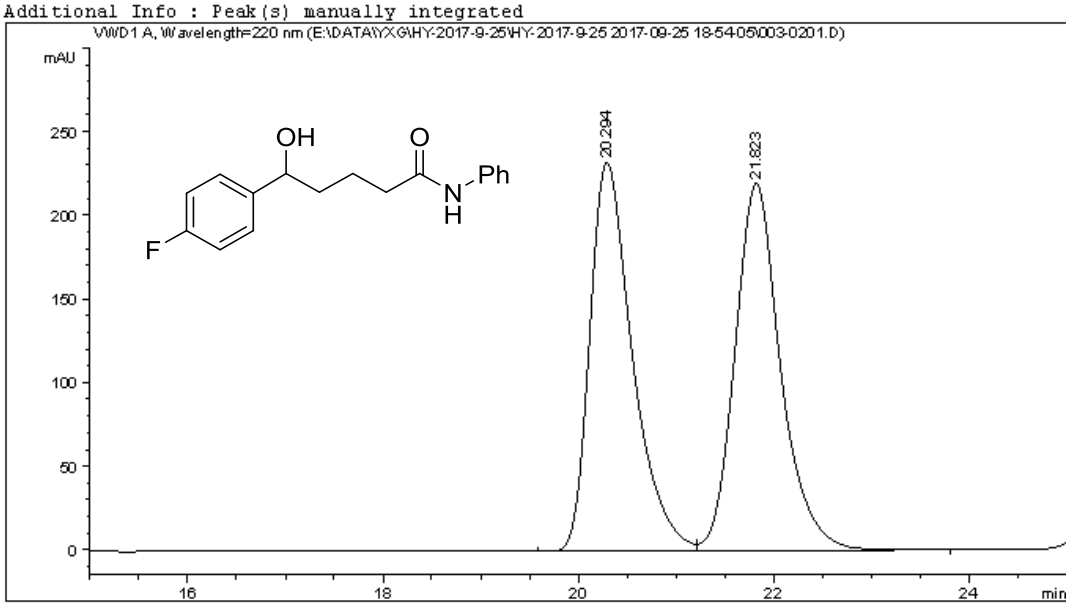
```
    ==================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260                           Location :   24
    Injection Date  : 3/21/2018 2:03:46 PM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\SC\ZHANG-HY-20180321-4-OMe\HY-20180321-4-OMe 2018-03-21 12-14-05\SC
                      -1-ASH-90-10-DAD--90MIN-1ML.M
    Last changed    : 3/21/2018 12:14:05 PM by SYSTEM
    Analysis Method : E:\DATA\SC\ZHANG-HY-20180321-4-OMe\HY-20180321-4-OMe 2018-03-21 12-14-05\SC
                      -1-ASH-90-10-DAD--90MIN-1ML.M (Sequence Method)
    Last changed    : 3/21/2018 3:34:48 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: DAD1 B, Sig=254,4 Ref=360,100

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  38.057 BB    1.8393 2.68096e4   180.97954 100.0000

    Totals :                  2.68096e4   180.97954

    ==================================================================
```

(*R*)-5-(4-fluorophenyl)-5-hydroxy-N-phenylpentanamide (2h)

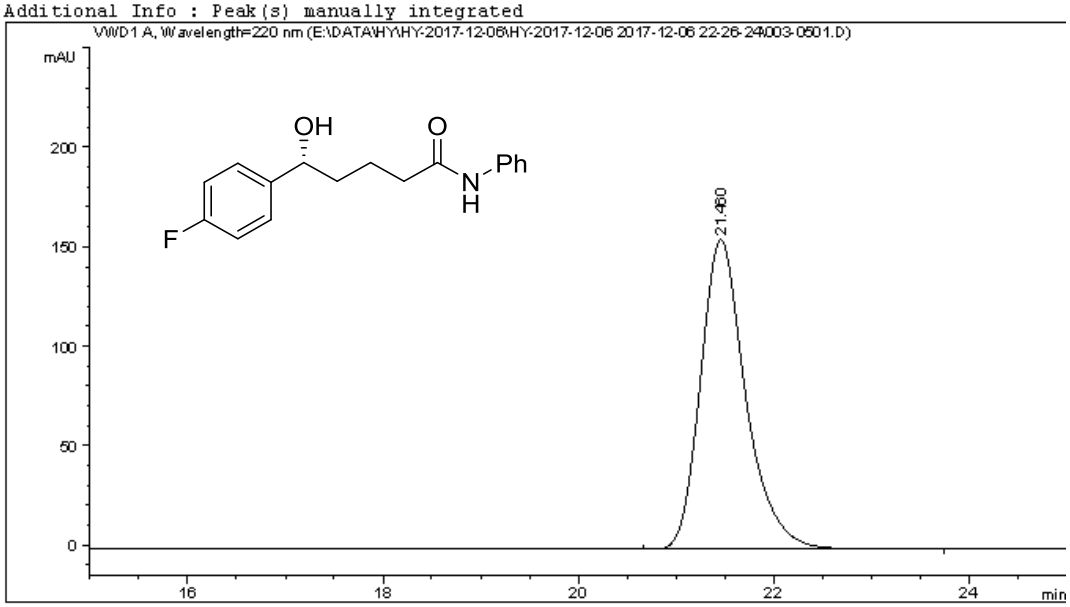
```
Data File E:\DATA\YXG\HY-2017-9-25\HY-2017-9-25 2017-09-25 18-54-05\003-0201.D
Sample Name: HY-2017-9-25-4-F-RAC-3

    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 3
    Injection Date  : 9/25/2017 7:05:33 PM                 Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YXG\HY-2017-9-25\HY-2017-9-25 2017-09-25 18-54-05\VWD-AD(1-6)-85
                      -15-0.5-1UL-220NM-60MIN.M
    Last changed    : 9/25/2017 7:51:08 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YXG\HY-2017-9-25\HY-2017-9-25 2017-09-25 18-54-05\VWD-AD(1-6)-85
                      -15-0.5-1UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:36:18 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  20.294 BV    0.4576 7041.72607  232.35959  49.6944
       2  21.823 VB    0.4910 7128.32568  219.42799  50.3056

    Totals :                  1.41701e4   451.78758

    ======================================================================

1260HPLC-VWD 3/4/2018 11:36:28 AM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\003-0501.D
Sample Name: HY-2017-12-06-4F-EE

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   5
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 3
    Injection Date  : 12/7/2017 12:20:22 AM                 Inj :   1
                                                     Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-0.5-1UL-220NM-40MIN.M
    Last changed    : 12/6/2017 10:26:25 PM by SYSTEM
    Analysis Method : E:\DATA\HY\HY-2017-12-06\HY-2017-12-06 2017-12-06 22-26-24\VWD-AD(1-2)-
                      85-15-0.5-1UL-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:33:34 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

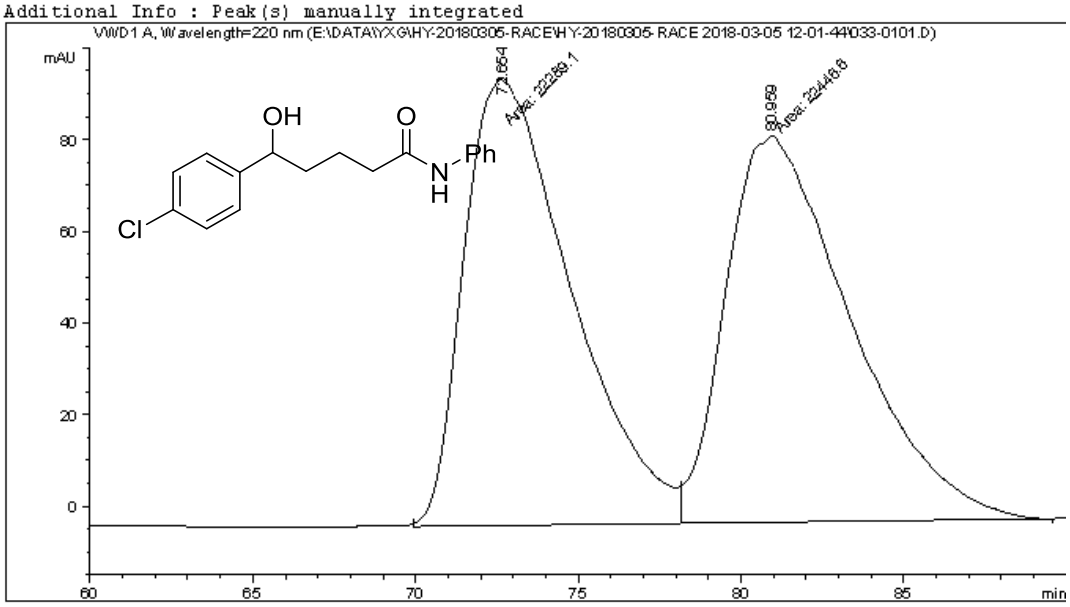



```
    ======================================================================
                            Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  21.460 BB    0.4851 5004.68115  155.67137 100.0000

    Totals :                  5004.68115  155.67137


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

(*R*)-5-(4-chlorophenyl)-5-hydroxy-N-phenylpentanamide (2i)

Data File E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\033-0101.D
Sample Name: HY-4-Cl-RACE

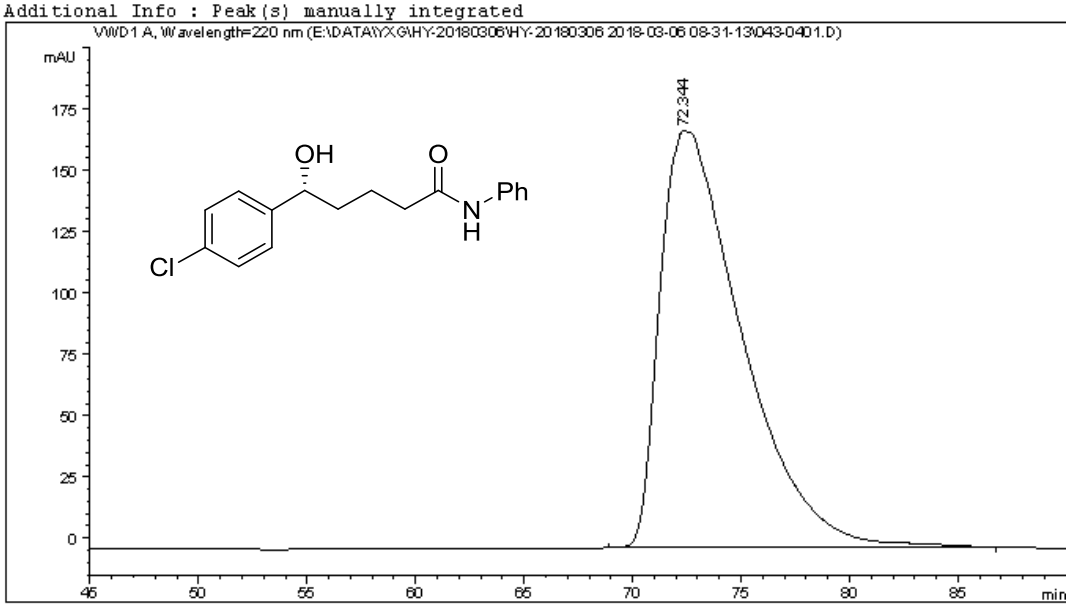
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   1
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 33
    Injection Date  : 3/5/2018 12:02:33 PM                 Inj :   1
                                                     Inj Volume : 6.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\DAD-AS
                      (1-6)-95-5-1ML-6UL-220NM-60MIN.M
    Last changed    : 3/5/2018 1:27:26 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YXG\HY-20180305-RACE\HY-20180305-RACE 2018-03-05 12-01-44\DAD-AS
                      (1-6)-95-5-1ML-6UL-220NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:02:11 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]       [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  72.654 MF    3.8065 2.22891e4    97.59178  49.8239
       2  80.959 FM    4.4414 2.24466e4    84.23253  50.1761

    Totals :                  4.47357e4   181.82431

    ======================================================================
```

Data File E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\043-0401.D
Sample Name: HY-4-Cl

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   4
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 43
    Injection Date  : 3/6/2018 10:04:32 AM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AS(1-6)-95-5
                      -1ML-5UL-220NM-100MIN.M
    Last changed    : 3/6/2018 8:31:13 AM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180306\HY-20180306 2018-03-06 08-31-13\VWD-AS(1-6)-95-5
                      -1ML-5UL-220NM-100MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:48:06 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

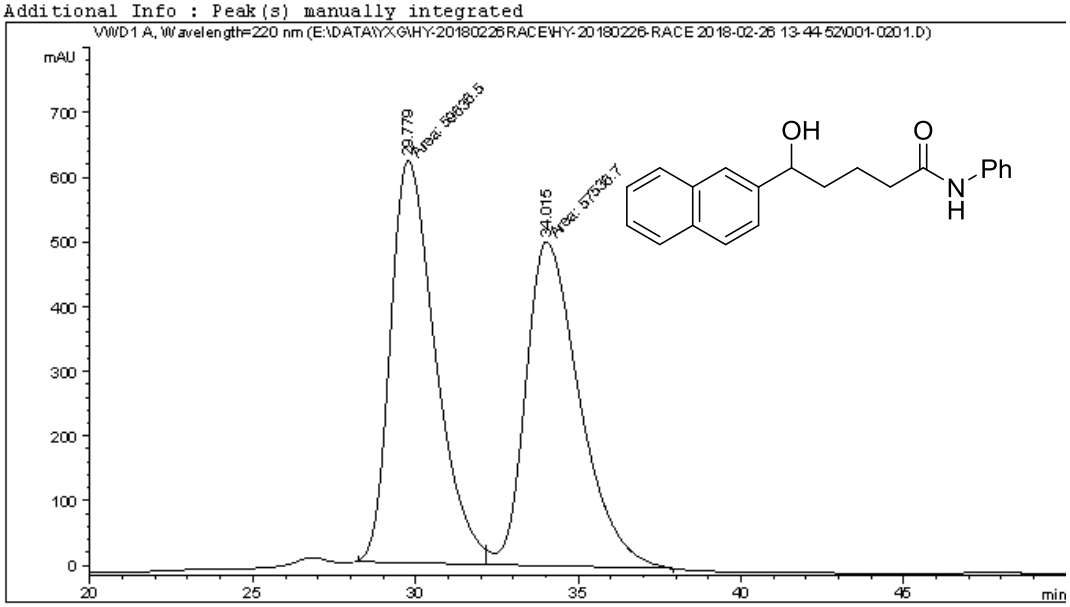



```
    ======================================================================
                            Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  72.344 BB    3.1905 4.47401e4   170.10446 100.0000

    Totals :                  4.47401e4   170.10446

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

(*R*)-5-hydroxy-5-(naphthalen-2-yl)-N-phenylpentanamide (2j)

Data File E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 13-44-52\001-0201.D
Sample Name: HY-NAI-RACE

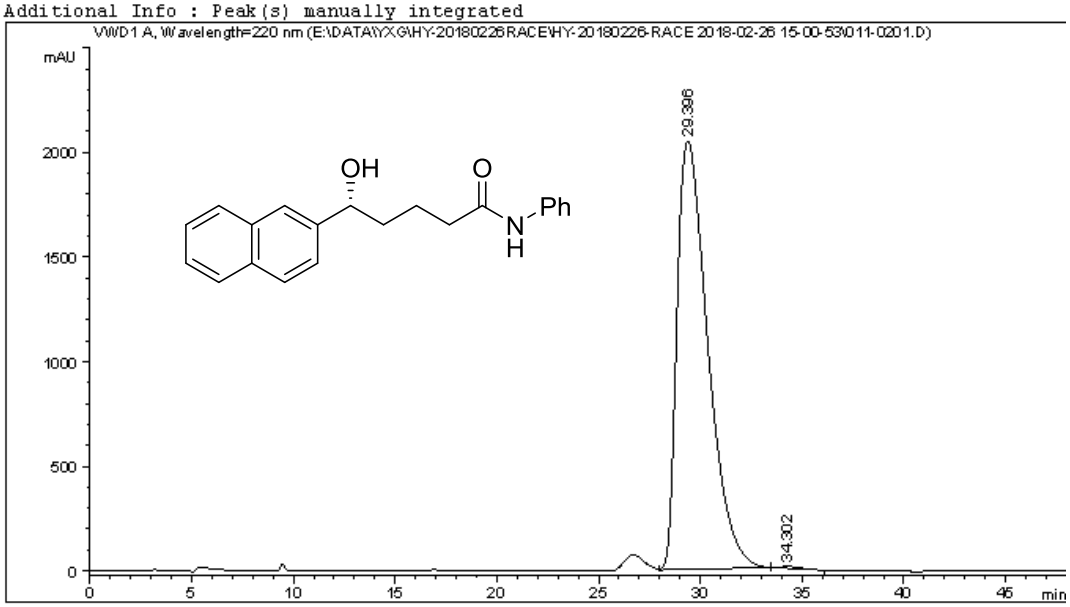
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 1
    Injection Date  : 2/26/2018 1:56:26 PM                 Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 13-44-52\VWD-AS(
                      1-6)-95-5-1.0ML-3UL-210NM-60MIN.M
    Last changed    : 2/26/2018 1:44:52 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 13-44-52\VWD-AS(
                      1-6)-95-5-1.0ML-3UL-210NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:14:33 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  29.779 MF    1.5989 5.96365e4   621.65820  50.8960
       2  34.015 FM    1.9140 5.75367e4   501.00873  49.1040

    Totals :                  1.17173e5  1122.66693


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

1260HPLC-VWD 3/8/2018 10:14:43 AM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 15-00-53\011-0201.D
Sample Name: HY-NAI

```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 11
    Injection Date  : 2/26/2018 4:03:18 PM                 Inj :   1
                                                     Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 15-00-53\VWD-AS(
                      1-6)-95-5-1.0ML-3UL-210NM-60MIN.M
    Last changed    : 2/26/2018 3:00:53 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-20180226RACE\HY-20180226-RACE 2018-02-26 15-00-53\VWD-AS(
                      1-6)-95-5-1.0ML-3UL-210NM-60MIN.M (Sequence Method)
    Last changed    : 3/4/2018 10:59:10 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

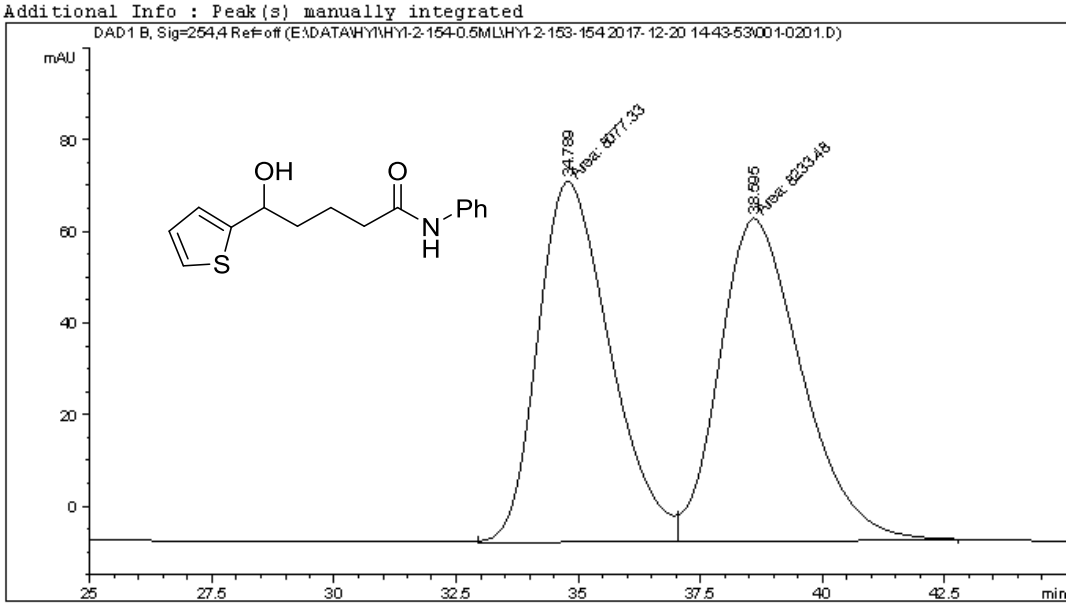



```
    ======================================================================
                            Area Percent Report
    ======================================================================

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


    Signal 1: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  29.396 VB    1.5956 2.15094e5  2049.17432  99.6990
       2  34.302 BB    1.1069  649.41217    8.38173   0.3010

    Totals :                  2.15743e5  2057.55604


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

(*R*)-5-hydroxy-N-phenyl-5-(thiophen-2-yl)pentanamide (2k)

Data File E:\DATA\HYI\HYI-2-154-0.5ML\HYI-2-153-154 2017-12-20 14-43-53\001-0201.D
Sample Name: HY-SAIFEN-RAC

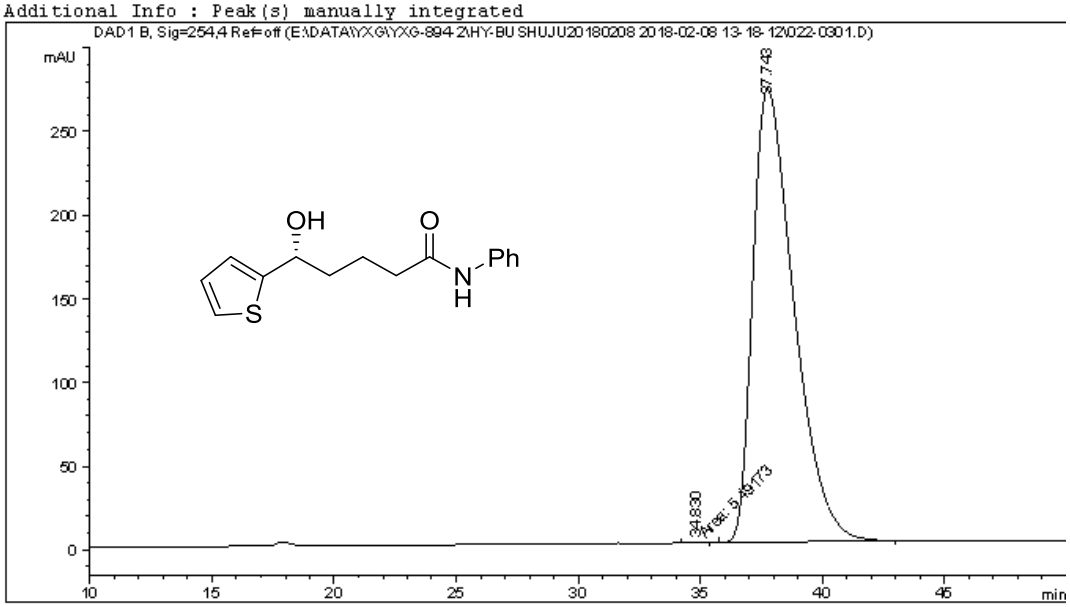
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                     Location : Vial 1
    Injection Date  : 12/20/2017 2:56:55 PM                 Inj :   1
                                                    Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\HYI\HYI-2-154-0.5ML\HYI-2-153-154 2017-12-20 14-43-53\DAD-OD(1-2
                      )-90-10-1ML-1UL-ALL-1H.M
    Last changed    : 12/20/2017 3:36:51 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\HYI\HYI-2-154-0.5ML\HYI-2-153-154 2017-12-20 14-43-53\DAD-OD(1-2
                      )-90-10-1ML-1UL-ALL-1H.M (Sequence Method)
    Last changed    : 3/8/2018 10:18:08 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 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  34.789 MF    1.7133 8077.33350   78.57515  49.5213
       2  38.595 FM    1.9492 8233.48340   70.40156  50.4787

    Totals :                  1.63108e4   148.97671

    ======================================================================
```

Data File E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\022-0301.D
Sample Name: HY-saifen

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260HPLC-DAD                  Location : Vial 22
    Injection Date  : 2/8/2018 2:51:07 PM               Inj :   1
                                                   Inj Volume : 3.000 µl
    Acq. Method     : E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\DAD-0D(1-2)
                      -90-10--1ML-210-230NM-60MIN.M
    Last changed    : 2/8/2018 1:18:12 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\DAD-0D(1-2)
                      -90-10--1ML-210-230NM-60MIN.M (Sequence Method)
    Last changed    : 3/4/2018 12:37:40 PM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

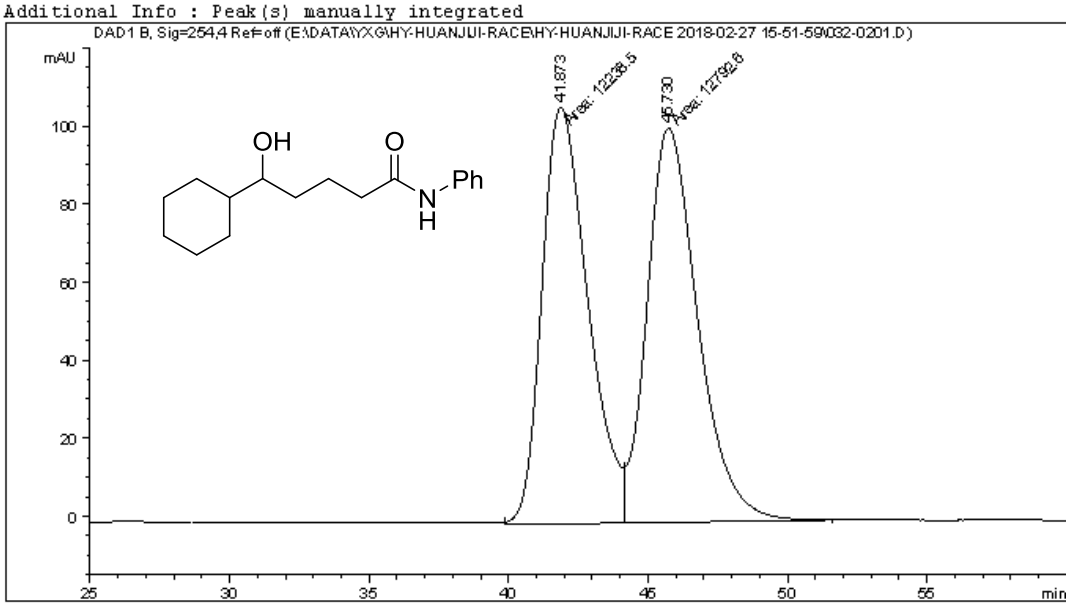



```
    ======================================================================
                            Area Percent Report
    ======================================================================

    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  34.830 MM    0.5646    5.49173 1.62112e-1   0.0173
       2  37.743 BB    1.7114 3.17273e4   270.70624  99.9827

    Totals :                  3.17328e4   270.86835


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

(*R*)-5-cyclohexyl-5-hydroxy-N-phenylpentanamide (2l)

Data File E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\032-0201.D
Sample Name: HY-HUANJIJI-RACE

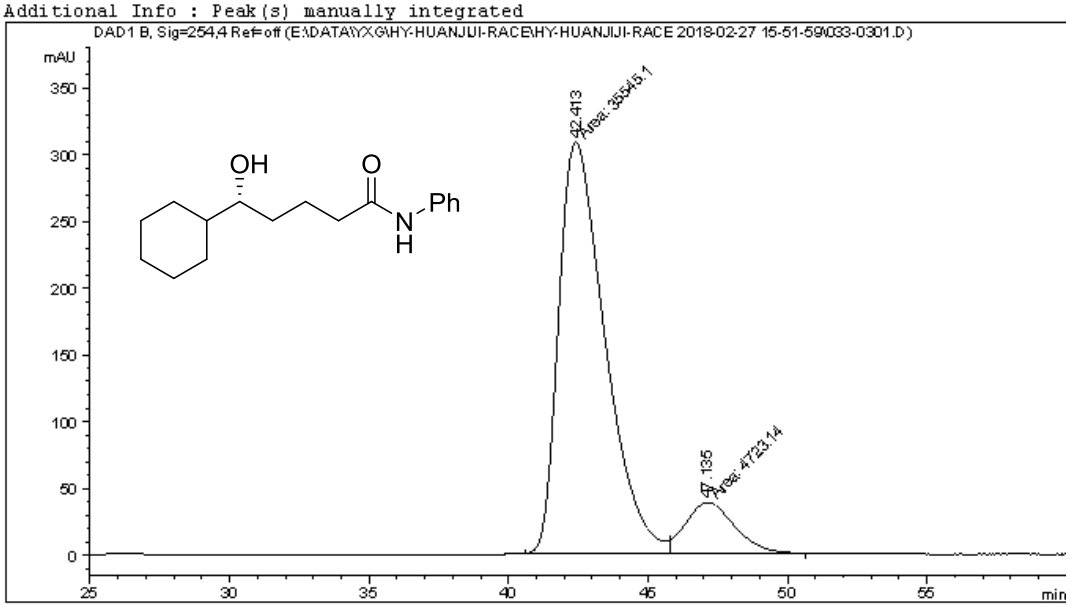
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-DAD                     Location : Vial 32
    Injection Date  : 2/27/2018 4:04:00 PM                  Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\DAD-0D
                      (1-2)-95-5-0.7ML-210-230NM-60MIN.M
    Last changed    : 2/27/2018 4:56:09 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\DAD-0D
                      (1-2)-95-5-0.7ML-210-230NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:23:23 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 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  41.873 MF    1.9117 1.22385e4   106.70069  48.8931
       2  45.730 FM    2.1120 1.27926e4   100.95264  51.1069

    Totals :                  2.50312e4   207.65333

    ======================================================================
```

Data File E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\033-0301.D
Sample Name: HY-HUANJIJI

```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260HPLC-DAD                   Location : Vial 33
    Injection Date  : 2/27/2018 5:04:56 PM               Inj :   1
                                                   Inj Volume : 5.000 µl
    Acq. Method     : E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\DAD-0D
                      (1-2)-95-5-0.7ML-210-230NM-60MIN.M
    Last changed    : 2/27/2018 4:56:09 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\HY-HUANJIJI-RACE\HY-HUANJIJI-RACE 2018-02-27 15-51-59\DAD-0D
                      (1-2)-95-5-0.7ML-210-230NM-60MIN.M (Sequence Method)
    Last changed    : 3/8/2018 10:26:20 AM by SYSTEM
                      (modified after loading)
    Additional Info : Peak(s) manually integrated
```

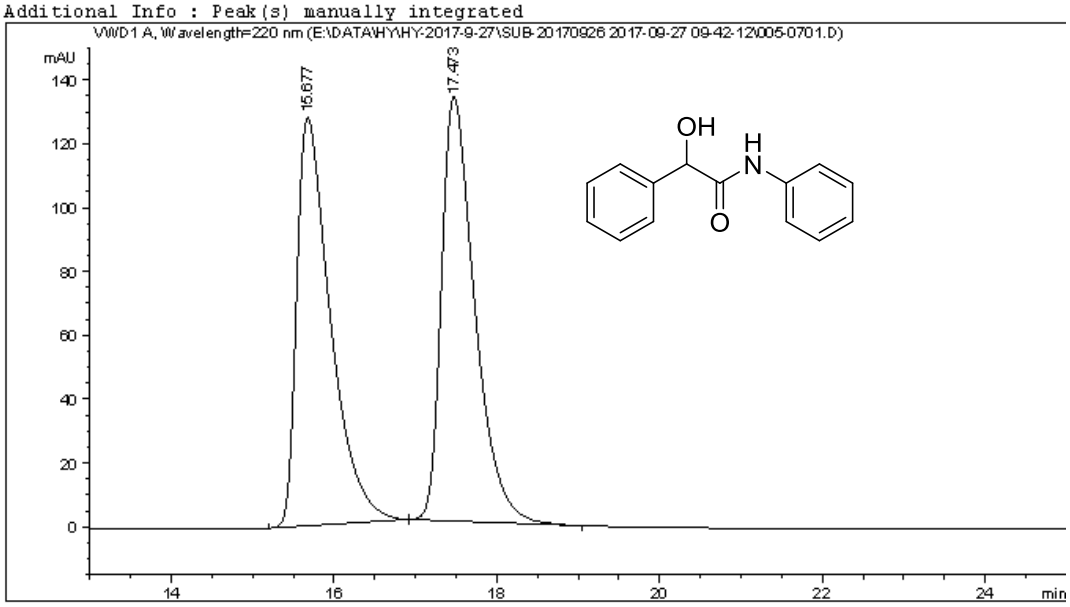



```
    ======================================================================
                              Area Percent Report
    ======================================================================

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


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

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  42.413 MF    1.9221 3.55451e4   308.21945  88.2708
       2  47.135 FM    2.0490 4723.13672   38.41894  11.7292

    Totals :                  4.02683e4   346.63839


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

(*S*)-2-hydroxy-N,2-diphenylacetamide (2m)

Data File E:\DATA\HY\HY-2017-9-27\SUB-20170926 2017-09-27 09-42-12\005-0701.D
Sample Name: HY-AERFA-RAC

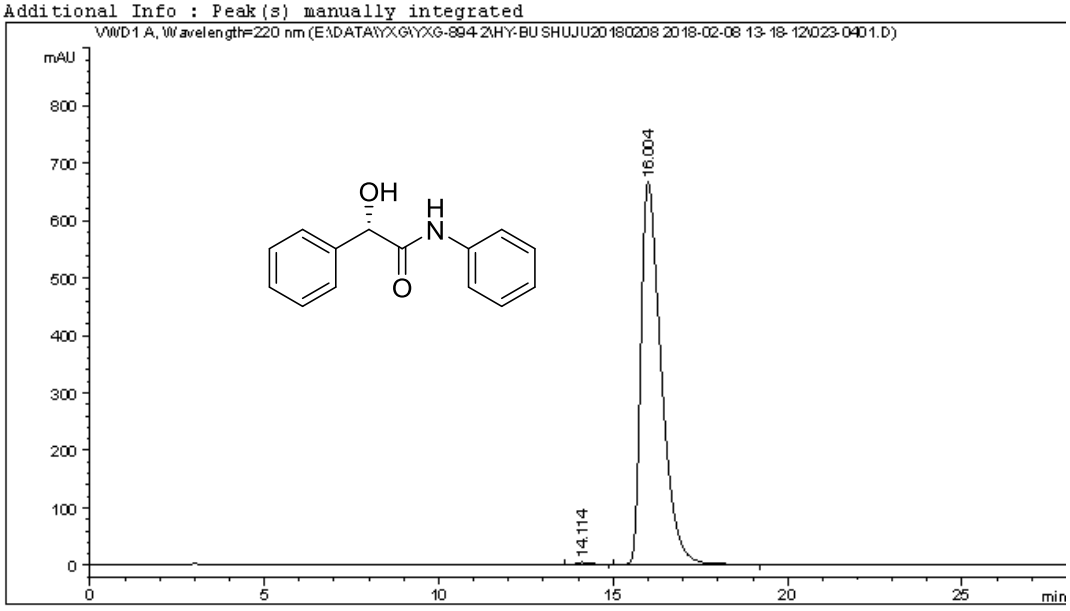
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   7
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 5
    Injection Date  : 9/27/2017 12:50:58 PM                Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\HY\HY-2017-9-27\SUB-20170926 2017-09-27 09-42-12\VWD-0J(1-6)-85-
                      15-1ML-1UL-220NM-40MIN.M
    Last changed    : 9/27/2017 1:23:09 PM by SYSTEM
                      (modified after loading)
    Analysis Method : E:\DATA\HY\HY-2017-9-27\SUB-20170926 2017-09-27 09-42-12\VWD-0J(1-6)-85-
                      15-1ML-1UL-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:41:04 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  15.677 BB    0.4301 3683.54932  127.85548  49.4296
       2  17.473 BB    0.4279 3768.55908  132.85428  50.5704

    Totals :                  7452.10840  260.70976

    ======================================================================
```

Data File E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\023-0401.D
Sample Name: HY-a-chanwu

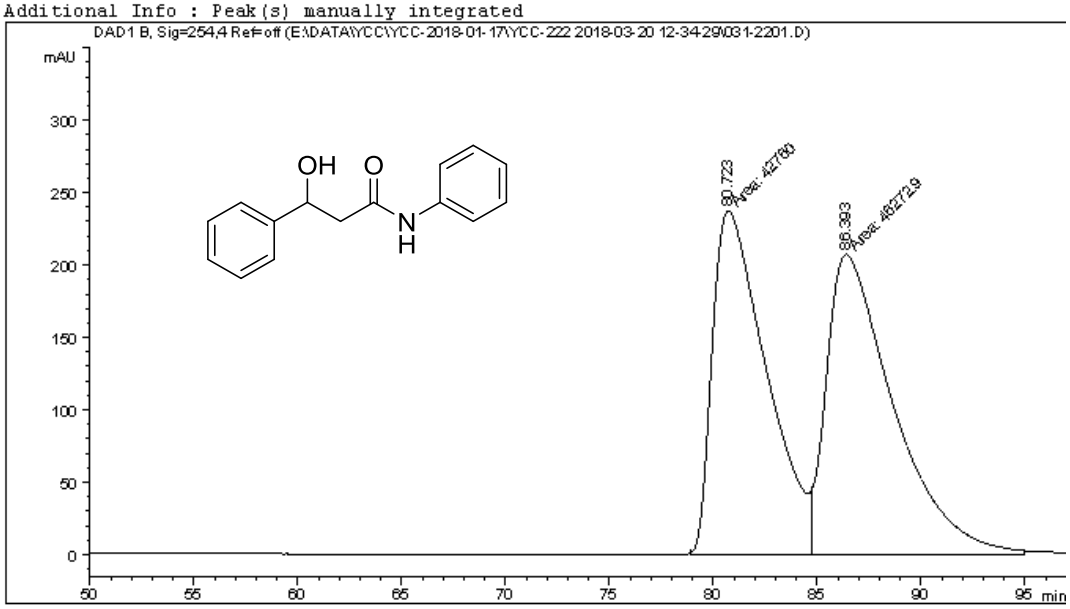
```
    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   4
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 23
    Injection Date  : 2/8/2018 3:52:08 PM                   Inj :   1
                                                    Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\VWD-0J(1-6)
                      -85-15-1ML-1UL-220NM-40MIN.M
    Last changed    : 2/8/2018 1:18:12 PM by SYSTEM
    Analysis Method : E:\DATA\YXG\YXG-894-2\HY-BUSHUJU20180208 2018-02-08 13-18-12\VWD-0J(1-6)
                      -85-15-1ML-1UL-220NM-40MIN.M  (Sequence Method)
    Last changed    : 3/4/2018 12:55:04 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=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]       [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  14.114 BB    0.4061  123.46416    4.26015   0.4575
       2  16.004 BB    0.6175 2.68627e4   664.73956  99.5425

    Totals :                  2.6986le4   668.99971


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

(*R*)-3-hydroxy-N,3-diphenylpropanamide (2n)

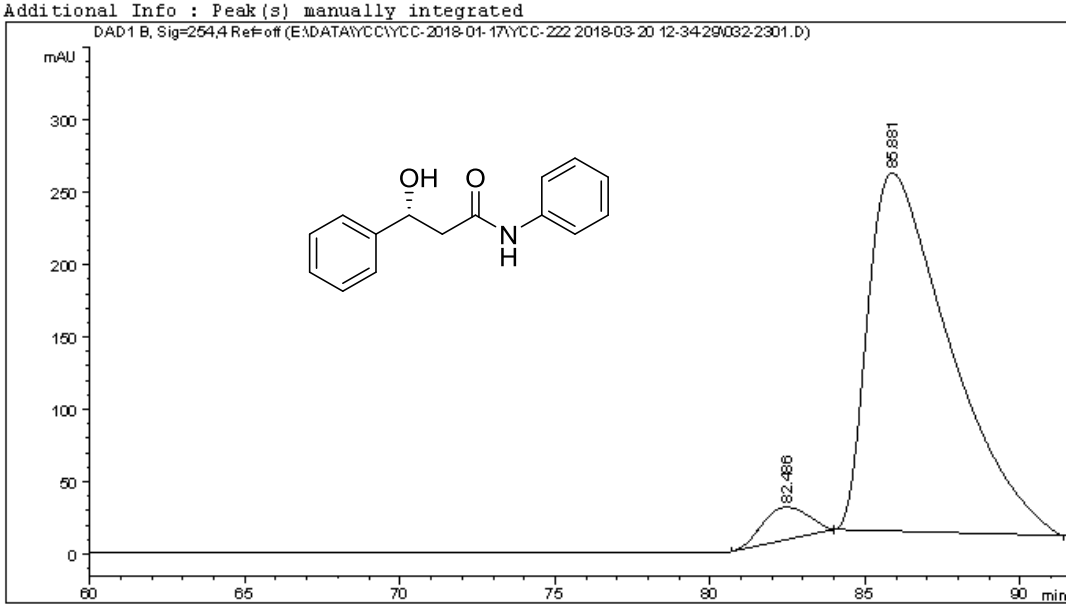
```
Data File E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\031-2201.D
Sample Name: BEITA-RAC

    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :  22
    Acq. Instrument : 1260HPLC-DAD                     Location : Vial 31
    Injection Date  : 3/20/2018 10:03:42 PM               Inj :   1
                                                   Inj Volume : 10.000 µl
    Acq. Method     : E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\DAD-0D(1-2)-95-5-
                      0.5ML-10UL-100MIN.M
    Last changed    : 3/20/2018 8:14:42 PM by SYSTEM
    Analysis Method : E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\DAD-0D(1-2)-95-5-
                      0.5ML-10UL-100MIN.M (Sequence Method)
    Last changed    : 3/21/2018 3:47:55 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: DAD1 B, Sig=254,4 Ref=off

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  80.723 MF    3.0053 4.27600e4   237.13538  48.0272
       2  86.393 FM    3.7267 4.62729e4   206.94102  51.9728

    Totals :                  8.90329e4   444.07640


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

1260HPLC-DAD 3/21/2018 3:48:15 PM SYSTEM                       Page 1 of 1
```

Data File E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\032-2301.D
Sample Name: BEITA-EE

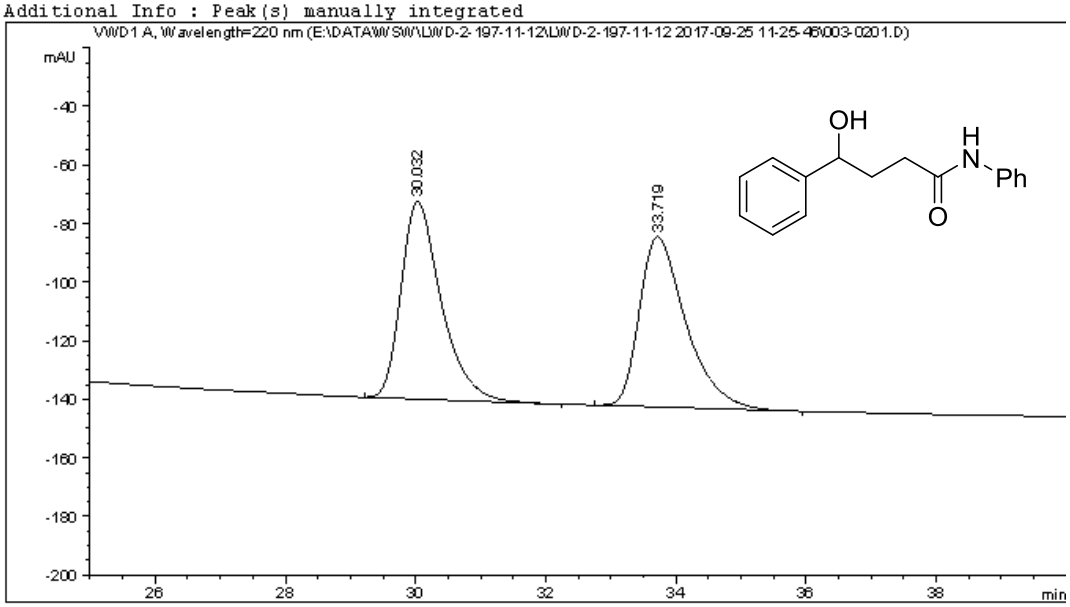
```
    ======================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :  23
    Acq. Instrument : 1260HPLC-DAD                   Location : Vial 32
    Injection Date  : 3/20/2018 11:44:43 PM               Inj :  1
                                                  Inj Volume : 10.000 µl
    Acq. Method     : E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\DAD-0D(1-2)-95-5-
                      0.5ML-10UL-100MIN.M
    Last changed    : 3/20/2018 8:14:42 PM by SYSTEM
    Analysis Method : E:\DATA\YCC\YCC-2018-01-17\YCC-222 2018-03-20 12-34-29\DAD-0D(1-2)-95-5-
                      0.5ML-10UL-100MIN.M (Sequence Method)
    Last changed    : 3/21/2018 3:52:24 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  82.486 BB    1.2306 2323.46973   22.28021   4.8588
       2  85.881 BB    2.4519 4.54960e4   247.58150  95.1412

    Totals :                  4.78194e4   269.86171


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

(*R*)-4-hydroxy-N,4-diphenylbutanamide (2o)

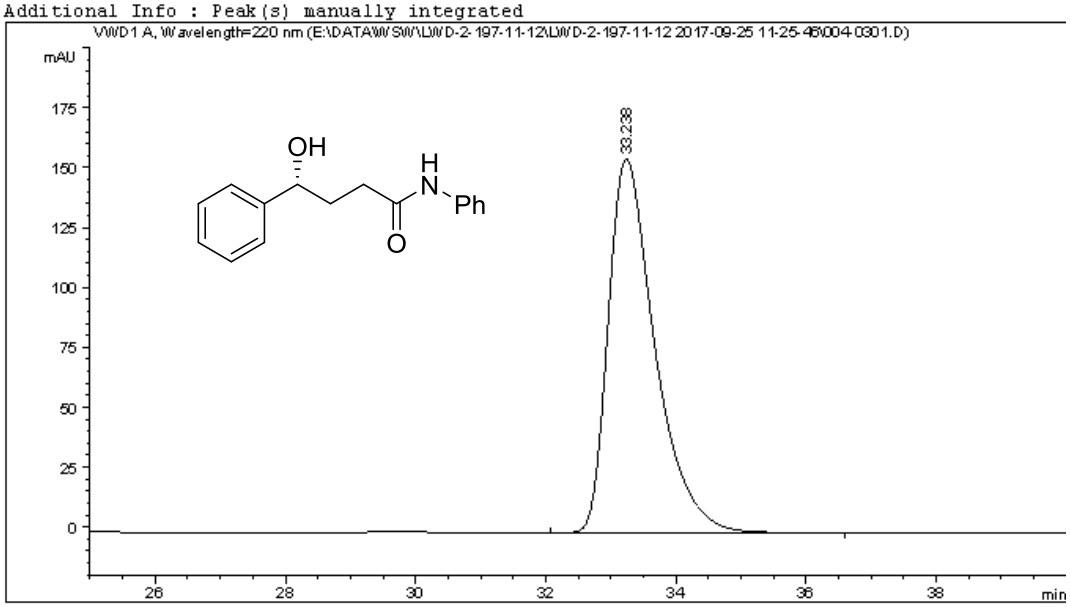
```
Data File E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\003-0201.D
Sample Name: HY-2017-9-25-JIAMA-RAC

    ======================================================================
    Acq. Operator   : SYSTEM                          Seq. Line :   2
    Acq. Instrument : 1260HPLC-VWD                     Location : Vial 3
    Injection Date  : 9/25/2017 11:44:15 AM                Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\VWD-AD(1
                      -6)-90-10-0.5-220NM-40MIN.M
    Last changed    : 9/25/2017 11:25:46 AM by SYSTEM
    Analysis Method : E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\VWD-AD(1
                      -6)-90-10-0.5-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:48:26 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|-------|----|-------|----------|----------|--------|
       1  30.032 BB    0.6439 2893.94897   67.54469  50.1456
       2  33.719 BBA   0.7499 2877.14575   58.08632  49.8544

    Totals :                  5771.09473  125.63101


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

1260HPLC-VWD 3/4/2018 11:48:56 AM SYSTEM                    Page 1 of 1
```

Data File E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\004-0301.D
Sample Name: HY-2017-9-25-JIAMA-EE

```
    ====================================================================
    Acq. Operator   : SYSTEM                        Seq. Line :   3
    Acq. Instrument : 1260HPLC-VWD                   Location : Vial 4
    Injection Date  : 9/25/2017 12:24:58 PM              Inj :   1
                                                   Inj Volume : 1.000 µl
    Acq. Method     : E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\VWD-AD(1
                      -6)-90-10-0.5-220NM-40MIN.M
    Last changed    : 9/25/2017 11:25:46 AM by SYSTEM
    Analysis Method : E:\DATA\WSW\LWD-2-197-11-12\LWD-2-197-11-12 2017-09-25 11-25-46\VWD-AD(1
                      -6)-90-10-0.5-220NM-40MIN.M (Sequence Method)
    Last changed    : 3/4/2018 11:51:19 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: VWD1 A, Wavelength=220 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]        %
    ----|-------|----|-------|----------|----------|--------|
       1  33.238 BB    0.7485 7760.06836  155.95757 100.0000

    Totals :                  7760.06836  155.95757


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

7. References

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