Supporting Information

Cobalt Catalyzed Multisubstituted Allylation of Chelation Assisted C-H bond of (Hetero)arenes with Cyclopropenes

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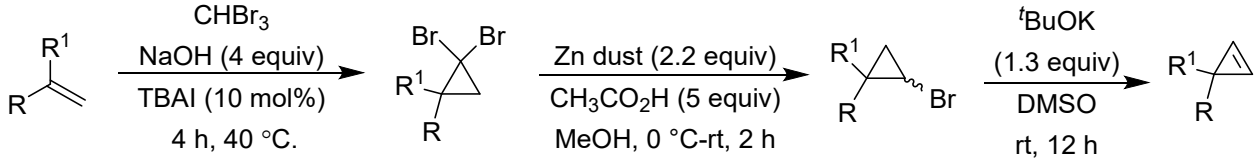
1. General Comments:

All reactions were carried out under nitrogen atmosphere using oven dried reaction tubes. Dry toluene was prepared by distilling over calcium hydride and stored over molecular sieves 4Å under nitrogen atmosphere. All the 1-(pyridin-2-yl)indole derivatives were synthesized from corresponding indoles employing literature procedure.[1] [Cp*CoI_2CO], and [Cp*$Co(CH_3CN)_3$]$(SbF_6)_2$ were synthesized from Co_2CO_8 according to the literature procedure.[2] Column chromatography was performed using RankemSilica gel (100-200 mesh) and the solvent system used unless otherwise specified, was ethyl acetate-hexanes with various percentage of polarity depending on the nature of the substrate.

2. Analytical Methods:

NMR data were recorded on 400 and 500 MHz spectrometers. ^{1}H and ^{13}C NMR spectra were referenced to signals of either deuterated solvents or residual protonated solvents. Infrared spectra were recorded on a Jasco ATR IR spectrometer. HRMS were recorded by electron spry ionization (ESI) method on a Q-TOF Micro with lock spray source.

3.1 Synthesis of cyclopropene derivatives:



Substituted alkene (1.0 equiv) was taken into the round bottom flask followed by bromoform (1.5 equiv) was added slowly through a syringe. The mixture was allowed to stir for 5 min, then 4 equivalents of 50% of aqueous NaOH solution was added to the reaction. Finally, TBAI (10 mol%) was added and the reaction mixture was kept in 40 °C preheated oil bath. TLC was checked during the reaction, after the completion of reaction, the reaction mixture was quenched with water followed by extracted with DCM and wash with water. The extracted organic layer was dried over Na_2SO_4, filtered, and concentrated to give a crude product. The obtained crude was further purified by column chromatography with silica gel using ethyl acetate/hexane as an eluent to give the product in excellent yield as yellow oil. R*f* = 0.60 in 1:9 ethyl acetate/hexane.
Dibromocyclopropane (1.0 equiv) and MeOH (30 mL) as taken into the round bottom flash with a stir bar. The reaction mixture was kept at 0 °C followed by 5 equivalents of CH_3CO_2H and 2.2 equivalents of Zn dust were added into the reaction mixture slowly. The reaction was monitored

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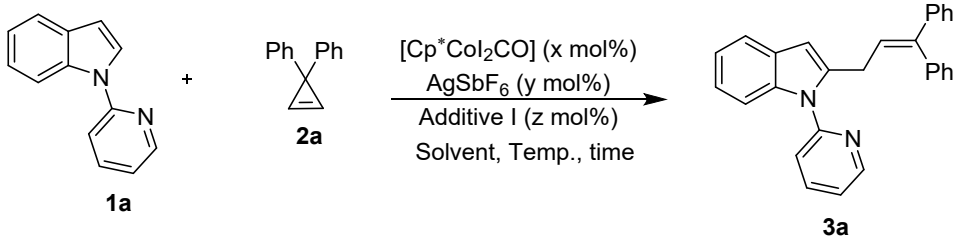
[1]Ackermann, L.; Lygin, A. V. *Org. Lett.* **2011**, *13*, 3332.
[2]B. Sun, T. Yoshino, S. Matsunaga, M. Kanai, *Adv. Synth. Catal*. **2014**, *356*, 1491 - 1495.

by TLC. Once the reaction was completed, the solvent was evaporated in a high vacuum then the crude was extracted with Et_2O and washed with water. The extracted organic layer was dried over Na_2SO_4, filtered, and concentrated in vacuo to obtained crude product, which was purified with silica gel column chromatography using ethyl acetate/hexane as an eluent to afford the product in good yield as yellow oil. R*f* = 0.60 in 1:9 ethyl acetate/hexane.

Bromocyclopropane (1.0 equiv) was taken into two-neck round bottom flask with dry DMSO (20 mL) under argon atmosphere. Then, ^{t}BuOK was added into the reaction flask at ambient temperature and stirred overnight. After the completion of reaction, the reaction mixture was quenched with distilled water. Subsequently, the reaction mixture was extracted with ethyl acetate, washed with water, and brine solution. The extracted organic layer was dried over Na_2SO_4, filtered, concentrated under vacuum and the resultant crude product was purified using column chromatography. The substituted cyclopropenes were obtained with good yield.

4.1 Cobalt catalyzed allylation of arenes: Optimization

In an oven-dried reaction tube, 1-(pyridin-2-yl)-1*H*-indole **1a** (50 mg, 0.26 mmol) and 3,3-diphenylcyclopropene **2a** (100 mg, 0.52 mmol), was added into the reaction tube. Subsequently, catalyst and additive (mol% as mentioned in the table) were added and 2 mL of dry solvent was added to the reaction tube and sealed with septa. It was kept in a preheated oil bath at the temperature mentioned in the table and stirred at same temperature for the time mentioned in the table below. Next, the reaction mixture was cooled to room temperature and dissolved in 5 mL of DCM, and filtered through a small pad of Celite. The solvent was evaporated to get the crude product, which was further purified by column chromatography to afford product 2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole **3a**.



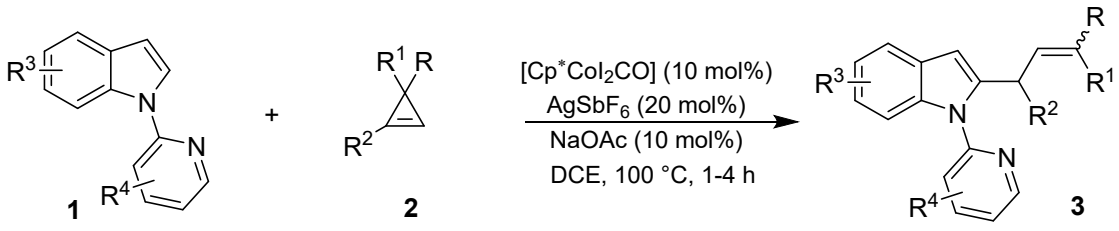
1a **2a** **3a**

Entry	[Cp*CoI_2CO] **(x mol%)**	**$AgSbF_6$ (y mol%)**	**Additive I (z mol%)**	**Solvent**	**Temp. (˚C)**	**Time (h)**	**Yield (%)**
1[a]	[10]	20	K_2CO_3 [10]	PhCl	100	24	-
2 [a]	[10]	20	K_2CO_3 [10]	DCE	100	24	5
3	[10]	20	K_2CO_3 [10]	DCE	100	24	24
4	[10]	20	K_2CO_3 [10]	DCE	120	24	48
5	[5]	10	K_2CO_3 [10]	DCE	100	24	14
6	[5]	10	K_2CO_3 [10]	DCE	120	36	10

7	[10]	20	KOAc [10]	DCE	100	24	60
8	[10]	20	AgOAc [10]	DCE	100	24	50
9	[10]	20	AgOTf [10]	DCE	100	24	25
10	[10]	20	Ag_2CO_3 [10]	DCE	100	24	trace
11	[10]	20	AgOAc [20]	DCE	100	24	trace
12	[10]	20	KOAc [30]	DCE	100	24	42
13	[10]	20	KOAc [50]	DCE	100	24	39
14	[10]	20	KOAc [100]	DCE	100	24	20
15	[10]	20	NaOPiv [10]	DCE	100	24	56
16	[10]	20	KOPiv [10]	DCE	100	24	72
17	[10]	20	Cs_2CO_3 [10]	DCE	100	24	20
18	[10]	20	KOAc [10]	DMF	100	24	-
19	[10]	20	KOAc [10]	DMSO	100	24	-
20	[10]	20	KOAc [10]	CH_3CN	100	24	-
21	[10]	20	KOAc [10]	DCM	100	24	36
22	[10]	20	NaOAc [10]	toluene	100	4	28
23	**[10]**	**20**	**NaOAc [10]**	**DCE**	**100**	**1.5**	**91**
24	[10]	20	NaOAc[10]	DCE	rt	2	-
25	-	20	NaOAc[10]	DCE	100	2	-
26	[10]	-	NaOAc[10]	DCE	100	2	trace
27	[10]	20	-	DCE	100	2	5
28	$[Cp^*RhCl_2]_2$ [5]	10	NaOAc [10]	DCE	100	4	trace
29	$[Cp^*Co(CH_3CN)_3(SbF_6)_2]$ [10]	-	NaOAc [10]	DCE	100	4	47
30	$[Cp^*CoCl_2]_2$[10]	10	NaOAc [10]	DCE	100	4	5

Reaction conditions: 1-(pyridin-2-yl)-1*H*-indole **1a** (1.0 equiv), Cycloprop-2-ene-1,1-diyldibenzene **2a** (2 equiv), Catalyst [Cp^*CoI_2CO] (5-10 mol %), Temperature, Time; 4 h, (1-2)[a] 1-Phenyl-1*H*-pyrazole (1.0 equiv).

5. Typical procedure for the cobalt catalyzed allylation of 1 with 2:



Oven-dried Schlenk tube was charged with substituted indole **1** (0.26 mmol, 1.0 equiv), NaOAc (10 mol%), $AgSbF_6$ (20 mol%) and [Cp*CoI_2CO] (10 mol%). The charged schlenk tube inner atmosphere was made inert through repeated (thrice) evacuation and refilled with nitrogen. Subsequently, 1 mL of dry DCE solvent was added to Schlenk tube. Cyclopropene **2** (0.52 mmol%, 2.0 equiv) was taken in (5 mL) dried vial, followed by 1 mL of dry DCE solvent was added. The charged schlenk tube was kept in preheated oil-bath at 100 °C and DCE solution of **2** was slowly added to reaction mixture about 1.5 h. The reaction mixture was stirred at same temperature throughout the mentioned period. After completion of the reaction (monitored by TLC), the reaction mixture was cooled to room temperature and passes through a pad of celite and concentrated to get the crude product. The crude product was purified by column chromatography through silica gel to afford the expected product **3** in good to excellent yield.

5.2 Typical procedure for the cobalt catalyzed reaction of 4 and 5 with 2a:

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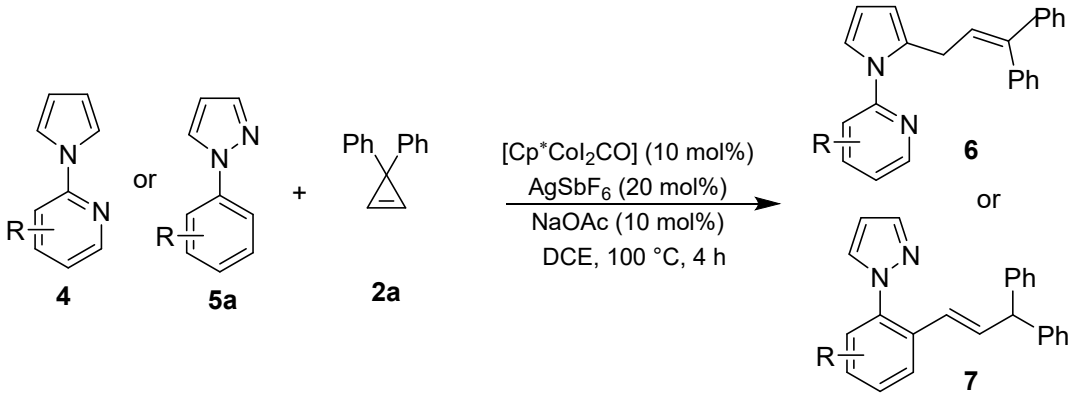
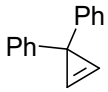


Oven-dried Schlenk tube was charged with substreate **4** or **5**(0.28 mmol, 1.0 equiv), **2a** (0.56 mmol%, 2.0 equiv), NaOAc (10 mol%), $AgSbF_6$ (20 mol%) and [Cp*CoI_2CO] (10 mol%). The charged Schlenk tube's inner atmosphere was made inert through repeated (thrice) evacuation and refilled with nitrogen. Subsequently, 2 mL of dry DCE solvent was added and it was kept in preheated oil bath at 100 °C. The reaction mixture was stirred at same temperature throughout the mentioned period. After completion of the reaction (monitored by TLC), the reaction mixture was cooled to room temperature and passes through a pad of celite, and concentrated to get the crude product. The crude product was purified by column chromatography through silica gel to afford the product **6** and **7** 82% isolated yield. This same reaction procedure was followed for other pyrazole derivatives.

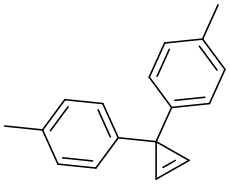
6. Properties and spectral data of synthesized compounds:

3,3-Diphenylcyclopropene (2a):



Yield: 60%; colourless liquid; *Rf*= 0.60 in 100% Hexane.
IR (ν_{max}, cm^{-1}): 3060, 1964, 1727, 1659, 1390, 1267, 1044.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.46 (s, 2H), 7.30-7.24 (m, 4H), 7.20-7.15 (m, 6H),
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 147.2, 128.8, 128.2, 125.8, 113.3,
HRMS: (ESI) *m*/*z* calcd for $C_{15}H_{12}$, 193.1012 $[M+H]^+$; found 193.1014.

3,3-Bis(4-methylphenyl)cyclopropene (2t):

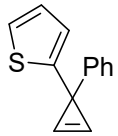


Yield: 34%; white solid; *Rf*= 0.5 in 100% Hexane.
IR (ν_{max}, cm^{-1}): 2998, 2867, 1726, 1510, 1470, 1275, 1176.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.45 (s, 2H), 7.10-7.05 (m, 8H), 2.31 (s, 6H).
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 144.4, 135.2, 128.8, 128.1, 113.1, 31.3, 21.1
HRMS: (ESI) *m*/*z* calcd for $C_{17}H_{16}$, 221.1325 $[M+H]^+$; found 221.1323.

3-Methyl-3phenylcyclopropene (2v):

Yield: 58%; colourless liquid; *Rf*= 0.60 in 100% Hexane.
IR (ν_{max}, cm^{-1}): 2972, 1743, 1589, 1467, 1273, 755.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.32–7.19 (m, 6H), 7.13 (t, J = 8.0 Hz, 1H), 1.62 (s, 3H).
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 150.0, 129.3, 127.9, 126.8, 126.1, 125.1, 115.6, 28.0.
HRMS: (ESI) *m*/*z* calcd for $C_{10}H_{10}$, 131.0855 $[M+H]^+$; found 131.0855.

3-Phenyl-3-thiophe-2-ylcyclopropene (2y):

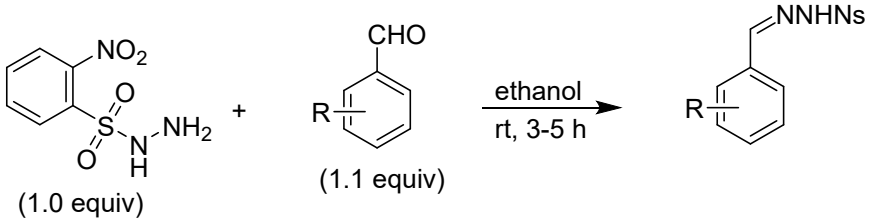


Yield: 25%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2972, 1738, 1587, 1470, 1141, 753.

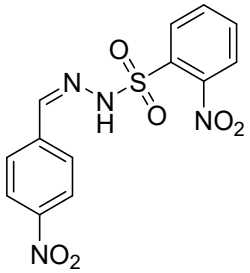
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.49 (s, 2H), 7.36-7.29 (m, 5H), 7.11 (dd, J = 5.1, 1.1 Hz, 1H), 6.92 (dd, J = 5.1, 3.5 Hz, 1H), 6.71 (dd, J = 3.4, 1.2 Hz, 1H),
^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 155.3, 145.8, 128.8, 128.4, 128.3, 127.9, 127.2, 126.4, 124.5, 123.2, 113.6
HRMS: (ESI) m/z calcd for $C_{13}H_{10}S$, 199.0576 $[M+H]^+$; found 199.0575.

General synthesis method for *N*-nosylhydrazones:

To a stirred solution of $NsNHNH_2$ (3.3 mmol, 1 equiv) in ethanol (10 mL) carbonyl compounds (3.6 mmol, 1.1 equiv) were added and the mixture was stirred for 3-5 h at room temperature. After completion of the reaction, the mixture was evaporated under high vacuum and the resulting solid ***N*-**nosylhydrazones was separated using flash column chromatography with 75-90% yields. Similar procedure was followed for ***N*-**tosylhydrazones**.**

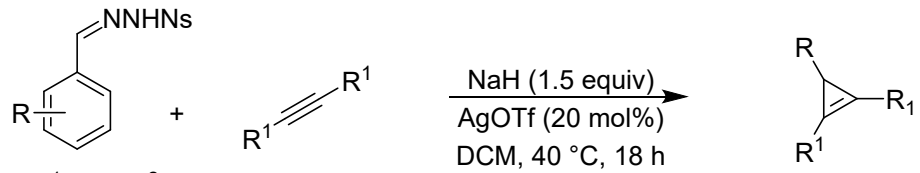


2-Nitro-*N*'-(4-nitrobenzylidene)benzenesulfonohydrazide:



Yield: 78%; yellow solid; R_f= 0.50 1:1 in Hexane/Ethylacetate.
IR (ν_{max}, cm^{-1}): 3024, 2435, 1570, 1376, 959, 750.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.24-8.15 (m, 3H), 8.12-8.00 (m, 2H), 7.96-7.55 (m, 4H),
^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 148.4, 145.6, 133.2, 131.1, 130.9, 129.4, 128.3, 127.5, 125.1, 124.7, 124.5, 123.9, 123.7.
HRMS: (ESI) m/z calcd for $C_{13}H_{10}N_4O_6S$, 350.0321 $[M+H]^+$; found 351.0392.

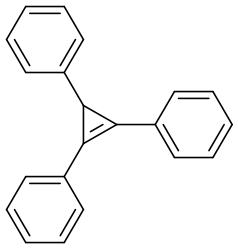
General procedure for the cyclopropenation of internal alkynes:



R, R^1, and R^2 = alkyl and aryl

A two neck round bottom flask was charged with *N*-nosylhydrazone of *p*-nitrobenzaldehyde (0.71 mmol, 1.0 equiv) and 60% NaH (0.73 mmol, 1.5 equiv) and was evacuated and filled with N_2 for three times, followed by addition of dry DCM (8.0 mL) via syringe. The resulting mixture was stirred at room temperature for 1 h. Then, diphenylacetylene (1.4 mmol, 2.0 equiv) and AgOTf (0.428 mmol, 20 mol %) were added and the system was stirred at 40 °C for 18 h. The progress of the reaction was monitored by TLC. When the reaction was completed, the crude reaction mixture was allowed to room temperature, and filtered through a short pad of silica gel with EtOAc as an eluent. The filtrate was evaporated under reduced pressure bellow 35 °C to leave a crude mixture, which was purified by column chromatography on silica gel (eluting with petroleum ether) to afford cyclopropene as a colorless oil with 20-30% yield. Other cyclopropenes also prepared using same procedure.

1,2,3-Triphenylcyclopropene (2ae):



Yield: 25%; yellow semi solid; *Rf*= 0.4 in 100% Hexane.

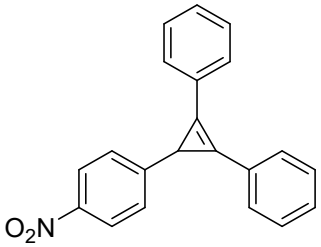
IR (ν_{max}, cm^{-1}): 3032, 1950, 1720, 1640, 1245, 1070.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.66 (d, J = 7.6 Hz, 4H), 7.39 (t, J = 8.4 Hz, 4H), 7.30 (t, J = 7.8 Hz, 2H), 7.25-7.17 (m, 4H), 7.14-7.10 (m, 1H), 3.35 (s, 1H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 144.6, 130.0, 128.9, 128.7, 128.6, 128.3, 125.9, 125.5, 112.6, 24.5

HRMS: (ESI) *m*/*z* calcd for $C_{21}H_{16}$, 269.1325 $[M+H]^+$; found 269.1321.

(3-(4-Nitrophenyl)cycloprop-1-ene-1,2-diyl)dibenzene (2ag):



Yield: 30%; yellow liquid; R_f= 0.20 in Hexane.

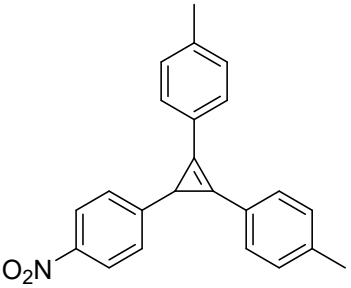
IR (ν_{max}, cm^{-1}): 3034, 2445, 1571, 1370, 870, 768.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.34 (d, J = 8.2 Hz, 2H), 7.64 (d, J = 7.3 Hz, 4H), 7.45 (t, J = 7.6 Hz, 4H), 7.41-7.34 (m, 4H), 3.34 (s, 1H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 153.5, 146.2, 130.0, 129.4, 129.1, 127.6, 126.4, 123.8, 111.3, 24.7.

HRMS: (ESI) m/z calcd for $C_{21}H_{15}F_4NO_2$, 313.1103 $[M+H]^+$; found 314.1169.

4,4'-(3-(4-Nitrophenyl)cycloprop-1-ene-1,2-diyl)bis(methylbenzene) (2ah):



Yield: 22%; yellow liquid; R_f= 0.20 in Hexane.

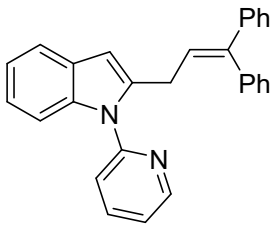
IR (ν_{max}, cm^{-1}): 3006, 2345, 1450, 1230, 900, 750.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.13 (d, J = 8.6 Hz, 2H), 7.47 (d, J = 8.0 Hz, 2H), 7.41 (d, J = 7.8 Hz, 2H), 7.36 (d, J = 8.6 Hz, 2H), 7.23 (d, J = 7.8 Hz, 2H), 7.16 (d, J = 8.0 Hz, 2H), 3.37 (s, 1H), 2.39 (s, 3H), 2.37 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.1, 140.6, 139.7, 131.9, 130.1, 129.9, 129.4, 126.8, 123.8, 115.9, 28.1, 21.8, 21.7.

HRMS: (ESI) m/z calcd for $C_{22}H_{14}F_4NO$, 384.1012 $[M+H]^+$; found 384.0992.

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3a):



Yield: 91%; pale yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

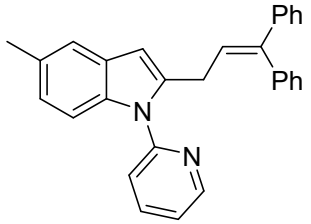
IR (ν_{max}, cm^{-1}): 3060, 2930, 1738, 1589, 1478, 1138, 766.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.53 (s, 1H), 7.77 (t, J = 8.7, Hz, 1H), 7.57 (d, J = 4.6, Hz, 1H), 7.35-7.27 (m, 5H), 7.25–7.20 (m, 4H), 7.16–7.10 (m, 6H), 6.53 (s, 1H), 6.15 (t, J = 8.1 Hz, 1H), 3.70 (d, J = 7.2 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.3, 149.7, 143.2, 142.6, 139.9, 139.5, 138.3, 137.5, 129.9, 128.6, 128.2, 128.1, 127.6, 127.3, 127.2, 125.5, 122.0, 121.9, 121.0, 120.8, 120.1, 110.3, 103.2, 28.8.

HRMS: (ESI) m/z calcd for $C_{28}H_{22}N_2$, 387.1856 $[M+H]^+$; found 387.1857.

4-Bromo-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1H-indole (3b):



Yield: 72%; Yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

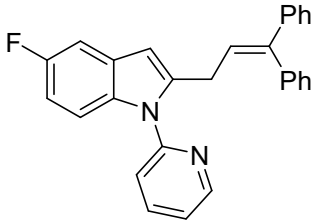
IR (ν_{max}, cm^{-1}): 3006, 2212, 1734, 1441, 1267, 753.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.52 (dd, J = 4.5, 2.1 Hz, 1H), 7.76 (dt, J = 8.6, 1.9 Hz, 1H) 7.35 (s, 1H), 7.32-7.28 (m, 4H), 7.25 (s, 1H), 7.24-7.20 (m, 4H), 6.95 (dd, J = 6.9, 1.3 Hz, 1H), 6.45 (s, 1H), 6.15 (t, J = 7.0 Hz, 1H), 3.69 (d, J = 7.3 Hz, 2H), 3.17 (s, 3H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.5, 149.6, 143.0, 142.6, 139.9, 139.5, 138.2, 135.7, 130.0, 129.9, 128.8, 128.2, 128.1, 127.5, 127.2, 127.1, 125.6, 123.3, 121.7, 120.7, 119.8, 109.9, 102.8, 28.7, 21.4

HRMS: (ESI) m/z calcd for $C_{29}H_{24}N_2$, 401.2012 $[M+H]^+$; found 401.1999.

2-(3,3-Diphenylallyl)-5-fluoro-1-(pyridin-2-yl)-1*H*-indole (3c):



Yield: 73%; Yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

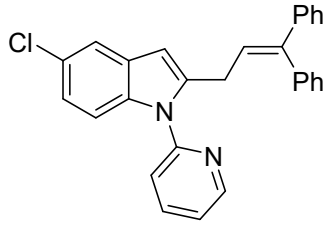
IR (ν_{max}, cm^{-1}): 2987, 1733, 1587, 1446, 1264, 756.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (dd, J = 4.8, 1.2 Hz, 1H), 7.78 (dt, J = 7.9, 1.8 Hz, 1H) 7.36-7.20 (m, 11H), 7.18-7.10 (m, 4H), 6.86 (dt, J = 9.1, 2.6 Hz, 1H), 6.48 (s, 1H), 6.14 (t, J = 7.2 Hz, 1H), 3.67 (d, J = 7.5 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.2, 149.8, 143.5, 142.4, 141.5, 139.4, 138.5, 134.1, 129.9, 128.3, 128.2, 128.2, 127.5, 127.3, 127.2, 120.9, 111.2, 110.1, 109.7, 105.2, 105.0, 103.5, 103.1, 28.7.

HRMS: (ESI) m/z calcd for $C_{28}H_{21}N_2$, 405.1762 $[M+H]^+$; found 405.1759.

5-Chloro-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3d):



Yield: 81 %; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

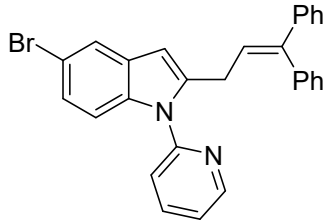
IR (ν_{max}, cm^{-1}): 3059, 2889, 1955, 1655, 1443, 1274, 701.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (d, J = 2.1 Hz, 1H), 7.78 (t, J = 8.8 Hz, 1H), 7.52 (s, 1H), 7.34-7.21 (m, 10H), 7.17–7.06 (m, 5H), 6.40 (s, 1H), 6.13 (t, J = 9.2 Hz, 1H), 3.67 (d, J = 7.1 Hz, 2H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.0, 149.9, 143.6, 142.5, 141.4, 139.4, 138.5, 135.9, 129.9, 129.7, 128.7, 128.3, 128.2, 127.6, 127.4, 127.3, 126.4, 124.9, 122.4, 122.1, 120.9, 119.5, 111.5, 102.7, 28.7.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}ClN_2$, 421.1466 $[M+H]^+$; found 421.1443.

5-Bromo-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3e):



Yield: 90%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

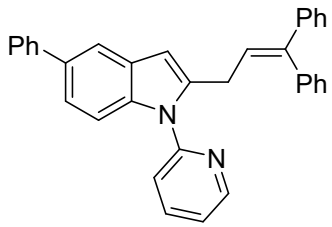
IR (ν_{max}, cm^{-1}): 3012, 2902, 1588, 1474, 1444, 1264, 749.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.53 (dd, J = 4.6, 0.9 Hz, 1H), 7.77 (dt, J = 7.9, 1.9 Hz, 1H), 7.68 (d, J = 3.0 Hz, 1H), 7.33-7.18 (m, 14H), 7.15–7.12 (m, 2H), 7.11.-7.09 (m, 2H), 6.45 (s, 1H), 6.12 (dt, J = 7.5, 1.4 Hz, 1H), 3.66 (d, J = 7.3 Hz, 2H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 150.9, 149.8, 143.5, 141.2, 139.3, 138.5, 136.1, 130.3, 129.9, 128.3, 128.2, 127.8, 128.2, 127.6, 127.4, 127.3, 126.2, 124.9, 124.6, 122.6, 122.4, 120.9, 113.9, 111.8, 102.5, 28.6.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}BrN_2$, 465.0961 $[M+H]^+$; found 467.0943.

2-(3,3-Diphenylallyl)-1-(pyrimidin-2-yl)-1*H*-indole (3f):



Yield: 78%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

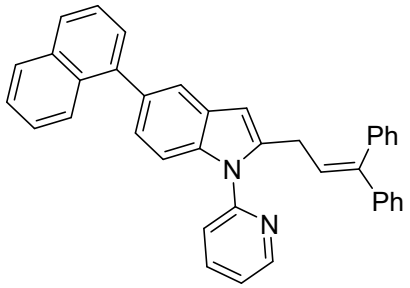
IR (ν_{max}, cm^{-1}): 2988, 1653, 1470, 1262, 754.

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.56 (dd, J = 4.8, 1.2 Hz, 1H), 7.25-7.78 (m, 2H), 7.64 (d, J = 7.6 Hz, 2H), 7.45-7.39 (m, 5H), 7.36–7.29 (m, 6H), 7.27–7.25 (m, 1H), 7.24–7.21 (m, 2H), 7.17-7.12 (m, 4H), 6.55 (s, 1H), 6.17 (t, J = 7.6 Hz, 1H), 3.72 (d, J = 7.4 Hz, 2H),

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C): δ 151.4, 149.8, 143.4, 140.7, 139.5, 138.4, 137.0, 134.4, 129.2, 128.8, 128.3, 128.2, 127.6, 127.4, 127.3, 127.2, 126.5, 125.4, 122.1, 121.8, 120.9, 118.7, 110.6, 103.6, 28.8.

HRMS: (ESI) m/z calcd for $C_{34}H_{26}N_2$, 463.2169 $[M+H]^+$; found 463.2159.

2-(3,3-Diphenylallyl)-5-(naphthalen-1-yl)-1-(pyridin-2-yl)-1*H*-indole (3g):



Yield: 65%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

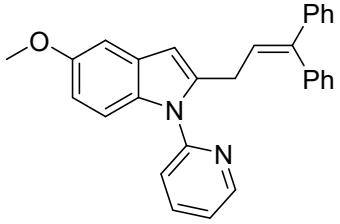
IR (ν_{max}, cm^{-1}): 3007, 2691, 1733, 1442, 1262, 758.

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.50 (d, J = 4.1 Hz, 1H), 7.92 (d, J = 8.3, Hz, 1H), 7.82 (d, J = 8.1 Hz, 1H), 7.78-7.72 (m, 2H), 7.61 (s, 1H), 7.46–7.38 (m, 4H), 7.33–7.14 (m, 12H), 7.10–7.06 (m, 4H), 6.52 (s, 1H), 6.12 (dt, J = 8.1, 2,1 Hz, 1H), 3.67 (d, J = 6.6 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.4, 149.8, 143.3, 142.6, 141.4, 140.6, 139.5, 138.4, 136.8, 133.9, 133.5, 132.2, 130.0, 128.7, 128.6, 128.4, 128.3, 128.2, 127.6, 127.4, 127.3, 127.1, 126.7, 125.8, 125.7, 125.5, 125.4, 124.5, 122.1, 121.5, 121.0, 110.1, 110.0, 103.3, 28.8.

HRMS: (ESI) m/z calcd for $C_{38}H_{28}N_2$, 513.2325 $[M+H]^+$; found 513.2311.

2-(3,3-diphenylallyl)-5-methoxy-1-(pyridin-2-yl)-1*H*-indole (3h):



Yield: 82%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

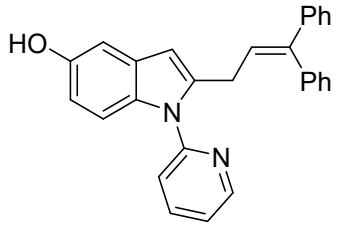
IR (ν_{max}, cm^{-1}): 2989, 1733, 1633, 1652, 1447, 1265, 754.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.52 (dd, J = 4.9, 1.9 Hz, 1H), 7.77 (t, J = 8.1 Hz, 1H), 7.35-7.20 (m, 10H), 7.19–7.10 (m, 4H), 7.05 (d, J = 2.4 Hz, 1H), 6.78 (dd, J = 8.8, 2.6 Hz, 1H), 6.47 (s, 1H), 6.15 (t, J = 7.5 Hz, 1H), 3.85 (s, 3H), 3.69 (d, J = 7.3 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 154.9, 151.4, 149.6, 143.1, 142.6, 140.4, 139.4, 138.3, 132.5, 129.6, 129.2, 128.2, 127.6, 127.3, 127.2, 125.5, 121.8, 120.6, 111.5, 111.2, 103.1, 102.2, 55.9, 28.8.

HRMS: (ESI) m/z calcd for $C_{29}H_{24}N_2O$, 417.1961 $[M+H]^+$; found 417.1952

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-indol-5-ol (3i):



Yield: 32%; yellow semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

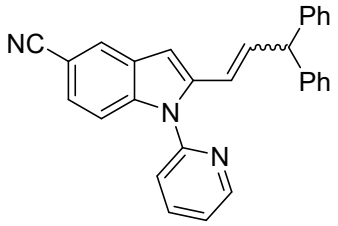
IR (ν_{max}, cm^{-1}): 3220, 2998, 2475, 1668, 1497, 756.

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.54 (d, J = 4.8, Hz, 1H), 8.19 (d, J = 3.6 Hz, 1H), 7.79 (dt, J = 7.9, 1.8 Hz, 1H), 7.62 (t, J = 8.6 Hz, 1H), 7.36–7.30 (m, 6H), 7.27–7.20 (m, 7H), 7.16–7.10 (m, 4H), 6.95–6.91 (m, 3H), 6.84 (d, J = 8.4 Hz, 1H), 6.86 (s, 1H), 6.14 (t, J = 6.7 Hz, 1H), 3.69 (d, J = 7.2 Hz, 2H).

$^{3}C\{^{1}H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 165.1, 151.3, 149.8, 147.9, 143.4, 142.6, 141.1, 139.2, 138.4, 135.0, 129.9, 129.4, 128.3, 128.2, 127.6, 127.3, 127.2, 125.3, 122.1, 120.9, 117.9, 116.2, 112.3, 111.2, 4, 28.8.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{23}N_2O$, 403.1805 $[M+H]^+$; found 403.1802.

(*E*) and (*Z*)-2-(3,3-Diphenylprop-1-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole-5-carbonitrile (3j):



Yield: 48% E/Z isomer (1.2 : 1) ratio pale pink semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

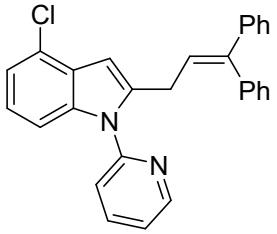
IR (ν_{max}, cm^{-1}): 3046, 2652, 1743, 1476, 1287, 790.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.11 (d, J = 4.8 Hz, 1H), 7.82 (d, J = 4.8 Hz, 0.8H), 7.79 (s, 1H), 7.64 (s, 0.8H), 7.31-7.21 (m, 6H), 7.20-7.11 (m, 10H), 7.08-6.94 (m, 10H), 6.92-6.87 (m, 2.7H), 6.65 (d, J = 7.3 Hz, 2H), 6.34 (s, 1H), 6.32 (s, 0.6H), 6.17 (s, 0.8H), 6.14 (d, J = 8.5 Hz, 1.6H), 6.03 (d, J = 10 Hz, 0.8H), 4.48-4.41 (m, 1.8H),

$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 149.7, 149.5, 149.4, 149.2, 143.7, 143.6, 142.9, 142.6, 142.3, 142.2, 139.5, 139.2, 138.7, 138.4, 137.9, 137.8, 130.1, 129.9, 128.4, 128.3, 128.2, 128.1, 128.0, 127.6, 127.5, 127.4, 127.3, 127.0, 125.5, 125.4, 125.1, 124.9, 122.5, 12.4, 120.9, 120.6, 111.8, 111.6, 104.0, 103.9, 103.7, 103.7, 103.4, 43.3, 42.4.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{23}N_2O$, 403.1808 $[M+H]^+$; found 403.1800.

4-Chloro-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3k):



Yield: 71%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

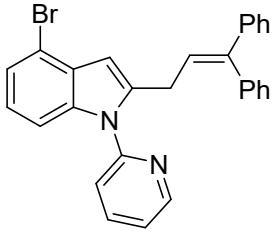
IR (ν_{max}, cm^{-1}): 2922, 1749, 1589, 1478, 1451, 1138, 742.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (s, 1H), 7.79 (d, J = 3.9 Hz, 1H), 7.61-7.40 (m, 2H), 7.33-7.26 (m, 5H), 7.24–7.20 (m, 3H), 7.16-7.08 (m, 5H), 6.95 (s, 1H), 6.48 (s, 1H), 6.13 (d, J = 7.0 1H), 3.65 (s, 2H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 149.9, 143.6, 142.5, 140.8, 139.5, 138.6, 137.9, 129.9, 129.8, 128.3, 128.7, 128.2, 127.9, 127.6, 127.4, 127.3, 127.1, 125.1, 122.5, 121.4, 121.4, 121.0, 120.9, 110.6, 103.1, 28.7.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}ClN_2$, 421.1466 $[M+H]^+$; found 421.1442.

4-Bromo-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3l):



Yield: 80%; Yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

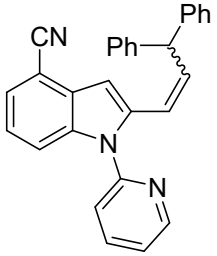
IR (ν_{max}, cm^{-1}): 2988, 1733, 1589, 1441, 1276, 752.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.49 (dd, J = 4.8, 1.5 Hz, 1H), 7.73 (dt, J = 9.2, 3.3 Hz, 1H) 7.41 (s, 1H), 7.36 (dd, J = 8.0, 1.8 Hz, 1H), 7.28–7.20 (m, 6H), 7.19-7.14 (m, 5H), 7.09-7.02 (m, 4H), 6.43 (s, 1H), 6.05 (dt, J = 8.8, 1.8 Hz, 1H), 3.58 (d, J = 7.0, 2H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 150.8, 149.9, 143.6, 142.5, 140.7, 139.4, 138.7, 138.3, 129.9, 128.3, 128.2, 127.6, 127.4, 127.3, 124.9, 124.0, 122.5, 121.3, 121.0, 115.5, 113.4, 121.4, 103.1, 28.6.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}BrN_2$, 465.0961 $[M+H]^+$; found 467.0932.

(*E*) and (*Z*)-2-(3,3-diphenylprop-1-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole-4-carbonitrile (3m):



Yield: 71%; Mixture of E/Z (2:1) ratio, Yellow semi solid; *Rf*= 0.5 in 3:7 EtOAc/Hexane.

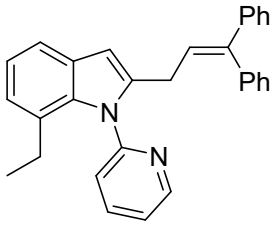
Spectra Z-isomer: IR (ν_{max}, cm^{-1}): 2988, 1733, 1589, 1441, 1276, 752.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.49 (s, 1H), 7.36-7.29 (m, 4H) 7.21-6.97 (m, 13H), 6.19-6.06 (m, 2H), 6.06 (d, J = 5.0 Hz, 1H), 4.52 (d, J = 6.5 Hz, 1H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 149.1, 148.9, 144.6, 142.8, 142.1, 139.5, 137.7, 136.6, 130.2, 129.9, 128.7, 128.5, 128.3, 127.6, 127.5, 125.7, 122.5, 121.5, 120.7, 118.7, 115.9, 102.1, 100.9, 44.0.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}N_3$, 412.1808 $[M+H]^+$; found 412.1798.

2-(3,3-Diphenylallyl)-7-ethyl-1-(pyridin-2-yl)-1*H*-indole (3n):



Yield: 66%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

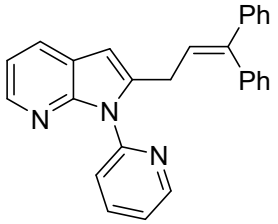
IR (ν_{max}, cm^{-1}): 3055, 2984, 1730, 1655, 1468, 1265, 753.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.47 (dd, J = 4.8, 1.3 Hz, 1H), 7.63 (dt, J = 8.2, 1.9 Hz, 1H), 7.36 (d, J = 7.7 Hz 1H), 7.24–7.18 (m, 5H), 7.17–7.12 (m, 4H), 7.11–7.09 (m, 2H), 7.01-6.98 (m, 3H), 6.87 (d, J = 7.2 Hz, 1H), 6.42 (s, 1H), 6.08 (t, J = 6.9, 1H), 3.25 (d, J = 7.3 Hz, 2H), 2.09-2.04 (m, 2H), 0.84 (t, J = 8.6 Hz, 3H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 153.3, 149.3, 143.1, 142.5, 140.8, 139.3, 137.8, 136.2, 129.9, 128.2, 127.6, 127.8, 127.2, 125.2, 124.0, 123.3, 122.3, 120.7, 118.0, 102.5, 28.4, 24.9, 14.6.

HRMS: (ESI) *m*/*z* calcd for $C_{30}H_{26}N_2$, 415.2169 $[M+H]^+$; found 415.2170.

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-pyrrolo[2,3-b]pyridine(3o):



Yield: 81%; yellow semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

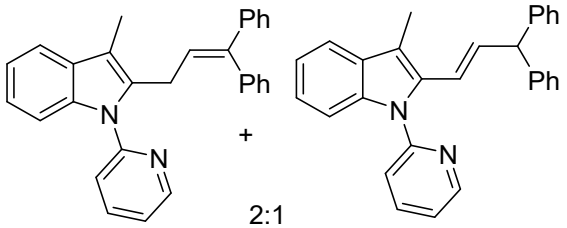
IR (ν_{max}, cm^{-1}): 2987, 1734, 1470, 1262, 752.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.53 (dd, J = 5.6, 1.8 Hz, 1H), 7.78 (dt, J = 8.5, 2.0 Hz, 1H), 7.68 (t, J = 1,4 Hz 1H), 7.35–7.31 (m, 2H), 7.31–7.29 (m, 2H), 7.28–7.23 (m, 5H), 7.23-7.21 (m, 2H), 7.20-7.19 (m, 2H), 6.46 (s, 1H), 6.12 (t, J = 6.1, 1H), 3.66 (dd, J = 7.4, 0.6 Hz, 2H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 150.9, 149.8, 142.4, 141.3, 139.4, 138.6, 136.2, 129.9, 128.6, 128.3, 128.2, 127.8, 127.8, 127.6, 122.6, 122.4, 120.9, 116.4, 113.9, 111.8, 102.6, 28.6.

HRMS: (ESI) *m*/*z* calcd for $C_{27}H_{21}N_3$, 388.1808 $[M+H]^+$; found 388.1805.

Mixture of 2-(3,3-Diphenylallyl)-3-methyl-1-(pyridin-2-yl)-1H-indole and (E)-2-(3,3-Diphenylprop-1-en-1-yl)-3-methyl-1-(pyridin-2-yl)-1*H*-indole (3p):



Yield: 52%; 2 : 1 ratio of allylated and vinylate proucts; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

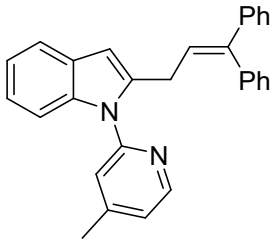
IR (ν_{max}, cm^{-1}): 2985, 1730, 1486, 1269, 750.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.58 (dd, *J* = 5.2, 1.8 Hz, 1H), 8.40 (dd, *J* = 4.7, 1.8 Hz, 0.3H), 7.69 (dt, *J* = 7.7, 1.9 Hz 1H), 7.59–7.46 (m, 3H), 7.35–7.25 (m, 6H), 7.23–7.14 (m, 14H), 7.11-7.00 (m, 3H), 6.95-6.89 (m, 1H), 6.34 (d, *J* = 16.1 Hz 1H), 6.24-6.20 (m, 1H), 6.18 (d, *J* = 7.7 Hz, 0.3H), 5.96 (t, *J* = 7.9 Hz, 0.3H), 4.85 (d, *J* = 7.3 Hz, 1H), 4.08-3.97 (m, 0.3H), 2.42 (s, 3H), 2.22 (s, 1H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 152.1, 151.8, 149.5, 149.4, 138.0, 137.9, 137.3, 137.2, 136.5, 133.1, 130.0, 129.8, 129.6, 128.7, 128.5, 128.3, 128.1, 127.4, 127.3, 127.2, 127.1, 127.0, 126.9, 126.5, 123.2, 122.2, 122.1, 121.6, 121.5, 121.4, 120.7, 120.1, 118.8, 118.1, 112.9, 110.8, 110.2, 54.9, 35.8, 10.1.

HRMS: (ESI) *m*/*z* calcd for $C_{29}H_{25}N_2$, 401.1012 $[M+H]^+$; found 401.2010.

2-(3,3-Diphenylallyl)-1-(4-methylpyridin-2-yl)-1*H*-indole (3q):



Yield: 64%; yellow semi liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

IR (ν_{max}, cm^{-1}): 3056, 1695, 1654, 1276, 1177, 702.

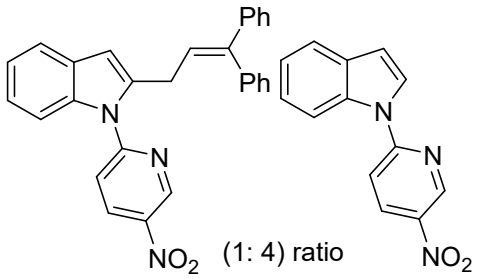
^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.38 (d, *J* = 5.0 Hz, 1H), 7.56 (dt, *J* = 5.0, 3.1 Hz, 1H), 7.38-7.27 (m, 4H), 7.24-7.20 (m, 3H), 7.16–7.10 (m, 7H), 7.05 (d, *J* = 5.0, 1H), 6.51 (s, 1H), 6.15 (t, *J* = 7.7 Hz, 1H), 3.68 (d, *J* = 7.4 Hz, 2H), 2.36 (s, 3H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 151.4, 149.8, 149.3, 143.1, 142.6, 139.9, 139.5, 137.6, 129.9, 128.6, 128.2, 128.1, 127.6, 127.2, 125.6, 123.3, 121.9, 121.8, 120.6, 120.1, 110.3, 102.9, 28.6, 21.1

HRMS: (ESI) *m*/*z* calcd for $C_{29}H_{24}N_2$, 401.2012 $[M+H]^+$; found 401.2001.

.

2-(3,3-Diphenylallyl)-1-(5-nitropyridin-2-yl)-1*H*-indole and 1-(5-Nitropyridin-2-yl)-1*H*-indole (3r):



Yield: 30%; Mixture of compounds (1:3) ratio; yellow solid; *Rf*= 0.5 in 3:7 EtOAc/Hexane.

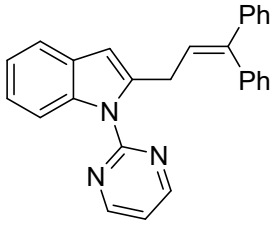
IR (ν_{max}, cm^{-1}): 3020, 1753, 1456, 1492, 760.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 9.37 (d, J = 2.7 Hz, 1H), 9.19 (d, J = 2.7 Hz, 0.3H), 8.54 (dt, J = 9.0, 2.9 Hz 0.3H), 8.49 (dd, J = 8.8, 2.7 Hz 0.3H), 7.74 (d, J = 7.7 Hz, 1H), 7.65 (d, J = 7.6 Hz, 1H), 7.59 (dd, J = 6.6, 1.0 Hz, 2H), 7.55 (d, J = 9.0 Hz, 0.3H), 7.51–7.48 (m, 0.8H), 7.39–7.31 (m, 4H), 7.28 (dt, J = 6.6, 1.0 Hz, 2H), 7.24-7.19 (m, 2H), 7.13-7.08 (m, 1.4H), 6.80 (d, J = 3.5 Hz 1H), 6.62 (s, 1H), 6.10 (t, J = 7.1 Hz, 0.3H), 3.83 (d, J = 7.3 Hz, 0.6H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 155.9, 155.4, 145.6, 143.6, 142.4, 141.5, 140.3, 140.1, 139.2, 136.9, 135.4, 133.8, 133.5, 131.2, 129.9, 128.8, 128.7, 128.3, 128.2, 127.7, 127.6, 127.5, 125.3, 125.1, 124.5, 123.1, 123.0, 122.2, 121.6, 120.7, 119.1, 114.8, 112.2, 110.5, 109.1, 106.1, 110.2, 29.1.

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{22}N_3O_2$, 432.1702 $[M+H]^+$; found 432.1704.

2-(3,3-Diphenylallyl)-1-(pyrimidin-2-yl)-1*H*-indole (3s):



Yield: 90%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

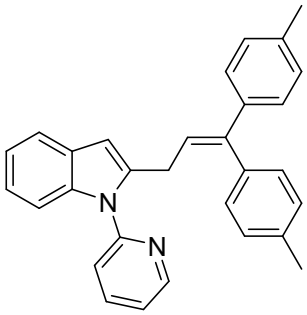
IR (ν_{max}, cm^{-1}): 3020, 2987, 1563, 1427, 1208, 755.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.65 (d, J = 4.8, Hz, 2H), 8.25 (d, J = 8.4 Hz, 1H), 7.53 (d, J = 7.5 Hz, 1H), 7.36-7.32 (m, 2H), 7.30–7.29 (m, 1H), 7.24–7.21 (m, 4H), 7.20–7.17 (m, 5H), 7.04 (t, J = 5.0 Hz, 1H), 6.55 (s, 1H), 6.24 (t, J = 7.5 Hz, 1H), 4.03 (d, J = 7.0 Hz, 2H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 158.2, 143.1, 142.9, 140.6, 139.8, 137.2, 130.0, 129.4, 128.3, 128.2, 127.7, 127.3, 127.2, 126.3, 122.8, 121.2, 117.1, 113.3, 106.5, 53.6, 30.7

HRMS: (ESI) *m*/*z* calcd for $C_{27}H_{21}N_3$, 388.1808 $[M+H]^+$; found 388.1811.

2-(3,3-Di-p-tolylallyl)-1-(pyridin-2-yl)-1*H*-indole (3t):



Yield: 95%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

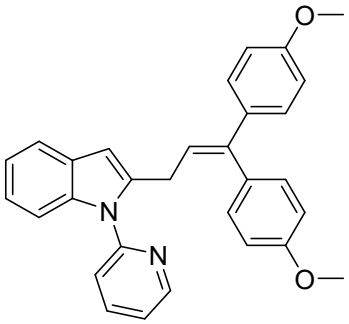
IR (ν_{max}, cm^{-1}): 2988, 2921, 1733, 1587, 1468, 1266, 755.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (dd, J = 4.5, 1.0 Hz, 1H), 7.75 (dt, J = 8.4, 1.6 Hz, 1H), 7.57 (d, J = 7.6 Hz, 1H), 7.38–7.20 (m, 4H), 7.16–7.09 (m, 4H), 7.06–6.99 (m, 4H), 6.52 (s, 1H), 6.07 (t, J = 7.3 Hz, 1H), 3.69 (d, J = 7.3 Hz, 2H), 2.35 (s, 3H), 2.30 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.4, 149.7, 142.9, 140.2, 140.0, 138.3, 137.5, 136.9, 136.8, 136.6, 129.8, 128.9, 128.8, 127.8, 127.5, 124.4, 121.9, 121.9, 120.9, 120.7, 120.1, 116.4, 110.3, 103.1, 28.7, 21.3, 21.1

HRMS: (ESI) *m*/*z* calcd for $C_{30}H_{26}N_2$, 415.2169 $[M+H]^+$; found 415.2165.

2-(3,3-Bis(4-methoxyphenyl)allyl)-1-(pyridin-2-yl)-1*H*-indole (3u):



Yield: 80%; yellow semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

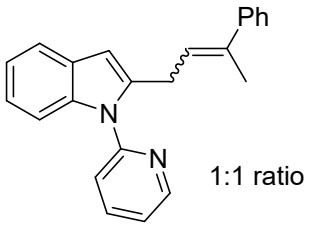
IR (ν_{max}, cm^{-1}): 3007, 2681, 1691, 1464, 1272, 756.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.57 (d, J = 4.8, Hz, 0.3H), 8.54 (dd, J = 4.9, 1.0 Hz, 1H), 8.21 (d, J = 8.4 Hz, 1H), 7.94 (d, J = 8.0 Hz, 0.3H), 7.80-7.76 (m, 1.7H), 7.55–7.53 (m, 2H), 7.47–7.45 (m, 1.3H), 7.30-7.10 (m, 12H), 7.25 (d, J = 8.3 Hz, 0.5H), 6.91 (d, J = 8.0 Hz, 2.3H), 6.82-6.77 (m, 3.6H), 6.26 (t, J = 7.5 Hz, 1H), 3.88 (s, 0.7H), 3.83 (s, 3H), 3.78 (s, 3H), 3.76 (s, 1.5H), 3.61 (d, J = 7.0 Hz, 2H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 152.7, 149.2, 149.0, 143.6, 141.7, 140.7, 138.4, 138.3, 135.8, 135.6, 132.5, 132.3, 131.2, 131.1, 130.6, 130.3, 129.4, 128.9, 128.7, 128.2, 125.2, 123.4, `123.1, 121.3, 121.0, 120.3, 119.7, 119.4, 119.0, 116.4, 114.3, 113.7, 113.5, 113.4, 113.3, 113.2, 112.8, 55.6, 55.5, 55.4, 55.3, 47.8, 27.7, 26.1

HRMS: (ESI) *m*/*z* calcd for $C_{30}H_{26}N_2O_2$, 447.2067 $[M+H]^+$; found 447.2067.

(Z)-2-(3-Phenylbut-2-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole and (E)-2-(3-Phenylbut-2-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole(3v):



Yield: 96%; (1:1) ratio; yellow semi solid; *Rf*= 0.4 in 1:9 EtOAc/Hexane.

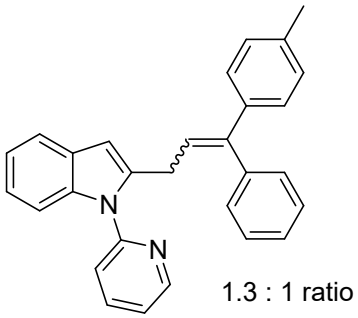
IR (ν_{max}, cm^{-1}): 2994, 2350, 1458, 1268, 775, 735.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.66 (dd, J = 8.3, 1.6 Hz, 1H), 8.52 (dd, J = 4.3, 1.8 Hz, 0.8H), 7.86 (dt, J = 7.8, 2 Hz, 1H), 7.76 (dt, J = 7.8, 2 Hz, 1H), 7.60-7.55 (m, 1.9H), 7.46 (d, J = 7.9 Hz, 1H), 7.36-7.18 (m, 14H), 7.17-7.09 (m, 6H), 6.52–6.47 (m, 1.9H), 5.83 (t, J = 7.8 Hz, 1H), 5.61(t, J = 7.9 Hz, 1H), 3.79 (d, J = 7.1 Hz, 2H), 3.52 (d, J = 7.5 Hz, 2H), 2.03 (s, 2.5H), 1.97 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.6, 149.8, 149.6, 143.6, 141.3, 140.5, 139.9, 138.3, 138.2, 137.5, 137.4, 136.7, 128.6, 128.3, 128.2, 128.2, 127.9, 126.9, 125.8, 124.3, 123.3, 121.1, 121.9, `121.8, 121.2, 121.1, 120.8, 120.7, 120.1, 120.0, 110.3, 110.1, 102.9, 102.8, 27.9, 27.6, 25.5, 16.0

HRMS: (ESI) *m*/*z* calcd for $C_{23}H_{20}N_2$, 325.1699 $[M+H]^+$; found 325.1704.

(E)-2-(3-phenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole and (Z)-2-(3-phenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole (3w):



Yield: 78%; mixture of (E/Z) isomers (1.3:1) ratio; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

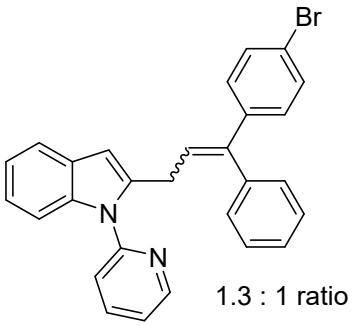
IR (ν_{max}, cm^{-1}): 2988, 2694, 1696, 1469, 1264, 756.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.47-8.44 (m, 1.4H), 7.75-7.68 (m, 2H), 7.53-7.48 (m, 1.5H), 7.32-7.10 (m, 14H), 7.09-7.02 (m, 9H), 6.97–6.93 (m, 4H), 6.45 (s, 1.5H), 6.04 (dt, J = 7.0, 1.3 Hz, 1.5H), 3.64-3.60 (m, 3H), 2.28 (s, 2H), 2.23 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 149.8, 143.2, 143.0, 142.9, 140.1, 139.7, 138.4, 138.3, 137.5, 136.5, 129.9, 129.8, 128.9, 128.6, 128.2, 127.9, 127.8, 127.6, 127.5, 127.2, 127.1, 125.2, `124.6, 122.0, 121.9, 121.8, 121.2, 121.0, 120.8, 120.3, 120.1, 119.5, 110.3, 103.2, 103.1, 28.7, 28.6, 21.3, 21.1

HRMS: (ESI) *m*/*z* calcd for $C_{29}H_{24}N_2$, 401.1939 $[M+H]^+$; found 401.2012.

(E)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1*H*-indole and (Z)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1*H*-indole(3x):



1.3 : 1 ratio

Yield: 73%; mixture of (E/Z) isomers (1.3:1) ratio; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

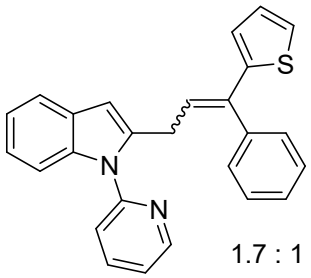
IR (ν_{max}, cm^{-1}): 3057, 2956, 1736, 1557, 1469, 1368, 1141, 698.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54-8.51 (m, 1.3H), 7.83-7.76 (m, 1.5H), 7.61-7.55 (m, 1.5H), 7.46-7.42 (d, J = 7.6 Hz, 1.5H), 7.37-7.29 (m, 6H), 7.28–7.21 (m, 5H), 7.16–7.07 (m, 7H), 7.02-6.97 (m, 2.5H), 6.55-6.51 (m, 1.3H), 6.21-6.11 (m, 1.5H), 3.70-3.67 (m, 2.5H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.3, 149.8, 142.2, 142.0, 141.6, 139.6, 138.9, 138.4, 137.5, 131.7, 131.5, 131.3, 130.1, 129.9, 128.6, 128.4, 128.3, 128.2, 127.6, 127.5, 127.4, 127.3, `127.2, 126.2, 126.0, 122.1, 121.4, 121.1, 120.9, 120.2, 110.3, 103.3, 29.8, 28.7

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21}BrN_2$, 401.1939 $[M+H]^+$; found 467.0940.

(E)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1*H*-indole and (Z)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1*H*-indole(3y):



1.7 : 1 ratio

Yield: 51%; mixture of (E/Z) isomers (1.7:1) ratio; white semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

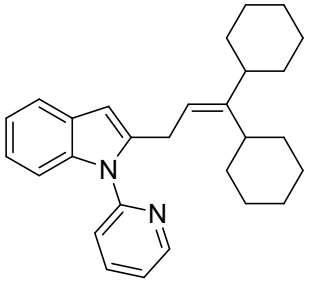
IR (ν_{max}, cm^{-1}): 3057, 2956, 1736, 1557, 1469, 1368, 1141, 698.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.56 (dd, J = 4.8, 1.9 Hz, 0.5H), 8.54 (dd, J = 4.9, 1.9 Hz, 1H), 7.81 (dt, J = 7.7, 1.6 Hz, 1.5H), 7.58 (dt, J = 4.4, 1.6 Hz, 1.6H), 7.39 (d, J = 7.9 Hz, 0.7H), 7.37-7.29 (m, 7H), 7.29-7.25 (m, 2H), 7.23-7.18 (m, 3.5H), 7.00 (dd, J = 5.1, 3.5 Hz, 0.5H), 6.91 (dd, J = 4.0, 1.1 Hz, 0.5H), 6.87 (dd, J = 4.7, 3.5 Hz, 1H), 6.57 (dd, J = 3.5, 1.2 Hz, 1H), 6.54 (s, 0.7H), 6.52 (d, J = 0.8 Hz, 1H), 6.23 (t, J = 7.3 Hz, 1H), 6.03 (t, J = 6.5 Hz, 0.5H), 3.91 (d, J = 7.4 Hz, 0.5H), 3.60 (d, J = 7.3 Hz, 2H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 138.4, 137.5, 137.2, 136.3, 129.7, 129.6, 128.7, 128.6, 128.4, 128.3, 128.2, 128.1, 128.0, 129.9, 127.8, 127.7, 127.6, 127.5, 127.3, 126.8, 126.4, 125.9, `125.5, 124.4, 124.2, 123.7, 122.1, 122.0, 121.9, 121.1, 120.9, 120.8, 120.7, 120.4, 120.1, 110.3, 103.3, 103.2, 29.0, 28.2.

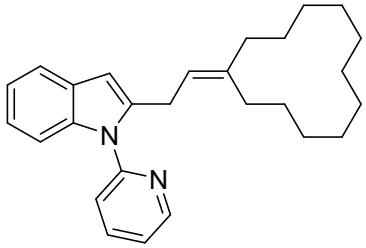
HRMS: (ESI) *m*/*z* calcd for $C_{26}H_{20}SN_2$, 393.1420 $[M+H]^+$; found 393.1419.

2-(3,3-Dicyclohexylallyl)-1-(pyridin-2-yl)-1*H*-indole (3z):



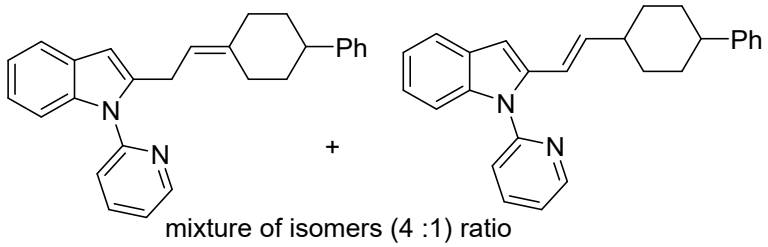
Yield: 74%; yellow liquid; R_f= 0.50 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 3020, 2945, 1550, 1455, 1280, 750.
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.55 (d, J = 4.7 Hz, 1H), 7.64 (t, J = 7.8 Hz, 1H), 7.49 (d, J = 8.4 Hz, 2H), 7.13-7.10 (m, 2H), 7.05(t, J = 4.4 Hz, 2H), 6.46 (s, 1H), 5.44 (t, J = 7.7 Hz, 1H), 2.06-1.97 (m, 5H), 1.32-1.09 (m, 12H), 0.84-0.75 (m, 5H), 0.75-0.69 (m, 4H),
$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.8, 149.1, 142.7, 137.8, 133.7, 132.2, 128.6, 127.5, 122.5, 121.5, 121.4, 121.0, 120.2, 111.3, 104.4, 31.7, 31.0, 30.3, 27.9, 22.7, 22.4, 14.0, 13.9,
HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{34}N_2$, 399.2795 $[M+H]^+$; found 399.2802.

2-(2-Cyclododecylideneethyl)-1-(pyridin-2-yl)-1*H*-indole (3aa):



Yield: 40%; yellow liquid; R_f= 0.50 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 3020, 2945, 1550, 1455, 1280, 750.
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (d, J = 4.6 Hz, 1H), 8.22 (d, J = 8.2 Hz, 2H), 7.78 (t, J = 8.4 Hz, 1H), 7.62 (d, J = 7.8 Hz, 1H), 7.48(s, 1H), 7.45 (d, J = 8.1 Hz, 1H), 7.30 (d, J = 6.9 Hz, 1H), 7.20 (t, J = 8.1 Hz, 1H), 7.11 (t, J = 6.6 Hz, 1H), 5.55 (t, J = 7.8 Hz, 1H), 3.54 (d, J = 6.9 Hz, 2H), 2.23 (t, J = 7.1 Hz, 2H), 2.12 (t, J = 6.6 Hz, 2H), 1.40-1.36 (m, 9H), 1.35-1.33 (m, 6H),
$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.6, 149.1, 138.5, 135.2, 130.5, 126.1, 123.2, 121.3, 121.2, 120.2, 119.5, 114.7, 113.1, 105.6, 32.0, 28.8, 25.1, 24.8, 24.5, 24.4, 24.3, 24.2, 23.9, 23.6, 23.3, 22.4.
HRMS: (ESI) *m*/*z* calcd for $C_{27}H_{34}N_2$, 387.2795 $[M+H]^+$; found 387.2808.

2-(2-(4-Phenylcyclohexylidene)ethyl)-1-(pyridin-2-yl)-1*H*-indole and (E)-2-(2-(4-Phenylcyclohexyl)vinyl)-1-(pyridin-2-yl)-1*H*-indole (3ab):



mixture of isomers (4 :1) ratio

Yield: 64%; yellow liquid; R_f= 0.50 in 1:9 EtOAc/Hexane.

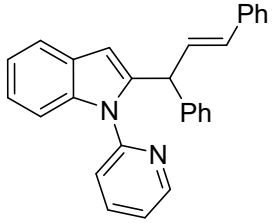
IR (ν_{max}, cm^{-1}): 3020, 2945, 1550, 1455, 1280, 750.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.59 (d, J = 4.4 Hz, 0.25H), 8.56 (d, J = 4.7 Hz, 1H), 7.76 (t, J = 7.5 Hz, 1H), 7.48 (d, J = 4.9 Hz, 1.3H), 7.40-7.33 (m, 1.5H), 7.29-7.16 (m, 5.5H), 7.15-7.01 (m, 8H), 6.75 (d, J = 14.5 Hz, 0.25H), 6.74 (d, J = 16.0 Hz, 0.25H), 6.38 (s, 1H), 6.31 (s, 0.25H), 5.18 (t, J = 8.0 Hz, 1H), 3.61-3.44 (m, 2H), 2.55 (t, J = 15 Hz, 2H), 2.22-2.00 (m, 2.5H), 1.89-1.65 (m, 4H), 1.40-1.17 (m, 2.4H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.6, 151.5, 149.7, 149.6, 149.1, 146.9, 146.7, 140.8, 140.2, 138.3, 137.5, 137.2, 135.7, 134.1, 130.6, 128.7, 128.5, 128.4, 127.0, 126.9, 126.2, 126.0, 125.9, 122.6, 122.0, 121.7, 121.6, 121.3, 120.7, 120.3, 120.1, 119.7, 118.2, 115.2, 110.8, 102.7, 101.5, 44.7, 40.2, 36.8, 35.8, 35.0, 34.4, 33.9, 30.7, 29.6, 29.4, 28.4, 26.1, 24.9.

HRMS: (ESI) *m*/*z* calcd for $C_{27}H_{26}N_2$, 378.5190 $[M+H]^+$; found 376.2175.

(E)-3-(1,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ac):



Yield: 92%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

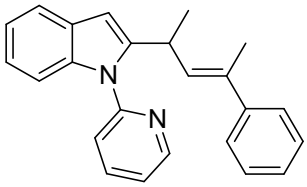
IR (ν_{max}, cm^{-1}): 3045, 2656, 1656, 1445, 1254, 756.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.44 (d, J = 4.6 Hz, 1H), 8.10 (d, J = 8.4 Hz, 1H), 7.67 (t, J = 8.0 Hz, 1H), 7.40-7.33 (m, 3H), 7.31-7.28 (m, 3H), 7.25–7.11 (m, 8H), 7.02 (t, J = 7.6 Hz, 2H), 6.67 (dd, J = 15.8, 7.4 Hz, 1H), 6.39 (d, J = 15.8 Hz, 1H), 5.07 (d, J = 7.2 Hz, 1H).

$^{13}C\{1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.5, 149.0, 142.8, 138.4, 137.4, 135.9, 132.0, 131.1, 129.6, 128.7, 128.6, 128.6, 127.4, 126.6, 124.4, 123.4, 121.5, 121.1, 120.3, 119.9, 114.6, 113.1, 46.2

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{23}N_2$, 387.1856 $[M+H]^+$; found 387.1858.

(E)-2-(4-phenylpent-3-en-2-yl)-1-(pyridin-2-yl)-1*H*-indole (3ad):



Yield: 30%; yellow semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

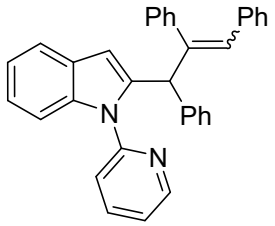
IR (ν_{max}, cm^{-1}): 2988, 2921, 1733, 1587, 1468, 1266, 755.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (dd, *J* = 4.4, 1.0 Hz, 1H), 8.17 (d, *J* = 8.4 Hz, 1H), 7.79 (dt, *J* = 8.1, 2.0 Hz, 1H), 7.67 (d, *J* = 7.8 Hz, 1H), 7.56 (s, 1H), 7.48 (d, *J* = 7.8 Hz, 1H), 7.41 (d, *J* = 7.2 Hz, 2H), 7.31-7.26 (m, 4H), 7.22–7.17 (m, 2H), 7.12 (dt, *J* = 7.1, 0.7 Hz, 1H), 6.00 (d, *J* = 5.9 Hz, 1H), 4.18-4.12 (m, 1H), 2.21 (d, *J* = 1.2 Hz, 3H), 1.56 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.6, 149.0, 143.8, 138.3, 135.8, 132.8, 133.2, 129.8, 128.2, 126.8, 125.9, 124.3, 123.2, 121.9, 120.9, 119.9, 119.7, 114.5, 113.1, 30.7, 21.1, 16.1.

HRMS: (ESI) *m*/*z* calcd for $C_{24}H_{22}N_2$, 339.1856 $[M+H]^+$; found 339.1863.

1-(Pyridin-2-yl)-2-(1,2,3-triphenylallyl)-1*H*-indole (3ae):



Yield: 51%; yellow semi solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

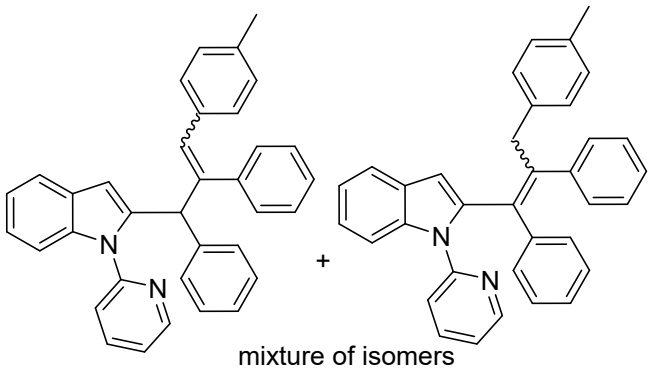
IR (ν_{max}, cm^{-1}): 3020, 2642, 1750, 1446, 1354, 690.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.20 (d, *J* = 2.6 Hz, 1H), 7.52 (d, *J* = 7.9 Hz, 1H), 7.27 (d, *J* = 5.6 Hz, 2H), 7.18-7.08 (m, 6H), 7.03-7.01 (m, 15H), 6.84 (d, *J* = 7.7 Hz, 1H), 5.10 (s, 1H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 150.6, 150.3, 148.7, 141.7, 139.2, 137.1, 129.3, 129.2, 128.6, 128.3, 128.1, 128.0, 127.8, 127.9, 126.9, 126.6, 126.5, 124.3, 121.8, 121.4, 121.3, 120.9, 118.1, 111.9, 52.3

HRMS: (ESI) *m*/*z* calcd for $C_{34}H_{27}N_2$, 463.2169 $[M+H]^+$; found 463.2165.

2-(1,2-Diphenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole and 2-(2,3-Diphenyl-1-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole (3af):



mixture of isomers

Yield: 26%; 2 (1:1) : 1 (2:1) ratio; yellow semi liquid; R_f= 0.50 in 2:8 EtOAc/Hexane.

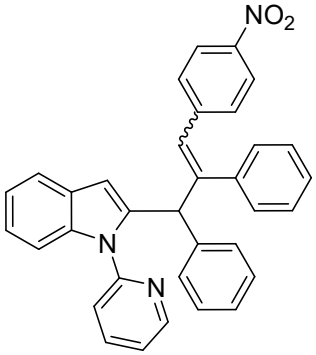
IR (ν_{max}, cm^{-1}): 3010, 2940, 1450, 1355, 1258, 754.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.62 (d, J = 4.9 Hz, 0.6H), 8.49 (d, J = 4.4 Hz, 1H), 8.43 (d, J = 3.8 Hz, 0.3H), 8.28 (d, J = 4.4 Hz, 1H), 7.82 (d, J = 8.1 Hz, 1H), 7.76 (d, J = 8.3 Hz, 1H), 7.66-7.57 (m, 3H), 7.56-7.49 (m, 3H), 7.46-7.39 (m, 2H), 7.38-7.30 (m, 5H), 7.18-6.87 (m, 38H), 6.80 (d, J = 7.8 Hz, 2H), 6.63 (d, J = 7.7 Hz, 1.3H), 6.58 (d, J = 7.6 Hz, 1H), 6.14 (s, 1.3H), 5.78 (s, 0.6H), 5.28 (s, 0.3H), 5.14 (s, 1H), 2.42 (s, 3H), 2.32 (s, 0.6H), 2.27 (s, 0.6H), 2.22 (s, 3H), 2.18 (s, 2H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.0, 151.3, 150.6, .5, 150.4, 149.8, 149.1, 148.7, 145.7, 142.7, 141.8, 141.1, 140.6, 139.8, 138.4, 138.1, 137.4, 137.3, 137.2, 137.1, 136.5, 136.4, 135.9, 135.2, 134.2, 133.9, 133.5, 131.7, 130.7, 130.3, 130.0, 129.6, 129.2, 129.1, 128.8, 128.6, 128.5, 128.2, 127.8, 127.0, 126.9, 126.5, 126.4, 125.9, 124.3, 123.3, 122.3, 122.2, 122.1, 121.8, 121.4, 121.3, 121.2, 121.0, 120.8, 120.6, 120.7, 120.6, 119.9, 118.1, 117.1, 112.4, 111.8, 110.0, 106.6, 54.5, 52.8, 51.9, 21.5, 21.2, 21.1.

HRMS: (ESI) m/z calcd for $C_{35}H_{18}N_2$, 476.2252 $[M+H]^+$; found 476.2255.

2-(3-(4-Nitrophenyl)-1,2-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ag):



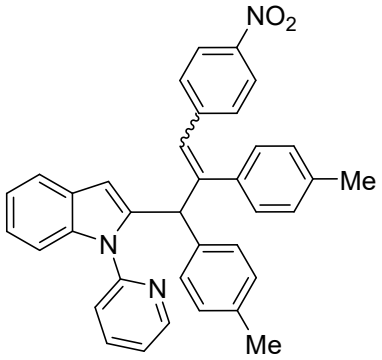
Yield: 30%; (5:3) ratio; yellow liquid; R_f= 0.50 in 9:1 Hexane/Ethyl acetate.

IR (ν_{max}, cm^{-1}): 3006, 2345, 1450, 1230, 900, 750.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.49 (dd, J = 4.8, 1.9 Hz, 1H), 8.27 (d, J = 9.0 Hz, 2H), 7.83 (d, J = 7.1 Hz, 1H), 7.76 (d, J = 8.5 Hz, 2H), 7.65 (dt, J = 8.5, 2.2 Hz, 2H), 7.51(d, J = 9.0 Hz, 2H), 7.21-7.17 (m, 3H), 7.12-7.07 (m, 8H), 7.00-6.98 (m, 2H), 6.97 (m, 4H), 5.48 (s, 1H),

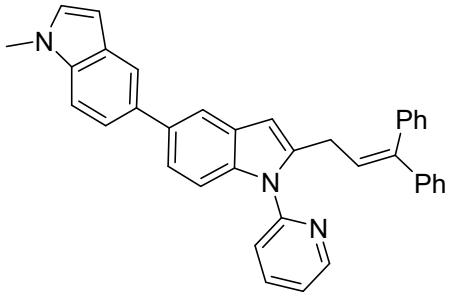
$^{13}C\{^{1}H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 151.0, 150.7, 149.2, 144.2, 143.7, 139.8, 136.2, 135.5, 130.5, 129.4, 129.3, 128.6, 128.4, 128.3, 126.9, 126.8, 123.9, 122.6, 121.6, 121.2, 119.5, 117.1, 112.1, 111.2, 108.6, 55.1.
HRMS: (ESI) *m*/*z* calcd for $C_{34}H_{25}N_3O_2$, 507.2437 $[M+H]^+$; found 507.2437.

2-(3-(4-Nitrophenyl)-1,2-di-p-tolylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ah):



Yield: 28%; yellow liquid; R_f= 0.50 in 9:1 Hexane/Ethyl acetate.
IR (ν_{max}, cm^{-1}): 3006, 2345, 1450, 1230, 900, 750.
^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.51 (dd, *J* = 4.8, 1.8 Hz, 1H), 7.84 (d, *J* = 8.6 Hz, 2H), 7.70 (t, *J* = 7.9 Hz, 2H), 7.61 (dt, *J* = 8.1, 1.7 Hz, 1H), 7.19-7.15 (m, 2H), 7.06-7.02 (m, 8H), 6.93 (s, 1H), 6.88 (s, 1H), 6.63 (d, *J* = 8.6 Hz, 2H), 2.96 (s, 1H), 2.35 (s, 3H), 2.32 (s, 3H),
$^{13}C\{^{1}H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 152.8, 151.8, 149.1, 145.7, 139.7, 139.6, 138.2, 137.8, 137.7, 137.2, 132.9, 130.6, 129.7, 128.3, 126.1, 124.3, 123.4, 123.1, 121.5, 121.1, 120.9, 120.0, 112.9, 111.5, 110.2, 107.0, 27.6, 21.5, 21.3.
HRMS: (ESI) *m*/*z* calcd for $C_{36}H_{29}N_3O_2$, 535.2260 $[M+H]^+$; found 535.257.

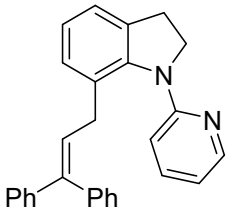
2-(3,3-Diphenylallyl)-1'-methyl-1-(pyridin-2-yl)-1*H*,1'*H*-5,5'-biindole (3ai):



Yield: 92%; white solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 3009, 2694, 1794, 1732, 1586, 1466, 1272, 753.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.54 (d, *J* = 4.5, Hz, 1H), 7.85 (d, *J* = 15.6 Hz, 2H), 7.78 (t, *J* = 8.2 Hz, 1H), 7.53 (d, *J* = 8.5 Hz, 1H), 7.48-7.40 (m, 2H), 7.39–7.28 (m, 5H), 7.28–7.20 (m, 5H), 7.19–7.12 (m, 4H), 7.05 (d, *J* = 2.8, 1H), 6.58 (s, 1H), 6.52 (d, *J* = 2.3 Hz, 1H), 6.18 (t, *J* = 7.7 Hz, 1H), 3.80 (s, 3H), 3.73 (d, *J* = 7.3 Hz, 2H).

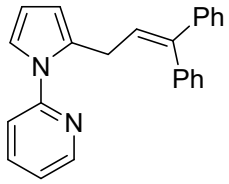
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.4, 149.7, 143.2, 142.6, 140.4, 139.5, 138.3, 136.5, 136.0, 135.8, 135.8, 134.2, 130.0, 129.3, 129.2, 129.0, 128.2, 127.6, 127.3, 127.2, 125.6, 122.2, 121.9, 120.8, 119.5, 118.7, 110.4, 109.3, 103.5, 101.2, 33.0, 28.8.
HRMS: (ESI) *m*/*z* calcd for $C_{37}H_{29}N_{32}$, 516.2434 $[M+H]^+$; found 516.2437.

7-(3,3-Diphenylallyl)-1-(pyridin-2-yl)indoline (3aj):



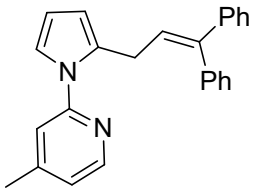
Yield: 33%; yellow liquid; R_f= 0.52 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 3010, 2940, 1490, 1355, 1267, 740.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.24 (d, *J* = 5.1 Hz, 1H), 8.01 (d, *J* = 8.2 Hz, 1H), 7.48 (t, *J* = 8.0 Hz, 1H), 7.31 (t, *J* = 7.5 Hz, 2H), 7.25 (d, *J* = 7.0 Hz, 1H),7.21-7.12 (m, 8H), 6.93 (d, *J* = 4.6 Hz, 1H), 6.66 (t, *J* = 7.8 Hz, 2H), 6.18 (t, *J* = 7.3 Hz, 1H), 3.94 (t, *J* = 8.6 Hz, 2H), 3.34 (d, *J* = 7.7 Hz, 2H), 3.09 (t, *J* = 8.5 Hz, 2H),
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 148.1, 142.7, 142.0, 140.1, 137.3, 133.1, 131.9, 130.1, 130.0, 128.6, 128.4, 128.3, 128.2, 127.5, 127.4, 127.2, 127.0, 124.7, 114.2, 113.3, 108.6, 49.6, 35.5, 27.8.
HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{24}N_2$, 388.1939 $[M]^+$; found 387.1854.

2-(2-(3,3-Diphenylallyl)-1*H*-pyrrol-1-yl)pyridine (6a):



Yield: 82%; yellow liquid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2988, 2701, 1700, 1470, 1272, 705.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.41 (d, *J* = 3.4 Hz, 1H), 8.24 (d, *J* = 4.2 Hz, 0.2H), 7.68 (t, *J* = 7.3 Hz, 1H), 7.59 (t, *J* = 7.3 Hz, 0.3H), 7.37-7.26 (m, 5H), 7.23-7.10 (m, 14H), 7.08-6.99 (m, 3H), 6.25 (s, 1H), 6.19-6.13 (m, 1.5H), 6.10-5.99 (m, 1.4H), 3.68 (d, *J* = 6.8 Hz, 2H), 3.34 (d, *J* = 6.8 Hz, 0.4H),
$^{13}C\{1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 148.9, 142.8, 139.8, 130.0, 128.3, 128.2, 128.1, 127.6, 127.5, 127.4, 127.2, 127.1, 126.8, 121.2, 120.9, 117.4, 109.9, 109.3, 28.8.
HRMS: (ESI) *m*/*z* calcd for $C_{24}H_{21}N_2$, 337.1699 $[M+H]^+$; found 337.1695.

2-(2-(3,3-Diphenylallyl)-1H-pyrrol-1-yl)-4-methylpyridine (6b):



Yield: 66%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

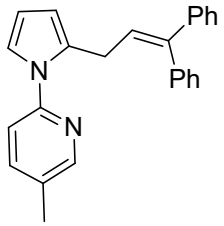
IR (ν_{max}, cm^{-1}): 3009, 2690, 1774, 1462, 1254, 756.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.27 (d, J = 5.1 Hz, 1H), 7.34–7.28 (m, 3H), 7.23–7.19 (m, 3H), 7.16–7.13 (m, 4H), 7.01–6.99 (m, 2H), 6.97 (d, J = 4.5 Hz, 1H), 6.23 (t, J = 3.4 Hz, 1H), 6.16–6.13 (m, 2H), 3.67 (d, J = 7.1 Hz, 2H), 2.33 (s, 3H),

$^{13}C\{1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.9, 149.7, 148.6, 142.3, 139.0, 132.5, 130.1, 128.1, 127.7, 127.2, 127.3, 127.1, 127.0, 122.5, 121.0, 118.5, 109.7, 109.2, 28.7, 21.2.

HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 351.1856 $[M+H]^+$; found 351.1853.

2-(2-(3,3-Diphenylallyl)-1*H*-pyrrol-1-yl)-5-methylpyridine (6c):



Yield: 54%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

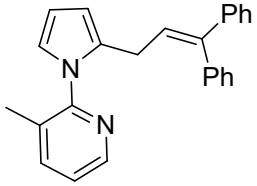
IR (ν_{max}, cm^{-1}): 3007, 2685, 1732, 1518, 1262, 1045, 755.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.27 (d, J = 4.8 Hz, 1H), 7.35–7.26 (m, 4H), 7.24–7.19 (m, 4H), 7.18–7.13 (m, 4H), 7.01–6.99 (m, 2H), 6.97 (d, J = 4.7 Hz, 1H), 6.23 (t, J = 3.4 Hz, 1H), 6.16–6.13 (m, 2H), 3.67 (d, J = 7.2 Hz, 2H), 2.33 (s, 3H),

$^{13}C\{1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.9, 149.7, 148.6, 142.9, 142.3, 139.8, 132.4, 130.0, 128.2, 128.1, 127.6, 127.2, 127.2, 127.1, 122.5, 121.1, 118.4, 109.7, 109.1, 28.7, 21.3.

HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 351.1856 $[M+H]^+$; found 351.1860.

2-(2-(3,3-Diphenylallyl)-1*H*-pyrrol-1-yl)-3-methylpyridine (6d):



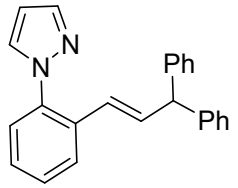
Yield: 48%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

IR (ν_{max}, cm^{-1}): 3006, 1596, 1489, 1360, 1275, 756.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.22 (d, J = 1.6 Hz, 1H), 7.48 (dd, J = 7.9, 2.3 Hz, 1H), 7.35–7.28 (m, 4H), 7.23–7.20 (m, 3H), 7.17–7.13 (m, 5H), 7.17–7.13 (m, 5H), 7.07 (d, J = 8.2 Hz, 1H), 7.00 (t, J = 2.6 Hz, 1H), 6.23 (t, J = 3.4 Hz, 1H), 6.16–6.13 (m, 2H), 3.65 (d, J = 7.4 Hz, 2H), 2.32 (s, 3H),

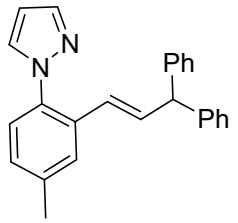
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 150.6, 149.1, 142.3, 139.8, 138.8, 132.3, 130.9, 130.0, 128.2, 128.1, 127.6, 127.1, 126.9, 120.9, 117.3, 109.4, 109.0, 28.8, 17.9.
HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 351.1856 $[M+H]^+$; found 351. 351.1860.

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)phenyl)-1*H*-pyrazole (7a):



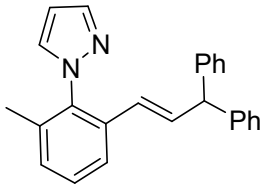
Yield: 67%; yellow liqauid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2942, 2680, 1750, 1575, 1268, 1297, 754.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.66 (d, *J* = 1.8 Hz, 1H), 7.63 (dd, *J* = 7.5, 1.8 Hz, 1H), 7.51 (d, *J* = 2.4 Hz, 1H), 7.39 (dd, *J* = 7.4, 1.8 Hz, 1H), 7.35–7.31 (m, 2H), 7.30–7.26 (m, 4H), 7.24–7.16 (m, 6H) 6.59 (dd, *J* = 16.5, 7.8 Hz, 1H), 6.35 (t, *J* = 2.4 Hz, 1H), 6.18 (d, *J* = 15.6 Hz, 1H), 4.82 (d, *J* = 7.8 Hz, 1H),
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 143.2, 140.6, 138.5, 135.4, 133.0, 131.4, 128.7, 128.4, 128.1, 127.2, 127.0, 126.6, 126.3, 106.4, 54.4.
HRMS: (ESI) *m*/*z* calcd for $C_{24}H_{20}N_2$, 337.1699 $[M+H]^+$; found 337.1694.

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)-4-methylphenyl)-1*H*-pyrazole (7b):



Yield: 47%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2988, 2685, 1732, 1518, 1262, 1045, 755.
^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.64 (d, *J* = 1.6 Hz, 1H), 7.47 (d, *J* = 2.3 Hz, 1H), 7.30–7.25 (m, 5H), 7.22–7.17 (m, 6H), 7.12 (d, *J* = 7.9 Hz, 1H), 6.56 (dd, *J* = 15.9, 7.7 Hz, 1H), 6.34 (t, *J* = 2.3 Hz, 1H), 6.14 (d, *J* = 15.7 Hz, 1H), 4.80 (d, *J* = 7.8 Hz, 1H), 2.38 (s, 3H),
$^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 143.3, 140.4, 138.3, 136.3, 135.0, 132.7, 131.5, 128.8, 128.7, 128.6, 127.3, 127.1, 126.6, 126.3, 106.3, 54.4, 21.3.
HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 337.1699 $[M+H]^+$; found 337.1862.

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)-6-methylphenyl)-1*H*-pyrazole (7c):



Yield: 61%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

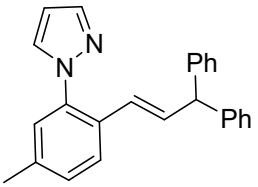
IR (ν_{max}, cm^{-1}): 3007, 2699, 1732, 1456, 1272, 756.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.64 (d, J = 1.8 Hz, 1H), 7.47 (dd, J = 2.4, 0.7 Hz, 1H), 7.43 (d, J = 1.4 Hz, 1H), 7.30–7.26 (m, 5H), 7.21–7.16 (m, 6H), 7.12 (dd, J = 7.9, 1.7 Hz, 1H), 6.56 (dd, J = 16.4, 7.7 Hz, 1H), 6.34 (t, J = 2.4 Hz, 1H), 6.14 (d, J = 15.9 Hz, 1H), 4.80 (d, J = 7.7 Hz, 1H), 2.38 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 143.4, 140.4, 138.3, 136.3, 135.1, 132.7, 131.5, 128.8, 128.5, 128.7, 127.3, 126.6, 126.3, 106.3, 54.4, 21.3.

HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 351.1856 $[M+H]^+$; found 351.1859.

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)-5-methylphenyl)-1*H*-pyrazole (7d):



Yield: 46%; yellow liquid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

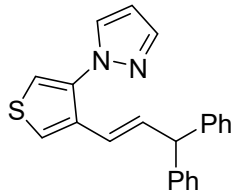
IR (ν_{max}, cm^{-1}): 3005, 2886, 1756, 1245, 1091, 755.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.65 (d, J = 1.6 Hz, 1H), 7.52 (d, J = 8.1 Hz, 1H), 7.49 (d, J = 2.5 Hz, 1H), 7.30–7.26 (m, 4H), 7.23–7.20 (m, 3H), 7.19–7.15 (m, 6H), 6.54 (dd, J = 15.6, 7.5 Hz, 1H), 6.34 (t, J = 2.5 Hz, 1H), 6.15 (d, J = 15.9 Hz, 1H), 4.80 (d, J = 7.7 Hz, 1H), 2.36 (s, 3H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 143.4, 140.5, 138.4, 138.3, 134.5, 131.4, 130.1, 129.9, 129.2, 128.7, 128.6, 128.1, 127.4, 127.0, 126.9, 126.8, 126.6, 106.3, 54.4, 21.1

HRMS: (ESI) *m*/*z* calcd for $C_{25}H_{22}N_2$, 351.1856 $[M+H]^+$; found 351.1853.

(E)-1-(4-(3,3-Diphenylprop-1-en-1-yl)thiophen-3-yl)-1*H*-pyrazole (7e):



Yield: 75%; yellow liquid; R_f= 0.52 in 1:9 EtOAc/Hexane.

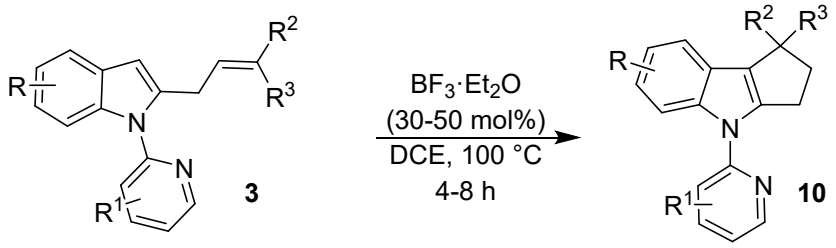
IR (ν_{max}, cm^{-1}): 3016, 2950, 1560, 1459, 1270, 680.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 7.64 (d, J = 2.4 Hz, 1H), 7.54 (d, J = 1.6 Hz, 1H), 7.39 (d, J = 7.1 Hz, 1H), 7.20-7.19 (m, 4H), 7.16-7.13 (m, 2H), 7.05 (t, J = 7.7 Hz, 2H), 6.94 (dd, J = 8.1, 0.8 Hz, 2H), 6.78 (d, J = 3.7 Hz, 1H), 6.55 (dd, J = 3.7, 1.5 Hz, 1H), 6.38 (d, J = 10.3 Hz, 1H), 6.31 (t, J = 2.4 Hz, 1H), 5.06 (dd, J = 10.5 Hz, 1H), 3.64 (d, J = 11.7 Hz, 1H),

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 145.5, 143.8, 143.2, 142.8, 142.2, 141.1, 140.8, 138.7, 129.5, 128.8, 128.6, 128.3, 127.9, 127.8, 127.7, 127.5, 127.4, 126.5, 125.1, 123.9, 122.6, 120.5, 114.1, 107.6, 37.6.

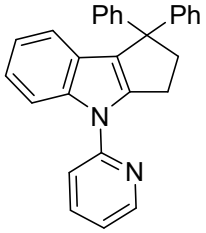
HRMS: (ESI) *m*/*z* calcd for $C_{22}H_{18}N_{2S}$, 342.1191 $[M+H]^+$; found 343.1261.

6. Synthesis of 10:



Reaction tube (15 mL) was charged with allylated indole **3** (0.13 mmol, 1.0 equiv) and dry DCE (2 mL). Subsequently, $BF_3 \cdot Et_2O$ (30 mol%) was added and kept in preheated oil bath at 100 °C. After completion of the reaction (monitored by TLC), the reaction mixture was cooled to room temperature and quenched with $NaHCO_3$ solution, then extracted DCM and washed with water. The collected organic layer was concentrated to get the crude product. The crude product was purified by column chromatography through silica gel to afford the expected product **10** in good yield.

1,1-Diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10a):



Yield: 81%; white solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

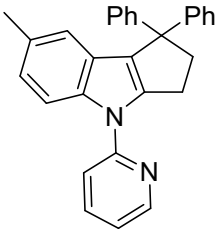
IR (ν_{max}, cm^{-1}): 3050, 2964, 1652, 1475, 1297, 1038, 736.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.47 (d, J = 4.8 Hz, 1H), 7.85 (d, J = 8.2 Hz, 1H), 7.67 (t, J = 8.5 Hz, 1H), 7.34 (d, J = 7.3 Hz, 1H), 7.32–7.27 (m, 4H), 7.24 (d, J = 7.9 Hz, 1H), 7.21–7.13 (m, 4H), 7.12–6.94 (m, 6H), 3.18 (t, J = 7.2 Hz, 2H), 3.09 (t, J = 7.8 Hz, 2H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.1, 149.3, 148.3, 143.8, 140.3, 138.3, 128.9, 127.6, 126.0, 125.6, 121.8, 121.3, 120.4, 119.5, 116.5, 112.8, 57.4, 47.4, 27.0

HRMS: (ESI) *m/z* calcd for $C_{28}H_{22}N_2$, 387.1856 $[M+H]^+$; found 387.1853.

1,1-Diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10b):



Yield: 55%; white solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

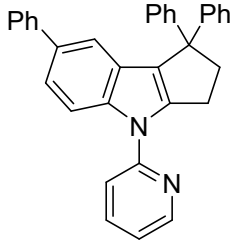
IR (ν_{max}, cm^{-1}): 3007, 1589, 1473, 1284, 1294, 752.

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.59 (dd, J = 4.8, 1.2 Hz, 1H), 7.87-7.82 (m, 2H), 7.48 (d, J = 7.5 Hz, 1H), 7.43 (d, J = 8.1 Hz, 4H), 7.33–7.29 (m, 5H), 7.24-7.18 (m, 3H), 7.14 (s, 1H), 7.02 (d, J = 8.9 Hz, 1H), 3.31 (t, J = 7.7 Hz, 2H), 3.20 (t, J = 7.2 Hz, 2H), 2.40 (s, 3H),

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C): δ 152.3, 149.2, 148.4, 143.9, 138.5, 138.2, 130.6, 128.2, 128.7, 128.2, 128.1, 128.0, 127.2, 125.9, 125.8, 123.2, 120.1, 119.4, 116.2, 112.5, 57.4, 47.5, 27.9, 21.6.

HRMS: (ESI) m/z calcd for $C_{29}H_{24}N_2$, 401.2012 $[M+H]^+$; found 401.2015.

1,1,7-Triphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10c):



Yield: 61%; white solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

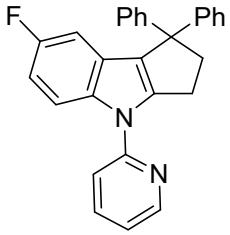
IR (ν_{max}, cm^{-1}): 2924, 1737, 1588, 1452, 701.

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.59 (dd, J = 5.0, 1.6 Hz, 1H), 8.00 (d, J = 8.6 Hz, 1H), 7.83 (dt, J = 8.6, 1.8 Hz, 1H), 7.83 (dt, J = 8.2, 1.8 Hz, 1H), 7.43–7.38 (m, 7H), 7.28–7.25 (m, 4H), 7.21–7.17 (m, 3H), 3.31 (t, J = 7.3 Hz, 2H), 3.20 (t, J = 7.3 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.1, 149.3, 148.3, 144.5, 142.4, 139.8, 138.4, 134.7, 129.1, 128.9, 128.7, 128.3, 127.9, 127.8, 127.5, 126.6, 126.1, 122.2, 121.6, 120.7, 120.5, 117.9, 116.3, 113.2, 57.5, 47.4, 27.9

HRMS: (ESI) m/z calcd for $C_{34}H_{26}N_2$, 463.2169 $[M+H]^+$; found 463.2167.

7-Fluoro-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10d):



Yield: 73%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

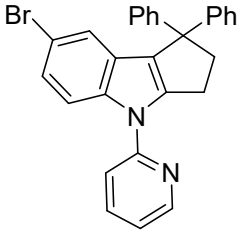
IR (ν_{max}, cm^{-1}): 3020, 2844, 1589, 1470, 1263, 1062, 702.

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.55 (dd, J = 4.9, 1.5 Hz, 1H), 7.93 (dd, J = 8.9, 4.6 Hz, 1H), 7.79 (dt, J = 7.8, 1.8 Hz, 1H), 7.39 (d, J = 8.4 Hz, 1H), 7.39-32 (m, 4H), 7.29-7.24 (m, 4H), 7.20–7.16 (m, 3H), 6.94 (dd, J = 9.3, 2.6 Hz, 1H), 6.88 (dt, J = 9.5, 2.6 Hz, 1H), 3.26 (t, J = 7.3 Hz, 2H), 3.17 (t, J = 7.3 Hz, 2H),

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C): δ 159.5, 157.6, 152.0, 149.2, 147.9, 145.3, 138.4, 136.7, 128.2, 127.8, 126.1, 120.5, 116.1, 113.9, 109.7, 104.6, 57.2, 47.2, 28.0, 27.9

HRMS: (ESI) m/z calcd for $C_{28}H_{21}FN_2$, 405.1762 $[M+H]^+$; found 405.1764.

7-Bromo-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10e):



Yield: 59%; brown solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

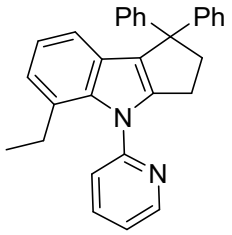
IR (ν_{max}, cm^{-1}): 3012, 2907, 1588, 1474, 1444, 1264, 749.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.57 (dd, J = 4.8, 1.5 Hz, 1H), 7.85 (d, J = 8.9 Hz, 1H), 7.81 (dt, J = 7.8, 2.0 Hz, 1H), 7.42 (d, J = 7.3 Hz, 1H), 7.32–7.27 (m, 4H), 7.24 (d, J = 7.9 Hz, 1H), 7.21–7.13 (m, 4H), 7.12–6.94 (m, 6H), 3.18 (t, J = 2.0 Hz, 1H), 7.40 (d, J = 8.3 Hz, 1H), 7.35-7.32 (m, 4H), 7.29–7.23 (m, 5H), 7.22–7.18 (m, 3H), 3.26 (t, J = 7.3 Hz, 2H), 3.17 (t, J = 7.3 Hz, 2H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 151.8, 149.3, 147.9, 145.1, 139.0, 138.5, 128.3, 127.8, 127.2, 127.0, 126.2, 124.7, 121.8, 120.8, 116.4, 114.7, 114.6, 57.4, 47.4, 27.8

HRMS: (ESI) *m*/*z* calcd for $C_{28}H_{21Br}N_2$, 465.0961 $[M+H]^+$; found 465.0949.

5-Ethyl-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10f):



Yield: 72%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

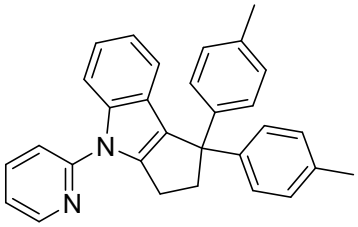
IR (ν_{max}, cm^{-1}): 2968, 2873, 1694, 1586, 1438, 1262, 1033, 750.

^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.58 (dd, J = 4.8, 1.7 Hz, 1H), 7.79 (dt, J = 8.2, 1.8 Hz, 1H), 7.39-35 (m, 4H), 7.30-7.20 (m, 8H), 7.19–7.13 (m, 3H), 7.03 (t, J = 7.6 Hz, 1H), 6.98 (d, J = 6.8 Hz, 1H), 7.12–6.94 (m, 6H), 3.18 (t, J = 2.0 Hz, 1H), 7.40 (d, J = 8.3 Hz, 1H), 7.35-7.32 (m, 4H), 3.12 (t, J = 7.0 Hz, 2H), 2.93 (t, J = 6.8 Hz, 2H), 2.42 (m, 2H), 0.97 (t, J = 7.8 Hz, 3H).

$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 153.2, 148.9, 148.5, 145.9, 139.6, 137.9, 129.1, 128.1, 127.9, 126.4, 126.2, 125.9, 122.3, 122.1, 121.2, 121.0, 117.4, 58.0, 47.2, 26.4, 25.8, 14.1

HRMS: (ESI) *m*/*z* calcd for $C_{30}H_{26}N_2$, 415.2169 $[M+H]^+$; found 415.2151.

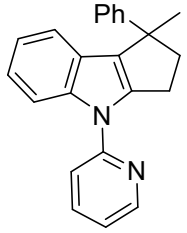
4-(Pyridin-2-yl)-1,1-di-p-tolyl-1,2,3,4-tetrahydrocyclopenta[b]indole (10g):



Yield: 70%; white solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.

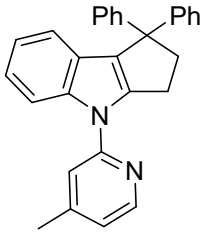
IR (ν_{max}, cm^{-1}): 2950, 2861, 1903, 1694, 1470, 1442, 812, 739.
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.56 (dd, J = 4.8, 1.3 Hz, 1H), 7.94 (d, J = 8.3 Hz, 1H), 7.79 (dt, J = 8.5, 1.9 Hz, 1H), 7.43 (d, J = 8.2 Hz, 1H), 7.33 (d, J = 7.7 Hz, 1H), 7.30–7.24 (m, 4H), 7.18–7.12 (m, 2H), 7.11–7.00 (m, 5H), 3.26 (t, J = 7.3 Hz, 2H), 3.13 (t, J = 7.3 Hz, 2H), 2.29 (s, 6H),
$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.2, 149.2, 145.5, 143.7, 140.3, 138.3, 135.4, 129.1, 128.4, 127.8, 125.6, 121.8, 121.2, 120.3, 119.5, 116.4, 112.8, 56.7, 47.4, 21.1
HRMS: (ESI) m/z calcd for $C_{30}H_{26}N_2$, 415.2169 $[M+H]^+$; found 415.2170.

1-Methyl-1-phenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10h):



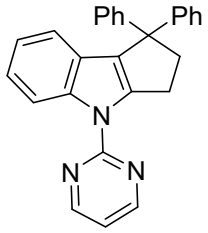
Yield: 80%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2964, 1692, 1473, 1262, 1062, 729.
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.58 (dd, J = 4.9, 0.8 Hz, 1H), 8.01 (d, J = 8.3 Hz, 1H), 7.81 (dt, J = 8.1, 2.0 Hz, 1H), 7.47 (d, J = 8.3 Hz, 1H), 7.41 (d, J = 8.3, 2H), 7.33 (d, J = 7.7 Hz, 1H), 7.27 (t, J = 7.7 Hz, 2H), 7.22-7.15 (m, 3H), 7.10 (t, J = 7.6 Hz, 1H), 3.17–3.12 (m, 2H), 2.76-2.64 (m, 2H), 1.81 (s, 3H).
$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.4, 152.0, 149.3, 149.2, 143.6, 140.4, 138.3, 128.6, 128.3, 126.4, 125.5, 121.1, 120.2, 119.0, 116.2, 113.0, 47.8, 47.6, 27.9, 27.1
HRMS: (ESI) m/z calcd for $C_{23}H_{20}N_2$, 325.1699 $[M+H]^+$; found 325.1700.

4-(4-Methylpyridin-2-yl)-1,1-diphenyl-1,2,3,4-tetrahydrocyclopenta[b]indole (10i):



Yield: 54%; white semi solid; *Rf*= 0.5 in 1:9 EtOAc/Hexane.
IR (ν_{max}, cm^{-1}): 2924, 1731, 1599, 1431, 1361, 702.
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 8.58 (dd, J = 4.8, 1.0 Hz, 1H), 8.01 (d, J = 8.4 Hz, 1H), 7.82 (dd, J = 8.4, 2.0 Hz, 1H), 7.47 (d, J = 8.1 Hz, 1H), 7.40 (d, J = 8.2 Hz, 2H), 7.33 (d, J = 7.7 Hz, 1H), 7.30-7.25 (m, 2H), 7.21-7.16 (m, 3H), 7.10 (dt, J = 7.2, 1.2 Hz, 1H), 3.17–3.12 (m, 2H), 2.75–2.63 (m, 2H), 2H), 1.81 (s, 3H).
$^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 152.4, 152.0, 149.3, 149.2, 143.6, 140.4, 138.3, 128.6, 128.3, 126.4, 125.5, 121.1, 120.2, 119.0, 116.2, 113.0, 47.8, 47.6, 27.9, 27.1
HRMS: (ESI) m/z calcd for $C_{29}H_{24}N_2$, 401.2012 $[M+H]^+$; found 401.2013.

1,1-Diphenyl-4-(pyrimidin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10j):



Yield: 71%; white solid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

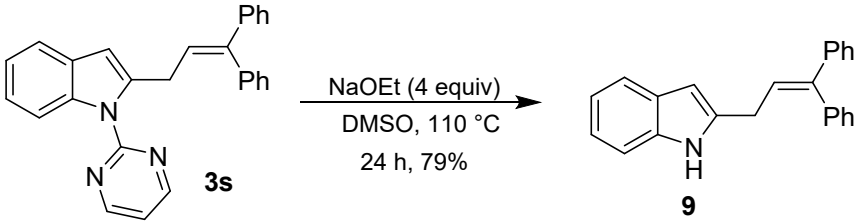
IR (ν_{max}, cm^{-1}): 3020, 2345, 1745, 1422, 1237, 752.

^1H NMR (500 MHz, $CDCl_3$, 24 °C): δ 8.82 (d, J = 8.4 Hz, 1H), 8.73 (d, J = 4.6 Hz, 2H), 7.33 (d, J = 7.7 Hz, 4H), 7.34-7.26 (m, 7H), 7.22 (t, J = 7.9 Hz, 2H), 7.17 (t, J = 7.9 Hz, 1H), 7.06 (t, J = 7.9 Hz, 1H), 3.62 (t, J= 6.8 Hz, 2H), 3.22 (t, J = 6.6 Hz, 2H),

$^{13}C\{^1H\}$ NMR (125 MHz, $CDCl_3$, 24 °C): δ 158.6, 158.0, 148.4, 144.3, 140.4, 1129.2, 128.1, 128.0, 126.6, 126.0, 122.5, 122.2, 119.2, 116.8, 115.9, 57.1, 47.5, 30.6.

HRMS: (ESI) *m*/*z* calcd for $C_{27}H_{21}N_3$, 388.1808 $[M+H]^+$; found 388.1810.

7. Removal of directing group: Synthesis of 9:



Compound **3s** (100 mg, 0.28 mmol) and NaOEt (76.6 mg, 1.12 mmol) were stirred in dry DMSO (3.0 ml) at 110 °C under N_2 for 24 h. Progress of the reaction was monitored by TLC. Once it completed, the reaction mixture was cooled to room temperature, the solvent was removed through reduced pressure and the residue was purified by silica gel chromatography using EA/Hexane (2: 8) as an eluent to afford compound **9** (68 mg, 79%).

Yield: 79%; Yellow semi liquid; *Rf*= 0.5 in 2:8 EtOAc/Hexane.

IR (ν_{max}, cm^{-1}): 3046, 2652, 1740, 1475, 1280, 752.

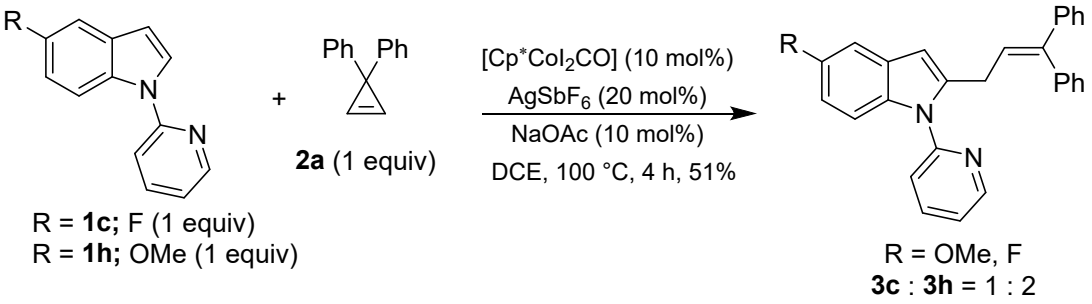
^1H NMR (400 MHz, $CDCl_3$, 24 °C): δ 7.50 (d, J = 7.9 Hz, 1H), 7.35-7.28 (m, 3H), 7.26-7.16 (m, 10H), 7.13 (t, J = 7.3 Hz, 1H), 6.39 (s, 1H), 6.28 (t, J = 8.2 Hz, 1H), 3.61 (d, J = 6.8 Hz, 2H).

$^{13}C\{1H\}$ NMR (100 MHz, $CDCl_3$, 24 °C): δ 154.2, 143.9, 142.4, 139.5, 139.4, 135.7, 129.9, 128.3, 128.2, 127.5, 127.4, 127.3, 124.5, 122.5, 121.2, 120.4, 111.0, 103.7, 28.2.

HRMS: (ESI) *m*/*z* calcd for $C_{23}H_{19}N$, 332.1410 $[M+Na]^+$; found 332.2013.

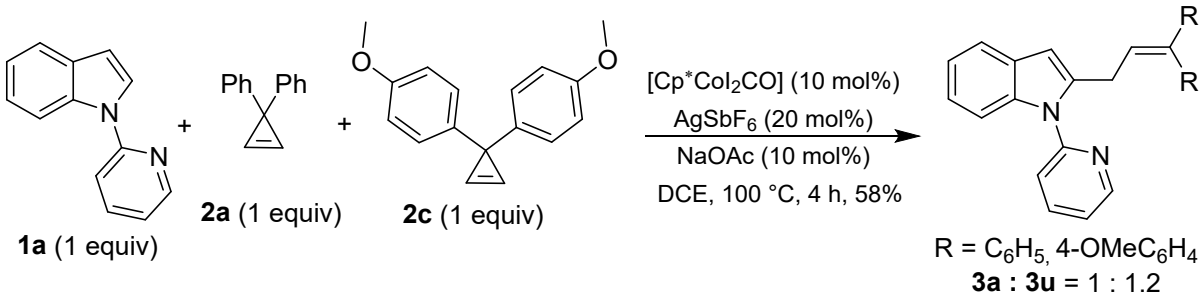
8. Control Experiments:

8.1 Intermolecular competitive experiment with 1:



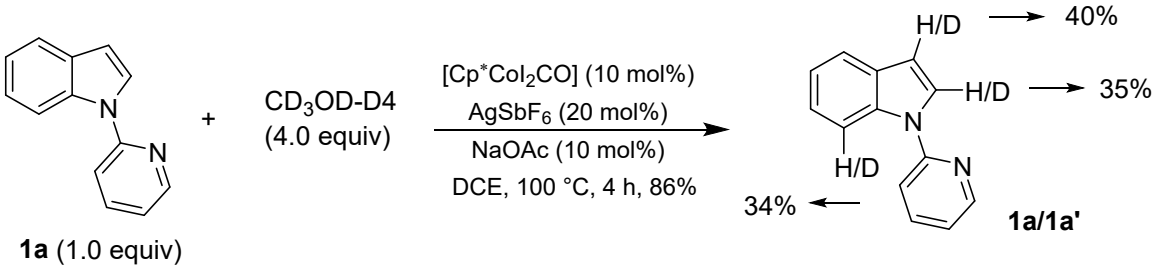
Following the general procedure, expected products **3c** and **3h** were isolated in 51% yield in 1: 2 ratio.

8.2 Intermolecular competitive experiment with 2:



Following the general procedure, expected products **3a** and **3u** were isolated in 58% yield in 1: 1.2 ratio.

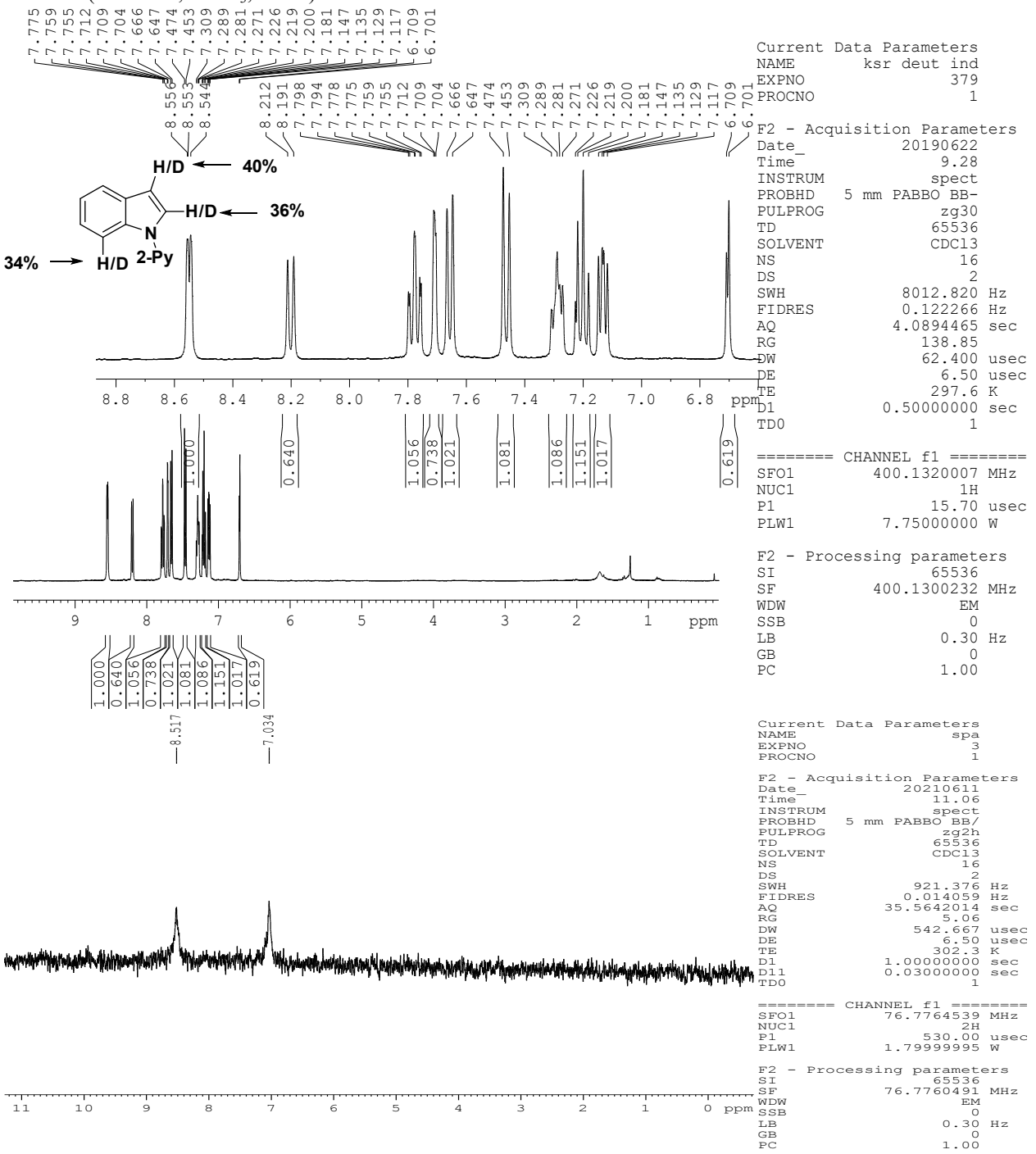
8.3 Deuterium exchange experiment:



1-(Pyridin-2-yl)-1*H*-indole **1a** (50 mg) (1 equiv), [Cp*CoI2CO], (10 mol %), NaOAc (10 mol %) and AgSbF6 (20 mol%) were taken in a 15 mL Schlenk tube. DCE (2 mL) was added to the raction mixture, followed by methanol-d_4 (4.0 equiv) was added to the reaction tube. The reaction was allowed to stir at ambient temperature for 4 hours. After 4 hours, the reaction was diluted with DCM, filtered through celite, and the filtrate was concentrated. The crude residue was purified by column chromatography using hexane: ethylacetate (1: 9). The recovered **1a** (86%) had deuterium incorporation at C2, C3, and C7 in 35%, 40%, and 34%, respectively.

Deuterium NMR of 1a'

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

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Current Data Parameters
NAME        ksr deut ind
EXPNO                379
PROCNO                 1

F2 - Acquisition Parameters
Date_           20190622
Time                9.28
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 138.85
DW                 62.400 usec
DE                  6.50 usec
TE                 297.6 K
D1            0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300232 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

```
Current Data Parameters
NAME                 spa
EXPNO                  3
PROCNO                 1

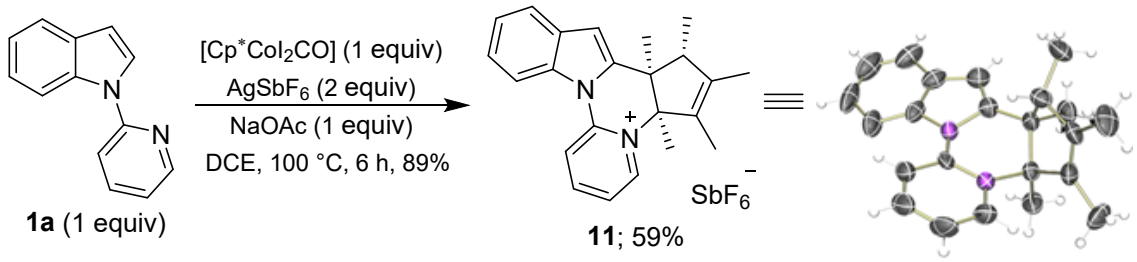
F2 - Acquisition Parameters
Date_           20210611
Time               11.06
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg2h
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH              921.376 Hz
FIDRES          0.014059 Hz
AQ             35.5642014 sec
RG                  5.06
DW                542.667 usec
DE                  6.50 usec
TE                302.3 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         76.7764539 MHz
NUC1                   2H
P1                530.00 usec
PLW1          1.79999995 W

F2 - Processing parameters
SI                 65536
SF           76.7760491 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

9. Stoichiometric experiements:

9.1 Syntheis of pyridinium salt 11:



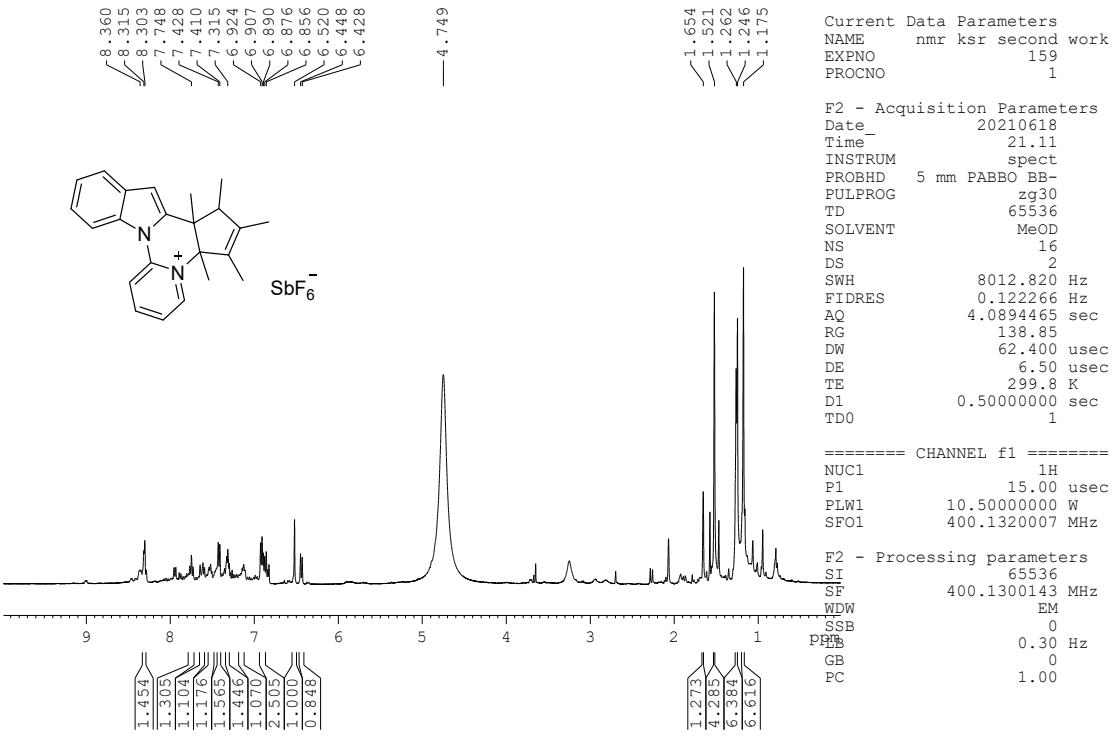
Oven-dried Schlenk tube was charged with **1a** (1 equiv, 0.26 mmol), NaOAc (1 equiv), $AgSbF_6$ (2 equiv) and [Cp*CoI_2CO] (1 equiv), then 4 mL of dry DCE was added. The charged schlenk tube's inner atmosphere was made inert through repeated (thrice) evacuation and refilling with nitrogen. The reaction tube stirs at 100 °C in preheated oil-bath for 6 hours. After 6 h, the reaction was cooled to room temperature and solvent was removed under vacuum. The remaining residue was washed with dry hexane (2 × 10 mL) under an inert atmosphere. The remaining residue was dissolved in dry DCM (25 mL) and the resulting reaction solution was filtered under argon atmosphere using sintered filter stick setup. The solvent was removed under vacuum to yield (98 mg, 59%) as a dark brown solid. Furthermore, compound **11** was confirmed by single crystal XRD.

Chemical formula of complex: ($C_{23}H_{25}F_6N_2Sb$) [M+]

Calculated m/z: 564.0960

Found: 564.0957

^{1}H NMR (400 MHz, MeOH-d_4, 24 °C):



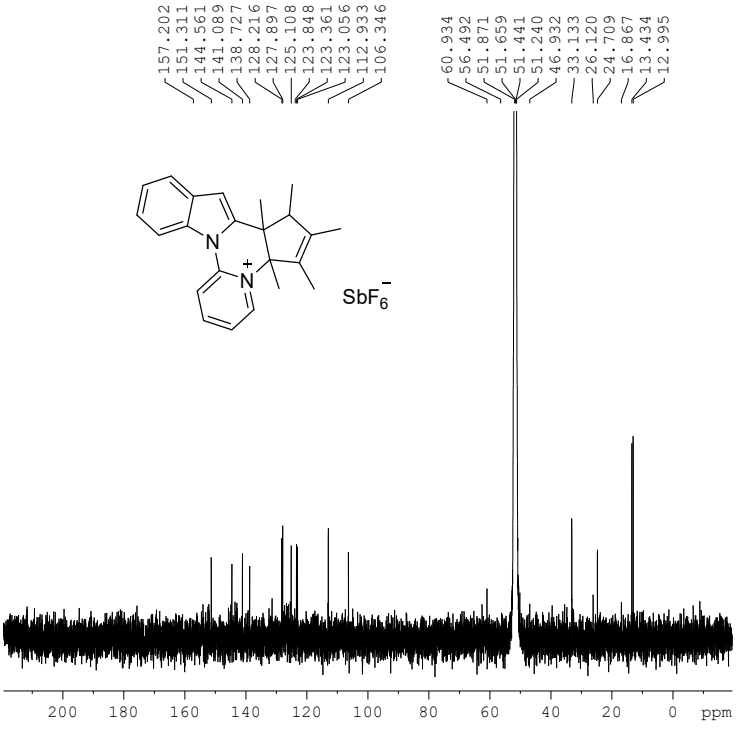

```
Current Data Parameters
NAME      nmr ksr second work
EXPNO                  159
PROCNO                   1

F2 - Acquisition Parameters
Date_           20210618
Time              21.11
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT             MeOD
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 138.85
DW                 62.400 usec
DE                   6.50 usec
TE                  299.8 K
D1            0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                  1H
P1                 15.00 usec
PLW1         10.50000000 W
SFO1         400.1320007 MHz

F2 - Processing parameters
SI                 65536
SF          400.1300143 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:




```
Current Data Parameters
NAME      nmr ksr second work
EXPNO                  164
PROCNO                   1

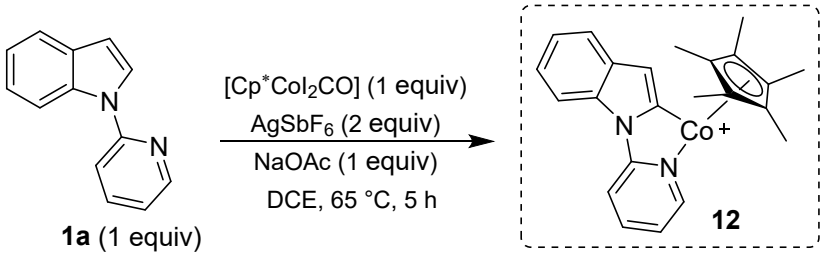
F2 - Acquisition Parameters
Date_           20210619
Time              12.51
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 16540
SOLVENT             CDCl3
NS                    600
DS                      4
SWH            24038.461 Hz
FIDRES          1.453353 Hz
AQ              0.3440320 sec
RG                 200.34
DW                 20.800 usec
DE                   6.50 usec
TE                  300.0 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
NUC1                 13C
P1                 10.00 usec
PLW1         47.00000000 W
SFO1         100.6228289 MHz

======== CHANNEL f2 ========
CPDPRG[2          waltz16
NUC2                  1H
PCPD2              90.00 usec
PLW2         10.50000000 W
PLW12         0.29166999 W
PLW13         0.23625000 W
SFO2         400.1316005 MHz

F2 - Processing parameters
SI                 32768
SF          100.6127690 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

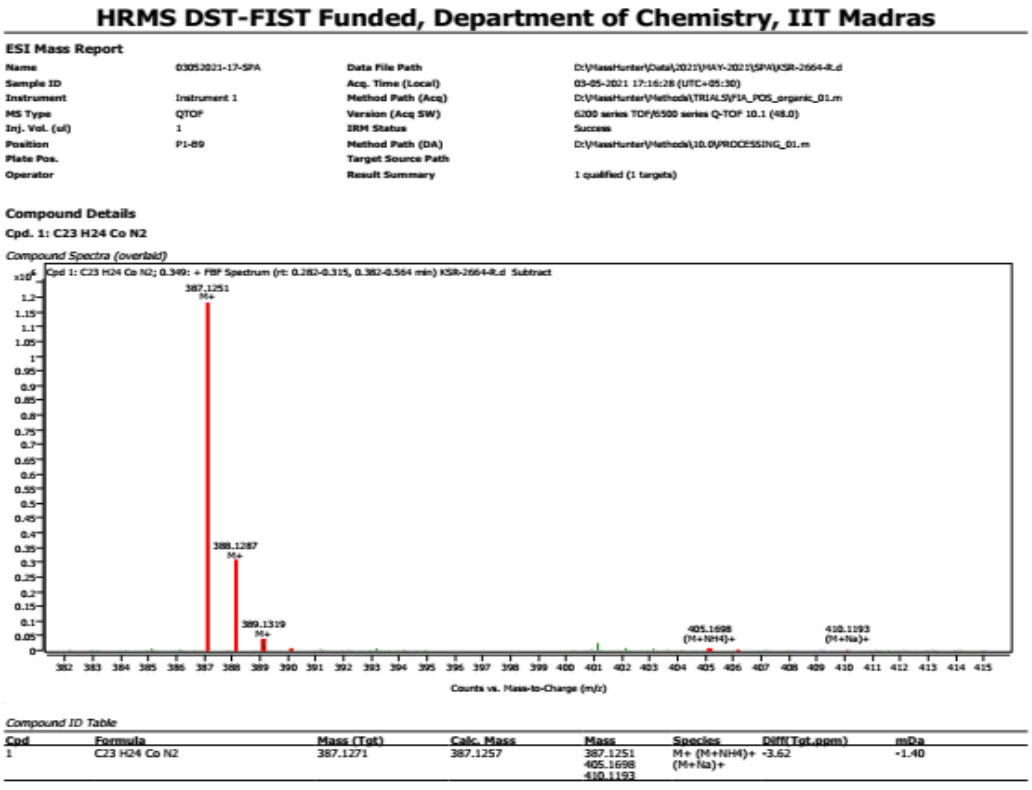
9.3 Preparation of complex 12:

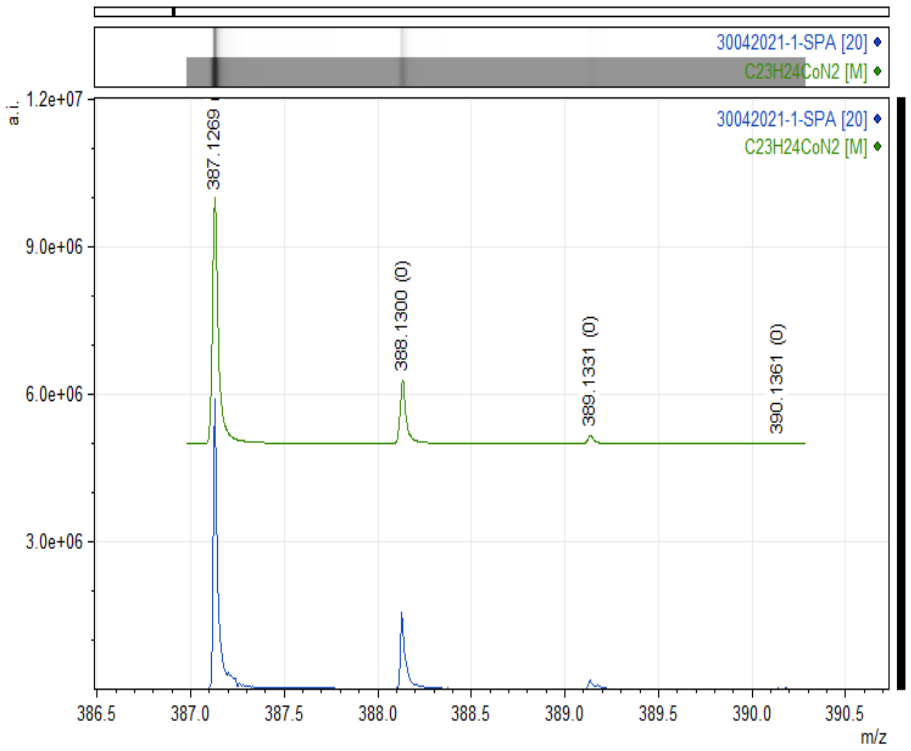


Chemical Formula: $C_{23}H_{24}CoN_2^+$
Exact Mass: 387.1266
Found Mass: 387.1260
Simulated Mass: 387.1269

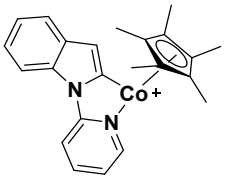
Oven-dried Schlenk tube was charged with **1a** (1 equiv, 0.26 mmol), NaOAc (1 equiv), $AgSbF_6$ (2 equiv) and [Cp*CoI_2CO] (1 equiv), then 4 mL of dry DCE was added. The charged schlenk tube‘s inner atmosphere was made inert through repeated (thrice) evacuation and refilling with nitrogen. The reaction tube stirs at 100 °C in preheated oil-bath for 6 hours. Then, the reaction was cooled to room temperature and solvent was removed under vacuum. The remaining residue was washed with dry hexane (2×10 mL) under an inert atmosphere. The remaining residue was dissolved in dry DCM (25 mL) and the resulting solution was filtered under argon atmosphere using sintered filter stick setup. The solvent was removed under vacuum and the resultant compound was analyzed by HRMS, which was in complete agreement with simulated mass sepctra.

HRMS and simulated isotopic pattern of 12:



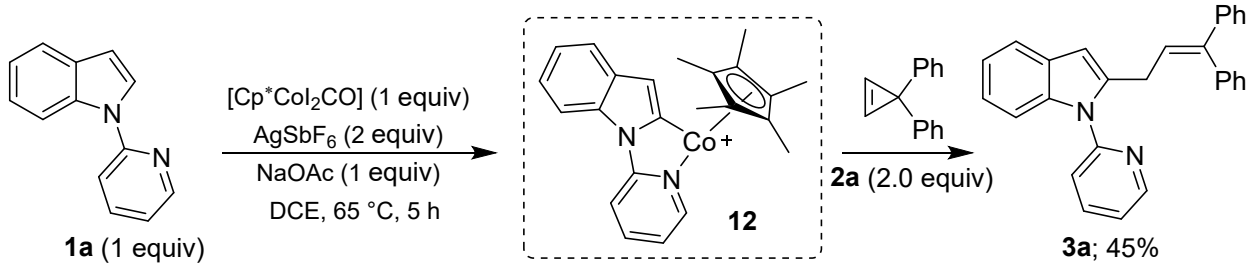


Simulated Isotopic pattern of 12



Chemical Formula: $C_{23}H_{24}CoN_2^+$
Exact Mass: 387.1266
Found Mass: 387.1251
Simulated Mass: 387.1269

9.4 Synthesis of 3a from complex 12:

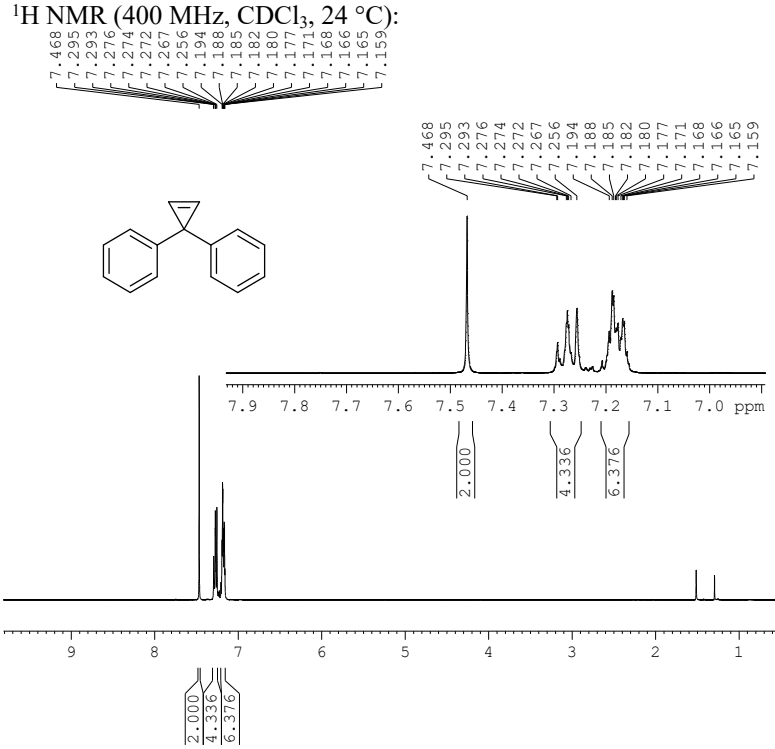


Oven-dried Schlenk tube was charged with **1a** (1 equiv, 0.26 mmol), NaOAc (1 equiv), $AgSbF_6$ (2 equiv) and [Cp*CoI_2CO] (1 equiv), then 4 mL of dry DCE was added. The charged schlenk tube‘s inner atmosphere was made inert through repeated (thrice) evacuation and refilling with nitrogen. The reaction tube stirs at 100 °C ni preheated oil-bath for 6 hours (complex **13** identified with HRMS). After 6 h, **2a** was added to the reaction slowly through a syringe pump for one hour. Then, the reaction was brought into room temperature and passes through a pad of celite and concentrated to get the crude product. The crude product was purified by column chromatography through silica gel to afford the expected product **3a** in 45% yield.

10. Spectral data:

3,3-Diphenylcyclopropene (2a):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

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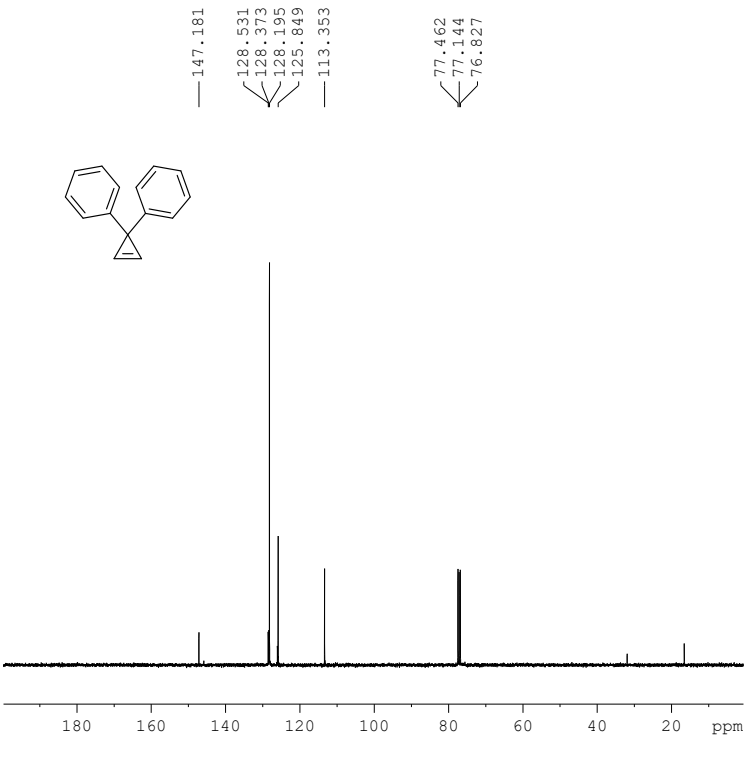
Current Data Parameters
NAME         s.m 2ph sym
EXPNO                252
PROCNO                 1

F2 - Acquisition Parameters
Date_           20170707
Time               19.41
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                124.58
DW                62.400 usec
DE                 6.50 usec
TE                294.1 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF          400.1300307 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:

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Current Data Parameters
NAME         s.m 2ph sym
EXPNO                340
PROCNO                 1

F2 - Acquisition Parameters
Date_           20170918
Time               1.30
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                16540
SOLVENT            CDCl3
NS                   256
DS                     4
SWH            24038.461 Hz
FIDRES          1.453353 Hz
AQ              0.3440320 sec
RG                200.34
DW                20.800 usec
DE                 6.50 usec
TE                297.9 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

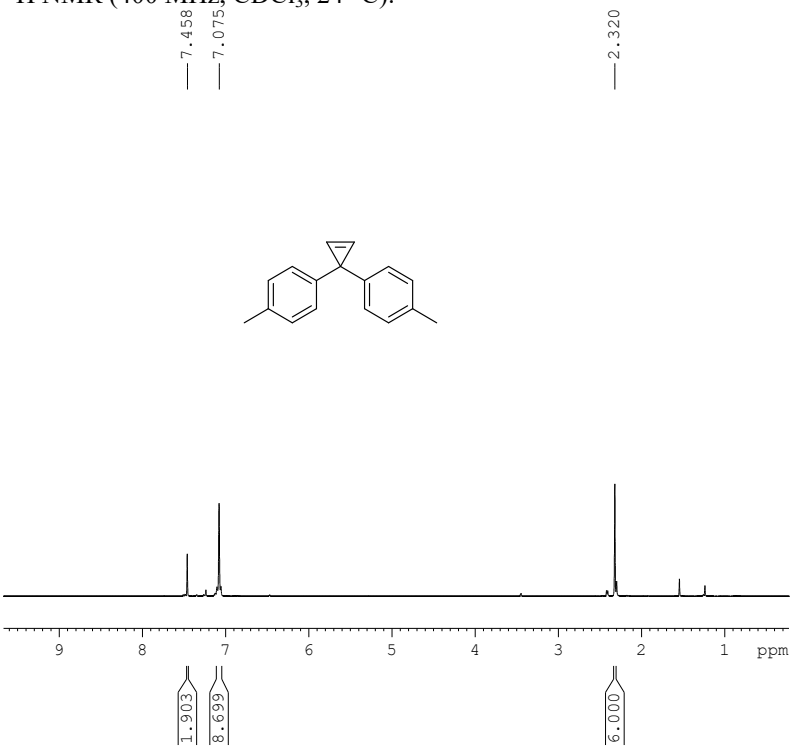
======== CHANNEL f1 ========
SFO1         100.6228289 MHz
NUC1                  13C
P1                 9.25 usec
PLW1         47.00000000 W

======== CHANNEL f2 ========
SFO2         400.1316005 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W

F2 - Processing parameters
SI                 32768
SF          100.6127607 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

3,3-Bis(4-methylphenyl)cyclopropene (2t):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



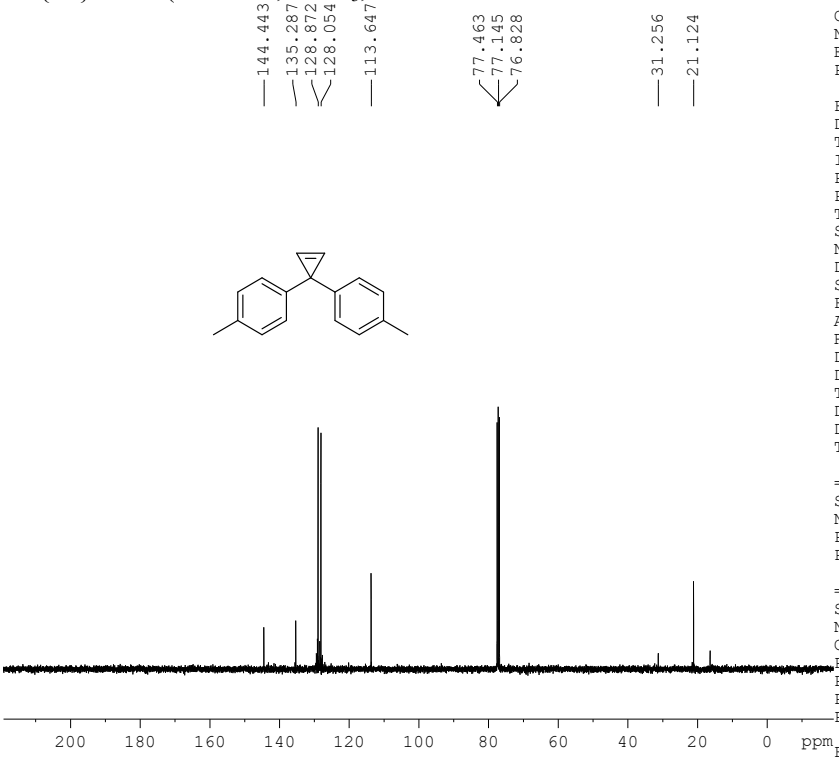

```
Current Data Parameters
NAME      s.m 2 me ph sym
EXPNO                 531
PROCNO                  1

F2 - Acquisition Parameters
Date_           20171226
Time              16.04
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ             4.0894465 sec
RG                153.13
DW                62.400 usec
DE                 6.50 usec
TE                293.7 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                 1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                65536
SF           400.1300205 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:

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Current Data Parameters
NAME      s.m 2 me ph sym
EXPNO                 532
PROCNO                  1

F2 - Acquisition Parameters
Date_           20171226
Time              16.12
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ             0.3440320 sec
RG                200.34
DW                20.800 usec
DE                 6.50 usec
TE                294.2 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

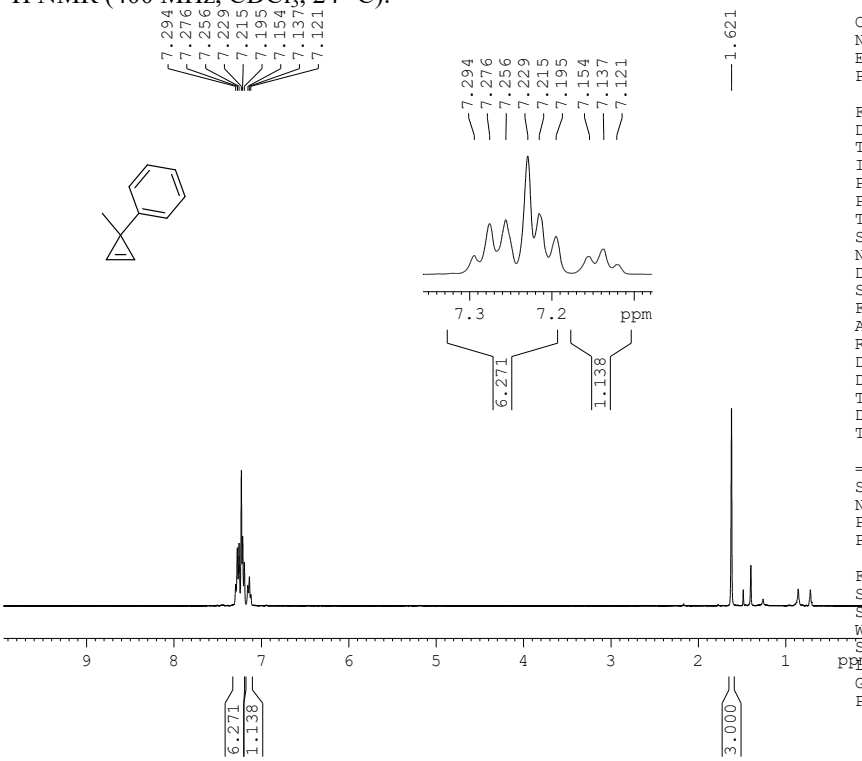
======== CHANNEL f1 ========
SFO1         100.6228289 MHz
NUC1                13C
P1                 9.25 usec
PLW1         47.00000000 W

======== CHANNEL f2 ========
SFO2         400.1316005 MHz
NUC2                 1H
CPDPRG[2         waltz16
PCPD2              90.00 usec
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W

F2 - Processing parameters
SI                32768
SF           100.6127602 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

3-Methyl-3phenylcyclopropene (2v):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



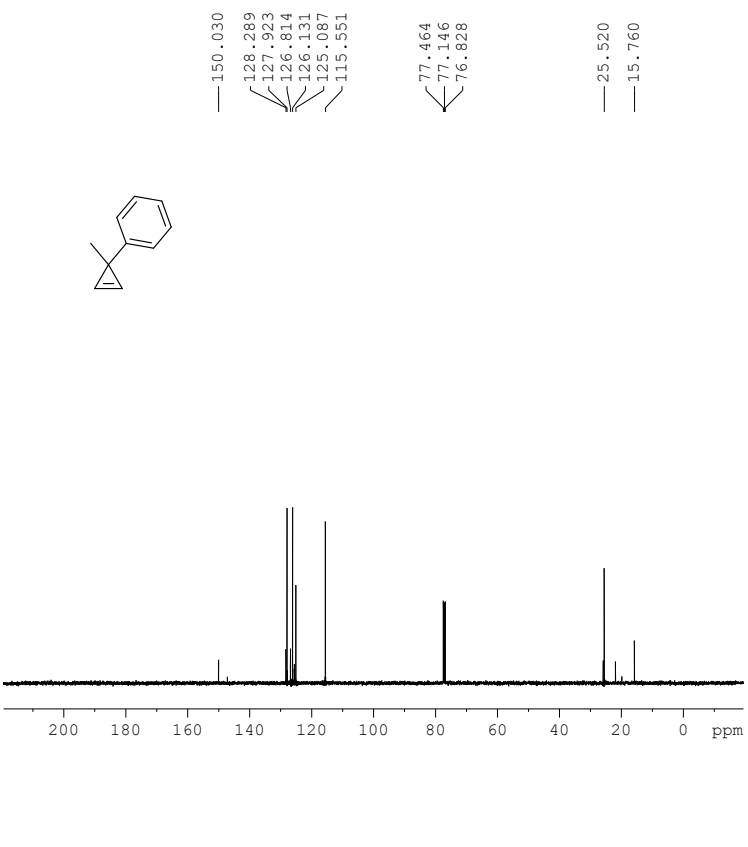

```
Current Data Parameters
NAME      s.m ph and me
EXPNO               720
PROCNO                1

F2 - Acquisition Parameters
Date_          20170330
Time             21.57
INSTRUM          spect
PROBHD   5 mm PABBO BB-
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                  16
DS                   2
SWH           8012.820 Hz
FIDRES        0.122266 Hz
AQ           4.0894465 sec
RG              88.51
DW             62.400 usec
DE              6.50 usec
TE             294.4 K
D1          0.50000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                 65536
SF          400.1300369 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:




```
Current Data Parameters
NAME      s.m ph and me
EXPNO               721
PROCNO                1

F2 - Acquisition Parameters
Date_          20170330
Time             21.59
INSTRUM          spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD               16540
SOLVENT          CDCl3
NS                 144
DS                   4
SWH          24038.461 Hz
FIDRES        1.453353 Hz
AQ           0.3440320 sec
RG              200.34
DW             20.800 usec
DE              6.50 usec
TE             294.6 K
D1          1.00000000 sec
D11         0.03000000 sec
TD0                  1

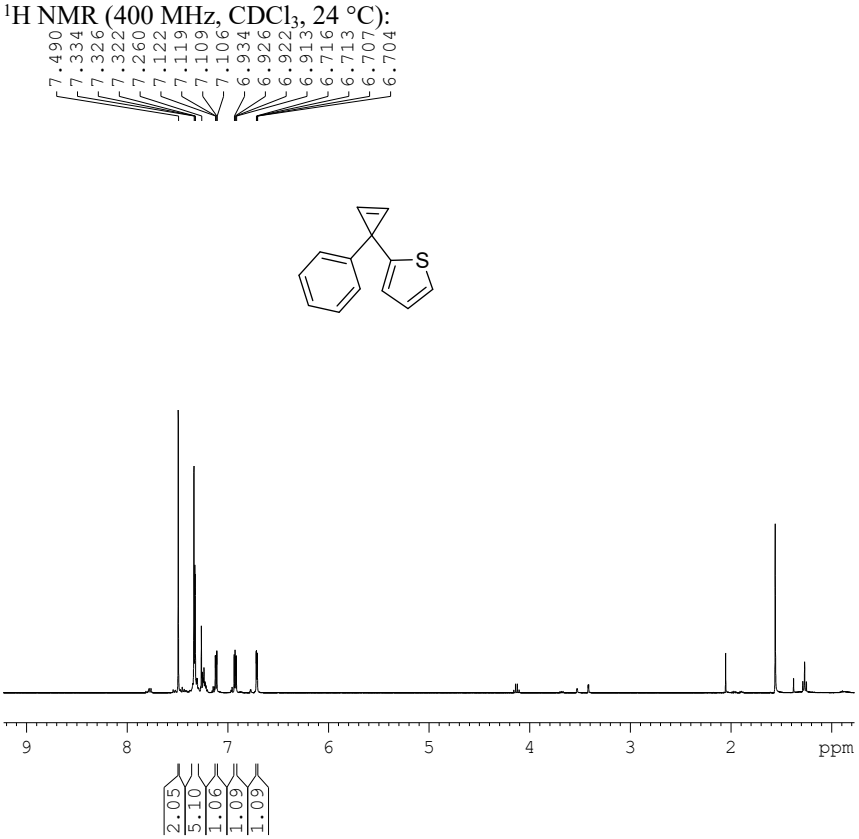
======== CHANNEL f1 ========
SFO1        100.6228289 MHz
NUC1                13C
P1                9.25 usec
PLW1        47.00000000 W

======== CHANNEL f2 ========
SFO2        400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         7.75000000 W
PLW12        0.23583999 W
PLW13        0.11863000 W

F2 - Processing parameters
SI                 32768
SF          100.6127634 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

3-Phenyl-3-thiophe-2-ylcyclopropene (2y):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



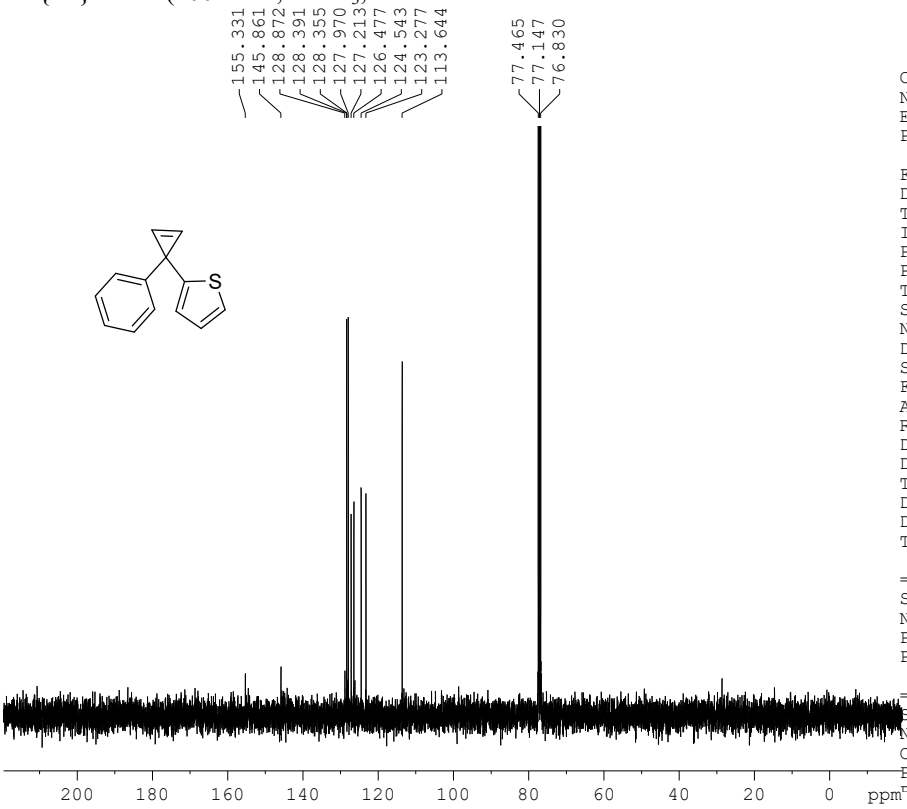

```
Current Data Parameters
NAME           spa40218
EXPNO               593
PROCNO                1

F2 - Acquisition Parameters
Date_           20180225
Time                5.05
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH              8012.820 Hz
FIDRES           0.122266 Hz
AQ               4.0894465 sec
RG                 200.34
DW                 62.400 usec
DE                   6.50 usec
TE                  298.9 K
D1              0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                  15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                     65536
SF           400.1300141 MHz
WDW                       EM
SSB       0
LB                    0.30 Hz
GB        0
PC                    1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME           spa402
EXPNO               5
PROCNO

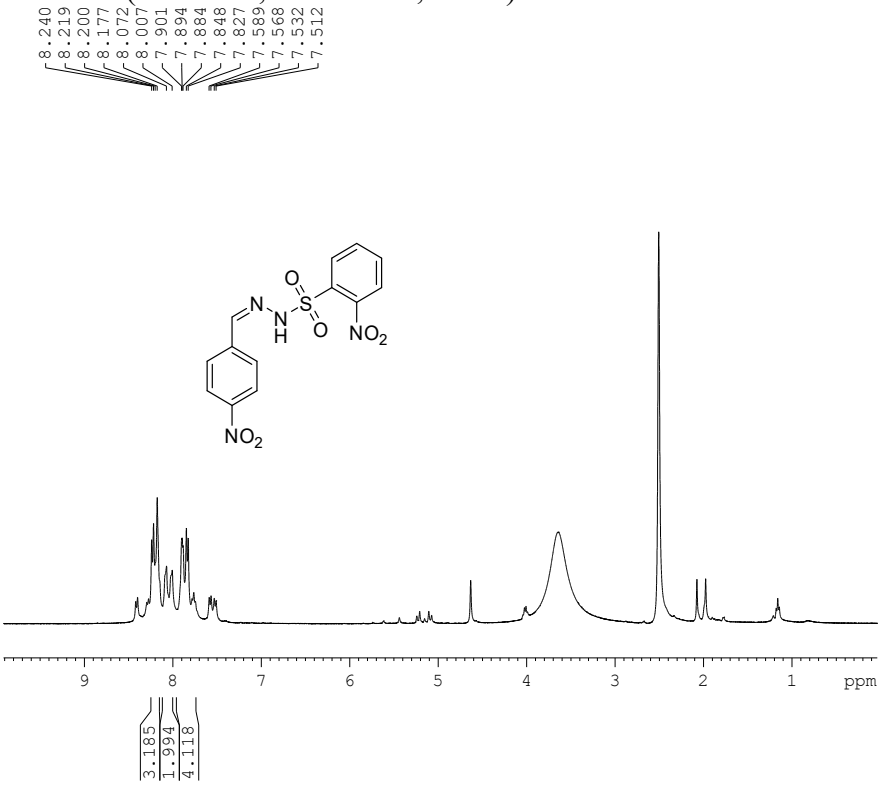
F2 - Acquisition Para
Date_          201802
Time               5.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                165
SOLVENT           CDC
NS                  2
DS
SWH           24038.4
FIDRES         1.4533
AQ            0.34403
RG               200.
DW               20.8
DE                 6.
TE               299
D1           1.000000
D11          0.030000
TD0

======== CHANNEL f1 =
SFO1        100.62282
NUC1                1
P1                 9.
PLW1        47.000000

======== CHANNEL f2 =
SFO2        400.13160
NUC2
CPDPRG[2         waltz
PCPD2              90.
PLW2          7.750000
```

2-Nitro-*N*'-(4-Nitrobenzylidene)benzenesulfonohydrazide:

^{1}H NMR (500 MHz, DMSO-D6, 24 °C):

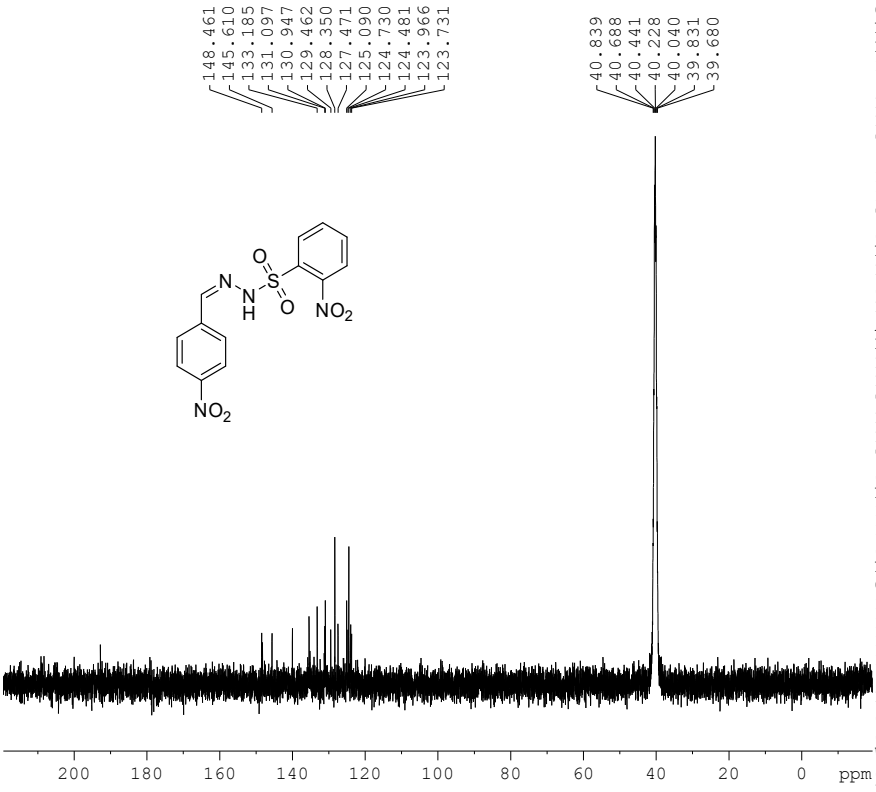



```
Current Data Parameters
NAME              2727 II
EXPNO                 480
PROCNO                  1

F2 - Acquisition Parame
Date_            20210822
Time                13.10
INSTRUM             spect
PROBHD   Z129392_0001 (
PULPROG             zg30
TD                 65536
SOLVENT             DMSO
NS                    16
DS                     2
SWH              8012.820
FIDRES           0.244532
AQ               4.0894465
RG                 153.13
DW                 62.400
DE                   6.50
TE                  297.6
D1             0.50000000
TD0                    1
SFO1          400.1320007
NUC1                  1H
P1                 15.00
PLW1          10.50000000

F2 - Processing paramet
SI                 65536
SF            400.1300000
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (100 MHz, DMSO-D6, 24 °C):



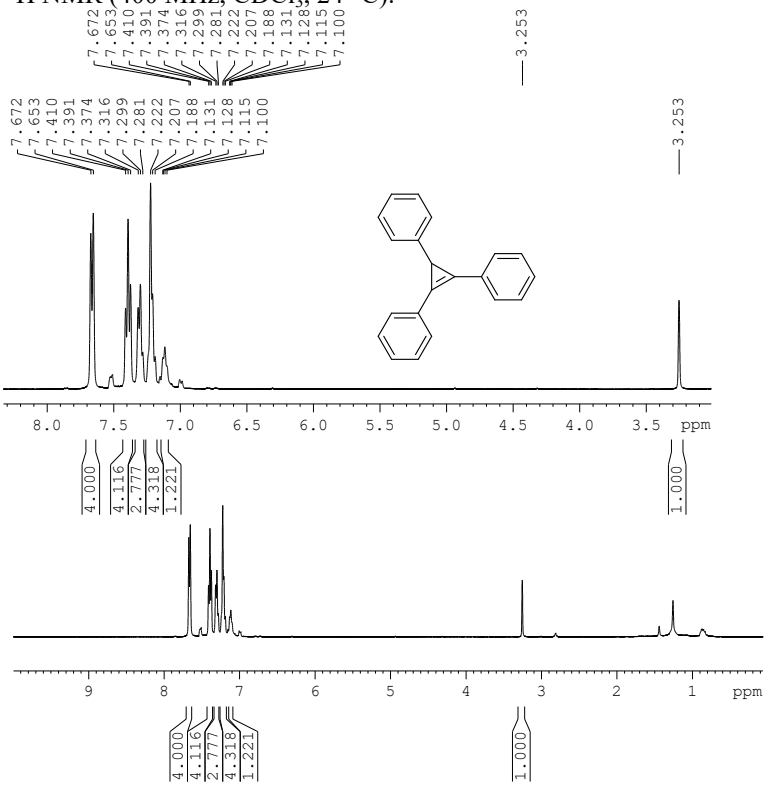

```
Current Data Parameters
NAME              2727 II
EXPNO                 481
PROCNO                  1

F2 - Acquisition Paramet
Date_            20210822
Time                13.16
INSTRUM             spect
PROBHD   Z129392_0001 (
PULPROG           zgpg30
TD                 16540
SOLVENT             DMSO
NS                   256
DS                     4
SWH             24038.461
FIDRES           2.906706
AQ               0.3440320
RG                 200.34
DW                 20.800
DE                   6.50
TE                  297.7
D1             1.00000000
D11            0.03000000
TD0                    1
SFO1          100.6228289
NUC1                  13C
P1                 10.00
PLW1          47.00000000
SFO2          400.1316005
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00
PLW2          10.50000000
PLW12          0.29166999
PLW13          0.14670999

F2 - Processing paramete
SI                 32768
SF            100.6127690
WDW                   EM
SSB                    0
```

1,2,3-Triphenylcyclopropene (2ae):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



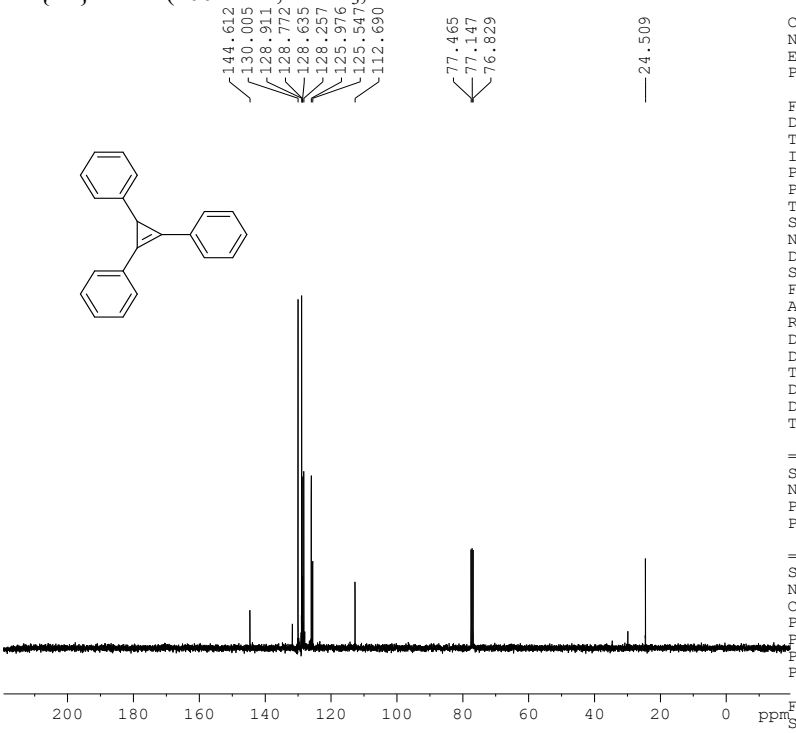

```
Current Data Parameters
NAME      nmr_2085%2f2087
EXPNO                  32
PROCNO                  1

F2 - Acquisition Parameters
Date_           20200507
Time              16.59
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    7
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ             4.0894465 sec
RG                 79.8
DW               62.400 usec
DE                6.50 usec
TE                297.3 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                 1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                65536
SF           400.1300525 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      nmr_2085%2f2087
EXPNO                  33
PROCNO                  1

F2 - Acquisition Parameters
Date_           20200507
Time              17.00
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                   27
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ             0.3440320 sec
RG                200.34
DW               20.800 usec
DE                6.50 usec
TE                297.4 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                   1

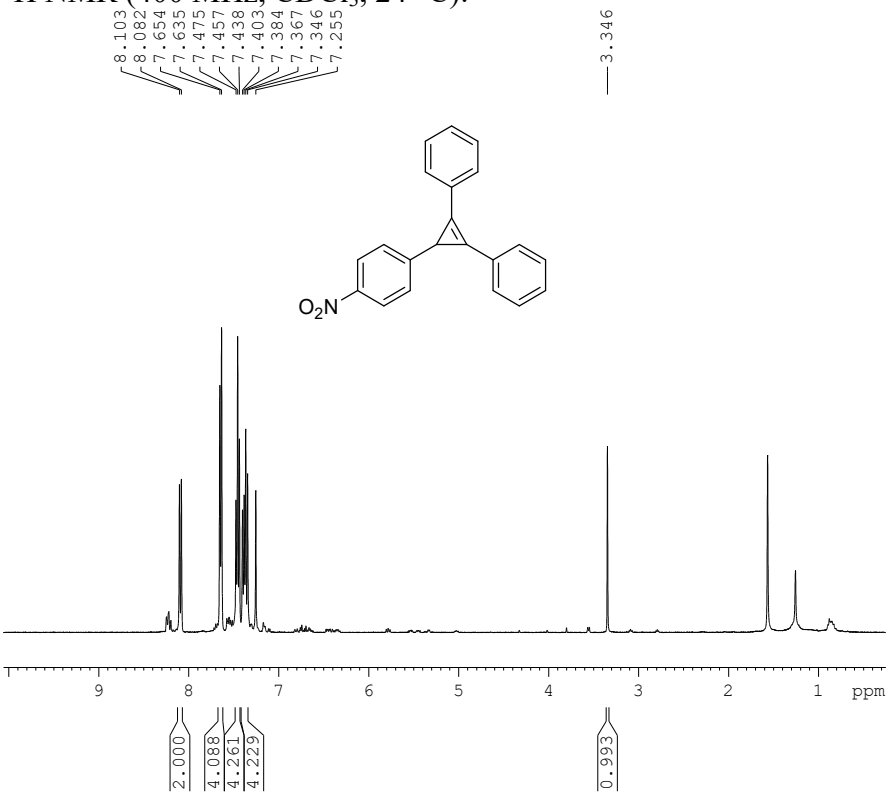
======== CHANNEL f1 ========
SFO1         100.6228289 MHz
NUC1                13C
P1                9.25 usec
PLW1         47.00000000 W

======== CHANNEL f2 ========
SFO2         400.1316005 MHz
NUC2                 1H
CPDPRG[2          waltz16
PCPD2             90.00 usec
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W

F2 - Processing parameters
SI                32768
SF           100.6127684 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

(3-(4-Nitrophenyl)cycloprop-1-ene-1,2-diyl)dibenzene (2ag):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

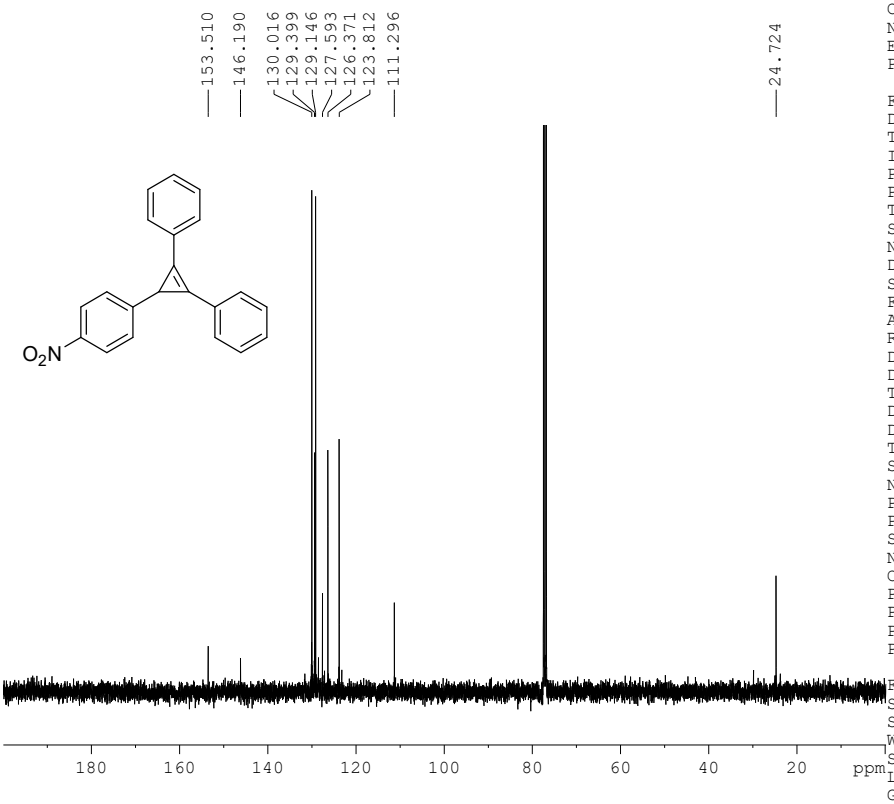



```
Current Data Parameters
NAME      2729 NO2 sm cy
EXPNO                488
PROCNO                 1

F2 - Acquisition Parame
Date_           20210822
Time               14.07
INSTRUM            spect
PROBHD   Z129392_0001 (
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     4
DS                     2
SWH             8012.820
FIDRES          0.244532
AQ             4.0894465
RG                200.34
DW                62.400
DE                  6.50
TE                 297.5
D1            0.50000000
TD0                    1
SFO1         400.1320007
NUC1                1H
P1                 15.00
PLW1         10.50000000

F2 - Processing paramet
SI                 65536
SF          400.1300116
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



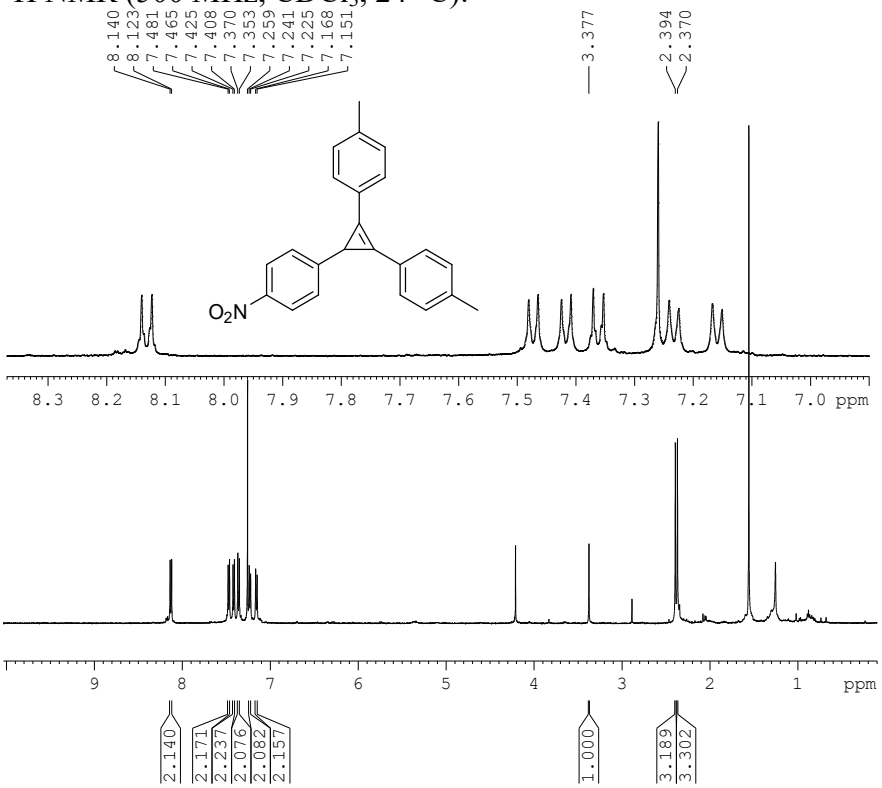

```
Current Data Parameters
NAME      2729 NO2 sm cy
EXPNO                489
PROCNO                 1

F2 - Acquisition Parame
Date_           20210822
Time               14.13
INSTRUM            spect
PROBHD   Z129392_0001 (
PULPROG           zgpg30
TD                 16540
SOLVENT            CDCl3
NS                   256
DS                     4
SWH            24038.461
FIDRES          2.906706
AQ             0.3440320
RG                200.34
DW                20.800
DE                  6.50
TE                 297.8
D1            1.00000000
D11           0.03000000
TD0                    1
SFO1         100.6228289
NUC1                13C
P1                 10.00
PLW1         47.00000000
SFO2         400.1316005
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00
PLW2         10.50000000
PLW12         0.29166999
PLW13         0.14670999

F2 - Processing paramet
SI                 32768
SF          100.6127572
WDW                   EM
SSB                    0
LB                  1.00
GB                     0
PC                  1.40
```

4,4'-(3-(4-Nitrophenyl)cycloprop-1-ene-1,2-diyl)bis(methylbenzene) (2ah):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



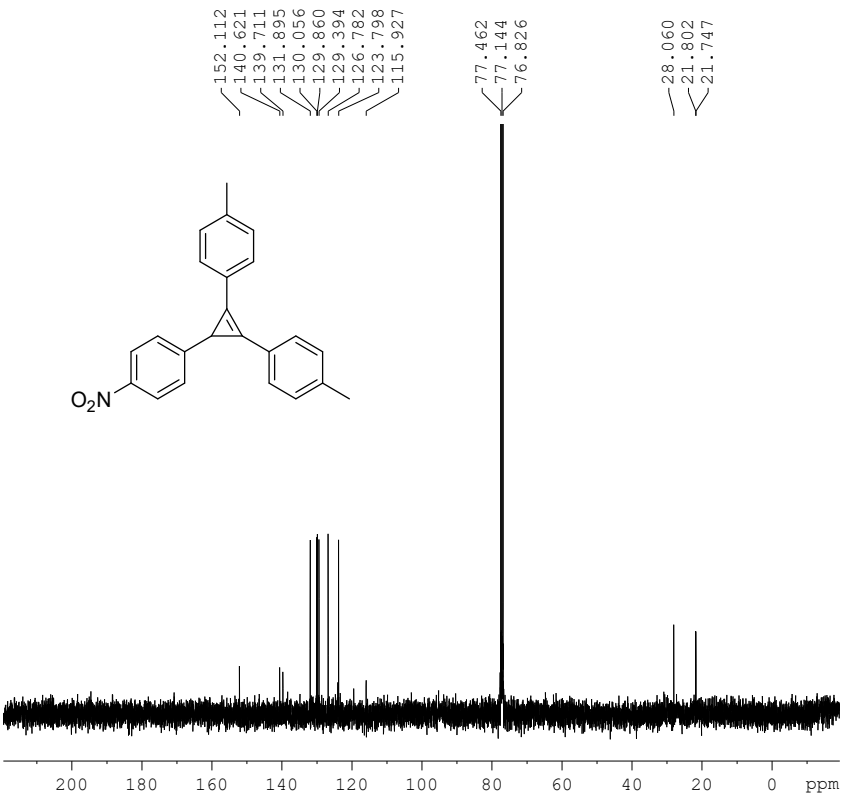

```
Current Data Parameters
NAME              2733 sm
EXPNO                  67
PROCNO                  1

F2 - Acquisition Parame
Date_           20210825
Time               15.11
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            10000.000
FIDRES          0.305176
AQ             1.6384000
RG                202.34
DW                50.000
DE                  6.50
TE                 299.7
D1             0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         500.1525008
NUC1                1H
P1                 11.75
PLW1         15.30000019

F2 - Processing paramet
SI                 65536
SF            500.1500122
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



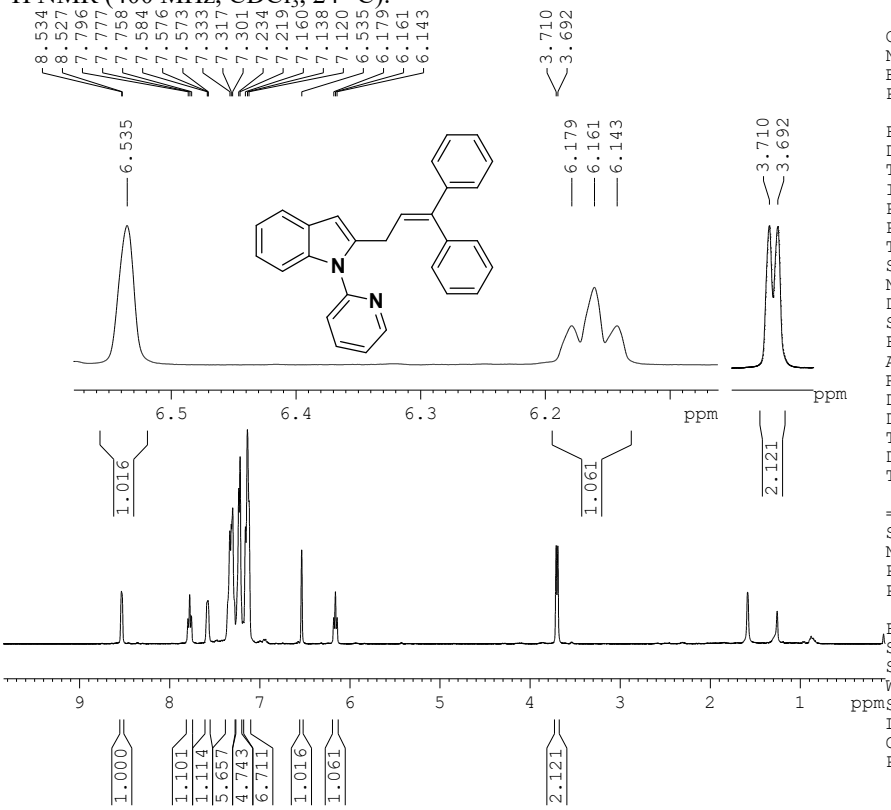

```
Current Data Parameters
NAME              2733 sm
EXPNO                 129
PROCNO                  1

F2 - Acquisition Paramet
Date_           20210825
Time               16.13
INSTRUM            spect
PROBHD   Z129392_0001 (
PULPROG           zgpg30
TD                 16540
SOLVENT            CDCl3
NS                  1095
DS                     4
SWH            24038.461
FIDRES          2.906706
AQ             0.3440320
RG                200.34
DW                20.800
DE                  6.50
TE                 297.8
D1             1.00000000
D11            0.03000000
TD0                    1
SFO1          100.6228289
NUC1                13C
P1                 10.00
PLW1          47.00000000
SFO2          400.1316005
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00
PLW2          10.50000000
PLW12          0.29166999
PLW13          0.14670999

F2 - Processing paramete
SI                 32768
SF            100.6127561
WDW                   EM
SSB                    0
LB                  1.00
GB                     0
```

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3a)

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



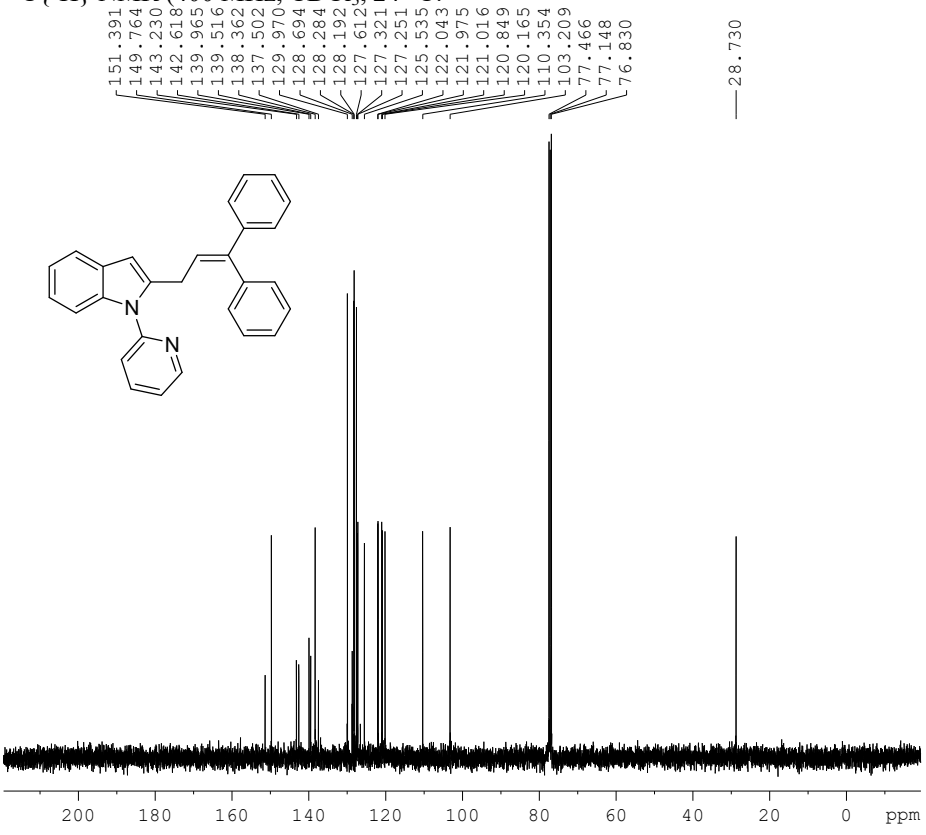

```
Current Data Parameters
NAME            ksr_945
EXPNO               191
PROCNO                1

F2 - Acquisition Parameters
Date_           20200526
Time_              17.26
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ             4.0894465 sec
RG                200.34
DW                62.400 usec
DE                 6.50 usec
TE                297.5 K
D1             0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300197 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME      ex. no. 945
EXPNO               4
PROCNO

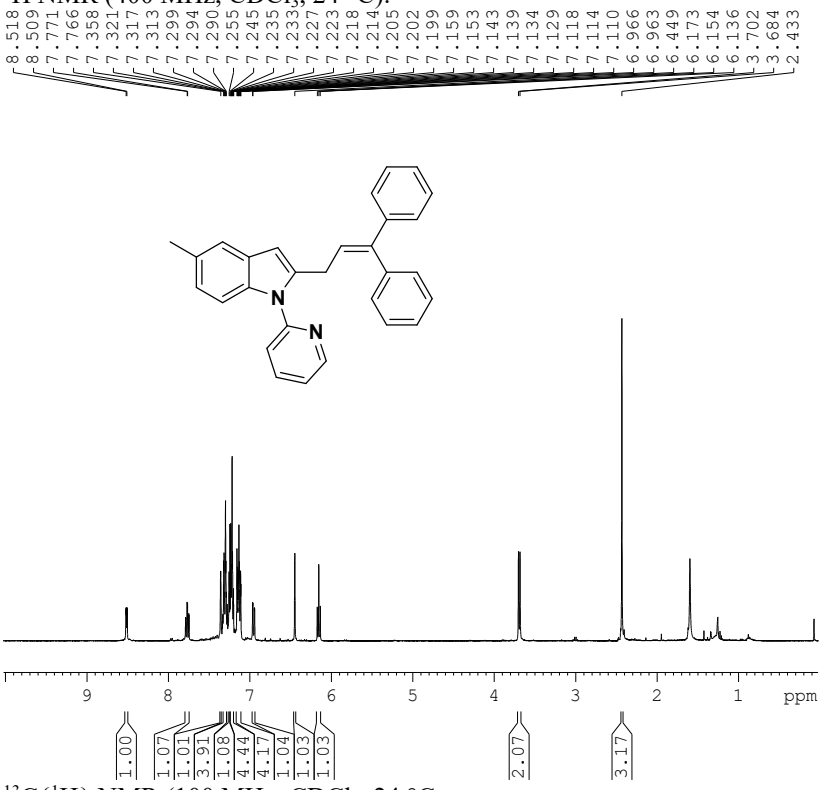
F2 - Acquisition Para
Date_          201908
Time_              9.
INSTRUM           spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                 165
SOLVENT            CDC
NS                   2
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                298
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1          100.62282
NUC1                  1
P1                   9.
PLW1          47.000000

======== CHANNEL f2 =
SFO2          400.13160
NUC2
CPDPRG[2          waltz
PCPD2                90.
PLW2           7.750000
```

2-(3,3-Diphenylallyl)-5-methyl-1-(pyridin-2-yl)-1*H*-indole (3b):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



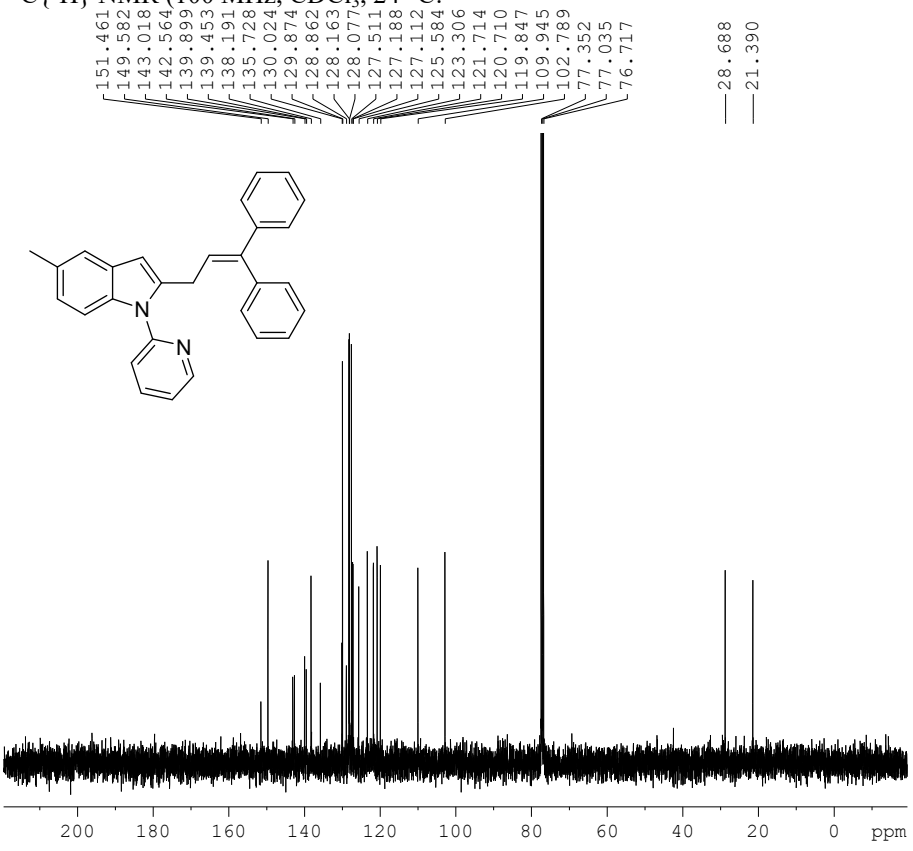

```
Current Data Parameters
NAME           1121 5me
EXPNO               311
PROCNO                1

F2 - Acquisition Parameters
Date_          20171117
Time              23.25
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ            4.0894465 sec
RG               169.77
DW               62.400 usec
DE                6.50 usec
TE               298.6 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                  1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                65536
SF          400.1300158 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME           1121 5me
EXPNO               312
PROCNO                1

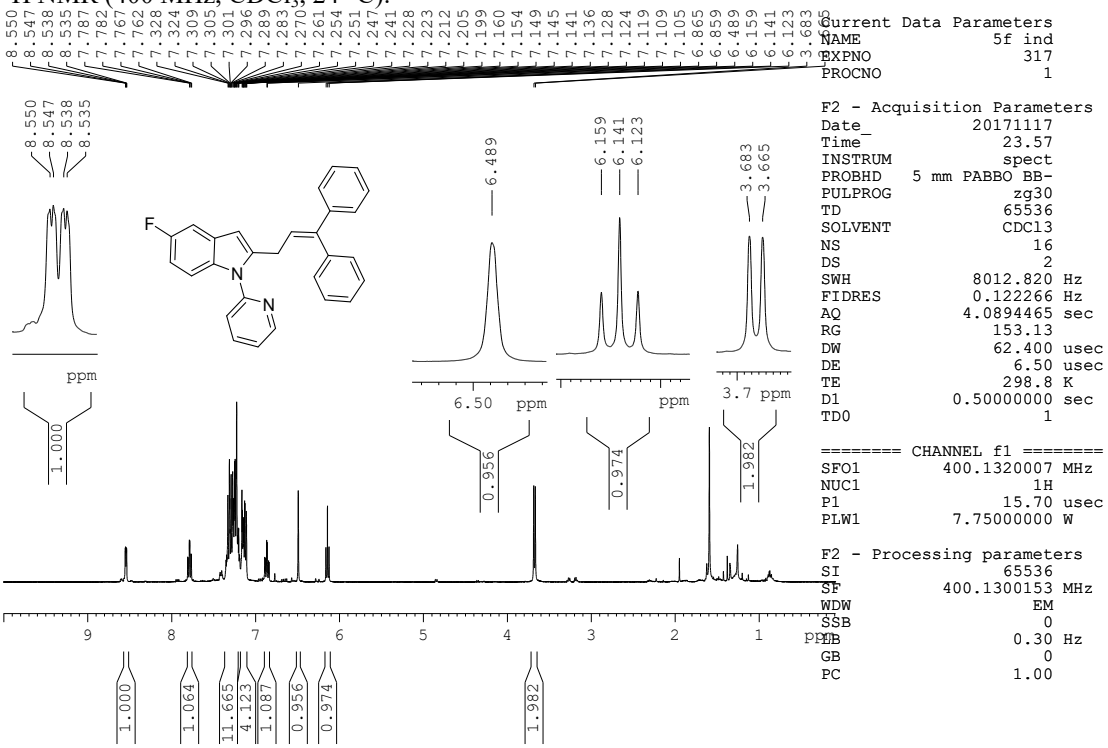
F2 - Acquisition Paramet
Date_          20171117
Time              23.32
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461
FIDRES         1.453353
AQ            0.3440320
RG               200.34
DW               20.800
DE                6.50
TE               299.0
D1            1.00000000
D11           0.03000000
TD0                   1

======== CHANNEL f1 ====
SFO1         100.6228289
NUC1                 13C
P1                  9.25
PLW1         47.00000000

======== CHANNEL f2 ====
SFO2         400.1316005
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00
```

2-(3,3-Diphenylallyl)-5-fluoro-1-(pyridin-2-yl)-1*H*-indole (3c):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



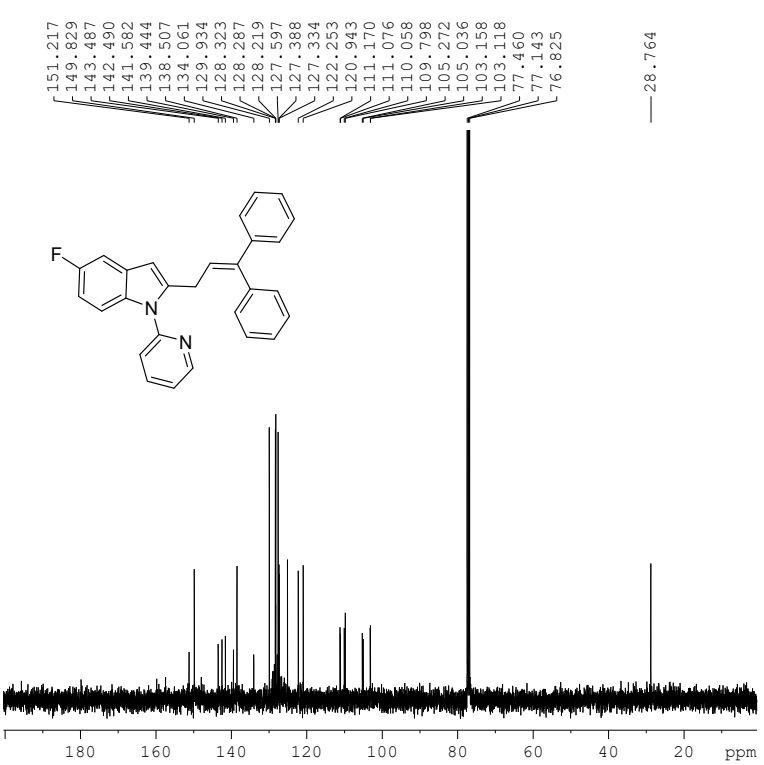

```
Current Data Parameters
NAME                  5f ind
EXPNO                    317
PROCNO                     1

F2 - Acquisition Parameters
Date_              20171117
Time                  23.57
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8012.820 Hz
FIDRES             0.122266 Hz
AQ                 4.0894465 sec
RG                    153.13
DW                    62.400 usec
DE                     6.50 usec
TE                    298.8 K
D1                 0.50000000 sec
TD0                        1

======== CHANNEL f1 ========
SFO1             400.1320007 MHz
NUC1                       1H
P1                      15.70 usec
PLW1              7.75000000 W

F2 - Processing parameters
SI                        65536
SF               400.1300153 MHz
WDW                       EM
SSB                        0
LB                      0.30 Hz
GB                         0
PC                      1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C:




```
Current Data Parameters
NAME                  5f ind
EXPNO                    318
PROCNO                     1

F2 - Acquisition Parameters
Date_              20171118
Time                   0.03
INSTRUM               spect
PROBHD   5 mm PABBO BB-
PULPROG              zgpg30
TD                    16540
SOLVENT               CDCl3
NS                      256
DS                        4
SWH               24038.461 Hz
FIDRES             1.453353 Hz
AQ                 0.3440320 sec
RG                    200.34
DW                    20.800 usec
DE                     6.50 usec
TE                    299.2 K
D1                 1.00000000 sec
D11                0.03000000 sec
TD0                        1

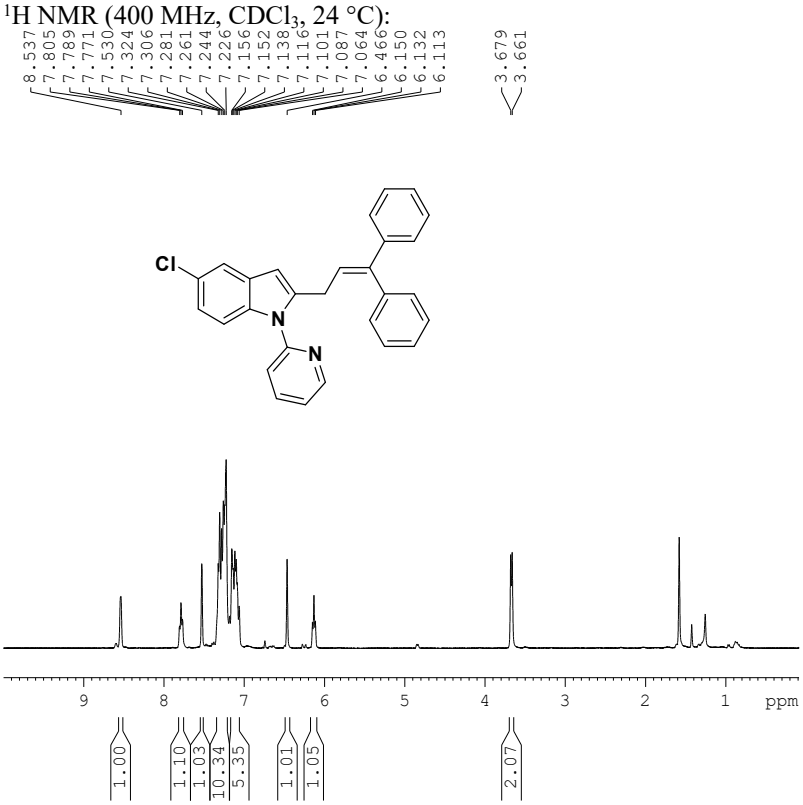
======== CHANNEL f1 ========
SFO1             100.6228289 MHz
NUC1                      13C
P1                     9.25 usec
PLW1              47.00000000 W

======== CHANNEL f2 ========
SFO2             400.1316005 MHz
NUC2                       1H
CPDPRG[2             waltz16
PCPD2                 90.00 usec
PLW2               7.75000000 W
PLW12              0.23583999 W
PLW13              0.11863000 W

F2 - Processing parameters
SI                        32768
SF               100.6127581 MHz
WDW                       EM
SSB                        0
LB                      1.00 Hz
GB                         0
PC                      1.40
```

5-Chloro-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3d):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



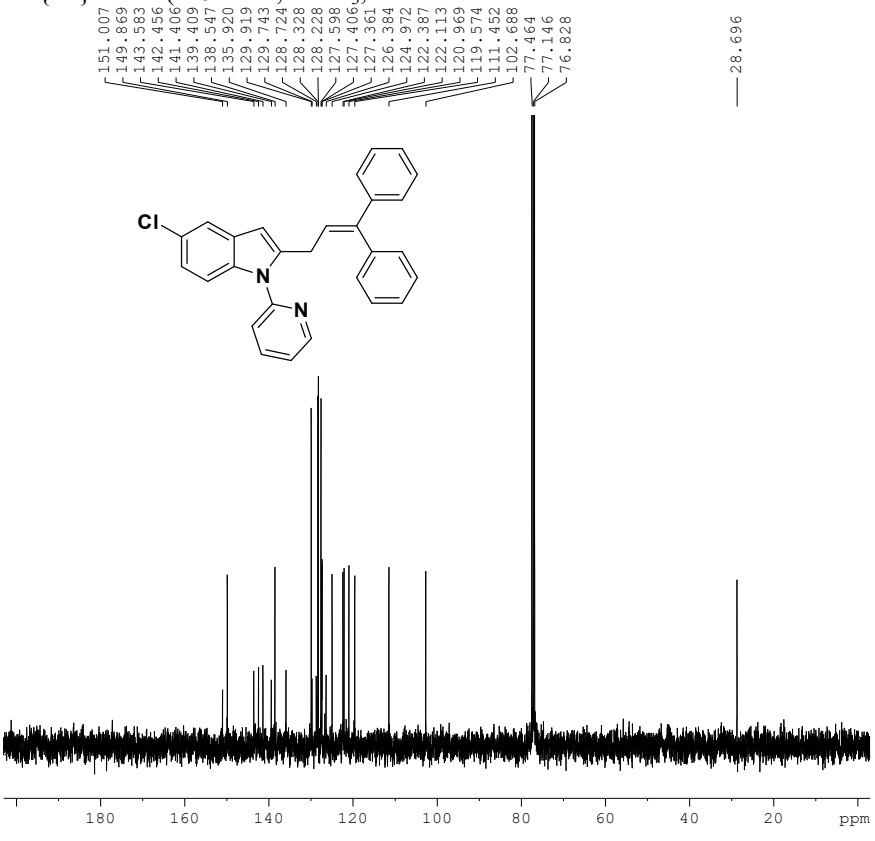

```
Current Data Parameters
NAME          1066 5 cl
EXPNO              342
PROCNO               1

F2 - Acquisition Parameters
Date_          20170918
Time               1.38
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES        0.122266 Hz
AQ            4.0894465 sec
RG               169.77
DW               62.400 usec
DE                6.50 usec
TE                297.4 K
D1           0.50000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                65536
SF          400.1300161 MHz
WDW                 EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME          1066 5 cl
EXPNO              343
PROCNO               1

F2 - Acquisition Parameter
Date_          20170918
Time               1.45
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 H
FIDRES         1.453353 H
AQ            0.3440320 s
RG               19.43
DW               20.800 u
DE                6.50 u
TE               297.9 K
D1           1.00000000 s
D11          0.03000000 s
TD0                  1

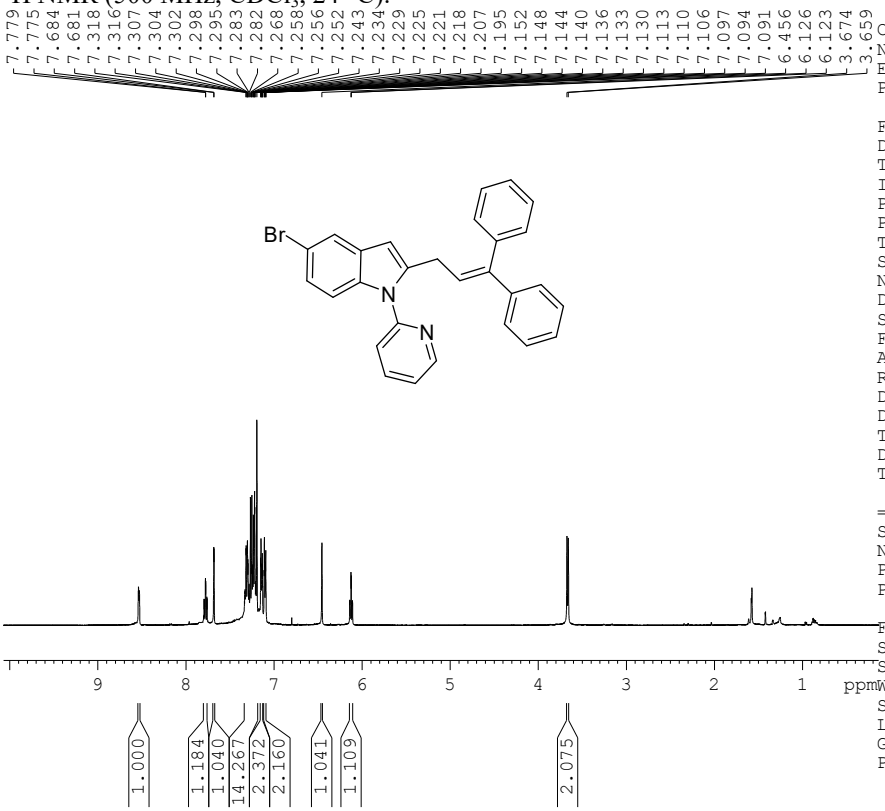
======== CHANNEL f1 =====
SFO1        100.6228289 M
NUC1                13C
P1                9.25 u
PLW1        47.00000000 W

======== CHANNEL f2 =====
SFO2        400.1316005 M
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 u
PLW2         7.75000000 W
PLW12        0.23583999 W
PLW13        0.11863000 W

F2 - Processing parameter
SI                32768
SF          100.6127587 M
WDW                 EM
```

5-Bromo-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3e):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



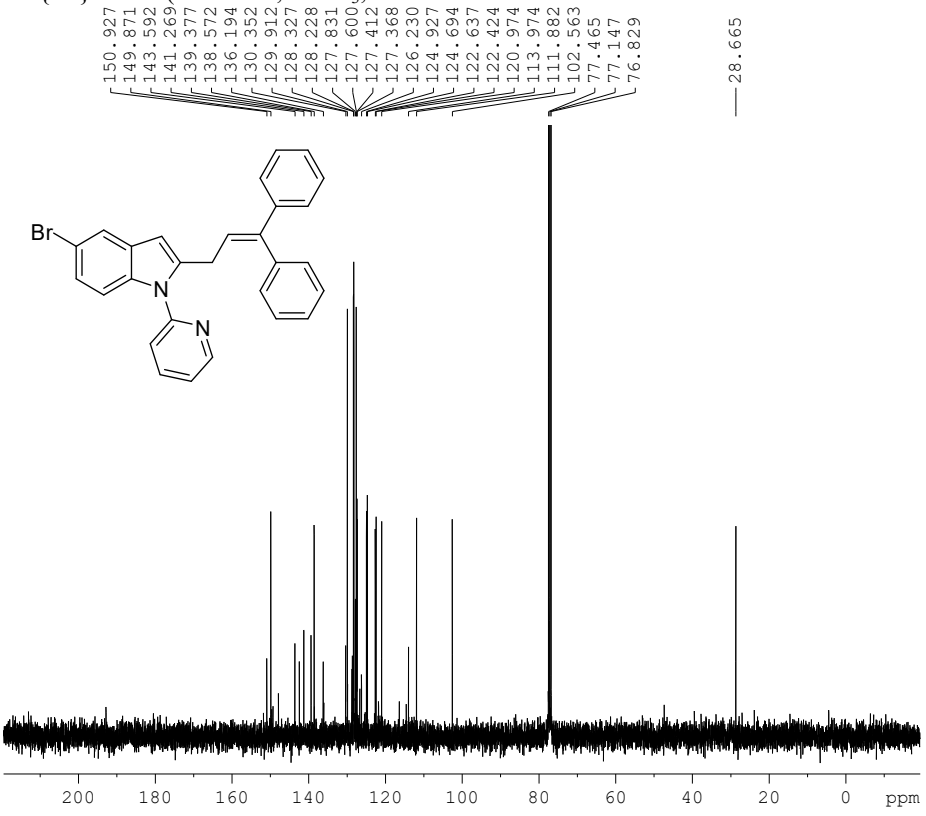

```
Current Data Parameters
NAME      exp. no. 986 and 990 5br
EXPNO                 110
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170719
Time              11.55
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES         0.305176 Hz
AQ            1.6384000 sec
RG                71.49
DW              50.000 usec
DE               6.50 usec
TE               300.1 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                  1H
P1                12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                 65536
SF          500.1500247 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME      exp. no. 986
EXPNO                 5
PROCNO

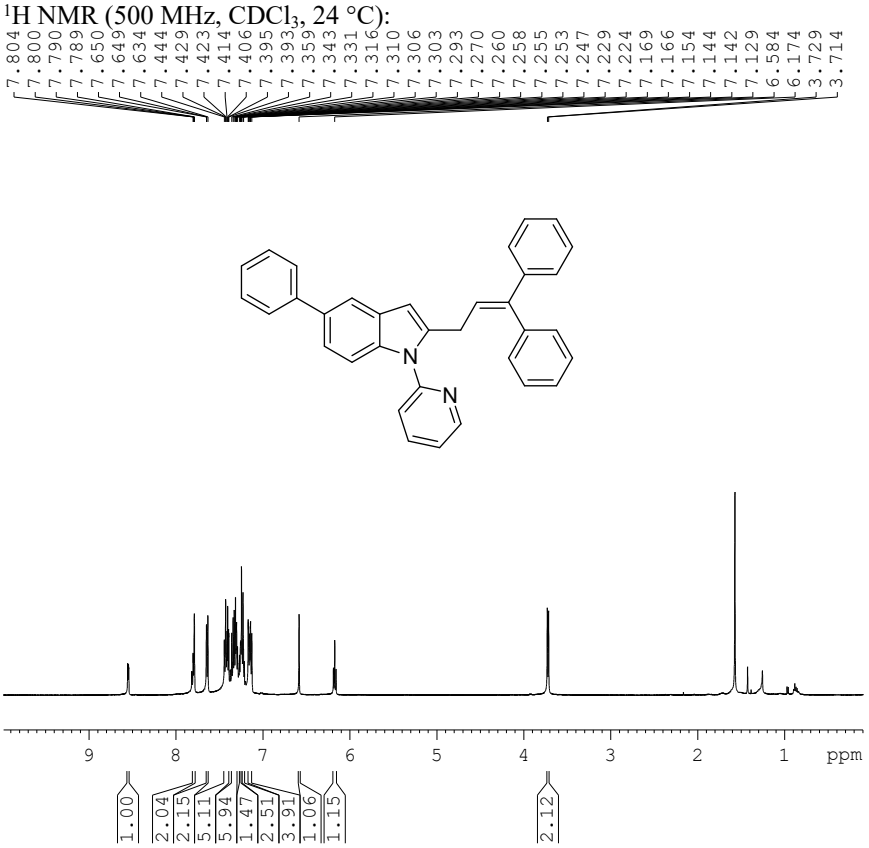
F2 - Acquisition Para
Date_           201707
Time                1.
INSTRUM           spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                165
SOLVENT           CDC
NS                  2
DS
SWH           24038.4
FIDRES         1.4533
AQ            0.34403
RG               200.
DW              20.8
DE                6.
TE               294
D1           1.000000
D11          0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                1
P1                 9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2         waltz
PCPD2              90.
PLW2          7.750000
```

2-(3,3-Diphenylallyl)-5-phenyl-1-(pyridin-2-yl)-1H-indole (3f):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME            1014 5ph
EXPNO              140
PROCNO               1

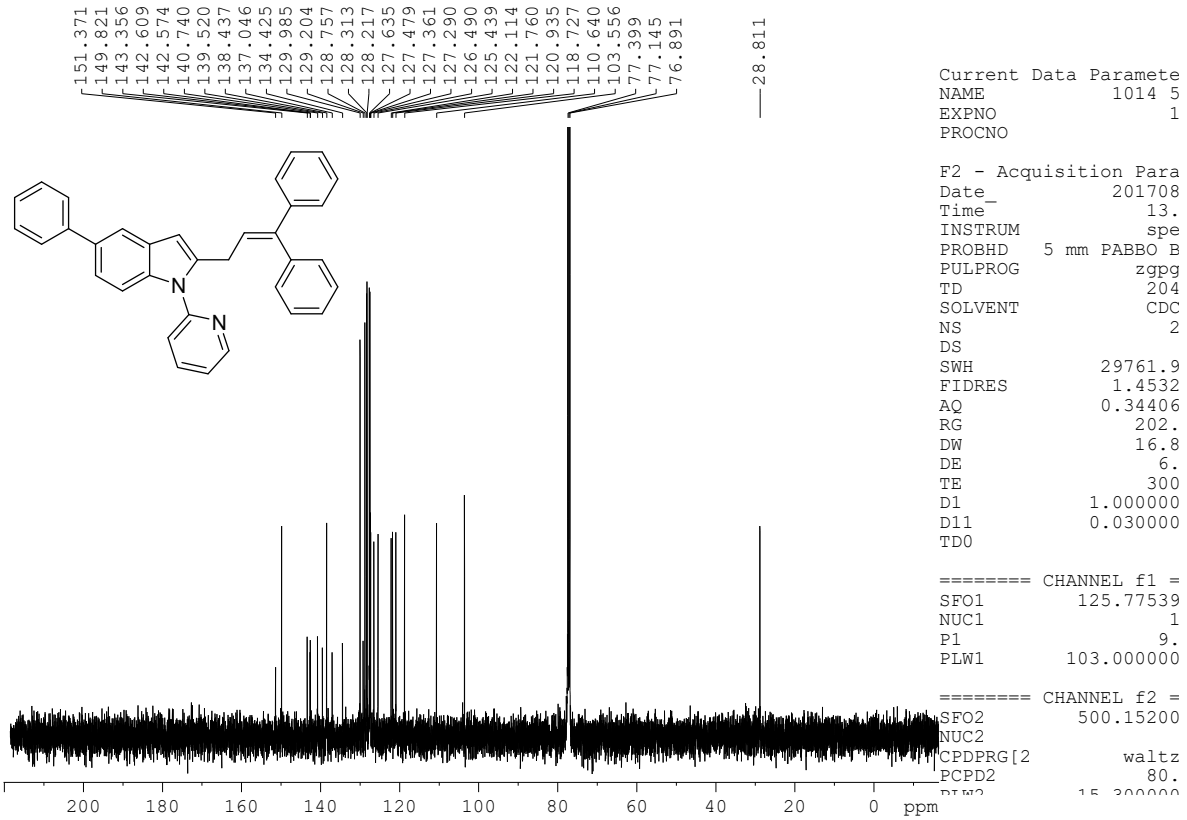
F2 - Acquisition Parameters
Date_           20170816
Time               13.30
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES          0.305176 Hz
AQ             1.6384000 sec
RG                114.76
DW                50.000 usec
DE                 6.50 usec
TE                300.1 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF           500.1500188 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

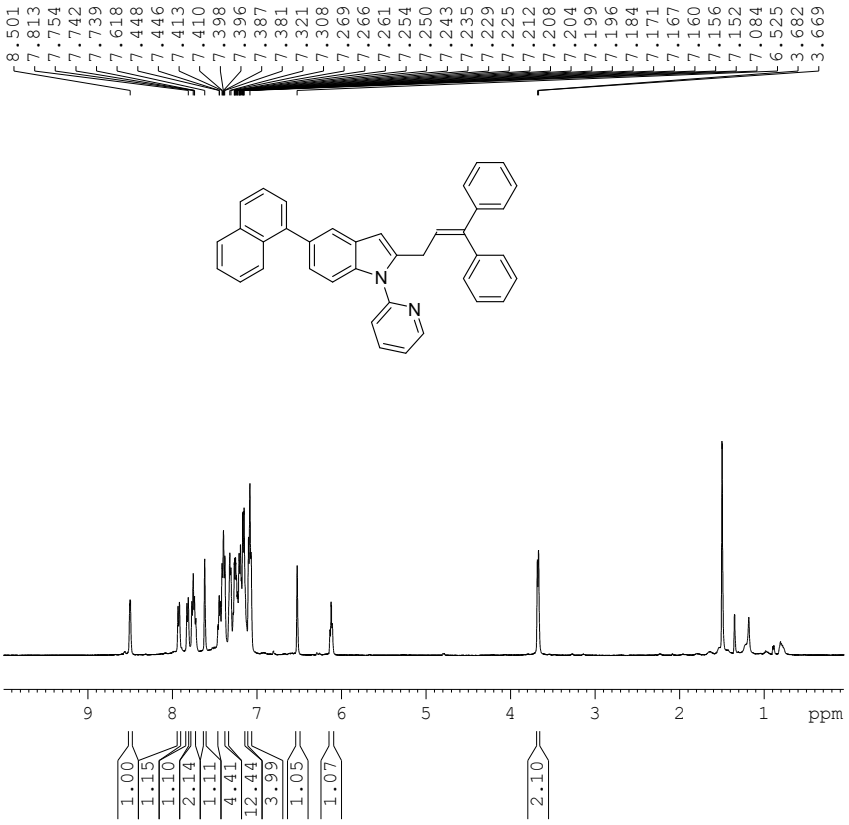
13

C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:



2-(3,3-Diphenylallyl)-5-(naphthalen-1-yl)-1-(pyridin-2-yl)-1H-indole (3g):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



Current Data Parameters
NAME 500 nmr data pure
EXPNO 143
PROCNO 1

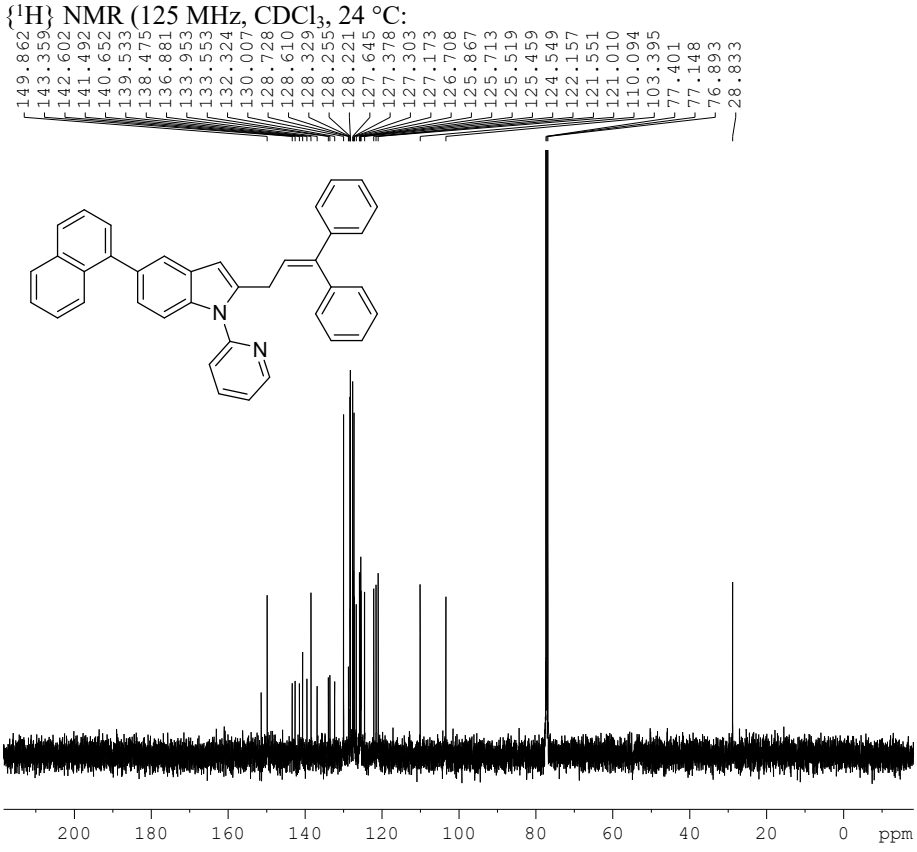
F2 - Acquisition Parameters
Date_ 20170816
Time 13.53
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 32
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6384000 sec
RG 101.5
DW 50.000 usec
DE 6.50 usec
TE 299.8 K
D1 0.50000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1525008 MHz
NUC1 1H
P1 12.75 usec
PLW1 15.30000019 W

F2 - Processing parameters
SI 65536
SF 500.1500589 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:

^{13}C



Current Data Paramete
NAME 500 nmr data
EXPNO 1
PROCNO

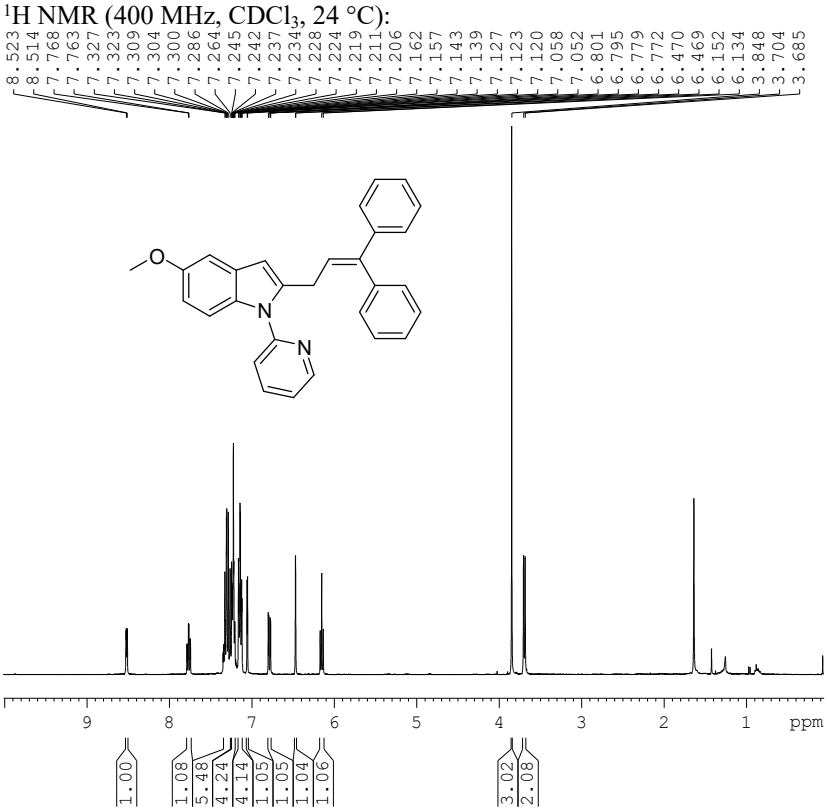
F2 - Acquisition Para
Date_ 201708
Time 14.
INSTRUM spe
PROBHD 5 mm PABBO B
PULPROG zgpg
TD 204
SOLVENT CDC
NS 2
DS
SWH 29761.9
FIDRES 1.4532
AQ 0.34406
RG 202.
DW 16.8
DE 6.
TE 300
D1 1.000000
D11 0.030000
TD0

======== CHANNEL f1 =
SFO1 125.77539
NUC1 1
P1 9.
PLW1 103.000000

======== CHANNEL f2 =
SFO2 500.15200
NUC2
CPDPRG[2 waltz
PCPD2 80.
PLW2 15.300000

2-(3,3-Diphenylallyl)-5-methoxy-1-(pyridin-2-yl)-1*H*-indole (3h):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



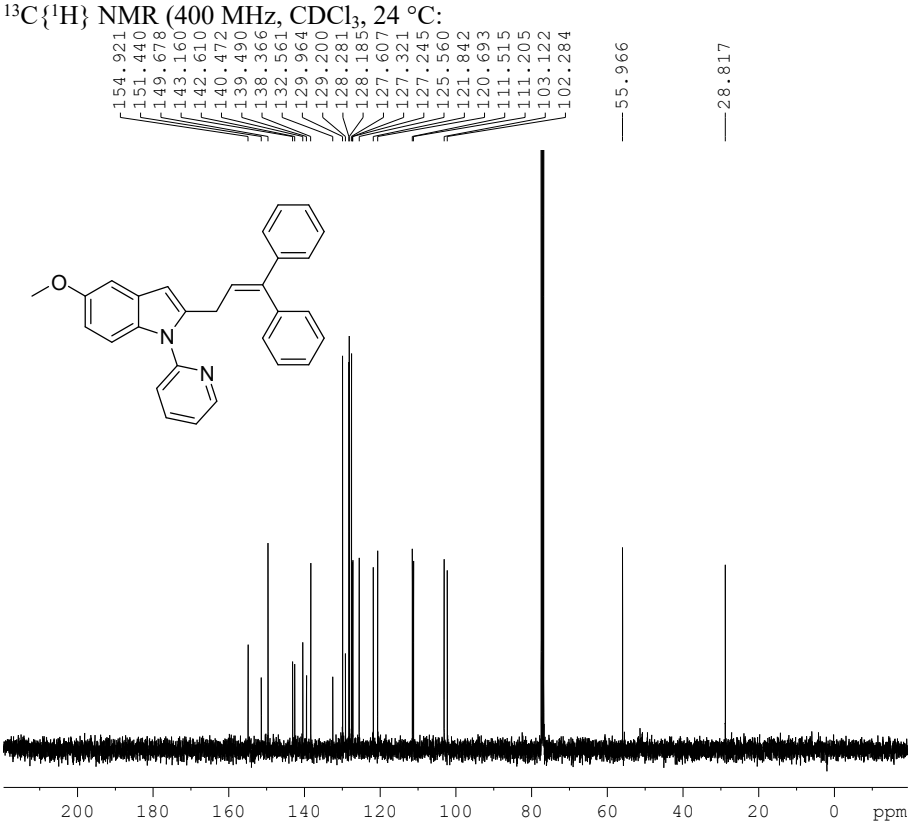

```
Current Data Parameters
NAME      ex. no. 966 and 1104
EXPNO                  518
PROCNO                   1

F2 - Acquisition Parameters
Date_           20171028
Time               10.39
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH              8012.820 Hz
FIDRES           0.122266 Hz
AQ               4.0894465 sec
RG                 138.85
DW                 62.400 usec
DE                  6.50 usec
TE                 292.2 K
D1              0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                  15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                     65536
SF           400.1300157 MHz
WDW                    EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      ex. no. 966 ar
EXPNO                519
PROCNO                 1

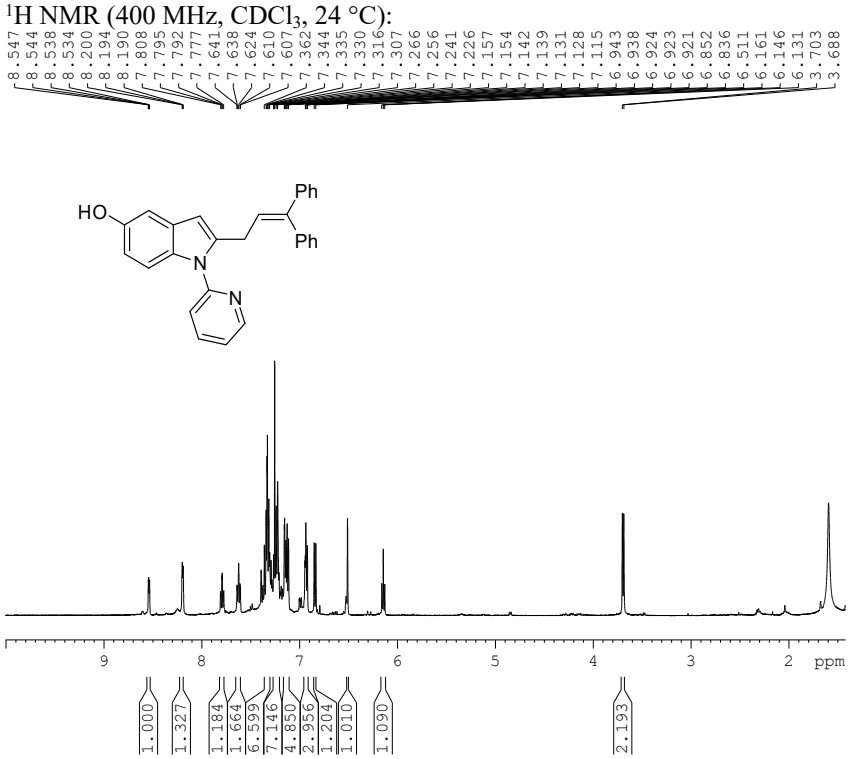
F2 - Acquisition Parame
Date_           2017102
Time               10.4
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg3
TD                 1654
SOLVENT            CDCl3
NS                   25
DS                    4
SWH            24038.46
FIDRES          1.45335
AQ             0.344032
RG                200.3
DW                20.80
DE                 6.5
TE                292.
D1             1.000000
D11            0.030000
TD0                    1

======== CHANNEL f1 ===
SFO1         100.622828
NUC1                13
P1                 9.2
PLW1          47.000000

======== CHANNEL f2 ===
SFO2         400.131600
NUC2                1H
CPDPRG[2         waltz1
PCPD2             90.0
PLW2           7.750000
```

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-indol-5-ol (3i):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



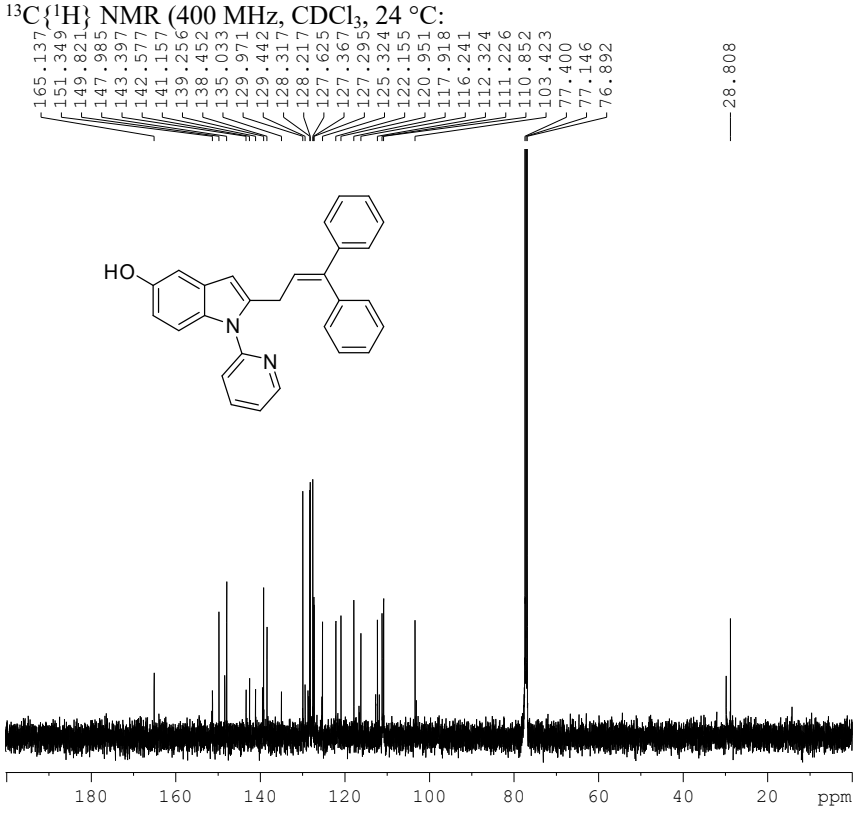

```
Current Data Parameters
NAME                  pure
EXPNO                  108
PROCNO                   1

F2 - Acquisition Parameters
Date_           20180217
Time_               3.55
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH           10000.000 Hz
FIDRES         0.305176 Hz
AQ            1.6384000 sec
RG               124.08
DW               50.000 usec
DE                6.50 usec
TE               301.1 K
D1            0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                 65536
SF          500.1500144 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:




```
Current Data Paramete
NAME                  pu
EXPNO                  1
PROCNO

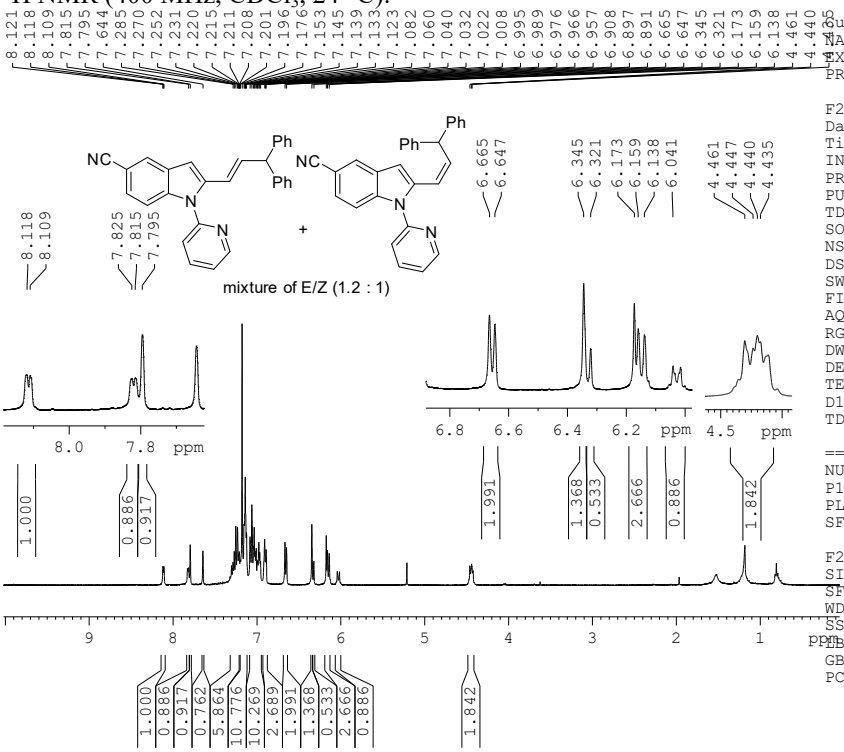
F2 - Acquisition Para
Date_           201802
Time                4.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG            zgpg
TD                  204
SOLVENT             CDC
NS                    5
DS
SWH            29761.9
FIDRES          1.4532
AQ             0.34406
RG                202.
DW                16.8
DE                  6.
TE                301
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         125.77539
NUC1                 1
P1                  9.
PLW1        103.000000

======== CHANNEL f2 =
SFO2         500.15200
NUC2
CPDPRG[2          waltz
PCPD2              80.
PLW2         15.300000
```

Mixture of (E)-2-(3,3-Diphenylprop-1-en-1-yl)-1-(pyridin-2-yl)-1H-indole-5-carbonitrile (xx) and (Z)-2-(3,3-Diphenylprop-1-en-1-yl)-1-(pyridin-2-yl)-1H-indole-5-carbonitrile (3j):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



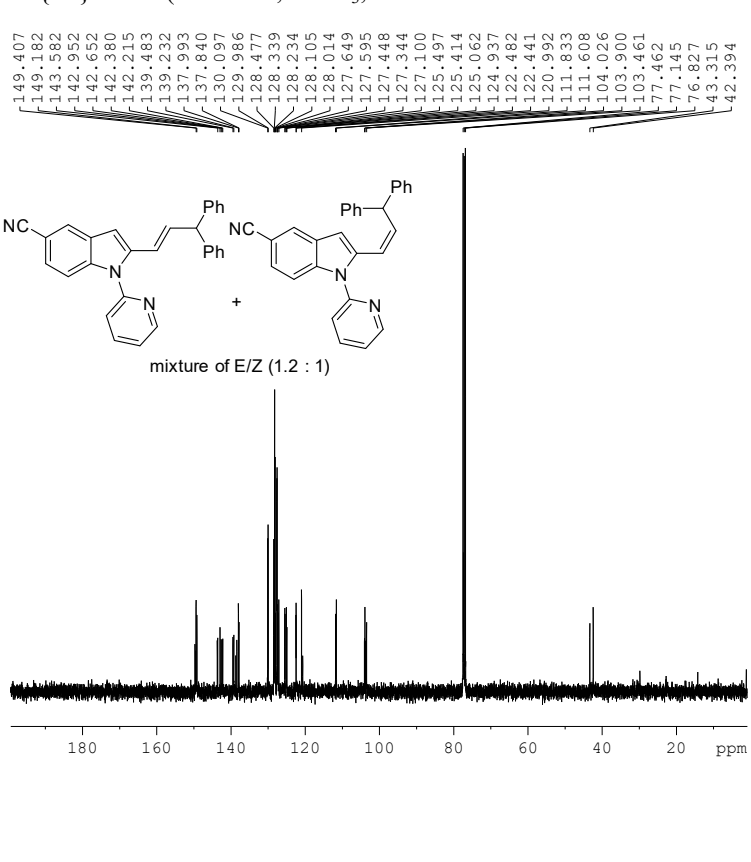

```
Current Data Parameters
NAME              PLOTTED
EXPNO                 161
PROCNO                  1

F2 - Acquisition Parameters
Date_           20210619
Time              12.15
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    8
DS                    2
SWH            8012.820 Hz
FIDRES        0.122266 Hz
AQ            4.0894465 sec
RG               169.77
DW               62.400 usec
DE                6.50 usec
TE                299.4 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
NUC1                 1H
P1                15.00 usec
PLW1         10.50000000 W
SFO1        400.1320007 MHz

F2 - Processing parameters
SI                65536
SF         400.1300429 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:




```
Current Data Parameters
NAME              PLOTTED
EXPNO                 162
PROCNO                  1

F2 - Acquisition Parameters
Date_           20210619
Time              12.30
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  600
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ            0.3440320 sec
RG               200.34
DW               20.800 usec
DE                6.50 usec
TE                300.4 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

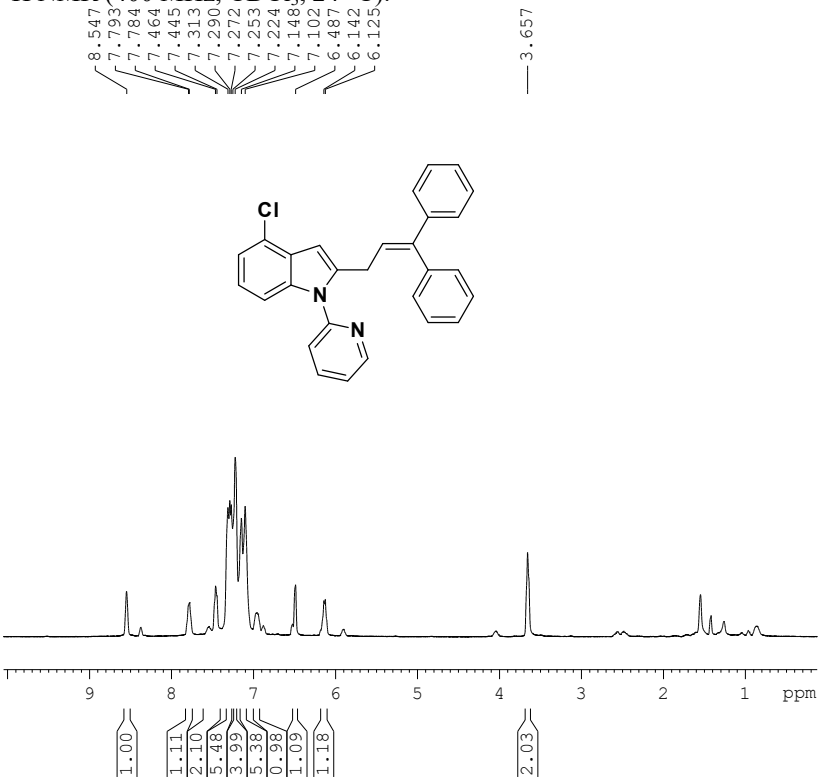
======== CHANNEL f1 ========
NUC1                13C
P1                10.00 usec
PLW1         47.00000000 W
SFO1        100.6228289 MHz

======== CHANNEL f2 ========
CPDPRG[2         waltz16
NUC2                 1H
PCPD2             90.00 usec
PLW2         10.50000000 W
PLW12         0.29166999 W
PLW13         0.23625000 W
SFO2        400.1316005 MHz

F2 - Processing parameters
SI                32768
SF         100.6127585 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

4-Chloro-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3k):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



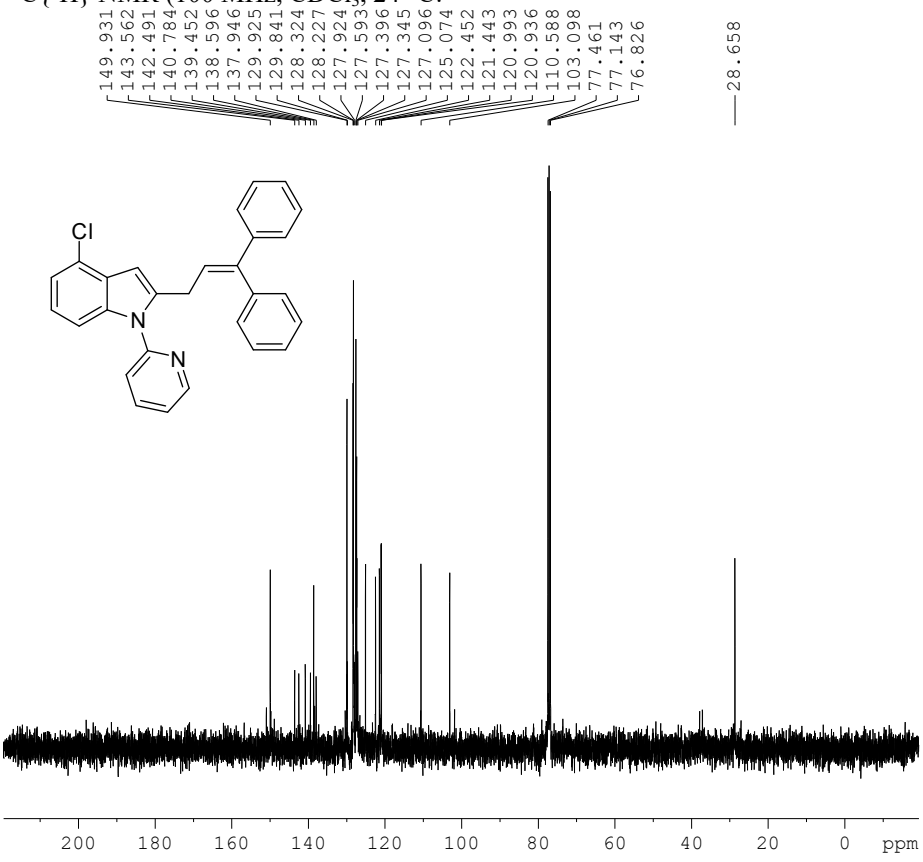

```
Current Data Parameters
NAME      exp. no. 1067 and
EXPNO                  448
PROCNO                   1

F2 - Acquisition Parameters
Date_           20170924
Time              17.33
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ            4.0894465 sec
RG               138.85
DW               62.400 usec
DE                6.50 usec
TE               304.2 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                 1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                65536
SF           400.1300217 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME      exp. no. 106
EXPNO                4
PROCNO

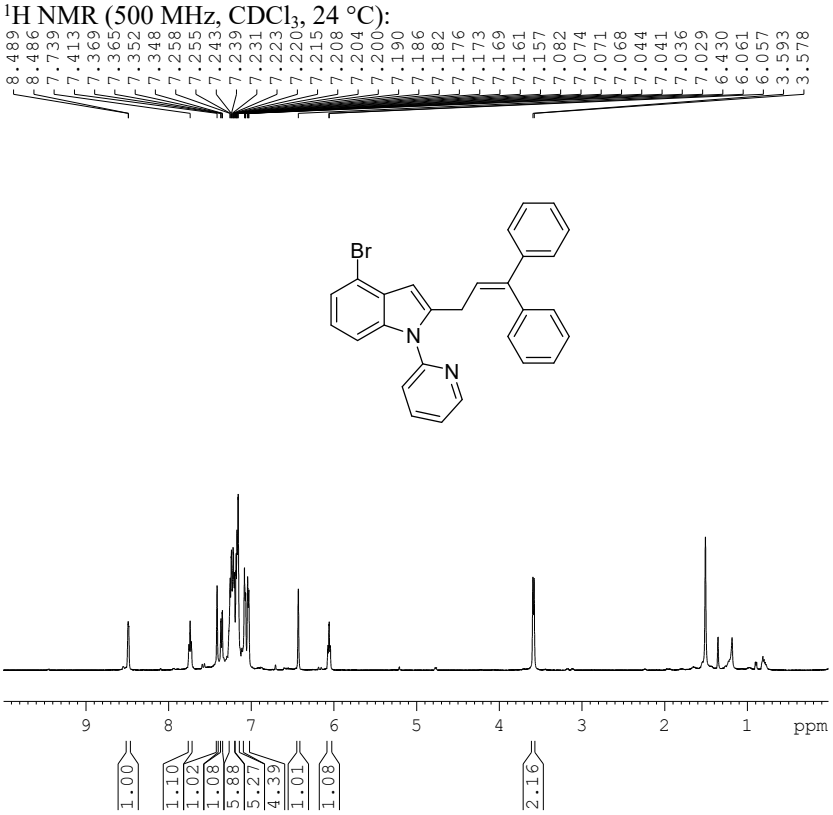
F2 - Acquisition Para
Date_           201709
Time               17.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                 165
SOLVENT            CDC
NS                   2
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                305
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                 1
P1                  9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2          waltz
PCPD2              90.
PLW2          7.750000
```

4-Bromo-2-(3,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3l):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



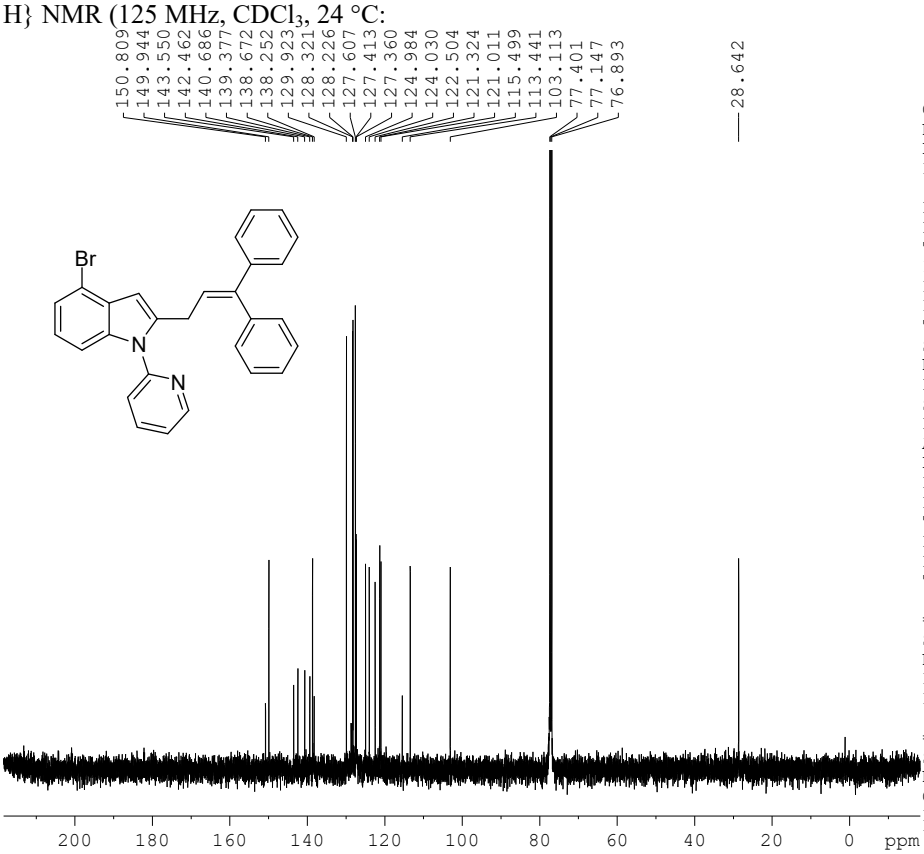

```
Current Data Parameters
NAME          1071 4 br
EXPNO              153
PROCNO               1

F2 - Acquisition Parameters
Date_          20170922
Time               4.11
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES         0.305176 Hz
AQ            1.6384000 sec
RG               114.76
DW               50.000 usec
DE                6.50 usec
TE                294.0 K
D1           0.50000000 sec
TD0                  1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1               1H
P1               12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                65536
SF          500.1500511 MHz
WDW                EM
SSB       0
LB              0.30 Hz
GB        0
PC              1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:




```
Current Data Paramete
NAME          1071 4
EXPNO              1
PROCNO

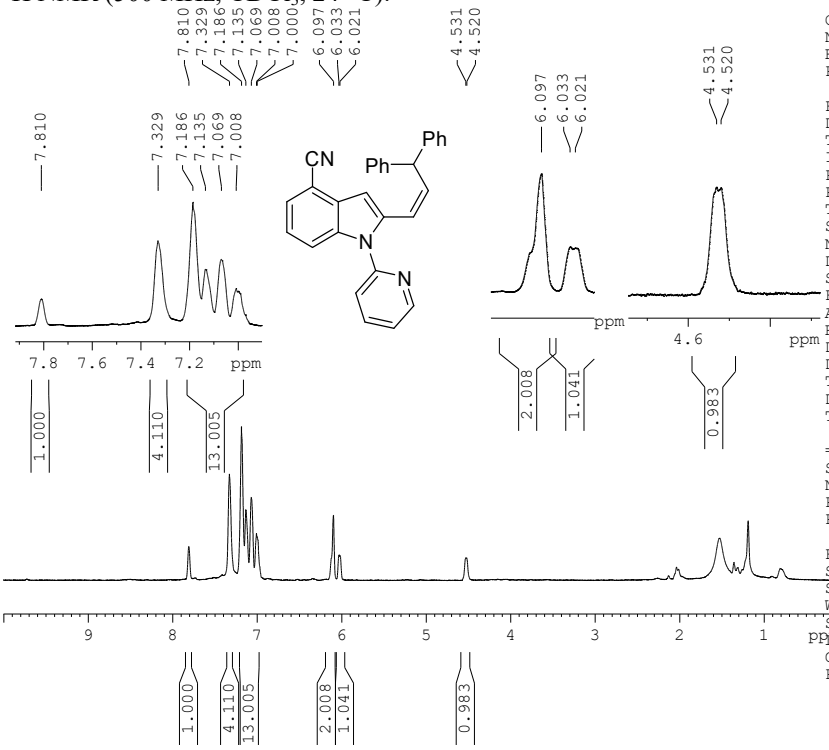
F2 - Acquisition Para
Date_          201709
Time               4.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                204
SOLVENT           CDC
NS                  5
DS
SWH           29761.9
FIDRES         1.4532
AQ            0.34406
RG               202.
DW               16.8
DE                 6.
TE               294
D1           1.000000
D11          0.030000
TD0

======== CHANNEL f1 =
SFO1        125.77539
NUC1               1
P1                 9.
PLW1       103.000000

======== CHANNEL f2 =
SFO2        500.15200
NUC2
CPDPRG[2         waltz
PCPD2             80.
PLW2          15.300000
```

(E)-2-(3,3-Diphenylprop-1-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole-4-carbonitrile(3m):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



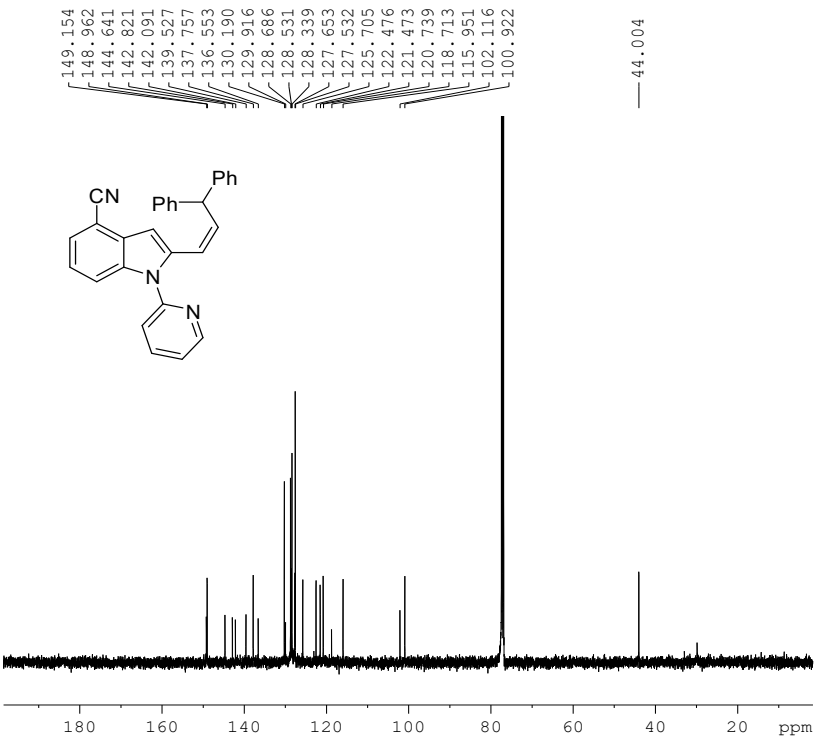

```
Current Data Parameters
NAME                  plotted
EXPNO                     454
PROCNO                      1

F2 - Acquisition Parameters
Date_               20170924
Time                   18.07
INSTRUM                spect
PROBHD   5 mm PABBO BB-
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                       16
DS                        2
SWH                8012.820 Hz
FIDRES             0.122266 Hz
AQ                 4.0894465 sec
RG                    200.34
DW                    62.400 usec
DE                     6.50 usec
TE                    303.7 K
D1                 0.50000000 sec
TD0                         1

======== CHANNEL f1 ========
SFO1           400.1320007 MHz
NUC1                      1H
P1                     15.70 usec
PLW1            7.75000000 W

F2 - Processing parameters
SI                        65536
SF               400.1300388 MHz
WDW                         EM
SSB                          0
LB                        0.30 Hz
GB                           0
PC                        1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME                  plotted
EXPNO                     187
PROCNO                      1

F2 - Acquisition Parameters
Date_               20170927
Time                    7.07
INSTRUM                spect
PROBHD   5 mm PABBO BB/
PULPROG              zgpg30
TD                    20480
SOLVENT               CDCl3
NS                     2000
DS                        4
SWH               29761.904 Hz
FIDRES             1.453218 Hz
AQ                 0.3440640 sec
RG                    202.34
DW                    16.800 usec
DE                     6.50 usec
TE                    298.7 K
D1                 1.00000000 sec
D11                0.03000000 sec
TD0                         1

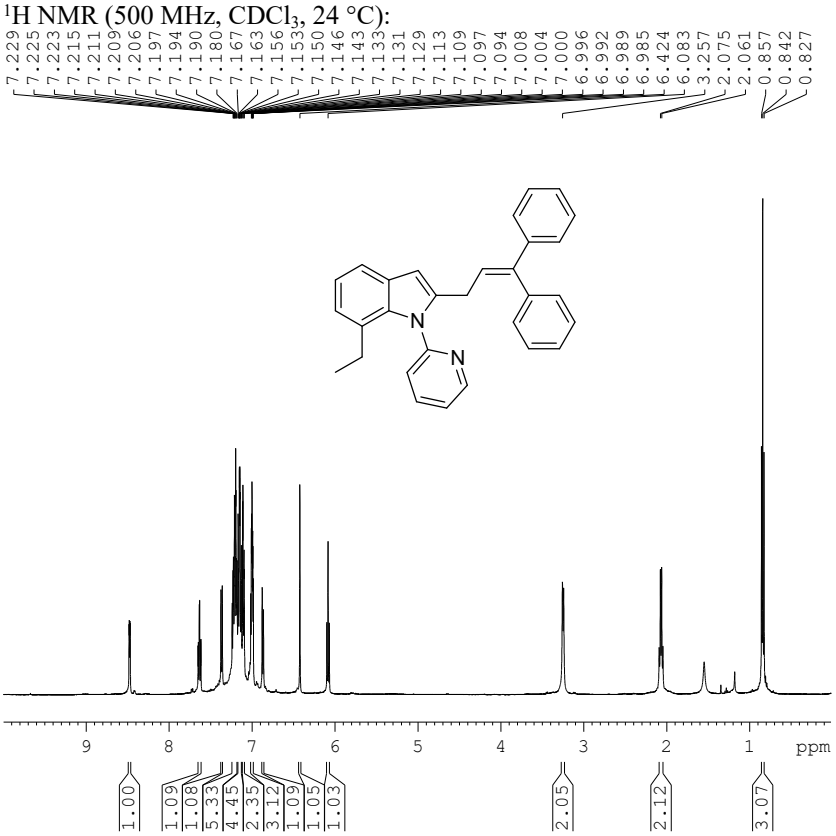
======== CHANNEL f1 ========
SFO1           125.7753932 MHz
NUC1                      13C
P1                     9.88 usec
PLW1           103.00000000 W

======== CHANNEL f2 ========
SFO2           500.1520006 MHz
NUC2                      1H
CPDPRG[2             waltz16
PCPD2                 80.00 usec
PLW2           15.30000019 W
PLW12           0.38863000 W
PLW13           0.19548000 W

F2 - Processing parameters
SI                        32768
SF               125.7628029 MHz
WDW                         EM
SSB                          0
LB                        1.00 Hz
GB                           0
PC                        1.40
```

2-(3,3-Diphenylallyl)-7-ethyl-1-(pyridin-2-yl)-1*H*-indole (3n):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



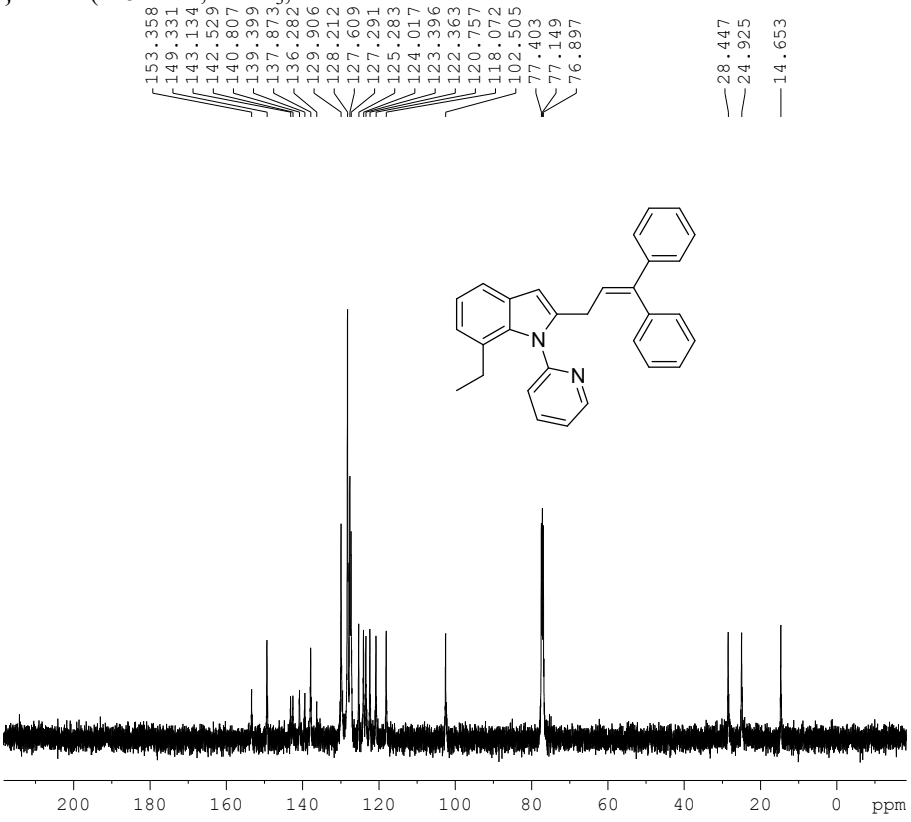

```
Current Data Parameters
NAME      ex. no. 1059 7et
EXPNO                  43
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170911
Time               15.23
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH           10000.000 Hz
FIDRES         0.305176 Hz
AQ            1.6384000 sec
RG                    64
DW                50.000 usec
DE                 6.50 usec
TE                299.8 K
D1           0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                 65536
SF          500.1500679 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:




```
Current Data Paramete
NAME      ex. no. 1059
EXPNO
PROCNO

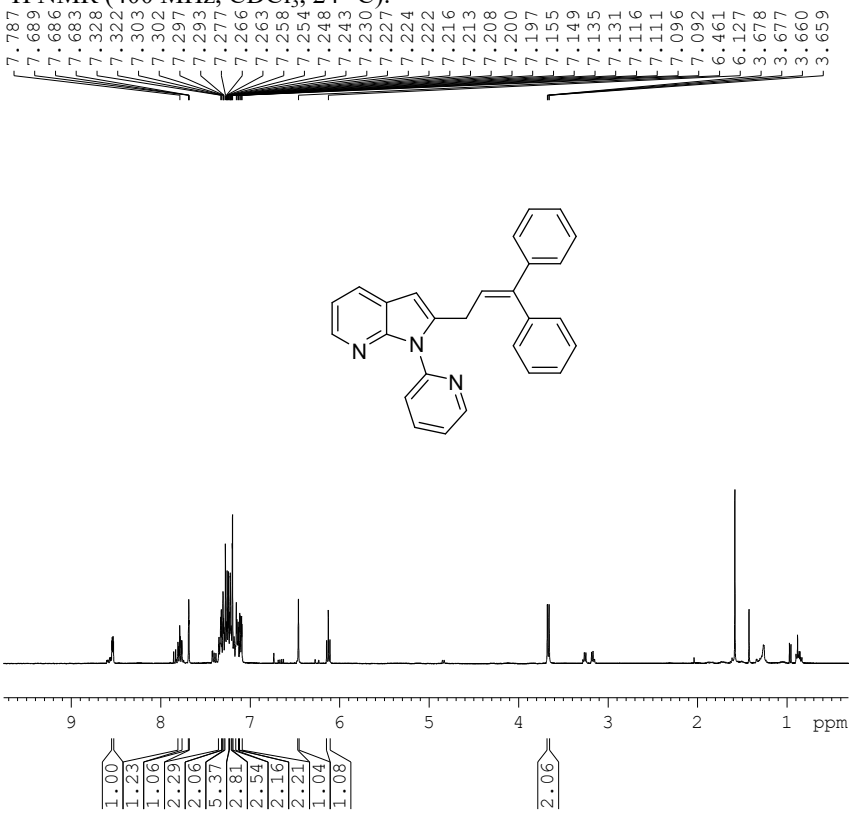
F2 - Acquisition Para
Date_           201709
Time               7.
INSTRUM           spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                 204
SOLVENT            CDC
NS                   5
DS
SWH            29761.9
FIDRES          1.4532
AQ             0.34406
RG                202.
DW                16.8
DE                  6.
TE                300
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         125.77539
NUC1                 1
P1                  9.
PLW1        103.000000

======== CHANNEL f2 =
SFO2         500.15200
NUC2
CPDPRG[2          waltz
PCPD2              80.
PLW2         15.300000
```

2-(3,3-Diphenylallyl)-1-(pyridin-2-yl)-1*H*-pyrrolo[2,3-b]pyridine (3o):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



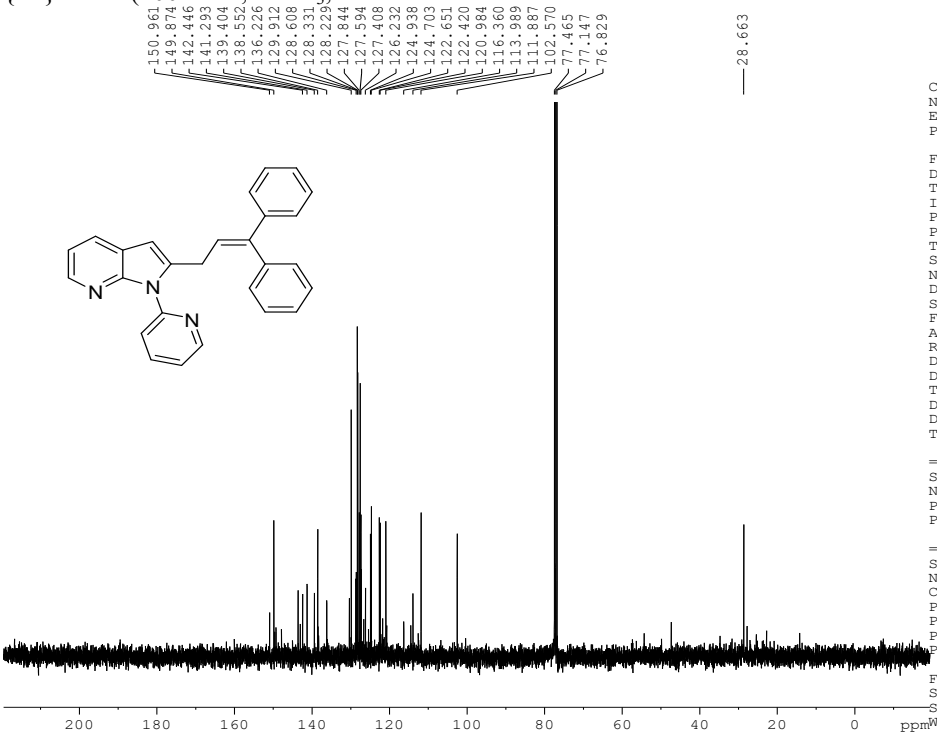

```
Current Data Parameters
NAME         1035 7n prd
EXPNO                583
PROCNO                 1

F2 - Acquisition Parameters
Date_           20170827
Time               22.24
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 153.13
DW                 62.400 usec
DE                  6.50 usec
TE                 298.8 K
D1            0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300165 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C {^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME         1035 7n prd
EXPNO                584
PROCNO                 1

F2 - Acquisition Parameter
Date_           20170827
Time               22.30
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 16540
SOLVENT            CDCl3
NS                   256
DS                     4
SWH            24038.461 H
FIDRES          1.453353 H
AQ             0.3440320 s
RG                 200.34
DW                 20.800 u
DE                  6.50 u
TE                 299.2 K
D1            1.00000000 s
D11           0.03000000 s
TD0                    1

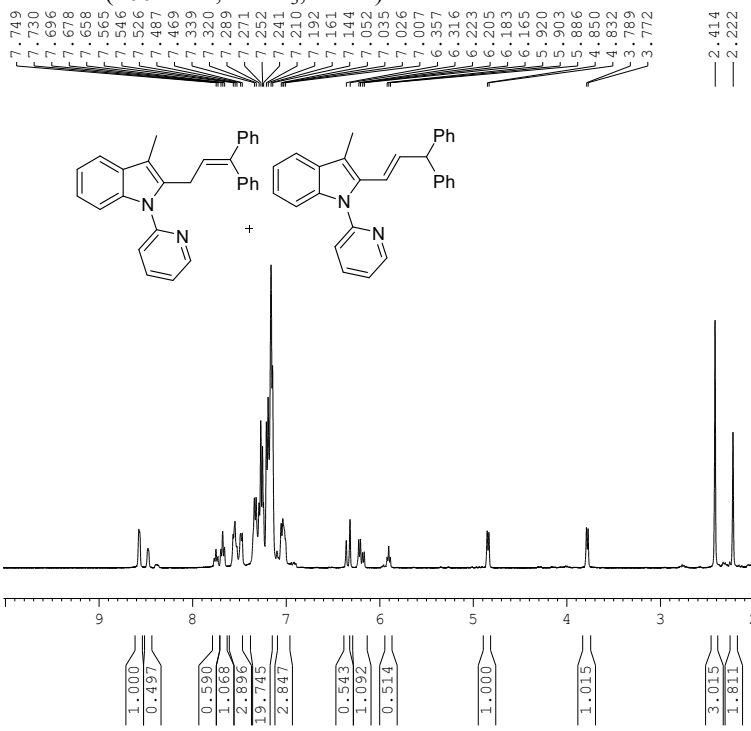
======== CHANNEL f1 =====
SFO1         100.6228289 M
NUC1                  13C
P1                  9.25 u
PLW1         47.00000000 W

======== CHANNEL f2 =====
SFO2         400.1316005 M
NUC2                   1H
CPDPRG[2          waltz16
PCPD2               90.00 u
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W

F2 - Processing parameter
SI                 32768
SF           100.6127586 M
WDW                   EM
```

2-(3,3-Diphenylallyl)-3-methyl-1-(pyridin-2-yl)-1H-indole and (E)-2-(3,3-Diphenylprop-1-en-1-yl)-3-methyl-1-(pyridin-2-yl)-1*H*-indole (3p):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

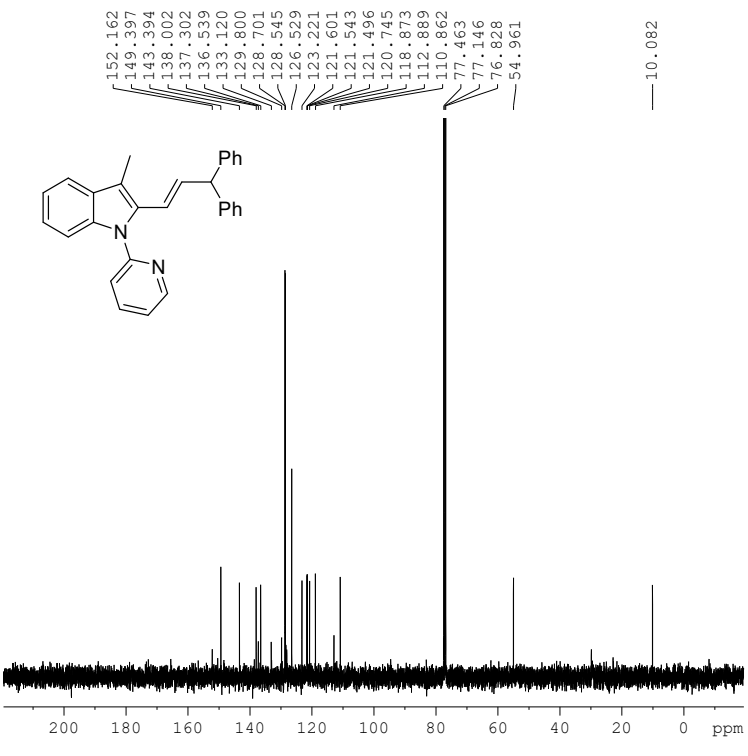



```
Current Data Parameters
NAME      1077 indole 3 methyl prd
EXPNO                 27
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171003
Time              23.44
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ             4.0894465 sec
RG                124.58
DW                62.400 usec
DE                 6.50 usec
TE                296.8 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                65536
SF          400.1300185 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```




```
Current Data Parameters
NAME      1077 indole 3 methyl prd
EXPNO                 26
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171003
Time              23.38
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ            0.3440320 sec
RG               200.34
DW                20.800 usec
DE                 6.50 usec
TE                297.5 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

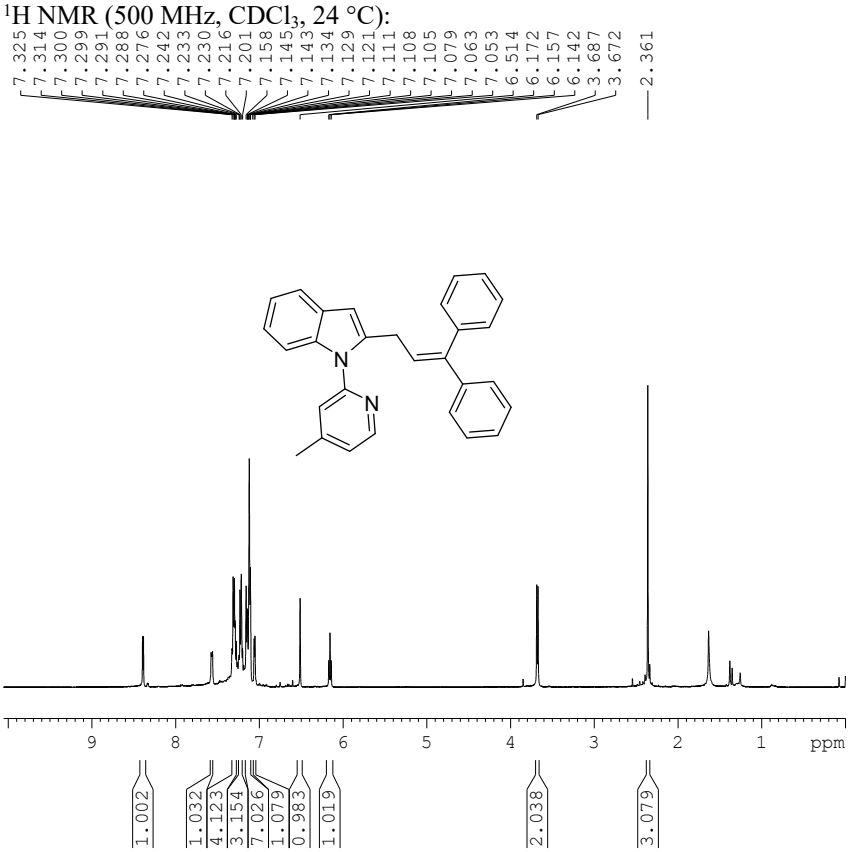
======== CHANNEL f1 ========
SFO1         100.6228289 MHz
NUC1                13C
P1                 9.25 usec
PLW1         47.00000000 W

======== CHANNEL f2 ========
SFO2         400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W

F2 - Processing parameters
SI                32768
SF          100.6127579 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

2-(3,3-Diphenylallyl)-1-(4-methylpyridin-2-yl)-1*H*-indole (3q):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



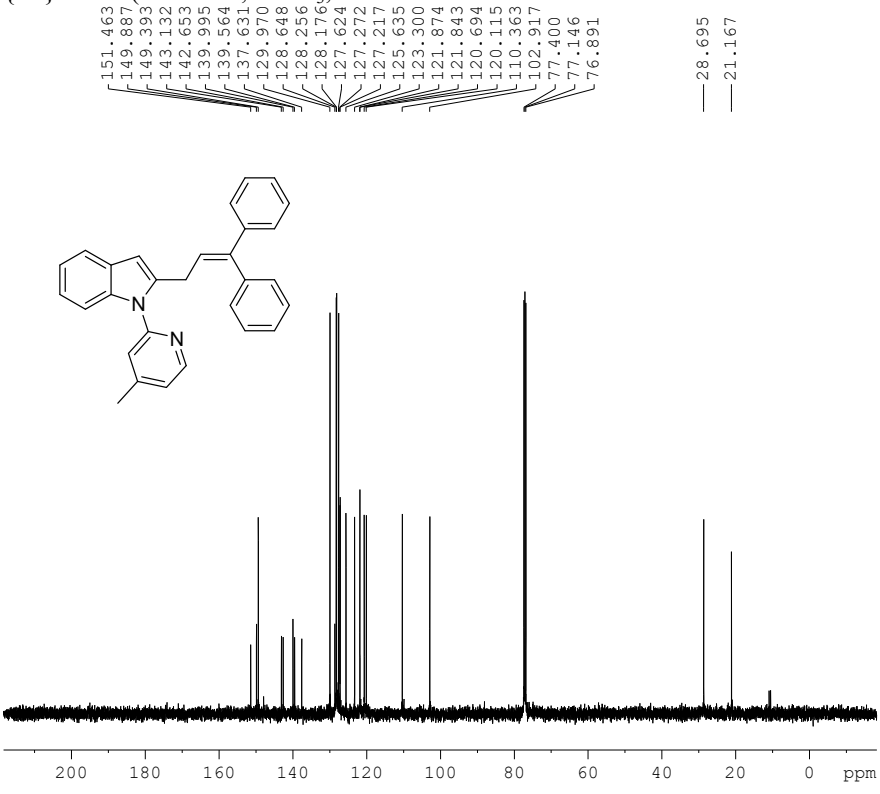

```
Current Data Parameters
NAME      exp. no. 1020 3me py
EXPNO                  118
PROCNO                   1

F2 - Acquisition Parameters
Date_            20170814
Time                15.40
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG              zg30
TD                  32768
SOLVENT             CDCl3
NS                     32
DS                      2
SWH             10000.000 Hz
FIDRES           0.305176 Hz
AQ              1.6384000 sec
RG                  71.49
DW                 50.000 usec
DE                  6.50 usec
TE                 300.9 K
D1              0.50000000 sec
TD0                     1

======== CHANNEL f1 ========
SFO1          500.1525008 MHz
NUC1                    1H
P1                  12.75 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                    65536
SF            500.1500269 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

^{13}C {^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:



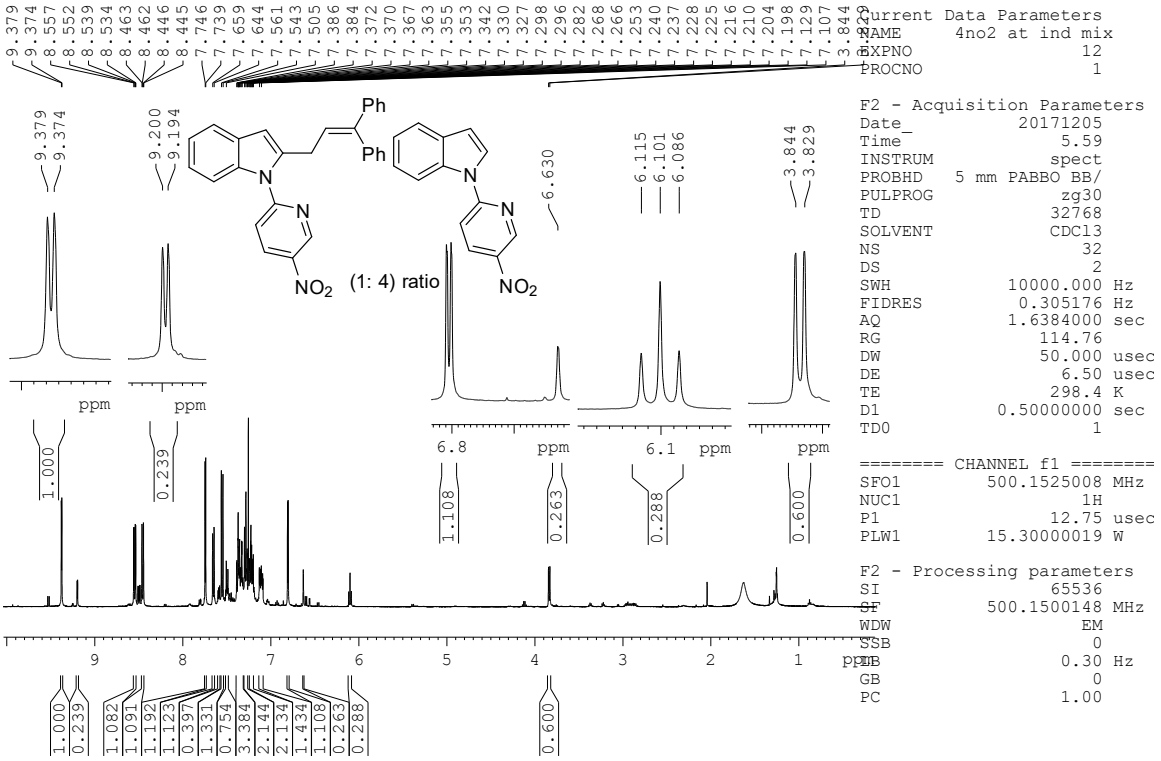

```
Current Data Paramete
NAME      exp. no. 10
EXPNO              1
PROCNO

F2 - Acquisition Para
Date_          201708
Time              15.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                204
SOLVENT           CDC
NS                  2
DS
SWH           29761.9
FIDRES         1.4532
AQ            0.34406
RG               202.
DW              16.8
DE                 6.
TE               301
D1            1.000000
D11           0.030000
TD0

======== CHANNEL f1 =
SFO1        125.77539
NUC1                1
P1                 9.
PLW1       103.000000

======== CHANNEL f2 =
SFO2        500.15200
NUC2
CPDPRG[2         waltz
PCPD2             80.
PLW2        15.300000
```

2-(3,3-Diphenylallyl)-1-(5-nitropyridin-2-yl)-1*H*-indole and 1-(5-nitropyridin-2-yl)-1*H*-indole(3r): ^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



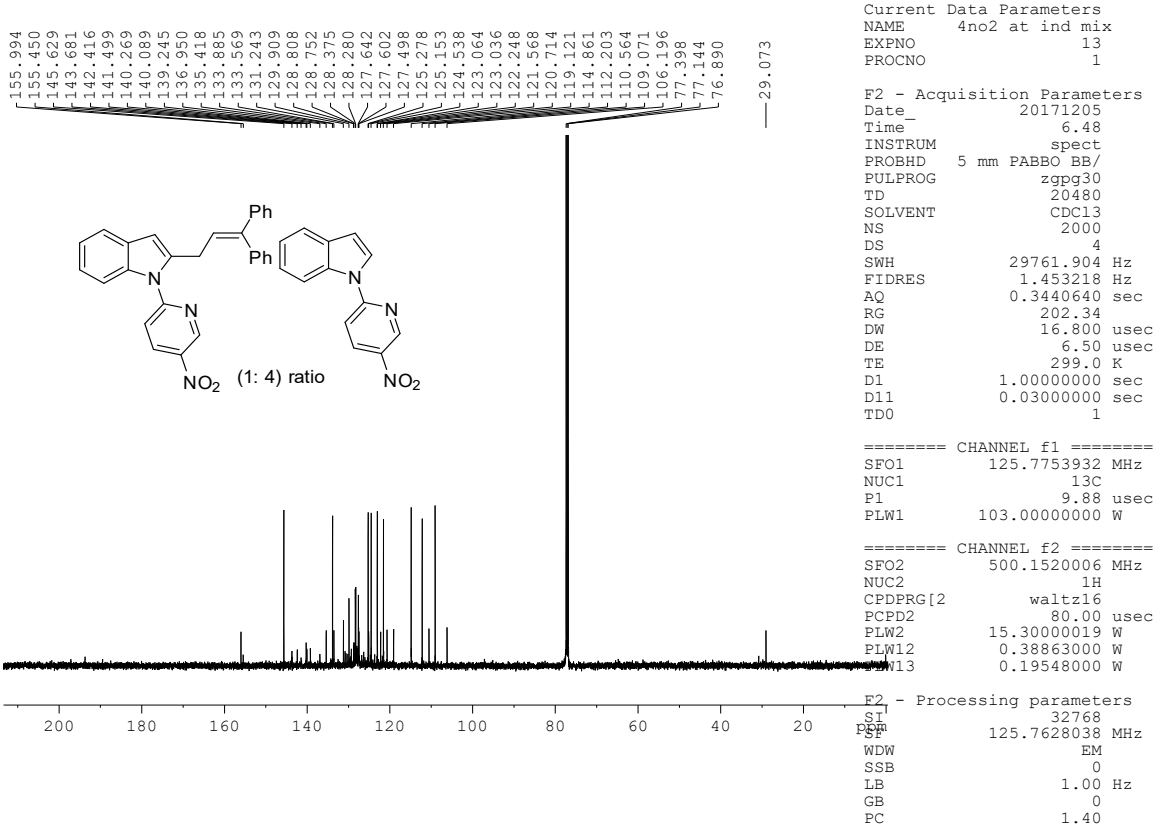
Current Data Parameters
NAME 4no2 at ind mix
EXPNO 12
PROCNO 1

F2 - Acquisition Parameters
Date_ 20171205
Time 5.59
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 32
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 1.6384000 sec
RG 114.76
DW 50.000 usec
DE 6.50 usec
TE 298.4 K
D1 0.50000000 sec
TD0 1

======== CHANNEL f1 ========
SFO1 500.1525008 MHz
NUC1 1H
P1 12.75 usec
PLW1 15.30000019 W

F2 - Processing parameters
SI 65536
SF 500.1500148 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

$^{13}C\{^1H\}$ NMR (400 MHz, $CDCl_3$, 24 °C:



Current Data Parameters
NAME 4no2 at ind mix
EXPNO 13
PROCNO 1

F2 - Acquisition Parameters
Date_ 20171205
Time 6.48
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 20480
SOLVENT CDCl3
NS 2000
DS 4
SWH 29761.904 Hz
FIDRES 1.453218 Hz
AQ 0.3440640 sec
RG 202.34
DW 16.800 usec
DE 6.50 usec
TE 299.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

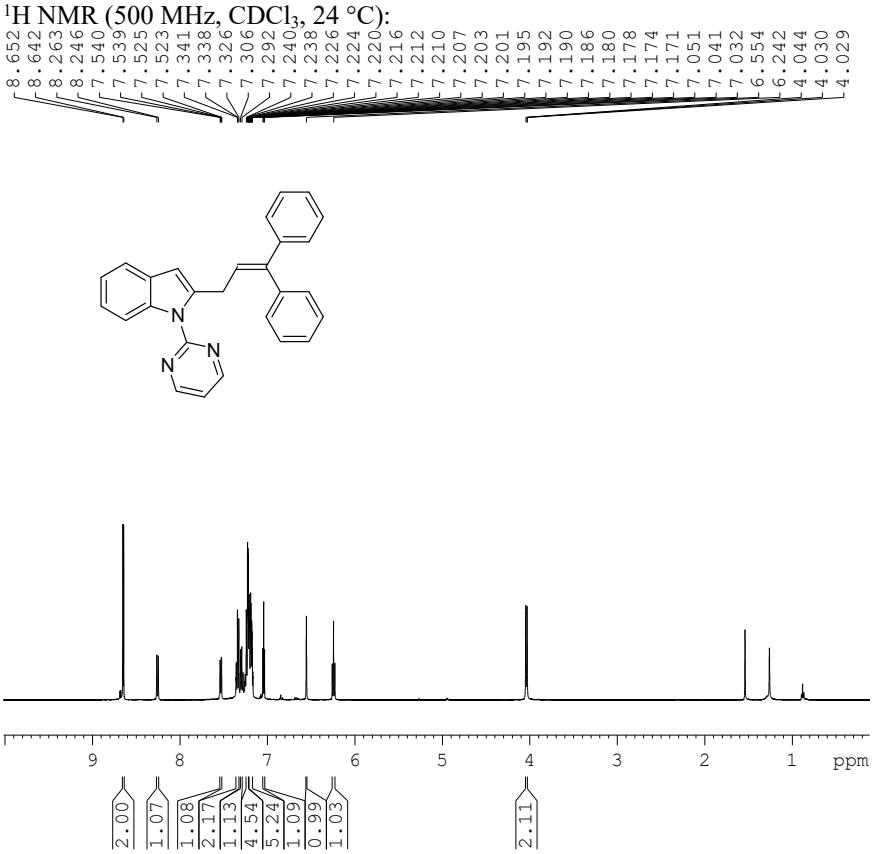
======== CHANNEL f1 ========
SFO1 125.7753932 MHz
NUC1 13C
P1 9.88 usec
PLW1 103.00000000 W

======== CHANNEL f2 ========
SFO2 500.1520006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 15.30000019 W
PLW12 0.38863000 W
PLW13 0.19548000 W

F2 - Processing parameters
SI 32768
SF 125.7628038 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

2-(3,3-diphenylallyl)-1-(pyrimidin-2-yl)-1H-indole (3s):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



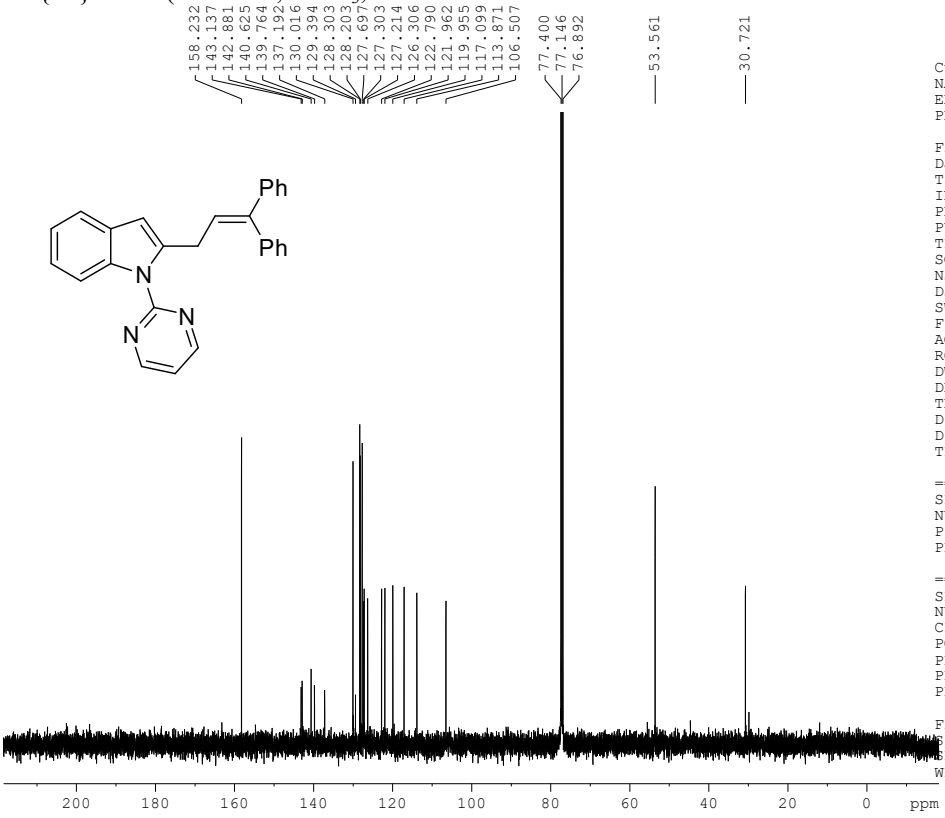

```
Current Data Parameters
NAME      994 pym direct allyl
EXPNO                 150
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170720
Time                18.22
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES          0.305176 Hz
AQ             1.6384000 sec
RG                 71.49
DW                50.000 usec
DE                 6.50 usec
TE                302.0 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF            500.1500286 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME           spa50617
EXPNO                99
PROCNO                1

F2 - Acquisition Paramete
Date_           20170623
Time                7.52
INSTRUM             spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 20480
SOLVENT            CDCl3
NS                   256
DS                     4
SWH            29761.904 H
FIDRES          1.453218 H
AQ             0.3440640 s
RG                 202.34
DW                16.800 u
DE                 6.50 u
TE                296.4 K
D1             1.00000000 s
D11            0.03000000 s
TD0                    1

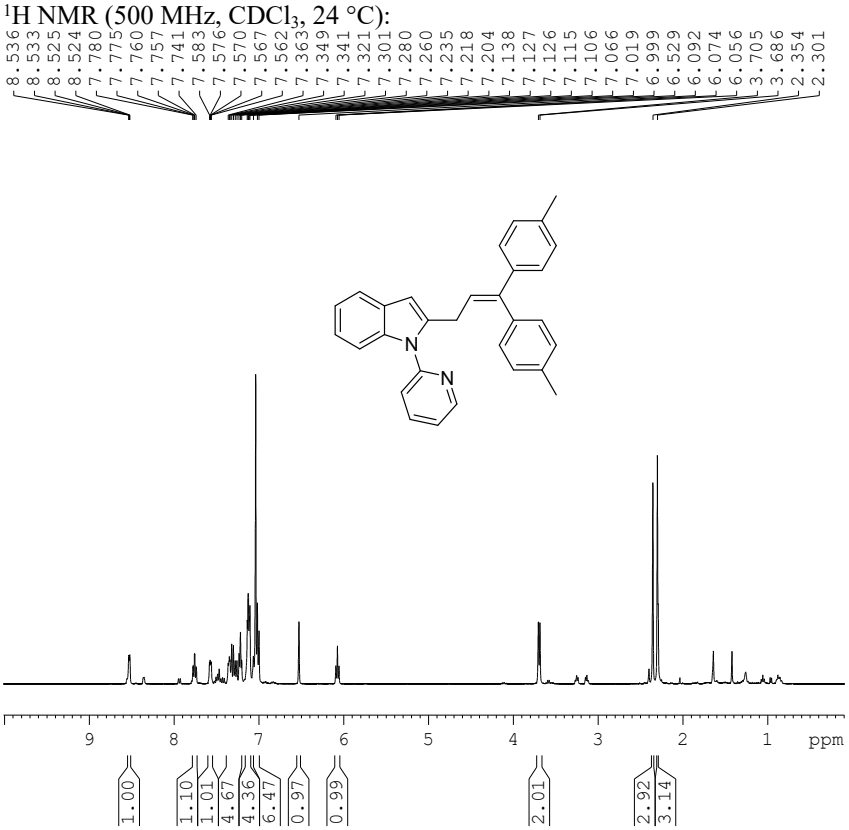
======== CHANNEL f1 =====
SFO1         125.7753932 M
NUC1                  13C
P1                 9.88 u
PLW1        103.00000000 W

======== CHANNEL f2 =====
SFO2         500.1520006 M
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              80.00 u
PLW2         15.30000019 W
PLW12         0.38863000 W
PLW13         0.19548000 W

F2 - Processing parameter
SI                 32768
SF           125.7628049 M
WDW                   EM
```

2-(3,3-Di-p-tolylallyl)-1-(pyridin-2-yl)-1*H*-indole (3t):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



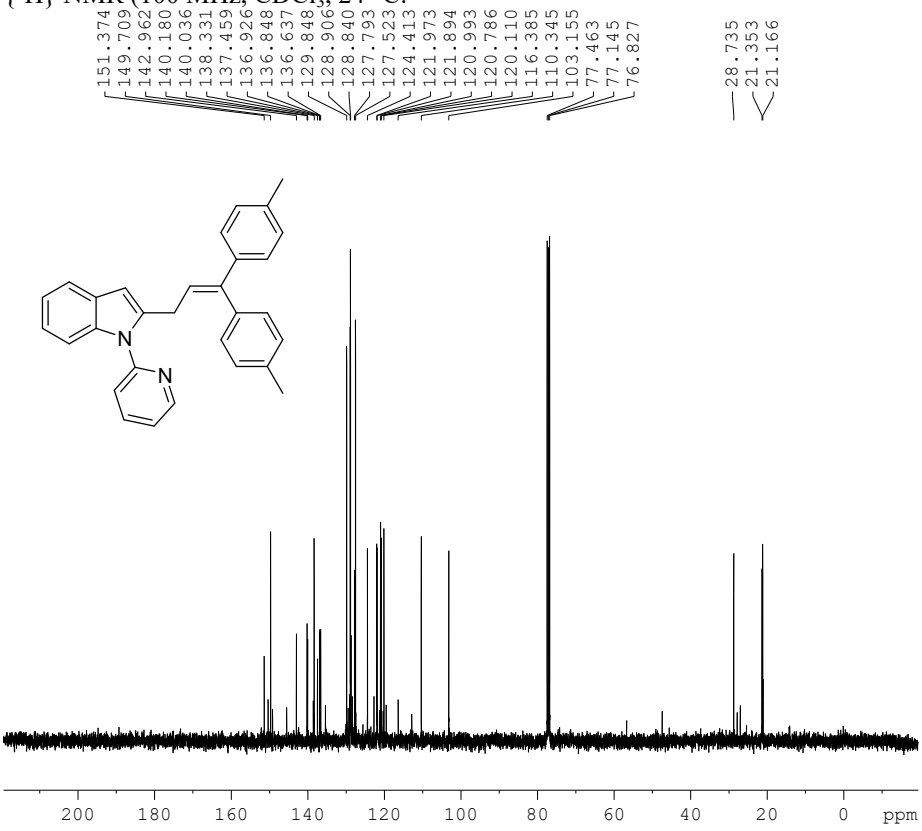

```
Current Data Parameters
NAME      1171 ph me symmetric
EXPNO                540
PROCNO                 1

F2 - Acquisition Parameters
Date_           20171227
Time               10.35
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 88.51
DW                62.400 usec
DE                 6.50 usec
TE                293.5 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300268 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C {^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



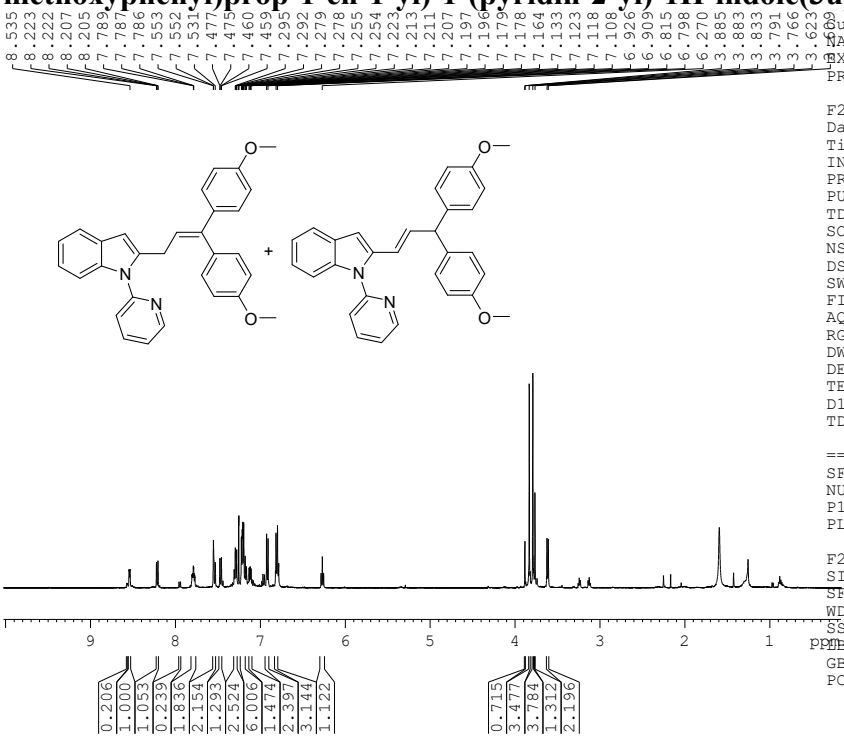

```
Current Data Paramete
NAME      1171 ph me s
EXPNO                5
PROCNO

F2 - Acquisition Para
Date_           201712
Time              10.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                 165
SOLVENT            CDC
NS                   2
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                294
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                 1
P1                  9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2          waltz
PCPD2               90.
PLW2          7.750000
```

2-(3,3-bis(4-methoxyphenyl)allyl)-1-(pyridin-2-yl)-1H-indole and (E)-2-(3,3-bis(4-methoxyphenyl)prop-1-en-1-yl)-1-(pyridin-2-yl)-1H-indole(3u):



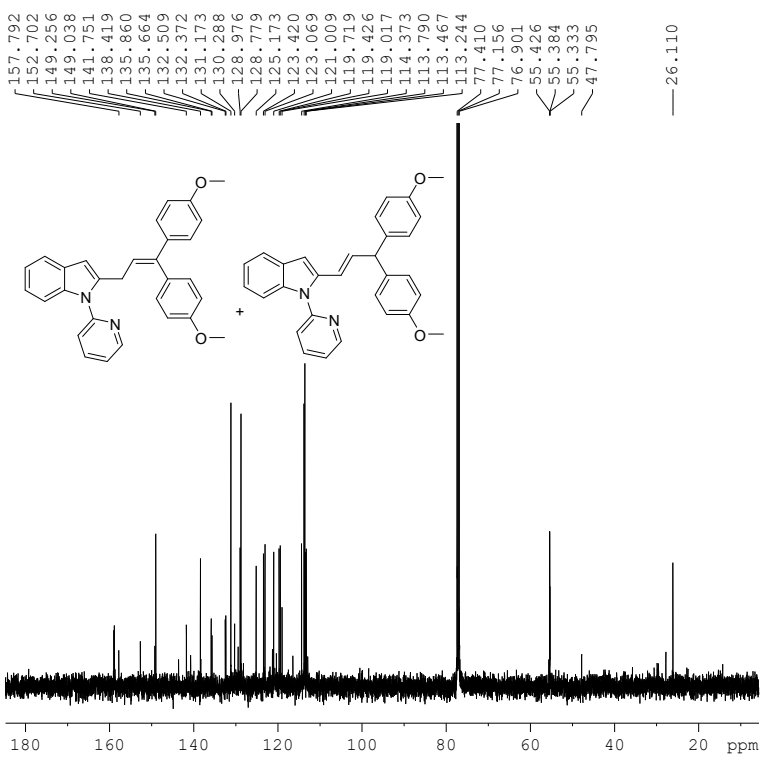
```
Current Data Parameters
NAME      1043 diphome symm
EXPNO                  308
PROCNO                   1

F2 - Acquisition Parameters
Date_           20170831
Time               23.20
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES          0.305176 Hz
AQ             1.6384000 sec
RG                114.76
DW                50.000 usec
DE                 6.50 usec
TE                299.2 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF           500.1500152 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):



```
Current Data Parameters
NAME      1043 diphome symm
EXPNO                  309
PROCNO                   1

F2 - Acquisition Parameters
Date_           20170831
Time               23.34
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 20480
SOLVENT            CDCl3
NS                   512
DS                     4
SWH            29761.904 Hz
FIDRES          1.453218 Hz
AQ             0.3440640 sec
RG                202.34
DW                16.800 usec
DE                 6.50 usec
TE                299.8 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

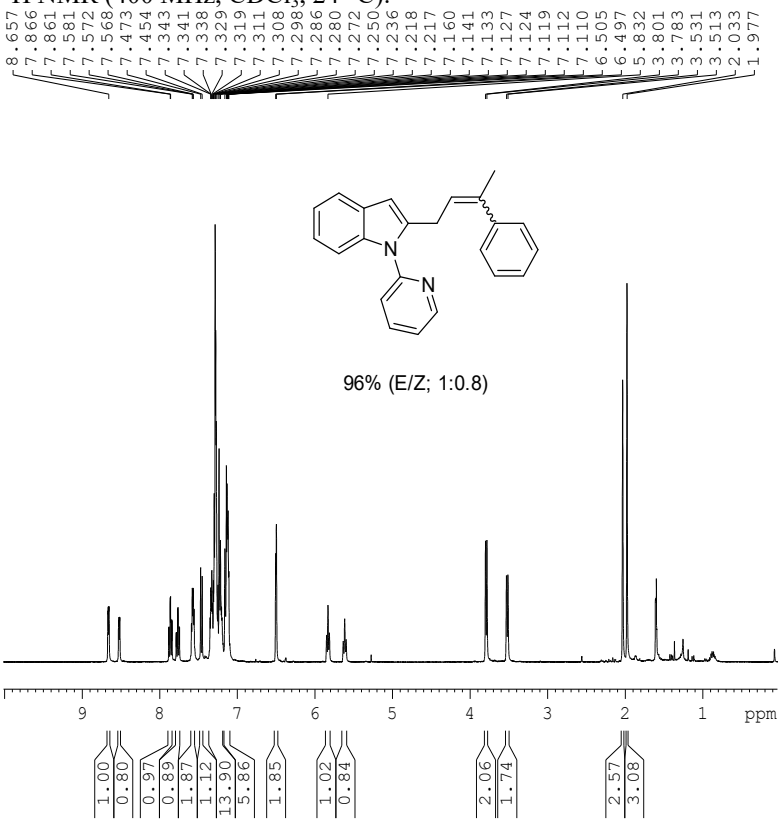
======== CHANNEL f1 ========
SFO1         125.7753932 MHz
NUC1                  13C
P1                 9.88 usec
PLW1        103.00000000 W

======== CHANNEL f2 ========
SFO2         500.1520006 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2         15.30000019 W
PLW12         0.38863000 W
PLW13         0.19548000 W

F2 - Processing parameters
SI                 32768
SF           125.7628018 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

Mixture of (Z)-2-(3-Phenylbut-2-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole and (E)-2-(3-Phenylbut-2-en-1-yl)-1-(pyridin-2-yl)-1*H*-indole (3v):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



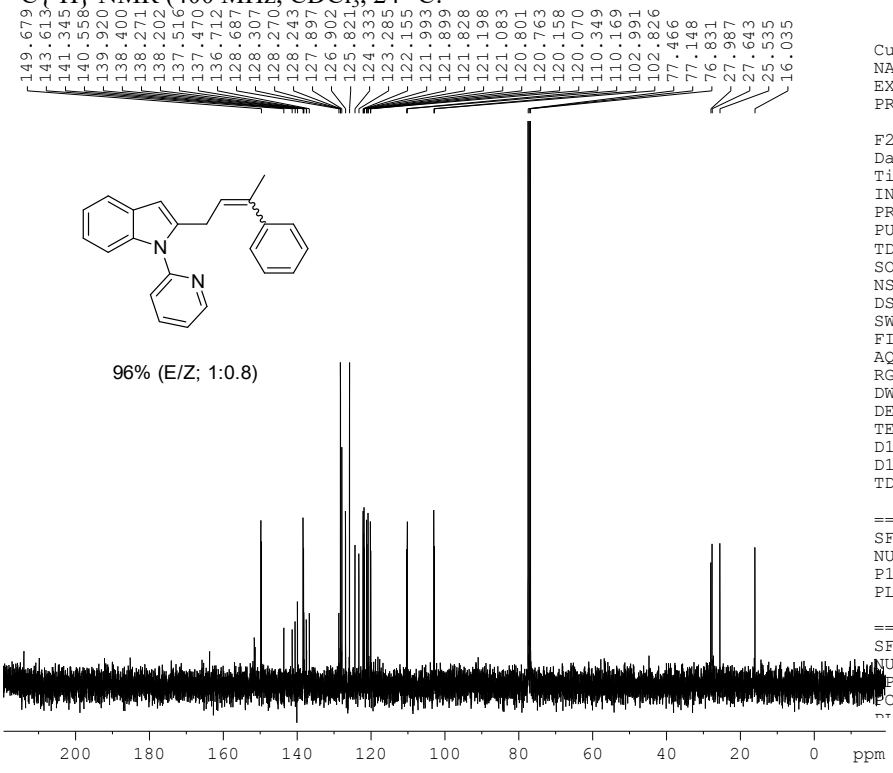

```
Current Data Parameters
NAME     ex.no. 889 and 890
EXPNO                247
PROCNO                 1

F2 - Acquisition Parameters
Date_           20170510
Time                1.34
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 138.85
DW                 62.400 usec
DE                  6.50 usec
TE                 295.0 K
D1            0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300193 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME     ex.no. 889 a
EXPNO                2
PROCNO

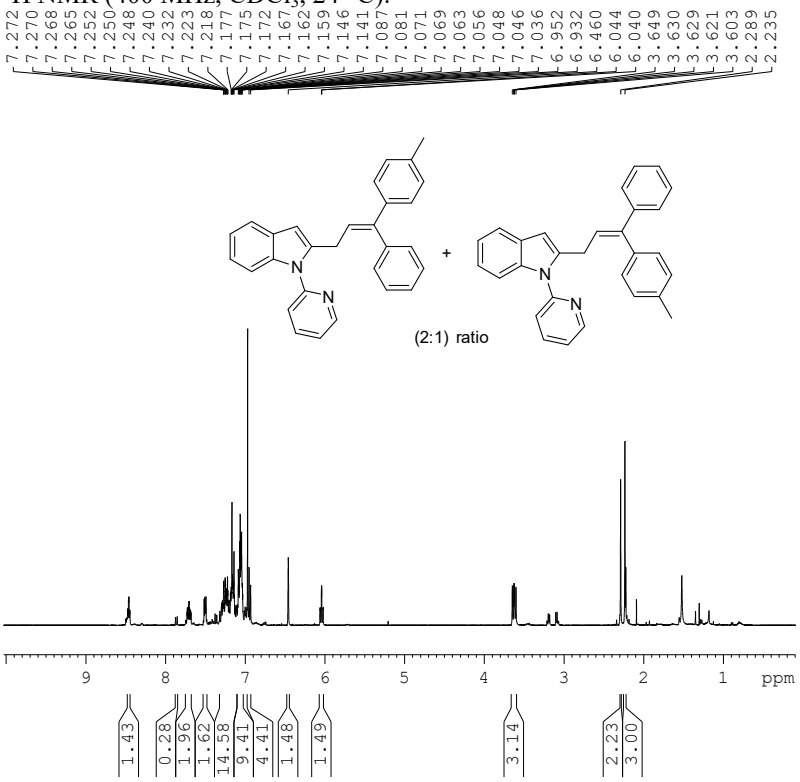
F2 - Acquisition Para
Date_          201705
Time               1.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                165
SOLVENT           CDC
NS                  1
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                295
D1            1.000000
D11           0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                1
P1                 9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2         waltz
PCPD2              90.
PLW2          7.750000
```

(E)-2-(3-phenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1H-indole and (Z)-2-(3-phenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1H-indole(3w):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



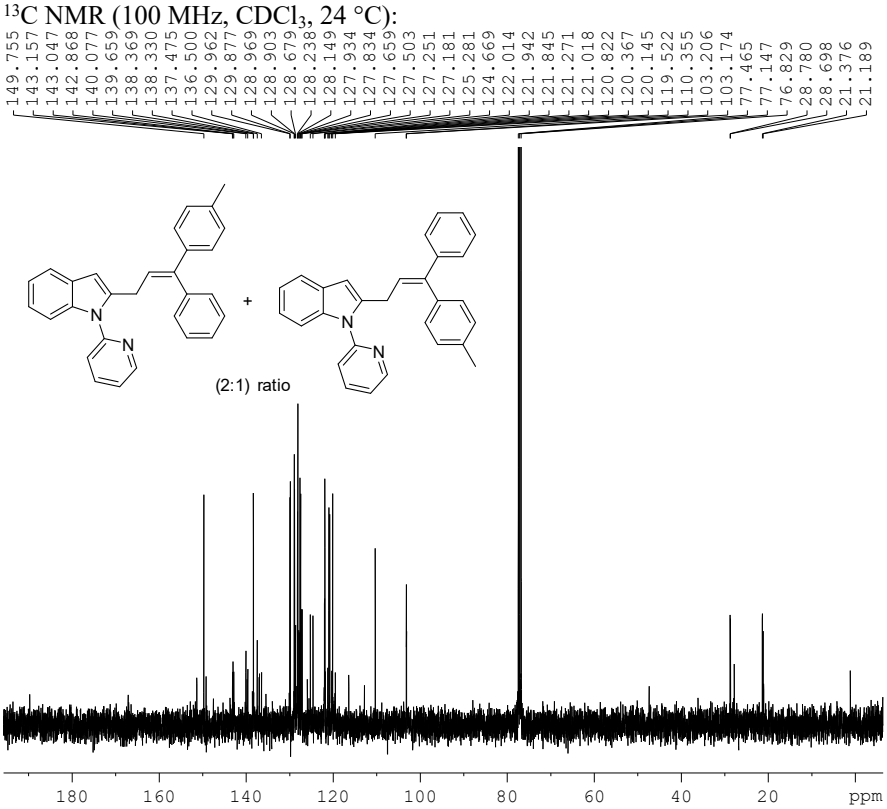

```
Current Data Parameters
NAME     1158 me ph mix isome
EXPNO                 430
PROCNO                  1

F2 - Acquisition Parameters
Date_           20171219
Time              18.14
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ            4.0894465 sec
RG               169.77
DW               62.400 usec
DE                6.50 usec
TE               293.4 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                65536
SF           400.1300469 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME     1158 me ph m
EXPNO                4
PROCNO

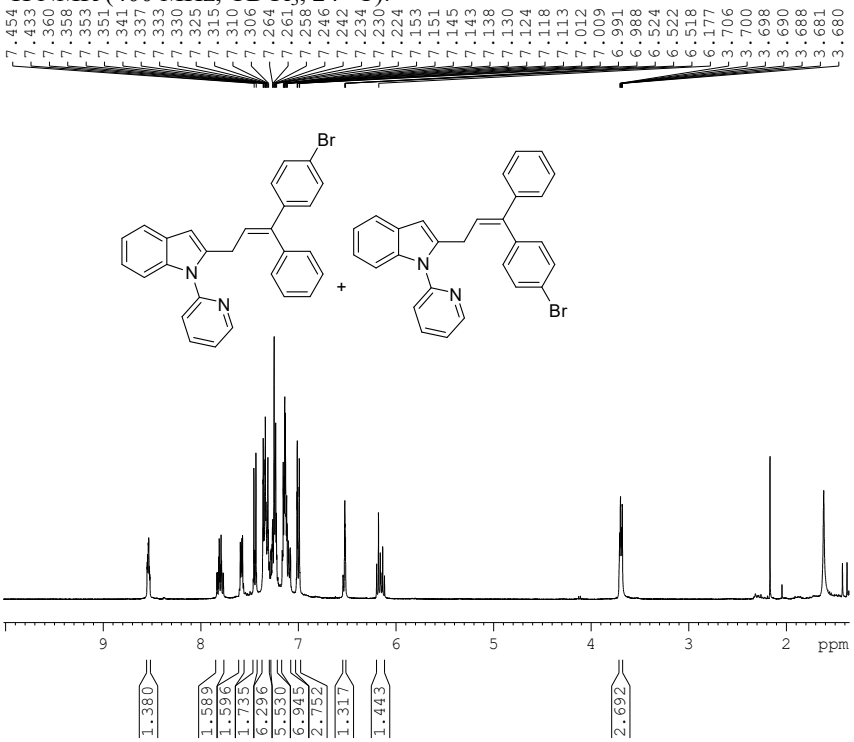
F2 - Acquisition Para
Date_           201712
Time              18.
INSTRUM           spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                165
SOLVENT           CDC
NS                  2
DS
SWH           24038.4
FIDRES         1.4533
AQ            0.34403
RG               200.
DW               20.8
DE                 6.
TE               293
D1            1.000000
D11           0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                1
P1                 9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2         waltz
PCPD2              90.
PLW2          7.750000
```

(E)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1H-indole and (Z)-2-(3-(4-bromophenyl)-3-phenylallyl)-1-(pyridin-2-yl)-1H-indole (3x):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



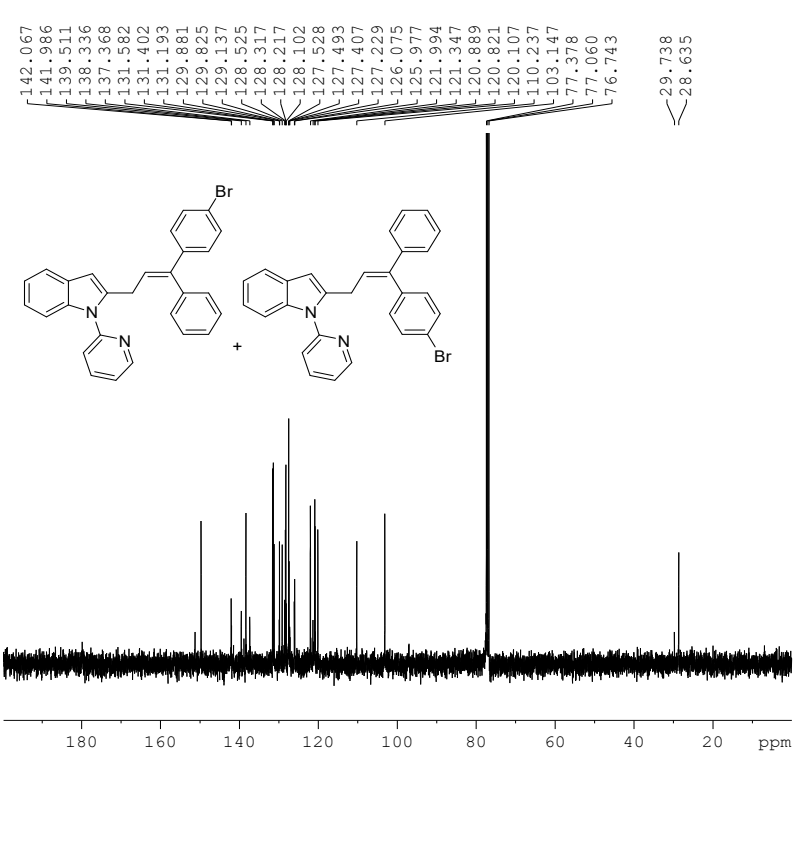

```
Current Data Parameters
NAME      1156 br ph mix isomer d
EXPNO                  427
PROCNO                   1

F2 - Acquisition Parameters
Date_           20171219
Time              17.37
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ             4.0894465 sec
RG                169.77
DW                62.400 usec
DE                 6.50 usec
TE                293.4 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                65536
SF          400.1300157 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      1156 br ph mix isomer
EXPNO                  428
PROCNO                   1

F2 - Acquisition Parameters
Date_           20171219
Time              17.44
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ             0.3440320 sec
RG                200.34
DW                20.800 usec
DE                 6.50 usec
TE                294.1 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

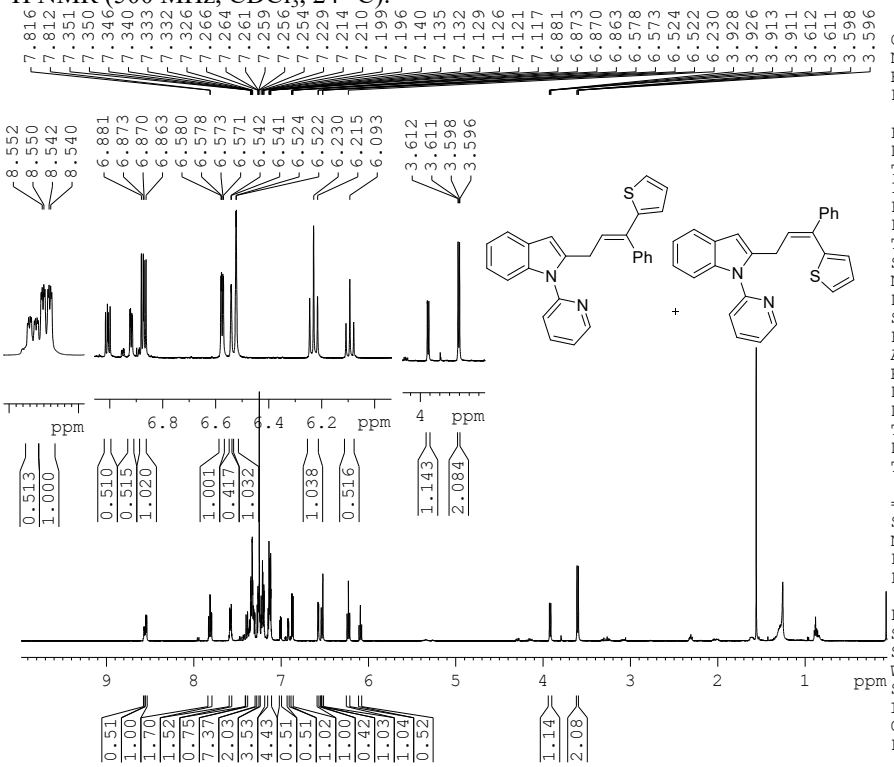
======== CHANNEL f1 ========
SFO1        100.6228289 MHz
NUC1                13C
P1                 9.25 usec
PLW1        47.00000000 W

======== CHANNEL f2 ========
SFO2        400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         7.75000000 W
PLW12        0.23583999 W
PLW13        0.11863000 W

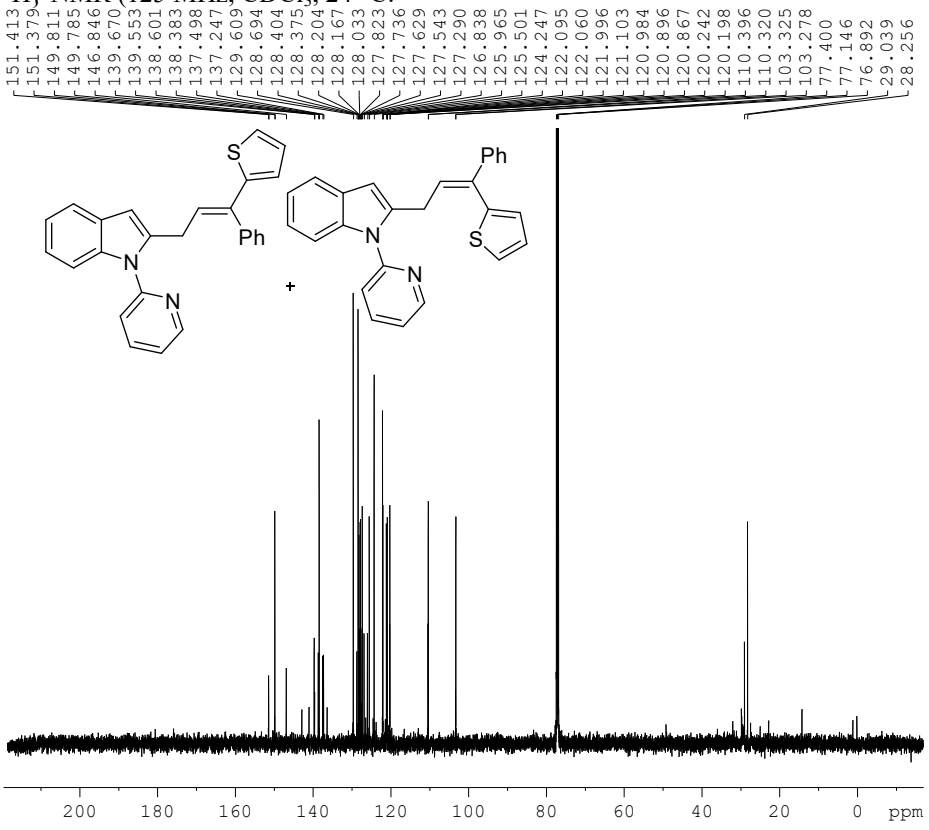
F2 - Processing parameters
SI                32768
SF          100.6127690 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

Mixture of (E)-2-(3-Phenyl-3-(thiophen-2-yl)allyl)-1-(pyridin-2-yl)-1*H*-indole and (Z)-2-(3-phenyl-3-(thiophen-2-yl)allyl)-1-(pyridin-2-yl)-1*H*-indole (3y):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):

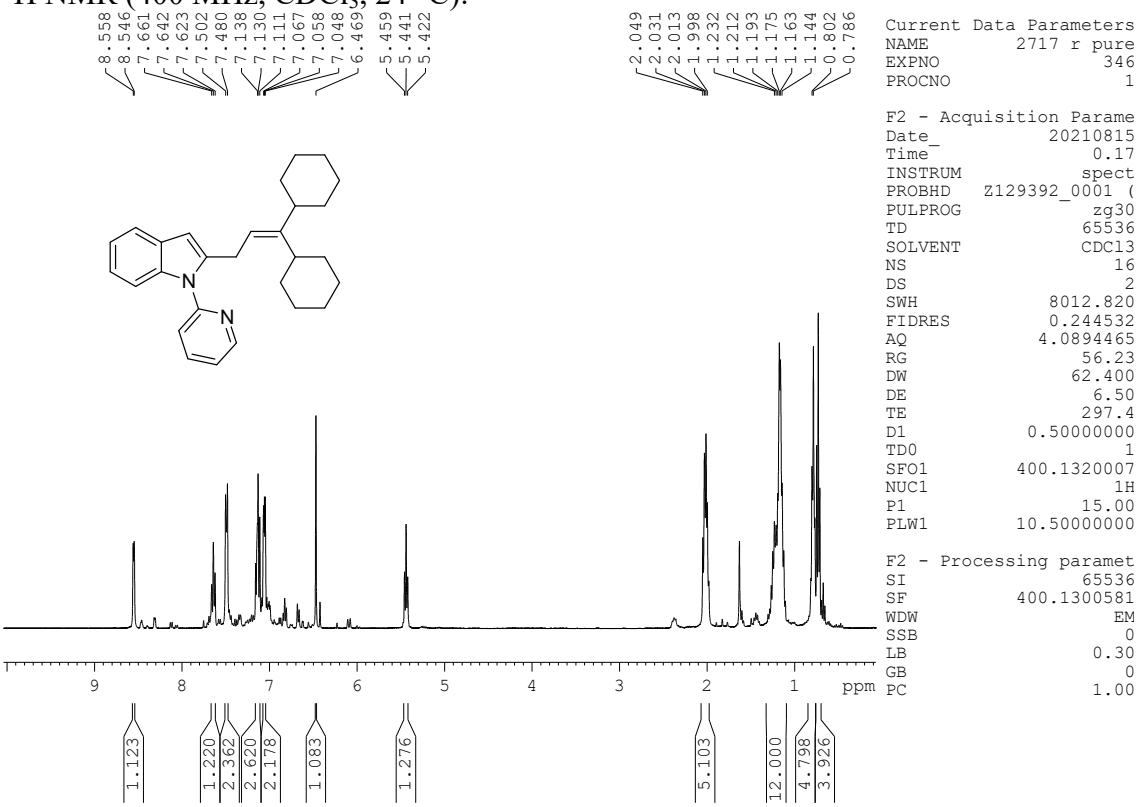


^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:



2-(3,3-Dicyclohexylallyl)-1-(pyridin-2-yl)-1*H*-indole (3z):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

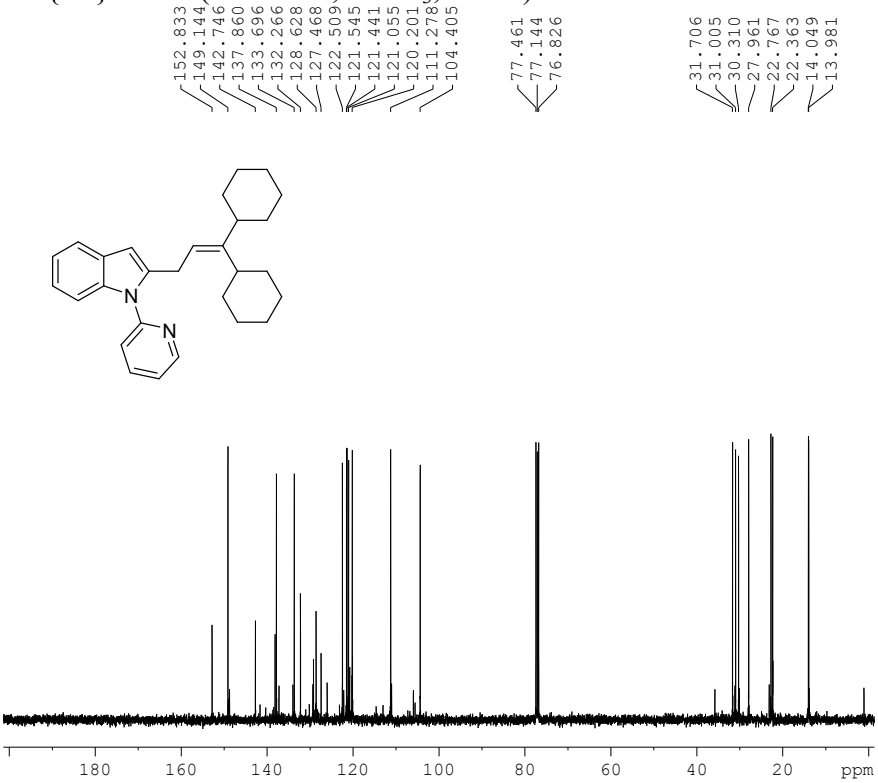



```
Current Data Parameters
NAME          2717 r pure
EXPNO                 346
PROCNO                  1

F2 - Acquisition Parame
Date_            20210815
Time                 0.17
INSTRUM             spect
PROBHD    Z129392_0001 (
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH              8012.820
FIDRES           0.244532
AQ               4.0894465
RG                   56.23
DW                  62.400
DE                    6.50
TE                   297.4
D1             0.50000000
TD0                     1
SFO1           400.1320007
NUC1                   1H
P1                  15.00
PLW1           10.50000000

F2 - Processing paramet
SI                  65536
SF             400.1300581
WDW                    EM
SSB                     0
LB                   0.30
GB                      0
PC                   1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



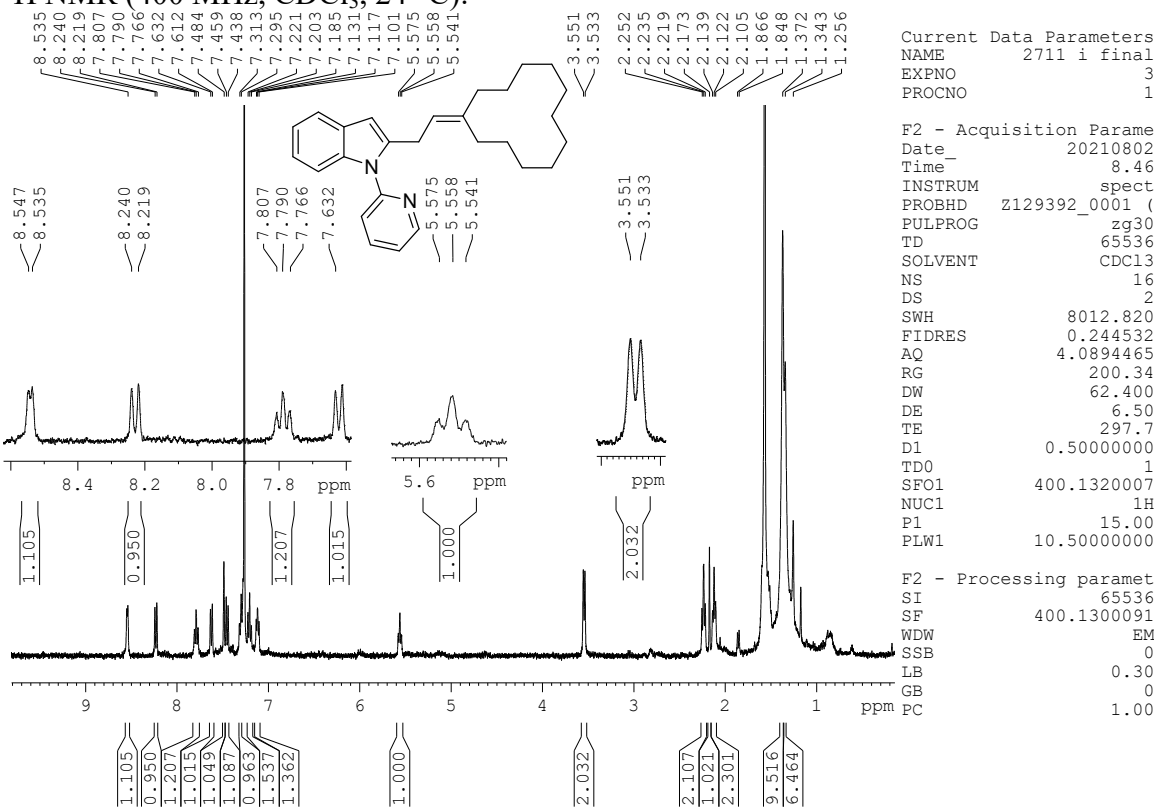

```
Current Data Parameters
NAME          2717 r pure
EXPNO                 347
PROCNO                  1

F2 - Acquisition Parame
Date_            20210815
Time                 0.24
INSTRUM             spect
PROBHD    Z129392_0001 (
PULPROG           zgpg30
TD                  16540
SOLVENT             CDCl3
NS                    256
DS                      4
SWH             24038.461
FIDRES           2.906706
AQ               0.3440320
RG                  200.34
DW                  20.800
DE                    6.50
TE                   298.1
D1             1.00000000
D11            0.03000000
TD0                     1
SFO1           100.6228289
NUC1                   13C
P1                  10.00
PLW1           47.00000000
SFO2           400.1316005
NUC2                   1H
CPDPRG[2          waltz16
PCPD2                90.00
PLW2           10.50000000
PLW12           0.29166999
PLW13           0.14670999

F2 - Processing paramete
SI                  32768
SF             100.6127644
WDW                    EM
SSB                     0
```

2-(2-Cyclododecylideneethyl)-1-(pyridin-2-yl)-1*H*-indole (3aa):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

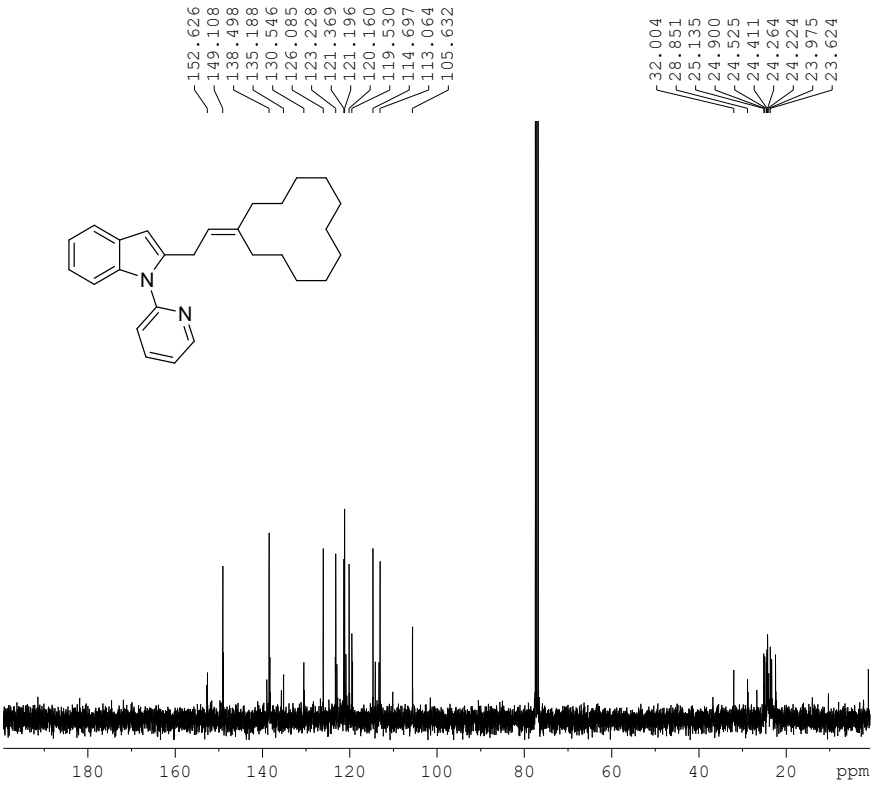


Current Data Parameters
NAME 2711 i final
EXPNO 3
PROCNO 1

F2 - Acquisition Parame
Date_ 20210802
Time 8.46
INSTRUM spect
PROBHD Z129392_0001 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8012.820
FIDRES 0.244532
AQ 4.0894465
RG 200.34
DW 62.400
DE 6.50
TE 297.7
D1 0.50000000
TD0 1
SFO1 400.1320007
NUC1 1H
P1 15.00
PLW1 10.50000000

F2 - Processing paramet
SI 65536
SF 400.1300091
WDW EM
SSB 0
LB 0.30
GB 0
PC 1.00

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



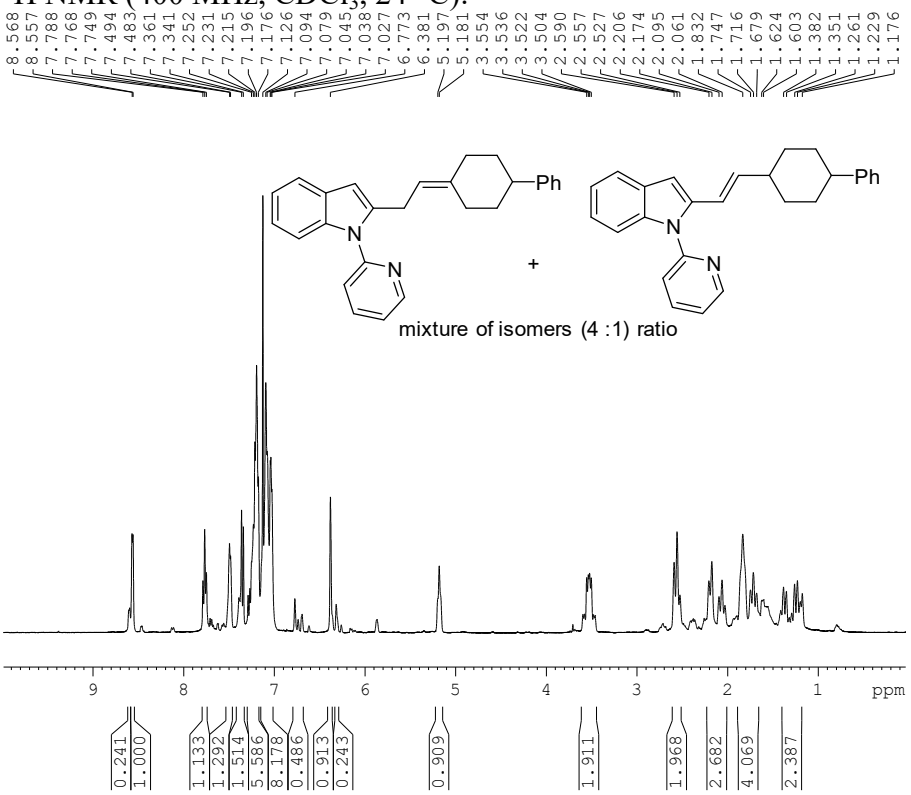
Current Data Parameters
NAME 2711 i final
EXPNO 10
PROCNO 1

F2 - Acquisition Parame
Date_ 20210802
Time 12.05
INSTRUM spect
PROBHD Z129392_0001 (
PULPROG zgpg30
TD 16540
SOLVENT CDCl3
NS 188
DS 4
SWH 24038.461
FIDRES 2.906706
AQ 0.3440320
RG 200.34
DW 20.800
DE 6.50
TE 297.8
D1 1.00000000
D11 0.03000000
TD0 1
SFO1 100.6228289
NUC1 13C
P1 10.00
PLW1 47.00000000
SFO2 400.1316005
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00
PLW2 10.50000000
PLW12 0.29166999
PLW13 0.14670999

F2 - Processing paramet
SI 32768
SF 100.6127599
WDW EM
SSB 0
LB 1.00

2-(2-(4-Phenylcyclohexylidene)ethyl)-1-(pyridin-2-yl)-1*H*-indole and (E)-2-(2-(4-Phenylcyclohexyl)vinyl)-1-(pyridin-2-yl)-1*H*-indole (3ab):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

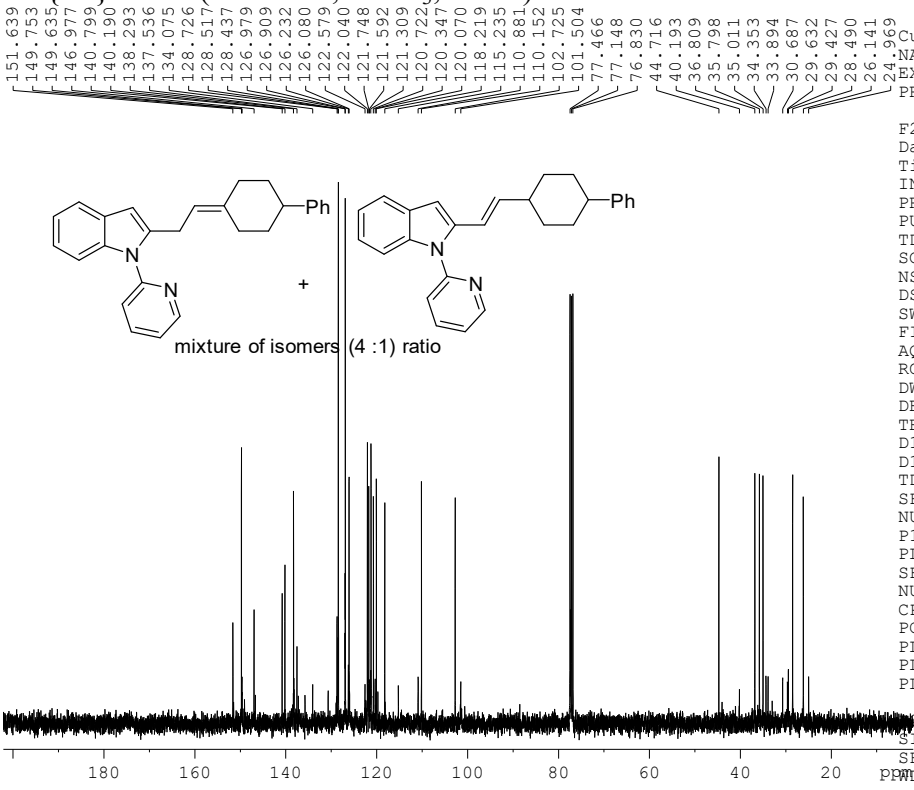



```
Current Data Parameters
NAME      ksr 2710 final
EXPNO                 21
PROCNO                 1

F2 - Acquisition Parame
Date_           20210803
Time              11.06
INSTRUM           spect
PROBHD   Z129392_0001 (
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820
FIDRES        0.244532
AQ            4.0894465
RG                 79.8
DW               62.400
DE                6.50
TE               298.2
D1           0.50000000
TD0                   1
SFO1         400.1320007
NUC1                1H
P1                15.00
PLW1         10.50000000

F2 - Processing paramet
SI                65536
SF         400.1300629
WDW                  EM
SSB                   0
LB                 0.30
GB                    0
PC                 1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



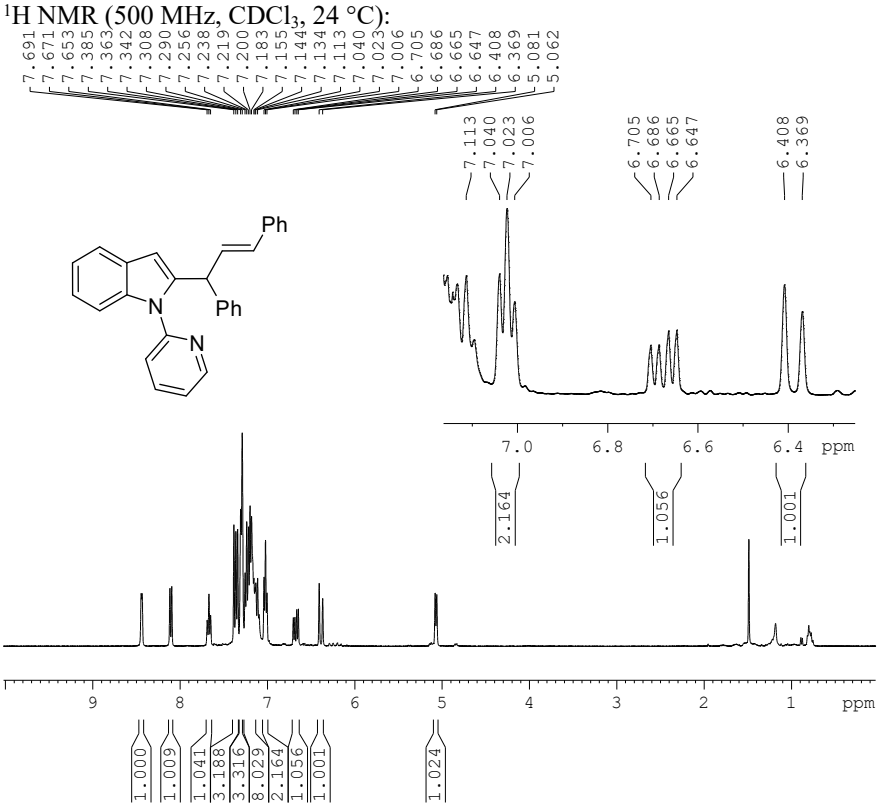

```
Current Data Parameters
NAME      ksr 2710 final
EXPNO                 22
PROCNO                 1

F2 - Acquisition Paramet
Date_           20210803
Time              11.13
INSTRUM           spect
PROBHD   Z129392_0001 (
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461
FIDRES         2.906706
AQ            0.3440320
RG               200.34
DW               20.800
DE                6.50
TE               298.2
D1           1.00000000
D11          0.03000000
TD0                   1
SFO1         100.6228289
NUC1                13C
P1                10.00
PLW1         47.00000000
SFO2         400.1316005
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00
PLW2         10.50000000
PLW12         0.29166999
PLW13         0.14670999

F2 - Processing paramete
SI                32768
SF         100.6127647
WDW                  EM
```

(E)-3-(1,3-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole(3ac):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



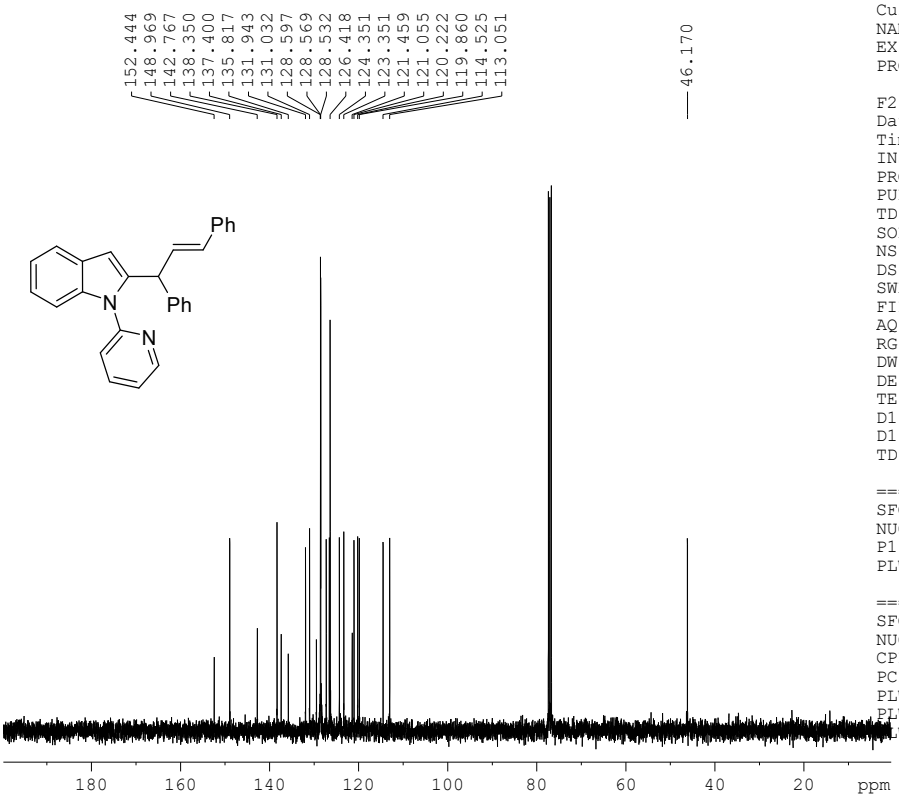

```
Current Data Parameters
NAME      ksr_2082 proto
EXPNO                  9
PROCNO                 1

F2 - Acquisition Parame
Date_           20200503
Time              11.18
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    10
DS                     2
SWH             8012.820
FIDRES          0.122266
AQ             4.0894465
RG                169.77
DW                62.400
DE                  6.50
TE                297.4
D1            0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         400.1320007
NUC1                1H
P1                 15.70
PLW1          7.75000000

F2 - Processing paramet
SI                 65536
SF          400.1300558
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C NMR (1OO MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      ksr_2082 proton
EXPNO                  7
PROCNO                 1

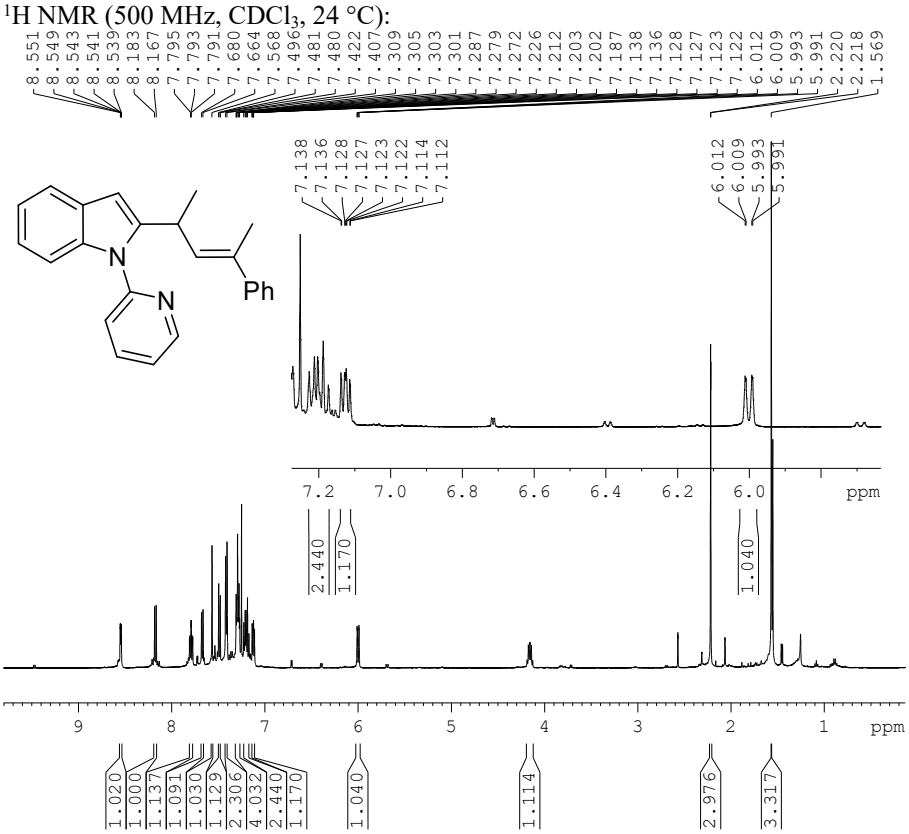
F2 - Acquisition Paramet
Date_           20200503
Time              11.15
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG           zgpg30
TD                 16540
SOLVENT            CDCl3
NS                   193
DS                     4
SWH            24038.461
FIDRES          1.453353
AQ             0.3440320
RG                200.34
DW                20.800
DE                  6.50
TE                297.5
D1            1.00000000
D11           0.03000000
TD0                    1

======== CHANNEL f1 ====
SFO1         100.6228289
NUC1                13C
P1                 9.25
PLW1         47.00000000

======== CHANNEL f2 ====
SFO2         400.1316005
NUC2                1H
CPDPRG[2         waltz16
PCPD2              90.00
PLW2          7.75000000
PLW12         0.23583999
PLW13         0.11863000
```

(E)-3-(4-phenylpent-3-en-2-yl)-1-(pyridin-2-yl)-1*H*-indole (3ad):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



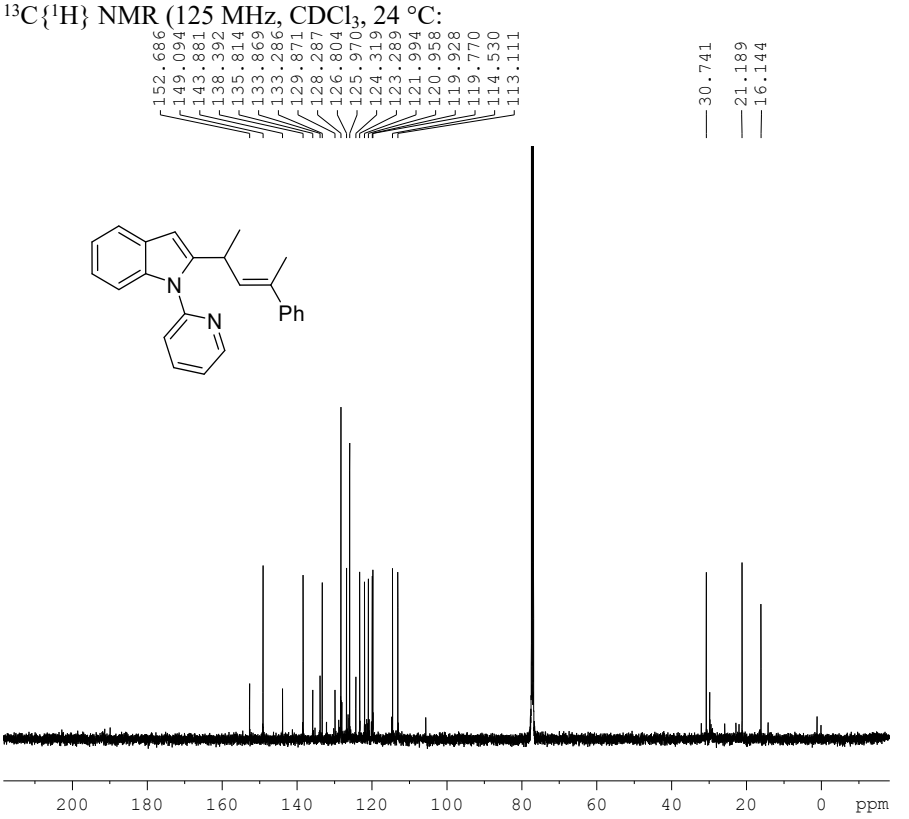

```
Current Data Parameters
NAME                  pure
EXPNO                   86
PROCNO                   1

F2 - Acquisition Parame
Date_              20180215
Time                 10.26
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT              CDCl3
NS                      32
DS                       2
SWH              10000.000
FIDRES           0.305176
AQ               1.6384000
RG                  124.08
DW                  50.000
DE                    6.50
TE                   300.6
D1               0.50000000
TD0                      1

======== CHANNEL f1 ===
SFO1           500.1525008
NUC1                    1H
P1                   12.75
PLW1           15.30000019

F2 - Processing paramet
SI                    65536
SF           500.1500164
WDW                     EM
SSB                      0
LB                    0.30
GB                       0
PC                    1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME                  pure
EXPNO                  106
PROCNO                   1

F2 - Acquisition Paramet
Date_              20180217
Time                  3.33
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                   20480
SOLVENT              CDCl3
NS                    3000
DS                       4
SWH              29761.904
FIDRES           1.453218
AQ               0.3440640
RG                  202.34
DW                  16.800
DE                    6.50
TE                   302.0
D1               1.00000000
D11              0.03000000
TD0                      1

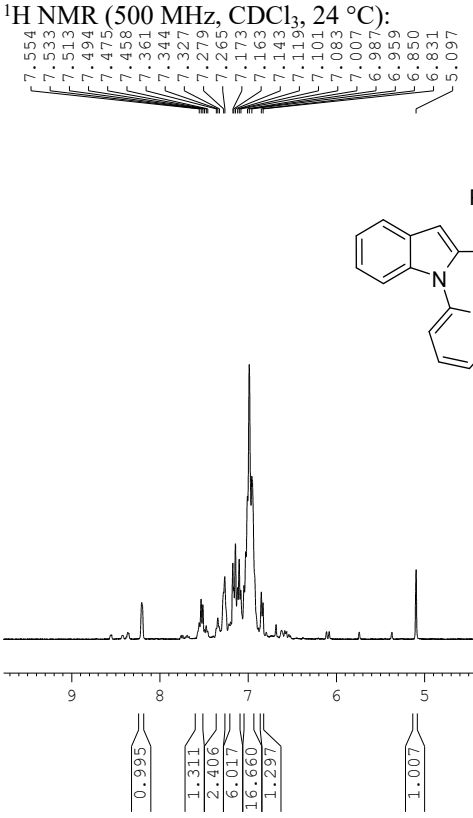
======== CHANNEL f1 ====
SFO1           125.7753932
NUC1                   13C
P1                    9.88
PLW1          103.00000000

======== CHANNEL f2 ====
SFO2           500.1520006
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                80.00
PLW2           15.30000019
PLW12           0.38863000
PLW13           0.19548000

F2 - Processing paramete
```

1-(Pyridin-2-yl)-2-(1,2,3-triphenylallyl)-1*H*-indole (3ae):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



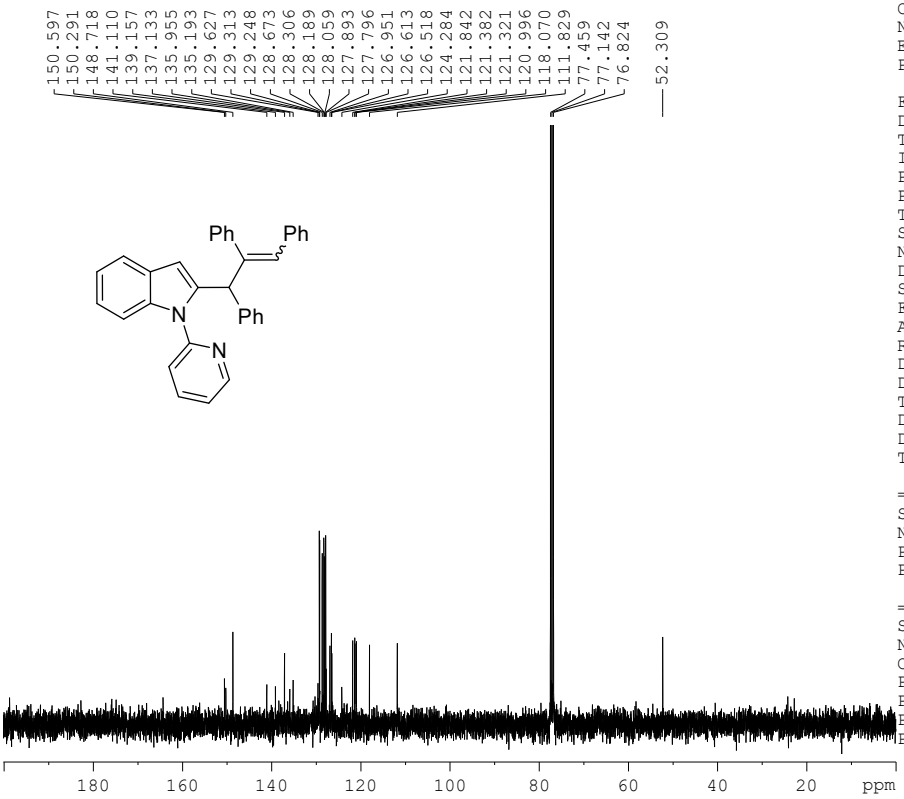

```
Current Data Parameters
NAME      nmr_2085%2f208
EXPNO                 38
PROCNO                 1

F2 - Acquisition Parame
Date_           20200508
Time              15.31
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH             8012.820
FIDRES          0.122266
AQ             4.0894465
RG                200.34
DW                62.400
DE                  6.50
TE                297.1
D1             0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         400.1320007
NUC1                  1H
P1                 15.70
PLW1          7.75000000

F2 - Processing paramet
SI                 65536
SF           400.1300437
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      nmr_2085%2f2087
EXPNO                  39
PROCNO                  1

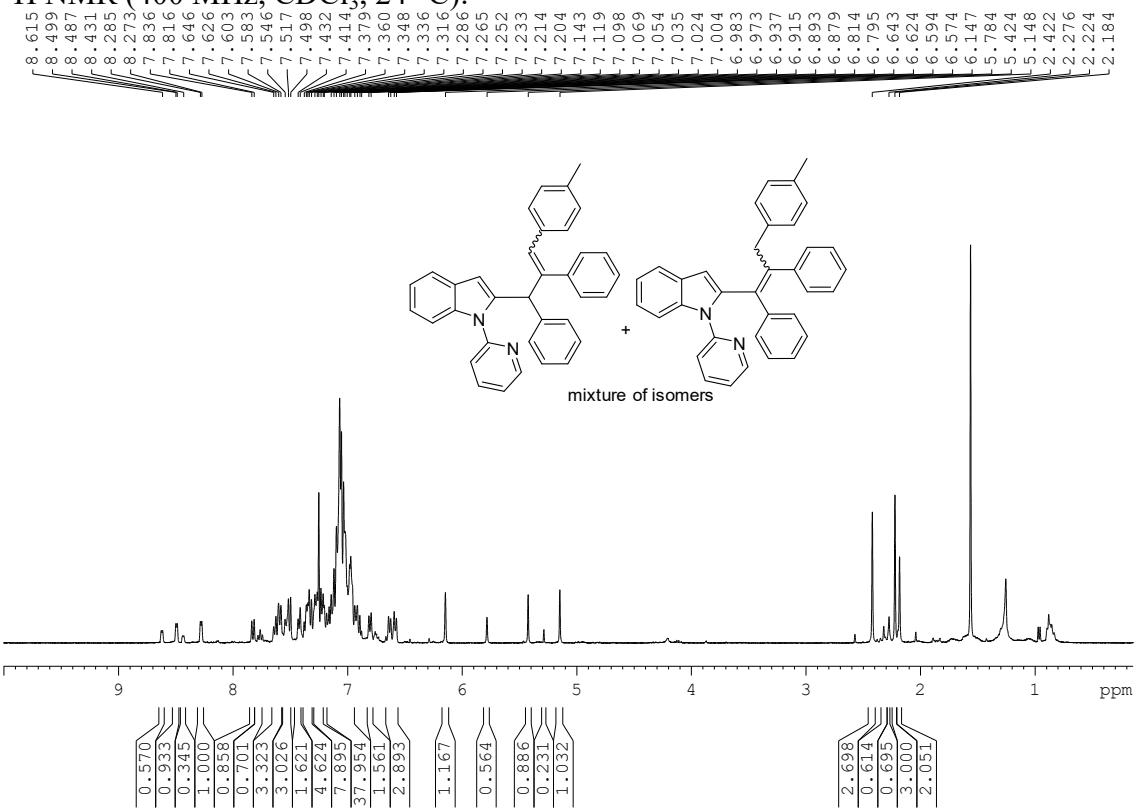
F2 - Acquisition Paramete
Date_           20200508
Time              15.37
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 H
FIDRES         1.453353 H
AQ            0.3440320 s
RG                200.34
DW              20.800 u
DE                6.50 u
TE               297.4 K
D1           1.00000000 s
D11          0.03000000 s
TD0                    1

======== CHANNEL f1 =====
SFO1         100.6228289 M
NUC1                 13C
P1                 9.25 u
PLW1         47.00000000 W

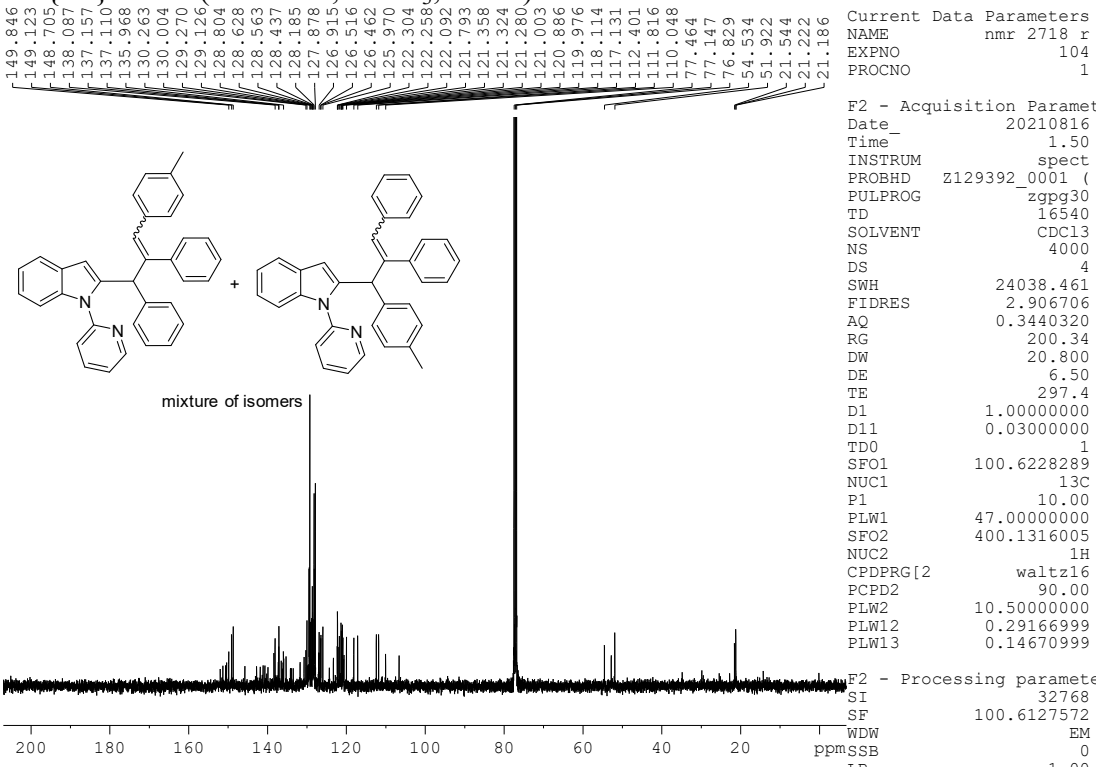
======== CHANNEL f2 =====
SFO2         400.1316005 M
NUC2                  1H
CPDPRG[2          waltz16
PCPD2               90.00 u
PLW2          7.75000000 W
PLW12         0.23583999 W
PLW13         0.11863000 W
```

2-(1,2-Diphenyl-3-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole and 2-(2,3-Diphenyl-1-(p-tolyl)allyl)-1-(pyridin-2-yl)-1*H*-indole (3af):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

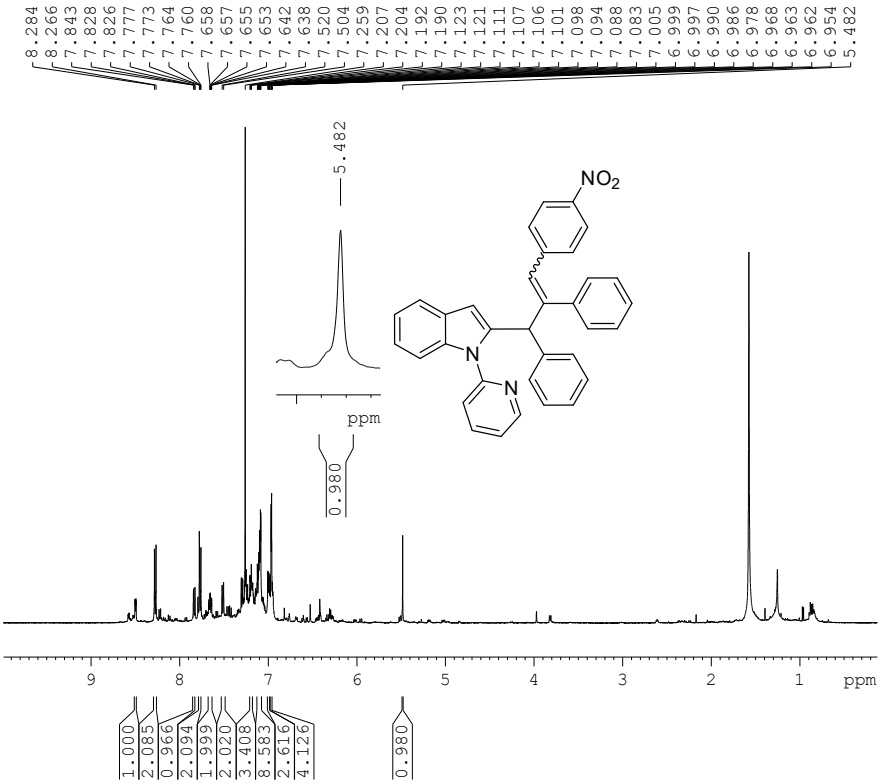


^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):



2-(3-(4-Nitrophenyl)-1,2-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ag):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



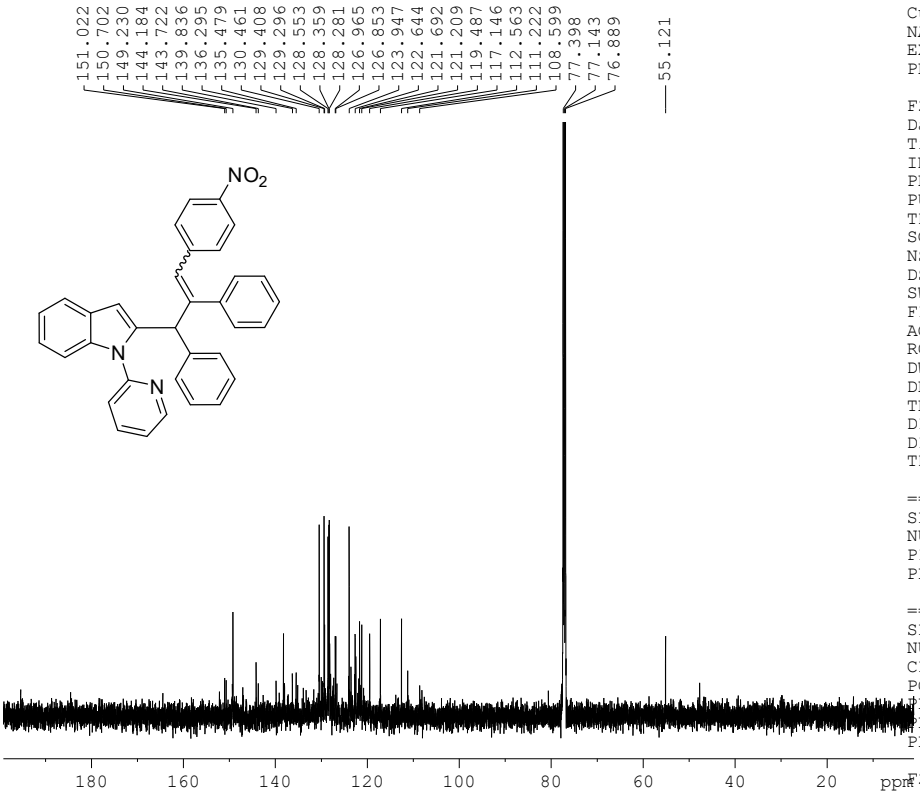

```
Current Data Parameters
NAME         2730 part 1
EXPNO                 64
PROCNO                 1

F2 - Acquisition Parame
Date_           20210824
Time               23.57
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            10000.000
FIDRES          0.305176
AQ             1.6384000
RG                162.95
DW                50.000
DE                  6.50
TE                297.8
D1             0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         500.1525008
NUC1                1H
P1                 11.75
PLW1         15.30000019

F2 - Processing paramet
SI                 65536
SF          500.1500124
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME         2730 part
EXPNO                6
PROCNO               1

F2 - Acquisition Parame
Date_           2021082
Time               1.0
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg3(
TD                2048(
SOLVENT           CDCl3
NS                 300(
DS                    4
SWH           29761.90
FIDRES         1.45321
AQ            0.344064(
RG                202.3
DW                16.80(
DE                 6.5(
TE                298.4
D1            1.0000000(
D11           0.0300000(
TD0                   1

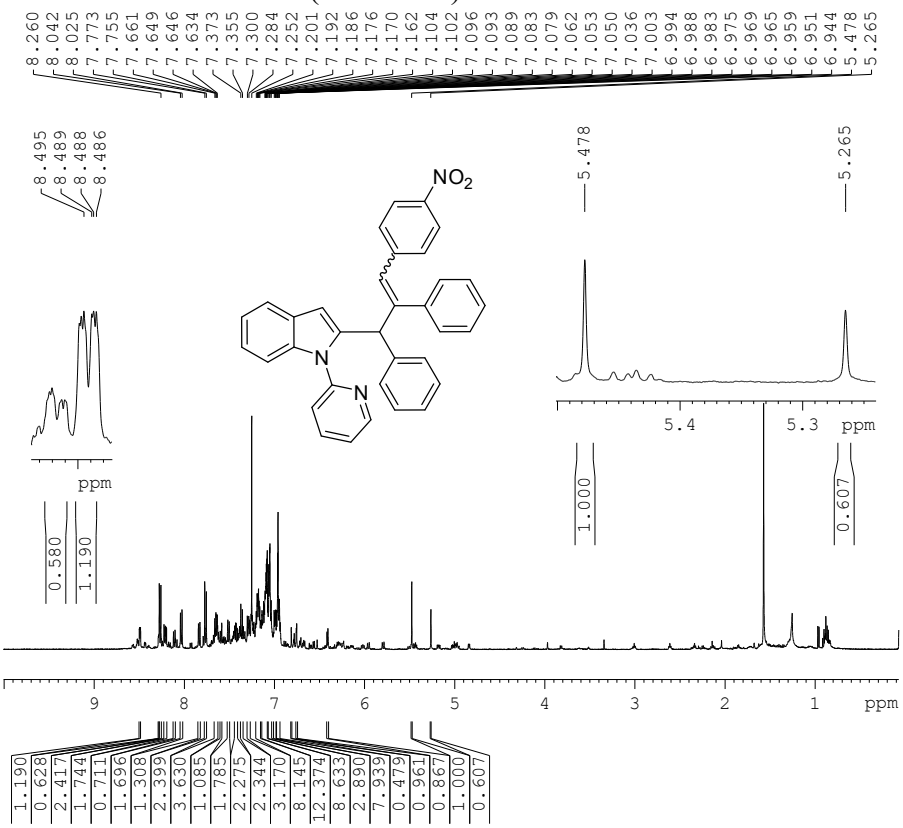
======== CHANNEL f1 ===
SFO1         125.775393
NUC1               13(
P1                10.2(
PLW1        103.0000000(

======== CHANNEL f2 ===
SFO2         500.152000
NUC2                1H
CPDPRG[2         waltz1(
PCPD2             80.0(
PLW2         15.3000001
PLW12         0.3965899
PLW13         0.1994800(

F2 - Processing paramet
```

2-(3-(4-Nitrophenyl)-1,2-diphenylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ag):

Mixture of isomer with (1:0.6 ratio):




```
Current Data Parameters
NAME      2730 mix of is
EXPNO                 52
PROCNO                 1

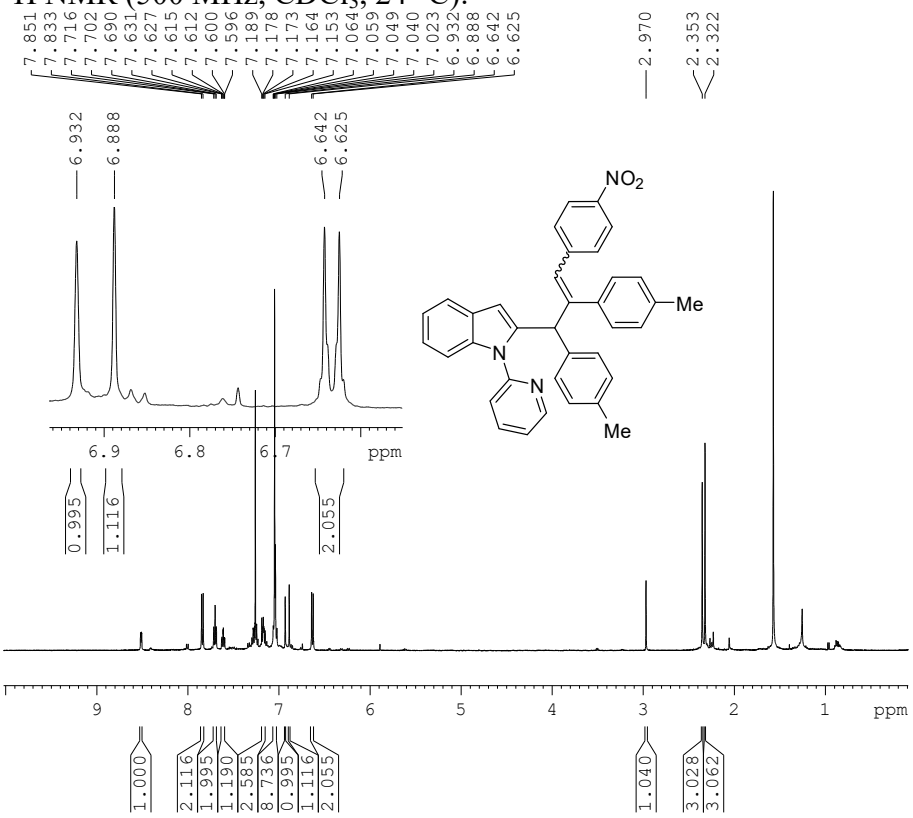
F2 - Acquisition Parame
Date_           20210823
Time               12.48
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000
FIDRES          0.305176
AQ             1.6384000
RG                202.34
DW                50.000
DE                  6.50
TE                 301.6
D1             0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         500.1525008
NUC1                1H
P1                 11.75
PLW1         15.30000019

F2 - Processing paramet
SI                 65536
SF           500.1500159
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

3-(3-(4-Nitrophenyl)-1,2-di-*p*-tolylallyl)-1-(pyridin-2-yl)-1*H*-indole (3ah):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



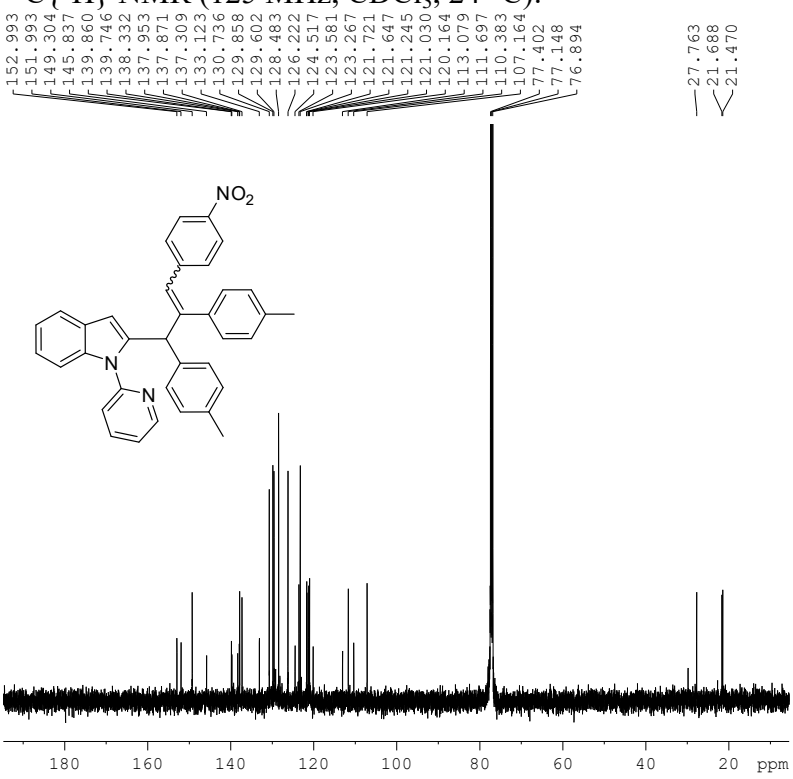

```
Current Data Parameters
NAME          2735 final
EXPNO                 70
PROCNO                 1

F2 - Acquisition Parame
Date_           20210827
Time                1.57
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             10000.000
FIDRES          0.305176
AQ              1.6384000
RG                 138.53
DW                 50.000
DE                   6.50
TE                  297.2
D1             0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         500.1525008
NUC1                1H
P1                 11.75
PLW1         15.30000019

F2 - Processing paramet
SI                 65536
SF          500.1500124
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME          2735 final
EXPNO                 71
PROCNO                 1

F2 - Acquisition Parame
Date_           20210827
Time                3.09
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 20480
SOLVENT            CDCl3
NS                  3000
DS                     4
SWH            29761.904
FIDRES          1.453218
AQ              0.3440640
RG                 202.34
DW                 16.800
DE                   6.50
TE                  297.6
D1             1.00000000
D11            0.03000000
TD0                    1

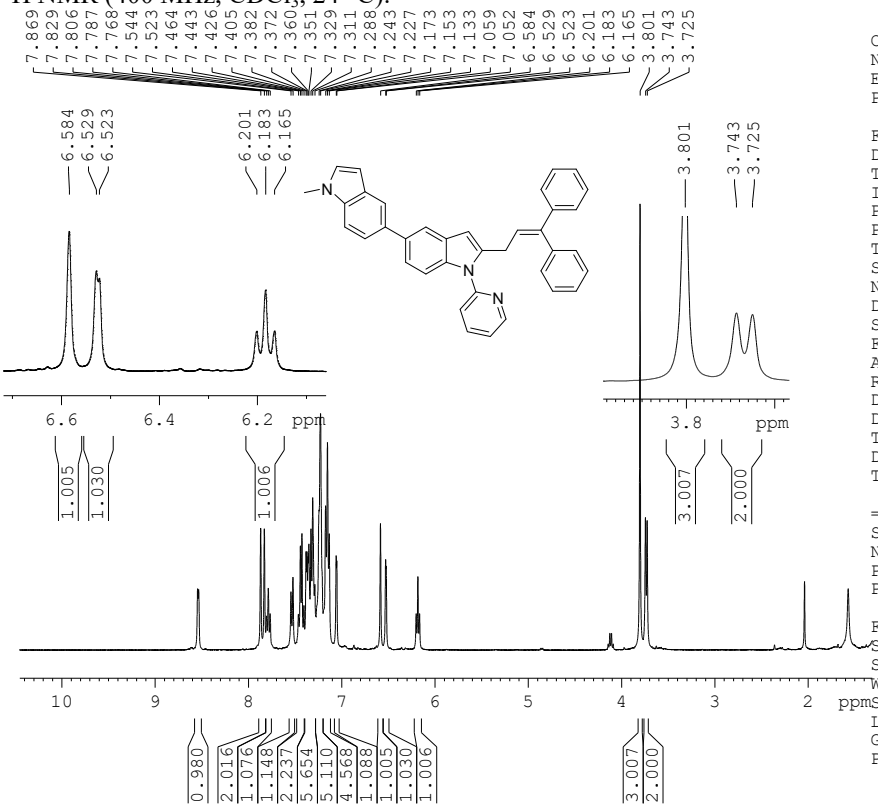
======== CHANNEL f1 ===
SFO1         125.7753932
NUC1                13C
P1                 10.20
PLW1        103.00000000

======== CHANNEL f2 ===
SFO2         500.1520006
NUC2                1H
CPDPRG[2         waltz16
PCPD2              80.00
PLW2         15.30000019
PLW12         0.39658999
PLW13         0.19948000

F2 - Processing paramet
SI                 32768
```

2-(3,3-Diphenylallyl)-1'-methyl-1-(pyridin-2-yl)-1*H*,1'*H*-5,5'-biindole (3ai):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



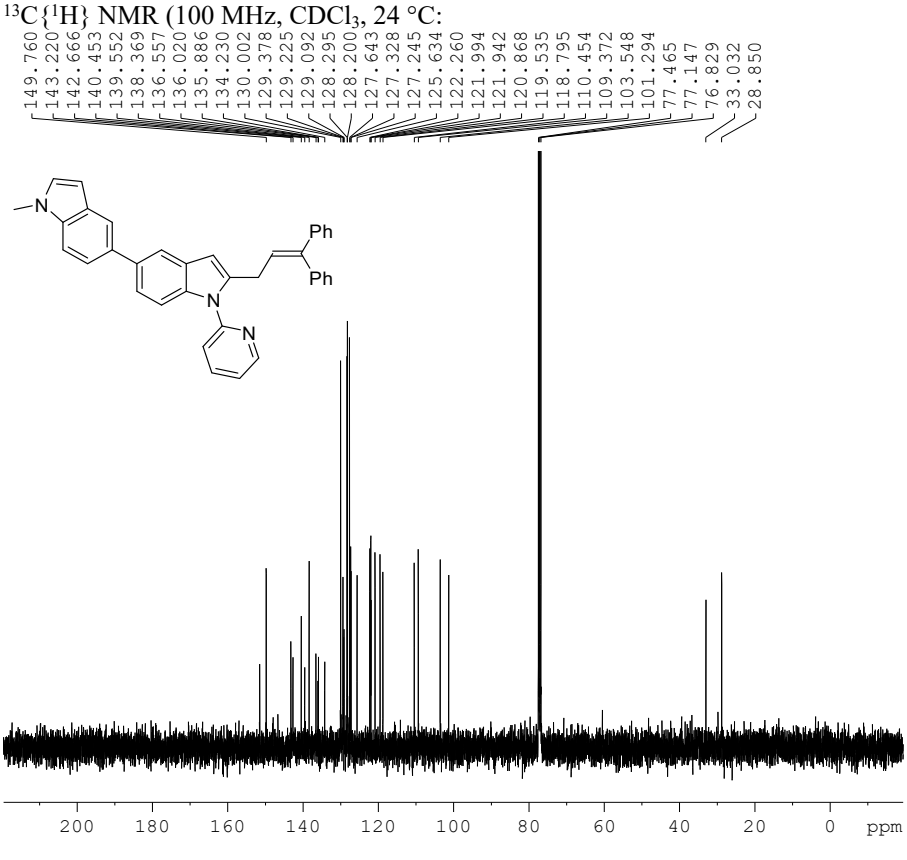

```
Current Data Parameters
NAME      ksr selectivity nmr
EXPNO                  383
PROCNO                   1

F2 - Acquisition Parameters
Date_           20190622
Time                9.43
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH              8012.820 Hz
FIDRES           0.122266 Hz
AQ             4.0894465 sec
RG                153.13
DW                62.400 usec
DE                 6.50 usec
TE                297.7 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF           400.1300209 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME      ksr selectiv
EXPNO                3
PROCNO

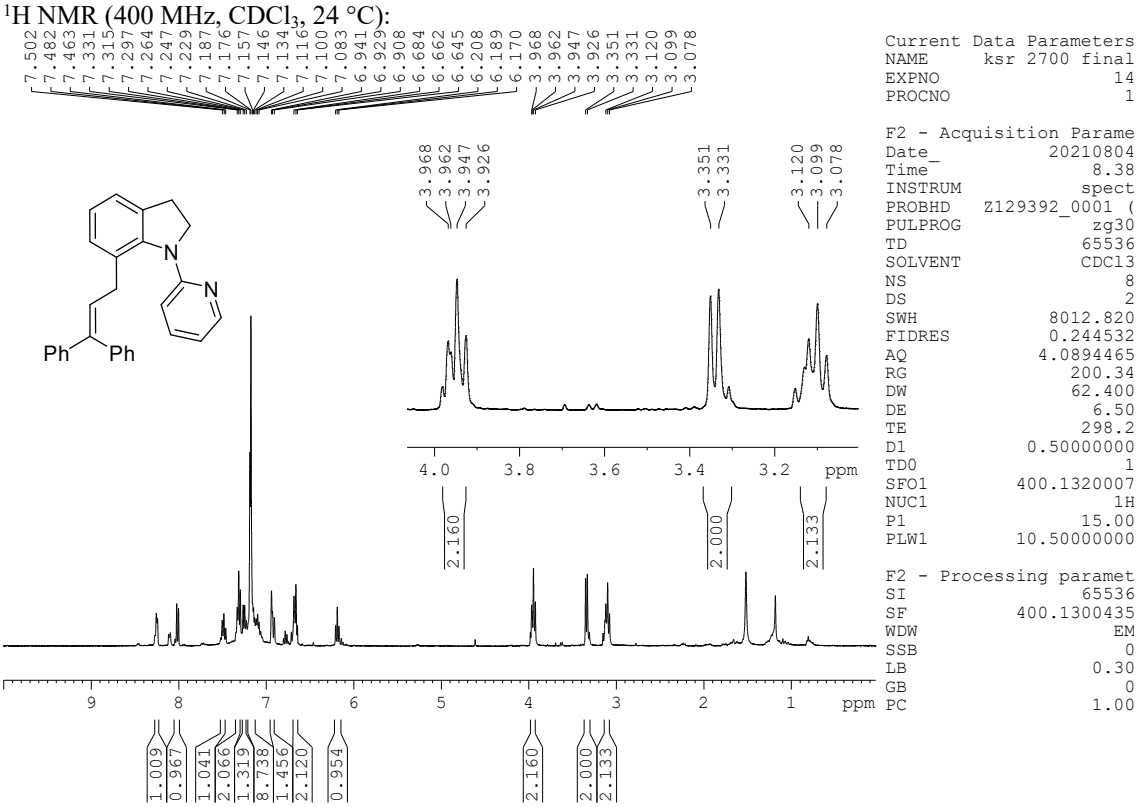
F2 - Acquisition Para
Date_          201906
Time                9.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG            zgpg
TD                  165
SOLVENT             CDC
NS                    2
DS
SWH             24038.4
FIDRES           1.4533
AQ              0.34403
RG                200.
DW                20.8
DE                  6.
TE                298
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1          100.62282
NUC1                  1
P1                   9.
PLW1          47.000000

======== CHANNEL f2 =
SFO2          400.13160
NUC2
CPDPRG[2           waltz
PCPD2                90.
PLW2           7.750000
```

7-(3,3-Diphenylallyl)-1-(pyridin-2-yl)indoline (3aj):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

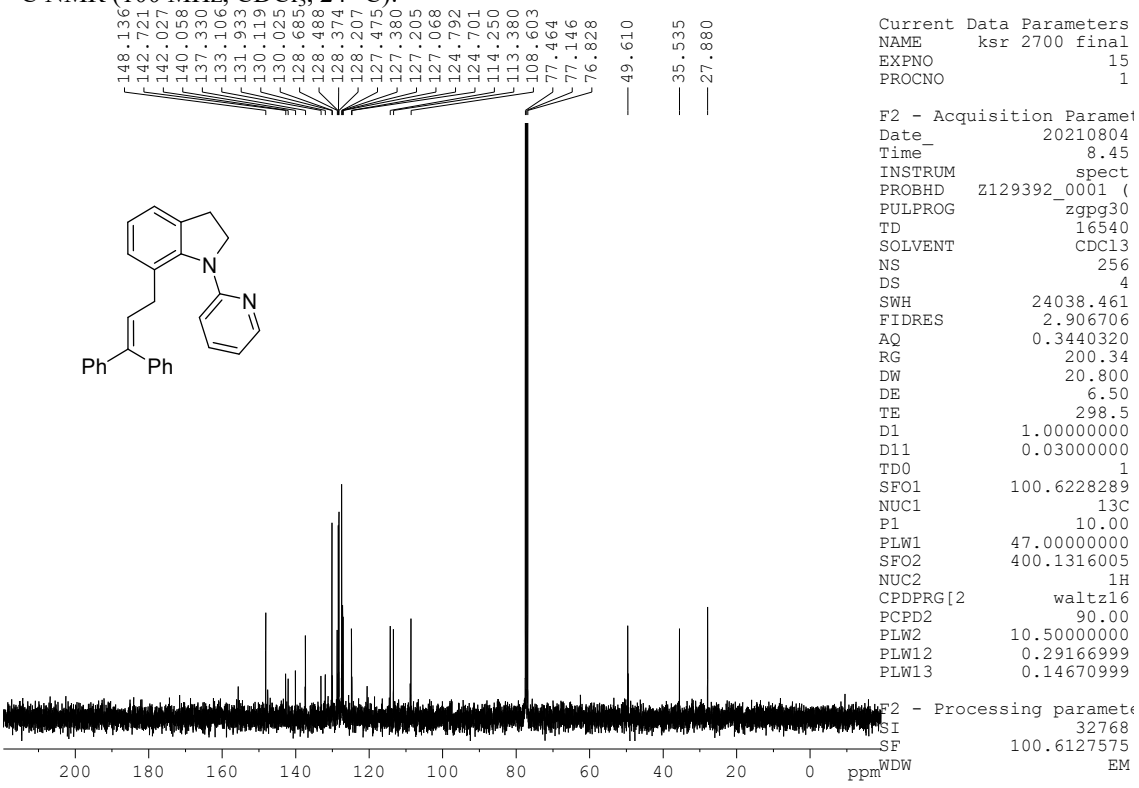



```
Current Data Parameters
NAME      ksr 2700 final
EXPNO                 14
PROCNO                 1

F2 - Acquisition Parame
Date_           20210804
Time                8.38
INSTRUM            spect
PROBHD   Z129392_0001 (
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     2
SWH             8012.820
FIDRES          0.244532
AQ             4.0894465
RG                200.34
DW                62.400
DE                  6.50
TE                 298.2
D1            0.50000000
TD0                    1
SFO1          400.1320007
NUC1                  1H
P1                 15.00
PLW1          10.50000000

F2 - Processing paramet
SI                 65536
SF          400.1300435
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):



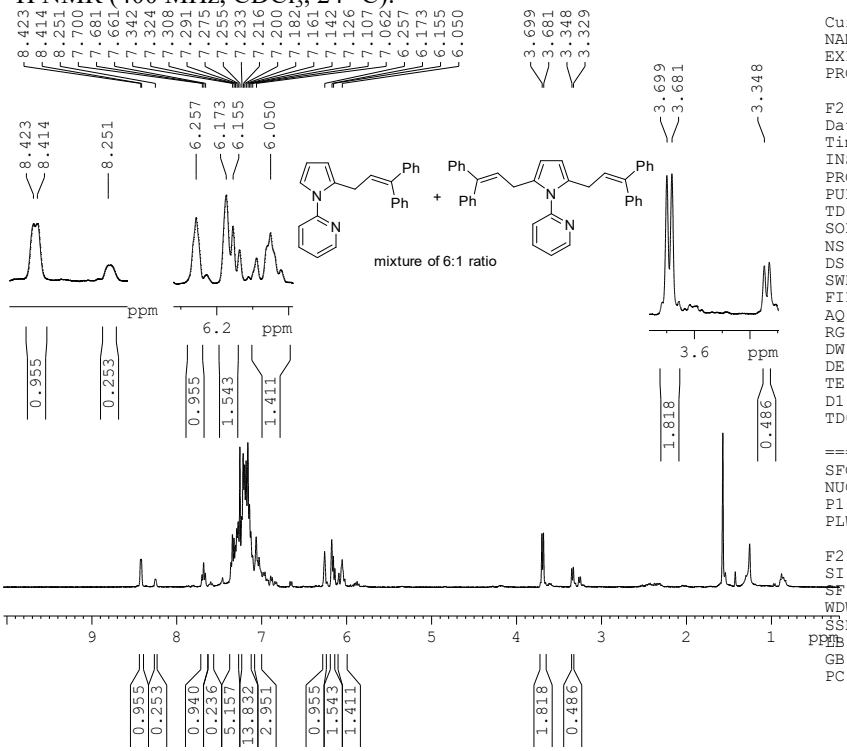

```
Current Data Parameters
NAME      ksr 2700 final
EXPNO                 15
PROCNO                 1

F2 - Acquisition Paramet
Date_           20210804
Time                8.45
INSTRUM            spect
PROBHD   Z129392_0001 (
PULPROG          zgpg30
TD                 16540
SOLVENT            CDCl3
NS                   256
DS                     4
SWH            24038.461
FIDRES          2.906706
AQ             0.3440320
RG                200.34
DW                20.800
DE                  6.50
TE                 298.5
D1            1.00000000
D11           0.03000000
TD0                    1
SFO1          100.6228289
NUC1                  13C
P1                 10.00
PLW1          47.00000000
SFO2          400.1316005
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              90.00
PLW2          10.50000000
PLW12          0.29166999
PLW13          0.14670999

F2 - Processing paramete
SI                 32768
SF          100.6127575
WDW                   EM
```

2-(2-(3,3-Diphenylallyl)-1*H*-pyrrol-1-yl)pyridine (6a):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



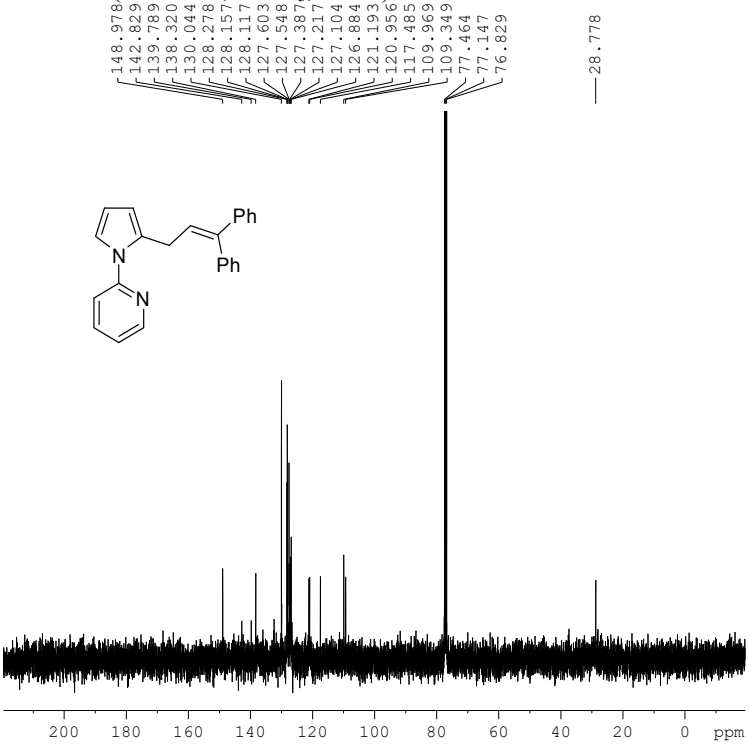

```
Current Data Parameters
NAME            KSR 949
EXPNO               577
PROCNO                1

F2 - Acquisition Parameters
Date_          20170624
Time               1.57
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES         0.122266 Hz
AQ             4.0894465 sec
RG                200.34
DW                62.400 usec
DE                 6.50 usec
TE                294.4 K
D1             0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                 65536
SF          400.1300121 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME           spa40617
EXPNO               578
PROCNO                1

F2 - Acquisition Parameters
Date_          20170624
Time               2.05
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ             0.3440320 sec
RG                200.34
DW                20.800 usec
DE                 6.50 usec
TE                294.9 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                   1

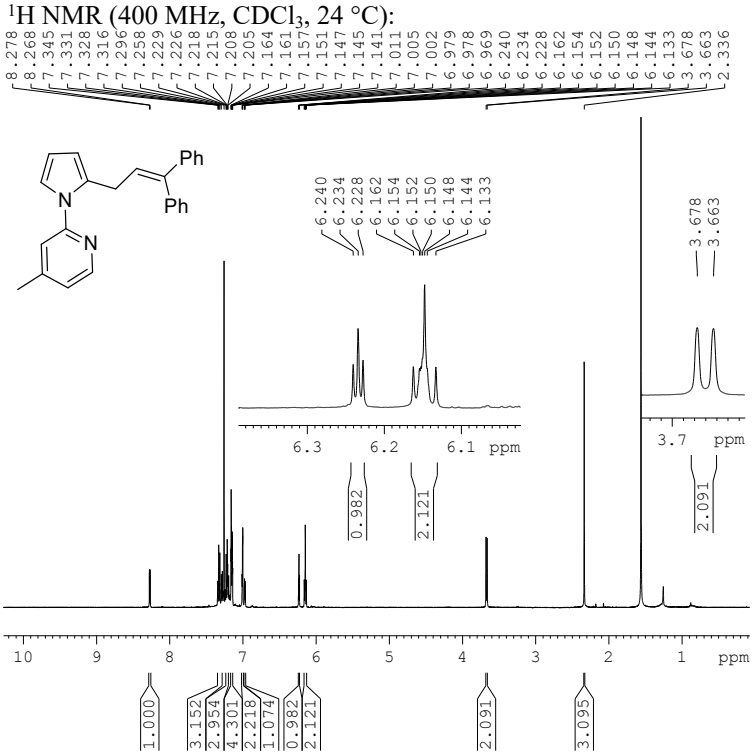
======== CHANNEL f1 ========
SFO1        100.6228289 MHz
NUC1                13C
P1                9.25 usec
PLW1        47.00000000 W

======== CHANNEL f2 ========
SFO2        400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2         7.75000000 W
PLW12        0.23583999 W
PLW13        0.11863000 W

F2 - Processing parameters
SI                 32768
SF          100.6127577 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

2-(2-(3,3-Diphenylallyl)-1*H*-pyrrol-1-yl)-4-methylpyridine (6b):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



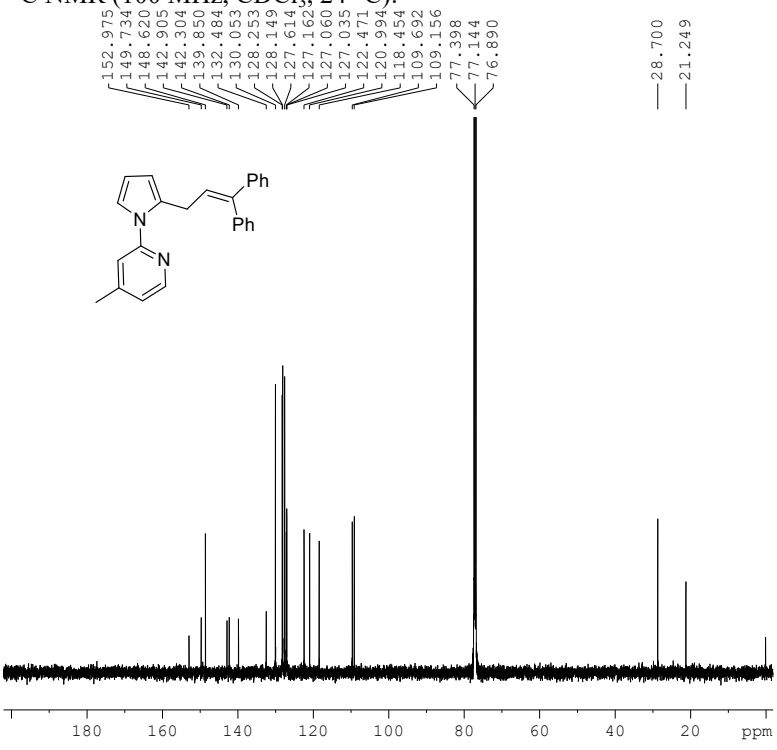

```
Current Data Parameters
NAME                  pure
EXPNO                  107
PROCNO                   1

F2 - Acquisition Parameters
Date_              20190424
Time                  6.45
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT              CDCl3
NS                      32
DS                       2
SWH              10000.000 Hz
FIDRES           0.305176 Hz
AQ               1.6384000 sec
RG                  180.86
DW                  50.000 usec
DE                    6.50 usec
TE                   302.5 K
D1               0.50000000 sec
TD0                      1

======== CHANNEL f1 ========
SFO1          500.1525008 MHz
NUC1                    1H
P1                   11.75 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                    65536
SF            500.1500132 MHz
WDW                      EM
SSB                       0
LB                     0.30 Hz
GB                        0
PC                     1.00
```

^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME                  pure
EXPNO                  108
PROCNO                   1

F2 - Acquisition Parameters
Date_              20190424
Time                  8.55
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG             zgpg30
TD                   20480
SOLVENT              CDCl3
NS                    9231
DS                       4
SWH              29761.904 Hz
FIDRES           1.453218 Hz
AQ               0.3440640 sec
RG                  202.34
DW                  16.800 usec
DE                    6.50 usec
TE                   303.2 K
D1               1.00000000 sec
D11              0.03000000 sec
TD0                      1

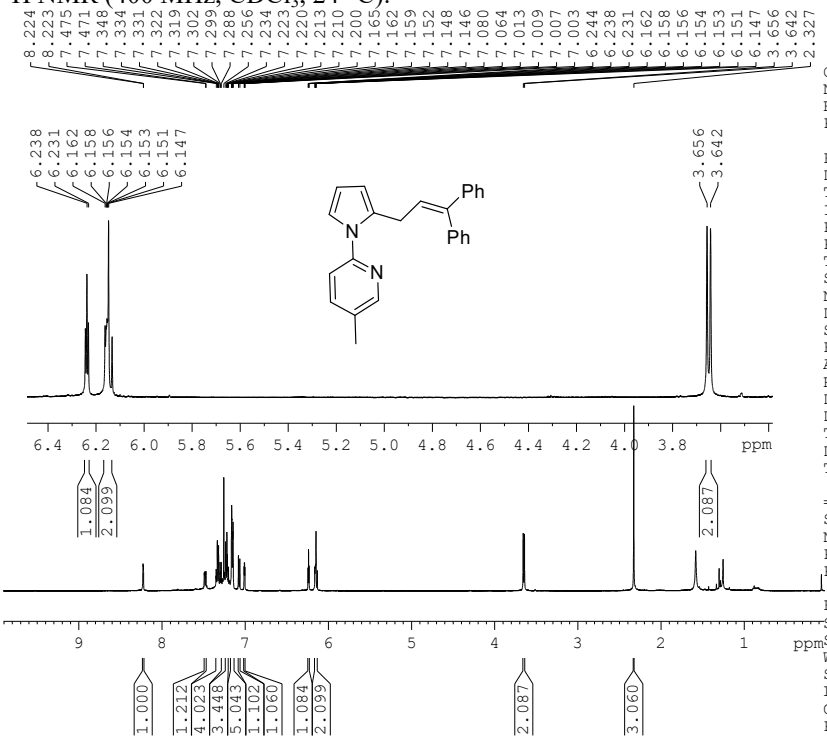
======== CHANNEL f1 ========
SFO1         125.7753932 MHz
NUC1                   13C
P1                   10.20 usec
PLW1        103.00000000 W

======== CHANNEL f2 ========
SFO2          500.1520006 MHz
NUC2                    1H
CPDPRG[2          waltz16
PCPD2                80.00 usec
PLW2          15.30000019 W
PLW12          0.38863000 W
PLW13          0.19548000 W

F2 - Processing parameters
SI                    32768
SF            125.7628005 MHz
WDW                      EM
SSB                       0
LB                     1.00 Hz
GB                        0
PC                     1.40
```

2-(2-(3,3-diphenylallyl)-1H-pyrrol-1-yl)-5-methylpyridine(6c):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



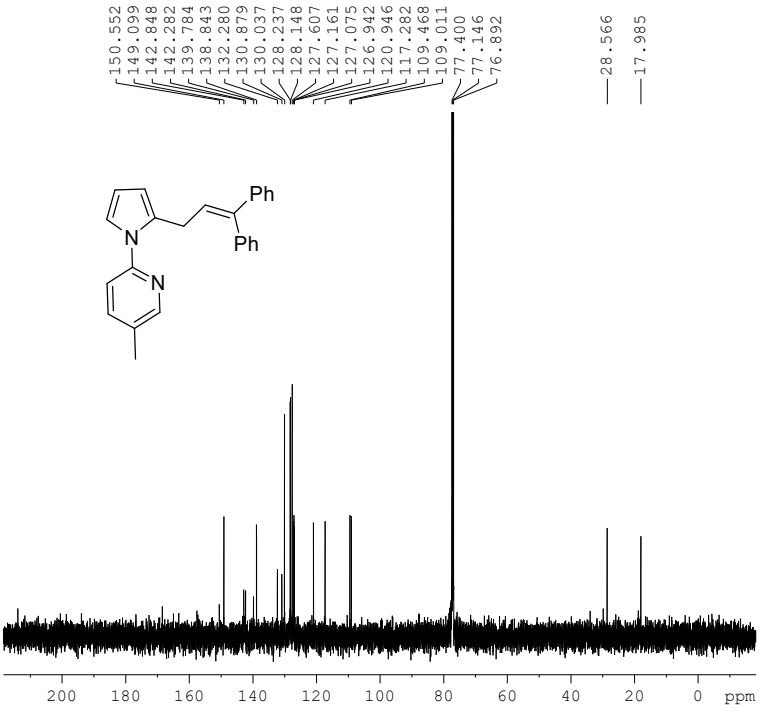

```
Current Data Parameters
NAME      942 pyr prd 4me
EXPNO                  92
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170623
Time               6.44
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES         0.305176 Hz
AQ            1.6384000 sec
RG               124.08
DW               50.000 usec
DE                6.50 usec
TE               294.8 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                1H
P1                12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                65536
SF           500.1500144 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      942 pyr prd 4me
EXPNO                  93
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170623
Time               6.52
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                20480
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           29761.904 Hz
FIDRES         1.453218 Hz
AQ            0.3440640 sec
RG               202.34
DW               16.800 usec
DE                6.50 usec
TE               295.3 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

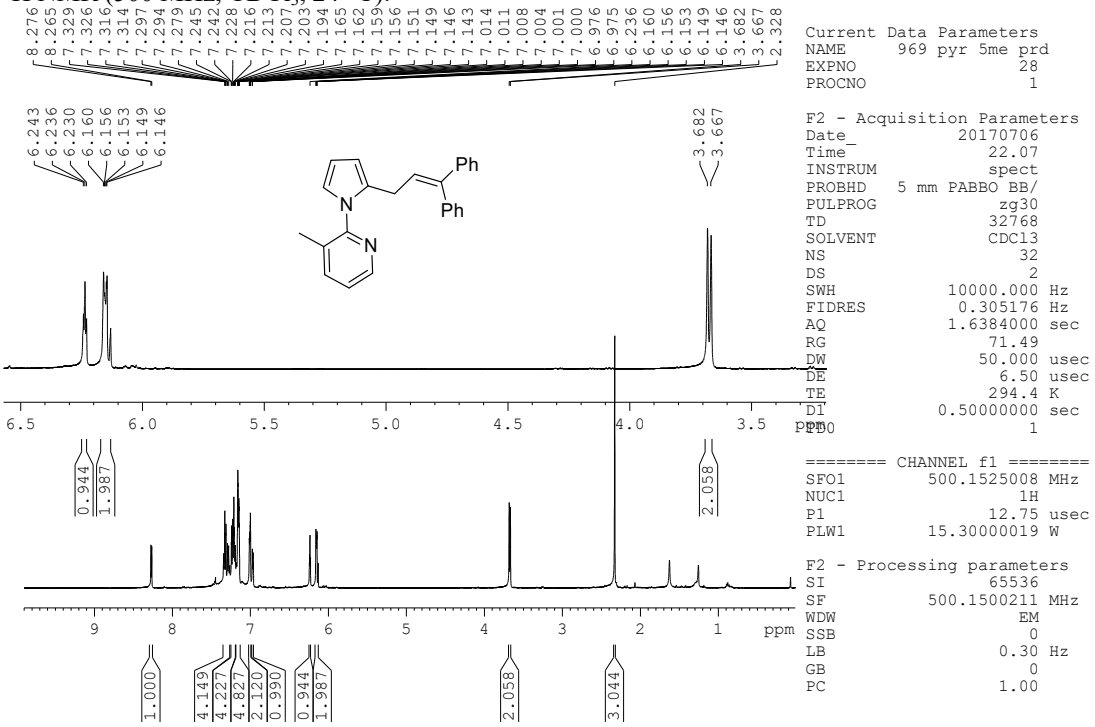
======== CHANNEL f1 ========
SFO1        125.7753932 MHz
NUC1                13C
P1                9.88 usec
PLW1       103.00000000 W

======== CHANNEL f2 ========
SFO2        500.1520006 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        15.30000019 W
PLW12        0.38863000 W
PLW13        0.19548000 W

F2 - Processing parameters
SI                32768
SF          125.7628041 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
```

2-(2-(3,3-diphenylallyl)-1H-pyrrol-1-yl)-3-methylpyridine(6d):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



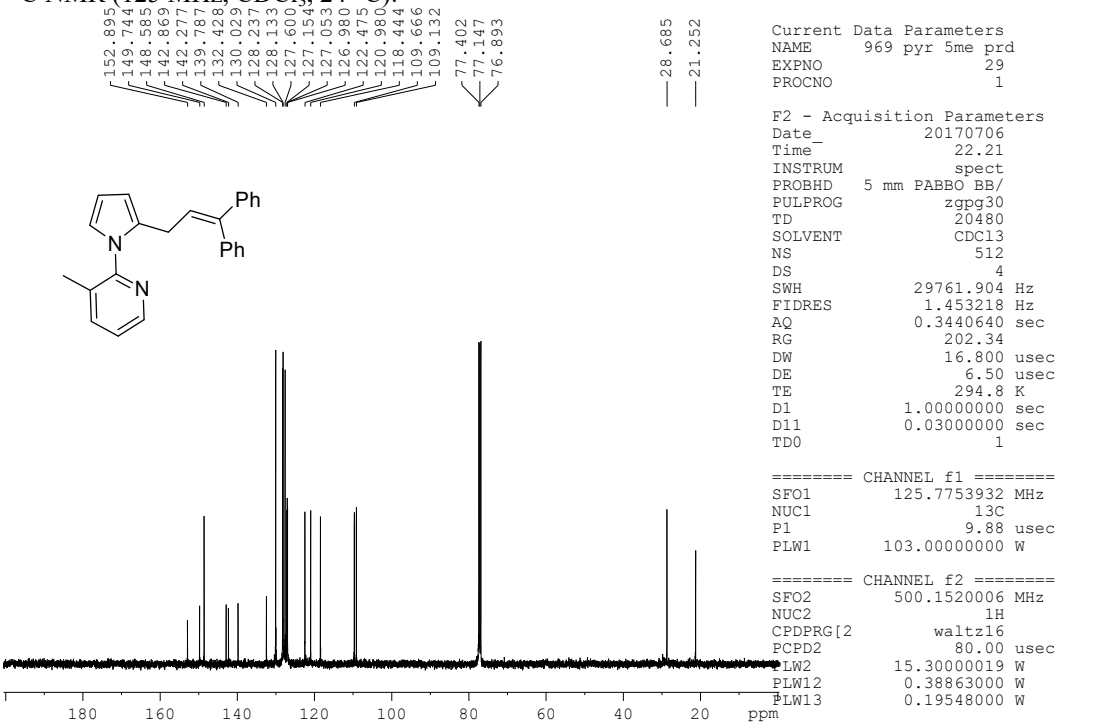

```
Current Data Parameters
NAME      969 pyr 5me prd
EXPNO                  28
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170706
Time              22.07
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6384000 sec
RG                71.49
DW               50.000 usec
DE                6.50 usec
TE                294.4 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                  1H
P1                12.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                65536
SF          500.1500211 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      969 pyr 5me prd
EXPNO                  29
PROCNO                  1

F2 - Acquisition Parameters
Date_           20170706
Time              22.21
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                20480
SOLVENT           CDCl3
NS                  512
DS                    4
SWH           29761.904 Hz
FIDRES         1.453218 Hz
AQ            0.3440640 sec
RG                202.34
DW               16.800 usec
DE                6.50 usec
TE                294.8 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0                   1

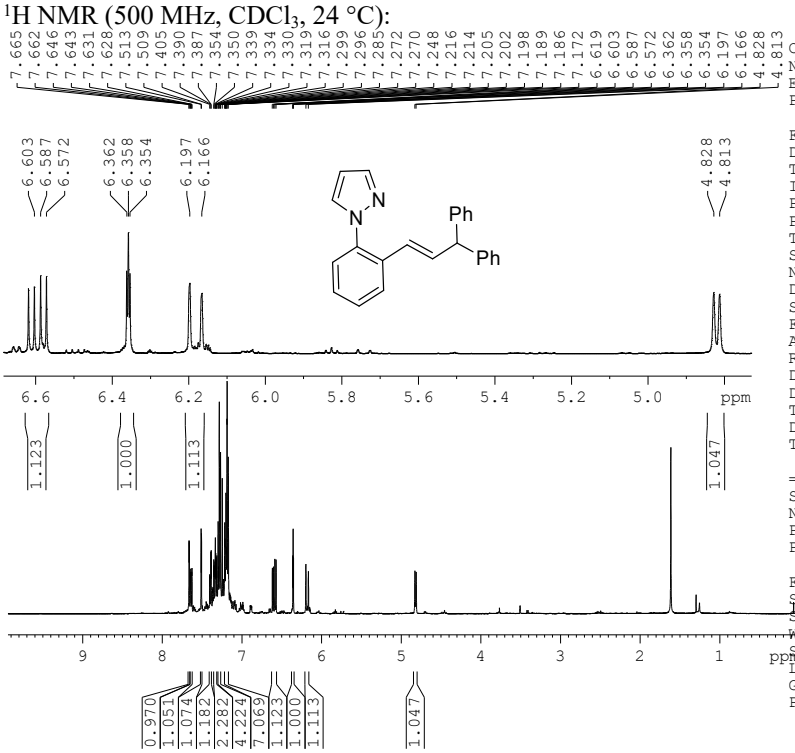
======== CHANNEL f1 ========
SFO1        125.7753932 MHz
NUC1                 13C
P1                9.88 usec
PLW1       103.00000000 W

======== CHANNEL f2 ========
SFO2        500.1520006 MHz
NUC2                  1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        15.30000019 W
PLW12        0.38863000 W
PLW13        0.19548000 W

F2 - Processing parameters
SI                32768
SF          125.7628073 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)phenyl)-1*H*-pyrazole(7a):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



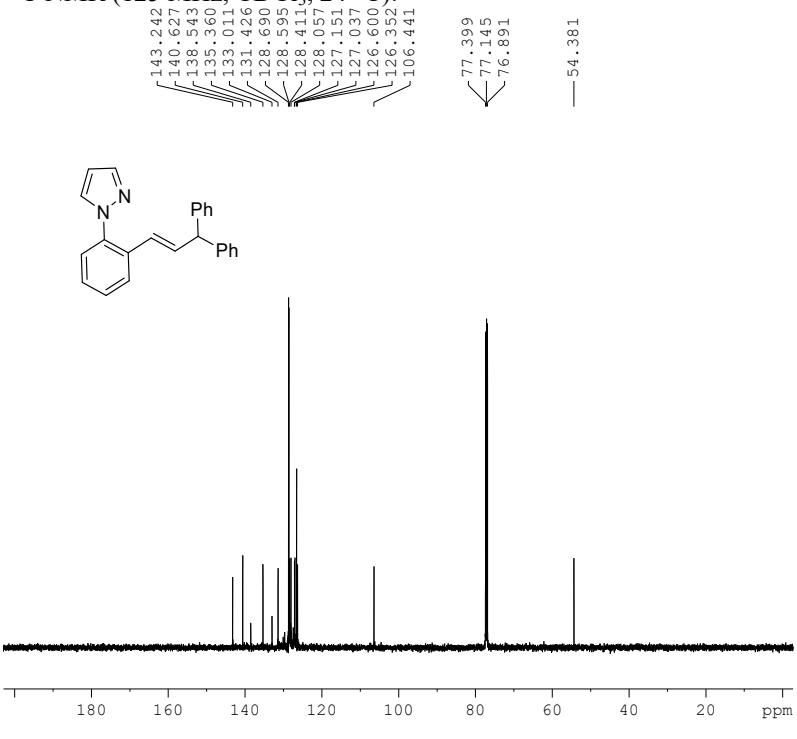

```
Current Data Parameters
NAME      pyrrole parent
EXPNO                121
PROCNO                 1

F2 - Acquisition Parameters
Date_           20190426
Time                4.15
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES         0.305176 Hz
AQ             1.6384000 sec
RG                 101.5
DW                50.000 usec
DE                 6.50 usec
TE                296.6 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1          500.1525008 MHz
NUC1                  1H
P1                 11.75 usec
PLW1          15.30000019 W

F2 - Processing parameters
SI                 65536
SF            500.1500186 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      pyrrole parent
EXPNO                122
PROCNO                 1

F2 - Acquisition Parameters
Date_           20190426
Time                4.29
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                 20480
SOLVENT            CDCl3
NS                   512
DS                     4
SWH            29761.904 Hz
FIDRES         1.453218 Hz
AQ             0.3440640 sec
RG                 202.34
DW                16.800 usec
DE                 6.50 usec
TE                297.3 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

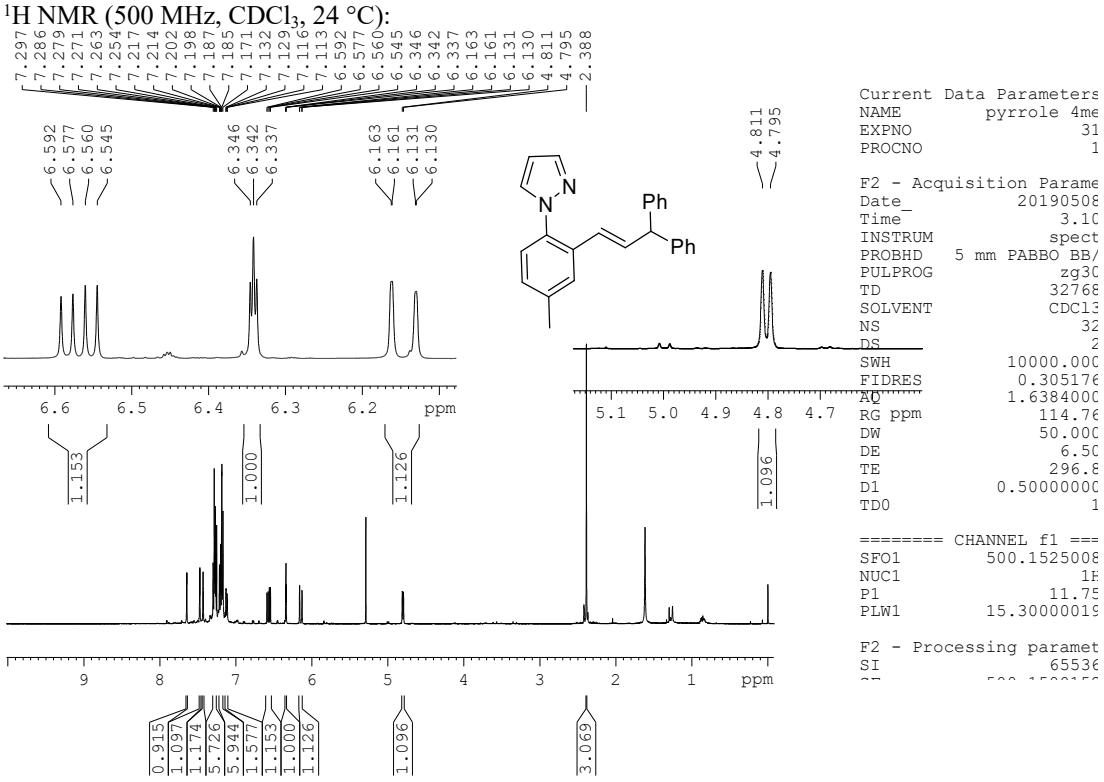
======== CHANNEL f1 ========
SFO1          125.7753932 MHz
NUC1                  13C
P1                 10.20 usec
PLW1          103.00000000 W

======== CHANNEL f2 ========
SFO2          500.1520006 MHz
NUC2                  1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2          15.30000019 W
PLW12          0.38863000 W
PLW13          0.19548000 W

F2 - Processing parameters
SI                 32768
SF            125.7628053 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

(E)-1-(2-(3,3-diphenylprop-1-en-1-yl)-4-methylphenyl)-1H-pyrazole (7b):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



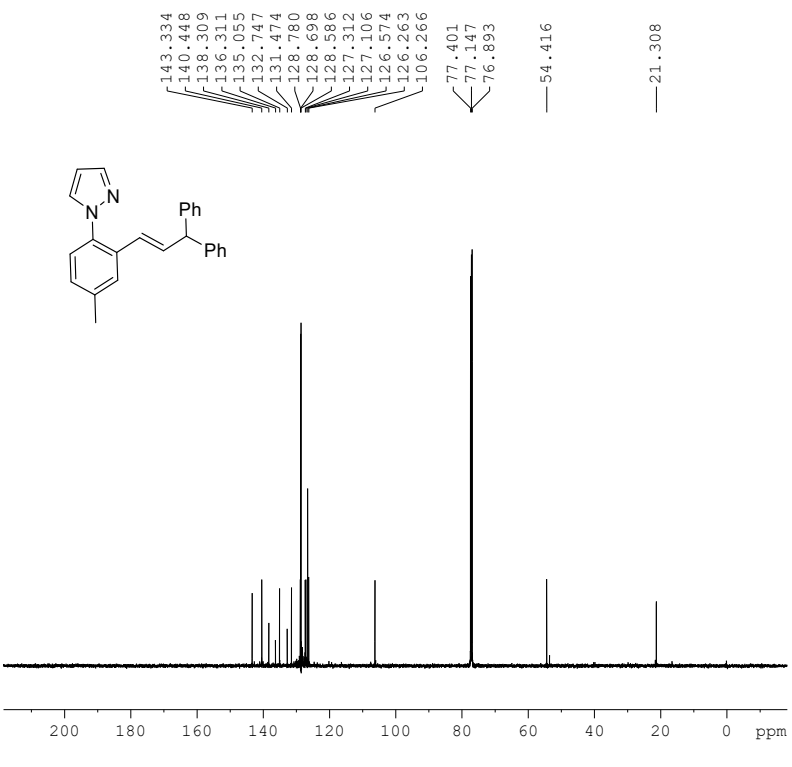
Current Data Parameters
NAME pyrrole 4me
EXPNO 31
PROCNO 1

F2 - Acquisition Parame
Date_ 20190508
Time 3.10
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 32
DS 2
SWH 10000.000
FIDRES 0.305176
AQ 1.6384000
RG ppm 114.76
DW 50.000
DE 6.50
TE 296.8
D1 0.50000000
TD0 1

======== CHANNEL f1 ===
SFO1 500.1525008
NUC1 1H
P1 11.75
PLW1 15.30000019

F2 - Processing paramet
SI 65536

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):



Current Data Parameters
NAME pyrrole 4me
EXPNO 32
PROCNO 1

F2 - Acquisition Parameters
Date_ 20190508
Time 4.23
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 20480
SOLVENT CDCl3
NS 3000
DS 4
SWH 29761.904 Hz
FIDRES 1.453218 Hz
AQ 0.3440640 sec
RG 202.34
DW 16.800 usec
DE 6.50 usec
TE 297.4 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

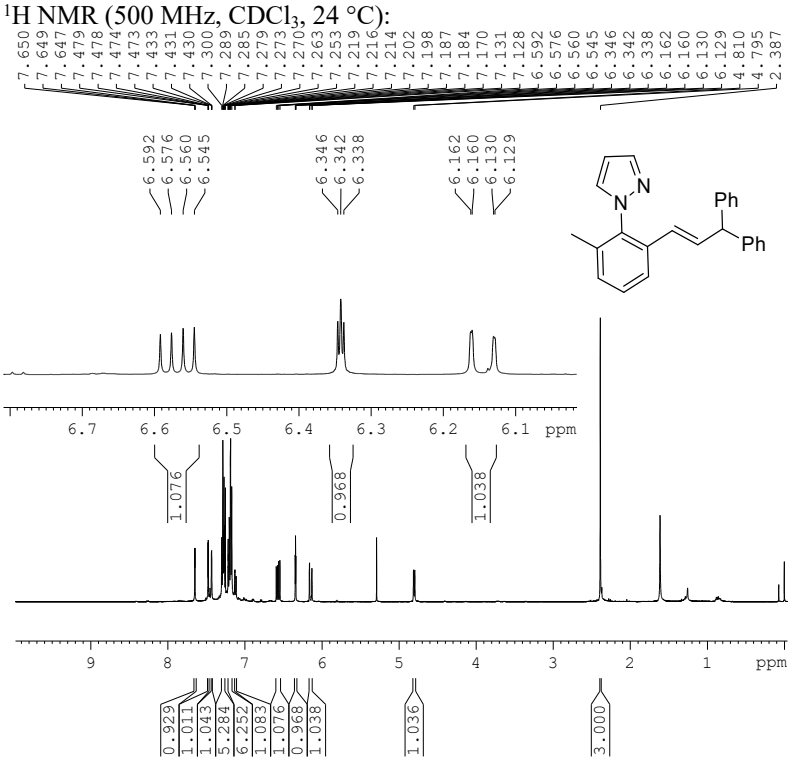
======== CHANNEL f1 ========
SFO1 125.7753932 MHz
NUC1 13C
P1 10.20 usec
PLW1 103.00000000 W

======== CHANNEL f2 ========
SFO2 500.1520006 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 15.30000019 W
PLW12 0.38863000 W
PLW13 0.19548000 W

F2 - Processing parameters
SI 32768
SF 125.7628034 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

(E)-1-(2-(3,3-Diphenylprop-1-en-1-yl)-6-methylphenyl)-1*H*-pyrazole(7c):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



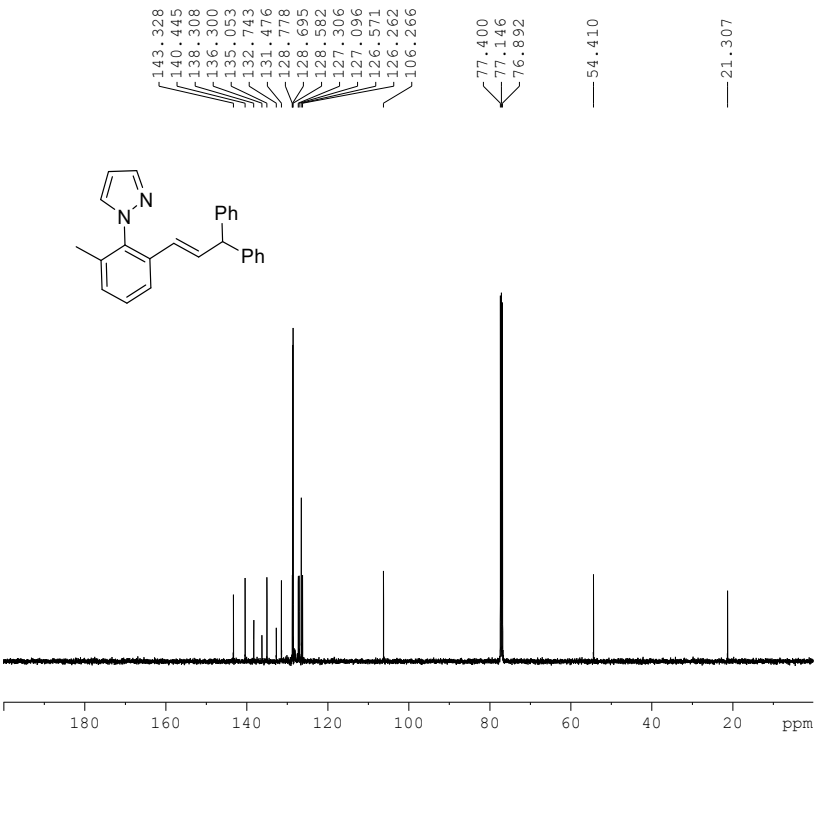

```
Current Data Parameters
NAME      pyrrole 2me 1729
EXPNO                 37
PROCNO                 1

F2 - Acquisition Parameters
Date_           20190508
Time               7.10
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES            0.305176 Hz
AQ              1.6384000 sec
RG                 114.76
DW                 50.000 usec
DE                  6.50 usec
TE                296.2 K
D1              0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 11.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF            500.1500158 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME      pyrrole 2me 1729
EXPNO                 38
PROCNO                 1

F2 - Acquisition Parameters
Date_           20190508
Time               7.35
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                20480
SOLVENT           CDCl3
NS                 1000
DS                    4
SWH           29761.904 Hz
FIDRES            1.453218 Hz
AQ              0.3440640 sec
RG                 202.34
DW                 16.800 usec
DE                  6.50 usec
TE                297.0 K
D1              1.00000000 sec
D11             0.03000000 sec
TD0                    1

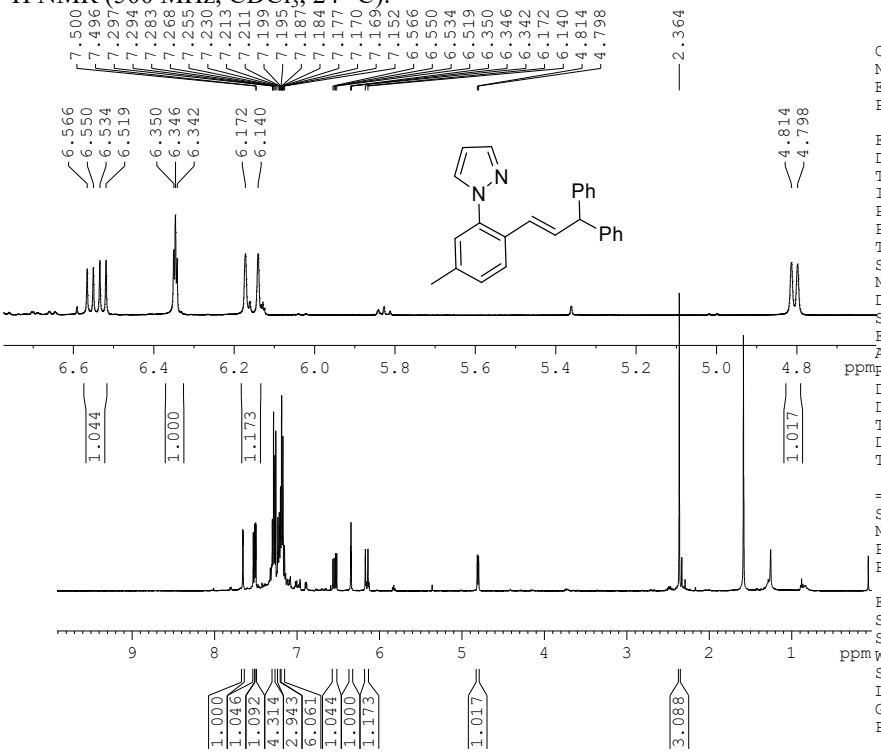
======== CHANNEL f1 ========
SFO1        125.7753932 MHz
NUC1                  13C
P1                 10.20 usec
PLW1        103.00000000 W

======== CHANNEL f2 ========
SFO2         500.1520006 MHz
NUC2                   1H
CPDPRG[2          waltz16
PCPD2              80.00 usec
PLW2         15.30000019 W
PLW12         0.38863000 W
PLW13         0.19548000 W

F2 - Processing parameters
SI                 32768
SF           125.7628041 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

(E)-1-(2-(3,3-diphenylprop-1-en-1-yl)-5-methylphenyl)-1H-pyrazole(7d):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



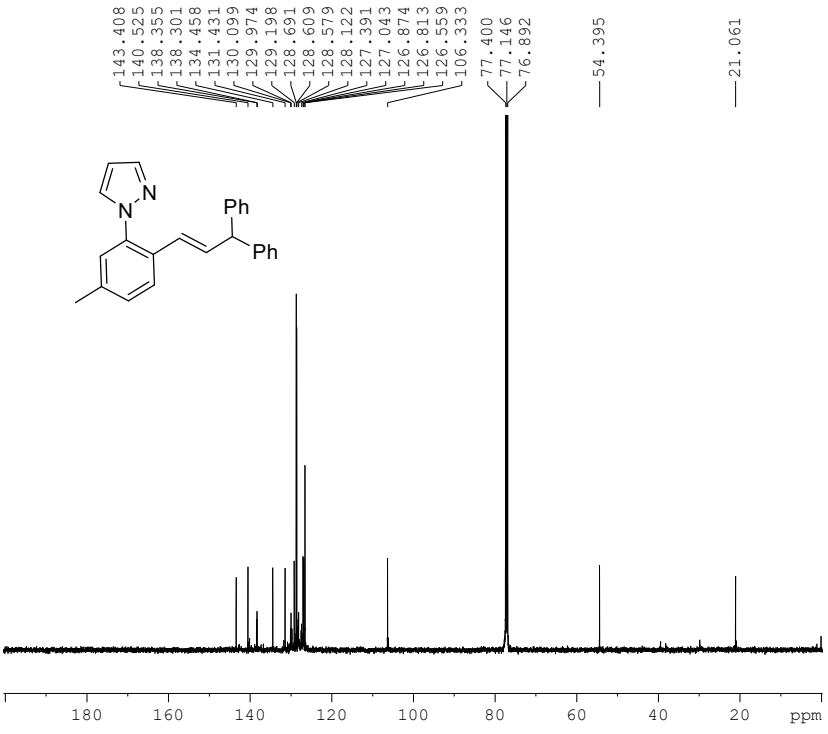

```
Current Data Parameters
NAME       pyyrole  3me
EXPNO                33
PROCNO                1

F2 - Acquisition Parameters
Date_          20190607
Time              18.17
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                32768
SOLVENT           CDCl3
NS                   32
DS                    2
SWH           10000.000 Hz
FIDRES        0.305176 Hz
AQ            1.6384000 sec
RG               124.08
DW               50.000 usec
DE                6.50 usec
TE                297.8 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        500.1525008 MHz
NUC1                  1H
P1                11.75 usec
PLW1        15.30000019 W

F2 - Processing parameters
SI                65536
SF          500.1500145 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00
```

^{13}C NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME       pyrazole 3me
EXPNO                34
PROCNO                1

F2 - Acquisition Parameters
Date_          20190607
Time              19.53
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                20480
SOLVENT           CDCl3
NS                 4000
DS                    4
SWH           29761.904 Hz
FIDRES         1.453218 Hz
AQ            0.3440640 sec
RG               202.34
DW               16.800 usec
DE                6.50 usec
TE                297.9 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

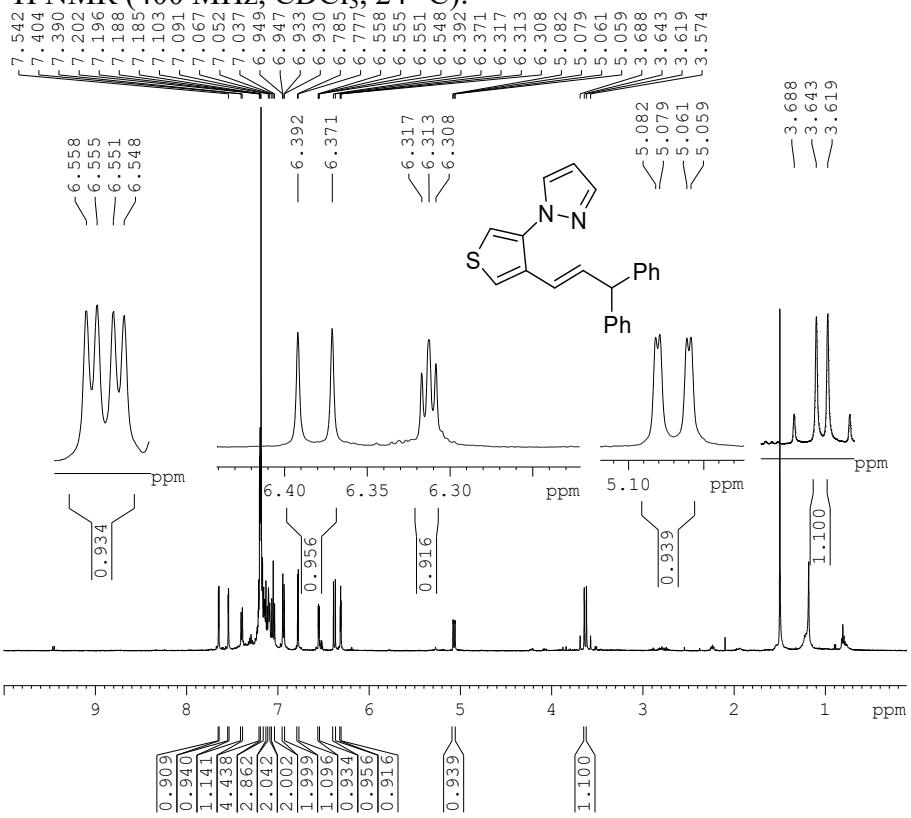
======== CHANNEL f1 ========
SFO1        125.7753932 MHz
NUC1                 13C
P1                10.20 usec
PLW1       103.00000000 W

======== CHANNEL f2 ========
SFO2        500.1520006 MHz
NUC2                  1H
CPDPRG[2         waltz16
PCPD2             80.00 usec
PLW2        15.30000019 W
PLW12        0.38863000 W
PLW13        0.19548000 W

F2 - Processing parameters
SI                32768
SF          125.7628030 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40
```

(E)-1-(4-(3,3-Diphenylprop-1-en-1-yl)thiophen-3-yl)-1*H*-pyrazole (7e):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



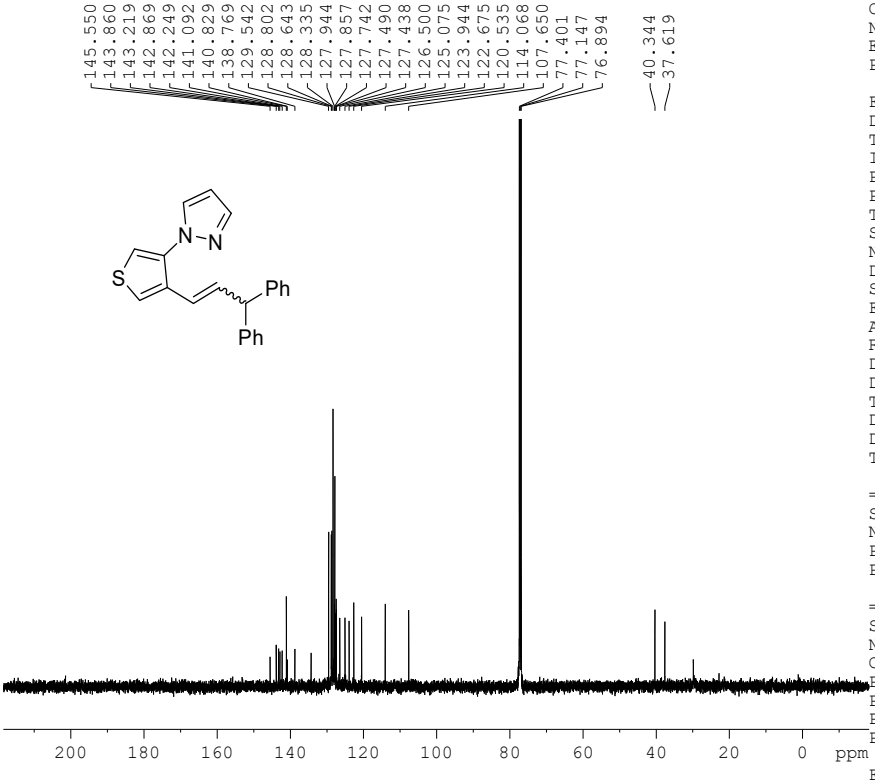

```
Current Data Parameters
NAME           2715 THIO
EXPNO                  7
PROCNO                 1

F2 - Acquisition Parame
Date_           20210807
Time               11.10
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                     8
DS                     2
SWH            10000.000
FIDRES          0.305176
AQ             1.6384000
RG                138.53
DW                50.000
DE                  6.50
TE                 296.8
D1            0.50000000
TD0                    1

======== CHANNEL f1 ===
SFO1         500.1525008
NUC1                1H
P1                 11.75
PLW1         15.30000019

F2 - Processing paramet
SI                 65536
SF          500.1500496
WDW                   EM
SSB                    0
LB                  0.30
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C):




```
Current Data Parameters
NAME           2715 THIO
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameter
Date_           20210809
Time               13.37
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG          zgpg30
TD                 20480
SOLVENT            CDCl3
NS                  1500
DS                     4
SWH           29761.904 Hz
FIDRES         1.453218 Hz
AQ            0.3440640 se
RG                202.34
DW                16.800 us
DE                 6.50 us
TE                299.6 K
D1           1.00000000 se
D11          0.03000000 se
TD0                    1

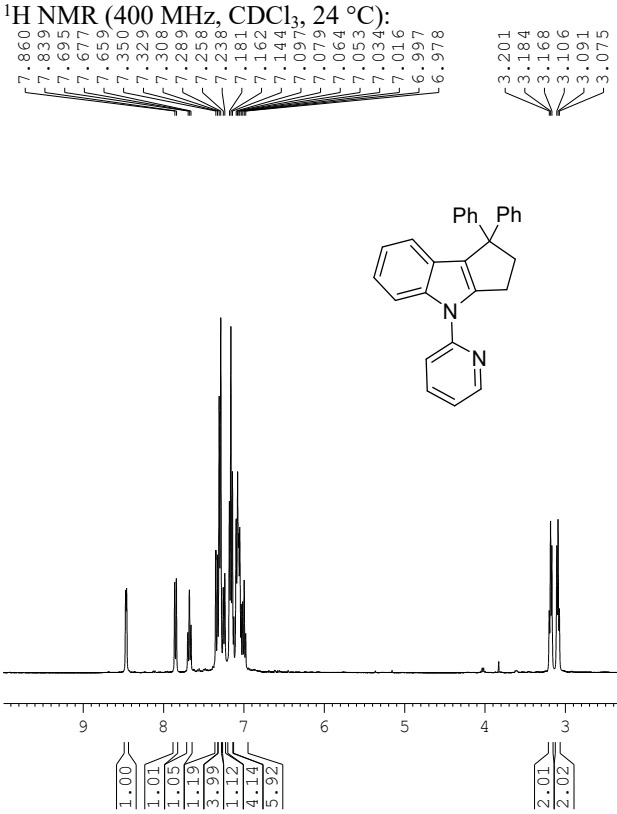
======== CHANNEL f1 ======
SFO1        125.7753932 MH
NUC1                13C
P1                10.20 us
PLW1       103.00000000 W

======== CHANNEL f2 ======
SFO2        500.1520006 MH
NUC2                1H
CPDPRG[2         waltz16
PCPD2             80.00 us
PLW2        15.30000019 W
PLW12        0.39658999 W
PLW13        0.19948000 W

F2 - Processing parameters
```

1,1-Diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10a):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



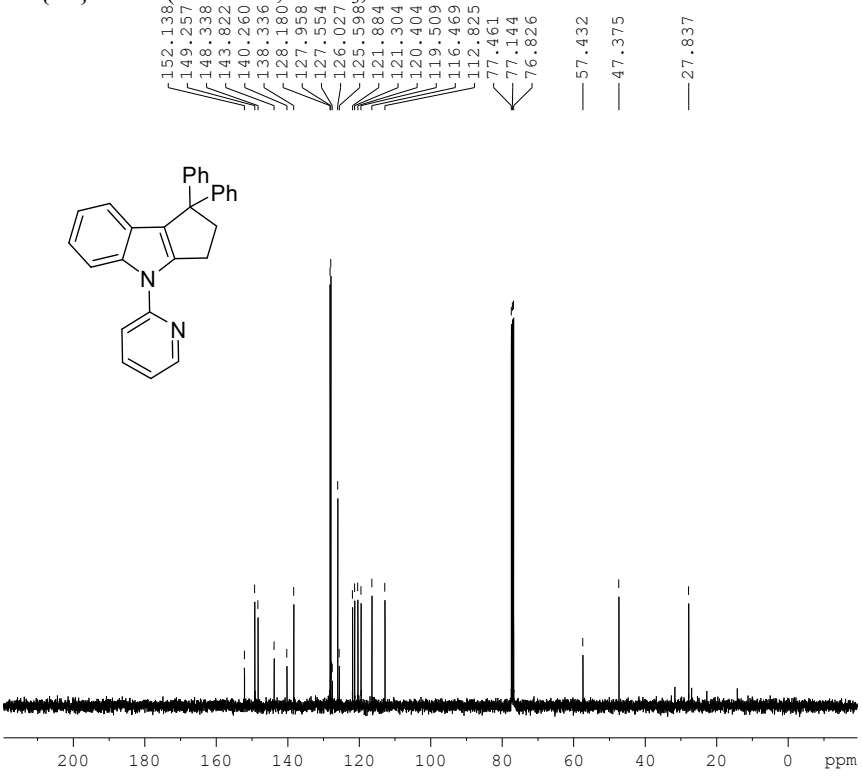

```
Current Data Parameters
NAME     1859 apllication pa
EXPNO                 426
PROCNO                  1

F2 - Acquisition Parameters
Date_           20190824
Time                9.16
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ             4.0894465 sec
RG                 95.73
DW                62.400 usec
DE                 6.50 usec
TE                297.9 K
D1           0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF          400.1300634 MHz
WDW                   EM
SSB      0
LB                 0.30 Hz
GB       0
PC                 1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME            spa411
EXPNO                4
PROCNO

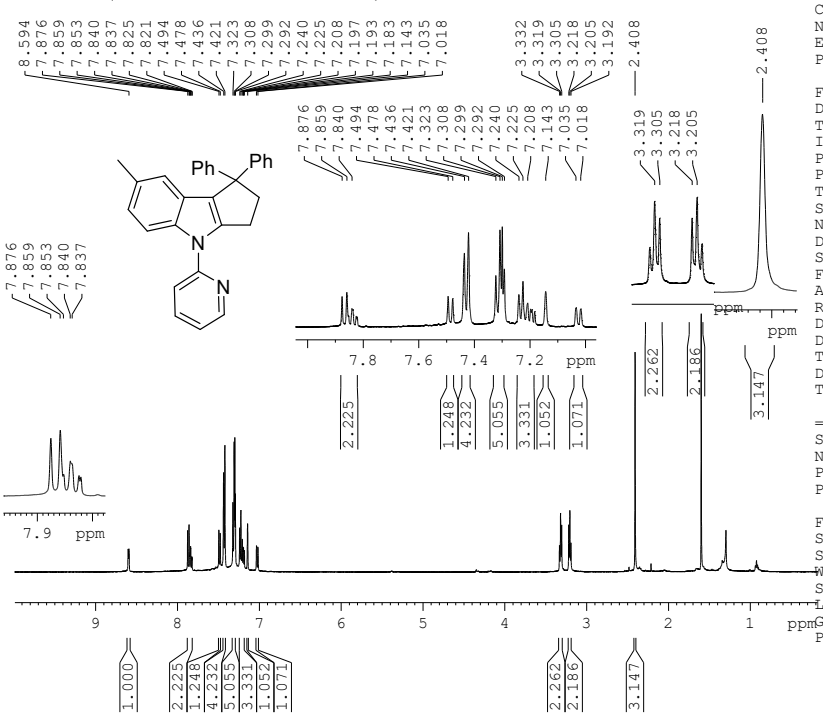
F2 - Acquisition Para
Date_           201711
Time               13.
INSTRUM             spe
PROBHD   5 mm PABBO B
PULPROG            zgpg
TD                  165
SOLVENT             CDC
NS                    2
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                294
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                 1
P1                  9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2          waltz
PCPD2              90.
PLW2          7.750000
```

1,1-Diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10b):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



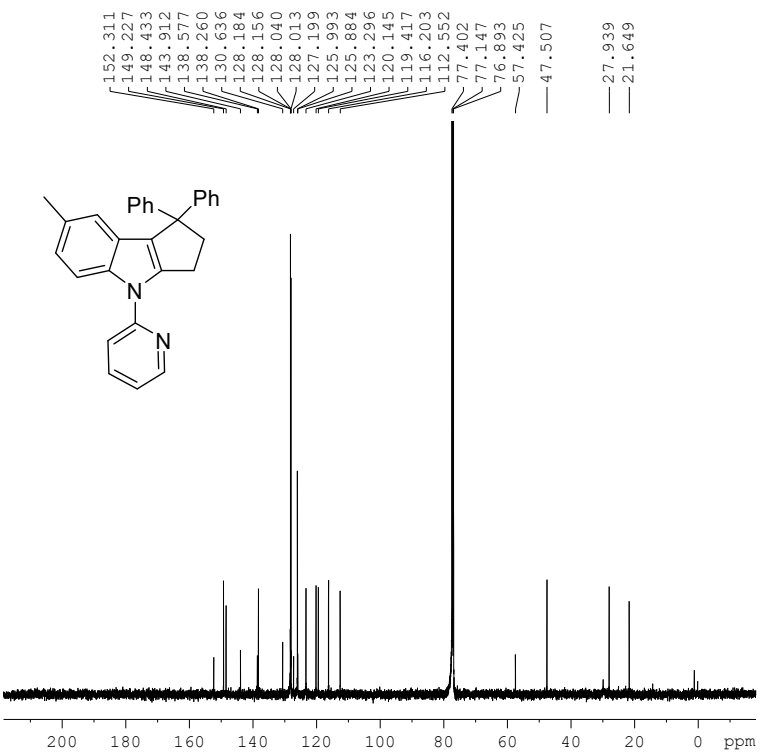
```
Current Data Parameters
NAME      1207 5me ind application second work
EXPNO                233
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180201
Time                6.20
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES          0.305176 Hz
AQ             1.6384000 sec
RG                138.53
DW                50.000 usec
DE                 6.50 usec
TE                297.7 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF            500.1499927 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:



```
Current Data Parameters
NAME      1207 5me ind application second work
EXPNO                234
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180201
Time                8.19
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG           zgpg30
TD                 20480
SOLVENT            CDCl3
NS                  5000
DS                     4
SWH            29761.904 Hz
FIDRES          1.453218 Hz
AQ             0.3440640 sec
RG                202.34
DW                16.800 usec
DE                 6.50 usec
TE                298.7 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

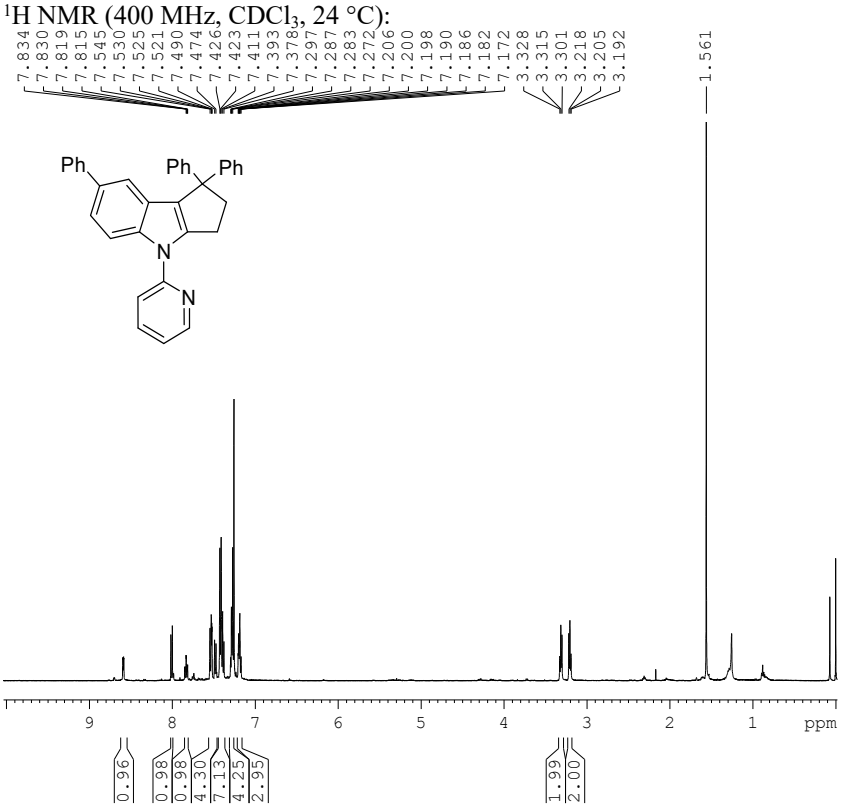
======== CHANNEL f1 ========
SFO1         125.7753932 MHz
NUC1                  13C
P1                 9.88 usec
PLW1        103.00000000 W

======== CHANNEL f2 ========
SFO2         500.1520006 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2         15.30000019 W
PLW12         0.38863000 W
PLW13         0.19548000 W

F2 - Processing parameters
SI                 32768
SF           125.7628016 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40
```

1,1,7-Triphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10c):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



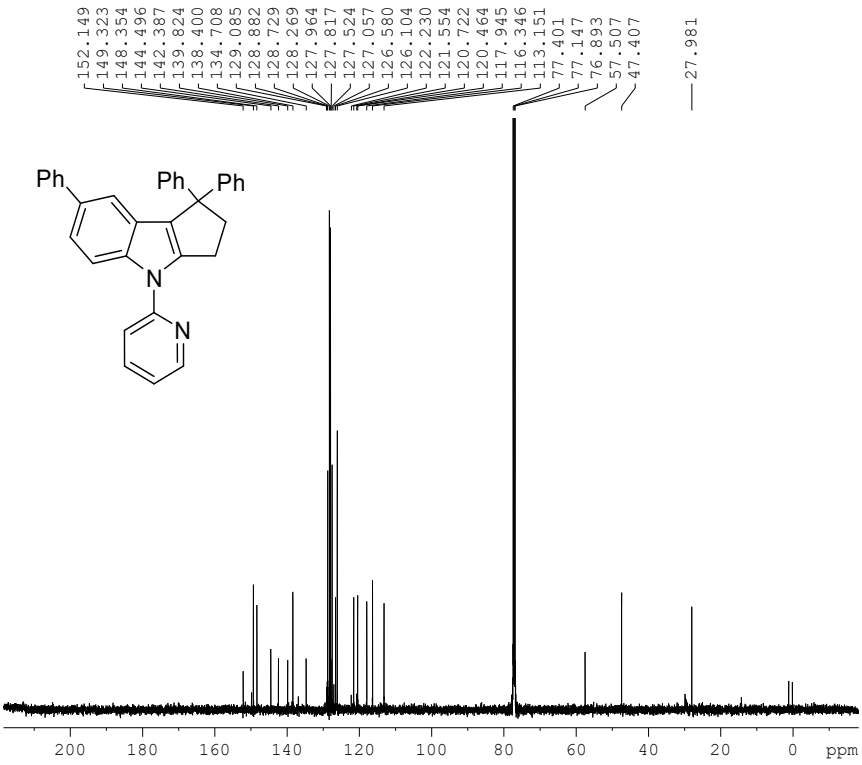
Current Data Paramete
NAME spa502
EXPNO
PROCNO

F2 - Acquisition Para
Date_ 201802
Time 20.
INSTRUM spe
PROBHD 5 mm PABBO B
PULPROG zg
TD 327
SOLVENT CDC
NS
DS
SWH 10000.0
FIDRES 0.3051
AQ 1.63840
RG 138.
DW 50.0
DE 6.
TE 297
D1 0.500000
TD0

======== CHANNEL f1 =
SFO1 500.15250
NUC1
P1 12.
PLW1 15.300000

F2 - Processing param
SI 655
SF 500.15001
WDW
SSB 0
LB 0.

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:



Current Data Paramete
NAME spa502
EXPNO
PROCNO

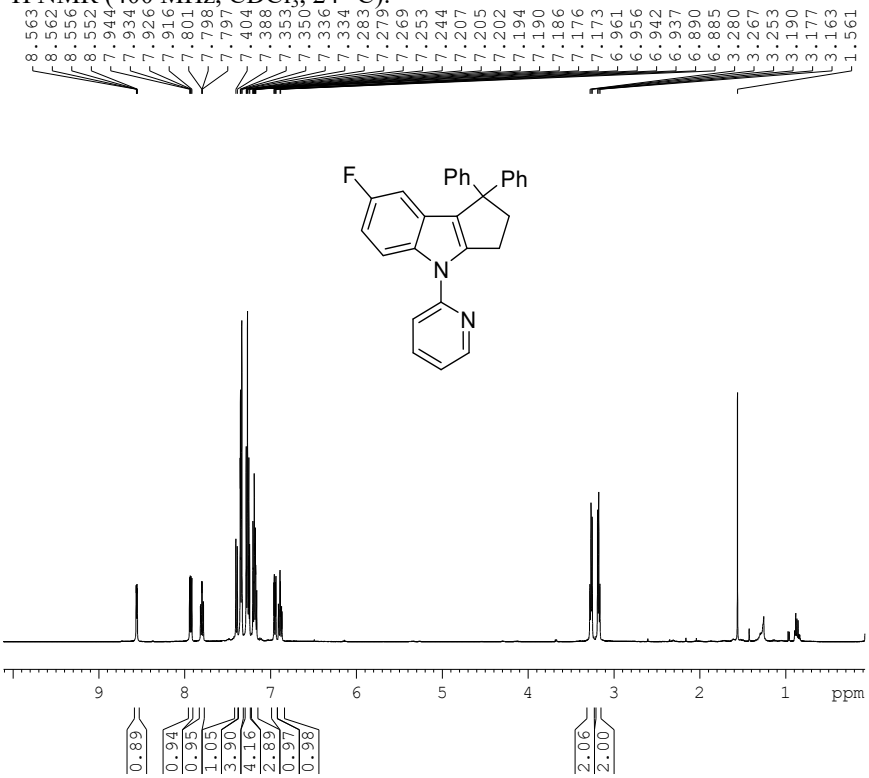
F2 - Acquisition Para
Date_ 201802
Time 23.
INSTRUM spe
PROBHD 5 mm PABBO B
PULPROG zgpg
TD 204
SOLVENT CDC
NS 80
DS
SWH 29761.9
FIDRES 1.4532
AQ 0.34406
RG 202.
DW 16.8
DE 6.
TE 298
D1 1.000000
D11 0.030000
TD0

======== CHANNEL f1 =
SFO1 125.77539
NUC1 1
P1 9.
PLW1 103.000000

======== CHANNEL f2 =
SFO2 500.15200
NUC2
CPDPRG[2 waltz
PCPD2 80.

7-Fluoro-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10d):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



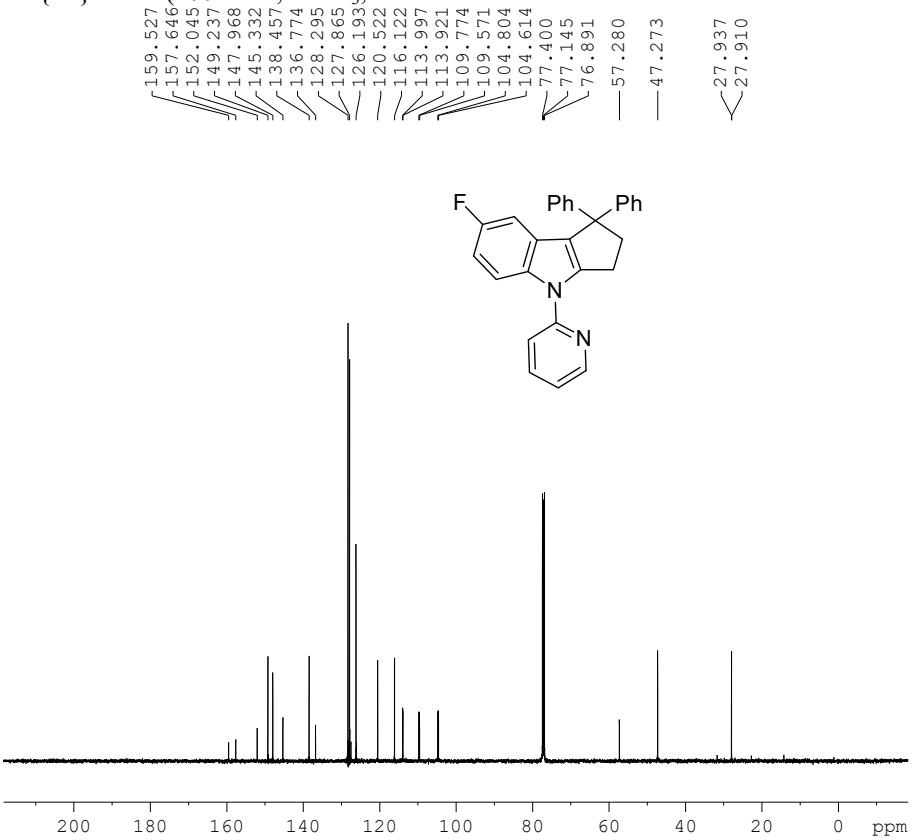

```
Current Data Paramete
NAME           spa502
EXPNO
PROCNO

F2 - Acquisition Para
Date_          201802
Time               0.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG           zg
TD               327
SOLVENT          CDC
NS
DS
SWH          10000.0
FIDRES        0.3051
AQ           1.63840
RG               89.
DW               50.0
DE                6.
TE              297
D1          0.500000
TD0

======== CHANNEL f1 =
SFO1       500.15250
NUC1
P1              12.
PLW1       15.300000

F2 - Processing param
SI               655
SF         500.15002
WDW
SSB      0
LB                0.
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME           pure r
EXPNO
PROCNO

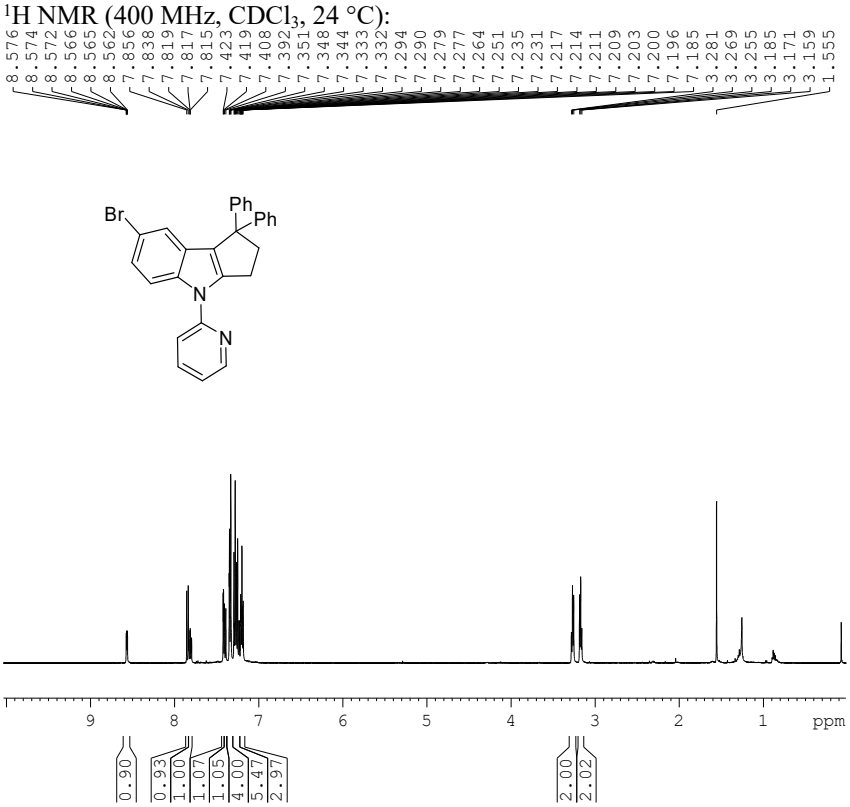
F2 - Acquisition Para
Date_          201802
Time               0.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG         zgpg
TD               204
SOLVENT          CDC
NS                10
DS
SWH          29761.9
FIDRES        1.4532
AQ           0.34406
RG               202.
DW               16.8
DE                6.
TE              298
D1          1.000000
D11         0.030000
TD0

======== CHANNEL f1 =
SFO1       125.77539
NUC1               1
P1                 9.
PLW1       103.000000

======== CHANNEL f2 =
SFO2       500.15200
NUC2
CPDPRG[2        waltz
PCPD2             80.
```

7-Bromo-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10e):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



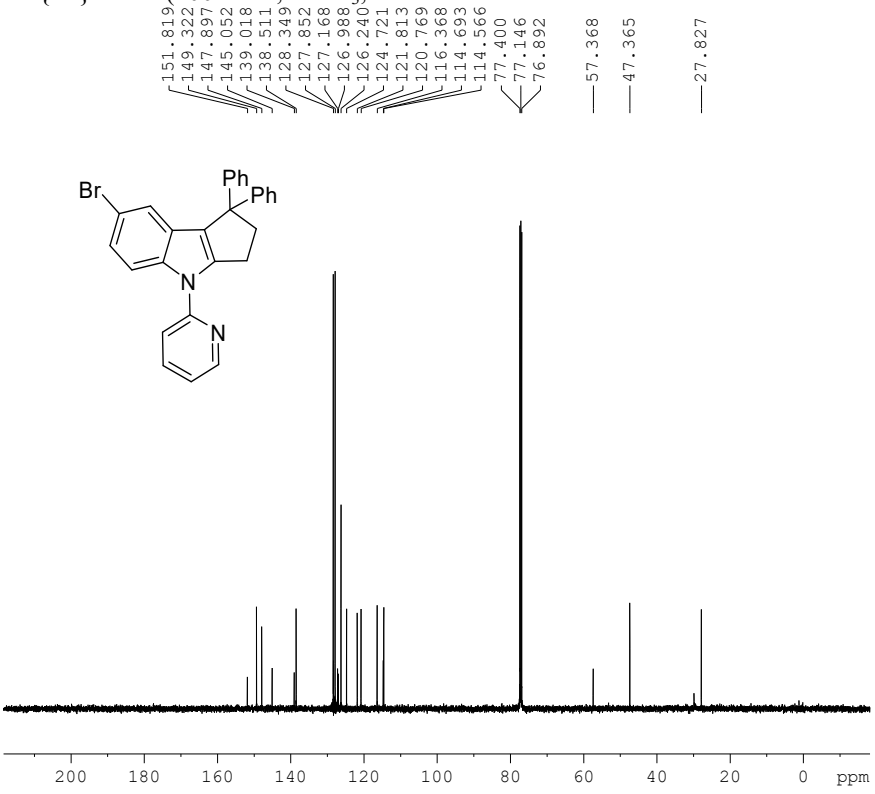

```
Current Data Paramete
NAME            spa502
EXPNO
PROCNO

F2 - Acquisition Para
Date_           201802
Time              23.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG            zg
TD                327
SOLVENT           CDC
NS
DS
SWH           10000.0
FIDRES         0.3051
AQ            1.63840
RG               114.
DW               50.0
DE                6.
TE                297
D1           0.500000
TD0

======== CHANNEL f1 =
SFO1        500.15250
NUC1
P1                12.
PLW1        15.300000

F2 - Processing param
SI                655
SF          500.15001
WDW
SSB       0
LB                0.
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME            spa502
EXPNO
PROCNO

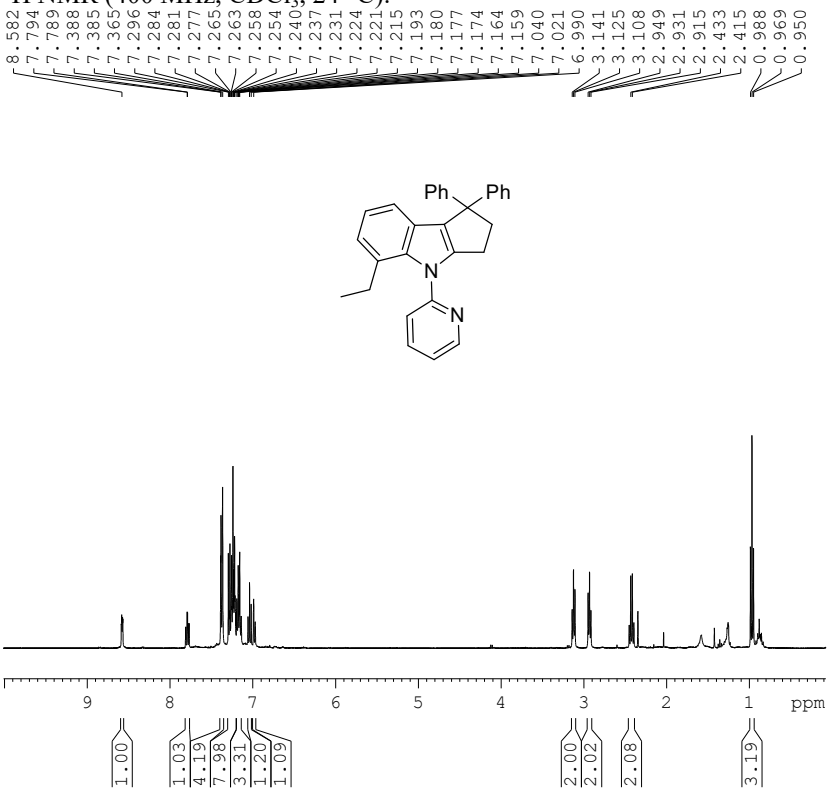
F2 - Acquisition Para
Date_           201802
Time              0.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                204
SOLVENT           CDC
NS                 10
DS
SWH           29761.9
FIDRES         1.4532
AQ            0.34406
RG               202.
DW               16.8
DE                6.
TE                298
D1           1.000000
D11          0.030000
TD0

======== CHANNEL f1 =
SFO1        125.77539
NUC1                1
P1                 9.
PLW1       103.000000

======== CHANNEL f2 =
SFO2        500.15200
NUC2
CPDPRG[2         waltz
PCPD2             80.
```

5-Ethyl-1,1-diphenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10f):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



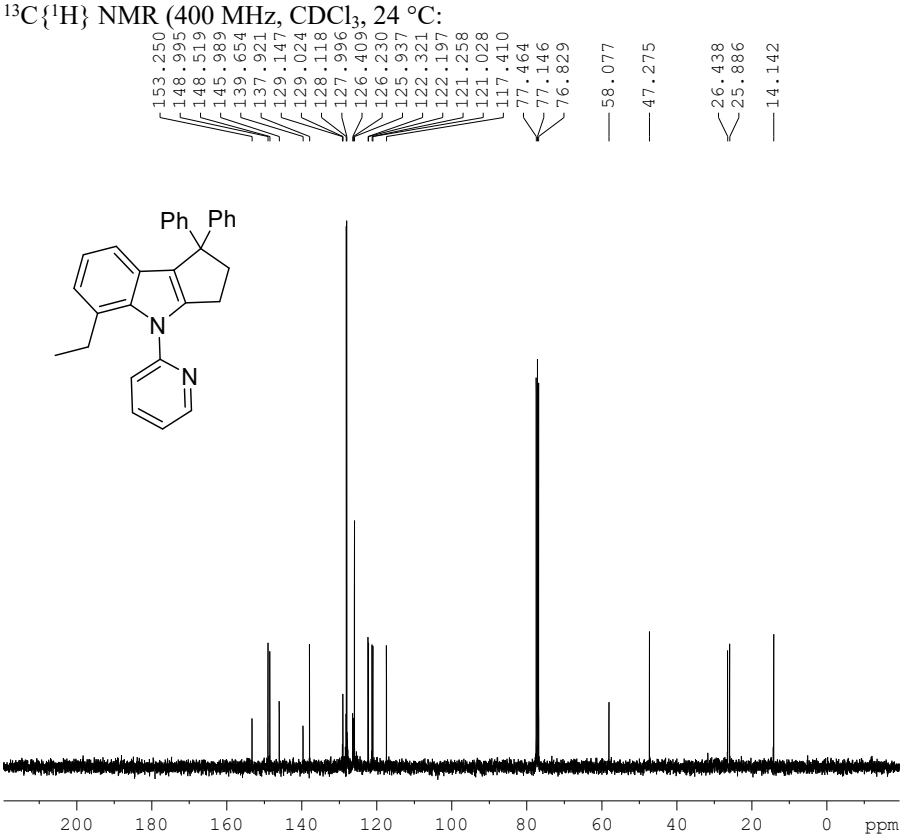

```
Current Data Parameters
NAME      1205 7 et appli
EXPNO                 583
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180131
Time                8.16
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                 124.58
DW                 62.400 usec
DE                  6.50 usec
TE                 296.7 K
D1              0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                    65536
SF           400.1300217 MHz
WDW                     EM
SSB       0
LB                  0.30 Hz
GB        0
PC                  1.00
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME                  12
EXPNO                  5
PROCNO

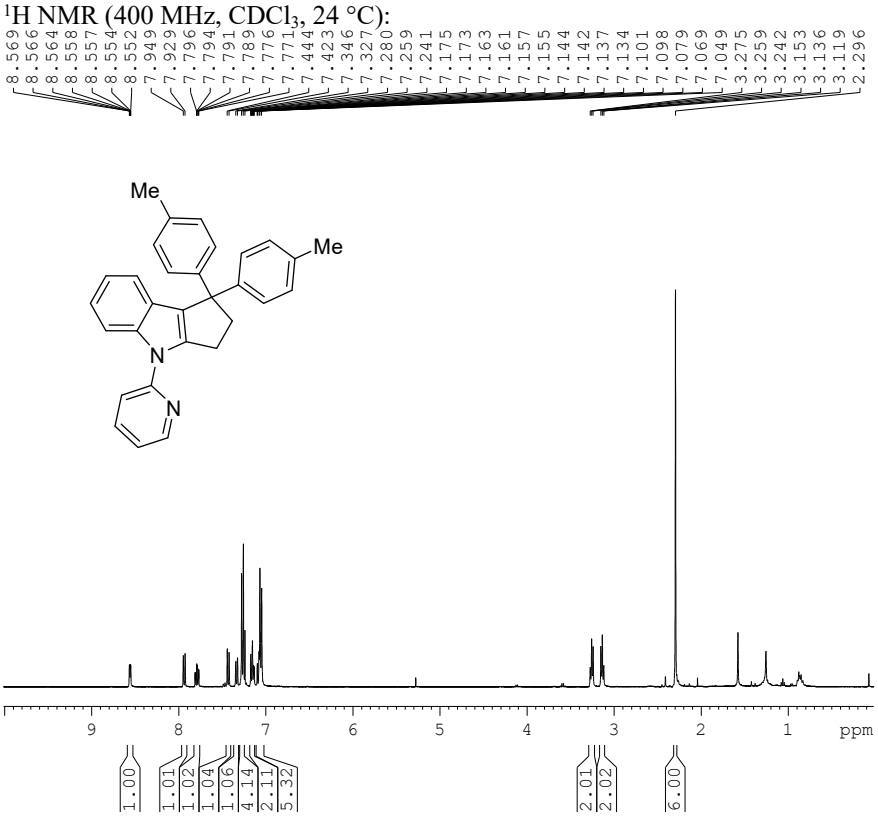
F2 - Acquisition Para
Date_           201801
Time                8.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG            zgpg
TD                  165
SOLVENT             CDC
NS                    2
DS
SWH             24038.4
FIDRES           1.4533
AQ              0.34403
RG                200.
DW                20.8
DE                  6.
TE                297
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                 1
P1                  9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2          waltz
PCPD2               90.
PLW2          7.750000
```

4-(Pyridin-2-yl)-1,1-di-p-tolyl-1,2,3,4-tetrahydrocyclopenta[b]indole (10g):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



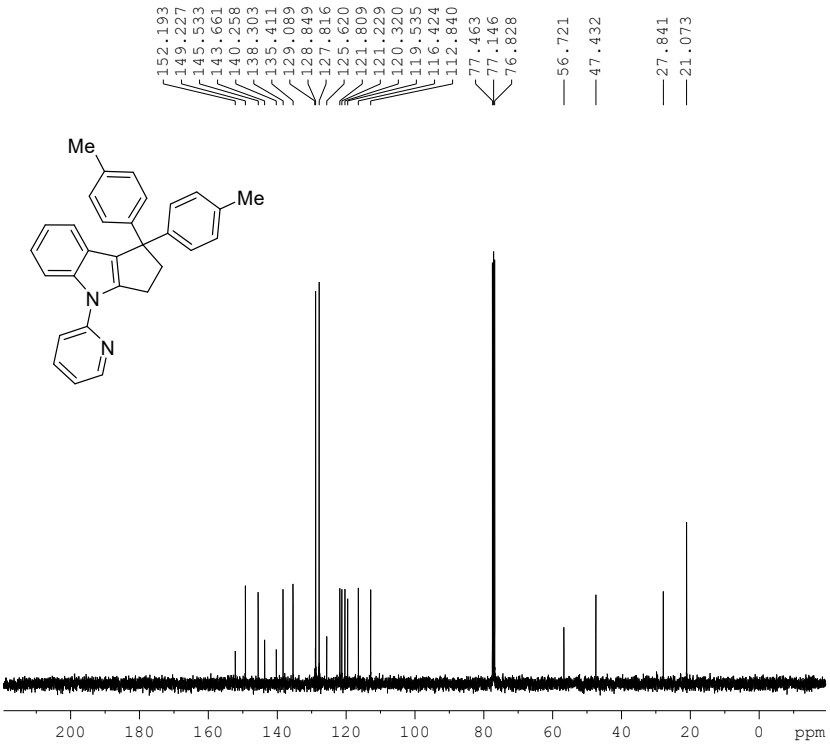

```
Current Data Paramete
NAME              spa412
EXPNO                  5
PROCNO

F2 - Acquisition Para
Date_              201712
Time                10.
INSTRUM              spe
PROBHD   5 mm PABBO B
PULPROG              zg
TD                  655
SOLVENT             CDC
NS
DS
SWH              8012.8
FIDRES           0.1222
AQ               4.08944
RG                 138.
DW                 62.4
DE                   6.
TE                   293
D1              0.500000
TD0

======== CHANNEL f1 =
SFO1           400.13200
NUC1
P1                  15.
PLW1            7.750000

F2 - Processing param
SI                   655
SF             400.13001
WDW
SSB       0
LB                   0.
```

^{13}C{^{1}H} NMR (400 MHz, $CDCl_3$, 24 °C:




```
Current Data Paramete
NAME              spa412
EXPNO                  5
PROCNO

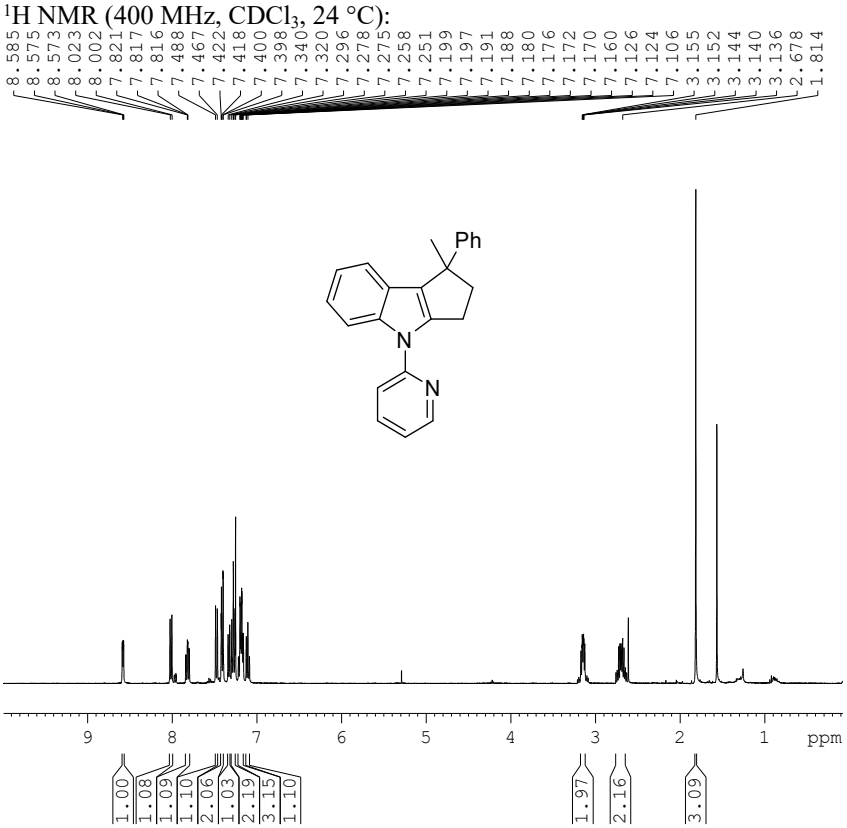
F2 - Acquisition Para
Date_              201712
Time                10.
INSTRUM              spe
PROBHD   5 mm PABBO B
PULPROG            zgpg
TD                  165
SOLVENT             CDC
NS                    2
DS
SWH             24038.4
FIDRES           1.4533
AQ               0.34403
RG                 200.
DW                 20.8
DE                   6.
TE                   293
D1              1.000000
D11             0.030000
TD0

======== CHANNEL f1 =
SFO1           100.62282
NUC1                   1
P1                    9.
PLW1           47.000000

======== CHANNEL f2 =
SFO2           400.13160
NUC2
CPDPRG[2           waltz
PCPD2                 90.
```

1-Methyl-1-phenyl-4-(pyridin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10h):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



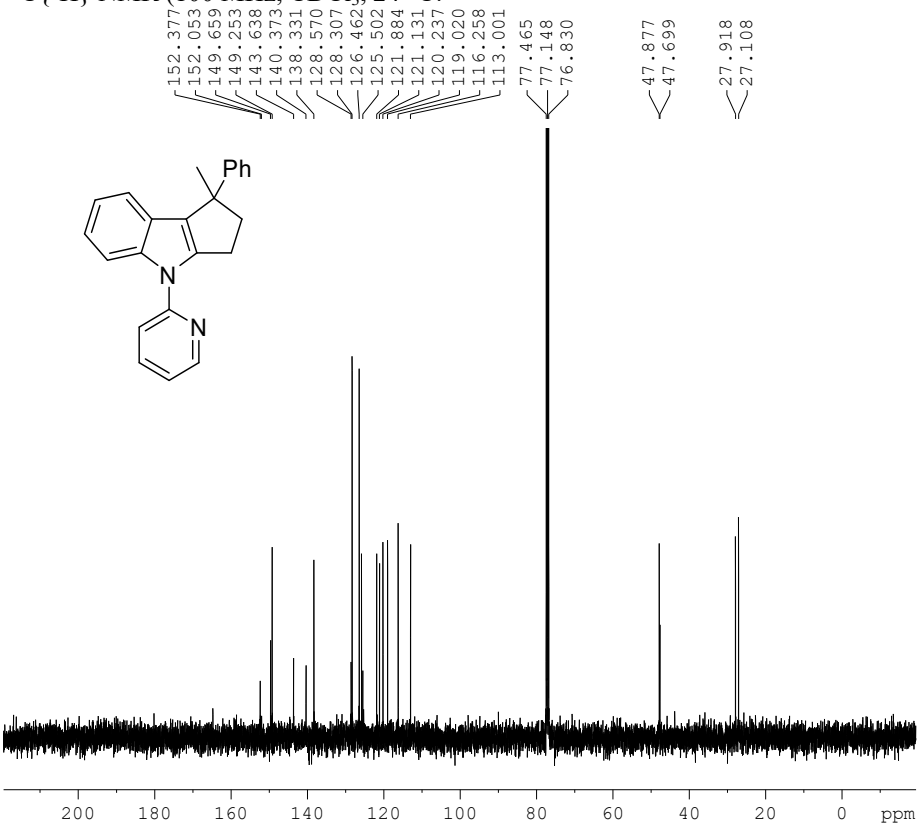

```
Current Data Parameters
NAME     1212 parent appli me
EXPNO                  92
PROCNO                  1

F2 - Acquisition Parameters
Date_           20180203
Time               15.27
INSTRUM            spect
PROBHD   5 mm PABBO BB-
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             8012.820 Hz
FIDRES          0.122266 Hz
AQ              4.0894465 sec
RG                200.34
DW                62.400 usec
DE                 6.50 usec
TE                296.8 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         400.1320007 MHz
NUC1                   1H
P1                 15.70 usec
PLW1          7.75000000 W

F2 - Processing parameters
SI                 65536
SF            400.1300131 MHz
WDW                   EM
SSB       0
LB                 0.30 Hz
GB        0
PC                 1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C):




```
Current Data Paramete
NAME     1212 parent
EXPNO
PROCNO

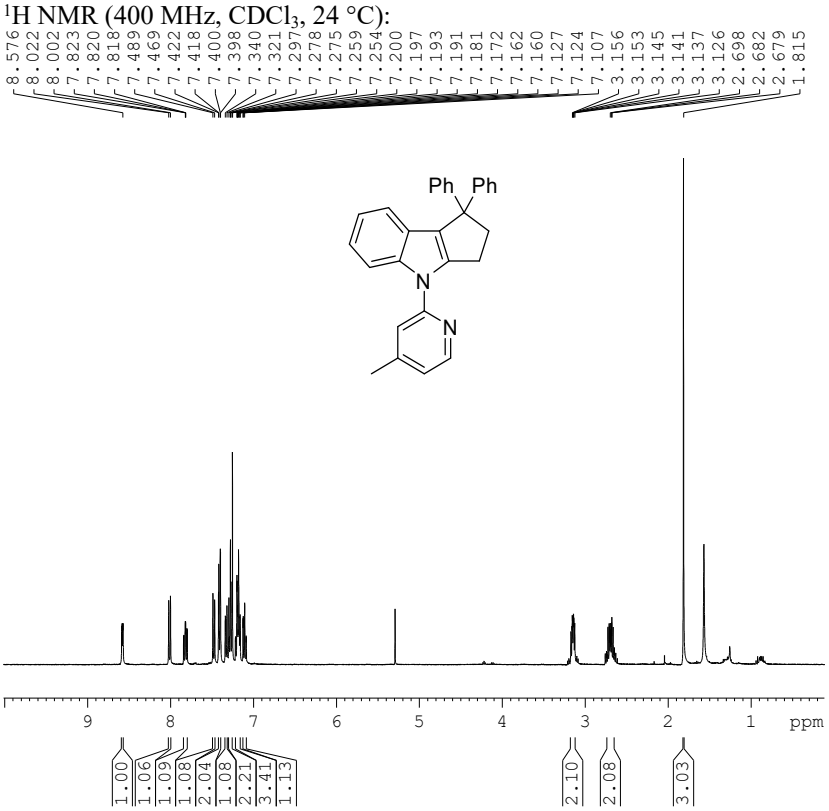
F2 - Acquisition Para
Date_           201802
Time              15.
INSTRUM            spe
PROBHD   5 mm PABBO B
PULPROG           zgpg
TD                 165
SOLVENT            CDC
NS                   5
DS
SWH            24038.4
FIDRES          1.4533
AQ             0.34403
RG                200.
DW                20.8
DE                  6.
TE                297
D1             1.000000
D11            0.030000
TD0

======== CHANNEL f1 =
SFO1         100.62282
NUC1                 1
P1                  9.
PLW1         47.000000

======== CHANNEL f2 =
SFO2         400.13160
NUC2
CPDPRG[2          waltz
PCPD2              90.
```

4-(4-Methylpyridin-2-yl)-1,1-diphenyl-1,2,3,4-tetrahydrocyclopenta[b]indole (10i):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):



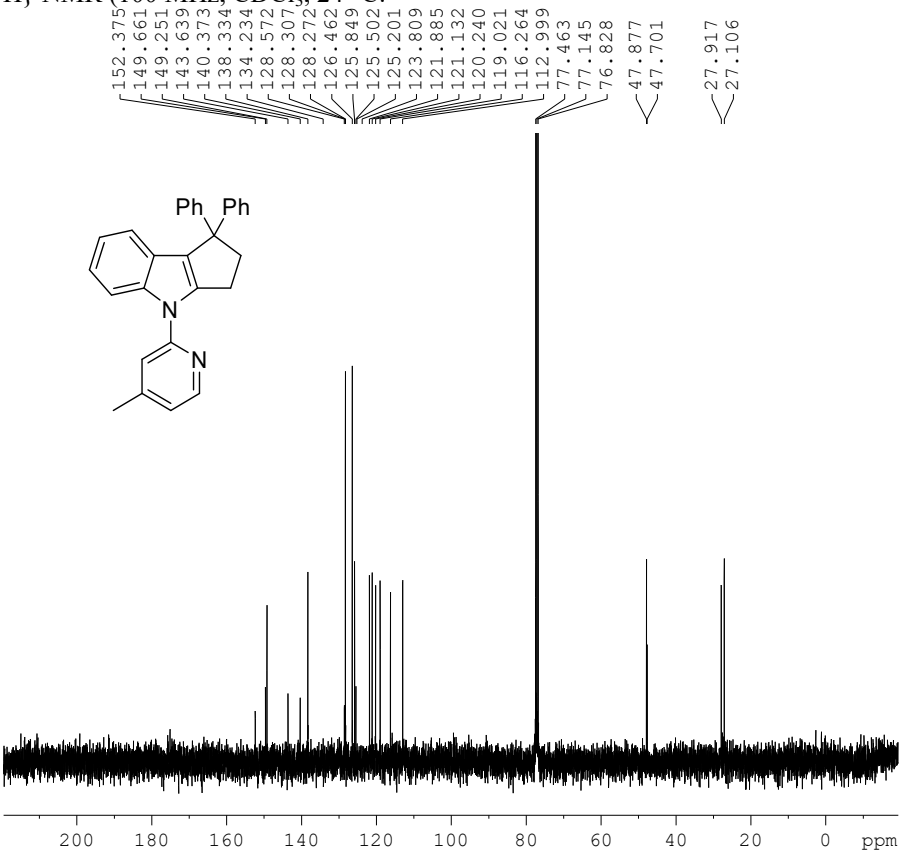

```
Current Data Parameters
NAME     1213  appli py 4me
EXPNO                155
PROCNO                 1

F2 - Acquisition Parameters
Date_           20180205
Time               8.44
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            8012.820 Hz
FIDRES        0.122266 Hz
AQ            4.0894465 sec
RG               200.34
DW               62.400 usec
DE                6.50 usec
TE               297.1 K
D1            0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.70 usec
PLW1         7.75000000 W

F2 - Processing parameters
SI                65536
SF           400.1300121 MHz
WDW                  EM
SSB       0
LB                0.30 Hz
GB        0
PC                1.00
```

^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$, 24 °C:




```
Current Data Paramete
NAME     1213  appli
EXPNO                1
PROCNO

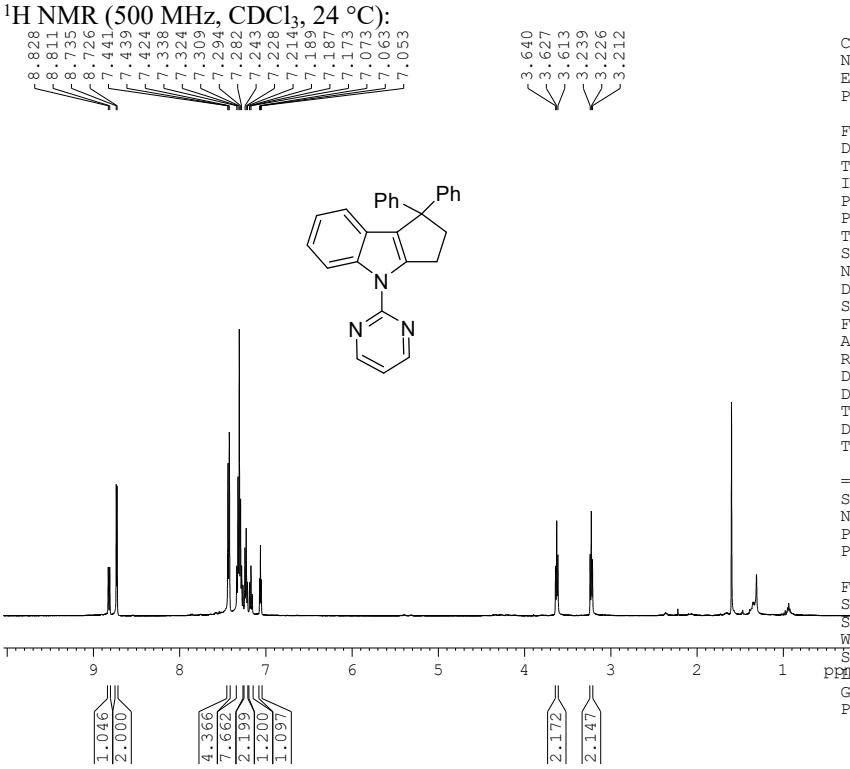
F2 - Acquisition Para
Date_          201802
Time               8.
INSTRUM          spe
PROBHD   5 mm PABBO B
PULPROG          zgpg
TD                165
SOLVENT           CDC
NS                  6
DS
SWH           24038.4
FIDRES         1.4533
AQ            0.34403
RG               200.
DW               20.8
DE                 6.
TE               297
D1           1.000000
D11          0.030000
TD0

======== CHANNEL f1 =
SFO1        100.62282
NUC1                1
P1                 9.
PLW1        47.000000

======== CHANNEL f2 =
SFO2        400.13160
NUC2
CPDPRG[2         waltz
PCPD2             90.
PLW2         7.750000
```

1,1-Diphenyl-4-(pyrimidin-2-yl)-1,2,3,4-tetrahydrocyclopenta[b]indole (10j):

^{1}H NMR (500 MHz, $CDCl_3$, 24 °C):



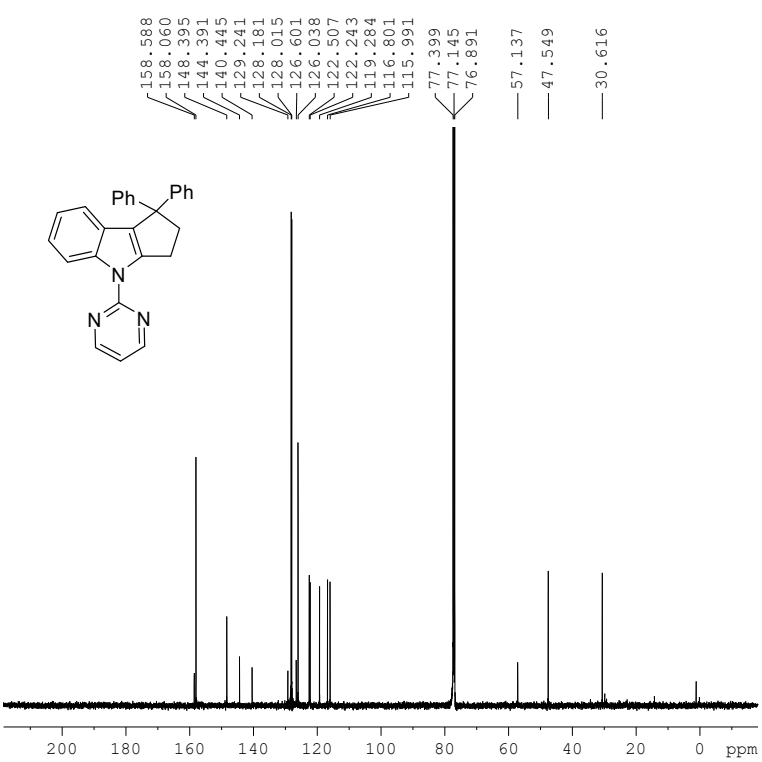

```
Current Data Parameters
NAME      1207 pym ind applic
EXPNO                  231
PROCNO                   1

F2 - Acquisition Parameters
Date_           20180131
Time               21.51
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 32768
SOLVENT            CDCl3
NS                    32
DS                     2
SWH            10000.000 Hz
FIDRES          0.305176 Hz
AQ             1.6384000 sec
RG                124.08
DW                50.000 usec
DE                 6.50 usec
TE                298.7 K
D1             0.50000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         500.1525008 MHz
NUC1                   1H
P1                 12.75 usec
PLW1         15.30000019 W

F2 - Processing parameters
SI                 65536
SF            500.1499885 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$, 24 °C:




```
Current Data Parameters
NAME      1207 pym ind application
EXPNO                  232
PROCNO                   1

F2 - Acquisition Parameters
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PULPROG           zgpg30
TD                 20480
SOLVENT            CDCl3
NS                  5000
DS                     4
SWH            29761.904 Hz
FIDRES          1.453218 Hz
AQ             0.3440640 sec
RG                202.34
DW                16.800 usec
DE                 6.50 usec
TE                299.3 K
D1             1.00000000 sec
D11            0.03000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         125.7753932 MHz
NUC1                  13C
P1                 9.88 usec
PLW1        103.00000000 W

======== CHANNEL f2 ========
SFO2         500.1520006 MHz
NUC2                   1H
CPDPRG[2         waltz16
PCPD2              80.00 usec
PLW2         15.30000019 W
PLW12         0.38863000 W
PLW13         0.19548000 W

F2 - Processing parameters
SI                 32768
SF            125.7628024 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
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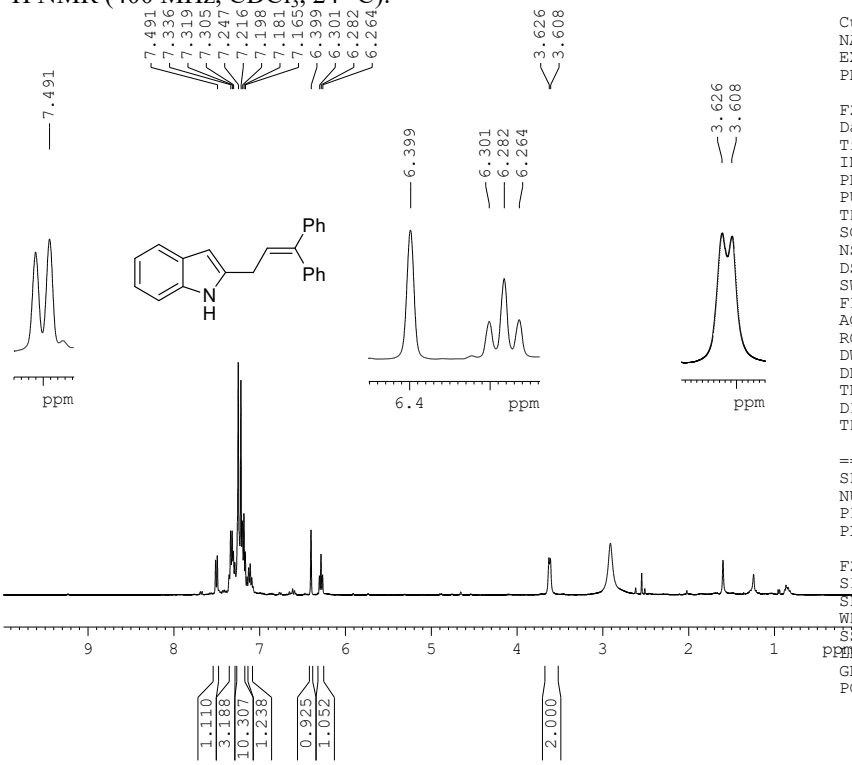
2-(3,3-Diphenylallyl)-1*H*-indole (9):

^{1}H NMR (400 MHz, $CDCl_3$, 24 °C):

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Current Data Parameters
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EXPNO                32
PROCNO                1

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PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    8
DS                    2
SWH            8012.820 Hz
FIDRES        0.122266 Hz
AQ            4.0894465 sec
RG                108.26
DW                62.400 usec
DE                 6.50 usec
TE                298.3 K
D1           0.50000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        400.1320007 MHz
NUC1                1H
P1                15.00 usec
PLW1        10.50000000 W

F2 - Processing parameters
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SF        400.1300270 MHz
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SSB                 0
LB                0.30 Hz
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PC                1.00
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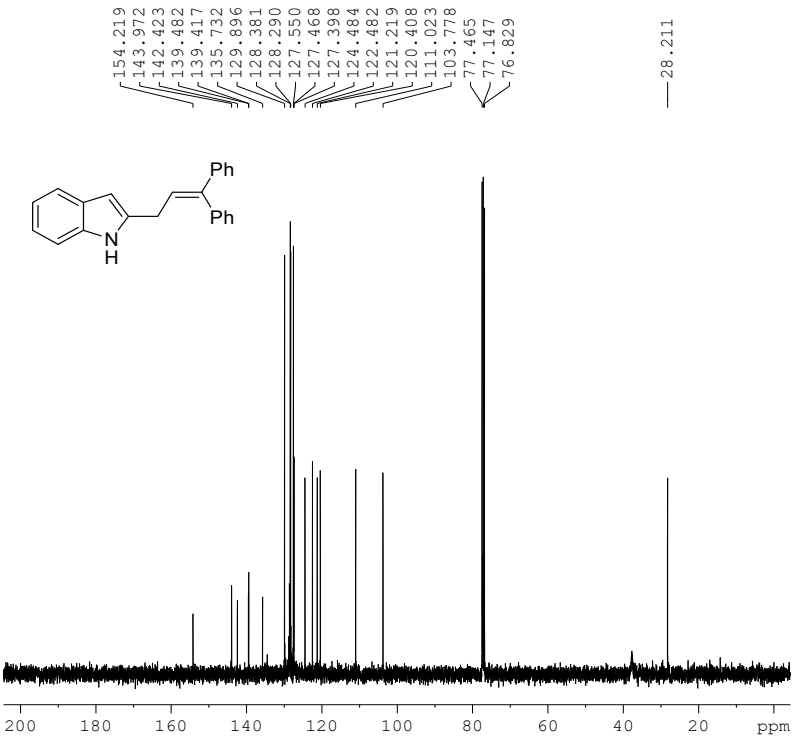
^{13}C NMR (100 MHz, $CDCl_3$, 24 °C):

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Current Data Parameters
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EXPNO                33
PROCNO                1

F2 - Acquisition Parameters
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Time              14.06
INSTRUM           spect
PROBHD   5 mm PABBO BB-
PULPROG          zgpg30
TD                16540
SOLVENT           CDCl3
NS                  256
DS                    4
SWH           24038.461 Hz
FIDRES         1.453353 Hz
AQ            0.3440320 sec
RG                200.34
DW                20.800 usec
DE                 6.50 usec
TE                298.7 K
D1           1.00000000 sec
D11          0.03000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        100.6228289 MHz
NUC1                13C
P1                10.00 usec
PLW1        47.00000000 W

======== CHANNEL f2 ========
SFO2        400.1316005 MHz
NUC2                1H
CPDPRG[2         waltz16
PCPD2             90.00 usec
PLW2        10.50000000 W
PLW12        0.29166999 W
PLW13        0.14670999 W

F2 - Processing parameters
SI                32768
SF        100.6127610 MHz
WDW                EM
SSB                 0
LB                1.00 Hz
GB                  0
PC                1.40
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Crystal data of 12: ORTEP diagram

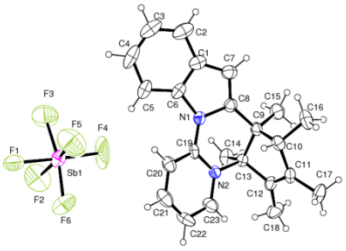

Table 1. Crystal data and structure refinement for co1.

Identification code	shelx	
Empirical formula	C23 H25 F6 N2 Sb	
Formula weight	565.20	
Temperature	296(2) K	
Wavelength	0.71073 Å	
Crystal system	Monoclinic	
Space group	P 21/n	
Unit cell dimensions	a = 8.1550(5) Å	α= 90°.
	b = 15.9851(10) Å	β= 102.305(2)°.
	c = 18.1298(11) Å	γ = 90°.
Volume	2309.1(2) $Å^3$	
Z	4	
Density (calculated)	1.626 Mg/m^3	
Absorption coefficient	1.256 mm^{-1}	
F(000)	1128	
Crystal size	0.150 x 0.100 x 0.100 mm^3	
Theta range for data collection	3.308 to 24.997°.	
Index ranges	-9<=h<=9, -19<=k<=19, -21<=l<=21	
Reflections collected	43544	
Independent reflections	4052 [R(int) = 0.0918]	
Completeness to theta = 24.997°	99.7 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.7453 and 0.5799	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	4052 / 66 / 350	
Goodness-of-fit on F^2	1.131	
Final R indices [I>2sigma(I)]	R1 = 0.0724, wR2 = 0.1457	
R indices (all data)	R1 = 0.1044, wR2 = 0.1587	
Extinction coefficient	0.0050(5)	

Largest diff. peak and hole 0.607 and -0.480 e.Å^{-3}

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (Å^{2}x 10^3) for co1. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
Sb(1)	1383(1)	8076(1)	5512(1)	67(1)
F(1)	1170(40)	8900(20)	6170(20)	151(13)
F(2)	1110(40)	8969(12)	4862(12)	151(8)
F(3)	3629(19)	8300(18)	5748(19)	174(9)
F(4)	1640(50)	7202(17)	4932(19)	199(12)
F(5)	1480(40)	7348(16)	6267(13)	167(8)
F(6)	-945(15)	8025(12)	5346(15)	146(8)
F(1')	640(40)	8660(20)	6219(18)	160(12)
F(2')	2230(40)	8980(16)	5133(19)	208(11)
F(3')	3400(20)	7903(15)	6206(13)	147(8)
F(4')	2230(50)	7608(19)	4773(16)	206(13)
F(5')	920(40)	7067(12)	5870(15)	176(9)
F(6')	-450(30)	8084(15)	4779(13)	172(9)
C(1)	6150(10)	4949(6)	4049(4)	62(2)
C(2)	7629(12)	5083(8)	4596(5)	86(3)
C(3)	7767(14)	5763(9)	5029(6)	96(4)
C(4)	6521(16)	6342(7)	4956(5)	90(4)
C(5)	5007(12)	6252(6)	4412(5)	74(3)
C(6)	4852(10)	5520(5)	3986(4)	56(2)
C(7)	5674(10)	4324(6)	3496(5)	63(2)
C(8)	4123(9)	4487(5)	3103(4)	51(2)
C(9)	2969(9)	4057(4)	2463(4)	47(2)
C(10)	1726(9)	3429(5)	2726(4)	54(2)
C(11)	299(10)	3409(4)	2029(4)	53(2)
C(12)	364(9)	4072(5)	1589(4)	53(2)
C(13)	1745(8)	4663(4)	1963(4)	43(2)
C(14)	2478(11)	5255(5)	1458(4)	63(2)
C(15)	4066(11)	3611(5)	1984(5)	68(2)
C(16)	2481(13)	2588(5)	2978(5)	80(3)
C(17)	-971(12)	2735(6)	1919(6)	81(3)

C(18)	-709(11)	4246(6)	814(4)	81(3)
C(19)	1932(9)	5499(4)	3192(4)	45(2)
C(20)	1184(10)	6005(5)	3646(4)	58(2)
C(21)	-428(12)	6248(5)	3421(5)	71(2)
C(22)	-1347(11)	5993(6)	2732(5)	77(3)
C(23)	-594(11)	5482(5)	2295(5)	65(2)
N(1)	3562(7)	5235(4)	3384(3)	47(1)
N(2)	1028(7)	5233(3)	2514(3)	44(1)

Table 3. Bond lengths [Å] and angles [°] for co1.

Sb(1)-F(6')	1.778(11)
Sb(1)-F(5)	1.786(14)
Sb(1)-F(4)	1.788(12)
Sb(1)-F(1')	1.792(14)
Sb(1)-F(4')	1.797(16)
Sb(1)-F(2')	1.799(16)
Sb(1)-F(5')	1.809(14)
Sb(1)-F(1)	1.811(13)
Sb(1)-F(3)	1.825(14)
Sb(1)-F(2)	1.834(13)
Sb(1)-F(6)	1.860(12)
Sb(1)-F(3')	1.867(11)
C(1)-C(6)	1.384(11)
C(1)-C(2)	1.404(12)
C(1)-C(7)	1.410(11)
C(2)-C(3)	1.331(15)
C(2)-H(2)	0.9300
C(3)-C(4)	1.360(15)
C(3)-H(3)	0.9300
C(4)-C(5)	1.415(14)
C(4)-H(4)	0.9300
C(5)-C(6)	1.393(11)
C(5)-H(5)	0.9300
C(6)-N(1)	1.419(9)

C(7)-C(8)	1.339(10)
C(7)-H(7)	0.9300
C(8)-N(1)	1.414(9)
C(8)-C(9)	1.496(10)
C(9)-C(13)	1.540(9)
C(9)-C(15)	1.548(10)
C(9)-C(10)	1.571(10)
C(10)-C(16)	1.508(10)
C(10)-C(11)	1.525(11)
C(10)-H(10)	0.9800
C(11)-C(12)	1.334(10)
C(11)-C(17)	1.479(10)
C(12)-C(18)	1.513(10)
C(12)-C(13)	1.516(9)
C(13)-C(14)	1.525(9)
C(13)-N(2)	1.554(8)
C(14)-H(14A)	0.9600
C(14)-H(14B)	0.9600
C(14)-H(14C)	0.9600
C(15)-H(15A)	0.9600
C(15)-H(15B)	0.9600
C(15)-H(15C)	0.9600
C(16)-H(16A)	0.9600
C(16)-H(16B)	0.9600
C(16)-H(16C)	0.9600
C(17)-H(17A)	0.9600
C(17)-H(17B)	0.9600
C(17)-H(17C)	0.9600
C(18)-H(18A)	0.9600
C(18)-H(18B)	0.9600
C(18)-H(18C)	0.9600
C(19)-N(2)	1.361(8)
C(19)-N(1)	1.367(9)
C(19)-C(20)	1.385(10)
C(20)-C(21)	1.348(11)
C(20)-H(20)	0.9300

C(21)-C(22)	1.374(12)
C(21)-H(21)	0.9300
C(22)-C(23)	1.370(11)
C(22)-H(22)	0.9300
C(23)-N(2)	1.357(9)
C(23)-H(23)	0.9300

F(5)-Sb(1)-F(4)	87.2(14)
F(6')-Sb(1)-F(1')	99.9(15)
F(6')-Sb(1)-F(4')	81.0(16)
F(1')-Sb(1)-F(4')	173.0(17)
F(6')-Sb(1)-F(2')	92.2(12)
F(1')-Sb(1)-F(2')	93.9(18)
F(4')-Sb(1)-F(2')	79.1(17)
F(6')-Sb(1)-F(5')	93.8(11)
F(1')-Sb(1)-F(5')	94.6(17)
F(4')-Sb(1)-F(5')	92.3(14)
F(2')-Sb(1)-F(5')	168.6(16)
F(5)-Sb(1)-F(1)	88.0(18)
F(4)-Sb(1)-F(1)	175(2)
F(5)-Sb(1)-F(3)	93.9(13)
F(4)-Sb(1)-F(3)	93.1(14)
F(1)-Sb(1)-F(3)	86.4(12)
F(5)-Sb(1)-F(2)	168.3(11)
F(4)-Sb(1)-F(2)	104.1(15)
F(1)-Sb(1)-F(2)	80.8(17)
F(3)-Sb(1)-F(2)	88.8(11)
F(5)-Sb(1)-F(6)	88.5(11)
F(4)-Sb(1)-F(6)	96.6(13)
F(1)-Sb(1)-F(6)	84.1(11)
F(3)-Sb(1)-F(6)	170.1(11)
F(2)-Sb(1)-F(6)	87.0(10)
F(6')-Sb(1)-F(3')	170.4(10)
F(1')-Sb(1)-F(3')	88.8(14)
F(4')-Sb(1)-F(3')	90.9(15)
F(2')-Sb(1)-F(3')	91.3(11)

F(5')-Sb(1)-F(3')	81.3(10)
C(6)-C(1)-C(2)	119.0(9)
C(6)-C(1)-C(7)	108.6(7)
C(2)-C(1)-C(7)	132.4(10)
C(3)-C(2)-C(1)	119.5(11)
C(3)-C(2)-H(2)	120.2
C(1)-C(2)-H(2)	120.2
C(2)-C(3)-C(4)	122.1(10)
C(2)-C(3)-H(3)	119.0
C(4)-C(3)-H(3)	119.0
C(3)-C(4)-C(5)	121.4(10)
C(3)-C(4)-H(4)	119.3
C(5)-C(4)-H(4)	119.3
C(6)-C(5)-C(4)	115.8(10)
C(6)-C(5)-H(5)	122.1
C(4)-C(5)-H(5)	122.1
C(1)-C(6)-C(5)	122.1(8)
C(1)-C(6)-N(1)	106.3(7)
C(5)-C(6)-N(1)	131.3(8)
C(8)-C(7)-C(1)	109.0(8)
C(8)-C(7)-H(7)	125.5
C(1)-C(7)-H(7)	125.5
C(7)-C(8)-N(1)	108.3(7)
C(7)-C(8)-C(9)	133.6(7)
N(1)-C(8)-C(9)	118.0(6)
C(8)-C(9)-C(13)	112.9(6)
C(8)-C(9)-C(15)	107.7(6)
C(13)-C(9)-C(15)	109.8(6)
C(8)-C(9)-C(10)	113.4(6)
C(13)-C(9)-C(10)	101.6(5)
C(15)-C(9)-C(10)	111.4(6)
C(16)-C(10)-C(11)	115.0(7)
C(16)-C(10)-C(9)	114.4(7)
C(11)-C(10)-C(9)	100.9(6)
C(16)-C(10)-H(10)	108.7
C(11)-C(10)-H(10)	108.7

C(9)-C(10)-H(10)	108.7
C(12)-C(11)-C(17)	127.9(8)
C(12)-C(11)-C(10)	111.0(6)
C(17)-C(11)-C(10)	121.0(7)
C(11)-C(12)-C(18)	127.8(7)
C(11)-C(12)-C(13)	110.4(6)
C(18)-C(12)-C(13)	121.9(7)
C(12)-C(13)-C(14)	117.8(6)
C(12)-C(13)-C(9)	101.4(6)
C(14)-C(13)-C(9)	117.1(6)
C(12)-C(13)-N(2)	107.9(5)
C(14)-C(13)-N(2)	105.8(5)
C(9)-C(13)-N(2)	106.0(5)
C(13)-C(14)-H(14A)	109.5
C(13)-C(14)-H(14B)	109.5
H(14A)-C(14)-H(14B)	109.5
C(13)-C(14)-H(14C)	109.5
H(14A)-C(14)-H(14C)	109.5
H(14B)-C(14)-H(14C)	109.5
C(9)-C(15)-H(15A)	109.5
C(9)-C(15)-H(15B)	109.5
H(15A)-C(15)-H(15B)	109.5
C(9)-C(15)-H(15C)	109.5
H(15A)-C(15)-H(15C)	109.5
H(15B)-C(15)-H(15C)	109.5
C(10)-C(16)-H(16A)	109.5
C(10)-C(16)-H(16B)	109.5
H(16A)-C(16)-H(16B)	109.5
C(10)-C(16)-H(16C)	109.5
H(16A)-C(16)-H(16C)	109.5
H(16B)-C(16)-H(16C)	109.5
C(11)-C(17)-H(17A)	109.5
C(11)-C(17)-H(17B)	109.5
H(17A)-C(17)-H(17B)	109.5
C(11)-C(17)-H(17C)	109.5
H(17A)-C(17)-H(17C)	109.5

H(17B)-C(17)-H(17C)	109.5
C(12)-C(18)-H(18A)	109.5
C(12)-C(18)-H(18B)	109.5
H(18A)-C(18)-H(18B)	109.5
C(12)-C(18)-H(18C)	109.5
H(18A)-C(18)-H(18C)	109.5
H(18B)-C(18)-H(18C)	109.5
N(2)-C(19)-N(1)	116.4(6)
N(2)-C(19)-C(20)	119.8(7)
N(1)-C(19)-C(20)	123.8(7)
C(21)-C(20)-C(19)	120.9(8)
C(21)-C(20)-H(20)	119.6
C(19)-C(20)-H(20)	119.6
C(20)-C(21)-C(22)	119.8(8)
C(20)-C(21)-H(21)	120.1
C(22)-C(21)-H(21)	120.1
C(23)-C(22)-C(21)	118.5(8)
C(23)-C(22)-H(22)	120.7
C(21)-C(22)-H(22)	120.7
N(2)-C(23)-C(22)	122.3(8)
N(2)-C(23)-H(23)	118.8
C(22)-C(23)-H(23)	118.8
C(19)-N(1)-C(8)	122.7(6)
C(19)-N(1)-C(6)	128.2(6)
C(8)-N(1)-C(6)	107.8(6)
C(23)-N(2)-C(19)	118.6(6)
C(23)-N(2)-C(13)	117.5(6)
C(19)-N(2)-C(13)	123.9(5)

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($Å^2 x\ 10^3$)for co1. The anisotropic displacement factor exponent takes the form: $-2\pi^2[\ h^2 a^{*2} U^{11} + ... + 2\ h\ k\ a^*\ b^*\ U^{12}\ ]$

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}

Sb(1)	74(1)	68(1)	57(1)	-12(1)	13(1)	-12(1)
F(1)	73(15)	200(20)	160(20)	-101(18)	-25(12)	42(14)
F(2)	190(20)	143(13)	136(14)	50(11)	80(14)	7(14)
F(3)	78(10)	190(20)	270(20)	-35(17)	68(13)	-7(11)
F(4)	290(20)	133(18)	177(19)	-121(17)	56(15)	8(17)
F(5)	200(20)	163(17)	139(15)	53(14)	43(15)	50(15)
F(6)	92(10)	152(13)	177(19)	-26(15)	-9(11)	-39(9)
F(1')	110(20)	270(30)	113(14)	-5(15)	48(15)	78(19)
F(2')	190(20)	168(16)	260(20)	33(16)	39(19)	-71(17)
F(3')	81(10)	159(17)	170(16)	-63(13)	-43(10)	42(10)
F(4')	320(30)	160(20)	141(15)	-20(17)	70(17)	70(20)
F(5')	205(18)	109(12)	182(19)	22(13)	-34(16)	-50(12)
F(6')	135(14)	206(16)	127(14)	-9(14)	-77(11)	10(13)
C(1)	53(5)	78(6)	54(5)	16(4)	7(4)	-13(5)
C(2)	70(6)	124(9)	60(6)	18(6)	3(5)	-29(6)
C(3)	77(7)	141(11)	63(6)	-3(7)	1(5)	-48(8)
C(4)	128(9)	96(8)	48(5)	-22(5)	26(6)	-66(8)
C(5)	87(6)	69(6)	66(5)	-20(5)	15(5)	-28(5)
C(6)	62(5)	62(5)	42(4)	-2(4)	7(4)	-23(4)
C(7)	52(5)	68(5)	69(5)	4(5)	11(4)	0(4)
C(8)	48(4)	50(4)	55(4)	-2(4)	14(4)	-6(3)
C(9)	53(4)	43(4)	46(4)	-8(3)	11(3)	6(3)
C(10)	62(5)	45(4)	58(5)	5(4)	18(4)	4(4)
C(11)	65(5)	35(4)	63(5)	-11(4)	20(4)	-5(4)
C(12)	56(5)	50(5)	50(4)	-14(4)	7(3)	-6(4)
C(13)	45(4)	41(4)	44(4)	-3(3)	11(3)	-3(3)
C(14)	86(6)	56(5)	53(5)	3(4)	27(4)	-9(4)
C(15)	72(6)	72(6)	66(5)	-17(5)	23(4)	8(5)
C(16)	116(8)	41(5)	84(6)	3(5)	26(6)	10(5)
C(17)	92(7)	63(6)	94(7)	-15(5)	31(6)	-39(5)
C(18)	81(6)	95(7)	53(5)	-5(5)	-13(4)	-13(5)
C(19)	67(5)	25(3)	43(4)	0(3)	14(3)	-1(3)
C(20)	76(6)	52(5)	49(4)	-1(4)	20(4)	12(4)
C(21)	100(7)	65(6)	56(5)	7(4)	35(5)	28(5)
C(22)	69(6)	85(7)	78(6)	14(5)	17(5)	44(5)
C(23)	70(5)	66(5)	57(5)	4(4)	8(4)	18(4)

N(1)	50(4)	43(3)	46(3)	-7(3)	10(3)	-1(3)
N(2)	49(3)	40(3)	43(3)	-1(3)	9(3)	3(3)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$x 10^3) for co1.

	x	y	z	U(eq)
H(2)	8505	4700	4655	104
H(3)	8746	5845	5392	115
H(4)	6668	6808	5272	108
H(5)	4167	6656	4343	89
H(7)	6332	3871	3417	76
H(10)	1311	3683	3144	65
H(14A)	2831	4939	1068	95
H(14B)	3425	5544	1754	95
H(14C)	1641	5654	1232	95
H(15A)	4732	4018	1790	103
H(15B)	3356	3324	1571	103
H(15C)	4790	3215	2292	103
H(16A)	1759	2294	3244	119
H(16B)	3562	2666	3305	119
H(16C)	2604	2269	2544	119
H(17A)	-1583	2757	2316	122
H(17B)	-422	2202	1929	122
H(17C)	-1733	2807	1441	122
H(18A)	-1806	4012	781	121
H(18B)	-200	3997	436	121
H(18C)	-801	4839	734	121
H(20)	1802	6180	4112	70
H(21)	-917	6587	3731	85
H(22)	-2454	6164	2565	92
H(23)	-1217	5300	1833	78

Table 6. Torsion angles [°] for co1.

C(6)-C(1)-C(2)-C(3)	-1.5(13)
C(7)-C(1)-C(2)-C(3)	176.6(9)
C(1)-C(2)-C(3)-C(4)	-0.6(15)
C(2)-C(3)-C(4)-C(5)	-0.2(16)
C(3)-C(4)-C(5)-C(6)	2.9(13)
C(2)-C(1)-C(6)-C(5)	4.4(12)
C(7)-C(1)-C(6)-C(5)	-174.1(7)
C(2)-C(1)-C(6)-N(1)	178.6(7)
C(7)-C(1)-C(6)-N(1)	0.2(9)
C(4)-C(5)-C(6)-C(1)	-4.9(12)
C(4)-C(5)-C(6)-N(1)	-177.6(8)
C(6)-C(1)-C(7)-C(8)	-0.8(9)
C(2)-C(1)-C(7)-C(8)	-179.0(9)
C(1)-C(7)-C(8)-N(1)	1.1(9)
C(1)-C(7)-C(8)-C(9)	-179.6(8)
C(7)-C(8)-C(9)-C(13)	-151.9(8)
N(1)-C(8)-C(9)-C(13)	27.4(9)
C(7)-C(8)-C(9)-C(15)	-30.5(12)
N(1)-C(8)-C(9)-C(15)	148.8(6)
C(7)-C(8)-C(9)-C(10)	93.2(10)
N(1)-C(8)-C(9)-C(10)	-87.5(8)
C(8)-C(9)-C(10)-C(16)	-80.5(8)
C(13)-C(9)-C(10)-C(16)	158.1(7)
C(15)-C(9)-C(10)-C(16)	41.2(9)
C(8)-C(9)-C(10)-C(11)	155.5(6)
C(13)-C(9)-C(10)-C(11)	34.0(6)
C(15)-C(9)-C(10)-C(11)	-82.8(7)
C(16)-C(10)-C(11)-C(12)	-142.5(7)
C(9)-C(10)-C(11)-C(12)	-18.9(8)
C(16)-C(10)-C(11)-C(17)	39.7(11)
C(9)-C(10)-C(11)-C(17)	163.3(7)
C(17)-C(11)-C(12)-C(18)	-8.7(14)
C(10)-C(11)-C(12)-C(18)	173.7(8)
C(17)-C(11)-C(12)-C(13)	172.6(7)

C(10)-C(11)-C(12)-C(13)	-5.0(9)
C(11)-C(12)-C(13)-C(14)	156.5(7)
C(18)-C(12)-C(13)-C(14)	-22.3(10)
C(11)-C(12)-C(13)-C(9)	27.3(8)
C(18)-C(12)-C(13)-C(9)	-151.5(7)
C(11)-C(12)-C(13)-N(2)	-83.9(7)
C(18)-C(12)-C(13)-N(2)	97.3(8)
C(8)-C(9)-C(13)-C(12)	-158.7(6)
C(15)-C(9)-C(13)-C(12)	81.1(7)
C(10)-C(9)-C(13)-C(12)	-36.9(6)
C(8)-C(9)-C(13)-C(14)	71.6(8)
C(15)-C(9)-C(13)-C(14)	-48.5(8)
C(10)-C(9)-C(13)-C(14)	-166.5(6)
C(8)-C(9)-C(13)-N(2)	-46.1(7)
C(15)-C(9)-C(13)-N(2)	-166.3(6)
C(10)-C(9)-C(13)-N(2)	75.7(6)
N(2)-C(19)-C(20)-C(21)	-0.8(11)
N(1)-C(19)-C(20)-C(21)	179.5(7)
C(19)-C(20)-C(21)-C(22)	-0.2(13)
C(20)-C(21)-C(22)-C(23)	1.1(14)
C(21)-C(22)-C(23)-N(2)	-1.2(14)
N(2)-C(19)-N(1)-C(8)	-26.3(9)
C(20)-C(19)-N(1)-C(8)	153.4(7)
N(2)-C(19)-N(1)-C(6)	168.7(6)
C(20)-C(19)-N(1)-C(6)	-11.6(11)
C(7)-C(8)-N(1)-C(19)	-168.6(7)
C(9)-C(8)-N(1)-C(19)	11.9(10)
C(7)-C(8)-N(1)-C(6)	-1.0(8)
C(9)-C(8)-N(1)-C(6)	179.6(6)
C(1)-C(6)-N(1)-C(19)	167.3(7)
C(5)-C(6)-N(1)-C(19)	-19.2(13)
C(1)-C(6)-N(1)-C(8)	0.5(8)
C(5)-C(6)-N(1)-C(8)	174.0(8)
C(22)-C(23)-N(2)-C(19)	0.3(12)
C(22)-C(23)-N(2)-C(13)	-179.1(7)
N(1)-C(19)-N(2)-C(23)	-179.6(6)

C(20)-C(19)-N(2)-C(23)	0.7(10)
N(1)-C(19)-N(2)-C(13)	-0.2(9)
C(20)-C(19)-N(2)-C(13)	-179.9(6)
C(12)-C(13)-N(2)-C(23)	-37.0(8)
C(14)-C(13)-N(2)-C(23)	90.0(7)
C(9)-C(13)-N(2)-C(23)	-145.0(6)
C(12)-C(13)-N(2)-C(19)	143.6(6)
C(14)-C(13)-N(2)-C(19)	-89.4(7)
C(9)-C(13)-N(2)-C(19)	35.6(8)

Symmetry transformations used to generate equivalent atoms:

Table 7. Hydrogen bonds for co1 [Å and °].

D-H...A	d(D-H)	d(H...A)	d(D...A)	<(DHA)
C(5)-H(5)...F(4'^b)	0.93	2.44	3.30(3)	154.0
C(7)-H(7)...F(5^a)#1	0.93	2.62	3.50(2)	158.9
C(14)-H(14A)...F(2^a)#2	0.96	2.57	3.530(16)	173.6
C(14)-H(14B)...F(1'^b)#3	0.96	2.56	3.21(3)	125.1
C(20)-H(20)...F(4^a)	0.93	2.23	2.977(18)	136.7
C(20)-H(20)...F(4'^b)	0.93	2.57	3.28(3)	133.3
C(22)-H(22)...F(1^a)#4	0.93	2.54	3.12(3)	120.3
C(22)-H(22)...F(1'^b)#4	0.93	2.61	3.31(4)	132.6
C(23)-H(23)...F(1^a)#4	0.93	2.56	3.13(3)	120.5

Symmetry transformations used to generate equivalent atoms:

#1 -x+1,-y+1,-z+1 #2 -x+1/2,y-1/2,-z+1/2 #3 x+1/2,-y+3/2,z-1/2

#4 x-1/2,-y+3/2,z-1/2