

Electronic Supplementary Data

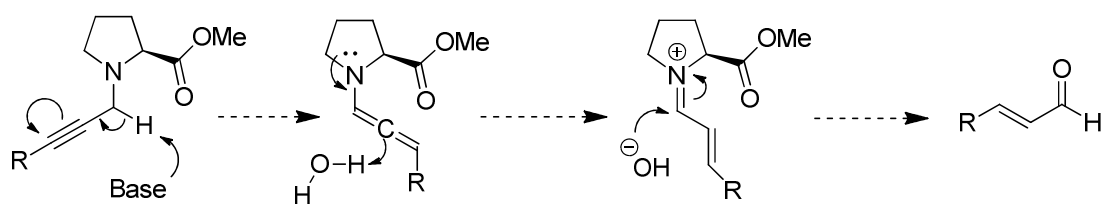
Base mediated 5-*endo-dig* cyclization of *N*-propargyl proline derivatives: A facile entry to pyrrolizidine scaffolds

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Proposed Mechanism for the formation of cinnamaldehyde:



R = Aryl or alkyl

X-Ray Crystallography data of **6a**:

Compound	6a
Empirical Formula	C ₁₅ H ₁₇ N ₁ O ₂
Formula mass	243.3
T[K]	296K
Crystal system	Monoclinic
Space group	P 2 ₁ /n
a[Å]	8.0317(3)
b[Å]	10.8377(2)
c[Å]	15.2538(2)
α [°]	90
β [°]	102.930(1)
γ [°]	90
V[Å ³]	1294.10(2)
Z	4
D(Calcd.) [g.cm ⁻³]	1.25
μ (Mo-K α) [mm ⁻¹]	0.083
F(000)	519.9
θ range [°]	2.3 to 25.0
Index range	$-9 \leq h \leq 9$ $-12 \leq k \leq 12$ $-18 \leq l \leq 18$
Reflections collected	8981
Independent reflections	2286
Data/restraints/parameters	2286/0/164
R1, wR2 [I>2 σ (I)][a]	0.047,0.137
R1, wR2 (all data) ^[a]	0.058,0.140
GOF	1.056
$\Delta\rho$ (min), $\Delta\rho$ (max) [e•Å ³]	-0.163, 0.271

General Methods:

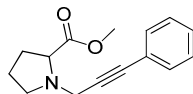
All reactions were carried out under inert atmosphere. All the reagents used were purchased from commercial sources and used as such. All the N-propargyl proline ester derivatives were prepared using known literature procedure.¹ ¹H and ¹³C NMR spectra were recorded in CDCl₃ using 400 MHz Bruker FT-NMR spectrometer. Chemical shift values are reported in parts per million relative to TMS. High resolution mass spectra (HRMS) were recorded on a waters-Q-ToF spectrometer. The IR spectra were recorded on a Bruker FT-IR spectrometer. Thin layer chromatography was performed on Merck silica gel 60 F254 TLC plates using EtOAc/Hexane mixture as an eluent. Column chromatography was carried out through silica gel (100-200 mesh).

General procedure for the synthesis of N-propargyl proline ester Derivatives:¹

Formaldehyde (0.25 mmol), phenylacetylene (0.25 mmol), sodium bicarbonate (0.2 mmol), and CuCl (0.02 mmol) were stirred over night with proline methyl ester hydrochloride (0.2 mmol) at 35°C under argon. After completion, the reaction mixture was directly loaded on a silica gel column and purified using Hexane/EtOAc mixture (15 %) as an eluent.

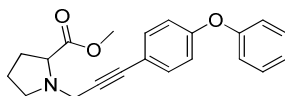
Spectral data of N-propargyl proline ester Derivatives:

Methyl-1-(3-phenylprop-2-yn-1-yl)pyrrolidine-2-carboxylate (5a):¹



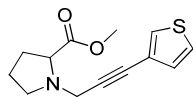
80% Yield; brown color liquid; FT IR 2360 (C≡C), 1745 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.43-7.40 (m, 2H), 7.30-7.27 (m, 3H), 3.79 (d, *J* = 1.6 Hz, 2H), 3.73 (s, 3H), 3.50 (dd, *J* = 9.0 Hz, 6.4 Hz, 1H), 3.16-3.11 (m, 1H), 2.81-2.75 (m, 1H), 2.2-2.1 (m, 1H), 2.05-1.91 (m, 2H), 1.87-1.78 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) 174.3, 131.8, 128.3, 128.2, 123.0, 85.4, 84.1, 62.9, 52.6, 52.1, 42.2, 29.7, 23.4.

Methyl-1-(3-(4-phenoxyphenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5b):



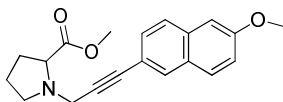
62% Yield; yellow liquid; FT IR 2360 (C≡C), 1740 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.38 (d, *J* = 8.8 Hz, 2H), 7.36-7.31 (m, 2H), 7.14-7.10 (m, 1H), 7.02-6.99 (m, 2H), 6.91 (d, *J* = 8.8 Hz, 2H), 3.78 (d, *J* = 1.20 Hz, 2H), 3.73 (s, 3H), 3.50 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.16-3.11 (m, 1H), 2.80-2.74 (m, 1H), 2.22-2.13 (m, 1H), 2.05-1.80 (m, 3H), ¹³C NMR (100 MHz, CDCl₃) 174.3, 157.5, 156.6, 133.4, 130.0, 123.9, 119.4, 118.4, 117.7, 85.0, 83.5, 63.1, 52.7, 52.1, 42.4, 29.8, 23.5; HRMS (ESI) calcd for C₂₁H₂₂NO₃ 336.1599, found 336.1590 [M+H]⁺.

Methyl-1-(3-(thiophen-3-yl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5c):



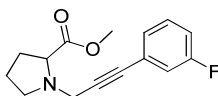
62% Yield; yellow liquid; FT IR 2362 (C≡C), 1740 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.39 (dd, *J* = 3.0 Hz, 1.0 Hz, 1H), 7.22 (dd, *J* = 5.0 Hz, 3.0 Hz, 1H), 7.07 (dd, *J* = 5.0 Hz, 1.1 Hz, 1H), 3.75 (s, 2H), 3.71 (s, 3H), 3.46 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.13-3.09 (m, 1H), 2.77-2.70 (m, 1H), 2.20-2.11 (m, 1H), 2.02-1.88 (m, 2H), 1.85-1.76 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) 174.3, 130.1, 128.7, 125.3, 122.0, 83.7, 80.5, 63.0, 52.6, 52.1, 42.3, 29.7, 23.4; HRMS (ESI) calcd for C₁₃H₁₆NO₂S 250.0901, found 250.0907 [M+H]⁺.

Methyl-1-(3-(6-methoxynaphthalen-2-yl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5d):



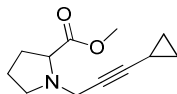
48.6% Yield; colorless solid; mp 66 – 68 °C; FT IR 2330 (C≡C), 1745 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.86 (s, 1H), 7.66 (t, *J* = 9.3 Hz, 2H), 7.44 (dd, *J* = 8.4 Hz, 1.6 Hz, 1H), 7.14 (dd, *J* = 8.9 Hz, 2.6 Hz, 1H), 7.09 (d, *J* = 2.3 Hz, 1H), 3.91 (s, 3H), 3.84 (d, *J* = 2.16, 2H), 3.74 (s, 3H), 3.55 (dd, *J* = 9.0 Hz, 6.4 Hz, 1H), 3.19-3.15 (m, 1H), 2.86-2.80 (m, 1H), 2.26-2.16 (m, 1H), 2.07-1.93 (m, 2H), 1.90-1.84 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) 174.4, 158.3, 134.1, 131.5, 129.3, 129.3, 128.5, 126.9, 119.5, 180.0, 105.8, 86.0, 83.7, 63.1, 55.5, 52.7, 52.2, 42.5, 29.9, 23.5; HRMS (ESI) calcd for C₂₀H₂₂NO₃ 324.1599, found 324.1593 [M+H]⁺.

Methyl-1-(3-(3-fluorophenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5e):



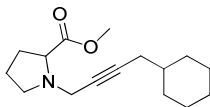
88% Yield; yellow liquid; FT IR 2357 (C≡C), 1744 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.28-7.22 (m, 1H), 7.21-7.18 (m, 1H), 7.13-7.09 (m, 1H), 7.03-6.98 (m, 1H), 3.79 (d, *J* = 1.2 Hz, 2H), 3.73 (s, 3H), 3.48 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.17-3.16 (m, 1H), 2.79-2.73 (m, 1H), 2.23-2.13 (m, 1H), 2.06-1.91 (m, 2H), 1.88-1.80 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) 174.2, 162.4 (d, *J*_{C-F} = 245 Hz), 129.9 (d, *J*_{C-F} = 8.8 Hz), 127.7 (d, *J*_{C-F} = 2.8 Hz), 124.9 (d, *J*_{C-F} = 9.6 Hz), 118.6 (d, *J*_{C-F} = 22.6 Hz), 115.6 (d, *J*_{C-F} = 20.5 Hz), 85.4, 84.2, 63.1, 52.7, 52.1, 42.3, 29.8, 23.4; HRMS (ESI) calcd for C₁₅H₁₇FNO₂ 262.1243, found 262.1241 [M+H]⁺.

Methyl-1-(3-(cyclopropyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5f):



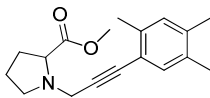
67% Yield; light yellow liquid; FT IR 2359 (C≡C), 1746 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 3.70 (s, 3H), 3.47 (d, *J* = 1.9 Hz, 2H), 3.34 (dd, *J* = 9.1 Hz, 6.5 Hz, 1H), 3.03-2.99 (m, 1H), 2.65-2.59 (m, 1H), 2.16-2.07 (m, 1H), 1.98-1.83 (m, 2H), 1.81-1.73 (m, 1H), 1.23-1.15 (m, 1H), 0.73-0.69 (m, 2H), 0.64-0.59 (m, 2H); ¹³C NMR (100 MHz, CDCl₃) 174.4, 88.8, 69.7, 62.9, 52.5, 52.1, 41.9, 29.8, 23.4, 8.3, -0.5; HRMS (ESI) calcd for C₁₂H₁₈NO₂ 208.1337, found 208.1337 [M+H]⁺.

Methyl-1-(4-cyclohexylbut-2-yn-1-yl)pyrrolidine-2-carboxylate (5g):



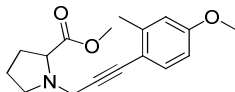
63% Yield; colorless liquid; FT IR 2309 (C≡C), 1737(C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 3.67 (s, 3H), 3.50 (t, *J* = 2.0 Hz, 2H), 3.38 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.02-2.97 (m, 1H), 2.7 (m, 1H), 2.13-2.06 (m, 1H), 2.02 (td, *J* = 6.6 Hz, 2.1 Hz, 2H), 1.97-1.83 (m, 2H), 1.76-1.58 (m, 6H), 1.43-1.32 (m, 1H), 1.24-1.04 (m, 3H), 0.93 (dq, *J* = 12.2 Hz, 2.9 Hz, 2H); ¹³C NMR (100 MHz, CDCl₃) 174.4, 84.4, 75.1, 62.7, 52.3, 52.0, 41.8, 37.4, 32.7, 29.7, 26.6, 26.3, 26.1, 23.4; HRMS (ESI) calcd for C₁₆H₂₆NO₂ 264.1963, found 264.1962 [M+H]⁺.

Methyl-1-(3-(2,4,5-trimethylphenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5h):



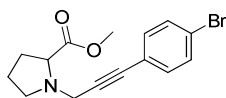
64% Yield; yellow solid; mp 60 – 62 °C; FT IR 2358 (C≡C), 1747 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.16 (s, 1H), 6.95 (s, 1H), 3.84 (d, *J* = 4.24 Hz, 2H), 3.73 (s, 3H), 3.55 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.14-3.09 (m, 1H), 2.85-2.80 (m, 1H), 2.34 (s, 3H), 2.20 (s, 3H), 2.18 (s, 3H), 2.05-1.80 (m, 4H); ¹³C NMR (100 MHz, CDCl₃) 174.4, 137.3, 137.0, 133.7, 133.1, 130.9, 120.0, 86.7, 84.6, 62.7, 52.4, 52.1, 42.3, 29.8, 23.5, 20.3, 19.7, 19.1; HRMS (ESI) calcd for C₁₈H₂₄NO₂ 286.1807, found 286.1808 [M+H]⁺.

Methyl-1-(3-(4-methoxy-2-methylphenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5i):



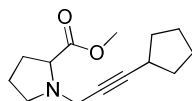
66% Yield; yellow liquid; FT IR 2358 (C≡C), 1738 (C=O) cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 7.31 (d, *J* = 8.4 Hz, 1H), 6.71 (d, *J* = 2.5 Hz, 1H), 6.65 (dd, *J* = 8.5 Hz, 2.6 Hz, 1H), 3.82 (d, *J* = 4.0 Hz, 2H), 3.77 (s, 3H), 3.71 (s, 3H), 3.53 (dd, *J* = 9.0 Hz, 6.5 Hz, 1H), 3.14-3.09 (m, 1H), 2.83-2.77 (m, 1H), 2.38 (s, 3H), 2.20-2.11 (m, 1H), 2.04-1.89 (m, 2H), 1.85-1.79 (m, 1H); ¹³C NMR (100 MHz, CDCl₃) 174.4, 159.4, 141.9, 133.5, 115.2, 115.1, 111.2, 86.3, 84.2, 62.8, 55.3, 52.5, 52.1, 42.4, 29.8, 23.5, 21.2; HRMS (ESI) calcd for C₁₇H₂₂NO₃ 288.1599, found 288.1596 [M+H]⁺.

Methyl-1-(3-(4-bromophenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5j):



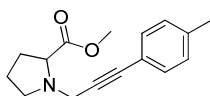
71% Yield; light yellow liquid; FT IR 2358 (C≡C), 1743 (C=O), cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 7.43 (d, J = 8.5 Hz, 2H), 7.28 (d, J = 8.5 Hz, 2H), 3.77 (s, 2H), 3.73 (s, 3H), 3.46 (dd, J = 9.0 Hz, 6.4 Hz, 1H), 3.20-3.12 (m, 1H), 2.78-2.71 (m, 1H), 2.23-2.12 (m, 1H), 2.05-1.90 (m, 2H), 1.87-1.79 (m, 1H); ^{13}C NMR (100 MHz, CDCl_3) 174.1, 133.2, 131.5, 122.3, 121.9, 85.5, 84.3, 63.0, 52.6, 52.1, 42.3, 29.7, 23.3; HRMS (ESI) calcd for $\text{C}_{15}\text{H}_{17}\text{BrNO}_2$ 322.0442, found 322.0441 $[\text{M}+\text{H}]^+$.

Methyl-1-(3-cyclopentylprop-2-yn-1-yl)pyrrolidine-2-carboxylate (5k):



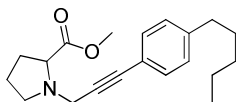
70% Yield; light yellow liquid; FT IR 2358 (C≡C), 1747 (C=O) cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 3.71 (s, 3H), 3.52 (d, J = 2.0 Hz, 2H), 3.39 (dd, J = 9.0 Hz, 6.4 Hz, 1H), 3.06-3.01 (m, 1H), 2.70-2.55 (m, 2H), 2.17-2.07 (m, 1H), 2.00-1.85 (m, 4H), 1.80-1.75 (m, 1H), 1.72-1.64 (m, 2H), 1.60-1.47 (m, 4H); ^{13}C NMR (100 MHz, CDCl_3) 174.5, 90.1, 73.8, 62.9, 52.4, 52.1, 42.0, 34.2, 30.3, 29.9, 25.0, 23.5; HRMS (ESI) calcd for $\text{C}_{14}\text{H}_{22}\text{NO}_2$ 236.1650, found 236.1651 $[\text{M}+\text{H}]^+$.

Methyl-1-(3-(p-tolyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5l):



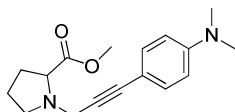
93% Yield; brown liquid; FT IR 2367 (C≡C), 1745 (C=O), cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 7.31 (d, J = 8.0, 2H), 7.09 (d, J = 8.0, 2H), 3.78 (d, J = 1.7 Hz, 2H), 3.72 (s, 3H), 3.50 (dd, J = 9.1 Hz, 6.5 Hz, 1H), 3.15-3.10 (m, 1H), 2.80-2.74 (m, 1H), 2.33 (s, 3H), 2.22-2.13 (m, 1H), 2.02-1.81 (m, 3H); ^{13}C NMR (100 MHz, CDCl_3) 174.4, 138.3, 131.7, 129.1, 120.0, 85.6, 83.4, 63.0, 52.6, 52.2, 42.4, 29.8, 23.5, 21.5; HRMS (ESI) calcd for $\text{C}_{16}\text{H}_{20}\text{NO}_2$ 258.1494, found 258.1497 $[\text{M}+\text{H}]^+$.

Methyl-1-(3-(4-pentylphenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5m):



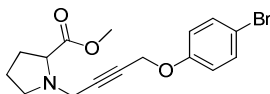
50% Yield; light yellow liquid; FT IR 2364 (C≡C), 1746 (C=O), cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 7.32 (d, J = 8.2 Hz, 2H), 7.09 (d, J = 8.2 Hz, 2H), 3.78 (d, J = 2.1, 2H), 3.72 (s, 3H), 3.50 (dd, J = 9.0 Hz, 6.5 Hz, 1H), 3.14-3.10 (m, 1H), 2.81-2.74 (m, 1H), 2.57 (t, J = 7.9 Hz, 2H), 2.20-2.12 (m, 1H), 2.04-1.90 (m, 2H), 1.85-1.77 (m, 1H), 1.61-1.53 (m, 2H), 1.36-1.23 (m, 4H), 0.87 (t, J = 7.0 Hz, 3H); ^{13}C NMR (100 MHz, CDCl_3) 174.3, 143.4, 131.7, 128.5, 120.2, 85.6, 83.3, 62.9, 52.6, 52.1, 42.3, 35.9, 31.5, 31.0, 29.8, 23.5, 22.6, 14.1; HRMS (ESI) calcd for $\text{C}_{20}\text{H}_{28}\text{NO}_2$ 314.2120, found 314.2123 $[\text{M}+\text{H}]^+$.

Methyl-1-(3-(4-(dimethylamino)phenyl)prop-2-yn-1-yl)pyrrolidine-2-carboxylate (5n):



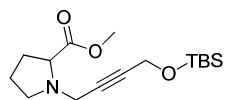
46% Yield; brown liquid; FT IR 2358 (C≡C), 1747 (C=O) cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 7.29 (d, J = 8.9 Hz, 2H), 6.59 (d, J = 8.9 Hz, 2H), 3.77 (d, J = 2.9 Hz, 2H), 3.72 (s, 3H), 3.51 (dd, J = 9.0 Hz, 6.5 Hz, 1H), 3.13-3.10 (m, 1H), 2.90 (s, 6H), 2.81-2.74 (m, 1H), 2.21-2.11 (m, 1H), 2.03-1.88 (m, 2H), 1.84-1.76 (m, 1H); ^{13}C NMR (100 MHz, CDCl_3) 174.5, 150.1, 132.8, 111.8, 110.0, 86.2, 81.5, 63.0, 52.6, 52.1, 42.5, 40.3, 29.8, 23.5; HRMS (ESI) calcd for $\text{C}_{17}\text{H}_{23}\text{N}_2\text{O}_2$ 287.1759, found 287.1751 $[\text{M}+\text{H}]^+$.

Methyl-1-(4-(4-bromophenoxy)but-2-yn-1-yl)pyrrolidine-2-carboxylate (5o):



60% Yield; light yellow liquid; FT IR 2348 (C≡C), 1740 (C=O), cm^{-1} ; ^1H NMR (400 MHz, CDCl_3) 7.40 (d, J = 9.1 Hz, 2H), 6.84 (d, J = 9.1 Hz, 2H), 4.68 (t, J = 1.9 Hz, 2H), 3.70 (s, 3H), 3.60 (t, J = 1.9 Hz, 2H), 3.31 (dd, J = 9.0 Hz, 6.6 Hz, 1H), 3.03-3.0 (m, 1H), 2.60 (m, 1H), 2.11-2.01 (m, 1H), 2.0-1.82 (m, 2H), 1.77-1.70 (m, 1H); ^{13}C NMR (100 MHz, CDCl_3) 174.1, 156.7, 132.3, 117.0, 113.8, 82.8, 79.8, 62.7, 56.4, 52.4, 52.1, 41.5, 29.6, 23.3; HRMS (ESI) calcd for $\text{C}_{16}\text{H}_{19}\text{BrNO}_3$ 352.0548, found 352.0549 $[\text{M}+\text{H}]^+$.

Methyl-1-(4-((tert-butyldimethylsilyl)oxy)but-2-yn-1-yl)pyrrolidine-2-carboxylate (5p):

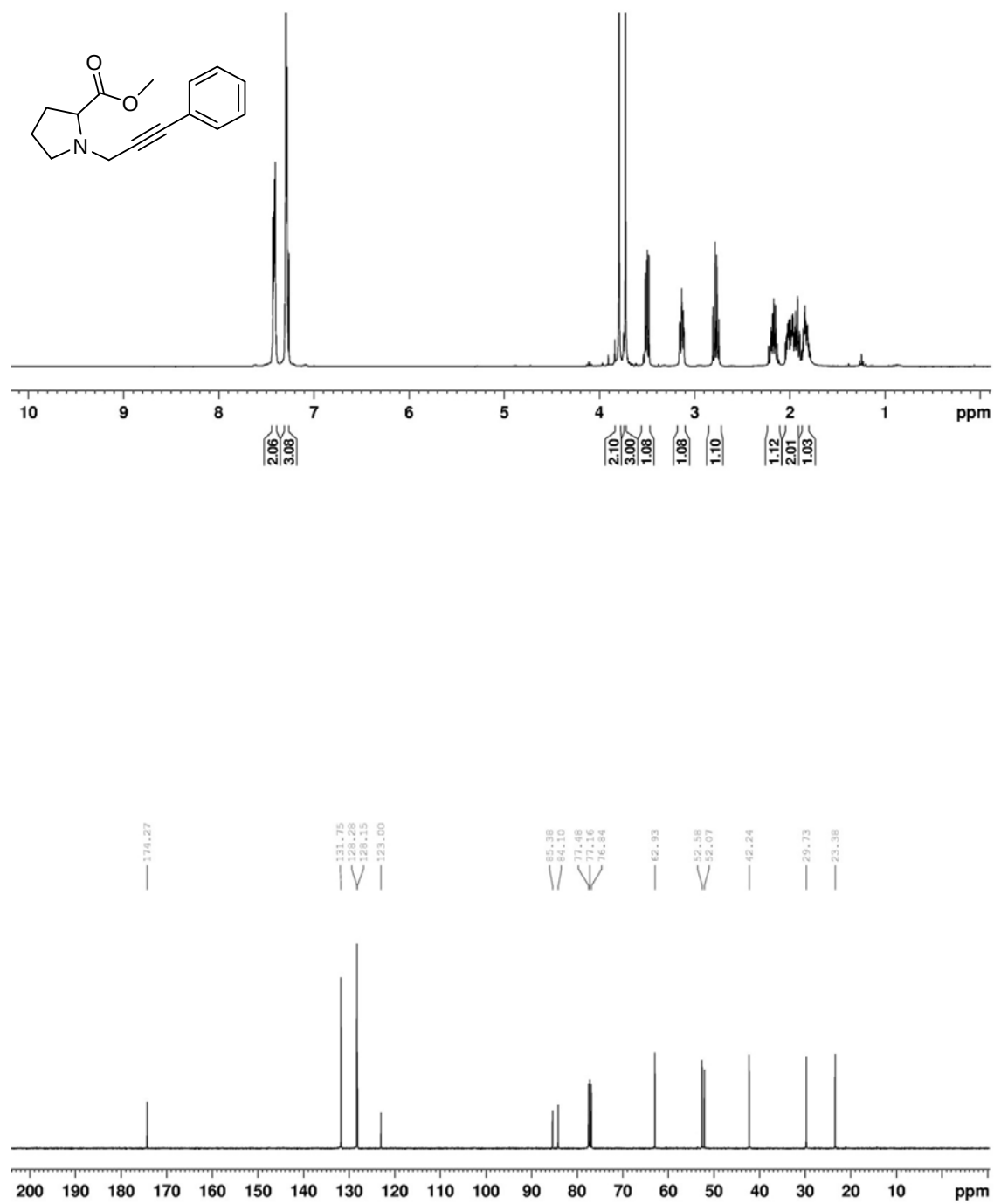


71% Yield; colorless liquid; FT IR 2370 (C≡C), 1738 (C=O), cm⁻¹; ¹H NMR (400 MHz, CDCl₃) 4.28 (s, 2H), 3.68 (s, 3H), 3.57 (s, 2H), 3.39 (dd, *J* = 8.9 Hz, 6.6 Hz, 1Hz), 3.02-2.9 (m, 1H), 2.70-2.63 (m, 1H), 2.15-2.05 (m, 1H), 1.97-1.72 (m, 3H), 0.86 (s, 9H), 0.06 (s, 6H); ¹³C NMR (100 MHz, CDCl₃) 174.2, 84.0, 79.3, 62.5, 52.3, 52.0, 51.8, 41.5, 29.6, 25.8, 23.3, 18.3, -5.1.

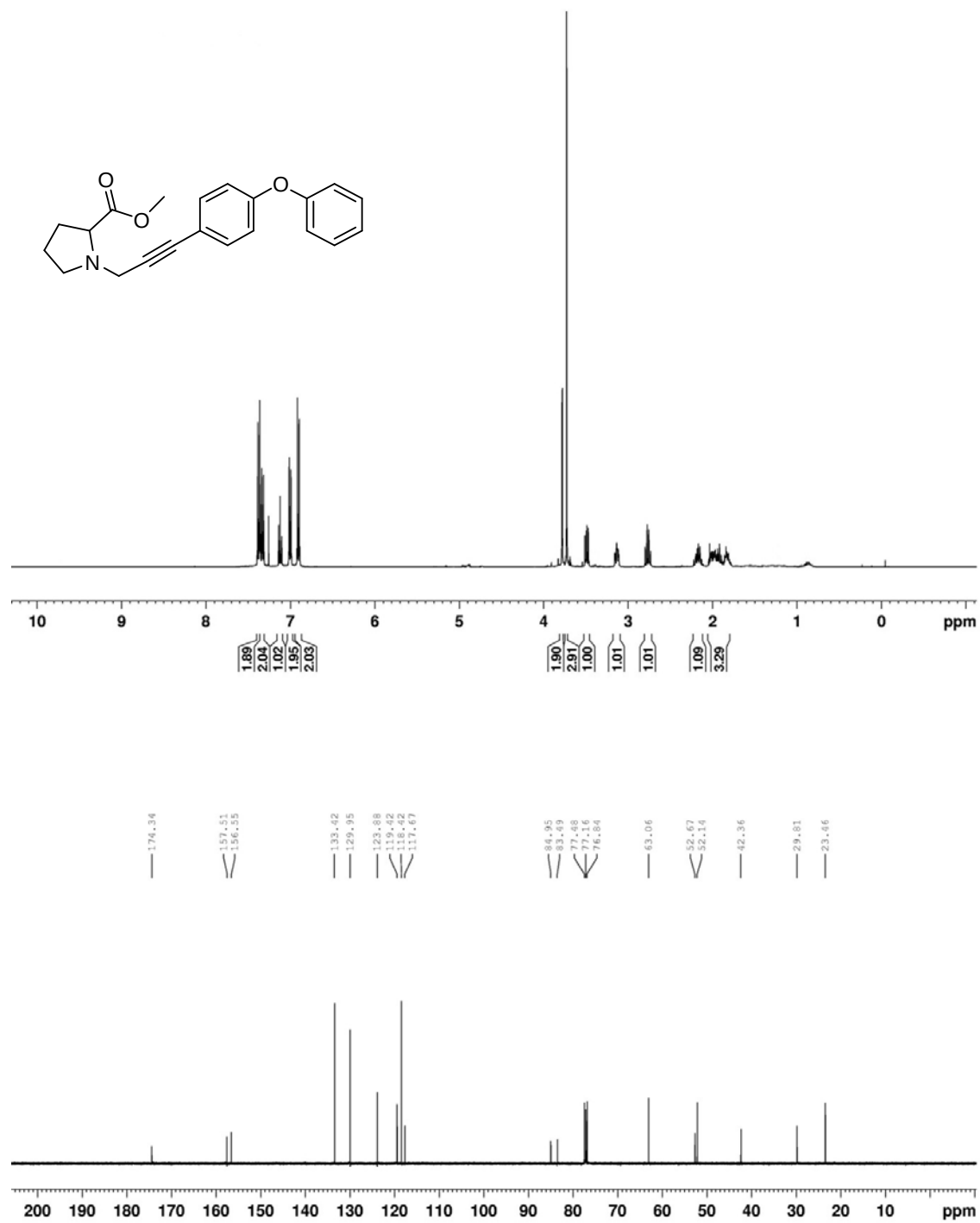
Reference:

1. Uhlig N, Li C –J, *Org. Lett.*, 14 (2012) 3000.

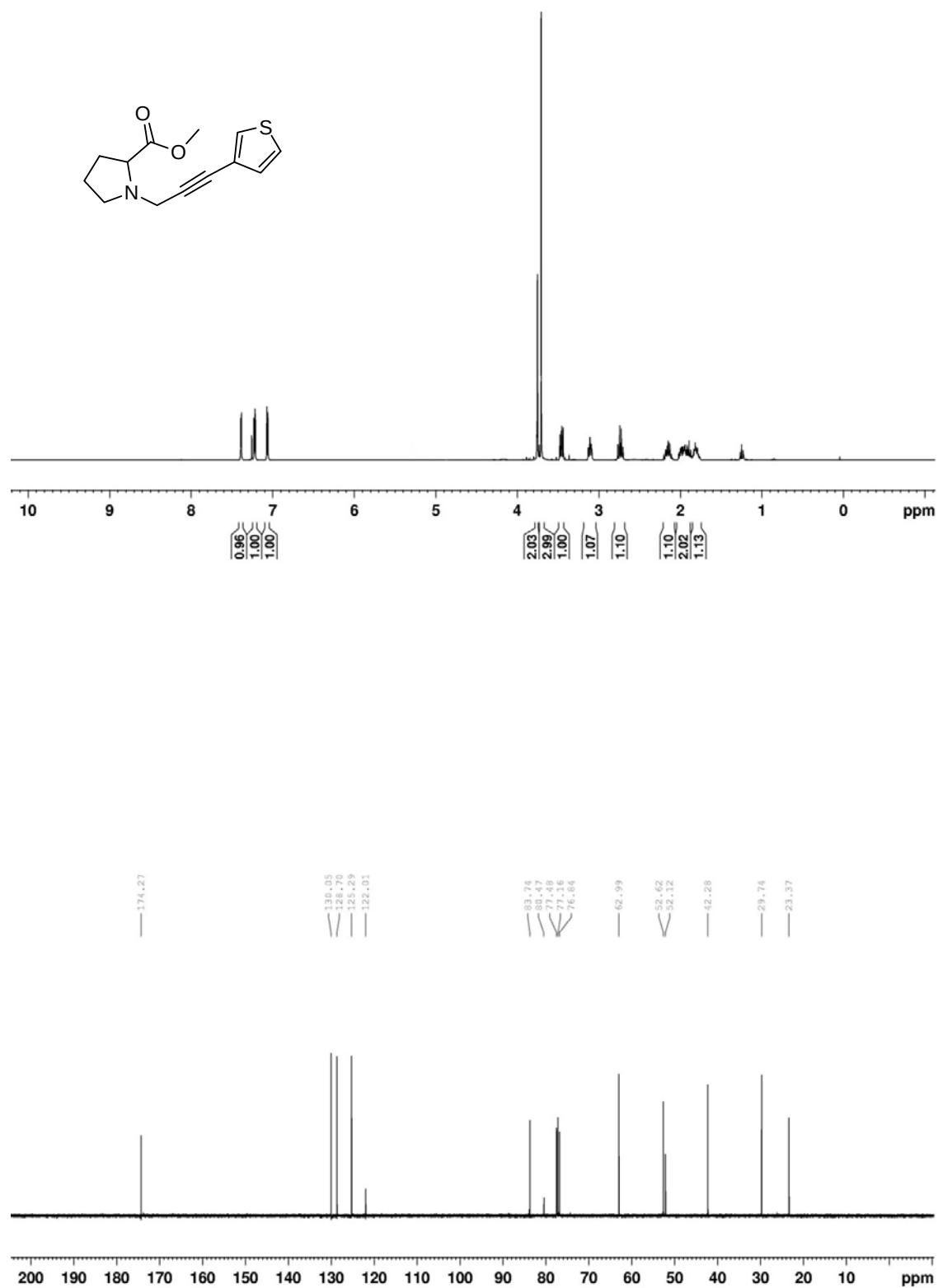
Spectra of N-propargyl proline ester Derivatives:



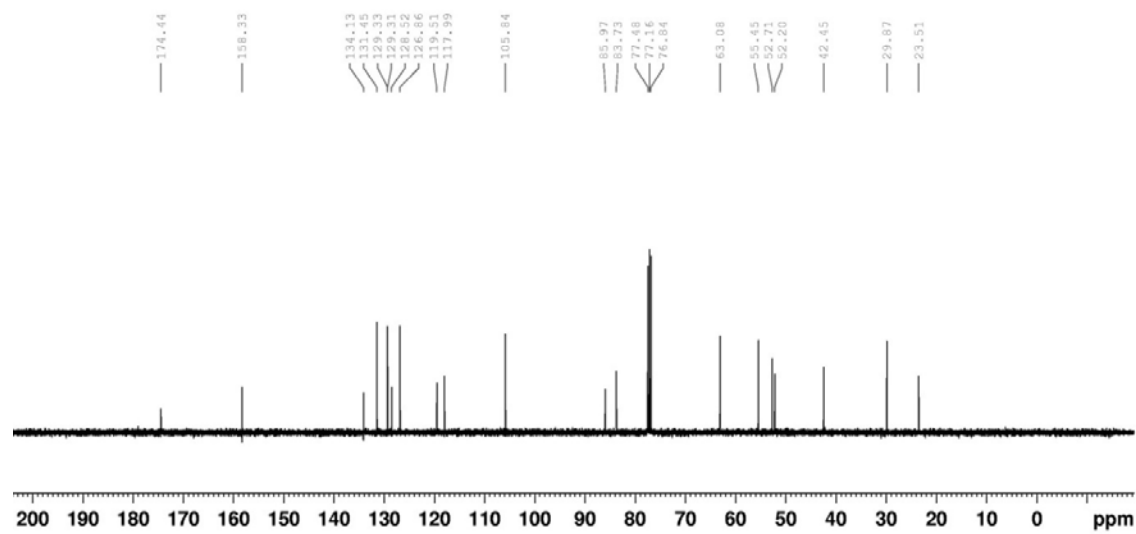
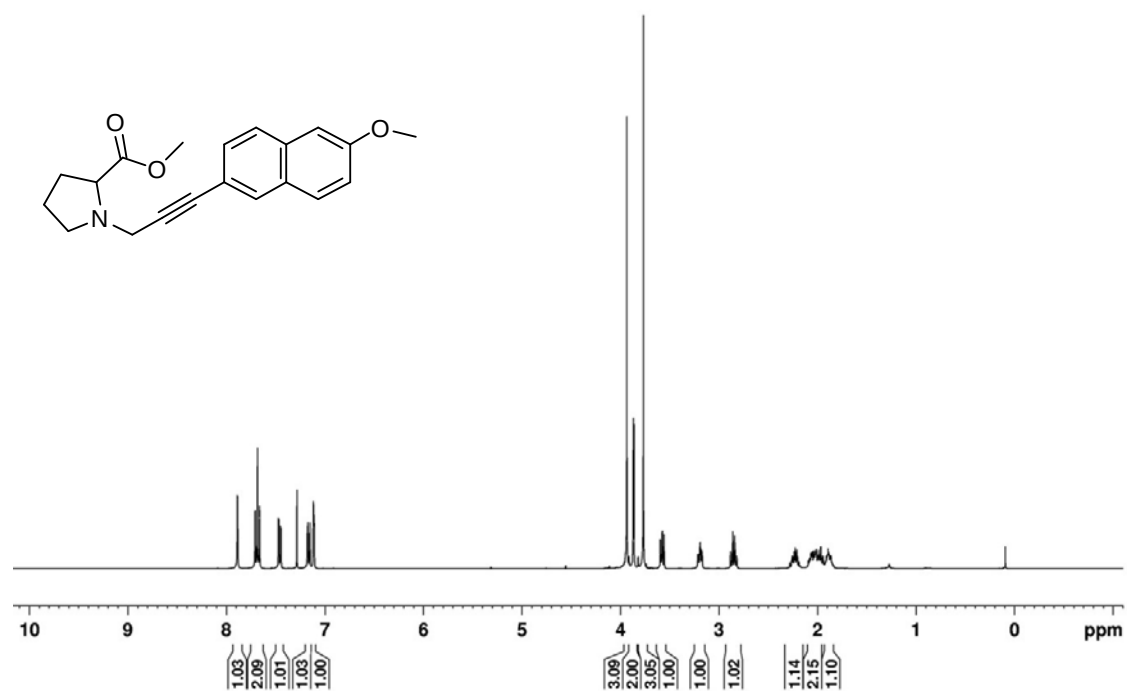
¹H and ¹³C spectra of 5a



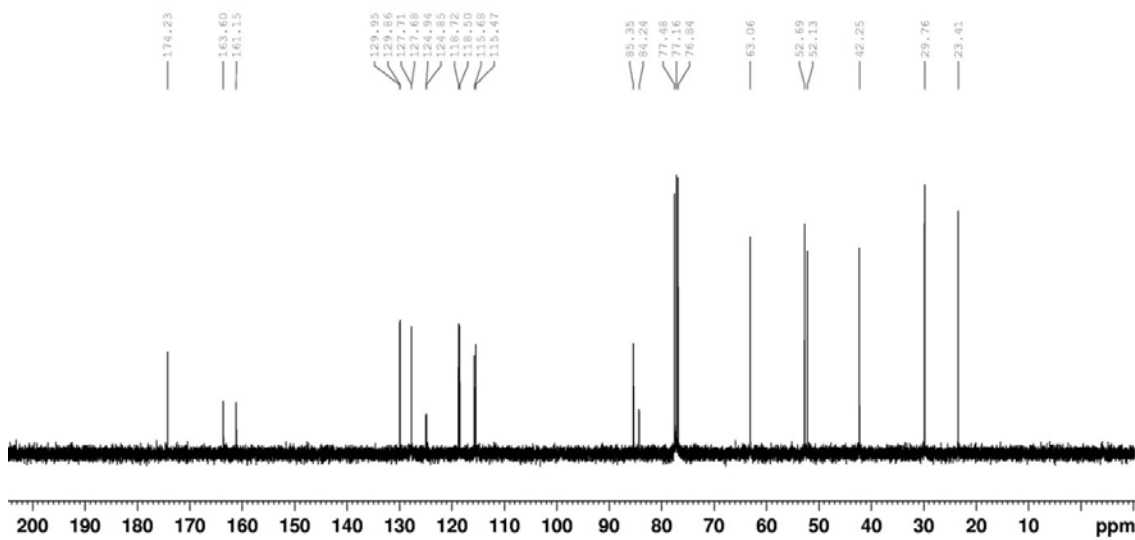
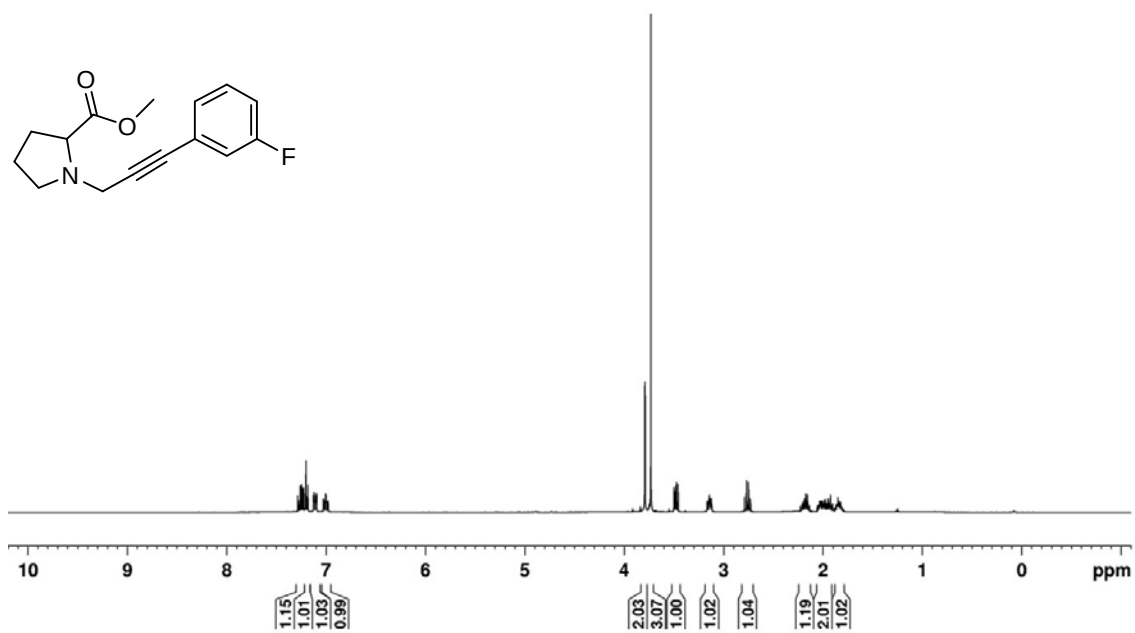
^1H and ^{13}C spectra of **5b**



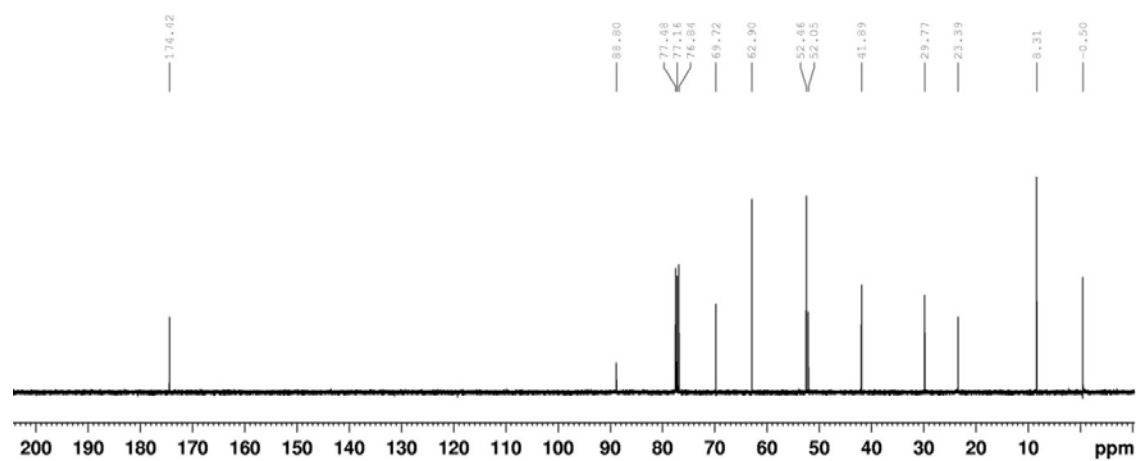
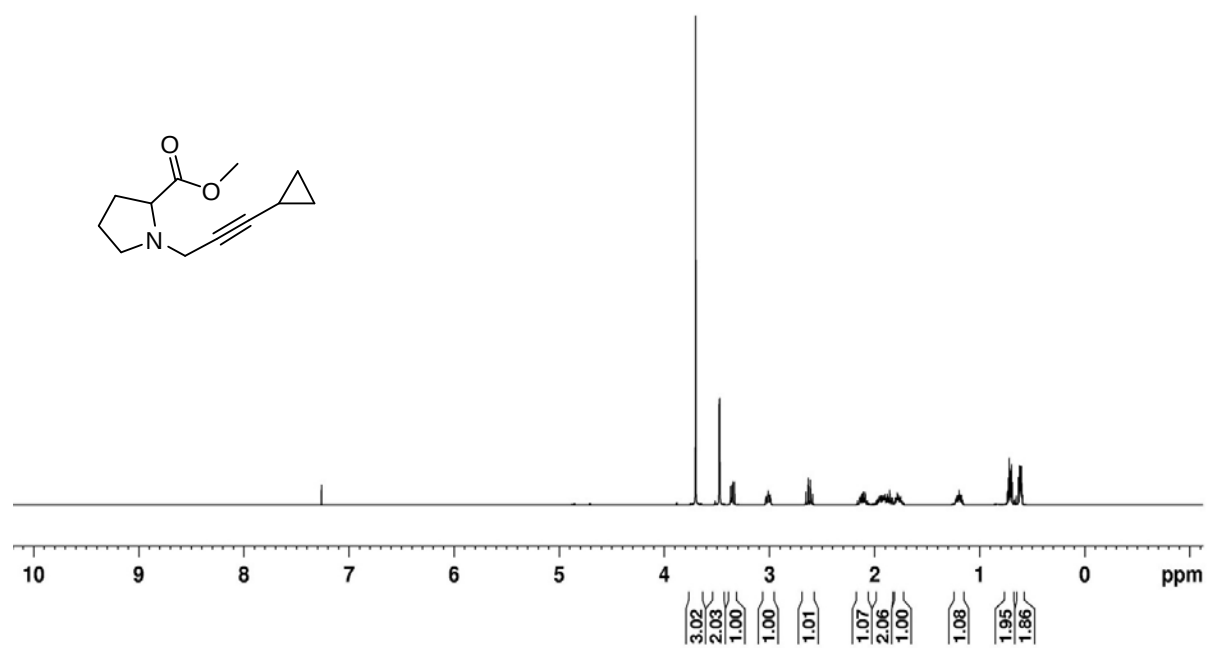
^1H and ^{13}C spectra of 5c



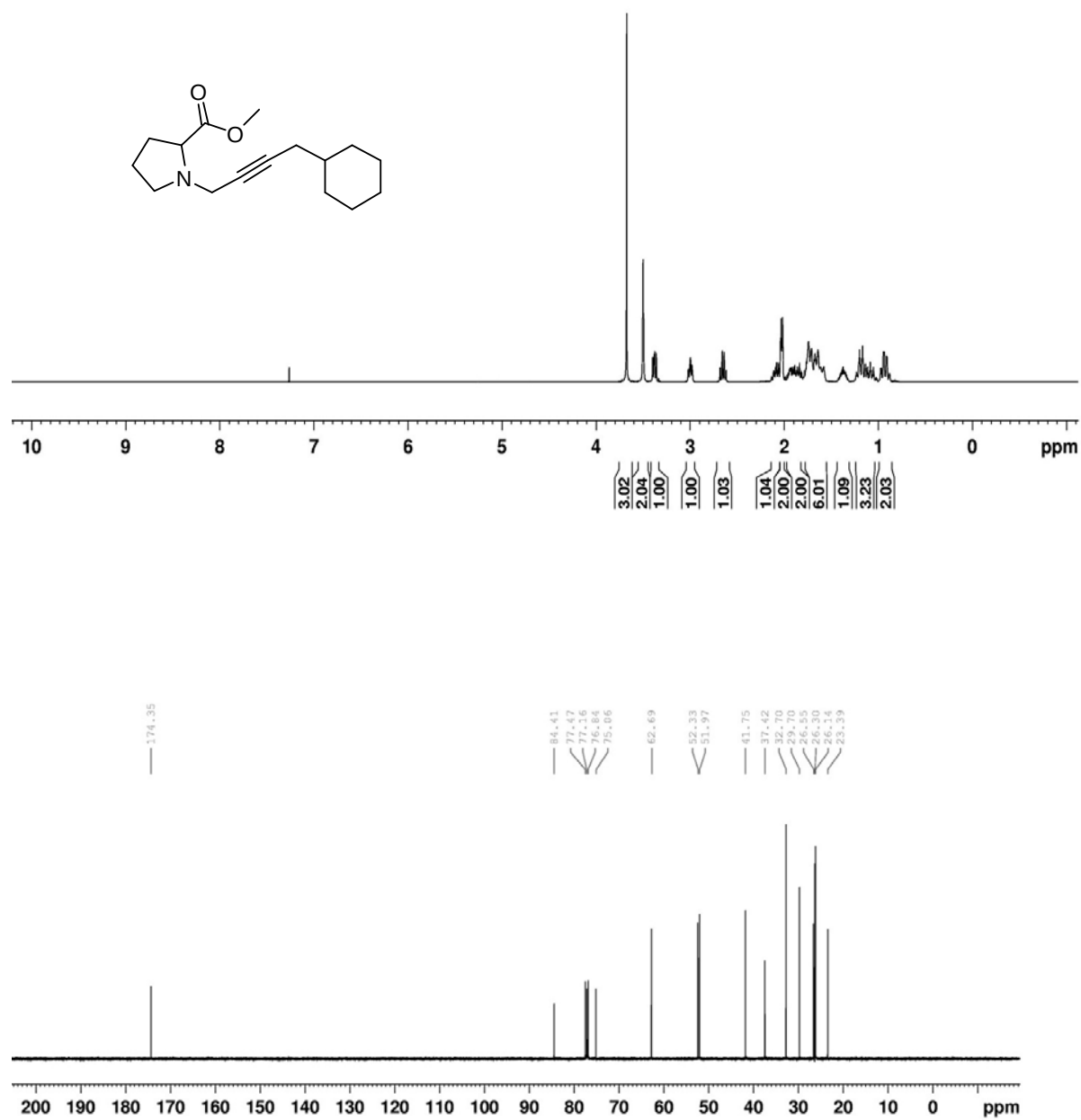
^1H and ^{13}C spectra of **5d**



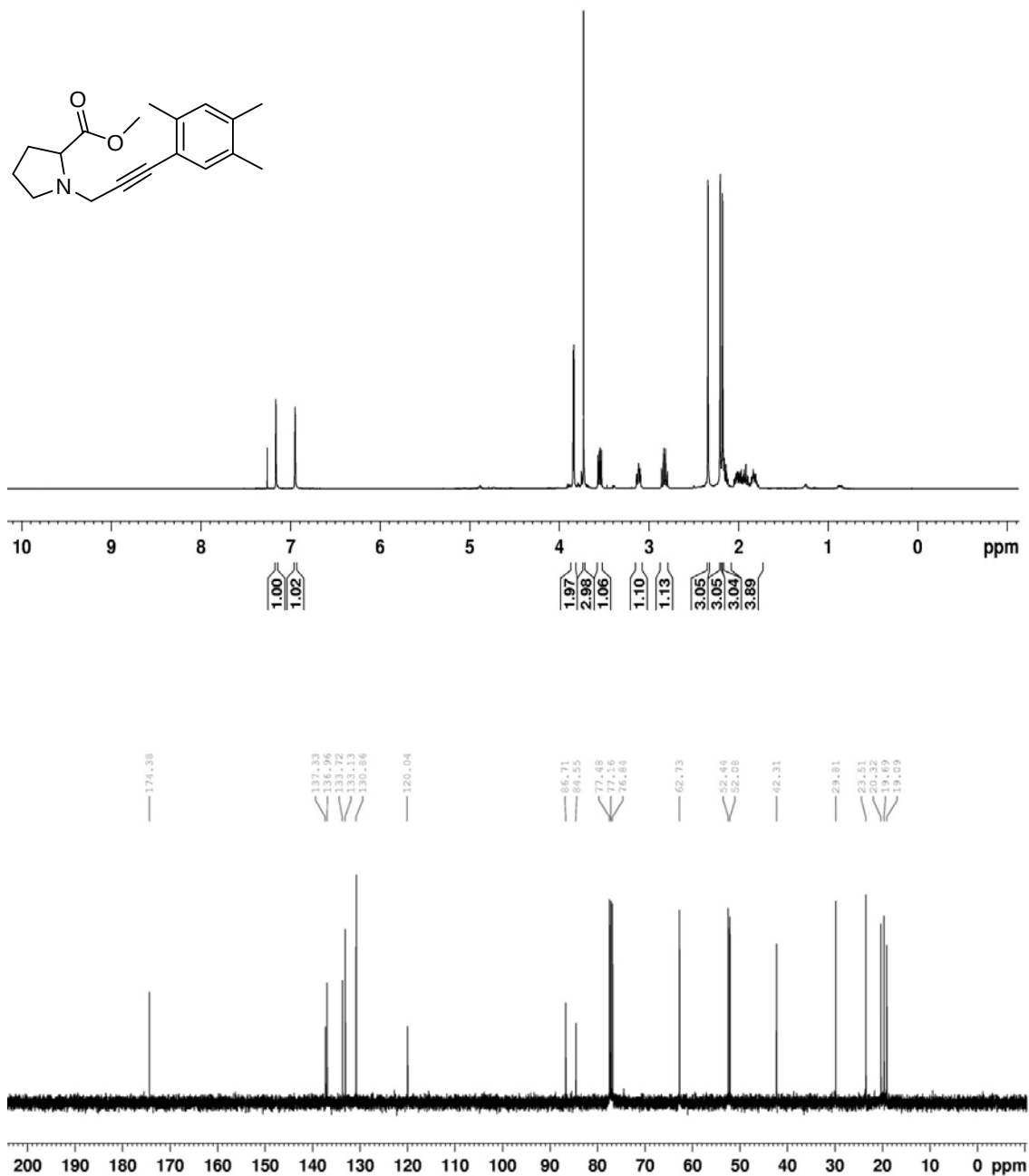
^1H and ^{13}C spectra of 5e



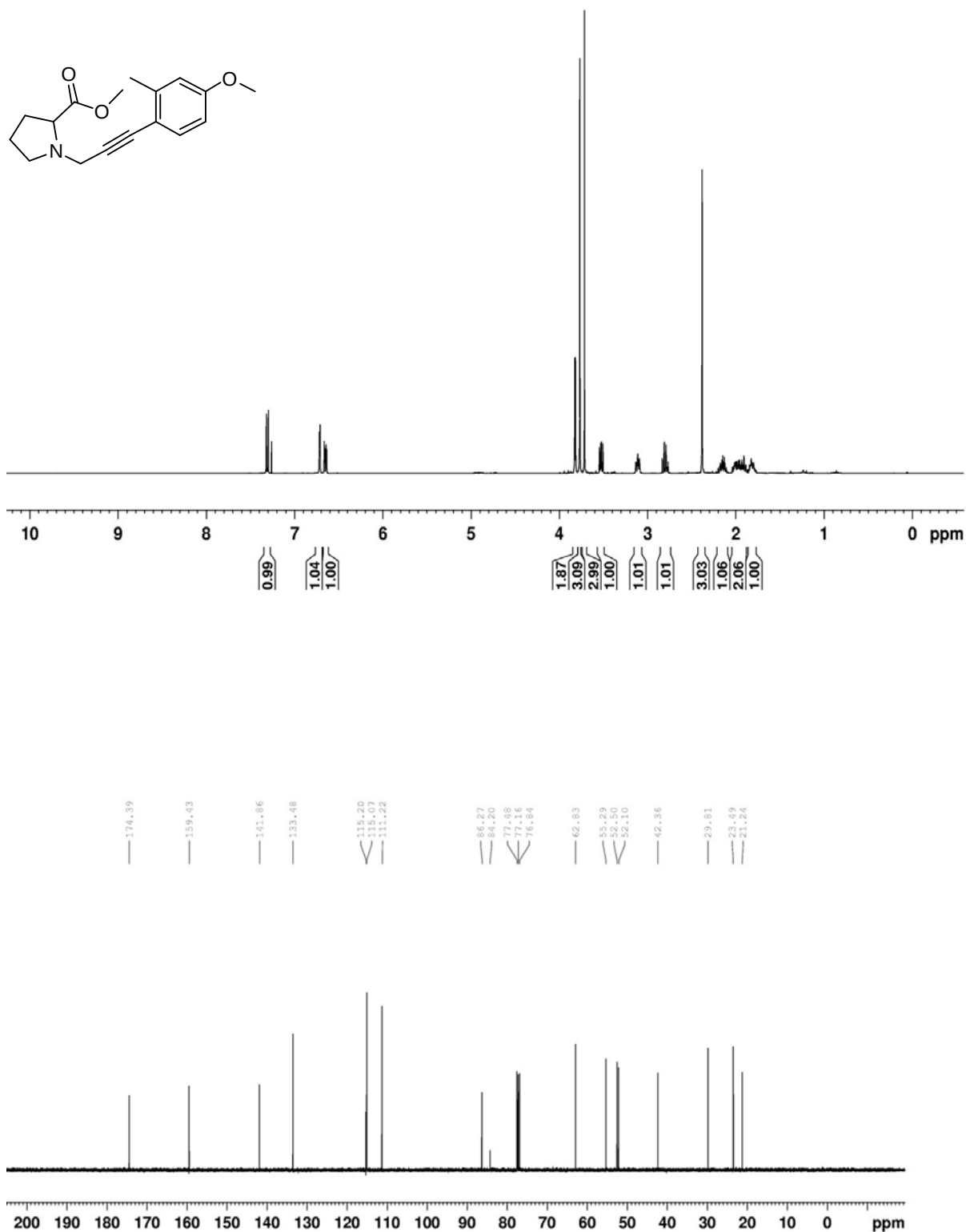
¹H and ¹³C spectra of 5f



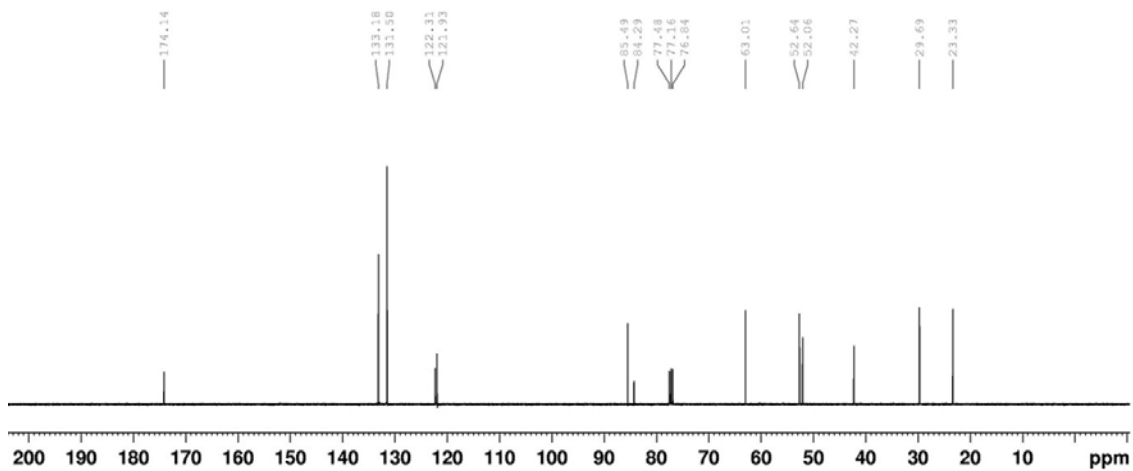
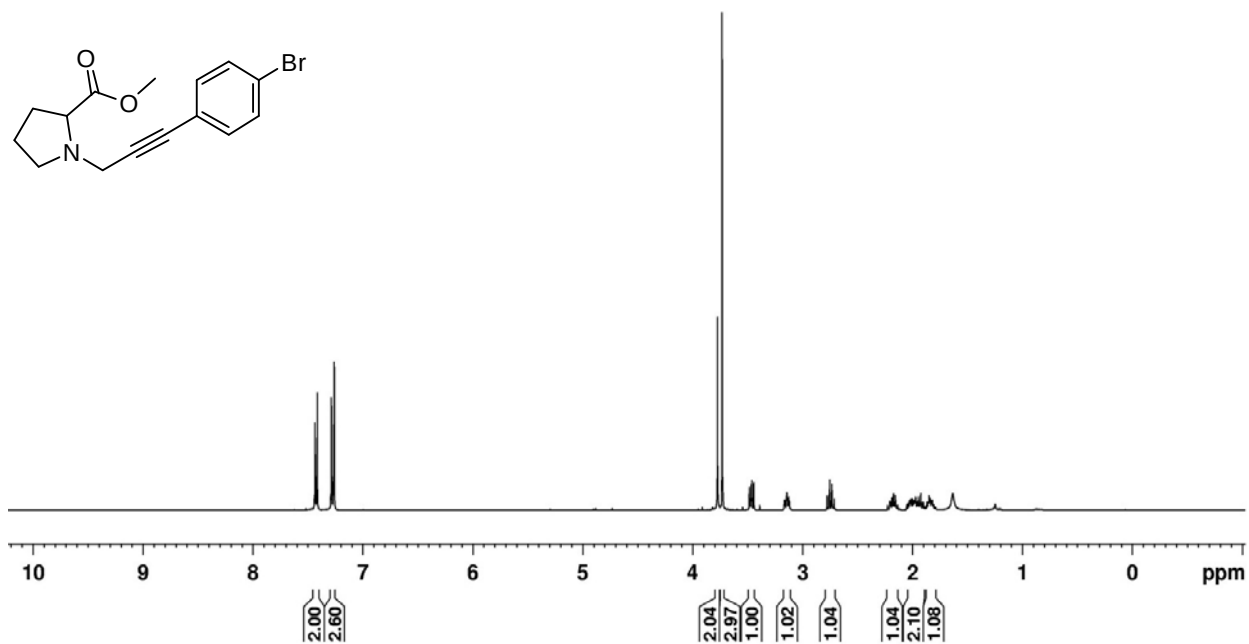
^1H and ^{13}C spectra of **5g**



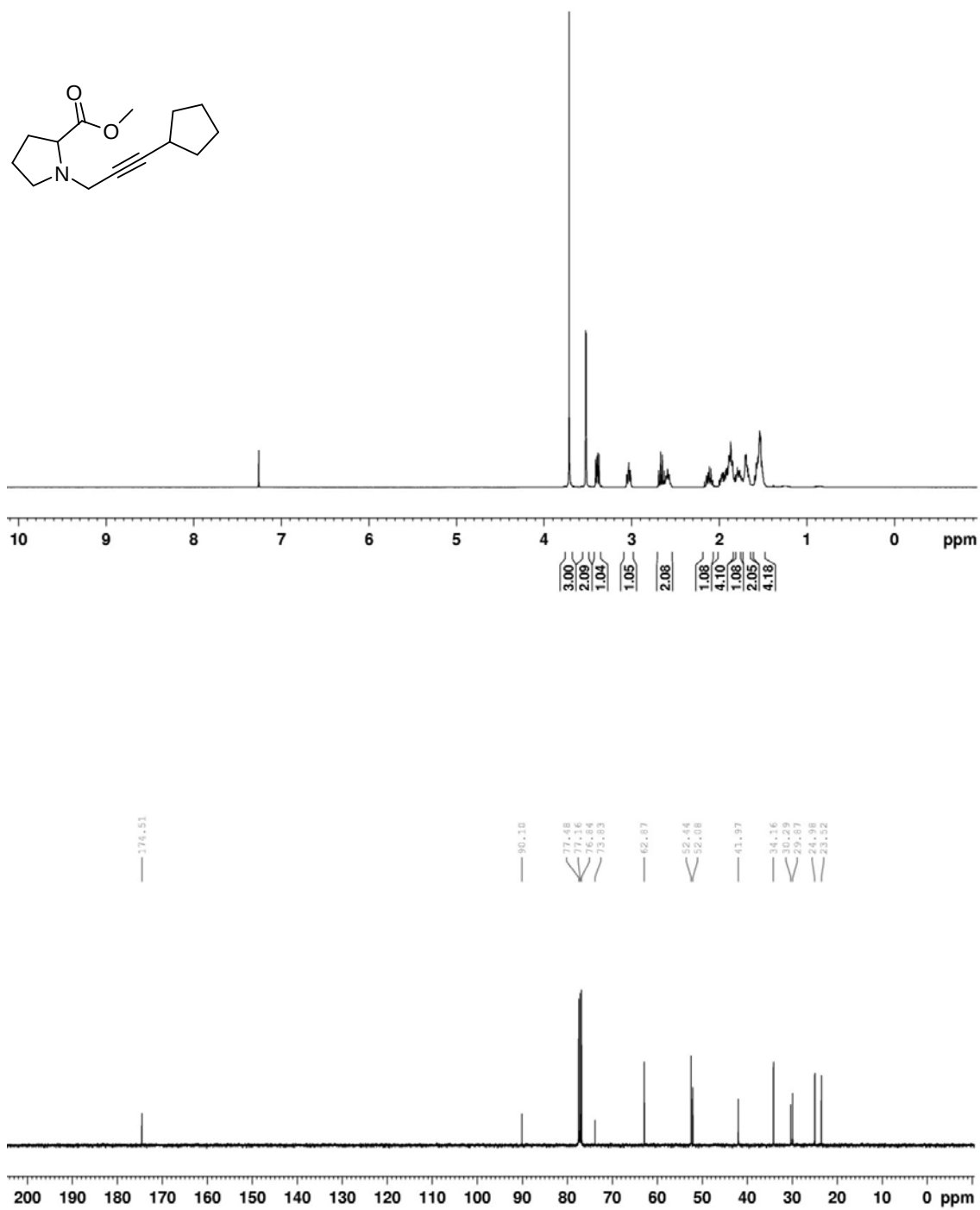
^1H and ^{13}C spectra of **5h**



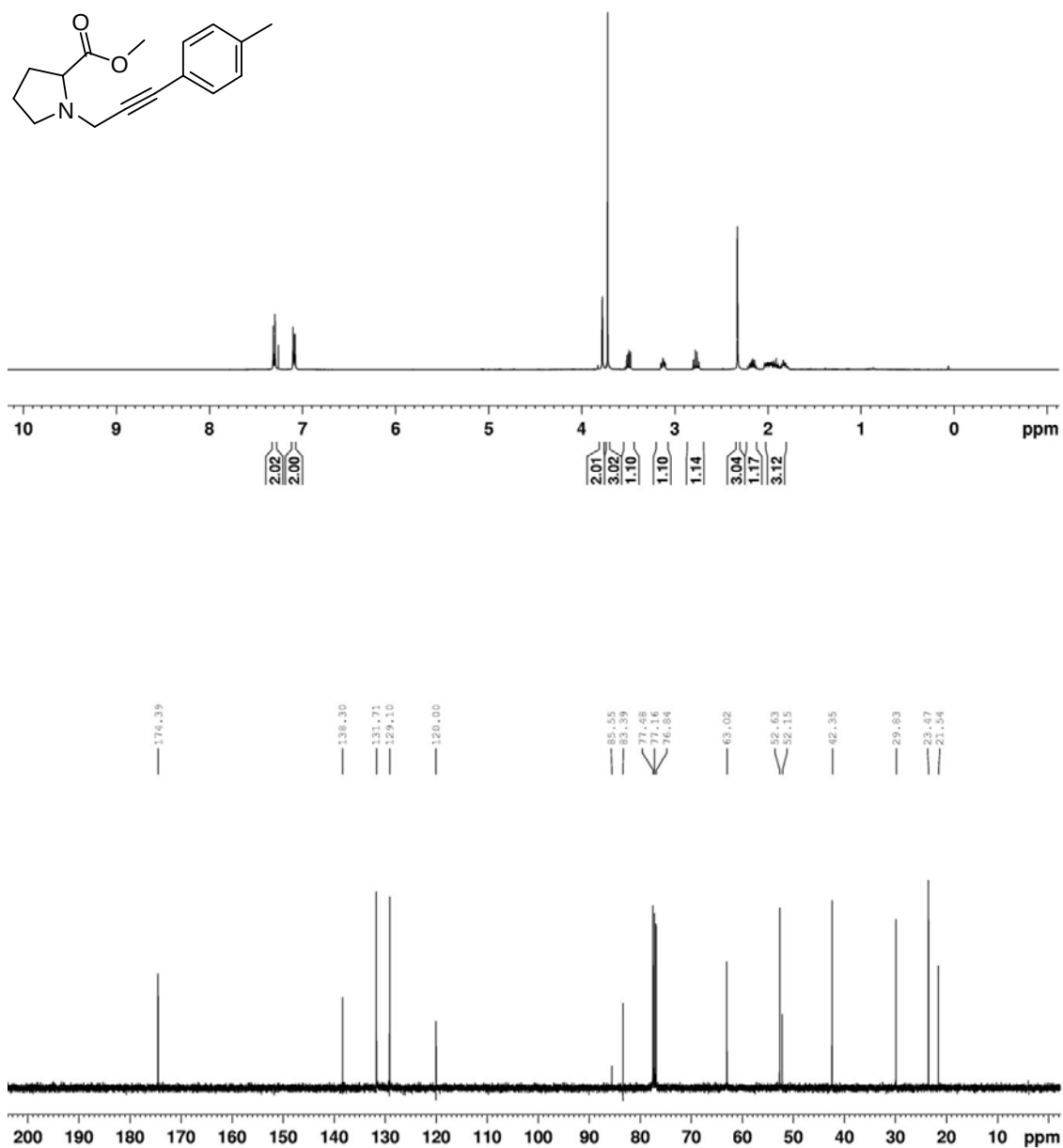
^1H and ^{13}C spectra of **5i**



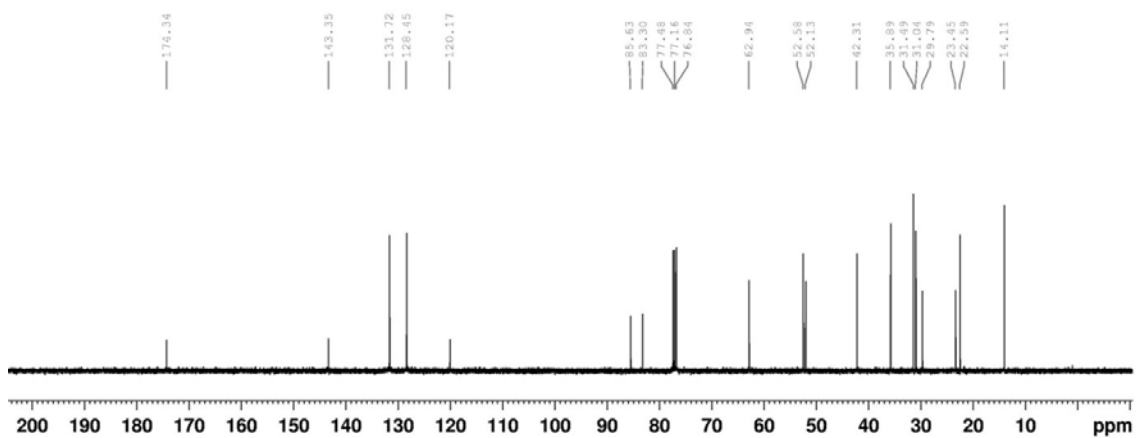
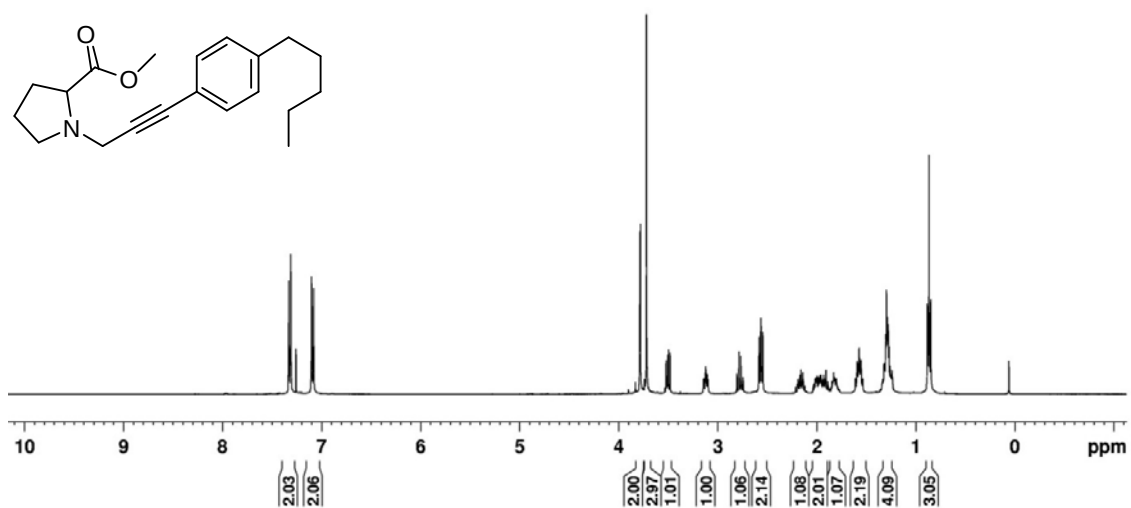
¹H and ¹³C spectra of **5j**



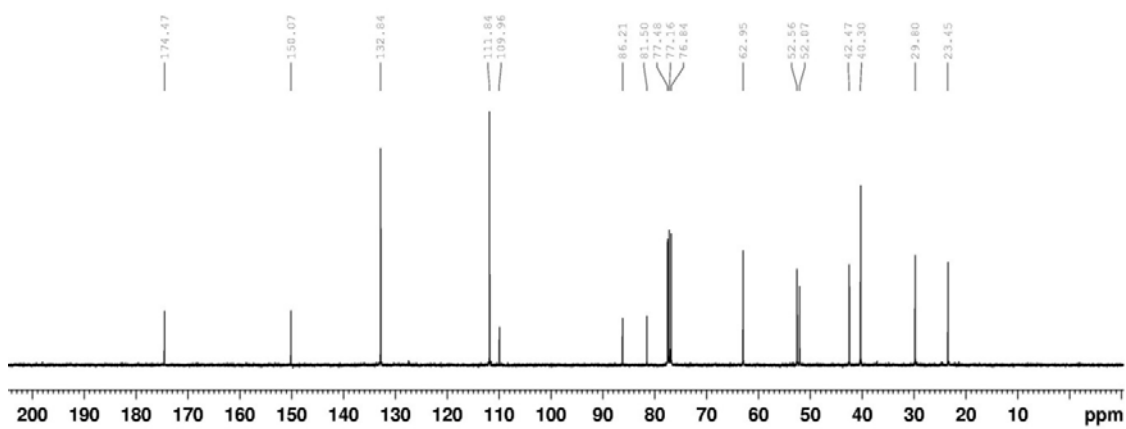
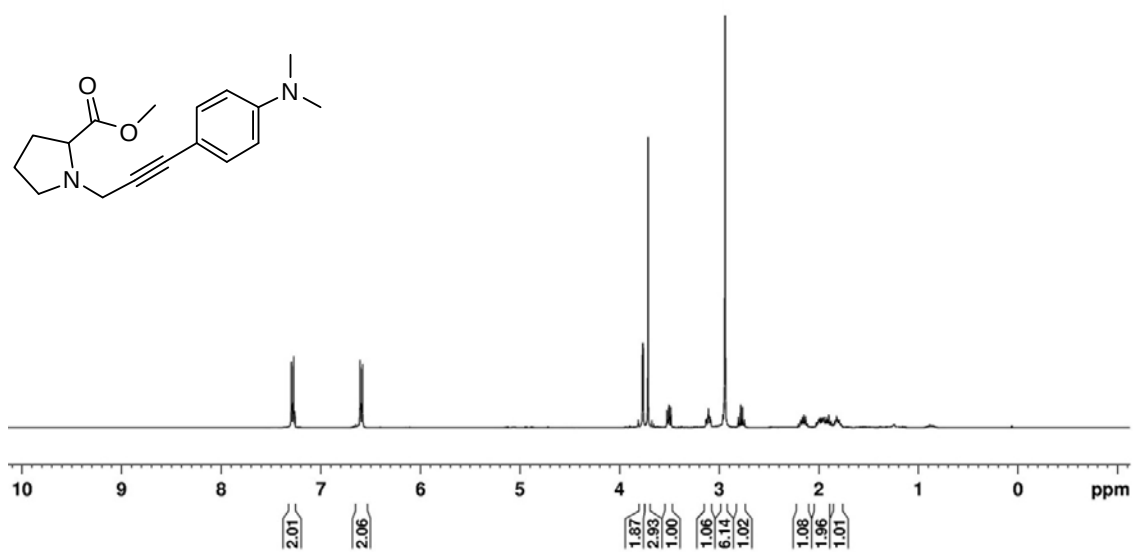
¹H and ¹³C spectra of **5k**



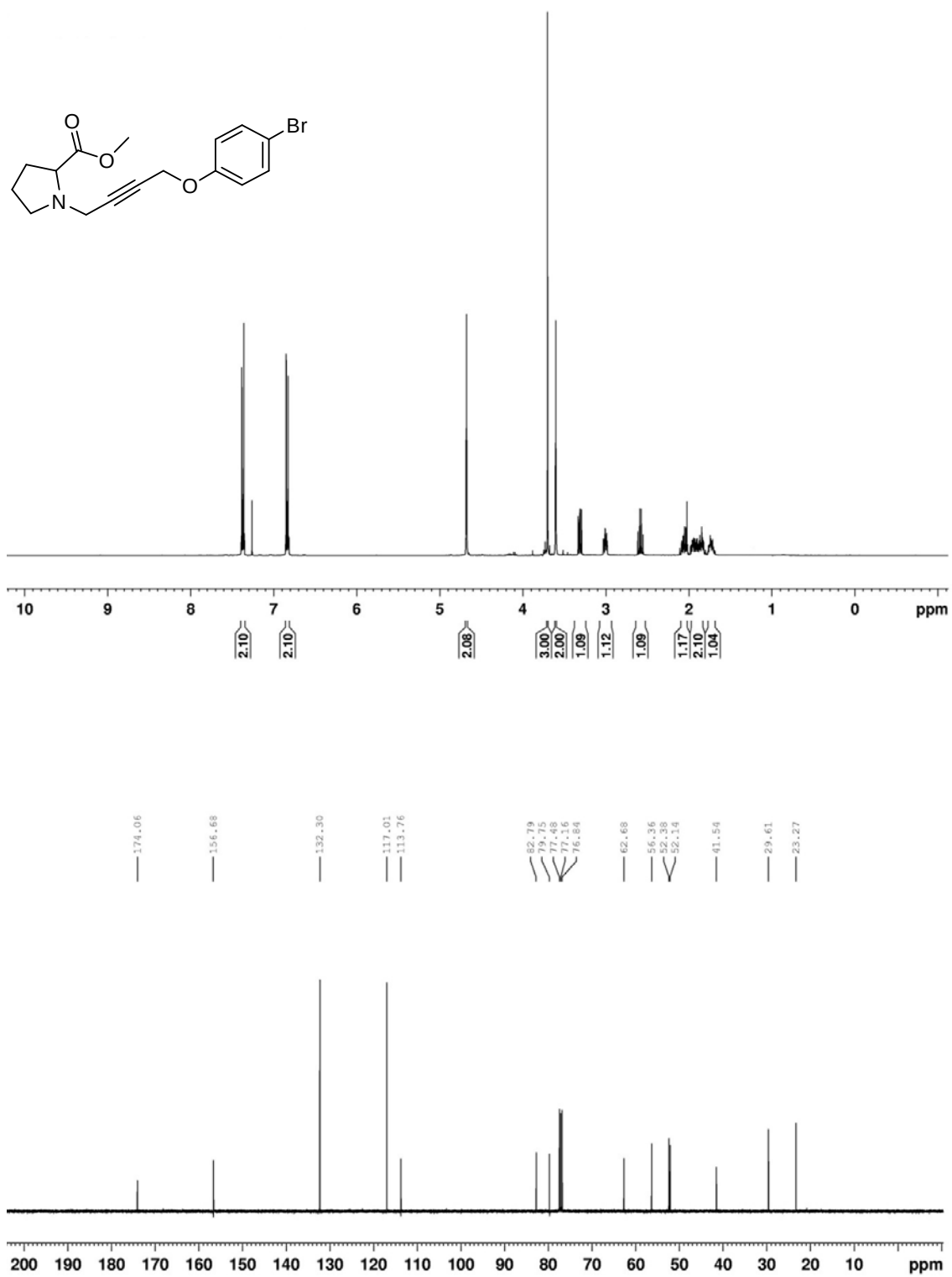
^1H and ^{13}C spectra of **5l**



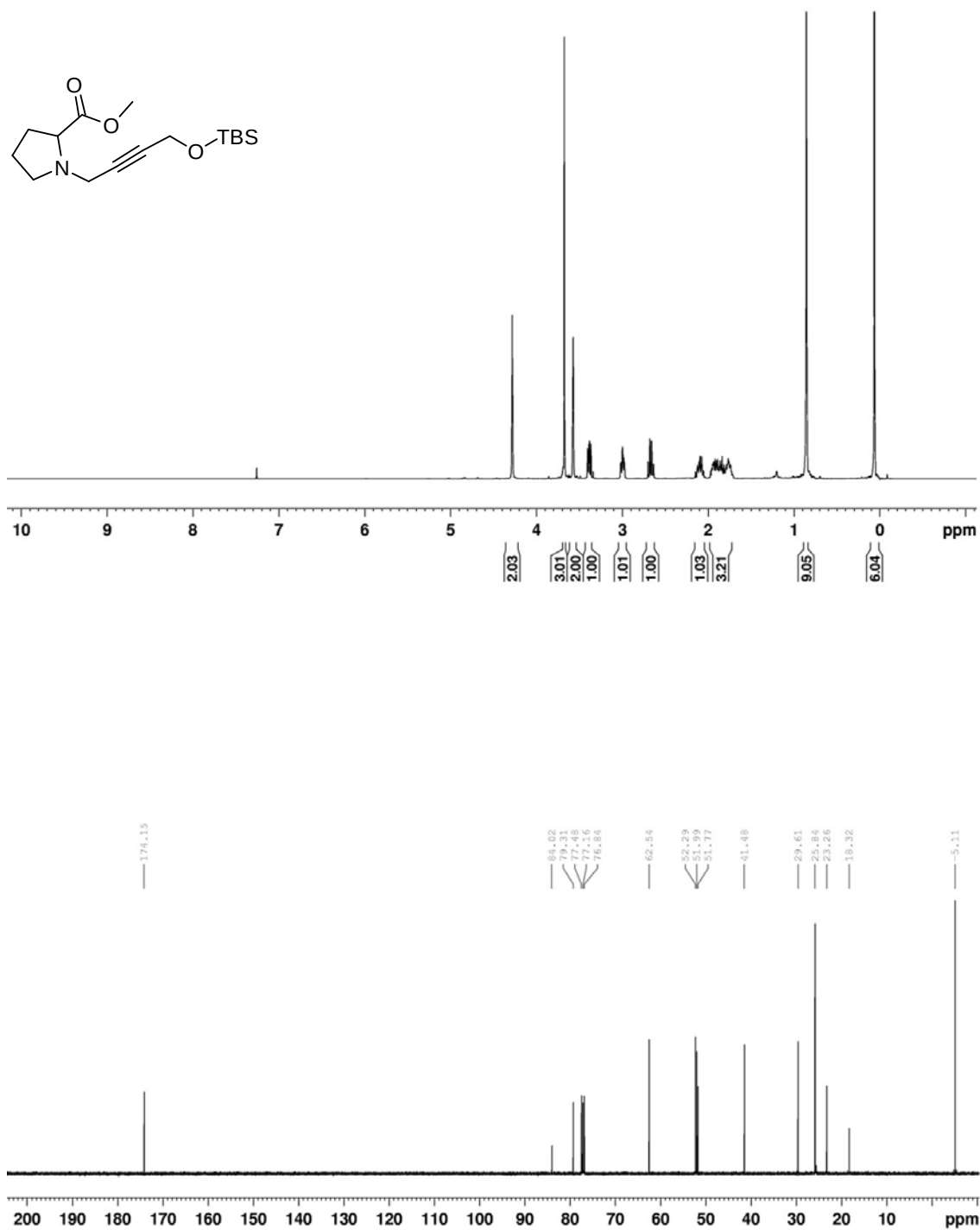
¹H and ¹³C spectra of **5m**



^1H and ^{13}C spectra of **5n**

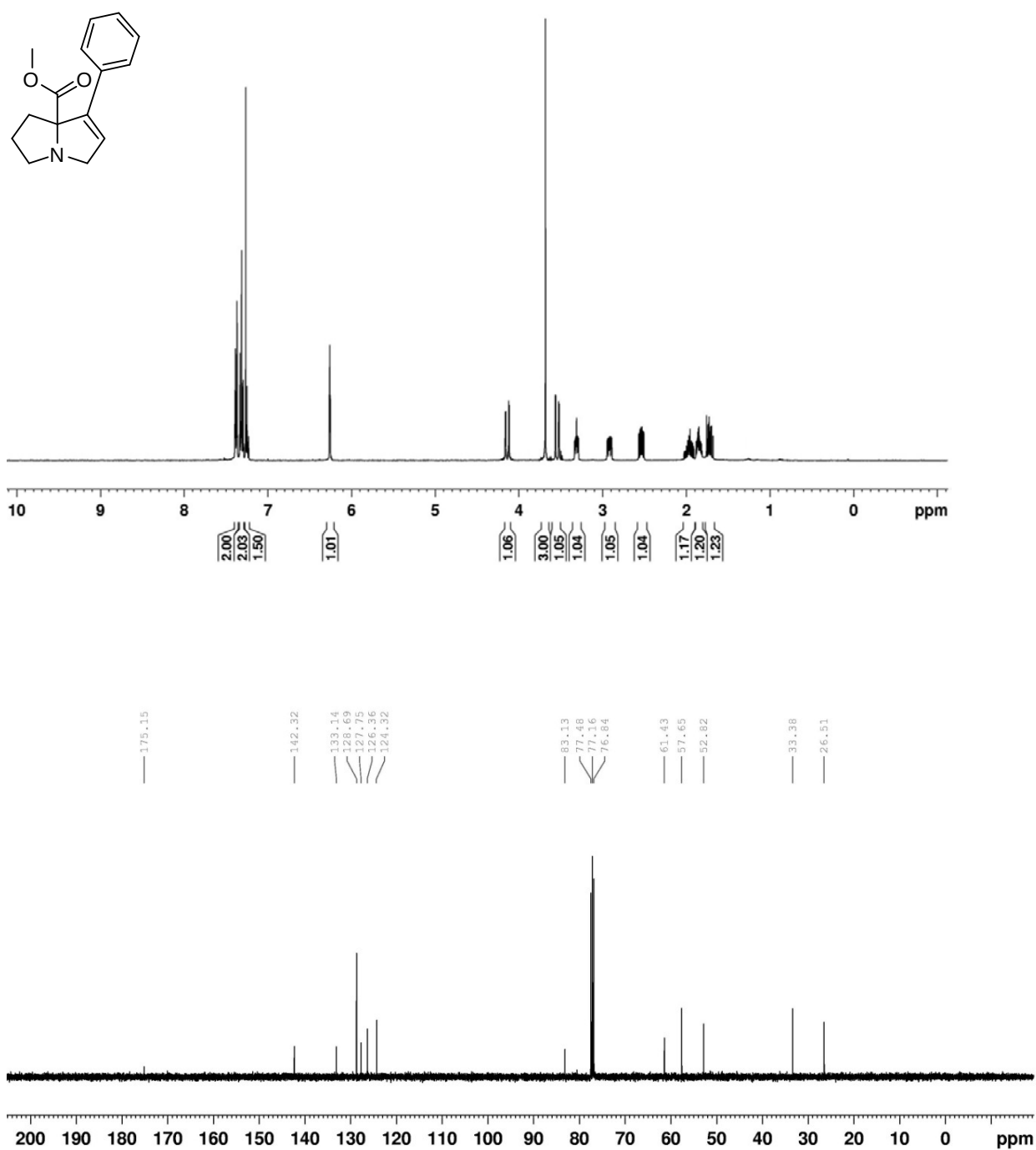


^1H and ^{13}C spectra of **50**

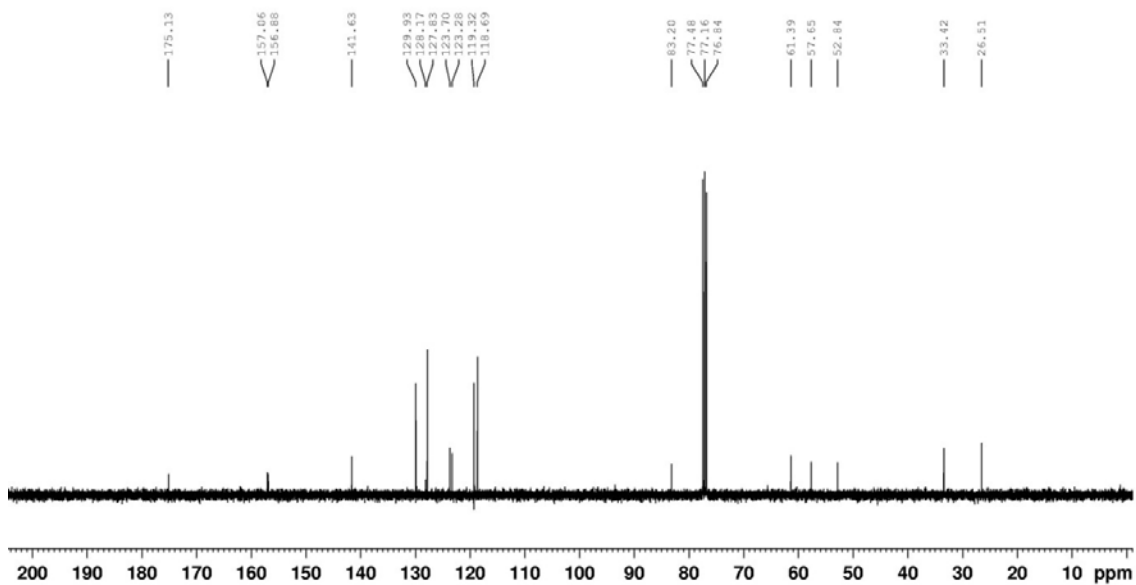
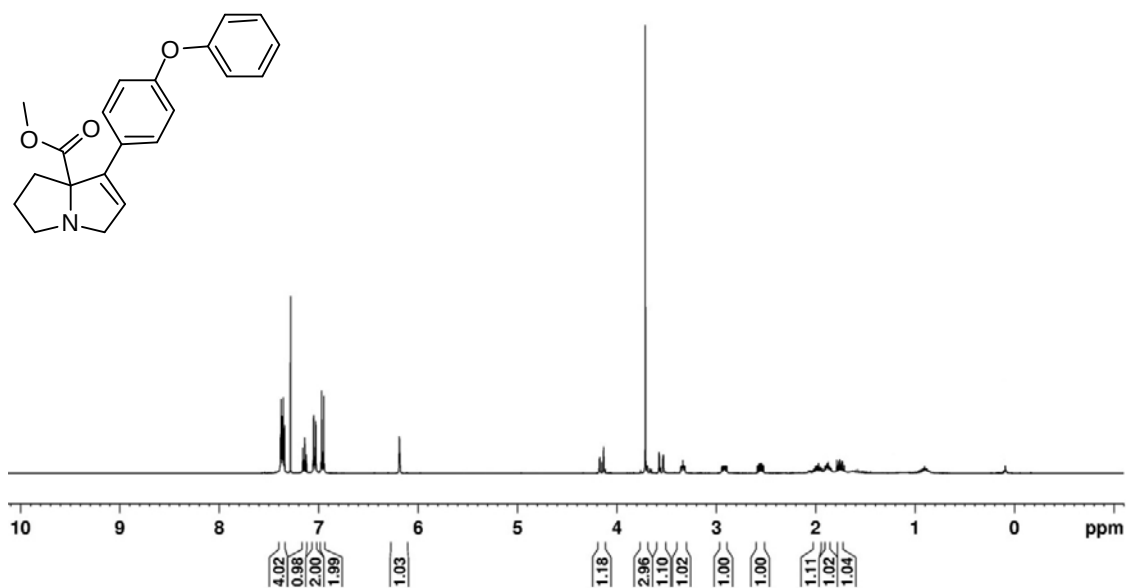


^1H and ^{13}C spectra of **5p**

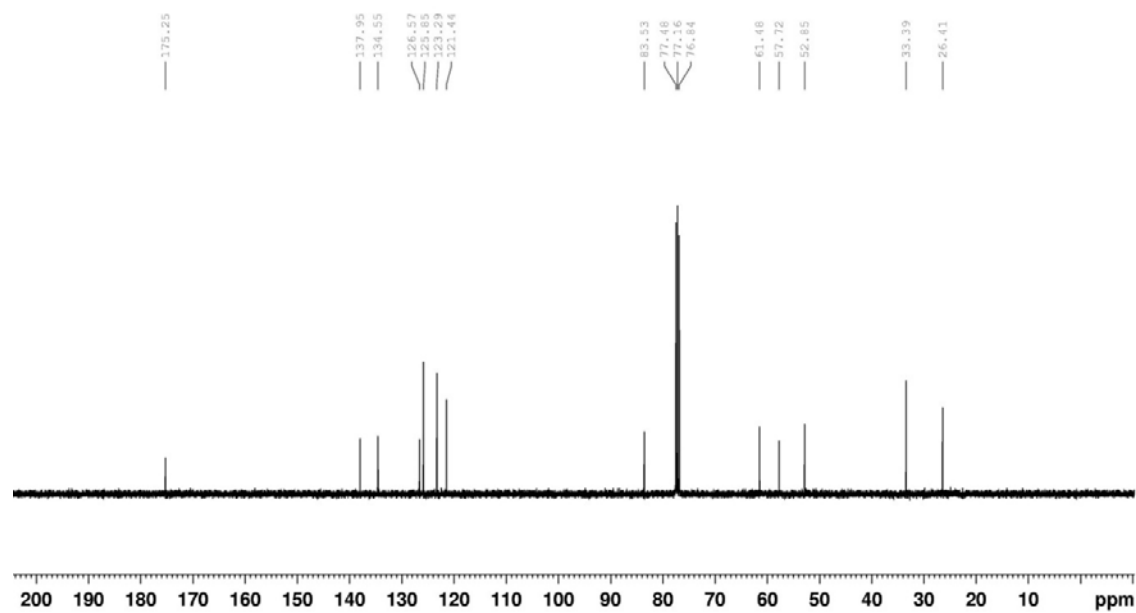
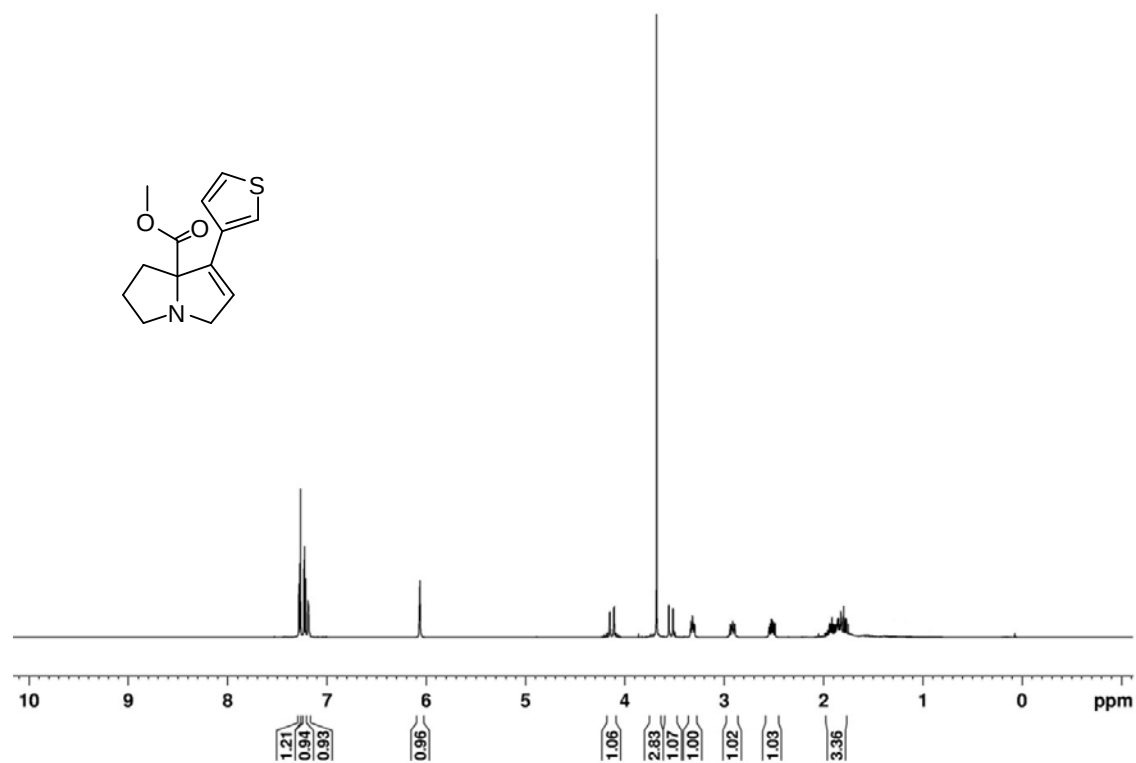
Spectra of Pyrrolizidine Derivatives



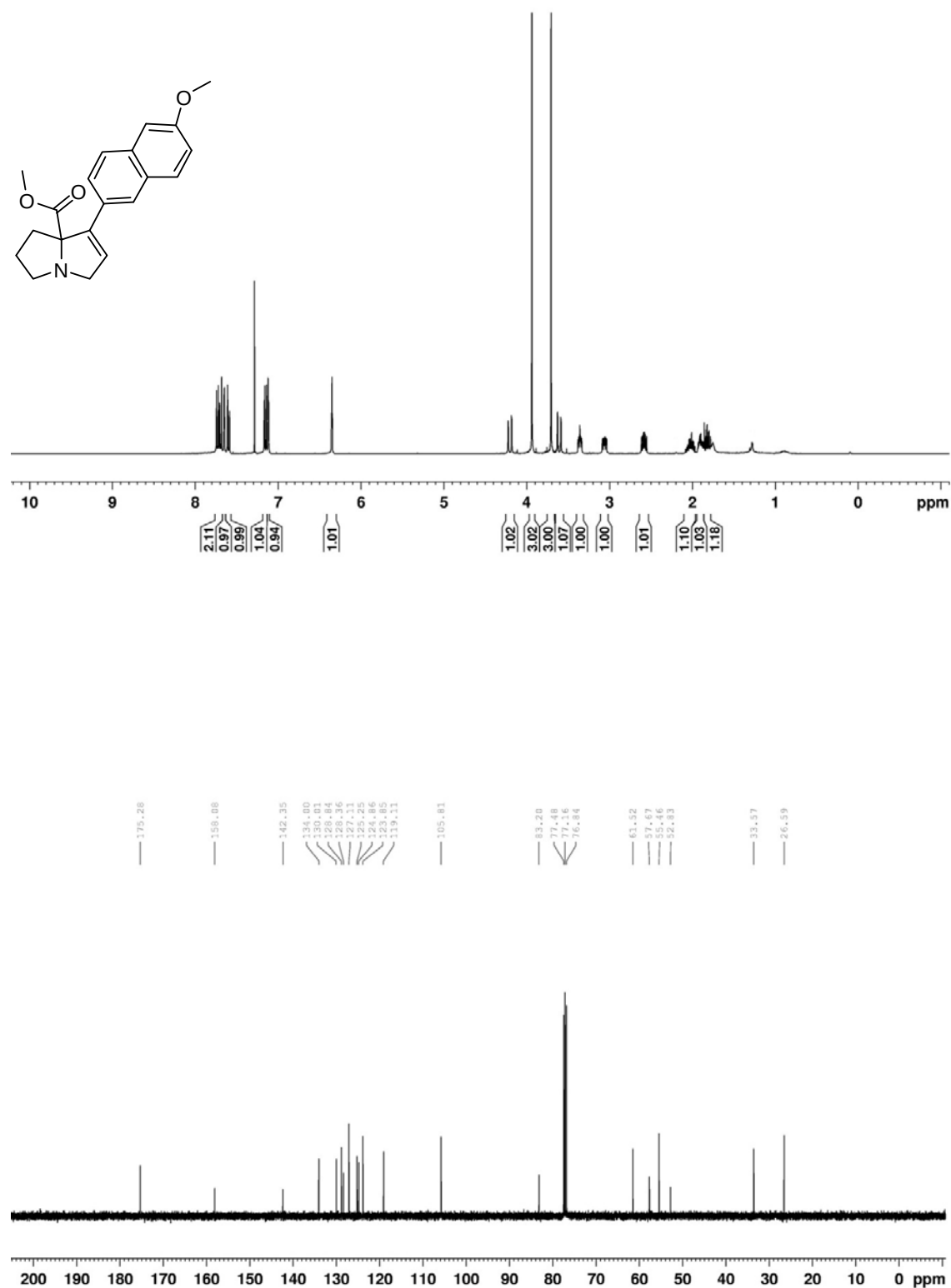
¹H and ¹³C spectra of **6a**



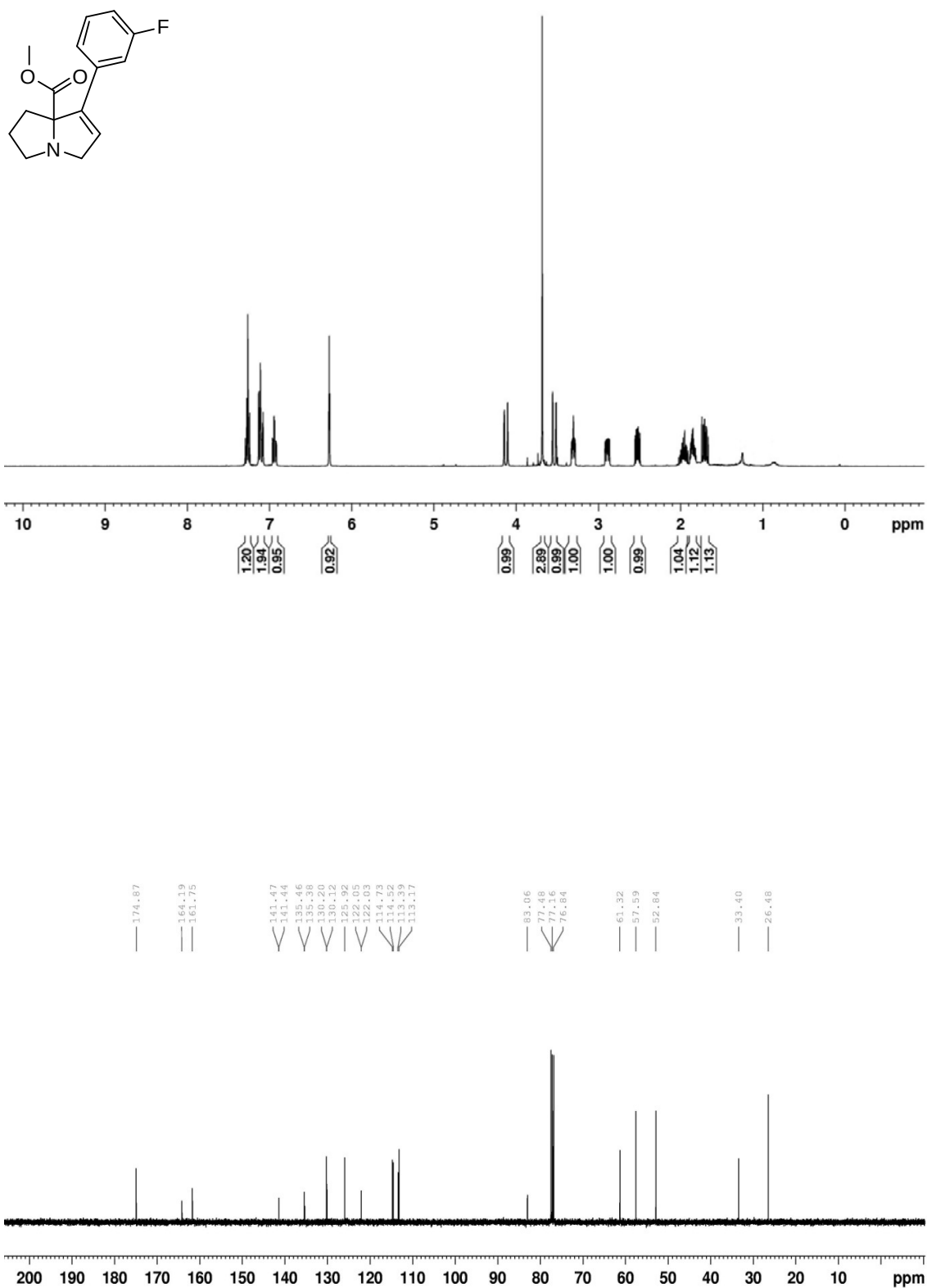
¹H and ¹³C spectra of **6b**



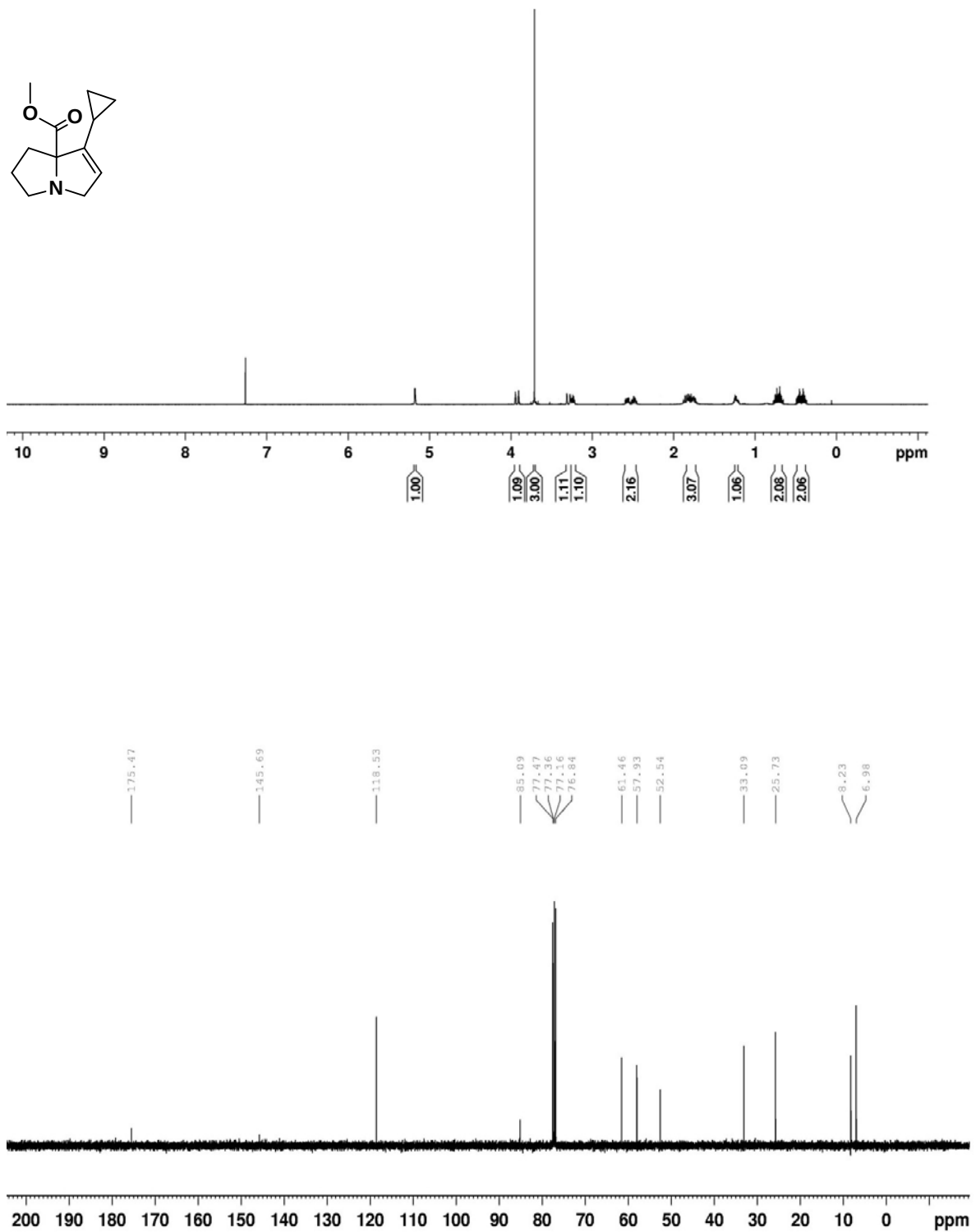
^1H and ^{13}C spectra of **6c**



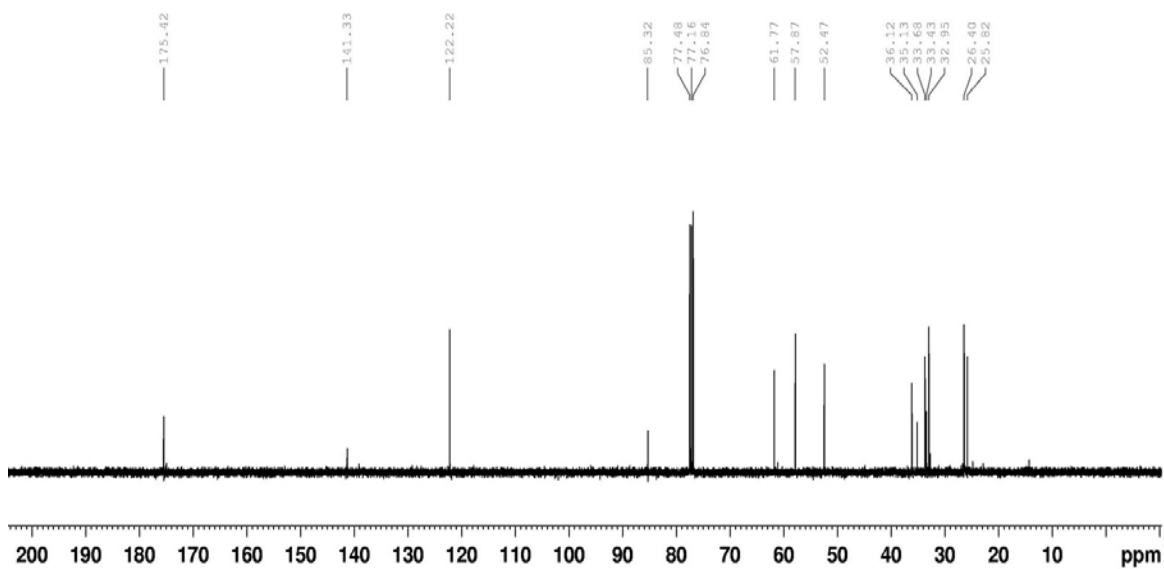
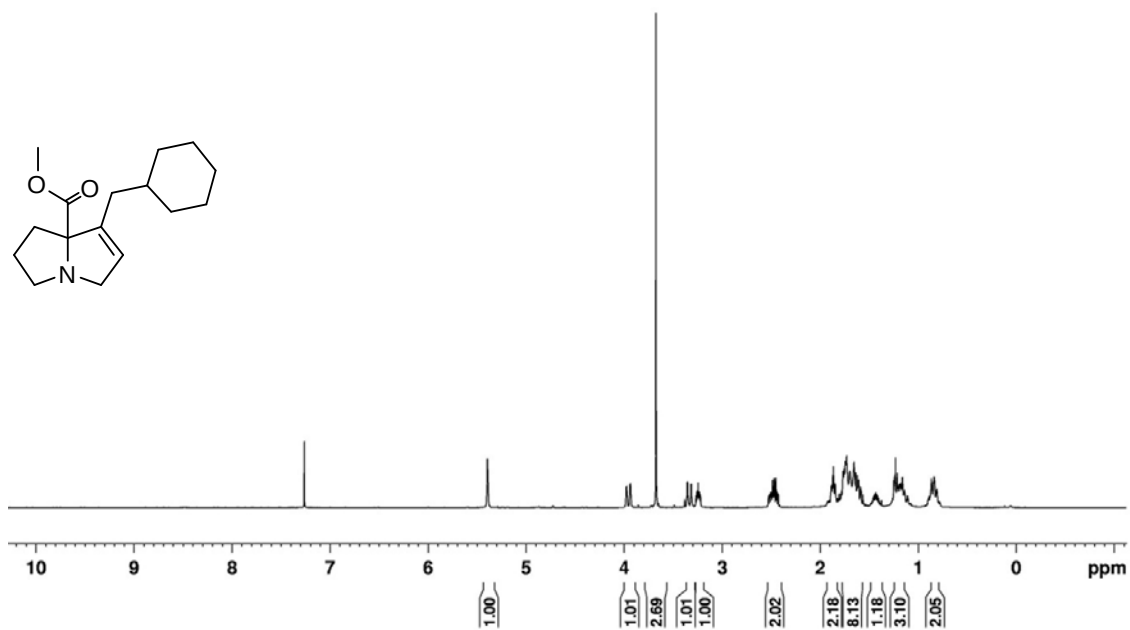
^1H and ^{13}C spectra of **6d**



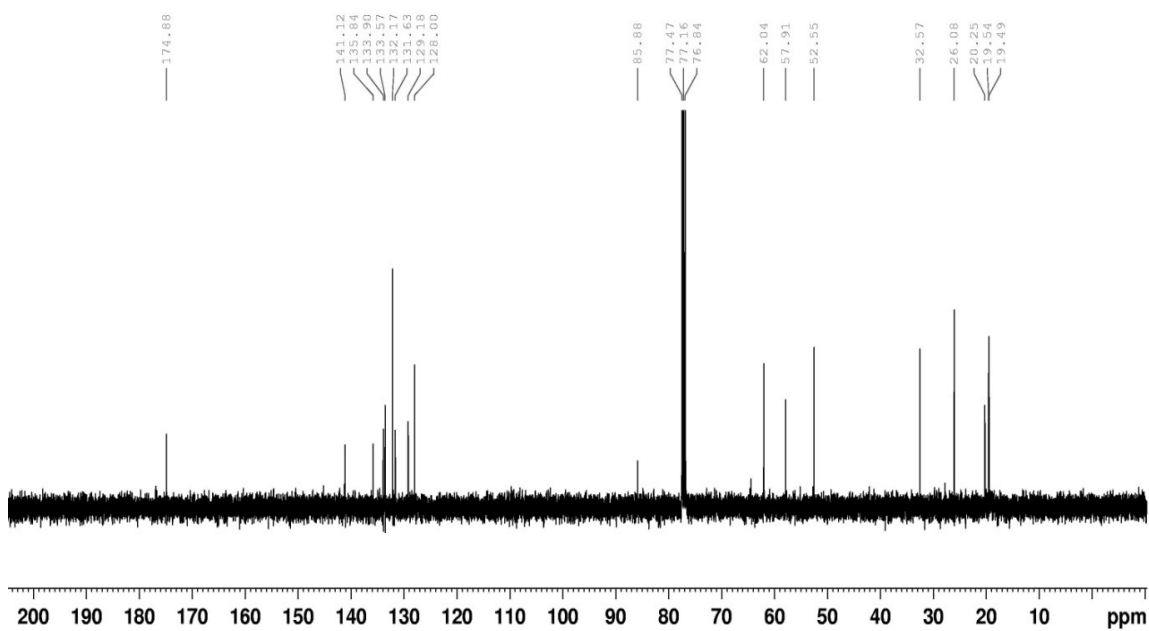
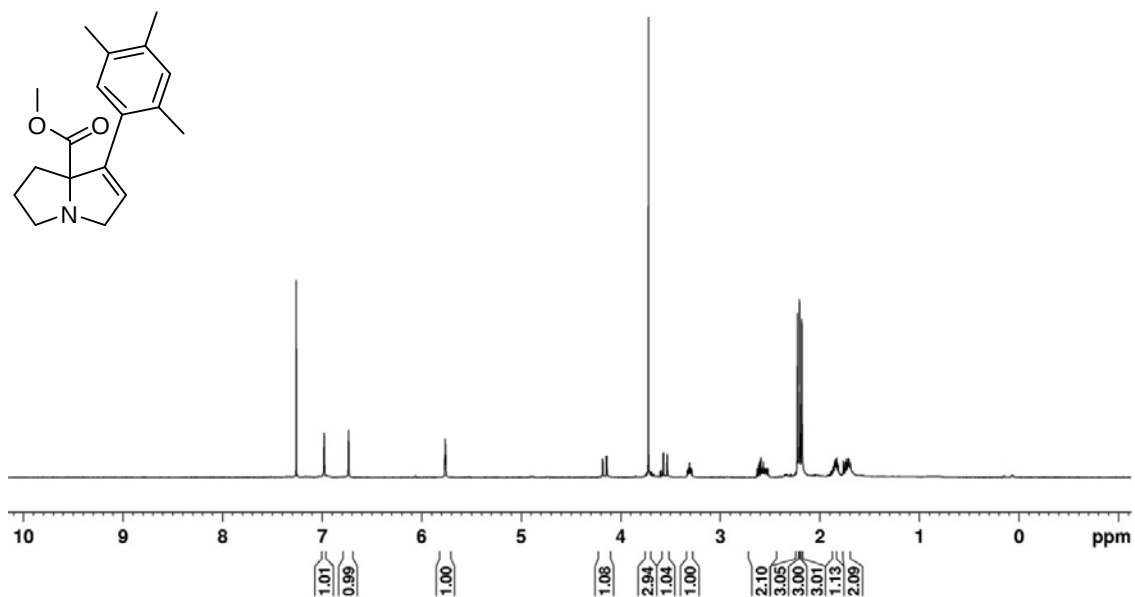
^1H and ^{13}C spectra of **6e**



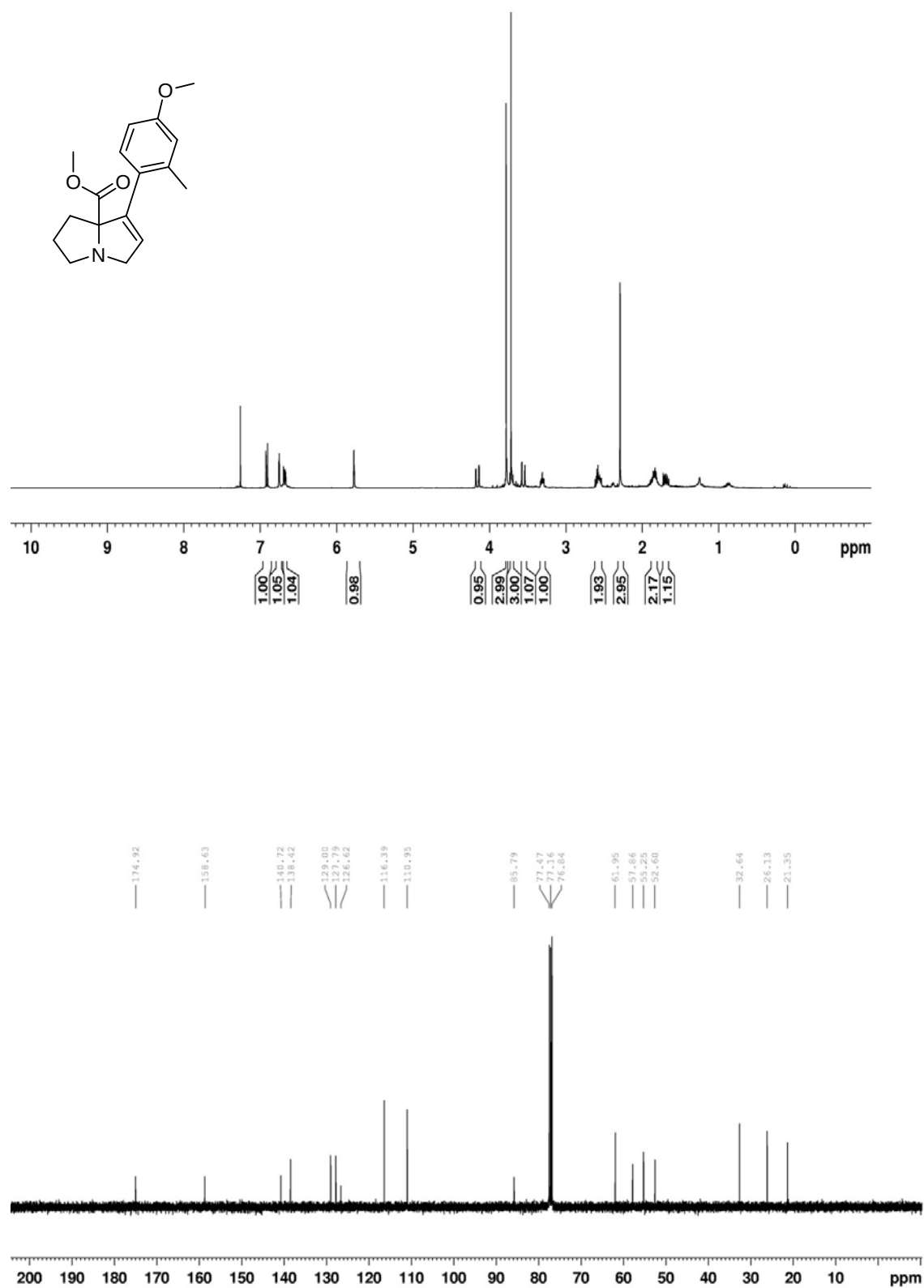
^1H and ^{13}C spectra of **6f**



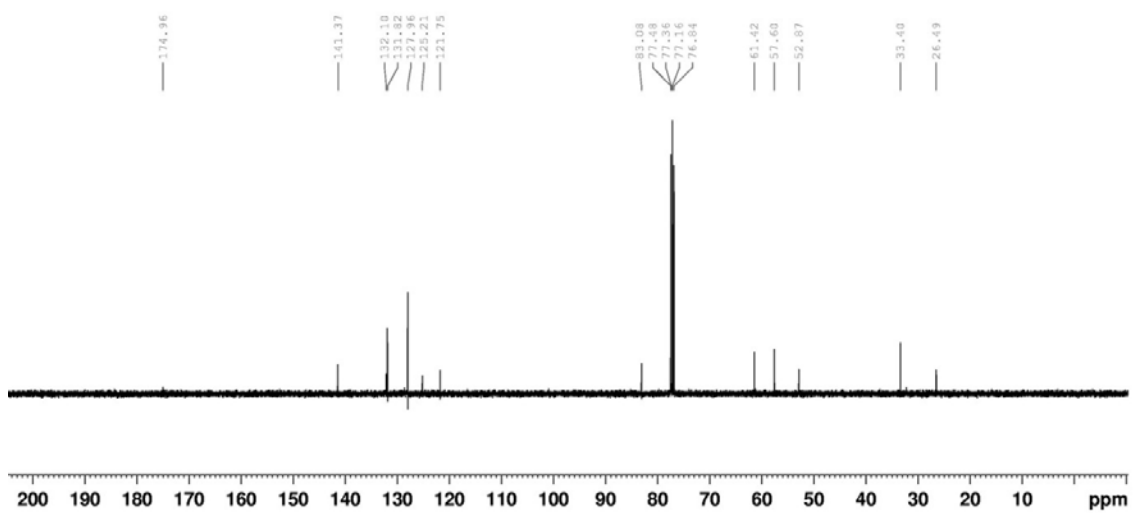
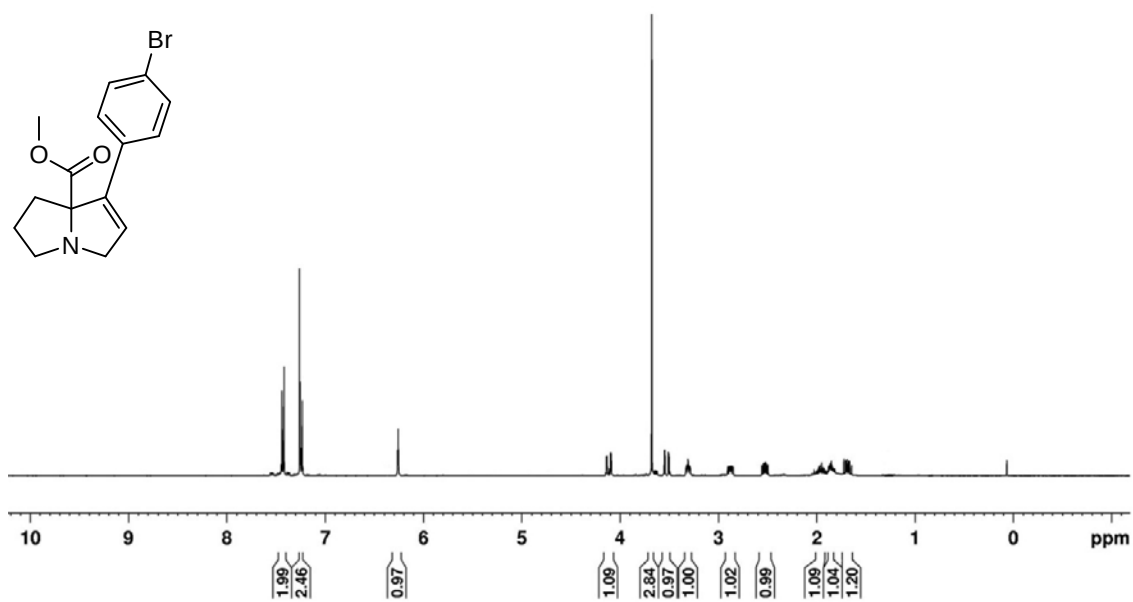
^1H and ^{13}C spectra of **6g**



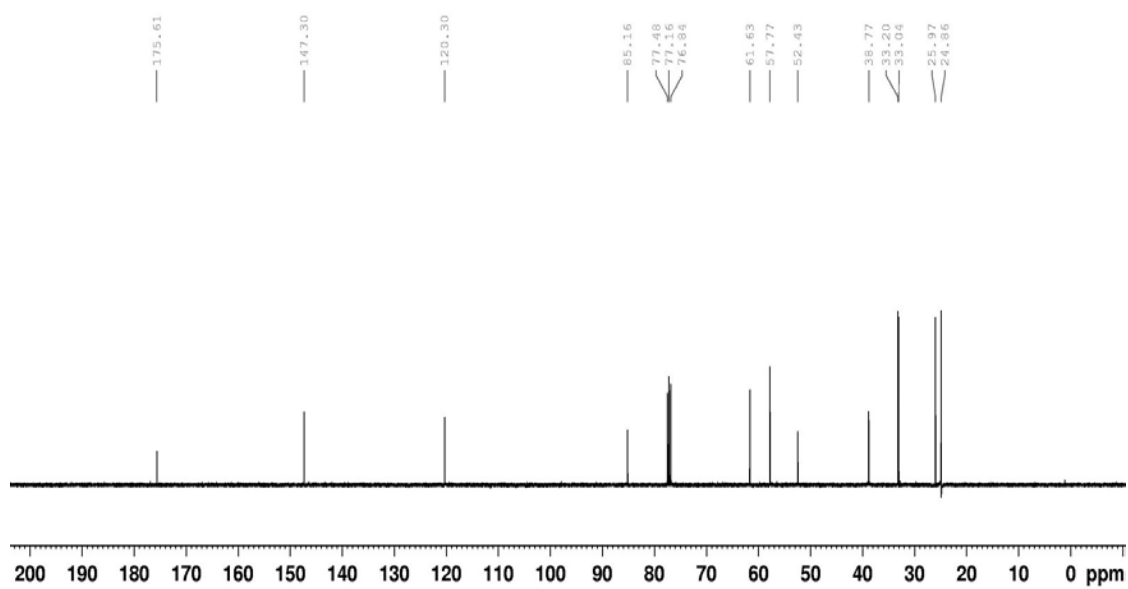
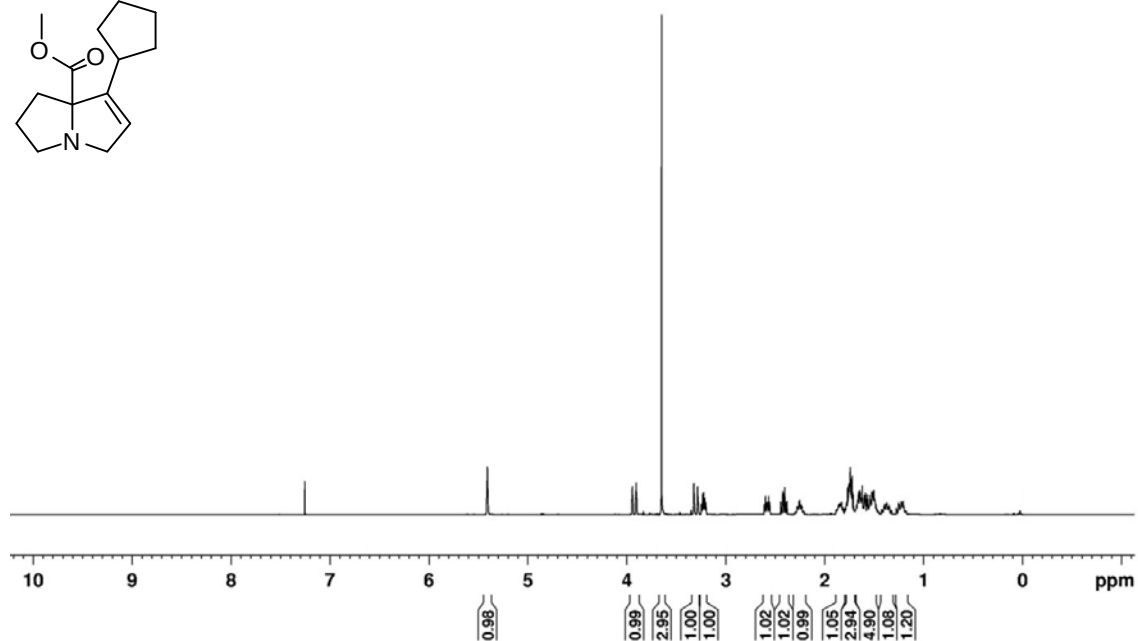
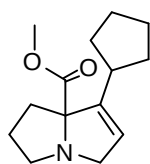
¹H and ¹³C spectra of **6h**



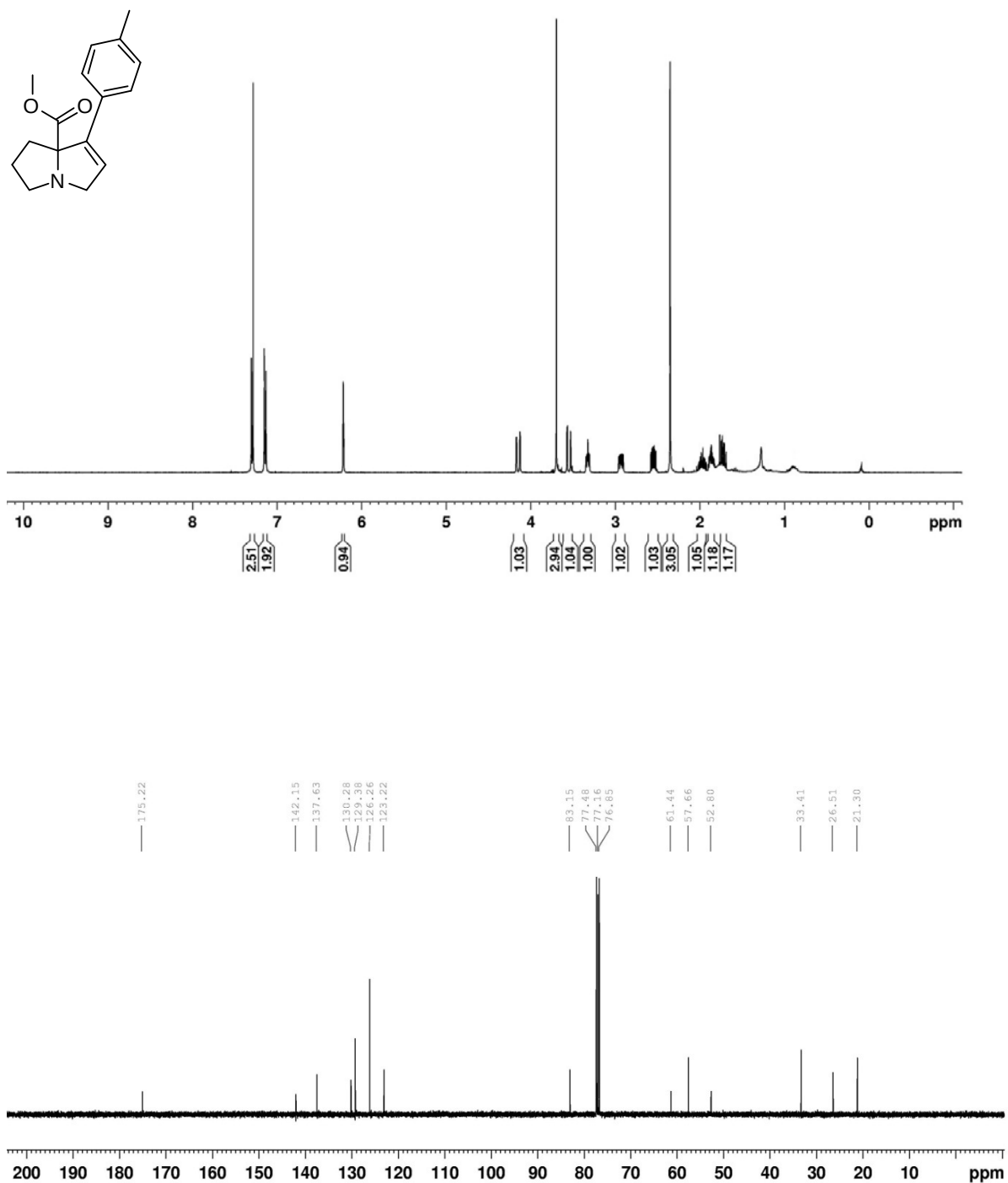
¹H and ¹³C spectra of **6i**



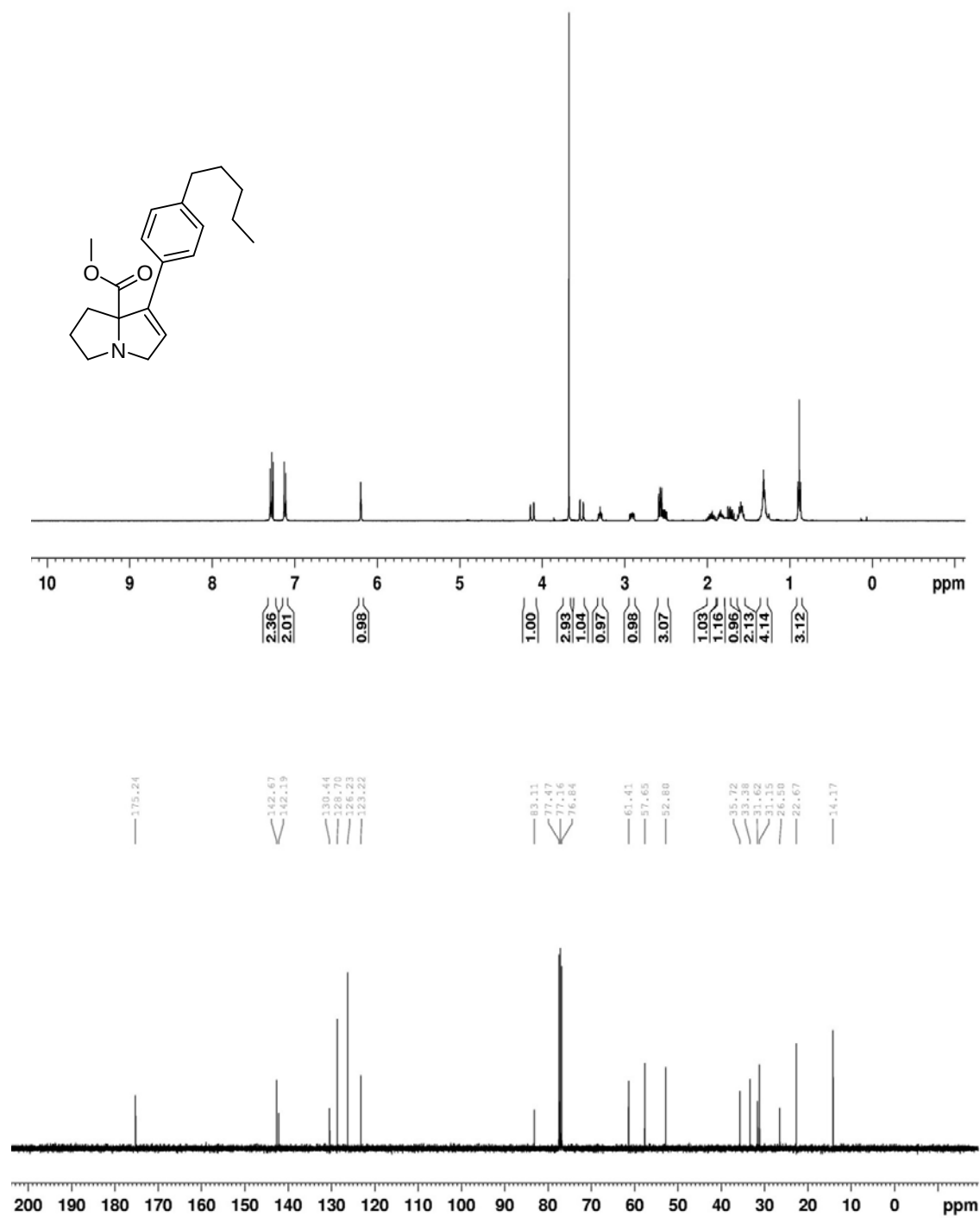
^1H and ^{13}C spectra of **6j**



^1H and ^{13}C spectra of **6k**



^1H and ^{13}C spectra of **6l**



^1H and ^{13}C spectra of **6m**