

Supporting Information for

**Catalytic Asymmetric Synthesis of Tetrahydropyridazines
via Inverse Electron-Demand aza-Diels-Alder Reaction of
Enol Ethers with Azoalkenes**

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Table of Contents

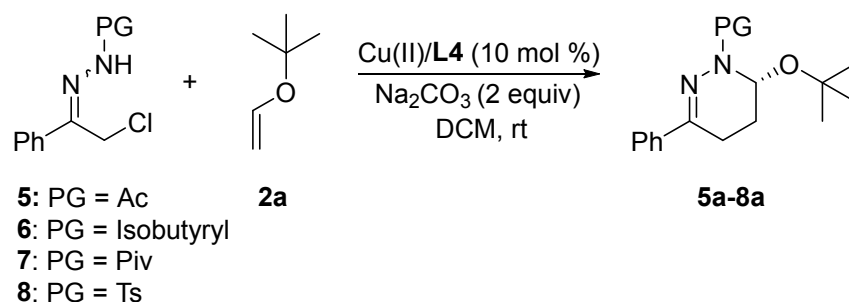
I.	General Remarks.....	S2
II.	N-Acyl Substituent Hydrazones Screening for Catalytic Asymmetric IEDDA of Enol Ethers with Azoalkenes.....	S2-3
III.	General Procedure for Asymmetric IEDDA of Enol Ethers with <i>in situ</i> Formed Azoalkenes.....	S3-11
IV.	Procedure for Transformation.....	S11-12
V.	References.....	S12
VI.	¹ H NMR and ¹³ C NMR Spectra.....	S13-51
VII.	HPLC Chromatograms.....	S52-87

I. General Remarks

^1H NMR spectra were recorded on a VARIAN Mercury 300 MHz spectrometer in CDCl_3 . Chemical shifts are reported in ppm with the internal TMS signal at 0.0 ppm as a standard. The data are reported as (s = single, d = double, t = triple, q = quartet, m = multiple or unresolved, and brs = broad single). ^{13}C NMR spectra were recorded on a Bruker 100 MHz or 75 MHz spectrometer in CDCl_3 . Chemical shifts are reported in ppm with the internal chloroform signal at 77.0 ppm as a standard. Commercially available reagents were used without further purification. All reactions were monitored by TLC with silica gel-coated plates. Diastereomeric ratios were determined from crude ^1H NMR or HPLC analysis. Enantiomeric ratios were determined by HPLC, using a chiralpak IB-H column, a chiralpak AD-H column or a chiralcel AS-H column with hexane and *i*-PrOH as solvents and Azoalkenes¹ and chiral ligands **L4-L7**² were prepared according to the literature procedure. The absolute configuration of **3aa** were determined unequivocally according to the X-ray diffraction analysis, and those of other adducts were deduced on the basis of these results.

II. N-acyl Substituent Hydrazones Screening for Catalytic Asymmetric IEDDA of enol ethers with Azoalkenes

Table S-1. Optimization Results^a

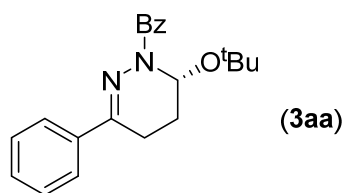


Entry	Hydrazone	Time/h	Yield/% ^b	Ee/% ^c
1	5	12	78	0
2	6	12	67	0
3	7	12	11	n.d
4	8	12	trace	n.d

^a All reactions were carried out with 0.20 mmol of hydrazone and 0.50 mmol of **2a** in 2.0 mL of CH₂Cl₂. ^b Isolated yield. ^c Ee was determined by HPLC analysis.

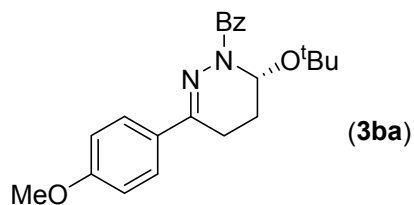
III. General Procedure for Catalytic Asymmetric IEDDA of Enol Ethers with Azoalkenes Catalyzed by Cu(II)/(*S,S*)-*t*-Bu-Phosferrox

Under argon atmosphere, (*S,S*)-*t*-Bu-Phosferrox (11 mg, 0.022 mmol) and Cu(OTf)₂ (7.2 mg, 0.020 mmol) were dissolved in 2 mL of DCM, and stirred at room temperature for about 0.5 h. After the reaction temperature was dropped to -20 °C, α-halogeno-hydrozone **2** (0.2 mmol), Na₂CO₃ (0.4 mmol) were added sequentially. Then, the Enol Ether **1** (0.8 mmol) was added. Once starting material was consumed (monitored by TLC), the organic solvent was removed and the residue was purified by column chromatography to give the cycloaddition product, which was then directly analyzed by HPLC to determine the enantiomeric excess.

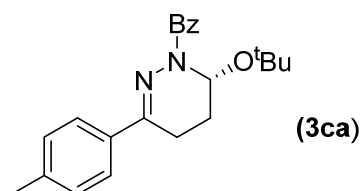


(R)-(6-(tert-butoxy)-3-phenyl-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 2): Yield (83%); white solid; $[\alpha]^{25}_{\text{D}} = -218.7$ (*c* 0.88, CH₂Cl₂); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.74 (d, *J* = 6.3 Hz, 2H), 7.63-7.60 (m, 2H), 7.47-7.39 (m, 3H), 7.33-7.30 (m, 3H), 6.39 (s, 1H), 2.99-2.85 (m, 1H), 2.72-2.64 (m, 1H), 2.19-2.12 (m, 1H), 1.90-1.79 (m, 1H), 1.31 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.3, 148.3, 137.1, 135.4, 130.0, 129.5, 129.0, 128.1, 127.1, 125.2, 74.5, 68.9, 28.4, 25.1, 18.5. HRMS: calcd. for C₂₁H₂₄N₂O₂ + H⁺: 337.1871, found: 337.1909. The product was analyzed by HPLC to determine the enantiomeric excess: 94% ee

(Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); t_r = 5.31 and 7.19 min.

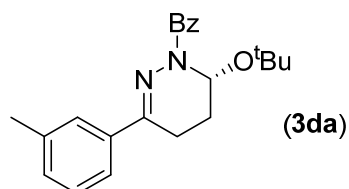


(R)-6-(tert-butoxy)-3-(4-methoxyphenyl)-5,6-dihydropyridazin-1(4H)-yl(phenyl)methanone (Table 2, entry 3): Yield (83%); white solid; $[\alpha]_D^{25} = -211.6$ (c 0.50, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.75 (d, J = 6.9 Hz, 2H), 7.57 (d, J = 8.1 Hz, 2H), 7.45-7.42 (m, 3H), 7.33-7.31 (m, 3H), 6.85 (d, J = 8.1 Hz, 2H), 6.34 (s, 1H), 3.82 (s, 3H), 2.94-2.84 (m, 1H), 2.69-2.62 (m, 1H), 2.18-2.11 (m, 1H), 1.91-1.80 (m, 1H), 1.32 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 160.3, 148.3, 135.6, 135.2, 130.8, 129.9, 129.5, 127.2, 126.7, 113.5, 74.5, 68.9, 55.2, 28.5, 25.3, 18.5; HRMS Calcd. For $\text{C}_{22}\text{H}_{26}\text{N}_2\text{O}_3 + \text{H}^+$: 367.1977, found: 367.2041. The product was analyzed by HPLC to determine the enantiomeric excess: 92% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); t_r = 6.99 and 9.41 min.

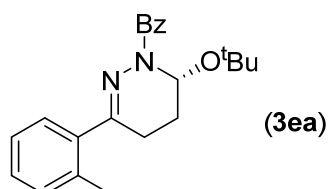


(R)-6-(tert-butoxy)-3-(p-tolyl)-5,6-dihydropyridazin-1(4H)-yl(phenyl)methanone (Table 2, entry 4): Yield (90%); white solid; $[\alpha]_D^{25} = -220.5$ (c 0.88, CHCl_3); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.74 (d, J = 6.3 Hz, 2H), 7.51 (d, J = 8.1 Hz, 2H), 7.46-7.40 (m, 3H), 7.14-7.10 (m, 2H), 6.38 (s, 1H), 2.90-2.83 (m, 1H), 2.70-2.62 (m, 1H), 2.34 (s, 3H), 2.17-2.10 (m, 1H), 1.88-1.82 (m, 1H), 1.31 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 169.4, 148.6, 139.1, 135.5, 134.5, 130.0, 129.5, 128.9, 127.2, 125.3, 74.6, 69.0, 28.5, 25.3, 18.6; HRMS Calcd. For $\text{C}_{22}\text{H}_{26}\text{N}_2\text{O}_2 + \text{H}^+$: 351.2028, found: 351.2065. The product was analyzed by HPLC to determine the

enantiomeric excess: 94% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 6.63$ and 10.56 min.

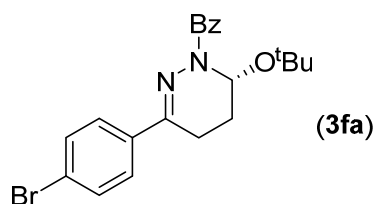


(R)-(6-(tert-butoxy)-3-(m-tolyl)-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 5): Yield (71%); white solid; $[\alpha]_D^{25} = -201.5$ (*c* 1.02, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.76 (d, *J* = 6.9 Hz, 2H), 7.45-7.41 (m, 5H), 7.24-7.12 (m, 2H), 6.38 (s, 1H), 3.00-2.84 (m, 1H), 2.72-2.63 (m, 1H), 2.32 (s, 3H), 2.18-2.13 (m, 1H), 1.87-1.78 (m, 1H), 1.31 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.5, 148.7, 137.8, 137.2, 135.5, 130.1, 129.8, 129.7, 128.2, 127.2, 126.1, 122.5, 74.7, 69.0, 28.6, 25.3, 21.5, 18.7; HRMS Calcd. For C₂₂H₂₆N₂O₂ + H⁺: 351.2028, found: 351.2066. The product was analyzed by HPLC to determine the enantiomeric excess: 87% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 5.04$ and 6.80 min.

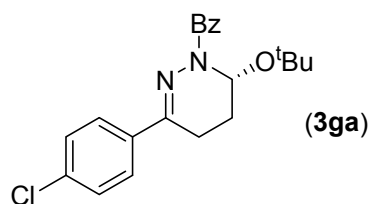


(R)-(6-(tert-butoxy)-3-(o-tolyl)-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 6): Yield (82%); white solid; $[\alpha]_D^{25} = -239.5$ (*c* 0.92, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.62 (d, *J* = 6.0 Hz, 2H), 7.36-7.24 (m, 4H), 7.19-7.10 (m, 3H), 6.40 (s, 1H), 3.01-2.87 (m, 1H), 2.45-2.37 (m, 1H), 2.13 (s, 3H), 2.10-2.06 (m, 1H), 1.94-1.87 (m, 1H), 1.33 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.7, 152.8, 138.1, 136.0, 135.7, 130.9, 129.7, 129.0, 128.1, 127.6, 127.3, 125.5, 74.6, 68.6, 28.5, 25.6, 22.6, 20.5; HRMS Calcd. For C₂₂H₂₆N₂O₂ + H⁺: 351.2028, found: 351.2065. The product was analyzed by HPLC to determine the enantiomeric excess:

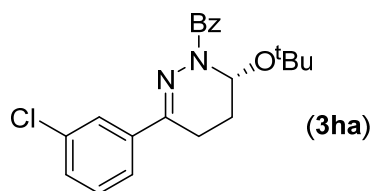
90% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); t_r = 5.22 and 5.98 min.



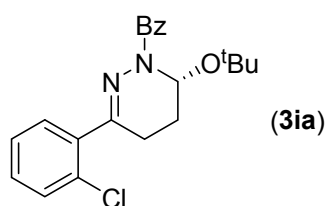
(R)-(3-(4-bromophenyl)-6-(tert-butoxy)-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 7): Yield (92%); white solid; $[\alpha]_D^{25} = -214.1$ (*c* 0.54, CH₂Cl₂); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.71 (d, *J* = 6.6 Hz, 2H), 7.49-7.39 (m, 7H), 6.37 (s, 1H), 2.95-2.82 (m, 1H), 2.66-2.58 (m, 1H), 2.19-2.11 (m, 1H), 1.88-1.79 (m, 1H), 1.31 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.4, 147.4, 136.1, 135.3, 131.3, 130.1, 129.5, 127.3, 126.9, 123.3, 74.7, 68.9, 28.5, 25.1, 18.4; HRMS Calcd. For C₂₁H₂₃BrN₂O₂ + H⁺: 415.0976, found: 415.1011. The product was analyzed by HPLC to determine the enantiomeric excess: 92% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); t_r = 7.60 and 11.58 min.



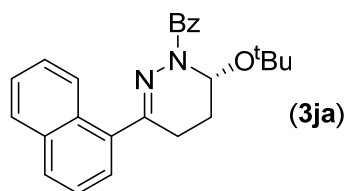
(R)-(6-(tert-butoxy)-3-(4-chlorophenyl)-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 8): Yield (92%); white solid; $[\alpha]_D^{25} = -201.5$ (*c* 0.84, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.71 (d, *J* = 6.6 Hz, 2H), 7.49-7.39 (m, 7H), 6.37 (s, 1H), 2.95-2.82 (m, 1H), 2.66-2.58 (m, 1H), 2.19-2.11 (m, 1H), 1.88-1.79 (m, 1H), 1.31 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.4, 147.3, 135.6, 135.3, 134.9, 130.1, 129.5, 128.4, 127.3, 126.6, 74.7, 68.9, 28.5, 25.1, 18.5; HRMS Calcd. For C₂₁H₂₃ClN₂O₂ + H⁺: 371.1482, found: 371.1519. The product was analyzed by HPLC to determine the enantiomeric excess: 93% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); t_r = 7.19 and 10.80 min.



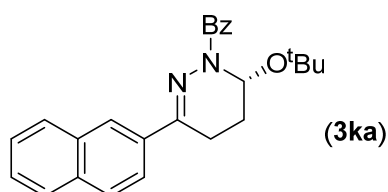
(R)-6-(tert-butoxy)-3-(3-chlorophenyl)-5,6-dihydropyridazin-1(4H)-yl(phenyl) methanone (Table 2, entry 9): Yield (78%); white solid; $[\alpha]_D^{25} = -226$ (c 0.06, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.73 (d, $J = 6.3$ Hz, 2H), 7.60 (m, 1H), 7.49-7.41 (m, 4H), 7.30-7.20 (m, 2H), 6.38 (s, 1H), 2.95-2.82 (m, 1H), 2.67-2.58 (m, 1H), 2.18-2.12 (m, 1H), 1.88-1.77 (m, 1H), 1.31 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 169.4, 147.3, 135.6, 135.3, 134.9, 130.1, 129.5, 128.4, 127.3, 126.6, 74.7, 68.9, 28.5, 25.1, 18.5; HRMS Calcd. For $\text{C}_{21}\text{H}_{23}\text{ClN}_2\text{O}_2 + \text{H}^+$: 371.1482, found: 371.1519. The product was analyzed by HPLC to determine the enantiomeric excess: 72% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 7.11$ and 11.39 min.



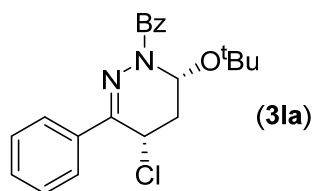
(R)-6-(tert-butoxy)-3-(2-chlorophenyl)-5,6-dihydropyridazin-1(4H)-yl(phenyl) methanone (Table 2, entry 10): Yield (90%); white solid; $[\alpha]_D^{25} = -208.1$ (c 0.97, CHCl_3); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.74 (d, $J = 6.3$ Hz, 2H), 7.51 (d, $J = 8.1$ Hz, 2H), 7.46-7.40 (m, 3H), 7.14-7.10 (m, 2H), 6.38 (s, 1H), 2.90-2.83 (m, 1H), 2.70-2.62 (m, 1H), 2.34 (s, 3H), 2.17-2.10 (m, 1H), 1.88-1.82 (m, 1H), 1.31 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 169.5, 151.6, 137.9, 135.1, 132.2, 130.1, 129.9, 129.7, 129.5, 128.6, 127.2, 126.6, 74.7, 69.1, 28.6, 25.4, 22.7; HRMS Calcd. For $\text{C}_{21}\text{H}_{23}\text{ClN}_2\text{O}_2 + \text{H}^+$: 371.1482, found: 371.1519. The product was analyzed by HPLC to determine the enantiomeric excess: 94% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 6.37$ and 7.71 min.



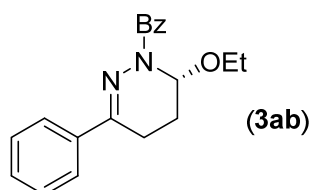
(R)-6-(tert-butoxy)-3-(naphthalen-1-yl)-5,6-dihydropyridazin-1(4H)-yl(phenyl) methanone (Table 2, entry 11): Yield (85%); white solid; $[\alpha]_D^{25} = -48.4$ (c 0.64, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 8.03 (s, 1H), 7.80-7.69 (m, 6H), 7.48-7.45 (m, 5H), 6.42 (s, 1H), 3.05-2.98 (m, 1H), 2.88-2.79 (m, 1H), 2.23-2.19 (m, 1H), 1.95-1.87 (m, 1H), 1.33 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 157.6, 148.4, 135.5, 134.8, 133.6, 132.9, 130.2, 129.7, 128.4, 127.9, 127.6, 127.3, 126.6, 126.2, 125.2, 122.9, 74.8, 69.1, 28.6, 25.3, 18.5; HRMS Calcd. For $\text{C}_{25}\text{H}_{26}\text{N}_2\text{O}_2 + \text{H}^+$: 387.2028, found: 387.2064. The product was analyzed by HPLC to determine the enantiomeric excess: 86% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 6.83$ and 9.33 min.



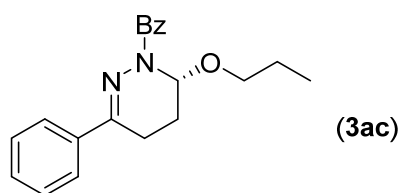
(R)-6-(tert-butoxy)-3-(naphthalen-2-yl)-5,6-dihydropyridazin-1(4H)-yl(phenyl) methanone (Table 2, entry 12): Yield (88%); white solid; $[\alpha]_D^{25} = -200.5$ (c 0.44, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 8.03 (m, 1H), 7.80-7.69 (m, 6H), 7.48-7.45 (m, 5H), 6.42 (s, 1H), 3.82 (s, 3H), 3.05-2.98 (m, 1H), 2.88-2.79 (m, 1H), 2.23-2.18 (m, 1H), 1.93-1.88 (m, 1H), 1.33 (s, 9H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 169.5, 148.3, 135.5, 134.7, 133.5, 132.9, 130.1, 129.6, 128.3, 127.8, 127.5, 127.3, 126.5, 126.2, 125.2, 122.8, 74.7, 69.1, 28.6, 25.3, 18.5; HRMS Calcd. For $\text{C}_{25}\text{H}_{26}\text{N}_2\text{O}_2 + \text{H}^+$: 387.2028, found: 387.2064. The product was analyzed by HPLC to determine the enantiomeric excess: 84% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_r = 6.82$ and 9.33 min



((4S,6R)-6-(tert-butoxy)-4-chloro-3-phenyl-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Table 2, entry 16): Yield (62%); white solid; $[\alpha]_D^{25} = -230.5$ (*c* 0.80, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.77 -7.69 (m, 4H), 7.48-7.33 (m, 6H), 6.41 (s, 1H), 4.97 (d, *J* = 5.7 Hz, 1H), 2.78-2.73 (m, 1H), 2.37-2.32 (m, 1H), 2.19-2.11 (m, 1H), 1.88-1.79 (m, 1H), 1.35 (s, 9H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 169.8, 143.7, 134.5, 130.6, 129.7, 129.5, 128.3, 127.4, 126.2, 75.3, 68.1, 40.9, 34.2, 28.5; HRMS Calcd. For C₂₁H₂₃ClN₂O₂ + H⁺: 371.1482, found: 371.1520. The product was analyzed by HPLC to determine the enantiomeric excess: 83% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); *t_r* = 7.36 and 10.60 min

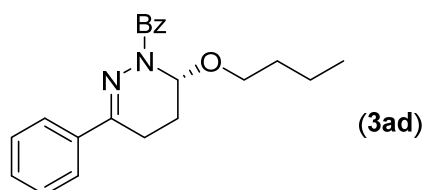


(R)-(6-ethoxy-3-phenyl-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Scheme 2): Yield (88%); white solid; $[\alpha]_D^{25} = -184.6$ (*c* 0.94, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) δ 7.77 (d, *J* = 7.5 Hz, 2H), 7.62-7.61 (m, 2H), 7.50-7.41 (m, 3H), 7.33-7.31 (m, 3H), 6.19 (s, 1H), 3.81-3.71 (m, 2H), 2.84-2.65 (m, 2H), 2.35-2.30 (m, 1H), 1.91-1.85 (m, 1H), 1.20 (t, *J* = 7.2 Hz, 3H); ¹³C NMR (CDCl₃, TMS, 75 MHz) 170.8, 148.0, 136.9, 134.9, 130.1, 129.7, 129.0, 128.1, 127.1, 125.2, 74.1, 63.9, 23.1, 18.3, 15.1. The product was analyzed by HPLC to determine the enantiomeric excess: 90% ee (Chiralpak IB-H, *i*-propanol/hexane = 10/90, flow rate 1.0 mL/min, λ = 254 nm); *t_r* = 5.42 and 7.01 min.



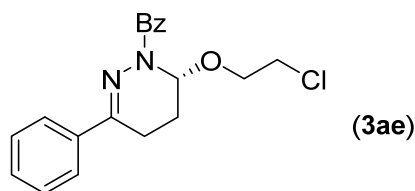
(R)-phenyl(3-phenyl-6-propoxy-5,6-dihydropyridazin-1(4H)-yl)methanone

(Scheme 3): Yield (94%); white solid; $[\alpha]^{25}_{\text{D}} = -130.5$ (*c* 0.88, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.77 (d, $J = 7.8$ Hz, 2H), 7.62-7.60 (m, 2H), 7.49-7.41 (m, 3H), 7.33-7.31 (m, 3H), 6.18 (s, 1H), 3.74-3.59 (m, 2H), 2.85-2.68 (m, 2H), 2.38-2.31 (m, 1H), 1.90-1.83 (m, 1H), 1.62-1.52 (m, 2H), 0.89 (t, $J = 7.2$ Hz, 3H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 170.8, 148.1, 136.9, 134.9, 130.1, 129.7, 129.0, 128.1, 127.1, 125.3, 74.3, 70.0, 23.0, 22.8, 18.3, 10.4. The product was analyzed by HPLC to determine the enantiomeric excess: 90% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_{\text{r}} = 6.19$ and 7.53 min

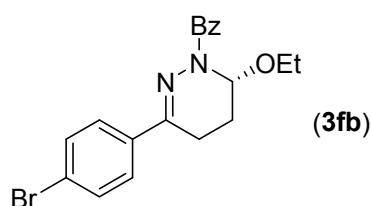


(R)-(6-butoxy-3-phenyl-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone

(Scheme 2): Yield (95%); white solid; $[\alpha]^{25}_{\text{D}} = -124.7$ (*c* 0.66, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.77 (d, $J = 7.8$ Hz, 2H), 7.63-7.60 (m, 2H), 7.49-7.41 (m, 3H), 7.33-7.31 (m, 3H), 6.18 (s, 1H), 3.70 (q, $J_1 = 6.9$ Hz, $J_2 = 19.2$ Hz, 2H), 2.84-2.71 (m, 2H), 2.35-2.30 (m, 1H), 1.92-1.80 (m, 1H), 1.57-1.52 (m, 2H), 1.35-1.29 (m, 2H), 0.88 (t, $J = 7.2$ Hz, 3H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 170.9, 148.2, 137.0, 135.0, 130.2, 129.7, 129.1, 128.2, 127.2, 125.3, 74.3, 68.3, 31.7, 23.2, 19.2, 18.4, 13.8. The product was analyzed by HPLC to determine the enantiomeric excess: 88% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_{\text{r}} = 5.96$ and 7.25 min

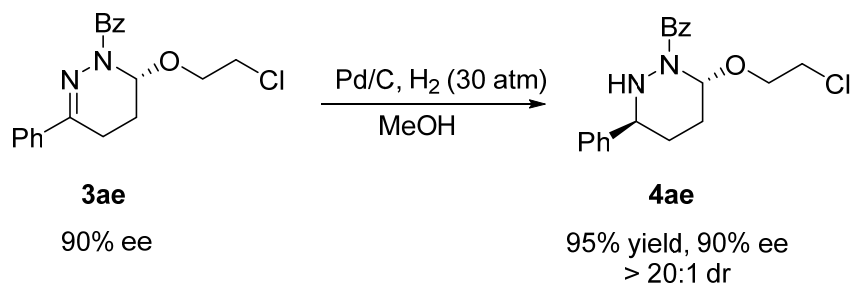


(R)-(6-(2-chloroethoxy)-3-phenyl-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Scheme 2): Yield (93%); white solid, $[\alpha]^{25}_{\text{D}} = -94.5$ (*c* 0.60, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.77 (d, *J* = 6.6 Hz, 2H), 7.62-7.60 (m, 2H), 7.50-7.41 (m, 3H), 7.34-7.31 (m, 3H), 6.21 (s, 1H), 4.07-3.93 (m, 2H), 3.70-3.60 (m, 2H), 2.91-2.68 (m, 2H), 2.45-2.37 (m, 1H), 1.95-1.88 (m, 1H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 171.1, 148.5, 136.8, 134.6, 130.5, 129.9, 129.3, 128.3, 127.3, 125.3, 74.5, 68.5, 43.0, 23.0, 18.3; HRMS Calcd. For $\text{C}_{19}\text{H}_{19}\text{ClN}_2\text{O}_2 + \text{H}^+$: 343.1169, found: 343.1205. The product was analyzed by HPLC to determine the enantiomeric excess: 90% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_{\text{r}} = 10.61$ and 14.02 min.

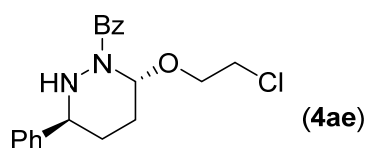


(R)-(3-(4-bromophenyl)-6-ethoxy-5,6-dihydropyridazin-1(4H)-yl)(phenyl)methanone (Scheme 2): Yield (95%); white solid, $[\alpha]^{25}_{\text{D}} = -184.5$ (*c* 0.71, CH_2Cl_2); ^1H NMR (CDCl_3 , TMS, 300 MHz) 7.73 (d, *J* = 6.6 Hz, 2H), 7.51-7.42 (m, 7H), 6.17 (s, 1H), 3.82-3.70 (m, 2H), 2.87-2.74 (m, 1H), 2.68-2.60 (m, 1H), 2.37-2.30 (m, 1H), 1.91-1.81 (m, 1H), 1.23 (t, *J* = 6.6 Hz, 3H); ^{13}C NMR (CDCl_3 , TMS, 75 MHz) δ 170.7, 147.1, 135.9, 134.9, 131.3, 130.3, 129.6, 127.3, 126.8, 123.3, 74.1, 64.1, 23.1, 18.2, 15.1; The product was analyzed by HPLC to determine the enantiomeric excess: 90% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, $\lambda = 254$ nm); $t_{\text{r}} = 7.73$ and 10.02 min.

IV. Procedure for Transformation of **3ae**



A suspension of Pd/C (10 mg) and **3ae** (0.3 mmol) in MeOH (5 mL) was stirred at 40 °C under 30 atm hydrogen atmosphere. After being stirred for 15 h, the mixture was filtrated through a pad of Celite and the filtration was concentrated in vacuo, the residue was purified by column chromatography on silica gel to afford the desired the product **4ae** in 95% yield (dr > 20:1), which was then directly analyzed by HPLC to determine the enantiomeric excess.

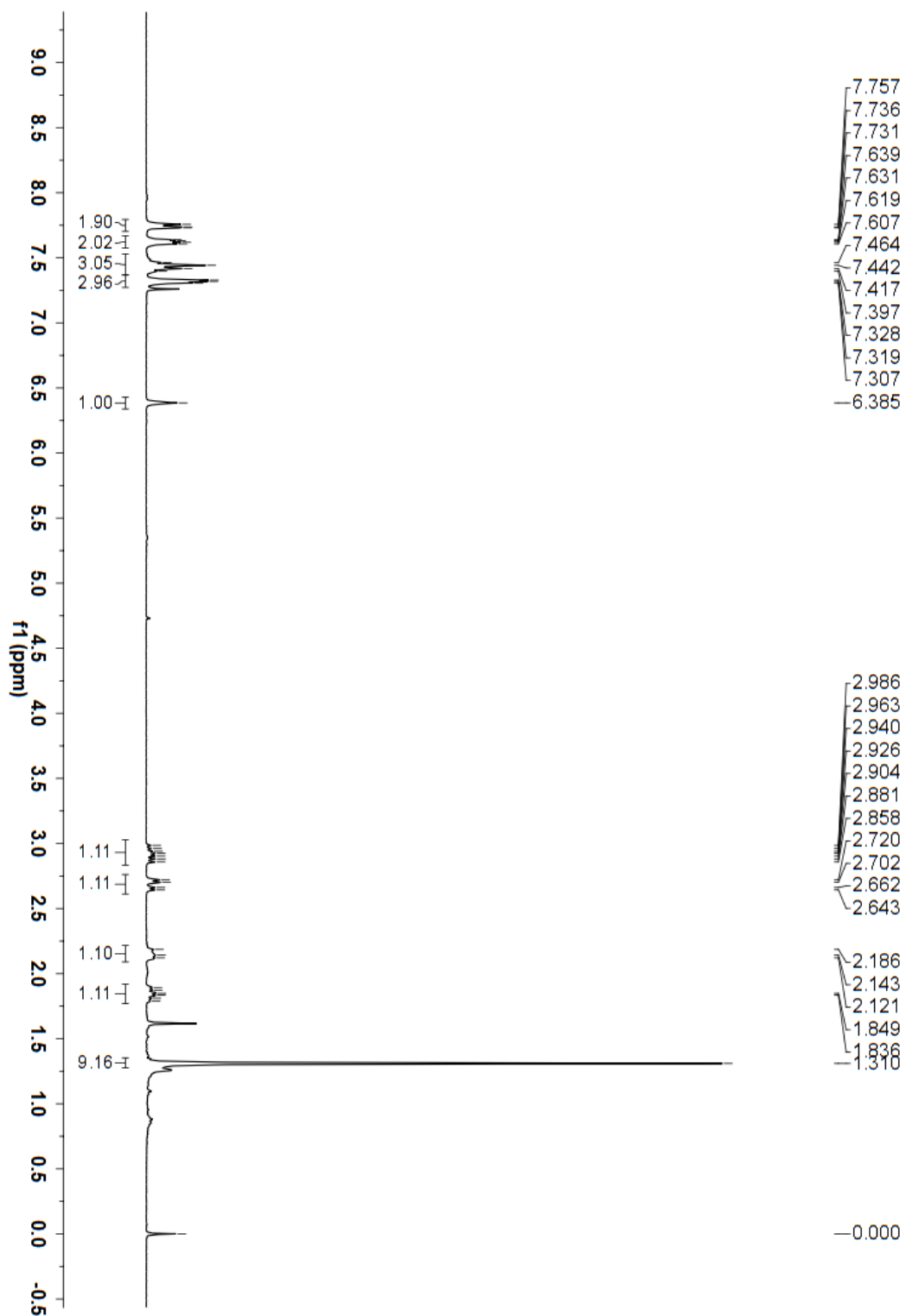
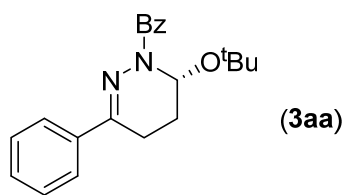


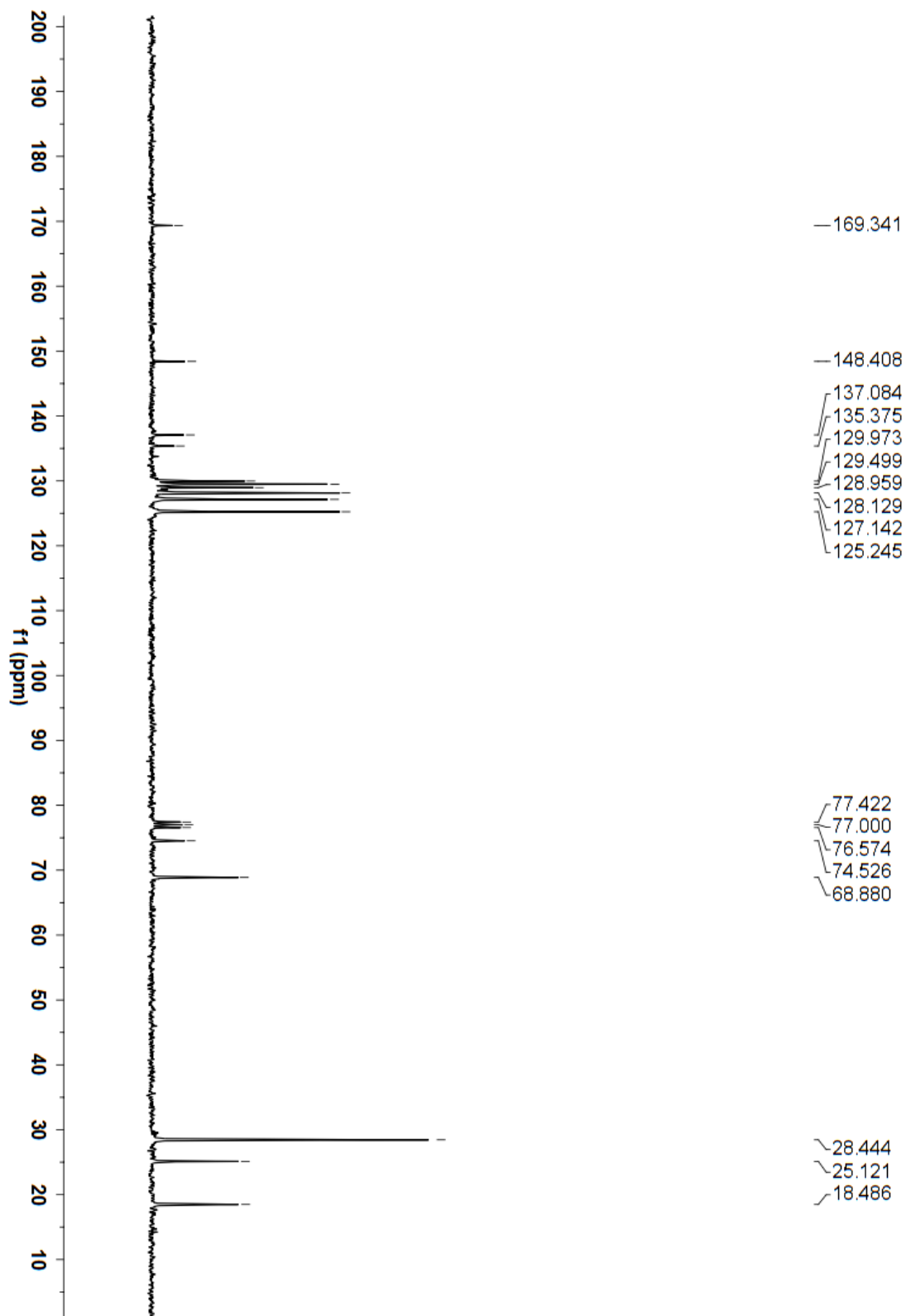
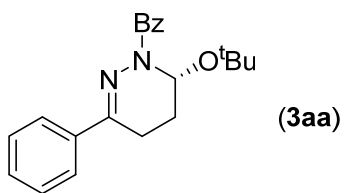
((3R,6R)-6-(2-chloroethoxy)-3-phenyltetrahydropyridazin-1(2H)-yl)(phenyl)methanone (Scheme 3): Yield (95%); white solid; $[\alpha]^{25}_D = -195.5$ (*c* 0.80, CHCl₃); ¹H NMR (CDCl₃, TMS, 300 MHz) 7.69 (d, *J* = 6.9 Hz, 2H), 7.41-7.38 (m, 3H), 7.27-7.26 (m, 6H), 6.00 (s, 1H), 4.18-4.14 (m, 1H), 4.00-3.91 (m, 2H), 3.79-3.69 (m, 3H), 2.23-2.01 (m, 4H); ¹³C NMR (CDCl₃, TMS, 75 MHz) δ 167.6, 139.8, 130.1, 128.3, 128.4, 127.6, 127.4, 126.6, 76.1, 67.8, 60.1, 28.8, 24.3; HRMS Calcd. For C₁₉H₂₁ClN₂O₂ + H⁺: 345.1325, found: 345.1363. The product was analyzed by HPLC to determine the enantiomeric excess: 90% ee (Chiralpak IB-H, *i*-propanol/hexane = 5/95, flow rate 1.0 mL/min, λ = 254 nm); *t*_r = 10.12 and 12.02 min.

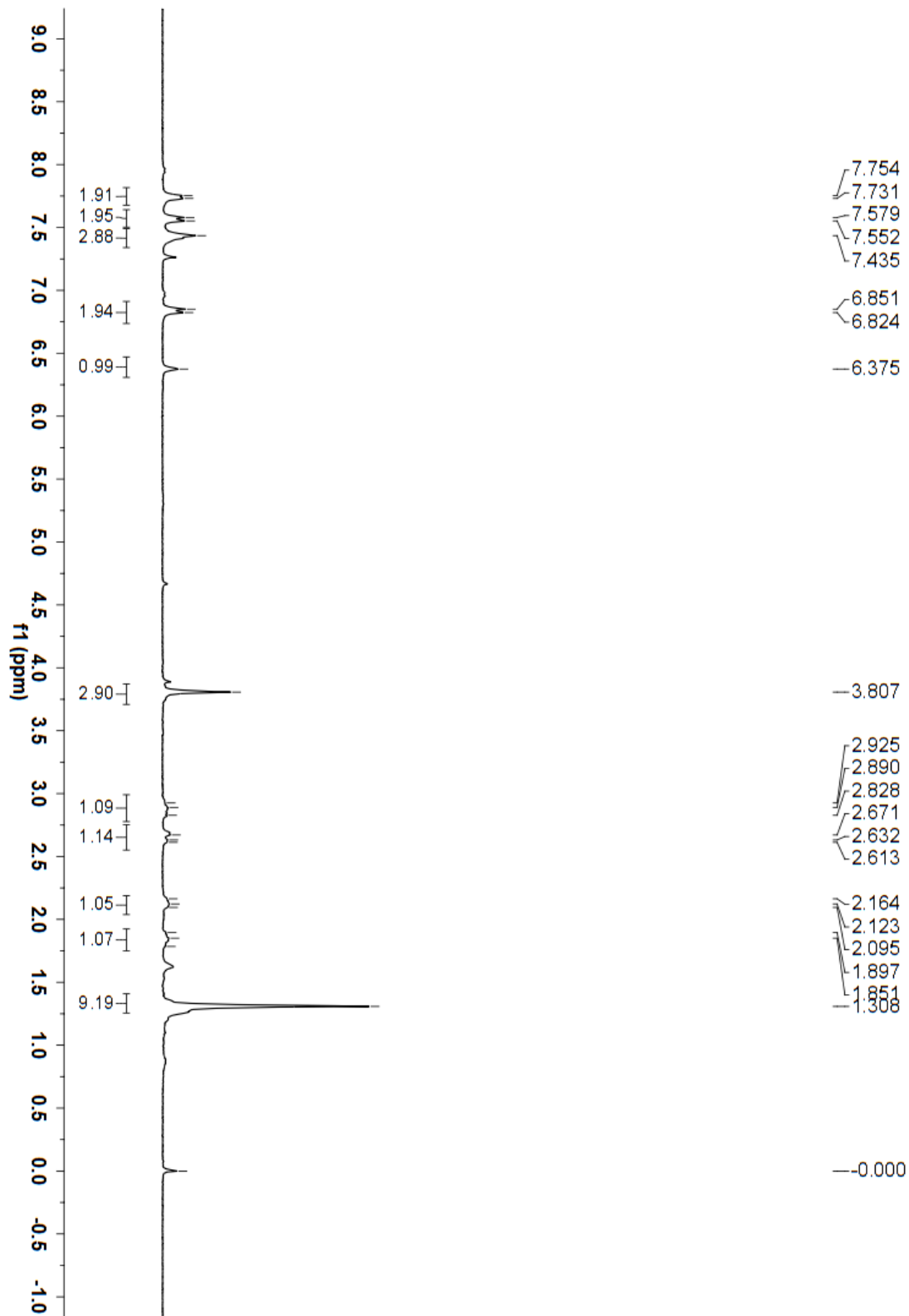
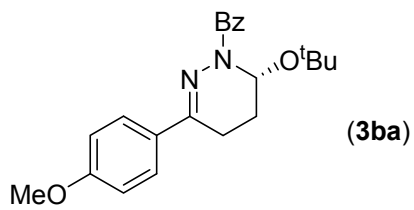
V. References

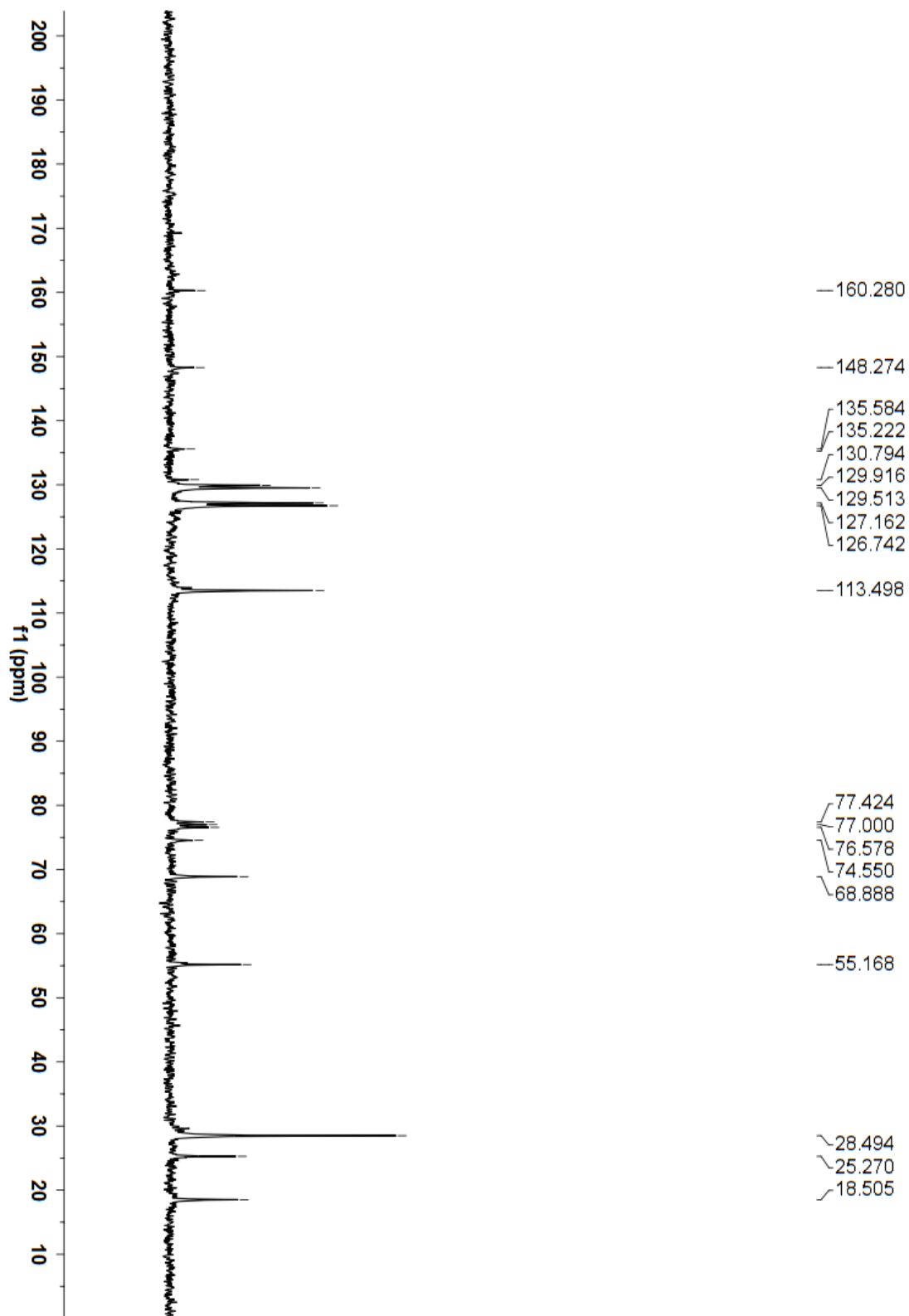
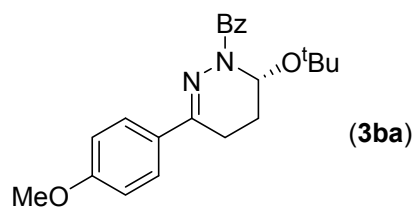
- 1 a) J.-R. Chen, W.-R. Dong, M. Candy, F.-F. Pan, M. Jörres, C. Bolm, *J. Am. Chem. Soc.* **2012**, *134*, 6924; b) M. S. South, T. L. Jakuboski, M. D. Westmeyer, D. R. Dukesherer, *J. Org. Chem.* **1996**, *61*, 8921.
3. C. J. Richards, A. W. Mulvaney, *Tetrahedron: Asymmetry* **1996**, *7*, 1419.

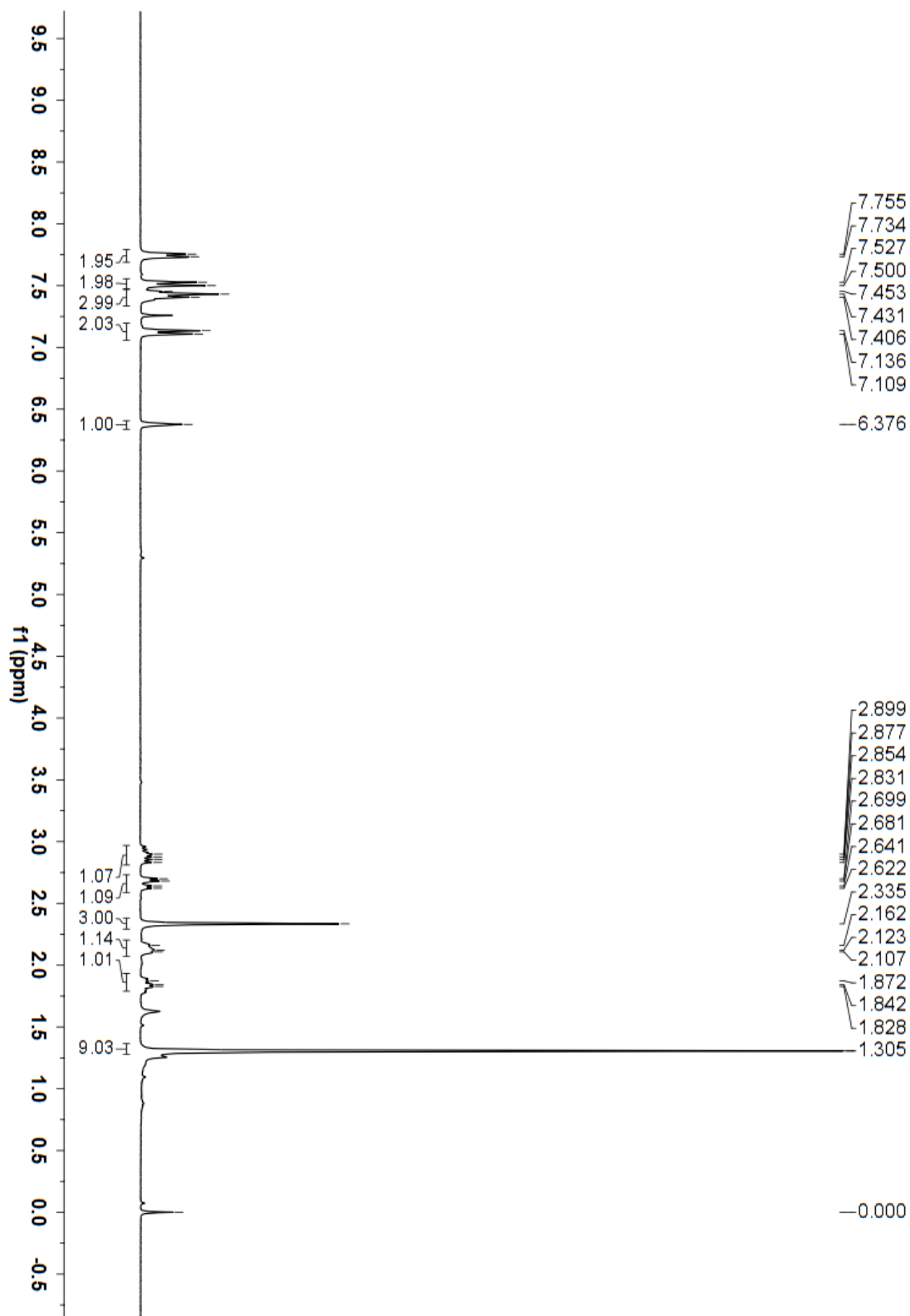
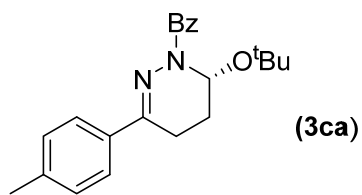
VI. ¹H NMR and ¹³C NMR spectra

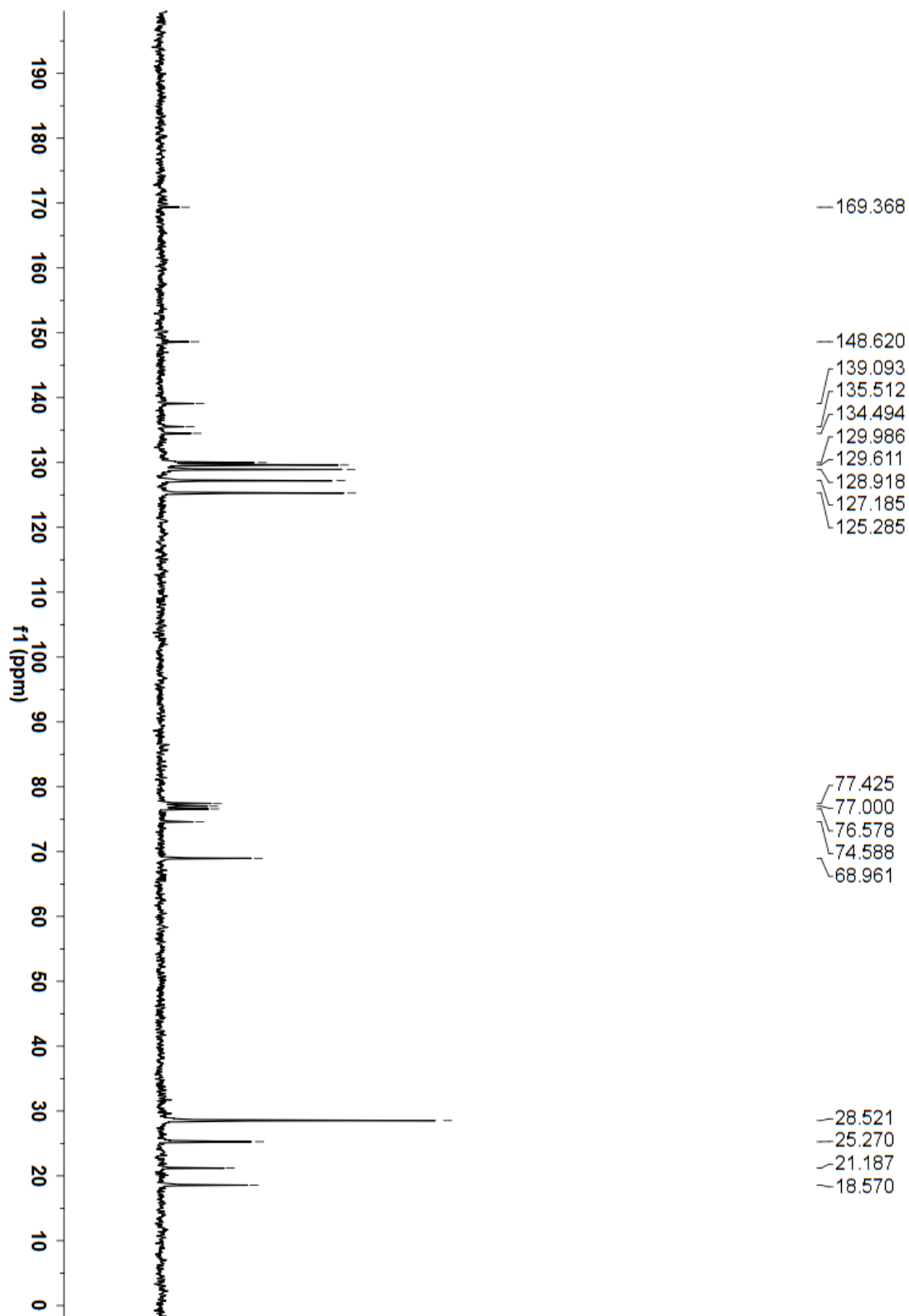
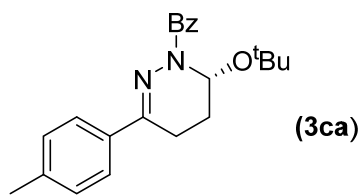


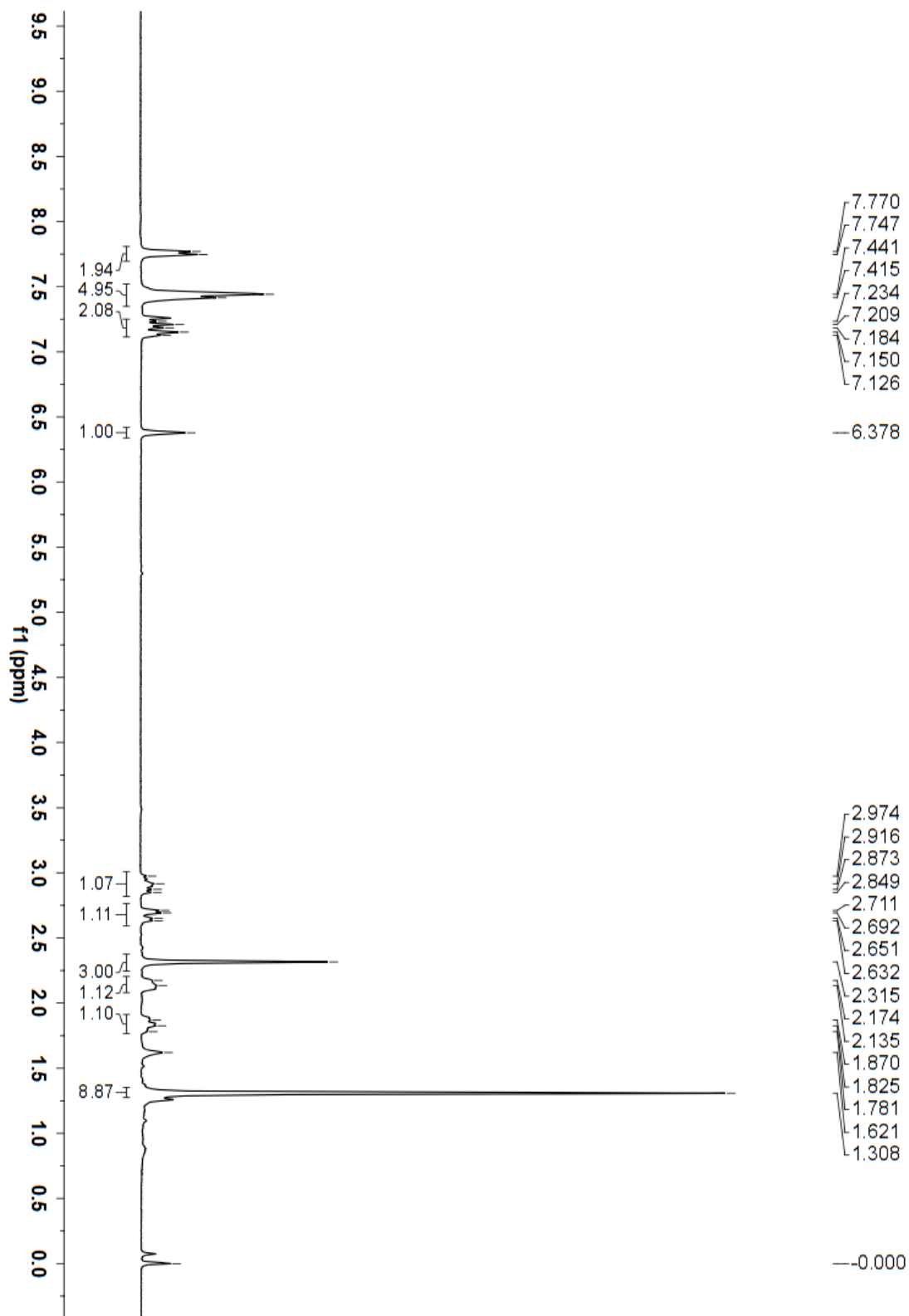
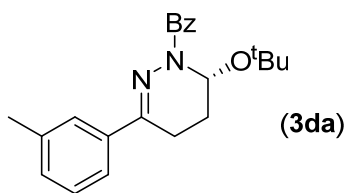


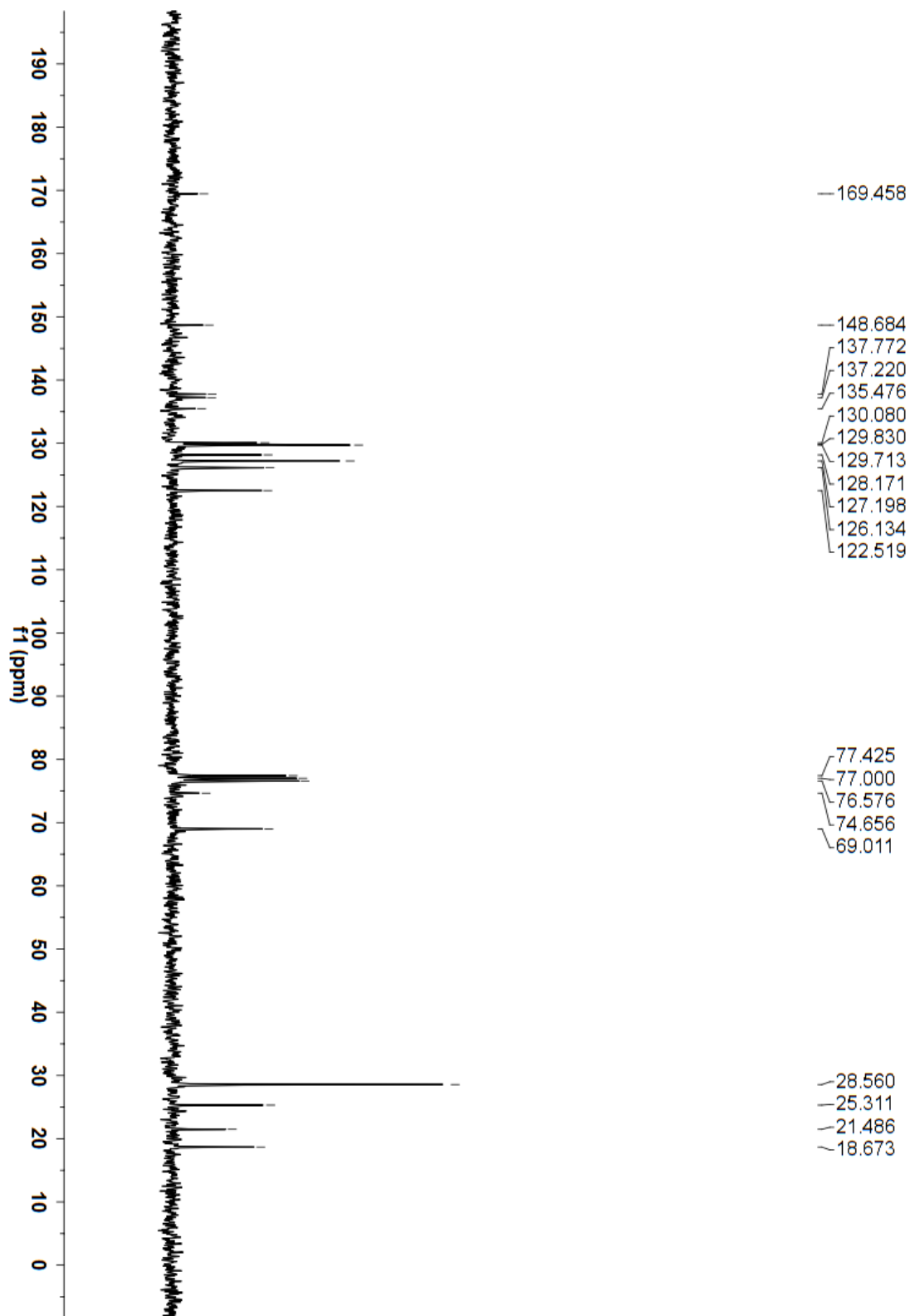
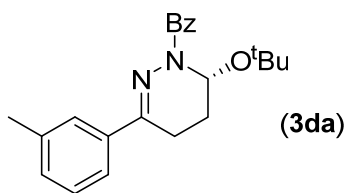


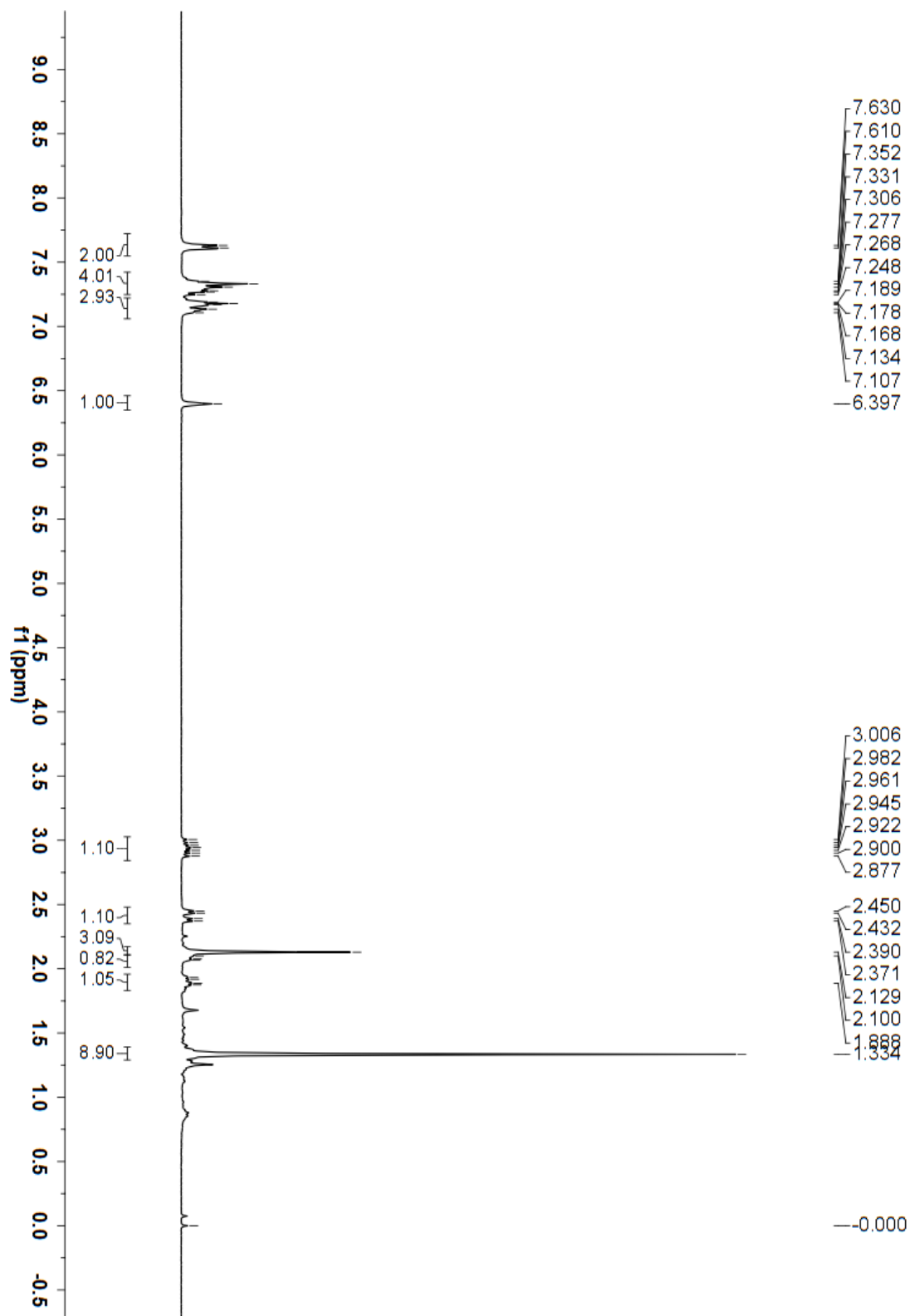
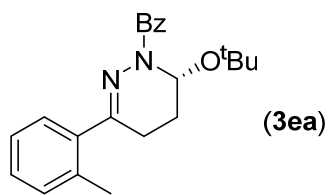


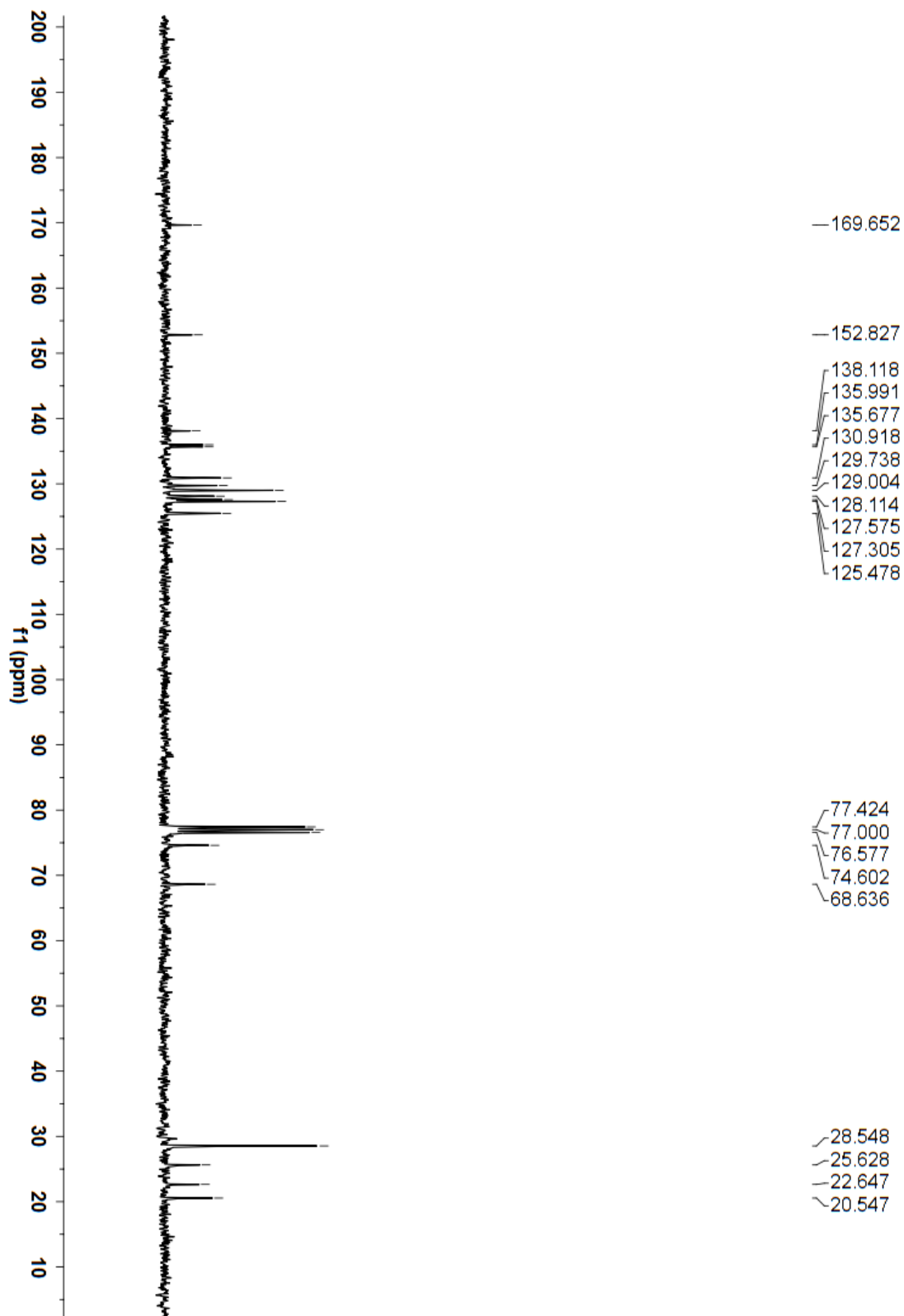
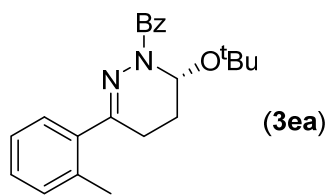


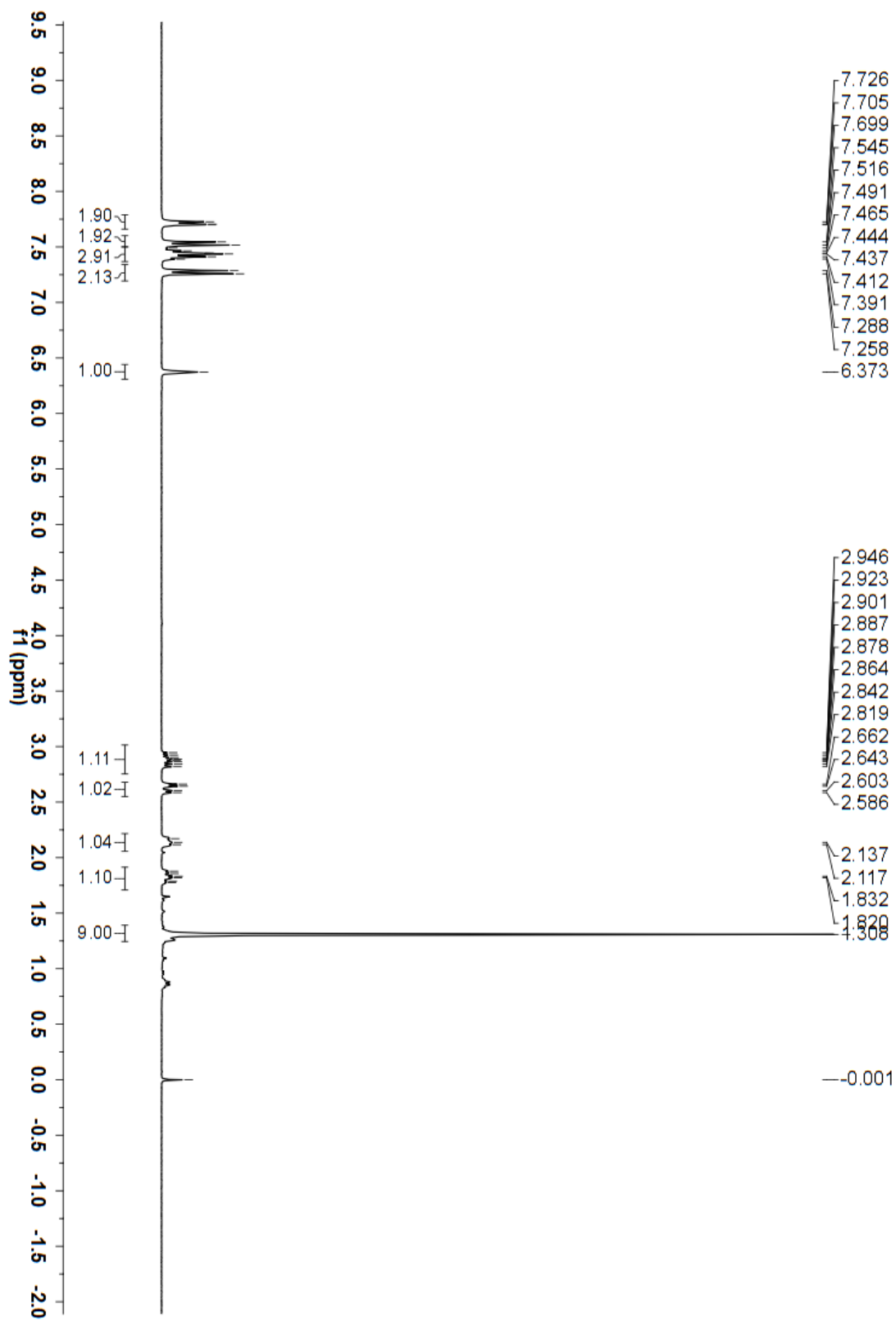
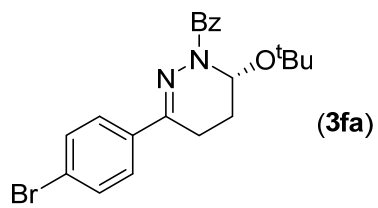


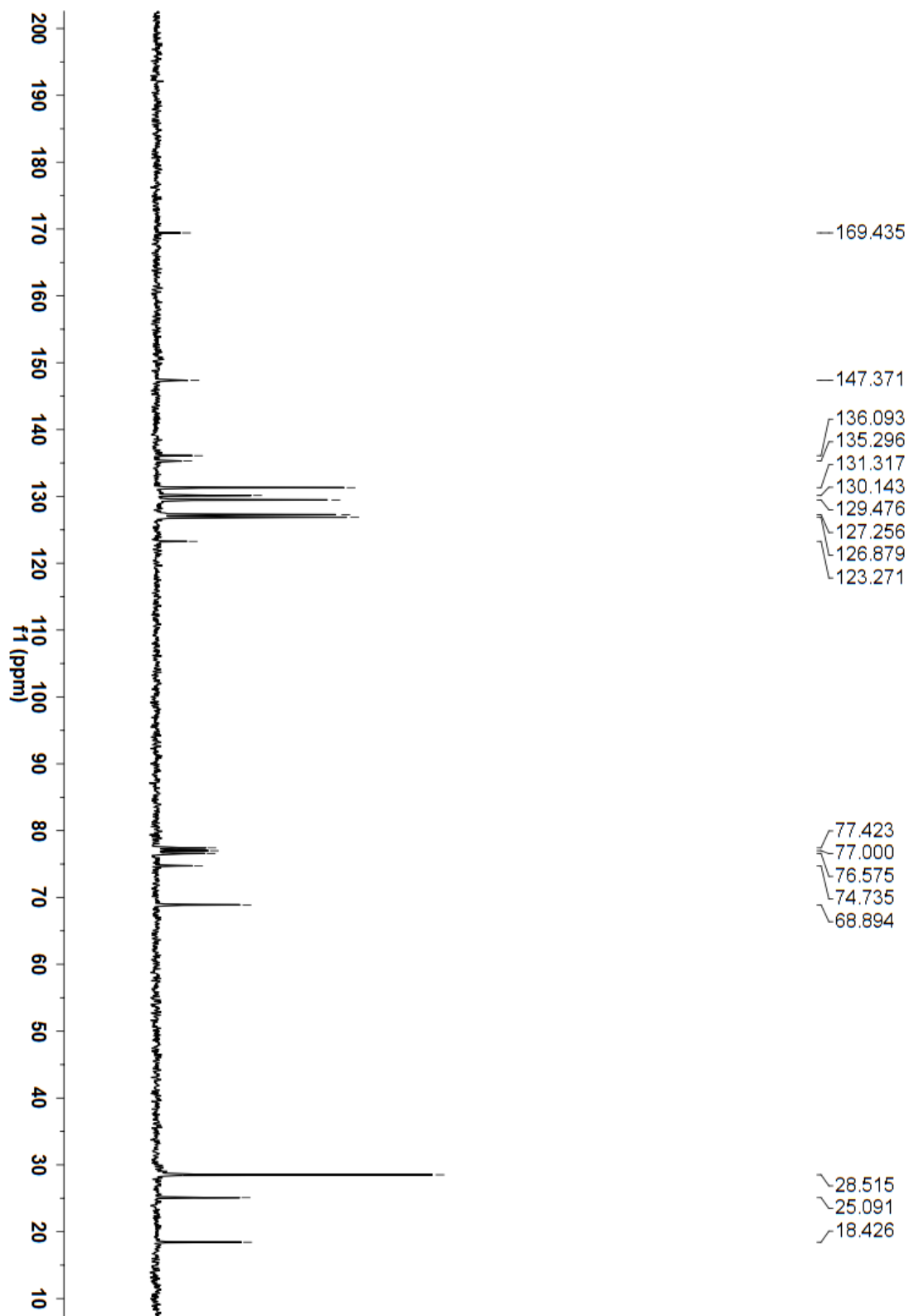
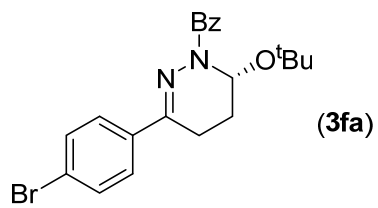


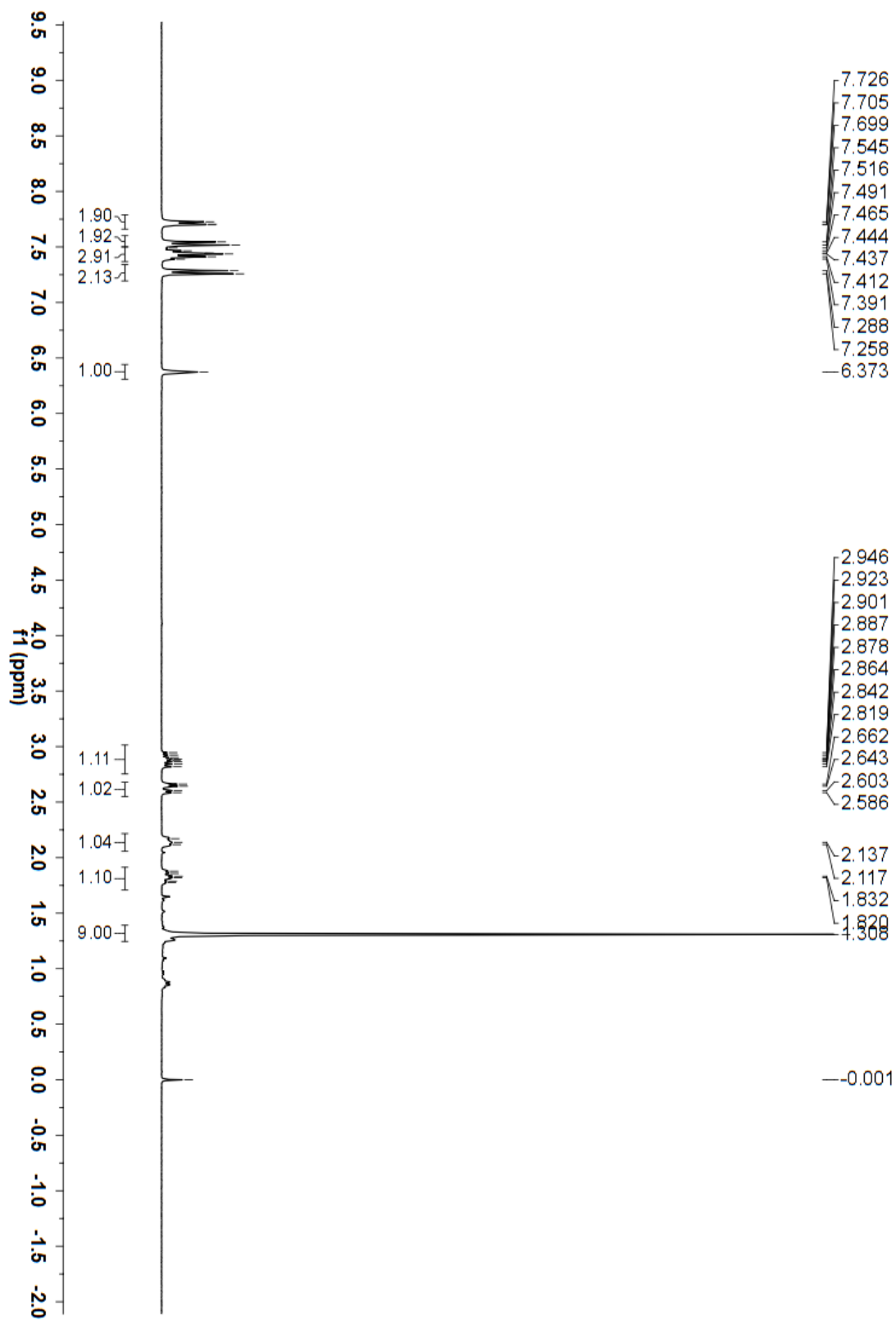
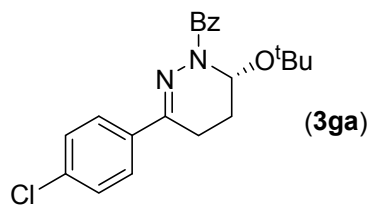


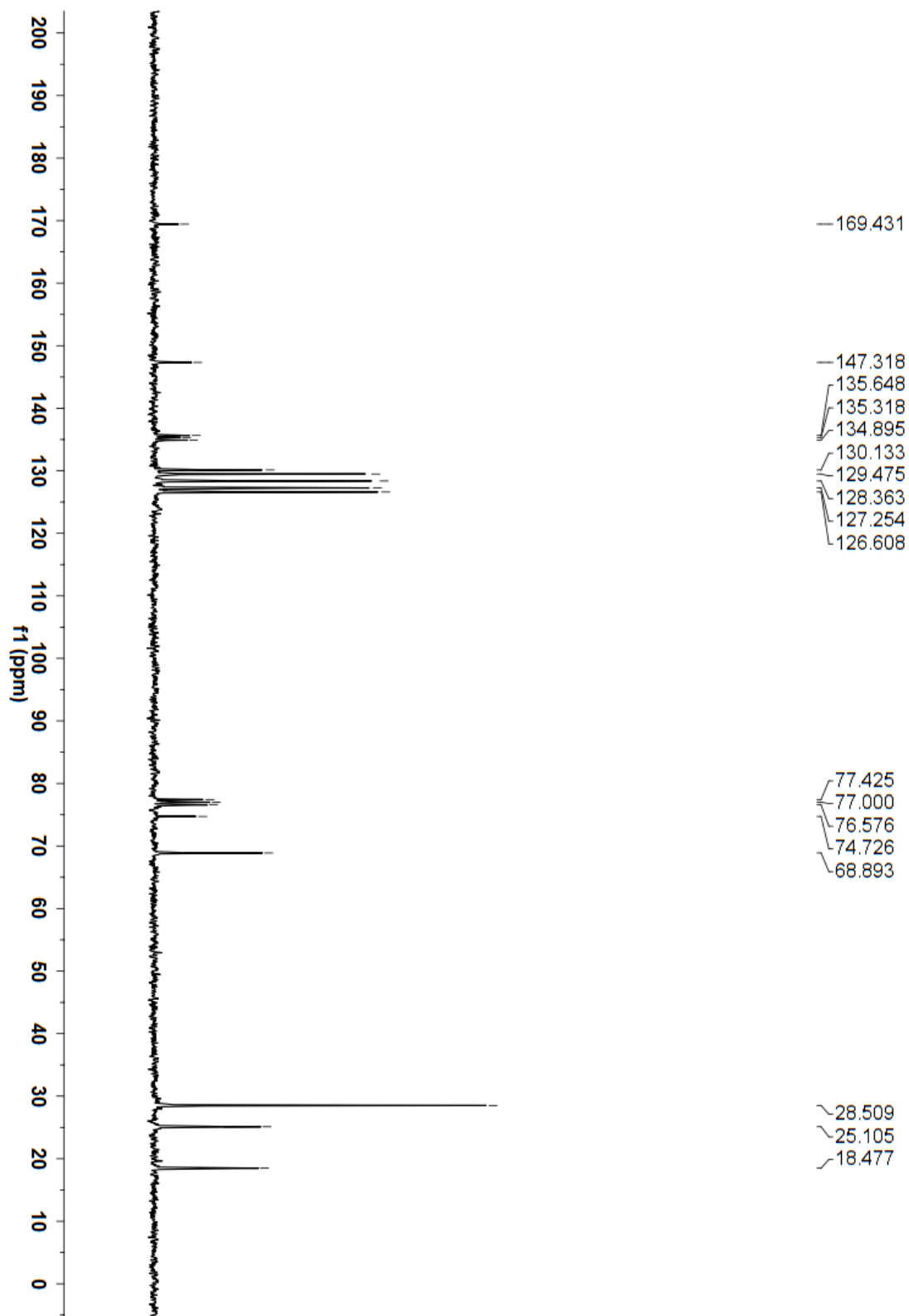
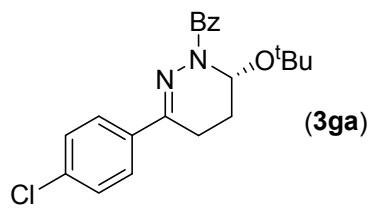


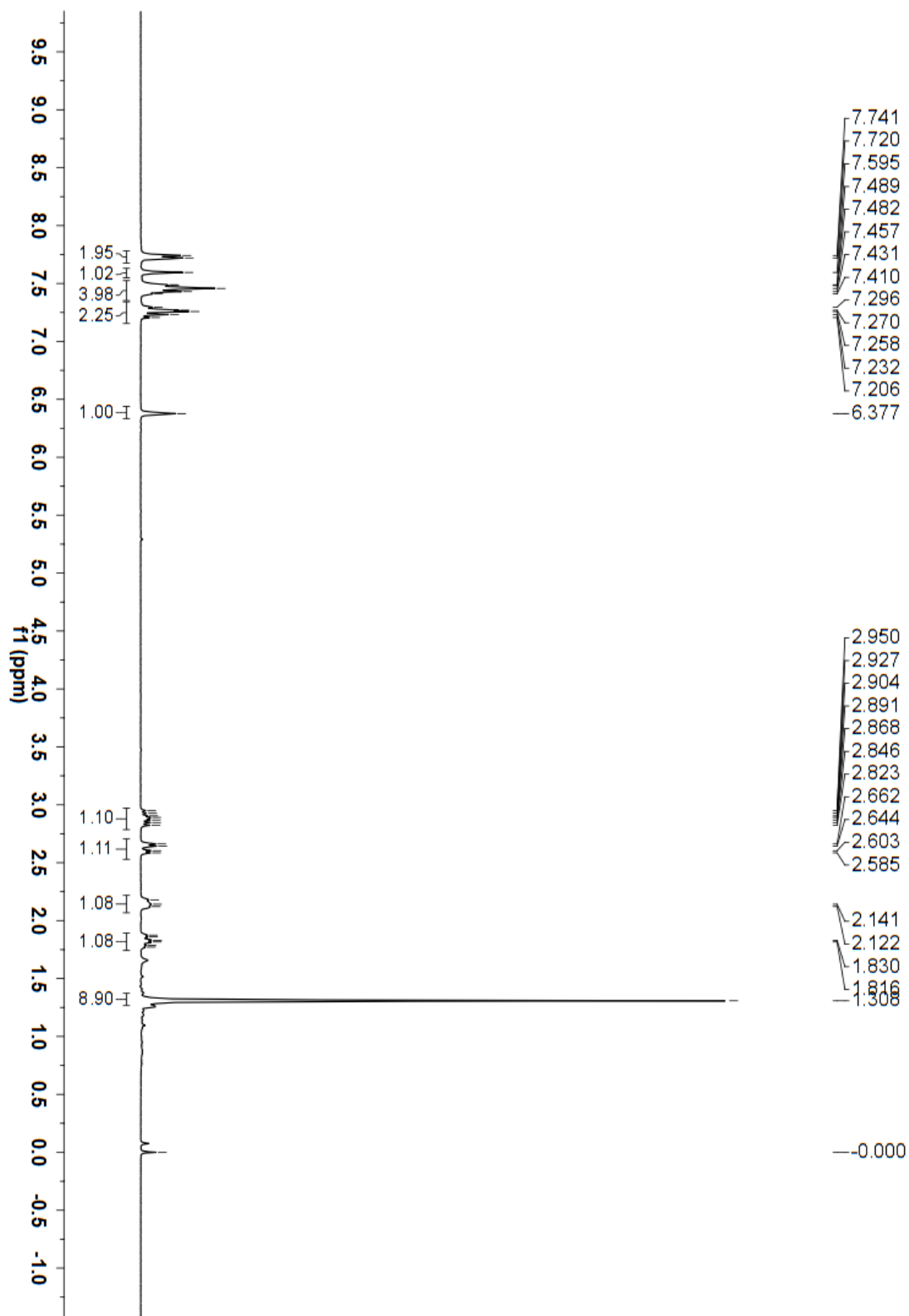
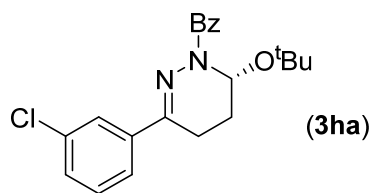


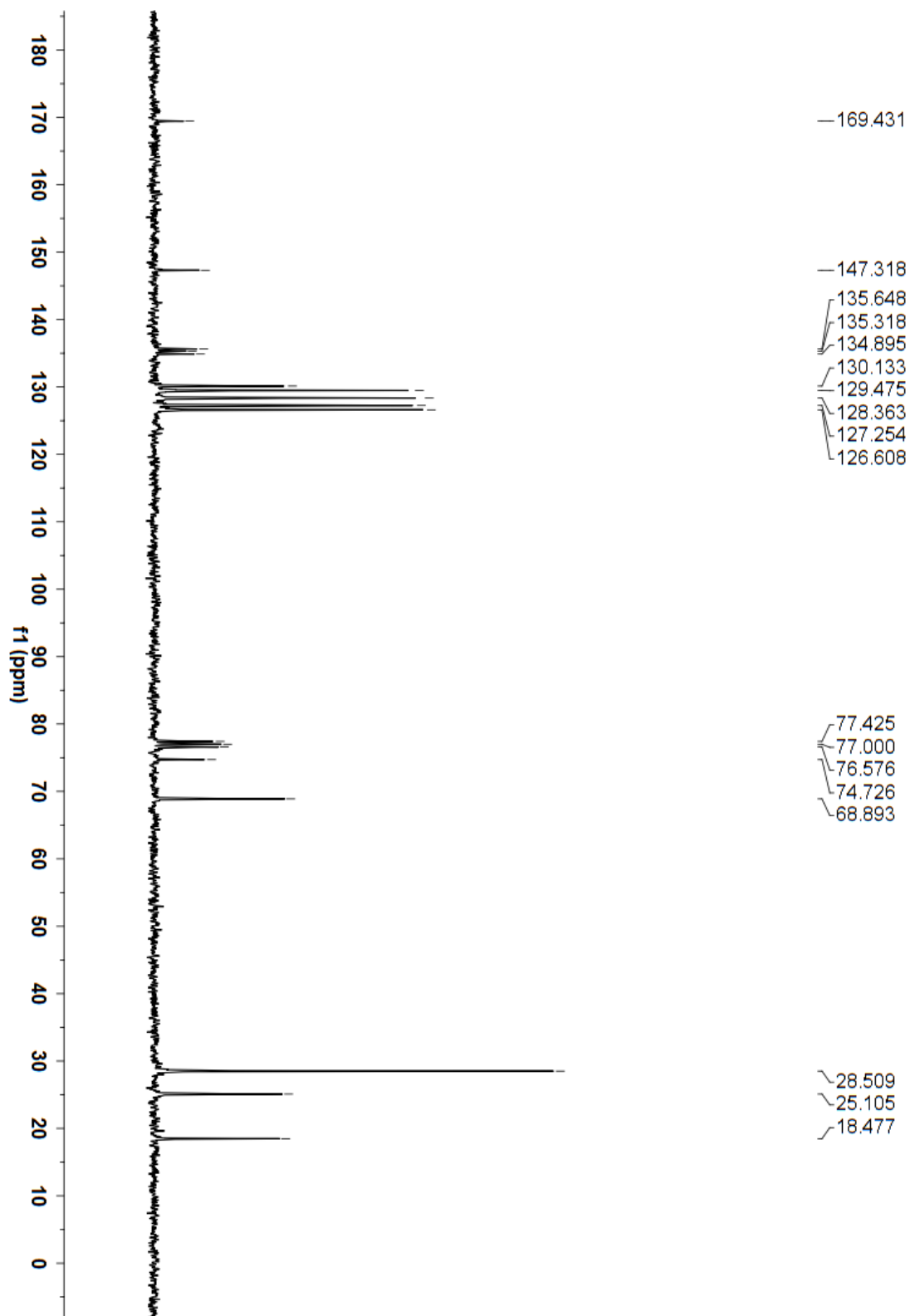
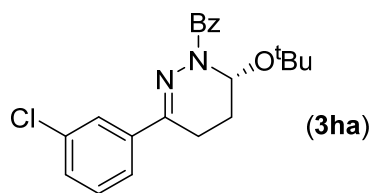


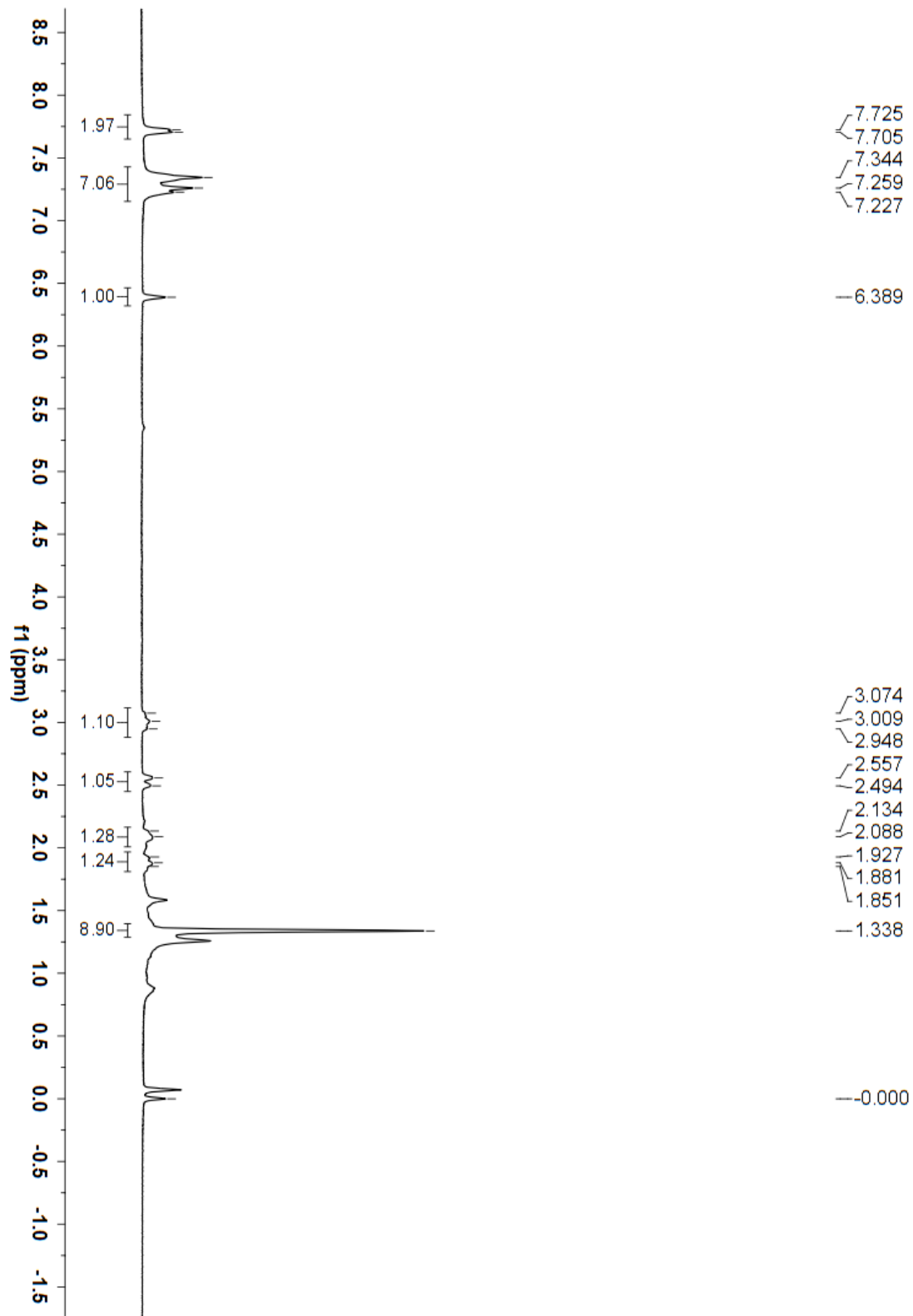
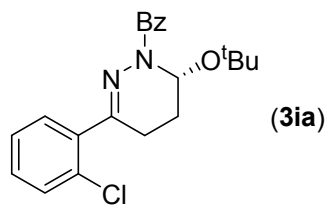


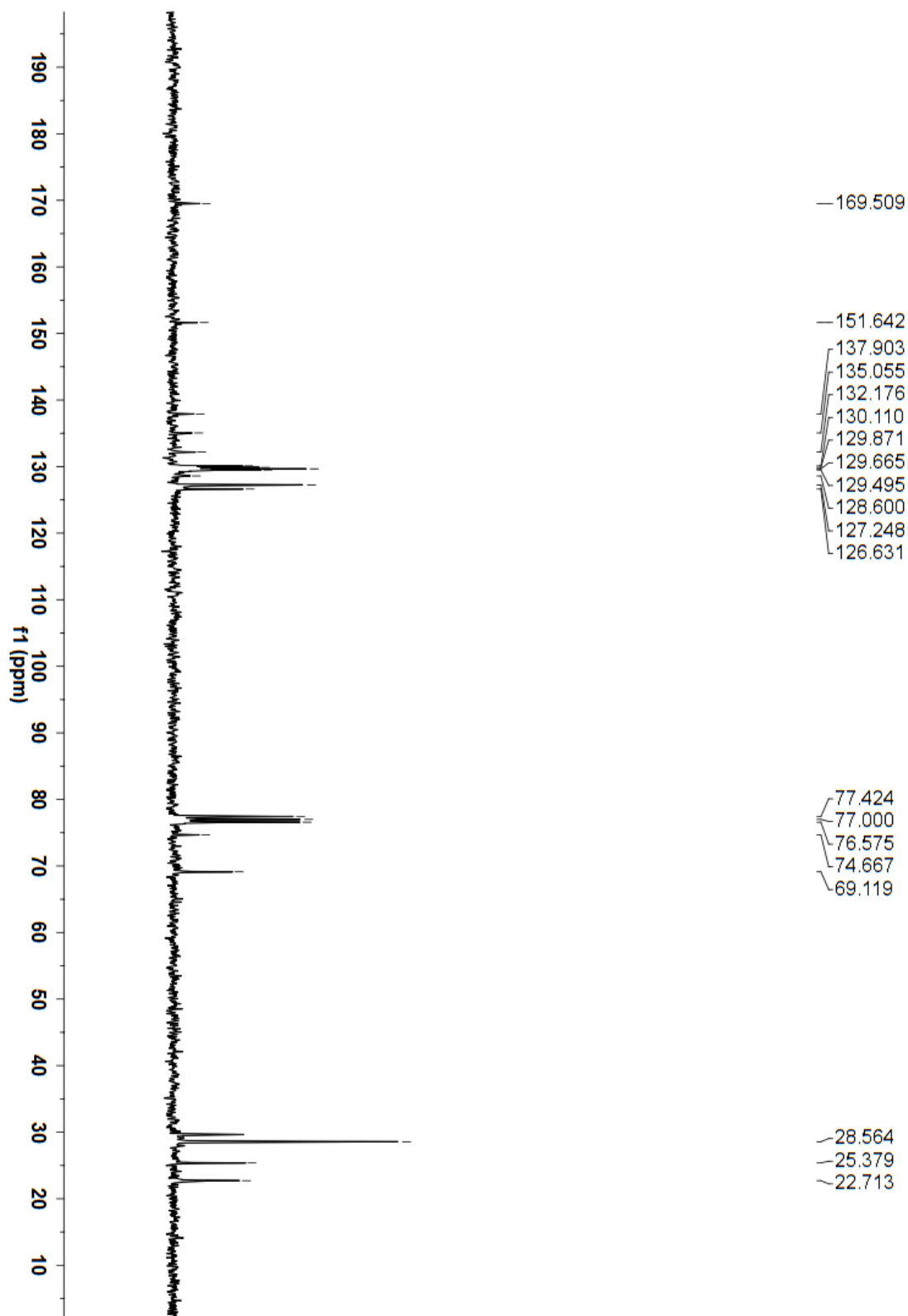
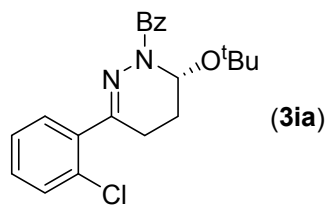


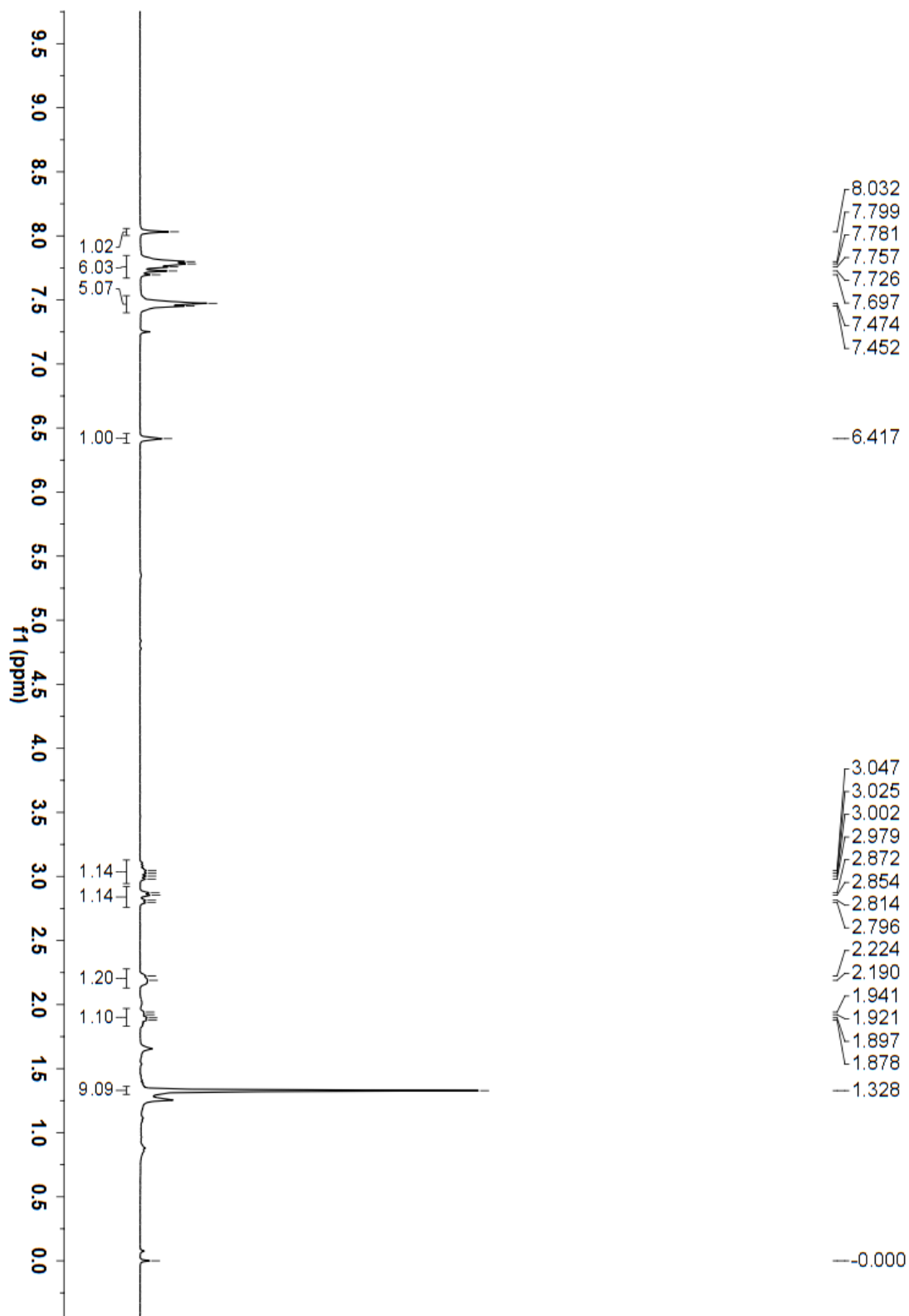
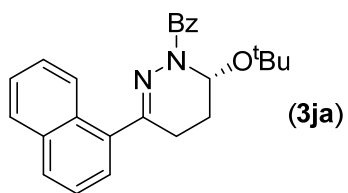


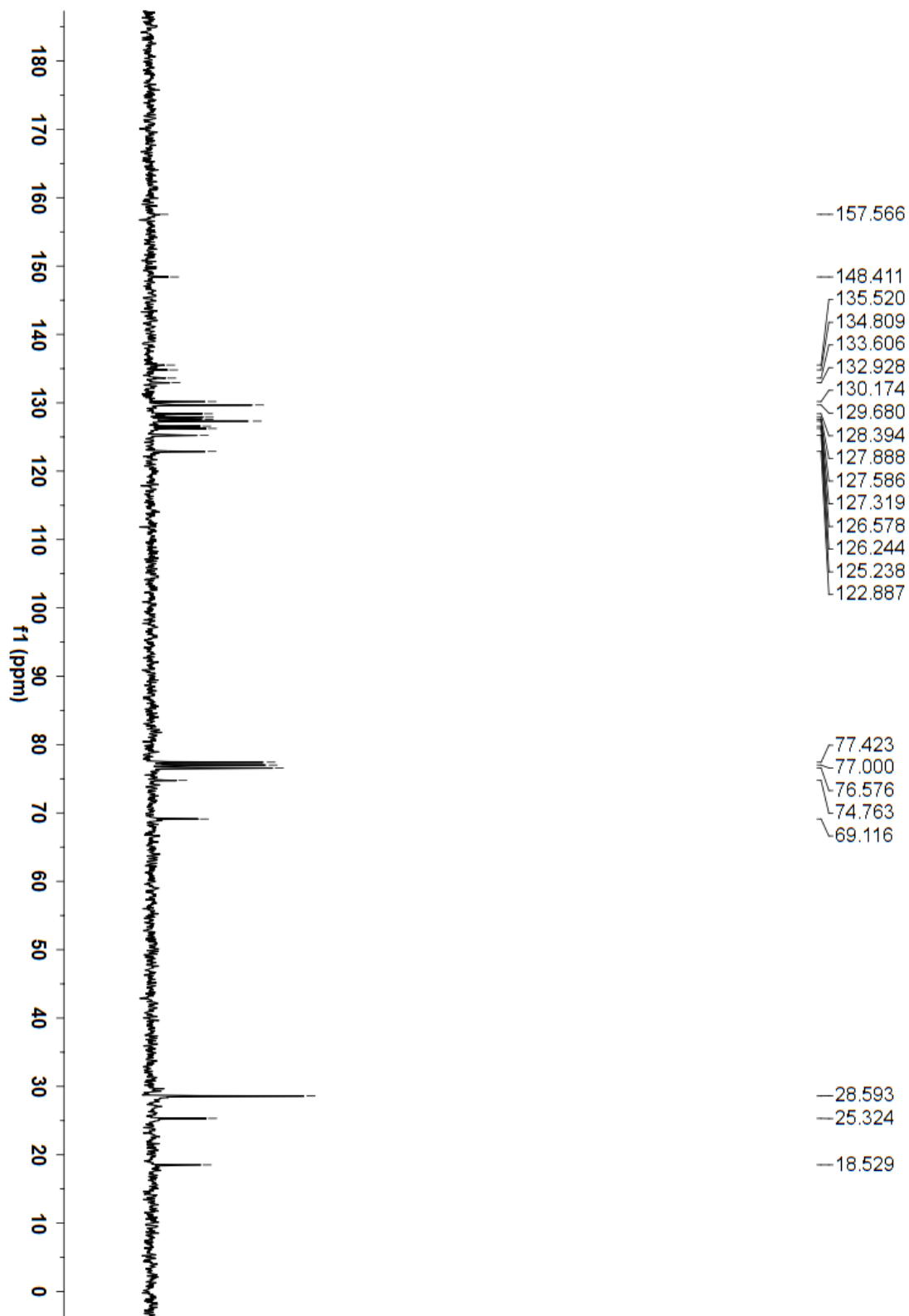
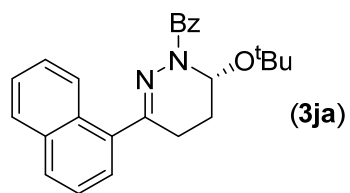


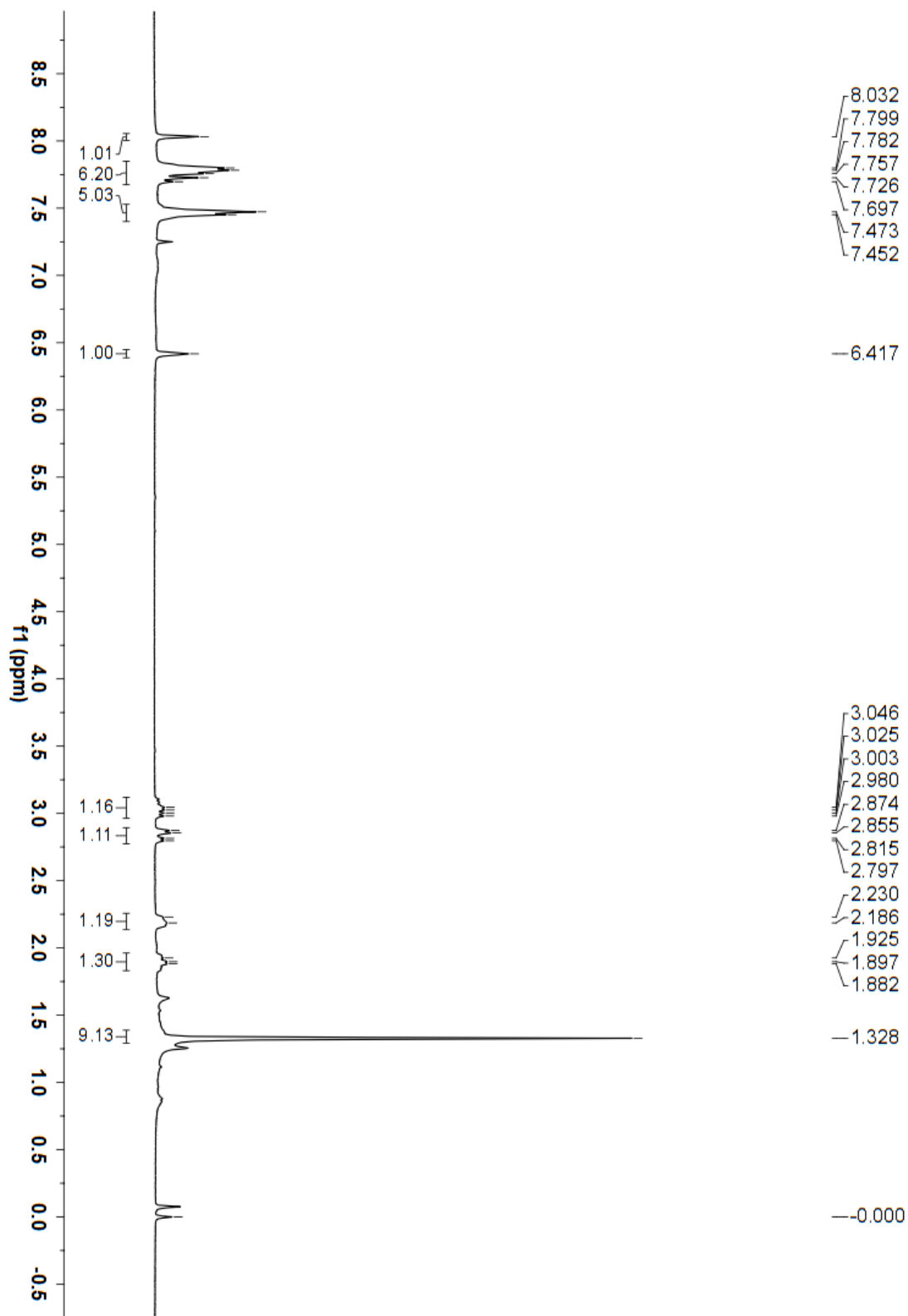
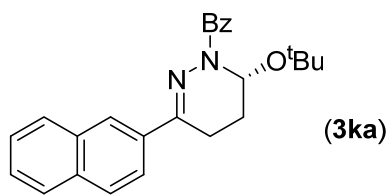


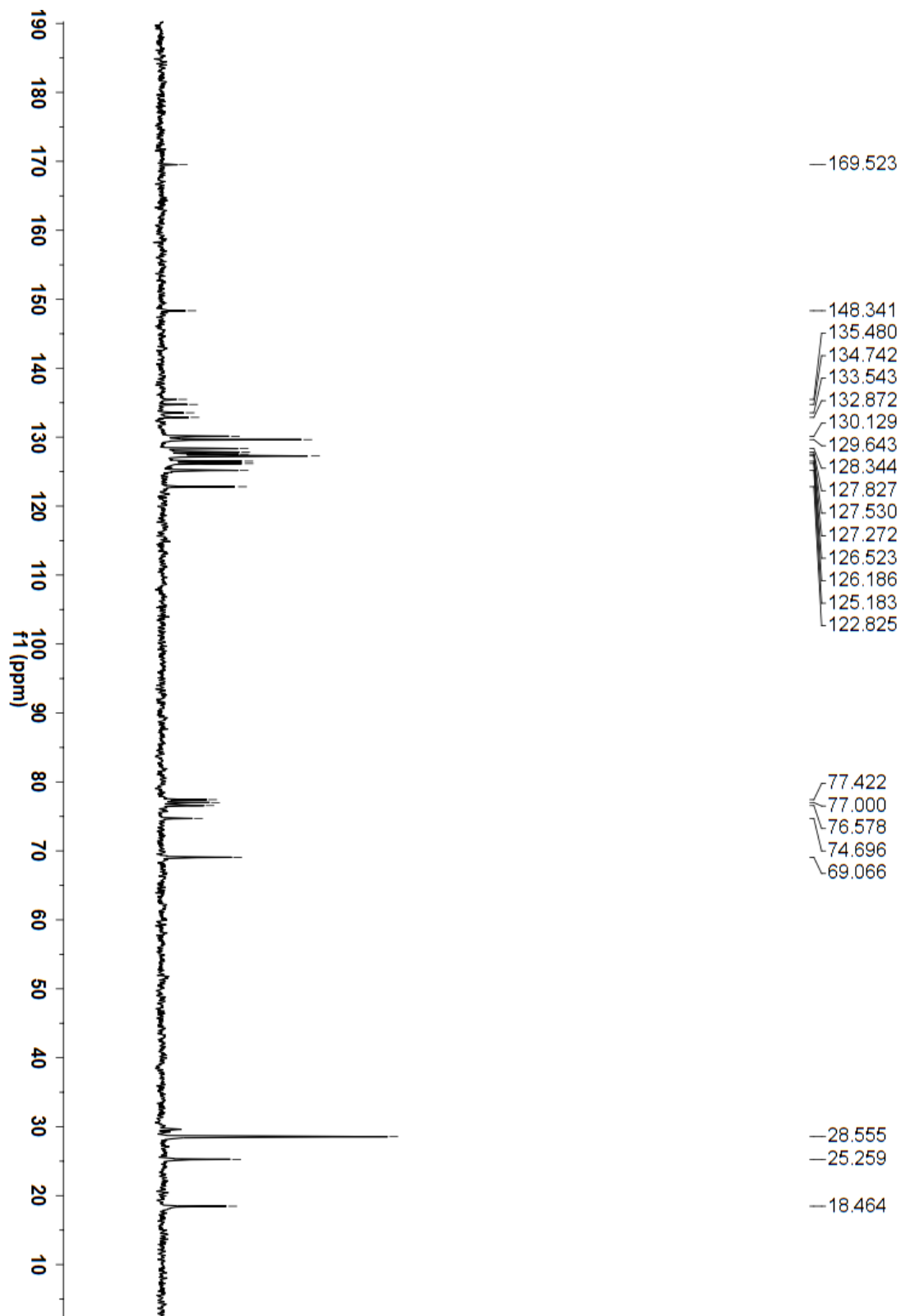
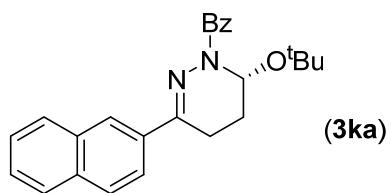


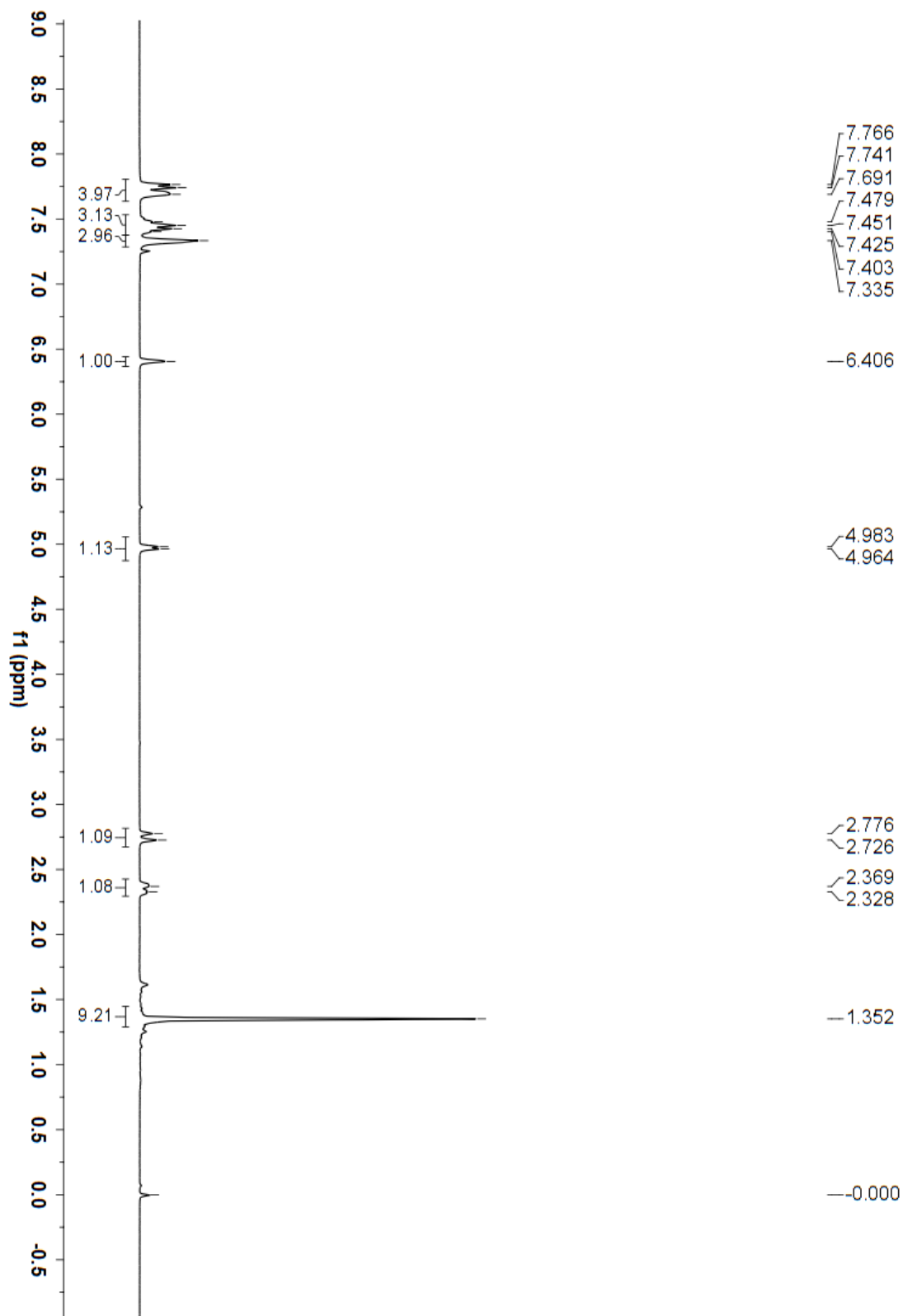
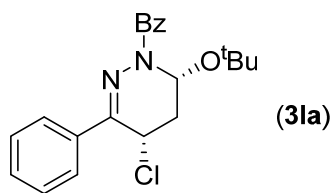




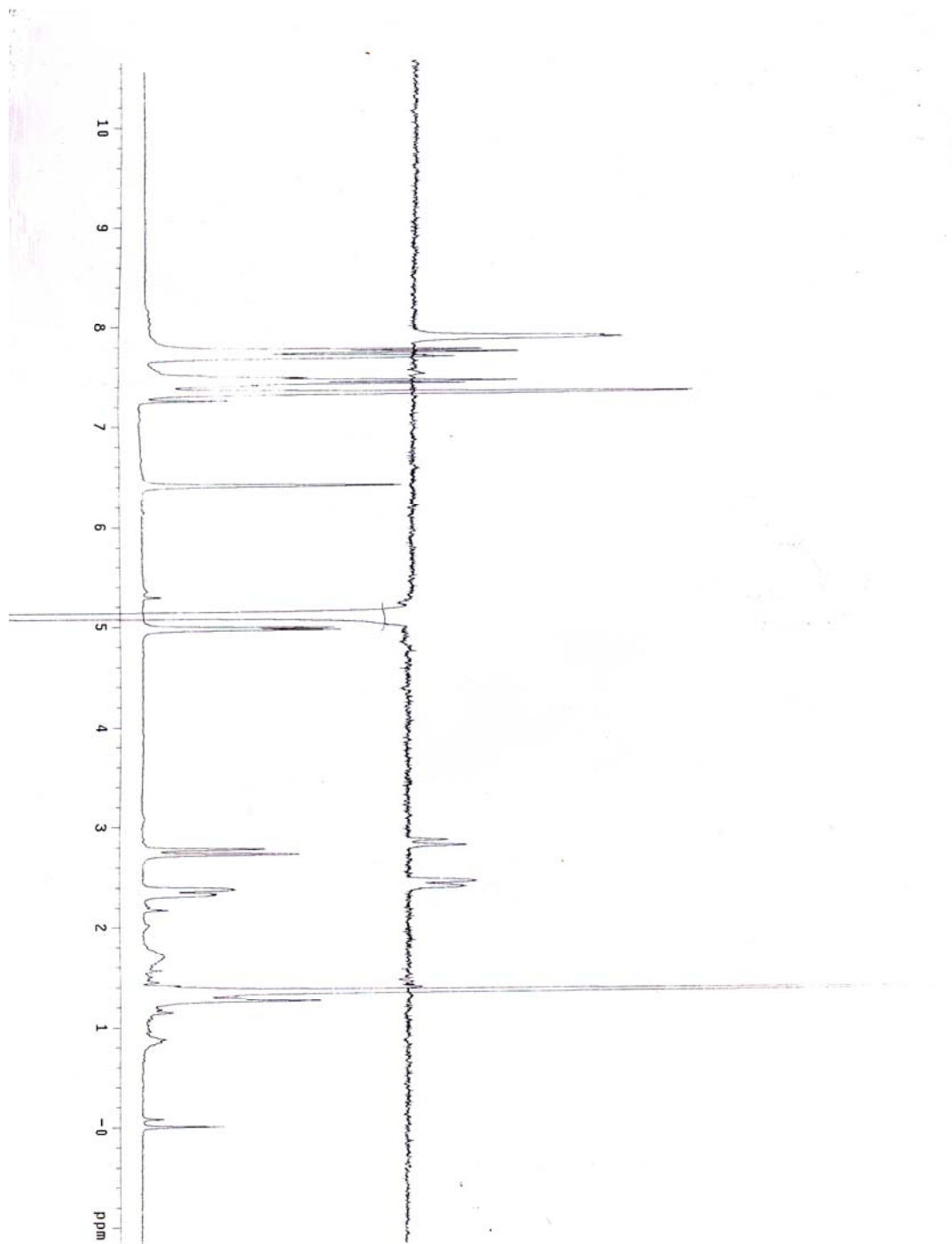
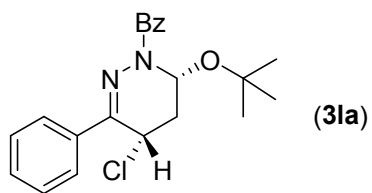


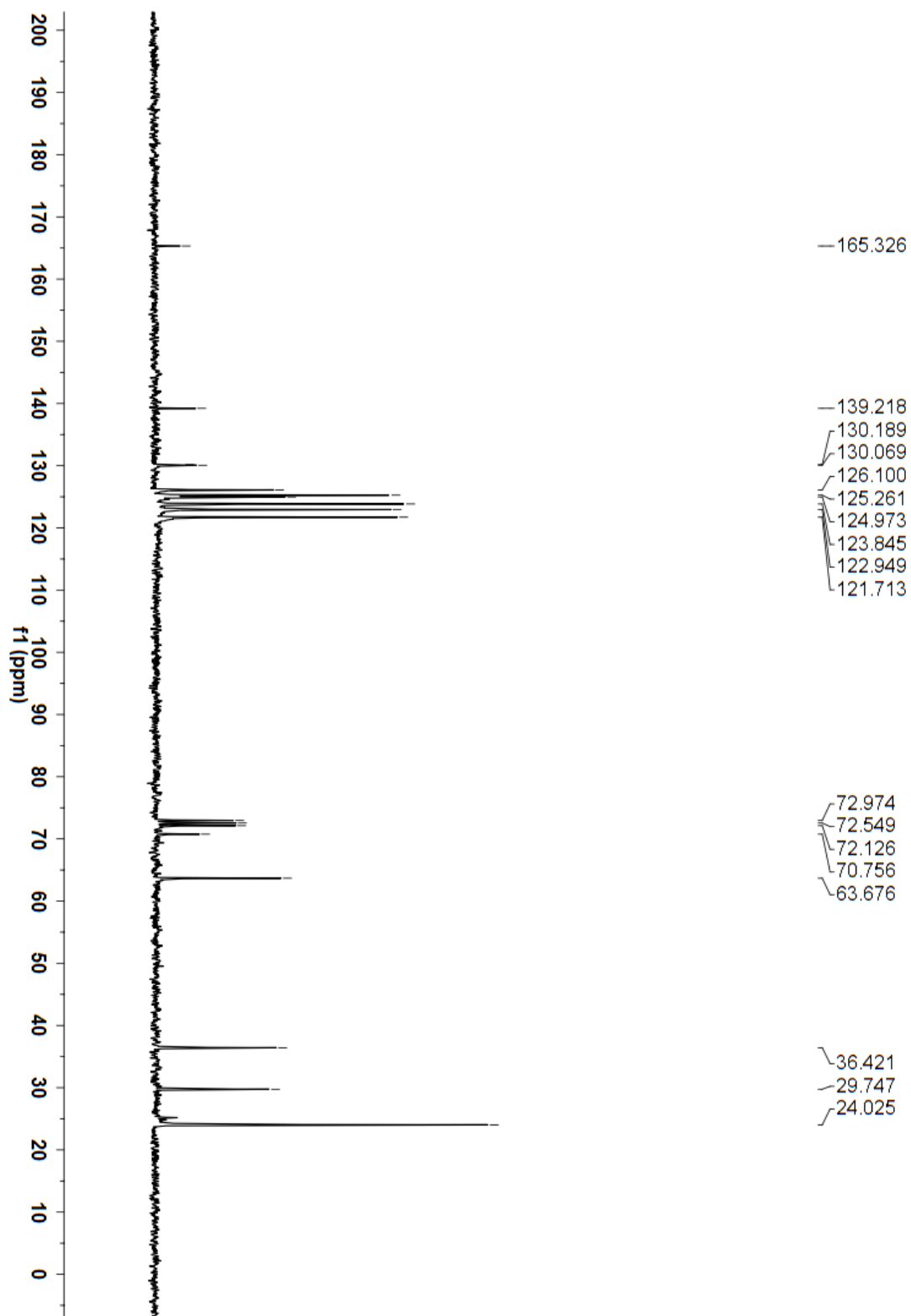
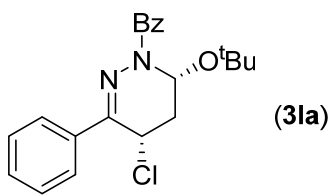


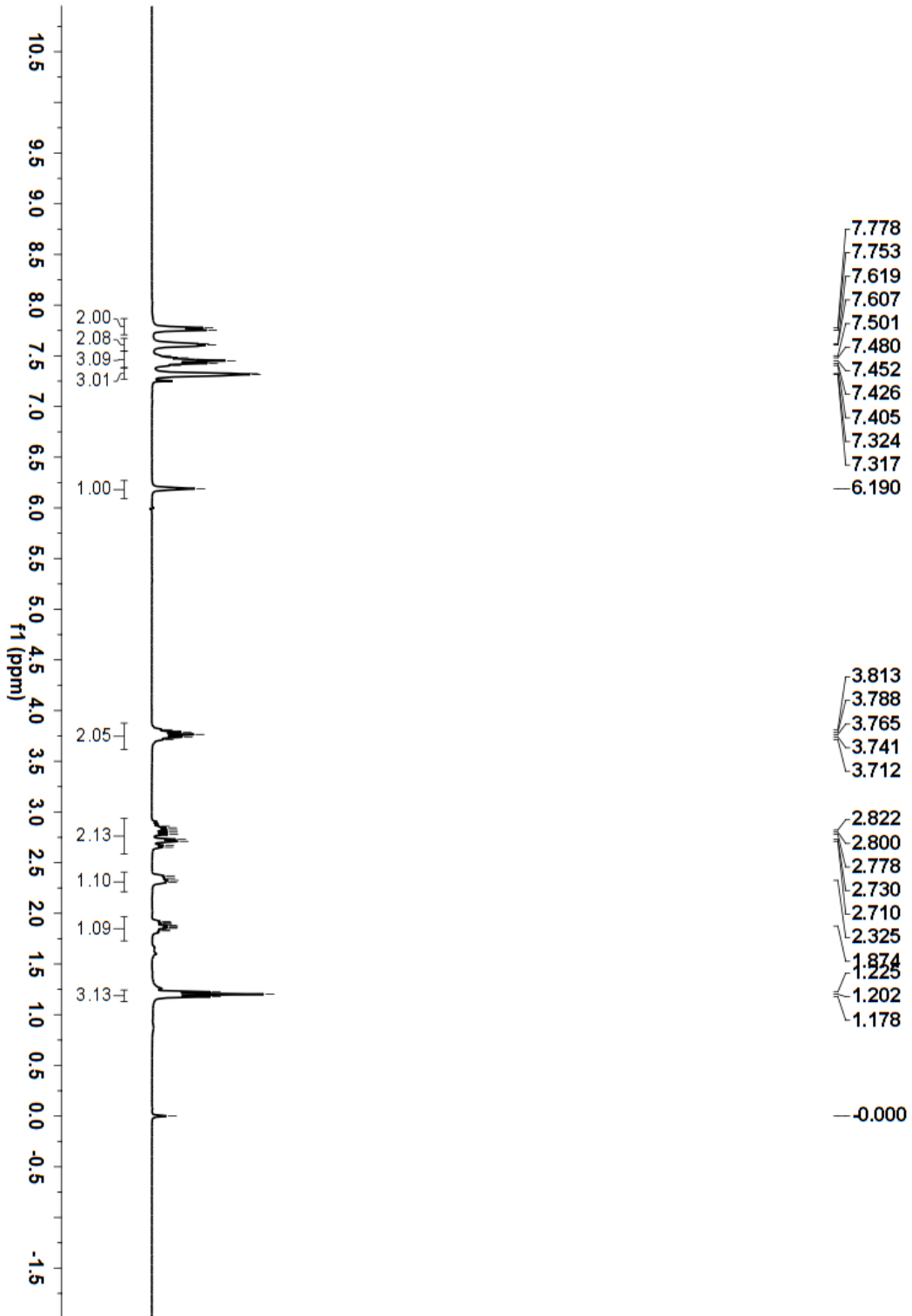
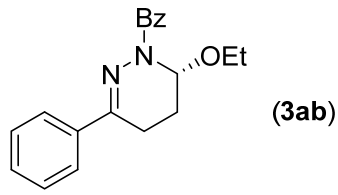


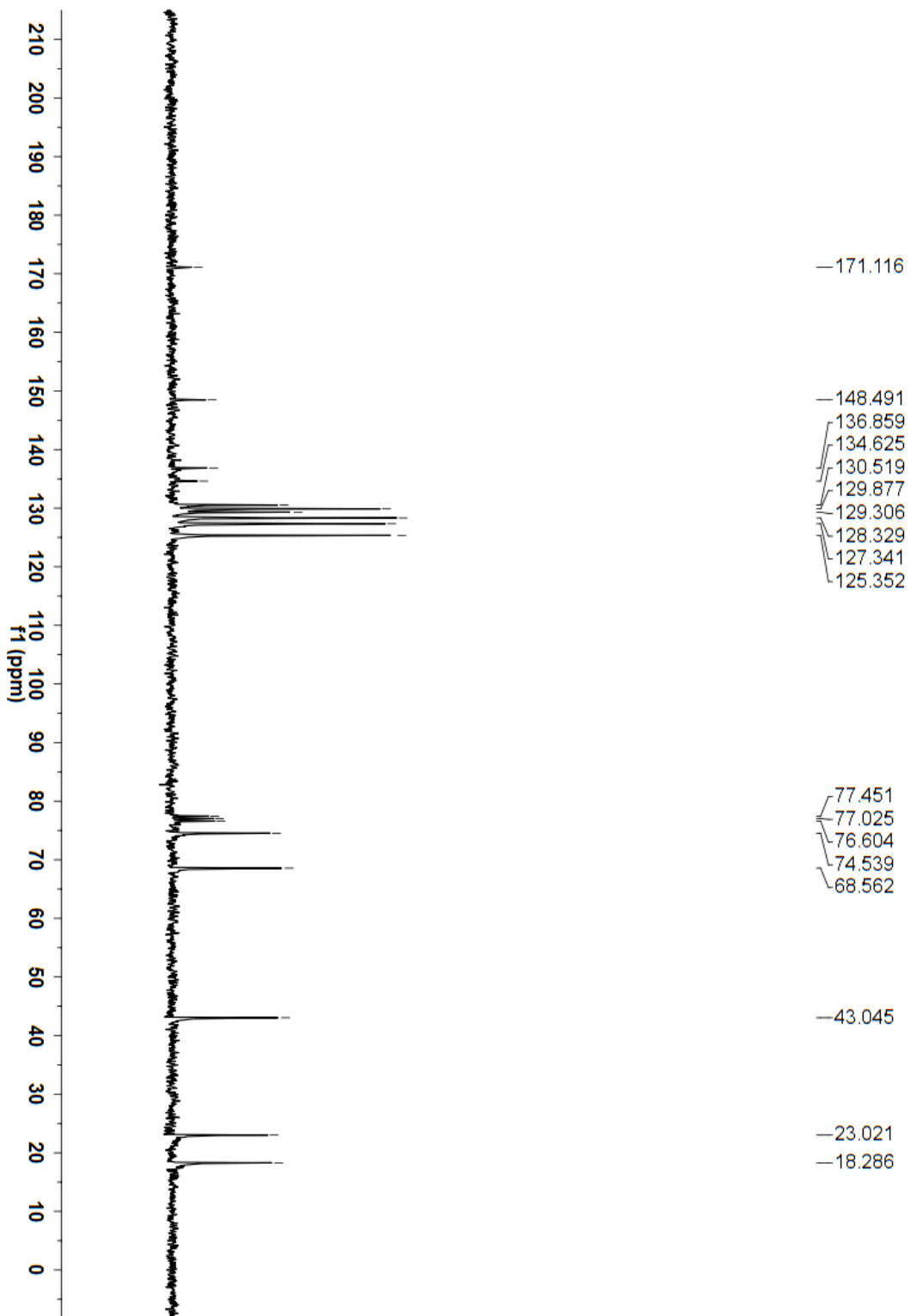
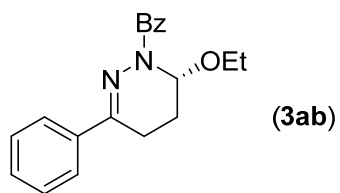


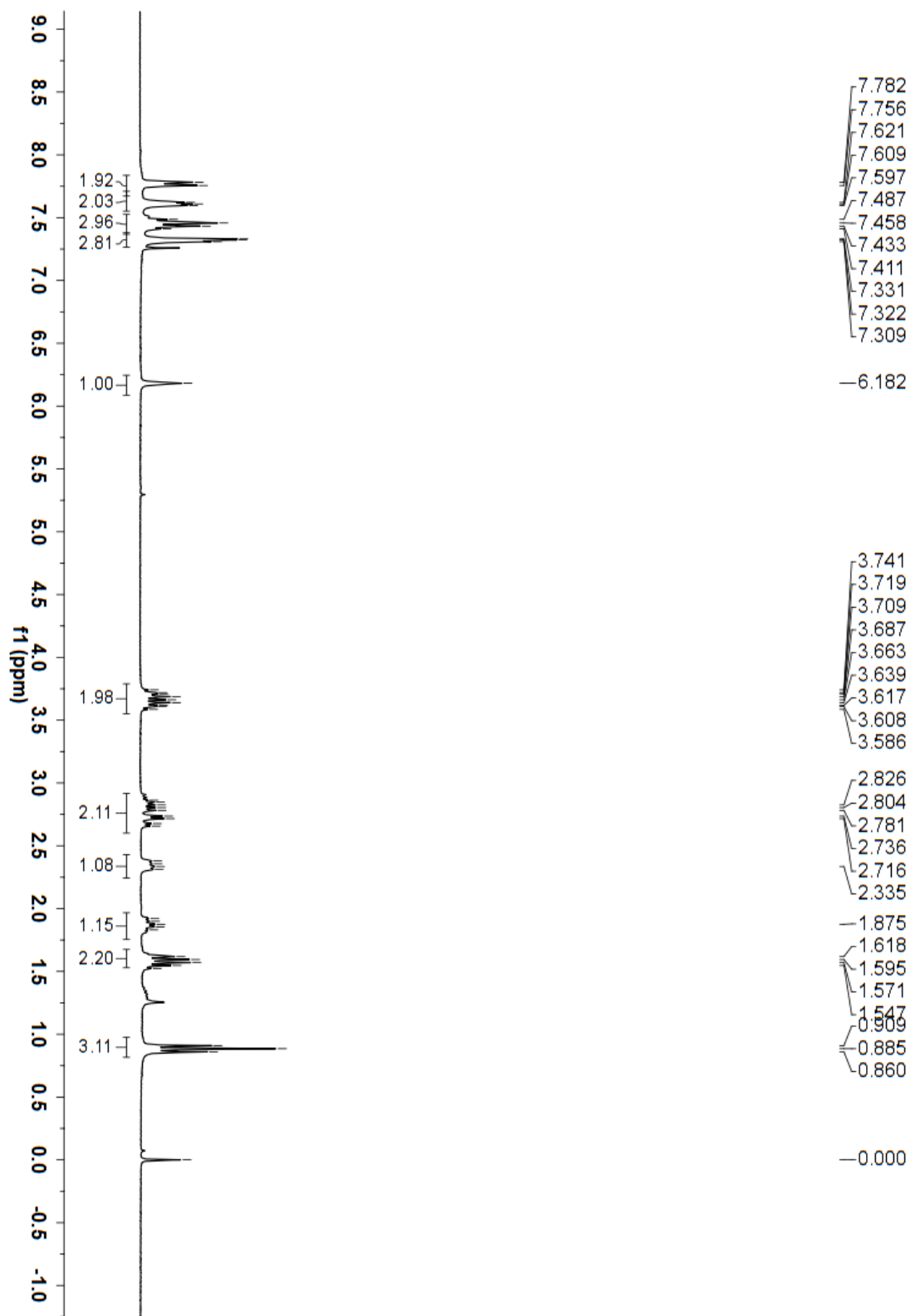
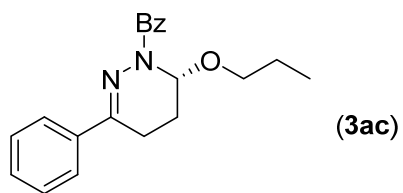
NOE spectrum of 3la

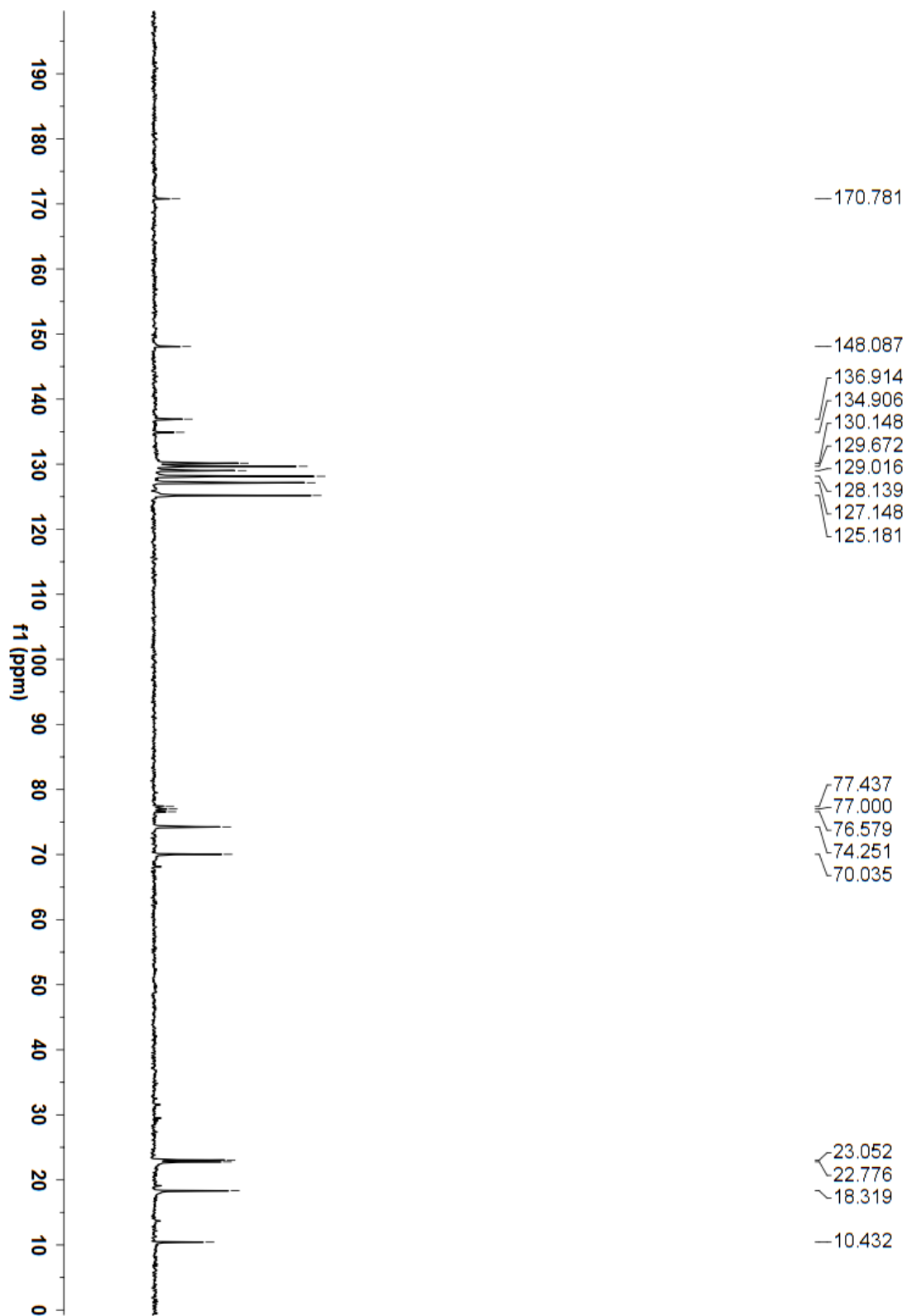
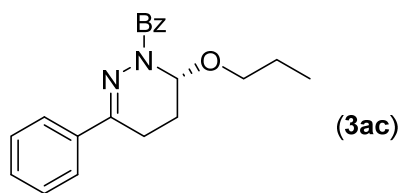


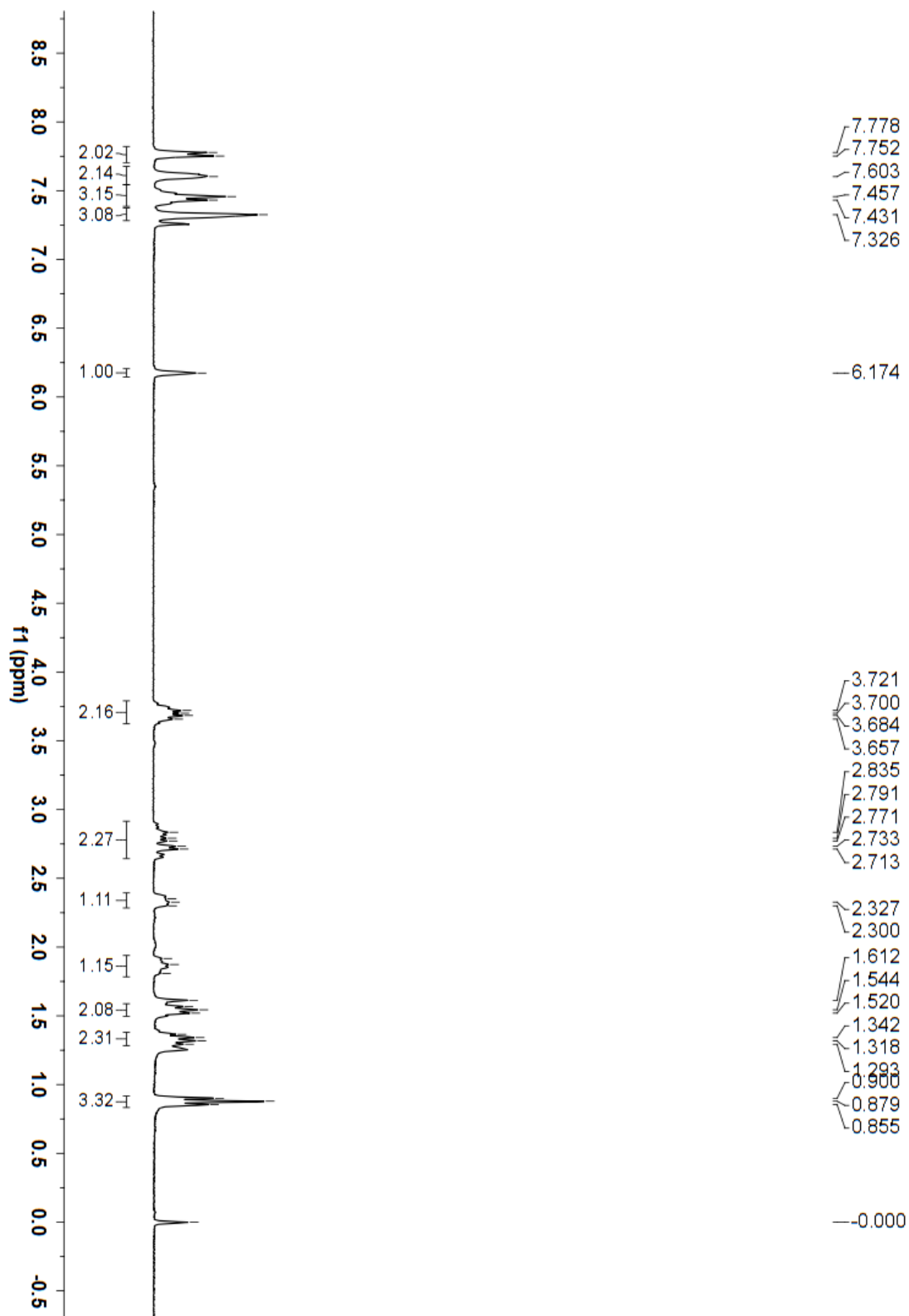
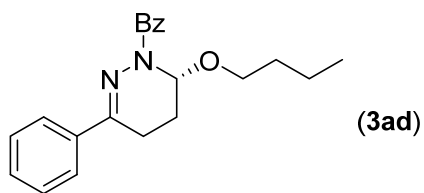


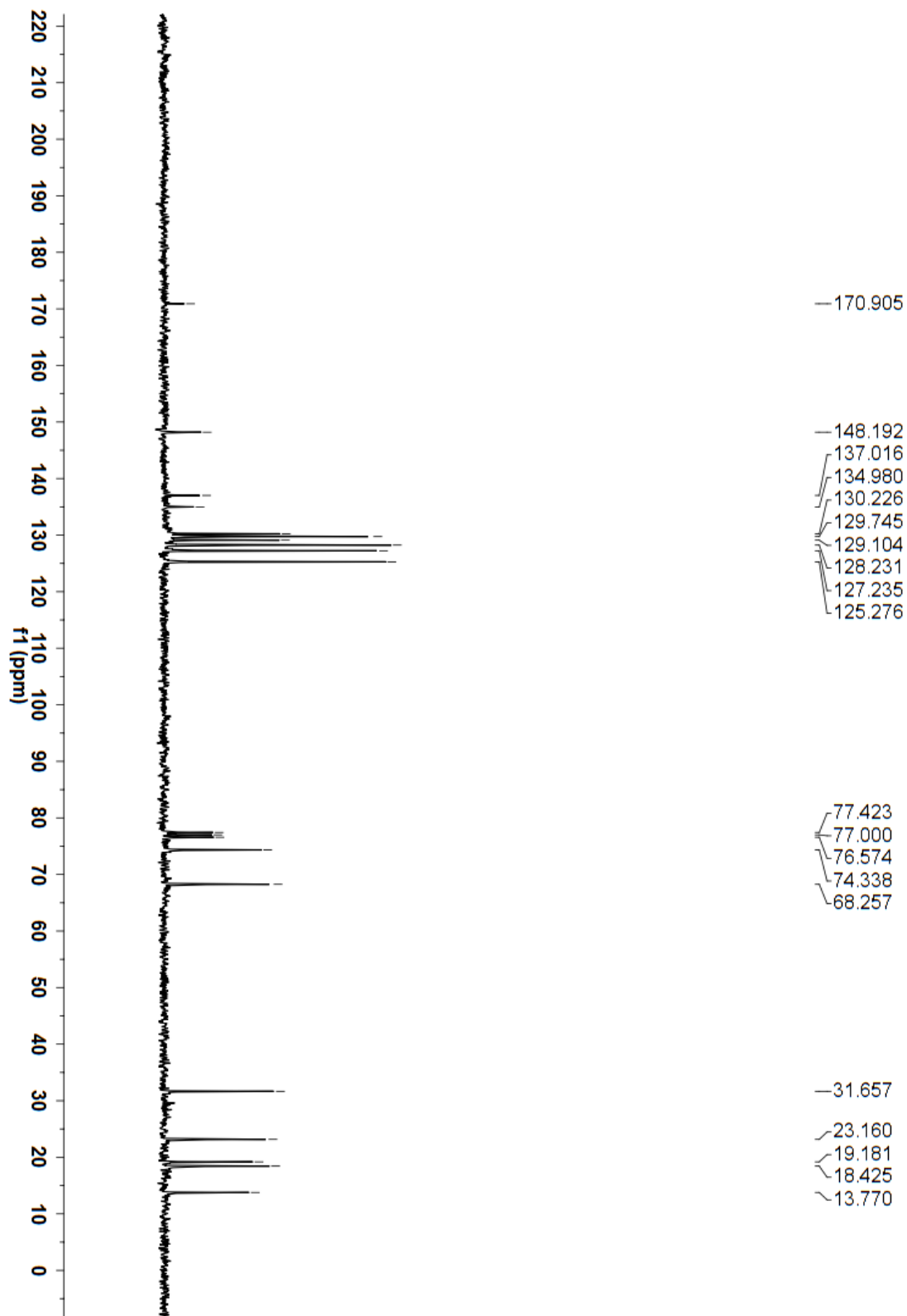
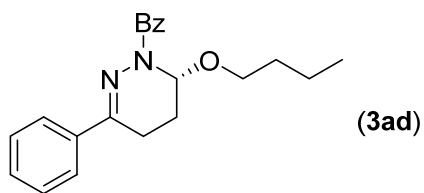


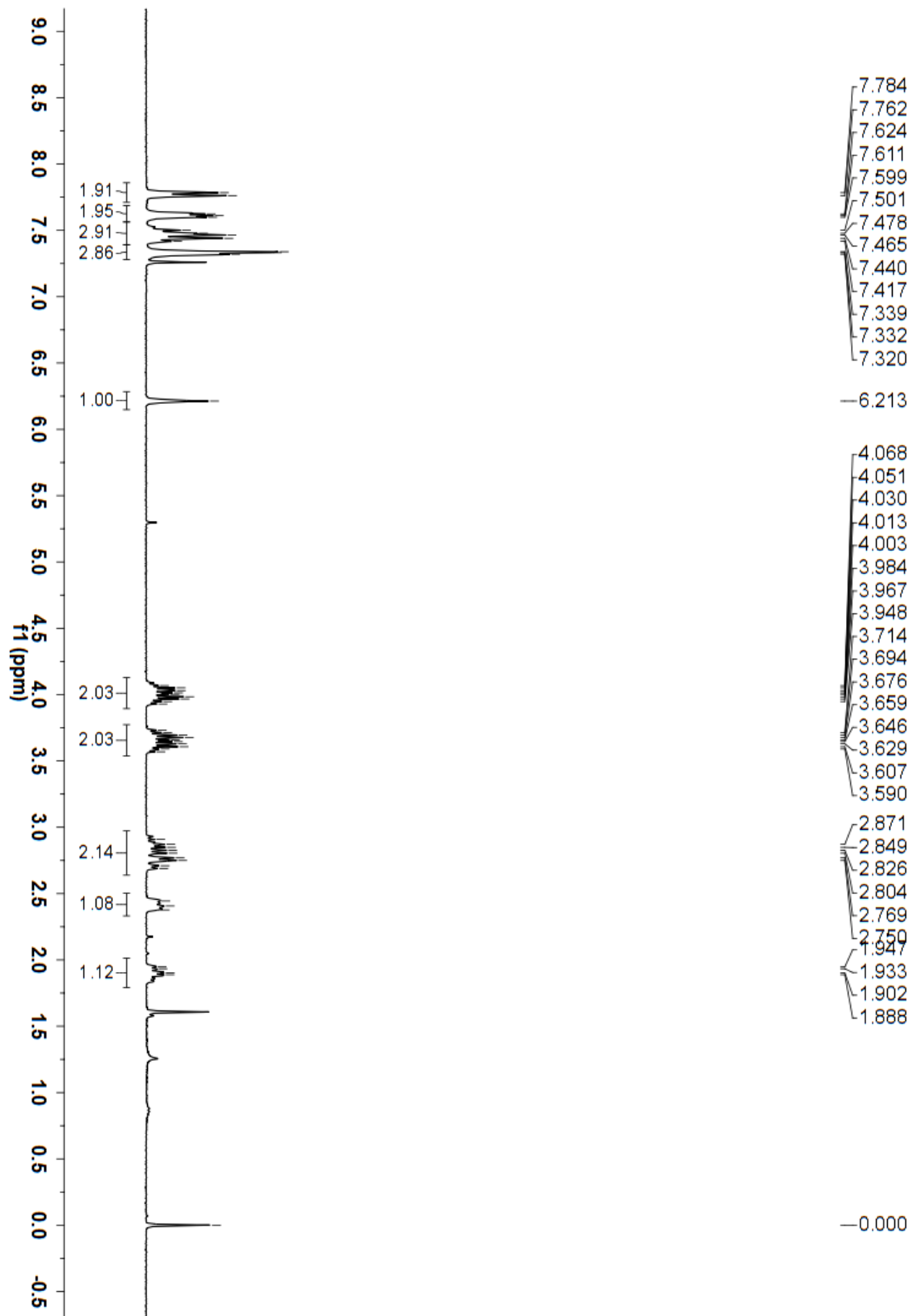
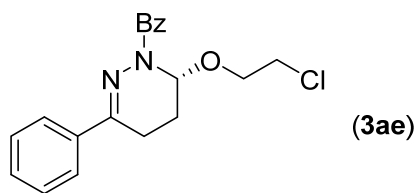


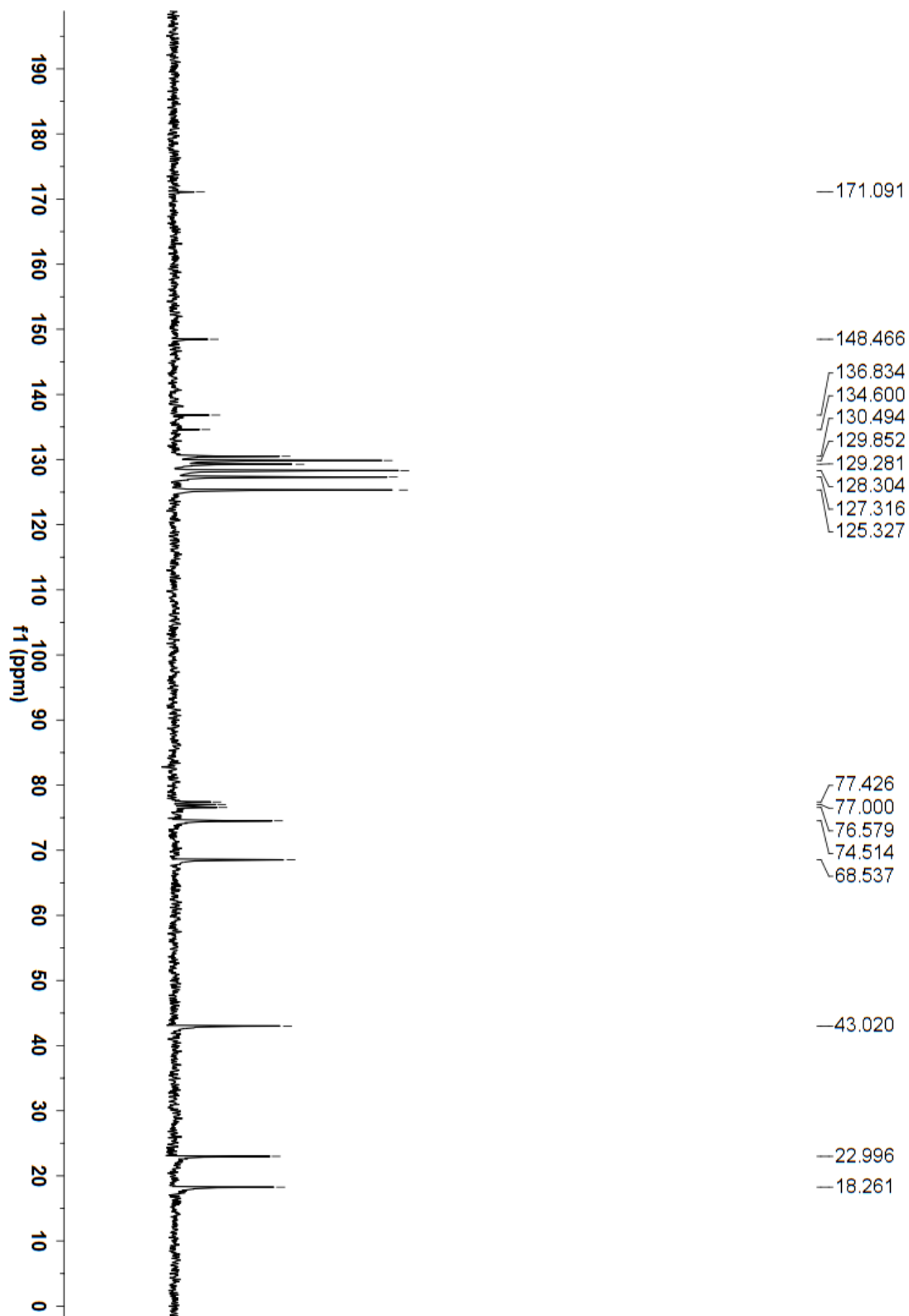
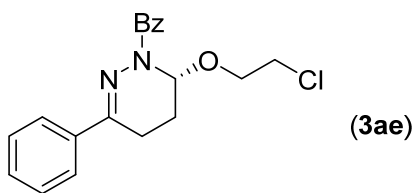


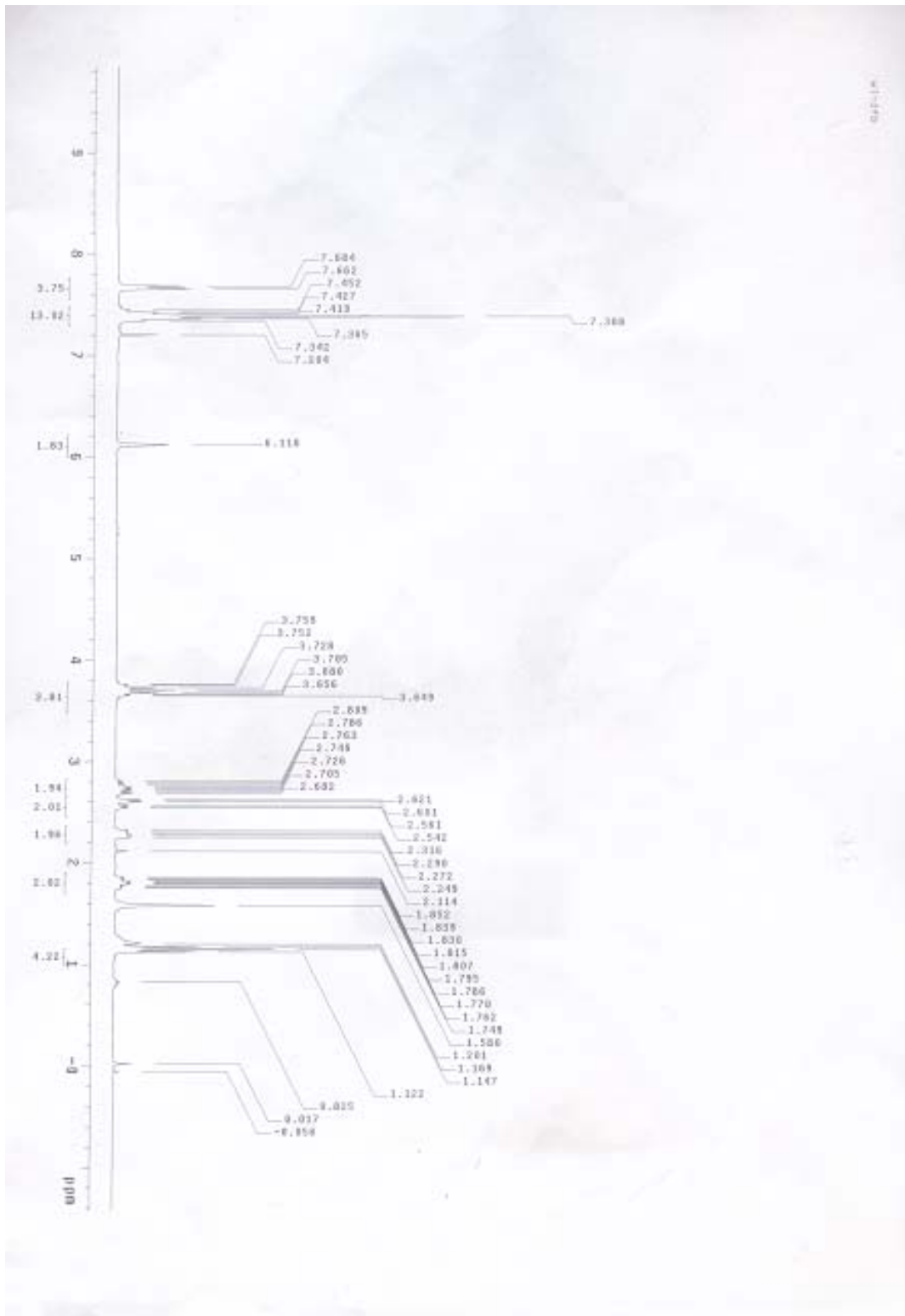
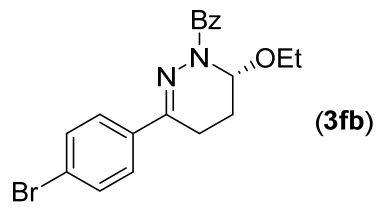


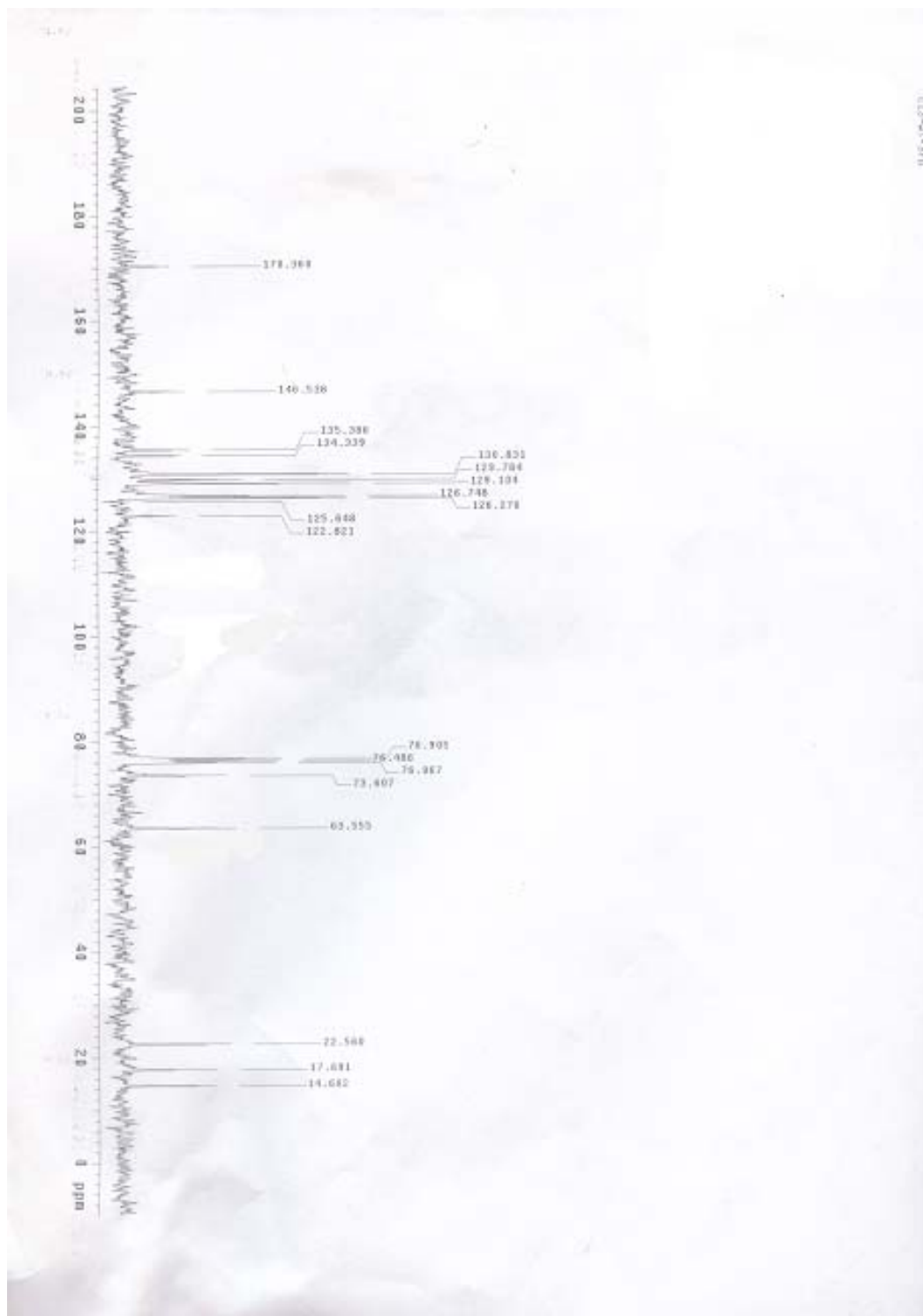
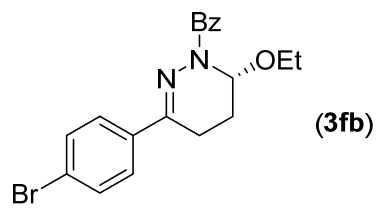


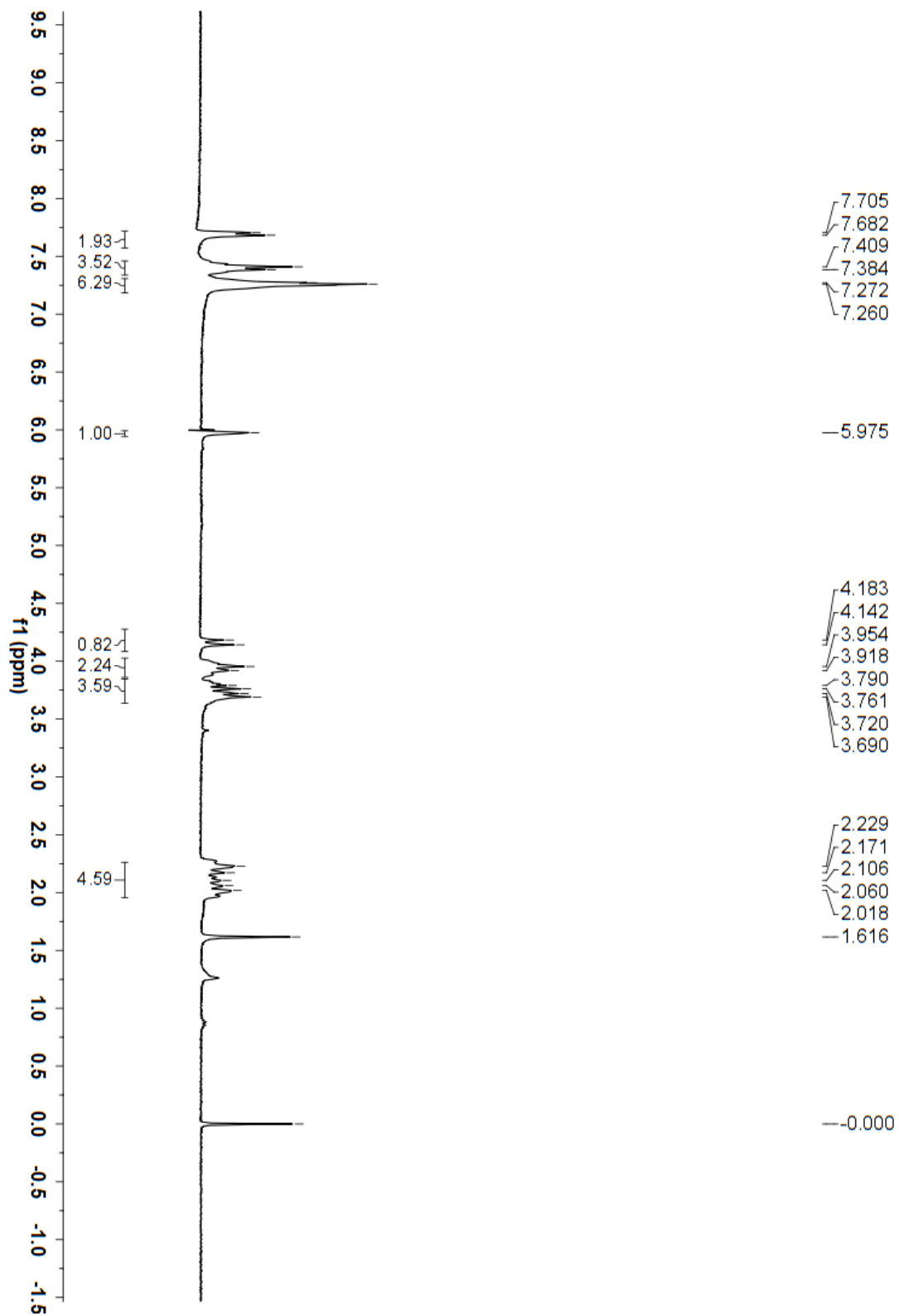
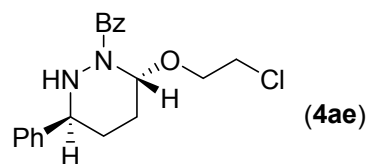




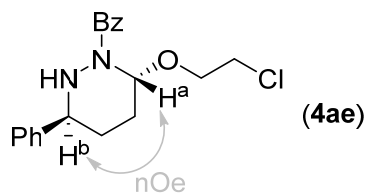




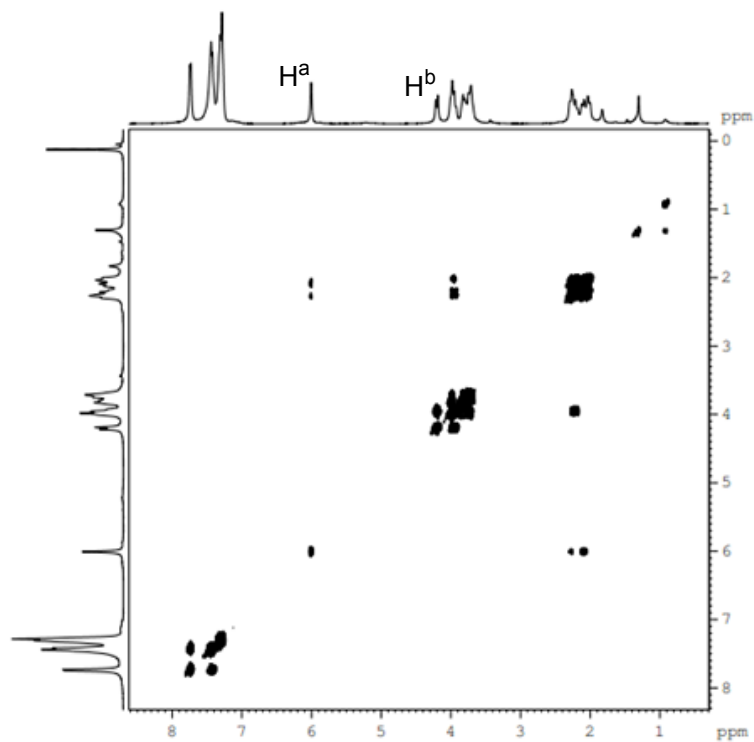




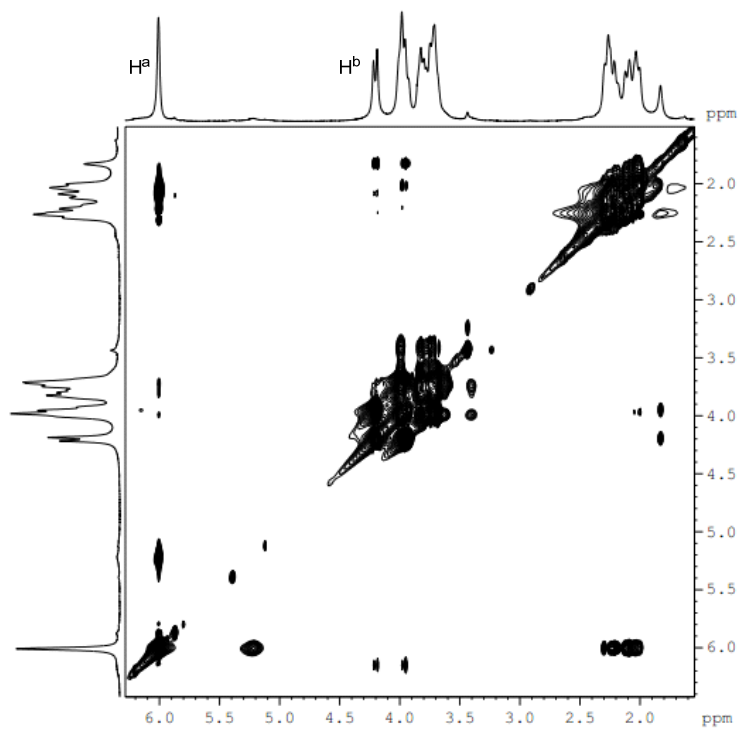
COSY and ROESY Spectra of 4ae

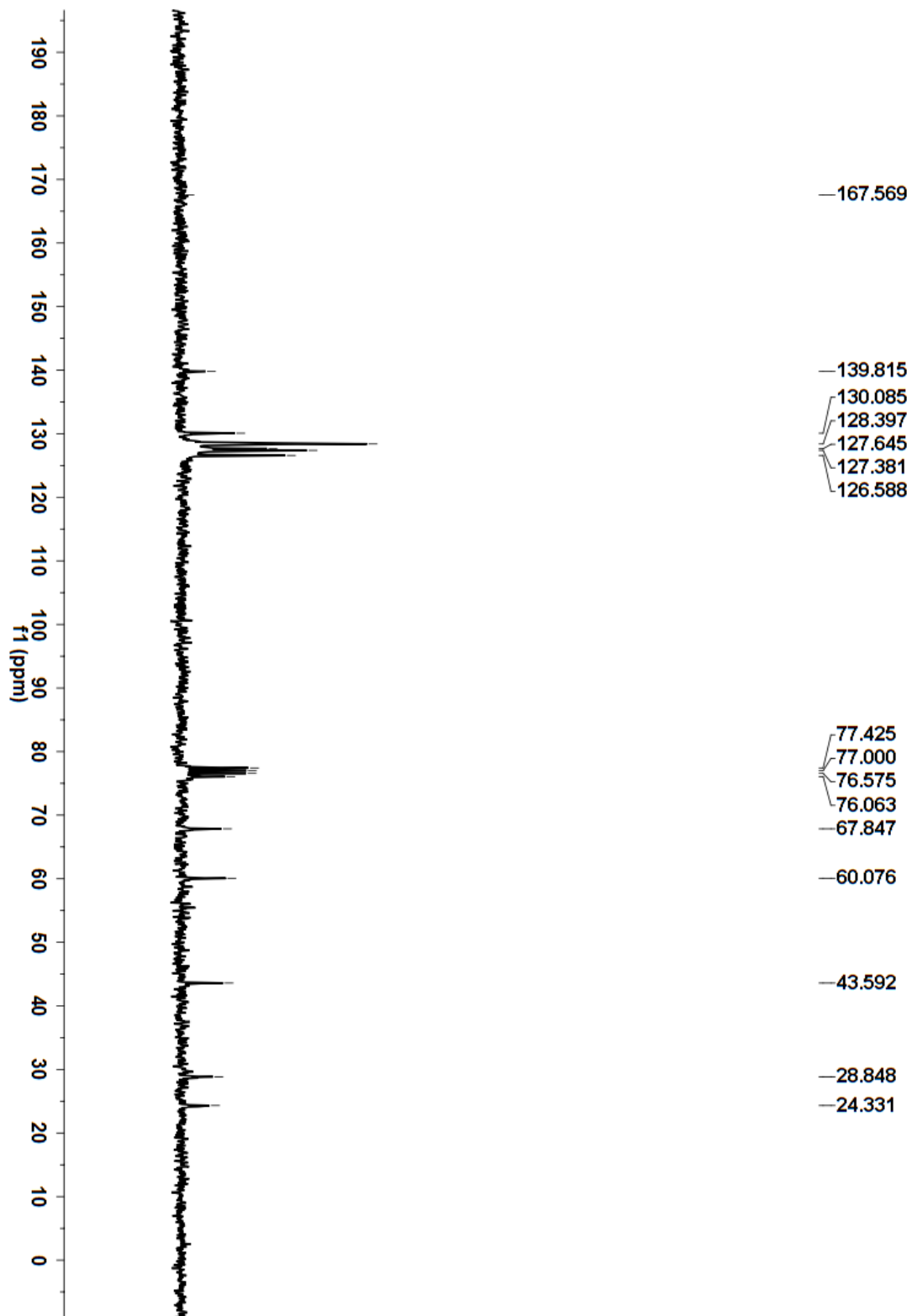
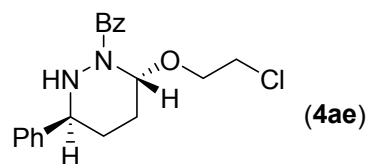


¹H-COSY

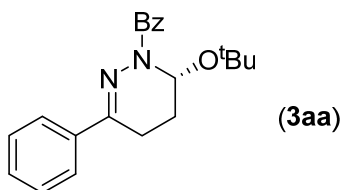


¹H-ROESY





VII. HPLC Chromatograms

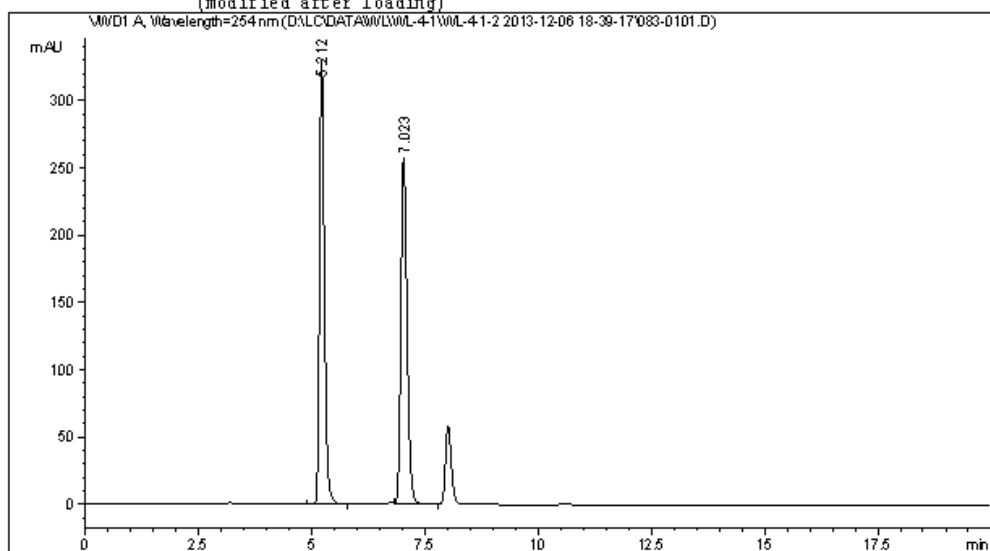


Data File D:\LC\DATA\WL\WL-4-1\WL-4-1-2 2013-12-06 18-39-17\083-0101.D
 Sample Name: WL-4-1A-2

```

=====
Acq. Operator   : WL                      Seq. Line :    1
Acq. Instrument : Instrument 1             Location  : Vial 83
Injection Date  : 12/6/2013 6:40:24 PM    Inj       :    1
                                           Inj Volume: 5 µl

Acq. Method     : D:\LC\DATA\WL\WL-4-1\WL-4-1-2 2013-12-06 18-39-17\IBH-5-95-1ML-254NM-
                  20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-1\WL-4-1-2 2013-12-06 18-39-17\083-0101.D\DA.M (IBH-5-
                  95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:08:21 AM by LJ
                  (modified after loading)
  
```



Area Percent Report

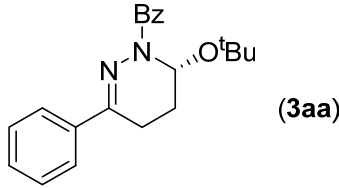
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VWD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]	Area %
1	5.212	VB	0.1157	2490.40967	50.3038	329.89075	50.3038
2	7.023	VB	0.1463	2460.32837	49.6962	257.67664	49.6962

Totals : 4950.73804 587.56738

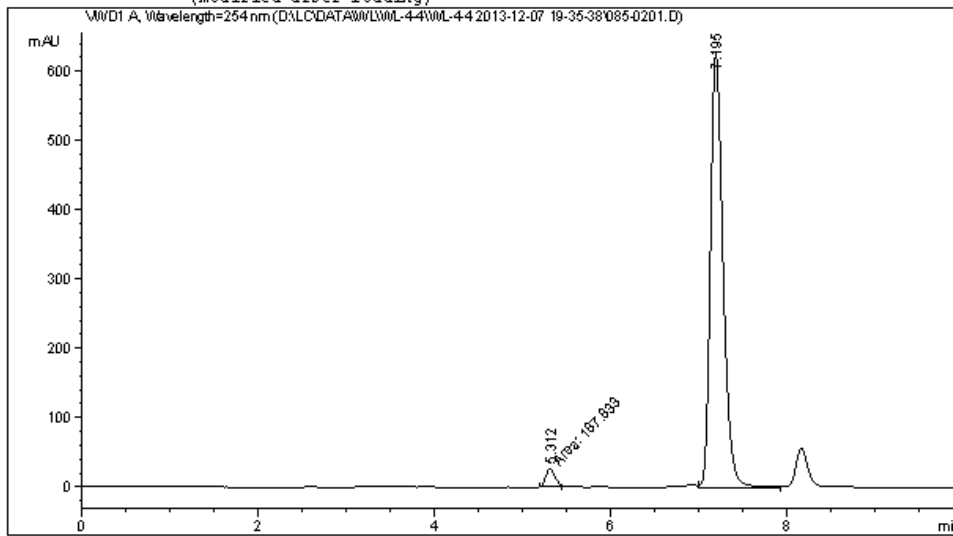


Data File D:\LC\DATA\WL\WL-4-4\WL-4-4 2013-12-07 19-35-38\085-0201.D
 Sample Name: WL-4-4

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1              Location  : Vial 85
Injection Date  : 12/7/2013 7:48:01 PM    Inj       :    1
                                           Inj Volume: 5 µl

Acq. Method     : D:\LC\DATA\WL\WL-4-4\WL-4-4 2013-12-07 19-35-38\IBH-5-95-IML-254MM-10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-4\WL-4-4 2013-12-07 19-35-38\085-0201.D\DA.M (IBH-5-95-
IML-254MM-10MIN.M)
Last changed    : 4/29/2014 11:20:32 AM by LJ
                 (modified after loading)
=====
  
```



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

```

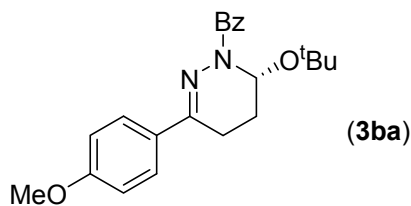
Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	5.312	MM	0.1204	187.83296	2.9383	25.99990
2	7.195	WV	0.1521	6204.70947	97.0617	625.74530

Totals : 6392.54243 651.74520

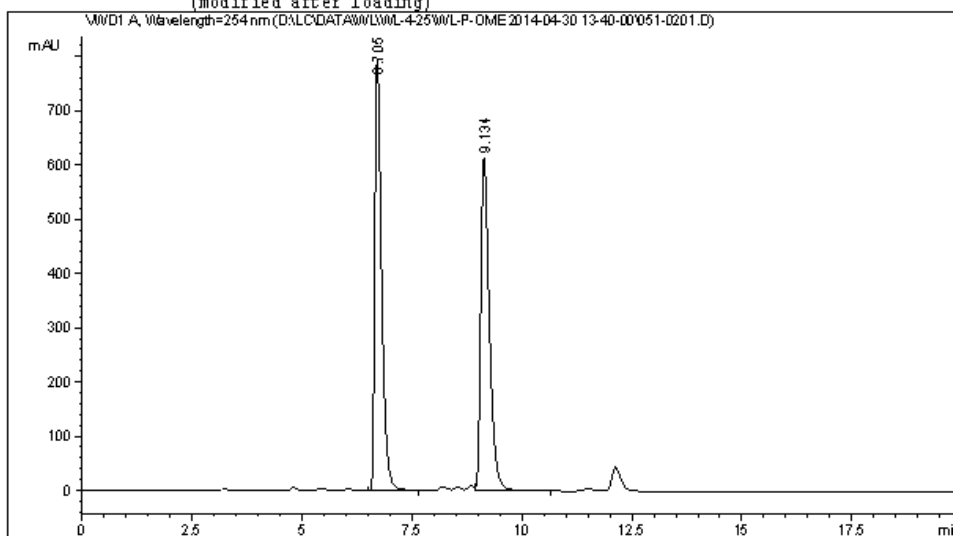
=====
 *** End of Report ***



Data File D:\LC\DATA\WL\WL-4-25\WL-P-OME 2014-04-30 13-40-00\051-0201.D
 Sample Name: WL-P-OME

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 51
Injection Date  : 4/30/2014 1:52:04 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-P-OME 2014-04-30 13-40-00\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-P-OME 2014-04-30 13-40-00\051-0201.D\DA.M (IBH-5-
                95-1ML-254NM-20MIN.M)
Last changed    : 4/30/2014 2:59:17 PM by WL
                (modified after loading)
=====
  
```



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

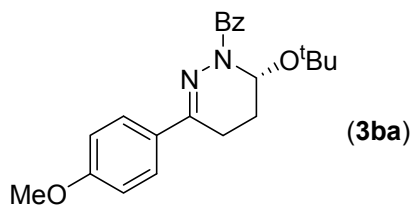
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.705	VB	0.1621	8593.24121	797.29364	50.4386
2	9.134	VB	0.2086	8443.77930	613.66840	49.5614

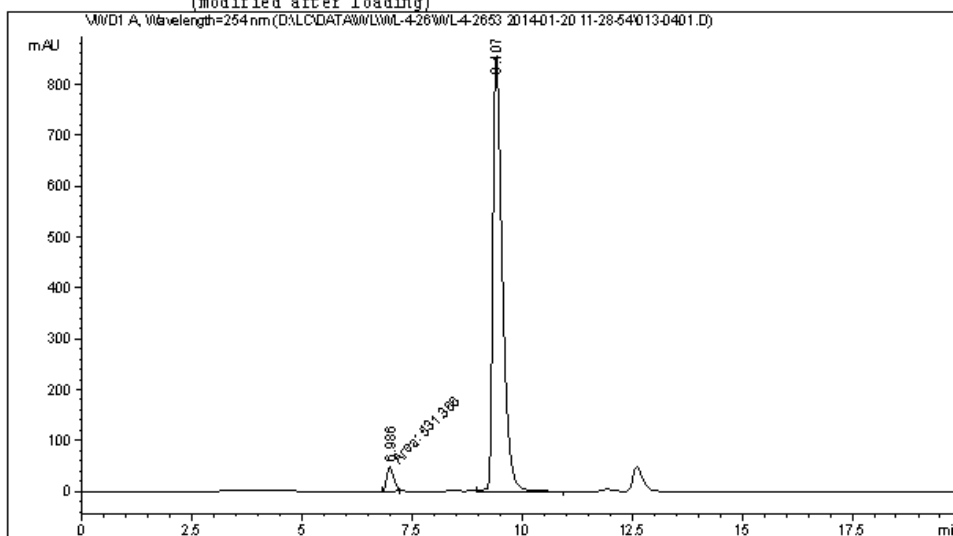
Totals : 1.70370e4 1410.96204



Data File D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\013-0401.D
 Sample Name: WL-4-26-P-OMe

```

=====
Acq. Operator   : WL                      Seq. Line :    4
Acq. Instrument : Instrument 1             Location  : Vial 13
Injection Date  : 1/20/2014 12:22:47 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\013-0401.D\DA.M (IBH-
                5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:06:56 AM by LJ
                (modified after loading)
=====
  
```



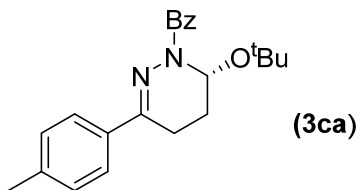
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

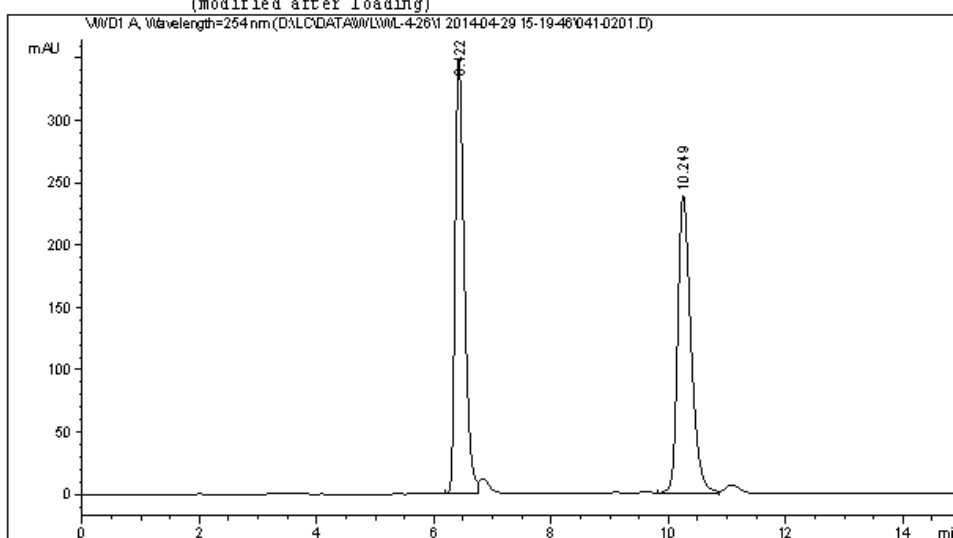
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.986	MM	0.1814	531.36639	48.82936	3.9724
2	9.407	VB	0.2286	1.28452e4	850.56592	96.0276
Totals :				1.33766e4	899.39528	



Data File D:\LC\DATA\WL\WL-4-26\1 2014-04-29 15-19-46\041-0201.D
 Sample Name: WL-P-Me

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 41
Injection Date  : 4/29/2014 3:31:52 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\1 2014-04-29 15-19-46\IBH-2-98-1ML-254NM-20MIN.M
Last changed    : 1/4/2014 11:34:16 AM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-26\1 2014-04-29 15-19-46\041-0201.D\DA.M (IBH-2-98-1ML-
254NM-20MIN.M)
Last changed    : 4/30/2014 2:55:31 PM by WL
                 (modified after loading)
  
```



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

```

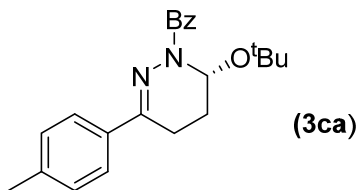
Sorted By       :      Signal
Multiplier      :      1.0000
Dilution        :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	6.422	BV	0.1684	3800.10181	50.1161	347.43890
2	10.249	WV	0.2413	3782.49390	49.8839	239.13953

Totals : 7582.59570 586.57843

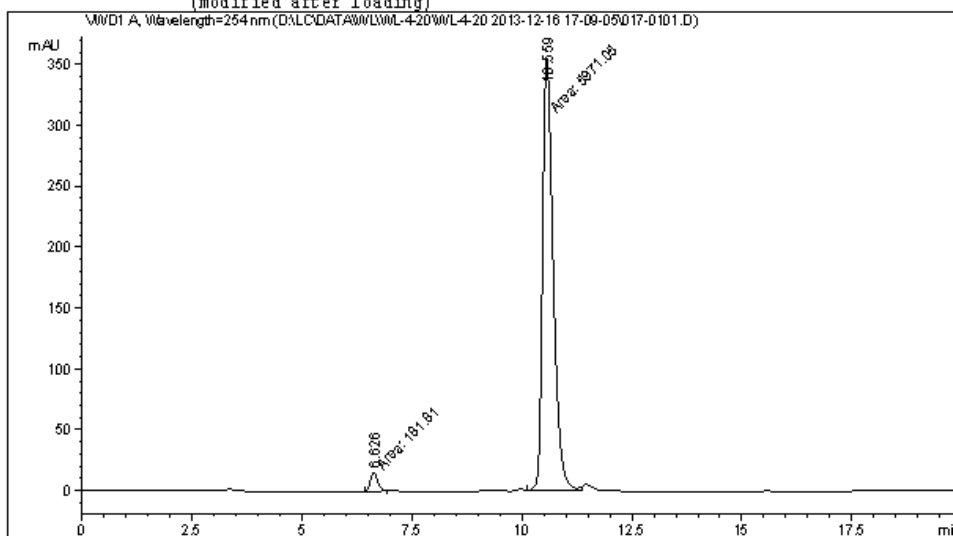
=====
 *** End of Report ***



Data File D:\LC\DATA\WL\WL-4-20\WL-4-20 2013-12-16 17-09-05\017-0101.D
 Sample Name: WL-4-20

```

=====
Acq. Operator   : WL                      Seq. Line :    1
Acq. Instrument : Instrument 1             Location  : Vial 17
Injection Date  : 12/16/2013 5:09:50 PM Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-20\WL-4-20 2013-12-16 17-09-05\IBH-2-98-1ML-254NM-
                  20MIN.M
Last changed    : 12/14/2013 6:08:52 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-20\WL-4-20 2013-12-16 17-09-05\017-0101.D\DA.M (IBH-2-
                  98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:23:36 AM by LJ
                  (modified after loading)
=====
  
```



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

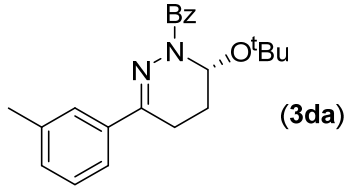
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.626	MM	0.1939	181.81018	15.62860	2.9549
2	10.559	MM	0.2805	5971.04932	354.79544	97.0451

Totals : 6152.85950 370.42404

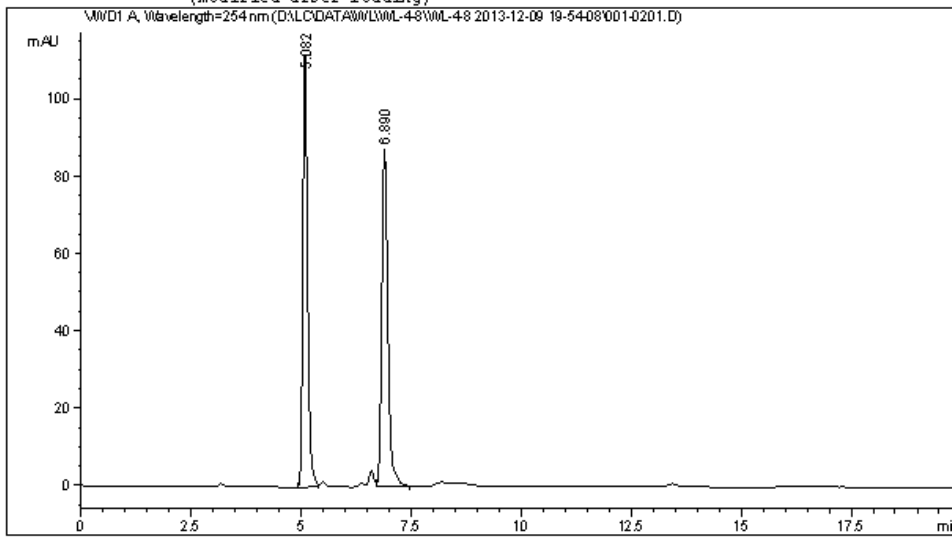


Data File D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 19-54-08\001-0201.D
 Sample Name: WL-4-8C

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 1
Injection Date  : 12/9/2013 8:06:06 PM    Inj       :    1
                                           Inj Volume: 5 µl

Acq. Method     : D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 19-54-08\IBH-5-95-IML-254NM-20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 19-54-08\001-0201.D\DA.M (IBH-5-95-
IML-254NM-20MIN.M)
Last changed    : 4/29/2014 12:29:29 PM by LJ
                 (modified after loading)
  
```



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

```

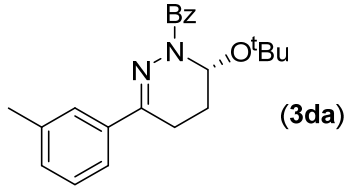
Sorted By       :      Signal
Multiplier      :      1.0000
Dilution        :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	5.082	BV	0.1157	845.01178	49.9824	111.98994
2	6.890	VB	0.1480	845.60645	50.0176	87.24610

Totals : 1690.61823 199.23605

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

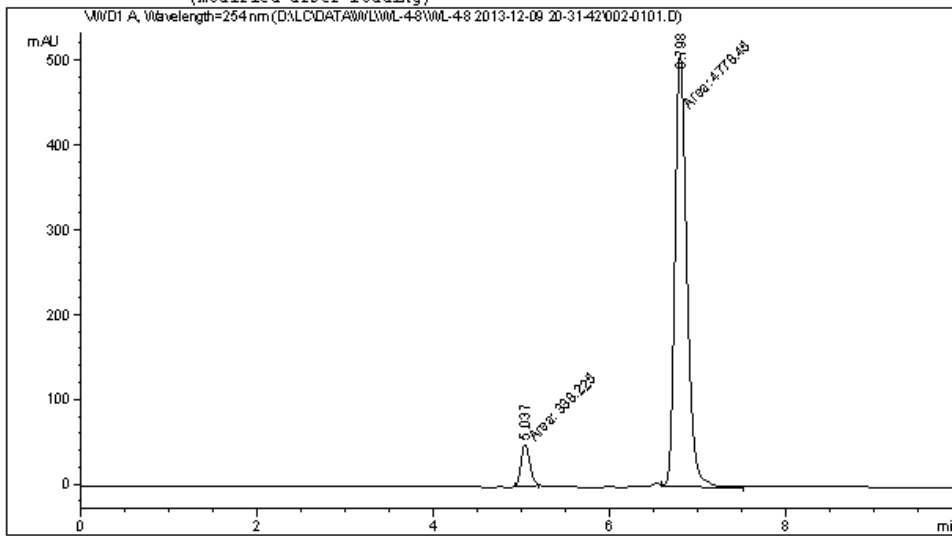


Data File D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 20-31-42\002-0101.D
 Sample Name: WL-4-9C

```

=====
Acq. Operator   : WL                      Seq. Line :    1
Acq. Instrument : Instrument 1             Location  : Vial 2
Injection Date  : 12/9/2013 8:32:56 PM    Inj       :    1
                                           Inj Volume: 5 µl

Acq. Method     : D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 20-31-42\IBH-5-95-IML-254MM-10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-8\WL-4-8 2013-12-09 20-31-42\002-0101.D\DA.M (IBH-5-95-
IML-254MM-10MIN.M)
Last changed    : 4/29/2014 12:31:29 PM by LJ
                 (modified after loading)
  
```



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

```

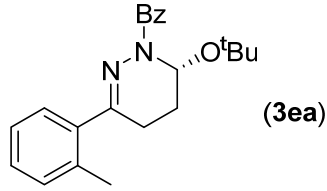
Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	5.037	MM	0.1153	338.22537	6.6103	48.90654
2	6.798	MM	0.1561	4778.44727	93.3897	510.15604

Totals : 5116.67264 559.06258

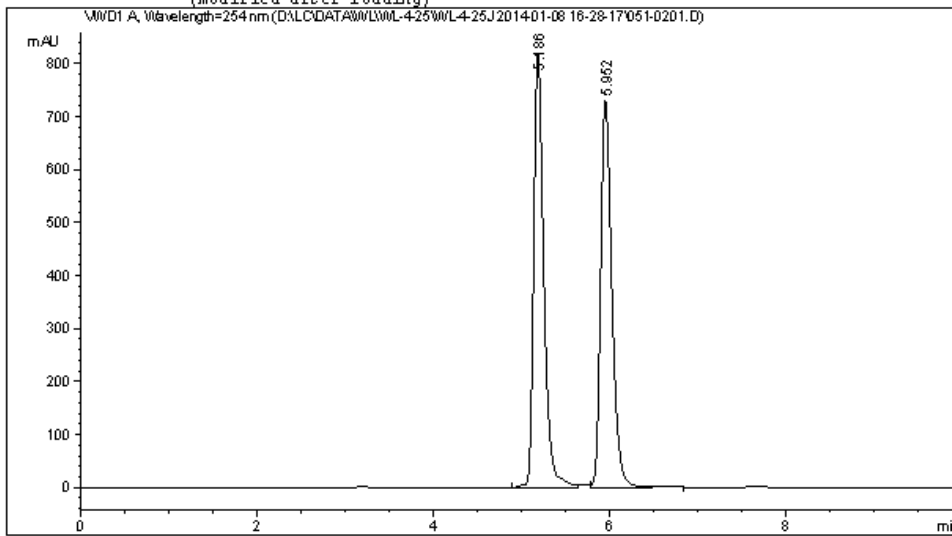
=====
 *** End of Report ***



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\051-0201.D
 Sample Name: WL-4-25J

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 51
Injection Date  : 1/8/2014 4:40:53 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\IBH-5-95-1ML-254NM-
                  10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\051-0201.D\DA.M (IBH-5-
                  95-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 10:53:19 AM by LJ
                  (modified after loading)
=====
  
```



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

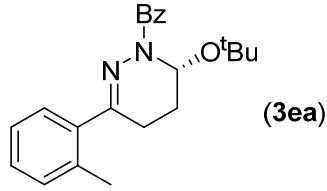
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.186	BV	0.1208	6528.46240	817.94946	50.3314
2	5.952	VB	0.1350	6442.49365	729.65796	49.6686

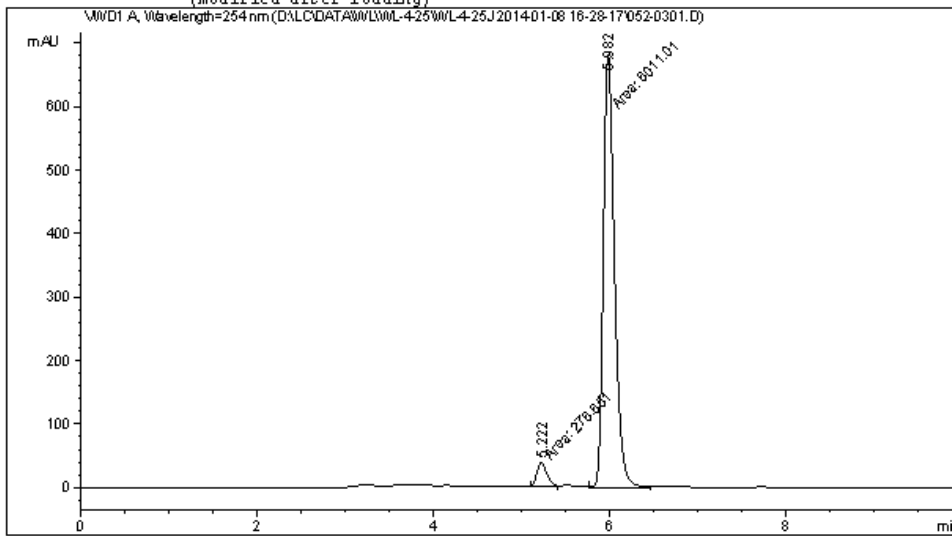
Totals : 1.29710e4 1547.60742



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\052-0301.D
 Sample Name: WL-4-26I

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 52
Injection Date  : 1/8/2014 4:52:09 PM     Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\IBH-5-95-1ML-254NM-
                  10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25J 2014-01-08 16-28-17\052-0301.D\DA.M (IBH-5-
                  95-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 10:55:04 AM by LJ
                  (modified after loading)
=====
  
```



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

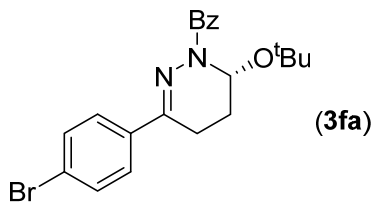
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.222	MM	0.1267	276.65070	36.40430	4.3999
2	5.982	MM	0.1467	6011.00830	683.10138	95.6001

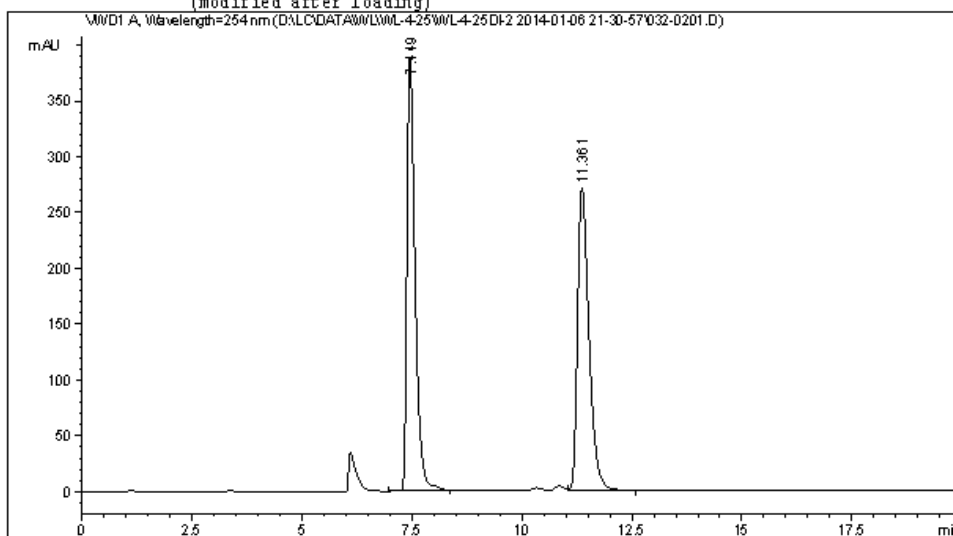
Totals : 6287.65900 719.50568



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25DI-2 2014-01-06 21-30-57\032-0201.D
 Sample Name: WL-4-25D

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 32
Injection Date  : 1/6/2014 9:42:52 PM     Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25DI-2 2014-01-06 21-30-57\IBH-2-98-1ML-254NM-
                20MIN.M
Last changed    : 1/4/2014 11:34:16 AM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25DI-2 2014-01-06 21-30-57\032-0201.D\DA.M (
                IBH-2-98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:52:14 AM by LJ
                (modified after loading)
=====
  
```



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

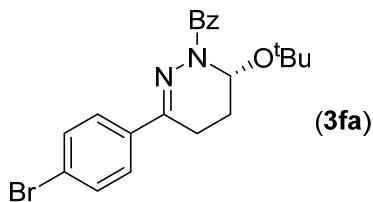
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.449	BB	0.1956	4998.01807	387.46234	50.3587
2	11.361	VB	0.2773	4926.82666	271.35916	49.6413

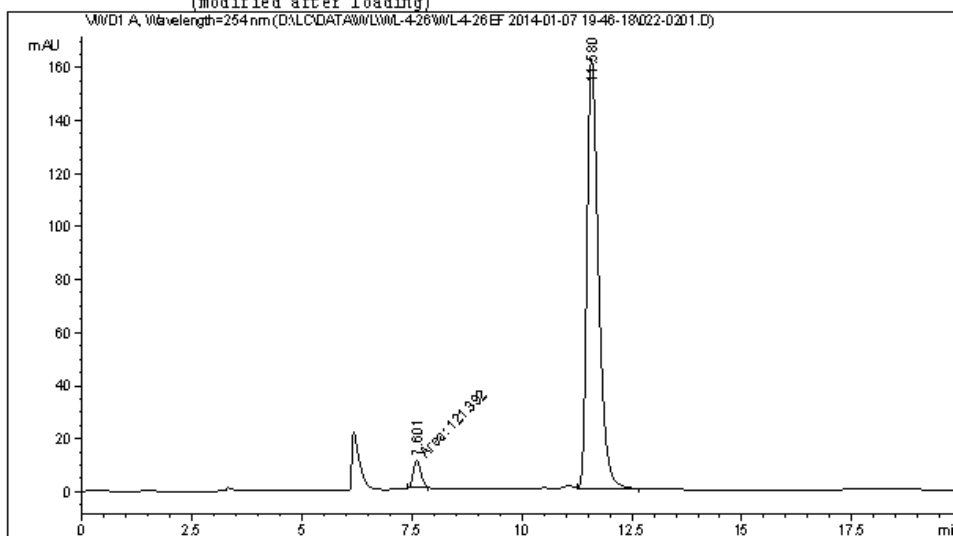
Totals : 9924.84473 658.82150



Data File D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\022-0201.D
 Sample Name: WL-4-26E

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 22
Injection Date  : 1/7/2014 7:58:08 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\IBH-2-98-1ML-254NM-
20MIN.M
Last changed    : 1/4/2014 11:34:16 AM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\022-0201.D\DA.M (IBH-
2-98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:10:48 AM by LJ
(modified after loading)
=====
  
```



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

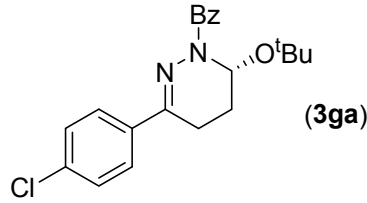
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.601	MM	0.1970	121.39237	10.27163	3.9337
2	11.580	VB	0.2769	2964.54126	162.50475	96.0663

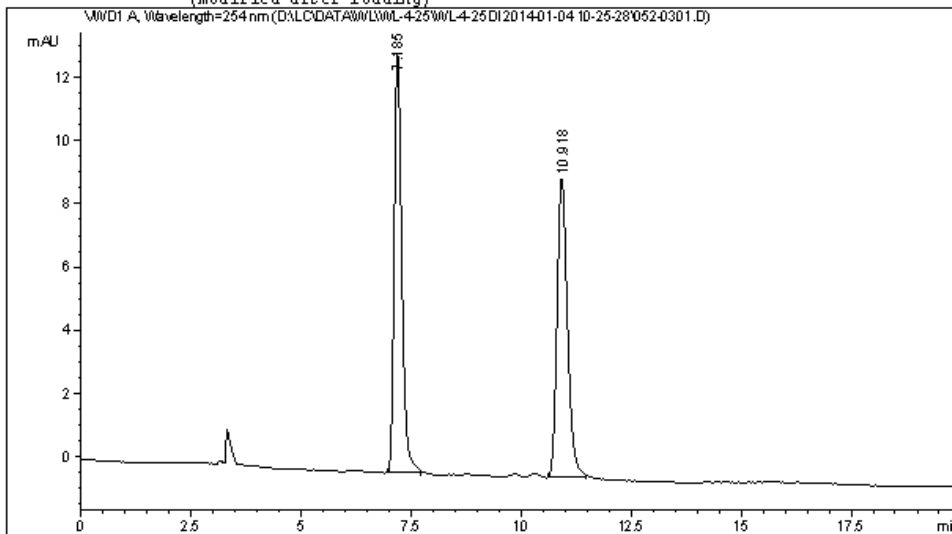
Totals : 3085.93363 172.77638



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25DI 2014-01-04 10-25-28\052-0301.D
 Sample Name: WL-4-25I

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 52
Injection Date  : 1/4/2014 10:58:30 AM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25DI 2014-01-04 10-25-28\IBH-2-98-1ML-254NM-
                20MIN.M
Last changed    : 12/14/2013 6:08:52 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25DI 2014-01-04 10-25-28\052-0301.D\DA.M (IBH-
                2-98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:50:48 AM by LJ
                (modified after loading)
=====
  
```



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

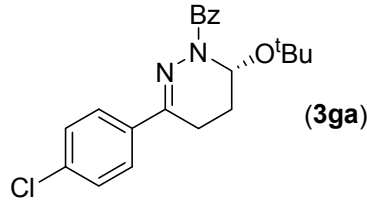
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.185	BB	0.1844	160.06186	13.26579	50.8135
2	10.918	BB	0.2538	154.93663	9.45452	49.1865

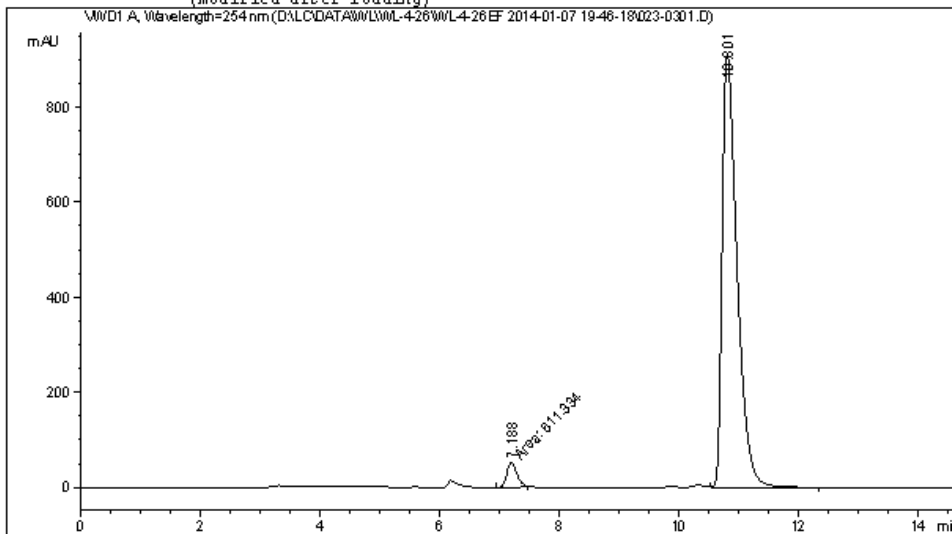
Totals : 314.99849 22.72031



Data File D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\023-0301.D
 Sample Name: WL-4-26F

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 23
Injection Date  : 1/7/2014 8:19:09 PM     Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\IBH-2-98-1ML-254NM-
                20MIN.M
Last changed    : 1/4/2014 11:34:16 AM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-26\WL-4-26EF 2014-01-07 19-46-18\023-0301.D\DA.M (IBH-
                2-98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:12:09 AM by LJ
                (modified after loading)
=====
  
```



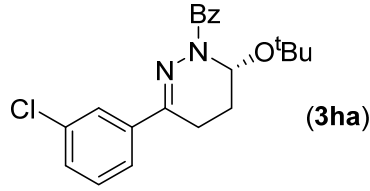
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

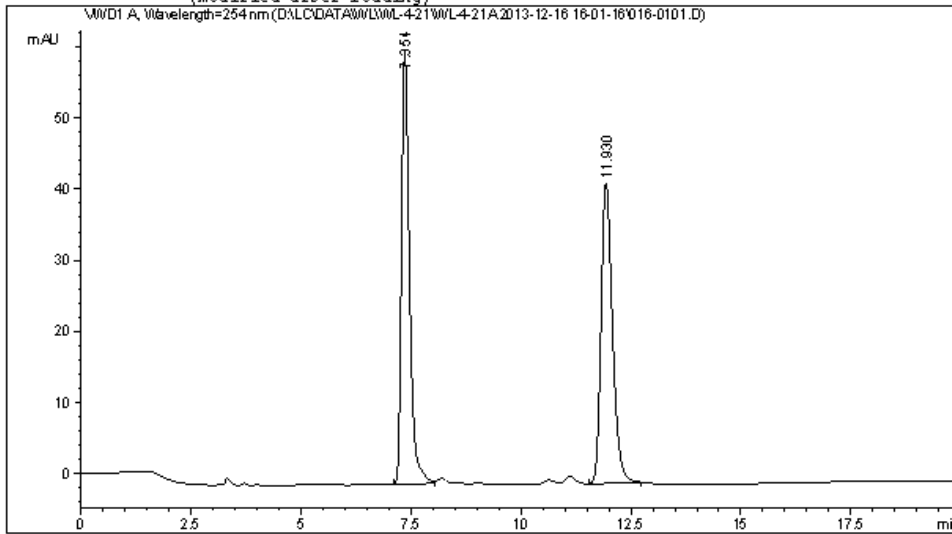
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.188	MM	0.1957	611.33374	52.07383	3.7350
2	10.801	VB	0.2629	1.57564e4	911.24622	96.2650
Totals :				1.63677e4	963.32005	



Data File D:\LC\DATA\WL\WL-4-21\WL-4-21A 2013-12-16 16-01-16\016-0101.D
 Sample Name: WL-4-21A

```

=====
Acq. Operator   : WL                      Seq. Line :    1
Acq. Instrument : Instrument 1             Location  : Vial 16
Injection Date  : 12/16/2013 4:02:19 PM  Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-21\WL-4-21A 2013-12-16 16-01-16\IBH-2-98-1ML-254NM-
                  20MIN.M
Last changed    : 12/14/2013 6:08:52 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-21\WL-4-21A 2013-12-16 16-01-16\016-0101.D\DA.M (IBH-2-
                  98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:25:12 AM by LJ
                  (modified after loading)
=====
  
```



Area Percent Report

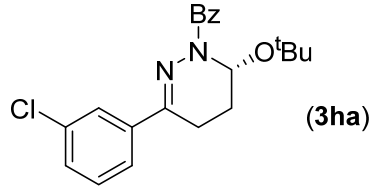
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.354	BB	0.1918	771.19611	60.72404	50.2937
2	11.930	BB	0.2763	762.19025	42.19497	49.7063

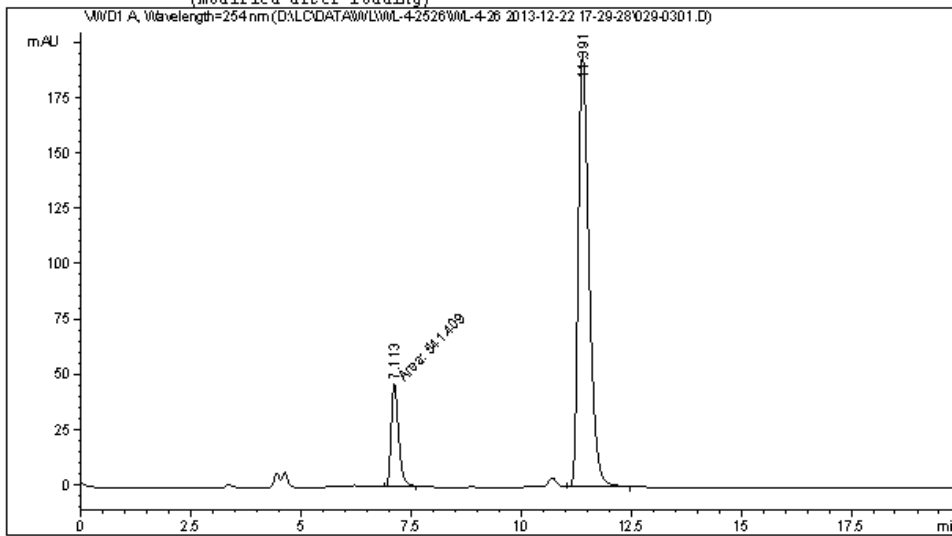
Totals : 1533.38635 102.91902



Data File D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\029-0301.D
 Sample Name: WL-4-26A

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 29
Injection Date  : 12/22/2013 5:52:34 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\IBH-2-98-1ML-254NM-
                20MIN.M
Last changed    : 12/14/2013 6:08:52 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\029-0301.D\DA.M (IBH-
                2-98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:03:38 AM by LJ
                (modified after loading)
=====
  
```



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 Area Percent Report
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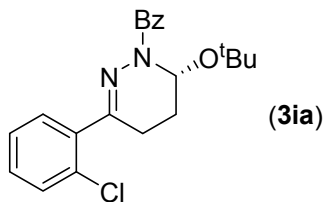
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.113	MM	0.1950	541.40942	46.27402	13.9196
2	11.391	VB	0.2620	3348.13721	195.85858	86.0804

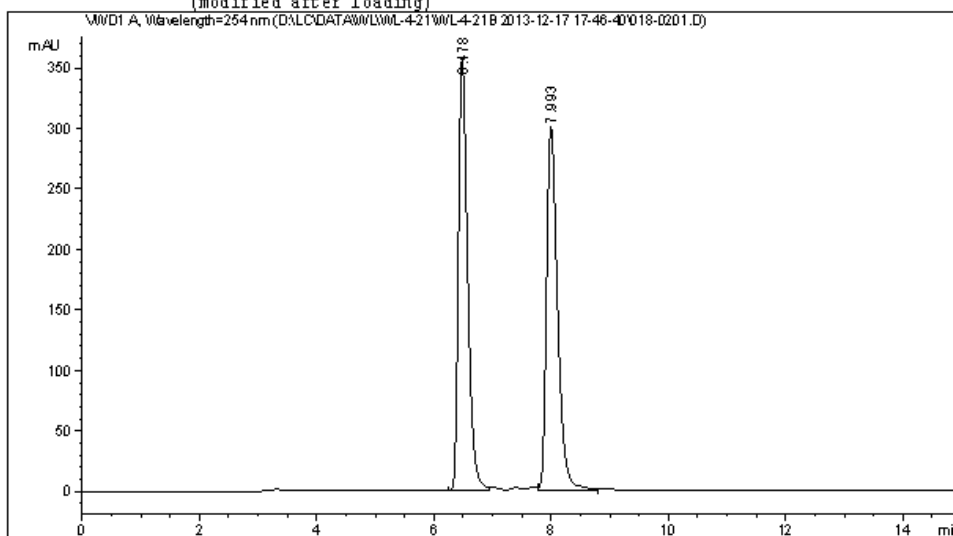
Totals : 3889.54663 242.13260



Data File D:\LC\DATA\WL\WL-4-21\WL-4-21B 2013-12-17 17-46-40\018-0201.D
 Sample Name: WL-4-21B

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 18
Injection Date  : 12/17/2013 5:58:34 PM  Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-21\WL-4-21B 2013-12-17 17-46-40\IBH-2-98-1ML-254NM-
                  20MIN.M
Last changed    : 12/14/2013 6:08:52 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-21\WL-4-21B 2013-12-17 17-46-40\018-0201.D\DA.M (IBH-2-
                  98-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:41:55 AM by LJ
                  (modified after loading)
=====
  
```



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 Area Percent Report
 =====

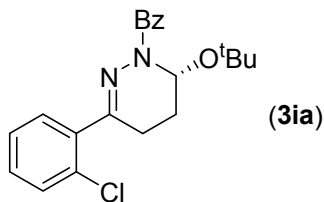
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.478	VB	0.1674	3927.07129	357.65637	49.8830
2	7.993	VB	0.1998	3945.48730	300.49277	50.1170

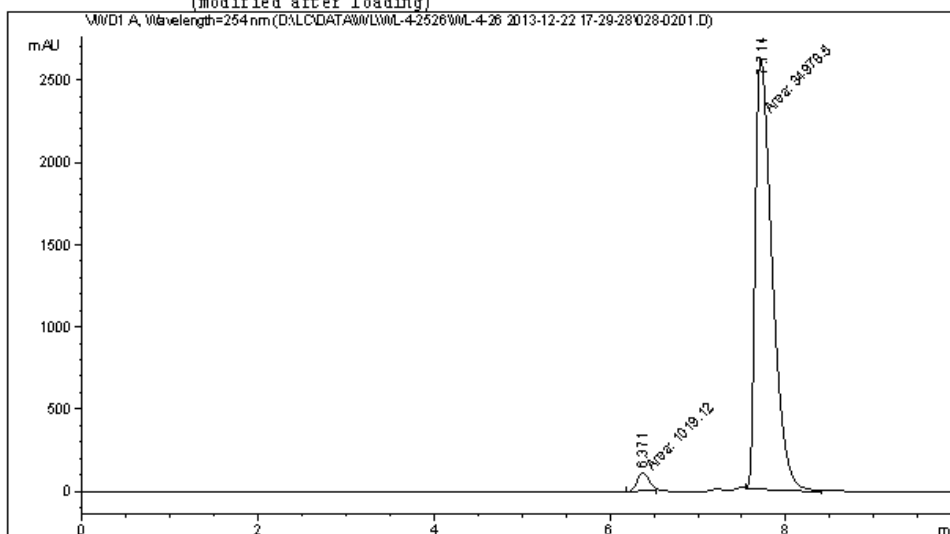
Totals : 7872.55859 658.14914



Data File D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\028-0201.D
 Sample Name: WL-4-26B

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1              Location  : Vial 28
Injection Date  : 12/22/2013 5:41:18 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\IBH-2-98-1ML-254NM-
                  10MIN.M
Last changed    : 12/14/2013 6:08:33 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-4-2526\WL-4-26 2013-12-22 17-29-28\028-0201.D\DA.M (IBH-
                  2-98-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 11:01:42 AM by LJ
                  (modified after loading)
=====
  
```



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

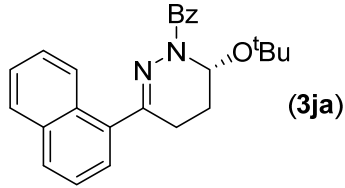
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.371	MM	0.1595	1019.12268	106.47696	2.8311
2	7.714	MM	0.2228	3.49785e4	2616.99414	97.1689

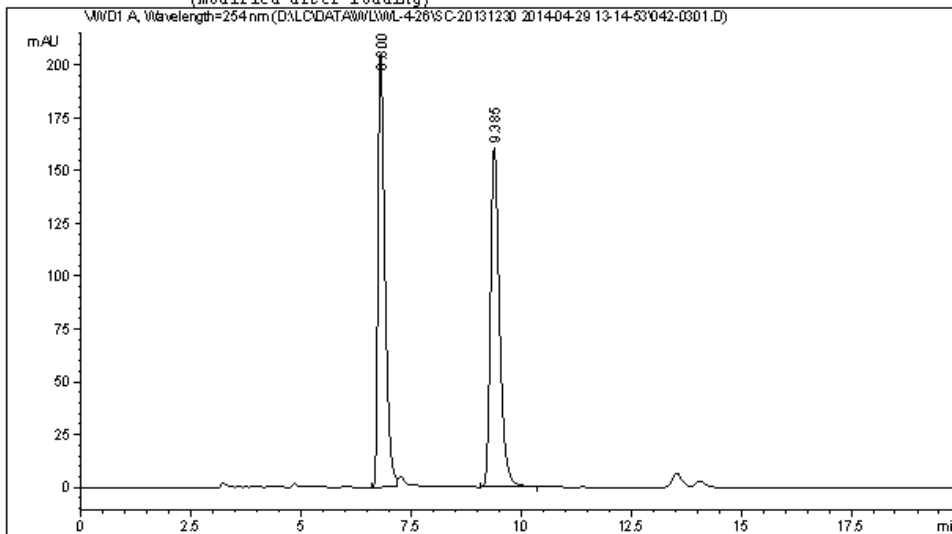
Totals : 3.59976e4 2723.47110



Data File D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\042-0301.D
 Sample Name: WL-1-NAP-RAC

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 42
Injection Date  : 4/29/2014 1:47:51 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\042-0301.D\DA.M (
                IBH-5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 3:17:05 PM by WL
                (modified after loading)
=====
  
```



Area Percent Report

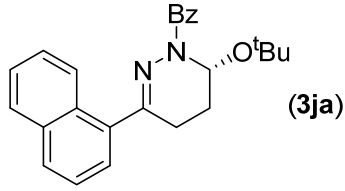
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.800	BV	0.1661	2255.38159	205.12239	49.3754
2	9.385	BB	0.2189	2312.44043	160.60262	50.6246

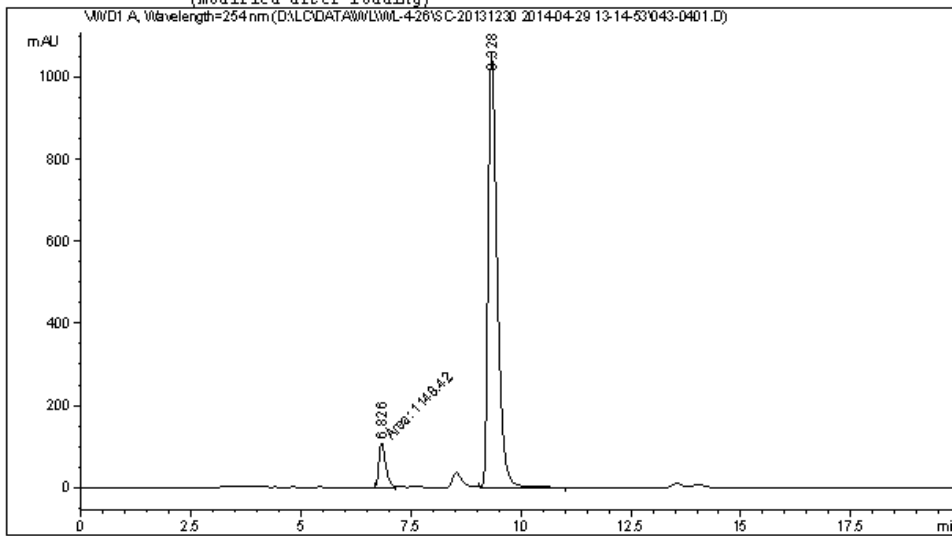
Totals : 4567.82202 365.72501



Data File D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\043-0401.D
 Sample Name: WL-1-NAP

```

=====
Acq. Operator   : WL                      Seq. Line :    4
Acq. Instrument : Instrument 1             Location  : Vial 43
Injection Date  : 4/29/2014 2:08:53 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\043-0401.D\DA.M (
                IBH-5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 3:15:48 PM by WL
                (modified after loading)
=====
  
```



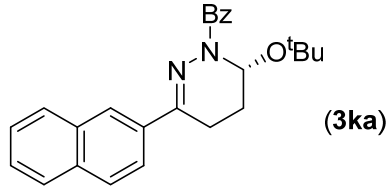
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

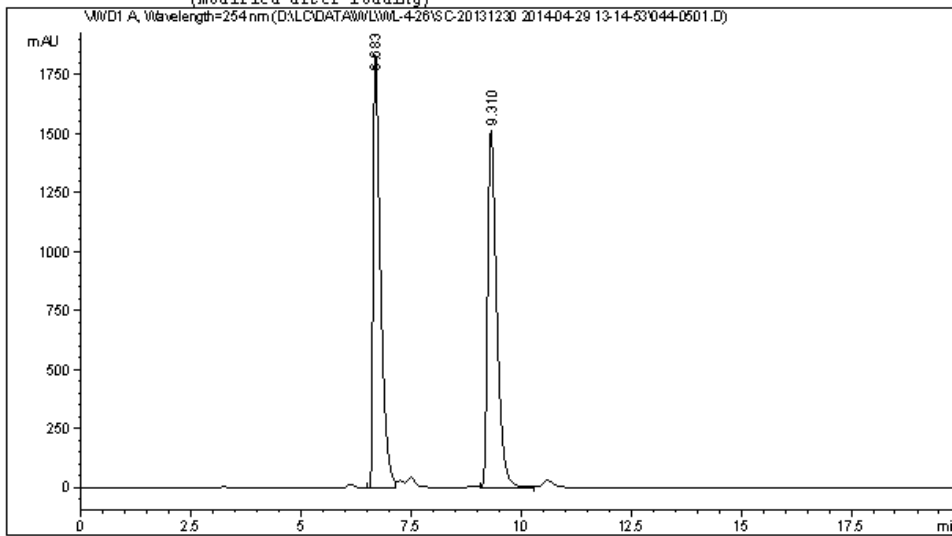
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.826	MM	0.1783	1148.42334	107.33015	7.0653
2	9.328	VB	0.2166	1.51059e4	1054.43152	92.9347
Totals :				1.62544e4	1161.76167	



Data File D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\044-0501.D
 Sample Name: WL-2-NAP-RAC

```

=====
Acq. Operator   : WL                      Seq. Line :    5
Acq. Instrument : Instrument 1             Location  : Vial 44
Injection Date  : 4/29/2014 2:30:02 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\044-0501.D\DA.M (
                IBH-5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 3:12:20 PM by WL
                (modified after loading)
=====
  
```



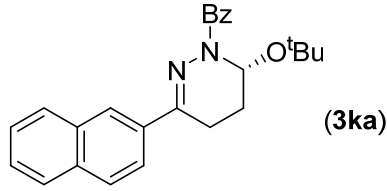
Area Percent Report

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

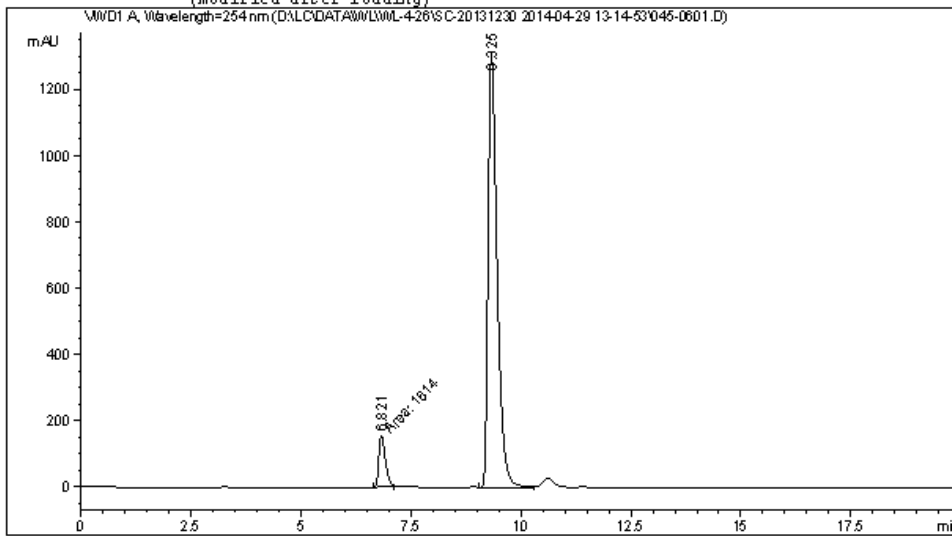
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.683	W	0.1724	2.14143e4	1837.24854	49.4901
2	9.310	W	0.2180	2.18556e4	1513.33411	50.5099
Totals :				4.32699e4	3350.58264	



Data File D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\045-0601.D
 Sample Name: WL-2-NAP

```

=====
Acq. Operator   : WL                      Seq. Line :    6
Acq. Instrument : Instrument 1             Location  : Vial 45
Injection Date  : 4/29/2014 2:51:03 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\SC-20131230 2014-04-29 13-14-53\045-0601.D\DA.M (
                IBH-5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 3:13:41 PM by WL
                (modified after loading)
=====
  
```



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 Area Percent Report
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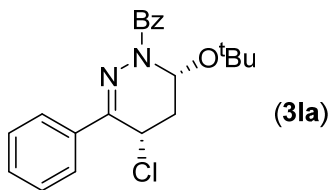
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution      :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.821	MM	0.1748	1613.99902	153.85608	7.9250
2	9.325	WV	0.2167	1.87520e4	1308.09534	92.0750

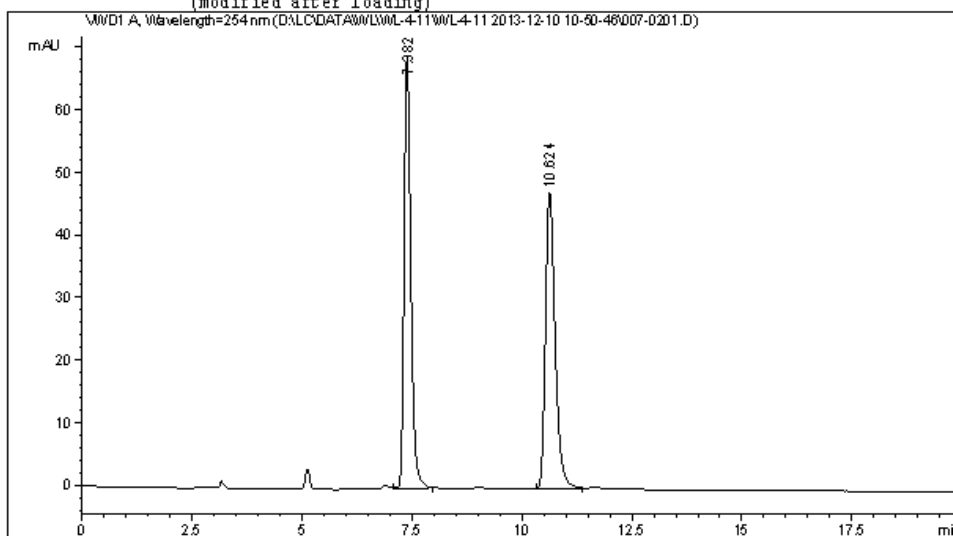
Totals : 2.03660e4 1461.95142



Data File D:\LC\DATA\WL\WL-4-11\WL-4-11 2013-12-10 10-50-46\007-0201.D
 Sample Name: WL-4-11

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 7
Injection Date  : 12/10/2013 11:02:42 AM Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-11\WL-4-11 2013-12-10 10-50-46\IBH-5-95-1ML-254NM-
                  20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-11\WL-4-11 2013-12-10 10-50-46\007-0201.D\DA.M (IBH-5-
                  95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:16:36 AM by LJ
                  (modified after loading)
=====
  
```



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

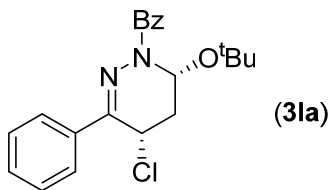
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.382	VB	0.1642	736.11414	68.77456	50.4836
2	10.624	BB	0.2318	722.01031	47.34943	49.5164

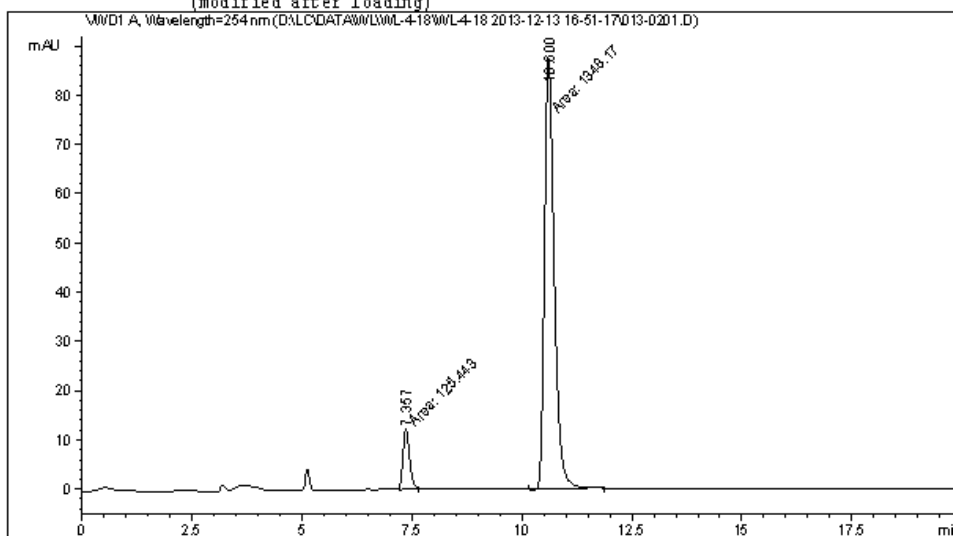
Totals : 1458.12445 116.12399



Data File D:\LC\DATA\WL\WL-4-18\WL-4-18 2013-12-13 16-51-17\013-0201.D
 Sample Name: WL-4-18

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1              Location  : Vial 13
Injection Date  : 12/13/2013 5:03:11 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-18\WL-4-18 2013-12-13 16-51-17\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-18\WL-4-18 2013-12-13 16-51-17\013-0201.D\DA.M (IBH-5-
                95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 10:20:17 AM by LJ
                (modified after loading)
  
```



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

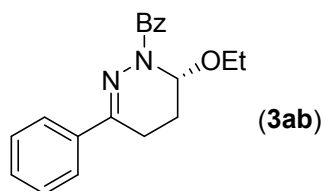
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.357	MM	0.1725	125.44329	12.12067	8.5126
2	10.600	MM	0.2568	1348.17187	87.48681	91.4874

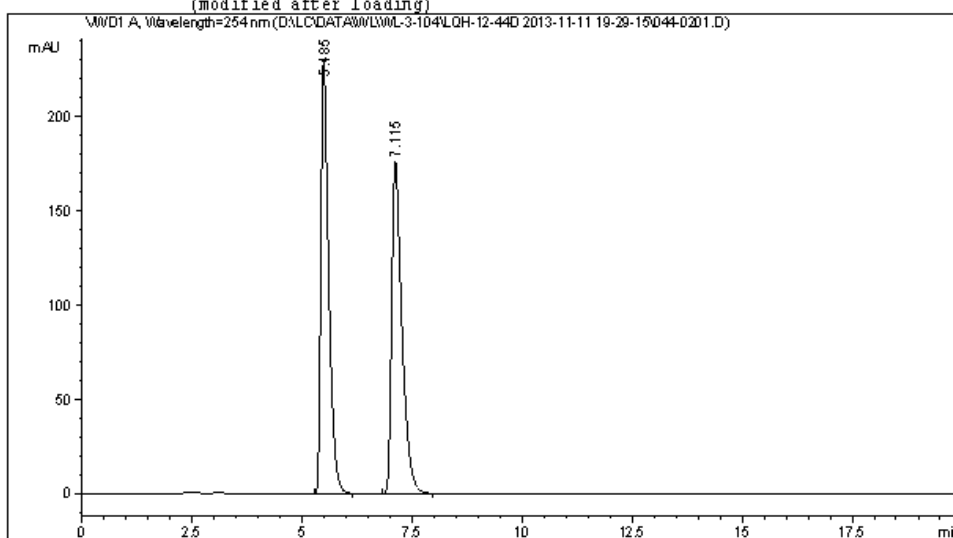
Totals : 1473.61517 99.60748



Data File D:\LC\DATA\WL\WL-3-104\LQH-12-44D 2013-11-11 19-29-15\044-0201.D
 Sample Name: WL-3-105A

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 44
Injection Date  : 11/11/2013 7:41:47 PM Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-3-104\LQH-12-44D 2013-11-11 19-29-15\ADH-10-90-10ML-
                254NM-20MIN.M
Last changed    : 11/11/2013 7:28:27 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-3-104\LQH-12-44D 2013-11-11 19-29-15\044-0201.D\DA.M (
                ADH-10-90-10ML-254NM-20MIN.M)
Last changed    : 3/12/2015 10:29:20 AM by HR
                (modified after loading)
=====
  
```



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

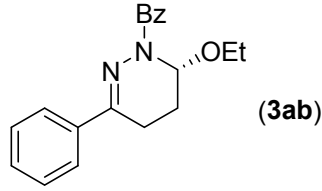
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.485	BB	0.1834	2838.54687	229.88132	49.9962
2	7.115	BB	0.2377	2838.97607	176.01826	50.0038

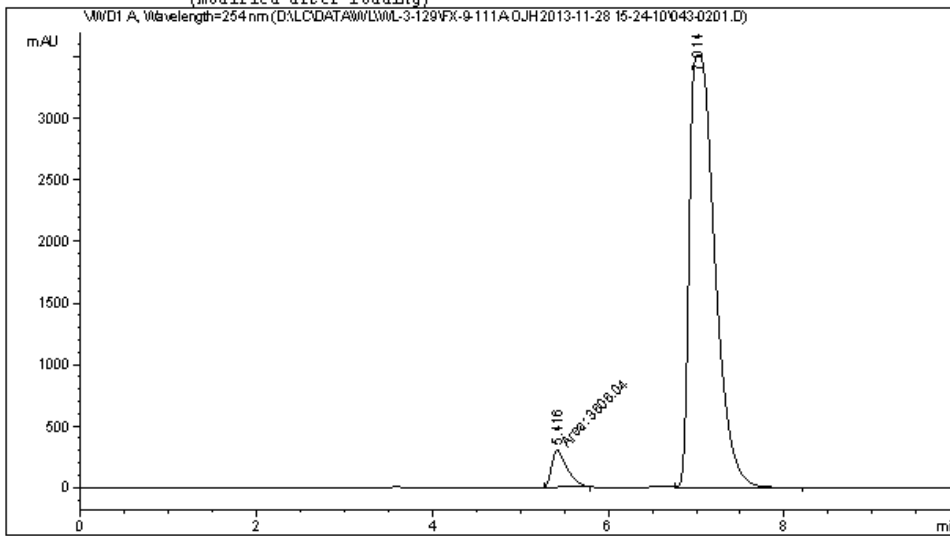
Totals : 5677.52295 405.89958



Data File D:\LC\DATA\WL\WL-3-129\FX-9-111A-0JH 2013-11-28 15-24-10\043-0201.D
 Sample Name: WL-3-129

```

=====
Acq. Operator   : LJ                               Seq. Line :    2
Acq. Instrument : Instrument 1                     Location  : Vial 43
Injection Date  : 11/28/2013 3:36:51 PM          Inj       :    1
                                                    Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-3-129\FX-9-111A-0JH 2013-11-28 15-24-10\ADH-10-90-10ML-
                254NM-10MIN.M
Last changed    : 11/11/2013 6:42:33 PM by WL
Analysis Method : D:\LC\DATA\WL\WL-3-129\FX-9-111A-0JH 2013-11-28 15-24-10\043-0201.D\DA.M (
                ADH-10-90-10ML-254NM-10MIN.M)
Last changed    : 3/12/2015 10:25:01 AM by HR
                (modified after loading)
=====
  
```



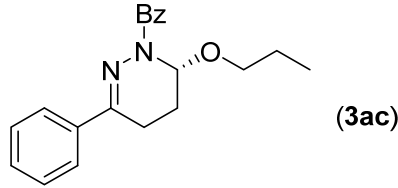
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

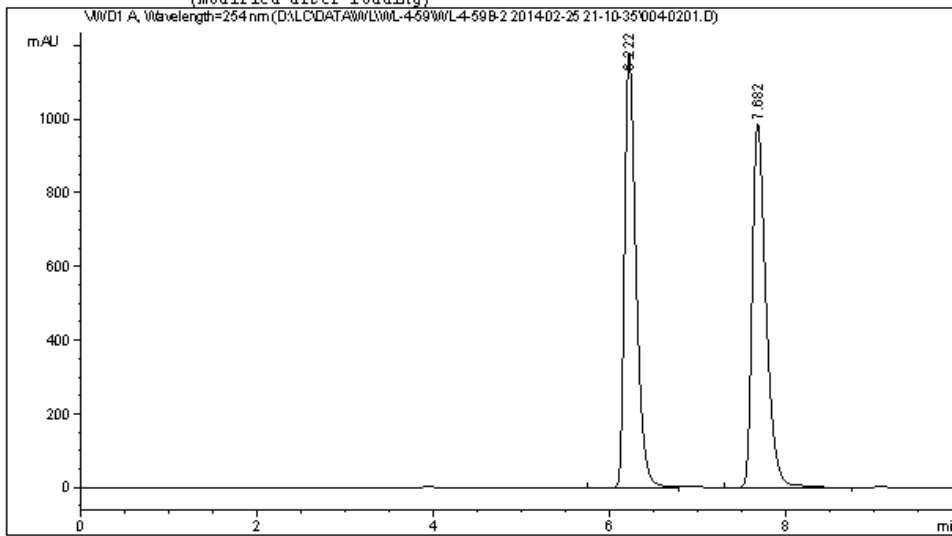
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.416	MM	0.1984	3606.04150	302.93976	4.8769
2	7.014	VB	0.3072	7.03349e4	3521.93457	95.1231
Totals :				7.39409e4	3824.87433	



Data File D:\LC\DATA\WL\WL-4-59\WL-4-59B-2 2014-02-25 21-10-35\004-0201.D
 Sample Name: WL-4-59B

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 4
Injection Date  : 2/25/2014 9:23:12 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-59\WL-4-59B-2 2014-02-25 21-10-35\IBH-5-95-1ML-254NM-
                  10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-59\WL-4-59B-2 2014-02-25 21-10-35\004-0201.D\DA.M (IBH-
                  5-95-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 11:27:40 AM by LJ
                  (modified after loading)
=====
  
```



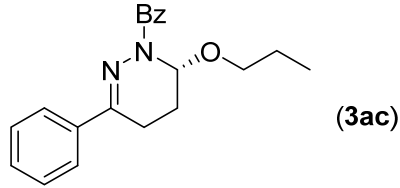
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

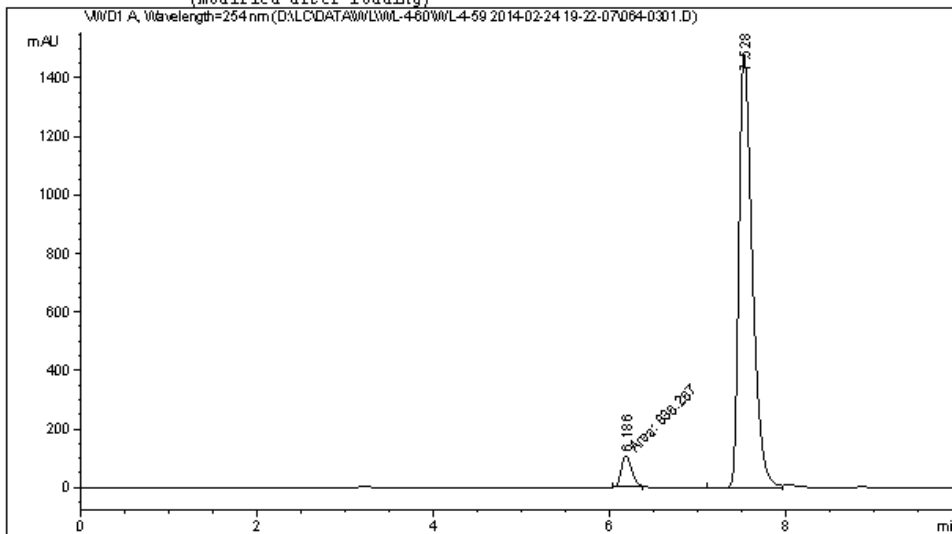
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.222	WV	0.1375	1.06314e4	1175.98132	49.7857
2	7.682	VB	0.1647	1.07229e4	986.37415	50.2143
Totals :				2.13543e4	2162.35547	



Data File D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\064-0301.D
 Sample Name: WL-4-60B

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 64
Injection Date  : 2/24/2014 7:46:07 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\IBH-5-95-1ML-254NM-
                  10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\064-0301.D\DA.M (IBH-5-
                  95-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 11:32:11 AM by LJ
                  (modified after loading)
=====
  
```



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

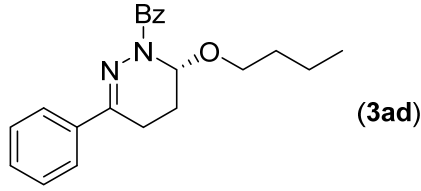
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.186	MM	0.1328	836.26691	104.93655	5.0665
2	7.528	WV	0.1613	1.56697e4	1480.58765	94.9335

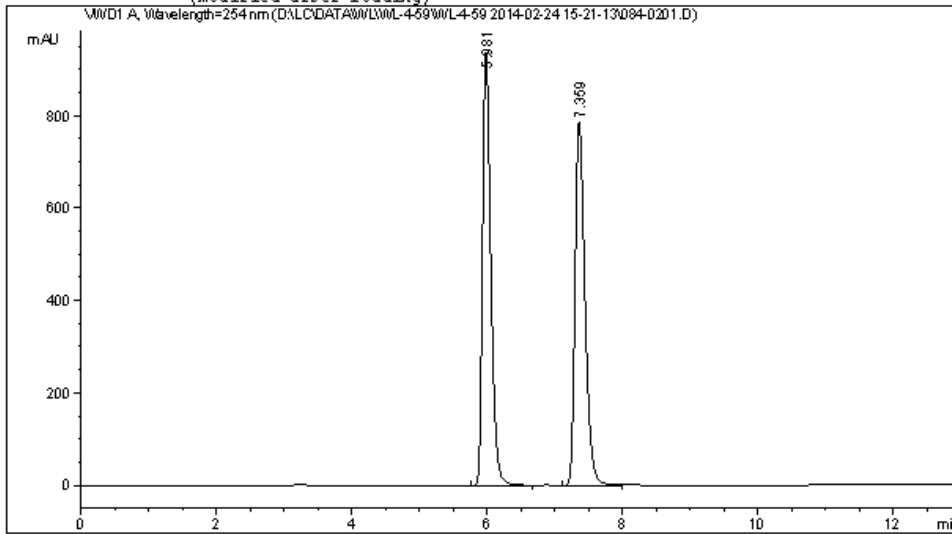
Totals : 1.65059e4 1585.52419



Data File D:\LC\DATA\WL\WL-4-59\WL-4-59 2014-02-24 15-21-13\084-0201.D
 Sample Name: WL-4-59A

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 84
Injection Date  : 2/24/2014 3:33:13 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-59\WL-4-59 2014-02-24 15-21-13\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-59\WL-4-59 2014-02-24 15-21-13\084-0201.D\DA.M (IBH-5-
                95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:29:10 AM by LJ
                (modified after loading)
=====
  
```



Area Percent Report

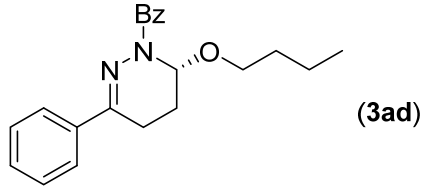
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.981	VB	0.1299	7999.81250	939.34564	49.9769
2	7.359	WV	0.1564	8007.22217	787.98041	50.0231

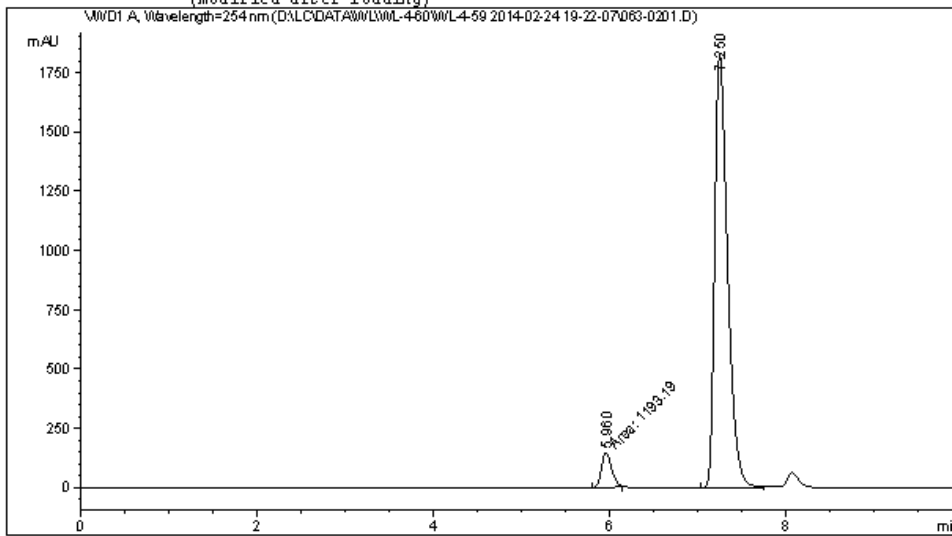
Totals : 1.60070e4 1727.32605



Data File D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\063-0201.D
 Sample Name: WL-4-60A

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 63
Injection Date  : 2/24/2014 7:34:32 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\IBH-5-95-1ML-254NM-
10MIN.M
Last changed    : 3/16/2013 2:34:08 AM by LJ
Analysis Method : D:\LC\DATA\WL\WL-4-60\WL-4-59 2014-02-24 19-22-07\063-0201.D\DA.M (IBH-5-
95-1ML-254NM-10MIN.M)
Last changed    : 4/29/2014 11:33:51 AM by LJ
(modified after loading)
=====
  
```



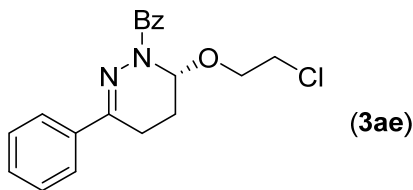
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

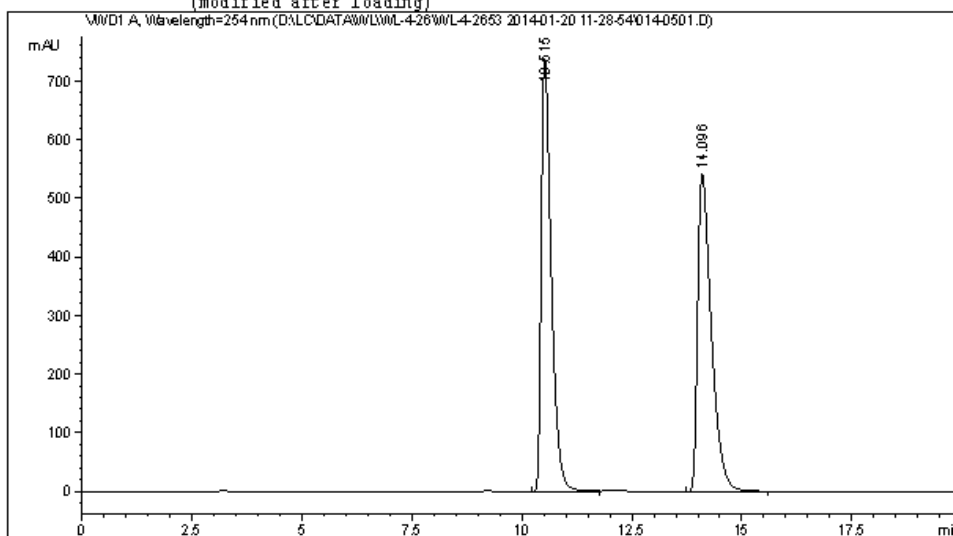
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.960	MM	0.1349	1193.19312	147.42174	6.0378
2	7.250	WV	0.1550	1.85690e4	1827.17297	93.9622
Totals :				1.97622e4	1974.59471	



Data File D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\014-0501.D
 Sample Name: WL-4-53B

```

=====
Acq. Operator   : WL                      Seq. Line :    5
Acq. Instrument : Instrument 1             Location  : Vial 14
Injection Date  : 1/20/2014 12:43:53 PM   Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\IBH-5-95-1ML-254NM-
                  20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\014-0501.D\DA.M (IBH-
                  5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:09:20 AM by LJ
                  (modified after loading)
=====
  
```



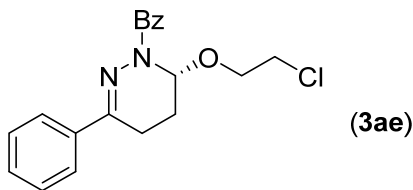
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

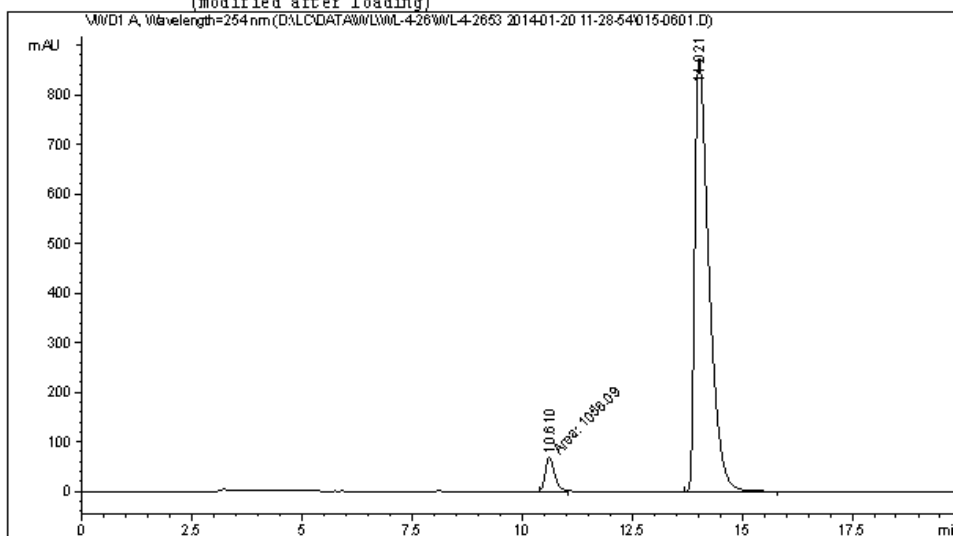
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	10.515	BB	0.2410	1.17575e4	738.84564	50.0912
2	14.096	BB	0.3252	1.17147e4	541.40094	49.9088
Totals :				2.34722e4	1280.24658	



Data File D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\015-0601.D
 Sample Name: WL-4-53A

```

=====
Acq. Operator   : WL                      Seq. Line :    6
Acq. Instrument : Instrument 1             Location  : Vial 15
Injection Date  : 1/20/2014 1:04:46 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\IBH-5-95-1ML-254NM-
                20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-26\WL-4-2653 2014-01-20 11-28-54\015-0601.D\DA.M (IBH-
                5-95-1ML-254NM-20MIN.M)
Last changed    : 4/29/2014 11:08:40 AM by LJ
                (modified after loading)
  
```



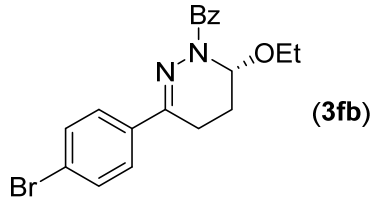
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

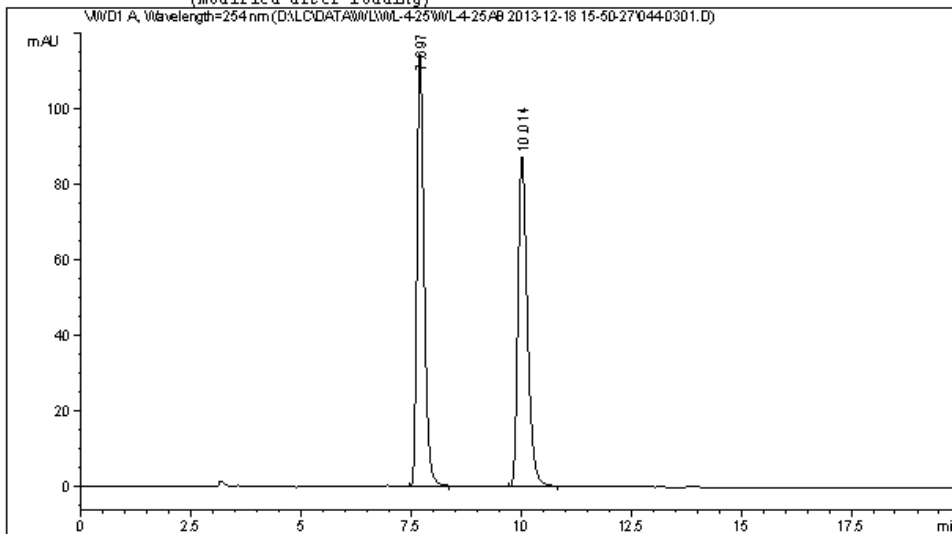
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	10.610	MM	0.2550	1056.08972	69.03258	5.1071
2	14.021	BB	0.3363	1.96227e4	873.76843	94.8929
Totals :				2.06788e4	942.80101	



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 15-50-27\044-0301.D
 Sample Name: WL-4-3

```

=====
Acq. Operator   : WL                      Seq. Line :    3
Acq. Instrument : Instrument 1             Location  : Vial 44
Injection Date  : 12/18/2013 4:33:26 PM Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 15-50-27\IBH-5-95-1ML-254NM-
                  20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 15-50-27\044-0301.D\DA.M (IBH-
                  5-95-1ML-254NM-20MIN.M)
Last changed    : 3/12/2015 10:41:36 AM by HR
                  (modified after loading)
=====
  
```



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

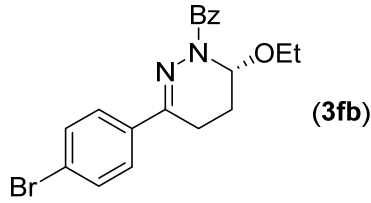
```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.697	VB	0.1736	1302.98120	114.40872	50.0190
2	10.014	VB	0.2262	1301.99097	87.38954	49.9810

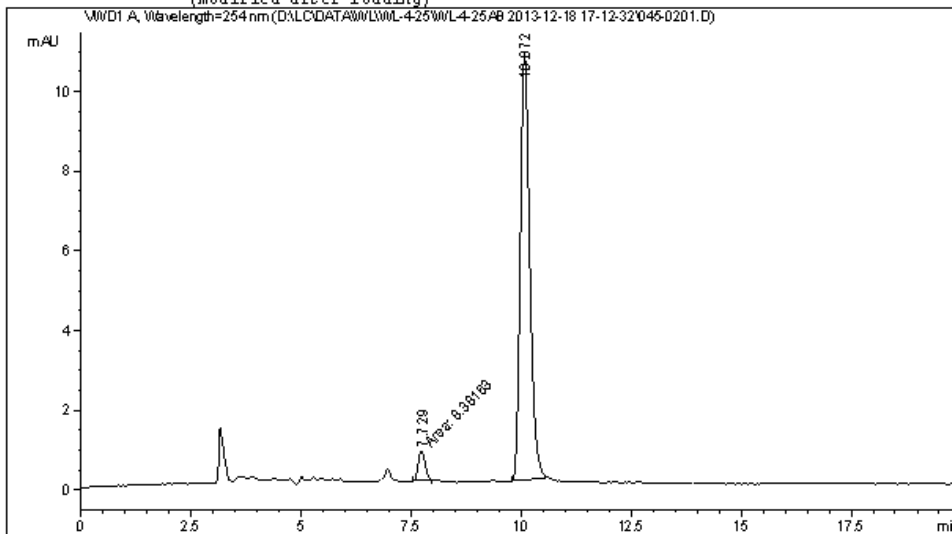
Totals : 2604.97217 201.79826



Data File D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 17-12-32\045-0201.D
 Sample Name: WL-4-3B

```

=====
Acq. Operator   : WL                      Seq. Line :    2
Acq. Instrument : Instrument 1             Location  : Vial 45
Injection Date  : 12/18/2013 5:34:29 PM Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 17-12-32\IBH-5-95-1ML-254NM-
                  20MIN.M
Last changed    : 3/19/2013 4:45:39 AM by TL
Analysis Method : D:\LC\DATA\WL\WL-4-25\WL-4-25AB 2013-12-18 17-12-32\045-0201.D\DA.M (IBH-
                  5-95-1ML-254NM-20MIN.M)
Last changed    : 3/12/2015 10:44:20 AM by HR
                  (modified after loading)
=====
  
```



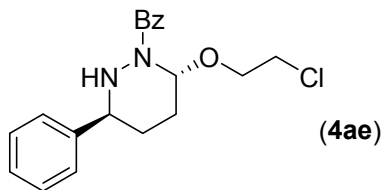
=====
 Area Percent Report
 =====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

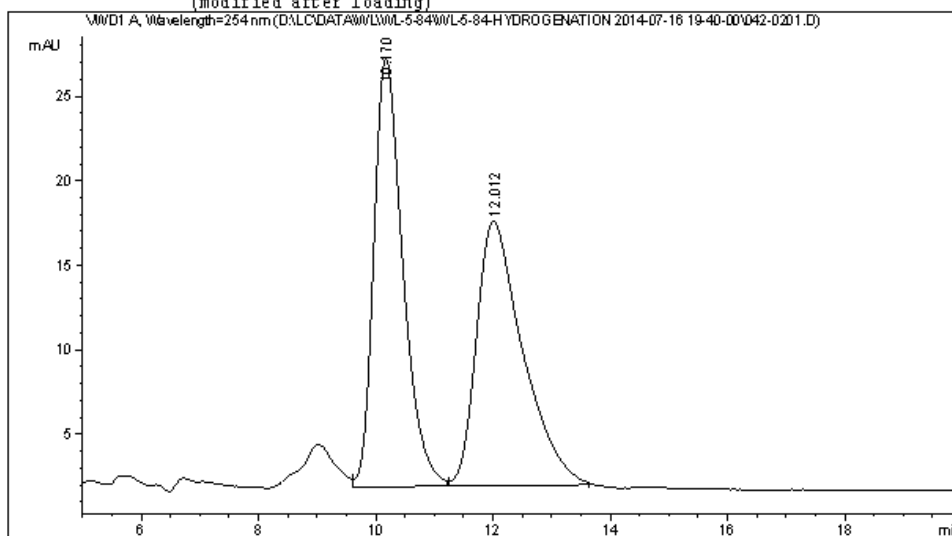
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.729	MM	0.1824	8.38163	7.65811e-1	4.9928
2	10.072	BB	0.2282	159.49309	10.67656	95.0072
Totals :				167.87472	11.44238	



Data File D:\LC\DATA\WL\WL-5-84\WL-5-84-HYDROGENATION 2014-07-16 19-40-00\042-0201.D
 Sample Name: WL-5-84-RAC

```

=====
Acq. Operator   : LJ                               Seq. Line :    2
Acq. Instrument : Instrument 1                     Location  : Vial 42
Injection Date  : 7/16/2014 7:52:26 PM           Inj       :    1
                                                    Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\WL\WL-5-84\WL-5-84-HYDROGENATION 2014-07-16 19-40-00\ASH-10-90-
                  1ML-254NM.M
Last changed    : 7/16/2014 7:38:20 PM by LJ
Analysis Method : D:\LC\DATA\WL\WL-5-84\WL-5-84-HYDROGENATION 2014-07-16 19-40-00\042-0201.
                  D\DA.M (ASH-10-90-1ML-254NM.M)
Last changed    : 3/24/2015 8:27:09 PM by HR
                  (modified after loading)
  
```



Area Percent Report

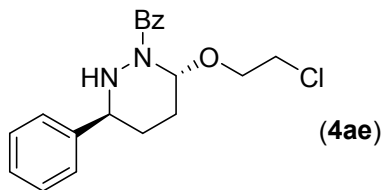
```

Sorted By      : Signal
Multiplier     : 1.0000
Dilution       : 1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	10.170	VB	0.5242	872.56244	50.4484	25.33277
2	12.012	BB	0.7827	857.04962	49.5516	15.62326

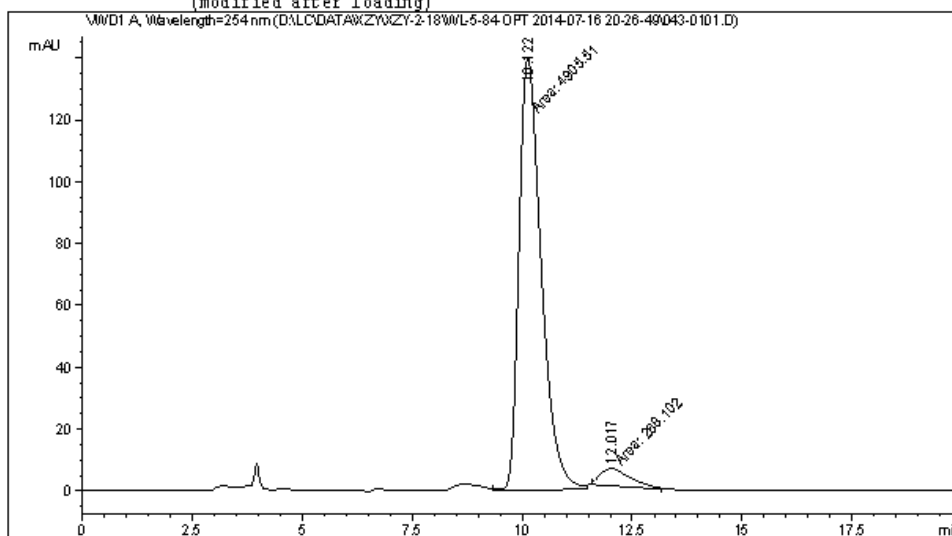
Totals : 1729.61206 40.95603



Data File D:\LC\DATA\XYZ\XYZ-2-18\WL-5-84-OPT 2014-07-16 20-26-49\043-0101.D
 Sample Name: wl-5-84-opt

```

=====
Acq. Operator   : LJ                      Seq. Line :    1
Acq. Instrument : Instrument 1             Location  : Vial 43
Injection Date  : 7/16/2014 8:28:37 PM    Inj       :    1
                                           Inj Volume: 5 µl
Acq. Method     : D:\LC\DATA\XYZ\XYZ-2-18\WL-5-84-OPT 2014-07-16 20-26-49\ASH-10-90-1ML-
                  254NM.M
Last changed    : 7/16/2014 7:38:20 PM by LJ
Analysis Method : D:\LC\DATA\XYZ\XYZ-2-18\WL-5-84-OPT 2014-07-16 20-26-49\043-0101.D\DA.M (
                  ASH-10-90-1ML-254NM.M)
Last changed    : 3/24/2015 8:24:38 PM by HR
                  (modified after loading)
=====
  
```



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

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
Use Multiplier & Dilution Factor with ISTDs
  
```

Signal 1: VMD1 A, Wavelength=254 nm

Peak #	RetTime [min]	Type	Width [min]	Area mAU	Area %	Height [mAU]
1	10.122	MM	0.5858	4905.50586	94.8179	139.57521
2	12.017	MM	0.7964	268.10248	5.1821	5.61045

Totals : 5173.60834 145.18566