

Electronic Supplementary Information for:

**Endo-5-norbornene-2,3-dimethanol promoted asymmetric
Heck/Suzuki cascade reaction of *N*-(2-bromophenyl)acrylamides**

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1. General information.

Chemicals

Chemicals were commercially purchased from Adamas-beta, Energy Chemical, Aladdin, Daicel Chiral Technologies (China) Co., etc, and directly used without further purification unless otherwise stated. Pd(TFA)₂ was purchased from Adamas-beta. Toluene and mesitylene were purified by freshly distilled prior to use. Phosphoramidite ligand **L1** was prepared according to our previous report (M. Chen, X. Wang, P. Yang, X. Kou, Z.-H. Ren and Z.-H. Guan, *Angew. Chem. Int. Ed.*, 2020, **59**, 12199-12205; M. Chen, X. Wang, Z.-H. Ren and Z.-H. Guan, *CCS Chem.*, 2021, **3**, 69-77.)

L1: ¹H NMR (400 MHz, CDCl₃) δ 8.09 (s, 4H), 7.87 (s, 1H), 7.73 (s, 1H), 7.27 (s, 1H), 7.21 (s, 1H), 7.06 (d, *J* = 8.0 Hz, 1H), 6.95 (t, *J* = 8.0 Hz, 1H), 6.68 (s, 1H), 6.48 (d, *J* = 4.0 Hz, 1H), 6.37 (d, *J* = 8.0 Hz, 1H), 6.34 (s, 2H), 4.14 (d, *J* = 16.0 Hz, 1H), 3.43 (dd, *J* = 16.0, 4.0 Hz, 1H), 2.93 (s, 4H), 2.72 (s, 2H), 2.42 (s, 2H), 2.02 (s, 6H), 1.94 - 1.79 (m, 6H), 1.77 - 1.57 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 144.6, 144.2, 143.3, 143.1, 140.0, 139.7, 139.6, 139.5, 137.8, 136.8, 135.5, 135.0, 132.0, 131.8, 131.6, 131.4, 131.3, 131.1, 130.7, 130.1, 129.9, 129.8, 129.4, 129.1, 128.9, 128.7, 128.2, 125.6, 125.5, 125.1, 124.9, 124.7, 124.6, 122.2, 122.0, 121.9, 120.9, 120.7, 120.2, 49.3, 29.2, 29.2, 27.9, 27.9, 22.6, 22.6, 22.5, 22.4, 20.9. HRMS calcd (ESI) *m/z* for C₅₂H₃₉F₁₅NNaO₂P: [M+Na]⁺ 1048.2371, found 1048.2356.

The norbornenes **N10** was prepared according to literature procedures. (J. M. Goll and E. Fillion, *Organometallics*, 2008, **27**, 3622-3625; P. Liu, M. Yasir and A. F. M. Kilbinger, *Angew. Chem. Int. Ed.*, 2019, **58**, 15278-15282.)

Chromatography

Analytical thin-layer chromatography (TLC) was carried out with silica gel pre-coated glass plates (TLC-Silica gel GF254, coating thickness: 0.20-0.25 mm, particle size: 10-40 μm) purchased from Xinnuo Chemical (Yantai, China). The TLC was visualized with a UV lamp (254 or 365 nm).

Flash Column chromatography was carried out on silica gel (60 Å, 200-300 mesh) purchased from Xinnuo Chemicals (Yantai, China) with technical grade solvents as the eluent. All the yields referred to spectroscopically and chromatographically pure compounds.

Nuclear magnetic resonance (NMR) spectroscopy

¹H NMR spectra were recorded on Bruker AVANCE III instrument (400 MHz

spectrometer). The analytical sample was dissolved in an appropriate deuterated solvent. The employed deuterated solvent and the measuring frequency are indicated in each ^1H NMR data. Chemical shifts are reported in parts per million (ppm) with the solvent resonance as the internal reference (CDCl_3 δ 7.26). The following abbreviations (or combinations thereof) were used to explain multiplicities: s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, b = broad. Coupling constants, J were reported in Hertz unit (Hz).

^{13}C NMR spectra were recorded on Bruker AVANCE III instrument (101 MHz spectrometer). The employed deuterated solvent and the measuring frequency are both indicated in each ^{13}C NMR data. Chemical shifts are reported in ppm with the solvent resonance as the internal reference (CDCl_3 δ 77.0).

High resolution mass spectrometry (HRMS)

HRMS were recorded on a liquid chromatography/quadrupole time-of-flight mass spectrometer (MicroTof-Q II mass spectrometer, Bruker Daltonics) using electrospray ionization-time of flight (ESI-TOF) at the Instrumental Analysis Center of Northwest University. The calculated values are based on the most abundant isotope.

Optical rotations

Optical rotations were measured with a WZZ-2S automatic polarimeter purchased from Shanghai INESA Physico-Optical instrument company using a sodium lamp (sodium D line, $\lambda = 589$ nm) in the indicated solvent at the indicated temperature. The measurements were carried out in a 1.5 mL cell (50 mm length) with concentrations (g/100mL) reported in the corresponding solvent. The optical rotation values ($[\alpha]_D$) were reported at a given temperature ($^\circ\text{C}$) in $\text{deg. mL g}^{-1} \text{ dm}^{-1}$.

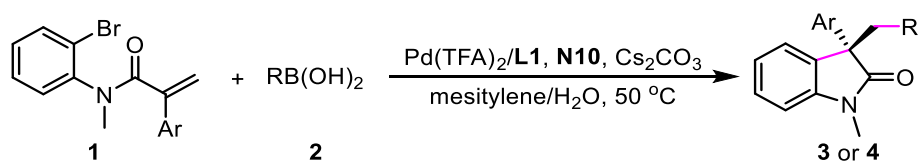
High performance liquid chromatography (HPLC)

HPLC analysis was performed on an Agilent Technologies 1260 Series using Chiralpak columns IA, IC, or IG (Daicel Chiral Reagent Company). The solvents (n-hexane and iso-propanol, HPLC-grade) used as the eluent were purchased from Oceanpak. The column type and the eluent (a mixture of n-hexane and iso-propanol) are indicated for each experiment.

X-ray crystallography

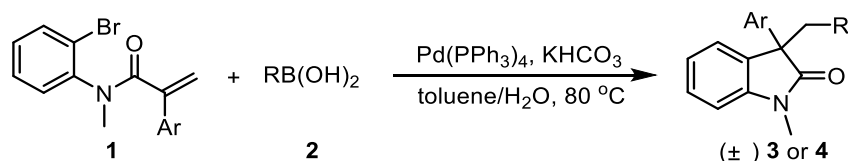
X-ray crystallography was performed on a BRUKERSMA RTAPEXIICCD diffractometer at Instrumental Analysis Center of Northwest University.

2. Typical procedure for the asymmetric Heck/Suzuki reaction.



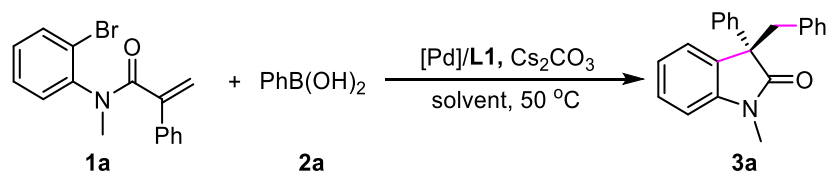
The 10 mL round-bottom flask was charged with acrylamides **1** (0.1 mmol, 1.0 equiv), RB(OH)_2 (2.0 equiv), Pd(TFA)_2 (8 mol%), **L1** (16 mol%), **N10** (60 mol%), Cs_2CO_3 (3.0 equiv) and H_2O (0.1 mL) in mesitylene (0.5 mL) under N_2 atmosphere. The reaction was then heated in $50\text{ }^\circ\text{C}$ and stirred for 12 h. Upon completion of the reaction, the reaction mixture was cooled down to room temperature. The reaction was purified by column chromatography on silica gel with hexanes: ethyl acetate (10:1) as the eluent to afford the corresponding product **3 or 4**.

3. Typical procedure for synthesis of the racemic Heck/Suzuki products.



The 10 mL round-bottom flask was charged with acrylamides **1** (0.1 mmol, 1.0 equiv), RB(OH)_2 (2.0 equiv), $\text{Pd(PPh}_3)_4$ (5 mol%), KHCO_3 (3.0 equiv) and H_2O (50 equiv) in toluene (0.8 mL) under N_2 atmosphere. The reaction was then heated in $80\text{ }^\circ\text{C}$ and stirred for 12 h. Upon completion of the reaction, the reaction mixture was cooled down to room temperature. The reaction was purified by column chromatography on silica gel with hexanes: ethyl acetate (10:1) as the eluent to afford the corresponding product (\pm) -**3 or 4**.

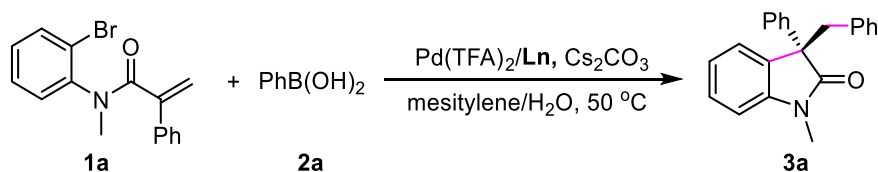
4. Table S1. Screening of catalyst and solvent.^a



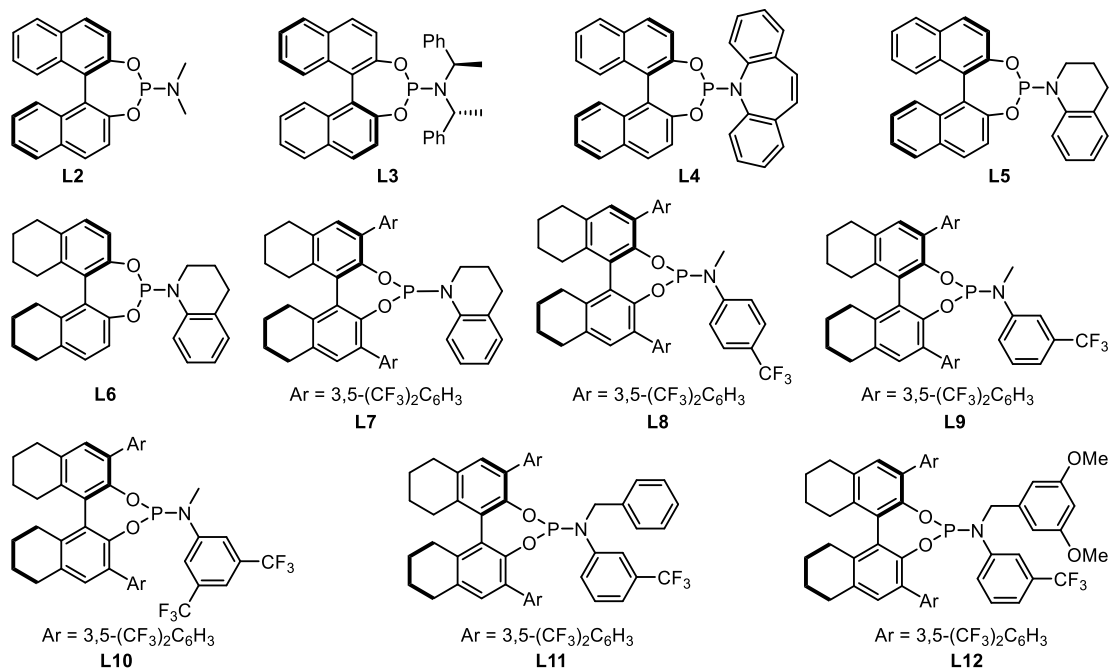
entry	[Pd]	solvent	yield (%)	ee (%)
1	Pd(OAc) ₂	Toluene	34	49
2	Pd(TFA) ₂	Toluene	58	68
3	Pd(acac) ₂	Toluene	8	56
4	Pd(dba) ₂	Toluene	51	65
5	Pd(TFA) ₂	Dioxane	10	61
6	Pd(TFA) ₂	CH ₃ CN	0	--
7	Pd(TFA) ₂	DMF	0	--
8	Pd(TFA) ₂	Mesitylene	64	72
9 ^b	Pd(TFA) ₂	Mesitylene	75	70

^aConditions: **1a** (0.1 mmol), **2a** (0.2 mmol), [Pd] (8 mol%), **L1** (16 mol%), Cs₂CO₃ (0.3 mmol), solvent (0.5 mL), N₂, 50 °C, 12 h. Isolated yield, and enantiomeric excess (ee) were determined by chiral HPLC analysis. ^bH₂O (0.1 mL) was added.

Table S2. Screening of phosphoramidite ligands.^a

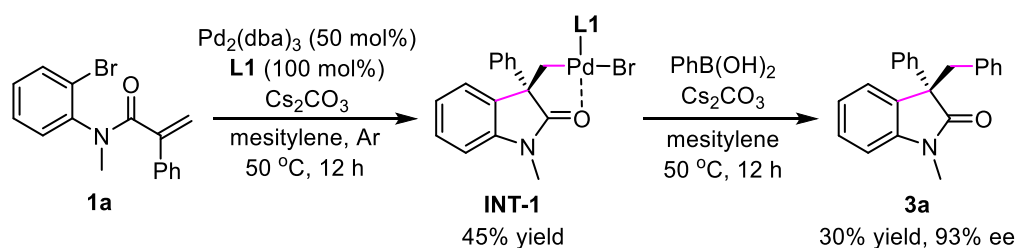


entry	Ln	yield (%)	ee (%)
1	L2	30	3
2	L3	53	0
3	L4	61	5
4	L5	26	30
5	L6	24	16
6	L7	49	40
7	L8	26	39
8	L9	42	50
9	L10	31	49
10	L11	31	66
11	L12	65	60



^aConditions: **1a** (0.1 mmol), **2a** (0.2 mmol), Pd(TFA)₂ (8 mol%), **Ln** (16 mol%), Cs₂CO₃ (0.3 mmol), mesitylene (0.5 mL), H₂O (0.1 mL), N₂, 50 °C, 12 h. Isolated yield, and enantiomeric excess (ee) were determined by chiral HPLC analysis.

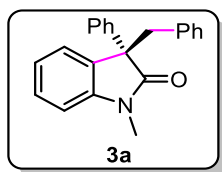
5. Synthesis of intermediate INT-1 and mechanistic study.



In a 10 mL round-bottom flask, acrylamides **1a** (0.1 mmol, 1.0 equiv) was added to the solution of $\text{Pd}_2(\text{dba})_3$ (0.05 mmol, 0.5 equiv) and **L1** (0.1 mmol, 1.0 equiv) in mesitylene (2 mL). Then, the flask was evacuated and back-filled with argon (3 times) and then stirred at 50 °C for 12 h. The residue was purified by column chromatography on silica gel (hexanes: ethyl acetate = 15:1) to give the σ -alkyl palladium **INT-1** (45% yield). ^1H NMR (CDCl_3 , 400 MHz) δ 8.53 (s, 2H), 8.15 (s, 2H), 7.81 (d, $J = 6.4$ Hz, 3H), 7.56 - 7.54 (m, 2H), 7.36 (s, 1H), 7.31 (d, $J = 7.6$ Hz, 4H), 7.18 - 7.15 (m, 3H), 6.82 (d, $J = 7.6$ Hz, 1H), 6.74 (d, $J = 8.0$ Hz, 1H), 6.59 (s, 1H), 6.38 (s, 1H), 5.76 (s, 1H), 3.95 (d, $J = 18.4$ Hz, 1H), 3.25 (d, $J = 16.8$ Hz, 1H), 2.95 (s, 3H), 2.80 (s, 3H), 2.21 - 2.16 (m, 2H), 2.05 - 2.01 (m, 1H), 1.90 - 1.83 (m, 14H), 1.68 (t, $J = 10.4$ Hz, 1H), 0.88 (s, 3H). HRMS calcd (ESI) m/z for $\text{C}_{68}\text{H}_{53}\text{F}_{15}\text{N}_2\text{O}_3\text{PPd}$: $[\text{M}-\text{Br}]^+$ 1367.2606, found: 1367.2642.

In a 10 mL round-bottom flask, the σ -alkyl palladium **INT-1** (0.045 mmol, 1.0 equiv), $\text{PhB}(\text{OH})_2$ (0.09 mmol, 2.0 equiv), Cs_2CO_3 (0.09 mmol, 2.0 equiv) in mesitylene (0.5 mL) was heated at 50 °C under stirring for 12 h. After the completion of the reaction, the residue was purified by column chromatography on silica gel (hexanes: ethyl acetate = 10: 1) to give the product **3a** (30% yield, 93% ee).

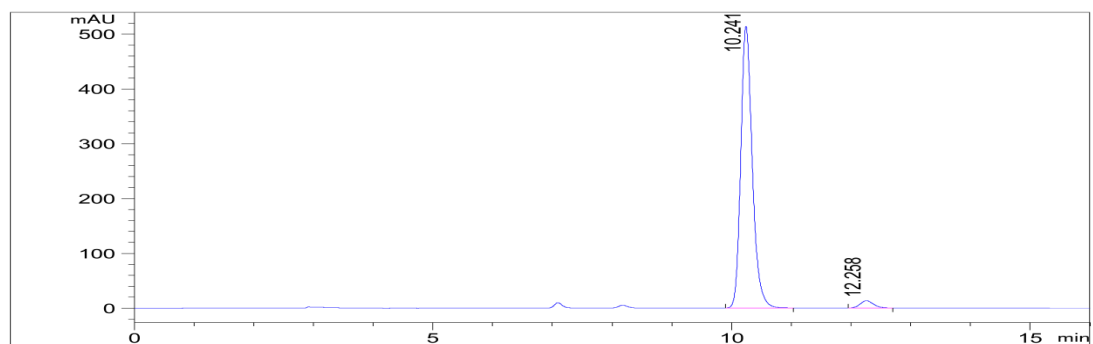
6. Characterization data of the products.



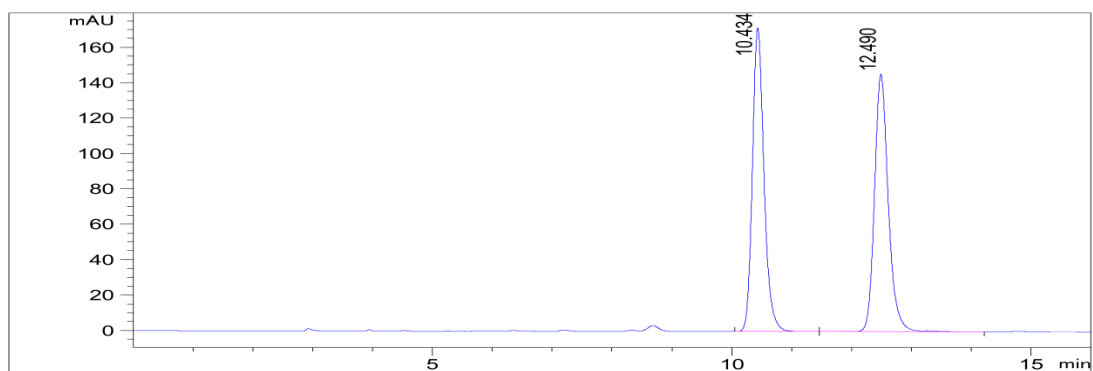
(S)-3-benzyl-1-methyl-3-phenylindolin-2-one (**3a**)

Yield: 72% (22.5 mg), ee = 94%, $[\alpha]_D^{21} = -79.5$ (c = 1.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.51 - 7.48 (m, 2H), 7.34 - 7.30 (m, 2H), 7.27 - 7.24 (m, 1H), 7.21 - 7.16 (m, 2H), 7.07 - 6.97 (m, 4H), 6.83 (dd, *J* = 8.0, 2.0 Hz, 2H), 6.58 (d, *J* = 8.0 Hz, 1H), 3.70 (d, *J* = 12.8 Hz, 1H), 3.44 (d, *J* = 12.8 Hz, 1H), 2.91 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.7, 143.6, 139.6, 135.6, 131.1, 129.9, 128.5, 128.1, 127.3, 127.2, 126.4, 125.4, 122.1, 107.9, 58.2, 43.9, 25.9. HRMS (ESI) calcd. for C₂₂H₂₀NO [M+H]⁺: 314.1539, found: 314.1547.

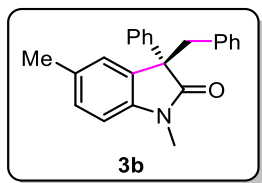
The ee of compound **3a** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.24 min, *t*_{minor} = 12.26 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.241	MF	514.722	0.223	6887.147	96.974
2	12.258	MF	13.533	0.265	214.926	3.026



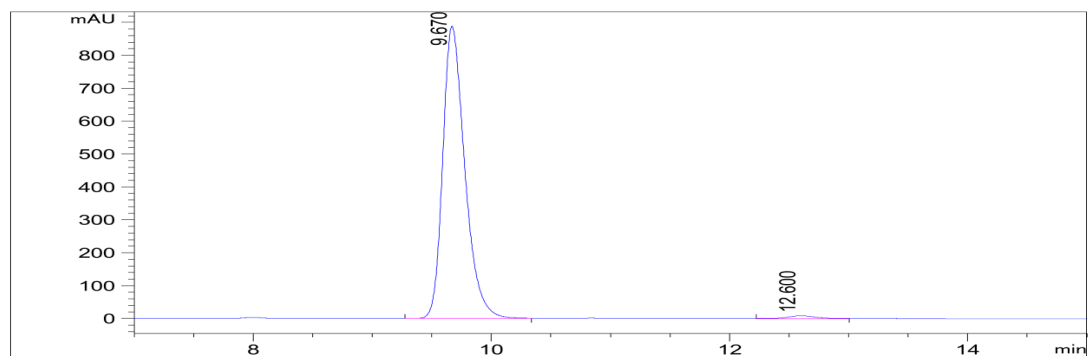
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.434	BB	171.416	0.209	2306.237	49.699
2	12.490	BV R	145.265	0.247	2334.162	50.301



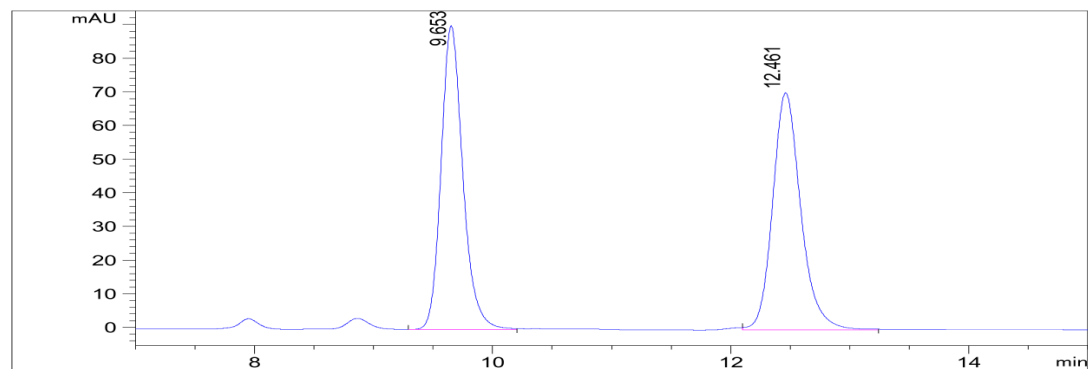
(S)-3-benzyl-1,5-dimethyl-3-phenylindolin-2-one (3b)

Yield: 65% (21.4 mg), ee = 97%, $[\alpha]_D^{18} = -32.7$ (c = 1.2, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 7.05 - 6.99 (m, 5H), 6.82 (dd, *J* = 7.6, 1.2 Hz, 2H), 6.49 (d, *J* = 8.4 Hz, 1H), 3.68 (d, *J* = 12.8 Hz, 1H), 3.44 (d, *J* = 12.8 Hz, 1H), 2.91 (s, 3H), 2.34 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.7, 141.4, 139.9, 135.7, 131.6, 131.4, 130.0, 128.5, 128.4, 127.3, 127.2, 126.4, 126.1, 107.7, 58.3, 43.8, 26.0, 21.2. HRMS (ESI) calcd. for C₂₃H₂₂NO [M+H]⁺: 328.1696, found: 328.1696.

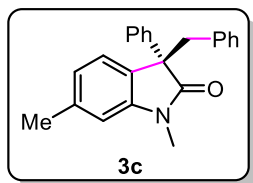
The ee of compound **3b** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, t_{major} = 9.67 min, t_{minor} = 12.60 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.670	MF	889.155	0.215	11465.117	98.731
2	12.600	MM	8.695	0.282	147.346	1.269



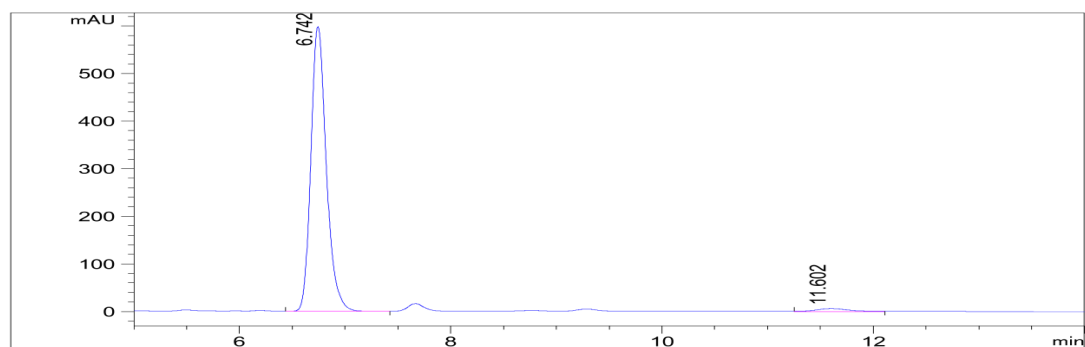
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.653	MF	90.323	0.212	1148.411	49.791
2	12.461	FM	70.476	0.274	1158.044	50.209



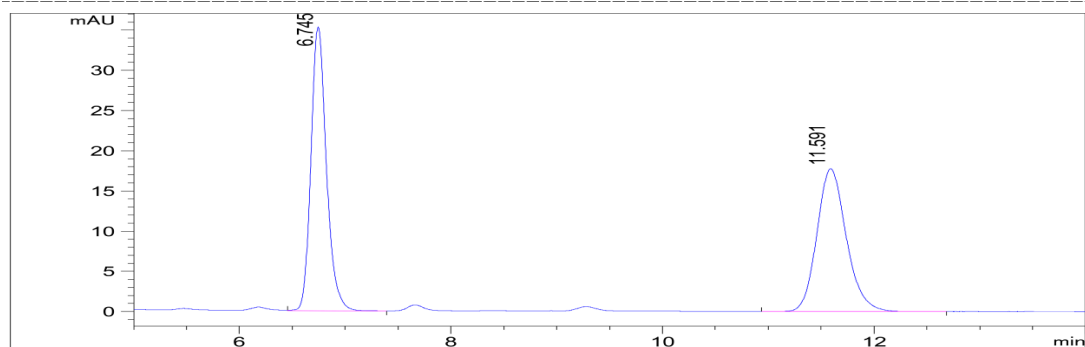
(S)-3-benzyl-1,6-dimethyl-3-phenylindolin-2-one (3c)

Yield: 77% (25.2 mg), ee = 96%, $[\alpha]_D^{18} = -70.9$ (c = 1.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 8.0 Hz, 2H), 7.31 (t, *J* = 7.2 Hz, 2H), 7.24 (t, *J* = 7.2 Hz, 1H), 7.06 - 7.00 (m, 4H), 6.88 - 6.83 (m, 3H), 6.43 (s, 1H), 3.65 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.8 Hz, 1H), 2.91 (s, 3H), 2.31 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.0, 143.7, 139.9, 138.1, 135.8, 130.0, 128.4, 128.0, 127.3, 127.2, 126.4, 125.2, 122.6, 108.9, 57.9, 43.9, 25.9, 21.7. HRMS (ESI) calcd. for C₂₃H₂₂NO [M+H]⁺: 328.1696, found: 328.1697.

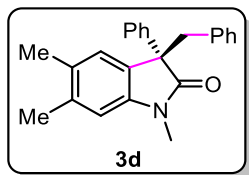
The ee of compound **3c** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.74 min, *t*_{minor} = 11.60 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.742	BB	596.690	0.155	6074.348	97.760
2	11.602	MM	6.411	0.362	139.177	2.240



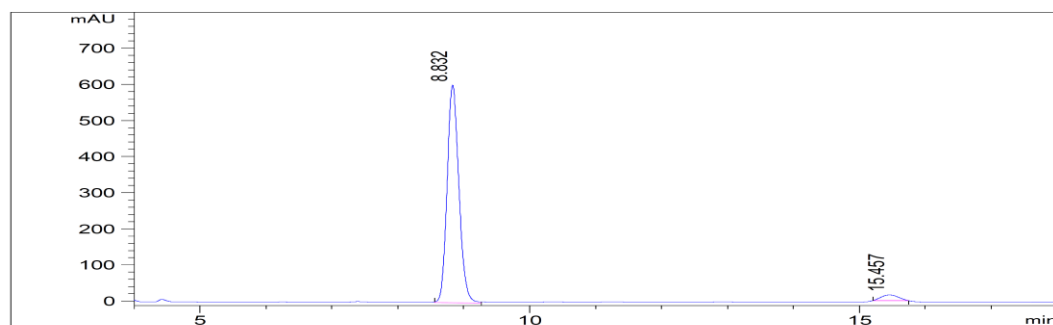
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.745	FM	35.305	0.169	358.193	51.039
2	11.591	BB	17.763	0.298	343.609	48.961



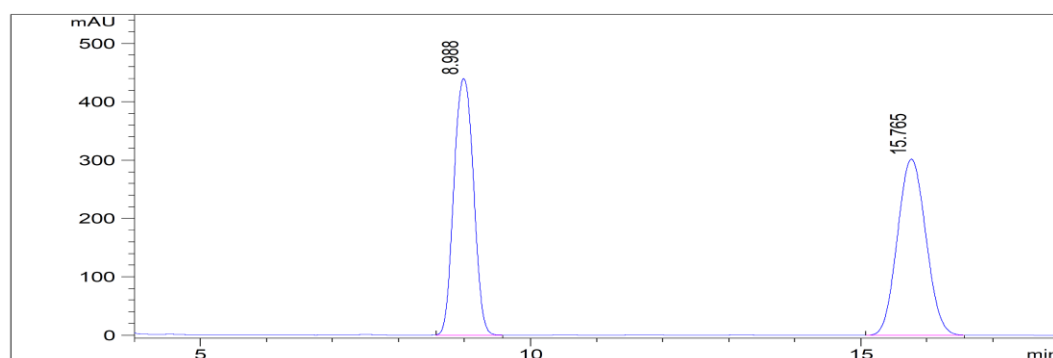
(S)-3-benzyl-1,5,6-trimethyl-3-phenylindolin-2-one (3d)

Yield: 53% (18.0 mg), ee = 93%, $[\alpha]_D^{32} = -38.8$ (c = 1.2, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 8.0 Hz, 2H), 7.35 - 7.31 (m, 2H), 7.28 - 7.24 (m, 1H), 7.05 - 6.99 (m, 3H), 6.93 (s, 1H), 6.83 (d, *J* = 7.2 Hz, 2H), 6.42 (s, 1H), 3.64 (d, *J* = 13.6 Hz, 1H), 3.45 (d, *J* = 12.4 Hz, 1H), 2.91 (s, 3H), 2.24 (t, *J* = 2.0 Hz, 6H); ¹³C NMR (101 MHz, CDCl₃) δ 177.9, 141.6, 140.1, 136.2, 135.9, 130.0, 129.9, 128.5, 128.4, 127.3, 127.2, 126.6, 126.4, 109.4, 58.1, 43.8, 26.0, 20.2, 19.6. HRMS (ESI) calcd. for C₂₄H₂₄NO [M+H]⁺: 342.1852, found: 342.1859.

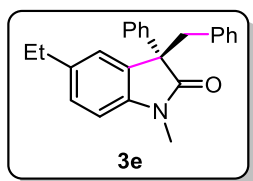
The ee of compound **3d** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.83 min, *t*_{minor} = 15.46 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.832	MM	602.284	0.207	7479.896	96.320
2	15.457	MM	15.659	0.304	285.814	3.680



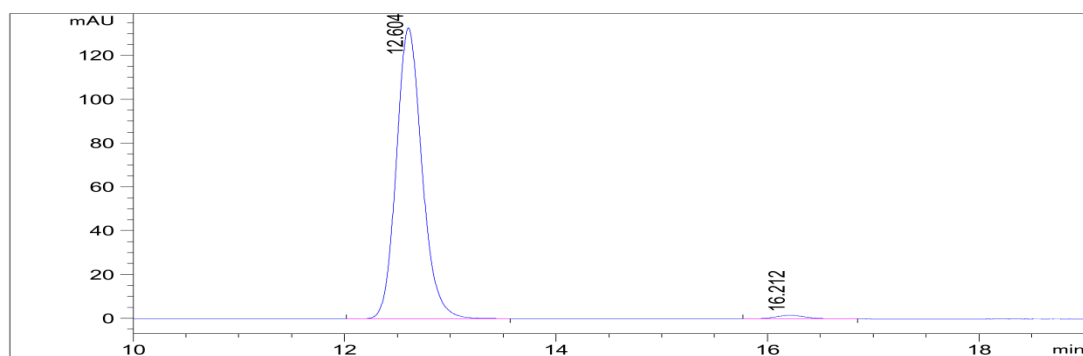
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.988	FM	439.784	0.345	9093.594	50.014
2	15.765	MF	302.398	0.501	9088.509	49.986



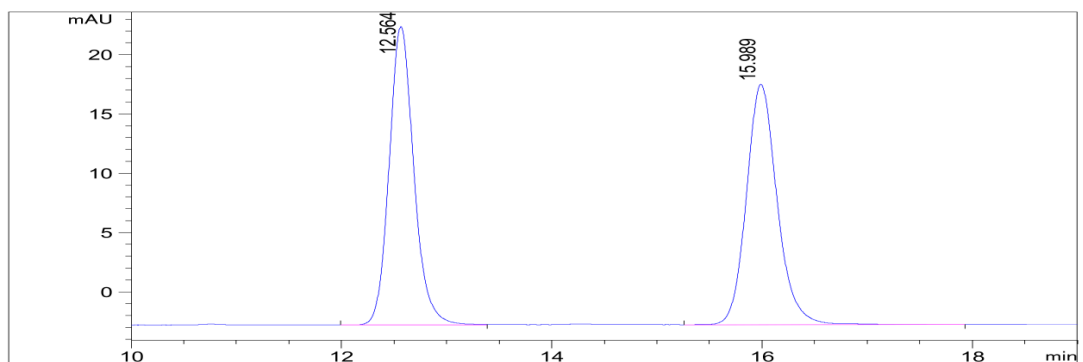
(S)-3-benzyl-5-ethyl-1-methyl-3-phenylindolin-2-one (3e)

Yield: 72% (24.6 mg), ee = 97%, $[\alpha]_D^{19} = -56.6$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 7.05 - 6.98 (m, 5H), 6.82 (d, *J* = 6.8 Hz, 2H), 6.52 (d, *J* = 7.6 Hz, 1H), 3.67 (d, *J* = 12.8 Hz, 1H), 3.45 (d, *J* = 12.8 Hz, 1H), 2.93 (s, 3H), 2.68 - 2.60 (m, 2H), 1.22 (t, *J* = 7.6 Hz, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 141.5, 139.8, 138.3, 135.8, 131.2, 130.0, 128.5, 127.3, 127.3, 127.3, 126.4, 125.2, 107.7, 58.3, 44.0, 28.7, 26.1, 16.2. HRMS (ESI) calcd. for C₂₄H₂₄NO [M+H]⁺: 342.1852, found: 342.1860.

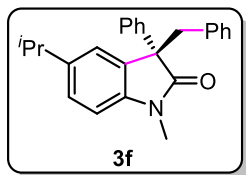
The ee of compound **3e** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 12.60 min, *t*_{minor} = 16.21 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	12.604	MF	132.907	0.282	2248.198	98.584
2	16.212	MM	1.583	0.340	32.299	1.416



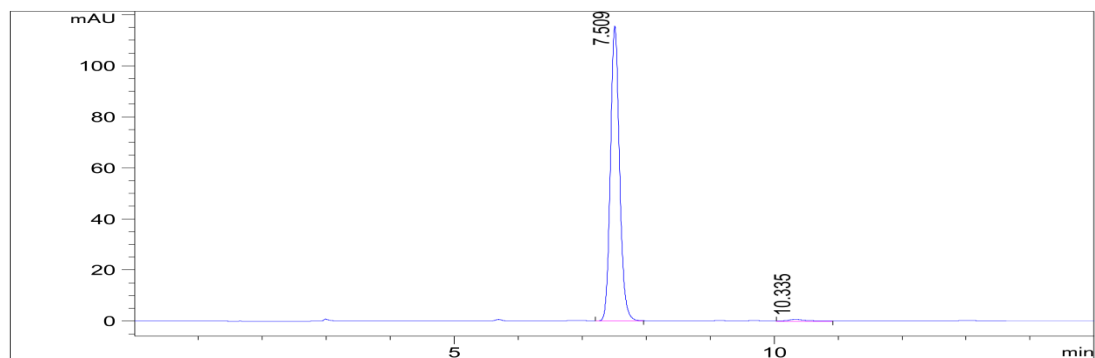
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	12.564	MF	25.179	0.273	411.885	49.948
2	15.989	VB	20.268	0.310	412.742	50.052



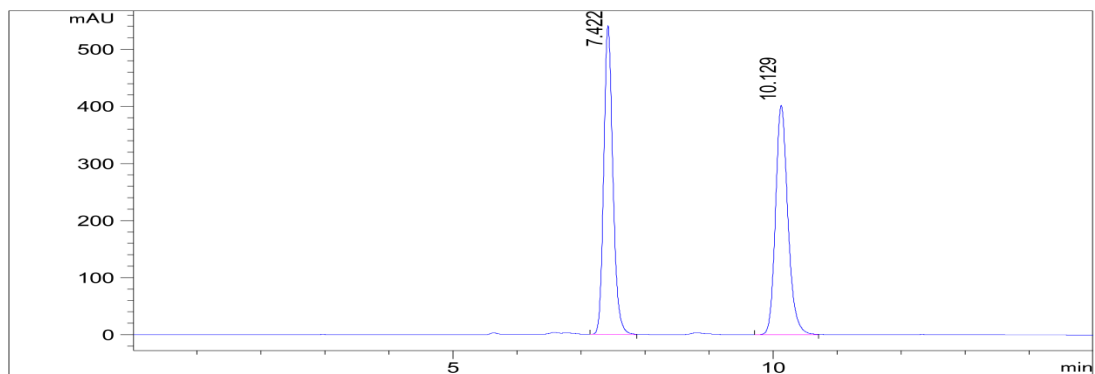
(S)-3-benzyl-5-isopropyl-1-methyl-3-phenylindolin-2-one (3f)

Yield: 70% (24.9 mg), ee = 97%, $[\alpha]_D^{18} = -79.6$ (c = 0.7, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.51 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 6.8 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 7.06 - 6.98 (m, 5H), 6.81 (d, *J* = 6.8 Hz, 2H), 6.52 (d, *J* = 8.0 Hz, 1H), 3.66 (d, *J* = 12.8 Hz, 1H), 3.46 (d, *J* = 12.4 Hz, 1H), 2.95 (s, 3H), 2.93 - 2.86 (m, 1H), 1.24 (t, *J* = 6.4 Hz, 6H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 142.9, 141.6, 139.7, 135.8, 130.9, 130.0, 128.5, 127.4, 127.3, 126.4, 125.8, 123.9, 107.6, 58.3, 44.1, 33.9, 26.1, 24.6, 24.0. HRMS (ESI) calcd. for C₂₅H₂₆NO [M+H]⁺: 356.2009, found: 356.2011.

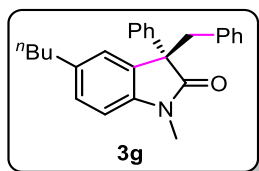
The ee of compound **3f** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.51 min, *t*_{minor} = 10.34 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.509	MF	115.801	0.165	1144.833	98.276
2	10.335	MM	0.827	0.405	20.082	1.724



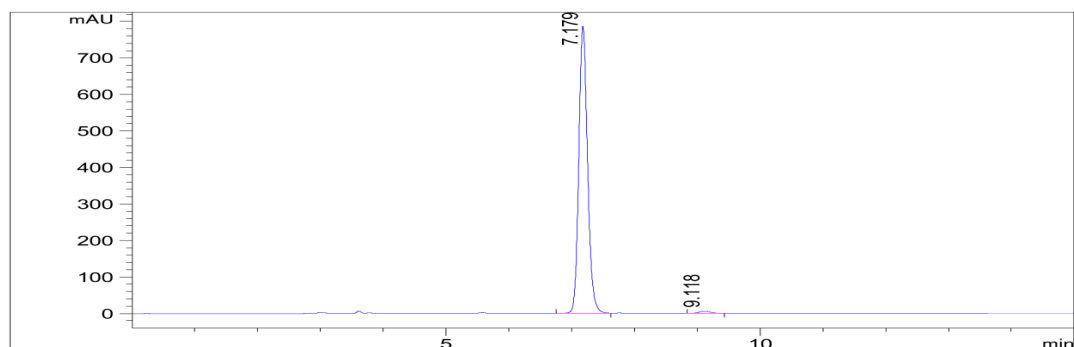
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.422	MF	541.245	0.166	5381.096	49.895
2	10.129	MF	402.017	0.224	5403.739	50.105



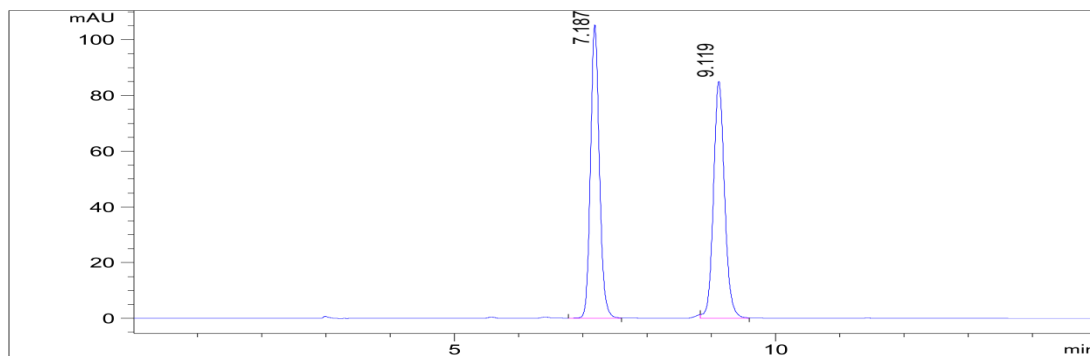
(S)-3-benzyl-5-butyl-1-methyl-3-phenylindolin-2-one (3g)

Yield: 56% (20.7 mg), ee = 98%, $[\alpha]_D^{18} = -146.8$ (c = 0.4, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 6.8 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 7.05 - 6.98 (m, 5H), 6.83 (d, *J* = 6.4 Hz, 2H), 6.51 (d, *J* = 8.4 Hz, 1H), 3.69 (d, *J* = 12.8 Hz, 1H), 3.44 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H), 2.60 (dd, *J* = 15.2, 7.6 Hz, 2H), 1.61 - 1.56 (m, 2H), 1.34 (dd, *J* = 14.8, 7.2 Hz, 2H), 0.95 (t, *J* = 7.2 Hz, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 141.5, 139.9, 136.8, 135.8, 131.1, 130.0, 128.5, 127.9, 127.3, 127.3, 126.4, 125.7, 107.6, 58.3, 43.9, 35.3, 34.0, 26.1, 22.1, 14.0. HRMS (ESI) calcd. for C₂₆H₂₈NO [M+H]⁺: 370.2165, found: 370.2162.

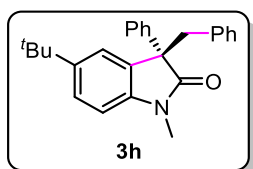
The ee of compound **3g** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0mL/min, λ = 254nm, *t*_{major} = 7.18 min, *t*_{minor} = 9.12 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.179	MF	787.851	0.161	7614.782	99.083
2	9.118	MM	5.983	0.196	70.493	0.917



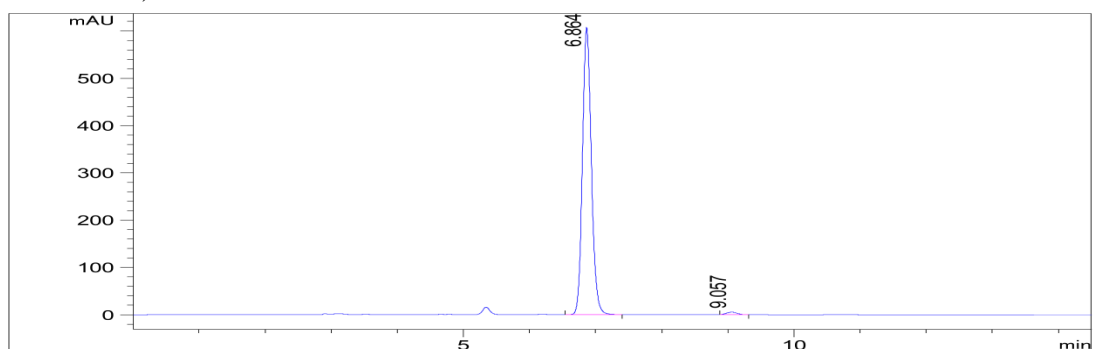
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.187	MF	105.441	0.160	1013.711	49.718
2	9.119	MF	85.176	0.201	1025.192	50.282



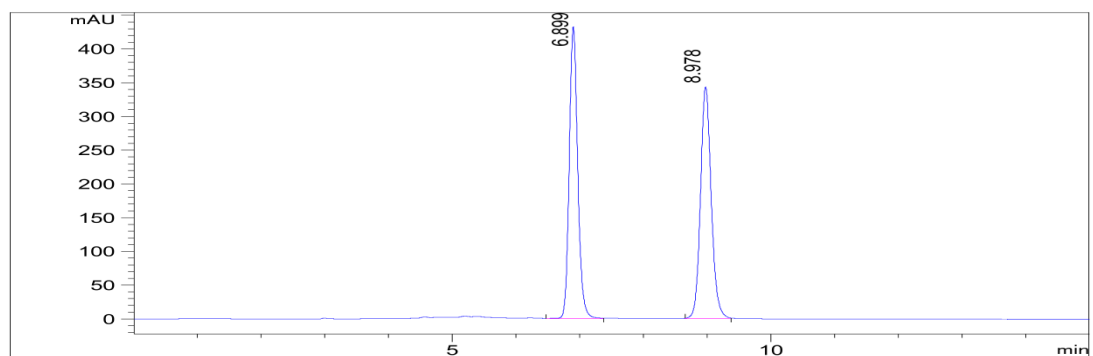
(S)-3-benzyl-5-(tert-butyl)-1-methyl-3-phenylindolin-2-one (3h)

Yield: 74% (27.3 mg), ee = 98%, $[\alpha]_D^{18} = -88.4$ (c = 0.5, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.52 (d, *J* = 7.2 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 6.8 Hz, 1H), 7.21 (dd, *J* = 8.4, 2.0 Hz, 1H), 7.17 (d, *J* = 1.6 Hz, 1H), 7.04 - 6.98 (m, 3H), 6.80 (d, *J* = 6.8 Hz, 2H), 6.54 (d, *J* = 8.0 Hz, 1H), 3.65 (d, *J* = 12.8 Hz, 1H), 3.47 (d, *J* = 13.2 Hz, 1H), 2.96 (s, 3H), 1.31 (s, 9H); ¹³C NMR (101 MHz, CDCl₃) δ 177.9, 145.1, 141.3, 139.7, 135.9, 130.4, 130.1, 128.5, 127.4, 127.3, 126.4, 124.4, 123.3, 107.3, 58.3, 44.2, 34.5, 31.5, 26.1. HRMS (ESI) calcd. for C₂₆H₂₈NO [M+H]⁺: 370.2165, found: 370.2168.

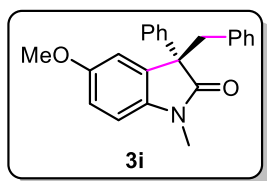
The ee of compound **3h** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.86 min, *t*_{minor} = 9.06 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.864	MF	608.052	0.157	5711.472	98.866
2	9.057	FM	5.516	0.198	65.529	1.134



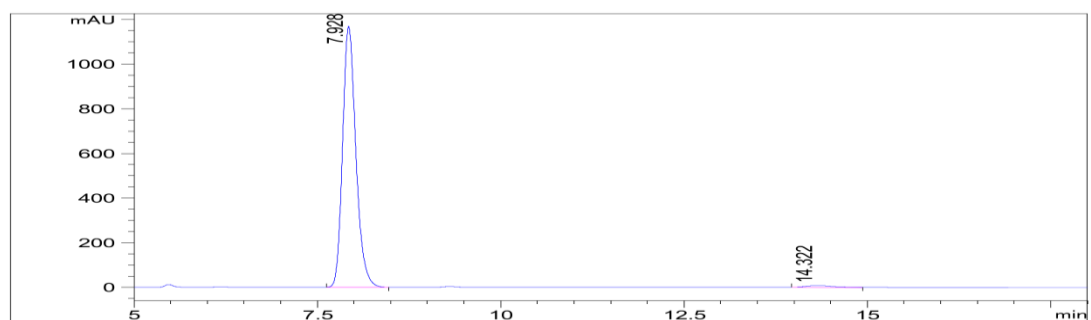
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.899	MF	432.845	0.154	3993.943	49.795
2	8.978	FM	343.579	0.195	4026.865	50.205



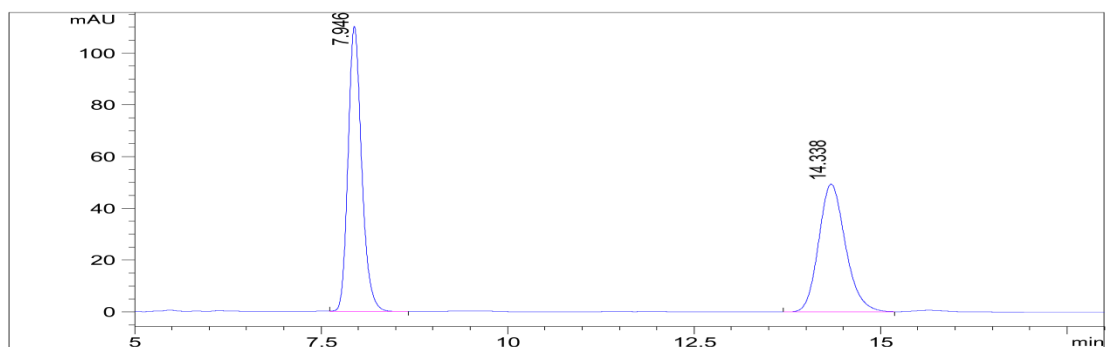
(S)-3-benzyl-5-methoxy-1-methyl-3-phenylindolin-2-one (3i)

Yield: 74% (25.4 mg), ee = 97%, $[\alpha]_D^{18} = -40.0$ (c = 1.4, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 7.2 Hz, 2H), 7.36 - 7.32 (m, 2H), 7.30 - 7.26 (m, 1H), 7.06 - 7.00 (m, 3H), 6.86 (dd, *J* = 7.2, 1.2 Hz, 2H), 6.79 (d, *J* = 2.4 Hz, 1H), 6.74 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.51 (d, *J* = 8.4 Hz, 1H), 3.77 (s, 3H), 3.69 (d, *J* = 12.4 Hz, 1H), 3.45 (d, *J* = 12.8 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.4, 155.6, 139.6, 137.3, 135.6, 132.5, 130.0, 128.6, 127.4, 127.2, 126.5, 112.8, 112.5, 108.2, 58.6, 55.8, 43.8, 26.1. HRMS (ESI) calcd. for C₂₃H₂₂NO₂ [M+H]⁺: 344.1645, found: 344.1644.

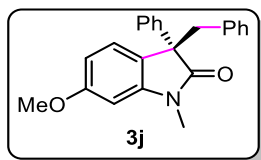
The ee of compound **3i** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 60/40, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.93 min, *t*_{minor} = 14.32 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.928	MF	1169.367	0.210	14745.798	98.562
2	14.322	MF	8.200	0.437	215.148	1.438



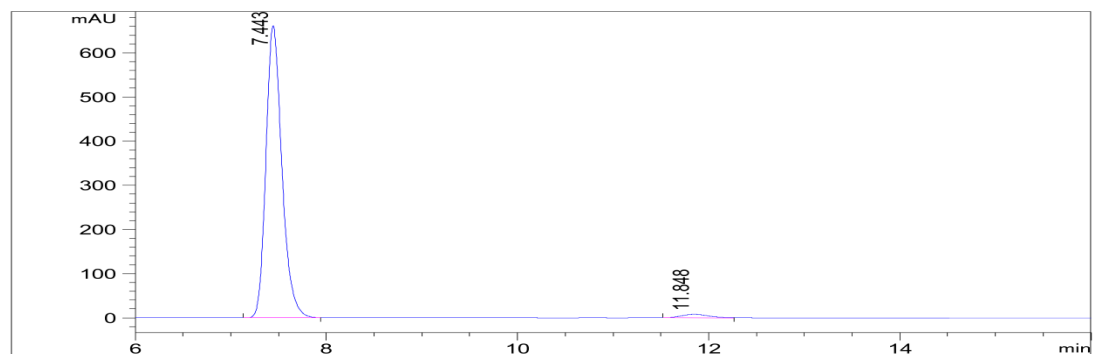
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.946	MM	106.129	0.198	1259.153	50.440
2	14.338	MF	49.402	0.417	1237.180	49.560



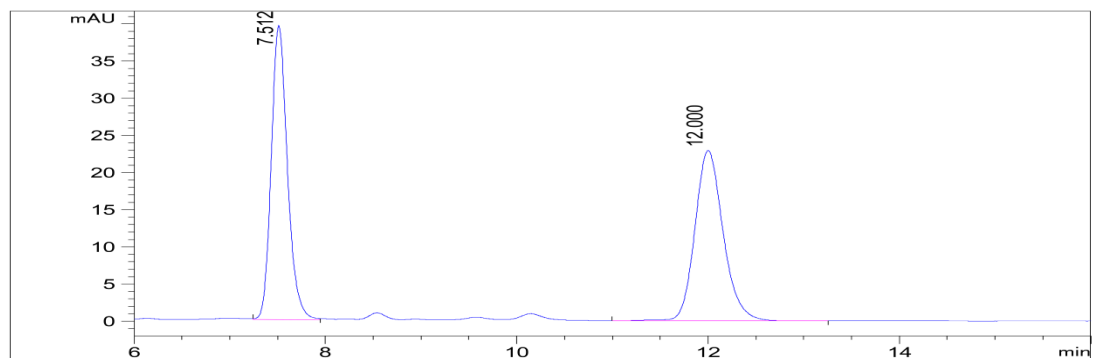
(S)-3-benzyl-6-methoxy-1-methyl-3-phenylindolin-2-one (3j)

Yield: 74% (25.4 mg), ee = 96%, $[\alpha]_D^{18} = -69.7$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 7.6 Hz, 2H), 7.33 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 7.08 - 7.00 (m, 4H), 6.84 (dd, *J* = 7.6, 1.6 Hz, 2H), 6.58 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.20 (d, *J* = 2.4 Hz, 1H), 3.80 (s, 3H), 3.65 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.8 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.3, 160.1, 144.9, 140.0, 135.9, 130.0, 128.5, 127.4, 127.3, 127.2, 126.4, 126.1, 123.0, 106.1, 95.8, 57.7, 55.4, 44.1, 26.0. HRMS (ESI) calcd. for C₂₃H₂₂NO₂ [M+H]⁺: 344.1645, found: 344.1643.

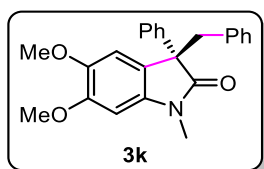
The ee of compound **3j** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.44 min, *t*_{minor} = 11.85 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.443	MF	661.726	0.193	7676.477	98.066
2	11.848	FM	7.726	0.327	151.411	1.934



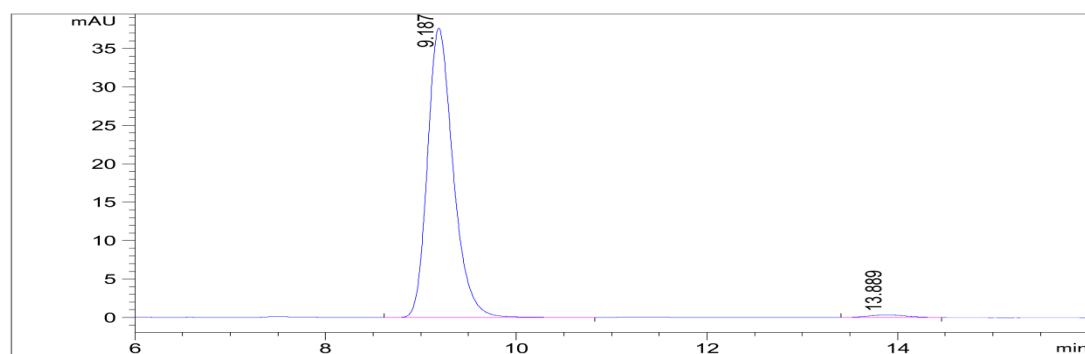
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.512	MF	39.594	0.196	465.552	49.788
2	12.000	BB	22.888	0.315	469.520	50.212



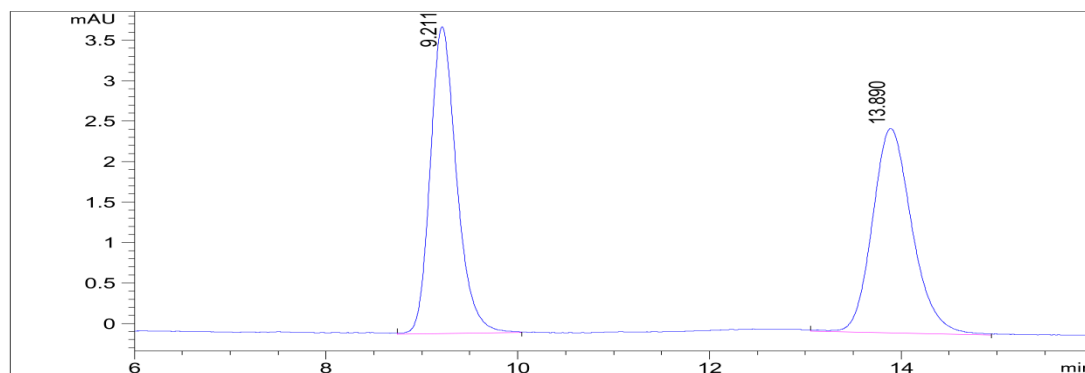
(S)-3-benzyl-5,6-dimethoxy-1-methyl-3-phenylindolin-2-one (3k)

Yield: 58% (21.6 mg), ee = 97%, $[\alpha]_D^{18} = -63.5$ (c = 1.6, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 6.8 Hz, 1H), 7.07 - 7.02 (m, 3H), 6.84 (dd, *J* = 7.6, 1.2 Hz, 2H), 6.70 (s, 1H), 6.27 (s, 1H), 3.87 (s, 3H), 3.82 (s, 3H), 3.62 (d, *J* = 12.8 Hz, 1H), 3.47 (d, *J* = 12.8 Hz, 1H), 2.96 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.1, 149.4, 144.6, 139.8, 137.6, 135.9, 130.0, 128.5, 127.5, 127.4, 127.3, 126.5, 121.5, 110.5, 93.8, 58.3, 56.8, 56.2, 43.8, 26.2. HRMS (ESI) calcd. for C₂₄H₂₄NO₃ [M+H]⁺: 374.1750, found: 374.1758.

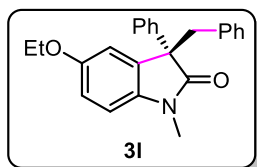
The ee of compound **3k** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 60/40, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.19 min, *t*_{minor} = 13.89 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.187	BB	37.614	0.283	704.698	98.615
2	13.889	MM	0.352	0.469	9.900	1.385



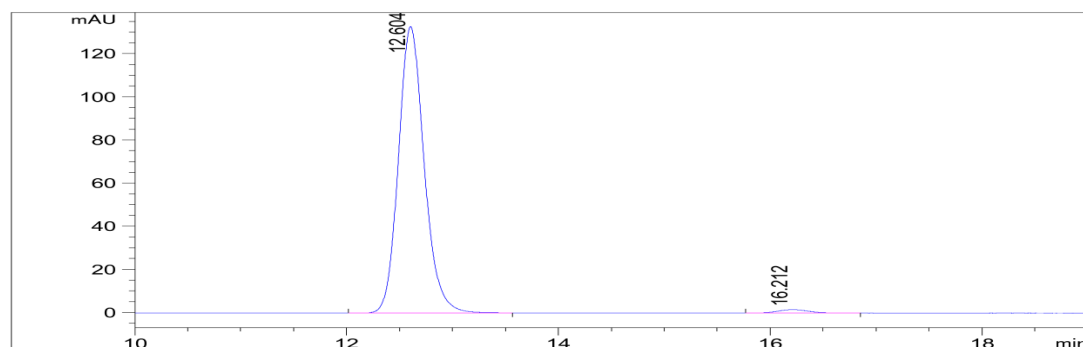
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.211	MM	3.793	0.319	72.598	50.062
2	13.890	MM	2.524	0.478	72.419	49.938



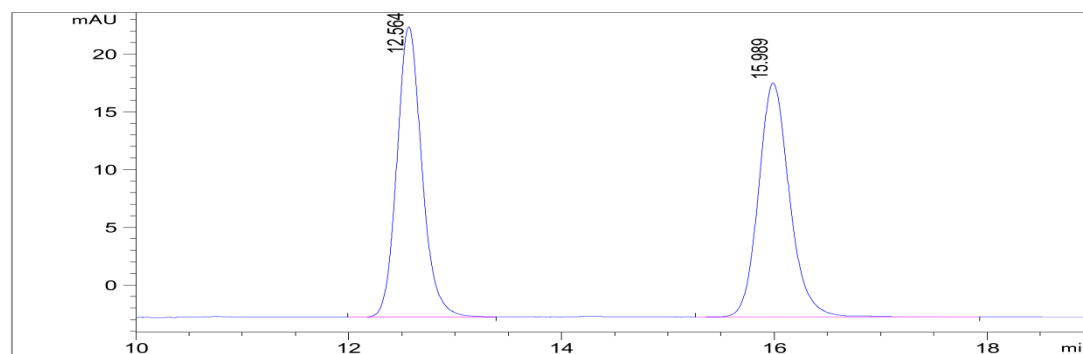
(S)-3-benzyl-5-ethoxy-1-methyl-3-phenylindolin-2-one (3I)

Yield: 63% (22.5 mg), ee = 97%, $[\alpha]_D^{18} = -35.8$ (c = 1.2, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 7.03 (dd, *J* = 13.2, 6.0 Hz, 3H), 6.86 (dd, *J* = 7.6, 1.6 Hz, 2H), 6.81 (d, *J* = 2.4 Hz, 1H), 6.74 (dd, *J* = 8.8, 2.8 Hz, 1H), 6.50 (d, *J* = 8.4 Hz, 1H), 4.02 - 3.93 (m, 2H), 3.69 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.8 Hz, 1H), 2.91 (s, 3H), 1.40 (t, *J* = 7.2 Hz, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 154.9, 139.7, 137.3, 135.7, 132.5, 130.0, 128.6, 127.4, 127.4, 127.2, 126.5, 113.5, 113.4, 108.3, 64.2, 58.7, 43.8, 26.1, 14.9. HRMS (ESI) calcd. for C₂₄H₂₄NO₂ [M+H]⁺: 358.1802, found: 358.1814.

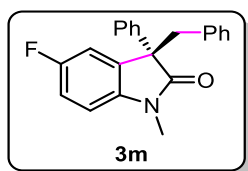
The ee of compound **3I** was determined by HPLC using an IA_{Dai}cel column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 12.60 min, *t*_{minor} = 16.21 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	12.604	MF	132.907	0.282	2248.198	98.584
2	16.212	MM	1.583	0.340	32.299	1.416



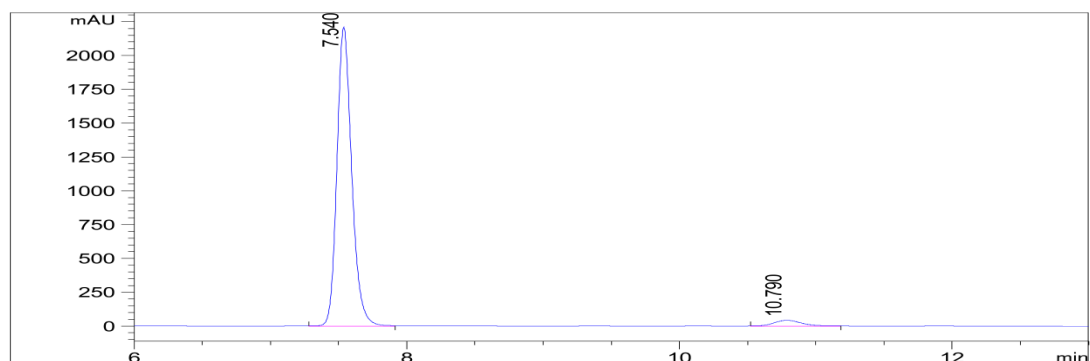
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	12.564	MF	25.179	0.273	411.885	49.948
2	15.989	VB	20.268	0.310	412.742	50.052



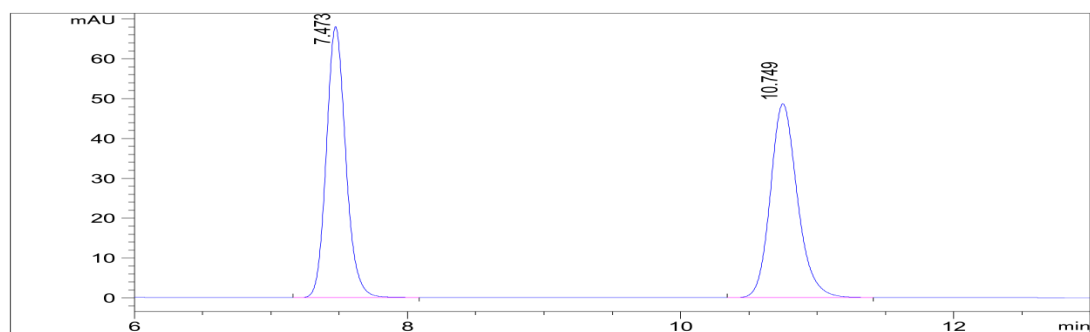
(S)-3-benzyl-5-fluoro-1-methyl-3-phenylindolin-2-one (3m)

Yield: 67% (22.2 mg), ee = 93%, $[\alpha]_D^{18} = -69.1$ (c = 1.3, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.47 (d, *J* = 7.2 Hz, 2H), 7.36 (t, *J* = 6.8 Hz, 2H), 7.30 (t, *J* = 7.2 Hz, 1H), 7.07 - 7.01 (m, 3H), 6.97 - 6.88 (m, 2H), 6.86 (dd, *J* = 7.2, 1.2 Hz, 2H), 6.52 (q, *J* = 4.4 Hz, 1H), 3.72 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 158.9 (d, *J*_{CF} = 238.9 Hz), 139.7, 139.1, 135.2, 133.0 (d, *J*_{CF} = 7.9 Hz), 129.9, 128.7, 127.7, 127.5, 127.1, 126.7, 114.4 (d, *J*_{CF} = 23.4 Hz), 113.4 (d, *J*_{CF} = 24.6 Hz), 108.4 (d, *J*_{CF} = 8.1 Hz), 58.7, 43.8, 26.2. HRMS (ESI) calcd. for C₂₂H₁₉FNO [M+H]⁺: 332.1445, found: 332.1445.

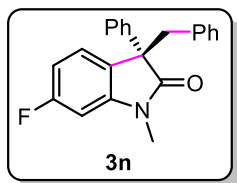
The ee of compound **3m** was determined by HPLC using an IA_{Dai}cel column (n-hexane/*i*-PrOH = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.54 min, *t*_{minor} = 10.79 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.540	MF	2215.010	0.126	16793.711	96.621
2	10.790	MF	42.785	0.229	587.354	3.379



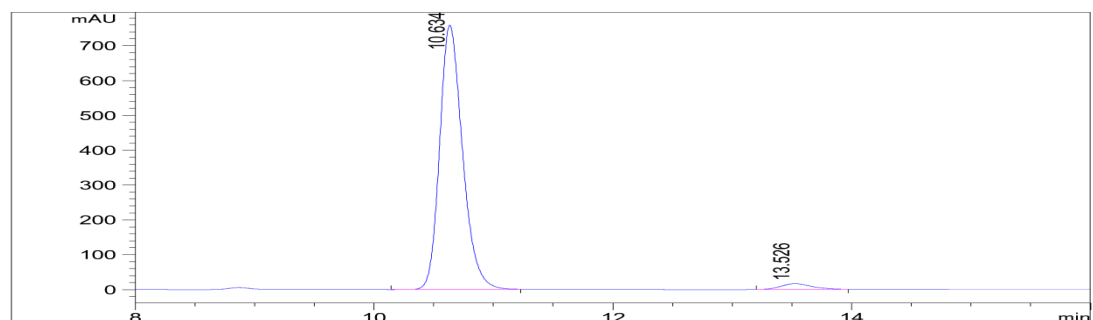
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.473	MF	68.076	0.165	673.719	50.055
2	10.749	MF	48.685	0.230	672.238	49.945



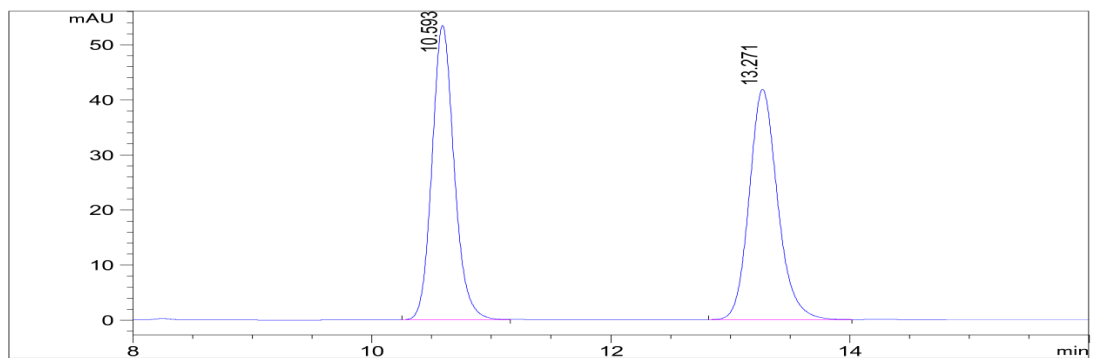
(S)-3-benzyl-6-fluoro-1-methyl-3-phenylindolin-2-one (3n)

Yield: 65% (21.5 mg), ee = 94%, $[\alpha]_D^{18} = -85.9$ (c = 1.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.47 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 6.8 Hz, 2H), 7.31 - 7.27 (m, 1H), 7.13 (dd, *J* = 8.4, 5.6 Hz, 1H), 7.09 - 7.01 (m, 3H), 6.4 (d, *J* = 6.4 Hz, 2H), 6.78 - 6.73 (m, 1H), 6.35 (dd, *J* = 8.8, 2.0 Hz, 1H), 3.69 (d, *J* = 12.8 Hz, 1H), 3.42 (d, *J* = 12.8 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.1, 163.0 (d, *J*_{CF} = 243.6 Hz), 145.2 (d, *J*_{CF} = 11.5 Hz), 139.4, 135.4, 129.9, 128.6, 127.5, 127.2, 127.1 (d, *J*_{CF} = 92.2 Hz), 126.5, 126.4, 108.2 (d, *J*_{CF} = 22.2 Hz), 96.7 (d, *J*_{CF} = 27.3 Hz), 57.9, 44.0, 26.1. HRMS (ESI) calcd. for C₂₂H₁₉FNO [M+H]⁺: 332.1445, found: 332.1443.

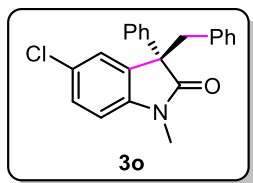
The ee of compound **3n** was determined by HPLC using an IA_{Dai}cel column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.63 min, *t*_{minor} = 13.53 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.634	MF	759.276	0.222	10123.767	97.040
2	13.526	MF	16.731	0.308	308.802	2.960



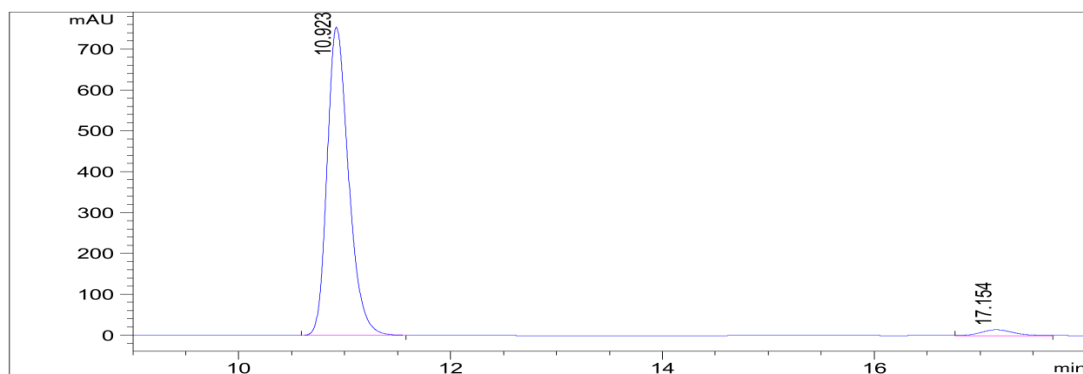
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.593	MF	53.486	0.215	690.741	49.823
2	13.271	MF	41.864	0.277	695.642	50.177



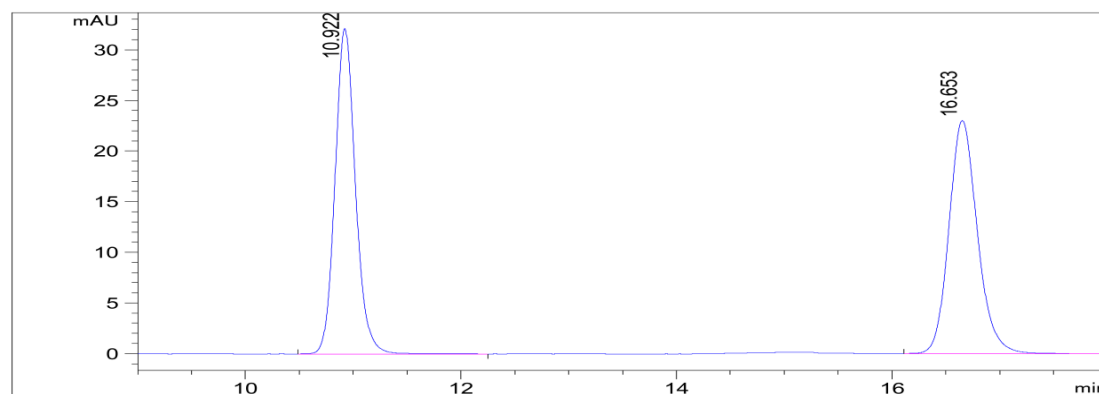
(S)-3-benzyl-5-chloro-1-methyl-3-phenylindolin-2-one (3o)

Yield: 55% (19.1 mg), ee = 95%, $[\alpha]_D^{19} = -17.0$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.45 (d, *J* = 6.0 Hz, 2H), 7.36 - 7.30 (m, 3H), 7.18 (s, 2H), 7.05 (s, 3H), 6.85 (s, 2H), 6.51 (d, *J* = 7.2 Hz, 1H), 3.71 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.4 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.3, 142.3, 139.0, 135.1, 133.2, 129.9, 128.7, 128.1, 127.7, 127.5, 127.1, 126.7, 125.6, 108.9, 58.5, 43.8, 26.1. HRMS (ESI) calcd. for C₂₂H₁₉ClNO [M+H]⁺: 348.1150, found: 348.1149.

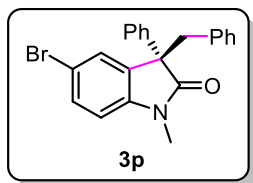
The ee of compound **3o** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.92 min, *t*_{minor} = 17.15 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.923	MF	754.395	0.235	10641.728	97.254
2	17.154	MF	14.392	0.348	300.525	2.746



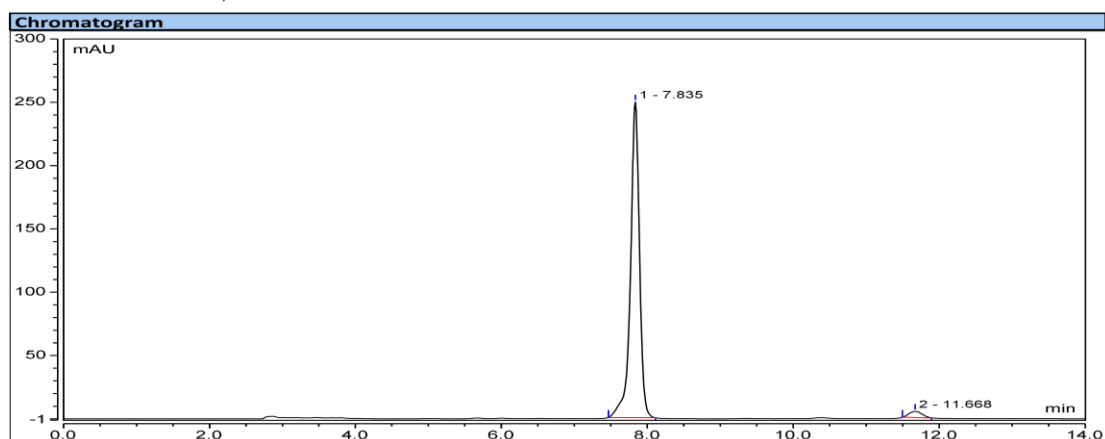
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.922	BB	32.079	0.202	423.115	50.065
2	16.653	BBA	22.973	0.282	422.024	49.935



(S)-3-benzyl-5-bromo-1-methyl-3-phenylindolin-2-one (3p)

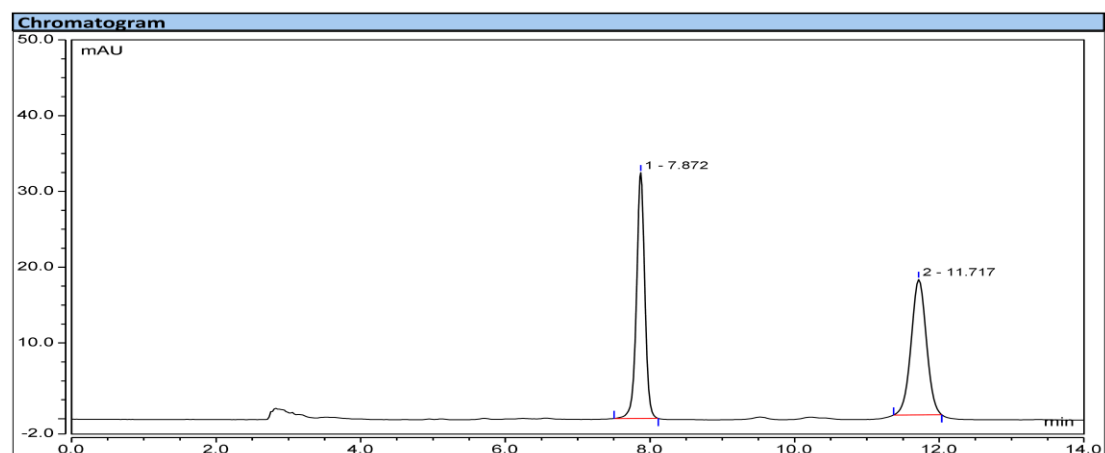
Yield: 50% (19.6 mg), ee = 95%, $[\alpha]_D^{27} = -18.5$ (c = 2.8, CHCl₃), ¹H NMR (400 MHz,) δ 7.46 - 7.44 (m, 2H), 7.39 - 7.31 (m, 5H), 7.08 - 7.03 (m, 3H), 6.84 (dd, *J* = 6.8, 1.2 Hz, 2H), 6.48 (d, *J* = 8.0 Hz, 1H), 3.70 (d, *J* = 12.8 Hz, 1H), 3.43 (d, *J* = 12.8 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃), δ 177.2, 142.7, 138.9, 135.1, 133.5, 131.0, 129.9, 128.7, 128.4, 127.7, 127.5, 127.1, 126.7, 114.8, 109.4, 58.5, 43.7, 26.1. HRMS (ESI) calcd. for C₂₂H₁₈BrNNaO [M+Na]⁺: 414.0464, found: 414.0466.

The ee of compound **3p** was determined by HPLC using an IA_{Dai}cel column (n-hexane/*i*-PrOH = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.84 min, *t*_{minor} = 11.67 min).



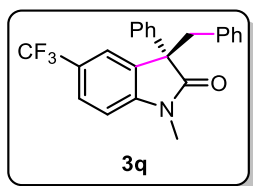
Integration Results

No.	Peak Name	Retention Time (min)	Area (mAU*min)	Height (mAU)	Relative Area (%)	Relative Height (%)
1		7.835	35.518	249.323	97.30	98.10
2		11.668	0.985	4.822	2.70	1.90



Integration Results

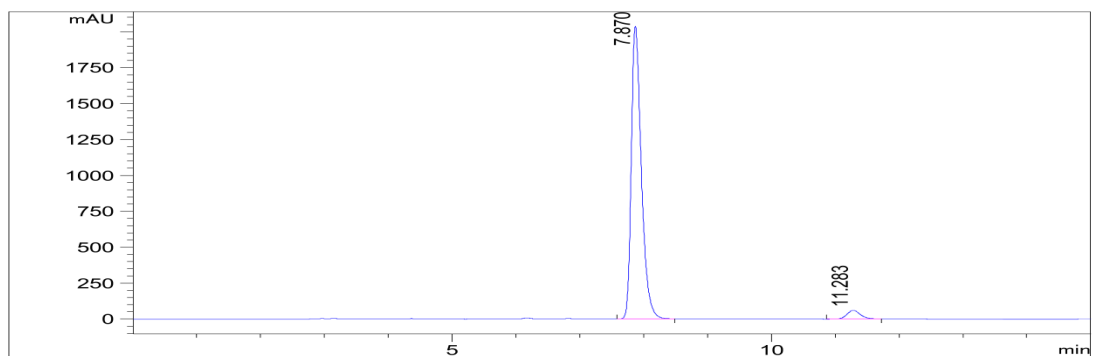
No.	Peak Name	Retention Time (min)	Area (mAU*min)	Height (mAU)	Relative Area (%)	Relative Height (%)
1		7.872	4.289	32.439	49.58	64.47
2		11.717	4.362	17.878	50.42	35.53



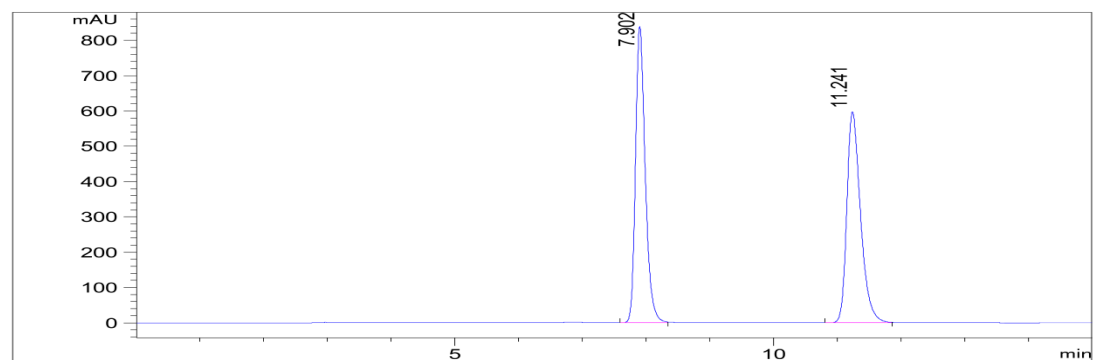
(S)-3-benzyl-1-methyl-3-phenyl-5-(trifluoromethyl)indolin-2-one (3q)

Yield: 71% (27.1 mg), ee = 92%, $[\alpha]_D^{18} = -24.2$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 - 7.42 (m, 4H), 7.39 - 7.35 (m, 2H), 7.34 - 7.30 (m, 1H), 7.08 - 7.00 (m, 3H), 6.79 (d, *J* = 6.8 Hz, 2H), 6.66 (d, *J* = 8.0 Hz, 1H), 3.73 (d, *J* = 12.8 Hz, 1H), 3.47 (d, *J* = 12.8 Hz, 1H), 2.98 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 146.7, 138.6, 135.0, 131.9, 129.8, 128.8, 127.8, 127.6, 127.1, 126.8, 125.9 (q, *J*_{CF} = 4.0 Hz), 124.2, 122.5 (q, *J*_{CF} = 3.7 Hz), 107.7, 58.3, 44.0, 26.2. HRMS (ESI) calcd. for C₂₃H₁₉F₃NO [M+H]⁺: 382.1413, found: 382.1413.

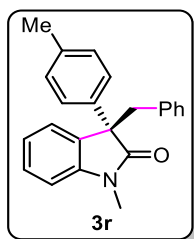
The ee of compound **3q** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.87 min, *t*_{minor} = 11.28 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.870	FM	2038.909	0.182	22306.992	96.142
2	11.283	MF	60.770	0.245	895.108	3.858



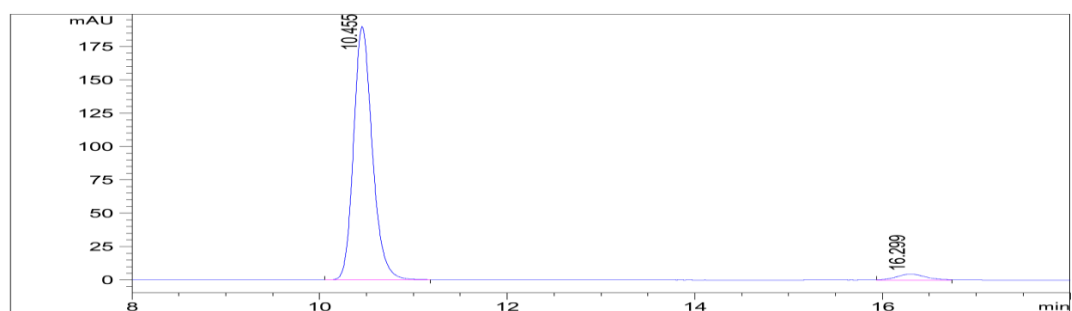
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.902	FM	837.978	0.177	8893.450	49.898
2	11.241	MF	597.844	0.249	8929.662	50.102



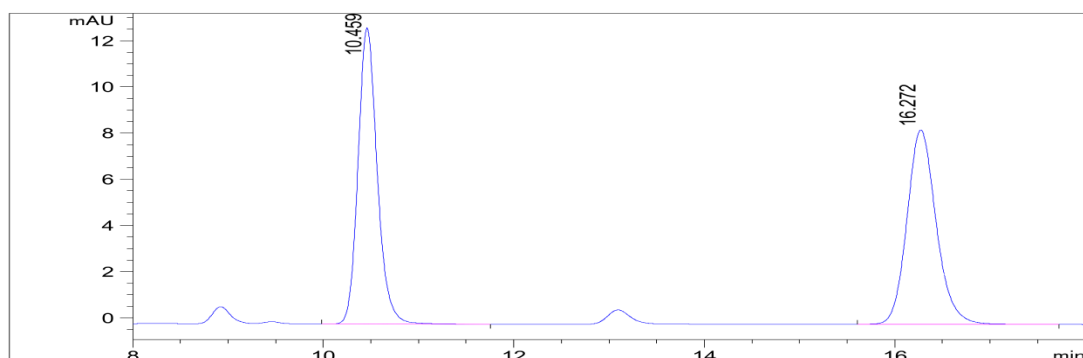
(S)-3-benzyl-1-methyl-3-(p-tolyl)indolin-2-one (3r)

Yield: 70% (22.9 mg), ee = 93%, $[\alpha]_D^{18} = -99.7$ (c = 0.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.37 (d, *J* = 8.4 Hz, 2H), 7.21 - 7.18 (m, 2H), 7.14 (d, *J* = 8.0 Hz, 2H), 7.08 - 6.98 (m, 4H), 6.83 (dd, *J* = 7.6, 1.2 Hz, 2H), 6.60 (d, *J* = 7.6 Hz, 1H), 3.70 (d, *J* = 12.4 Hz, 1H), 3.42 (d, *J* = 12.8 Hz, 1H), 2.93 (s, 3H), 2.32 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.9, 143.7, 137.1, 136.7, 135.7, 131.4, 130.0, 129.2, 128.0, 127.4, 127.1, 126.4, 125.4, 122.1, 107.9, 58.0, 43.9, 26.0, 21.0. HRMS (ESI) calcd. for C₂₃H₂₁NNaO [M+Na]⁺: 350.1515, found: 350.1520.

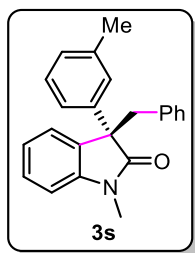
The ee of compound **3r** was determined by HPLC using an IADaice column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.46 min, *t*_{minor} = 16.30 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.455	FM	190.006	0.232	2641.245	96.660
2	16.299	FM	4.352	0.349	91.259	3.340



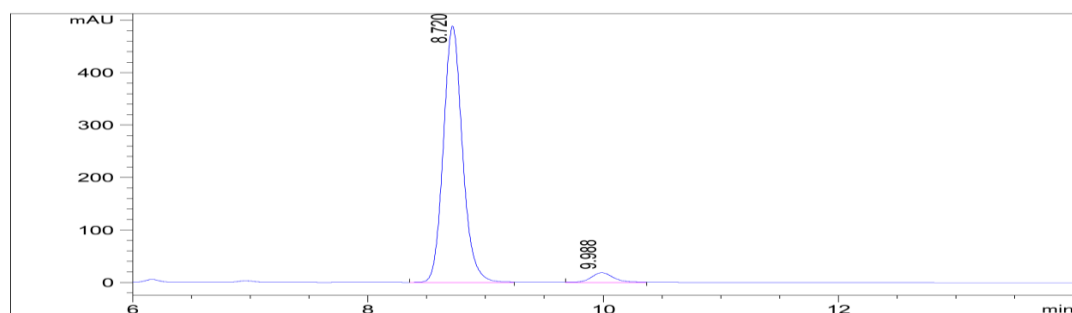
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.459	BB	12.804	0.216	179.481	49.983
2	16.272	BB	8.413	0.329	179.601	50.017



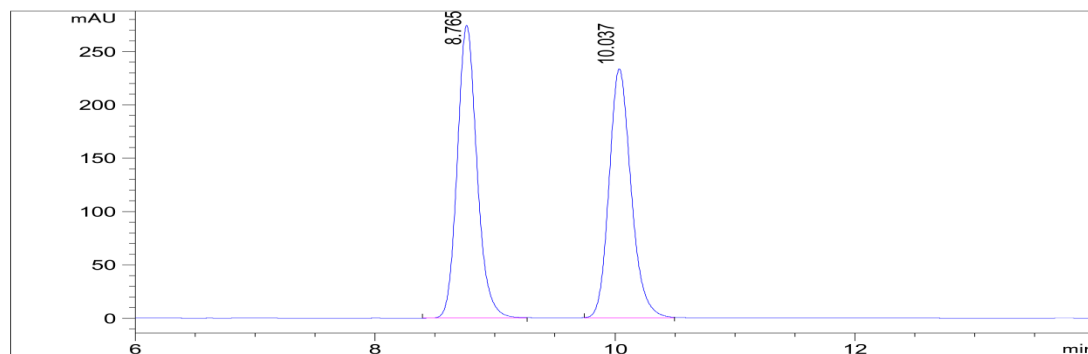
(S)-3-benzyl-1-methyl-3-(m-tolyl)indolin-2-one (3s)

Yield: 69% (22.6 mg), ee = 92%, $[\alpha]_D^{18} = -71.9$ (c = 0.8, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.30 (s, 1H), 7.27 - 7.25 (m, 1H), 7.24 - 7.18 (m, 3H), 7.09 (t, $J = 6.4$ Hz, 2H), 7.05 - 6.98 (m, 3H), 6.83 (d, $J = 6.8$ Hz, 2H), 6.59 (d, $J = 7.6$ Hz, 1H), 3.71 (d, $J = 12.4$ Hz, 1H), 3.44 (d, $J = 12.4$ Hz, 1H), 2.93 (s, 3H), 2.34 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.8, 143.7, 139.7, 138.2, 135.7, 131.5, 130.0, 128.4, 128.2, 128.2, 127.8, 127.3, 126.4, 125.3, 124.2, 122.1, 107.9, 58.2, 43.8, 26.0, 21.6. HRMS (ESI) calcd. for $\text{C}_{23}\text{H}_{22}\text{NO}$ $[\text{M}+\text{H}]^+$: 328.1696, found: 328.1707.

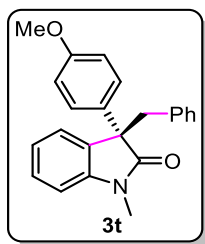
The ee of compound **3s** was determined by HPLC using an IA_{Daiacel} column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 8.72$ min, $t_{\text{minor}} = 9.99$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.720	MF	489.277	0.188	5523.569	95.870
2	9.988	MF	18.333	0.216	237.979	4.130



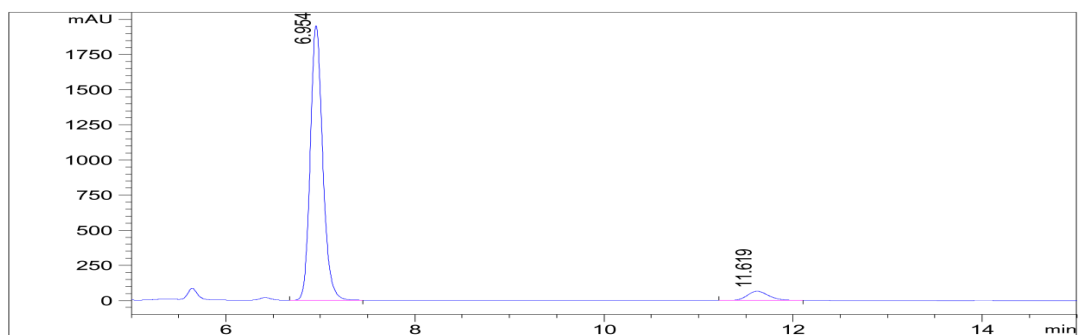
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.765	MF	274.619	0.190	3133.837	51.206
2	10.037	FM	233.828	0.213	2986.164	48.794



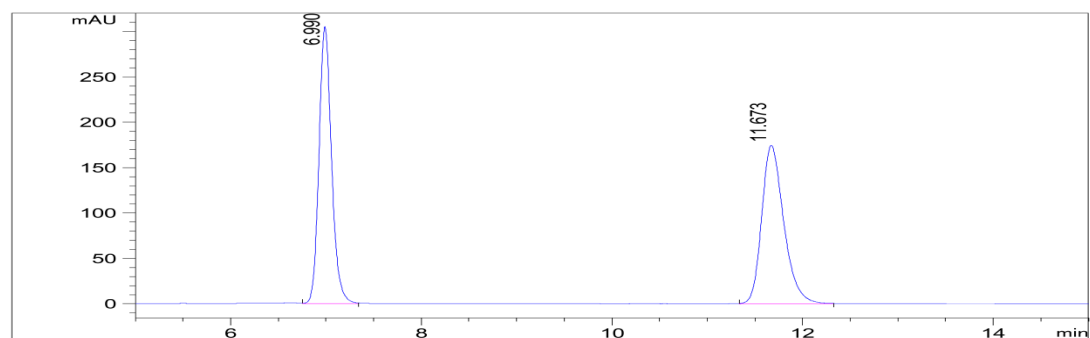
(S)-3-benzyl-3-(4-methoxyphenyl)-1-methylindolin-2-one (3t)

Yield: 67% (23.0 mg), ee = 89%, $[\alpha]_D^{18} = -21.5$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.42 (d, *J* = 8.8 Hz, 2H), 7.23 - 7.18 (m, 2H), 7.08 - 6.98 (m, 4H), 6.87 (d, *J* = 8.8 Hz, 2H), 6.83 (d, *J* = 6.4 Hz, 2H), 6.61 (d, *J* = 7.6 Hz, 1H), 3.79 (s, 3H), 3.67 (d, *J* = 12.8 Hz, 1H), 3.41 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.0, 158.8, 143.7, 135.7, 131.7, 131.3, 130.0, 128.4, 128.1, 127.4, 126.4, 125.4, 122.1, 113.9, 108.0, 57.5, 55.3, 44.1, 26.0. HRMS (ESI) calcd. for C₂₃H₂₂NO₂ [M+H]⁺: 344.1645, found: 344.1651.

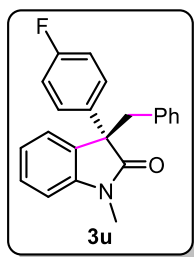
The ee of compound **3t** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.95 min, *t*_{minor} = 11.62 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.954	MF	1956.477	0.152	17899.309	94.503
2	11.619	MF	65.328	0.266	1041.067	5.497



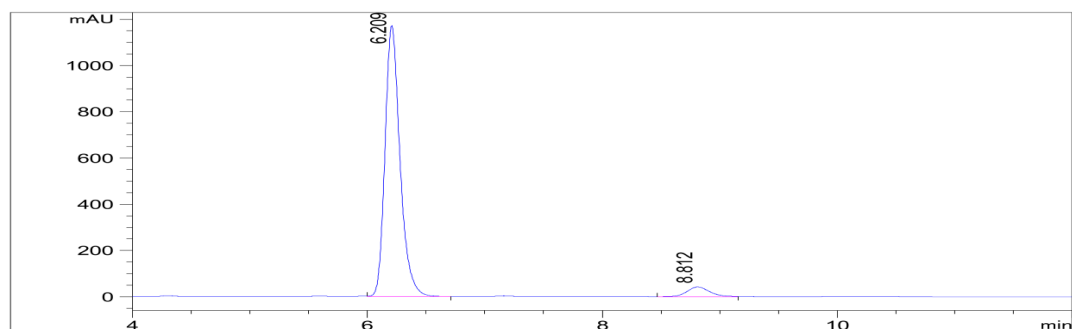
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.990	MF	305.624	0.153	2804.749	49.841
2	11.673	FM	174.713	0.269	2822.661	50.159



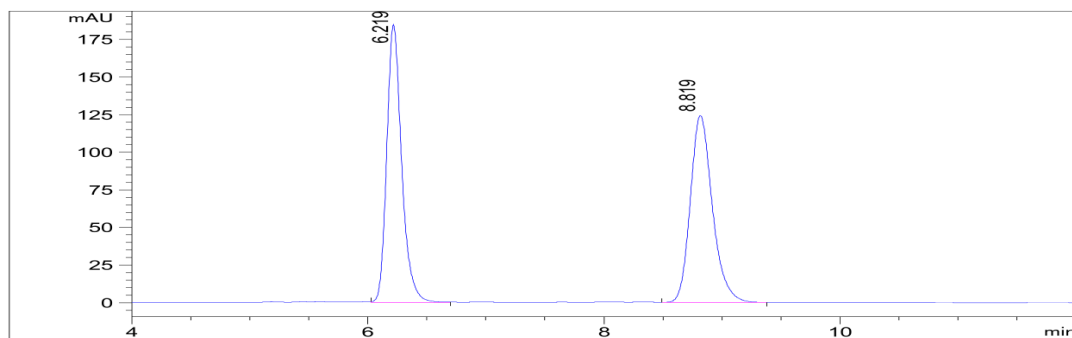
(S)-3-benzyl-3-(4-fluorophenyl)-1-methylindolin-2-one (3u)

Yield: 70% (23.3 mg), ee = 90%, $[\alpha]_D^{18} = -104.2$ (c = 0.6, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 - 7.47 (m, 2H), 7.25 - 7.18 (m, 2H), 7.10 - 6.99 (m, 6H), 6.81 (d, *J* = 6.8 Hz, 2H), 6.62 (d, *J* = 7.6 Hz, 1H), 3.65 (d, *J* = 12.8 Hz, 1H), 3.41 (d, *J* = 12.8 Hz, 1H), 2.95 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.6, 162.1 (d, *J*_{CF} = 245.0 Hz), 143.7, 135.4, 130.8, 129.9, 129.0 (d, *J*_{CF} = 8.0 Hz), 128.3, 127.4, 126.6, 125.5, 122.2, 115.3 (d, *J*_{CF} = 21.2 Hz), 108.1, 57.6, 44.3, 26.1. HRMS (ESI) calcd. for C₂₂H₁₉FNO [M+H]⁺: 332.1445, found: 332.1458.

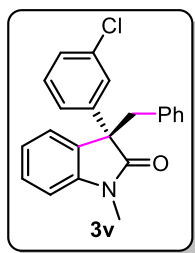
The ee of compound **3u** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.21 min, *t*_{minor} = 8.81 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.209	FM	1172.506	0.148	10432.102	94.881
2	8.812	MF	42.180	0.222	562.813	5.119



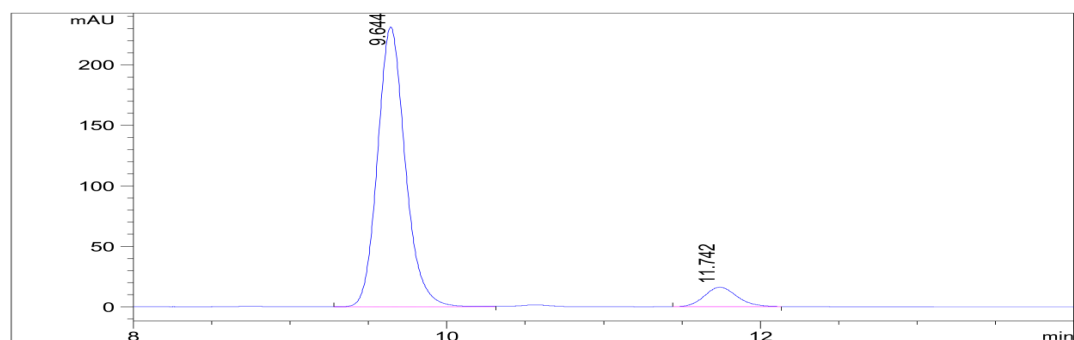
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.219	MF	184.621	0.146	1613.229	49.961
2	8.819	MF	124.315	0.217	1615.737	50.039



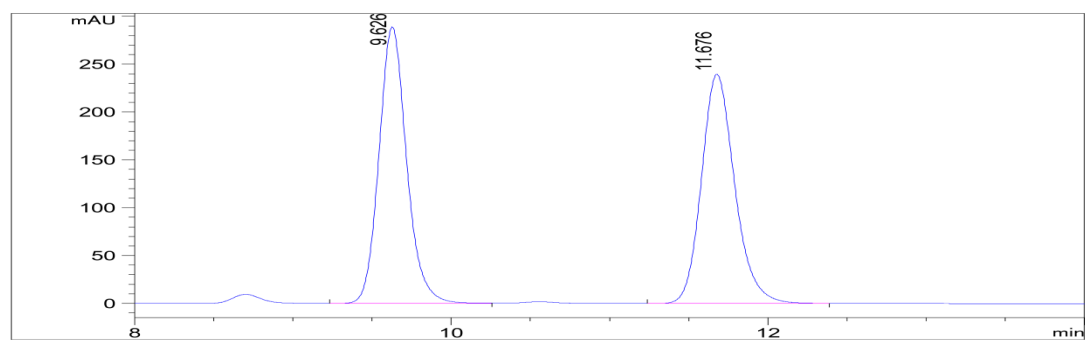
(S)-3-benzyl-3-(3-chlorophenyl)-1-methylindolin-2-one (3v)

Yield: 63% (21.8 mg), ee = 84%, $[\alpha]_D^{18} = -69.5$ ($c = 0.8$, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.47 (s, 1H), 7.42 - 7.40 (m, 1H), 7.28 - 7.27 (m, 2H), 7.25 - 7.19 (m, 2H), 7.11 - 7.00 (m, 4H), 6.81 (d, $J = 6.4$ Hz, 2H), 6.62 (d, $J = 8.0$ Hz, 1H), 3.66 (d, $J = 12.8$ Hz, 1H), 3.41 (d, $J = 12.4$ Hz, 1H), 2.95 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.1, 143.6, 141.7, 135.2, 134.4, 130.5, 129.9, 129.8, 128.4, 127.6, 127.5, 127.4, 126.6, 125.6, 125.4, 122.4, 108.2, 58.0, 44.0, 26.1. HRMS (ESI) calcd. for $\text{C}_{22}\text{H}_{19}\text{ClNO}$ $[\text{M}+\text{H}]^+$: 348.1150, found: 348.1161.

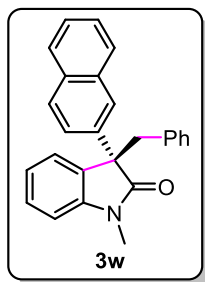
The ee of compound **3v** was determined by HPLC using an $\text{IA}_{\text{Daicel}}$ column (n-hexane/*i*-PrOH = 95/5, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 9.64$ min, $t_{\text{minor}} = 11.74$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.644	MM	231.484	0.205	2842.866	92.244
2	11.742	FM	16.253	0.245	239.040	7.756



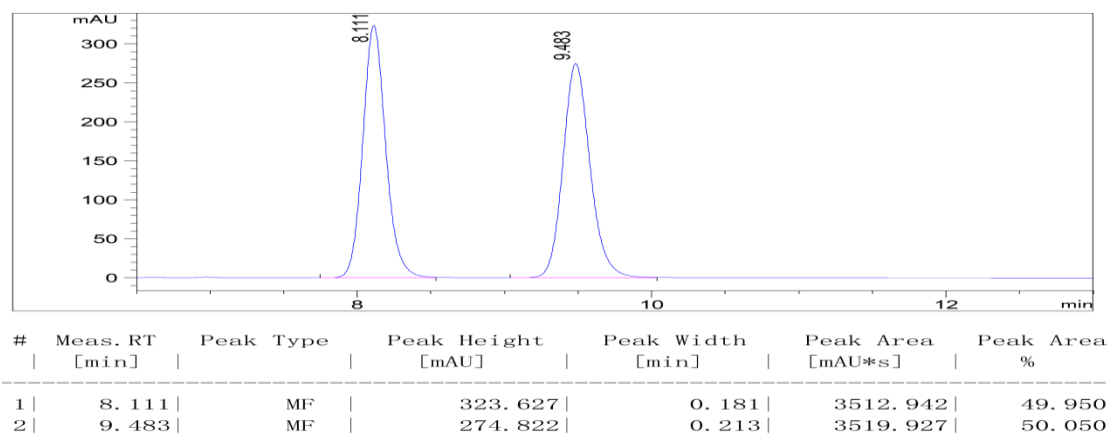
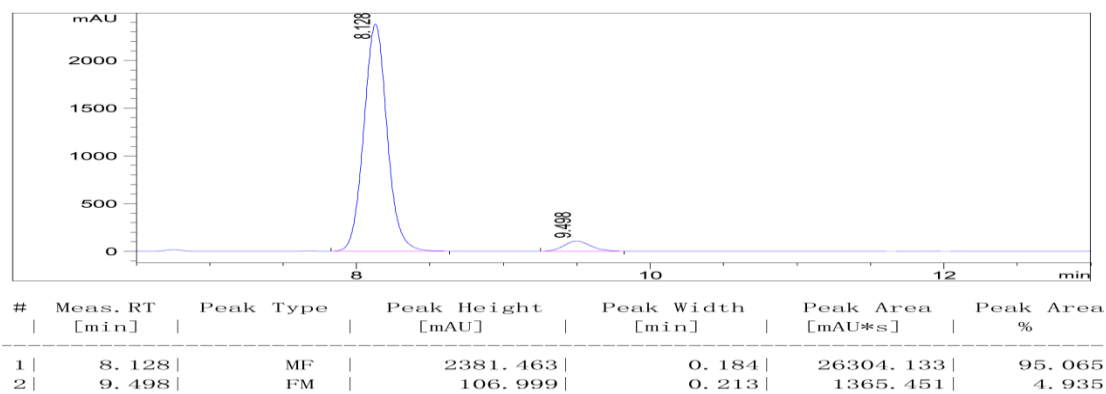
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.626	MF	289.118	0.203	3515.545	50.087
2	11.676	MF	239.708	0.244	3503.372	49.913

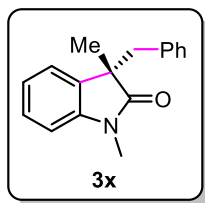


(S)-3-benzyl-1-methyl-3-(naphthalen-2-yl)indolin-2-one (3w)

Yield: 65% (23.6 mg), ee = 90%, $[\alpha]_D^{18} = -99.6$ (c = 0.7, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.91 (d, *J* = 2.0 Hz, 1H), 7.83 - 7.79 (m, 3H), 7.60 (dd, *J* = 8.4, 2.0 Hz, 1H), 7.48 - 7.44 (m, 2H), 7.26 - 7.22 (m, 2H), 7.11 - 7.00 (m, 4H), 6.86 (dd, *J* = 8.0, 1.2 Hz, 2H), 6.64 (d, *J* = 7.6 Hz, 1H), 3.82 (d, *J* = 12.8 Hz, 1H), 3.57 (d, *J* = 12.4 Hz, 1H), 2.97 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 143.8, 137.1, 135.6, 133.2, 132.6, 131.3, 130.0, 128.3, 128.2, 128.2, 127.4, 126.5, 126.1, 126.0, 125.5, 125.4, 122.3, 108.1, 99.9, 58.4, 43.7, 26.1. HRMS (ESI) calcd. for C₂₆H₂₂NO [M+H]⁺: 364.1696, found: 364.1693.

The ee of compound **3w** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.13 min, *t*_{minor} = 9.50 min).

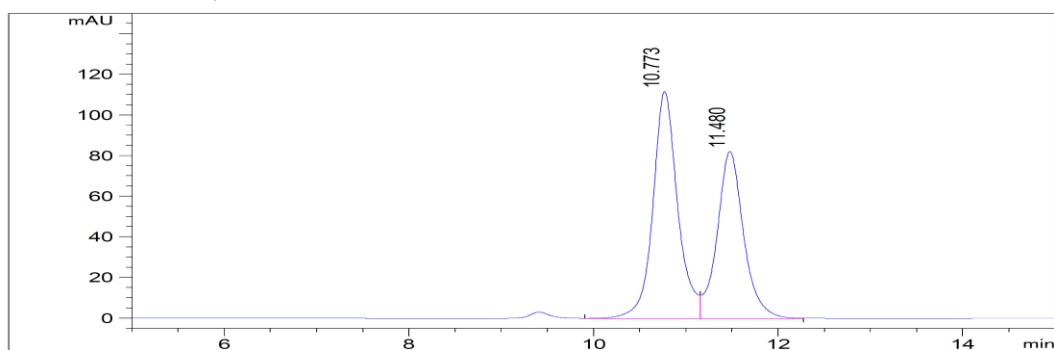




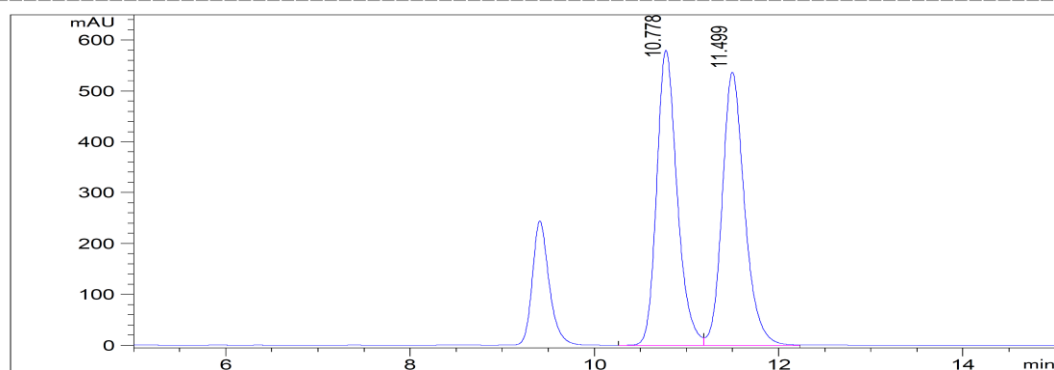
(S)-3-benzyl-1,3-dimethylindolin-2-one (3x)

Yield: 42% (10.5 mg), ee = 12%, $[\alpha]_D^{33} = -11.3$ (c = 0.53, MeOH), or $[\alpha]_D^{33} = -14.2$ (c = 0.53, *i*PrOH), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.18 (td, $J = 7.6, 1.2$ Hz, 1H), 7.13 (dd, $J = 7.6, 1.6$ Hz, 1H), 7.08 - 7.01 (m, 4H), 6.86 - 6.83 (m, 2H), 6.61 (d, $J = 7.6$ Hz, 1H), 3.12 (d, $J = 12.8$, 1H), 3.01 (d, $J = 13.2$ Hz, 1H), 2.99 (s, 3H), 1.47 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 180.0, 143.1, 136.1, 133.0, 129.8, 127.7, 127.5, 126.4, 123.3, 122.0, 107.7, 49.9, 44.5, 25.9, 22.7.

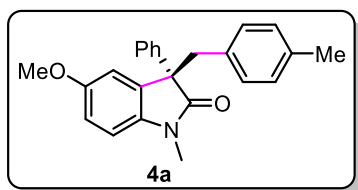
The ee of compound **3x** was determined by HPLC using an IG_{Daicel} column (n-hexane/*i*-PrOH = 98/2, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 10.77$ min, $t_{\text{minor}} = 11.48$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.773	VV	111.632	0.278	2084.104	55.964
2	11.480	MF	82.222	0.332	1639.879	44.036



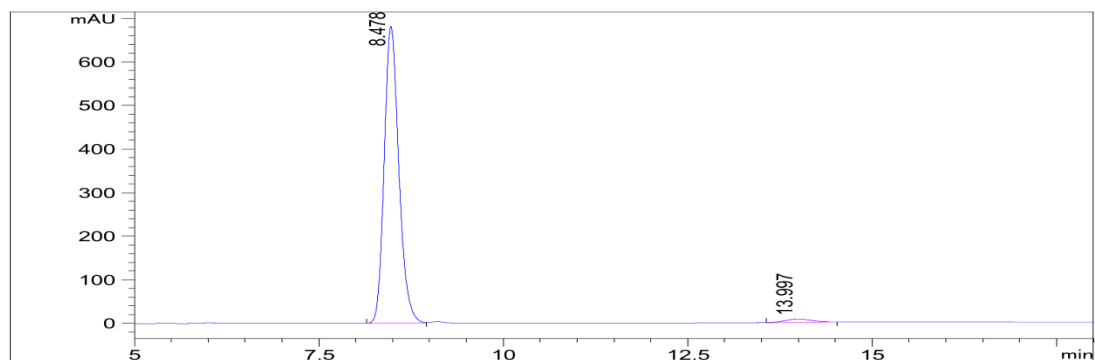
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.778	BV	580.038	0.236	8952.672	49.763
2	11.499	MF	536.626	0.281	9038.028	50.237



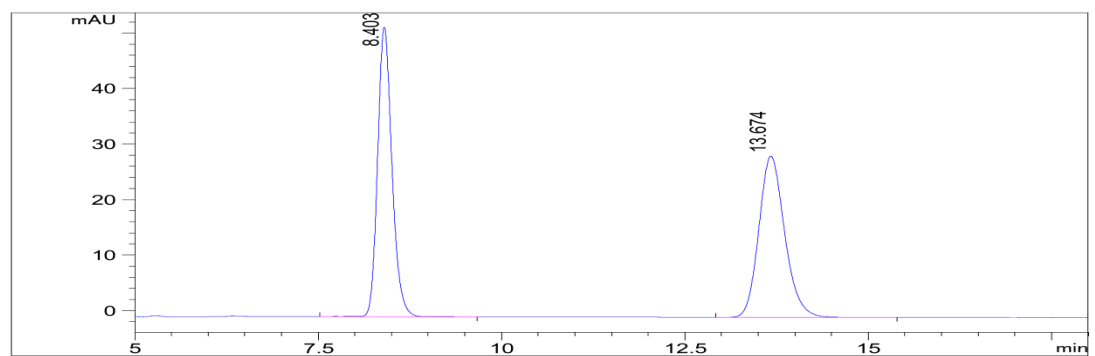
(S)-5-methoxy-1-methyl-3-(4-methylbenzyl)-3-phenylindolin-2-one (4a)

Yield: 70% (25.0 mg), ee = 96%, $[\alpha]_D^{19} = -22.3$ (c = 1.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.6 Hz, 2H), 7.33 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 6.83 (d, *J* = 8.0 Hz, 2H), 6.79 (d, *J* = 2.4 Hz, 1H), 6.76 - 6.73 (m, 3H), 6.54 (d, *J* = 8.4 Hz, 1H), 3.77 (s, 3H), 3.64 (d, *J* = 12.8 Hz, 1H), 3.41 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H), 2.19 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 155.5, 139.7, 137.4, 135.9, 132.6, 132.5, 129.8, 128.5, 128.2, 127.3, 127.2, 112.8, 112.5, 108.3, 58.6, 55.8, 43.4, 26.1, 21.0. HRMS (ESI) calcd. for C₂₄H₂₄NO₂ [M+H]⁺: 358.1802, found: 358.1819.

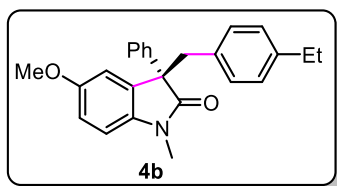
The ee of compound **4a** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.48 min, *t*_{minor} = 14.00 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.478	MF	682.003	0.230	9417.779	97.923
2	13.997	MF	7.748	0.430	199.707	2.077



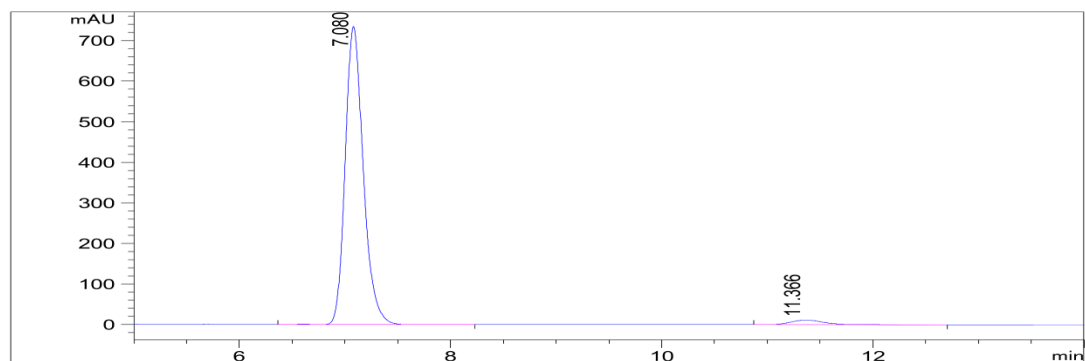
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.403	VV R	52.118	0.207	711.713	49.979
2	13.674	BB	29.043	0.378	712.302	50.021



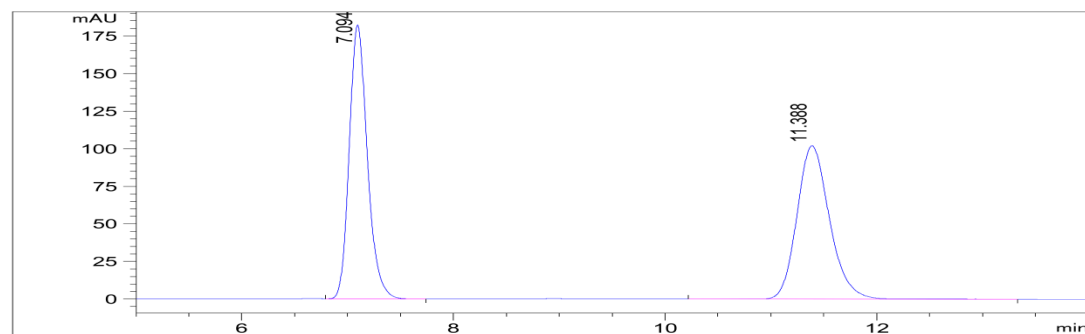
(S)-3-(4-ethylbenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4b)

Yield 72% (26.7 mg), ee = 95%, $[\alpha]_D^{21} = -22.4$ (c = 1.4, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 8.0 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 6.86 (d, *J* = 8.0 Hz, 2H), 6.77 - 6.74 (m, 4H), 6.53 (d, *J* = 8.0 Hz, 1H), 3.77 (s, 3H), 3.62 (d, *J* = 13.2 Hz, 1H), 3.44 (d, *J* = 12.8 Hz, 1H), 2.93 (s, 3H), 2.49 (q, *J* = 7.6 Hz, 2H), 1.12 (t, *J* = 7.6 Hz, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 155.5, 142.4, 139.7, 137.4, 132.8, 132.6, 129.9, 128.5, 127.4, 127.3, 126.9, 112.7, 112.6, 108.3, 58.6, 55.8, 43.4, 28.3, 26.1, 15.6. HRMS (ESI) calcd. for C₂₅H₂₆NO₂ [M+H]⁺: 372.1958, found: 372.1971.

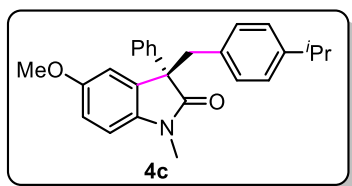
The ee of compound **4b** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 60/40, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.08 min, *t*_{minor} = 11.37 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.080	VV R	734.483	0.183	8765.938	97.296
2	11.366	BB	11.483	0.328	243.643	2.704



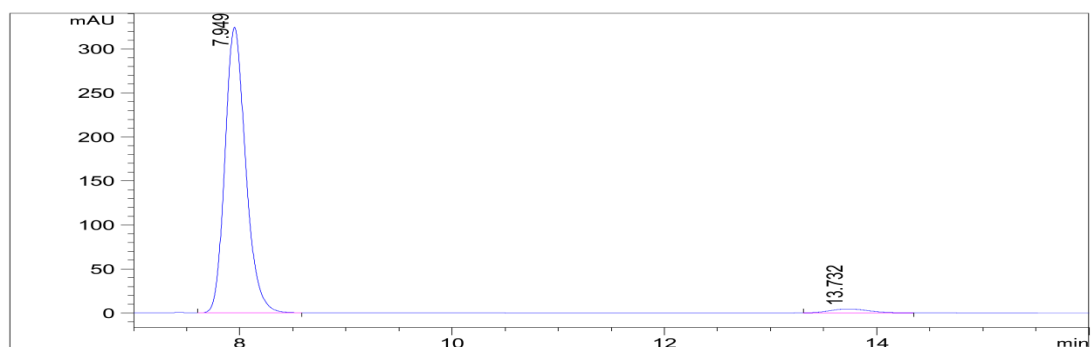
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.094	FM	182.184	0.199	2170.739	49.926
2	11.388	VB R	102.012	0.329	2177.175	50.074



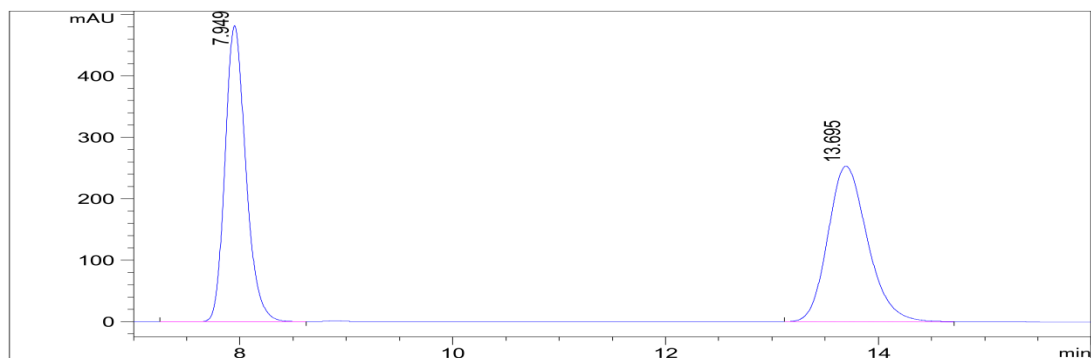
(S)-3-(4-isopropylbenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4c)

Yield: 74% (28.5 mg), 95% ee, $[\alpha]_D^{21} = -25.6$ ($c = 1.6$, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.49 (d, $J = 7.2$ Hz, 2H), 7.34 (t, $J = 7.2$ Hz, 2H), 7.28 (d, $J = 7.2$ Hz, 1H), 6.89 (d, $J = 8.0$ Hz, 2H), 6.75 (d, $J = 7.6$ Hz, 4H), 6.53 (d, $J = 8.4$ Hz, 1H), 3.76 (s, 3H), 3.59 (d, $J = 12.8$ Hz, 1H), 3.46 (d, $J = 12.8$ Hz, 1H), 2.91 (s, 3H), 2.79 - 2.72 (m, 1H), 1.13 (dd, $J = 6.8, 1.6$ Hz, 6H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.5, 155.5, 147.1, 139.6, 137.4, 132.9, 132.6, 129.9, 128.5, 127.4, 127.3, 125.4, 112.7, 112.6, 108.2, 58.6, 55.8, 43.5, 33.5, 26.1, 24.0, 23.8. HRMS (ESI) calcd. for $\text{C}_{26}\text{H}_{28}\text{NO}_2$ $[\text{M}+\text{H}]^+$: 386.2115, found: 386.2128.

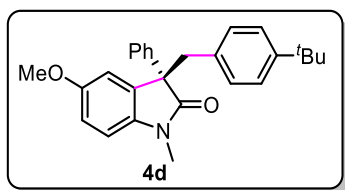
The ee of compound **4c** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 7.95$ min, $t_{\text{minor}} = 13.73$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.949	FM	324.456	0.226	4407.672	97.344
2	13.732	MF	4.658	0.430	120.261	2.656



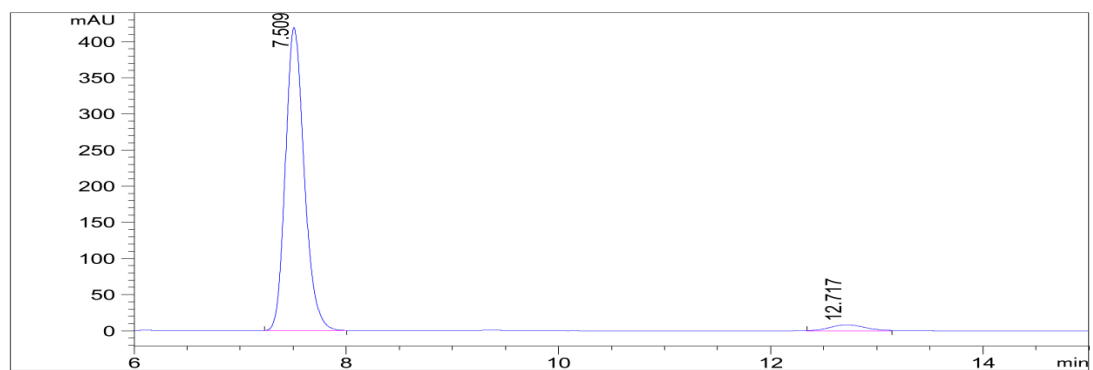
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.949	MF	482.029	0.227	6553.250	49.920
2	13.695	FM	253.484	0.432	6574.374	50.080



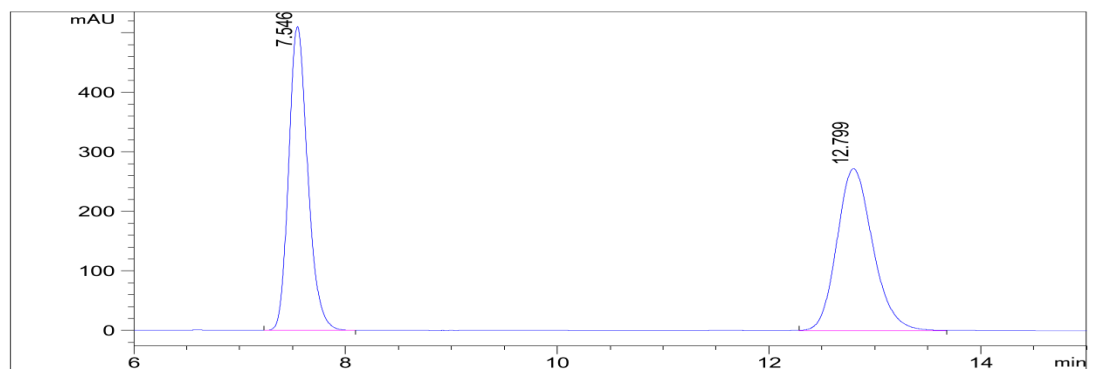
(S)-3-(4-(tert-butyl)benzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4d)

Yield: 70% (27.9 mg), ee = 93%, $[\alpha]_D^{18} = -26.1$ (c = 1.7, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 7.05 (d, *J* = 8.0 Hz, 2H), 6.76 - 6.72 (m, 4H), 6.53 (d, *J* = 8.4 Hz, 1H), 3.75 (s, 3H), 3.57 (d, *J* = 12.8 Hz, 1H), 3.48 (d, *J* = 12.8 Hz, 1H), 2.91 (s, 3H), 1.20 (s, 9H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 155.5, 149.3, 139.6, 137.4, 132.6, 132.6, 129.6, 128.5, 127.3, 124.2, 112.8, 112.6, 108.2, 58.6, 55.8, 43.4, 34.2, 31.2, 26.1. HRMS (ESI) calcd. for C₂₇H₃₀NO₂ [M+H]⁺: 400.2271, found: 400.2287.

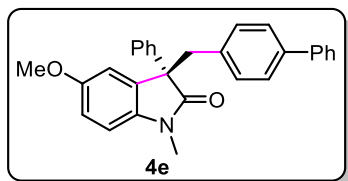
The ee of compound **4d** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.51 min, *t*_{minor} = 12.72 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.509	MF	419.505	0.206	5195.427	96.472
2	12.717	MF	8.319	0.381	189.976	3.528



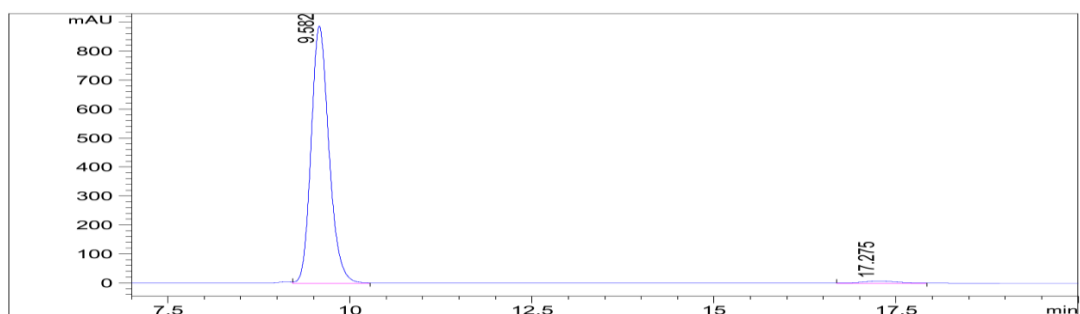
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.546	MF	510.374	0.209	6388.309	49.965
2	12.799	MF	272.000	0.392	6397.383	50.035



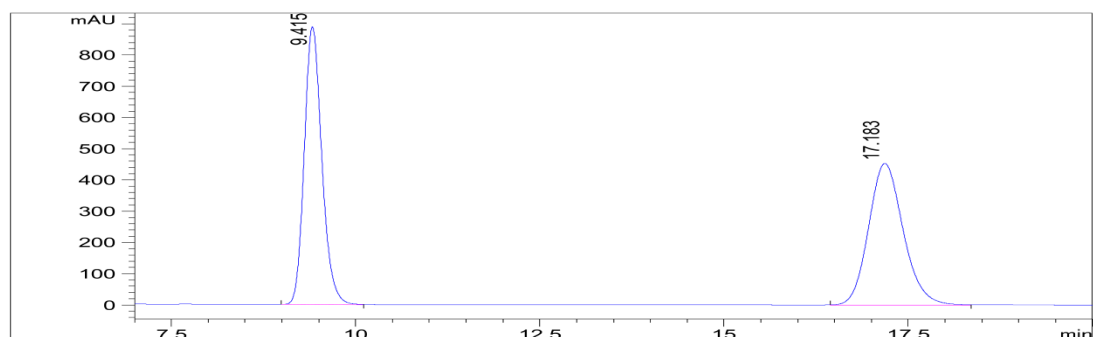
**(S)-3-([1,1'-biphenyl]-4-ylmethyl)-5-methoxy-1-methyl-3-phenylindolin-2-one
(4e)**

Yield: 79% (33.1 mg), ee = 97%, $[\alpha]_D^{19} = +33.5$ (c = 1.7, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (t, *J* = 8.0 Hz, 4H), 7.36 (q, *J* = 7.6 Hz, 4H), 7.30 - 7.27 (m, 4H), 6.93 (d, *J* = 8.0 Hz, 2H), 6.83 (d, *J* = 2.4 Hz, 1H), 6.75 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.52 (d, *J* = 8.4 Hz, 1H), 3.77 (s, 3H), 3.72 (d, *J* = 12.8 Hz, 1H), 3.49 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.4, 155.6, 140.6, 139.6, 139.1, 137.4, 134.8, 132.5, 130.4, 128.7, 128.6, 127.4, 127.2, 127.1, 126.8, 126.0, 112.8, 112.6, 108.4, 58.6, 55.8, 43.5, 26.1. HRMS (ESI) calcd. for C₂₉H₂₆NO₂ [M+H]⁺: 420.1958, found: 420.1954.

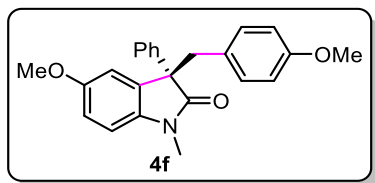
The ee of compound **4e** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.58 min, *t*_{minor} = 17.28 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.582	MF	887.465	0.284	15111.474	98.378
2	17.275	MM	7.356	0.565	249.222	1.622



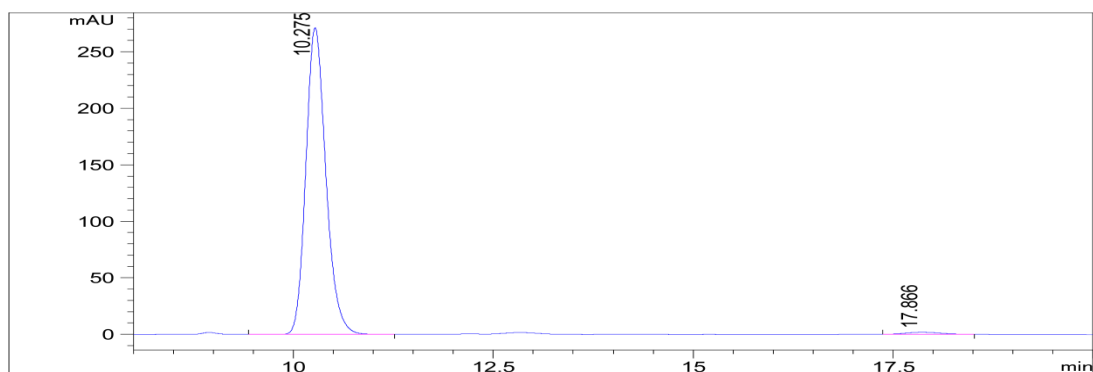
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.415	MF	889.201	0.276	14728.681	49.950
2	17.183	MF	452.936	0.543	14758.121	50.050



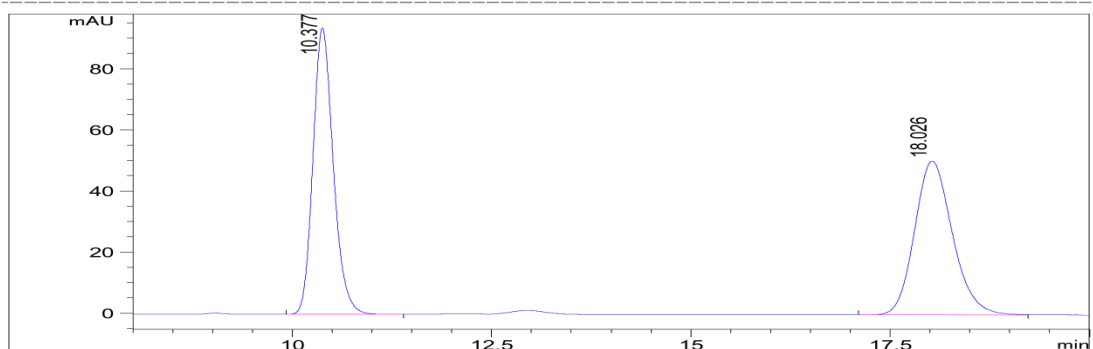
(S)-5-methoxy-3-(4-methoxybenzyl)-1-methyl-3-phenylindolin-2-one (4f)

Yield: 74% (27.6 mg), ee = 97%, $[\alpha]_D^{18} = -6.8$ (c = 1.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.28 (d, *J* = 7.2 Hz, 1H), 6.81 - 6.73 (m, 4H), 6.55 (dd, *J* = 13.2, 8.4 Hz, 3H), 3.78 (s, 3H), 3.69 (s, 3H), 3.63 (d, *J* = 13.2 Hz, 1H), 3.39 (d, *J* = 13.2 Hz, 1H), 2.94 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 158.2, 155.6, 139.7, 137.4, 132.7, 131.0, 128.5, 127.7, 127.3, 127.2, 112.8, 112.7, 112.5, 108.3, 58.7, 55.8, 55.0, 43.0, 26.1. HRMS (ESI) calcd. for C₂₄H₂₄NO₃ [M+H]⁺: 374.1751, found:374.1769.

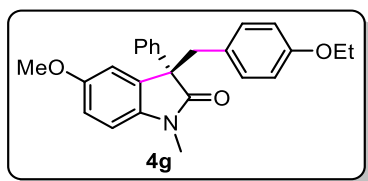
The ee of compound **4f** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.28 min, *t*_{minor} = 17.87 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.275	VB R	271.234	0.267	4719.554	98.692
2	17.866	MM	1.981	0.526	62.559	1.308



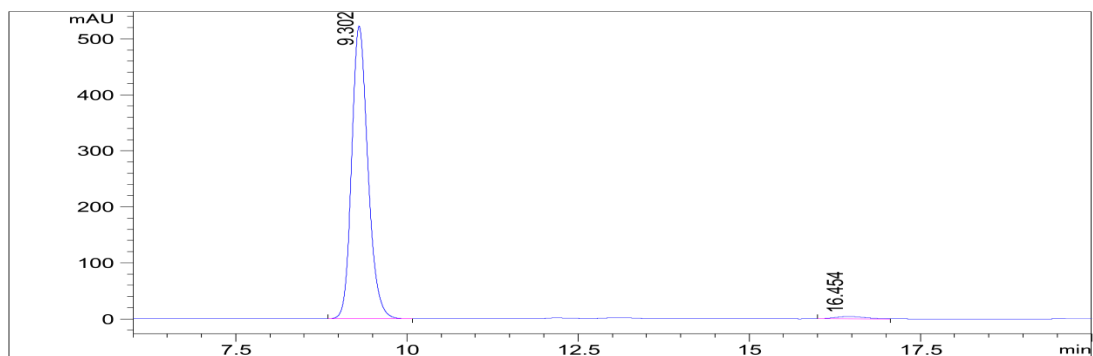
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.377	BB	93.673	0.272	1655.907	50.006
2	18.026	MF	50.315	0.548	1655.495	49.994



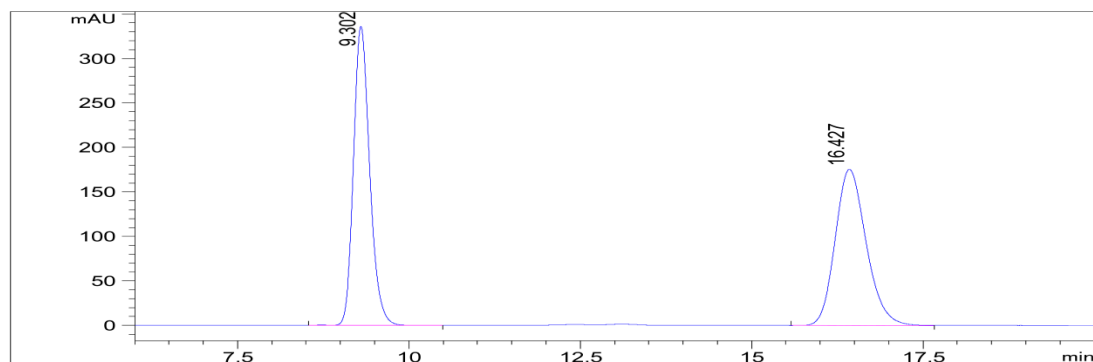
(S)-3-(4-ethoxybenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4g)

Yield: 76% (29.4 mg), ee = 97%, $[\alpha]_D^{20} = -10.7$ (c = 0.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 6.8 Hz, 2H), 7.28 (d, *J* = 8.4 Hz, 1H), 6.81 - 6.74 (m, 4H), 6.57 - 6.52 (m, 3H), 3.90 (q, *J* = 6.8 Hz, 2H), 3.78 (s, 3H), 3.63 (d, *J* = 12.8 Hz, 1H), 3.38 (d, *J* = 13.2 Hz, 1H), 2.94 (s, 3H), 1.34 (t, *J* = 6.8 Hz, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.6, 157.5, 155.6, 139.7, 137.4, 132.7, 131.0, 128.5, 127.6, 127.4, 127.2, 113.4, 112.7, 112.4, 108.3, 63.2, 58.8, 55.8, 43.0, 26.1, 14.8. HRMS (ESI) calcd. for C₂₅H₂₆NO₃ [M+H]⁺: 388.1907, found: 388.1924.

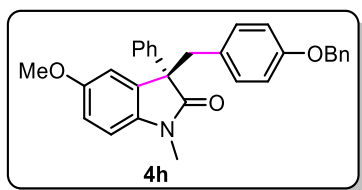
The ee of compound **4g** was determined by HPLC using an IC_{Daicel} column (n-hexane/i-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, t_{major} = 9.30 min, t_{minor} = 16.45 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.302	MF	523.102	0.275	8639.233	98.541
2	16.454	MF	4.140	0.515	127.906	1.459



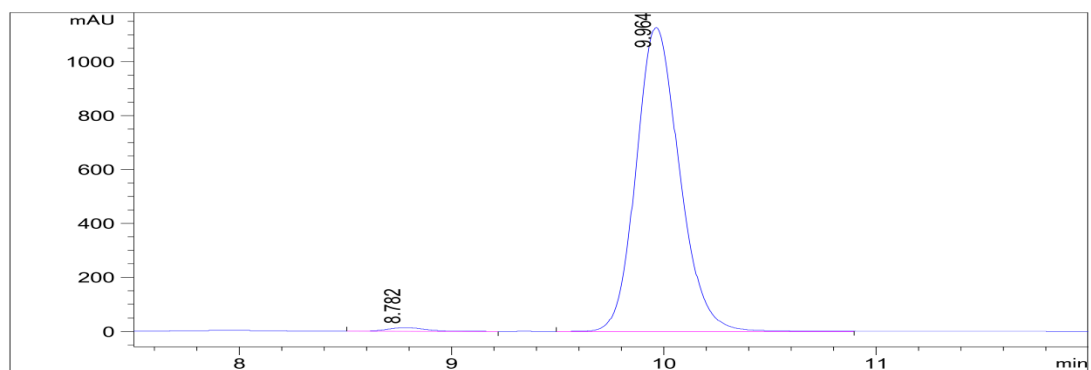
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.302	VB R	335.969	0.252	5524.593	50.049
2	16.427	MF	175.565	0.523	5513.731	49.951



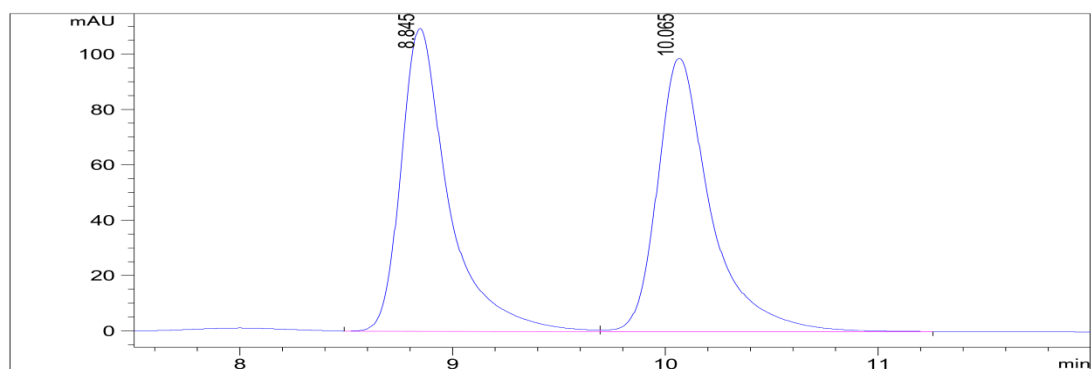
(S)-3-(4-(benzyloxy)benzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4h)

Yield: 71% (31.9 mg), ee = 98%, $[\alpha]_D^{20} = -2.1$ (c = 2.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.2 Hz, 2H), 7.36 - 7.25 (m, 8H), 6.80 - 6.74 (m, 4H), 6.64 (d, *J* = 8.4 Hz, 2H), 6.52 (d, *J* = 8.4 Hz, 1H), 4.94 (s, 2H), 3.77 (s, 3H), 3.63 (d, *J* = 13.2 Hz, 1H), 3.39 (d, *J* = 13.2 Hz, 1H), 2.91 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 157.3, 155.6, 139.6, 137.4, 137.0, 132.7, 131.0, 128.5, 128.4, 128.0, 127.8, 127.4, 127.2, 113.8, 112.7, 112.4, 108.3, 69.7, 58.7, 55.8, 43.0, 26.1. HRMS (ESI) calcd. for C₃₀H₂₈NO₃ [M+H]⁺: 450.2064, found: 450.2061.

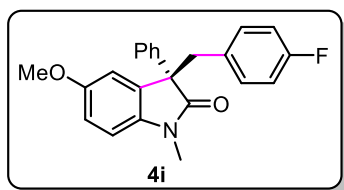
The ee of compound **4h** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{minor} = 8.78 min, *t*_{major} = 9.96 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.782	VB	14.087	0.200	178.114	1.100
2	9.964	MF	1127.314	0.237	16011.175	98.900



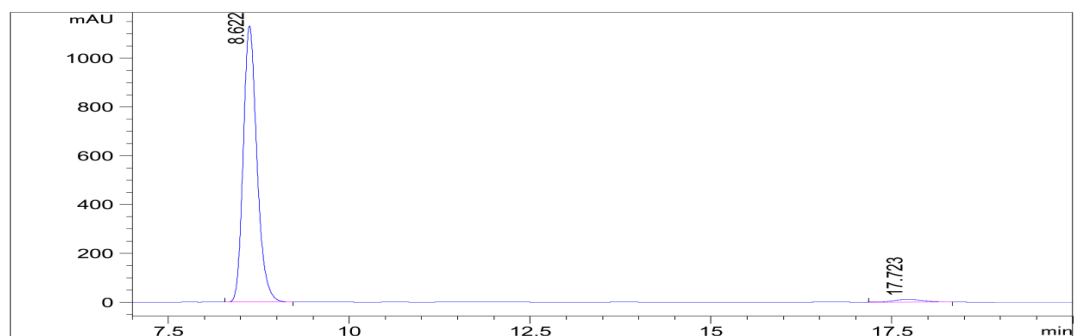
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.845	FM	109.458	0.260	1706.348	49.797
2	10.065	MF	98.750	0.290	1720.251	50.203



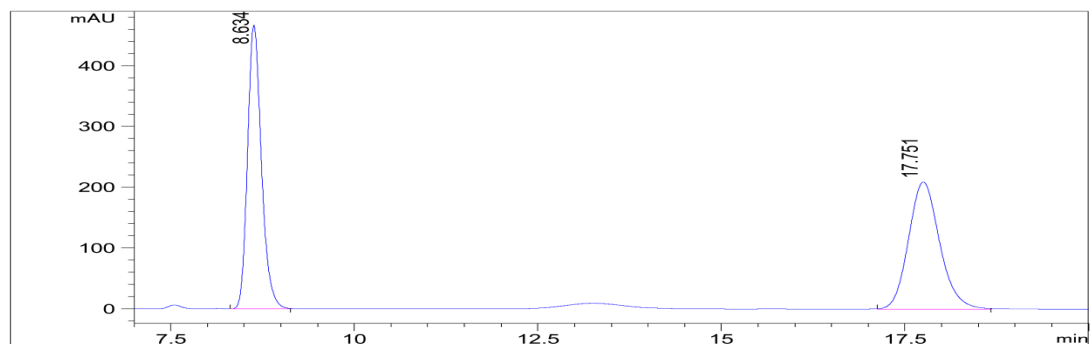
(S)-3-(4-fluorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4i)

Yield: 82% (29.6 mg), 96% ee, $[\alpha]_D^{18} = -32.7$ ($c = 1.9$, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.47 (d, $J = 7.2$ Hz, 2H), 7.34 (t, $J = 7.2$ Hz, 2H), 7.29 (d, $J = 6.8$ Hz, 1H), 6.84 - 6.81 (m, 3H), 6.77 - 6.69 (m, 3H), 6.54 (d, $J = 8.4$ Hz, 1H), 3.78 (s, 3H), 3.68 (d, $J = 13.2$ Hz, 1H), 3.39 (d, $J = 12.8$ Hz, 1H), 2.93 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.3, 161.6 (d, $J_{CF} = 243.4$ Hz), 155.7, 139.4, 137.3, 132.4, 131.4 (d, $J_{CF} = 7.8$ Hz), 131.3 (d, $J_{CF} = 3.2$ Hz), 128.6, 127.5, 127.1, 114.2 (d, $J_{CF} = 20.9$ Hz), 112.6 (d, $J_{CF} = 29.2$ Hz), 108.4, 58.6, 55.8, 42.9, 26.1. HRMS (ESI) calcd. for $\text{C}_{23}\text{H}_{21}\text{FNO}_2$ $[\text{M}+\text{H}]^+$: 362.1551, found: 362.1550.

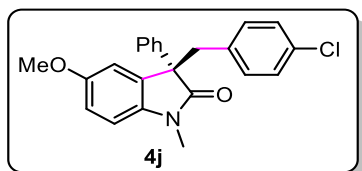
The ee of compound **4i** was determined by HPLC using an IC_{Dai}cel column (n-hexane/i-PrOH = 80/20, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 8.62$ min, $t_{\text{minor}} = 17.72$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.622	MF	1133.190	0.219	14891.011	97.831
2	17.723	MM	11.267	0.488	330.095	2.169



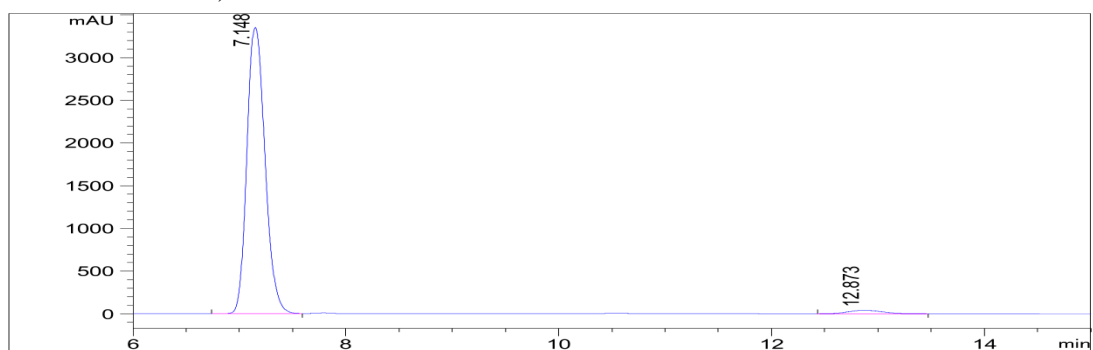
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.634	MF	467.151	0.219	6135.394	49.970
2	17.751	MF	209.059	0.490	6142.789	50.030



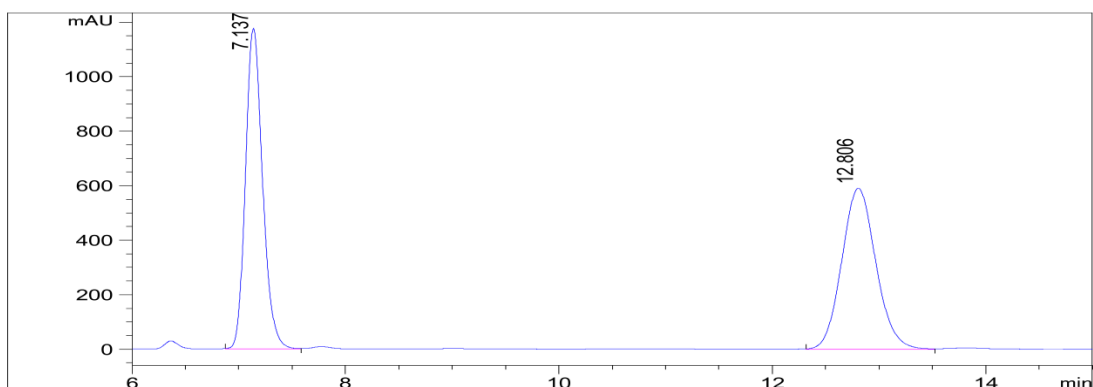
(S)-3-(4-chlorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4j)

Yield: 78% (29.4 mg), ee = 95%, $[\alpha]_D^{18} = -20.0$ (c = 1.6, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.46 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 7.00 (d, *J* = 8.4 Hz, 2H), 6.82 - 6.79 (m, 3H), 6.76 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.55 (d, *J* = 8.4 Hz, 1H), 3.78 (s, 3H), 3.68 (d, *J* = 12.8 Hz, 1H), 3.39 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.2, 155.7, 139.4, 137.3, 134.2, 132.4, 132.3, 131.3, 128.6, 127.6, 127.5, 127.1, 112.8, 112.5, 108.5, 58.5, 55.8, 43.0, 26.2. HRMS (ESI) calcd. for C₂₃H₂₁ClNO₂ [M+H]⁺: 378.1255, found: 378.1265.

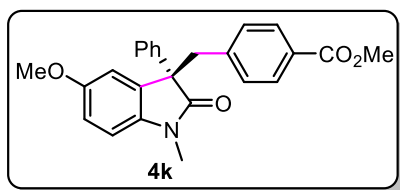
The ee of compound **4j** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.15 min, *t*_{minor} = 12.87 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.148	MF	3350.274	0.198	39724.672	97.662
2	12.873	FM	42.353	0.374	950.951	2.338



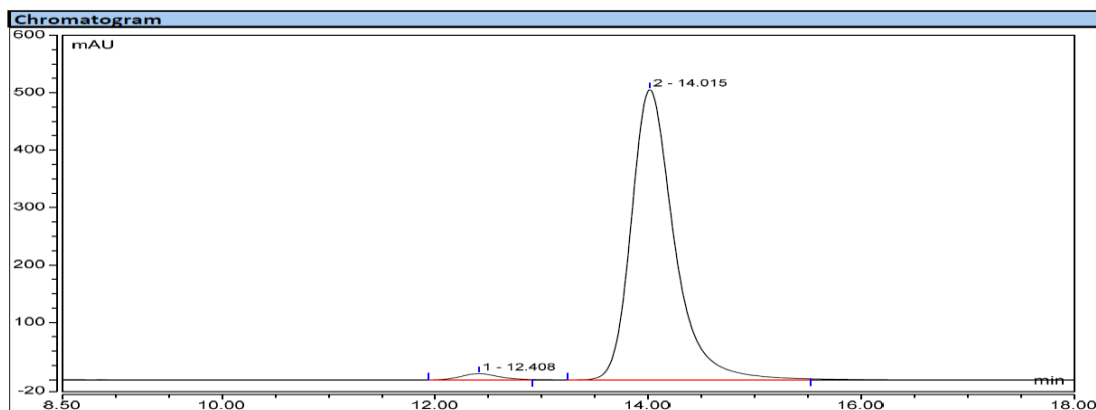
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.137	FM	1177.625	0.186	13118.810	50.021
2	12.806	FM	590.722	0.370	13107.754	49.979



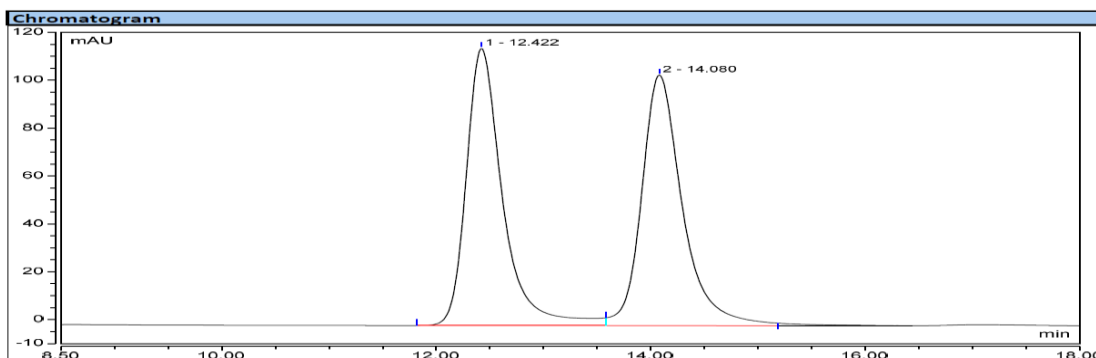
methyl (S)-4-((5-methoxy-1-methyl-2-oxo-3-phenylindolin-3-yl)methyl)benzoate (4k)

Yield: 62% (24.9 mg), ee = 96%, $[\alpha]_D^{27} = -12.5$ (c = 1.92, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.71 (d, *J* = 8.4 Hz, 2H), 7.47 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 2H), 7.30 (d, *J* = 7.2 Hz, 1H), 6.95 (d, *J* = 8.0 Hz, 2H), 6.83 (d, *J* = 2.4 Hz, 1H), 6.74 (dd, *J* = 8.4, 2.8 Hz, 1H), 6.51 (d, *J* = 8.4 Hz, 1H), 3.84 (s, 3H), 3.78 (s, 3H), 3.78 (d, *J* = 12.4 Hz, 1H), 3.46 (d, *J* = 12.4 Hz, 1H), 2.92 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.1, 167.0, 155.7, 141.2, 139.4, 137.2, 132.1, 130.0, 128.7, 128.6, 128.3, 127.5, 127.1, 112.8, 112.5, 108.4, 58.4, 55.8, 51.9, 43.6, 26.1. HRMS (ESI) calcd. for C₂₅H₂₃NNaO₄ [M+Na]⁺: 424.1519, found: 424.1534.

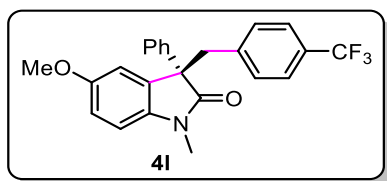
The ee of compound **4k** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{minor} = 12.41 min, *t*_{major} = 14.02 min).



No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %
1		12.408	4.652	11.052	1.93	2.14
2		14.015	236.642	505.606	98.07	97.86



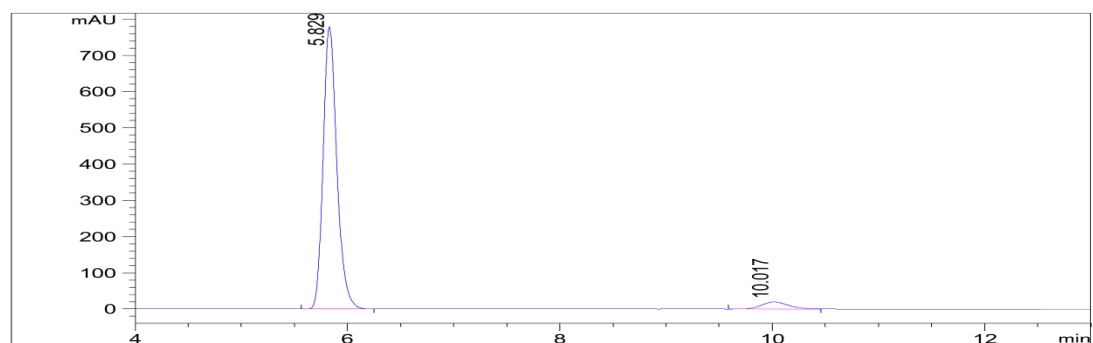
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %
1		12.422	45.539	115.763	49.77	52.50
2		14.080	45.959	104.719	50.23	47.50



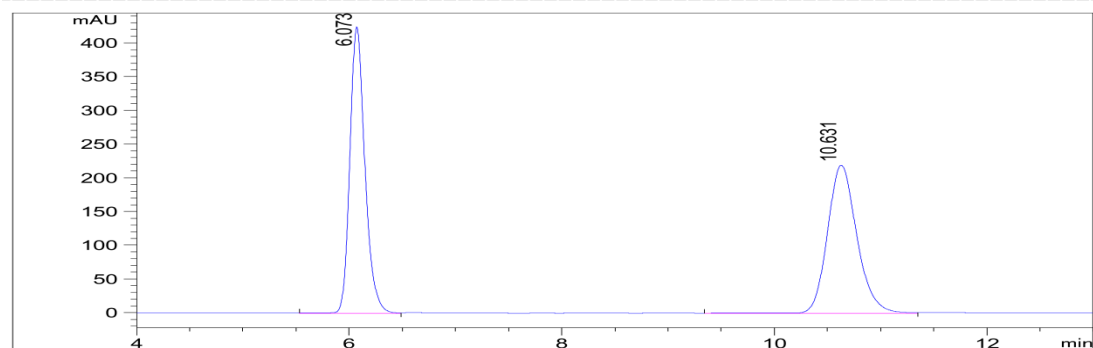
(S)-5-methoxy-1-methyl-3-phenyl-3-(4-(trifluoromethyl)benzyl)indolin-2-one (4I)

Yield: 79% (32.5 mg), ee = 91%, $[\alpha]_D^{21} = -25.3$ (c = 1.8, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.2 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 2H), 7.31 - 7.28 (m, 3H), 6.99 (d, *J* = 8.0 Hz, 2H), 6.82 (d, *J* = 2.8 Hz, 1H), 6.77 (dd, *J* = 8.4, 2.8 Hz, 1H), 6.55 (d, *J* = 8.4 Hz, 1H), 3.78 (s, 3H), 3.76 (d, *J* = 12.8 Hz, 1H), 3.48 (d, *J* = 12.8 Hz, 1H), 2.93 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.1, 155.8, 139.9, 138.2 (d, *J*_{CF} = 206.0 Hz), 132.1, 130.3, 128.8 (d, *J*_{CF} = 32.1 Hz), 128.7, 127.6, 127.1, 124.1 (d, *J*_{CF} = 270.3 Hz), 124.3 (q, *J*_{CF} = 3.8 Hz), 112.7 (d, *J*_{CF} = 11.9 Hz), 108.6, 58.4, 55.8, 43.4, 26.1. HRMS (ESI) calcd. for C₂₄H₂₁F₃NO₂ [M+H]⁺: 412.1519, found: 412.1534.

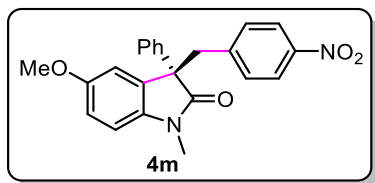
The ee of compound **4I** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 5.83 min, *t*_{minor} = 10.02 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	5.829	MF	779.785	0.149	6994.180	95.376
2	10.017	MF	19.286	0.293	339.084	4.624



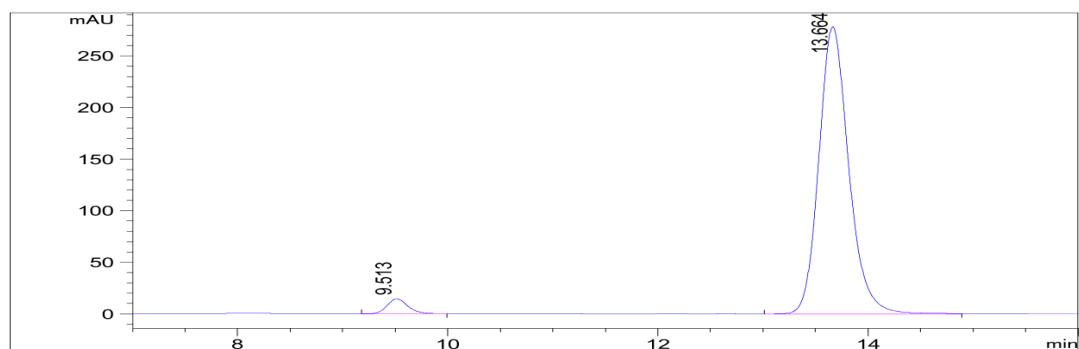
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.073	MF	424.635	0.164	4183.896	49.838
2	10.631	MF	219.445	0.320	4211.087	50.162



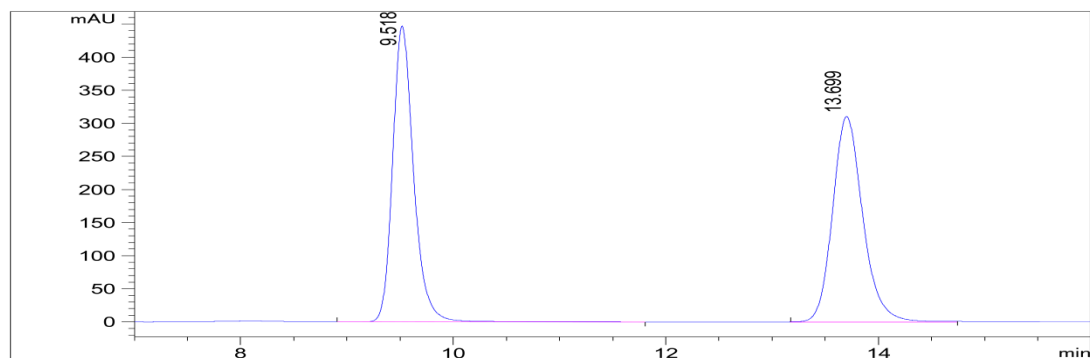
(S)-5-methoxy-1-methyl-3-(4-nitrobenzyl)-3-phenylindolin-2-one (4m)

Yield: 76% (29.5 mg), ee = 93%, $[\alpha]_D^{20} = -13.7$ (c = 1.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.90 (d, *J* = 8.8 Hz, 2H), 7.48 - 7.46 (m, 2H), 7.36 (t, *J* = 6.8 Hz, 2H), 7.32 - 7.31 (m, 1H), 7.06 (d, *J* = 8.8 Hz, 2H), 6.87 (d, *J* = 2.4 Hz, 1H), 6.77 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.56 (d, *J* = 8.4 Hz, 1H), 3.84 (d, *J* = 12.8 Hz, 1H), 3.80 (s, 3H), 3.50 (d, *J* = 12.8 Hz, 1H), 2.95 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 176.8, 155.8, 146.7, 143.6, 139.0, 137.0, 131.7, 130.8, 128.7, 127.7, 127.0, 122.6, 112.8, 112.5, 108.7, 58.3, 55.8, 43.3, 26.2. HRMS (ESI) calcd. for C₂₃H₂₁N₂O₄ [M+H]⁺: 389.1496, found: 389.1507.

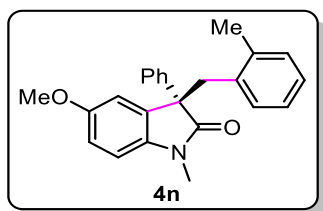
The ee of compound **4m** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{minor} = 9.51 min, *t*_{major} = 13.66 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.513	MM	14.516	0.230	200.671	3.518
2	13.664	MF	278.325	0.330	5503.377	96.482



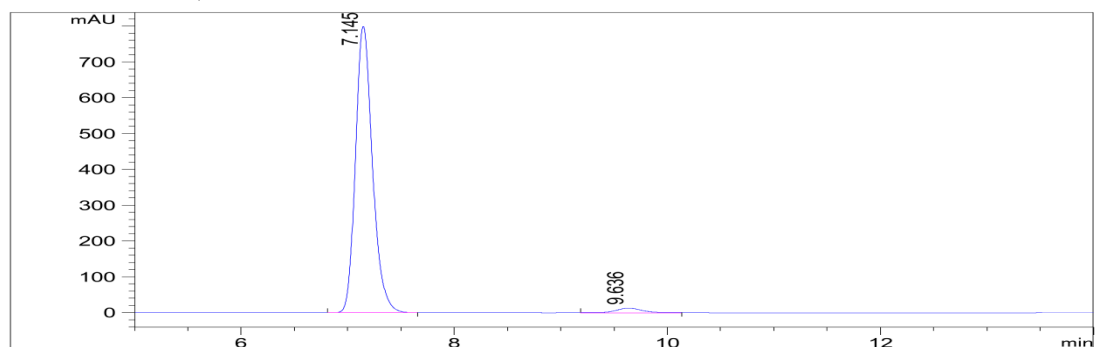
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.518	VV R	446.577	0.208	6131.980	49.983
2	13.699	MF	310.602	0.329	6136.190	50.017



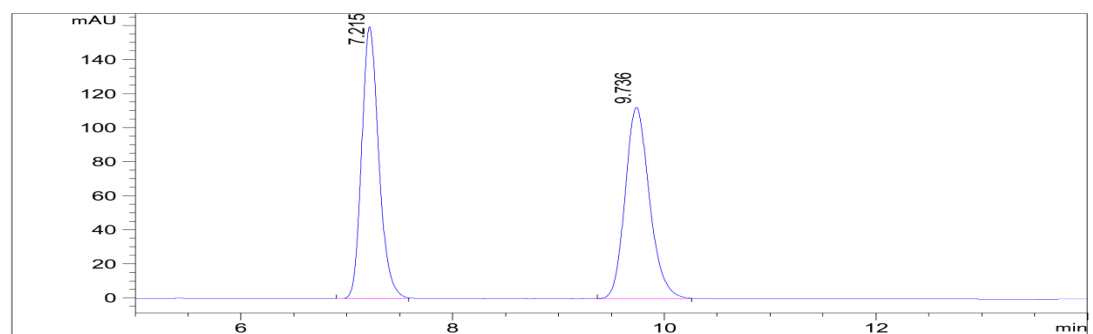
(S)-5-methoxy-1-methyl-3-(2-methylbenzyl)-3-phenylindolin-2-one (4n)

Yield: 84% (30.0 mg), ee = 95%, $[\alpha]_D^{21} = -62.9$ (c = 1.5, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.54 (d, *J* = 7.2 Hz, 2H), 7.35 (t, *J* = 6.8 Hz, 2H), 7.30 - 7.27 (m, 1H), 6.99 - 6.97 (m, 2H), 6.84 (td, *J* = 8.0, 2.4 Hz, 1H), 6.78 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.69 (d, *J* = 7.6 Hz, 1H), 6.63 (d, *J* = 8.4 Hz, 1H), 6.54 (d, *J* = 2.4 Hz, 1H), 3.69 (s, 3H), 3.63 (d, *J* = 13.6 Hz, 1H), 3.58 (d, *J* = 13.6 Hz, 1H), 3.04 (s, 3H), 2.05 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.9, 155.3, 139.5, 137.3, 137.2, 134.5, 131.9, 130.1, 129.5, 128.5, 127.5, 127.4, 126.6, 125.1, 113.1, 113.0, 108.3, 57.9, 55.7, 39.8, 26.3, 20.1. HRMS (ESI) calcd. for C₂₄H₂₄NO₂ [M+H]⁺: 358.1802, found: 358.1820.

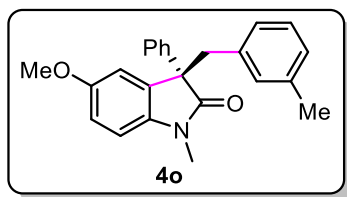
The ee of compound **4n** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 7.15 min, *t*_{minor} = 9.64 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.145	MF	799.074	0.185	8860.623	97.730
2	9.636	MM	12.474	0.275	205.782	2.270



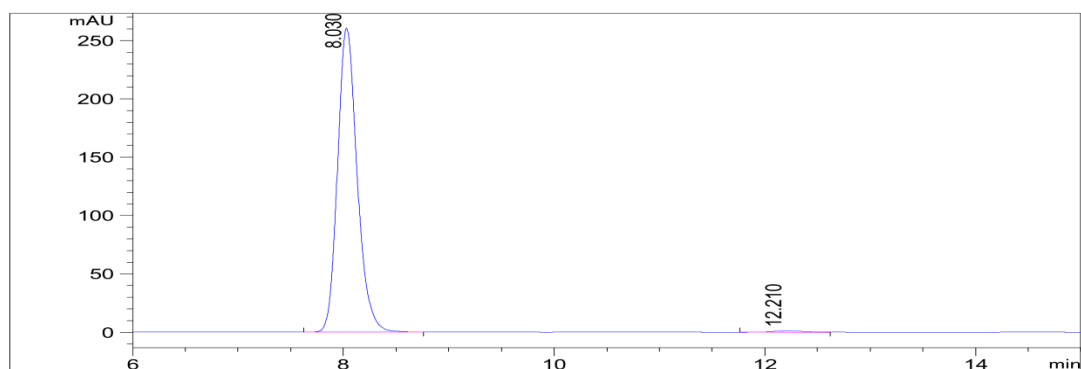
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	7.215	MF	159.702	0.188	1798.854	49.980
2	9.736	FM	112.464	0.267	1800.303	50.020



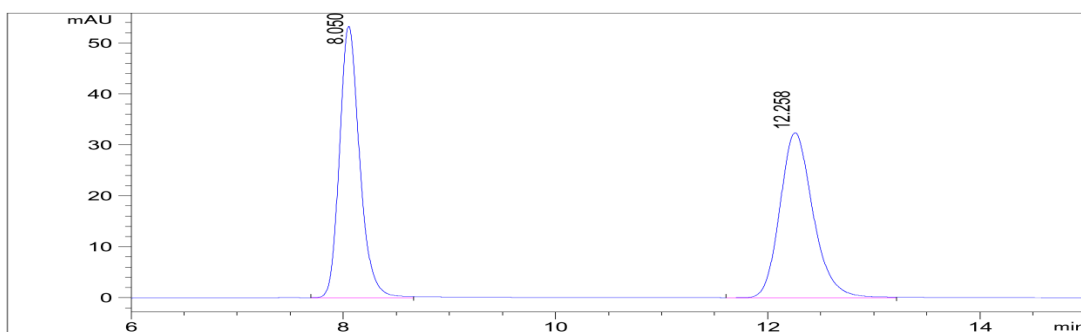
(S)-5-methoxy-1-methyl-3-(3-methylbenzyl)-3-phenylindolin-2-one (4o)

Yield: 60% (21.4 mg), ee = 99%, $[\alpha]_D^{19} = -43.7$ (c = 1.2, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 6.93 - 6.85 (m, 2H), 6.79 (d, *J* = 2.4 Hz, 1H), 6.74 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.67 - 6.64 (m, 2H), 6.52 (d, *J* = 8.4 Hz, 1H), 3.77 (s, 3H), 3.64 (d, *J* = 12.8 Hz, 1H), 3.41 (d, *J* = 12.8 Hz, 1H), 2.93 (s, 3H), 2.14 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 155.6, 139.6, 137.4, 136.9, 135.6, 132.6, 130.8, 128.5, 127.4, 127.3, 127.1, 127.0, 112.9, 112.6, 108.2, 58.6, 55.9, 43.8, 26.1, 21.1. HRMS (ESI) calcd. For C₂₄H₂₄NO₂ [M+H]⁺: 358.1802, found: 358.1815.

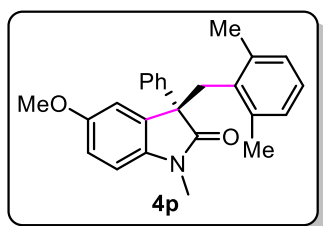
The ee of compound **4o** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.03 min, *t*_{minor} = 12.21 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.030	FM	260.881	0.216	3379.753	99.268
2	12.210	MF	1.185	0.351	24.927	0.732



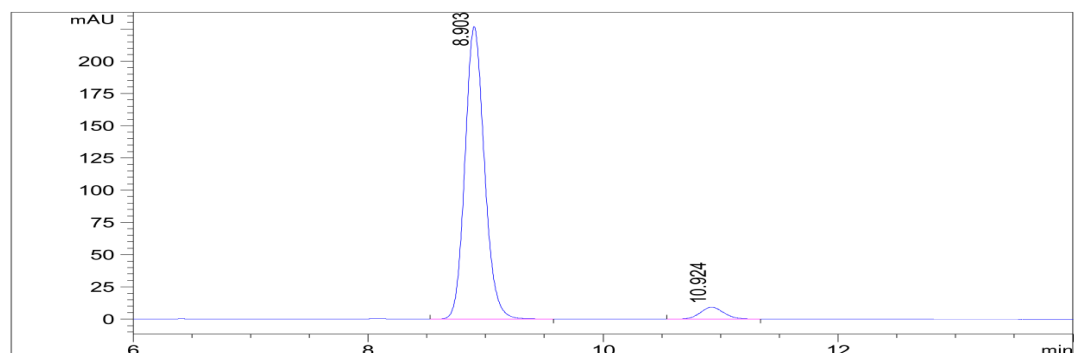
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.050	MF	53.352	0.220	705.645	49.977
2	12.258	MF	32.422	0.363	706.292	50.023



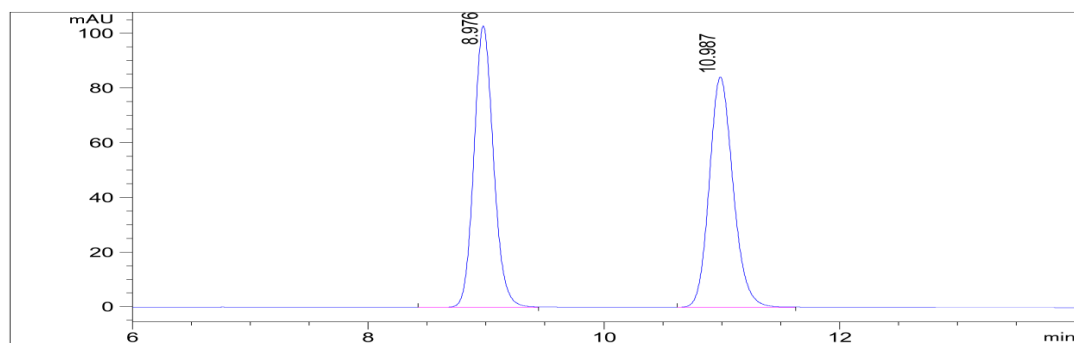
(S)-3-(2,6-dimethylbenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4p)

Yield: 68% (25.2 mg), ee = 90%, $[\alpha]_D^{21} = -119.9$ (c = 1.3, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.67 (dd, *J* = 8.4, 1.6 Hz, 2H), 7.32 - 7.27 (m, 3H), 6.98 (t, *J* = 7.2 Hz, 1H), 6.86 (d, *J* = 7.6 Hz, 2H), 6.84 - 6.81 (m, 1H), 6.74 (d, *J* = 8.4 Hz, 1H), 5.90 (d, *J* = 2.4 Hz, 1H), 3.86 (d, *J* = 14.4 Hz, 1H), 3.51 (s, 3H), 3.45 (d, *J* = 14.4 Hz, 1H), 3.17 (s, 3H), 1.60 (s, 6H); ¹³C NMR (101 MHz, CDCl₃) δ 178.8, 154.7, 140.0, 138.4, 137.2, 134.7, 129.7, 128.3, 128.1, 127.8, 127.3, 126.5, 114.0, 108.3, 55.9, 55.7, 39.2, 26.5, 20.6. HRMS (ESI) calcd. for C₂₅H₂₆NO₂ [M+H]⁺: 372.1958, found: 372.1969.

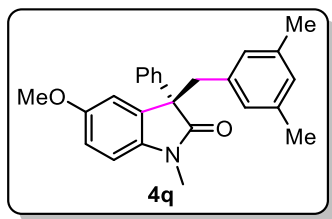
The ee of compound **4p** was determined by HPLC using an IA_{Daicel} column (n-hexane/i-PrOH = 95/5, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.90 min, *t*_{minor} = 10.92 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.903	MM	226.896	0.192	2616.286	95.356
2	10.924	MM	9.178	0.231	127.412	4.644



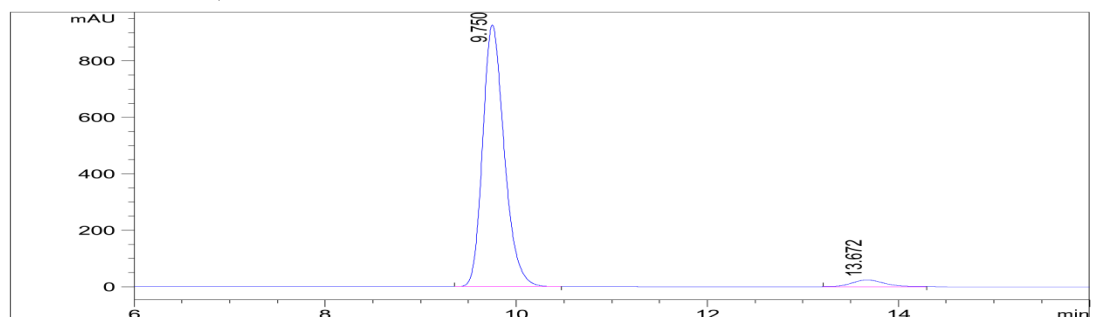
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	8.976	MF	102.935	0.192	1187.917	50.012
2	10.987	MF	84.336	0.235	1187.351	49.988



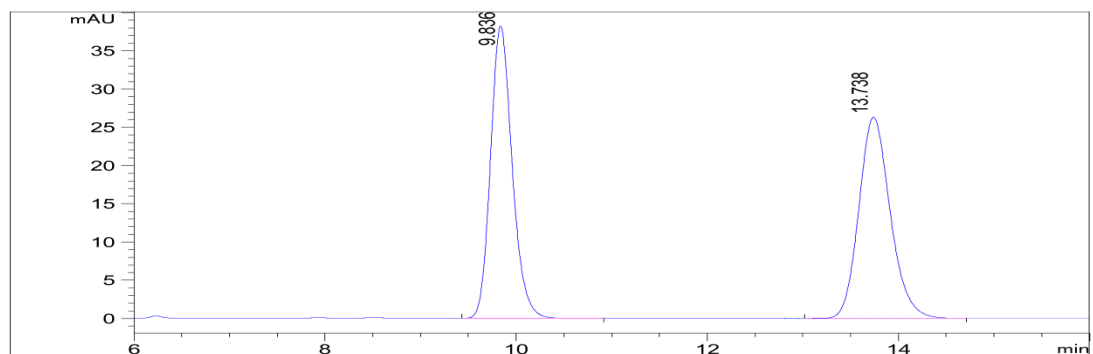
(S)-3-(3,5-dimethylbenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4q)

Yield: 90% (33.4 mg), ee = 93%, $[\alpha]_D^{18} = -47.1$ (c = 1.8, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.49 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 6.8 Hz, 2H), 7.28 (d, *J* = 6.8 Hz, 1H), 6.78 (d, *J* = 2.0 Hz, 1H), 6.74 (d, *J* = 8.4 Hz, 1H), 6.68 (s, 1H), 6.53 (d, *J* = 8.4 Hz, 1H), 6.46 (s, 2H), 3.76 (s, 3H), 3.59 (d, *J* = 12.8 Hz, 1H), 3.37 (d, *J* = 12.8 Hz, 1H), 2.94 (s, 3H), 2.09 (s, 6H); ¹³C NMR (101 MHz, CDCl₃) δ 177.6, 155.5, 139.7, 137.5, 136.7, 135.5, 132.6, 128.5, 127.9, 127.8, 127.3, 113.1, 112.7, 108.1, 58.5, 56.0, 43.8, 26.1, 21.0. HRMS (ESI) calcd. for C₂₅H₂₆NO₂ [M+H]⁺: 372.1958, found: 372.1971.

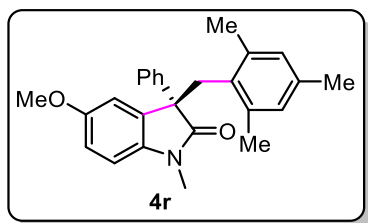
The ee of compound **4q** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 80/20, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.75 min, *t*_{minor} = 13.67 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.750	MF	927.359	0.261	14549.935	96.435
2	13.672	MF	23.631	0.379	537.813	3.565



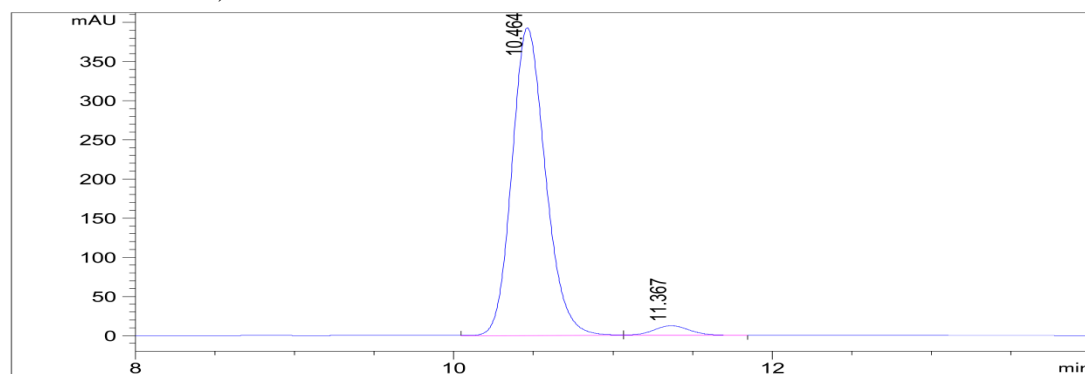
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.836	BB	38.181	0.241	600.478	50.009
2	13.738	BB	26.297	0.352	600.260	49.991



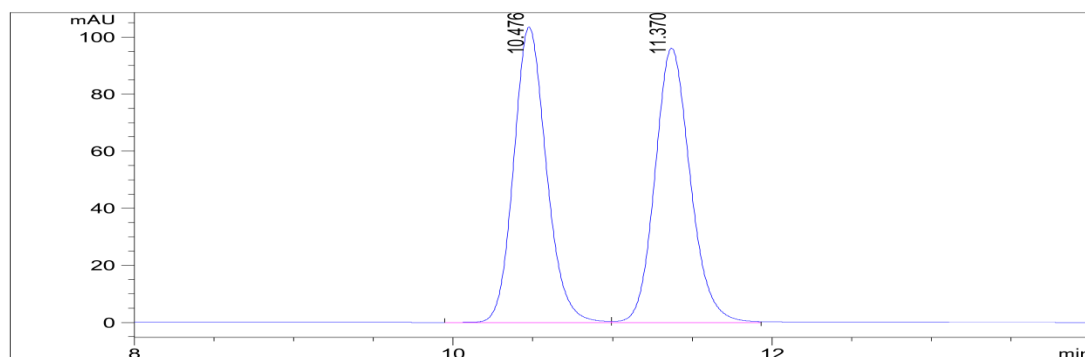
(S)-5-methoxy-1-methyl-3-phenyl-3-(2,4,6-trimethylbenzyl)indolin-2-one (4r)

Yield: 88% (33.9 mg), ee = 93%, $[\alpha]_D^{21} = -113.0$ (c = 1.4, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.68 (d, *J* = 7.2 Hz, 2H), 7.29 - 7.25 (m, 3H), 6.82 (d, *J* = 8.4 Hz, 1H), 6.74 (d, *J* = 8.4 Hz, 1H), 6.69 (s, 2H), 5.93 (s, 1H), 3.82 (d, *J* = 14.4 Hz, 1H), 3.51 (s, 3H), 3.39 (d, *J* = 14.4 Hz, 1H), 3.17 (s, 3H), 2.19 (s, 3H), 1.54 (s, 6H); ¹³C NMR (101 MHz, CDCl₃) δ 178.8, 154.6, 139.9, 138.3, 137.2, 135.8, 131.5, 129.9, 128.8, 128.2, 127.8, 127.2, 114.1, 114.0, 108.2, 56.0, 55.5, 38.9, 26.5, 20.7, 20.4. HRMS (ESI) calcd. for C₂₆H₂₈NO₂ [M+H]⁺: 386.2115, found: 386.2128.

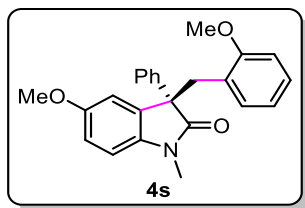
The ee of compound **4r** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 98/2, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 10.46 min, *t*_{minor} = 11.37 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.464	FM	393.133	0.245	5769.271	96.559
2	11.367	MF	12.583	0.272	205.600	3.441



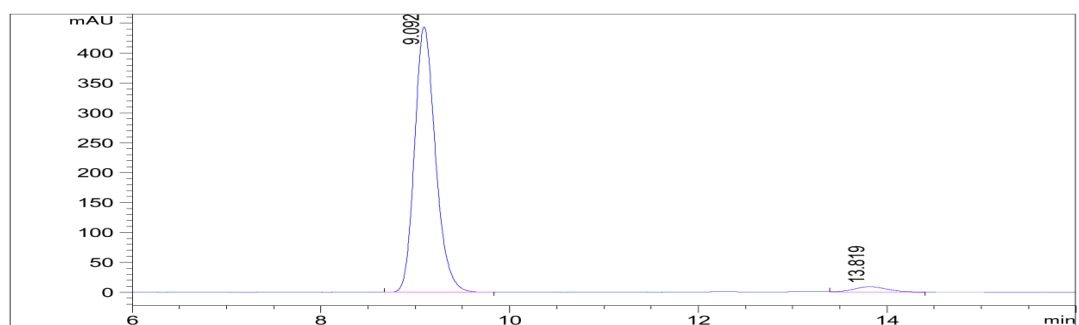
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	10.476	BV	103.417	0.220	1471.273	49.913
2	11.370	MF	96.060	0.256	1476.398	50.087



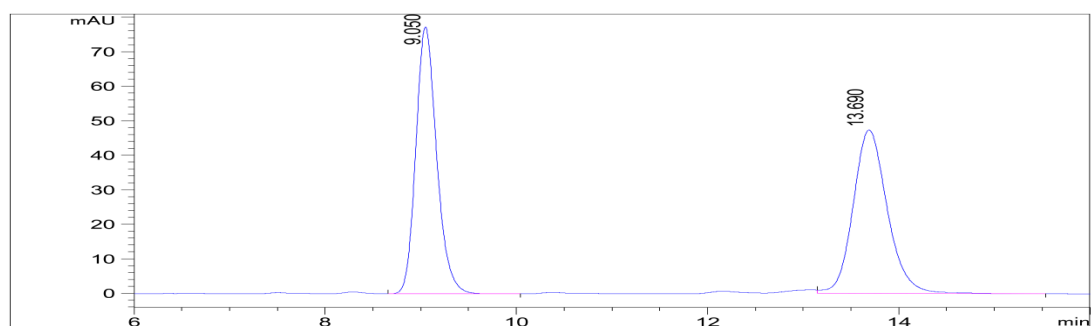
(S)-5-methoxy-3-(2-methoxybenzyl)-1-methyl-3-phenylindolin-2-one (4s)

Yield: 88% (32.8 mg), ee = 94%, $[\alpha]_D^{21} = -105.9$ (c = 1.8, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 7.2 Hz, 2H), 7.32 (t, *J* = 7.2 Hz, 2H), 7.27 (d, *J* = 7.2 Hz, 1H), 7.03 - 6.99 (m, 2H), 6.83 (d, *J* = 2.8 Hz, 1H), 6.70 - 6.66 (m, 2H), 6.54 (d, *J* = 8.4 Hz, 1H), 6.48 (d, *J* = 8.4 Hz, 1H), 3.85 (d, *J* = 12.8 Hz, 1H), 3.72 (s, 3H), 3.57 (d, *J* = 13.2 Hz, 1H), 3.54 (s, 3H), 3.03 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 178.2, 157.1, 155.1, 140.3, 137.2, 132.4, 130.5, 128.4, 127.8, 127.2, 124.7, 119.6, 113.6, 112.2, 109.7, 107.4, 58.4, 55.7, 54.6, 35.8, 26.2. HRMS (ESI) calcd. for C₂₄H₂₄NO₃ [M+H]⁺: 374.1751, found: 374.1765.

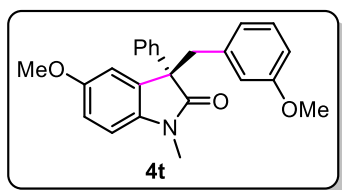
The ee of compound **4s** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.09 min, *t*_{minor} = 13.82 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.092	FM	443.617	0.256	6822.427	96.908
2	13.819	MM	8.887	0.408	217.707	3.092



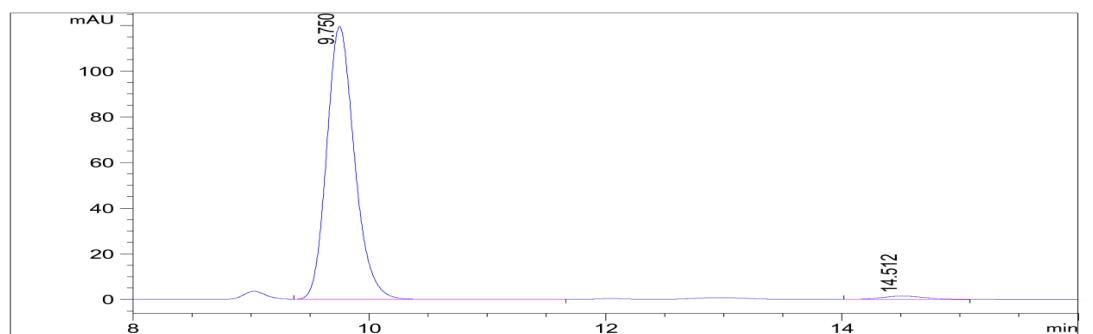
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.050	VB	77.224	0.235	1170.555	49.889
2	13.690	FM	47.338	0.414	1175.771	50.111



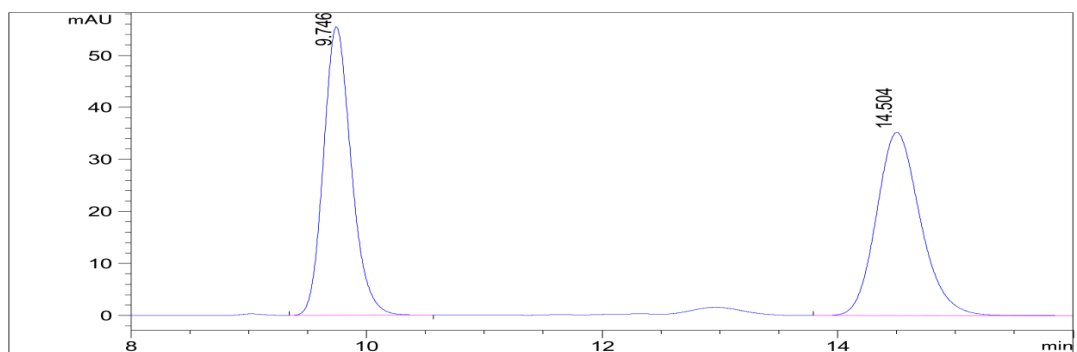
(S)-5-methoxy-3-(3-methoxybenzyl)-1-methyl-3-phenylindolin-2-one (4t)

Yield: 78% (27.8 mg), ee = 96%, $[\alpha]_D^{18} = -49.4$ (c = 1.6, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 6.95 (t, *J* = 8.0 Hz, 1H), 6.79 - 6.74 (m, 2H), 6.62 (dd, *J* = 8.0, 2.4 Hz, 1H), 6.55 (d, *J* = 8.4 Hz, 1H), 6.50 (d, *J* = 7.2 Hz, 1H), 6.36 (s, 1H), 3.76 (s, 3H), 3.64 (d, *J* = 12.8 Hz, 1H), 3.57 (s, 3H), 3.44 (d, *J* = 12.8 Hz, 1H), 2.95 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.4, 158.7, 155.6, 139.6, 137.4, 137.2, 132.5, 128.6, 128.4, 127.4, 127.2, 122.6, 114.5, 113.1, 112.9, 112.6, 108.3, 58.5, 55.8, 54.9, 43.9, 26.1. HRMS (ESI) calcd. for C₂₄H₂₃NNaO₂ [M+Na]⁺: 380.1621, found: 380.1609.

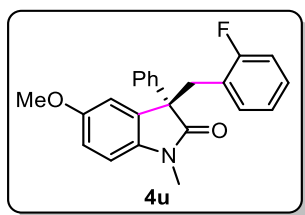
The ee of compound **4t** was determined by HPLC using an IC_{Dai}cel column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.75 min, *t*_{minor} = 14.51 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.750	VV R	119.522	0.253	1959.896	98.013
2	14.512	FM	1.499	0.442	39.741	1.987



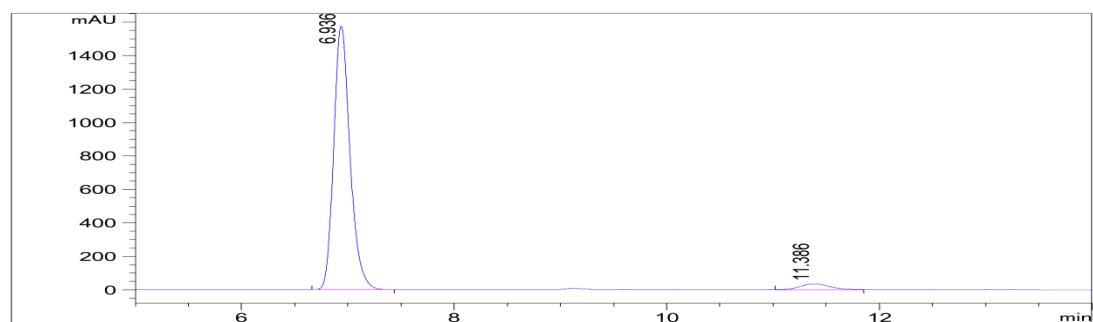
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.746	BB	55.423	0.251	909.346	49.913
2	14.504	BBA	35.208	0.398	912.524	50.087



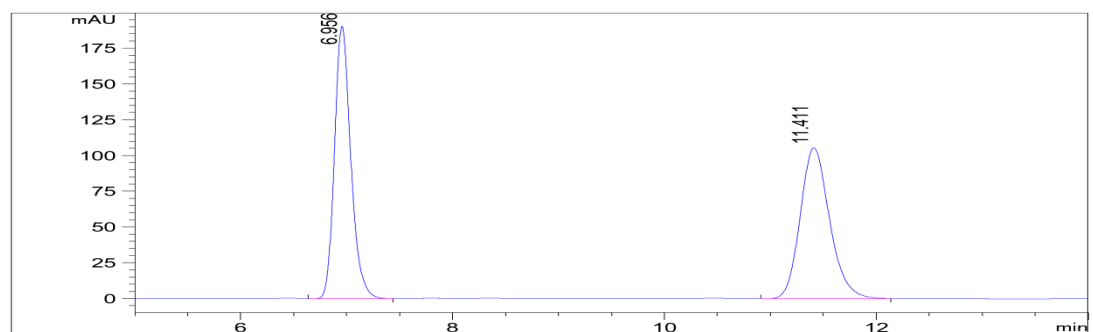
(S)-3-(2-fluorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4u)

Yield: 88% (31.8 mg), ee = 92%, $[\alpha]_D^{21} = -64.0$ (c = 1.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.48 (d, *J* = 8.0 Hz, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.29 (d, *J* = 7.2 Hz, 1H), 7.06 - 7.01 (m, 2H), 6.88 - 6.84 (m, 2H), 6.77 - 6.72 (m, 2H), 6.52 (d, *J* = 8.4 Hz, 1H), 3.76 (s, 3H), 3.68 (q, *J* = 13.2 Hz, 2H), 3.03 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.6, 160.7 (d, *J*_{CF} = 244.4 Hz), 155.6, 139.7, 137.0, 131.8, 131.0 (d, *J*_{CF} = 3.6 Hz), 128.6, 128.4 (d, *J*_{CF} = 8.2 Hz), 127.5, 127.1, 123.4, 123.3 (d, *J*_{CF} = 3.5 Hz), 114.8 (d, *J*_{CF} = 23.1 Hz), 113.3, 112.7, 108.0, 58.1, 55.8, 35.3, 26.3. HRMS (ESI) calcd. for C₂₃H₂₁FNO₂ [M+H]⁺: 362.1551, found: 362.1565.

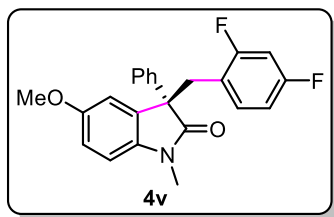
The ee of compound **4u** was determined by HPLC using an IC_{Daicel} column (n-hexane/i-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.94 min, *t*_{minor} = 11.39 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.936	MF	1576.772	0.178	16834.416	96.095
2	11.386	MF	35.771	0.319	684.013	3.905



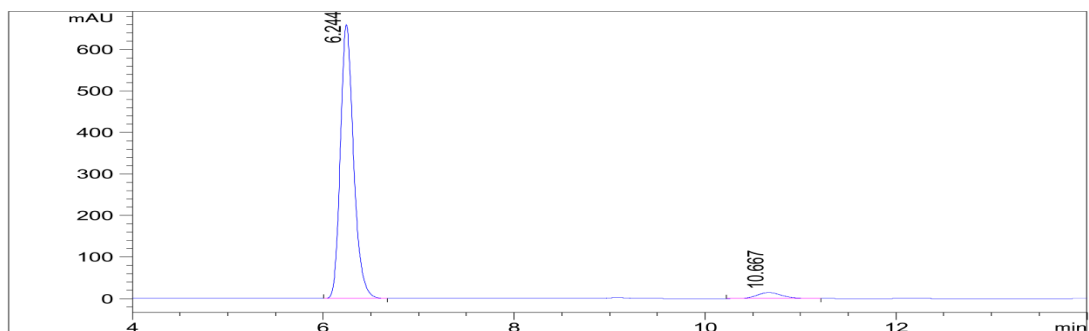
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.956	FM	190.542	0.178	2034.535	49.974
2	11.411	MF	105.662	0.321	2036.622	50.026



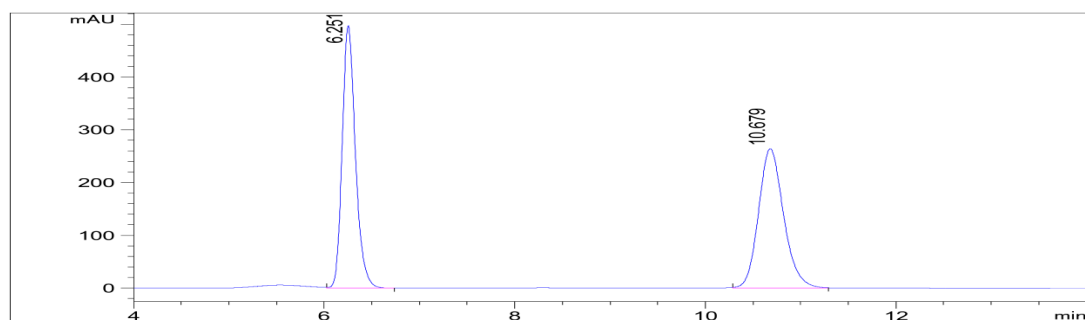
(S)-3-(2,4-difluorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4v)

Yield: 81% (30.7 mg), ee = 92%, $[\alpha]_D^{20} = -62.9$ (c = 1.0, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.46 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 6.8 Hz, 2H), 7.29 (d, *J* = 6.8 Hz, 1H), 7.03 (q, *J* = 8.4 Hz, 1H), 6.89 (s, 1H), 6.75 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.83 - 6.49 (m, 3H), 3.77 (s, 3H), 3.64 (s, 2H), 3.04 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 160.7 (d, *J*_{CF} = 258.8 Hz), 155.7, 139.5, 137.0, 131.8 (q, *J*_{CF} = 5.4 Hz), 131.6, 128.6, 127.5, 127.0, 119.2 (d, *J*_{CF} = 15.9 Hz), 113.3, 112.7, 110.5 (dd, *J*_{CF} = 20.6, 3.4 Hz), 108.2, 103.2 (t, *J*_{CF} = 25.9 Hz), 58.1, 55.8, 34.9, 26.3. HRMS (ESI) calcd. for C₂₃H₂₀F₂NO₂ [M+H]⁺: 380.1457, found: 380.1463.

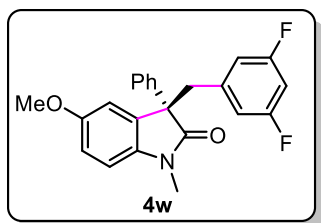
The ee of compound **4v** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.24 min, *t*_{minor} = 10.67 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.244	MF	660.532	0.160	6341.875	96.045
2	10.667	MM	14.450	0.301	261.127	3.955



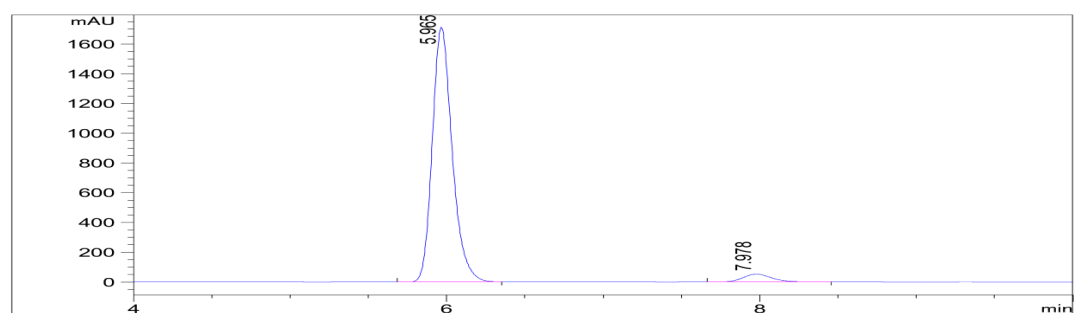
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.251	FM	497.814	0.160	4790.893	49.754
2	10.679	FM	264.246	0.305	4838.287	50.246



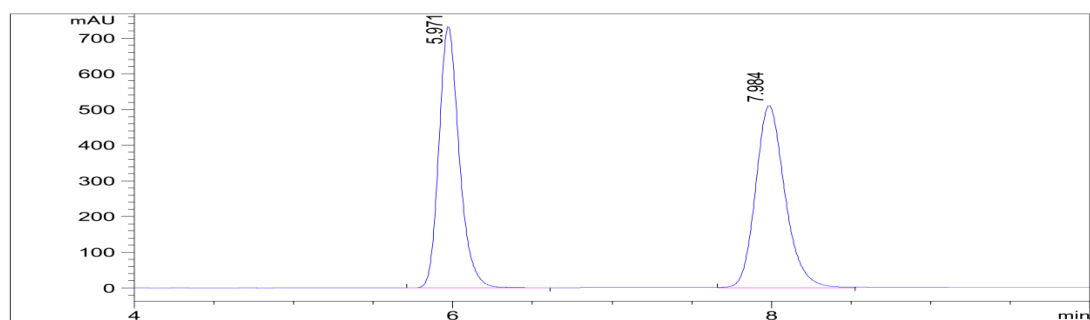
(S)-3-(3,5-difluorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4w)

Yield: 90% (34.1 mg), ee = 92%, $[\alpha]_D^{21} = -45.7$ (c = 1.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.46 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 6.8 Hz, 2H), 7.31 - 7.27 (m, 1H), 6.81 - 6.77 (m, 2H), 6.61 (d, *J* = 8.4 Hz, 1H), 6.54 - 6.50 (m, 1H), 6.43 (dd, *J* = 8.4, 2.0 Hz, 2H), 3.78 (s, 3H), 3.68 (d, *J* = 12.8 Hz, 1H), 3.39 (d, *J* = 12.8 Hz, 1H), 3.00 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.0, 162.1 (dd, *J*_{CF} = 246.1, 12.7 Hz), 155.8, 139.7 (t, *J*_{CF} = 9.2 Hz), 139.1, 137.2, 131.8, 128.7, 127.7, 127.0, 112.8 (d, *J*_{CF} = 24.8 Hz), 112.8 (d, *J*_{CF} = 11.9 Hz), 112.8 (d, *J*_{CF} = 1.0 Hz), 108.6, 102.1 (t, *J*_{CF} = 25.1 Hz), 58.1, 55.9, 43.2, 26.2. HRMS (ESI) calcd. for C₂₃H₁₉F₂NNaO₂ [M+Na]⁺: 402.1276, found: 402.1289.

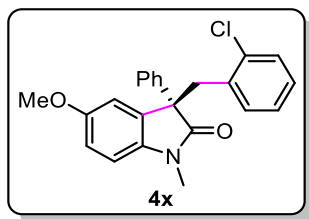
The ee of compound **4w** was determined by HPLC using an IC_{Daicel} column (n-hexane/i-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 5.97 min, *t*_{minor} = 7.98 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	5.965	MF	1711.746	0.147	15148.109	95.760
2	7.978	MM	52.874	0.211	670.786	4.240



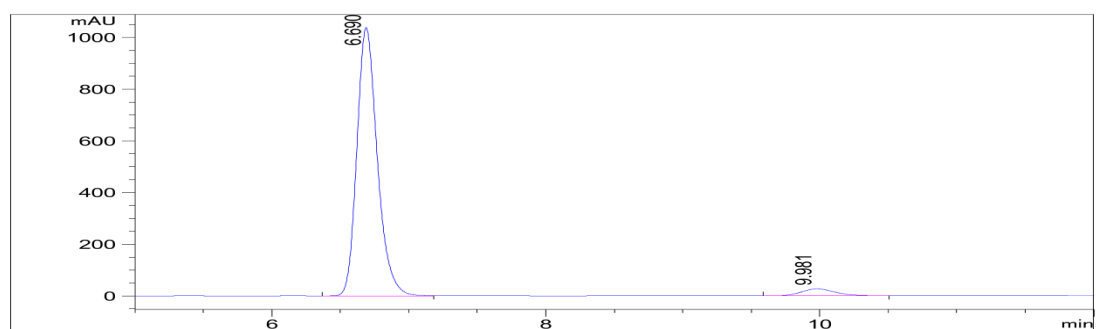
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	5.971	BB	729.694	0.135	6470.240	49.728
2	7.984	FM	510.536	0.214	6540.961	50.272



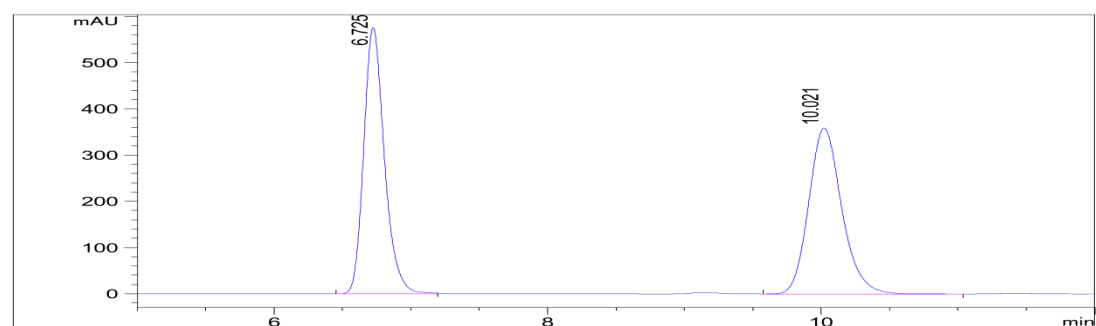
(S)-3-(2-chlorobenzyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (4x)

Yield: 91% (34.3 mg), ee = 92% $[\alpha]_D^{21} = -118.6$ (c = 2.1, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.50 - 7.48 (m, 2H), 7.34 (t, *J* = 7.2 Hz, 2H), 7.30 - 7.28 (m, 1H), 7.14 - 7.12 (m, 1H), 7.06 (dd, *J* = 6.4, 2.0 Hz, 1H), 6.99 - 6.96 (m, 2H), 6.87 (d, *J* = 2.8 Hz, 1H), 6.73 (dd, *J* = 8.4, 2.8 Hz, 1H), 6.56 (d, *J* = 8.4 Hz, 1H), 3.91 (d, *J* = 13.2 Hz, 1H), 3.80 (d, *J* = 13.6 Hz, 1H), 3.73 (s, 3H), 3.09 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.8, 155.3, 139.7, 136.9, 134.7, 134.3, 131.2, 130.4, 129.3, 128.6, 127.9, 127.5, 127.2, 126.1, 113.5, 113.1, 108.1, 58.1, 55.8, 39.1, 26.4. HRMS (ESI) calcd. for C₂₃H₂₁ClNO₂ [M+H]⁺: 378.1255, found: 378.1270.

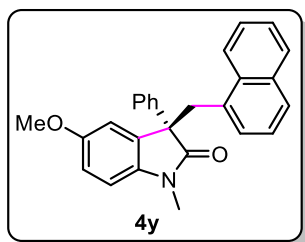
The ee of compound **4x** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 6.69 min, *t*_{minor} = 9.98 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.690	MF	1040.195	0.172	10739.191	96.014
2	9.981	MM	26.551	0.280	445.844	3.986



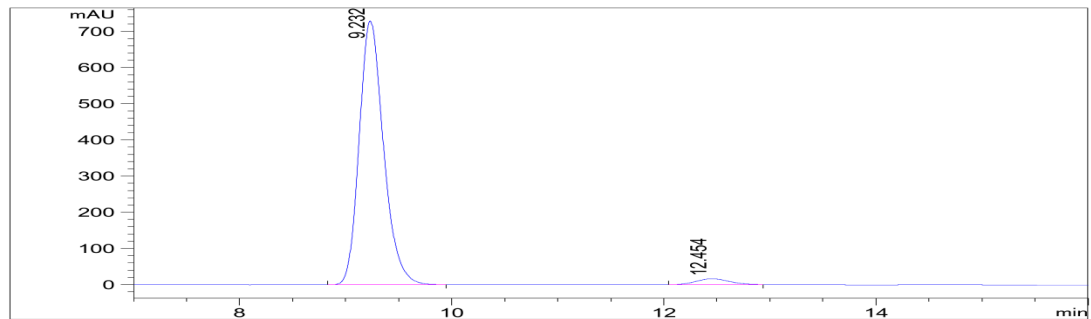
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	6.725	MF	575.859	0.175	6032.608	50.038
2	10.021	VB	358.616	0.258	6023.465	49.962



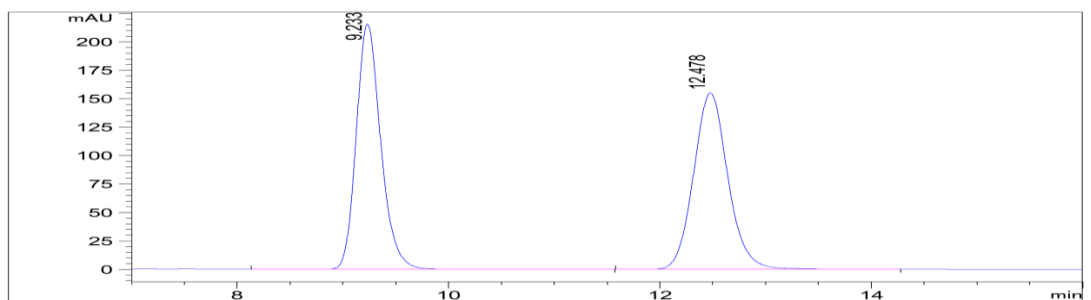
(S)-5-methoxy-1-methyl-3-(naphthalen-1-ylmethyl)-3-phenylindolin-2-one (4y)

Yield: 84% (33.0 mg), ee = 94%, $[\alpha]_D^{21} = -72.4$ ($c = 1.8$, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.94 - 7.91 (m, 1H), 7.69 - 7.67 (m, 1H), 7.58 - 7.56 (m, 3H), 7.38 - 7.30 (m, 5H), 7.15 (t, $J = 7.2$ Hz, 1H), 7.06 (d, $J = 7.2$ Hz, 1H), 6.58 - 6.56 (m, 2H), 6.42 (d, $J = 9.2$ Hz, 1H), 4.17 (d, $J = 14.0$ Hz, 1H), 4.03 (d, $J = 14.0$ Hz, 1H), 3.47 (s, 3H), 2.92 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.9, 155.1, 139.8, 137.1, 133.4, 132.4, 132.4, 131.6, 128.5, 128.2, 127.7, 127.4, 127.4, 127.3, 125.1, 125.1, 124.6, 124.4, 113.3, 113.3, 108.1, 58.3, 55.6, 39.0, 26.2. HRMS (ESI) calcd. for $\text{C}_{27}\text{H}_{24}\text{NO}_2$ $[\text{M}+\text{H}]^+$: 394.1802, found: 394.1819.

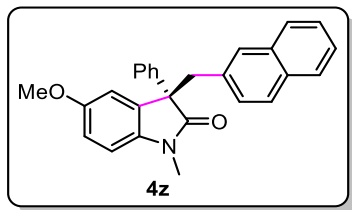
The ee of compound **4y** was determined by HPLC using an IC_{Daicel} column (n-hexane/*i*-PrOH = 70/30, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 9.23$ min, $t_{\text{minor}} = 12.45$ min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.232	MF	729.340	0.267	11670.873	96.884
2	12.454	MF	16.614	0.377	375.385	3.116



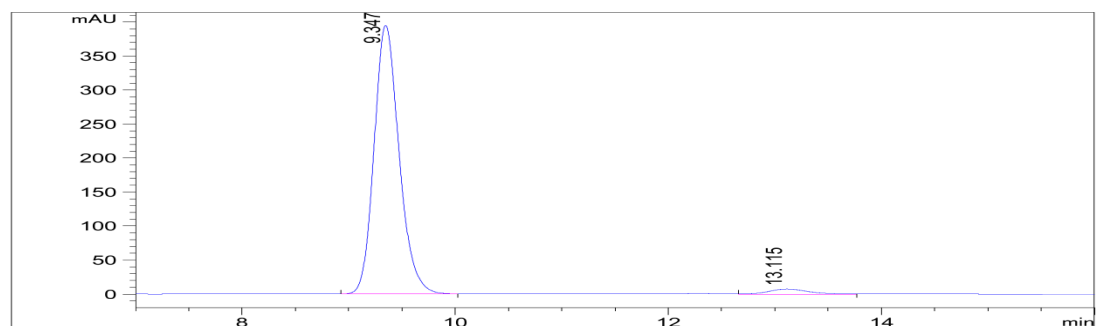
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.233	VV R	215.444	0.248	3482.145	49.887
2	12.476	BB	155.148	0.347	3497.906	50.113



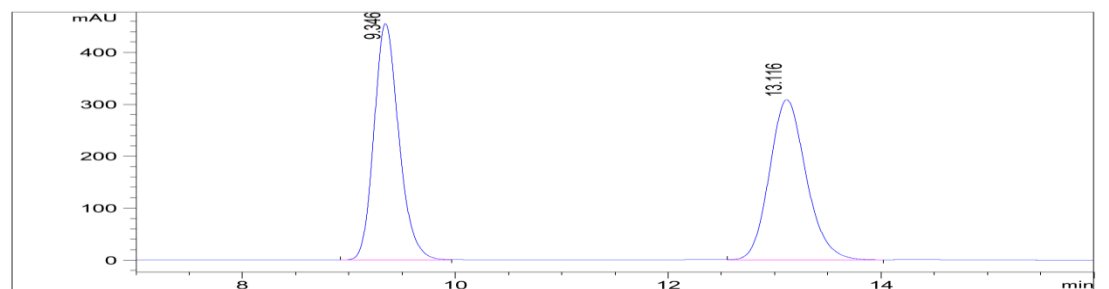
(S)-5-methoxy-1-methyl-3-(naphthalen-2-ylmethyl)-3-phenylindolin-2-one (4z)

Yield: 60% (23.6 mg), ee = 94%, $[\alpha]_D^{21} = -25.9$ (c = 1.7, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.68 (dd, *J* = 6.0, 3.6 Hz, 1H), 7.61 (dd, *J* = 6.0, 3.2 Hz, 1H), 7.54 - 7.49 (m, 3H), 7.38 - 7.34 (m, 5H), 7.32 - 7.30 (m, 1H), 6.98 (dd, *J* = 8.8, 2.0 Hz, 1H), 6.85 (d, *J* = 2.8 Hz, 1H), 6.69 (dd, *J* = 8.4, 2.4 Hz, 1H), 6.43 (d, *J* = 8.4 Hz, 1H), 3.86 (d, *J* = 12.8 Hz, 1H), 3.74 (s, 3H), 3.60 (d, *J* = 12.8 Hz, 1H), 2.87 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 177.5, 155.6, 139.7, 137.3, 133.3, 132.9, 132.4, 132.1, 128.8, 128.6, 128.3, 127.6, 127.5, 127.3, 127.2, 126.8, 125.6, 125.4, 112.9, 112.6, 108.4, 58.6, 55.9, 43.9, 26.1. HRMS (ESI) calcd. for C₂₇H₂₄NO₂ [M+H]⁺: 394.1802, found: 394.1811.

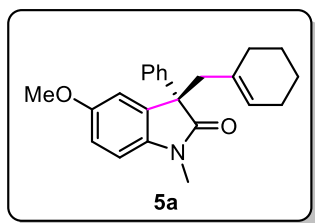
The ee of compound **4z** was determined by HPLC using an IC_{Daicel} column (n-hexane/i-PrOH = 70/30, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 9.35 min, *t*_{minor} = 13.12 min).



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.347	FM	395.012	0.272	6452.605	97.136
2	13.115	MM	7.486	0.424	190.240	2.864



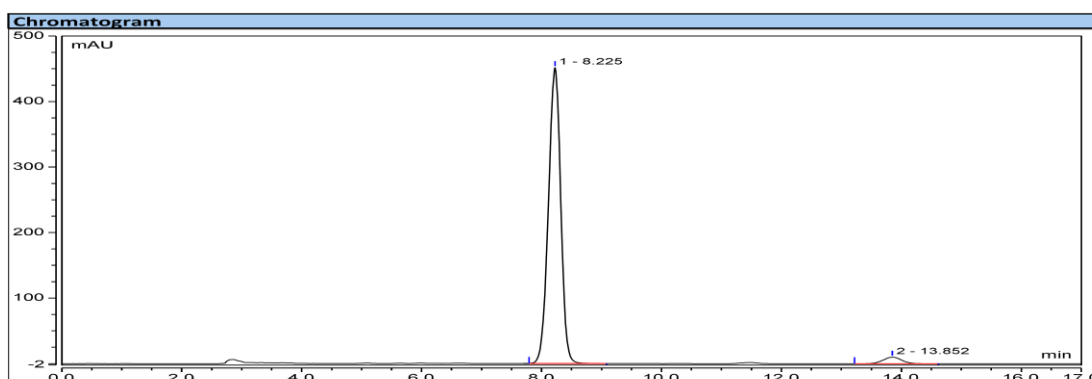
#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.346	FM	455.266	0.271	7416.220	49.949
2	13.116	FM	308.882	0.401	7431.356	50.051



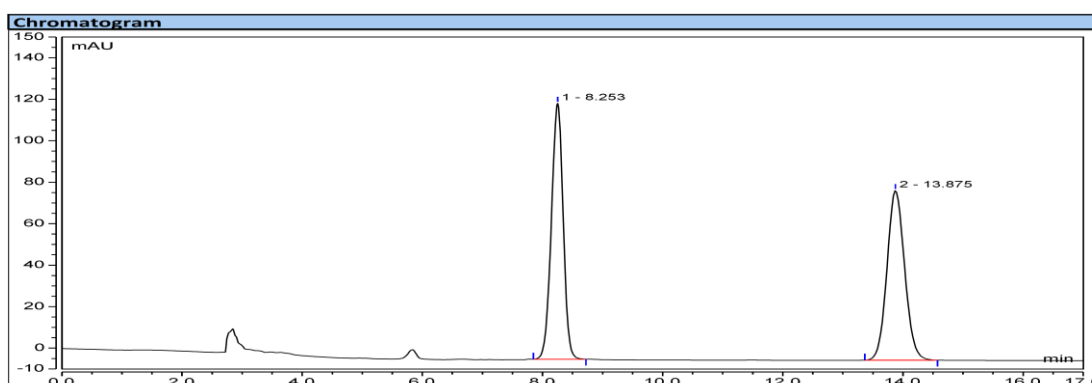
(S)-3-(cyclohex-1-en-1-ylmethyl)-5-methoxy-1-methyl-3-phenylindolin-2-one (5a)

Yield: 85% (29.5 mg), ee = 94%, $[\alpha]_D^{27} = -18.67$ (c = 1.9, CHCl₃), ¹H NMR (400 MHz, CDCl₃) δ 7.41 - 7.39 (m, 2H), 7.31 - 7.27 (m, 2H), 7.26 - 7.21 (m, 1H), 6.86 - 6.83 (m, 2H), 6.76 (dd, *J* = 7.2, 1.6 Hz, 1H), 5.29 (s, 1H), 3.79 (s, 3H), 3.16 (s, 3H), 3.10 (d, *J* = 12.8 Hz, 1H), 2.82 (d, *J* = 13.2 Hz, 1H), 1.80 (s, 2H), 1.55 (d, *J* = 16.4 Hz, 1H), 1.39 - 1.35 (m, 1H), 1.34 - 1.28 (m, 4H); ¹³C NMR (101 MHz, CDCl₃) δ 178.2, 155.6, 140.4, 137.6, 133.2, 132.8, 128.4, 127.2, 127.0, 126.3, 113.2, 112.5, 108.2, 57.4, 55.9, 46.1, 29.7, 26.4, 25.4, 23.0, 22.0. HRMS (ESI) calcd. for C₂₃H₂₅NNaO₂ [M+Na]⁺: 370.1778, found: 370.1789.

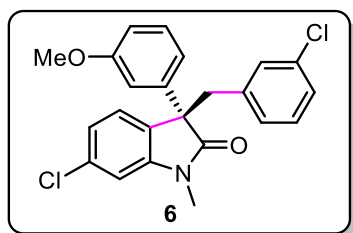
The ee of compound **5a** was determined by HPLC using an IA_{Daicel} column (n-hexane/*i*-PrOH = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, *t*_{major} = 8.23 min, *t*_{minor} = 13.85 min).



Integration Results						
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %
1		8.225	107.256	451.852	96.78	97.85
2		13.852	3.570	9.937	3.22	2.15



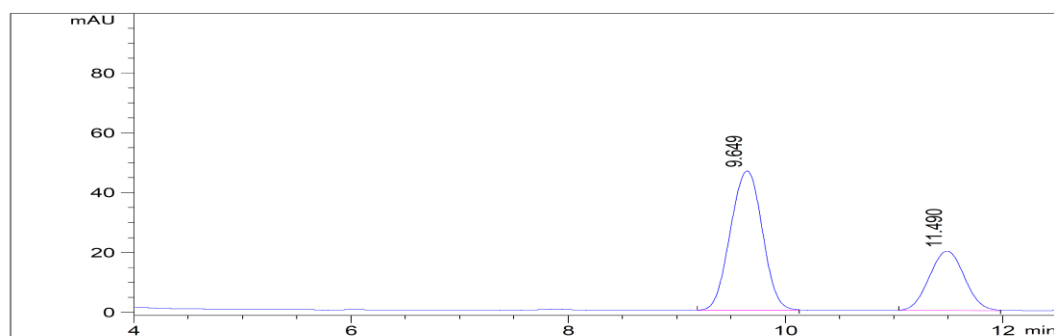
Integration Results						
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %
1		8.253	27.976	123.363	50.01	60.12
2		13.875	27.968	81.819	49.99	39.88



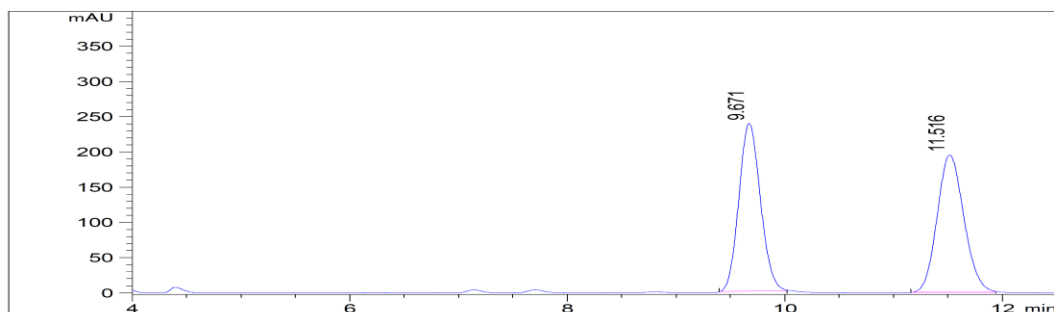
(S)-6-chloro-3-(3-chlorobenzyl)-3-(3-methoxyphenyl)-1-methylindolin-2-one (6)

Yield: 90% (37.1 mg), ee = 36%, $[\alpha]_D^{32} = -23.2$ (c = 2.6, CHCl_3), $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.26 (t, $J = 8.0$ Hz, 1H), 7.09 (t, $J = 8.0$ Hz, 2H), 7.05 - 7.01 (m, 2H), 6.97 (t, $J = 8.0$ Hz, 2H), 6.85 - 6.82 (m, 2H), 6.72 (d, $J = 7.6$ Hz, 1H), 6.65 (d, $J = 1.6$ Hz, 1H), 3.78 (s, 3H), 3.65 (d, $J = 12.8$, 1H), 3.37 (d, $J = 12.8$, 1H), 2.96 (s, 3H); $^{13}\text{C NMR}$ (101 MHz, CDCl_3) δ 177.3, 159.7, 144.8, 140.3, 137.3, 134.1, 133.3, 129.8, 129.7, 129.0, 128.8, 128.1, 126.9, 126.2, 122.1, 119.4, 113.6, 112.5, 108.9, 57.6, 55.2, 43.2, 26.2.

The ee of compound **6** was determined by HPLC using an IC_{Daicel} column (n-hexane/i-PrOH = 80/20, flow rate = 1.0 mL/min, $\lambda = 254$ nm, $t_{\text{major}} = 9.65$ min, $t_{\text{minor}} = 11.49$ min).

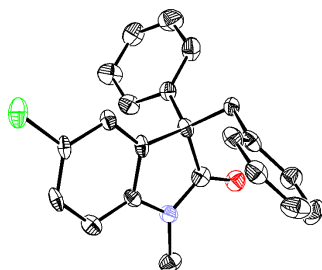


#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.649	FM	46.600	0.341	954.374	68.127
2	11.490	MF	19.867	0.375	446.498	31.873



#	Meas. RT [min]	Peak Type	Peak Height [mAU]	Peak Width [min]	Peak Area [mAU*s]	Peak Area %
1	9.671	MM	237.963	0.230	3276.904	49.607
2	11.516	MM	195.024	0.284	3328.817	50.393

7. X-ray structure of **3o** and parameters.

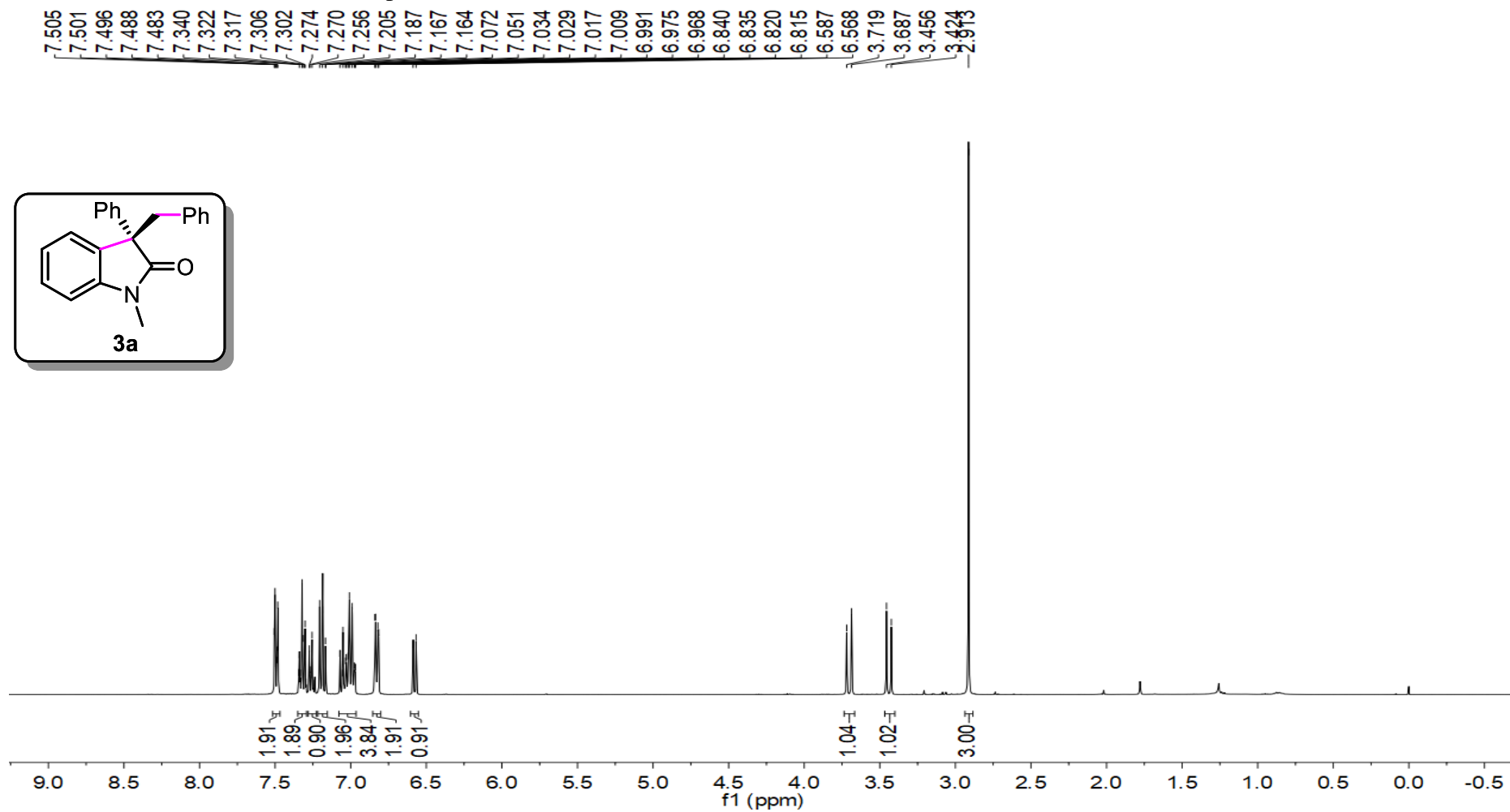


X-ray of **3o** (CCDC: 2174890)

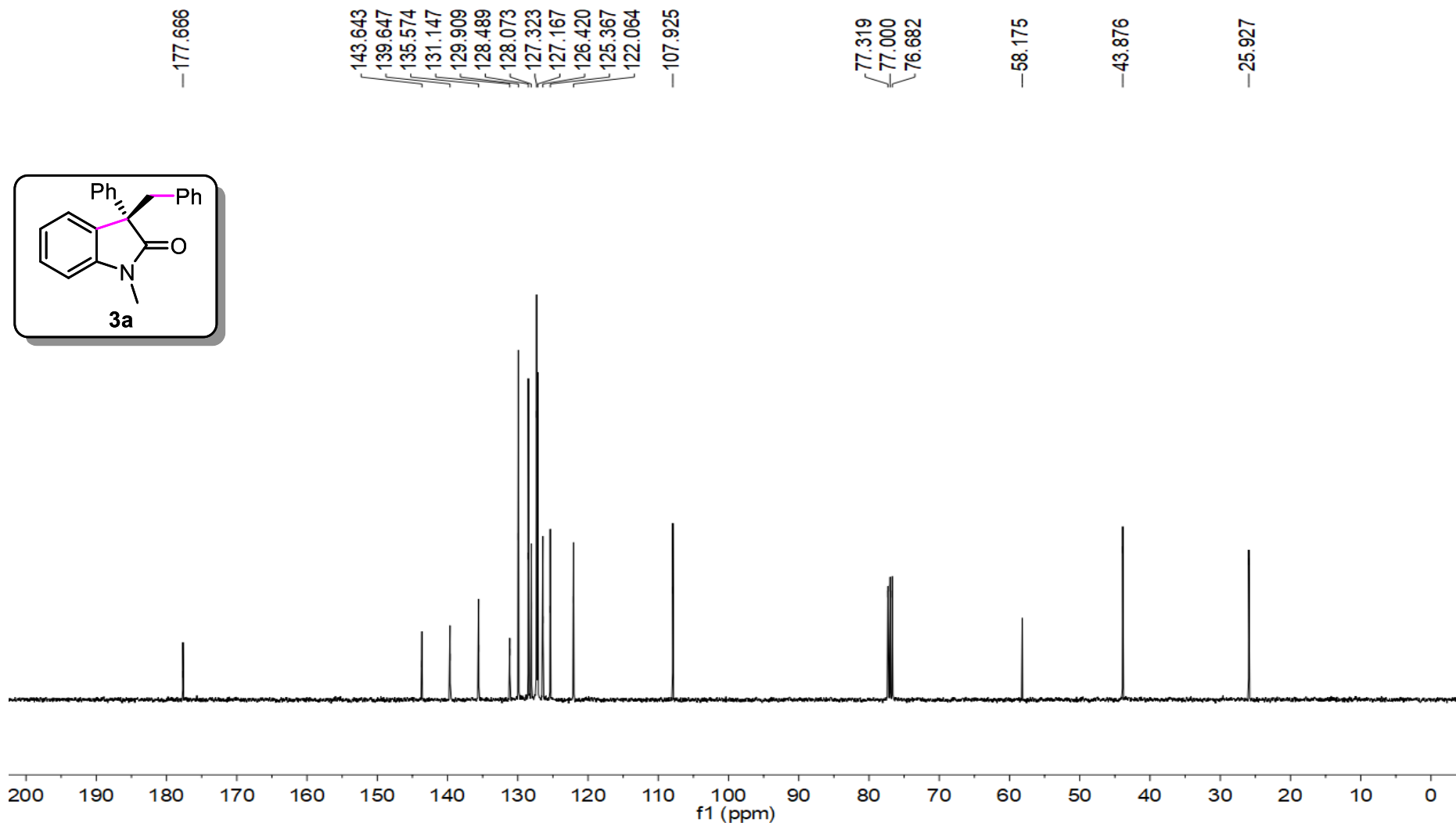
Bond precision	C-C = 0.0161 Å
	Wavelength = 0.71073
Cell	a = 9.050 (4) α = 96.353 (8)
	b = 9.105 (4) β = 93.200 (7)
	c = 11.832 (5) γ = 111.089 (7)
Temperature	296 K
Volume	899.3 (6)
Space group	P 1
Sum formula	C ₂₂ H ₁₈ Cl N O
Mr	347.82
D _x , g cm ⁻³	1.284
Z	1
Mu (mm ⁻¹)	0.221
F ₀₀₀	364.0
h,k,lmax	11, 11, 14
Nref	3950
Tmin,Tmax	0.528, 0.745
Correction method= # Reported T Limits	Tmin = 0.528 Tmax = 0.745
AbsCorr = MULTT-SCAN	
Data completeness	1.12/0.56
Theta(max)	25.981
R(reflections)	0.0690 (2104)
wR2(reflections)	0.1990 (3950)
S	1.029
Npar	454

8. Copies of ^1H and ^{13}C NMR spectra

^1H NMR (400 MHz, CDCl_3) of compound **3a**



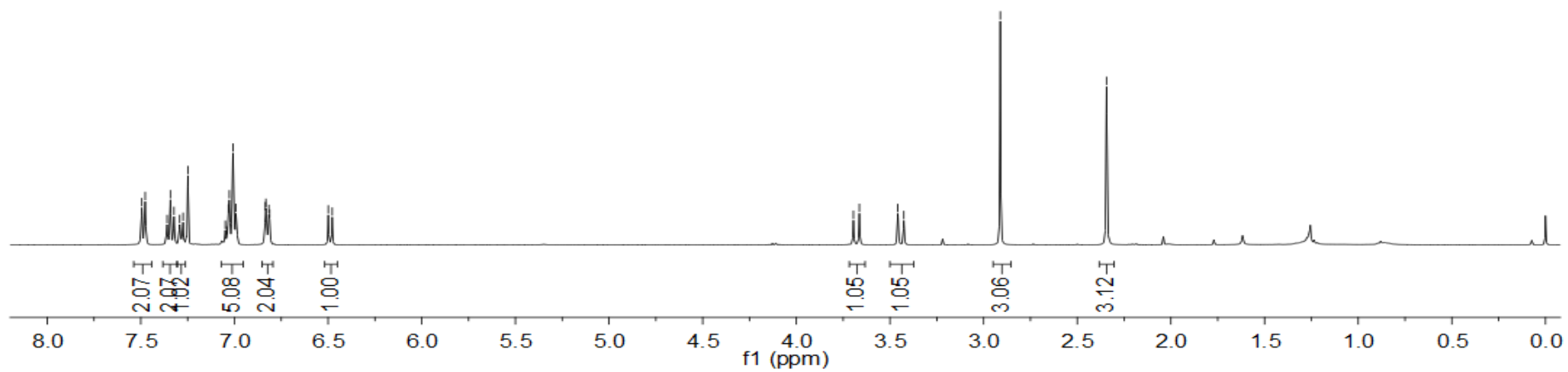
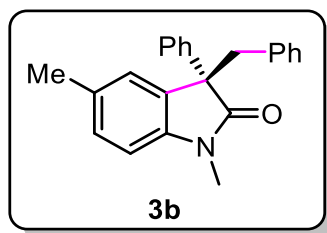
^{13}C NMR (101 MHz, CDCl_3) of compound **3a**



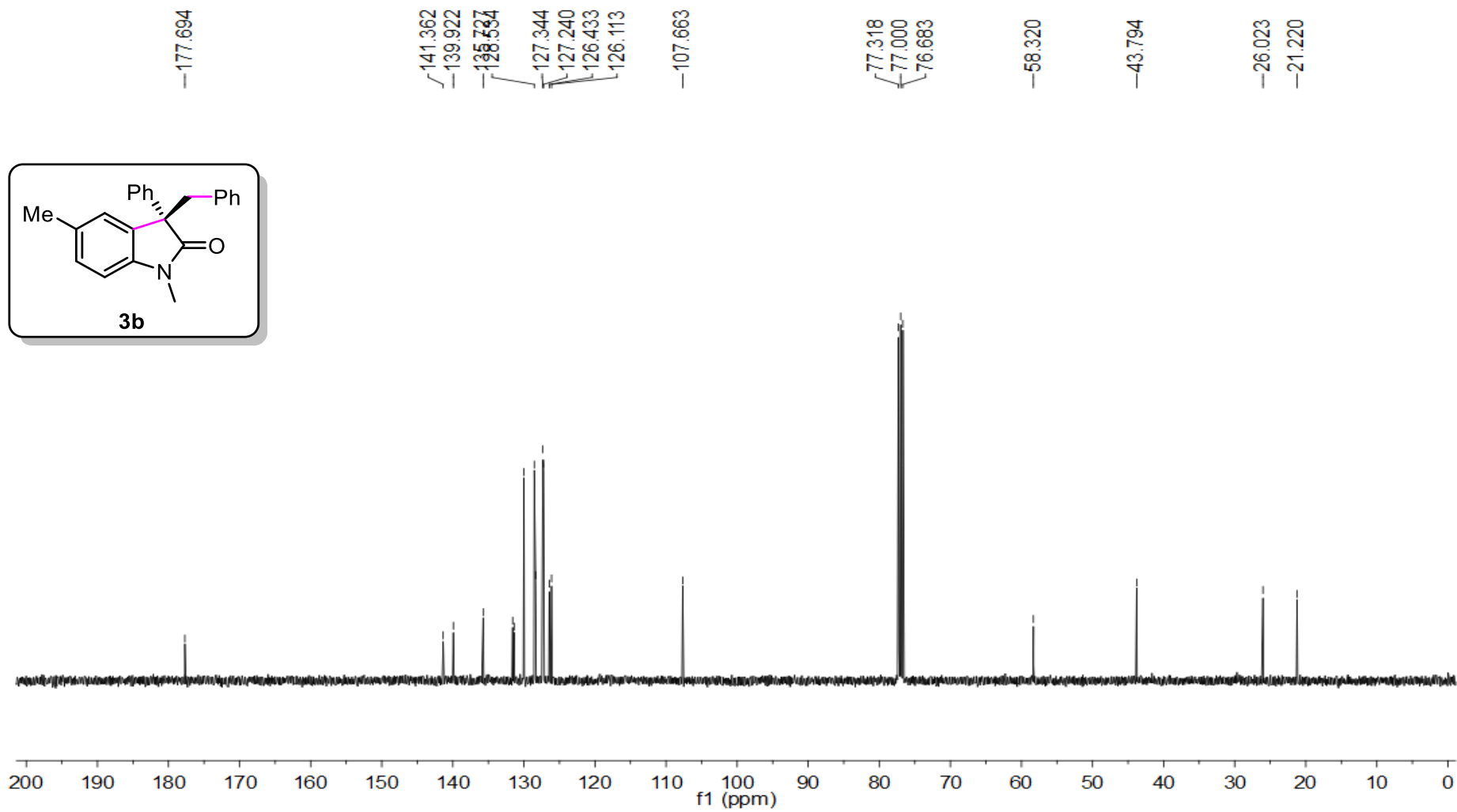
^1H NMR (400 MHz, CDCl_3) of compound **3b**

7.477
7.360
7.342
7.323
7.292
7.274
7.248
— 6.992
— 6.812
— 6.499
— 6.478

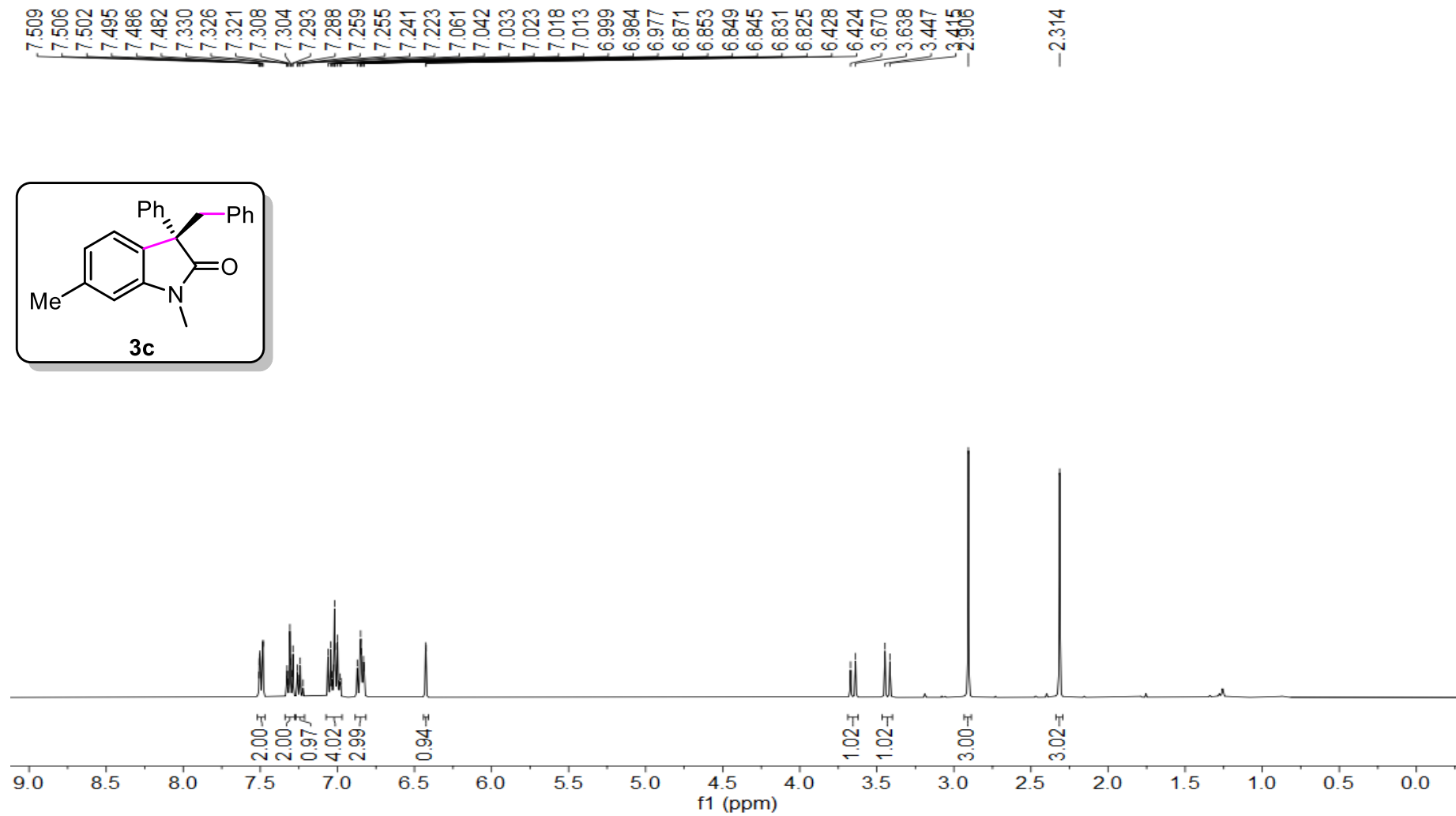
3.695
— 3.663
— 3.458
3.426
— 2.911
— 2.344



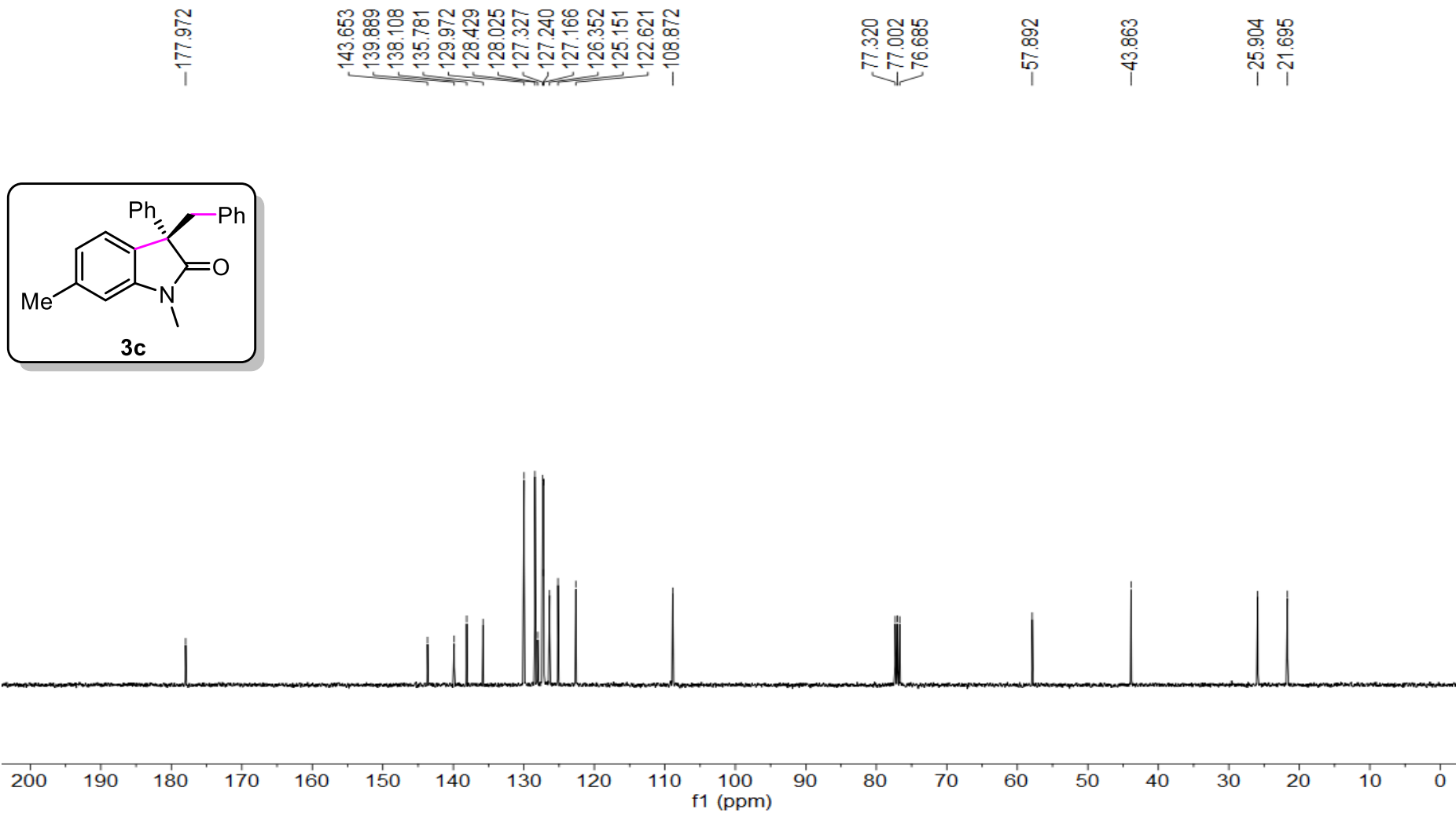
^{13}C NMR (101 MHz, CDCl_3) of compound **3b**



¹H NMR (400 MHz, CDCl₃) of compound **3c**



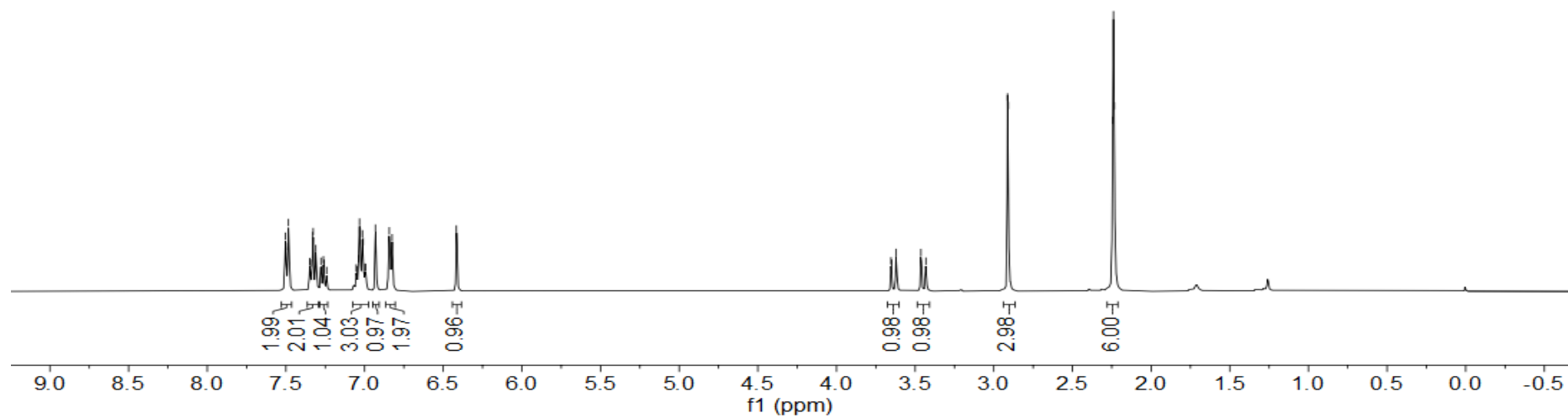
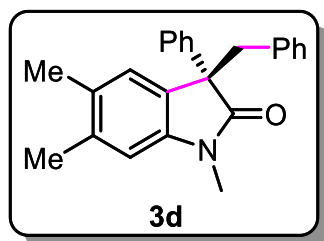
^{13}C NMR (101 MHz, CDCl_3) of compound **3c**



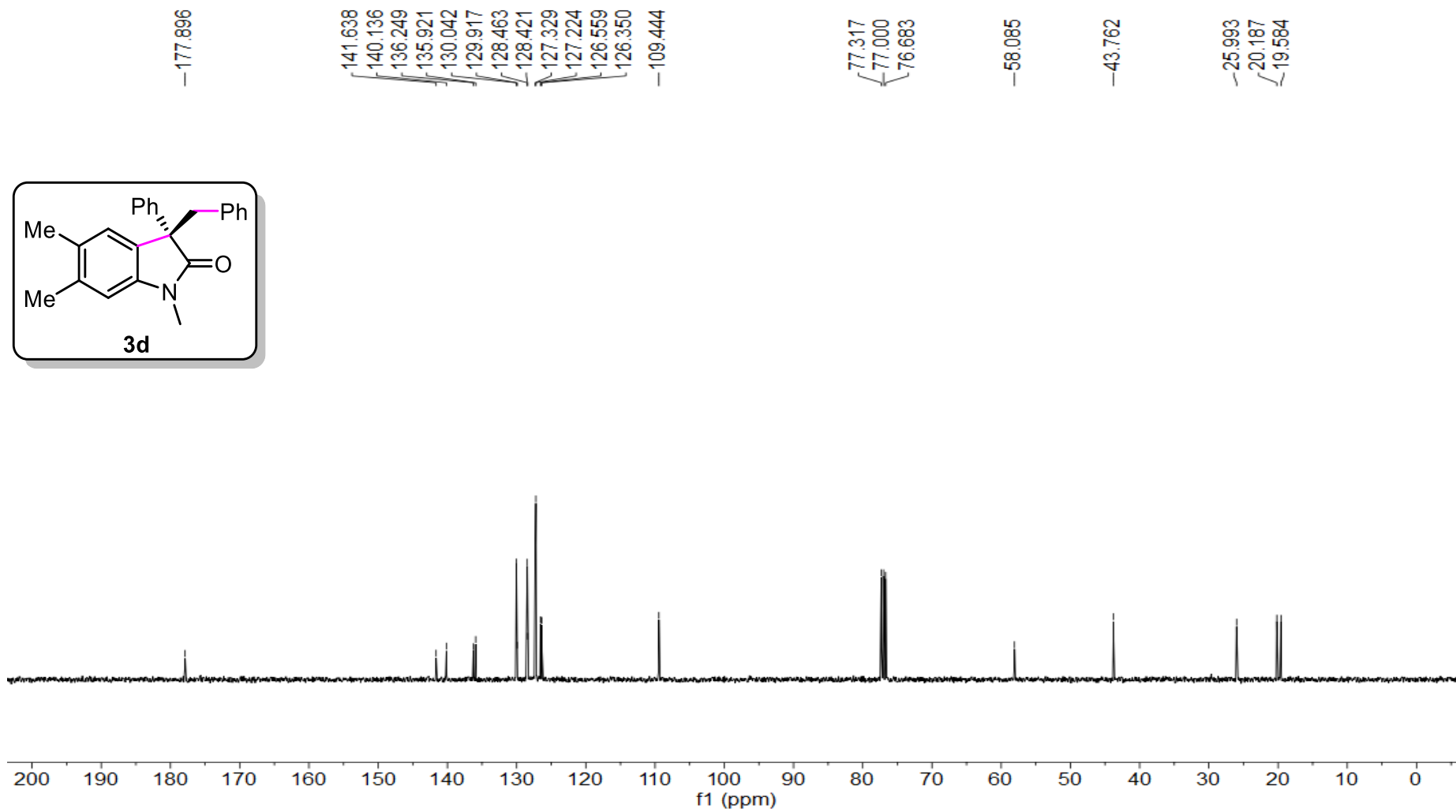
^1H NMR (400 MHz, CDCl_3) of compound **3d**

7.504
7.500
7.484
7.331
7.327
7.310
7.278
7.262
7.039
7.032
7.028
7.014
7.009
6.931
6.843
6.825
6.817

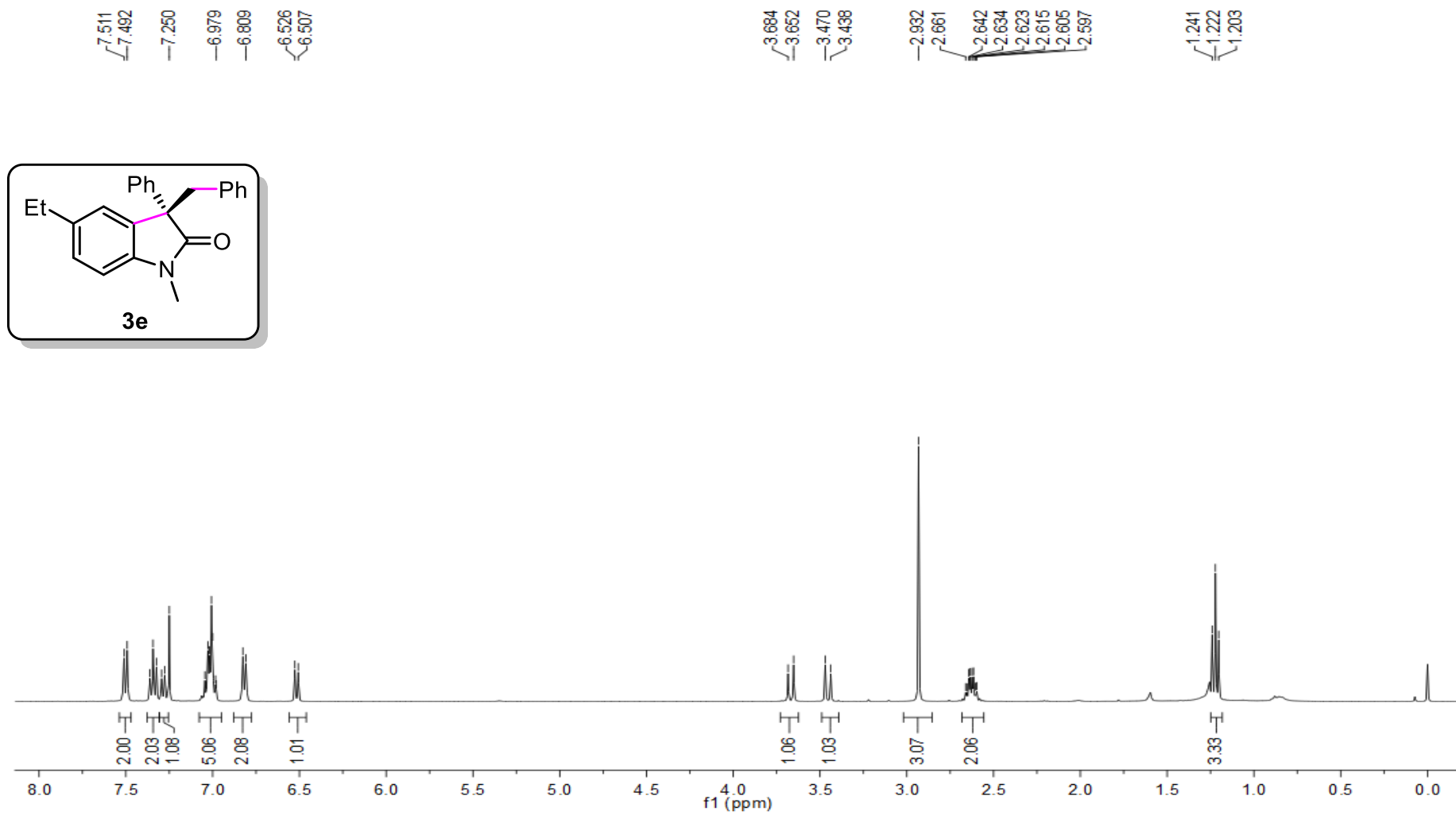
3.654
3.649
3.620
3.463
3.432
2.913
2.908
2.245
2.239
2.234



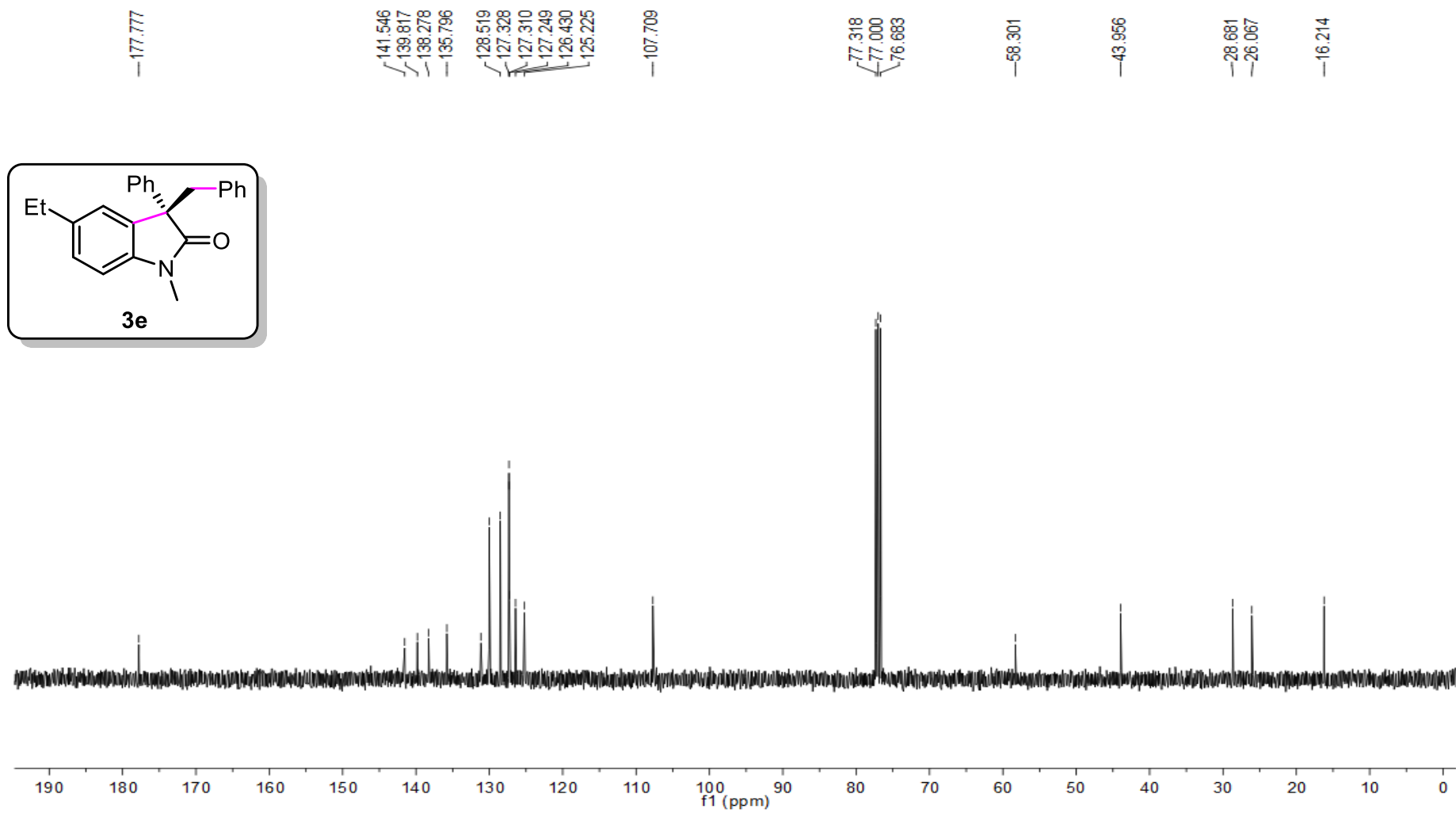
^{13}C NMR (101 MHz, CDCl_3) of compound **3d**



^1H NMR (400 MHz, CDCl_3) of compound **3e**



^{13}C NMR (101 MHz, CDCl_3) of compound **3e**

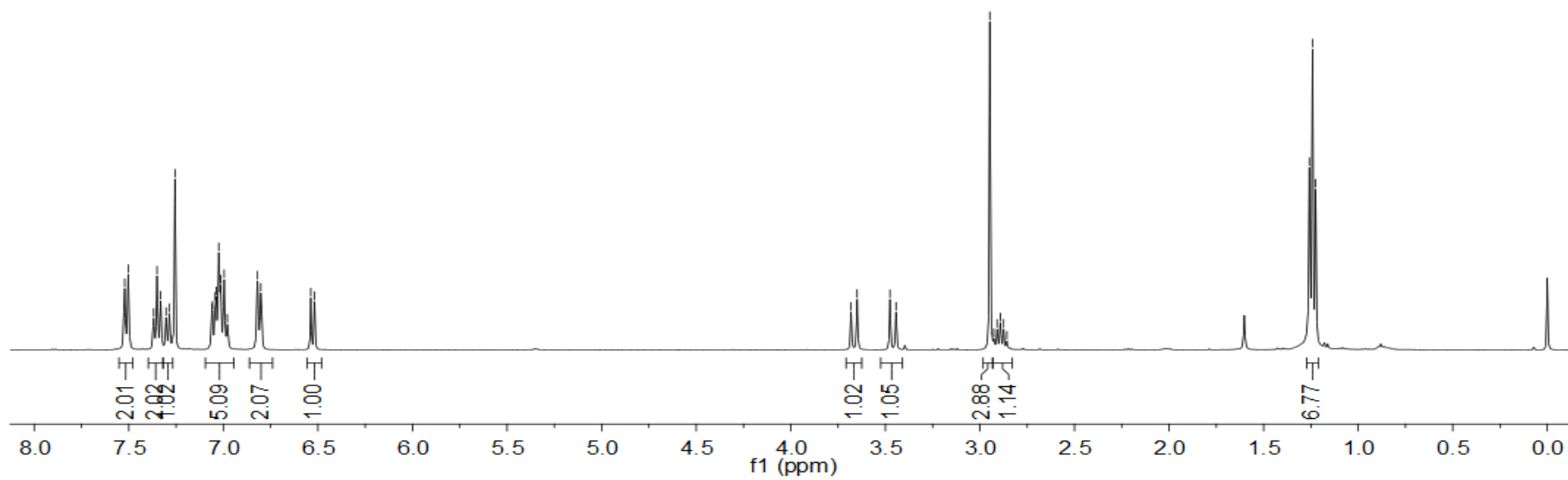
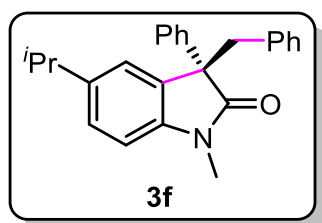


^1H NMR (400 MHz, CDCl_3) of compound **3f**

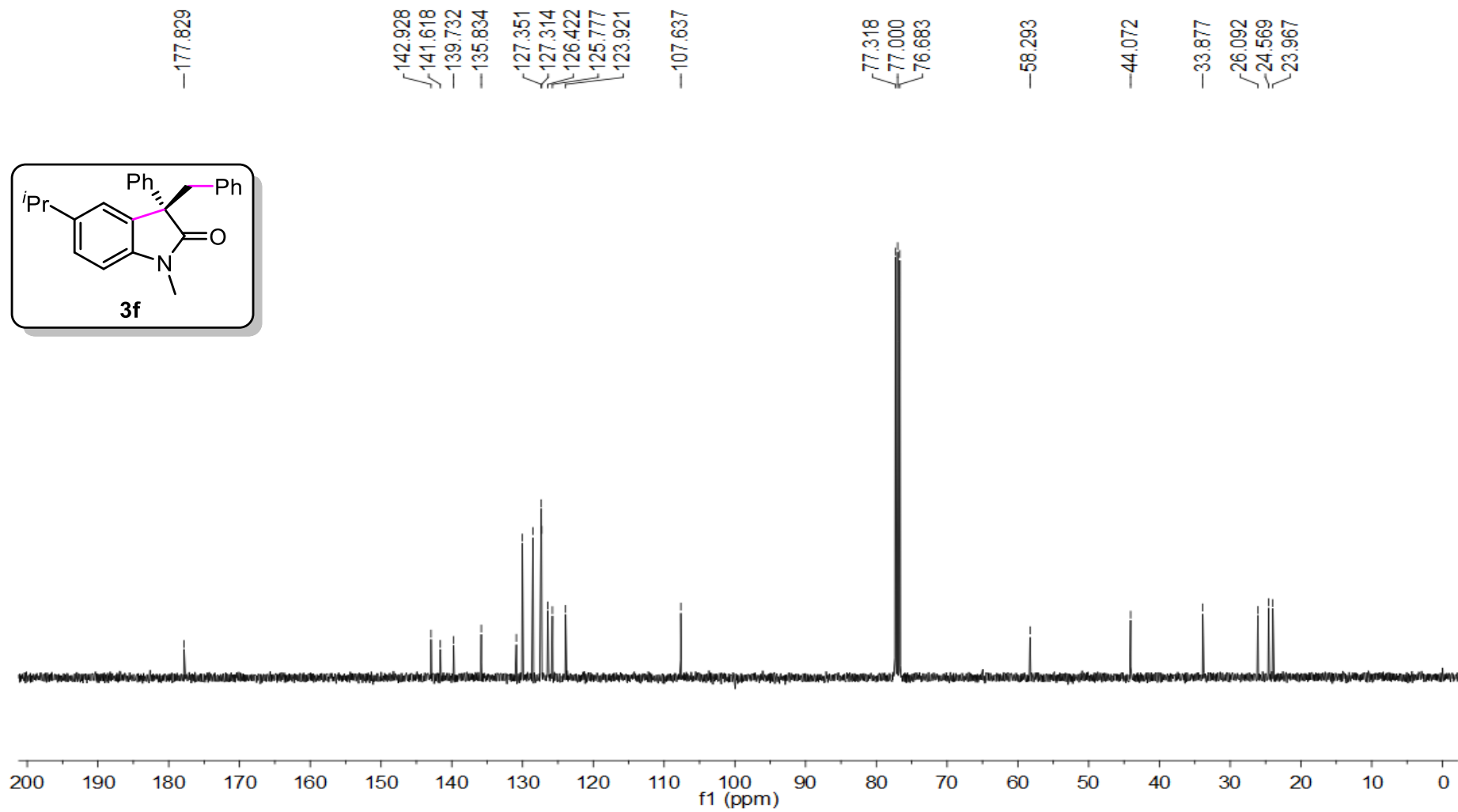
7.503
7.368
7.351
7.331
7.303
7.285
7.256
— 6.979
— 6.802
6.538
6.518

3.681
3.649
— 3.444
2.948
2.927
2.909
2.892
2.875
2.858

1.258
1.242
1.225



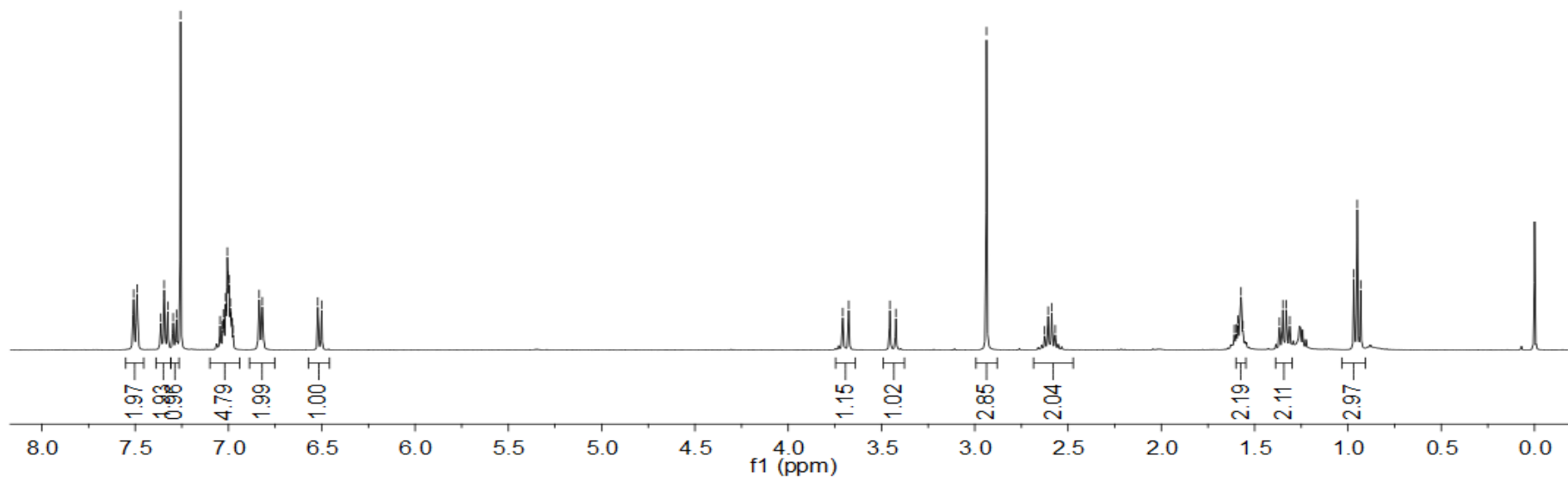
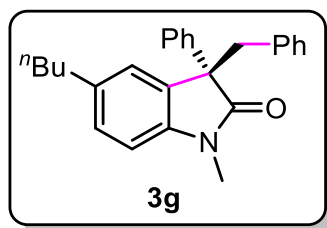
^{13}C NMR (101 MHz, CDCl_3) of compound **3f**



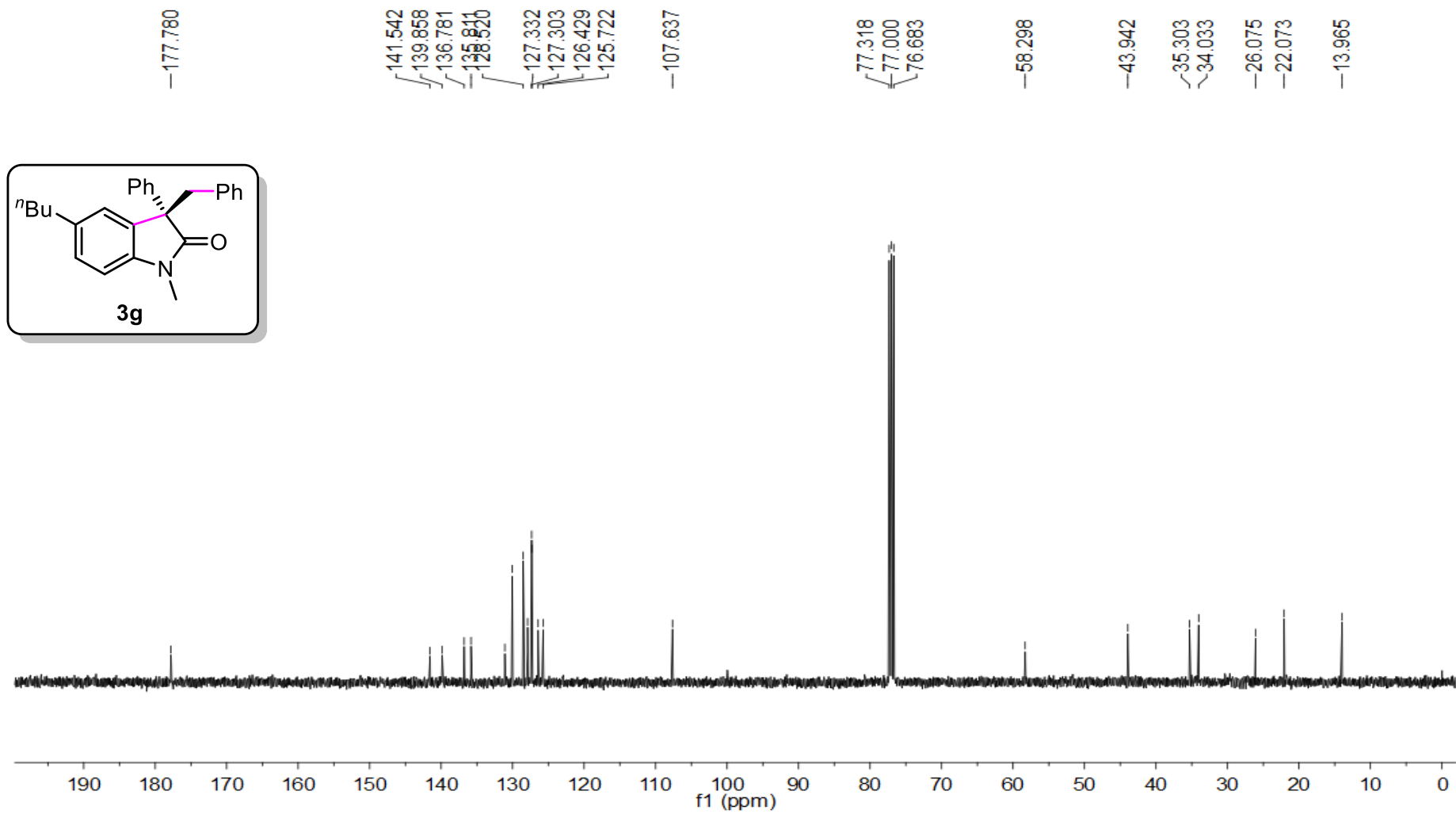
^1H NMR (400 MHz, CDCl_3) of compound **3g**

7.490
7.362
7.345
7.326
7.297
7.279
7.257
7.001
6.819
6.521
6.500

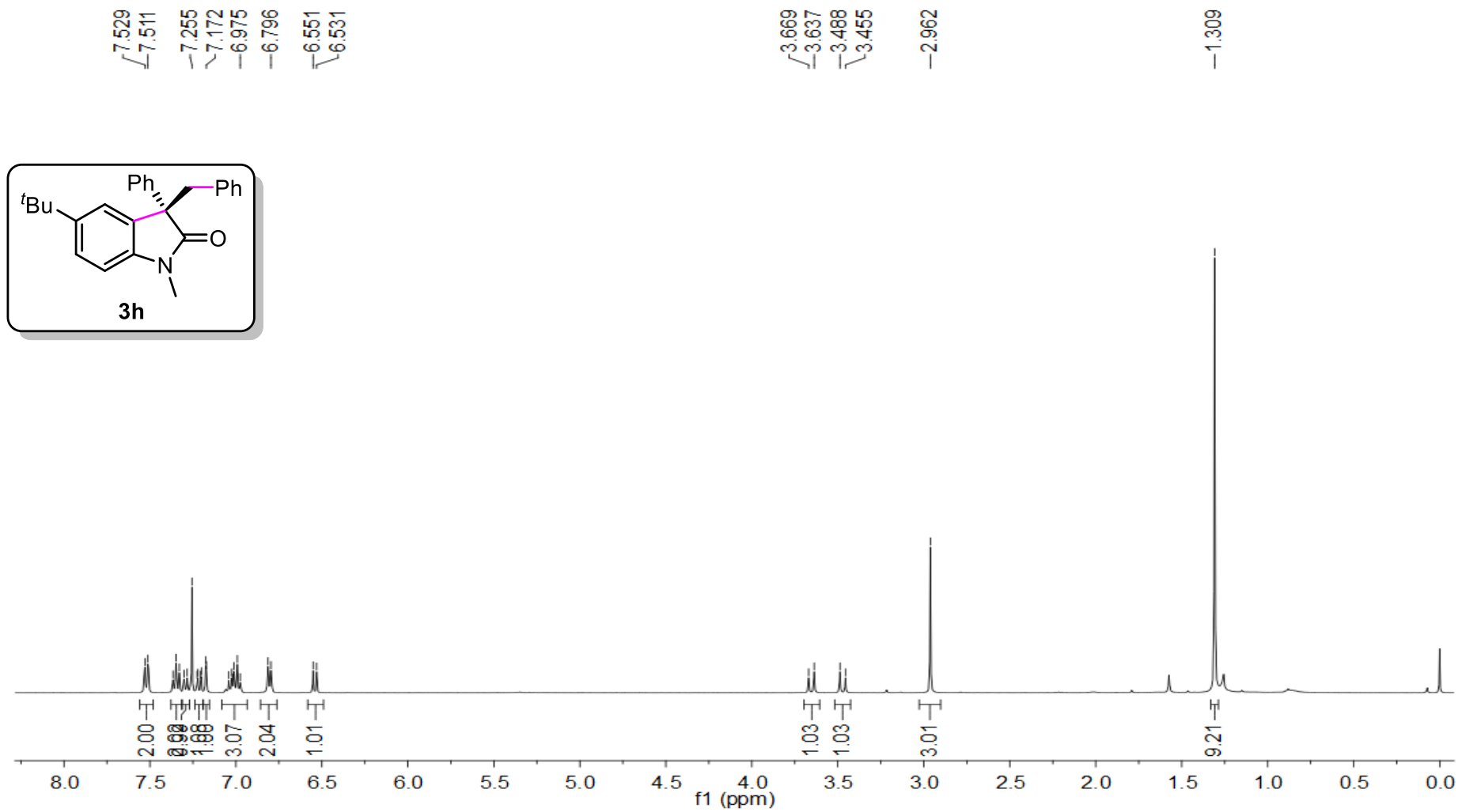
3.708
3.676
3.455
3.423
2.937
2.626
2.607
2.588
2.569
1.599
1.589
1.573
1.564
1.311
0.968
0.950
0.932



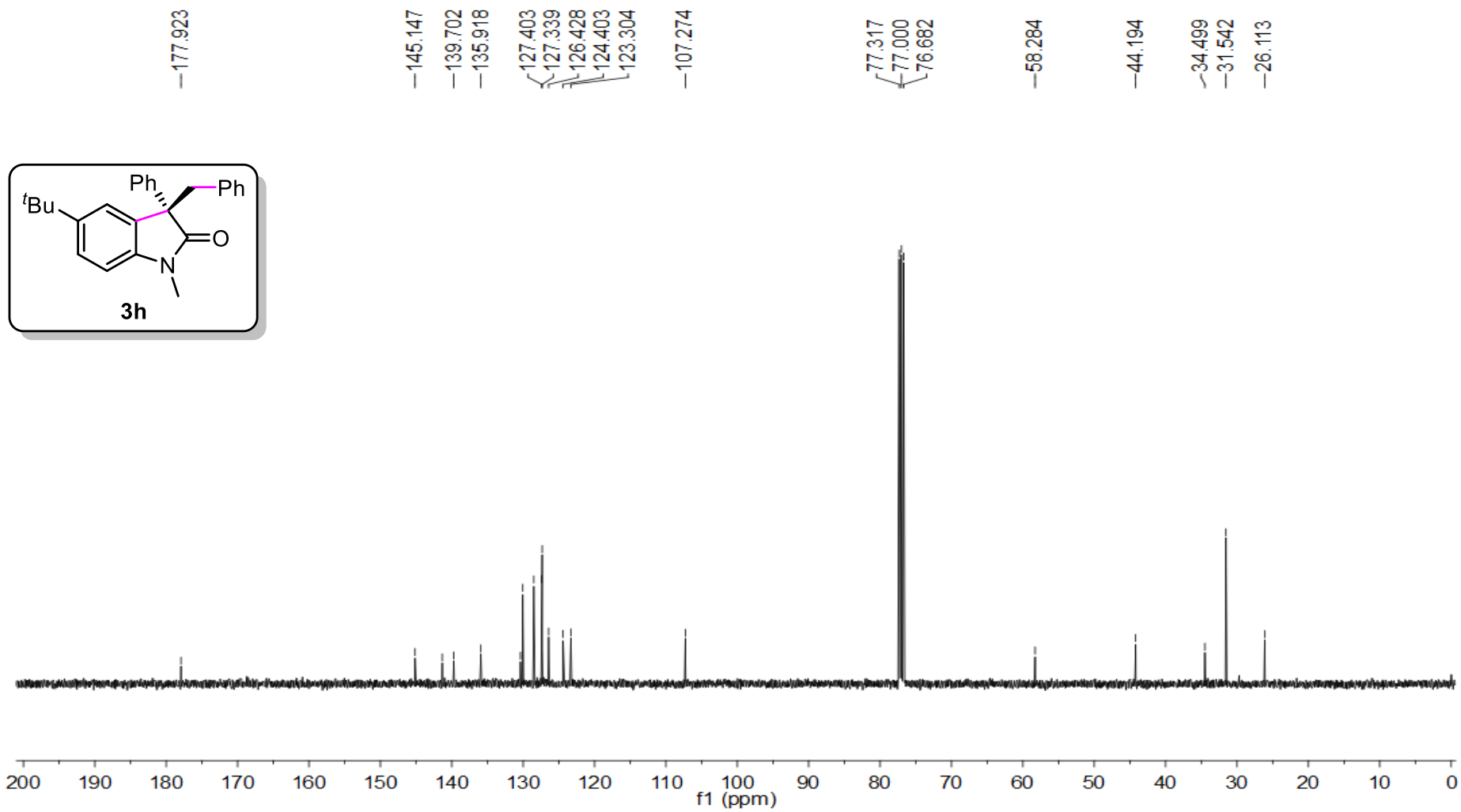
^{13}C NMR (101 MHz, CDCl_3) of compound **3g**



^1H NMR (400 MHz, CDCl_3) of compound **3h**

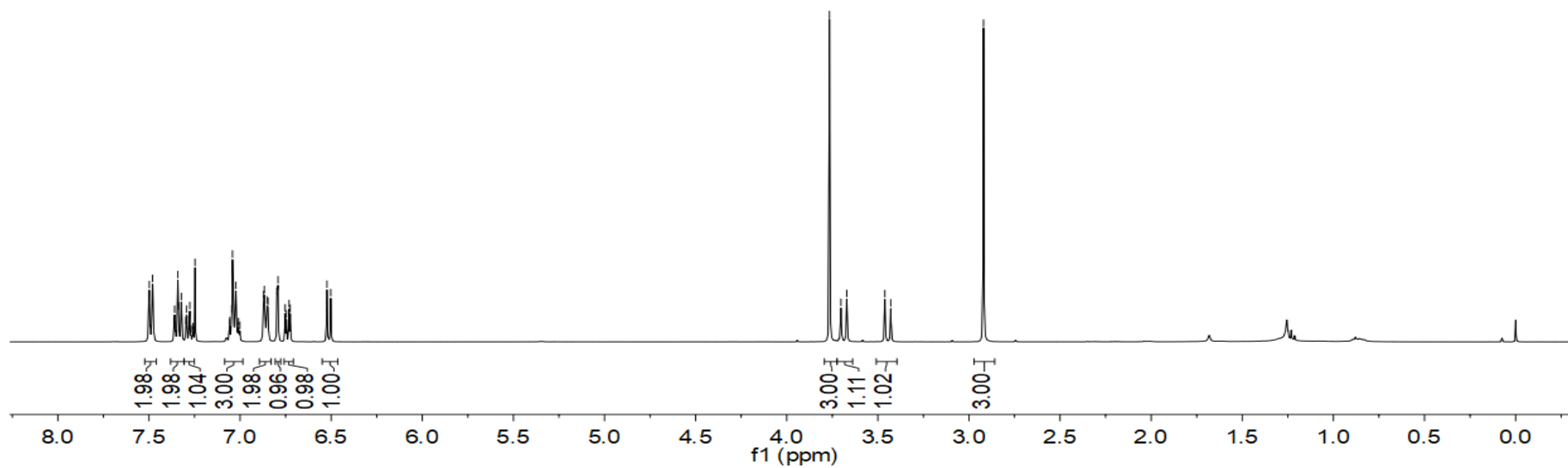
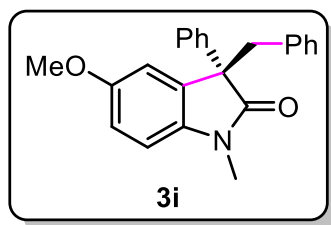


^{13}C NMR (101 MHz, CDCl_3) of compound **3h**

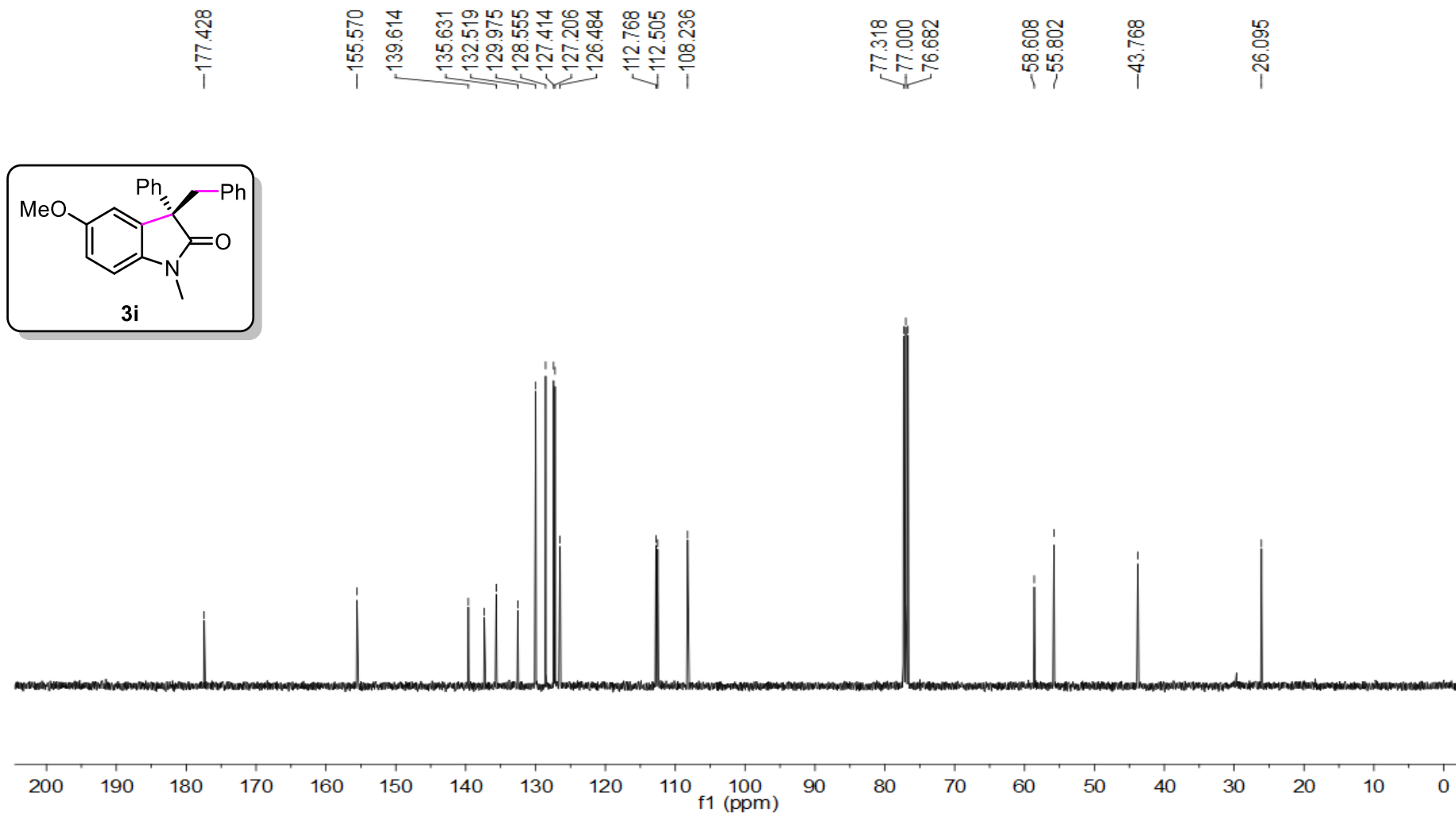


^1H NMR (400 MHz, CDCl_3) of compound **3i**

7.498
7.480
7.359
7.355
7.342
7.338
7.322
7.297
7.294
7.291
7.282
7.276
7.270
7.261
7.258
7.255
7.247
7.059
7.056
7.046
7.042
7.037
7.032
7.023
7.013
7.009
7.001
6.870
6.867
6.852
6.847
6.798
6.792
6.752
6.746
6.731
6.725
6.523
6.502
3.766
3.702
3.671
3.461
3.429
2.920



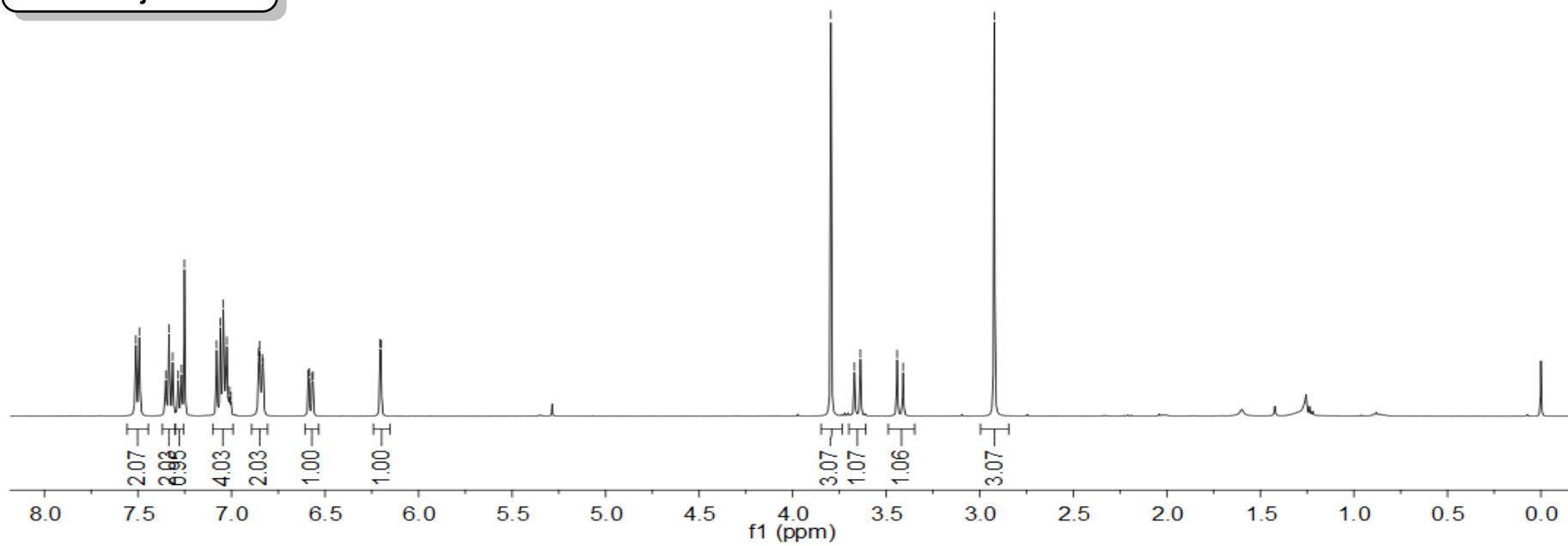
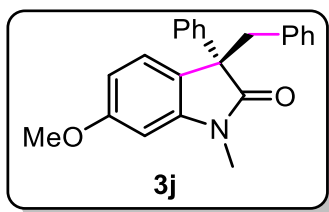
^{13}C NMR (101 MHz, CDCl_3) of compound **3i**



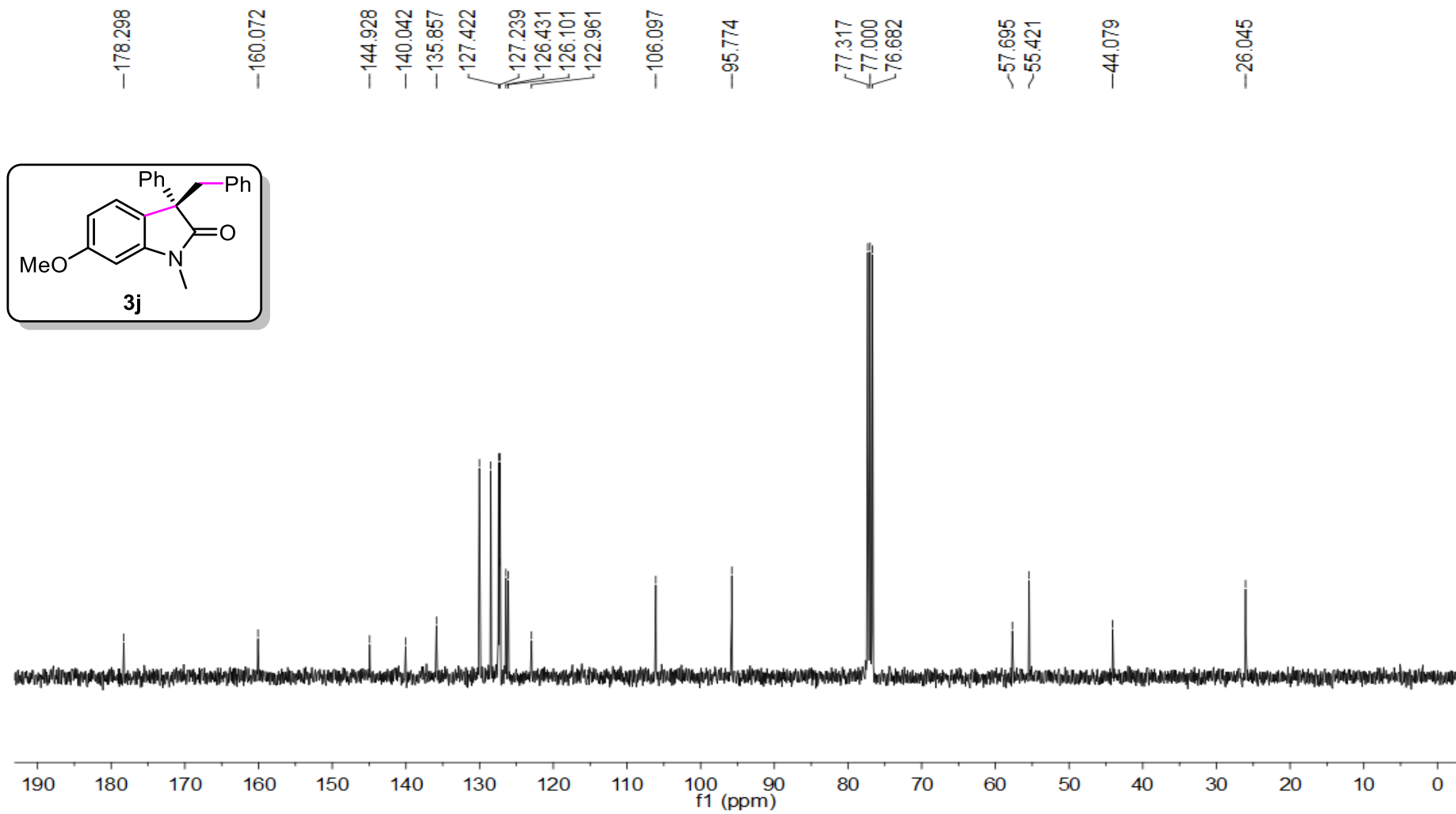
^1H NMR (400 MHz, CDCl_3) of compound **3j**

7.492
7.351
7.333
7.314
7.285
7.267
7.252
-7.003
-6.831
-6.564
-6.206
-6.200

3.796
3.670
3.638
3.442
3.410
-2.922



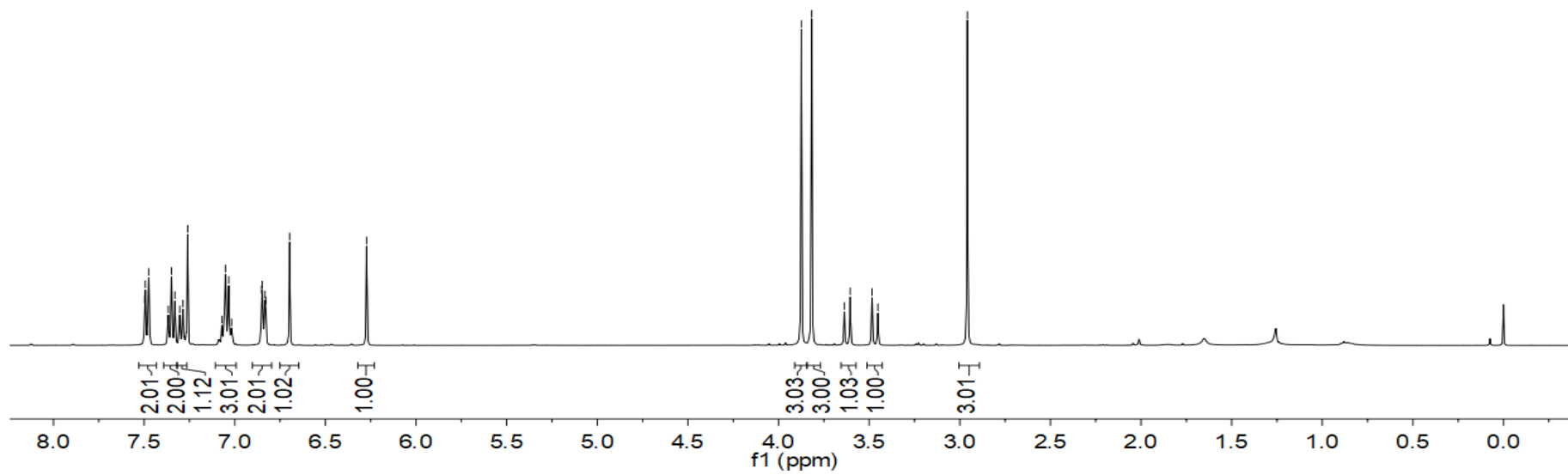
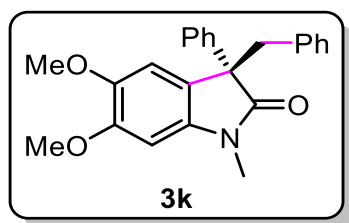
^{13}C NMR (101 MHz, CDCl_3) of compound **3j**



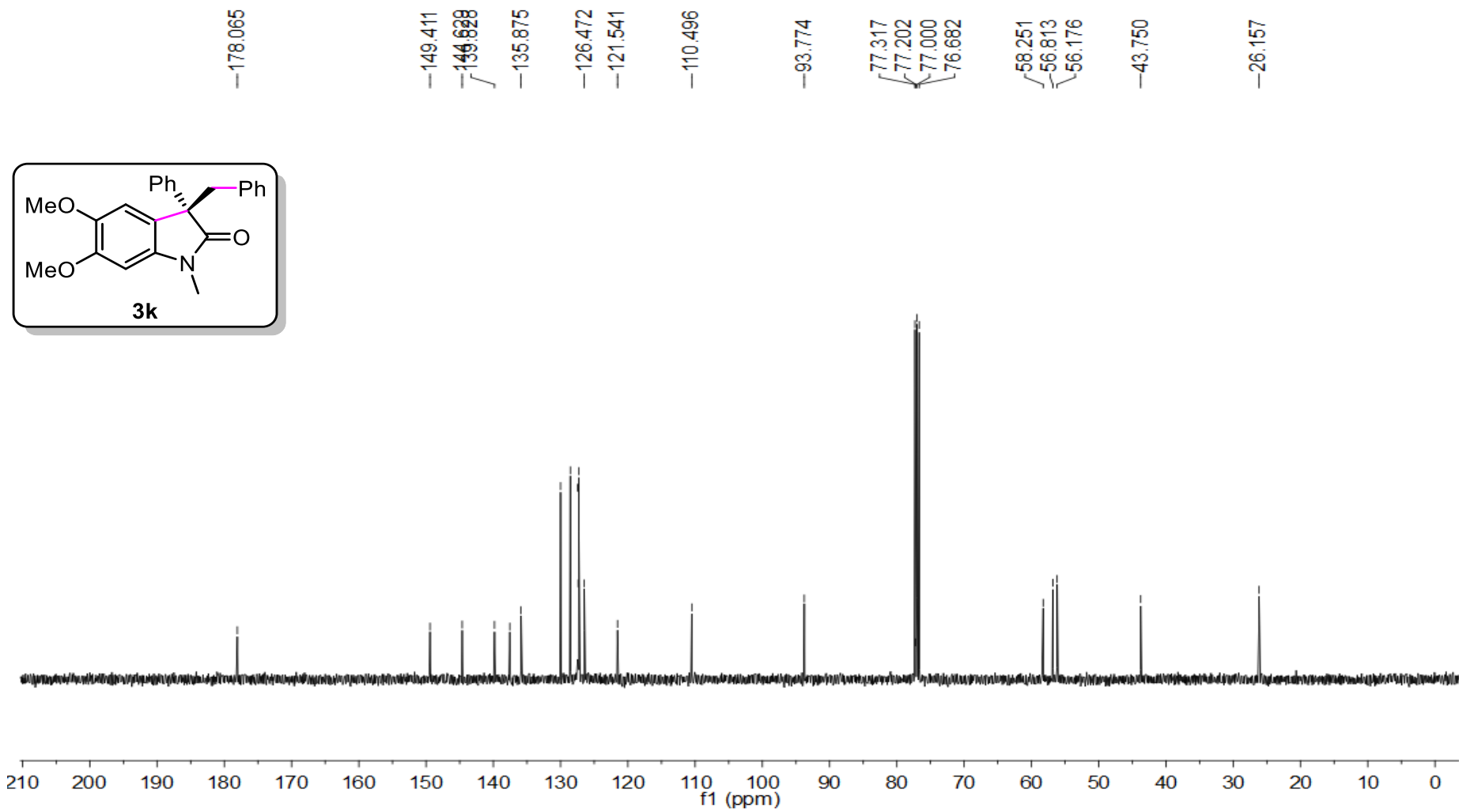
^1H NMR (400 MHz, CDCl_3) of compound **3k**

7.497
7.494
7.475
7.367
7.349
7.330
7.303
7.286
7.259
7.071
7.051
7.033
7.018
6.852
6.849
6.833
6.829
6.698
6.273

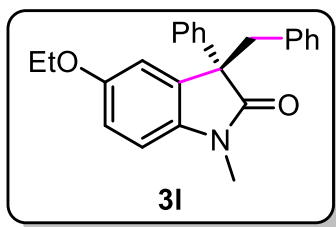
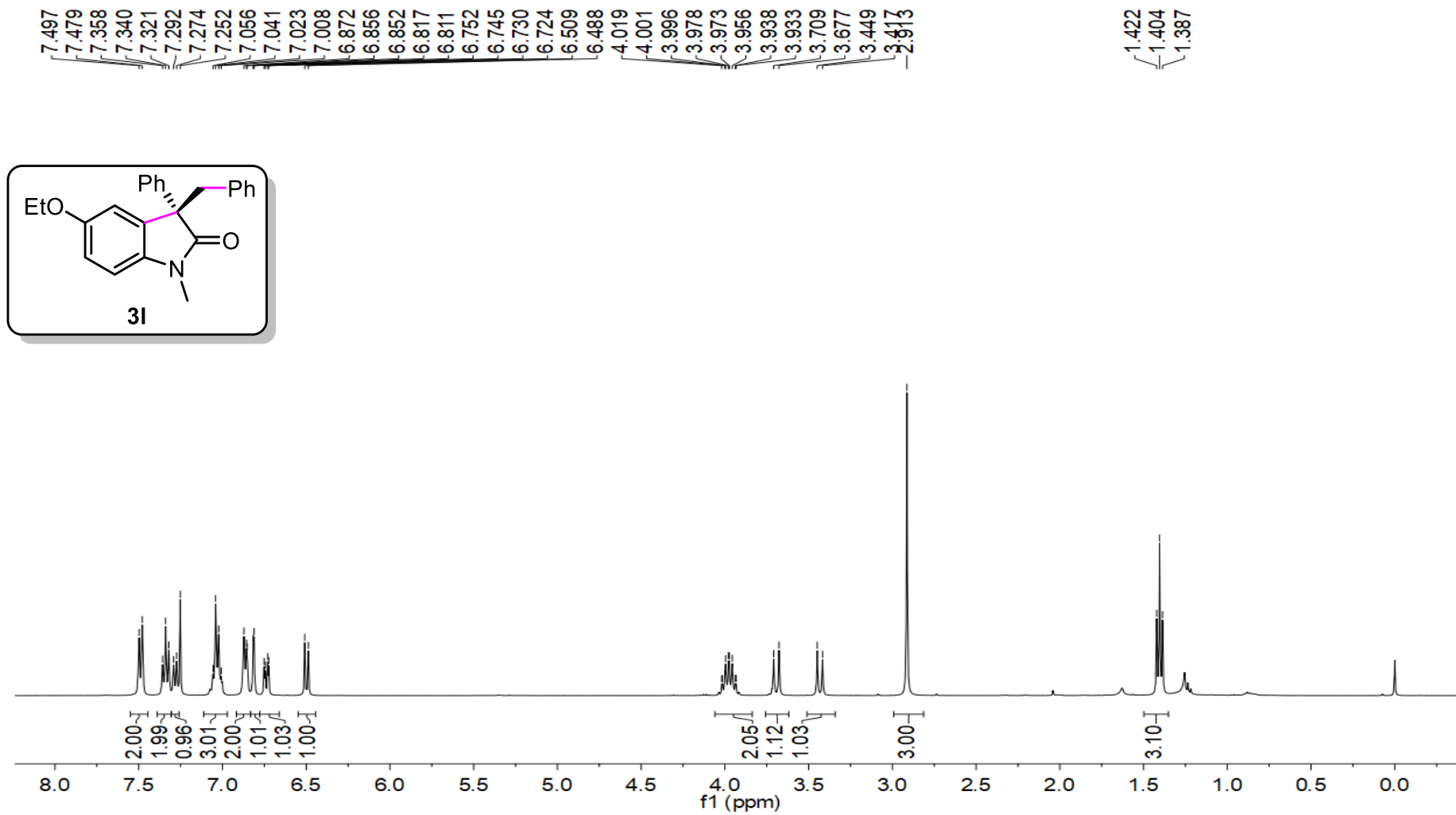
3.874
3.817
3.637
3.605
3.484
3.452
-2.958



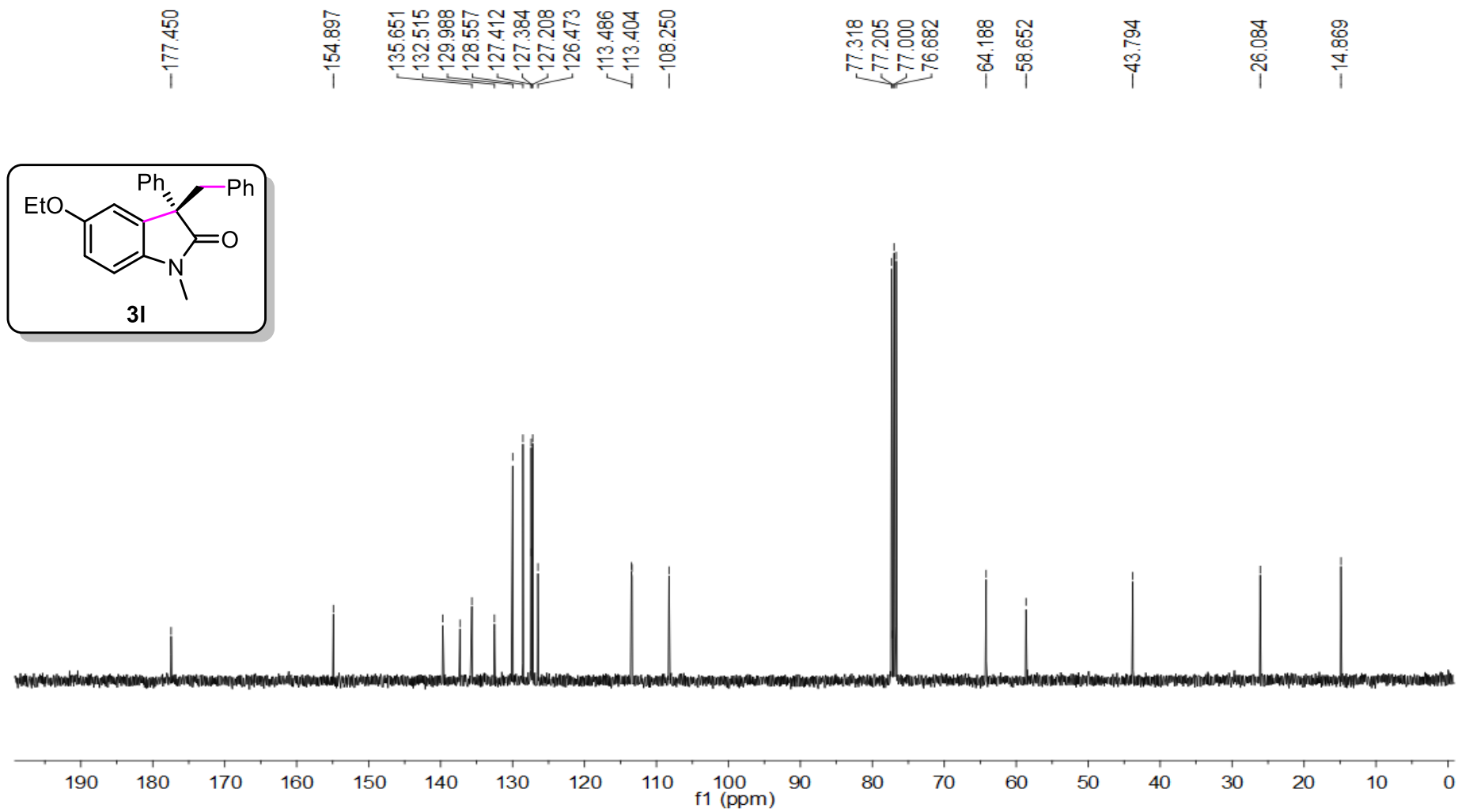
^{13}C NMR (101 MHz, CDCl_3) of compound **3k**



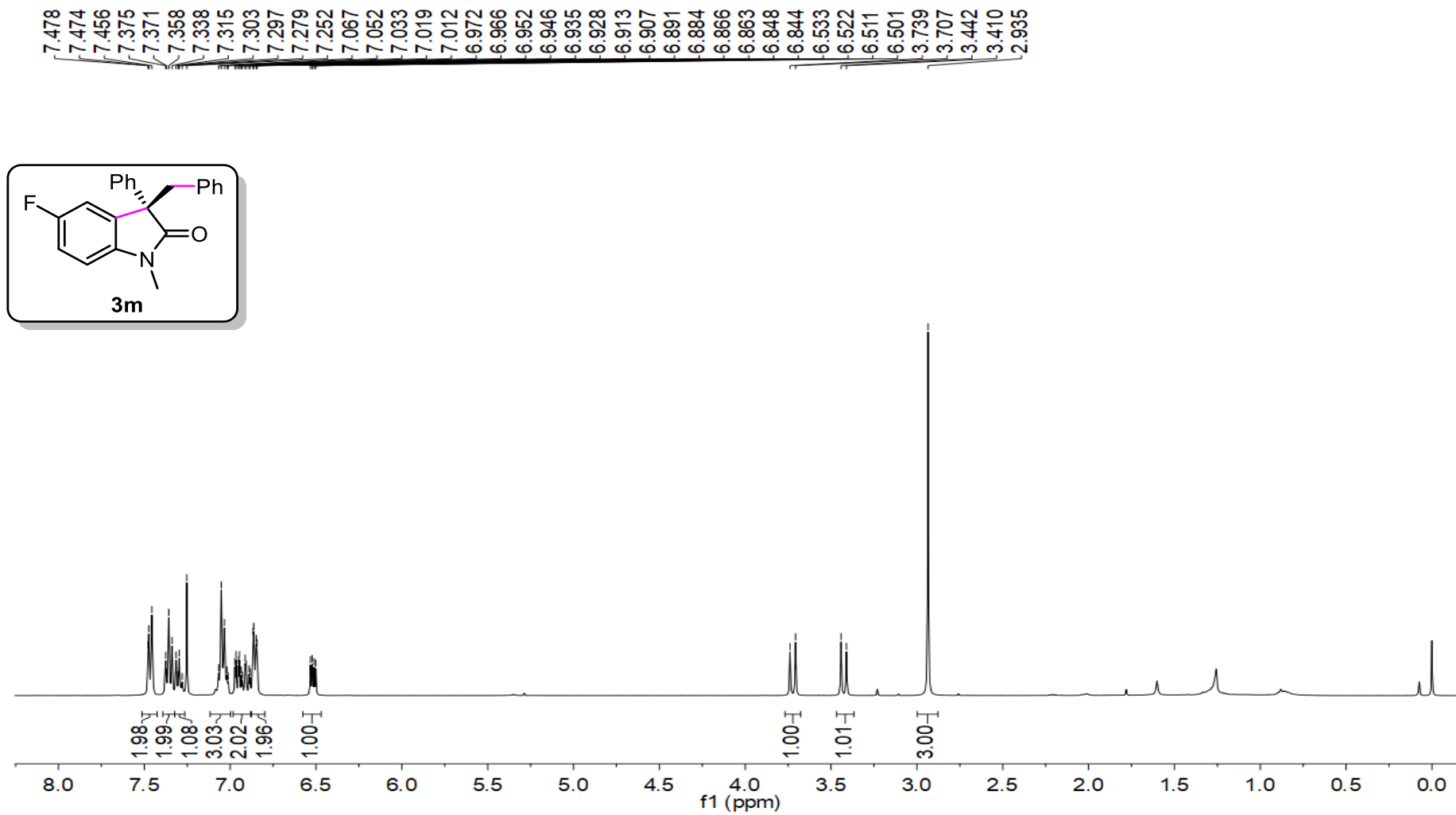
^1H NMR (400 MHz, CDCl_3) of compound **31**



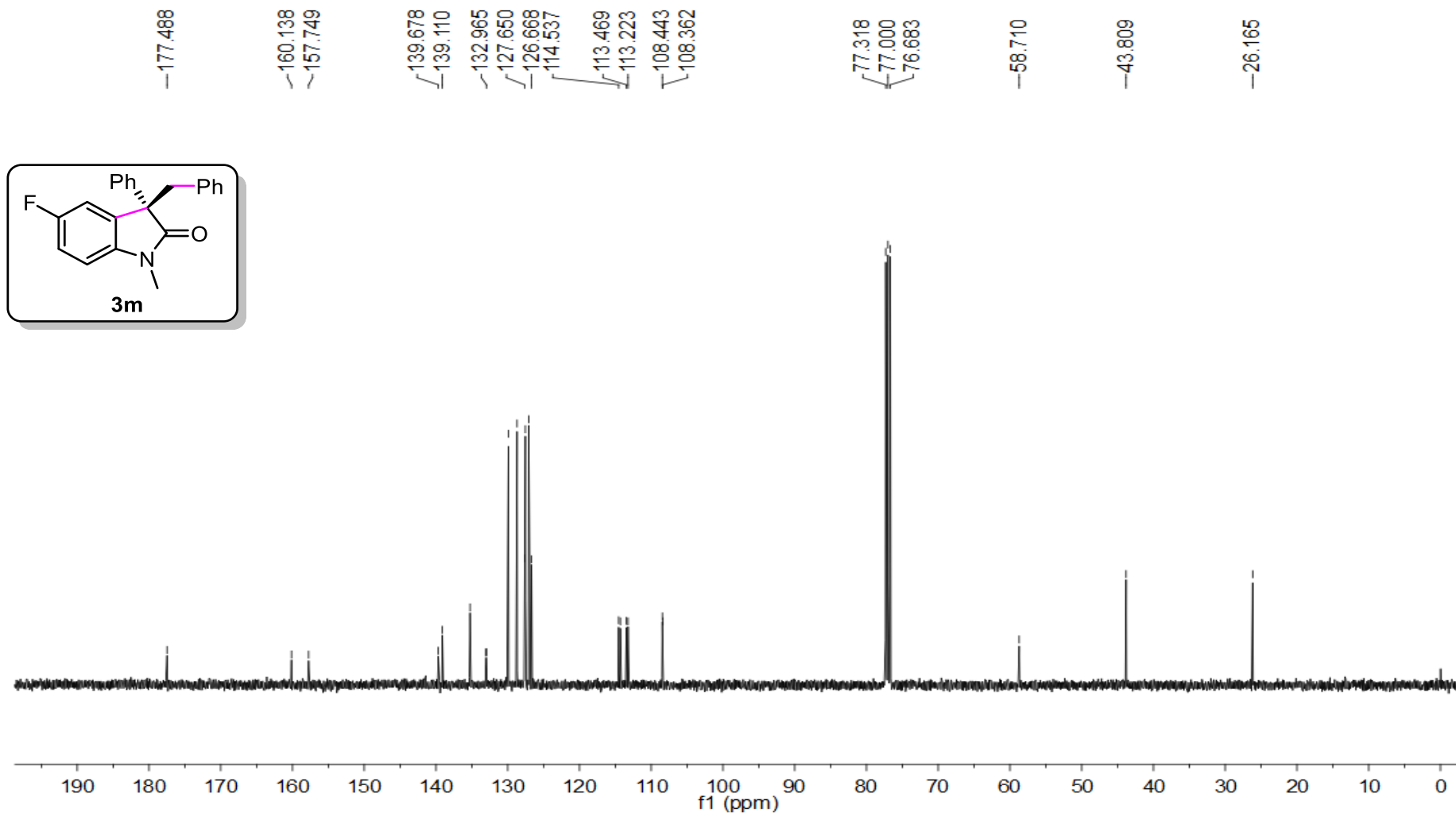
^{13}C NMR (101 MHz, CDCl_3) of compound **3l**



^1H NMR (400 MHz, CDCl_3) of compound **3m**

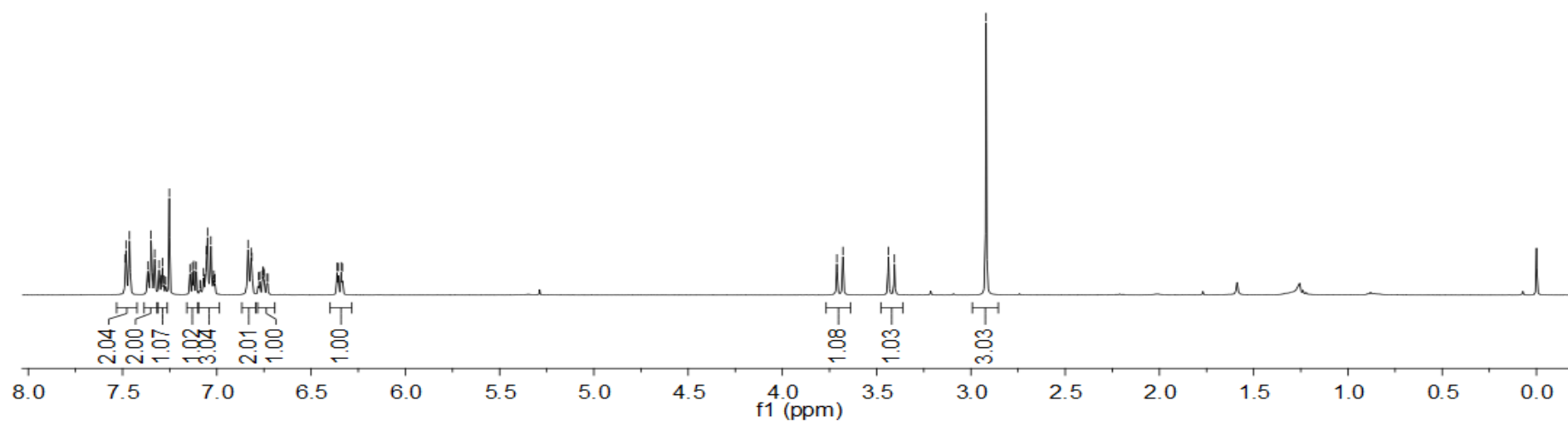
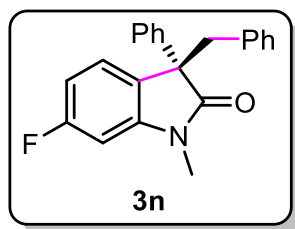


^{13}C NMR (101 MHz, CDCl_3) of compound **3m**

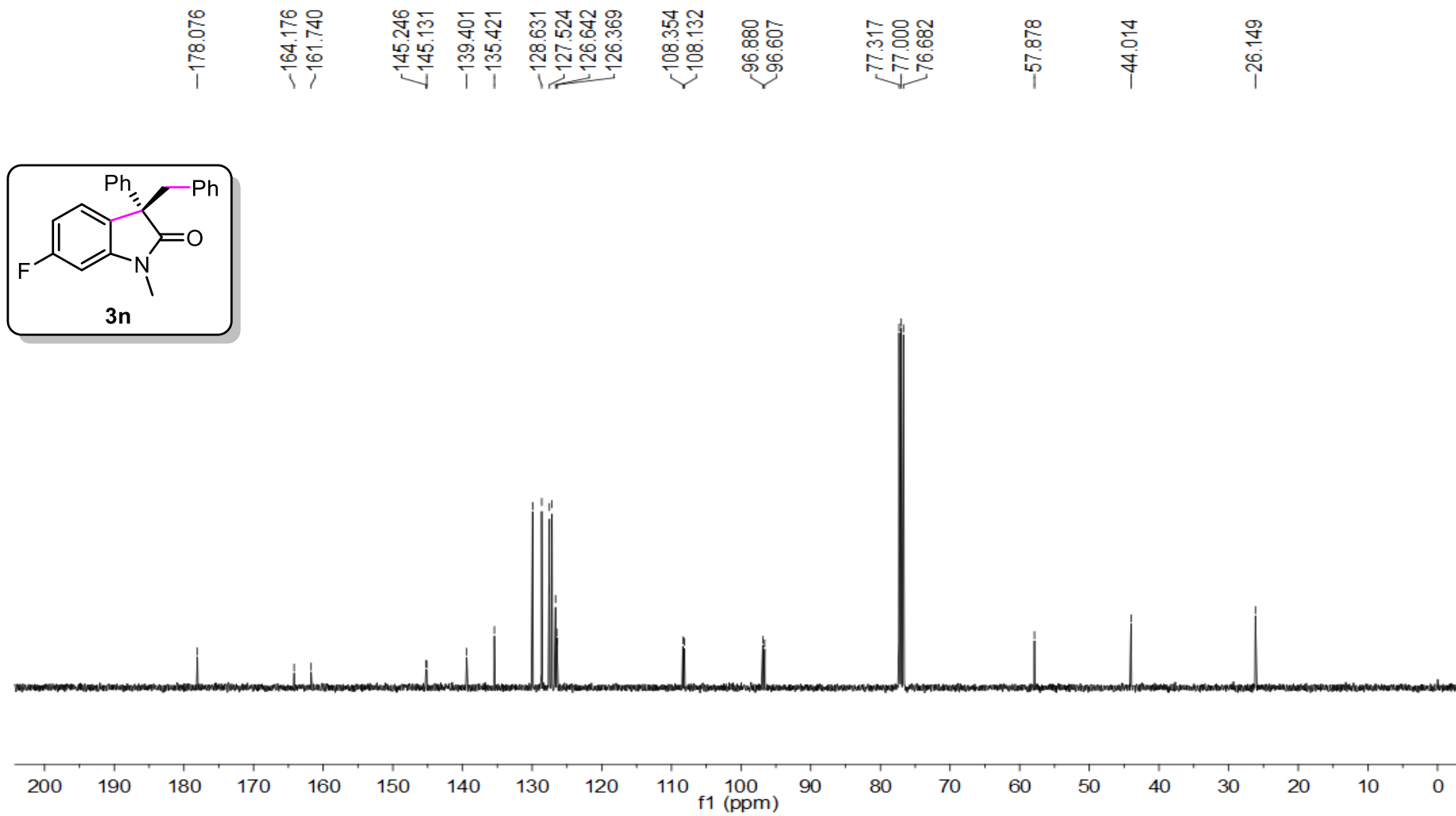


^1H NMR (400 MHz, CDCl_3) of compound **3n**

7.349
7.294
7.270
7.129
7.089
7.063
7.031
7.009
6.735
6.362
6.357
6.340
6.334
3.711
3.679
3.438
3.406
2.920



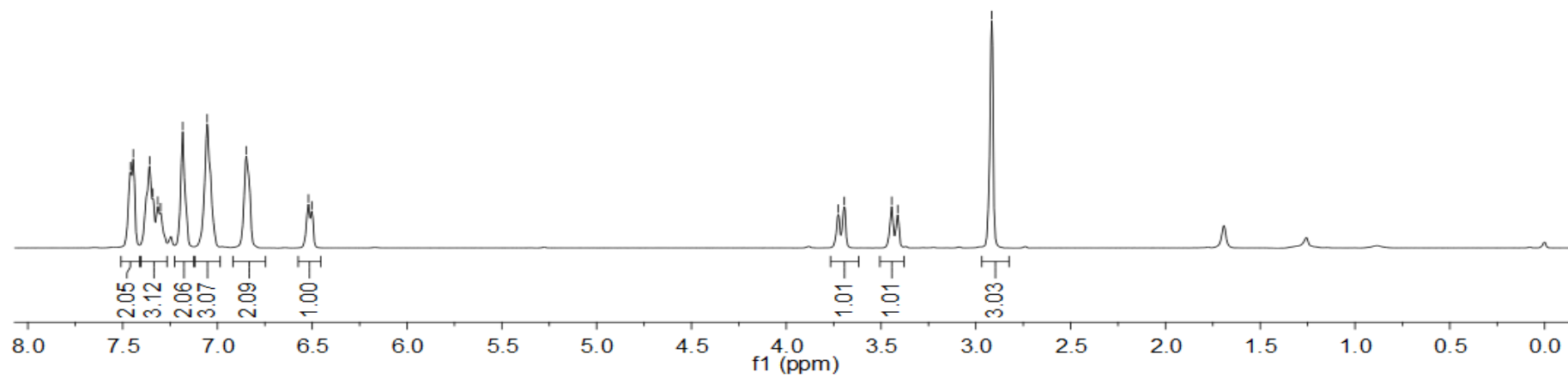
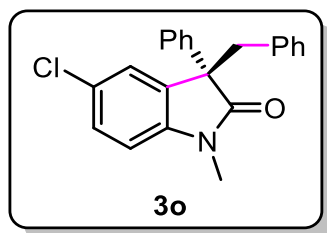
^{13}C NMR (101 MHz, CDCl_3) of compound **3n**



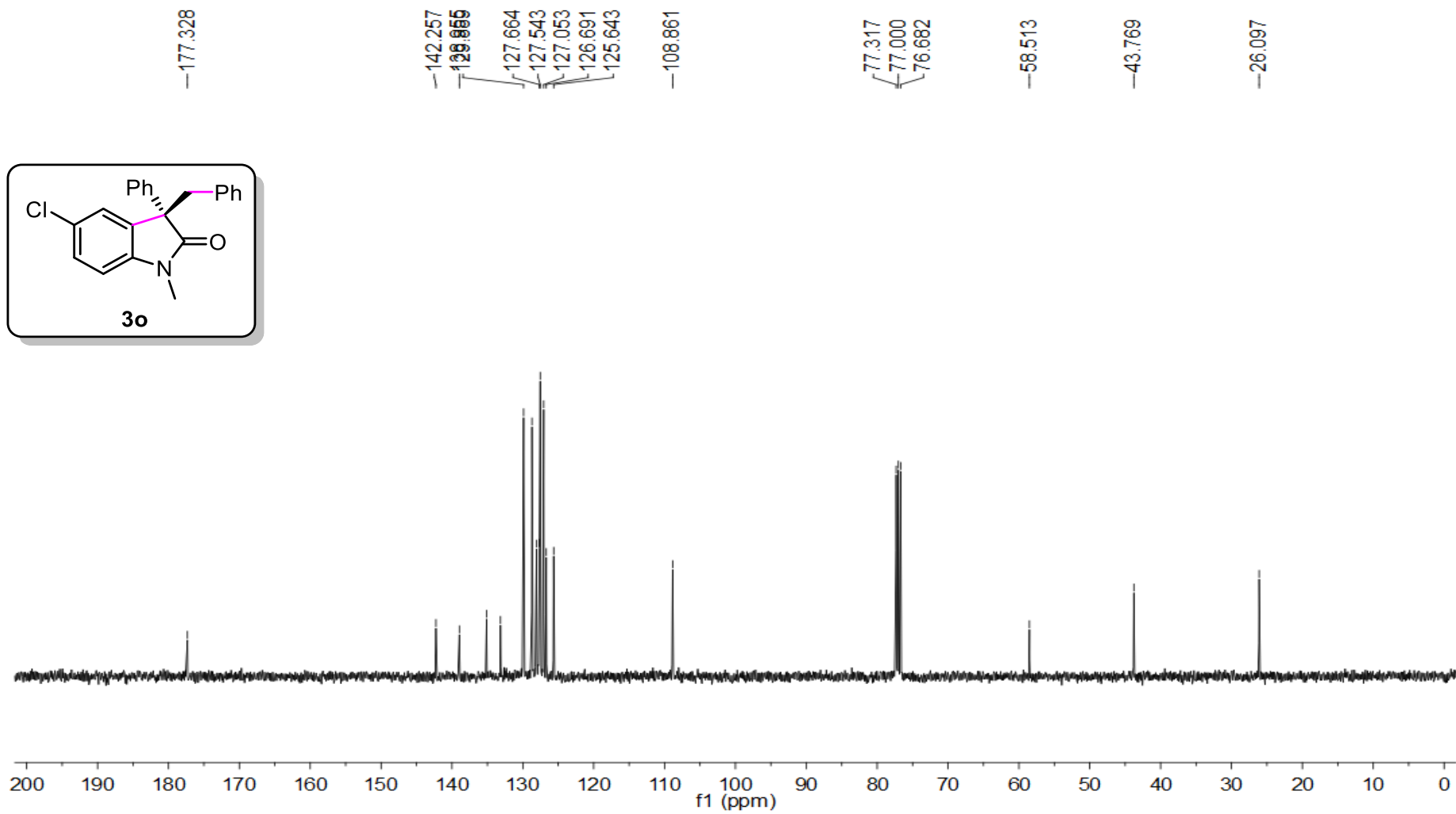
^1H NMR (400 MHz, CDCl_3) of compound **3o**

7.459
7.444
7.358
7.340
7.315
7.300
7.183
7.054
6.848
6.520
6.502

3.725
3.693
3.443
3.412
2.916



^{13}C NMR (101 MHz, CDCl_3) of compound **3o**

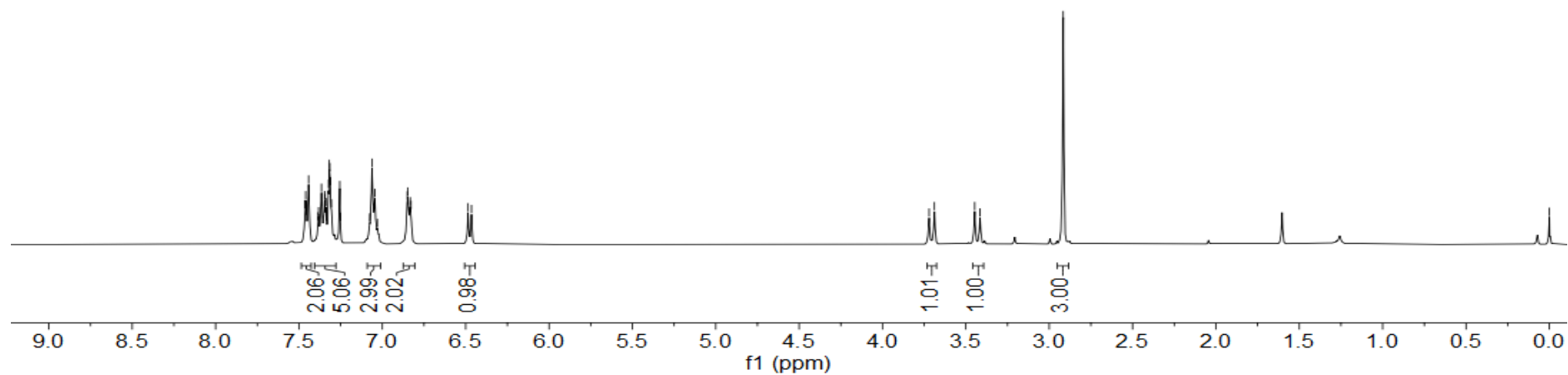
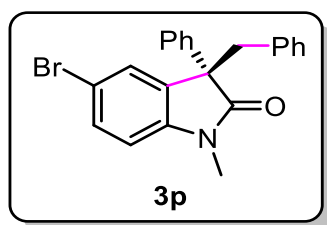


¹H NMR (400 MHz, CDCl₃) of compound **3p**

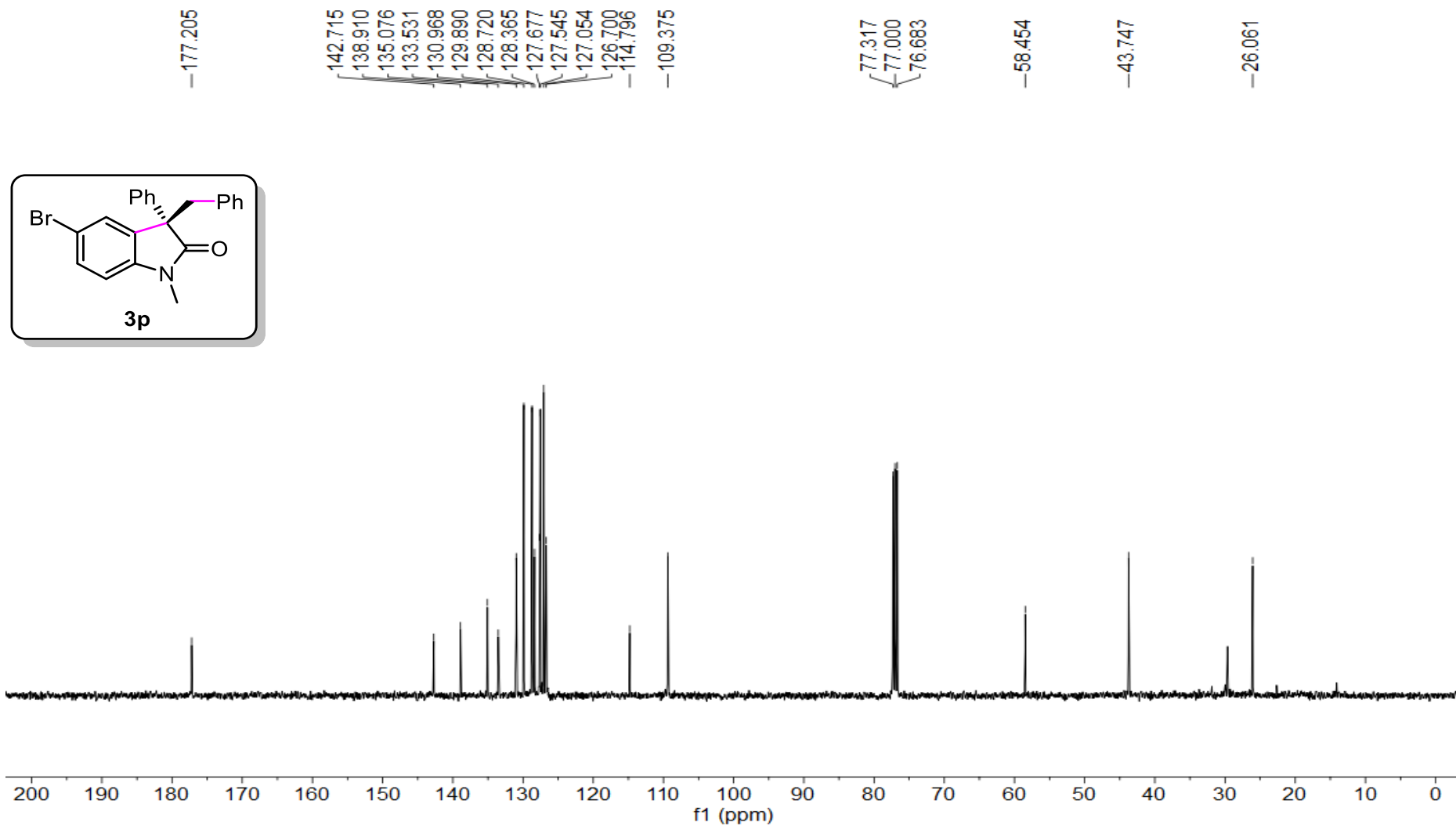
7.463
7.460
7.456
7.442
7.385
7.383
7.378
7.365
7.361
7.346
7.343
7.338
7.334
7.322
7.318
7.315
7.311
7.306
7.255
7.252
7.075
7.062
7.045
7.030
6.850
6.847
6.833
6.828
6.485
6.465

3.720
3.688
3.447
3.415
-2.916

-0.000



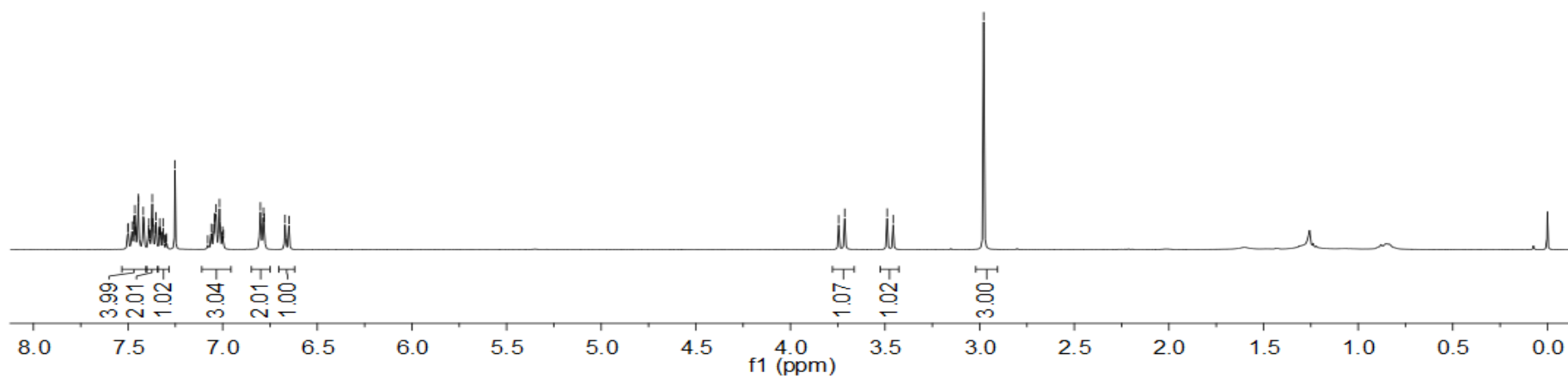
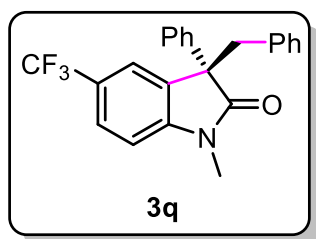
^{13}C NMR (101 MHz, CDCl_3) of compound **3p**



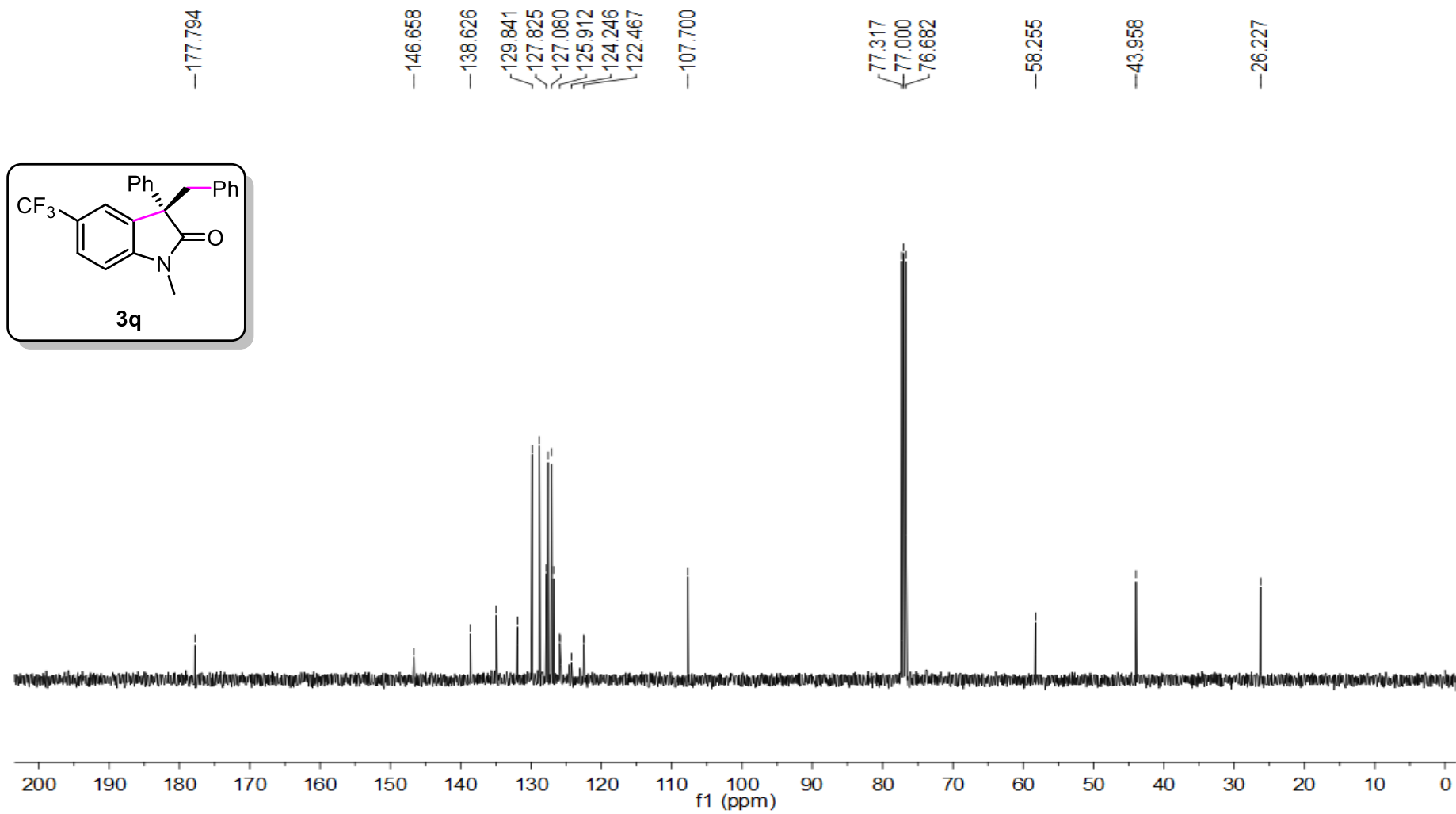
^1H NMR (400 MHz, CDCl_3) of compound **3q**

7.447
7.393
7.372
7.353
7.329
7.308
7.252
-6.995
-6.801
-6.784
-6.780
-6.670
-6.650

3.745
3.713
3.489
3.457
-2.979



^{13}C NMR (101 MHz, CDCl_3) of compound **3q**



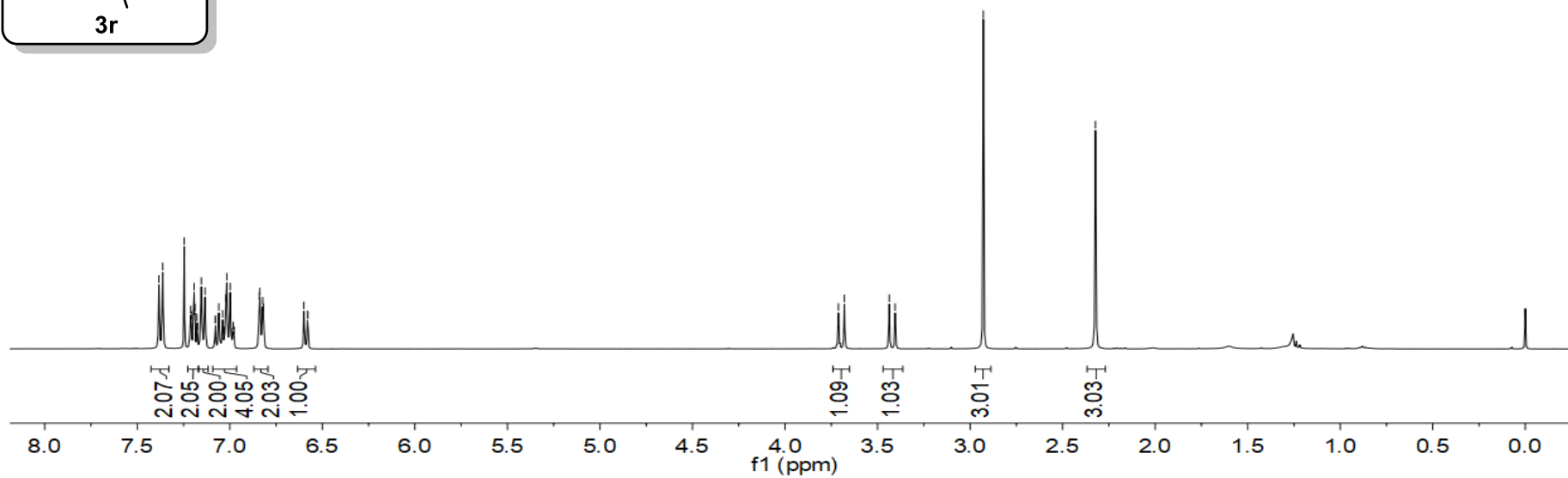
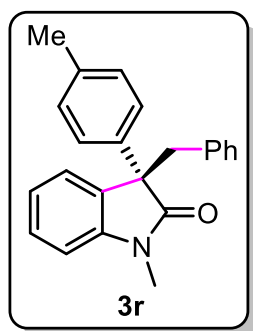
^1H NMR (400 MHz, CDCl_3) of compound **3r**

7.383
7.362
7.246
7.211
7.208
7.193
7.189
7.178
7.175
7.154
7.134
7.079
7.077
7.060
7.039
7.030
7.021
7.017
6.998
6.987
6.982
6.976
6.841
6.838
6.822
6.818
6.600
6.581
6.578

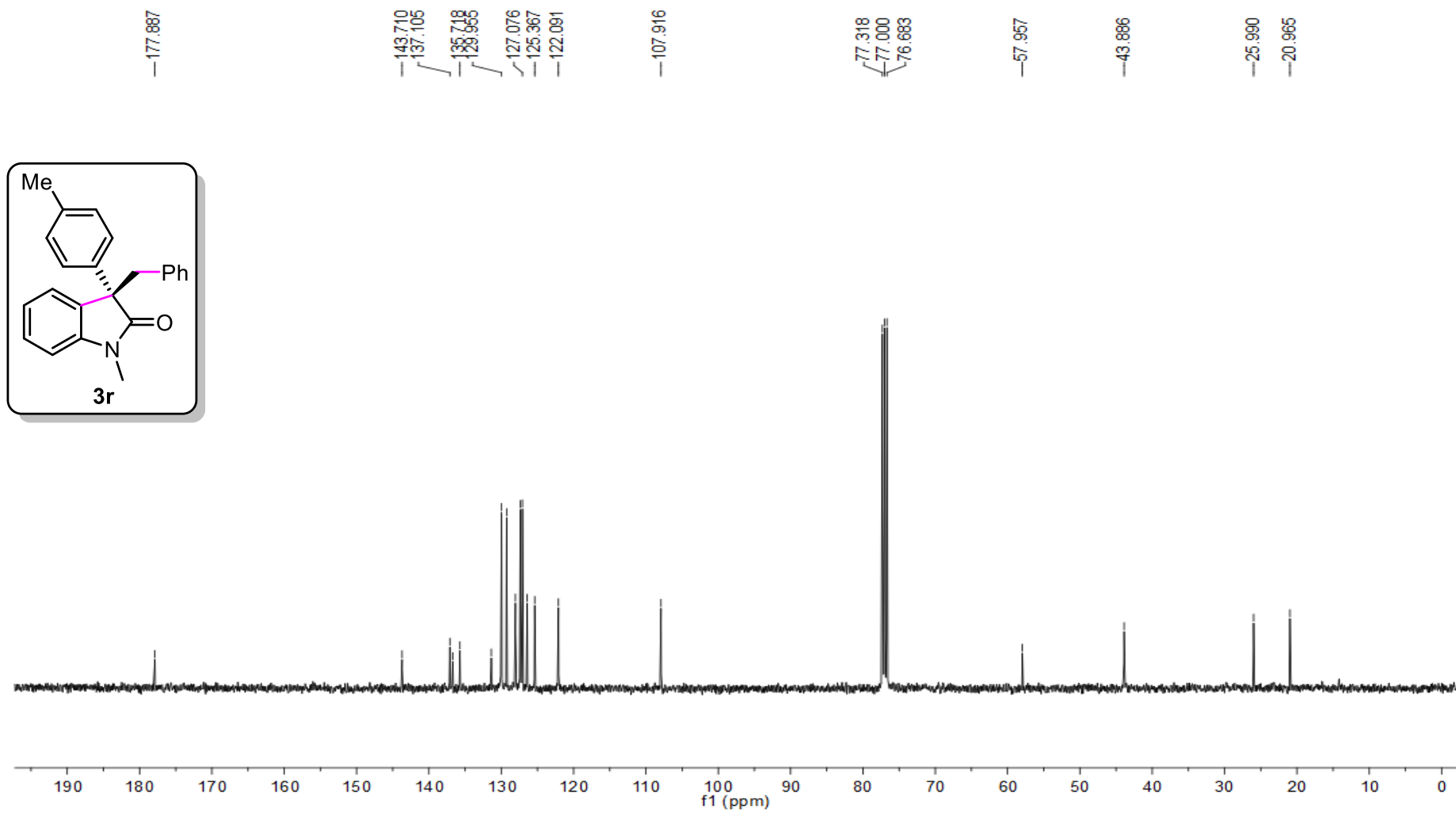
3.711
3.680
3.437
3.405

-2.929

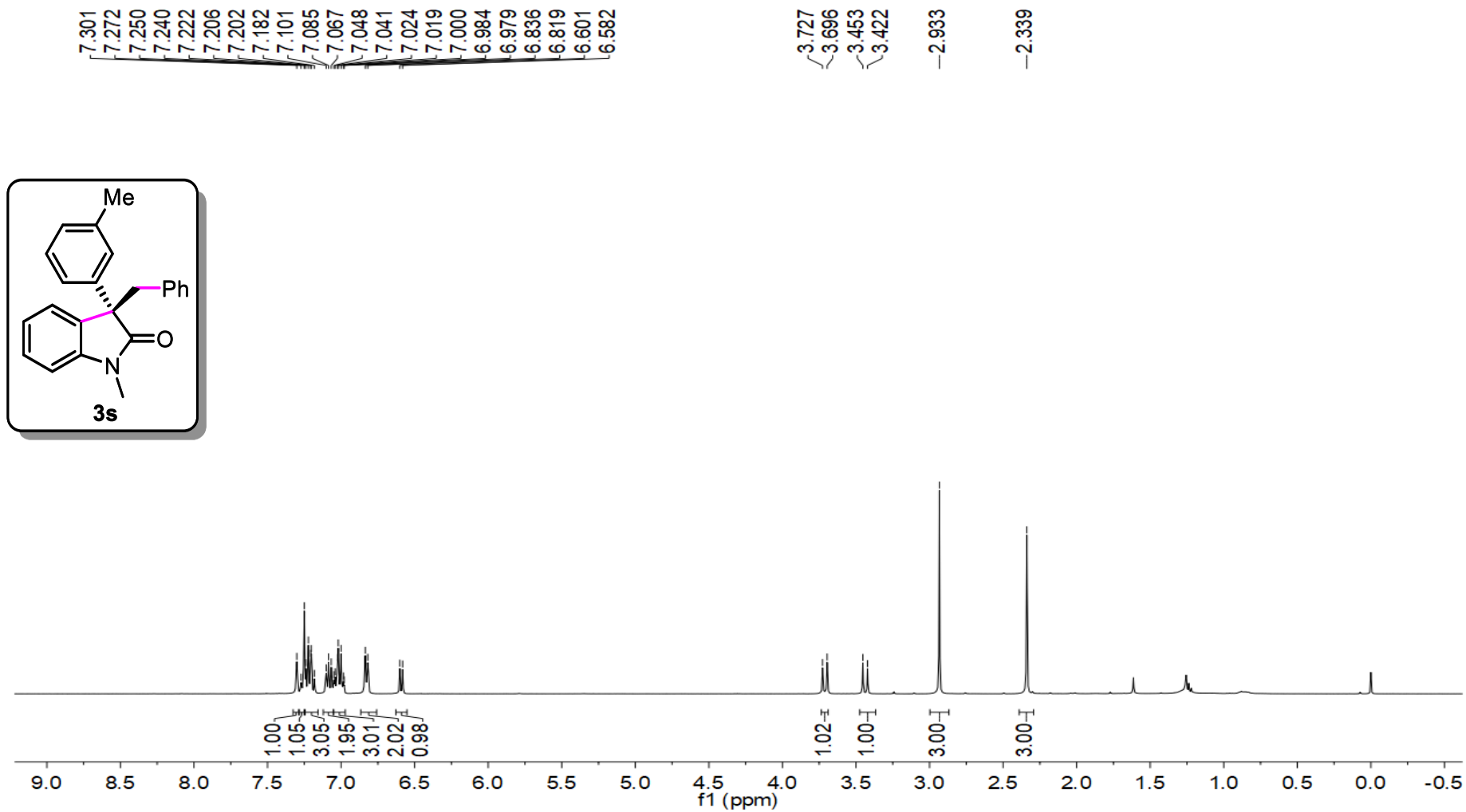
-2.323



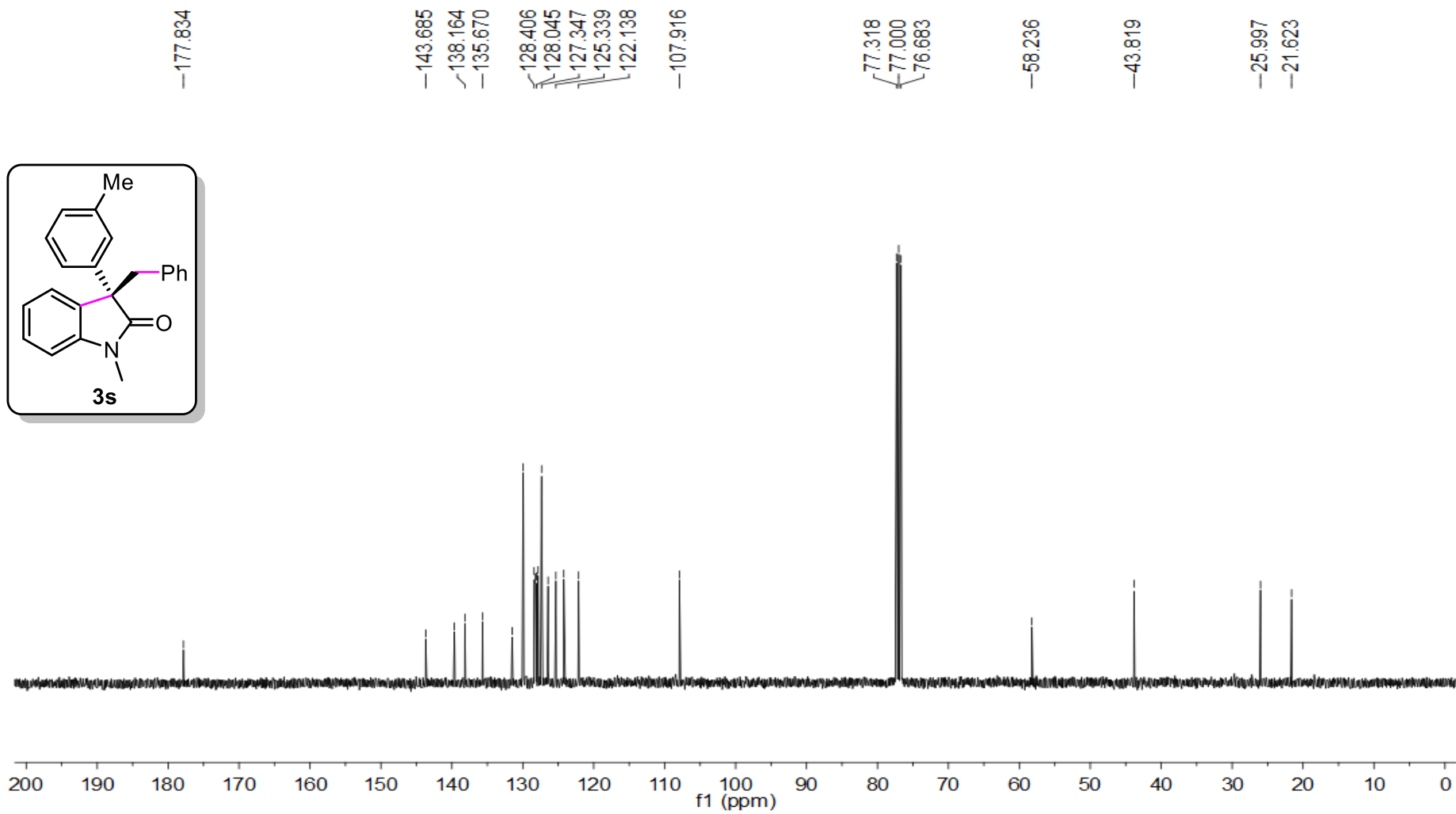
^{13}C NMR (101 MHz, CDCl_3) of compound **3r**



^1H NMR (400 MHz, CDCl_3) of compound **3s**



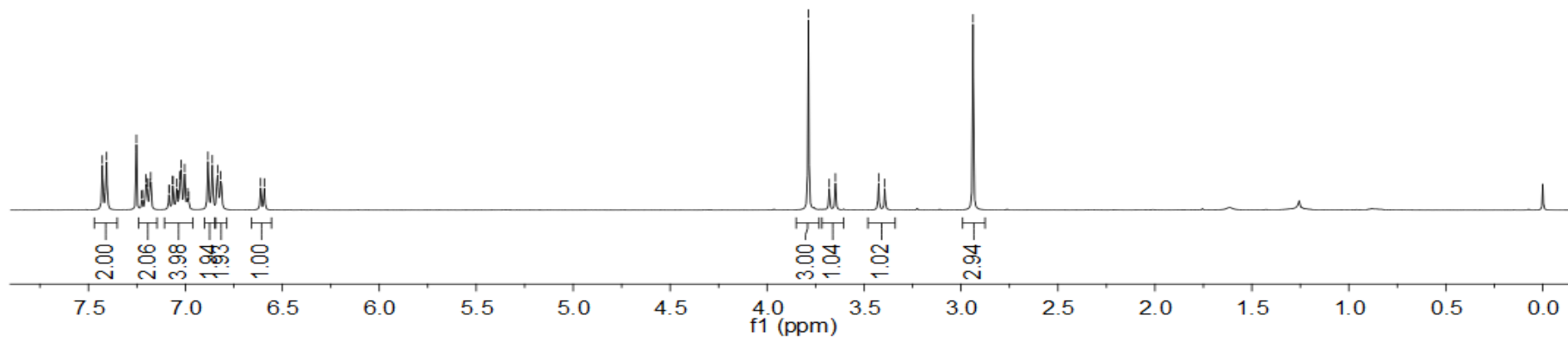
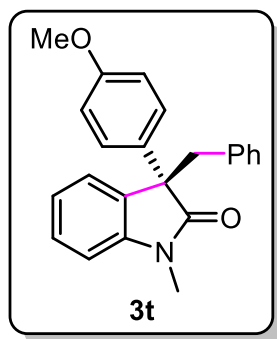
^{13}C NMR (101 MHz, CDCl_3) of compound **3s**



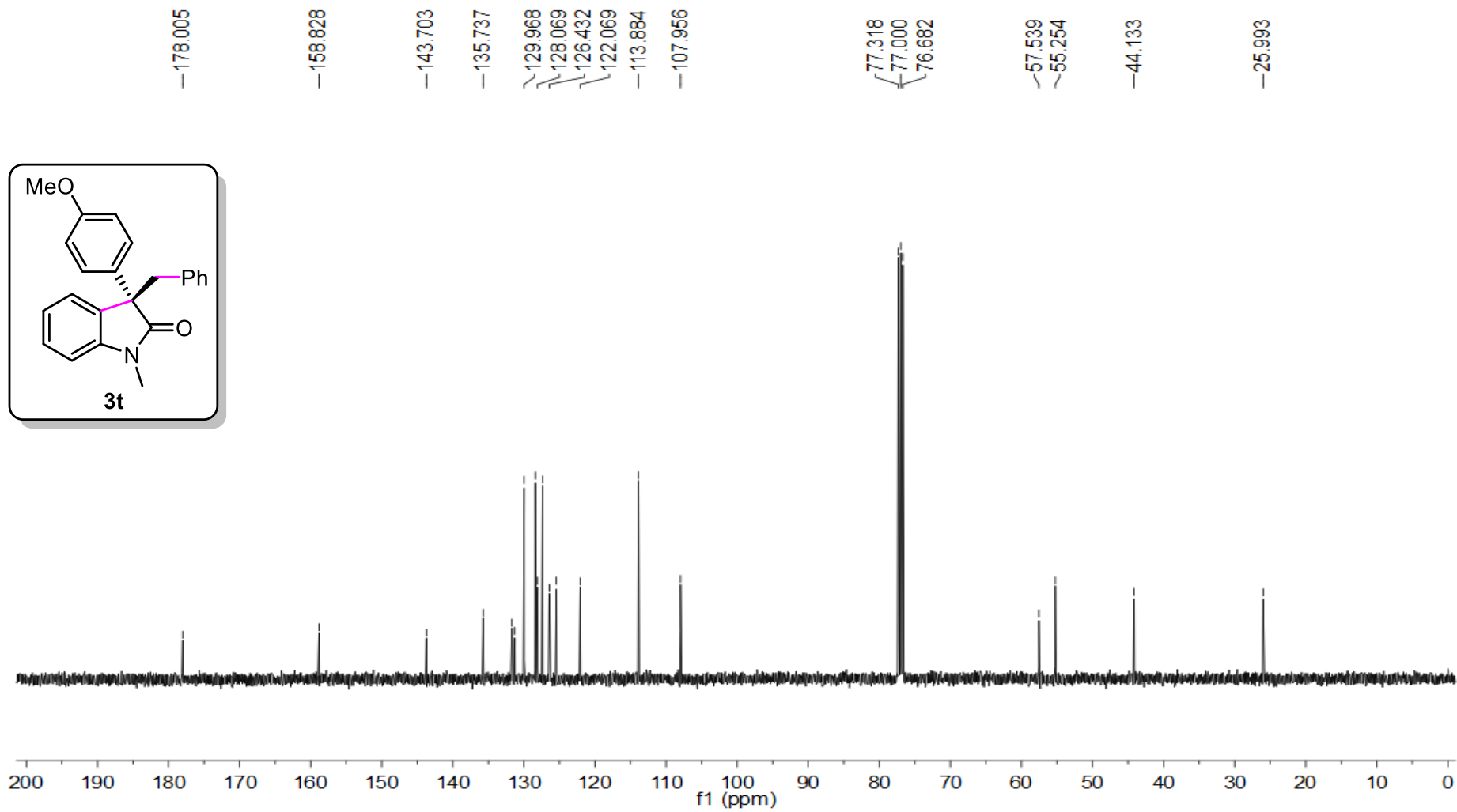
^1H NMR (400 MHz, CDCl_3) of compound **3t**

7.428
7.402
7.045
6.988
6.817
6.612
6.593

3.787
3.680
3.648
3.425
3.393
-2.938



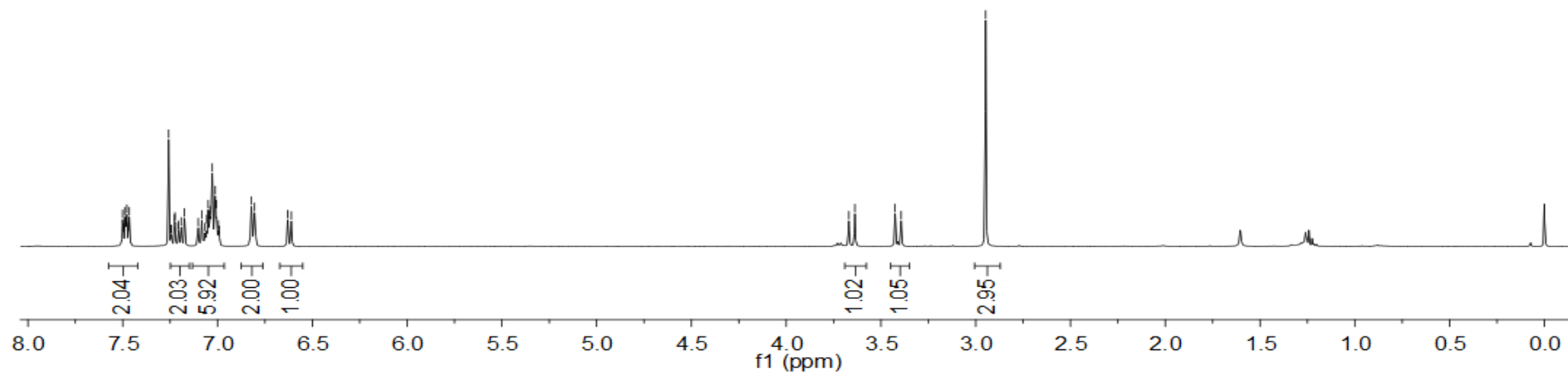
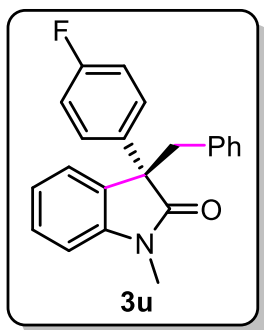
^{13}C NMR (101 MHz, CDCl_3) of compound **3t**



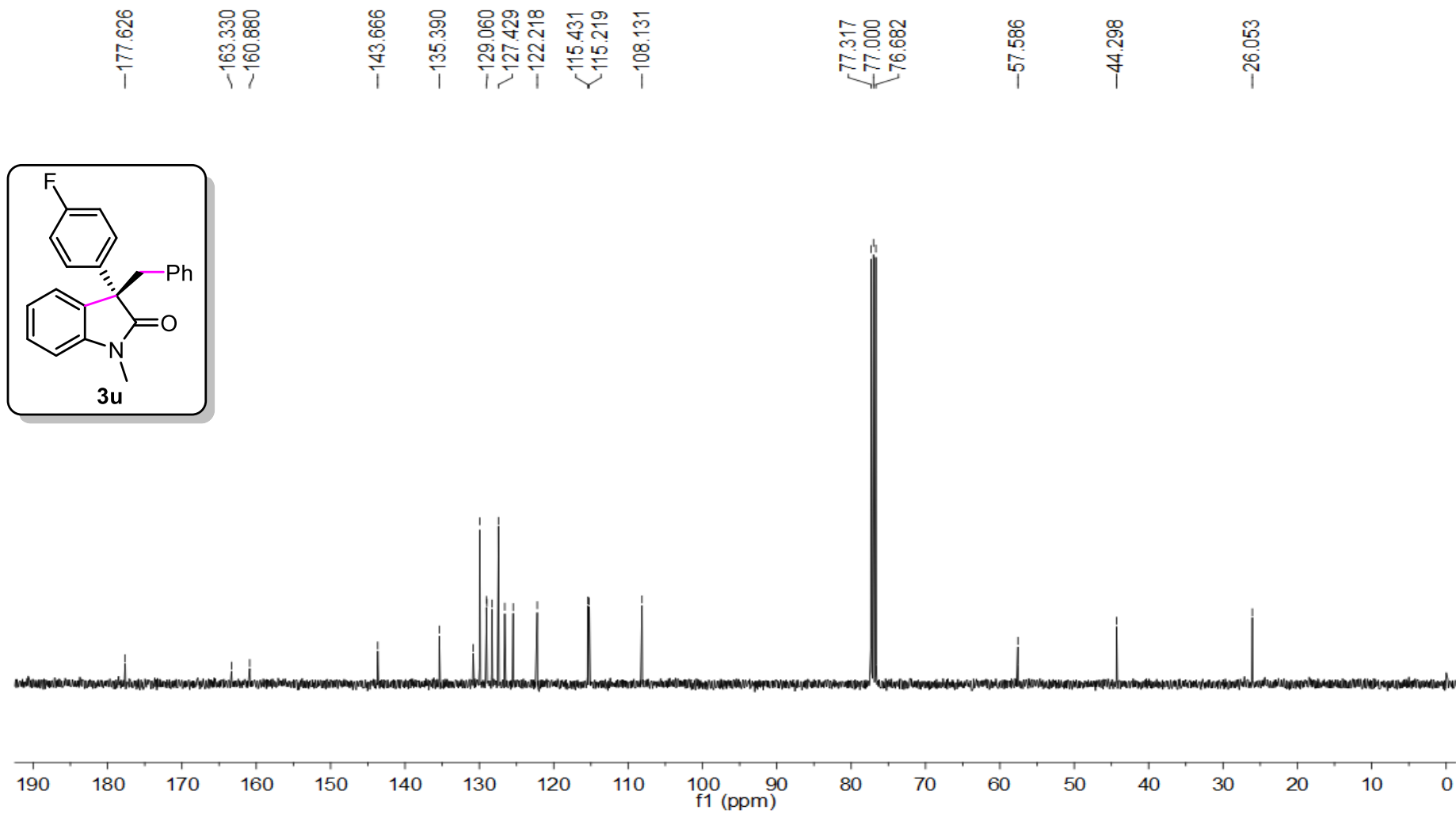
^1H NMR (400 MHz, CDCl_3) of compound **3u**

7.488
7.483
7.479
7.471
7.466
7.258
6.991
6.805
6.630
6.611

3.669
3.637
3.425
3.393
2.948



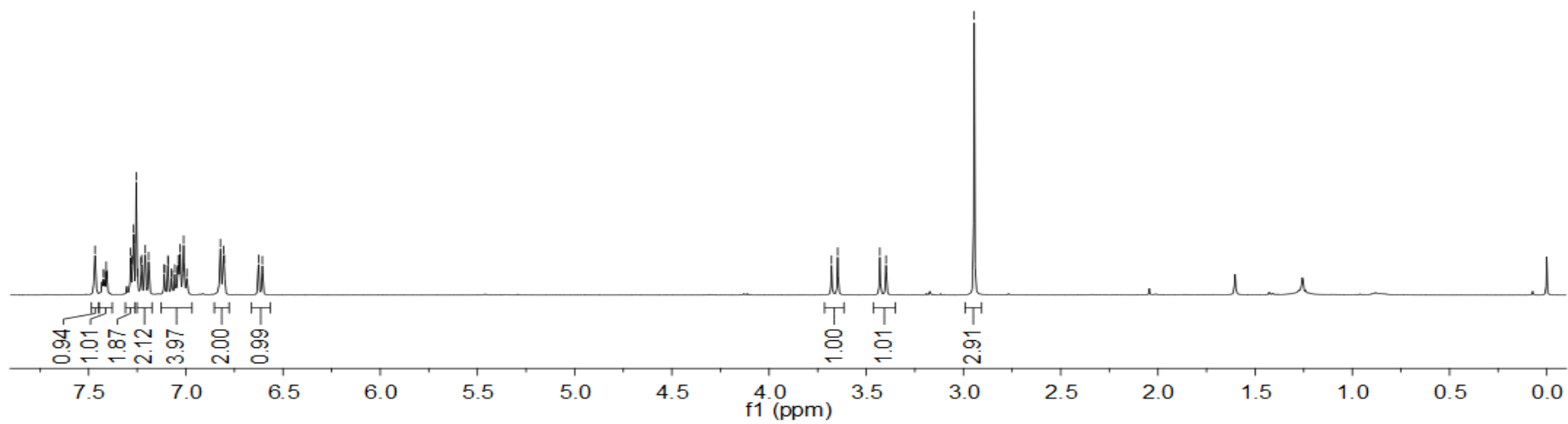
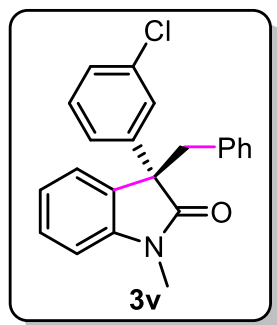
^{13}C NMR (101 MHz, CDCl_3) of compound **3u**



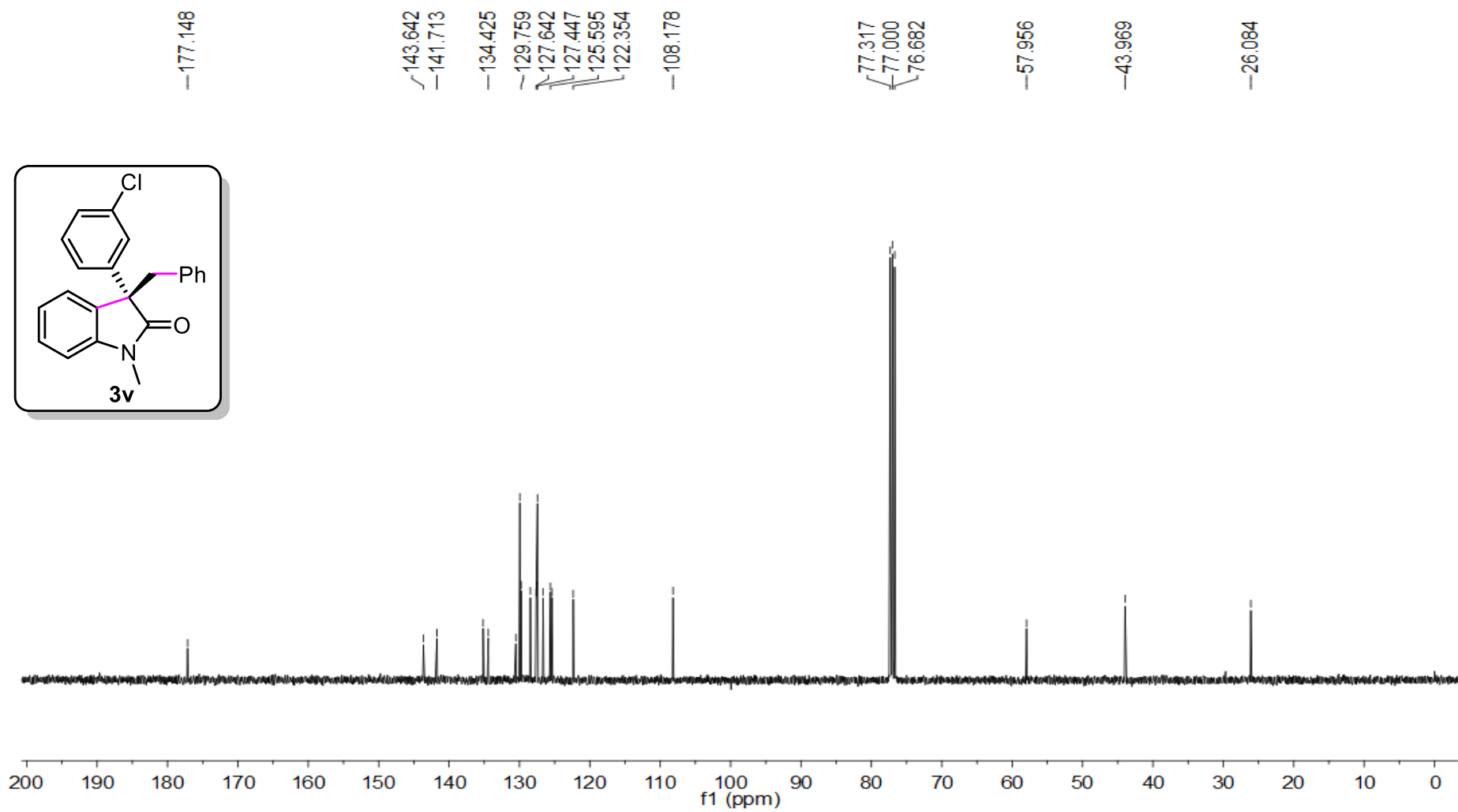
^1H NMR (400 MHz, CDCl_3) of compound **3v**

7.409
7.269
7.230
7.111
7.074
7.039
6.995
6.802
6.626
6.606

3.679
3.647
3.430
3.399
2.945



^{13}C NMR (101 MHz, CDCl_3) of compound **3v**

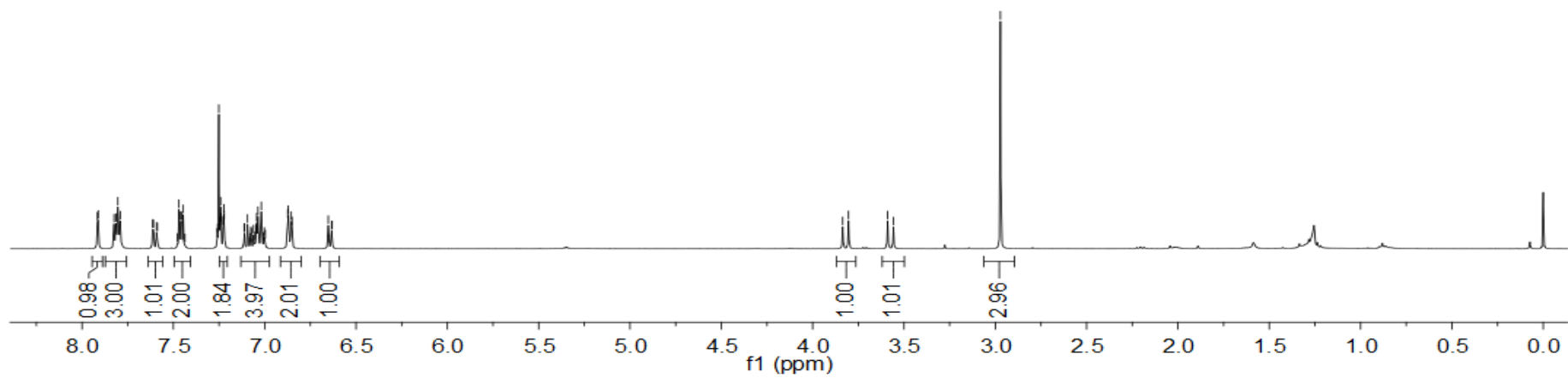
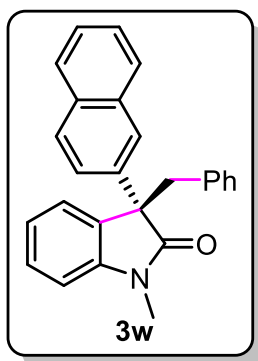


^1H NMR (400 MHz, CDCl_3) of compound **3w**

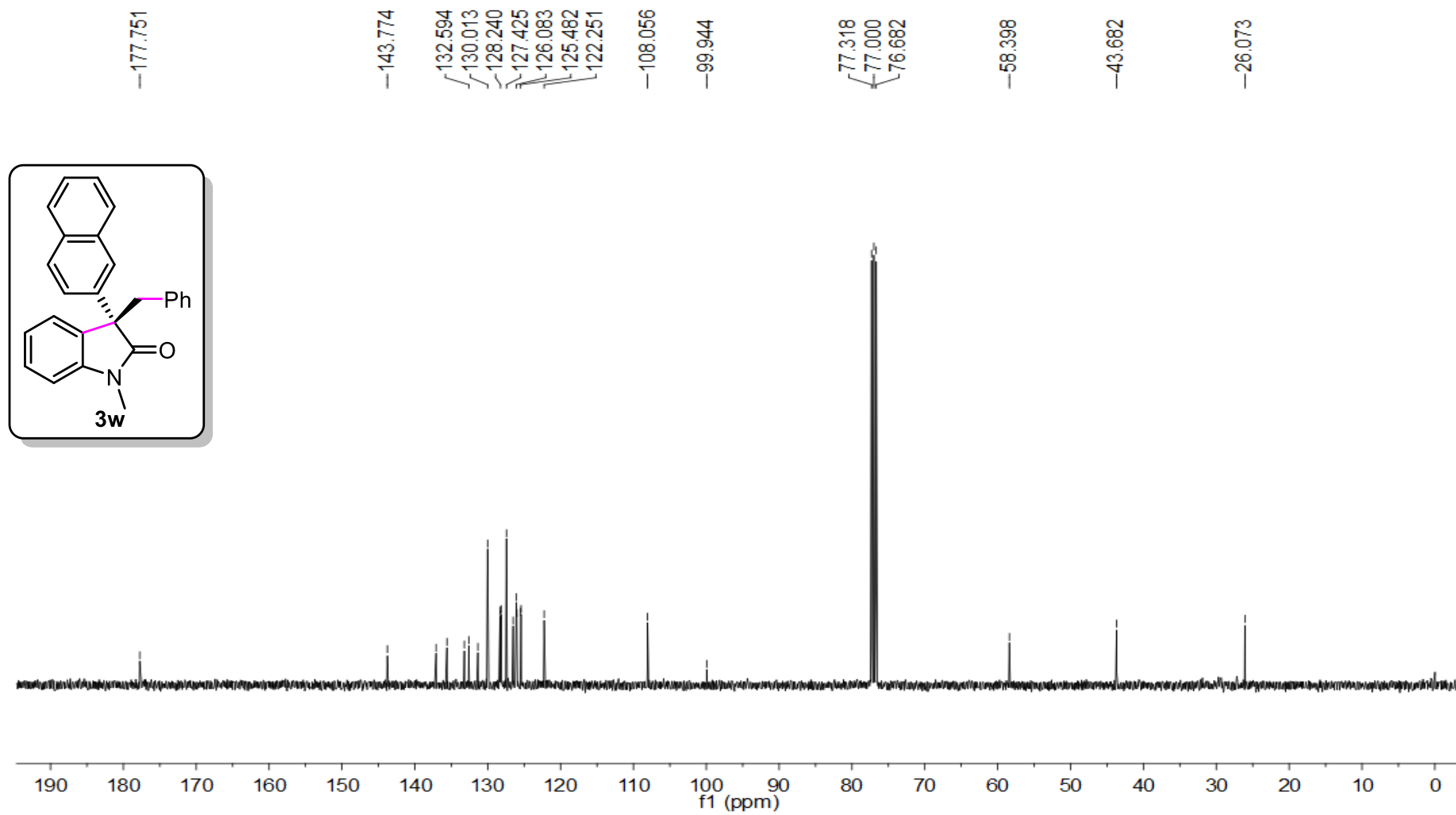
7.911
7.825
7.815
7.804
7.791
7.478
7.436
7.113
7.044
6.850
6.652
6.646
6.633
6.631

3.835
3.803
3.589
3.558

2.972



^{13}C NMR (101 MHz, CDCl_3) of compound **3w**

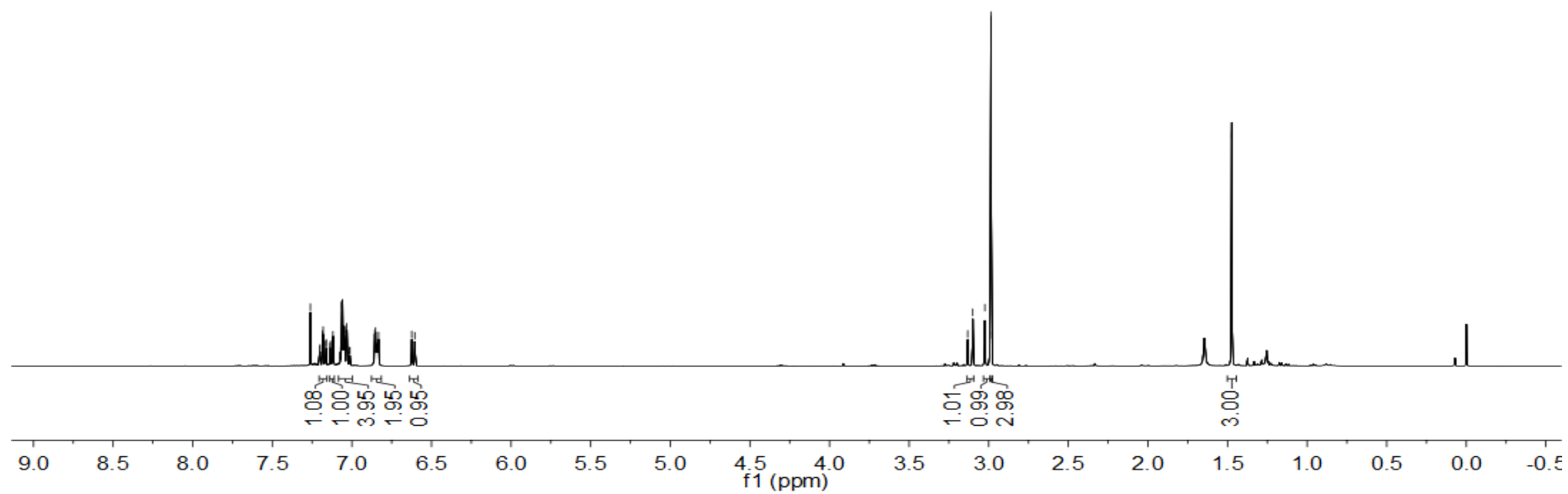
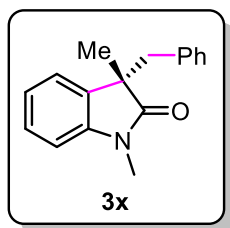


^1H NMR (400 MHz, CDCl_3) of compound **3x**

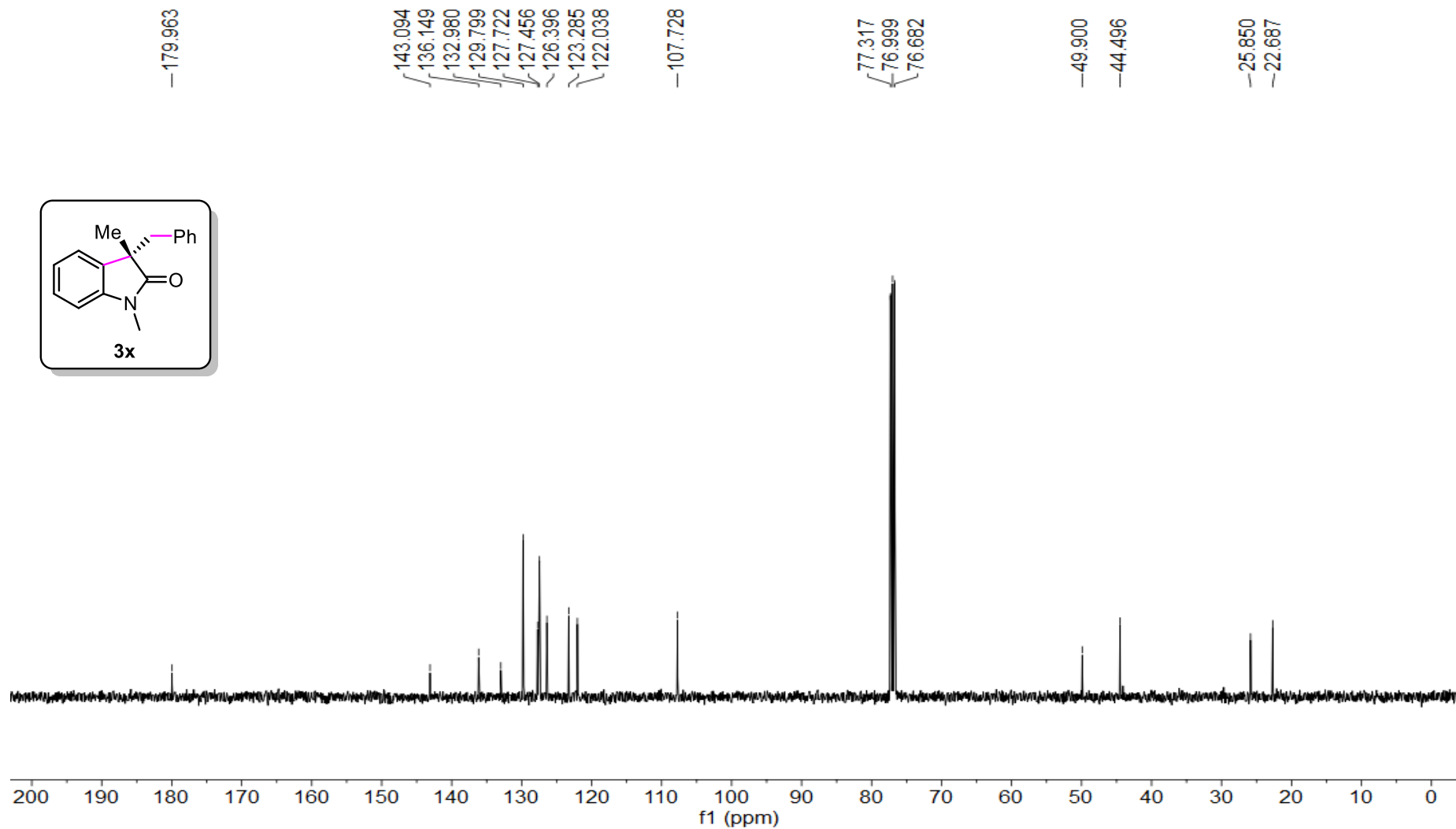
7.261
7.203
7.200
7.184
7.181
7.165
7.161
7.138
7.134
7.119
7.116
7.075
7.071
7.063
7.059
7.051
7.044
7.032
7.022
7.015
7.012
6.856
6.852
6.839
6.832
6.624
6.605

3.132
3.100
3.024
2.991
2.985

-1.474



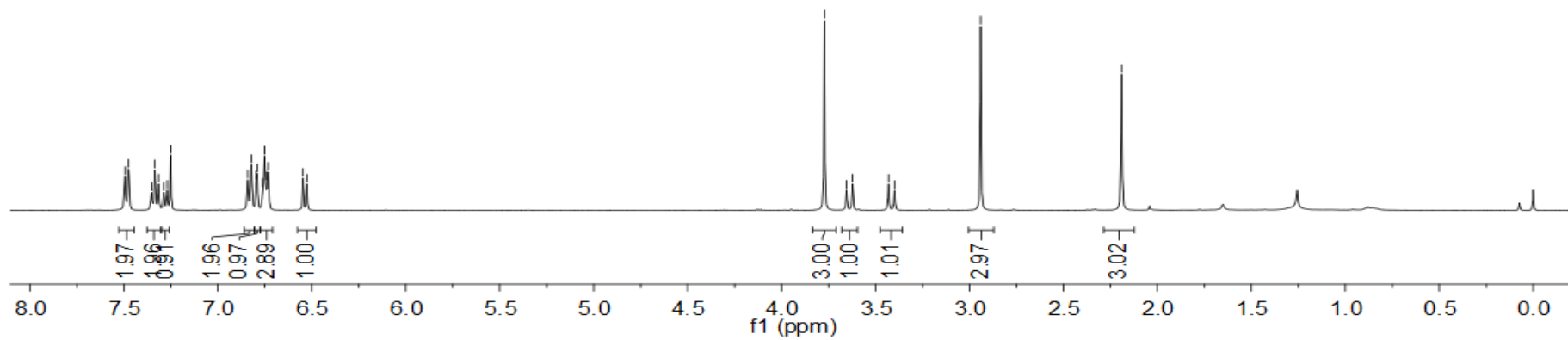
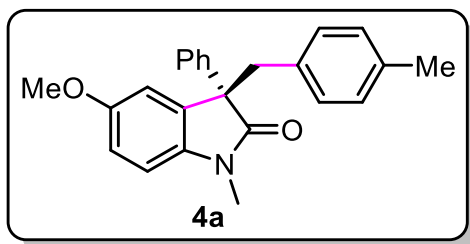
^{13}C NMR (101 MHz, CDCl_3) of compound **3x**



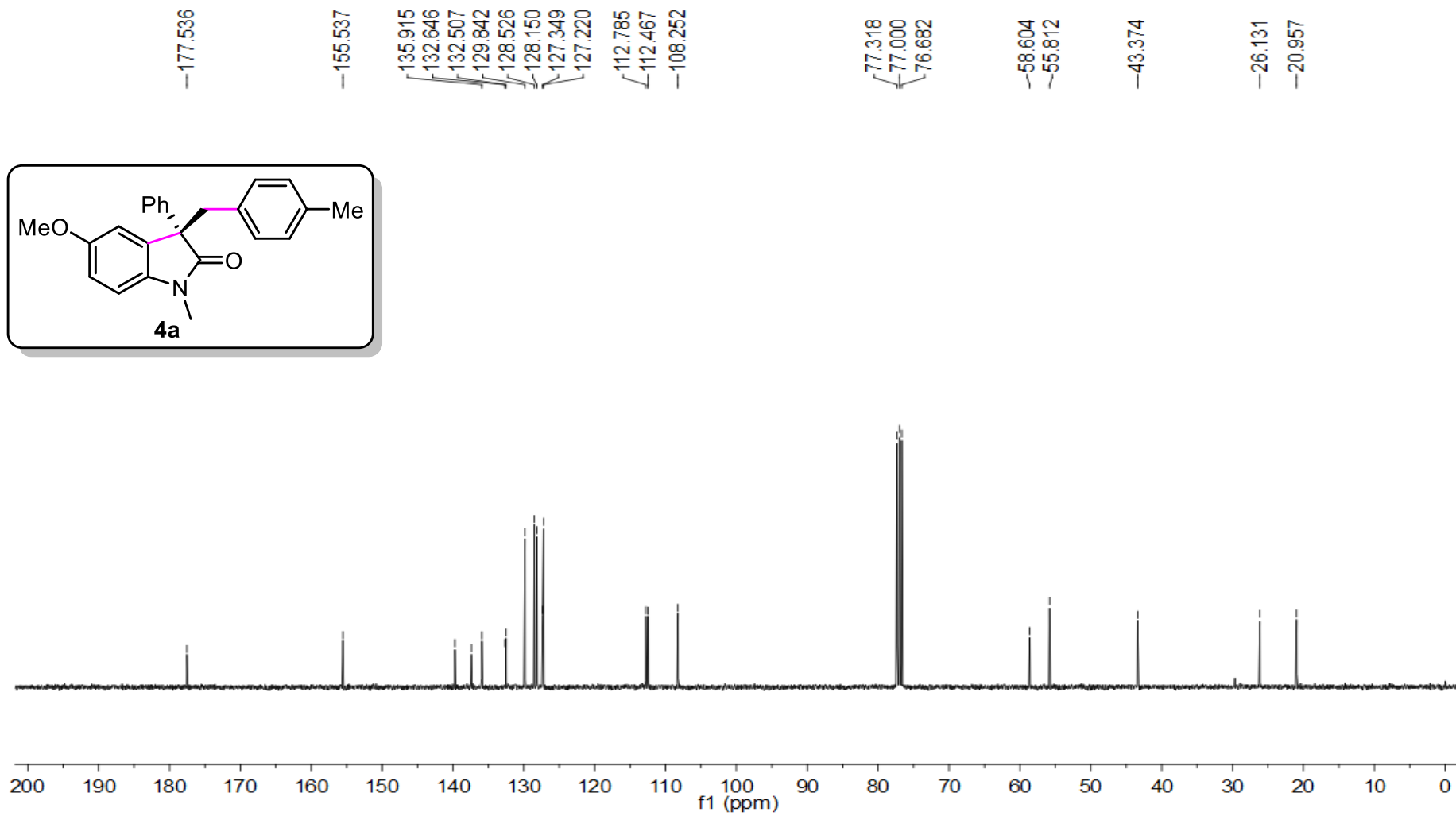
^1H NMR (400 MHz, CDCl_3) of compound **4a**

7.494
7.475
7.353
7.335
7.315
7.287
7.269
7.251
6.751
6.732
6.547
6.526

3.772
3.654
3.622
3.430
3.398
-2.940
-2.190



^{13}C NMR (101 MHz, CDCl_3) of compound **4a**

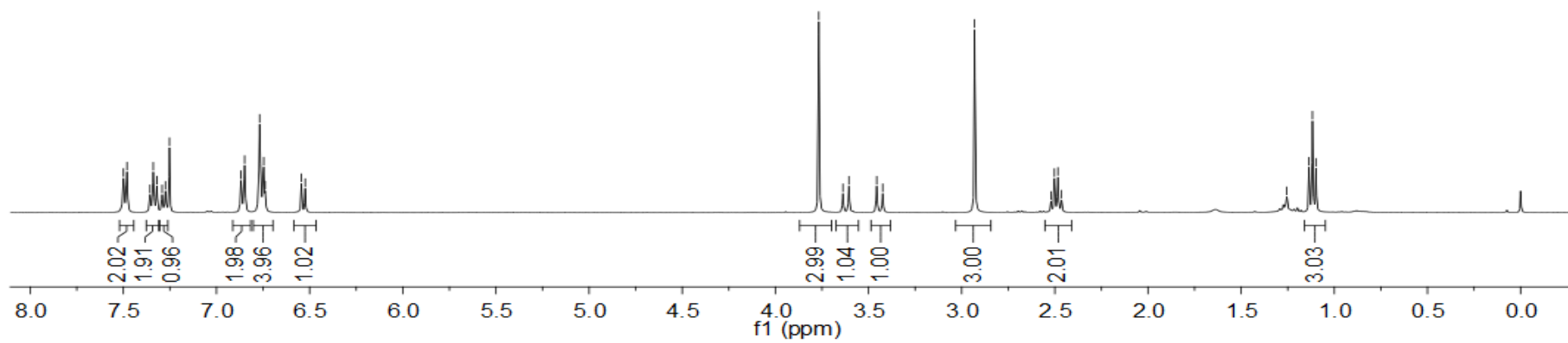
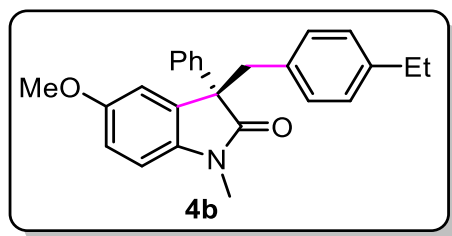


^1H NMR (400 MHz, CDCl_3) of compound **4b**

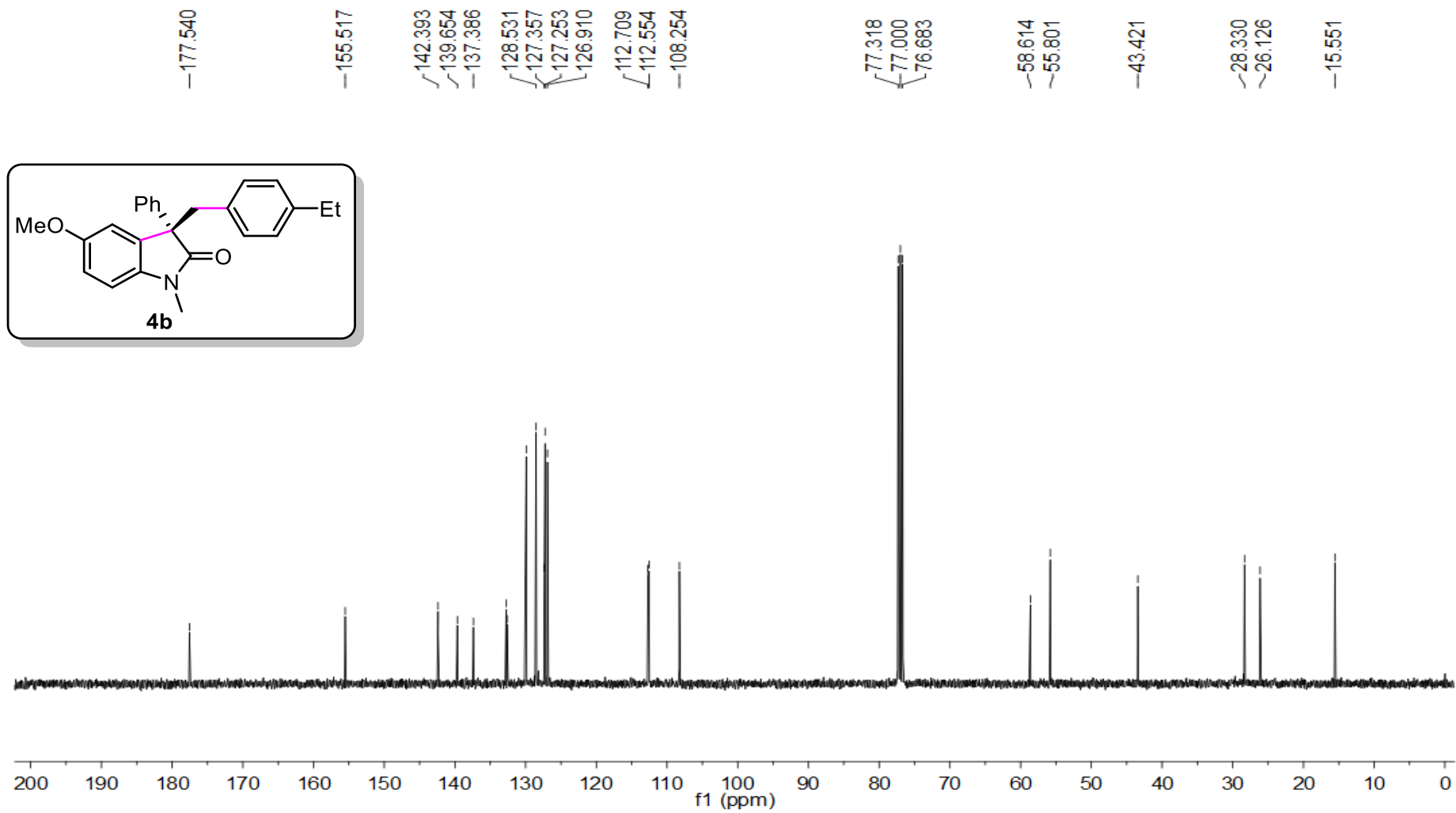
7.500
7.480
7.357
7.339
7.320
7.292
7.274
6.768
6.746
6.739
6.544
6.524

3.767
3.638
3.605
3.456
3.424
-2.931
2.521
2.502
2.483
2.464

1.255
1.136
1.117
1.098



^{13}C NMR (101 MHz, CDCl_3) of compound **4b**

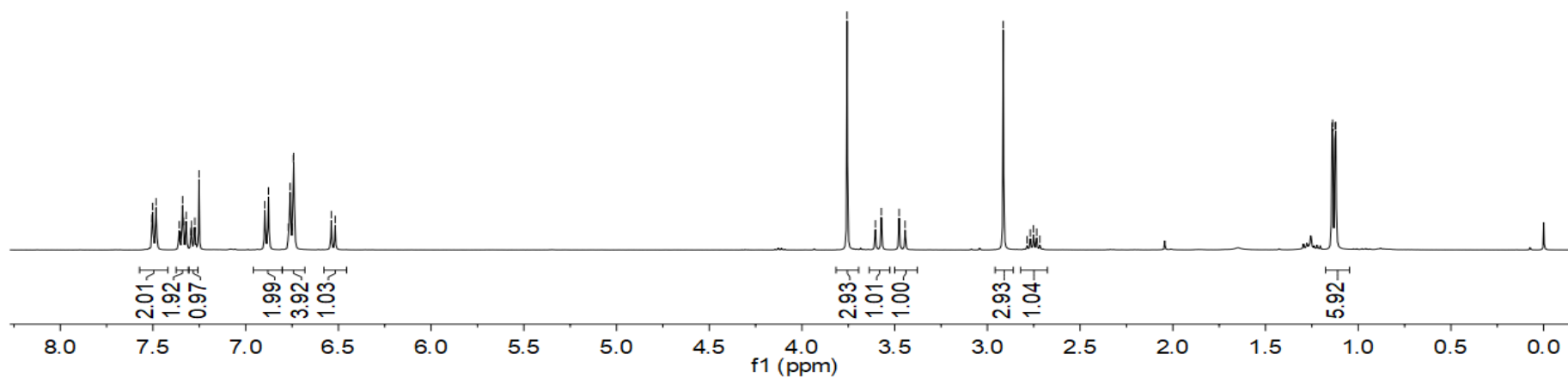
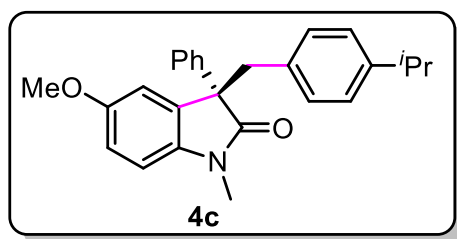


^1H NMR (400 MHz, CDCl_3) of compound **4c**

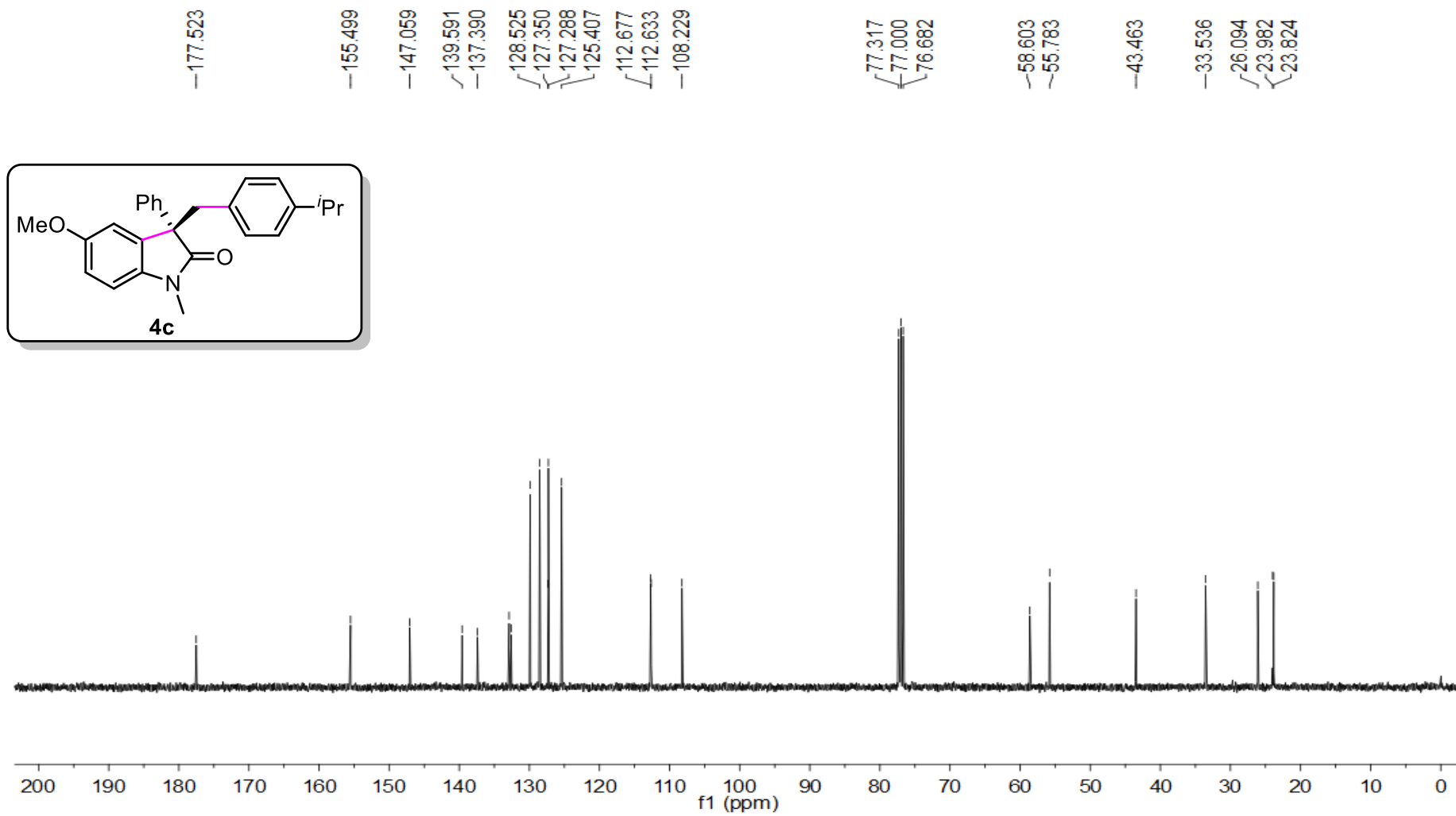
7.505
7.501
7.483
7.358
7.353
7.340
7.337
7.321
7.296
7.293
7.290
7.275
7.252
6.897
6.877
6.770
6.760
6.750
6.743
6.741
6.538
6.517

3.756
3.604
3.572
3.476
3.444
2.914
2.786
2.769
2.751
2.734
2.717

1.142
1.138
1.125
1.121



^{13}C NMR (101 MHz, CDCl_3) of compound **4c**

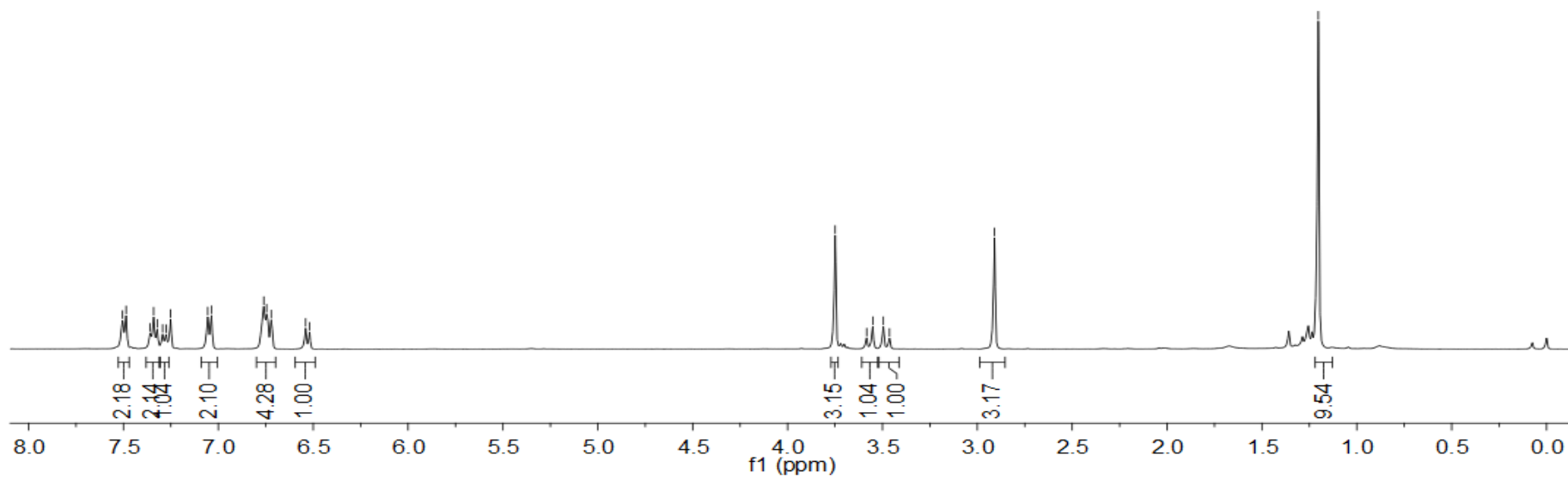
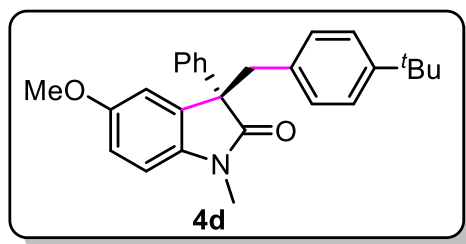


¹H NMR (400 MHz, CDCl₃) of compound **4d**

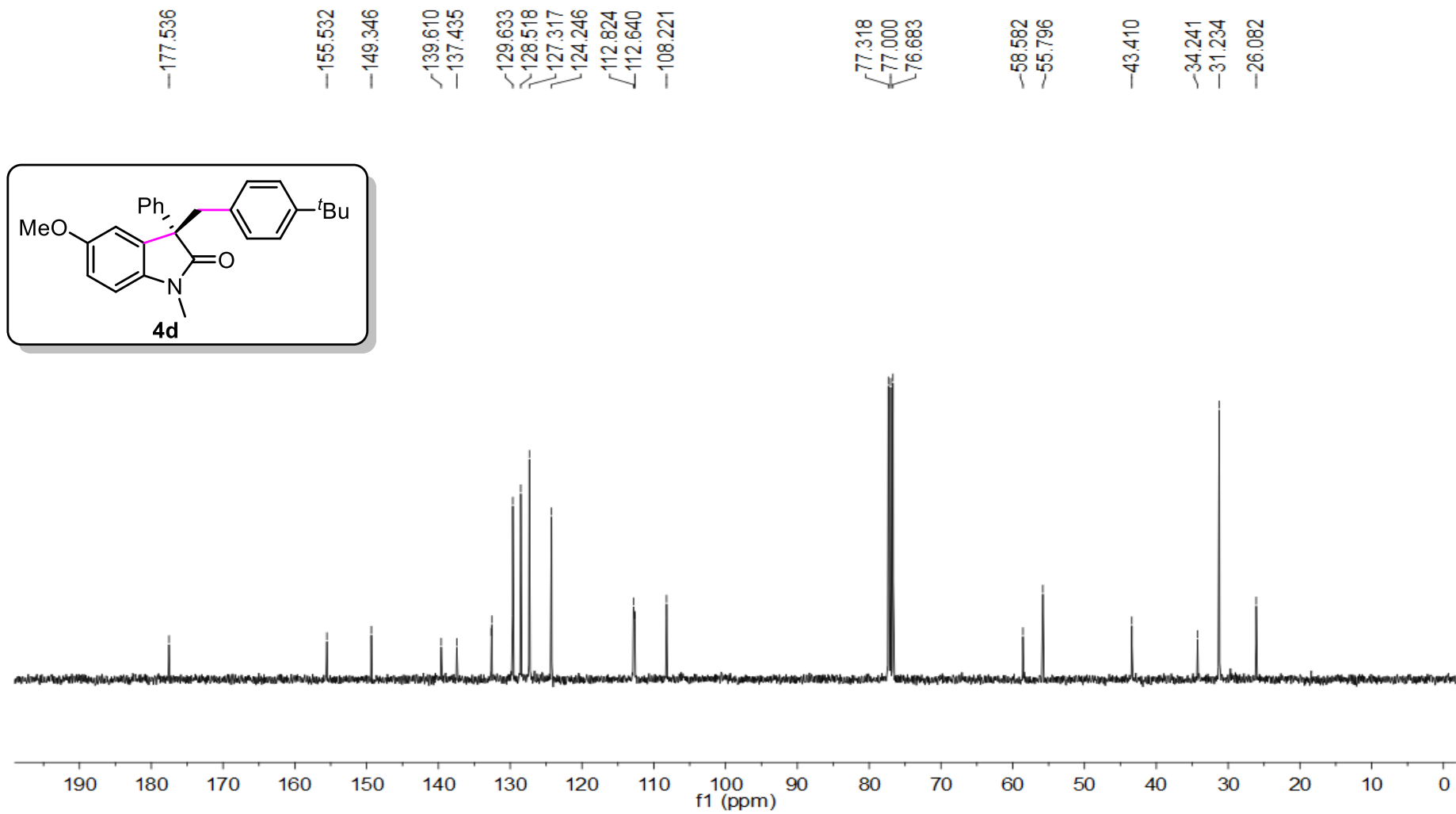
7.486
7.341
7.322
7.293
7.275
7.251
— 7.036
— 6.721
6.540
6.519

— 3.749
3.551
3.495
3.463
— 2.909

— 1.203



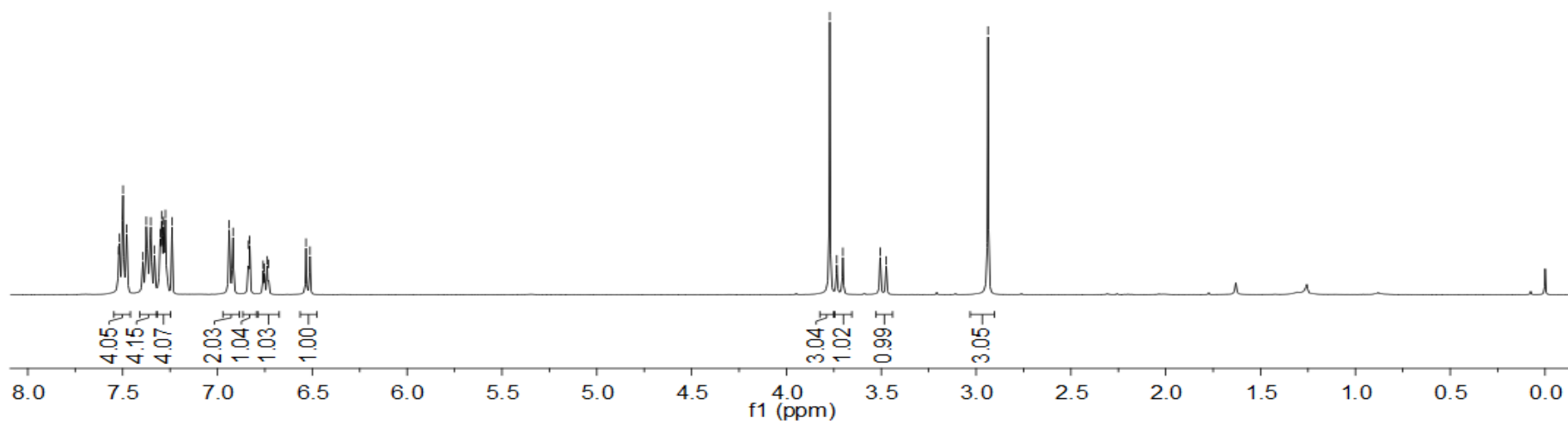
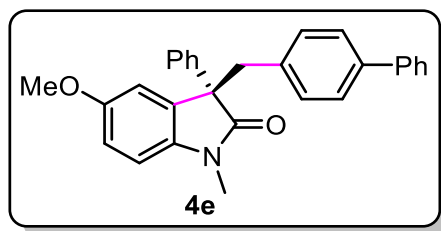
^{13}C NMR (101 MHz, CDCl_3) of compound **4d**



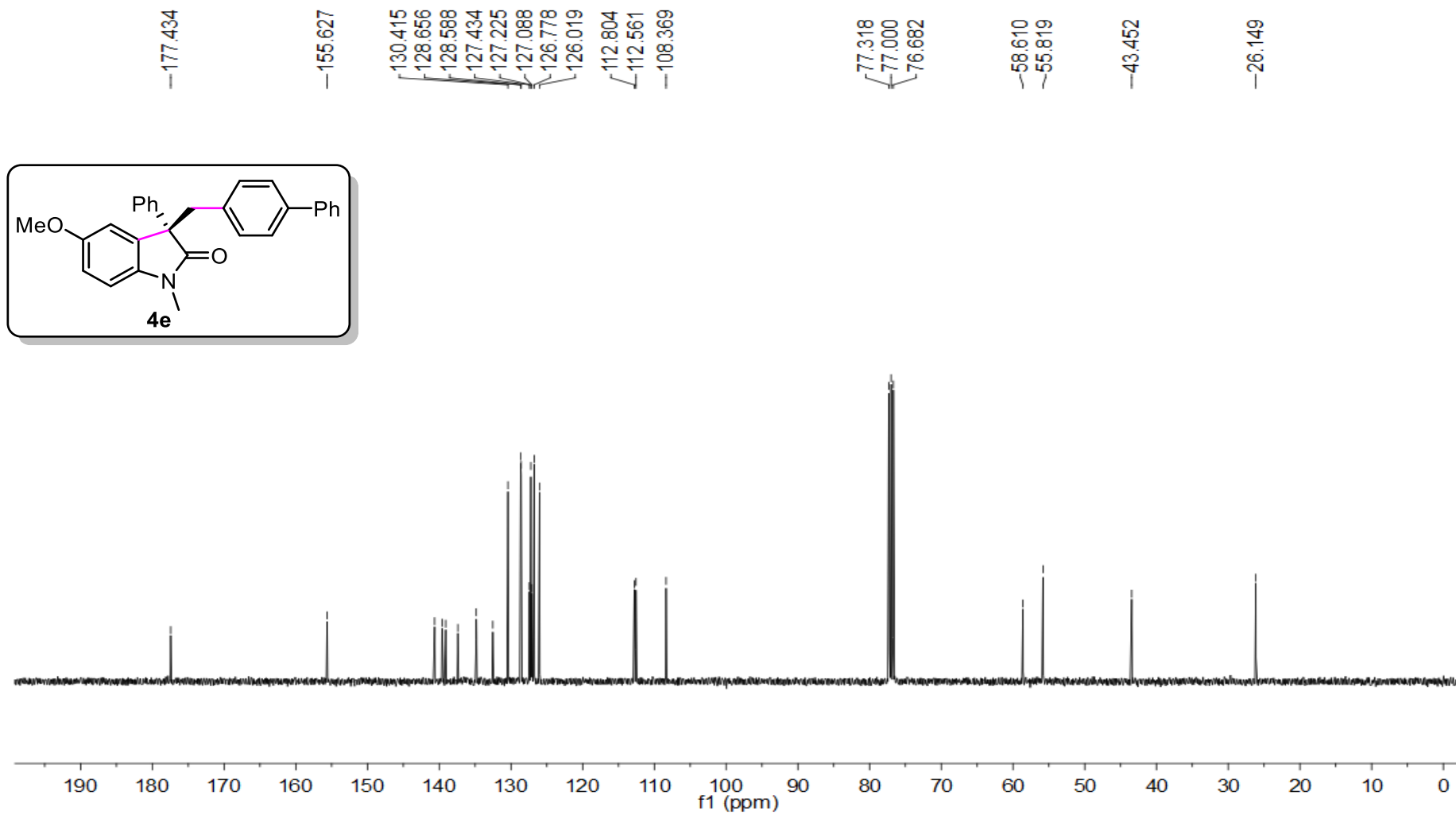
^1H NMR (400 MHz, CDCl_3) of compound **4e**

7.479
7.375
7.332
7.295
7.284
7.240
6.938
6.753
6.732
6.533
6.512

3.772
3.734
3.702
3.506
3.474
-2.937



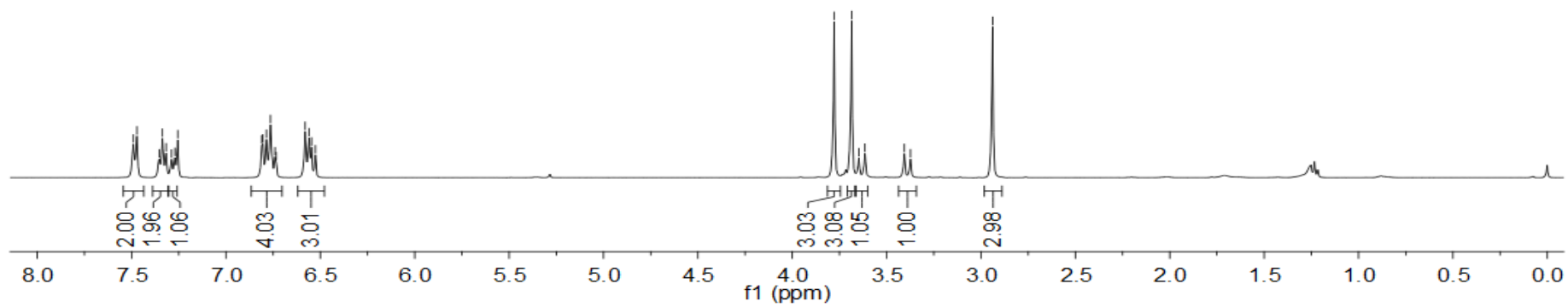
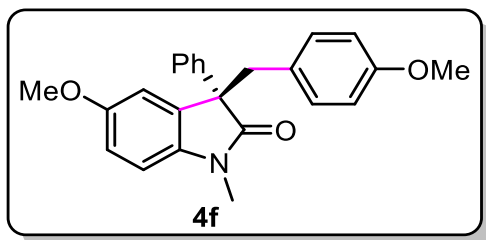
^{13}C NMR (101 MHz, CDCl_3) of compound **4e**



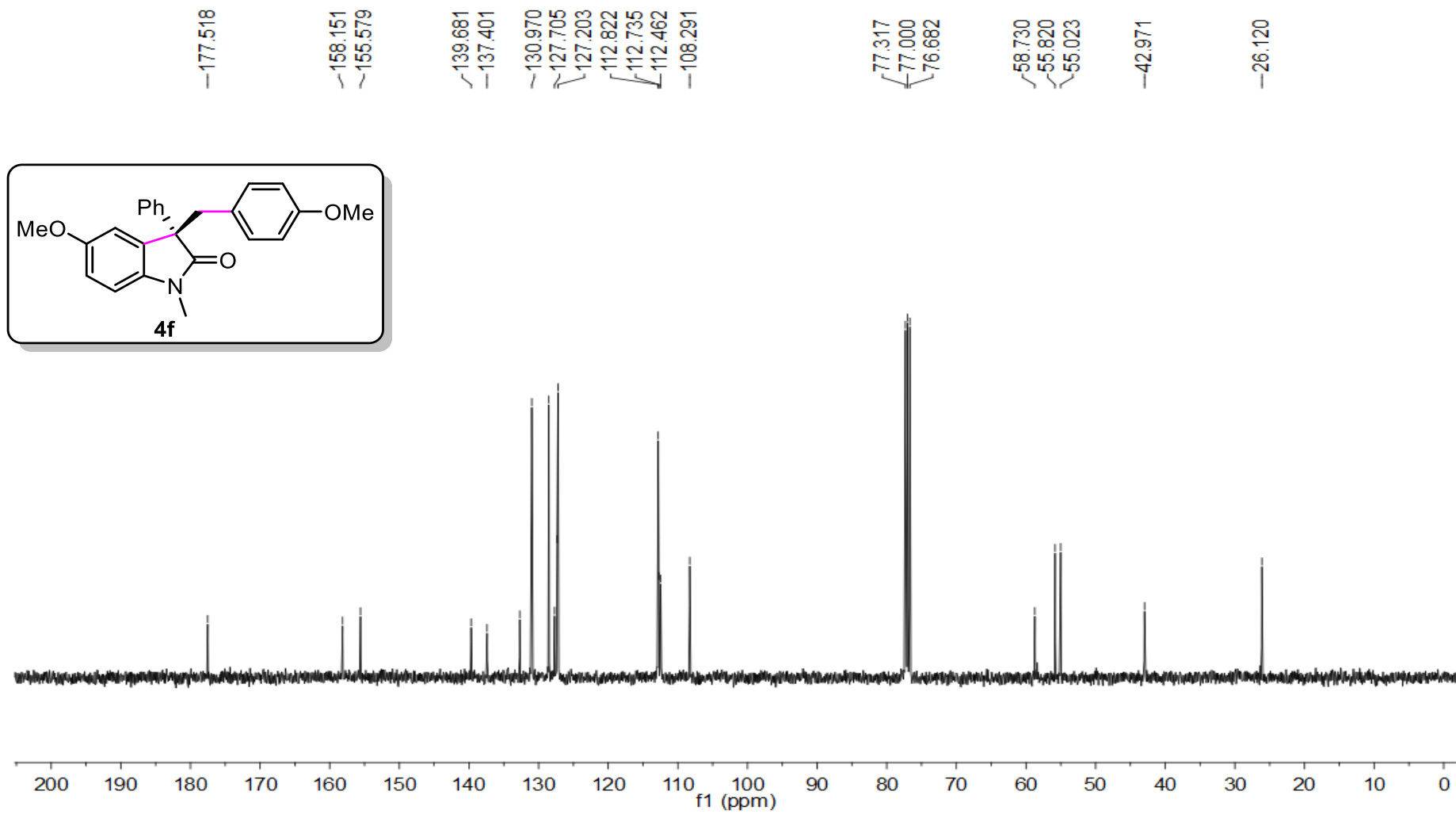
^1H NMR (400 MHz, CDCl_3) of compound **4f**

7.490
7.472
7.354
7.336
7.317
7.289
7.271
6.854
6.764
6.734
6.580
6.559
6.547
6.526

3.778
3.685
3.647
3.614
3.406
3.373
-2.938



^{13}C NMR (101 MHz, CDCl_3) of compound **4f**

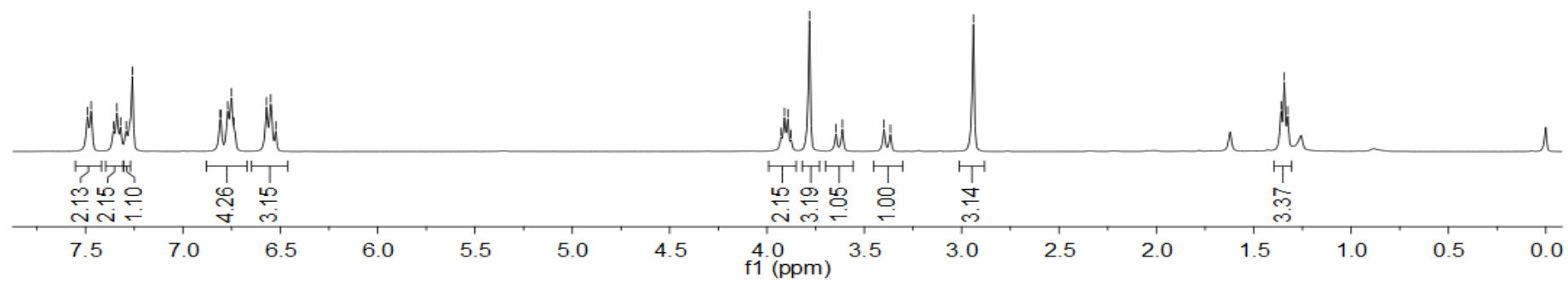
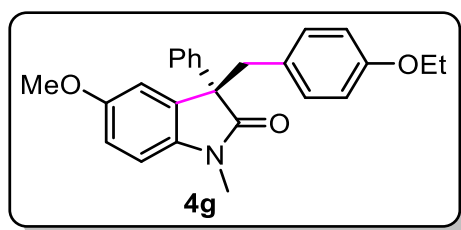


^1H NMR (400 MHz, CDCl_3) of compound **4g**

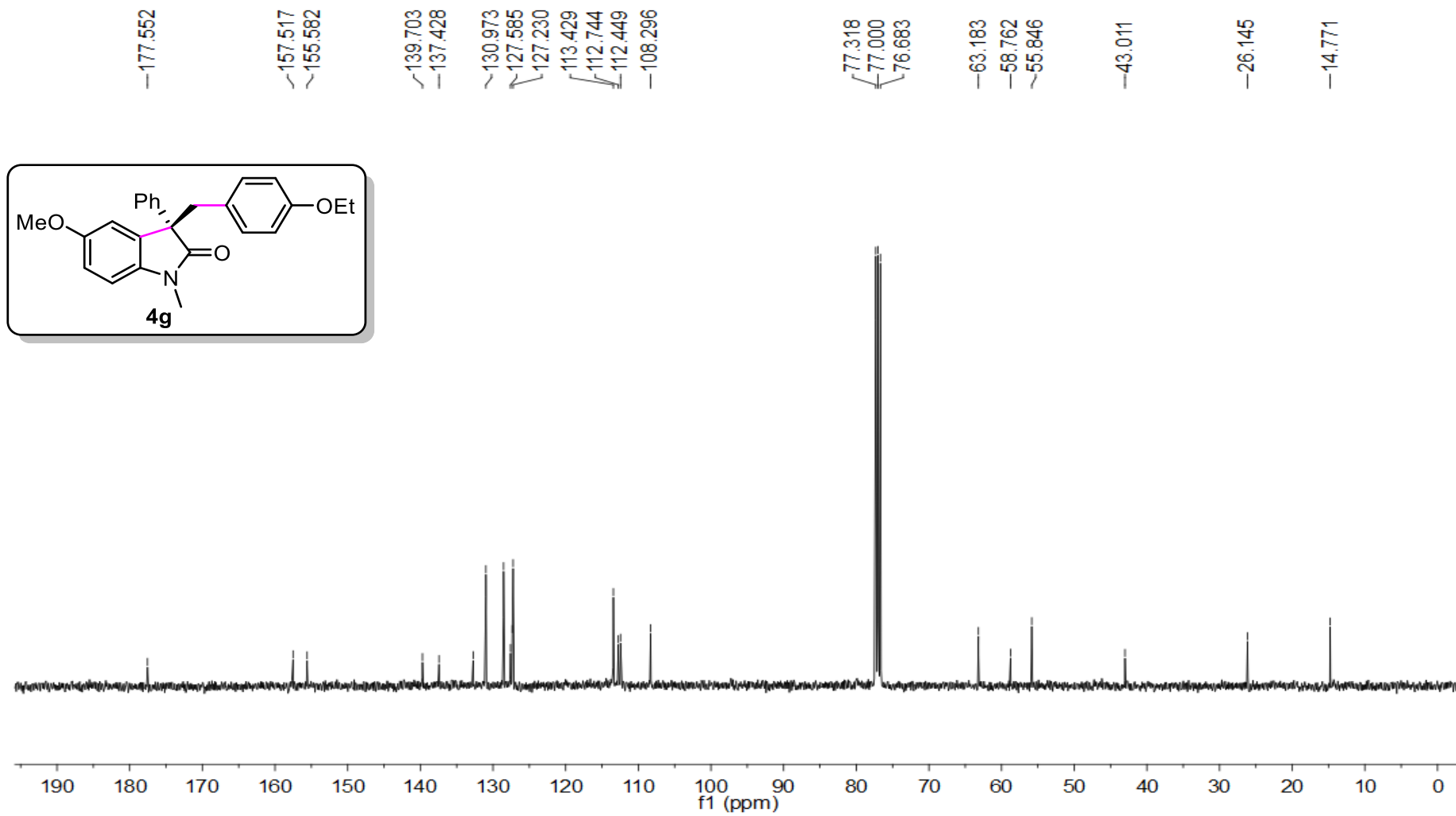
7.489
7.471
7.356
7.339
7.320
7.291
6.750
6.738
6.571
6.549
6.523

3.927
3.910
3.893
3.876
3.782
3.645
3.613
3.399
3.366
-2.940

1.360
1.343
1.325



^{13}C NMR (101 MHz, CDCl_3) of compound **4g**



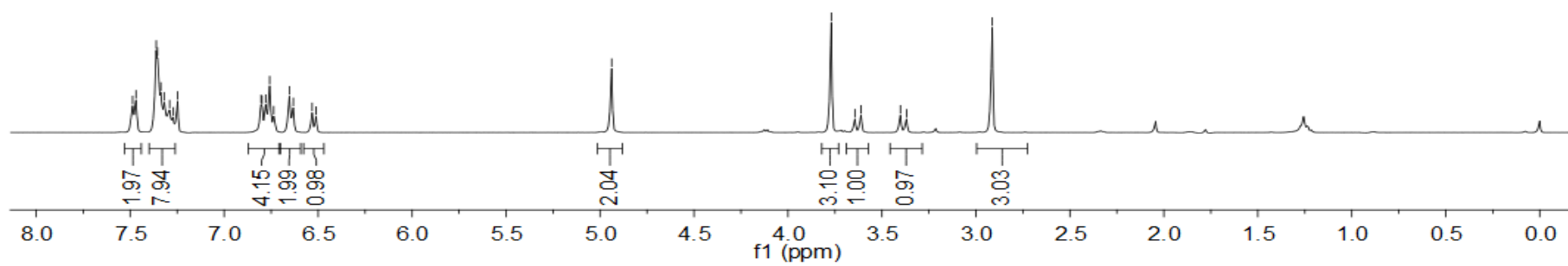
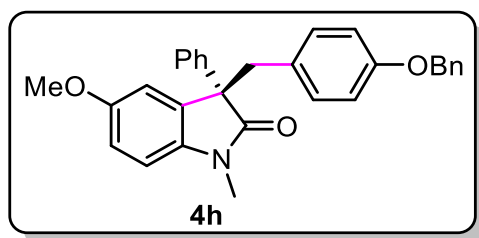
¹H NMR (400 MHz, CDCl₃) of compound **4h**

7.361
7.355
7.337
7.318
7.290
7.272
7.248
6.804
6.799
6.779
6.758
6.736
6.653
6.632
6.532
6.511

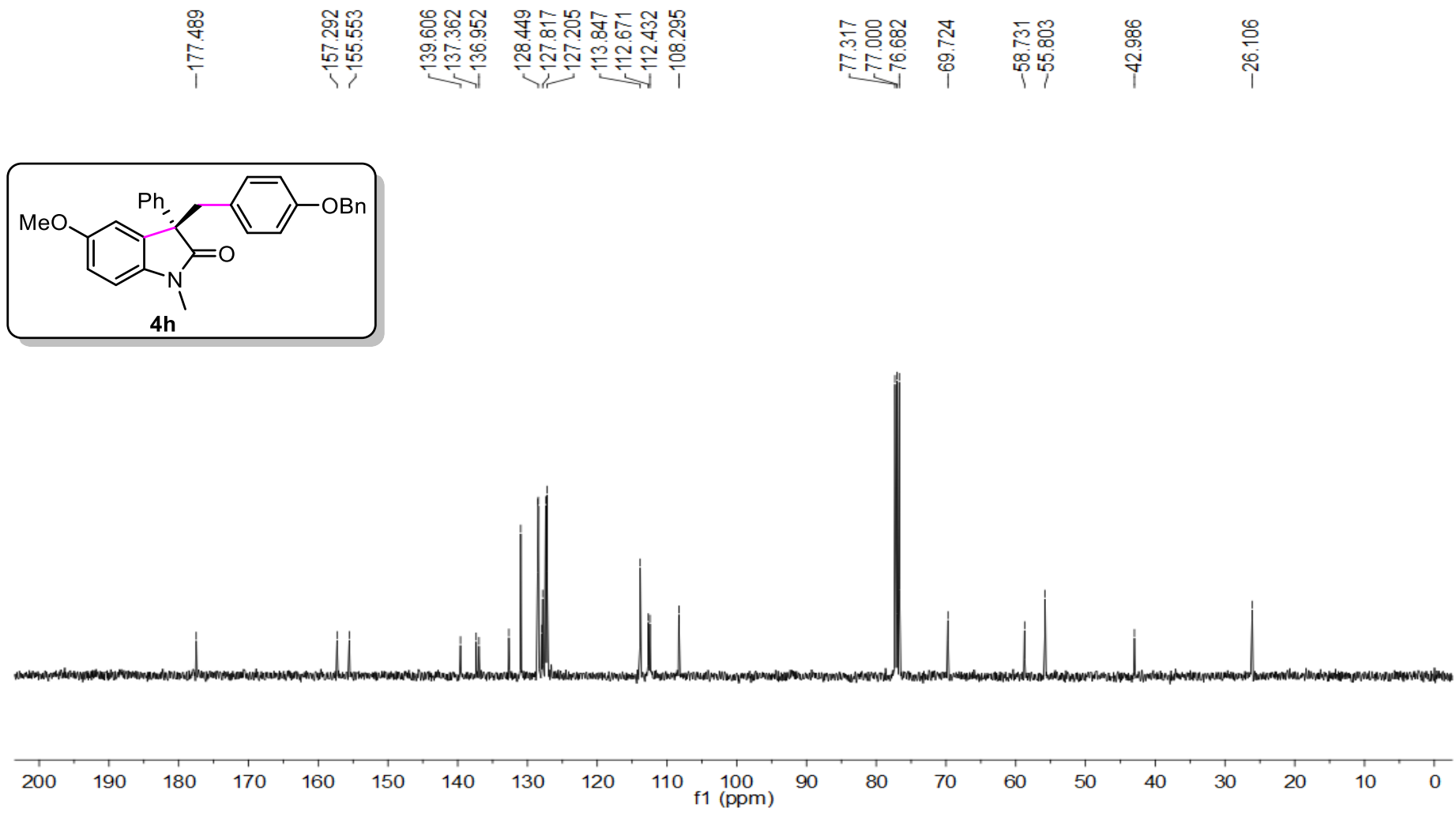
—4.938

3.769
3.644
3.611
3.402
3.369

—2.913



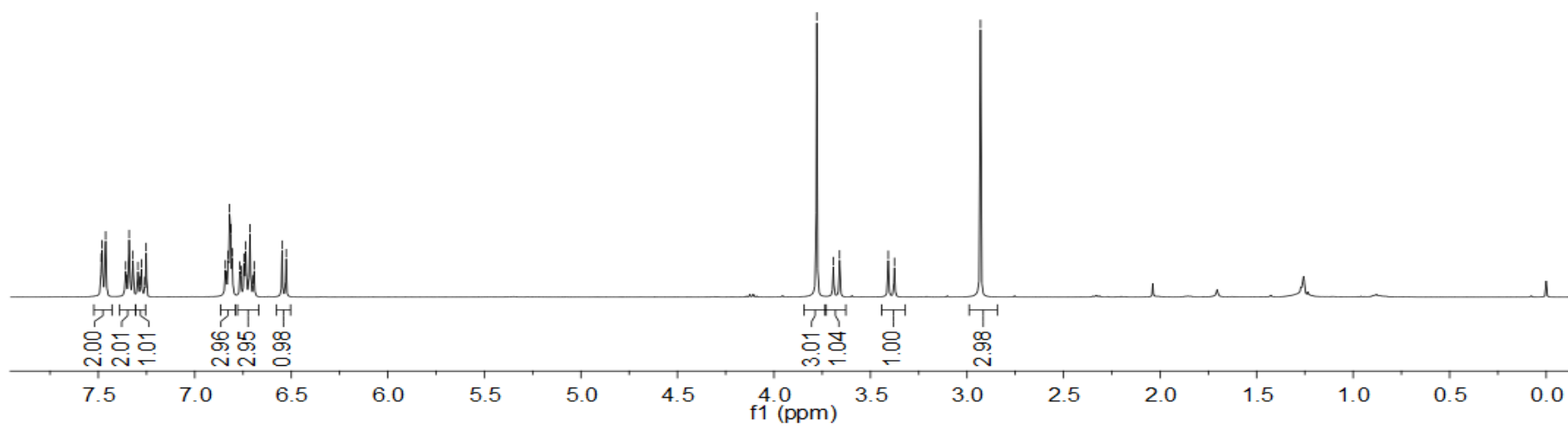
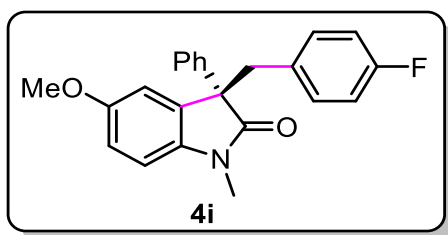
^{13}C NMR (101 MHz, CDCl_3) of compound **4h**



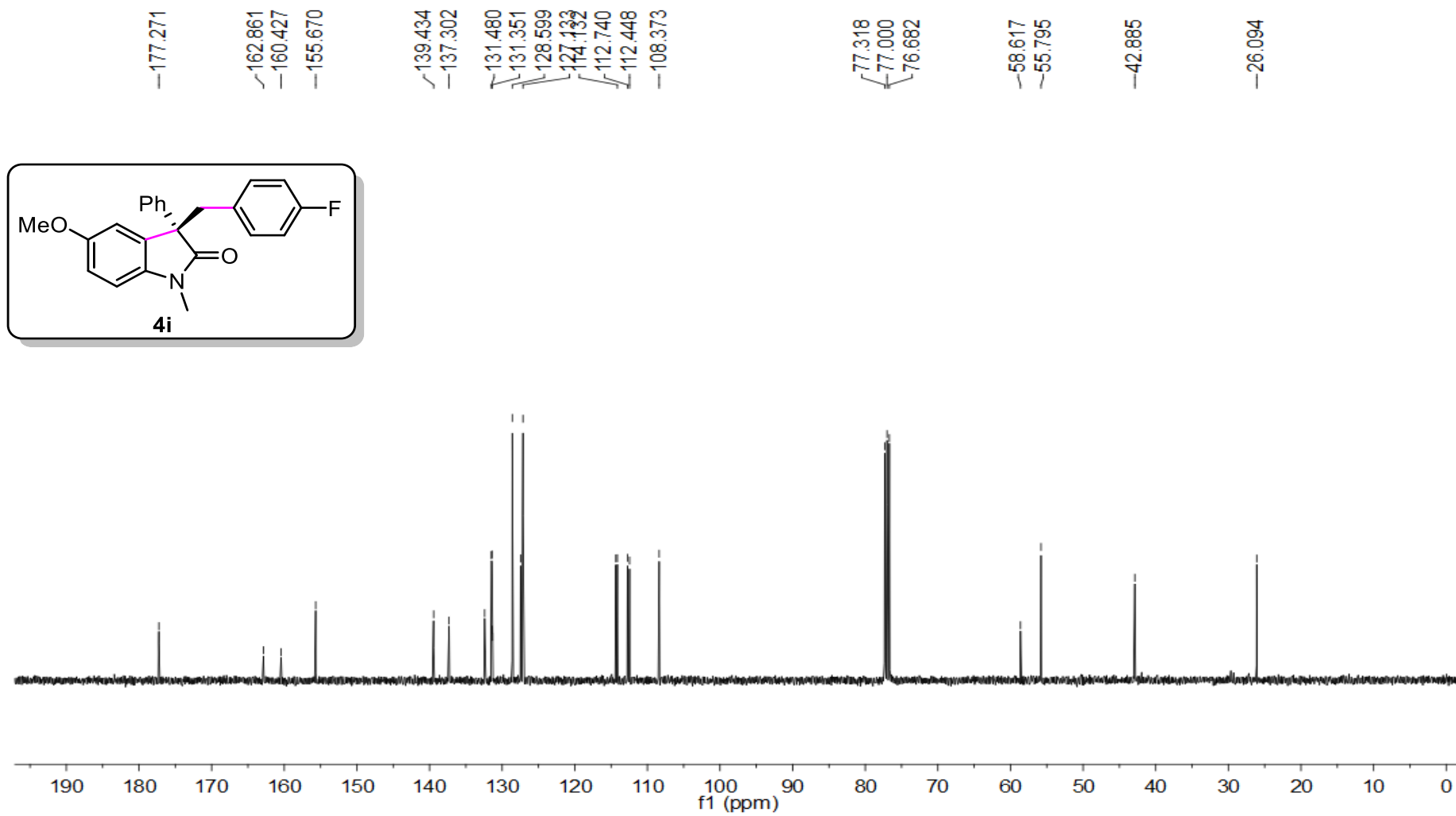
^1H NMR (400 MHz, CDCl_3) of compound **4i**

7.340
7.321
7.294
7.282
7.277
7.258
7.252
6.813
6.745
6.692
6.548
6.527

3.778
3.693
3.660
3.408
3.376
-2.930



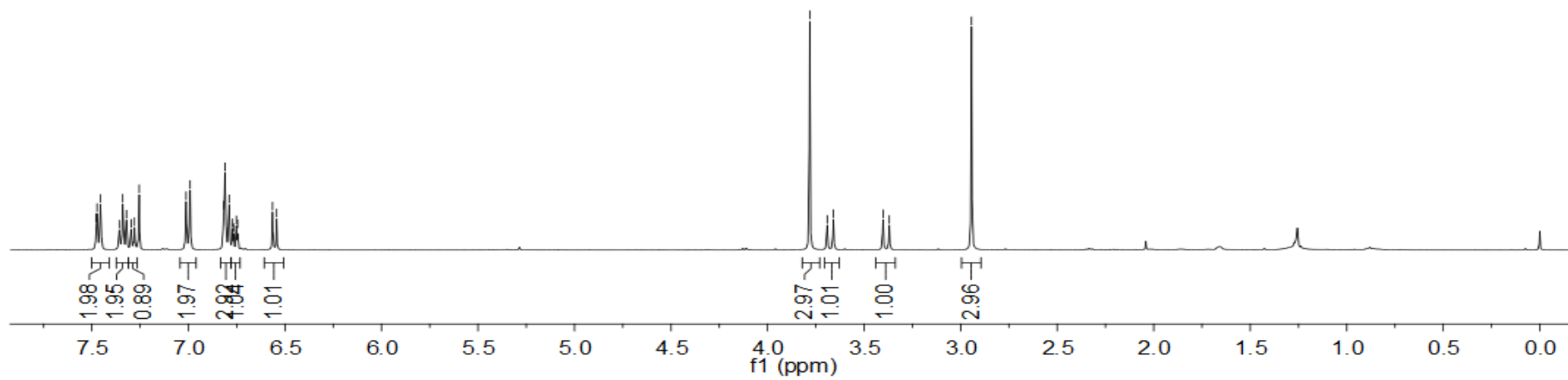
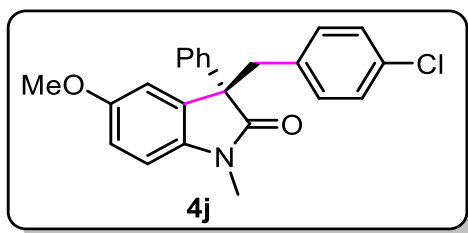
^{13}C NMR (101 MHz, CDCl_3) of compound **4i**



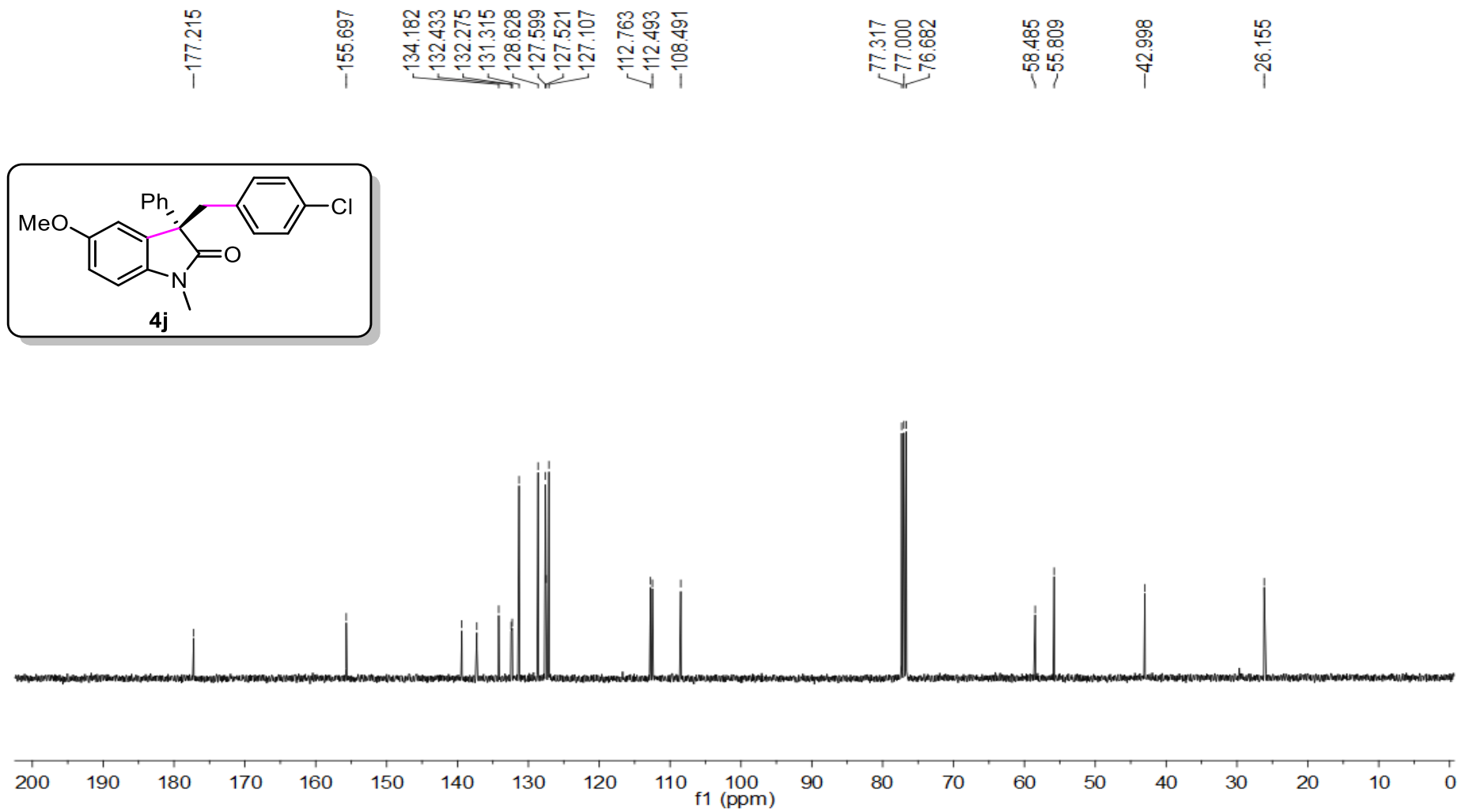
^1H NMR (400 MHz, CDCl_3) of compound **4j**

7.340
7.321
7.297
7.279
7.255
-6.991
-6.745
-6.564
-6.543

3.782
3.691
3.659
-3.402
-3.370
-2.944



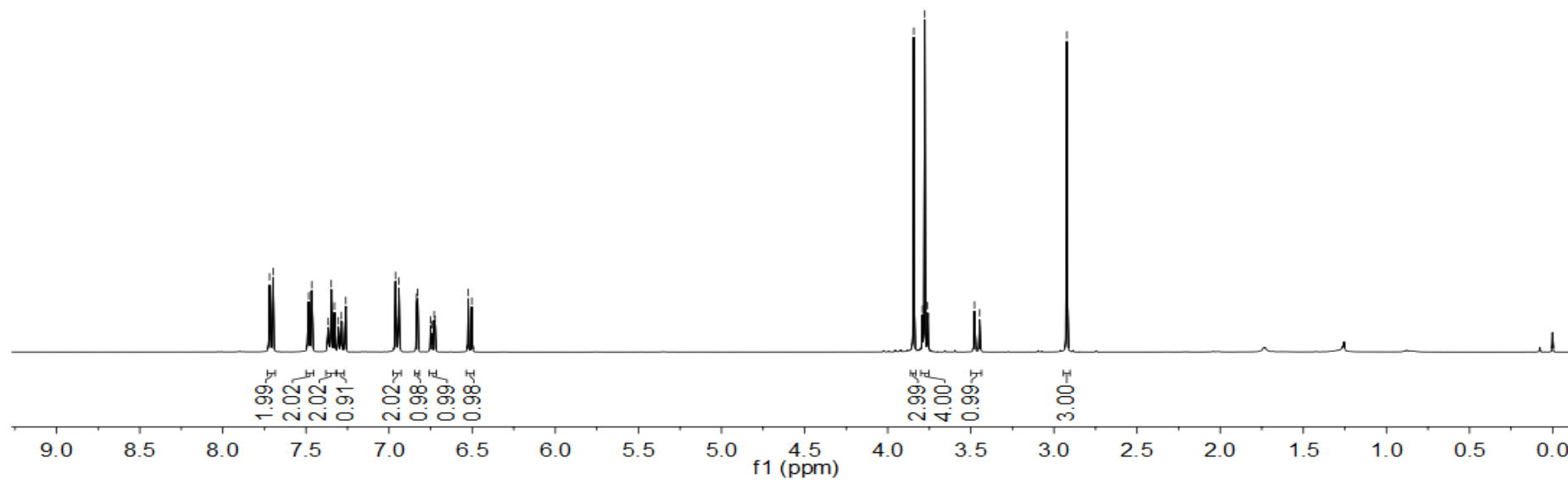
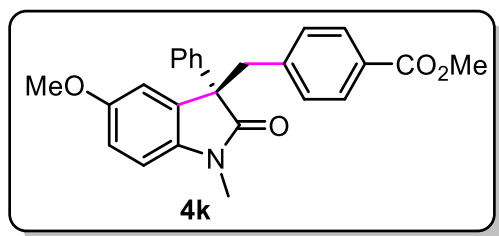
^{13}C NMR (101 MHz, CDCl_3) of compound of **4j**



¹H NMR (400 MHz, CDCl₃) of compound **4k**

7.719
7.698
7.484
7.465
7.366
7.348
7.328
7.305
7.287
7.261
6.961
6.941
6.834
6.828
6.750
6.743
6.729
6.722
6.523
6.502

3.843
3.791
3.778
3.760
3.478
3.447
-2.923



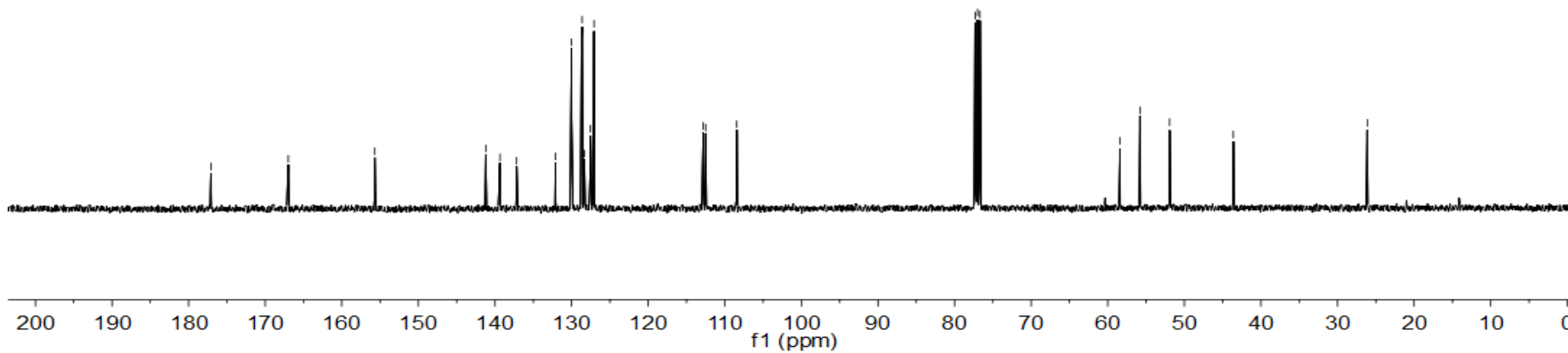
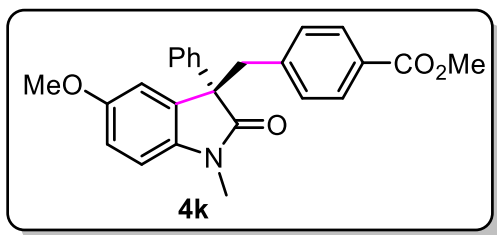
^{13}C NMR (101 MHz, CDCl_3) of compound **4k**

—177.095
—166.987
—155.688
141.194
139.350
137.173
132.096
130.006
128.712
128.623
128.329
127.536
127.068
112.812
112.492
108.435

77.318
77.000
76.682

58.400
55.785
51.918
43.603

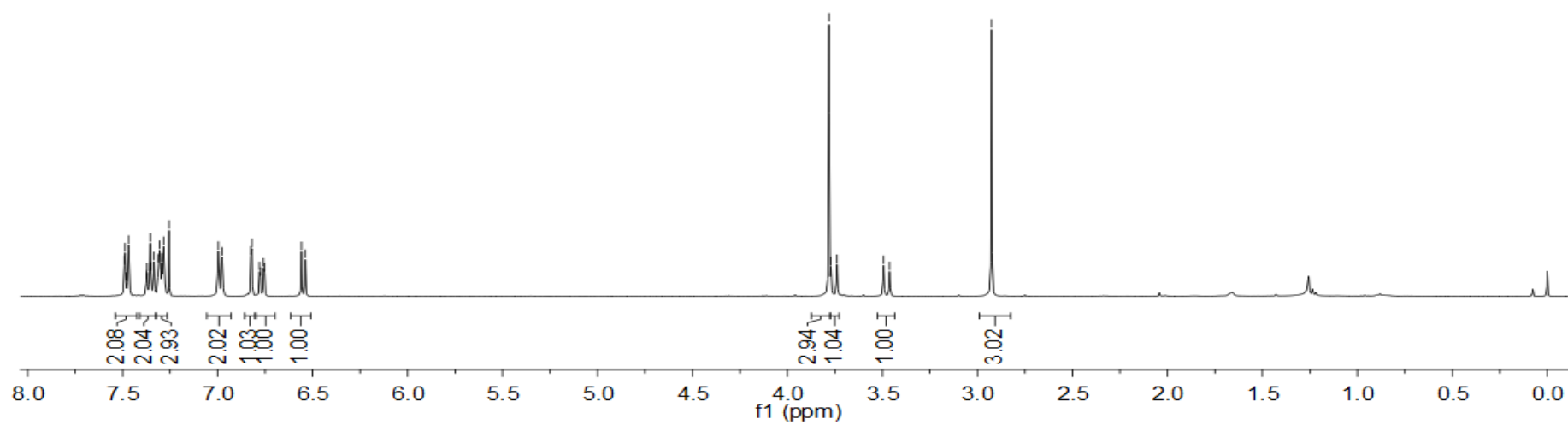
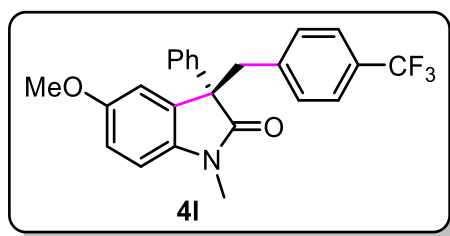
26.119



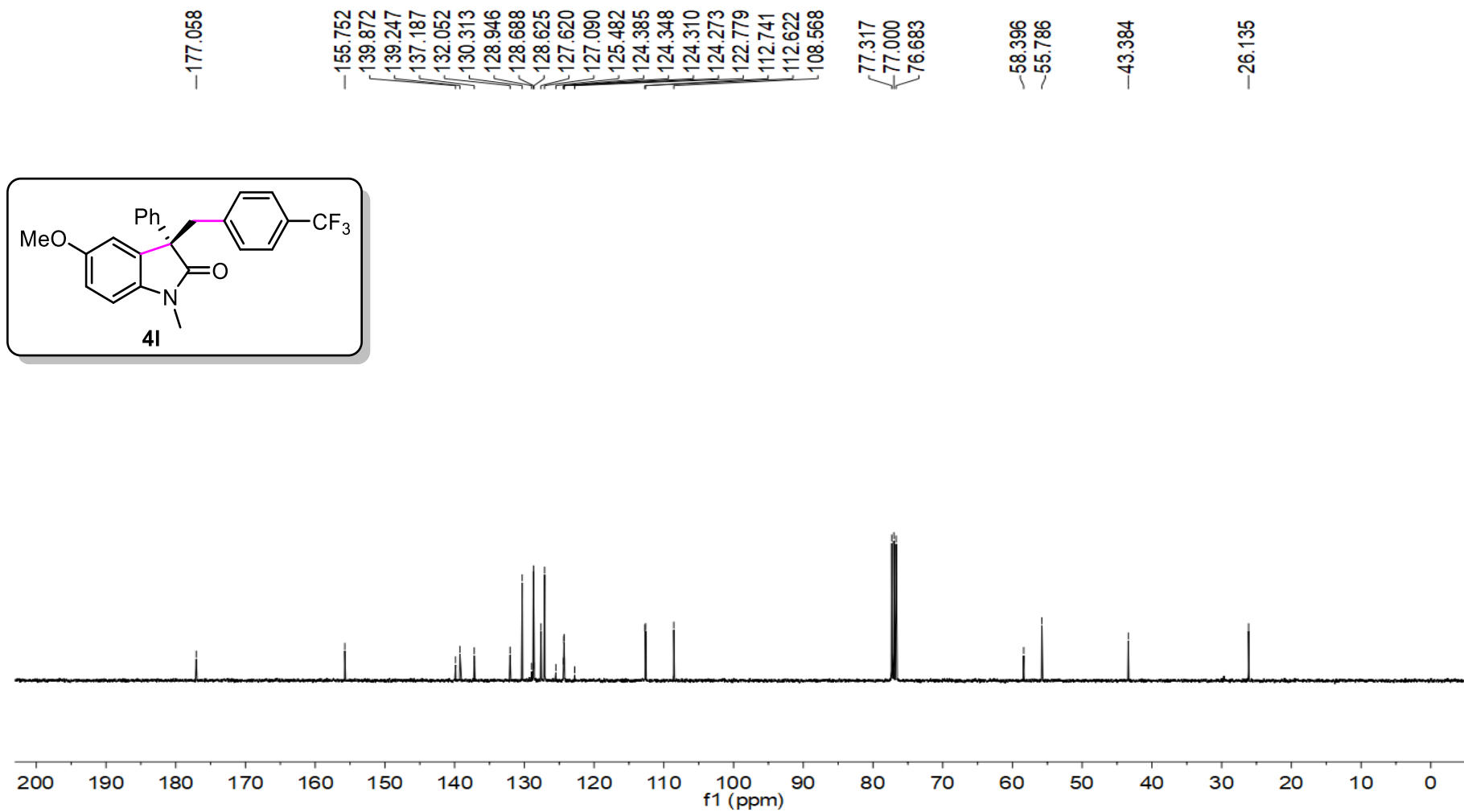
^1H NMR (400 MHz, CDCl_3) of compound **4I**

7.469
7.372
7.350
7.311
7.293
7.256
— 6.976
— 6.752
— 6.559
— 6.538

3.782
3.771
3.739
— 3.494
— 3.462
— 2.925



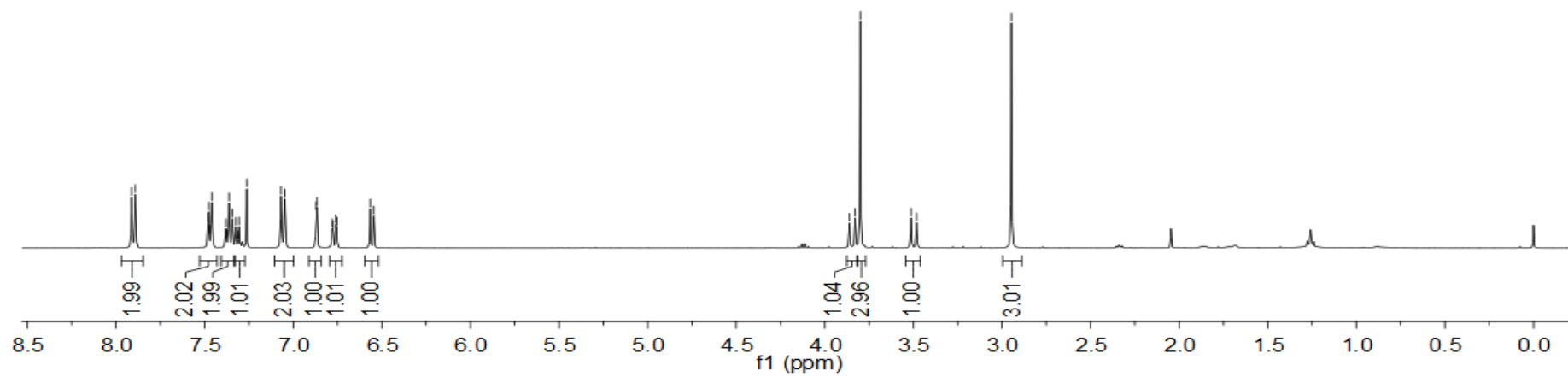
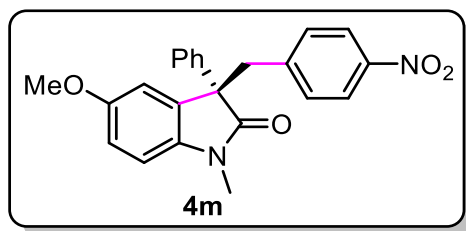
^{13}C NMR (101 MHz, CDCl_3) of compound **4I**



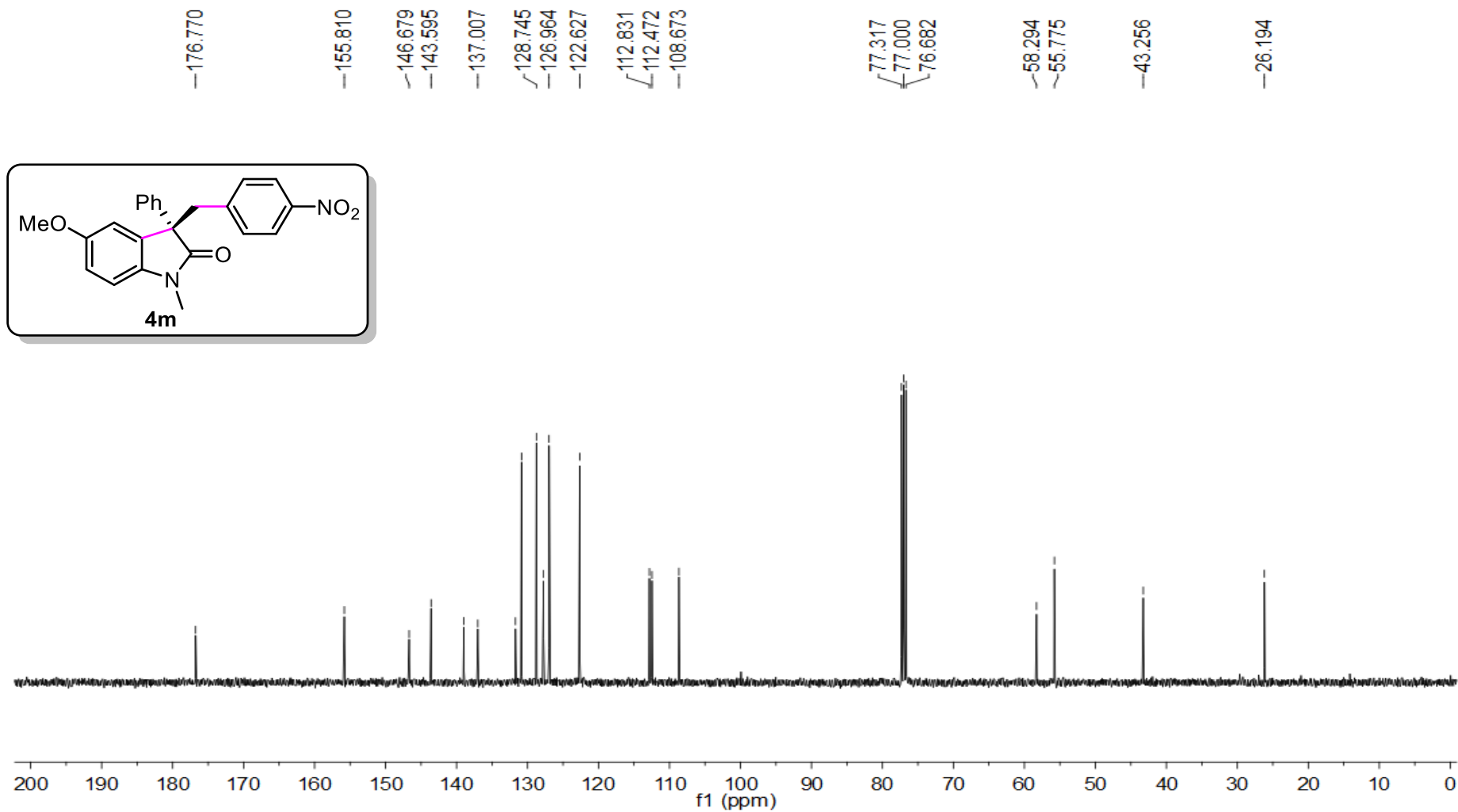
^1H NMR (400 MHz, CDCl_3) of compound **4m**

7.913
7.891
7.461
7.344
7.264
7.047
6.754
6.566
6.545

3.861
3.829
3.799
3.514
3.482
-2.947

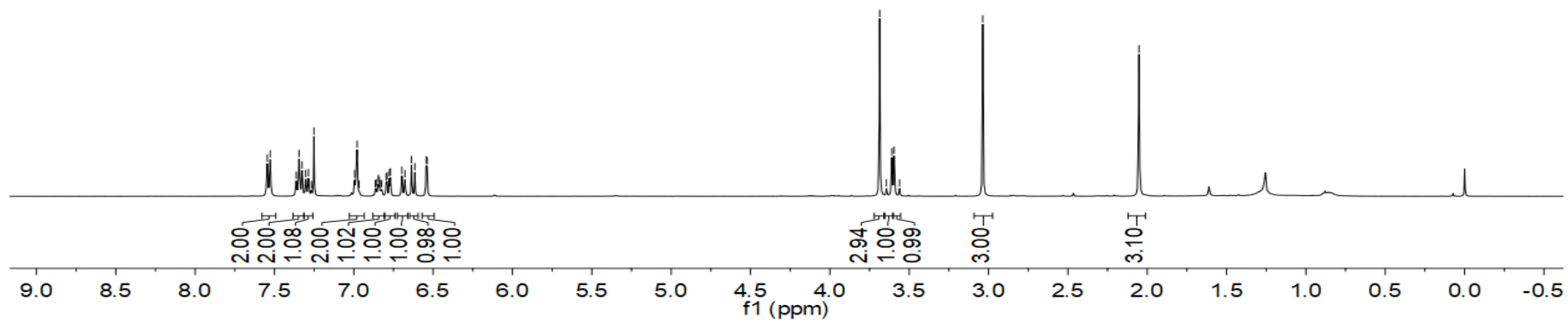
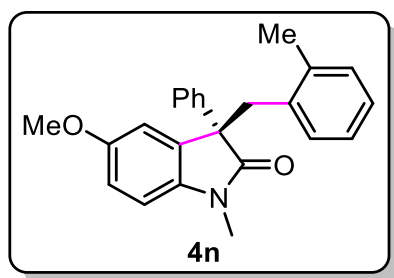


^{13}C NMR (101 MHz, CDCl_3) of compound **4m**

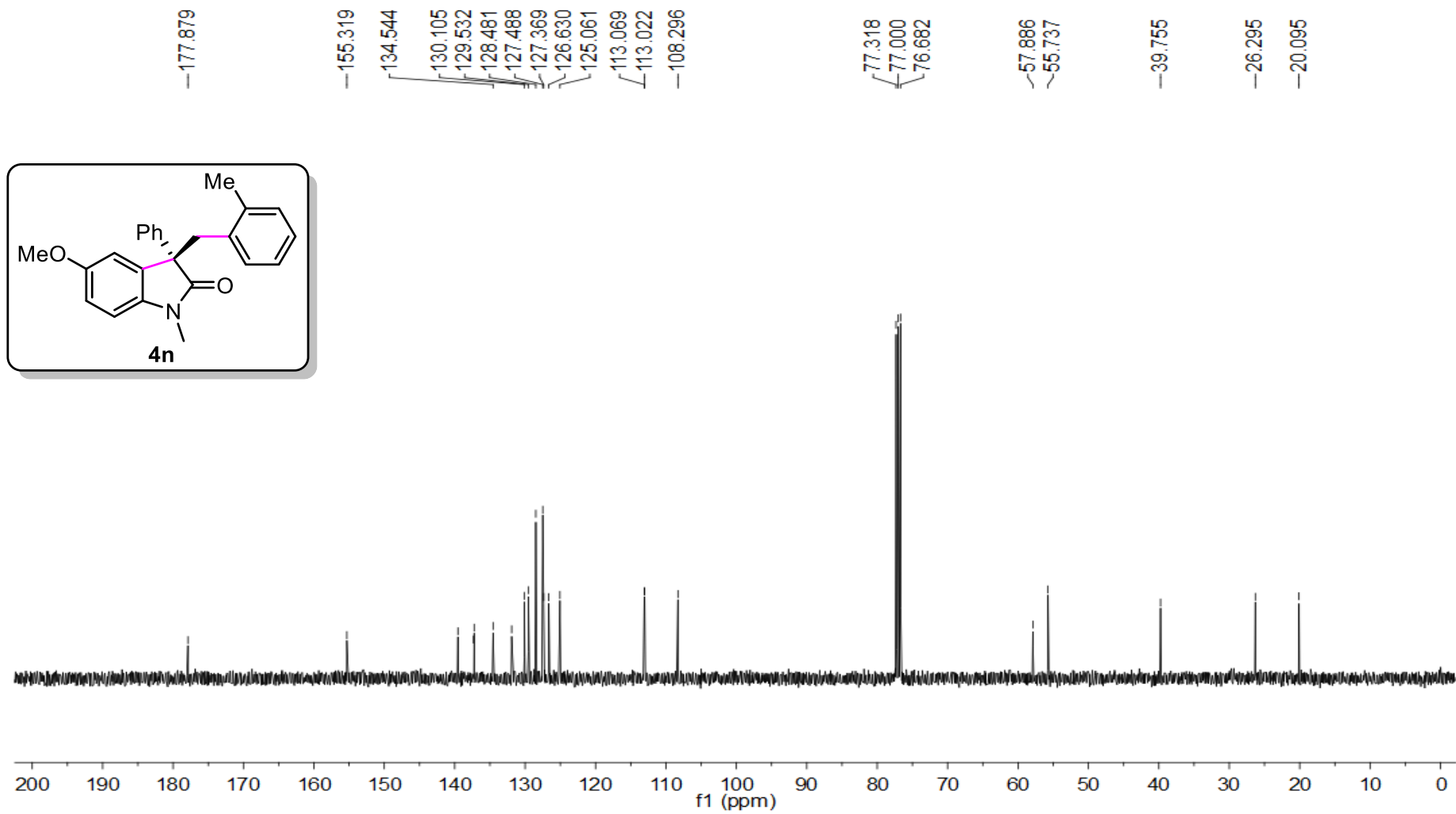


^1H NMR (400 MHz, CDCl_3) of compound **4n**

7.548
7.545
7.527
7.363
7.346
7.326
7.303
7.291
7.286
7.267
7.251
6.994
6.979
6.967
6.865
6.859
6.845
6.839
6.831
6.824
6.796
6.790
6.775
6.769
6.697
6.678
6.636
6.615
6.544
6.538
3.686
3.643
3.609
3.595
3.561
-3.036
-2.052



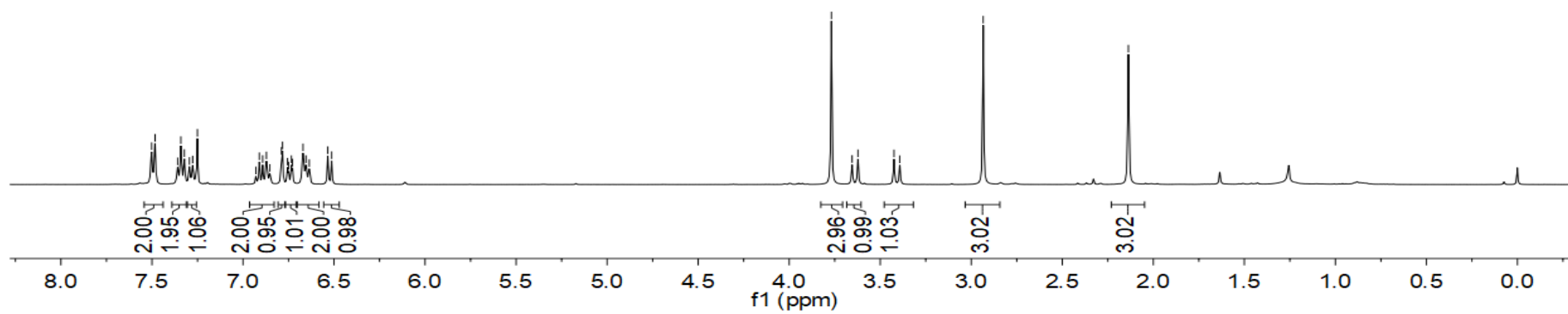
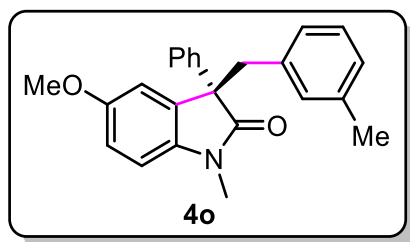
^{13}C NMR (101 MHz, CDCl_3) of compound **4n**



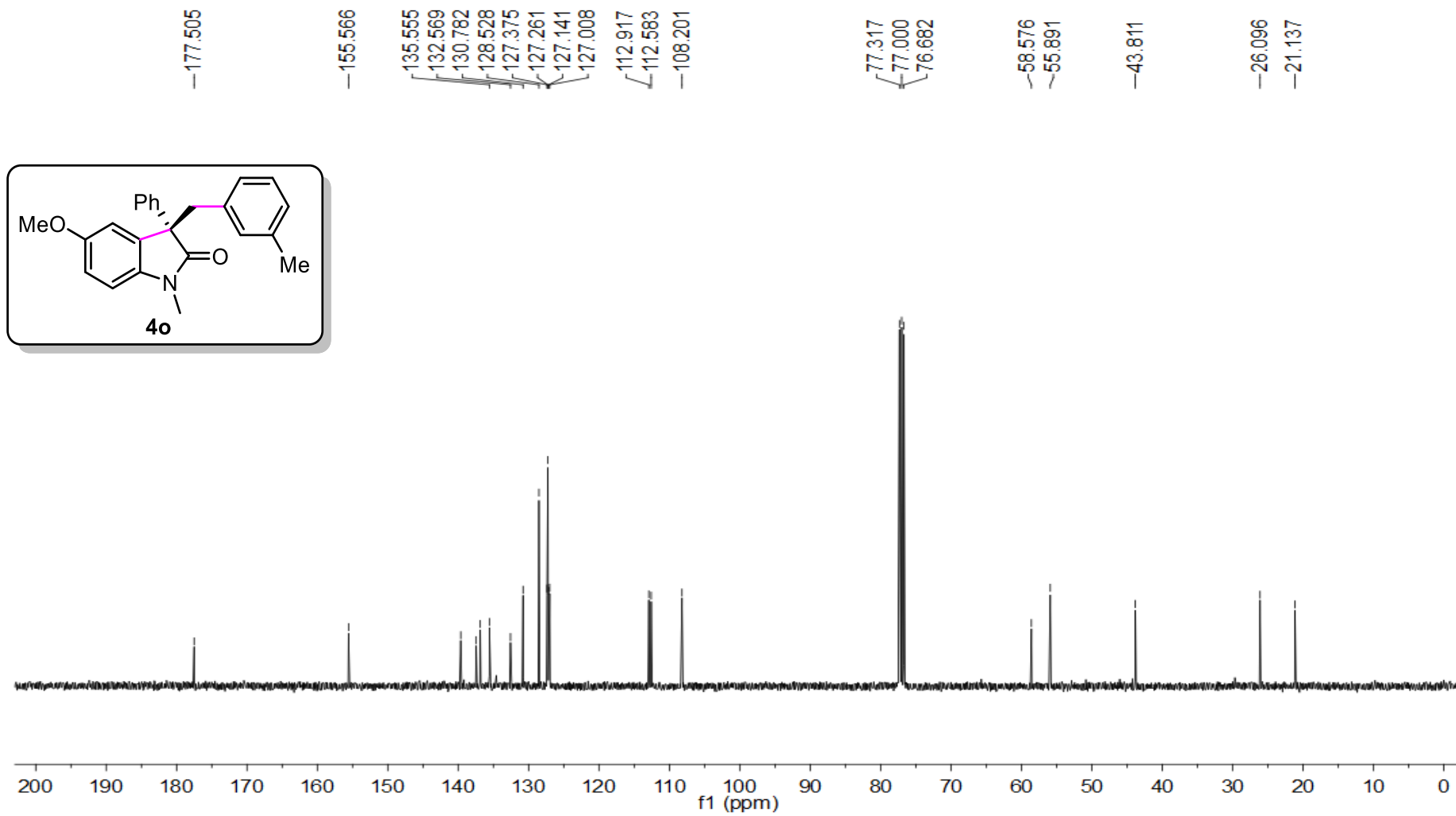
^1H NMR (400 MHz, CDCl_3) of compound **4o**

7.502
7.483
7.359
7.341
7.322
7.294
7.276
7.251
6.929
6.910
6.892
6.871
6.852
6.789
6.783
6.755
6.749
6.734
6.728
6.670
6.654
6.636
6.534
6.513

3.768
3.654
3.622
3.424
3.392
-2.934
-2.137



^{13}C NMR (101 MHz, CDCl_3) of compound **4o**

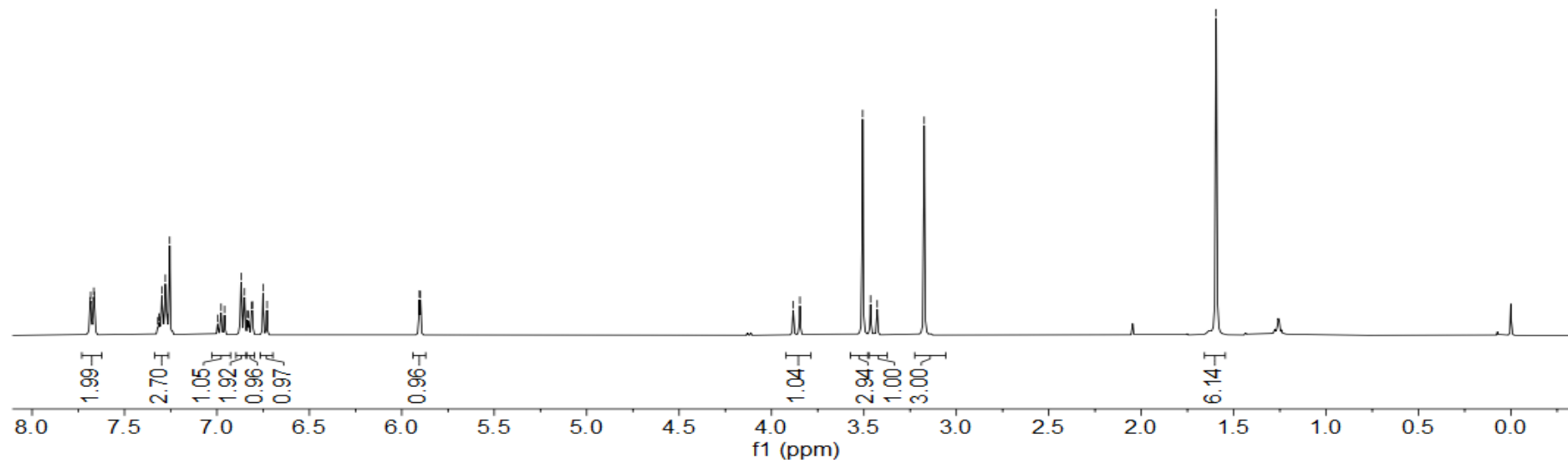
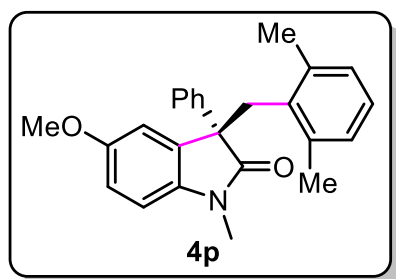


^1H NMR (400 MHz, CDCl_3) of compound **4p**

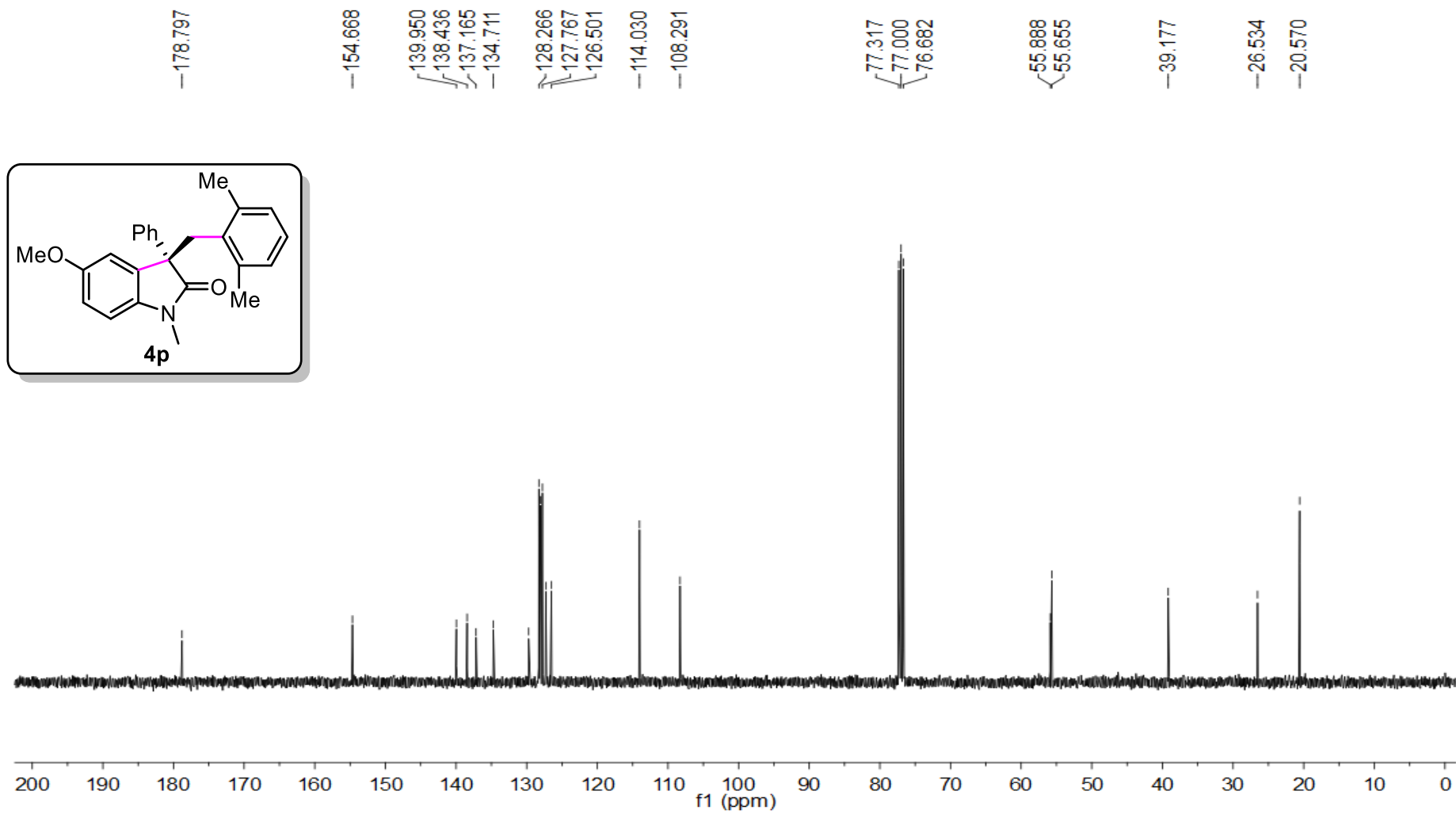
7.687
7.683
7.666
7.663
7.319
7.313
7.308
7.298
7.279
7.266
7.256
6.996
6.978
6.959
6.870
6.851
6.835
6.828
6.814
6.807
6.750
6.729
5.905
5.899

3.883
3.847
3.507
3.464
3.428
3.174

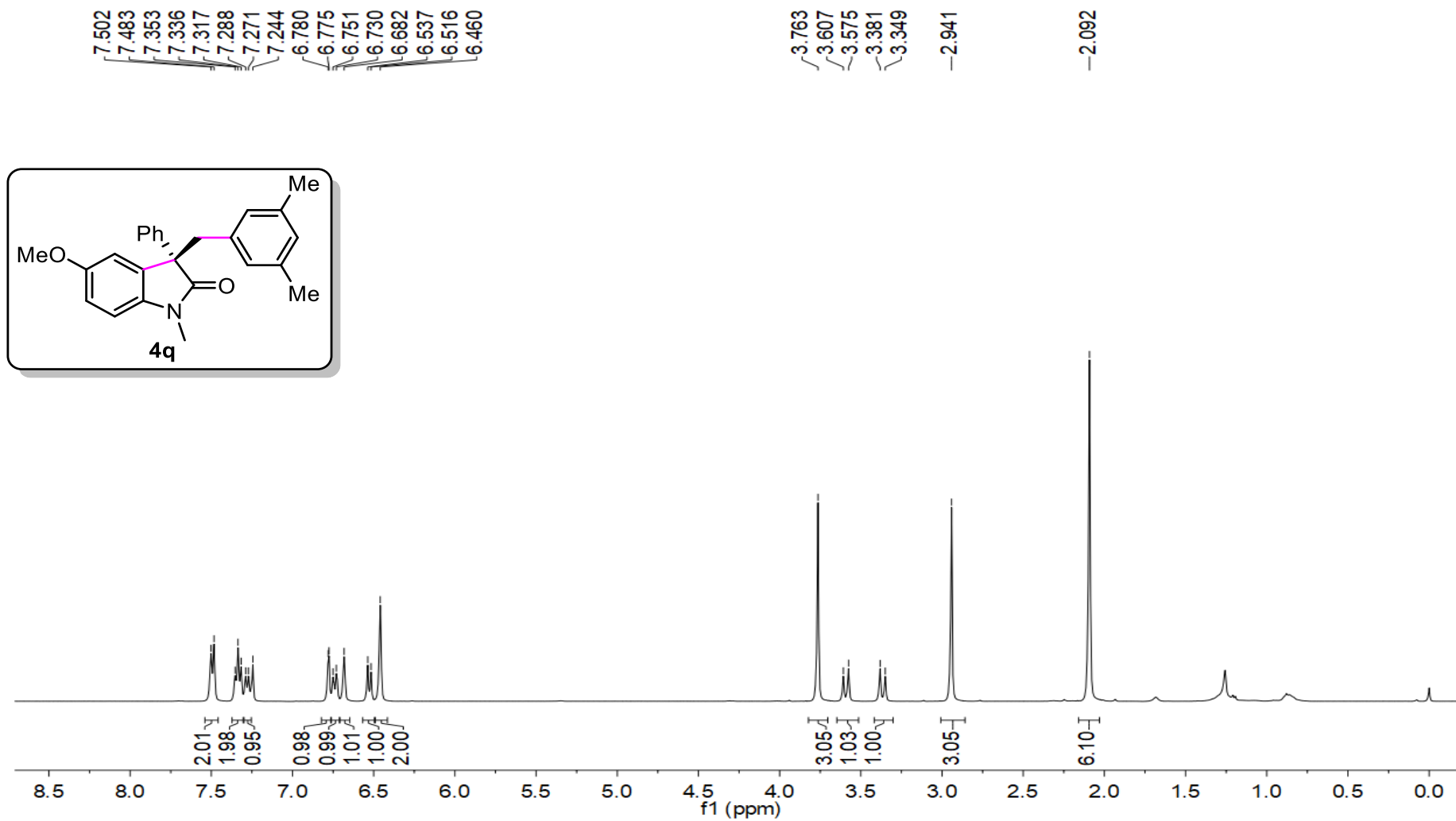
1.595



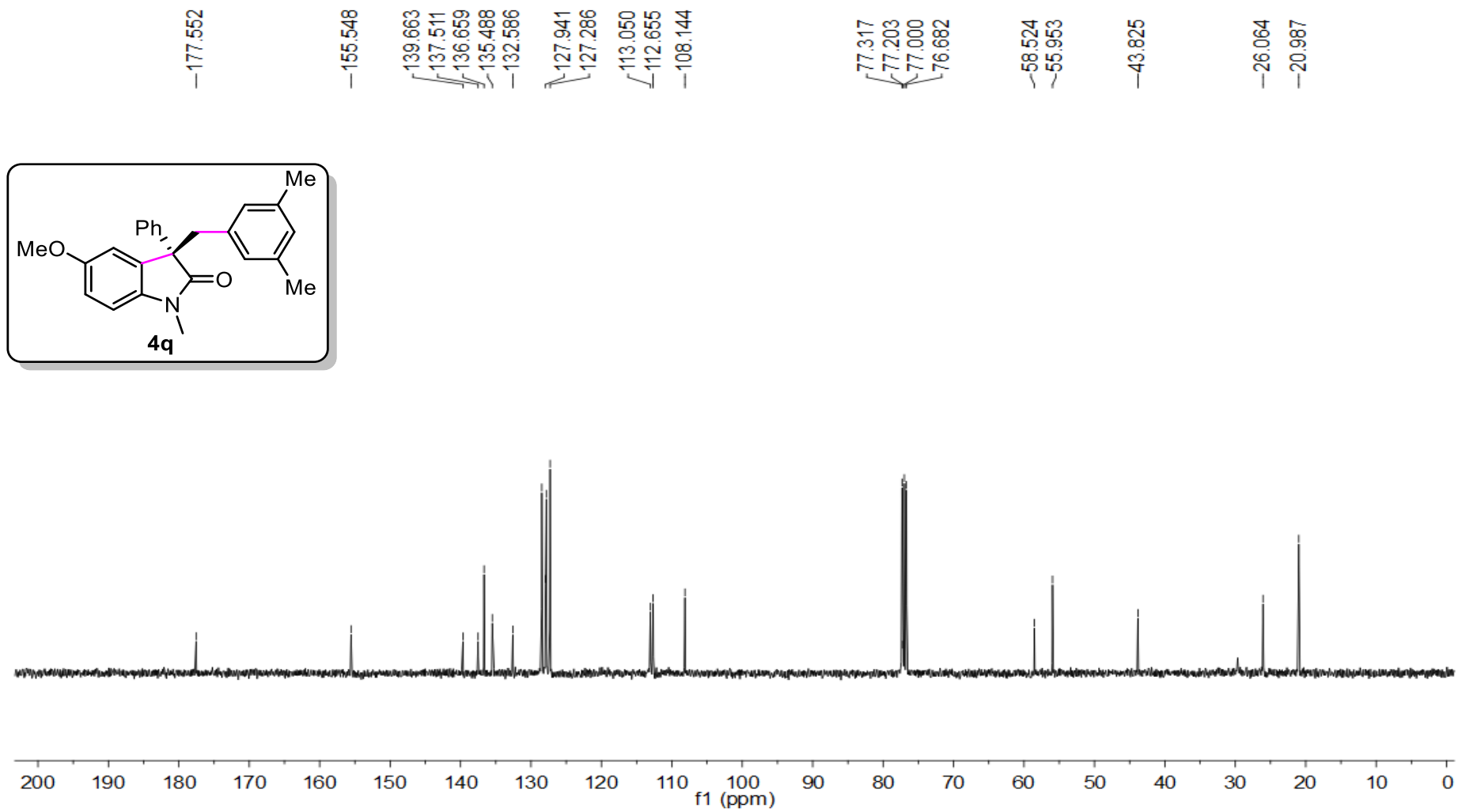
^{13}C NMR (101 MHz, CDCl_3) of compound **4p**



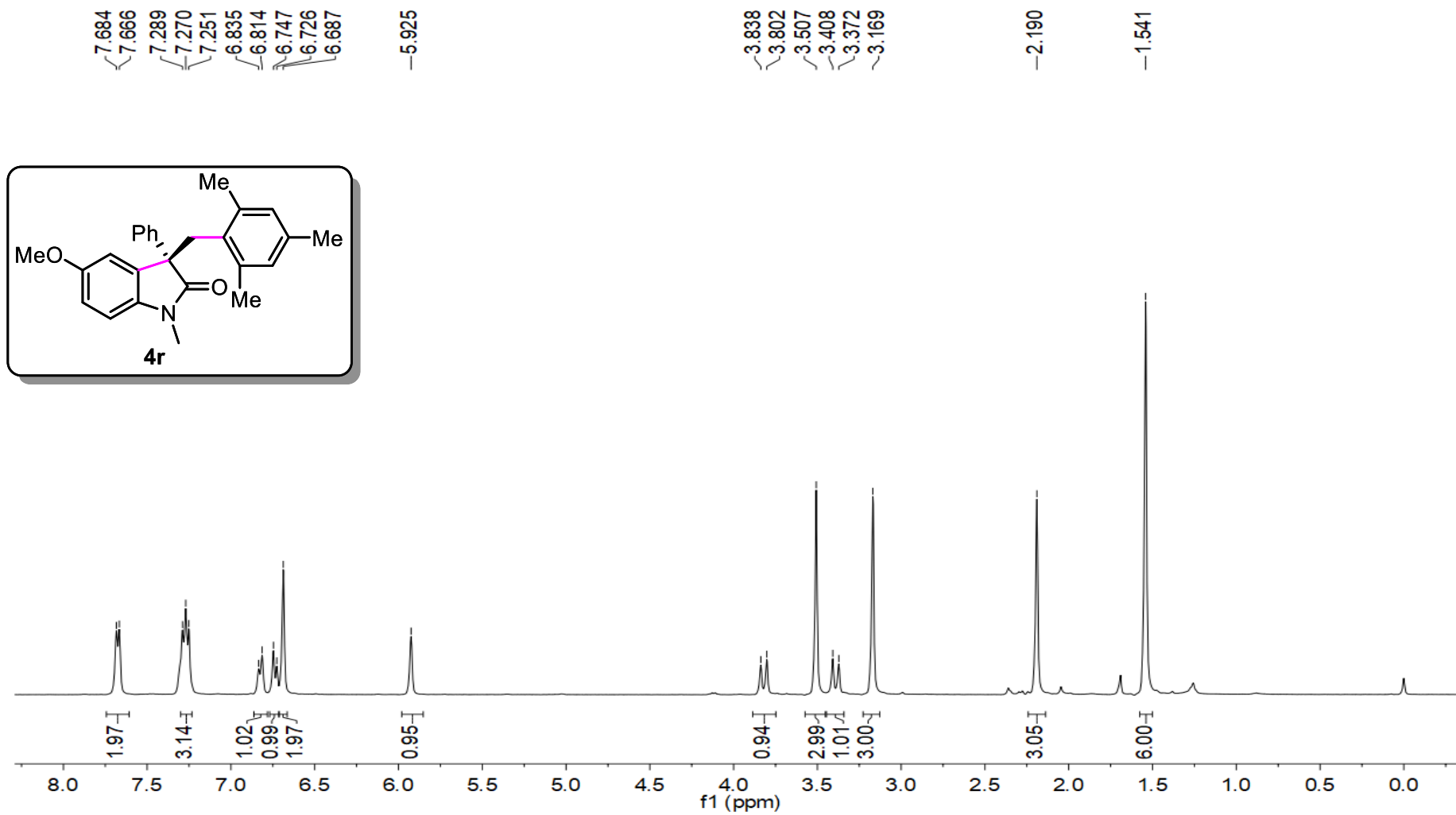
^1H NMR (400 MHz, CDCl_3) of compound **4q**



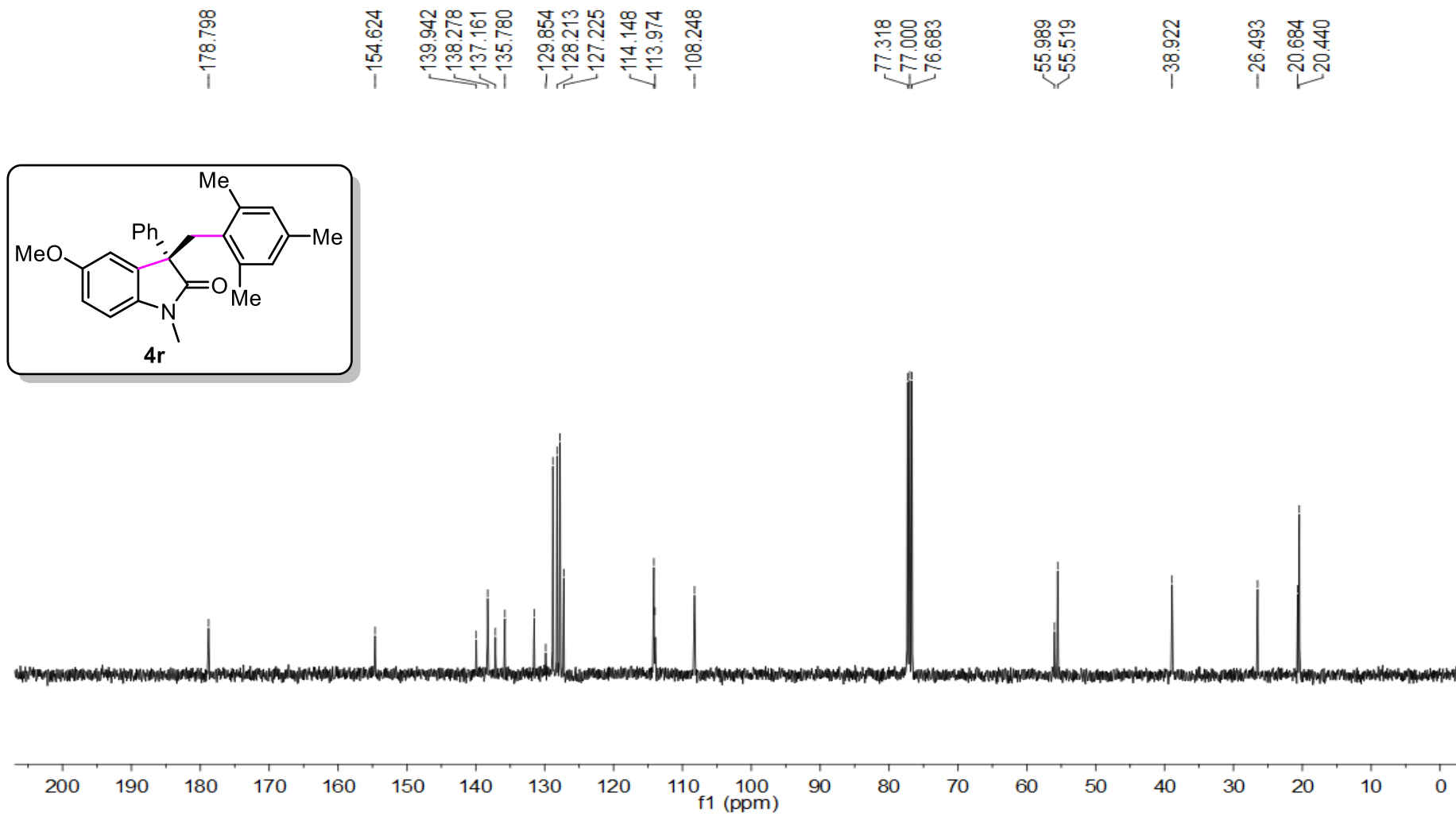
^{13}C NMR (101 MHz, CDCl_3) of compound **4q**



^1H NMR (400 MHz, CDCl_3) of compound **4r**



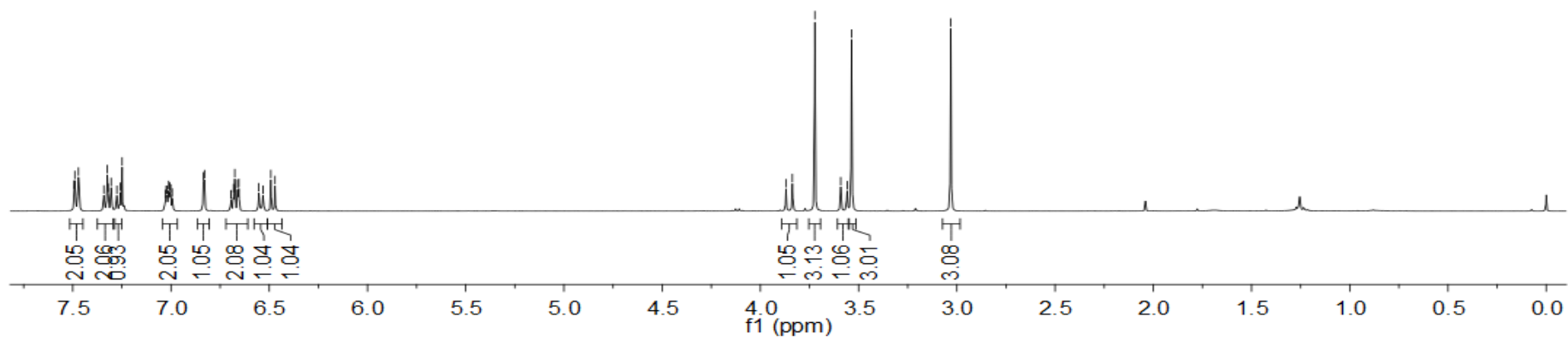
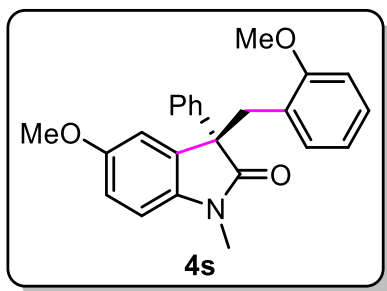
^{13}C NMR (101 MHz, CDCl_3) of compound **4r**



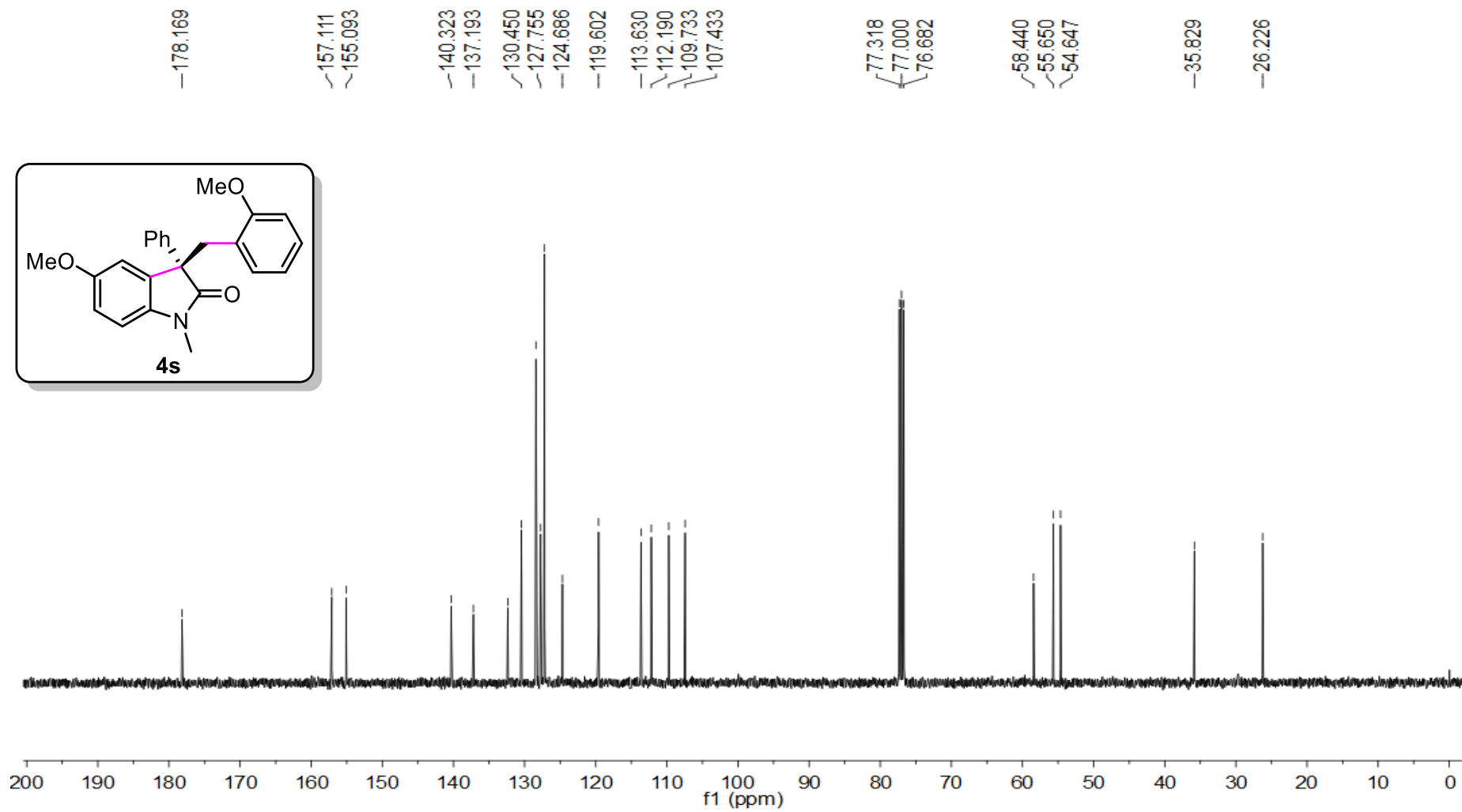
^1H NMR (400 MHz, CDCl_3) of compound **4s**

7.489
7.342
7.320
7.276
7.249
-6.994
-6.836
-6.829
-6.695
-6.693
-6.682
-6.675
-6.661
-6.655
-6.553
-6.532
-6.492
-6.471

3.869
3.837
3.723
3.591
3.558
3.536
-3.031

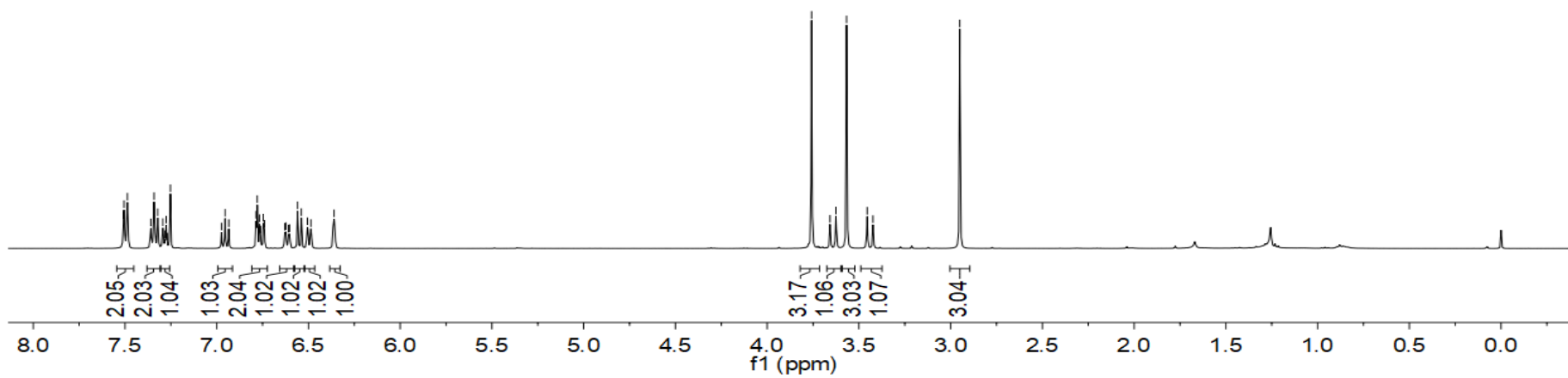
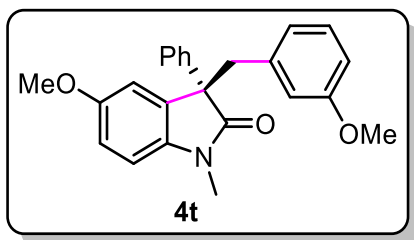


^{13}C NMR (101 MHz, CDCl_3) of compound **4s**

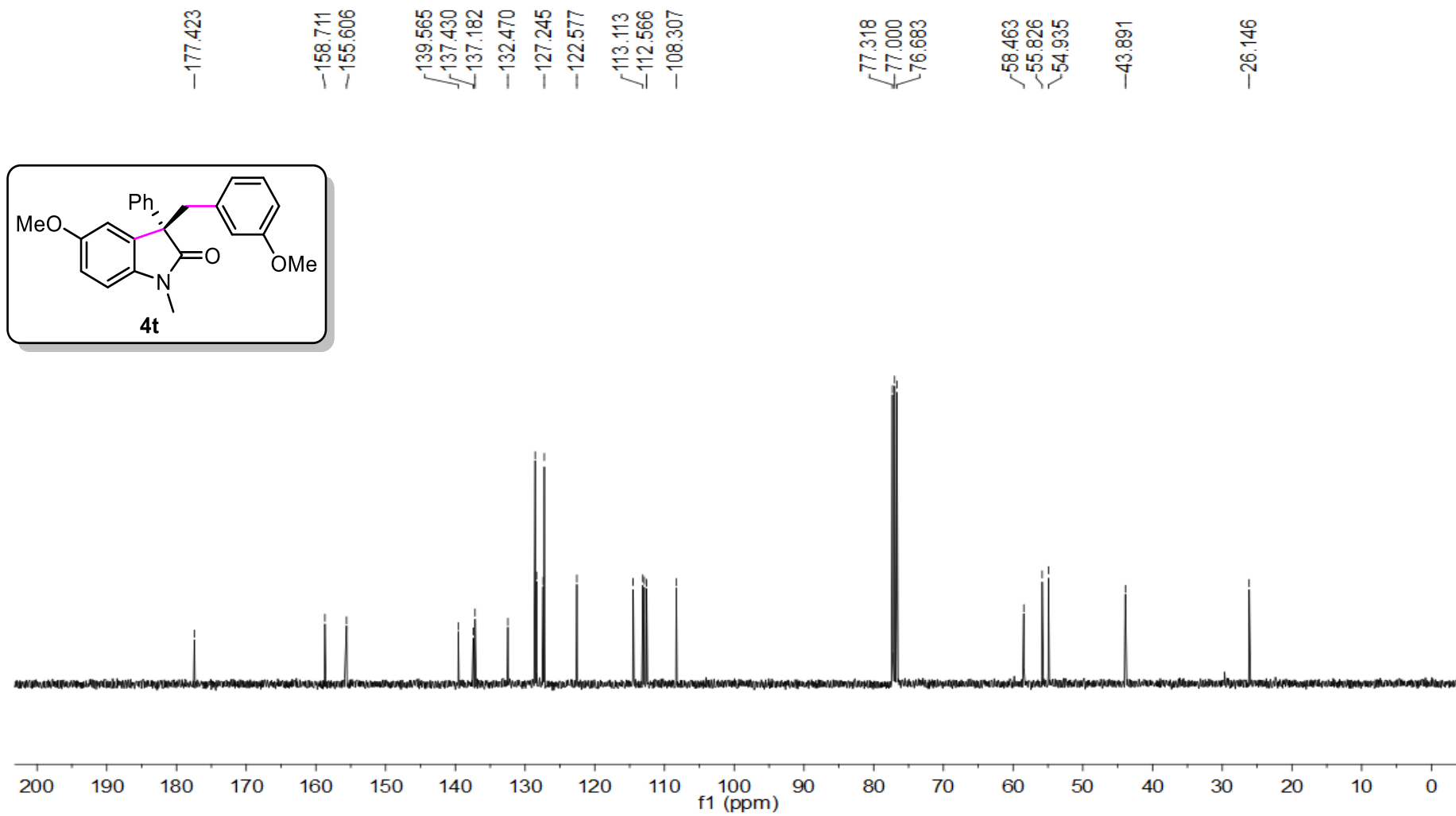


^1H NMR (400 MHz, CDCl_3) of compound **4t**

7.509
7.506
7.487
7.359
7.341
7.322
7.294
7.281
7.276
7.252
6.974
6.954
6.935
6.785
6.779
6.767
6.761
6.746
6.740
6.629
6.623
6.609
6.603
6.560
6.539
6.505
6.487
6.361
3.758
3.657
3.625
3.567
3.455
2.650



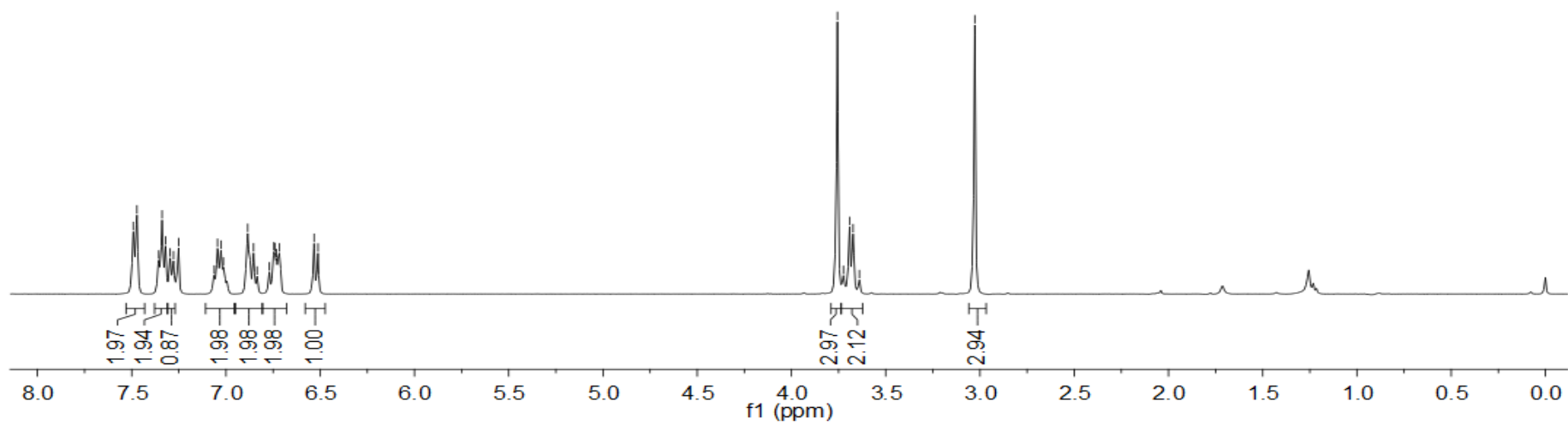
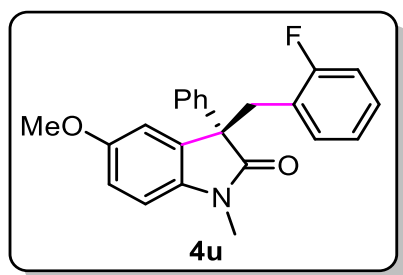
^{13}C NMR (101 MHz, CDCl_3) of compound **4t**



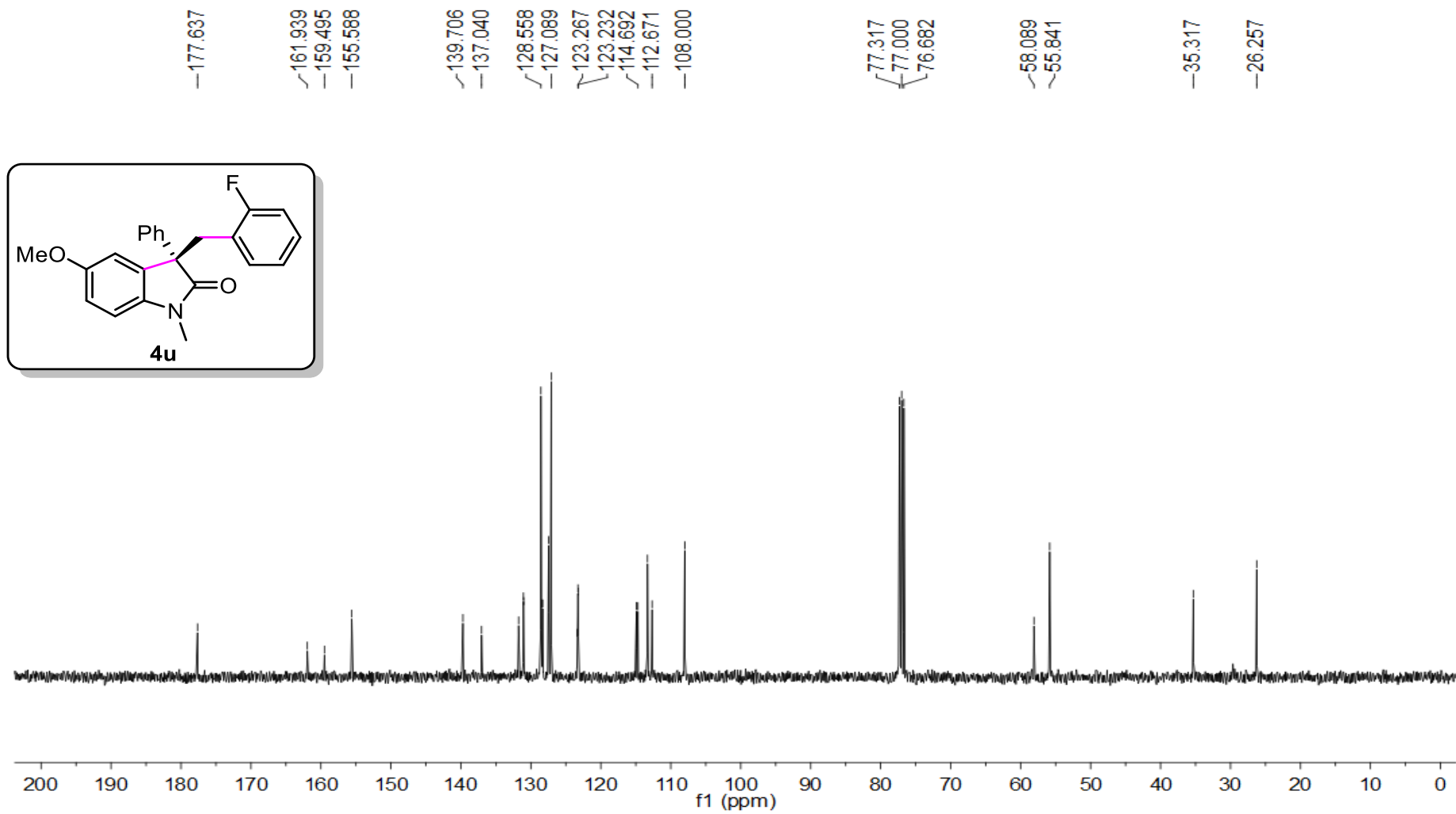
^1H NMR (400 MHz, CDCl_3) of compound **4u**

7.472
7.357
7.339
7.320
7.296
7.278
7.251
7.014
6.770
6.718
6.533
6.512

3.756
3.725
3.692
3.673
3.640
3.027

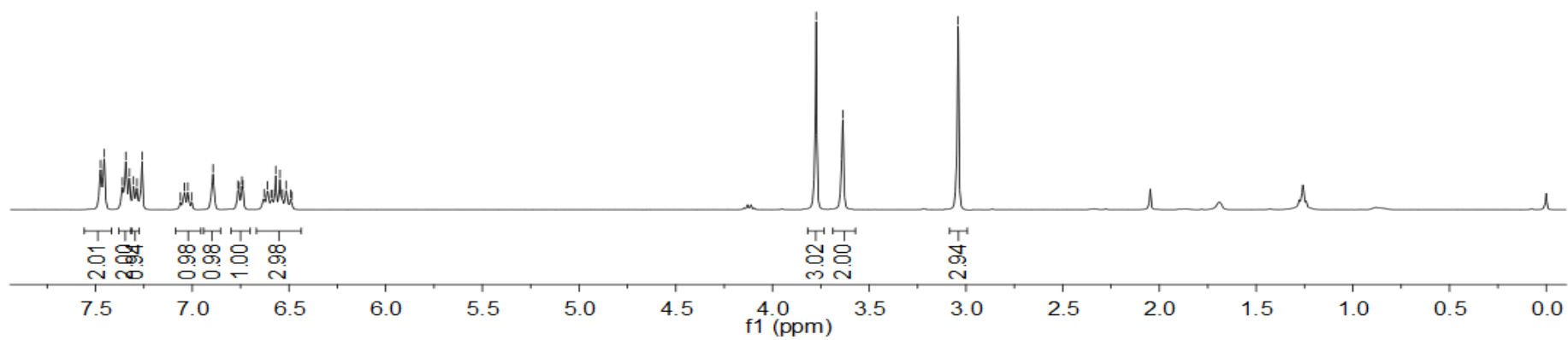
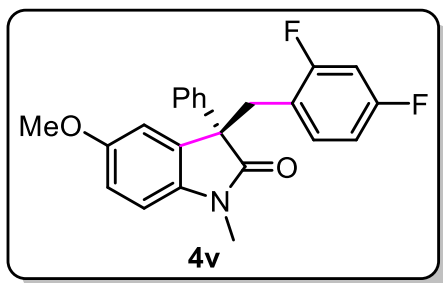


^{13}C NMR (101 MHz, CDCl_3) of compound **4u**

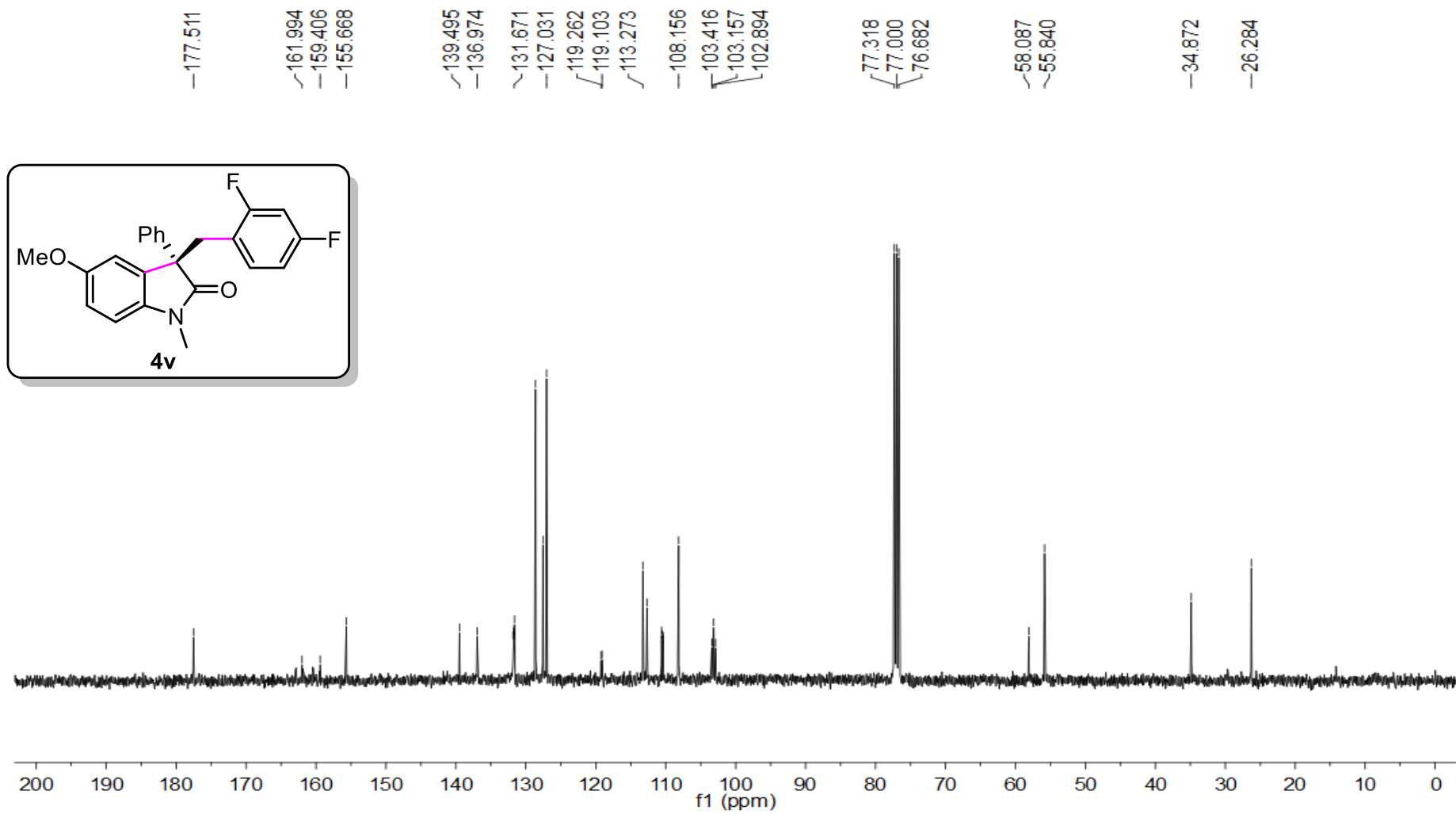


^1H NMR (400 MHz, CDCl_3) of compound **4v**

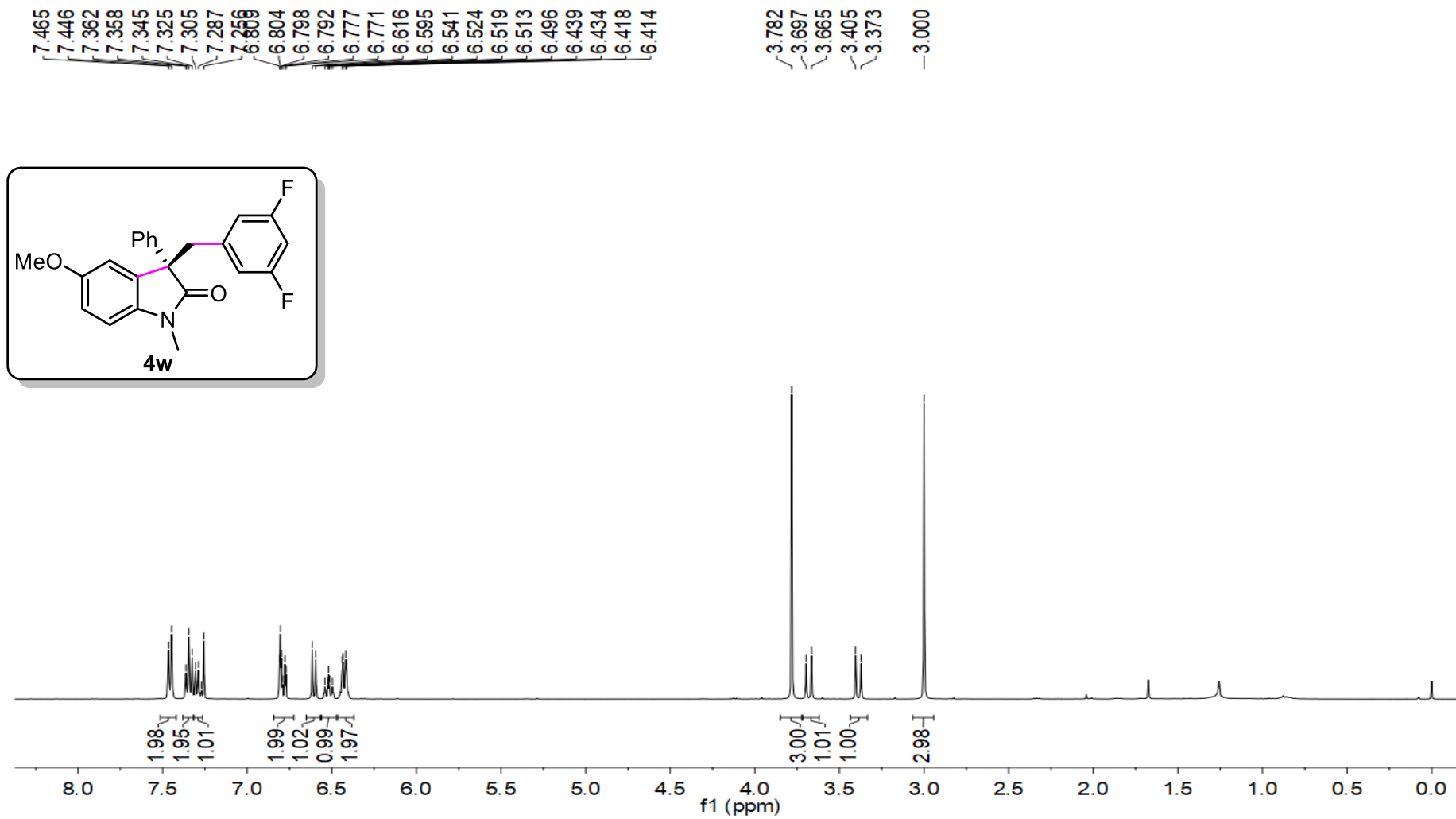
7.455
7.324
7.303
7.286
7.259
6.892
6.758
6.743
6.737
6.628
6.612
6.591
6.586
6.568
6.547
6.533
6.515
6.492
6.486
-3.774
-3.637
-3.040



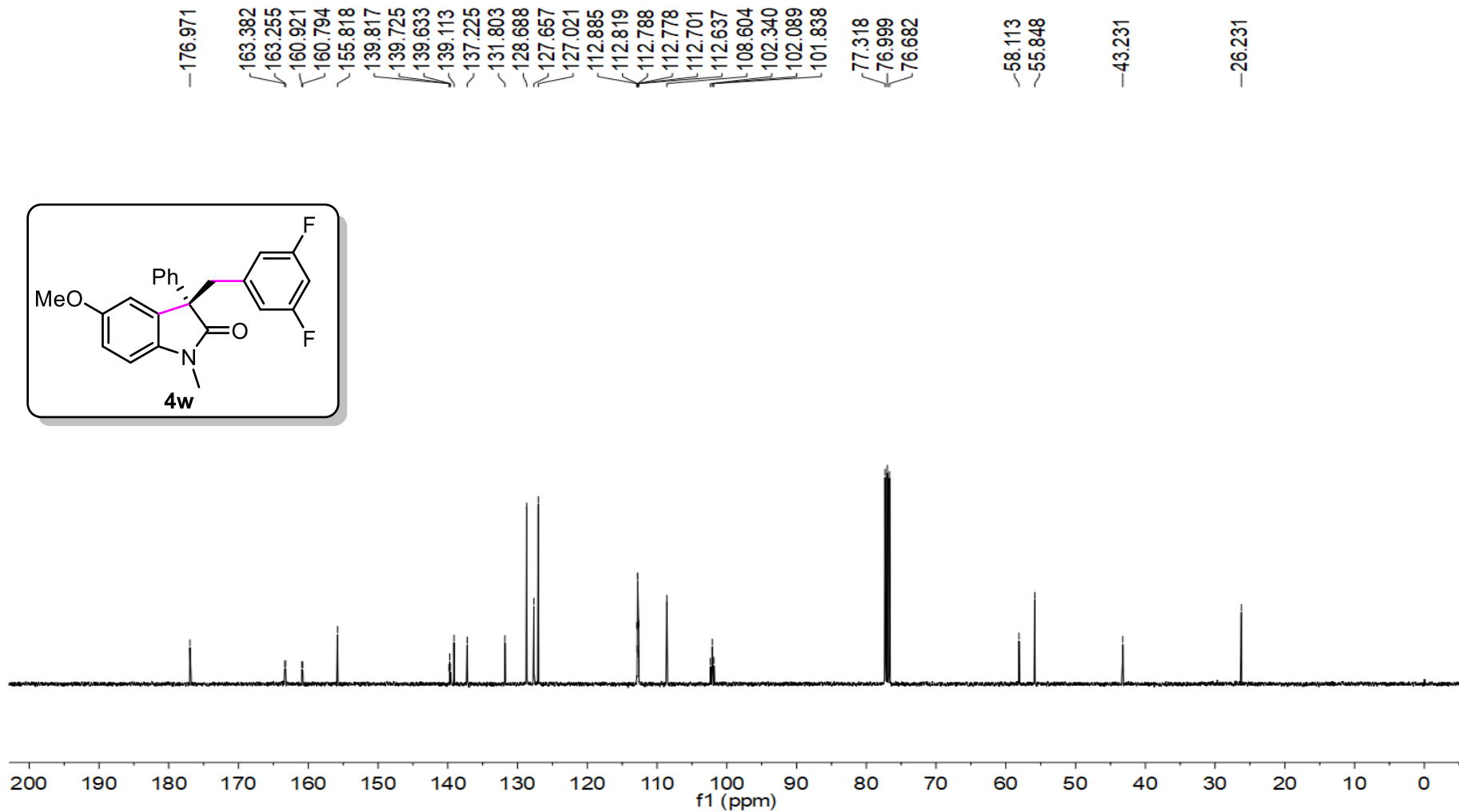
^{13}C NMR (101 MHz, CDCl_3) of compound **4v**



^1H NMR (400 MHz, CDCl_3) of compound **4w**

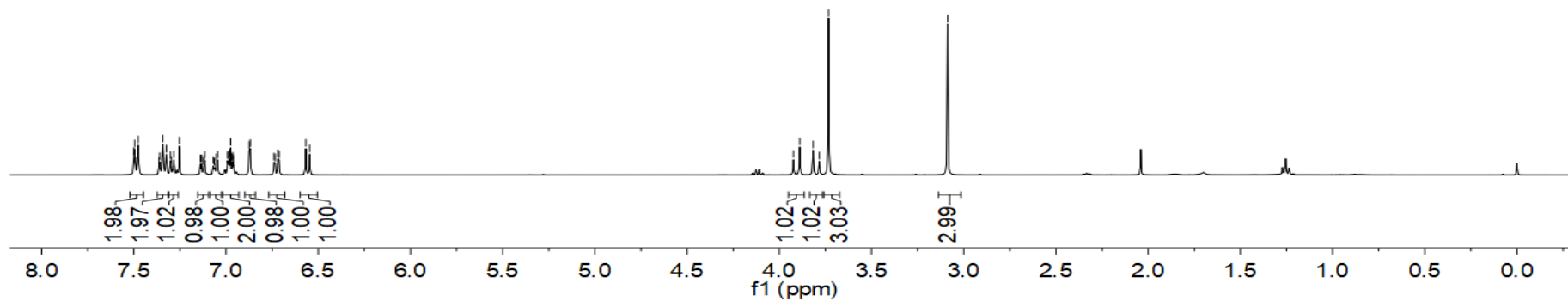
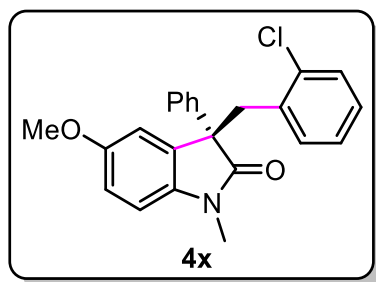


^{13}C NMR (101 MHz, CDCl_3) of compound **4w**

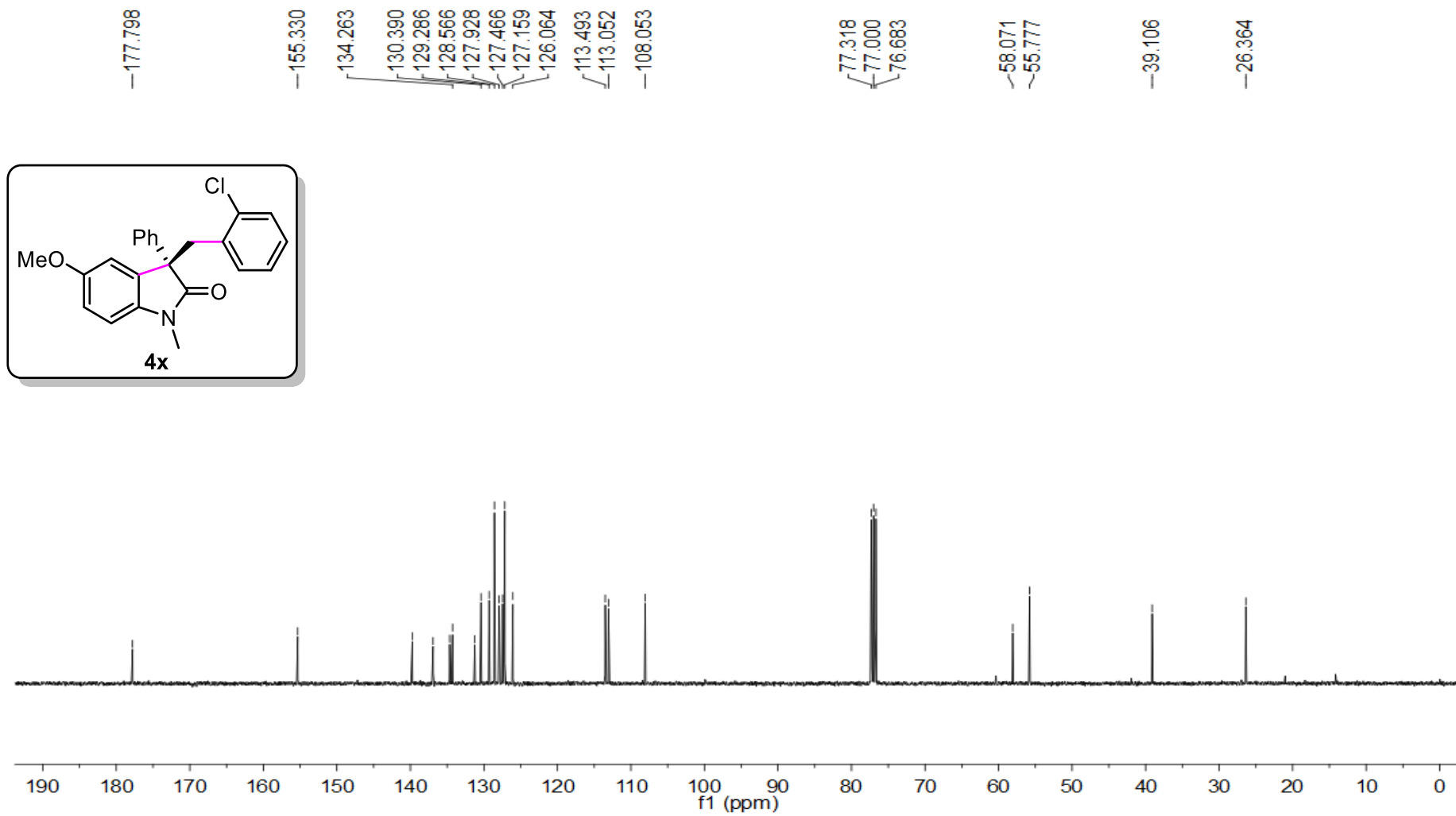


^1H NMR (400 MHz, CDCl_3) of compound **4x**

7.499
7.496
7.491
7.477
7.363
7.361
7.343
7.324
7.301
7.298
7.283
7.253
7.139
7.133
7.123
7.120
7.116
7.069
7.064
7.053
7.046
6.992
6.986
6.982
6.976
6.968
6.964
6.960
6.875
6.868
6.740
6.733
6.719
6.712
6.568
6.547
3.923
3.890
3.817
3.783
3.733
3.088

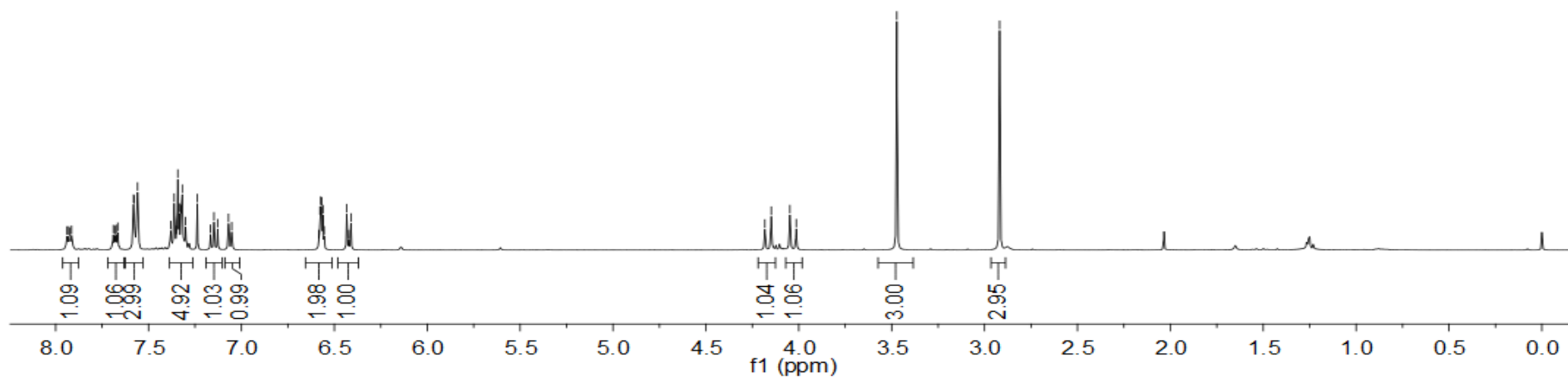
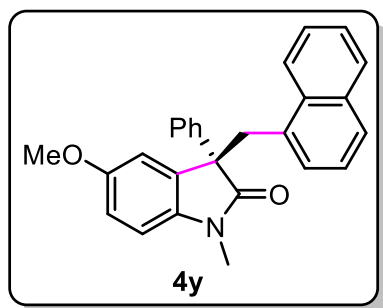


^{13}C NMR (101 MHz, CDCl_3) of compound **4x**

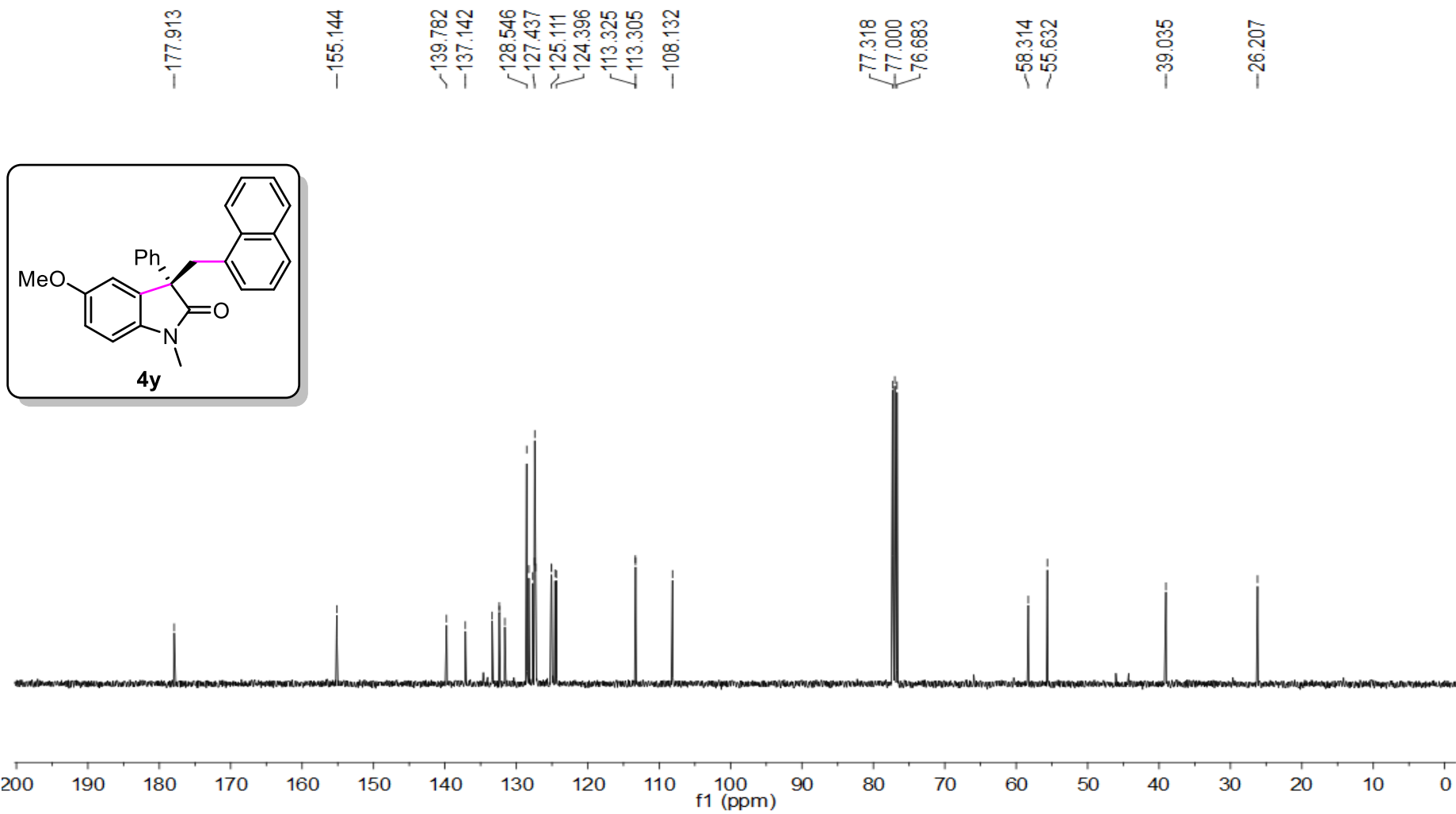


^1H NMR (400 MHz, CDCl_3) of compound **4y**

7.930
7.923
7.914
7.559
7.362
7.166
7.052
6.584
6.578
6.573
6.567
6.561
6.555
6.433
6.422
6.410
4.183
4.148
4.048
4.013
3.472
2.919



^{13}C NMR (101 MHz, CDCl_3) of compound **4y**

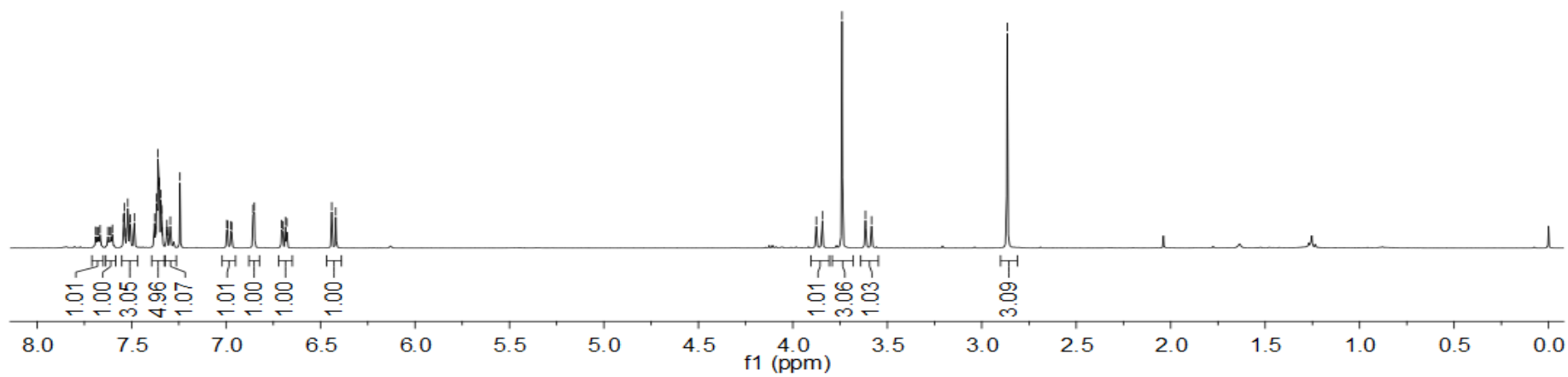
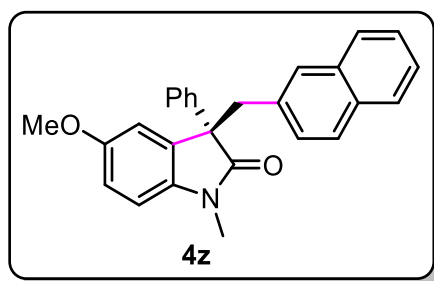


^1H NMR (400 MHz, CDCl_3) of compound **4z**

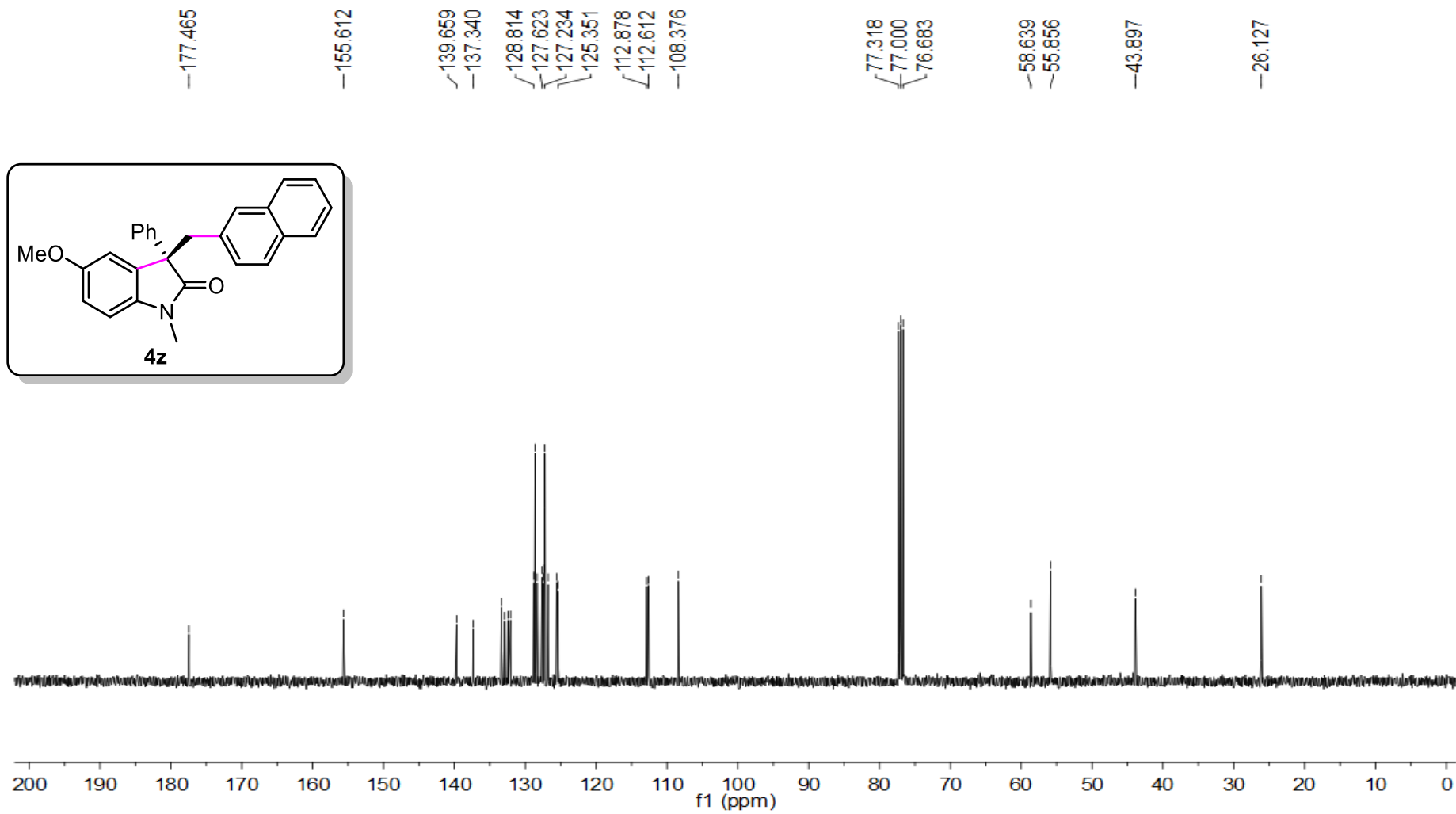
7.666
7.602
7.520
7.373
7.354
7.316
7.244
6.974
6.850
6.679
6.440
6.419

3.876
3.844
3.739
3.615
3.583

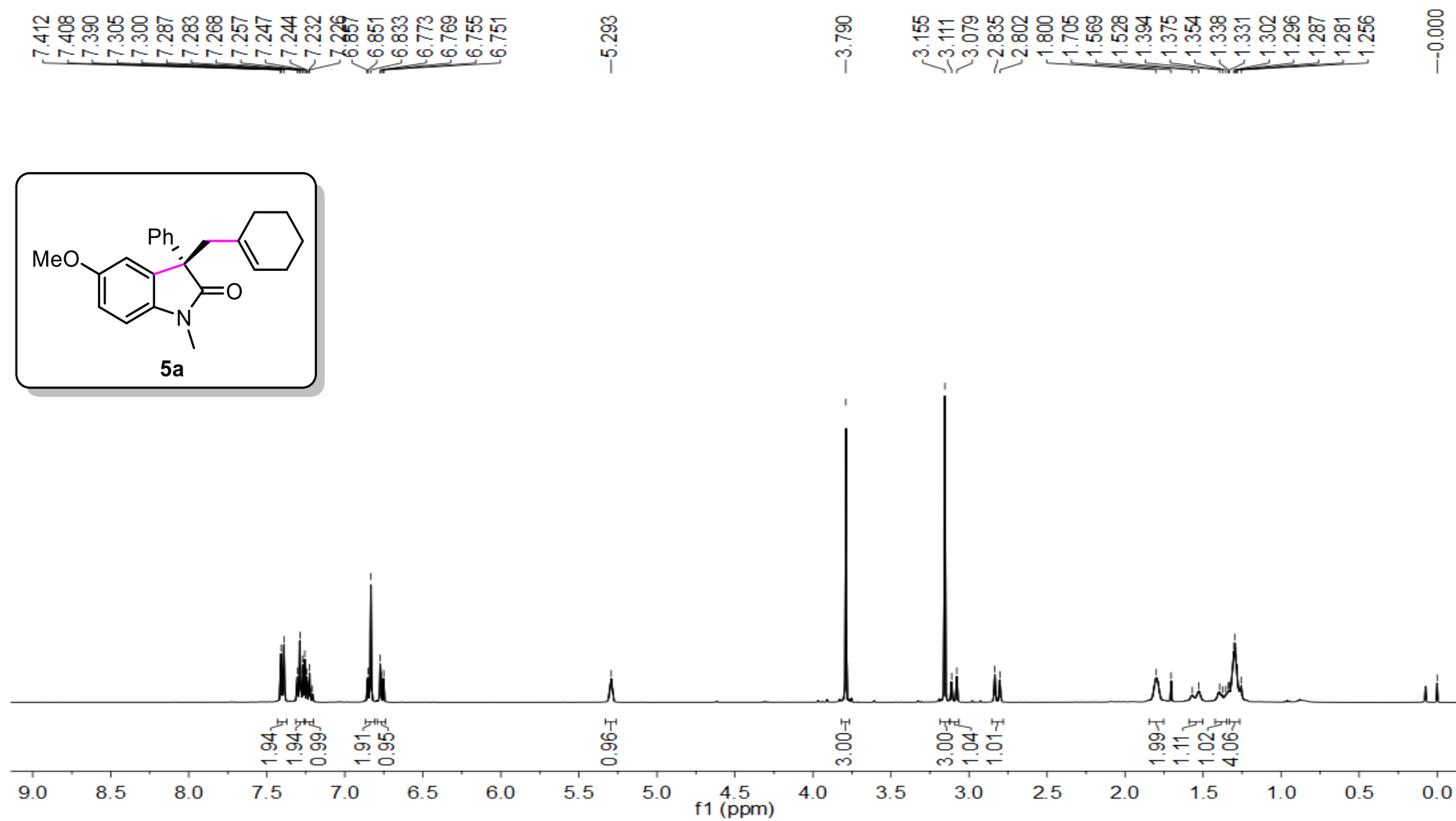
2.865



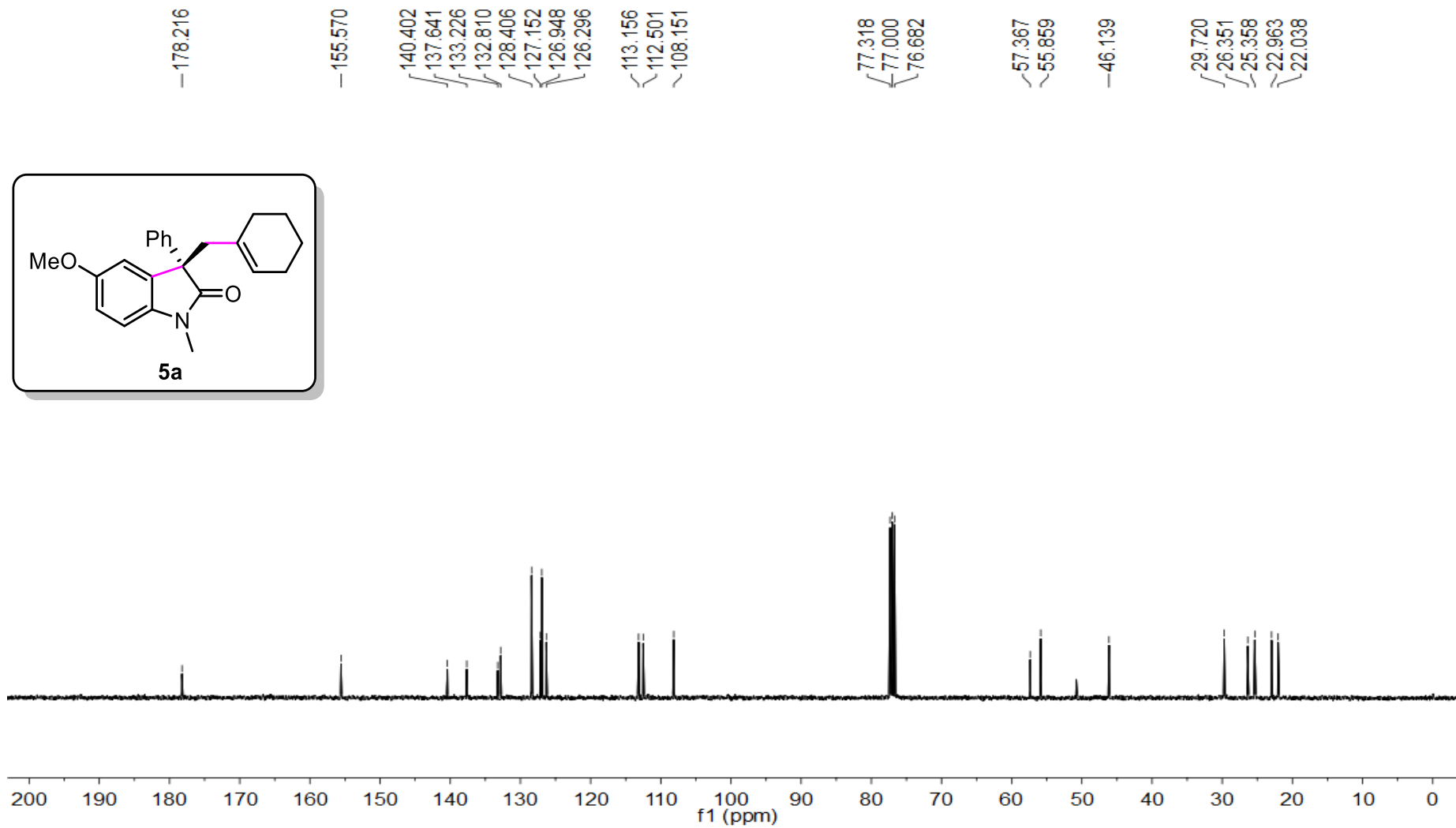
^{13}C NMR (101 MHz, CDCl_3) of compound **4z**



^1H NMR (400 MHz, CDCl_3) of compound **5a**



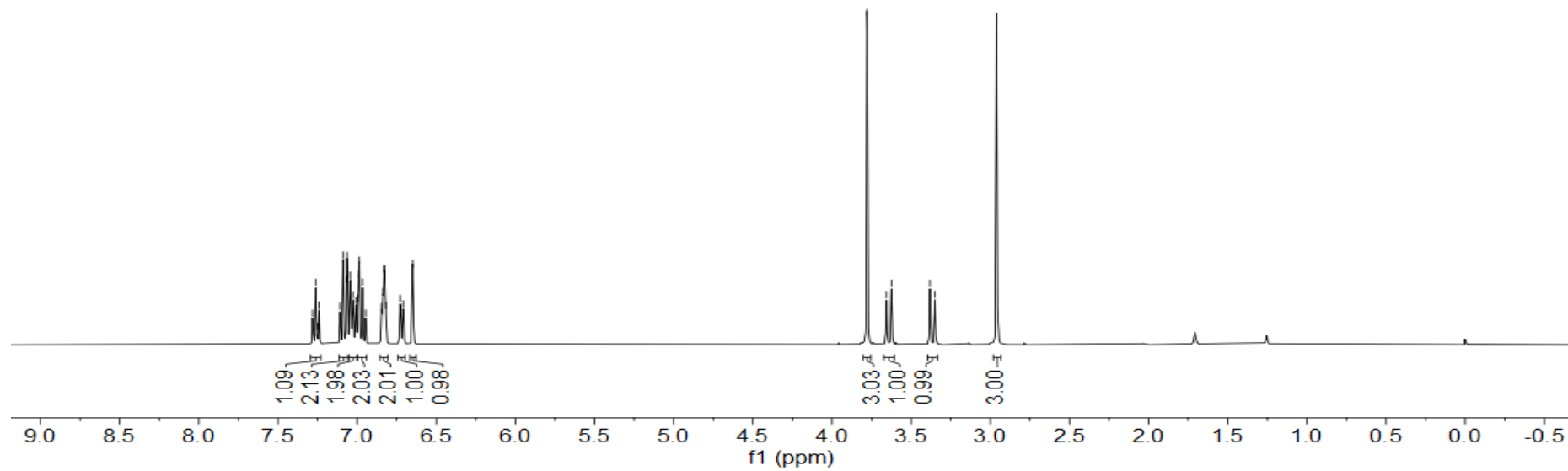
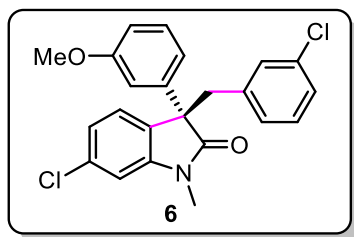
^{13}C NMR (101 MHz, CDCl_3) of compound **5a**



¹H NMR (400 MHz, CDCl₃) of compound **6**

7.281
7.261
7.251
7.241
7.109
7.089
7.068
7.064
7.045
7.041
7.027
7.007
6.995
6.990
6.985
6.966
6.946
6.846
6.837
6.831
6.826
6.818
6.728
6.709
6.652
6.648

3.779
3.656
3.624
3.382
3.350
-2.960



^{13}C NMR (101 MHz, CDCl_3) of compound **6**

