Supporting Information for

ArPNO Catalyzed Acylative Kinetic Resolutions of Tertiary Alcohols: Access to 3-Hydroxy-3-Substituted Oxindoles

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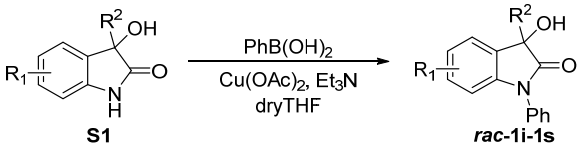
Contents

1. General information

All reactions were carried out in oven-dried tube, and monitored by thin layer chromatography (TLC). All reagents were reagent grade quality and purchased from commercial sources unless otherwise indicated. ^{1}H NMR spectra were recorded on commercial instruments (400/600 MHz). Data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, sep = septet, br = broad, m = multiplet), coupling constants (Hz), integration. ^{13}C NMR data were collected on commercial instruments (100/150 MHz) with complete proton decoupling. Chemical shifts are reported in ppm from the tetramethylsilane with the solvent resonance as internal standard. Coupling constants (*J*) are reported in Hz. Enantiomer excesses were determined by chiral HPLC analysis on Chiralcel ODH/IA/ID in comparison with the authentic racemates. Chiral HPLC analysis recorded on Thermo scientific Dionex Ultimate 3000. Optical rotations were reported as follows: $[\alpha]_D^T$ (c: = g/100mL, in solvent). Optical rotations recorded on Autopol Automatic Polarimeter. All products were further characterized by high-resolution mass spectra (HRMS). The HRMS was obtained using a Q-TOF instrument equipped with an ESI source. All the solvents were purified by usual methods before use. The starting materials *rac*-**1a-1f**[1]、*rac*-**1t**[1] and *rac*-**1g**[2] were prepared according to the literature procedures. Catalyst **6a-6g** were prepared according to the literature procedures[3].

2. Synthesis of staring materials

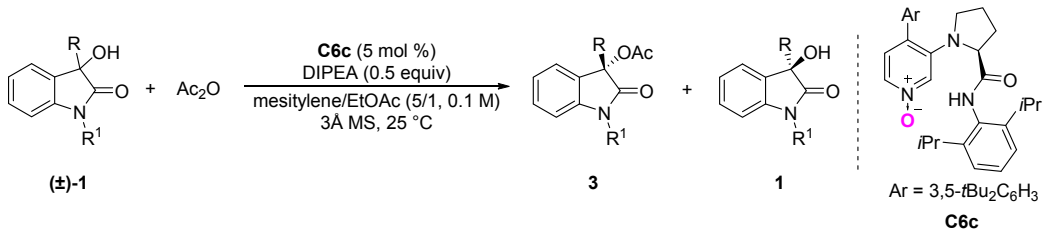
Synthesis of substrates *rac*-**1i-1s, 1h**



Materials **S1** were prepared according to the literature[1].

According to reference[4], material **S1** (3.0 mmol), $PhB(OH)_2$ (683.8 mg, 4.5 mmol), $Cu(OAc)_2$ (598.9 mg, 3.0 mmol) and Et_3N (834 μL, 6.0 mmol) were dissolved in THF (30 mL). The reaction was stirred at room temperature under anhydrous conditions. After the reaction was complete (monitoring by TLC), the reaction mixture was filtered through a pad of celite. The solids were washed with EtOAc for many times. The residue was purified by flash column chromatography on silica gel (eluent: ether/ethyl acetate = 9/1 to 4/1, v/v) to give *rac*-**1i-1s** as white solids.

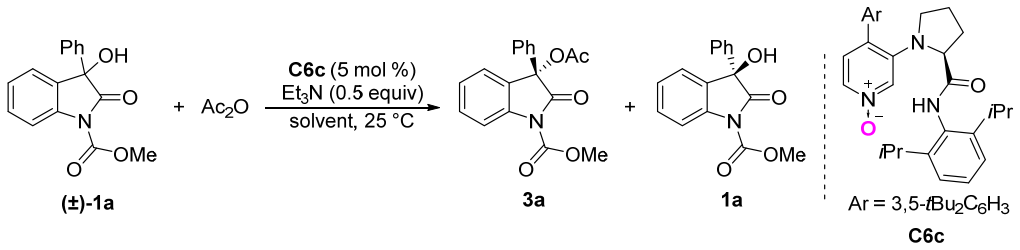
3. General procedure for kinetic resolution of 3-hydroxy-3-substituted oxindole



In a test tube, (±)-**1** (0.1 mmol), **C6c** (2.7 mg, 5 mol %), and 3Å MS (10 mg) were added. Then, mesitylene/EtOAc (5/1, v/v, 1 mL), DIPEA (6.5 mg, 0.5 equiv), and acetic anhydride (15.3 mg, 1.5 equiv) were added successively. The reaction was stirred under air at 25 ^{o}C for 35-60 h. After the reaction was complete (monitoring by TLC), the reaction solution was quenched with methanol. Subsequently, the reaction mixture was concentrated under vacuum. The residue was purified by flash column chromatography on silica gel (eluent: ether/ethyl acetate = 15/1 to 5/1, v/v) to give the recovered alcohol **1a–t** and acylated products **3a–t**. The enantiomeric ratios of **1a–t** and **3a–t** were determined by chiral HPLC analysis. Conversion was determined by enantiomeric excess (ee) of **1** and **3**. *s*-Factors were calculated by Kagan's equation[5].

4. Screening of the solvent

Table S1 Screening of the solvents[a]

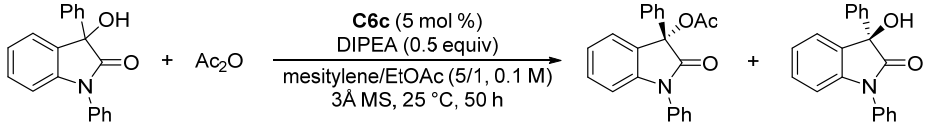


entry	solvent	t (h)	ee (**3a**) (%)[b]	ee (**1a**) (%)[b]	conv (%)[c]	*s*[d]
1	toluene	10	89	-	-	-
2	PhF	10	80	-	-	-
3	$PhCF_3$	10	78	-	-	-
4	mesitylene	10	91	-	-	-
5	mesitylene/EtOAc = 1:1	10	83	17	17	13
6	mesitylene/EtOAc = 2:1	10	87	25	22	21
7	mesitylene/EtOAc = 4:1	21	84	37	31	15
8	mesitylene/EtOAc = 5:1	21	87	37	30	29
9	mesitylene/EtOAc = 5:1	36	84	58	41	20
10	mesitylene/EtOAc = 6:1	36	83	50	38	16
11	mesitylene/EtOAc = 5:1	72	81	77	49	22

[a]Reaction conditions: (±)-**1a** (0.1 mmol), Ac_2O (0.75 equiv), **C6c** (5 mol %), Et_3N (0.5 equiv), solvent (1 mL) under air at 25 °C. [b]Determined by chiral HPLC analysis. [c]Conversion was determined by enantiomeric excess (ee) of **1a** and **3a**. [d]s-Factors were calculated by Kagan's equation.[5]

Note: Due to the poor solubility of alcohol **1a** in toluene, PhF, $PhCF_3$ and mesitylene, the ee value of recovered alcohol **1a** could not be determined accurately, and only the ee value ester product **3a** could be provided.

5. Gram-scale synthesis of 1i

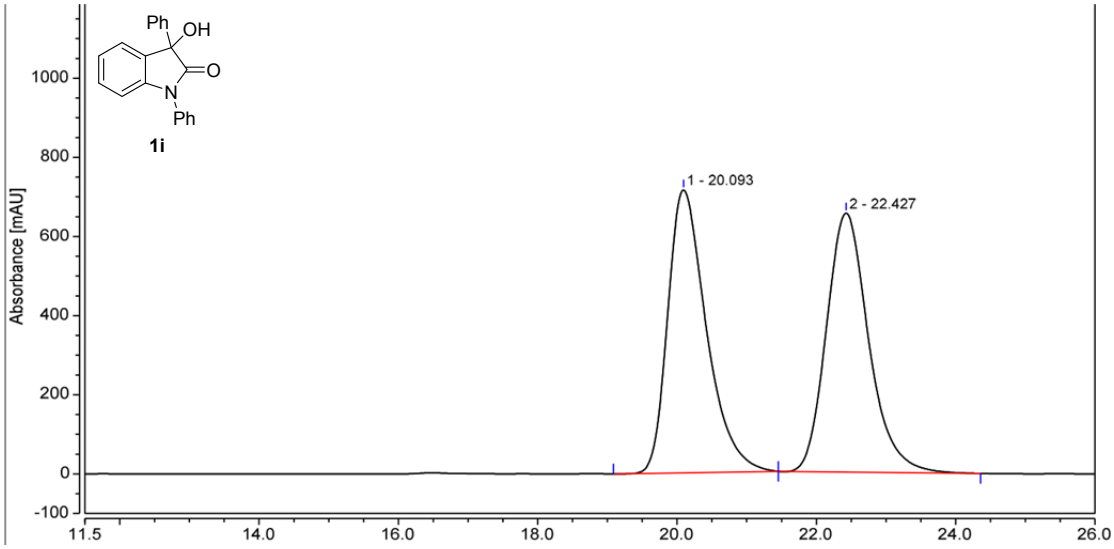


Scheme S4

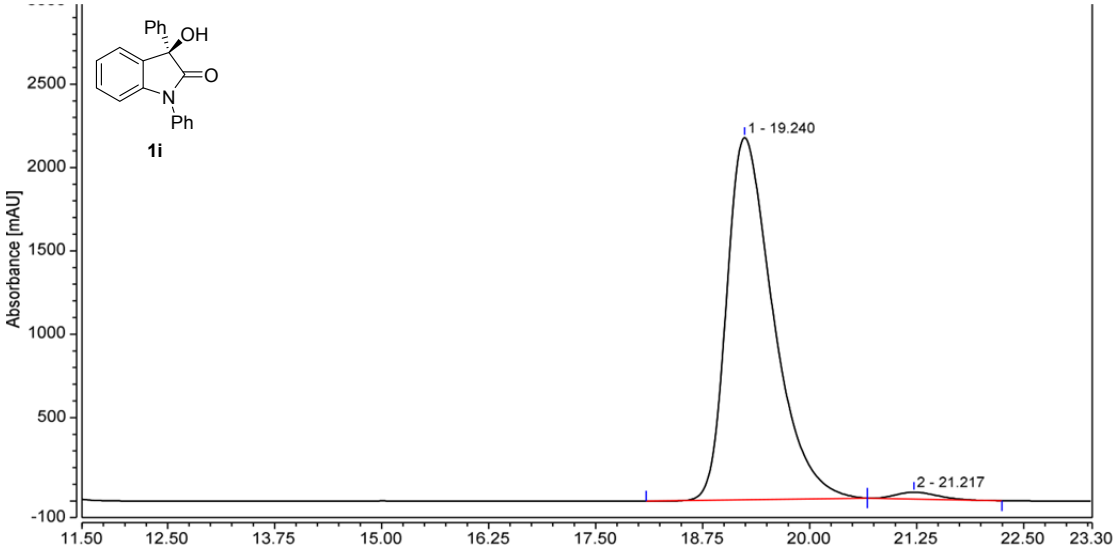
In a round-bottomed flask, (±)-**1i** (1.054 g, 3.5 mmol), **C6c** (2.7 mg, 5 mol %), and 3Å MS (10 mg) were added. Then, mesitylene/EtOAc (5/1, v/v, 35 mL), DIPEA (226.2 mg, 1.7 mmol), and acetic anhydride (0.536 g, 5.3 mmol) were added successively. The reaction was stirred under air at 25 °C for 50 h. After the reaction was complete (monitoring by TLC), The reaction solution was

quenched with methanol. Subsequently, the reaction mixture was concentrated under vacuum. The residue was purified by flash column chromatography on silica gel (eluent: ether/ethyl acetate = 15/1 to 5/1, v/v) to give the recovered alcohol **1i** (0.4395 g, 42% yield, 97% ee) and acylated products **3i** (0.5865 g, 49% yield, 92% ee). The enantiomeric ratios of **1i** and **3i** were determined by chiral HPLC analysis. Conversion was determined by enantiomeric excess (ee) of **1** and **3**. *s*-Factors were calculated by Kagan's equation.[5]

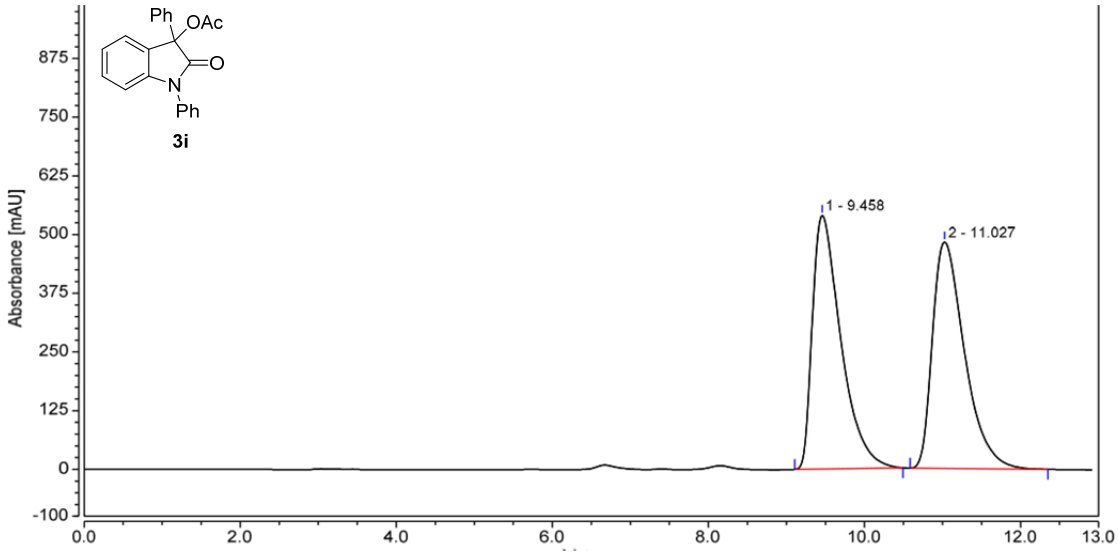
Figure S1. HPLC spectra of **1i/3i** on a gram-scale



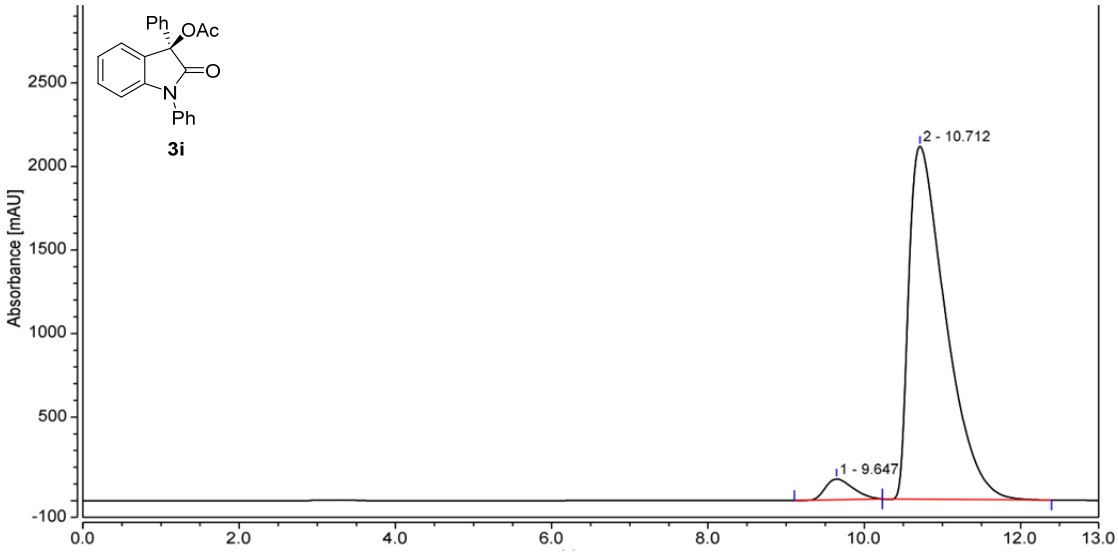
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	20.093	458.397	714.900	49.97	52.20
2	22.427	458.941	654.519	50.03	47.80
Total:		**917.338**	**1369.419**	**100.00**	**100.00**



Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	19.240	1368.286	2173.328	98.37	98.16
2	21.217	22.640	40.808	1.63	1.84
Total:		**1390.926**	**2214.136**	**100.00**	**100.00**



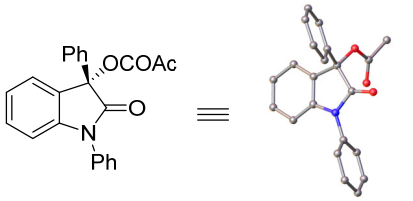
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.458	228.468	540.519	49.85	52.83
2	11.027	229.859	482.641	50.15	47.17
Total:		**458.327**	**1023.159**	**100.00**	**100.00**



Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.647	51.336	124.683	4.26	5.57
2	10.712	1153.594	2112.366	95.74	94.43
Total:		**1204.930**	**2237.049**	**100.00**	**100.00**

6. The X-ray data for product 3i

Recrystallization in petroleum ether/ethyl acetate afforded crystals suitable for X-ray analysis.



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

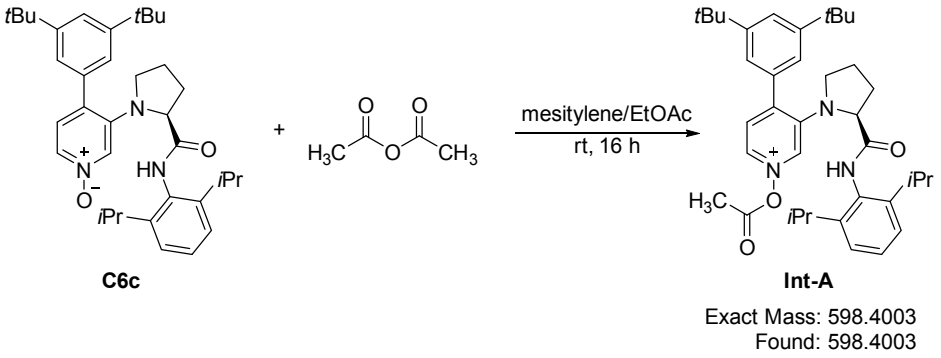
CCDC: 2168306

Table S1 Crystal data and structure refinement for 3i.

Identification code	**3i**
Empirical formula	$C_{22}H_{17}NO_3$
Formula weight	343.39
Temperature/K	189.99(10)
Crystal system	orthorhombic
Space group	$P2_12_12_1$
a/Å	8.30180(10)
b/Å	10.53570(10)
c/Å	20.17220(10)
α/°	90
β/°	90
γ/°	90
Volume/Å^3	1764.37(3)
Z	4
ρ_{calc}g/cm^3	1.2926
μ/mm^{-1}	0.697
F(000)	722.3
Crystal size/mm^3	0.09 × 0.06 × 0.04
Radiation	Cu Kα (λ = 1.54184)
2Θ range for data collection/°	8.76 to 143.14
Index ranges	$-10 \le h \le 9$, $-12 \le k \le 12$, $-24 \le l \le 24$
Reflections collected	22801
Independent reflections	3414 [R_{int} = 0.0336, R_{sigma} = 0.0176]
Data/restraints/parameters	3414/0/236
Goodness-of-fit on F^2	1.103
Final R indexes [I>=2σ (I)]	R_1 = 0.0340, wR_2 = 0.0863
Final R indexes [all data]	R_1 = 0.0345, wR_2 = 0.0868
Largest diff. peak/hole / e Å^{-3}	0.13/-0.26
Flack parameter	-0.14(13)

7. HRMS analysis

A mixture of **C6c** and acetic anhydride was stirred in mesitylene/EtOAc (5/1, v/v, 0.5 mL) at rt for 16 h.



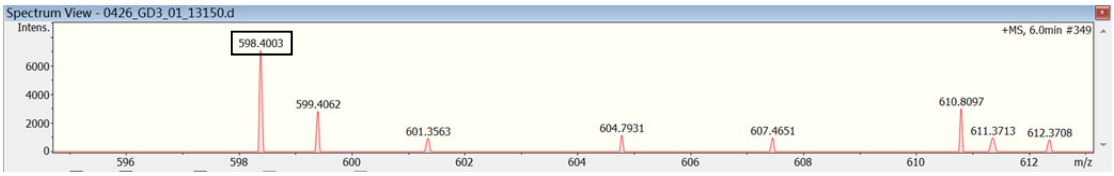
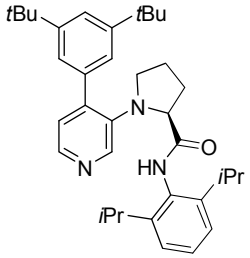


Figure S2. HRMS experiment

8. The analytical and spectral characterization data for Catalyst 7c, 6h, 6i

(*S*)-1-(4-(3,5-Di-*tert*-butylphenyl)pyridin-3-yl)-N-(2,6-diisopropylphenyl)pyrrolidine-2-carboxamide（C7c）



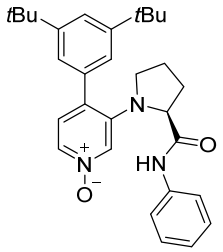
White solid, m.p.: 77.3-79.0 °C. R_f = 0.35 (CH_2Cl_2/MeOH, 30/1, v/v). $[\alpha]_D^{26}$ = -64.6 (c = 0.07, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.52 (s, 1H), 8.34 (d, *J* = 4.8 Hz, 1H), 7.68 (s, 1H), 7.26 (t, *J* = 8.4 Hz, 3H), 7.21 (d, *J* = 4.8 Hz, 1H), 7.12 (d, *J* = 7.8 Hz, 2H), 4.33 (t, *J* = 7.8 Hz, 2H), 3.26 – 3.22 (m, 1H), 2.89 – 2.85 (m, 2H), 2.55 – 2.49 (m, 2H), 2.11 – 2.05 (m, 1H), 1.93 – 1.85 (m, 2H), 1.30 (s, 18H), 1.00 – 0.86 (m, 12H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 172.3, 151.5, 146.3, 143.3, 142.4, 141.2, 139.7, 138.6, 130.3, 128.5, 125.8, 123.4, 122.5, 122.0, 64.2, 54.5, 35.0, 31.6, 31.5, 28.7, 25.1, 23.5.

HRMS (ESI): exact mass calcd for $C_{36}H_{49}N_3NaO^+$ $(M+Na)^+$ requires m/z 562.3768, found m/z 562.3761.

(*S*)-4-(3,5-Di-*tert*-butylphenyl)-3-(2-(phenylcarbamoyl)pyrrolidin-1-yl)pyridine 1-oxide（C6h）



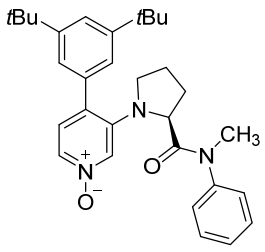
White solid, m.p.: 135.6-138.3 °C. R_f = 0.19 (CH_2Cl_2/MeOH, 30/1, v/v). $[\alpha]_D^{25}$ = -45.3 (c = 0.08, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.82 (s, 1H), 8.35 (d, *J* = 7.8 Hz, 1H), 7.86 (dd, *J* = 6.6, 1.8 Hz, 1H), 7.46 (t, *J* = 7.8 Hz, 1H), 7.32 (d, *J* = 1.8 Hz, 2H), 7.24 (d, *J* = 7.2 Hz, 2H), 7.15 – 7.11 (m, 3H), 6.97 (t, *J* = 7.2 Hz, 1H), 4.24 (t, *J* = 7.2 Hz, 1H), 3.27 – 3.23 (m, 1H), 2.91 – 2.87 (m, 1H), 2.39 – 2.34 (m, 1H), 2.10 – 2.04 (m, 1H), 1.94 – 1.90 (m, 1H), 1.83 – 1.78 (m, 1H), 1.35 (s, 18H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 170.4, 151.4, 145.0, 137.7, 137.4, 132.3, 130.8, 129.5, 128.9, 128.3, 124.2, 123.1, 122.2, 119.8, 64.3, 54.9, 35.1, 31.7, 31.6, 25.2.

HRMS (ESI): exact mass calcd for $C_{30}H_{37}N_3NaO_2^+$ $(M+Na)^+$ requires m/z 494.2778, found m/z 494.2776.

(*S*)-4-(3,5-Di-*tert*-butylphenyl)-3-(2-(methyl(phenyl)carbamoyl)pyrrolidin-1-yl)pyridine 1-oxide（C6i）



White solid, m.p.: 97.9-101.2 °C. R_f = 0.24 (CH_2Cl_2/MeOH, 30/1, v/v). $[\alpha]_D^{25}$ = +34.7 (c = 0.2, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.92 (s, 1H), 7.79 (d, *J* = 4.8 Hz, 1H), 7.48 (s, 1H), 7.38 (s, 2H), 7.30 – 7.28 (m, 3H), 7.03 (d, *J* = 4.8 Hz, 1H), 6.70 (s, 2H), 4.28 (t, *J* = 7.2 Hz, 1H), 3.35 – 3.31 (m, 1H), 3.12 (s, 2H), 3.08 (t, *J* = 7.8 Hz, 1H), 1.85 – 1.81 (m, 1H), 1.76 – 1.69 (m, 1H), 1.68 – 1.56 (m, 1H), 1.33 (s, 18H).

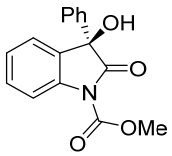
^{13}C NMR (150 MHz, $CDCl_3$) δ 171.8, 151.1, 144.3, 142.6, 137.9, 129.9, 129.8, 129.3, 128.9, 127.9, 127.5, 122.9, 121.7, 59.3, 51.5, 37.8, 35.0, 31.5, 31.2, 24.4.

HRMS (ESI): exact mass calcd for $C_{31}H_{39}N_3NaO_2^+$ $(M+Na)^+$ requires m/z 508.2934, found m/z 508.2931.

9. The analytical and spectral characterization data for products

(*R*)-Methyl 3-hydroxy-2-oxo-3-phenylindoline-1-carboxylate（1a）

(Known compound, see: H. Mandai, R. Shiomoto, K. Fujii, K. Mitsudo and S. Suga, *Org. Lett.,* 2021, **23**, 1169.)



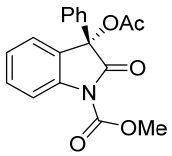
White solid (10.6 mg, 37% yield, 96% ee). m.p.: 145.6-147.5 ^oC. R_f = 0.24 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 11.438 min, 14.042 min; $[\alpha]_D^{25}$ = +64.6 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.97 (d, *J* = 7.8 Hz, 1H), 7.40 (t, *J* = 7.2 Hz, 1H), 7.34 – 7.30 (m, 6H), 7.21 (t, *J* = 7.8 Hz, 1H), 3.95 (s, 1H), 3.89 (br, 1H).

HRMS (ESI): exact mass calcd for $C_{16}H_{13}NNaO_4^+$ $(M+Na)^+$ requires m/z 306.0737, found m/z 306.0736.

(*S*)-Methyl 3-(acetoxy)-2-oxo-3-phenylindoline-1-carboxylate（3a）



White solid (17.5 mg, 54% yield, 83% ee). m.p.: 159.7-162.6 °C. R_f = +0.44 (Pet/EtOAc, 5/1, v/v).

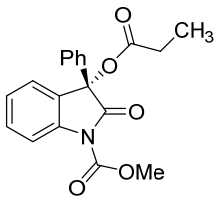
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.302 min, 20.263 min. $[\alpha]_D^{25}$ = 68.8 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.08 (d, *J* = 8.4 Hz, 1H), 7.48 – 7.45 (m, 1H), 7.35 – 7.30 (m, 5H), 7.27 – 7.25 (m, 2H), 3.96 (s, 3H), 2.17 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 171.6, 169.5, 151.5, 140.3, 135.8, 130.6, 129.4, 128.78, 128.75, 127.2, 124.1, 115.6, 80.9, 54.0, 20.7.

HRMS (ESI): exact mass calcd for $C_{18}H_{15}NNaO_5^+$ $(M+Na)^+$ requires m/z 348.0842, found m/z 348.0843.

(*S*)-Methyl 3-(propionyloxy)-2-oxo-3-phenylindoline-1-carboxylate（3b）



White solid, m.p.: 138.2-140.8 °C. R_f = 0.47 (Pet/EtOAc, 5/1, v/v);

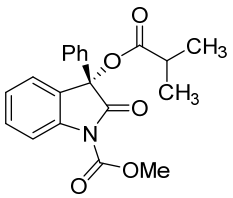
^{1}H NMR (600 MHz, $CDCl_3$) δ 8.07 (d, *J* = 8.4 Hz, 1H), 7.48 – 7.45 (m, 1H), 7.35 – 7.29 (m, 5H), 7.25 – 7.21 (m, 2H), 3.96 (s, 3H), 2.71 (sep, *J* = 7.2 Hz, 1H), 1.24 (d, *J* = 6.6 Hz, 3H), 1.18 (d, *J* = 7.2 Hz, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.0, 171.6, 151.5, 140.3, 135.9, 130.6, 129.4, 128.8, 127.3, 126.7, 125.5, 124.0, 115.6, 80.7, 54.0, 27.3, 8.8.

HRMS (ESI): exact mass calcd for $C_{19}H_{17}NNaO_5^+$ $(M+Na)^+$ requires m/z 362.0999, found m/z 362.0999.

(*S*)-methyl 3-(isobutyryloxy)-2-oxo-3-phenylindoline-1-carboxylate（3c）

(Known compound, see: H. Mandai, R. Shiomoto, K. Fujii, K. Mitsudo and S. Suga, *Org. Lett.,* 2021, **23**, 1169.)

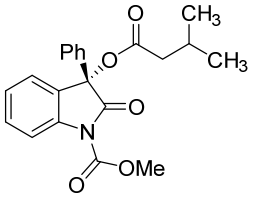


White solid, m.p.: 103.2-106.3 ^{o}C. R_f = 0.51 (Pet/EtOAc, 5/1, v/v).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.07 (d, *J* = 8.4 Hz, 1H), 7.48 – 7.45 (m, 1H), 7.35 – 7.29 (m, 5H), 7.25 – 7.21 (m, 2H), 3.96 (s, 1H), 2.71 (sep, *J* = 7.0 Hz, 1H), 1.24 (d, *J* = 6.6 Hz, 3H), 1.18 (d, *J* = 7.2 Hz, 3H).

HRMS (ESI): exact mass calcd for $C_{20}H_{19}NNaO_5^+$ $(M+Na)^+$ requires m/z 376.1155, found m/z 376.1158.

(*S*)-Methyl 3-((3-methylbutanoyl)oxy)-2-oxo-3-phenylindoline-1-carboxylate（3d）



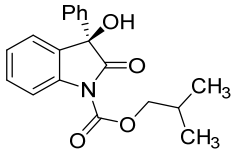
White solid, m.p.: 90.6-92.4 ^{o}C. R_f = 0.49 (Pet/EtOAc, 5/1, v/v).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.07 (d, *J* = 8.4 Hz, 1H), 7.47 – 7.45 (m, 1H), 7.35 – 7.29 (m, 5H), 7.25 – 7.23 (m, 2H), 3.96 (s, 3H), 2.33 (dd, *J* = 14.4, 7.2 Hz, 1H), 2.28 (dd, *J* = 15, 7.2 Hz, 1H), 2.14 (sep, *J* = 7.2 Hz, 1H), 0.97 (dd, *J* = 8.4, 6.6 Hz, 6H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 171.7, 171.6, 151.5, 140.4, 136.0, 130.6, 129.4, 128.8, 127.4, 126.8, 125.4, 124.0, 115.7, 80.8, 54.1, 43.0, 26.1, 22.5.

HRMS (ESI): exact mass calcd for $C_{21}H_{21}NNaO_5^+$ $(M+Na)^+$ requires m/z 390.1312, found m/z 390.1314.

(*R*)-Isobutyl -3-hydroxy-2-oxo-3-phenylindoline-1-carboxylate（1e）



White solid (12.2 mg, 38% yield, 98% ee). m.p.: 118.7-120.2 ^{o}C. R_f = 0.23 (Pet/EtOAc, 5/1, v/v).

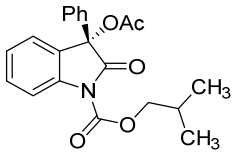
HPLC CHIRALCEL ID, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 8.992 min, 11.087 min. $[\alpha]_D^{25}$ = +40.0 (c = 0.6, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.00 (d, *J* = 7.8 Hz, 1H), 7.42 (td, *J* = 7.8, 1.8 Hz, 1H), 7.37 – 7.32 (m, 6H), 7.23 (td, *J* = 7.2, 1.2 Hz, 1H), 4.21 (dd, *J* = 10.8, 6.6 Hz, 1H), 4.15 (dd, *J* = 10.8, 6.6 Hz, 1H), 3.34 (br, 1H), 2.11 (sep, *J* = 7.2 Hz, 1H), 1.03 (dd, *J* = 6.6, 2.4 Hz, 6H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 175.7, 151.0, 139.8, 130.5, 128.9, 128.8, 125.7, 125.6, 115.6, 77.9, 73.7, 27.9, 19.1.

HRMS (ESI): exact mass calcd for $C_{19}H_{19}NNaO_4^+$ $(M+Na)^+$ requires m/z 348.1206, found m/z 349.1209.

(*S*)-Isobutyl -3-acetoxy-2-oxo-3-phenylindoline-1-carboxylate（3e）



Colorless oil (16.7 mg, 45% yield, 80% ee). R_f = 0.43 (Pet/EtOAc, 5/1, v/v).

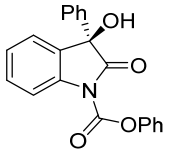
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 5.903 min, 7.880 min. $[\alpha]_D^{25}$ = +54.7 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.06 (d, *J* = 8.4 Hz, 1H), 7.47 – 7.44 (m, 1H), 7.34 – 7.30 (m, 5H), 7.26 – 7.22 (m, 2H), 4.18 (dd, *J* = 10.8, 6.6 Hz, 1H), 4.10 (dd, *J* = 10.2, 6.6 Hz, 1H), 2.16 (s, 3H), 2.08 (sep, *J* = 6.6 Hz, 1H), 0.99 (dd, *J* = 6.6, 3 Hz, 6H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 169.4, 151.1, 140.5, 136.0, 130.6, 129.4, 128.8, 127.2, 126.7, 125.3, 124.1, 115.6, 80.9, 73.4, 27.8, 20.7, 19.14, 19.10;

HRMS (ESI): exact mass calcd for $C_{21}H_{21}NNaO_5^+$ $(M+Na)^+$ requires m/z 390.1312, found m/z 390.1316.

(*R*)-Phenyl 3-hydroxy-2-oxo-3-phenylindoline-1-carboxylate（1f）



White solid (14.0 mg, 41% yield, 94% ee). m.p.: 109.8-113.8 ^{o}C. R_f = 0.32 (Pet/EtOAc, 5/1, v/v).

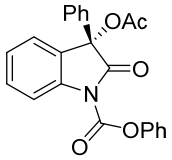
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 20.018 min, 24.643 min. $[\alpha]_D^{25}$ = +29.5 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.01 (d, *J* = 8.4 Hz, 1H), 7.41 – 7.35 (m, 5H), 7.32 – 7.29 (m, 4H), 7.27 – 7.25 (m, 4H), 3.87 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 175.6, 150.1, 149.4, 139.5, 139.0, 130.6, 130.3, 129.7, 129.0, 128.9, 126.7, 126.1, 125.8, 125.3, 115.8, 78.0.

HRMS (ESI): exact mass calcd for $C_{14}H_{11}NSNaO_4^+$ $(M+Na)^+$ requires m/z 368.0893, found m/z 368.0896.

(*S*)-Phenyl 3-acetoxy-2-oxo-3-phenylindoline-1-carboxylate（3f）



White solid (19.3 mg, 50% yield, 67% ee). m.p.: 173.9-177.6 ^{o}C. R_f = 0.52 (Pet/EtOAc, 5/1, v/v).

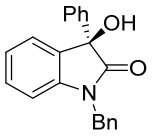
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.660 min, 10.730 min. $[\alpha]_D^{25}$ = +45.8 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.11 – 8.09 (m, 1H), 7.50 – 7.47 (m, 1H), 7.41 – 7.35 (m, 7H), 7.41 – 7.35 (m, 5H), 2.21 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 171.2, 169.6, 150.2, 149.5, 140.1, 135.7, 130.8, 129.63, 129.60, 128.9, 127.3, 126.5, 125.8, 124.2, 121.7, 115.8, 80.9, 20.8;

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_4^+$ $(M+Na)^+$ requires m/z 410.0999, found m/z 410.0989.

(*R*)-1-Benzyl-3-hydroxy-3-phenylindolin-2-one（1g）



White solid (11.4 mg, 36% yield, 69% ee). m.p.: 143.1-143.9 ^{o}C. R_f = 0.19 (Pet/EtOAc, 5/1, v/v).

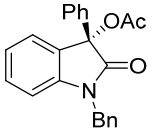
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 11.607 min, 13.375 min. $[\alpha]_D^{25}$ = +16.5 (c = 0.6, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.40 – 7.38 (m, 2H), 7.33 – 7.23 (m, 9H), 7.19 (td, *J* = 7.8, 1.2 Hz, 1H), 7.01 (td, *J* = 7.8, 1.2 Hz, 1H), 6.76 (d, *J* = 7.8 Hz, 1H), 5.01 (d, *J* = 15.6 Hz, 1H), 4.78 (d, *J* = 15.6 Hz, 1H), 3.88 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.9, 142.7, 140.3, 135.5, 131.9, 129.8, 129.0, 128.7, 128.4, 127.9, 127.4, 125.5, 125.1, 123.7, 109.9, 78.1, 44.1.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_2^+$ $(M+Na)^+$ requires m/z 338.1151, found m/z 338.1149.

(*S*)-1-Benzyl-2-oxo-3-phenylindolin-3-yl acetate（3g）



White solid (14.7 mg, 41% yield, 81% ee). m.p.: 137.2-139.3 ^{o}C. R_f = 0.40 (Pet/EtOAc, 5/1, v/v).

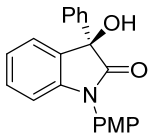
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.900 min, 12.222 min. $[\alpha]_D^{25}$= +25.6 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.38 – 7.36 (m, 2H), 7.35 – 7.28 (m, 7H), 7.25 – 7.21 (m, 3H), 7.05 (td, *J* = 7.8, 1.2 Hz, 1H), 6.71 (d, *J* = 7.8 Hz, 1H), 4.92 (dd, *J* = 21.6, 16.2 Hz, 2H), 2.19 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 174.1, 169.2, 143.7, 136.7, 135.6, 130.1, 129.1, 128.8, 128.7, 128.3, 127.7, 127.3, 126.4, 124.2, 123.2, 109.9, 81.4, 44.3, 21.0.

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_3^+$ $(M+Na)^+$ requires m/z 380.1257, found m/z 380.1255.

(*R*)-3-Hydroxy-1-(4-methoxyphenyl)-3-phenylindolin-2-one（1h）



White solid (10.6 mg, 32% yield, 85% ee). m.p.: 181.2-184.4 ^{o}C. R_f = 0.21 (Pet/EtOAc, 5/1, v/v).

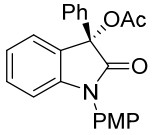
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 16.365 min, 20.872 min. $[\alpha]_D^{25}$ = +28.0 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ7.49 – 7.47 (m, 2H), 7.37 – 7.31 (m, 6H), 7.27 – 7.25 (m, 1H), 7.09 (t, *J* = 7.2 Hz, 1H), 7.04 (d, *J* = 9.0 Hz, 2H), 6.82 (d, *J* = 7.8 Hz, 1H), 3.86 (s, 3H), 3.36 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.2, 159.5, 144.1, 131.3, 129.9, 128.9, 128.5, 128.0, 126.7, 125.4, 125.3, 124.0, 115.2, 110.1, 78.2, 55.7.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_3^+$ $(M+Na)^+$ requires m/z 354.1101, found m/z 354.1095.

(*S*)-1-(4-Methoxyphenyl)-2-oxo-3-phenylindolin-3-yl acetate（3h）



White solid (16.1 mg, 43% yield, 77% ee). m.p.: 163.8-167.1 ^{o}C. R_f = 0.43 (Pet/EtOAc, 5/1, v/v).

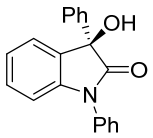
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 14.178 min, 20.467 min. $[\alpha]_D^{25}$ = +33.8 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.49 – 7.48 (m, 2H), 7.38 – 7.35 (m, 5H), 7.32 – 7.29 (m, 2H), 7.13 (t, *J* = 7.2 Hz, 1H), 7.02 (d, *J* = 9.0 Hz, 1H), 6.78 (d, *J* = 8.4 Hz, 1H), 3.84 (s, 3H), 2.21 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.8, 169.4, 159.5, 145.5, 136.5, 130.1, 129.0, 128.7, 128.4, 128.0, 127.3, 126.5, 124.4, 123.4, 115.0, 109.9, 81.3, 55.6, 21.0;

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_4^+$ $(M+Na)^+$ requires m/z 396.1206, found m/z 396.1198.

(*R*)-3-Hydroxy-1,3-diphenylindolin-2-one（1i）



White solid (13.7 mg, 45% yield, 97% ee). m.p.: 166.0-169.6 ^{o}C. R_f = 0.23 (Pet/EtOAc, 5/1, v/v).

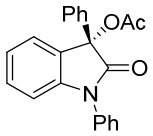
HPLC CHIRALCEL IA, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 19.536 min, 21.868 min. $[\alpha]_D^{25}$ = +140.2 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.51 (t, *J* = 7.2 Hz, 2H), 7.47 – 7.39 (m, 5H), 7.35 – 7.28 (m, 4H), 7.24 (d, *J* = 9.0 Hz, 1H), 3.36 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.0, 143.6, 140.5, 134.1, 131.5, 129.9, 129.8, 128.9, 128.5, 128.4, 126.6, 125.4, 124.1, 110.1, 78.2.

HRMS (ESI): exact mass calcd for $C_{20}H_{15}NNaO_2^+$ $(M+Na)^+$ requires m/z 324.0995, found m/z 324.0995.

(*S*)-2-Oxo-1,3-diphenylindolin-3-yl acetate（3i）



White solid (16.9 mg, 49% yield, 95% ee). m.p.: 145.9-149.6 ^{o}C. R_f = 0.48 (Pet/EtOAc, 5/1, v/v).

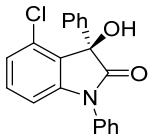
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.727 min, 10.500 min. $[\alpha]_D^{25}$ = +72.5 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.53 – 7.47 (m, 6H), 7.43 – 7.38 (m, 4H), 7.34 – 7.32 (m, 2H), 7.15 (t, *J* = 7.2 Hz, 1H), 6.86 (d, *J* = 8.4 Hz, 1H), 2.22 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.5, 169.4, 145.0, 136.5, 134.7, 130.1, 129.7, 129.1, 128.7, 128.4, 128.1, 126.7, 126.5, 124.5, 123.5, 109.9, 81.3, 20.9.

HRMS (ESI): exact mass calcd for $C_{22}H_{17}NNaO_3^+$ $(M+Na)^+$ requires m/z 366.1101, found m/z 366.1098.

(*R*)-4-Chloro-3-hydroxy-1,3-diphenylindolin-2-one（1j）



White solid (13.7 mg, 41% yield, 99% ee). m.p.: 179.0-182.6 ^{o}C. R_f = 0.32 (Pet/EtOAc, 5/1, v/v).

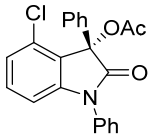
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 10.328 min, 12.397 min. $[\alpha]_D^{25}$= -9.3 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.52 (t, *J* = 7.8 Hz, 2H), 7.48 – 7.46 (m, 2H), 7.44 – 7.35 (m, 6H), 7.25 (t, *J* = 7.8 Hz, 1H), 7.08 (d, *J* = 7.8 Hz, 1H), 6.81 (d, *J* = 7.8 Hz, 1H), 3.57 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 175.4, 145.6, 138.1, 133.8, 132.3, 131.2, 130.0, 128.8, 128.7, 128.1, 126.6, 125.6, 124.9, 108.6, 78.7.

HRMS (ESI): exact mass calcd for $C_{20}H_{14}ClNNaO_2^+$ $(M+Na)^+$ requires m/z 358.0605, found m/z 358.0606.

(*S*)-4-Chloro-2-oxo-1,3-diphenylindolin-3-yl acetate（3j）



White solid (19.7 mg, 52% yield, 83% ee). m.p.: 163.3-167.0 ^{o}C. R_f = 0.48 (Pet/EtOAc, 5/1, v/v).

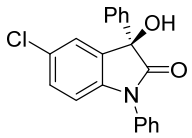
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 7.642 min, 8.897 min. $[\alpha]_D^{25}$ = +74.1 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 – 7.48 (m, 4H), 7.45 – 7.40 (m, 6H), 7.28 (t, *J* = 3.6 Hz, 1H), 7.09 (d, *J* = 7.8 Hz, 1H), 6.76 (d, *J* = 7.8 Hz, 1H), 2.29 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 172.9, 169.7, 146.8, 134.4, 134.2, 131.4, 131.3, 129.8, 129.3, 128.9, 128.7, 127.1, 126.1, 124.9, 124.4, 108.4, 81.4, 20.5.

HRMS (ESI): exact mass calcd for $C_{22}H_{16}ClNNaO_3^+$ $(M+Na)^+$ requires m/z 400.0711, found m/z 400.0713.

(*R*)-5-Chloro-3-hydroxy-1,3-diphenylindolin-2-one（1k）



White solid (14.7 mg, 44% yield, 99% ee). m.p.: 175.9-179.6 ^{o}C. R_f = 0.24 (Pet/EtOAc, 5/1, v/v).

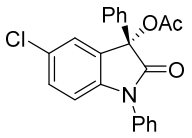
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.260 min, 14.766 min. $[\alpha]_D^{25}$ = +54.9 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 (t, *J* = 7.8 Hz, 2H), 7.47 – 7.42 (m, 5H), 7.39 – 7.34 (m, 3H), 7.31 (d, *J* = 2.4 Hz, 1H), 7.31 (dd, *J* = 8.4, 1.8 Hz, 1H), 6.82 (d, *J* = 8.4 Hz, 1H), 3.85 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 176.7, 142.0, 139.9, 133.8, 133.1, 130.0, 129.9, 129.8, 129.4, 129.0, 128.8, 128.7, 126.5, 125.8, 125.3, 111.2, 78.2.

HRMS (ESI): exact mass calcd for $C_{20}H_{14}ClNNaO_2^+$ $(M+Na)^+$ requires m/z 358.0605, found m/z 358.0603.

(*S*)-5-Chloro-2-oxo-1,3-diphenylindolin-3-yl acetate（3k）



White solid (18.9 mg, 50% yield, 90% ee). m.p.: 172.6-176.5 ^{o}C. R_f = 0.44 (Pet/EtOAc, 5/1, v/v).

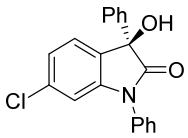
HPLC CHIRALCEL ID, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 13.750 min, 21.401 min. $[\alpha]_D^{25}$ = +43.9 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.53 – 7.50 (m, 2H), 7.48 – 7.46 (m, 2H), 7.44 – 7.39 (m, 6H), 7.30 – 7.28 (m, 2H), 6.78 (d, *J* = 9.0 Hz, 1H), 2.24 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.1, 169.5, 143.6, 135.8, 134.3, 130.1, 129.9, 129.8, 129.3, 128.9, 128.8, 128.6, 126.3, 124.7, 111.0, 81.0, 20.9.

HRMS (ESI): exact mass calcd for $C_{22}H_{16}ClNNaO_3^+$ $(M+Na)^+$ requires m/z 400.0711, found m/z 400.0697.

(*R*)-6-Chloro-3-hydroxy-1,3-diphenylindolin-2-one（1l）



White solid (15.4 mg, 46% yield, 97% ee). m.p.: 198.9-201.2 ^{o}C. R_f = 0.32 (Pet/EtOAc, 5/1, v/v).

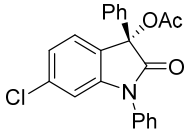
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 15.917 min, 22.748 min. $[\alpha]_D^{25}$ = +80.6 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.55 (t, *J* = 7.8 Hz, 2H), 7.47 – 7.41 (m, 5H), 7.38 – 7.33 (m, 3H), 7.25 (d, *J* = 6.6 Hz, 1H), 7.08 (dd, *J* = 7.8, 1.8 Hz, 1H), 6.87 (d, *J* = 1.8 Hz, 1H), 3.63 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.0, 144.7, 140.0, 135.8, 133.7, 130.1, 129.8, 128.0, 128.9, 128.8, 126.5, 126.4, 125.3, 110.8, 77.9.

HRMS (ESI): exact mass calcd for $C_{20}H_{14}ClNNaO_2^+$ $(M+Na)^+$ requires m/z 358.0605, found m/z 358.0604.

(*S*)-6-Chloro-2-oxo-1,3-diphenylindolin-3-yl acetate（3l）



White solid (18.4 mg, 49% yield, 92% ee). m.p.: 196.9-200.2 ^{o}C. R_f = 0.48 (Pet/EtOAc, 5/1, v/v).

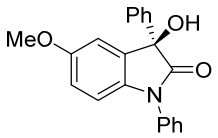
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, retention time: 8.312 min, 10.654 min. $[\alpha]_D^{25}$ = +42.5 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 – 7.52 (m, 2H), 7.48 – 7.42 (m, 8H), 7.23 (d, *J* = 7.8 Hz, 1H), 7.12 (dd, *J* = 7.8, 1.8 Hz, 1H), 6.83 (d, *J* = 1.8 Hz, 1H), 2.22 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.4, 169.5, 146.3, 136.1, 135.9, 134.2, 130.0, 129.3, 128.9, 128.8, 127.0, 126.4, 125.5, 123.5, 110.6, 80.8, 20.9.

HRMS (ESI): exact mass calcd for $C_{22}H_{16}ClNNaO_3^+$ $(M+Na)^+$ requires m/z 400.0711, found m/z 400.0705.

(*R*)-3-Hydroxy-5-methoxy-1,3-diphenylindolin-2-one（1m）



White solid (15.6 mg, 47% yield, 83% ee). m.p.: 110.5.0-113.6 °C. R_f = 0.13 (Pet/EtOAc, 5/1, v/v).

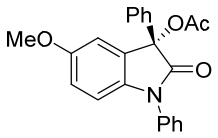
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 11.643 min, 19.335 min. $[\alpha]_D^{25}$ = +69.2 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 – 7.51 (m, 2H), 7.49 – 7.45 (m, 4H), 7.42 – 7.39 (m, 1H), 7.37 – 7.31 (m, 3H), 6.94 (d, *J* = 2.4 Hz, 1H), 6.84 – 6.79 (m, 2H), 3.75 (s, 3H), 3.72 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 176.9, 157.0, 140.5, 136.8, 134.4, 132.6, 129.8, 128.8, 128.5, 128.2, 126.3, 125.4, 115.0, 111.6, 110.9, 78.5, 55.9.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_3^+$ $(M+Na)^+$ requires m/z 354.1101, found m/z 354.1096.

(*S*)-5-Methoxy-2-oxo-1,3-diphenylindolin-3-yl acetate（3m）



White solid (16.5 mg, 44% yield, 83% ee). m.p.: 157.8-161.0 °C. R_f = 0.28 (Pet/EtOAc, 5/1, v/v).

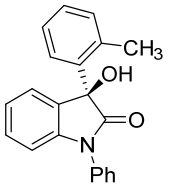
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 254 nm, retention time: 10.995 min, 12.090 min. $[\alpha]_D^{25}$ = +69.4 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.51 – 7.45 (m, 6H), 7.40 – 7.38 (m, 4H), 6.91 (d, *J* = 2.4 Hz, 1H), 6.86 – 6.79 (m, 2H), 3.78 (s, 3H), 2.22 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.3, 169.4, 156.6, 138.4, 136.5, 134.9, 129.7, 129.3, 129.1, 128.8, 128.2, 126.7, 126.4, 114.5, 111.3, 110.5, 81.6, 55.9, 21.0.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_4^+$ $(M+Na)^+$ requires m/z 380.1257, found m/z 380.1248.

(*R*)-3-Hydroxy-1-phenyl-3-(o-tolyl)indolin-2-one（1n）



White solid (11.1 mg, 35% yield, 93% ee). m.p.: 170.2-173.0 °C. R_f = 0.25 (Pet/EtOAc, 5/1, v/v).

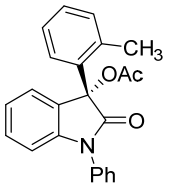
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 9.383 min, 11.168 min. $[\alpha]_D^{25}$ = +5.9 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.01 (d, *J* = 7.8 Hz, 1H), 7.54 (t, *J* = 7.8 Hz, 2H), 7.48 – 7.42 (m, 3H), 7.31 (t, *J* = 7.8 Hz, 1H), 7.26 – 7.22 (m, 2H), 7.09 – 7.07 (m, 2H), 7.03 (t, *J* = 7.8 Hz, 1H), 6.88 (d, *J* = 7.8 Hz, 1H), 3.49 (br, 1H), 2.00 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 176.4, 144.2, 138.1, 134.5, 134.2, 131.6, 130.3, 129.9, 128.5, 128.4, 126.3, 126.2, 126.1, 125.4, 110.0, 77.7, 19.6.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_2^+$ $(M+Na)^+$ requires m/z 338.1151, found m/z 338.1159.

(*S*)-2-Oxo-1-phenyl-3-(o-tolyl)indolin-3-yl acetate（3n）



White solid (16.7 mg, 47% yield, 89% ee). m.p.: 147.5-151.3 °C. R_f = 0.44 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 7.338 min, 8.273 min. $[\alpha]_D^{25}$ = +23.7 (c = 0.3, $CHCl_3$).

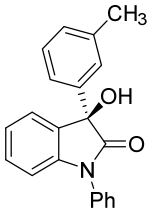
^{1}H NMR (600 MHz, $CDCl_3$) δ 7.51 – 7.45 (m, 4H), 7.40 – 7.37 (m, 1H), 7.28 (t, *J* = 7.8 Hz, 1H), 7.23 – 7.19 (m, 4H), 7.14 – 7.08 (m, 2H), 6.80 (d, *J* = 7.8 Hz, 1H), 2.57 (s, 3H), 2.18 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.4, 168.9, 145.4, 137.8, 134.7, 133.1, 130.2, 129.7, 128.9, 128.4, 128.0, 127.4, 126.9, 126.0, 124.8, 123.6, 110.0, 82.9, 21.4, 21.0.

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_3^+$ $(M+Na)^+$ requires m/z 380.1257, found m/z

380.1256.

(*R*)-3-Hydroxy-1-phenyl-3-(m-tolyl)indolin-2-one（1o）



White solid (15.5 mg, 49% yield, 83% ee). m.p.: 122.8-126.6 ^{o}C. R_f = 0.24 (Pet/EtOAc, 5/1, v/v).

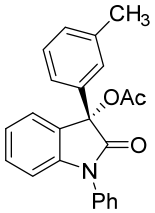
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0mL/min, λ = 256 nm, retention time: 8.190 min, 10.218 min. $[\alpha]_D^{25}$ = +95.7 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.53 – 7.50 (m, 2H), 7.45 – 7.39 (m, 3H), 7.33 – 7.32 (m, 2H), 7.25 – 7.20 (m, 3H), 7.12 – 7.08 (m, 2H), 6.88 (d, *J* = 7.8 Hz, 1H), 3.83 (br, 1H), 2.33 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.1, 143.5, 140.4, 138.4, 131.6, 129.7, 129.6, 129.2, 128.3, 126.5, 126.0, 125.3, 124.0, 122.5, 110.0, 78.2, 21.7.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_2^+$ $(M+Na)^+$ requires m/z 338.1151, found m/z 338.1150.

(*S*)-2-Oxo-1-phenyl-3-(m-tolyl)indolin-3-yl acetate（3o）



White solid (17.1 mg, 48% yield, 87% ee). m.p.: 174.2-178.1 ^{o}C. R_f = 0.47 (Pet/EtOAc, 5/1, v/v).

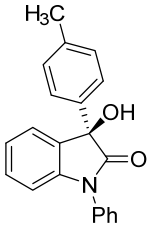
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 8.172 min, 9.900 min. $[\alpha]_D^{25}$ = +55.9 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.50 – 7.43 (m, 4H), 7.40 – 7.37 (m, 2H), 7.31 – 7.28 (m, 2H), 7.24 – 7.22 (m, 1H), 7.19 – 7.15 (m, 2H), 7.11 (t, *J* = 7.8 Hz, 1H), 6.83 (d, *J* = 7.8 Hz, 1H), 2.35 (s, 3H), 2.20 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.7, 169.5, 145.0, 138.6, 136.4, 134.7, 130.0, 129.9, 129.7, 128.6, 128.4, 128.2, 127.1, 127.0, 124.5, 123.6, 123.5, 110.0, 81.4, 21.7, 21.0.

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_3^+$ $(M+Na)^+$ requires m/z 380.1257, found m/z 380.1260.

(*R*)-3-Hydroxy-1-phenyl-3-(p-tolyl)indolin-2-one（1p）



White solid (14.7 mg, 47% yield, 75% ee). m.p.: 124.0-126.4 °C. R_f = 0.24 (Pet/EtOAc, 5/1, v/v).

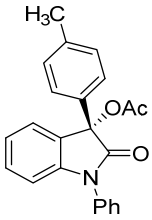
HPLC CHIRALCEL IA, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 20.473 min, 25.571 min. $[\alpha]_D^{25}$ = +85.3 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.51 (t, *J* = 7.8 Hz, 2H), 7.44 – 7.39 (m, 3H), 7.36 – 7.33 (m, 3H), 7.25 – 7.24 (m, 1H), 7.15 (d, *J* = 7.8 Hz, 2H), 7.09 (t, *J* = 7.8 Hz, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 3.65 (br, 1H), 2.33 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.1, 148.5, 138.3, 137.6, 134.2, 131.6, 129.8, 129.7, 129.5, 128.4, 126.6, 125.4, 125.3, 124.0, 110.1, 78.1, 21.3.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_2^+$ $(M+Na)^+$ requires m/z 338.1151, found m/z 338.1142.

(*S*)-2-Oxo-1-phenyl-3-(p-tolyl)indolin-3-yl acetate（3p）



White solid (17.1 mg, 48% yield, 83% ee). m.p.: 164.2-166.1 °C. R_f = 0.47 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm,

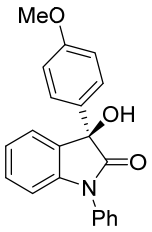
retention time: 8.221 min, 11.033 min. $[\alpha]_D^{25}$ = +46.8 (c = 0.5, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.50 (t, *J* = 7.8 Hz, 2H), 7.46 – 7.44 (m, 2H), 7.41 – 7.37 (m, 3H), 7.32 – 7.30 (m, 2H), 7.18 (d, *J* = 7.8 Hz, 2H), 7.14 (t, *J* = 7.8 Hz, 1H), 6.84 (d, *J* = 7.8 Hz, 1H), 2.35 (s, 3H), 2.20 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.7, 169.5, 145.1, 139.1, 134.8, 133.5, 133.1, 129.7, 129.5, 128.3, 128.1, 127.0, 126.5, 124.5, 123.5, 110.0, 81.3, 21.3, 21.0.

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_3^+$ $(M+Na)^+$ requires m/z 380.1257, found m/z 380.1258.

(*R*)-3-Hydroxy-3-(4-methoxyphenyl)-1-phenylindolin-2-one（1q）



White solid (15.0 mg, 45% yield, 69% ee). m.p.: 156.1-159.4 ^oC. R_f = 0.12 (Pet/EtOAc, 5/1, v/v).

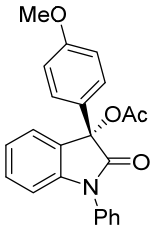
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 16.843 min, 22.111 min. $[\alpha]_D^{25}$ = +80.2 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.46 (t, *J* = 7.8 Hz, 2H), 7.38 – 7.35 (m, 5H), 7.31 (d, *J* = 7.8 Hz, 1H), 7.21 (t, *J* = 7.8 Hz, 1H), 7.06 (t, *J* = 7.8 Hz, 1H), 6.83– 6.81 (m, 3H), 4.07 (br, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.2, 159.6, 143.4, 134.1, 132.5, 131.6, 129.7, 129.6, 128.3, 127.0, 126.5, 125.3, 124.0, 114.1, 110.0, 77.8, 55.3.

HRMS (ESI): exact mass calcd for $C_{21}H_{17}NNaO_3^+$ $(M+Na)^+$ requires m/z 354.1101, found m/z 354.1094.

(*S*)-3-(4-Methoxyphenyl)-2-oxo-1-phenylindolin-3-yl acetate（3q）



White solid (16.5 mg, 44% yield, 82% ee). m.p.: 134.3-138.2 °C. R_f = 0.28 (Pet/EtOAc, 5/1, v/v).

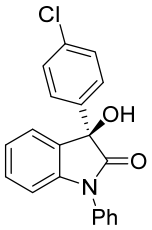
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 11.960 min, 17.981 min. $[\alpha]_D^{25}$ = +71.40 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.52 – 7.49 (m, 2H), 7.45 – 7.39 (m, 5H), 7.34 – 7.30 (m, 2H), 7.15 (t, *J* = 6.6 Hz, 1H), 6.92 – 6.89 (m, 2H), 6.84 (d, *J* = 7.8 Hz, 1H), 3.80 (s, 3H), 2.20 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.8, 169.6, 160.3, 145.0, 130.1, 129.7, 128.3, 128.2, 128.1, 127.9, 127.0, 124.5, 123.4, 114.1, 110.0, 81.0, 55.4, 21.0.

HRMS (ESI): exact mass calcd for $C_{23}H_{19}NNaO_4^+$ $(M+Na)^+$ requires m/z 396.1206, found m/z 396.1210.

(*R*)-3-(4-Chlorophenyl)-3-hydroxy-1-phenylindolin-2-one（1r）



White solid (9.6 mg, 29% yield, 88% ee). m.p.: 133.3-135.0 °C. R_f = 0.21 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 7.855 min, 12.186 min. $[\alpha]_D^{25}$ = +84.9 (c = 0.3, $CHCl_3$).

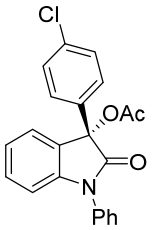
^{1}H NMR (600 MHz, $CDCl_3$) δ 7.53 (t, *J* = 7.8 Hz, 2H), 7.43 – 7.38 (m, 5H), 7.31 – 7.27 (m, 4H), 7.11 (t, *J* = 7.8 Hz, 1H), 6.89 (d, *J* = 7.8 Hz, 1H), 4.11 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 176.8, 143.4, 139.0, 134.4, 133.9, 131.2, 130.0, 129.8, 128.9, 128.5, 127.0, 126.5, 125.3, 124.3, 110.3, 77.8.

HRMS (ESI): exact mass calcd for $C_{20}H_{14}ClNNaO_2^+$ $(M+Na)^+$ requires m/z 358.0605, found m/z

358.0598.

(*S*)-3-(4-Chlorophenyl)-2-oxo-1-phenylindolin-3-yl acetate（3r）



White solid (16.4 mg, 43% yield, 75% ee). m.p.: 157.1-160.7 ^{o}C. R_f = 0.41 (Pet/EtOAc, 5/1, v/v).

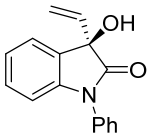
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 8.905 min, 11.168 min. $[\alpha]_D^{25}$ = +46.3 (c = 0.3, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.51 (t, *J* = 7.8 Hz, 2H), 7.45 – 7.41 (m, 5H), 7.36 – 7.28 (m, 4H), 7.15 (t, *J* = 7.8 Hz, 1H), 6.85 (d, *J* = 7.8 Hz, 1H), 2.20 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 177.2, 159.6, 143.4, 134.1, 132.5, 131.6, 129.7, 129.6, 128.3, 127.0, 126.5, 125.3, 114.1, 110.0, 77.8, 55.3.

HRMS (ESI): exact mass calcd for $C_{22}H_{16}ClNNaO_3^+$ $(M+Na)^+$ requires m/z 354.1101, found m/z 354.1094.

(*R*)-3-Hydroxy-1-phenyl-3-vinylindolin-2-one（1s）



White solid (8.2 mg, 33% yield, 98% ee). m.p.: 116.5-119.8 ^{o}C. R_f = 0.16 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ID, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 16.466 min, 19.528 min. $[\alpha]_D^{25}$ = +50.4 (c = 0.4, $CHCl_3$).

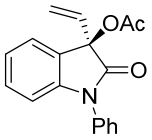
^{1}H NMR (600 MHz, $CDCl_3$) δ 7.54 – 7.51 (m, 2H), 7.43 – 7.41 (m, 4H), 7.29 – 7.26 (m, 1H), 7.16 – 7.14 (m, 1H), 6.84 (d, *J* = 7.8 Hz, 1H), 6.14– 6.09 (m, 1H), 5.50 (d, *J* = 17.4 Hz, 1H), 5.38 (d, *J* = 10.2 Hz, 1H), 3.37 (br, 1H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 176.3, 143.5, 136.4, 134.1, 129.9, 129.8, 129.0, 128.4, 126.6,

125.2, 123.9, 117.2, 110.1, 77.4.

HRMS (ESI): exact mass calcd for $C_{16}H_{13}NNaO_2^+$ $(M+Na)^+$ requires m/z 274.0838, found m/z 274.0838.

(*R*)-2-Oxo-1-phenyl-3-vinylindolin-3-yl acetate（3s）



White solid (15.9 mg, 54% yield, 57% ee). m.p.: 100.6-103.3 °C. R_f = 0.44 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm, retention time: 7.783 min, 9.143 min. $[\alpha]_D^{25}$ = +15.3 (c = 0.3, $CHCl_3$).

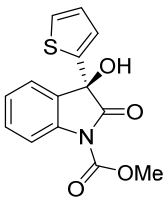
^{1}H NMR (600 MHz, $CDCl_3$) δ 7.52 – 7.50 (m, 2H), 7.44 – 7.39 (m, 3H), 7.29 – 7.25 (m, 2H), 7.10 (t, *J* = 7.8 Hz, 1H), 6.77 (d, *J* = 7.8 Hz, 1H), 6.12 (dd, *J* = 17.4, 10.8 Hz, 1H), 5.41 (d, *J* = 10.8 Hz, 1H), 5.36 (d, *J* = 16.8 Hz, 1H), 2.12 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 173.0, 169.2, 144.6, 134.6, 133.2, 130.1, 129.8, 128.4, 127.0, 126.2, 124.1, 123.3, 119.5, 110.0, 80.7, 20.9.

HRMS (ESI): exact mass calcd for $C_{18}H_{15}NNaO_3^+$ $(M+Na)^+$ requires m/z 316.0944, found m/z 316.0947.

(*R*)-Methyl 3-hydroxy-2-oxo-3-(thiophen-2-yl)indoline-1-carboxylate（1t）

(Known compound, see: H. Mandai, R. Shiomoto, K. Fujii, K. Mitsudo and S. Suga, *Org. Lett.,* 2021, **23**, 1169.)



White solid (10.4 mg, 36% yield, 98% ee). m.p.: 116.2-120.0 °C. R_f = 0.17 (Pet/EtOAc, 5/1, v/v).

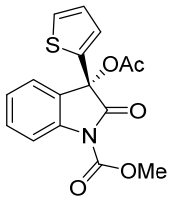
HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 90/10, flow rate = 1.0 mL/min, λ = 256 nm,

retention time: 14.312 min, 17.983 min. $[\alpha]_D^{25}$ = -31.2 (c = 0.7, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.93 (d, *J* = 8.4 Hz, 1H), 7.54 (d, *J* = 6.6 Hz, 1H), 7.41 (t, *J* = 7.8 Hz, 1H), 7.31 (d, *J* = 4.2 Hz, 1H), 7.26 (t, *J* = 7.8 Hz, 1H), 6.89 (t, *J* = 4.2 Hz, 1H), 6.83 (d, *J* = 1.8 Hz, 1H), 4.10 (br, 1H), 3.95 (s, 1H).

HRMS (ESI): exact mass calcd for $C_{14}H_{11}NSNaO_4^+$ $(M+Na)^+$ requires m/z 312.0301, found m/z 312.0296.

(*S*)-Methyl 3-acetoxy-2-oxo-3-(thiophen-2-yl)indoline-1-carboxylate（3t）



White solid (13.3 mg, 40% yield, 89% ee). m.p.: 200.2-203.8 °C. R_f = 0.43 (Pet/EtOAc, 5/1, v/v).

HPLC CHIRALCEL ODH, *n*-hexane/2-propanol = 95/5, flow rate = 0.5 mL/min, λ = 256 nm, retention time: 12.005 min, 20.882 min. $[\alpha]_D^{25}$ = +128.7 (c = 0.4, $CHCl_3$).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.05 (d, *J* = 7.8 Hz, 1H), 7.47 (t, *J* = 7.8 Hz, 1H), 7.43 (d, *J* = 7.2 Hz, 1H), 7.40 (d, *J* = 5.4 Hz, 1H), 7.27 (t, *J* = 7.2 Hz, 1H), 6.93 (t, *J* = 4.8 Hz, 1H), 6.84 (d, *J* = 3.6 Hz, 1H), 3.97 (s, 3H), 2.13 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$) δ 170.4, 169.3, 151.4, 139.9, 137.9, 131.0, 128.8, 128.2, 126.8, 128.7, 125.3, 123.9, 115.7, 78.7, 54.1, 20.6.

HRMS (ESI): exact mass calcd for $C_{16}H_{13}NSNaO_5^+$ $(M+Na)^+$ requires m/z 48.0842, found m/z 348.0843.

10. Reference

(1) H. Mandai, R. Shiomoto, K. Fujii, K. Mitsudo and S. Suga, *Org. Lett.,* 2021, **23**, 1169.

(2) M. D. Greenhalgh, S. M. Smith, D. M. Walden, J. E. Taylor, Z. Brice, E. R. T. Robinson, C. Fallan, D. B. Cordes, A. M. Z. Slawin, H. C. Richardson, M. A. Grove, P. H.-Y. Cheong and A. D. Smith, *Angew. Chem., Int. Ed.,* 2018, **57**, 3200.

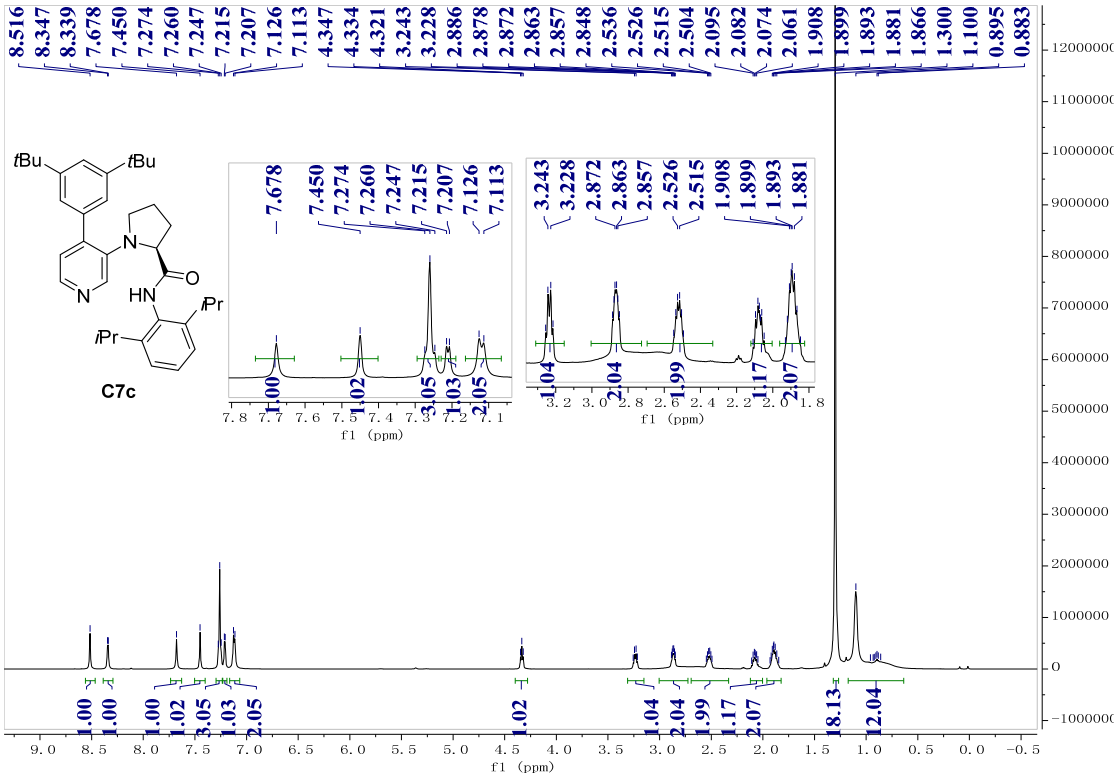
(3) M.-S. Xie, M. Shan, N. Li, Y.-G. Chen, X.-B. Wang, X. Cheng, Y. Tian, X.-X. Wu, Y. Deng, G.-R. Qu and H.-M. Guo, *ACS Catal.,* 2022, **12**, 877.

(4) K. S. Kumar, R. Adepu, S. Sandra, D. Rambabu, R. Krishna, M. C. Reddy, R. Misra, M. Pal, *Bioorg. Med. Chem. Lett.,* **2012**, 22, 1146-1150.

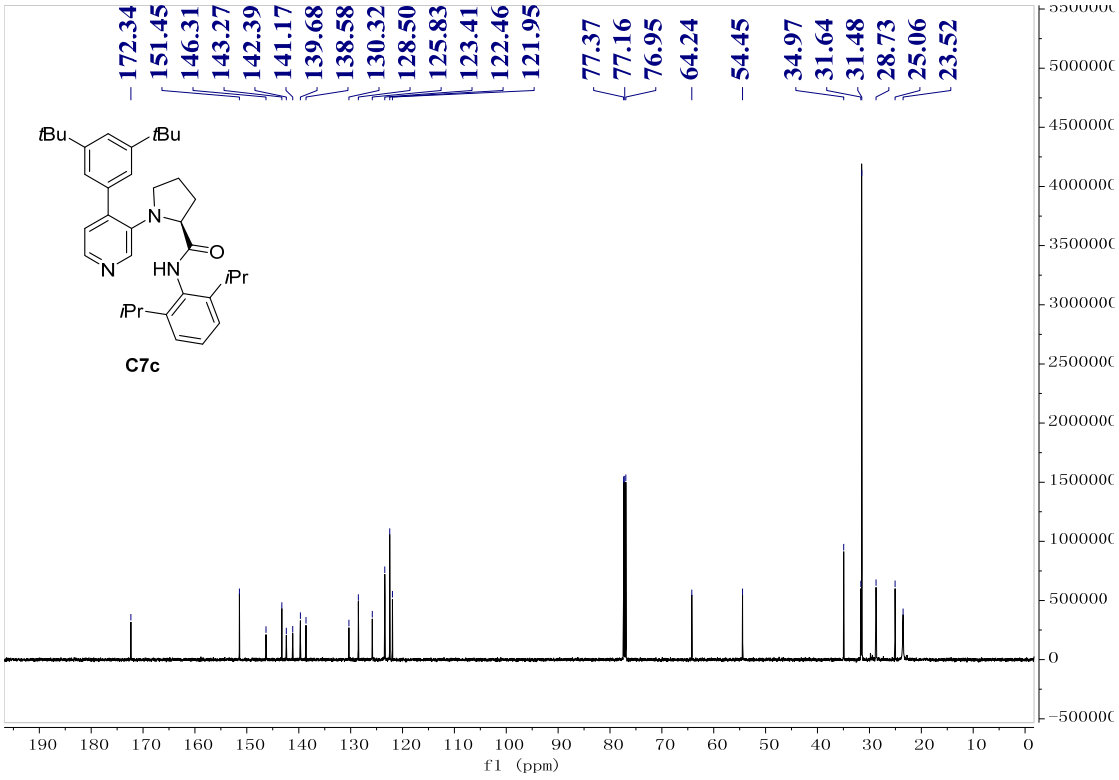
(5) H. B. Kagan and J.-C. Fiaud, *Top*. *Stereochem*., 1988, **18**, 249.

11. Copies of NMR spectra

^{1}H NMR for C7c



^{13}C NMR for C7c



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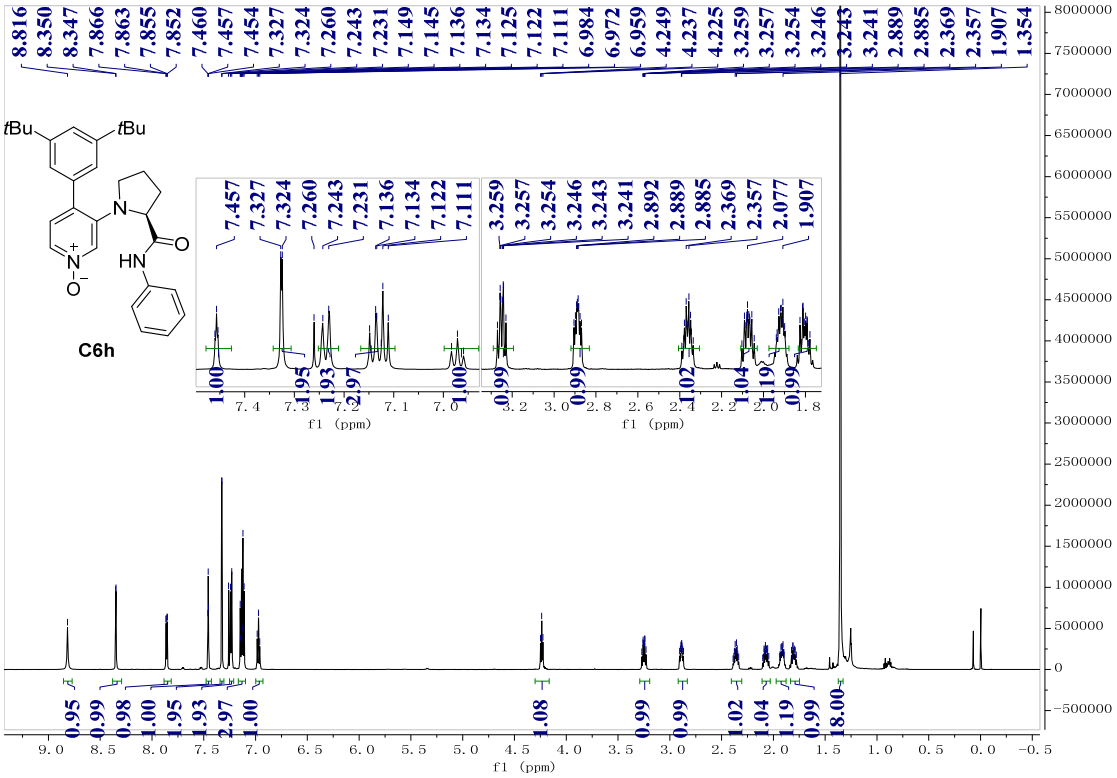

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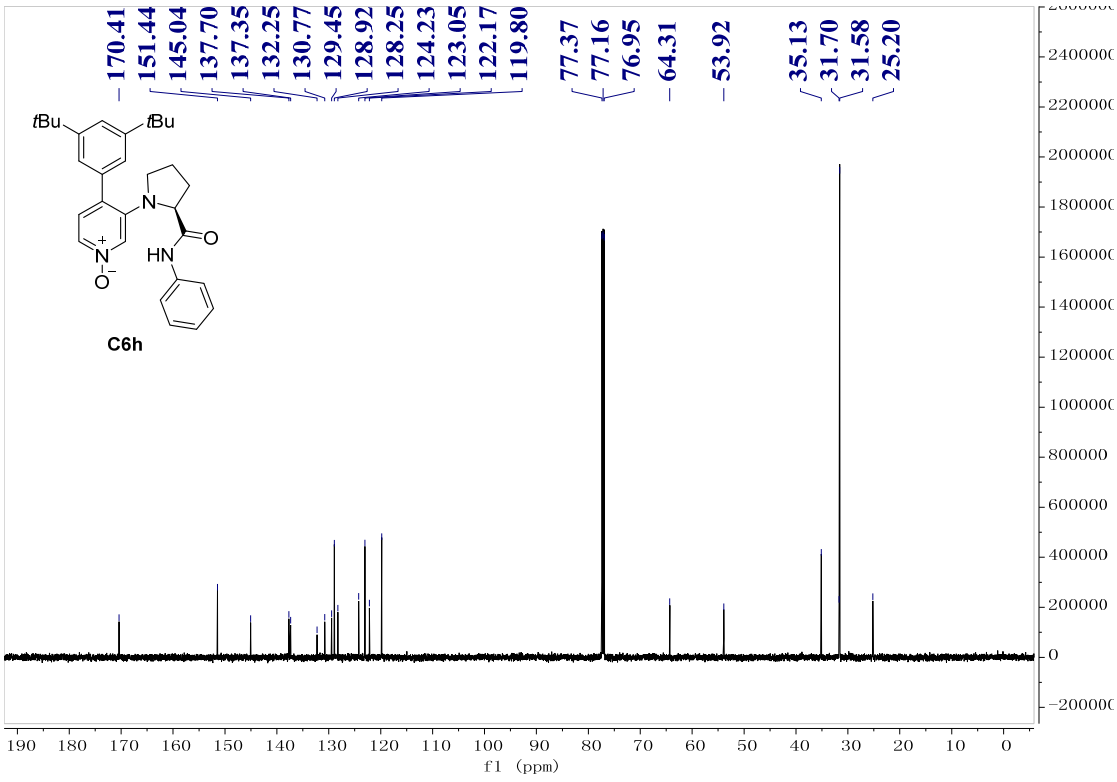
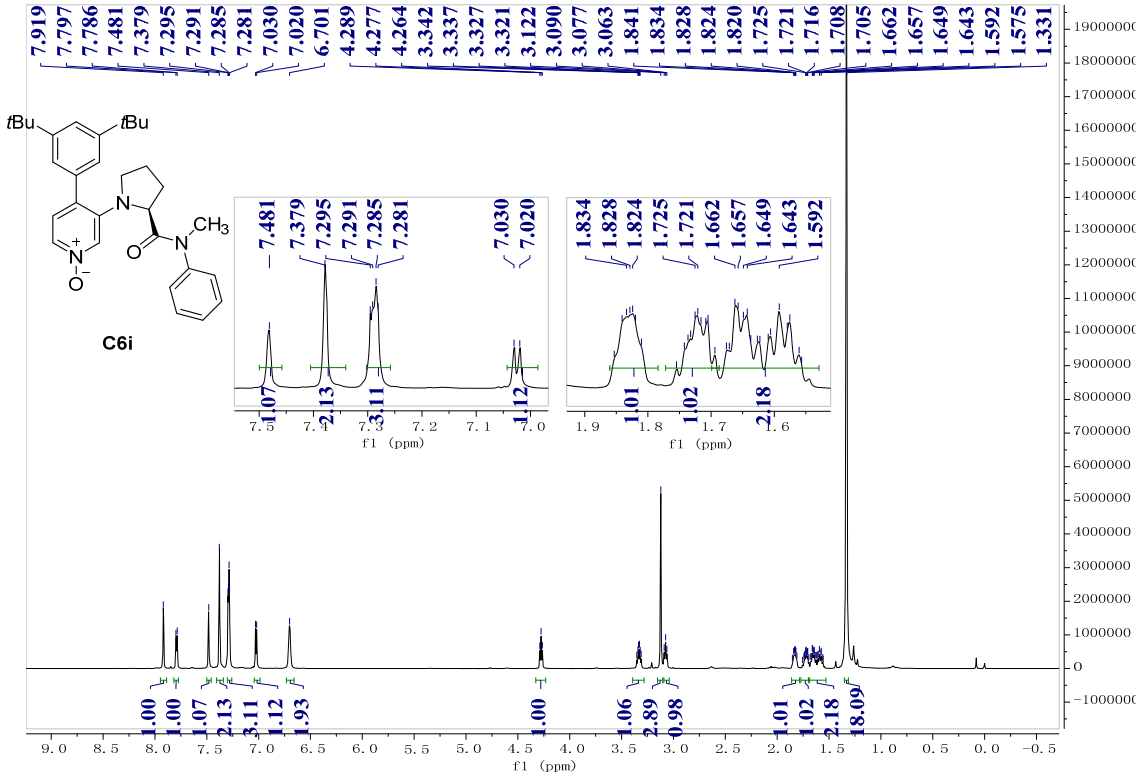
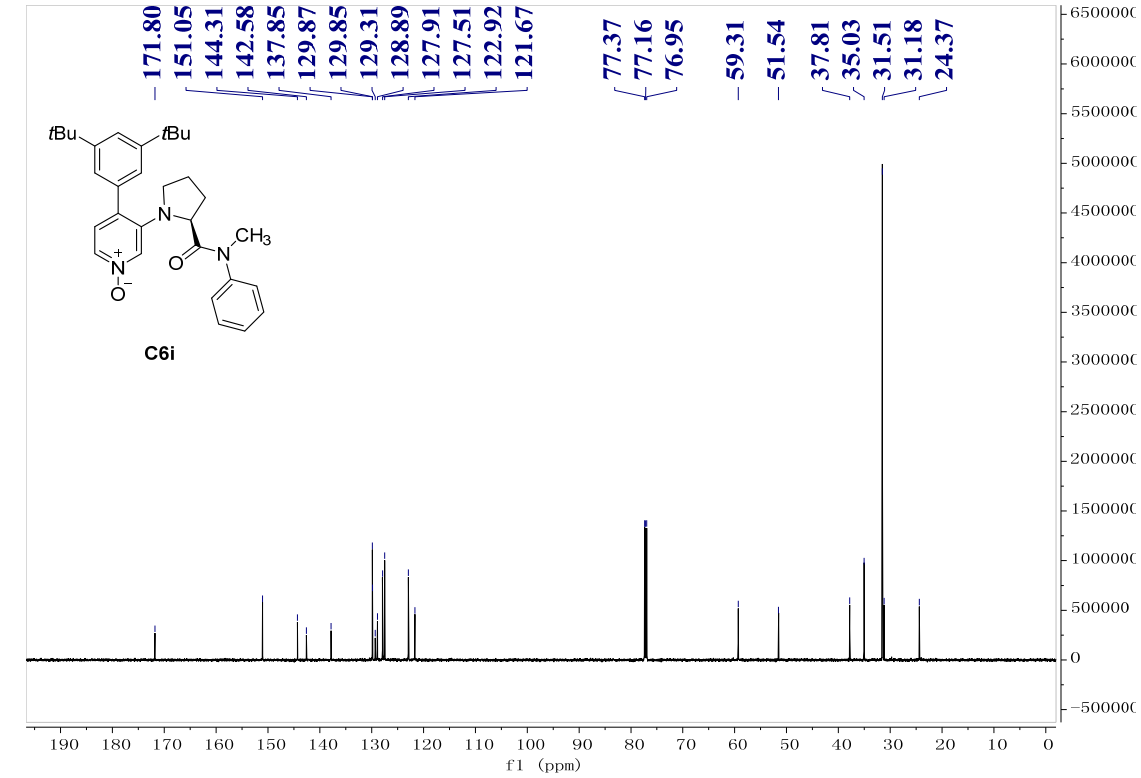


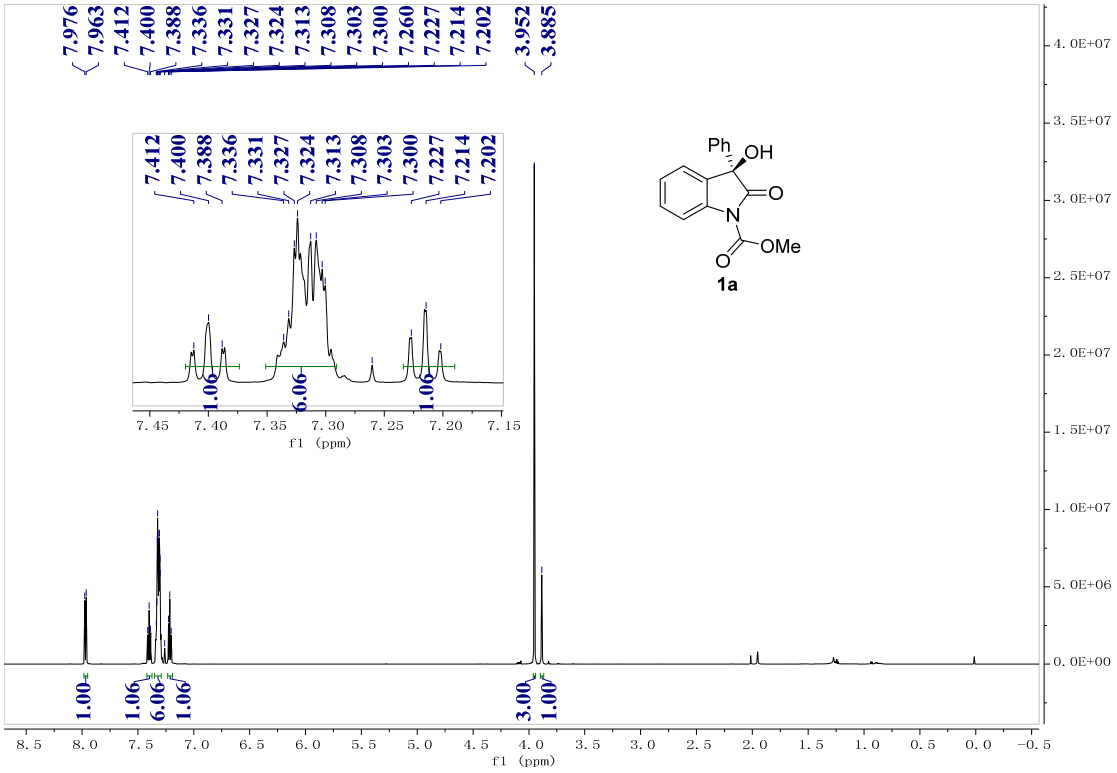
^{1}H NMR for C6i



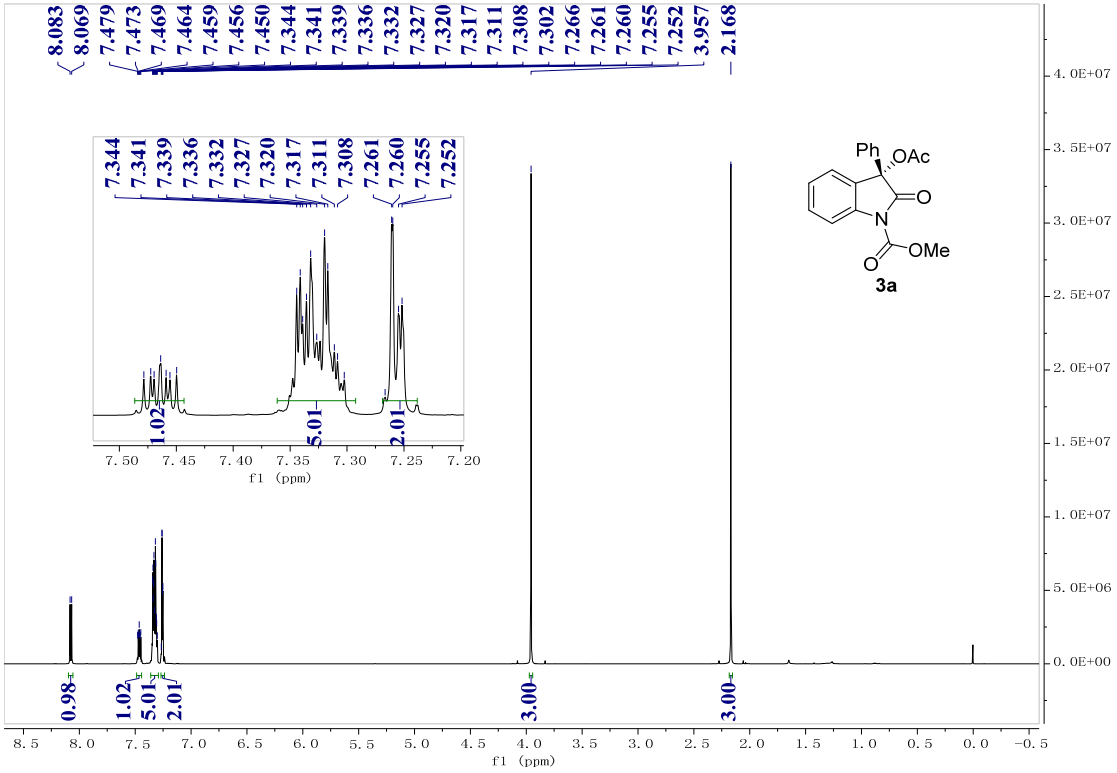
^{13}C NMR for C6i



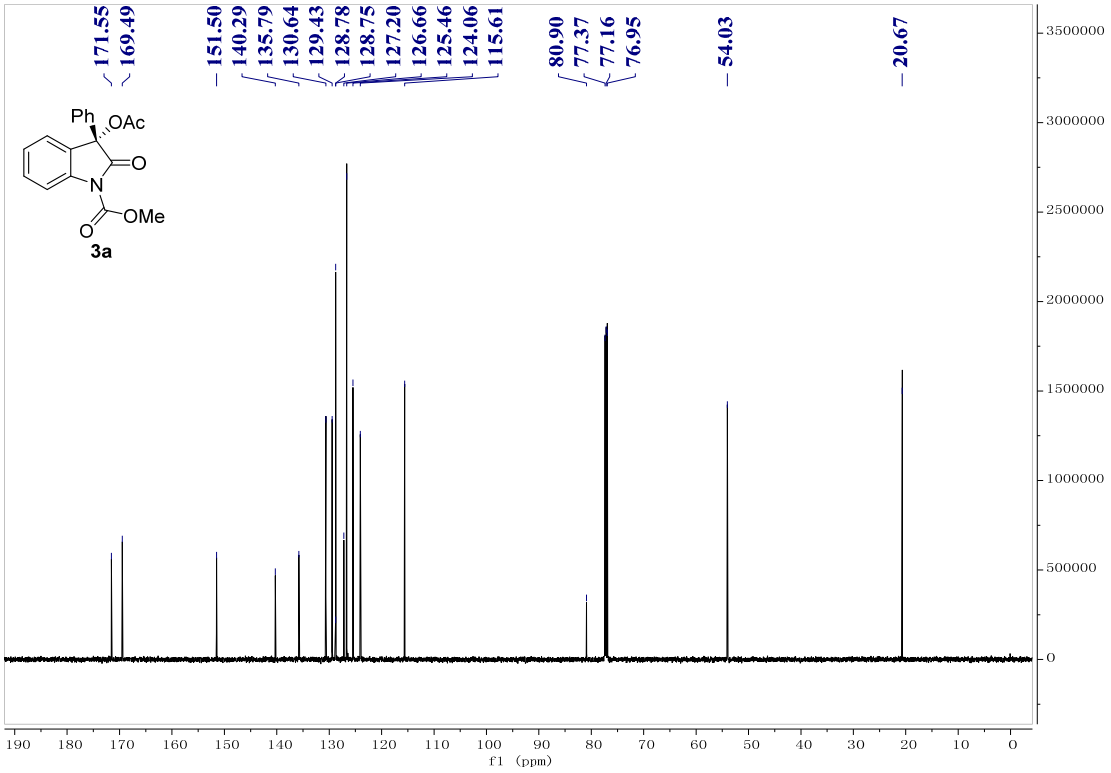
^{1}H NMR for 1a



^{1}H NMR for 3a



^{13}C NMR for 3a



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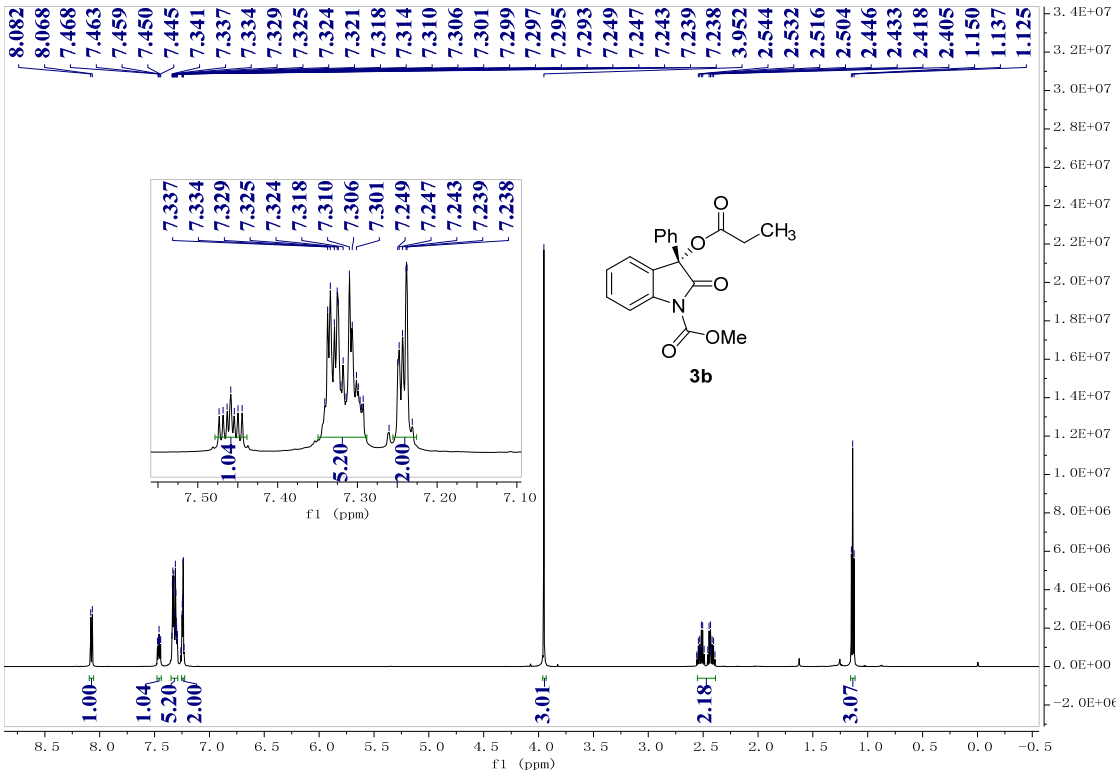

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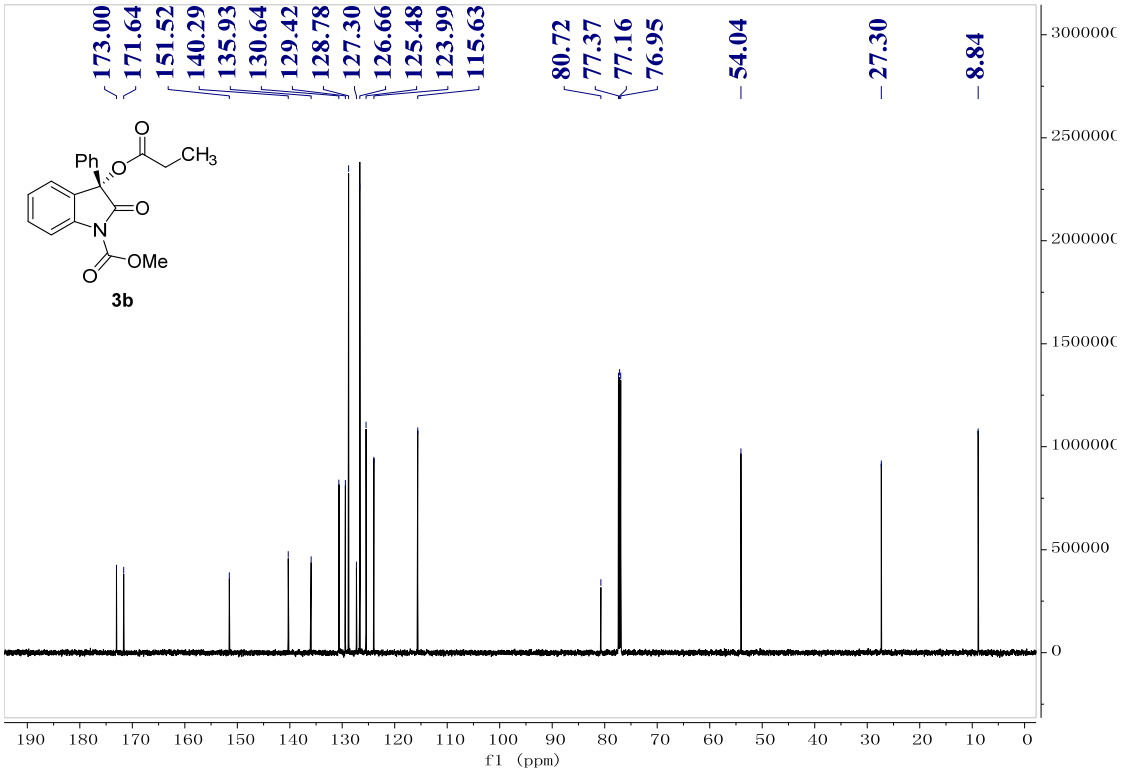

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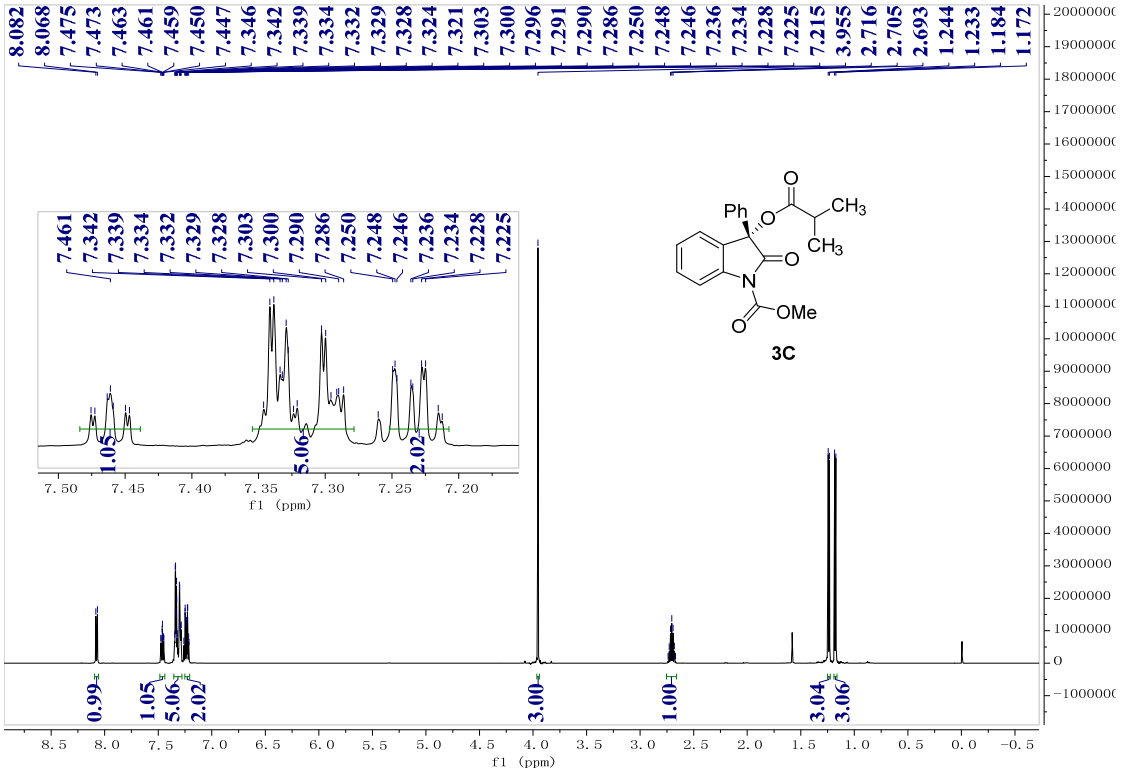
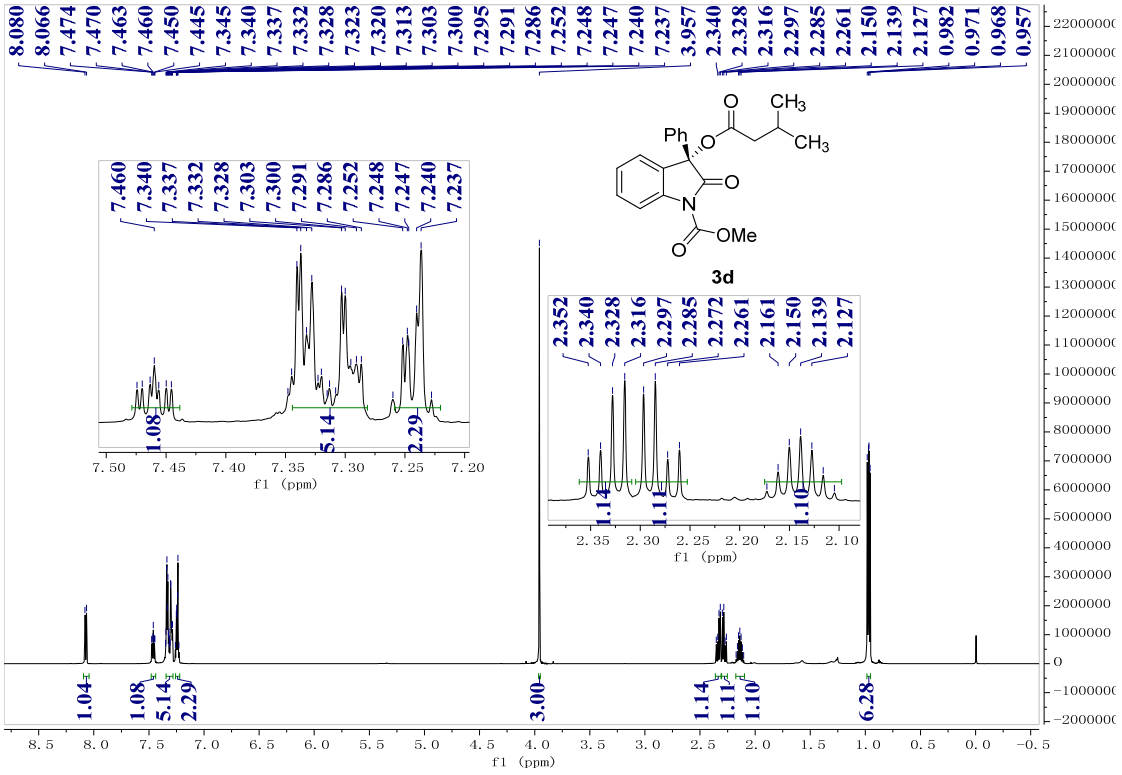
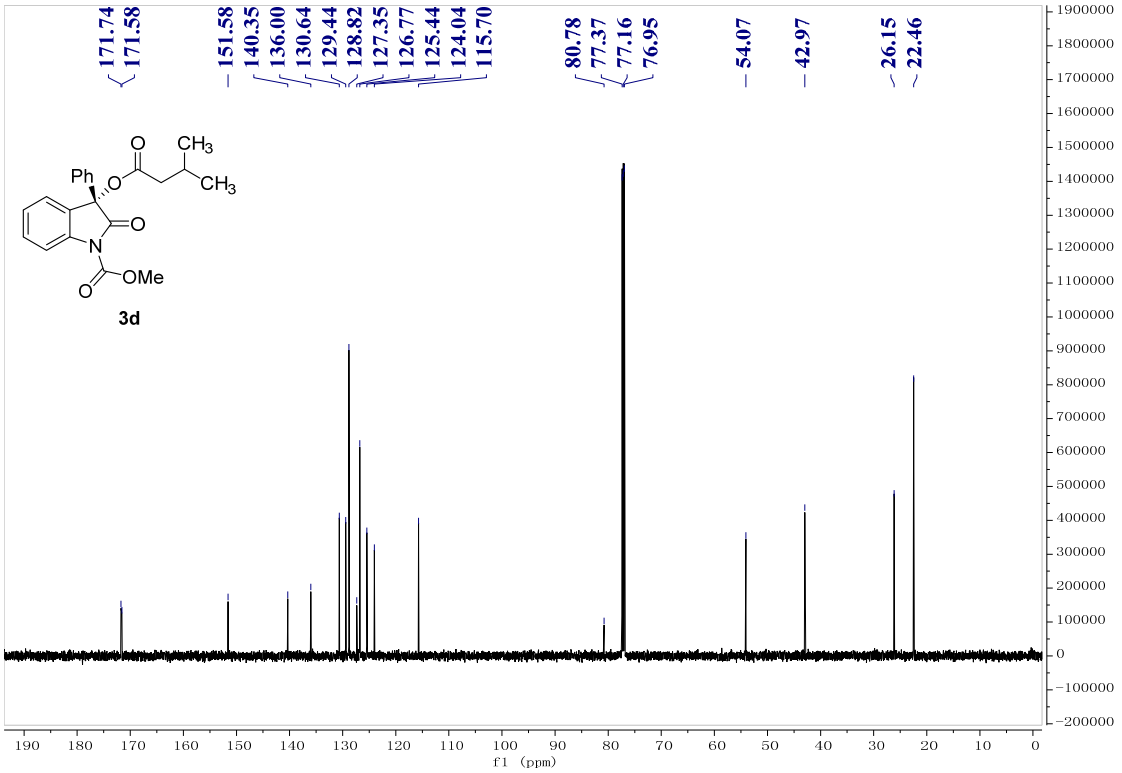


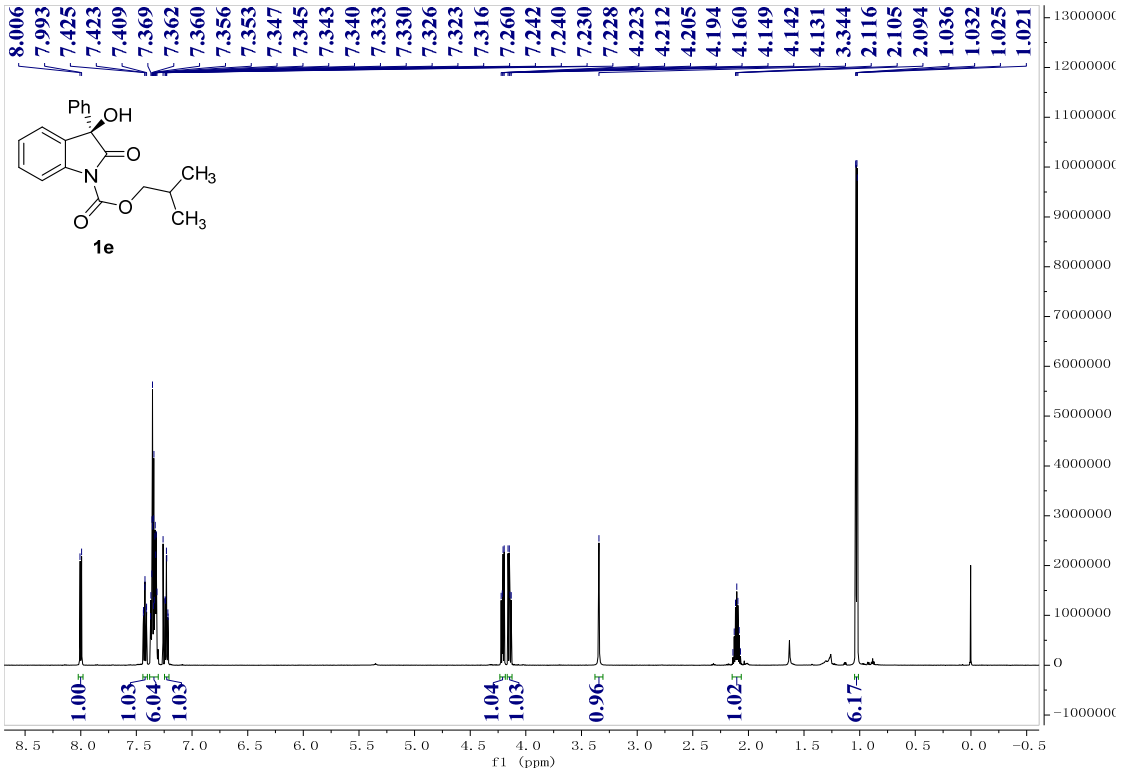
^{1}H NMR for 3d



^{13}C NMR for 3d



^{1}H NMR for 1e



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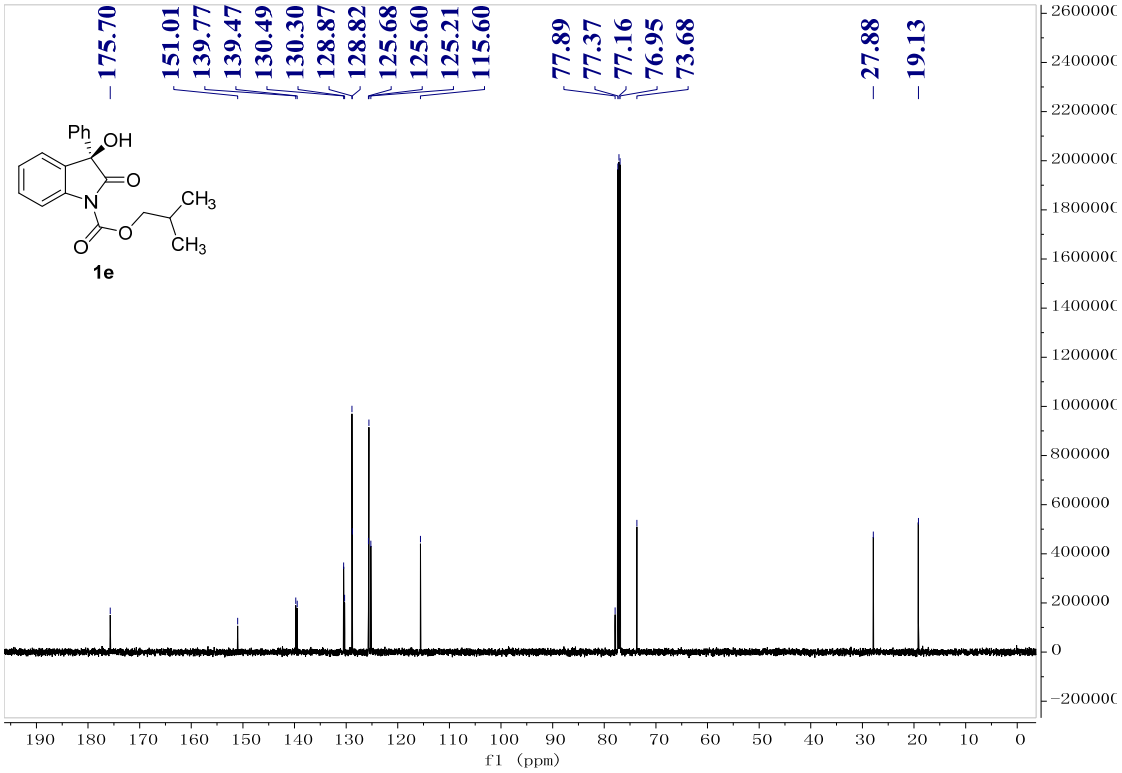

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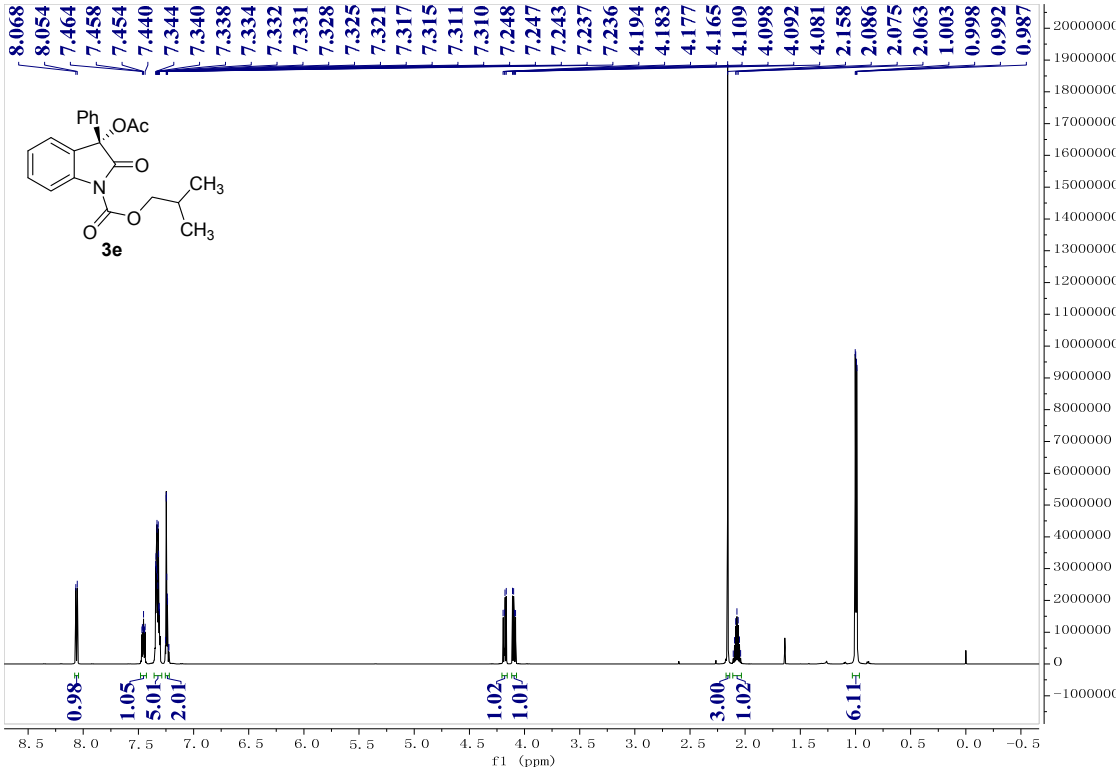

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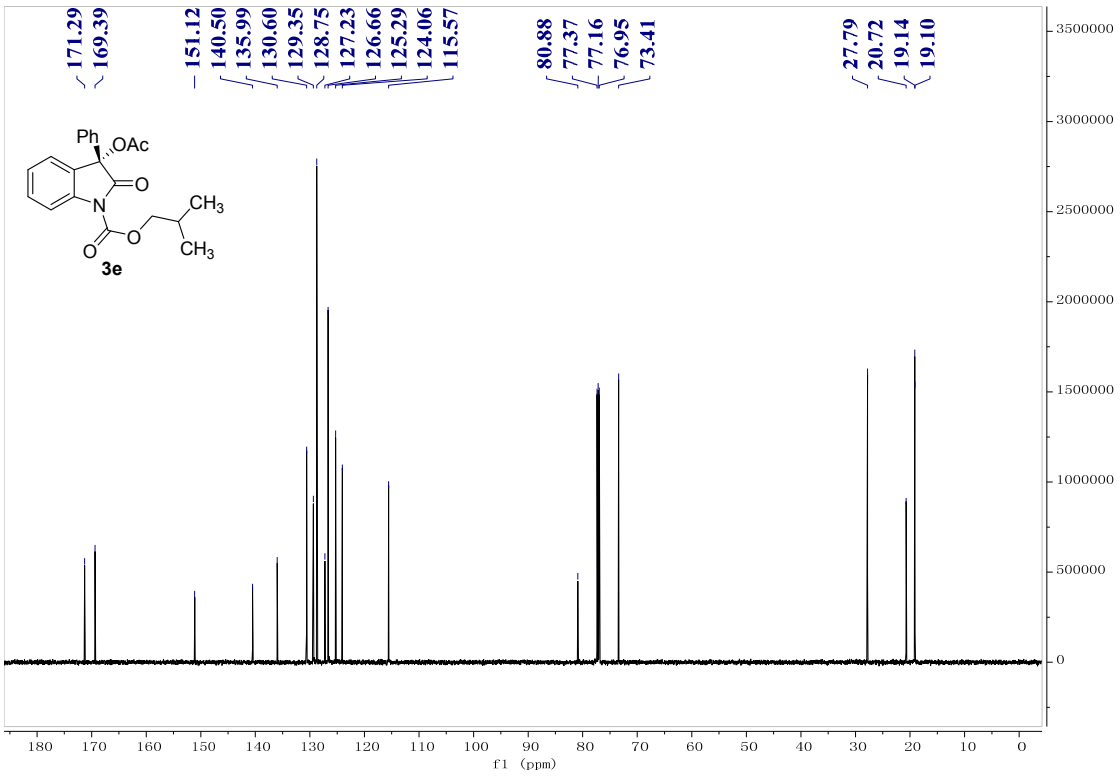

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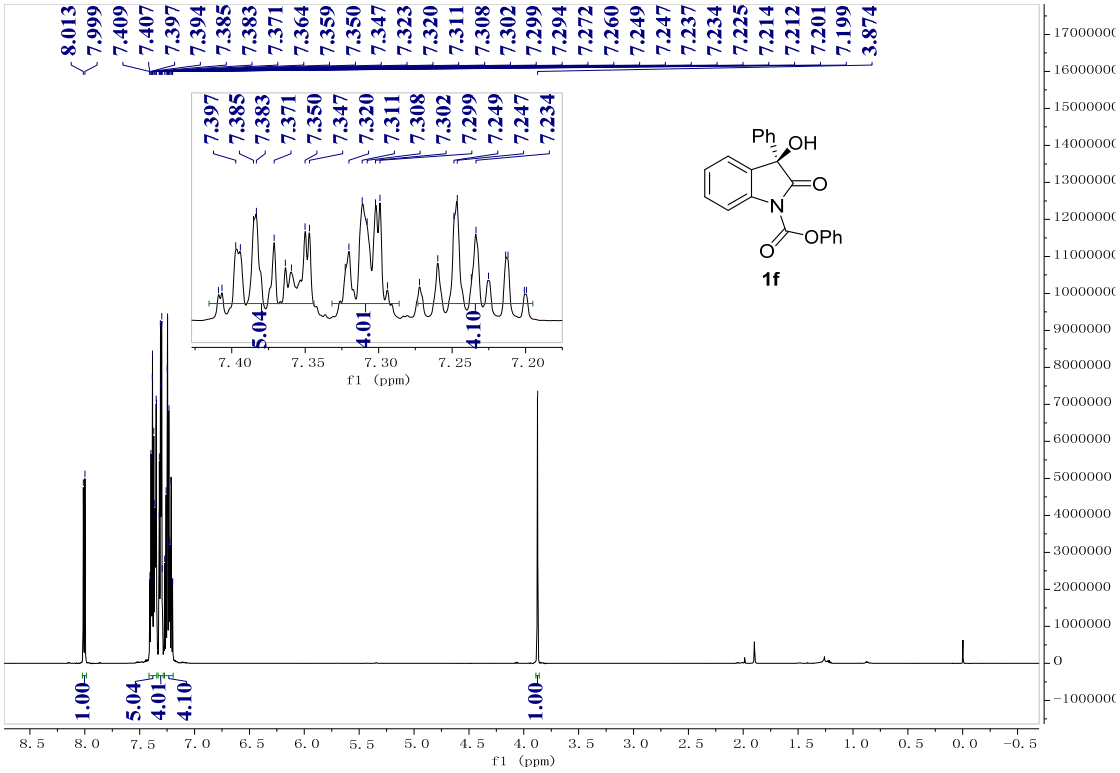

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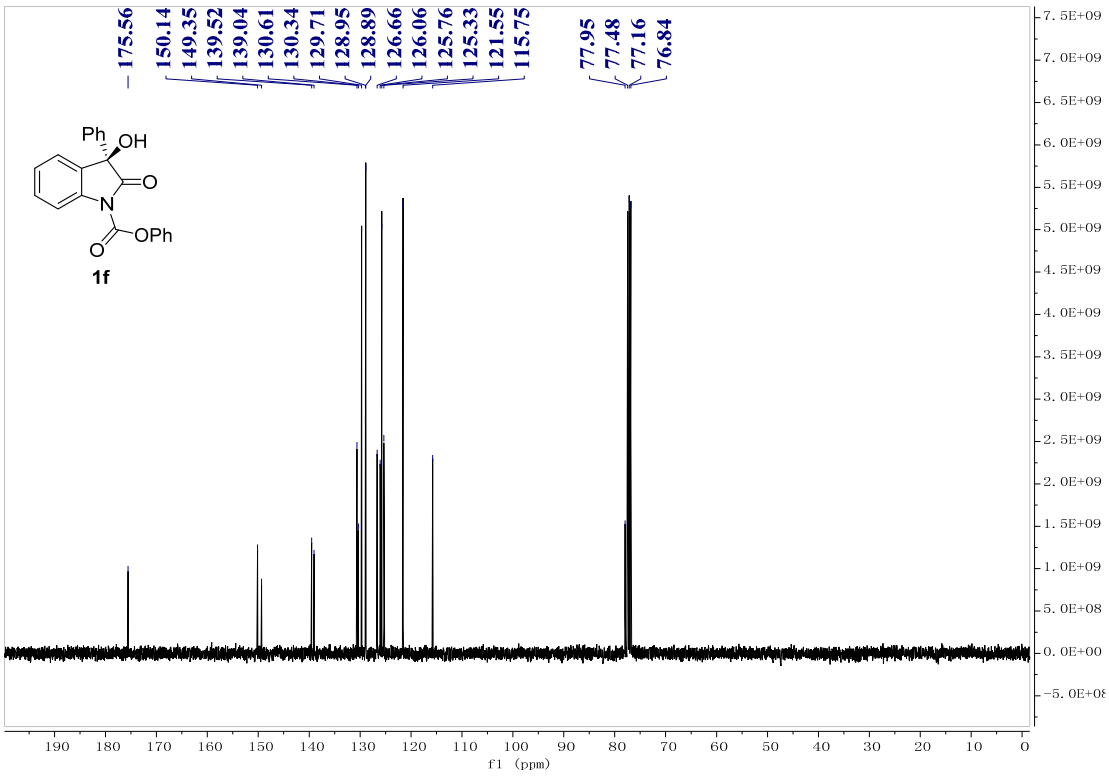

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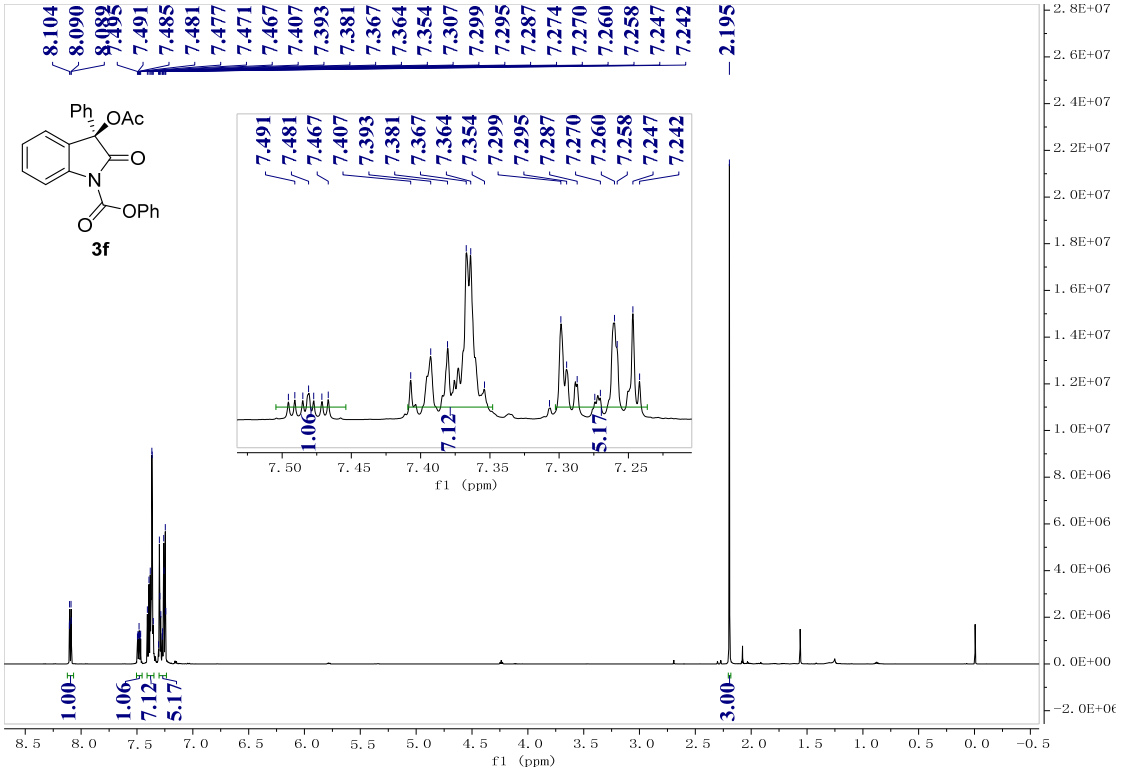

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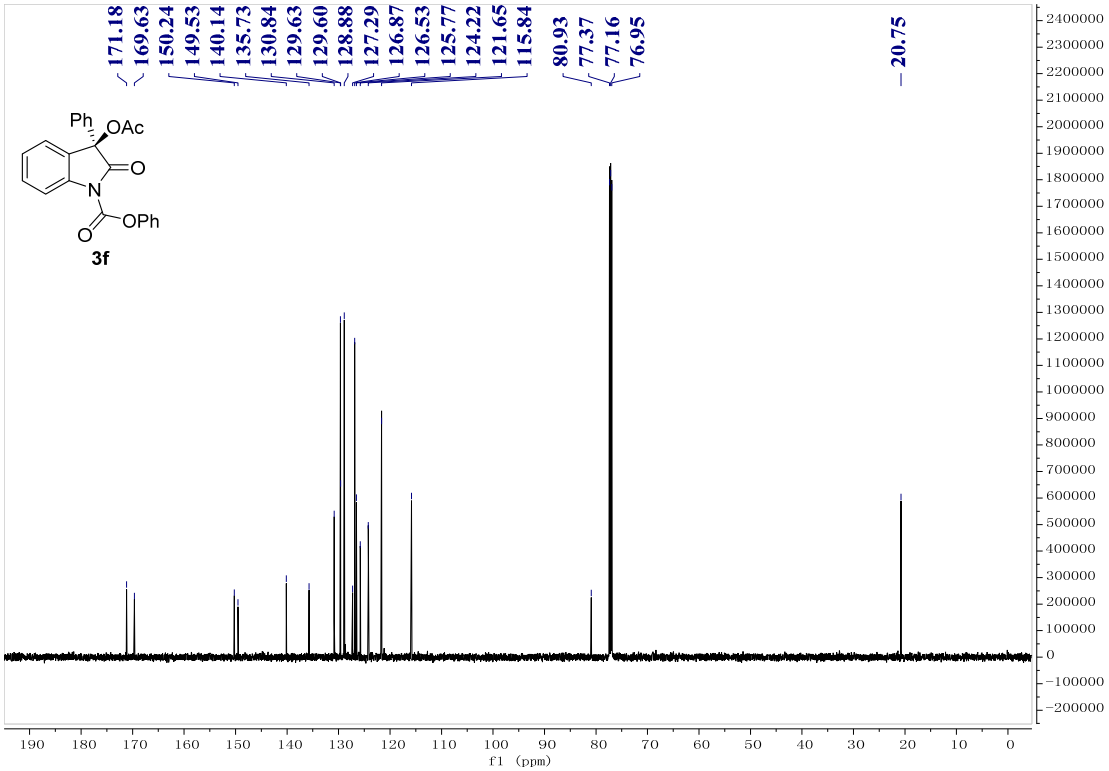
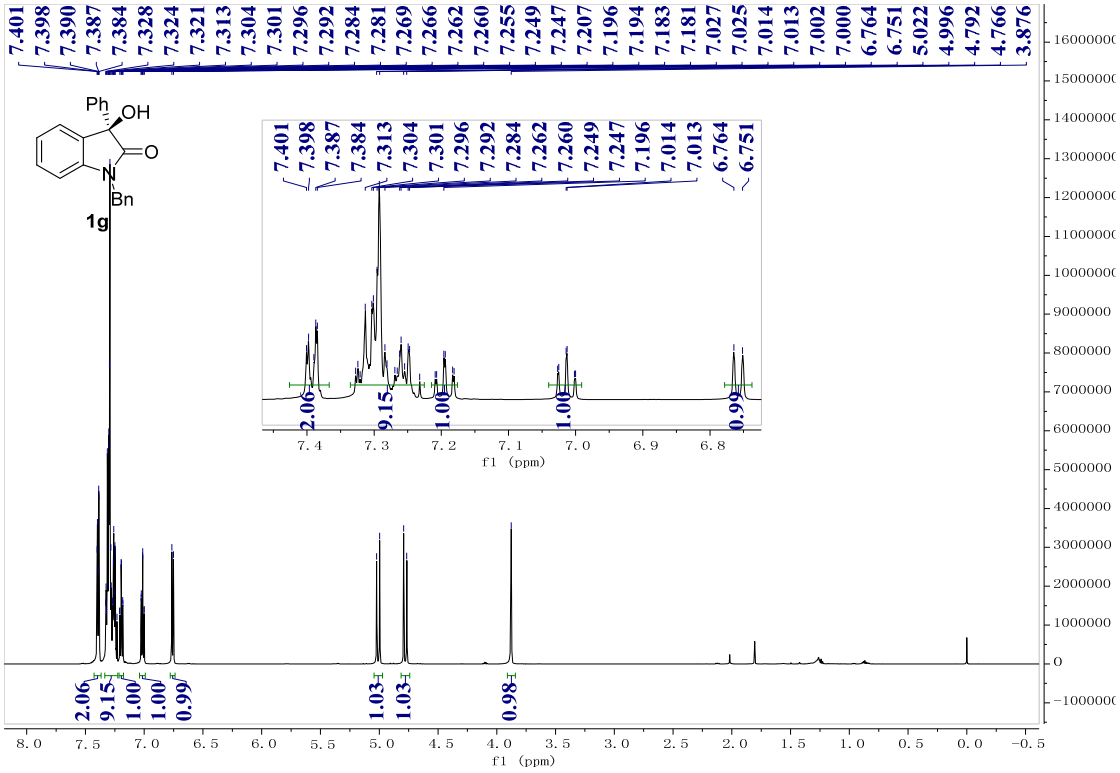
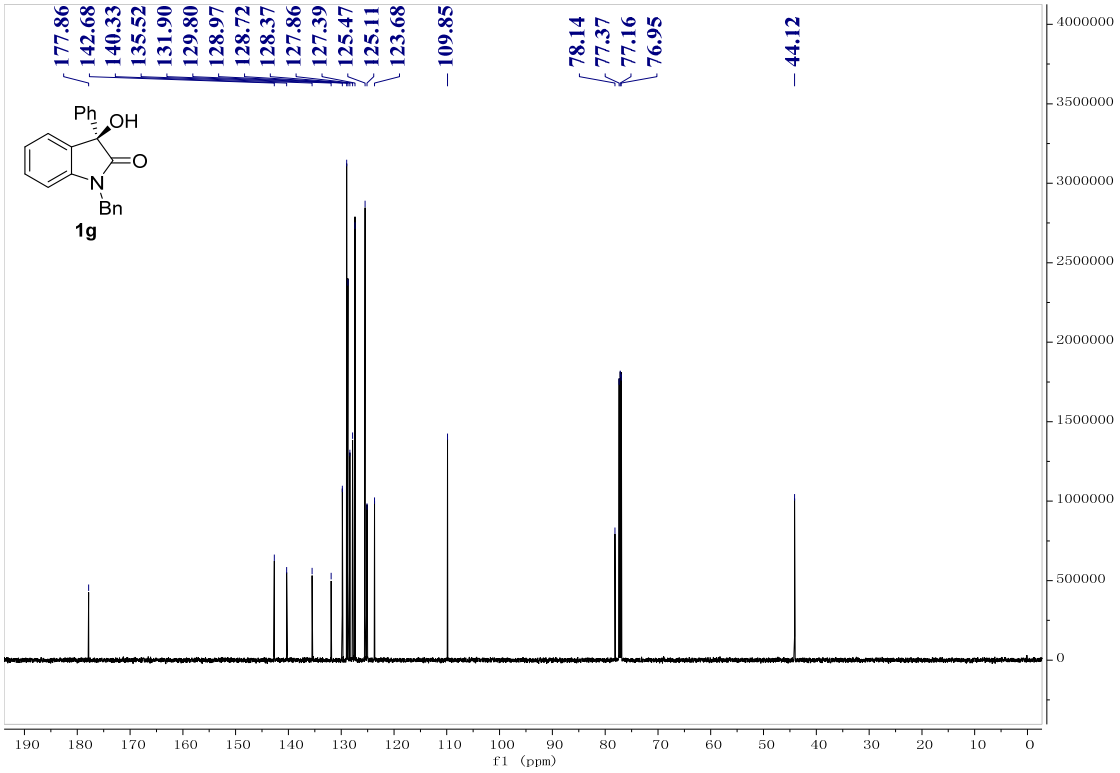


^{1}H NMR for 1g



^{13}C NMR for 1g



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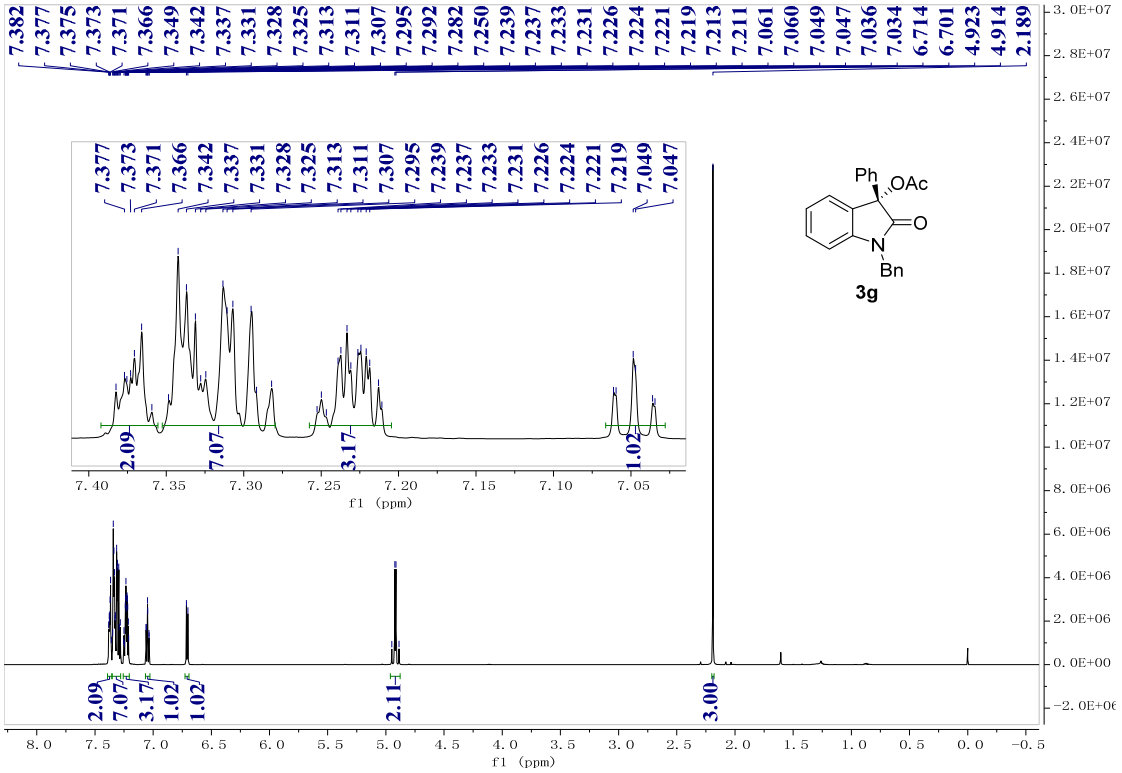

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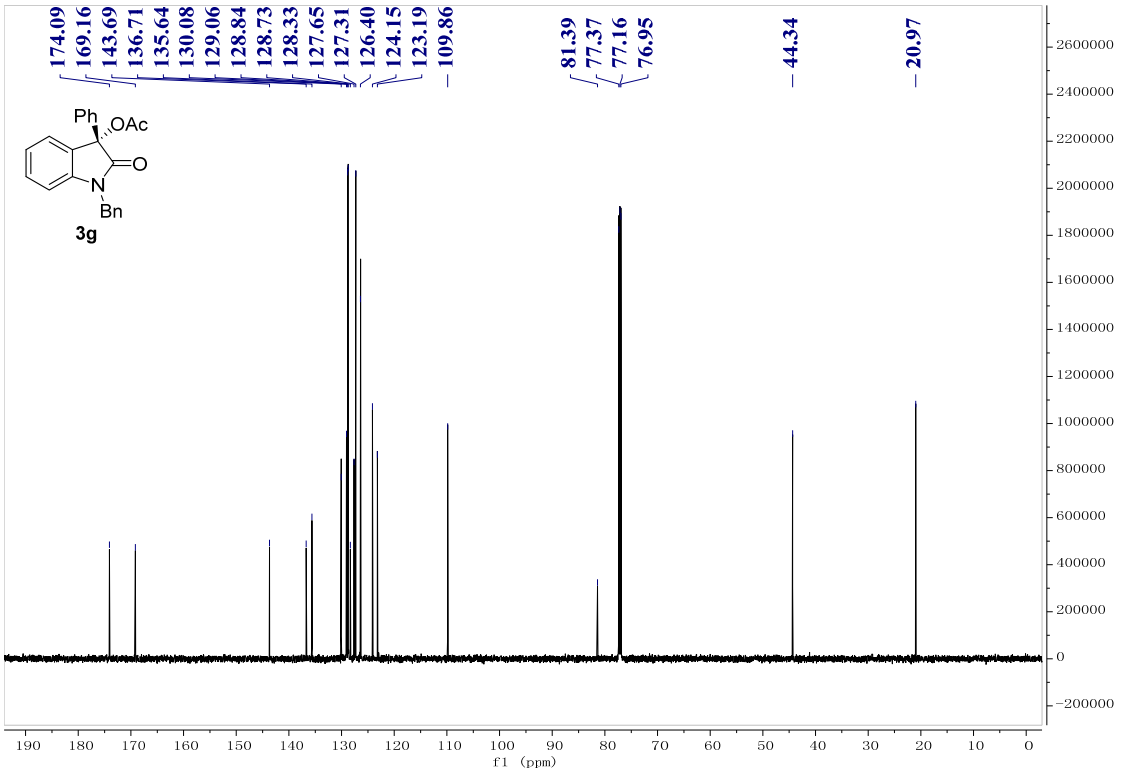
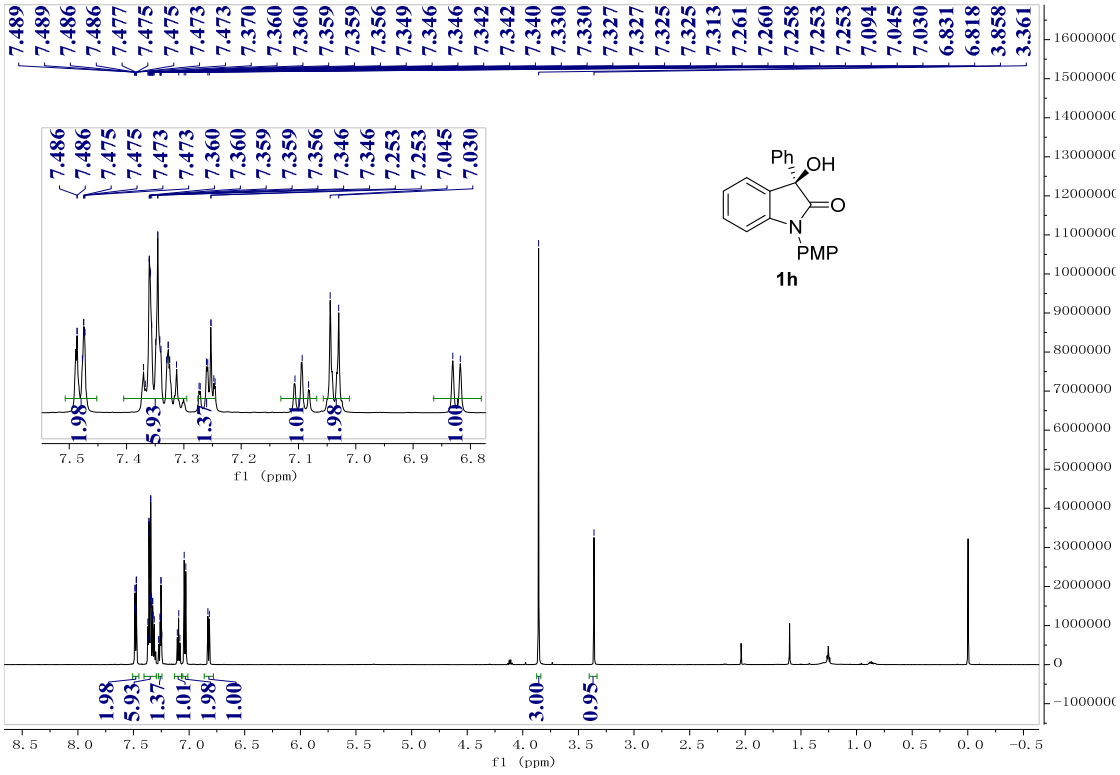


^{1}H NMR for 1h



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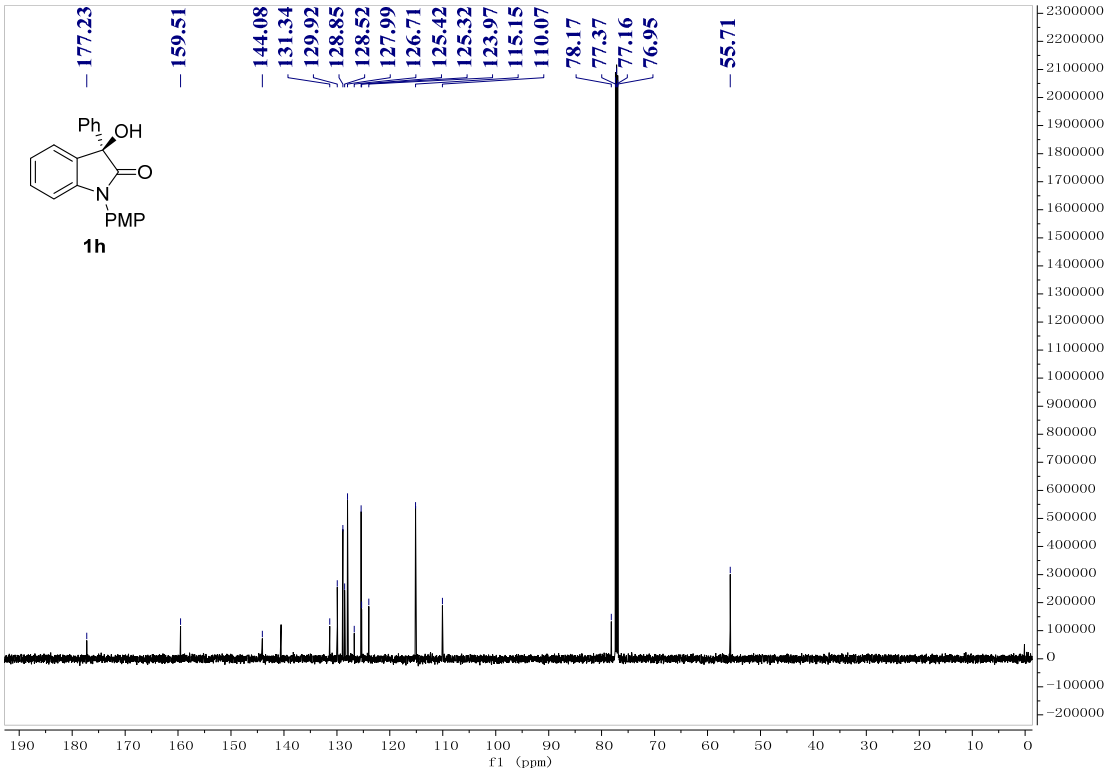

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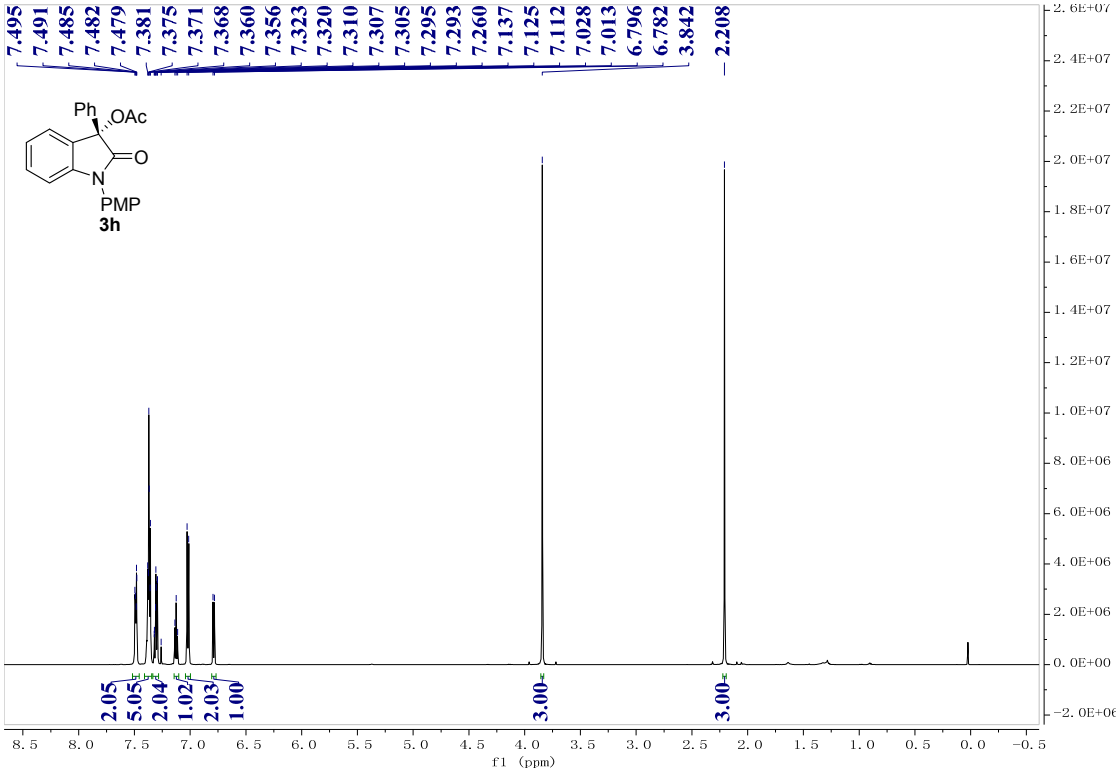
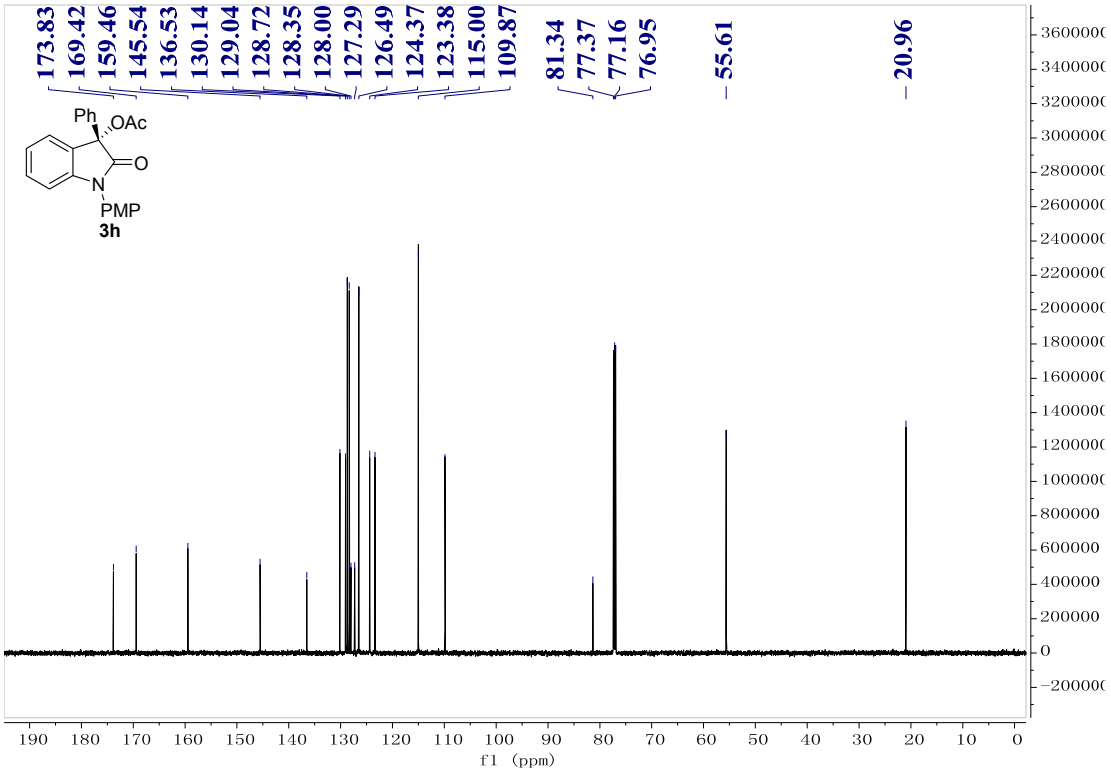
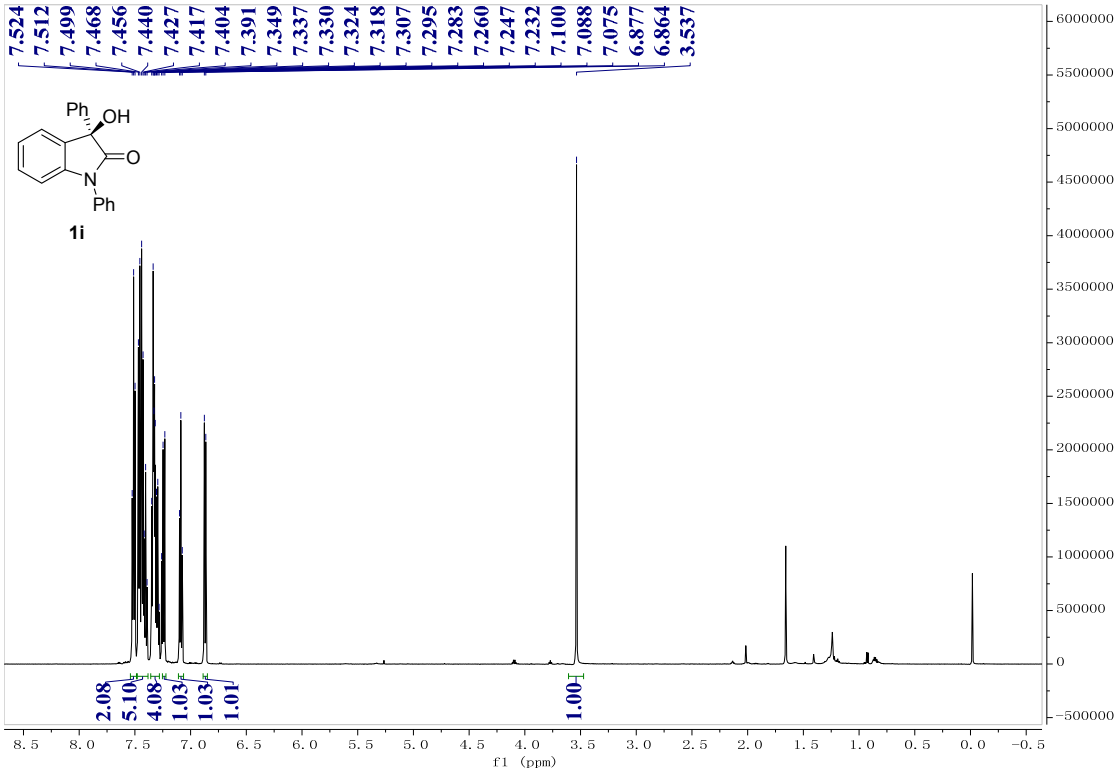


^{13}C NMR for 3h



^{1}H NMR for 1i



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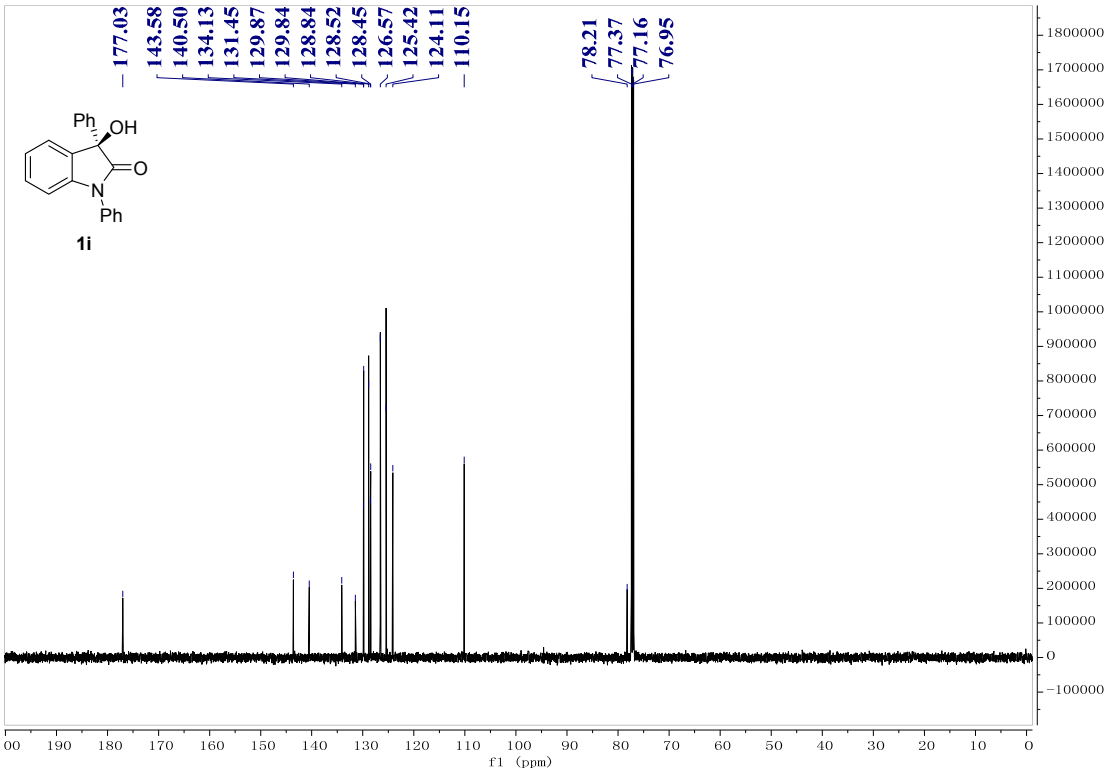

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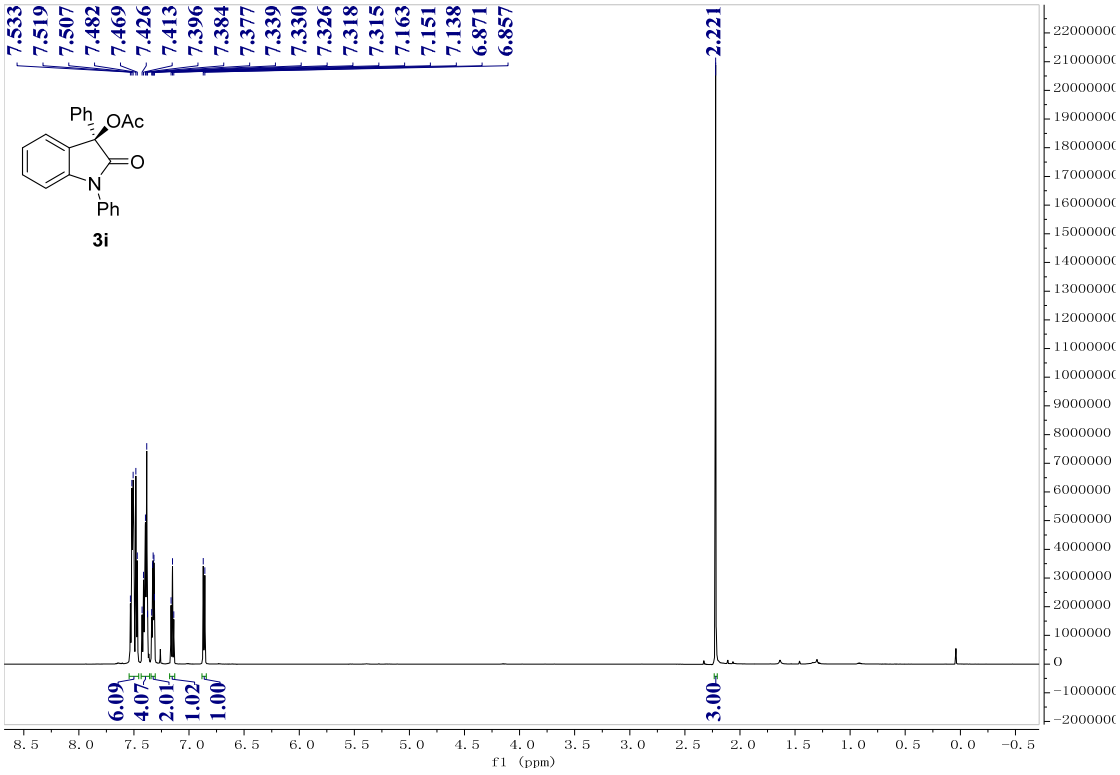
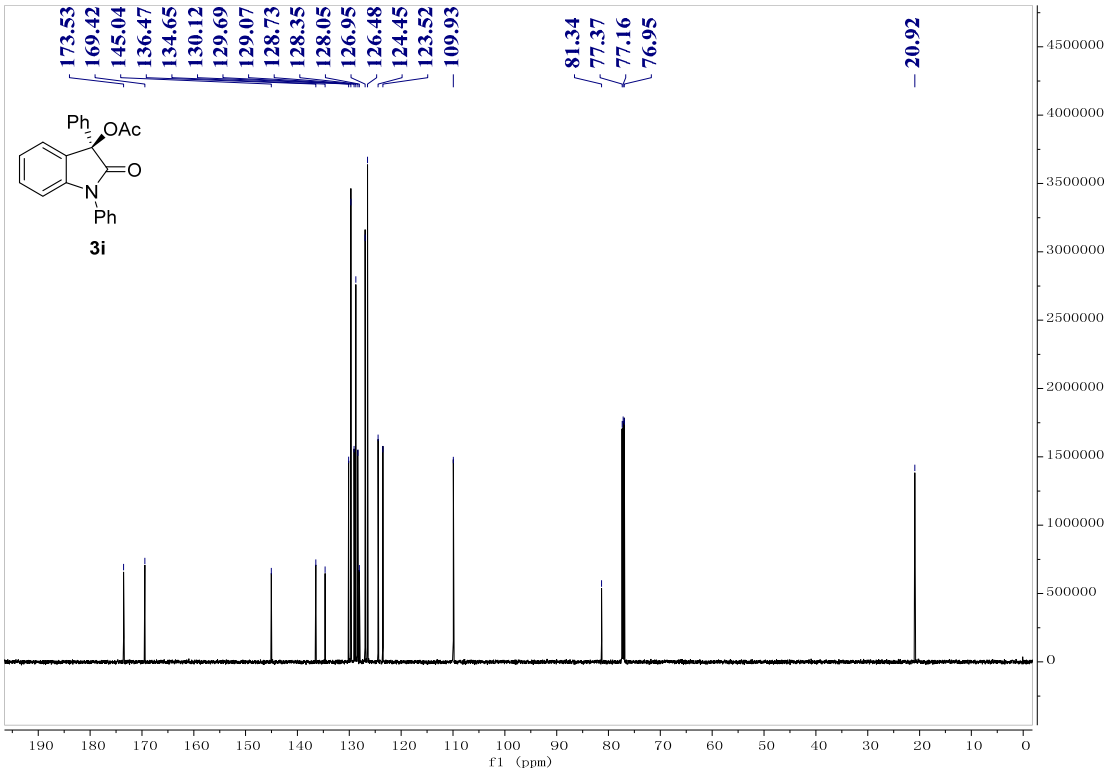


^{13}C NMR for 3i



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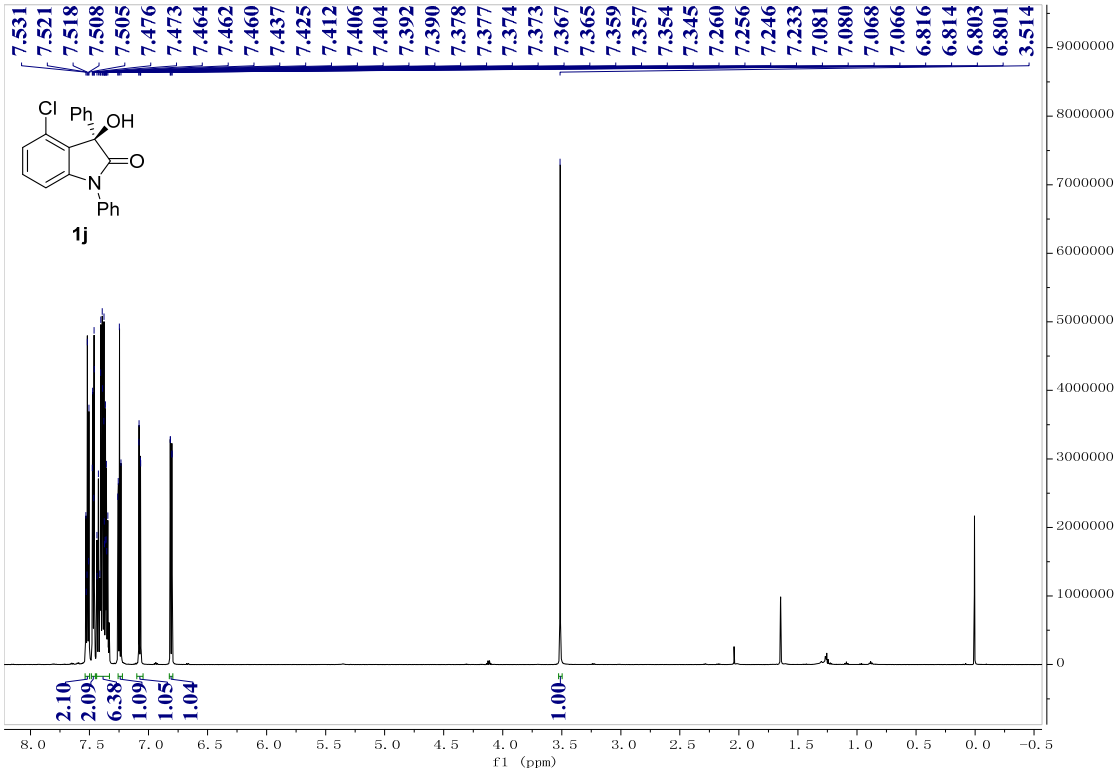

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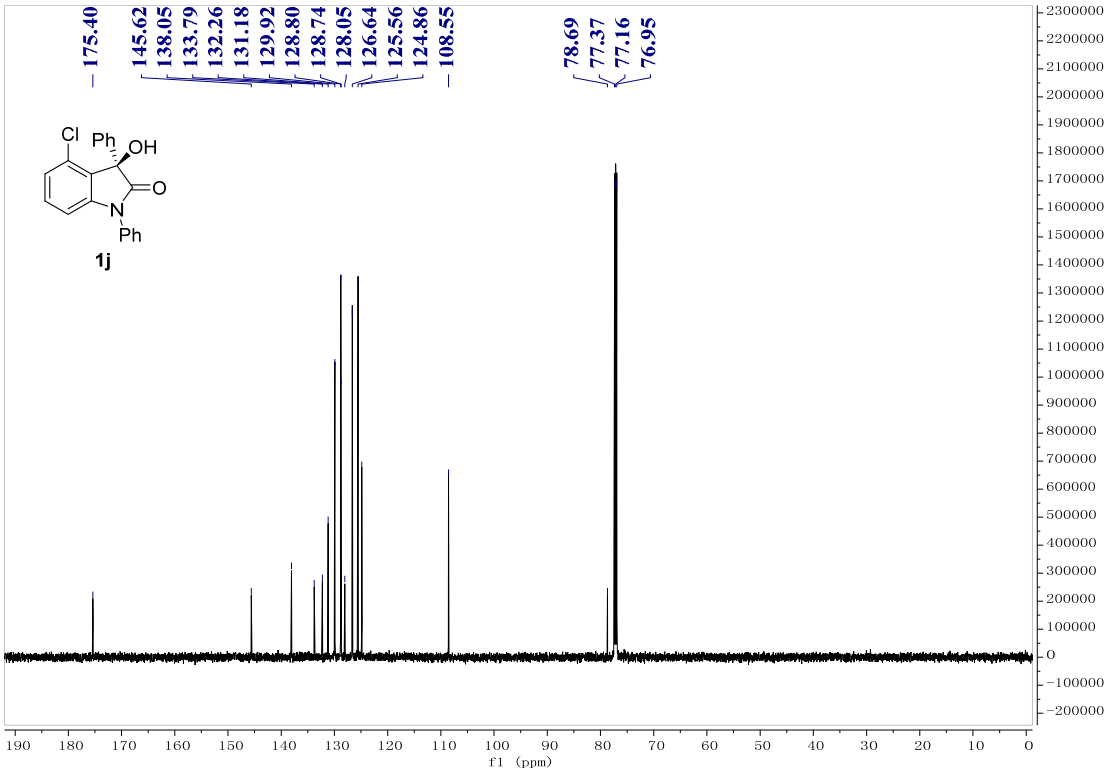

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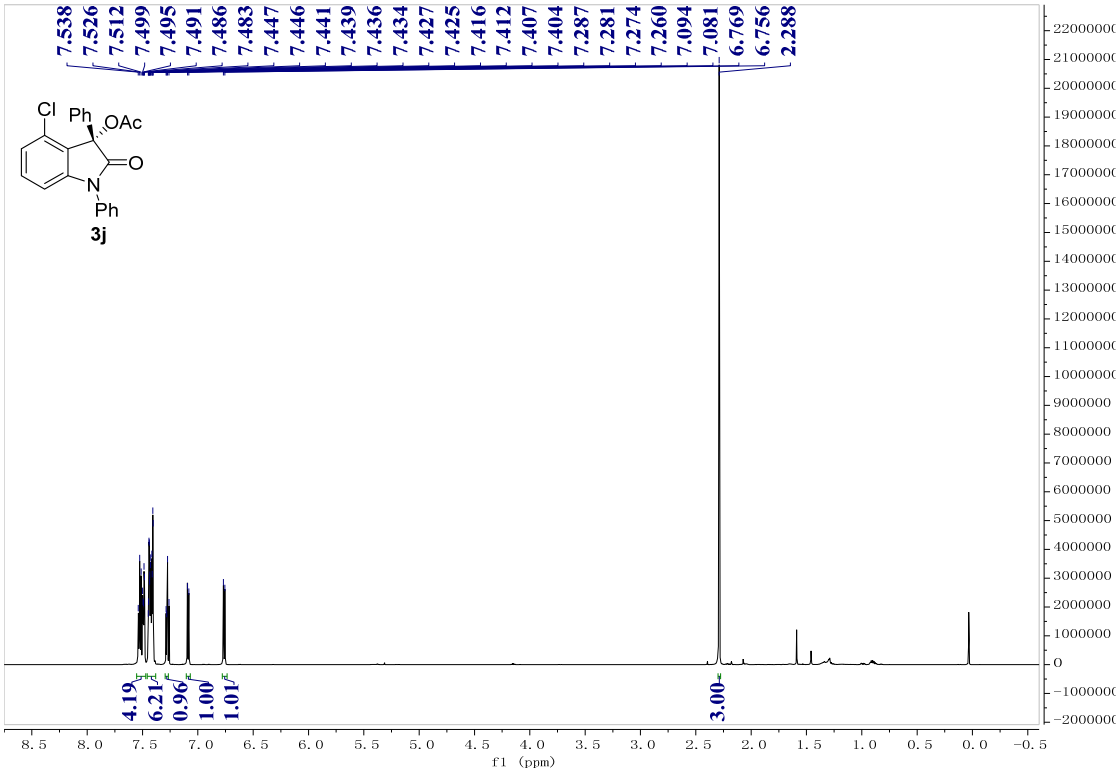
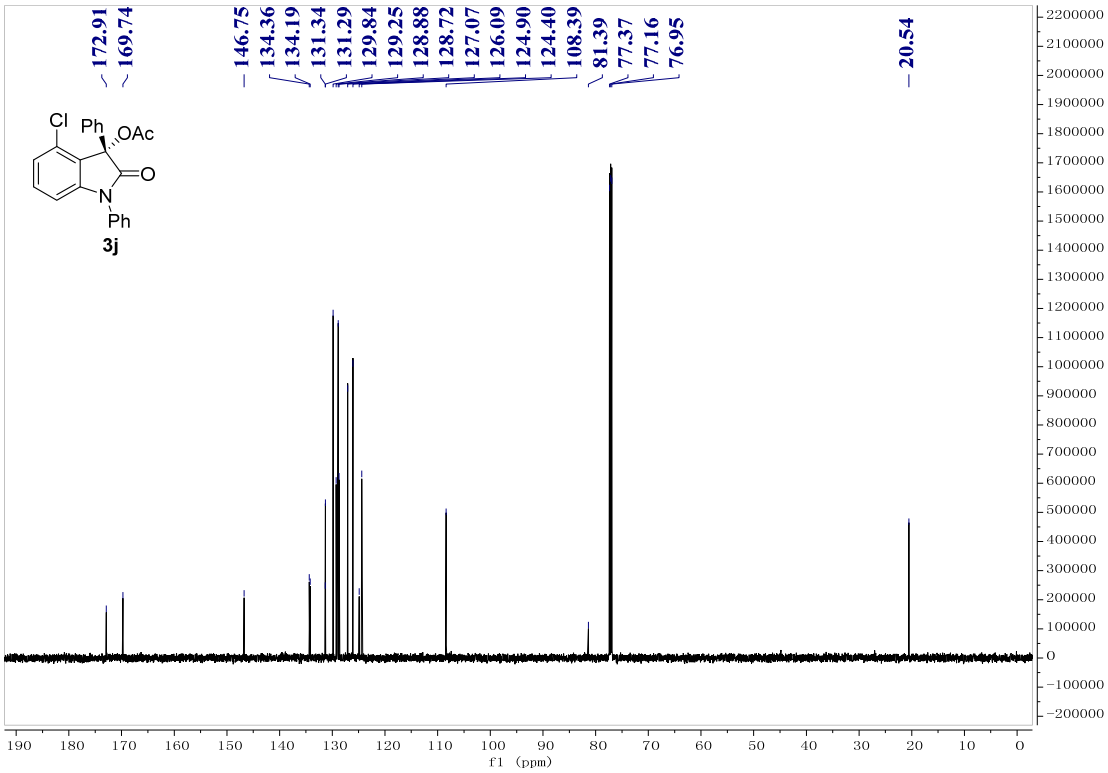
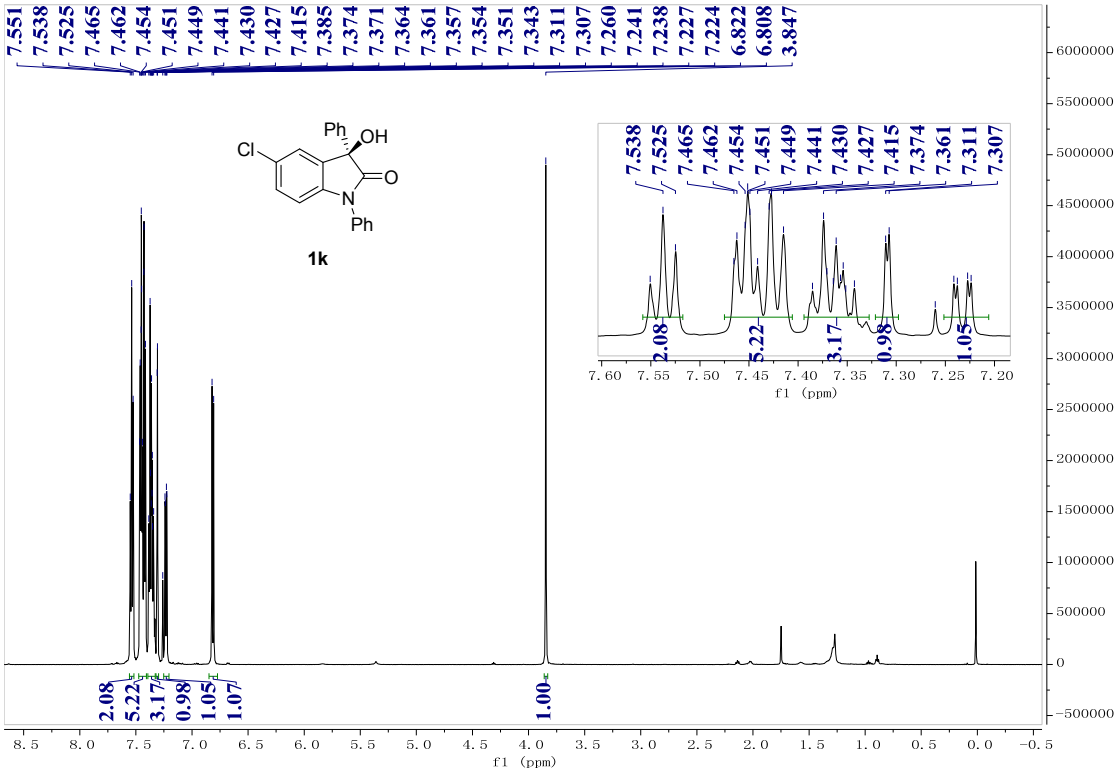


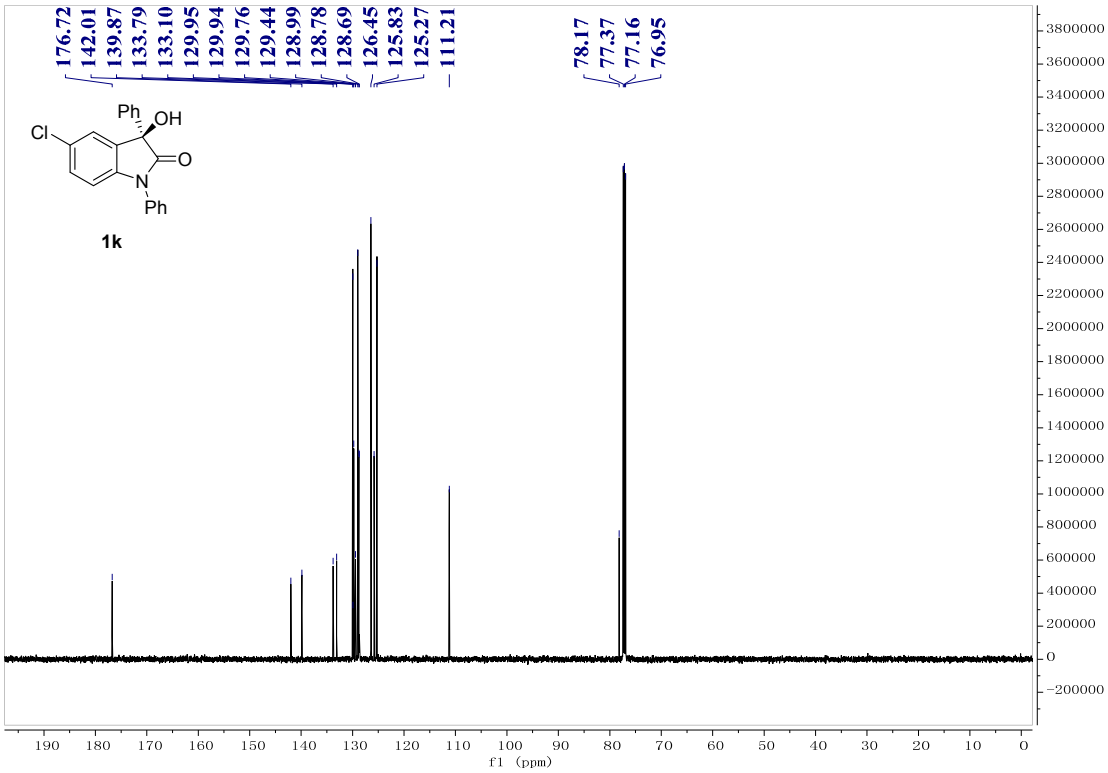
^{13}C NMR for 3j



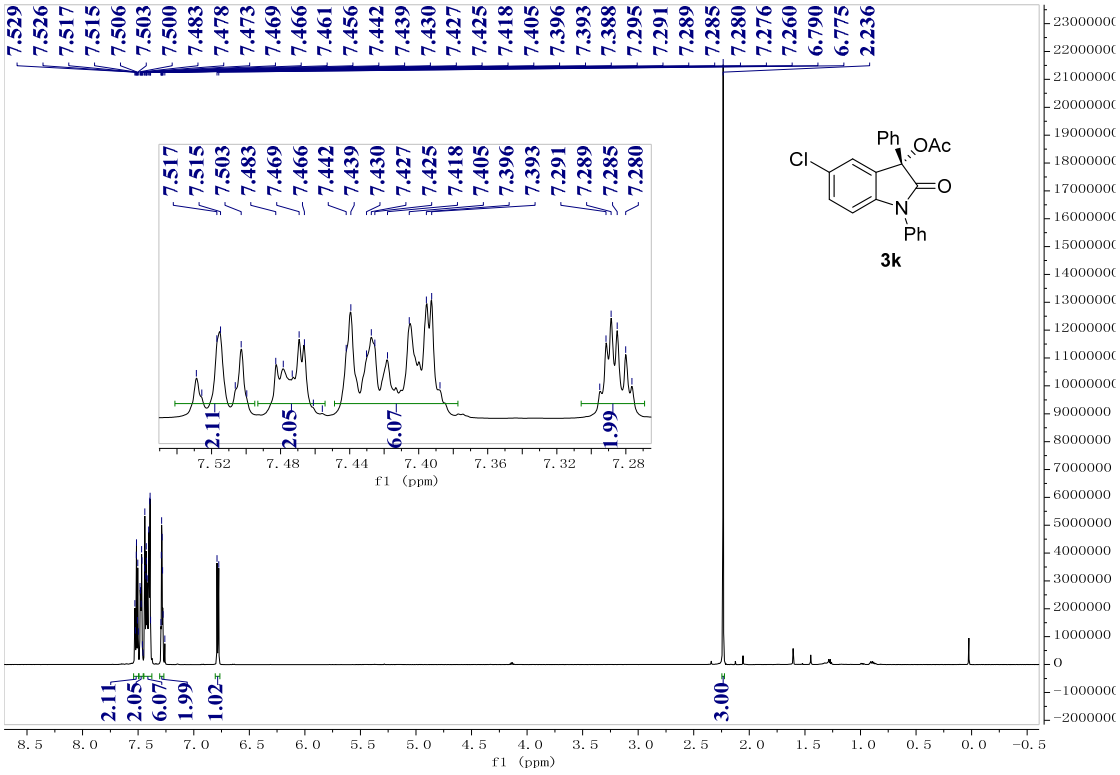
^{1}H NMR for 1k



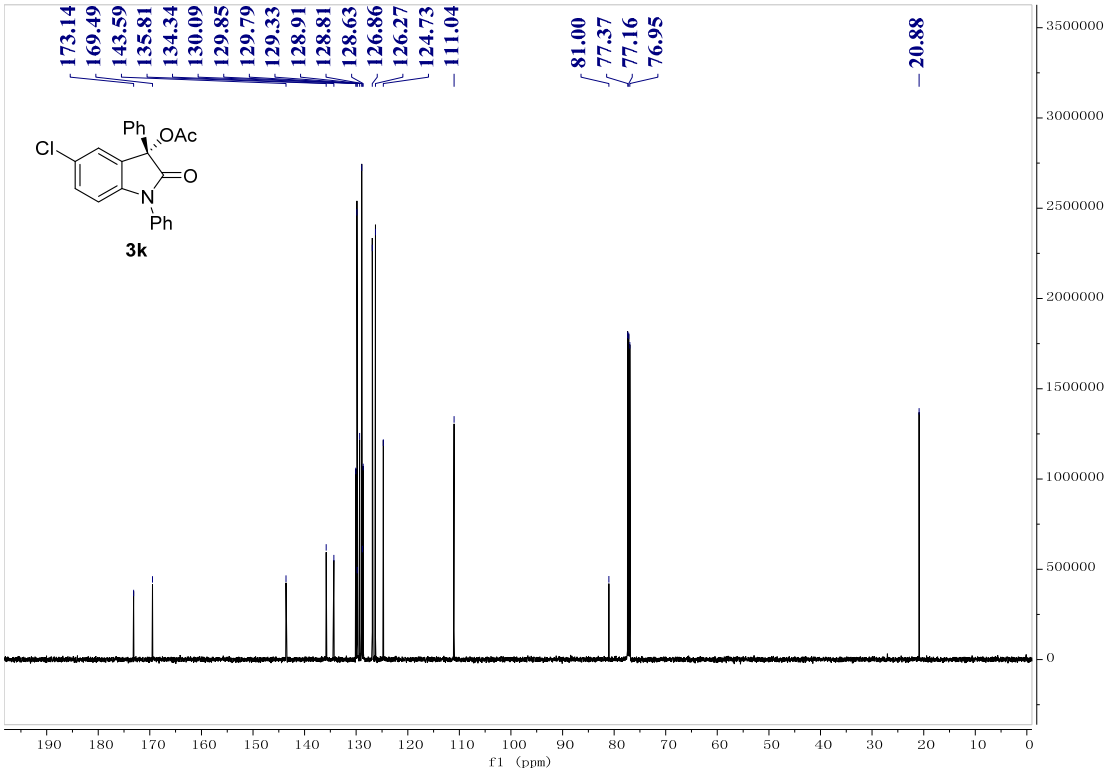
^{13}C NMR for 1k



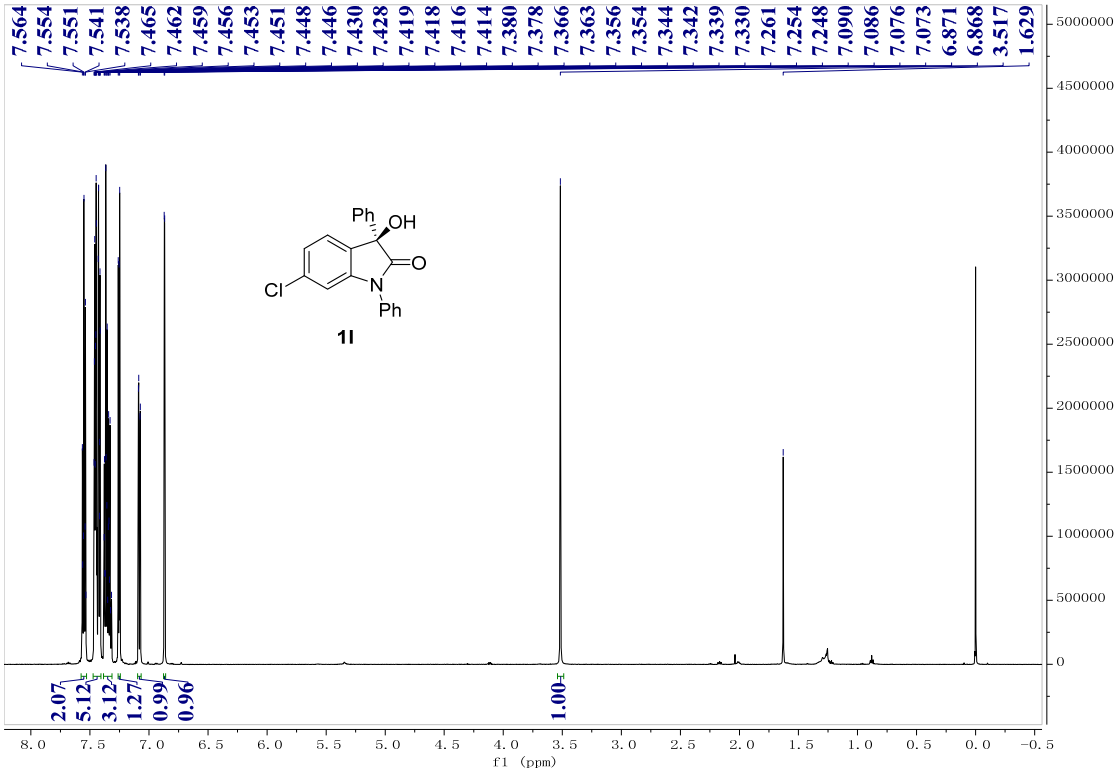
^{1}H NMR for 3k



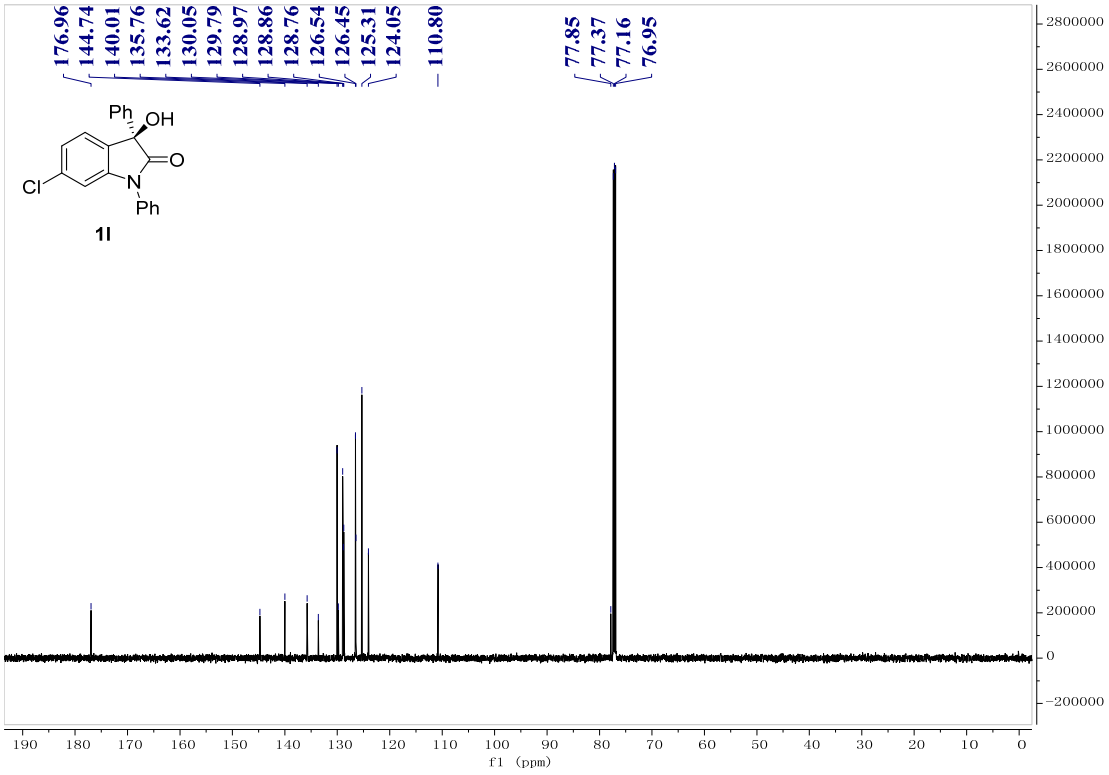
^{13}C NMR for 3k



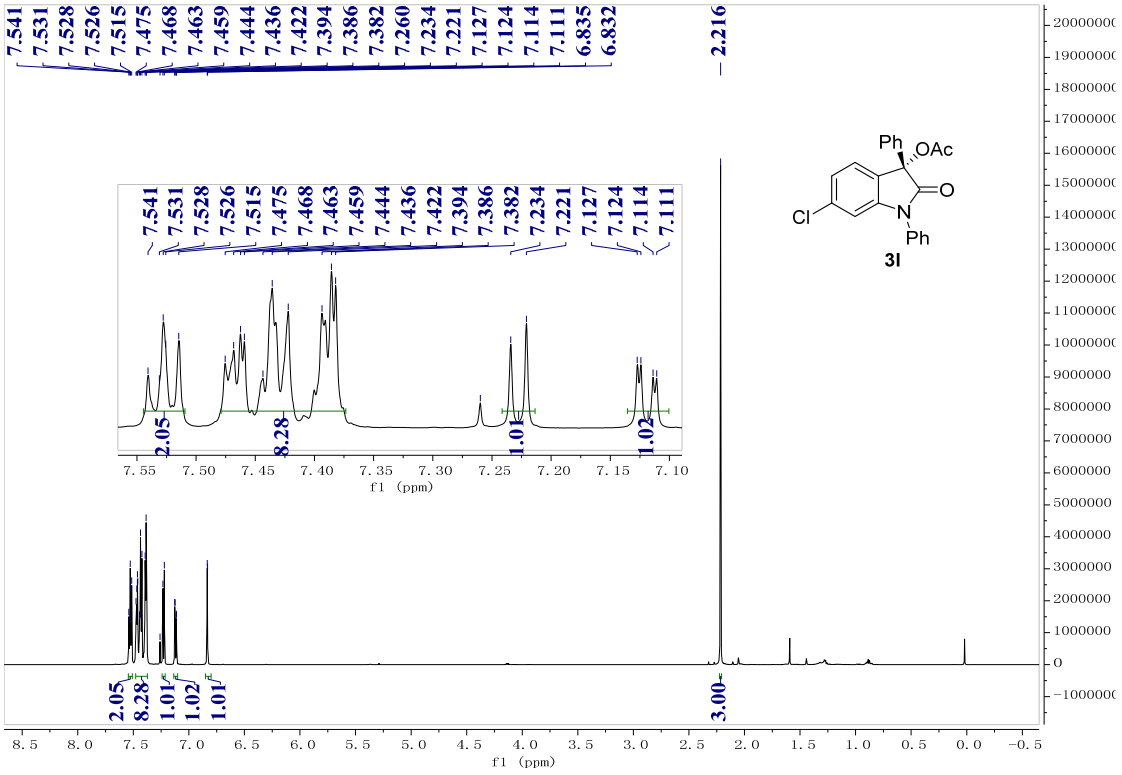
^{1}H NMR for 1l



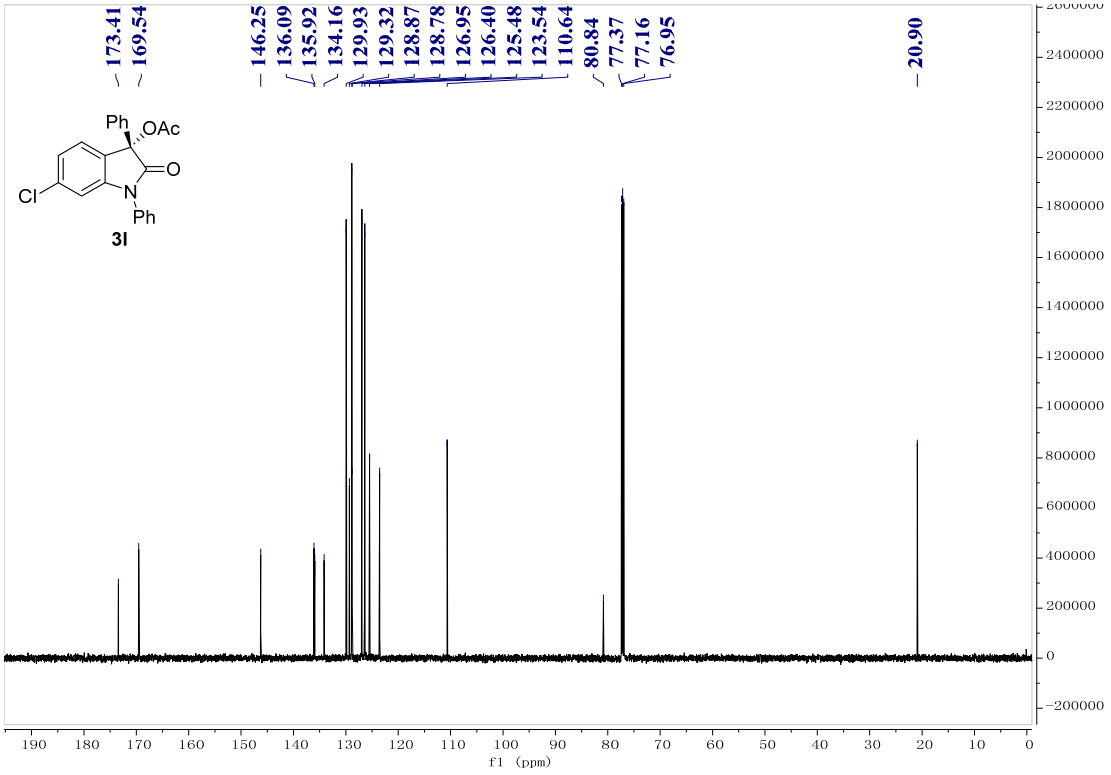
^{13}C NMR for 1l



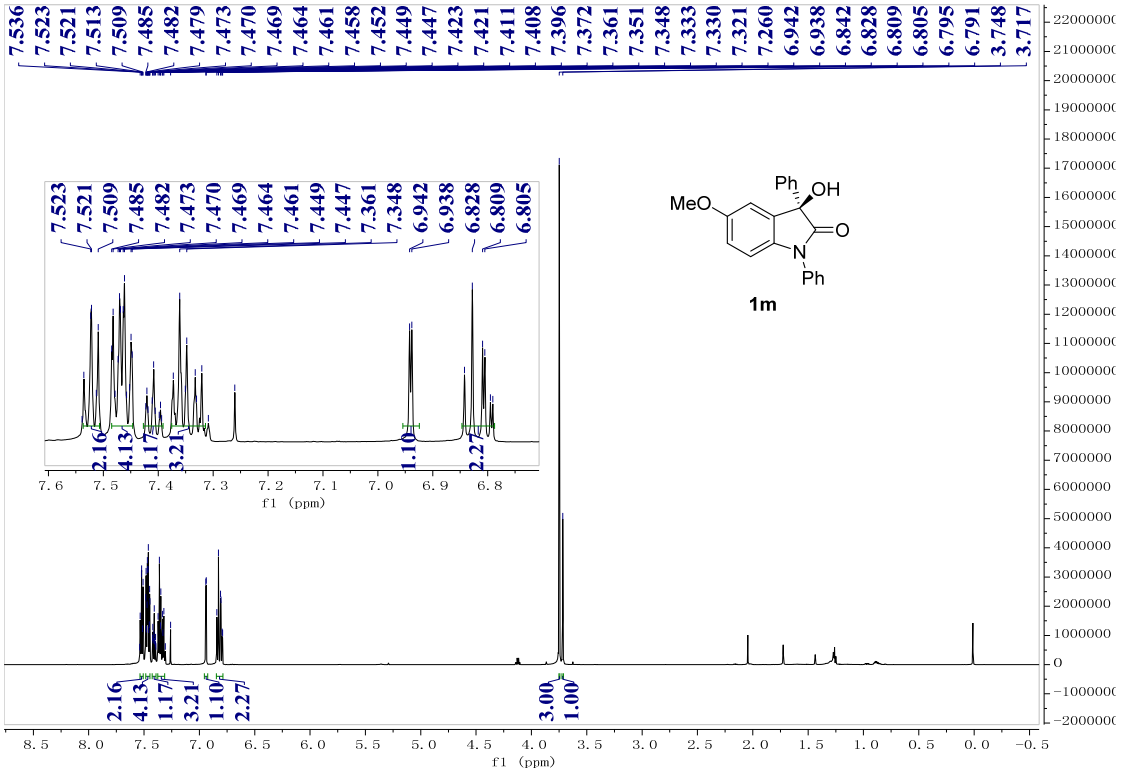
^{1}H NMR for 3l



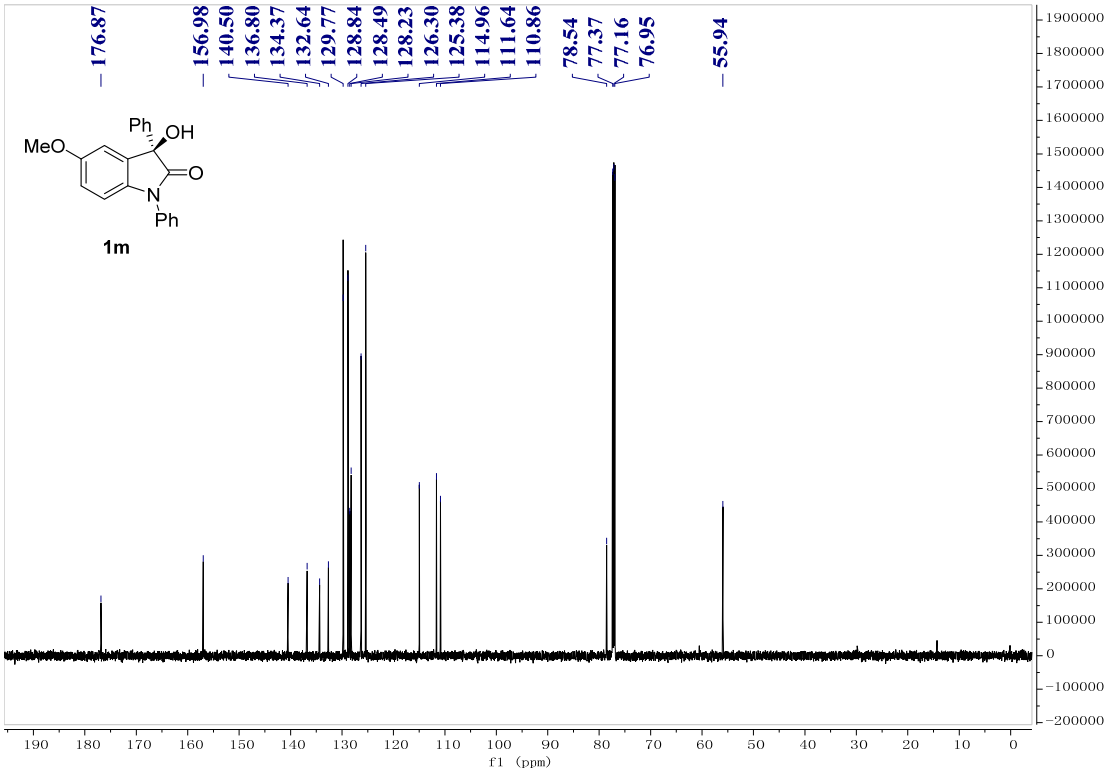
^{13}C NMR for 3l



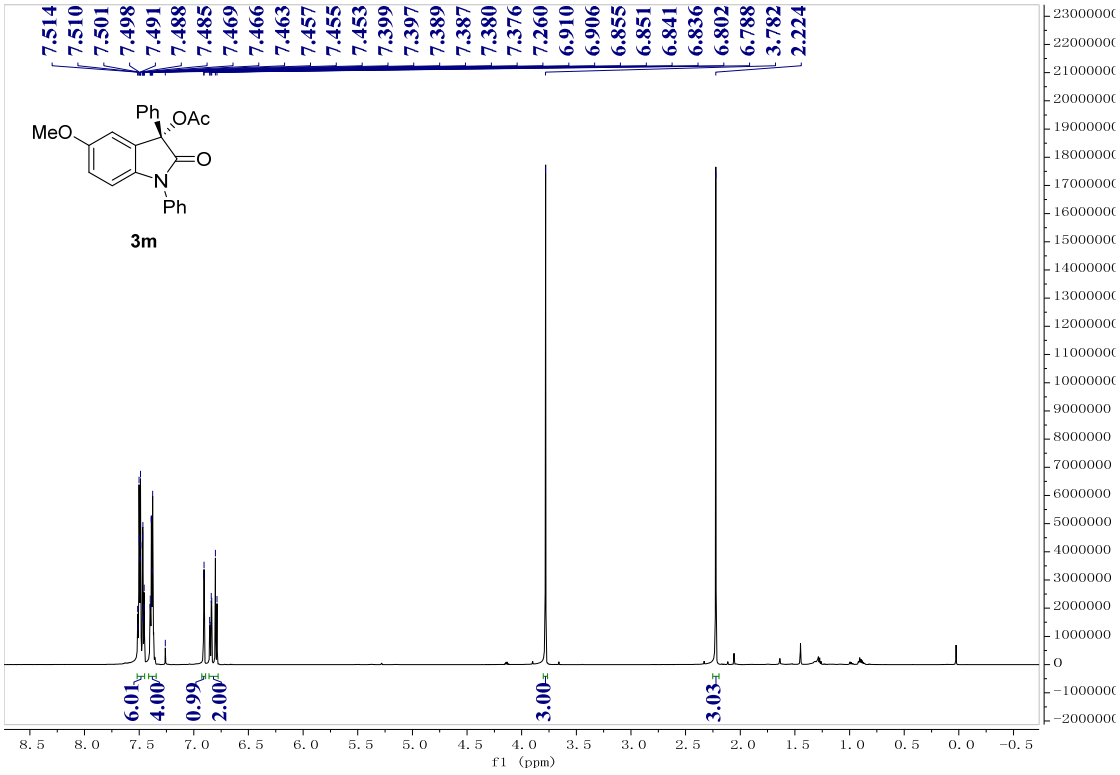
^{1}H NMR for 1m



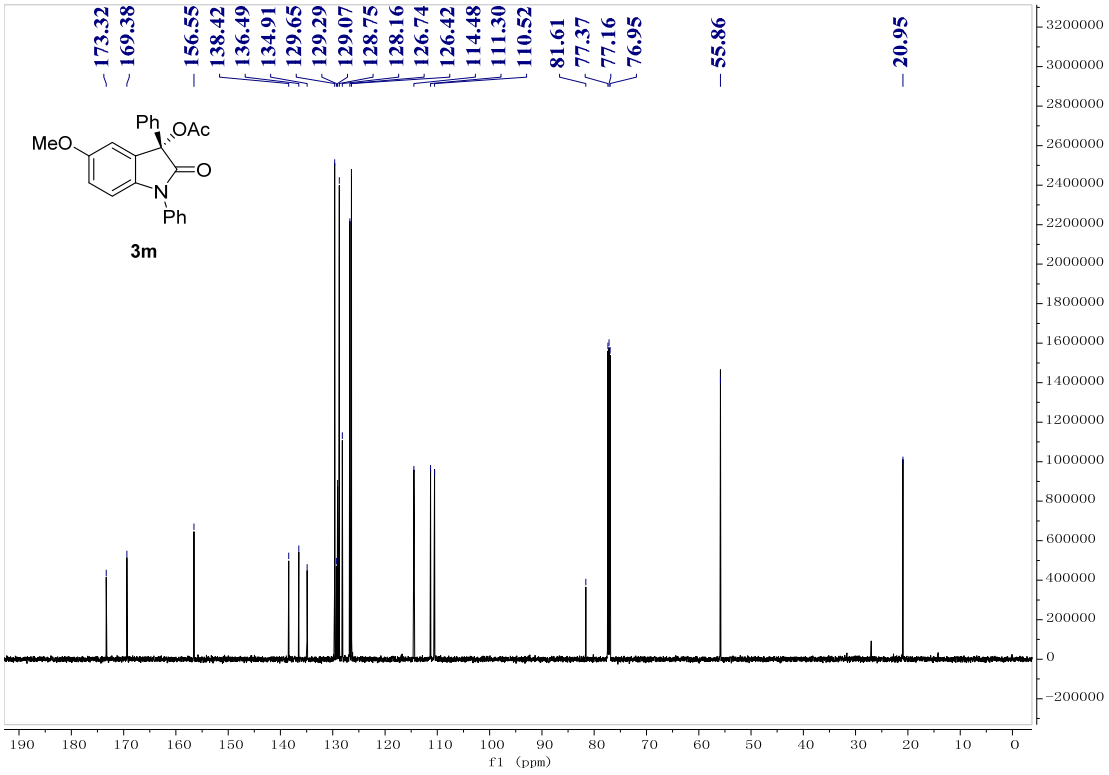
^{13}C NMR for 1m



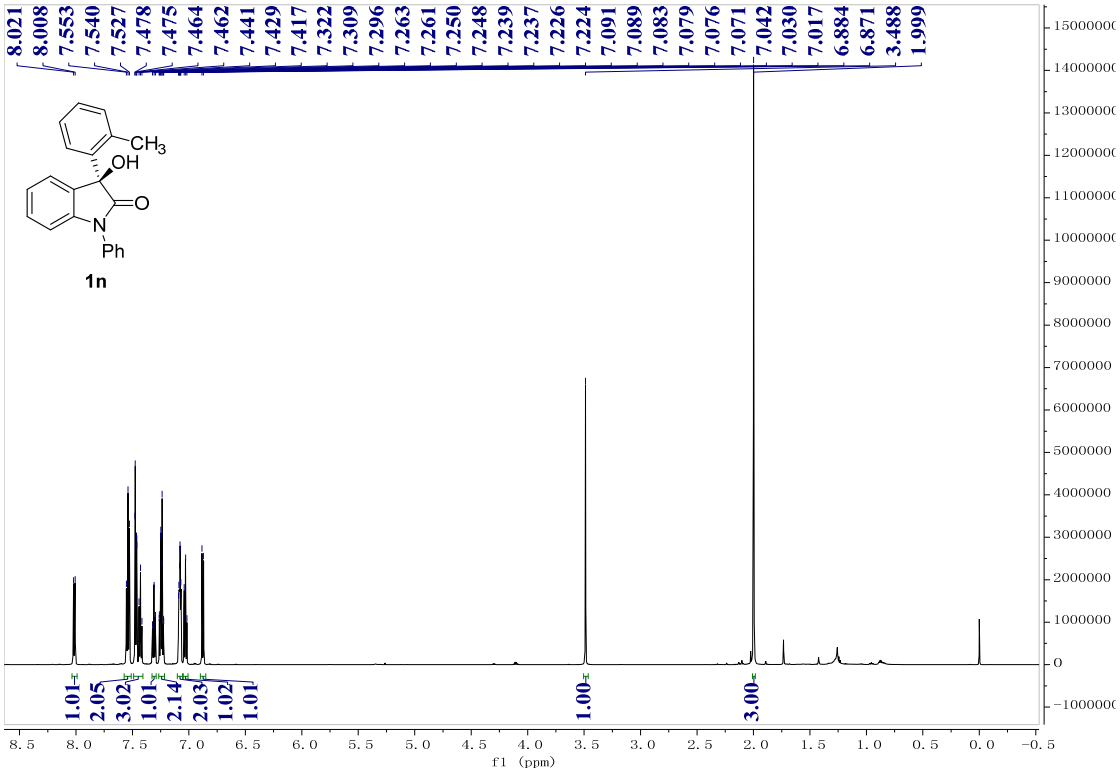
^{1}H NMR for 3m



^{13}C NMR for 3m



^{1}H NMR for 1n



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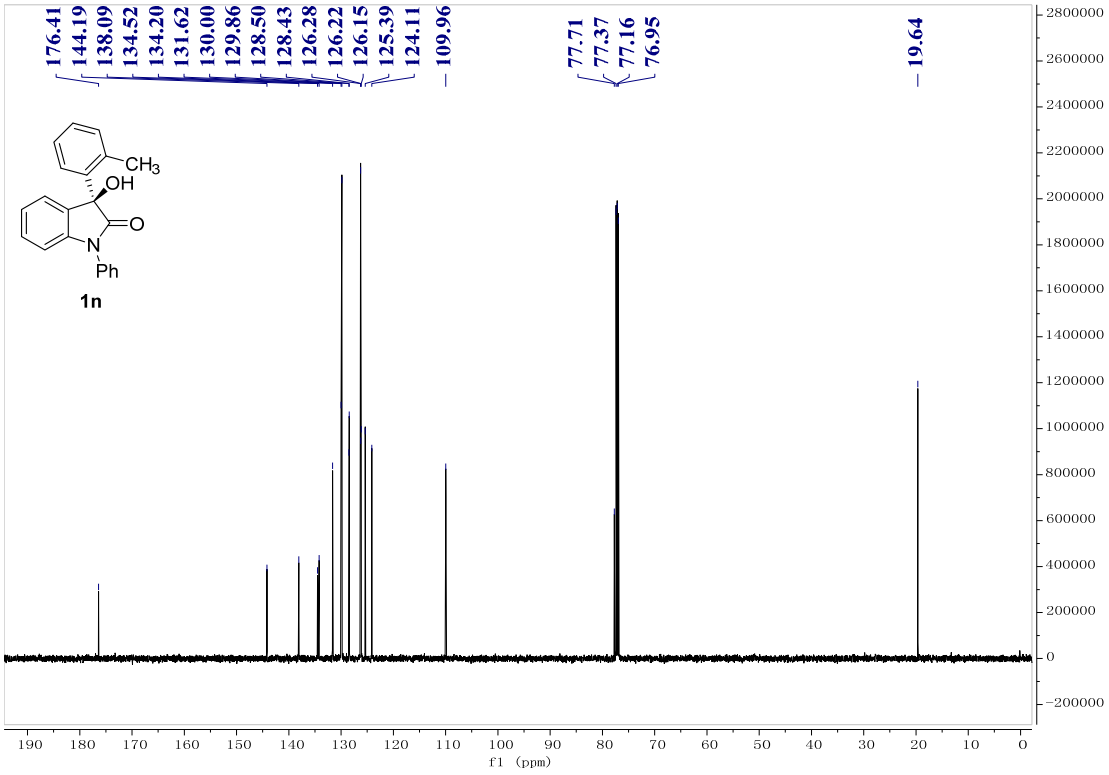
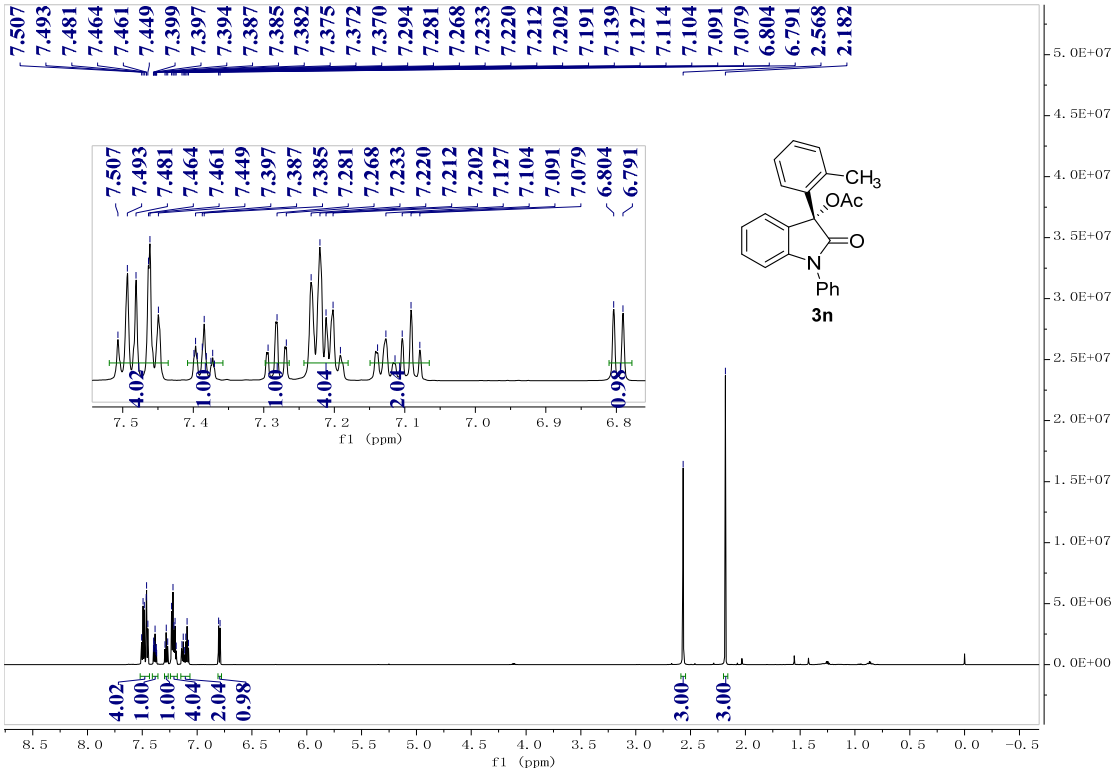
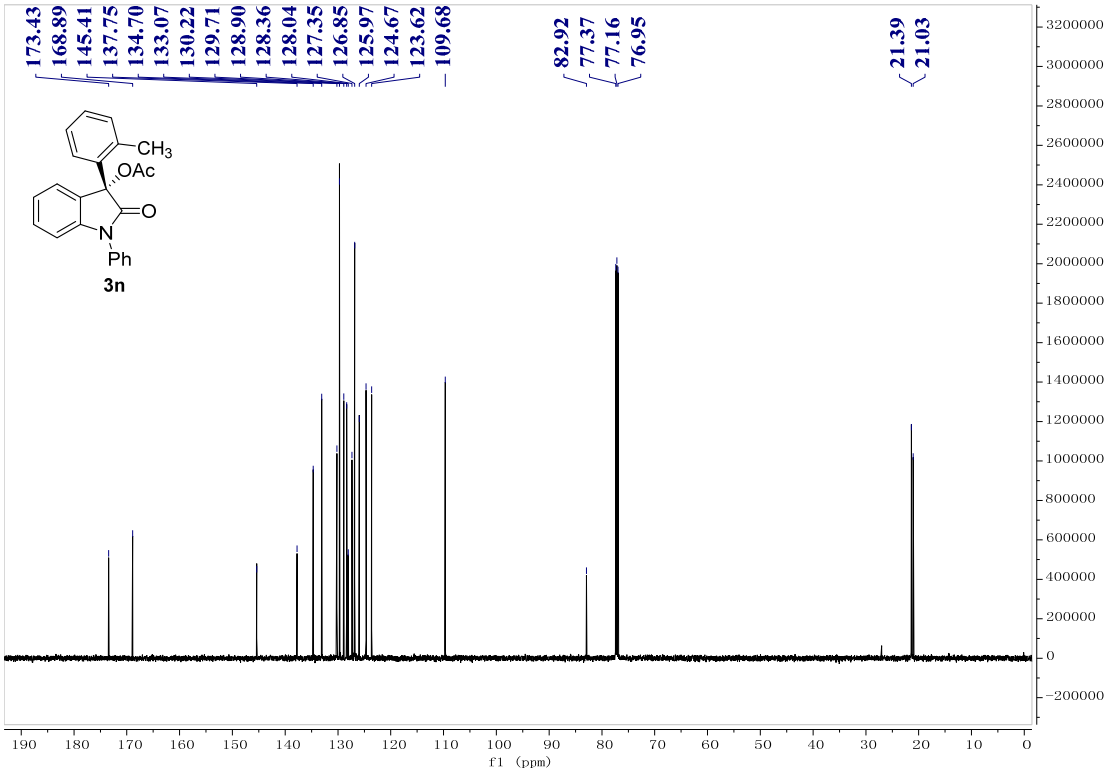


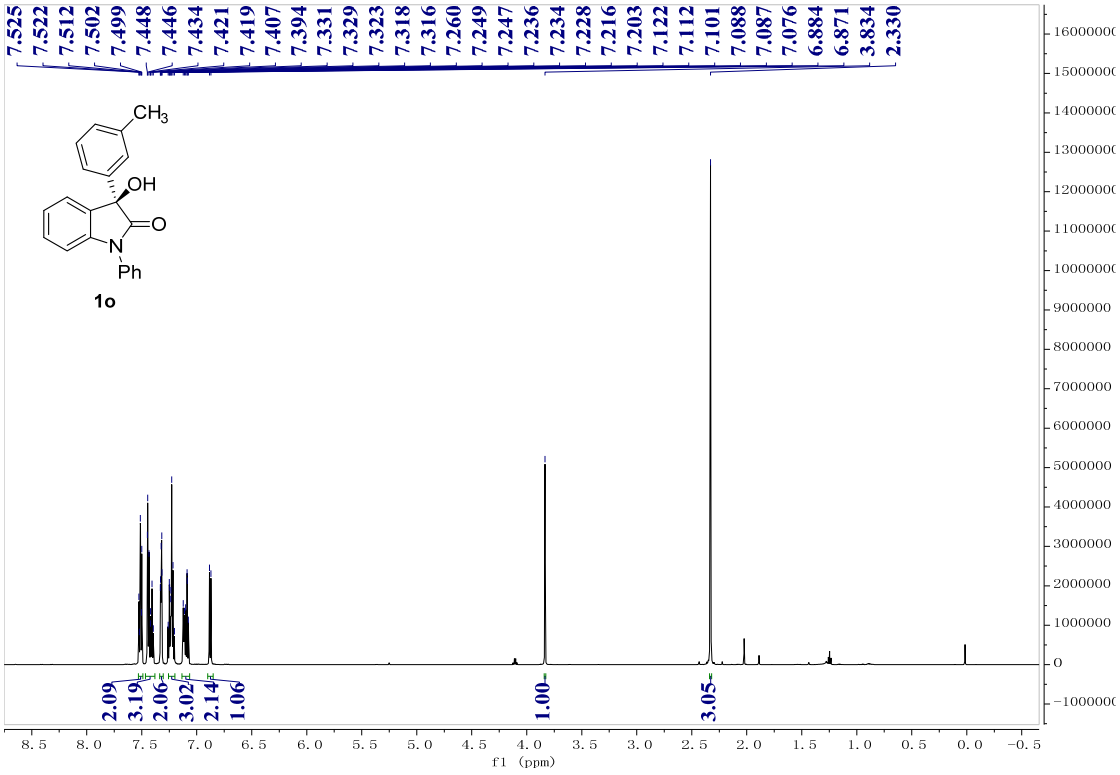
^{1}H NMR for 3n



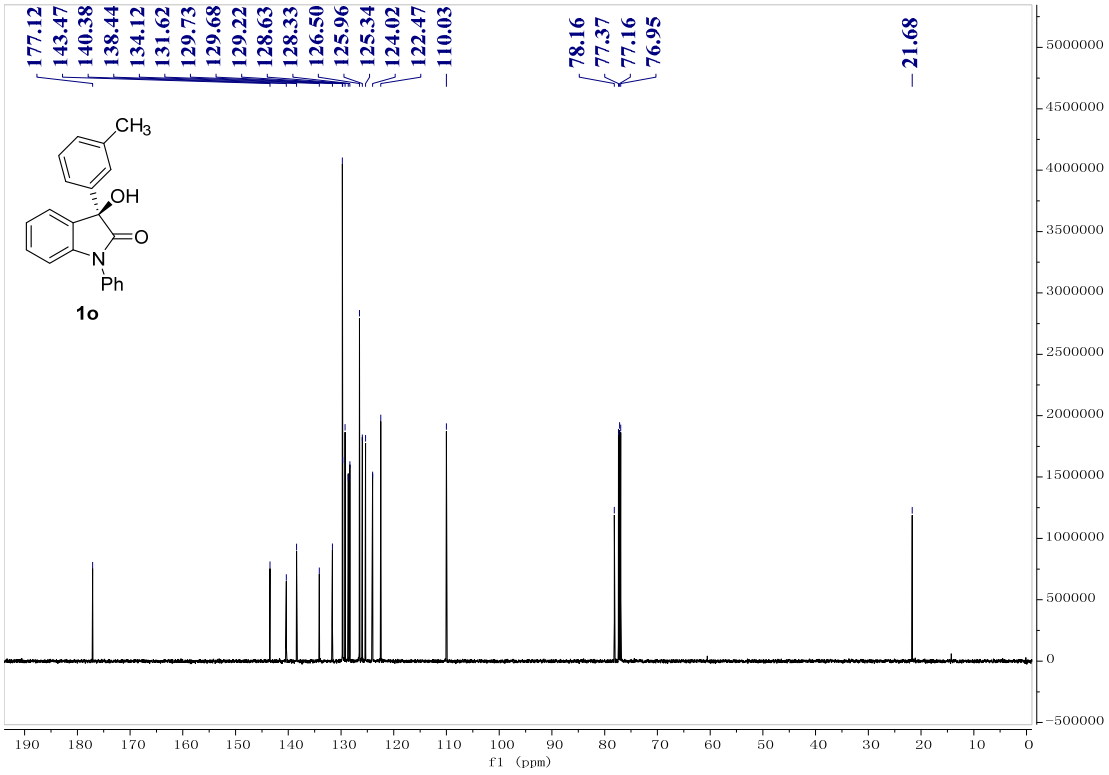
^{13}C NMR for 3n



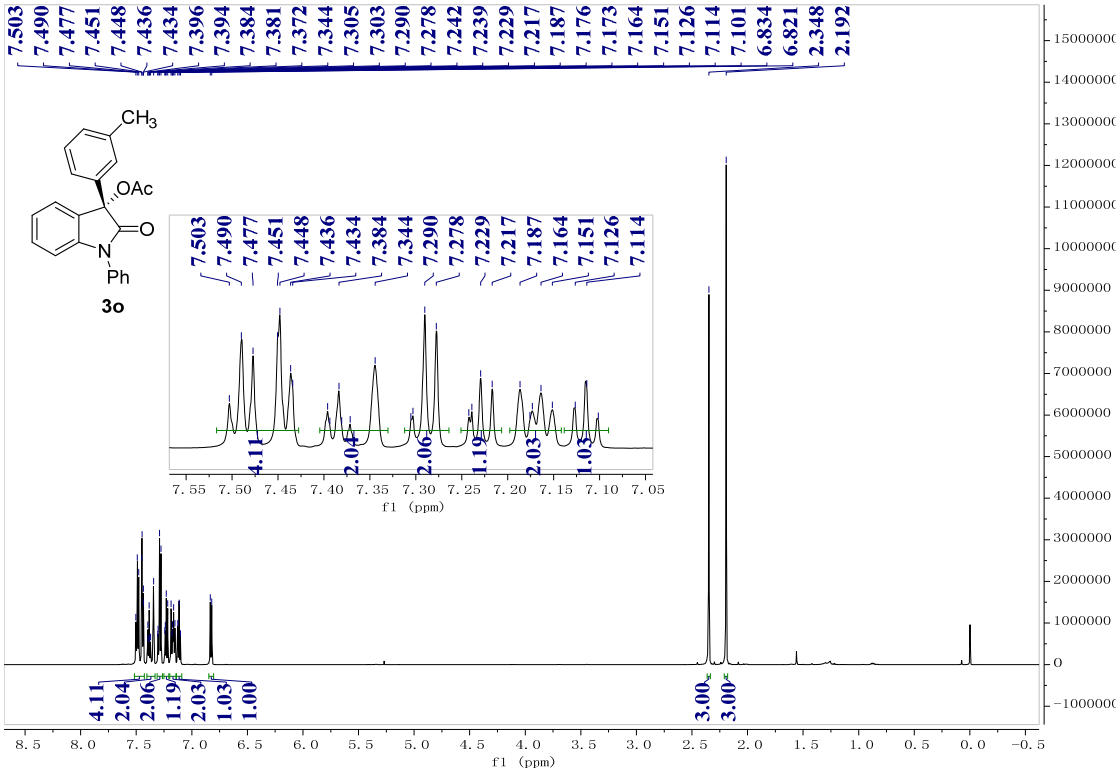
^{1}H NMR for 1o



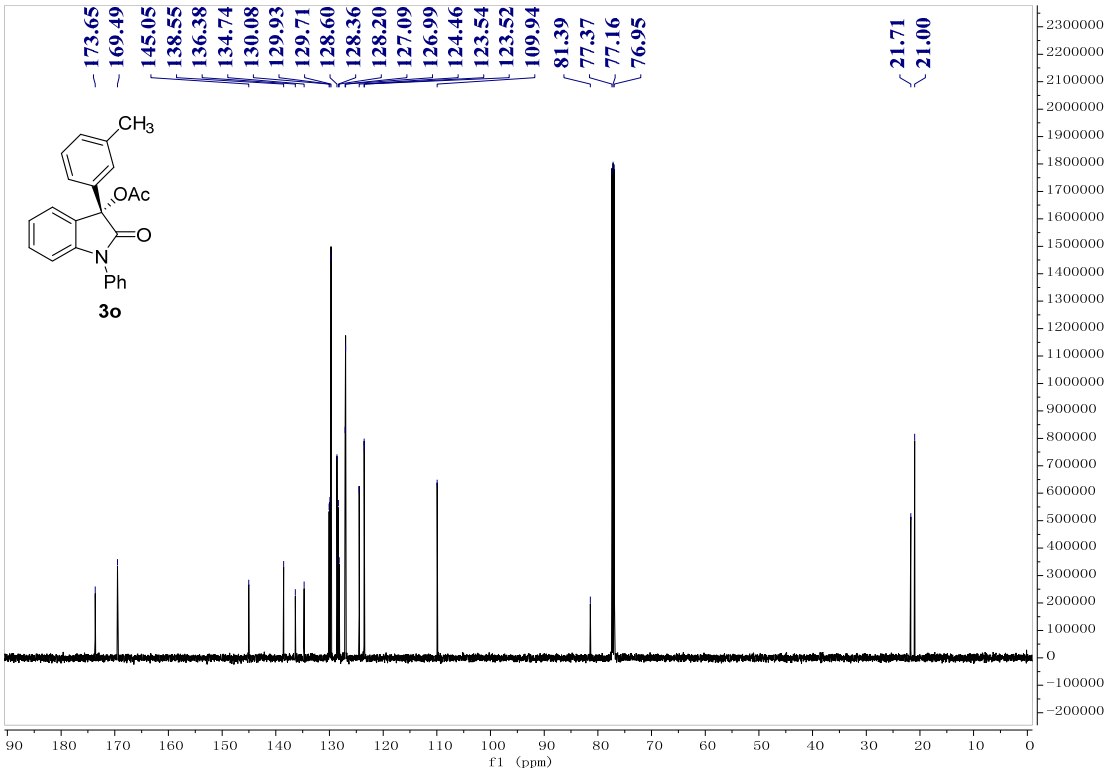
^{13}C NMR for 1o



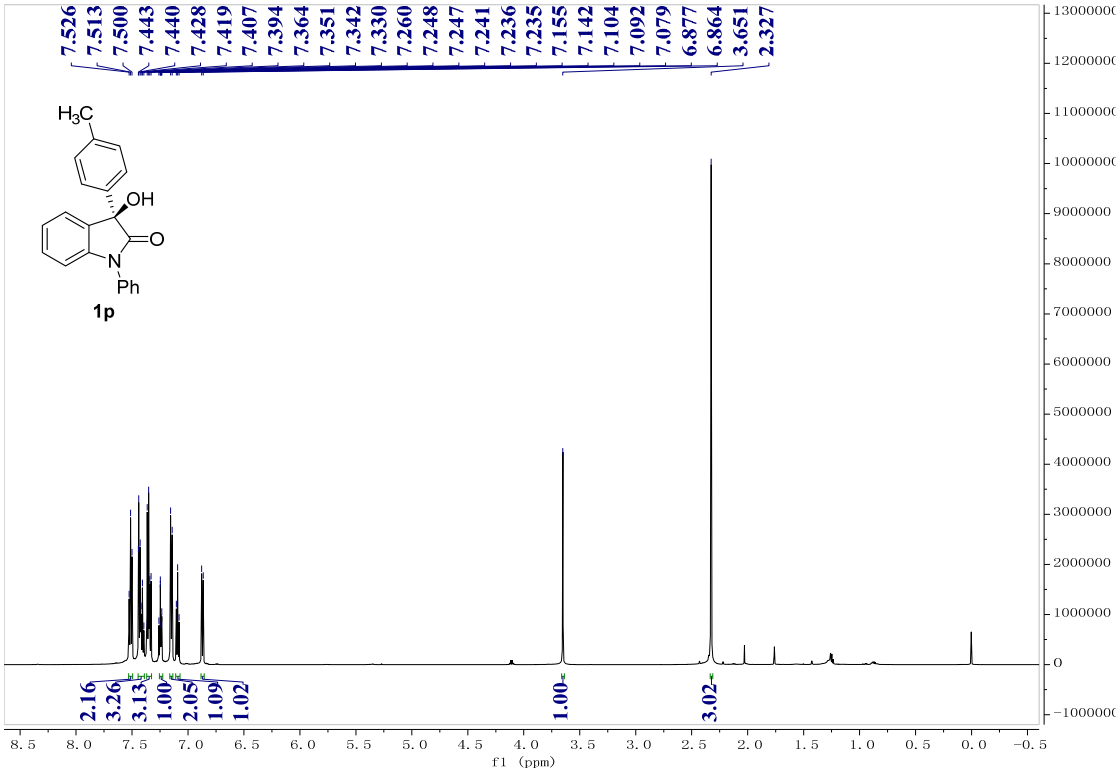
^{1}H NMR for 3o



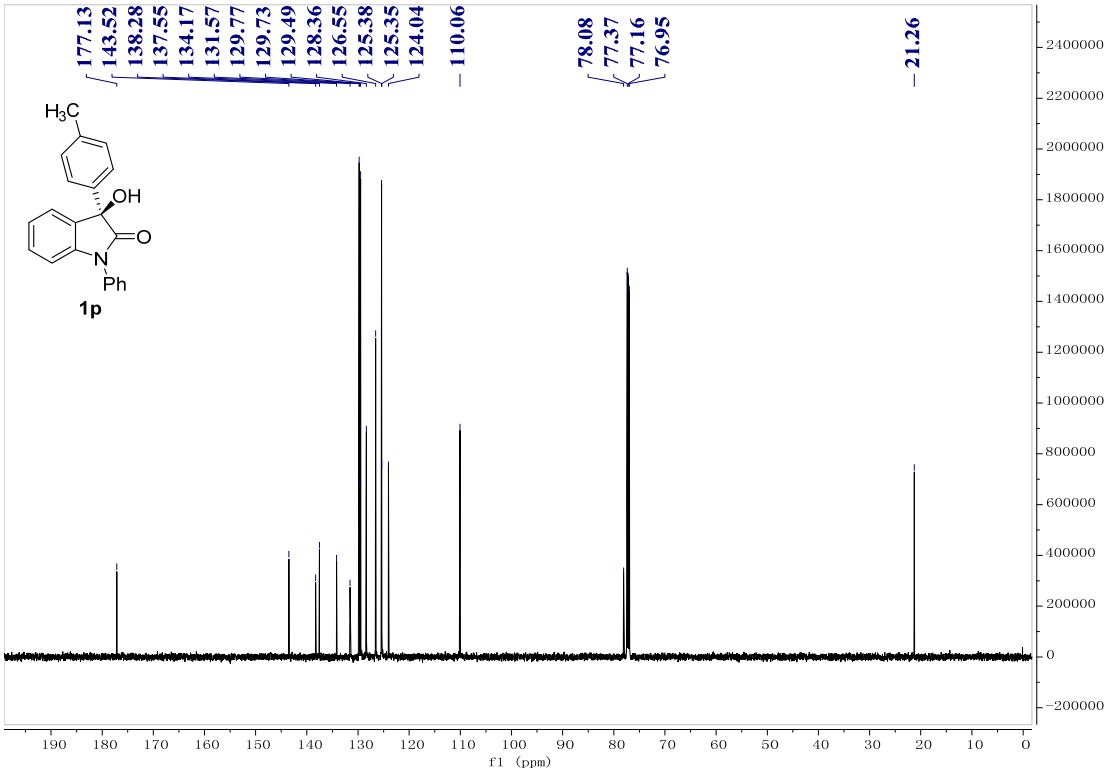
^{13}C NMR for 3o



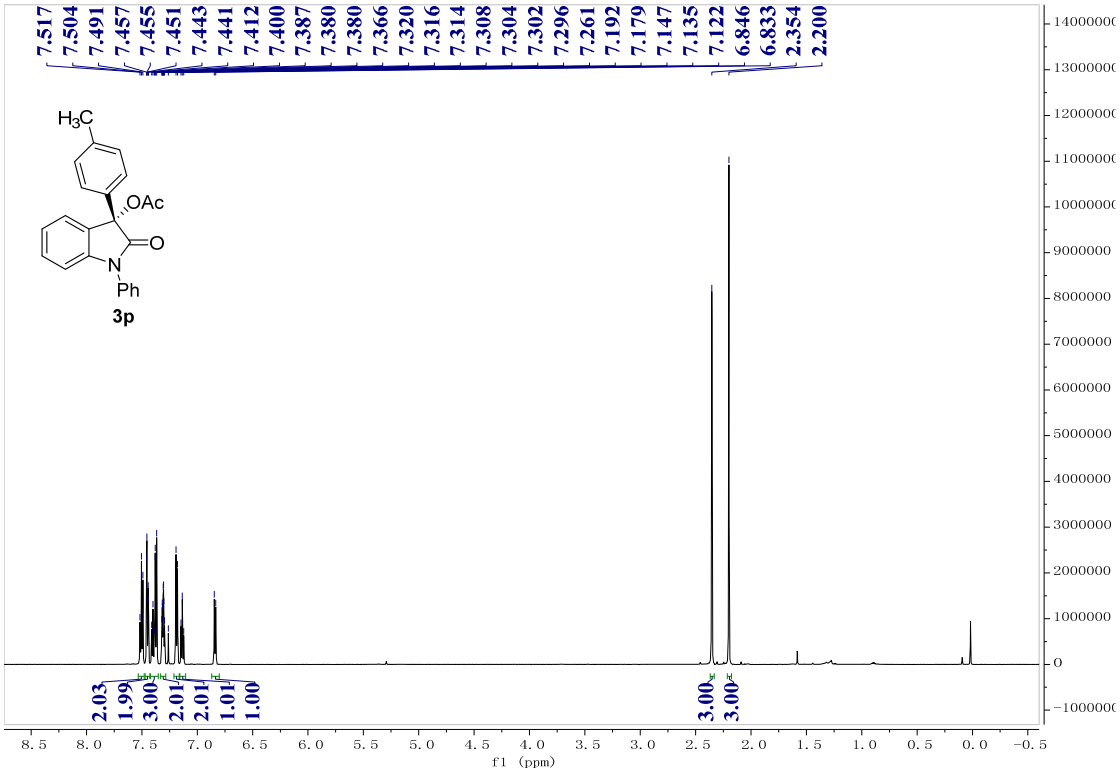
^{1}H NMR for 1p



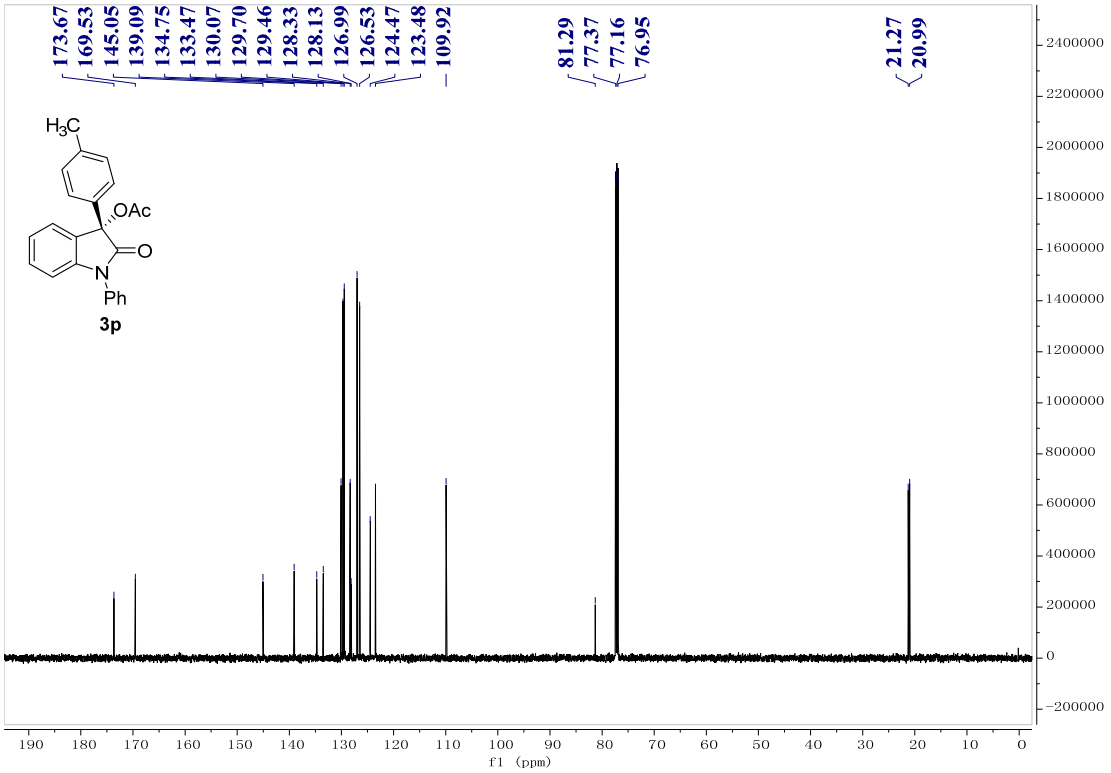
^{13}C NMR for 1p



^{1}H NMR for 3p



^{13}C NMR for 3p



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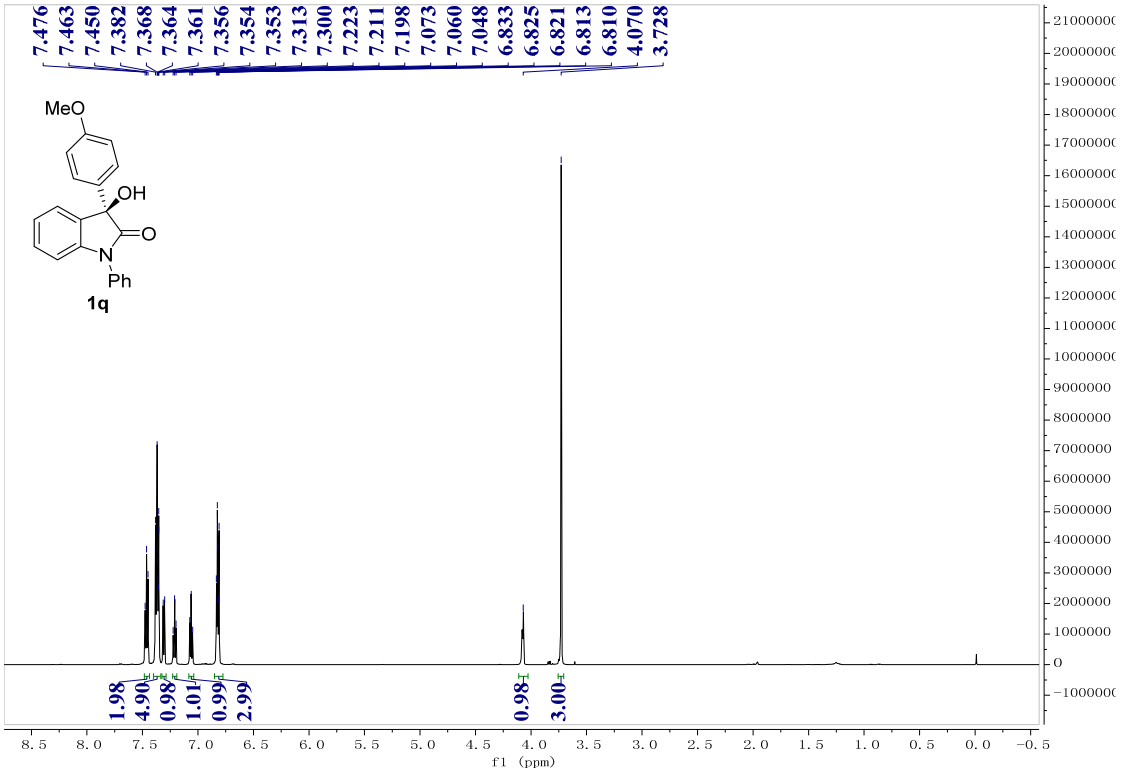

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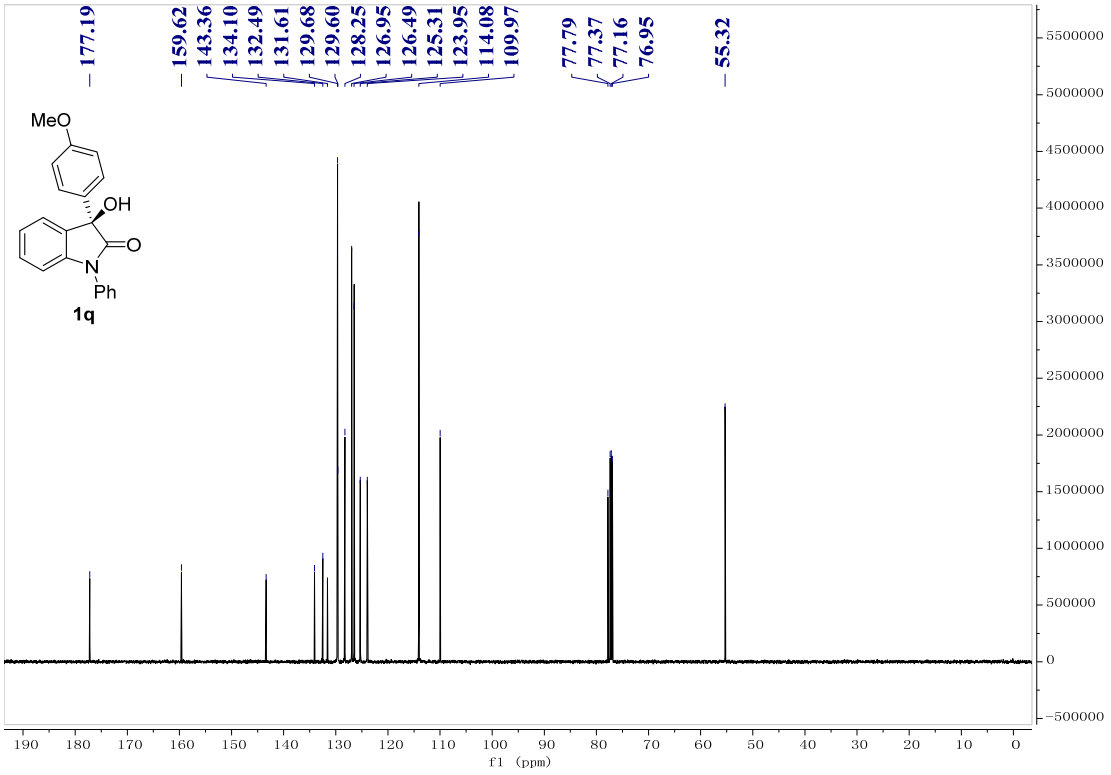
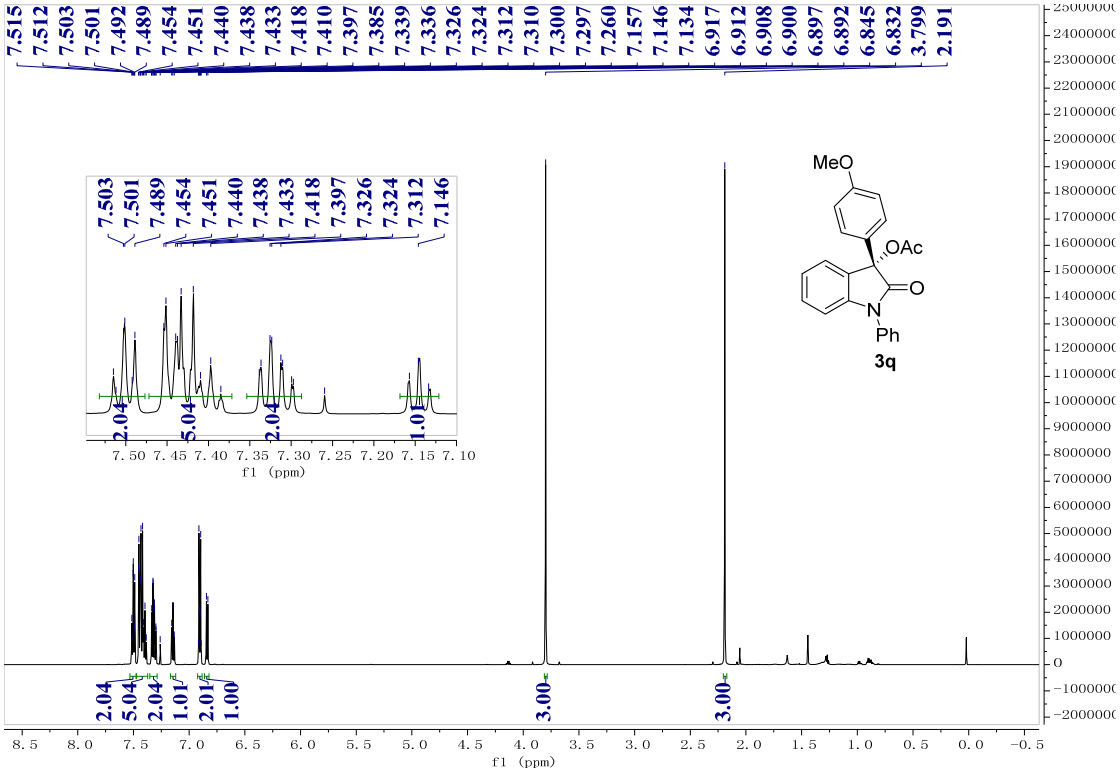


^{1}H NMR for 3q



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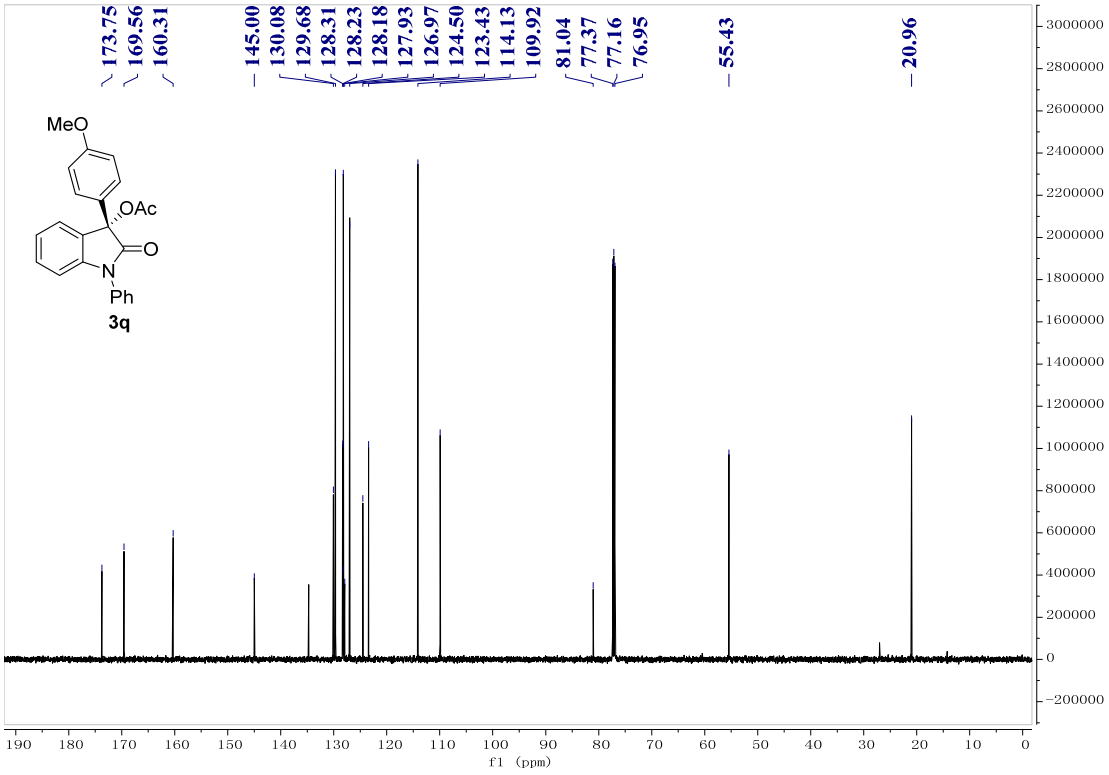
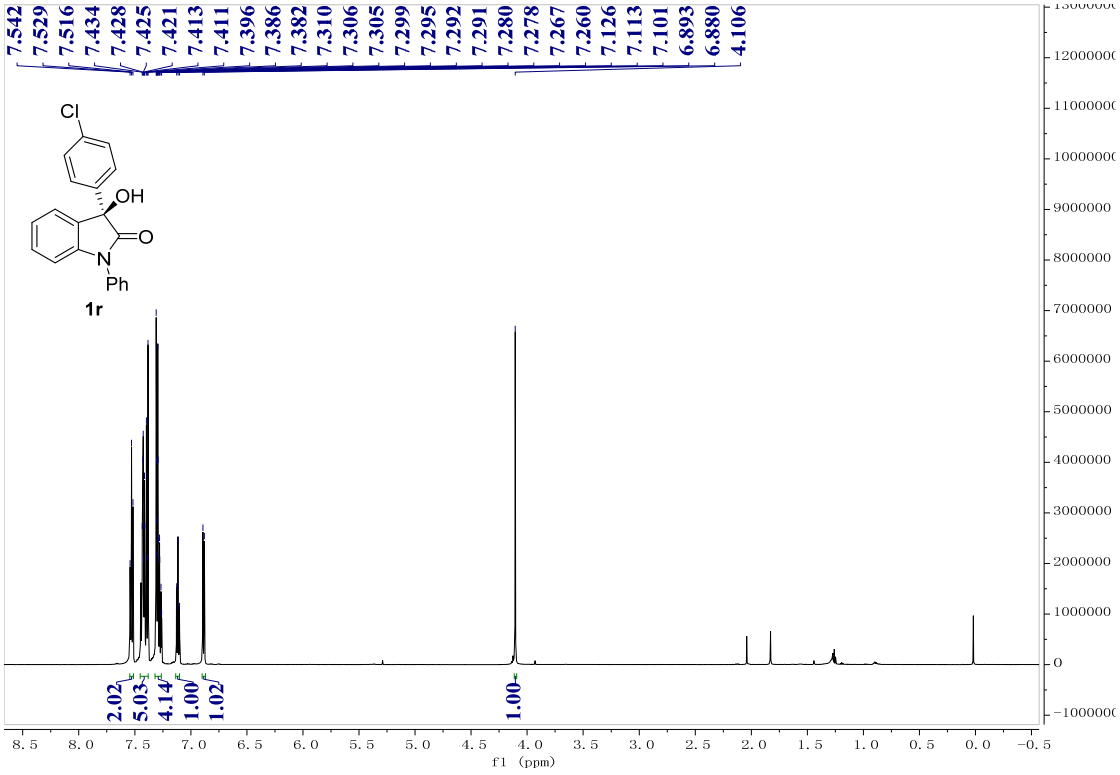


^{1}H NMR for 1r



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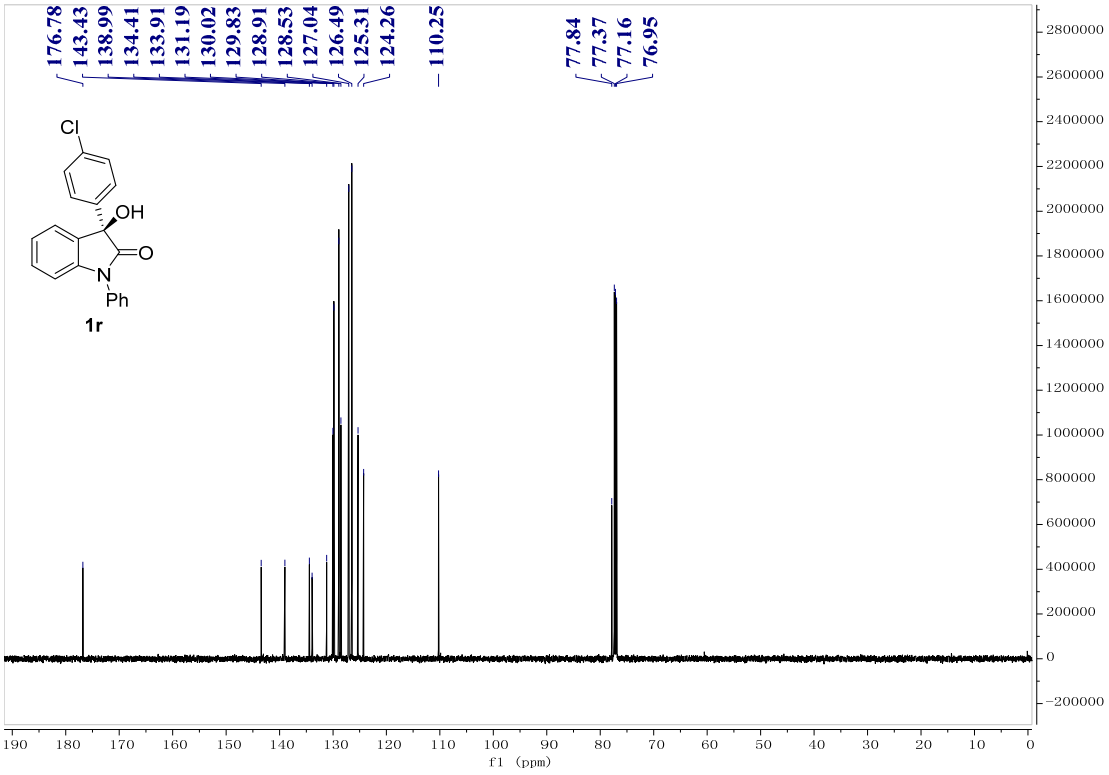
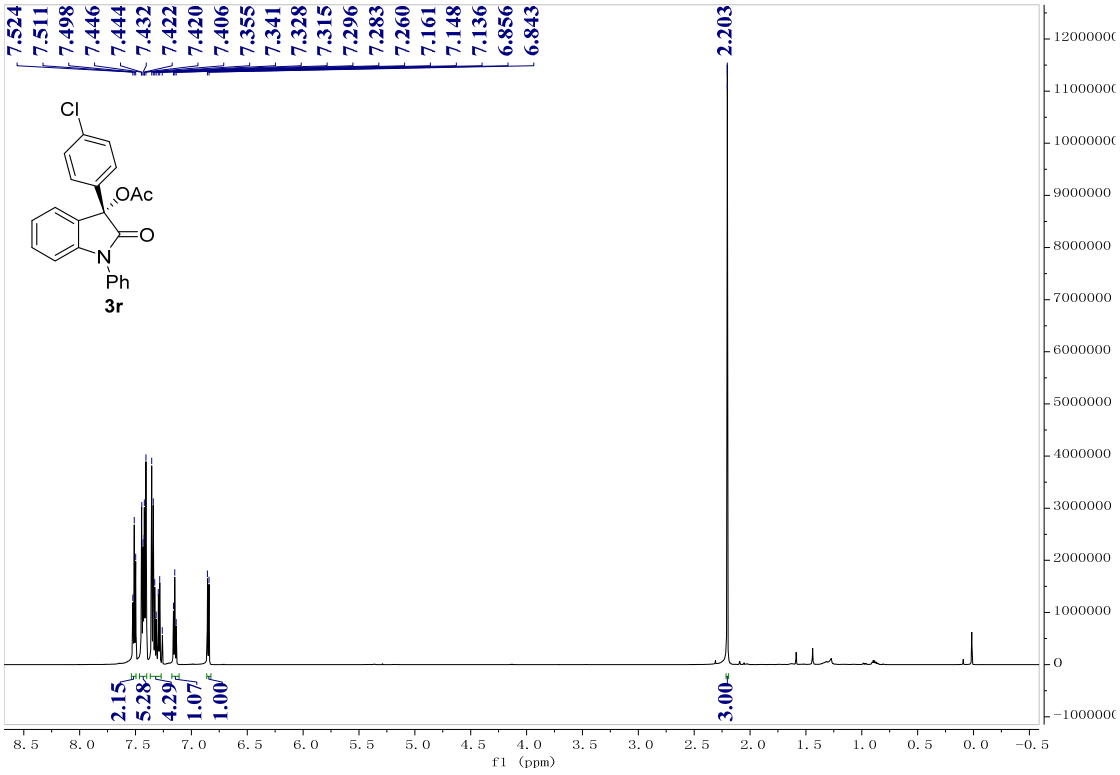


^{1}H NMR for 3r



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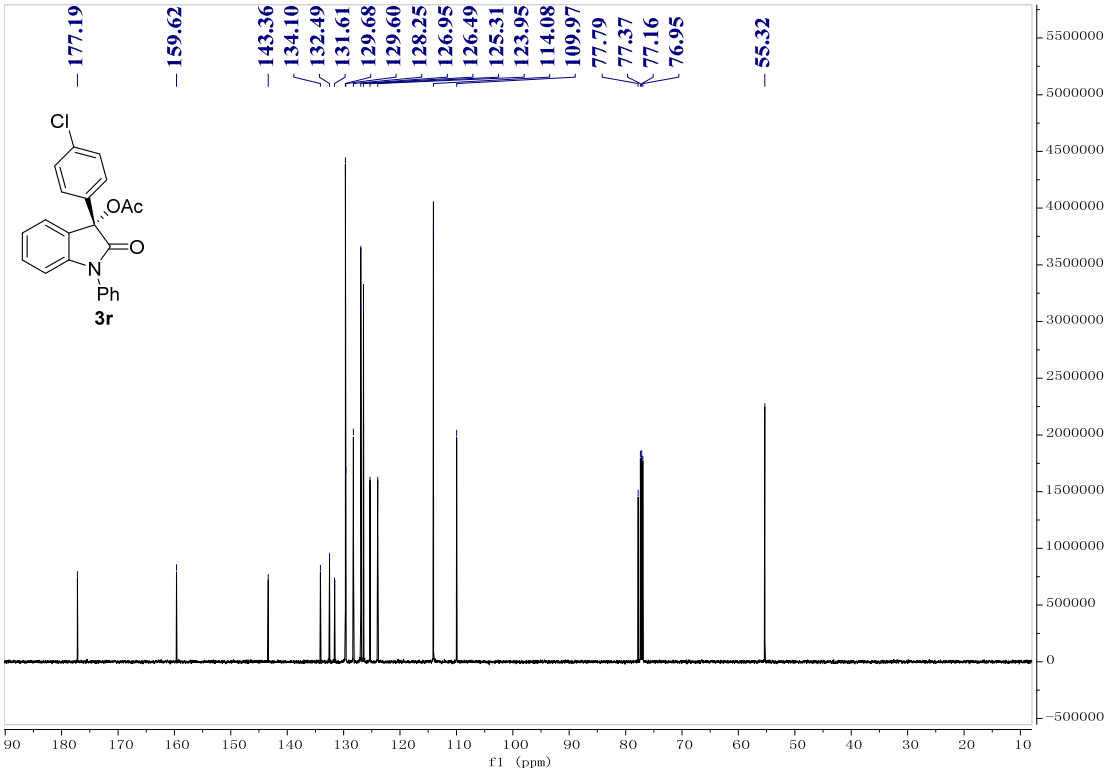
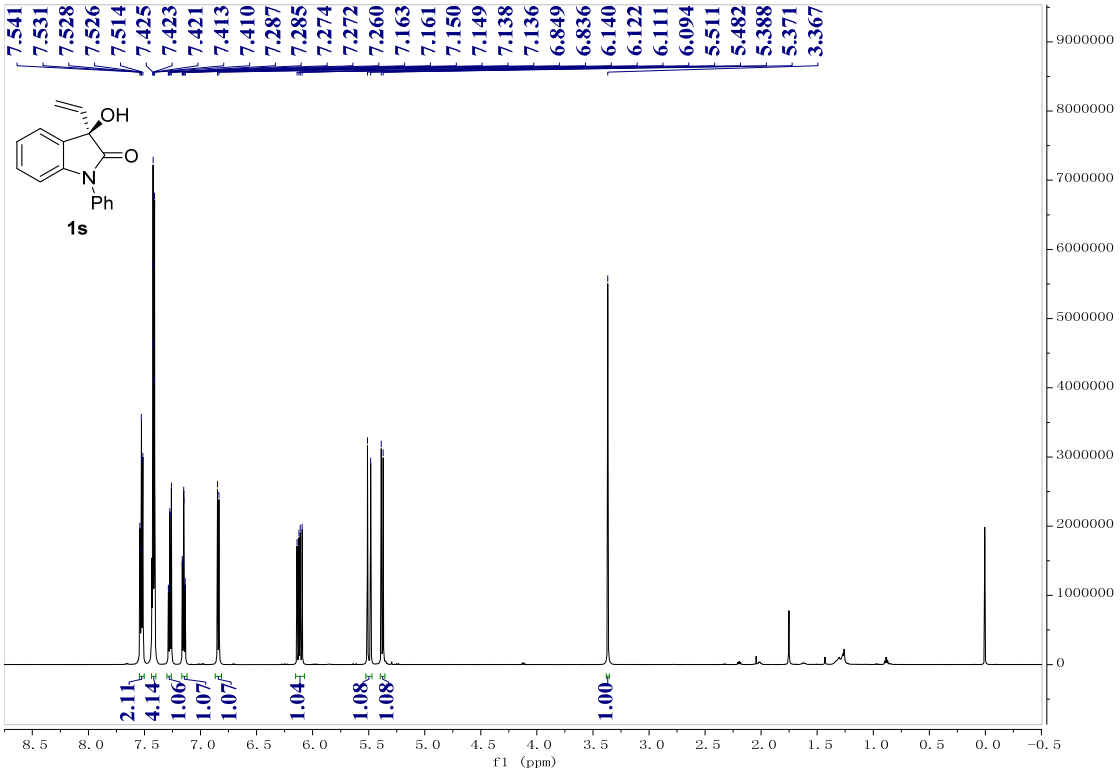


^{1}H NMR for 1s



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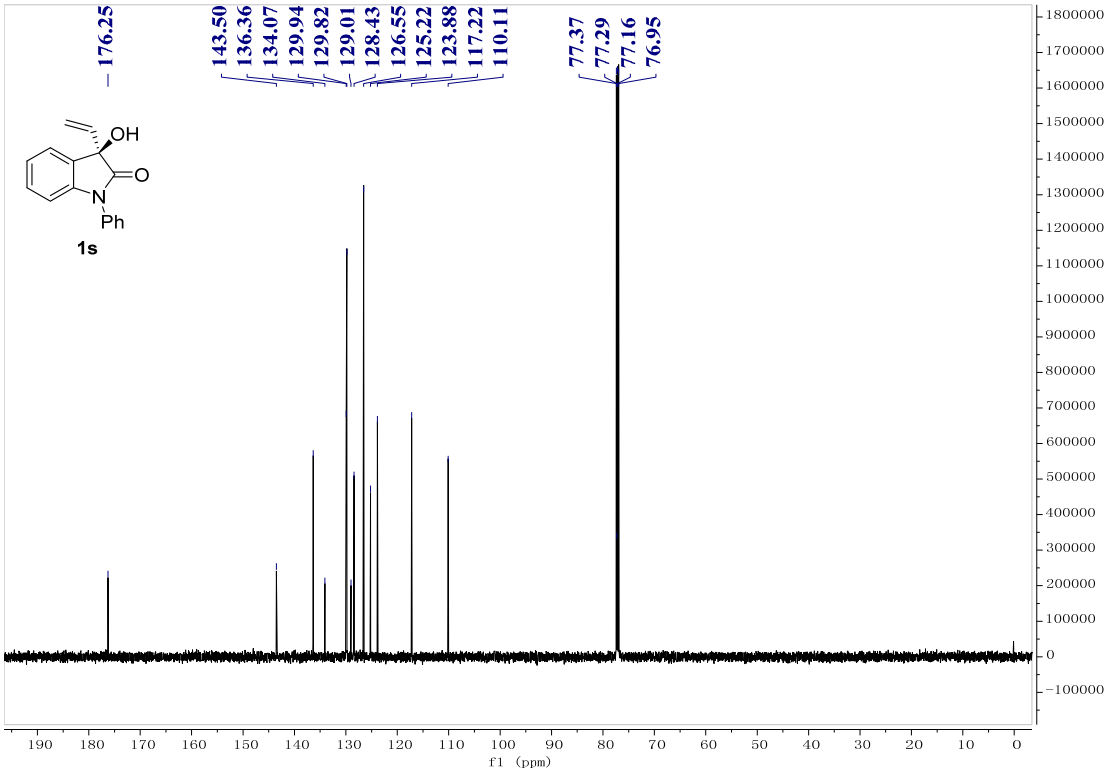
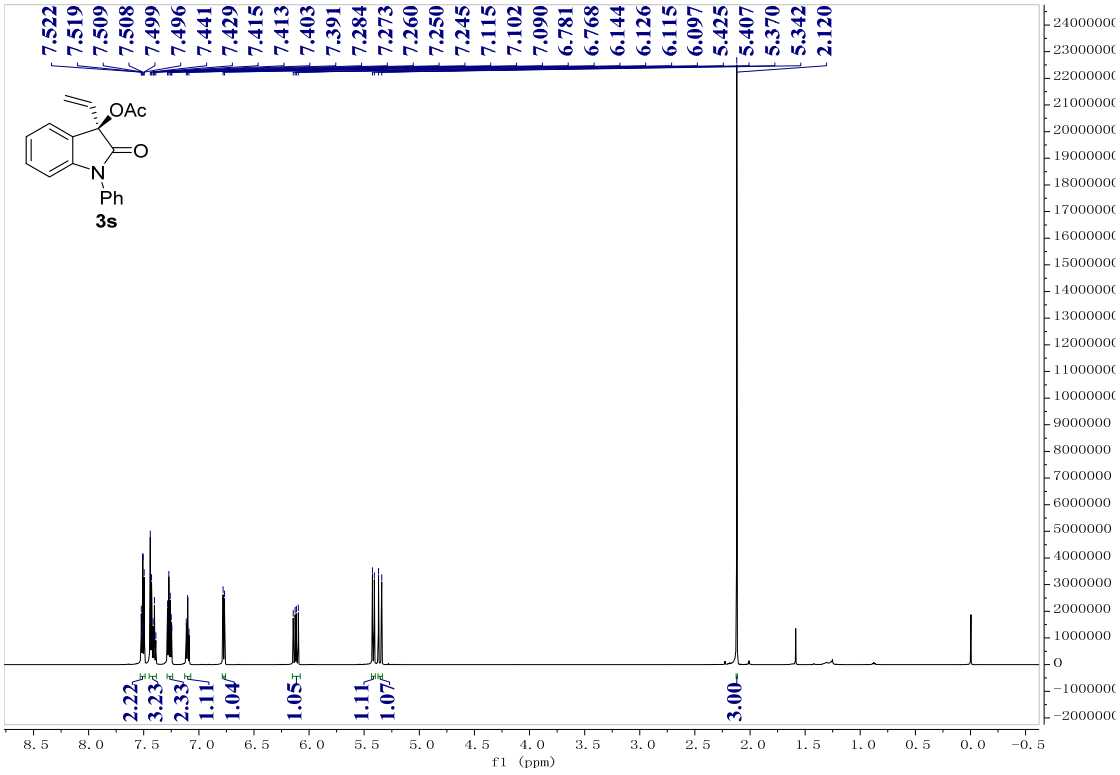
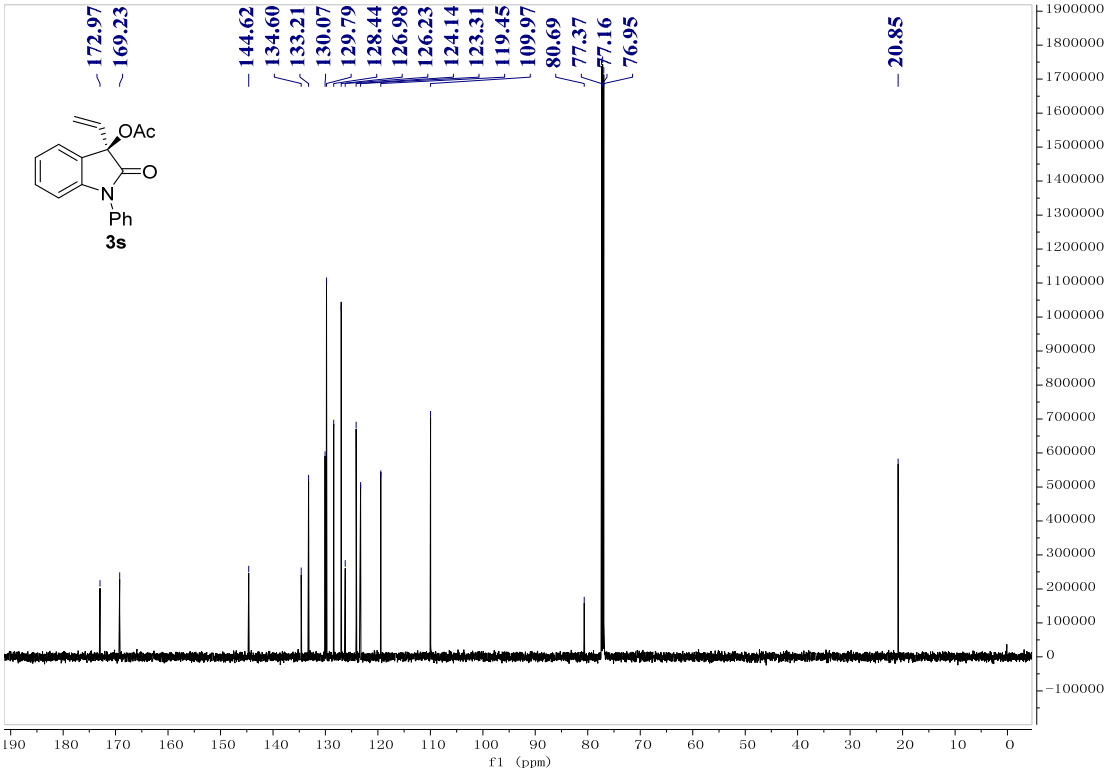


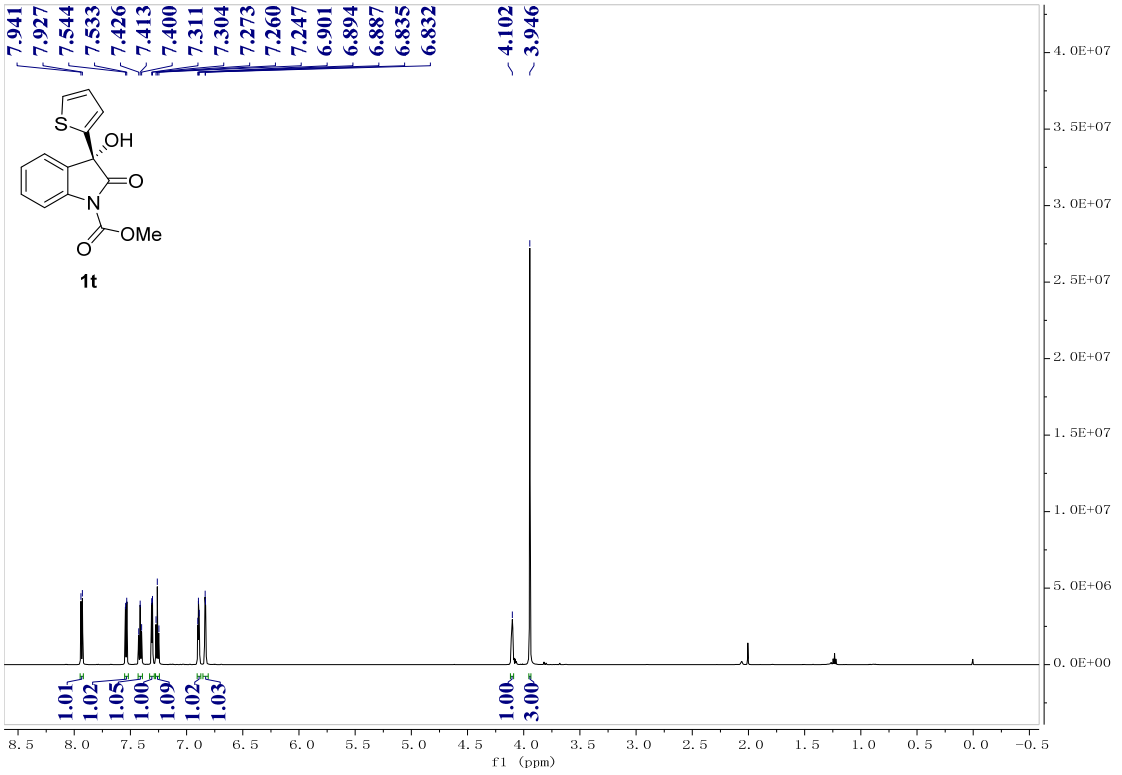
^{1}H NMR for 3s



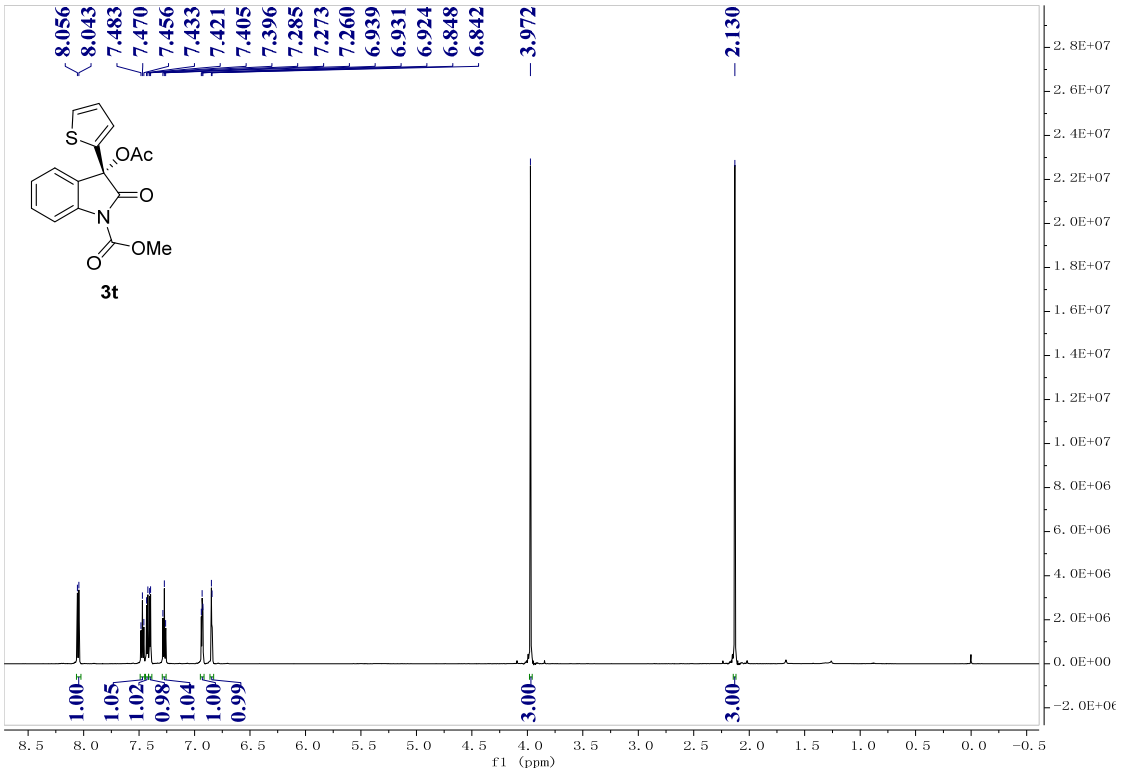
^{13}C NMR for 3s



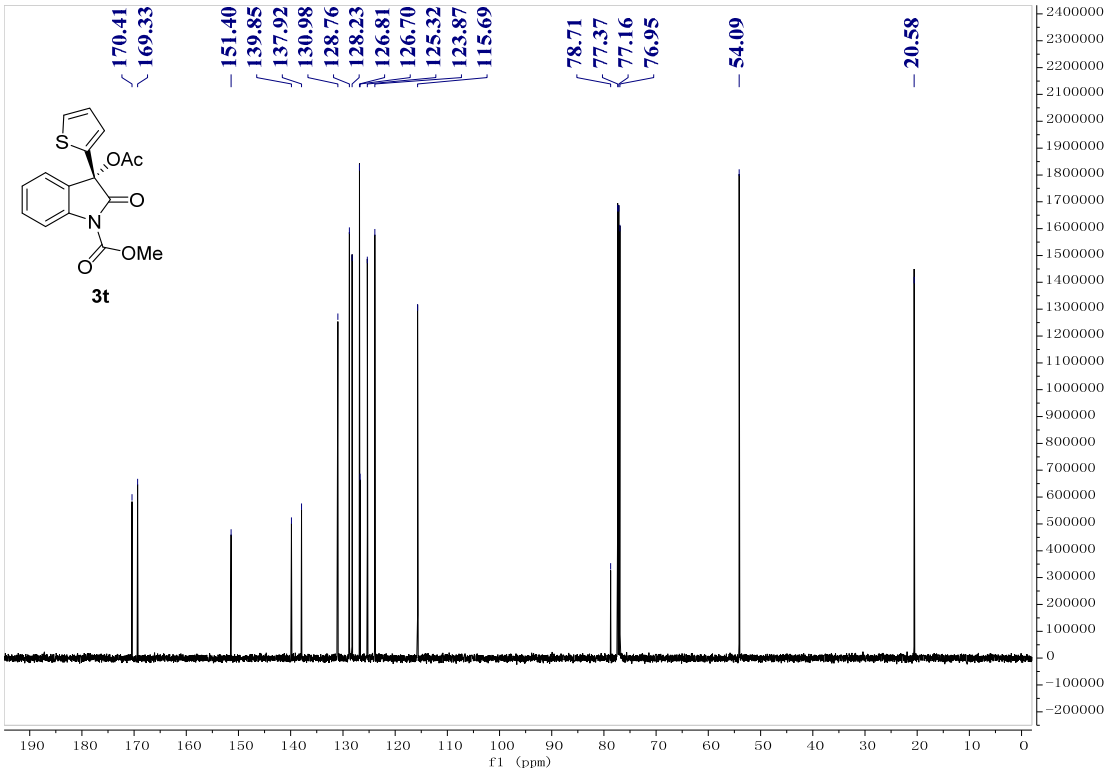
^{1}H NMR for 1t



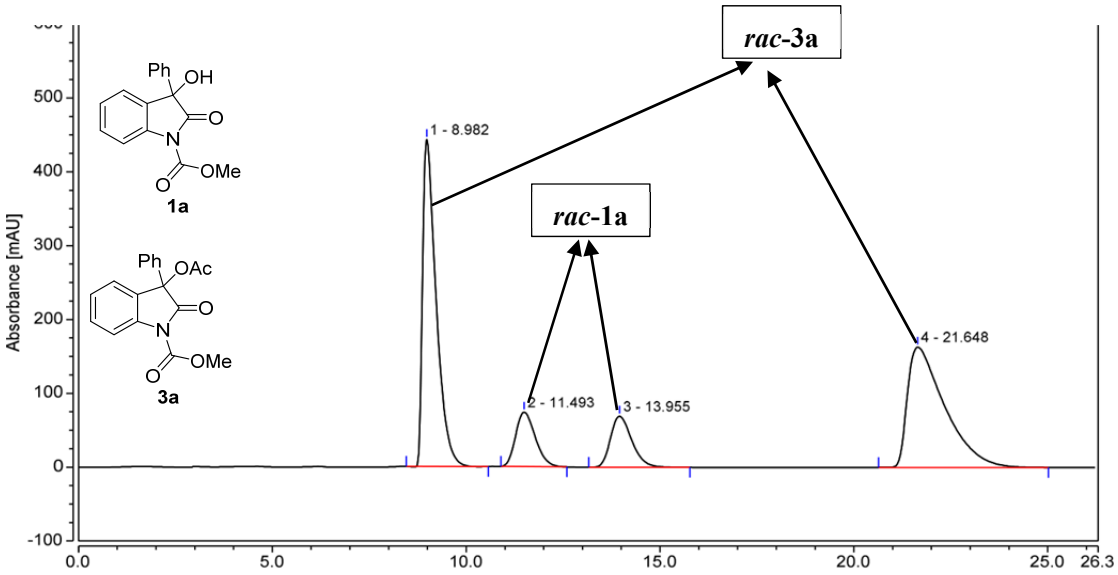
^{1}H NMR for 3t



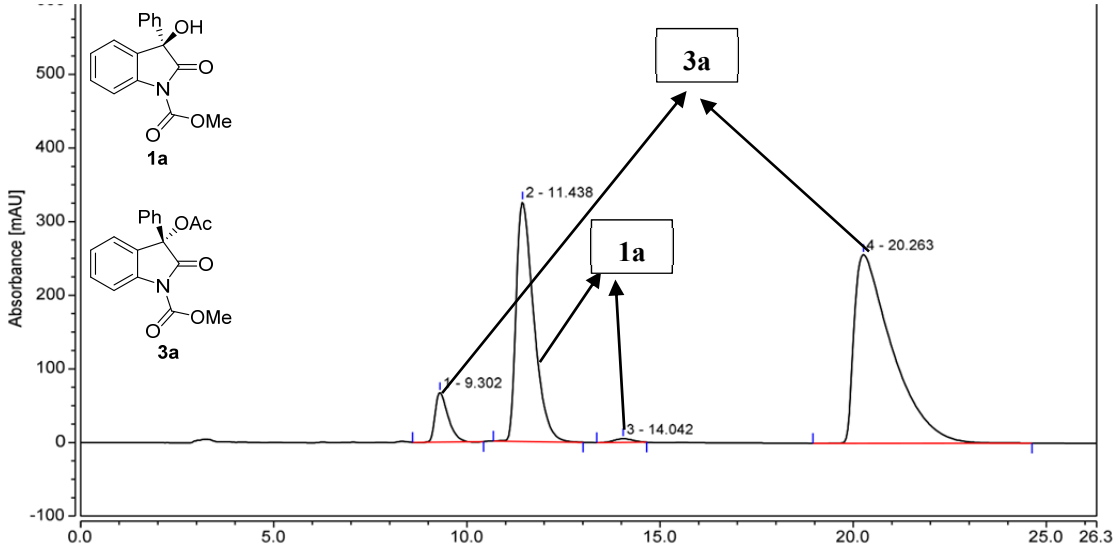
^{13}C NMR for 3t



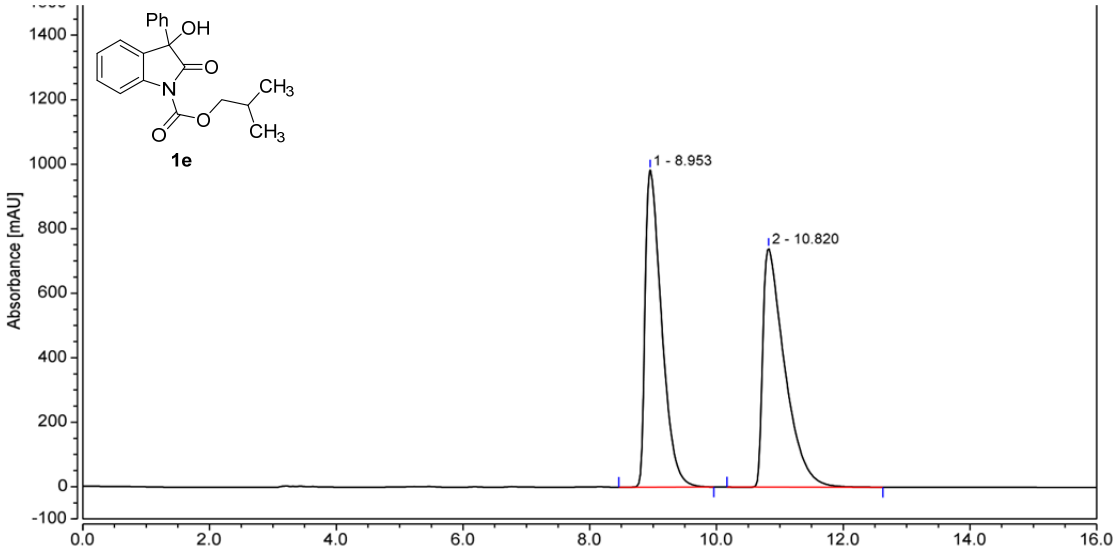
12. Copies of HPLC spectra



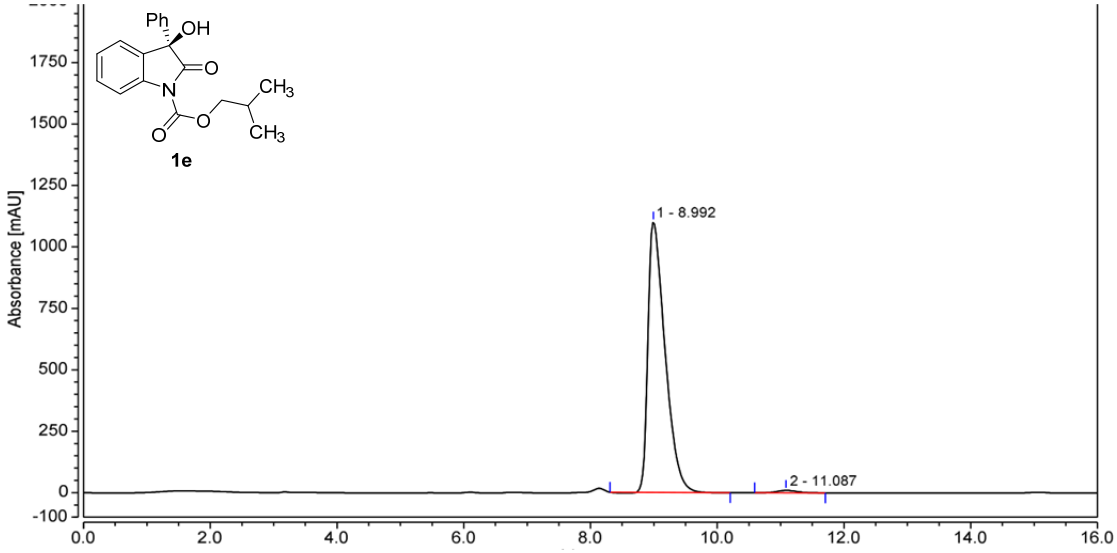
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.982	179.249	442.833	39.95	59.13
2	11.493	43.360	73.753	9.66	9.85
3	13.955	44.436	69.322	9.90	9.26
4	21.648	181.686	162.996	40.49	21.76
Total:		**448.731**	**748.904**	**100.00**	**100.00**



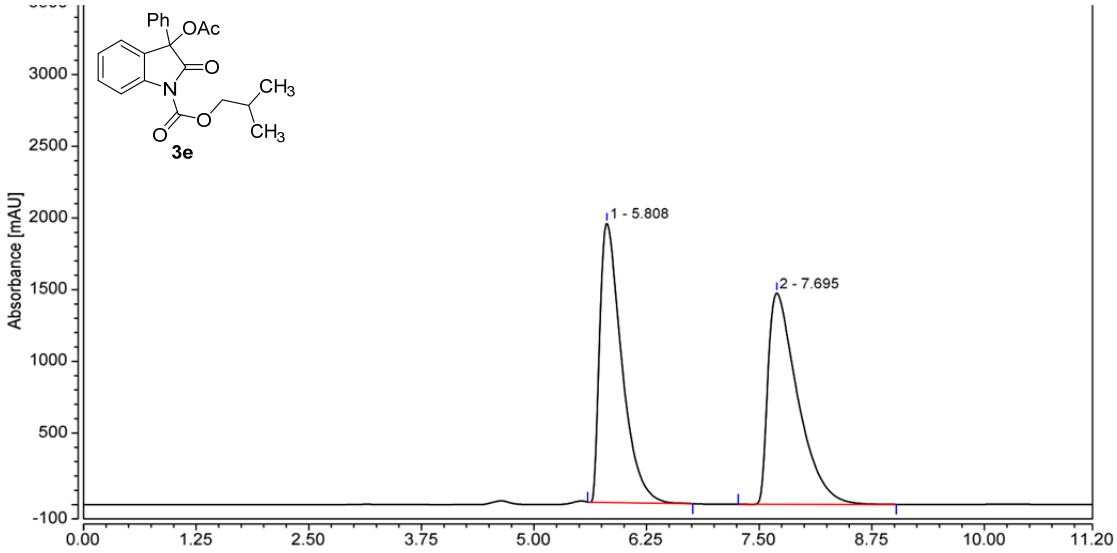
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.302	25.666	67.161	5.19	10.27
2	11.438	172.828	325.271	34.96	49.76
3	14.042	2.784	4.947	0.56	0.76
4	20.263	293.074	256.290	59.28	39.21
Total:		**494.352**	**653.669**	**100.00**	**100.00**



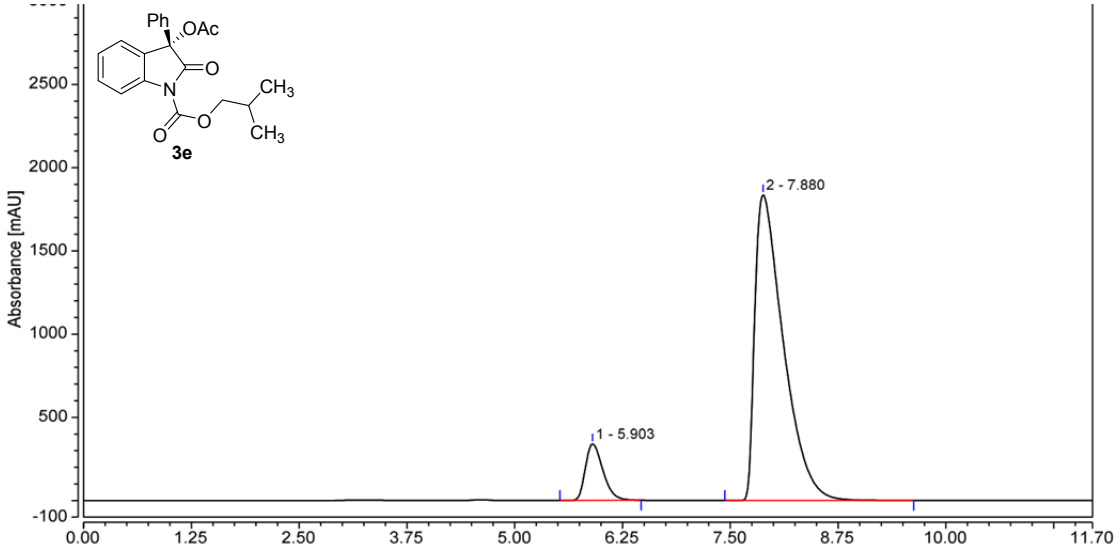
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.953	296.429	983.672	49.97	57.05
2	10.820	296.827	740.481	50.03	42.95
Total:		**593.257**	**1724.153**	**100.00**	**100.00**



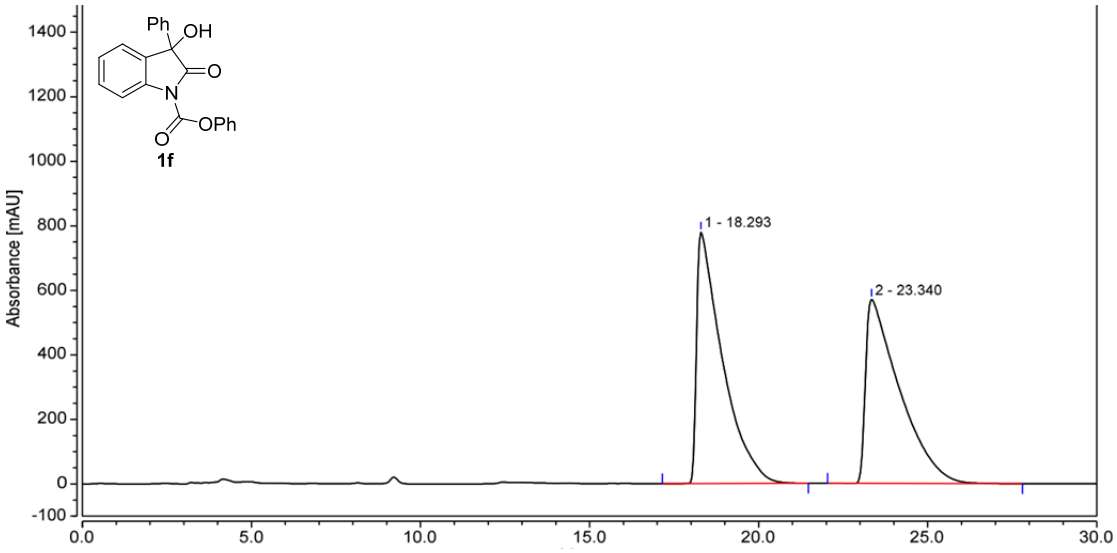
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.992	343.786	1101.191	98.92	99.10
2	11.087	3.755	10.048	1.08	0.90
Total:		**347.541**	**1111.239**	**100.00**	**100.00**



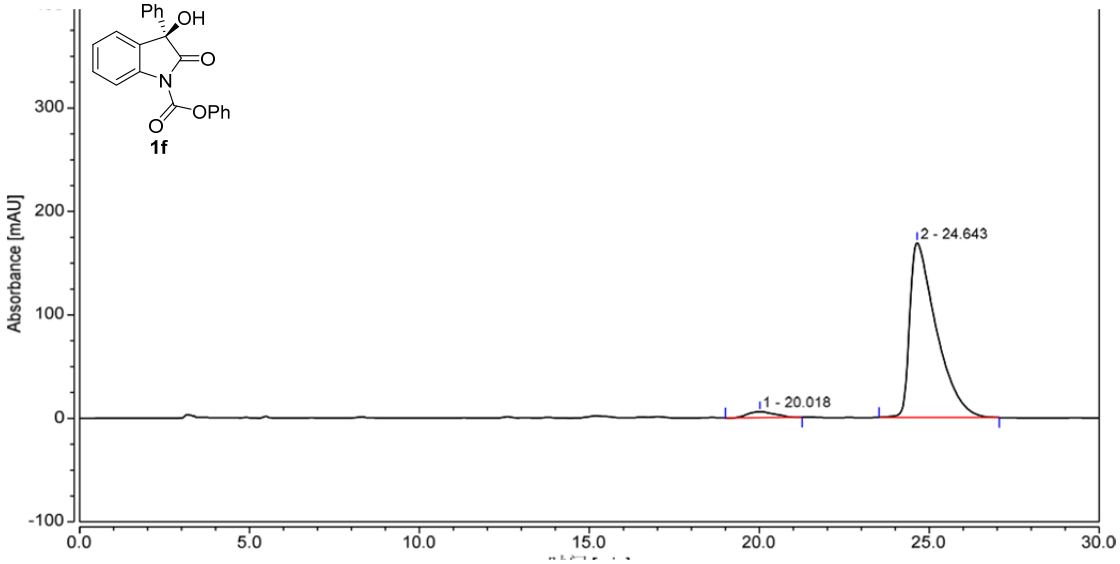
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	5.808	550.701	1948.825	49.43	56.92
2	7.695	563.297	1475.237	50.57	43.08
Total:		**1113.998**	**3424.062**	**100.00**	**100.00**



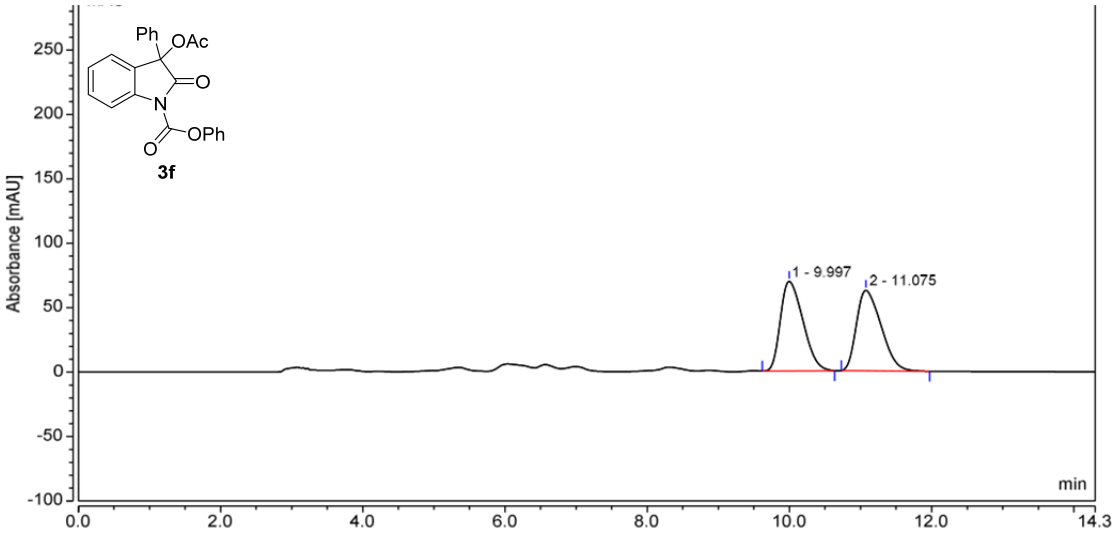
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	5.903	80.381	339.541	10.24	15.60
2	7.880	704.656	1836.636	89.76	84.40
Total:		**785.037**	**2176.177**	**100.00**	**100.00**



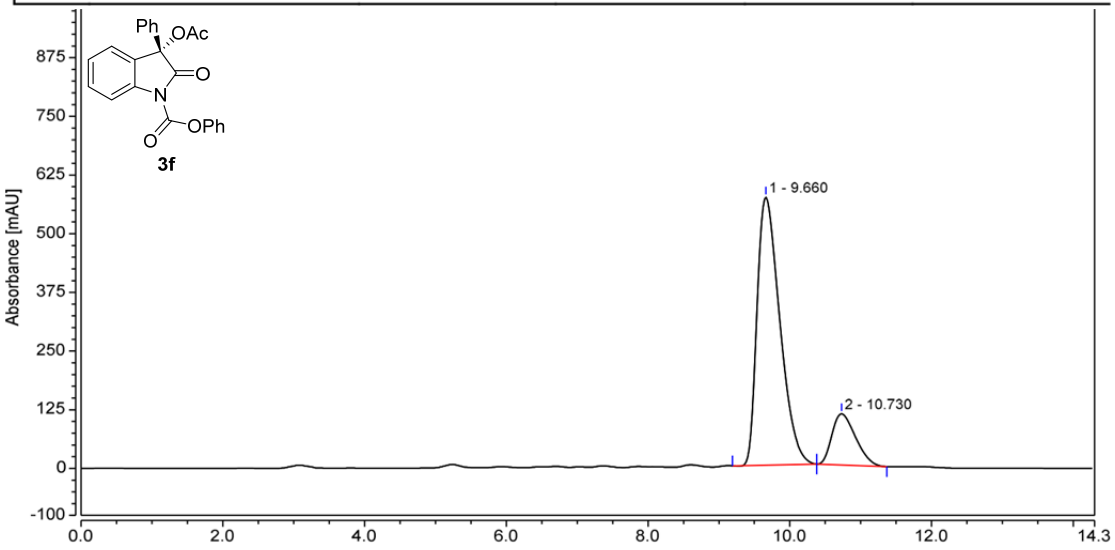
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	18.293	687.033	779.896	50.94	57.76
2	23.340	661.615	570.361	49.06	42.24
Total:		**1348.648**	**1350.257**	**100.00**	**100.00**



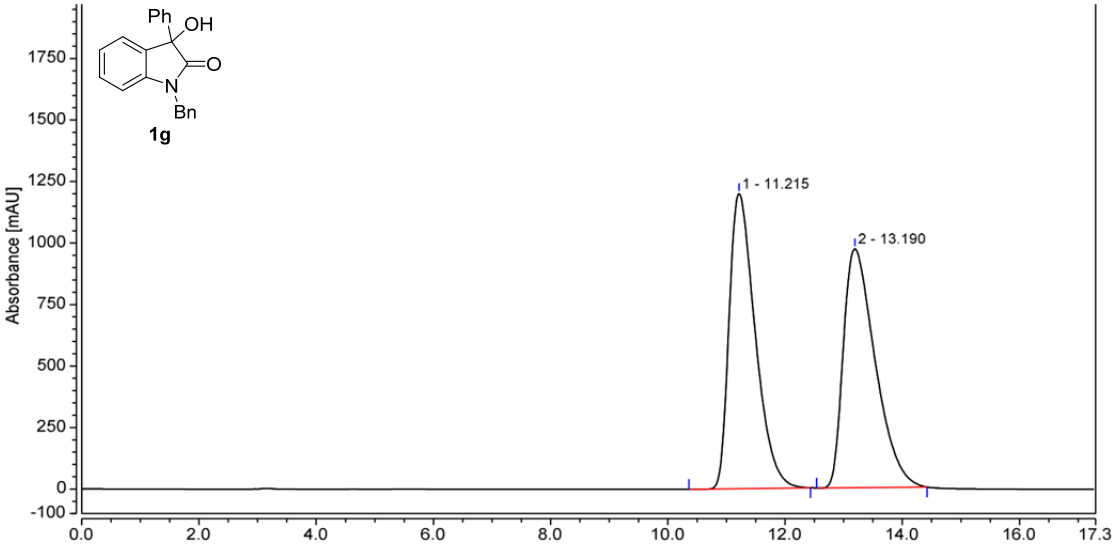
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	20.018	5.210	5.723	3.29	3.28
2	24.643	152.967	168.892	96.71	96.72
Total:		**158.177**	**174.615**	**100.00**	**100.00**



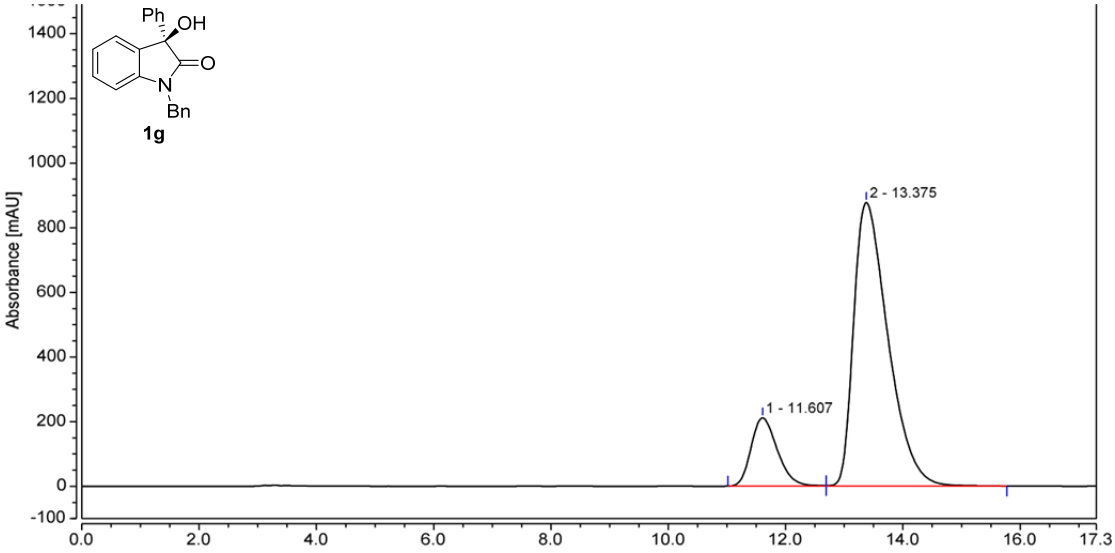
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.997	25.558	69.678	50.42	52.68
2	11.075	25.137	62.590	49.58	47.32
Total:		**50.695**	**132.267**	**100.00**	**100.00**



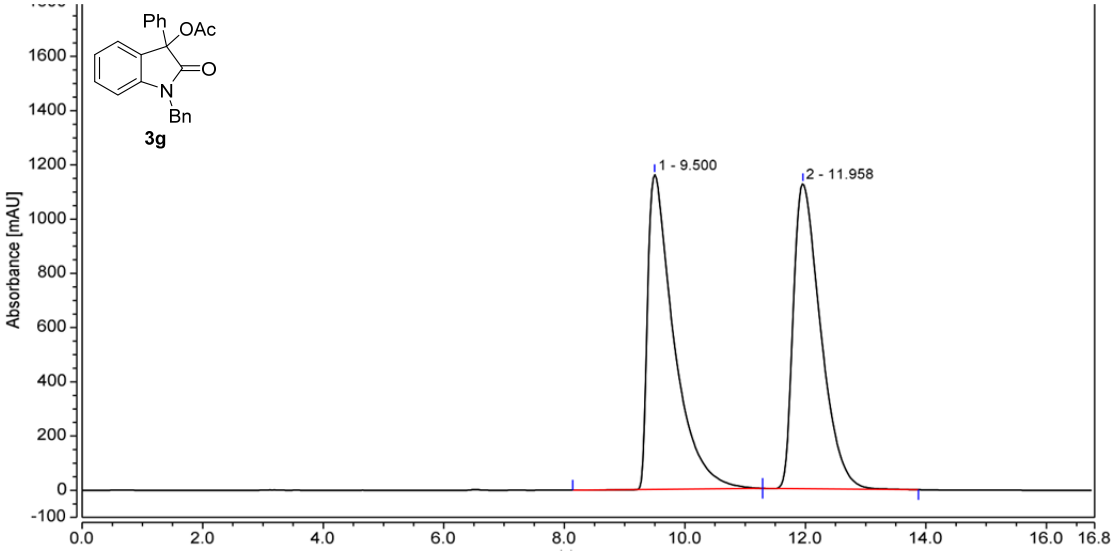
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.660	211.370	570.987	83.41	83.96
2	10.730	42.050	109.122	16.59	16.04
Total:		**253.420**	**680.108**	**100.00**	**100.00**



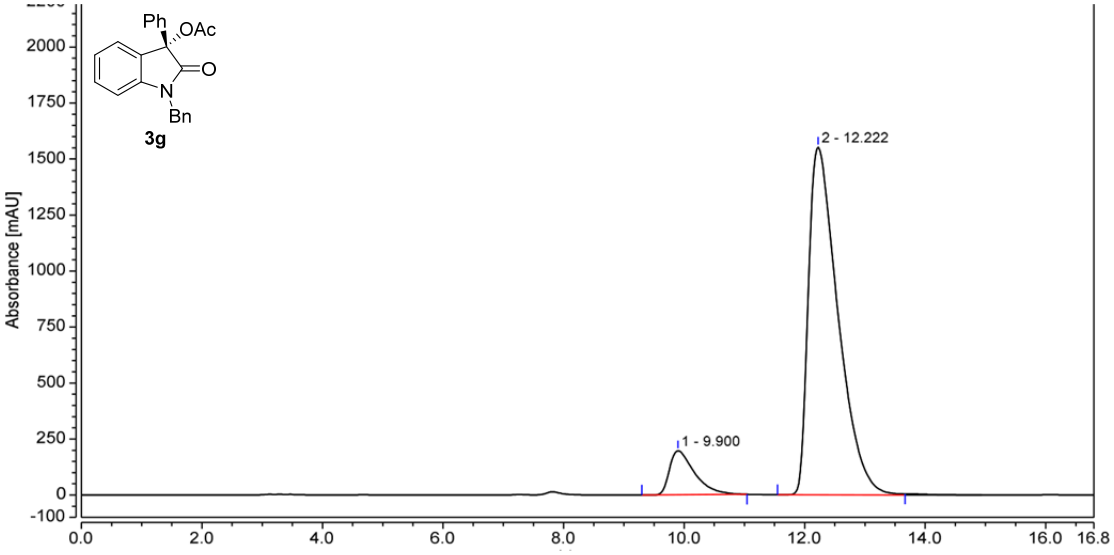
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.215	617.849	1200.074	50.26	55.25
2	13.190	611.376	971.927	49.74	44.75
Total:		**1229.224**	**2172.001**	**100.00**	**100.00**



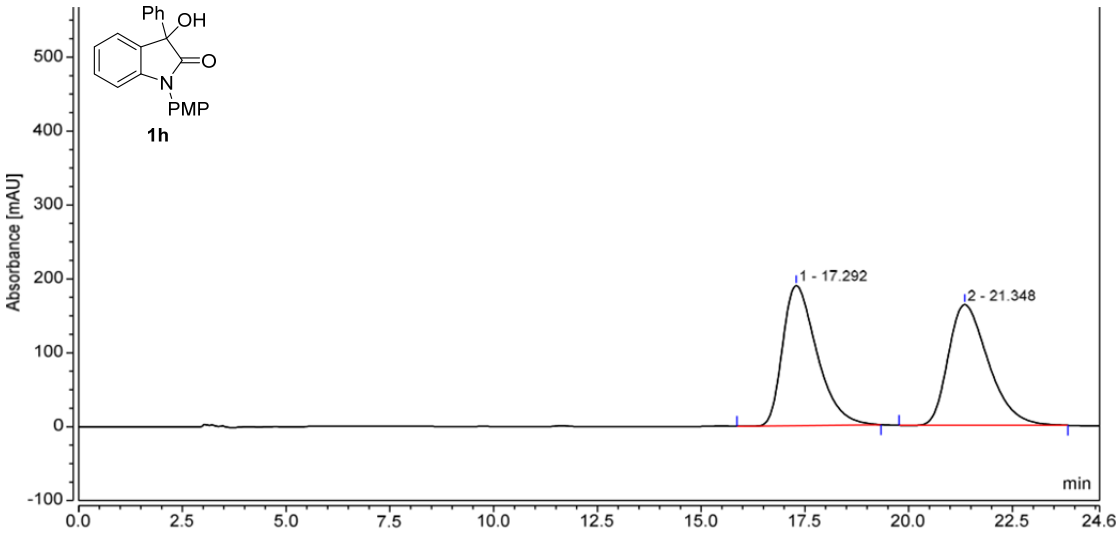
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.607	109.626	211.150	15.57	19.39
2	13.375	594.595	877.820	84.43	80.61
Total:		**704.221**	**1088.970**	**100.00**	**100.00**



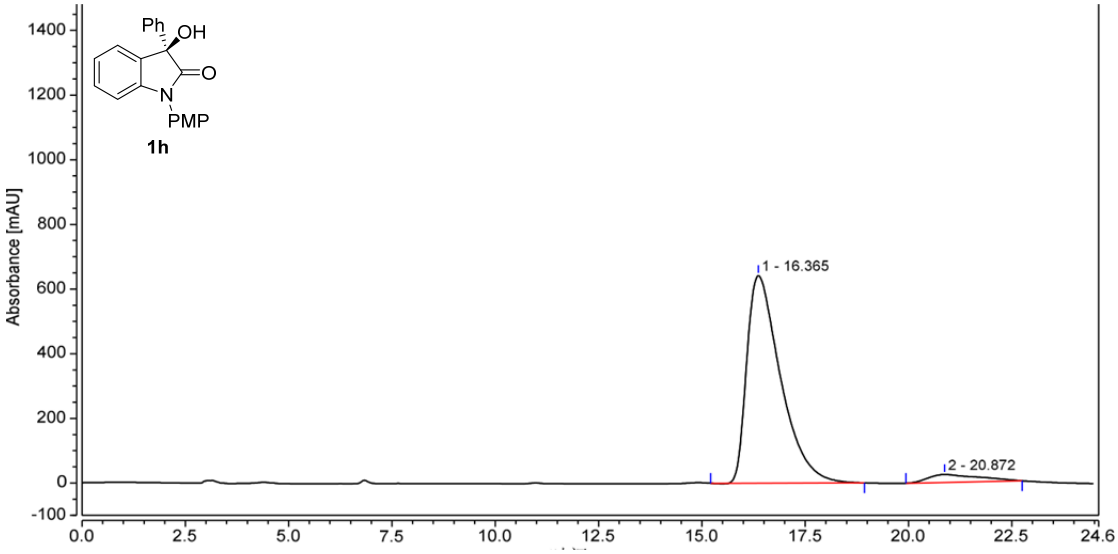
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.500	585.020	1160.640	49.78	50.78
2	11.958	590.195	1124.835	50.22	49.22
Total:		**1175.215**	**2285.475**	**100.00**	**100.00**



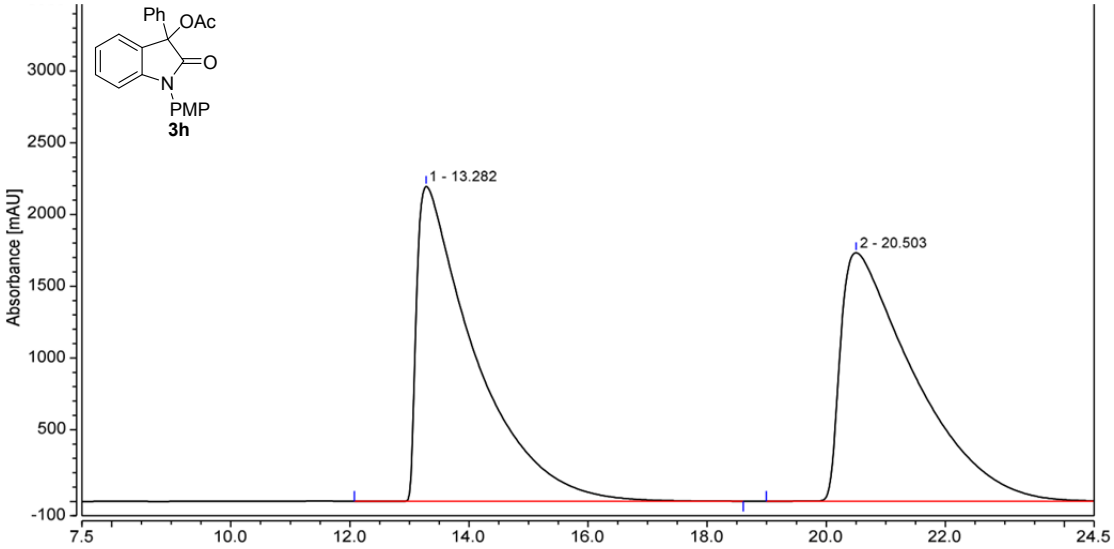
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.900	94.648	196.486	9.70	11.24
2	12.222	881.278	1551.744	90.30	88.76
Total:		**975.926**	**1748.230**	**100.00**	**100.00**



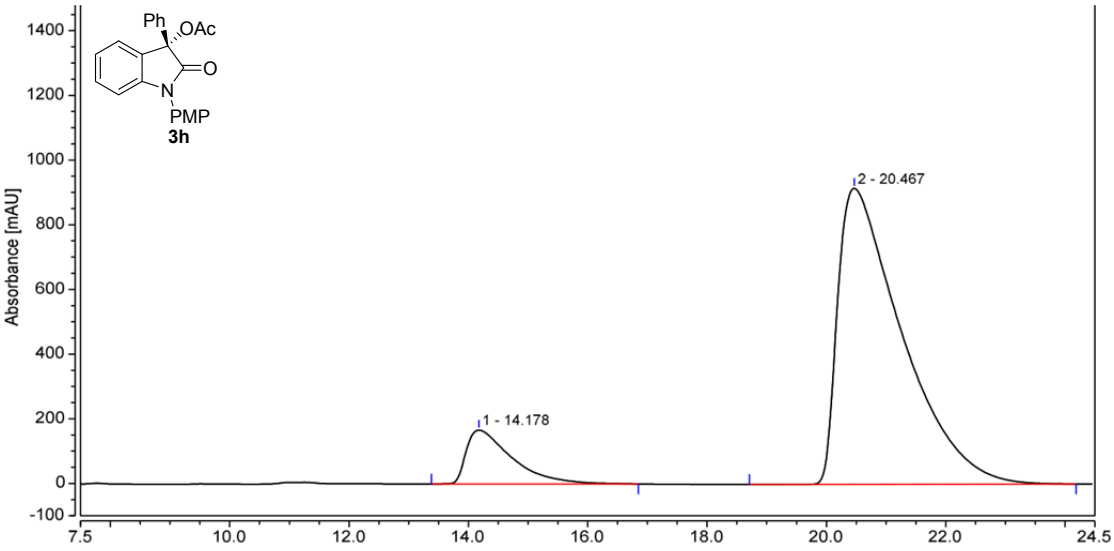
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	17.292	181.684	189.503	49.75	53.69
2	21.348	183.516	163.451	50.25	46.31
Total:		**365.200**	**352.954**	**100.00**	**100.00**



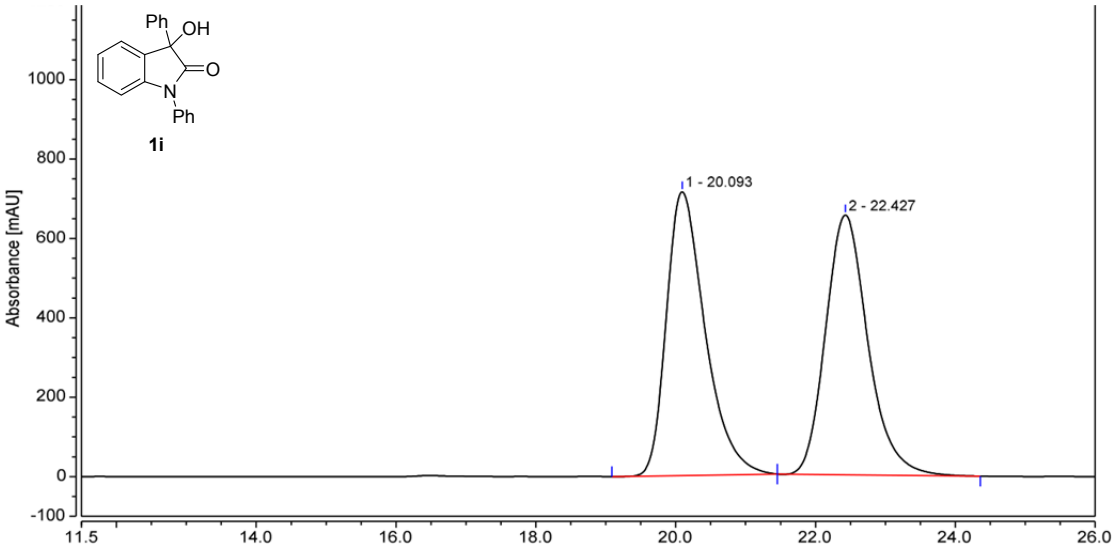
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	16.365	606.833	642.235	94.61	96.32
2	20.872	34.594	24.504	5.39	3.68
Total:		**641.428**	**666.738**	**100.00**	**100.00**



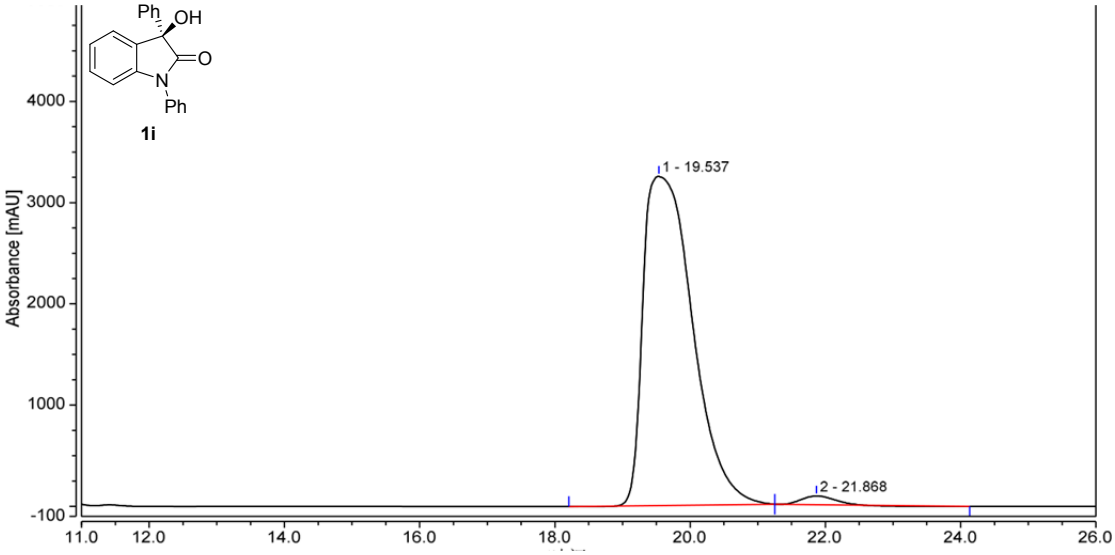
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	13.282	2480.960	2196.143	49.82	55.90
2	20.503	2498.847	1732.723	50.18	44.10
Total:		**4979.808**	**3928.866**	**100.00**	**100.00**



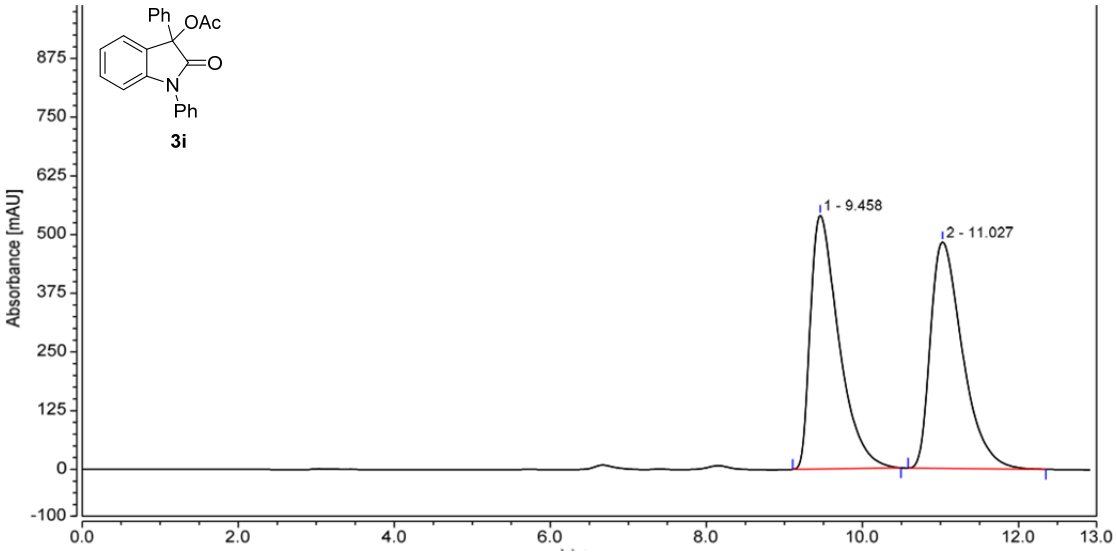
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	14.178	147.339	166.540	11.45	15.40
2	20.467	1139.010	915.112	88.55	84.60
Total:		**1286.349**	**1081.652**	**100.00**	**100.00**



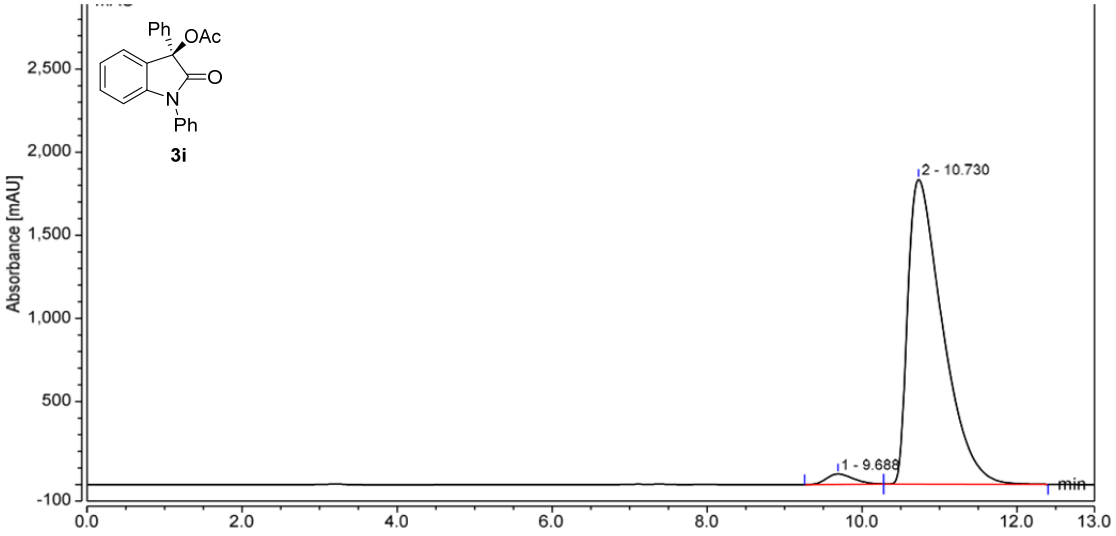
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	20.093	458.397	714.900	49.97	52.20
2	22.427	458.941	654.519	50.03	47.80
Total:		**917.338**	**1369.419**	**100.00**	**100.00**



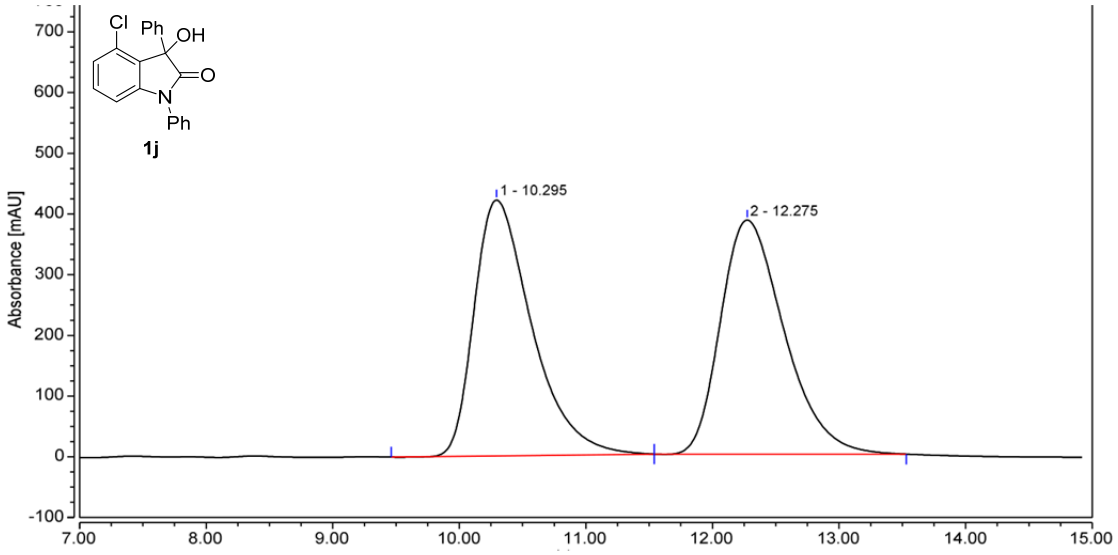
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	19.537	2752.949	3251.750	98.46	97.42
2	21.868	43.145	86.009	1.54	2.58
Total:		**2796.094**	**3337.760**	**100.00**	**100.00**



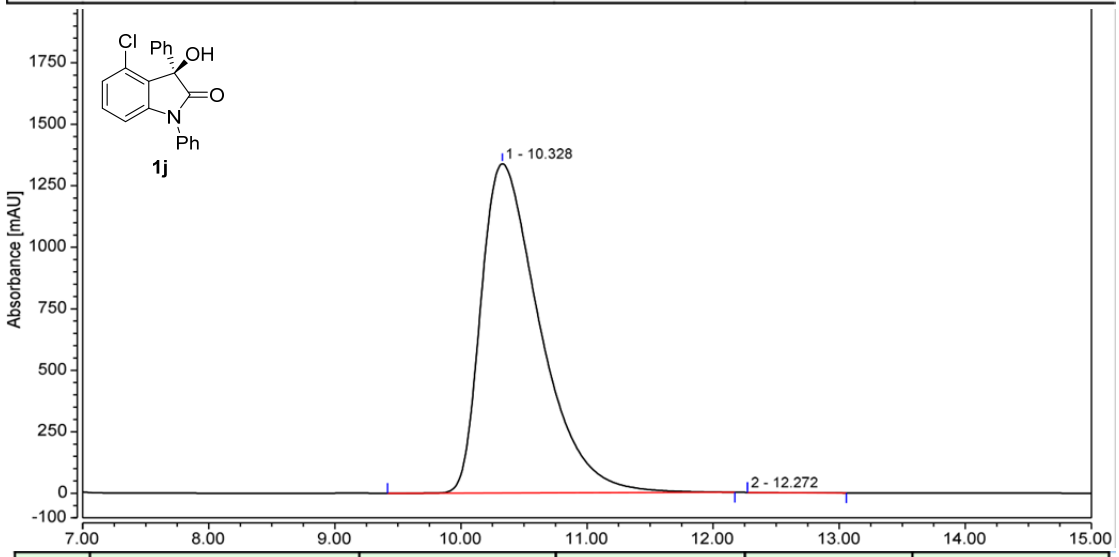
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.458	228.468	540.519	49.85	52.83
2	11.027	229.859	482.641	50.15	47.17
Total:		**458.327**	**1023.159**	**100.00**	**100.00**



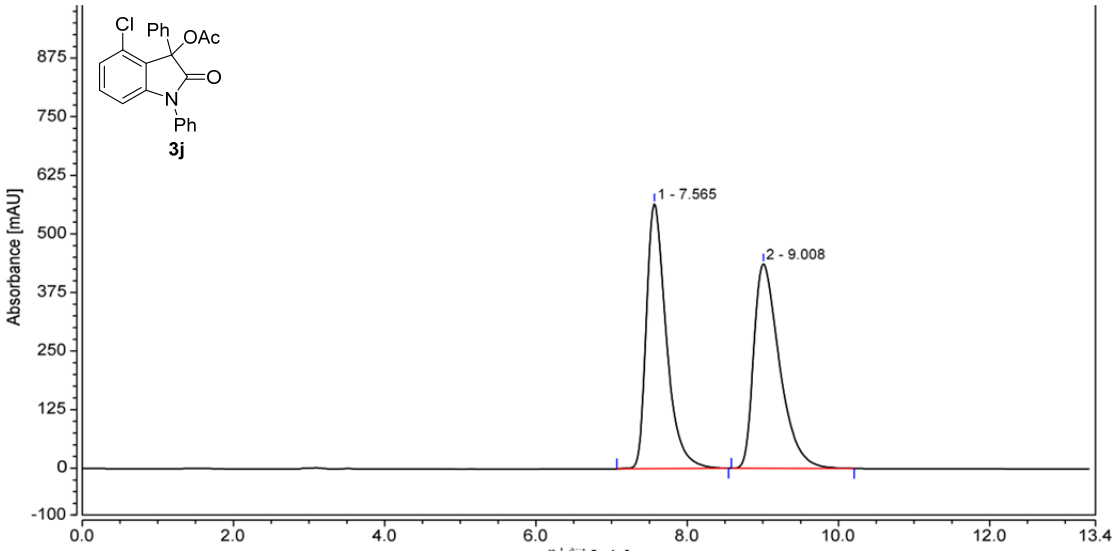
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.688	25.080	62.982	2.57	3.32
2	10.730	952.170	1833.930	97.43	96.68
Total:		**977.250**	**1896.912**	**100.00**	**100.00**



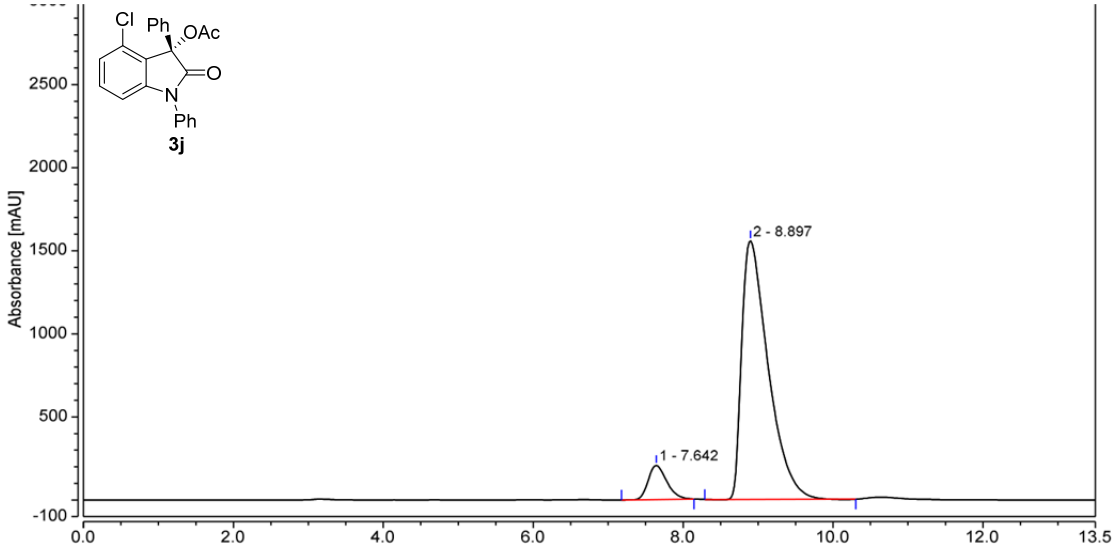
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	10.295	219.549	420.485	49.41	52.16
2	12.275	224.747	385.594	50.59	47.84
Total:		**444.296**	**806.079**	**100.00**	**100.00**



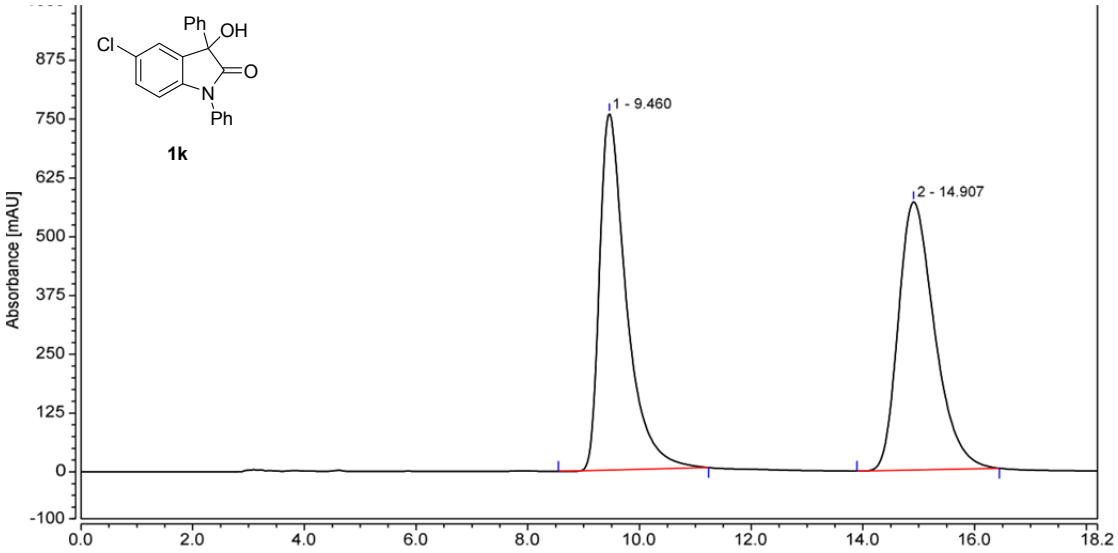
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	10.328	723.483	1338.261	99.95	100.00
2	12.397	0.386	0.000	0.05	0.00
Total:		**723.869**	**1338.261**	**100.00**	**100.00**



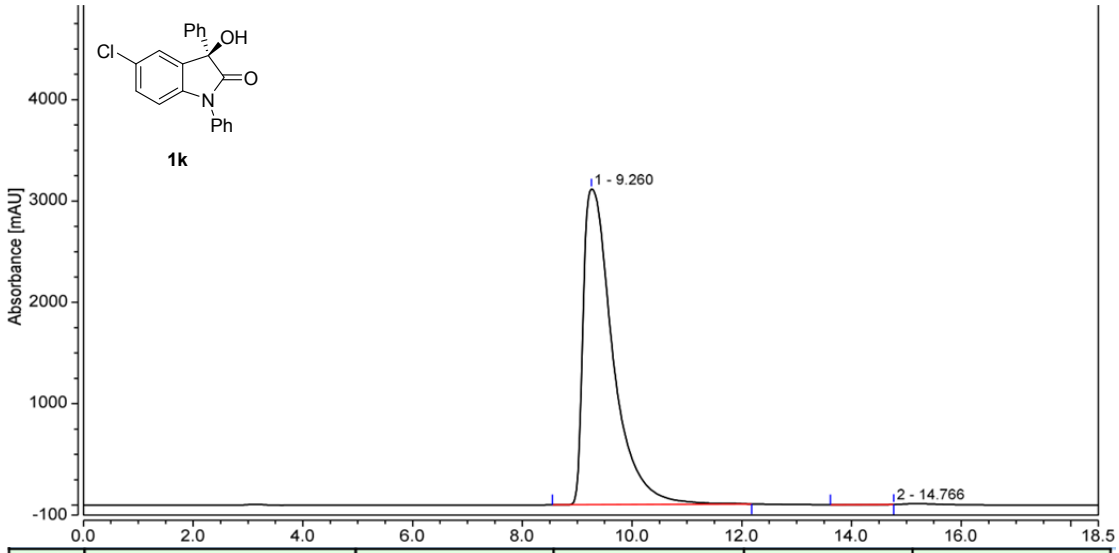
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.565	172.424	565.012	50.01	56.44
2	9.008	172.379	436.157	49.99	43.56
Total:		**344.802**	**1001.169**	**100.00**	**100.00**



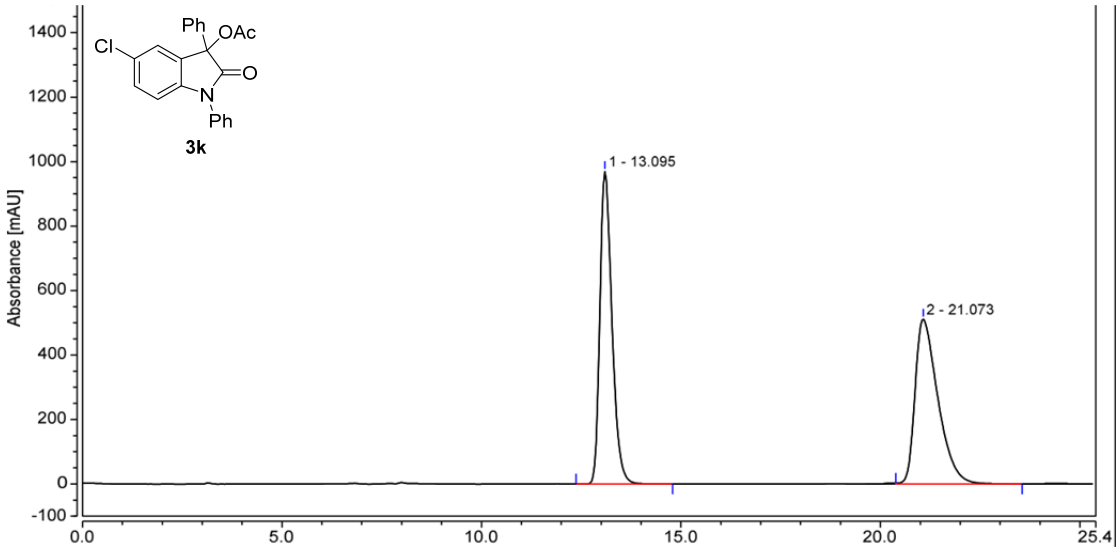
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.642	58.559	205.213	8.42	11.65
2	8.897	636.699	1556.555	91.58	88.35
Total:		**695.258**	**1761.767**	**100.00**	**100.00**



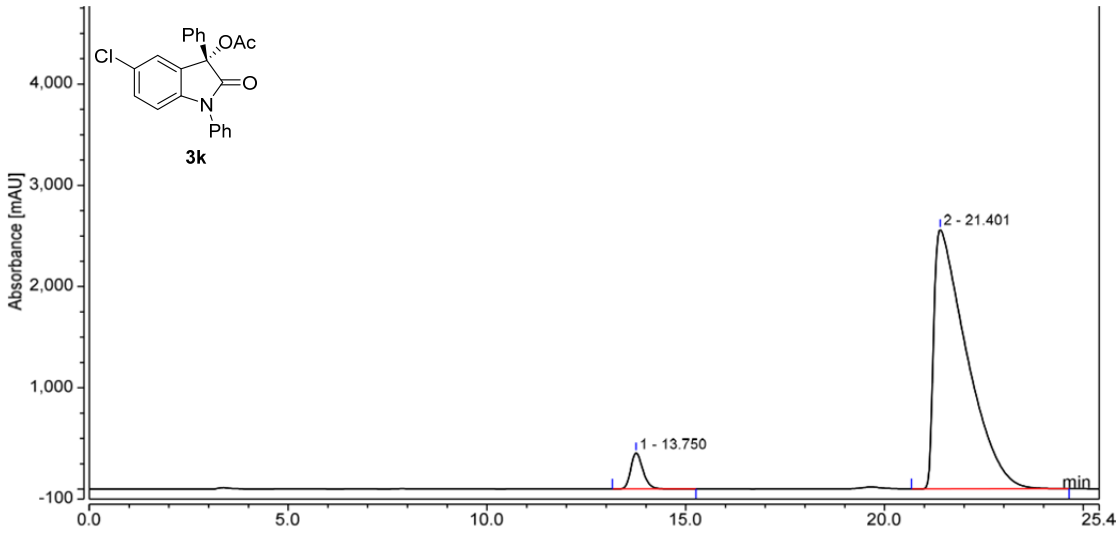
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.460	421.957	758.342	49.62	57.07
2	14.907	428.341	570.402	50.38	42.93
Total:		**850.297**	**1328.744**	**100.00**	**100.00**



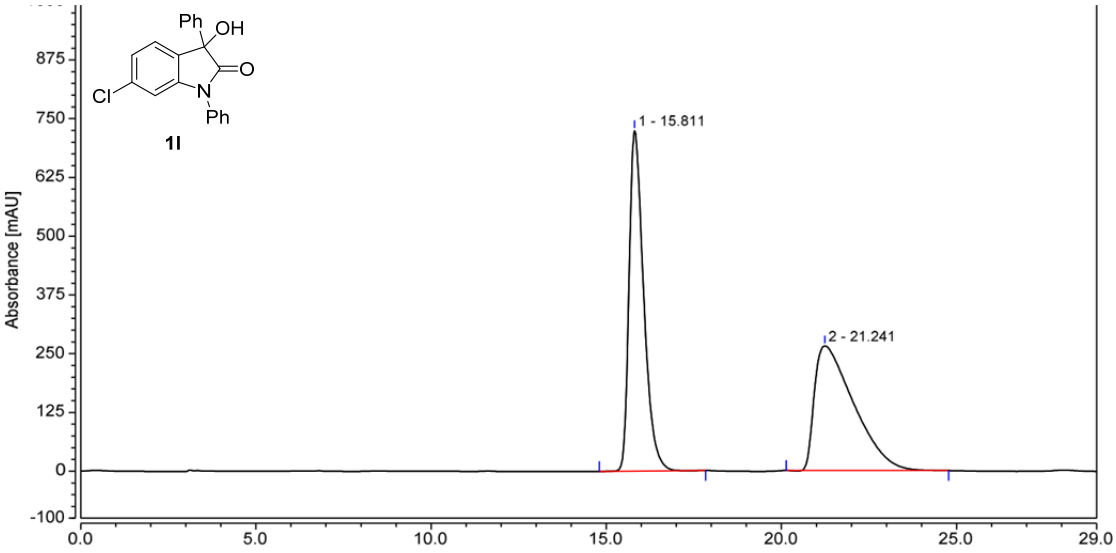
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.260	1946.416	3115.453	99.91	100.00
2	14.766	1.741	0.000	0.09	0.00
Total:		**1948.157**	**3115.453**	**100.00**	**100.00**



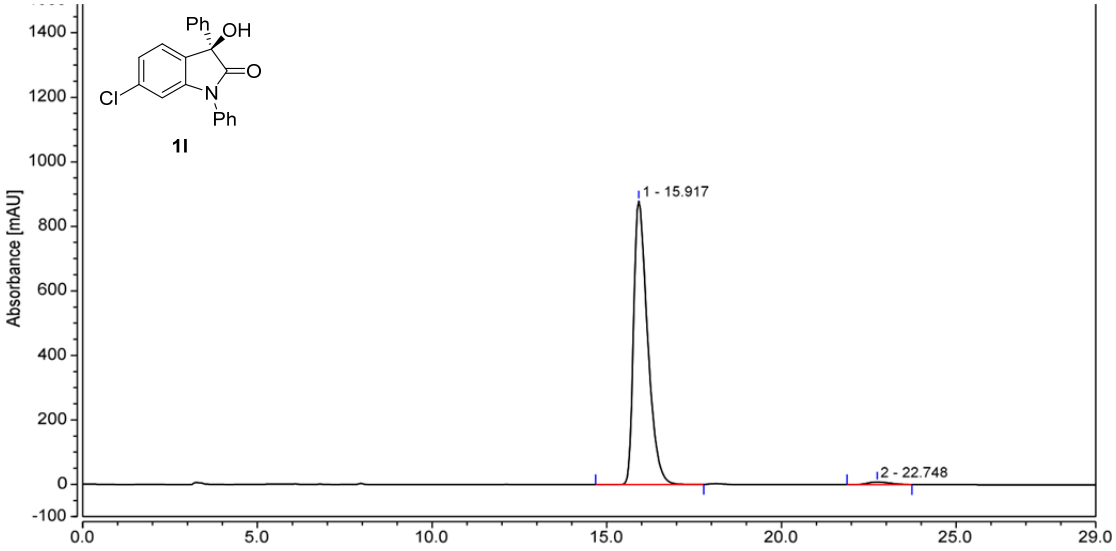
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	13.095	340.235	969.987	49.92	65.46
2	21.073	341.284	511.740	50.08	34.54
Total:		**681.519**	**1481.727**	**100.00**	**100.00**



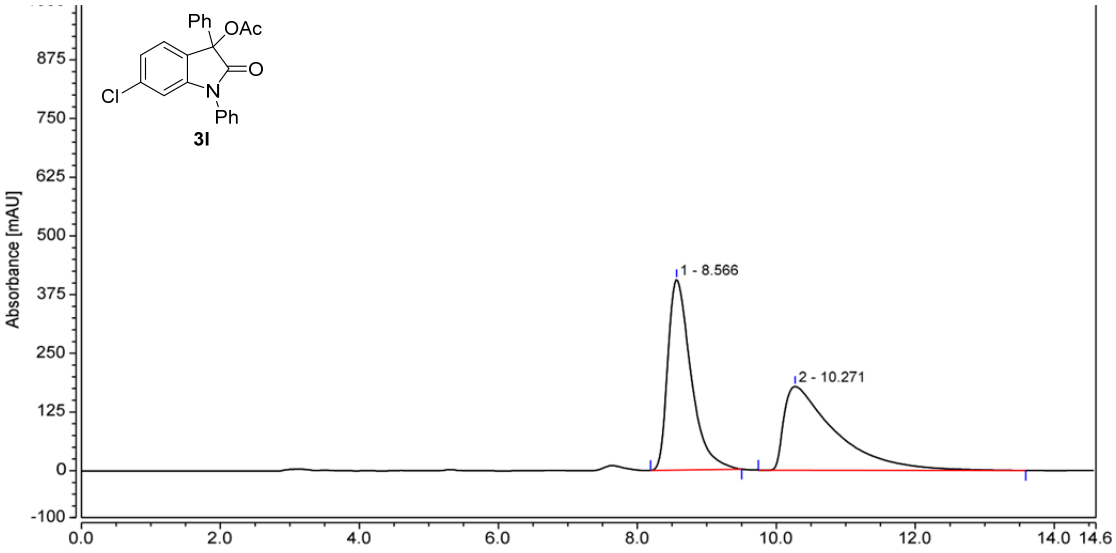
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	13.750	126.641	356.108	4.89	12.21
2	21.401	2461.796	2560.402	95.11	87.79
Total:		**2588.437**	**2916.510**	**100.00**	**100.00**



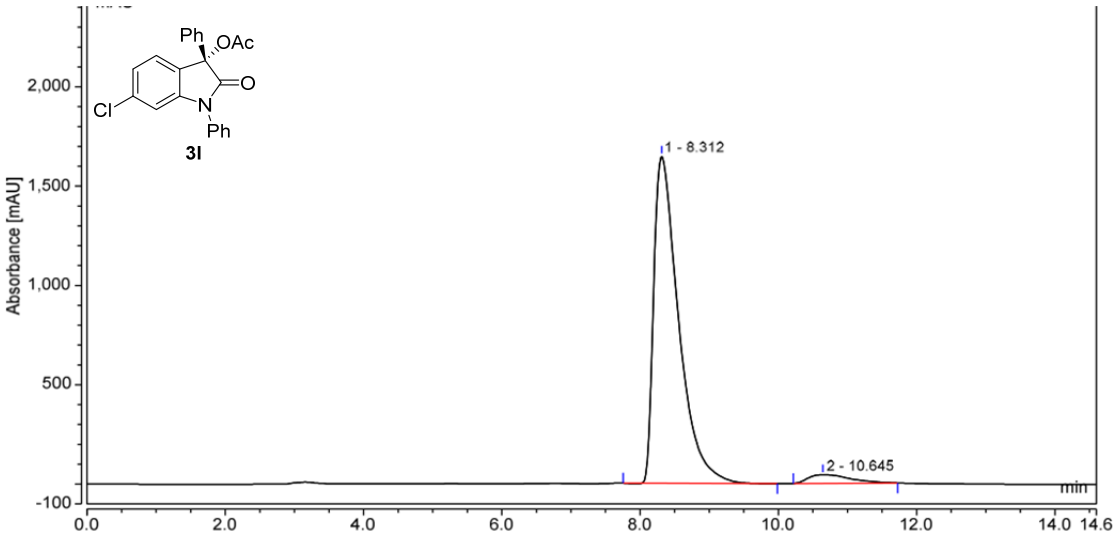
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	15.811	349.994	724.481	50.36	73.20
2	21.241	345.027	265.308	49.64	26.80
Total:		**695.021**	**989.789**	**100.00**	**100.00**



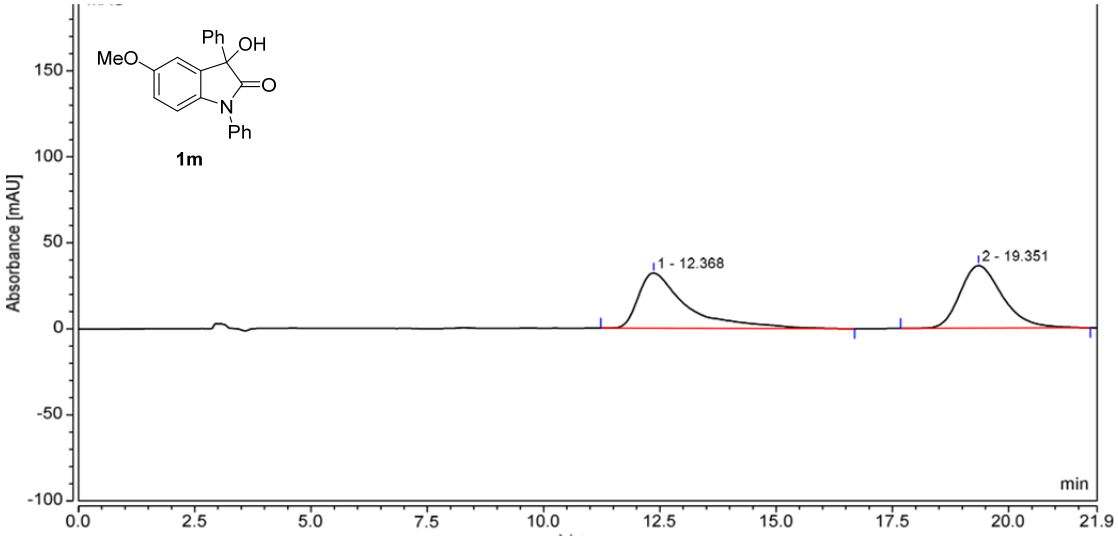
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	15.917	407.939	879.225	98.50	99.07
2	22.748	6.220	8.277	1.50	0.93
Total:		**414.159**	**887.502**	**100.00**	**100.00**



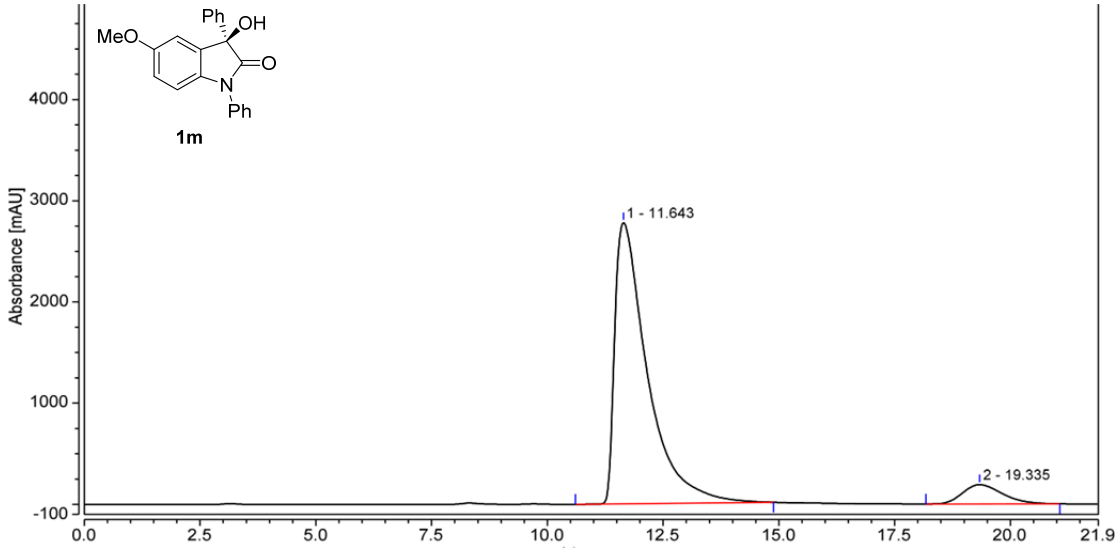
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.566	156.955	405.627	50.82	69.48
2	10.271	151.874	178.191	49.18	30.52
Total:		**308.829**	**583.818**	**100.00**	**100.00**



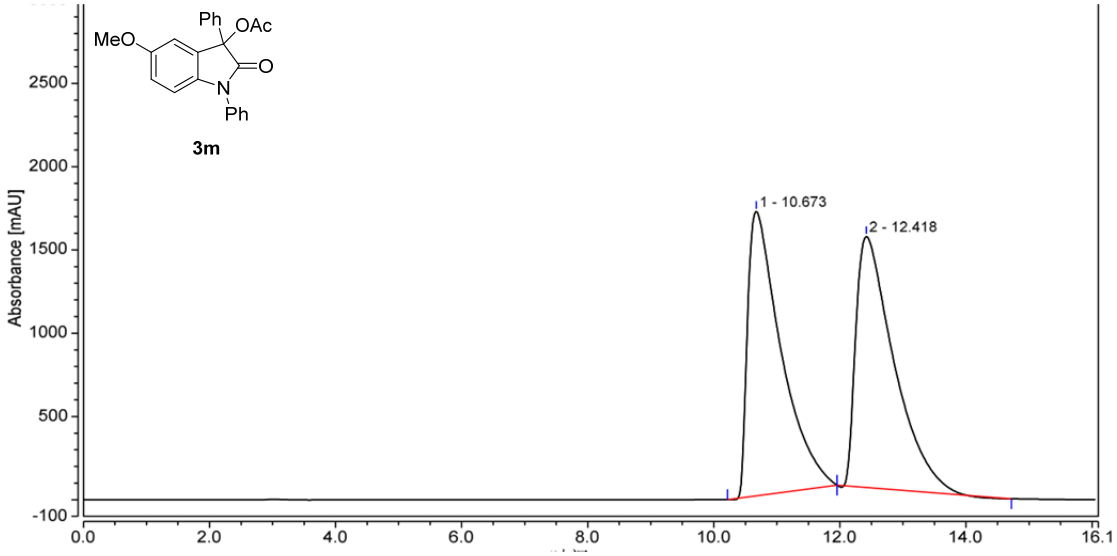
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.312	685.666	1646.799	95.75	97.44
2	10.645	30.463	43.223	4.25	2.56
Total:		**716.129**	**1690.021**	**100.00**	**100.00**



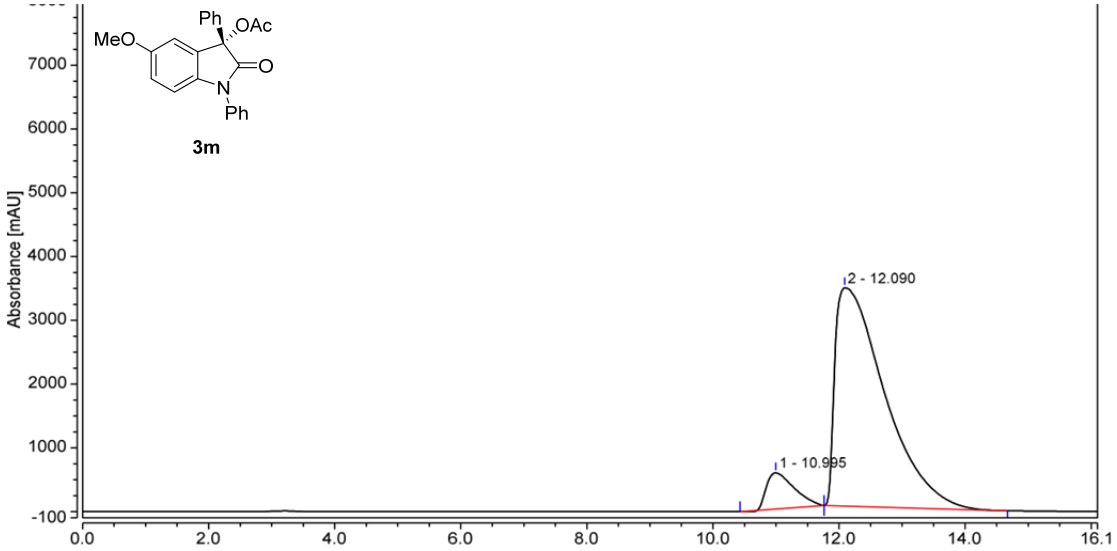
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	12.368	38.587	32.097	50.11	46.89
2	19.351	38.421	36.353	49.89	53.11
Total:		**77.008**	**68.450**	**100.00**	**100.00**



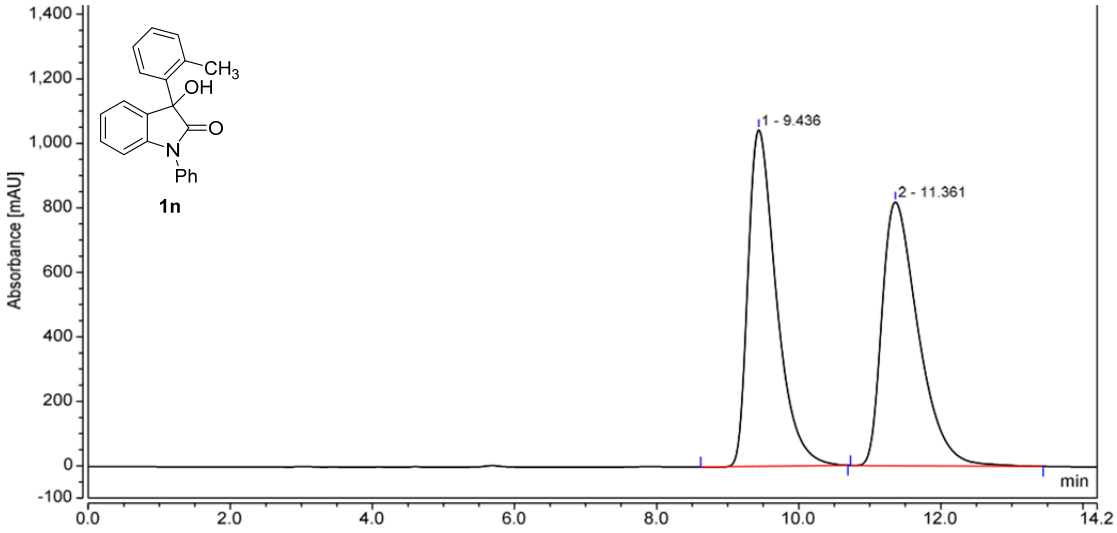
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.643	2264.839	2779.093	92.23	93.59
2	19.335	190.734	190.376	7.77	6.41
Total:		**2455.572**	**2969.469**	**100.00**	**100.00**



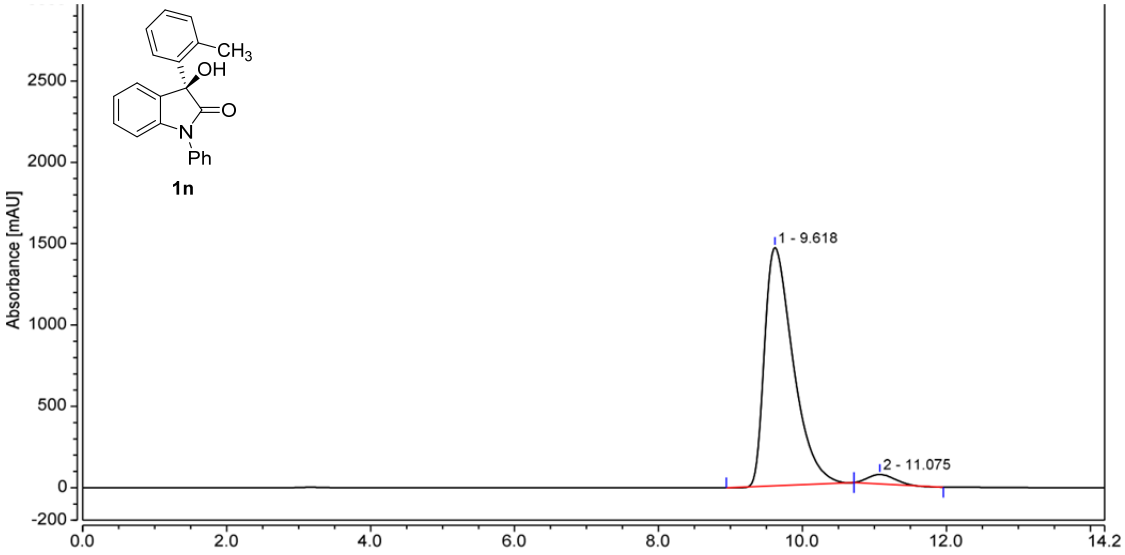
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	10.673	1046.076	1708.305	49.77	53.13
2	12.418	1055.640	1507.048	50.23	46.87
Total:		**2101.716**	**3215.353**	**100.00**	**100.00**



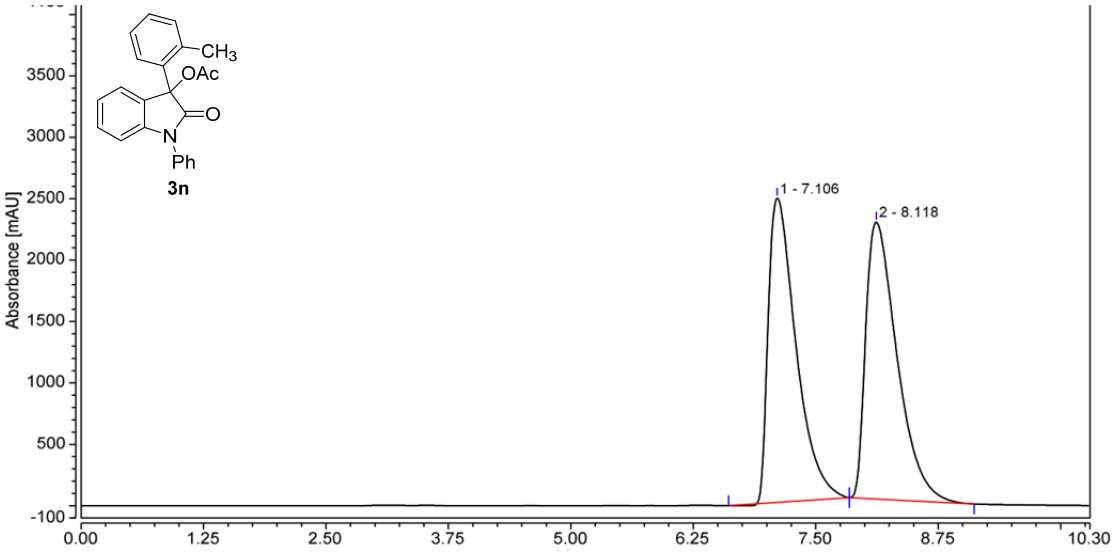
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	10.995	286.982	568.553	8.40	14.23
2	12.090	3131.182	3427.777	91.60	85.77
Total:		**3418.164**	**3996.330**	**100.00**	**100.00**



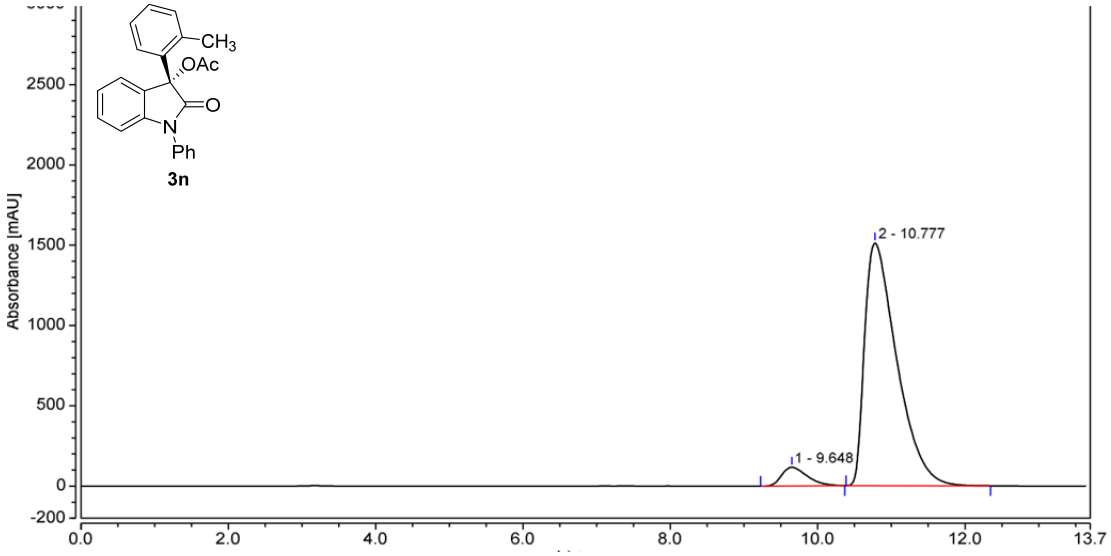
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.436	481.013	1043.921	49.92	56.07
2	11.361	482.560	817.886	50.08	43.93
Total:		**963.573**	**1861.806**	**100.00**	**100.00**



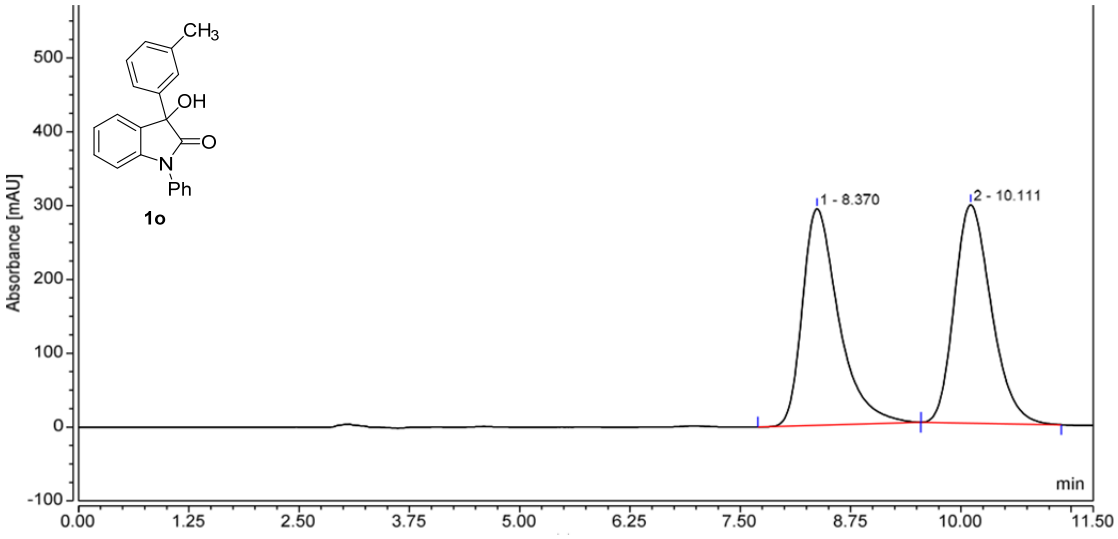
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.618	675.626	1464.420	96.50	96.21
2	11.075	24.485	57.664	3.50	3.79
Total:		**700.110**	**1522.084**	**100.00**	**100.00**



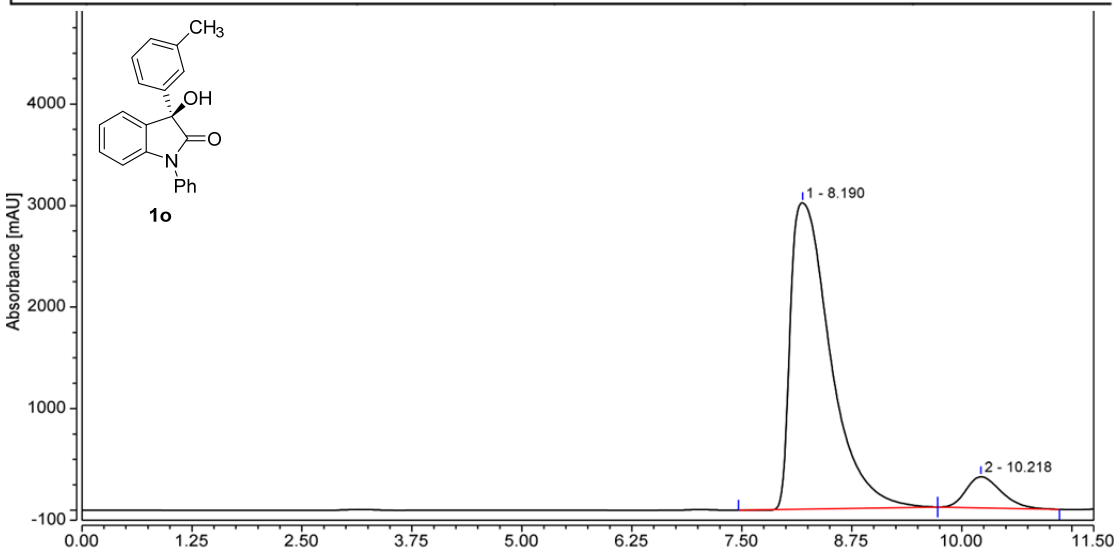
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.106	811.778	2477.399	49.25	52.34
2	8.118	836.548	2256.315	50.75	47.66
Total:		**1648.326**	**4733.714**	**100.00**	**100.00**



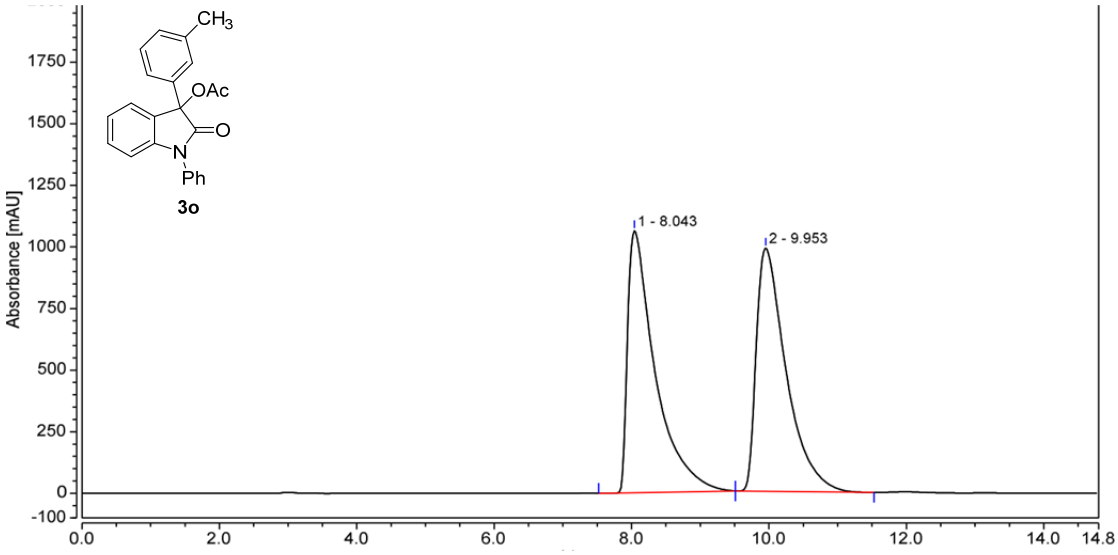
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	9.648	47.066	116.723	5.79	7.17
2	10.777	765.358	1511.770	94.21	92.83
Total:		**812.425**	**1628.493**	**100.00**	**100.00**



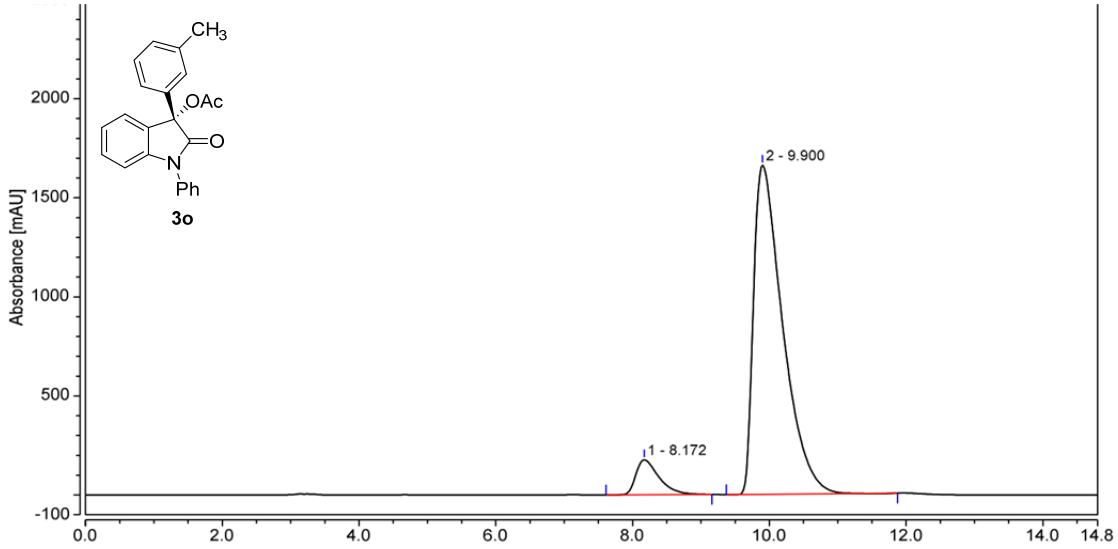
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.370	140.262	293.578	49.35	49.80
2	10.111	143.930	295.905	50.65	50.20
Total:		**284.191**	**589.483**	**100.00**	**100.00**



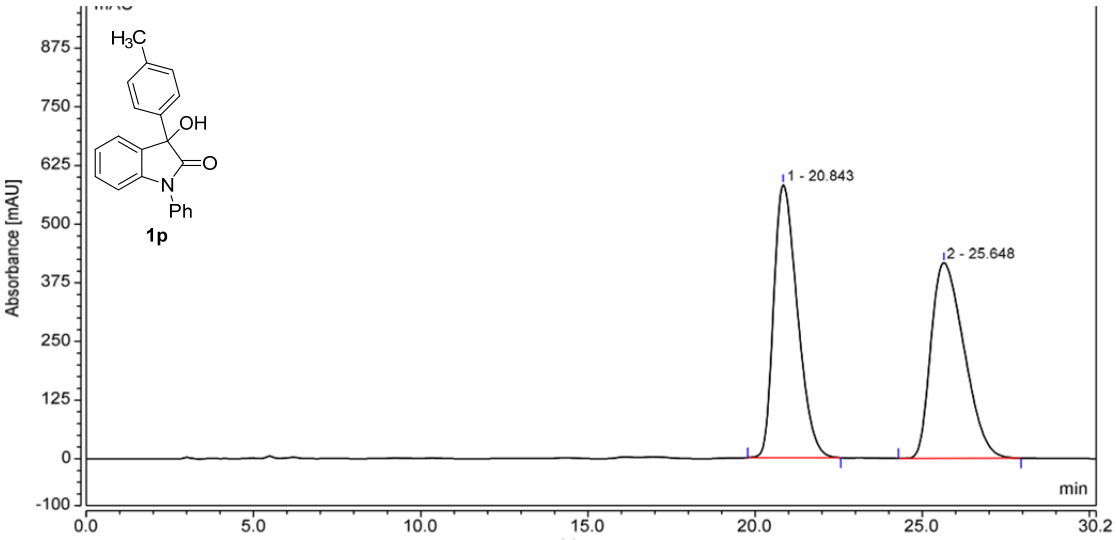
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.190	1587.177	3020.418	91.74	90.78
2	10.218	142.861	306.935	8.26	9.22
Total:		**1730.038**	**3327.353**	**100.00**	**100.00**



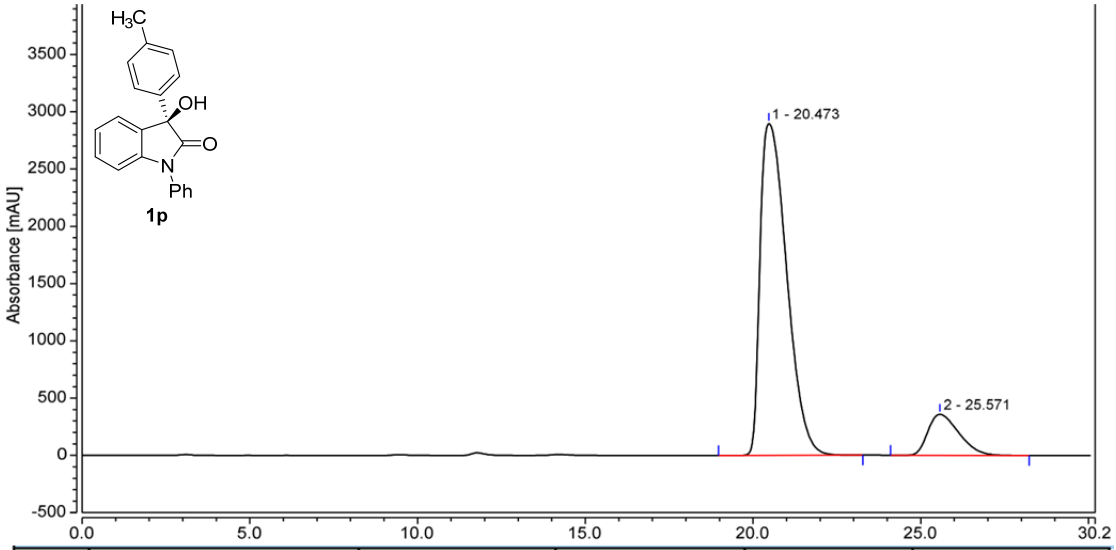
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.043	493.138	1063.508	49.82	51.86
2	9.953	496.719	987.278	50.18	48.14
Total:		**989.857**	**2050.786**	**100.00**	**100.00**



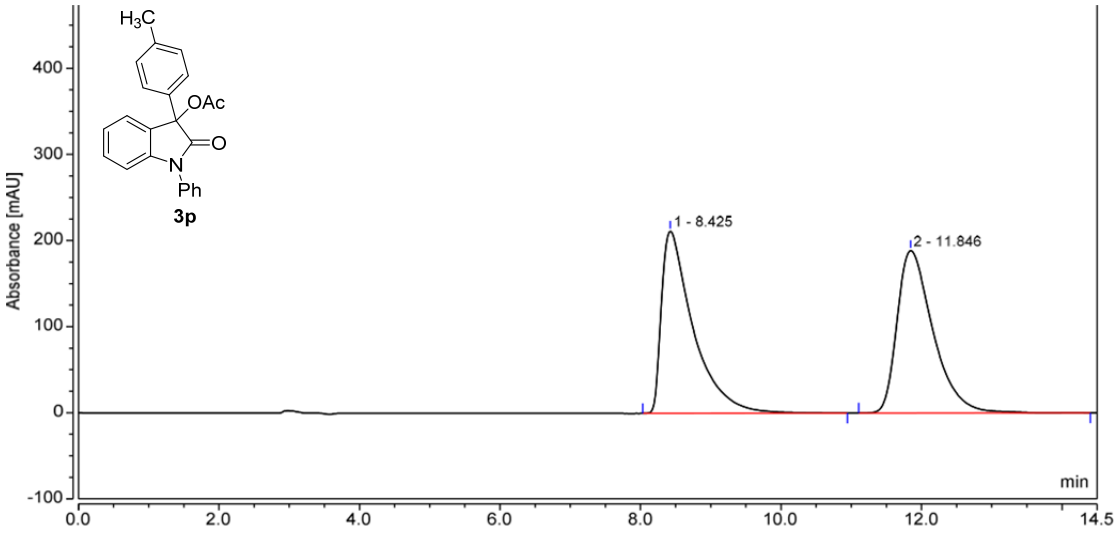
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.172	69.223	175.945	7.80	9.57
2	9.900	817.873	1661.813	92.20	90.43
Total:		**887.096**	**1837.758**	**100.00**	**100.00**



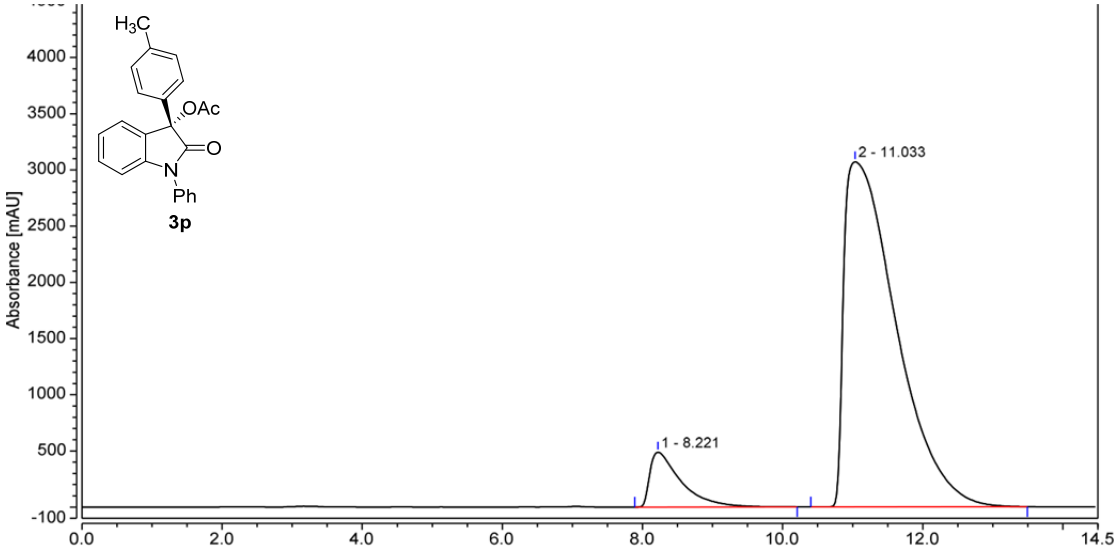
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	20.843	478.734	581.893	49.95	58.25
2	25.648	479.731	417.078	50.05	41.75
Total:		**958.465**	**998.970**	**100.00**	**100.00**



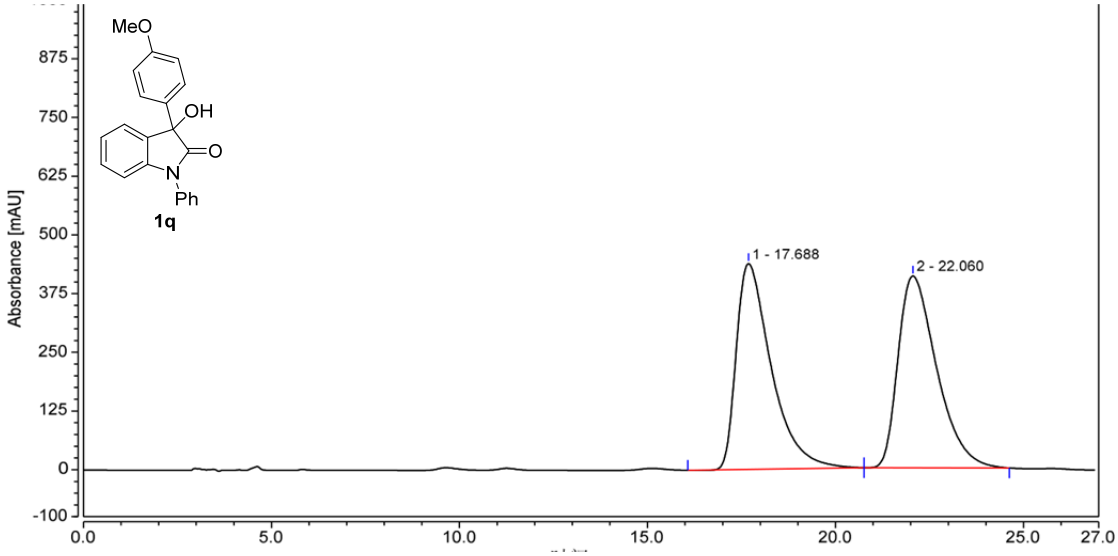
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	20.473	2656.251	2899.082	87.35	89.00
2	25.571	384.632	358.399	12.65	11.00
Total:		**3040.883**	**3257.481**	**100.00**	**100.00**



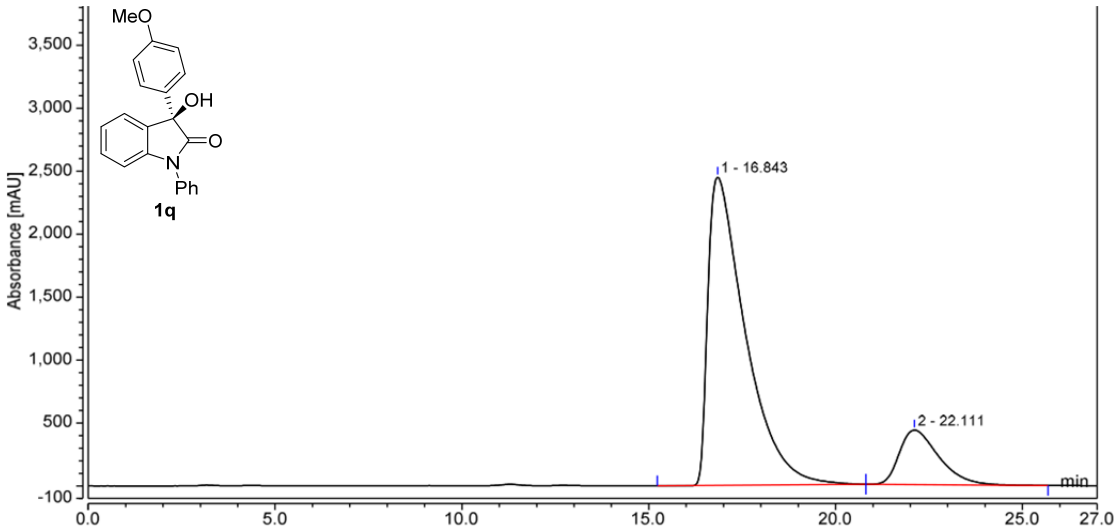
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.425	110.724	211.734	49.76	52.87
2	11.846	111.812	188.721	50.24	47.13
Total:		**222.536**	**400.454**	**100.00**	**100.00**



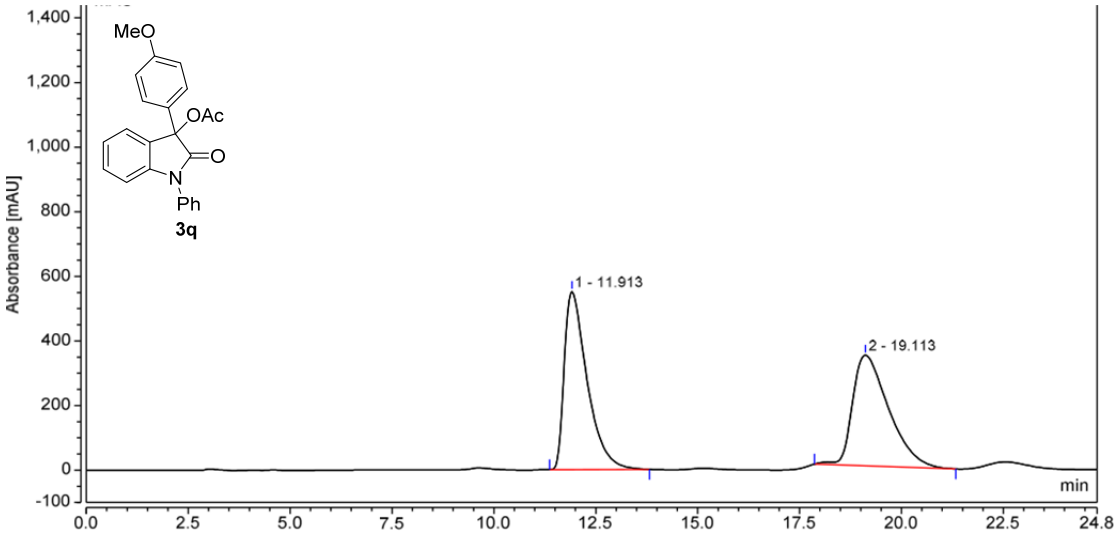
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.221	251.319	488.373	8.66	13.72
2	11.033	2650.401	3071.029	91.34	86.28
Total:		**2901.720**	**3559.402**	**100.00**	**100.00**



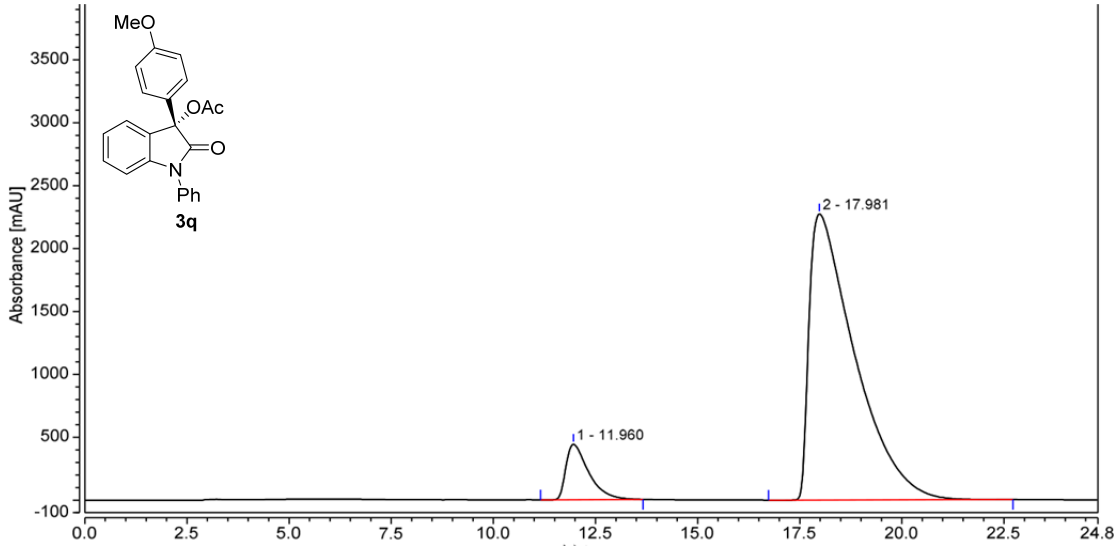
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	17.688	473.388	438.336	49.36	51.76
2	22.060	485.666	408.589	50.64	48.24
Total:		**959.055**	**846.924**	**100.00**	**100.00**



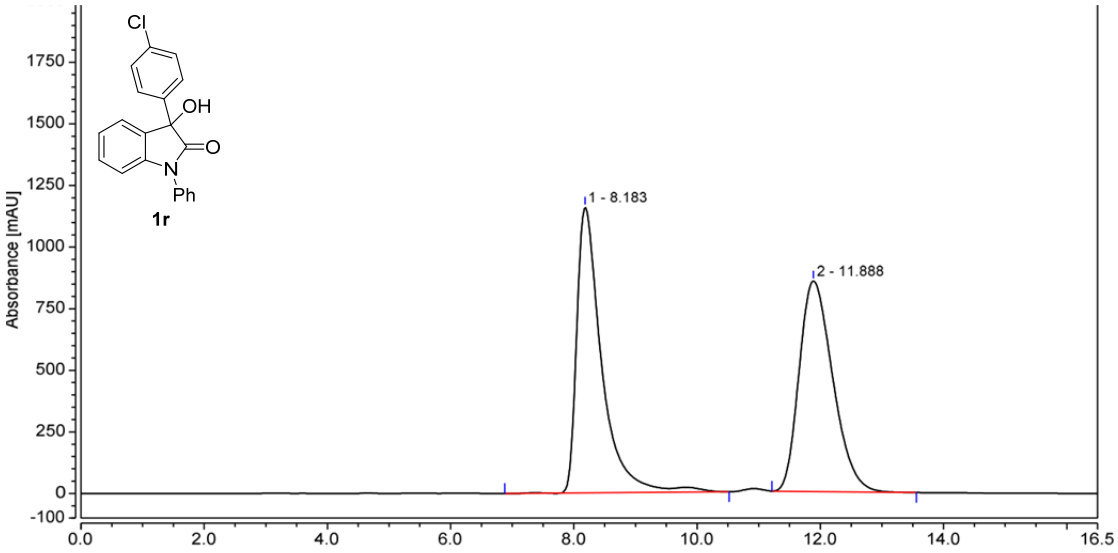
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	16.843	2839.725	2447.883	84.26	84.97
2	22.111	530.381	432.961	15.74	15.03
Total:		**3370.105**	**2880.844**	**100.00**	**100.00**



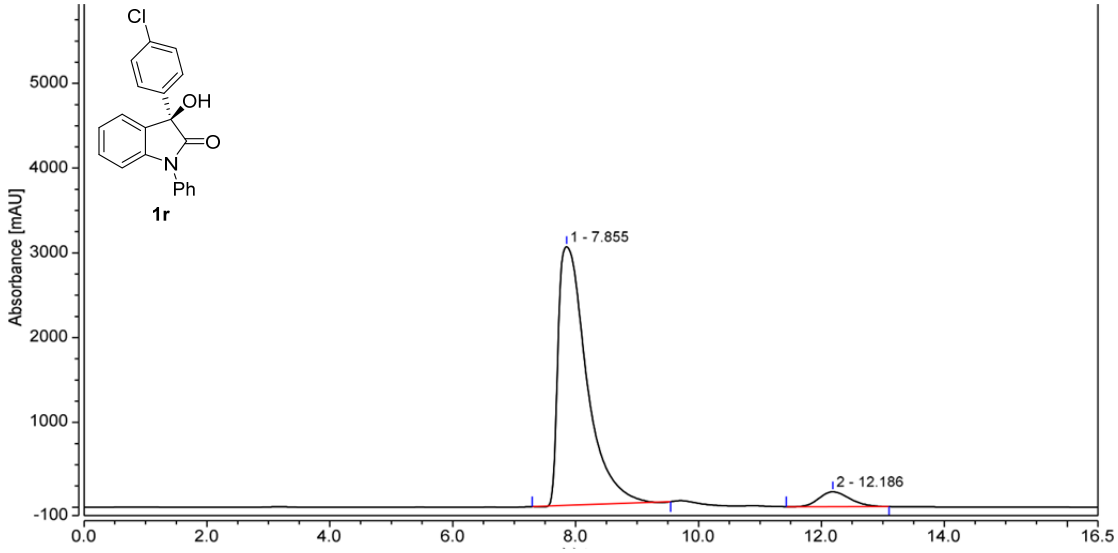
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.913	359.636	551.737	50.50	61.68
2	19.113	352.576	342.794	49.50	38.32
Total:		**712.211**	**894.531**	**100.00**	**100.00**



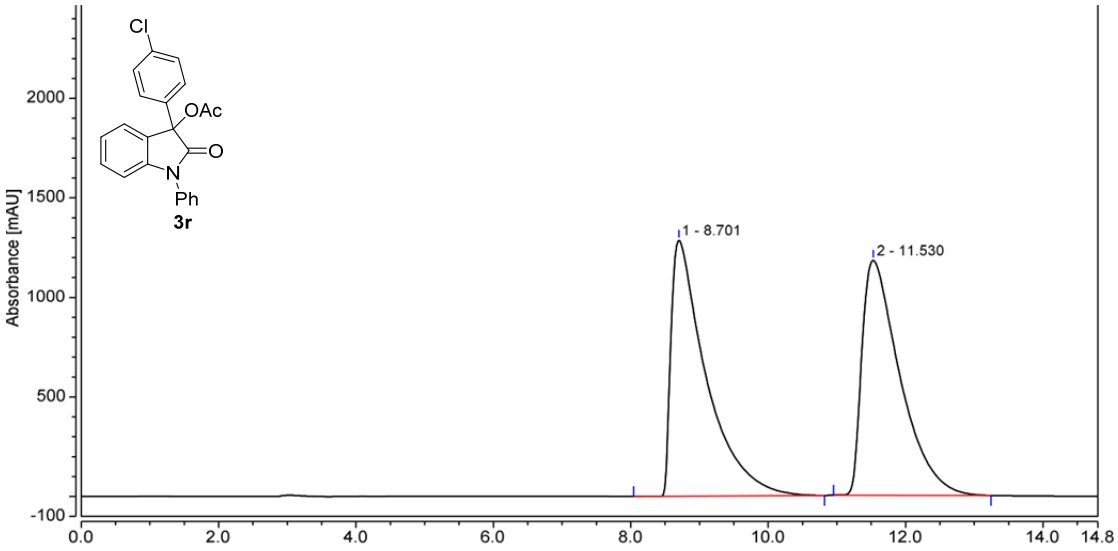
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.960	284.455	441.398	8.82	16.25
2	17.981	2939.452	2274.628	91.18	83.75
Total:		**3223.907**	**2716.026**	**100.00**	**100.00**



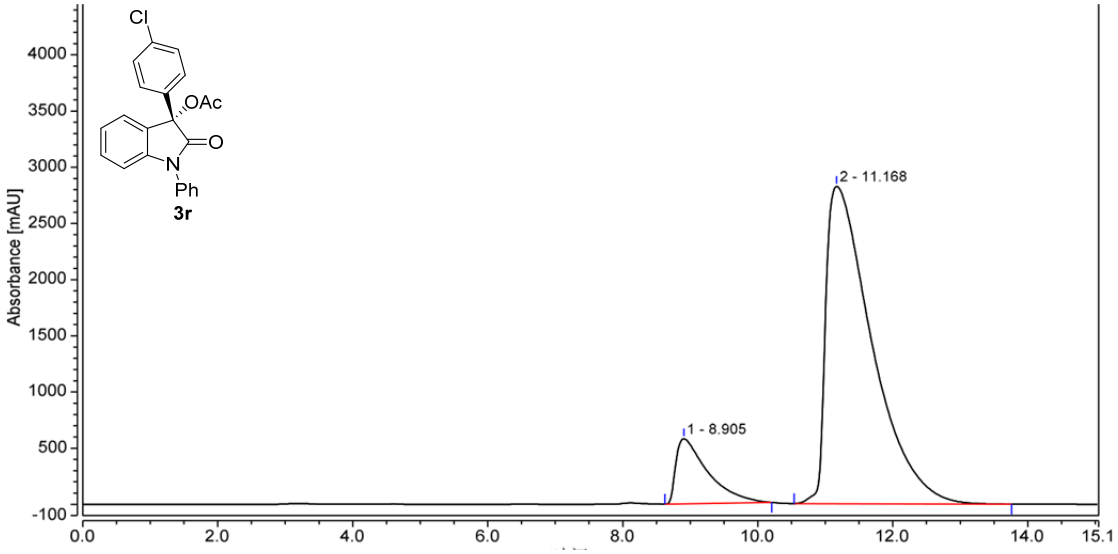
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.183	545.332	1159.857	50.18	57.56
2	11.888	541.492	855.070	49.82	42.44
Total:		**1086.824**	**2014.927**	**100.00**	**100.00**



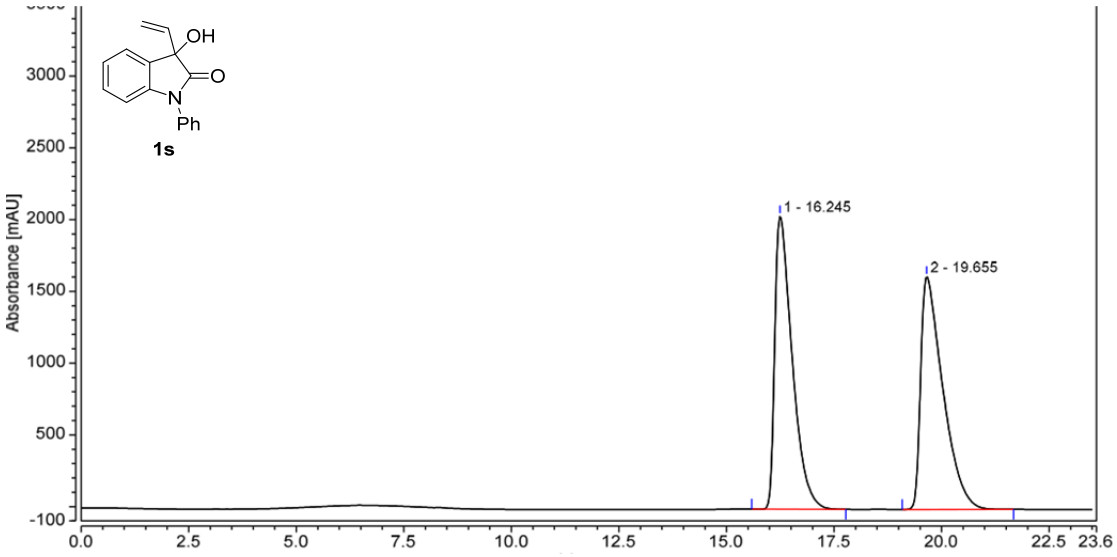
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.855	1635.945	3053.711	94.15	94.57
2	12.186	101.632	175.416	5.85	5.43
Total:		**1737.577**	**3229.127**	**100.00**	**100.00**



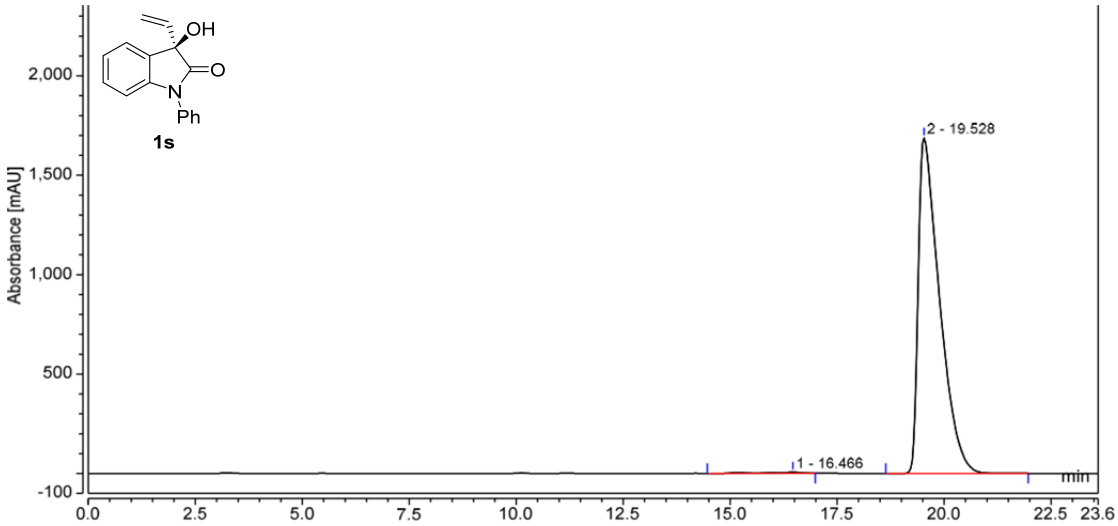
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.701	757.812	1285.848	50.05	52.14
2	11.530	756.299	1180.415	49.95	47.86
Total:		**1514.111**	**2466.263**	**100.00**	**100.00**



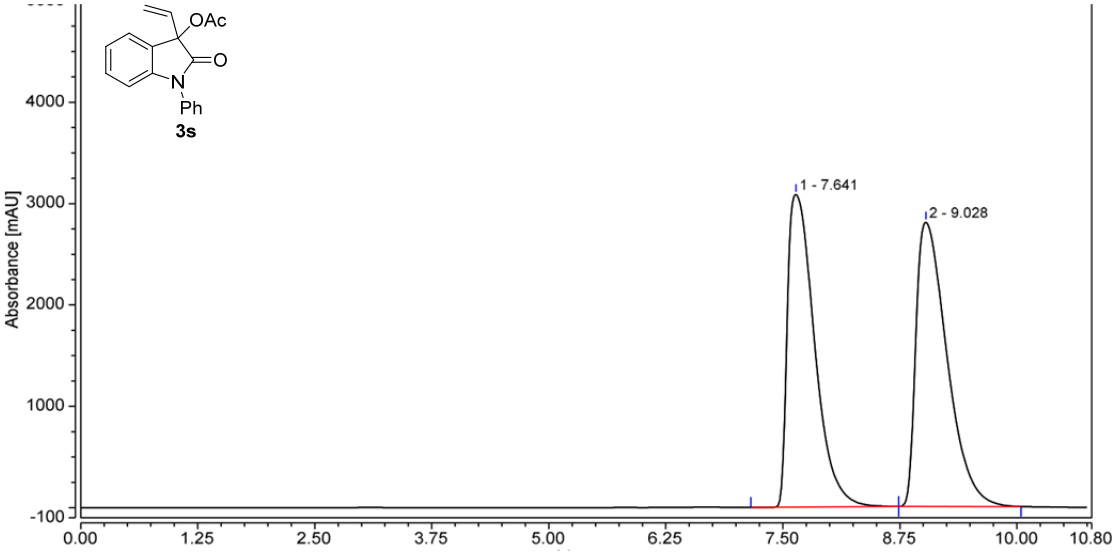
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	8.905	316.637	579.144	12.44	17.01
2	11.168	2228.230	2824.804	87.56	82.99
Total:		**2544.867**	**3403.948**	**100.00**	**100.00**



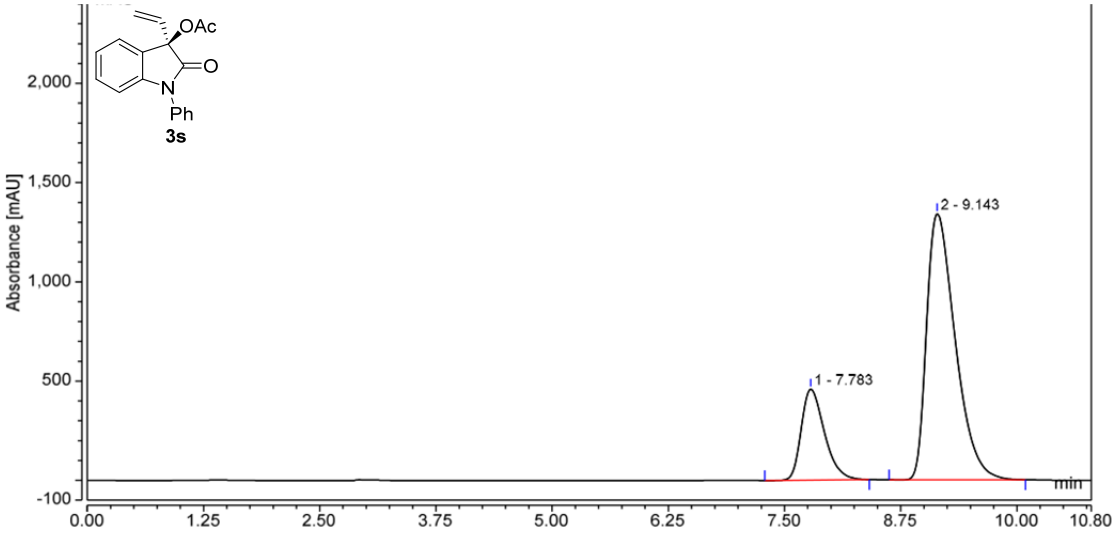
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	16.245	957.875	2043.901	49.69	55.74
2	19.655	969.754	1623.187	50.31	44.26
Total:		**1927.628**	**3667.088**	**100.00**	**100.00**



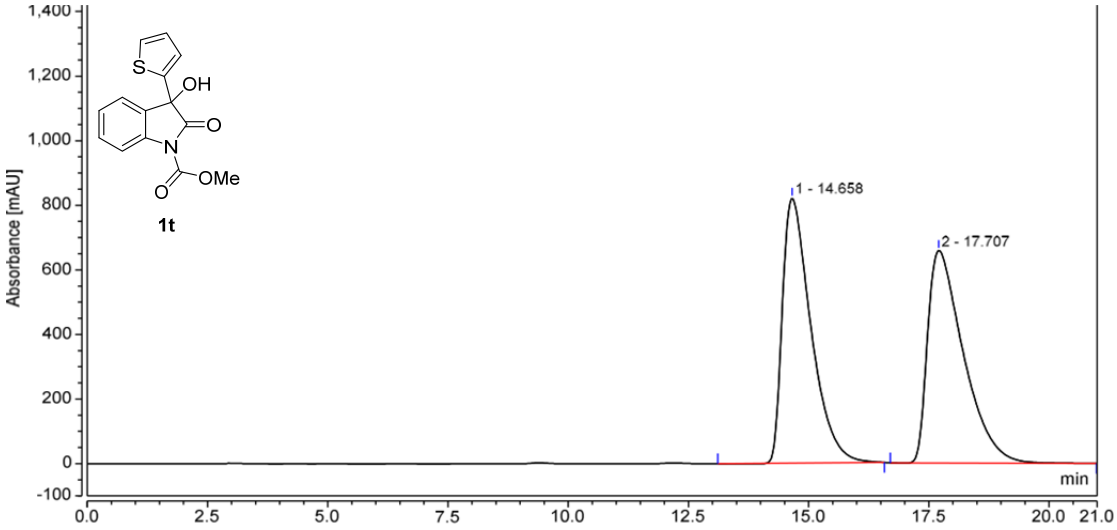
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	16.466	5.865	5.917	0.60	0.35
2	19.528	973.332	1688.392	99.40	99.65
Total:		**979.198**	**1694.309**	**100.00**	**100.00**



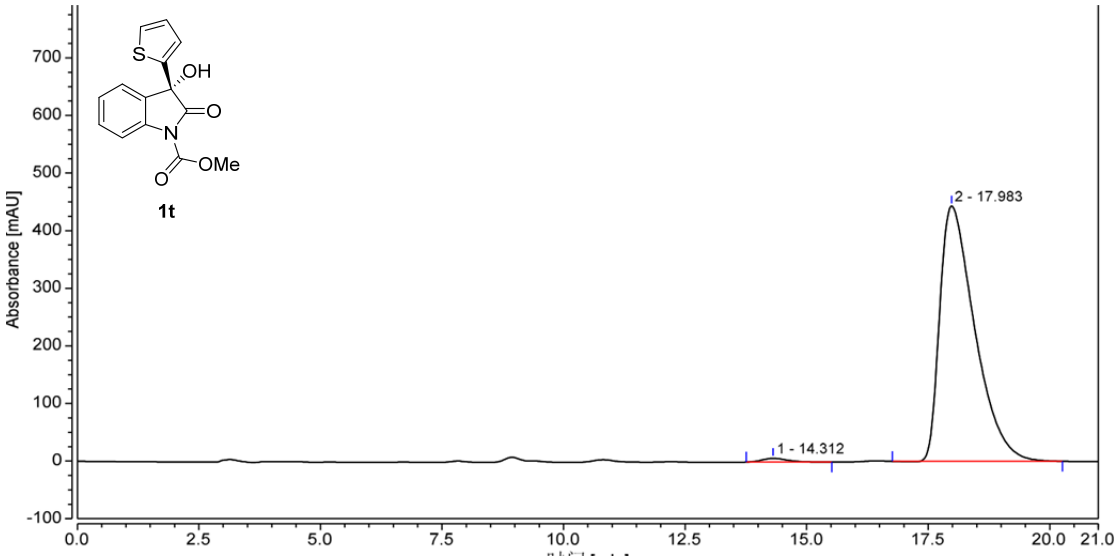
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.641	1034.750	3084.036	48.99	52.37
2	9.028	1077.388	2805.315	51.01	47.63
Total:		**2112.139**	**5889.351**	**100.00**	**100.00**



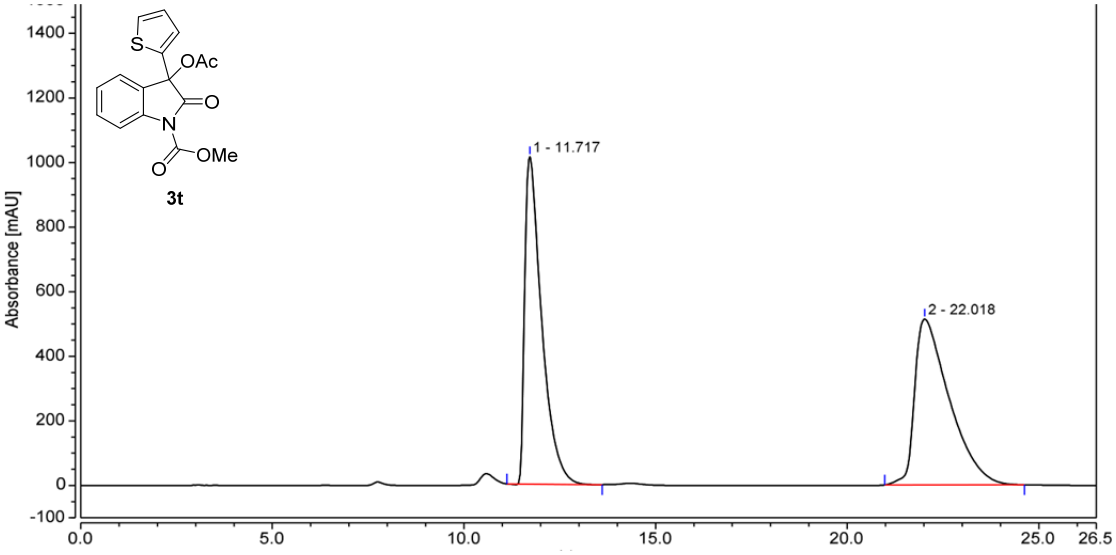
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	7.783	132.984	458.036	21.77	25.46
2	9.143	477.837	1340.939	78.23	74.54
Total:		**610.821**	**1798.975**	**100.00**	**100.00**



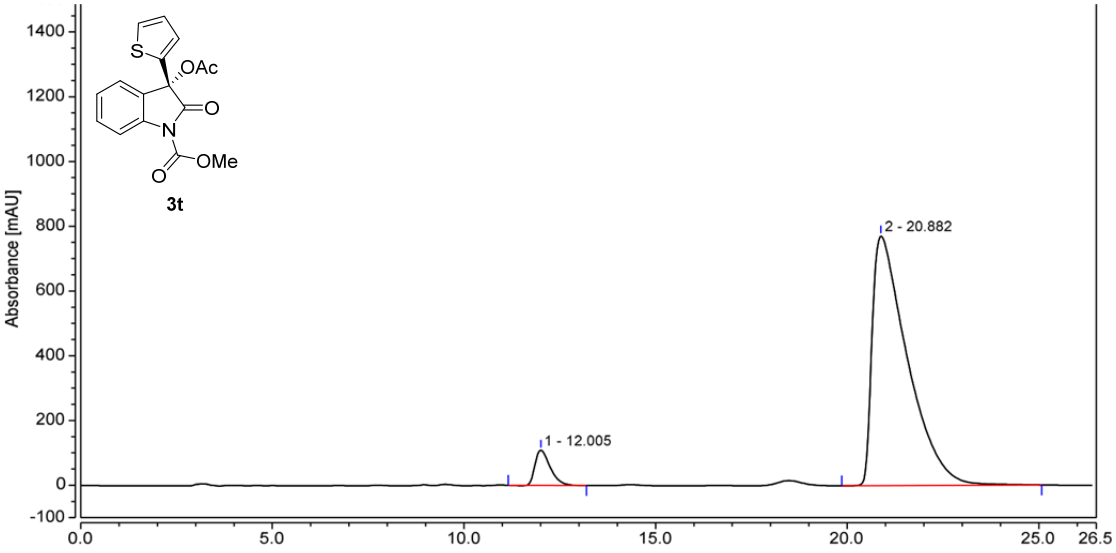
Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	14.658	564.468	820.239	49.85	55.49
2	17.707	567.781	657.926	50.15	44.51
Total:		**1132.249**	**1478.166**	**100.00**	**100.00**



Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	14.312	3.981	6.403	1.06	1.42
2	17.983	370.023	443.447	98.94	98.58
Total:		**374.004**	**449.849**	**100.00**	**100.00**



Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	11.717	519.891	1013.821	49.06	66.36
2	22.018	539.891	513.915	50.94	33.64
Total:		**1059.781**	**1527.736**	**100.00**	**100.00**



Peak	Retention Time min	Area mAU*min	Height mAU	Area %	Height %
1	12.005	50.026	109.382	5.75	12.42
2	20.882	819.377	771.118	94.25	87.58
Total:		**869.403**	**880.501**	**100.00**	**100.00**