Supporting Information

Lewis acid-catalyzed cascade via intercepted Meyer-Schuster *O*-allenylation and [3,3]-sigmatropic rearrangement: Divergent synthesis of 2-alkenylanilines and indoles

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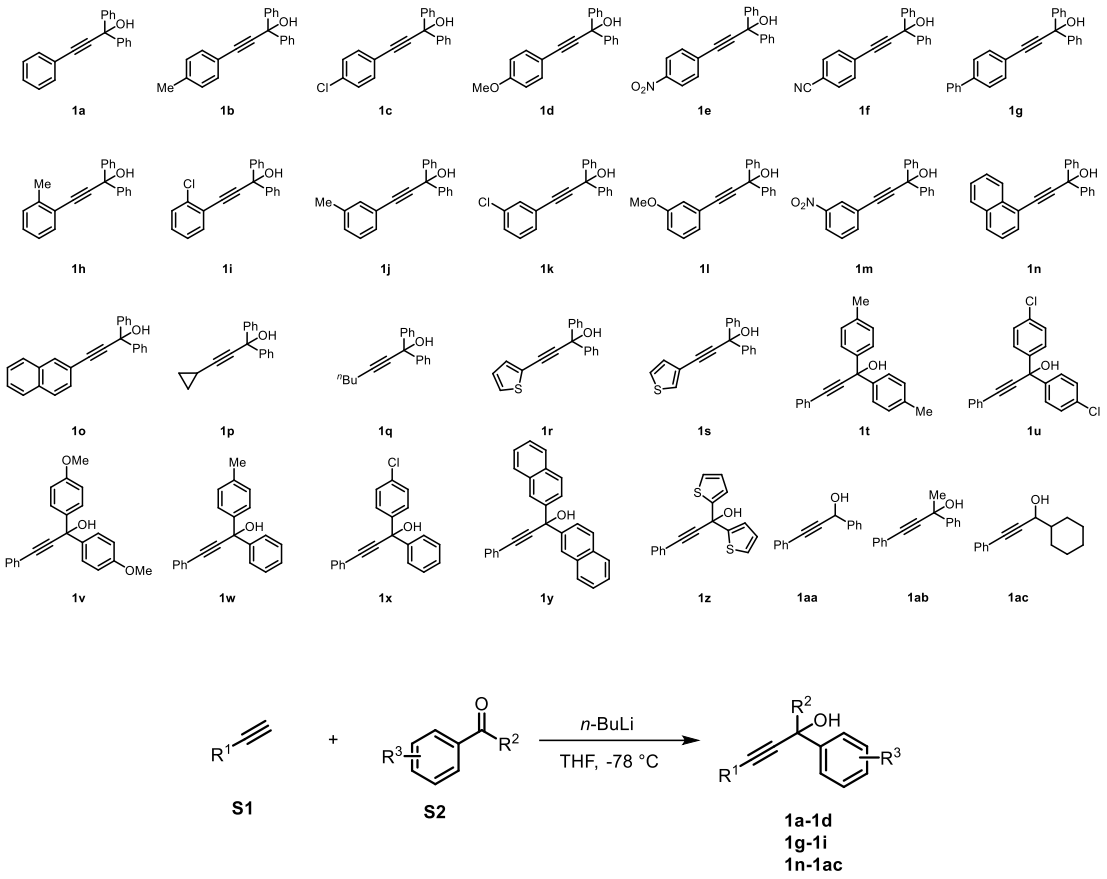
General information

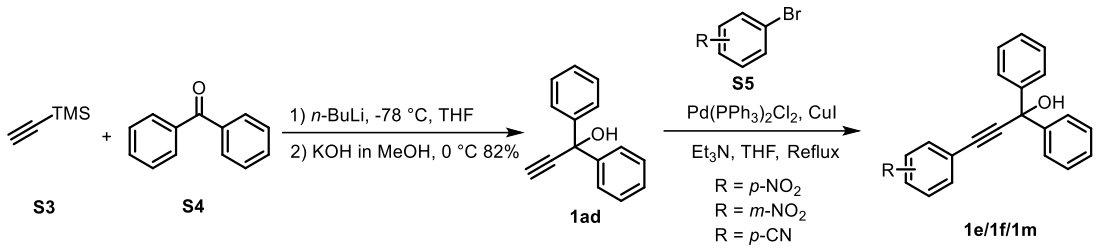
All moisture or oxygen-sensitive reactions were carried out in a nitrogen atmosphere with dry solvents under anhydrous conditions, unless otherwise noted. The solvents used were purified by distillation over the drying agents indicated and were transferred under nitrogen: THF (Na), CH_2Cl_2 (CaH_2), toluene (Na), $ClCH_2CH_2Cl$ (CaH_2). Reagents were purchased at commercial quality and used without further purification. All reactions were monitored by thin-layer chromatography carried out on 0.25 mm Rushan silica gel plates (GF254) and visualized by exposure to UV light (254 nm) or $KMnO_4$. The products were purified by column chromatography on silica gel (300−400 meshes) from Titan in China. ^1H NMR and ^{13}C NMR spectra were recorded in $CDCl_3$ on a Bruker Advance III 400 MHz instrument (resonance frequencies 400 MHz for ^1H and 100 MHz for ^{13}C). Chemical shifts were reported in δ value (ppm) relative to $CDCl_3$ (^1H NMR: 7.26 ppm, ^{13}CNMR: 77.00 ppm) or TMS (0.00 ppm). The following abbreviations were used to explain the multiplicities: s = singlet, d = doublet, t = triplet, m = multiplet. Mass spectrometric data were obtained using a Bruker Solaril X70 high resolution mass spectrometer (samples were dissolved in CH_3OH and the ion source was ESI). The IR spectra were recorded on a Nicolet iN10.

General procedure for the preparation of propargyl alcohols 1a-1ac

Propargyl alcohols were prepared according to the reported literature [1,2]. General synthetic routes of propargylic alcohols **1a-1ac** are shown below.



To the solution of **S1** (22.0 mmol, 2.2 equiv.) in dry THF (20 mL) was slowly added *n*-BuLi (21.0 mmol, 2.5 M in THF, 2.1 equiv.) at -78 °C under N_2 atmosphere. The reaction mixture was stirred at this temperature for 0.5 h, then a solution of the corresponding ketones/aldehydes **S2** (10.0 mmol, 1.0 equiv.) in 10 mL of THF was added dropwise via a syringe. The reaction mixture was stirred at -78 °C for another 1-1.5 h until the disappearance of the starting material indicated by TLC (thin-layer chromatography) analysis. Then the reaction mixture was quenched with saturated aqueous NH_4Cl solution and THF was removed under vacuum. The resulting aqueous phase was extracted with EtOAc (30 mL × 3). The combined organic layers were washed with water (30 mL) and brine (30 mL), dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography (petroleum ether/EtOAc = 10/1) or by crystallization with petroleum ether to give **1a-1d**, **1g-1i**, **1n-1ac**. The spectral data was in accordance with the reported data [1].

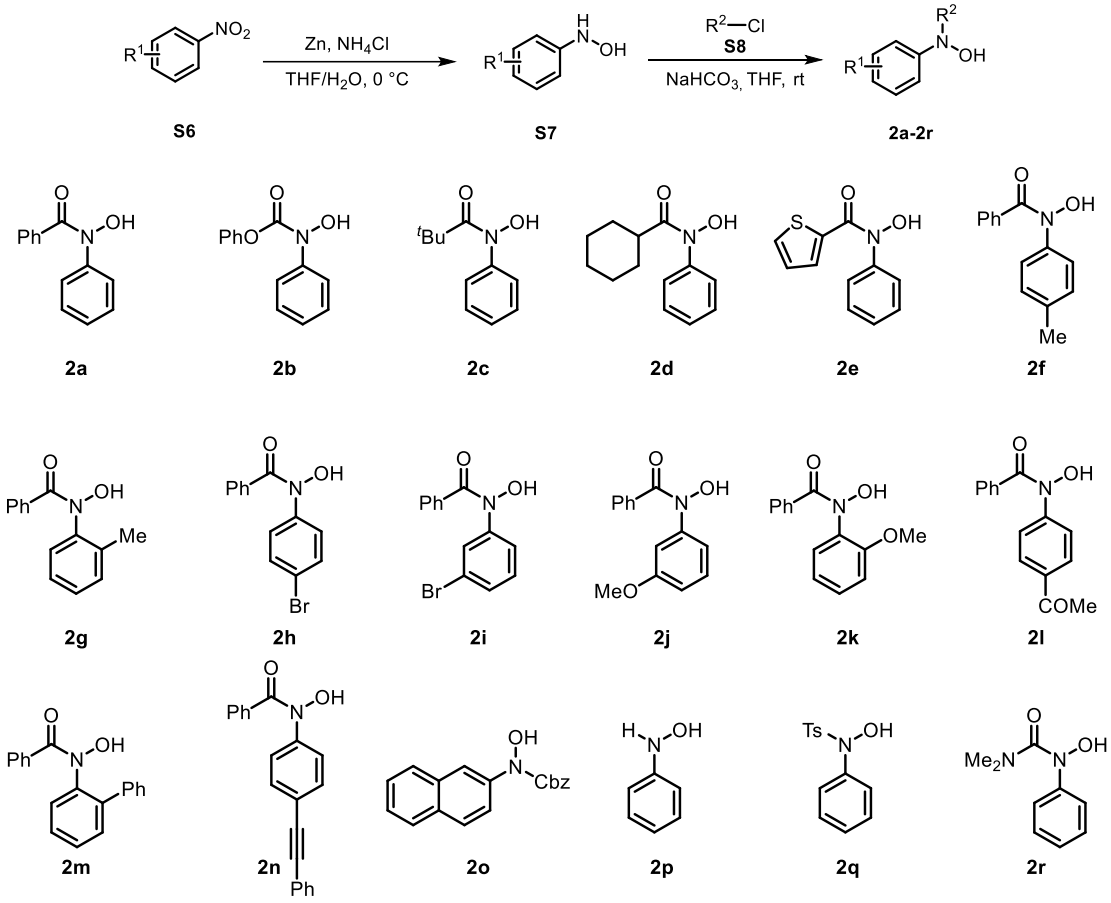


To the solution of **S3** (22.0 mmol, 2.2 equiv., 3.1 mL) in dry THF (20 mL) was slowly added *n*-BuLi (21.0 mmol, 2.5 M in THF, 2.1 equiv., 8.4 mL) at -78 °C under N_2 atmosphere. The reaction mixture was stirred at this temperature for 0.5 h, then a solution of the corresponding diphenyl ketone **S4** (10.0 mmol, 1.0 equiv., 1.82 g) in 10 mL of THF was added dropwise via a syringe. The reaction mixture was stirred at -78 °C for another 1-1.5 h until the disappearance of the starting material indicated by TLC (thin-layer chromatography) analysis. After the reaction has returned to room temperature, a solution of potassium hydroxide (50.0 mmol, 5.0 equiv., 2.81 g) in MeOH (10 mL) was added to the mixture at 0 ℃. Reaction was complete within 30 min as monitored by TLC. The mixture was poured into a saturated solution of NH_4Cl (25 mL). THF and MeOH were removed under reduced pressure. The residue was extracted with EtOAc (30 mL × 3). The combined organic layers were washed with brine, dried over Na_2SO_4, filtered and the solvent was evaporated under reduced pressure. The residue was purified by flash column chromatography on silica gel (petroleum ether/EtOAc = 20/1) to afford the desired product **1ad** (1.71 g, 82%).

To a solution of *p*-bromo-nitrobenzene, *m*-bromo-nitrobenzene or *p*-bromobenzonitrile **S5** (5.0 mmol, 1.0 equiv.) and the corresponding alkyne **1ad** (6.5 mmol, 1.3 equiv., 1.04 g) in THF (3 mL/mmol) were added $Pd(PPh_3)_2Cl_2$ (0.10 mmol, 0.02 equiv., 70.2 mg) and CuI (0.20 mmol, 0.04 equiv., 38.1 mg), and the reaction mixture was degassed with N_2. To this solution was added Et_3N (10.0 mmol, 2.0 equiv., 1.4 mL), and the reaction mixture was stirred under refluxing for 12 h. The solvent was removed under vacuum, and the residue was purified by flash column chromatography on silica gel (petroleum ether/EtOAc = 10/1) to afford the desired coupling product **1e/1f/1m**. The spectral data was in accordance with the reported data [2].

General procedure for the preparation of *N*-protected arylhdroxyamines 2

N-protected arylhydroxyamines were prepared according to the reported literature [3,4]. General synthetic route of *N*-protected arylhydroxyamines **2a-2r** is shown below.



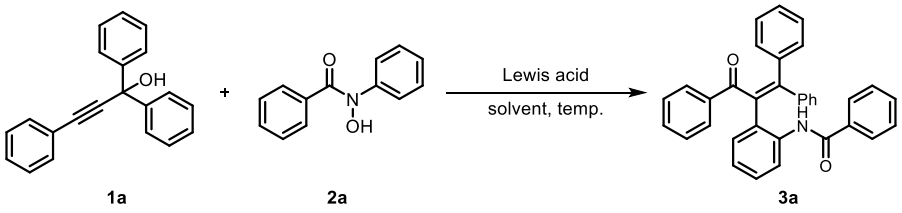
To a solution of nitrobenzene **S6** (10 mmol, 1 equiv.), NH_4Cl (11.0 mmol, 1.1 equiv., 0.59 g) in THF (40 mL) and H_2O (20 mL) was added Zn (20.0 mmol, 2.0 equiv., 1.31 g) at 0 °C under N_2 atmosphere. The reaction mixture was stirred at 0 °C for 1 h, then filtered through a short pad of celite and extracted with DCM. The combined organic layers were washed with brine, dried with Na_2SO_4, and solvent was evaporated. Recrystallization from petroleum ether/DCM afforded *N*-arylhydroxyamines **S7** or **2p**.

To a stirred suspension of *N*-arylhydroxyamines **S7** (5.0 mmol, 1.0 equiv.) and $NaHCO_3$ (6.0 mmol, 1.2 equiv., 0.50 g) in THF (10 mL) at 0 °C under N_2 atmosphere was dropwise added a solution of the corresponding acyl chloride **S8** (6.0 mmol, 1.2 equiv.) in THF (5 mL). The reaction was stirred for 2 h at the room temperature. After

that, the reaction mixture was filtered through a short pad of celite and the celite was washed with EtOAc. The organic layers were combined and concentrated in vacuo. The residue was purified by chromatography on silica gel (petroleum ether/EtOAc = 4/1) to afford the title compounds **2a-2o** and **2q-2r**. The spectral data was in accordance with the reported data[3,4].

Screening of reaction conditions for the synthesis of 3a

To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohols **1a** (0.20 mmol, 1.0 equiv., 56.9 mg), *N*-phenylbenzolhydroxyamine **2a**, and solvent (2 mL) followed by acid catalyst under N_2 atmosphere. The reaction mixture was stirred at suitable temperature and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1) to give the final product **3a**.



1a **2a** **3a**

Table S1. Screening of reaction conditions for the synthesis of **3a** [a]

entry	Lewis acid	equiv. of **2a**	t/h	solvent	T/°C	yield (%)[b]
1	$Cu(OTf)_2$	1.5	0.5	1,2-DCE	45	70
2	$Ca(OTf)_2$	1.5	0.5	1,2-DCE	45	15
3	$Al(OTf)_3$	1.5	0.5	1,2-DCE	45	47
4	$Zn(OTf)_2$	1.5	0.5	1,2-DCE	45	57
5	AgOTf	1.5	0.5	1,2-DCE	45	54
6	$Yb(OTf)_3$	1.5	0.5	1,2-DCE	45	35
7	$Y(OTf)_3$	1.5	0.5	1,2-DCE	45	30
8	$Bi(OTf)_3$	1.5	5	1,2-DCE	45	Trace
9	$Sc(OTf)_3$	1.5	0.5	1,2-DCE	45	36
10	TsOH	1.5	3	1,2-DCE	45	26

11	$BF_3{\cdot}Et_2O$	1.5	0.5	1,2-DCE	45	24
12	$FeCl_3$	1.5	0.5	1,2-DCE	45	64
13	$Fe(OTf)_2$	1.5	0.5	1,2-DCE	45	72
14	$CuOTf{\cdot}½(C_6H_6)$	1.5	0.5	1,2-DCE	45	72
15	CuI	1.5	0.5	1,2-DCE	45	N.R.
16	$Fe(OTf)_2$	1.5	2	1,2-DCE	rt	75
17	TsOH	1.5	6	1,2-DCE	rt	51
18	$BF_3{\cdot}Et_2O$	1.5	7	1,2-DCE	rt	42
19	$Fe(OTf)_3$	1.5	2	1,2-DCE	rt	72
20	CuCl	1.5	24	1,2-DCE	rt	15
21	$CuOTf{\cdot}½(C_6H_6)$	1.5	2	1,2-DCE	rt	80
22	$Cu(OTf)_2$	1.5	2	1,2-DCE	rt	77
23[c]	$Cu(OTf)_2$	1.5	2	1,2-DCE	rt	82
24[d]	$Cu(OTf)_2$	1.5	2	1,2-DCE	rt	70
25[c]	$CuOTf{\cdot}½(C_6H_6)$	1.5	2	1,2-DCE	rt	81
26[d]	**$CuOTf{\cdot}½(C_6H_6)$**	**1.5**	**2**	**1,2-DCE**	**rt**	**90**
27[d]	$CuOTf{\cdot}½(C_6H_6)$	1	2	1,2-DCE	rt	62
28[d]	$CuOTf{\cdot}½(C_6H_6)$	1.25	2	1,2-DCE	rt	68
29[d]	$CuOTf{\cdot}½(C_6H_6)$	1.75	2	1,2-DCE	rt	80
30[d]	$CuOTf{\cdot}½(C_6H_6)$	2	2	1,2-DCE	rt	81
31[d]	$CuOTf{\cdot}½(C_6H_6)$	1.5	4	1,2-DCE	0-rt	83
32[d]	$CuOTf{\cdot}½(C_6H_6)$	1.5	4	1,2-DCE	0	81
33[d]	$CuOTf{\cdot}½(C_6H_6)$	1.5	2	DCM	rt	80
34[d]	$CuOTf{\cdot}½(C_6H_6)$	1.5	24	THF	rt	20
35[d]	$CuOTf{\cdot}½(C_6H_6)$	1.5	24	toluene	rt	25

[a]Reaction conditions: compounds **1a** (0.20 mmol) and **2a**, solvent (2 mL), catalyst (0.20 equiv.); [b]Yield of the isolated product; [c]Catalyst is used at 0.30 equivalents. [d]Catalyst is used at 0.40 equivalents.

Screening of reaction conditions for the synthesis of 4a

To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohols **1a** (0.20 mmol, 1.0 equiv., 56.9 mg), *N*-phenylbenzolhydroxyamine **2a**, and solvent (2 mL) followed by acid catalyst and polymethylhydrosiloxane (PMHS) under N_2 atmosphere. The reaction mixture was stirred at suitable temperature and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on

silica gel (petroleum ether/EtOAc = 50:1 to 30:1) to give the final product **4a**.

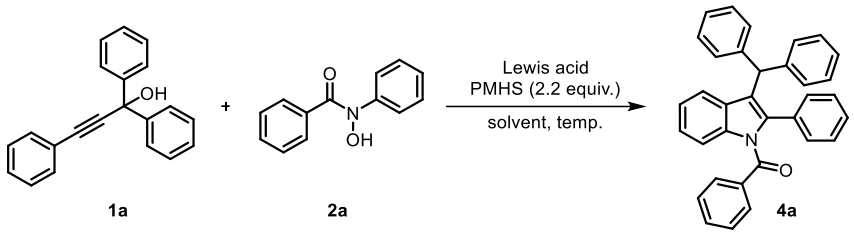


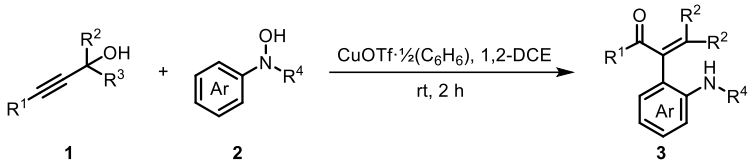
Table S2. Screening of reaction conditions for the synthesis of **4a** [a]

entry	Lewis acid (equiv.)	equiv. of **2a**	t/h	solvent	T/℃	yield (%)[b]
1	$FeCl_3$ (0.2)	1.2	4	1,2-DCE	rt	71
2	$Fe(OTf)_3$ (0.2)	1.2	4	1,2-DCE	rt	66
3	$Fe(OTf)_2$ (0.2)	1.2	4	1,2-DCE	rt	68
4	$FeBr_3$ (0.2)	1.2	4	1,2-DCE	rt	70
5	$Cu(OTf)_2$ (0.2)	1.2	4	1,2-DCE	rt	46
6	$CuOTf·½(C_6H_6)$ (0.2)	1.2	4	1,2-DCE	rt	trace
7	$Sc(OTf)_3$ (0.2)	1.2	4	1,2-DCE	rt	52
8	$Bi(OTf)_3$ (0.2)	1.2	4	1,2-DCE	rt	65
9	$Al(OTf)_3$ (0.2)	1.2	4	1,2-DCE	rt	20
10	$Y(OTf)_3$ (0.2)	1.2	4	1,2-DCE	rt	45
11	$ZnBr_2$ (0.2)	1.2	4	1,2-DCE	rt	nd
12	$Ca(OTf)_2$ (0.2)	1.2	4	1,2-DCE	rt	32
13	$CuCl_2$ (0.2)	1.2	4	1,2-DCE	rt	trace
14	$BF_3·Et_2O$ (0.2)	1.2	4	1,2-DCE	rt	67
15	$Fe(acac)_3$ (0.2)	1.2	4	1,2-DCE	rt	n.r
16	$FeCl_3$ (0.2)	1.2	4	THF	rt	20
17	$FeCl_3$ (0.2)	1.2	4	toluene	rt	nd
18	$Fe(OAc)_2$ (0.2)	1.2	6	1,2-DCE	rt	nd
19	$Fe(OAc)_2·H_2O$ (0.2)	1.2	6	1,2-DCE	rt	nd
20[c]	$FeCl_3$ (0.2)	1.2	2	1,2-DCE	rt	trace
21[d]	$FeCl_3$ (0.2)	1.2	4	1,2-DCE	rt	62
22	$FeCl_3$ (0.2)	1.2	2	1,2-DCE	60	65
23	$BF_3·Et_2O$ (0.2)	1.5	2	1,2-DCE	60	38
24	$FeCl_3$ (0.2)	1.5	4	1,2-DCE	rt	75
25	**$FeCl_3$ (0.2)**	**1.5**	**2**	**1,2-DCE**	**60**	**83**
26	**$Cu(OTf)_2$ (0.2)**	**1.5**	**2**	**1,2-DCE**	**60**	**82**
27	$Cu(OTf)_2$ (0.4)	1.5	2	1,2-DCE	60	80
28[e]	$Cu(OTf)_2$ (0.4)	1.5	2	1,2-DCE	60	62
29	$Cu(OTf)_2$ (0.2)	2	2	1,2-DCE	60	62
30[e]	$FeCl_3$ (0.2)	1.5	2	1,2-DCE	60	81
31[e]	$Cu(OTf)_2$ (0.2)	1.5	2	1,2-DCE	60	78

32	$Cu(OTf)_2$ (0.1)	1.5	2	1,2-DCE	60	50
33	$Cu(OTf)_2$ (0.15)	1.5	2	1,2-DCE	60	56

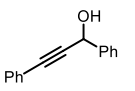
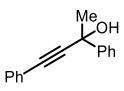
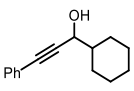
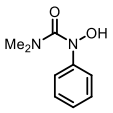
[a]Reaction conditions: compounds **1a** (0.20 mmol) and **2a** (0.24-0.40 mmol), solvent (2 mL), PMHS (2.2 equiv., 50 μL), catalyst (0.10-0.40 equiv.); [b]Yield of the isolated product; [c]DMES instead of PMHS; [d]HFIP (1.0 equiv.) was added; [e] PMHS was used at 4.4 equivalents.

General procedure for the synthesis of 3

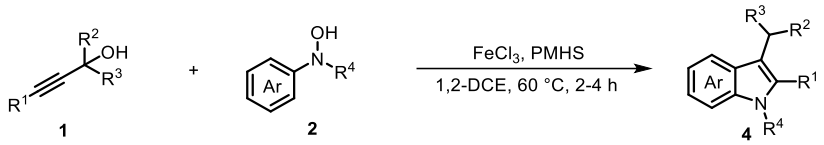


To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohols **1** (0.20 mmol, 1.0 equiv.), *N*-protected arylhydroxyamines **2** (0.30 mmol, 1.5 equiv.), and 1,2-DCE (2 mL) followed by CuOTf·½(C_6H_6) (0.08 mmol, 0.40 equiv., 20.2 mg) under N_2 atmosphere. The reaction mixture was stirred at room temperature and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1 or 5:1) to give the final product **3**.

Table S3. Unsuccessful substrates for the synthesis of **3**

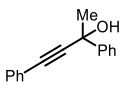
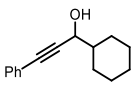
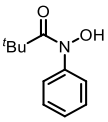
number	1aa	1ab	1ac	2p	2q	2r
structure						
result	complex mixture	complex mixture	no reaction	complex mixture	no reaction	no reaction

General procedure for the synthesis of 4



To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohols **1** (0.20 mmol, 1.0 equiv.), *N*-protected arylhydroxyamines **2** (0.30 mmol, 1.5 equiv.), and 1,2-DCE (2 mL) followed by $FeCl_3$ (0.04 mmol, 6.7 mg) and PMHS (0.44 mmol, 50 μL) under N_2 atmosphere. The reaction mixture was stirred at 60 °C and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 50:1 to 30:1) to give the final product **4**.

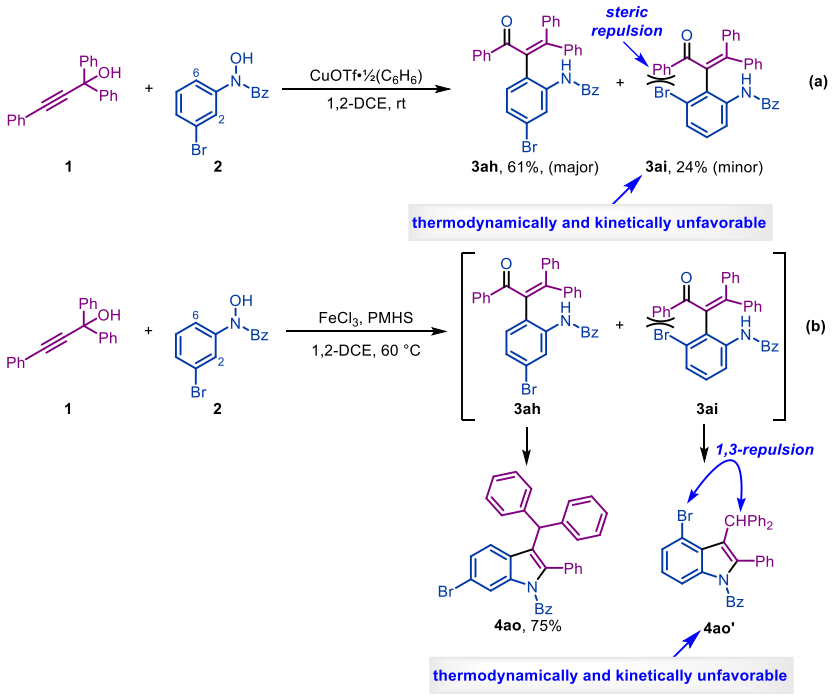
Table S4. Unsuccessful substrates for the synthesis of **4**

number	1ab	1ac	2c	2p	2q
structure					
result	complex mixture	no reaction	complex mixture	complex mixture	no reaction

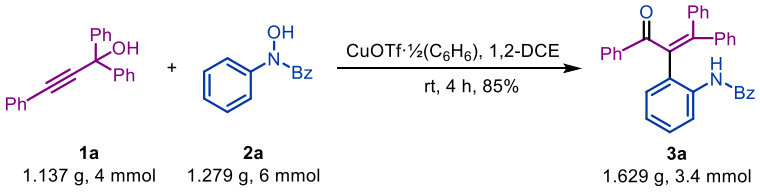
Explanation about regioselective formation of 4ao

In **Scheme a**, **3ah** predominates over **3ai** due to significant steric repulsion between the bromine atom and the benzoyl group in the latter. This interaction makes **3ai** less stable (thermodynamically unfavorable) and slower to form (kinetically unfavorable). **In Scheme b**, the intermediates **3ah** and **3ai** both proceed to form indole products. However, the putative product **4ao'** suffers from destabilizing 1,3-repulsion, making it unstable. Consequently, it readily converts, favoring the formation of the stable product **4ao**. This *in situ* transformation effectively enhances the observed

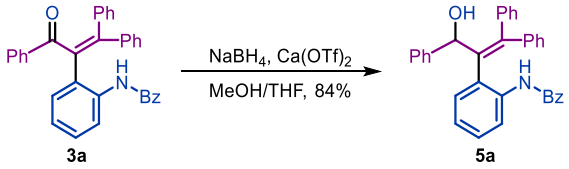
regioselectivity.



Scale-up preparation and transformation of 3a



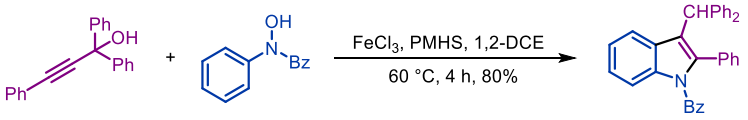
To a 100 mL round-bottom flask, equipped with a magnetic stir bar, was added propargyl alcohol **1a** (4.0 mmol, 1.0 equiv., 1.137 g), *N*-phenylbenzolhydroxyamine **2a** (6.0 mmol, 1.5 equiv., 1.279 g), and 1,2-DCE (20 mL) followed by CuOTf·½(C_6H_6) (1.6 mmol, 0.40 equiv., 0.403 g) under N_2 atmosphere. The reaction mixture was stirred at room temperature and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (20 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1) to give the final product **3a** in 85% yield (3.4 mmol, 1.629 g).



3a 5a

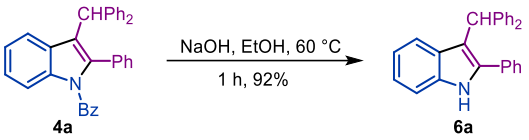
To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added tetra-substituted unsaturated ketone **3a** (0.20 mmol, 1.0 equiv., 95.9 mg), $Ca(OTf)_2$ (0.04 mmol, 0.20 equiv., 13.5 mg), $NaBH_4$ (0.40 mmol, 2 equiv., 15.1 mg) in MeOH (0.2 mL) and THF (2.4 mL) under N_2 atmosphere. The reaction mixture was stirred at room temperature and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous NH_4Cl solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 4:1) to give the final product **5a** in 84% yield (40.5 mg).

Scale-up preparation and transformation of 4a



1a 1.137 g, 4 mmol　　**2a** 1.279 g, 6 mmol　　**4a** 1.502 g, 3.2 mmol

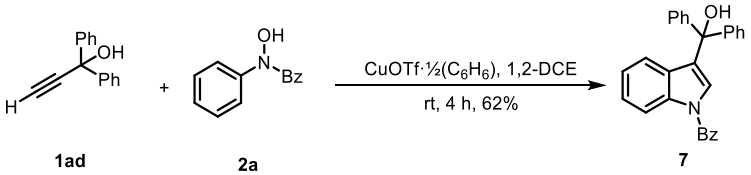
To a 100 mL round-bottom flask, equipped with a magnetic stir bar, was added propargyl alcohols **1a** (1.137 g, 4.0 mmol, 1.0 eqiv.), *N*-phenylbenzolhydroxyamine **2a** (1.279 g, 6.0 mmol, 1.5 equiv.), and solvent (20 mL) followed by $FeCl_3$ (0.135 g, 0.80 mmol, 0.20 equiv.) and PMHS (8.80 mmol, 1 mL) under N_2 atmosphere. The reaction mixture was stirred at 60 °C and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (20 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 50:1 to 30:1) to give the final product **4a** in 81% yield (3.2 mmol, 1.502 g).



To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added 1,2,3-trisubstituted indole **4a** (0.20 mmol, 1.0 equiv., 92.7 mg), NaOH (0.40 mmol, 2.0 equiv., 16.0 mg) in MeOH (3 mL) open to air. The reaction mixture was stirred at 60 ℃ for about 1 h and monitored by TLC. Upon completion, the reaction mixture was quenched with saturated aqueous NH_4Cl solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 20:1) to give the final product **6a** in 92% yield (66.1 mg).

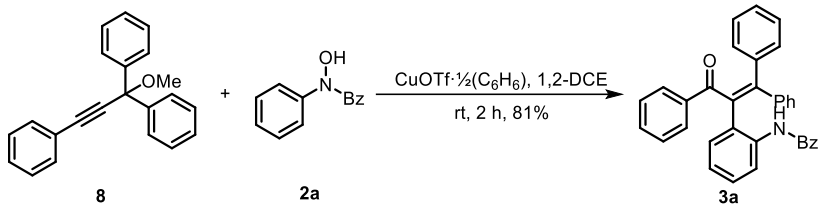
Mechanism study

Study of terminal alkyne



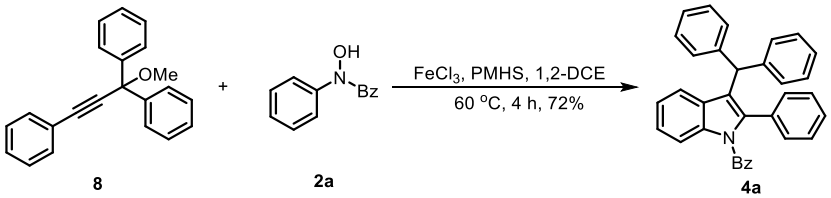
To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added terminal alkyne **1ad** (0.20 mmol, 1.0 equiv., 41.7 mg), *N*-phenylbenzolhydroxyamine **2a** (0.30 mmol, 1.5 equiv., 64.0 mg), and 1,2-DCE (2 mL) followed by CuOTf·½(C_6H_6) (0.08 mmol, 0.40 equiv., 20.2 mg) under N_2 atmosphere. The reaction mixture was stirred at room temperature for 4 h. The reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 15:1 to 7:1) to give the final product **7** in 62% yield (50.0 mg).

Study of propargyl ether



8 2a 3a

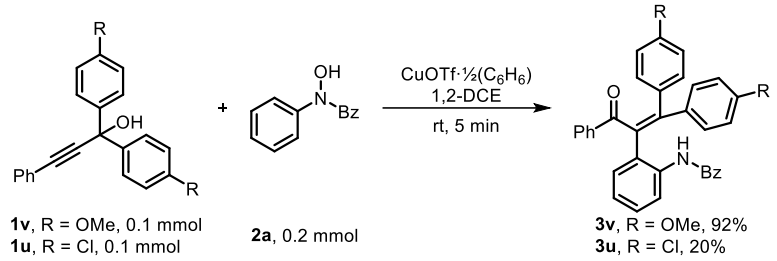
To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl ether **8** (0.20 mmol, 1.0 equiv., 59.7 mg), *N*-phenylbenzolhydroxyamine **2a** (0.30 mmol, 1.5 equiv., 64.0 mg), and 1,2-DCE (2 mL) followed by CuOTf·½(C_6H_6) (0.08 mmol, 0.40 equiv., 20.2 mg) under N_2 atmosphere. The reaction mixture was stirred at room temperature for 2 h. The reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1) to give the final product **3a** in 81% yield (77.7 mg).



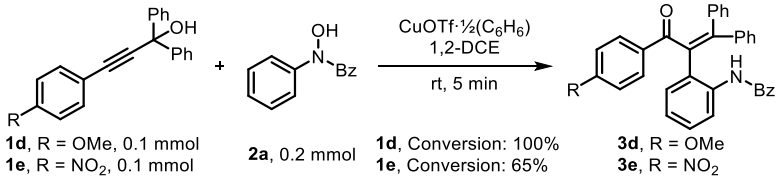
8 2a 4a

To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl ether **8** (0.20 mmol, 1.0 equiv., 59.7 mg), *N*-phenylbenzolhydroxyamine **2a** (0.30 mmol, 1.5 equiv., 64.0 mg), and 1,2-DCE (2 mL) followed by $FeCl_3$ (0.04 mmol, 0.20 equiv., 6.7 mg) and PMHS (0.44 mmol, 50 μL) under N_2 atmosphere. The reaction mixture was stirred at 60 °C for 4 h. Upon completion, the reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (20 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 50:1 to 30:1) to give the final product **4a** in 72% yield (66.8 mg).

Competition experiments



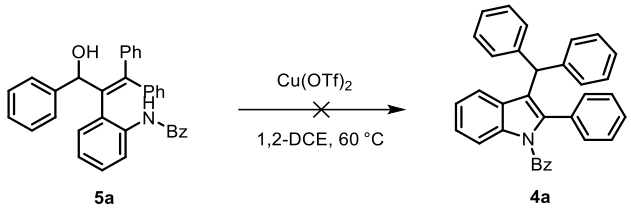
To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohol **1v** (0.10 mmol, 1.0 equiv., 34.4 mg), **1u** (0.10 mmol, 1.0 equiv., 35.3 mg), *N*-phenylbenzolhydroxyamine **2a** (0.20 mmol, 2.0 equiv., 42.6 mg), and 1,2-DCE (2 mL) followed by CuOTf·½(C_6H_6) (0.04 mmol, 0.40 equiv., 10.1 mg) under N_2 atmosphere. The reaction mixture was stirred at room temperature for 5 minutes. The reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1) to give **3v** in 92% yield (49.6 mg) and **3u** in 20% yield (11.0 mg).



To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added propargyl alcohol **1d** (0.10 mmol, 1.0 equiv., 31.4 mg), **1e** (0.10 mmol, 1.0 equiv., 32.9 mg), *N*-phenylbenzolhydroxyamine **2a** (0.20 mmol, 2.0 equiv., 42.6 mg), and 1,2-DCE (2 mL) followed by CuOTf·½(C_6H_6) (0.04 mmol, 0.40 equiv., 10.1 mg) under N_2 atmosphere. The reaction mixture was stirred at room temperature for 5 minutes. The reaction mixture was quenched with saturated aqueous $NaHCO_3$ solution. The aqueous phase was extracted with EtOAc (10 mL × 3). The organic extracts were combined and washed with brine, dried over anhydrous Na_2SO_4, and evaporated under vacuum. The residue was purified by column chromatography on silica gel (petroleum ether/EtOAc = 10:1 to 5:1) to give the remaining raw material **1e** in 35% (11.5 mg) and a mixture of **3d**/**3e** (76.3 mg). **3d** and **3e** were inseparable by column chromatography, and their ^1H

NMR signals were severely overlapped.

Conversion experiments



5a **4a**

To a 10 mL Schlenk tube, equipped with a magnetic stir bar, was added **5a** (0.20 mmol, 1.0 equiv., 96.3 mg) in 1,2-DCE (2 mL) followed by $Cu(OTf)_2$ (0.04 mmol, 0.20 equiv., 14.5 mg) under N_2 atmosphere. The reaction mixture was stirred at 60 ℃ and monitored by TLC. After 24 hours, no desired product was detected, and compound **5a** remained unreacted.

The conversion experiments revealed that the allylic alcohol was not converted to the indole under our conditions, while confirming that PMHS reduced C=C bond of enone **3a**. These results supported the formation of **4a** via a reduction/cyclization/elimination pathway from **3a**.

References

[1] Yaragorla, S.; Kumar, A. Synthesis of trisubstituted alkenes bearing a quaternary carbon by Lewis-acid catalyzed regioselective reaction of internal alkynols with 2-pyrrolylanilines. *J. Org. Chem.* **2025**, *90*, 4459–4465.

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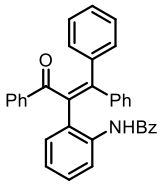
[3] Yuan, H.; Guo, L.; Liu, F.; Miao, Z.; Feng, L.; Gao. H. Copper-catalyzed tandem O-vinylation of arylhydroxylamines/[3,3]-rearrangement/cyclization: Synthesis of highly substituted indoles and benzoindoles. *ACS Catal.* **2019**, *9*, 3906-3912.

[4] Nakamura, I.; Jo, T.; Ishida, Y.; Tashiro, H.; Terada, M. Cationic *N* -heterocyclic carbene copper-catalyzed [1,3]-alkoxy rearrangement of *N*- alkoxyanilines. *Org. Lett.* **2017**, *19*, 3059–3062.

Spectra data of compounds 3, 4, 5a, 6a and 7

***N*-(2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3a)**

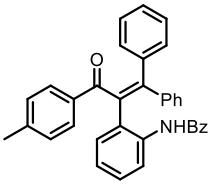
Result: White solid, 86.3 mg, 90% yield; Melting point: 214.5 – 216.0 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.93 (s, 1H), 8.13 (d, *J* = 8.0 Hz, 1H), 7.97 (d, *J* = 7.6 Hz, 2H), 7.91 (d, *J* = 7.2 Hz, 2H), 7.51 – 7.36 (m, 4H), 7.30– 7.22 (m, 4H), 7.18 – 7.17 (m, 2H), 7.14 – 6.97 (m, 9H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.1, 165.3, 147.5, 140.2, 139.3, 136.1, 135.9, 135.6, 134.7, 133.4, 131.6, 130.8, 129.8, 129.74, 129.70, 128.8, 128.6, 128.4, 128.3, 128.2, 128.1, 127.9, 127.1, 124.4, 123.1; **IR**: ῡ = 3298, 1664, 1641, 1630, 1446, 1308, 753, 689, 568 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{26}NO_2^+$ $[M + H]^+$: 480.1959, Found: 480.1952.

***N*-(2-(3-oxo-1,1-diphenyl-3-(p-tolyl)prop-1-en-2-yl)phenyl)benzamide (3b)**

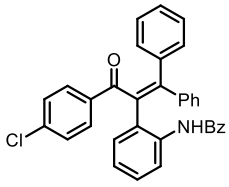
Result: Yellow solid, 83.0 mg, 84% yield; Melting point: 185.8 – 186.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.05 (s, 1H), 8.16 (d, *J* = 8.0 Hz, 1H), 8.0 (d, *J* = 7.2 Hz, 2H), 7.89 (d, *J* = 8.0 Hz, 2H), 7.51 – 7.43 (m, 3H), 7.24 – 7.19 (m, 4H), 7.14 – 7.06 (m, 8H), 7.03 – 6.96 (m, 3H), 2.28 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.6, 165.2, 146.8, 144.5, 140.3, 139.4, 136.3, 135.9, 134.8, 133.4, 131.6, 130.7, 130.0, 129.7, 129.6, 129.5, 129.2, 128.7, 128.6, 128.2, 128.1, 127.9, 127.1, 124.2, 122.9, 21.6; **IR**: ῡ = 3298, 1664, 1641, 1632, 1446, 1308, 753, 689, 568 cm^{-1}; **HRMS** (**FT– ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2117.

***N*-(2-(3-(4-chlorophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3c)**

Result: Yellow solid, 94.6 mg, 92% yield; Melting point: 213.9 – 217.4 ℃

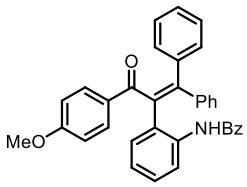


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.68 (s, 1H), 8.03 (d, *J* = 8.0 Hz, 1H), 7.88 – 7.82 (m, 4H), 7.49 (t, *J* = 7.2 Hz, 1H), 7.41 (d, *J* = 7.6 Hz, 2H), 7.25 – 7.01 (m, 15H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.9, 165.4, 148.2, 140.3, 139.6, 139.3, 135.9, 135.1, 134.4, 131.7, 131.0, 130.6, 130.0,

129.8, 128.9, 128.7, 128.6, 128.5, 128.4, 128.2, 128.0, 127.0, 124.8, 123.7; **IR**: $\bar{\upsilon}$ = 3329, 1665, 1532, 1310, 1250, 741, 700, 571 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}ClNO_2^+$ $[M + H]^+$: 514.1568, Found: 514.1568.

***N*-(2-(3-(4-methoxyphenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3d)**

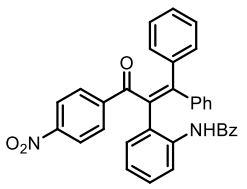
Result: Yellow solid, 86.6 mg, 85% yield; Melting point: 152.7 – 156.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.17 (s, 1H), 8.17 (d, *J* = 8.0 Hz, 1H), 7.98 (d, *J* = 8.8 Hz, 4H), 7.52 – 7.43 (m, 3H), 7.23 – 7.20 (m, 4H), 7.12 – 7.05 (m, 6H), 7.03 – 6.93 (m, 3H), 6.48 (d, *J* = 8.8 Hz, 2H), 3.74 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.6, 165.2, 163.8, 146.5, 140.3, 139.5, 136.4, 135.9, 134.8, 132.3, 131.6, 130.6, 129.7, 129.6, 129.5, 128.8, 128.64, 128.58, 128.2, 128.1, 128.0, 127.9, 127.2, 124.2, 122.9, 113.8, 55.3; **IR**: $\bar{\upsilon}$ = 3347, 1665, 1528, 1443, 1253, 750, 703, 578 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_3^+$ $[M + H]^+$: 510.2064, Found: 510.2066.

***N*-(2-(3-(4-nitrophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3e)**

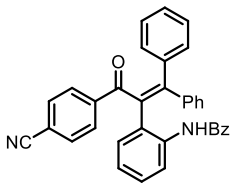
Result: Yellow solid, 79.7 mg, 76% yield; Melting point: 240.0 – 241.9 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.22 (s, 1H), 7.97 – 7.91 (m, 4H), 7.82 (d, *J* = 8.0 Hz, 1H), 7.68 (d, *J* = 7.6 Hz, 2H), 7.44 (t, *J* = 7.6 Hz, 1H), 7.35 – 7.27 (m, 3H), 7.22 – 7.05 (m, 12H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.5, 165.7, 150.3, 149.6, 141.3, 140.6, 139.3, 135.6, 134.9, 134.0, 132.8, 131.81, 131.78, 130.5, 130.4, 130.3, 129.1, 128.9, 128.5, 128.3, 128.1, 126.9, 125.6, 125.0, 123.3; **IR**: $\bar{\upsilon}$ = 3421, 1659, 1508, 1342, 1236, 751, 703, 575 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}N_2O_4^+$ $[M + H]^+$: 525.1809, Found: 525.1807.

***N*-(2-(3-(4-cyanophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3f)**

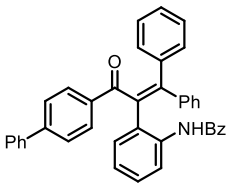
Result: Yellow solid, 90.8 mg, 90% yield; Melting point: 157.1 – 160.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.30 (s, 1H), 7.89 (d, *J* = 8.0 Hz, 2H), 7.79 (d, *J* = 8.0 Hz, 1H), 7.67 (d, *J* = 7.6 Hz, 2H), 7.46 (t, *J* = 7.6 Hz, 1H), 7.38 – 7.32 (m, 4H), 7.27 – 7.03 (m, 13H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.8, 165.8, 150.1, 140.5, 139.7, 139.3, 135.6, 134.8, 134.0, 132.8, 131.83, 131.76, 131.7, 130.4, 130.3, 129.6, 129.01, 128.98, 128.7, 128.4, 128.2, 128.0, 126.9, 125.5, 125.0, 117.8, 115.5; **IR**: ῡ = 3326, 1671, 1641, 1470, 1275, 750, 684, 572 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{25}N_2O_2^+$ $[M + H]^+$: 505.1911, Found: 505.1918.

***N*-(2-(3-([1,1'-biphenyl]-4-yl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3g)**

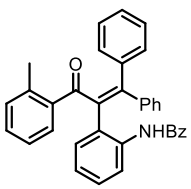
Result: Yellow solid, 100.0 mg, 90% yield; Melting point: 215.1 – 216.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.95 (s, 1H), 8.14 (d, *J* = 8.0 Hz, 1H), 8.04 (d, *J* = 8.4 Hz, 2H), 7.93 (d, *J* = 6.8 Hz, 2H), 7.51– 7.19 (m, 14H), 7.15 – 7.06 (m, 8H), 7.02 – 6.98 (m, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.6, 165.3, 147.4, 145.8, 140.3, 139.5, 139.4, 136.2, 135.8, 134.70, 134.68, 131.6, 130.9, 130.4, 123.0, 129.8, 129.7, 128.80, 128.78, 128.6, 128.3, 128.22, 128.17, 128.1, 127.9, 127.1, 127.0, 124.5, 123.2; **IR**: ῡ = 3344, 1671, 1529, 1445, 1259, 756, 700, 596 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{40}H_{30}NO_2^+$ $[M + H]^+$: 556.2271, Found: 556.2265.

***N*-(2-(3-oxo-1,1-diphenyl-3-(o-tolyl)prop-1-en-2-yl)phenyl)benzamide (3h)**

Result: Yellow solid, 73.1 mg, 74% yield; Melting point: 175.4 – 178.1 ℃

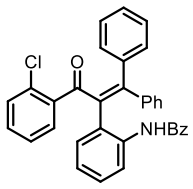


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.85 (s, 1H), 8.12 (d, *J* = 8.0 Hz, 1H), 7.98 (d, *J* = 7.6 Hz, 1H), 7.90 (d, *J* = 7.2 Hz, 2H), 7.51 – 7.41 (m, 3H), 7.30 – 7.29 (m, 1H), 7.26 – 7.17 (m, 2H), 7.11 – 6.98 (m, 13H), 2.40 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 200.9, 165.2, 148.2, 140.6, 140.4, 139.4, 137.2, 136.0, 134.8, 132.0, 131.9, 131.6, 131.2, 130.6, 130.4, 129.8,129.5,

128.7, 128.6, 128.3, 128.2, 127.94, 127.88, 127.1, 125.3, 124.5, 123.2, 120.2, 21.4; **IR**: $\bar{\upsilon}$ = 1660, 1634, 1523, 1438, 1308, 753, 699, 572 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2116.

***N*-(2-(3-(2-chlorophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3i)**

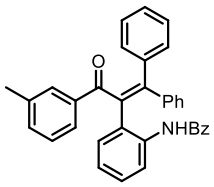
Result: Yellow solid, 77.1 mg, 75% yield; Melting point: 166.6 – 167.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.27 (s, 1H), 7.95 (d, *J* = 8.0 Hz, 1H), 7.77 (d, *J* = 7.6 Hz, 2H), 7.61 (d, *J* = 7.2 Hz, 1H), 7.47 (t, *J* = 7.6 Hz, 1H), 7.41 – 7.33 (m, 3H), 7.29 – 7.25 (m, 1H), 7.15 – 7.05 (m, 11H), 7.01 – 6.95 (m, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.9, 165.4, 152.6, 140.8, 139.9, 137.4, 136.0, 135.9, 134.6, 132.7, 132.1, 131.9, 131.6, 131.3, 130.7, 130.3, 130.0, 128.84, 128.78, 128.7, 128.5, 128.1, 127.9, 127.0, 126.2, 125.0, 124.0; **IR**: $\bar{\upsilon}$ = 3296, 1668, 1641, 1481, 1301, 747, 703, 637 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}ClNO_2^+$ $[M + H]^+$: 514.1568, Found: 514.1570.

***N*-(2-(3-oxo-1,1-diphenyl-3-(m-tolyl)prop-1-en-2-yl)phenyl)benzamide (3j)**

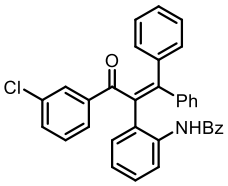
Result: Yellow solid, 79.0 mg, 80% yield; Melting point: 167.8 – 169.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.92 (s, 1H), 8.13 (d, *J* = 8.0 Hz, 1H), 7.92 (d, *J* = 7.2 Hz, 2H), 7.80 (d, *J* = 6.4 Hz, 1H), 7.74 (s, 1H), 7.51 – 7.41 (m, 3H), 7.26 – 7.23 (m, 2H), 7.20 – 7.15 (m, 4H), 7.07 – 6.98 (m, 9H), 2.24 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.1, 165.3, 147.2, 140.4, 139.4, 138.2, 136.1, 135.9, 134.7, 134.2, 131.6, 130.8, 130.1, 129.81, 129.78, 129.7, 128.7, 128.6, 128.3, 128.24, 128.17, 128.1, 127.9, 127.2, 127.1, 124.4, 123.1, 120.3, 21.1 ; **IR**: $\bar{\upsilon}$ = 3375, 1670, 1619, 1472, 1259, 746, 695, 594 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2118.

***N*-(2-(3-(3-chlorophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3k)**

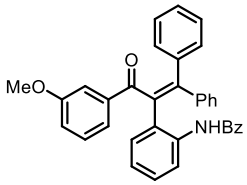
Result: Yellow solid, 91.5 mg, 89% yield; Melting point: 157.1 – 160.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.63 (s, 1H), 8.02 (d, *J* = 8.0 Hz, 1H), 7.86 – 7.78 (m, 4H), 7.48 (t, *J* = 7.6 Hz, 1H), 7.40 (t, *J* = 7.6 Hz, 2H), 7.29 – 7.22 (m, 3H), 7.16 – 7.07 (m, 11H), 7.05 – 7.01 (m, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.8, 165.4, 148.7, 140.4, 139.3, 137.8, 135.9, 135.1, 134.53, 134.48, 132.9, 131.7, 131.1, 130.7, 130.0, 129.9, 129.6, 129.4, 129.0, 128.6, 128.53, 128.47, 128.2, 128.0, 127.8, 127.0, 124.8, 123.8; **IR**: $\bar{\upsilon}$ = 3376, 1668, 1635, 1470, 1245, 746, 700, 599 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}ClNO_2^+$ $[M + H]^+$: 514.1568, Found: 514.1568.

***N*-(2-(3-(3-methoxyphenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3l)**

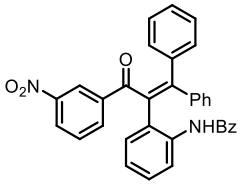
Result: Yellow solid, 87.7 mg, 86% yield; Melting point: 166.5 – 167.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.91 (s, 1H), 8.15 (d, *J* = 8.0 Hz, 1H), 7.92 (d, *J* = 7.6 Hz, 2H), 7.60 (d, *J* = 7.6 Hz, 1H), 7.50 – 7.42 (m, 4H), 7.25 – 6.93 (m, 15H), 3.72(s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.3, 159.6, 147.5, 140.3, 139.4, 137.3, 136.2, 135.8, 134.8, 131.6 130.8, 129.8, 129.7, 129.6, 129.4, 128.8, 128.6, 128.3, 128.2, 128.1, 127.9, 127.1, 124.4, 123.0, 122.8, 120.2, 113.5, 55.3; **IR**: $\bar{\upsilon}$ = 3356, 1671, 1470, 1259, 1025, 750, 700, 596 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_3^+$ $[M + H]^+$: 510.2064, Found: 510.2063.

***N*-(2-(3-(3-nitrophenyl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3m)**

Result: Yellow solid, 81.8 mg, 78% yield; Melting point: 195.4 – 196.3 ℃

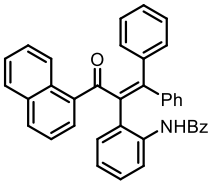


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.65 (s, 1H), 8.35 (s, 1H), 8.14 (d, *J* = 7.6 Hz, 1H), 8.06 (d, *J* = 8.8 Hz, 1H), 7.86 (d, *J* = 8.0 Hz, 1H), 7.72 (d, *J* = 7.6 Hz , 2H), 7.45 (t, *J* = 7.2 Hz, 1H), 7.36 – 7.04 (m, 16H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 196.9, 165.6, 150.3, 147.8, 140.6, 139.3, 137.8, 135.7, 134.73, 134.69, 134.1 132.3, 131.8, 131.6, 130.4, 130.2, 129.3, 129.1, 129.0, 128.8, 128.5, 128.3, 128.1, 126.9 126.8, 125.4, 124.7, 124.3; **IR**:

$\bar{\upsilon}$ = 3373, 1641, 1481, 1345, 1250, 752, 700, 558 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}N_2O_4^+$ $[M + H]^+$: 525.1809, Found: 525.1810.

***N*-(2-(3-(naphthalen-1-yl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3n)**

Result: Yellow solid, 74.1 mg, 70% yield; Melting point: 192.6 – 194.8 ℃

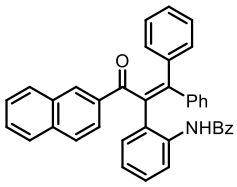


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.90 – 8.78 (m, 2H), 8.21 (d, *J* = 7.2 Hz, 1H), 8.04 (d, *J* = 8.0 Hz, 1H), 7.89 (d, *J* = 7.2 Hz, 2H), 7.76 (d, *J* = 8.0Hz, 1H), 7.70 (d, *J* = 7.6 Hz, 1H), 7.50 – 7.39 (m, 5H), 7.34 (d, *J* = 7.6 Hz, 1H), 7.25 – 7.22 (m, 2H), 7.13 – 7.03 (m, 8H), 6.91 – 6.84 (m, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 200.7, 165.4, 149.4, 140.8, 139.7, 137.8, 137.7, 136.0, 134.7, 134.0, 133.7, 131.6, 131.44, 131.37, 131.00, 130.96, 130.0, 129.6, 128.7, 128.6, 128.4, 128.2, 128.0, 127.90, 127.85, 127.1, 126.3, 125.9, 124.8, 123.9, 123.7; **IR**: $\bar{\upsilon}$ = 3329, 1644, 1473, 1262, 786, 700, 596 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{38}H_{28}NO_2^+$ $[M + H]^+$: 530.2115, Found: 530.2117.

***N*-(2-(3-(naphthalen-2-yl)-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3o)**

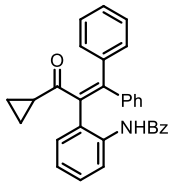
Result: Yellow solid, 97.5 mg, 92% yield; Melting point: 150.1 – 150.4 ℃

^{1}H NMR (400 MHz, $CDCl_3$): δ 8.89 (s, 1H), 8.52 (s, 1H), 8.12 (d, *J* = 8.4 Hz, 1H), 7.99 (d, *J* = 7.6 Hz, 1H), 7.91 (d, *J* = 7.6 Hz, 2H), 7.84 (d, *J* = 8.0 Hz, 1H), 7.73 (t, *J* = 8.0 Hz, 2H), 7.52 (t, *J* = 7.2 Hz, 1H), 7.46 (t, *J* = 7.6 Hz, 2H), 7.42 – 7.38 (m, 2H), 7.33 (d, *J* = 7.6 Hz, 1H), 7.23 – 7.21 (m, 3H), 7.17 – 7.08 (m, 5H), 7.07 – 7.00 (m, 4H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.3, 147.4, 140.4, 139.4, 135.90, 135.89, 135.88, 135.5, 134.6, 133.3, 132.4, 132.2, 131.6, 130.8, 129.9, 129.7, 129.6, 128.8, 128.7, 128.5, 128.4, 128.3, 128.1, 128.0, 127.6, 127.1, 126.6, 124.61, 124.57, 123.4; **IR**: $\bar{\upsilon}$ = 3267, 2923, 1640, 1507, 1297, 746, 700, 589 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{38}H_{28}NO_2^+$ $[M + H]^+$: 530.2115, Found: 530.2119.



***N*-(2-(3-cyclopropyl-3-oxo-1,1-diphenylprop-1-en-2-yl)phenyl)benzamide (3p)**

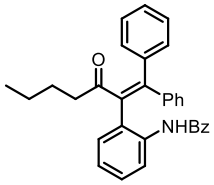
Result: Yellow solid, 66.5 mg, 75% yield; Melting point: 149.0 – 149.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.46 (s, 1H), 8.16 (d, *J* = 8.0 Hz, 1H), 7.89 (d, *J* = 7.6 Hz, 2H), 7.53-7.43 (m, 3H), 7.34 – 7.25 (m, 6H), 7.19 – 7.03 (m, 5H), 6.96 (d, *J* = 7.2 Hz, 2H), 1.98 – 1.92 (m, 1H), 0.96 – 0.94 (m, 2H), 0.74 – 0.67 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 208.7, 165.3, 147.5, 140.8, 139.6, 139.3, 136.2, 134.6, 131.7, 131.1, 130.01, 129.99, 129.8, 128.9, 128.64, 128.57, 128.24, 128.20, 127.8, 127.1, 124.7, 122.8, 22.9, 13.6; **IR**: ῡ = 3347, 1657, 1648, 1480, 1263, 756, 696, 597 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{31}H_{26}NO_2^+$ $[M + H]^+$: 444.1958, Found: 444.1968.

***N*-(2-(3-oxo-1,1-diphenylhept-1-en-2-yl)phenyl)benzamide (3q)**

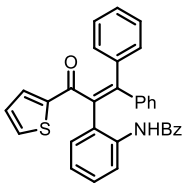
Result: Yellow solid, 69.9 mg, 76% yield; Melting point: 96.7 – 98.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.78 (s, 1H), 8.23 (d, *J* = 8.0 Hz, 1H), 7.94 (d, *J* = 7.2 Hz, 2H), 7.55 – 7.46 (m, 3H), 7.34 – 7.26 (m, 4H), 7.24 – 7.18 (m, 3H), 7.11 – 7.02 (m, 4H), 6.92 – 6.90 (m, 2H), 2.42 (t, *J* = 7.2 Hz, 2H), 1.43-1.36 (m, 2H), 1.12 – 1.03 (m, 2H), 0.73 (t, *J* = 7.2 Hz, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 209.3, 165.1, 146.2, 140.4, 139.2, 139.1, 136.3, 134.7, 131.7, 130.4, 129.44, 129.36, 129.0, 128.7, 128.6, 128.50, 128.48, 128.1, 127.9, 127.1, 124.3, 122.5, 42.6, 25.7, 21.9, 13.6; **IR**: ῡ = 3367, 1653, 1476, 1259, 750, 699, 566 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{30}NO_2^+$ $[M + H]^+$: 460.2271, Found: 460.2278.

***N*-(2-(3-oxo-1,1-diphenyl-3-(thiophen-2-yl)prop-1-en-2-yl)phenyl)benzamide (3r)**

Result: Yellow solid, 69.0 mg, 71% yield; Melting point: 231.0 – 233.1 ℃

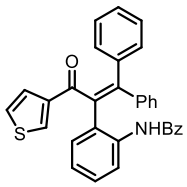


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.91 (s, 1H), 8.14 (d, *J* = 8.0 Hz, 1H), 7.92 (d, *J* = 7.6 Hz, 2H), 7.54 – 7.44 (m, 4H), 7.29 – 7.23 (m, 5H), 7.18 – 7.08 (m, 6H), 7.05 – 7.01 (m, 3H), 6.93 (t, *J* = 4.0 Hz, 1H); **^{13}C NMR**

(100 MHz, $CDCl_3$): δ 191.1, 165.3, 147.8, 143.5, 140.4, 139.4, 136.2, 135.9, 135.2, 134.9, 134.7, 131.6, 131.0, 129.8, 129.7, 129.6, 128.9, 128.6, 128.4, 128.22, 128.18, 127.9, 127.1, 124.4, 123.1; **IR**: $\bar{\upsilon}$ = 3325, 1660, 1526, 1492, 1442, 1305, 752, 702, 574 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{24}NO_2S^+$ $[M + H]^+$: 486.1522, Found: 486.1523.

***N*-(2-(3-oxo-1,1-diphenyl-3-(thiophen-3-yl)prop-1-en-2-yl)phenyl)benzamide (3s)**

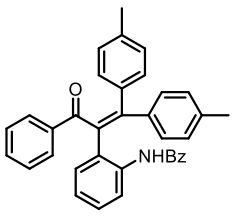
Result: Yellow solid, 62.2 mg, 64% yield; Melting point: 222.1 – 223.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.81 (s, 1H), 8.10 (d, *J* = 6.4 Hz, 1H), 8.03 (s, 1H), 7.88 (d, *J* = 6.4 Hz, 2H), 7.51 – 7.41 (m, 4H), 7.26 – 7.01 (m, 14H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 192.7, 165.4, 147.5, 141.6, 140.5, 139.5, 136.8 136.2, 135.0, 134.7, 131.7, 131.0, 130.2, 129.9, 129.8, 128.9, 128.6, 128.4, 128.2, 128.1, 128.0, 127.4, 127.1, 126.3, 124.6, 123.3; **IR**: $\bar{\upsilon}$ = 3314, 1659, 1526, 1404, 1304, 752, 700, 572 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{24}NO_2S^+$ $[M + H]^+$: 486.1522, Found: 486.1527.

***N*-(2-(3-oxo-3-phenyl-1,1-di-p-tolylprop-1-en-2-yl)phenyl)benzamide (3t)**

Result: Yellow solid, 83.3 mg, 82% yield; Melting point: 169.5 – 172.2 ℃

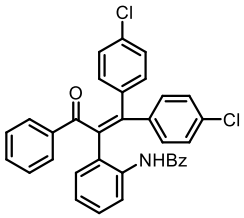


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.85 (s, 1H), 8.18 (d, *J* = 8.0 Hz, 1H), 7.96 (d, *J* = 7.2 Hz, 2H), 7.90 (d, *J* = 7.6 Hz, 2H), 7.51 – 7.37 (m, 4H), 7.30 – 7.24 (m, 4H), 7.07 – 7.05 (m, 2H), 7.01 (t, *J* = 7.2 Hz, 1H), 6.92 – 6.87 (m, 6H), 2.21 (s, 3H), 2.18 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.2, 165.3, 147.7, 138.24, 138.18, 137.7, 136.6, 136.2, 136.0, 134.9, 134.6, 133.2, 131.6, 130.7, 129.9, 129.81, 129.77, 129.7, 128.8, 128.7, 128.64, 128.57, 128.4, 127.1, 124.3, 122.8, 21.2, 21.1; **IR**: $\bar{\upsilon}$ = 3315, 1670, 1535, 1447, 1310, 757. 686, 528 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{30}NO_2^+$ $[M + H]^+$: 508.2271, Found: 508.2272.

***N*-(2-(1,1-bis(4-chlorophenyl)-3-oxo-3-phenylprop-1-en-2-yl)phenyl)benzamide**

(3u)

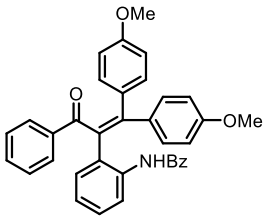
Result: Yellow solid, 87.8 mg, 80% yield; Melting point: 205.6 – 206.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.81 (s, 1H), 8.06 (d, *J* = 8.0 Hz, 1H), 7.94 (d, *J* = 7.6 Hz, 2H), 7.87 (d, *J* = 7.6 Hz, 2H), 7.51 (t, *J* = 7.6 Hz, 1H), 7.45 – 7.40 (m, 3H), 7.31 – 7.25 (m, 3H), 7.22 (d, *J* = 7.6 Hz, 1H), 7.10 – 6.98 (m, 9H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.6, 145.1, 138.4, 137.6, 136.9, 136.2, 135.6, 134.6, 134.4, 133.7, 131.8, 131.3, 131.0, 130.0, 129.8, 129.2, 128.63, 128.58, 128.5, 128.3, 127.0, 124.9, 123.8; **IR**: $\bar{\upsilon}$ = 3412, 1676, 1631, 1492, 1305, 1090, 817, 701, 500 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}ClNO_2^+$ $[M + H]^+$: 548.1179, Found: 548.1172.

***N*-(2-(1,1-bis(4-methoxyphenyl)-3-oxo-3-phenylprop-1-en-2-yl)phenyl)benzamide (3v)**

Result: Yellow solid, 84.2 mg, 78% yield; Melting point: 150.6 – 151.7 ℃

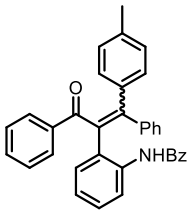


^{1}H NMR (400 MHz, $CDCl_3$): δ 8.67 (s, 1H), 8.13 (d, *J* = 8.0 Hz, 1H), 7.93 (d, *J* = 7.6 Hz, 2H), 7.82 (d, *J* = 7.6 Hz, 2H), 7.48 (t, *J* = 7.2 Hz, 1H), 7.42 – 7.35 (m, 3H), 7.27 – 7.23 (m, 4H), 7.09 – 6.97 (m, 5H), 6.64 – 6.60 (m, 4H), 3.70 (s, 3H), 3.67 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.4, 165.4, 159.6, 159.5, 147.5, 136.5, 135.8, 134.7, 133.5, 133.3, 133.0, 131.9, 131.7, 131.6, 131.4, 131.0, 130.9, 129.7, 128.6, 128.5, 128.3, 127.0, 124.6, 123.1, 113.5, 113.3, 55.1; **IR**: $\bar{\upsilon}$ = 3317, 1672, 1603, 1503, 1251, 1014, 755, 705, 550 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{30}NO_4^+$ $[M + H]^+$: 540.2169, Found: 540.2169.

(*E/Z*)-*N*-(2-(3-oxo-1,3-diphenyl-1-(p-tolyl)prop-1-en-2-yl)phenyl)benzamide (3w)

(This compound is a mixture of *E/Z* isomers)

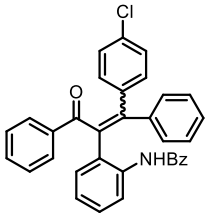
Result: Yellow solid, 82.9 mg, 84% yield; Melting point: 156.9 – 160.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.91 – 8.88 (m, 1H), 8.16 (t, *J* = 8.0 Hz, 1H), 7.99 – 7.89 (m, 4H), 7.51 – 7.36 (m, 4H), 7.31 – 7.23 (m, 4H), 7.18 – 6.97 (m, 7H), 6.93 – 6.87 (m, 3H), 2.21 – 2.18 (m, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.2, 199.1, 165.30, 165.26, 147.6, 147.5, 140.6, 139.6, 138.31, 138.25, 137.42, 136.40, 136.20, 136.15, 136.1, 136.0, 135.1, 134.83, 134.80, 133.31, 133.25, 131.6, 130.8, 130.7, 129.83, 129.81, 129.74, 129.67, 128.9, 128.73, 128.68, 128.6, 128.42, 128.38, 128.3, 128.2, 128.1, 127.9, 127.10, 127.08, 124.4, 124.3, 123.0, 122.9, 21.2, 21.1; **IR**: ῡ = 3341, 1655, 1529, 1443, 1307, 753, 703, 590 cm^{-1}; **HRMS** (**FT-ICR-MS ESI^{+}**) calculated for $C_{35}H_{28}NO_2^{+}$ $[M + H]^{+}$: 494.2115, Found: 494.2117.

(*E/Z*)-N-(2-(1-(4-chlorophenyl)-3-oxo-1,3-diphenylprop-1-en-2-yl)phenyl)benzamide (3x) (This compound is a mixture of *E/Z* isomers)

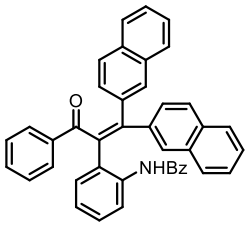
Result: Yellow solid, 91.9 mg, 89% yield; Melting point: 190.3 – 192.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.93 – 8.84 (m, 1H), 8.09 (d, *J* = 8.4 Hz, 1H), 7.97 – 7.88 (m, 4H), 7.52 – 7.22 (m, 8H), 7.17 – 6.99 (m, 10H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.0, 198.9, 165.5, 165.4, 146.4, 146.3, 139.9, 139.0, 138.8, 137.9, 136.3, 136.2, 136.1, 135.82, 135.80, 134.6, 134.5, 134.4, 134.1, 133.7, 133.4, 131.7, 131.2, 131.0, 130.9, 130.8, 129.82, 129.77, 129.7, 129.0, 128.9, 128.61, 128.58, 128.5, 128.43, 128.40, 128.2, 128.1, 127.1, 124.8, 124.6, 123.6, 123.4; **IR**: ῡ = 3411, 1672, 1577, 1446, 1301, 1247, 1013, 752, 700 cm^{-1}; **HRMS** (**FT-ICR-MS ESI^{+}**) calculated for $C_{34}H_{25}ClNO_2^{+}$ $[M + H]^{+}$: 514.1568, Found: 514.1565.

***N*-(2-(1,1-di(naphthalen-2-yl)-3-oxo-3-phenylprop-1-en-2-yl)phenyl)benzamide (3y)**

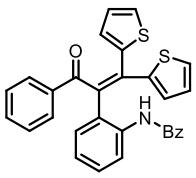
Result: Yellow solid, 96.2 mg, 83% yield; Melting point: 201.5 – 202.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.90 (s, 1H), 8.08 (d, *J* = 8.0 Hz, 1H), 7.98 (d, *J* = 7.6 Hz, 2H), 7.85 (d, *J* = 7.2 Hz, 2H), 7.76 (s, 1H), 7.70 – 7.64 (m, 2H), 7.60 – 7.45 (m, 6H),7.41 – 7.18 (m, 13H), 7.00 (t, *J* = 7.2 Hz, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.1, 165.5, 147.6, 138.0, 136.9, 136.6, 136.3, 136.2, 134.7, 133.3, 132.81, 132.76, 132.7, 132.6, 131.6, 131.0, 130.3, 130.2, 129.8, 129.6, 129.0, 128.6, 128.4, 128.2, 128.1, 128.0, 127.6, 127.53, 127.48, 127.31, 127.27, 127.1, 126.64, 126.62, 126.4, 126.2, 124.8, 123.5; **IR**: $\bar{\upsilon}$ = 3331, 1671, 1535, 1398, 1312, 749, 698, 563 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{42}H_{30}NO_2^+$ $[M + H]^+$: 580.2272, Found: 580.2271.

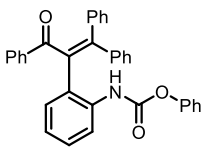
***N*-(2-(3-oxo-3-phenyl-1,1-di(thiophen-2-yl)prop-1-en-2-yl)phenyl)benzamide (3z)**

Result: Yellow solid, 78.7 mg, 80% yield; Melting point: 230.4 – 231.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.56 (s, 1H), 8.45 (d, *J* = 8.0 Hz, 1H), 8.02 (t, *J* = 8.0 Hz, 4H), 7.53 – 7.35 (m, 8H), 7.21 – 7.15 (m, 3H), 7.02 – 7.01 (m, 1H), 6.84 – 6.78 (m, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.7, 165.3, 140.5, 140.1, 137.2, 135.1, 134.8, 134.7, 133.7, 132.5, 131.7, 131.2, 130.5, 130.4, 129.9, 129.8, 129.3, 128.7, 128.5, 127.9, 127.3, 126.6, 126.3, 124.7, 123.2, 120.2; **IR**: $\bar{\upsilon}$ = 3314, 1664, 1533, 1412, 1302, 756, 700, 560 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{30}H_{22}NO_2S_2^+$ $[M + H]^+$: 492.1087, Found: 492.1085.

phenyl (2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)carbamate (3aa)



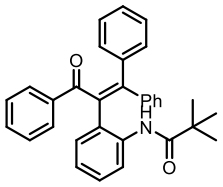
Result: Yellow solid, 61.5 mg, 62% yield; Melting point: 165.9 – 169.2 ℃

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.96 (d, *J* = 8.0 Hz, 2H), 7.86 – 7.84 (m, 1H), 7.66 (s, 1H), 7.42 – 7.29 (m, 5H), 7.22 – 7.10 (m, 15H), 6.98 (t, *J* = 7.6 Hz, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.7, 151.6, 150.6, 147.8, 140.4, 139.7, 136.4, 135.1, 135.0, 133.2, 130.5, 130.0, 129.6, 129.2, 128.9, 128.44, 128.41, 128.3, 128.1, 128.0, 125.4, 124.0, 121.6; **IR**: $\bar{\upsilon}$ = 3306, 1729, 1641, 1492, 1442, 1194, 752, 692, 578

cm^{-1}; **HRMS (FT-ICR-MS ESI$^+$)** calculated for $C_{34}H_{26}NO_3^+$ $[M + H]^+$: 496.1907, Found: 496.1904.

***N*-(2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)pivalamide (3ab)**

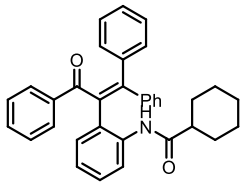
Result: Yellow solid, 80.1 mg, 88% yield; Melting point: 134.6 – 135.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.52 (s, 1H), 8.13 (d, *J* = 8.4 Hz, 1H), 7.96 (d, *J* = 7.2 Hz, 2H), 7.42 (t, *J* = 7.2 Hz, 1H), 7.31 (t, *J* = 7.6 Hz, 2H), 7.24 – 7.07 (m, 12H), 6.97 – 6.93 (m, 1H), 1.32 (s, 9H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.6, 176.6, 146.5, 140.2, 139.1, 136.3, 135.7, 133.4, 130.3, 129.7, 129.6, 128.7, 128.4, 128.34, 128.26, 128.2, 128.1, 127.9, 123.7, 122.5, 39.8, 27.6; **IR**: $\bar{\upsilon}$ = 3359, 1685, 1630, 1473, 1446, 1157, 749, 694, 635 cm^{-1}; **HRMS (FT-ICR-MS ESI$^+$)** calculated for $C_{32}H_{30}NO_2^+$ $[M + H]^+$: 460.2271, Found: 460.2274.

***N*-(2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)cyclohexanecarboxamide (3ac)**

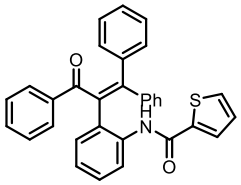
Result: Yellow solid, 81.6 mg, 84% yield; Melting point: 179.5 – 180.6 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.04 – 8.07 (m, 2H), 7.95 (d, *J* = 7.2 Hz, 2H), 7.42 (t, *J* = 7.2 Hz, 1H), 7.31 (t, *J* = 7.6 Hz, 2H), 7.20 – 7.08 (m, 12H), 6.93 (t, *J* = 7.6 Hz, 1H), 2.18 – 2.10 (m, 1H), 1.93 – 1.90 (m, 2H), 1.81 – 1.78 (m, 2H), 1.68 – 1.66 (m, 1H), 1.54 – 1.44 (m, 2H), 1.33 – 1.23 (m, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.6, 174.3, 147.3, 140.4, 139.5, 136.1, 136.0, 133.3, 130.7, 129.9, 129.72, 129.66, 128.8, 128.7, 128.4, 128.3, 128.2, 128.1, 128.0, 124.0, 122.6, 46.5, 29.6, 25.64, 25.58; **IR**: $\bar{\upsilon}$ = 3321, 1649, 1523, 1438, 1243, 765, 700, 577 cm^{-1}; **HRMS (FT-ICR-MS ESI$^+$)** calculated for $C_{34}H_{32}NO_2^+$ $[M + H]^+$: 486.2428, Found: 486.2433.

***N*-(2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)thiophene-2-carboxamide (3ad)**

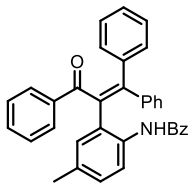
Result: Yellow solid, 80.6 mg, 83% yield; Melting point: 189.8 – 191.4 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.95 (s, 1H), 8.13 (d, *J* = 8.0 Hz, 1H), 7.98 (d, *J* = 7.6 Hz, 2H), 7.73 (d, *J* = 3.2 Hz, 1H), 7.48 (d, *J* = 4.8 Hz, 1H), 7.40 (t, *J* = 7.2 Hz, 1H), 7.30 (d, *J* = 7.6 Hz, 2H), 7.25 – 7.19 (m, 4H), 7.14 – 7.06 (m, 9H), 6.98 (t, *J* = 7.6 Hz, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.3, 159.8, 147.7, 140.2, 139.7, 139.3, 136.1, 135.9, 135.7, 133.5, 130.8, 130.6, 129.8, 129.72, 129.65, 129.3, 128.8, 128.44, 128.41, 128.3, 128.1, 127.90, 127.85, 124.4, 122.8, 120.2; **IR**: ῡ = 3296, 1654, 1530, 1442, 1312, 1245, 752, 702, 574 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{24}NO_2S^+$ [M + H] $^+$: 486.1522, Found: 486.1522.

***N*-(4-methyl-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3ae)**

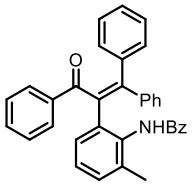
Result: Yellow solid, 84.9 mg, 86% yield; Melting point: 180.7 – 181.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.69 (s, 1H), 7.95 (d, *J* = 7.6 Hz, 3H), 7.85 (d, *J* = 7.6 Hz, 2H), 7.47 (t, *J* = 7.2 Hz, 1H), 7.43 – 7.35 (m, 3H), 7.28 – 7.23 (m, 2H), 7.16 – 7.13 (m, 3H), 7.11 – 7.04 (m, 9H), 2.20 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.1, 165.2, 147.3, 140.4, 139.4, 136.1, 135.6, 134.8, 134.2, 133.2, 131.5, 131.0, 130.1, 129.9, 129.8, 129.7, 129.5, 128.5, 128.4, 128.28, 128.25, 128.1, 127.9, 127.0, 123.4, 20.8; **IR**: ῡ = 3305, 1666, 1634, 1504, 1473, 1443, 1282, 692, 578 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ [M + H] $^+$: 494.2115, Found: 494.2112.

***N*-(2-methyl-6-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3af)**

Result: Yellow solid, 51.3 mg, 52% yield; Melting point: 213.7 – 218.6 ℃

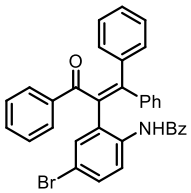


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.80 – 7.78 (m, 3H), 7.56-7.55 (m, 2H), 7.39 (t, *J* = 7.2 Hz, 1H), 7.30 – 7.20 (m, 7H), 7.11 (t, *J* = 6.0 Hz, 2H), 7.06 – 6.98 (m, 9H), 2.17 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.9, 166.1, 149.1, 141.4, 140.6, 138.6, 136.8, 136.7, 136.43, 136.39, 134.1, 133.7, 132.3, 131.4, 131.1, 130.6, 130.3, 129.6, 128.3, 128.22, 128.16, 128.1, 127.9, 127.84, 127.80, 127.0, 18.7; **IR**: ῡ = 3347, 1664, 1641, 1481, 1232, 696,

575 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2112.

***N*-(4-bromo-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3ag)**

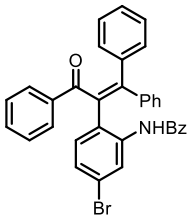
Result: Yellow solid, 102.8 mg, 92% yield; Melting point: 202.7 – 204.0 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.90 (s, 1H), 8.04 (d, *J* = 8.0 Hz, 1H), 7.95 – 7.87 (m, 4H), 7.53 – 7.28 (m, 9H), 7.18 – 7.11 (m, 7H), 7.03 – 7.01 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.2, 148.6, 139.9, 138.9, 135.7, 135.3, 134.4, 133.9, 133.6, 133.1, 131.9, 131.8, 131.7, 129.8, 129.69, 129.66, 128.7, 128.62, 128.56, 128.2, 128.1, 127.0, 124.6, 121.8, 117.0; **IR**: $\bar{\upsilon}$ = 3298, 1668, 1630, 1482, 1276, 1064, 812, 689, 574 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}BrNO_2^+$ $[M + H]^+$: 558.1063, 560.1045, Found: 558.1074, 560.1052.

***N*-(5-bromo-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3ah)**

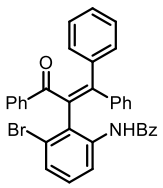
Result: Yellow solid, 68.4 mg, 61% yield; Melting point: 184.5 – 189.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.93 (s, 1H), 8.43 (s, 1H), 7.95-7.89 (m, 4H), 7.52 (t, *J* = 7.2 Hz, 1H), 7.47 – 7.39 (m, 3H), 7.30 (t, *J* = 7.6 Hz, 2H), 7.17 – 7.10 (m, 10H), 7.03 – 7.02 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.3, 148.3, 140.0, 139.1, 137.4, 135.8, 134.6, 134.3, 133.6, 131.94, 131.92, 129.73, 129.69, 129.66, 128.7, 128.52, 128.46, 128.4, 128.2, 128.1, 127.4, 127.1, 125.6, 122.5, 118.6; **IR**: $\bar{\upsilon}$ = 3414, 1688, 1656, 1565, 1506, 1405, 1279, 1237, 639, 589 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}BrNO_2^+$ $[M + H]^+$: 558.1063, 560.1045, Found: 558.1072, 560.1051.

***N*-(3-bromo-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3ai)**

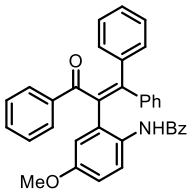
Result: Yellow solid, 26.6 mg, 24% yield; Melting point: 190.4 – 193.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.89 (s, 1H), 8.10 – 8.03 (m, 3H), 7.89 (d, *J* = 7.2 Hz, 2H), 7.53 – 7.43 (m, 3H), 7.33 – 7.29 (m, 2H), 7.20 – 7.03 (m, 13H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.4, 164.8, 151.8, 140.0, 139.6, 138.2, 135.6, 134.7, 133.4, 132.9, 132.5, 131.8, 130.8, 130.3, 129.9, 129.0, 128.9, 128.7, 128.1, 128.0, 127.8, 127.7, 127.1, 126.9, 124.8, 121.7; **IR**: $\bar{\upsilon}$ = 3324, 1668, 1626, 1565, 1516, 1293, 770, 689, 604 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}BrNO_2^+$ $[M + H]^+$: 558.1063, 560.1045, Found: 558.1071, 560.1051.

***N*-(4-methoxy-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3aj)**

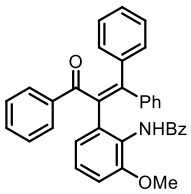
Result: Yellow solid, 83.6 mg, 82% yield; Melting point: 171.8 – 174.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.43 (s, 1H), 7.91 (d, *J* = 7.2 Hz, 2H), 7.82 – 7.75 (m, 3H), 7.45 (t, *J* = 7.2 Hz, 1H), 7.38 – 7.29 (m, 3H), 7.24 – 7.13 (m, 9H), 7.09 – 7.06 (m, 3H), 6.79 – 6.77 (m, 2H), 3.61 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.9, 165.6, 156.4, 148.0, 140.5, 139.7, 136.1, 135.6, 134.5, 133.1, 133.0, 131.4, 130.1, 129.9, 129.6, 128.9, 128.41, 128.35, 128.30, 128.26, 128.0, 126.9, 125.8, 116.6, 113.9, 55.3; **IR**: $\bar{\upsilon}$ = 3378, 1672, 1626, 1473, 1240, 767, 692, 585 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_3^+$ $[M + H]^+$: 510.2064, Found: 510.2060.

***N*-(2-methoxy-6-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3ak)**

Result: Yellow solid, 87.7 mg, 86% yield; Melting point: 224.8 – 228.3 ℃

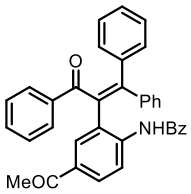


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.78 (d, *J* = 8.0 Hz, 2H), 7.56 – 7.55 (m, 2H), 7.34 – 7.31 (m, 3H), 7.25 – 7.23 (m, 3H), 7.17 – 7.14 (m, 3H), 7.06 – 6.96 (m, 7H), 6.87 (t, *J* = 7.6 Hz, 2H), 6.78 – 6.73 (m, 2H), 3.73 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.6, 168.1, 154.8, 149.5, 141.9, 141.4, 137.1, 136.1, 134.0, 131.8, 131.6, 131.2, 131.0, 129.5, 128.3, 128.1, 128.0, 127.9, 127.7, 127.6, 127.5, 127.1, 125.8, 124.5, 110.1, 55.6; **IR**: $\bar{\upsilon}$ = 3370, 1683, 1637, 1454, 1258, 1046, 696, 594 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for

$C_{35}H_{28}NO_3^+$ [M + H] $^+$: 510.2064, Found: 510.2059.

***N*-(4-acetyl-2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (3al)**

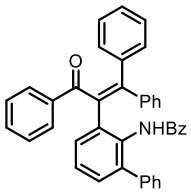
Result: Yellow solid, 94.9 mg, 91% yield; Melting point: 169.7 – 170.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.33 (s, 1H), 8.38 (d, *J* = 8.4 Hz, 1H), 8.02 – 7.92 (m, 5H), 7.53 – 7.28 (dd, *J* = 8.4, 2.00 Hz, 1H), 7.56 – 7.46 (m, 3H), 7.42 (t, *J* = 7.6 Hz, 1H), 7.32 (t, *J* = 7.6 Hz, 2H), 7.21 – 7.18 (m, 2H), 7.14 – 7.06 (m, 6H), 7.03 – 7.01 (m, 2H), 2.46 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.0, 196.6, 165.3, 148.6, 140.7, 139.7, 138.9, 135.4, 134.4, 134.2, 133.7, 132.3, 132.0, 130.8, 129.8, 129.52, 129.50, 129.4, 129.1, 128.7, 128.5, 128.3, 128.2, 128.0, 127.1, 121.5, 26.4; **IR**: ῡ = 3661, 3309, 2984, 1672, 1638, 1515, 1255, 700, 570 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{28}NO_3^+$ [M + H] $^+$: 522.2064, Found: 522.2060.

***N*-(3-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)-[1,1'-biphenyl]-2-yl)benzamide (3am)**

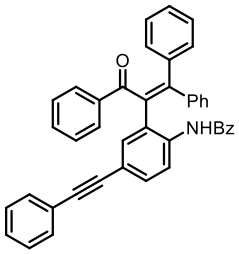
Result: Yellow solid, 83.4 mg, 75% yield; Melting point: 211.5 – 216.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.74 (d, *J* = 7.2 Hz, 2H), 7.59 – 7.53 (m, 2H), 7.30 – 7.11 (m, 15H), 7.08 – 7.04 (m, 4H), 6.98 – 6.96 (m, 4H), 6.86 (t, *J* = 7.6 Hz, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 199.6, 167.7, 149.9, 141.8, 141.2, 140.9, 139.1, 136.9, 136.4, 133.5, 133.3, 132.8, 131.9, 131.5, 131.1, 130.9, 129.8, 129.5, 128.7, 128.3, 128.2, 128.1, 128.0, 127.9, 127.7, 127.5, 127.3, 127.2, 126.8; **IR**: ῡ = 3344, 1655, 1634, 1476, 1274, 757, 700, 590 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{40}H_{30}NO_2^+$ [M + H] $^+$: 556.2271, Found: 556.2278.

***N*-(2-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)-4-(phenylethynyl)phenyl)benzamide (3an)**

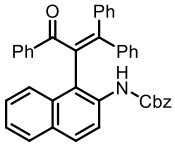
Result: Yellow solid, 106.7 mg, 92% yield; Melting point: 220.1 – 221.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.01 (s, 1H), 8.26 (d, *J* = 8.4 Hz, 1H), 8.00 (d, *J* = 7.6 Hz, 2H), 7.94 (d, *J* = 7.2 Hz, 2H), 7.52 – 7.41 (m, 8H), 7.35 – 7.29 (m, 5H), 7.20 – 7.08 (m, 8H), 7.04 – 7.01 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.8, 165.0, 147.9, 134.0, 138.8, 136.1, 135.6, 134.5, 134.2, 133.6, 133.2, 132.2, 131.8, 131.4, 129.8, 129.63, 129.61, 129.1, 128.7, 128.6, 128.5, 128.3, 128.19, 128.16, 128.0, 127.1, 127.0, 123.0, 122.3, 118.8, 89.3, 88.9; **IR**: $\bar{\upsilon}$ = 3324, 1645, 1572, 1507, 1293, 1243, 689 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{42}H_{30}NO_2^+$ $[M + H]^+$: 580.2271, Found: 580.2270.

benzyl (1-(3-oxo-1,1,3-triphenylprop-1-en-2-yl)naphthalen-2-yl)carbamate (3ao)

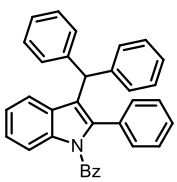
Result: Yellow solid, 103.0 mg, 92% yield; Melting point: 225.3 – 226.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.10 (d, *J* = 8.4 Hz, 1H), 7.92 (d, *J* = 7.2 Hz, 2H), 7.70-7.67 (m, 2H), 7.51 (s, 1H), 7.39 – 7.14 (m, 16H), 7.00 (d, *J* = 6.8 Hz, 1H), 6.91 – 6.86 (m, 4H), 5.22-5.10 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 198.4, 153.5, 152.4, 140.8, 140.1, 136.3, 136.1, 134.1, 133.4, 132.7, 132.5, 130.6, 130.3, 129.5, 129.2, 128.8, 128.5, 128.41, 128.37, 128.2, 128.03, 127.97, 127.6, 126.8, 125.0, 124.6, 66.7.(Signal overlap in the congested aromatic region of the ^{13}C NMR spectra results in fewer observed signals than the theoretical number of carbon atoms); **IR**: $\bar{\upsilon}$ = 3332, 1638, 1567, 1500, 1285, 1237, 680 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{42}H_{30}NO_2^+$ $[M + H]^+$: 560.2221, Found: 560.2200 (the error is within 5 ppm).

(3-benzhydryl-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4a)

Result: Yellow solid, 76.0 mg, 82% yield; Melting point: 212.4 – 212.9 ℃

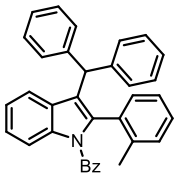


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.66 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.31 (t, *J* = 7.6 Hz, 1H), 7.27 – 7.11 (m, 19H), 7.02 (t, *J* = 7.6 Hz, 1H), 5.61 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 143.0, 137.8, 137.5, 135.4, 132.4, 132.2, 130.1, 129.9, 129.0, 128.8, 128.3,

128.1, 128.0, 127.8, 126.3, 123.9, 122.6, 122.2, 121.8, 114.0, 47.5; **IR**: ῡ = 3053, 1680, 1446, 1320, 1022, 899, 750, 692, 607 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}KNO^+$ $[M + K]^+$: 502.1568, Found: 502.1566.

(3-benzhydryl-2-(o-tolyl)-1*H*-indol-1-yl)(phenyl)methanone (4b)

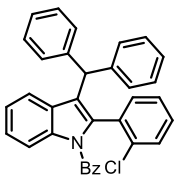
Result: Yellow solid, 76.4 mg, 80% yield; Melting point: 175.2 – 178.9 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.55 (d, *J* = 8.0 Hz, 2H), 7.45 (d, *J* = 8.0 Hz, 1H), 7.37 (t, *J* = 7.6 Hz, 1H), 7.28 – 6.99 (m, 19H), 5.34 (s, 1H), 1.97 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.4, 142.9, 142.3, 137.8, 137.6, 137.2, 135.1, 132.3, 131.7, 131.5, 129.8, 129.6, 129.01, 128.96, 128.8, 128.5, 128.3, 128.13, 128.07, 126.3, 126.2, 125.2, 123.6, 122.6, 122.5, 121.7, 114.5, 47.7, 20.0; **IR**: ῡ = 3057, 1672, 1450, 1312, 1024, 895, 756, 691, 608 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{27}NaNO_2^+$ $[M + Na]^+$: 500.1985, Found: 500.1985.

(3-benzhydryl-2-(2-chlorophenyl)-1*H*-indol-1-yl)(phenyl)methanone (4c)

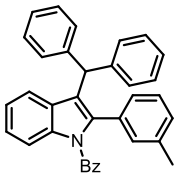
Result: Yellow solid, 76.7 mg, 77% yield; Melting point: 192.1 – 192.6 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, *J* = 7.2 Hz, 2H), 7.41 (t, *J* = 7.6 Hz, 1H), 7.36 (d, *J* = 8.0 Hz, 1H), 7.30 – 7.07 (m, 18H), 7.01 (t, *J* = 7.6 Hz, 1H), 5.38 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.1, 142.4, 142.2, 137.2, 134.8, 134.7, 134.4, 133.0, 132.4, 131.5, 129.9, 129.7, 129.3, 129.1, 128.9, 128.7, 128.4, 128.11, 128.05, 126.5, 126.24, 126.18, 124.0, 123.7, 122.5, 121.8, 114.7, 47.6; **IR**: ῡ = 3065, 1679, 1599, 1446, 1308, 1024, 742, 494, 611 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}ClNO_2^+$ $[M + H]^+$: 498.1619, Found: 498.1614.

(3-benzhydryl-2-(m-tolyl)-1*H*-indol-1-yl)(phenyl)methanone (4d)

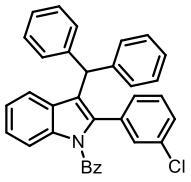
Result: Yellow solid, 86.0 mg, 90% yield; Melting point: 166.3 – 167.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.69 (d, *J* = 8.0 Hz, 1H), 7.49 (d, *J* = 7.6 Hz, 2H), 7.31 – 7.14 (m, 14H), 7.10 (d, *J* = 7.6 Hz, 1H), 7.01 (t, *J* = 7.2 Hz, 2H), 6.95 – 6.89 (m, 3H), 5.61 (s, 1H), 2.16 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 143.1, 137.9, 137.5, 137.4, 135.5, 132.2, 132.0, 131.0, 129.8, 129.1, 128.9, 128.5, 128.3, 127.93, 127.85, 127.2, 126.3, 123.8, 122.6, 122.1, 121.7, 114.0, 47.6, 21.1; **IR**: $\bar{\upsilon}$ = 3049, 1683, 1450, 1321, 1025, 788, 696, 611 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{27}NaNO_2^+$ $[M + Na]^+$: 500.1985, Found: 500.1981.

(3-benzhydryl-2-(3-chlorophenyl)-1*H*-indol-1-yl)(phenyl)methanone (4e)

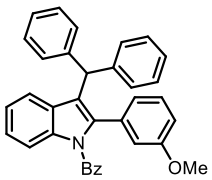
Result: Yellow solid, 85.7 mg, 86% yield; Melting point: 170.7 – 172.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.36 (t, *J* = 7.2 Hz, 1H), 7.28 – 7.01 (m, 19H), 5.57 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.6, 142.6, 137.6, 136.1, 135.3, 134.0, 133.8, 132.6, 130.2, 129.8, 129.2, 129.0, 128.7, 128.4, 128.24, 128.20, 127.9, 126.5, 124.3, 123.1, 122.8, 121.9, 114.1, 47.6; **IR**: $\bar{\upsilon}$ = 3061, 1679, 1599, 1446, 1308, 1024, 742, 694, 611 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}ClNaNO^+$ $[M + Na]^+$: 520.1439, Found: 520.1435.

(3-benzhydryl-2-(3-methoxyphenyl)-1*H*-indol-1-yl)(phenyl)methanone (4f)

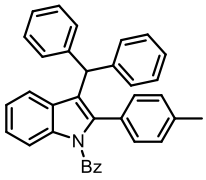
Result: Yellow solid, 75.0 mg, 76% yield; Melting point: 148.8 – 150.0 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.67 (d, *J* = 8.0 Hz, 1H), 7.53 (d, *J* = 7.2 Hz, 2H), 7.35 (t, *J* = 7.2 Hz, 1H), 7.29 – 7.16 (m, 13H), 7.10 – 7.01 (m, 3H), 6.76 (d, *J* = 7.6 Hz, 1H), 6.68 – 6.64 (m, 2H), 5.65 (s, 1H), 3.59 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 158.8, 143.0, 137.5, 135.3, 133.4, 132.4, 129.9, 129.10, 129.06, 128.8, 128.3, 128.1, 126.3, 124.0, 122.7, 122.6, 122.1, 121.8, 115.2, 114.0, 113.9, 55.0, 47.5; **IR**: $\bar{\upsilon}$ = 3061, 1679, 1450, 1316, 1218, 1044, 745, 692, 614 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2121.

(3-benzhydryl-2-(p-tolyl)-1*H*-indol-1-yl)(phenyl)methanone (4g)

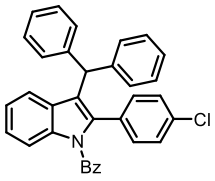
Result: Yellow solid, 84.1 mg, 88% yield; Melting point: 195.4 – 196.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.58 (d, *J* = 8.0 Hz, 1H), 7.53 (d, *J* = 7.6 Hz, 2H), 7.33 (t, *J* = 7.2 Hz, 1H), 7.26 – 7.10 (m, 14H), 7.05 – 6.95 (m, 5H), 5.62 (s, 1H), 2.23 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 143.1, 138.0, 137.6, 137.5, 135.4, 132.4, 130.0, 129.2, 129.1, 128.8, 128.7, 128.3, 128.1, 126.3, 123.7, 122.5, 121.9, 121.7, 113.9, 47.5, 21.2; **IR**: $\bar{\upsilon}$ = 3054, 1683, 1450, 1320, 1022, 898, 744, 692, 614 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{27}NaNO_2^+$ $[M + Na]^+$: 500.1985, Found: 500.1983.

(3-benzhydryl-2-(4-chlorophenyl)-1*H*-indol-1-yl)(phenyl)methanone (4h)

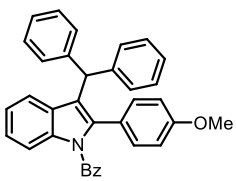
Result: Yellow solid, 86.7 mg, 87% yield; Melting point: 209.6 – 211.4 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.54 (t, *J* = 7.2 Hz, 3H), 7.39 (t, *J* = 7.6 Hz, 1H), 7.27 – 7.03 (m, 18H), 7.02 (t, *J* = 7.2 Hz, 1H), 5.56 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.6, 142.7, 137.5, 136.5, 135.2, 133.9, 132.7, 131.3, 130.8, 129.9, 129.0, 128.7, 128.4, 128.3, 128.2, 126.4, 124.1, 122.8, 122.7, 121.8, 114.0, 47.5; **IR**: $\bar{\upsilon}$ = 3055, 1679, 1450, 1320, 1094, 1022, 746, 692, 611 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}ClNaNO^+$ $[M + Na]^+$: 520.1439, Found: 520.1446.

(3-benzhydryl-2-(4-methoxyphenyl)-1*H*-indol-1-yl)(phenyl)methanone (4i)

Result: Yellow solid, 77.0 mg, 78% yield; Melting point: 205.0 – 205.6 ℃

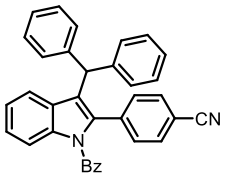


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.63 (d, *J* = 8.0 Hz, 1H), 7.52 (d, *J* = 7.2 Hz, 2H), 7.34 (t, *J* = 7.6 Hz, 1H), 7.28 – 7.05 (m, 16H), 7.01 (t, *J* = 8.0 Hz, 1H), 6.68 (d, *J* = 8.4 Hz, 2H), 5.60 (s, 1H), 3.70 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 159.0, 143.0, 137.6, 137.3, 135.3, 132.4, 131.4, 129.9, 129.0, 128.8, 128.3, 128.1, 126.3, 124.4, 123.7, 122.5, 121.8, 121.6, 113.9, 113.5, 55.1, 47.5; **IR**: $\bar{\upsilon}$ = 3053, 1681, 1450, 1320, 1243,

1029, 897, 745, 689 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ [M + H] $^+$: 494.2115, Found: 494.2118.

4-(3-benzhydryl-1-benzoyl-1*H*-indol-2-yl)benzonitrile (4j)

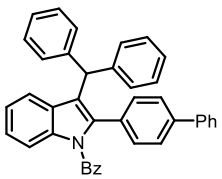
Result: Yellow solid, 70.4 mg, 72% yield; Melting point: 228.2 – 229.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.59 (d, *J* = 7.2 Hz, 2H), 7.49 – 7.44 (m, 4H), 7.31 – 7.10 (m, 16H), 7.04 (d, *J* = 7.6 Hz, 1H), 5.55 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.3, 142.3, 137.6, 137.2, 135.6, 134.9, 133.1, 131.7, 130.5, 129.9, 128.9, 128.6, 128.51, 128.46, 126.6, 124.7, 123.9, 123.0, 122.1, 118.5, 114.1, 111.2, 47.5; **IR**: $\bar{\upsilon}$ = 3065, 2223, 1668, 1450, 1305, 752, 696, 612, 555 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{24}NaN_2O^+$ [M + Na] $^+$: 511.1781, Found: 511.1777.

(2-([1,1'-biphenyl]-4-yl)-3-benzhydryl-1*H*-indol-1-yl)(phenyl)methanone (4k)

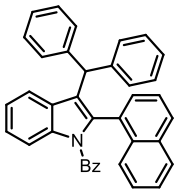
Result: Yellow solid, 81.0 mg, 75% yield; Melting point: 215.5 – 217.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.67 (d, *J* = 8.0 Hz, 1H), 7.55 (d, *J* = 7.2 Hz, 2H), 7.49 (d, *J* = 7.2 Hz, 2H), 7.42 – 7.12 (m, 22H), 7.04 (t, *J* = 7.6 Hz, 1H), 5.68 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 142.9, 140.4, 137.6, 137.5, 135.3, 132.4, 131.1, 130.5, 130.0, 129.1, 128.8, 128.7, 128.3, 128.1, 127.4, 126.9, 126.6, 126.3, 124.0, 122.7, 122.4, 121.8, 114.0, 47.5; **IR**: $\bar{\upsilon}$ = 3061, 1691, 1448, 1297, 1021, 937, 841, 696, 601 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{40}H_{30}NO^+$ [M + H] $^+$: 540.2322, Found: 540.2325.

(3-benzhydryl-2-(naphthalen-1-yl)-1*H*-indol-1-yl)(phenyl)methanone (4l)

Result: Yellow solid, 81.2 mg, 79% yield; Melting point: 226.5 – 227.8 ℃

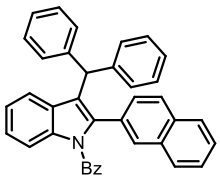


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.84 (d, *J* = 8.4 Hz, 1H), 7.69 (d, *J* = 8.0 Hz, 2H), 7.61 – 7.57 (m, 2H), 7.39 (t, *J* = 7.2 Hz, 1H), 7.33 – 7.18 (m, 11H), 7.14 – 7.08 (m, 5H), 6.99 – 6.98 (m, 2H), 6.90 (t, *J* = 7.2 Hz, 2H), 5.37 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 142.8, 142.4,

137.6, 135.8, 134.8, 133.0, 132.8, 131.6, 129.9, 129.4, 129.1, 129.0, 128.93, 128.89, 128.6, 128.4, 128.1, 128.0, 127.3, 126.6, 126.3, 126.1, 125.9, 125.3, 124.6, 124.1, 123.7, 122.9, 121.8, 114.8, 47.8; **IR**: $\bar{\upsilon}$ = 3053, 1679, 1446, 1308, 1209, 1020, 750, 692, 608 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{38}H_{28}NO^+$ [M + H] $^+$: 514.2165, Found: 514.2159.

(3-benzhydryl-2-(naphthalen-2-yl)-1*H*-indol-1-yl)(phenyl)methanone (4m)

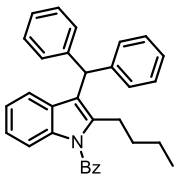
Result: Yellow solid, 86.3 mg, 84% yield; Melting point: 192.5 – 193.6 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.72-7.69 (m, 1H), 7.66 – 7.60 (m, 4H), 7.55 (d, *J* = 7.6 Hz, 2H), 7.43 – 7.41 (m, 2H), 7.29 – 7.03 (m, 17H), 5.67 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 143.0, 137.7, 137.6, 135.2, 132.5, 132.4, 132.3, 129.9, 129.6, 129.5, 129.1, 128.9, 128.3, 128.0, 127.9, 127.7, 127.5, 127.4, 126.37, 126.35, 126.3, 124.0, 122.8, 122.7, 121.8, 114.0, 47.7; **IR**: $\bar{\upsilon}$ = 3053, 1683, 1446, 1305, 1025, 744, 692, 612 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{38}H_{28}NO^+$ [M + H] $^+$: 514.2165, Found: 514.2163.

(3-benzhydryl-2-butyl-1*H*-indol-1-yl)(phenyl)methanone (4n)

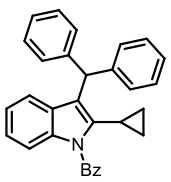
Result: Yellow solid, 62.1 mg, 70% yield; Melting point: 95.1 – 95.7 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.74 (d, *J* = 7.2 Hz, 2H), 7.62 (t, *J* = 7.2 Hz, 1H), 7.48 (t, *J* = 7.6 Hz, 2H), 7.30 – 7.21 (m, 10H), 6.91 – 6.87 (m, 3H), 6.74 – 6.72 (m, 1H), 5.79 (s, 1H), 2.88 (t, *J* = 8.0 Hz, 2H), 1.42 – 1.34 (m, 2H), 1.20 – 1.11 (m, 2H), 0.74 (t, *J* = 7.2 Hz, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 142.7, 140.0, 136.9, 135.5, 133.1, 130.0, 129.4, 129.1, 128.8, 128.3, 126.4, 122.2, 121.8, 120.6, 120.5, 113.8, 47.4, 32.0, 25.6, 22.6, 13.7; **IR**: $\bar{\upsilon}$ = 2958, 1687, 1450, 1316, 1025, 742, 696, 600 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{29}NaNO_2^+$ [M + Na] $^+$: 466.2141, Found: 466.2141.

(3-benzhydryl-2-cyclopropyl-1*H*-indol-1-yl)(phenyl)methanone (4o)

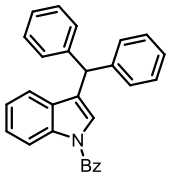
Result: Yellow solid, 62.4 mg, 73% yield; Melting point: 134.3 – 137.4 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.74 (d, *J* = 7.2 Hz, 2H), 7.58 (t, *J* = 6.8 Hz, 1H), 7.49 – 7.43 (m, 3H), 7.30 – 7.21 (m, 10H), 7.10 – 7.06 (m, 1H), 6.96 – 6.90 (m, 2H), 6.03 (s, 1H), 1.61 – 1.56 (m, 1H), 0.63 – 0.61 (m, 2H), 0.49 – 0.47 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.2, 142.7, 138.7, 136.6, 136.3, 132.7, 129.8, 129.1, 128.7, 128.5, 128.3, 126.3, 123.43, 123.37, 122.2, 121.1, 113.5, 47.6, 9.4, 8.3; **IR**: $\bar{\upsilon}$ = 3061, 1683, 1450, 1339, 1220, 1022, 876, 748, 695 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{31}H_{25}NaNO^+$ $[M + Na]^+$: 450.1828, Found: 450.1834.

(3-benzhydryl-1*H*-indol-1-yl)(phenyl)methanone (4p)

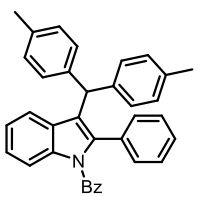
Result: Yellow solid, 58.1 mg, 75% yield; Melting point: 110.2 – 111.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.28 (d, *J* = 8.4 Hz, 1H), 7.65 (d, *J* = 7.6 Hz, 2H), 7.52 (t, *J* = 7.2 Hz, 1H), 7.42 (t, *J* = 7.6 Hz, 2H), 7.34 – 7.14 (m, 13H), 6.77 (s, 1H), 5.58 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 168.3, 142.3, 136.8, 134.4, 131.9, 130.4, 129.2, 128.8, 128.43, 128.39, 126.8, 126.6, 125.6, 125.0, 123.7, 120.2, 116.3, 48.5; **IR**: $\bar{\upsilon}$ = 3052, 1681, 1453, 1332, 1019, 902, 750, 688, 597 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{28}H_{22}NO^+$ $[M + H]^+$: 388.1696, Found: 388.1691.

(3-(di-p-tolylmethyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4q)

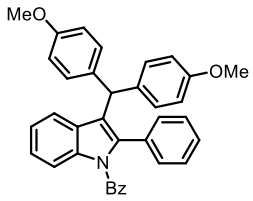
Result: Yellow solid, 77.7mg, 79% yield; Melting point: 168.9 – 171.6 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.30 (t, *J* = 7.2 Hz, 1H), 7.19 – 7.12 (m, 9H), 7.07 – 7.00 (m, 9H), 5.54 (s, 1H), 2.30 (s, 6H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 140.1, 137.6, 137.5, 135.7, 135.5, 132.33, 132.30, 130.2, 129.9, 128.93, 128.89, 128.8, 128.3, 128.1, 127.9, 127.7, 123.9, 122.5, 122.0, 113.9, 46.7, 21.0; **IR**: $\bar{\upsilon}$ = 3066, 1691, 1449, 1312, 1024, 895, 756, 696, 572 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{30}NO^+$ $[M + H]^+$: 492.2322, Found: 492.2324.

(3-(bis(4-methoxyphenyl)methyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4r)

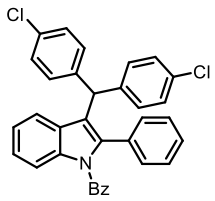
Result: Yellow solid, 76.5 mg, 73% yield; Melting point: 155.0 – 156.6 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.66 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.6 Hz, 1H), 7.20 – 7.12 (m, 9H), 7.08 – 7.02 (m, 5H), 6.80 (d, *J* = 8.8 Hz, 4H), 5.50 (s, 1H), 3.77 (s, 6H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 157.9, 137.6, 137.4, 135.4, 132.4, 132.3, 130.1, 129.9, 128.8, 128.1, 127.9, 127.7, 123.9, 122.7, 122.6, 121.9, 114.0, 113.6, 55.2, 45.9; **IR**: ῡ = 3062, 1676, 1507, 1320, 1243, 1175, 898, 696, 589 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{30}NO_3^+$ $[M + H]^+$: 524.2220, Found: 524.2225.

(3-(bis(4-chlorophenyl)methyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4s)

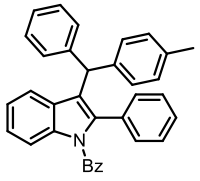
Result: Yellow solid, 88.4 mg, 83% yield; Melting point: 80.6 – 84.9 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.63 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.34 (t, *J* = 7.6 Hz, 1H), 7.23 – 7.10 (m, 12H), 7.08 – 7.05 (m, 6H), 5.52 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.7, 141.0, 138.1, 137.5, 135.2, 132.6, 132.3, 131.9, 130.3, 130.0, 129.9, 128.6, 128.2, 128.1, 128.0, 124.1, 122.8, 121.3, 120.9, 114.1, 46.4; **IR**: ῡ = 3053, 1699, 1488, 1297, 1089, 1013, 738, 625 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}ClNO^+$ $[M + H]^+$: 532.1229, Found: 532.1230.

phenyl(2-phenyl-3-(phenyl(p-tolyl)methyl)-1*H*-indol-1-yl)methanone (4t)

Result: Yellow solid, 76.4 mg, 80% yield; Melting point: 177.3 – 182.8 ℃



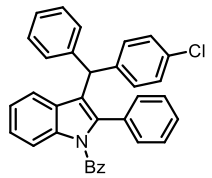
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, *J* = 8.4 Hz, 1H), 7.52 (d, *J* = 7.2 Hz, 2H), 7.32 (t, *J* = 7.6 Hz, 1H), 7.26 – 7.12 (m, 14H), 7.08 – 7.01 (m, 5H), 5.57 (s, 1H), 2.32(s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 143.2, 139.9, 137.7, 137.6, 135.8, 135.5, 132.4, 132.3, 130.2, 129.9, 129.02, 129.00, 128.9, 128.8, 128.2, 128.1, 128.0, 127.8, 126.2, 123.9, 122.6, 122.4, 121.9,

114.0, 47.1, 21.0; **IR**: $\bar{\upsilon}$ = 3065, 1664, 1446, 1309, 1022, 895, 752, 693, 604 cm^{-1}; **HRMS** (**FT-ICR-MS ESI**$^+$) calculated for $C_{35}H_{27}NaNO^+$ $[M + Na]^+$: 500.1985, Found: 500.1983.

(3-((4-chlorophenyl)(phenyl)methyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4u)

Result: Yellow solid, 84.7 mg, 85% yield; Melting point: 164.3 – 165.0 ℃

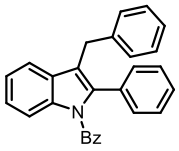
^{1}H NMR (400 MHz, $CDCl_3$): δ 7.65 (d, *J* = 8.4 Hz, 1H), 7.51 (d, *J* = 7.6 Hz, 2H), 7.32 (t, *J* = 7.2 Hz, 1H), 7.28 – 7.12 (m, 15H), 7.10 – 7.01 (m, 4H), 5.57 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.8, 142.4, 141.5, 137.9, 137.5, 135.3, 132.5, 132.09, 132.05, 130.4, 130.1, 129.9, 128.9, 128.5, 128.4, 128.1, 128.0, 127.9, 126.5, 124.0, 122.7, 121.5, 114.1, 47.0; **IR**: $\bar{\upsilon}$ = 3057, 1668, 1489, 1450, 1301, 1014, 751, 692, 604 cm^{-1}; **HRMS** (**FT-ICR-MS ESI**$^+$) calculated for $C_{34}H_{24}ClKNO^+$ $[M + K]^+$: 536.1178, Found: 536.1174.



(3-benzyl-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4v)

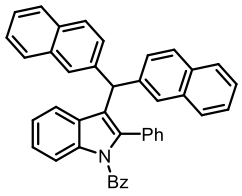
Result: Yellow solid, 39.5 mg, 51% yield; Melting point: 124.0 – 127.8 ℃

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.66 (d, *J* = 8.0 Hz, 1H), 7.58 (d, *J* = 8.0 Hz, 2H), 7.42 (d, *J* = 7.2 Hz, 1H), 7.36 (t, *J* = 7.2 Hz, 1H), 7.28 – 7.10 (m, 14H), 4.09 (s, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 140.4, 137.6, 137.4, 135.5, 132.4, 132.2, 130.0, 129.80, 129.75, 128.5, 128.2, 128.14, 128.06, 127.6, 126.0, 124.4, 122.9, 119.8, 118.9, 114.2, 30.4; **IR**: $\bar{\upsilon}$ = 3064, 1696, 1451, 1297, 1022, 735, 702, 662, 529 cm^{-1}; **HRMS** (**FT-ICR-MS ESI**$^+$) calculated for $C_{28}H_{21}NaNO^+$ $[M + Na]^+$: 410.1515, Found: 410.1521.



(3-(di(naphthalen-2-yl)methyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4w)

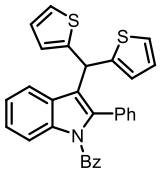
Result: Yellow solid, 86.8 mg, 77% yield; Melting point: 180.2 – 180.5 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.82 (d, *J* = 7.2 Hz, 2H), 7.75 (d, *J* = 8.4 Hz, 2H), 7.71 – 7.68 (m, 3H), 7.61 (s, 2H), 7.54 (d, *J* = 7.6 Hz, 2H), 7.47 – 7.41 (m, 4H), 7.35 – 7.31 (m, 3H), 7.24 – 7.14 (m, 9H), 6.97 (t, *J* = 7.6 Hz, 1H), 5.90 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.0, 140.6, 138.0, 137.6, 135.4, 133.4, 132.5, 132.2, 130.2, 130.0, 128.9, 128.12, 128.07, 128.01, 127.98, 127.9, 127.6, 127.4, 126.0, 125.7, 124.0, 122.8, 121.8, 121.6, 114.0, 48.0; **IR**: ῡ = 3052, 1699, 1455, 1305, 1022, 744, 700, 658, 532 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{42}H_{29}NaNO^+$ $[M + Na]^+$: 586.2142, Found: 586.2144.

(3-(di(thiophen-2-yl)methyl)-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4x)

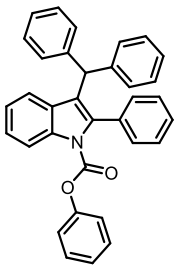
Result: Yellow solid, 76.1 mg, 80% yield; Melting point: 190.5 – 191.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.63 (d, *J* = 8.4 Hz, 1H), 7.53 (d, *J* = 7.6 Hz, 2H), 7.42 – 7.34 (m, 2H), 7.25 – 7.11 (m, 11H), 6.94 – 6.91 (m, 4H), 5.95 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.9, 146.4, 137.5, 137.3, 135.3, 132.6, 131.7, 130.1, 129.97, 129.95, 128.2, 128.1, 127.6, 126.5, 125.9, 124.5, 124.2, 122.6, 121.7, 121.6, 114.0, 38.9; **IR**: ῡ = 3053, 1700, 1448, 1303, 1021, 747, 700, 678, 535 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{30}H_{21}NaNOS_2^+$ $[M + Na]^+$: 498.0957, Found: 498.0961.

phenyl 3-benzhydryl-2-phenyl-1*H*-indole-1-carboxylate (4aa)

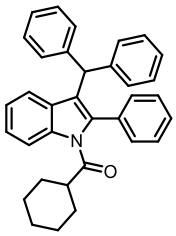
Result: Yellow solid, 77.7 mg, 81% yield; Melting point: 165.9 – 169.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.31 (d, *J* = 8.4 Hz, 1H), 7.38 – 7.06 (m, 21H), 6.91 (d, *J* = 8.0 Hz, 2H), 5.45 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 150.0, 149.7, 142.6, 137.1, 136.7, 133.3, 130.0, 129.3, 129.1, 129.0, 128.3, 128.2, 128.0, 126.3, 126.0, 124.6, 123.7, 123.2, 121.8, 120.9, 115.5, 47.6; **IR**: ῡ = 3062, 1735, 1450, 1362, 1331, 1194, 1022, 743, 700 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{25}KNO_2^+$ $[M + K]^+$: 518.1517, Found: 518.1511.

(3-benzhydryl-2-phenyl-1*H*-indol-1-yl)(cyclohexyl)methanone (4ab)

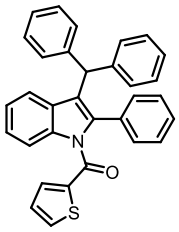
Result: Yellow solid, 38.5 mg, 41% yield; Melting point: 145.3 – 146.2 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.26 (d, *J* = 8.4 Hz, 1H), 7.45 – 7.44 (m, 3H), 7.34 – 7.31 (m, 2H), 7.27 – 7.17 (m, 7H), 7.10 (d, *J* = 7.2 Hz, 4H), 7.05 – 7.02 (m, 2H), 5.44 (s, 1H), 2.15 – 2.08 (m, 1H), 1.59 – 1.53 (m, 4H), 1.46 – 1.31 (m, 3H), 1.11 – 1.00 (m, 1H), 0.70 – 0.59 (m, 2H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 178.2, 142.8, 137.3, 136.0, 133.3, 130.1, 129.0, 128.8, 128.7, 128.4, 128.3, 126.3, 124.6, 122.9, 122.8, 121.4, 115.4, 47.7, 45.9, 29.1, 25.5, 25.4; **IR**: $\bar{\upsilon}$ = 3068, 1735, 1450, 1362, 1331, 1194, 1022, 743, 700 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{31}KNO^+$ $[M + K]^+$: 518.1517, Found: 518.1511.

(3-benzhydryl-2-phenyl-1*H*-indol-1-yl)(thiophen-2-yl)methanone (4ac)

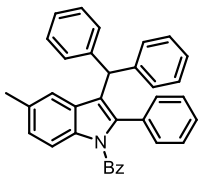
Result: Yellow solid, 77.0 mg, 82% yield; Melting point: 182.4 – 184.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.74 (d, *J* = 8.0 Hz, 1H), 7.41 (d, *J* = 4.8 Hz, 1H), 7.27 – 7.16 (m, 17H), 7.10 (d, *J* = 8.0 Hz, 1H), 7.00 (t, *J* = 7.6 Hz, 1H), 6.75 (t, *J* = 4.0 Hz, 1H), 5.68 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 163.1, 143.0, 138.6, 137.6, 137.3, 135.2, 134.0, 132.2, 129.8, 129.1, 128.6, 128.3, 128.2, 127.9, 127.3, 126.3, 123.8, 122.5, 121.9, 121.8, 113.4, 47.6; **IR**: $\bar{\upsilon}$ = 2922, 1649, 1451, 1413, 1318, 816, 757, 692 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{32}H_{23}NaNOS^+$ $[M + Na]^+$: 492.1393, Found: 492.1398.

(3-benzhydryl-5-methyl-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4ag)

Result: Yellow solid, 74.5 mg, 78% yield; Melting point: 191.2 – 192.0 ℃

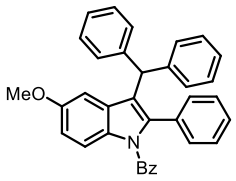


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.54 – 7.46 (m, 3H), 7.31 – 7.01 (m, 18H), 6.98 (d, *J* = 8.8 Hz, 1H), 6.89 (s, 1H), 5.60 (s, 1H), 2.23 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.8, 143.0, 137.8, 135.8, 135.5,

132.4, 132.2, 132.0, 130.1, 129.9, 129.1, 129.0, 128.2, 128.0, 127.9, 127.7, 126.3, 125.3, 122.0, 121.6, 113.7, 47.5, 21.4; **IR**: ῡ = 3054, 1679, 1471, 1347, 1301, 1021, 737, 691, 627 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO^+$ [M + H] $^+$: 478.2165, Found: 478.2166.

(3-benzhydryl-5-methoxy-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4ah)

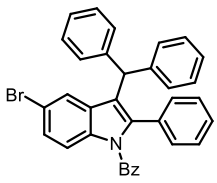
Result: Yellow solid, 79.0 mg, 80% yield; Melting point: 223.5 – 224.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.60 (d, *J* = 8.8 Hz, 1H), 7.49 (d, *J* = 7.6 Hz, 2H), 7.31 – 7.11 (m, 18H), 6.79 (d, *J* = 8.8 Hz, 1H), 6.50 (s, 1H), 5.57 (s, 1H)**,** 3.53 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.7, 155.5, 143.0, 138.3, 135.5, 132.4, 132.3, 132.2, 130.1, 129.9, 129.7, 129.1, 128.3, 128.0, 127.9, 127.7, 126.3, 122.2, 114.9, 112.8, 104.1, 55.4, 47.5; **IR**: ῡ = 3052, 1676, 1473, 1322, 1228, 941, 810, 692 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO_2^+$ [M + H] $^+$: 494.2115, Found: 494.2116.

(3-benzhydryl-5-bromo-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4ai)

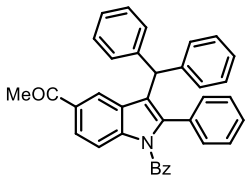
Result: Yellow solid, 87.9 mg, 81% yield; Melting point: 203.4 – 204.0 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.55 (d, *J* = 8.8 Hz, 1H), 7.48 (d, *J* = 7.2 Hz, 2H), 7.33 – 7.08 (m, 20H), 5.58 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.6, 142.5, 138.8, 136.2, 134.9, 132.6, 131.6, 130.5, 130.1, 129.9, 128.9, 128.4, 128.14, 128.09, 128.06, 126.8, 126.5, 124.1, 121.3, 115.8, 115.4, 47.3; **IR**: ῡ = 3065, 1679, 1595, 1446, 1310, 902, 772, 692, 493 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}BrNaNO^+$ [M + Na] $^+$: 564.0933, 566.0915, Found: 564.0931, 566.0920.

1-(3-benzhydryl-1-benzoyl-2-phenyl-1*H*-indol-5-yl)ethan-1-one (4aj)

Result: Yellow solid, 88.0 mg, 87% yield; Melting point: 186.9 – 187.3 ℃

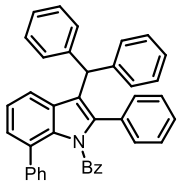


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.83 (d, *J* = 8.8 Hz, 1H), 7.66 – 7.64 (m, 2H), 7.52 (d, *J* = 8.0 Hz, 2H), 7.36 (t, *J* = 7.2 Hz, 1H), 7.31 – 7.12 (m, 17H), 5.66 (s, 1H)**,** 2.33 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 197.6, 169.6, 142.8, 139.9, 139.0, 134.7, 132.9, 132.0, 131.5, 129.98, 129.95, 129.0, 128.5, 128.4, 128.2, 128.14, 128.11, 126.6, 123.7, 123.4, 122.4, 113.8, 47.5, 26.4; **IR**: ῡ = 3063, 1673, 1301, 1232, 909, 791, 700, 658, 595 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{36}H_{28}NO_2$ $[M + H]^+$: 506.2115, Found: 506.2115.

(3-benzhydryl-2,7-diphenyl-1*H*-indol-1-yl)(phenyl)methanone (4ak)

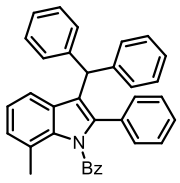
Result: Yellow solid, 89.6 mg, 83% yield; Melting point: 151.0 – 151.3 ℃

^{1}H NMR (400 MHz, $CDCl_3$): δ 7.29 – 7.20 (m, 17H), 7.08 – 6.95 (m, 9H), 6.87 (d, *J* = 7.6 Hz, 2H), 5.57 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.5, 143.2, 140.2, 139.2, 135.1, 134.9, 132.5, 131.3, 130.7, 130.0, 129.1, 129.0, 128.7, 128.41, 128.36, 128.2, 128.0, 127.9, 127.4, 126.6, 126.2, 125.4, 122.0, 120.7, 119.5, 47.7; **IR**: ῡ = 3057, 1699, 1408, 1301, 1022, 742, 689, 608 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{40}H_{30}NO^+$ $[M + H]^+$: 540.2322, Found: 540.2319.



(3-benzhydryl-7-methyl-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4al)

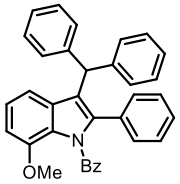
Result: Yellow solid, 66.9 mg, 70% yield; Melting point: 181.3 – 181.9 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.50 (d, *J* = 7.6 Hz, 2H), 7.35 (t, *J* = 7.6 Hz, 1H), 7.27 – 7.15 (m, 12H), 7.11 – 7.08 (m, 5H), 7.05 – 6.96 (m, 3H), 5.49 (s, 1H), 2.25 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 171.4, 143.3, 137.9, 136.5, 135.6, 133.3, 131.6, 130.7, 130.3, 129.1, 128.8, 128.2, 128.1, 127.9, 126.3, 126.2, 122.9, 122.0, 119.63, 119.55, 47.7, 20.8; **IR**: ῡ = 3068, 1691, 1446, 1301, 907, 727, 696 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{35}H_{28}NO^+$ $[M + H]^+$: 478.2165, Found: 478.2171.

(3-benzhydryl-7-methoxy-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4am)

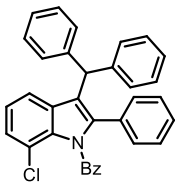
Result: Yellow solid, 61.2 mg, 62% yield; Melting point: 203.0 – 206.9 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.57 (d, *J* = 7.6 Hz, 2H), 7.45 (t, *J* = 7.2 Hz, 1H), 7.32 – 7.17 (m, 17H), 6.92 (t, *J* = 8.0 Hz, 1H), 6.76 (d, *J* = 8.0 Hz, 1H), 6.56 (d, *J* = 7.6 Hz, 1H), 5.54 (s, 1H), 3.40 (s, 3H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.8, 146.5, 143.4, 138.7, 136.2, 132.9, 131.3, 130.5, 129.8, 129.4, 129.1, 128.3, 128.22, 128.18, 128.0, 127.1, 126.1, 122.1, 119.6, 114.4, 104.8, 55.0, 47.7; **IR**: ῡ = 3061, 1699, 1492, 1320, 1251, 1029, 773, 692, 616 cm^{-1}; **HRMS (FT-ICR-MS ESI$^+$)** calculated for $C_{35}H_{28}NO_2^+$ $[M + H]^+$: 494.2115, Found: 494.2117.

(3-benzhydryl-7-chloro-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4an)

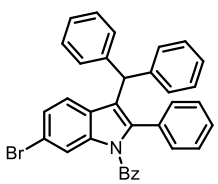
Result: Yellow solid, 59.8 mg, 60% yield; Melting point: 212.0 – 215.8 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 7.51 (d, *J* = 7.6 Hz, 2H), 7.43 (t, *J* = 7.2 Hz, 1H), 7.26 – 7.12 (m, 18H), 7.08 (d, *J* = 8.0 Hz, 1H), 6.95 (t, *J* = 8.0 Hz, 1H), 5.51 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 170.8, 143.0, 139.3, 135.4, 133.9, 133.8, 130.7, 130.6, 130.5, 130.1, 129.0, 128.6, 128.5, 128.3, 128.0, 126.3, 124.3, 122.3, 120.2, 119.1, 118.0, 47.6; **IR**: ῡ = 3062, 1699, 1595, 1419, 1236, 1021, 735, 695, 593 cm^{-1}; **HRMS (FT-ICR-MS ESI$^+$)** calculated for $C_{34}H_{24}ClNaNO^+$ $[M + Na]^+$: 520.1439, Found: 520.1443.

(3-benzhydryl-6-bromo-2-phenyl-1*H*-indol-1-yl)(phenyl)methanone (4ao)

Result: Yellow solid, 81.4 mg, 71% yield; Melting point: 183.9 – 188.7 ℃

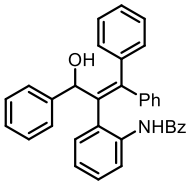


^{1}H NMR (400 MHz, $CDCl_3$): δ 7.96 (s, 1H), 7.46 (d, *J* = 7.6 Hz, 2H), 7.33 – 7.20 (m, 7H), 7.18 – 7.12(m, 12H), 6.94 (d, *J* = 8.4 Hz, 1H), 5.58 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 169.7, 142.7, 138.2, 138.1, 134.8, 132.6, 131.7, 130.1, 129.9, 129.0, 128.4, 128.10, 128.07, 127.7, 127.6, 126.5, 126.0, 122.8, 121.8, 117.8, 117.1, 47.3; **IR**: ῡ = 3052, 1679,

1446, 1305, 1021, 898, 773, 689, 661 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{24}BrNaNO^+$ $[M + Na]^+$: 564.0933, 566.0915, Found: 564.0932, 566.0917.

_N_-(2-(3-hydroxy-1,1,3-triphenylprop-1-en-2-yl)phenyl)benzamide (5a)

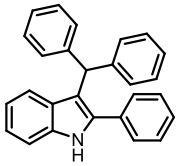
Result: Yellow solid, 40.5 mg, 84% yield; Melting point: 205.1 –206.3 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 9.20 (s, 1H), 8.02 (d, *J* = 7.2 Hz, 2H), 7.79 (d, *J* = 8.0 Hz, 1H), 7.57 – 7.47 (m, 3H), 7.41 –7.15 (m, 10H), 7.09 (t, *J* = 8.0 Hz, 1H), 6.96 – 6.95 (m, 3H), 6.85 – 6.80 (m, 2H), 6.72 (t, *J* = 7.6 Hz, 1H), 6.31 (d, *J* = 7.2 Hz, 1H), 6.04 (s, 1H), 3.48 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 165.3, 145.3, 141.9, 141.4, 141.1, 136.9, 136.5, 134.7, 132.2, 131.7, 130.4, 129.3, 128.9, 128.7, 128.6, 128.0, 127.8, 127.5, 127.34, 127.25, 126.9, 126.0, 123.7, 123.0, 74.6; **IR**: ῡ = 3054, 1665, 1295, 1233, 920, 805, 700, 661, 591 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{34}H_{28}NO_2$ $[M + H]^+$: 504.1934, Found: 504.1938.

3-benzhydryl-2-phenyl-1*H*-indole (6a)

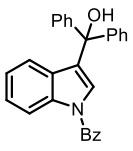
Result: Yellow solid, 66.1 mg, 92% yield; Melting point: 175.6 – 177.1 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.00 (s, 1H), 7.42 – 7.30 (m, 6H), 7.23 – 7.15 (m, 10H), 7.13 – 7.05 (m, 2H), 6.88 (t, *J* = 7.2 Hz, 1H), 5.81 (s, 1H); **^{13}C NMR** (100 MHz, $CDCl_3$): δ 144.1, 136.1, 135.7, 132.9, 129.2, 128.7, 128.5, 128.4, 128.2, 128.0, 126.0, 121.9, 121.5, 119.6, 115.1, 110.8, 47.7; **IR**: ῡ = 3064, 1665, 1295, 1226, 908, 792, 699, 664, 587 cm^{-1}; **HRMS** (**FT-ICR-MS ESI$^+$**) calculated for $C_{27}H_{22}N$ $[M + H]^+$: 360.1747, Found: 360.1753.

(3-(hydroxydiphenylmethyl)-1*H*-indol-1-yl)(phenyl)methanone (7)

Result: Yellow solid, 50.0 mg, 62% yield; Melting point: 182.2 – 182.4 ℃



^{1}H NMR (400 MHz, $CDCl_3$): δ 8.31 (d, *J* = 8.0 Hz, 1H), 7.65 (d, *J* = 8.0 Hz, 2H), 7.53 (t, *J* = 7.6 Hz, 1H), 7.45 – 7.38 (m, 6H), 7.34 – 7.24 (m, 8H), 7.14 (t, *J* = 7.6 Hz, 1H), 6.87 (s, 1H), 2.96 (s, 1H); **^{13}C NMR** (100 MHz,

$CDCl_3$): δ 168.5, 145.2, 137.1, 134.1, 132.1, 129.3, 129.0, 128.44, 128.35, 128.1, 127.5, 127.3, 127.1, 125.0, 123.8, 121.9, 116.4, 78.4; **IR**: ῡ = 3056, 1647, 1532, 1423, 1301, 749, 692, 582 cm^{-1}; **HRMS** (**FT-ICR-MS ESI**$^+$) calculated for $C_{28}H_{22}NO_2^+$ $[M + H]^+$: 404.1646, Found: 404.1642.

X-ray crystallographic analysis of 3a and 4a

The single crystal of **3a** and **4a** was recrystallized from dichloromethane and petroleum ether. The supplementary crystallographic data for the structure of **3a** and **4a** has been deposited at the Cambridge Crystallographic Data Centre as CCDC 2467777 and CCDC 2467778.

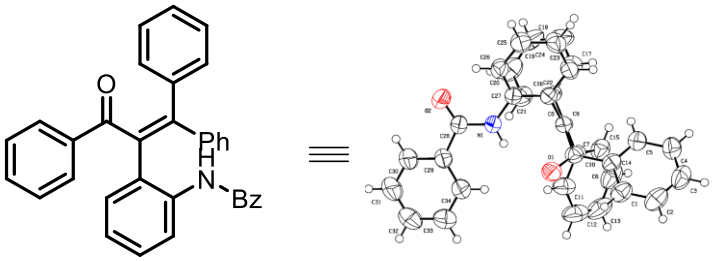


Fig. S1 ORTEP drawings of 3a, probability level = 50%

Table S5. Crystal data and structure refinement for **3a**

CCDC	2467777
Empirical formula	$C_{34}H_{25}NO_2$
Formula weight	479.55
Temperature/K	293(2)
Crystal system	Monoclinic
Space group	P21/c
a/Å	8.9551(3)
b/Å	15.6619(4)
c/Å	19.0529(6)
α/°	90.00
β/°	96.617(3)

γ/°	90.00
Volume/Å^3	2654.44(14)
Z	4
ρcalcg/cm^3	1.200
μ/mm^{-1}	0.581
F(000)	1008.0
Radiation	CuKα (λ = 1.54184)
2Θ range for data collection/°	7.32 to 153.52
Index ranges	-11 ≤ h ≤ 11, -19 ≤ k ≤ 16, -23 ≤ l ≤ 22
Reflections collected	33817
Independent reflections	5482 [R_{int} = 0.0642, R_{sigma} = 0.0391]
Data/restraints/parameters	5482/0/335
Goodness-of-fit on F^2	1.032
Final R indexes [I>=2σ (I)]	R_1 = 0.0471, wR_2 = 0.1293
Final R indexes [all data]	R_1 = 0.0630, wR_2 = 0.1428
Largest diff. peak/hole / e Å^{-3}	0.18/-0.20

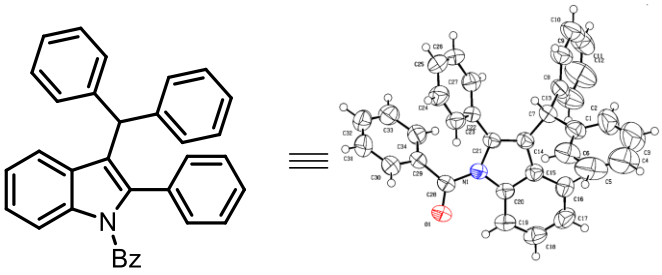


Fig. S2 ORTEP drawings of 4a, probability level = 50%

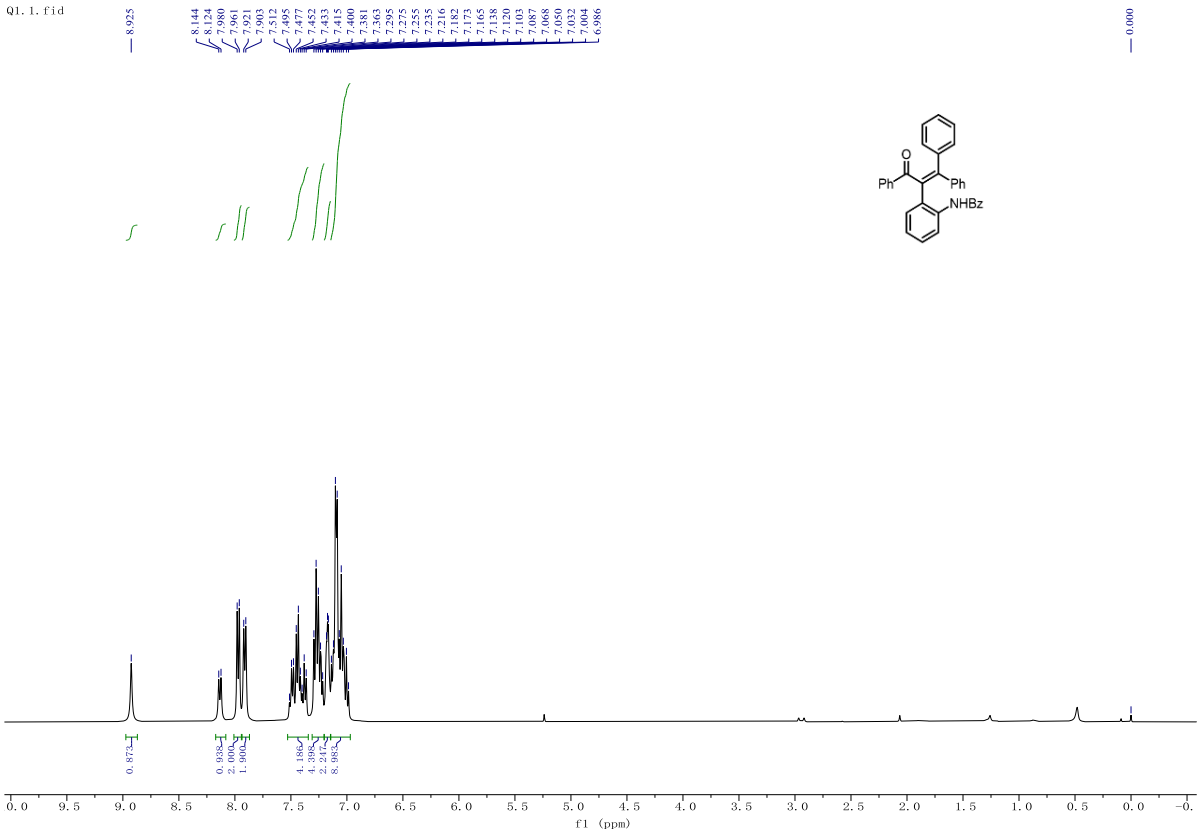
Table S6. Crystal data and structure refinement for **4a**

CCDC	2467778
Empirical formula	$C_{34}H_{25}NO$
Formula weight	463.55
Temperature/K	307(2)
Crystal system	Monoclinic
Space group	P21/n

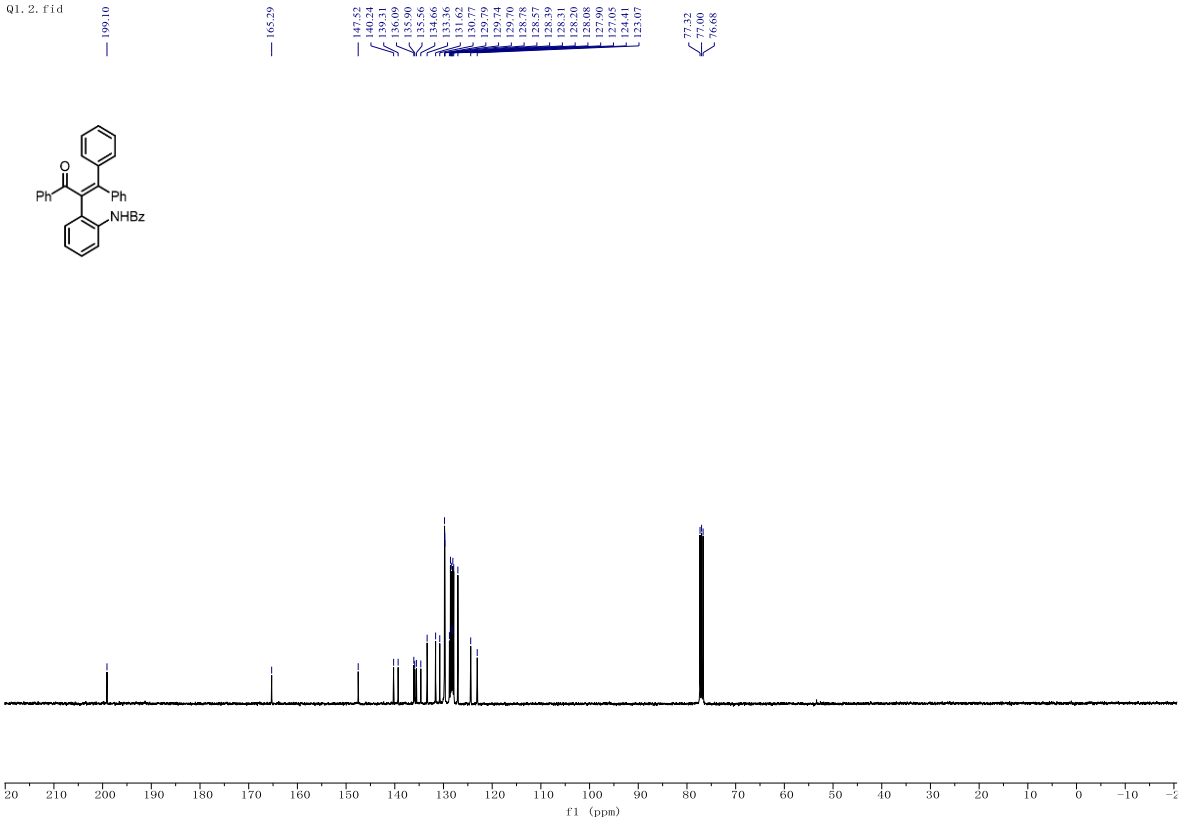
a/Å	15.829(5)
b/Å	8.280(3)
c/Å	20.368(6)
α/°	90.00
β/°	106.189(11)
γ/°	90.00
Volume/$Å^3$	2563.6(13)
Z	4
ρcalcg/cm^3	1.201
μ/mm^{-1}	0.072
F(000)	976.0
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	4.16 to 55.12
Index ranges	$-20 \leq h \leq 20$, $-10 \leq k \leq 10$, $-26 \leq l \leq 26$
Reflections collected	95053
Independent reflections	5920 [R_{int} = 0.1437, R_{sigma} = 0.0427]
Data/restraints/parameters	5920/0/321
Goodness-of-fit on F^2	1.024
Final R indexes [I>=2σ (I)]	R_1 = 0.0554, wR_2 = 0.1400
Final R indexes [all data]	R_1 = 0.0998, wR_2 = 0.1760
Largest diff. peak/hole / e $Å^{-3}$	0.26/-0.34

Copies of ^{1}H and ^{13}C NMR Spectra

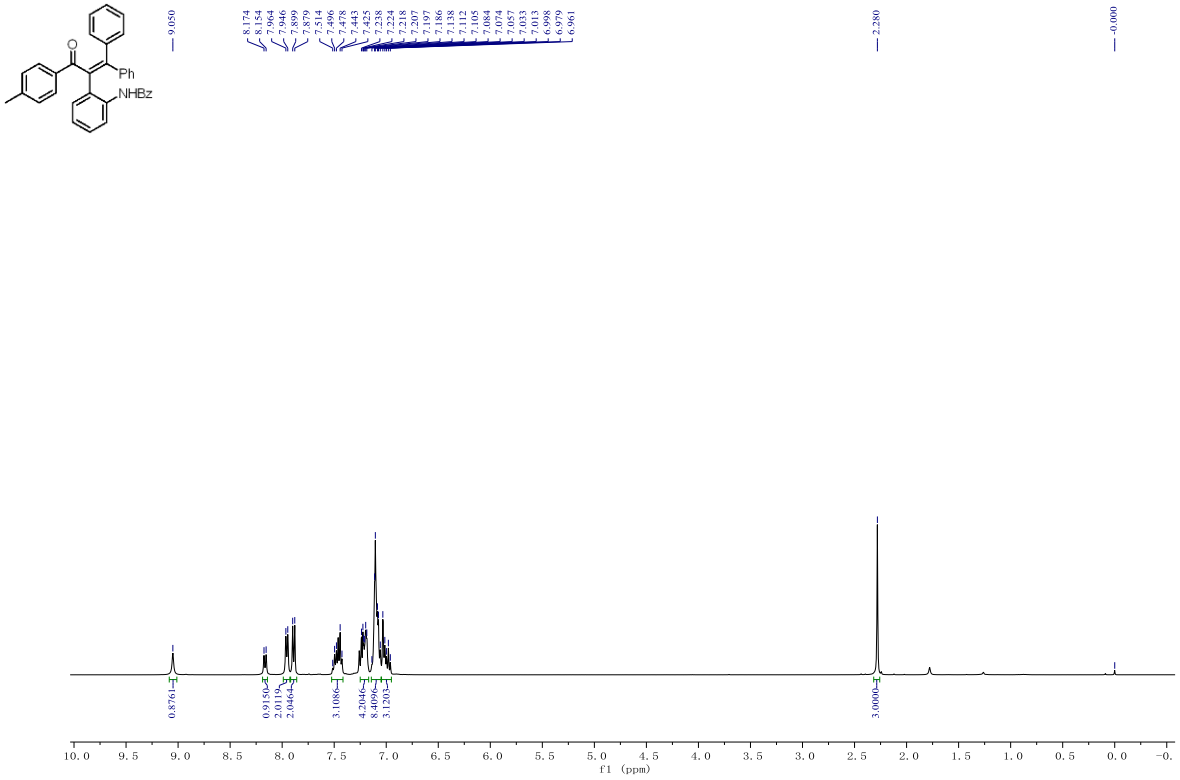
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3a



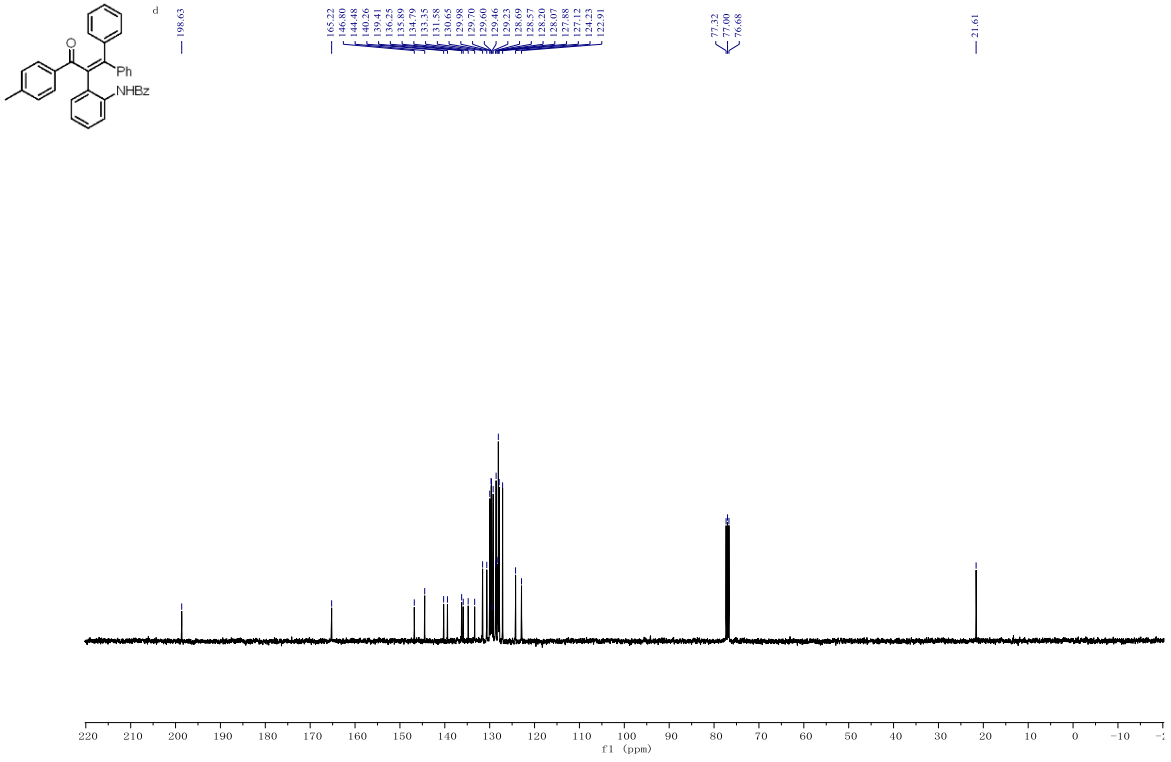
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3a



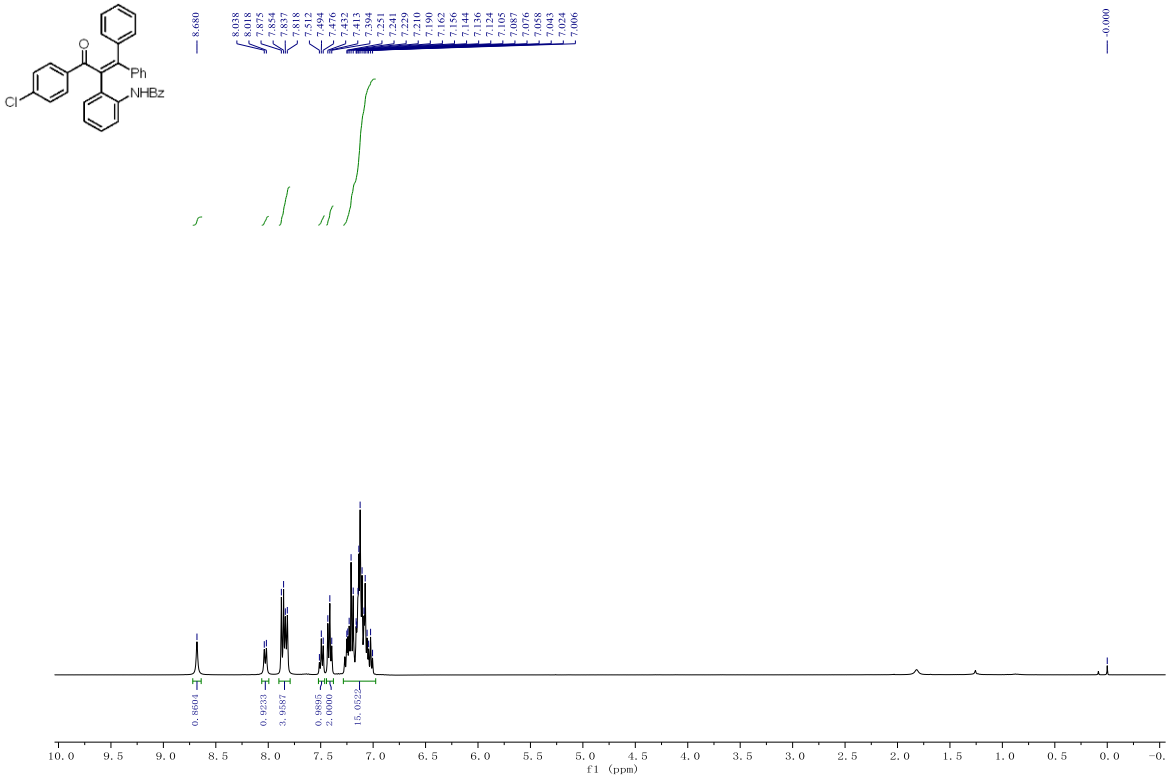
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3b



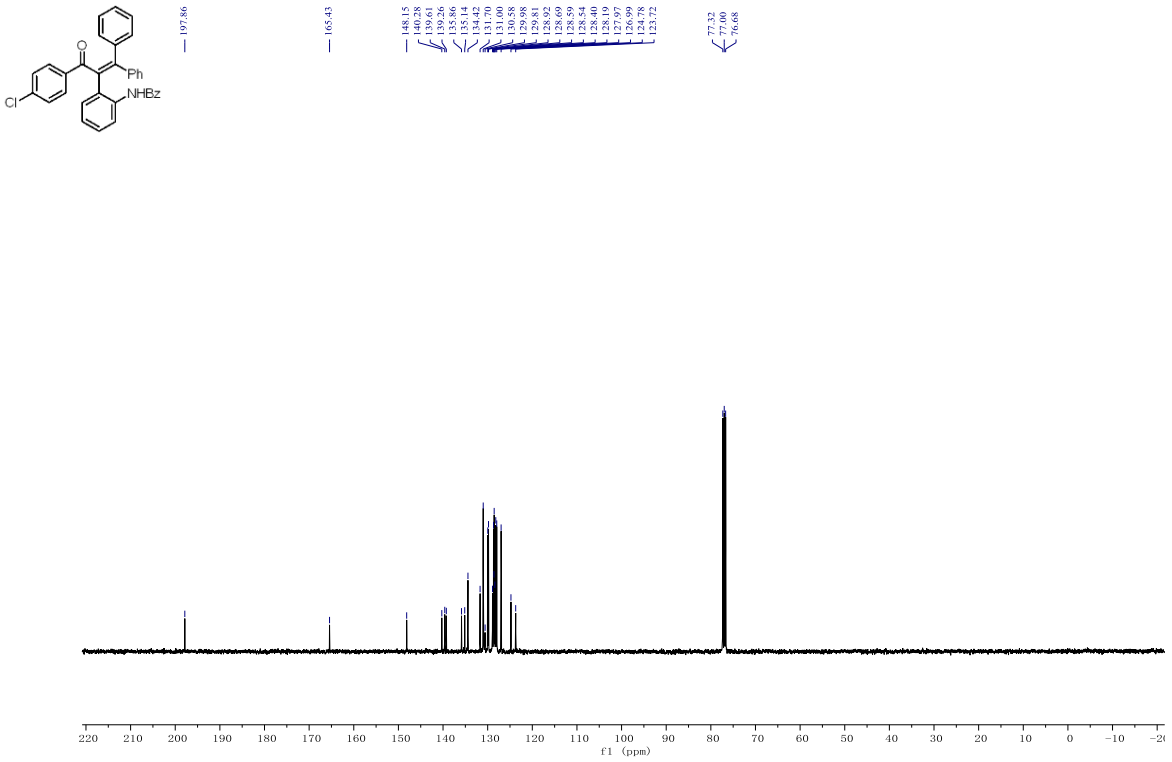
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3b



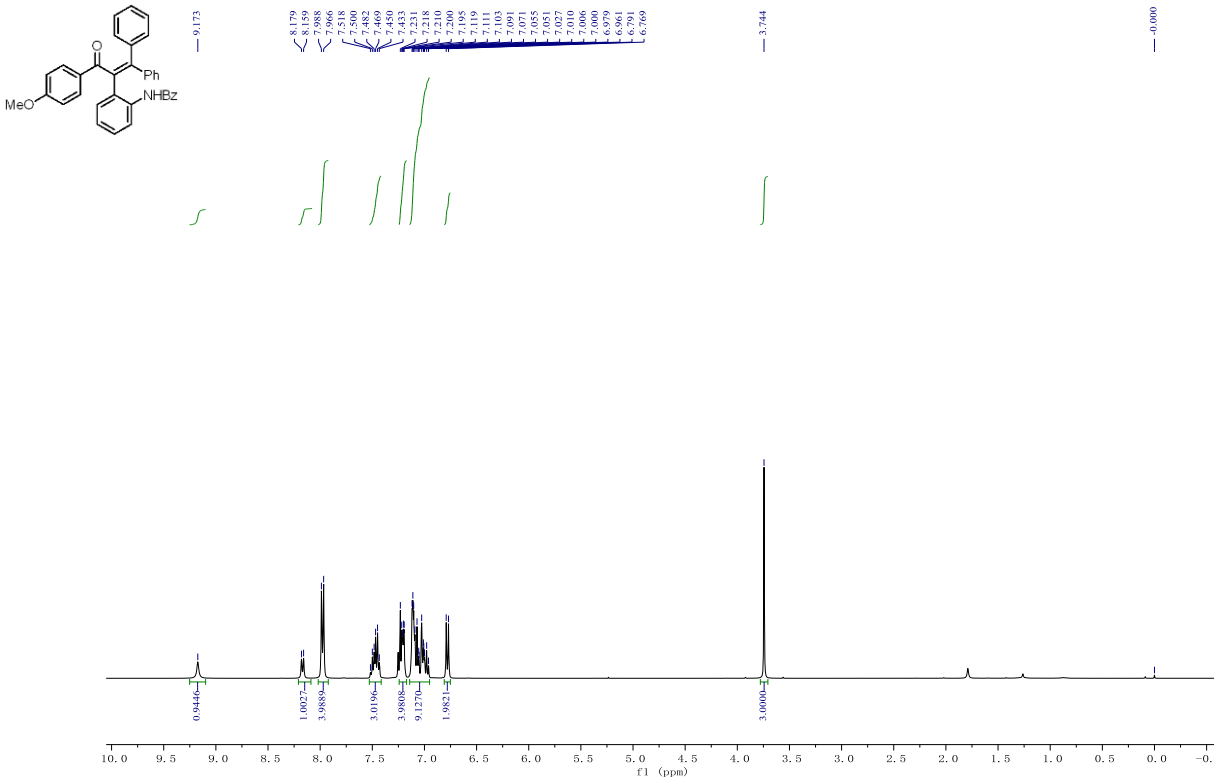
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3c



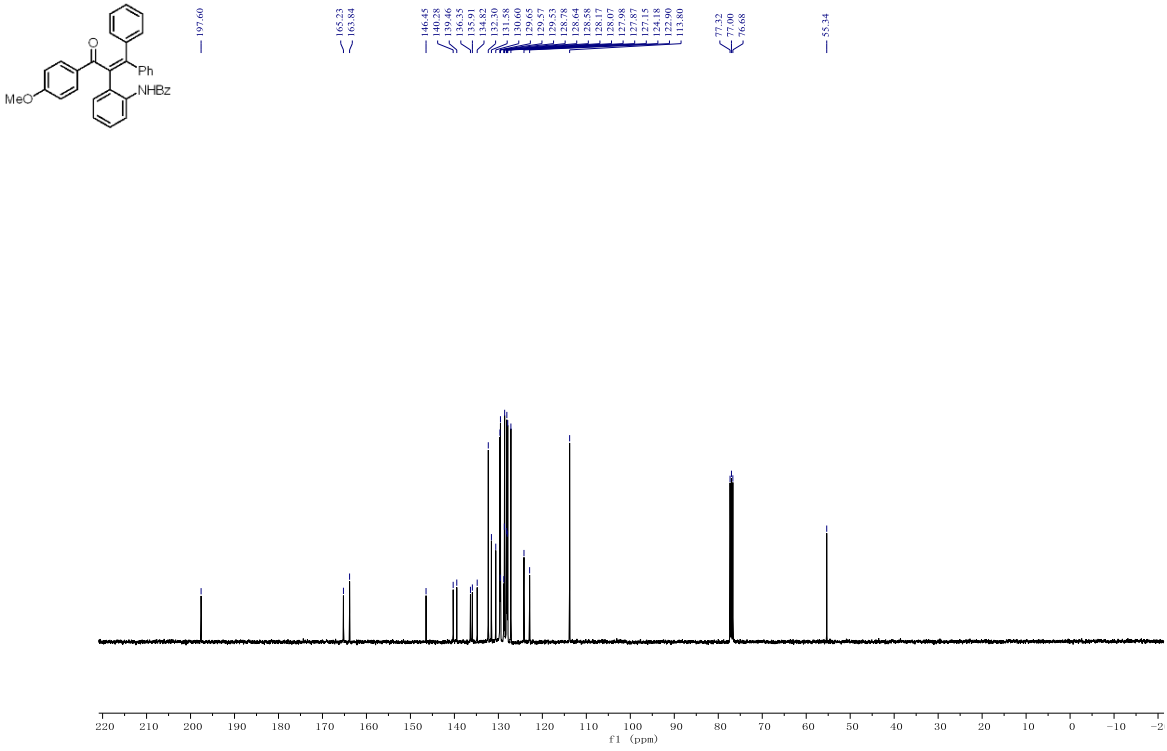
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3c



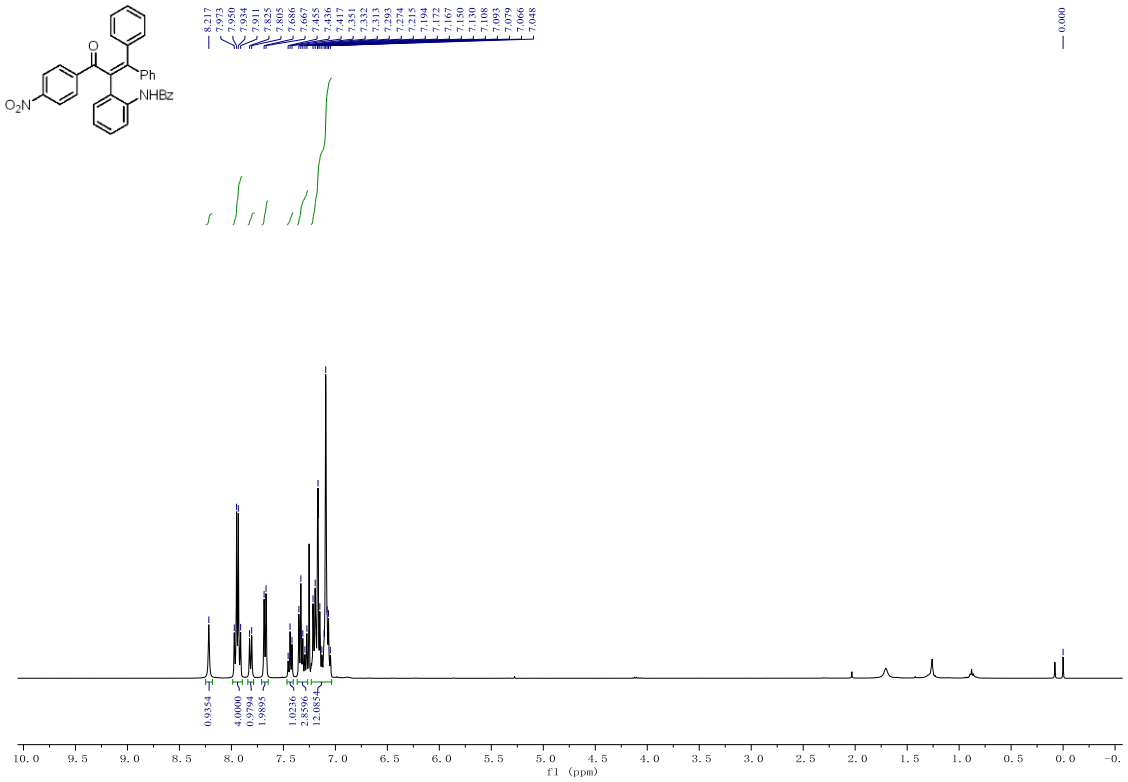
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3d



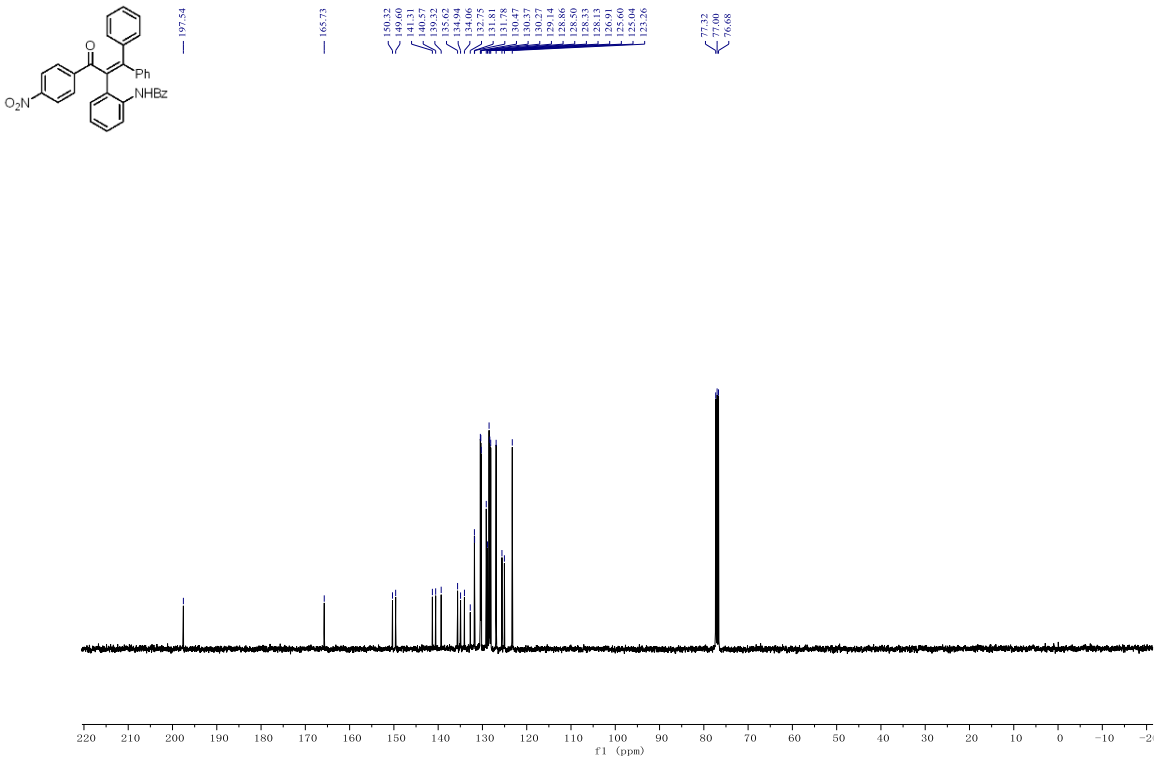
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3d



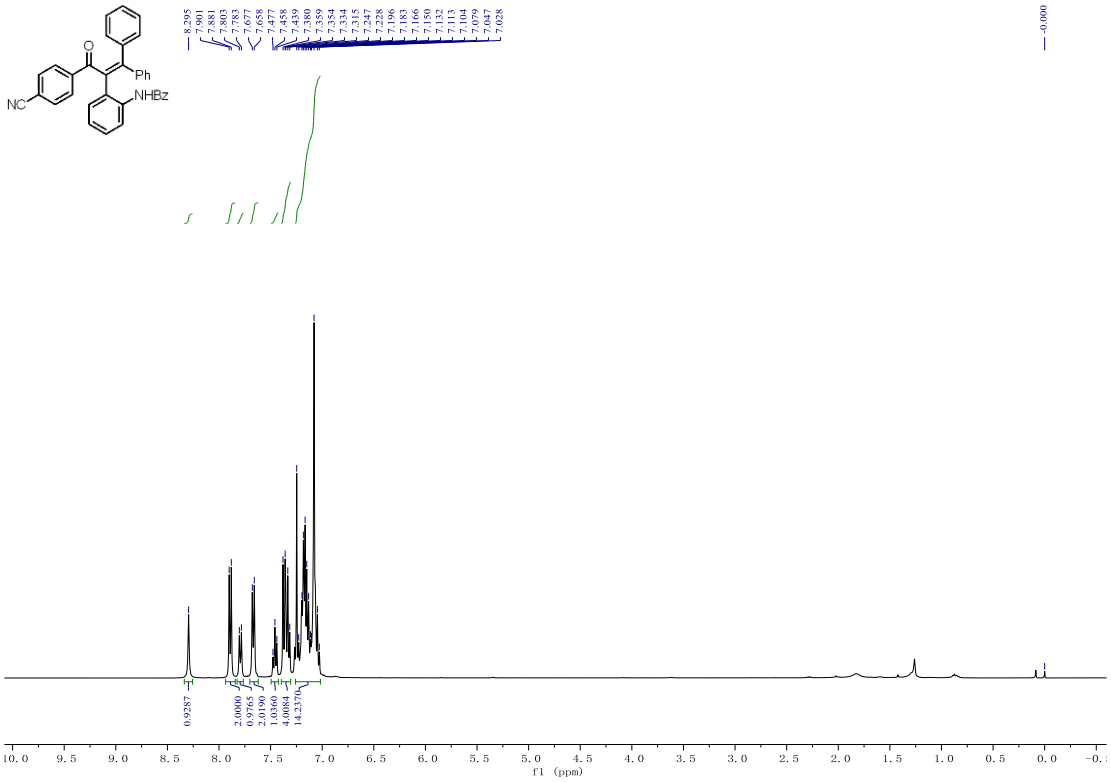
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3e



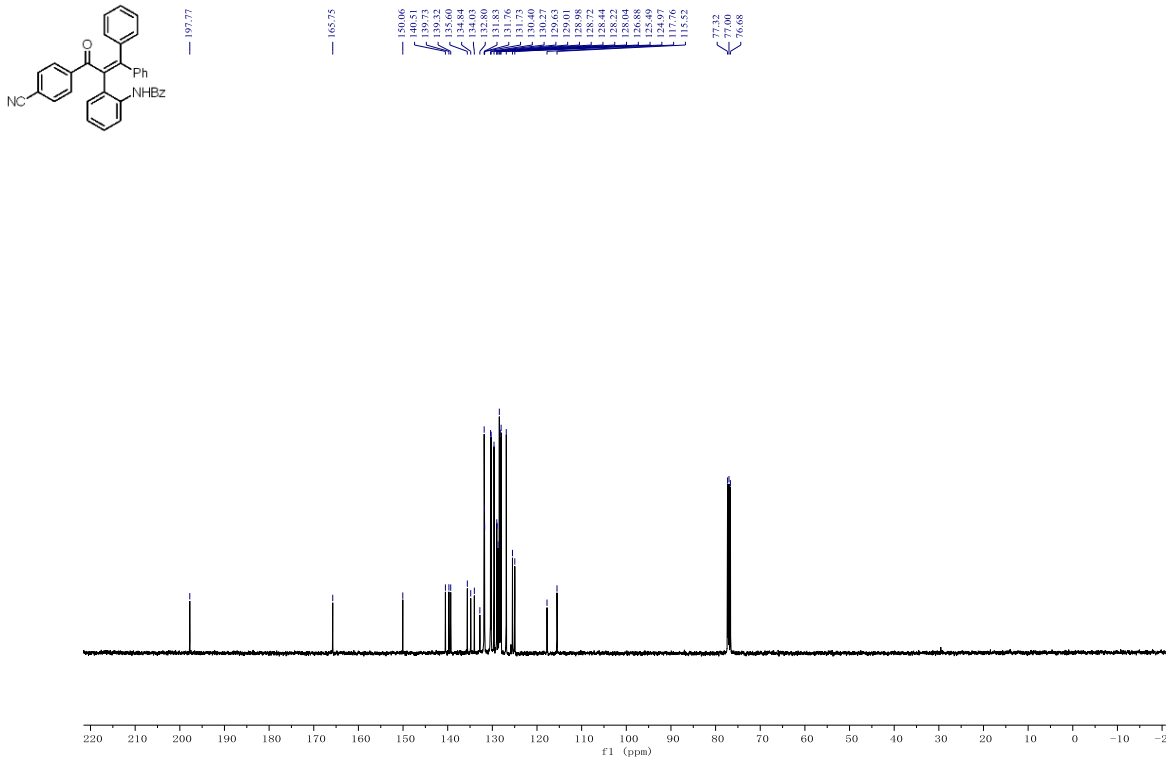
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3e



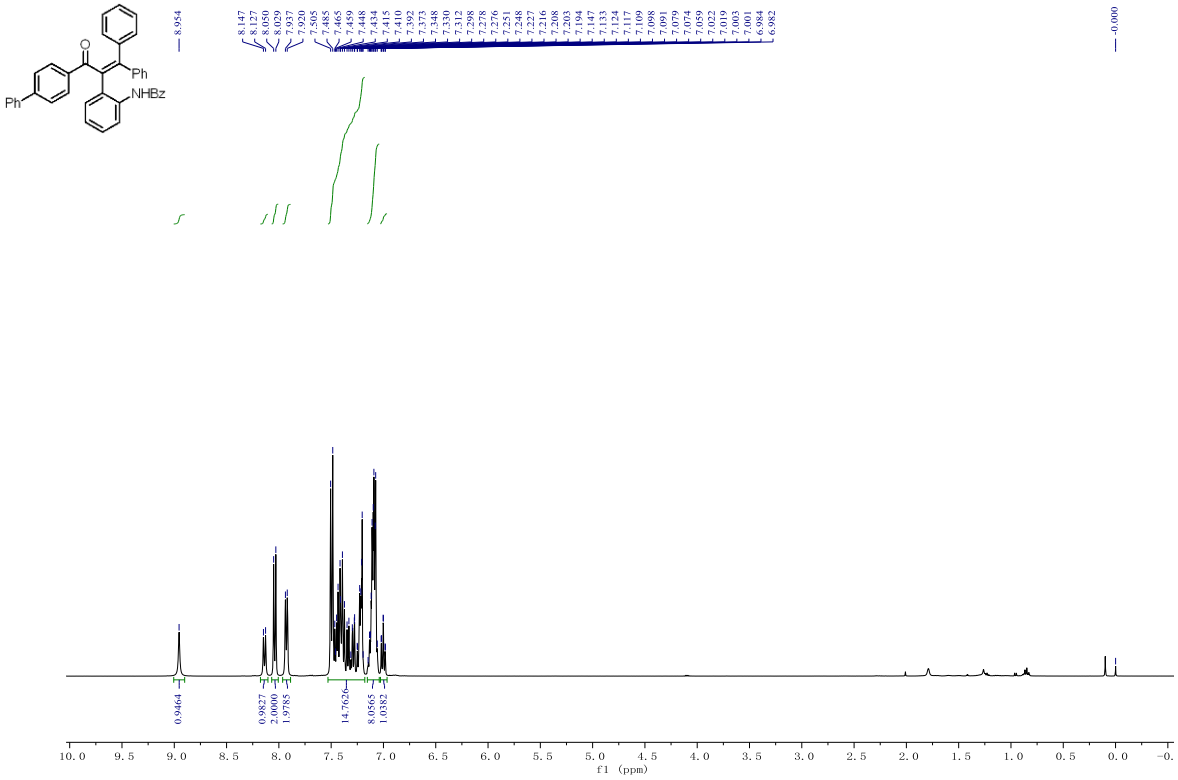
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3f



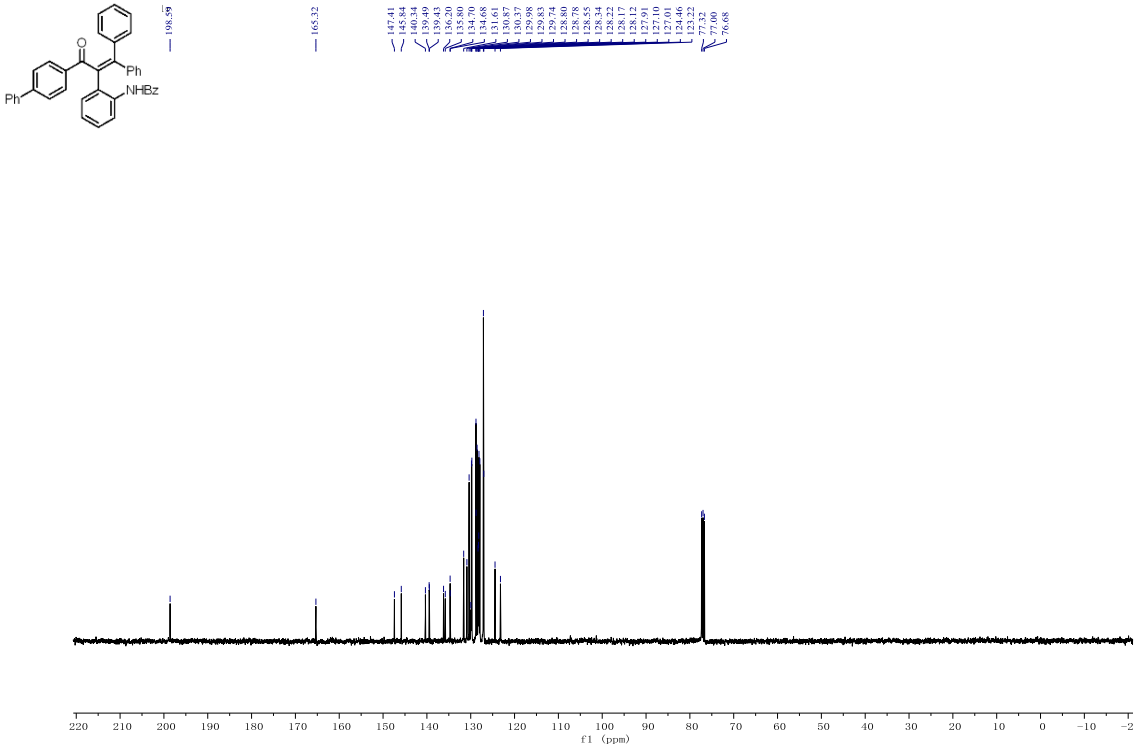
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3f



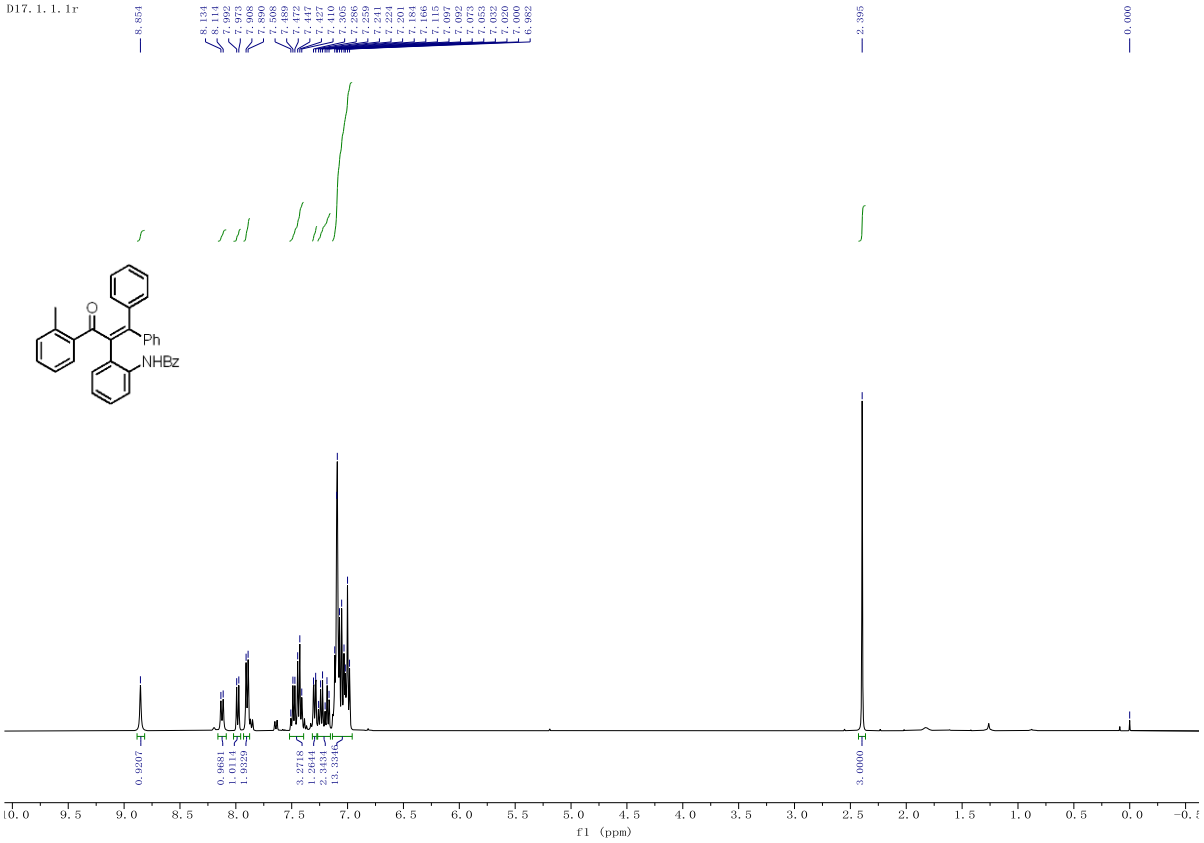
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3g



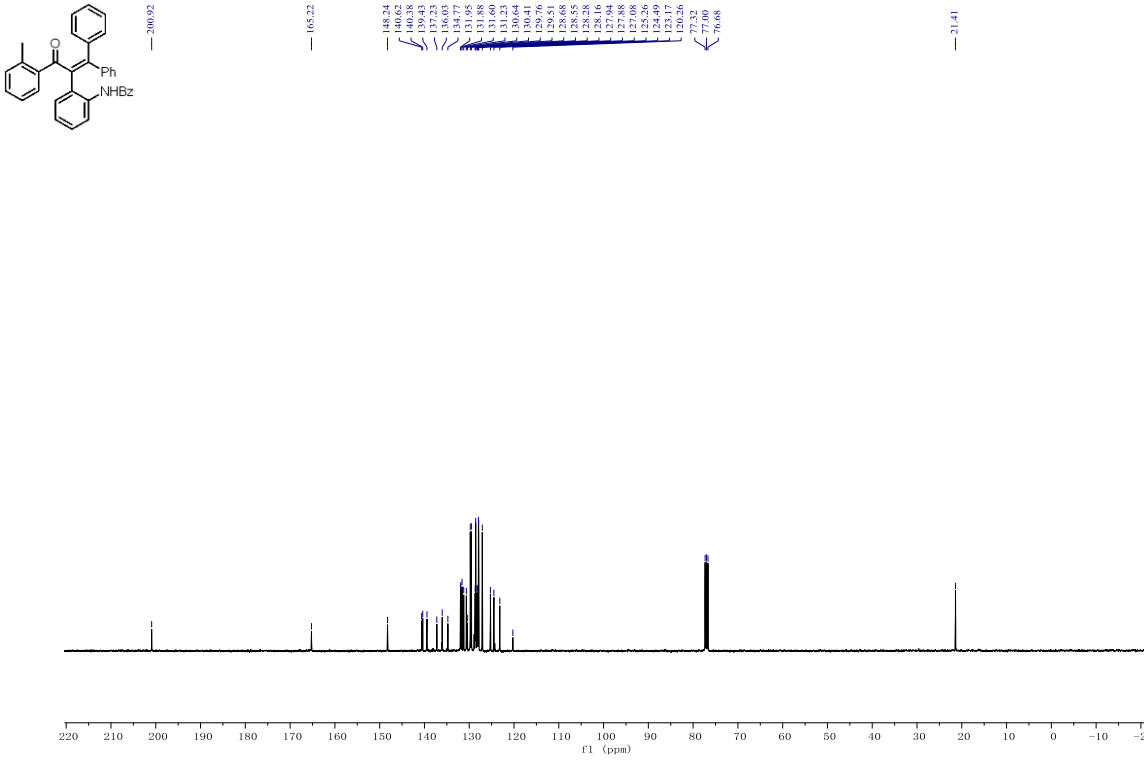
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3g



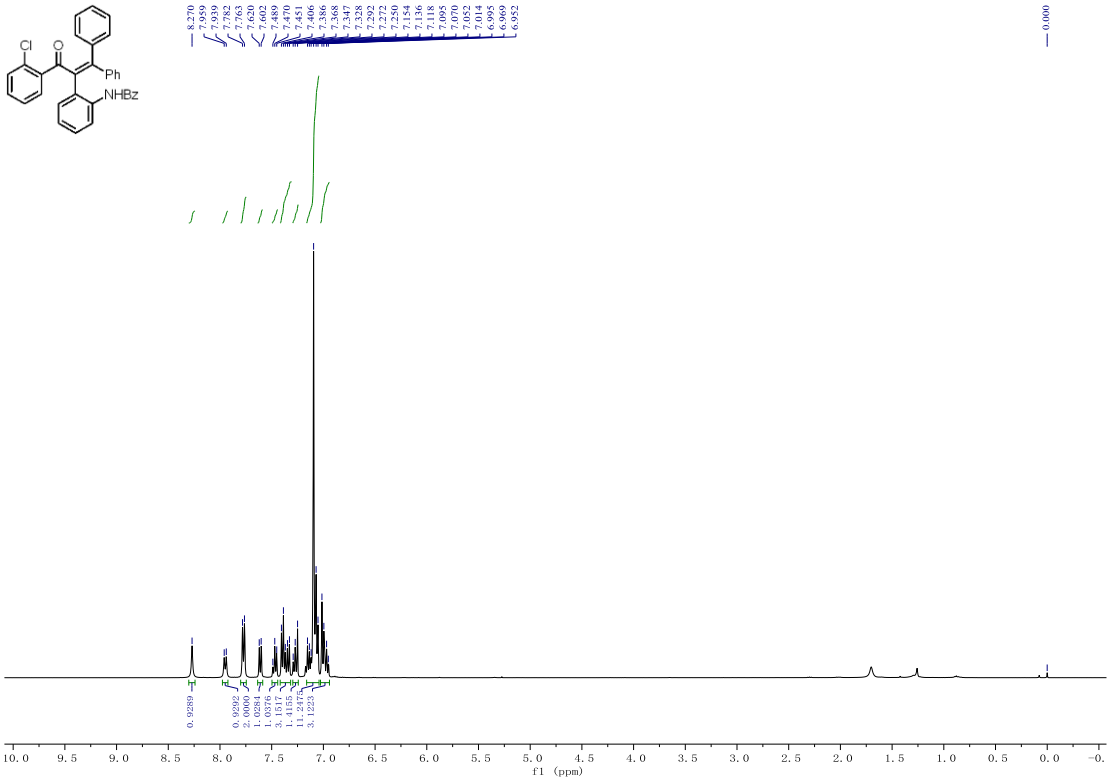
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3h



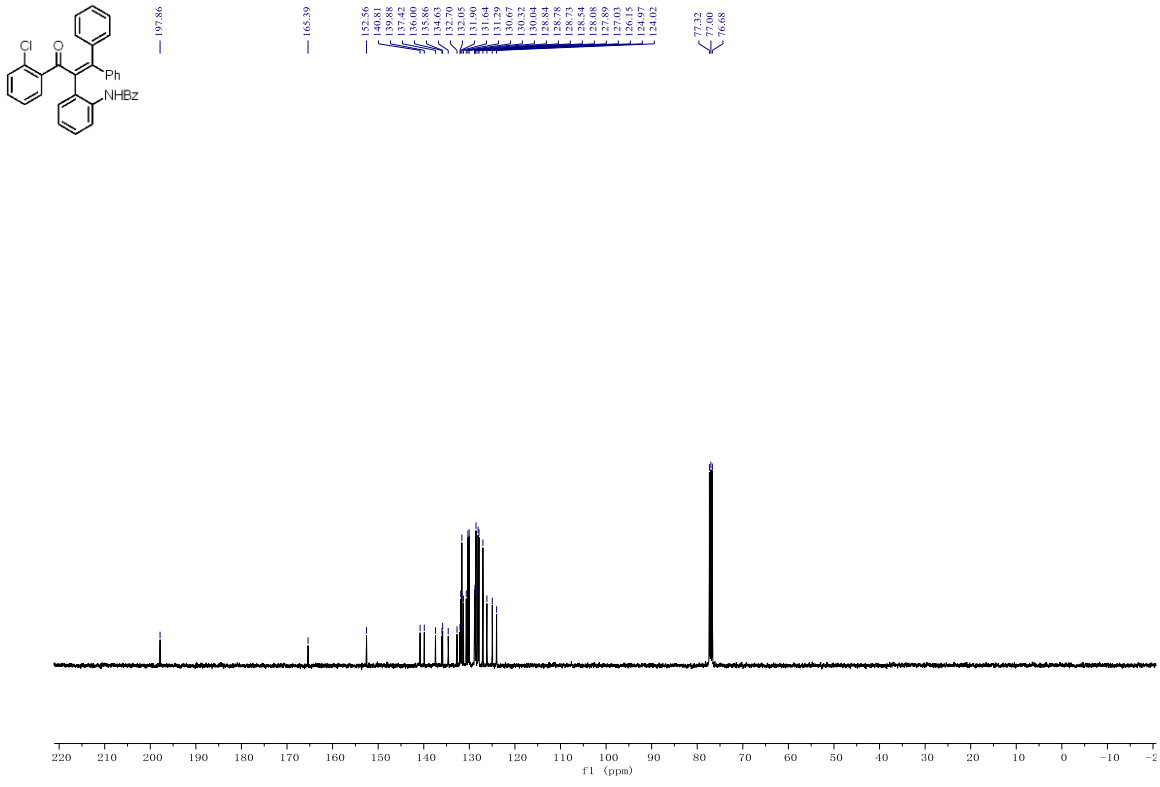
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3h



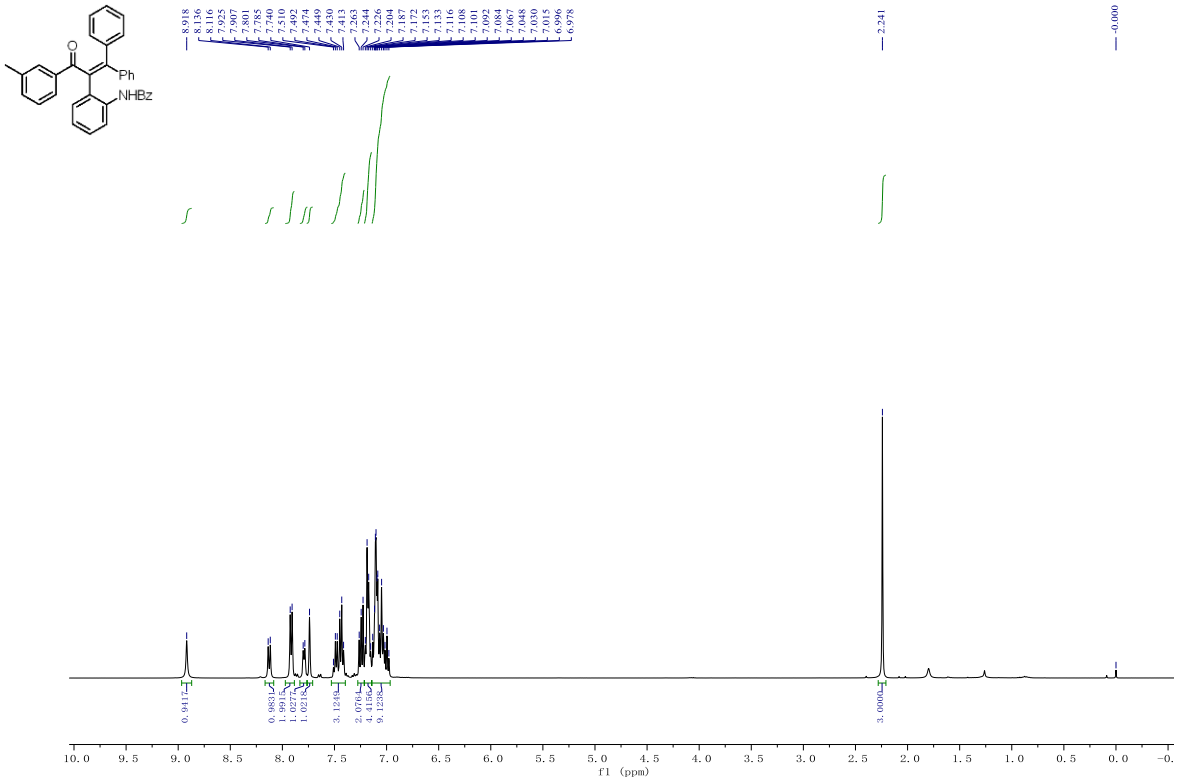
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3i



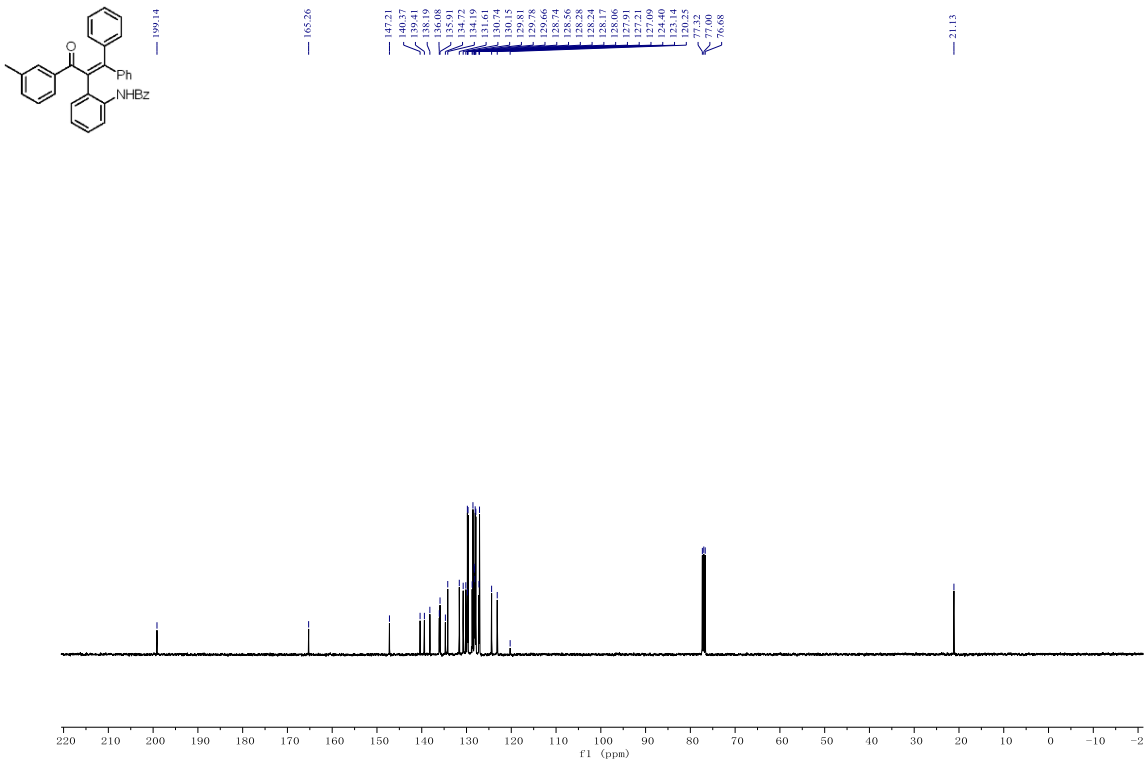
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3i



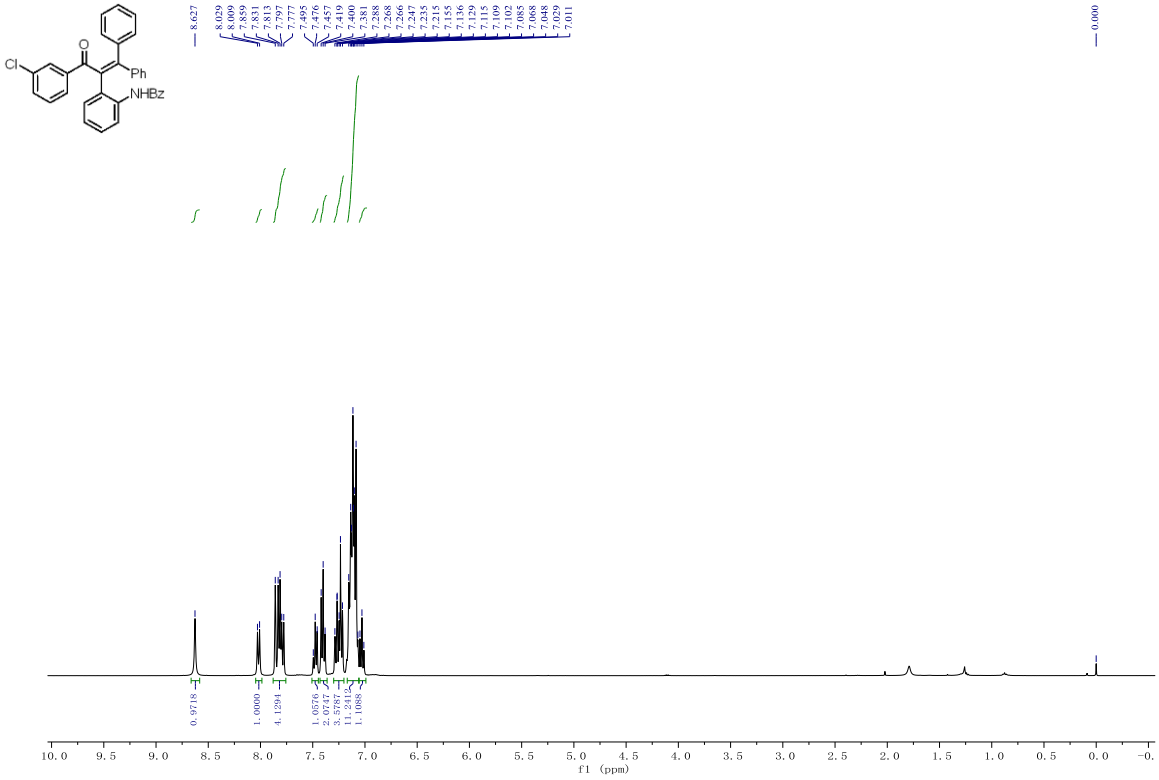
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3j



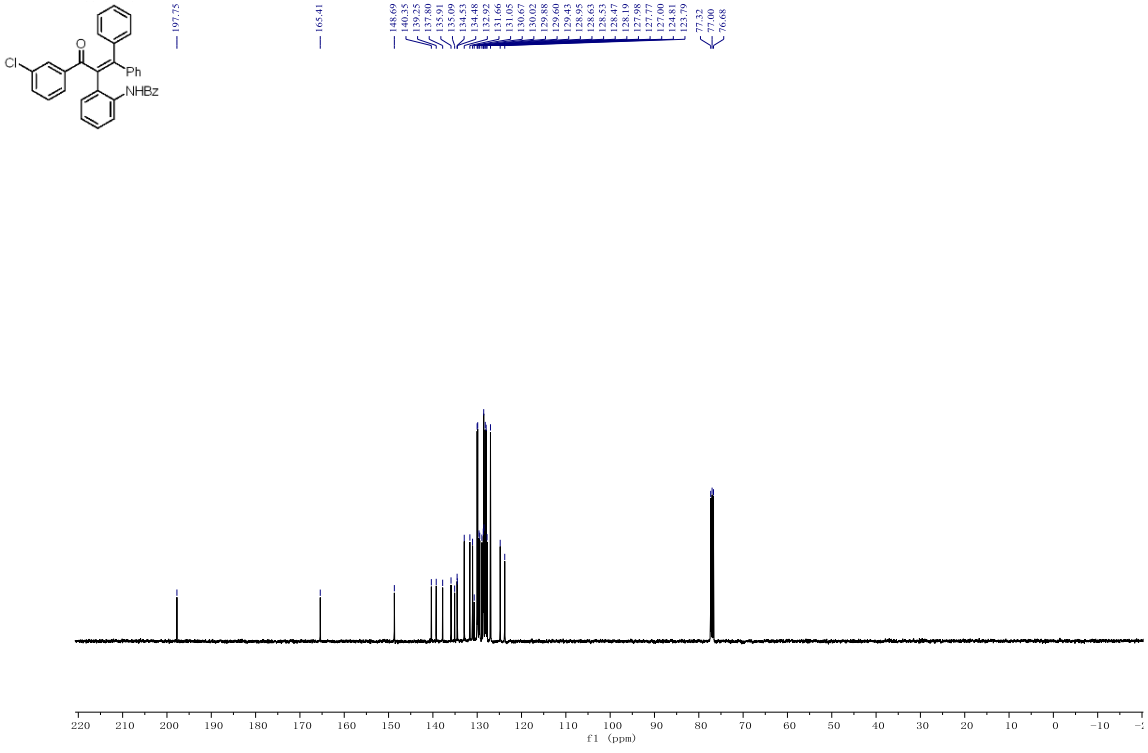
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3j



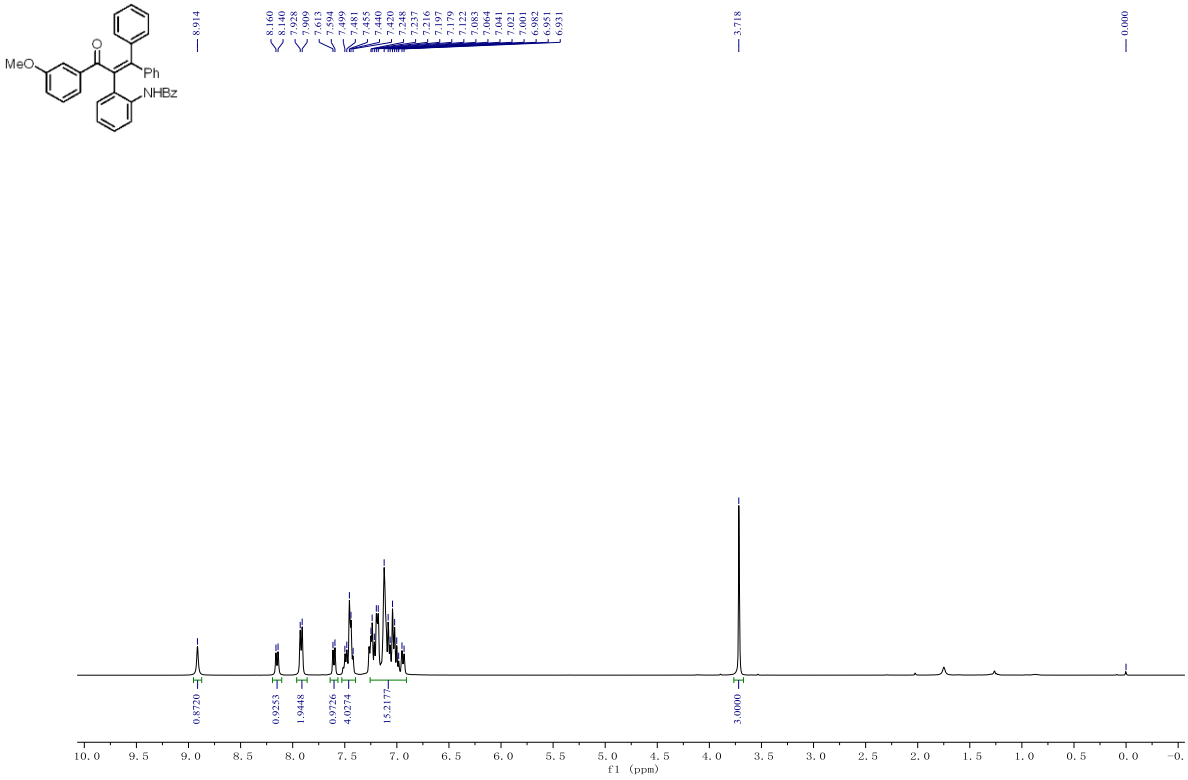
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3k



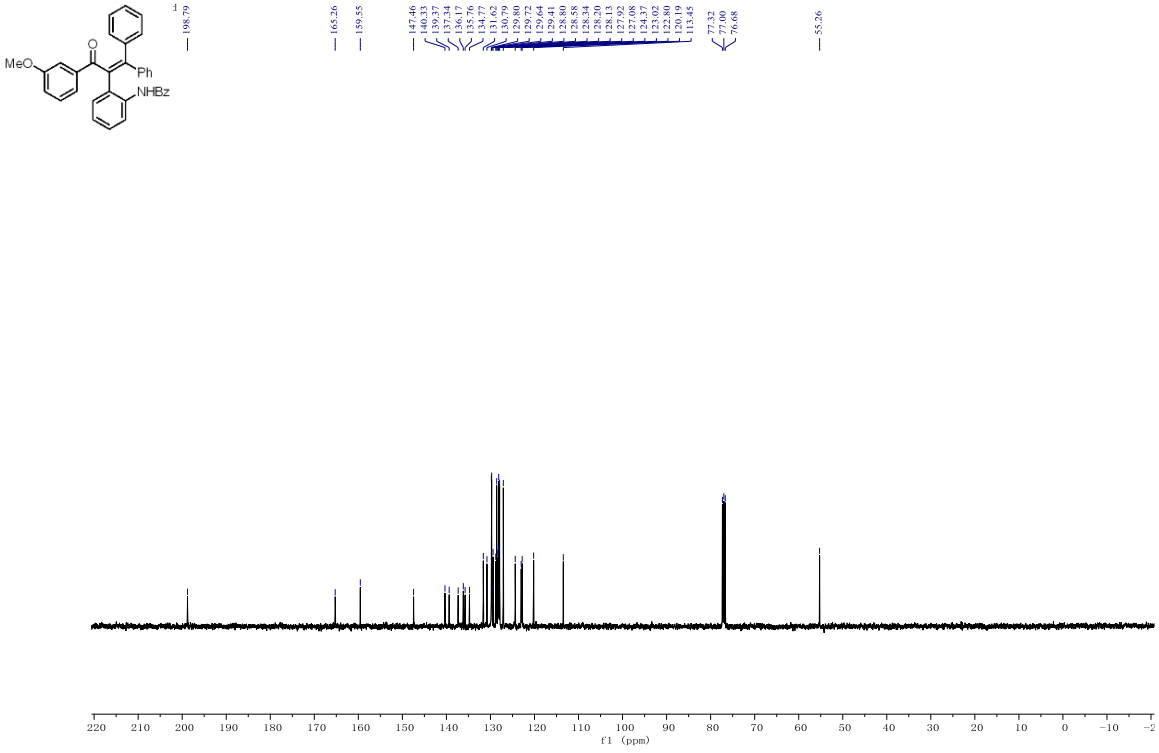
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3k



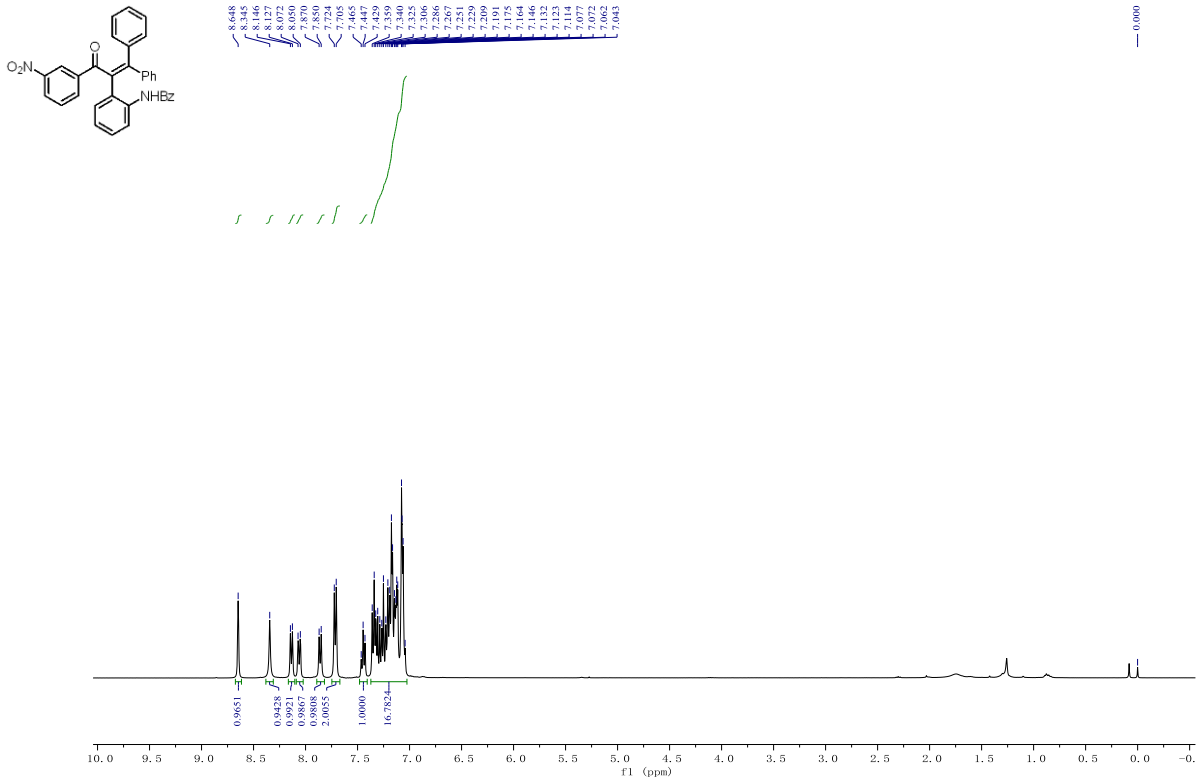
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3l



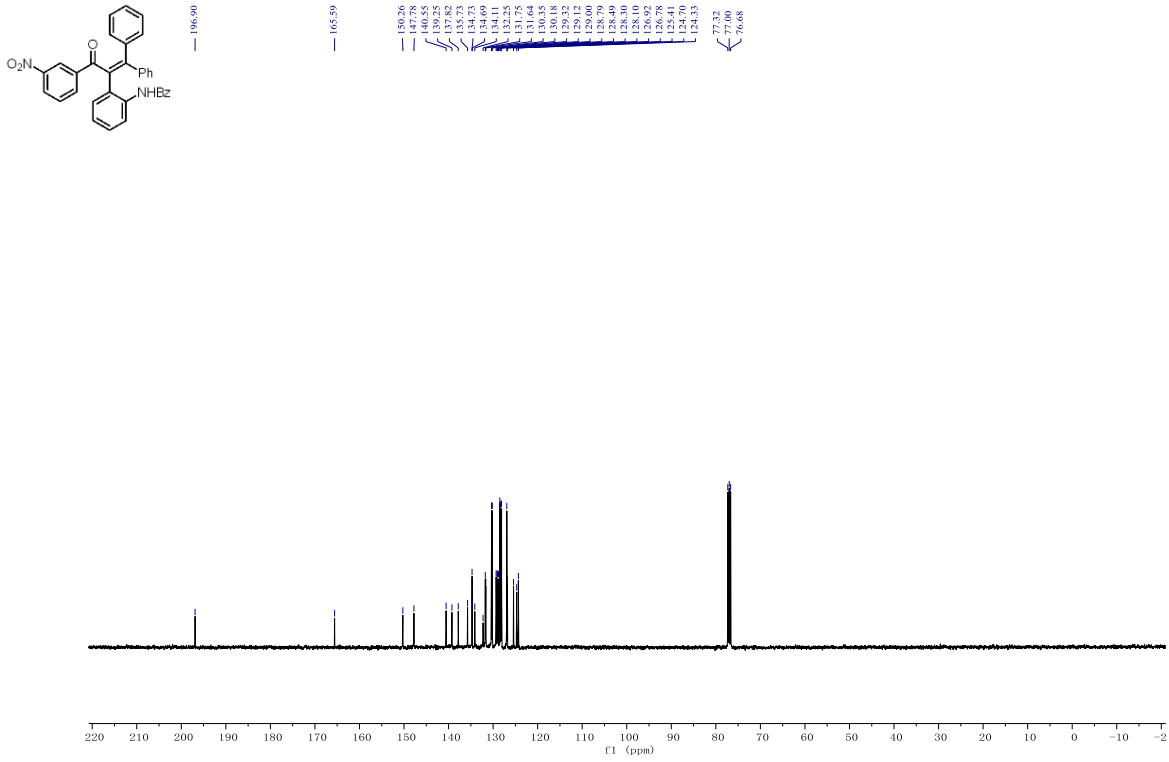
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3l



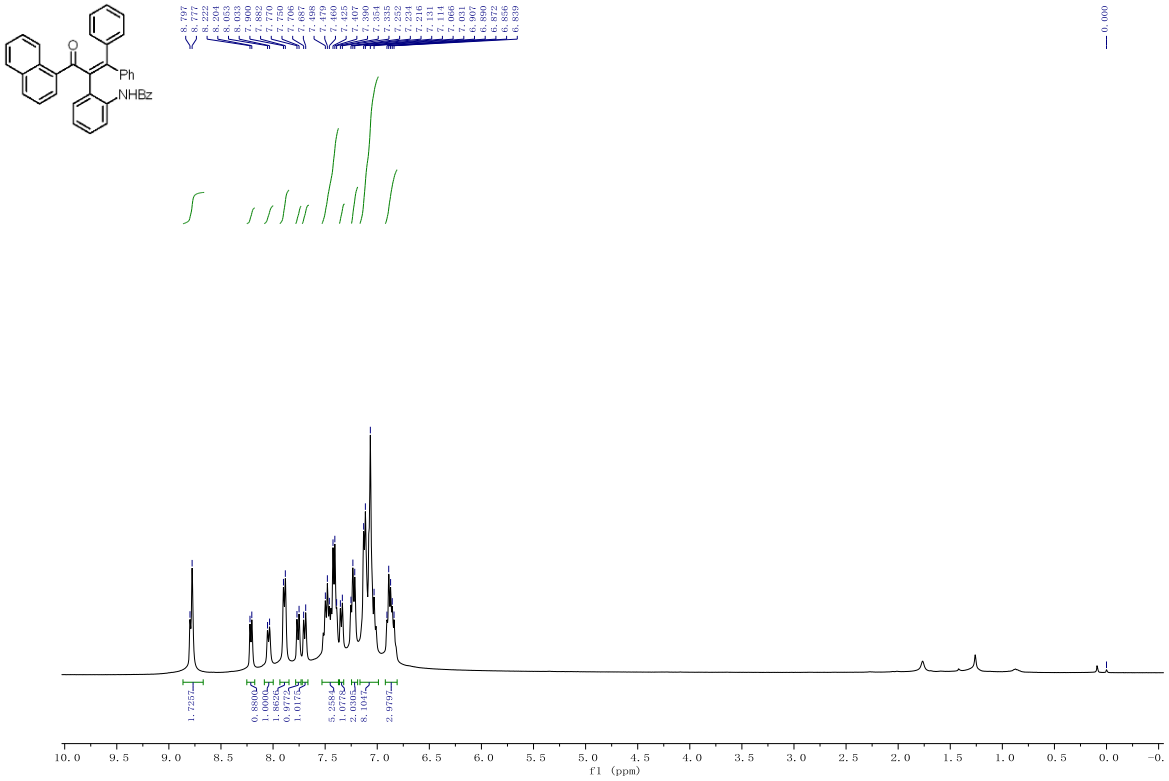
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3m



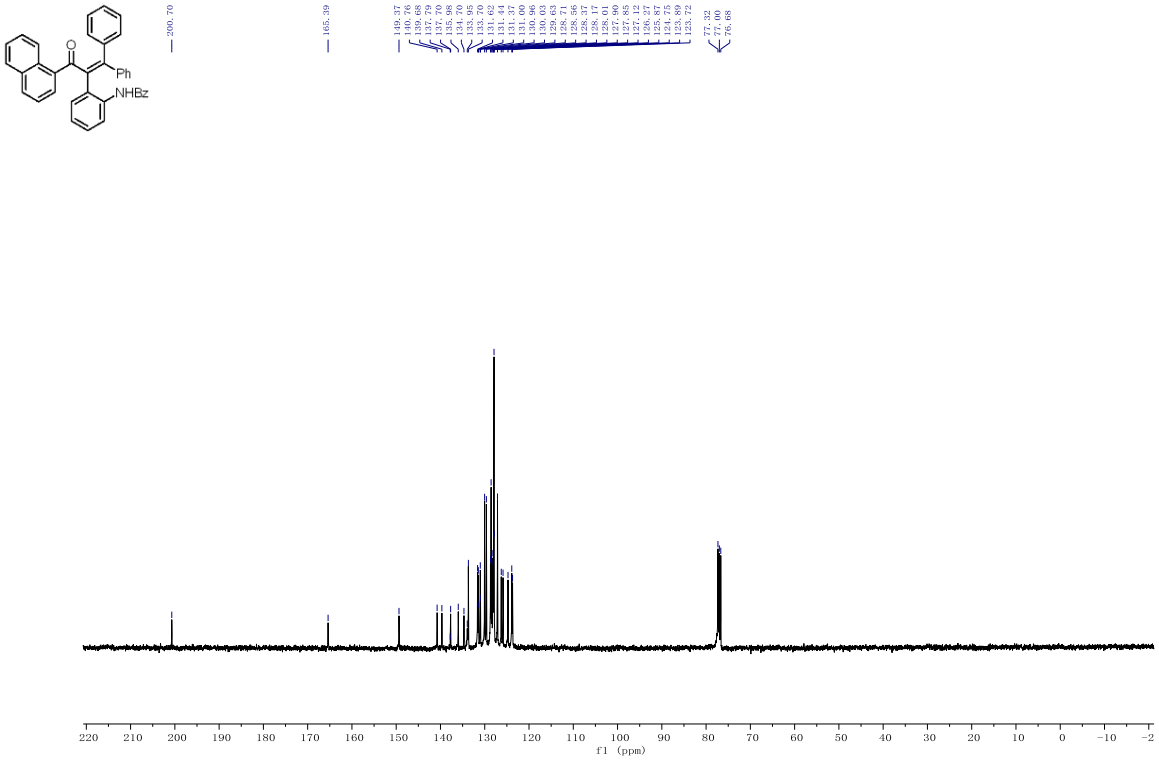
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3m



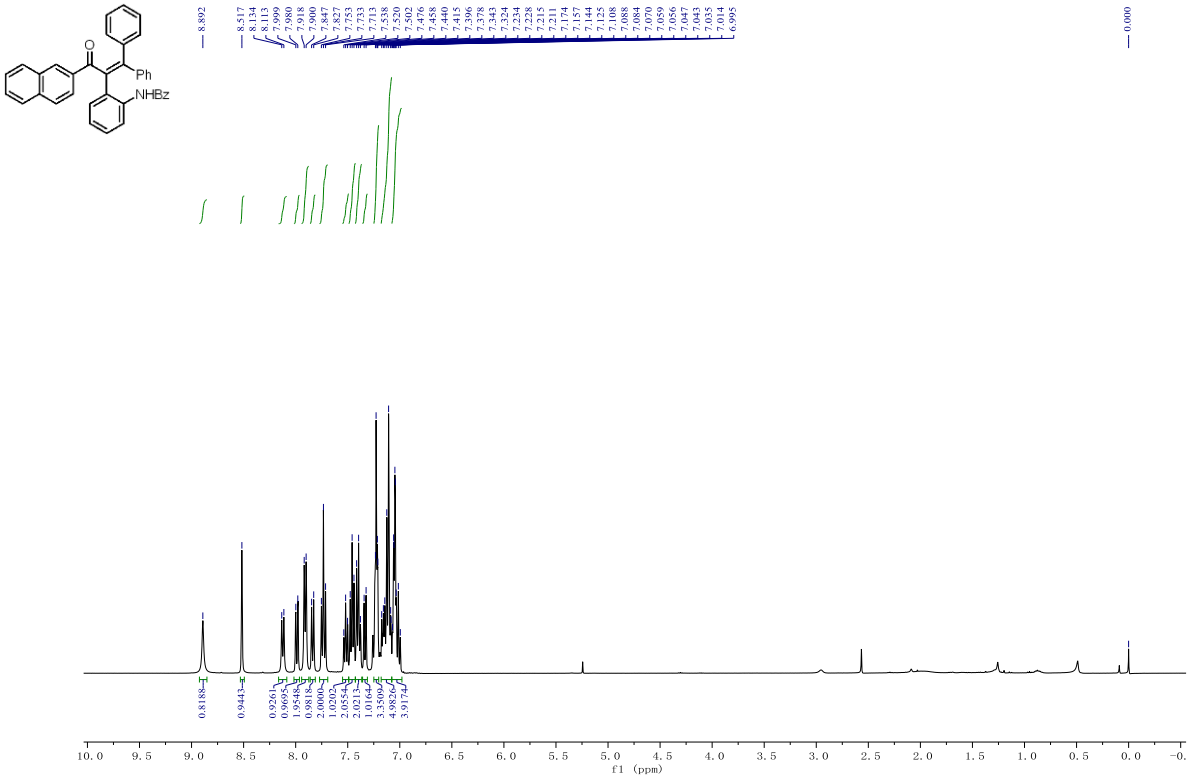
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3n



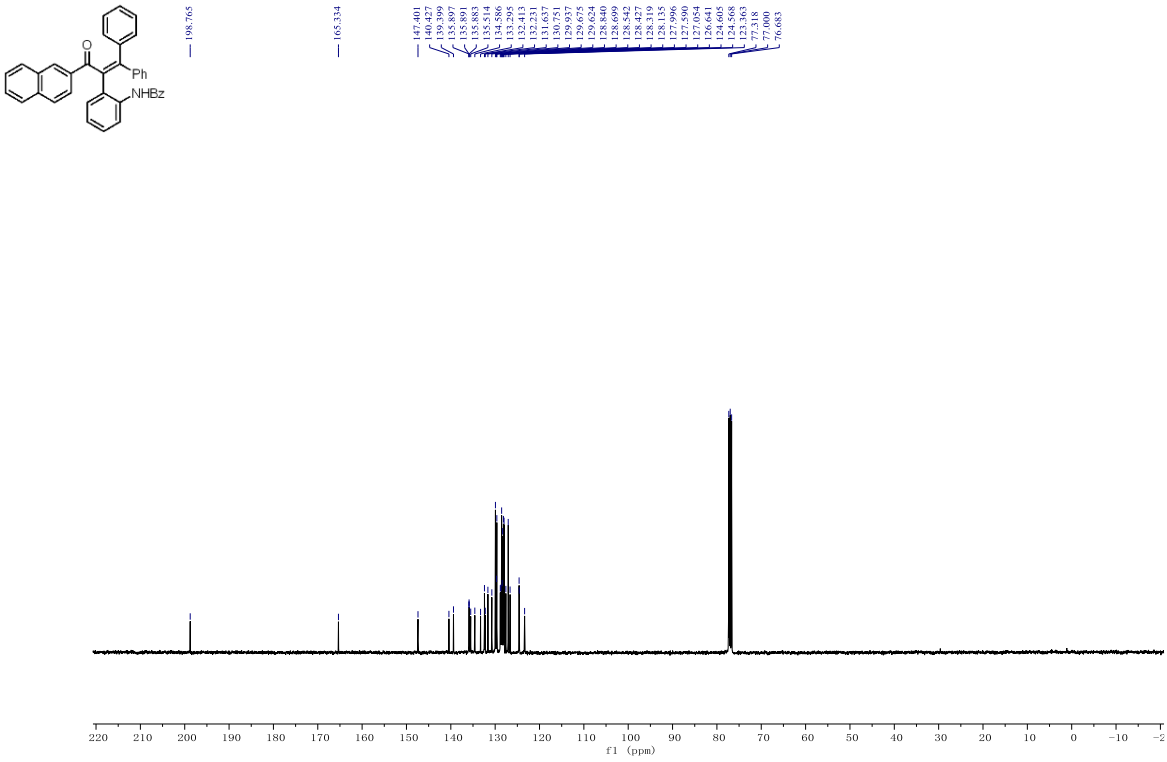
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3n



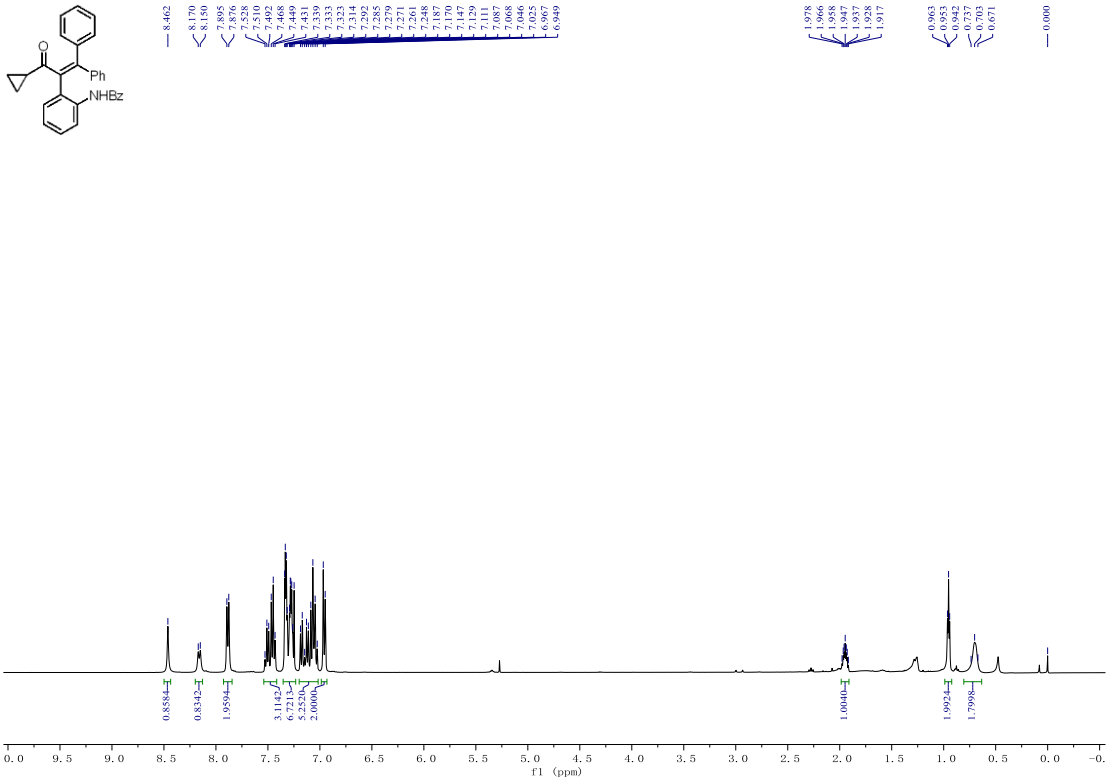
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3o



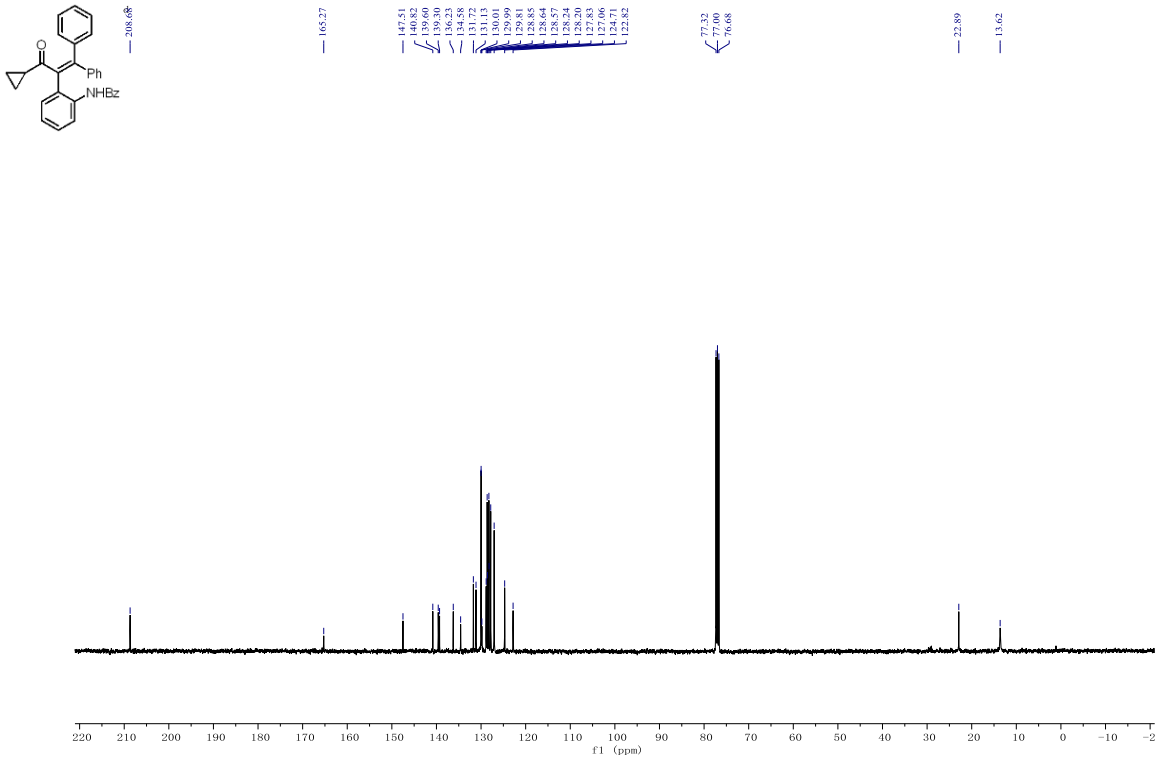
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3o



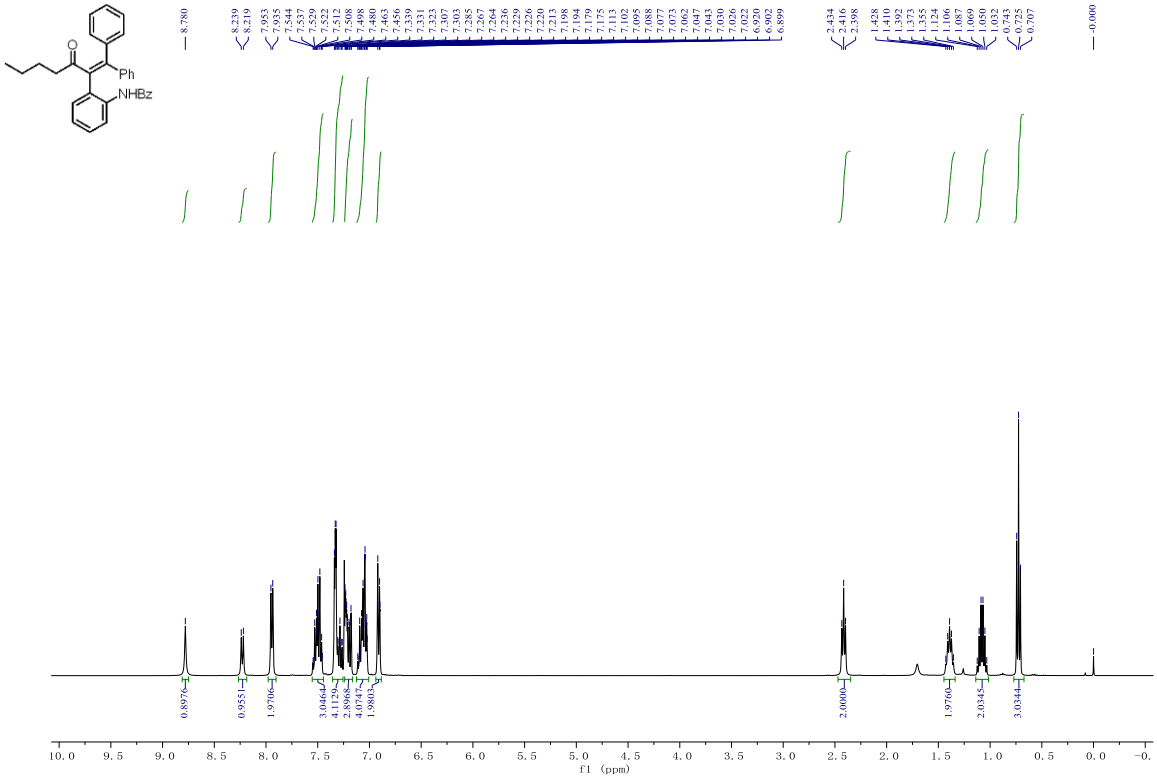
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3p



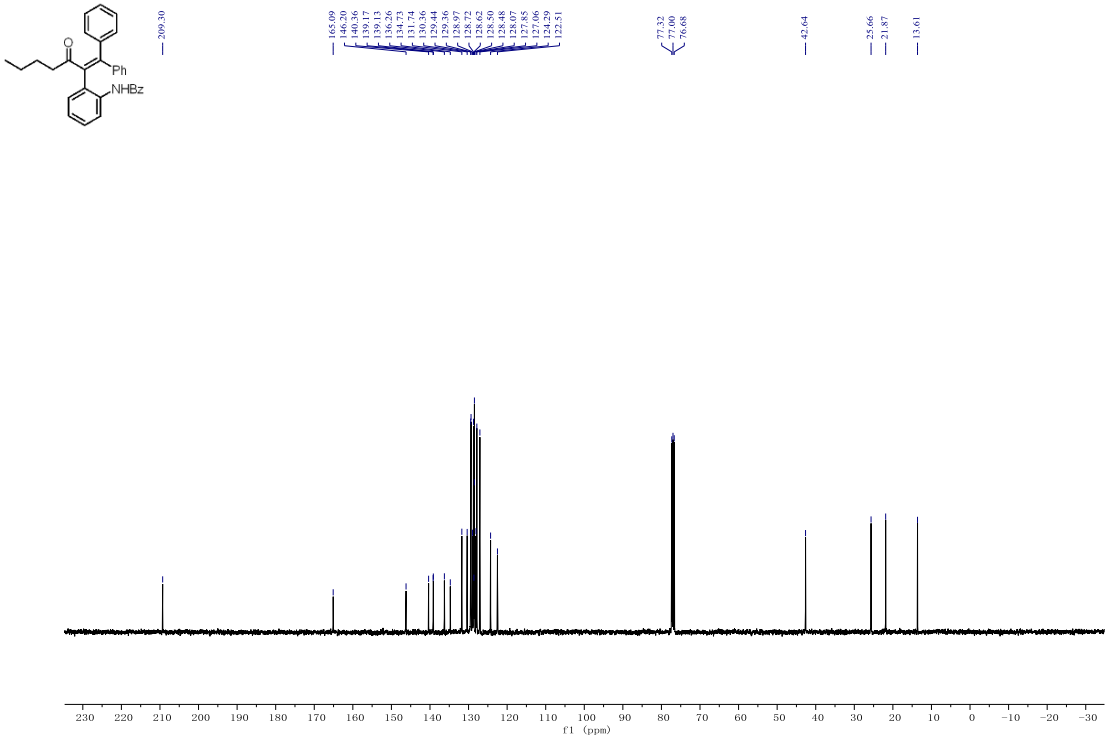
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3p



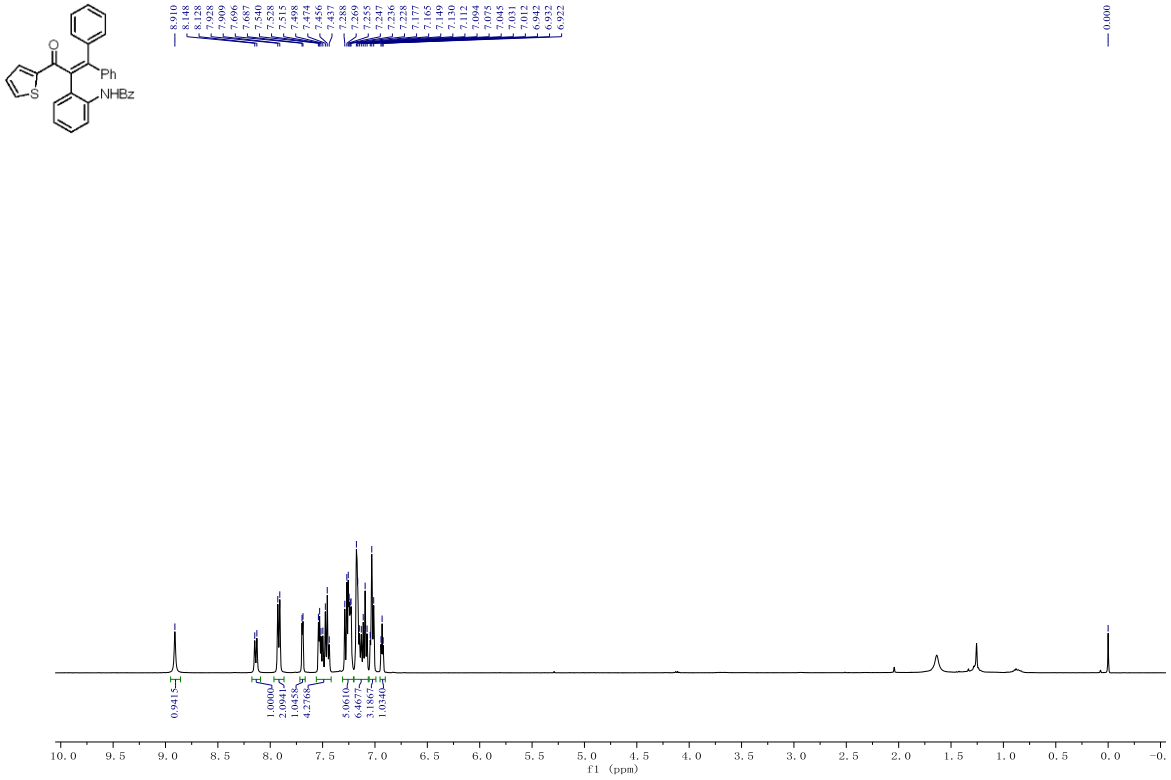
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3q



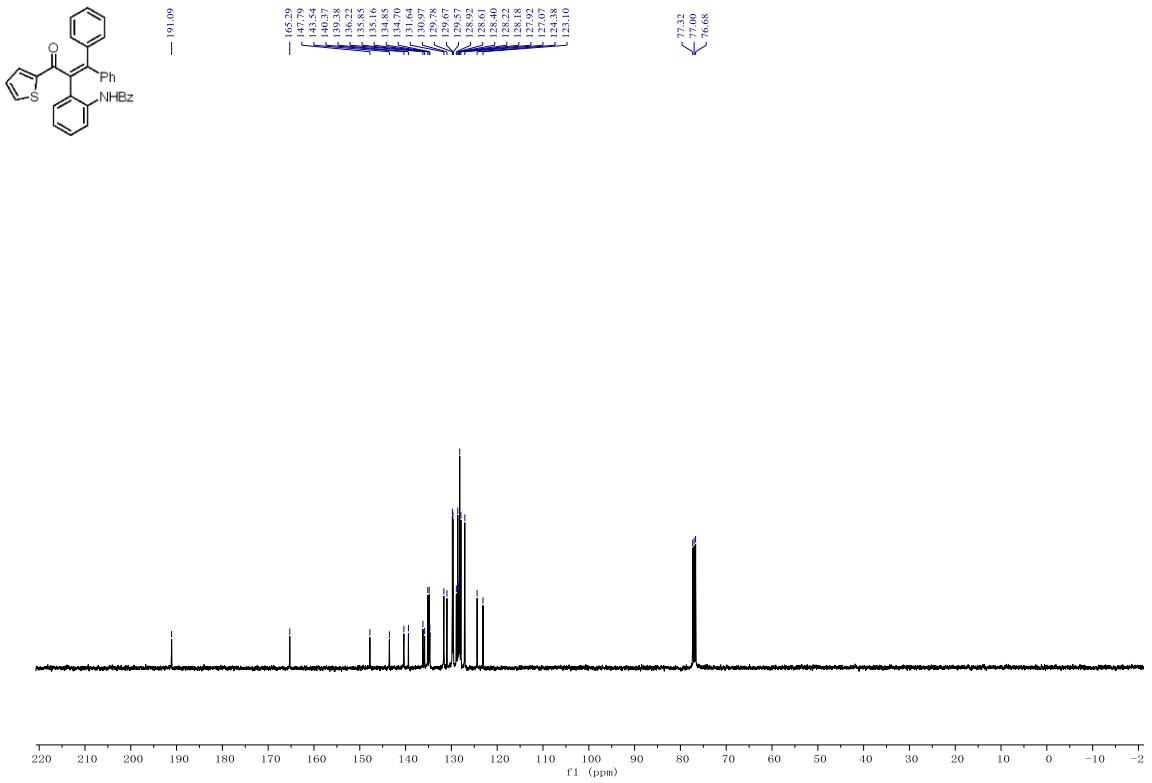
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3q



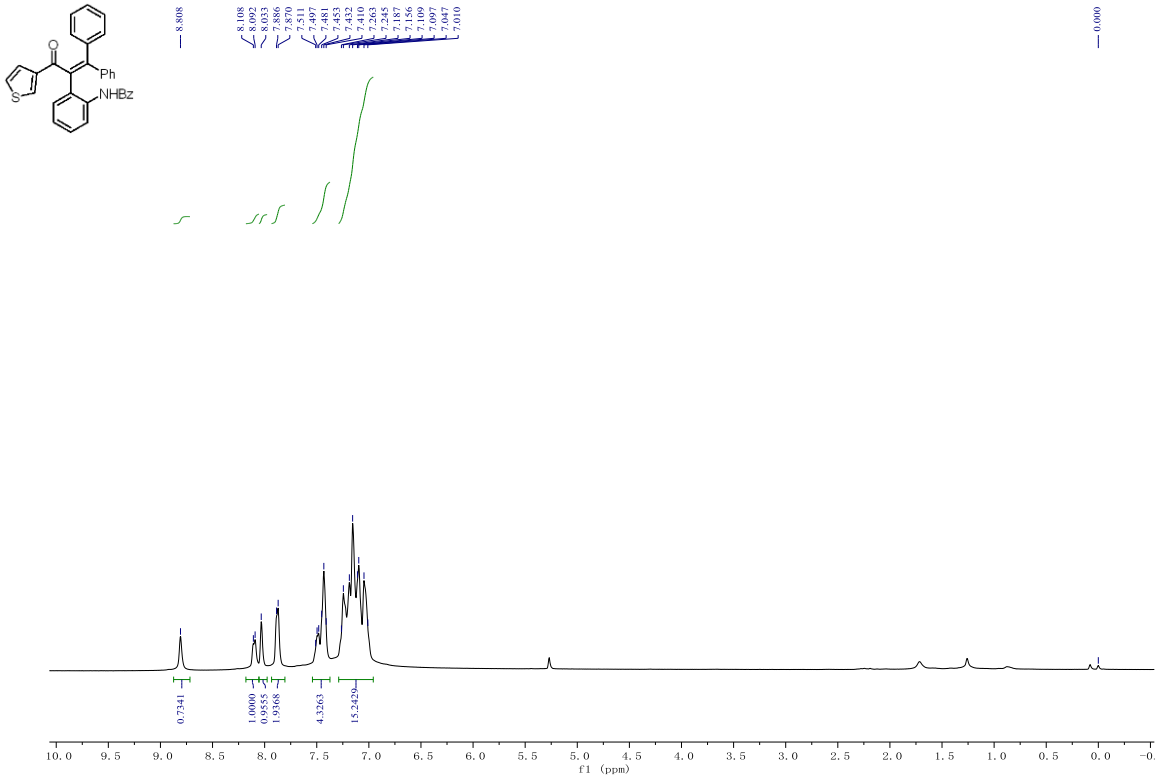
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3r



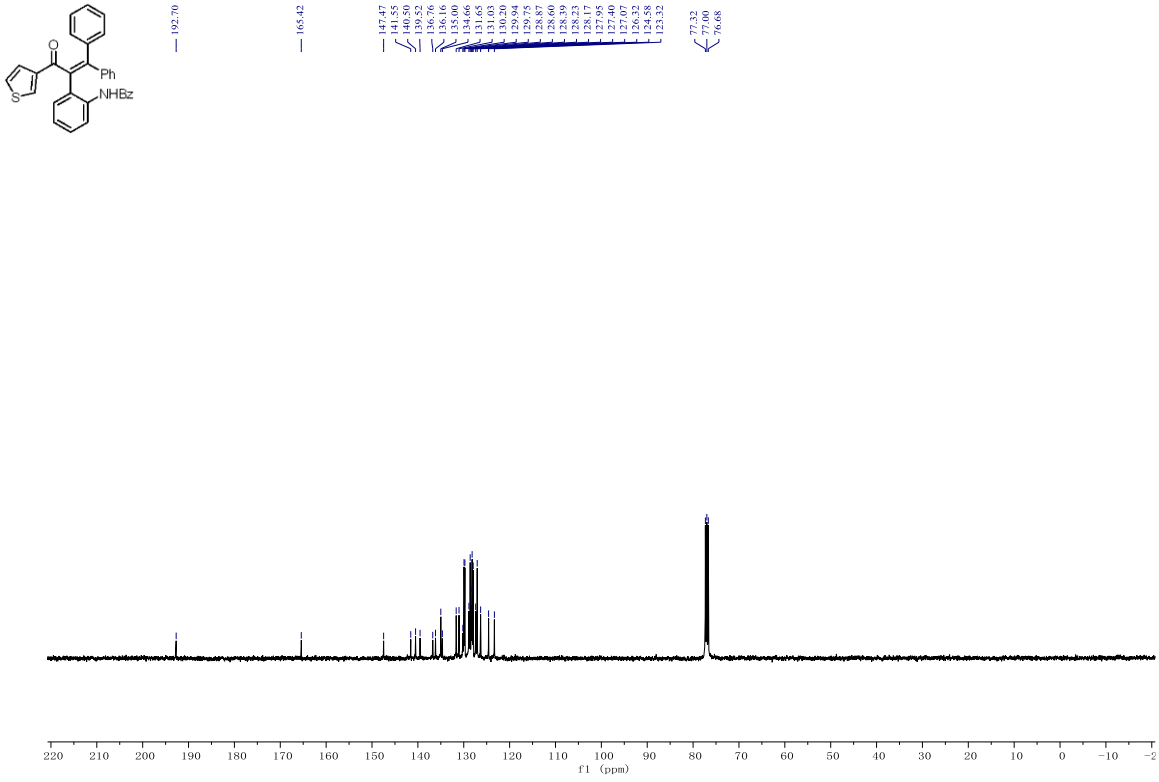
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3r



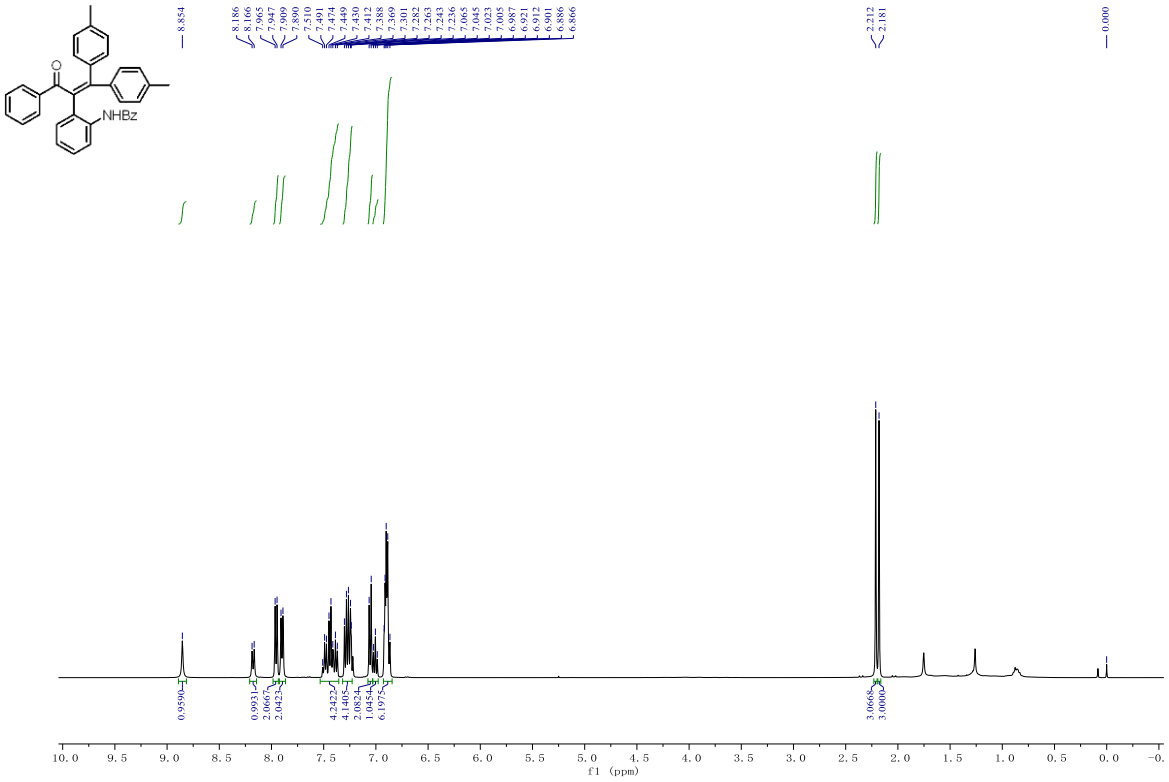
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3s



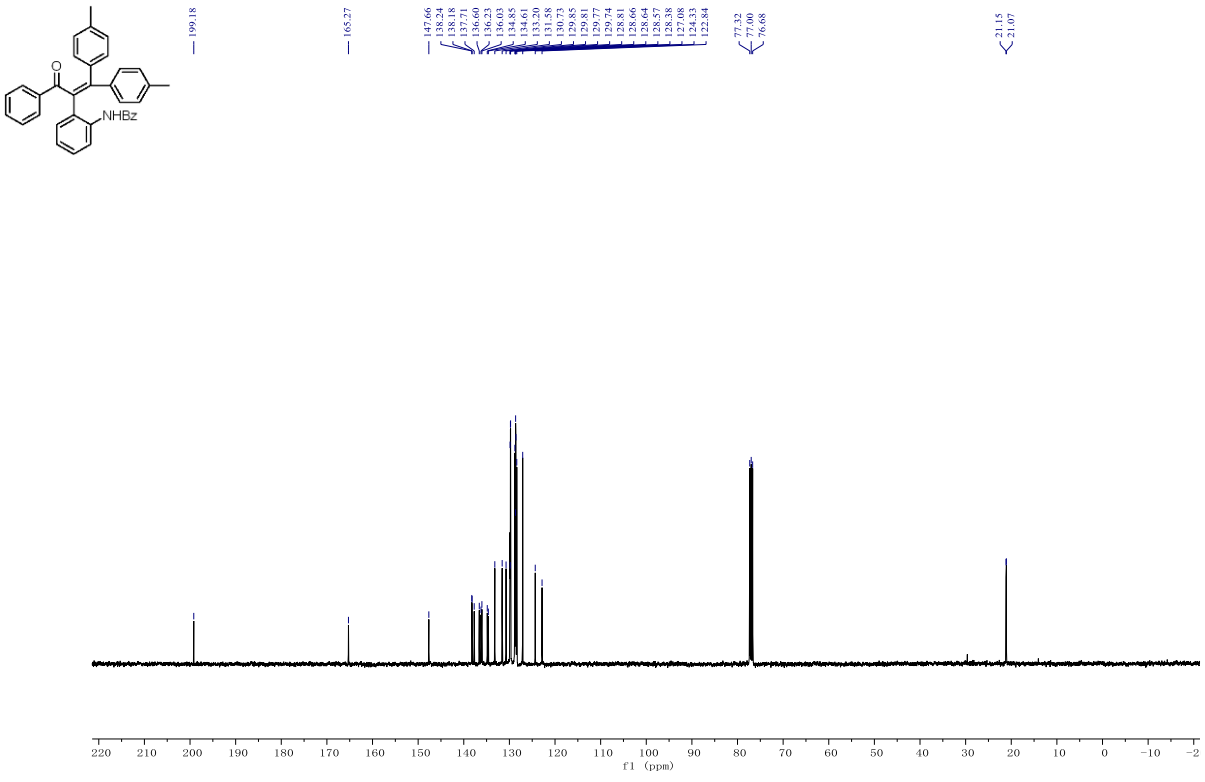
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3s



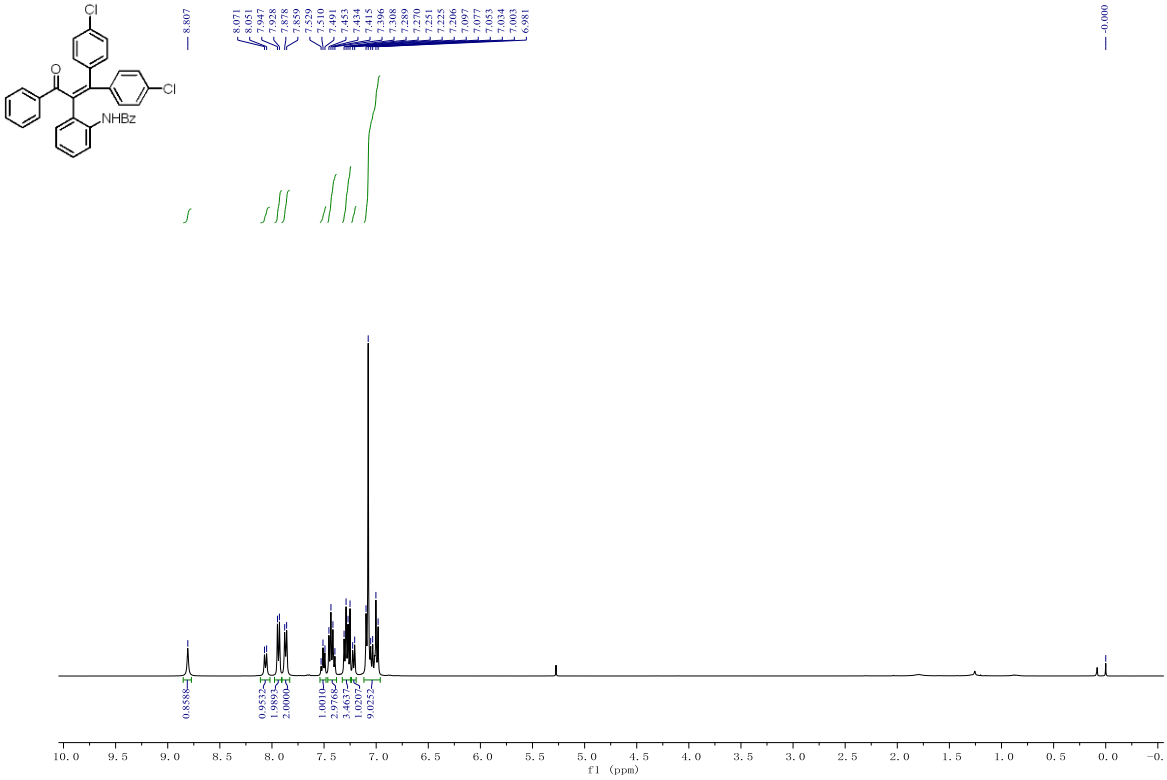
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3t



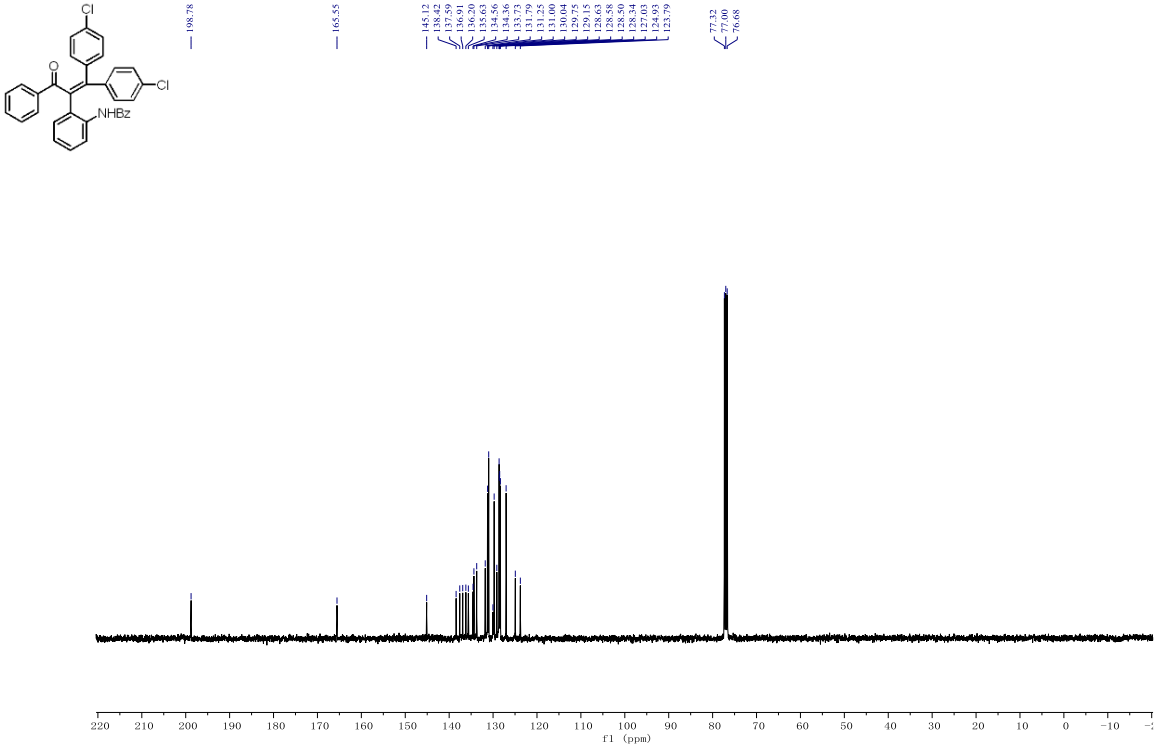
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3t



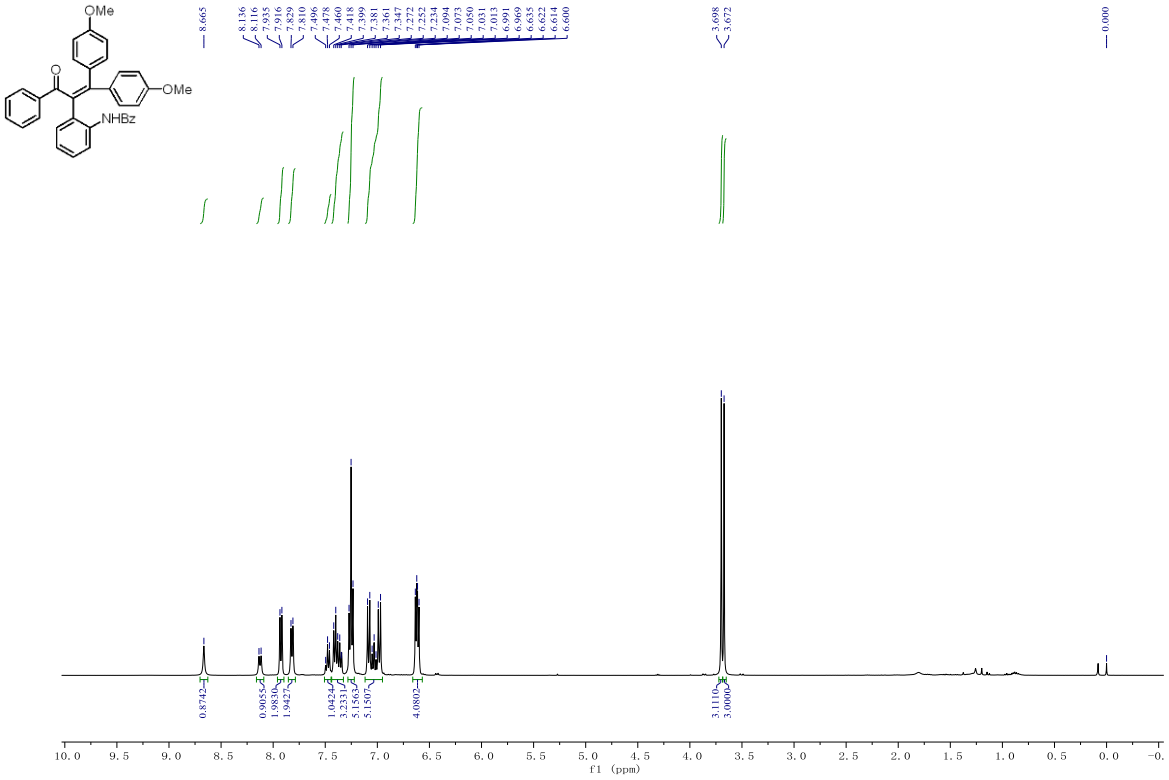
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3u



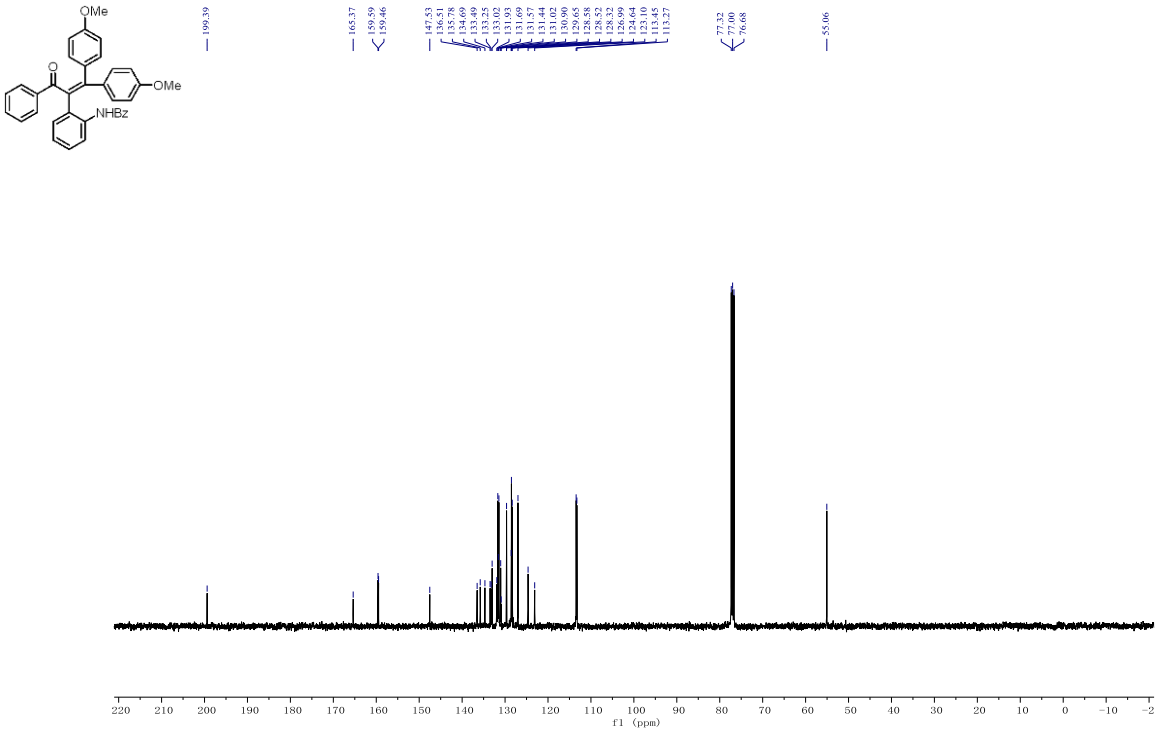
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3u



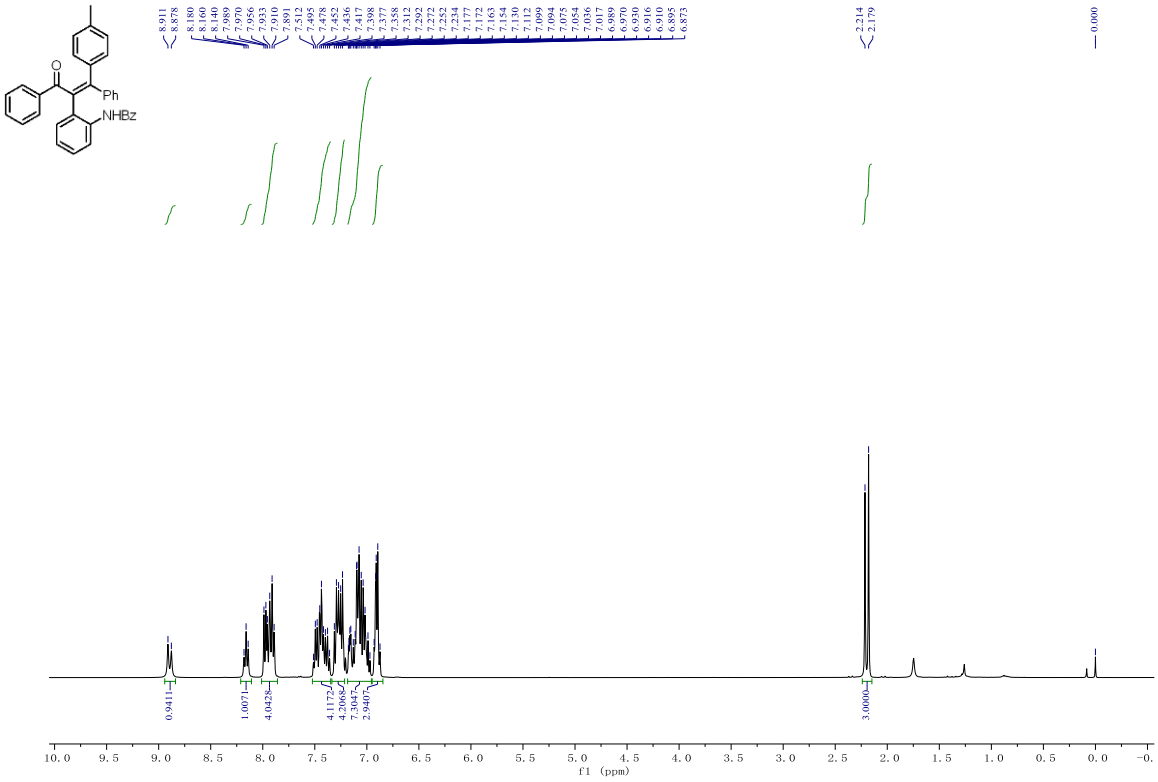
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3v



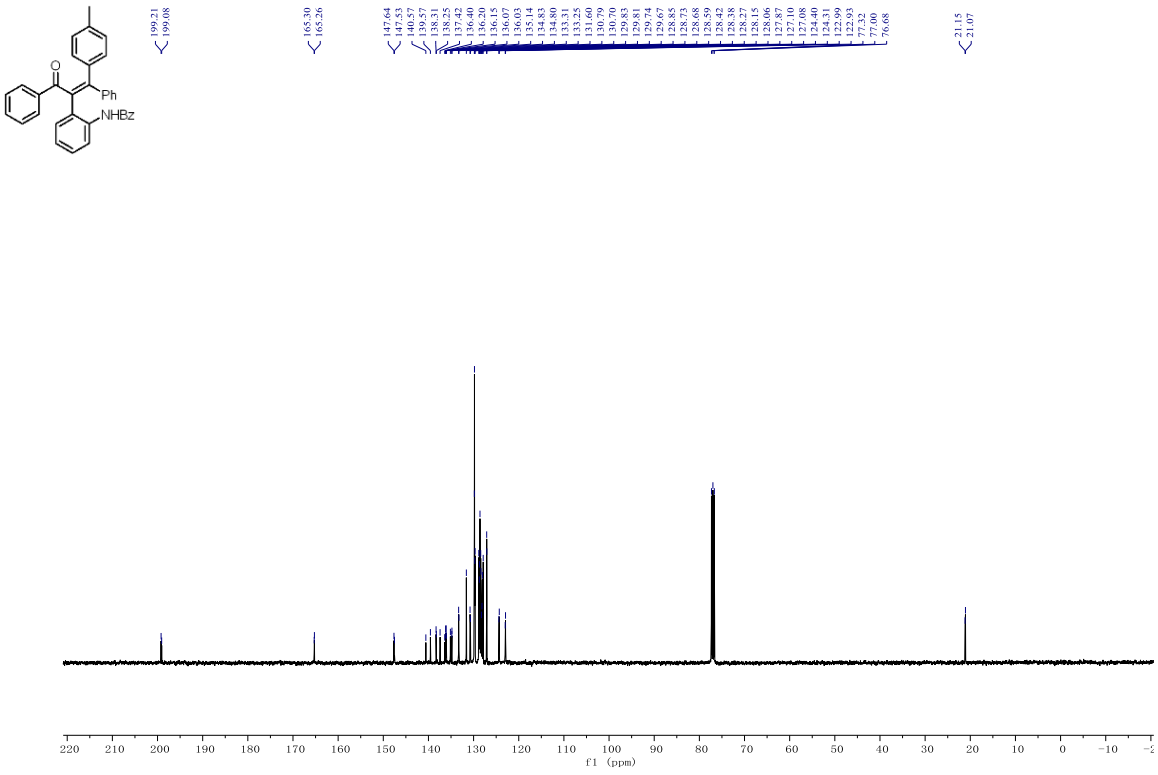
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3v



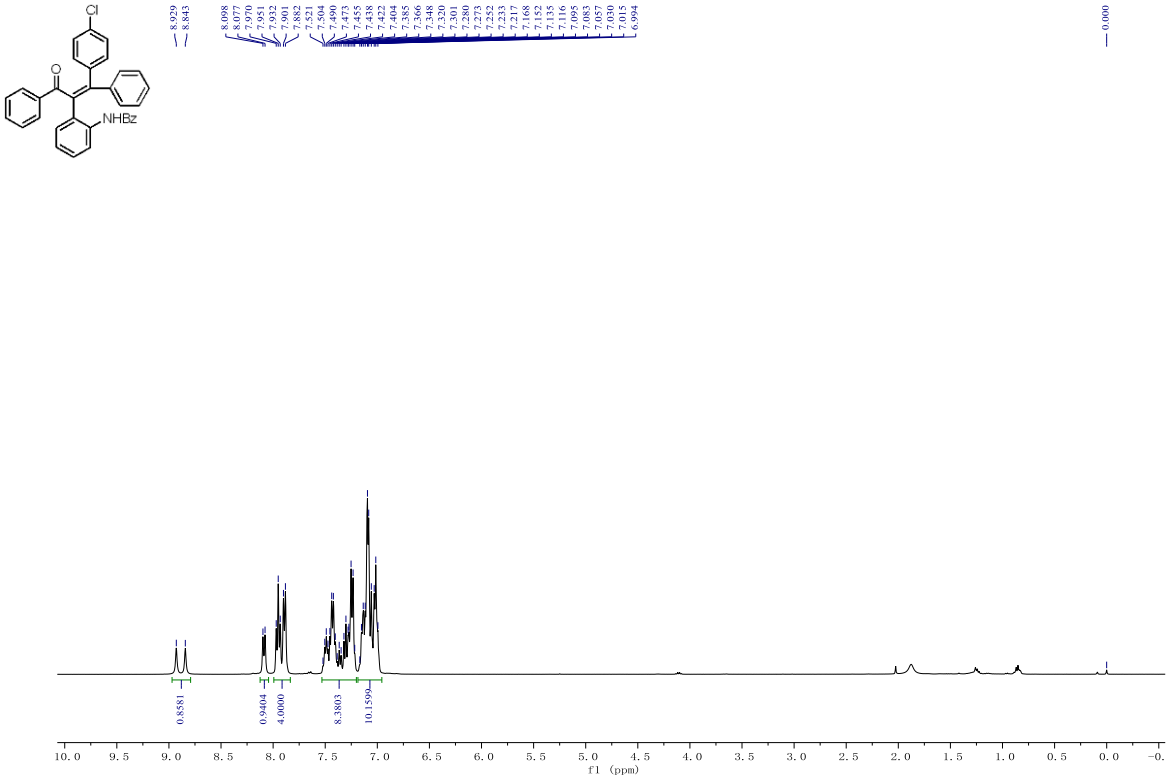
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3w (*E/Z* mixture)



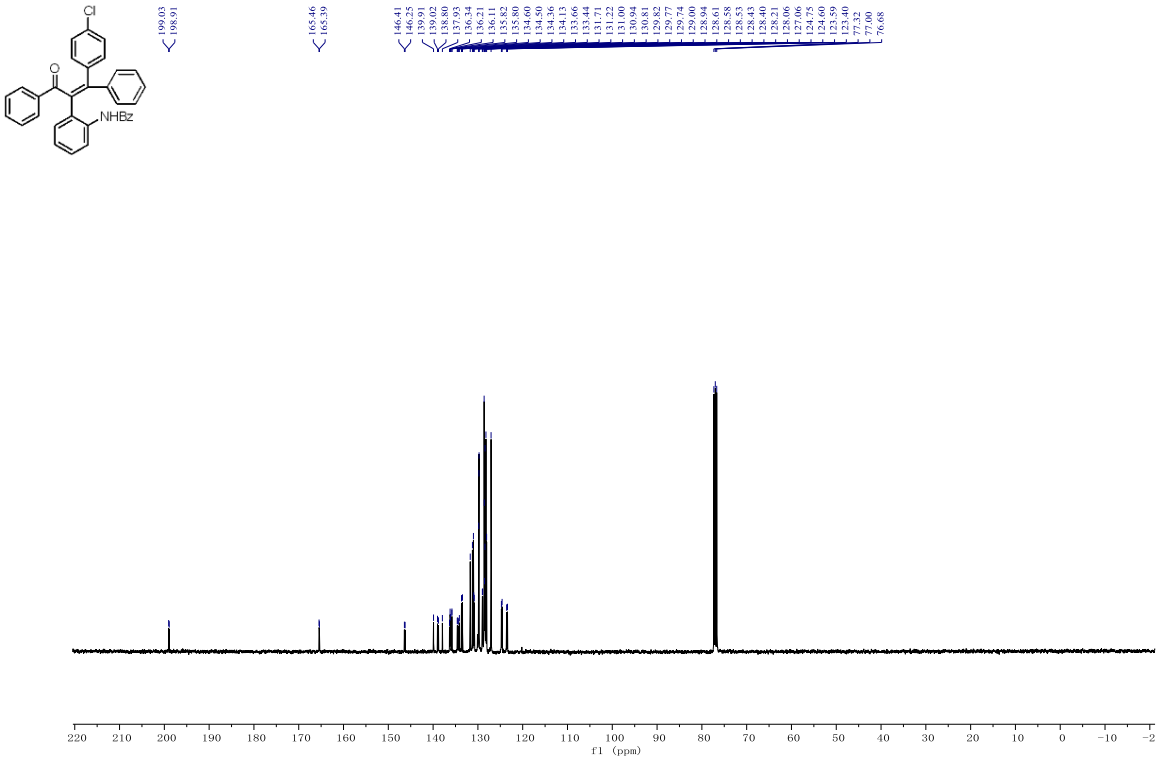
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3w (*E/Z* mixture)



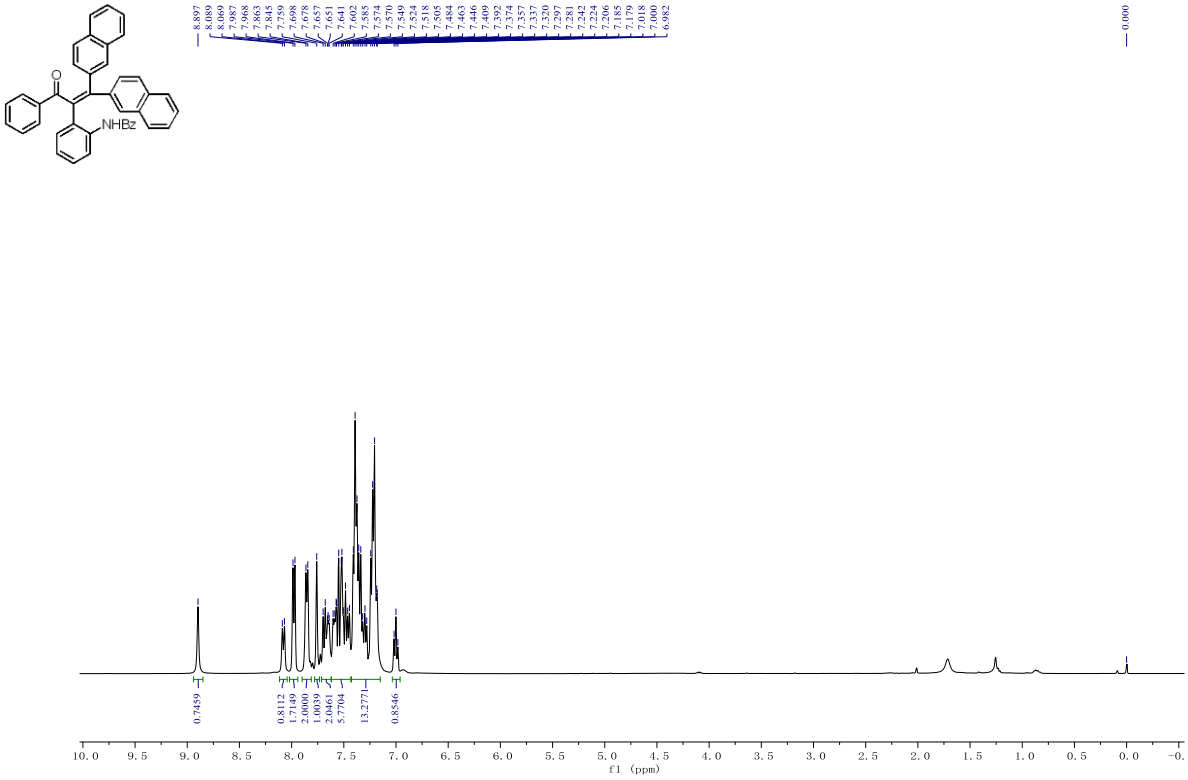
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3x (*E/Z* mixture)



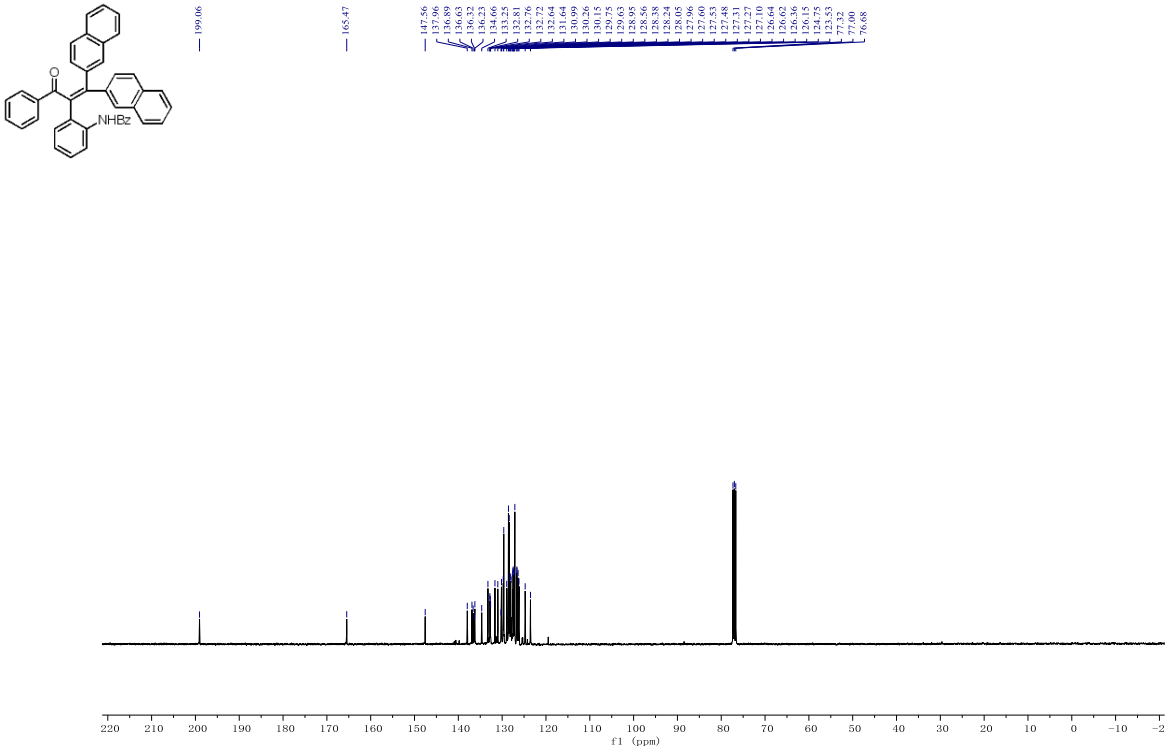
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3x (*E/Z* mixture)



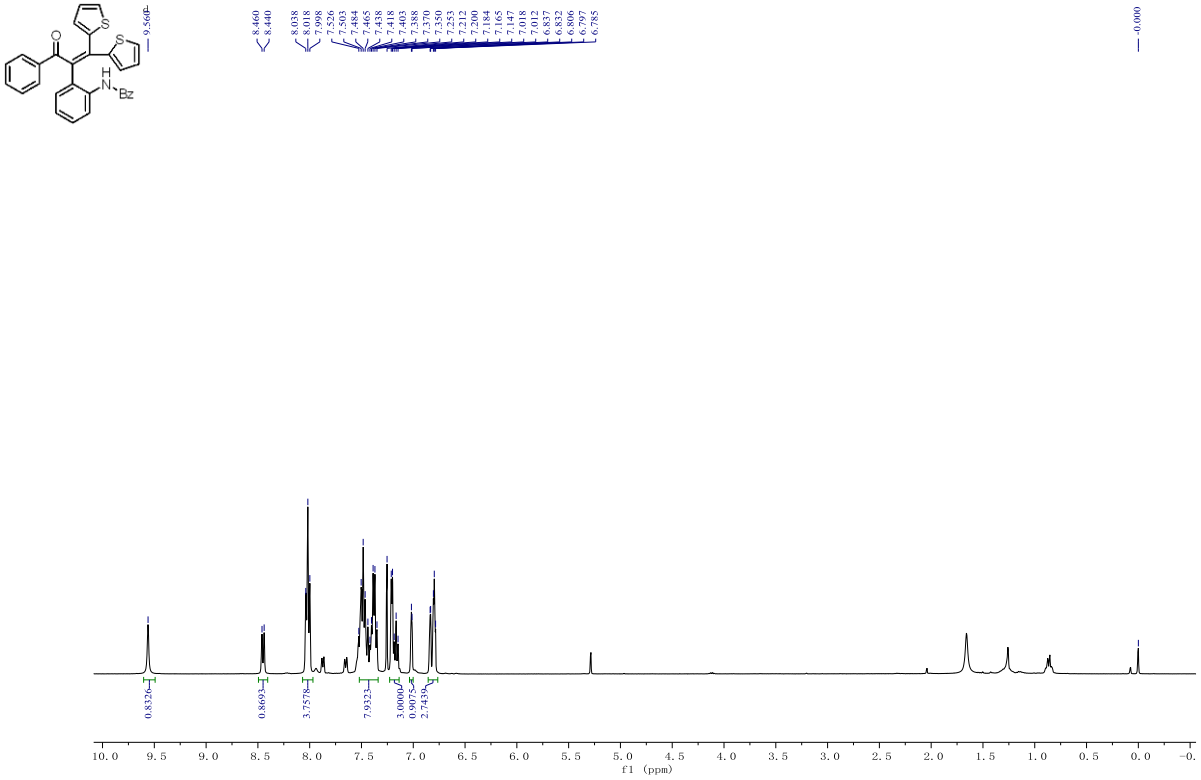
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3y



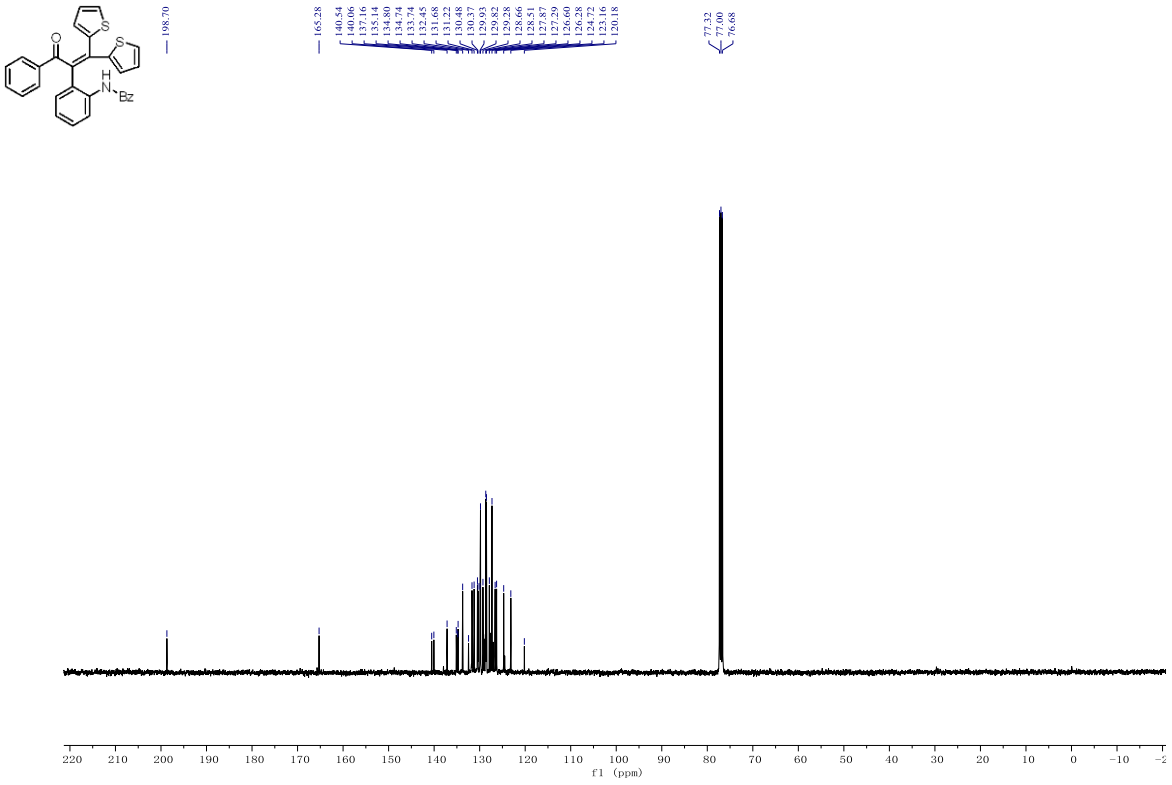
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3y



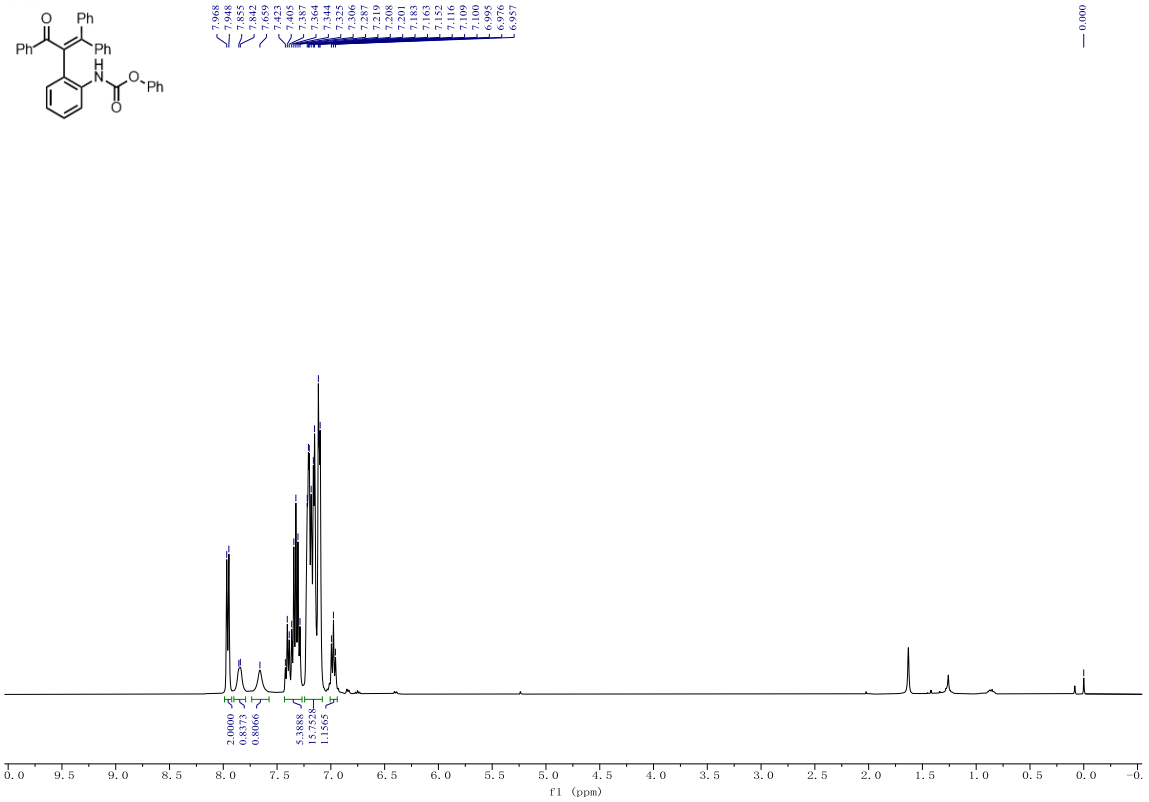
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3z



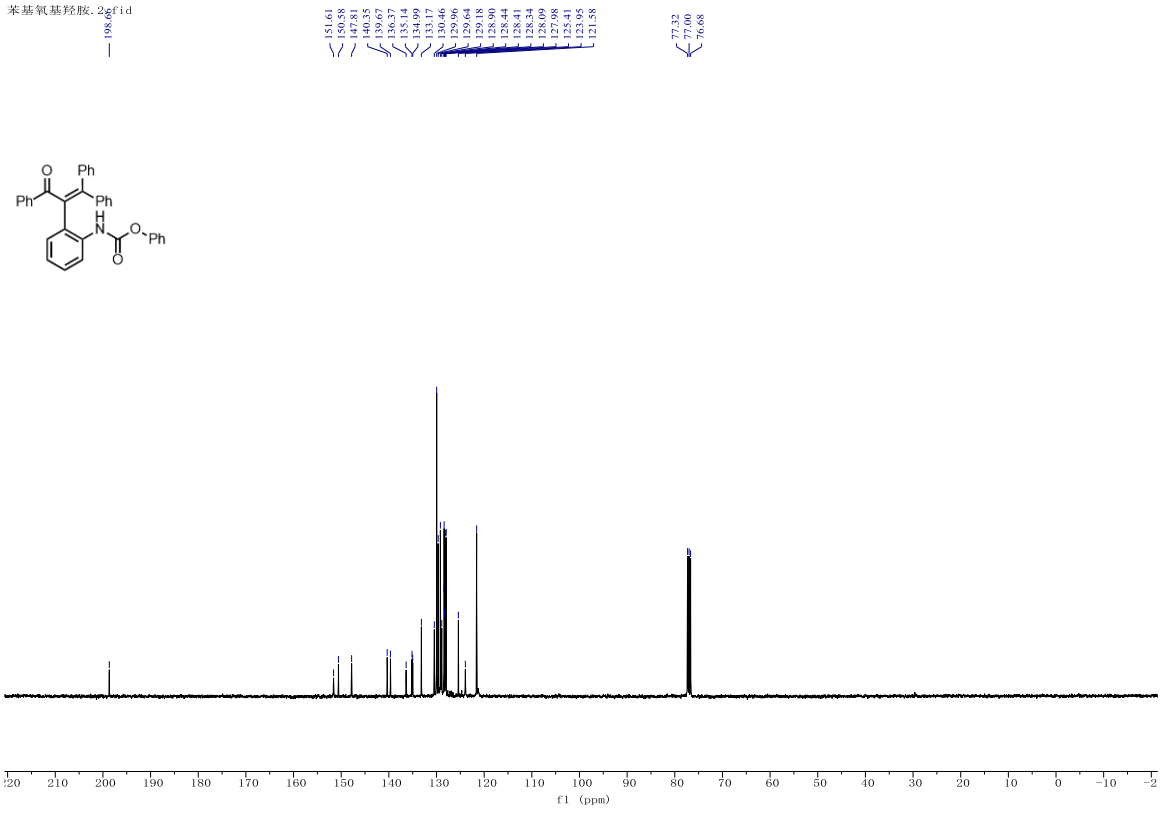
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3z



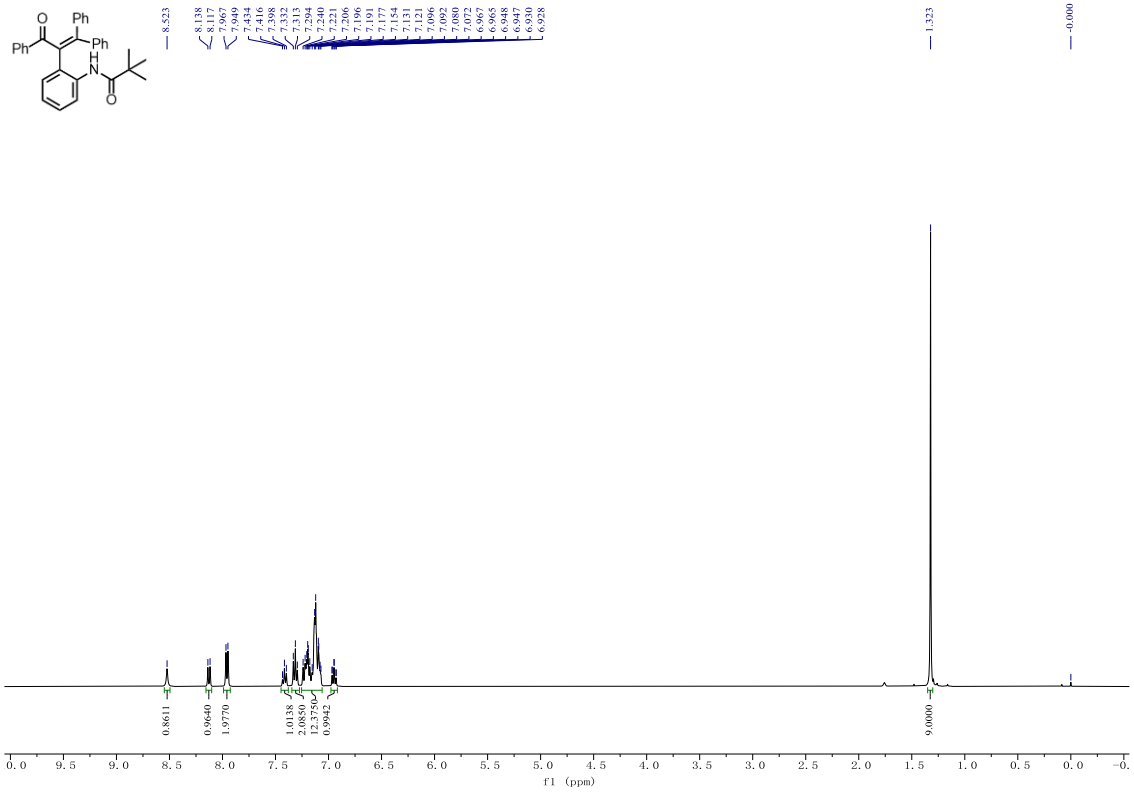
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3aa



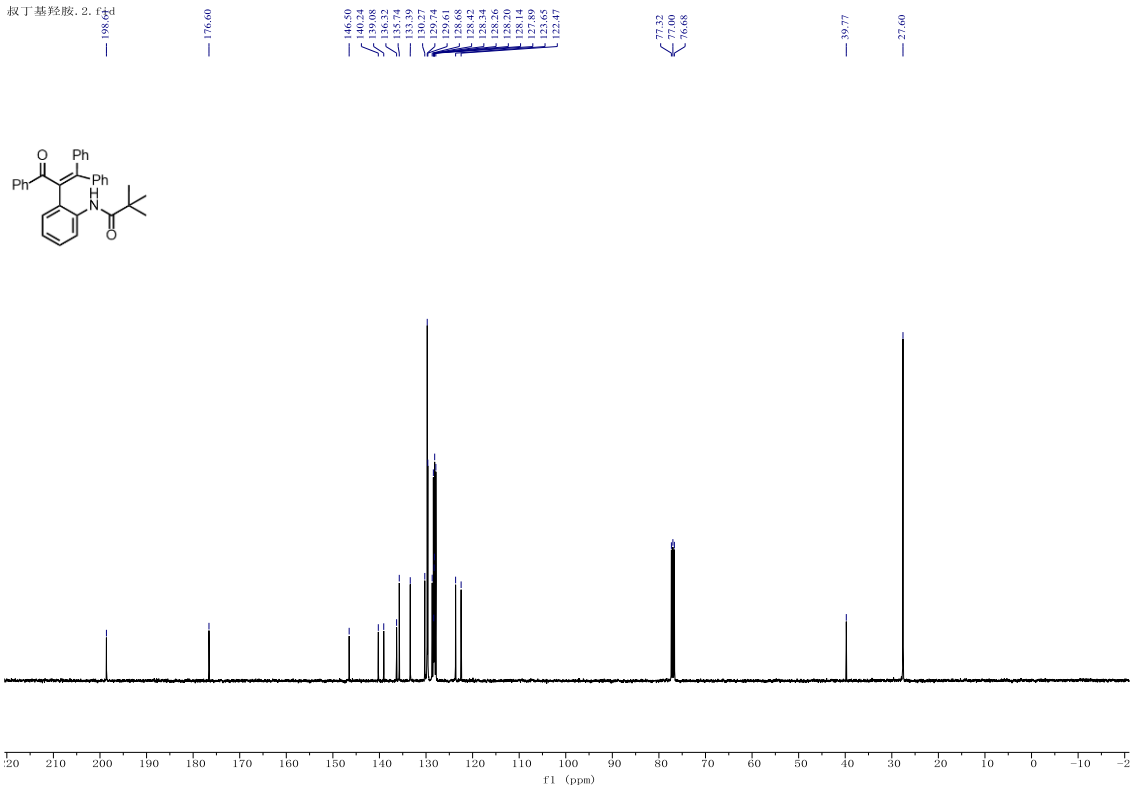
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3aa



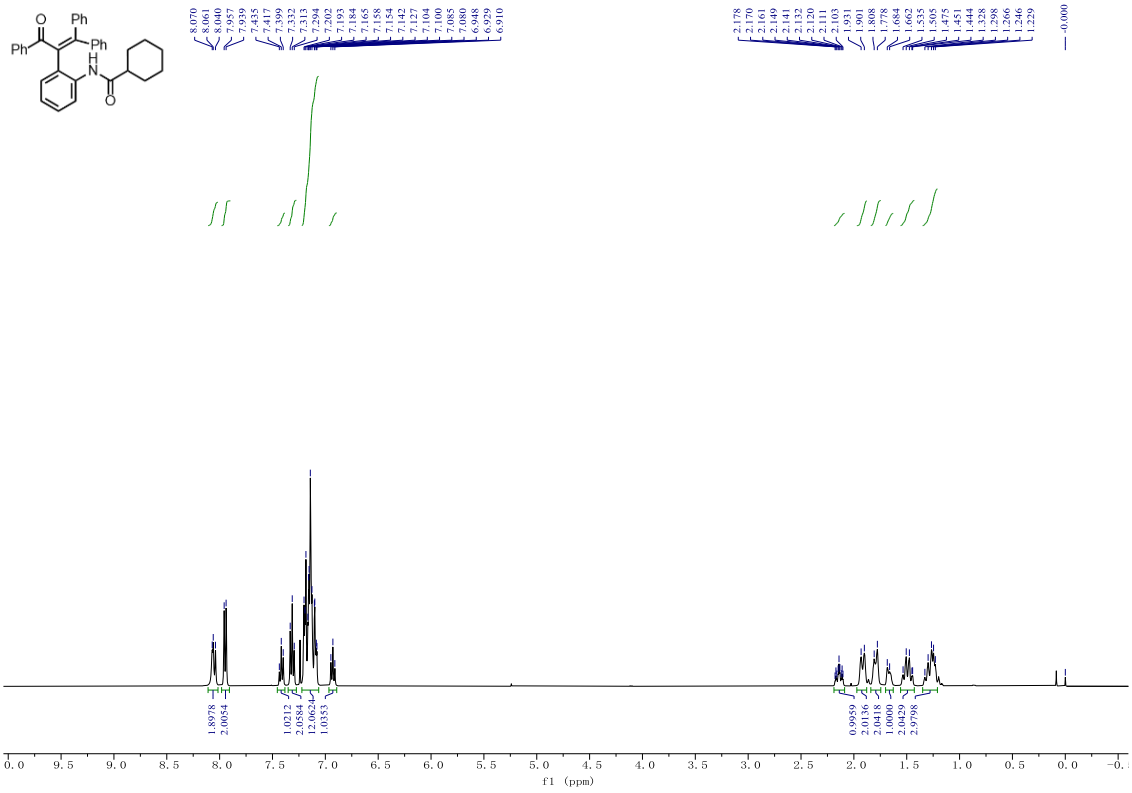
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ab



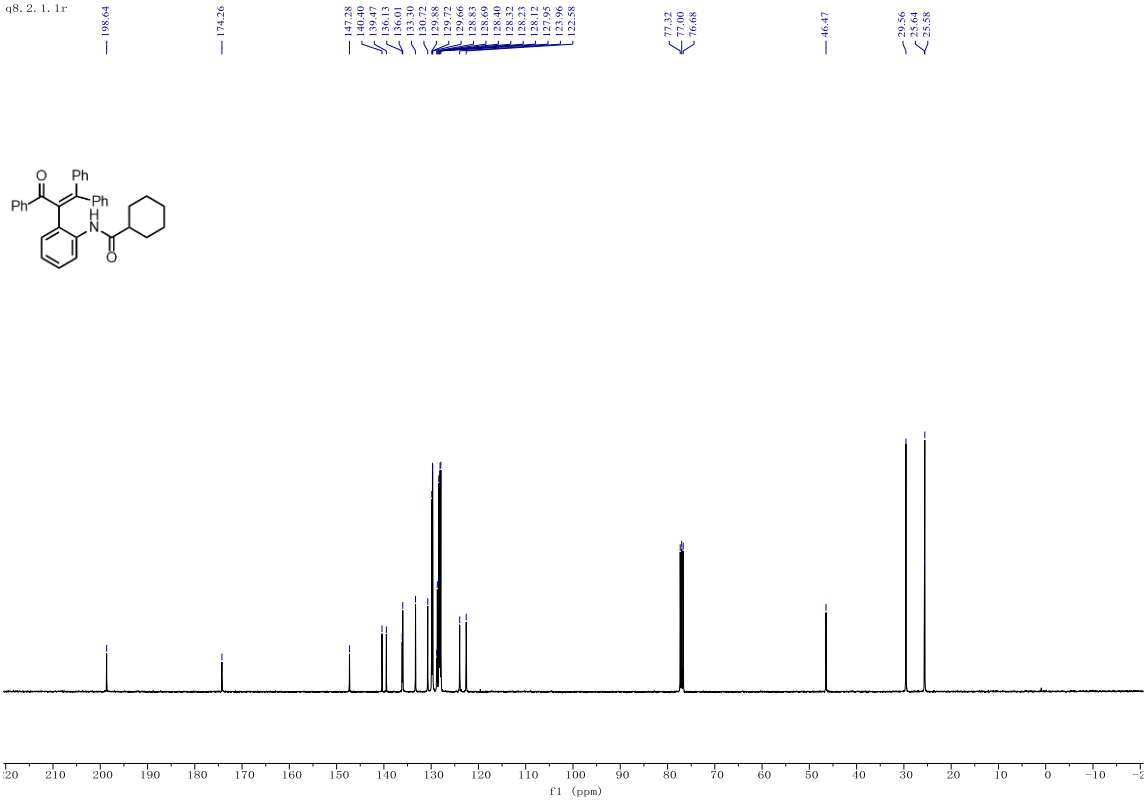
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ab



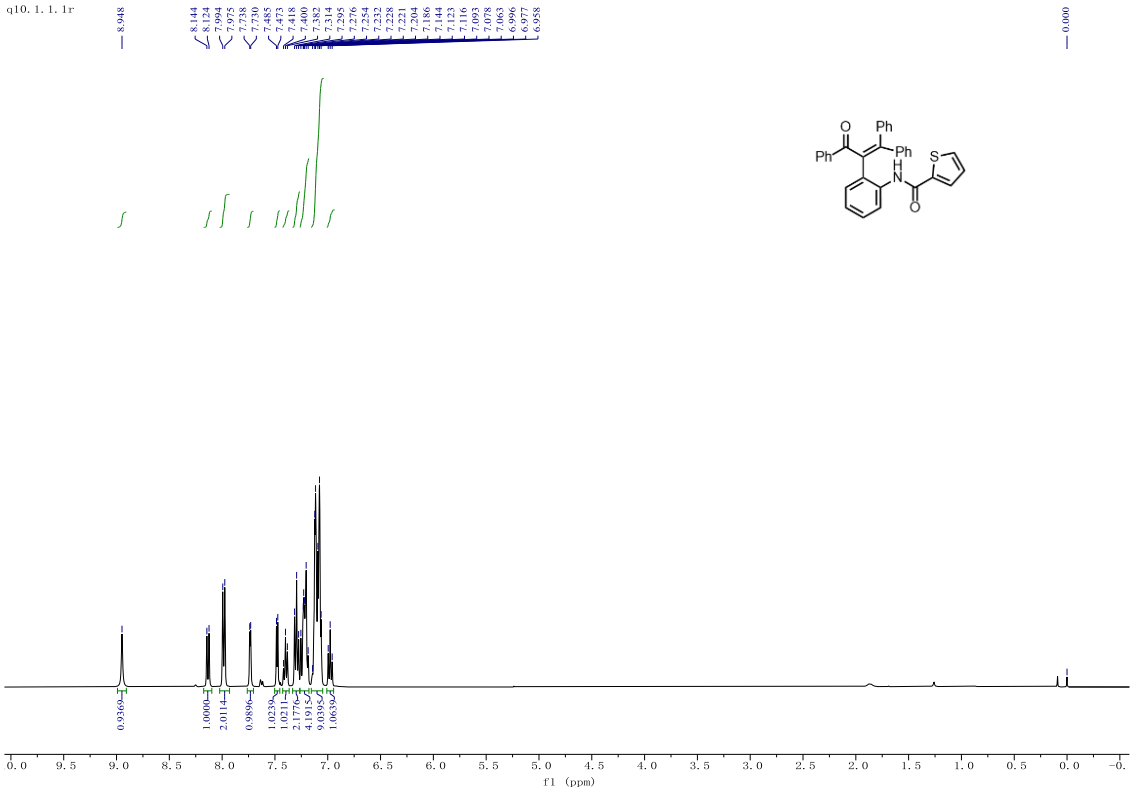
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ac



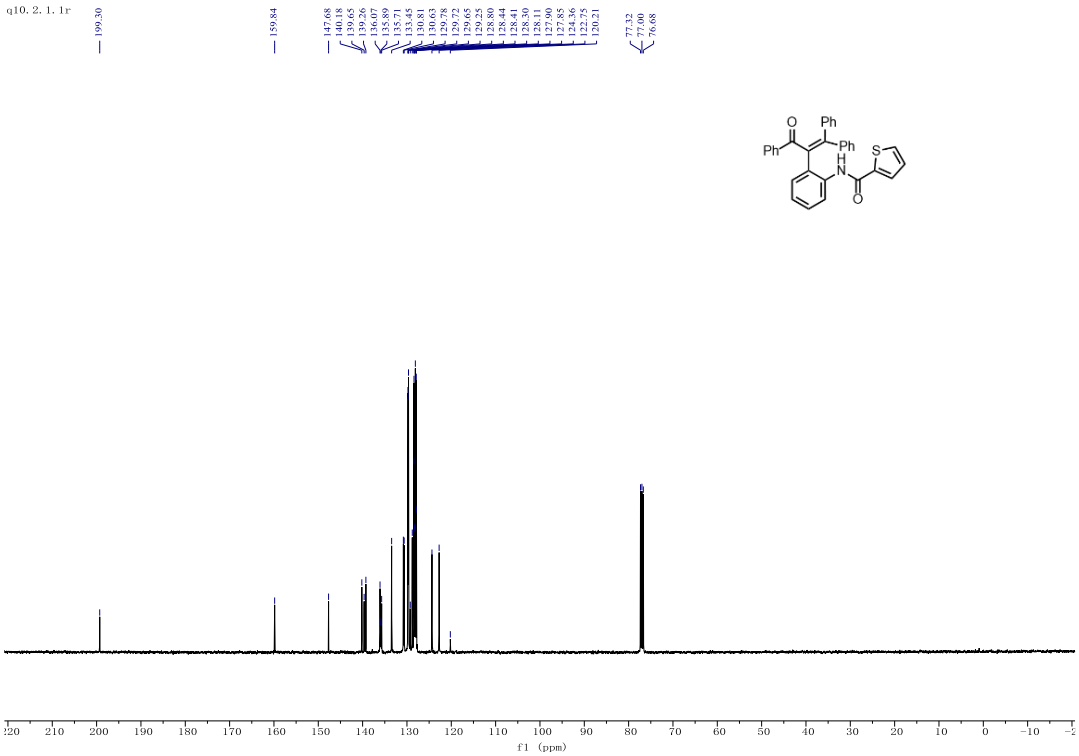
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ac



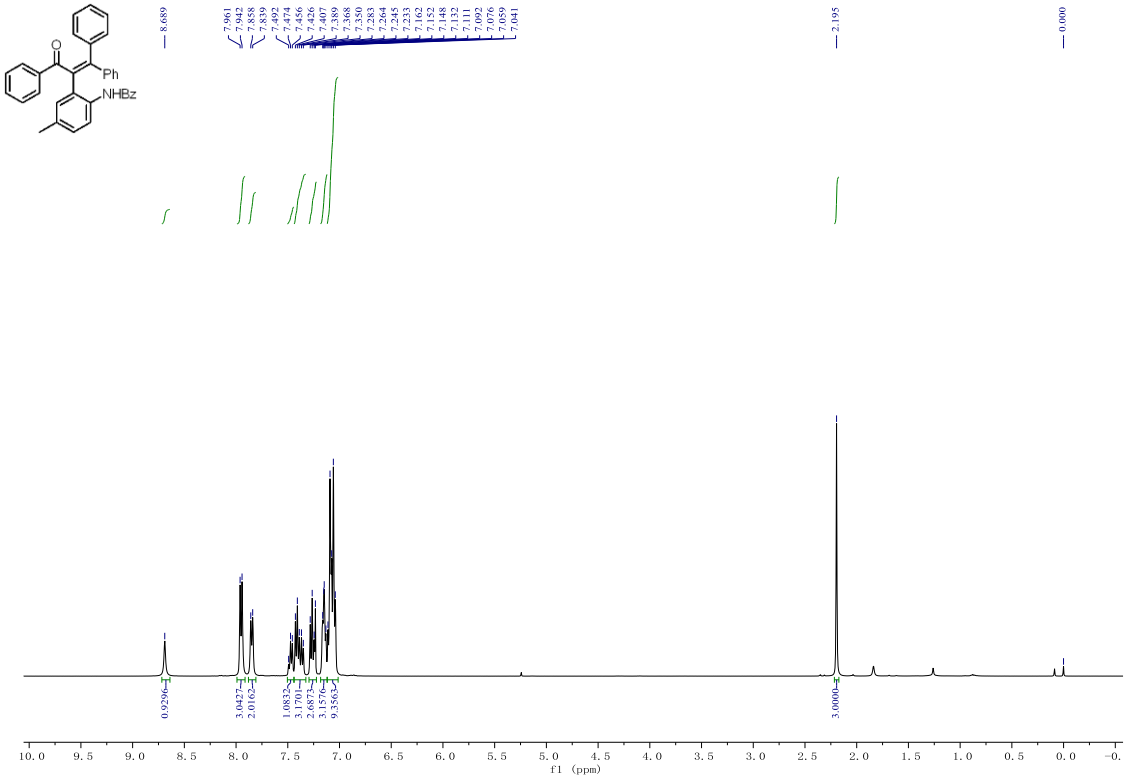
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ad



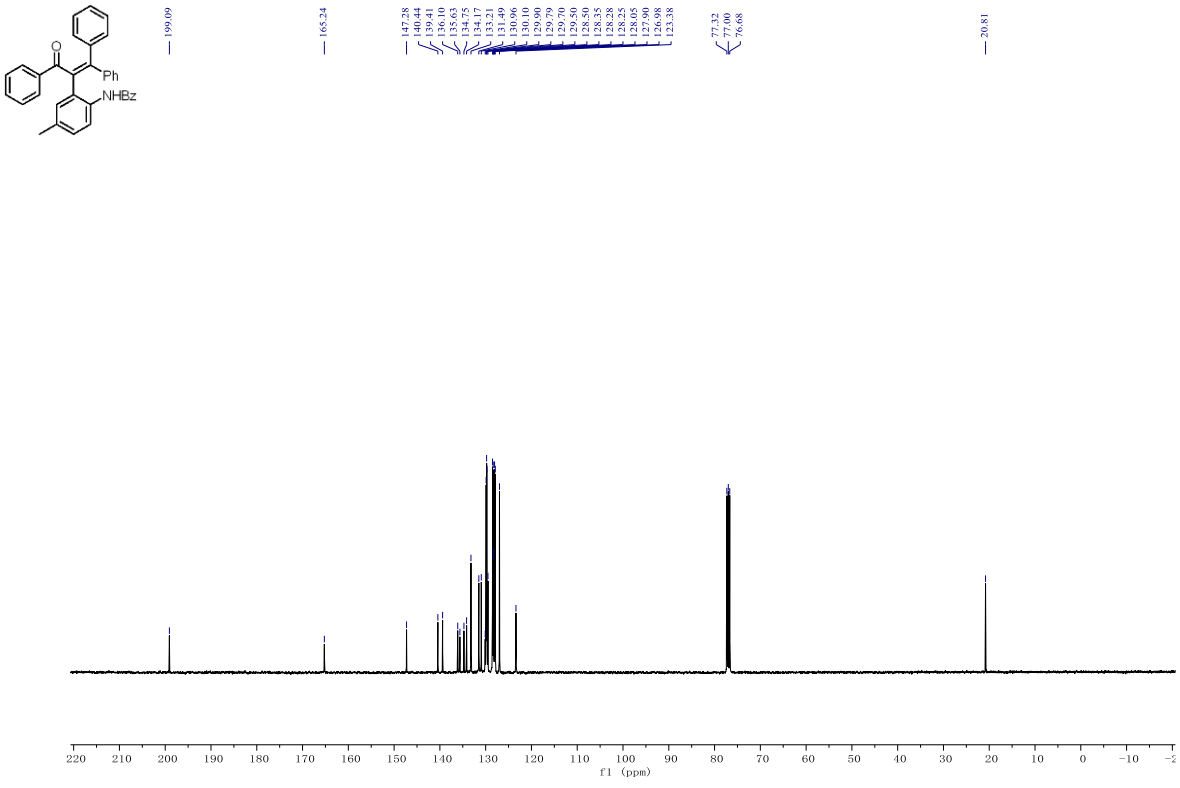
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ad



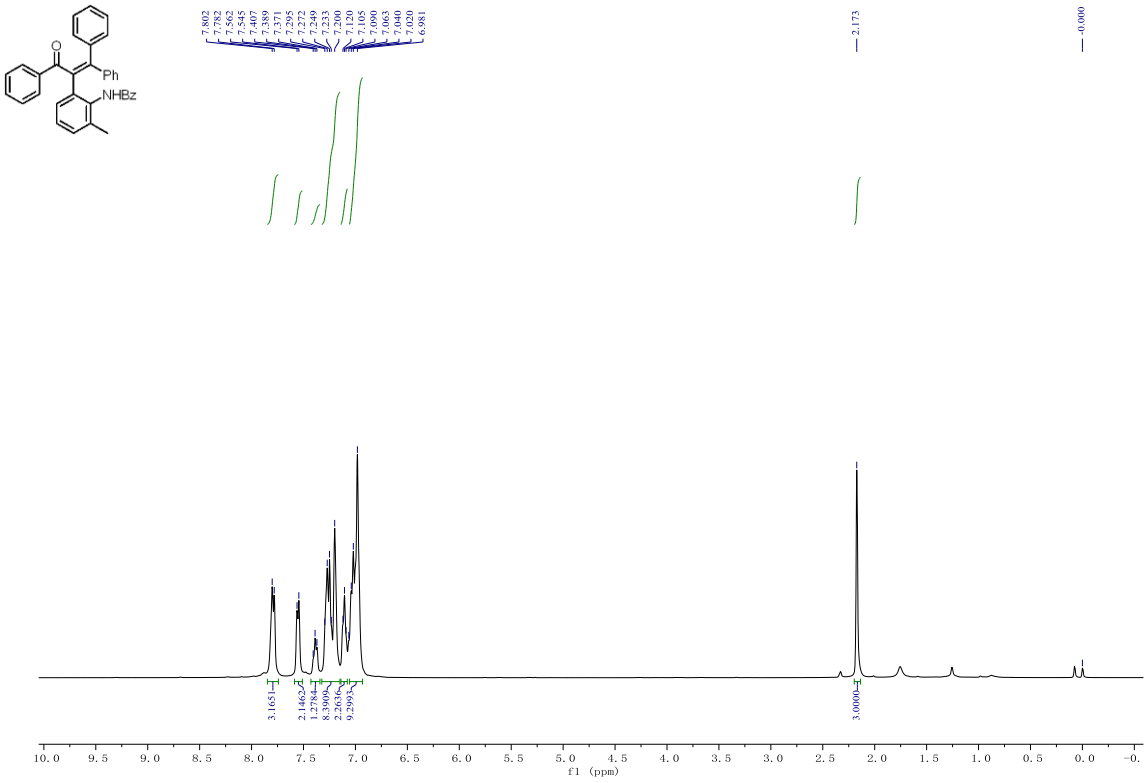
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ae



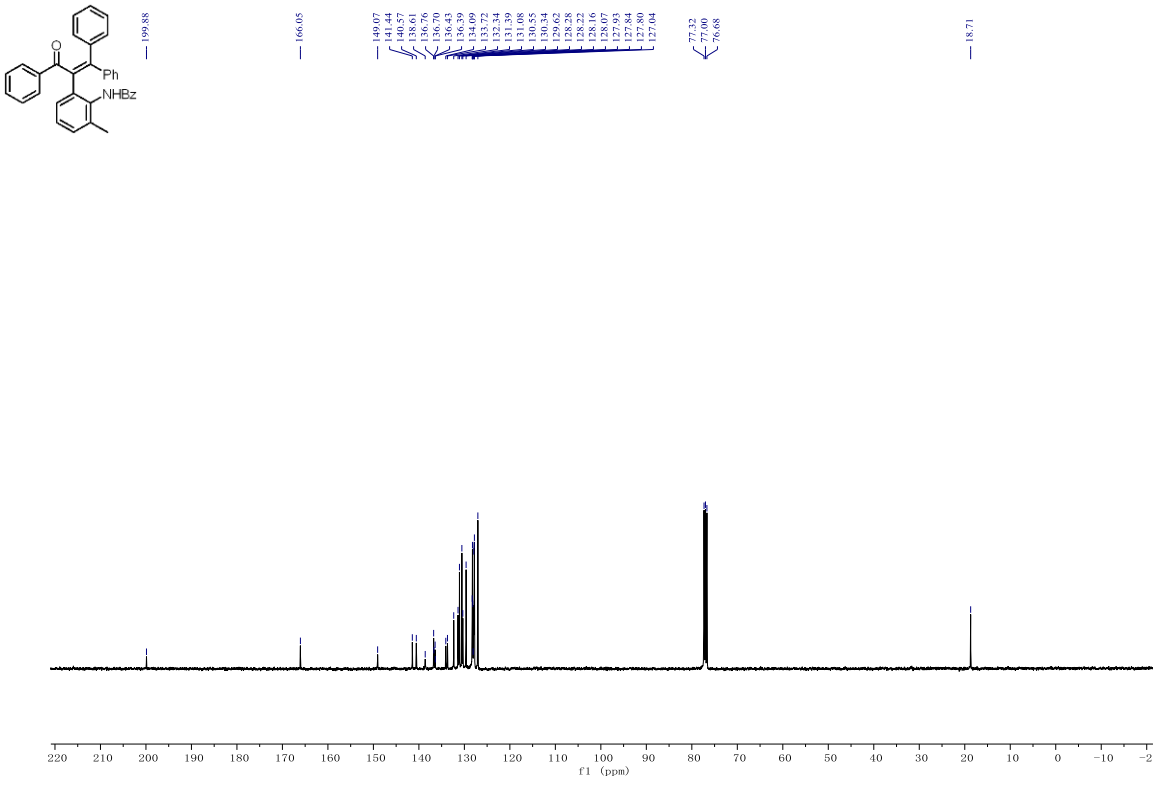
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ae



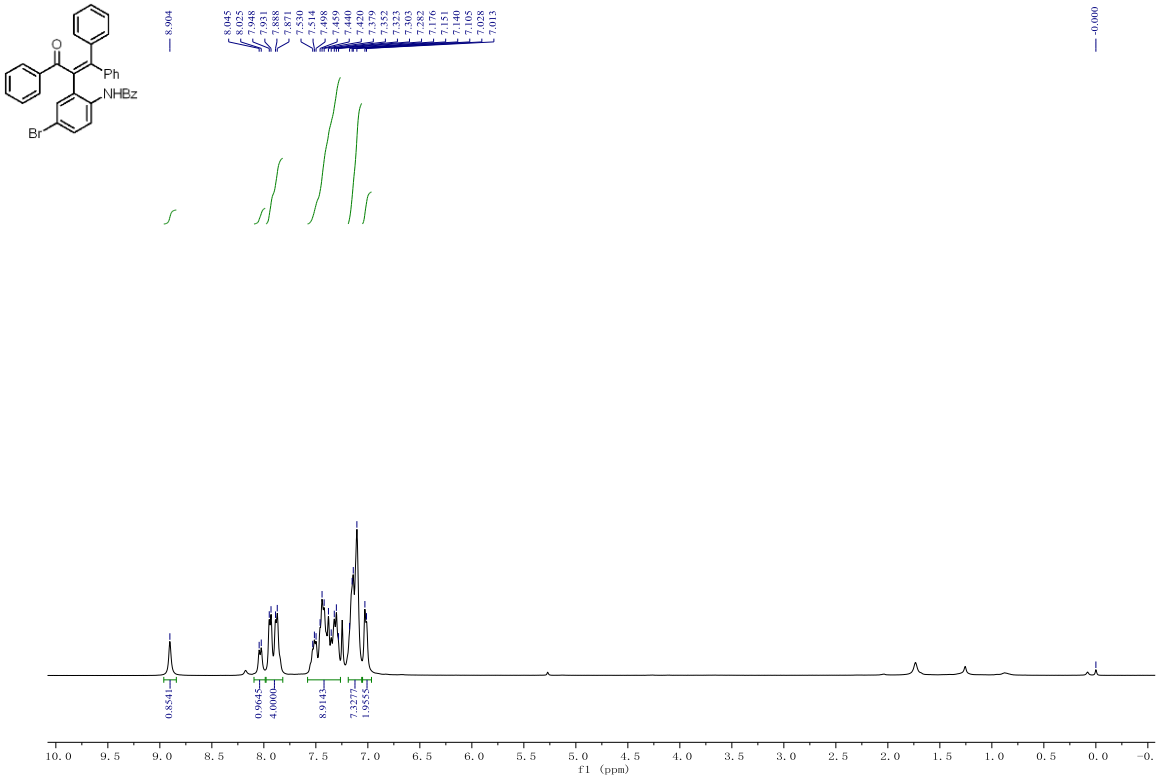
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3af



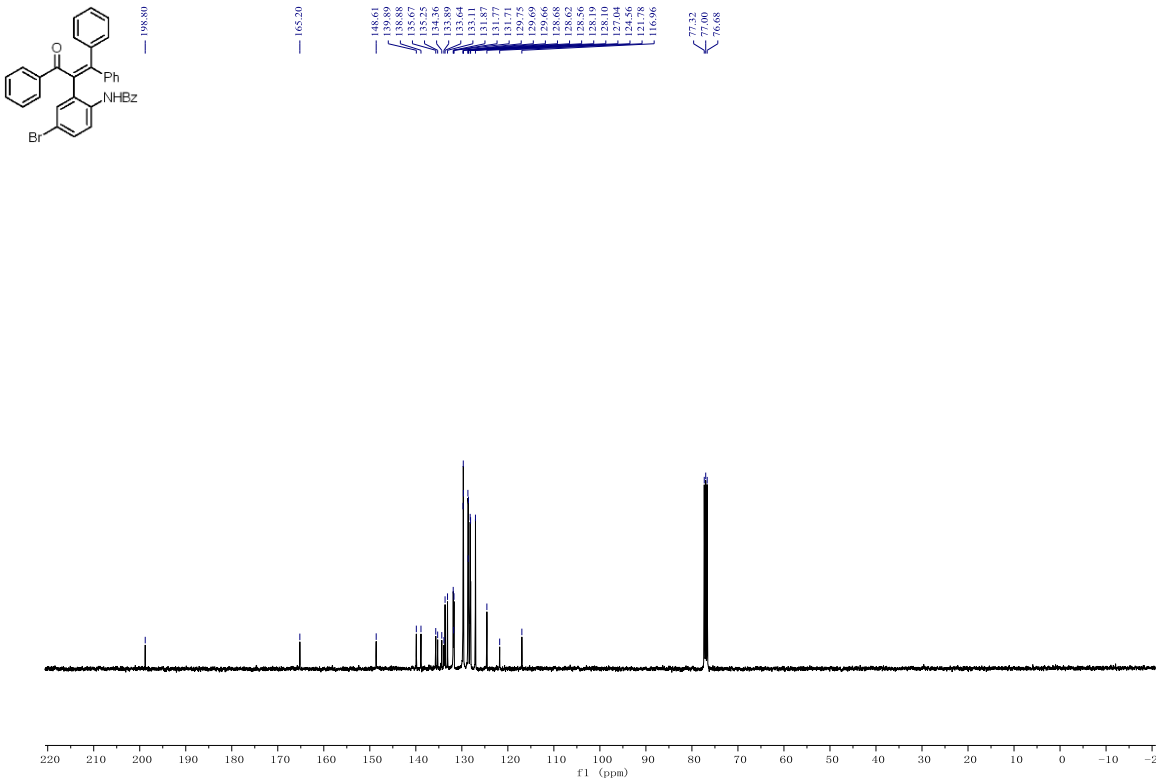
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3af



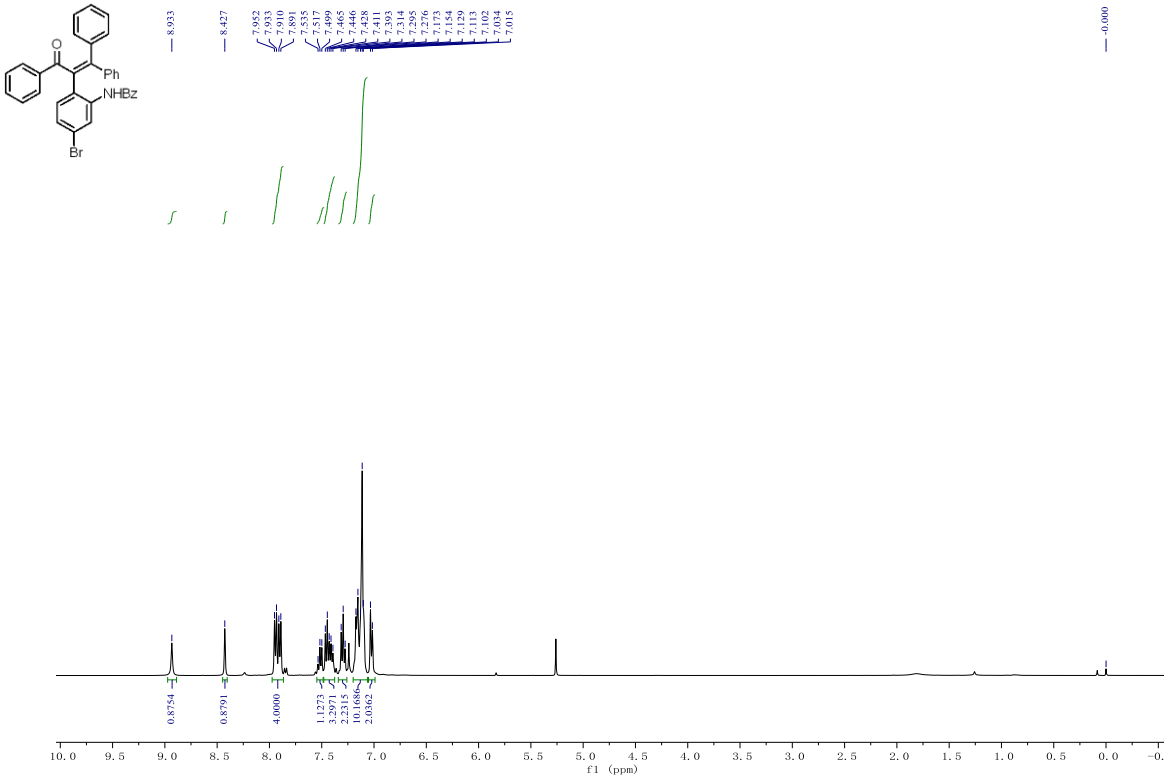
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ag



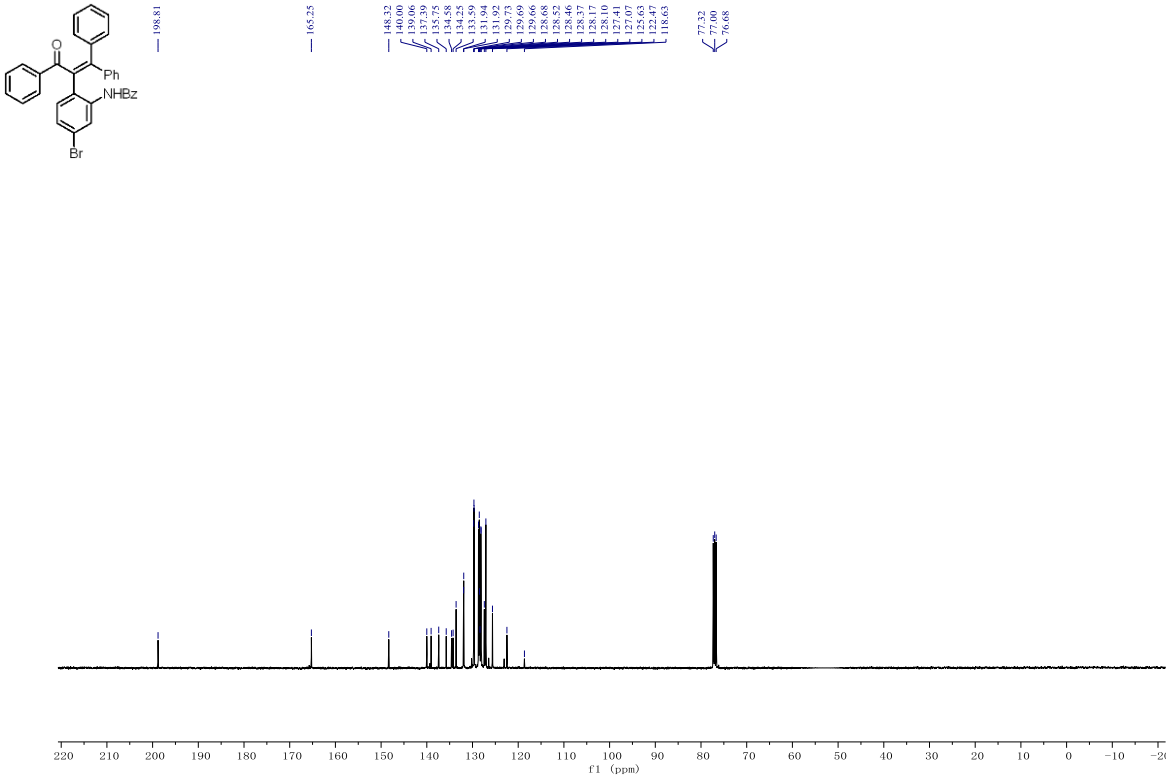
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ag



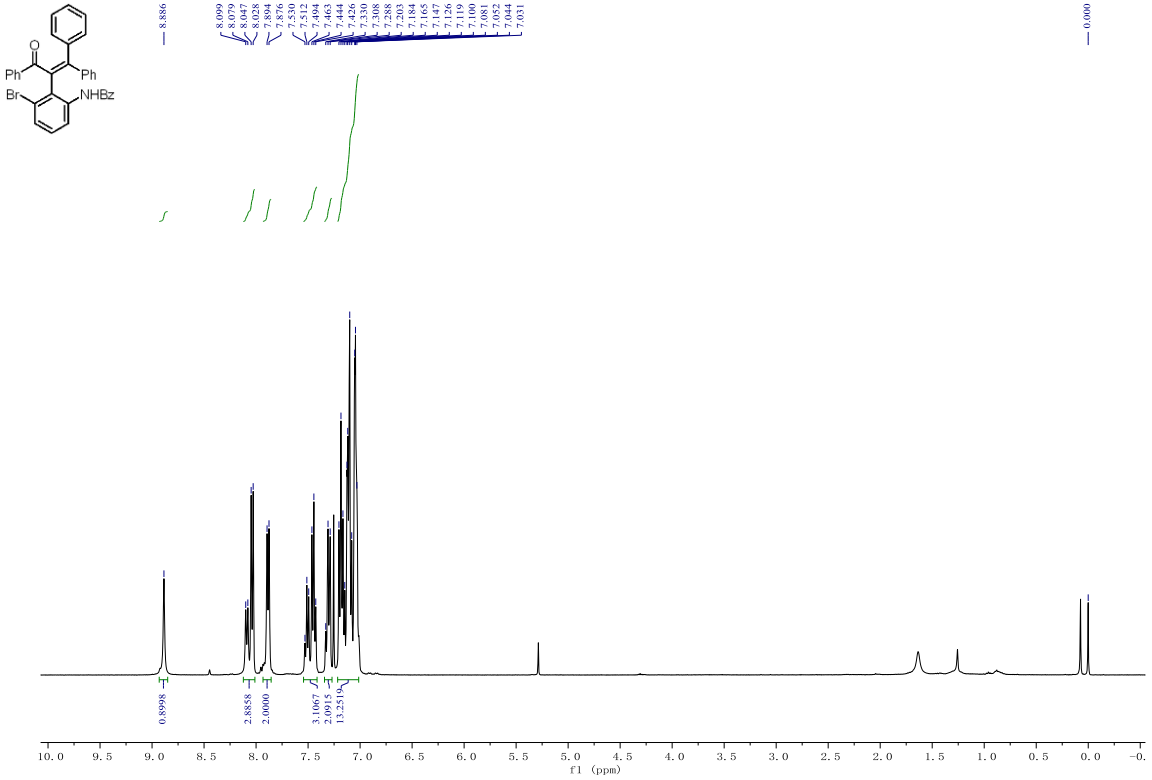
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ah



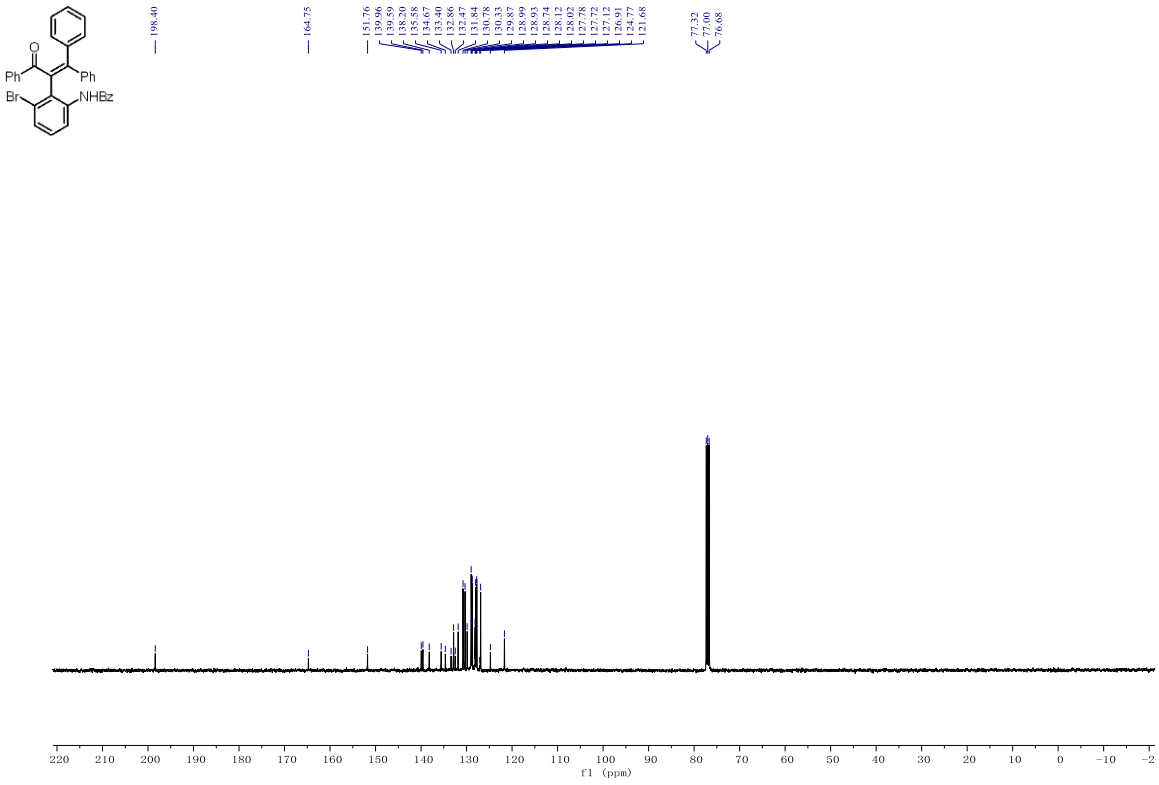
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ah



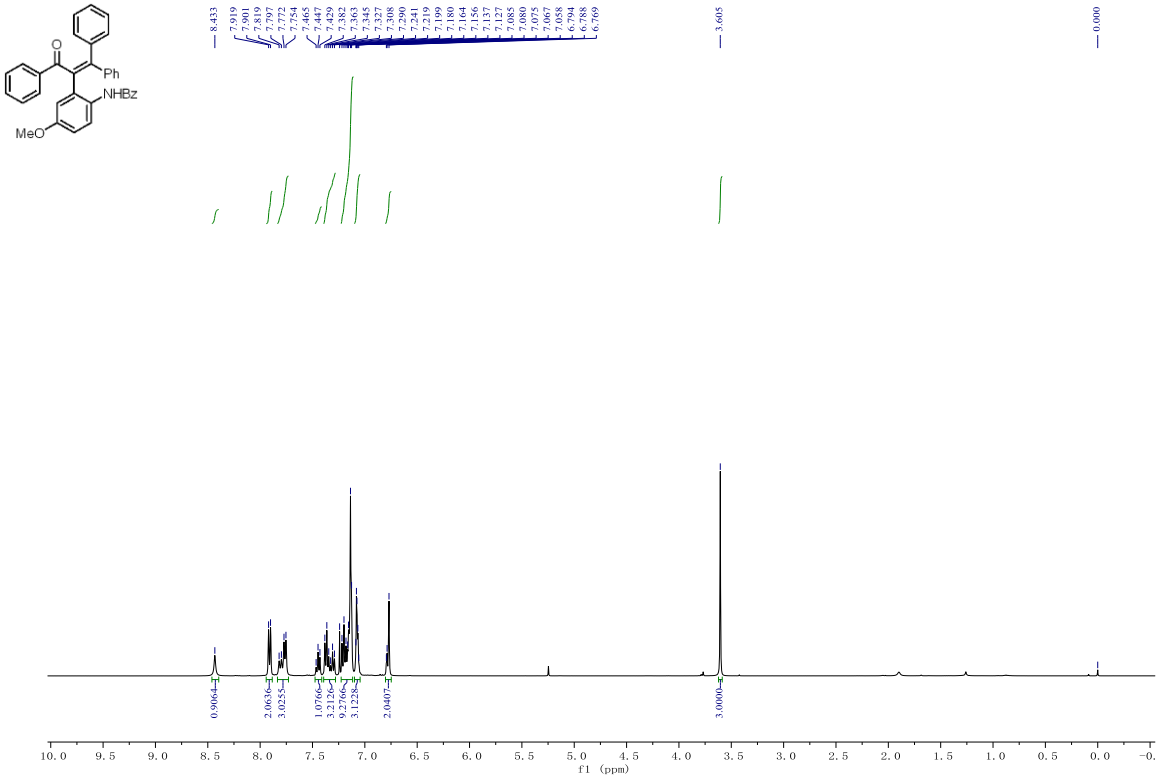
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ai



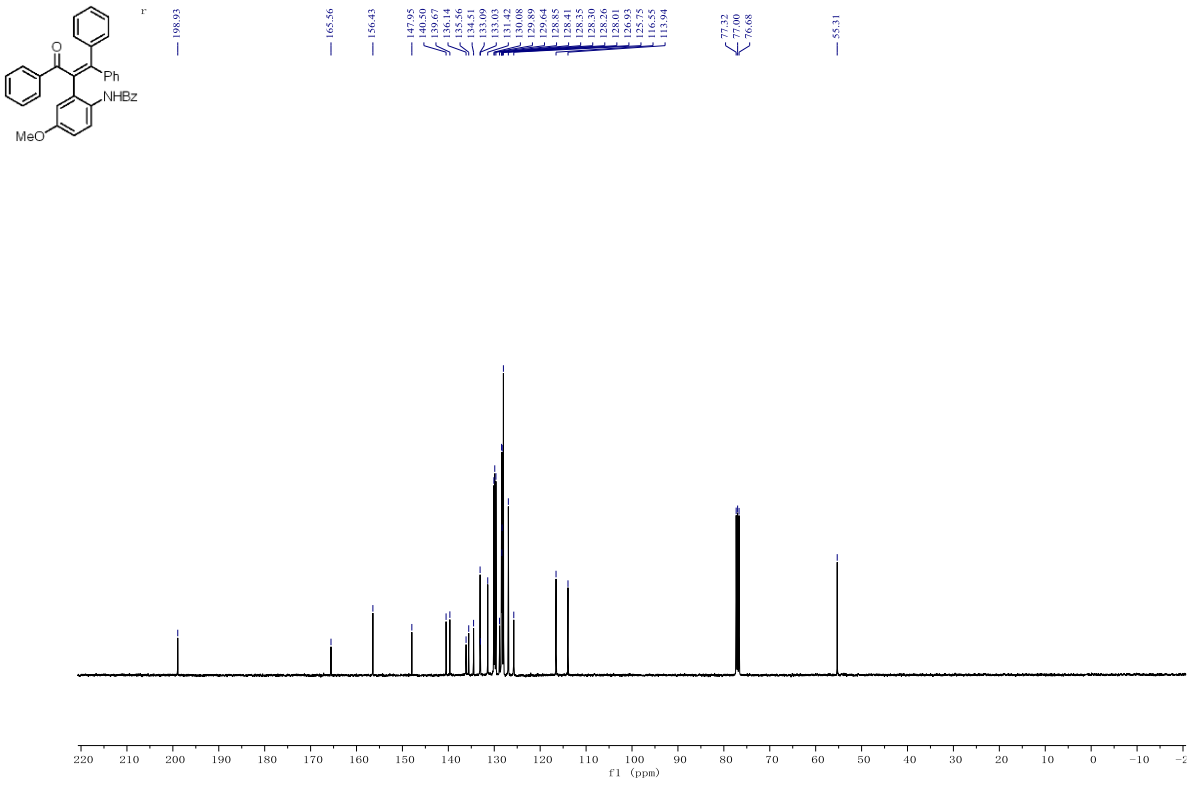
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ai



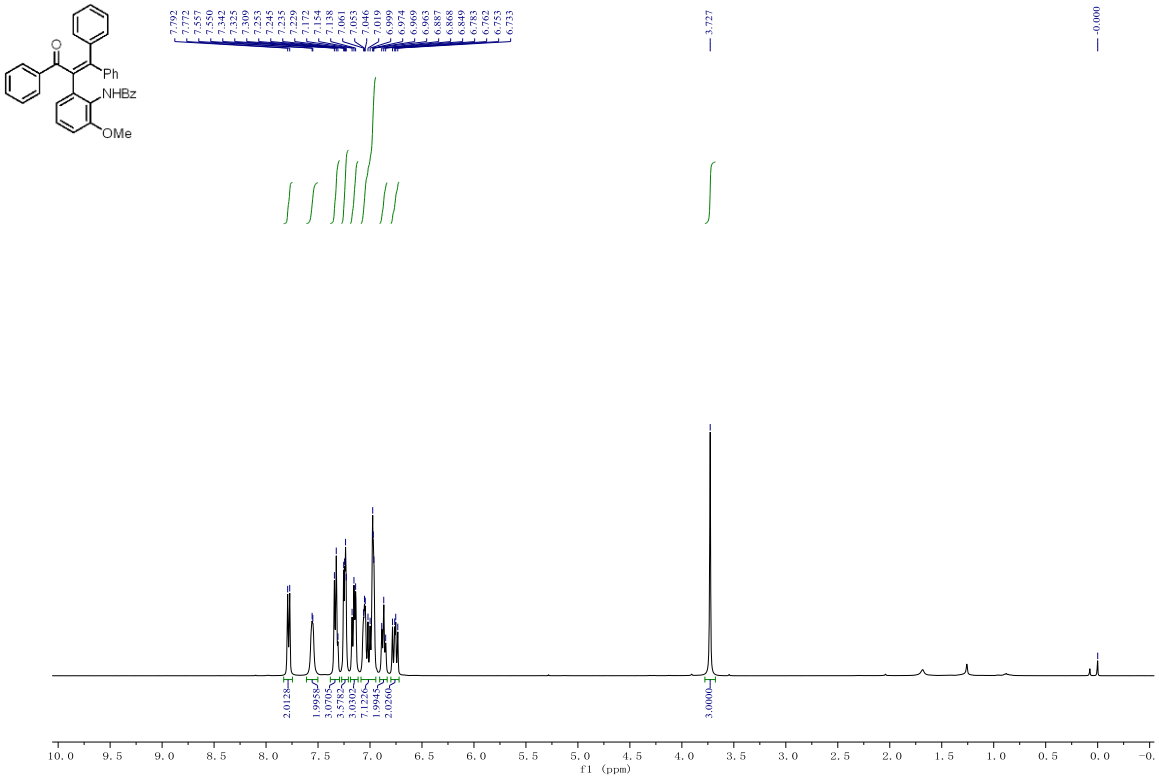
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3aj



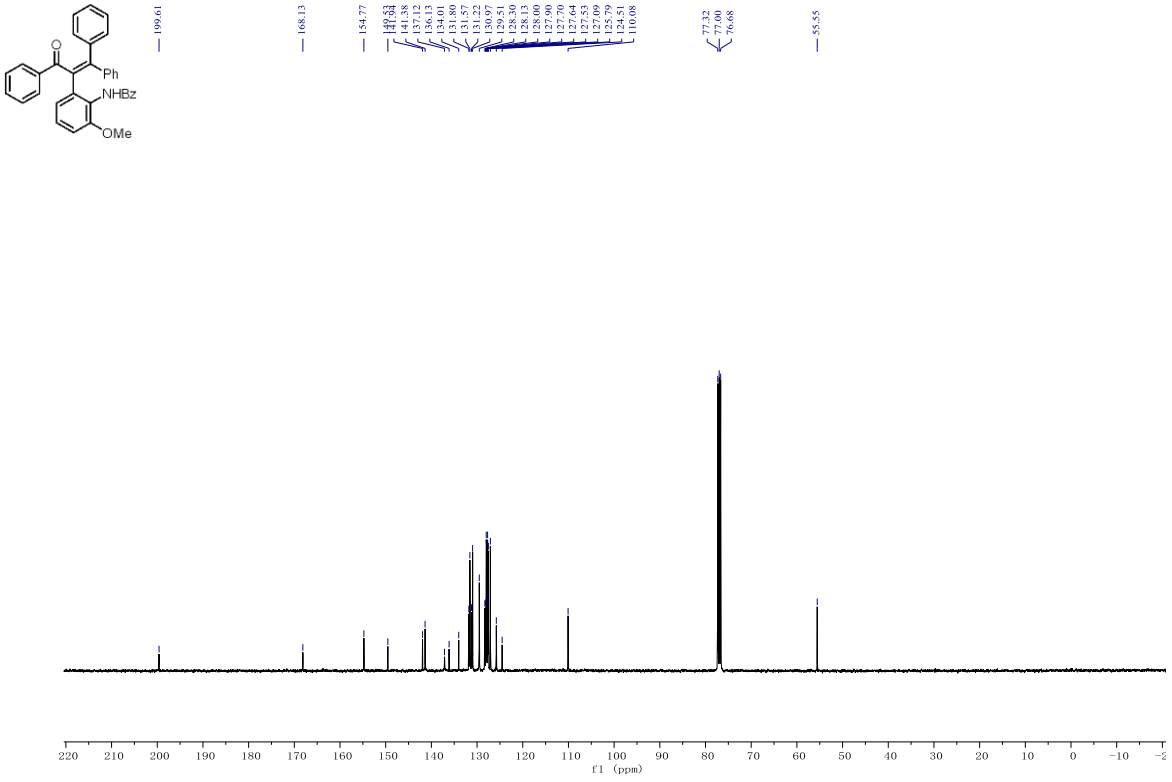
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3aj



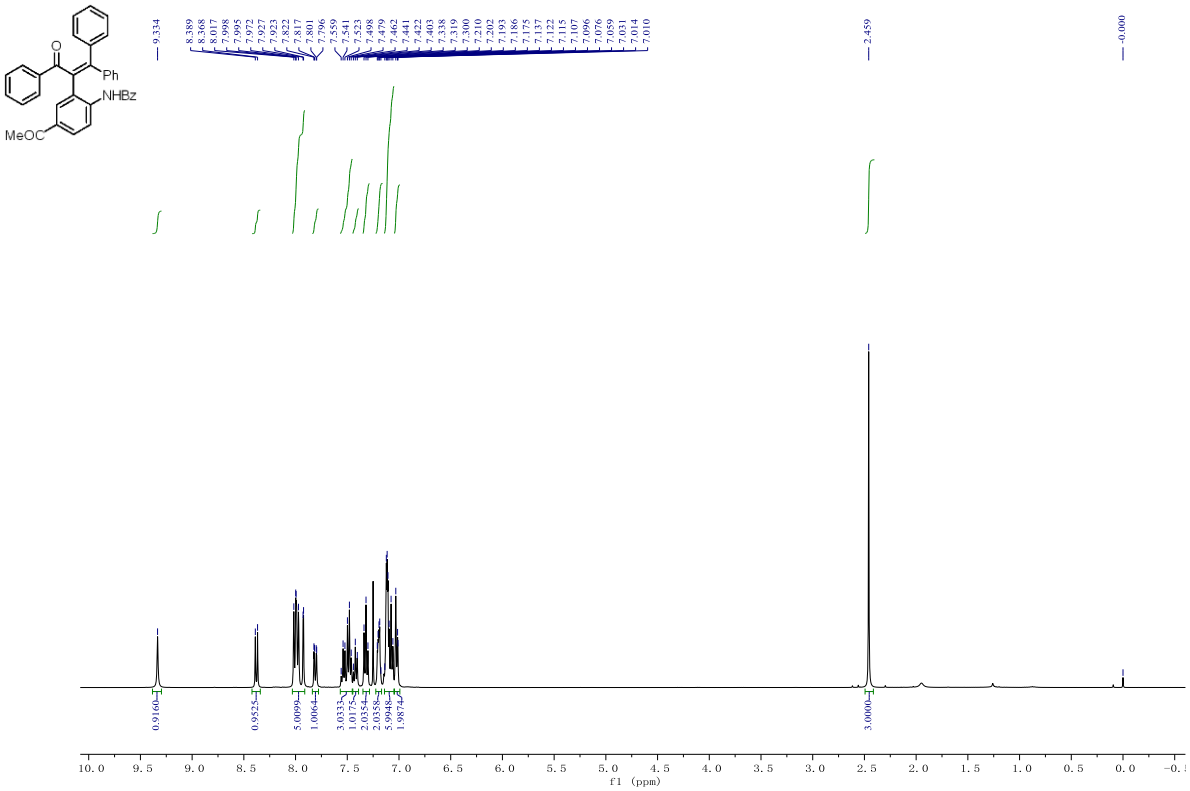
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ak



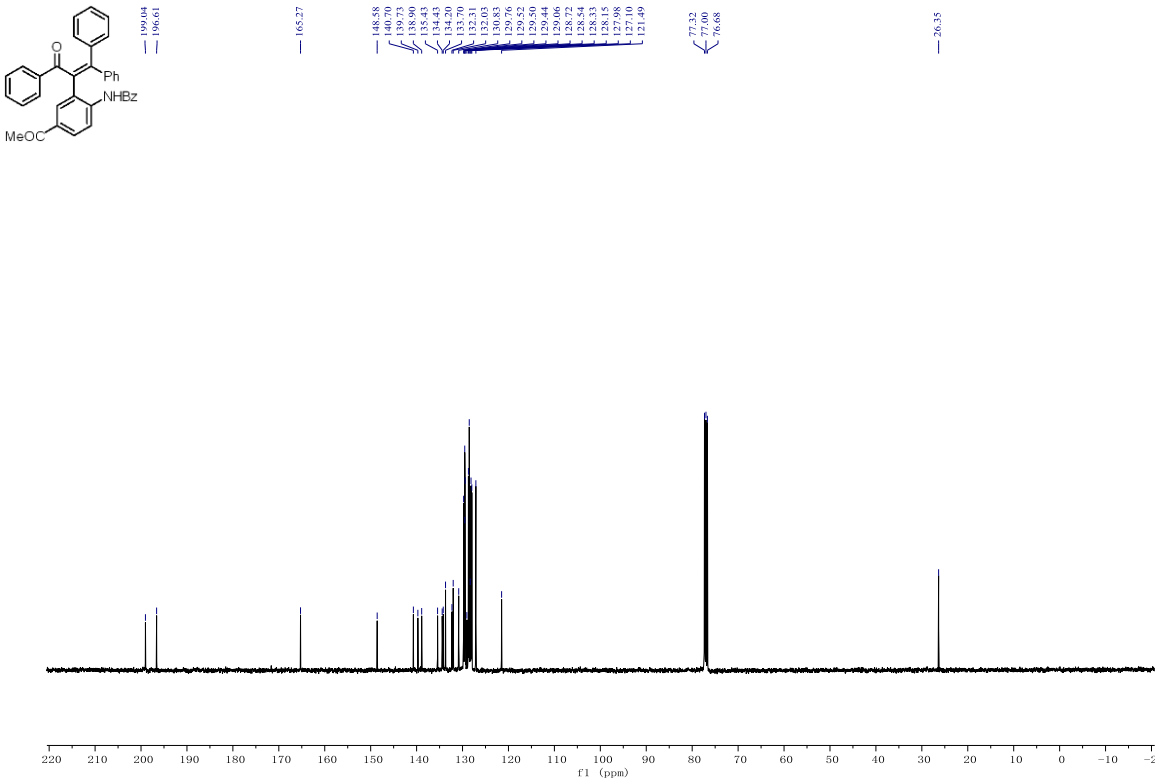
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ak



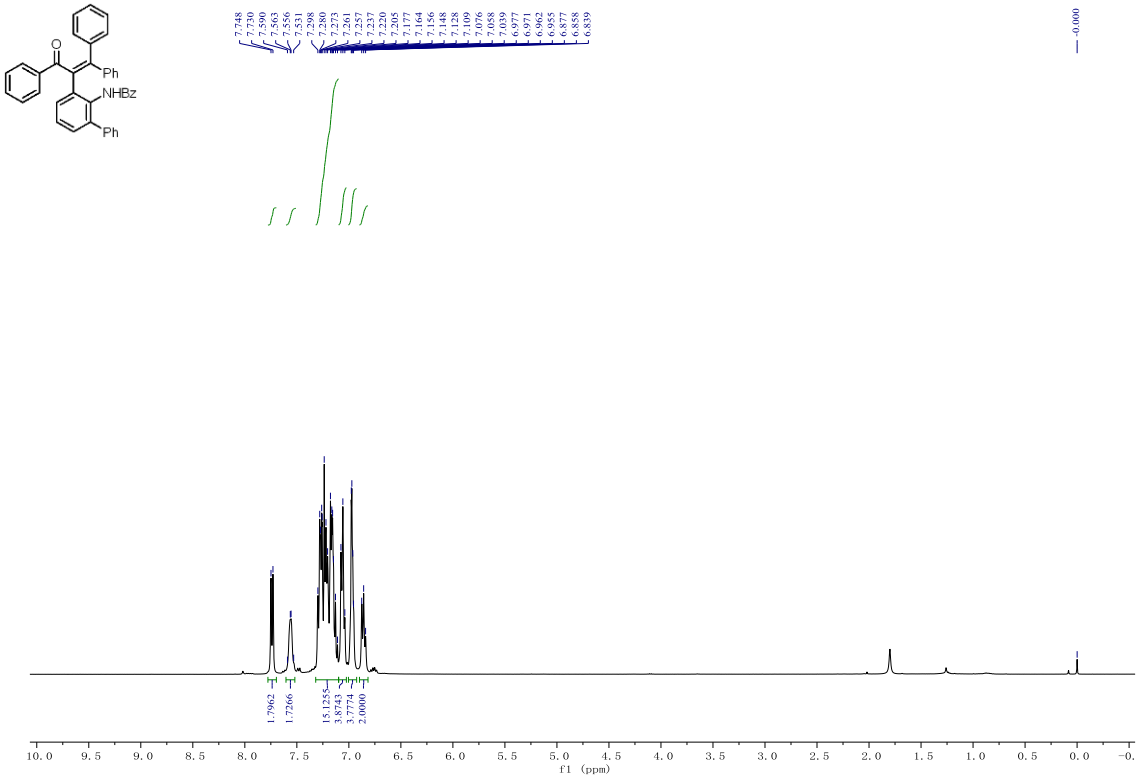
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3al



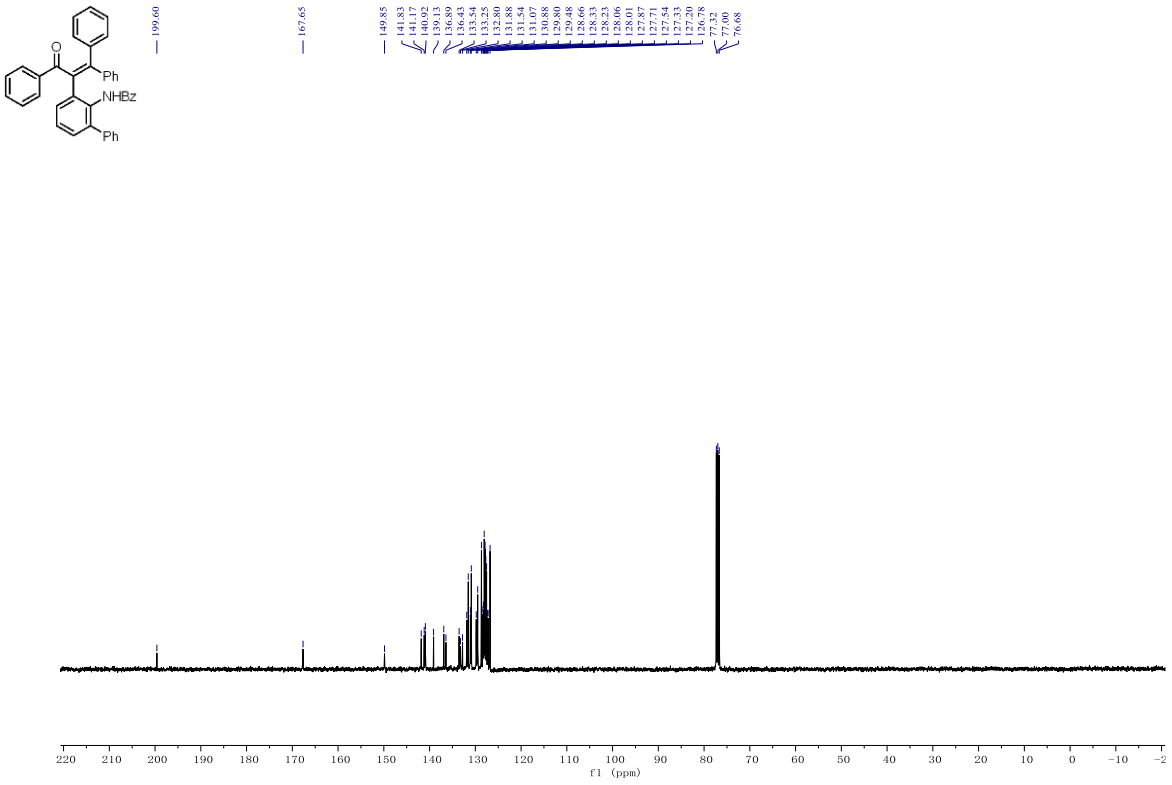
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3al



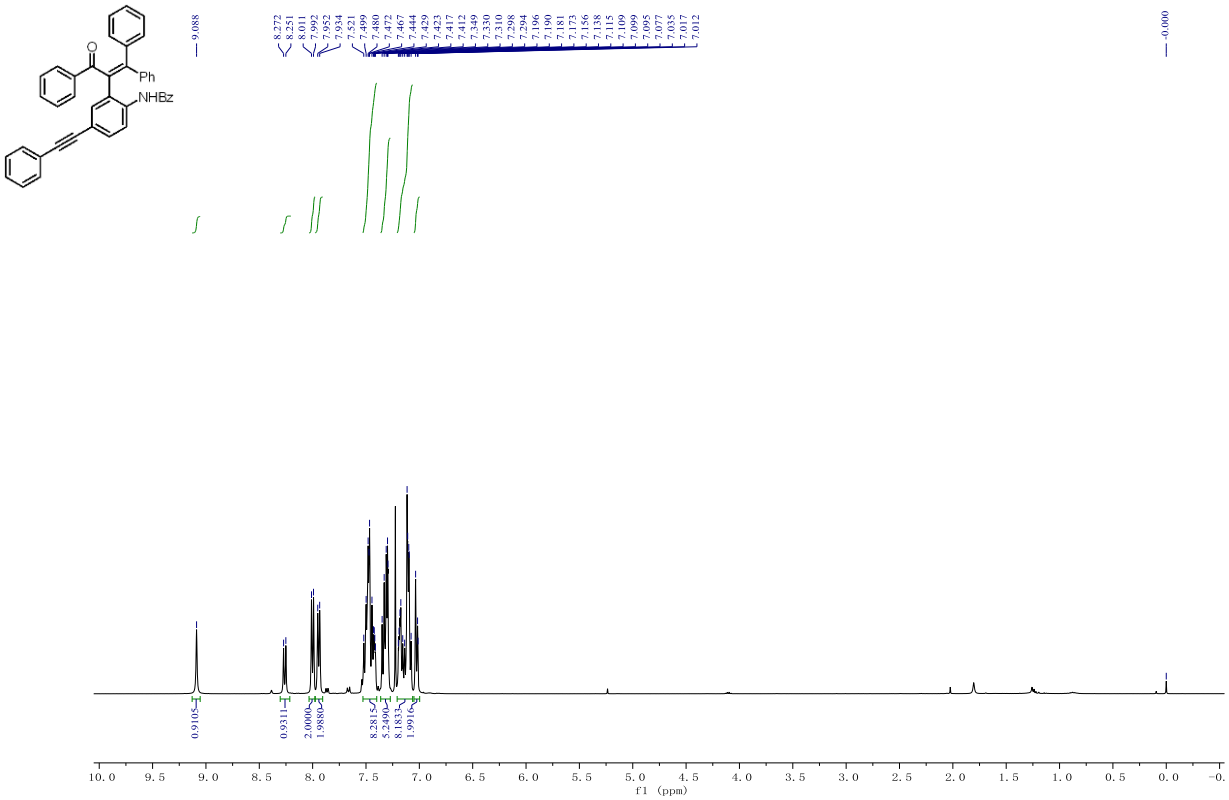
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3am



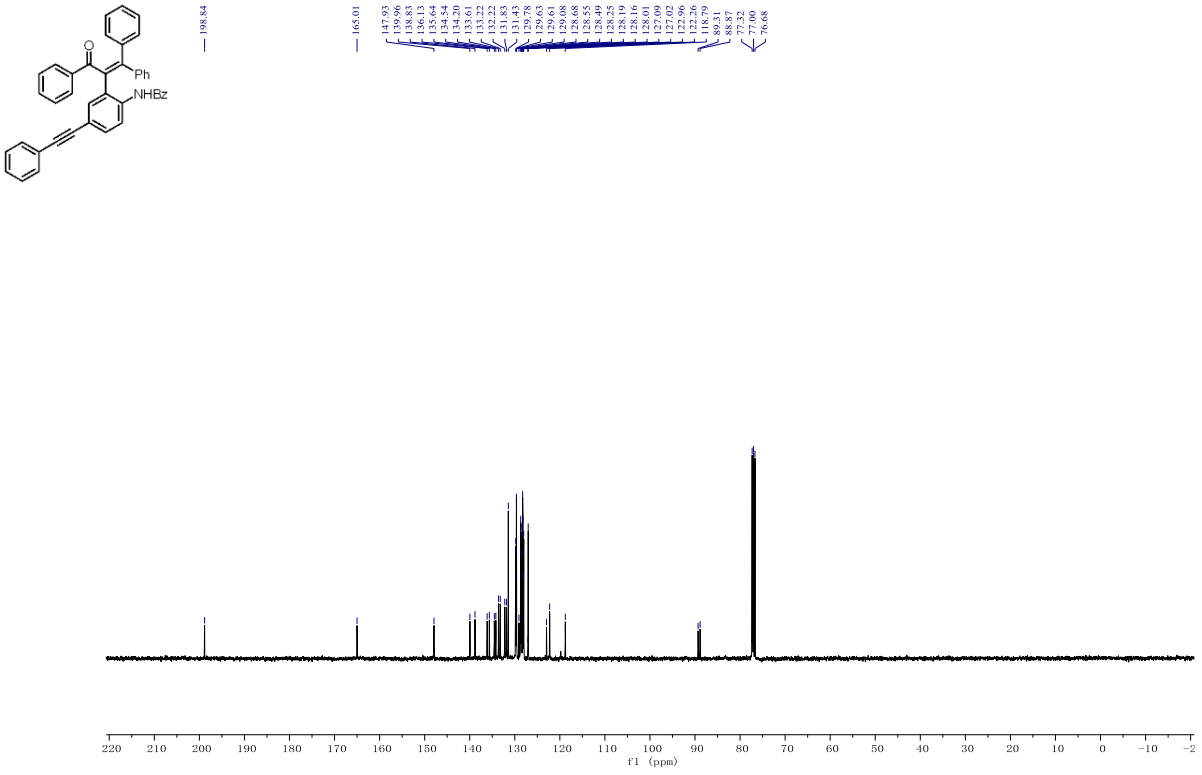
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3am



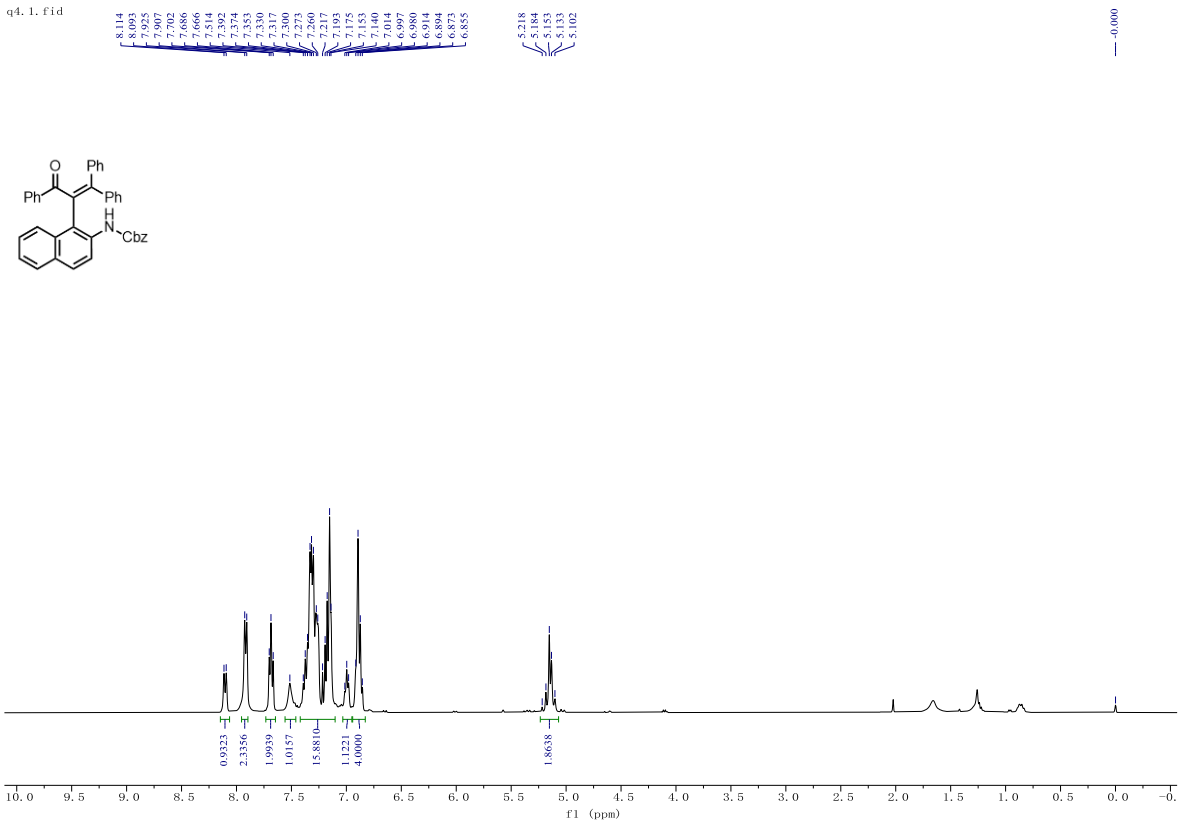
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3an



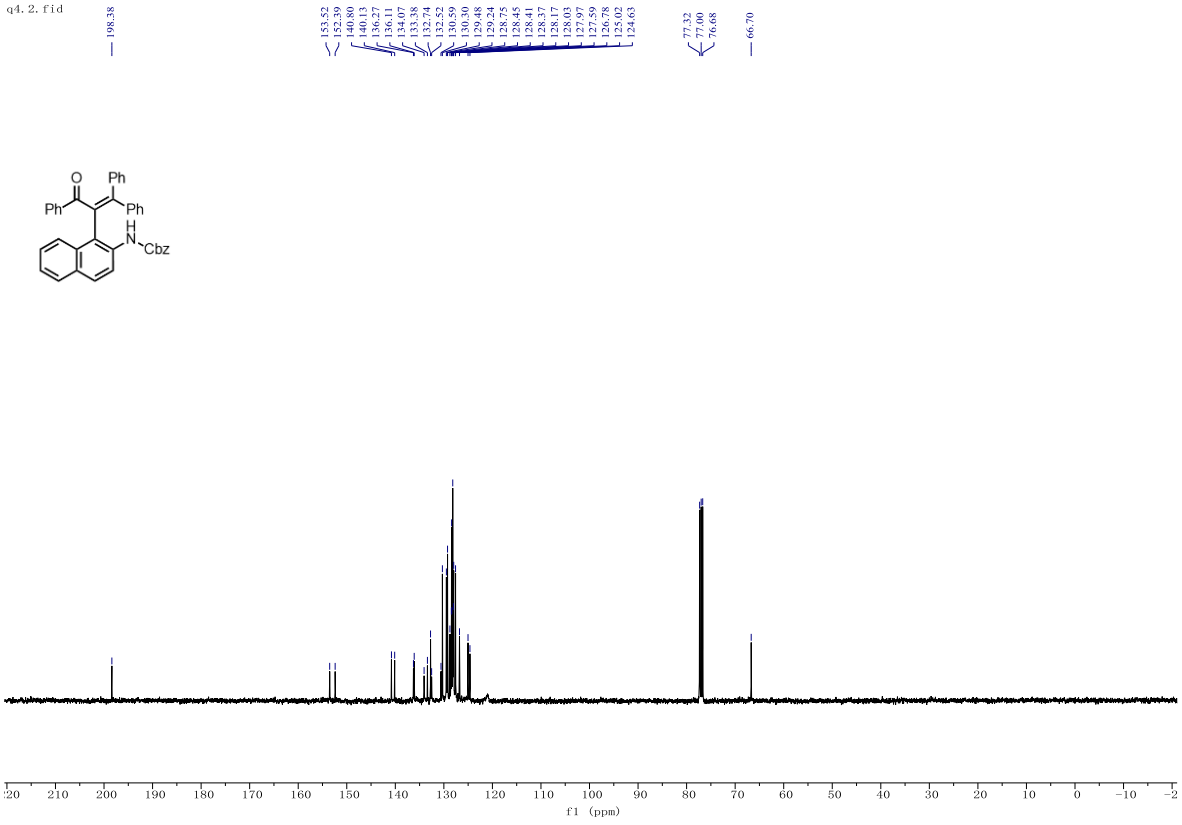
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3an



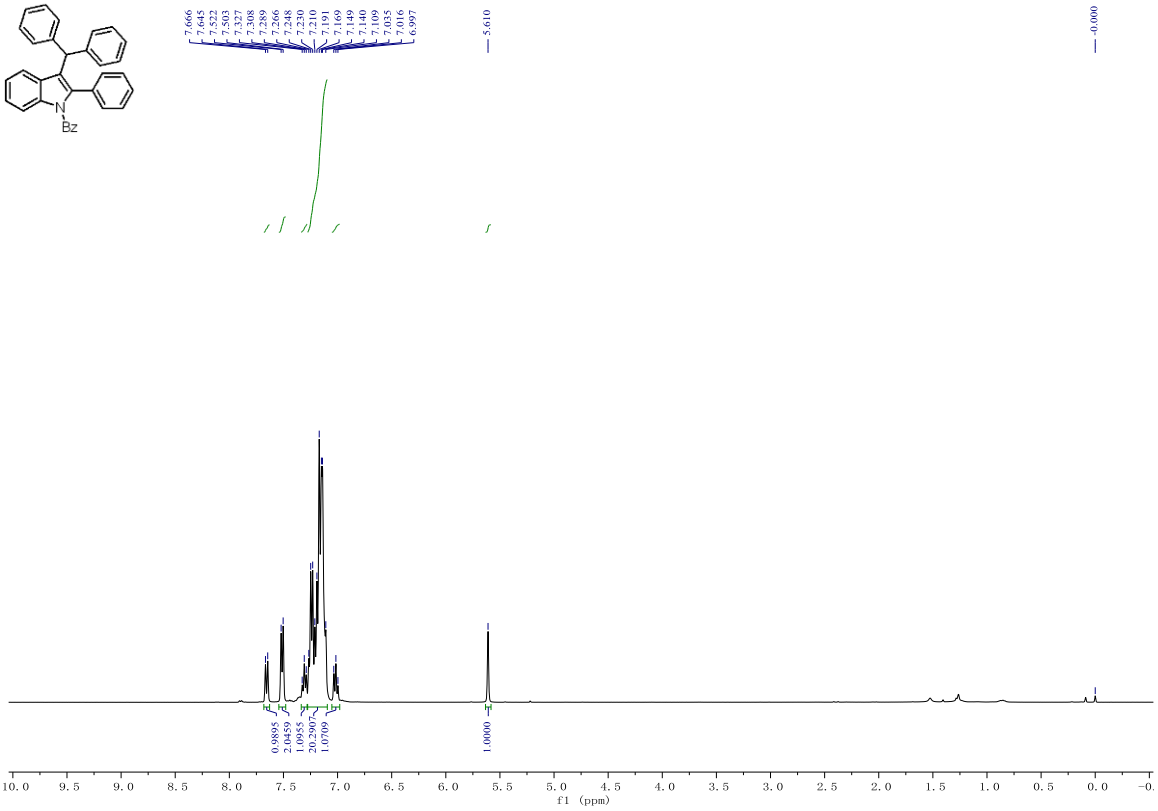
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 3ao



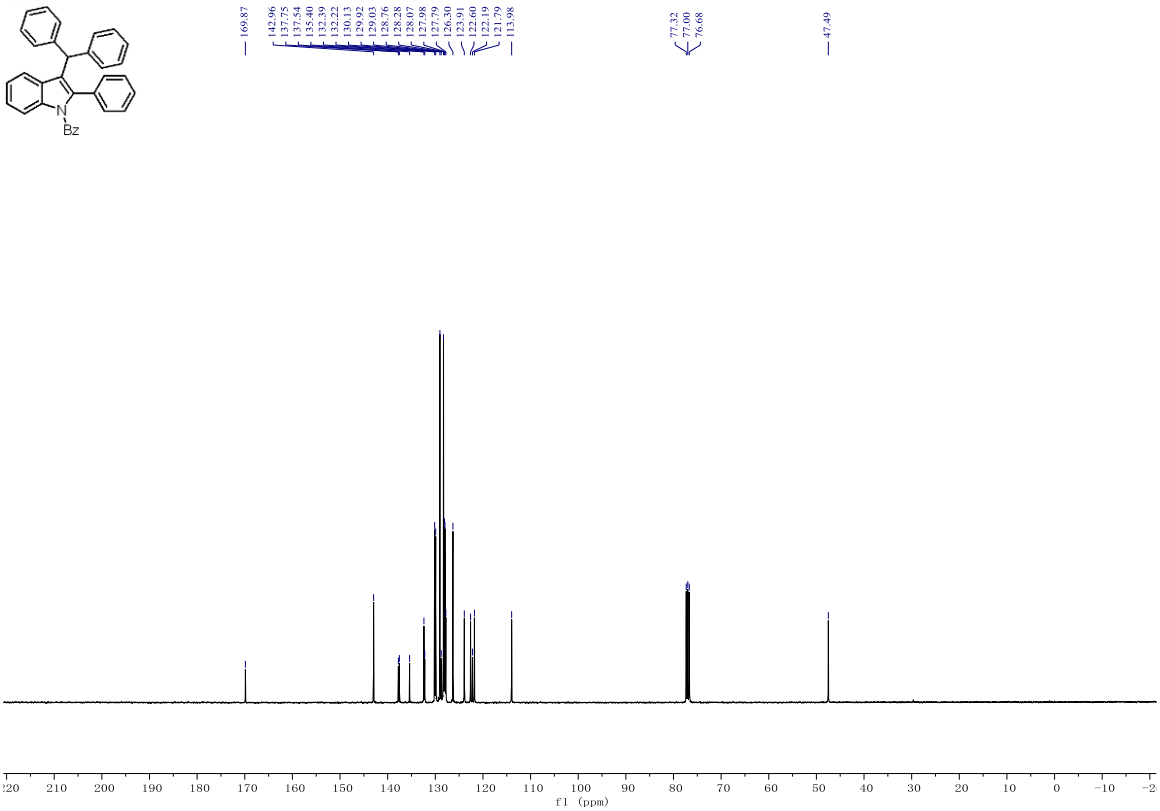
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 3ao



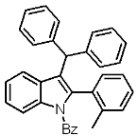
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4a



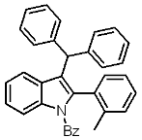
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4a



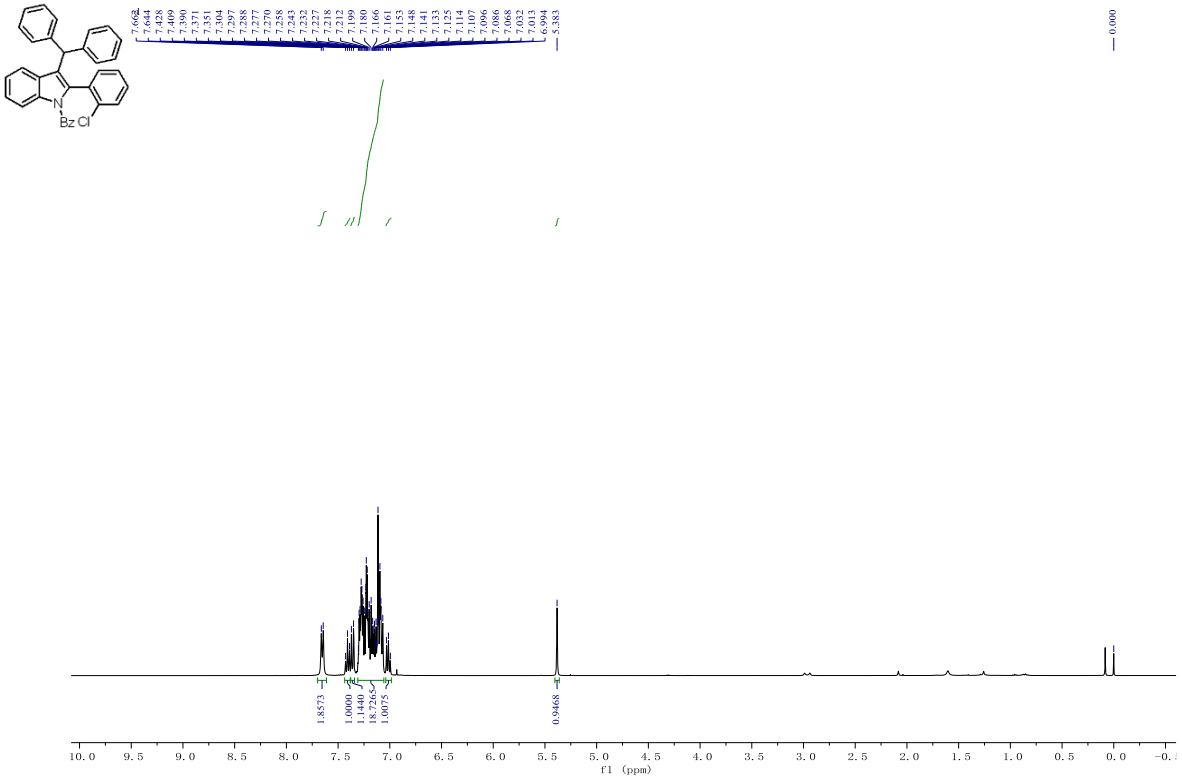
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4b



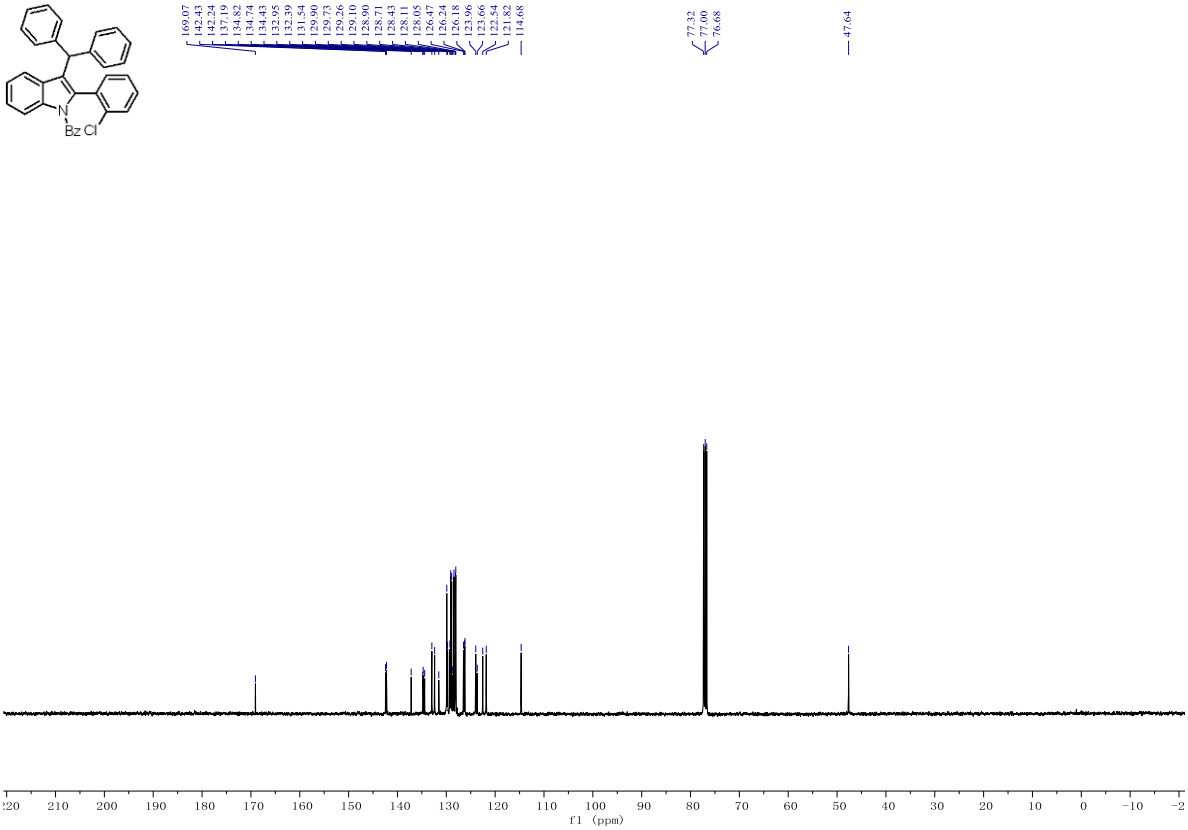
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4b



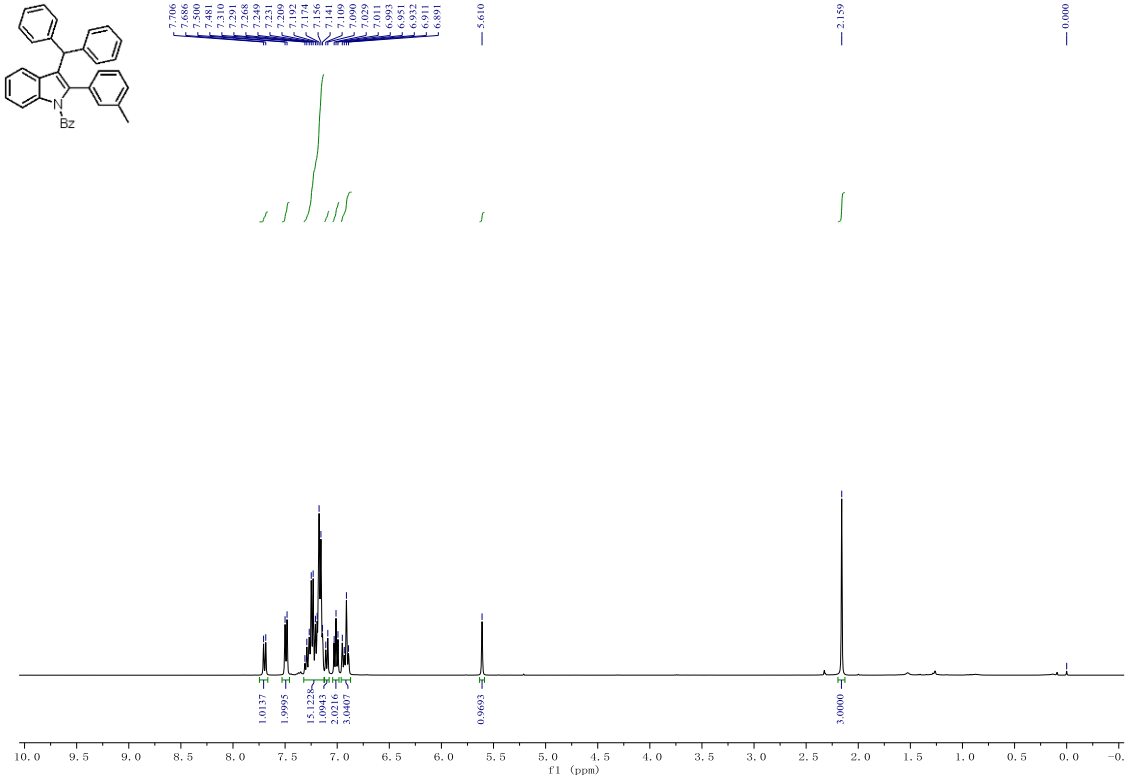
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4c



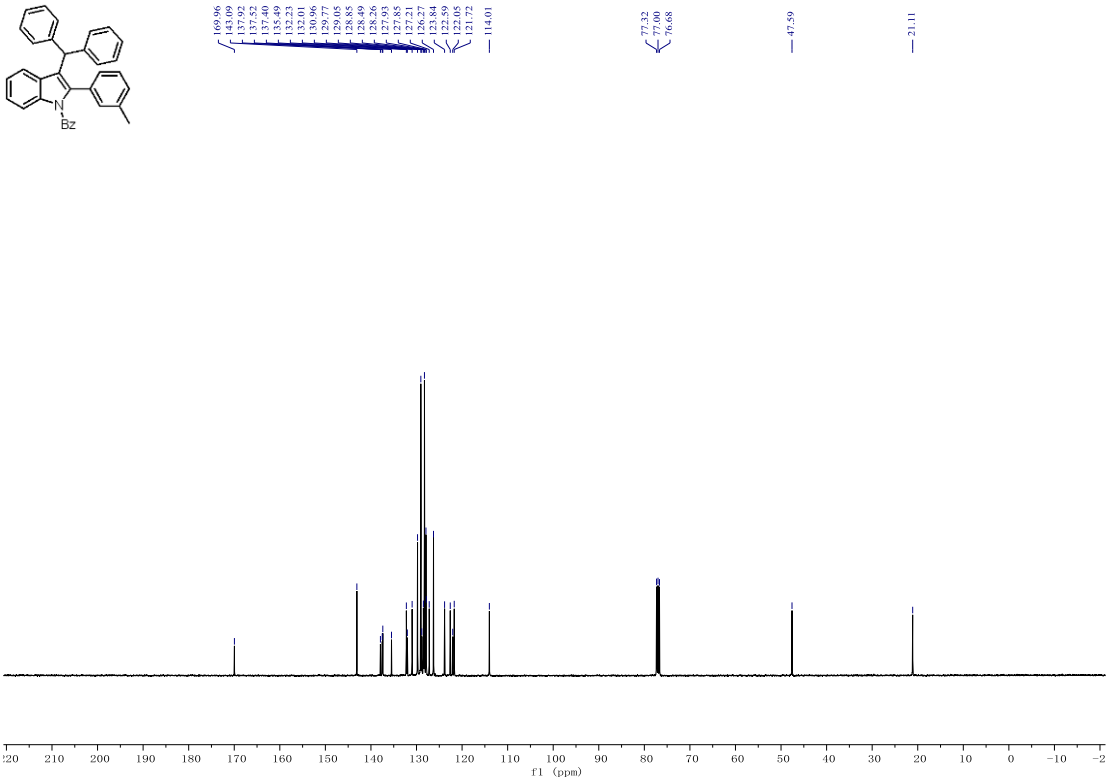
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4c



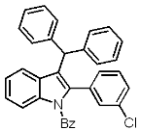
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4d



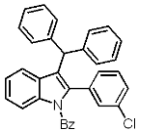
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4d



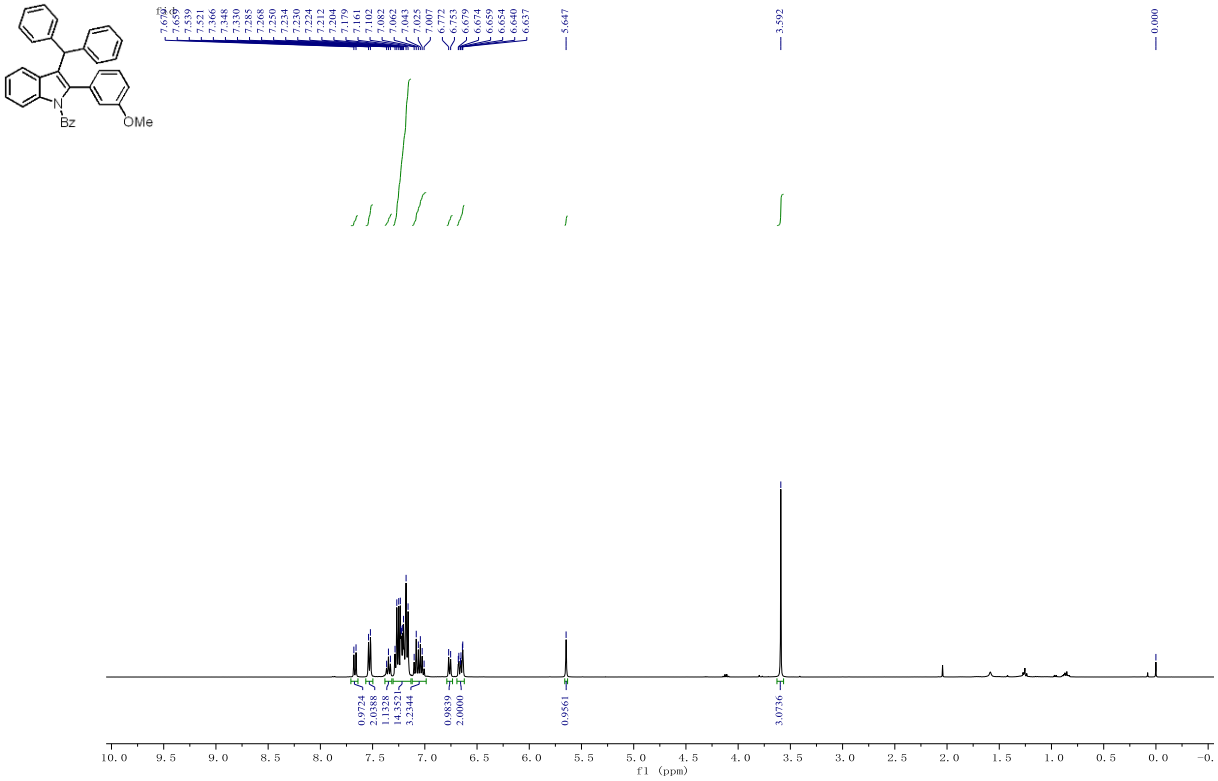
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4e



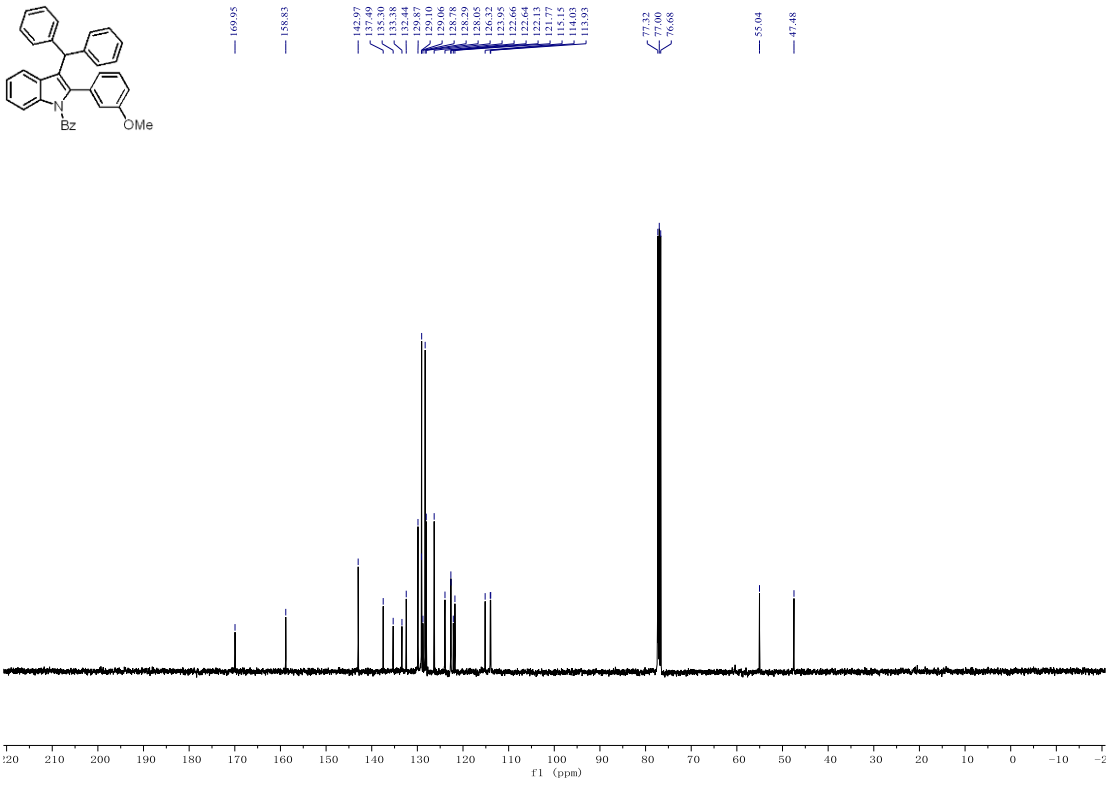
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4e



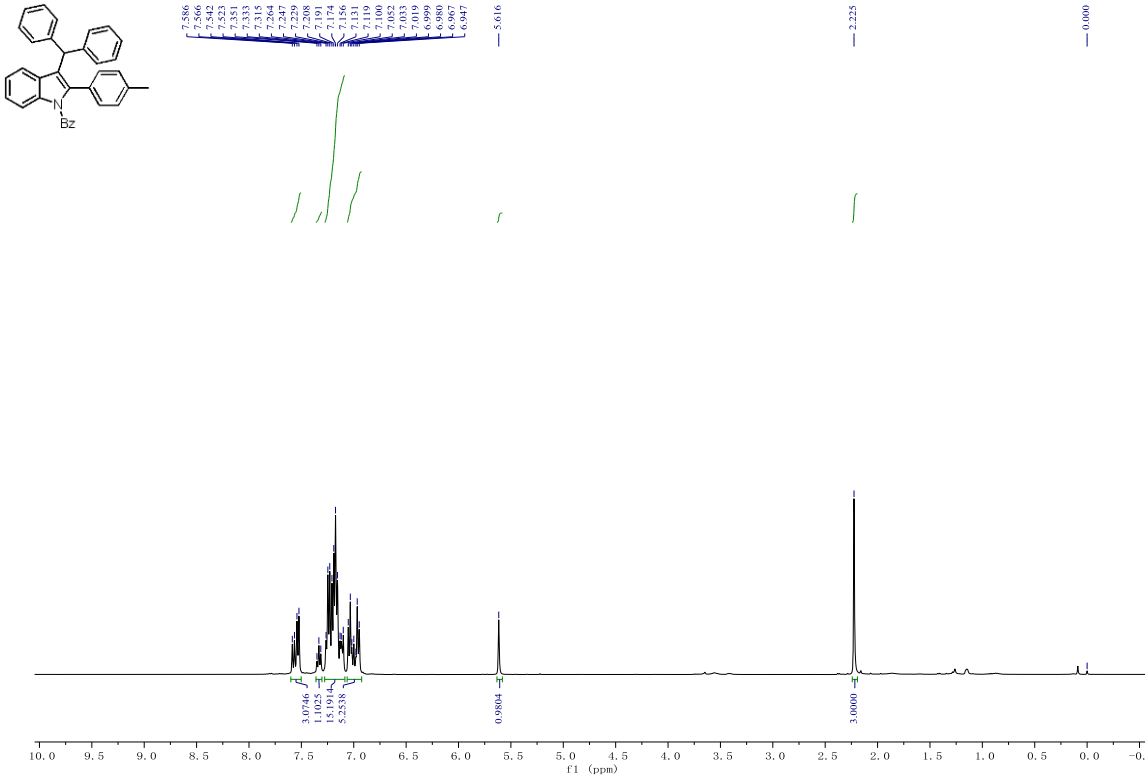
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4f



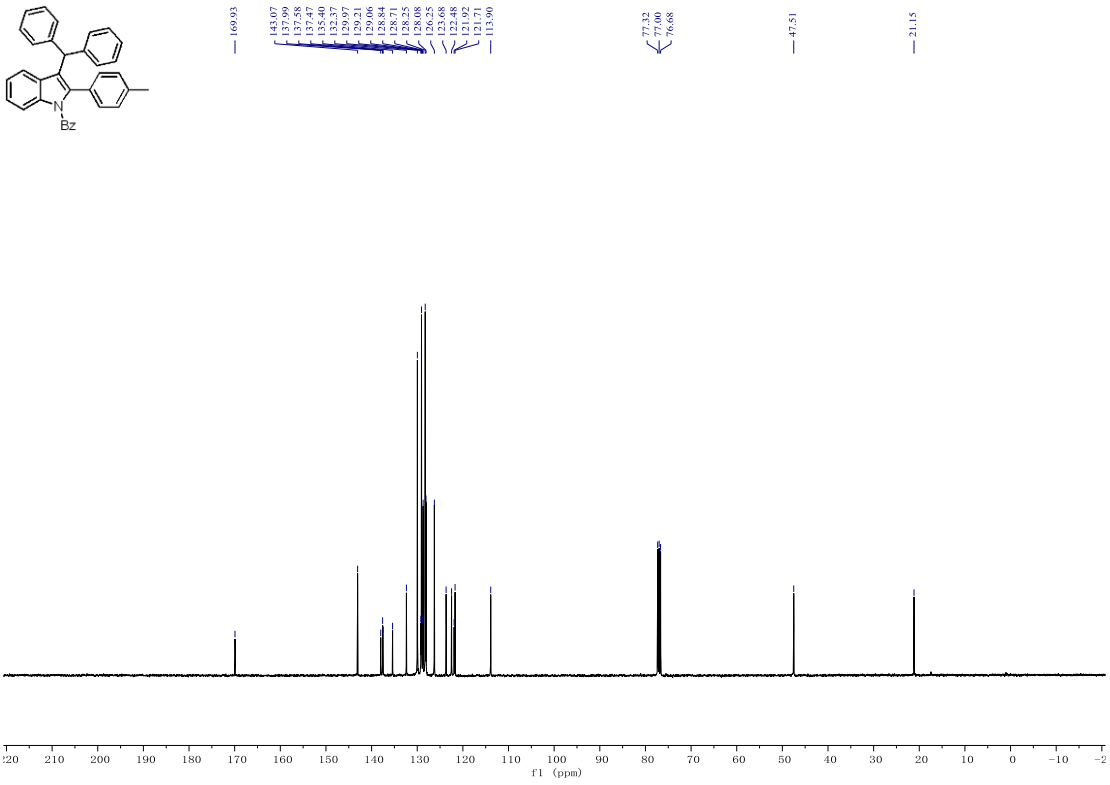
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4f



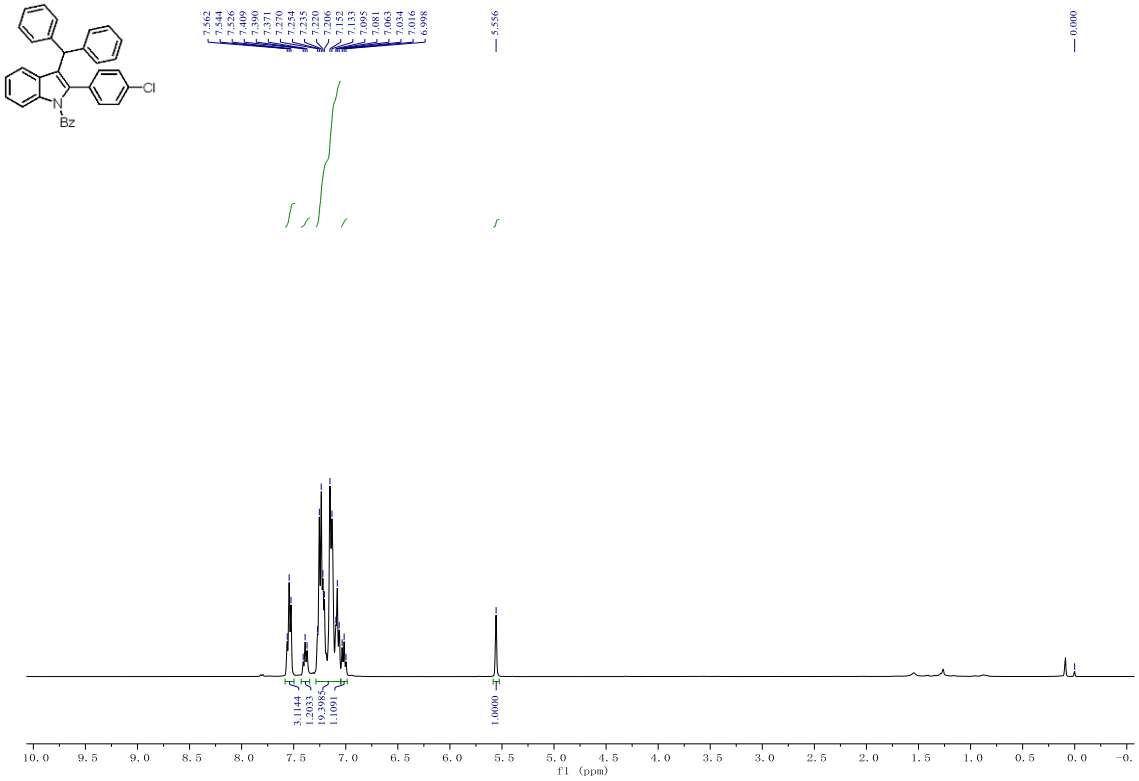
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4g



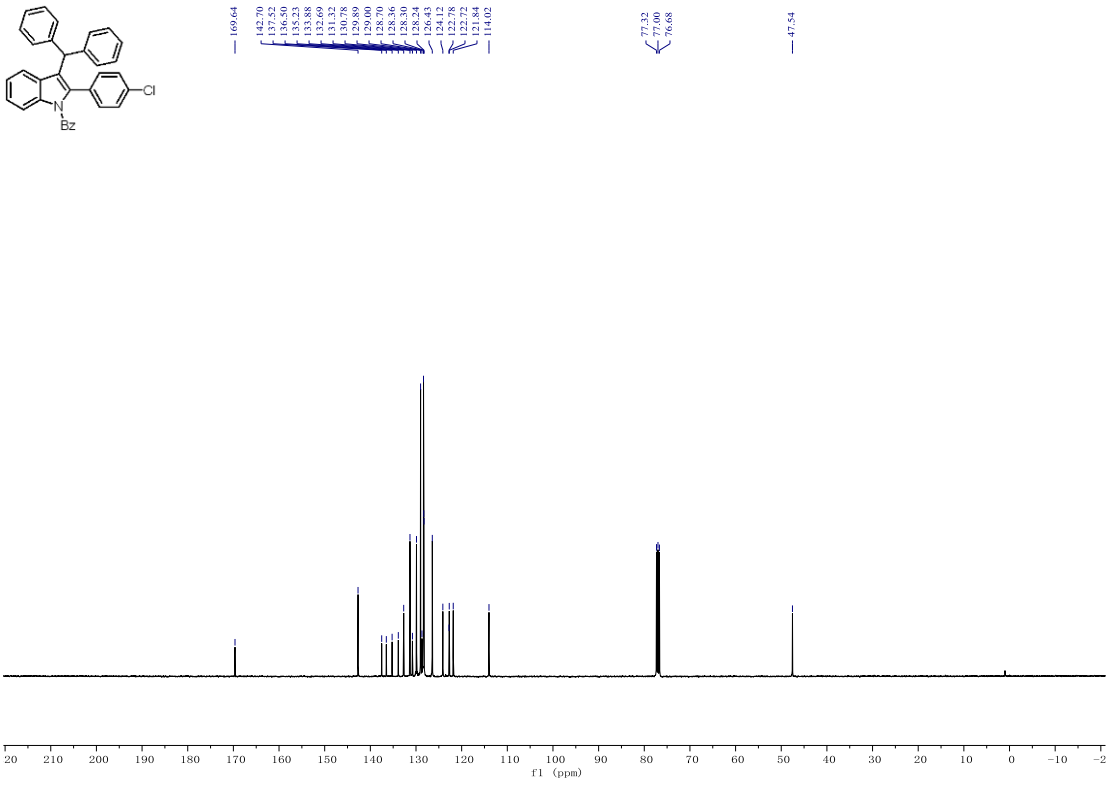
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4g



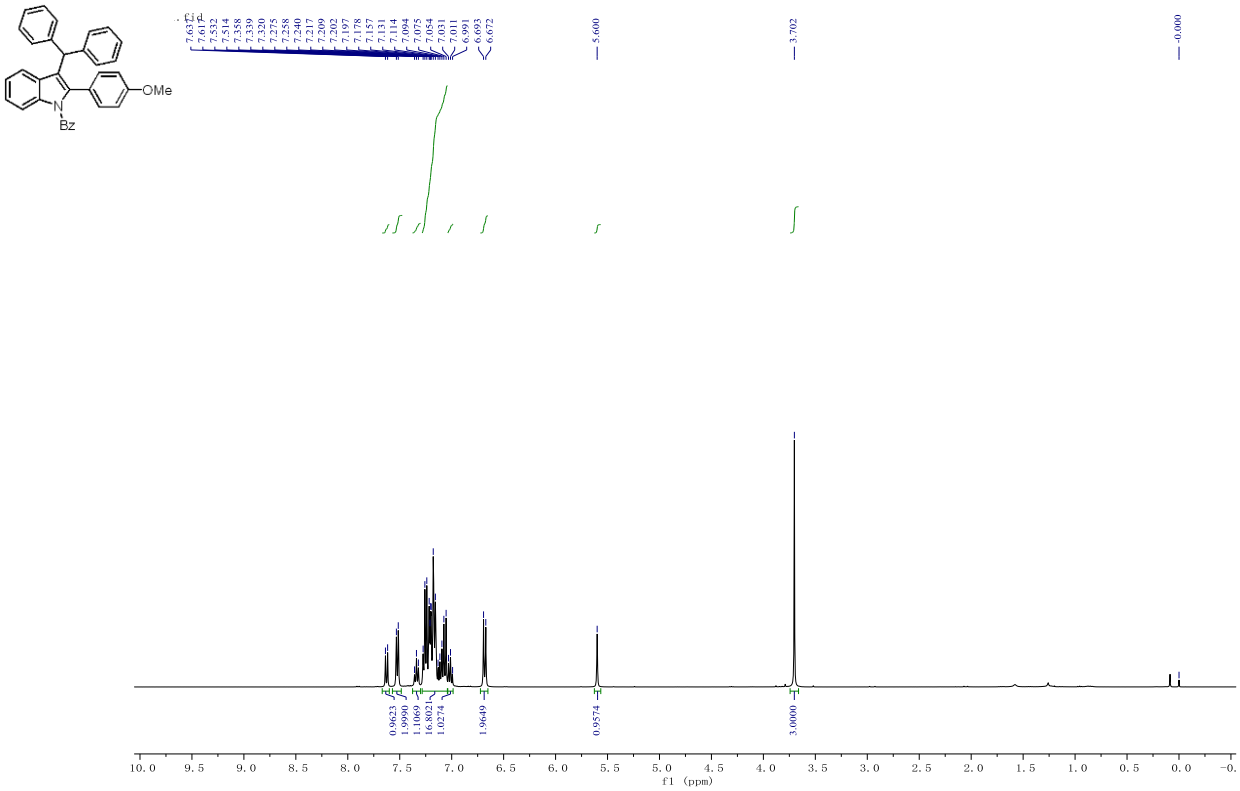
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4h



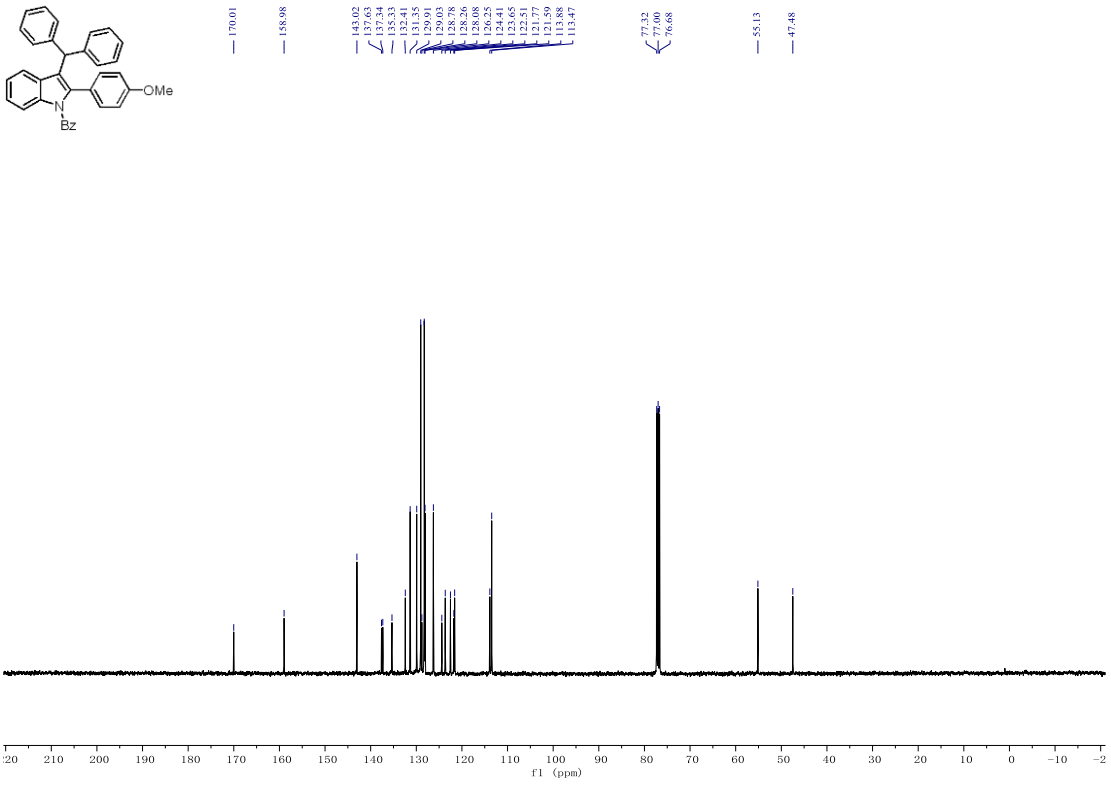
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4h



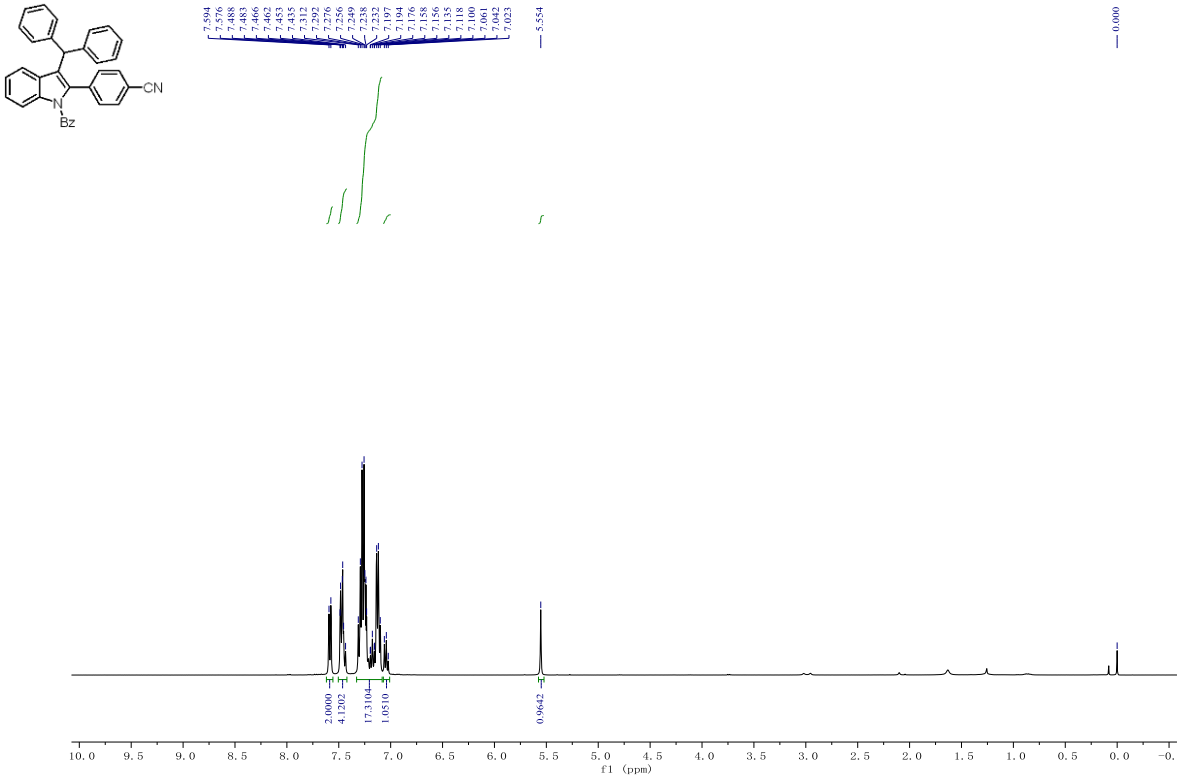
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4i



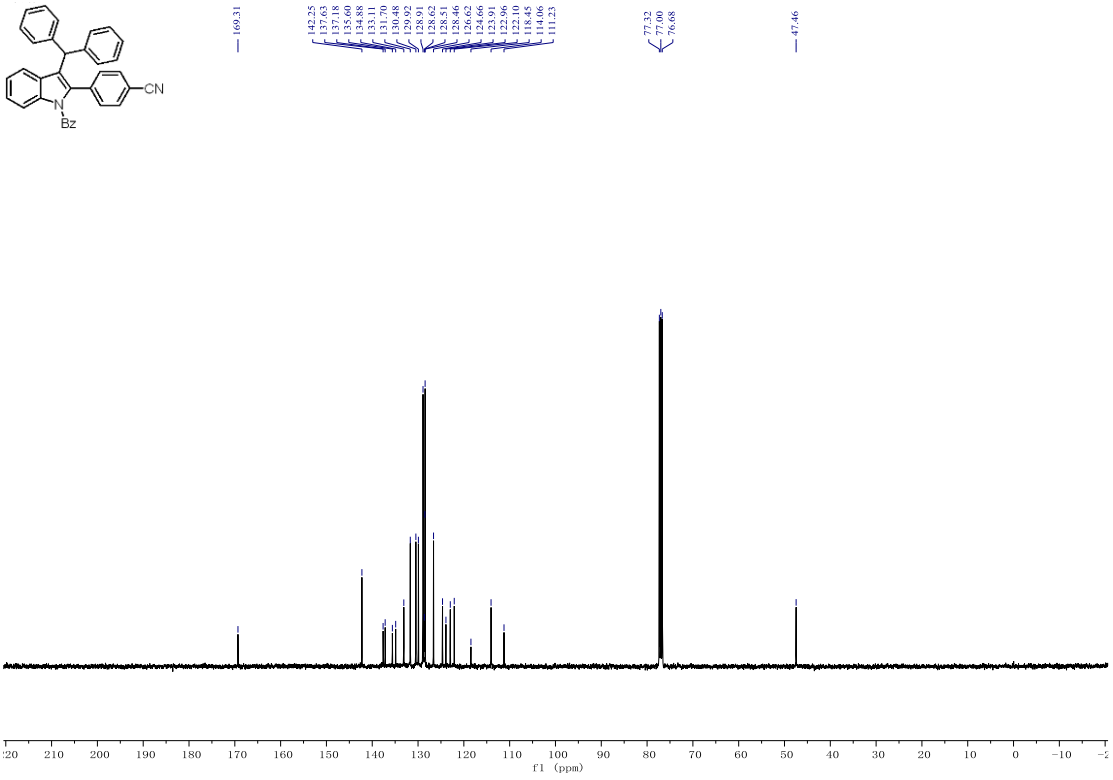
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4i



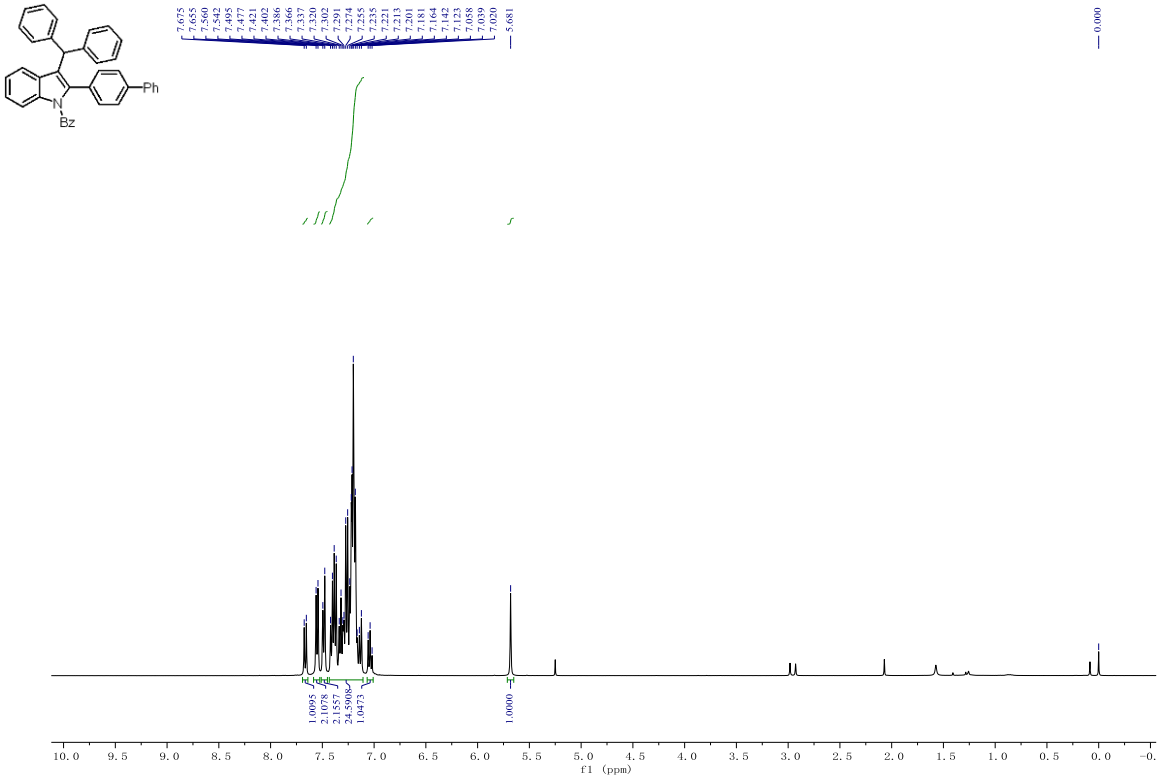
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4j



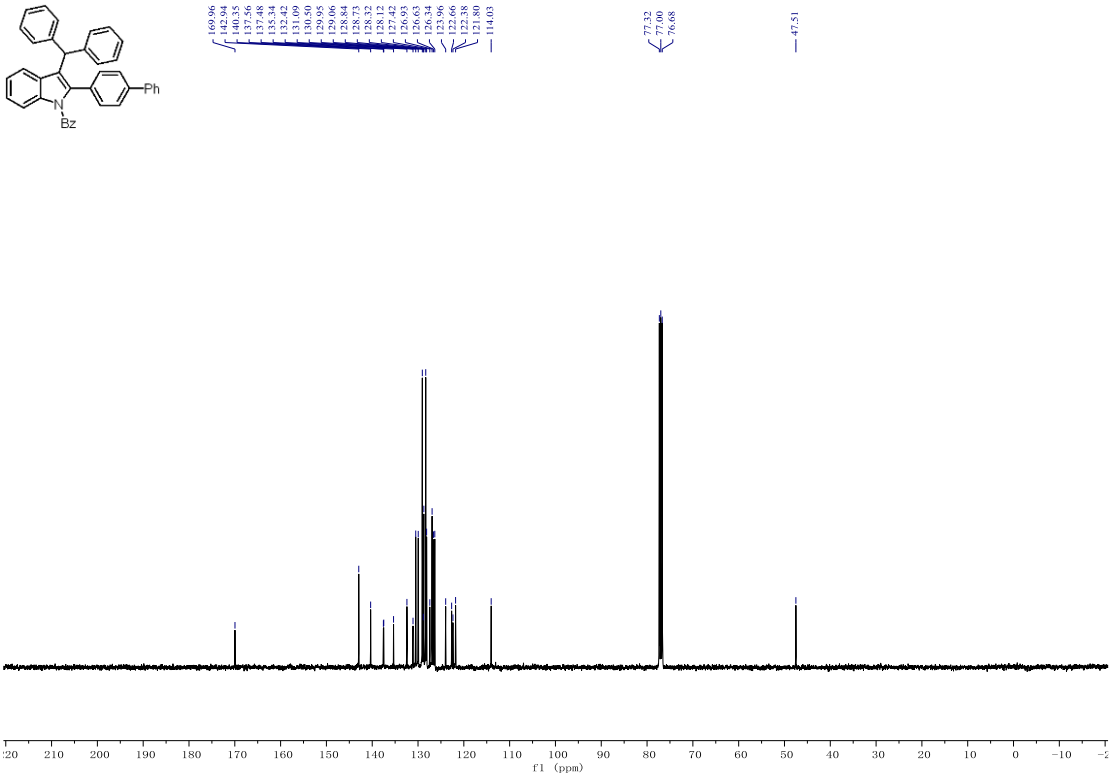
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4j



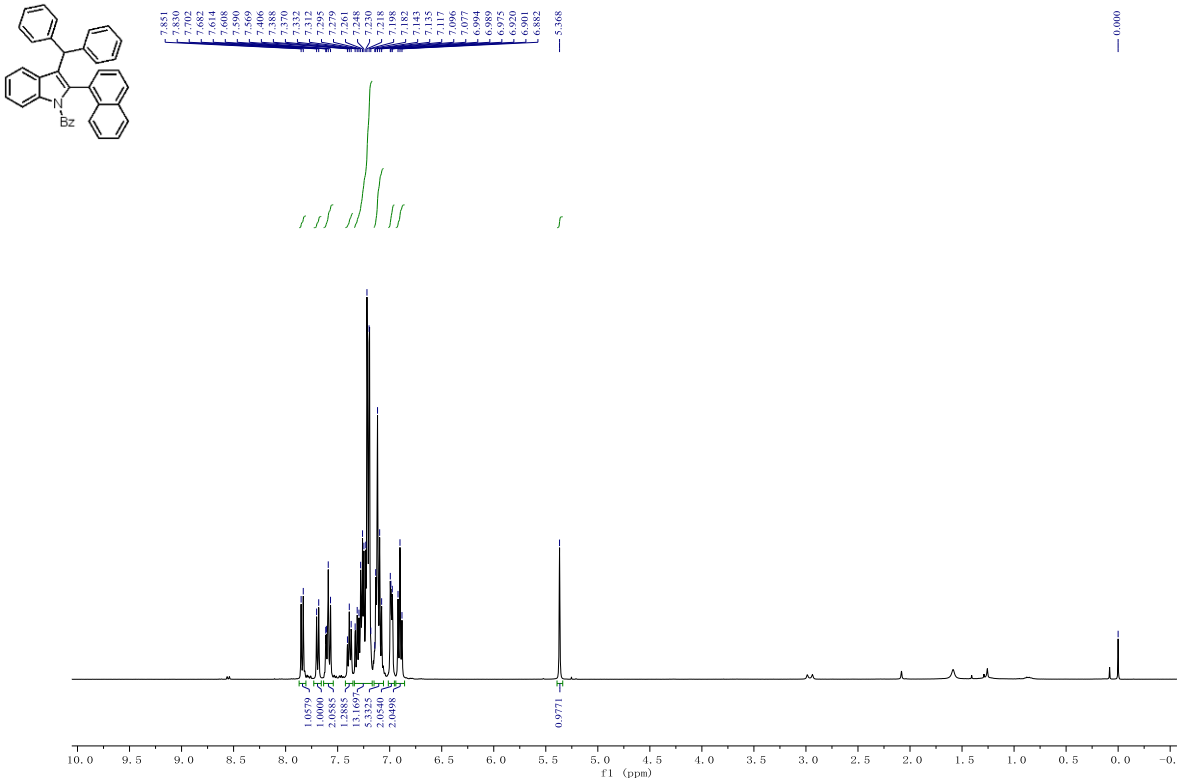
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4k



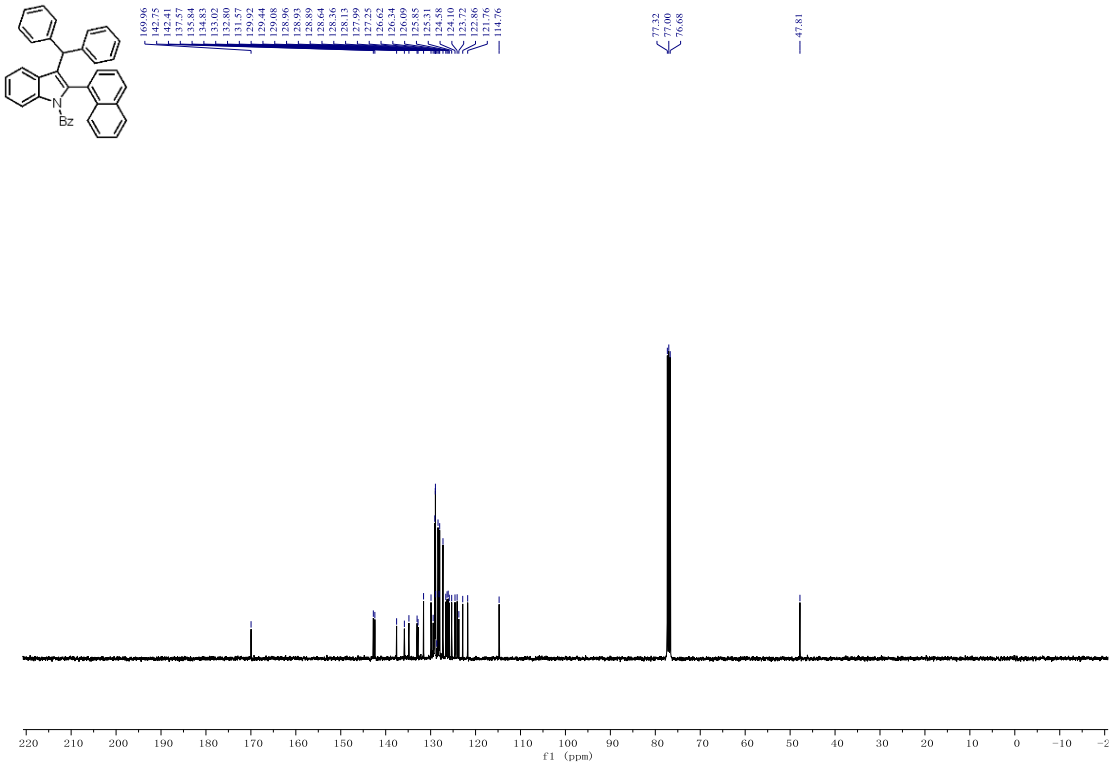
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4k



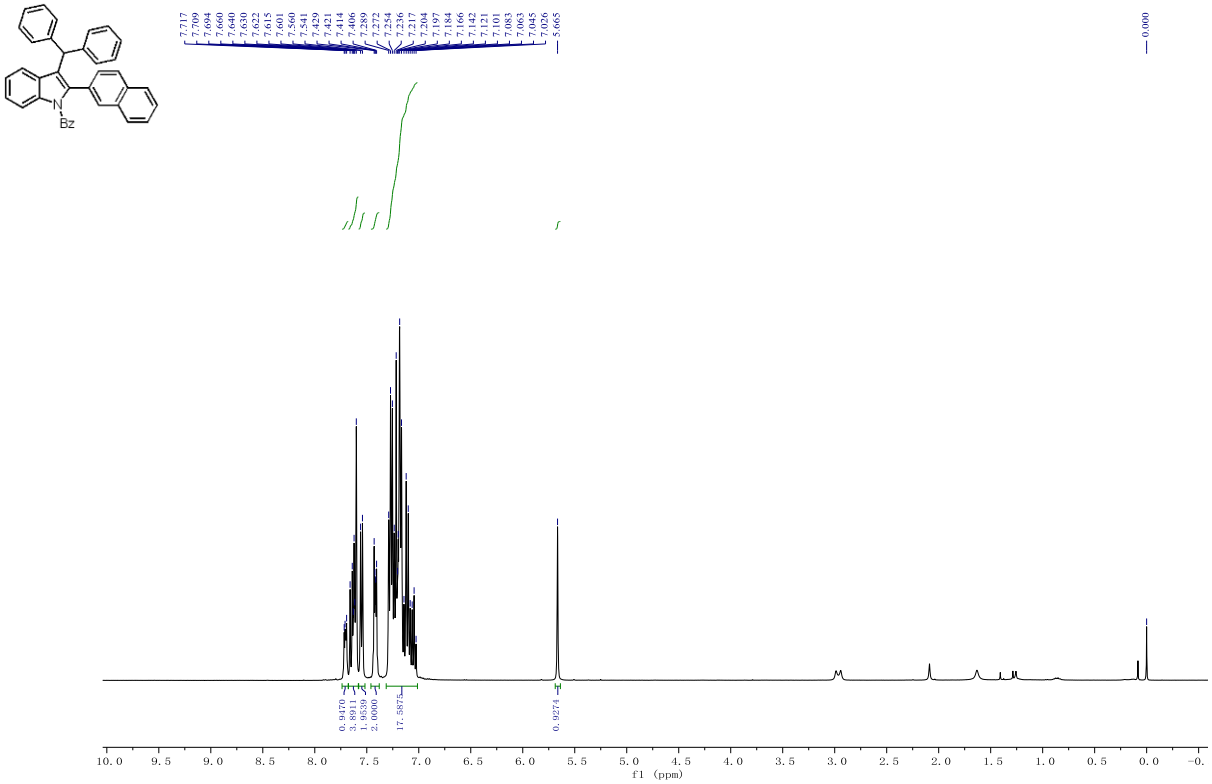
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4l



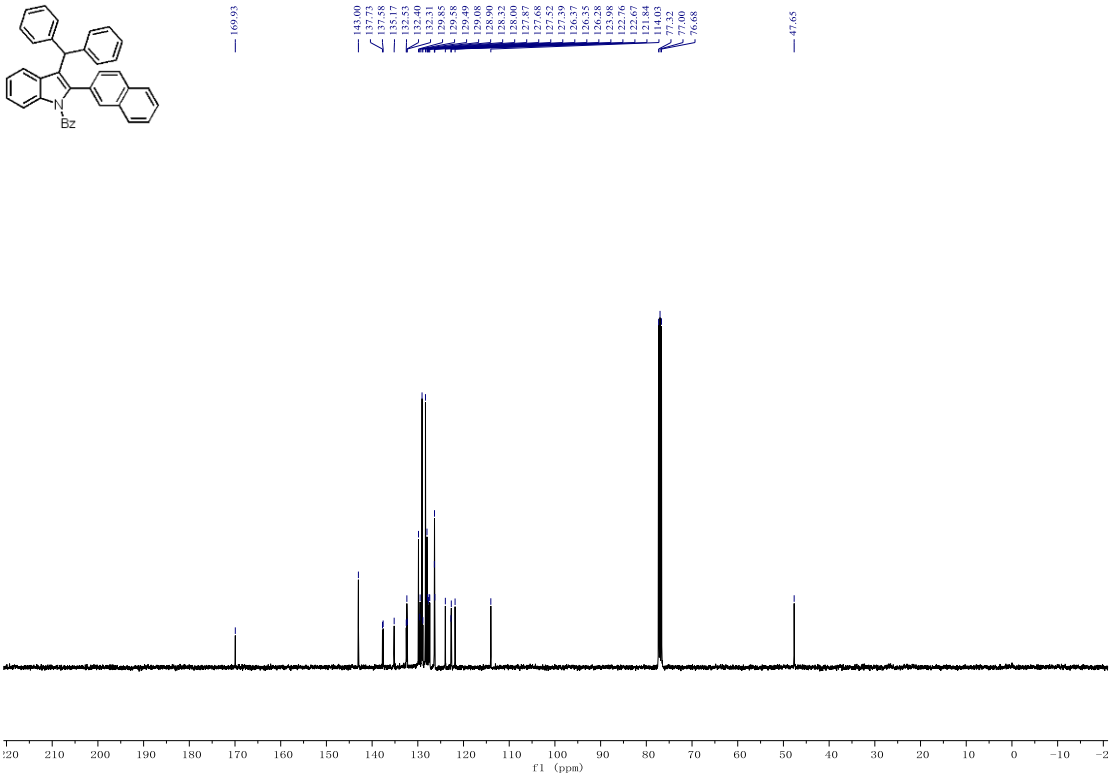
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4l



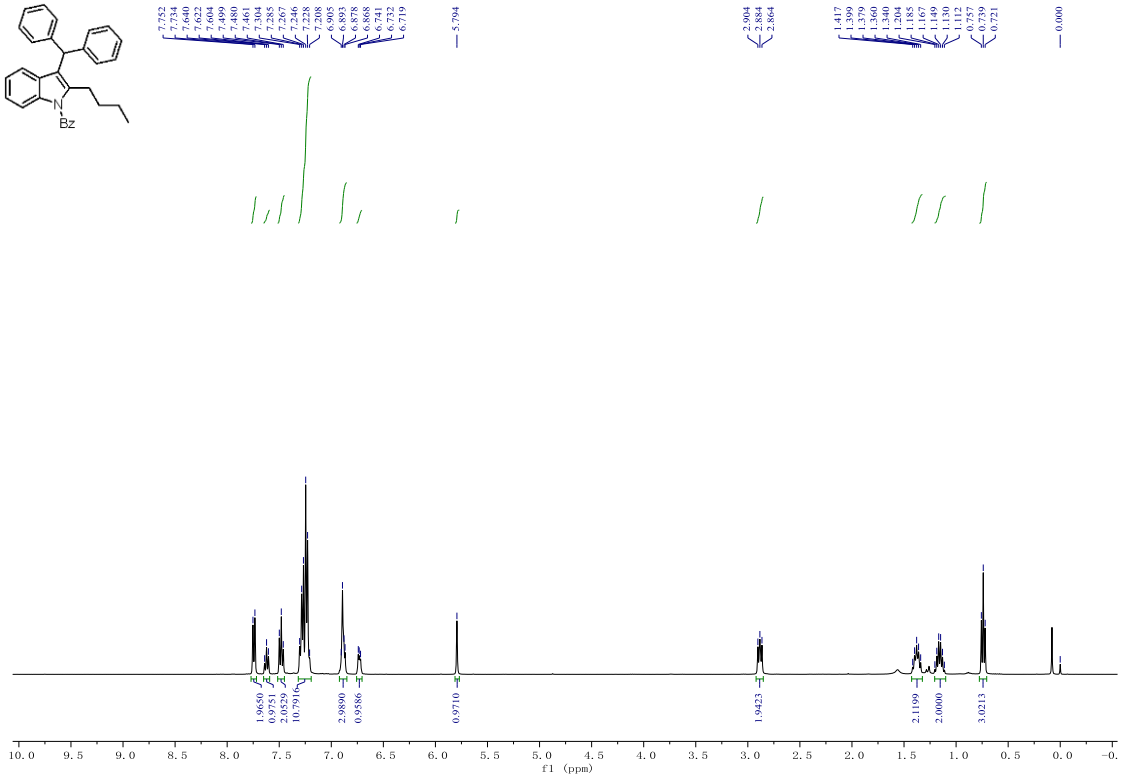
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4m



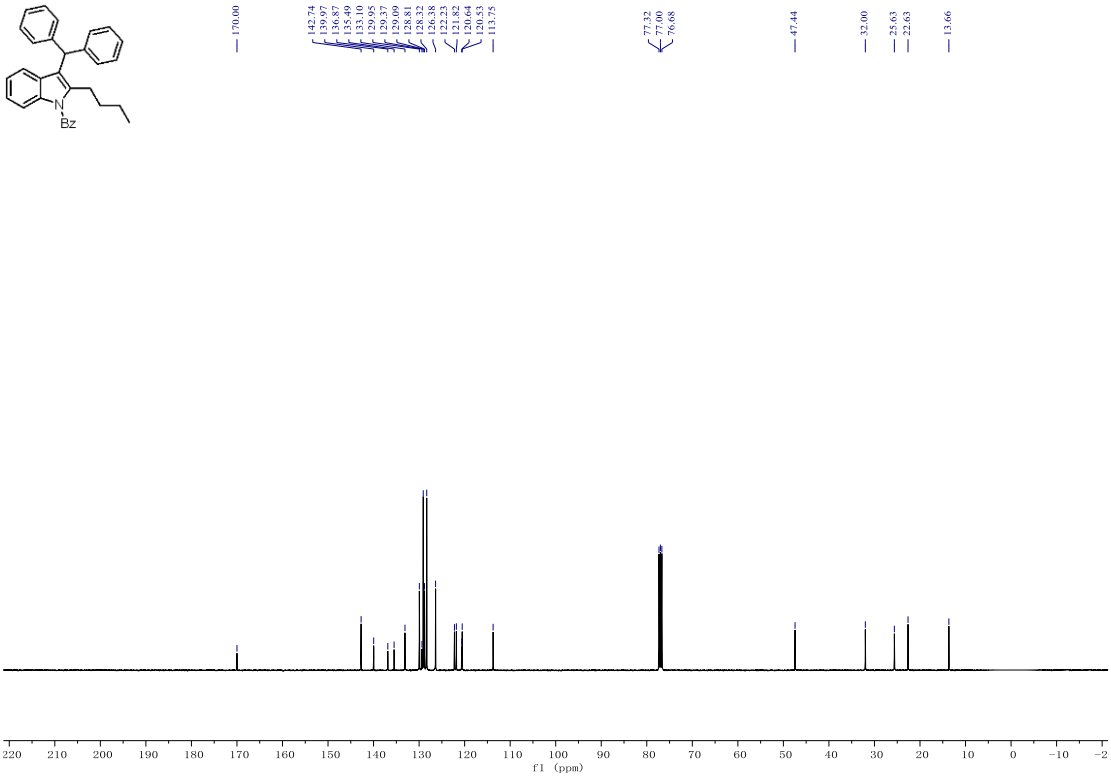
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4m



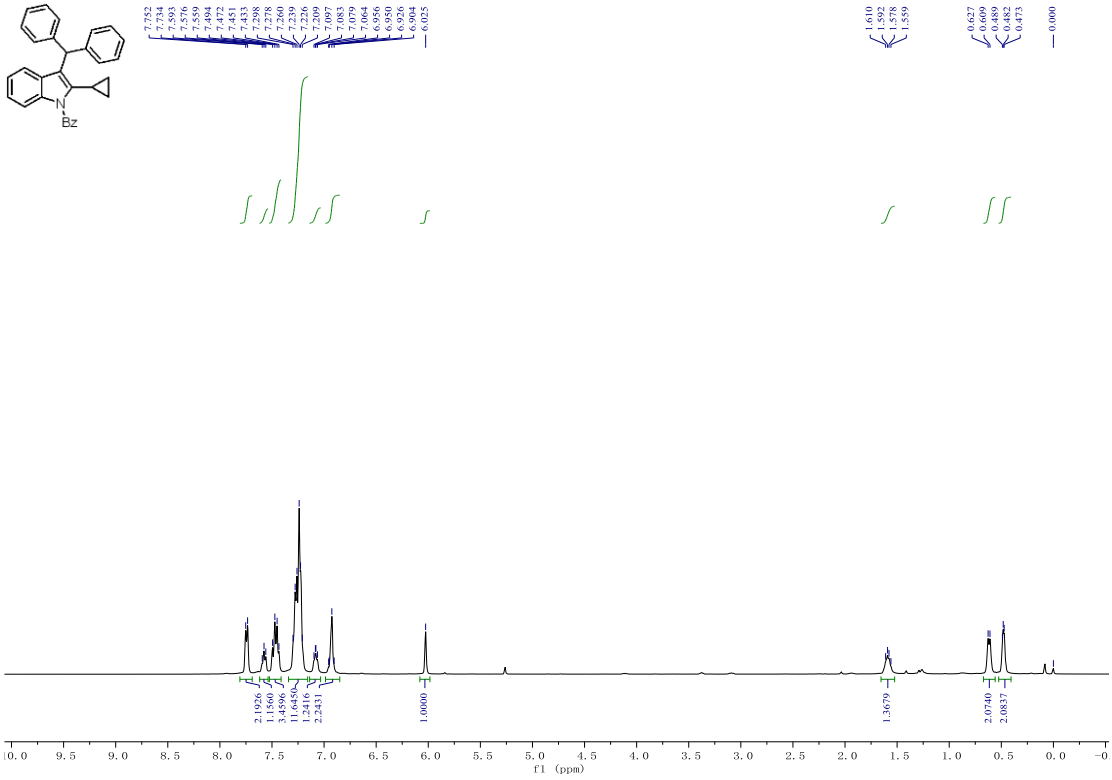
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4n



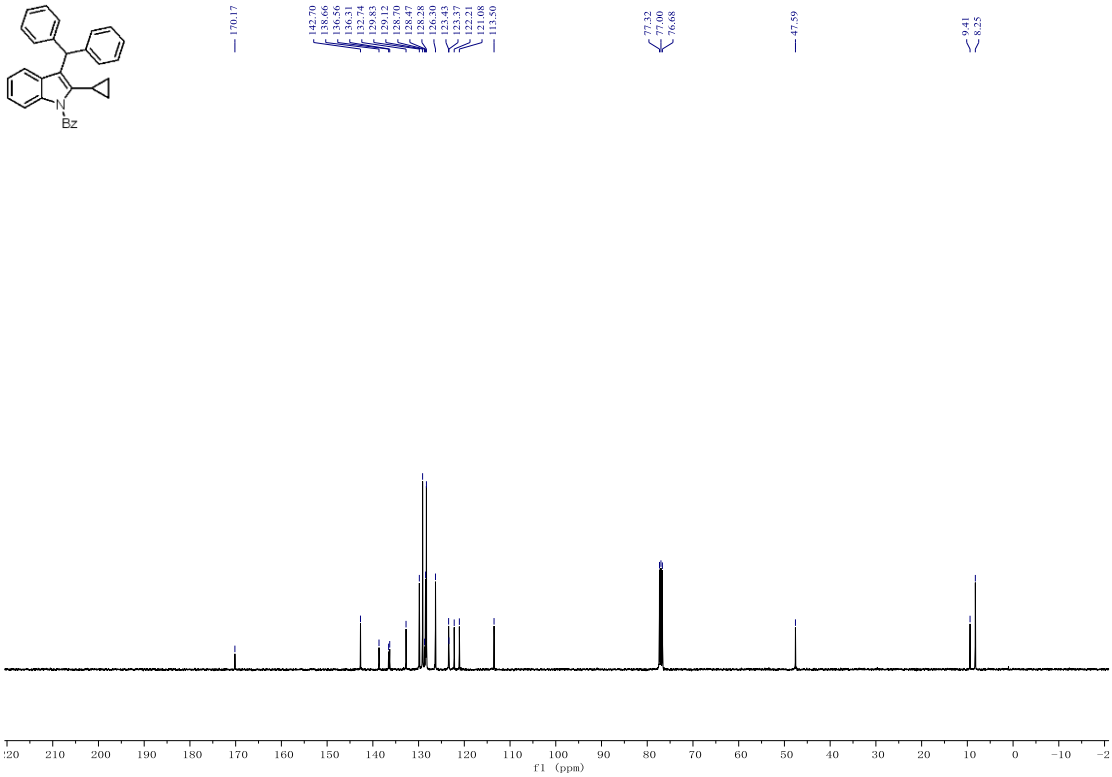
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4n



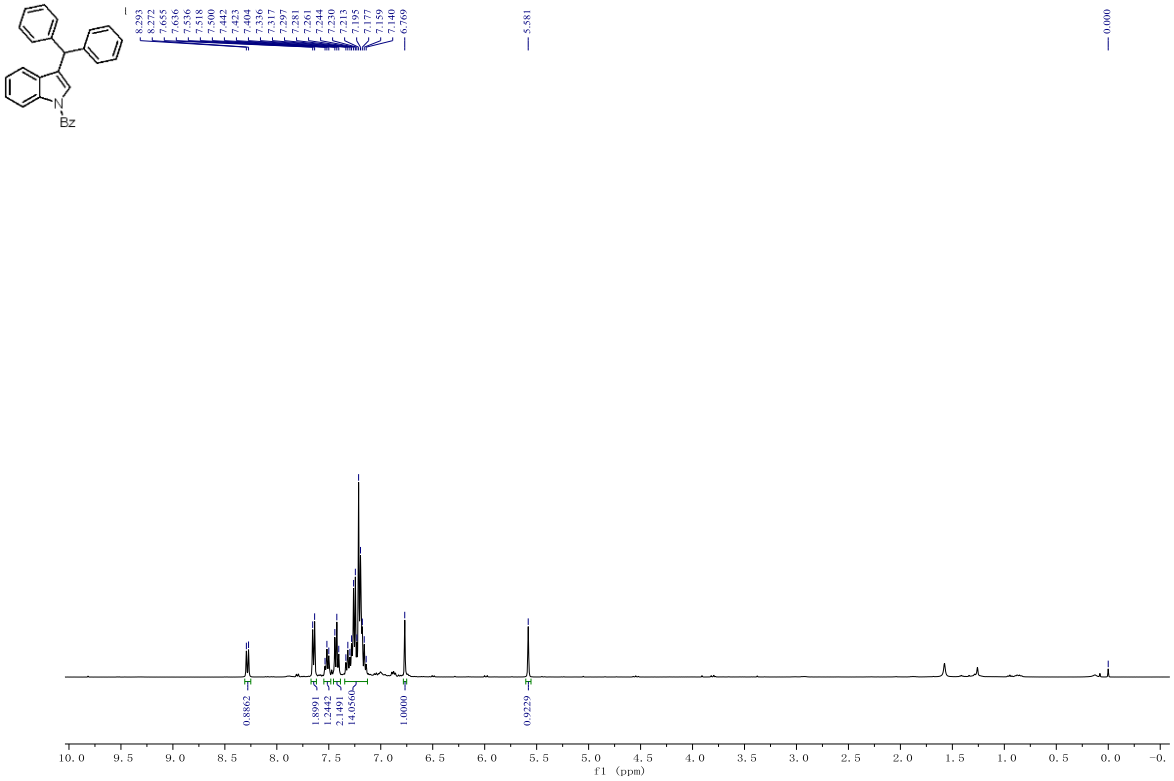
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4o



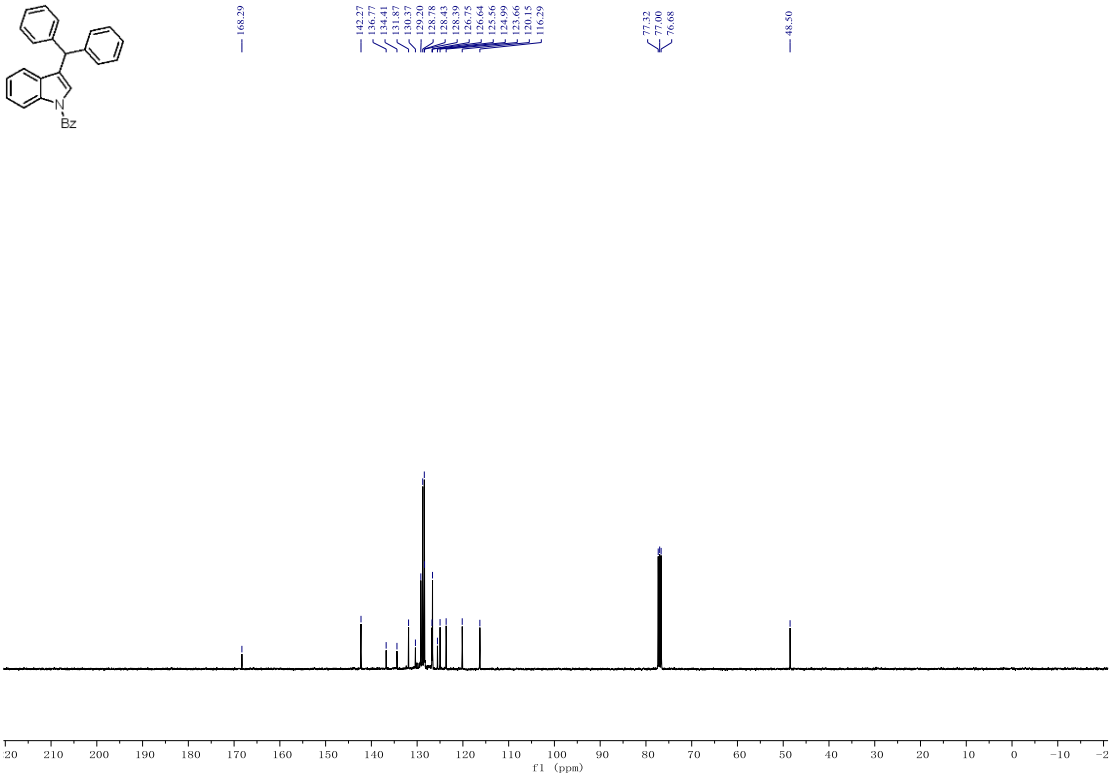
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4o



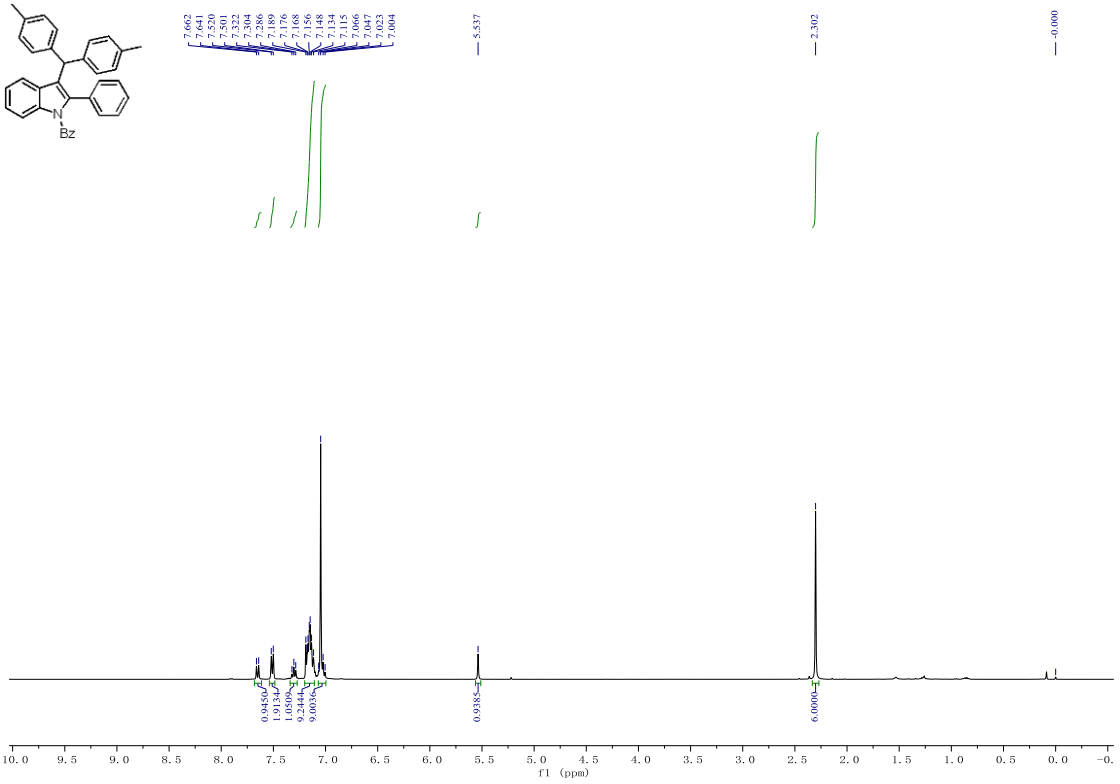
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4p



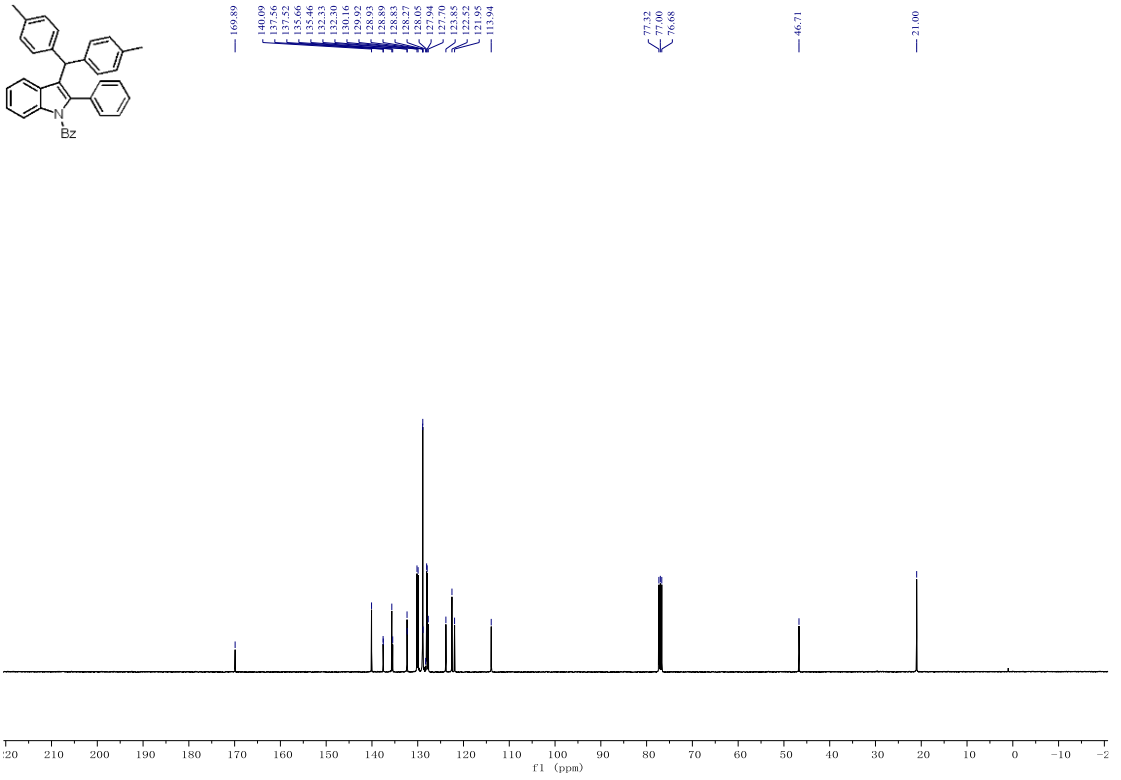
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4p



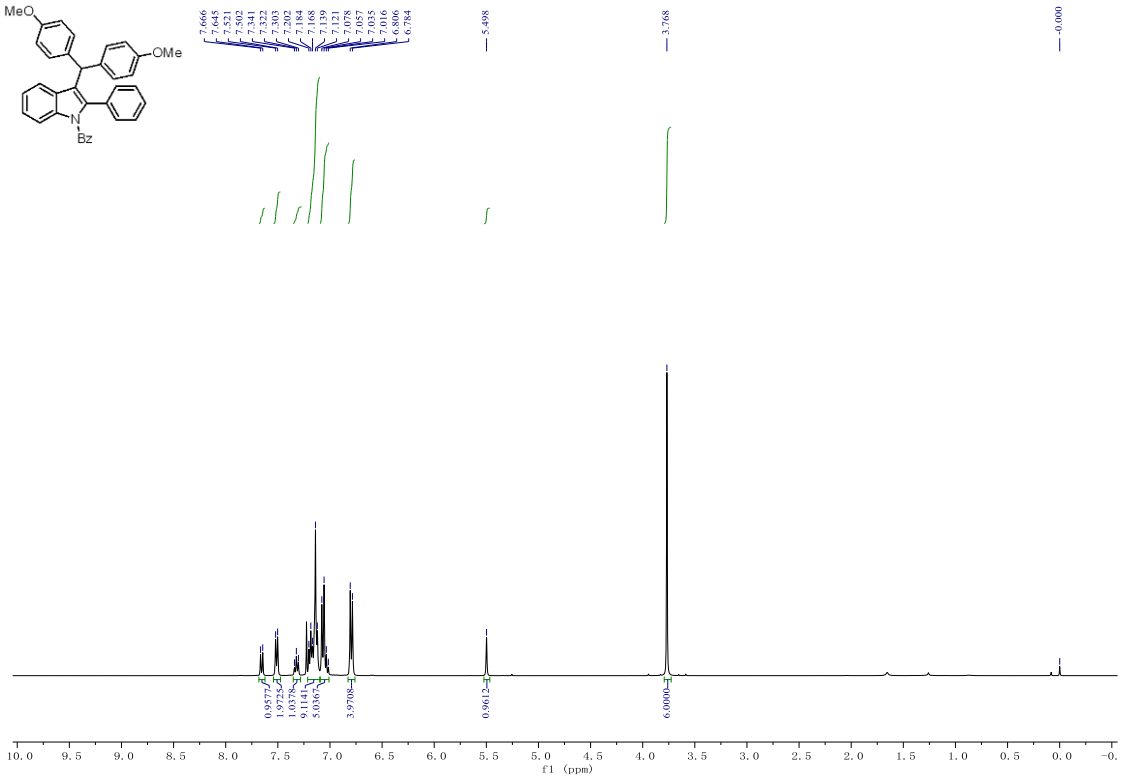
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4q



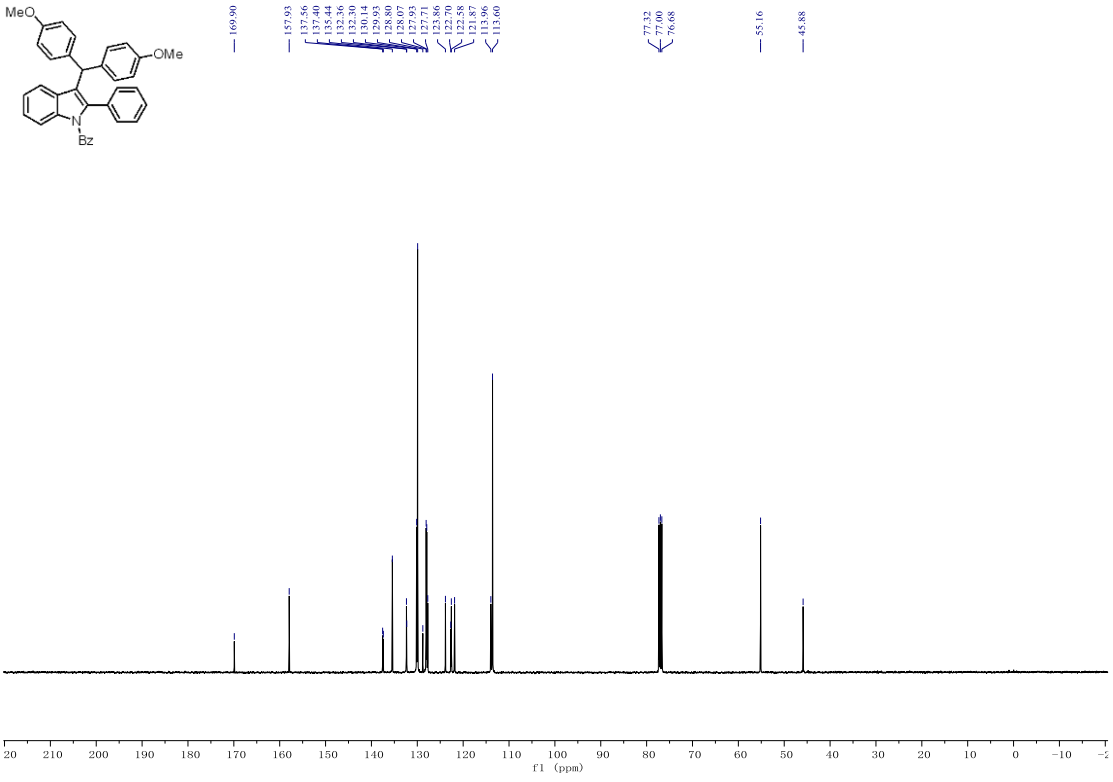
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4q



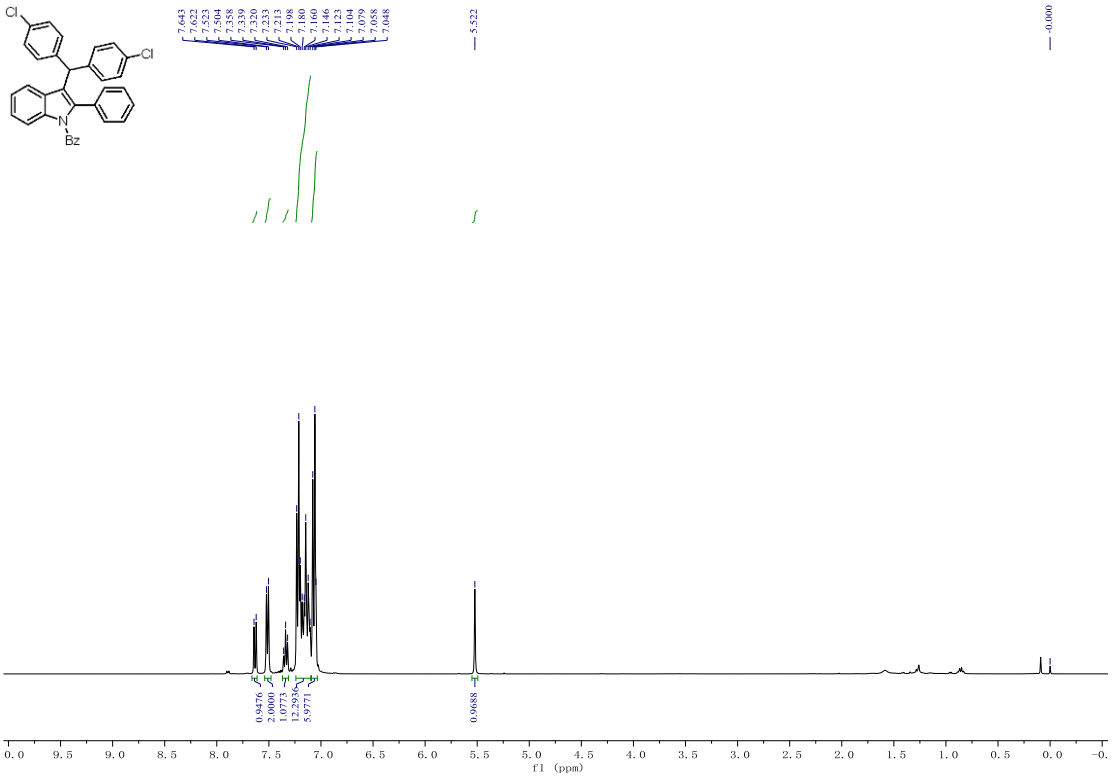
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4r



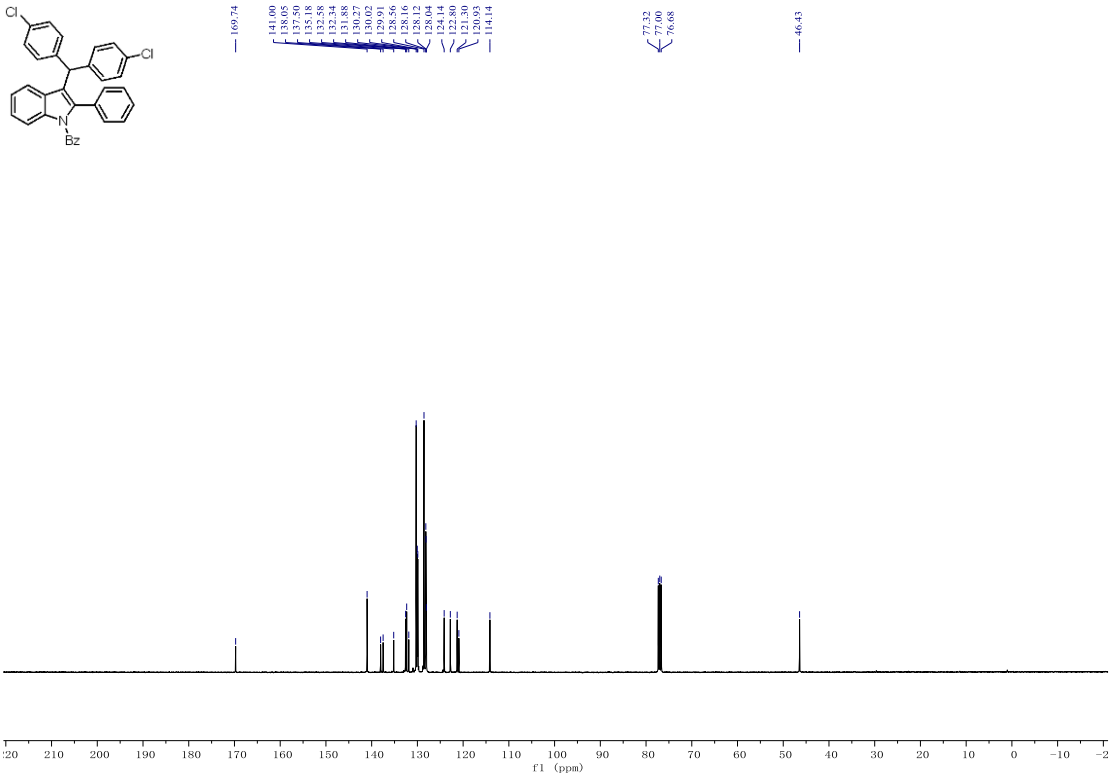
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4r



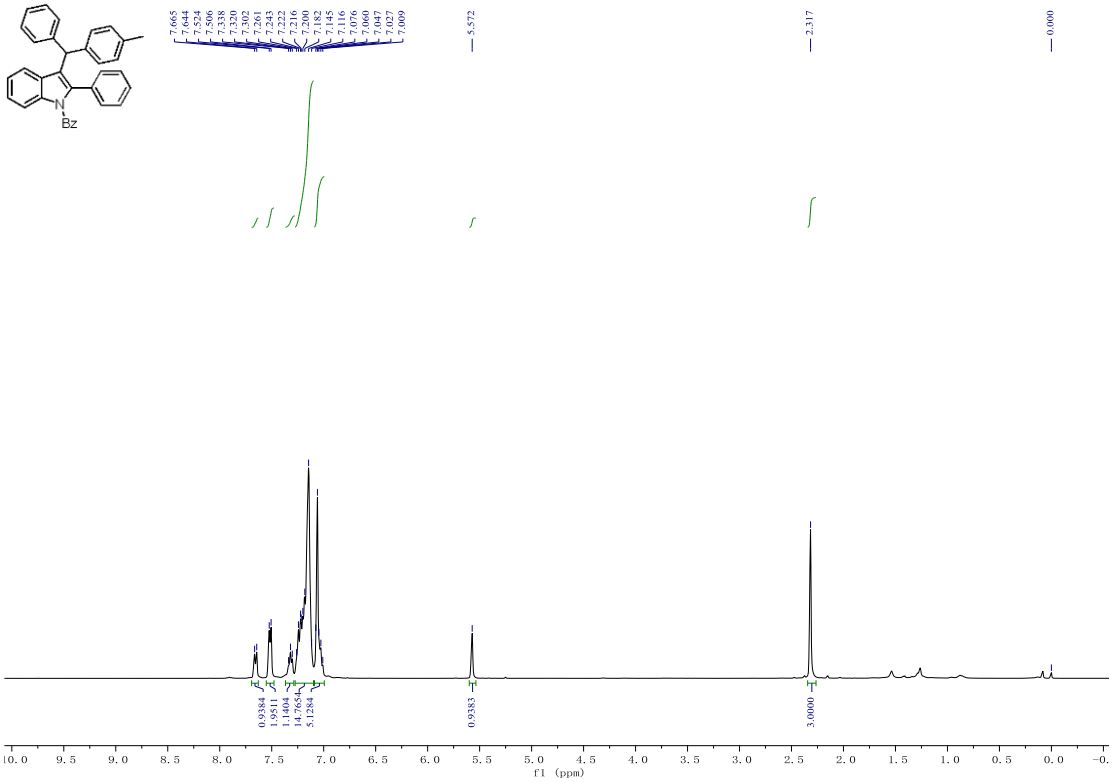
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4s



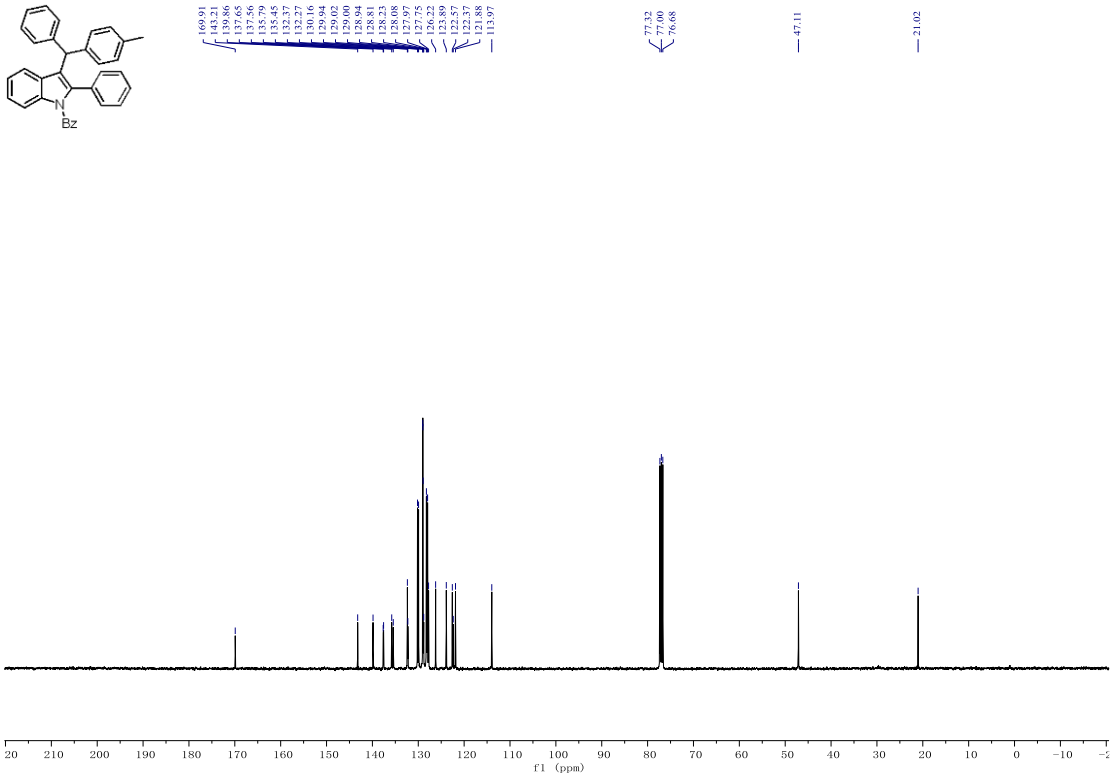
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4s



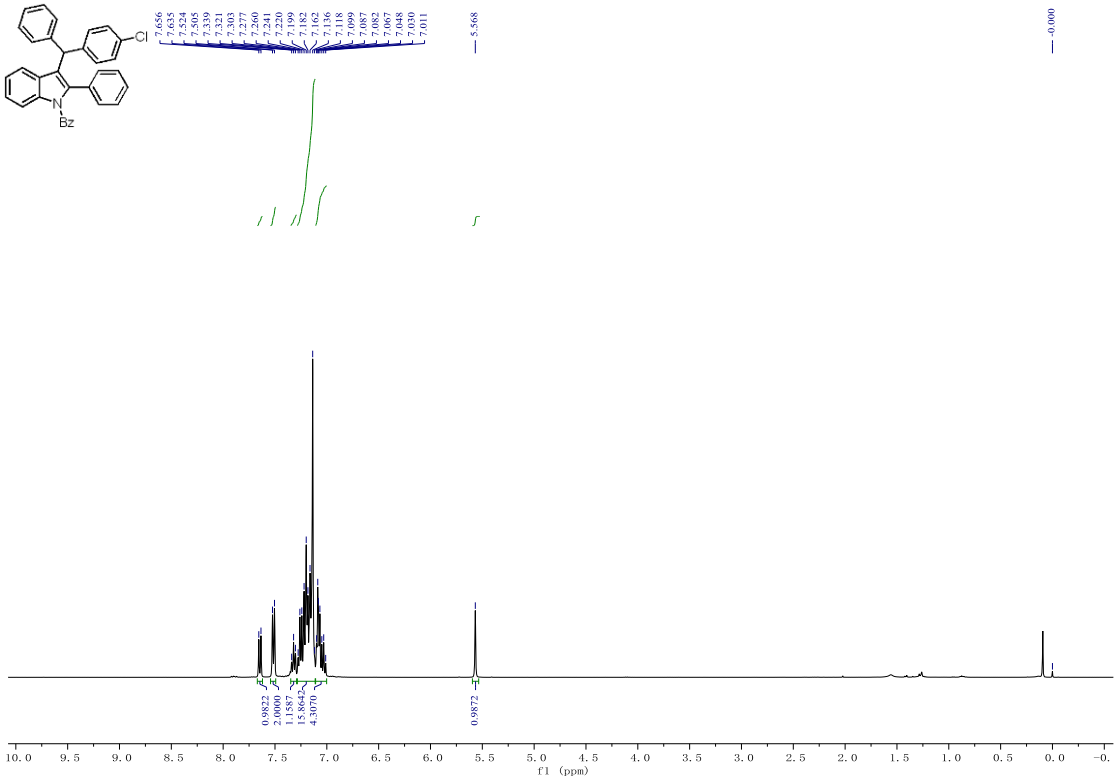
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4t



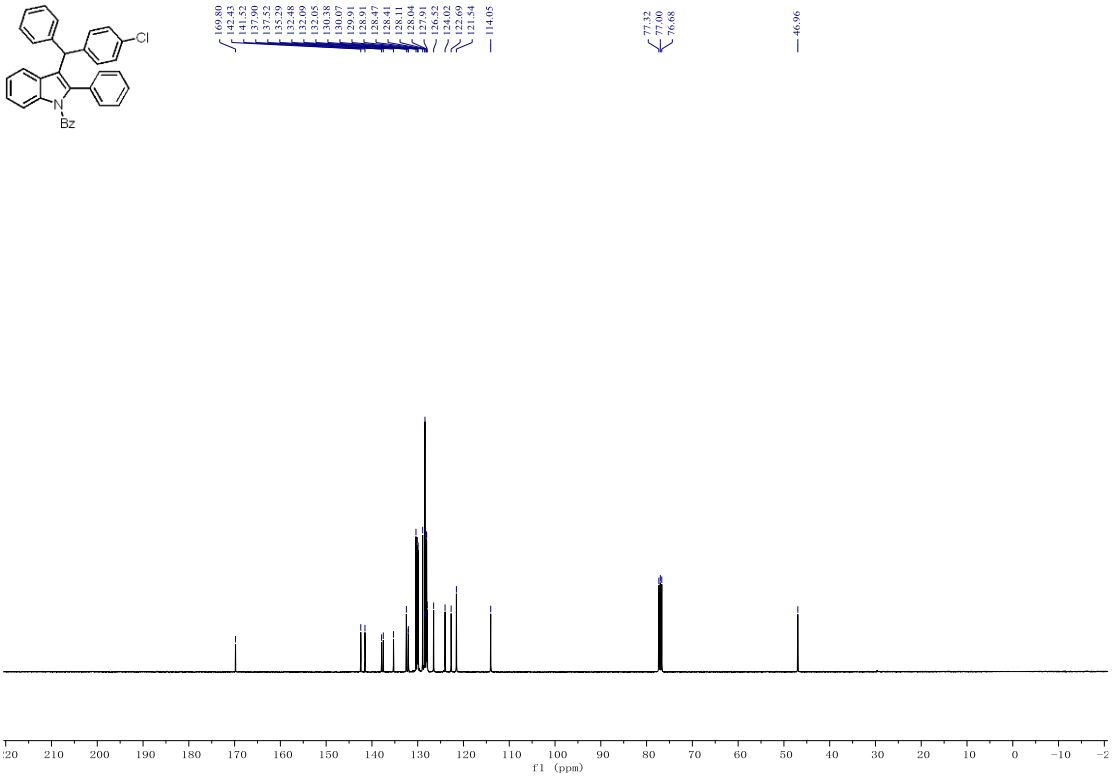
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4t



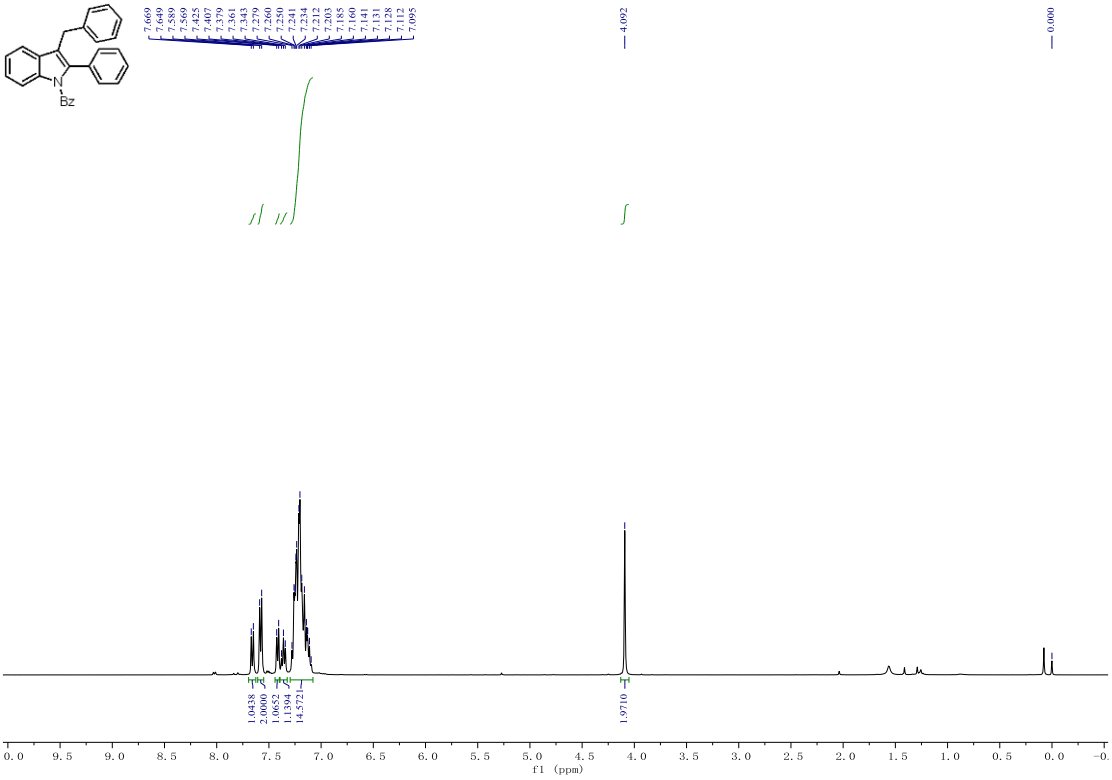
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4u



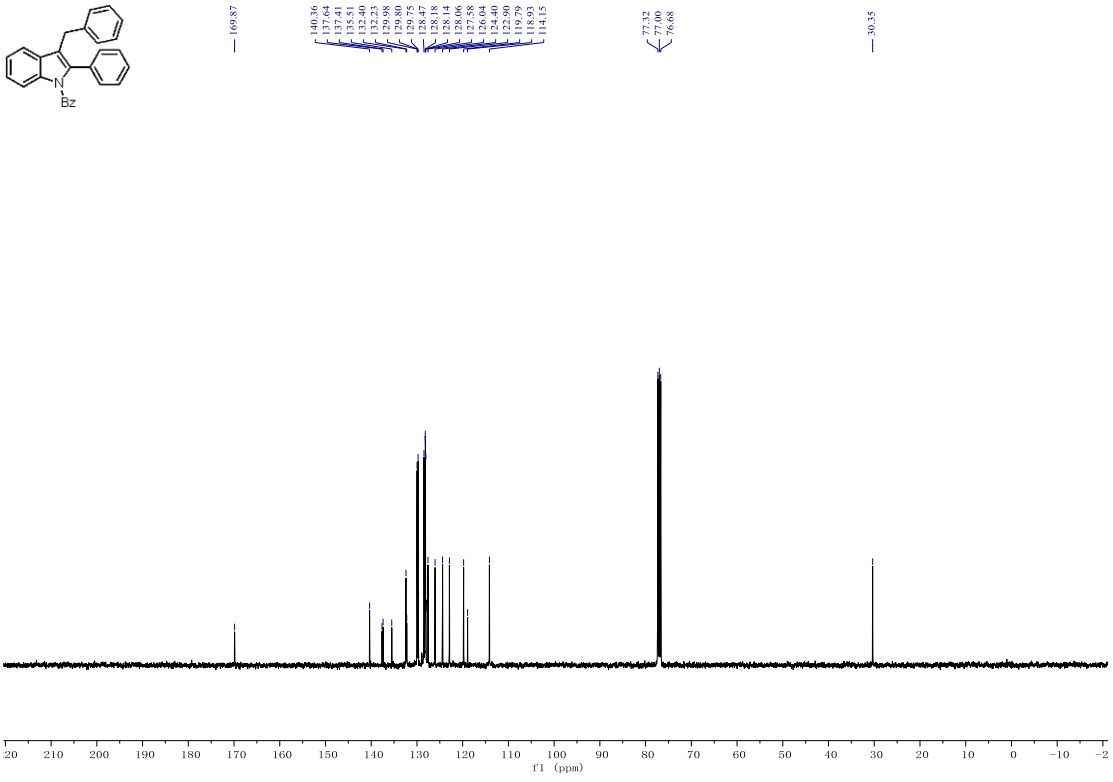
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4u



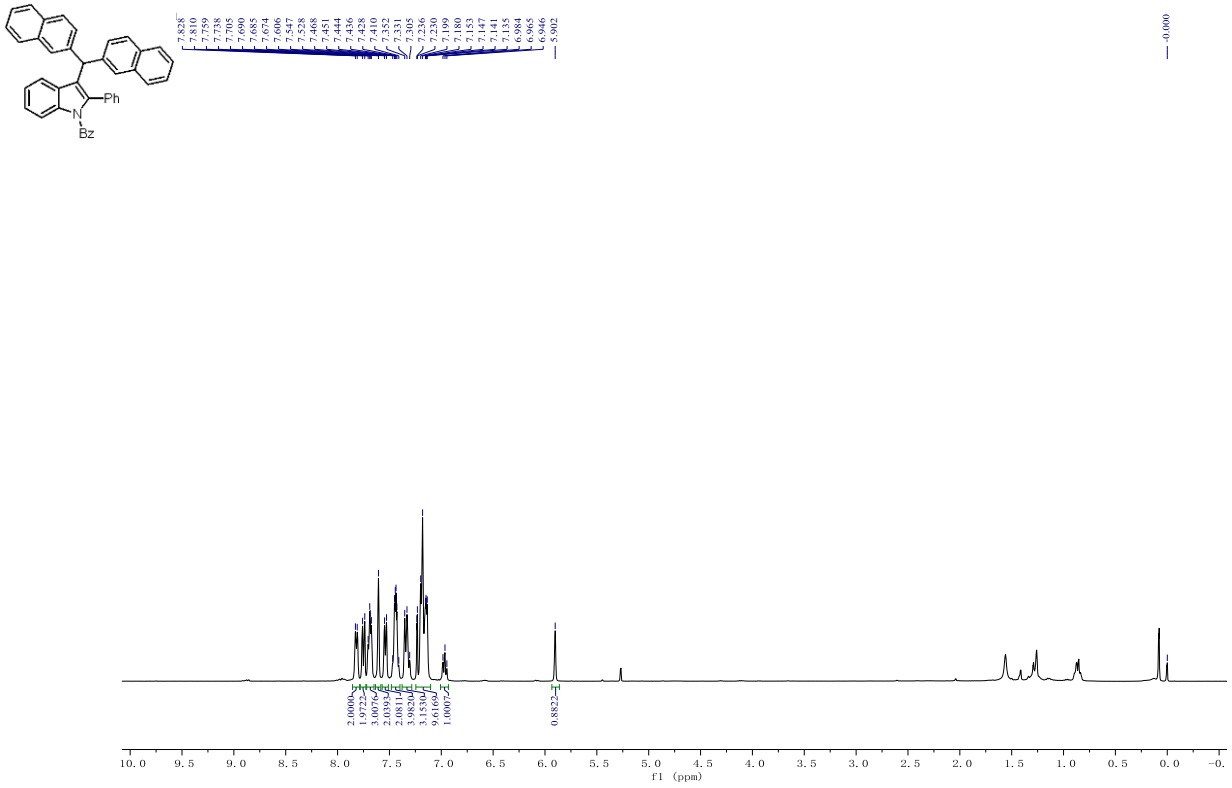
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4v



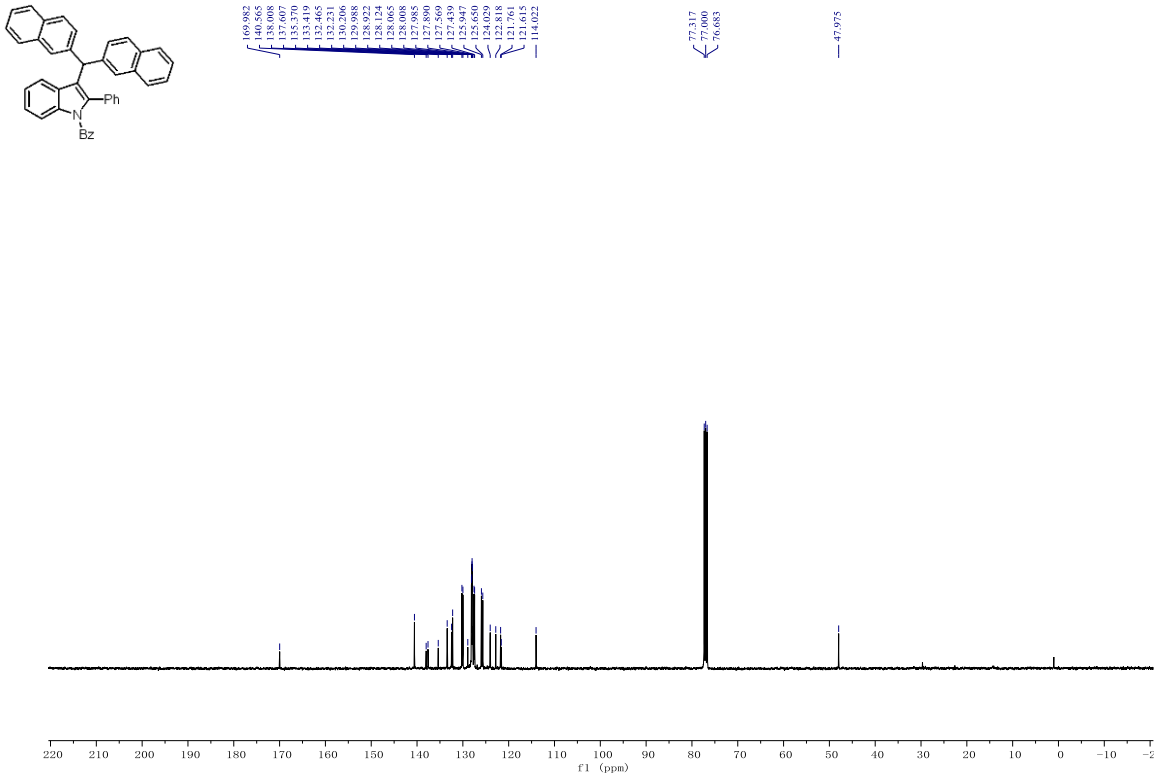
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4v



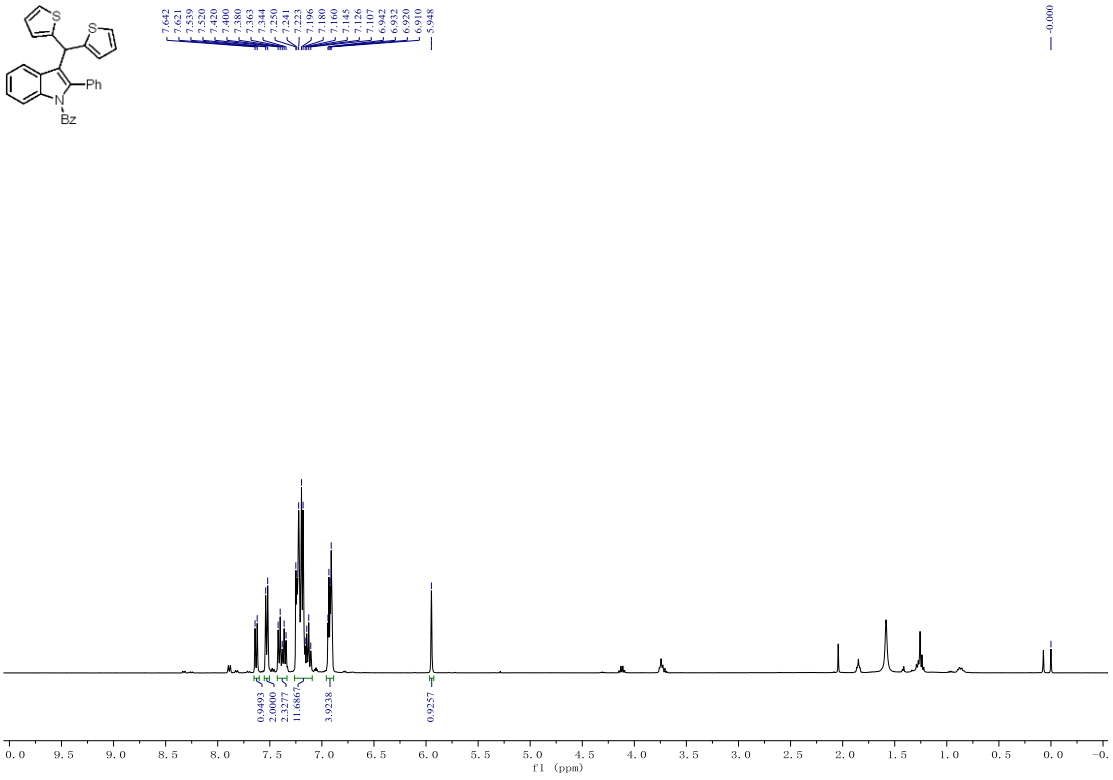
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4w



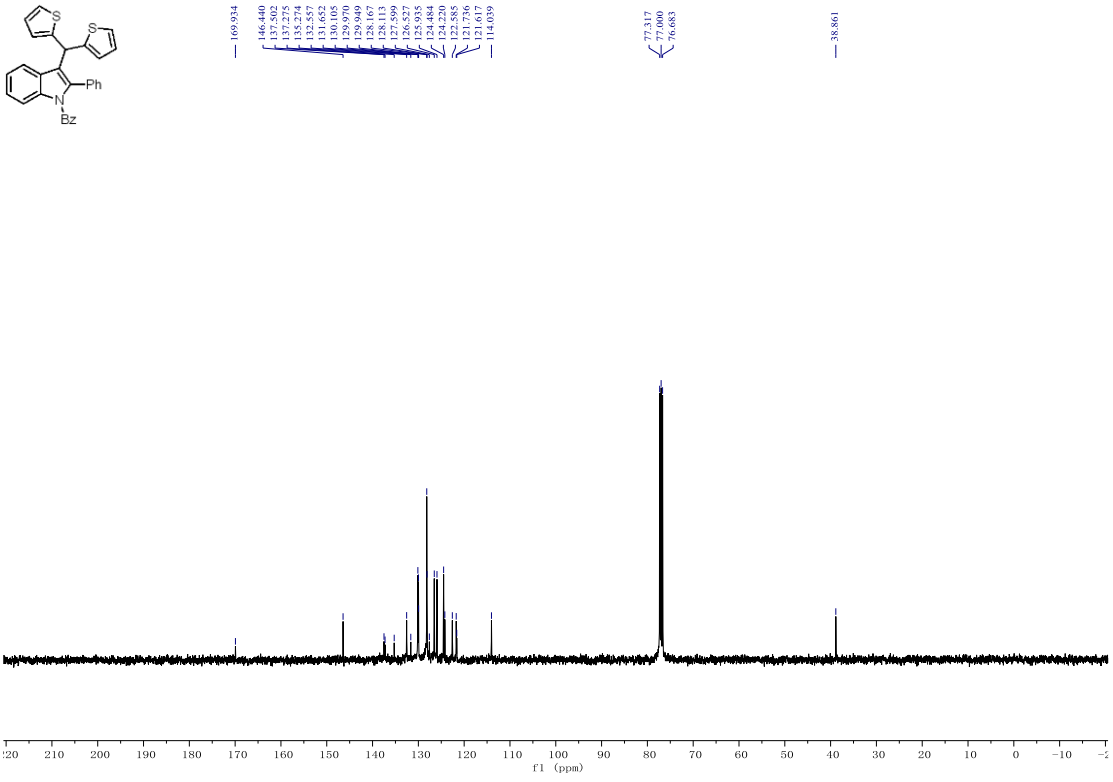
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4w



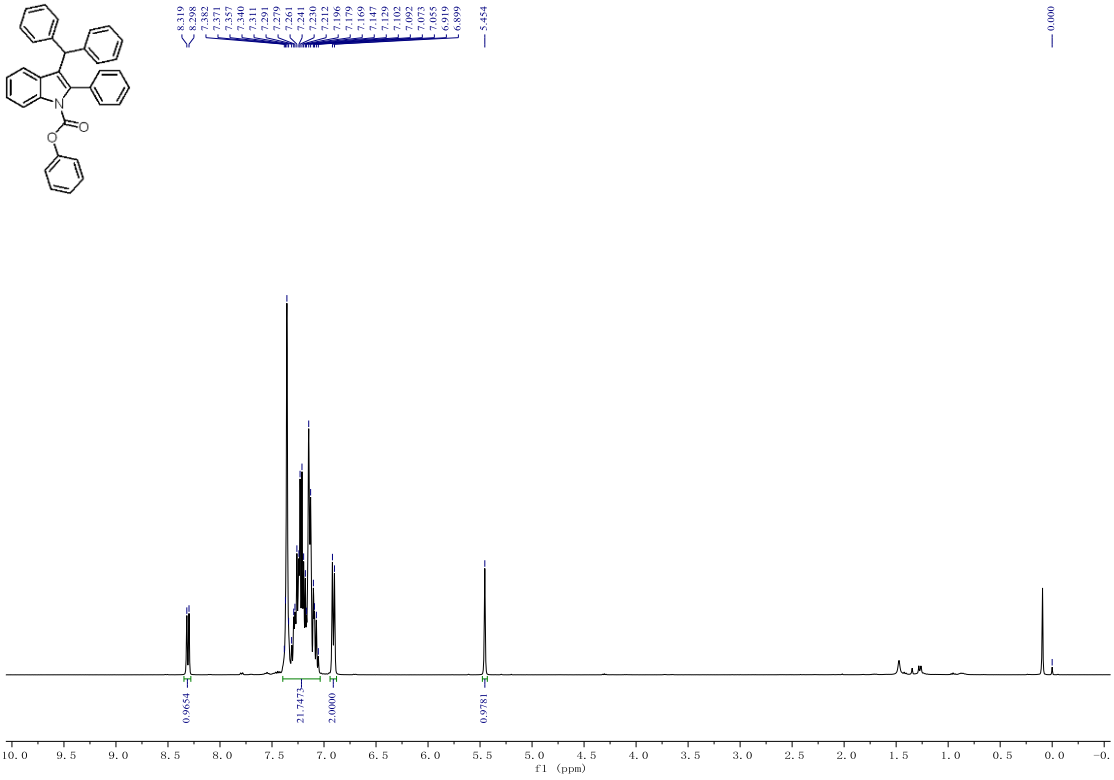
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4x



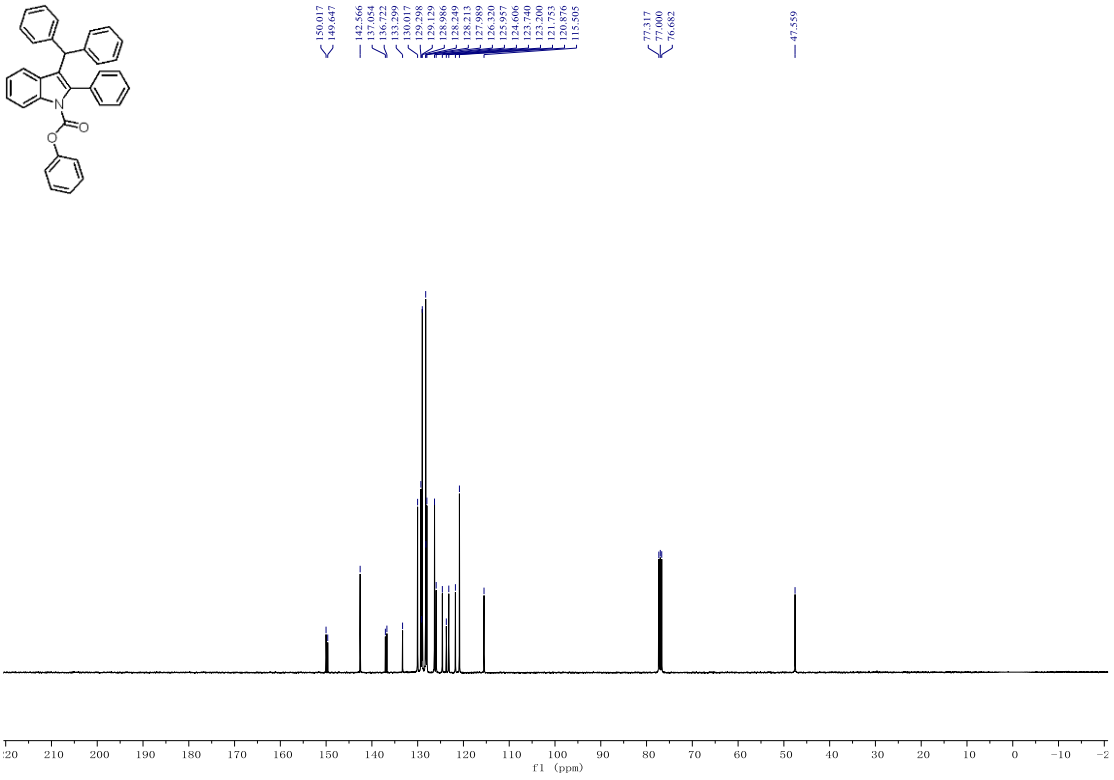
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4x



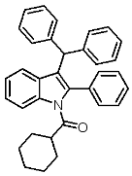
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4aa



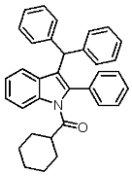
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4aa



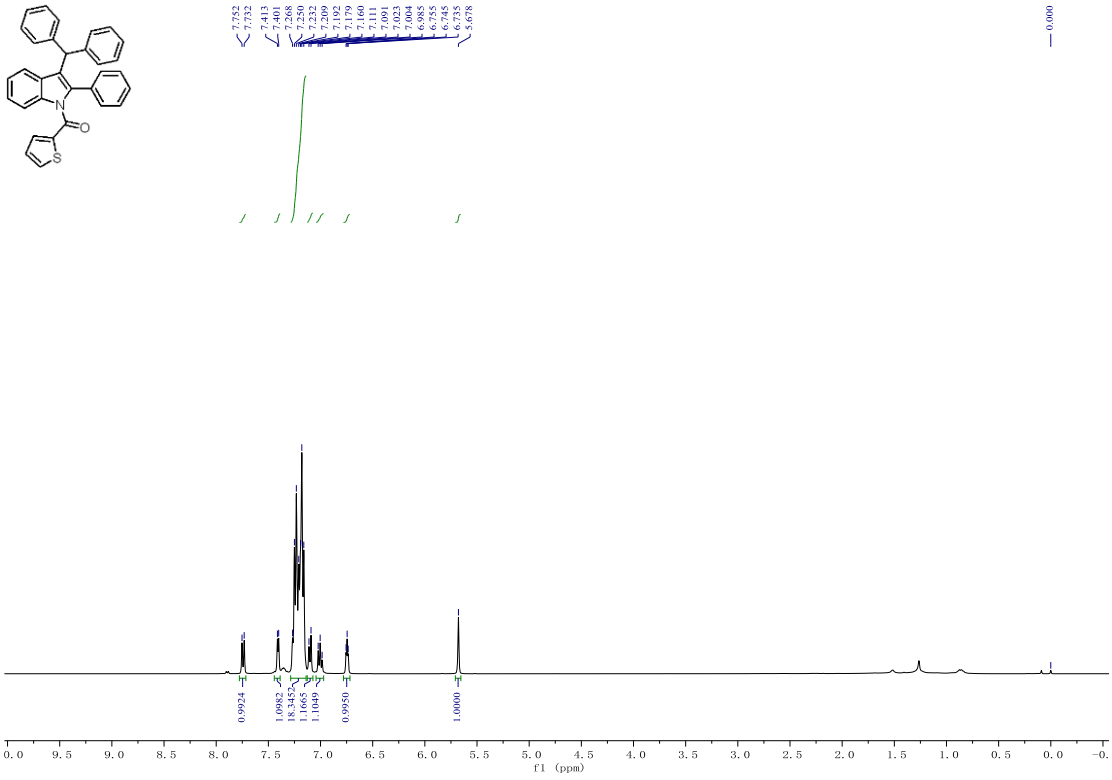
^{1}H NMR (400 MHz, CDCl3) spectroscopy of 4ab



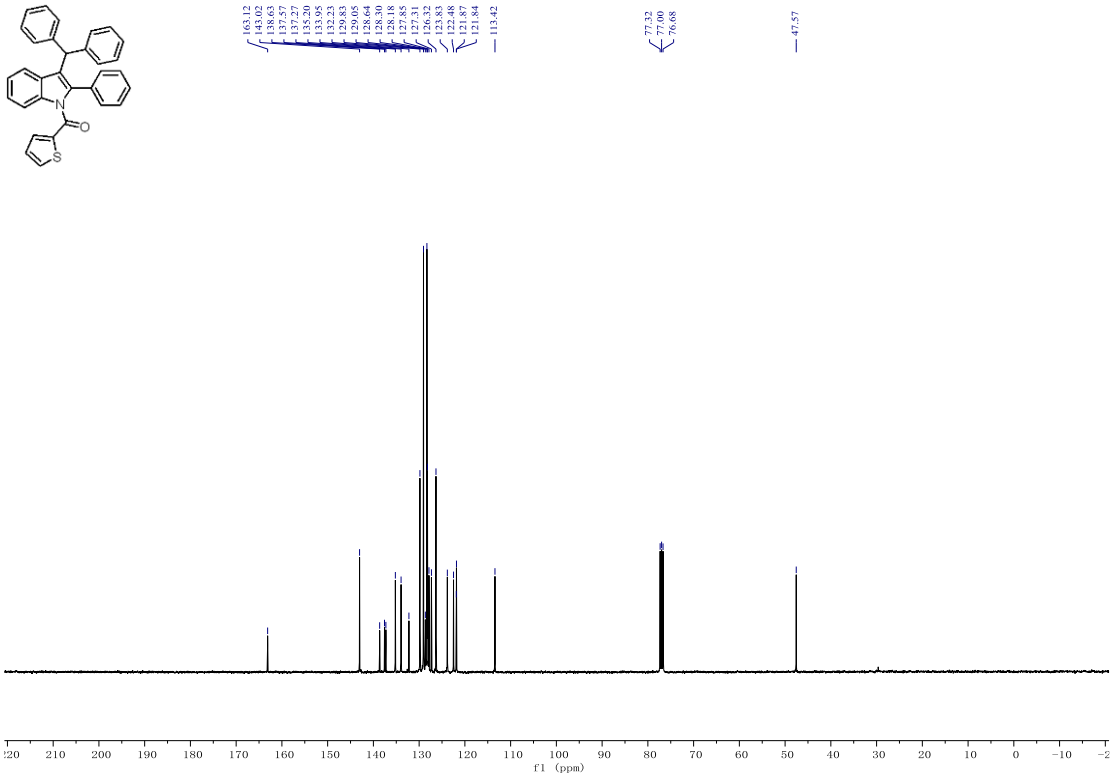
^{13}C NMR (100 MHz, CDCl3) spectroscopy of 4ab



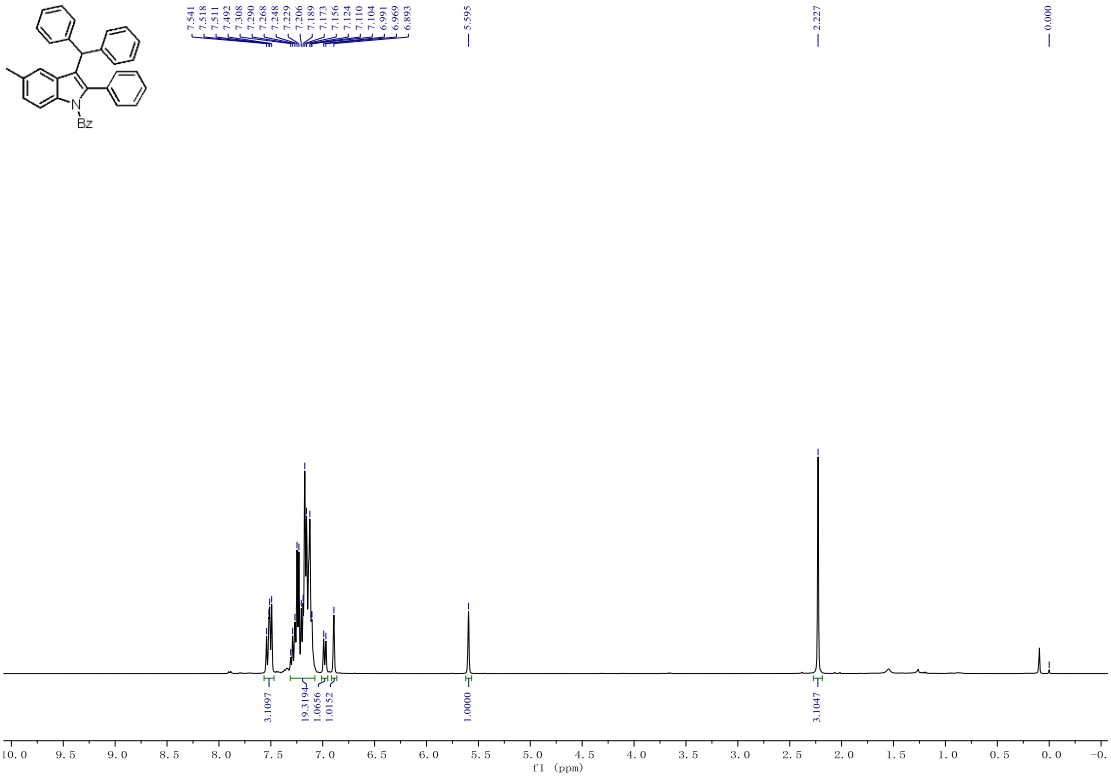
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ac



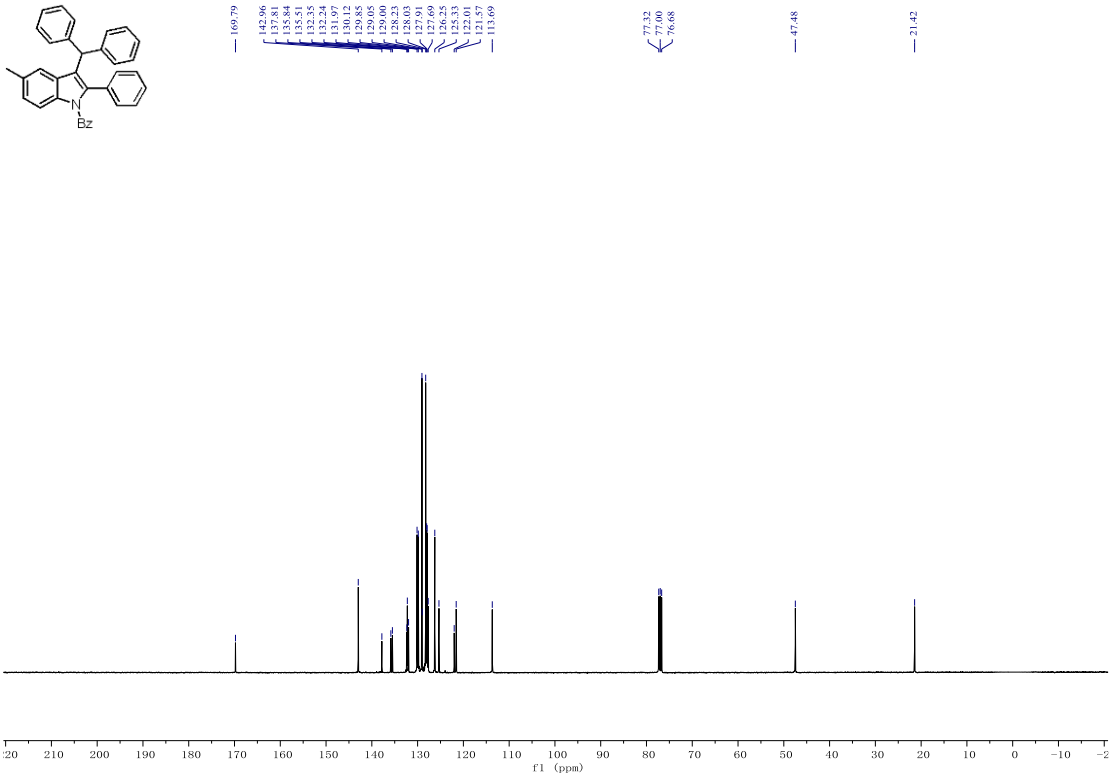
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ac



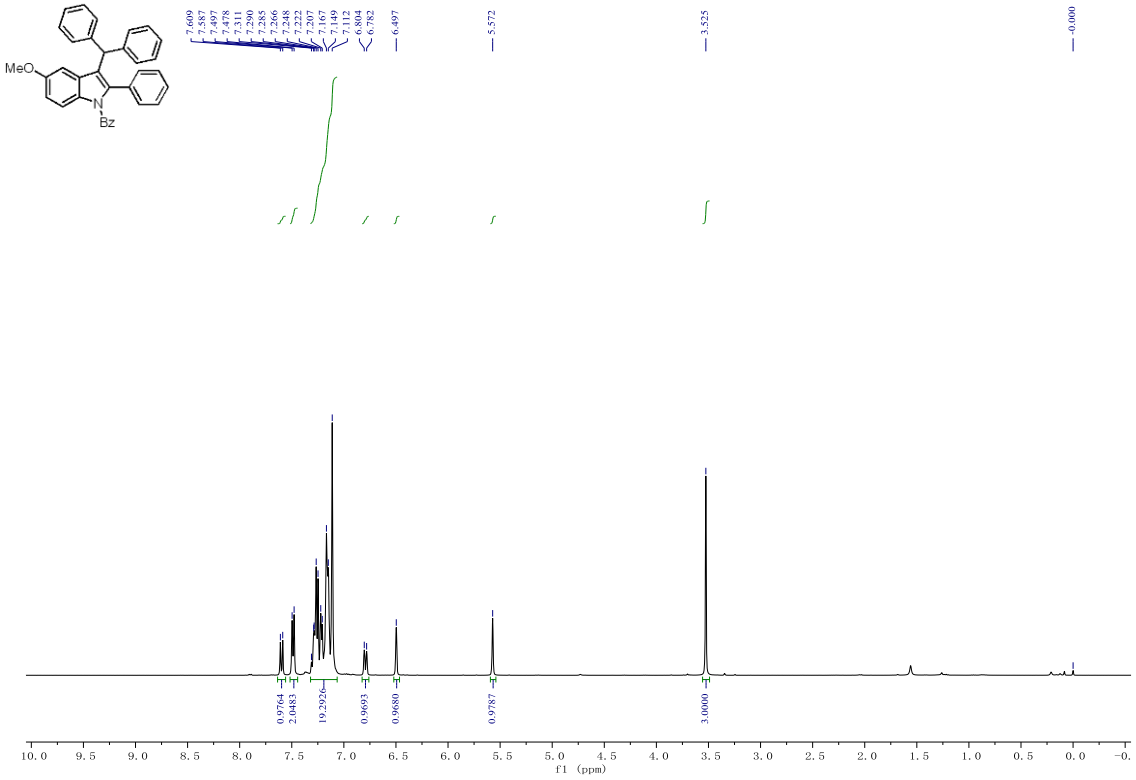
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ag



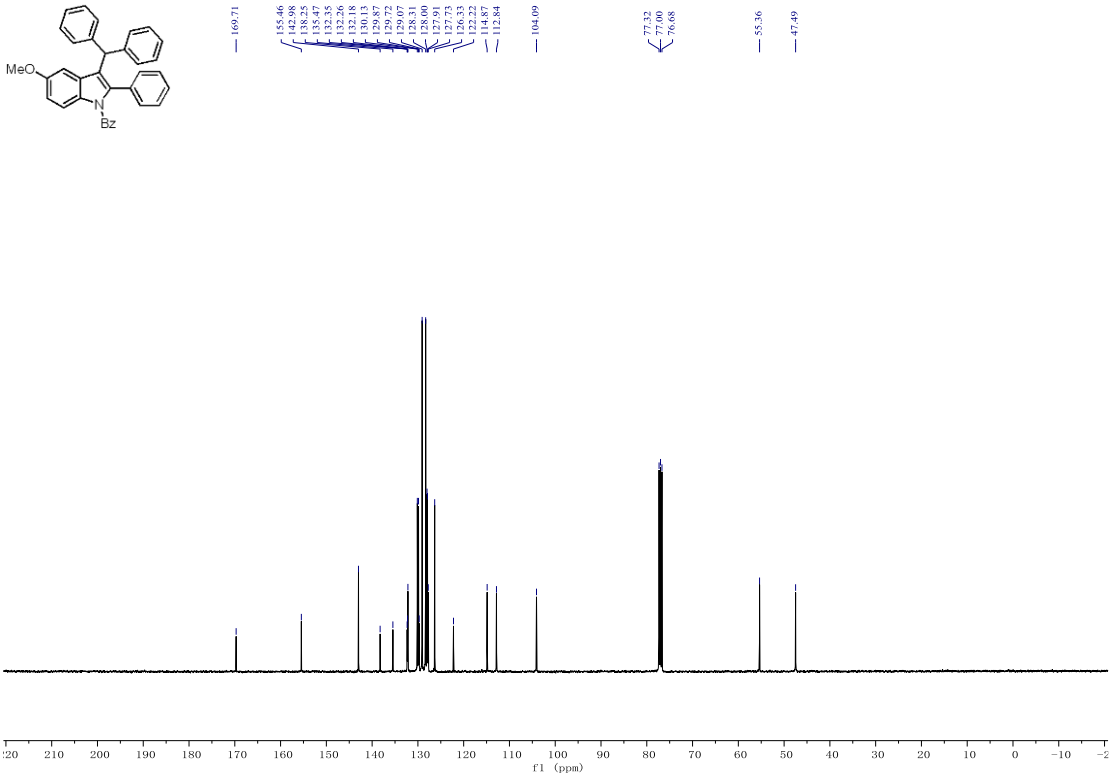
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ag



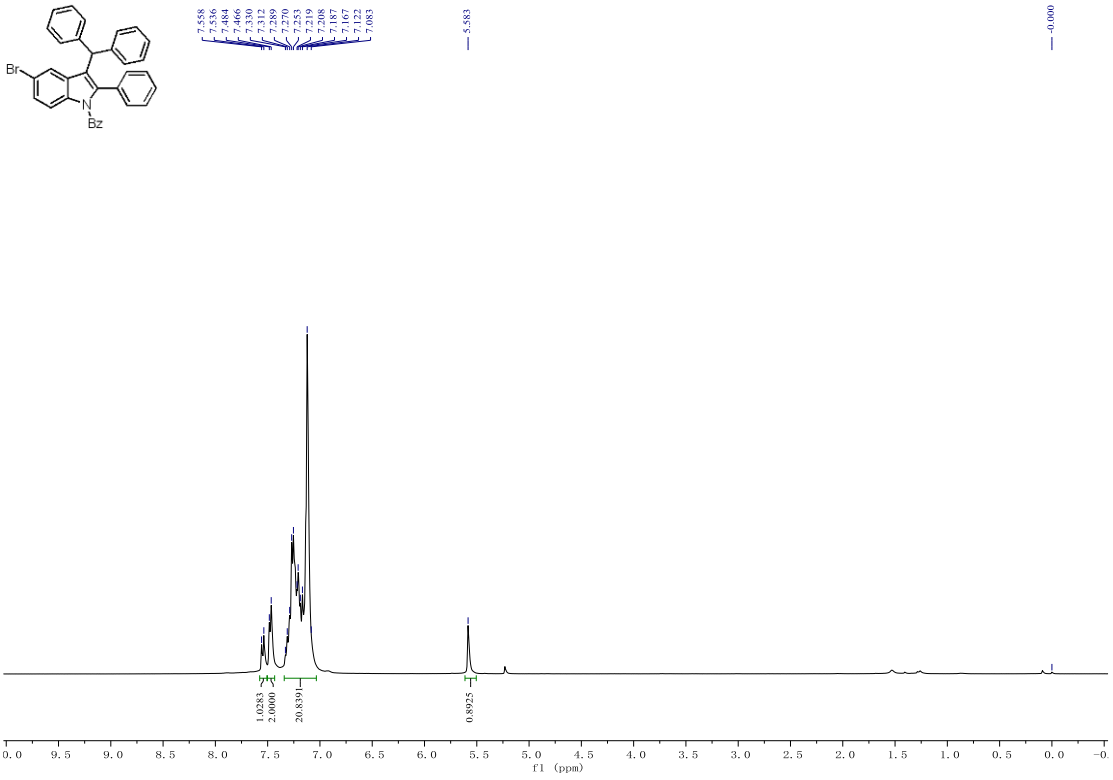
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ah



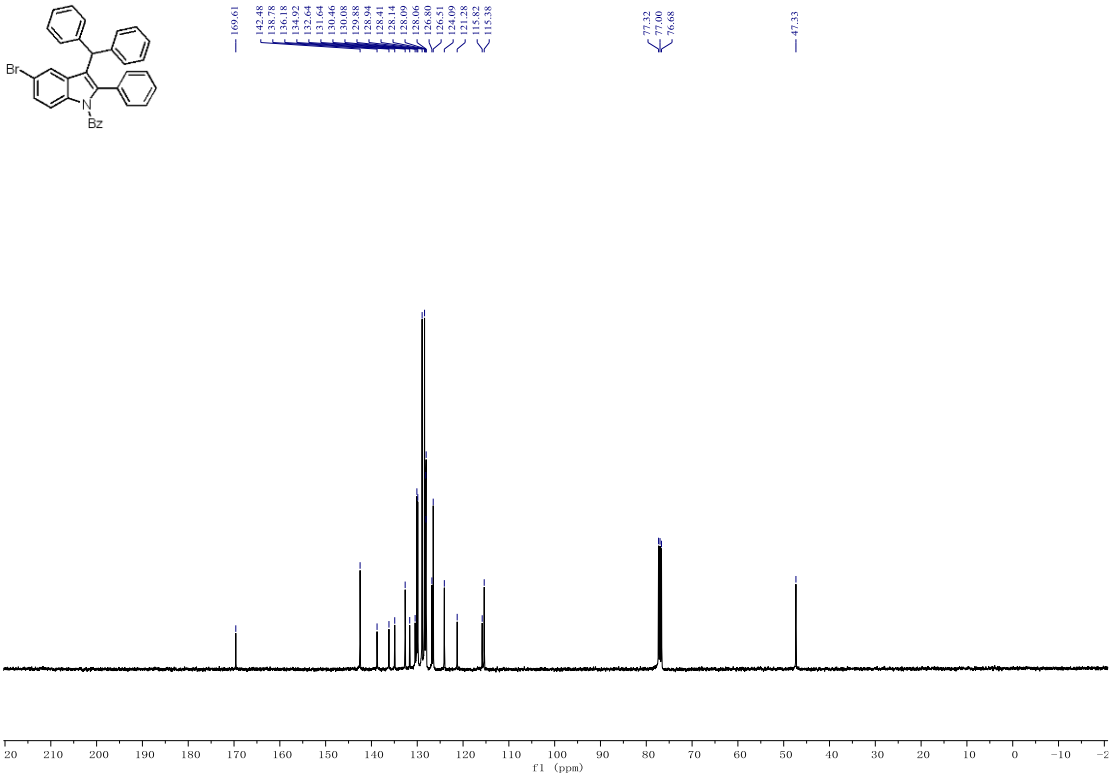
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ah



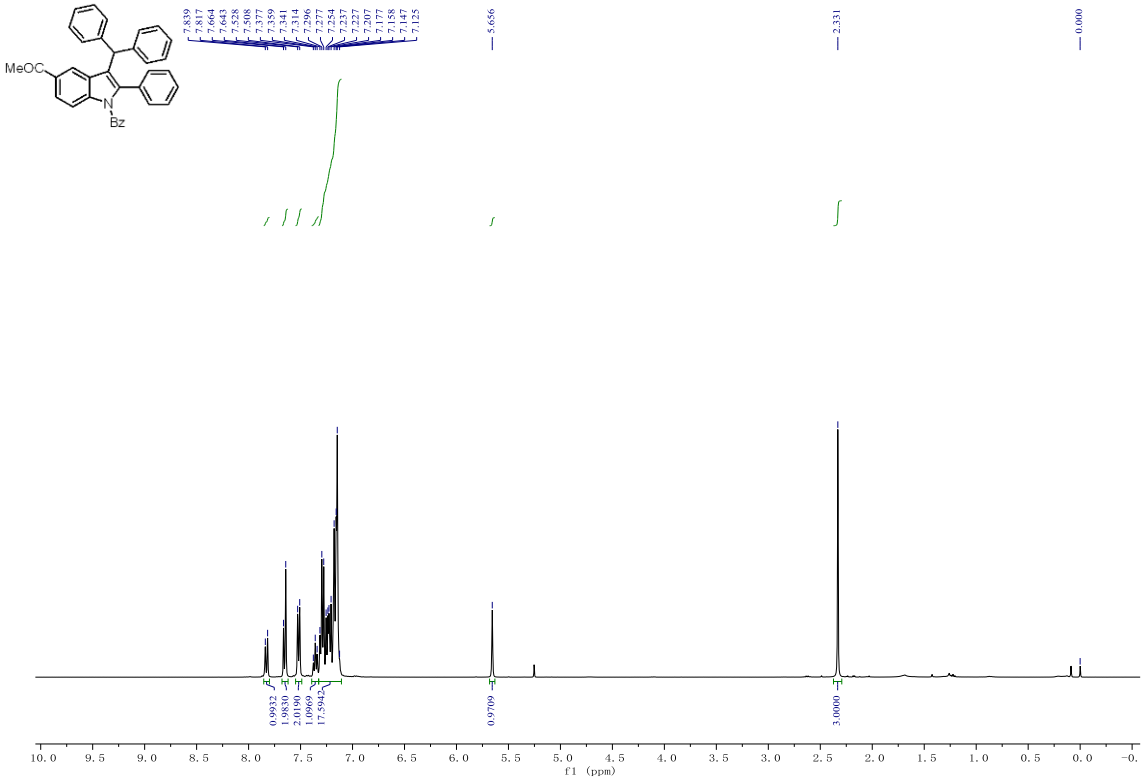
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ai



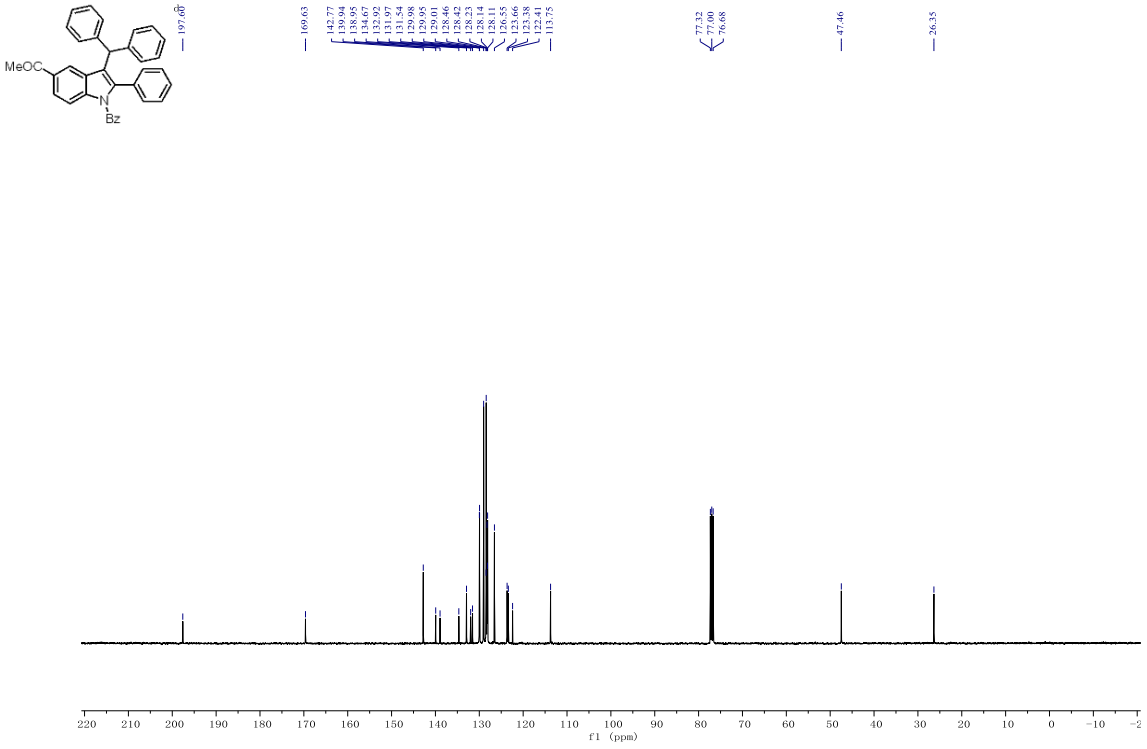
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ai



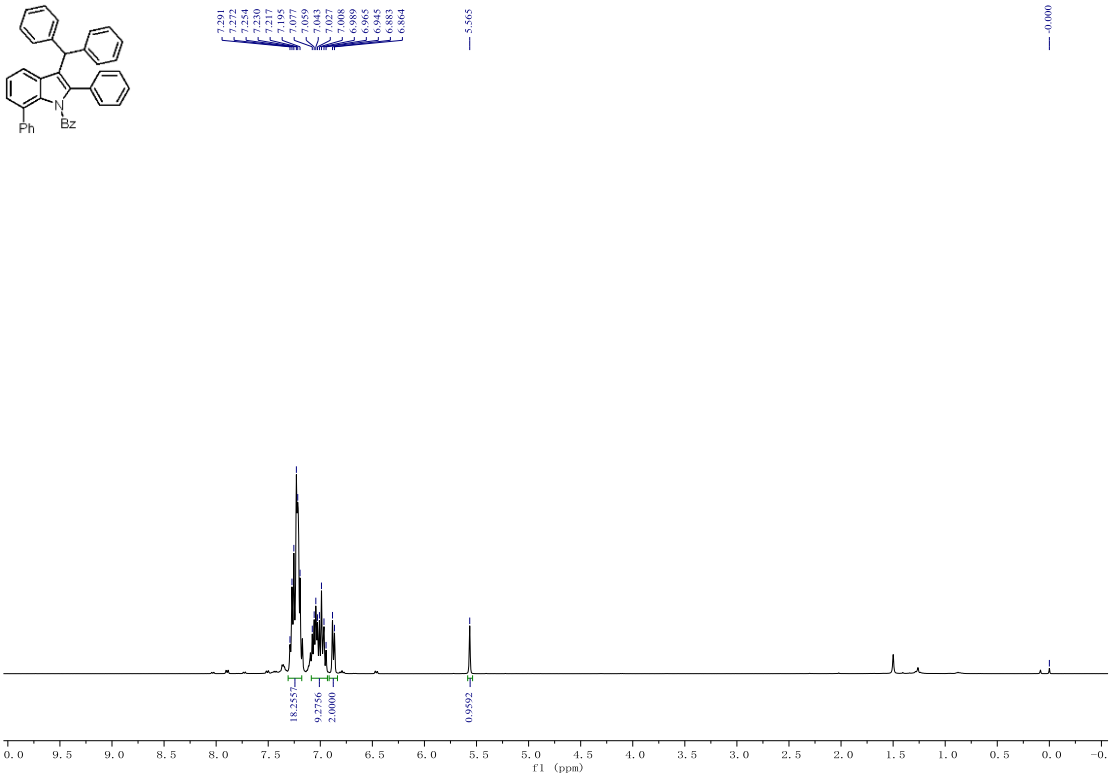
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4aj



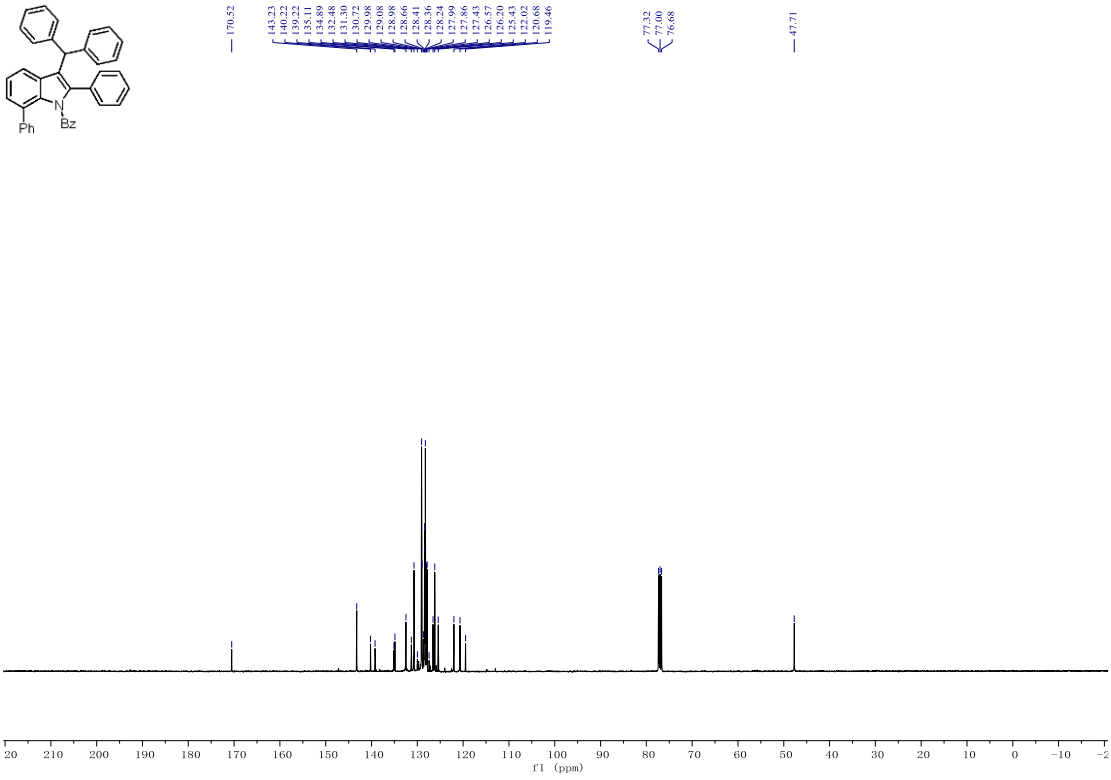
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4aj



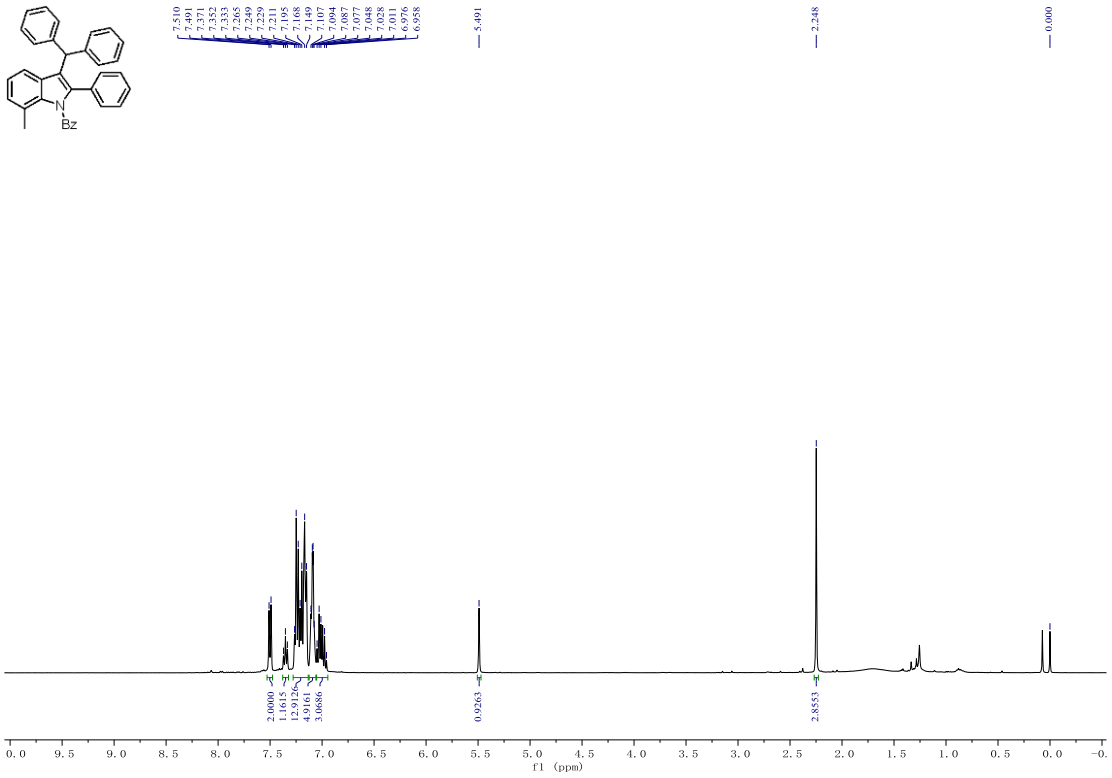
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ak



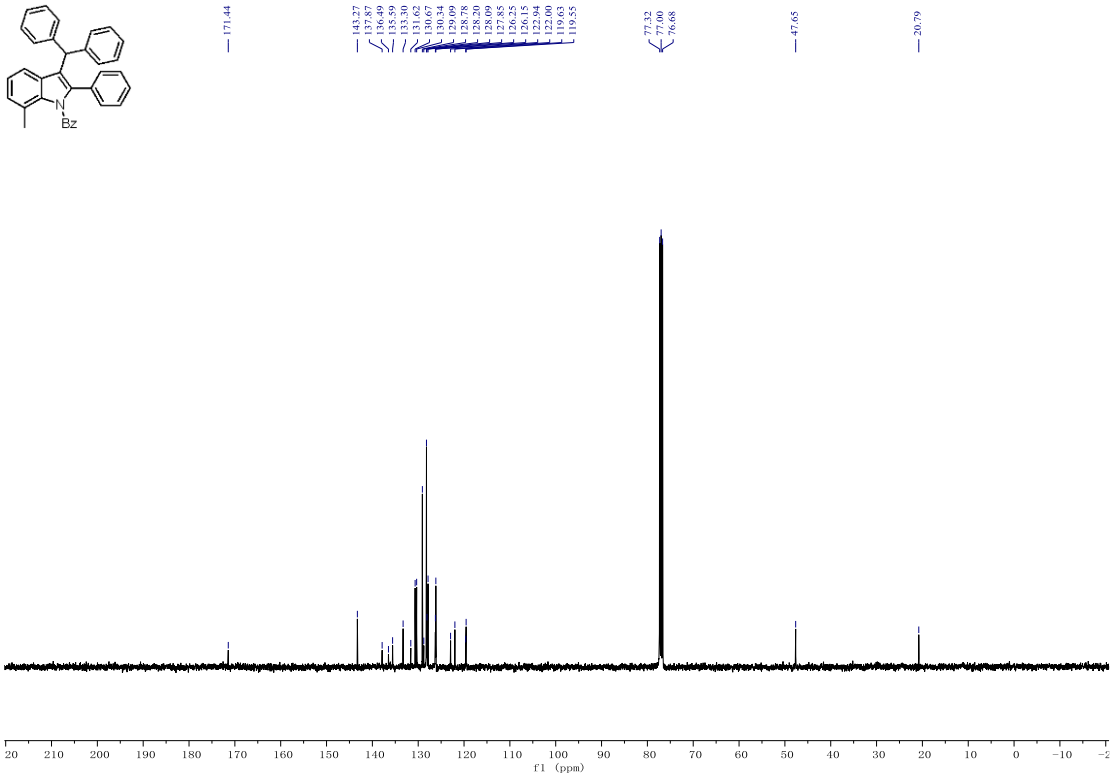
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ak



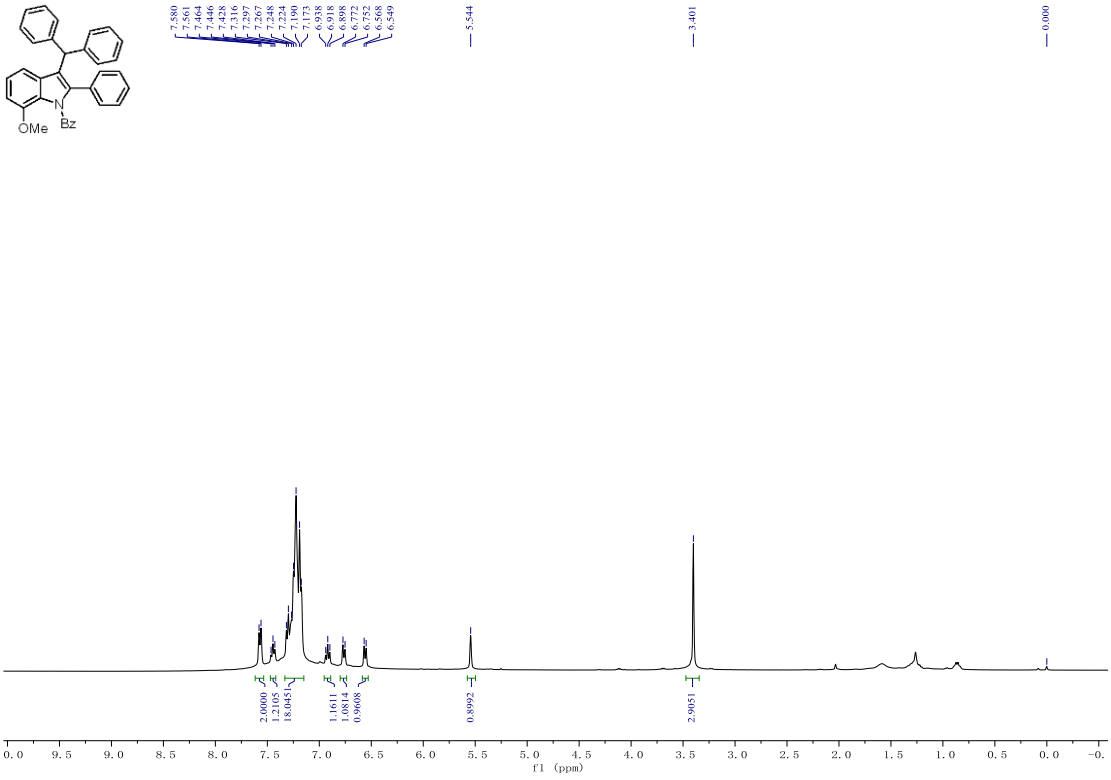
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4al



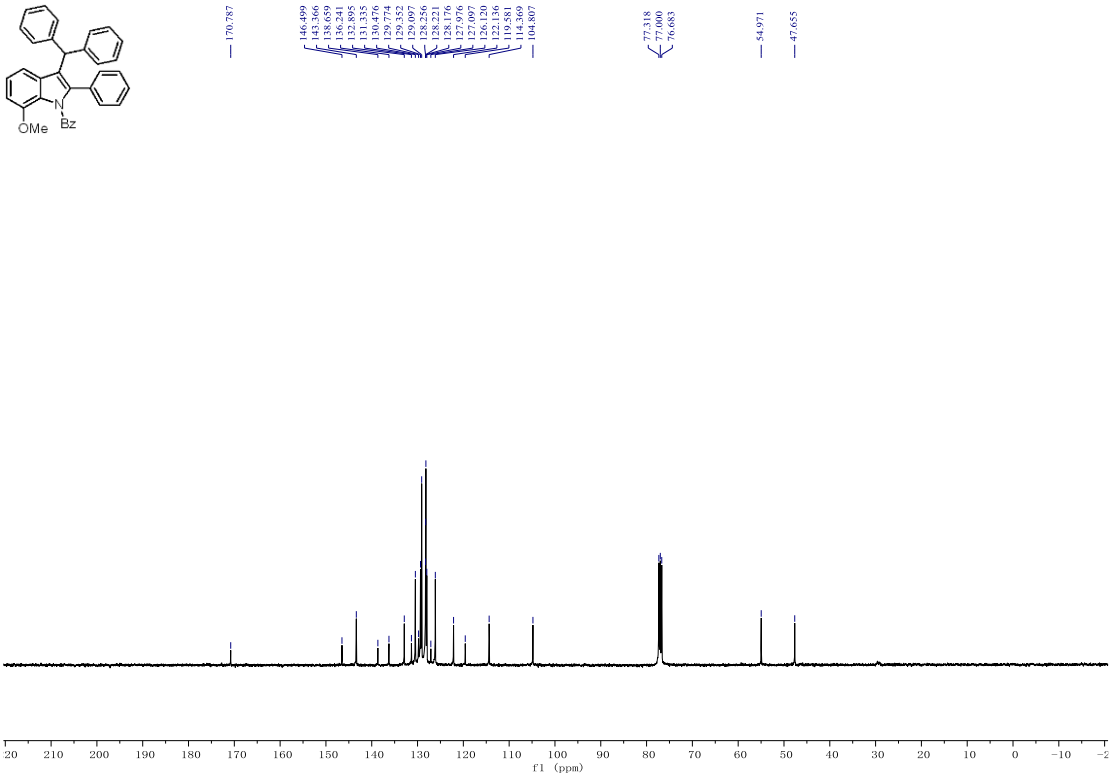
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4al



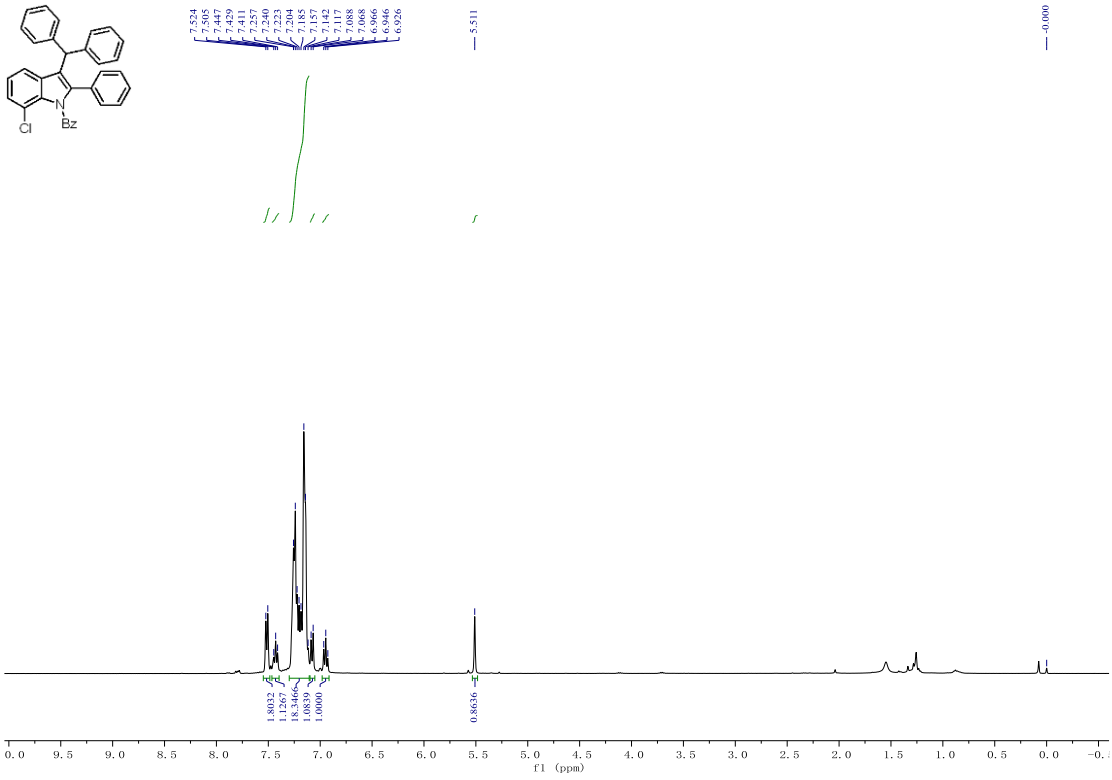
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4am



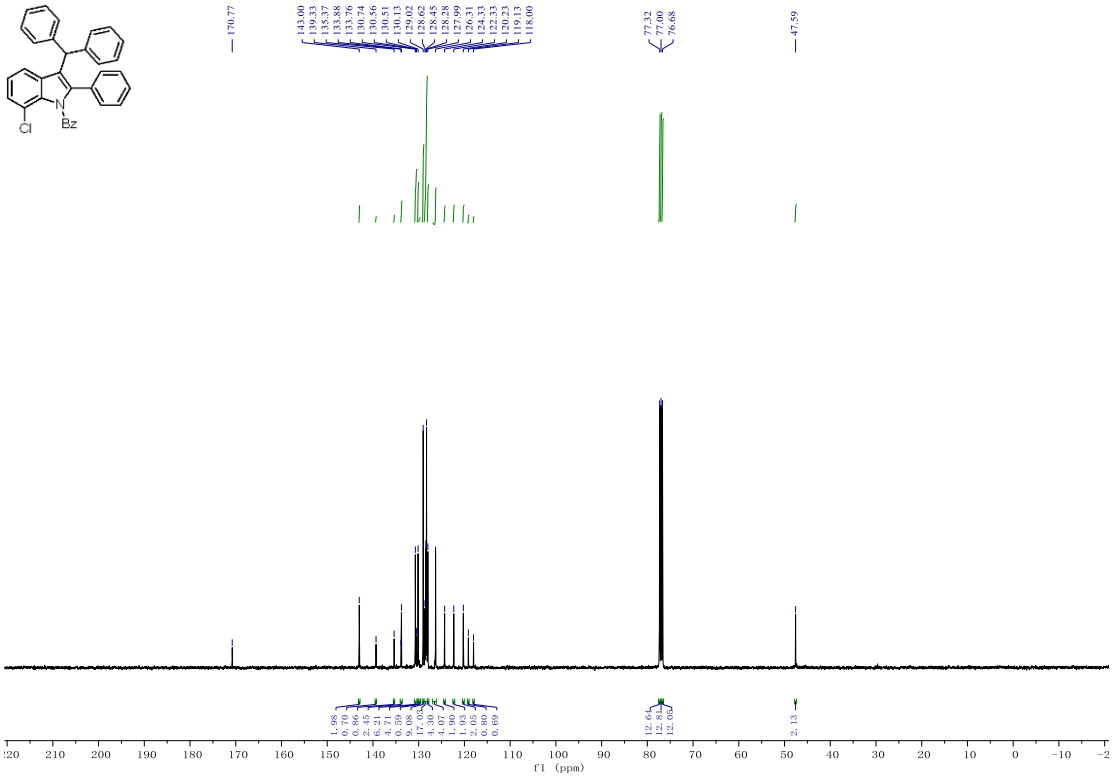
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4am



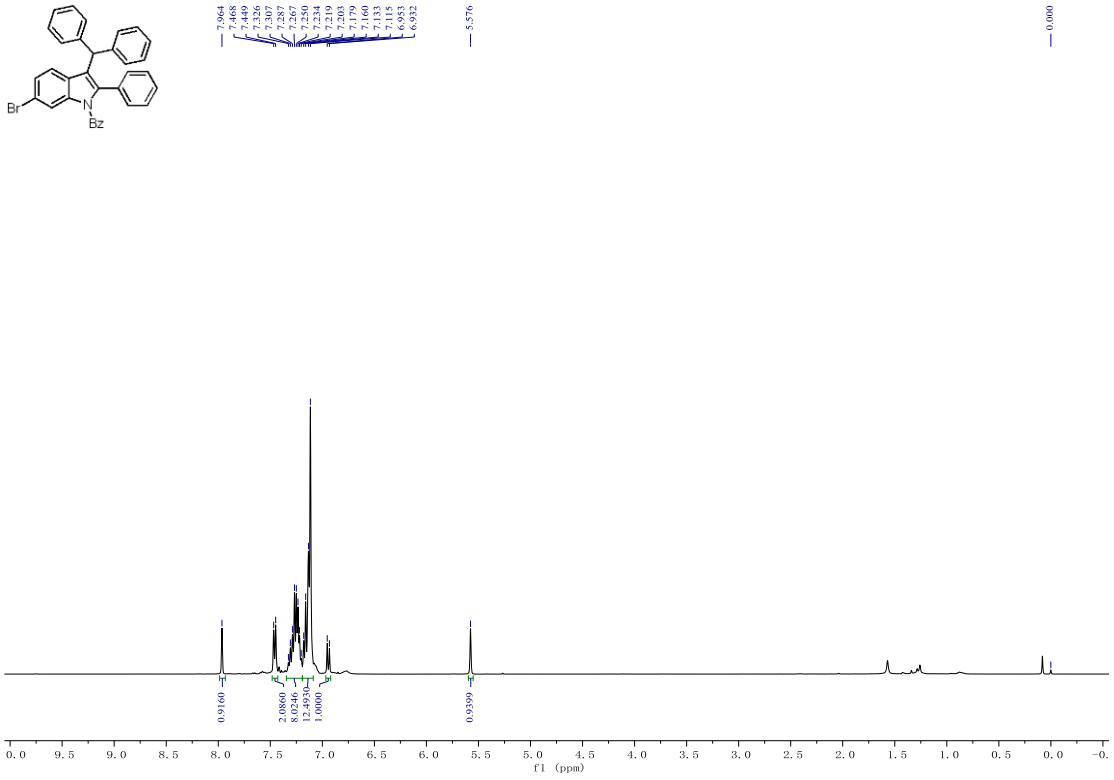
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4an



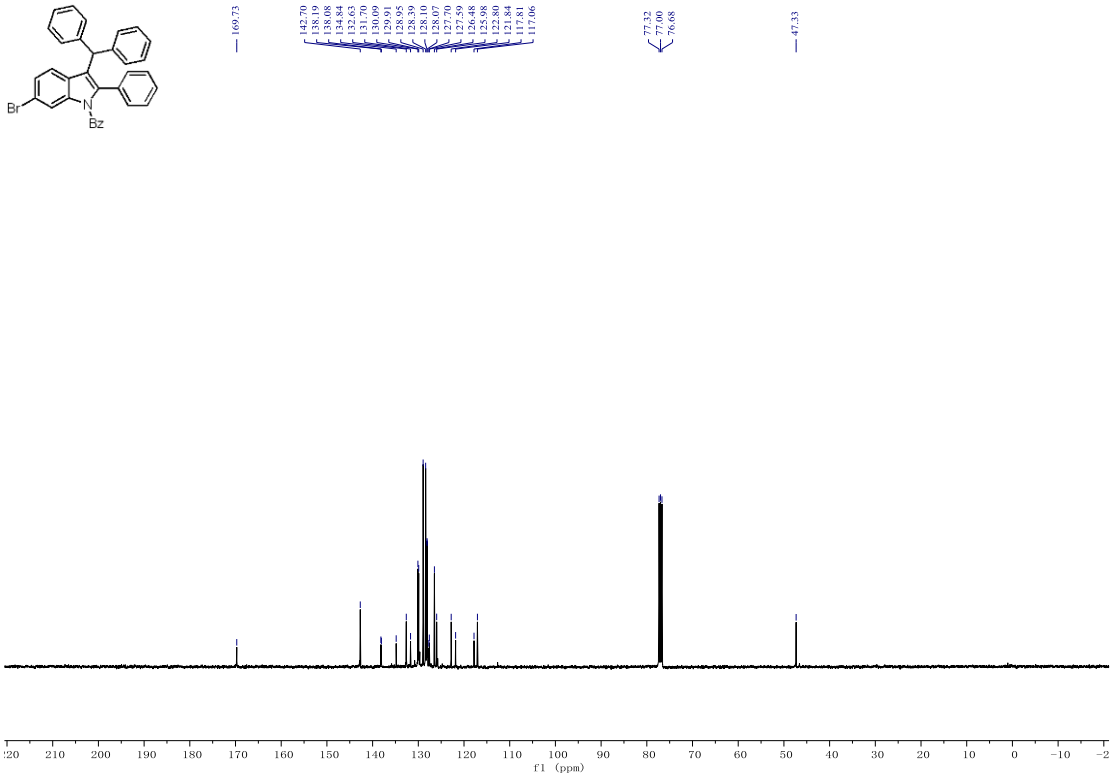
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4an



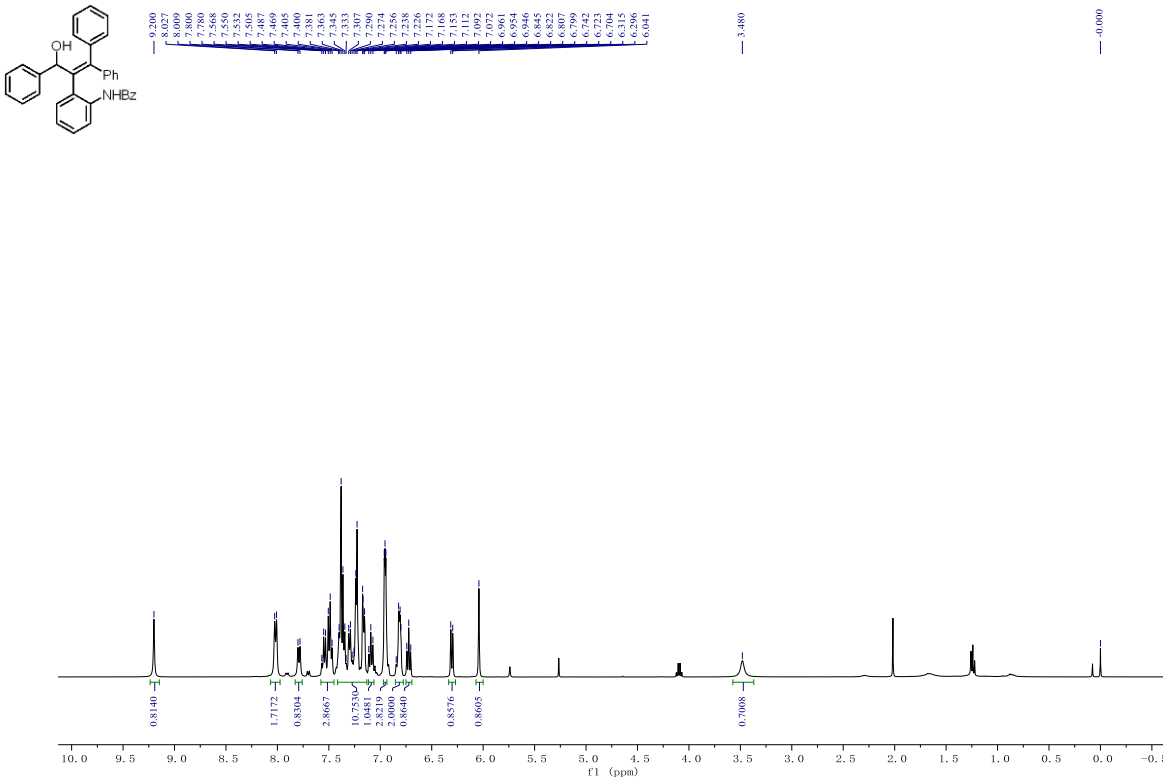
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 4ao



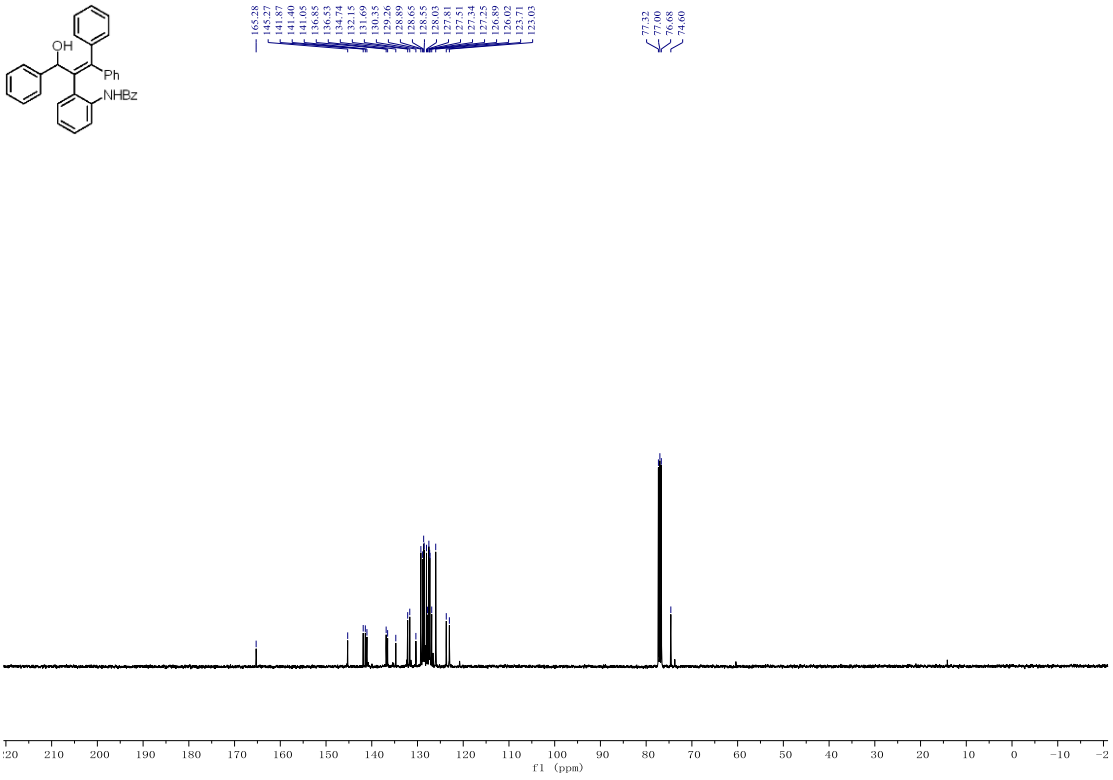
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 4ao



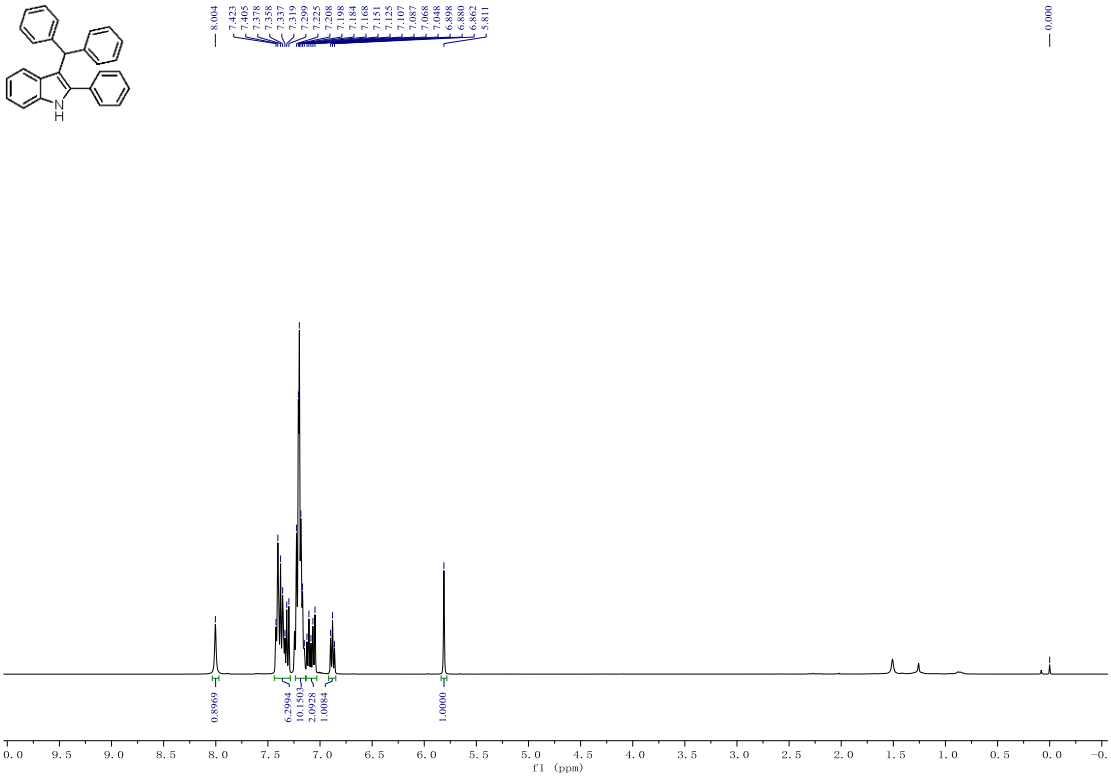
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 5a



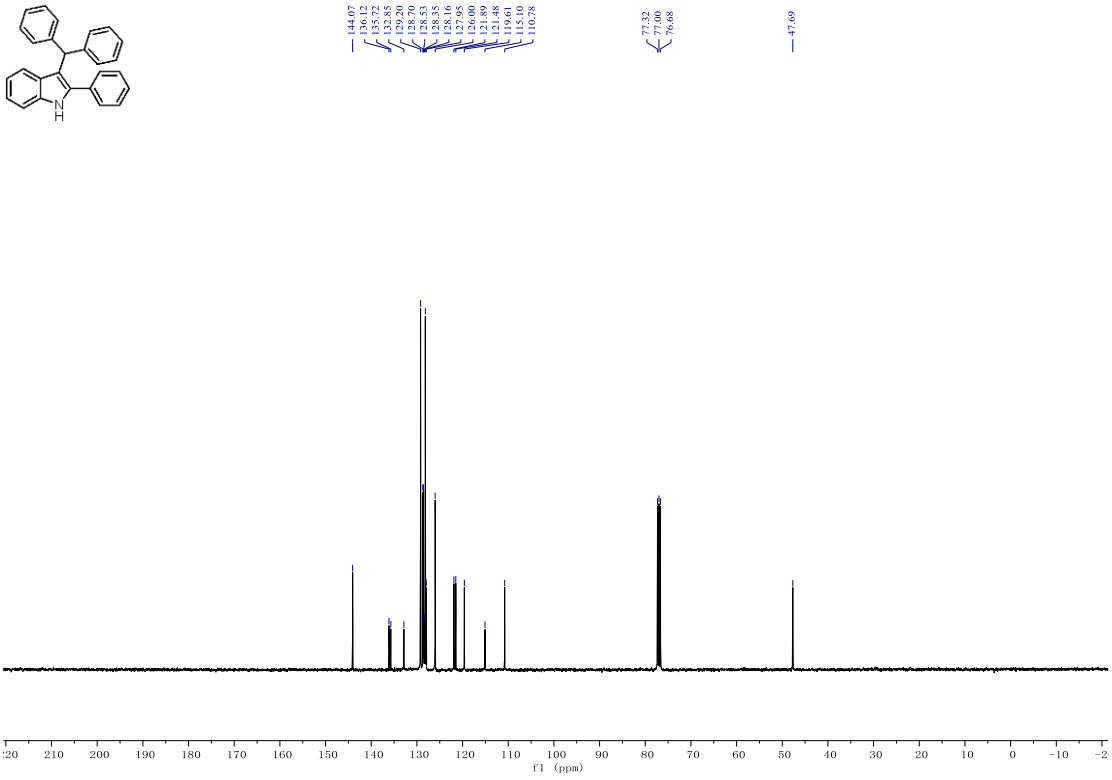
^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 5a



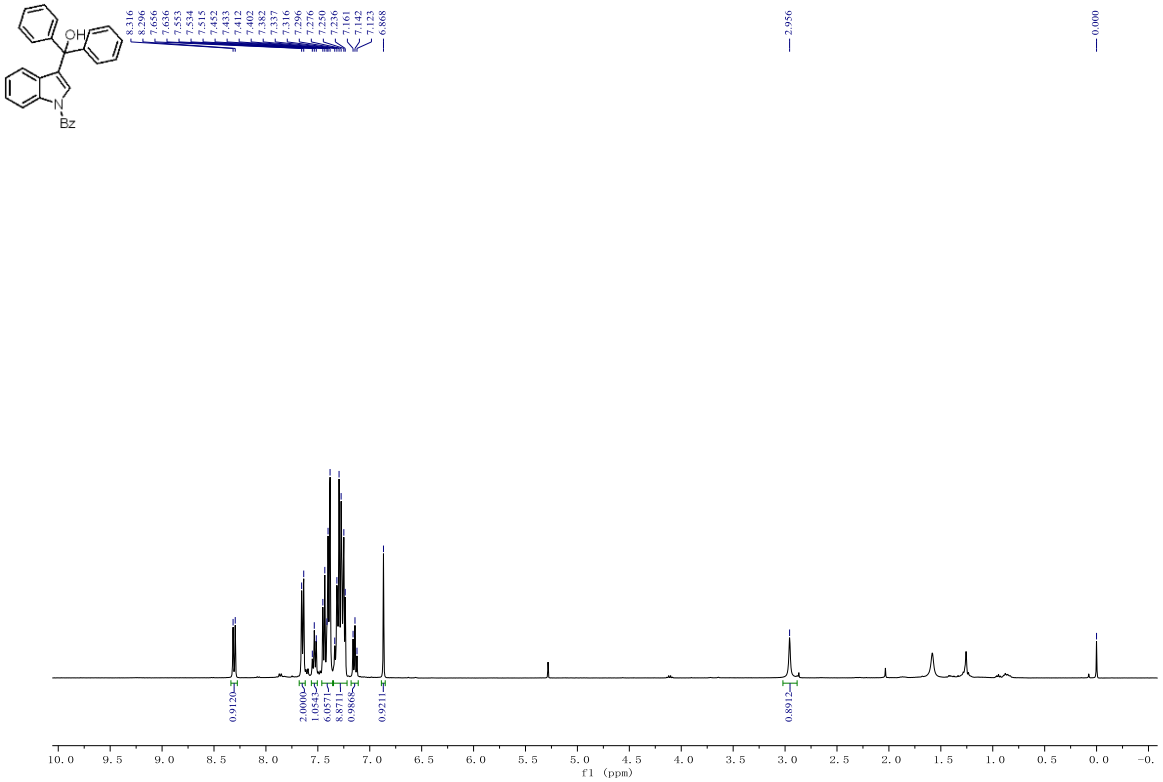
^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 6a



^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 6a



^{1}H NMR (400 MHz, $CDCl_3$) spectroscopy of 7



^{13}C NMR (100 MHz, $CDCl_3$) spectroscopy of 7