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Supporting Information

Highly Enantioselective Synthesis of ß-Amino Acid Derivatives by the Lewis Base Catalyzed Hydrosilylation of ß-Enamino Esters

Hong-Jie Zheng, [a, b] Wen-Bing Chen, [a, b] Zhi-Jun Wu, [c] Jin-Gen Deng, [a] Wen-Qing Lin, [a] Wei-Cheng Yuan, [a] and Xiao-Mei Zhang*[a]

[a] *Key Laboratory for Asymmetric Synthesis and Chiraltechnology of Sichuan Province*

Chengdu Institute of Chemistry, Chinese Academy of Sciences, Chengdu 610041, China.

Fax: +86-028-85229250; Tel: +86-028-85257883

E-mail: xmzhang@cioc.ac.cn.

[b] *Graduate School of Chinese Academy of Sciences, Beijing, 100049,China.*

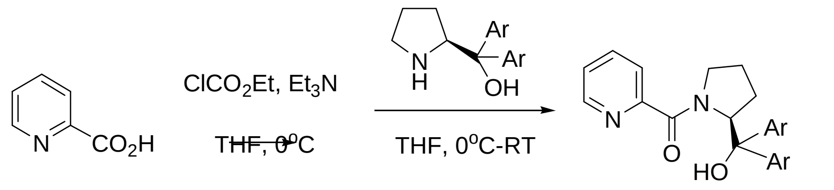
[c] *Chengdu Institute of Biology, Chinese Academy of Sciences, Chengdu, 610041, China.*

? .General Information.

All starting materials were of the highest commercially available grade and used without further purification. All solvents used in the reactions were distilled from appropriate drying agents prior to use. Reactions were monitored by thin layer chromatography using silica gel HSGF254 plates. Flash chromatography (FC) was performed using silica gel HG/T2354-92. ^{1}H and ^{13}C NMR (300 and 75 MHz, respectively) spectra were recorded in $CDCl_3$. ^{1}H NMR chemical shifts are reported in ppm (**d**) relative to tetramethylsilane (TMS) with the solvent resonance employed as the internal standard ($CDCl_3$, d = 7.26 ppm). Data are reported as follows: chemical shift, multiplicity (s = singlet, brs = broad singlet, d = doublet, t = triplet, q = quartet, m = multiplet), coupling constants (Hz) and integration. ^{13}C NMR chemical shifts are reported in ppm from tetramethylsilane (TMS) with the solvent resonance as the internal standard ($CDCl_3$, **d =** 77.0 ppm). ESI HRMS spectra were recorded on BioTOF Q. HPLC analysis was performed on Waters-Breeze (2487 Dual ? Absorbance Detector and 1525 Binary HPLC Pump). Chiralpak AD, OD and OJ columns were purchased from Daicel Chemical Industries (Hong Kong, China). Optical rotations were measured on a Perkin-Elmer 341 Polarimeter at ? = 589 nm (c g/100ml). All enantiomer ratios have been controlled by coinjections of the pure sample with the racemic substrates.

? . synthesis of catalysts

Synthesis of catalysts 2a, 2b and 2c.



2a: Ar = Ph
2b: Ar = *p*MeC_6H_4
2c: Ar = 3, 5-$Me_2C_6H_3$

A solution of ethyl chloroformate (0.1 mL, 1 mmol) in dry THF (2 mL) was dropped in a solution of 2-picolinic acid (123 mg, 1 mmol) and triethylamine (0.15 mL, 1 mmol) in dry THF (25 mL) at 0? within 15 min. The resulting mixture was stirred for 1h before 1 mmol of chiral aminoalcohol in dry THF (10 mL) was added dropwisely. The mixture was stirred at 0? for 1h and then at room temperture for overnight. The mixture was quenched with water. The aqueous layer was extracted with ethyl acetate (3×15 mL) and the combined organic layer was dried over $MgSO_4$ for 2h, filtered and concentrated under reduced pressure. The resulting residue was subject to flash chrogromatography (eluant: ethyl acetate/petroleum ether = 1/2 to 1/1) to give the pure catalysts.

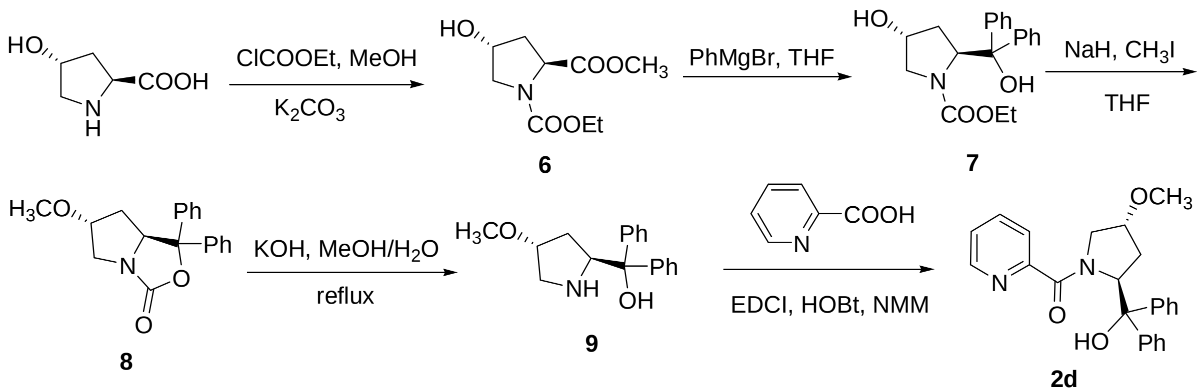
(*S*)-(2-(hydroxydiphenylmethyl)pyrrolidin-1-yl)(pyridin-2-yl)methanone (2a)[1]**:** White solid, prepared from *(S)*- diphenyl(pyrrolidin-2-yl)methanol and 2-picolinic acid, yield 73%. ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.56 and 8.26 (2×br s, 1H), 7.71-7.77 (m, 1H), 7.15-7.52 (m, 12H), 6.69 (s, 1H), 5.42-5.50 (m, 1H), 3.19-3.97 (m, 2H), 2.03-2.14 (m, 2H), 1.50-1.82 (m, 1H), 0.75-1.25 (m, 1H).

(*S*)-(2-(hydroxydip-tolylmethyl)pyrrolidin-1-yl)(pyridin-2-yl)methanone (2b): Prepared from *(S)*- pyrrolidin-2-yl-di-p-tolylmethanol and 2-picolinic acid, yield 76%. White solid , mp =

164.0-165.5 ., $[a]_D^{20}$ = -119.2 (c = 0.2, $CHCl_3$). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.56 and 8.27 (2×br s, 1H), 7.70-7.75 (m, 1H), 7.60 (br, 1H), 7.11-7.52 (m, 9H), 6.48 (s, 1H), 5.57 and 5.42 (2×br s, 1H), 3.54 and 3.96 (2×br s, 1H), 3.17 and 3.31(2×br s, 1H), 2.34 (s, 3H), 2.32 (s, 3H), 2.13 (br s, 1H), 1.97-2.01 (m, 1H), 1.57 (br s, 1H), 1.21 and 0.95 (m, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 20.9, 21.0, 23.9, 29.3, 48.2, 50.6, 64.9, 67.2, 81.8, 123.3, 124.7, 125.5, 127.1, 127.5, 127.9, 128.2, 128.5, 136.6, 137.3, 140.4, 143.2, 145.8, 148.4, 154.2, 169.9. ESI-HRMS exact mass calcd. for $(C_{25}H_{26}N_2O_2 + Na)^+$ requires m/z 409.1886, found m/z 409.1892.

(*S*)-(2-(bis(3,5-dimethylphenyl)(hydroxy)methyl)pyrrolidin-1-yl)(pyridin-2-yl)methanone (2c): Prepared from *(S)*-bis(3,5-dimethylphenyl)(pyrrolidin-2-yl)methanol and 2-picolinic acid, yield 75%. White solid, mp = 182.0-183.5 ., $[a]_D^{20}$ = -83.2 (c = 0.2, $CHCl_3$). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.56 and 8.30 (2×br s, 1H), 7.49-7.72 (br, 2H), 7.25-7.29 (m, 1H), 6.70-7.26 (m, 7H), 5.41-5.57 (br, 1H), 2.80-3.98 (m, 2H), 2.0-2.3 (m, 14H), 1.58 (br s, 1H), 1.0-1.21 (m, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.1, 21.4, 21.7, 23.9, 29.2, 48.1, 50.6, 64.9, 66.9, 82.2, 123.1, 124.5, 125.4, 125.9, 128.6, 136.7, 137.0, 1423.0, 145.7, 148.5, 154.2, 169.8. ESI-HRMS exact mass calcd. for $(C_{27}H_{30}N_2O_2 + Na)^+$ requires m/z 437.2199, found m/z 437.2200.

Synthesis of catalysts 2d[2]



Synthesis of (2*S*,4*R*)-1-ethyl 2-methyl 4-hydroxypyrrolidine-1,2-dicarboxylate (**6**)

(2*S*,4*R*)-4-hydroxyproline (13.1 g, 0.1 mol), K_2CO_3 (27.5 g, 0.2 mol) and 150 mL of methanol were added into a two necked flask. The mixture was cooled to 0? . Then ethyl chlorofomate (29 mL, 0.3 mol) was added dropwise to the mixture. After the addition, the ice bath was removed and the mixture was allowed to stirred at RT for 48h. The solvent was removed at reduced pressure, the residue was dissolved in water and extracted with DCM (3×25 mL). The combined organic layer was dried over Na_2SO_4. The *N*,*O*-protected product **6** was obtained in 98% yield as a silghtly yellow oil. ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 4.42-4.47 (m, 2H), 4.07-4.14 (m, 2H), 3.70-3.74 (m, 3H), 3.40-3.60 (m, 2H), 3.90 (brs, 1H), 2.20-2.38 (m, 1H), 2.02-2.08 (m, 1H), 1.14-1.28 (m, 3H).

Synthesis of (2*S*,4*R*)-ethyl 4-hydroxy-2-(hydroxydiphenylmethyl)pyrrolidine-1-carboxylate (**7**)

To a solution of PhMgBr (100 mmol) in THF was added **6** (4.34 g, 20 mmol) in 10 mL of THF dropwisely at 0? for 1h. The mixture was stirred at RT for 8h and quenced with saturated NH_4Cl. The organic phase was separated and dried over anhydrous Na_2SO_4. Removal of the solvent gave a yellow solid. Recrystallization from EtOAc afforded **7** as a white solid (2.4 g, 37%).^{1}H NMR (300 MHz,

$CDCl_3$, TMS) d = 7.27-7.42 (m, 10H), 5.05-5.10 (m, 1H), 3.87-4.07 (m, 3H), 3.50-3.54(m, 1H), 2.96-2.99(m, 1H), 2.02-2.16(m, 3H), 1.12(t, *J*=7.0, 3H).

Synthesis of (6*R*,7*aS*)-6-methoxy-1,1-diphenyl-tetrahydropyrrolo[1,2-c]oxazol-3(1H)-one (**8**)

A solution of **7** (341 mg, 1 mmol) and CH_3I (0.5 mL, 8 mmol) in THF was cooled to 0? , then NaH (53 mg, 1.3 mmol) was added. After being stirred for 6h, the reaction solution was quenced with saturated NH_4Cl. The organic phase was separated, and the aqueous was extracted with DCM (3×20 mL). The organic phase was combined and dried over anhydrous Na_2SO_4 and filitered. The filtrate was concentrated under reduced pressure to give a residue, which was chromatographed on silica gel (1/5 to 1/1 of EtOAc/ hexane as eluent) to give the product **8** as a white solid (260 mg, 84%). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.64-7.65 (m, 2H), 7.56-7.62 (m, 2H), 7.29-7.36 (m, 4H), 7.20-7.24 (m, 2H), 4.56 (dd, *J* = 6.6Hz, *J* = 9.8 Hz, 1H), 3.83 (br s, 1H), 3.26 (s, 3H), 3.02-3.10 (m, 2H), 1.74-1.79 (m, 1H), 1.60-1.67 (m, 1H).

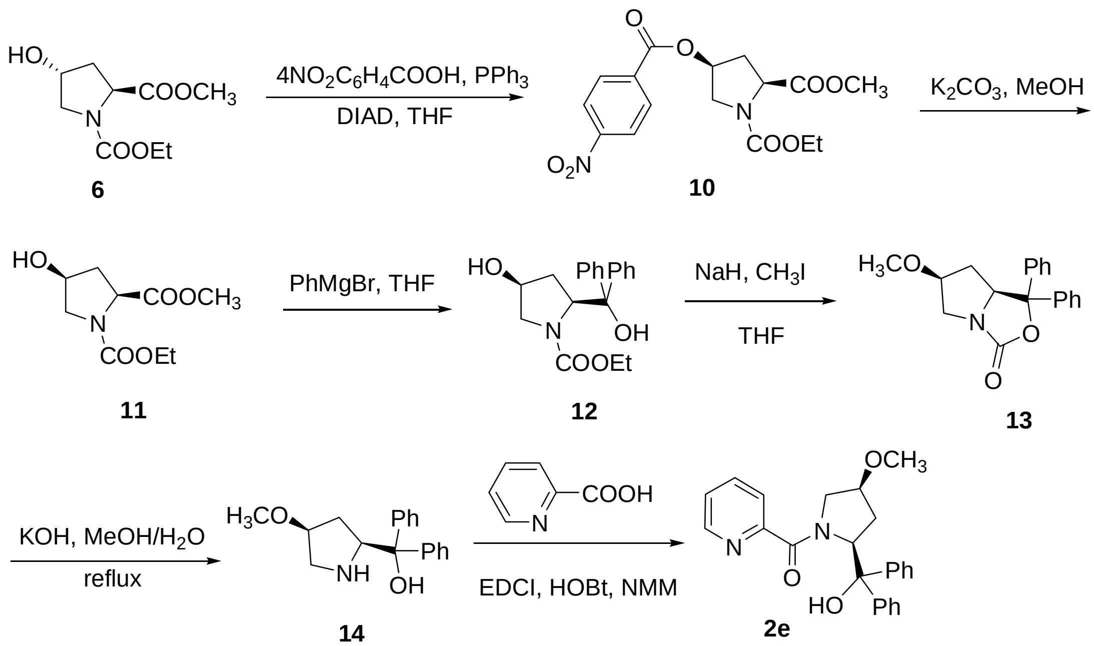
Synthesis of ((2*S*,4*R*)-4-methoxypyrrolidin-2-yl)diphenylmethanol (**9**)

8 (260 mg, 0.84 mmol) and KOH (188 mg, 3.36 mmol) was dissolved in 10 mL of MeOH and 5 mL of H_2O. The mixture was refluxed for 24h. The solvent was removed in vacuo and the residue was extracted with DCM (3×15 mL). The combined organic phase was dried over anhydrous Na_2SO_4 and filtered. The filtrate was concentrated under reduced pressure to give **9** (220 mg, 96%), which was used without further purification.

Synthesis of ((2*S*,4*R*)-2-(hydroxydiphenylmethyl)-4-methoxypyrrolidin-1-yl)(pyridin-2-yl) methanone (**2d**)

To a solution of **9** (174 mg, 0.6 mmol) and 2-picolinic acid (74mg, 0.6mmol) in DCM (20 mL) was added HOBt (175 mg, 1.2 mmol), NMM (1 mL) and EDCI (230 mg, 1.2 mmol) at 0.. After being stirred at room temperature for 12h. The reaction solution was washed with aqueous HCl (1.0N, 10 mL), $NaHCO_3$ (2N, 10 mL) and brine (10 mL). The organic phase was dried over anhydrous Na_2SO_4 and filtered. The filtrate was concentrated under reduced pressure to give the residue, which was purified through chromatography on silica gel (eluent: hexane/EtOAc = 5/1 to 1/1) to give **2d** (180 mg, 75%) as a white solid. Mp = 200.3-203.0 ., $[a]_D^{20}$ = -54.0 (c = 0.2 in $CHCl_3$). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.30-8.54 (m, 1H), 7.70-7.74 (m, 1H), 7.59-7.62 (m, 1H), 7.25-7.56 (m, 12H), 6.42 (br s, 1H), 5.56-5.89 (br, 1H), 3.73-3.76 (m, 1H), 3.19-3.45 (m, 2H), 3.10 (s, 3H), 2.18-2.48 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 35.4, 53.4, 53.8, 55.5, 56.2, 66.1, 77.2, 78.6, 81.8, 123.9, 124.8, 126.1, 126.3, 127.3, 127.4, 127.7, 127.8, 127.9, 128.6, 136.8, 143.1, 145.6, 148.1, 153.6. ESI-HRMS exact mass calcd. for $(C_{24}H_{24}N_2O_3 + Na)^+$ requires m/z 411.1679, found m/z 411.1689.

Synthesis of catalyst 2e



Synthesis of (2*S*,4*R*)-1-ethyl 2-methyl 4-(4-nitrobenzoyloxy)pyrrolidine-1,2- dicarboxylate (**10**)

4-Nitrobenzoic acid (1.2 g, 7 mmol), triphenylphosphine (1.84 g, 7 mmol) and **6** (1.1 g, 5 mmol) were dissolved in 25 mL of anhydrous THF. The solution was cooled to 0.. Then a solution of DIAD (1.42 g, 7 mmol) in 5 mL of THF was added dropwise. After the addition, the mixture was stirred at 0. for 12h. Then the reaction was quenced with aqueous NH_4Cl and extracted with DCM(3×15mL). The organic phase was combined and washed with NaOH (1N), H_2O, brine repectively, then dried over Na_2SO_4. The solvent was removed in vacuo. The residue was purified by recrystallization from EtOH to afford **10** as a yellow solid in 76% yield. ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.27-8.30 (m, 2H), 8.13-8.16 (m, 2H), 5.60 (br s, 1H), 4.55-4.67 (m, 1H), 4.13-4.22 (m, 2H), 3.80-3.87 (m, 2H), 3.68 (d, *J* = 7.4 Hz, 3H), 2.51-2.56 (m, 2H), 1.21-1.31 (m, 3H).

Synthesis of (2*S*,4*S*)-1-ethyl 2-methyl 4-hydroxypyrrolidine-1,2-dicarboxylate (**11**)

The mixture of **10** (1.1 g, 3 mmol), K_2CO_3 (1.0 g, 7 mmol) and 20 mL of MeOH was stirred for 6h at RT. Then the mixture was dissolved in water and extracted with DCM (3×20 mL). Removal of the solvent gave the crude product, which was subjected to FC (eluent: petroleum ether/ethyl acetate = 5/1 to 1/1) to give **11** as a colorless oil in 60% yield. ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 4.33-4.41 (m, 2H), 4.09-4.17 (m, 2H), 3.76 (d, *J* = 5.8 Hz, 3H), 3.55-3.65 (m, 2H), 3.25-3.48 (m, 1H), 2.30-2.34 (m, 1H), 2.06-2.14 (m, 1H), 1.16-1.27 (m, 3H).

Synthesis of **12-2e**

The procedures of synthesis of **12-2e** are similar to those of **7-2d**.

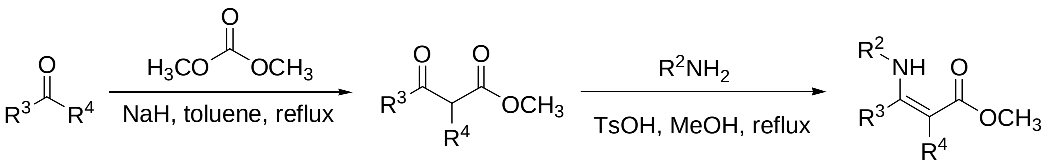
(2*S*,4*S*)-ethyl 4-hydroxy-2-(hydroxydiphenylmethyl)pyrrolidine-1-carboxylate (12): Yield = 33%, ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.49-7.52 (m, 2H), 7.15-7.41 (m, 8H), 4.96 (d, *J* = 8.6 Hz, 1H), 4.69 (br, 1H), 4.35 (br, 1H), 3.96-4.09 (m, 2H), 3.76 (br, 1H), 3.40-3.44 (m, 1H), 2.26-2.36 (m, 1H), 1.85 (d, *J* = 14.8 Hz, 1H), 0.89 (br, 3H).

(6*S*,7*aS*)-6-methoxy-1,1-diphenyl-tetrahydropyrrolo[1,2-c]oxazol-3(1H)-one (13): Yield = 85%, White solid, mp = 141.0-143.6 ., $[a]_D^{20}$ = -230.4 (c = 0.2 in $CHCl_3$). ^{1}H NMR (300 MHz,

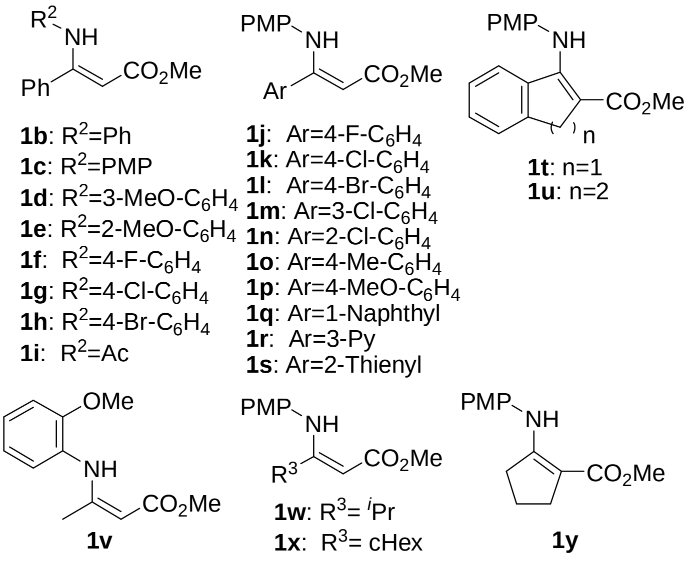
$CDCl_3$, TMS) d = 7.50-7.53 (m, 2H), 7.26-7.38 (m, 8H), 4.63 (dd, *J* = 7.4 Hz, *J* = 8.7 Hz, 1H), 4.00-4.02 (m, 1H), 3.88 (dd, *J* = 2.8 Hz, *J* = 12.5 Hz, 1H), 3.02-3.26 (m, 1H), 3.17 (s, 3H), 2.01-2.10 (m, 1H), 1.36-1.43 (m, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 35.4, 52.0, 56.9, 67.5, 81.0, 86.2, 125.7, 126.0, 127.8, 128.4, 128.6, 140.0, 143.3, 160.4. ESI-HRMS exact mass calcd. for $(C_{19}H_{19}NO_3 + Na)^+$ requires m/z 332.1257, found m/z 332.1248.

((2*S*,4*S*)-2-(hydroxydiphenylmethyl)-4-methoxypyrrolidin-1-yl)(pyridin-2-yl)methanone (2e): Yield = 54% (two steps) White solid , mp = 190.6-191.8 ., $[a]_D^{20}$ = +49.0 (c = 0.2 in $CHCl_3$). ^{1}H NMR (300 MHz, $[D_6]$DMSO, TMS) d = 8.37 and 8.57 (2×brs, 1H), 6.62-7.78 (m, 13H), 6.03 and 6.39 (2×brs, 1H), 5.48 (brs, 1H), 4.12-4.28 (m, 1H), 3.64-3.80 (m, 2H), 3.15-3.25 (m, 3H), 2.31-2.50 (m, 1H), 1.84-1.97 (m, 1H). ^{13}C-NMR (75 MHz, $[D_6]$DMSO, TMS): d = 33.0, 34.1, 53.1, 54.6, 56.4, 63.0, 77.8, 80.1, 123.7, 124.4, 125.9, 126.2, 126.4, 126.8, 127.7, 136.4, 143.8, 145.1, 146.0, 148.0, 153.1,161.5, 161.5, 165.7, 167.4. ESI-HRMS exact mass calcd. for $(C_{24}H_{24}N_2O_3 + Na)^+$ requires m/z 411.1679, found m/z 411.1670.

? . Typical procedure for the synthesis of *ß*-keto esters[3] and *N*-aryl *ß*-enamino esters[4].



1b-1h, 1j-1y



To a dried three-necked flask equipped with a dropping funnel, a condenser, and a magnetic stirrer was added NaH (7.1 g, 95%, 280 mmol), dimethyl carbonate (18.0 g, 200 mL), and toluene (100 mL). The mixture was heated to reflux. A solution of ketone (100 mmol) in toluene (50 mL) was added dropwise from the dropping funnel over 1-2 h. After the addition, the mixture was heated to reflux until the evolution of hydrogen ceased (15-20 min). When the reaction was cooled to room temperature, glacial acetic acid (30 mL) was added dropwise and a heavy, pasty solid appeared. Ice-water was added until the solid was dissolved completely. The toluene layer was separated, and the water layer was washed with toluene (3×100 mL). The combined toluene solution was washed with water (100 mL) and brine (100 mL), then dried over Na_2SO_4. After evaporation of the solvent, the mixture was distilled under reduced pressure or subjected chromatography to give the desired *ß*-keto esters in 80-95% yield.

A mixture of *ß*-keto ester (10 mmol), arylamine (10 mmol) and *p*-toluenesulfonic acid monohydrate (0.19 g, 1 mmol) was dissolved in 10 mL of methanol and refluxed overnight. After the reaction mixture was cooled to room temperature, the solvent was removed under reduced pressure. The residue was dissoved with 30mL EtOAc and washed with water and birne. The organic phase was seperated and dried over Na_2SO_4. The mixture was subsequently filtered and the solvents were removed in vacuo. The crude product was purified by FC to give the pure *N*-aryl *ß*-enamino esters.

(*Z*)-methyl 3-phenyl-3-(phenylamino)acrylate (1b)[5]: Yield = 55%, yellow solid, mp = 72.5-73.0 ., ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.28 (br s, 1H), 7.26-7.36 (m, 5H), 7.06-7.11 (m, 2H), 6.88-6.93 (m, 1H), 6.66-6.69 (m, 1H), 5.00 (s, 1H), 3.75 (s, 3H).

(*Z*)-methyl 3-(4-methoxyphenylamino)-3-phenylacrylate (1c): Yield = 50%, Yellow solid, mp = 94.4-96.7? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.22 (br s, 1H), 7.22-7.34 (m, 5H), 6.63-6.65 (m, 4H), 4.93 (s, 1H), 4.20 (q, *J* = 7.1 Hz, 2H), 3.69 (s, 3H), 1.32 (t, *J* = 7.1 Hz, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): d = 50.6, 55.3, 88.9, 113.8, 124.3, 128.2, 128.3,129.2, 133.3, 135.9, 155.8, 160.0, 170.6. ESI-HRMS exact mass calcd. for $(C_{17}H_{17}NO_3 + Na)^+$ requires m/z 306.1101, found m/z 306.1105.

(*Z*)-methyl 3-(3-methoxyphenylamino)-3-phenylacrylate (1d): Yield = 55%, yellow solid, mp = 48.5-50.6 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.27 (br s, 1H), 7.26-7.37 (m, 5H), 6.99 (t, *J* = 8.1 Hz, 1H), 6.49- 6.50 (m, 1H), 6.28 (m, 1H), 6.17 (t, *J* = 2.2 Hz, 1H), 5.00 (s, 1H), 3.74 (s, 3H), 3.55 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.7, 55.0, 90.8, 107.5, 109.1, 114.5, 128.1, 128.5, 129.3, 129.5, 136.0, 141.4, 159.0, 159.7, 170.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{17}NO_3 + Na)^+$ requires m/z 306.1101, found m/z 306.1104.

(*Z*)-methyl 3-(2-methoxyphenylamino)-3-phenylacrylate (1e): Yield = 51%, yellow solid, mp = 115.6-117.5 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.27 (brs, 1H), 7.26-7.37 (m, 5H), 6.84-6.87 (m, 2H), 6.51-6.52 (m, 1H), 6.20-6.23 (1H), 5.00 (s, 1H), 3.90 (s, 3H), 3.75 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.7, 55.7, 90.9, 110.4, 119.8, 121.8, 122.9, 127.9, 128.3, 129.3, 129.4,136.2, 150.4, 158.5, 170.1. ESI-HRMS exact mass calcd. for $(C_{17}H_{17}NO_3 + Na)^+$ requires m/z 306.1101, found m/z 306.1097.

(*Z*)-methyl 3-(4-fluorophenylamino)-3-phenylacrylate (1f): Yield = 65%, yellow solid, mp = 135.6-138.0 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.25 (br s, 1H), 7.30-7.36 (m, 25H), 7.02-7.05 (m, 2H), 6.57-6.60 (m, 2H), 5.03 (s, 1H), 3.75 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.7, 90.4, 115.2 (d, *J* = 22.5 Hz), 124.1 (d, *J* = 8.0 Hz), 128.3, 128.4, 129.5, 135.6, 136.4 (d, *J* = 2.7 Hz), 158.9 (d, *J* = 241 Hz), 159.4, 170.5. ESI-HRMS exact mass calcd. for $(C_{16}H_{14}FNO_2 + Na)^+$ requires m/z 294.0901, found m/z 294.0910.

(*Z*)-methyl 3-(4-chlorophenylamino)-3-phenylacrylate (1g): Yield = 60%, yellow solid, mp = 94.7-96.7 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.24 (br s, 1H), 7.30-7.37 (m, 25H), 7.15-7.19 (m, 2H), 6.50-6.54 (m, 2H), 5.03 (s, 1H), 3.74 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.8, 91.4, 123.3, 128.1, 128.2, 128.6, 128.7, 129.6, 135.5, 139.0, 158.7, 170.4. ESI-HRMS exact mass calcd. for ($C_{16}H_{14}ClNO_2$ + H)$^+$ requires m/z 288.0786, found m/z 288.0790.

(*Z*)-methyl 3-(4-bromophenylamino)-3-phenylacrylate (1h): Yield = 61%, yellow solid, mp = 159.1-161.8 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.24 (br s, 1H), 7.30-7.37 (m, 25H), 7.15-7.19 (m, 2H), 6.50-6.54 (m, 2H), 5.03 (s, 1H), 3.74 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.8, 91.5, 115.8, 123.5, 128.1, 128.6, 129.7, 131.6, 135.4, 139.5, 158.6, 170.3. ESI-HRMS exact mass calcd. for ($C_{16}H_{14}BrNO_2$ + H)$^+$ requires m/z 354.0100, found m/z 354.0092.

(*Z*)-methyl 3-acetamido-3-phenylacrylate (1i)[6]: Synthesized according to the literature method.[5] Yellow oil, ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.64 (s, 1H), 7.38-7.40 (m, 5H), 5.28 (s, 1H), 4.22 (q, *J* = 7.1 Hz, 2H), 2.16 (s, 3H), 1.32 (t, *J* = 7.1 Hz, 3H).

(*Z*)-methyl 3-(4-fluorophenyl)-3-(4-methoxyphenylamino)acrylate (1j): Yield = 56%, yellow solid, mp = 92.3-94.1? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.16 (br s, 1H), 7.26-7.31 (m, 2H), 6.91-6.98 (m, 2H), 6.63-6.65 (m, 4H), 4.90 (s, 1H), 3.73 (s, 3H), 3.71 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.3, 89.0, 113.9, 115.4 (d, *J* = 21.6 Hz), 124.5, 130.5 (d, *J* = 8.3 Hz), 131.9 (d, *J* = 3.2 Hz), 133.1, 156.0, 158.9, 161.4, 164.7, 170.5. ESI-HRMS exact mass calcd. for ($C_{17}H_{17}NO_3$ + Na)$^+$ requires m/z 324.1006, found m/z 324.1019.

(*Z*)-methyl 3-(4-chlorophenyl)-3-(4-methoxyphenylamino)acrylate (1k): Yield = 60%, yellow solid, mp = 123.7-126.0 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.14 (br s, 1H), 7.24-7.26 (m, 4H), 6.63-6.65 (m, 4H), 4.91 (s, 1H), 3.73 (s, 3H), 3.71 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.3, 89.3, 113.9, 124.5, 128.6, 129.6, 133.0, 134.4, 135.2, 156.0, 158.7, 170.4. ESI-HRMS exact mass calcd. For ($C_{17}H_{16}ClNO_3$ + H)$^+$ requires m/z 318.0891, found m/z 318.0889.

(*Z*)-methyl 3-(4-bromophenyl)-3-(4-methoxyphenylamino)acrylate (1l): Yield = 58%, yellow solid, mp = 133.5-135.6 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.16 (br s, 1H), 7.26-7.31 (m, 2H), 6.92-6.98 (m, 2H), 6.63-6.65 (m, 4H), 4.90 (s, 1H), 3.73 (s, 3H), 3.71 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.7, 55.3, 89.3, 114.0, 123.5, 124.5, 129.9, 131.5, 133.0, 134.9, 156.0, 158.7, 170.4. ESI-HRMS exact mass calcd. for ($C_{17}H_{17}BrNO_3$ + H)$^+$ requires m/z 362.0386, found m/z 362.0387.

(*Z*)-methyl 3-(3-chlorophenyl)-3-(4-methoxyphenylamino)acrylate (1m): Yield = 52%, viscous liquid, solified by standing, mp = 75.4-76.8 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.12 (br s, 1H), 7.35-7.36 (m, 1H), 7.26-7.29 (m, 1H), 7.13-7.17 (m, 2H), 6.64-6.66 (m, 4H), 4.92 (s,1H), 3.73 (s, 3H), 3.73 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.2, 89.6, 113.9, 124.4, 126.5, 128.2, 129.3, 129.4, 132.9, 134.2, 137.7, 156.0, 158.3, 170.3. ESI-HRMS exact mass calcd. for ($C_{17}H_{16}ClNO_3$ + Na)$^+$ requires m/z 340.0771, found m/z 340.0695.

(*Z*)-methyl 3-(2-chlorophenyl)-3-(4-methoxyphenylamino)acrylate (1n): Yield = 58%, yellow solid, mp = 91.5-93.5 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.35 (br s, 1H), 7.34-7.35 (m, 1H), 7.25-7.30 (m, 3H), 6.61-6.70 (m, 4H), 4.78 (s, 1H), 3.77 (s, 3H), 3.71 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.2, 88.0, 113.7, 124.0, 126.6, 129.8, 130.1, 130.7,132.5, 135.0, 156.2, 157.7, 170.5. ESI-HRMS exact mass calcd. for ($C_{17}H_{16}ClNO_3$ + Na)$^+$ requires m/z 340.0771, found m/z 340.0693.

(*Z*)-methyl 3-(4-methoxyphenylamino)-3-p-tolylacrylate (1o): Yield =50%, yellow solid, mp = 74.5-76.8 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.18 (br s, 1H), 7.18-7.26 (m, 2H), 7.05-7.08 (m, 2H), 6.64-6.66 (m, 4H), 4.92 (s, 1H), 3.73 (s, 3H), 3.71 (s, 3H), 2.32 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.3, 50.5, 55.3, 88.6, 113.8, 124.3, 128.2, 129.0, 132.9, 133.5, 139.4, 155.8, 160.1, 170.6. ESI-HRMS exact mass calcd. For $(C_{18}H_{19}NO_3 + H)^+$ requires m/z 298.1438, found m/z 298.1448.

(*Z*)-methyl 3-(4-methoxyphenyl)-3-(4-methoxyphenylamino)acrylate (1p): Yield = 46%, yellow solid, mp = 91.4-93.0 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.17 (br s, 1H), 7.22-7.26 (m, 2H), 6.75-7.79 (m, 2H), 6.64-6.65 (m, 4H), 4.91 (s, 1H), 3.77 (s, 3H), 3.73 (s, 3H), 3.70 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.5, 55.1, 55.3, 88.3, 113.6, 113.8, 124.3, 128.0, 129.8, 133.6, 155.7, 159.7, 160.3, 170.6. ESI-HRMS exact mass calcd. for $(C_{18}H_{19}NO_4 + Na)^+$ requires m/z 336.1206, found m/z 336.1210.

(*Z*)-methyl 3-(4-methoxyphenylamino)-3-(naphthalen-2-yl)acrylate (1q): Yield = 43%, yellow solid, mp = 92.6-94.7 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.30 (br s, 1H), 7.96 (s, 1H), 7.77-7.83 (m,2H), 7.66-7.69 (d, *J* = 8.6 Hz, 1H), 7.48-7.51 (m, 2H), 7.28-7.32 (m, 1H), 6.67- 6.71 (m, 2H), 6.58-6.62 (m, 2H), 5.09 (s, 1H), 3.77 (s, 3H), 3.66 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.2, 89.4, 113.9, 124.2, 125.6, 126.4, 126.9, 127.6, 127.7, 127.9, 128.3, 132.9, 133.3, 133.4, 133.6, 155.8, 159.8, 170.6. ESI-HRMS exact mass calcd. for $(C_{21}H_{19}NO_3 + Na)^+$ requires m/z 356.1257, found m/z 356.1250.

(*Z*)-methyl 3-(4-methoxyphenylamino)-3-(pyridin-3-yl)acrylate (1r): Yield = 35%, orange solid, mp = 102.8-105.4 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.14 (br s, 1H), 8.58-8.59 (m, 1H), 8.52-8.54 (m, 1H), 7.53-7.56 (m, 1H), 6.64-6.65 (m, 4H), 4.94 (s, 1H), 3.74 (s, 3H), 3.70 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.7, 55.3, 89.9, 114.2, 122.9, 125.1, 131.9, 132.6, 135.7, 149.1, 150.2, 156.6, 156.7, 170.3. ESI-HRMS exact mass calcd. for $(C_{16}H_{16}N_2O_3 + Na)^+$ requires m/z 307.1053, found m/z 307.1060.

(*Z*)-methyl 3-(4-methoxyphenylamino)-3-(thiophen-2-yl)acrylate (1s): Yield = 46%, light yellow solid, mp = 68.5-71.0 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d =10.04 (br s, 1H), 7.26-7.28 (m, 1H), 6.98-7.00 (m, 1H), 6.88-6.90 (m, 1H) ,6.80-6.82 (m, 2H), 6.69-6.72 (m, 2H), 5.13 (s, 1H), 3.74 (s, 3H), 3.73 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 50.6, 55.3, 88.9, 113.9, 114.2, 125.3, 127.0, 127.6, 129.0, 133.4, 153.1, 156.5, 170.4. ESI-HRMS exact mass calcd. for $(C_{15}H_{15}NO_3S + Na)^+$ requires m/z 312.0665, found m/z 312.0663.

Methyl 3-(4-methoxyphenylamino)-1H-indene-2-carboxylate (1t): Yield = 45%, yellow solid, mp = 107.0-108.6 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 9.14 (br s, 1H), 7.44-7.46 (d, *J* = 7.6 Hz, 1H), 7.26-7.32 (m, 1H), 7.17 (d, *J* = 8.6 Hz, 2H), 7.05 (t, *J* = 7.5 Hz, 1H), 6.89 (d, *J* = 8.6 Hz, 2H), 6.76 (d, *J* = 7.8 Hz, 4H), 3.85 (s, 3H), 3.83 (s, 3H), 3.63 (s, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 34.6, 50.6, 55.5, 100.2, 114.1, 123.8, 124.6, 125.7, 127.0, 128.2, 133.2, 137.5, 145.1, 156.5, 157.6, 168.6. ESI-HRMS exact mass calcd. for $(C_{18}H_{17}NO_3 + Na)^+$ requires m/z 318.1101, found m/z 318.1105.

Methyl 1-(4-methoxyphenylamino)-3,4-dihydronaphthalene-2-carboxylate (1u): Yield = 42%, yellow solid, mp = 92.6-94.7 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.13 (br s, 1H), 7.17-7.22 (m, 3H), 6.96-6.99 (m, 1H), 6.69-6.76 (m, 4H), 3.79 (s, 3H), 3.73 (s, 3H), 2.76-2.86 (m, 2H), 2.56-2.61 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 22.1, 29.0, 51.1, 55.3, 102.6, 114.0, 123.0, 125.5, 127.4, 128.0, 128.9, 129.8, 136.5, 140.1, 151.7, 155.2, 170.4. ESI-HRMS exact mass calcd. for $(C_{19}H_{19}NO_3 + Na)^+$ requires m/z 332.1257, found m/z 332.1258.

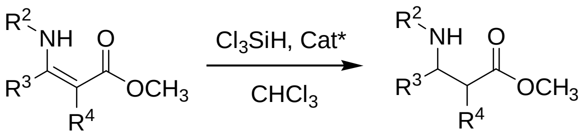
(*Z*)-methyl 3-(2-methoxyphenylamino)but-2-enoate (1v): Yield = 45%, colorless oil, ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.27 (brs, 1H), 7.08-7.14 (m, 2H), 6.87-6.92 (m, 2H), 4.76 (s,1H), 3.86 (s, 3H), 3.68 (s, 3H), 2.00 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 20.3, 50.2, 55.7, 85.8, 111.0, 120.3, 124.4, 125.4, 128.5, 152.5, 159.0, 170.5. $(C_{17}H_{16}ClNO_3 + Na)^+$ requires m/z 244.0944, found m/z 244.0950.

(*Z*)-methyl 3-(4-methoxyphenylamino)-4-methylpent-2-enoate (1w): Yield = 55%, yellow oil, ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.13 (br s, 1H), 7.01-7.05 (m, 2H), 6.85-6.89 (m, 2H), 4.71 (s, 1H), 3.80 (s, 3H), 3.68 (s, 3H), 2.66-2.75 (m, 1H), 1.07 (s, 3H), 1.04 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.9, 28.4, 50.2, 55.4, 80.0, 114.3, 127.8, 131.8, 157.8, 171.2, 171.6. ESI-HRMS exact mass calcd. for $(C_{14}H_{19}NO_3 + Na)^+$ requires m/z 272.1257, found m/z 272.1260.

(*Z*)-methyl 3-cyclohexyl-3-(4-methoxyphenylamino)acrylate (1x): Yield = 75%, white solid, mp = 103.8-106.1 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 10.15 (br s, 1H), 6.98-7.26 (m, 2H), 6.83-6.88 (m, 2H), 4.70 (s, 1H), 3.81 (s, 3H), 3.67 (s, 3H), 2.22-2.34 (m, 1H), 1.62-1.78 (m, 5H), 1.13-1.29 (m, 2H), 1.07-1.13 (m, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 25.8, 26.2, 32.4, 50.2, 55.4, 80.9, 114.2, 127.5, 131.7, 157.6, 169.8, 171.6. ESI-HRMS exact mass calcd. for $(C_{17}H_{23}NO_3 + Na)^+$ requires m/z 312.1570, found m/z 312.1558.

Methyl 2-(4-methoxyphenylamino)cyclopent-1-enecarboxylate (1y): Yield = 80%, white solid, mp = 67.1-69.6 ? , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 9.29 (br s, 1H), 6.96-7.02 (m, 2H), 6.80-6.85 (m, 2H), 3.80 (s, 3H), 3.72 (s, 3H), 2.63 (t, *J* = 7.5 Hz, 2H), 2.56 (t, *J* = 7.1 Hz, 2H), 1.78-1.88 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.6, 28.8, 33.2, 50.3, 55.4, 95.7, 114.3, 123.8, 133.7, 156.4, 161.9, 168.8. ESI-HRMS exact mass calcd. for $(C_{14}H_{17}NO_3 + H)^+$ requires m/z 270.1101, found m/z 270.1092.

? . Typical procedure for asymmetric hydrosilyation of *ß*-enamino esters:



1b - **1y**   **3b** - **3y**

Trichlorosilane (41 µL, 0.40 mmol, 2.0 equiv.) was added to a solution of the catalyst (0.02 mmol) and the corresponding *ß*–enamino ester (0.20 mmol) in 2 mL of dry $CHCl_3$ at -30 ? . The reaction mixture was stirred at -30 ? for 48h. Then the reaction was quenched with saturated aqueous solution of $NaHCO_3$. The mixture was extracted with EtOAc and the combined extracts was washed with brine and dried over anhydrous $MgSO_4$. Concentration in vacuo followed by flash chromatography on silica gel with hexane/ethyl acetate as the eluent afforded the *ß*–amino acid esters. The ee values were determined using established HPLC techniques with chiral stationary phases.

HPLC speration of chiral *ß*-amino esters

Compound	Column	i-PrOH/n-Hexane	Flow rate (mL/min)	? (nm)	T (°C)	t_R (min)
3b	AD-H	5%	1	254	25	9.865; 10.998
3c	AD-H	5%	1	254	25	17.956; 19.839
3d	AD-H	5%	1	254	25	17.511; 18.510
3e	AD-H	5%	1	254	25	14.569; 25.438
3f	AD-H	5%	1	254	25	23.162; 27.184
3g	AD-H	5%	1	254	25	25.972; 27.349
3h	OD-H	5%	1	254	25	23.572; 26.103
3j	AD-H	5%	1	254	25	11.318; 13.000
3k	AD-H	5%	1	254	25	9.918; 11.197
3l	AD-H	5%	1	254	25	12.214; 13.683
3m	OD-H	5%	1	254	25	17.540; 19.440
3n	AD-H	5%	1	254	25	13.681; 14.668
3o	OD-H	5%	1	254	25	12.328; 13.914
3p	AD-H	5%	1	254	25	17.889; 19.546
3q	OD-H	5%	1	254	25	25.364; 26.964
3r	OJ-H	30%	1	254	25	14.460; 17.185
3s	AD-H	5%	1	254	25	18.812; 21.107
3t	AD-H	5%	1	254	25	12.579; 24.294
3u	AD-H	5%	1	254	25	11.425; 15.437
3v	AD-H	5%	1	254	25	10.123; 12.073
3w	AD-H	5%	1	254	25	6.774; 7.825
3x	AD-H	5%	1	254	25	8.210; 9.734
3y	AD-H	5%	1	254	25	8.883; 11.071

Methyl 3-phenyl-3-(phenylamino)propanoate (3b): White solid, mp = 103.9-105.4 ? , $[a]_D^{20}$ = -5.1 (c = 0.2 in $CHCl_3$, 95%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d= 7.31-7.41 (m, 4H), 7.26-7.28 (m, 1H), 7.09-7.15 (m, 2H), 6.68-6.90 (m, 1H), 6.57-6.60 (m, 2H), 4.85 (t, *J* = 6.7 Hz, 1H), 4.54 (brs, 1H), 3.66 (s, 3H), 2.82 (d, *J* = 6.0 Hz, 2H).

Methyl 3-(4-methoxyphenylamino)-3-phenylpropanoate (3c): White solid, mp = 62.9-65.6 ? , $[a]_D^{20}$ = -6.2 (c = 0.2 in $CHCl_3$ in 95%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.25-7.41 (m, 5H), 6.71-6.74 (m, 2H), 6.55-6.59 (m, 2H), 4.80 (t, *J* = 6.7 Hz, 1H), 4.47 (brs, 1H), 3.70 (s, 3H), 3.66 (s, 3H), 2.82 (d, *J* = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.7, 51.8, 55.6, 55.8, 114.7, 115.1, 126.2, 127.4, 128.7, 140.9, 142.3, 152.3, 171.7. ESI-HRMS exact mass calcd. for $(C_{17}H_{19}NO_3 + Na)^+$ requires m/z 308.1257, found m/z 308.1260.

Methyl 3-(3-methoxyphenylamino)-3-phenylpropanoate (3d): White solid, mp = 72.8-74.6 ? , $[a]_D^{20}$ = -2.3 (c = 0.2 in $CHCl_3$, 96%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.25-7.39 (m, 5H), 7.02 (d, *J* = 8.1 Hz, 1H), 6.20-6.28 (m, 2H), 6.14-6.16 (m, 1H), 5.12 (br s, 1H), 4.83 (t, *J* = 6.7 Hz, 1H), 3.69 (s, 3H), 3.65 (s, 3H), 2.85 (d, *J* = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.4, 51.8, 54.8, 54.9, 99.8, 103.1, 106.8, 126.1, 127.4, 128.7, 129.8, 141.9, 147.9, 160.6, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{19}NO_3 + Na)^+$ requires m/z 308.1257, found m/z 308.1262.

Methyl 3-(2-methoxyphenylamino)-3-phenylpropanoate(3e): White solid, mp = 74.2-76.5 ? , $[a]_D^{20}$ = +17.7 (c = 0.2 in $CHCl_3$, 92%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.21-7.39 (m, 5H), 6.70-6.78 (m, 2H), 6.60-6.66 (m, 1H), 6.42-6.45 (d, *J* = 7.8 Hz, 1H), 5.02 (brs, 1H), 4.86 (t, *J* = 6.7 Hz, 1H), 3.88 (s, 3H), 3.65 (s, 3H), 2.82 (d, *J* = 6.7, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.9, 51.7, 54.8, 55.5, 109.6, 111.2, 116.9, 121.1, 126.2, 127.3, 128.7, 136.7, 142.3, 146.9, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{19}NO_3 + Na)^+$ requires m/z 308.1257, found m/z 308.1250.

Methyl 3-(4-fluorophenylamino)-3-phenylpropanoate (3f): White solid, mp = 66.0-67.4 ? , $[a]_D^{20}$ = +2.8 (c = 0.2 in EtOAc, 92%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.25-7.37 (m, 5H), 6.77-6.83 (m, 2H), 6.46-6.50 (m, 2H), 4.76 (t, *J* = 6.7 Hz, 3H), 4.47 (br s, 1H), 3.66 (s, 3H), 2.73-2.87 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.6, 51.9, 55.6, 114.6 (d, *J* = 7.4 Hz), 115.5 (d, *J* = 22.2 Hz), 126.2, 127.5, 128.8, 141.9, 143.0, 156.0 (d, *J* = 234 Hz), 171.5. ESI-HRMS exact mass calcd. for $(C_{16}H_{16}FNO_2 + Na)^+$ requires m/z 296.1057, found m/z 296.1052.

Methyl 3-(4-chlorophenylamino)-3-phenylpropanoate (3g): White solid, mp = 70.0-72.3 ? , $[a]_D^{20}$ = +24.2 (c = 0.2 in EtOAc, 93%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.26-7.34 (m, 5H), 7.03-7.06 (d, *J* = 8.3 Hz, 2H), 6.46-6.49 (d, *J* = 8.4 Hz, 2H), 4.78 (t, *J* = 6.7 Hz, 3H), 4.62 (br s, 1H), 3.66 (s, 3H), 2.74-2.88 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.5, 51.9, 55.0, 114.8, 122.4, 126.1, 127.6, 128.8, 128.9, 141.6, 145.3, 171.5. ESI-HRMS exact mass calcd. for $(C_{16}H_{16}ClNO_2 + Na)^+$ requires m/z 312.0762, found m/z 312.0751.

Methyl 3-(4-bromophenylamino)-3-phenylpropanoate (3h): White solid, mp = 100.3-102.1 ? , $[a]_D^{20}$ = -3.6 (c = 0.2 in EtOAc, 92%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.25-7.35 (m, 5H), 7.16-7.20 (m, 2H), 6.42-6.46 (m, 2H), 4.78 (m, 1H), 4.65 (br s, 1H), 3.65 (s, 1H), 2.81 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.5, 51.9, 54.9, 109.5, 115.3, 126.1, 127.6, 128.8, 131.8, 141.5, 145.7, 171.4. ESI-HRMS exact mass calcd. for $(C_{16}H_{16}BrNO_2 + Na)^+$ requires m/z 356.0257, found m/z 356.0267.

Methyl 3-(4-fluorophenyl)-3-(4-methoxyphenylamino)propanoate (3j): Yellow oil, $[a]_D^{20}$ = +3.4 (c = 0.2 in EtOAc, 93%ee) , ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.31-7.36 (m, 2H), 6.99-7.04 (m, 2H), 6.69-6.72 (m, 2H), 6.50-6.54 (m, 2H), 4.73 (t, *J* = 6.7 Hz, 1H), 4.32 (br s, 1H), 3.70 (s, 3H), 3.65 (s, 3H), 2.77 (d, *J* = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.6, 51.8, 55.1, 55.6, 114.7, 115.2, 115.6 (d, *J* = 21.3 Hz), 127.8 (d, *J* = 8.0 Hz), 138.0 (d, *J* = 3.1 Hz), 140.6, 152.4, 161.9

(d, J = 243.9 Hz), 171.5. ESI-HRMS exact mass calcd. for $(C_{17}H_{18}FNO_3 + Na)^+$ requires m/z 326.1163, found m/z 326.1164.

Methyl 3-(4-chlorophenyl)-3-(4-methoxyphenylamino)propanoate (3k): Yellow oil, $[a]_D^{20}$ = -32.0 (c = 0.2 in EtOAc, 92%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.27-7.33 (m, 4H), 6.68-6.72 (m, 2H), 6.48-6.52 (m, 2H), 4.73 (t, J = 6.7 Hz, 1H), 4.30 (br s, 1H), 3.70 (s, 3H), 3.66 (s, 3H), 2.77 (d, J = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.5, 51.9, 55.2, 55.6, 114.7, 115.1, 127.7, 128.9, 133.0, 140.5, 140.9, 152.4, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{18}ClNO_3 + Na)^+$ requires m/z 342.0867, found m/z 342.0865.

Methyl 3-(4-bromophenyl)-3-(4-methoxyphenylamino)propanoate (3l): Yellow oil, $[a]_D^{20}$ = +3.0 (c = 0.2 in EtOAc, 92%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.42-7.46 (m, 2H), 7.24-7.26 (m, 2H), 6.68-6.73 (m, 2H), 6.48-6.52 (m, 2H), 4.71 (t, J = 6.7 Hz, 1H), 4.31 (br s, 1H), 3.70 (s, 3H), 3.66 (s, 3H), 2.76 (d, J = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.4, 51.9, 55.2, 55.6, 114.7, 115.2, 121.1, 128.0, 131.8, 140.5, 141.4, 152.4, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{18}BrNO_3 + Na)^+$ requires m/z 386.0362, found m/z 386.0360.

Methyl 3-(3-chlorophenyl)-3-(4-methoxyphenylamino)propanoate (3m): Viscous liquid, $[a]_D^{20}$ = -1.8 (c = 0.2 in EtOAc, 91%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.38 (s, 1H), 7.23-7.27 (m, 3H), 6.53-6.73 (m, 2H), 6.50-6.53 (m, 2H), 4.72 (t, J = 6.7 Hz, 1H), 4.31 (br s, 1H), 3.70 (s, 3H), 3.66 (s, 3H), 2.77 (d, J = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.4, 51.9, 55.2, 55.6, 114.7, 115.2, 121.1, 128.0, 131.8, 140.5, 141.4, 152.4, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{18}ClNO_3 + Na)^+$ requires m/z 342.0867, found m/z 342.0871.

Methyl 3-(2-chlorophenyl)-3-(4-methoxyphenylamino)propanoate (3n): Yellow oil, $[a]_D^{20}$ = +75.4 (c = 0.2 in EtOAc, 91%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.47-749 (m, 1H), 7.35-7.38 (m, 1H), 7.17-7.20 (m, 5H), 5.16 (m, 1H), 3.69 (s, 3H), 3.66 (s, 3H), 2.96 (dd, J = 4.4 Hz, J = 15.0 Hz, 1H), 2.77 (dd, J = 8.3 Hz, J = 15.1 Hz, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 40.1, 51.9, 52.9, 55.6, 114.8, 115.1, 127.3, 128.7, 129.8, 132.8, 139.7, 152.8, 171.4. ESI-HRMS exact mass calcd. for $(C_{17}H_{18}ClNO_3 + Na)^+$ requires m/z 342.0867, found m/z 342.0870.

Methyl 3-(4-methoxyphenylamino)-3-p-tolylpropanoate (3o): Yellow oil, $[a]_D^{20}$ = -7.2 (c = 0.2 in EtOAc, 95%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.25-7.27 (m, 2H), 7.13-7.15 (m, 2H), 6.70-6.73 (m, 2H), 6.53-6.56 (m, 2H), 4.75 (t, J = 6.7 Hz, 1H), 4.27 (br s, 1H), 3.70 (s, 3H), 3.66 (s, 3H), 2.79 (d, J = 6.7 Hz, 2H), 2.33 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.4, 51.9, 55.2, 55.6, 114.7, 115.2, 121.1, 128.0, 131.8, 140.5, 141.4, 152.4, 171.4. ESI-HRMS exact mass calcd. for $(C_{18}H_{21}NO_3 + Na)^+$ requires m/z 322.1414, found m/z 342.1413.

Methyl 3-(4-methoxyphenyl)-3-(4-methoxyphenylamino)propanoate (3p): Yellow oil, $[a]_D^{20}$ = -1.0 (c = 0.2 in EtOAc, 95%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.26-7.29 (m, 2H), 6.84-6.87 (m, 2H), 6.70-6.73 (m, 2H), 6.52-6.56 (m, 2H), 4.73 (t, J = 6.7 Hz, 1H), 4.24 (br s, 1H), 3.77 (s, 3H), 3.70 (s, 3H), 3.65 (s, 3H), 2.79 (d, J = 6.7 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.6, 51.7, 55.1, 55.6, 114.0, 114.7, 115.1, 127.3, 134.3, 140.9, 152.2, 158.7, 171.7. ESI-HRMS exact mass calcd. for $(C_{18}H_{21}NO_4 + Na)^+$ requires m/z 338.1363, found m/z 338.1368.

Methyl 3-(4-methoxyphenylamino)-3-(naphthalen-2-yl)propanoate (3q): Solid, mp = 81.1-83.5 ? , $[a]_D^{20}$ = +7.5 (c = 0.2 in EtOAc, 95%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.82-7.87 (m, 4H), 7.47-7.55 (m, 2H), 6.70-6.74 (m, 2H), 6.60-6.63 (m, 2H), 4.96 (t, *J* = 6.8 Hz, 1H), 4.46 (br s, 1H), 3.70 (s, 3H), 3.68 (s, 3H), 2.90 (d, *J* = 6.8, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.6, 51.8, 55.5, 56.0, 114.6, 115.1,124.3, 125.0, 125.7, 126.1, 127.5, 127.8, 128.6, 132.8, 133.3, 139.8, 140.9, 152.2, 171.6. ESI-HRMS exact mass calcd. for $(C_{21}H_{21}NO_3 + Na)^+$ requires m/z 338.1414, found m/z 338.1410.

Methyl 3-(4-methoxyphenylamino)-3-(pyridin-3-yl)propanoate (3r): Yellow oil, $[a]_D^{20}$ = -2.5 (c = 0.2 in EtOAc, 70%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 8.63 (d, *J* = 2.0 Hz, 1H), 8.48 (dd, *J* = 1.3 Hz, *J* = 4.8 Hz, 1H), 7.67 (d, *J* = 7.9 Hz, 4H), 7.19-7.26 (m, 1H), 6.66-6.71 (m, 2H), 6.47-6.53 (m, 2H), 4.80 (t, *J* = 6.6 Hz, 1H), 4.40 (br s, 1H), 3.67 (s, 3H), 3.63 (s, 3H), 2.81 (d, *J* = 6.8 Hz, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.0, 51.9, 53.6, 55.6, 114.7, 115.3, 123.5, 133.9, 137.7, 140.2, 148.5, 148.8, 152.6, 171.1. ESI-HRMS exact mass calcd. for $(C_{16}H_{18}N_2O_3 + Na)^+$ requires m/z 309.1210, found m/z 309.1212.

Methyl 3-(4-methoxyphenylamino)-3-(thiophen-2-yl)propanoate(3s): Yellow oil, $[a]_D^{20}$ = -3.7(c = 0.2 in EtOAc, 88%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.17-7.19 (m, 1H), 6.93-6.98 (m, 2H), 6.74-6.77 (m, 2H), 6.62-6.66 (m, 2H), 5.08 (t, *J* = 6.5 Hz, 1H), 4.19 (br s, 1H), 3.72 (s, 3H), 3.67 (s, 3H), 2.85-2.98 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 42.2, 51.8, 52.0, 55.5, 114.7, 115.7, 123.7, 126.7, 140.4, 147.0, 152.7, 171.3. ESI-HRMS exact mass calcd. for $(C_{15}H_{17}NO_3S + Na)^+$ requires m/z 314.0821, found m/z 314.0822.

Methyl 1-(4-methoxyphenylamino)-2,3-dihydro-1H-indene-2-carboxylate (3t): Yellow oil, $[a]_D^{20}$ = +18.6 (c = 0.2 in EtOAc, 28%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.21-7.31 (m, 4H), 6.77-6.81 (m, 2H), 6.69-6.74 (m, 2H), 5.30 (d, *J* = 4.6 Hz, 1H), 3.83 (br s, 3H), 3.77 (s, 3H), 3.62-3.67 (m, 1H), 3.48 (s, 1H), 3.40-3.47 (m, 1H), 3.12 (dd, *J* = 8.4 Hz, *J* = 16.3 Hz, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 33.7, 48.3, 51.4, 55.7, 61.7, 114.7, 115.0, 124.4, 127.0, 128.3, 140.9, 141.3, 142.7, 152.4, 173.5. ESI-HRMS exact mass calcd. for $(C_{18}H_{19}NO_3 + Na)^+$ requires m/z 320.1257, found m/z 320.1251.

Methyl 1-(4-methoxyphenylamino)-1,2,3,4-tetrahydronaphthalene-2-carboxylate (3u): Yellow oil, $[a]_D^{20}$ = -119.4 (c = 0.2 in EtOAc, 54%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 7.09-7.26 (m, 4H), 6.77-6.80 (m, 2H), 6.68-6.82 (m, 2H), 4.94 (d, *J* = 4.6 Hz, 1H), 3.76 (s, 3H), 3.69 (br s, 1H), 3.61 (s, 3H), 2.98-3.04 (m, 2H), 2.88-2.92 (m, 1H), 2.79-2.82 (m, 1H), 2.10-2.19 (m 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.2, 27.8, 44.8, 51.5, 55.0, 55.7, 114.8, 115.8, 126.2, 127.3, 128.4, 128.9, 135.2, 137.8, 141.8, 152.6, 173.7. ESI-HRMS exact mass calcd. for $(C_{19}H_{21}NO_3 + Na)^+$ requires m/z 334.1414, found m/z 334.1420.

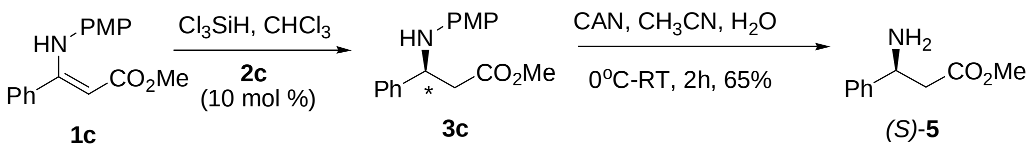
Methyl 3-(2-methoxyphenylamino)butanoate (3v): Yellow oil, $[a]_D^{20}$ = +12.4 (c = 0.2 in EtOAc, 17%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 6.86-6.88 (m, 1H), 6.76-6.80 (m, 1H), 6.65-6.70 (m, 2H), 4.28 (br s, 1H), 3.93-3.99 (m, 1H), 3.84 (s, 1H), 3.69 (s, 1H), 2.73 (dd, *J* = 15.0 Hz, *J* = 5.0 Hz, 1H), 2.39 (dd, *J* = 15.0 Hz, *J* = 7.6 Hz, 1H), 1.30 (d, *J* = 6.4 Hz, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 20.7, 41.0, 45.5, 51.6, 55.4, 109.7, 110.5, 116.6, 121.3, 136.5, 146.9, 172.3. ESI-HRMS exact mass calcd. for $(C_{12}H_{17}NO_3 + Na)^+$ requires m/z 246.1101, found m/z 246.1107.

Methyl 3-(4-methoxyphenylamino)-4-methylpentanoate (3w): Yellow oil, $[a]_D^{20}$ = +32.4 (c = 0.2 in EtOAc, 67%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 6.73-6.77 (m, 2H), 6.59-6.63 (m, 2H), 3.73 (s, 3H), 3.62 (s, 3H), 3.45 (br s, 1H), 2.39-2.54 (m, 2H), 1.87-1.93 (m, 1H), 0.98 (d, *J* = 6.8 Hz, 3H), 0.93 (d, *J* = 6.8 Hz, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 18.5, 18.6, 31.4, 36.5, 51.5, 55.6, 57.0, 114.8, 114.9, 141.6, 152.0, 172.8. ESI-HRMS exact mass calcd. for $(C_{14}H_{21}NO_3 + Na)^+$ requires m/z 274.1414, found m/z 274.1420.

Methyl 3-cyclohexyl-3-(4-methoxyphenylamino)propanoate (3x): Yellow oil, $[a]_D^{20}$ = +5.5 (c = 0.2 in EtOAc, 80%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 6.73-6.77 (m, 2H), 6.72-6.75 (m, 1H), 6.59-6.63 (m, 2H), 3.73 (s, 3H), 3.61 (s ,1H), 2.43-2.57 (s, 3H), 1.77-1.78 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 21.2, 28.8, 31.2, 34.1, 55.5, 56.3, 109.8, 110.2, 117.3, 120.0, 121.0, 136.5, 146.9. ESI-HRMS exact mass calcd. for $(C_{17}H_{25}NO_3 + Na)^+$ requires m/z 314.1727, found m/z 314.1725.

Methyl 2-(4-methoxyphenylamino)cyclopentanecarboxylate (3y): Yellow oil, $[a]_D^{20}$ = +36.8 (c = 0.2 in EtOAc, 28%ee). ^{1}H NMR (300 MHz, $CDCl_3$, TMS) d = 6.73-6.78 (m, 2H), 6.57-6.60 (m, 2H), 4.01 (q, *J* = 6.6 Hz, 1H), 3.73 (s, 3H), 3.53 (s, 3H), 3.06 (q, *J* = 7.5 Hz, 1H), 1.85-2.01 (m, 4H), 1.63-1.77 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$, TMS): d = 22.4, 27.8, 32.7, 47.0, 51.4, 55.7, 58.0, 114.7, 114.8. ESI-HRMS exact mass calcd. for $(C_{14}H_{17}NO_3 + Na)^+$ requires m/z 272.1257, found m/z 272.1249.

V. Experiment in gram scale and deprotection of *N*-PMP group of (*S*)- methyl 3-(4-methoxyphenylamino) -3-phenylpropanoate (3c)[7]

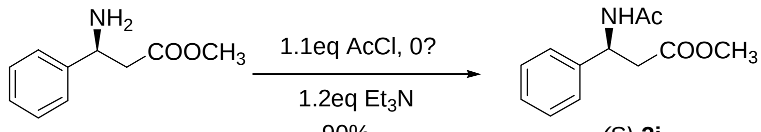


1c 1g Scale; **3c** 82% yield, 95% ee; *(S)*-**5** 95% ee

Catalyst **2c** (0.145g, 0.35mmol) and **1c** (1 g, 3.5 mmol) was dissolved in 35 mL of dry $CHCl_3$ and cooled to -30 ? . Trichlorosilane (0.72 mL, 7 mmol) was added to the solution and the reaction mixture was stirred at -30 ? for 48h. Then the reaction was quenched with saturated aqueous solution of $NaHCO_3$. The mixture was extracted with EtOAc and the combined extract was washed with brine and dried over anhydrous $MgSO_4$. Concentration in vacuo followed by flash chromatography on silica gel with hexane/ethyl acetate as the eluent afforded **3c** in 83% yield.

A solution of ammonium cerium nitrate (1.64g, 3 mmol) in water (5 mL) was added slowly to a stirred solution of compound (*S*)- methyl 3-(4-methoxyphenylamino) -3-phenylpropanoate (**3c**) (285mg, 1 mmol) in acetonitrile (10 mL) at 0? . After 2 hours, a solution of $NaHCO_3$ (5%) was added until pH = 6. Then sodium sulfite was added until the mixture became a brown suspension. The mixture was then extracted with ethyl acetate (4×30 mL) and the combined organic phase was dried over anhydrous sodium sulfate. The mixture was subsequently filtered and the solvents were removed in vacuo. The crude product was purified through flash column chromatography [petroleum ether/EtOAc (1/1)] on silica gel to afford (*S*)-**5** as a yellow oil, yield 65%. ^{1}H NMR (300Hz, $CDCl_3$, TMS): d = 7.23-7.37 (m, 5H), 4.42 (t, *J* = 6.8 Hz, 1H), 3.68 (s, 3H), 2.66 (d, *J* = 6.7 Hz, 2H), 1.79 (br s, 2H).

VI. Acetylation of the amino group of (*S*)- methyl 3-amino-3- phenylpropanoate (5)



(*S*)-**5**   95% ee

(*S*)-**3i**

95% ee, 99% ee (after a single recrystallization)
$[a]_D^{20}$ = -79.5 (c= 0.6, $CHCl_3$, 99% ee)
[lit][6] $[a]_D^{20}$ = -79.9 (c= 1.0, $CHCl_3$, *S*, 99% ee)

To a solution of *(S)*- methyl 3-amino-3-phenylpropanoate (**5**) (99 mg, 0.5 mmol) and Et_3N (0.1 mL, 0.6 mmol) in $CHCl_3$ was added CH_3COCl (0.06 mL in 1mL of $CHCl_3$) dropwise at 0? in 10 mins. The result solution was allowed to worm to RT and stirred for additional two hours. The reaction was quenced with water. Then the organic phase was separated and washed with $NaHCO_3$ (5%), water, brine respectively. The organic phase was dried over Na_2SO_4. The mixture was subsequently filtered and the solvents were removed in vacuo. The residue was subjected to FC to afford *(S)*- methyl 3-acetamido-3-phenylpropanoate (**3i**) as a white solid, yield 90%. ^{1}H NMR (300Hz, $CDCl_3$): d = 7.23-7.35 (m, 5H), 6.61 (d, *J* = 7.8 Hz, 1H) , 5.38-5.45 (m, 1H), 3.61 (s, 3H), 2.78-2.97 (m, 2H), 2.00 (s, 3H).

The enantiomers were analyzed by HPLC using a chiral AD-H column (n-heptane/2- propanol = 95/5, flow rate = 1.0 mL/min, wavelength = 220 nm; minor enantiomer: t_R = 27.47 min, major enantiomer: t_R = 30.18 min; $[a]_D^{20}$ = -79.5 (c= 0.6 in $CHCl_3$, 99% ee). Lit. [6] $[a]_D^{20}$ = -79.9 (c = 1.0 in $CHCl_3$, *S*, 99% ee).

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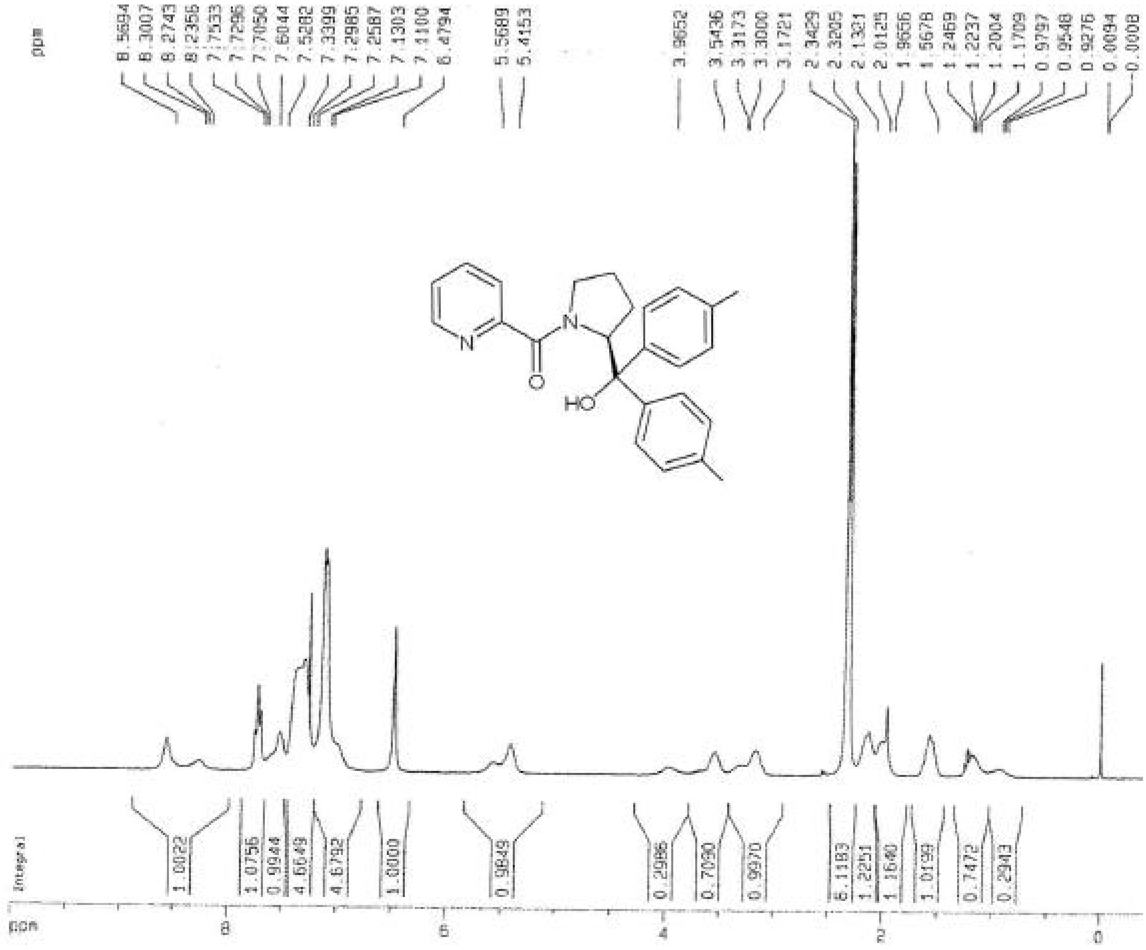
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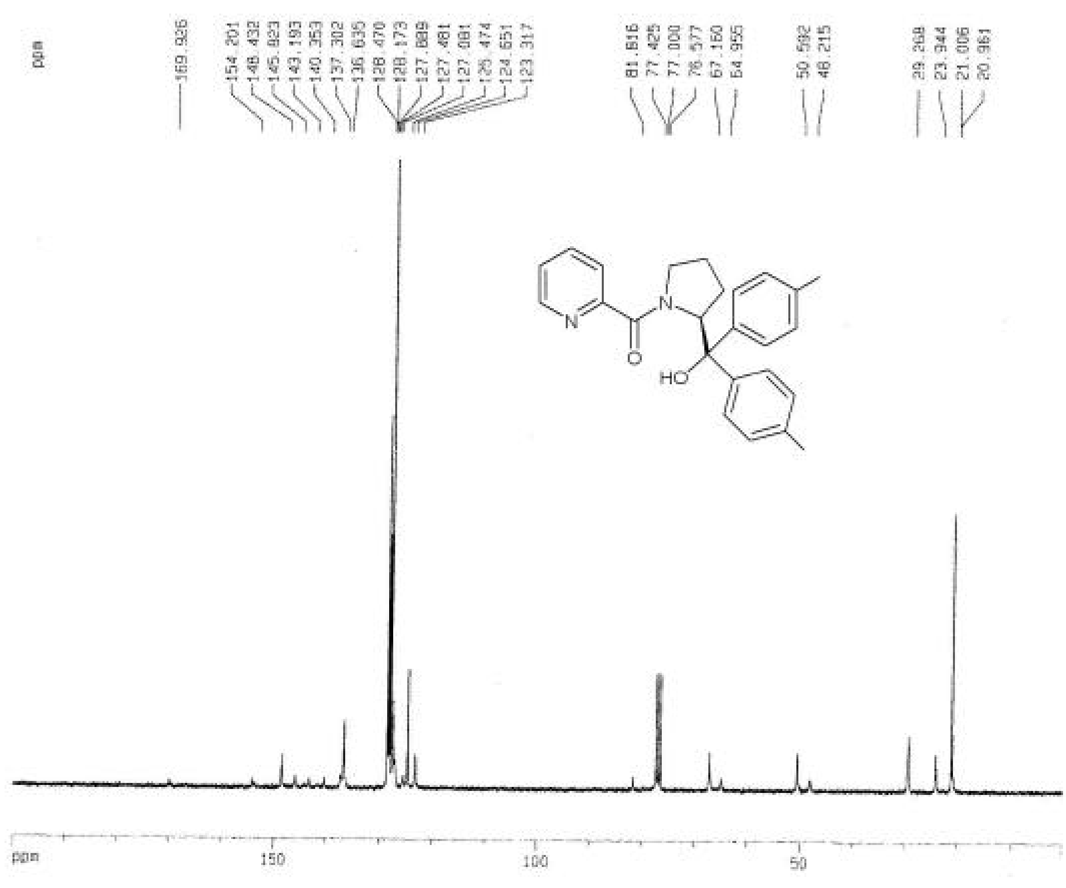
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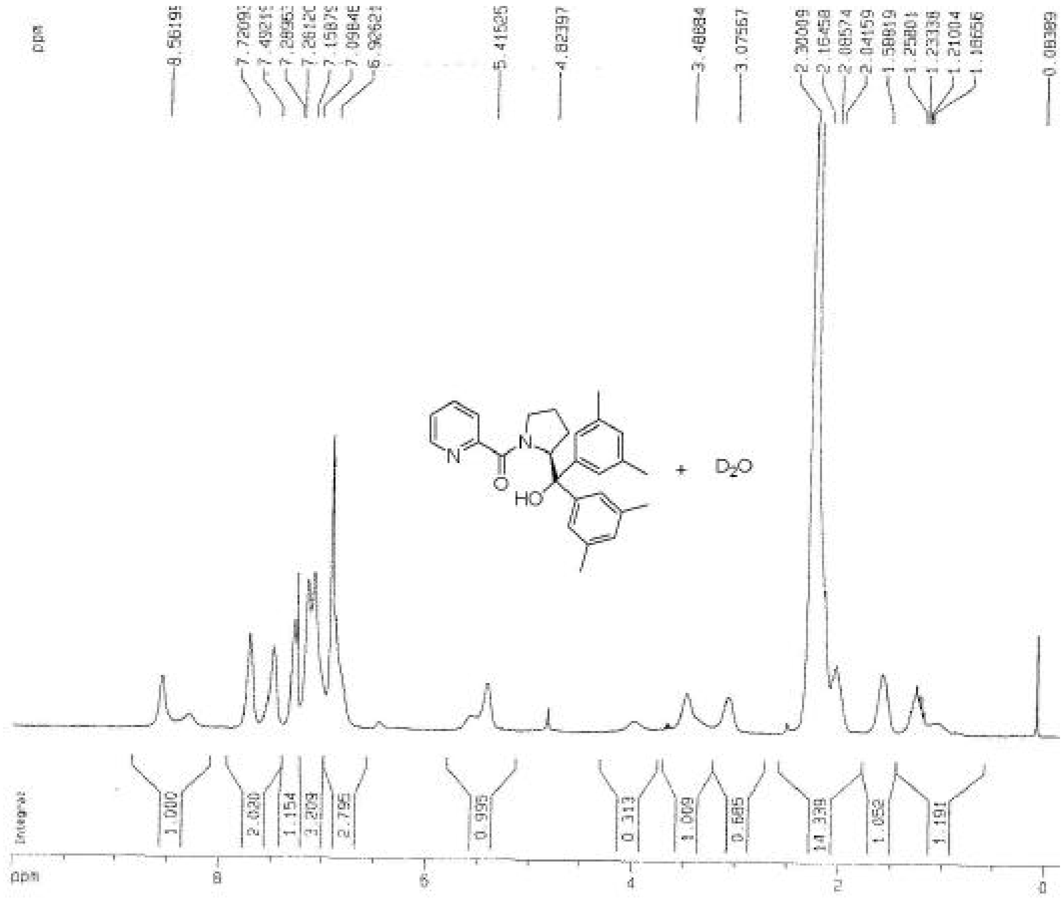
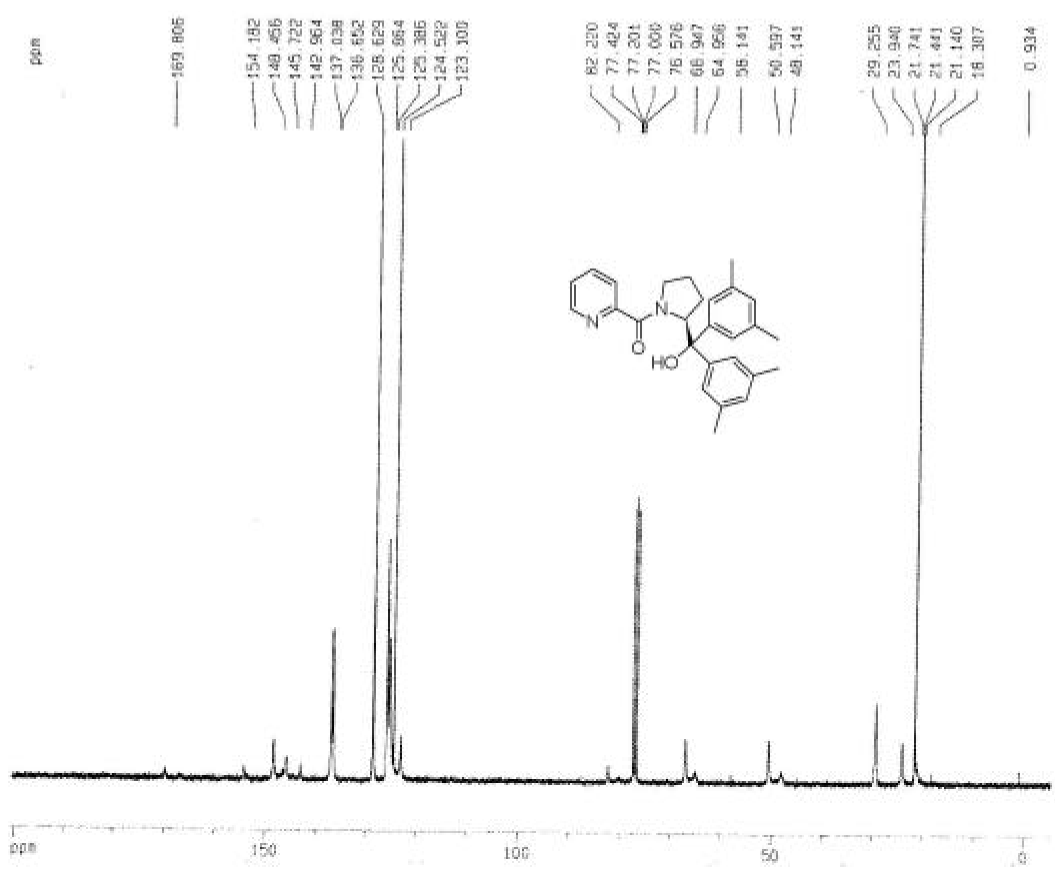
145.823
143.193
140.353
137.302
136.635
128.470
128.173
127.888
127.481
127.081
125.474
124.651
123.317
81.816
77.425
77.000
76.577
67.150
54.955
50.592
48.215
29.268
23.944
21.006
20.961
N
O
N
HO
ppm
150
100
50


ppm
8.56199
7.72093
7.49219
7.28963
7.26120
7.15879
7.09846
6.92621
5.41525
4.82397
3.48884
3.07567
2.30009
2.16458
2.08574
2.04159
1.58819
1.25801
1.23338
1.21004
1.18656
0.08389
+ D2O
Integral
1.000
2.020
1.154
3.209
2.795
0.995
0.313
1.009
0.685
14.339
1.052
1.191
ppm
8
6
4
2
0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148.456
145.722
142.964
137.038
136.652
128.629
125.864
125.386
124.522
123.100
82.220
77.424
77.201
77.000
76.576
66.947
64.956
56.141
50.597
48.141
29.255
23.940
21.741
21.441
21.140
18.307
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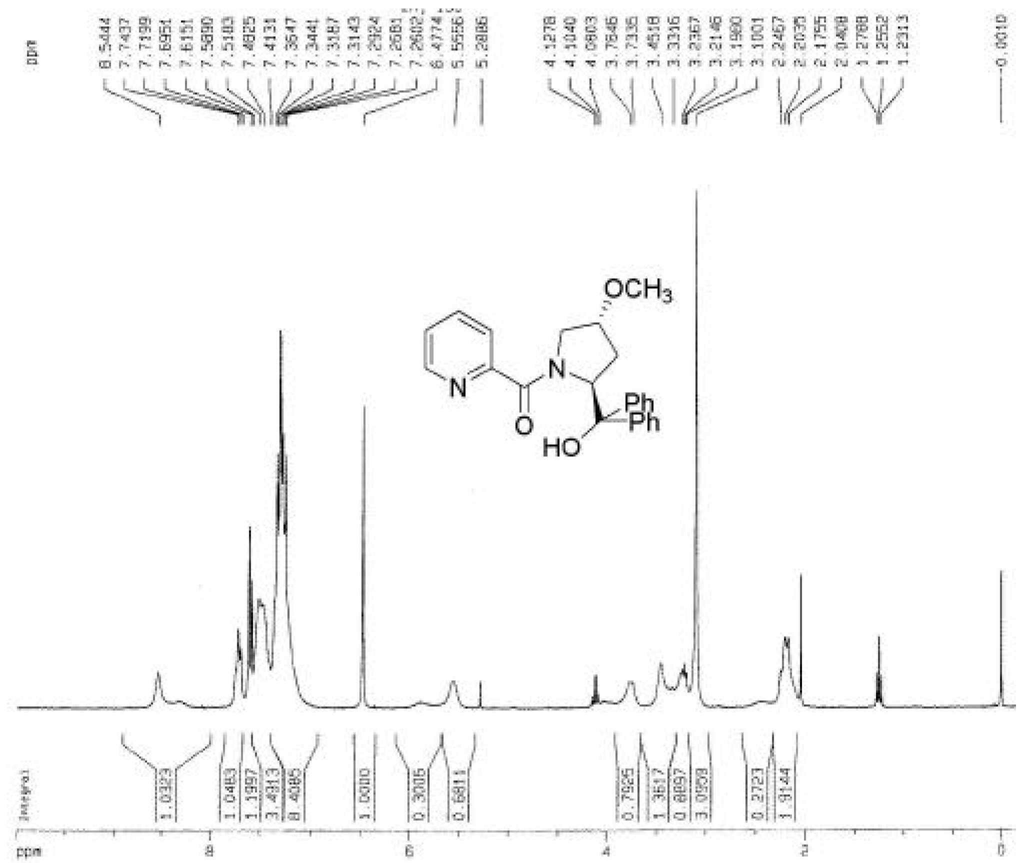
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N
N
O
Ph
Ph
HO
ppm
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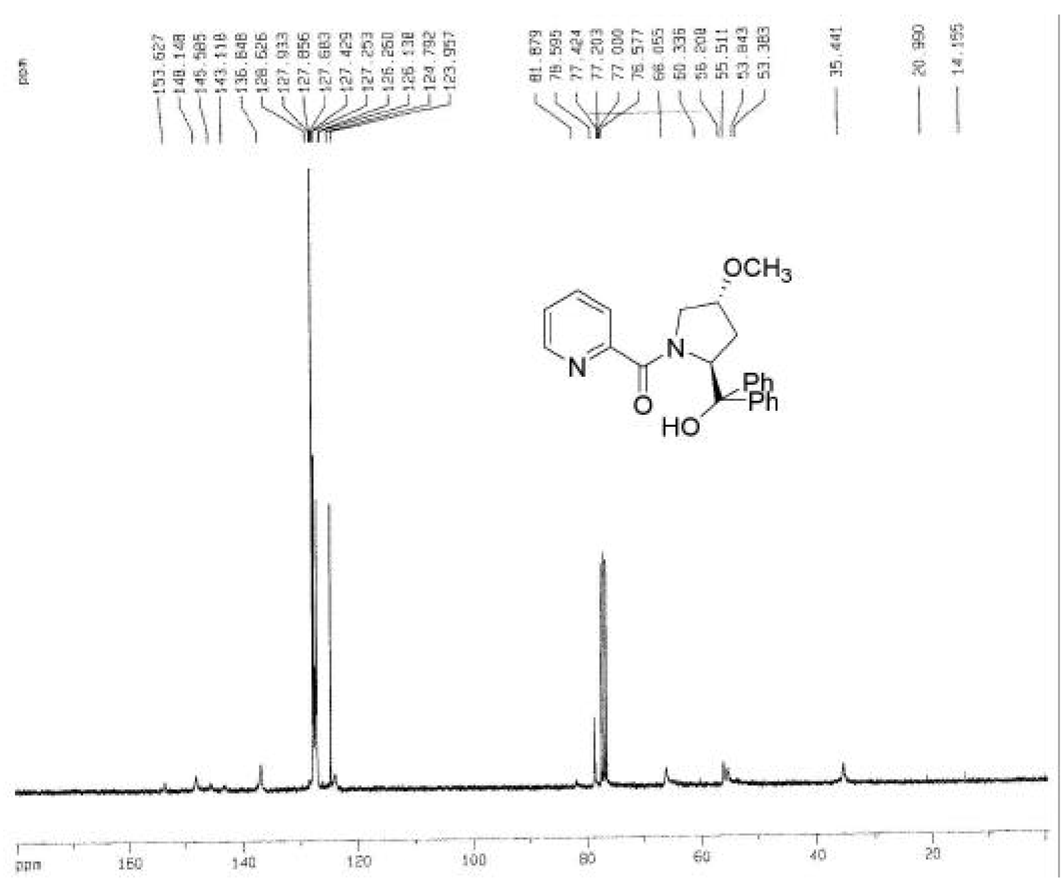
6
4
2
0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O
Ph
Ph
HO
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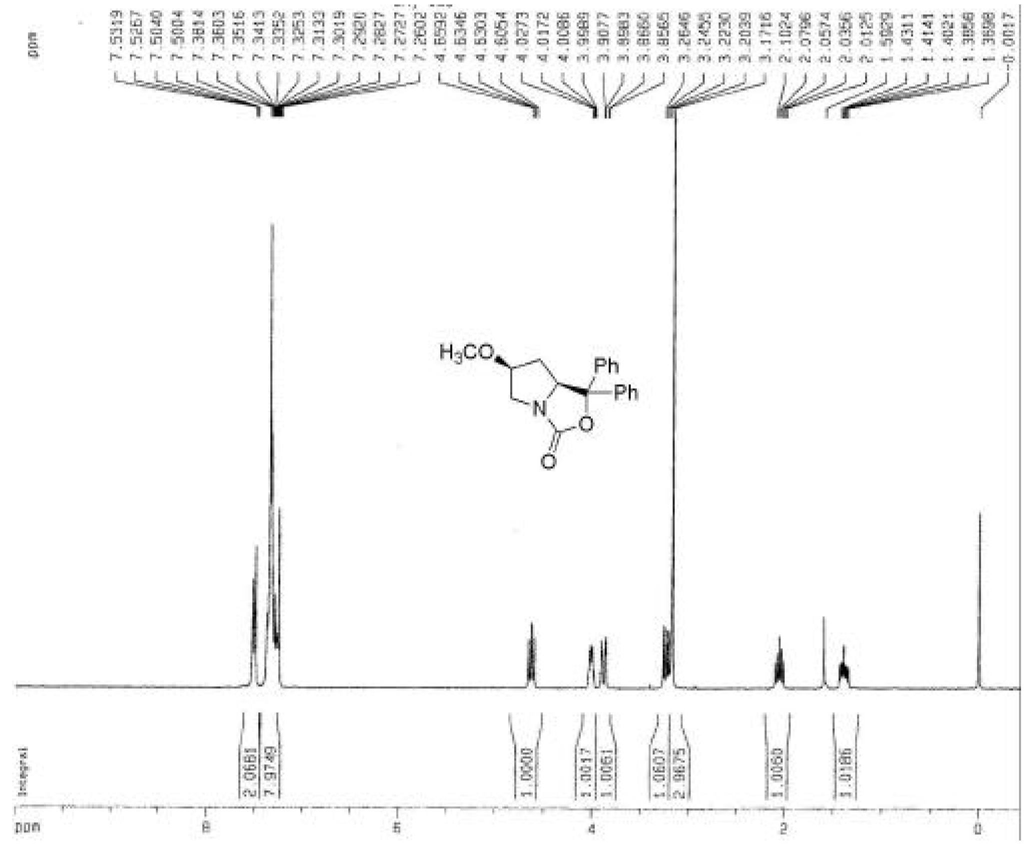
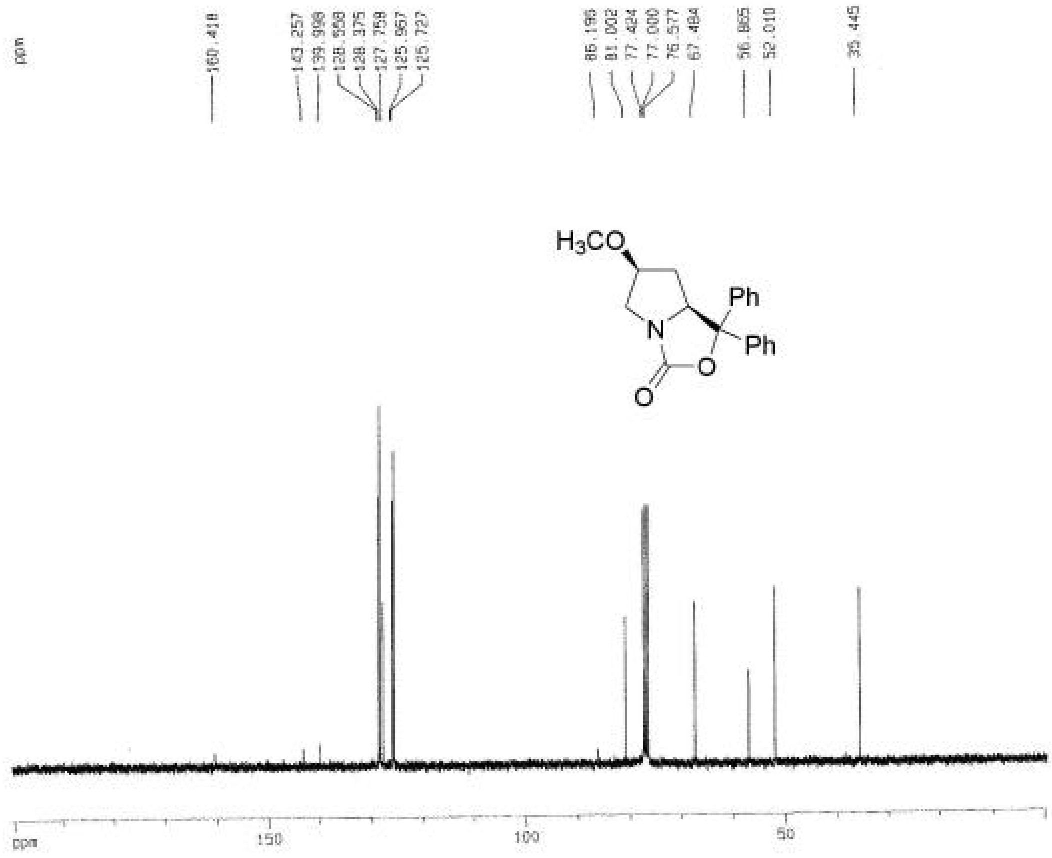
80
60
40
20



H3CO
Ph
Ph
N
O
O
ppm
Integral
8
6
4
2
0



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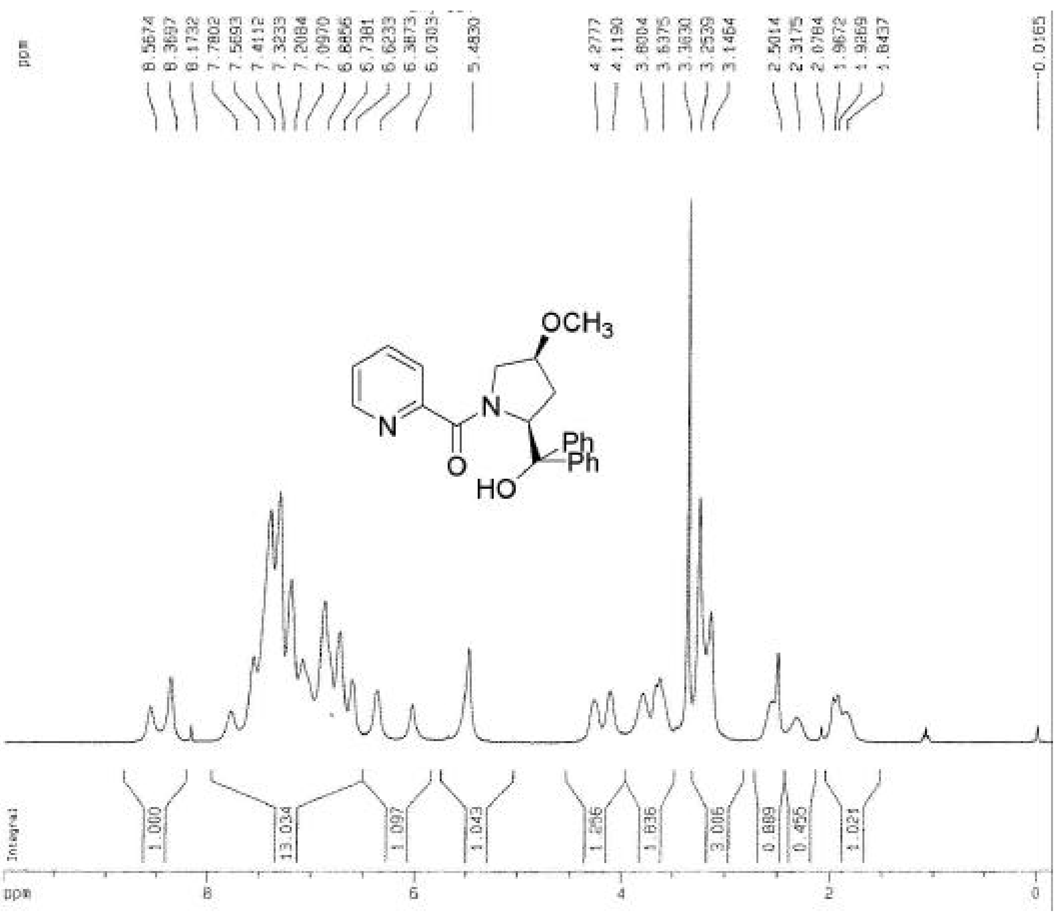
139.998
128.558
128.375
127.759
125.967
125.727
85.196
81.002
77.424
77.000
76.577
67.484
56.865
52.010
35.445
H3CO
Ph
Ph
N
O
O
150
100
50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8.1732
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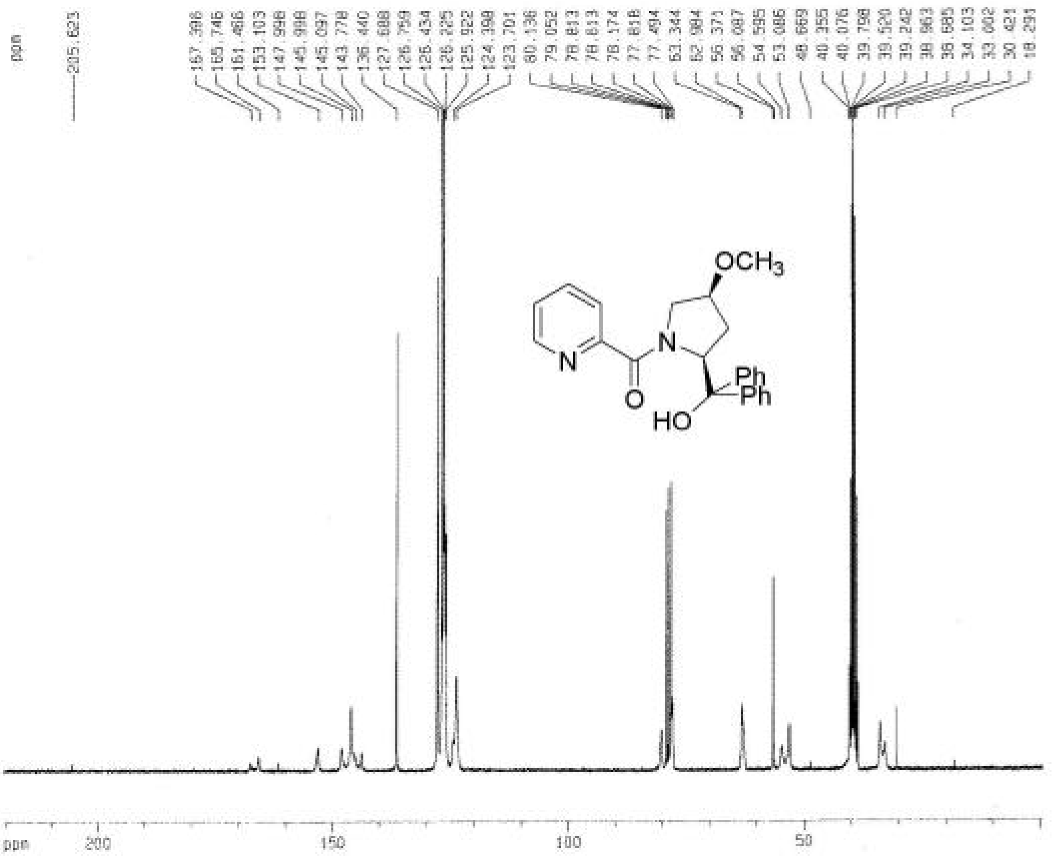
7.5693
7.4112
7.3233
7.2084
7.0970
6.8856
6.7381
6.6233
6.3873
6.0303
5.4830
4.2777
4.1190
3.8004
3.6375
3.3630
3.2539
3.1464
2.5014
2.3175
2.0784
1.9672
1.9269
1.8437
-0.0165
OCH3
N
N
O
HO
Ph
Ph
Integral
1.000
13.034
1.097
1.043
1.256
1.636
3.006
0.889
0.455
1.021
ppm
8
6
4
2
0


ppm
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165.746
161.466
153.103
147.998
145.097
143.778
136.440
127.688
126.759
126.434
126.225
125.922
124.398
123.701
80.136
79.052
78.813
78.613
78.174
77.818
77.494
63.344
62.984
56.371
56.087
54.595
53.086
48.669
40.355
40.076
39.798
39.520
39.242
38.963
38.685
34.103
33.662
30.421
18.291
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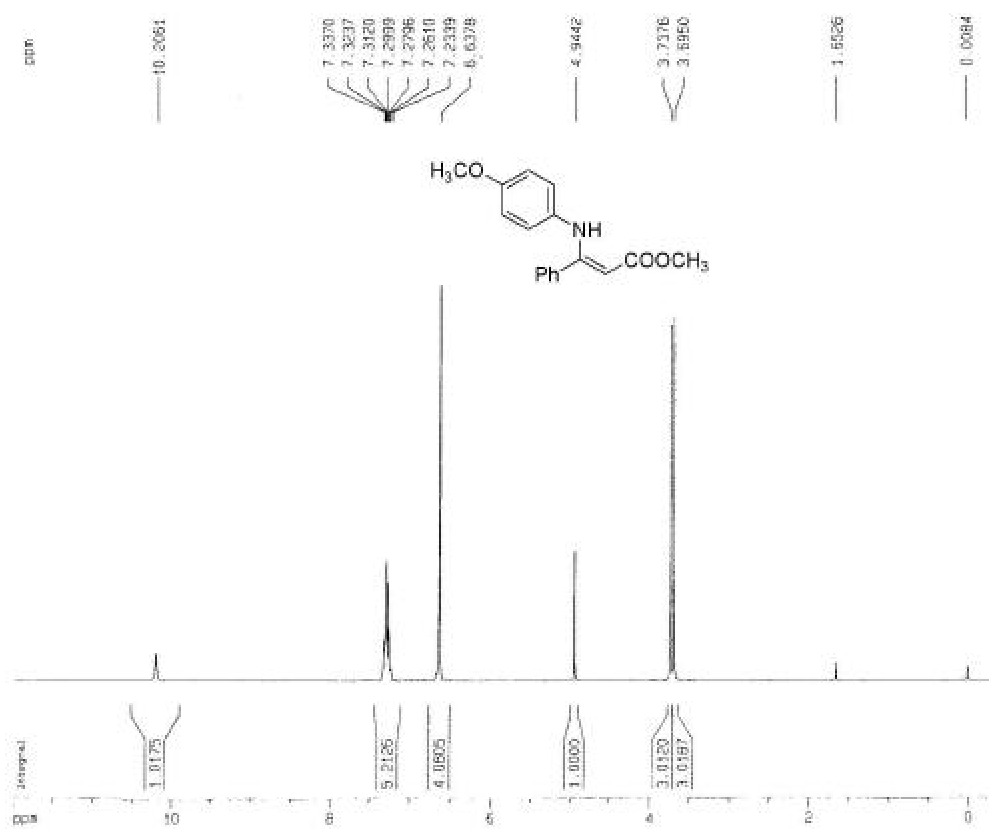
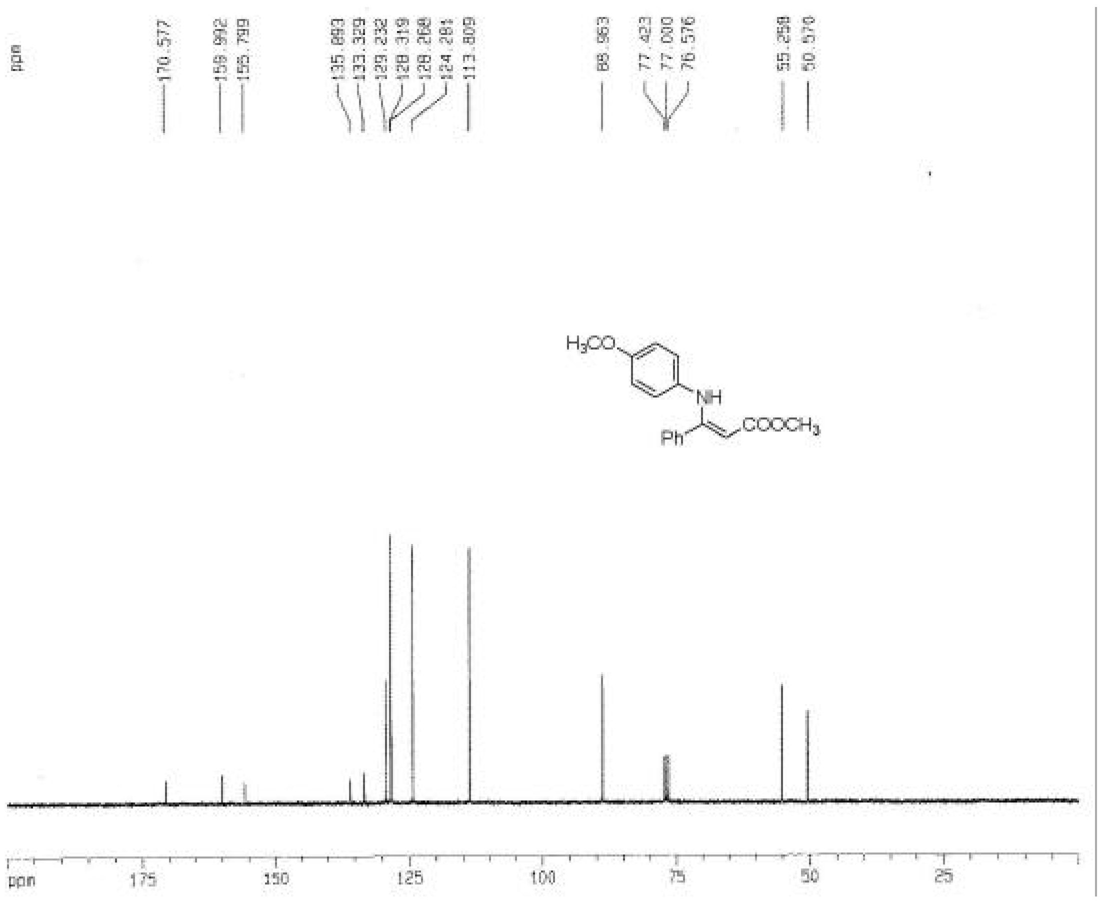
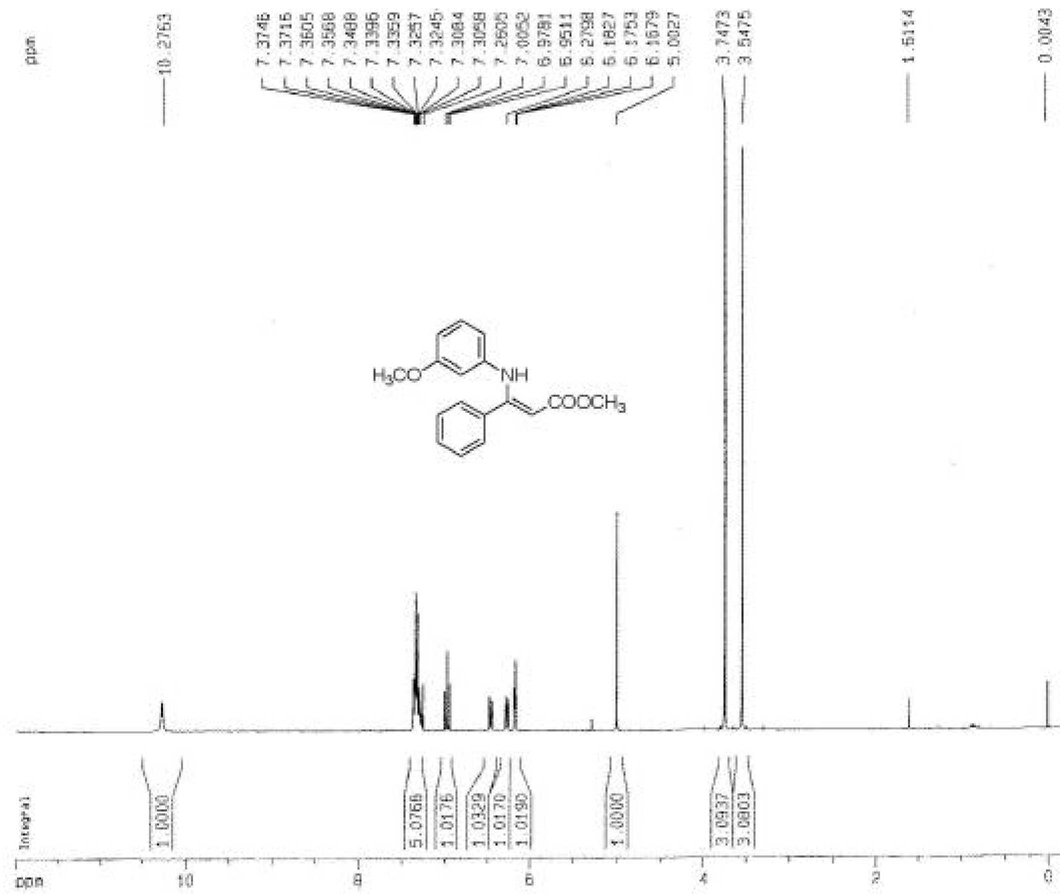
N
N
O
HO
Ph
Ph
ppm
200
150
100
50


ppm
10.2061
7.3370
7.3237
7.3120
7.2999
7.2796
7.2610
7.2339
6.6378
4.9442
3.7376
3.6950
1.6526
0.0084
H3CO
NH
COOCH3
Ph
Integral
1.0175
5.2126
4.0805
1.0000
3.0320
3.0187
ppm
10
8
6
4
2
0


ppm
170.577
158.992
155.799
135.893
133.329
129.232
128.319
128.268
124.281
113.809
88.963
77.423
77.000
76.576
55.258
50.570
H3CO
NH
COOCH3
Ph
ppm
175
150
125
100
75
50
25



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10.2763
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7.3716
7.3605
7.3568
7.3488
7.3396
7.3359
7.3257
7.3245
7.3084
7.3058
7.2605
7.0052
6.9781
6.9511
6.2798
6.1827
6.1753
6.1679
5.0027
3.7473
3.5475
1.5114
0.0043
H3CO
NH
COOCH3
Integral
1.0000
5.0768
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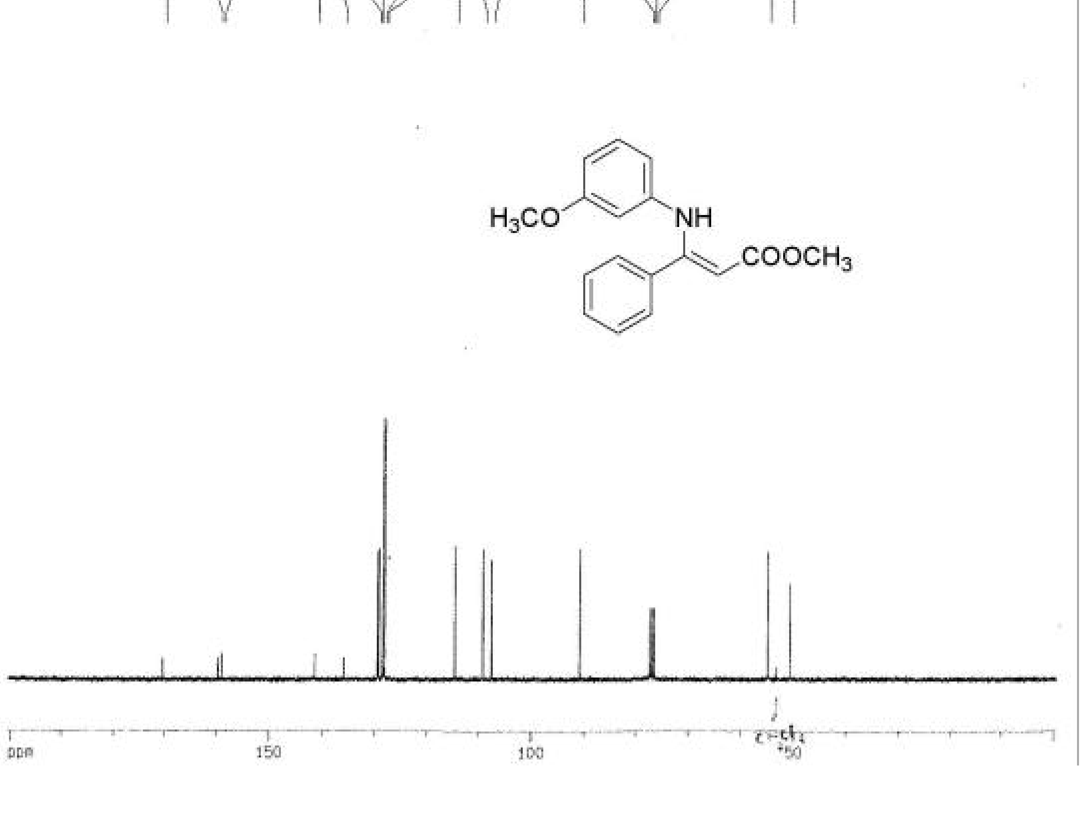
1.0329
1.0170
1.0190
1.0000
3.0937
3.0803
ppm
10
8
6
4
2
0



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159.022
141.438
136.008
129.465
129.266
128.450
128.118
114.461
109.101
107.489
90.804
77.424
77.000
76.577
54.955
50.708
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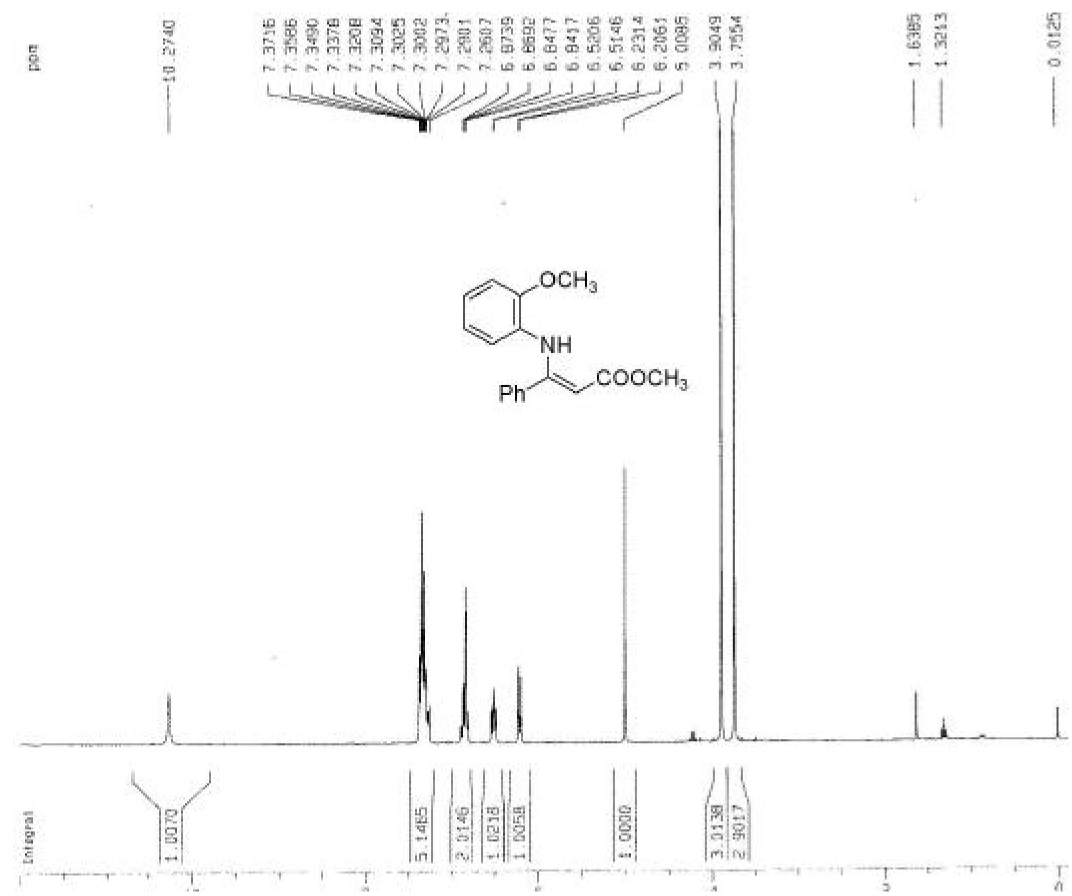
NH
COOCH3
ppm
150
100
50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7.3490
7.3378
7.3208
7.3094
7.3025
7.3002
7.2973
7.2801
7.2607
6.8739
6.8692
6.8477
6.8417
6.5206
6.5146
6.2314
6.2061
5.0085
3.9049
3.7554
1.6385
1.3213
0.0125
OCH3
NH
COOCH3
Ph
Integral
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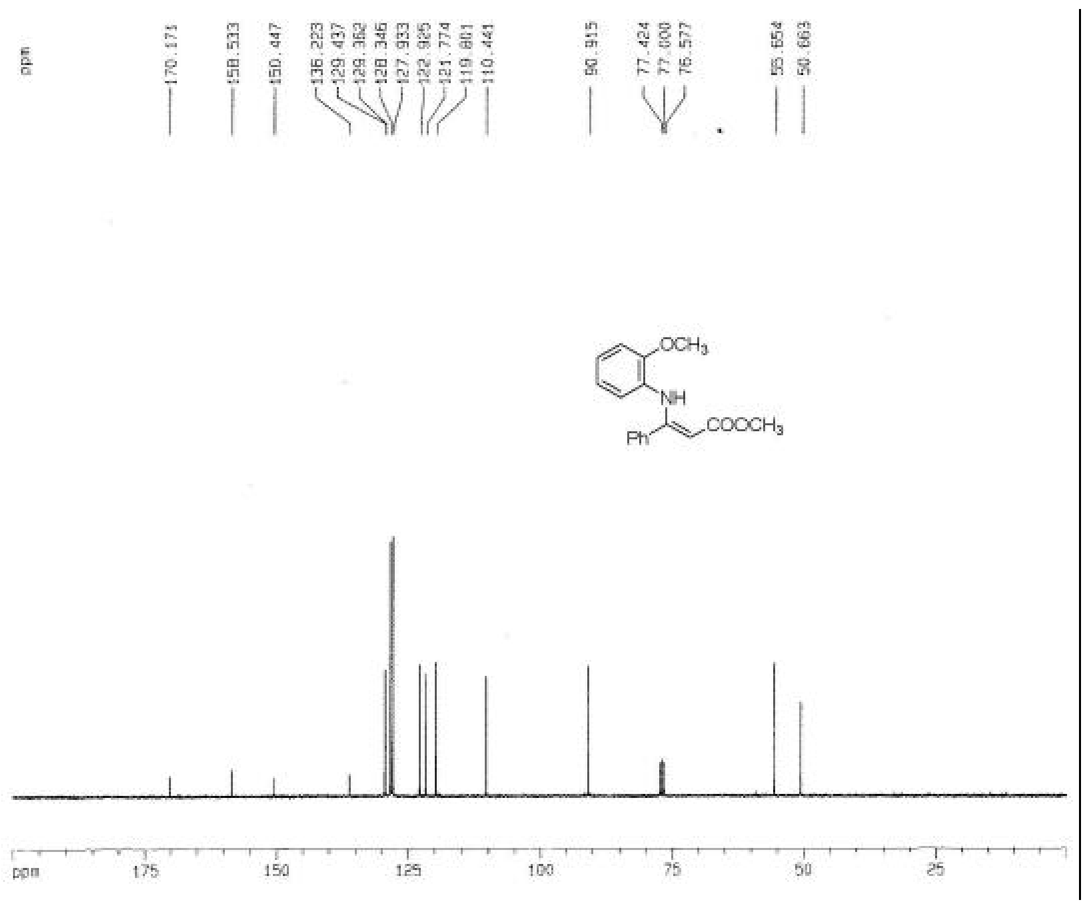
5.1465
2.0146
1.0218
1.0058
1.0000
3.0138
2.9017


ppm
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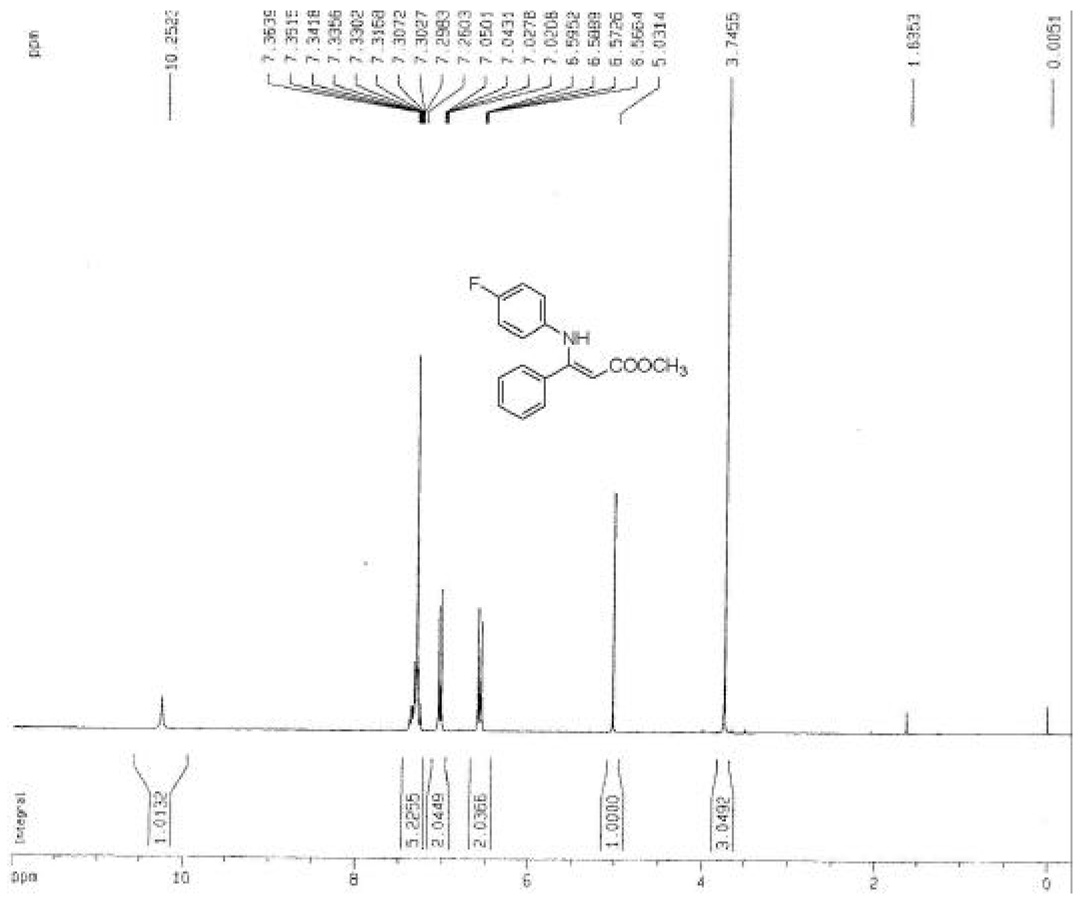
128.346
127.933
122.925
121.774
119.801
110.441
90.915
77.424
77.000
76.577
55.654
50.663
OCH3
NH
COOCH3
Ph
ppm
175
150
125
100
75
50
25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7.3168
7.3072
7.3027
7.2983
7.2603
7.0501
7.0431
7.0278
7.0208
6.5952
6.5889
6.5726
6.5664
5.0314
3.7455
1.6353
0.0051
F
NH
COOCH3
Integral
1.0132
5.2255
2.0449
2.0366
1.0000
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ppm
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6
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2
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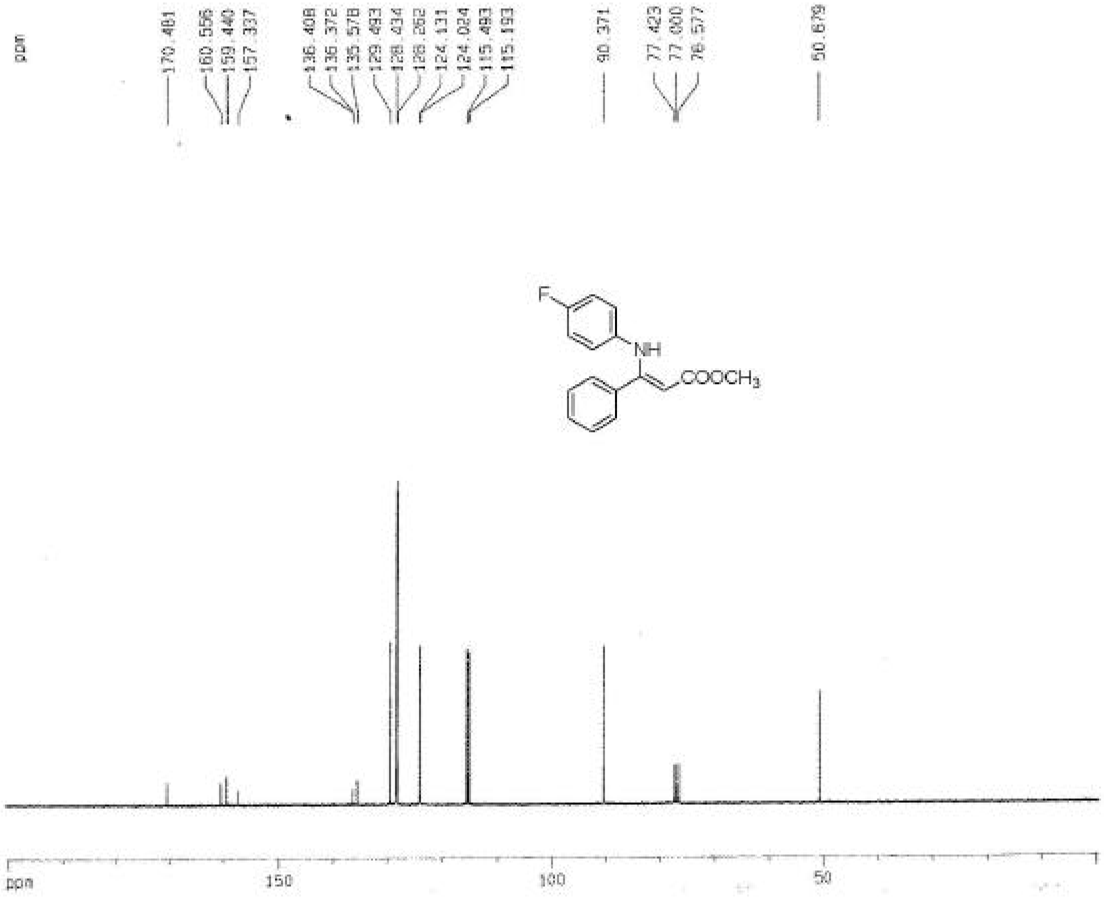
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129.493
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128.262
124.131
124.024
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90.371
77.423
77.000
76.577
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F
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ppm
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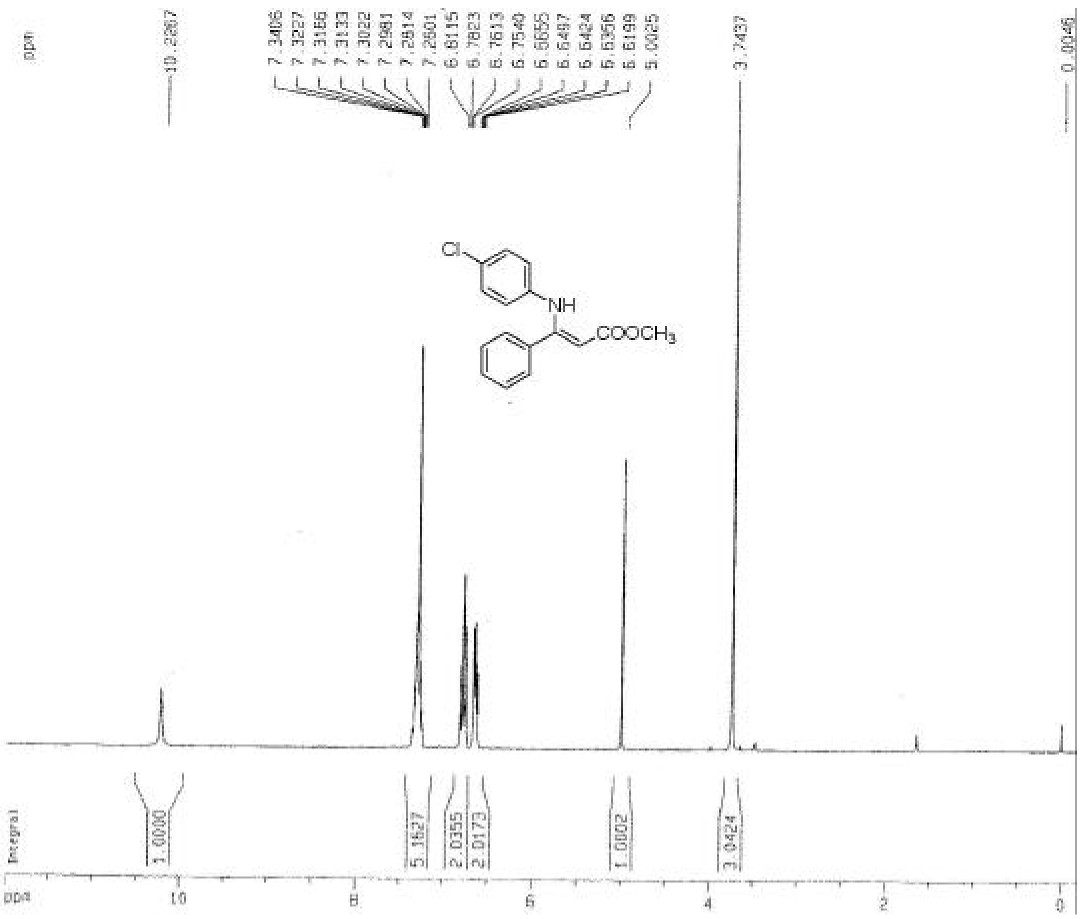
100
50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7.2814
7.2601
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6.7823
6.7613
6.7540
6.6655
6.6497
6.6424
6.6356
6.6199
5.0025
3.7437
0.0046
NH
Cl
COOCH3
Integral
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ppm
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8
6
4
2
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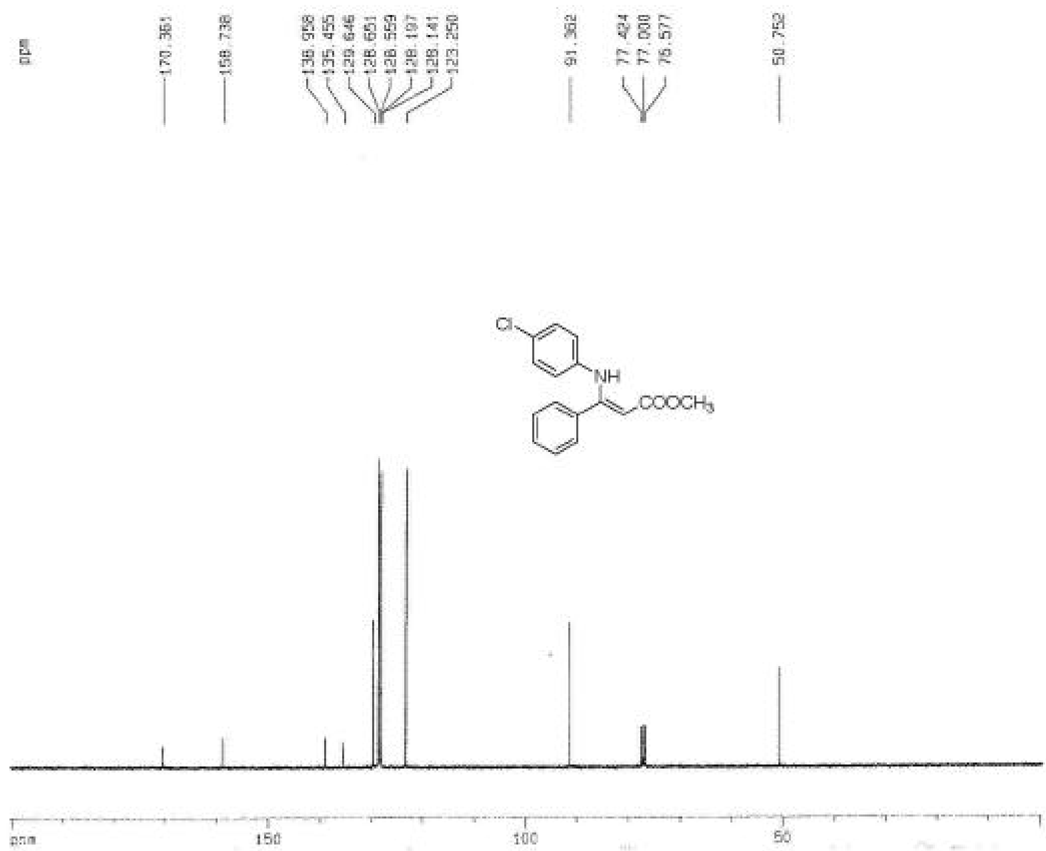
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128.559
128.197
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77.424
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Cl
NH
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ppm
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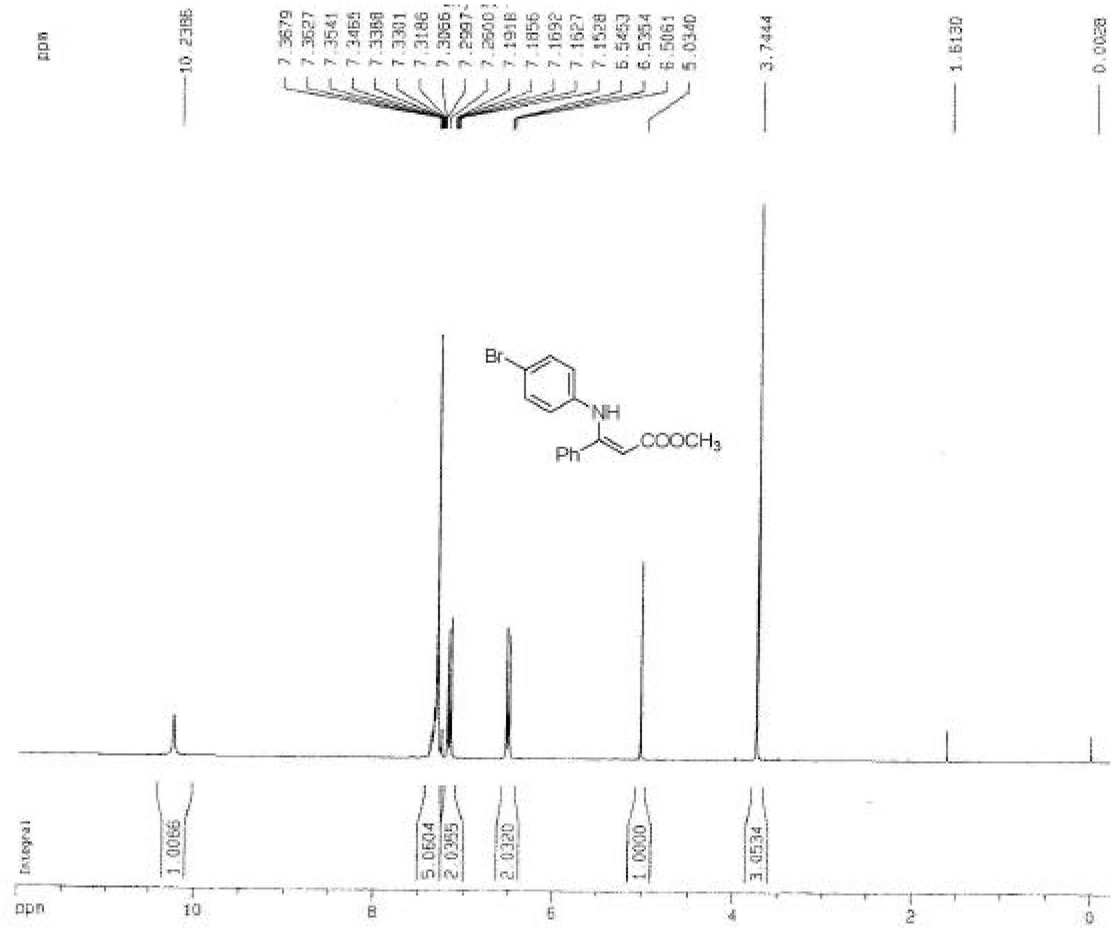
100
50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7.3388
7.3301
7.3186
7.3066
7.2997
7.2600
7.1918
7.1856
7.1692
7.1627
7.1528
6.5453
6.5354
6.5061
5.0340
3.7444
1.6130
0.0028
Br
NH
Ph
COOCH3
Integral
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5.0604
2.0355
2.0320
1.0000
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ppm
10
8
6
4
2
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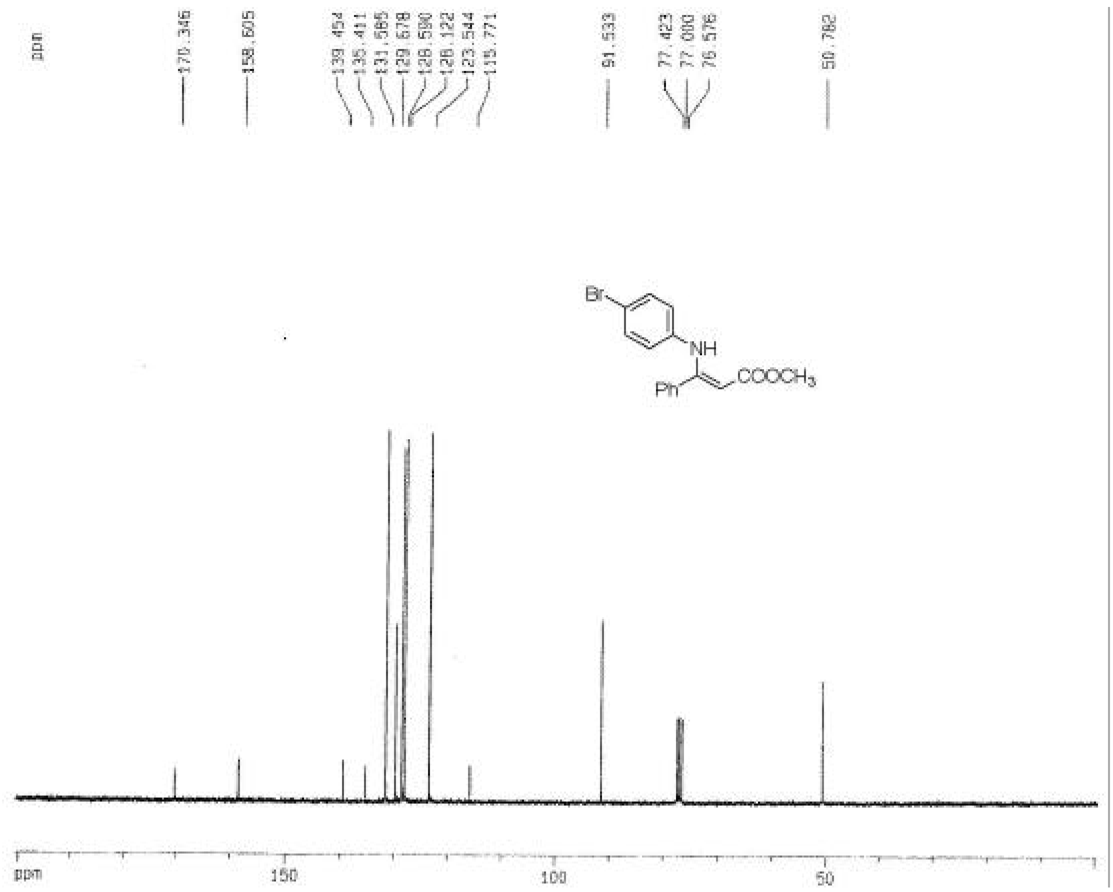
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77.000
76.576
50.782
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NH
Ph
COOCH3
ppm
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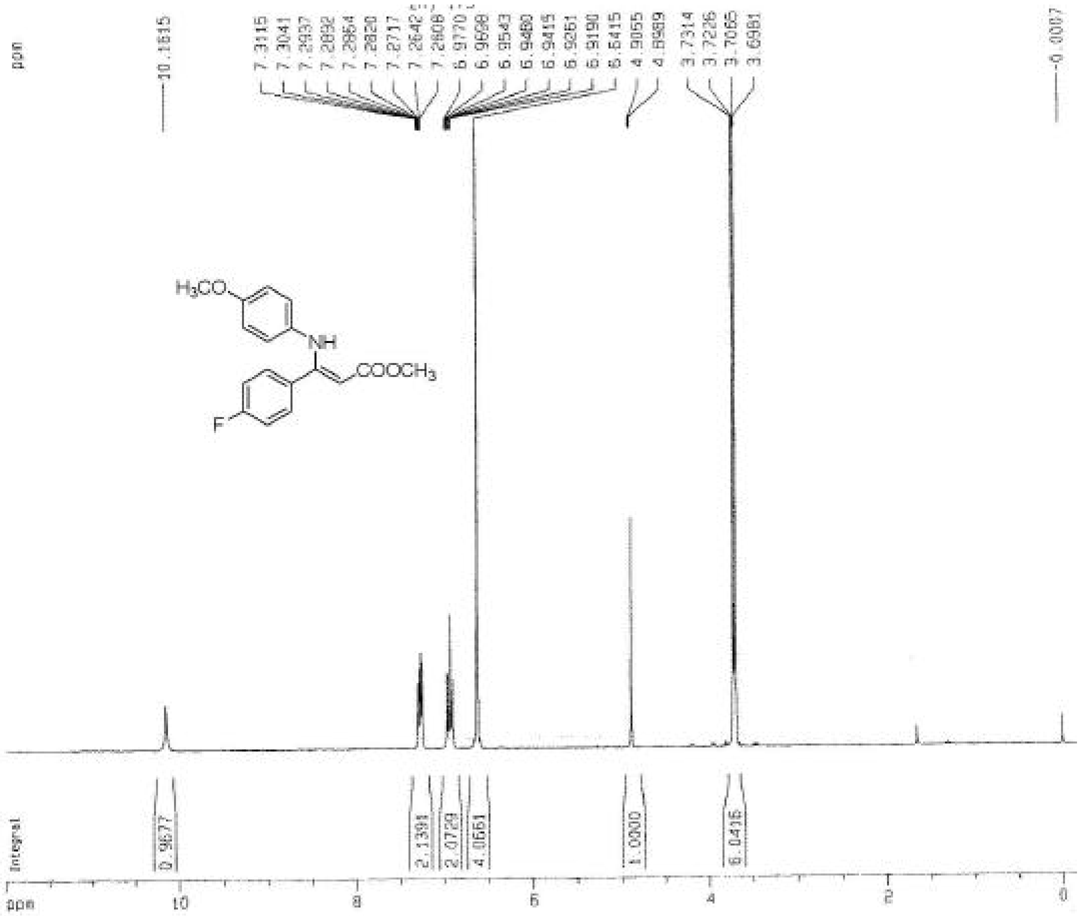
100
50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6.9770
6.9698
6.9543
6.9480
6.9415
6.9261
6.9190
6.6415
4.9055
4.8989
3.7314
3.7226
3.7065
3.6981
-0.0007
H_3CO
NH
$COOCH_3$
F
Integral
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6
4
2
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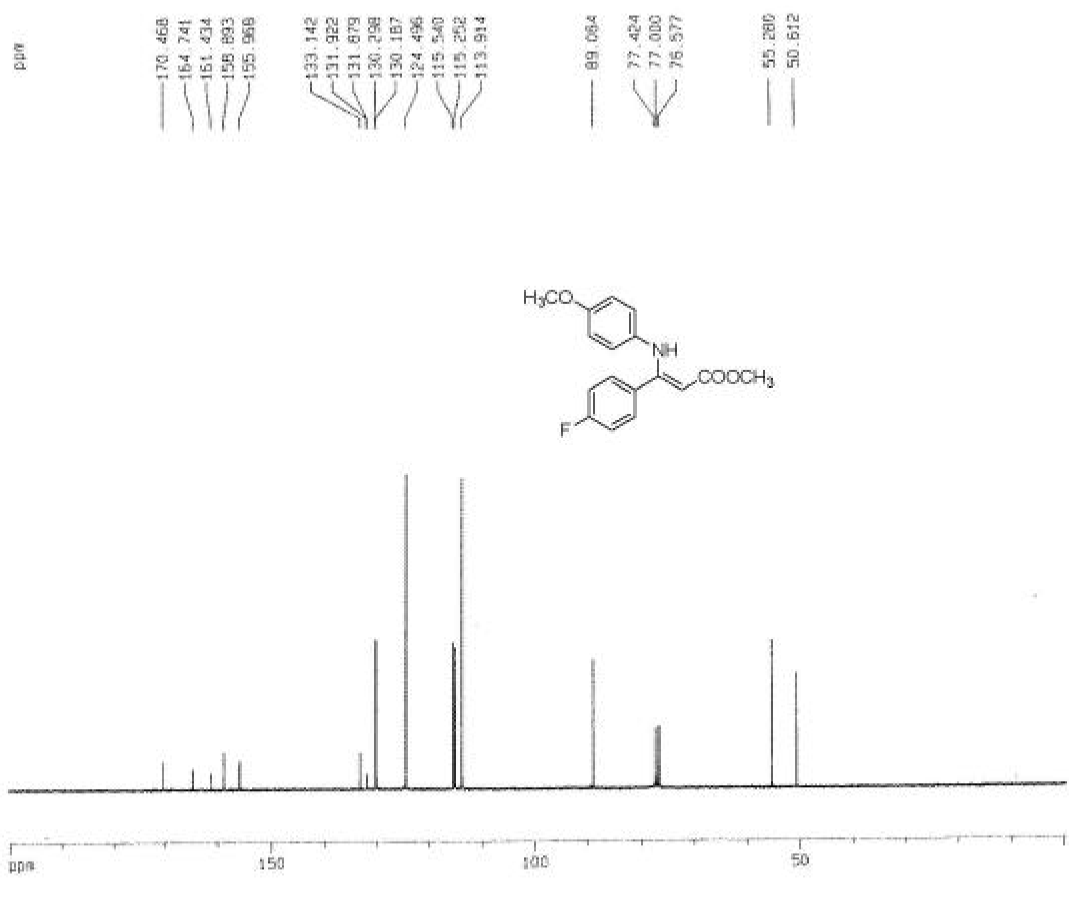
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130.187
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115.252
113.914
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76.577
55.280
50.612
H_3CO
NH
$COOCH_3$
F
ppm
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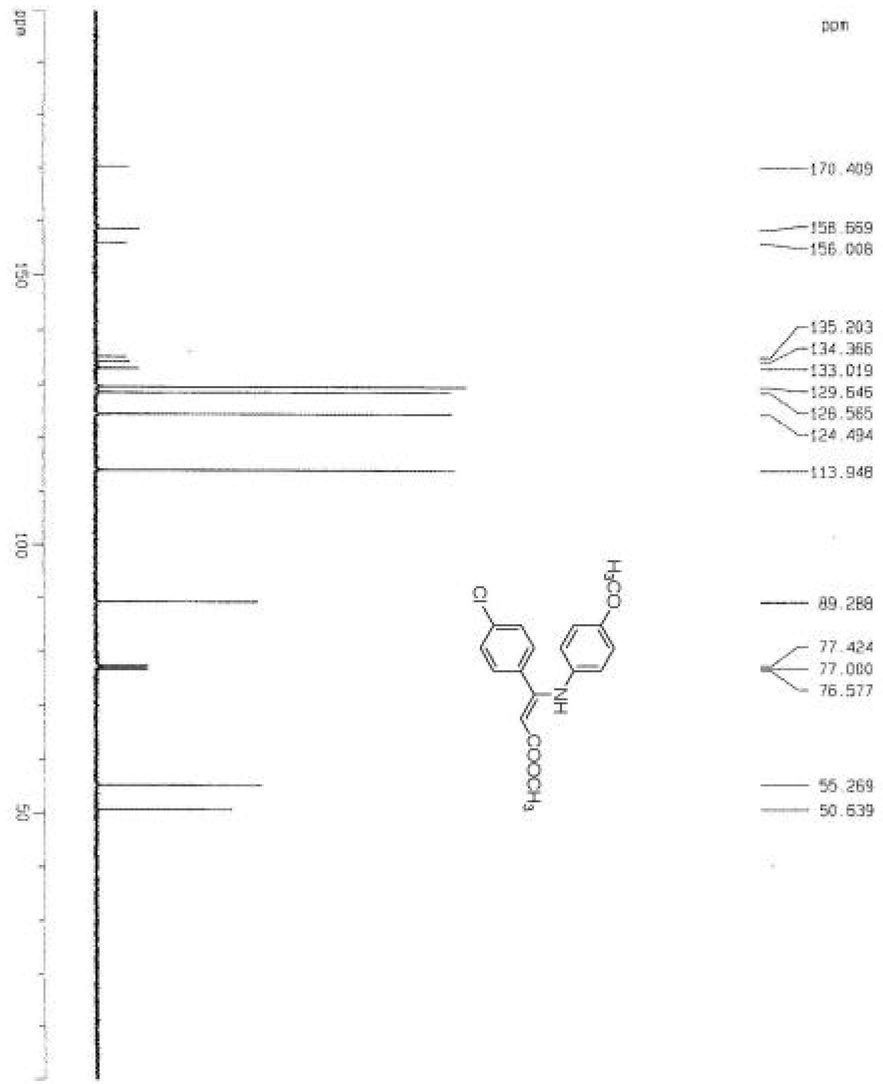
100
50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124.494
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76.577
55.269
50.639
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NH
$COOCH_3$
Cl
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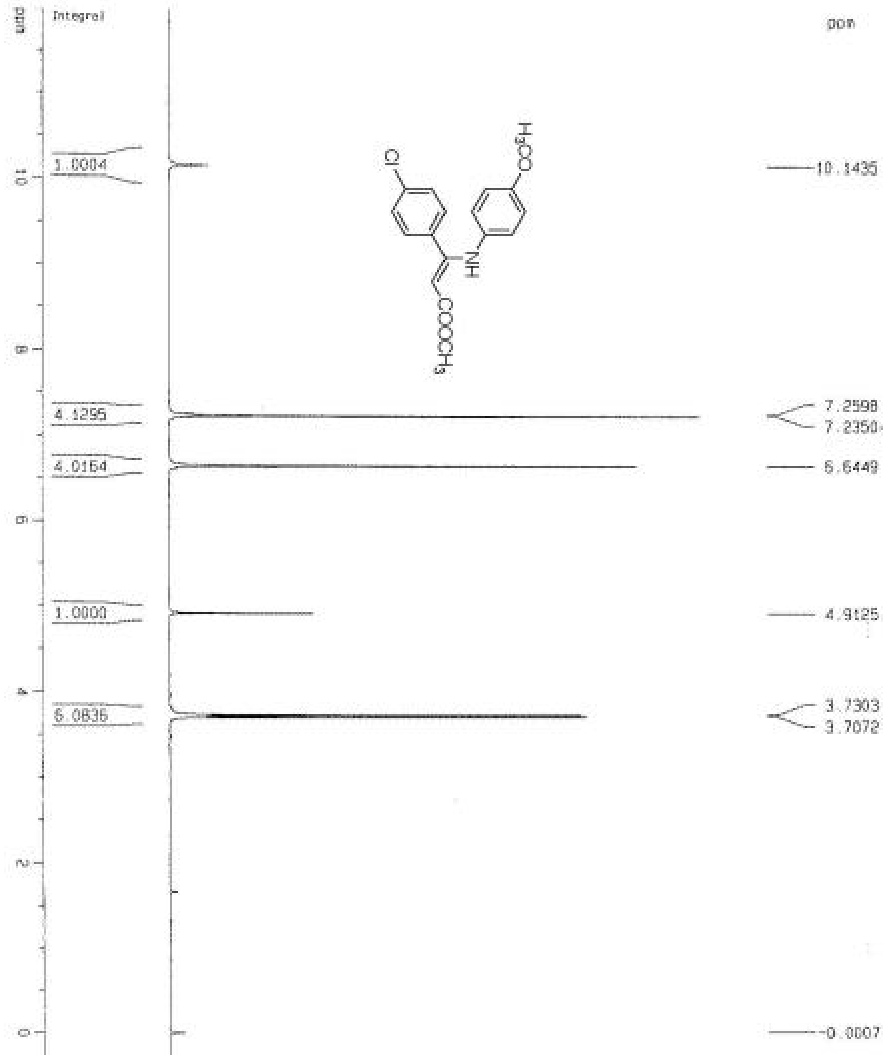
100
50
ppm

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H_3CO
NH
$COOCH_3$
Cl
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6
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2
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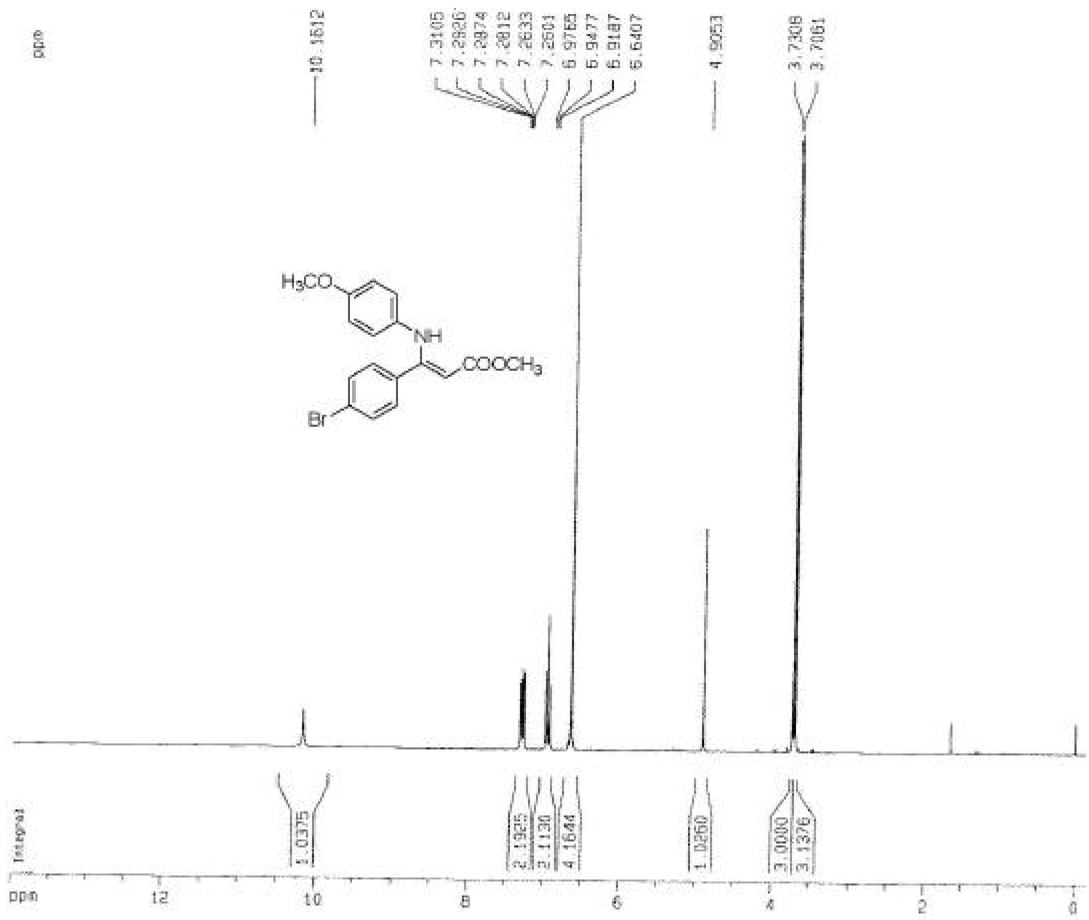
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6.9477
6.9187
6.6407
4.9053
3.7306
3.7061
H3CO
NH
COOCH3
Br
Integral
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2.1925
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4.1644
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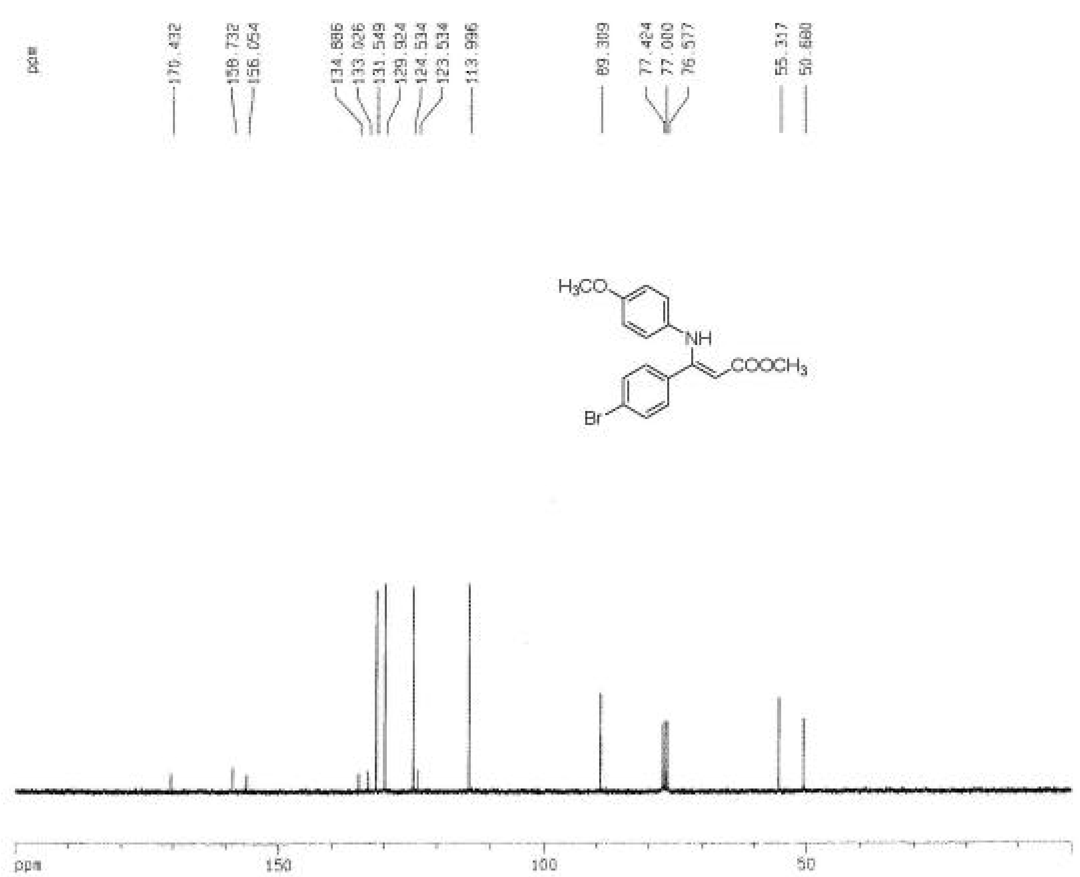
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77.000
76.577
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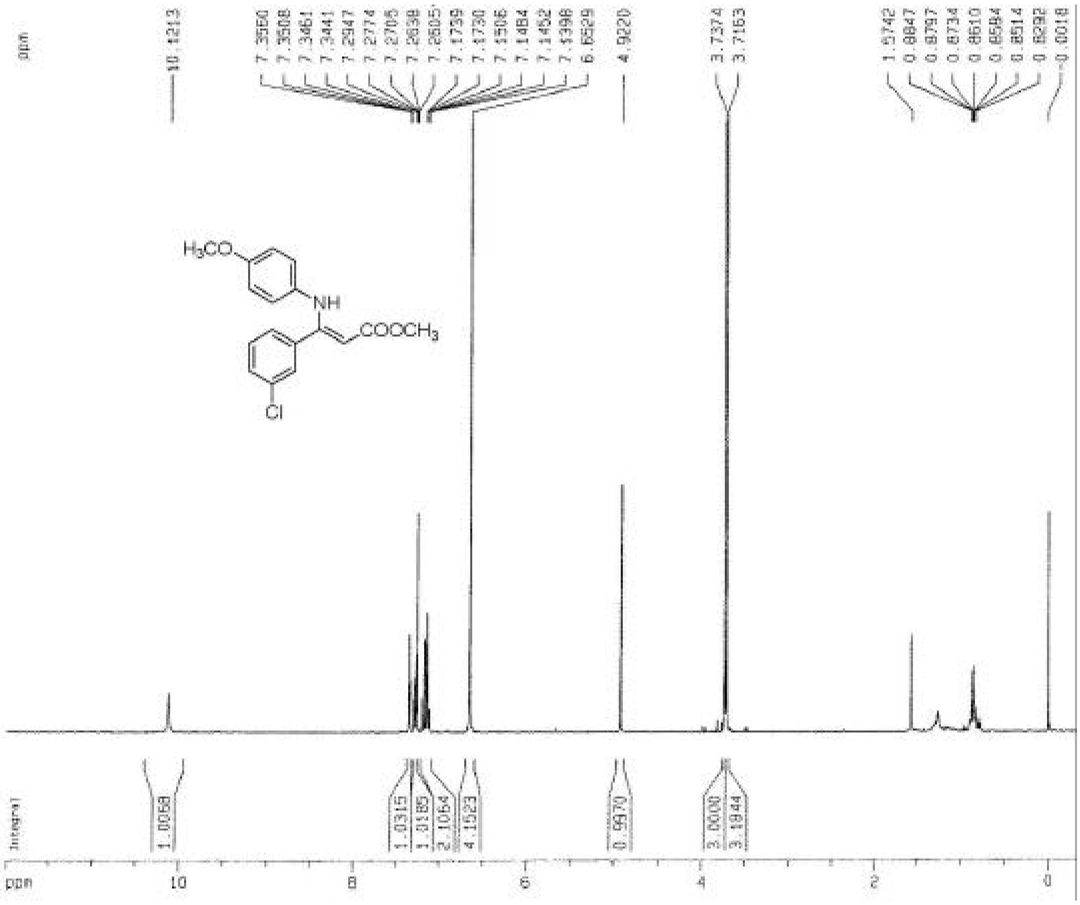
COOCH3
Br
ppm 150 100 50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7.2638
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7.1739
7.1730
7.1506
7.1484
7.1452
7.1398
6.6529
4.9220
3.7374
3.7163
1.5742
0.8847
0.8797
0.8734
0.8610
0.8584
0.8514
0.8292
0.0018
H3CO
NH
COOCH3
Cl
Integral
1.0068
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2.1064
4.1523
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6
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2
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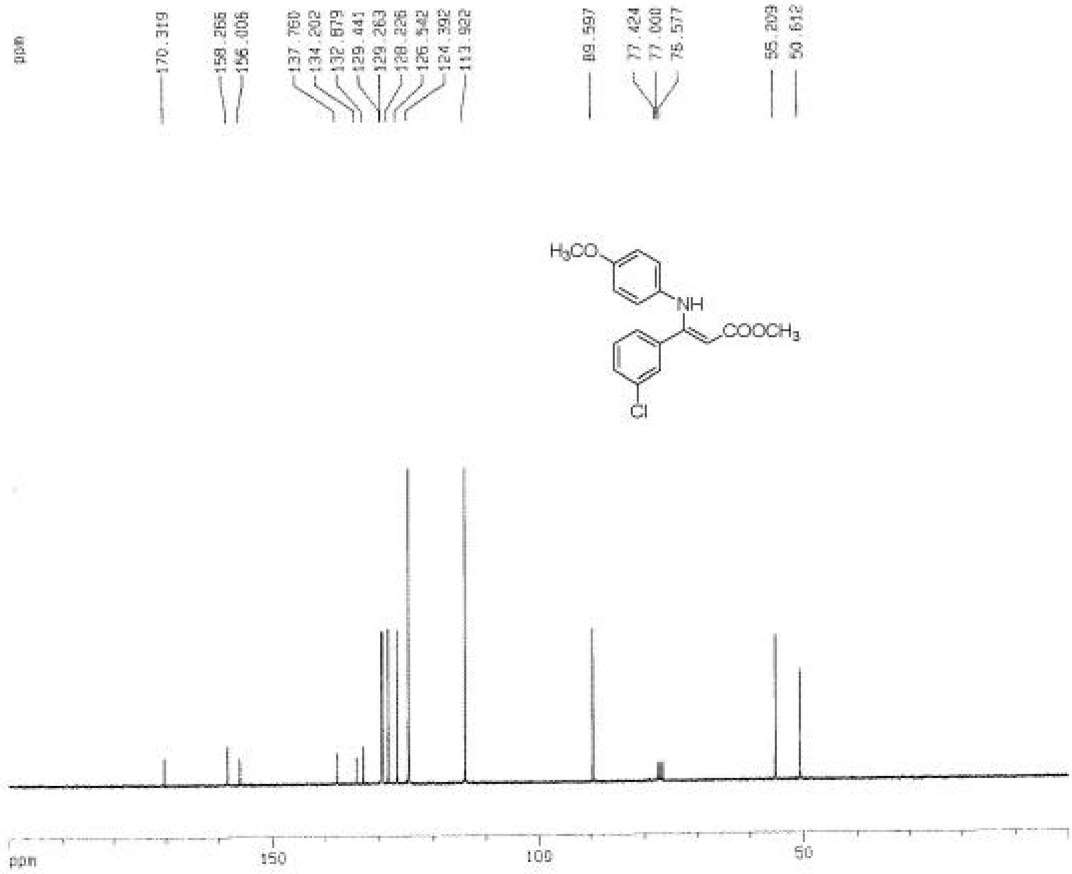
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129.441
129.263
128.226
126.542
124.392
113.922
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77.000
76.577
55.209
50.612
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NH
COOCH3
Cl
ppm
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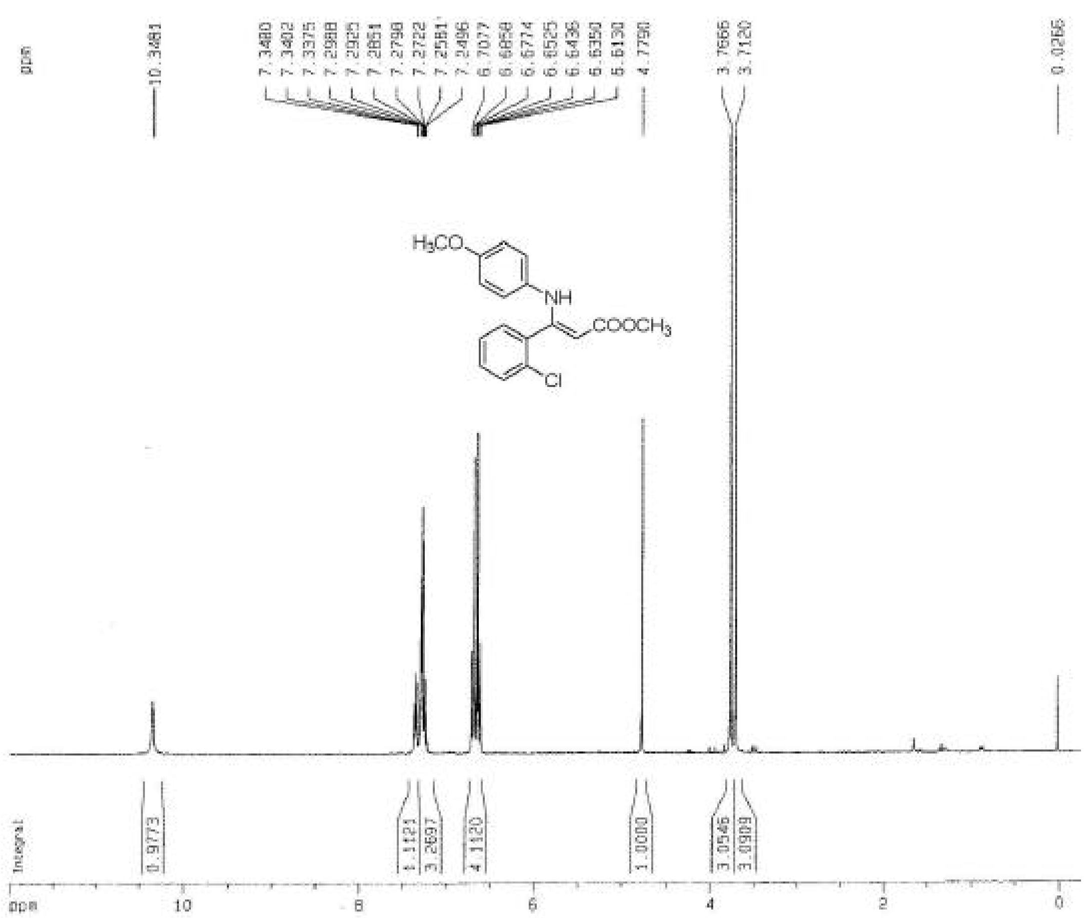
100
50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7.2988
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7.2722
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7.2496
6.7077
6.6858
6.6774
6.6525
6.6436
6.6350
6.6130
4.7790
3.7666
3.7120
0.0266
H3CO
NH
COOCH3
Cl
Integral
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3.2697
4.1120
1.0000
3.0546
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8
6
4
2
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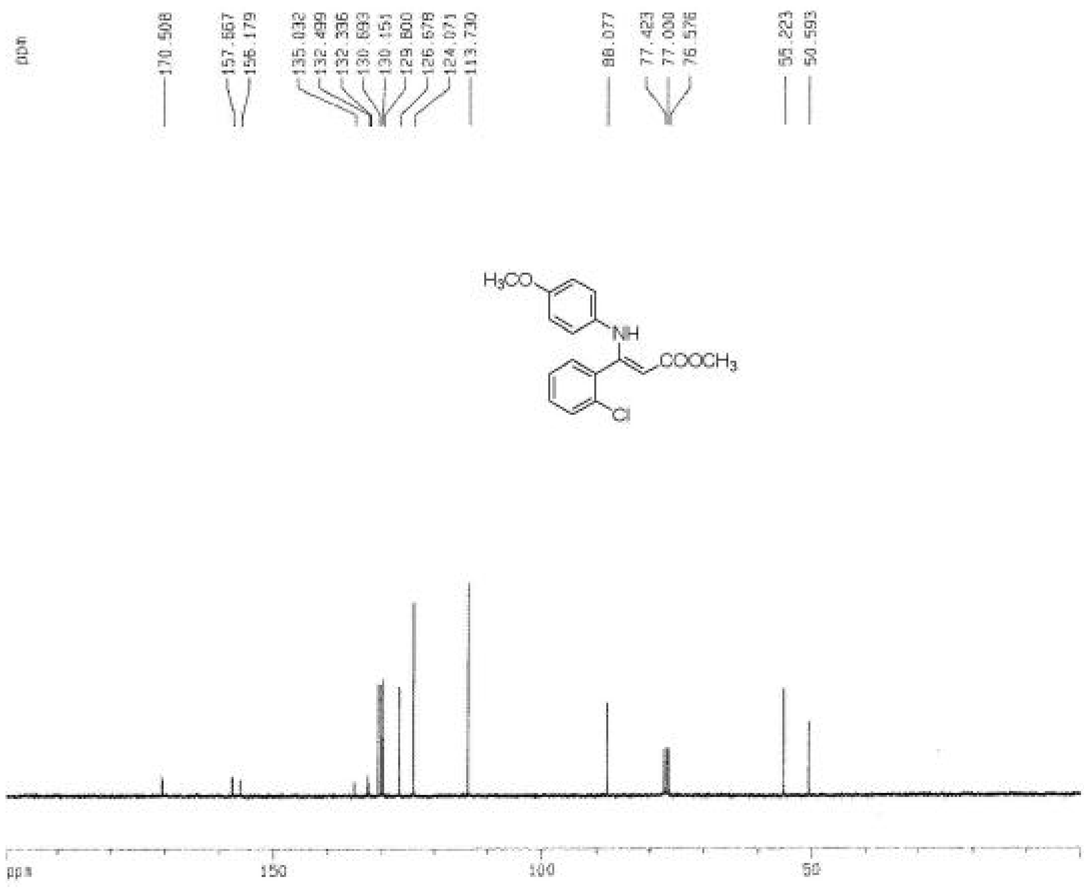
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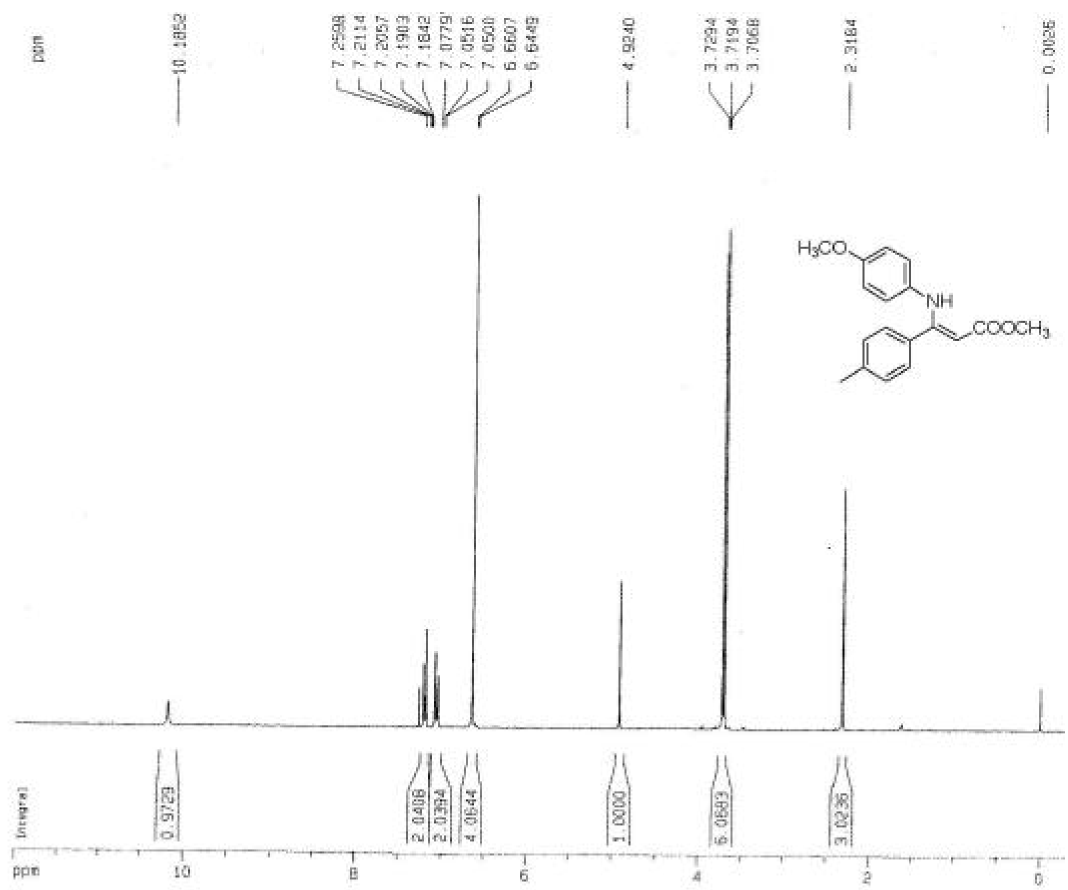
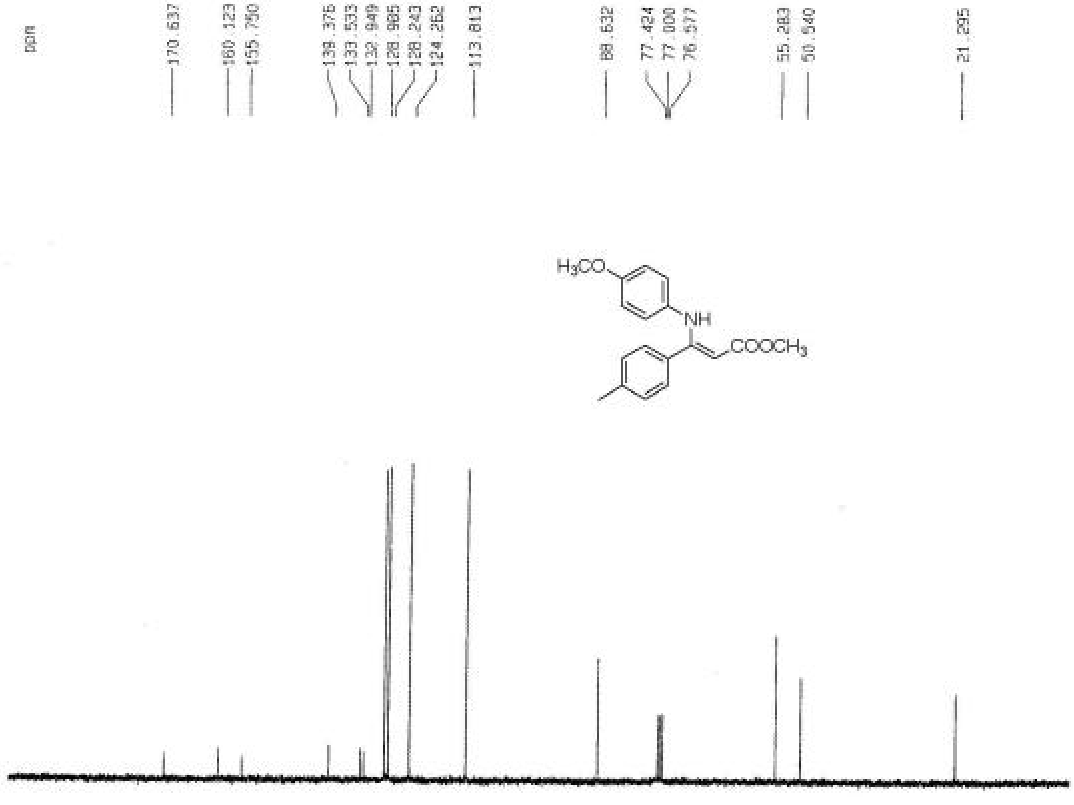
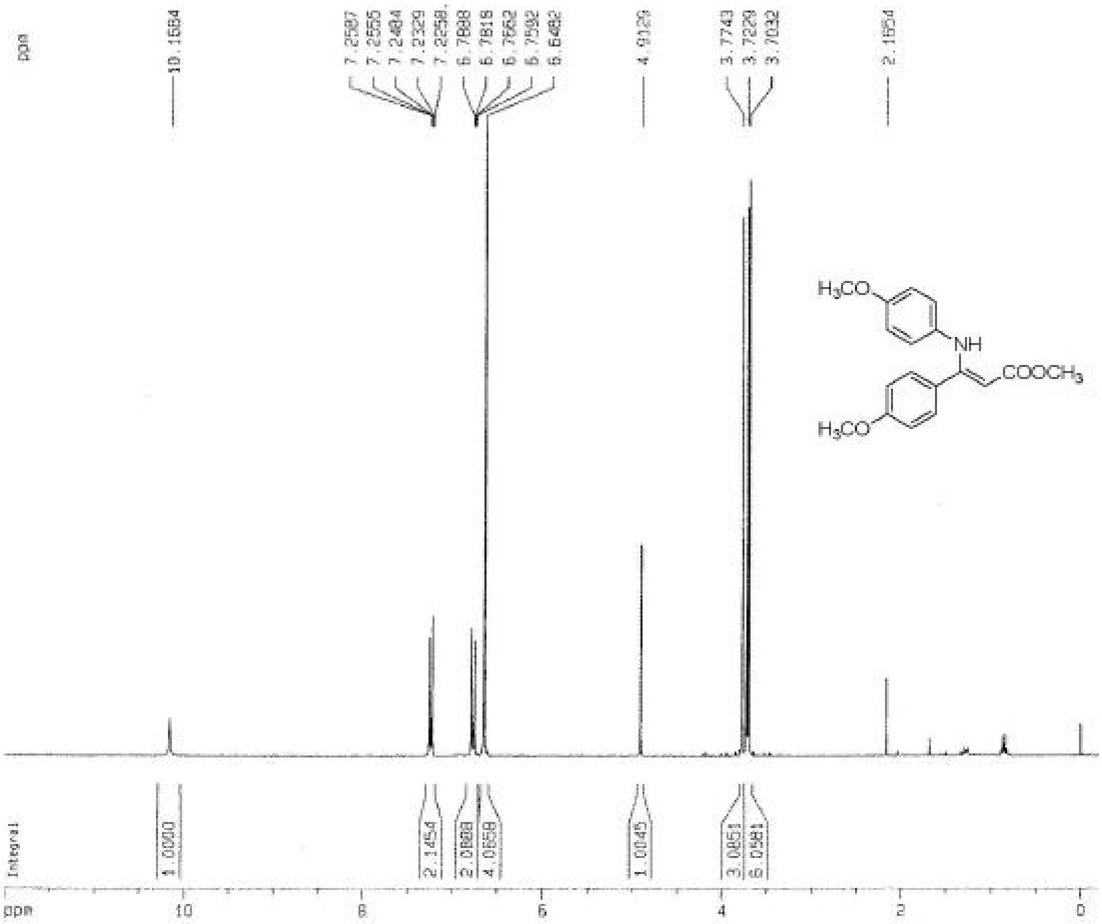
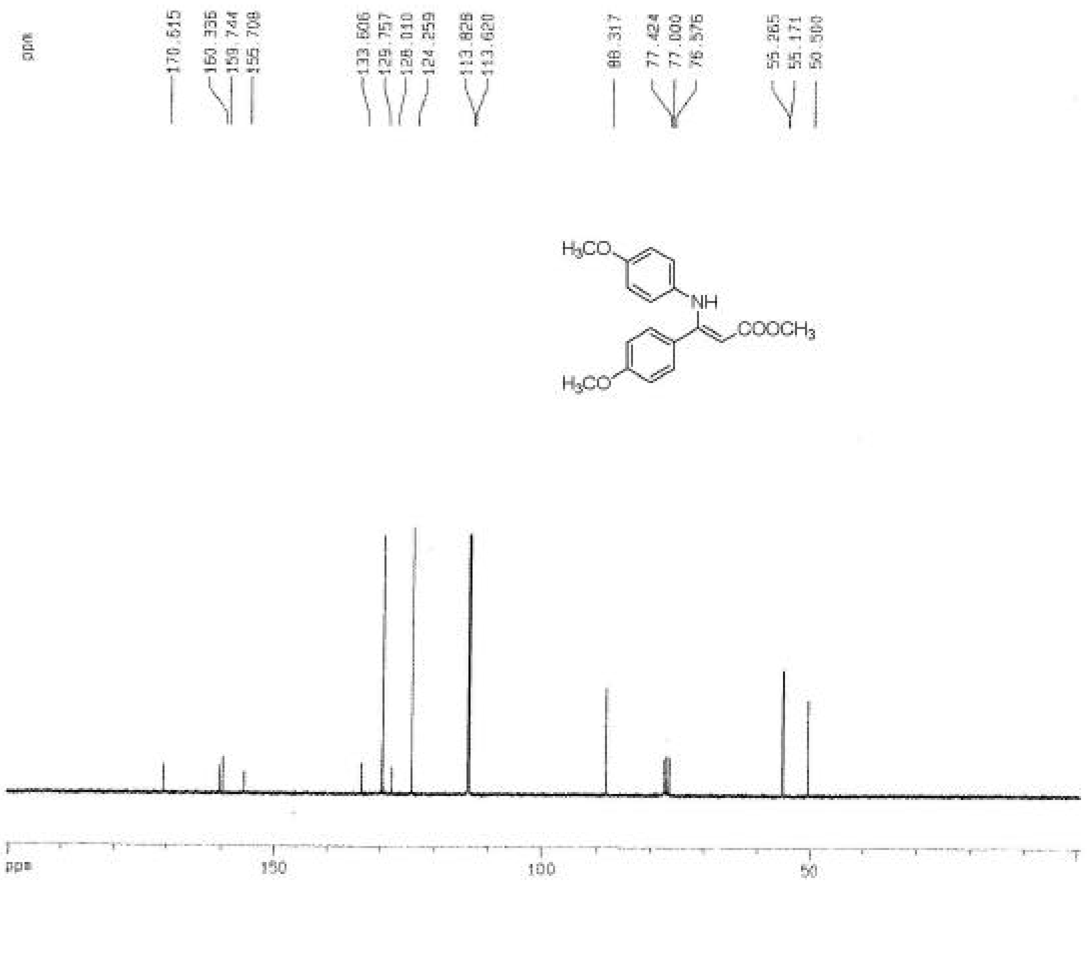
126.678
124.071
113.730
88.077
77.423
77.000
76.576
55.223
50.593
H3CO
NH
COOCH3
Cl
ppm
150
100
50


ppm
10.1852
7.2598
7.2114
7.2057
7.1903
7.1842
7.0779
7.0516
7.0500
6.6607
6.6449
4.9240
3.7294
3.7194
3.7068
2.3184
0.0026
H3CO
NH
COOCH3
Integral
0.9729
2.0408
2.0394
4.0644
1.0000
6.0683
3.0236
ppm
10
8
6
4
2
0


ppm
170.637
160.123
155.750
139.376
133.533
132.949
128.985
128.243
124.262
113.813
88.632
77.424
77.000
76.577
55.283
50.540
21.295
H3CO
NH
COOCH3
ppm
150
100
50


ppm
10.1584
7.2587
7.2555
7.2484
7.2329
7.2258
6.7888
6.7818
6.7662
6.7592
6.6482
4.9129
3.7743
3.7229
3.7032
2.1654
H3CO
NH
COOCH3
H3CO
Integral
1.0000
2.1454
2.0808
4.0658
1.0045
3.0851
6.0581
ppm
10
8
6
4
2
0


ppm
170.615
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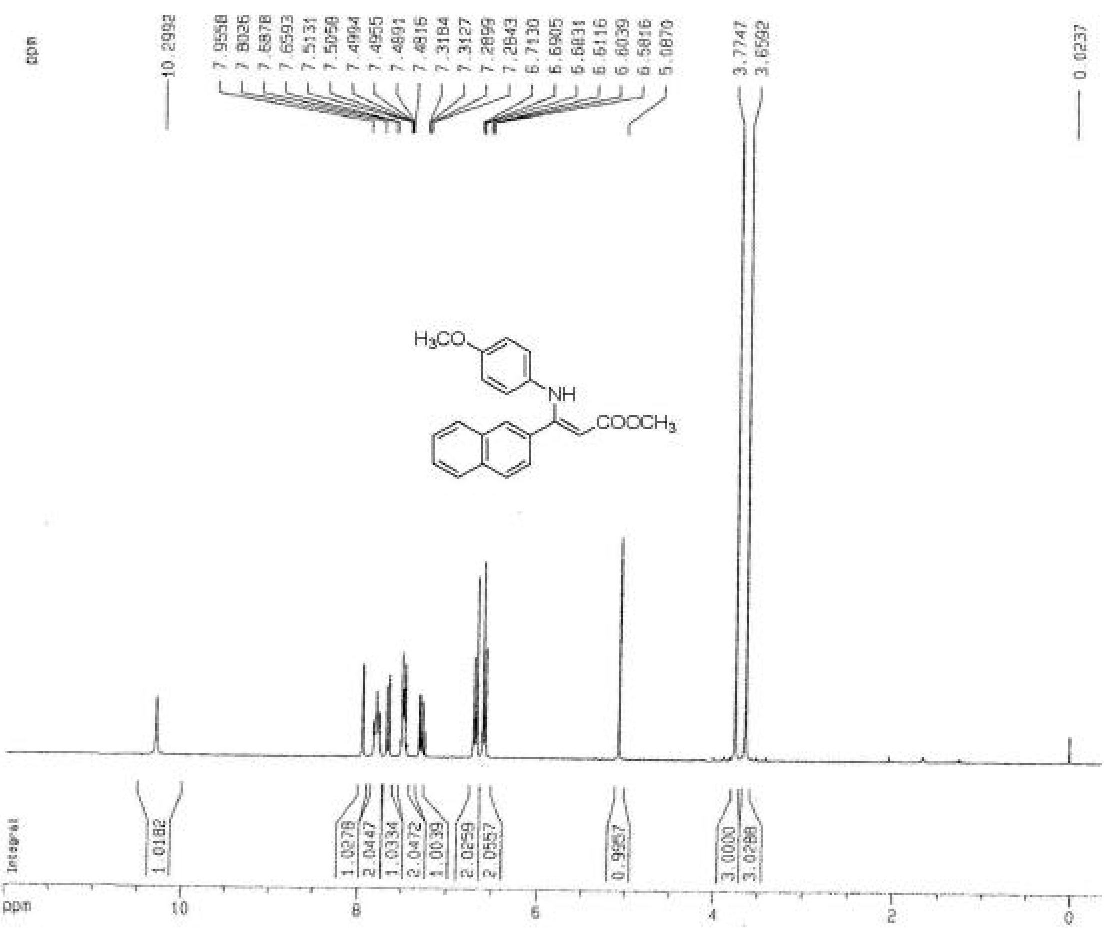
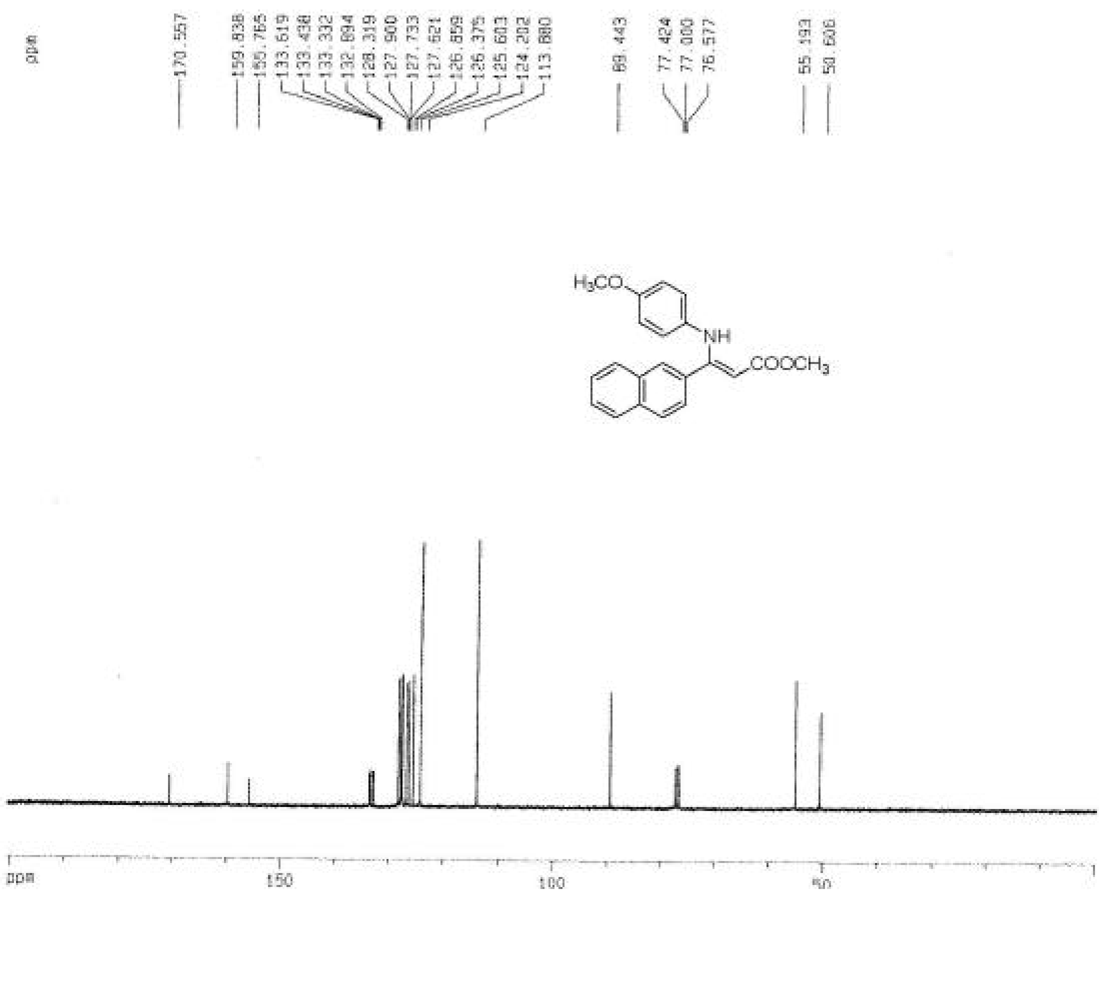
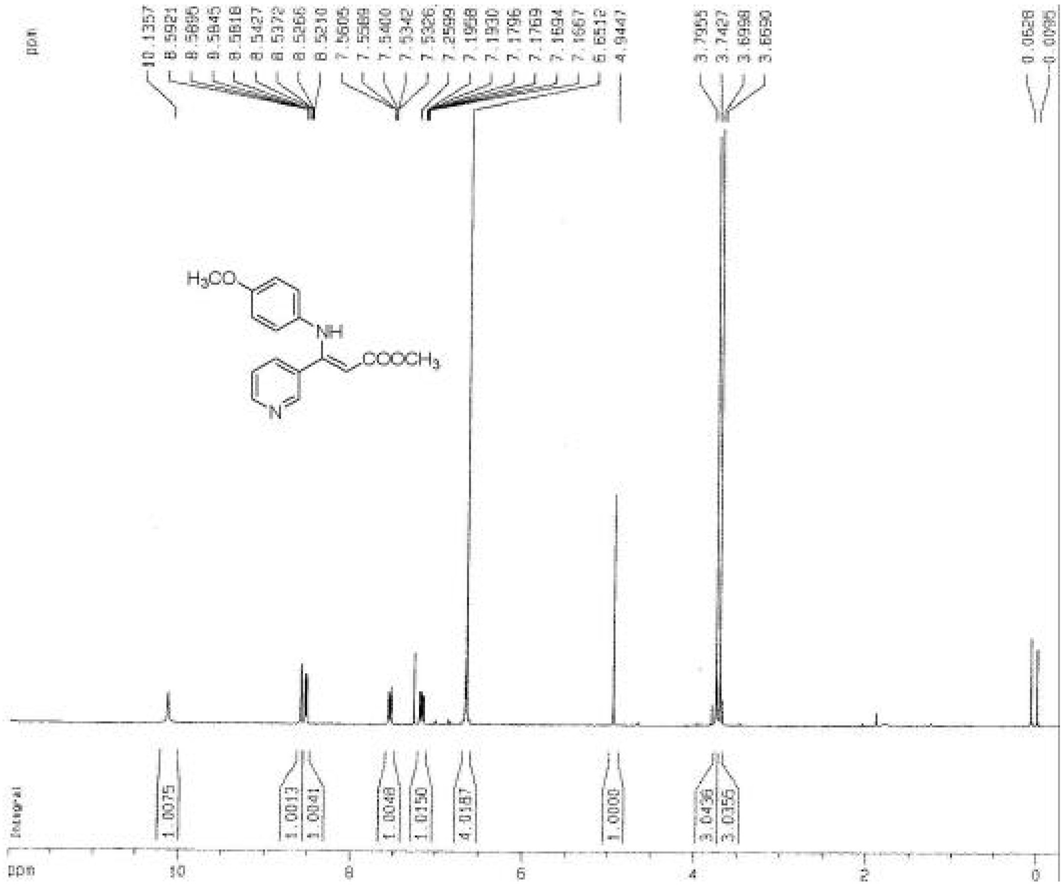
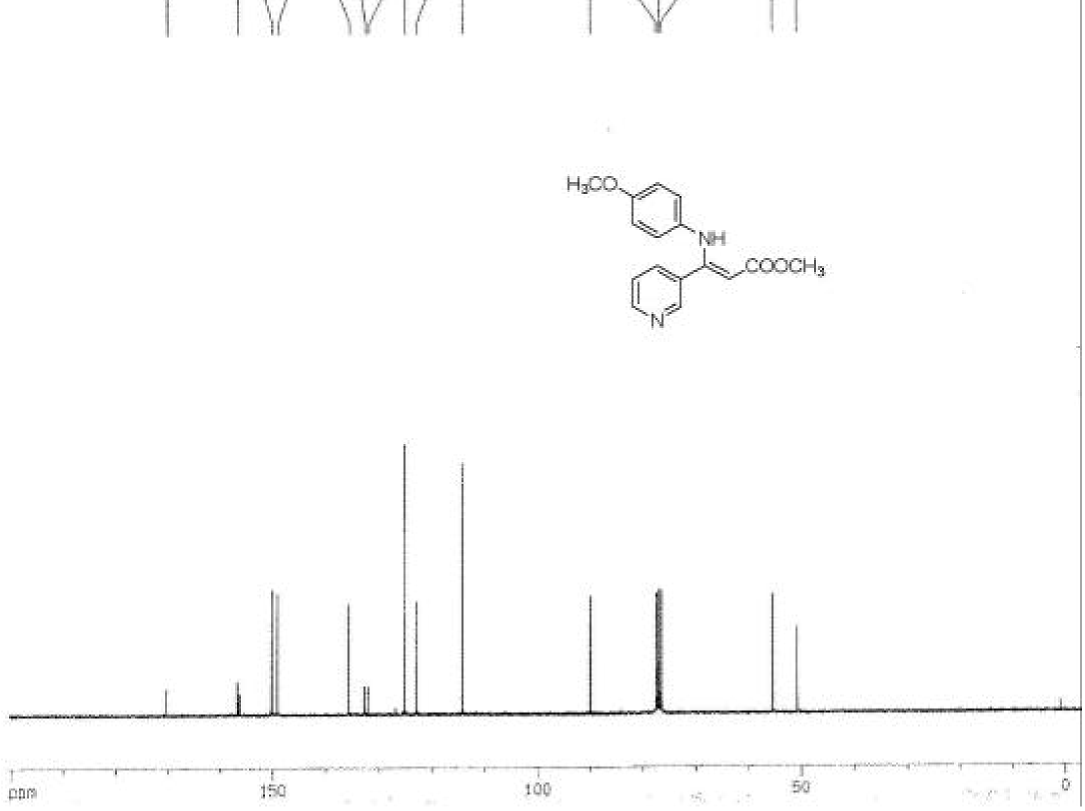
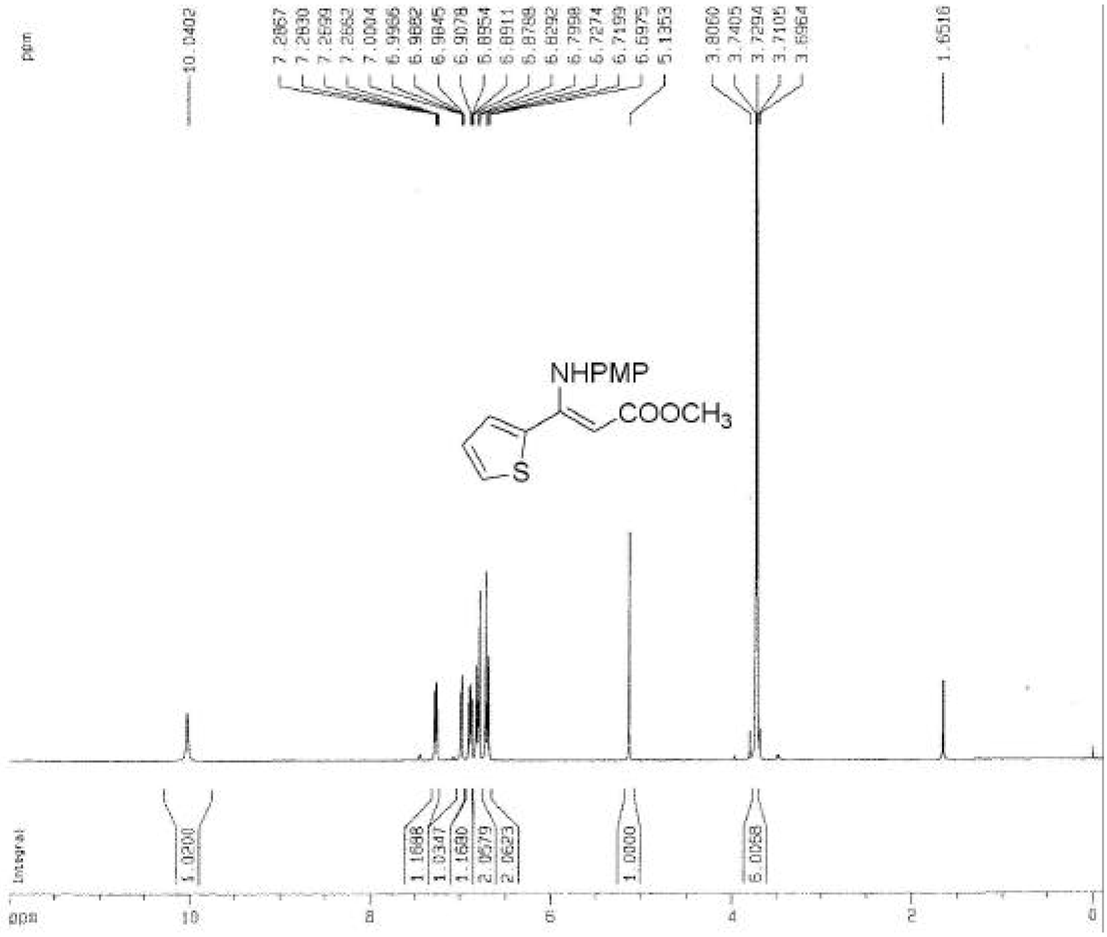
159.744
155.708
133.606
129.757
128.010
124.259
113.828
113.620
88.317
77.424
77.000
76.576
55.265
55.171
50.500
H3CO
NH
COOCH3
H3CO
ppm
150
100
50


ppm
10.2992
7.9558
7.8026
7.6878
7.6593
7.5131
7.5058
7.4994
7.4955
7.4891
7.4816
7.3184
7.3127
7.2899
7.2843
6.7130
6.6905
6.6831
6.6116
6.6039
6.5816
5.0870
3.7747
3.6592
0.0237
H3CO
NH
COOCH3
Integral
1.0182
1.0278
2.0447
1.0334
2.0472
1.0039
2.0259
2.0557
0.9957
3.0000
3.0288
ppm
10
8
6
4
2
0

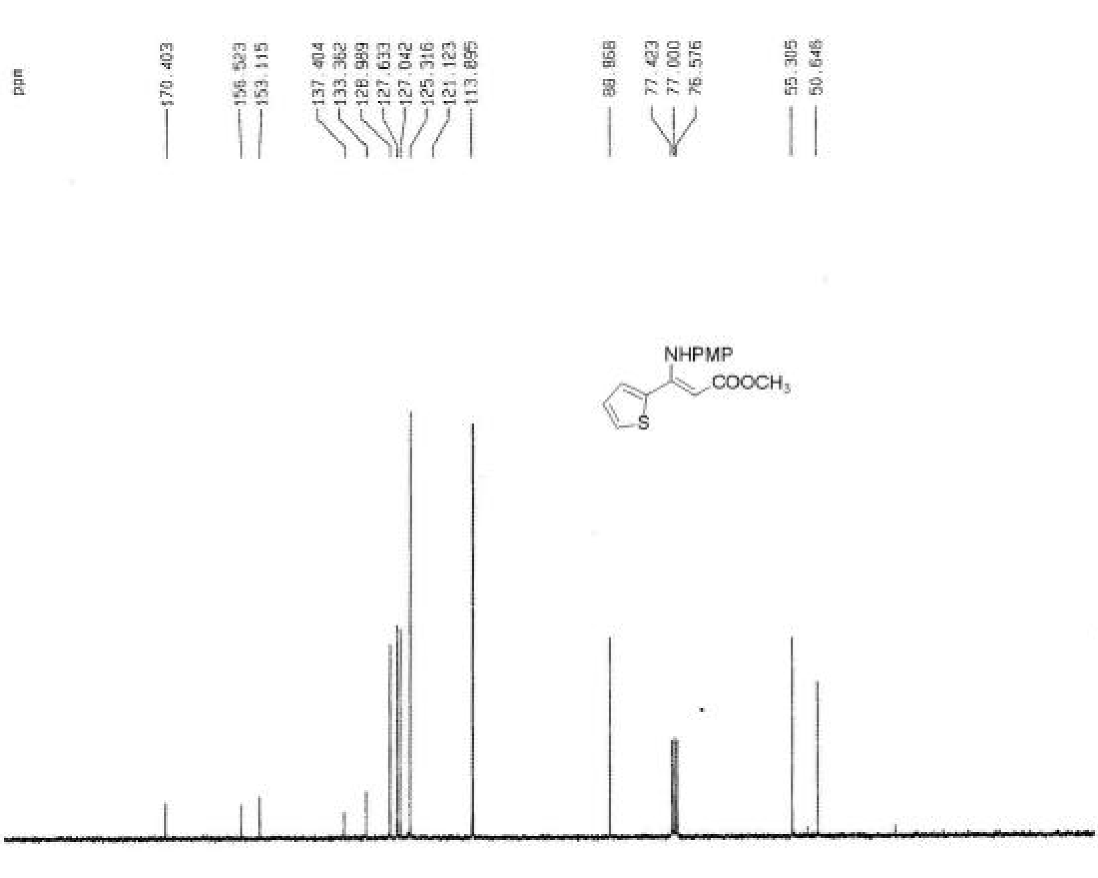

ppm
170.557
159.838
155.765
133.619
133.438
133.332
132.894
128.319
127.900
127.733
127.621
126.859
126.375
125.603
124.202
113.880
89.443
77.424
77.000
76.577
55.193
50.606
H3CO
NH
COOCH3
ppm
150
100
50


ppm
10.1357
8.5921
8.5895
8.5845
8.5818
8.5427
8.5372
8.5266
8.5210
7.5605
7.5589
7.5400
7.5342
7.5326
7.2599
7.1958
7.1930
7.1796
7.1769
7.1694
7.1667
6.6512
4.9447
3.7955
3.7427
3.6998
3.6690
0.0628
-0.0095
H_3CO
NH
$COOCH_3$
N
Integral
1.0075
1.0013
1.0041
1.0048
1.0150
4.0187
1.0000
3.0436
3.0356
ppm
10
8
6
4
2
0

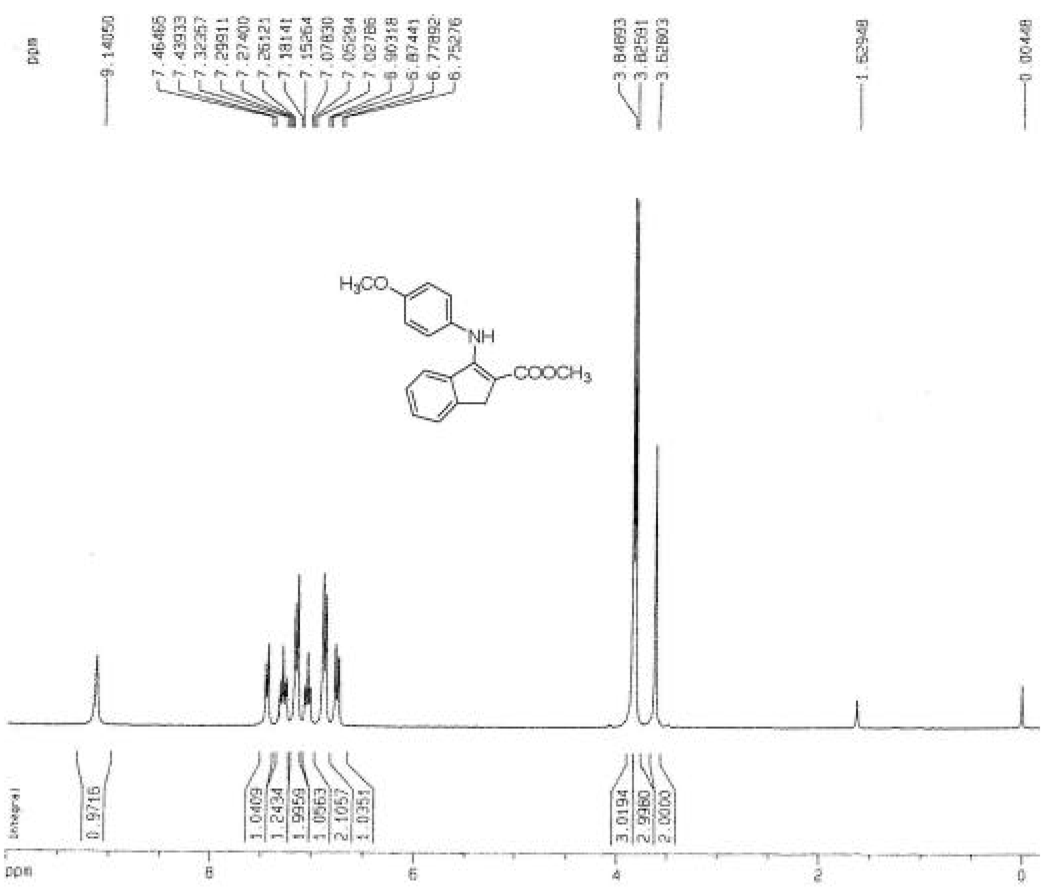

ppm
170.295
156.724
150.204
149.147
135.749
132.661
131.969
125.116
122.939
114.166
89.942
77.423
77.000
76.576
55.327
50.724
H_3CO
NH
$COOCH_3$
N
ppm
150
100
50
0

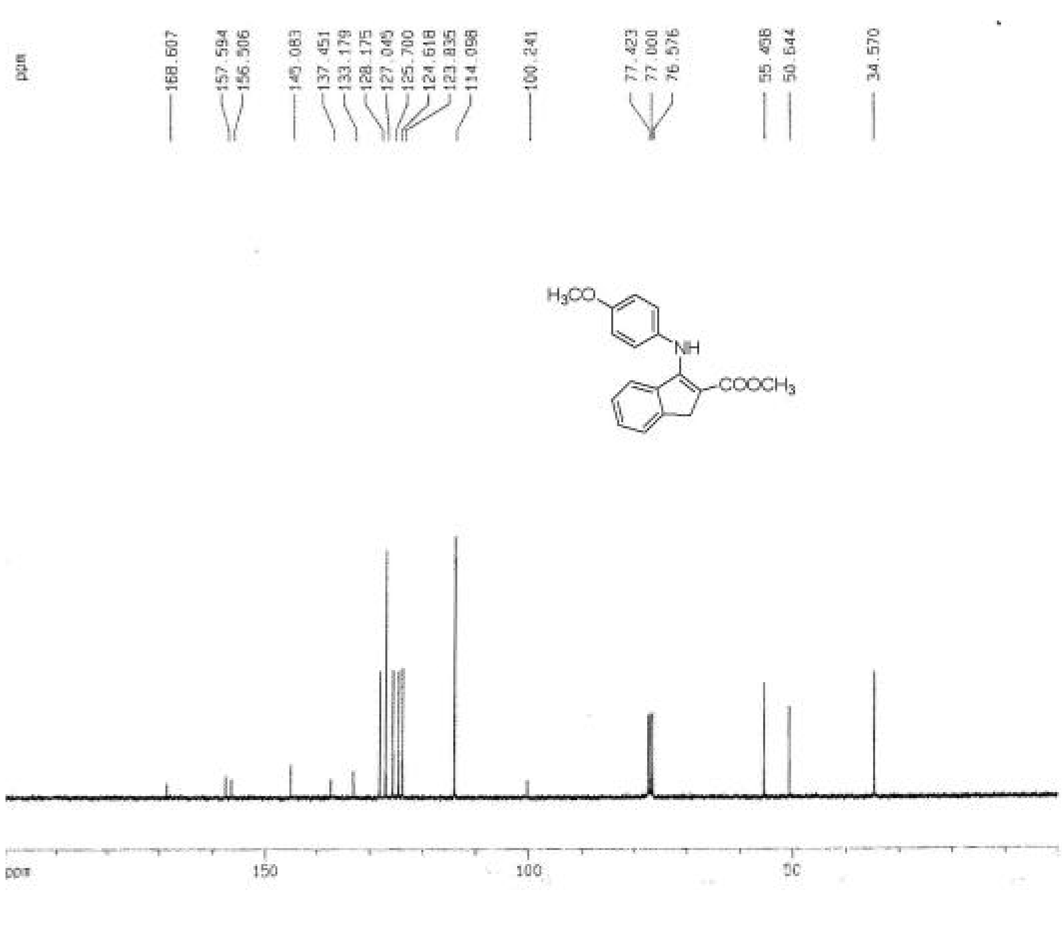


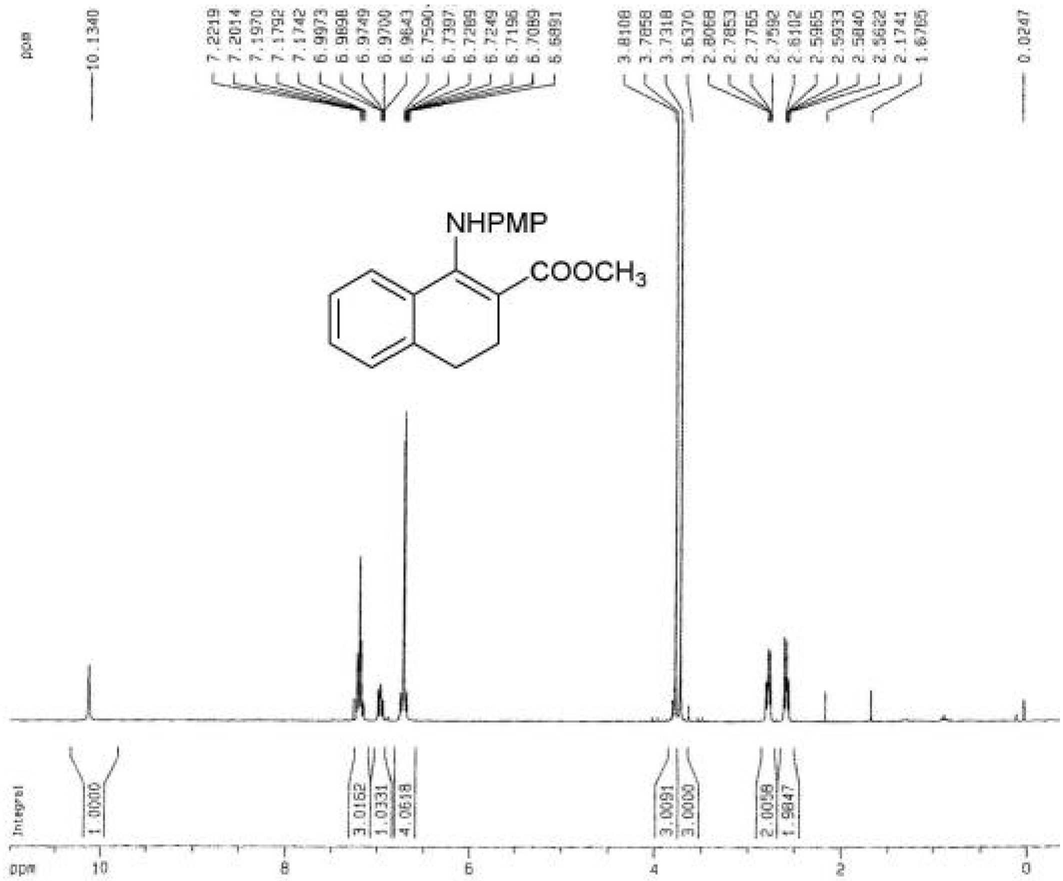
NHPMP
COOCH3
S
ppm
10.0402
7.2867
7.2830
7.2699
7.2662
7.0004
6.9986
6.9882
6.9845
6.9078
6.8954
6.8911
6.8788
6.8292
6.7998
6.7274
6.7199
6.6975
5.1353
3.8060
3.7405
3.7294
3.7105
3.6964
1.6516
Integral
1.0200
1.1688
1.0347
1.1680
2.0579
2.0623
1.0000
6.0058
10
8
6
4
2
0



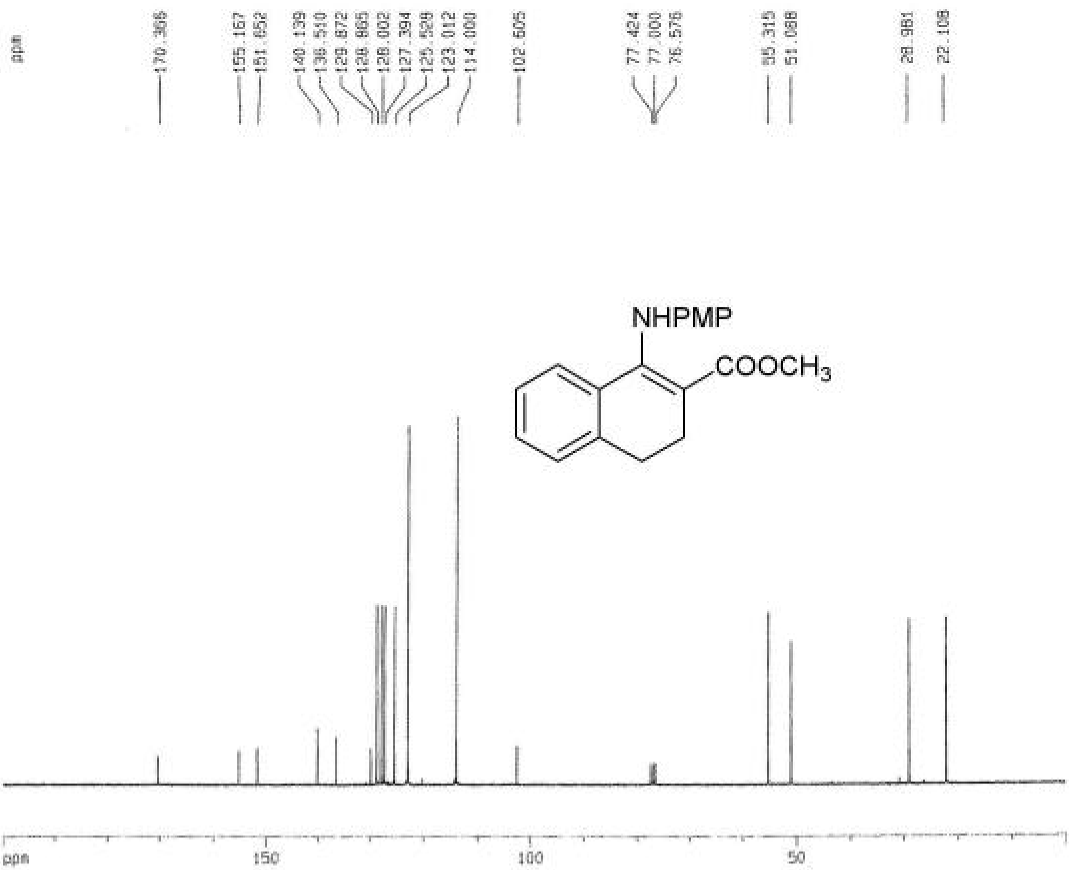
NHPMP
COOCH3
S
ppm
170.403
156.523
153.115
137.404
133.362
128.989
127.633
127.042
125.316
121.123
113.895
88.868
77.423
77.000
76.576
55.305
50.646
175
150
125
100
75
50
25


ppm
9.14050
7.46466
7.43933
7.32357
7.29911
7.27400
7.26121
7.18141
7.15264
7.07830
7.05294
7.02786
6.90318
6.87441
6.77892
6.75276
3.84693
3.82581
3.52803
1.52948
0.00446
H3CO
NH
COOCH3
Integral
0.9716
1.0409
1.2434
1.9958
1.0563
2.1057
1.0351
3.0194
2.9960
2.0000
ppm
8
6
4
2
0

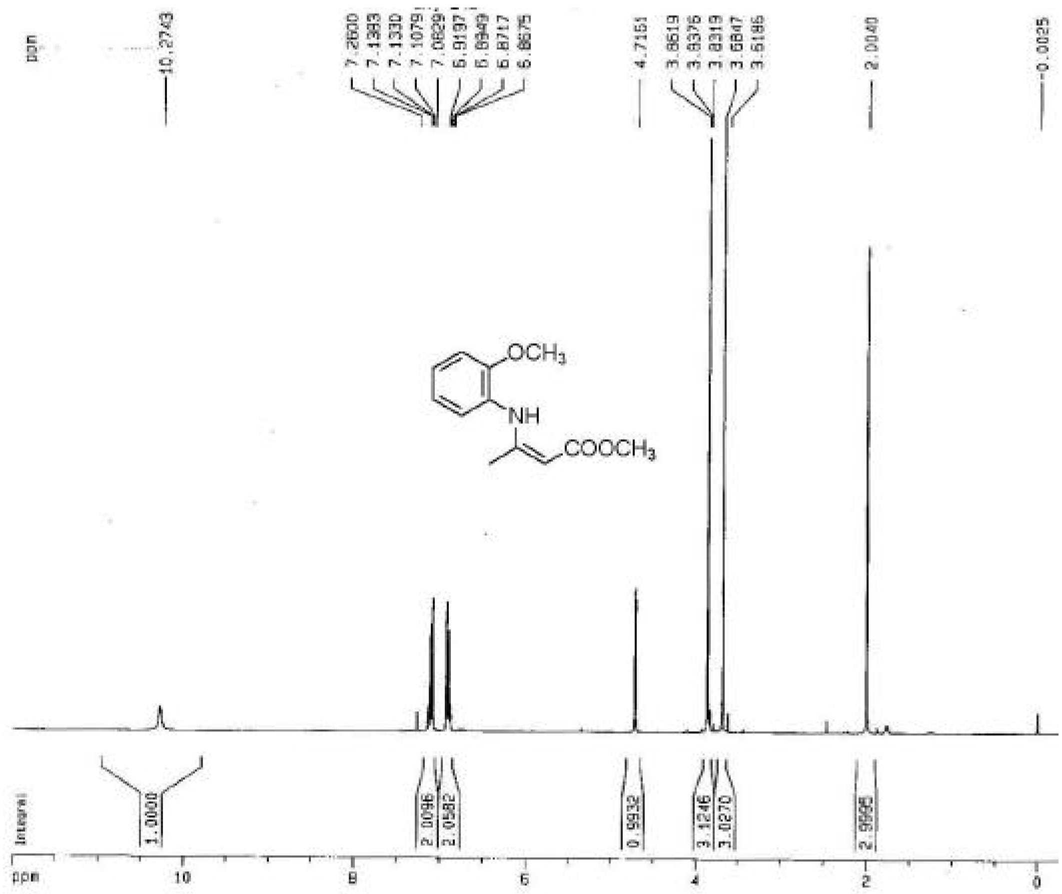

ppm
168.607
157.594
156.506
145.083
137.451
133.179
128.175
127.045
125.700
124.618
123.835
114.098
100.241
77.423
77.000
76.576
55.458
50.644
34.570
H3CO
NH
COOCH3
ppm
150
100
50



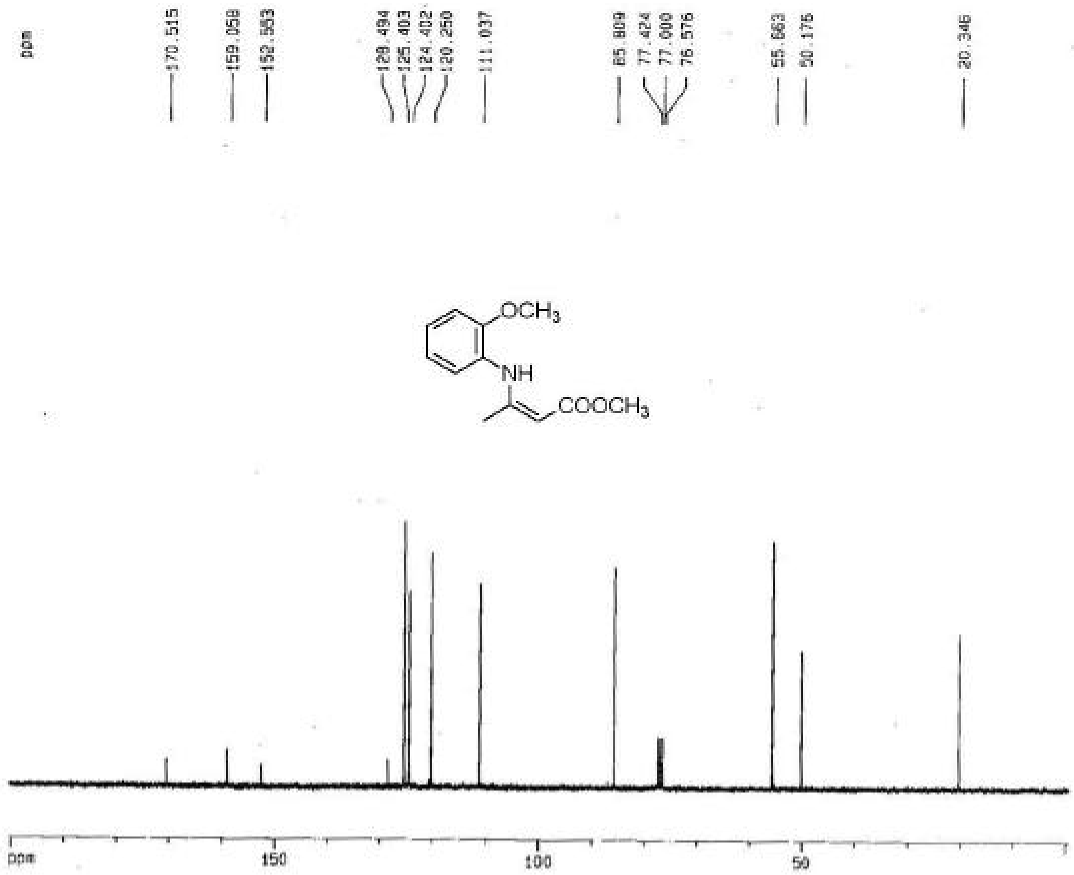
ppm
10.1340
7.2219
7.2014
7.1970
7.1792
7.1742
6.9973
6.9898
6.9749
6.9700
6.9643
6.7590
6.7397
6.7289
6.7249
6.7196
6.7089
6.6891
3.8108
3.7858
3.7318
3.6370
2.8068
2.7853
2.7765
2.7592
2.6102
2.5965
2.5933
2.5840
2.5622
2.1741
1.6765
0.0247
NHPMP
COOCH3
Integral
1.0000
3.0162
1.0331
4.0618
3.0091
3.0000
2.0058
1.9847
ppm
10
8
6
4
2
0



ppm
170.368
155.167
151.652
140.139
136.510
129.872
128.865
128.002
127.394
125.528
123.012
114.000
102.505
77.424
77.000
76.576
55.315
51.088
28.981
22.108
NHPMP
COOCH3
ppm
150
100
50



ppm
10.2743
7.2600
7.1383
7.1330
7.1079
7.0829
6.9197
6.8949
6.8717
6.8675
4.7151
3.8619
3.8376
3.8319
3.6847
3.6186
2.0040
-0.0025
OCH3
NH
COOCH3
Integral
1.0000
2.0096
2.0582
0.9932
3.1246
3.0270
2.9995
ppm
10
8
6
4
2
0



ppm
170.515
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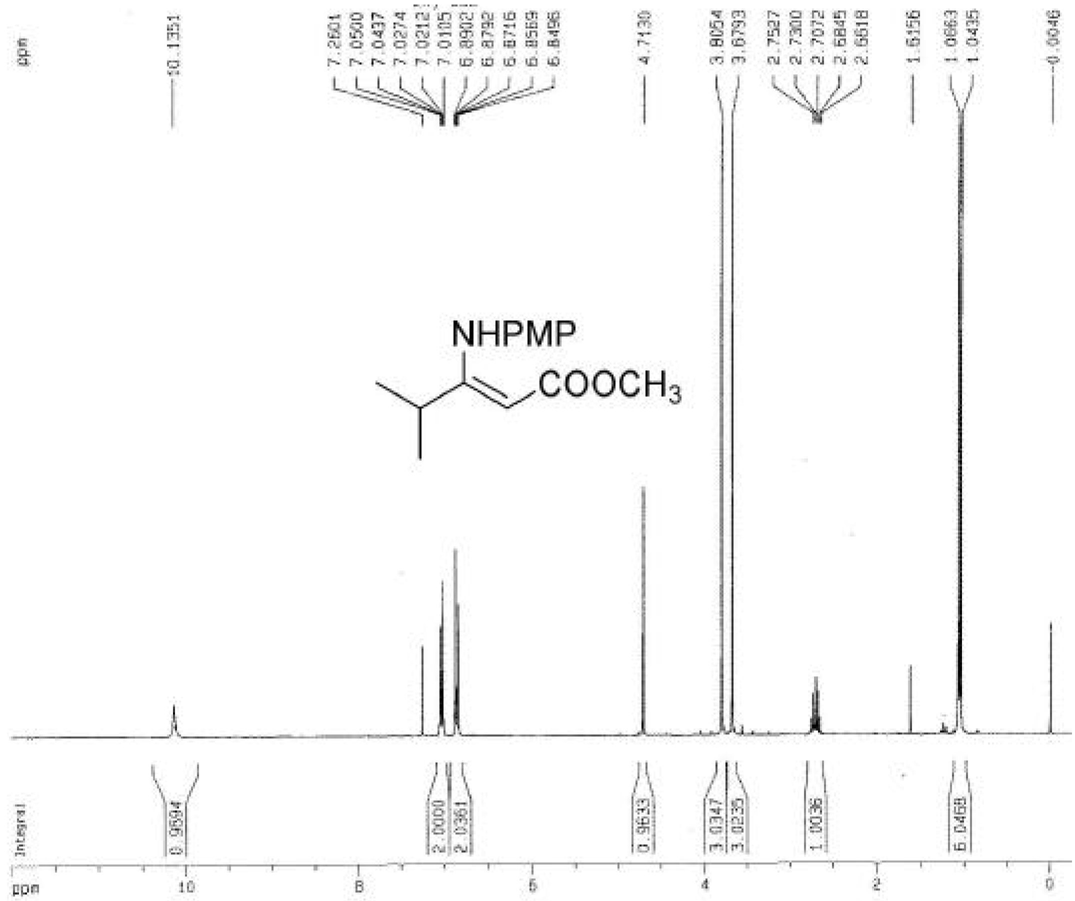
152.583
128.494
125.403
124.402
120.250
111.037
85.809
77.424
77.000
76.576
55.663
50.175
20.346
OCH3
NH
COOCH3
ppm
150
100
50


NHPMP
COOCH3
ppm
10.1351
7.2601
7.0500
7.0437
7.0274
7.0212
7.0105
6.8902
6.8792
6.8716
6.8569
6.8496
4.7130
3.8054
3.6793
2.7527
2.7300
2.7072
2.6845
2.6618
1.6156
1.0663
1.0435
-0.0046
Integral
0.9594
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2.0361
0.9633
3.0347
3.0235
1.0036
6.0468
ppm
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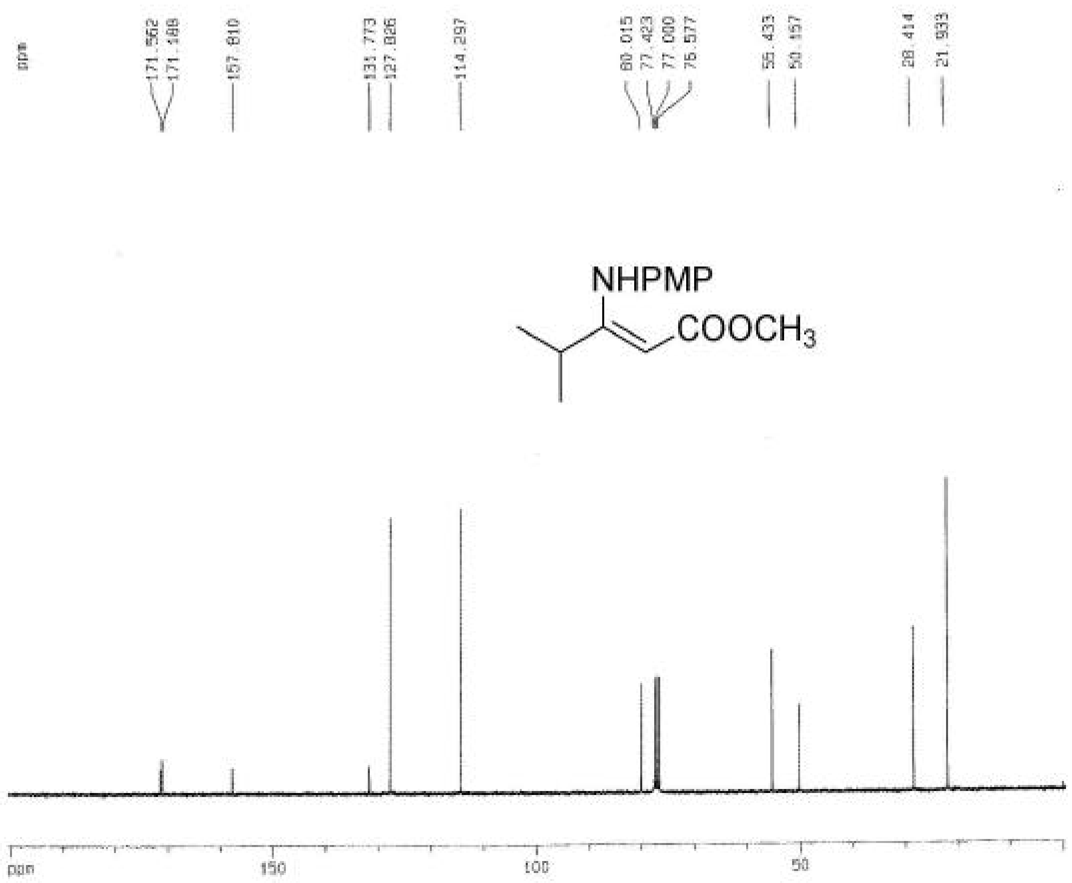
8
6
4
2
0


NHPMP
COOCH3
ppm
171.562
171.188
157.610
131.773
127.826
114.297
80.015
77.423
77.000
76.577
55.433
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28.414
21.933
ppm
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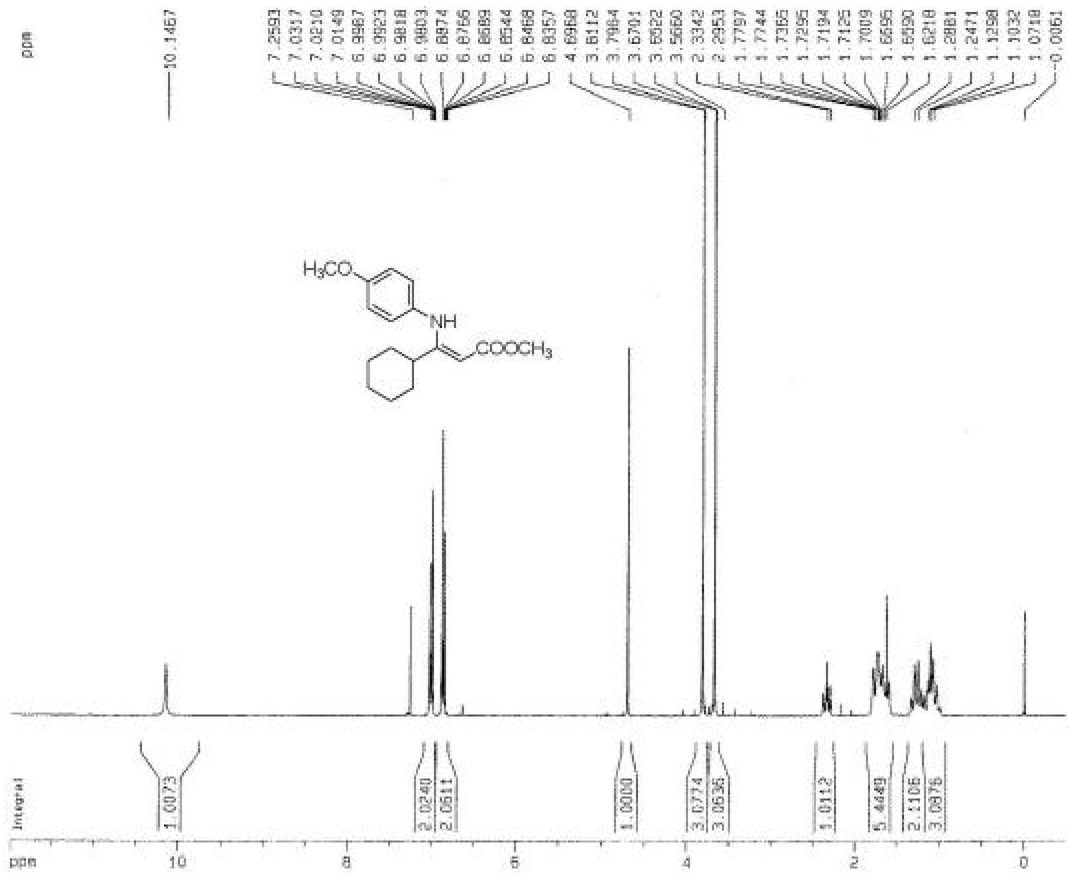
100
50


ppm
10.1467
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7.0317
7.0210
7.0149
6.9987
6.9923
6.9818
6.9803
6.8874
6.8766
6.8689
6.8544
6.8468
6.8357
4.6968
3.8112
3.7964
3.6701
3.6522
3.5660
2.3342
2.2953
1.7797
1.7244
1.7365
1.7295
1.7194
1.7125
1.7009
1.6595
1.6590
1.6218
1.2881
1.2471
1.1298
1.1032
1.0718
-0.0061
H3CO
NH
COOCH3
Integral
1.0073
2.0240
2.0511
1.0000
3.0774
3.0636
1.0112
5.4449
2.1106
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ppm
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8
6
4
2
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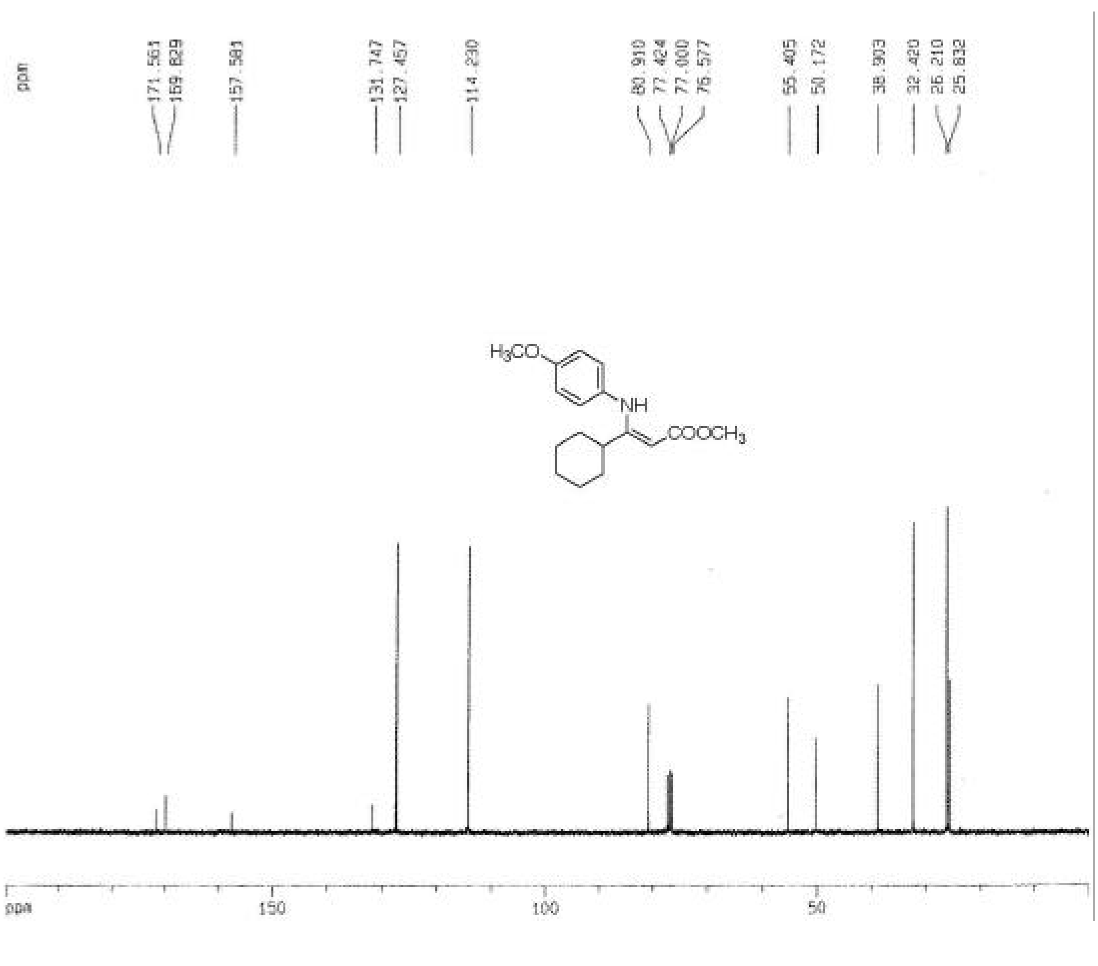
ppm
171.561
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127.457
114.230
80.910
77.424
77.000
76.577
55.405
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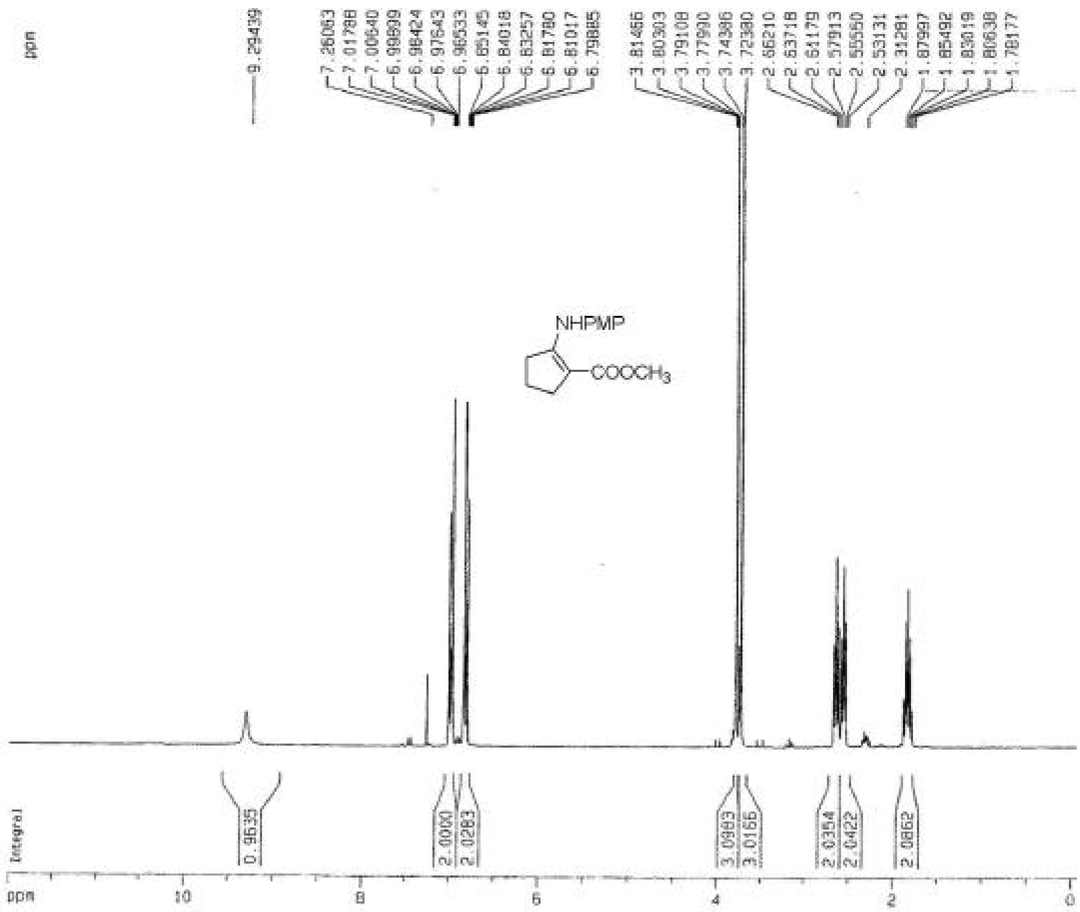
38.903
32.420
26.210
25.832
H3CO
NH
COOCH3
ppm
150
100
50


NHPMP
COOCH3
9.29439
0.9635
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3.0166
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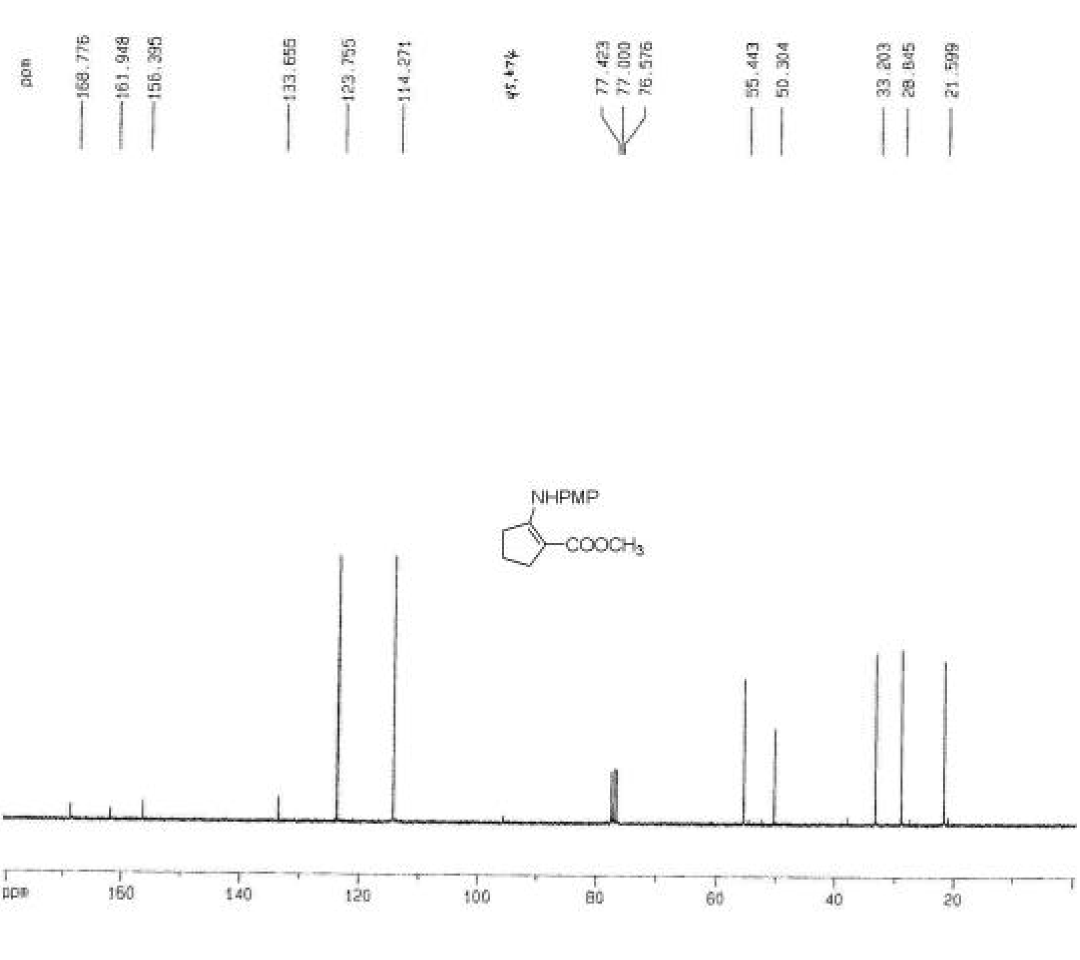
2.0422
2.0862
ppm
10
8
6
4
2
0


168.776
161.948
156.395
133.655
123.755
114.271
77.423
77.000
76.576
55.443
50.304
33.203
28.845
21.599
NHPMP
COOCH3
ppm
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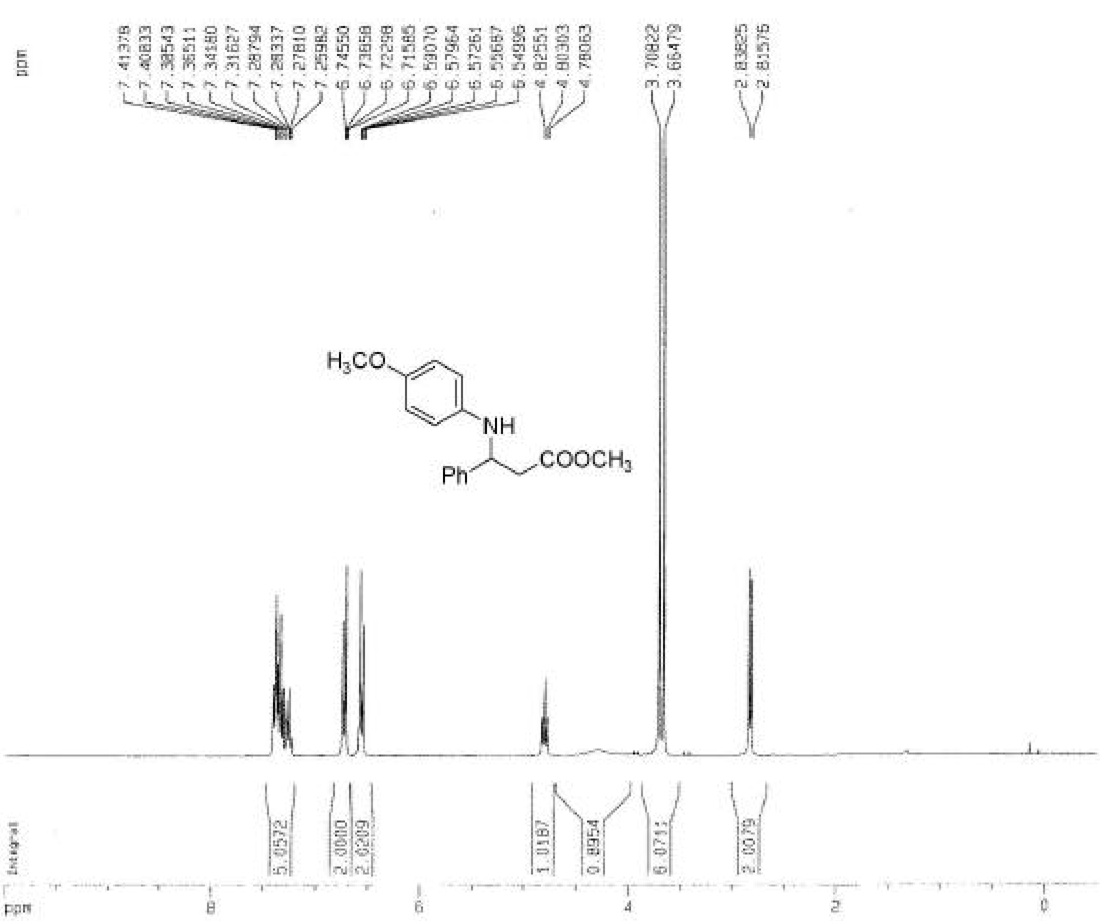
140
120
100
80
60
40
20


ppm
7.41378
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7.34180
7.31627
7.28794
7.28337
7.27810
7.25982
6.74550
6.73858
6.72298
6.71585
6.59070
6.57964
6.57261
6.55667
6.54996
4.82551
4.80303
4.78063
3.70822
3.66479
2.83825
2.81576
H3CO
NH
Ph
COOCH3
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2.0209
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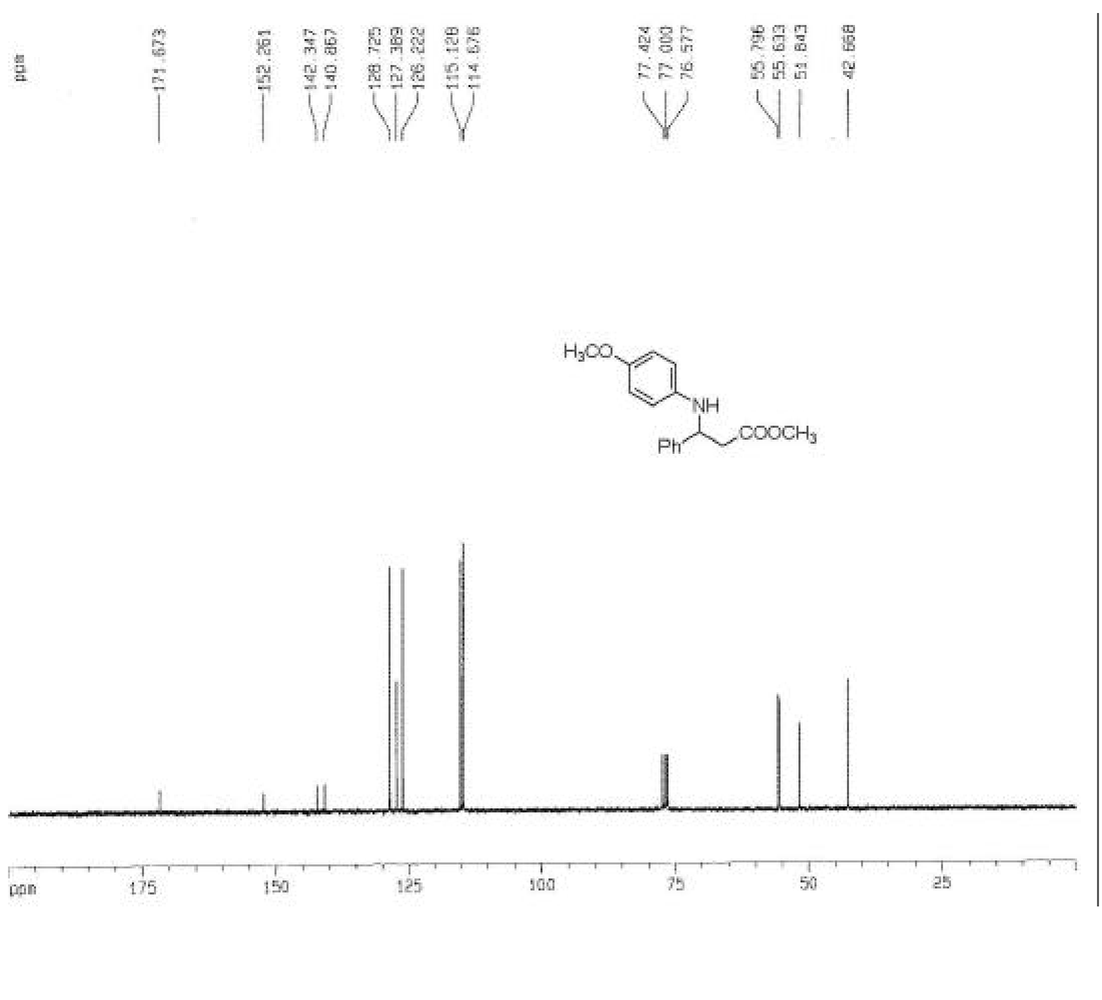
0.8954
6.0711
2.0079
ppm
8
6
4
2
0


ppm
171.673
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142.347
140.867
128.725
127.389
126.222
115.128
114.676
77.424
77.000
76.577
55.796
55.633
51.643
42.668
H3CO
NH
Ph
COOCH3
ppm
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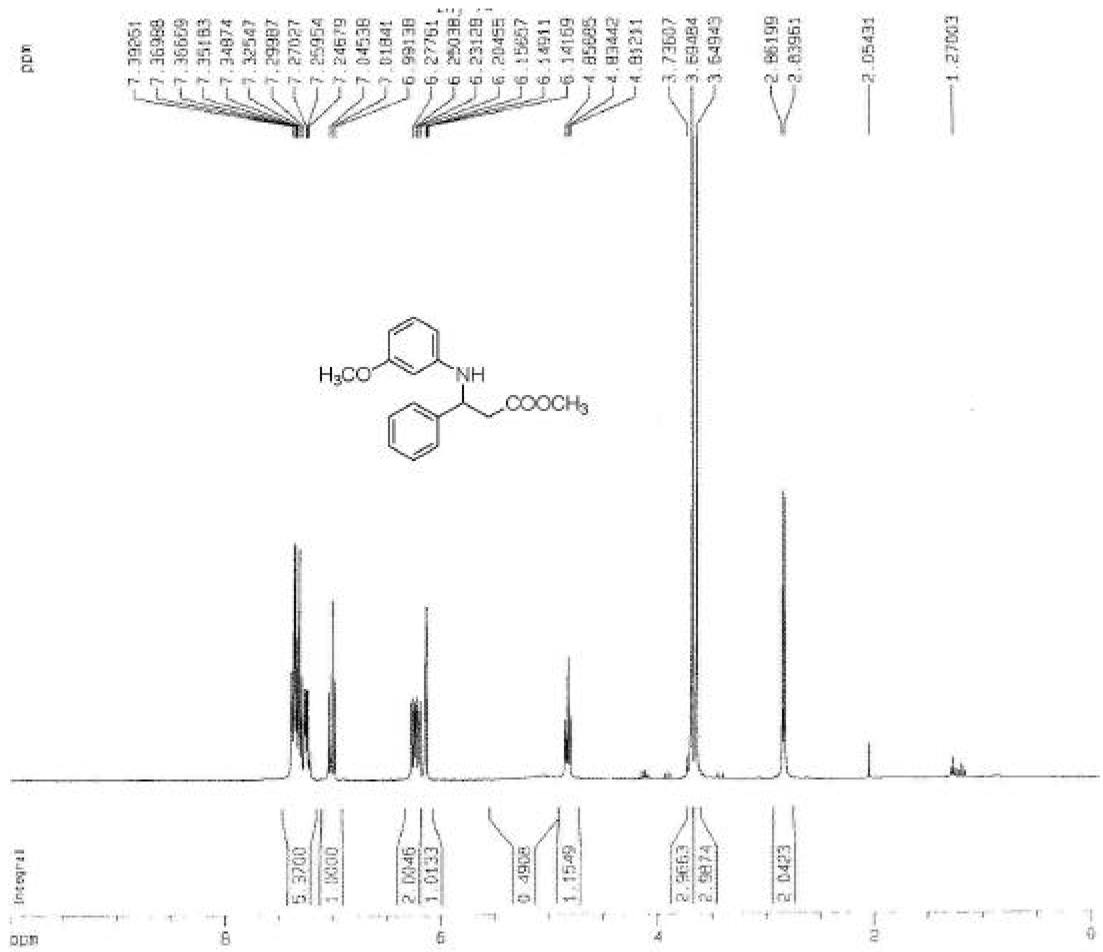
150
125
100
75
50
25



ppm
7.39251
7.36988
7.36669
7.35183
7.34874
7.32547
7.29987
7.27027
7.25954
7.24679
7.04538
7.01841
6.99138
6.27761
6.25038
6.23128
6.20455
6.15657
6.14911
6.14169
4.85665
4.83442
4.81211
3.73607
3.69484
3.64943
2.86199
2.83961
2.05431
1.27003
H3CO
NH
COOCH3
Integral
5.3700
1.0000
2.0046
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0.4908
1.1549
2.9663
2.9874
2.0423
ppm
8
6
4
2
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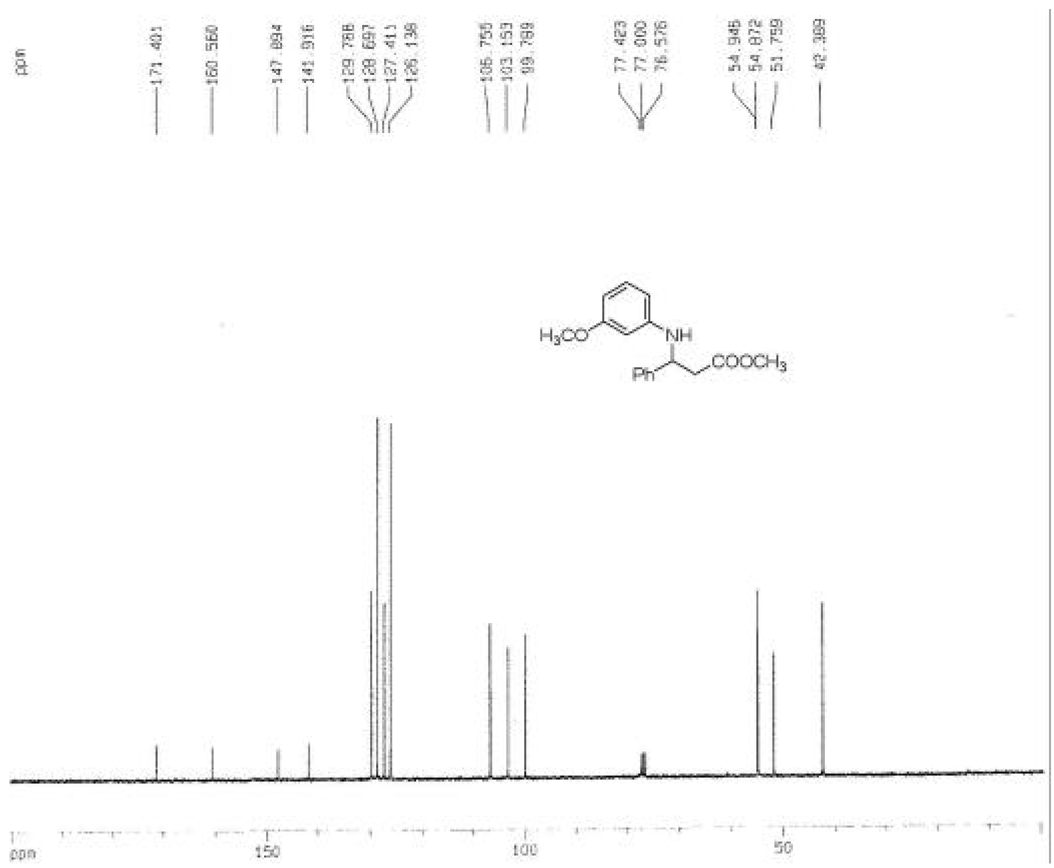
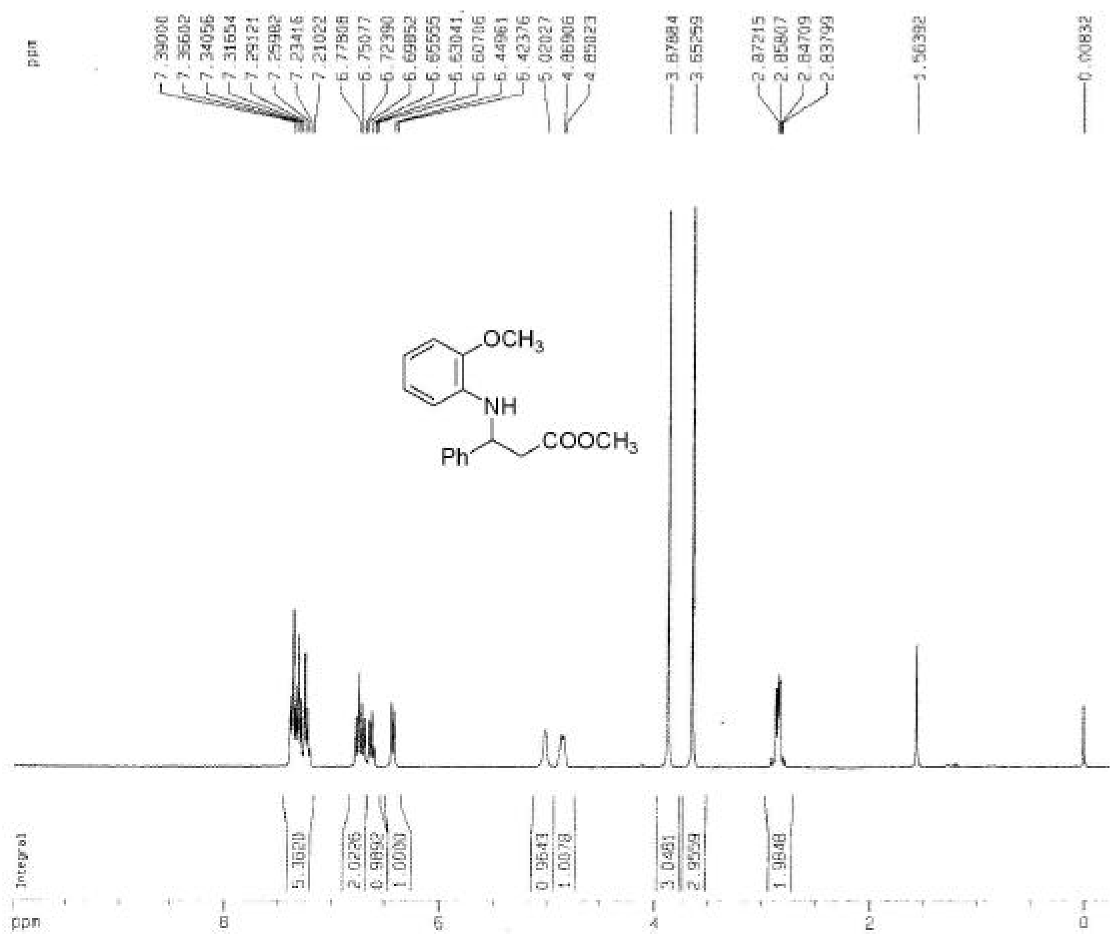
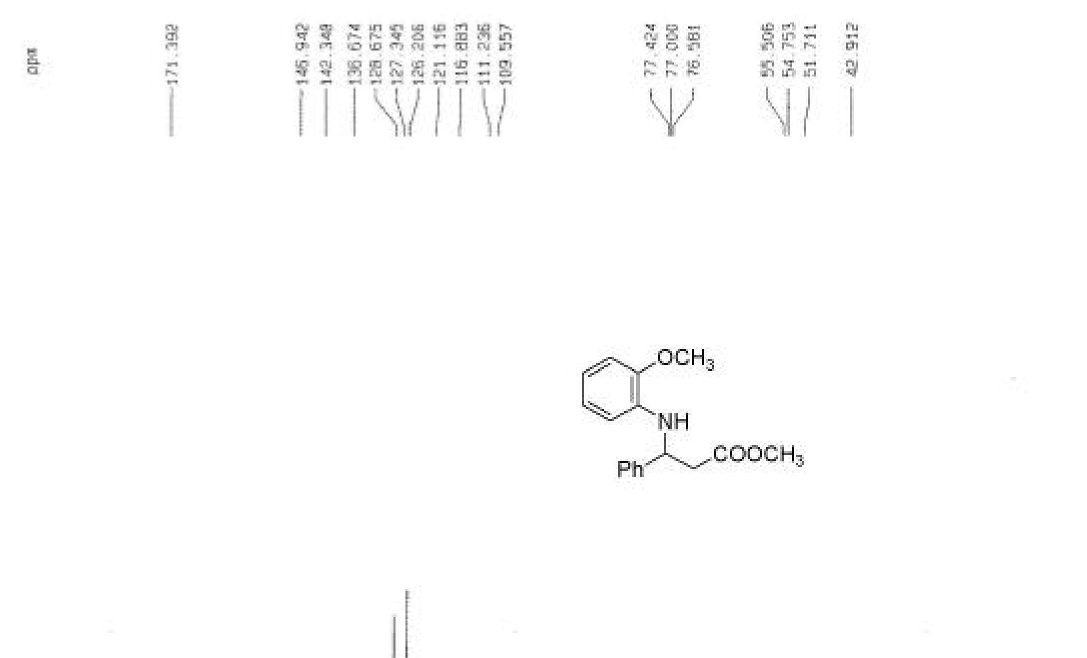


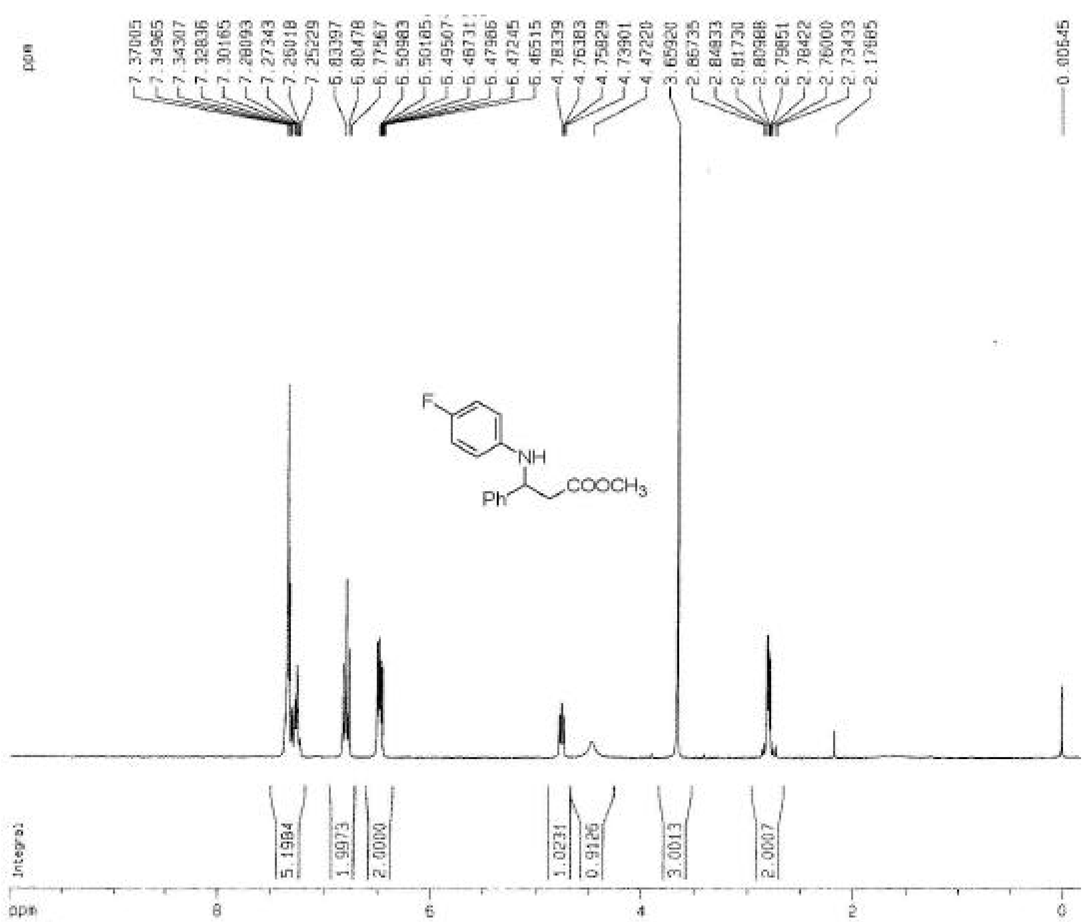
ppm
171.401
160.560
147.894
141.916
129.788
128.697
127.411
126.138
106.755
103.153
99.789
77.423
77.000
76.576
54.946
54.872
51.759
42.389
H3CO
NH
Ph
COOCH3
ppm
150
100
50



ppm
7.39000 7.36602 7.34056 7.31654 7.29121 7.25982 7.23416 7.21022 6.77808 6.75077 6.72390 6.69852 6.65555 6.63041 6.60706 6.44961 6.42376 5.02027 4.86906 4.85023 3.87684 3.65259 2.87215 2.85807 2.84709 2.83799 1.56392 0.00832
OCH3
NH
COOCH3
Ph
Integral
5.3620 2.0226 0.9892 1.0000 0.9543 1.0078 3.0461 2.9559 1.9848
ppm 8 6 4 2 0



ppm
171.392 146.942 142.349 136.674 128.675 127.345 126.206 121.116 116.883 111.236 109.557 77.424 77.000 76.581 55.506 54.753 51.711 42.912
OCH3
NH
COOCH3
Ph
ppm 150 100 50


ppm
7.37005
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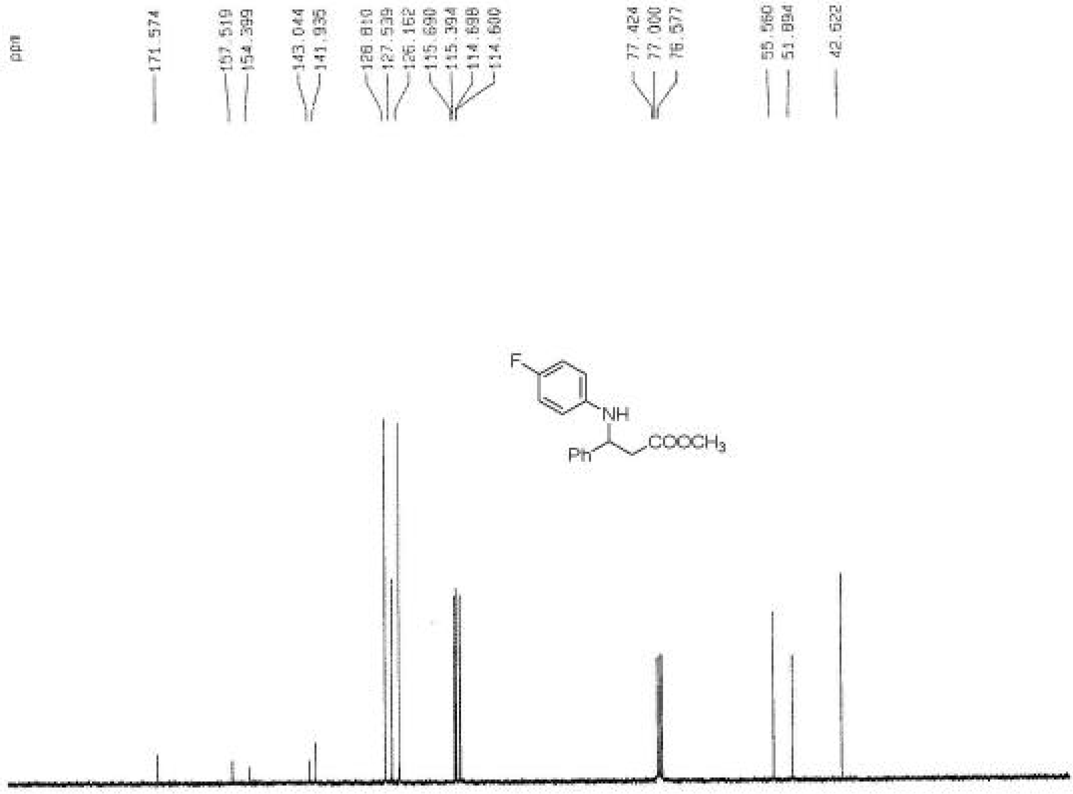
7.34307
7.32836
7.30165
7.28093
7.27343
7.26018
7.25229
6.83397
6.80478
6.77567
6.50983
6.50165
6.49507
6.48731
6.47986
6.47245
6.46515
4.78339
4.76383
4.75929
4.73901
4.47220
3.65920
2.86735
2.84933
2.81730
2.80988
2.79851
2.78422
2.76000
2.73433
2.17865
0.00545
F
NH
COOCH3
Ph
Integral
5.1984
1.9973
2.0000
1.0231
0.9126
3.0013
2.0007
ppm
8
6
4
2
0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143.044
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126.162
115.690
115.394
114.698
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77.000
76.577
55.560
51.694
42.522
F
NH
COOCH3
Ph
ppm
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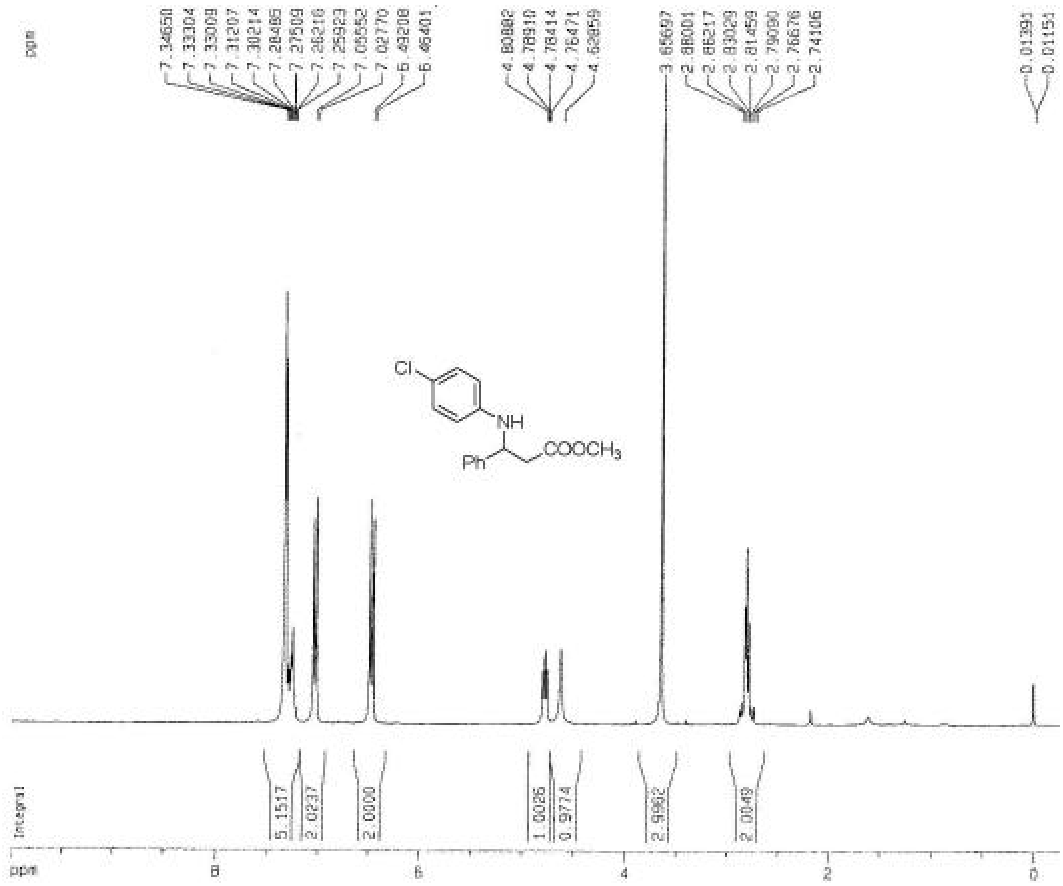
100
50



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7.34650
7.33304
7.33009
7.31207
7.30214
7.28486
7.27509
7.26216
7.25923
7.05552
7.02770
6.49208
6.46401
4.80882
4.78910
4.78414
4.76471
4.63859
3.65697
2.88001
2.86217
2.83029
2.81459
2.79090
2.76676
2.74106
0.01391
0.01151
Cl
NH
Ph
COOCH3
Integral
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2.0000
1.0026
0.9774
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2.0049
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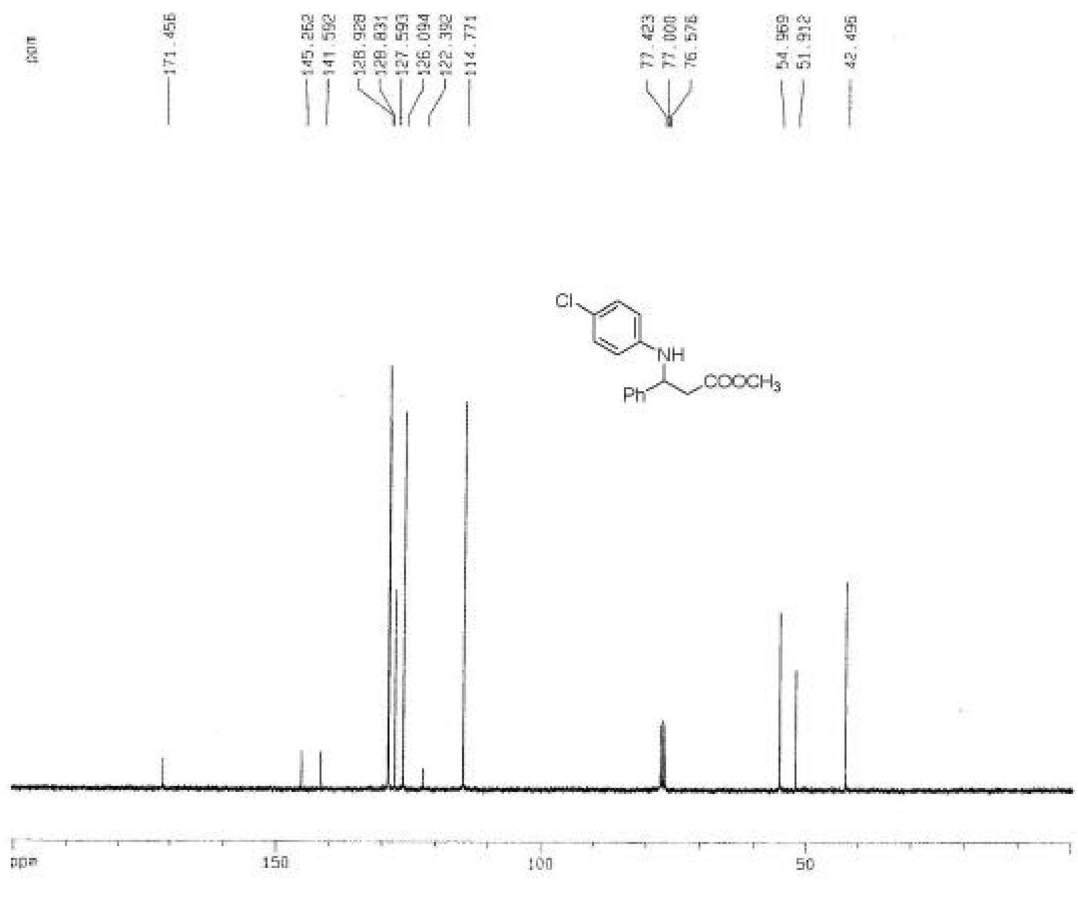

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127.593
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76.576
54.969
51.912
42.496
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NH
Ph
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ppm
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100
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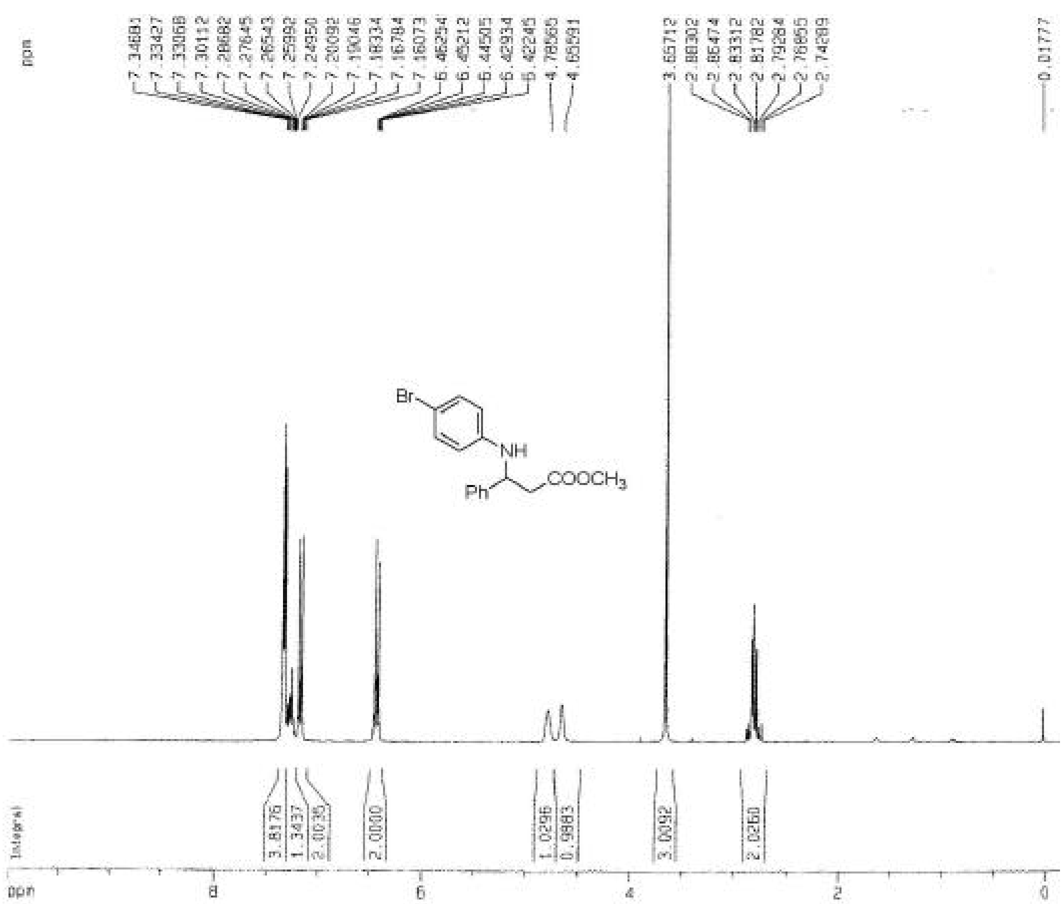
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7.24950
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7.19046
7.18334
7.16784
7.16073
6.46254
6.45212
6.44505
6.42934
6.42245
4.78565
4.65591
3.65712
2.88302
2.85474
2.83312
2.81782
2.79284
2.76855
2.74289
0.01777
Br
NH
Ph
COOCH3
Integral
3.8176
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2.0000
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2.0260
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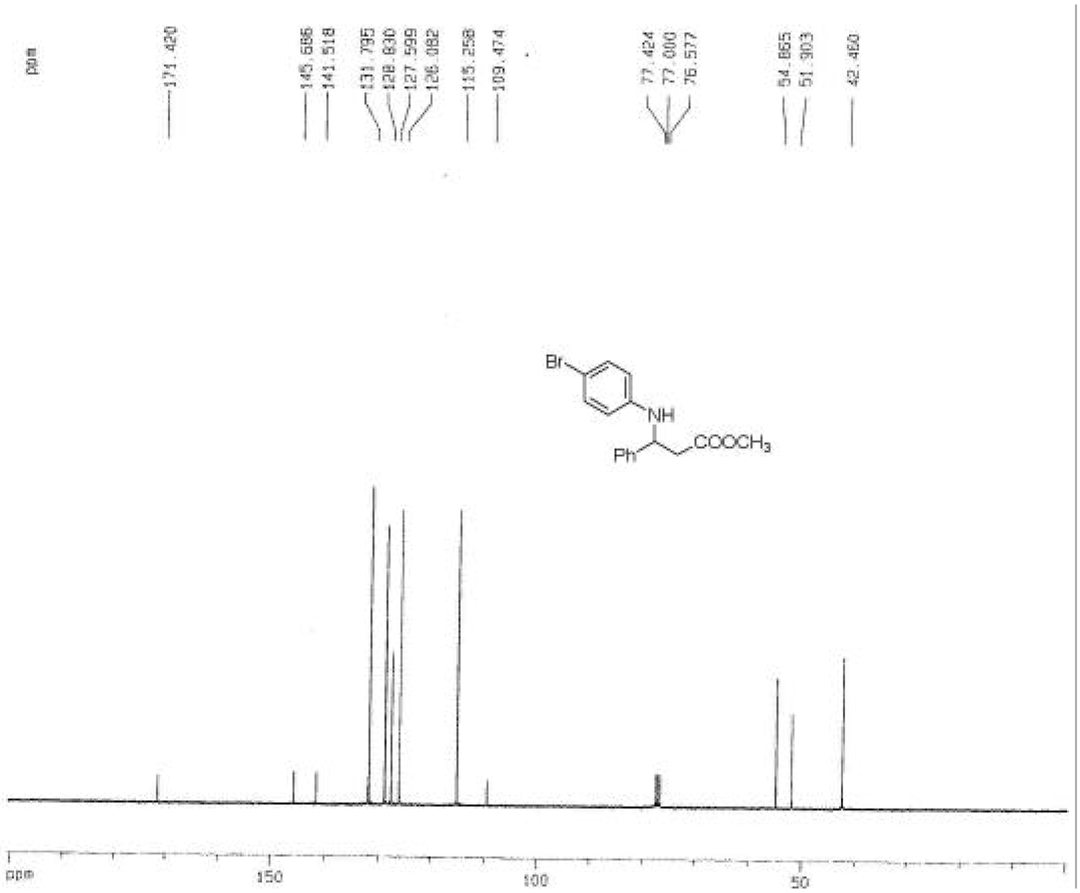
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76.577
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42.460
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NH
Ph
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ppm
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100
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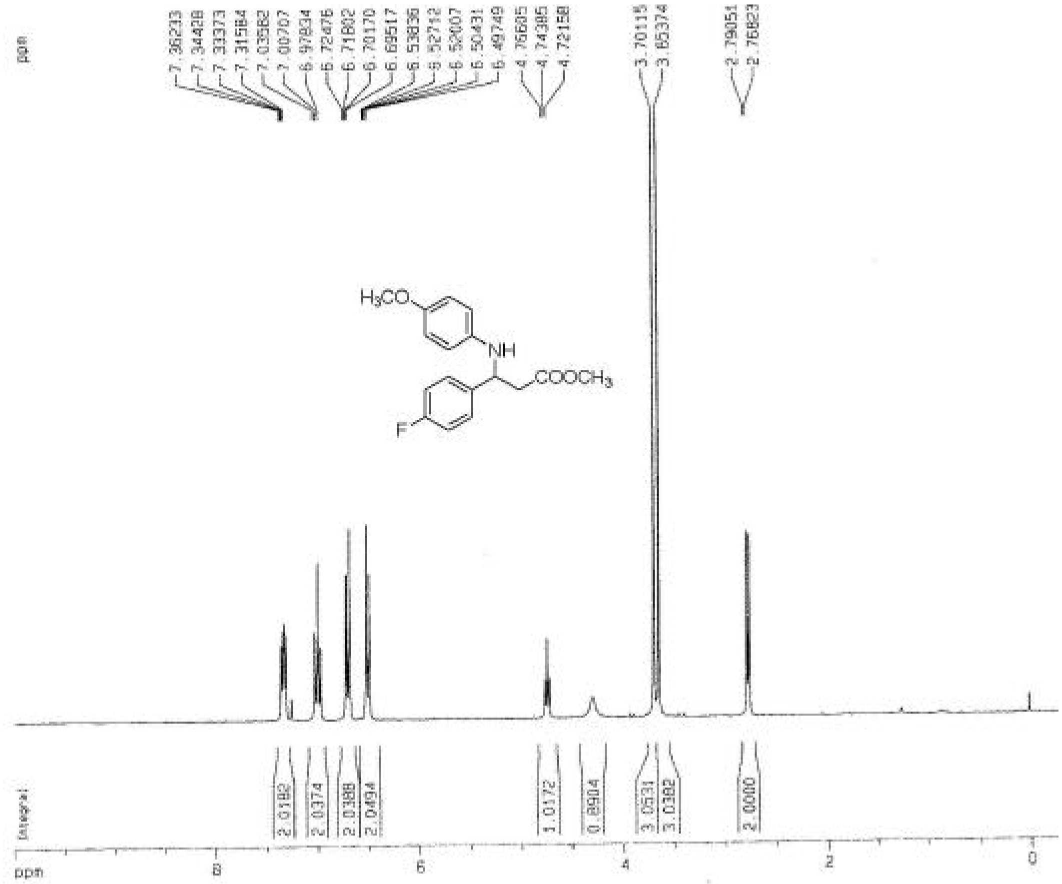
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6.71802
6.70170
6.69517
6.53836
6.52712
6.52007
6.50431
6.49749
4.76685
4.74385
4.72158
3.70115
3.65374
2.79051
2.76823
H3CO
NH
COOCH3
F
Integral
2.0182
2.0374
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1.0172
0.8904
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2.0000
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6
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2
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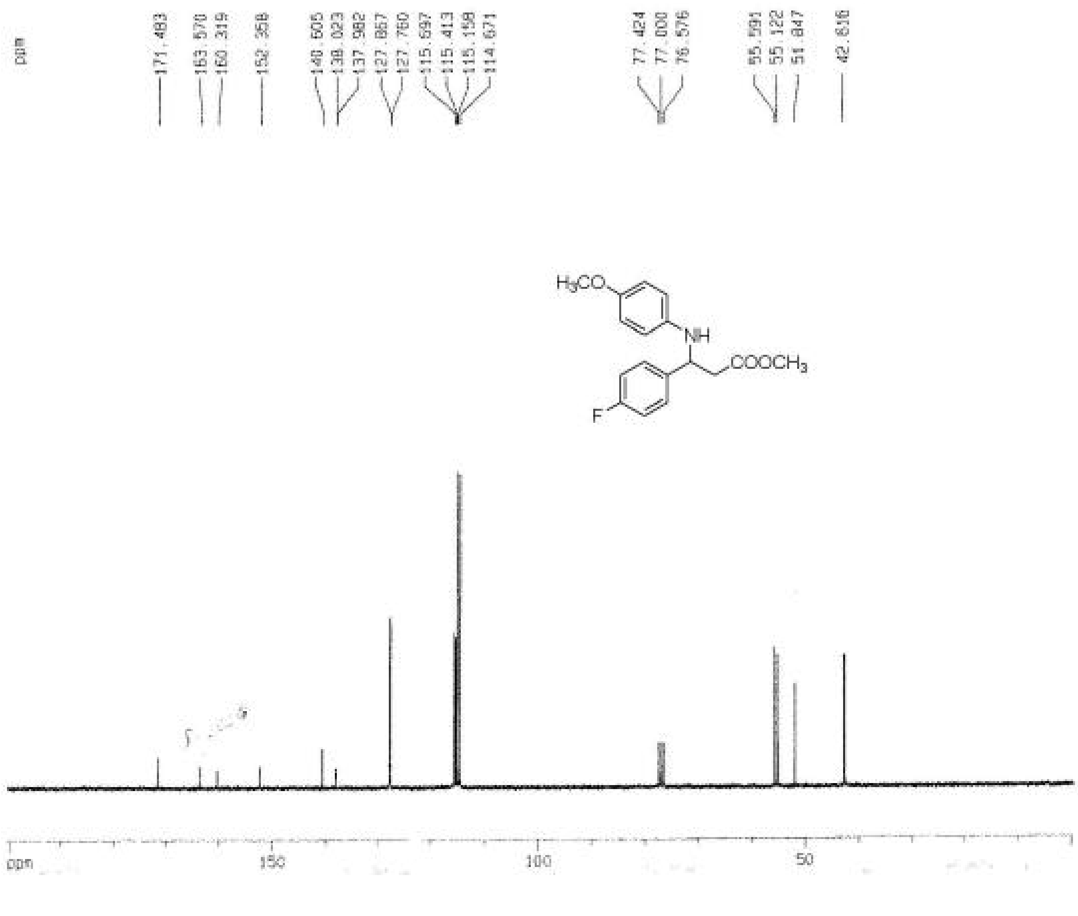
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140.505
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127.760
115.697
115.413
115.158
114.671
77.424
77.000
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55.591
55.122
51.847
42.816
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NH
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F
ppm
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100
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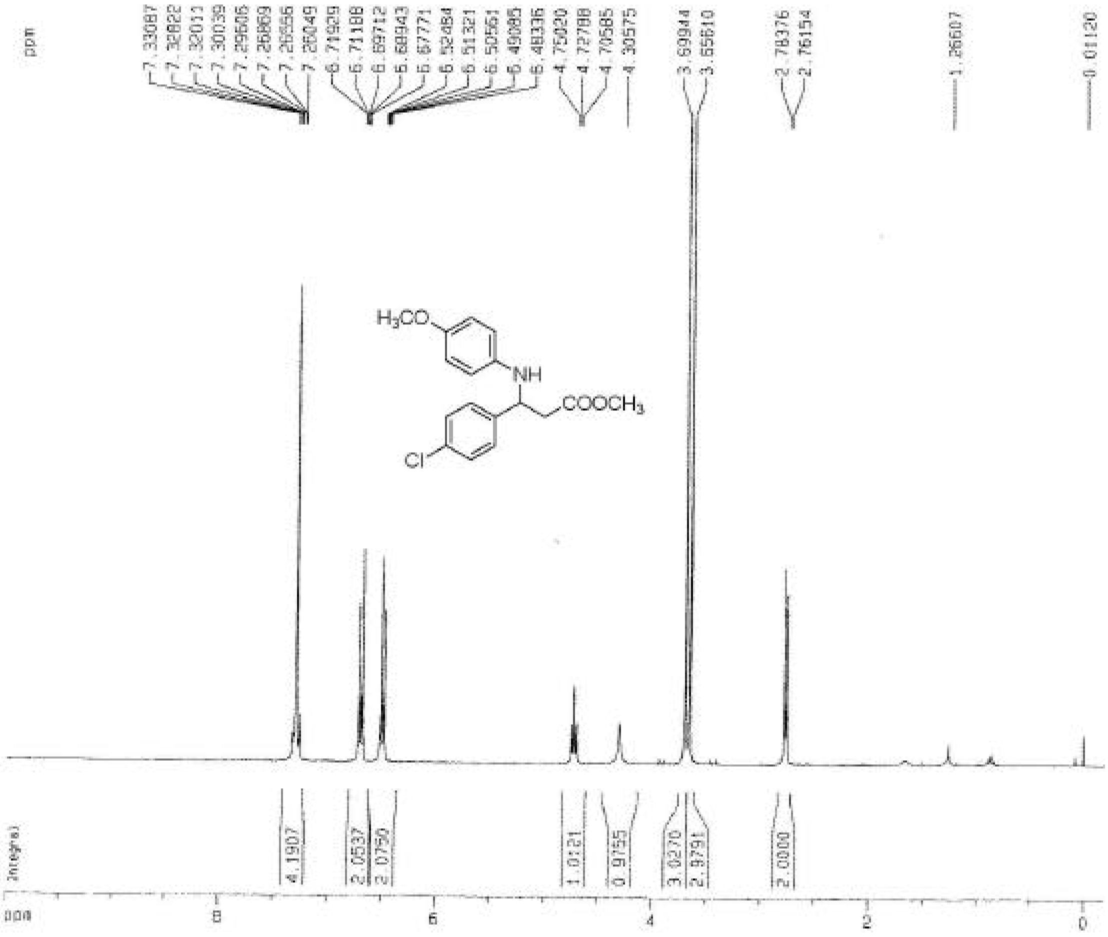

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7.26049
6.71929
6.71188
6.69712
6.68943
6.67771
6.52484
6.51321
6.50561
6.49085
6.48336
4.75020
4.72788
4.70585
4.30575
3.69944
3.65610
2.78376
2.76154
1.26607
0.01120
H3CO
NH
COOCH3
Cl
Integral
4.1907
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1.0121
0.9755
3.0270
2.9791
2.0000
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4
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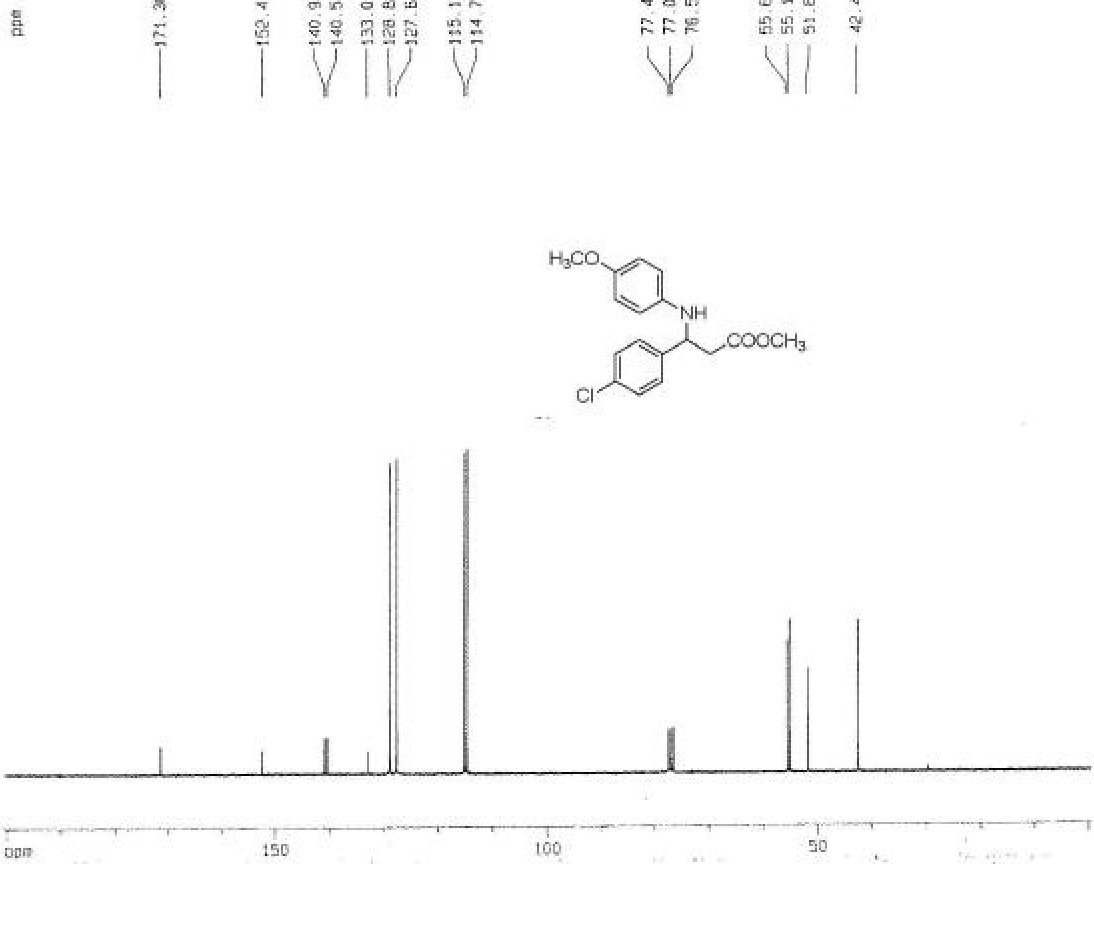

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140.523
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128.875
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115.175
114.708
77.425
77.000
76.576
55.611
55.196
51.882
42.457
H3CO
NH
COOCH3
Cl
ppm
150
100
50


zhj-206
ppm
7.46343
7.45540
7.44928
7.43351
7.42722
7.41938
7.26475
7.23674
6.72883
6.71716
6.70972
6.69493
6.68735
6.67553
6.51957
6.50795
6.50039
6.48658
6.47817
4.73226
4.70994
4.68792
4.31446
3.69877
3.65663
2.77953
2.75731
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H3CO
NH
COOCH3
Br
Integral
1.9795
2.1598
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1.0000
0.8710
3.0197
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1.9776
ppm
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6
4
2
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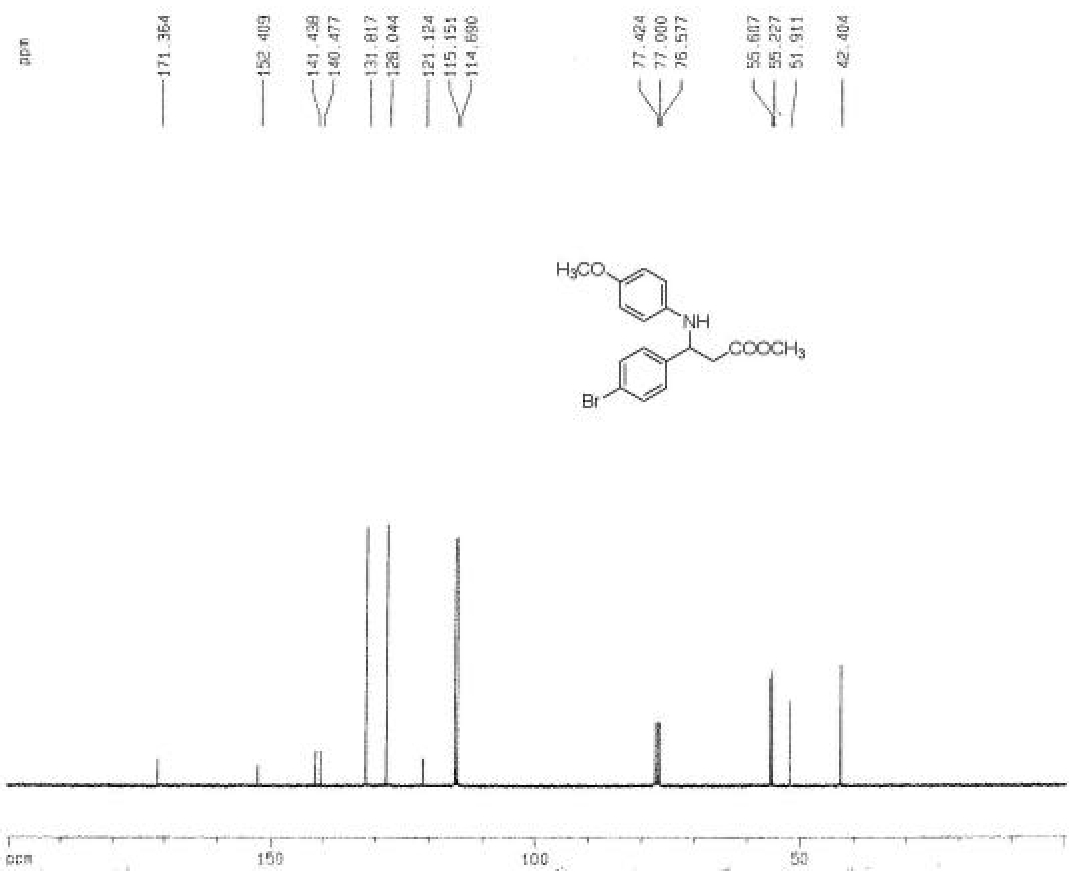
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140.477
131.617
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121.124
115.151
114.690
77.424
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55.607
55.227
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NH
COOCH3
Br
ppm
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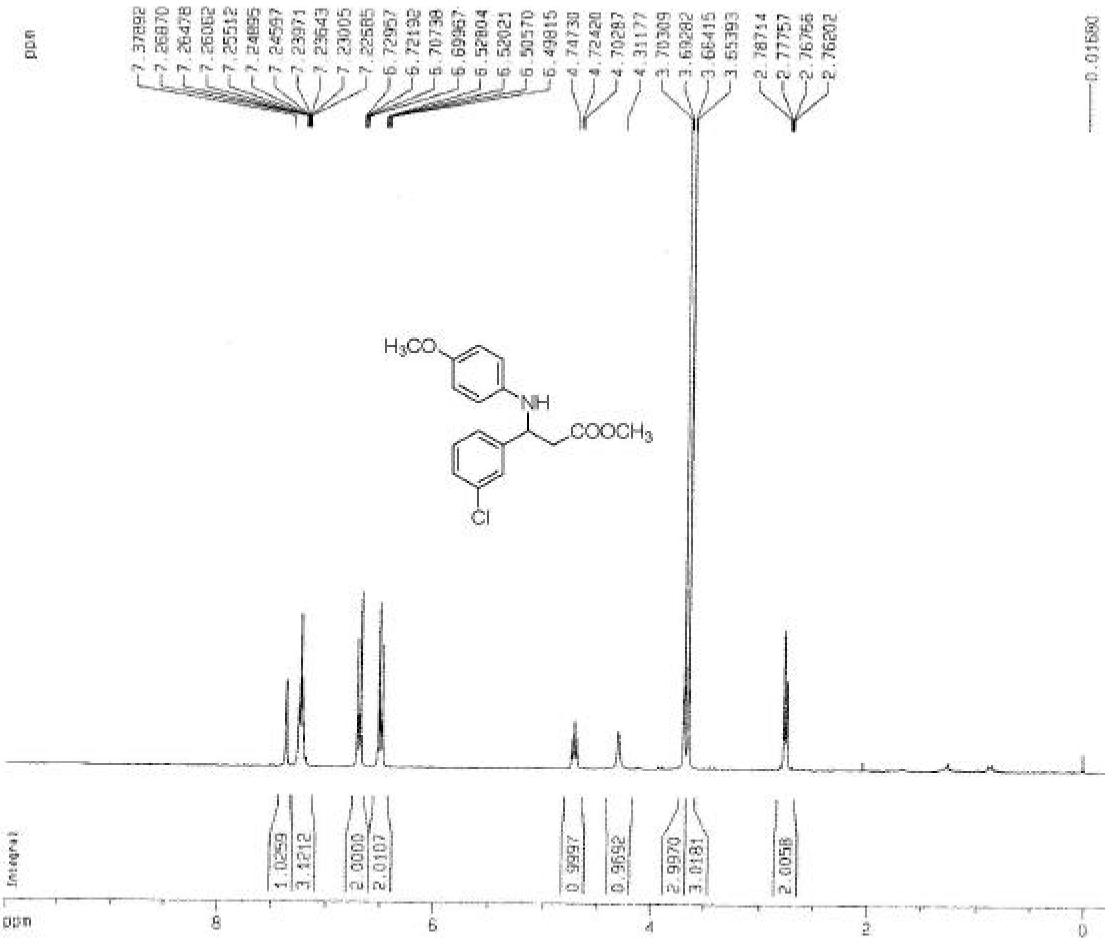
100
50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7.25512
7.24895
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7.23971
7.23643
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7.22585
6.72957
6.72192
6.70738
6.69967
6.52804
6.52021
6.50570
6.49815
4.74738
4.72420
4.70287
4.31177
3.70309
3.69282
3.66415
3.55393
2.78714
2.77757
2.76766
2.76202
0.01580
H3CO
NH
COOCH3
Cl
Integral
1.0259
3.1212
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2.0107
0.9997
0.9692
2.9970
3.0181
2.0058
ppm
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6
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2
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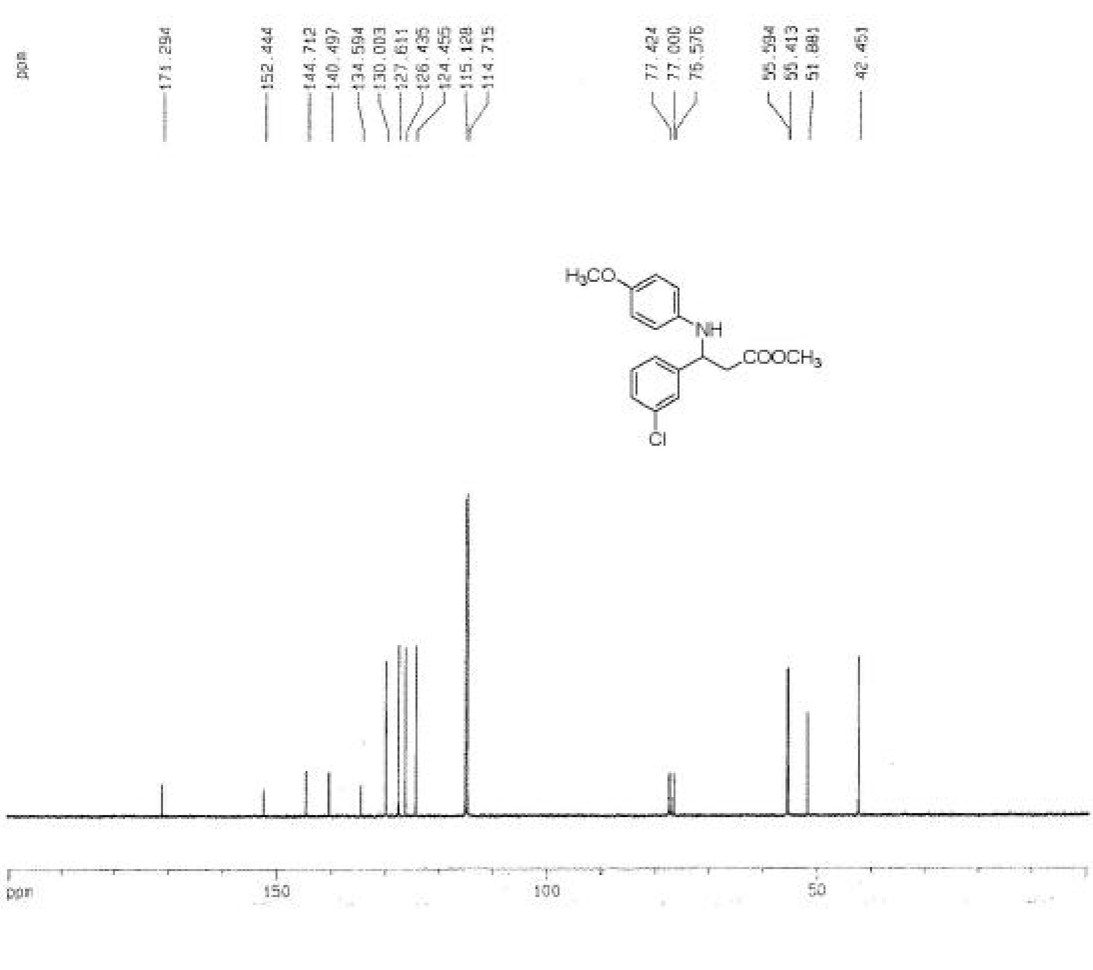
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124.455
115.128
114.715
77.424
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55.594
55.413
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NH
COOCH3
Cl
ppm
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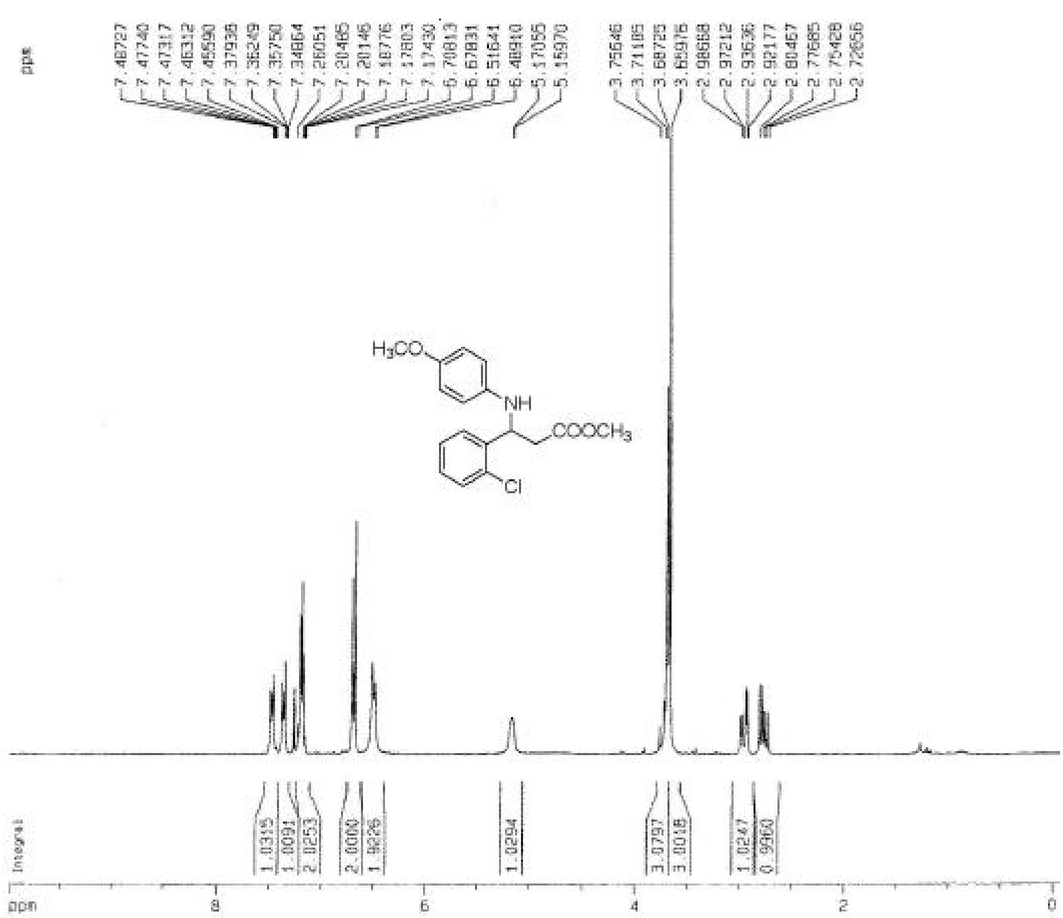
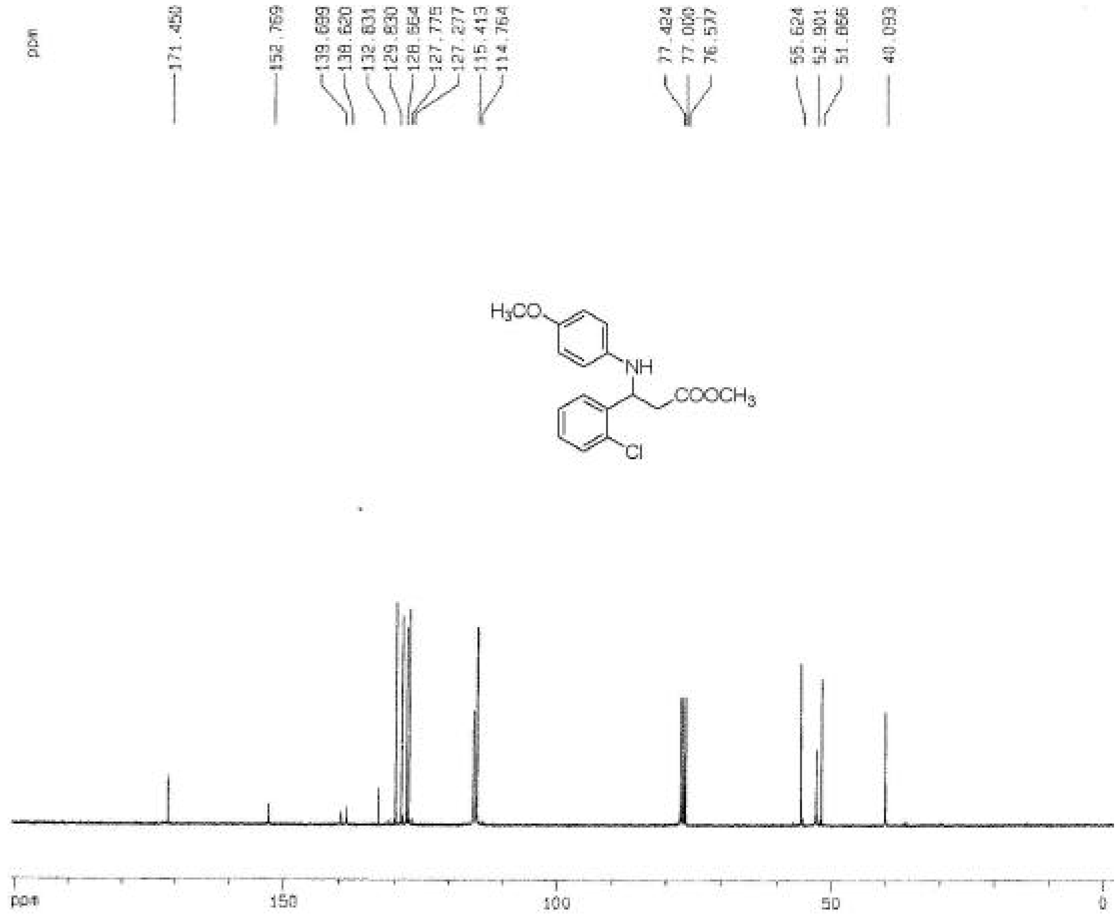
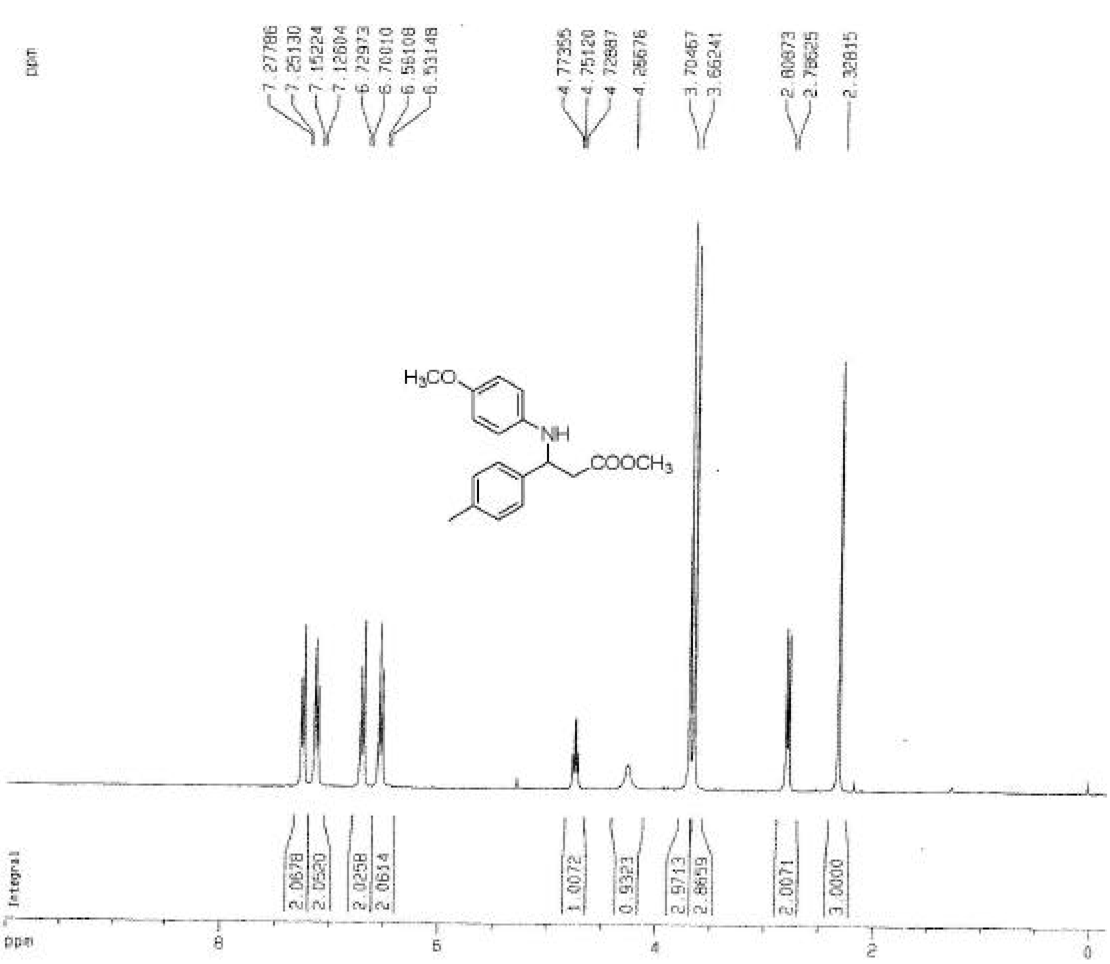
100
50



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4.72887
4.25676
3.70467
3.66241
2.80873
2.78625
2.32815
H3CO
NH
COOCH3
Integral
2.0678
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2.0258
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0.9321
2.9713
2.8659
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3.0000
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2
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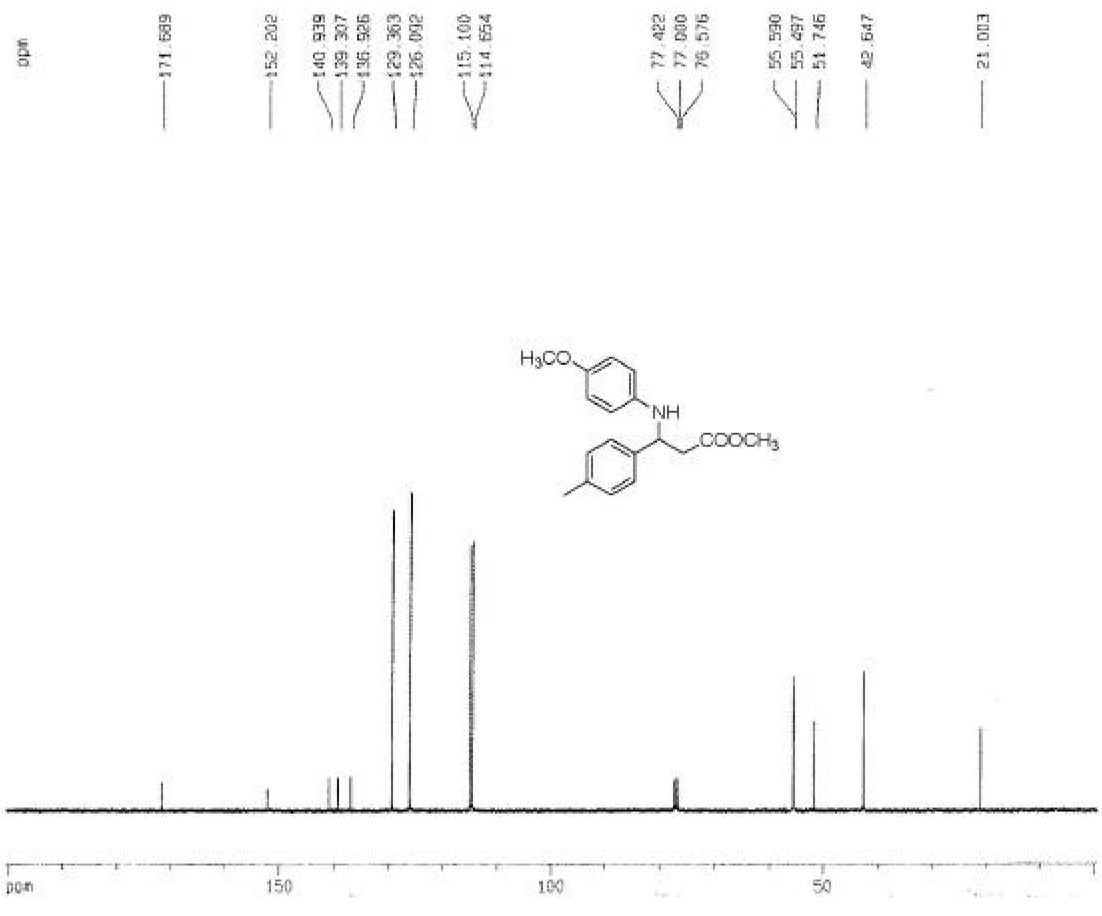
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139.307
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77.422
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51.746
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NH
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ppm
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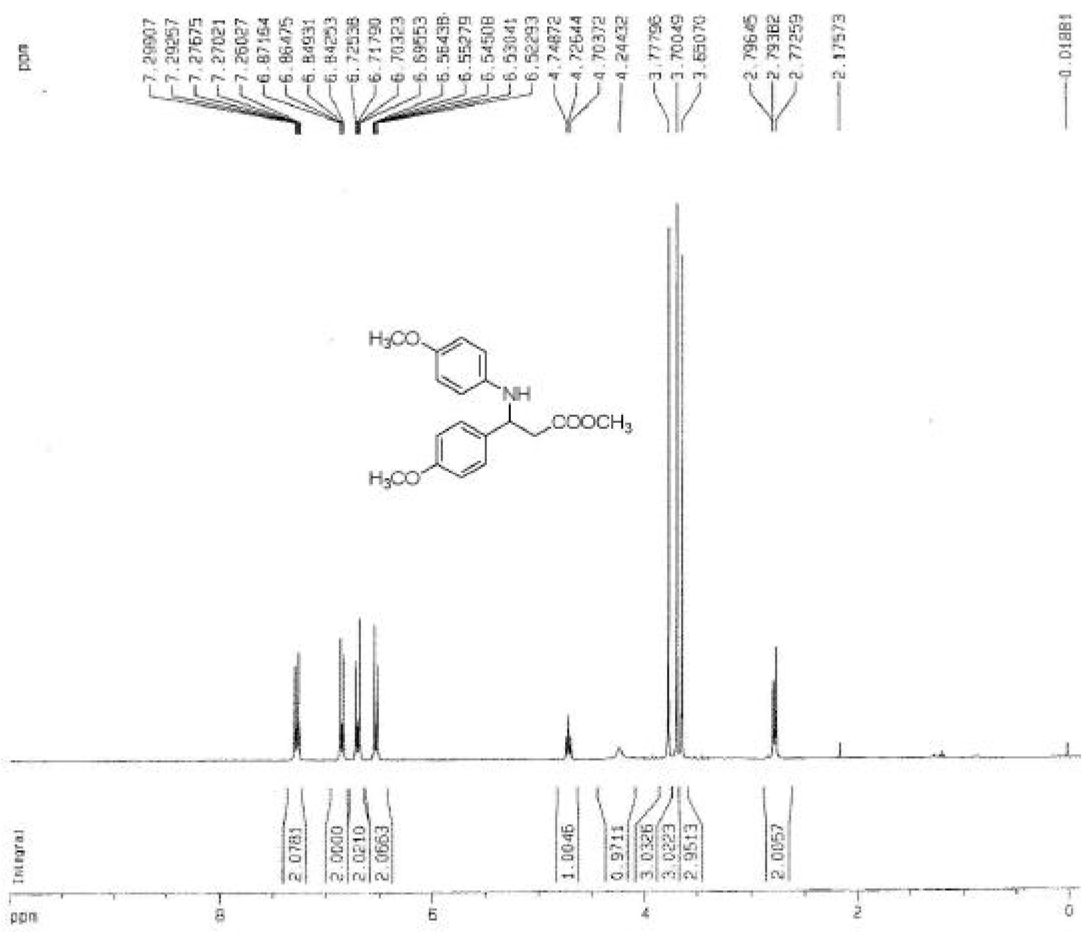
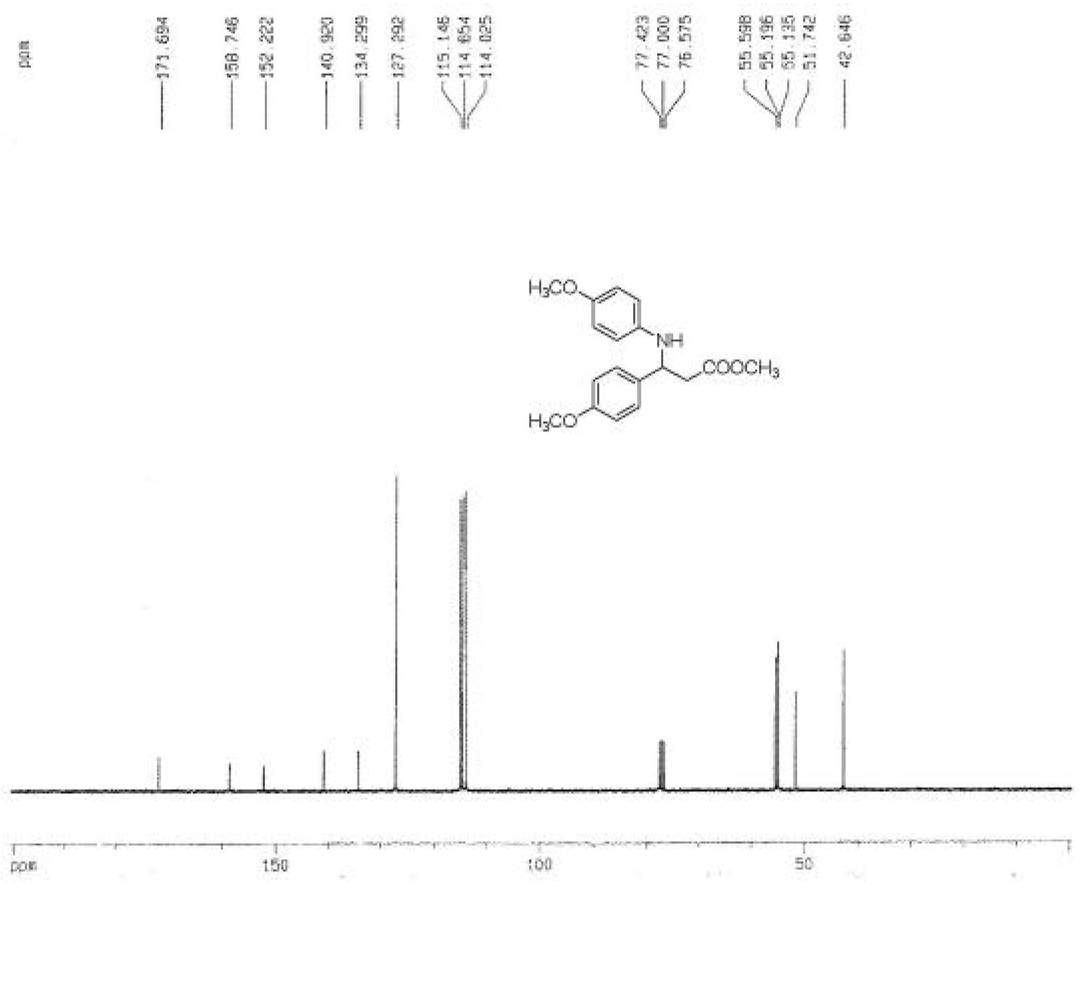
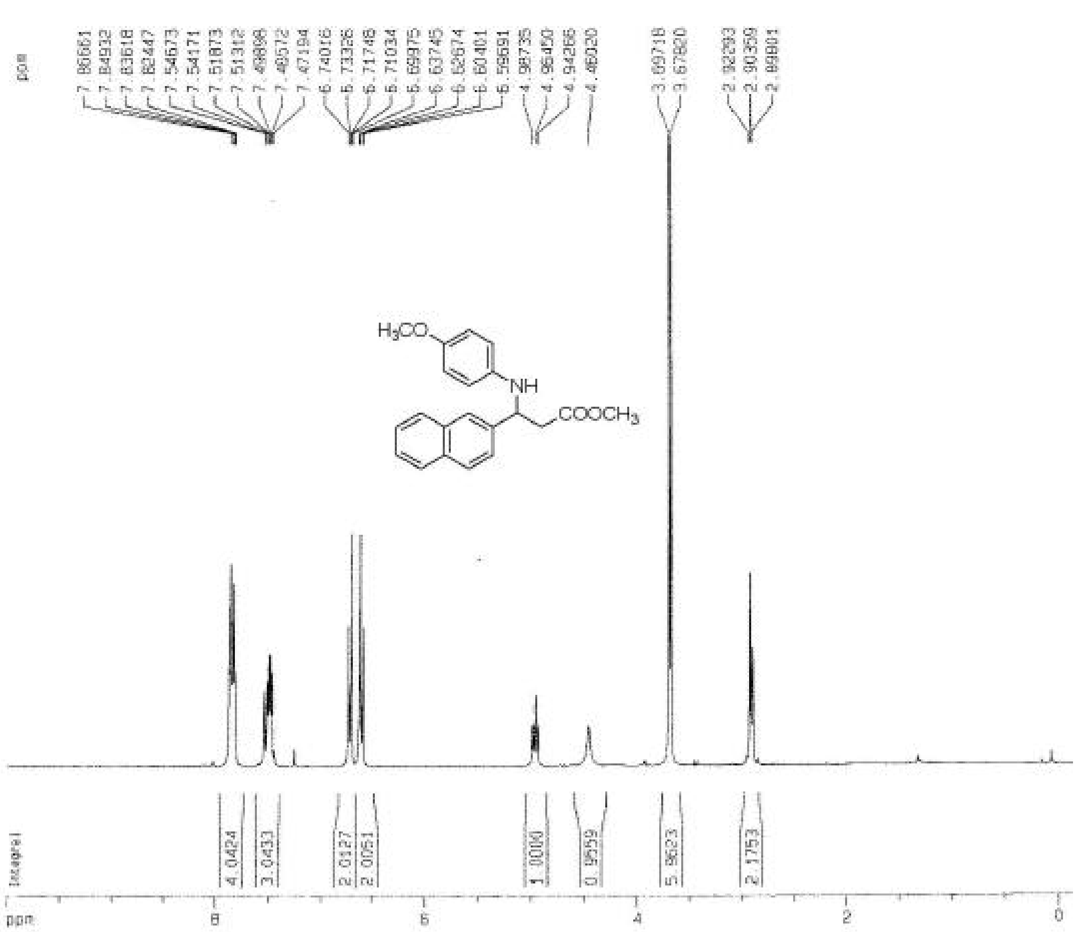
100
50



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6.69975
6.63745
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6.59691
4.98735
4.96450
4.94266
4.46020
3.69718
3.67820
2.92203
2.90359
2.89801
H3CO
NH
COOCH3
Integral
4.0424
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2.1753
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6
4
2
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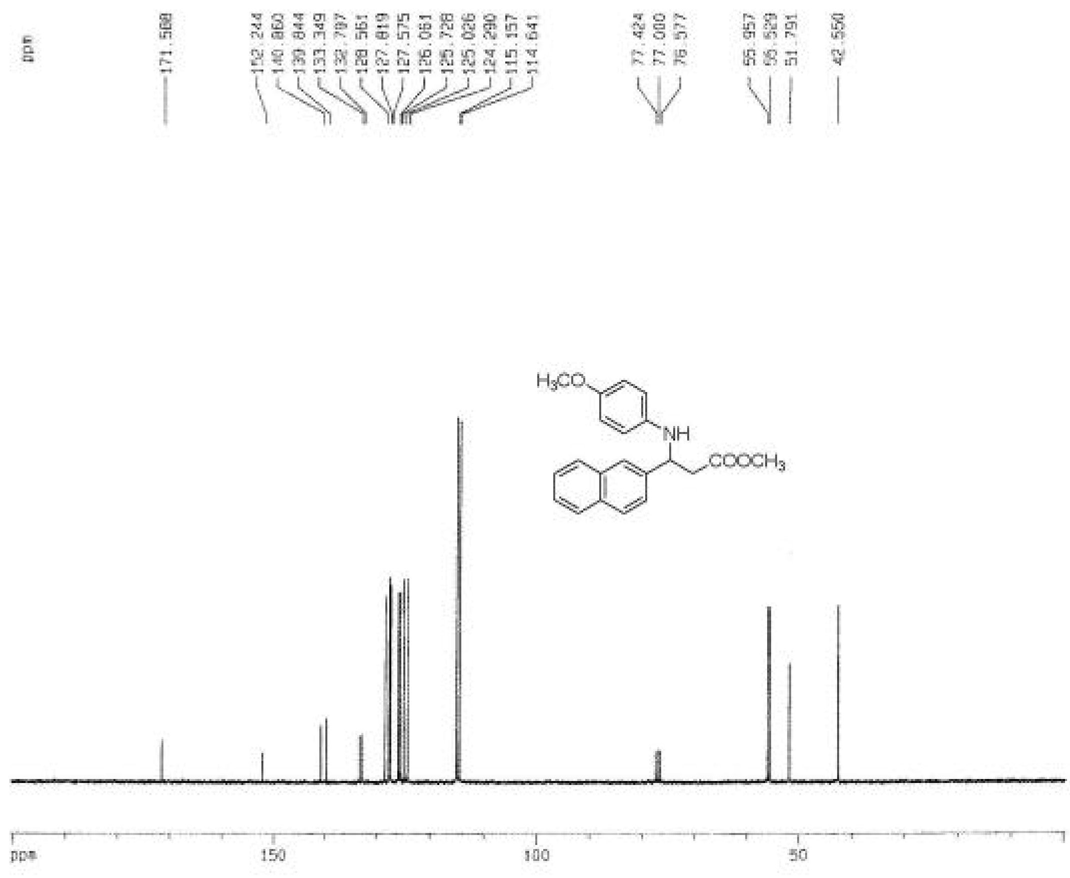
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127.575
126.061
125.728
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115.157
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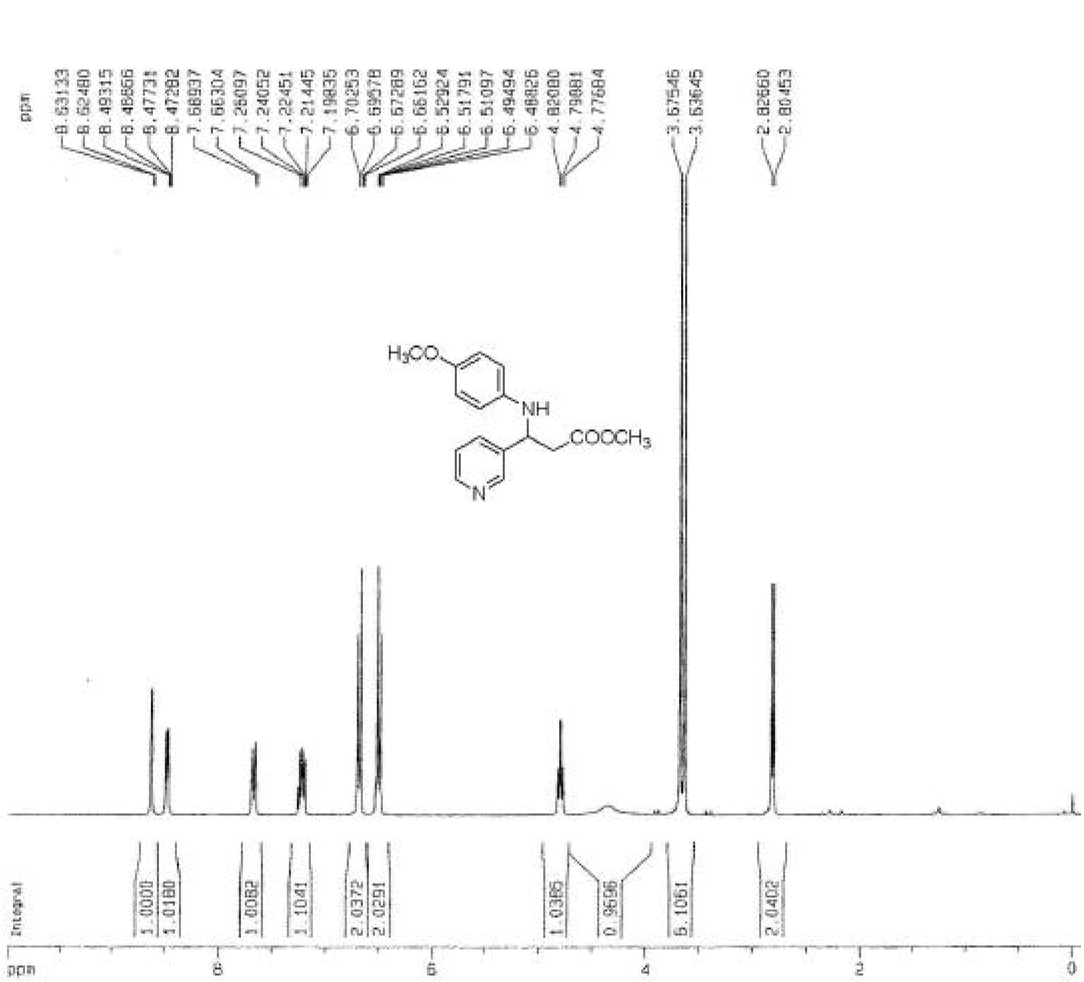

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7.21445
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6.52924
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6.51097
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6.48826
4.82080
4.79981
4.77684
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3.53645
2.82660
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H3CO
NH
COOCH3
N
Integral
1.0000
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1.0082
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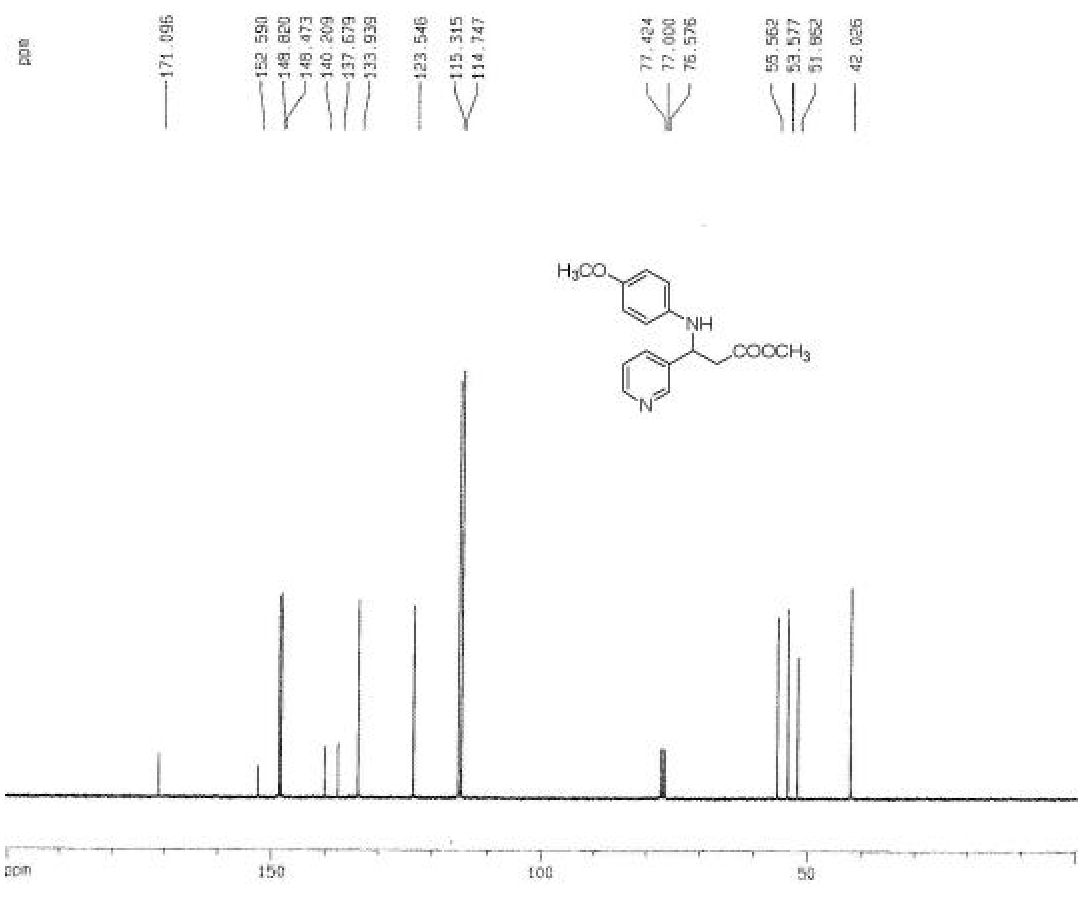

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115.315
114.747
77.424
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55.562
53.577
51.562
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NH
COOCH3
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ppm
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100
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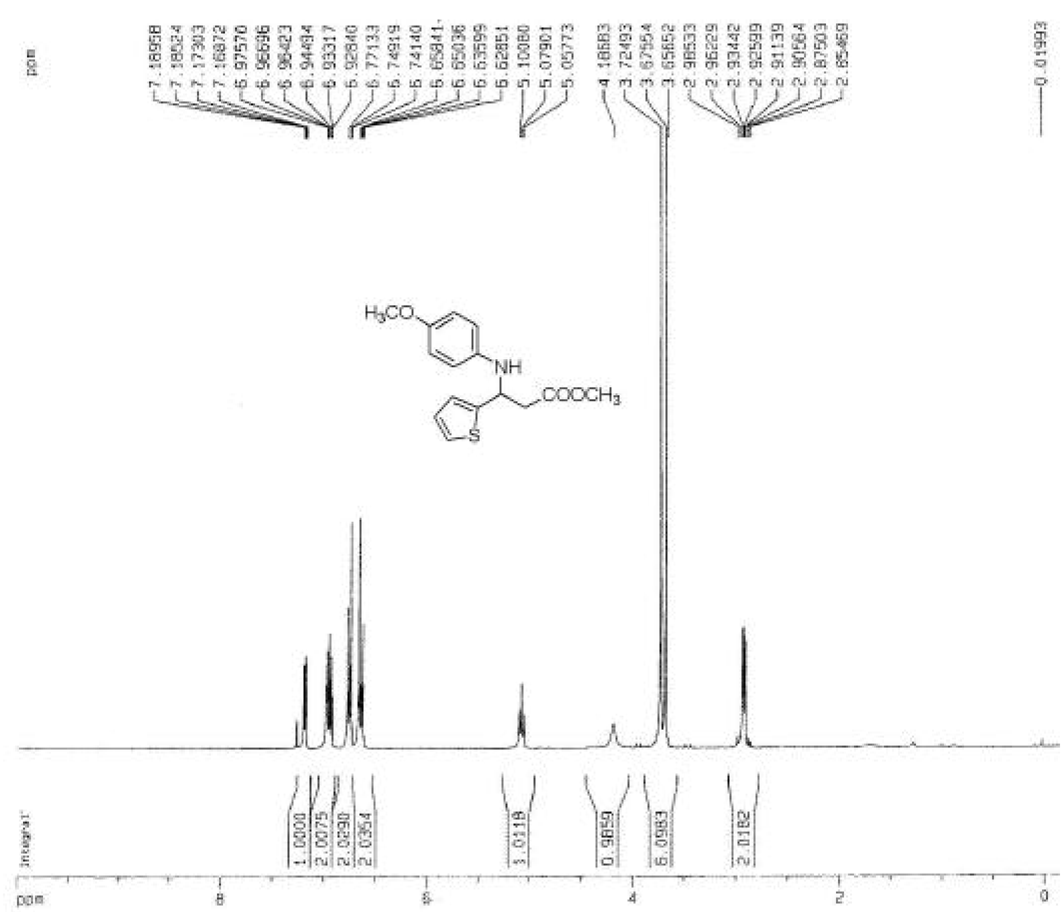
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6.63599
6.62851
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5.07901
5.05773
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3.65652
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2.96229
2.93442
2.92599
2.91139
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2.85469
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H3CO
NH
COOCH3
S
Integral
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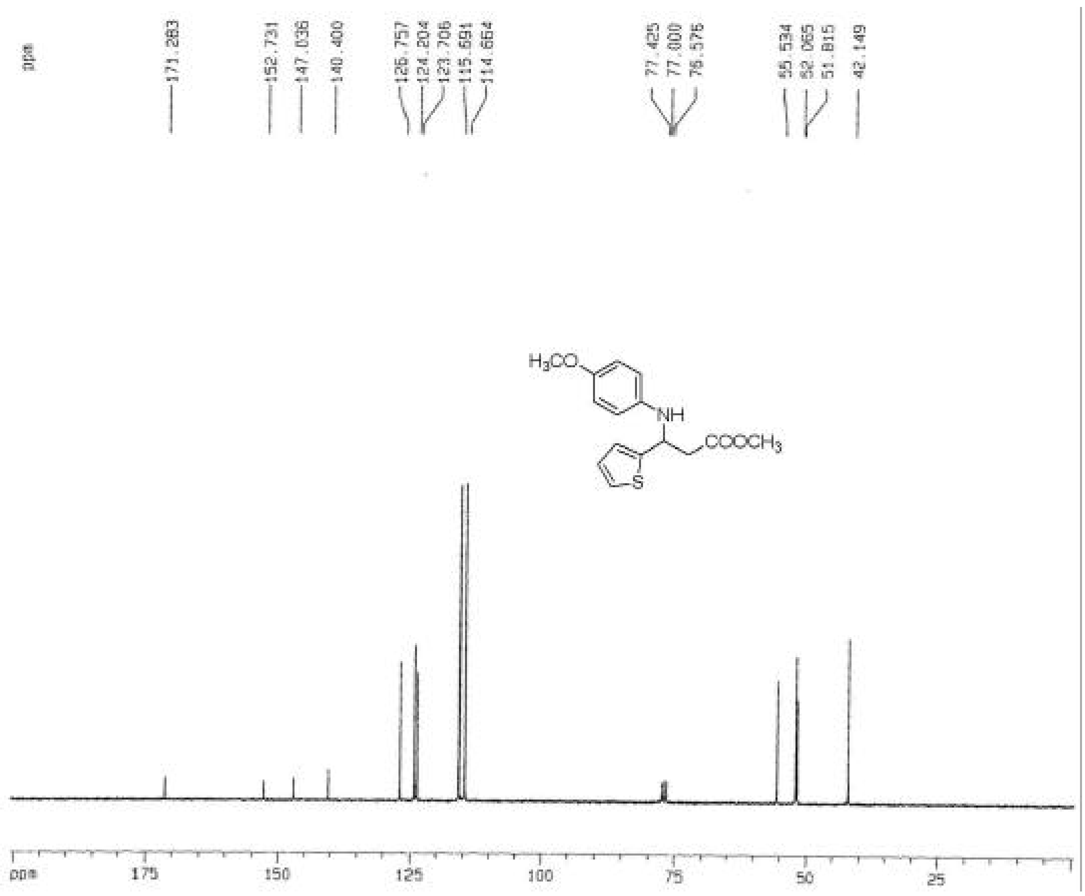
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77.000
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NH
COOCH3
S
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125
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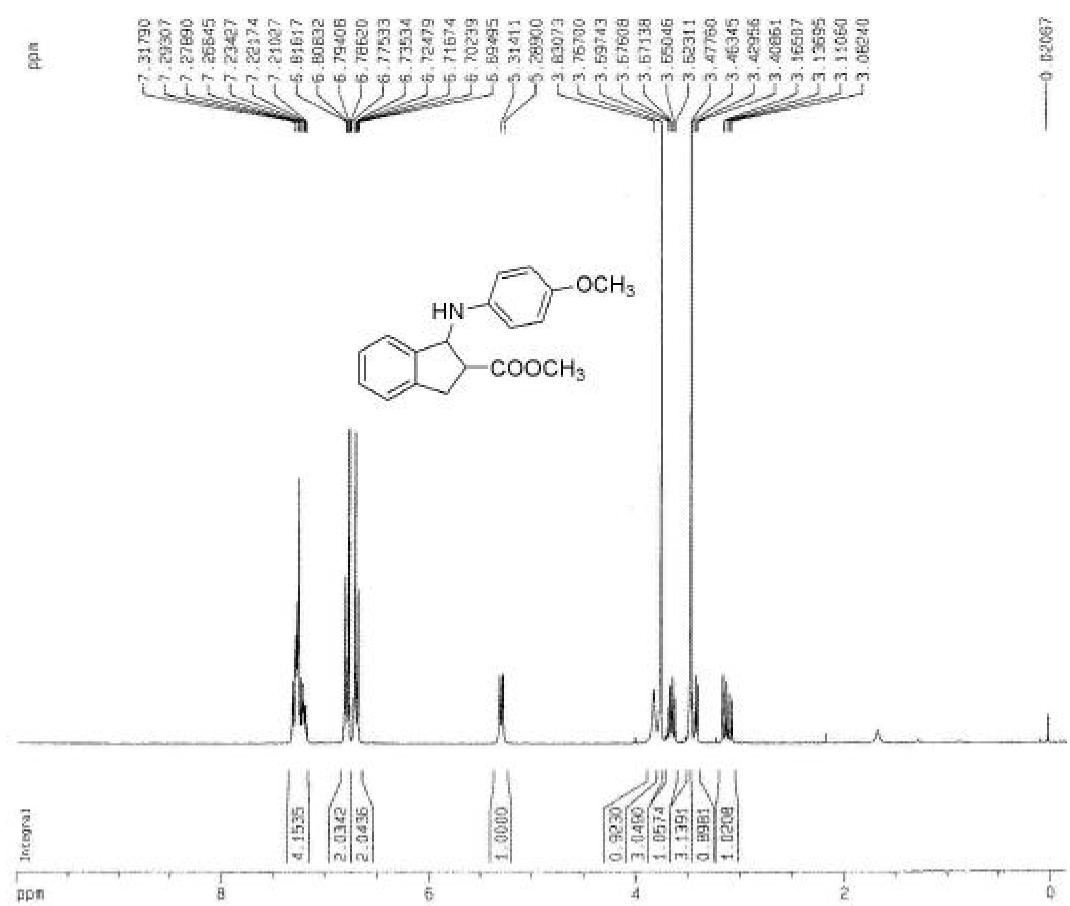
75
50
25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5.28900
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3.47760
3.46345
3.42956
3.40861
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HN
OCH3
COOCH3
Integral
4.1535
2.0342
2.0436
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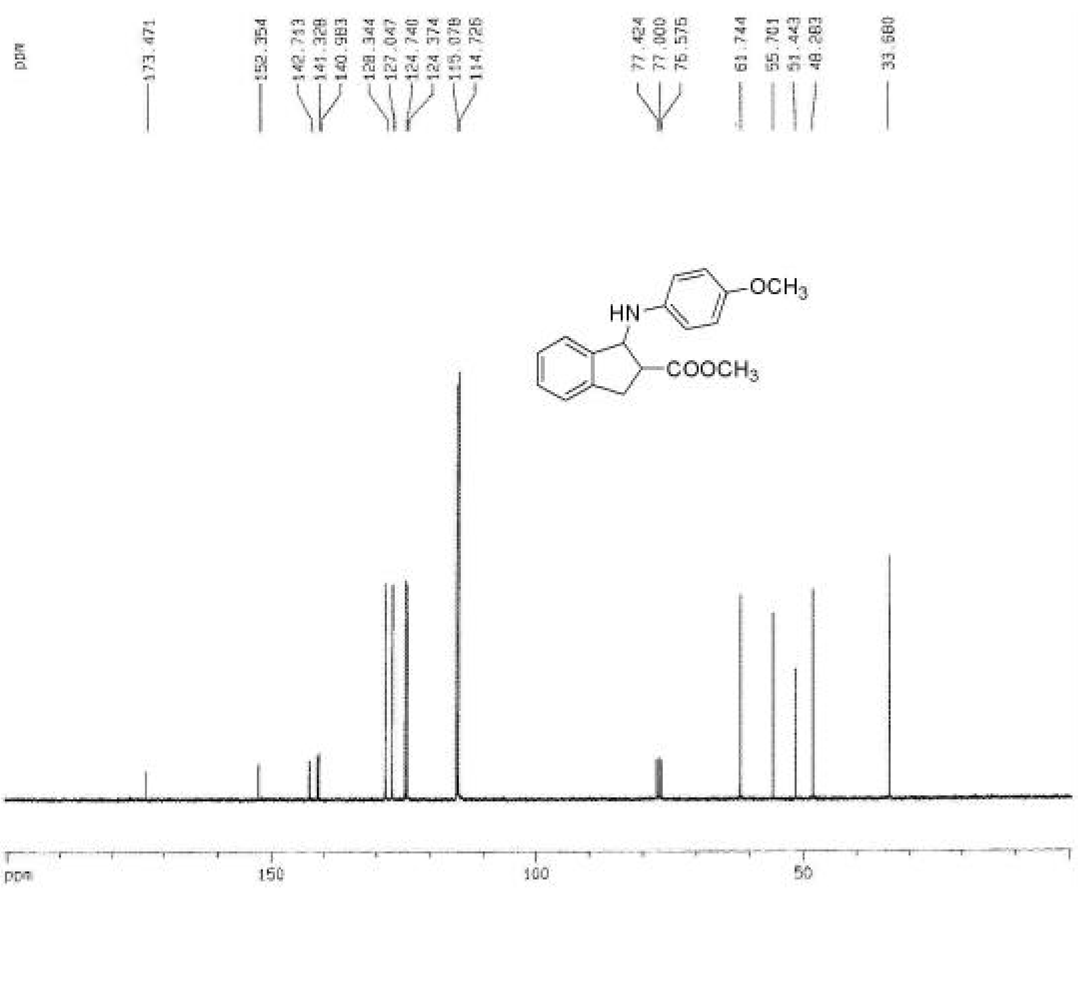
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124.374
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COOCH3
ppm
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100
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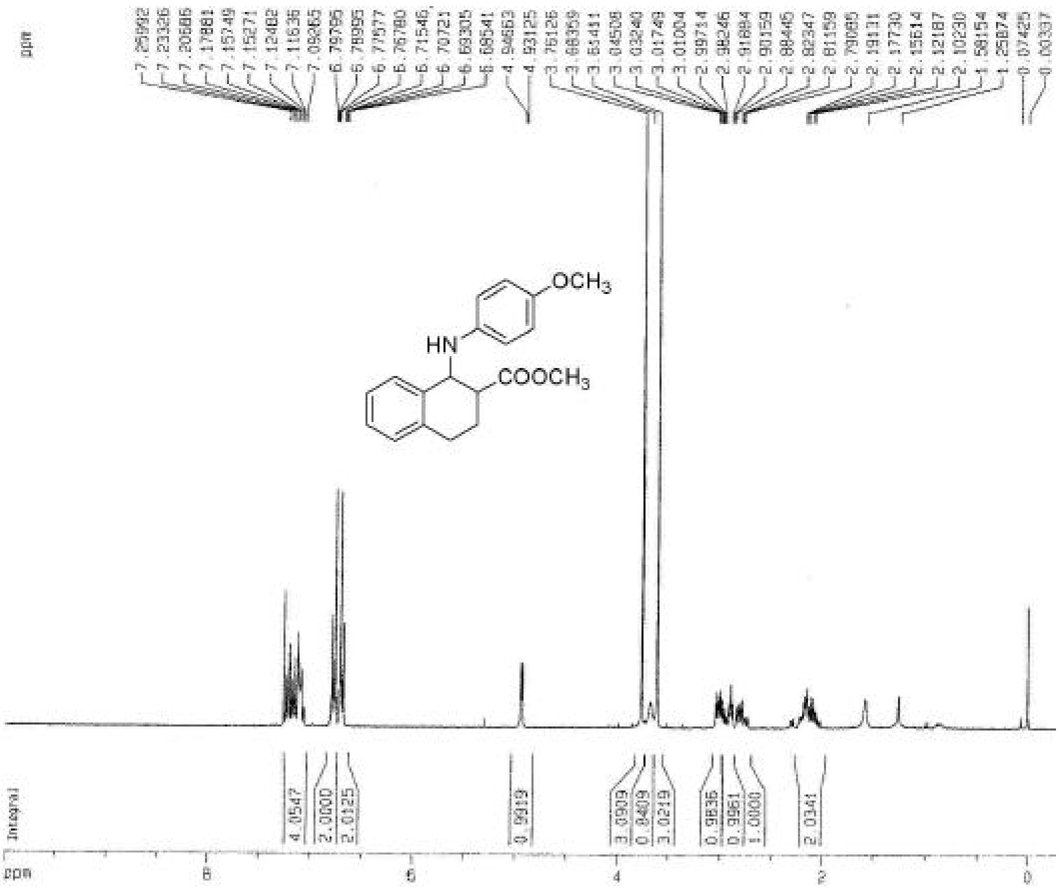
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6.78995
6.77577
6.76780
6.71546
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6.68541
4.94663
4.93125
3.76126
3.68359
3.61411
3.04508
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2.91884
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2.19131
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1.58154
1.25874
0.07425
0.00337
OCH_3
HN
$COOCH_3$
Integral
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2.0000
2.0125
0.9919
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3.0219
0.9836
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6
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2
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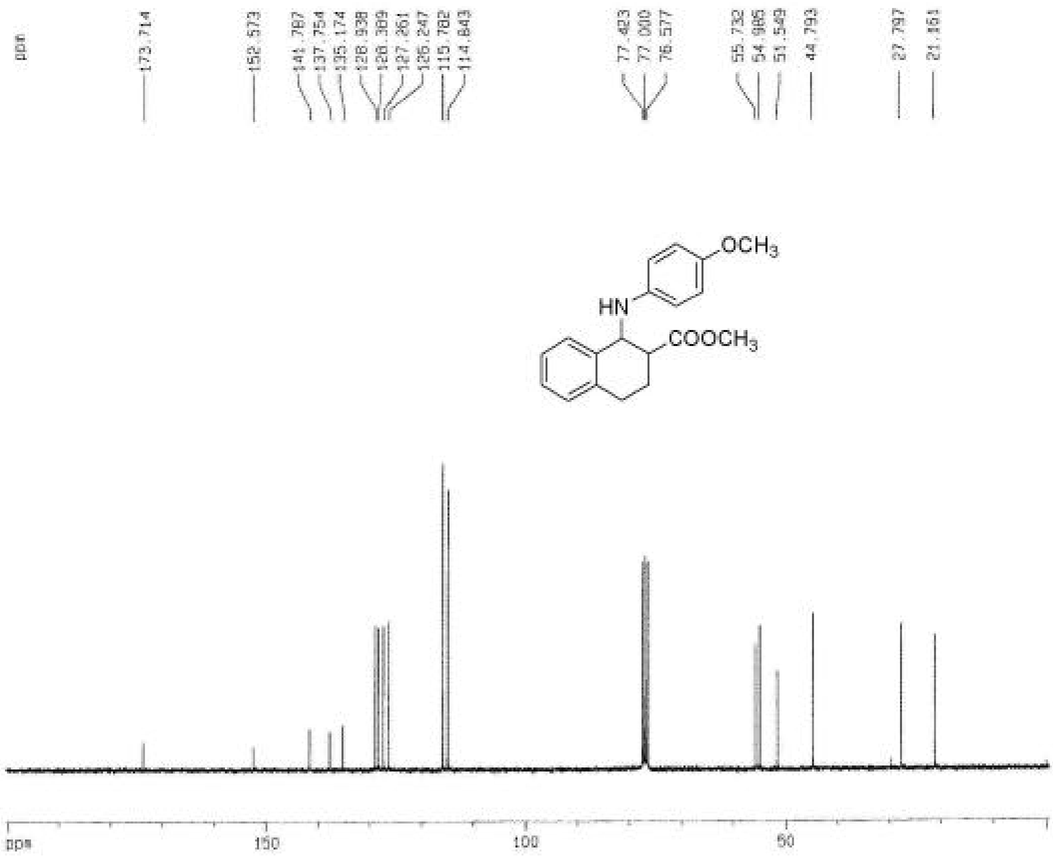
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128.309
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126.247
115.782
114.843
77.423
77.000
76.577
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51.549
44.793
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21.161
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HN
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100
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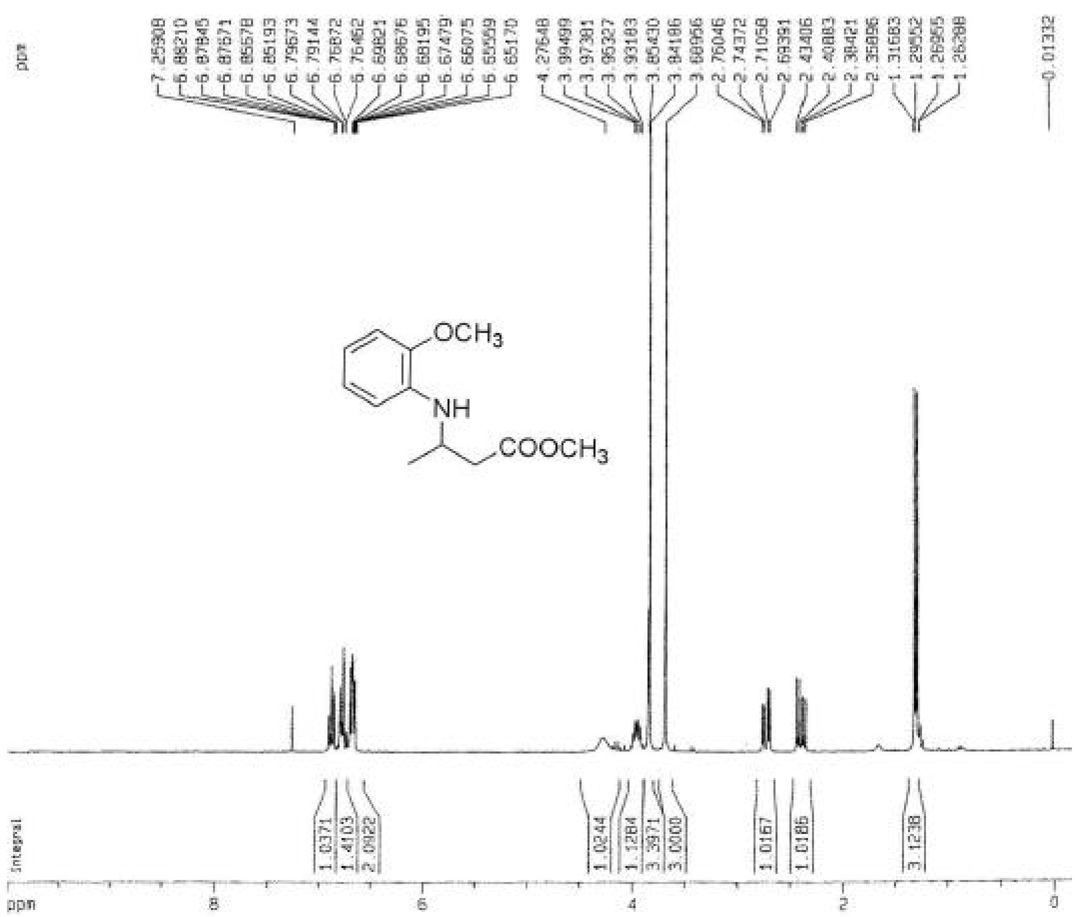
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NH
COOCH3
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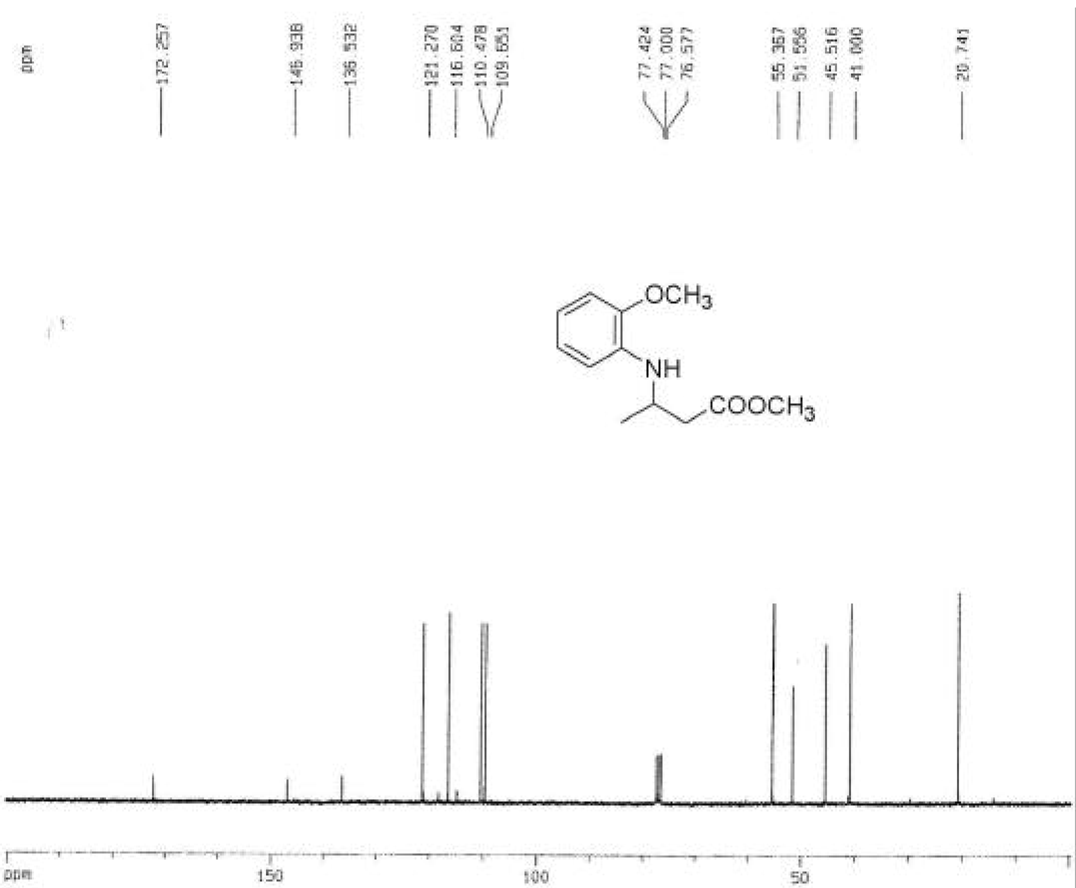
3.1238


OCH3
NH
COOCH3
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116.604
110.478
109.651
77.424
77.000
76.577
55.357
51.556
45.516
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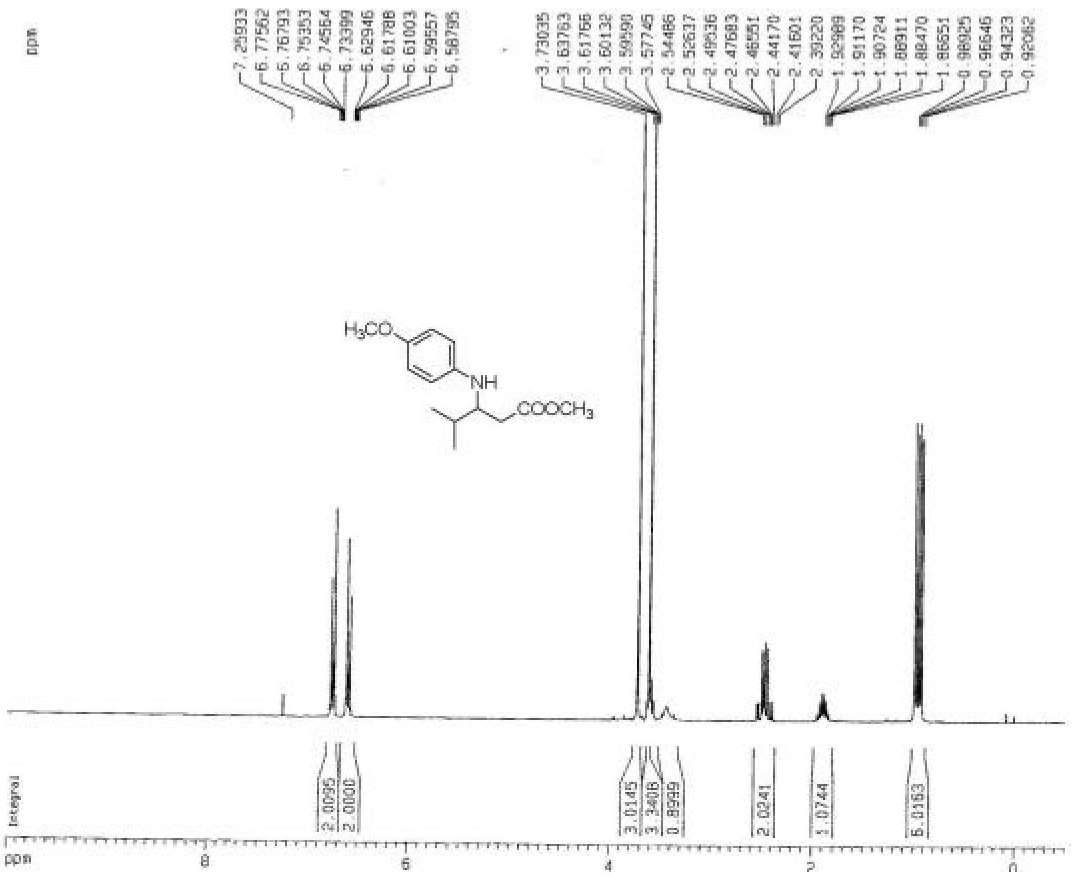
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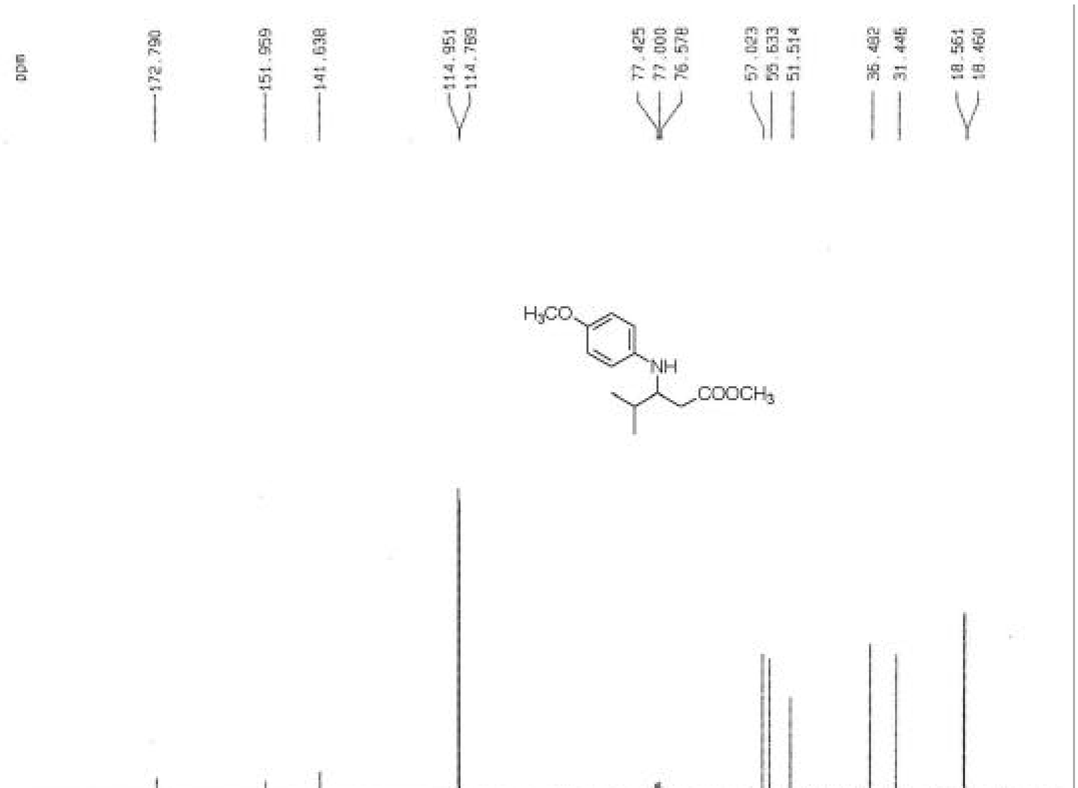
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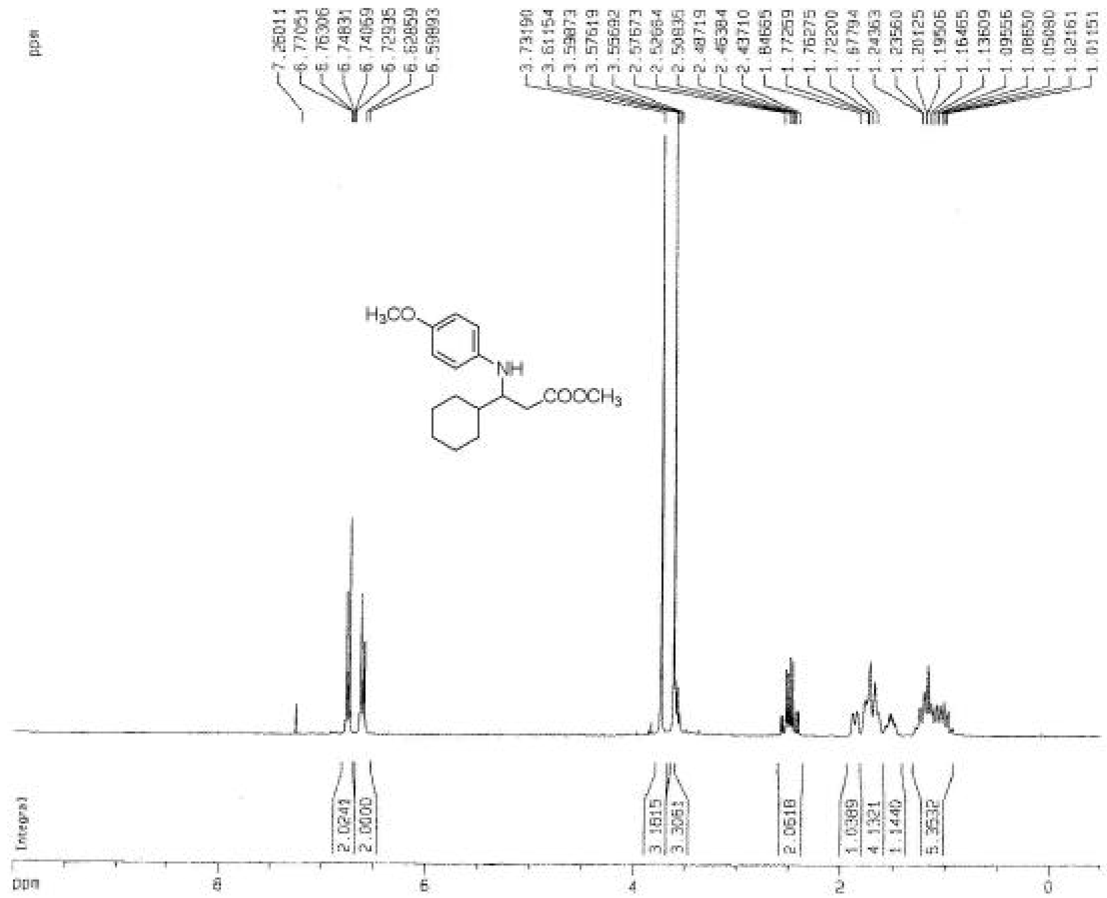
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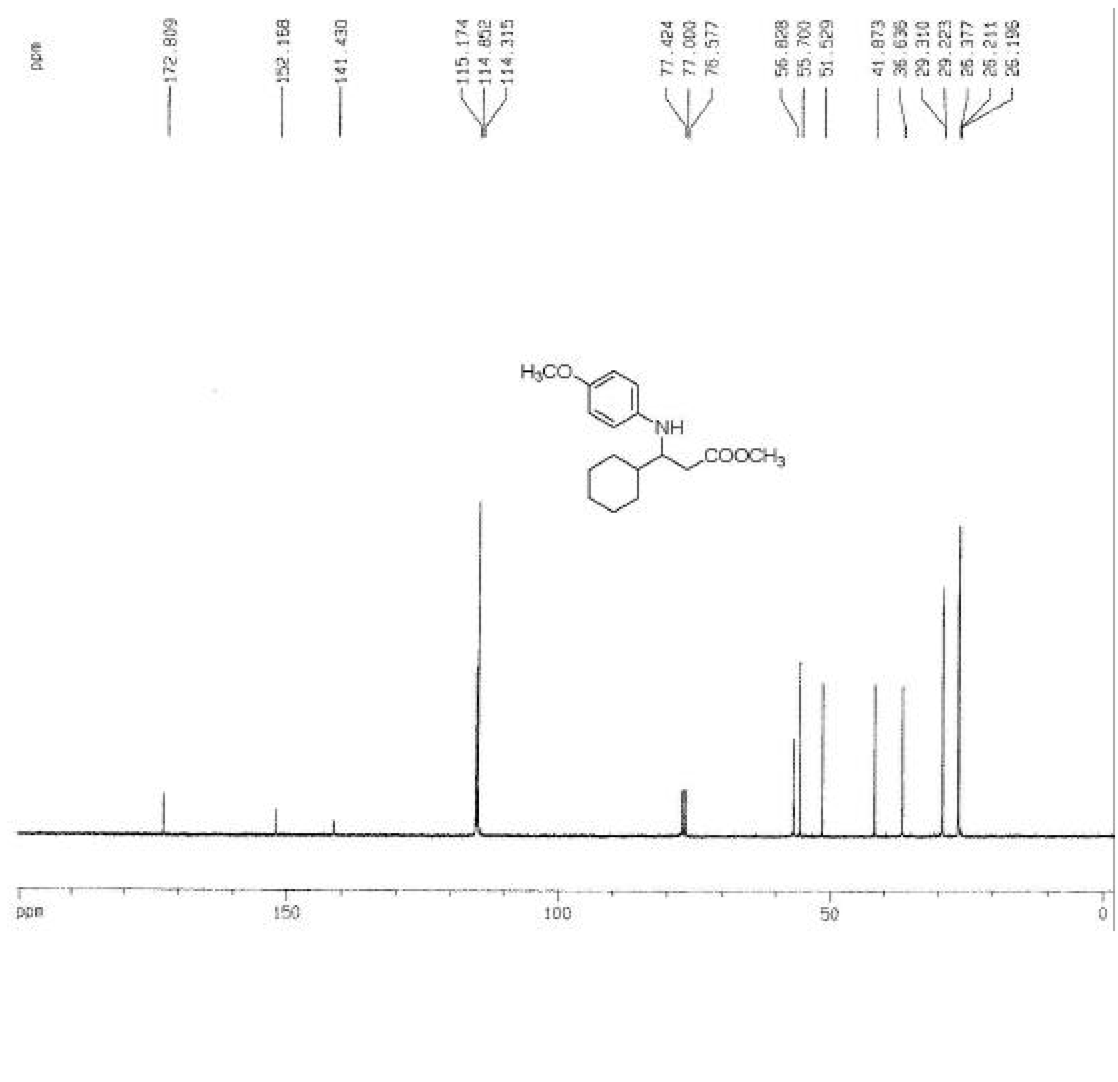
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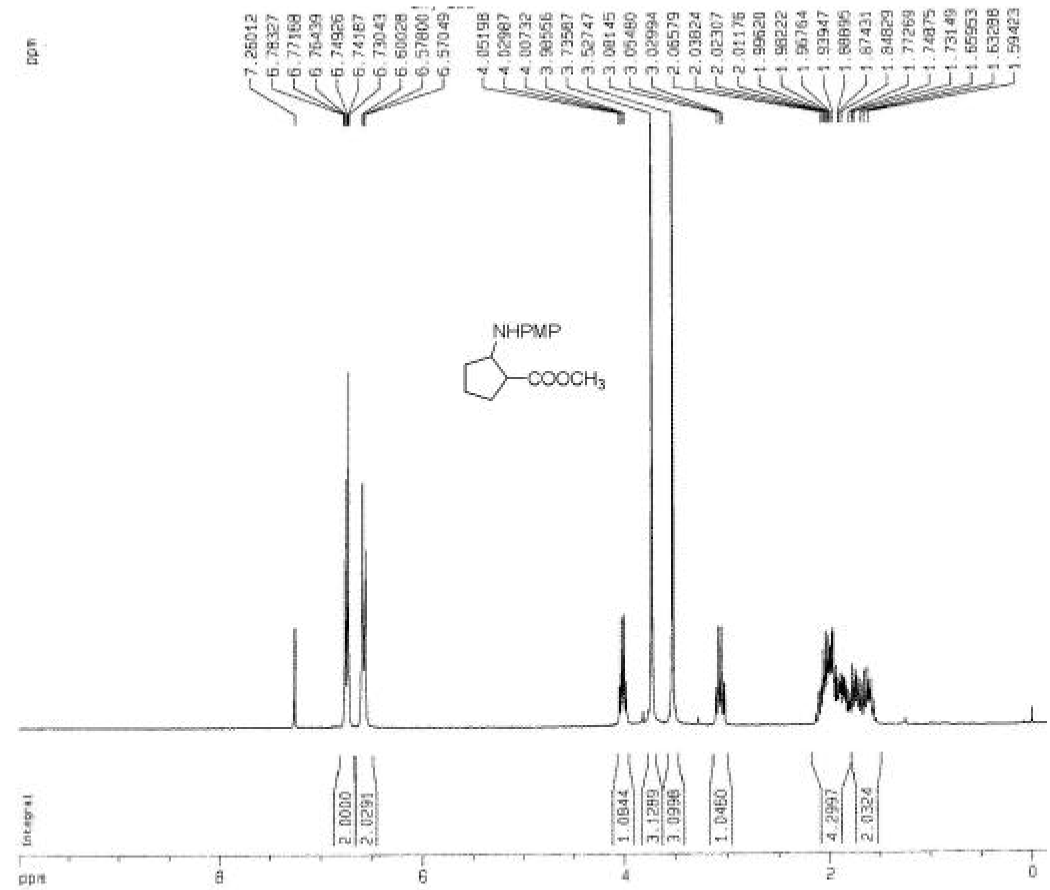
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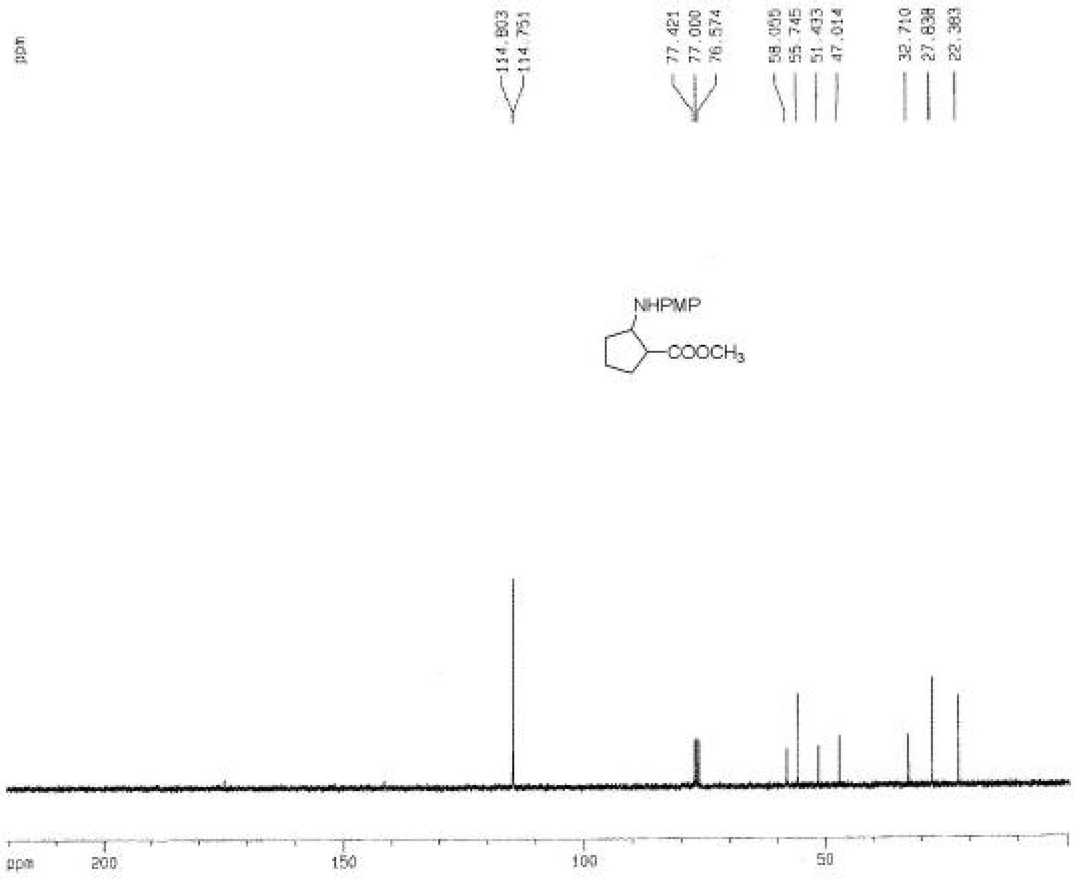
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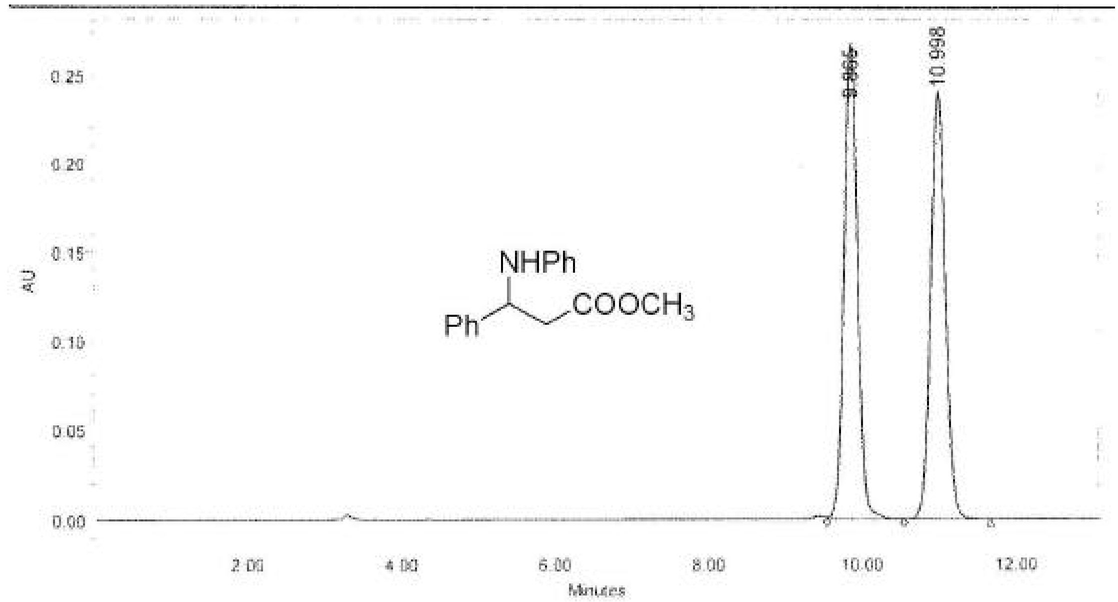

	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
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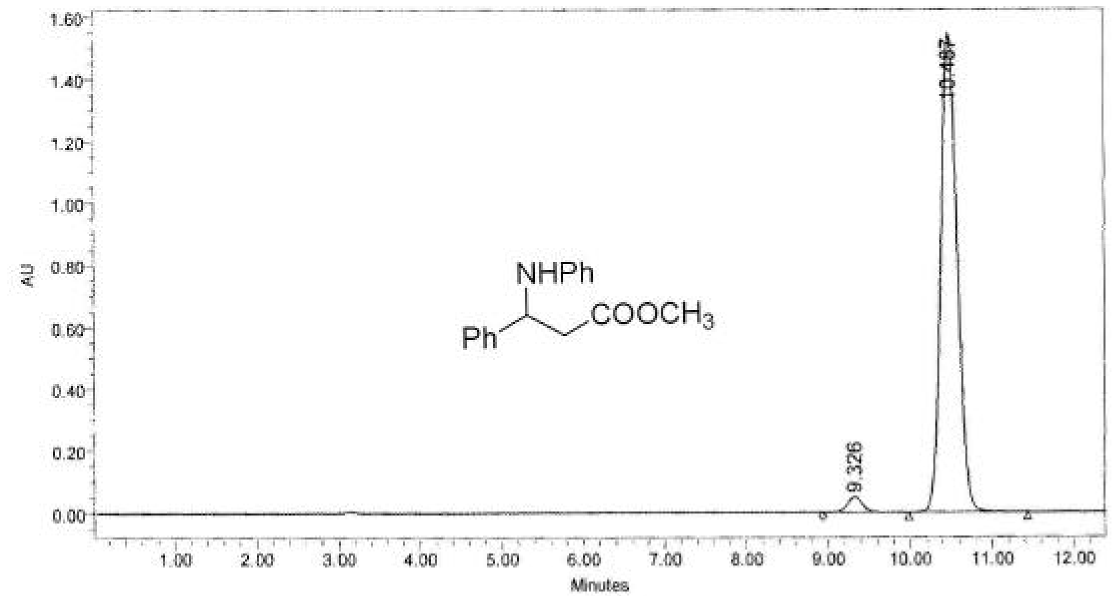
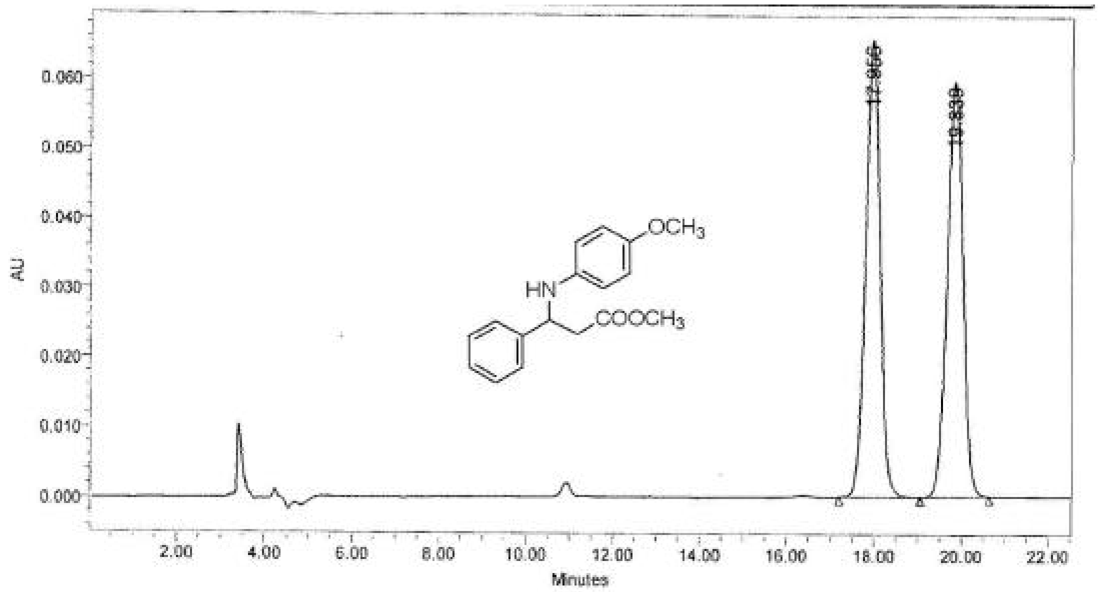
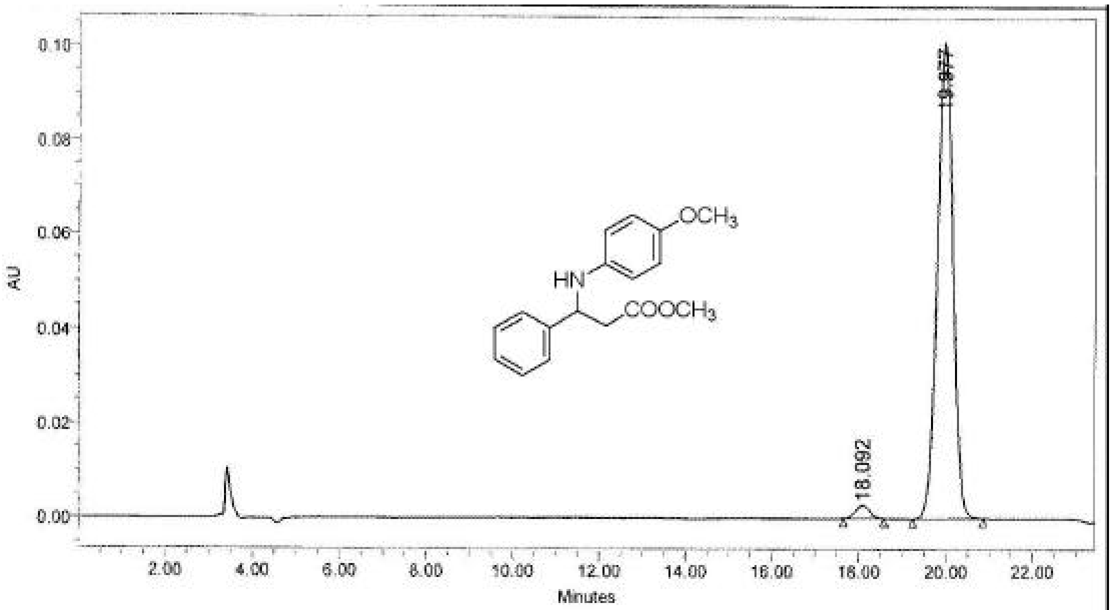


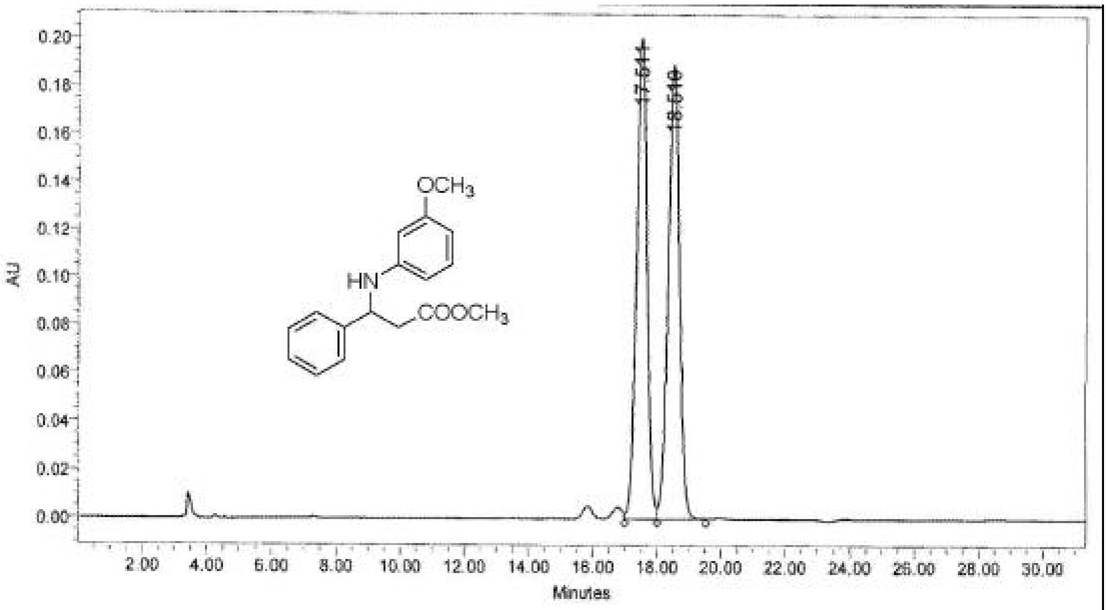
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	9.326	574360	2.63	48067	3.02
2	10.487	21261720	97.37	1541173	96.98



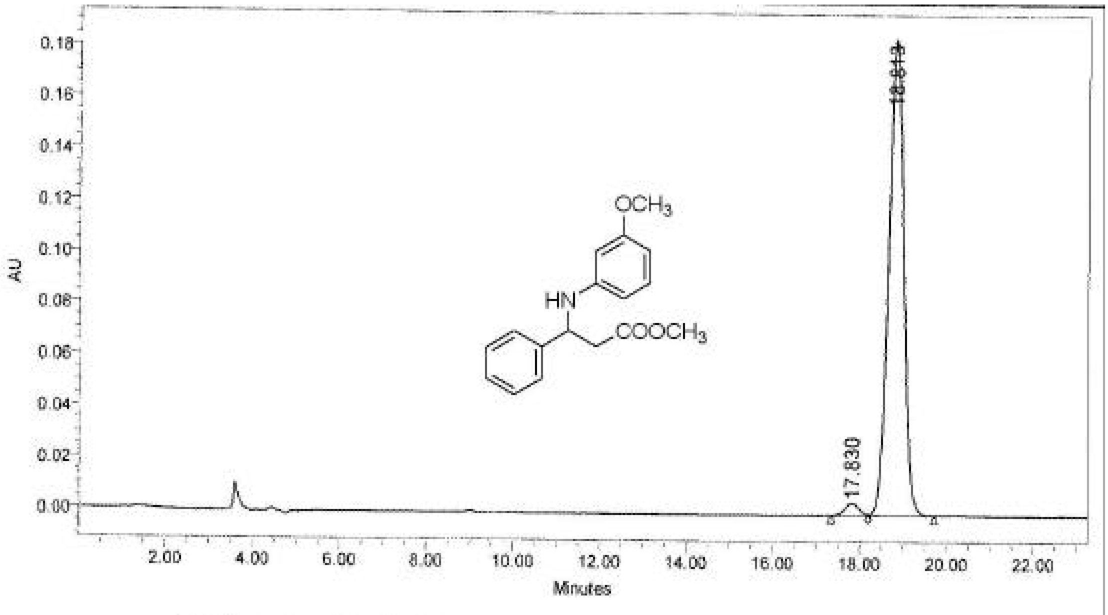
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	17.956	1512297	50.31	65611	52.37
2	19.839	1493415	49.69	59681	47.63



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	18.092	60838	2.34	2749	2.64
2	19.977	2535417	97.66	101316	97.36



	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
1	17.511	4652158	50.08	200819	51.39
2	18.510	4637990	49.92	189937	48.61



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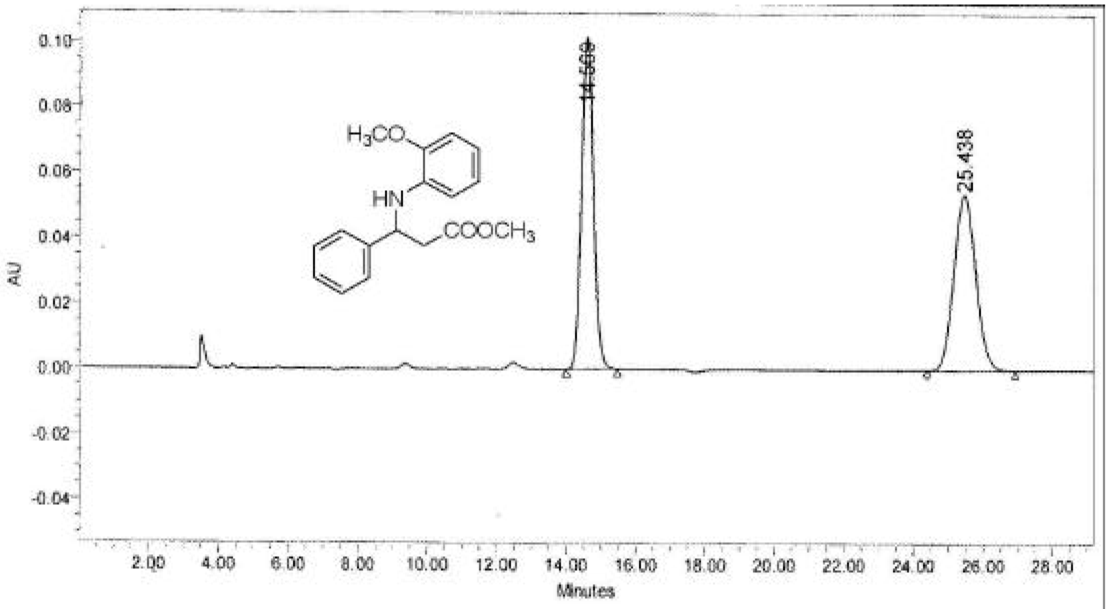
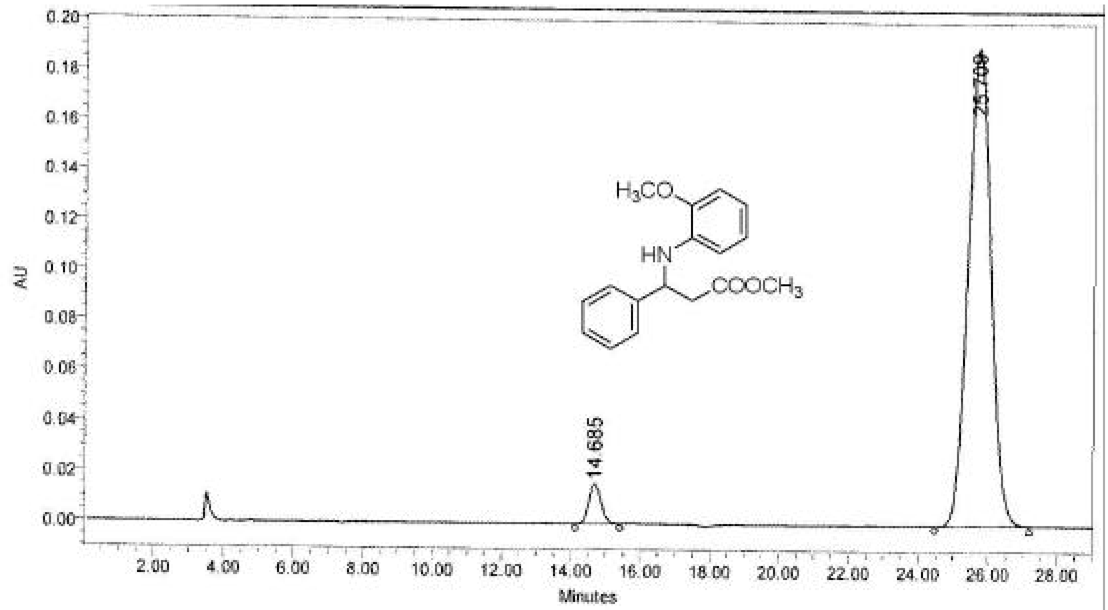
1	17.830	100939	2.23	4652	2.45
2	18.813	4420716	97.77	185536	97.55



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	14.569	2422795	50.53	101786	65.41
2	25.438	2372117	49.47	53818	34.59



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1	14.685	383684	4.24	16003	7.74
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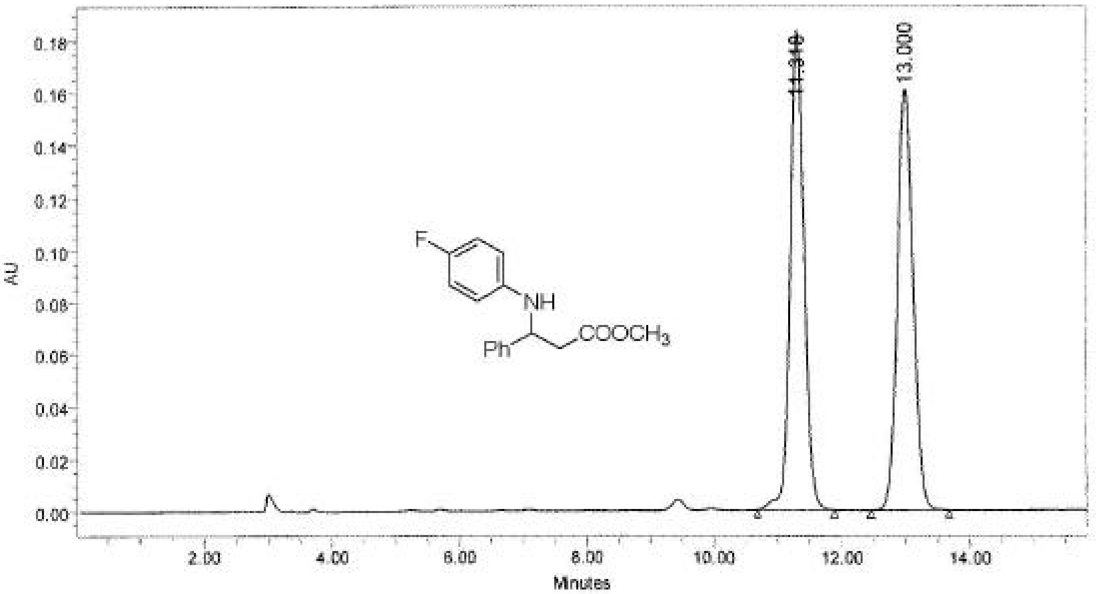

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1	11.318	2821723	50.46	183115	53.27
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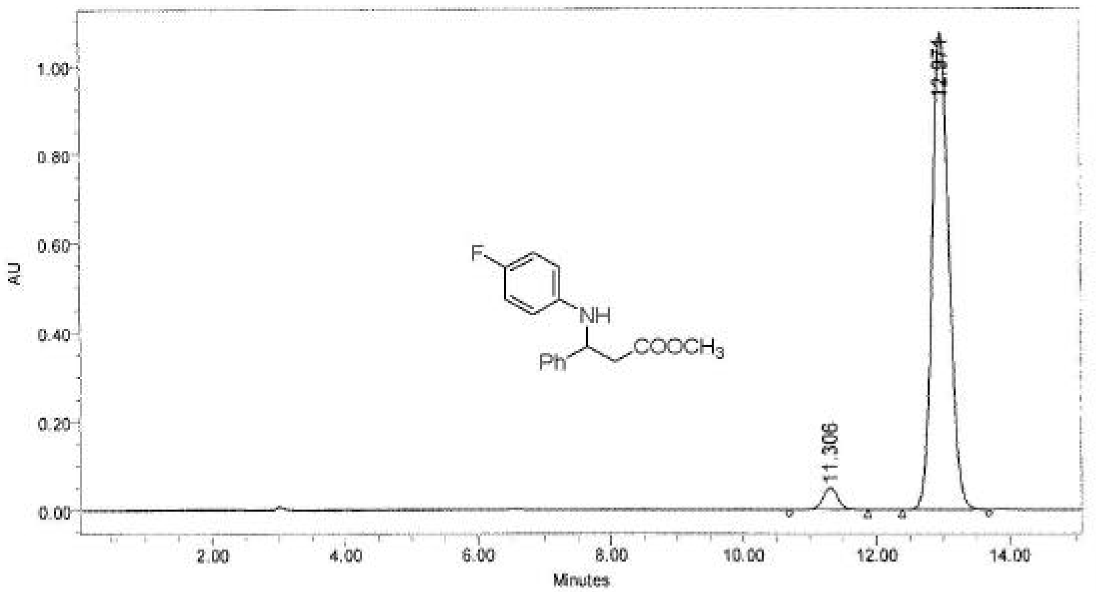

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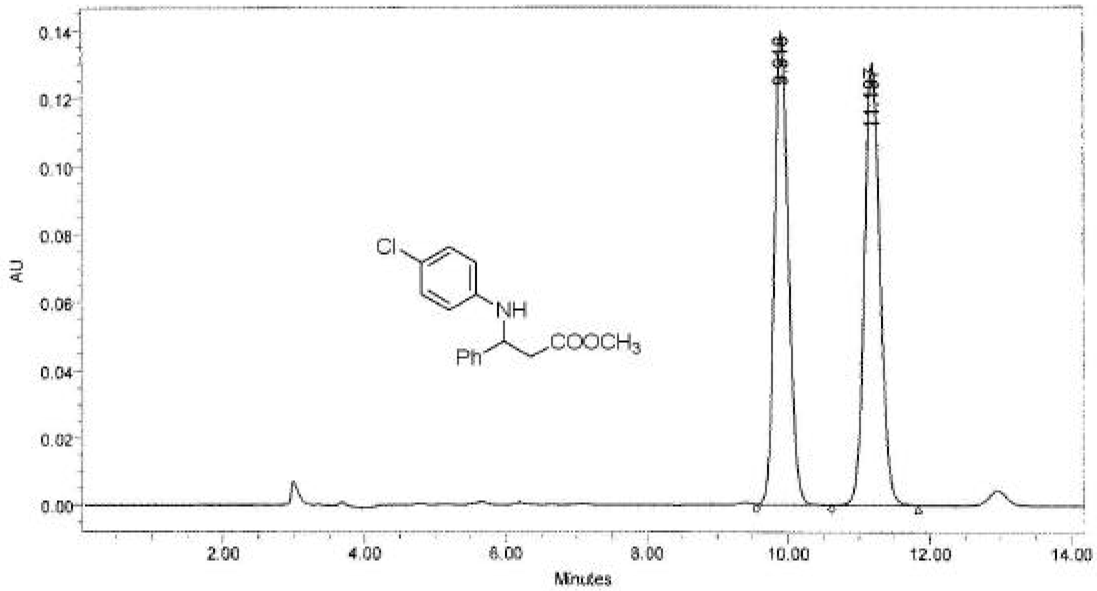
1	11.306	775786	3.94	49839	4.44
2	12.971	18895110	96.06	1071822	95.56



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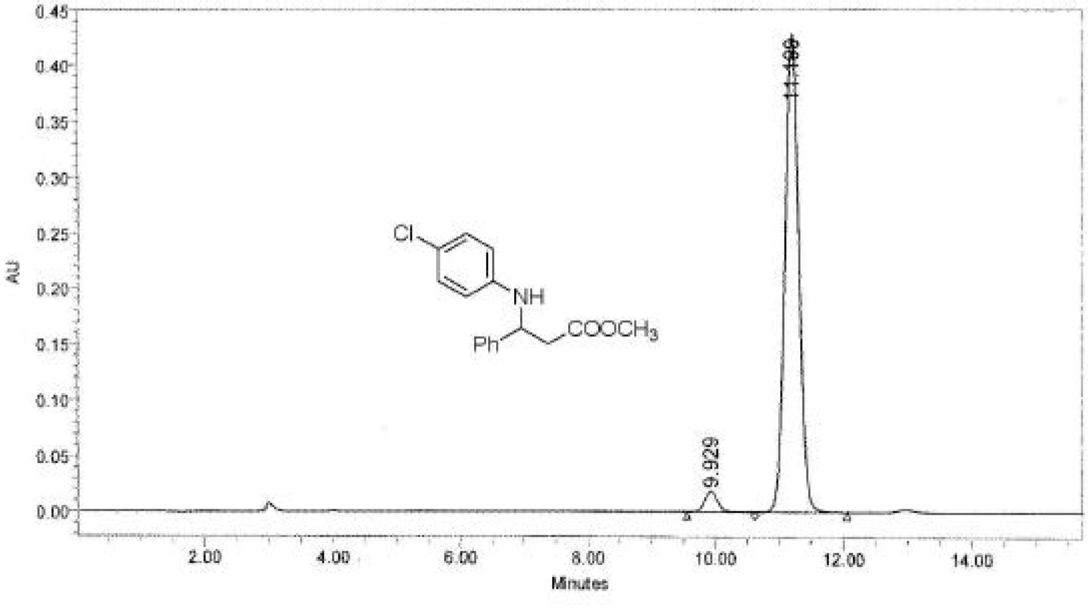

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1	9.929	248436	3.72	18325	4.10
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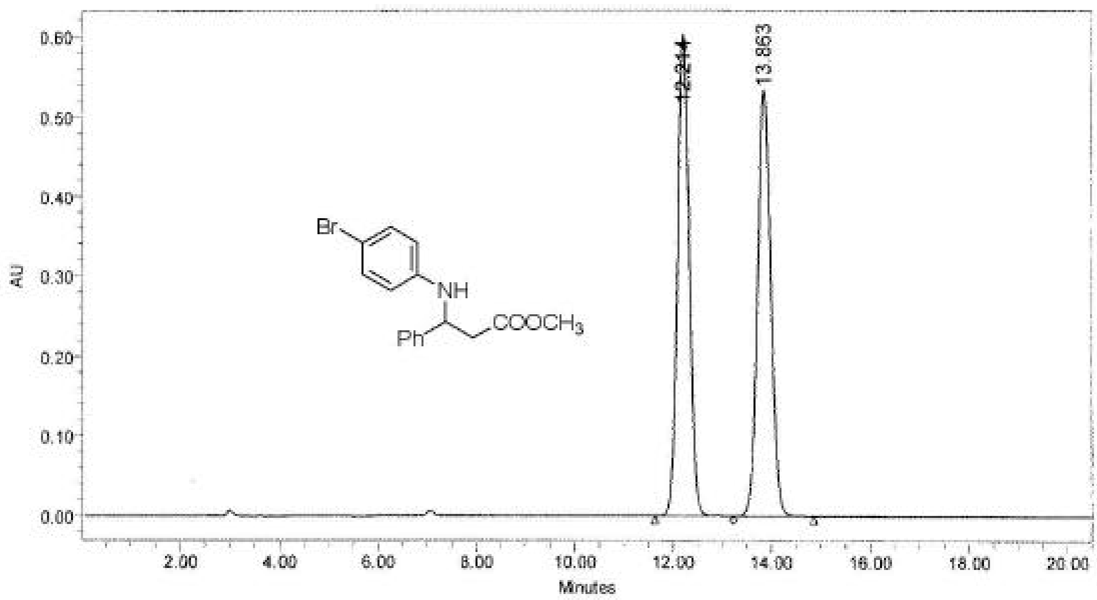

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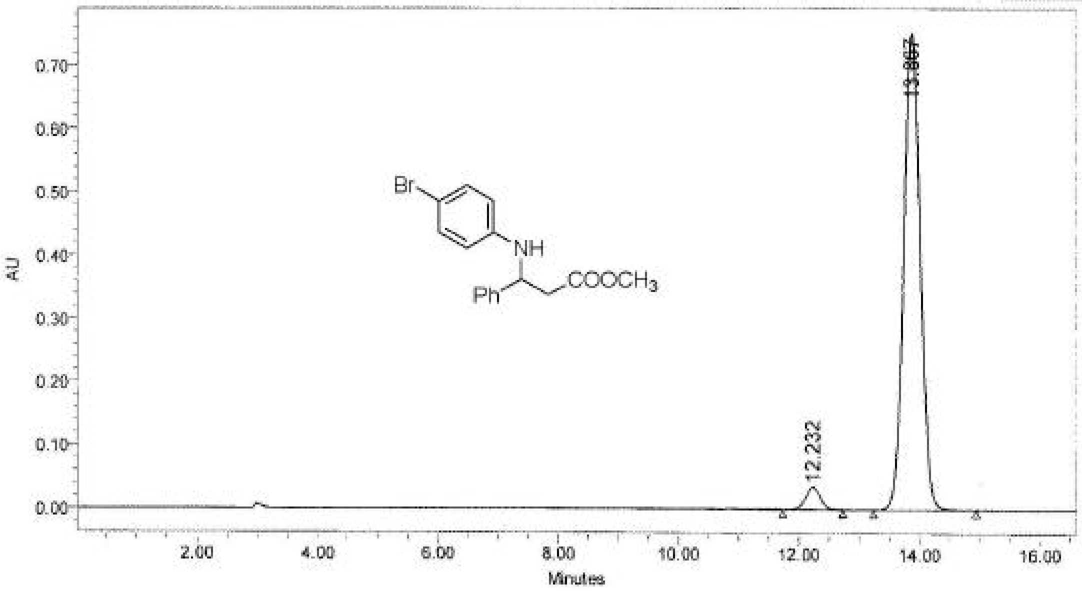

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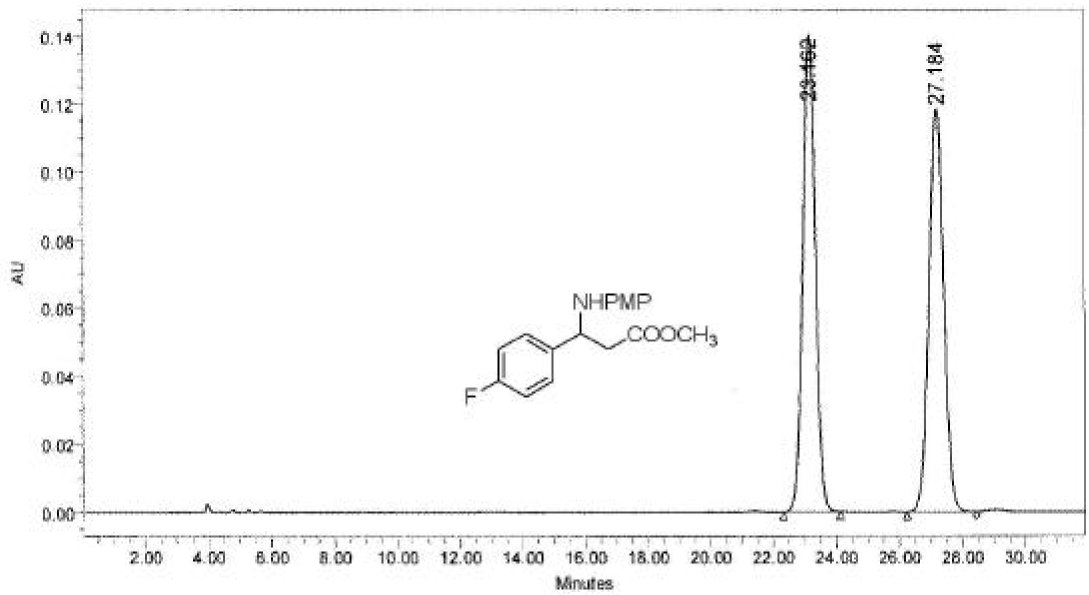

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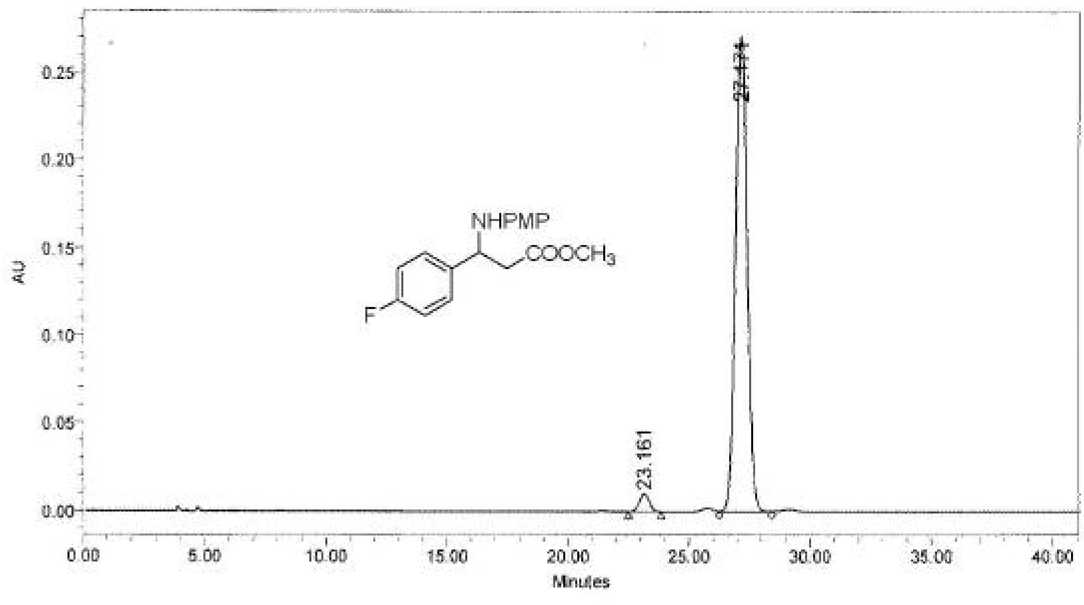

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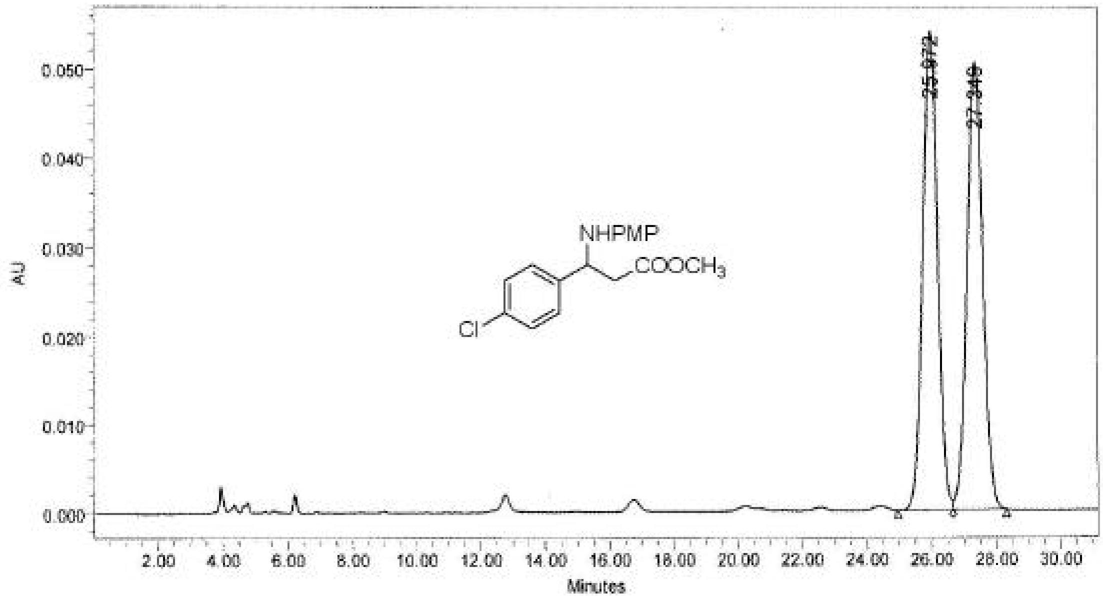
2	27.171	9034036	97.05	271450	96.47



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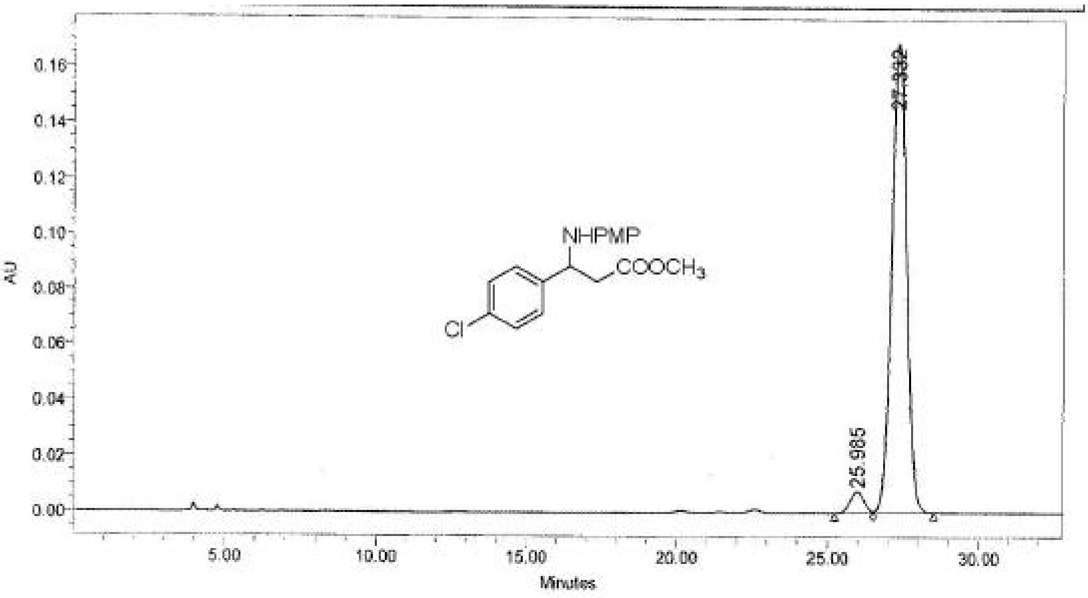

	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
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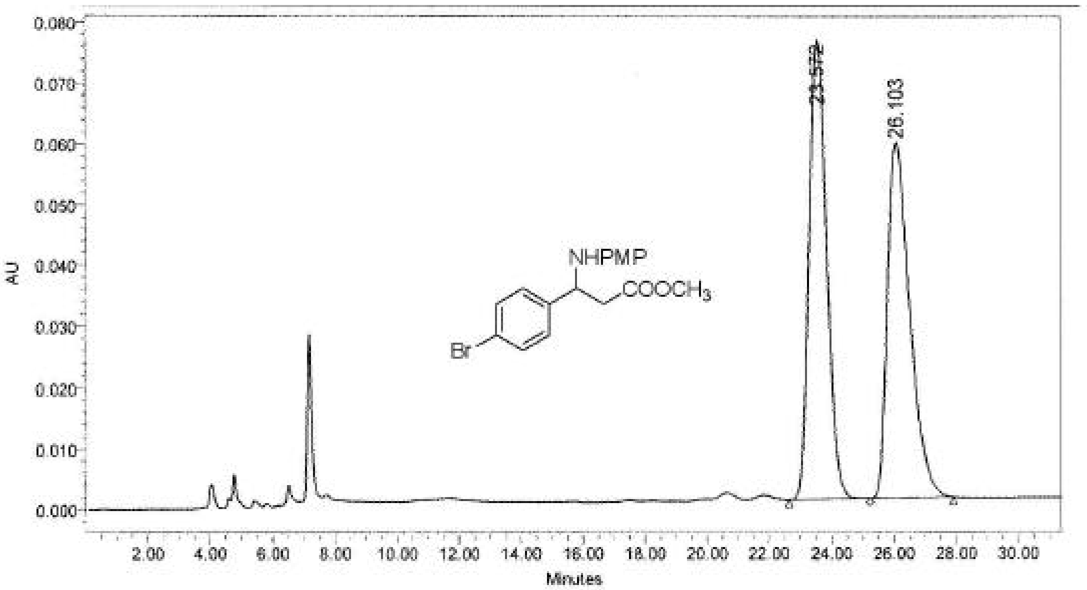
2	27.332	5767424	95.95	169655	95.66



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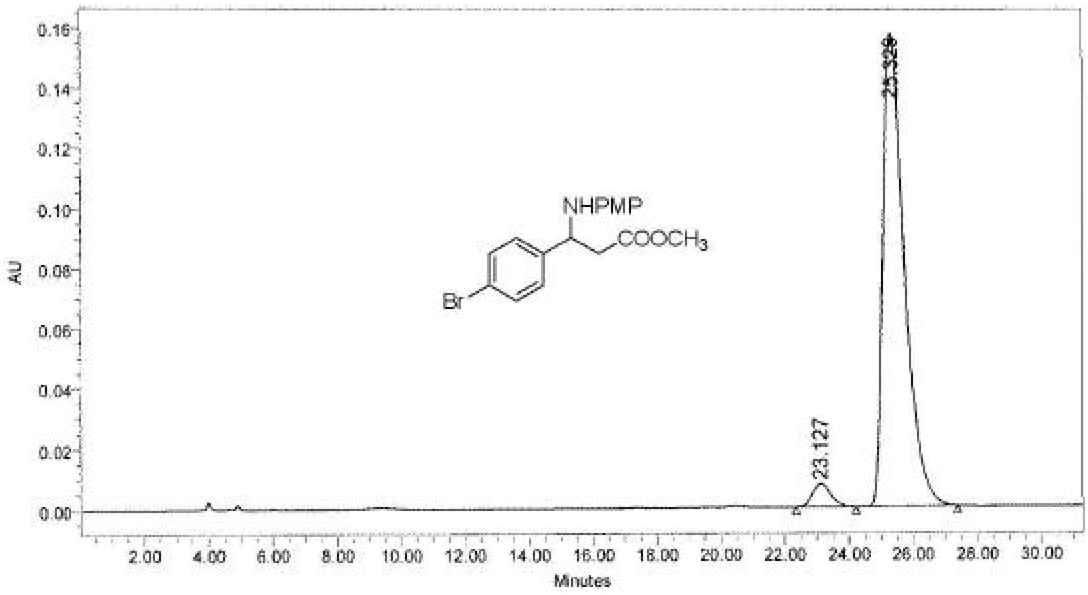
2	26.103	2916685	49.95	58390	43.57



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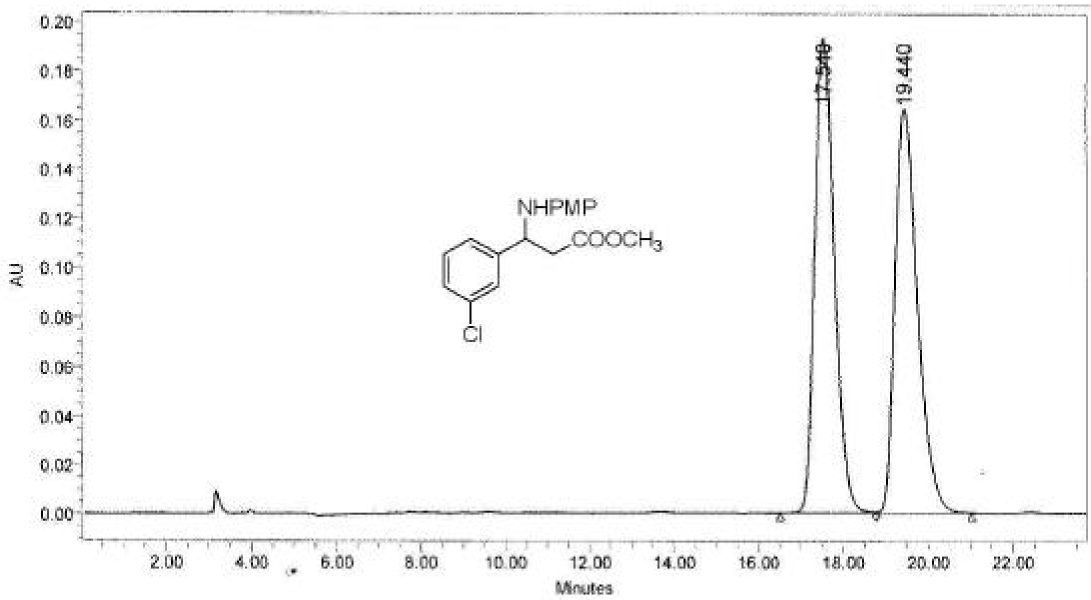

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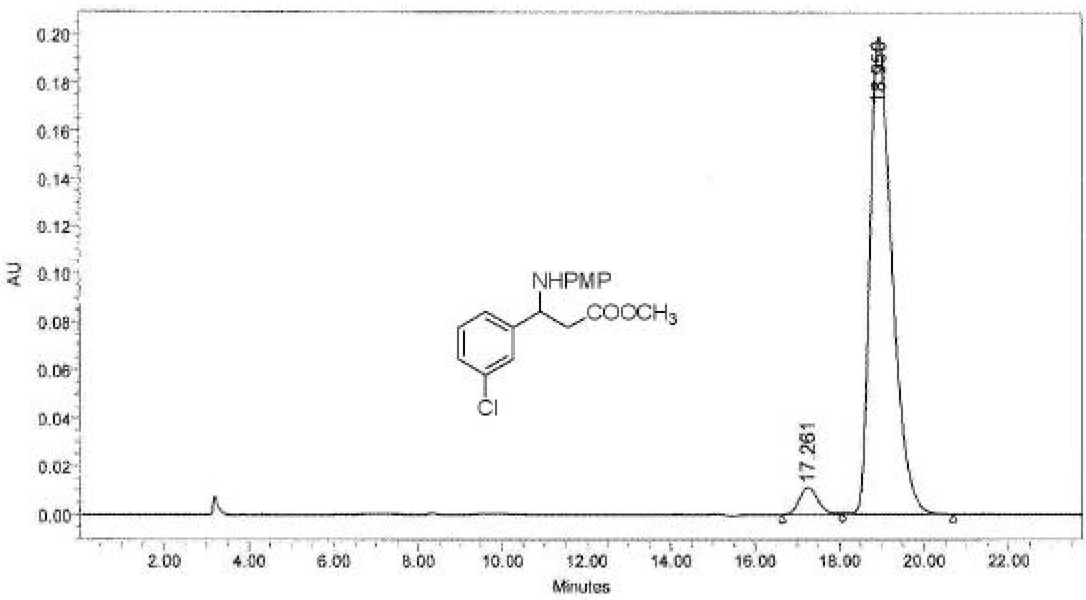
2	19.440	6091847	49.94	164512	45.95



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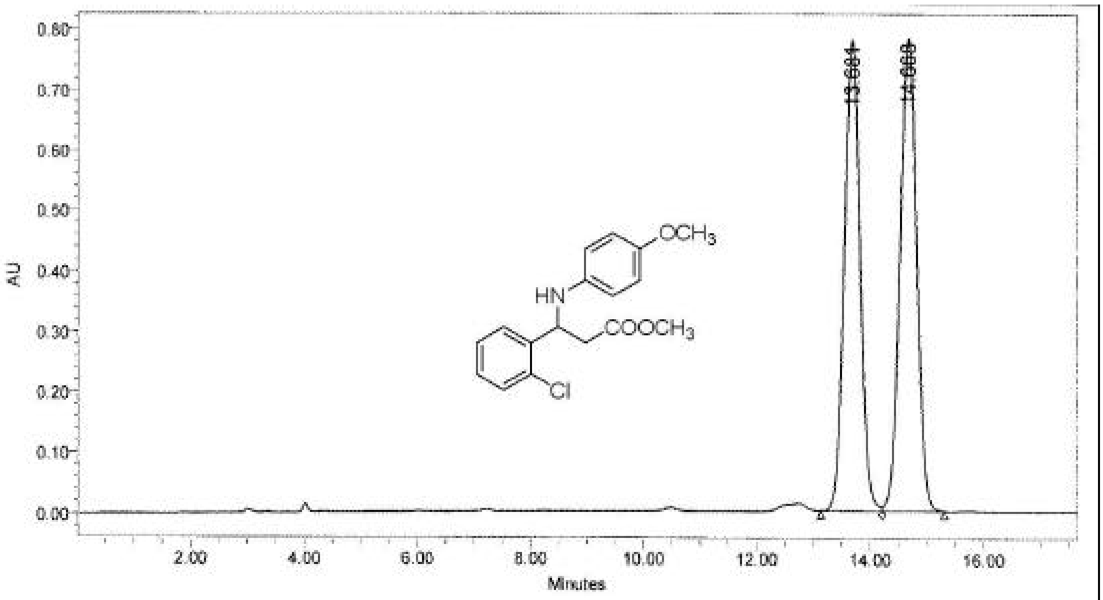
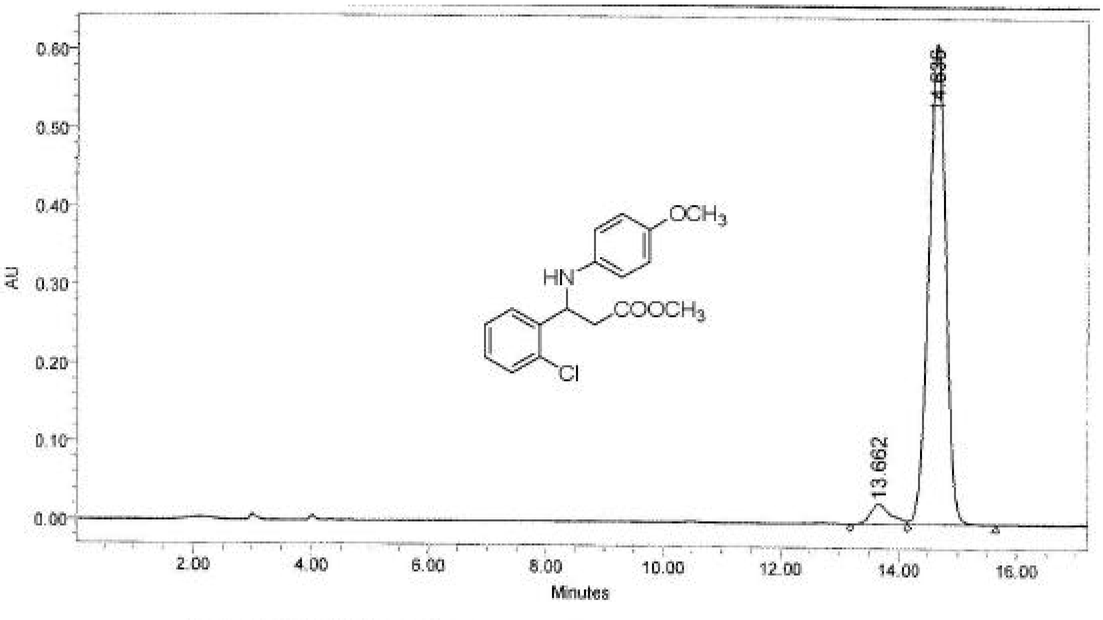
1	17.261	342536	4.50	11148	5.30
2	18.950	7268461	95.50	199281	94.70



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	13.681	14743441	48.44	776092	49.90
2	14.668	15693476	51.56	779209	50.10



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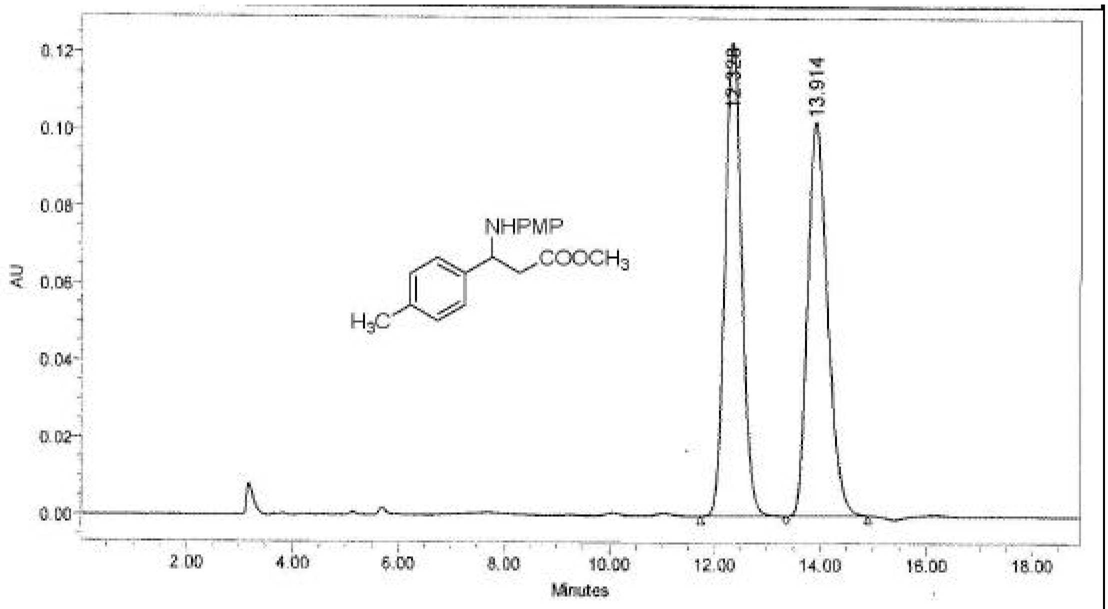

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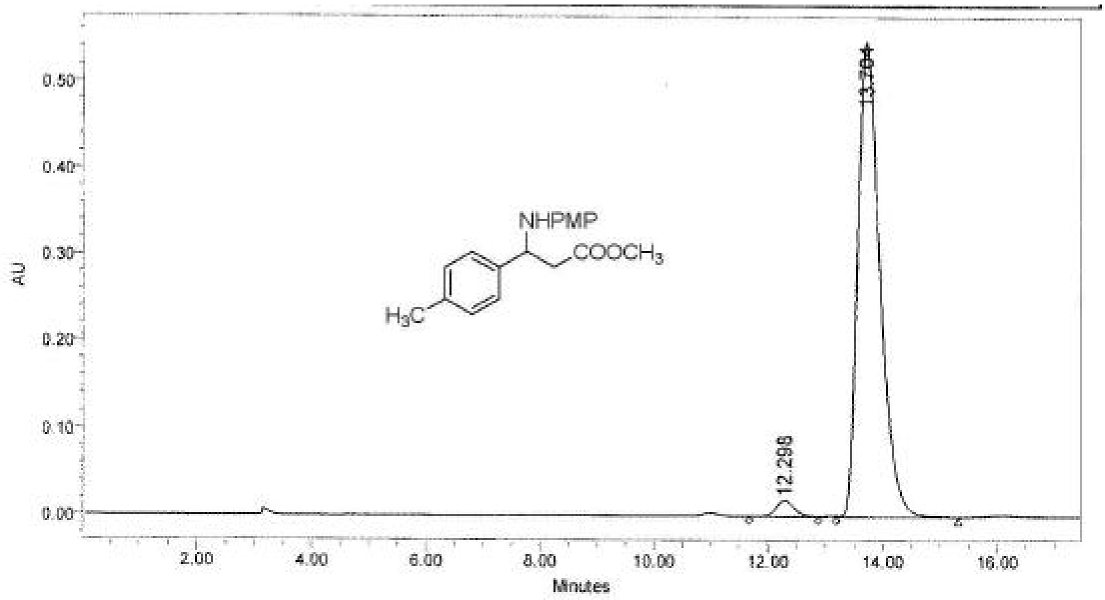
2	13.914	2690376	49.83	102324	45.40



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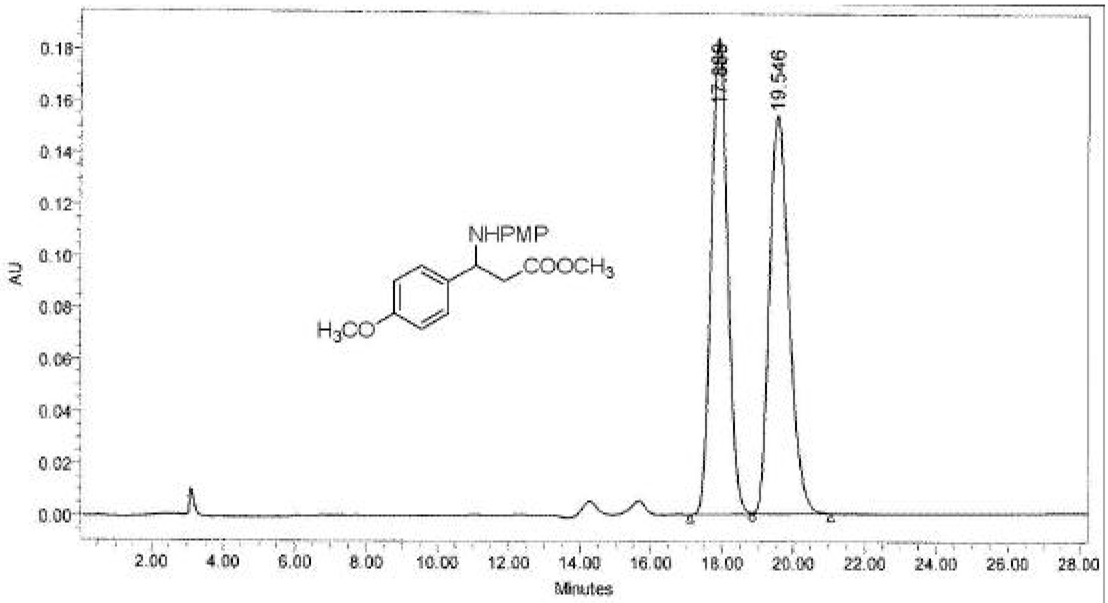
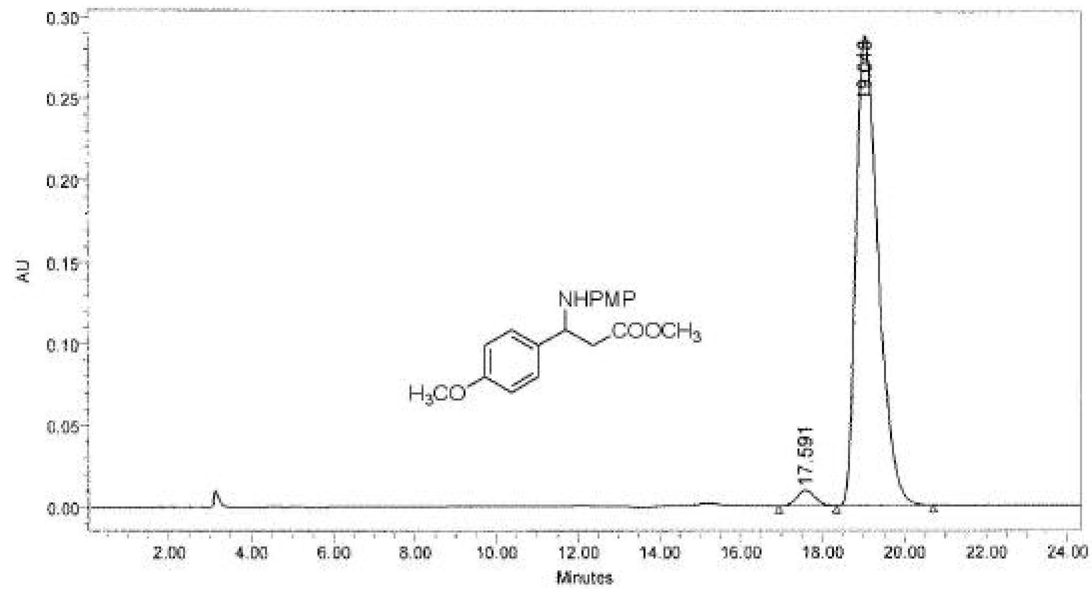
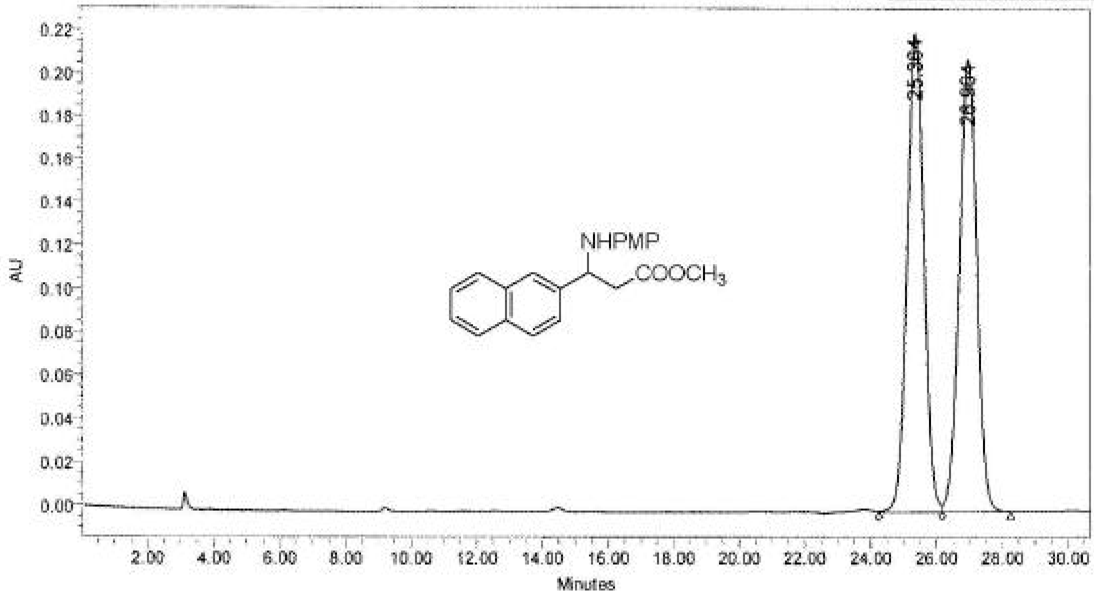
1	12.298	418719	2.75	18859	3.32
2	13.704	14801274	97.25	548742	96.68



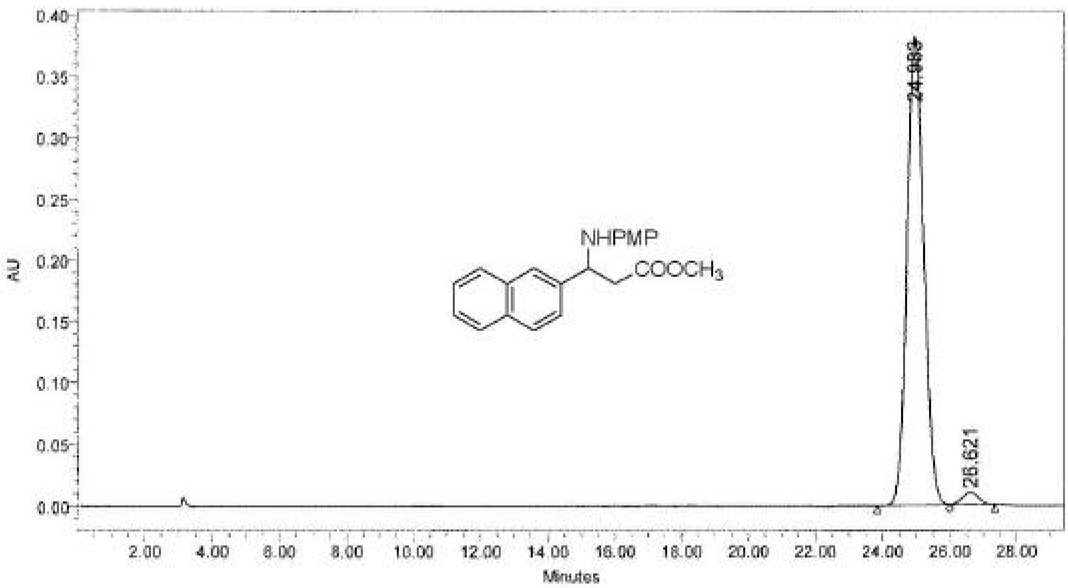
	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
1	17.889	5969818	50.01	184474	54.43
2	19.546	5968515	49.99	154445	45.57



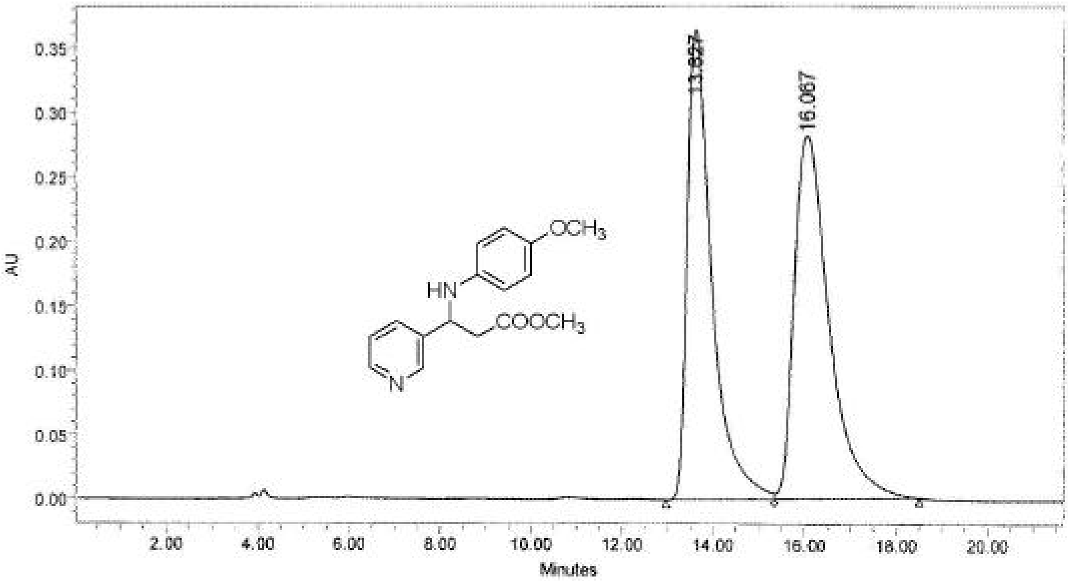
	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
1	17.591	286912	2.55	9389	3.15
2	19.048	10952035	97.45	288617	96.85



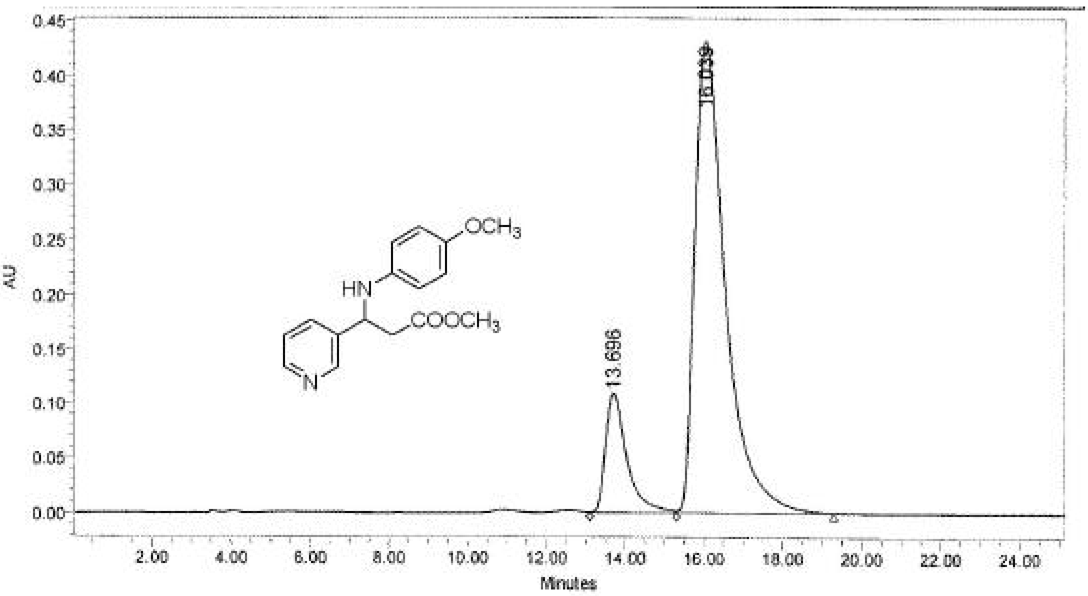
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	25.364	7813669	50.31	222306	51.41
2	26.964	7718866	49.69	210105	48.59



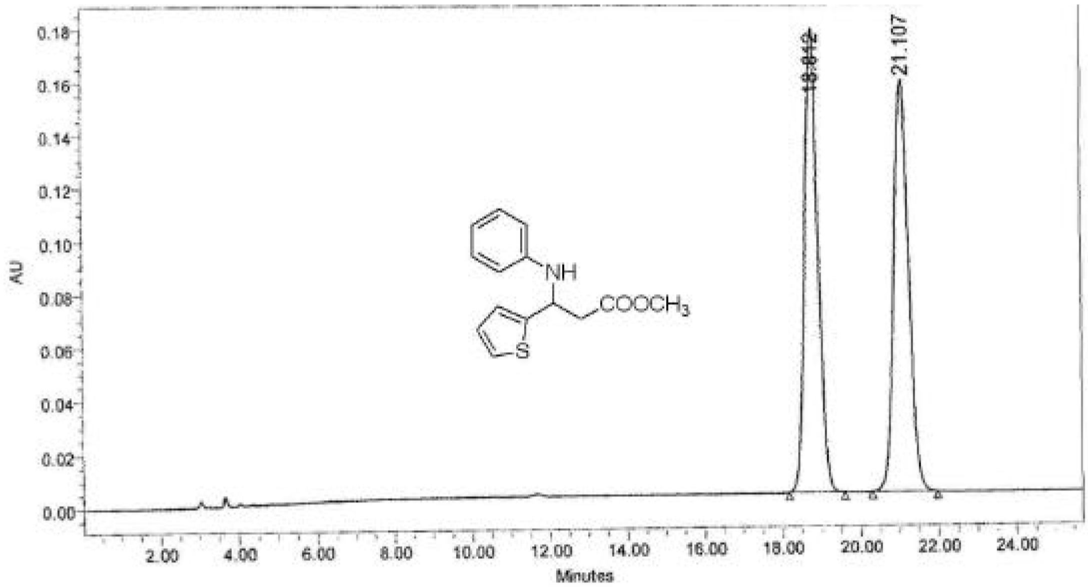
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	24.983	13268707	97.53	383522	97.53
2	26.621	335580	2.47	9711	2.47



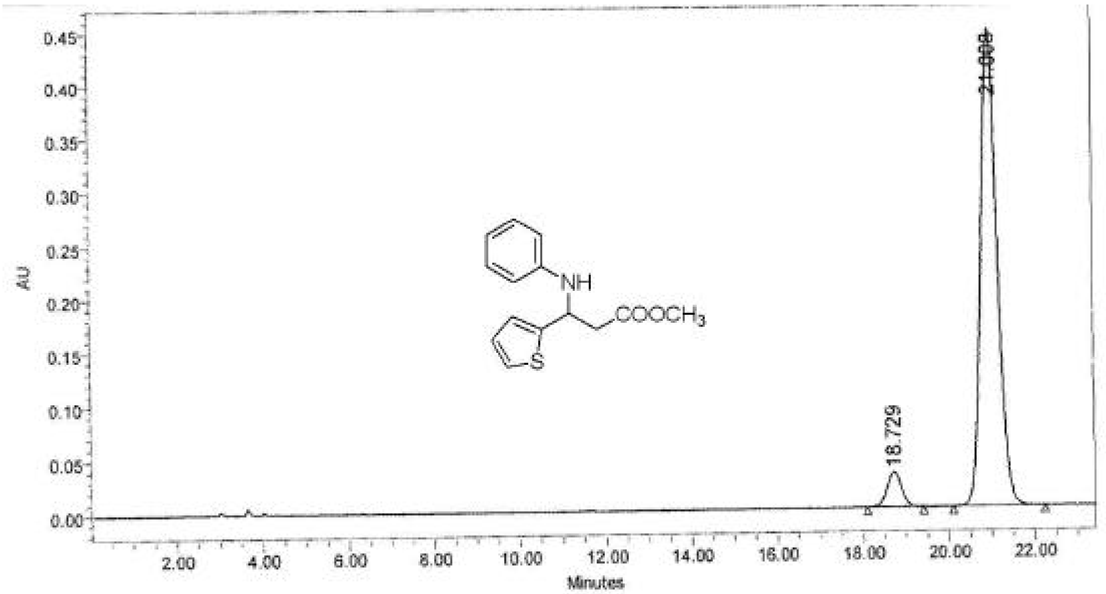
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	13.627	13779894	48.26	364189	56.38
2	16.067	14774186	51.74	281806	43.62



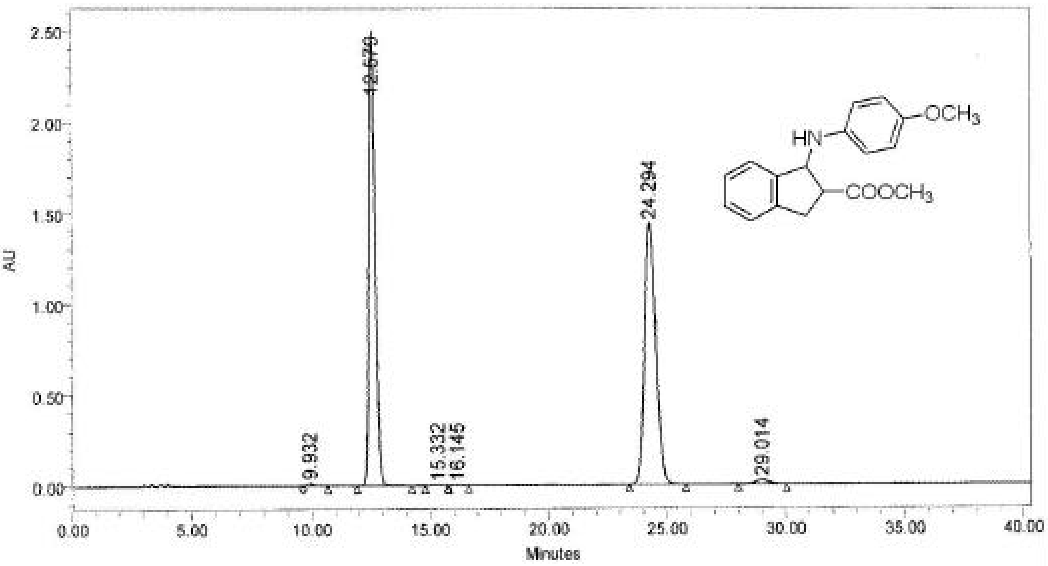
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	13.696	4072706	14.90	108927	20.20
2	16.039	23253643	85.10	430195	79.80



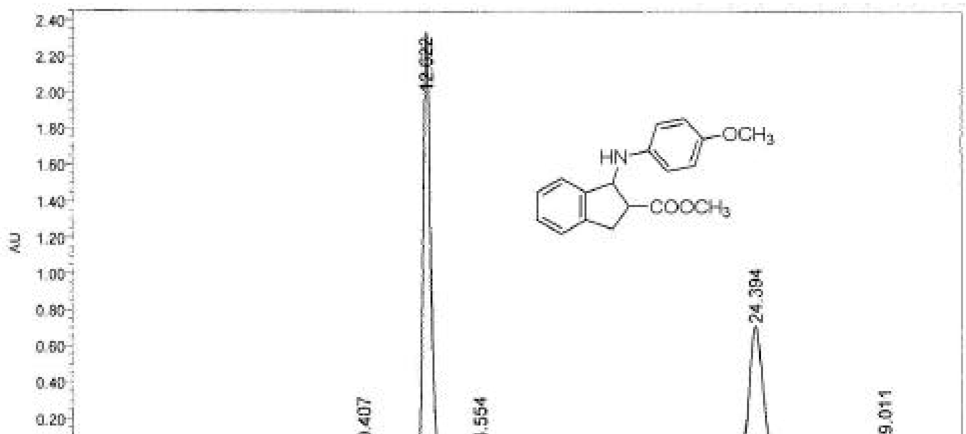
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	18.812	4119622	49.80	175405	52.98
2	21.107	4152883	50.20	155700	47.02



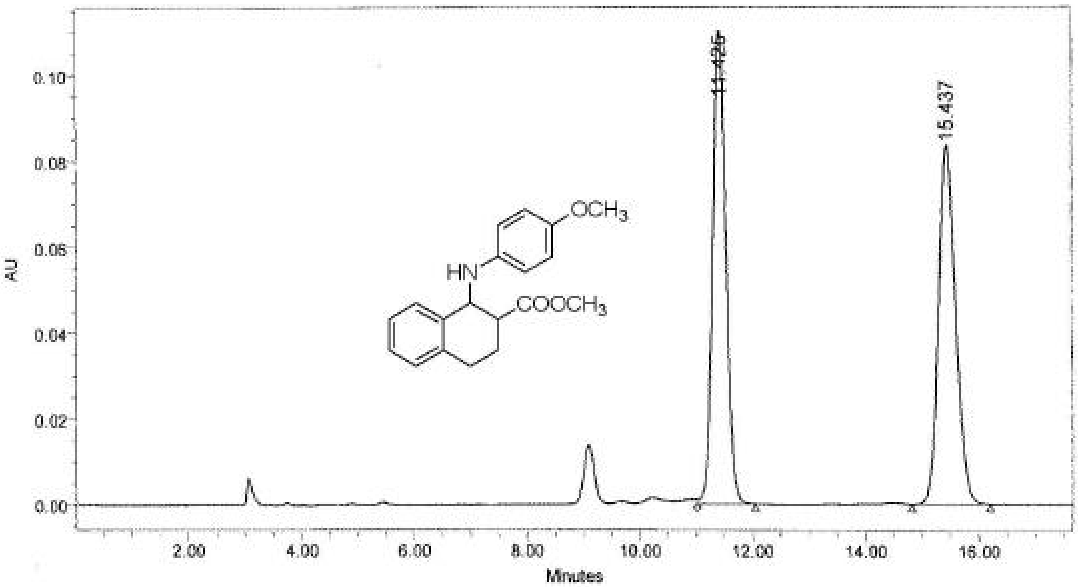
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	18.729	760376	5.96	32672	6.79
2	21.008	11988312	94.04	448393	93.21



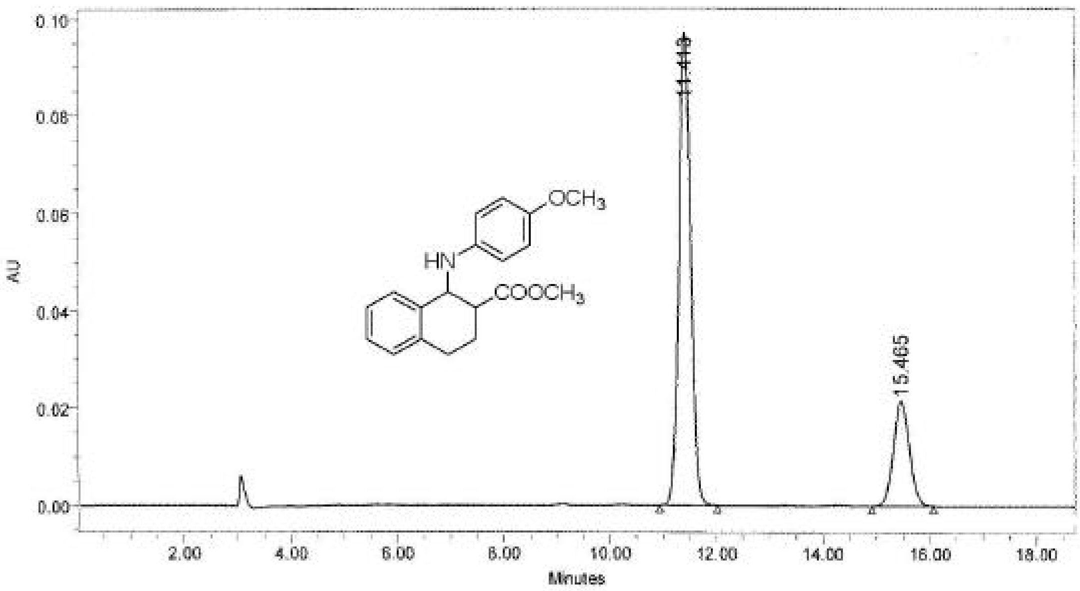
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	9.932	196413	0.21	12078	0.30
2	12.579	46149163	48.56	2496377	62.73
3	15.332	30361	0.03	1196	0.03
4	16.145	25851	0.03	1314	0.03
5	24.294	47705267	50.20	1445023	36.31
6	29.014	928275	0.98	23669	0.59



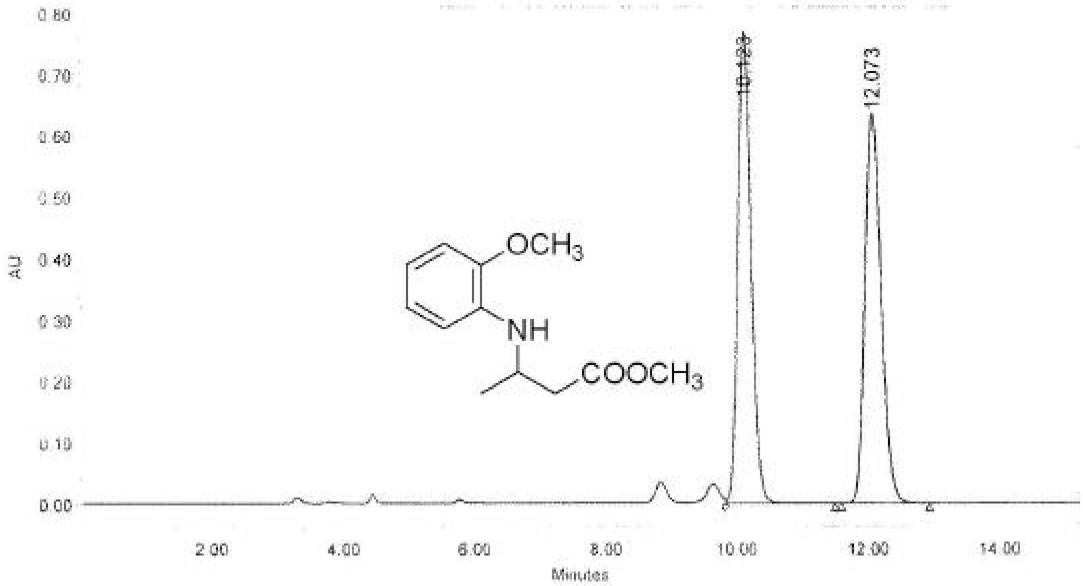
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	10.407	11305	0.02	675	0.02
2	12.622	42037719	62.76	2336270	75.46
3	14.554	46412	0.07	2244	0.07
4	24.394	23190186	34.62	713625	23.05
5	29.011	1691125	2.52	43207	1.40



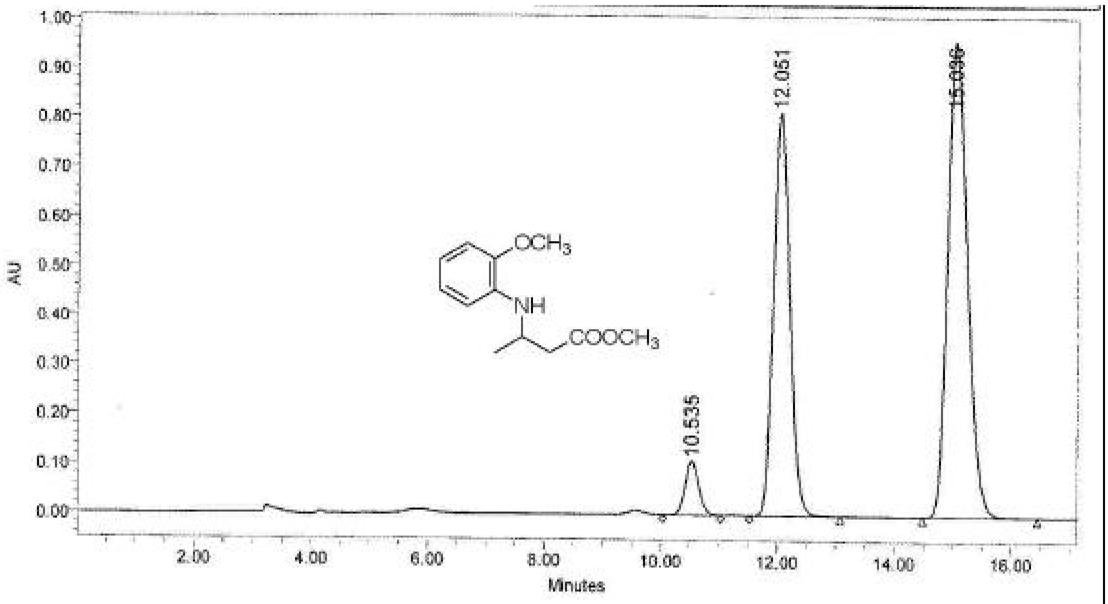
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	11.425	1782808	50.21	110171	56.92
2	15.437	1768049	49.79	83385	43.08



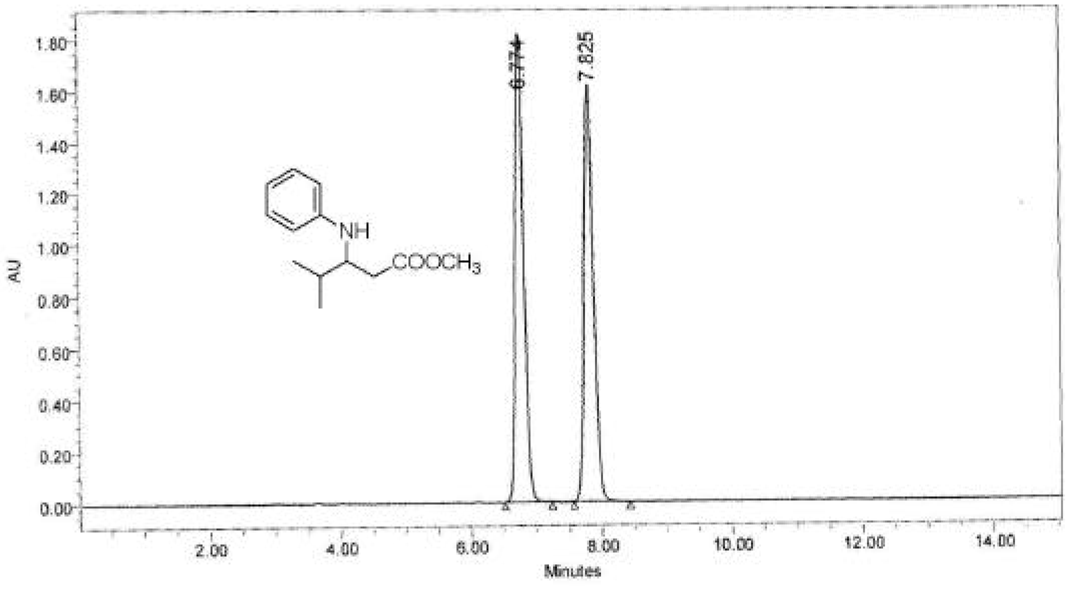
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	11.413	1498255	76.97	97007	81.86
2	15.465	448240	23.03	21497	18.14



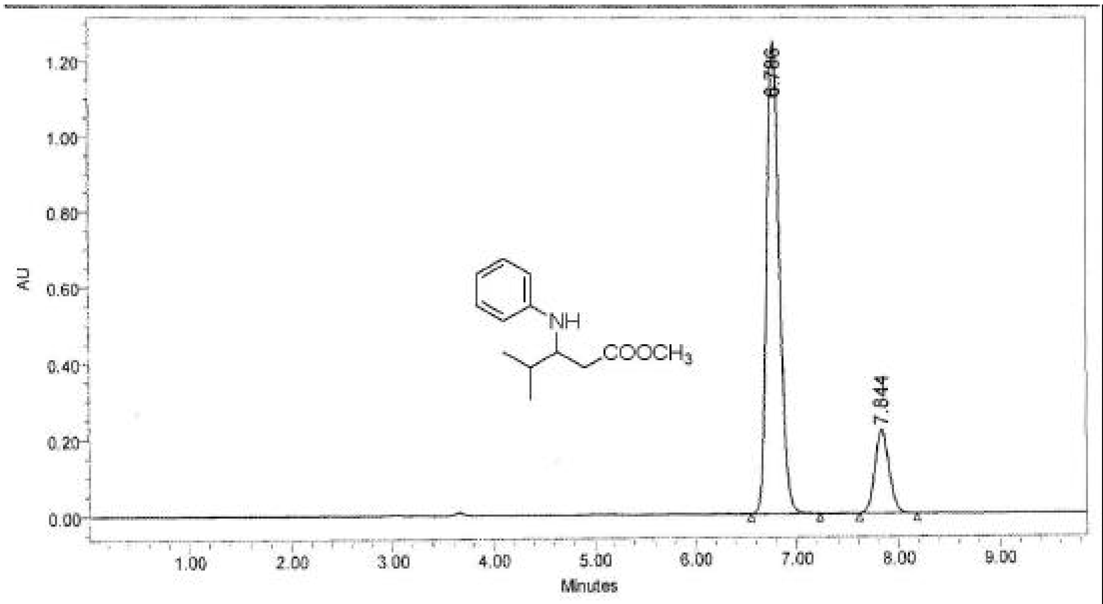
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	10.123	10854693	49.94	773915	54.75
2	12.073	10879588	50.06	639663	45.25



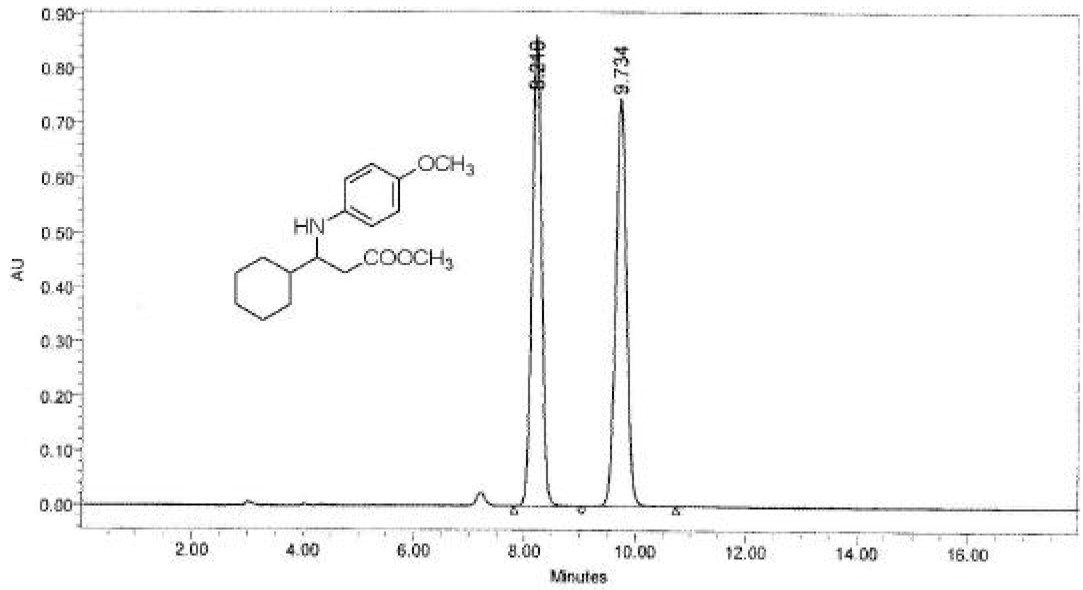
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	10.535	1796030	4.46	109423	5.81
2	12.051	15859064	39.40	813477	43.22
3	15.036	22594139	56.14	959277	50.97



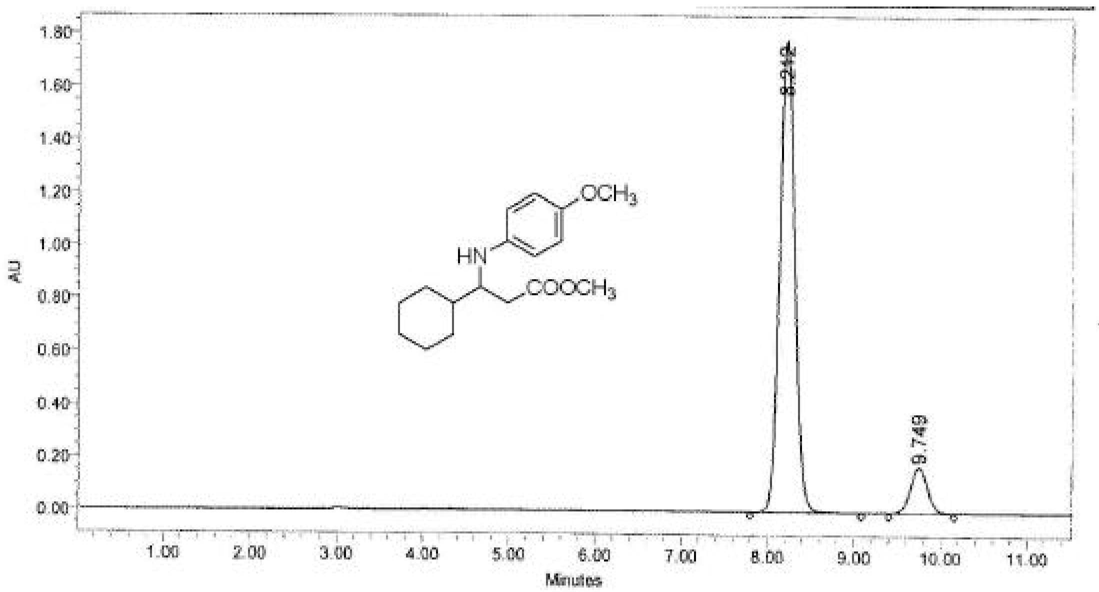
	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
1	6.774	16314505	49.75	1831599	52.89
2	7.825	16475344	50.25	1631382	47.11



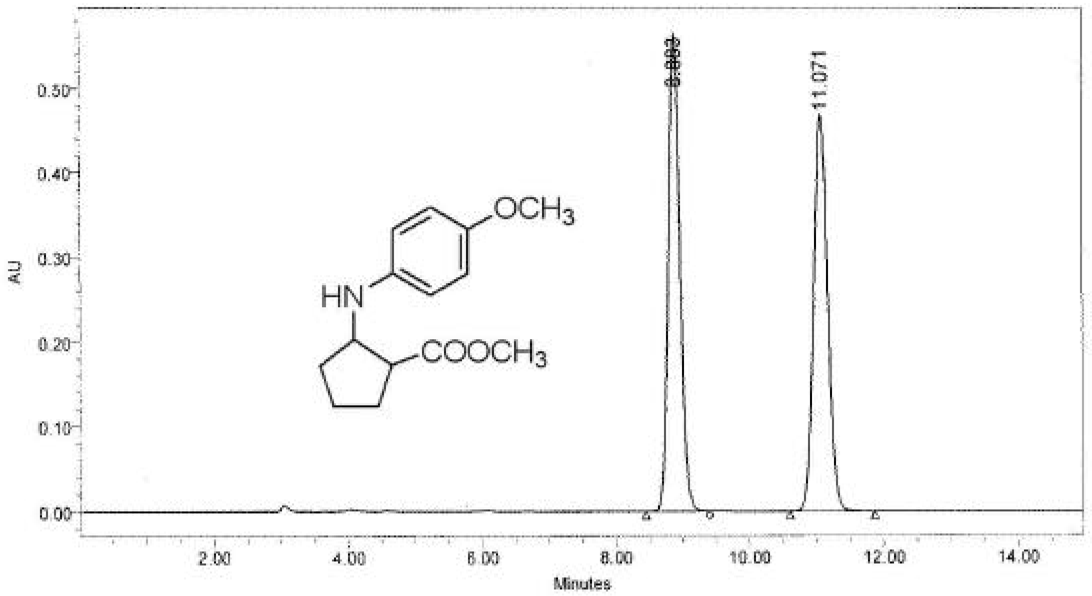
	RT (min)	Area (μV*sec)	% Area	Height (μV)	% Height
1	6.786	10819182	83.26	1252014	84.86
2	7.844	2175626	16.74	223340	15.14



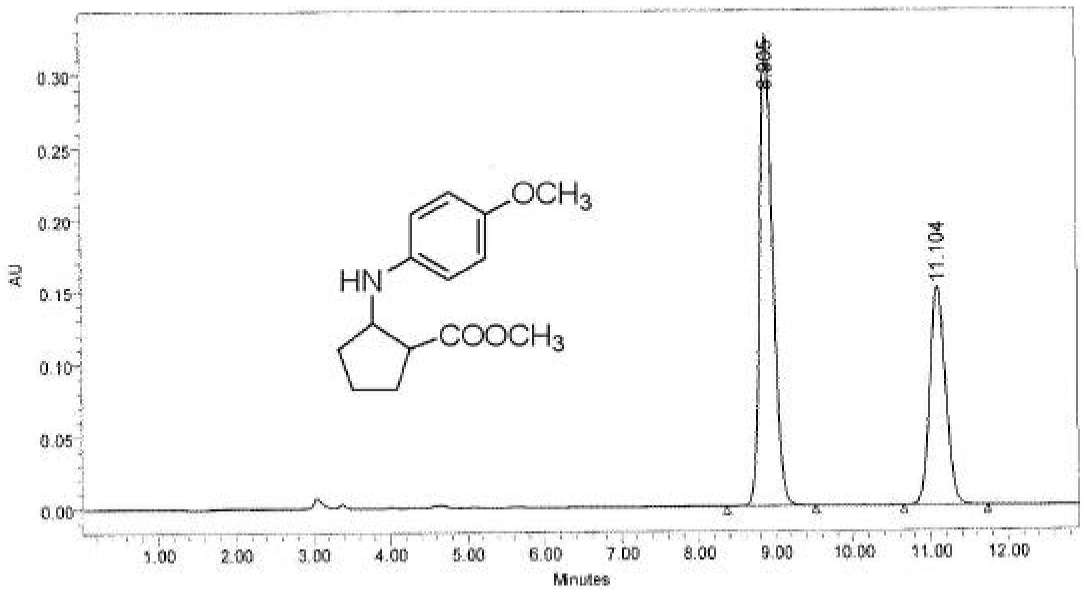
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	8.210	10118646	49.95	863528	53.68
2	9.734	10138910	50.05	745134	46.32



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	8.212	21556482	90.22	1781636	91.13
2	9.749	2337521	9.78	173308	8.87



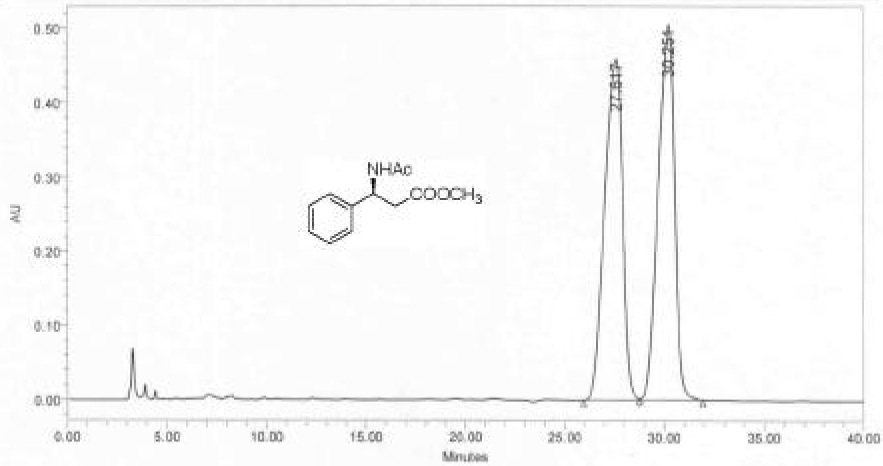
	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	8.883	6707006	49.97	566380	54.67
2	11.071	6714715	50.03	469554	45.33



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	8.905	3839693	64.16	327487	68.38
2	11.104	2145098	35.84	151459	31.62

SAMPLE INFORMATION

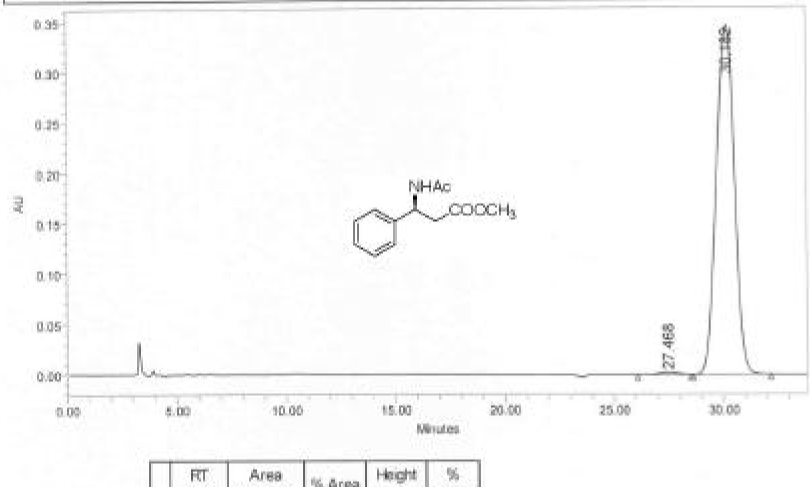
Sample Name:	zhj-0	Acquired By:	System
Sample Type:	Unknown	Date Acquired:	5/4/08 4:15:15 PM
Vial:	1	Acq. Method:	100A220
Injection #:	3	Date Processed:	5/4/08 5:03:40 PM
Injection Volume:	20.00 ul	Channel Name:	2487Channel 1
Run Time:	40.00 Minutes	Sample Set Name:	



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	27.617	28782887	49.81	457760	47.60
2	30.251	28998060	50.19	503990	52.40

SAMPLE INFORMATION

Sample Name:	zhj	Acquired By:	System
Sample Type:	Unknown	Date Acquired:	5/4/08 5:06:08 PM
Vial:	1	Acq. Method:	100A220
Injection #:	4	Date Processed:	5/4/08 5:41:05 PM
Injection Volume:	20.00 ul	Channel Name:	2487Channel 1
Run Time:	40.00 Minutes	Sample Set Name:	



	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	27.468	141976	0.71	2515	0.72
2	30.182	19817701	99.29	345104	99.28