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Supporting Information

Diastereodivergent Asymmetric Michael-Alkylation Reaction by Chiral *N,N'*-Dioxide/Metal Complexes

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Contents

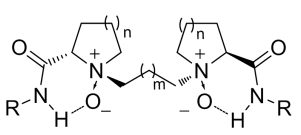
1. General Remakes

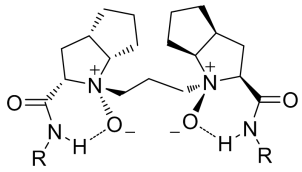
Reactions were carried out with commercial available reagent in dried apparatus. The THF and toluene were pretreated under the potassium hydroxide, and then distilled from the sodium benzophenone under nitrogen atmosphere before use. The yield was the purified state by flash chromatography in silica gel. Enantiomeric excesses were determined by HPLC analysis using the corresponding commercial chiral column (chiralcel ID, IA, IE column) as stated in the experimental procedures at 23 °C with the UV detector at 254 nm. Optical rotation were reported as follows: $[\alpha]^{T}_{D}$ (c g/100 mL, in solvent). The melting points of sprio-cyclo-propane-oxindoles were determined by melting instrument. ^{1}H NMR spectra were recorded on commercial instruments (400 MHz). Chemical shifts were reported in ppm from tetramethylsilane with the solvent resonance as the internal standard ($CDCl_3$, δ = 7.26). Spectra were reported as follows: chemical shift (δ ppm), multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, hept = heptet, m = multiplet), coupling constants (Hz), integration and assignment. ^{13}C NMR spectra were recorded on commercial instruments (100 MHz). Chemical shift were reported in ppm from tetramethylsilane with the solvent resonance as the internal standard ($CDCl_3$, δ = 77). HRMS was recorded on a commercial apparatus (ESI Source).

3-Chloride substituted oxindoles **1**[1] and the substituted β,γ-unsaturated-α-ketonesters **2**[2] were prepared from the procedure. TLC was performed on glass-backed silica plates. Chiral *N,N′*-dioxide ligands were prepared according to the methods mentioned in catalyst preparation section[3].

2 Selected Results of Optimization

1) The summarization of the reaction condition



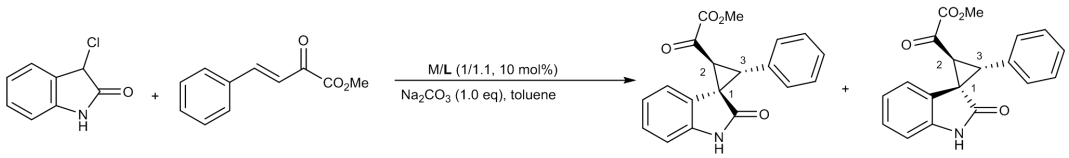


L-PrPr$_2$ n = 1, m = 1, R = 2,6-^{i}Pr$_2$C$_6$H$_3$
L-PrEt$_2$*p*Me n = 1, m = 1, R = 2,6-^{i}Pr$_2$-4-Me-C$_6$H$_2$
L-PrPr$_3$ n = 1, m = 1, R = 2,4,6-^{i}Pr$_3$C$_6$H$_2$
L$_2$-PrPr$_2$ n = 1, m = 0, R = 2,6-^{i}Pr$_2$C$_6$H$_3$
L-PrAd n = 1, m = 1, R = 1-Admantyl
L-PiPr$_2$ n = 2, m = 1, R = 2,6-^{i}Pr$_2$C$_6$H$_3$

L-RaPr$_2$ R = 2,6-^{i}Pr$_2$C$_6$H$_3$
L-RaPr$_3$ R = 2,4,6-^{i}Pr$_3$C$_6$H$_2$
L-RaEt$_2$ R = 2,6-Et$_2$C$_6$H$_3$

Scheme 2.1 The Screened Chiral *N,N′*-dioxide Ligands.

Table 2.1 Exploring the reaction conditions



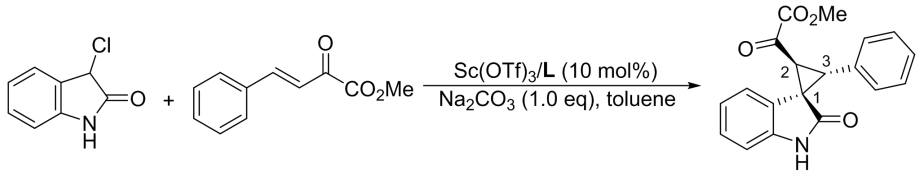
Entry	Metal salt	**L**	Yield (**3aa**/**3aa'**) (%)[b]	Ee (**3aa**/**3aa'**) (%)[c]

1	$Sc(OTf)_3$	L-$PrPr_2$	92/7	76/0
2	$Mg(OTf)_2$	L-$PrPr_2$	14/28	0/88
3	$Y(OTf)_3$	L-$PrPr_2$	47/37	-28/68
4	$Sc(NTf)_3$	L-$PrPr_2$	59/16	50/-5
5	$Ca(OTf)_2$	L-$PrPr_2$	38/12	-12/0
6	$Mg(NTf)_2$	L-$PrPr_2$	60/32	17/86
7	$Sc(OTf)_3$	L-$RaPr_2$	92/--	78/--
8 [d]	$Sc(OTf)_3$	L-$RaPr_2$	73/--	91/--
9 [d,e]	$Sc(OTf)_3$	L-$RaPr_2$	99/--	92/--
10 [f]	$Mg(OTf)_2$	L-$PrPr_2$	--/77	--/95

[a] Unless otherwise noted, the reaction was proceeded with **1a** (0.1 mmol), **2a** (0.1 mmol), metal salt (10 mol%), **L** (11 mol%), and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at 30 ºC for 24 h. [b] Isolated yield. [c] Determined by chiral HPLC on a chiral stationary phase (Chiralcel IA and IE). [d] At 0 ºC. [e] The reaction proceeded for 72 h. [f] At 40 ºC for 72 h.

2) Selected examples of the optimization of the ligands

Table 2.2 Exploring the Efficiency of the ligand with $Sc(OTf)_3$.

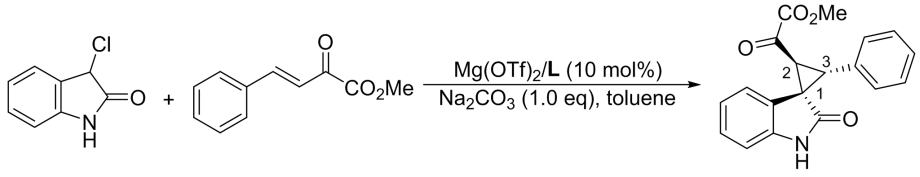


1a **2a** ***rel*-(1*R*,2*S*,3*R*)-3aa**

Entry	**L**	Yield of **3aa** (%)[b]	Ee of **3aa** (%)[c]
1	L-$PrPr_2$	92	76
2	L-PrAd	52	42
3	L-$PiPr_2$	94	70
4	L-$RaPr_2$	92	78
5	L-$RaPr_3$	99	68
6	L-$RaEt_2$	89	77

[a] The reaction proceeded with **1a** (0.1 mmol), **2a** (0.1 mmol), prepared **L**/$Sc(OTf)_3$ (1.1/1, 10 mol%) in THF, and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at 30 ºC for 24 h. [b] Isolated yield of *rel*-(1*R*,2*S*,3*R*)-**3aa**. [c] Determined by HPLC on a chiral stationary phase (chiralcel IE).

Table 2.3 Exploring the Efficiency of the ligand with $Mg(OTf)_2$.



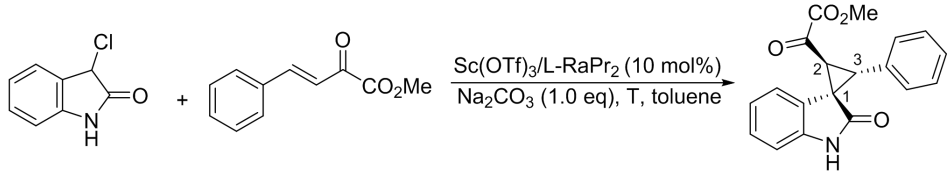
1a **2a** ***rel*-(1*S*,2*S*,3*R*)-3aa'**

Entry	**L**	Yield of **3aa'** (%)[b]	Ee of **3aa'** (%)[c]
1	L-PrPr$_2$	28	88
2	L-PrPr$_3$	67	70
3	L-PiPr$_2$	29	15
4	L-RaPr$_2$	21	81
5	L-PrEt$_2$*p*Me	13	8

[a] The reaction proceeded with **1a** (0.1 mmol), **2a** (0.1 mmol), prepared **L**/Mg(OTf)$_2$ (1.1/1, 10 mol%) in THF and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at 30 ºC for 24 h. [b] Isolated yield of *rel*-(1*S*,2*S*,3*R*)-**3aa'**. [c] Determined by HPLC on a chiral stationary phase (chiralcel IA).

3) Selected examples of optimization of the temperature

Table 2.4 The effect of temperature in **L-RaPr$_2$**/Sc(OTf)$_3$ complex catalyzed reaction.

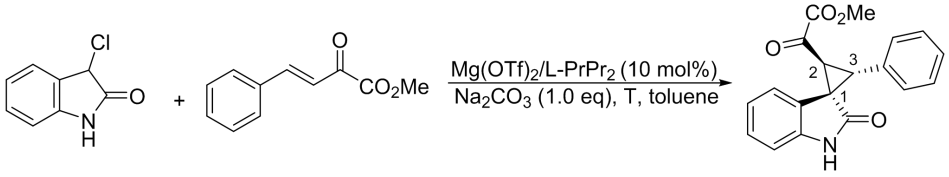


1a **2a** ***rel*-(1*R*,2*S*,3*R*)-3aa**

Entry	T (ºC)	Yield of **3aa** (%)[b]	ee of **3aa** (%)[c]
1	30	92	78
2	0	73	91
3	-10	59	45

[a] The reaction was proceeded with **1a** (0.1 mmol), **2a** (0.1 mmol), prepared **L-RaPr$_2$**/Sc(OTf)$_3$ (1.1/1, 10 mol%) in THF and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at the indicated temperature for 24 h. [b] Isolated yield of *rel*-(1*R*,2*S*,3*R*)-**3aa**. [c] Determined by HPLC on a chiral stationary phase (chiralcel IE).

Table 2.5 The effect of temperature in **L-PrPr$_2$**/Mg(OTf)$_2$ complex catalyzed reaction.



1a **2a** ***rel*-(1*S*,2*S*,3*R*)-3aa'**

entry	T (ºC)	yield of **3aa**' (%)[b]	ee of **3aa'** (%)[c]
1	30	65	88
2	40	77	95
3	50	67	89

[a] The reaction was proceeded with **1a** (0.1 mmol), **2a** (0.1 mmol), prepared **L-PrPr$_2$**/Mg(OTf)$_2$ (1.1/1, 10 mol%) in THF and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at the indicated temperature for 72 h. [b] Isolated yield of *rel*-(1*S*,2*S*,3*R*)-**3aa'**. [c] Determined by HPLC on a chiral stationary phase

(chiralcel IA).

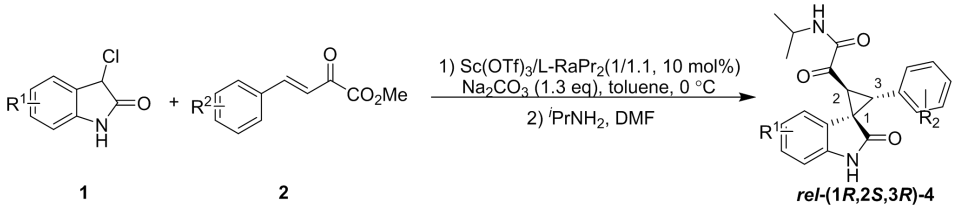
3 General procedure

1）Synthesis of *rel*-(1*R*,2*S*,3*R*)-**3** and **4**:

THF was added to a $Sc(OTf)_3$ (10 mol%) and **L-RaPr$_2$** (11 mol%) charged dried reaction tube under nitrogen atmosphere. After stirring at 30 ºC for 1 h, the solvent was removed under vacuum. Subsequently, 3-Cl oxindole (0.1 mmol), β,γ-unsaturated-α-ketonester (0.1 mmol), and Na_2CO_3 (0.13 mmol) were added. Toluene (1.0 mL) was lastly added to the nitrogen charged reaction tube at 0 °C and kept stirring for 72 h. The mixture was directly purified by the flash column chromatography and used for the next step if necessary.

^{i}PrNH$_2$/DMF amidation: To the *rel*-(1*R*,2*S*,3*R*)-product **3** was added ^{i}PrNH$_2$ (0.10 mL) and DMF (0.30 mL) at room temperature. After 12 hours, the mixture was purified by the flash column chromatography (PE: EA = 1:1).

Table 3.1 The Substrates Scope under **L-RaPr$_2$**/$Sc(OTf)_3$ condition.



Entry	R^1	R^2	**4**	Yield(%)[b]	d.r.[c]	Ee[c]
1	H	H	**4aa**	68 (97)	> 99:1	91
2	4-Me	H	**4ba**	43 (67)	> 99:1	86
3	4-F	H	**4ca**	49 (76)	> 99:1	86
4	5-Me	H	**4da**	64 (96)	> 99:1	89
5	5-F	H	**4ea**	58 (96)	> 99:1	81
6	6-F	H	**4ga**	58 (91)	> 99:1	90
7	6-Cl	H	**4ha**	67 (98)	98:2	88
8	6-Br	H	**4ia**	66 (83)	> 99:1	84
9	H	2-MeO	**4ah**	59 (71)	94:6	91
10	H	3-MeO	**4ai**	62 (98)	> 99:1	95
11	H	4-MeO	**4aj**	63 (96)	> 99:1	72
12	H	2-Me	**4ak**	47 (76)	> 99:1	96
13	H	4-Me	**4al**	60 (93)	> 99:1	87
14	H	4-F	**4av**	46 (96)	> 99:1	90
15	H	3-Cl	**4am**	50 (76)	> 99:1	85
16	H	4-Cl	**4an**	44 (79)	> 99:1	93
17	H	4-Br	**4ap**	42 (83)	> 99:1	94
18	H	4-Ph	**4aq**	51 (96)	> 99:1	92
19	H	2-Nap	**4ar**	56 (91)	> 99:1	93

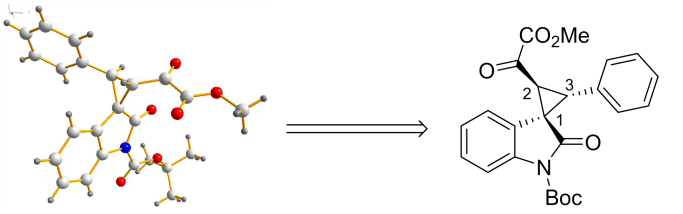
20	H	^{n}Bu	**4at**	68 (95)	76:24	99
21	H		**4au**	60 (99)	72:28	99

[a] Unless otherwise noted, the reaction was performed with **1** (0.1 mmol), **2** (0.1 mmol), **L-RaPr$_2$**/Sc(OTf)$_3$/ (1.1/1, 10 mol%), and Na_2CO_3 (1.3 eq) in toluene (1.0 mL) at 0 °C for 72 h; then the reaction was isolated by the flash chromatography column and was added with ^{i}PrNH$_2$ (0.1 mL) in DMF (0.30 mL) for 12 h. [b] Isolated yield, The data in parentheses was the isolated yield after 1). [c] Determined by HPLC on a chiral stationary phase.

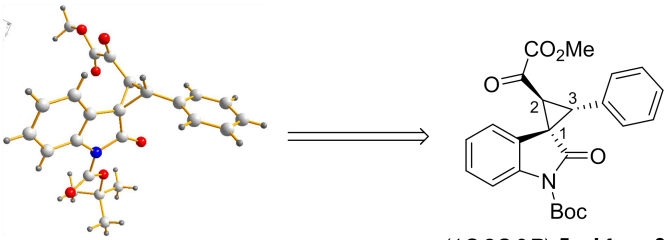
2）Synthesis of *rel*-(1*S*,2*S*,3*R*)-**3'**:

$Mg(OTf)_2$ (10 mol%), **L-PrPr$_2$** (11 mol%) were added to an over-dried reaction tube under nitrogen atmosphere. After THF (0.2 mL) was added, the mixture started stirring at 30 ºC for 1 h. Then the solvent was totally removed under vacuum. 3-Cl oxindole (0.1 mmol), β,γ-unsaturated-α-ketonester (0.1 mmol) and Na_2CO_3 (0.1 mmol) were added to the tube. Subsequently, toluene (1.0 mL) was added to the nitrogen charged reaction tube and stirred at 40 ºC for 72 h. This mixture was directly isolated under the flash chromatography (PE:Et_2O = 1:2).

4 Determination of absolute configuration of 3aa(')



(1*R*,2*S*,3*R*)-**5aa** from **3aa**



(1*S*,2*S*,3*R*)-**5aa'** from **3aa'**

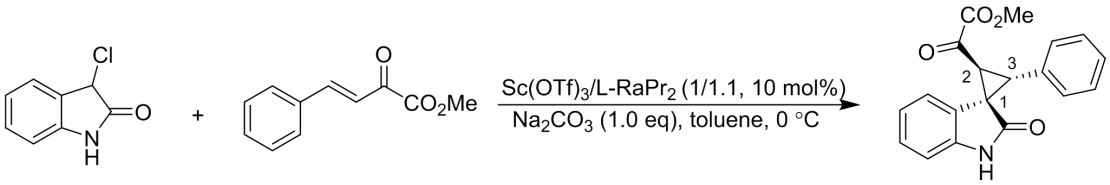
3aa and **3aa'** were synthesized from **L-RaPr$_2$**/Sc(OTf)$_3$ and **L-PrPr$_2$**/Mg(OTf)$_2$ respectively according to the general procedure. And then they were derived by using Boc_2O/DMAP to give the corresponding **5aa** and **5aa'**.

Finally, they were recrystallized from CH_2Cl_2 and petrol ether. CCDC 1411858 (*rel*-(1*R*,2*S*,3*R*)-**5aa)** and CCDC 1412691 (*rel*-(1*S*,2*S*,3*R*)-**5aa')** were assigned to be (1*R*,2*S*,3*R*) and (1*S*,2*S*,3*R*) respectively. These data can be obtained free from the Cambridge Crystallographic Data Centre via www.ccdc.cam.ac.uk/data_request/cif.

5 Studies of the mechanism

5.1 Nonlinear effect

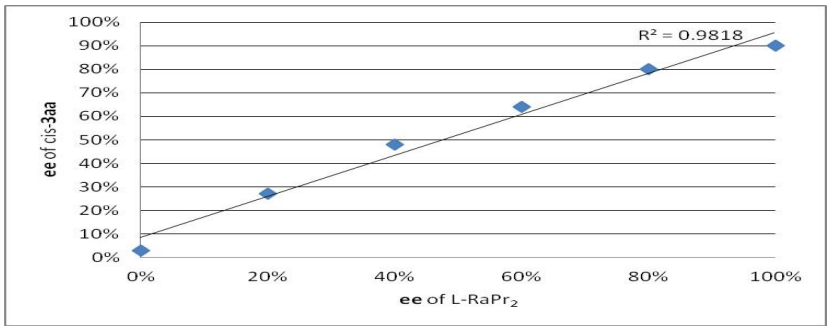
a. **L-RaPr$_2$**/Sc(OTf)$_3$ condition



1a **2a** ***rel*-(1*R*,2*S*,3*R*)-3aa**

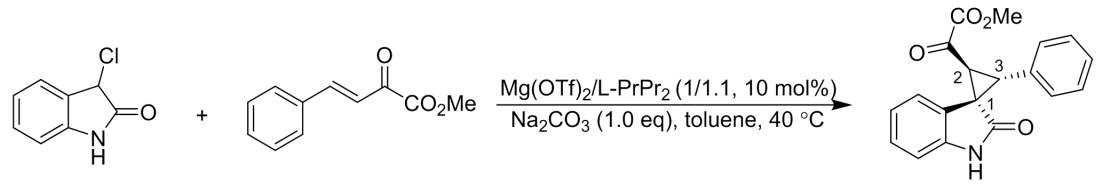
Entry	Ee of L-RaPr$_2$ (%)	Yield of **3aa** (%)	Ee of **3aa** (%)
1	0	60	3
2	20	68	27
3	40	74	48
4	60	71	64
5	80	78	80
6	100	81	90

[a] The reaction was performed with **1a** (0.1 mmol), **2a** (0.1 mmol), Sc(OTf)$_3$ (10 mol%), corresponding **L-RaPr$_2$** (11 mol%) and Na_2CO_3 (1.0 eq) in toluene (1.0 mL) at 0 ℃ for 48 h.



The nonlinear effect suggested that monomeric catalyst might be the main catalytical species.

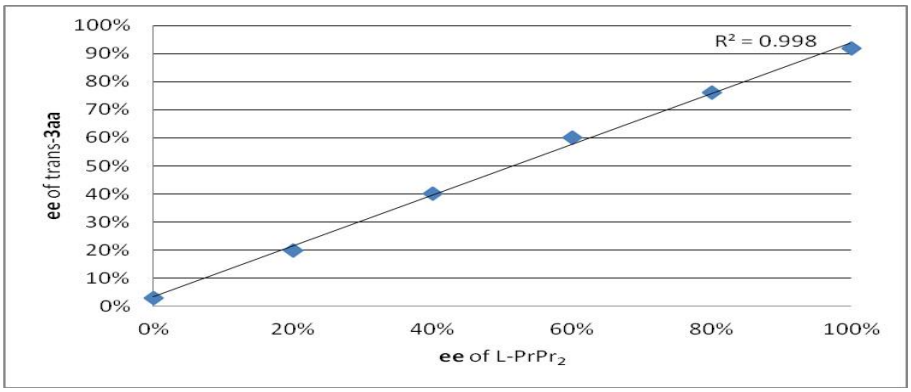
b. **L-PrPr$_2$**/Mg(OTf)$_2$ condition



1a **2a** ***rel*-(1*S*,2*S*,3*R*)-3aa'**

Entry	Ee of L-PrPr$_2$ (%)	Yield of **3aa'** (%)	Ee of **3aa'** (%)
1	0	48	3
2	20	56	20
3	40	59	40
4	60	47	60
5	80	63	76
6	100	60	92

[a] The reaction performed with **1a** (0.1 mmol), **2a** (0.1 mmol), Mg(OTf)$_2$ (10 mol%), corresponding **L-PrPr$_2$** (11 mol%), and Na_2CO_3 (1.0 eq) at 40 ℃ in toluene (1.0 mL) for 48 h.



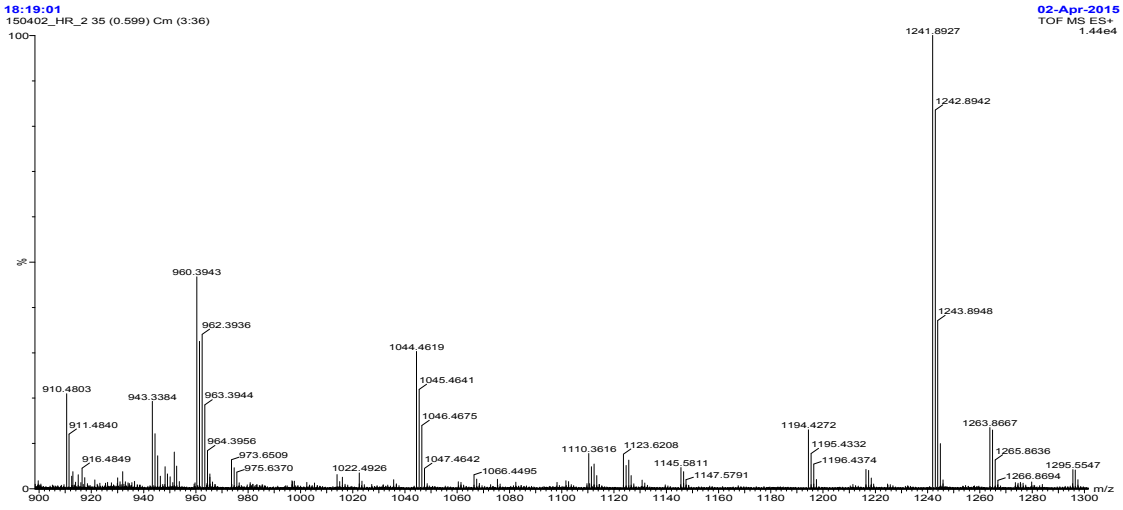
The nonlinear effect suggested that monomeric catalyst might be the main catalytical species.

5.2 The ORTEP diagramme of catalyst species

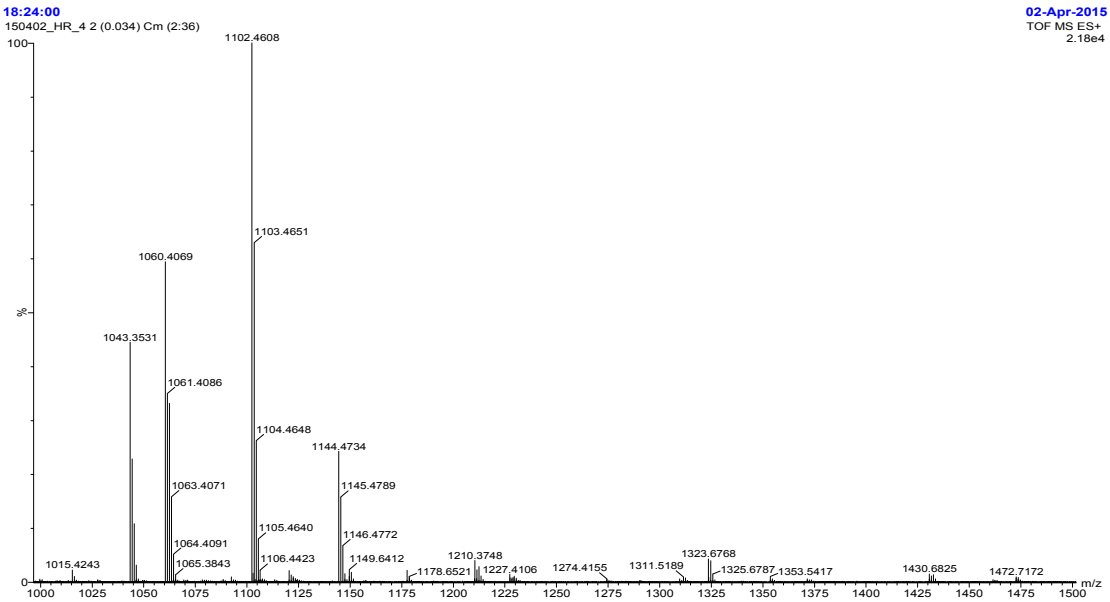
The crystalagraphic structure of CCDC 804337 [**L-RaPr$_2$**/Mg(OTf)$_2$], and CCDC 70400 [**L-PrPr$_2$**/Sc(OTf)$_3$], CCDC 882608 [**L-RaPr$_2$**/ Sc(OTf)$_3$/] have been confirmed in literature.[4] The coordination of *N,N′*-dioxides with either Sc(III) or Mg(II) is the same.

5.3 HRMS analysis of coordinative type

To check the coordinative type between substrates and Metal complexes, the complexes were stirred with the different substrate respectively. However, none of the possible coordinative fragment was found between β,γ-unsaturated-α-ketonester and metal complexes. On the contrary, the coordinative fragments from 3-Cl oxindole were detected.



The mixture was prepared from the prepared **L-PrPr$_2$**/Mg(OTf)$_2$ (1.1/1, 0.01 mol), **1a** (0.2 mmol) in toluene (0.2 mL) for 2 h. The peak at 960.3943 was the [L-PrPr$_2$+Mg^{2+}+OTf^-+**1a**], (calc. 960.3810).

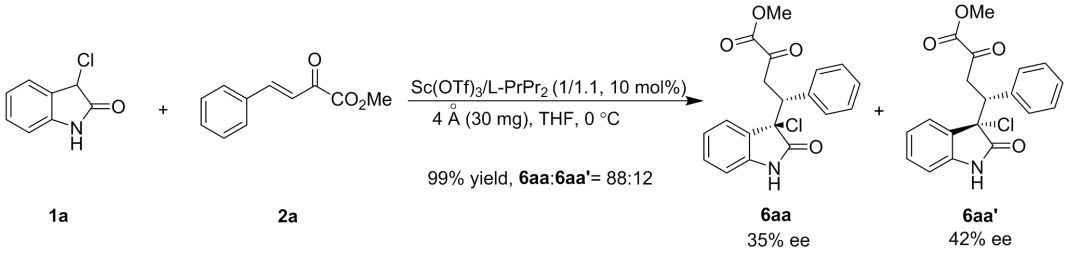


The mixture was prepared from the prepared **L-RaPr$_2$**/Sc(OTf)$_3$ (1.1/1, 0.01 mol), **1a** (0.2 mmol) in toluene (0.2 mL) for 2 h. The peak at 1210.3748 was the [L-RaPr$_2$+Sc^{3+}+2OTf^-+**1a**], (calc.1210.3665).

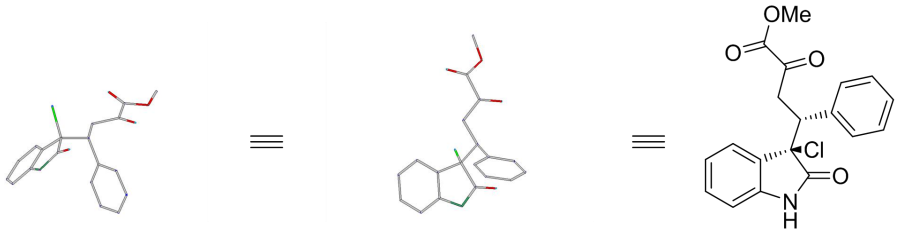
5.4 Comparative experiments

a) Synthesis of the Michale intermediate **6aa** and **6aa'**

Under the optimized condition without Na_2CO_3, only trace amount of Michael addition intermediates were detected. After optimizing these condition, the intermediate could be synthesized as follow. Sc(OTf)$_3$ (10 mol%) and **L-PrPr$_2$** (11 mol%) were added in a reaction tube under nitrogen, then, 0.2 mL THF was added with stirring for 30 min at 30 °C. After removing the solvent, **1a** (0.1 mmol), **2a** (0.1 mmol), 4 Å (30 mg), and 0.4 mL THF were added. Finnaly, the mixture was kept stirring at 0 °C for 48 h.



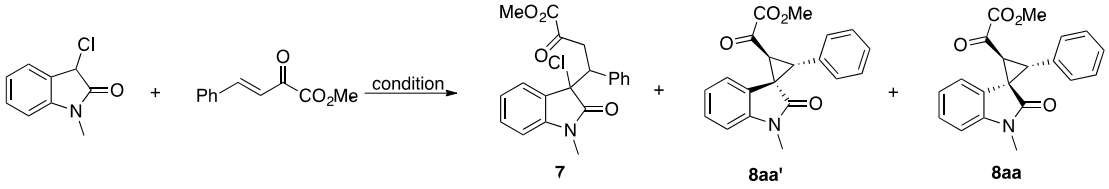
Two diastermers were partly isolated via flash column chromatography (PE : EA = 2:1). The **6aa** was further isolated via flash chromatography using a mixed eluent (PE : CH_2Cl_2 : acetone = 8 : 1 : 1). After recystallation, single diastereomer of **6aa** was isolated with the increasing ee value from 35% ee into 73% ee). Subsequently, the concentrated mother liquid was isolated again by the flash chromatography (PE : Et_2O = 1:2) to give **6aa'**. The racemic Michael intermediates were obtained by using racemic ligand.



top view front view **6aa**

Additionaly, the relative configuration of **6aa** was also confirmed by X-ray crystallographic analysis. CCDC 1545249 (**6aa)** could be obtained free from the Cambridge Crystallographic Data Centre via www.ccdc.cam.ac.uk/data_requst/cif.

b) Reactivity of *N*-Me 3-Cl oxindole



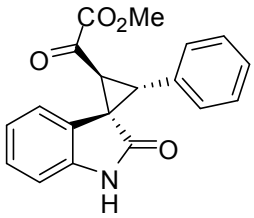
Entry	Condition[a]	7 [yield, ee]	8aa'[b] [yield, ee]	8aa[b] [yield, ee]
1	**L-RaPr$_2$**/Sc(OTf)$_3$	31%, 52%	—, —	25%, 30%
2	**L-PrPr$_2$**/Mg(OTf)$_2$	19%, -11%	40%, -4%	22%, -41%

[a]Unless otherwise noted, reactions were performed with **1** (0.1 mmol), **2** (0.1 mmol), chiral catalyst (10 mol%), Na_2CO_3 in toluene (1.0 mL) for 72 h. **L-PrPr$_2$**/Mg(OTf)$_2$ (1.1/1) and 1.0 eq of Na_2CO_3 were used at 40°C; **L-RaPr$_2$**/Sc(OTf)$_3$ (1.1/1, 10 mol%) and 1.0 eq of Na_2CO_3 were used at 0°C. [b] Isolated yield. ee was determined by HPLC on a chiral stationary.

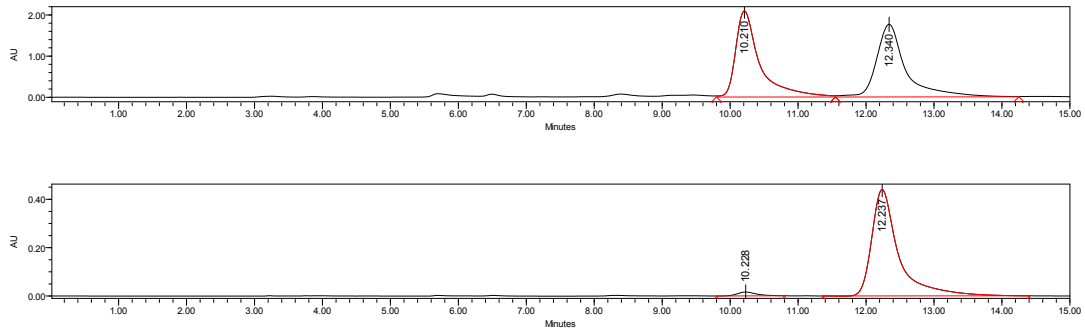
To check the role of aza-*ortho*-xylylene in this reaction. *N*-Me 3-Cl oxindole was synthesized and subjected into the optimized condition. However, both **L-RaPr$_2$**/Sc(OTf)$_3$ and **L-PrPr$_2$**/Mg(OTf)$_2$ showed very low reactivities and poor ees with the same Michael addition diastereomer detected. The relative configuration was confirmed by *N*-methylation of **3aa'** with an opposite ee. The newly induced methyl group may affect the pKa of the substrate and change the coordinative type. It's also very hard to construct another diastereomer of **7**, even when the central Lewis acid was changed.

6 Characterization of the products

Methyl (1*S*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:

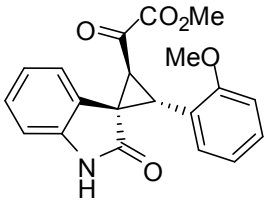


Prepared according to the general procedure. The compound of **3aa'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford light yellow oil in 77% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 12.24 min, t_r(minor) = 10.23 min, *ee* = 95%, dr > 99:1. $[\alpha]^{14.8}_D$ = 253.9 (c = 0.84, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.89 (s, 1H), 7.34 (d, *J* = 7.6 Hz, 1H), 7.32 – 7.26 (m, 5H), 7.24 – 7.18 (m, 1H), 7.02 (t, *J* = 7.6 Hz, 1H), 6.76 (d, *J* = 7.7 Hz, 1H), 4.35 (d, *J* = 8.3 Hz, 1H), 3.97 (d, *J* = 8.3 Hz, 1H), 3.86 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 173.3, 160.3, 141.3, 132.5, 129.2, 128.2, 128.2, 127.8, 125.4, 122.8, 122.4, 110.2, 53.5, 44.0, 41.0, 40.7. HRMS (ESI-TOF) calcd for $C_{19}H_{15}NO_4$ ($M+Na^+$) = 344.0899, found 344.0898.

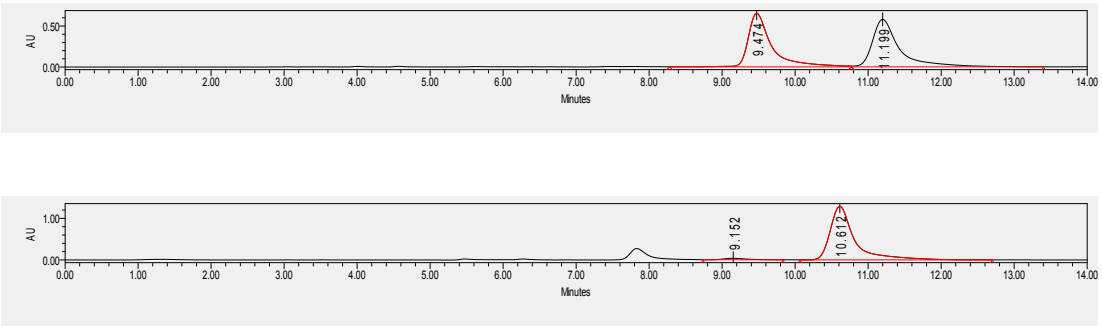


	Retention Time	Area	% Area
1	10.228	313815	2.54
2	12.237	12046603	97.46

Methyl (1*S*,2*S*,3*R*)-2-(2-(2-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



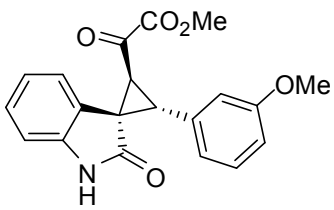
Prepared according to the general procedure. The compound of **3ah'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford white solid in 69% yield. Mp. 188.0 – 190.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.61 min, t_r(minor) = 9.15 min, *ee* = 95%, dr > 99:1. $[\alpha]^{11.0}_D$ = 250.0 (c = 0.03, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.22 (s, 1H), 7.37 (d, *J* = 7.6 Hz, 1H), 7.31 – 7.26 (m, 2H), 7.26 – 7.19 (m, 1H), 7.03 (t, *J* = 7.6 Hz, 1H), 6.96 (t, *J* = 7.6 Hz, 1H), 6.87 – 6.75 (m, 2H), 4.24 – 4.15 (m, 1H), 3.86 (s, 3H), 3.80 (d, *J* = 8.3 Hz, 1H), 3.59 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.7, 173.3, 160.4, 158.2, 141.0, 130.1, 129.1, 127.8, 125.9, 123.0, 122.3, 121.3, 120.2, 110.2 109.6, 55.3, 53.4, 43.6, 41.0, 36.7. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ ($M+Na^+$) = 374.1004, found 374.1006.



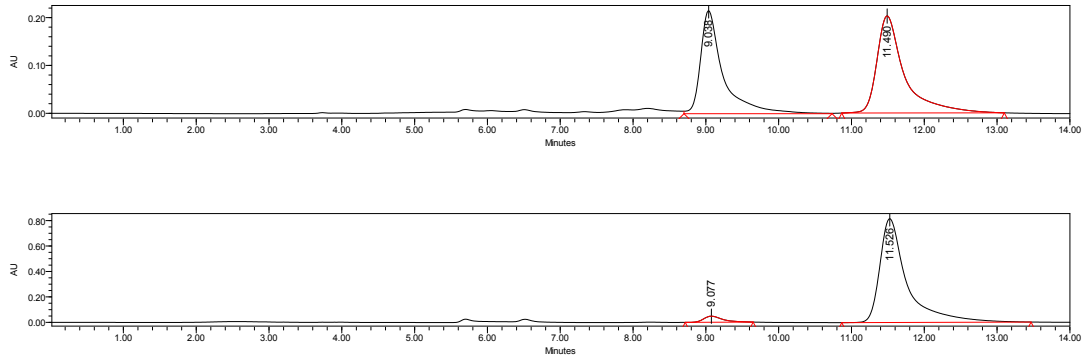
	Retention Time	Area	% Area
1	9.152	739851	2.43
2	10.612	29686935	97.57

Methyl (1*S*,2*S*,3*R*)-2-(2-(3-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:

Prepared according to the general procedure. The compound of **3ai'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford white solid in 70% yield. Mp. 148.0 – 150.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm)

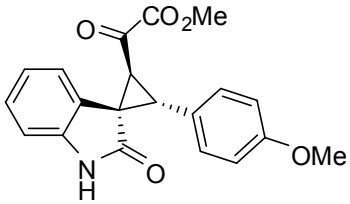


t_r(major) = 11.53 min, t_r(minor) = 9.08 min, *ee* = 92%, dr > 99:1. $[\alpha]^{14.9}_D$ = 281.65 (c = 0.28, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.10 (s, 1H), 7.35 (d, *J* = 7.6 Hz, 1H), 7.26 – 7.20 (m, 2H), 7.04 (t, *J* = 7.7 Hz, 1H), 6.93 – 6.78 (m, 4H), 4.35 (d, *J* = 8.3 Hz, 1H), 3.95 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H), 3.77 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 172.5, 160.3, 159.4, 141.0, 133.9, 129.2, 128.2, 125.4, 122.9, 122.5, 121.5, 114.9, 113.3, 109.8, 55.2, 53.5, 43.9, 41.0, 40.8. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ (M+Na$^+$) = 374.1004, found 374.1006.

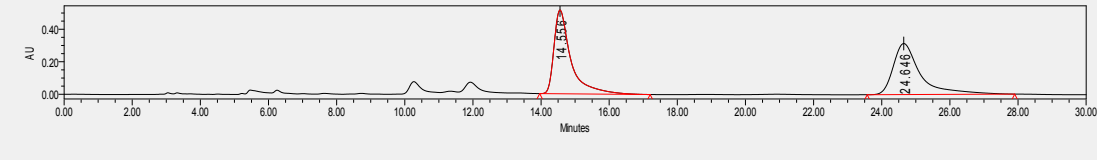


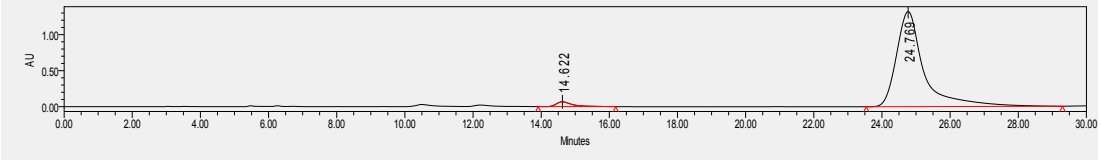
	Retention Time	Area	% Area
1	9.077	855723	3.90
2	11.526	21098002	96.10

Methyl (1*S*,2*S*,3*R*)-2-(2-(4-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



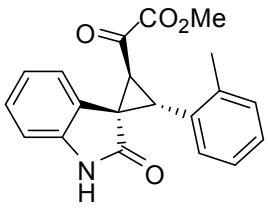
Prepared according to the general procedure. The compound of **3aj'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford colorless oil in 59% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 24.77 min, t_r(minor) = 14.62 min, *ee* = 94%, dr > 99:1. $[\alpha]^{12.9}_D$ = 196.9 (c = 0.10, in CH_2Cl_2). ^{1}H NMR (400 MHz,$CDCl_3$) δ = 7.75 (s, 1H), 7.36 (d, *J* = 7.7 Hz, 1H), 7.26 – 7.20 (m, 3H), 7.04 (t, *J* = 7.6 Hz, 1H), 6.89 – 6.82 (m, 3H), 4.33 (d, *J* = 8.3 Hz, 1H), 3.92 (d, *J* = 8.3 Hz, 1H), 3.88 (d, *J* = 4.7 Hz, 3H), 3.78 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.4, 172.4, 160.3, 159.1, 140.8, 130.2, 128.1, 125.6, 124.2, 123.0, 122.5, 113.6, 109.7, 55.2, 53.5, 43.9, 40.8, 40.8. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ (M+Na$^+$) = 374.1004, found 374.1001.



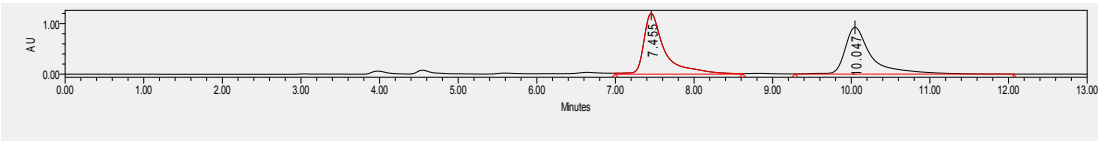


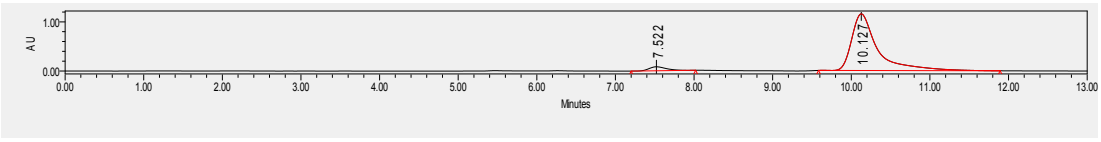
	Retention Time	Area	% Area
1	14.622	2192622	2.89
2	24.769	73779811	97.11

Methyl (1*S*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-o-tolylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



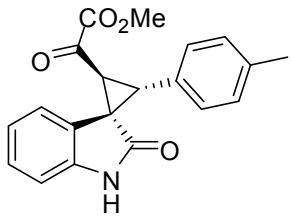
Prepared according to the general procedure. The compound of **3ak'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow solid in 50% yield. Mp. 150.0 – 152.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.13 min, t_r(minor) = 7.52 min, *ee* = 91%, dr > 99:1. $[\alpha]^{11.0}_D$ = 247.5 (c = 0.55, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.67 (s, 1H), 7.37 (d, *J* = 7.6 Hz, 1H), 7.34 – 7.28 (m, 1H), 7.25 – 7.16 (m, 3H), 7.13 – 7.08 (m, 1H), 7.07 – 7.01 (m, 1H), 6.77 (d, *J* = 7.8 Hz, 1H), 4.34 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H), 3.81 (d, *J* = 8.3 Hz, 1H), 1.96 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.5, 173.1, 160.4, 141.1, 137.6, 131.4, 129.9, 129.1, 128.2, 127.9, 125.7, 125.2, 122.7, 122.5, 110.1, 53.5, 43.8, 40.7, 40.0, 19.4. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+Na^+$) = 358.1055, found 358.1055.



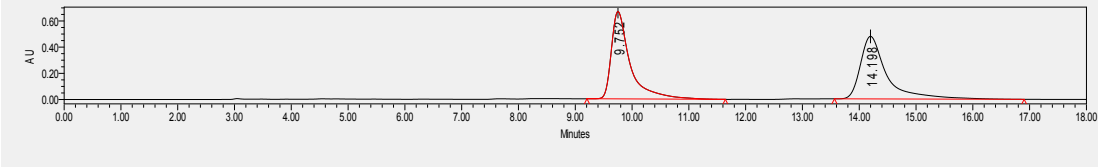


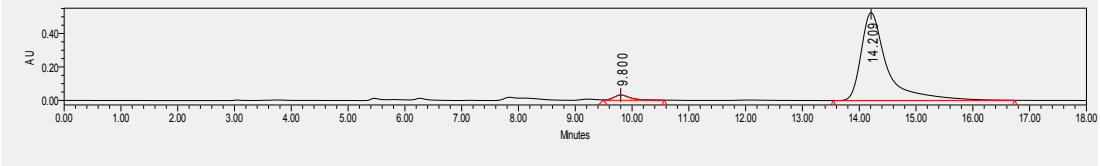
	Retention Time	Area	% Area
1	7.522	1227215	4.45
2	10.127	26323776	95.55

Methyl (1*S*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-p-tolylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



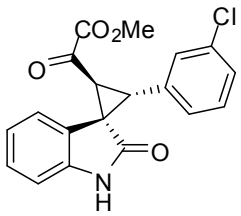
Prepared according to the general procedure. The compound of **3al'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow solid in 77% yield. Mp. 84.0 – 86.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 14.21 min, t_r(minor) = 9.80 min, *ee* = 93%, dr > 99:1. $[\alpha]^{14.0}_D$ = 249.5 (c = 0.42, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.43 (s, 1H), 7.35 (d, *J* = 7.6 Hz, 1H), 7.25 – 7.17 (m, 3H), 7.14 – 7.07 (m, 2H), 7.07 – 6.99 (m, 1H), 6.82 (d, *J* = 7.8 Hz, 1H), 4.34 (d, *J* = 8.3 Hz, 1H), 3.94 (d, *J* = 8.3 Hz, 1H), 3.86 (s, 3H), 2.31 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.4, 173.0, 160.4, 141.1, 137.5, 129.3, 129.0, 128.9, 128.1, 125.6, 122.9, 122.4, 109.9, 53.5, 43.9, 40.9, 40.7, 21.2. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+Na^+$) = 358.1055, found 358.1056.



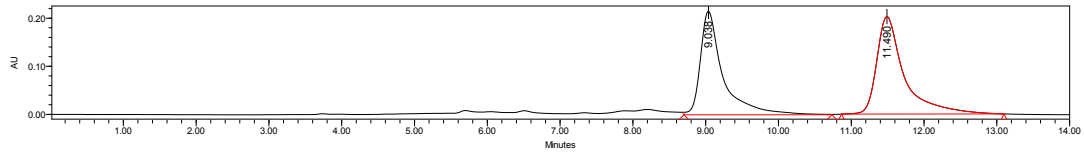


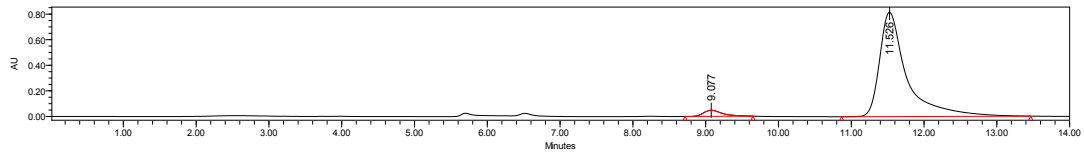
	Retention Time	Area	% Area
1	9.800	650120	3.75
2	14.209	16667191	96.25

Methyl (1*S*,2*S*,3*R*)-2-(-2-(3-chlorophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3am'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow oil in 77% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 11.53 min, t_r(minor) = 9.08 min, *ee* = 92%, dr > 99:1. $[\alpha]^{14.9}_D$ = 281.7 (c = 0.28, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.35 (s, 1H), 7.32 (d, *J* = 7.1 Hz, 2H), 7.26 – 7.16 (m, 4H), 7.04 (td, *J* = 7.7, 0.8 Hz, 1H), 6.86 (d, *J* = 7.7 Hz, 1H), 4.32 (d, *J* = 8.3 Hz, 1H), 3.91 (d, *J* = 8.3 Hz, 1H), 3.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.0, 172.5, 160.2, 141.1, 134.4, 134.1, 129.4, 129.3, 128.4, 128.0, 127.4, 125.0, 122.9, 122.6, 110.1, 53.6, 43.6, 40.4, 40.0. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+Na^+$) = 378.0509, found 378.0511; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+Na^+$) = 380.0480, found 380.0490.

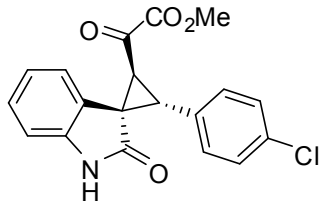




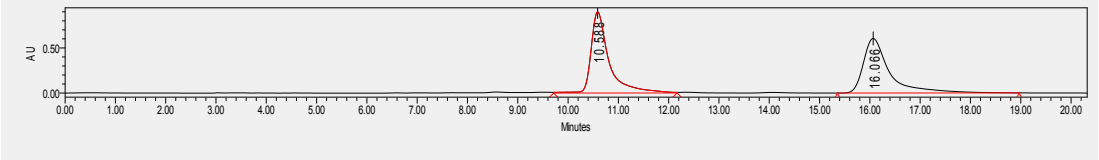
	Retention Time	Area	% Area
1	9.077	855723	3.90
2	11.526	21098002	96.10

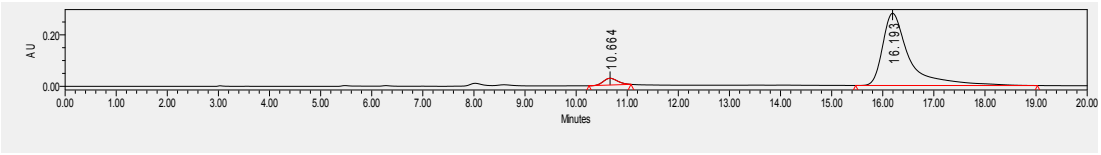
Methyl

(1*S*,2*S*,3*R*)-2-(2-(4-chlorophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



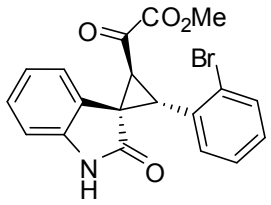
Prepared according to the general procedure. The compound of **3an'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow oil in 63% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 16.19 min, t_r(minor) = 10.66 min, *ee* = 91%, dr > 99:1. $[\alpha]^{14.9}_D$ = 295.5 (c = 0.27, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.59 (s, 1H), 7.33 (d, *J* = 7.6 Hz, 1H), 7.31 – 7.22 (m, 5H), 7.03 (t, *J* = 7.6 Hz, 1H), 6.81 (d, *J* = 7.7 Hz, 1H), 4.32 (d, *J* = 8.3 Hz, 1H), 3.91 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.0, 172.9, 160.3, 141.1, 133.7, 131.0, 130.5, 128.4, 128.4, 125.1, 122.9, 122.6, 110.1, 53.6, 43.7, 40.5, 40.0. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+Na^+$) = 378.0509, found 378.0513; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+Na^+$) = 380.0480, found 380.0491.



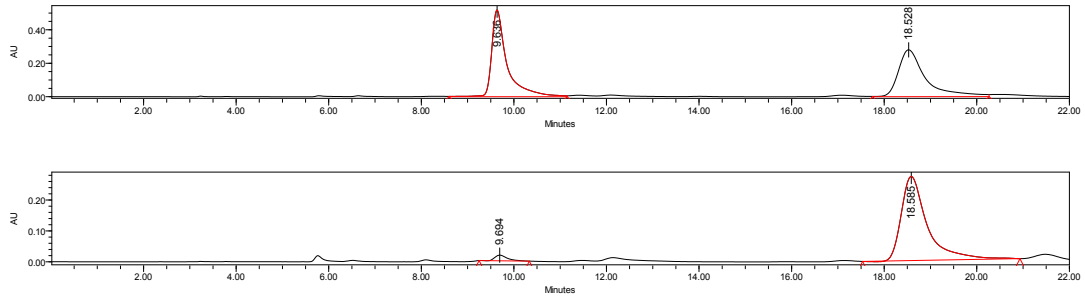


	Retention Time	Area	% Area
1	10.664	511787	4.77
2	16.193	10215126	95.23

Methyl (1*S*,2*S*,3*R*)-2-(2-(2-bromophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:

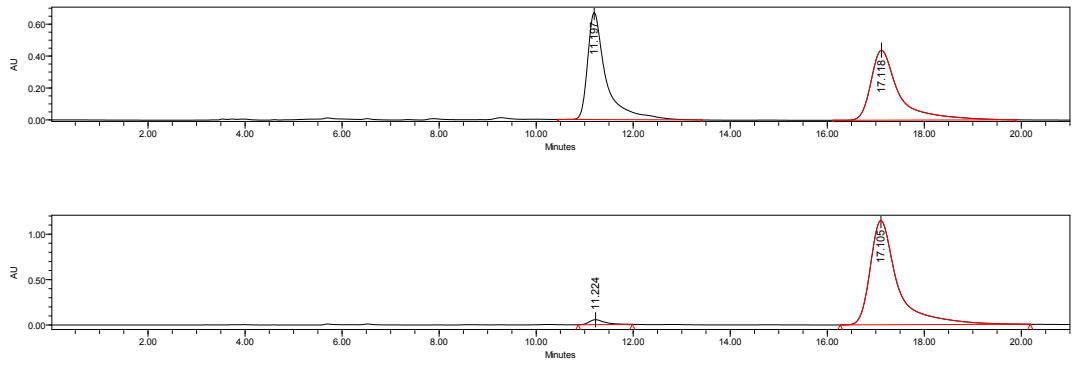


Prepared according to the general procedure. The compound of **3ao'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford white solid in 62% yield. Mp. 176.0 – 178.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 18.59 min, t_r(minor) = 9.69 min, *ee* = 94%, dr > 99:1. $[\alpha]^{11.0}_D$ = 49.5 (c = 0.20, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.41 (s, 1H), 7.50 (d, *J* = 7.9 Hz, 1H), 7.35 (m, 3H), 7.26 – 7.21 (m, 1H), 7.20 - 7.14 (m, 1H), 7.08 – 6.98 (m, 1H), 6.82 – 6.76 (m, 1H), 4.28 (d, *J* = 8.2 Hz, 1H), 3.89 – 3.83 (m, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.1, 172.9, 160.3, 141.3, 133.1, 132.5, 131.0, 129.4, 128.2, 127.2, 125.6, 125.1, 123.0, 122.5, 109.9, 53.5, 44.0, 41.2, 40.9. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{79}BrNO_4$ ($M+Na^+$) = 422.0004, found 422.0007; calcd for $C_{19}H_{14}{}^{81}BrNO_4$ ($M+Na^+$) = 423.9983, found 423.9993.



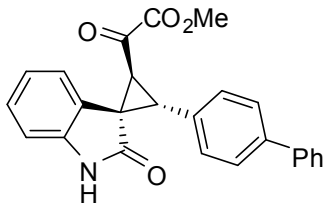
	Retention Time	Area	% Area
1	9.694	343895	3.13
2	18.585	10643433	96.87

Methyl (1*S*,2*S*,3*R*)-2-(2-(4-bromophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate: Prepared according to the general procedure. The compound of **3ap'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford light yellow solid in 81% yield. Mp. 66.0 – 68.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 17.11 min, t_r(minor) = 11.22 min, *ee* = 94%, dr > 99:1. $[\alpha]^{10.9}_D$ = 296.3 (c = 0.40, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.55 (s, 1H), 7.43 (d, *J* = 8.4 Hz, 1H), 7.33 (d, *J* = 7.6 Hz, 1H), 7.30 – 7.25 (m, 2H), 7.23 – 7.17 (m, 2H), 7.04 (t, *J* = 7.6 Hz, 1H), 6.81 (d, *J* = 7.8 Hz, 1H), 4.32 (d, *J* = 8.3 Hz, 1H), 3.89 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.0 172.9, 160.3, 141.1, 131.5, 131.4, 130.9, 128.4, 125.1, 122.9, 122.6, 121.9, 110.1, 53.6, 43.7, 40.4, 40.0. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{79}BrNO_4$ ($M+Na^+$) = 422.0004, found 422.0009; calcd for $C_{19}H_{14}{}^{81}BrNO_4$ ($M+Na^+$) = 423.9983, found 423.9989.

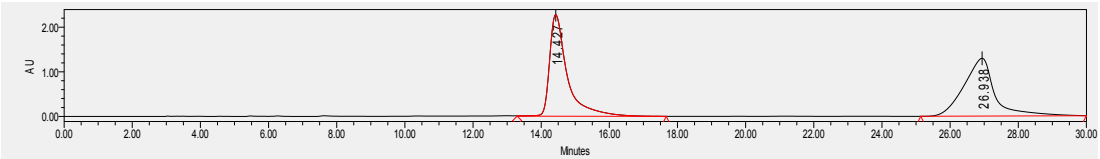


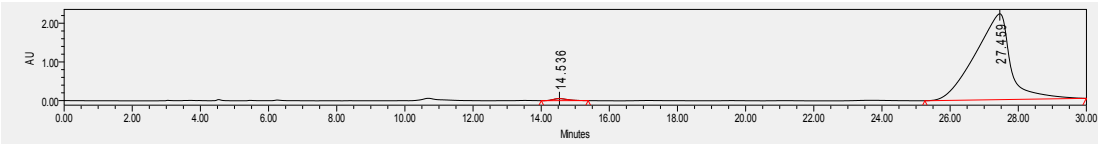
	Retention Time	Area	% Area
1	11.224	1233355	2.66
2	17.105	45173061	97.34

Methyl (1*S*,2*S*,3*R*)-2-(2-(biphenyl-4-yl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate: Prepared according to the general procedure. The compound of **3aq'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford white solid in 74% yield. Mp. 88.0 – 90.0



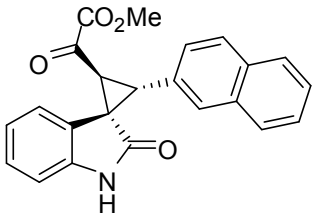
ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 27.46 min, t_r(minor) = 14.54 min, *ee* = 98%, dr > 99:1. $[\alpha]^{15.1}_D$ = 307.8 (c = 0.42, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.72 (s, 1H), 7.57 – 7.50 (m, 4H), 7.48 – 7.40 (m, 2H), 7.39 – 7.30 (m, 4H), 7.11 (t, *J* = 7.4 Hz, 1H), 7.00 (t, *J* = 7.5 Hz, 1H), 6.74 (d, *J* = 7.7 Hz, 1H), 4.40 (d, *J* = 8.3 Hz, 1H), 3.98 (d, *J* = 8.3 Hz, 1H), 3.86 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 173.2, 160.3, 141.2, 140.6, 131.5, 129.6, 128.8, 128.2, 127.4, 127.1, 126.9, 125.4, 122.9, 122.4, 110.1, 53.5, 44.0, 40.8, 40.6. HRMS (ESI-TOF) calcd for $C_{25}H_{19}NO_4$ (M+Na$^+$) = 420.1212, found 420.1210.



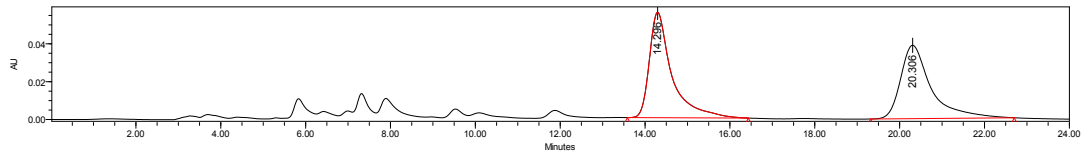


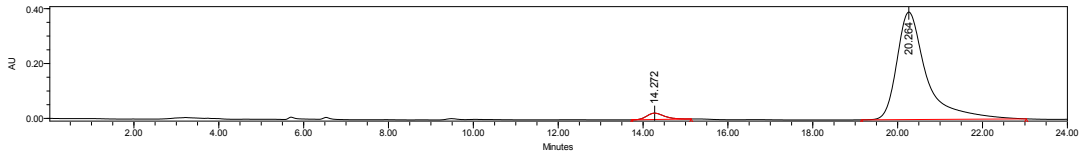
	Retention Time	Area	% Area
1	14.536	1564552	0.97
2	27.459	160521023	99.03

Methyl (1*S*,2*S*,3*R*)-2-(2-(naphthalen-2-yl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



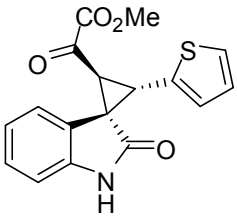
Prepared according to the general procedure. The compound of **3ar'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford light yellow oil in 71% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 20.26 min, t_r(minor) = 14.27 min, *ee* = 93%, dr > 99:1. $[\alpha]^{13.7}_D$ = 485.4 (c = 0.21, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.51 (s, 1H), 7.85 – 7.72 (m, 4H), 7.50 – 7.42 (m, 2H), 7.40 – 7.33 (m, 2H), 7.14 (t, *J* = 7.8 Hz, 1H), 7.02 (t, *J* = 7.8 Hz, 1H), 6.61 (d, *J* = 7.7 Hz, 1H), 4.48 (d, *J* = 8.3 Hz, 1H), 4.11 (d, *J* = 8.3 Hz, 1H), 3.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 173.0, 160.4, 141.1, 133.0, 132.9, 129.9, 128.2, 128.2, 127.9, 127.9, 127.7, 126.9, 126.3, 126.1, 125.4, 122.9, 122.4, 110.0, 53.6, 44.0, 41.1, 40.7. HRMS (ESI-TOF) calcd for $C_{23}H_{17}NO_4$ (M+Na$^+$) = 394.1055, found 394.1060.



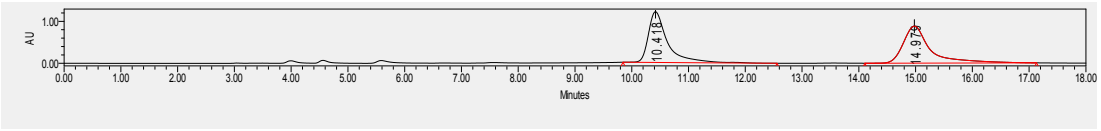


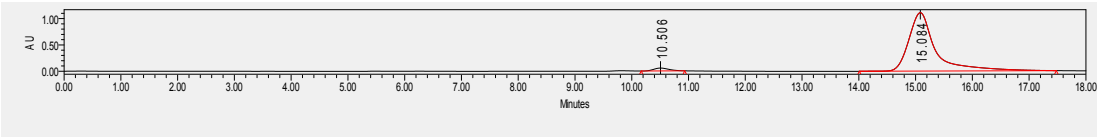
	Retention Time	Area	% Area
1	14.272	670529	3.42
2	20.264	18913427	96.58

Methyl (1*S*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-(thiophen-2-yl)spiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



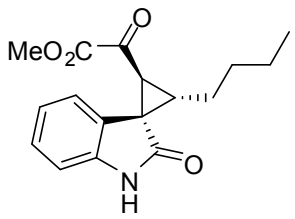
Prepared according to the general procedure. The compound of **3as'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow oil in 52% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 15.08 min, t_r(minor) = 10.51 min, *ee* = 95%, dr > 99:1. $[\alpha]^{13.7}_D$ = 150.6 (c = 0.53, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.72 (s, 1H), 7.30 (d, *J* = 7.6 Hz, 1H), 7.26 – 7.23 (m, 1H), 7.21 (d, *J* = 5.6 Hz, 1H), 7.08 (d, *J* = 3.4 Hz, 1H), 7.03 (t, *J* = 7.6 Hz, 1H), 6.98 – 6.93 (m, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 4.35 (d, *J* = 8.1 Hz, 1H), 3.99 (d, *J* = 8.1 Hz, 1H), 3.86 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 186.8, 172.5, 160.1, 141.2, 135.0, 128.3, 127.8, 126.8, 125.5, 124.9, 122.8, 122.5, 110.2, 53.6, 44.0, 41.9, 35.6. HRMS (ESI-TOF) calcd for $C_{17}H_{13}NO_4S$ ($M+Na^+$) = 350.0463, found 350.0464.





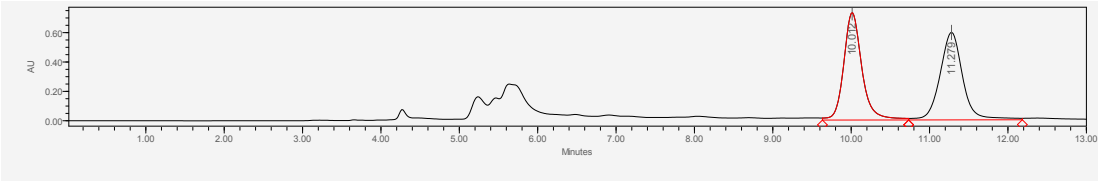
	Retention Time	Area	% Area
1	10.506	1023037	2.75
2	15.084	36154409	97.25

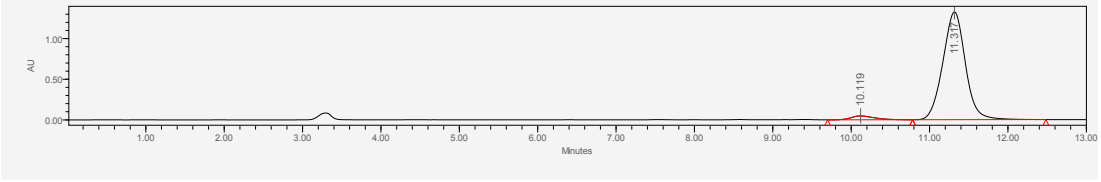
Methyl (1*S*,2*S*,3*R*)-2-(2-butyl-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3at'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow oil in 71% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 11.32 min, t_r(minor) = 10.11 min, *ee* = 93%, dr > 99:1. $[\alpha]^{12.3}_D$ = 174.5 (c = 0.43, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.07 (s, 1H), 7.27 – 7.22 (m, 1H), 7.06 – 7.02 (m, 2H), 7.00 (d, *J* = 7.8 Hz, 1H), 3.77 (s, 3H), 3.00 (d, *J* = 8.4 Hz, 1H), 2.71 (q, *J* = 7.5 Hz, 1H), 1.85 (dd, *J* = 13.9, 7.6 Hz, 1H), 1.70 (tt, *J* = 13.5, 6.8 Hz,

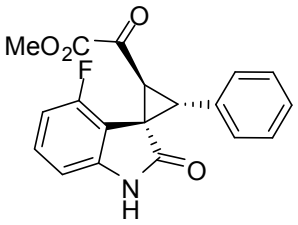
1H), 1.43 – 1.25 (m, 4H), 0.85 (t, J = 6.9 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.0, 175.8, 160.8, 141.5, 127.9, 126.3, 122.1, 121.3, 110.6, 53.1, 41.9, 40.1, 35.4, 30.8, 26.5, 22.1, 13.9. HRMS (ESI-TOF) calcd for $C_{17}H_{20}NO_4$ ($M+H^+$) = 302.1392, found 302.1385.



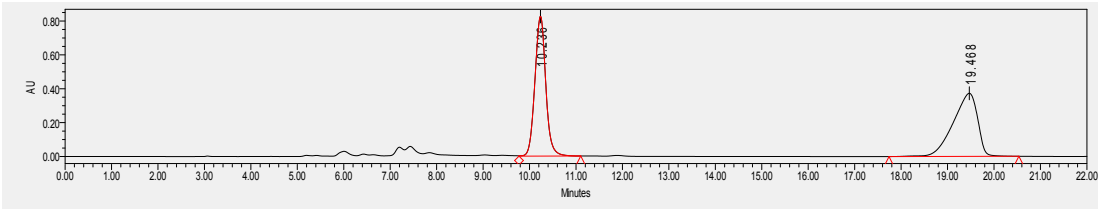


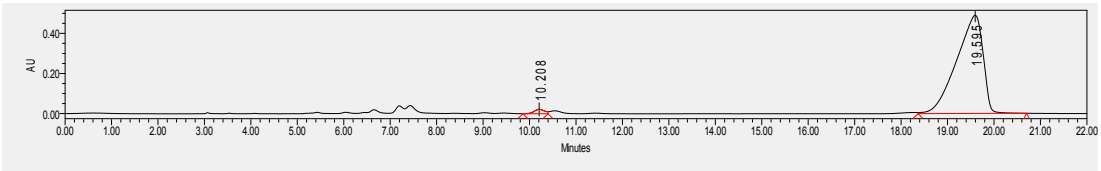
	Retention Time	Area	% Area
1	10.119	974803	3.55
2	11.317	26446603	96.45

Methyl (1*S*,2*S*,3*R*)-2-(4'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3ca'** was purified by silica gel chromatography (petroleum ether: Et_2O= 1:2) to afford white oil in 84% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 19.60 min, t_r(minor) = 10.21 min, *ee* = 96%, dr > 99:1. $[\alpha]^{14.6}_D$ = 213.2 (c = 0.34, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.66 (s, 1H), 7.39 – 7.27 (m, 5H), 7.22 – 7.14 (m, 1H), 6.76 – 6.67 (m, 1H), 6.61 (d, J = 7.8 Hz, 1H), 4.27 (d, J = 8.9 Hz, 1H), 3.96 (d, J = 8.9 Hz, 1H), 3.86 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 186.8, 172.9, 160.5, 157.4 (d, J = 247.4 Hz), 143.2 (d, J = 8.2 Hz), 132.5, 129.7 (d, J = 8.8 Hz), 129.2, 128.2, 127.8, 111.6 (d, J = 17.5 Hz), 110.1 (d, J = 21.3 Hz), 106.5 (d, J = 3.2 Hz), 53.4, 40.5, 37.0, 37.0. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+Na^+$) = 362.0805, found 362.0807.

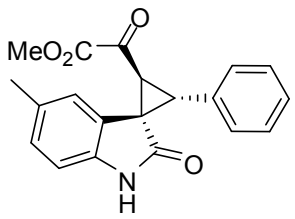




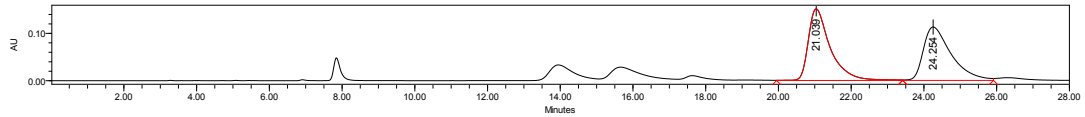
	Retention Time	Area	% Area
1	10.208	338532	1.71

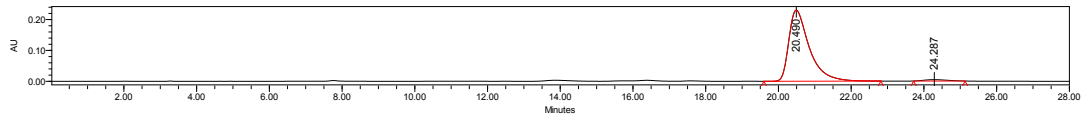
2	19.595	19409542	98.29

Methyl (1*S*,2*S*,3*R*)-2-(5'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



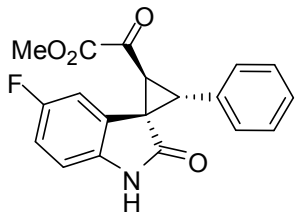
Prepared according to the general procedure. The compound of **3da'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford light yellow oil in 72% yield. HPLC (chiralcel ID, hexane/*i*-PrOH = 90:10, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 20.49 min, t_r(minor) = 24.2 9min, *ee* = 96%, dr > 99:1. $[\alpha]^{14.0}_D$ = 210.6 (c = 0.55, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.57 (s, 1H), 7.35 – 7.26 (m, 5H), 7.17 (s, 1H), 7.02 (d, *J* = 7.8 Hz, 1H), 6.68 (d, *J* = 7.9 Hz, 1H), 4.34 (d, *J* = 8.3 Hz, 1H), 3.94 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H), 2.34 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.4, 173.1, 160.3, 138.8, 132.6, 132.0, 129.1, 128.5, 128.2, 127.8, 125.5, 123.6, 109.8, 53.5, 44.1, 41.0, 40.6, 21.3. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+Na^+$) = 358.1055, found 358.1055.



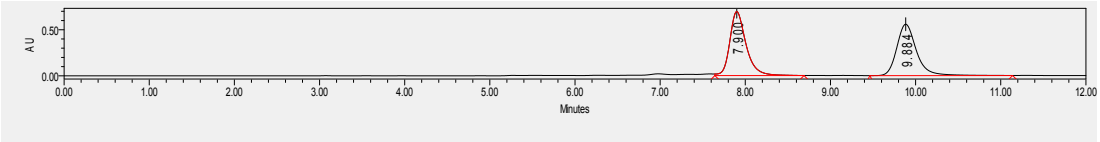


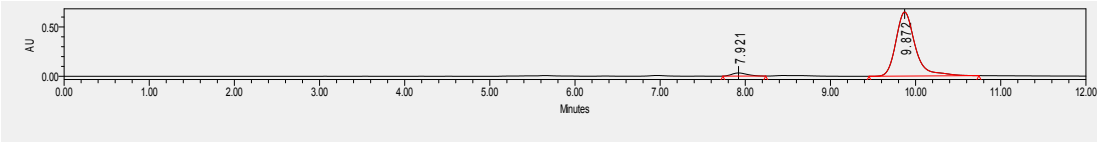
	Retention Time	Area	% Area
1	20.490	9003766	97.94
2	24.287	189526	2.06

Methyl (1*S*,2*S*,3*R*)-2-(5'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



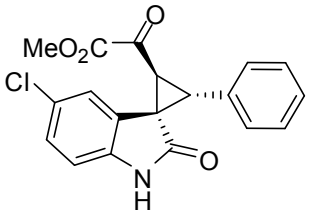
Prepared according to the general procedure. The compound of **3ea'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford yellow oil in 67% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.87 min, t_r(minor) = 7.92 min, *ee* = 92%, dr > 99:1. $[\alpha]^{13.4}_D$ = 235.2 (c = 0.78, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.09 (s, 1H), 7.40 – 7.26 (m, 5H), 7.18 – 7.12 (m, 1H), 6.95 – 6.88 (m, 1H), 6.66 – 6.60 (m, 1H), 4.36 (d, *J* = 8.3 Hz, 1H), 3.92 (d, *J* = 8.4 Hz, 1H), 3.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 173.3, 158.8 (d, *J* = 238.5 Hz), 157.6, 137.2 (d, *J* = 2.0 Hz), 132.2, 129.2, 128.3, 127.9, 126.9 (d, *J* = 9.3 Hz), 114.6 (d, *J* = 23.5 Hz), 111.1 (d, *J* = 26.5 Hz), 110.7 (d, *J* = 6.5 Hz), 53.6, 44.12 (d, *J* = 2.0 Hz), 41.6, 40.5. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+H^+$) = 340.0985, found 340.0982.



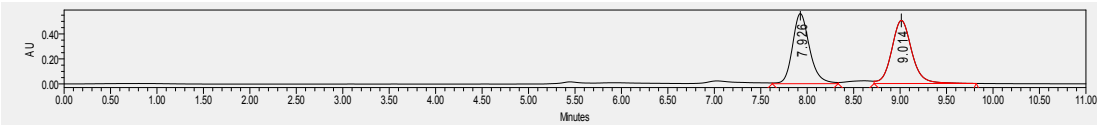


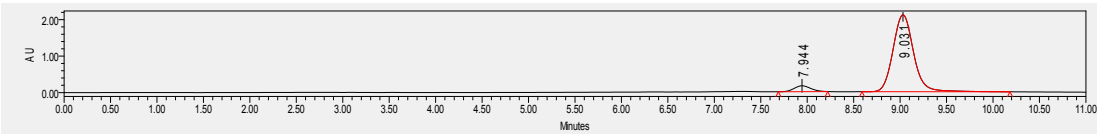
	Retention Time	Area	% Area
1	7.921	396567	3.74
2	9.872	10213204	96.26

Methyl (1*S*,2*S*,3*R*)-2-(5'-chloro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3fa'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford light yellow solid in 61% yield. Mp. 172.0 – 174.0 ºC, HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.03 min, t_r(minor) = 7.94 min, *ee* = 88%, dr > 99:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.74 (s, 1H), 7.39 (d, *J* = 1.5 Hz, 1H), 7.35 – 7.27 (m, 5H), 7.24 – 7.16 (m, 1H), 6.70 (d, *J* = 8.3 Hz, 1H), 4.37 (d, *J* = 8.4 Hz, 1H), 3.93 (d, *J* = 8.4 Hz, 1H), 3.89 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.2, 172.7, 160.3, 139.7, 132.0, 129.1, 128.3, 128.2, 128.0, 127.9, 127.1, 123.4, 111.9, 53.6, 43.8, 41.7, 40.5. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+H^+$) = 356.0690, found 356.0687; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+H^+$) = 358.0660, found 358.0651.

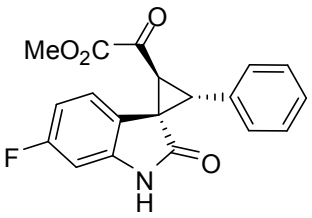




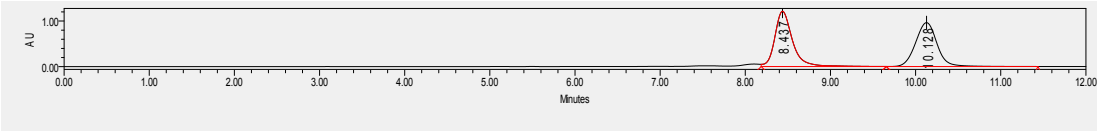
	Retention Time	Area	% Area
1	7.944	2004181	5.84
2	9.031	32337164	94.16

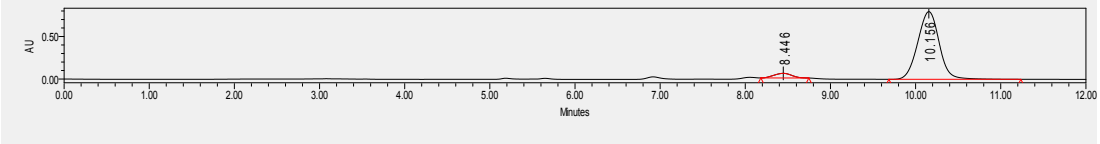
Methyl (1*S*,2*S*,3*R*)-2-(6'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:

Prepared according to the general procedure. The compound of **3ga'** was purified by silica gel chromatography (petroleum ether: Et_2O = 1:2) to afford a light yellow oil in 70% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.16 min, t_r(minor) = 8.45 min, *ee* = 89%, dr > 99:1. $[\alpha]^{14.5}{}_D$ = 234.5 (c = 0.68, in CH_2Cl_2). ^{1}H NMR (400



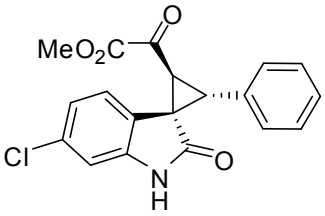
MHz, $CDCl_3$) δ = 9.12 (s, 1H), 7.35 – 7.26 (m, 6H), 6.75 – 6.66 (m, 1H), 6.48 (dd, *J* = 8.6, 2.3 Hz, 1H), 4.33 (d, *J* = 8.3 Hz, 1H), 3.94 (d, *J* = 8.3 Hz, 1H), 3.87 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.4, 173.8, 162.9 (d, *J* = 244.5 Hz), 160.3, 142.5 (d, *J* = 12.0 Hz), 132.3, 129.1, 128.3, 128.0, 124.1 (d, *J* = 9.7 Hz), 120.7 (d, *J* = 2.8 Hz), 108.8 (d, *J* = 12.4 Hz), 99.0 (d, *J* = 27.2 Hz), 53.6, 43.6, 41.0, 40.6. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+Na^+$) = 362.0805, found 362.0807.



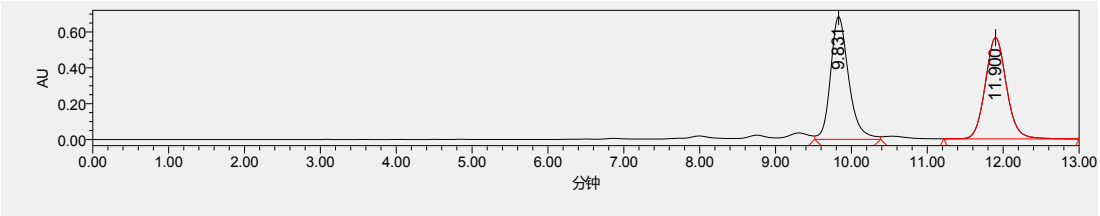


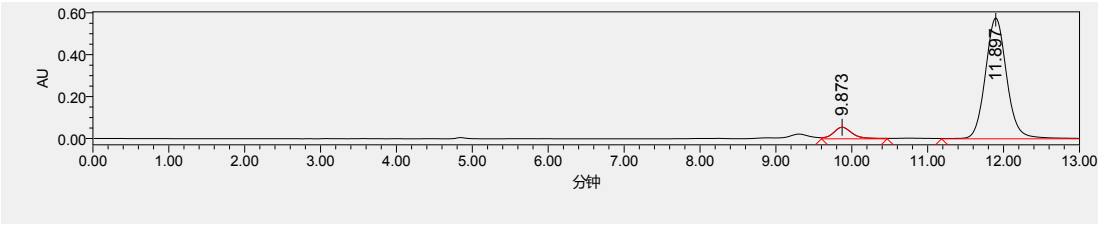
	Retention Time	Area	% Area
1	8.446	786510	5.34
2	10.156	13929911	94.66

Methyl (1*S*,2*S*,3*R*)-2-(-6'-chloro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



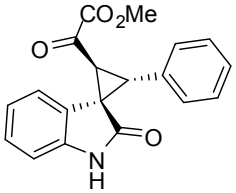
Prepared according to the general procedure. The compound of **3ha'** was purified by silica gel chromatography (petroleum ether: Et_2O = 2:1) to afford a colorless solid in 63% yield. HPLC (chiralcel IA, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 11.90 min, t_r(minor) = 9.87 min, *ee* = 84%, dr > 99:1. $[\alpha]^{14.5}_D$ = 222.6 (c = 0.38, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.83 (s, 1H), 7.39 – 7.26 (m, 6H), 7.00 (dd, *J* = 8.2, 1.7 Hz, 1H), 6.78 (d, *J* = 1.6 Hz, 1H), 4.36 (d, *J* = 8.3 Hz, 1H), 3.95 (d, *J* = 8.3 Hz, 1H), 3.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.3, 173.2, 160.3, 142.2, 134.1, 132.0, 129.1, 128.3, 128.0, 123.8, 123.8 122.4, 110.8, 53.6, 43.6, 41.2, 40.6. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+Na^+$) = 356.0690, found 356.0690; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+Na^+$) = 358.0660, found 358.0663.



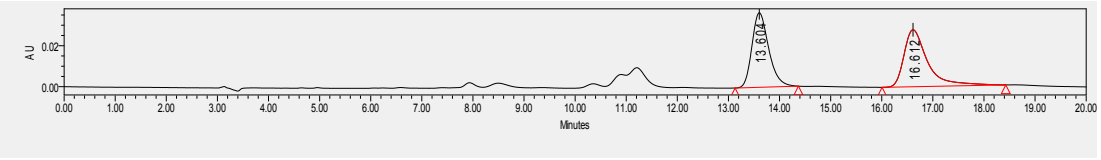


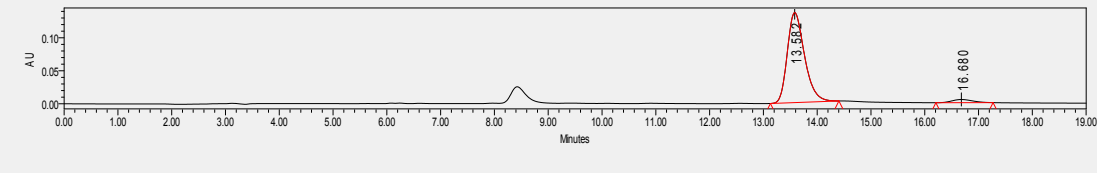
	Retention time	Area	% Area
1	9.873	955517	7.78
2	11.897	11325546	92.22

Methyl (1*R*,2*S*,3*R*) 2-oxo-2-(-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



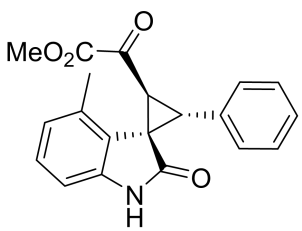
Prepared according to the general procedure. The compound of **3aa** was purified by silica gel chromatography (petroleum ether: EA = 1:1) to afford a colorless solid in 99% yield. Mp. 70.0 – 72.0 ºC. HPLC (chiralcel IE, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 13.58 min, t_r(minor) = 16.68 min, *ee* = 92%, dr > 99:1. $[\alpha]^{28.0}_D$ = 169.7 (c = 0.35, in CH_2Cl_2). ^{1}H NMR (400 MHz, DMSO) δ = 10.73 (s, 1H), 7.41 – 7.26 (m, 5H), 7.11 (d, *J* = 7.7, 1H), 6.88 (d, *J* = 7.7 Hz, 1H), 6.66 (t, *J* = 7.5 Hz, 1H), 6.11 (d, *J* = 7.5 Hz, 1H), 3.93 (d, *J* = 8.4 Hz, 1H), 3.72 (s, 3H), 3.61 (d, *J* = 8.4 Hz, 1H). ^{13}C NMR (101 MHz, DMSO) δ = 186.4, 174.0, 159.8, 142.4, 133.0, 129.5, 128.4, 127.7, 127.5, 125.6, 120.9, 120.8, 109.6, 52.7, 40.1, 38.6, 36.8. HRMS (ESI-TOF) calcd for $C_{19}H_{15}NO_4$ ($M+Na^+$) = 344.0899, found 344.0898.





	Retention Time	Area	% Area
1	13.582	3026150	95.91
2	16.680	129163	4.09

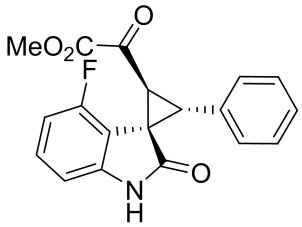
Methyl (1*R*,2*S*,3*R*)-2-(4'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3ba** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 67% yield. ^{1}H NMR (400 MHz, DMSO) δ = 10.77 (s, 1H), 7.34 – 7.26 (m, 3H), 7.20 (d, *J* = 5.3 Hz, 2H), 7.06 (t, *J* = 7.7 Hz, 1H), 6.79 (d, *J* = 7.7 Hz, 1H), 6.54 (d, *J* = 7.7 Hz, 1H), 4.16 (d, *J* = 8.6 Hz, 1H), 3.73 (s, 3H), 3.40 (d, *J* = 8.6 Hz, 1H), 1.21 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ = 187.7, 174.8, 159.8, 143.2, 135.4, 133.6, 129.6, 128.5, 127.8, 127.5, 124.3,

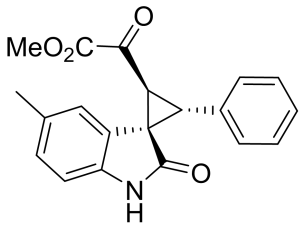
122.4, 107.9, 52.6, 40.6, 37.8, 35.5, 18.1. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+H^+$) = 336.1230, found 336.1230.

Methyl
(1*R*,2*S*,3*R*)-2-(4'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



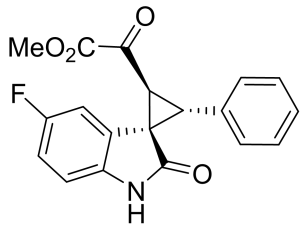
Prepared according to the general procedure. The compound of **3ca** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 76% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+H^+$) = 340.0980, found 340.0981.

Methyl
(1*R*,2*S*,3*R*)-2-(5'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



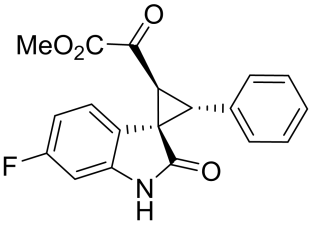
Prepared according to the general procedure. The compound of **3da** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 96% yield. ^{1}H NMR (400 MHz, DMSO) δ 10.61 (s, 1H), 7.42 – 7.27 (m, 5H), 6.92 (d, *J* = 7.8 Hz, 1H), 6.76 (d, *J* = 7.8 Hz, 1H), 5.92 (s, 1H), 3.87 (d, *J* = 8.4 Hz, 1H), 3.73 (d, *J* = 8.4 Hz, 3H), 3.58 (d, *J* = 8.4 Hz, 1H), 1.97 (s, 3H). ^{13}C NMR (101 MHz, DMSO) δ = 186.5, 174.0, 159.8, 140.0, 130.0, 129.5, 129.4, 128.3, 127.8, 127.6, 125.7, 121.7, 109.3, 52.7, 40.1, 38.5, 36.7, 20.6. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+H^+$) = 336.1230, found 336.1234.

Methyl
(1*R*,2*S*,3*R*)-2-(5'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



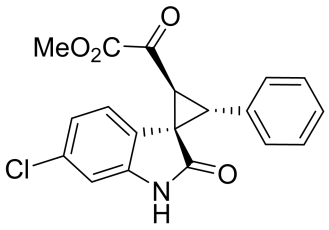
Prepared according to the general procedure. The compound of **3ea** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 96% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+H^+$) = 340.0980, found 340.0980.

Methyl
(1*R*,2*S*,3*R*)-2-(6'-fluoro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



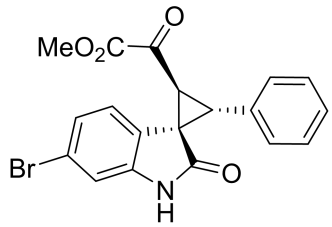
Prepared according to the general procedure. The compound of **3ga** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 91% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+H^+$) = 340.0980, found 340.0985.

Methyl
(1*R*,2*S*,3*R*)-2-(-6'-chloro-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



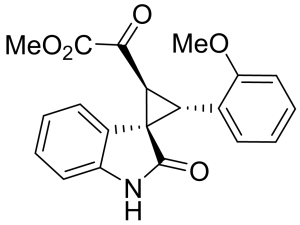
Prepared according to the general procedure. The compound of **3ha** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 98% yield. ^{1}H NMR (400 MHz, DMSO-d_6) δ = 10.89 (s, 1H), 7.40 -7.25 (m, 5H), 6.91 – 6.85 (m, 1H), 6.75 (d, J = 8.1, 1H), 6.07 (d, J = 8.1 Hz, 1H), 3.98 (d, J = 8.4 Hz, 1H), 3.73 (s, 3H), 3.62 (d, J = 8.4 Hz, 1H). ^{13}C NMR (101 MHz, DMSO-d_6) δ = 186.1, 173.9, 159.8, 143.8, 132.7, 132.0, 129.5, 128.5, 127.8, 124.6, 122.2, 120.5, 109.7, 52.8, 39.8, 38.7, 37.0.HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ (M+H$^+$) = 356.0684, found 356.0682; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ (M+H$^+$) = 358.0655, found 358.0649.

Methyl (1*R*,2*S*,3*R*)-2-(-6'-bromo-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



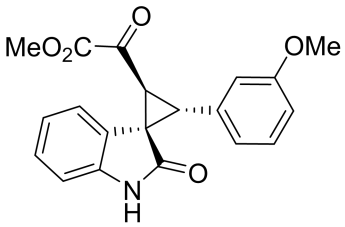
Prepared according to the general procedure. The compound of **3ia** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 83% yield. ^{1}H NMR (400 MHz, DMSO-d_6) δ 10.88 (s, 1H), 7.38 – 7.26 (m, 5H), 7.03 (s, 1H), 6.92 – 6.84 (m, 1H), 6.02 (d, J = 8.4 Hz, 1H), 3.98 (d, J = 8.4 Hz, 1H), 3.73 (s, 3H), 3.62 (d, J = 8.5 Hz, 1H). ^{13}C NMR (101 MHz, DMSO-d_6) δ 186.1, 173.8, 159.8, 144.0, 132.7, 129.5, 128.5, 127.8, 125.0, 123.4, 122.5, 120.2, 112.5, 52.8, 39.8, 38.7, 37.0. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{79}BrNO_4$ (M+H$^+$) = 400.0179, found 400.0184; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{81}BrNO_4$ (M+H$^+$) = 402.0159, found 402.0163.

Methyl (1*R*,2*S*,3*R*)-2-(2-(2-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



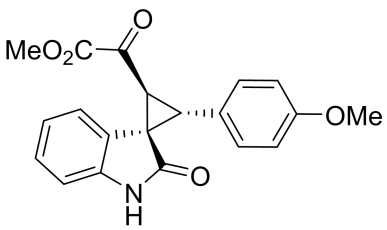
Prepared according to the general procedure. The compound of **3ah** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 71% yield. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ (M+H$^+$) = 352.1179, found 352.1182.

Methyl (1*R*,2*S*,3*R*)-2-(2-(3-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



Prepared according to the general procedure. The compound of **3ai** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 98% yield. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ (M+H$^+$) = 352.1179, found 352.1176.

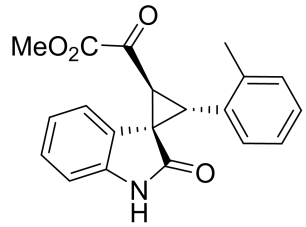
Methyl



(1*R*,2*S*,3*R*)-2-(2-(4-methoxyphenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate: Prepared according to the general procedure. The compound of **3aj** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 96% yield. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_5$ (M+H$^+$) =

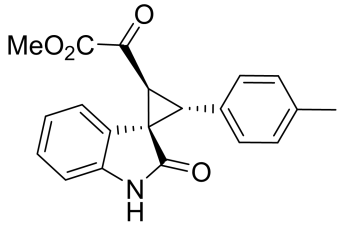
352.1179, found 352.1176.

Methyl (1*R*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-o-tolylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



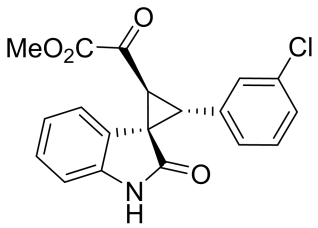
Prepared according to the general procedure. The compound of **3ak** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 76% yield. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+H^+$) = 336.1230, found 336.1233.

Methyl (1*R*,2*S*,3*R*)-2-oxo-2-(2'-oxo-2-p-tolylspiro[cyclopropane-1,3'-indoline]-3-yl)acetate:



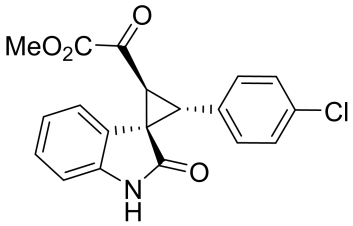
Prepared according to the general procedure. The compound of **3al** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 93% yield. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+H^+$) = 336.1230, found 336.1230.

Methyl (1*R*,2*S*,3*R*)-2-(-2-(3-chlorophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



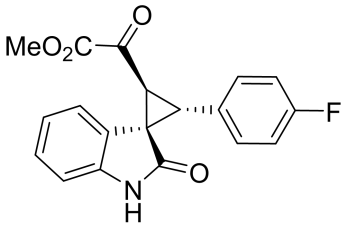
The compound of **3am** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 76% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+H^+$) = 356.0684, found 356.0684; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+H^+$) = 358.0655, found 358.0651.

Methyl (1*R*,2*S*,3*R*)-2-(2-(4-chlorophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate: The



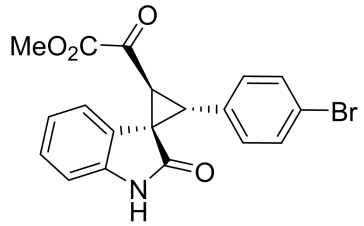
compound of **3an** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 76% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{35}ClNO_4$ ($M+H^+$) = 356.0684, found 356.0682; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{37}ClNO_4$ ($M+H^+$) = 358.0655, found 358.0648.

Methyl



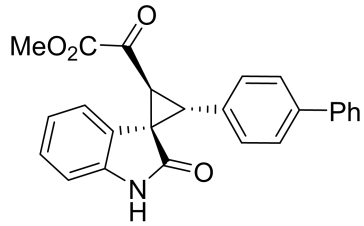
(1*R*,2*S*,3*R*)-2-(2-(4-fluorophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate: The compound of **3av** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 96% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}FNO_4$ ($M+H^+$) = 340.0980, found 340.0978.

Methyl
(1*R*,2*S*,3*R*)-2-(2-(4-bromophenyl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



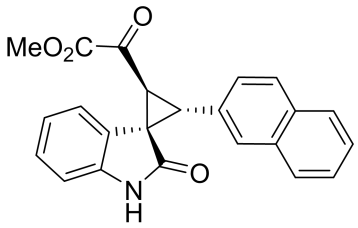
Prepared according to the general procedure. The compound of **3ap** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 83% yield. HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{79}BrNO_4$ ($M+H^+$) = 400.0179, found 400.0179; HRMS (ESI-TOF) calcd for $C_{19}H_{14}{}^{81}BrNO_4$ ($M+H^+$) = 402.0159, found 402.0158.

Methyl
(1*R*,2*S*,3*R*)-2-(2-(biphenyl-4-yl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:



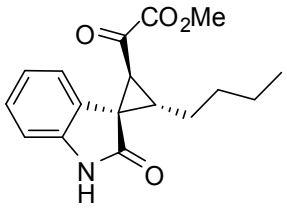
Prepared according to the general procedure. The compound of **3aq** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 96% yield. HRMS (ESI-TOF) calcd for $C_{25}H_{19}NO_4$ ($M+H^+$) = 398.1387, found 398.1392.

Methyl
(1*R*,2*S*,3*R*)-2-(2-(naphthalen-2-yl)-2'-oxospiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetate:

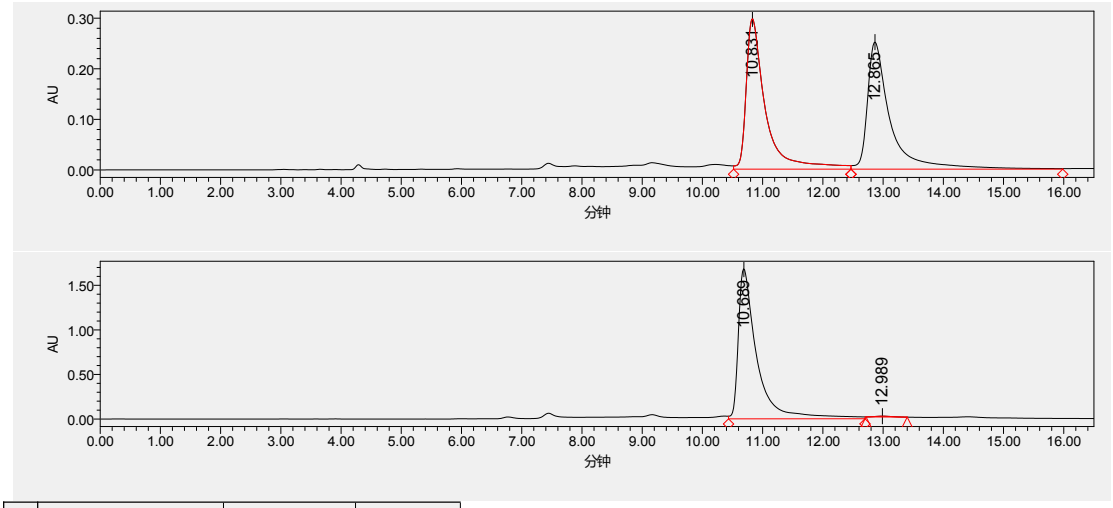


Prepared according to the general procedure. The compound of **3ar** was purified by silica gel chromatography (petroleum ether: EA = 1:1) in 91% yield. HRMS (ESI-TOF) calcd for $C_{23}H_{17}NO_4$ ($M+H^+$) = 372.1230, found 372.1232.

Methyl (1*R*,2*S*,3*R*)3-butyl-2'-oxo-3H-spiro[furan-2,3'-indoline]-5-carboxylate:

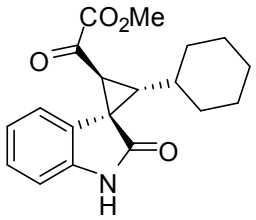


Prepared according to the general procedure. The compound of **3at** was purified by silica gel chromatography (petroleum ether: EA = 1:1) to afford a light yellow oil in 99% yield. HPLC (chiralcel IB, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.69 min, t_r(minor) = 12.99 min, *ee* = 99%, dr > 99:1. $[\alpha]^{12.5}{}_D$ = 124.4 (c = 0.62, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.82 (s, 1H), 7.26 – 7.18 (m, 2H), 7.04 – 6.96 (m, 1H), 6.94 (d, *J* = 7.7 Hz, 1H), 3.82 (s, 3H), 3.75 (d, *J* = 8.0 Hz, 1H), 2.68 (q, *J* = 7.5 Hz, 1H), 2.08 – 1.96 (m, 2H), 1.38 – 1.25 (m, 4H), 0.86 (t, *J* = 6.9 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.7, 174.8, 160.4, 140.7, 127.8, 126.0, 122.8, 122.4, 110.0, 53.3, 43.0, 42.9, 38.1, 31.3, 24.4, 22.1, 14.0. HRMS (ESI-TOF) calcd for $C_{17}H_{19}NO_4$ ($M+H^+$) = 324.1212, found 324.1219.

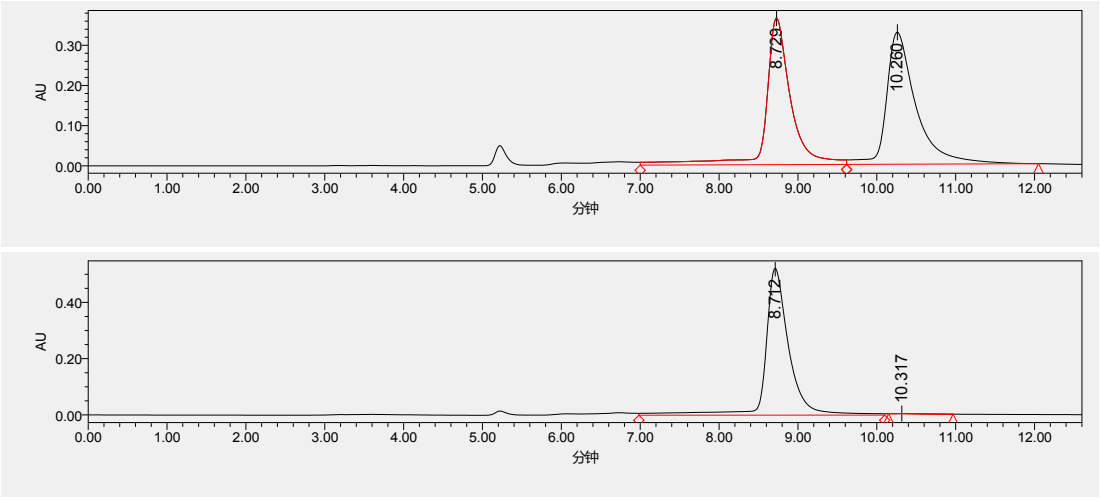


	Retention time	Area	% Area
1	10.689	36241524	99.51
2	12.989	176745	0.49

Methyl (1*R*,2*S*,3*R*)3-cyclohexyl-2'-oxo-3H-spiro[furan-2,3'-indoline]-5-carboxylate:

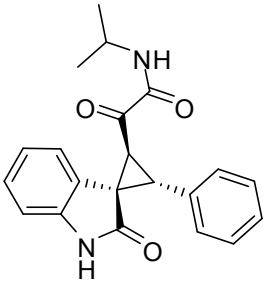


Prepared according to the general procedure. The compound of **3au** was purified by silica gel chromatography (petroleum ether: EA = 1:1) to afford colorless oil in 99% yield. HPLC (chiralcel ID, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 8.71 min, t_r(minor) = 10.32 min, *ee* = 99%, dr > 99:1. $[\alpha]^{11.9}_D$ = 158.8 (c = 0.41, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.86 (s, 1H), 7.24 (s, 1H), 7.11 – 7.03 (m, 2H), 6.98 (d, *J* = 7.8 Hz, 1H), 3.78 (s, 3H), 3.01 (d, *J* = 8.4 Hz, 1H), 2.62 – 2.51 (m, 1H), 1.99 – 1.90 (m, 1H), 1.88 – 1.81 (m, 1H), 1.65 – 1.48 (m, 3H), 1.41 – 1.19 (m, 4H), 1.10 – 0.95 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.0, 175.6, 160.9, 141.3, 127.9, 126.3, 122.2, 121.0, 110.5, 53.0, 41.5, 41.3, 40.0, 36.3, 32.5, 31.9, 26.0, 25.9, 25.5. HRMS (ESI-TOF) calcd for $C_{19}H_{22}NO_4$ ($M+H^+$) = 328.1549, found 328.1546.

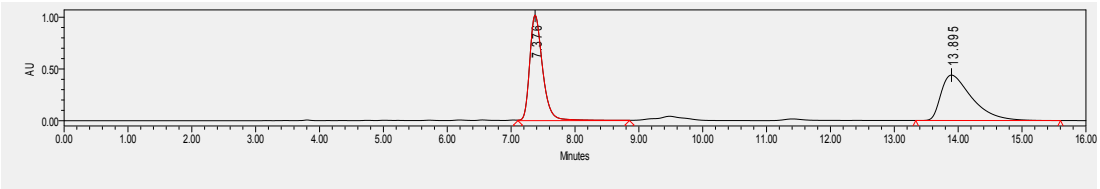


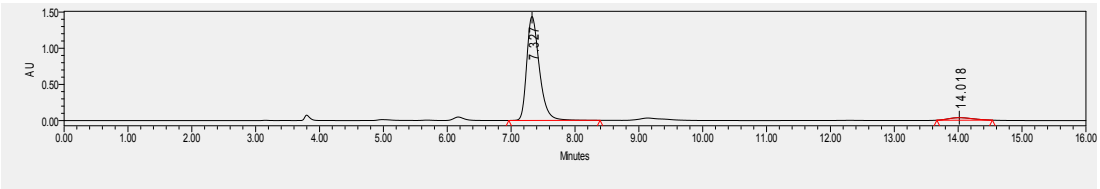
	Retention Time	Area	% Area
1	8.712	10803175	99.86
2	10.317	15507	0.14

1'-isopropyl (1*R*,2*S*,3*R*)-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



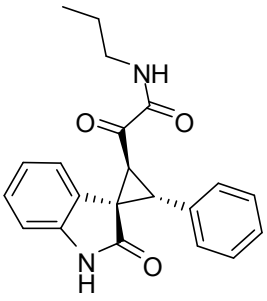
Prepared according to the general procedure. The compound of **4aa** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow oil in 68% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.33 min, t_r(minor) = 14.03 min, *ee* = 91%, dr > 99:1. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.50 (s, 1H), 7.35 – 7.28 (m, 3H), 7.24 – 7.18 (m, 2H), 7.15 – 7.06 (m, 1H), 6.96 – 6.87 (m, 2H), 6.73 – 6.66 (m, 1H), 6.07 (d, *J* = 7.5 Hz, 1H), 4.07 – 3.96 (m, 2H), 3.94 (d, *J* = 8.6 Hz, 1H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.4, 159.0, 141.0, 133.0, 129.8, 128.6, 127.9, 127.7, 125.7, 121.9, 121.7, 109.9, 41.9, 40.8, 38.5, 37.8, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{20}N_2O_3$ ($M+H^+$) = 349.1552, found 349.1554.



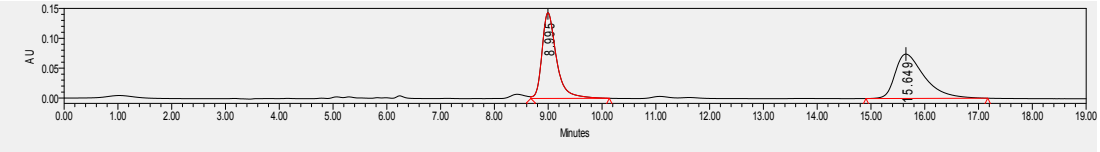


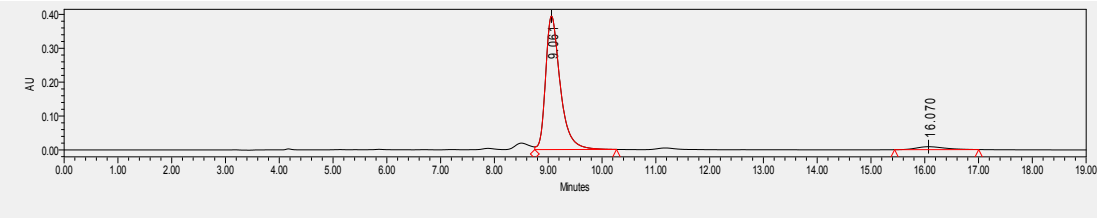
	Retention Time	Area	% Area
1	7.327	19650794	95.59
2	14.018	906620	4.41

3'-phenyl (1*R*,2*S*,3*R*)-1'-propylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



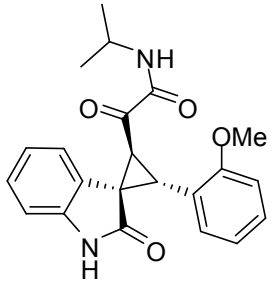
Prepared according to the general procedure. The compound of **4aa′** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow oil in 71% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.06 min, t_r(minor) = 16.07 min, *ee* = 92%, dr > 99:1. $[\alpha]^{28.6}_D$ = 236.5 (c = 0.36, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.56 (s, 1H), 7.36 – 7.27 (m, 3H), 7.24 – 7.18 (m, 2H), 7.14 – 7.06 (m, 2H), 6.87 (d, *J* = 7.7 Hz, 1H), 6.68 (td, *J* = 7.6, 0.9 Hz, 1H), 6.07 (d, *J* = 7.6 Hz, 1H), 4.01 (d, *J* = 8.6 Hz, 1H), 3.93 (d, *J* = 8.6 Hz, 1H), 3.36 – 3.12 (m, 2H), 1.62 – 1.54 (m, 2H), 0.92 (t, *J* = 7.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.4, 159.9, 141.1, 133.0, 129.8, 128.6, 128.0, 127.8, 125.7, 121.9, 121.7, 110.0, 41.2, 40.7, 38.6, 37.7, 22.5, 11.3. HRMS (ESI-TOF) calcd for $C_{21}H_{20}N_2O_3$ ($M+Na^+$) = 371.1372, found 371.1364.



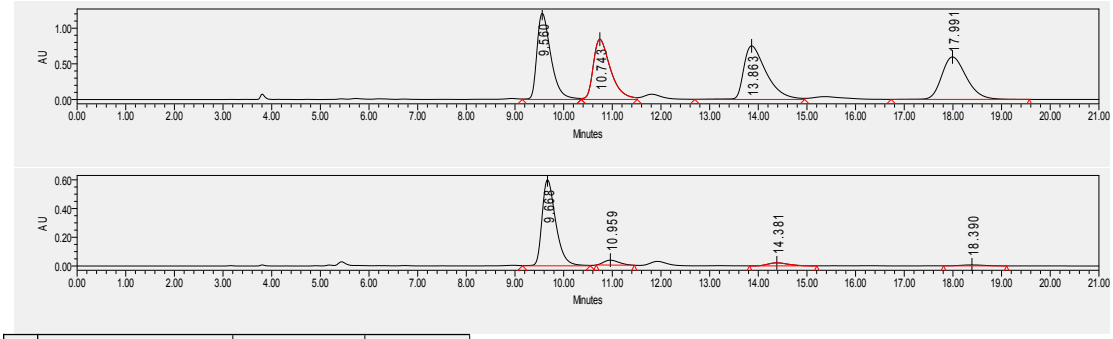


	Retention Time	Area	% Area
1	9.061	7437063	95.87
2	16.070	320587	4.13

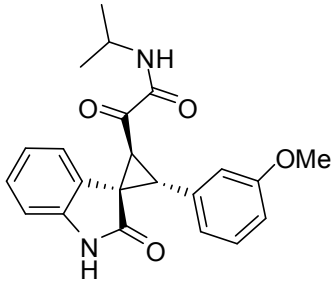
1'-isopropyl (1*R*,2*S*,3*R*)-3'-(2-methoxyphenyl)spiro[indoline-3,2'-piperidine]-2,5',6'-trione:



Prepared according to the general procedure. The compound of **4ah** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford red oil in 59% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.67 min, t_r(minor) = 14.38 min, *ee* = 91%, dr = 94:6. $[\alpha]^{14.1}_D$ = 183.9 (c = 1.36, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.96 (s, 1H), 7.35 – 7.25 (m, 2H), 7.10 – 7.03 (m, 1H), 7.02 – 6.95 (m, 1H), 6.94 – 6.82 (m, 2H), 6.74 – 6.68 (m, 1H), 6.67 – 6.61 (m, 1H), 6.00 (d, *J* = 8.0 Hz, 1H), 4.07 – 3.95 (m, 1H), 3.91 (d, *J* = 8.0 Hz, 1H), 3.81 (d, *J* = 8.0 Hz, 1H), 3.36 (s, 3H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.9, 174.5, 159.1, 158.8, 140.7, 129.8, 129.4, 127.3, 126.6, 122.1, 121.6, 120.6, 120.3, 110.7, 109.3, 55.2, 41.8, 40.4, 38.3, 34.7, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_4$ (M+H$^+$) = 379.1658, found 379.1653.



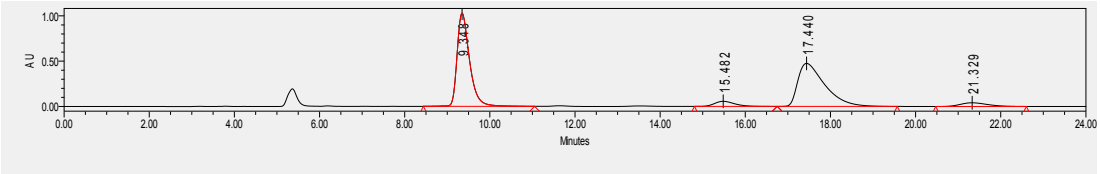
	Retention Time	Area	% Area
1	9.668	11725047	88.03
2	10.959	749804	5.63
3	14.381	618224	4.64
4	18.390	226498	1.70

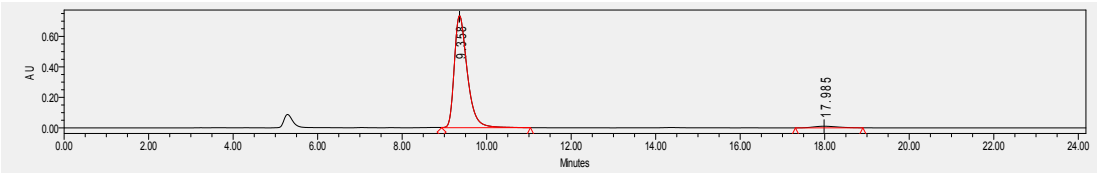


1'-isopropyl (1*R*,2*S*,3*R*)-3'-(3-methoxyphenyl)spiro[indoline-3,2'-piperidine]-2,5',6'-trione:

Prepared according to the general procedure. The compound of **4ai** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford colorless oil in 62% yield. HPLC (chiralcel IE,

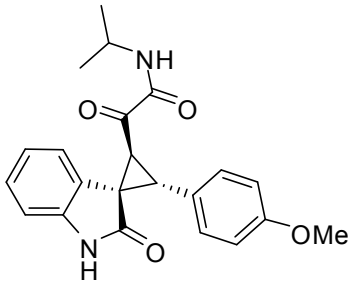
hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.36 min, t_r(minor) = 17.99 min, *ee* = 95%, dr > 99:1. $[\alpha]^{14.4}_D$ = 189.5 (c = 0.26, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.18 (s, 1H), 7.26 – 7.18 (m, 1H), 7.15 – 7.06 (m, 1H), 6.93 – 6.77 (m, 4H), 6.77 – 6.66 (m, 2H), 6.17 (d, *J* = 7.6 Hz, 1H), 4.17 – 3.96 (m, 2H), 3.93 (d, *J* = 8.6 Hz, 1H), 3.74 (s, 3H), 1.25 – 1.13 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.5, 174.1, 159.7, 159.0, 140.9, 134.5, 129.6, 127.8 125.7, 122.0, 122.0, 121.8, 115.3, 113.6, 109.8, 55.3, 41.9, 40.8, 38.5, 37.7, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_4$ ($M+H^+$) = 379.1658, found 379.1652.



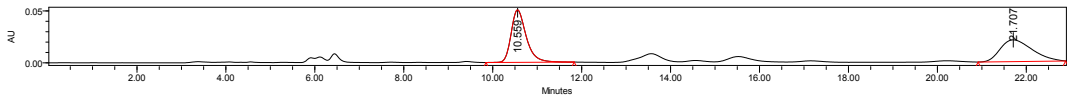


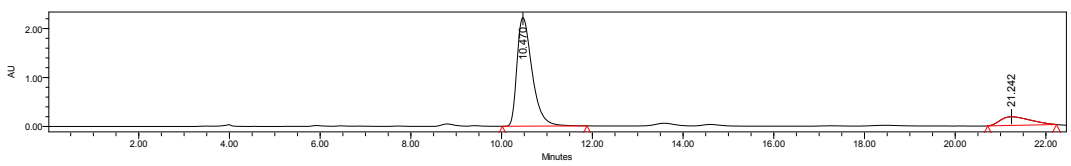
	Retention Time	Area	% Area
1	9.358	15657627	97.44
2	17.985	410938	2.56

1'-isopropyl (1*R*,2*S*,3*R*)-3'-(4-methoxyphenyl)spiro[indoline-3,2'-piperidine]-2,5',6'-trione:



Prepared according to the general procedure. The compound of **4aj** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow oil in 63% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.47 min, t_r(minor) = 21.24 min, *ee* = 72%, dr > 99:1. $[\alpha]^{14.4}_D$ = 136.7 (c = 0.22, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.39 (s, 1H), 7.18 – 7.05 (m, 3H), 6.94 – 6.79 (m, 4H), 6.71 (t, *J* = 7.6 Hz, 1H), 6.11 (d, *J* = 7.6 Hz, 1H), 4.06 – 3.93 (m, 2H), 3.90 (dd, *J* = 8.6, 3.7 Hz, 1H), 3.80 (s, 3H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.7, 174.4, 159.2, 159.0, 141.0, 130.9, 127.7, 125.8, 125.0, 121.9, 121.9, 113.9, 109.8, 55.3, 41.9, 40.9, 38.8, 37.3, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_4$ ($M+Na^+$) = 401.1477, found 401.1476.

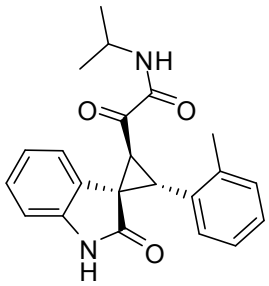




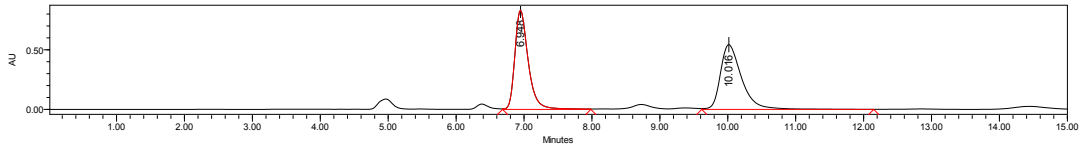
	Retention Time	Area	% Area
1	10.470	51302885	86.29

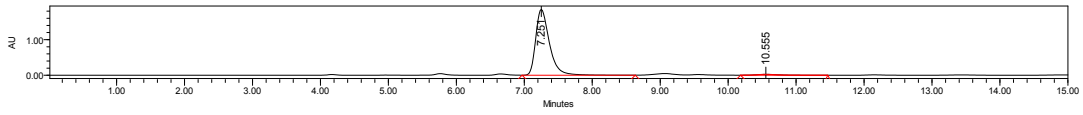
2	21.242	8148746	13.71

1'-isopropyl (1*R*,2*S*,3*R*)-3'-o-tolylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

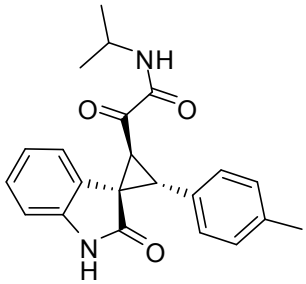


repared according to the general procedure. The compound of **4ak** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow oil in 47% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.25 min, t_r(minor) = 10.56 min, *ee* = 96%, dr > 99:1. $[\alpha]^{14.1}_D$ = 180.0 (c = 0.87, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.84 (s, 1H), 7.39 – 7.33 (m, 1H), 7.26 – 7.18 (m, 2H), 7.10 – 7.03 (m, 2H), 6.94 (d, *J* = 8.1 Hz, 1H), 6.86 (d, *J* = 7.7 Hz, 1H), 6.64 (t, *J* = 7.6 Hz, 1H), 5.99 (d, *J* = 7.5 Hz, 1H), 4.10 – 3.96 (m, 2H), 3.85 (d, *J* = 8.6 Hz, 1H), 1.85 (s, 3H), 1.24 – 1.13 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.7, 174.5, 159.0, 140.9, 138.9, 131.8, 130.1, 128.7, 128.2, 127.8, 126.0, 125.7, 121.9, 120.9, 110.0, 41.9, 40.7, 38.4, 37.2, 22.3, 22.3, 19.2. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_3$ ($M+H^+$) = 363.1709, found 363.1703.

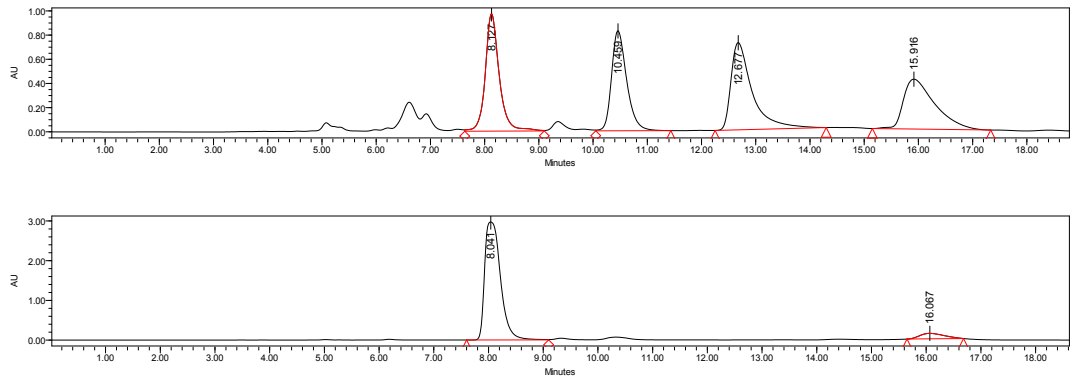




	Retention Time	Area	% Area
1	7.251	26008087	97.95
2	10.555	543636	2.05



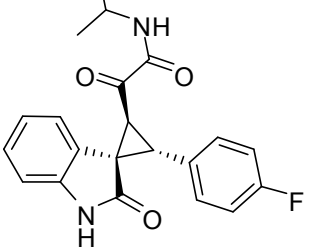
1'-isopropyl (1*R*,2*S*,3*R*)-3'-p-tolylspiro[indoline-3,2'-piperidine]-2,5',6'-trione: Prepared according to the general procedure. The compound of **4al** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 60% yield. Mp. 172.0 – 174.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 8.04 min, t_r(minor) = 16.07 min, *ee* = 87%, dr > 99:1. $[\alpha]^{14.9}_D$ = 169.0 (c = 0.43, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.39 (s, 1H), 7.15 – 7.05 (m, 5H), 6.95 – 6.85 (m, 2H), 6.75 – 6.65 (m, 1H), 6.11 (d, *J* = 7.5 Hz, 1H), 4.07 – 3.95 (m, 2H), 3.92 (dd, *J* = 8.6, 3.5 Hz, 1H), 2.34 (d, *J* = 6.0 Hz, 3H), 1.20 (d, *J* = 6.5 Hz, 3H), 1.16 (d, *J* = 6.7 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.7, 174.4, 159.0, 141.0, 137.7, 129.9, 129.6, 129.3, 127.7, 125.8, 121.9, 121.8, 109.8 , 41.9, 40.9, 38.6, 37.7, 22.3, 22.3, 21.2. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_3$ ($M+H^+$) = 385.1258, found 385.1527.

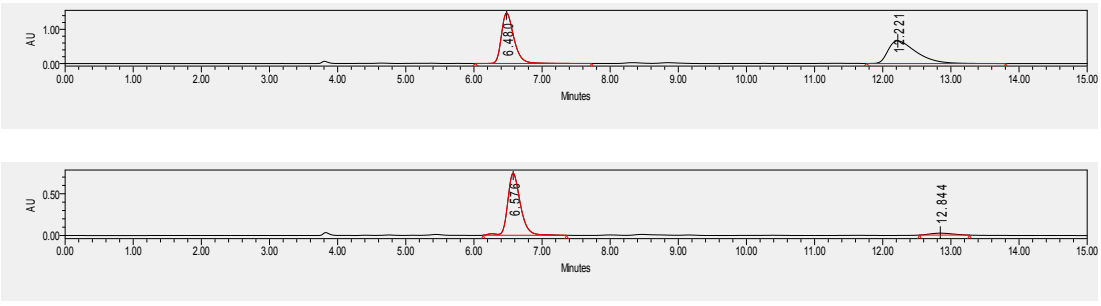


	Retention Time	Area	% Area
1	8.041	59605466	93.27
2	16.067	4302187	6.73

(1*R*,2*S*,3*R*)-3'-(4-fluorophenyl)-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

Prepared according to the general procedure. The compound of **4av** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford colorless oil in 46% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 6.576 min, t_r(minor) = 12.844 min, *ee* = 90%, dr > 99:1. $[\alpha]^{14.4}_D$ = 157.7 (c = 0.26, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.35 (s, 1H), 7.22 – 7.15 (m, 2H), 7.15 – 7.09 (m, 1H), 7.05 – 6.96 (m, 2H), 6.92 – 6.85 (m, 2H), 6.76 – 6.67 (m, 1H), 6.06 (d, *J* = 7.6 Hz, 1H), 4.10 – 3.91 (m, 2H), 3.90 – 3.82 (m, 1H), 1.25 – 1.12 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.5, 174.2, 162.3 (d, *J* = 243.6 Hz), 158.9, 141.0, 131.5 (d, *J* = 8.2 Hz), 128.9 (d, *J* = 3.3 Hz), 127.8, 125.5, 122.0, 121.7, 115.7, 115.5, 110.0, 41.9, 40.6, 38.75, 37.0, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}FN_2O_3$ ($M+H^+$) = 389.1277, found 389.1272.

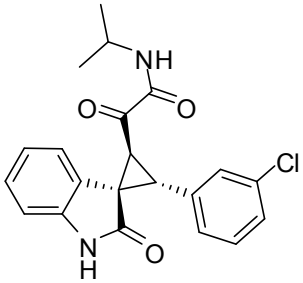




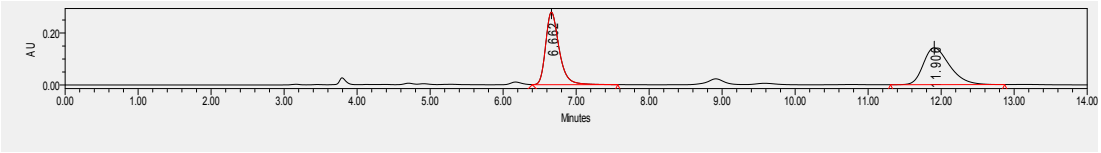
	Retention Time	Area	% Area
1	6.576	9588612	94.76
2	12.844	529960	5.24

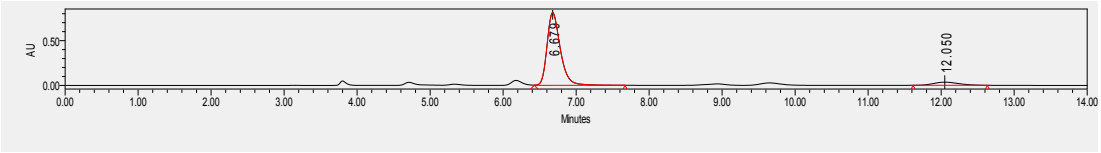
(1*R*,2*S*,3*R*)-3'-(3-chlorophenyl)-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione：

Prepared according to the general procedure. The compound of **4am** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford colorless oil in 50% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 6.68 min, t_r(minor) =



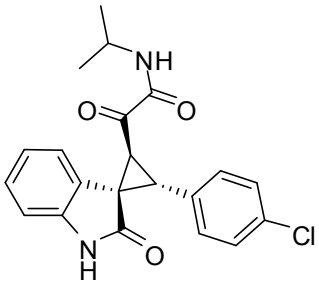
12.05 min, *ee* = 85%, dr > 99:1. $[\alpha]^{13.5}_D$ = 144.4 (c = 0.47, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.45 (d, *J* = 14.1 Hz, 1H), 7.28 – 7.24 (m, 3H), 7.17 – 7.02 (m, 2H), 6.95 – 6.85 (m, 2H), 6.78 – 6.69 (m, 1H), 6.11 (d, *J* = 7.6 Hz, 1H), 4.01 (dd, *J* = 14.3, 6.8 Hz, 1H), 3.96 (d, *J* = 8.5 Hz, 1H), 3.90 (t, *J* = 6.8 Hz, 1H), 1.22 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.3, 174.0, 158.9, 141.1, 135.2, 134.5, 129.9, 129.8, 128.3, 128.1, 128.0, 125.2, 122.1, 121.7, 110.1, 41.9, 40.6, 38.3, 37.0, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{35}ClN_2O_3$ ($M+H^+$) = 383.1162, found 383.1154; HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{37}ClN_2O_3$ ($M+H^+$) = 385.1133, found 385.1129.



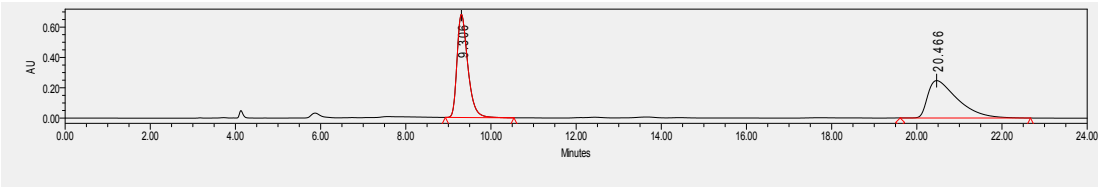


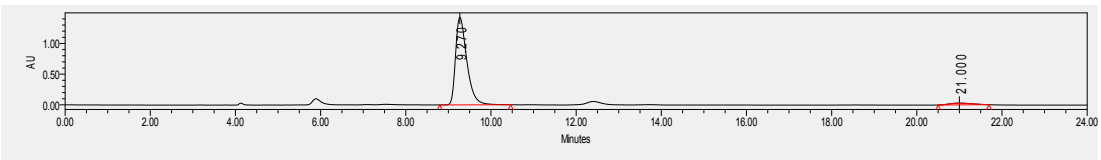
	Retention Time	Area	% Area
1	6.679	10183774	92.42
2	12.050	835828	7.58

(1*R*,2*S*,3*R*)-3'-(4-chlorophenyl)-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



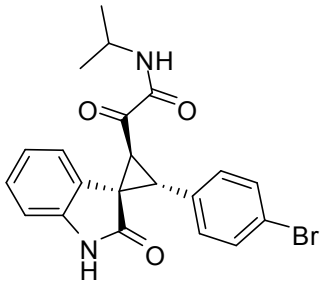
Prepared according to the general procedure. The compound of **4an** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 44% yield. Mp. 108.0 – 110.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.27 min, t_r(minor) = 21.00 min, *ee* = 93%, dr > 99:1. $[\alpha]^{14.0}_D$ = 192.8 (c = 0.77, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.80 (s, 1H), 7.29 (s, 2H), 7.20 – 7.06 (m, 3H), 6.97 – 6.85 (m, 2H), 6.76 – 6.89 (m, 1H), 6.08 (d, *J* = 7.5 Hz, 1H), 4.00 (m, 1H), 3.94 (d, *J* = 8.5 Hz, 1H), 3.87 (d, *J* = 8.6 Hz, 1H), 1.24 – 1.14 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.4, 174.3, 159.0, 141.2, 133.9, 131.7, 131.1, 128.8, 128.0, 125.3, 122.0, 121.7, 110.2, 42.0, 40.6, 38.5, 37.0, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{35}ClN_2O_3$ ($M+Na^+$) = 405.0982, found 405.0980; calcd for $C_{21}H_{19}{}^{37}ClN_2O_3$ ($M+Na^+$) = 407.0952, found 407.0966.



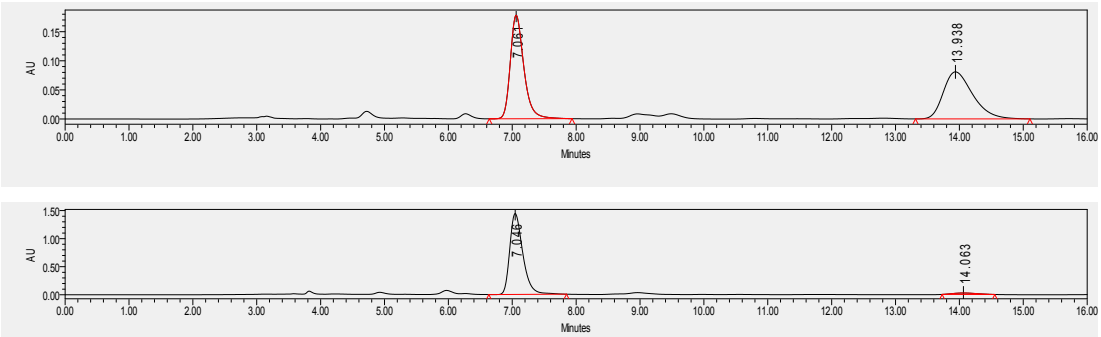


	Retention Time	Area	% Area
1	9.270	26209774	96.21
2	21.000	1033455	3.79

(1*R*,2*S*,3*R*)-3'-(4-bromophenyl)-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

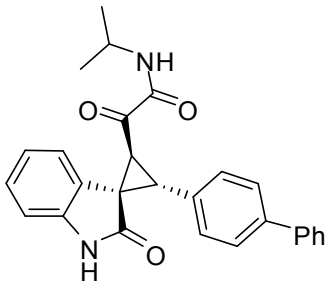


Prepared according to the general procedure. The compound of **4ap** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 42% yield. Mp. 108.0 – 110.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.05 min, t_r(minor) = 14.06 min, *ee* = 94%, dr > 99:1. $[\alpha]^{14.4}_D$ = 214.9 (c = 0.40, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.58 (s, 1H), 7.48 – 7.42 (m, 2H), 7.18 – 7.01 (m, 3H), 6.95 – 6.86 (m, 2H), 6.76 – 6.70 (m, 1H), 6.08 (d, *J* = 7.5 Hz, 1H), 4.06 – 3.95 (m, 1H), 3.91 (d, *J* = 8.4 Hz, 1H), 3.86 (d, *J* = 8.4 Hz, 1H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.4, 174.2, 158.9, 141.1, 132.2, 131.8, 131.5, 128.0, 125.3, 122.1, 122.1, 121.7, 110.1, 41.9, 40.5, 38.5, 37.0, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{79}BrN_2O_3$ (M+Na$^+$) = 449.0477, found 405.0486; calcd for $C_{21}H_{19}{}^{81}BrN_2O_3$ (M+Na$^+$) = 451.0456, found 451.0459.

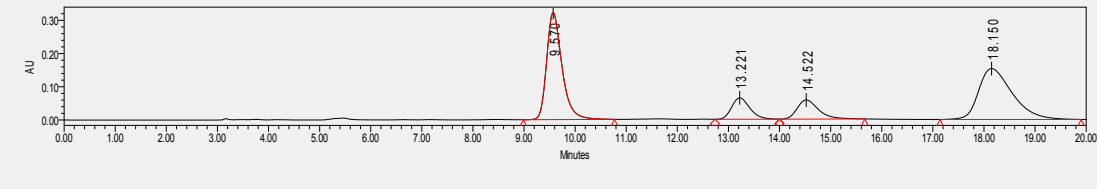


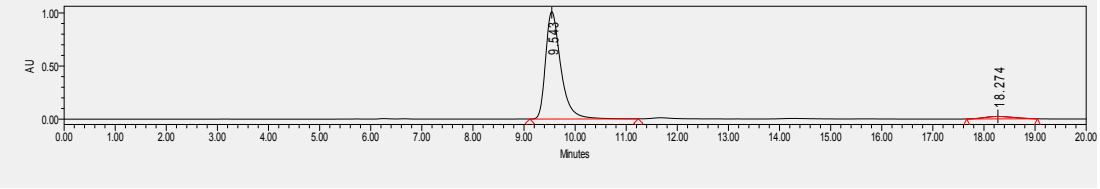
	Retention Time	Area	% Area
1	7.046	20562028	96.84
2	14.063	670147	3.16

(1*R*,2*S*,3*R*)-3'-(biphenyl-4-yl)-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



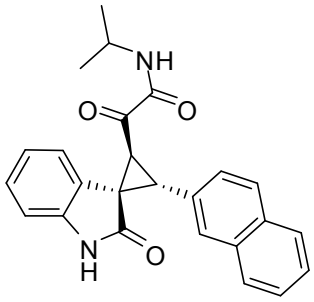
Prepared according to the general procedure. The compound of **4aq** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford yellow solid in 51% yield. Mp. 120.0 – 122.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.54 min, t_r(minor) = 18.27 min, *ee* = 92%, dr > 99:1. $[\alpha]^{13.4}_D$ = 259.2 (c = 0.37, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.56 (s, 1H), 7.63 – 7.53 (m, 4H), 7.47 – 7.40 (m, 2H), 7.37 – 7.31 (t, *J* = 7.3 Hz, 1H), 7.31 – 7.24 (m, 2H), 7.14 – 7.08 (m, 1H), 6.96 – 6.86 (m, 2H), 6.70 (t, *J* = 7.6 Hz, 1H), 6.17 (d, *J* = 7.6 Hz, 1H), 4.09 – 3.95 (m, 3H), 1.24 – 1.16 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.4, 159.0, 141.1, 140.7, 140.3, 132.1, 130.2, 128.8, 127.8, 127.5, 127.2, 127.0, 125.7, 122.0, 121.8, 110.0, 41.9, 40.9, 38.6, 37.6, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{27}H_{24}N_2O_3$ (M+Na$^+$) = 447.1685, found 447.1688.



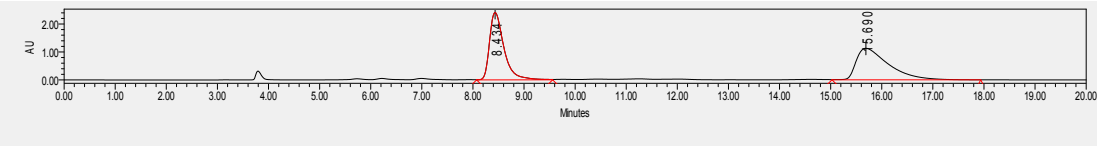


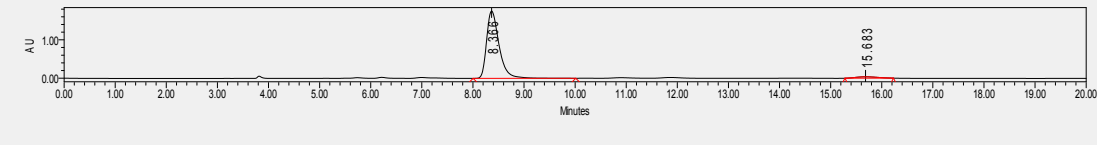
	Retention Time	Area	% Area
1	9.543	20935396	95.90
2	18.274	894005	4.10

1'-isopropyl (1*R*,2*S*,3*R*)-3'-(naphthalen-2-yl)spiro[indoline-3,2'-piperidine]-2,5',6'-trione:



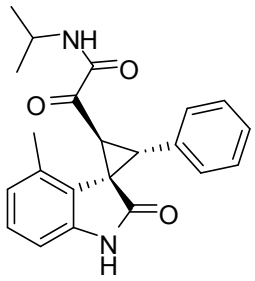
Prepared according to the general procedure. The compound of **4ar** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 56% yield. Mp. 115.0 – 117.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 8.37 min, t_r(minor) = 15.68 min, *ee* = 93%, dr > 99:1. $[\alpha]^{14.1}_D$ = 264.7 (c = 0.27, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.27 (s, 1H), 7.87 – 7.76 (m, 3H), 7.74 (d, *J* = 8.5 Hz, 1H), 7.54 – 7.45 (m, 2H), 7.22 (d, *J* = 8.4 Hz, 1H), 7.06 (t, *J* = 7.6 Hz, 1H), 6.96 – 6.85 (m, 2H), 6.65 – 6.55 (m, 1H), 6.06 (d, *J* = 7.6 Hz, 1H), 4.17 (d, *J* = 8.6 Hz, 1H), 4.09 (d, *J* = 8.6 Hz, 1H), 4.04 (m, 1H), 1.25 – 1.17 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.2, 159.0, 140.9, 133.2, 132.9, 132.9, 130.7, 128.4, 128.4, 127.9, 127.8, 127.7, 126.4, 126.3, 125.6, 122.1, 121.7, 109.9, 41.9, 40.9, 38.6, 38.0, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{25}H_{22}N_2O_3$ (M+Na$^+$) = 421.1528, found 421.1527.



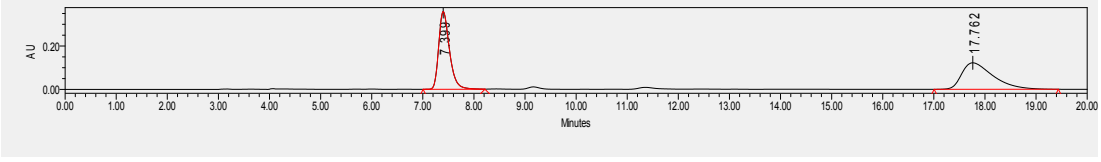


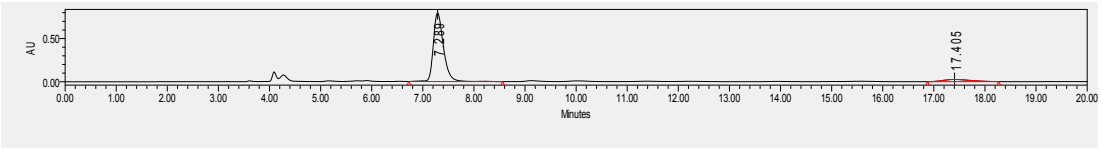
	Retention Time	Area	% Area
1	8.366	29749442	96.54
2	15.683	1066202	3.46

N-isopropyl (1*R*,2*S*,3*R*)-2-(-4'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indoline]-3-yl)-2-oxoacetamide: Prepared according to the general procedure. The compound of **4ba** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white oil in 43% yield. HPLC (chiralcel IE,



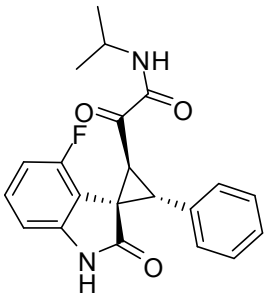
hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.29 min, t_r(minor) = 17.41 min, *ee* = 86%, dr > 99:1. $[\alpha]^{13.7}_D$ = 103.2 (c = 0.22, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.03 (s, 1H), 7.26 – 7.18 (m, 5H), 7.05 (t, *J* = 7.8 Hz, 1H), 6.85 (d, *J* = 7.9 Hz, 1H), 6.77 (d, *J* = 7.7 Hz, 1H), 6.58 (d, *J* = 7.8 Hz, 1H), 4.17 (d, *J* = 8.8 Hz, 1H), 4.10 – 3.96 (m, 1H), 3.80 (d, *J* = 8.8 Hz, 1H), 1.34 (s, 3H), 1.24 – 1.16 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 192.3, 175.0, 159.3, 141.6, 135.3, 134.8, 129.7, 128.6, 127.9, 127.7, 125.6, 122.4, 108.0, 41.8, 41.1, 38.8, 35.1, 22.4, 22.3, 18.7. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_3$ (M+Na^+) = 385.1528, found 385.1535.



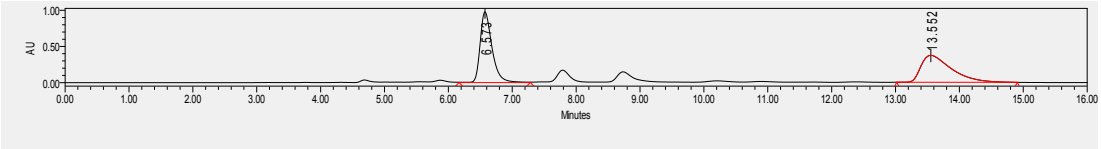


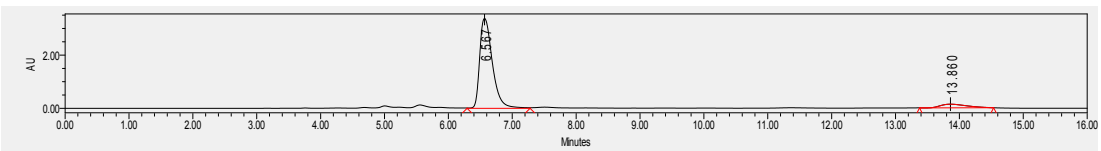
	Retention Time	Area	% Area
1	7.289	10959386	92.25
2	17.405	920811	7.75

(1*R*,2*S*,3*R*)-4-fluoro-1'-isopropyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



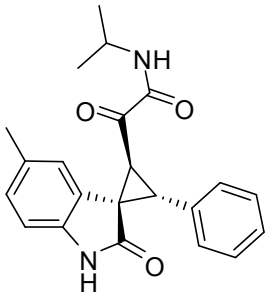
Prepared according to the general procedure. The compound of **4ca** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 49% yield. Mp. 118.0 – 120.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 6.57 min, t_r(minor) = 13.86 min, *ee* = 86%, dr > 99:1. $[\alpha]^{14.4}_D$ = 137.2 (c = 0.24, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.45 (s, 1H), 7.32 – 7.26 (m, 2H), 7.25 – 7.17 (m, 2H), 7.13 – 7.02 (m, 1H), 6.89 (d, *J* = 8.0 Hz, 1H), 6.71 (t, *J* = 8.2 Hz, 1H), 6.49 – 6.39 (m, 1H), 4.25 (t, *J* = 8.5 Hz, 1H), 4.08 – 3.95 (m, 1H), 3.88 (t, *J* = 7.0 Hz, 1H), 1.25 – 1.17 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 191.4, 174.2, 158.9, 157.5 (d, *J* = 247.8 Hz), 143.09 (d, *J* = 8.4 Hz), 134.5, 129.5 (d, *J* = 8.7 Hz), 129.3, 128.3, 127.8, 111.7 (d, *J* = 17.7 Hz), 110.0 (d, *J* = 21.0 Hz), 106.3 (d, *J* = 2.8 Hz), 41.9, 40.3, 38.3, 35.9, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}FN_2O_3$ (M+H^+) = 367.1458, found 367.1466.



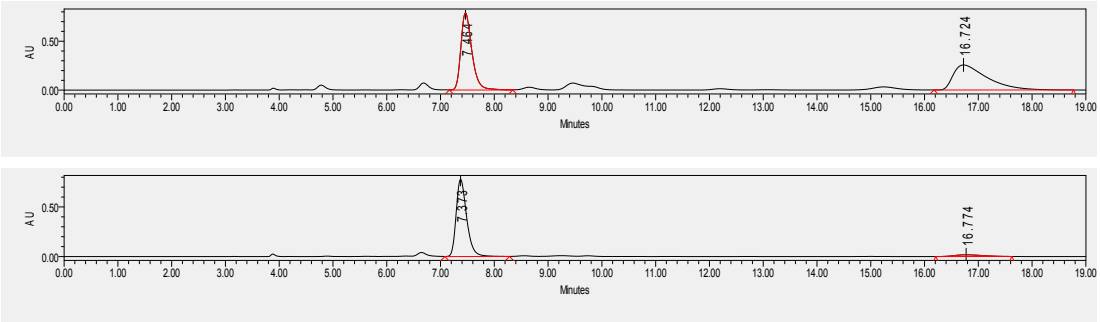


	Retention Time	Area	% Area
1	6.567	46541977	92.25
2	13.860	3909245	7.75

(1*R*,2*S*,3*R*)-1'-isopropyl-5-methyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

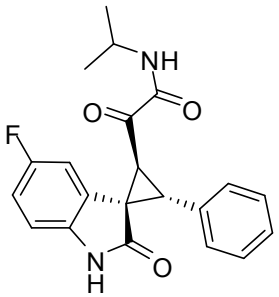


Prepared according to the general procedure. The compound of **4da** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 64% yield. Mp. 178.0 – 180.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.37 min, t_r(minor) = 16.77 min, *ee* = 89%, dr > 99:1. $[\alpha]^{13.1}_D$ = 194.9 (c = 0.39, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.39 (s, 1H), 7.36 – 7.28 (m, 3H), 7.24 – 7.17 (m, 2H), 6.93 – 6.85 (m, 2H), 6.76 (d, *J* = 7.9 Hz, 1H), 6.76 (d, *J* = 7.9 Hz, 1H), 5.86 (s, 1H), 4.06 – 3.95 (m, 2H), 3.91 (d, *J* = 8.6 Hz, 1H), 2.01 (s, 3H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.4, 159.0, 138.6, 133.1, 131.3, 129.8, 128.5, 128.1, 127.9, 125.7, 122.6, 109.6, 41.9, 40.9, 38.5, 37.7, 22.3, 22.3, 21.0. HRMS (ESI-TOF) calcd for $C_{22}H_{22}N_2O_3$ ($M+H^+$) = 363.1709, found 363.1704.

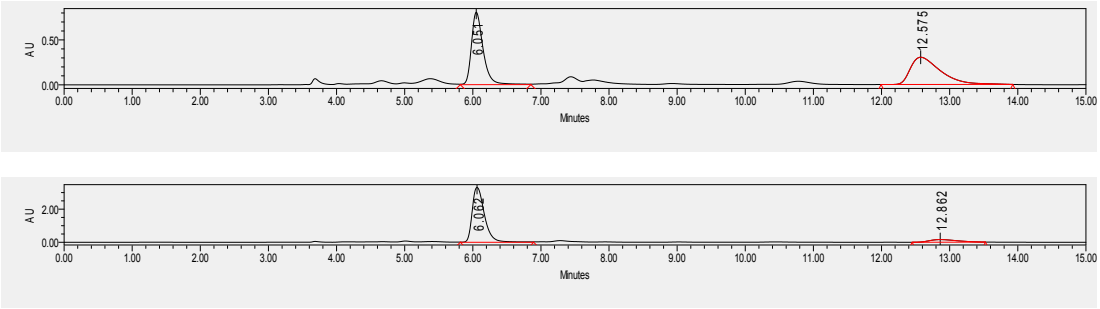


	Retention Time	Area	% Area
1	7.373	10583683	94.41
2	16.774	626430	5.59

(1*R*,2*S*,3*R*)-5-fluoro-1'-isopropyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

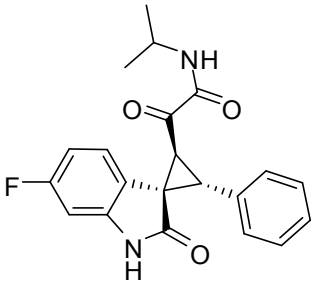


Prepared according to the general procedure. The compound of **4ea** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow solid in 58% yield. Mp. 190.0 – 192.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 6.06 min, t_r(minor) = 12.86 min, *ee* = 81%, dr > 99:1. $[\alpha]^{13.7}_D$ = 165.6 (c = 0.68, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.54 (s, 1H), 7.38 – 7.30 (m, 3H), 7.25 – 7.15 (m, 2H), 6.90 (d, *J* = 8.1 Hz, 1H), 6.84 – 6.76 (m, 2H), 5.80 (d, *J* = 8.3 Hz, 1H), 4.06 – 3.95 (m, 2H), 3.86 (d, *J* = 8.7 Hz, 1H), 1.25 – 1.13 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.5, 174.4, 158.9, 158.4 (d, *J* = 238.3 Hz), 137.0, 132.5, 129.6, 128.8, 128.3, 127.5 (d, *J* = 9.2 Hz), 114.2 (d, *J* = 23.7 Hz), 110.41 (d, *J* = 8.3 Hz), 109.7 (d, *J* = 25.9 Hz), 42.0, 40.8, 38.7, 37.9, 22.4, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}FN_2O_3$ ($M+H^+$) = 367.1458, found 367.1460.

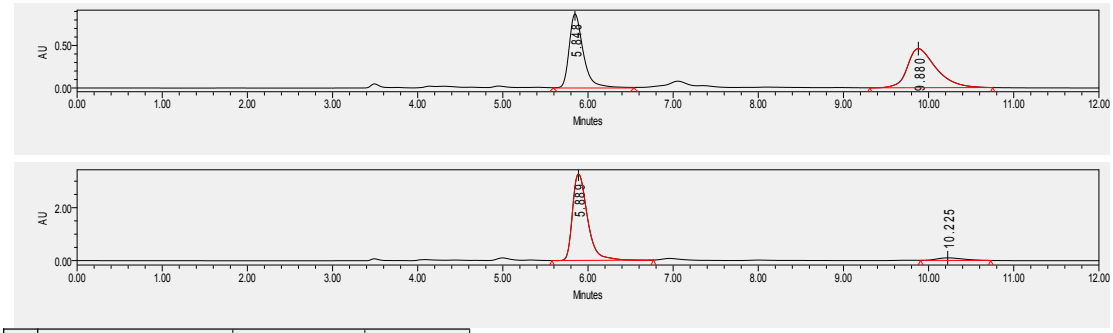


	Retention Time	Area	% Area
1	6.062	41500565	90.47
2	12.862	4370091	9.53

(1*R*,2*S*,3*R*)-6-fluoro-1'-isopropyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



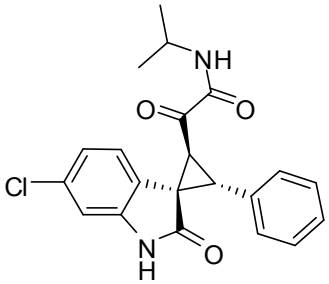
Prepared according to the general procedure. The compound of **4ga** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 58% yield. Mp. 106.0 – 108.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 5.89 min, t_r(minor) = 10.23 min, *ee* = 90%, dr > 99:1. $[\alpha]^{14.7}_D$ = 156.2 (c = 0.68, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.99 (s, 1H), 7.35 – 7.28 (m, 3H), 7.24 – 7.15 (m, 2H), 6.97 (d, *J* = 8.1 Hz, 1H), 6.64 – 6.56 (m, 1H), 6.41 – 6.30 (m, 1H), 5.96 (dd, *J* = 8.4, 5.2 Hz, 1H), 4.09 – 3.99 (m, 1H), 3.96 (d, *J* = 8.6 Hz, 1H), 3.87 (d, *J* = 8.6 Hz, 1H), 1.24 – 1.15 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.7, 174.9, 163.6 (d, *J* = 243.3 Hz), 158.9, 142.5 (d, *J* = 12.0 Hz), 132.9, 129.7, 128.6, 128.1, 122.5 (d, *J* = 9.7 Hz), 121.03 (d, *J* = 2.7 Hz), 108.3 (d, *J* = 23.7 Hz), 98.8 (d, *J* = 27.3 Hz), 42.0, 40.3, 38.3, 37.5, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}FN_2O_3$ ($M+H^+$) = 367.1458, found 367.1460.



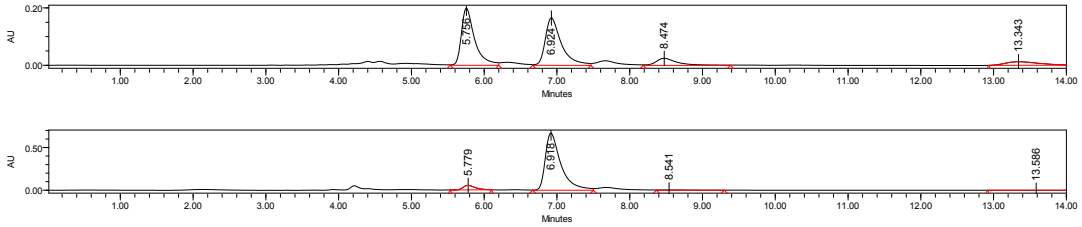
	Retention Time	Area	% Area
1	5.889	39631859	95.20
2	10.225	1996316	4.80

(1*R*,2*S*,3*R*)-6-chloro-1'-isopropyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione：

Prepared according to the general procedure. The compound of **4ha** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow solid in 67% yield. Mp. 108.0 – 110.0 ºC, HPLC (chiralcel IB, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 6.92 min, t_r(minor) = 5.78 min, *ee* = 88%, dr = 98:2. $[\alpha]^{14.6}_D$ = 204.8 (c = 0.42, in CH_2Cl_2). ^{1}H



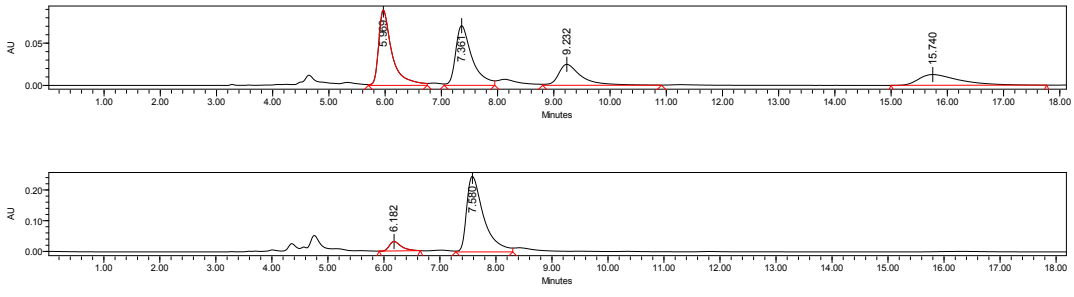
NMR (400 MHz, $CDCl_3$) δ = 8.81 (s, 1H), 7.35 – 7.29 (m, 3H), 7.22 – 7.16 (m, 2H), 6.95 (d, *J* = 8.3 Hz, 1H), 6.85 (d, *J* = 1.6 Hz, 1H), 6.64 (dd, *J* = 8.1, 1.7 Hz, 1H), 5.94 (d, *J* = 8.1 Hz, 1H), 4.08 – 3.96 (m, 1H), 3.97 (d, *J* = 8.5 Hz, 1H), 3.86 (d, *J* = 8.6 Hz, 1H), 1.24 – 1.17 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.4, 158.9, 142.2, 133.5, 132.7, 129.7, 128.7, 128.1, 124.1, 122.4, 122.0, 110.6, 42.0, 40.3, 38.4, 37.7, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{35}ClN_2O_3$ ($M+H^+$) = 383.1162, found 383.1156; HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{37}ClN_2O_3$ ($M+H^+$) = 385.1133, found 385.1142.



	Retention Time	Area	% Area
1	5.779	605520	5.64
2	6.918	9956371	92.76
3	8.541	142033	1.32
4	13.586	29232	0.27

(1*R*,2*S*,3*R*)-6-bromo-1'-isopropyl-3'-phenylspiro[indoline-3,2'-piperidine]-2,5',6'-trione：

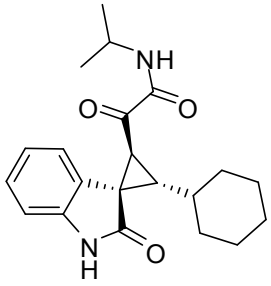
Prepared according to the general procedure. The compound of **4ia** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow solid in 66% yield. Mp. 116.0 – 118.0 ºC, HPLC (chiralcel IB, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.58 min, t_r(minor) = 6.18 min, *ee* = 84%, dr > 99:1. $[\alpha]^{14.8}{}_D$ = 130.5 (c = 0.44, in CH_2Cl_2). ^1H NMR (400 MHz, $CDCl_3$) δ = 8.79 (s, 1H), 7.36 – 7.26 (m, 3H), 7.21 – 7.16 (m, 2H), 7.00 (d, *J* = 1.2 Hz, 1H), 6.94 (d, *J* = 8.2 Hz, 1H), 6.80 (dd, *J* = 8.1, 1.4 Hz, 1H), 5.88 (d, *J* = 8.1 Hz, 1H), 4.09 – 3.99 (m, 1H), 3.97 (d, *J* = 8.5 Hz, 1H), 3.86 (d, *J* = 8.6 Hz, 1H), 1.24 – 1.17 (m, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.6, 174.3, 158.9, 142.3, 132.7, 129.7, 128.7, 128.2, 124.9, 124.6, 122.7, 121.4, 113.4, 42.0, 40.3, 38.4, 37.7, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{79}BrN_2O_3$ ($M+H^+$) = 427.0657, found 427.0658; HRMS (ESI-TOF) calcd for $C_{21}H_{19}{}^{81}BrN_2O_3$ ($M+H^+$) = 429.0637, found 429.0638.



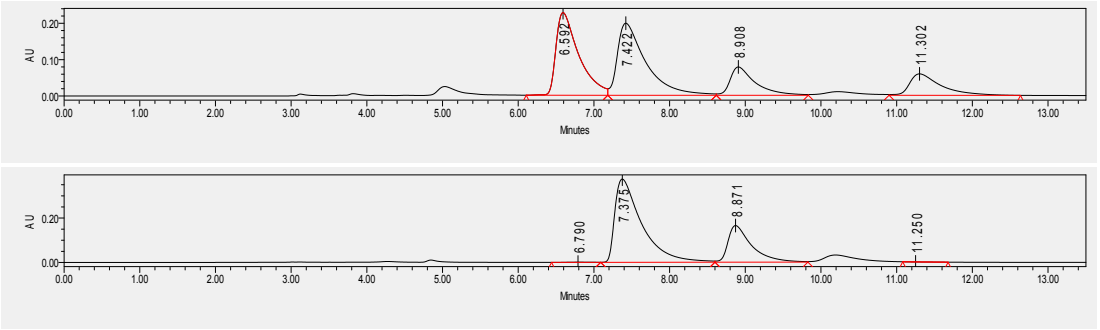
	Retention Time	Area	% Area

1	6.182	457160	8.08
2	7.580	5202782	91.92

(1*R*,2*S*,3*R*)-3'-cyclohexyl-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:

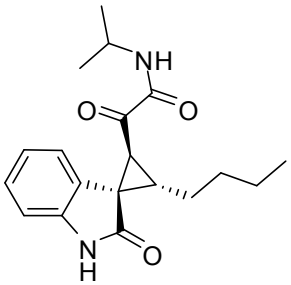


Prepared according to the general procedure. The compound of **4au** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 60% yield. Mp. 96.0 – 98.0 ℃, HPLC (chiralcel IB, hexane/*i*-PrOH = 90:10, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 7.38 min, t_r(minor) = 6.79 min, *ee* = 99%, dr = 72:28. $[\alpha]^{11.7}_D$ = 169.2 (c = 0.48, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.69 (s, 1H), 7.21 (t, *J* = 7.6 Hz, 1H), 7.11 (d, *J* = 7.5 Hz, 1H), 7.01 (t, *J* = 7.5 Hz, 1H), 6.93 (d, *J* = 7.7 Hz, 1H), 6.84 (d, *J* = 8.1 Hz, 1H), 3.98 – 3.90 (m, 1H), 3.46 (d, *J* = 8.6 Hz, 1H), 2.51 (dd, *J* = 10.1, 9.0 Hz, 1H), 1.92 – 1.88 (d, *J* = 4.9 Hz, 2H), 1.84 – 1.75 (m, 1H), 1.68 – 1.52 (m, 3H), 1.36 – 1.26 (m, 3H), 1.17 (d, *J* = 6.6 Hz, 3H), 1.13 (d, *J* = 6.6 Hz, 3H), 1.08 – 0.93 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.7, 175.0, 159.1, 141.2, 127.7, 126.6, 122.1, 121.1, 110.2, 41.7, 41.6, 40.0, 39.5, 36.2, 32.5, 32.0, 26.0, 25.9, 25.6, 22.3, 22.3. HRMS (ESI-TOF) calcd for $C_{21}H_{26}N_2O_3$ ($M+H^+$) = 355.2022, found 355.2021.



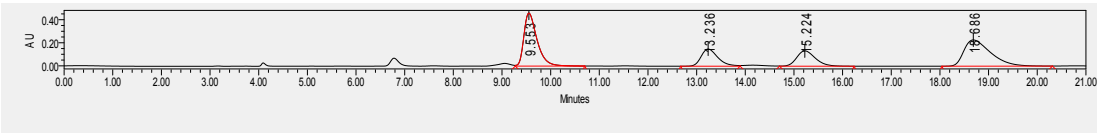
	Retention Time	Area	% Area
1	6.790	24456	0.19
2	7.375	9267899	71.90
3	8.871	3591929	27.87
4	11.250	5775	0.04

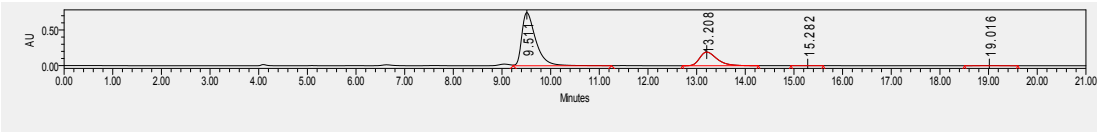
(1*R*,2*S*,3*R*)-3'-butyl-1'-isopropylspiro[indoline-3,2'-piperidine]-2,5',6'-trione:



Prepared according to the general procedure. The compound of **4at** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford light yellow oil in 68% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 9.51 min, t_r(minor) = 19.01 min, *ee* = 99%, dr = 76:24. $[\alpha]^{11.5}_D$ = 143.3 (c = 0.54, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.51 (s, 1H), 7.21 (t, *J* = 7.6 Hz, 1H), 7.08 (d, *J* = 7.3 Hz, 1H), 7.02 (t, *J* = 7.5 Hz, 1H), 6.92 (d, *J* = 7.7 Hz, 1H), 6.84 (d, *J* = 8.0 Hz, 1H), 4.01 – 3.89 (m, 1H), 3.43 (d, *J* = 8.6 Hz, 1H), 2.70 – 2.60 (m, 1H), 1.83 -1.79 (m, 1H), 1.78 – 1.65 (m, 1H), 1.35 – 1.24 (m, 4H), 1.17 (d, *J* = 6.5 Hz, 3H), 1.13 (d, *J* = 6.6 Hz, 3H), 0.84 (t, *J* = 7.0 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 190.9, 175.0, 159.0, 141.2, 127.7, 126.6, 122.0,

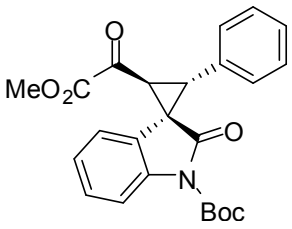
121.5, 110.2, 41.8, 40.1, 40.1, 35.4, 30.9, 26.4, 22.3, 22.3, 22.1, 13.9. HRMS (ESI-TOF) calcd for $C_{19}H_{24}N_2O_3$ ($M+H^+$) = 329.1865, found 329.1861.



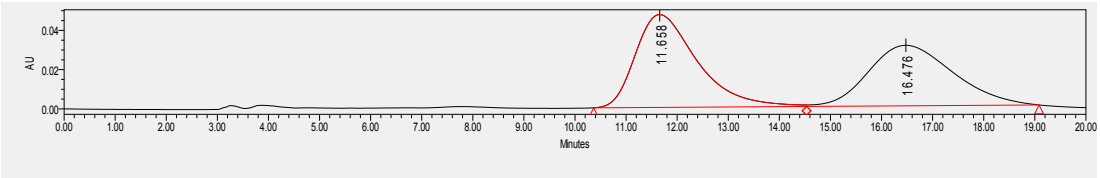


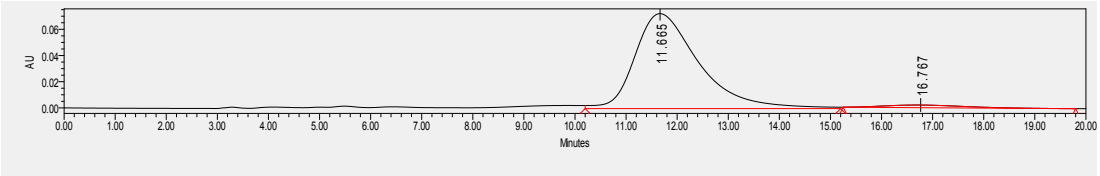
	Retention Time	Area	% Area
1	9.511	14857016	75.56
2	19.011	4700481	23.90
3	15.282	20146	0.10
4	19.016	85714	0.44

(1*R*,2*S*,3*R*) tert-butyl 2-(2-methoxy-2-oxoacetyl)-2'-oxo-3-phenylspiro[cyclopropane-1,3'-indoline]-1'-carboxylate:



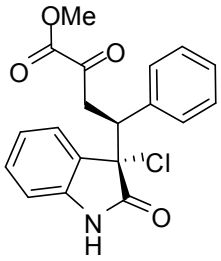
Prepared according to the general procedure. The compound of **5aa** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 60% yield. Mp. 168.0 – 170.0 ºC, HPLC (chiralcel IE, hexane/*i*-PrOH = 80:20, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 11.67 min, t_r(minor) = 16.77 min, *ee* = 93%, dr > 99:1. $[\alpha]^{12.6}_D$ = 176.0 (c = 0.52, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.88 (d, *J* = 8.2 Hz, 1H), 7.34 – 7.28 (m, 3H), 7.26 – 7.19 (m, 1H), 7.20 – 7.14 (m, 2H), 6.82 (t, *J* = 7.6 Hz, 1H), 6.03 (d, *J* = 7.6 Hz, 1H), 4.10 (d, *J* = 8.6 Hz, 1H), 3.86 (s, 3H), 3.53 (d, *J* = 8.6 Hz, 1H), 1.65 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 185.8, 171.3, 160.6, 149.0, 140.1, 132.2, 129.8, 128.7, 128.2, 128.2, 123.9, 121.1, 115.0, 84.8, 53.3, 41.0, 40.8, 39.6, 28.1. HRMS (ESI-TOF) calcd for $C_{24}H_{23}NO_6$ ($M+H^+$) = 444.1423, found 444.1418.



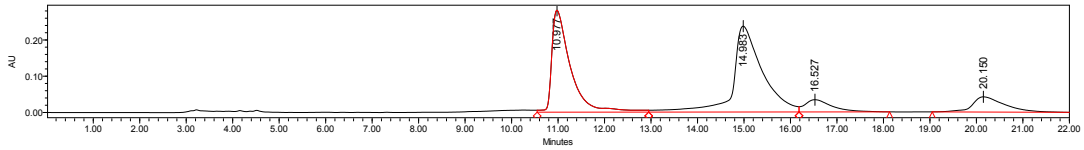


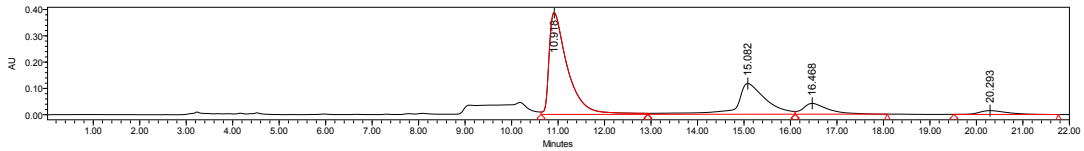
	Retention Time	Area	% Area
1	11.665	6322824	96.69
2	16.767	216148	3.31

Methyl 4-(-3-chloro-2-oxoindolin-3-yl)-2-oxo-4-phenylbutanoate:



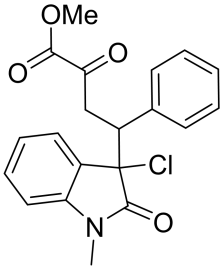
Prepared according to the above procedure. The product was purified by silica gel chromatography (petroleum ether: EA= 2:1) to afford white solid in 80% yield, and then recrystallization. The crude product after isolation, HPLC (chiralcel IB, hexane/*i*-PrOH = 90:10, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 10.92 min, t_r(minor) = 15.08 min, *ee* = 35%, dr = 88:12. Mp. 159.0 – 160.0 ºC, $[\alpha]^{28.4}_D$ = 38.8 (c = 0.36, in CH_2Cl_2). And then the mixture was further purified to give a pure diastereomer. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.05 (s, 1H), 7.30 (d, *J* = 7.7 Hz, 1H), 7.22 – 7.12 (m, 2H), 7.12 – 7.02 (m, 3H), 6.96 – 6.88 (m, 2H), 6.77 (d, *J* = 7.8 Hz, 1H), 4.12 – 4.02 (m, 2H), 3.83 (s, 3H), 3.73 (dd, *J* = 18.7, 10.6 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 191.0, 174.8, 160.9, 140.0, 135.8, 130.6, 129.5, 128.1, 128.1, 128.0, 126.0, 123.1, 110.5, 67.7, 53.2, 47.8, 40.0. HRMS (ESI-TOF) calcd for $C_{19}H_{16}{}^{35}ClNO_4$ ($M+Na^+$) = 380.0666, found 358.0667; HRMS (ESI-TOF) calcd for $C_{19}H_{16}{}^{37}ClNO_4$ ($M+Na^+$) = 382.0636, found 382.0618.



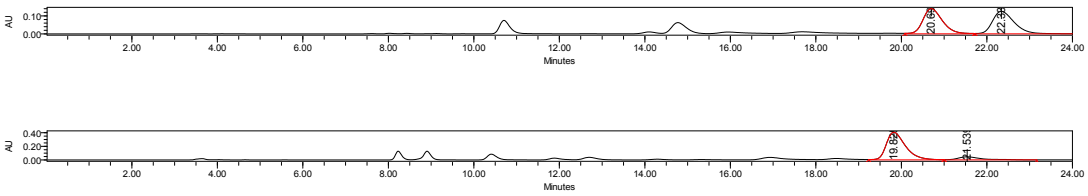


	Retention Time	Area	% Area
1	10.918	10661340	59.45
2	15.082	5103528	28.46
3	16.468	1543662	8.61
4	20.293	625570	3.49

Methyl 4-(1-methyl-3-chloro-2-oxoindolin-3-yl)-2-oxo-4-phenylbutanoate:

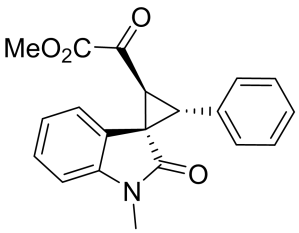


Prepared according to the above procedure of synthesis of the Michale intermediate. The product **7** was purified by silica gel chromatography (petroleum ether: EA= 2:1) to afford white solid in 21% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 19.82 min, t_r(minor) = 21.54 min, *ee* = 77%. $[\alpha]^{22.6}_D$ = 32.4 (c = 0.03, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.36 – 7.29 (m, 1H), 7.21 – 7.11 (m, 2H), 7.11 – 7.04 (m, 3H), 6.92 – 6.84 (m, 2H), 6.65 (d, *J* = 7.8 Hz, 1H), 4.16 – 4.02 (m, 2H), 3.85 (s, 3H), 3.71 (dd, *J* = 19.2, 11.2 Hz, 1H), 2.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 191.0, 173.0, 161.0, 142.9, 135.9, 130.5, 129.3, 128.0, 127.9, 127.6, 125.7, 123.0, 108.5, 67.6, 53.1, 48.0, 39.87, 26.26. HRMS (ESI-TOF) calcd for $C_{20}H_{18}{}^{35}ClNO_4$ ($M+H^+$) = 372.0997, found 372.0996; HRMS (ESI-TOF) calcd for $C_{20}H_{18}{}^{37}ClNO_4$ ($M+H^+$) = 374.0968, found 374.0964.

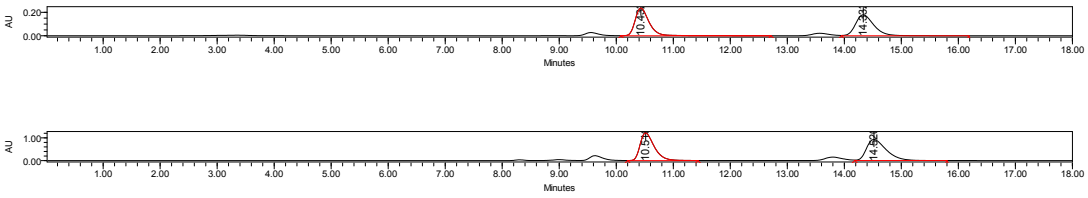


	Retention Time	Area	% Area
1	19.825	12684011	88.25
2	21.539	1688716	11.75

methyl 2-(-1'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indolin]-3-yl)-2-oxoacetate:

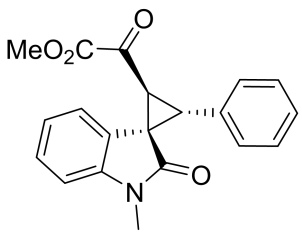


Prepared according to the procedure of the Synthesis of *rel*-(1*S*,2*S*,3*R*)-**3'**. The product **8aa'** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 40% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 14.52 min, t_r(minor) = 10.52 min, *ee* = -4%. $[\alpha]^{21.8}_D$ = 8.2 (c = 0.24, in CH_2Cl_2).^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.40 (d, *J* = 7.6 Hz, 1H), 7.34 – 7.26 (m, 6H), 7.07 (t, *J* = 7.6 Hz, 1H), 6.88 (d, *J* = 7.6 Hz, 1H), 4.39 (d, *J* = 8.4 Hz, 1H), 3.97 (d, *J* = 8.4 Hz, 1H), 3.87 (s, 3H), 3.19 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 187.4, 170.9, 160.4, 144.0, 132.3, 129.1, 128.2, 128.2, 127.8, 125.0, 122.6, 122.5, 108.1, 53.4, 43.8, 40.8, 40.5, 26.7. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ (M+H$^+$) = 336.1230, found 336.1229.



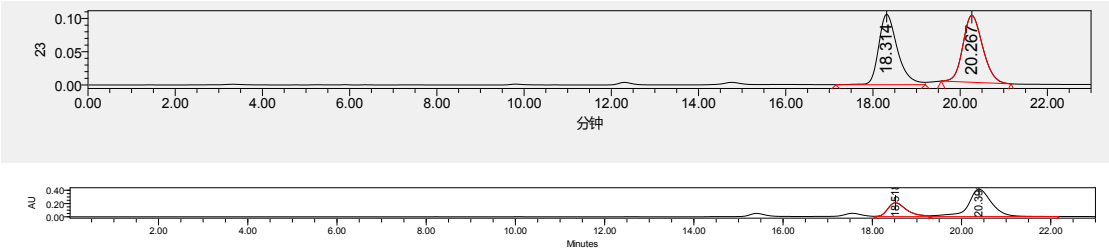
	Retention Time	Area	% Area
1	10.516	20464614	47.97
2	14.520	22195430	52.03

methyl 2-(-1'-methyl-2'-oxo-2-phenylspiro[cyclopropane-1,3'-indolin]-3-yl)-2-oxoacetate:



Prepared according to the procedure of the Synthesis of *rel*-(1*S*,2*S*,3*R*)-**3'**. The product **8aa** was purified by silica gel chromatography (petroleum ether: EA= 1:1) to afford white solid in 19% yield. HPLC (chiralcel IE, hexane/*i*-PrOH = 70:30, flow rate 1.0 mL/min, λ = 254 nm) t_r(major) = 20.39 min, t_r(minor) = 18.52 min, *ee* = -41%. $[\alpha]^{21.2}_D$ = -47.9 (c = 0.15, in CH_2Cl_2). ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.34 – 7.28 (m, 3H), 7.22 – 7.14 (m, 3H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.74 (t, *J* = 7.6 Hz, 1H), 6.05 (d, *J* = 7.6 Hz, 1H), 4.10 (d, *J* = 8.4 Hz, 1H), 3.86 (s, 3H), 3.53 (d, *J* = 8.4 Hz, 1H), 3.28 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ = 186.6, 172.7, 160.8,

144.0, 132.9, 129.7, 128.6, 128.0, 127.9, 125.0 122.0, 121.4, 108.3, 53.1, 40.7, 39.8, 37.8, 26.7. HRMS (ESI-TOF) calcd for $C_{20}H_{17}NO_4$ ($M+H^+$) = 336.1230, found 336.1231.



	Retention Time	Area	% Area
1	18.518	6181214	29.20
2	20.391	14990866	70.80

7 Reference

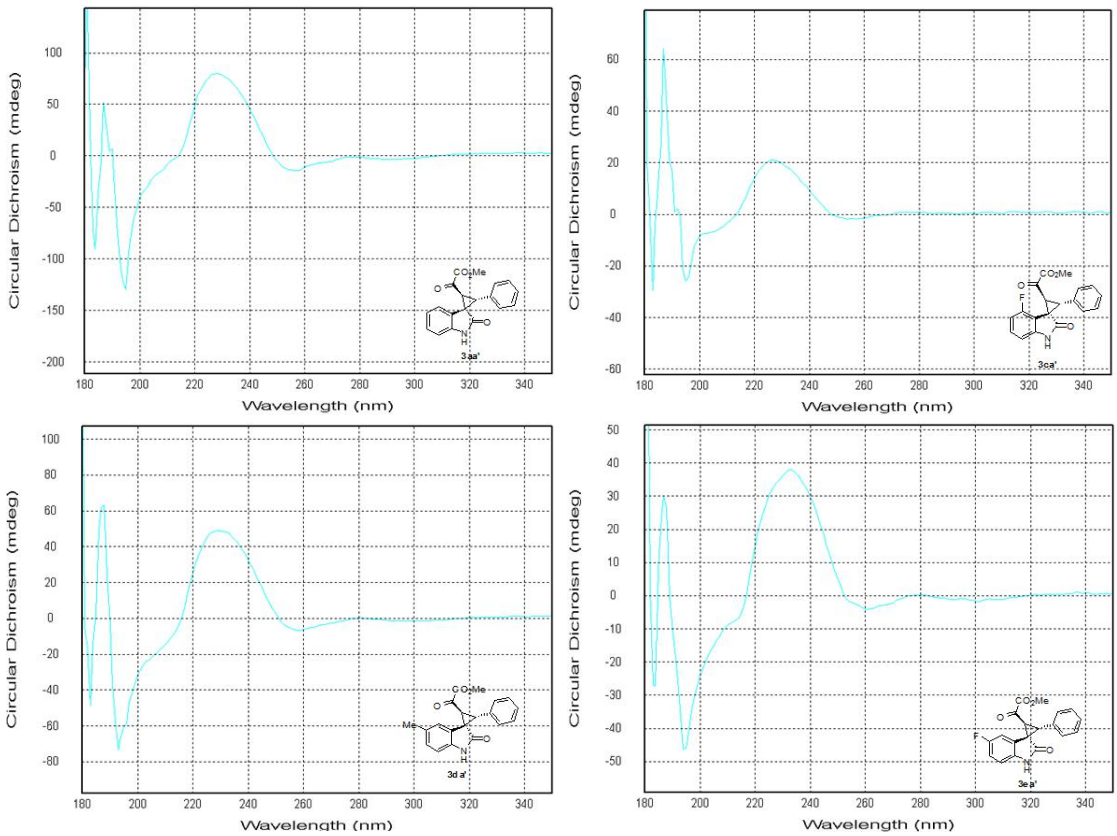
[1] J. Guillaumel, P. Demerseman, J.-M. Clavel, R. J. Royer, *Heterocyclic Chem.* **1980**, *17*, 1531.

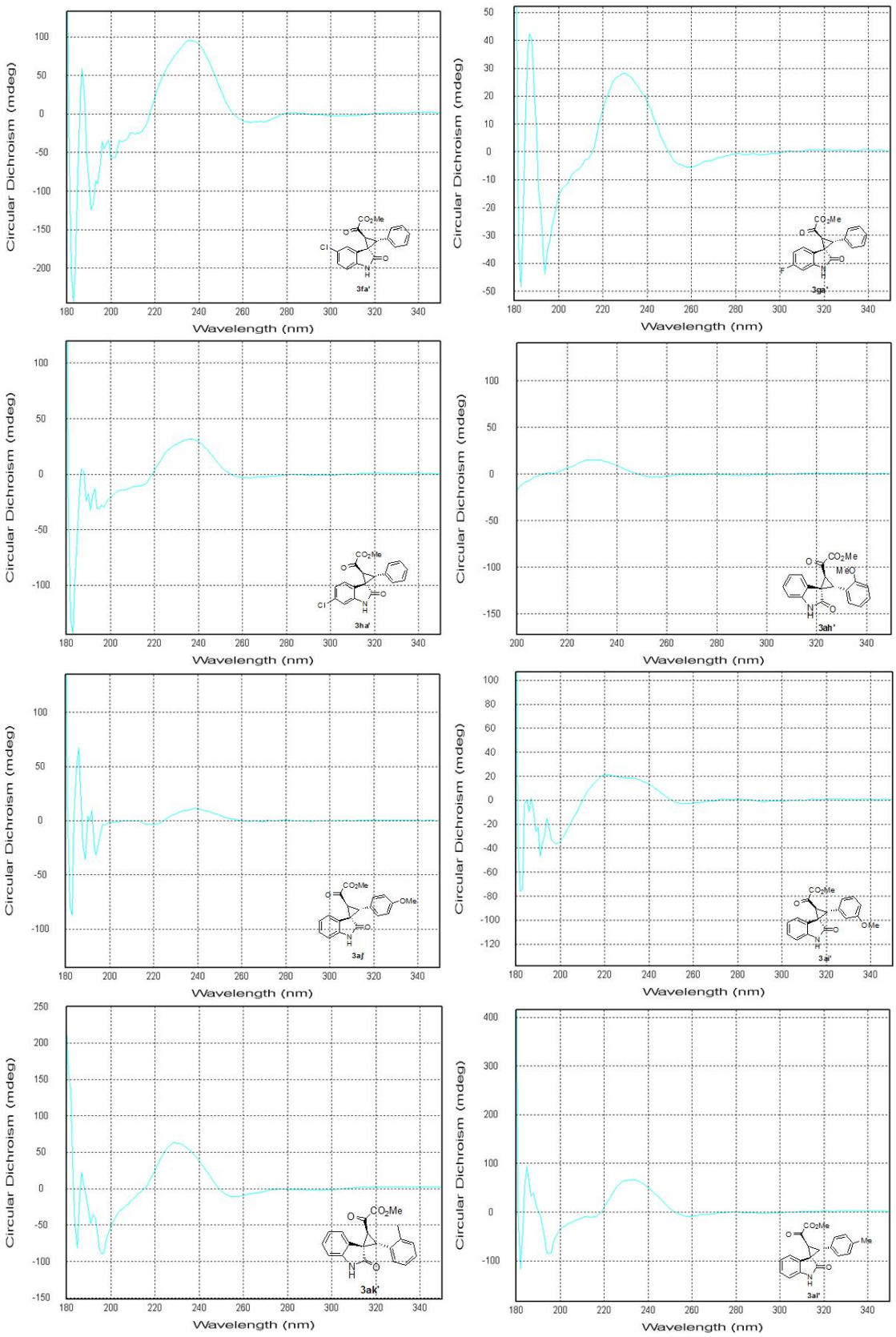
[2] J. H. Feng, X. Fu, Z. L. Chen, L. L. Lin, X. H. Liu, X. M. Feng, *Org. Lett.* **2013**, *15*, 2640.

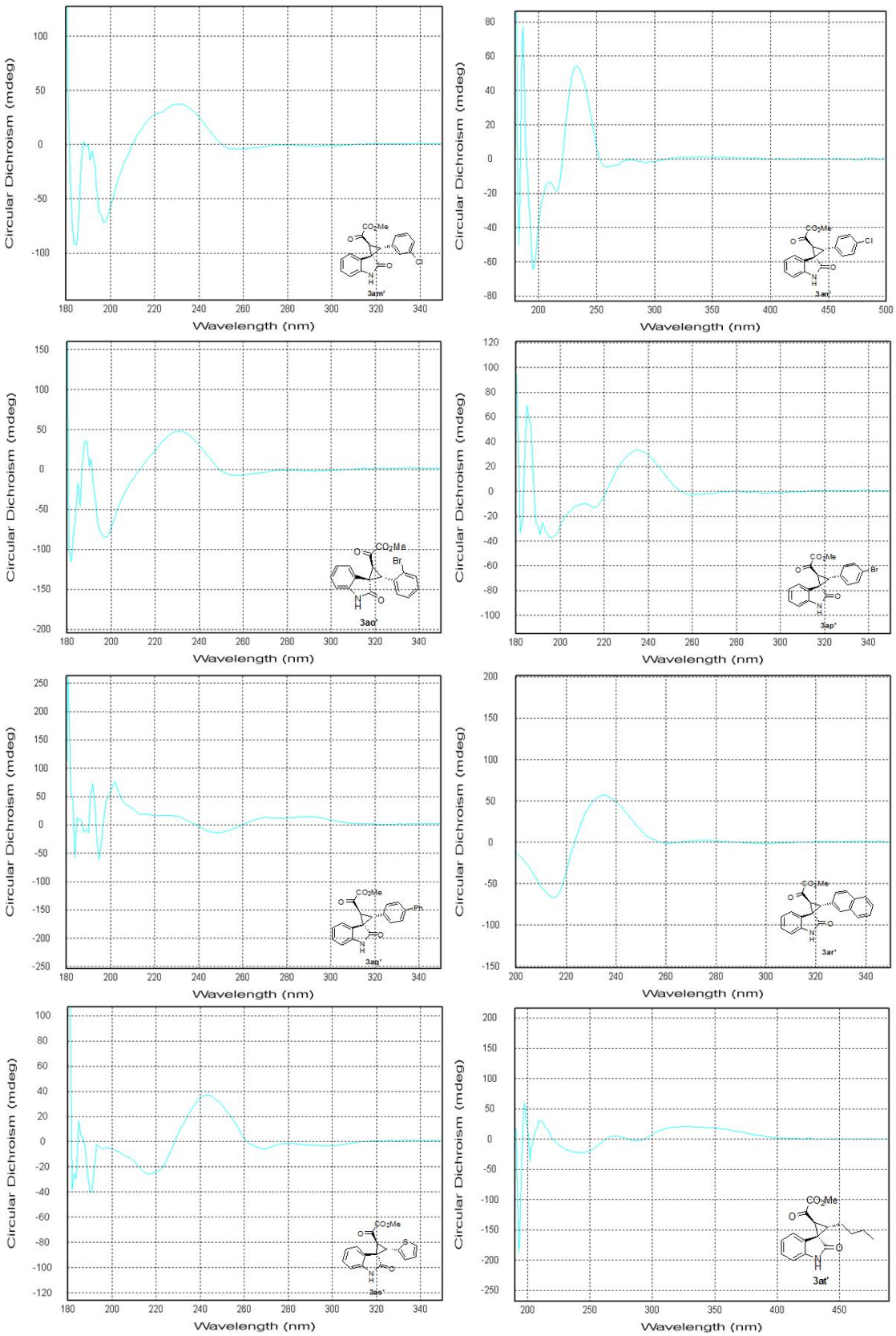
[3] Y. H. Wen, X. Huang, J. L. Huang, Y. Xiong, B. Qin, X. M. Feng, *Synlett.* **2005**, *16*, 2445.

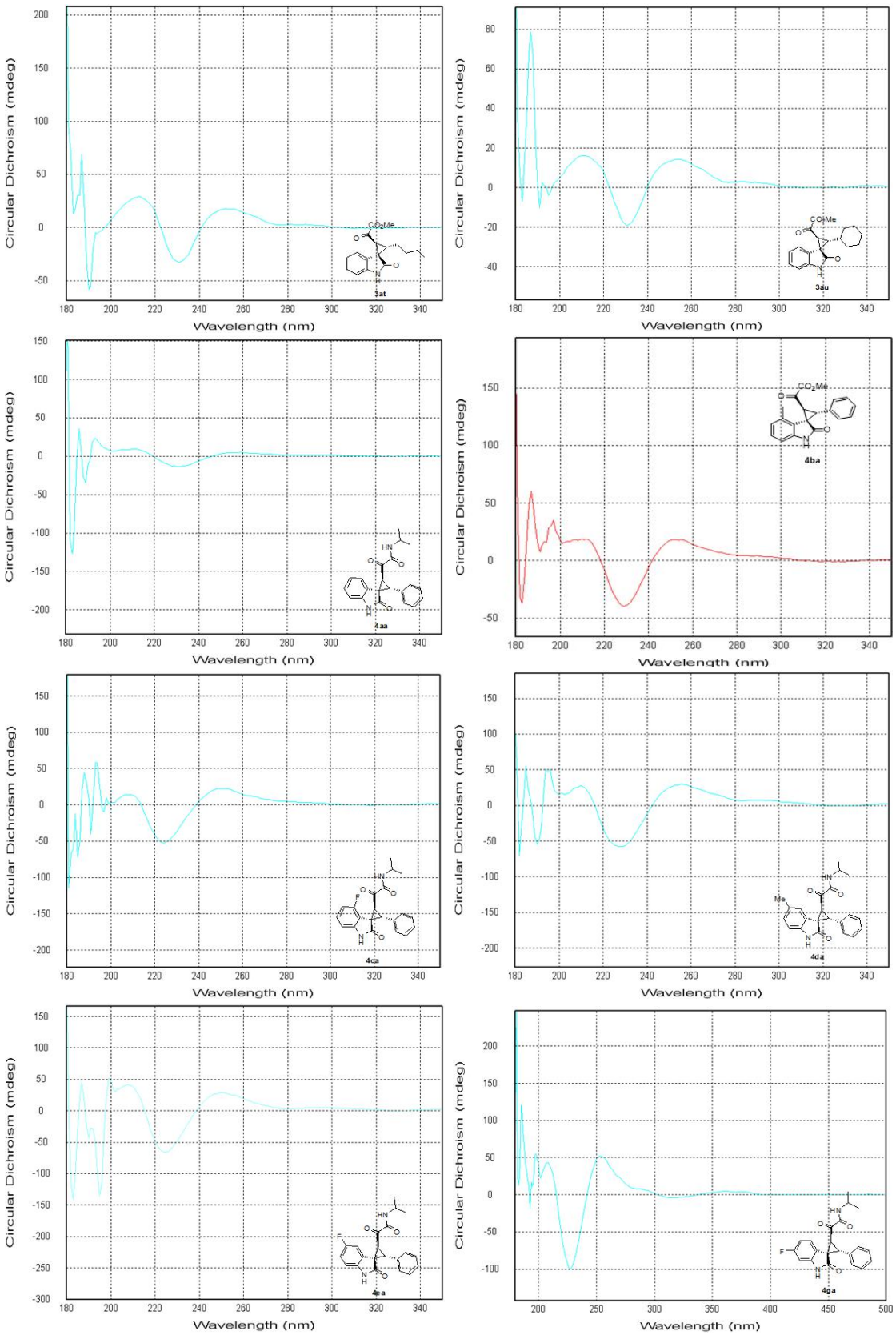
[4] a) X. H. Liu, L. L. Lin, X. M. Feng, *Acc. Chem. Res.* **2011**, *44*, 574; b) W. Li, X. H. Liu, X. Y. Hao, Y. F. Cai, L. Lin, X. M. Feng, *Angew. Chem.* **2012**, *124*, 8772; *Angew. Chem. Int. Ed.* **2012**, *51*, 8644; c) Y. L. Liu, D. J. Shang, X. Zhou, X. H. Liu, X. M. Feng, *Chem. Eur. J.* **2009**, *15*, 2055.

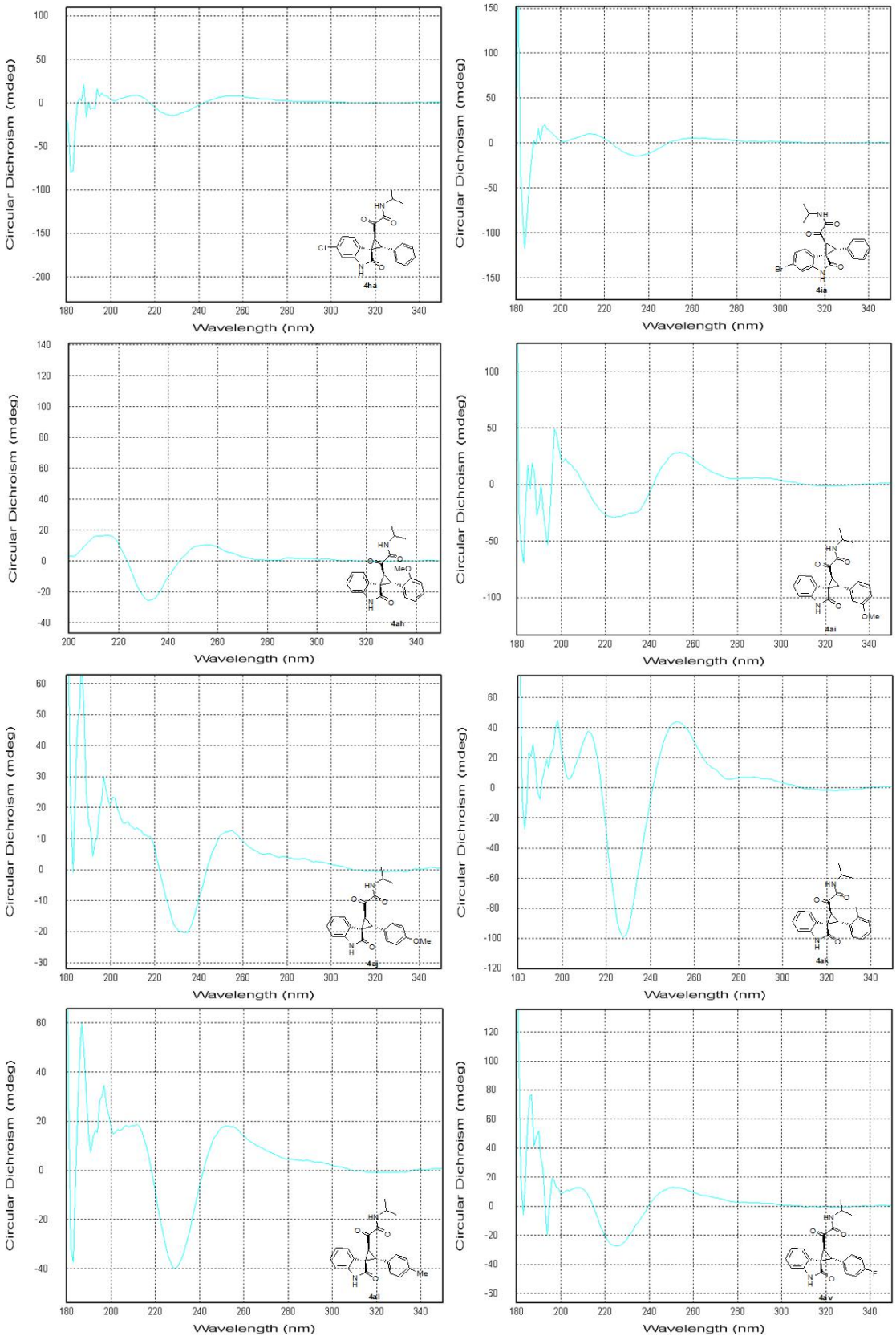
8 Copies of the CD Spectra

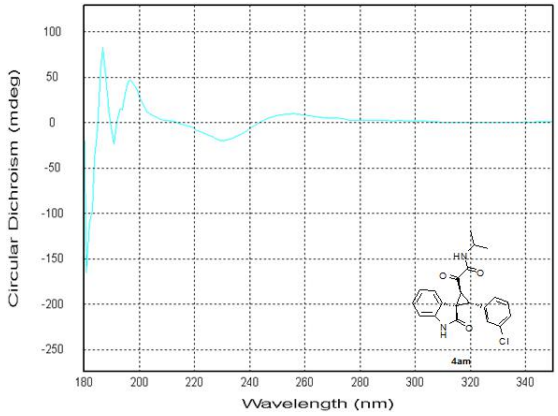


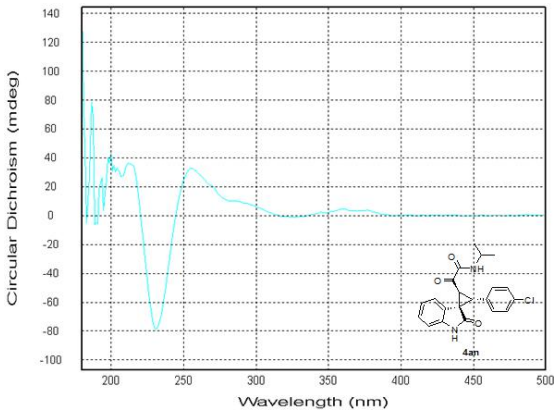

Circular Dichroism (mdeg)
Wavelength (nm)
3fa'
3ga'
3ha'
3ah'
3aj'
3ai'
3ak'
3al'

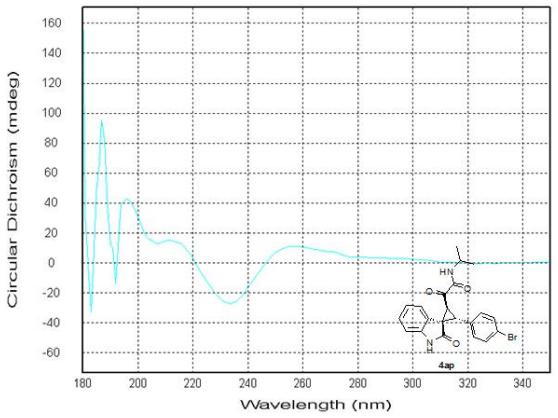

Circular Dichroism (mdeg)
Wavelength (nm)
3am'
3an'
3ao'
3ap'
3aq'
3ar'
3as'
3at'

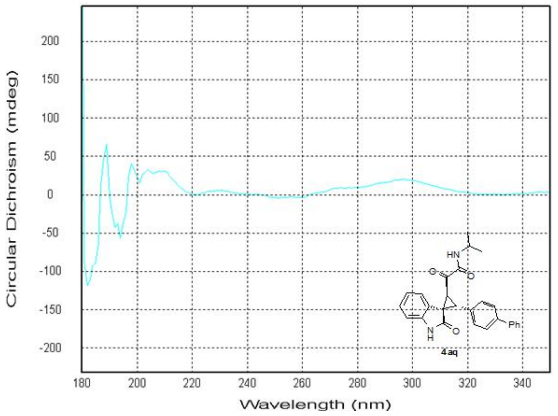

Circular Dichroism (mdeg)
Wavelength (nm)
3at
3au
4aa
4ba
4ca
4da
4ea
4ga

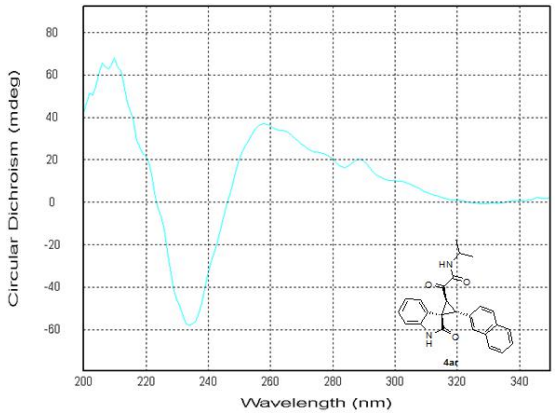

Circular Dichroism (mdeg)
Wavelength (nm)
4ha
4ia
4ah
4ai
4aj
4ak
4al
4av

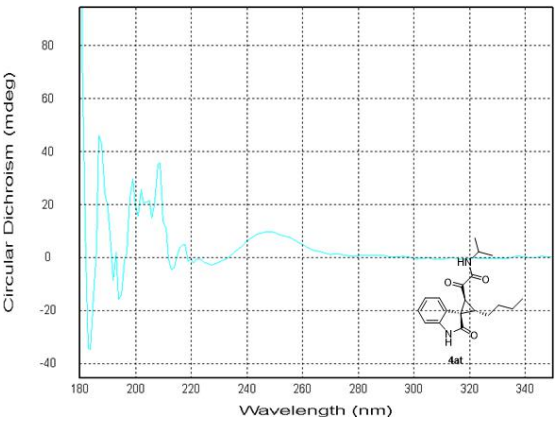

Circular Dichroism (mdeg)
Wavelength (nm)
4am

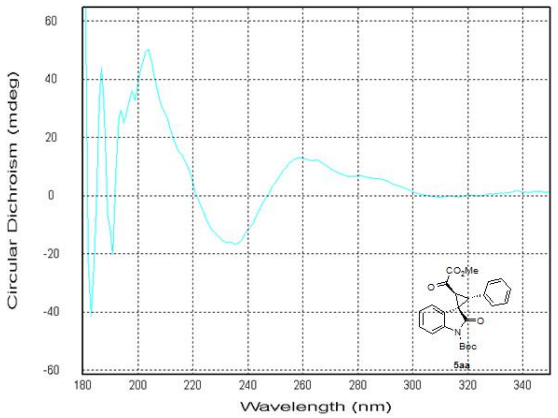

Circular Dichroism (mdeg)
Wavelength (nm)
4an


Circular Dichroism (mdeg)
Wavelength (nm)
4ap

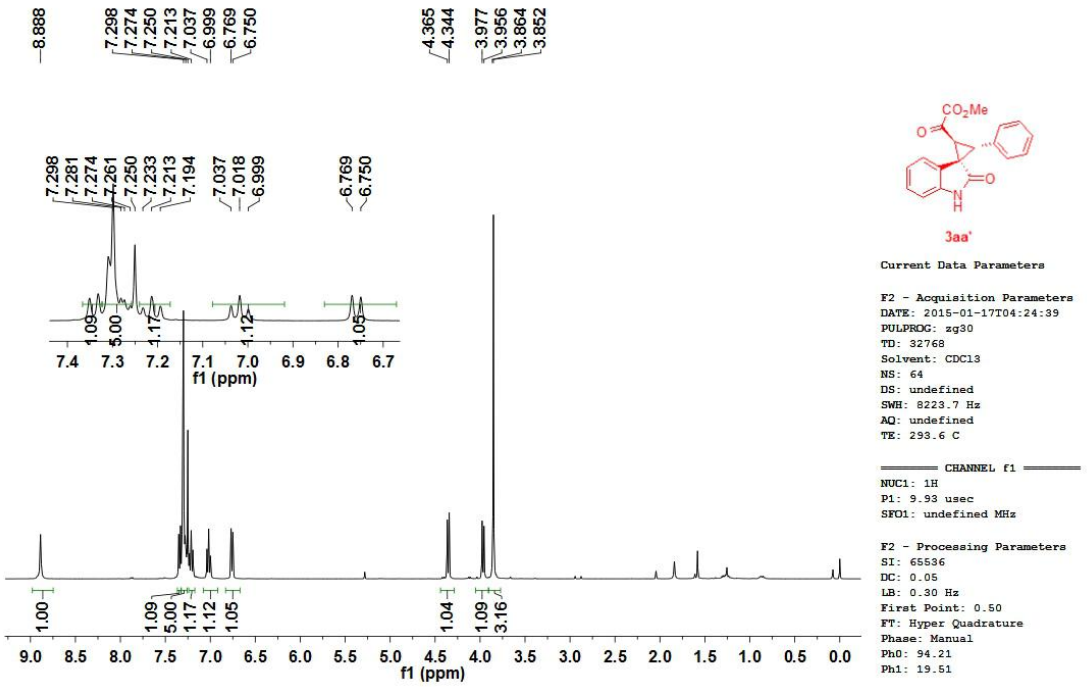

Circular Dichroism (mdeg)
Wavelength (nm)
4aq

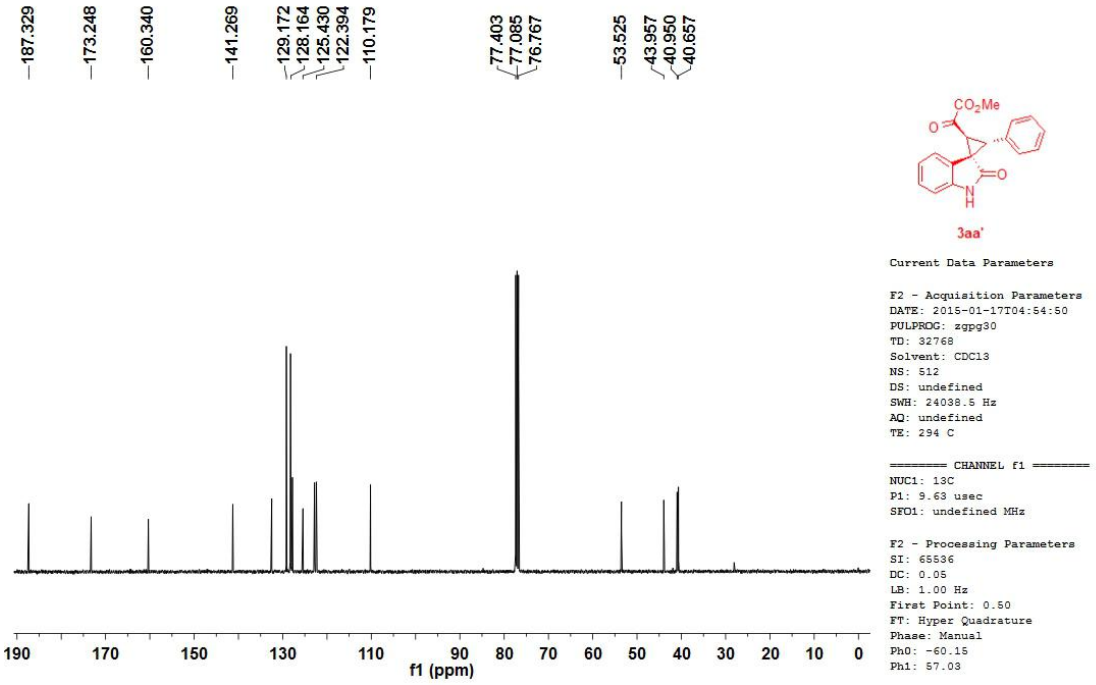

Circular Dichroism (mdeg)
Wavelength (nm)
4ar

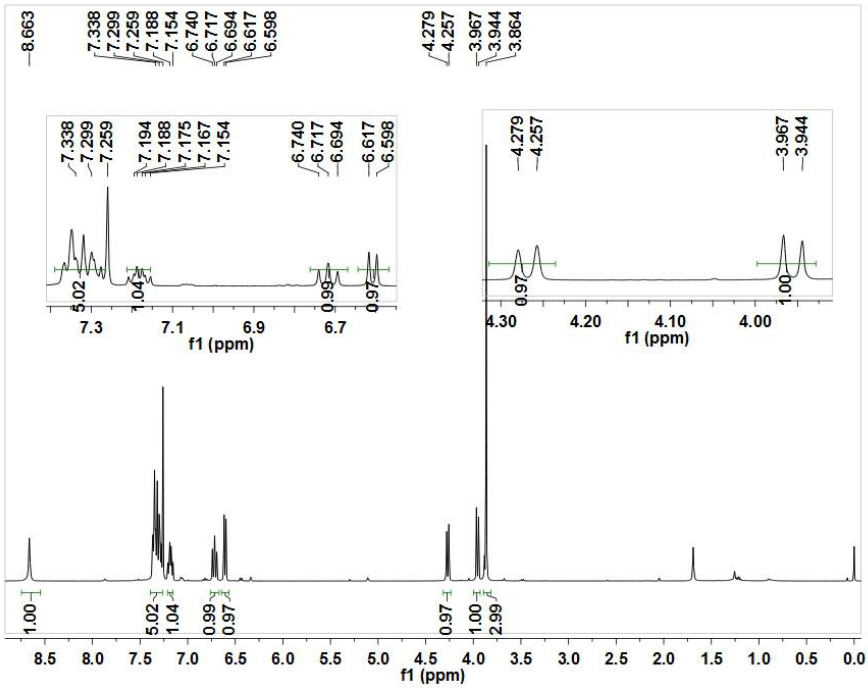

Circular Dichroism (mdeg)
Wavelength (nm)
4at


Circular Dichroism (mdeg)
Wavelength (nm)
5aa

9 Copies of the NMR Spectra







3ca'

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Current Data Parameters

F2 - Acquisition Parameters
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PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
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LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 97.34
Ph1: 14.52
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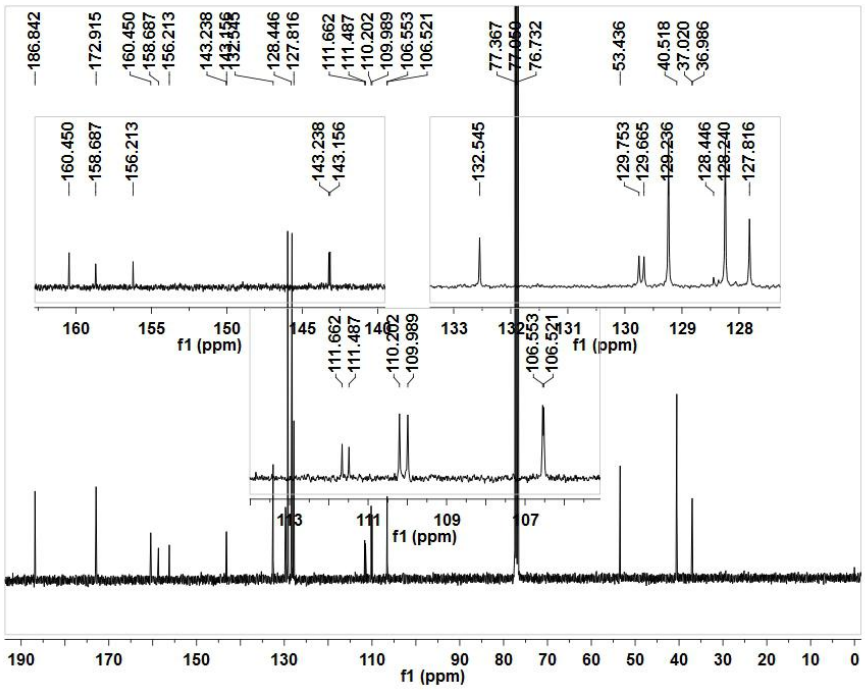

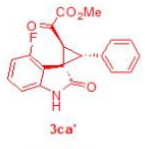

3ca'

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TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
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LB: 1.00 Hz
First Point: 0.50
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Ph1: 52.94
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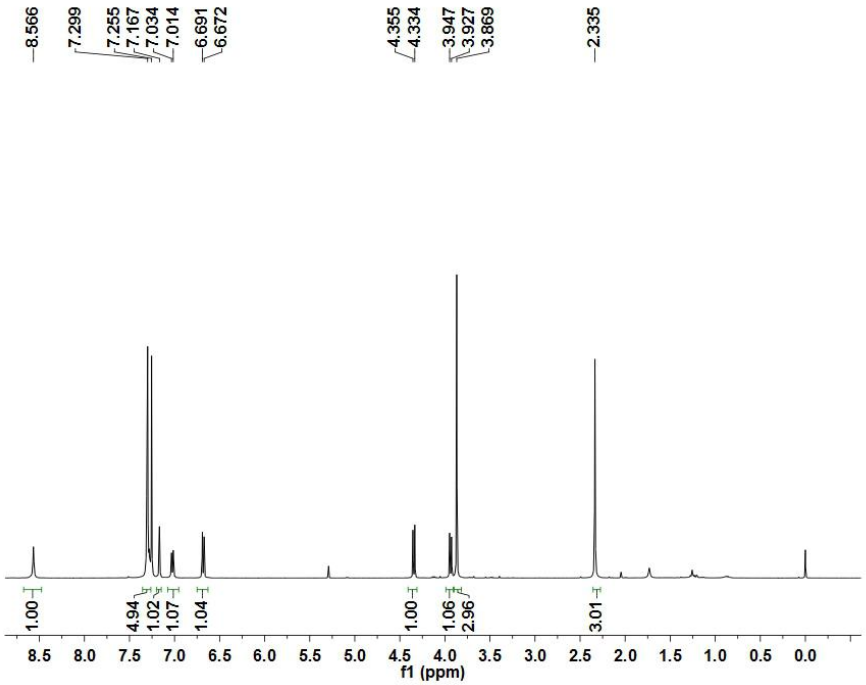

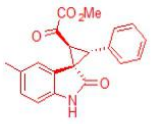

3da'

Current Data Parameters

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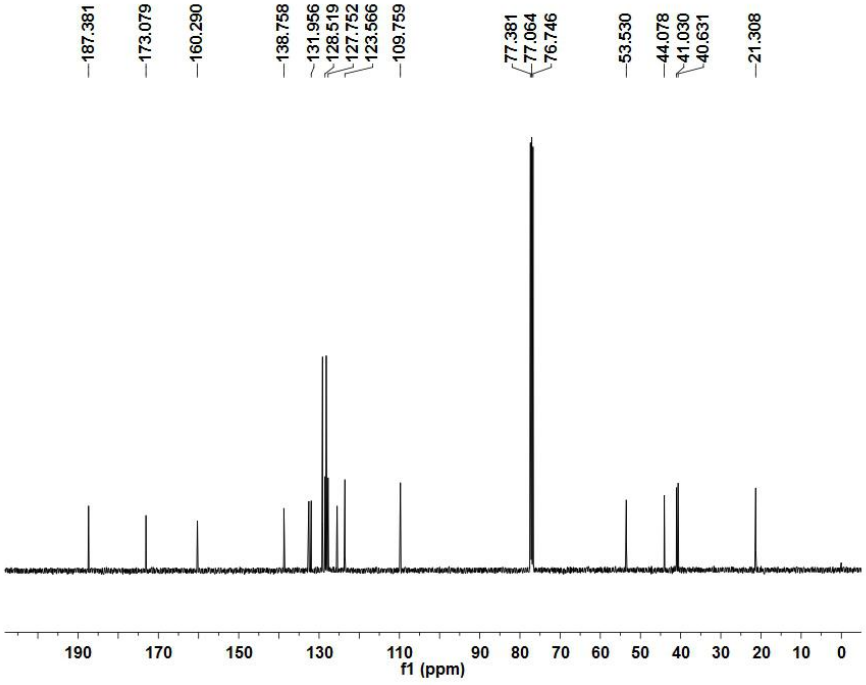
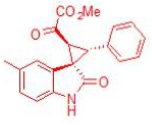
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.13
Ph1: 17.57





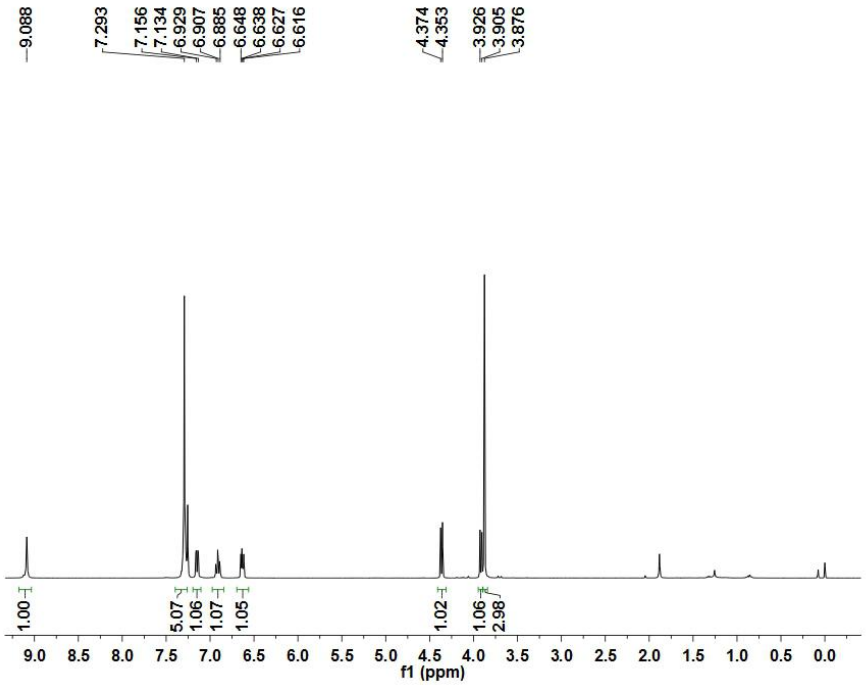
3da'

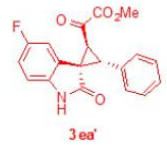
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-12-23T20:38:16
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -75.29
Ph1: 70.59





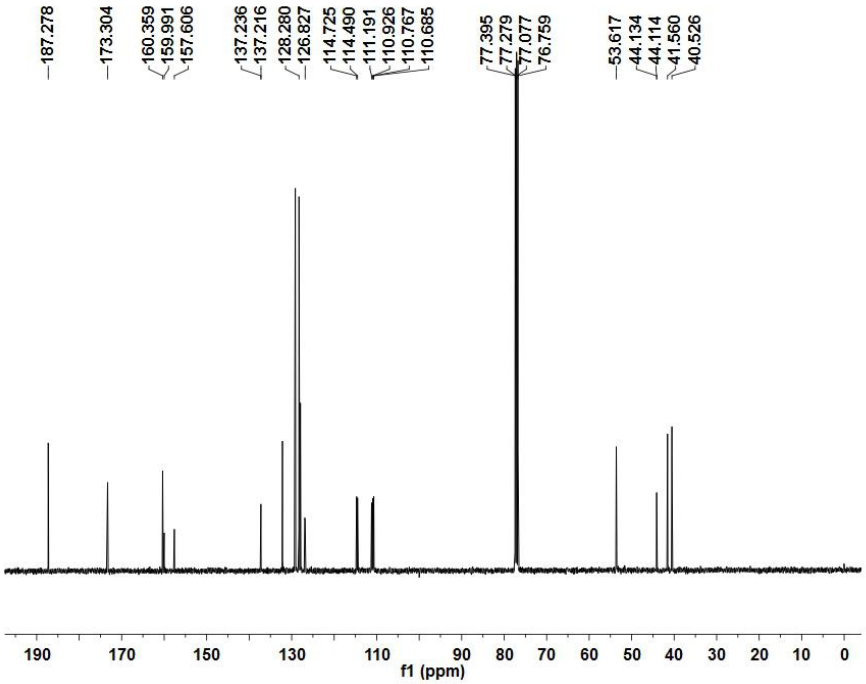
3ea'

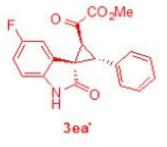
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-16T23:32:09
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.88
Ph1: 16.64





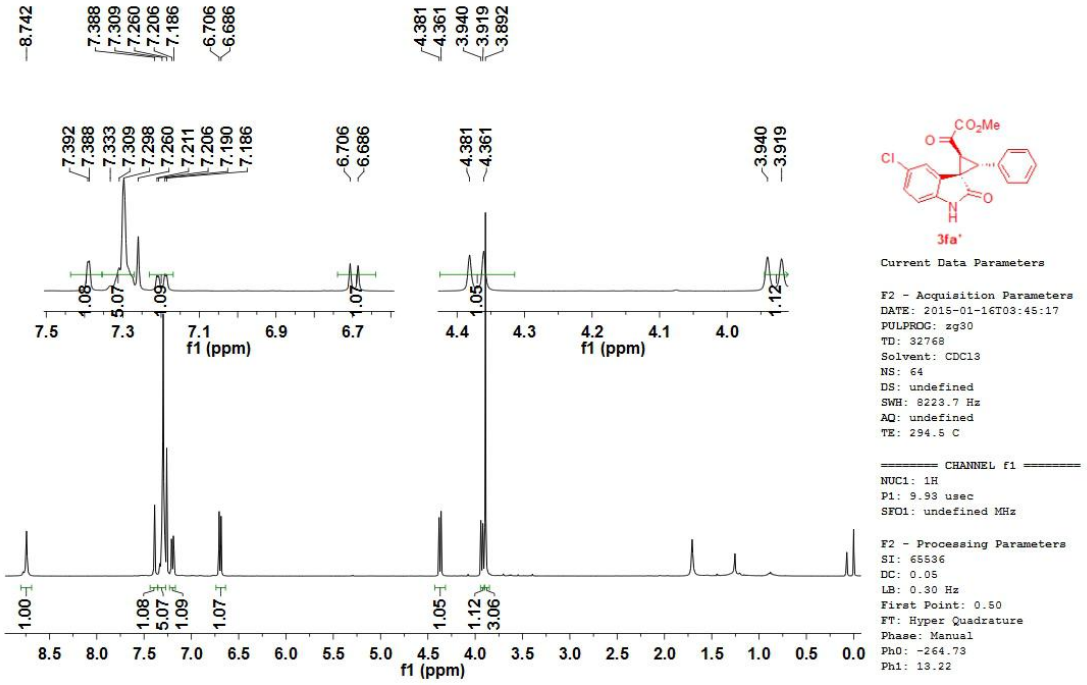
3ea'

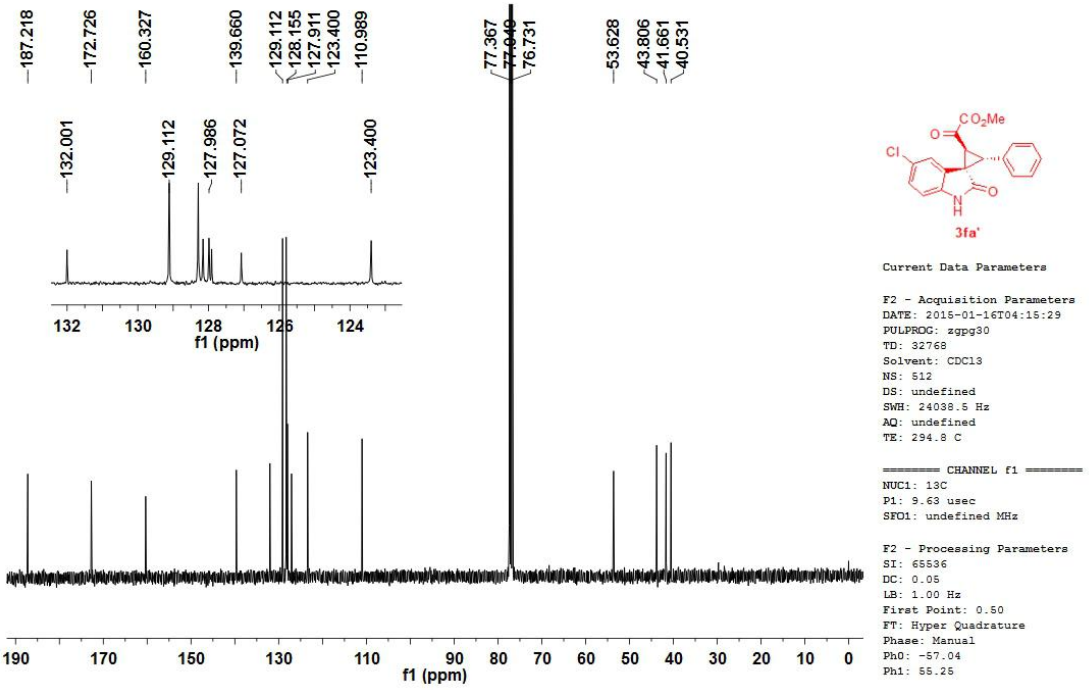
Current Data Parameters

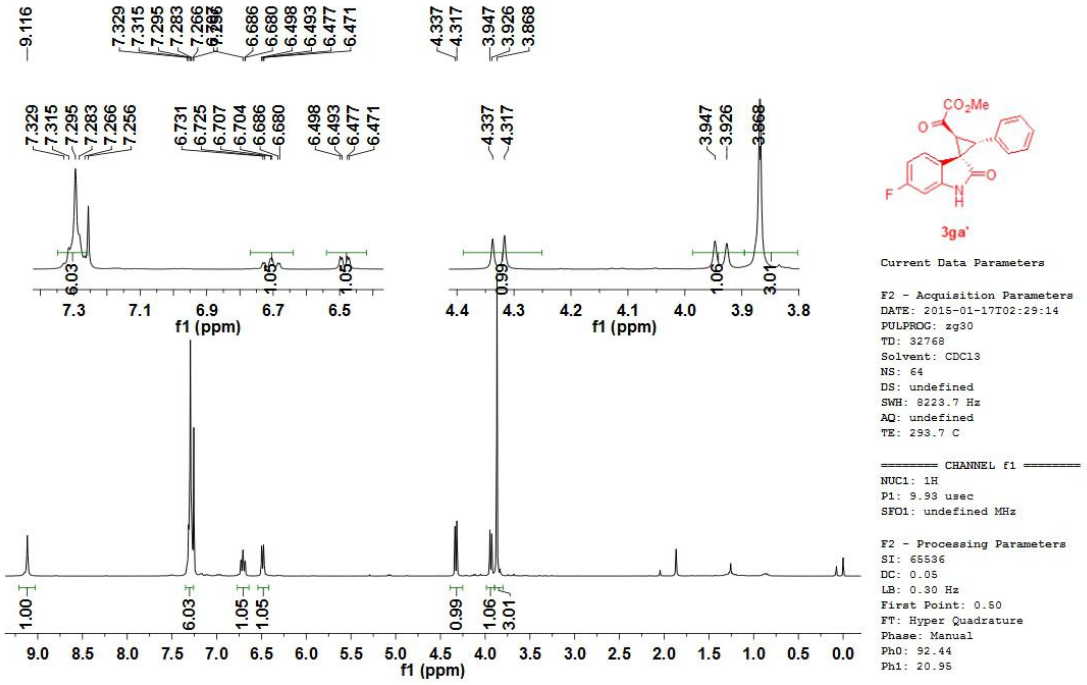
F2 - Acquisition Parameters
DATE: 2015-01-17T00:02:20
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

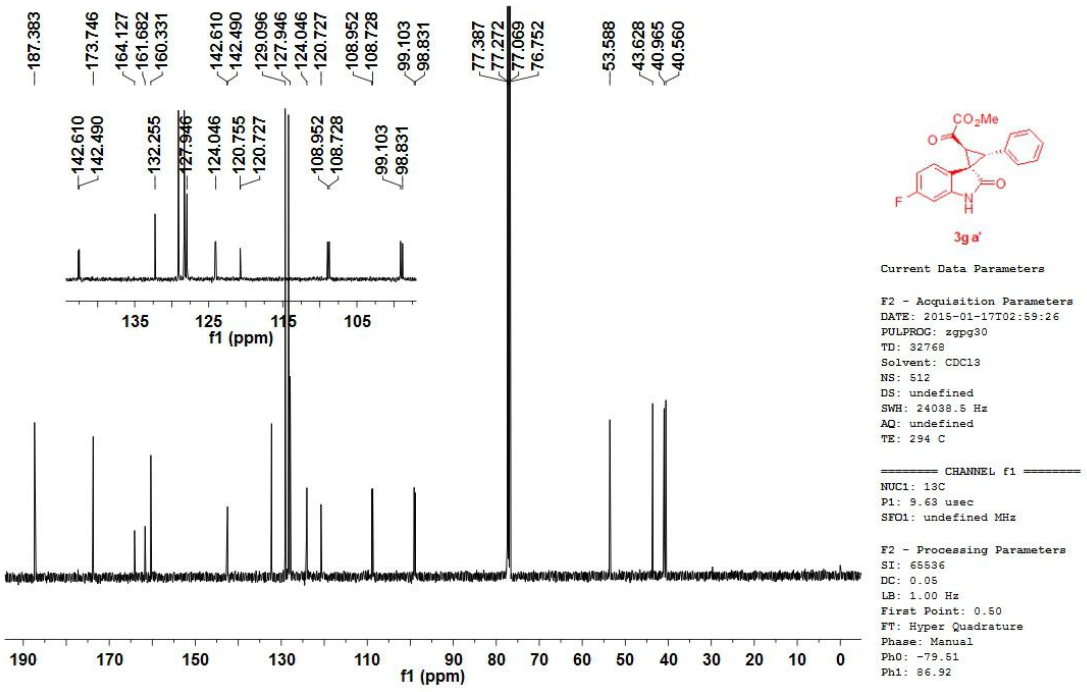
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

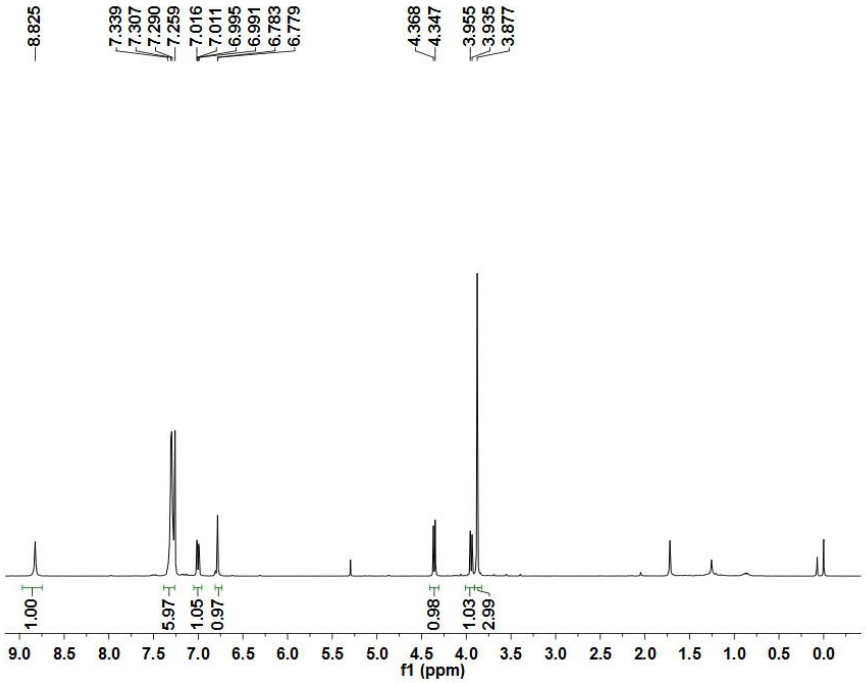
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -62.29
Ph1: 61.74

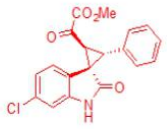

8.742
7.388
7.309
7.260
7.206
7.186
6.706
6.686
4.381
4.361
3.940
3.919
3.892
7.392
7.333
7.298
7.211
7.190
3.940
3.919
1.08
5.07
1.09
1.07
1.05
1.12
f1 (ppm)
1.00
1.08
5.07
1.09
1.07
1.05
1.12
3.06
f1 (ppm)
CO2Me
Cl
N
H
3fa'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-16T03:45:17
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294.5 C
======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -264.73
Ph1: 13.22


187.218
172.726
160.327
139.660
129.112
128.155
127.911
123.400
110.989
77.367
77.049
76.731
53.628
43.806
41.661
40.531
132.001
129.112
127.986
127.072
123.400
f1 (ppm)
f1 (ppm)
CO2Me
Cl
N
H
3fa'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-16T04:15:29
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.8 C
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -57.04
Ph1: 55.25


9.116
7.329
7.315
7.295
7.283
7.266
6.686
6.680
6.498
6.493
6.477
6.471
4.337
4.317
3.947
3.926
3.868
f1 (ppm)
1.00
6.03
1.05
1.05
0.99
1.06
3.01
CO2Me
F
N
H
3ga'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-17T02:29:14
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C
======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.44
Ph1: 20.95


187.383
173.746
164.127
161.682
160.331
142.610
142.490
129.096
127.946
124.046
120.727
108.952
108.728
99.103
98.831
77.387
77.272
77.069
76.752
53.588
43.628
40.965
40.560
132.255
120.755
f1 (ppm)
CO2Me
F
N
H
3ga'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-17T02:59:26
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -79.51
Ph1: 86.92





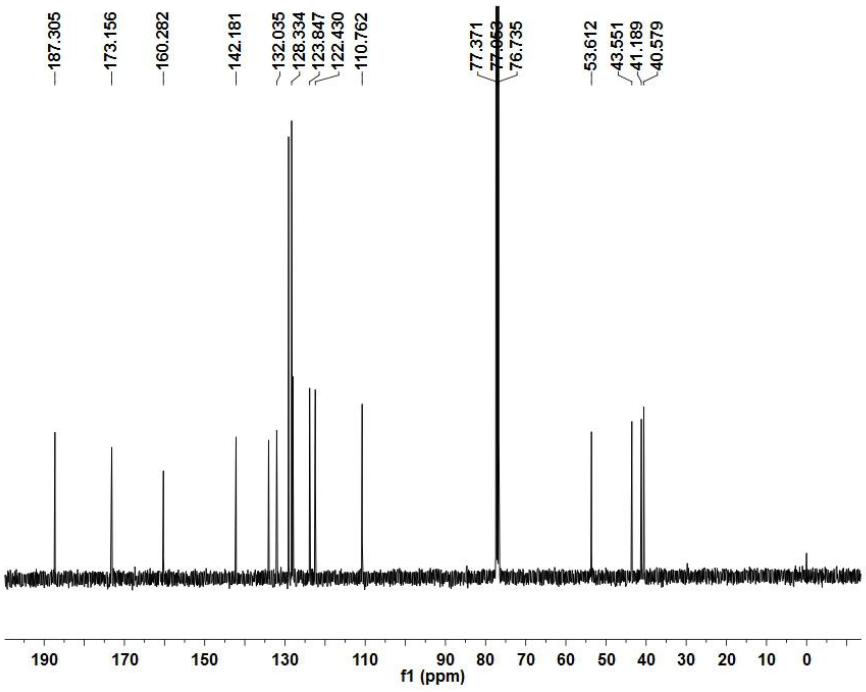
3h a'

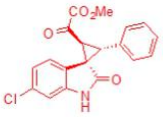
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-17T03:46:11
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 95.14
Ph1: 14.69





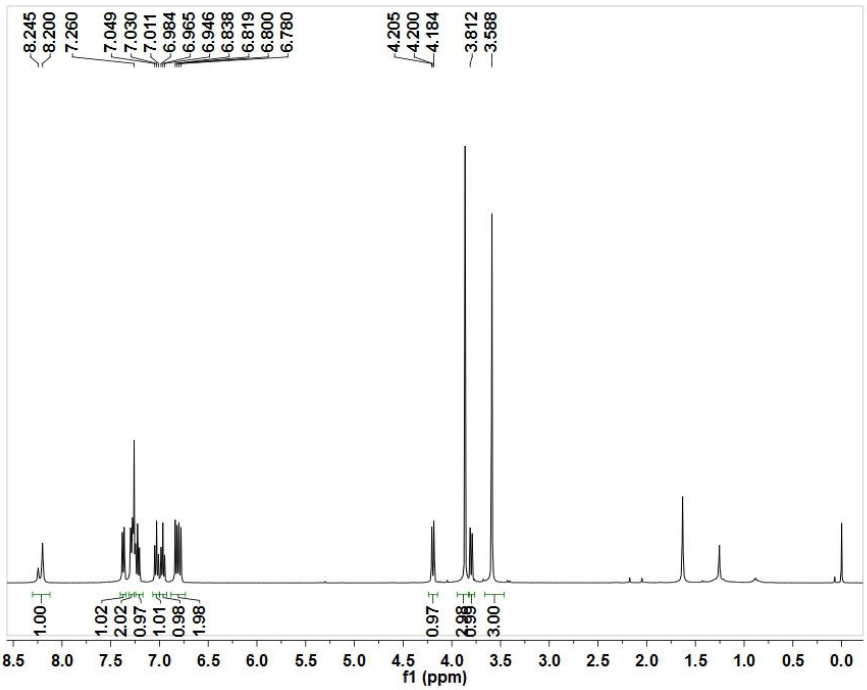
3h a'

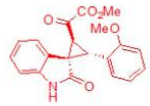
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-17T04:16:23
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -72.13
Ph1: 74.31





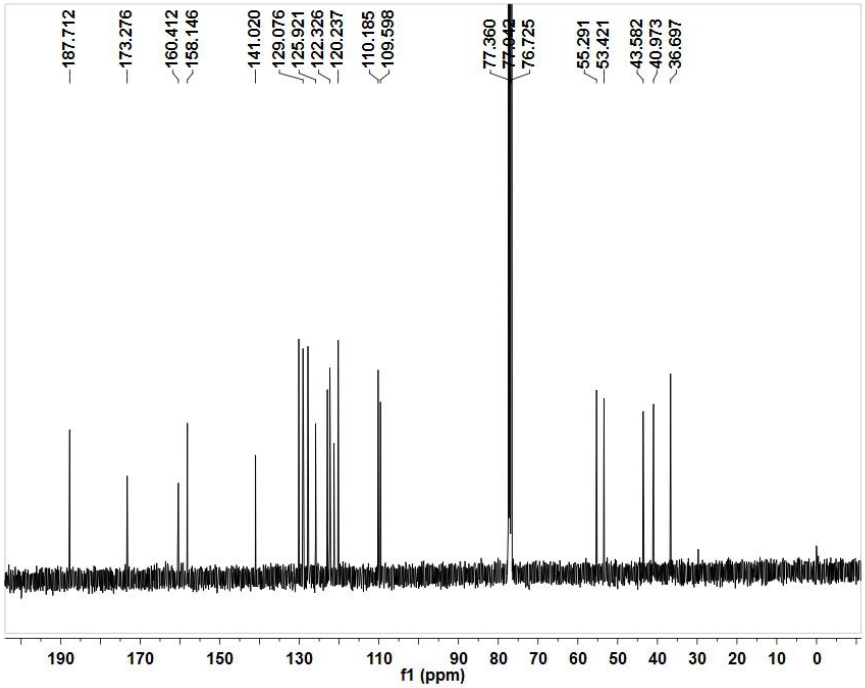
3ah'

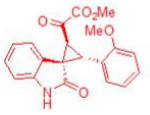
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-03-03T08:38:05
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 96.54
Ph1: 13.81





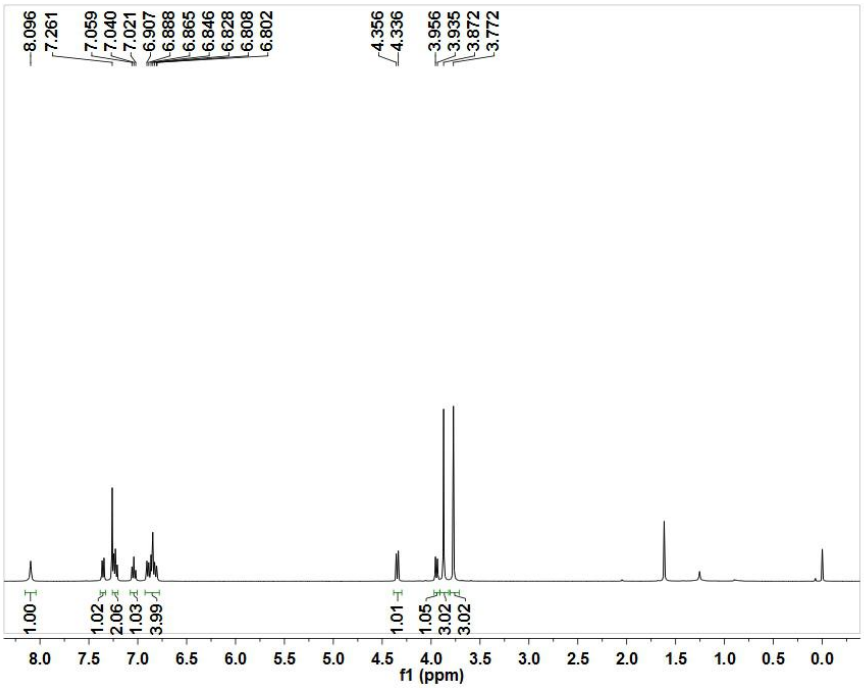
3ah'

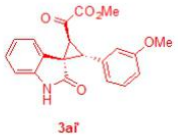
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-03-03T09:37:31
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -69.75
Ph1: 65.51





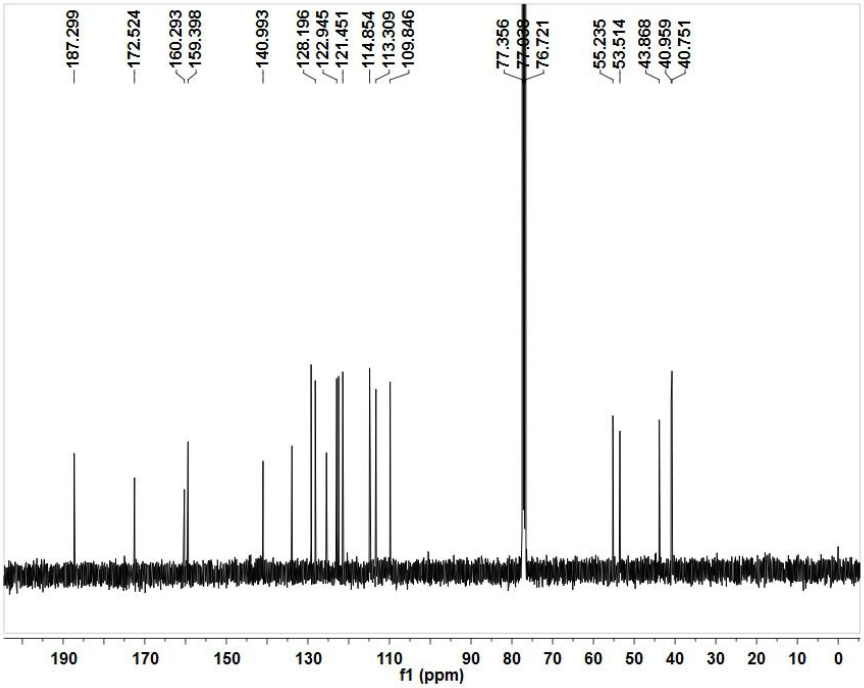
3aĭ

Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T18:06:21
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 99.83
Ph1: 9.25



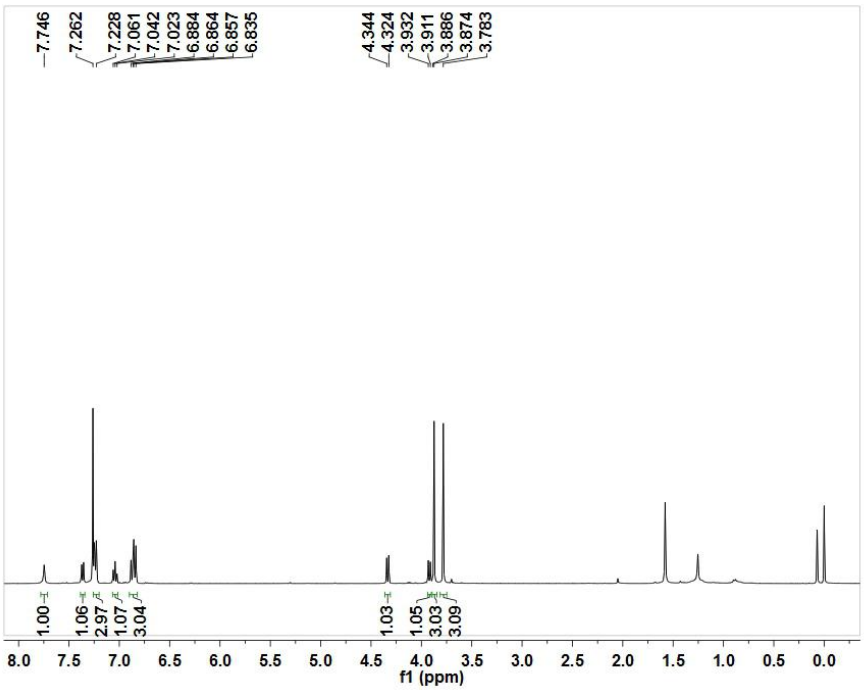
3aĭ

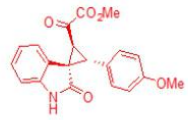
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T19:05:46
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -59.00
Ph1: 41.32





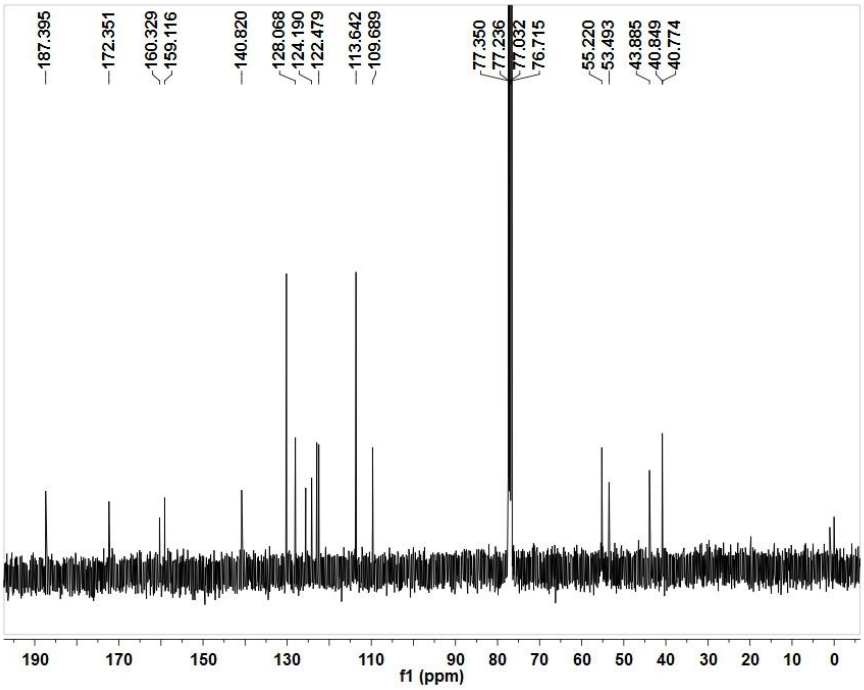
3aj'

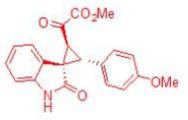
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T19:19:10
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 101.09
Ph1: 5.57





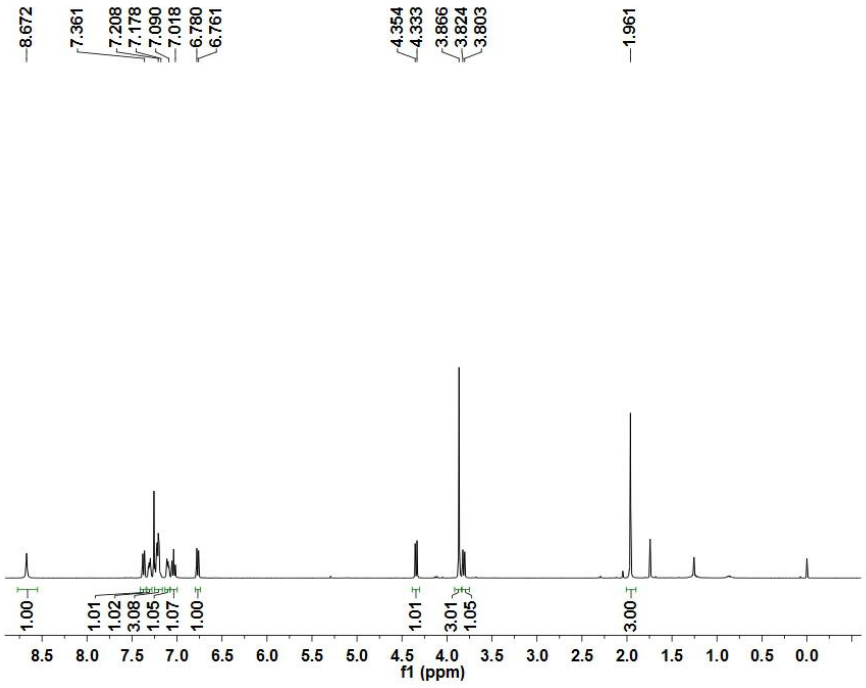
3aj'

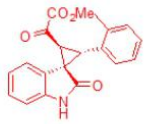
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T20:18:36
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -63.99
Ph1: 50.40





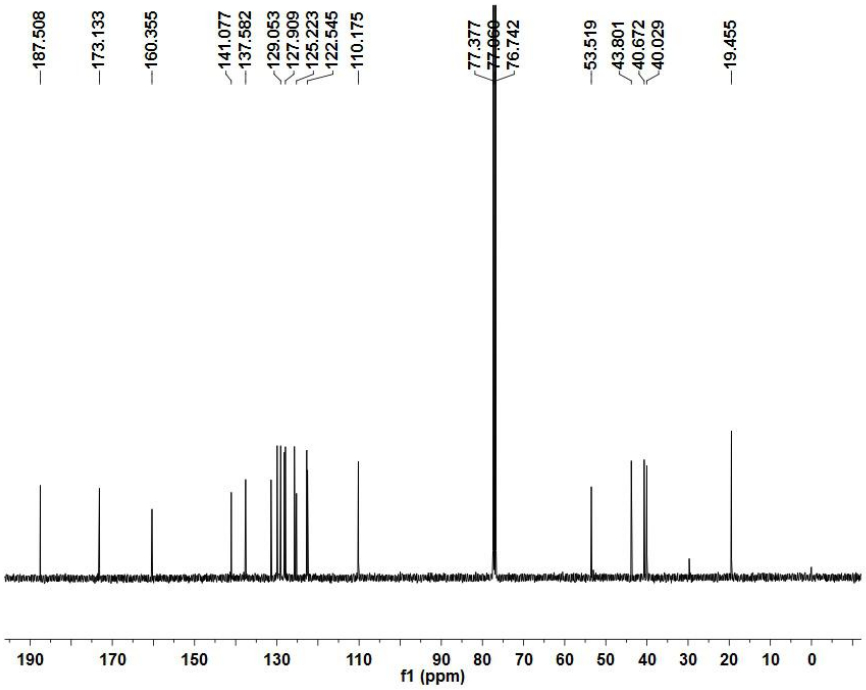
3ak'

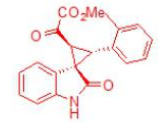
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T01:43:23
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -265.85
Ph1: 18.77





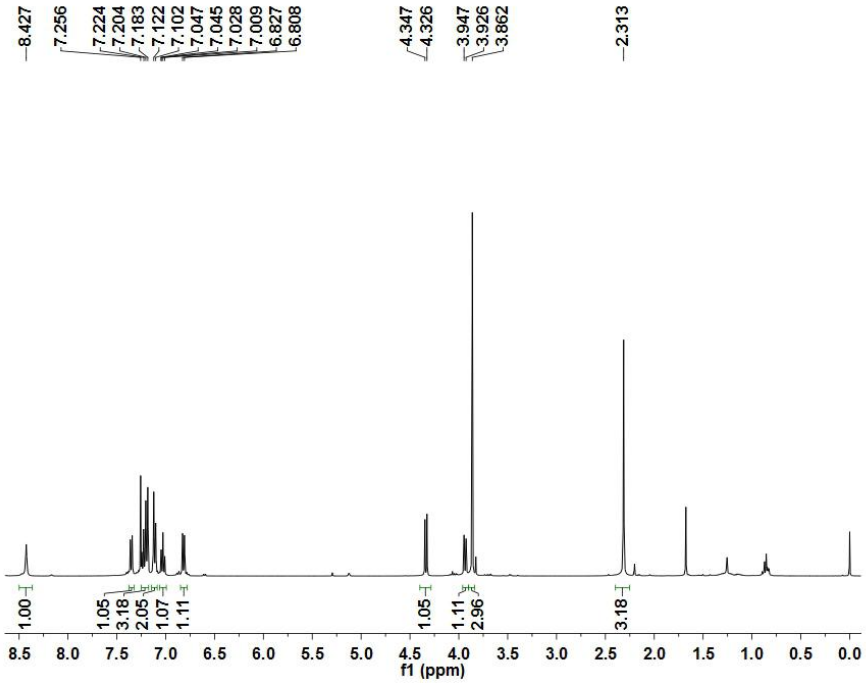
3ak'

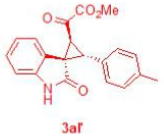
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T02:13:35
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -62.33
Ph1: 66.05





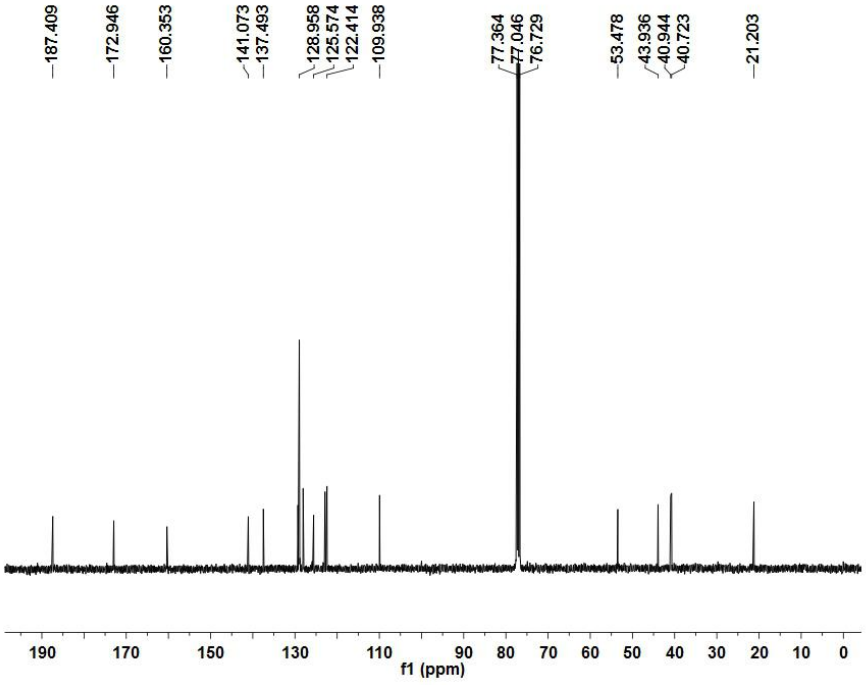
3af

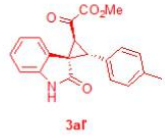
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-05T19:55:38
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 91.85
Ph1: 13.50





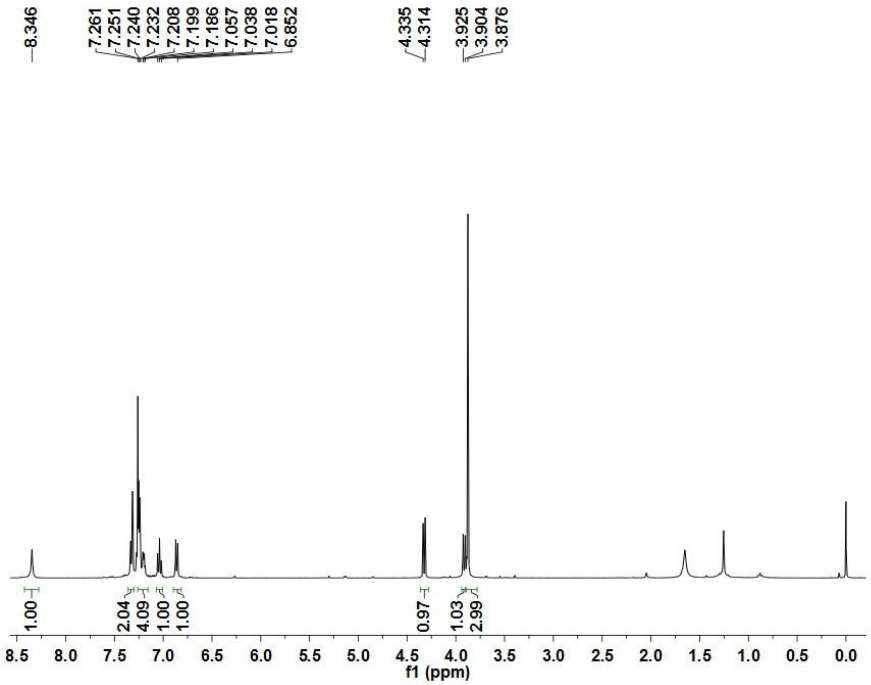
3af

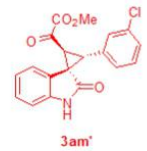
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-05T20:25:49
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -76.40
Ph1: 71.00





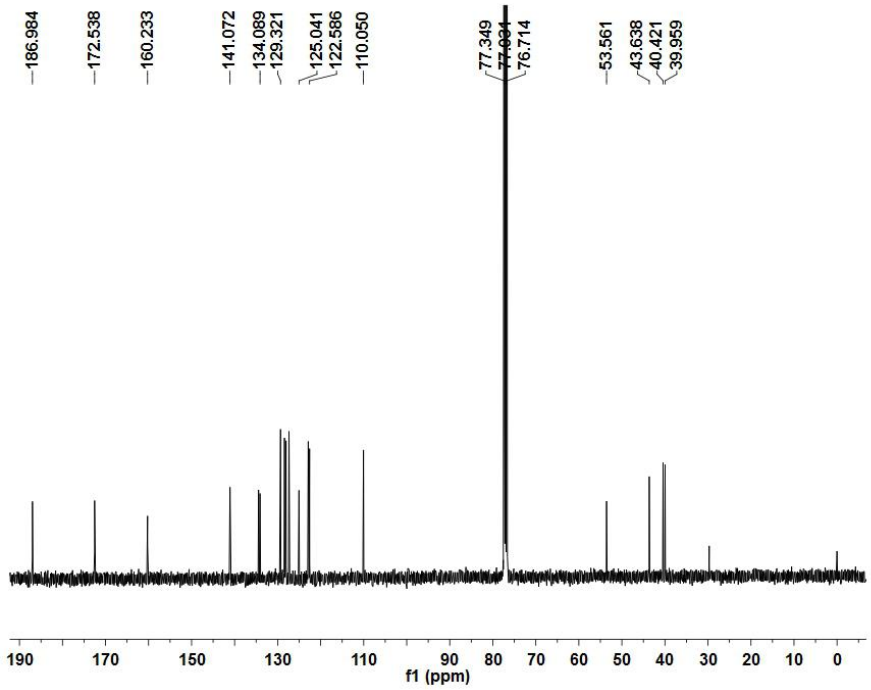
3am'

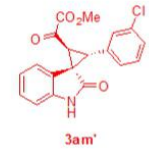
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-07-07T15:53:17
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 296.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.45
Ph1: 10.24





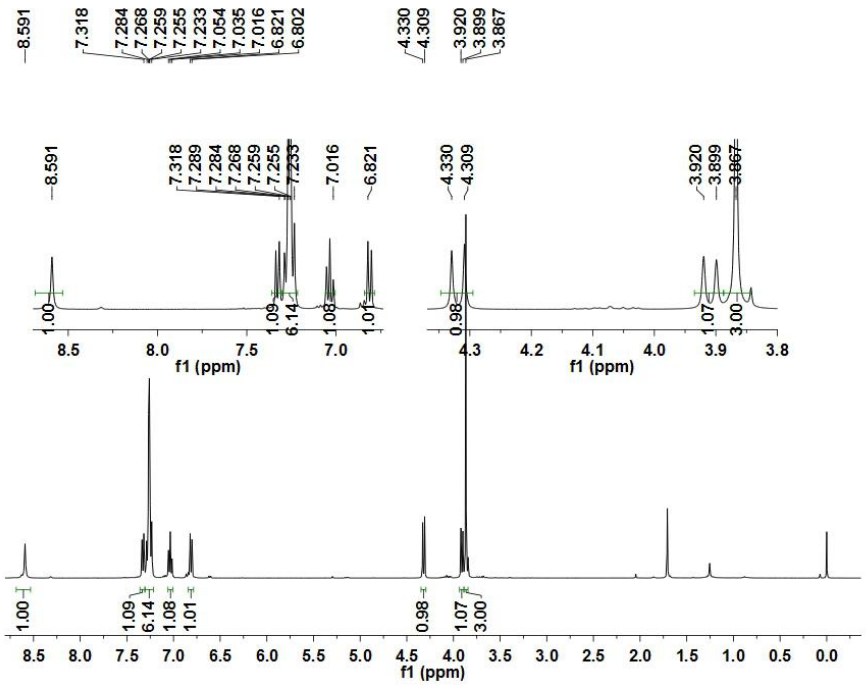
3am'

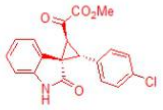
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-07-07T16:52:58
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296.9 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -74.79
Ph1: 67.84





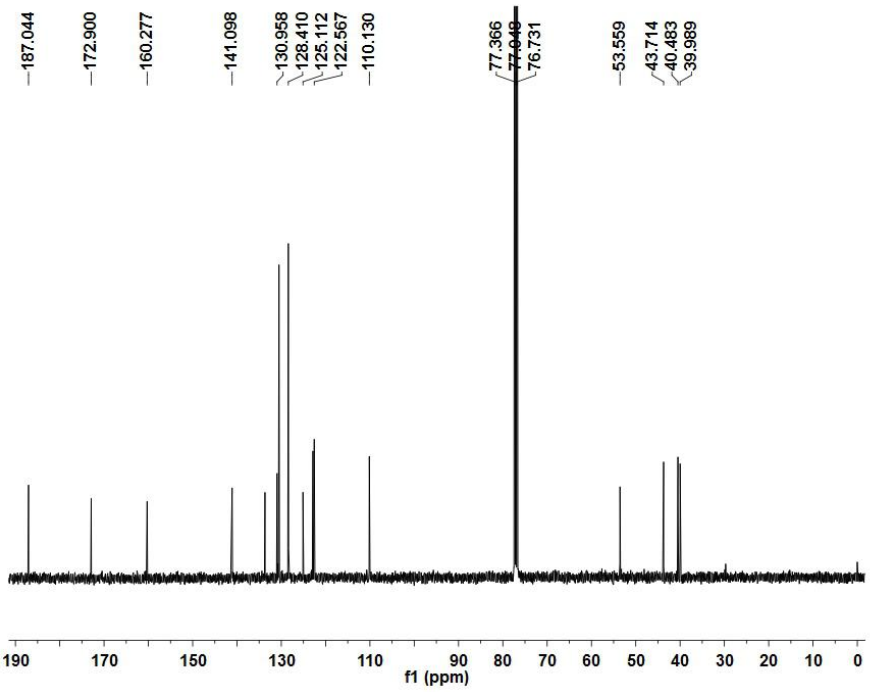
3an'

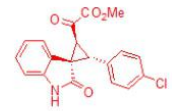
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-15T17:27:55
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 91.48
Ph1: 16.56





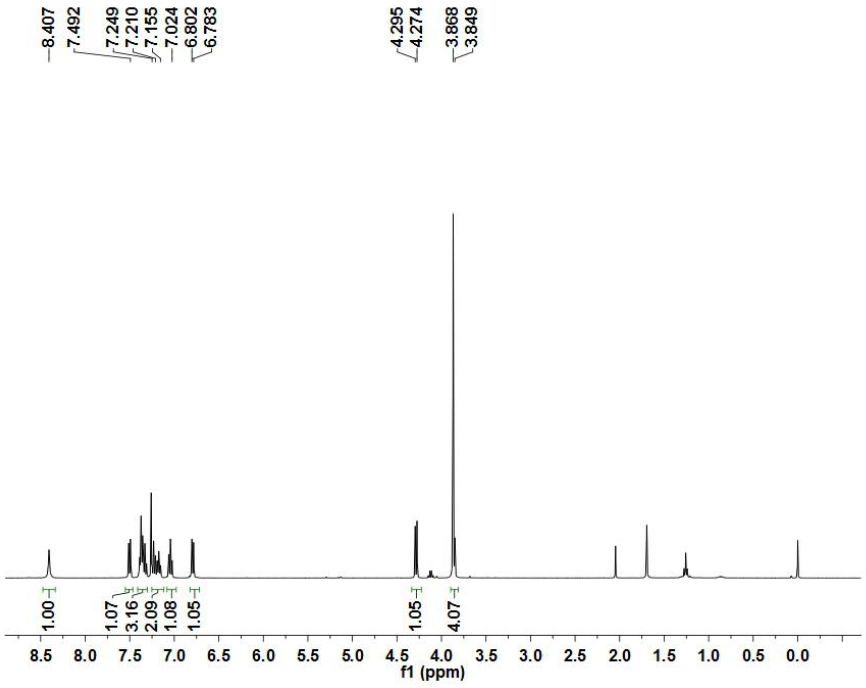
3an'

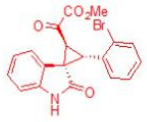
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-15T17:58:07
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -69.78
Ph1: 62.71





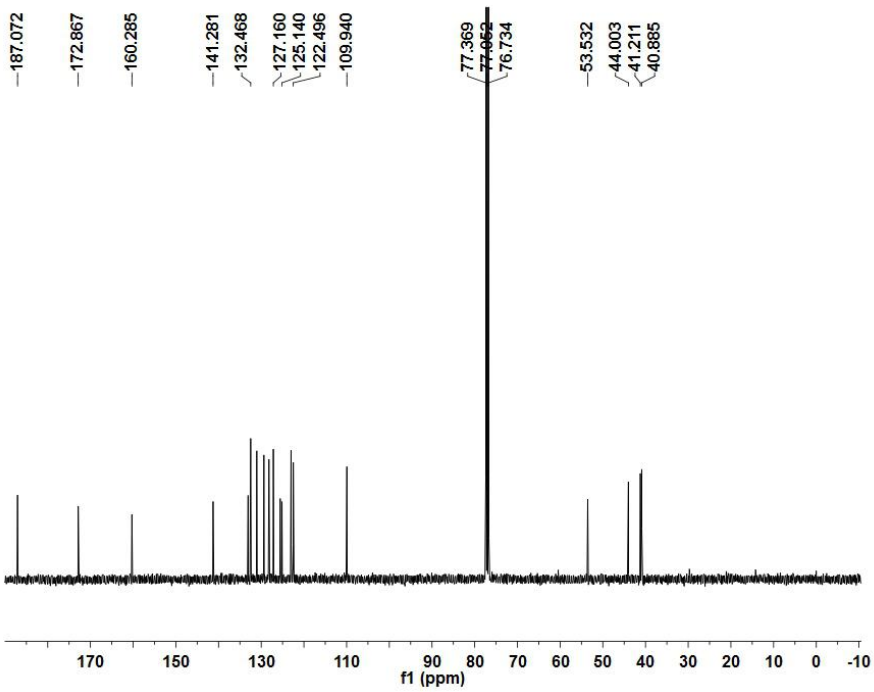
3ao'

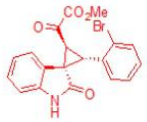
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-15T17:20:12
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 90.19
Ph1: 17.13





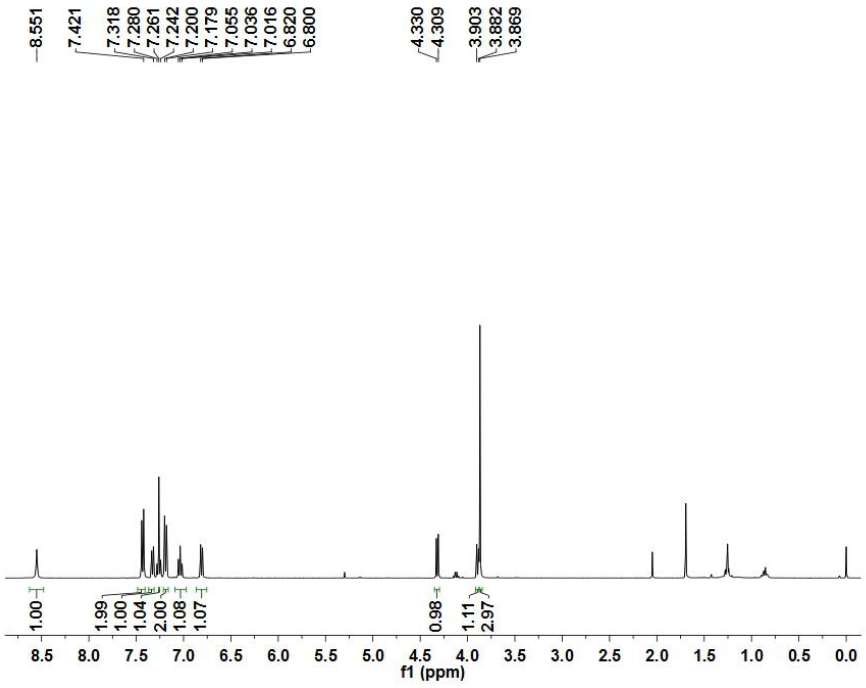
3ao'

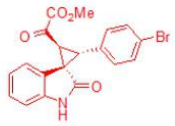
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-15T17:14:07
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -70.77
Ph1: 62.72





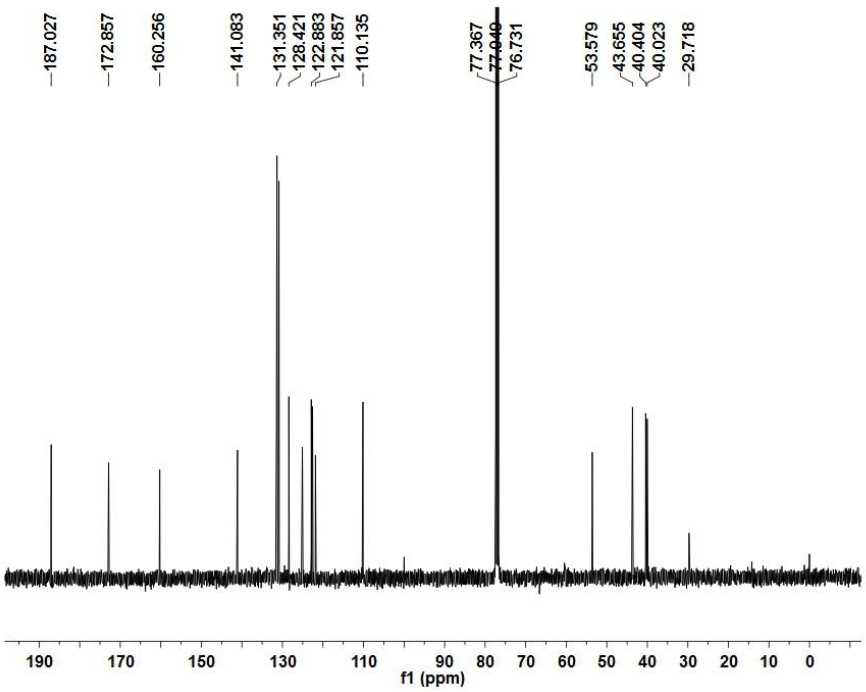
3ap'

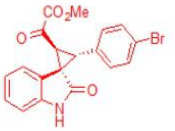
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T04:55:35
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.9 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 93.33
Ph1: 16.76





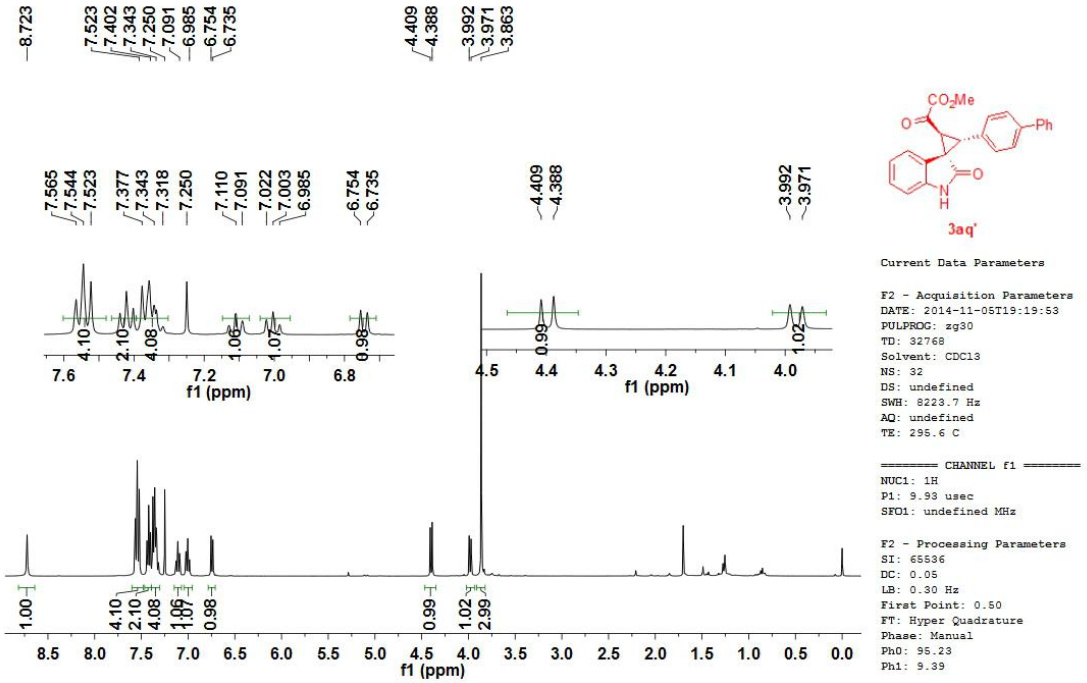
3ap'

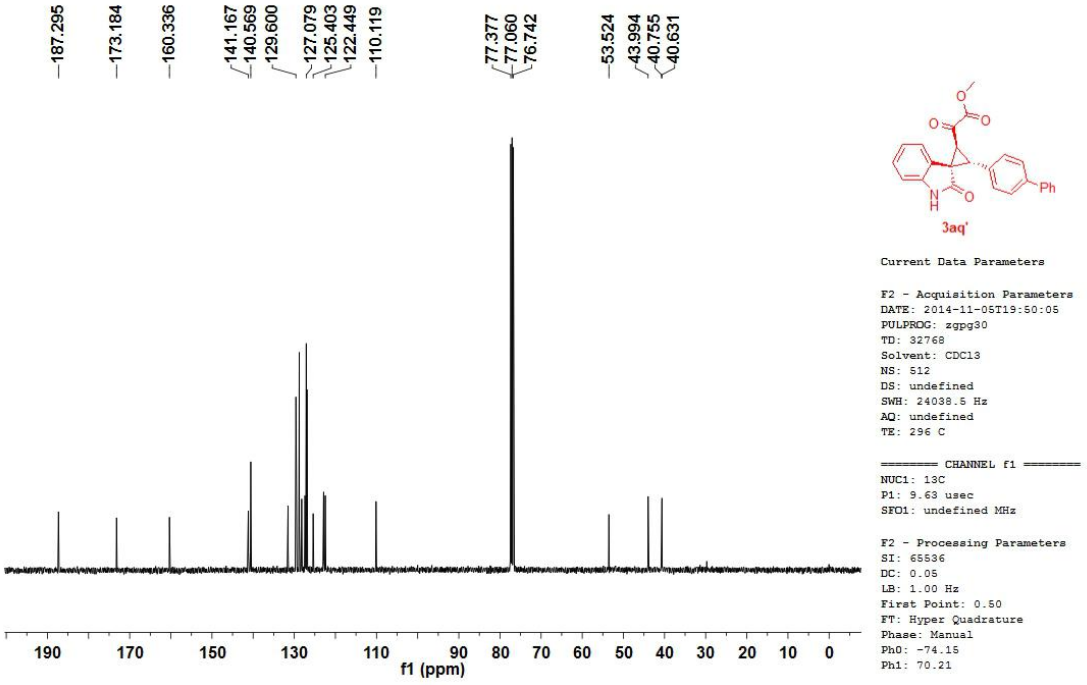
Current Data Parameters

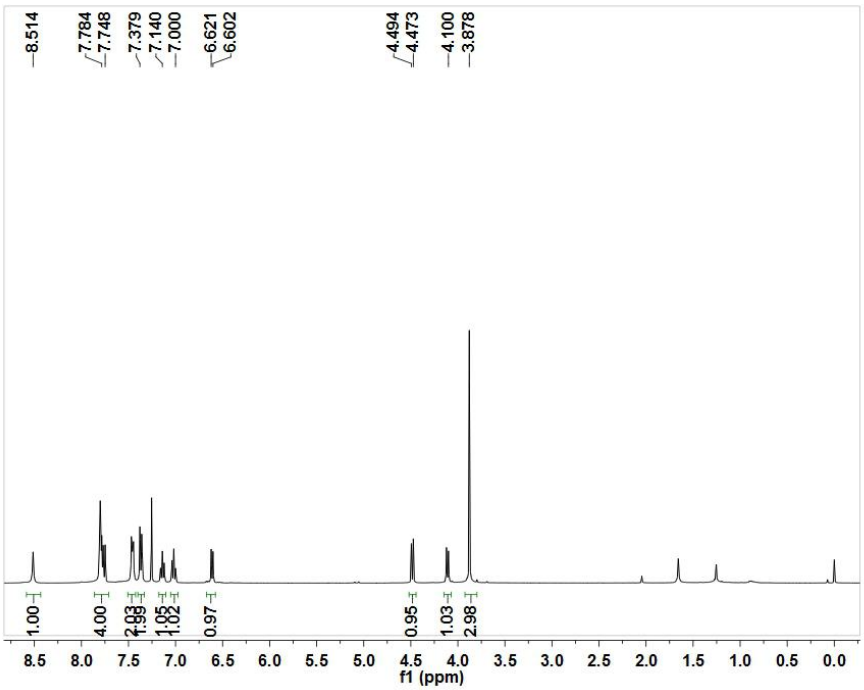
F2 - Acquisition Parameters
DATE: 2015-01-29T05:25:47
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.4 C

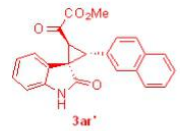
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -42.11
Ph1: 23.69


8.723
7.523
7.402
7.343
7.250
7.091
6.985
6.754
6.735
4.409
4.388
3.992
3.971
3.863
7.565
7.544
7.523
7.377
7.343
7.318
7.250
7.110
7.091
7.022
7.003
6.985
6.754
6.735
4.409
4.388
3.992
3.971
4.10
2.10
4.08
1.06
1.07
0.98
0.99
1.02
f1 (ppm)
1.00
4.10
2.10
4.08
1.06
1.07
0.98
0.99
1.02
2.99
f1 (ppm)
CO2Me
Ph
O
N
H
3aq'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2014-11-05T19:19:53
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.6 C
======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 95.23
Ph1: 9.39


187.295
173.184
160.336
141.167
140.569
129.600
127.079
125.403
122.449
110.119
77.377
77.060
76.742
53.524
43.994
40.755
40.631
f1 (ppm)
O
O
O
N
H
Ph
3aq'
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2014-11-05T19:50:05
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296 C
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -74.15
Ph1: 70.21



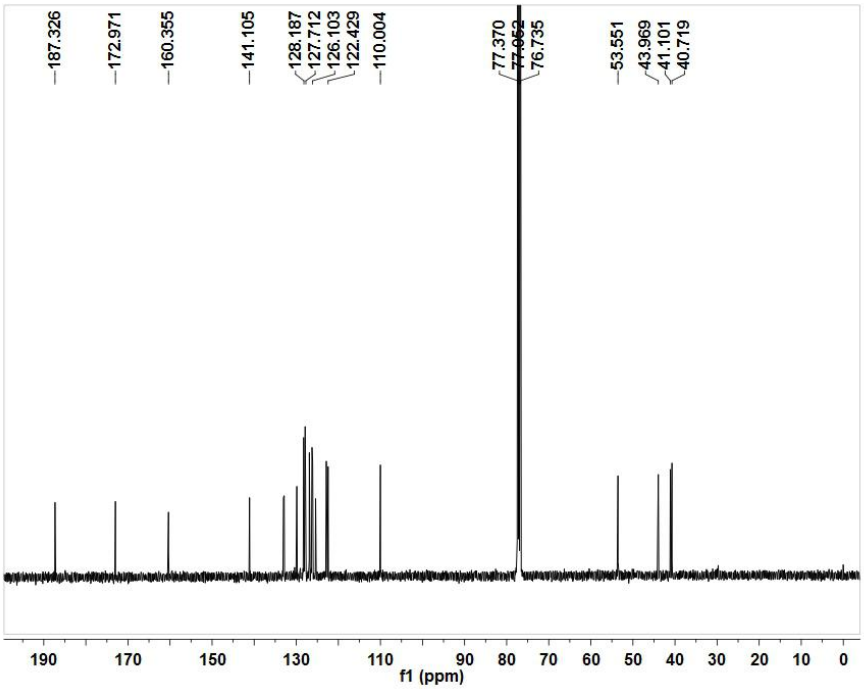


Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T20:32:24
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 99.66
Ph1: 6.08

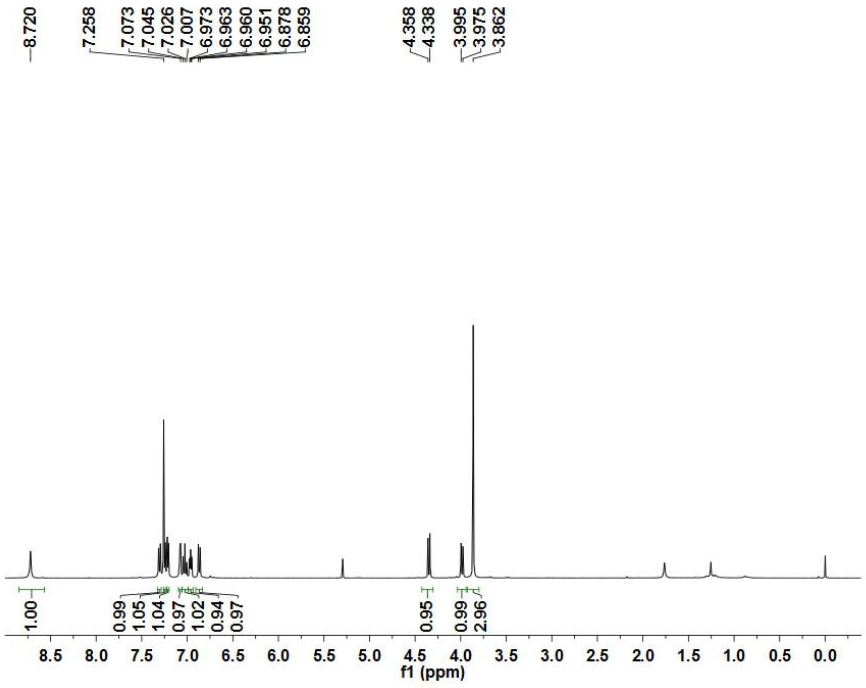


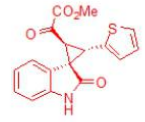
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T21:31:51
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -63.13
Ph1: 49.12





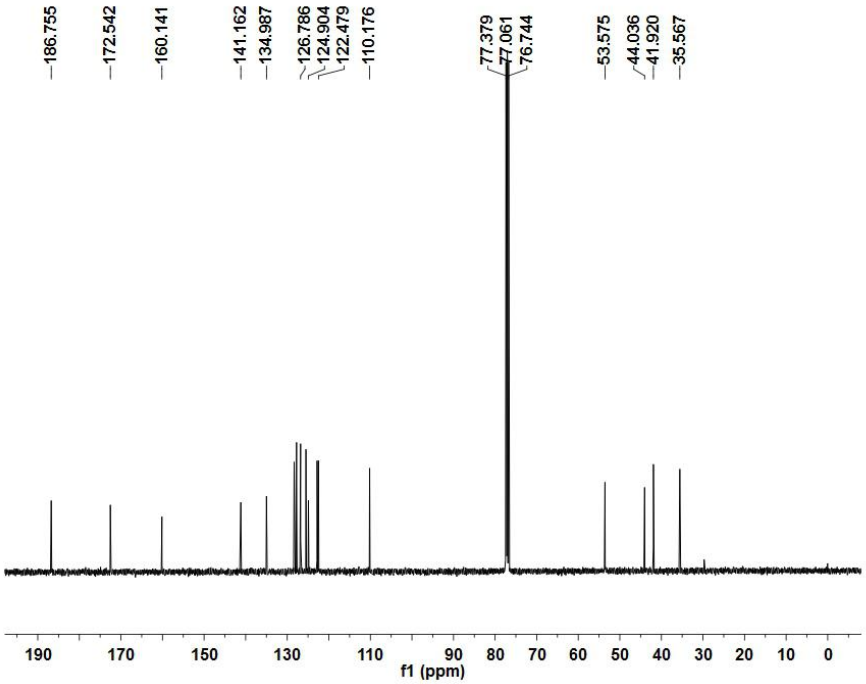
3as'

Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-22T23:57:42
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 97.83
Ph1: 15.30



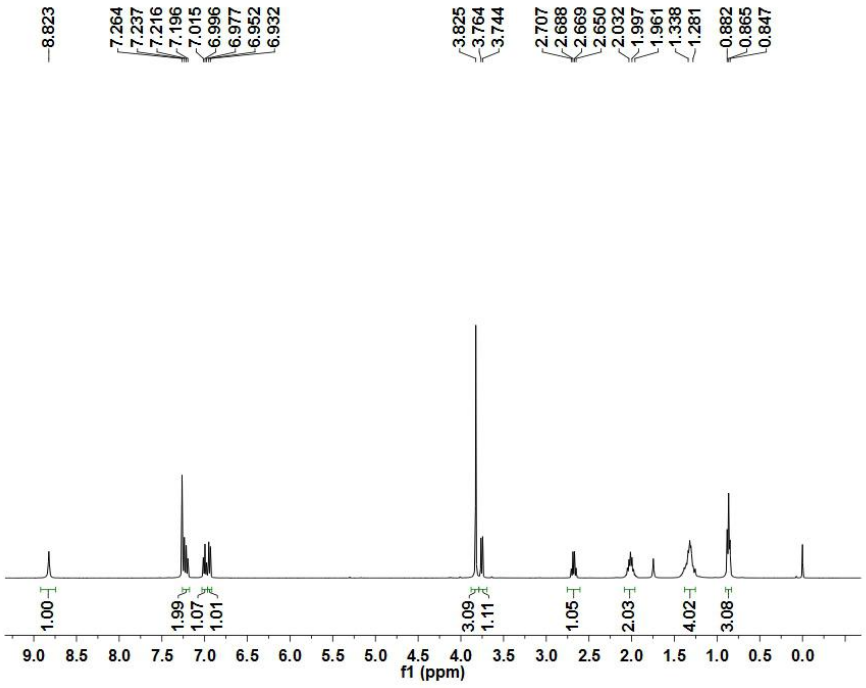
3as'

Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-23T00:27:54
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -74.89
Ph1: 81.37



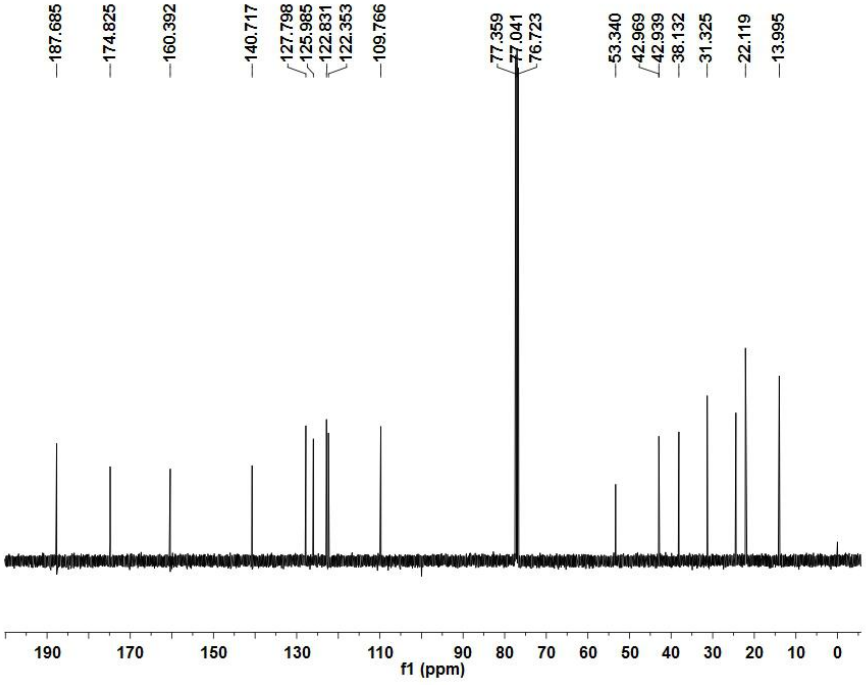
3at'

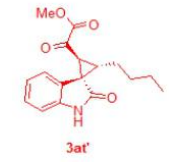
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T03:24:17
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 91.87
Ph1: 20.29





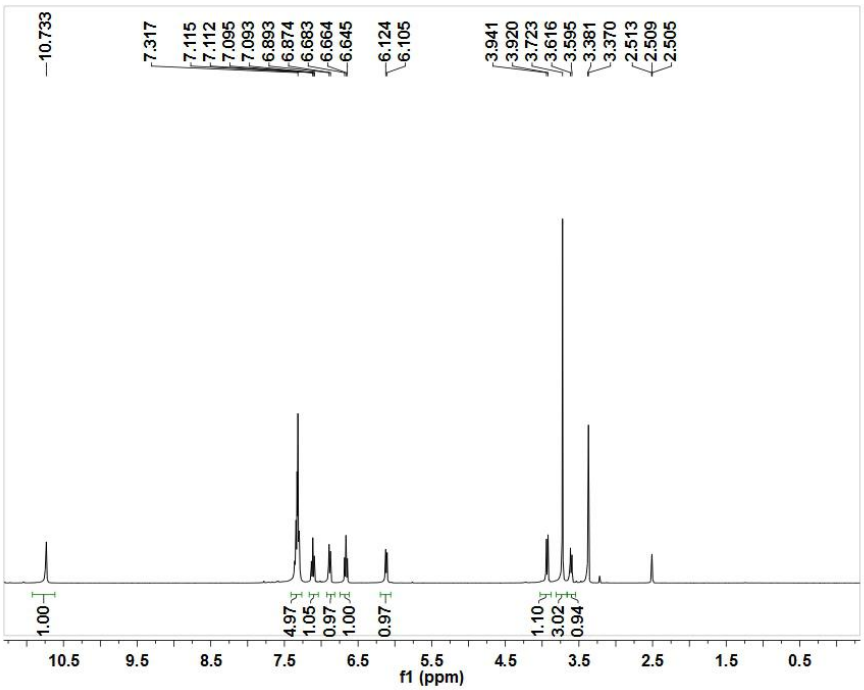
3at'

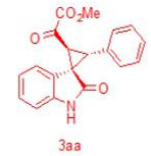
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T03:54:29
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.4 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
First Point: 0.50
FT: Hyper Quadrature
Phase: Global





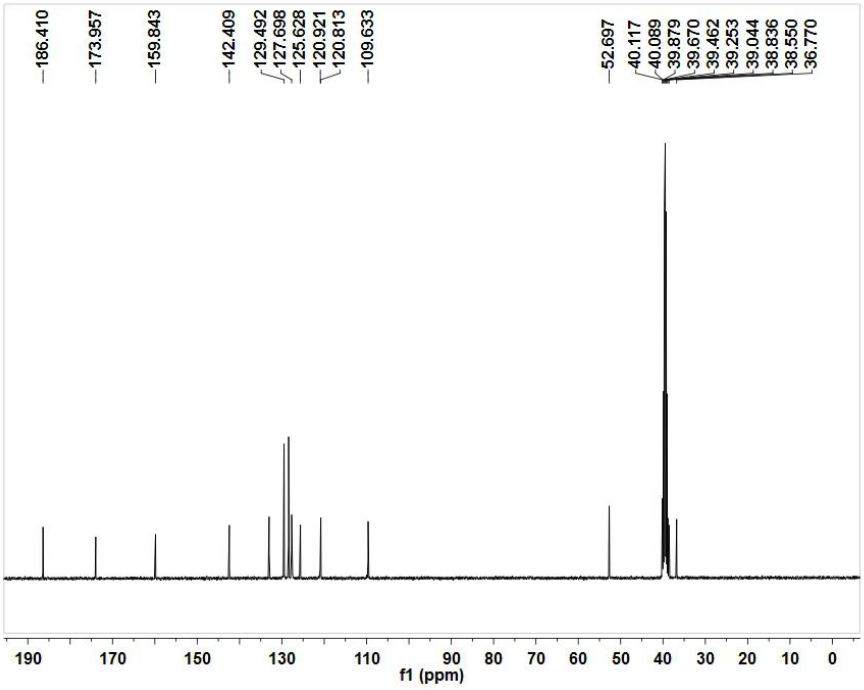
3aa

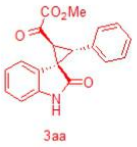
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-01T23:15:58
PULPROG: zg30
TD: 32768
Solvent: DMSO
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.4 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -263.67
Ph1: 22.35





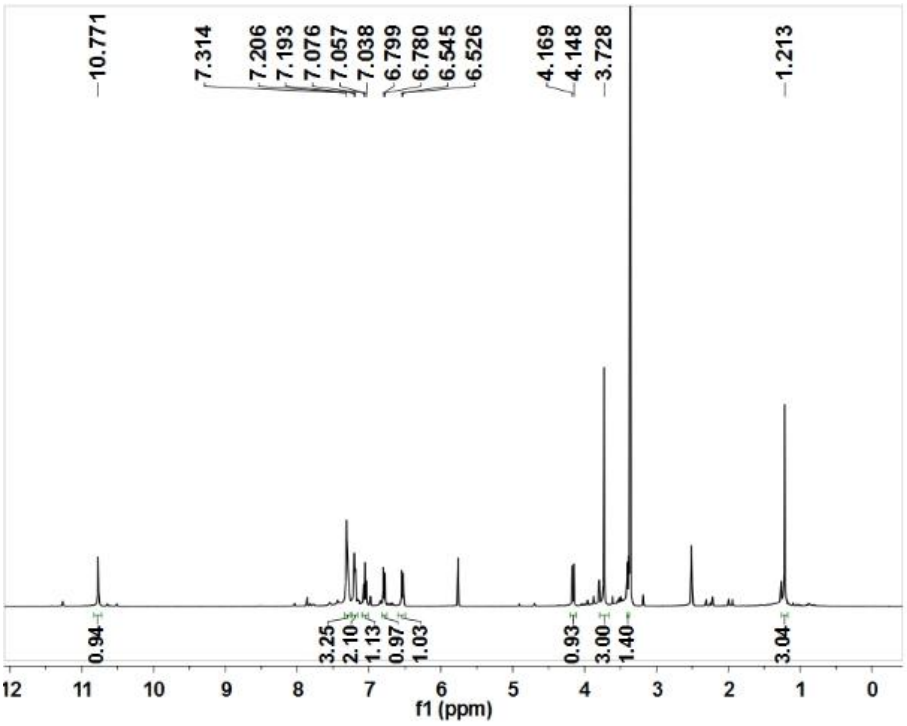
3aa

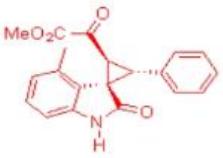
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-01T23:46:10
PULPROG: zgpg30
TD: 32768
Solvent: DMSO
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 295.8 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -66.42
Ph1: 58.90





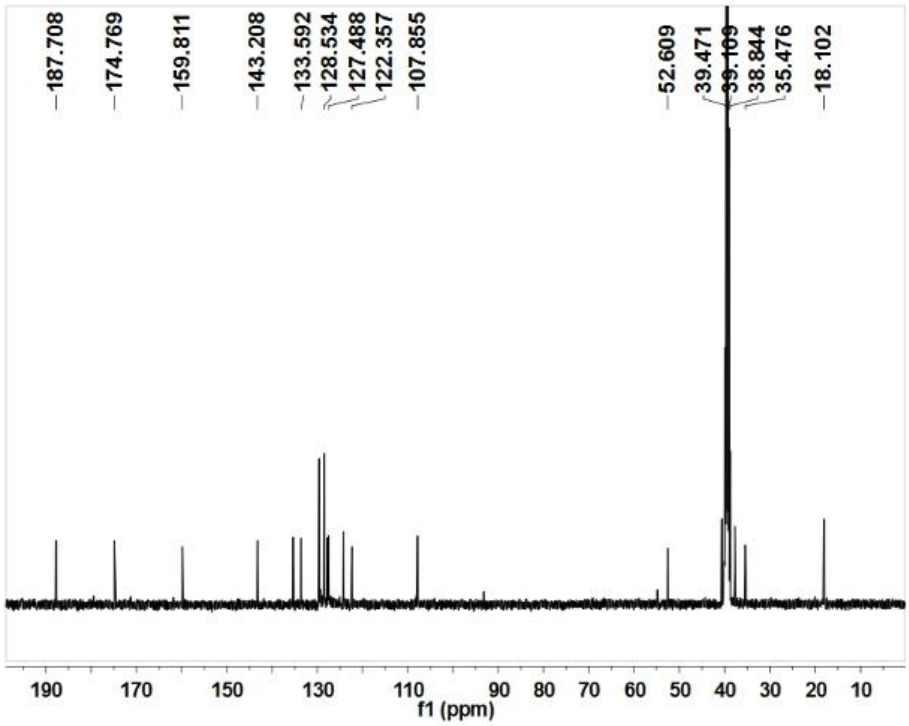
3ba

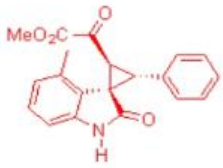
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-11T21:56:41
PULPROG: zg30
TD: 32768
Solvent: DMSO
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 296.9 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 93.33
Ph1: 20.01





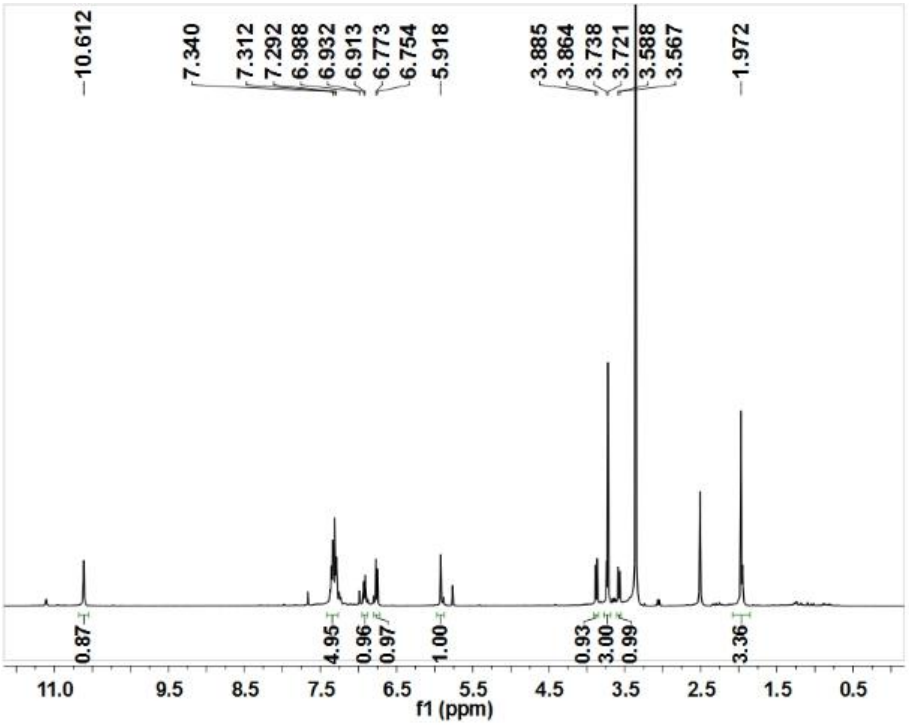
3ba

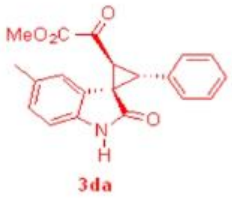
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-11T22:26:59
PULPROG: zgpg30
TD: 32768
Solvent: DMSO
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 297.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -78.08
Ph1: 80.20





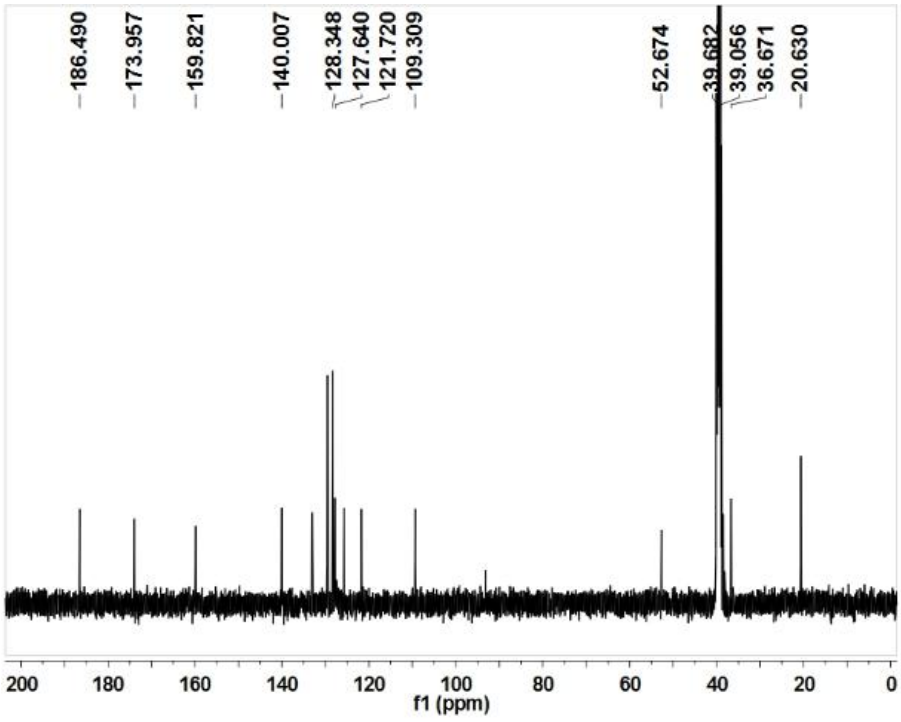
3da

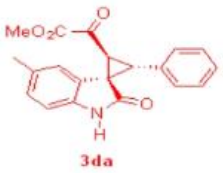
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-11T22:31:33
PULPROG: zg30
TD: 32768
Solvent: DMSO
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 297.2 C

CHANNEL f1
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 96.00
Ph1: 16.93





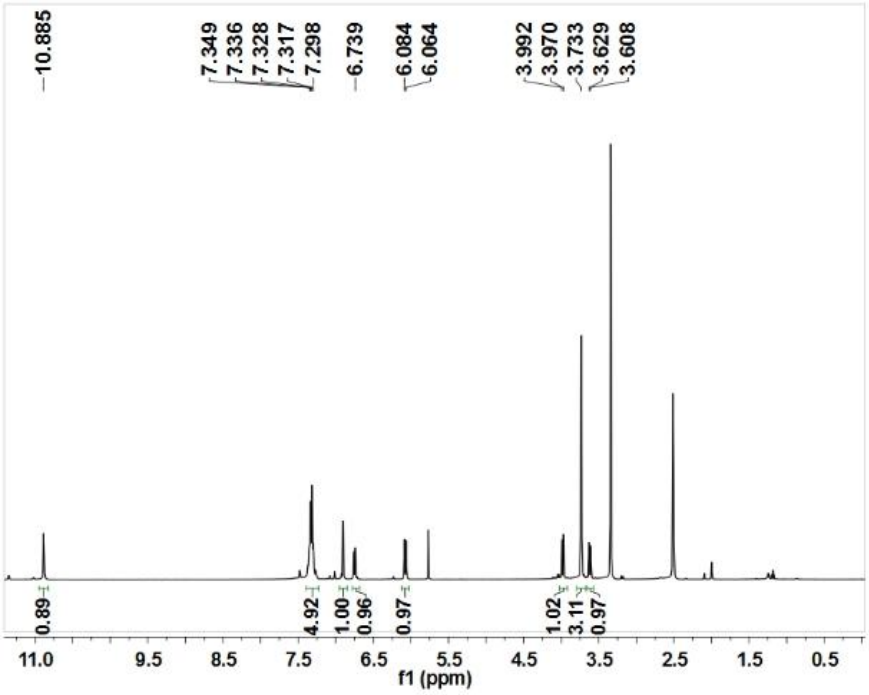
3da

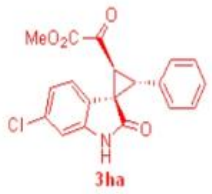
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-11T23:01:45
PULPROG: zgpg30
TD: 32768
Solvent: DMSO
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 297.4 C

CHANNEL f1
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -59.00
Ph1: 58.75



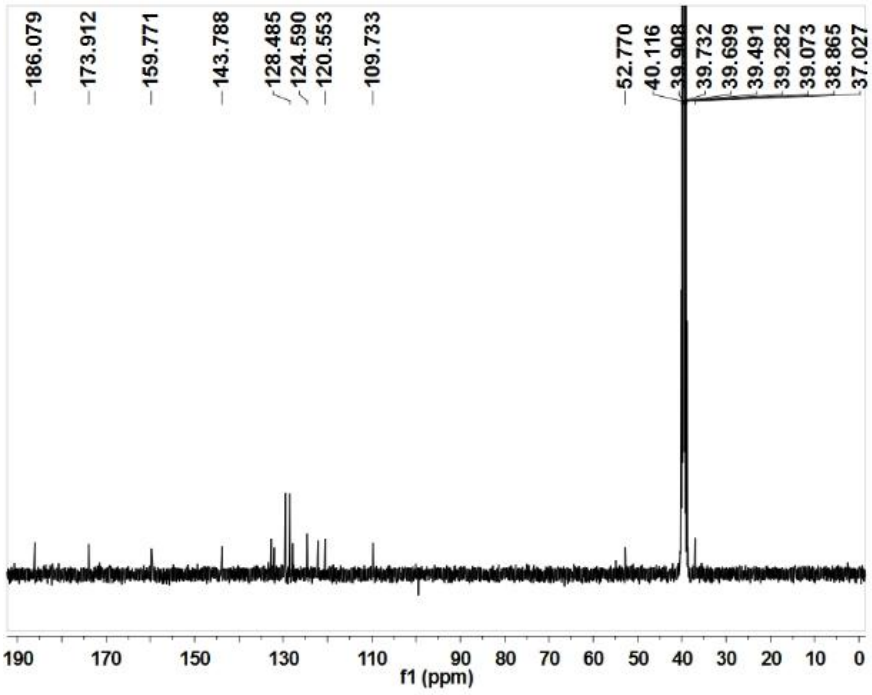


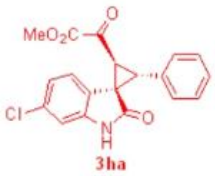
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-17T13:29:11
PULPROG: zg30
TD: 32768
Solvent: DMSO
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 297.1 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 88.01
Ph1: 20.77



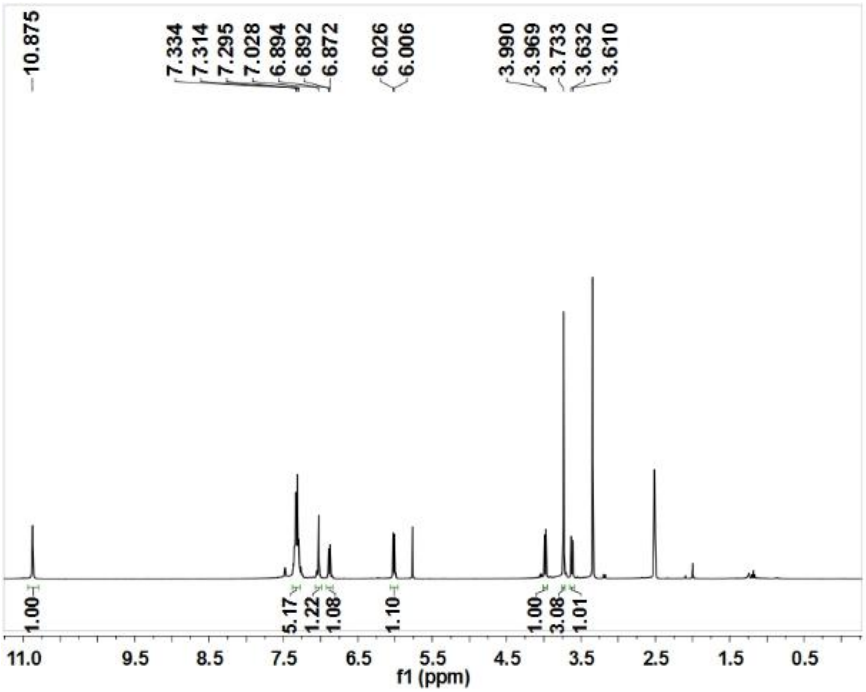


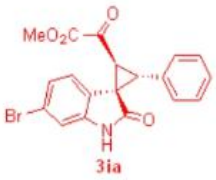
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-17T13:59:24
PULPROG: zgpg30
TD: 32768
Solvent: DMSO
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 297.5 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -30.76
Ph1: 12.62





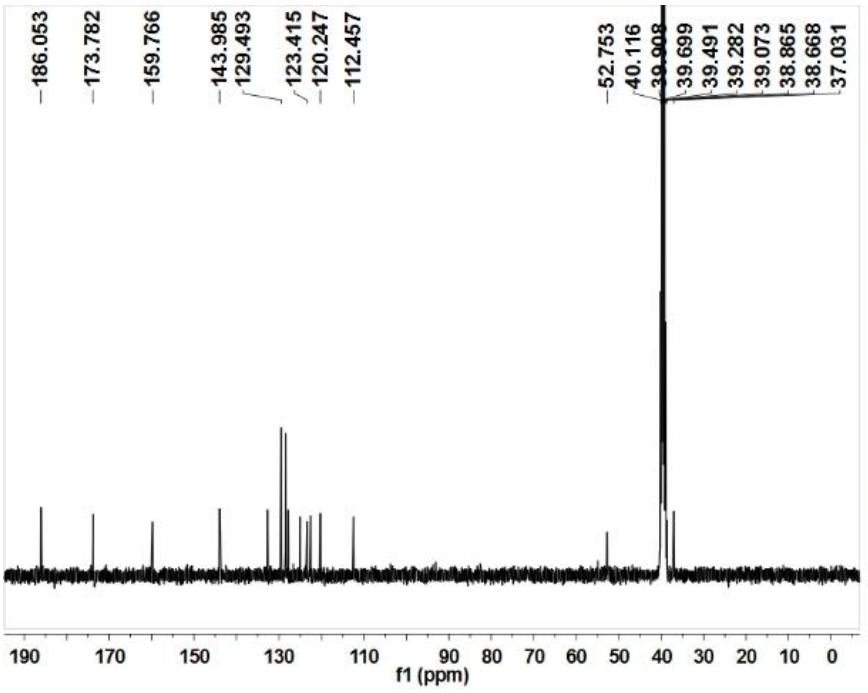
3ia

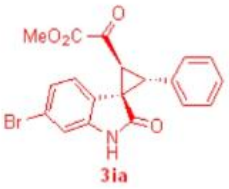
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-17T14:04:06
PULPROG: zg30
TD: 32768
Solvent: DMSO
NS: 32
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 297.3 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 89.19
Ph1: 19.84





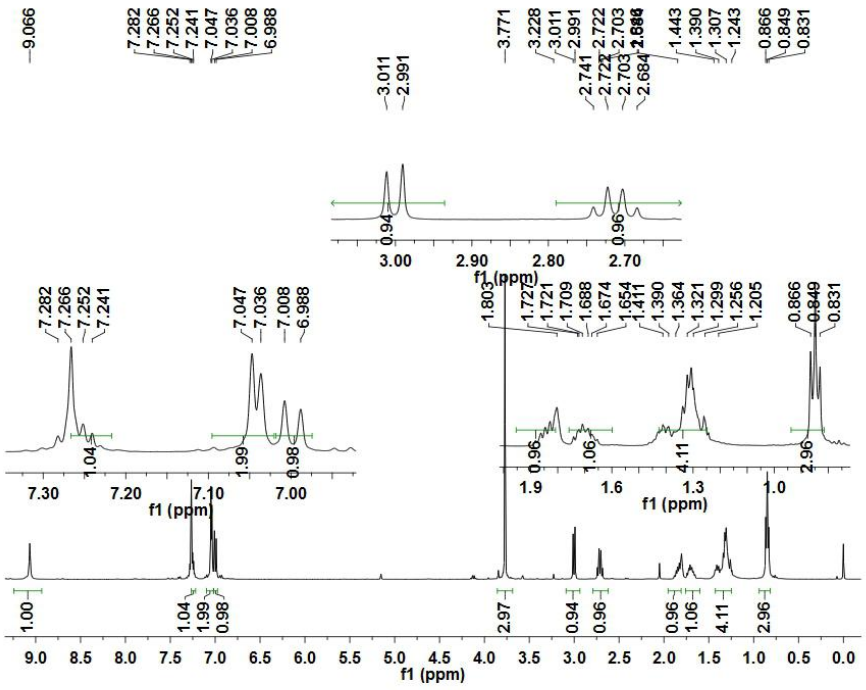
3ia

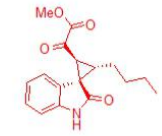
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-17T14:34:16
PULPROG: zgpg30
TD: 32768
Solvent: DMSO
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 297.6 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -49.49
Ph1: 41.71





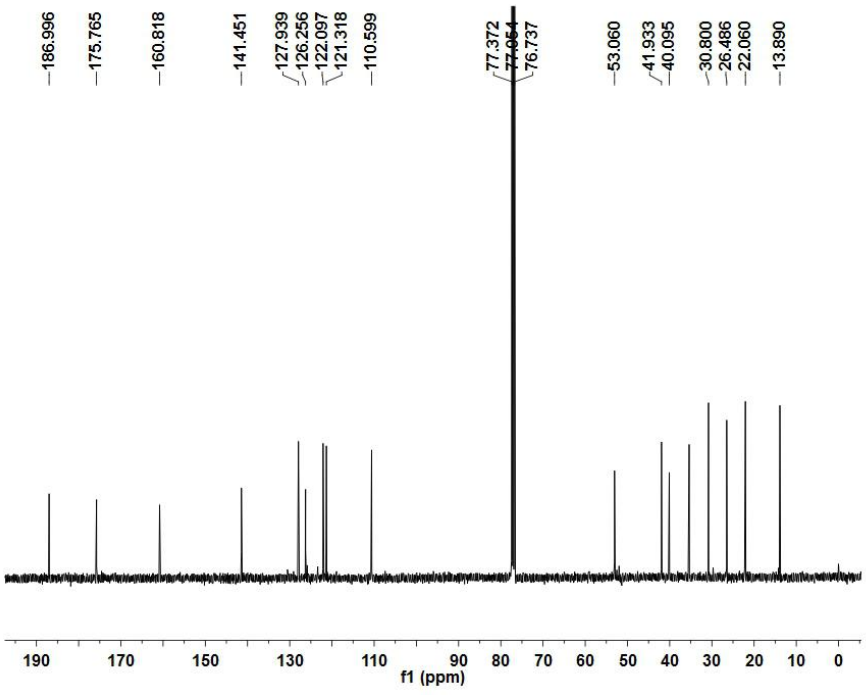
3at

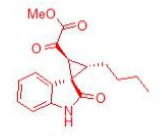
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T15:13:13
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -264.88
Ph1: 19.32





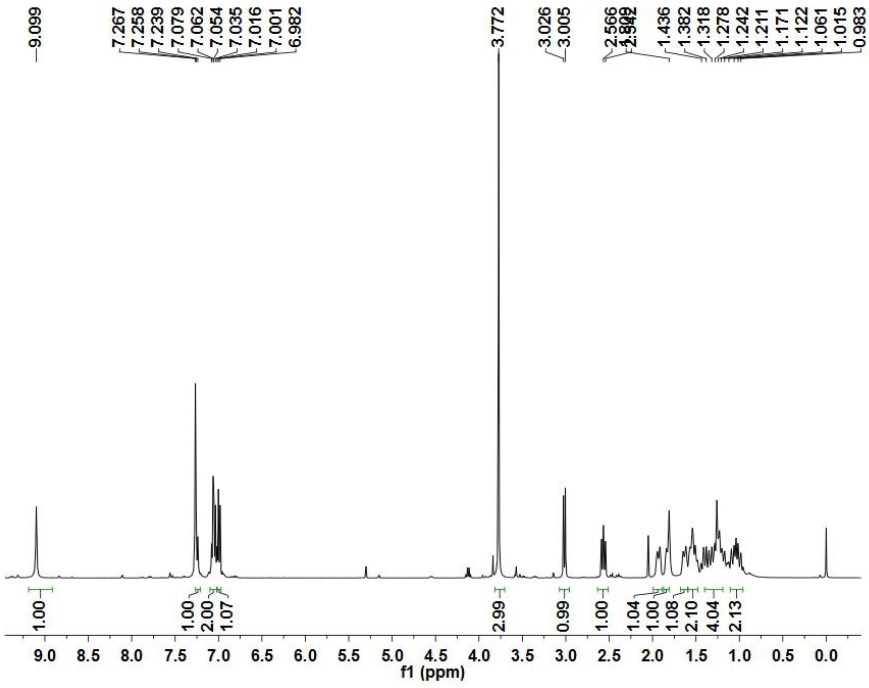
3at

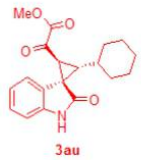
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T15:43:25
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -63.24
Ph1: 68.79





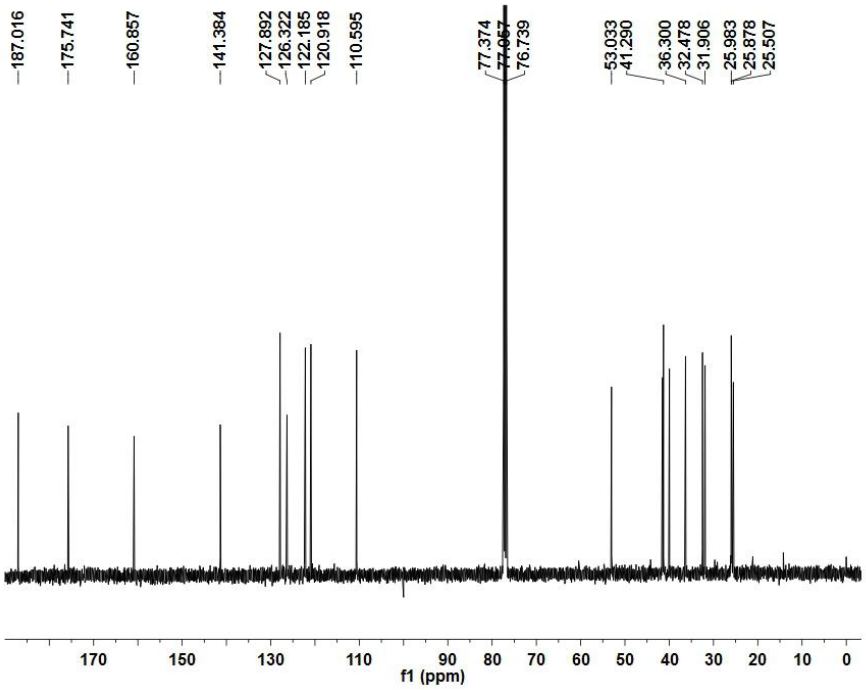
3au

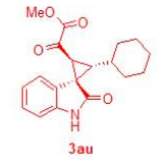
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T14:34:38
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -265.44
Ph1: 17.76





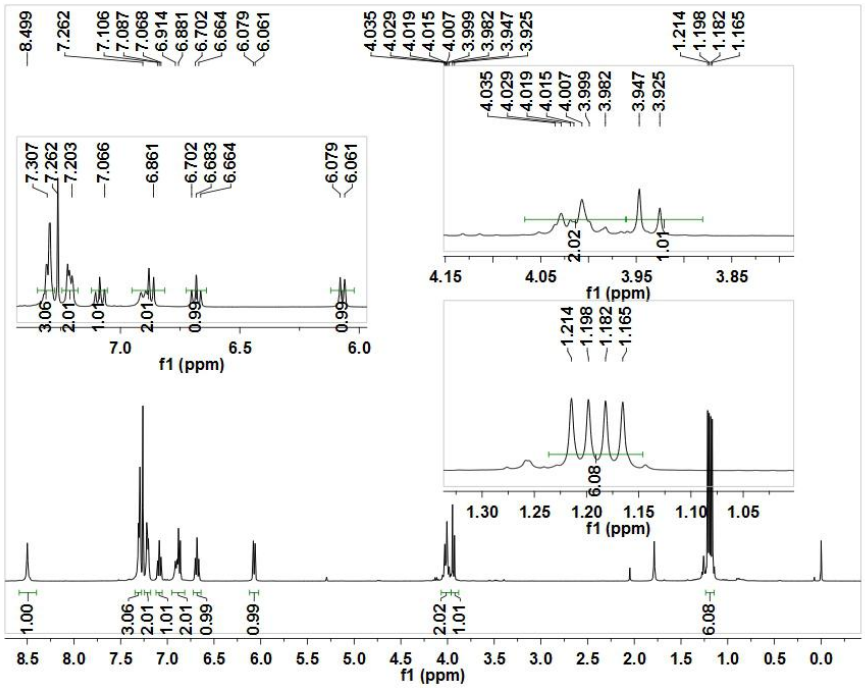
3au

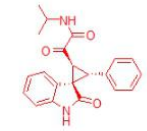
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-03T15:04:50
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -67.65
Ph1: 72.10





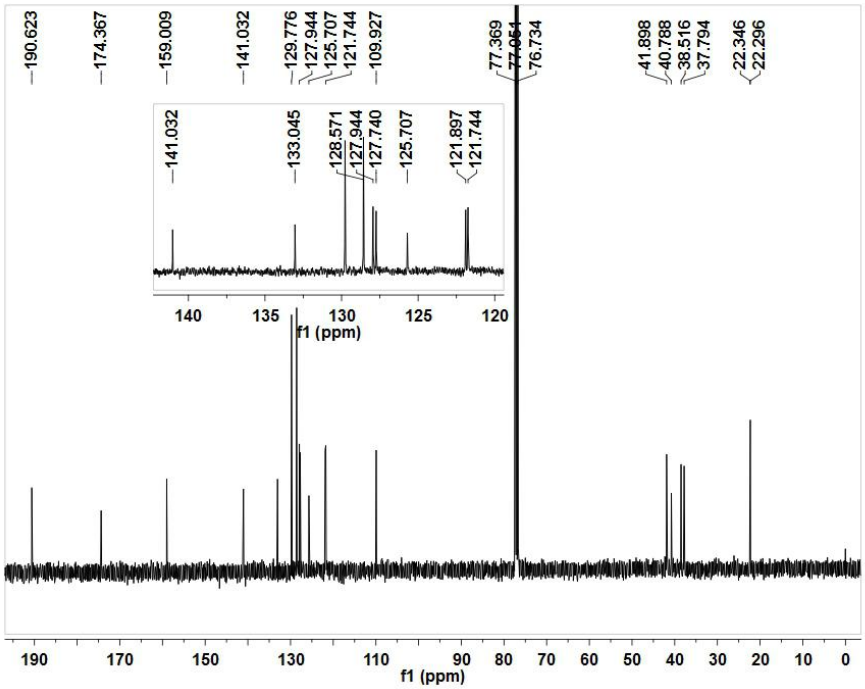
4aa

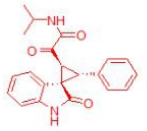
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-02T01:09:52
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.4 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.99
Ph1: 16.29





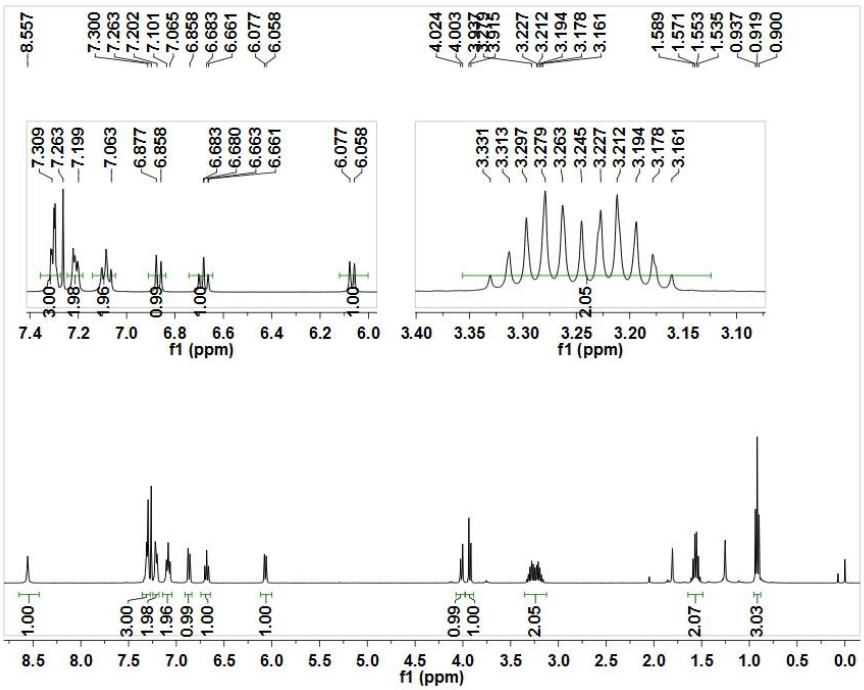
4aa

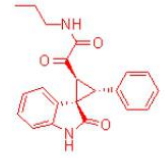
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-02T01:18:15
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 295.7 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -96.01
Ph1: 103.51





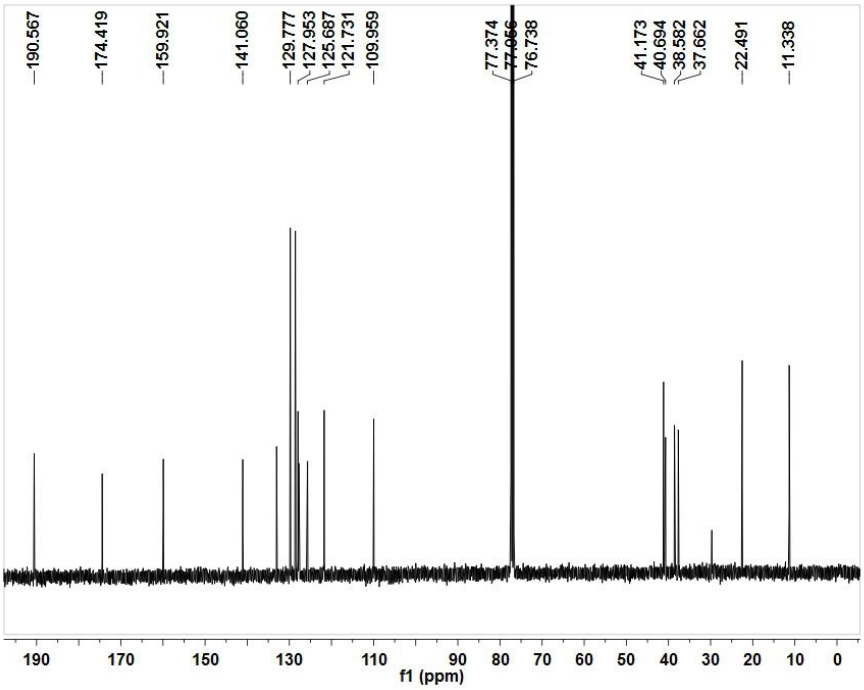
4ab

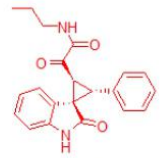
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-03T22:14:29
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 16
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -262.16
Ph1: 17.77





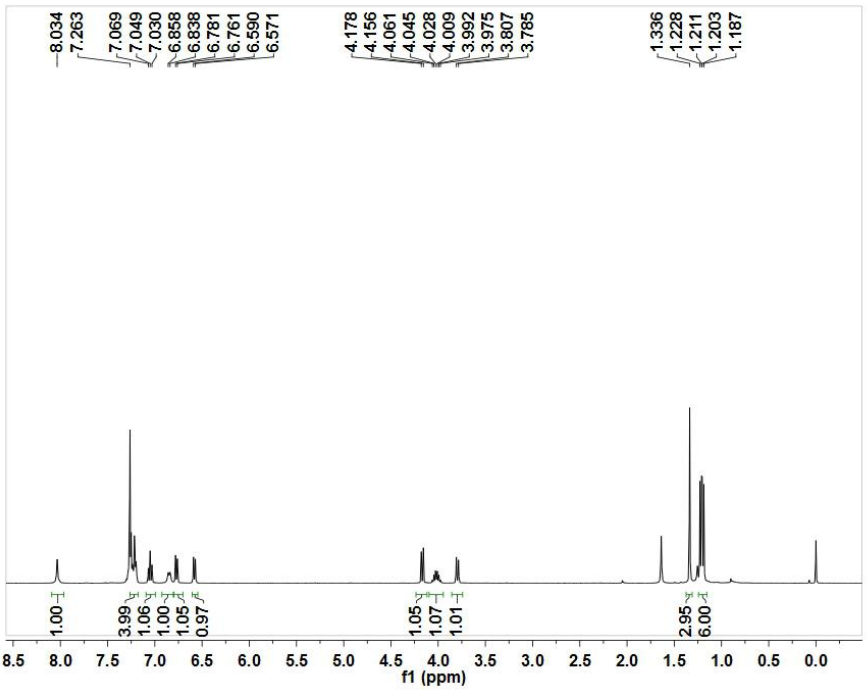
4aa'

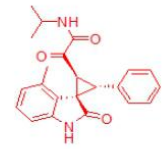
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-03T22:30:07
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 256
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.4 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -65.26
Ph1: 62.70





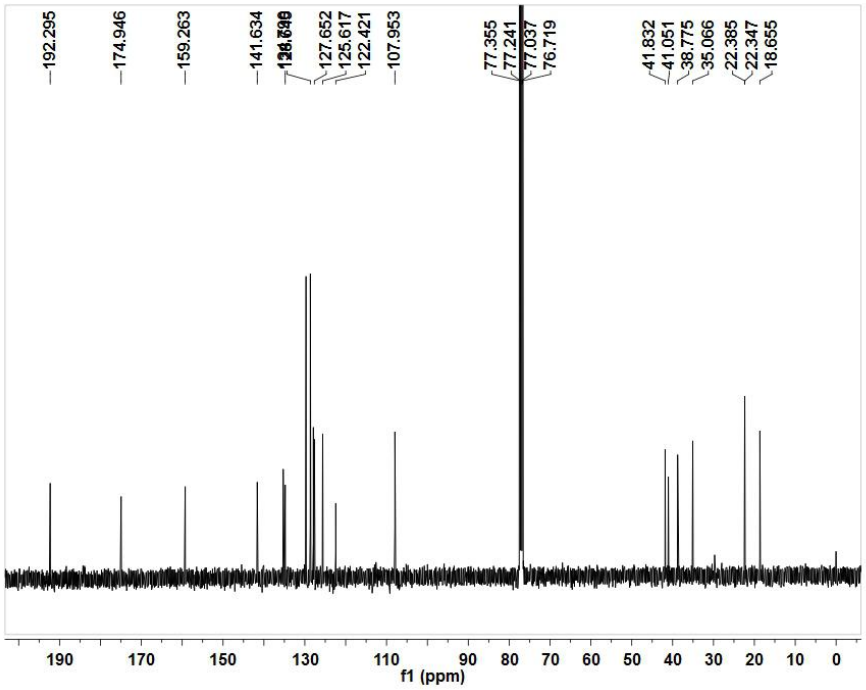
4ba

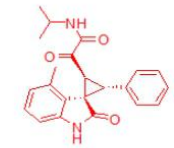
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T22:58:01
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 128
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 95.09
Ph1: 17.05





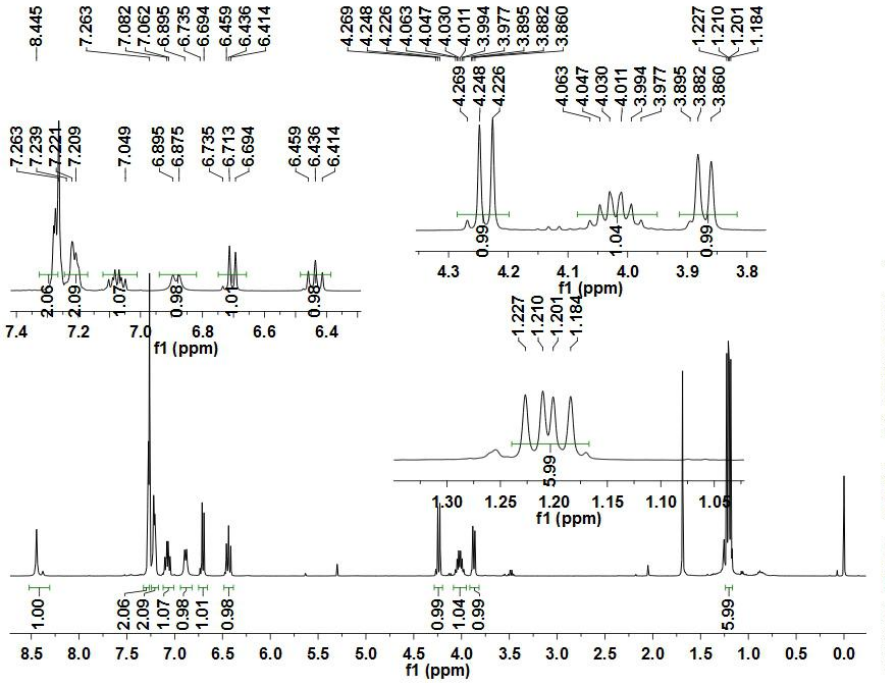
4ba

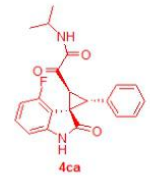
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-25T23:57:27
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -53.83
Ph1: 36.10



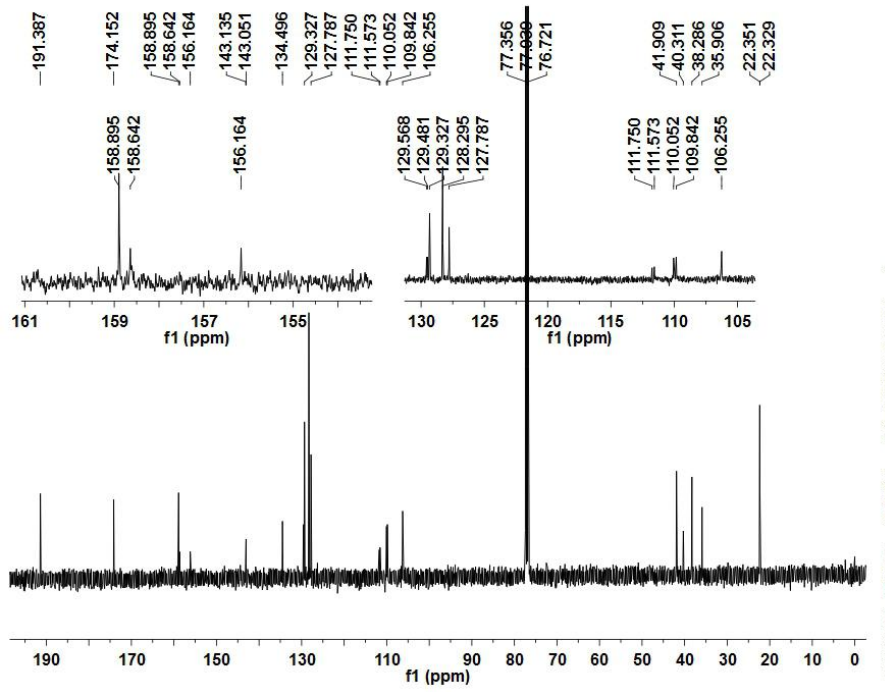


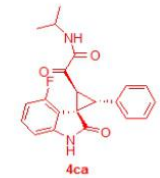
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T02:21:53
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -267.64
Ph1: 18.03



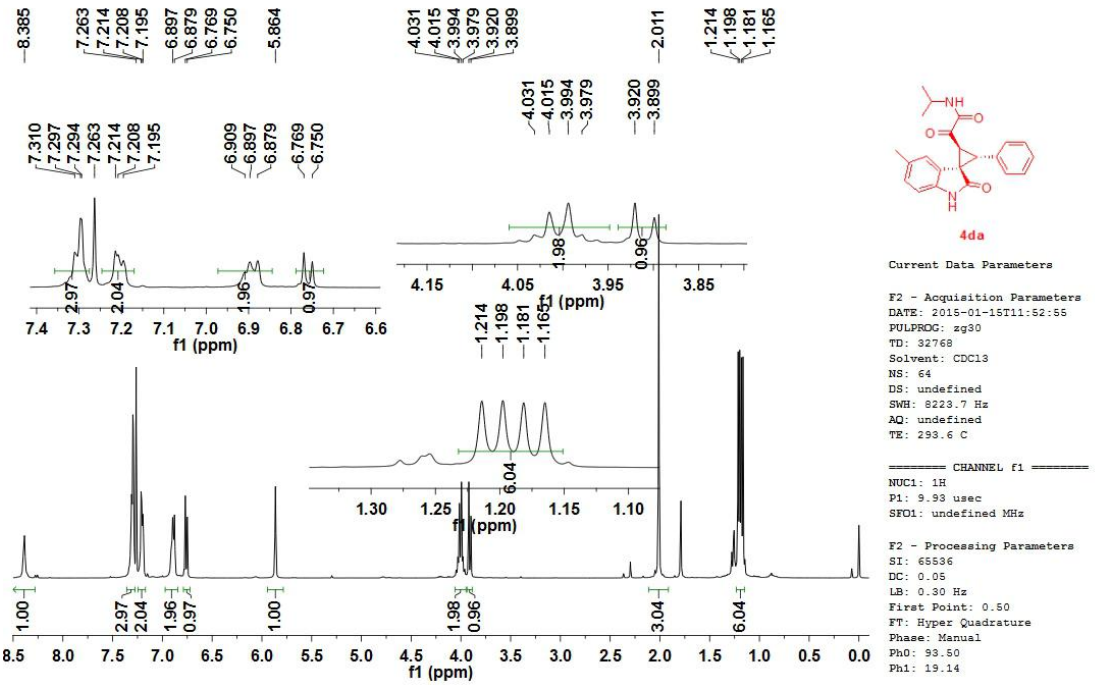


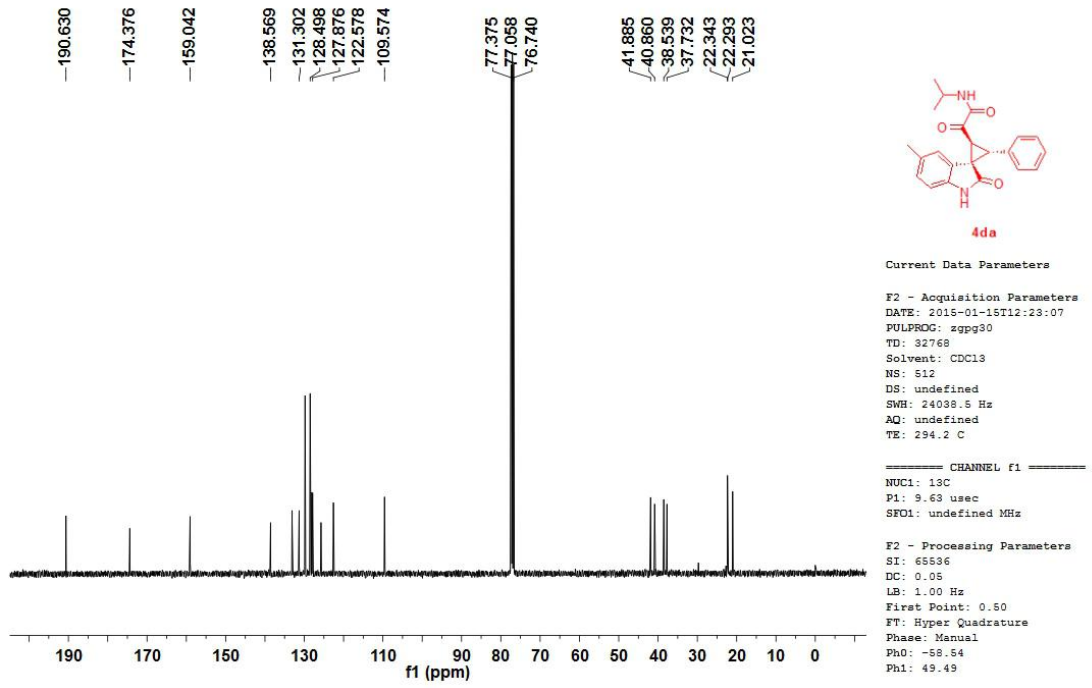
Current Data Parameters

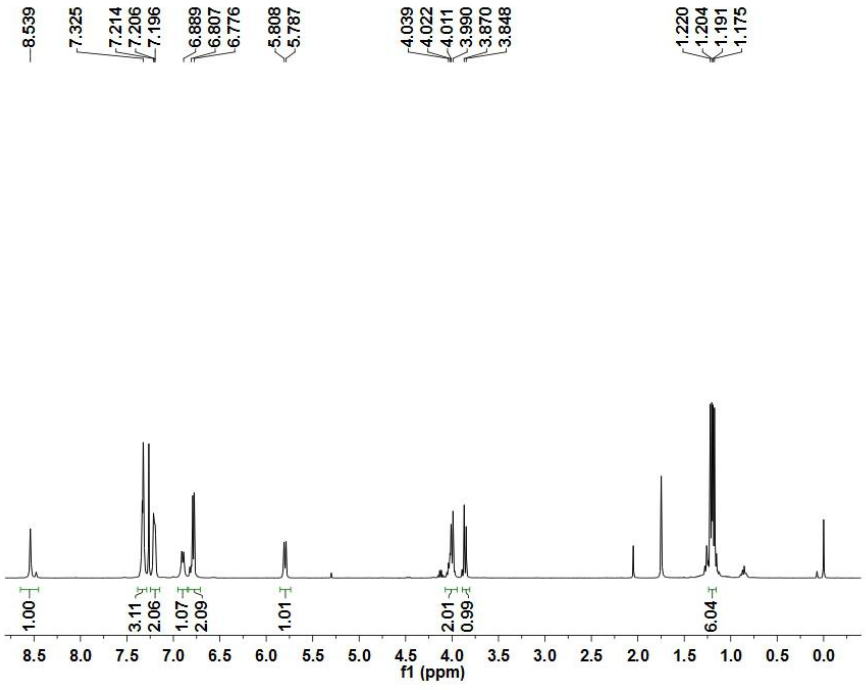
F2 - Acquisition Parameters
DATE: 2015-01-29T02:52:05
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

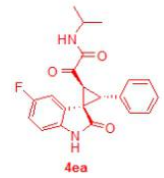
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -61.49
Ph1: 58.44


8.385
7.263
7.214
7.208
7.195
6.897
6.879
6.769
6.750
5.864
4.031
4.015
3.994
3.979
3.920
3.899
2.011
1.214
1.198
1.181
1.165
f1 (ppm)
1.00
2.97
2.04
1.96
0.97
1.00
1.98
0.96
3.04
6.04
4da
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-15T11:52:55
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C
======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 93.50
Ph1: 19.14


190.630
174.376
159.042
138.569
131.302
128.498
127.876
122.578
109.574
77.375
77.058
76.740
41.885
40.860
38.539
37.732
22.343
22.293
21.023
f1 (ppm)
4da
Current Data Parameters
F2 - Acquisition Parameters
DATE: 2015-01-15T12:23:07
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C
======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz
F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -58.54
Ph1: 49.49





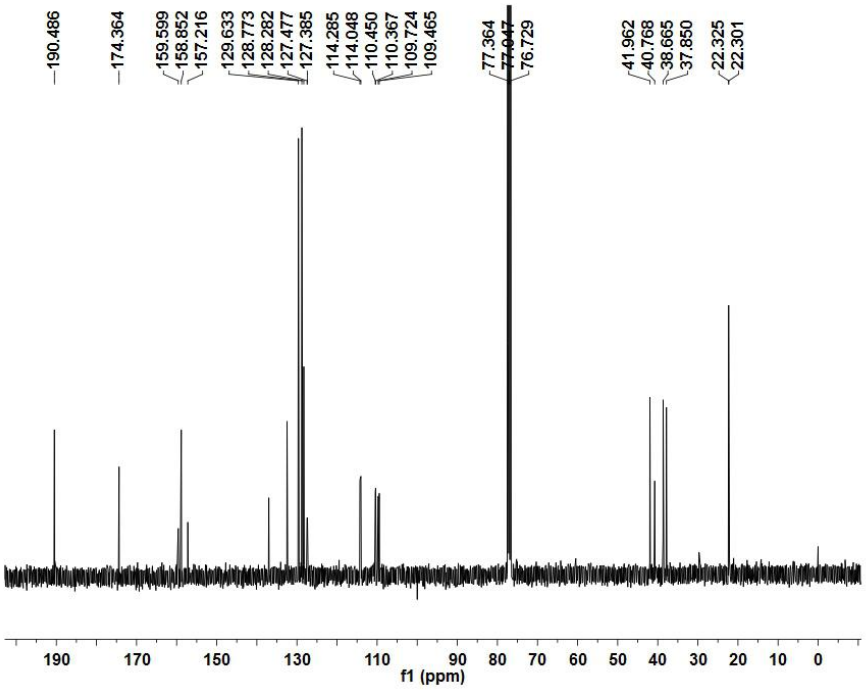
4ea

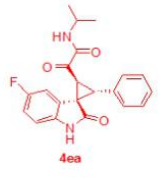
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T06:58:14
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.24
Ph1: 18.80





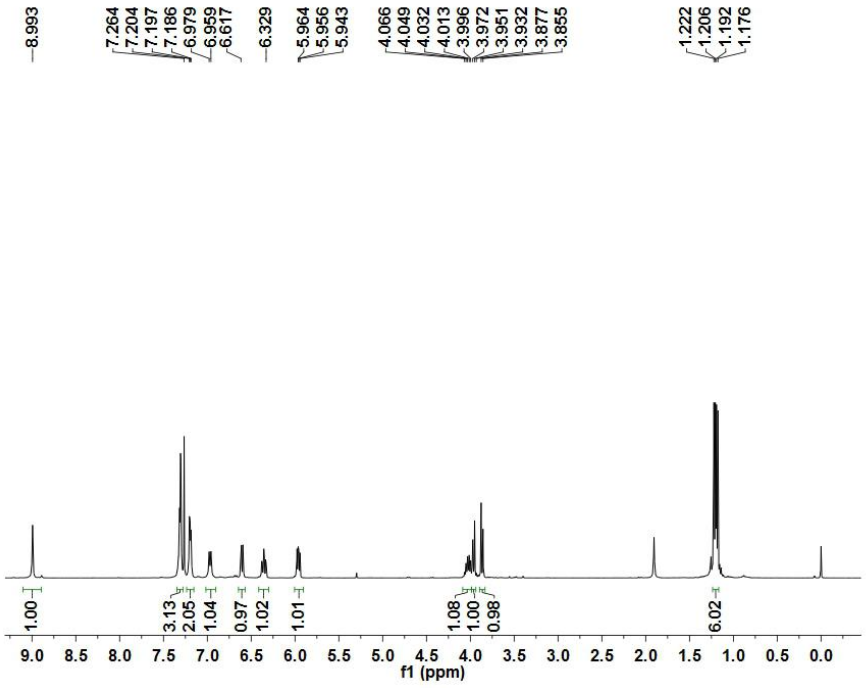
4ea

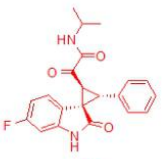
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T07:28:25
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -53.58
Ph1: 41.31





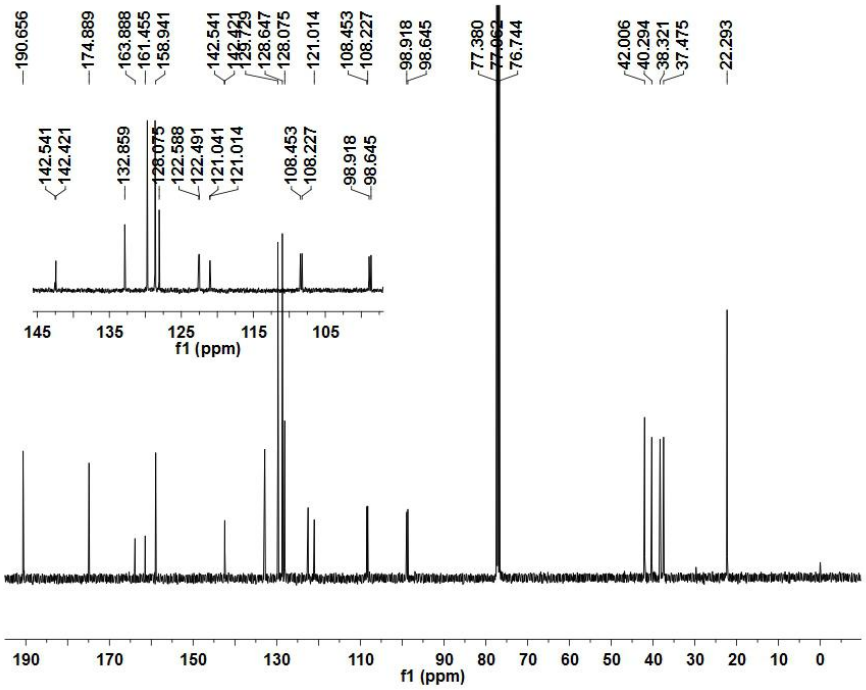
4ga

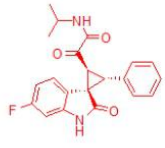
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T04:52:38
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

CHANNEL f1
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -264.29
Ph1: 19.74





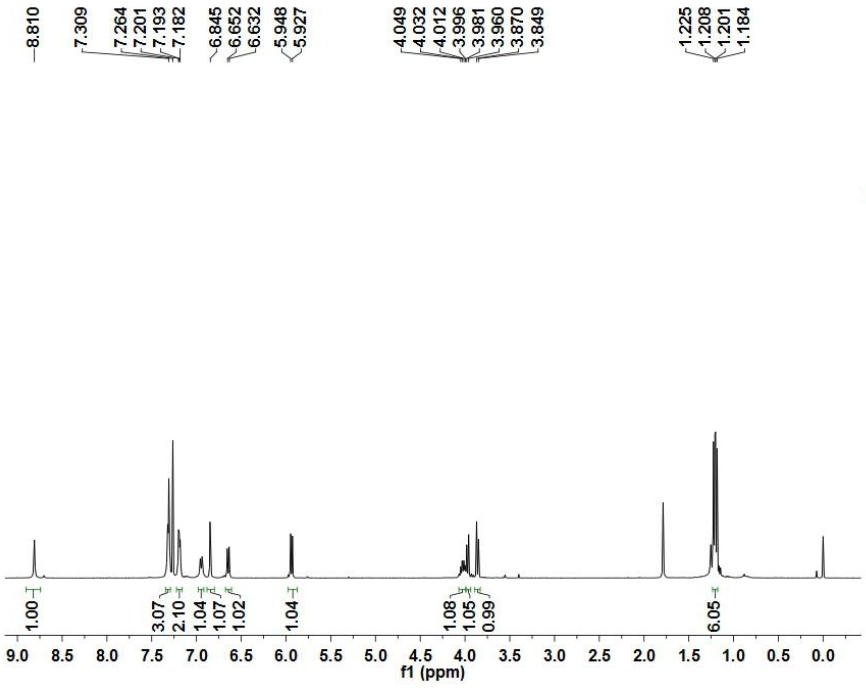
4ga

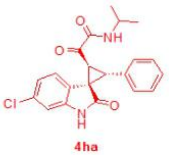
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T05:22:49
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

CHANNEL f1
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -60.14
Ph1: 60.48





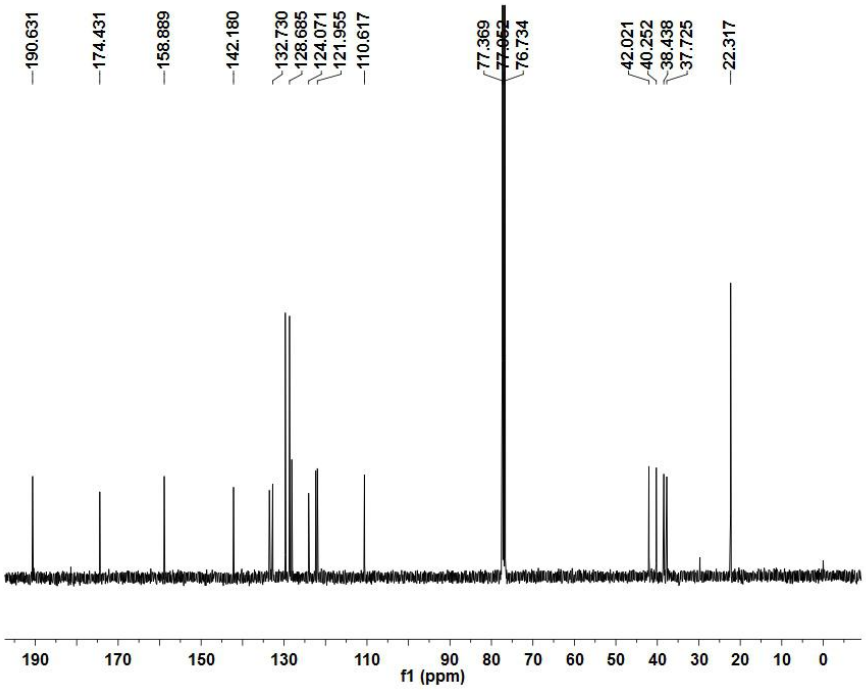
4ha

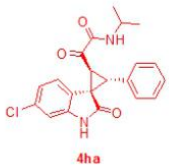
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T10:17:08
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.32
Ph1: 19.06





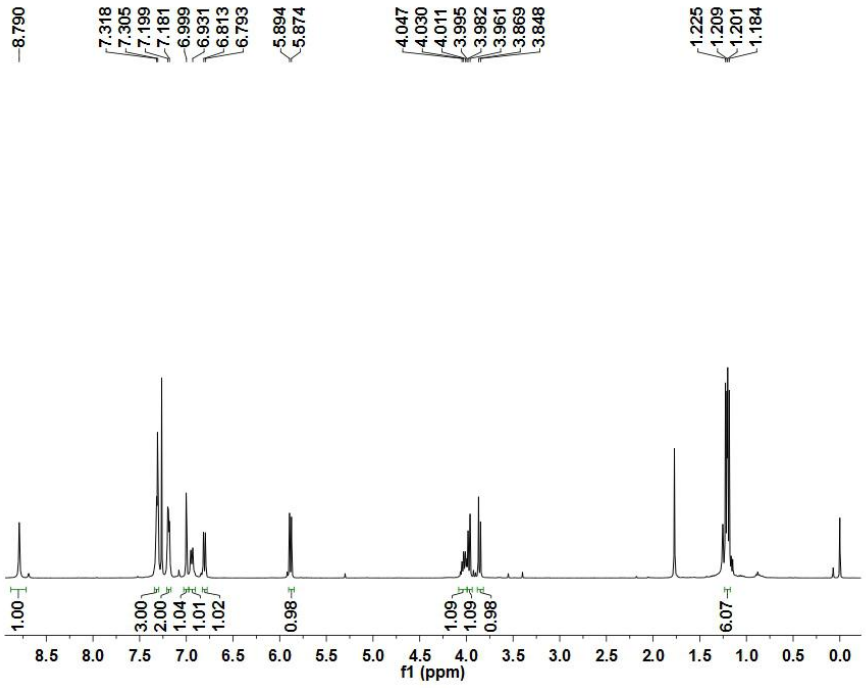
4ha

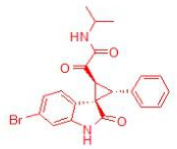
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T10:47:30
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -69.13
Ph1: 67.55





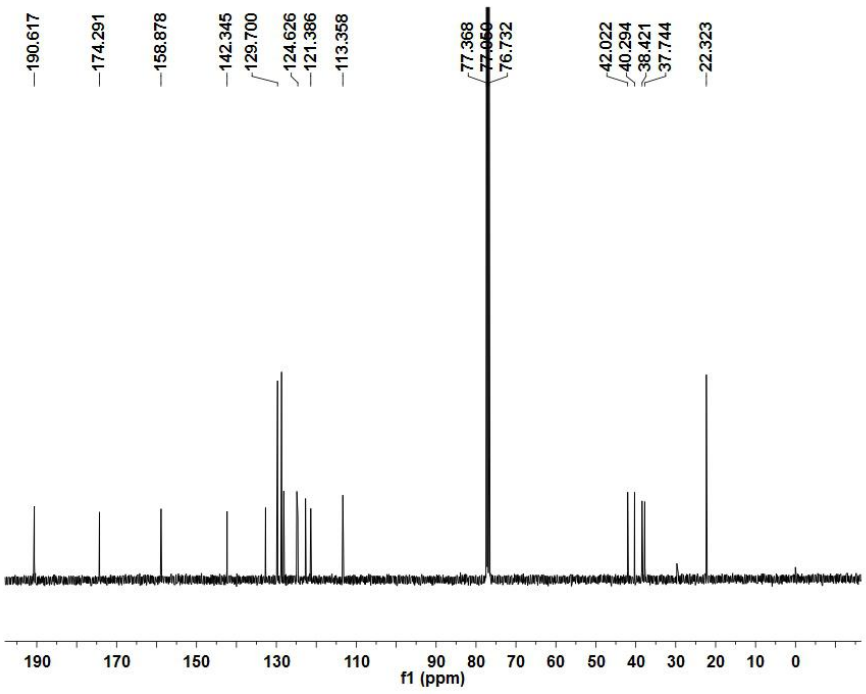
4ia

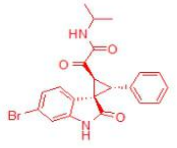
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T16:11:31
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -267.13
Ph1: 17.79





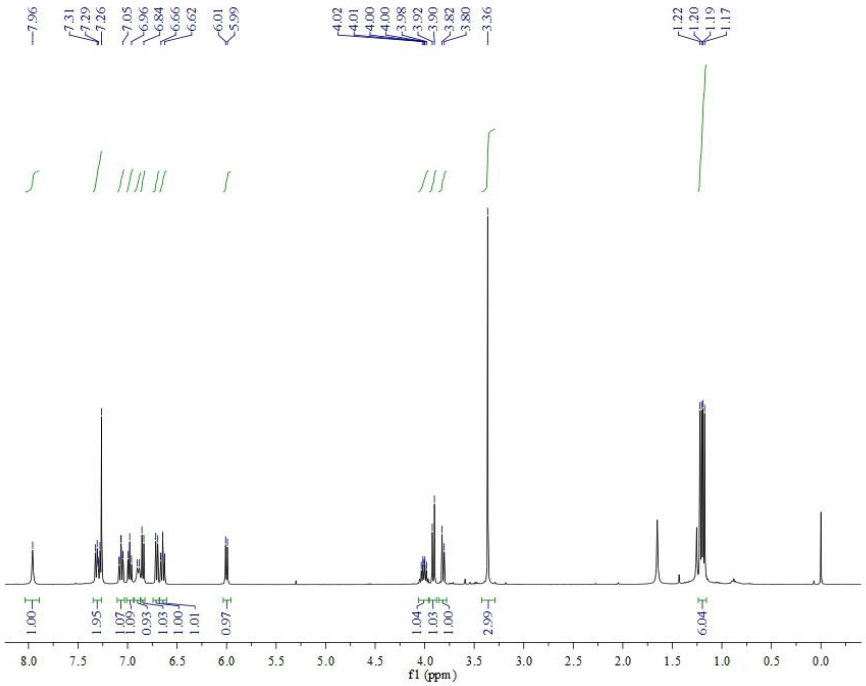
4ia

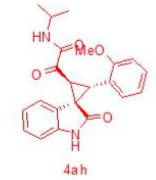
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T16:41:42
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -52.50
Ph1: 39.06





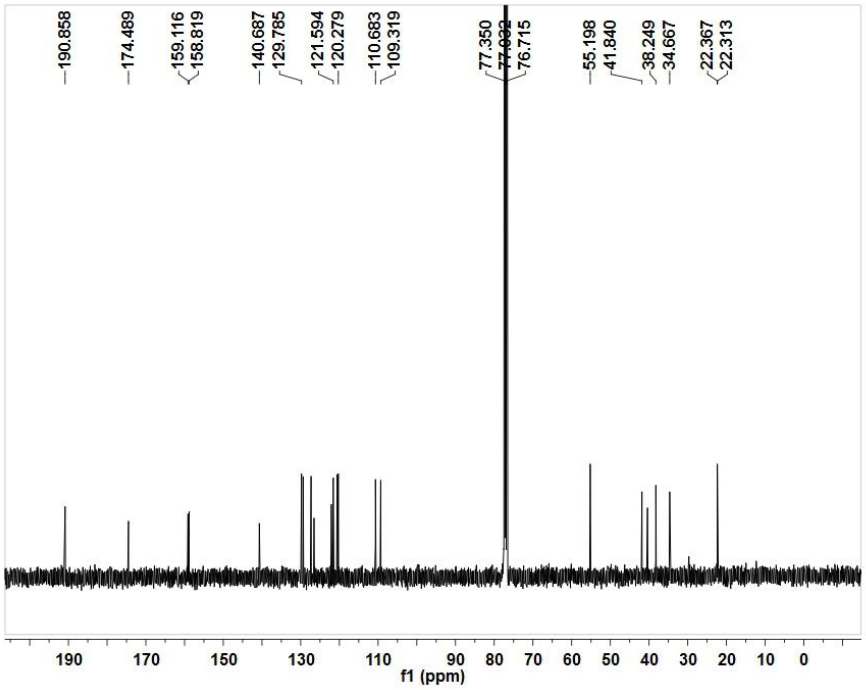
4ah

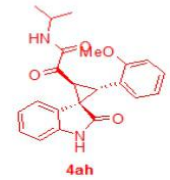
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-28T17:37:01
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.60
Ph1: 12.98





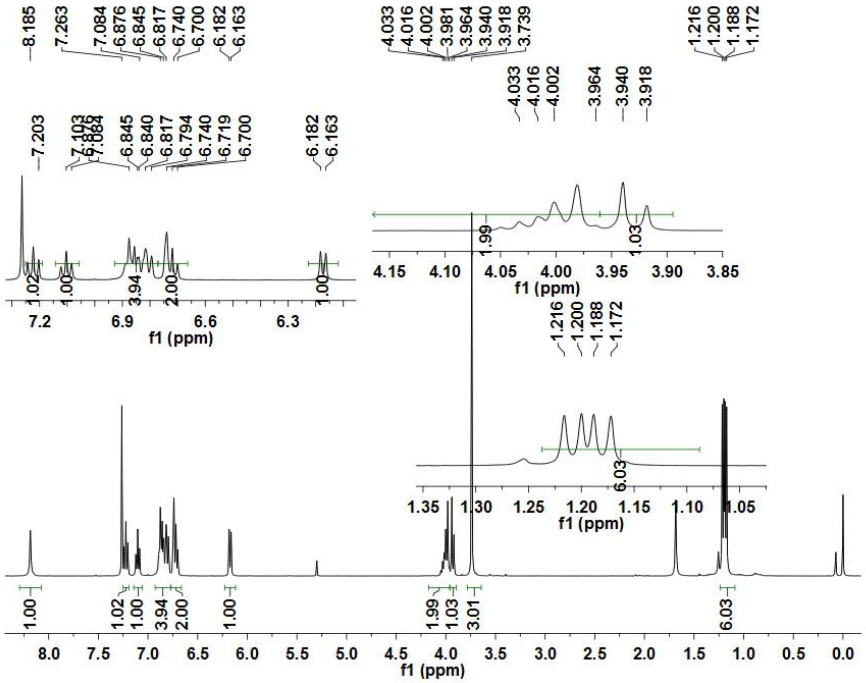
4ah

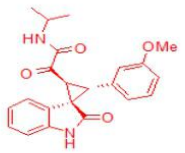
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-28T18:07:15
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -55.04
Ph1: 41.14





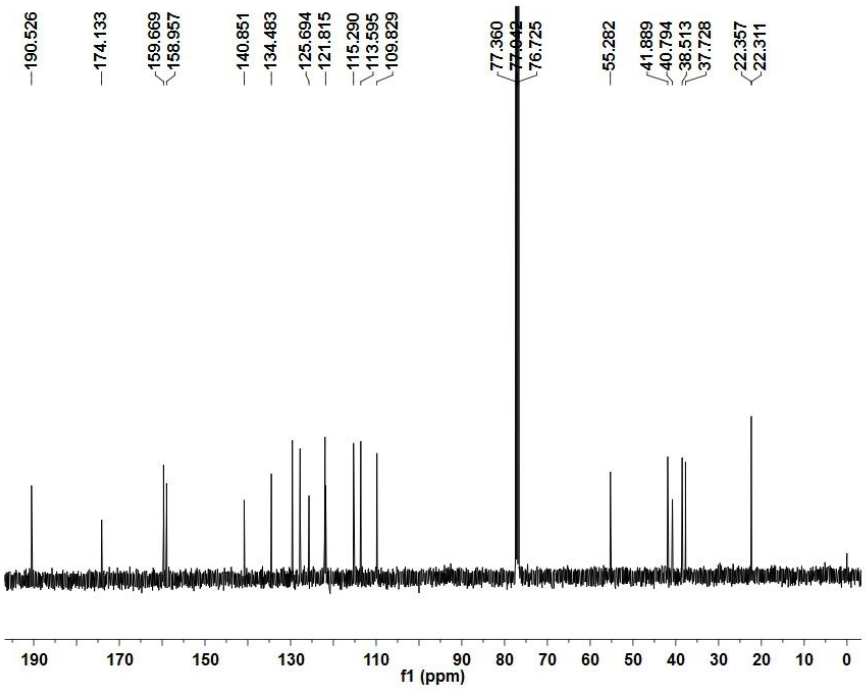
4ai

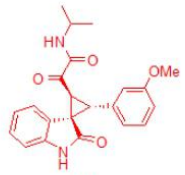
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-16T03:06:48
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.31
Ph1: 17.61





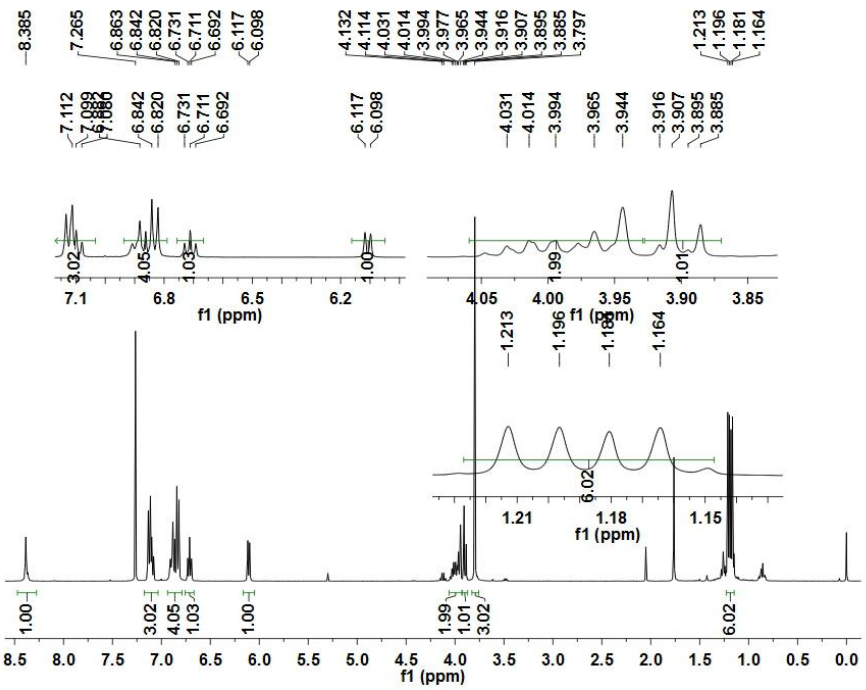
4ai

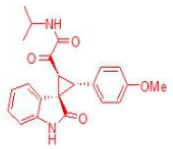
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-16T03:37:00
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.8 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -69.63
Ph1: 68.93





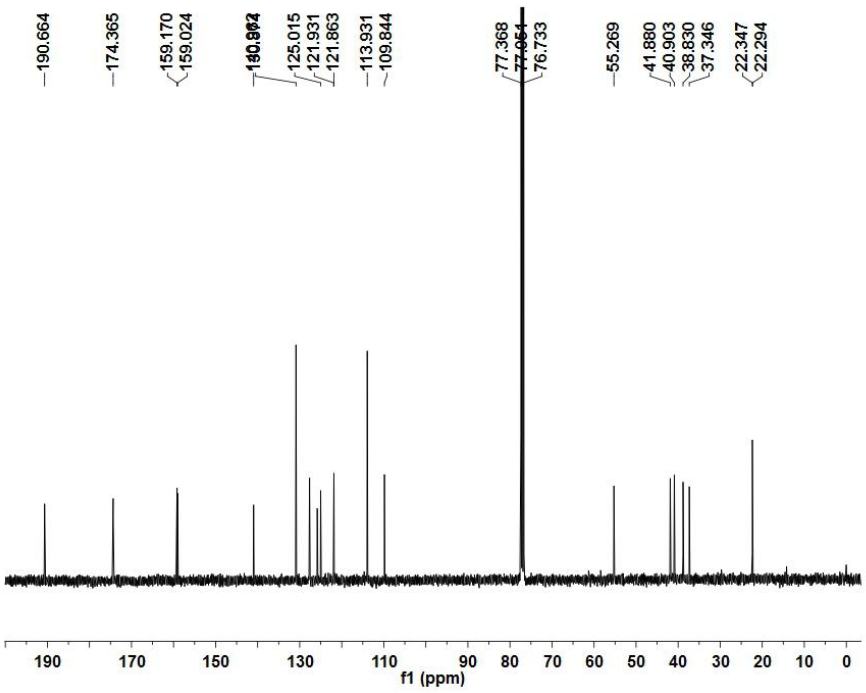
4aj

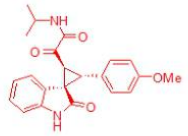
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T03:38:32
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.9 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -265.60
Ph1: 17.71





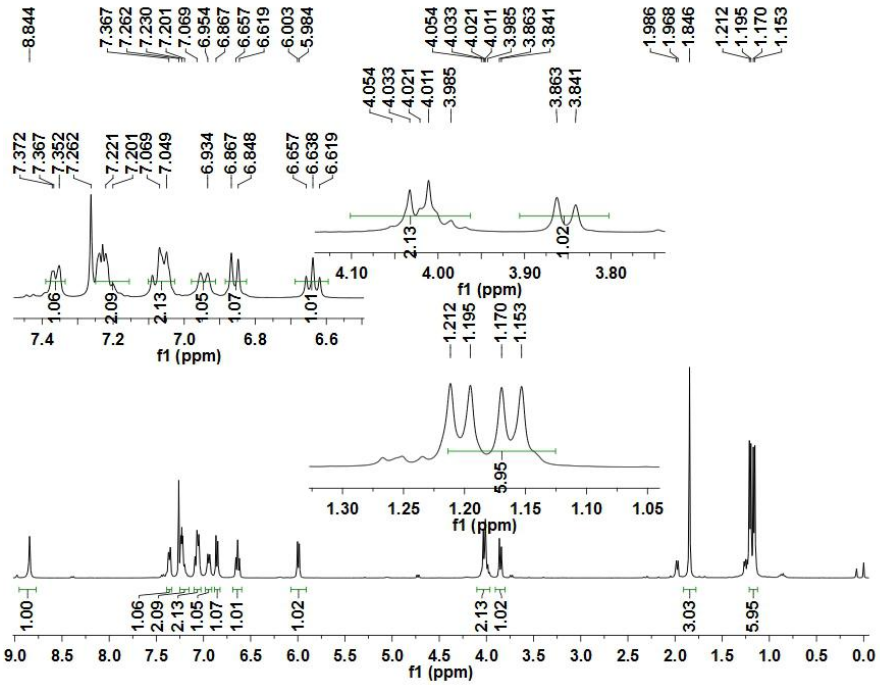
4aj

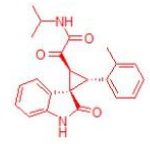
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-29T04:08:44
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -59.45
Ph1: 60.22





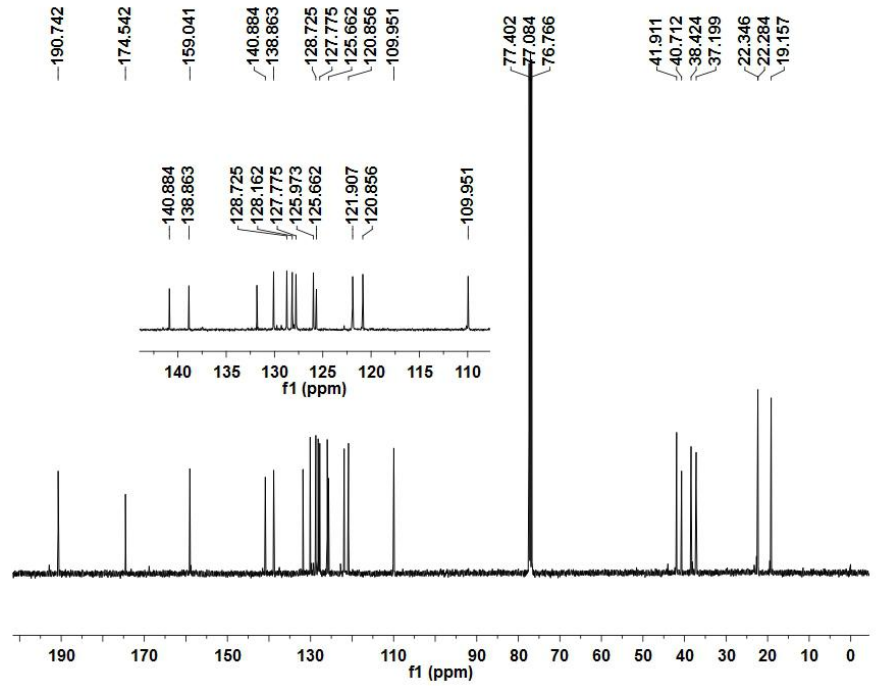
4ak

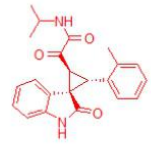
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-16T22:53:21
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -264.97
Ph1: 19.49





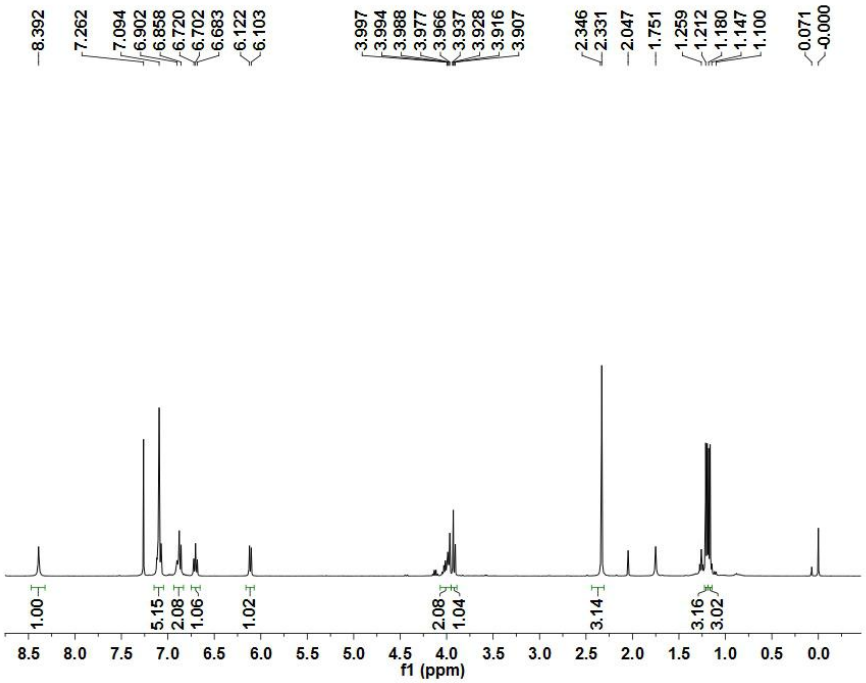
4ak

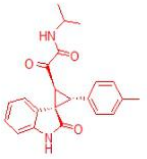
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-16T23:23:33
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -68.53
Ph1: 71.96





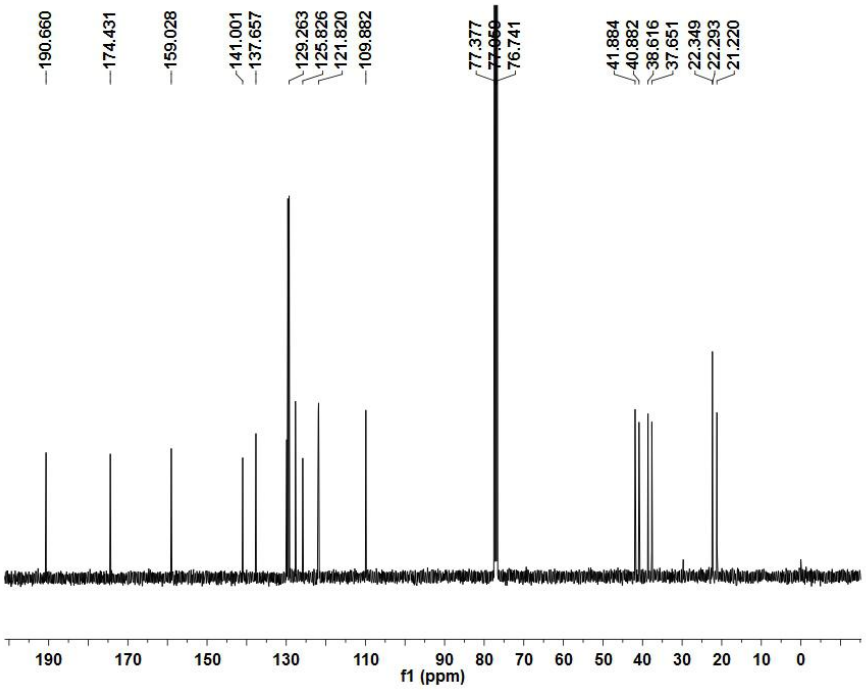
4al

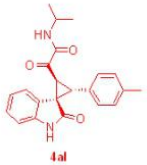
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-26T16:29:43
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 89.73
Ph1: 17.78





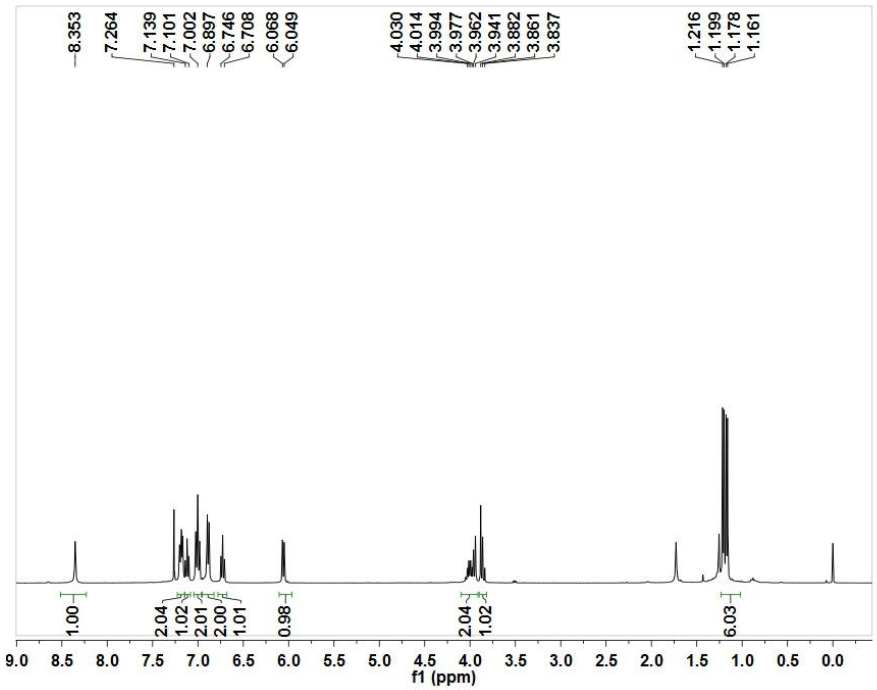
4al

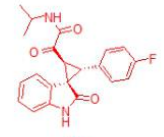
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T03:28:00
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -72.39
Ph1: 66.45





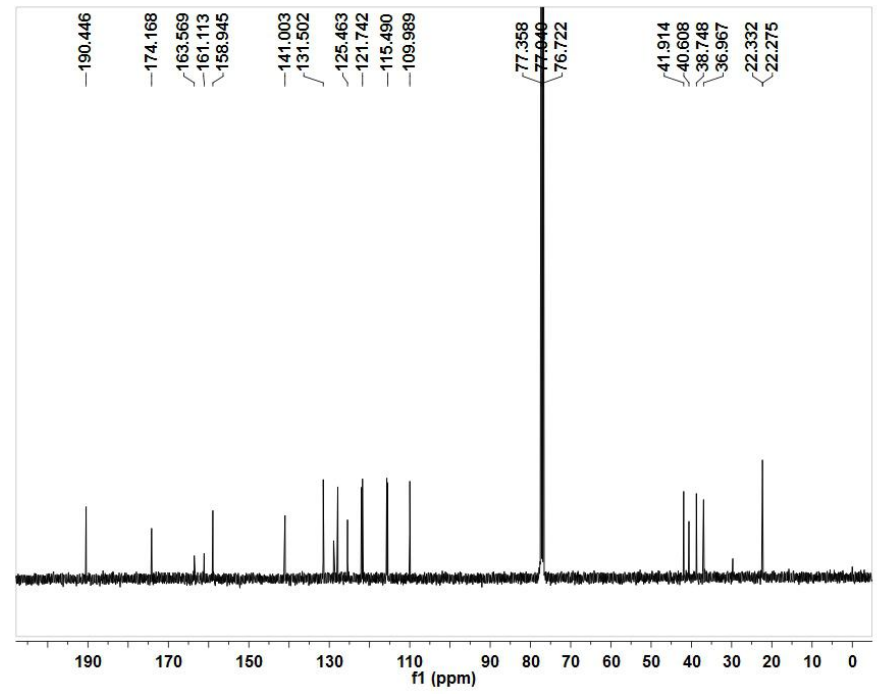
4av

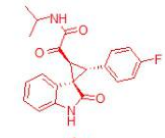
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-28T18:15:18
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.8 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 91.37
Ph1: 16.19





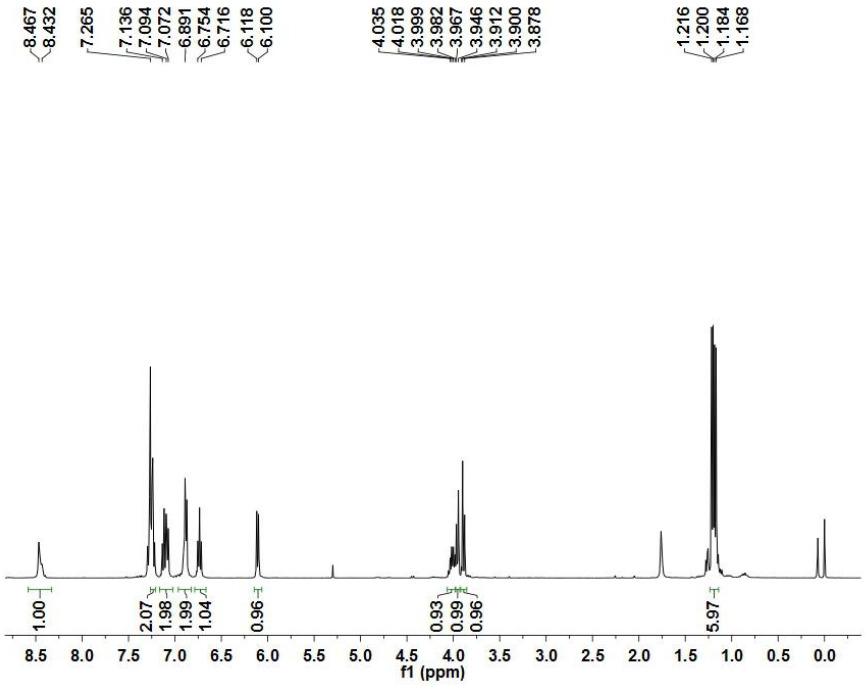
4av

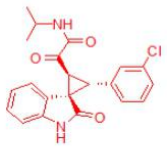
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-04-28T18:45:30
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -61.91
Ph1: 58.39





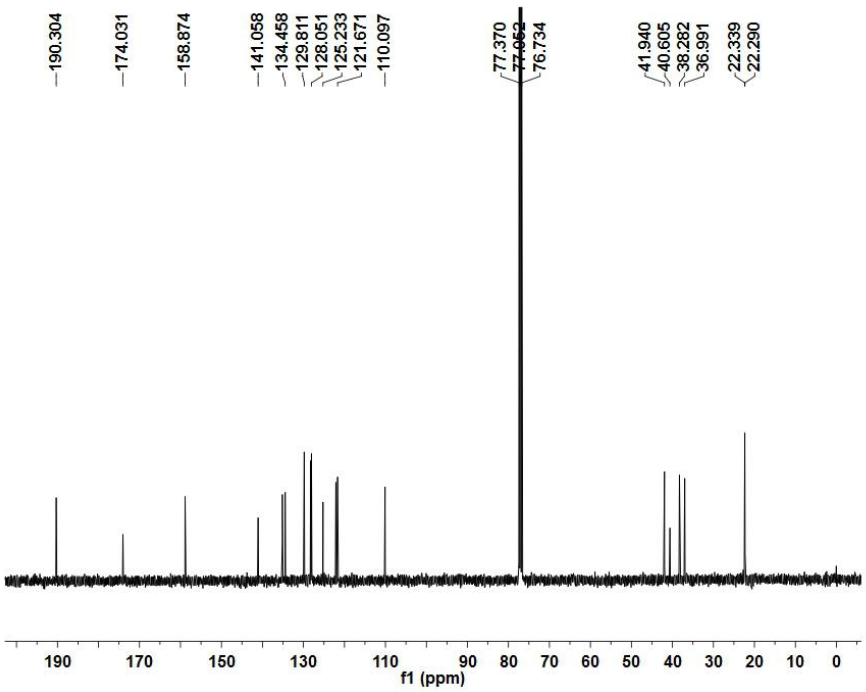
4am

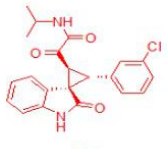
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-17T00:49:09
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -263.61
Ph1: 15.16





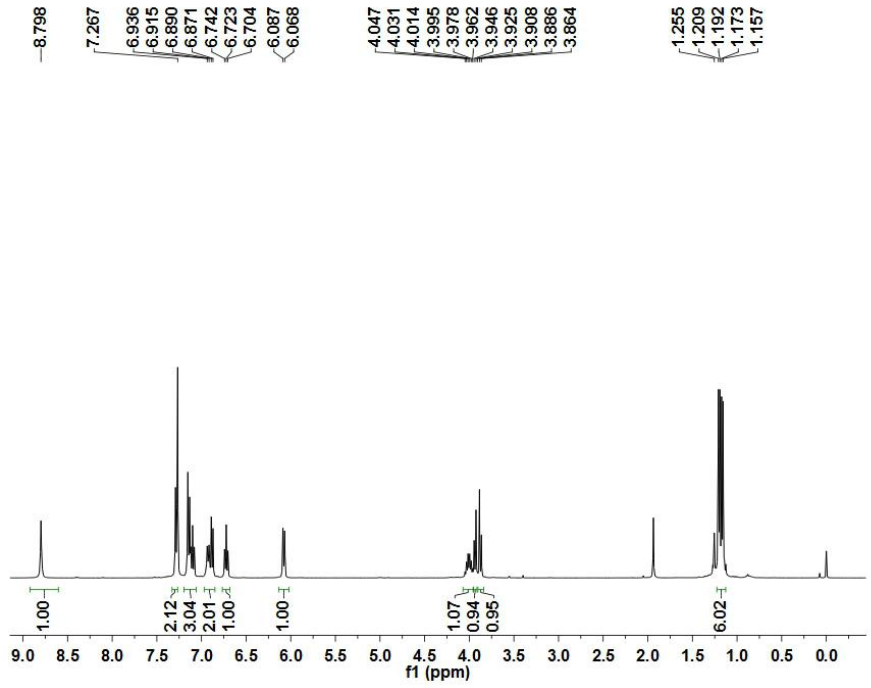
4am

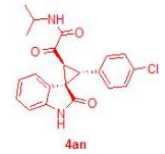
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-17T01:19:21
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.1 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -62.21
Ph1: 66.47





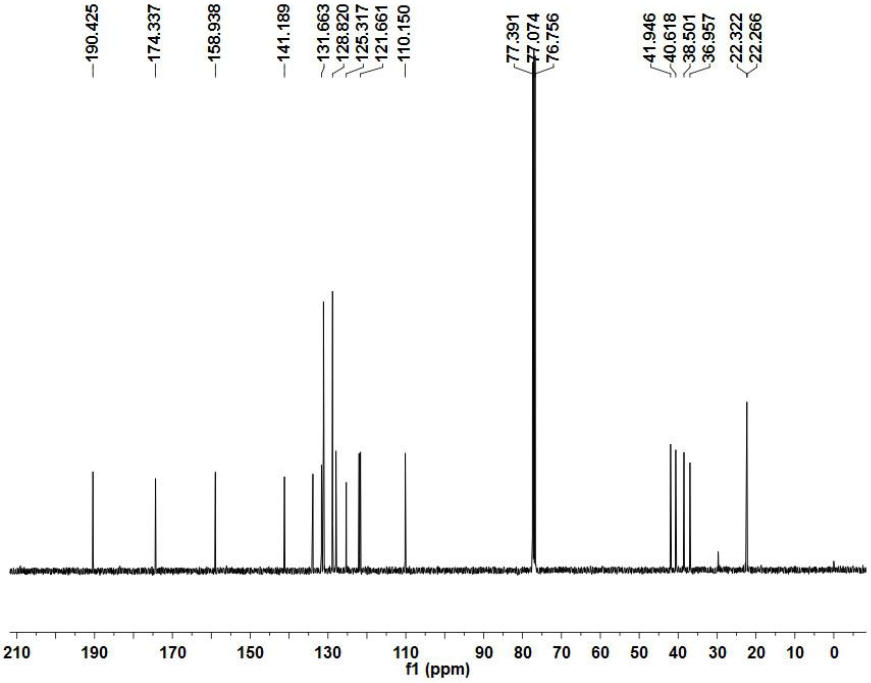
4an

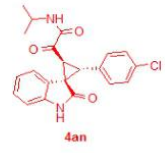
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T11:14:42
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.32
Ph1: 20.69





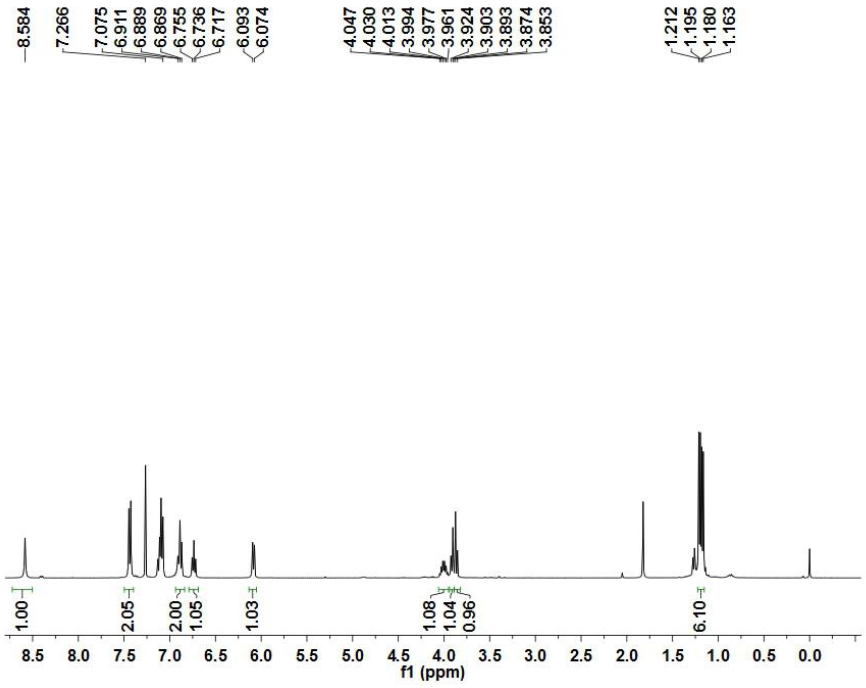
4an

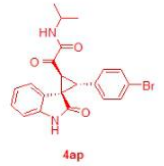
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-15T11:44:54
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -64.42
Ph1: 64.86





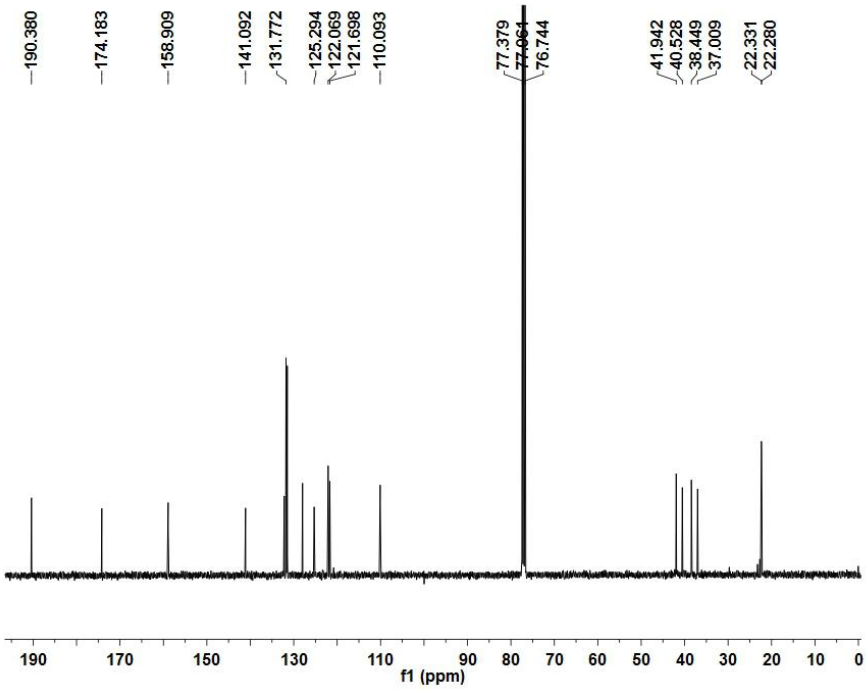
4ap

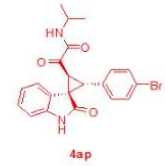
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T02:19:34
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.9 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 93.74
Ph1: 20.44





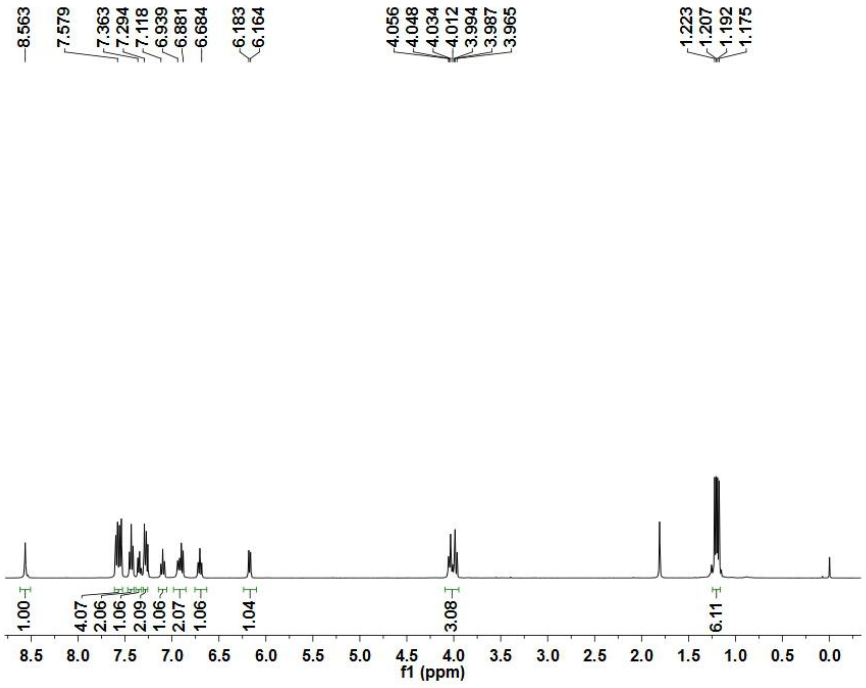
4ap

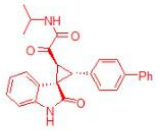
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T02:49:45
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -64.40
Ph1: 56.36





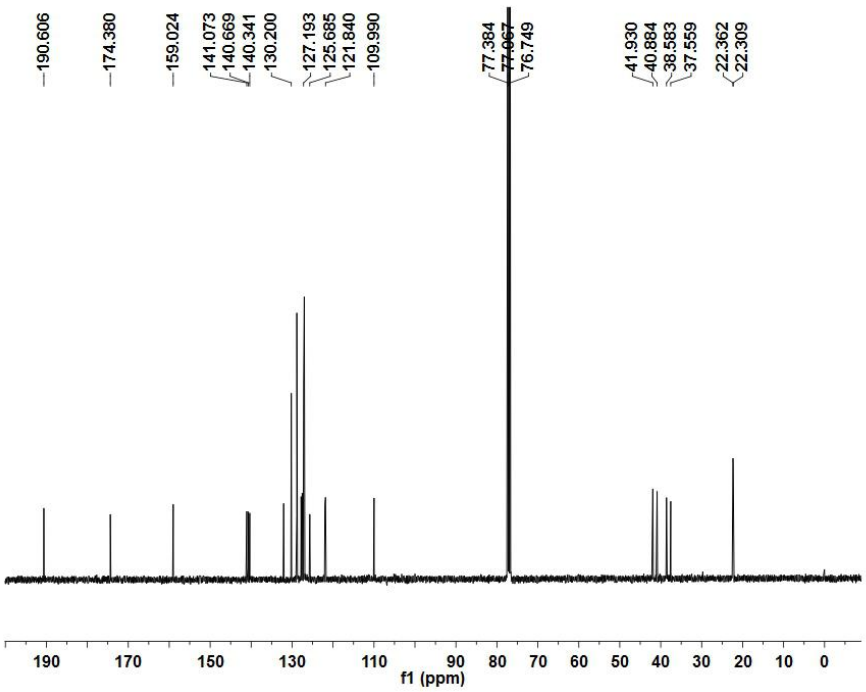
4aq

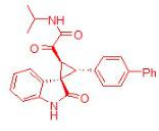
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T01:41:21
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -264.15
Ph1: 19.97





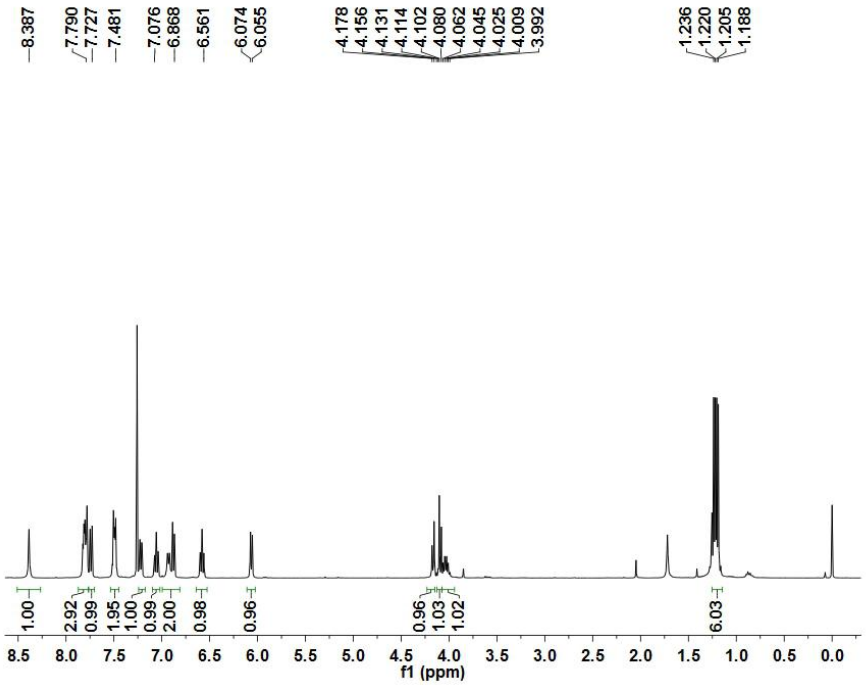
4aq

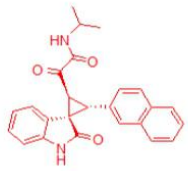
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-14T02:11:33
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -73.61
Ph1: 76.14





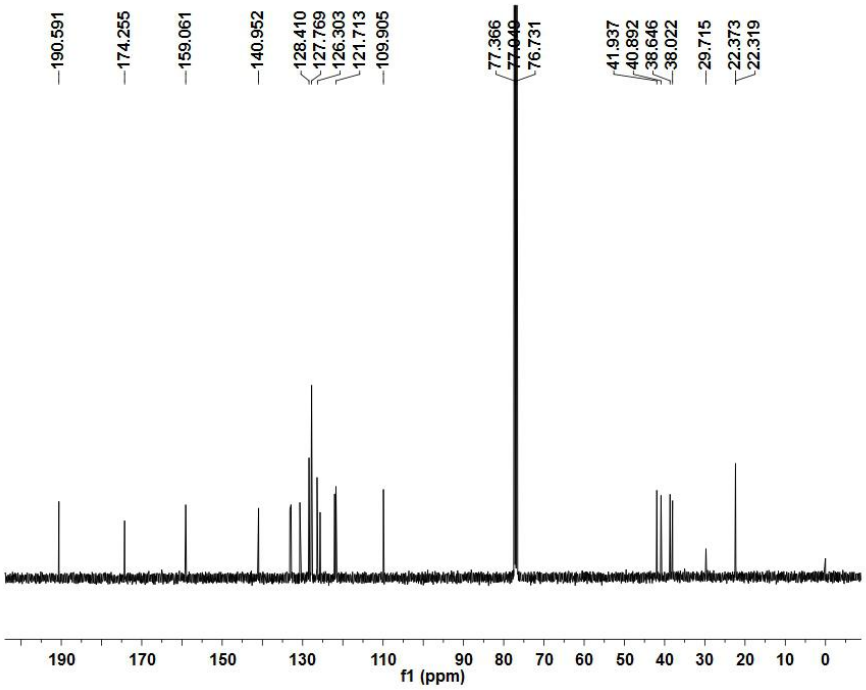
4ar

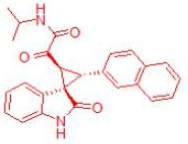
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-20T21:23:04
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.6 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 89.48
Ph1: 16.00





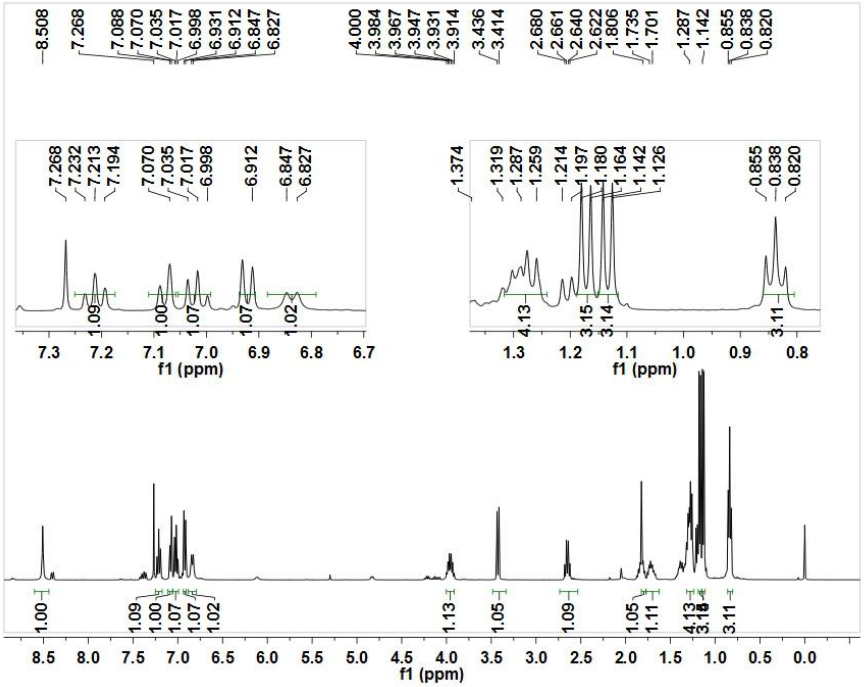
4ar

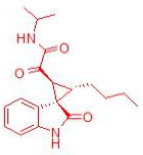
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2014-11-21T01:21:33
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 295.9 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -68.42
Ph1: 63.36





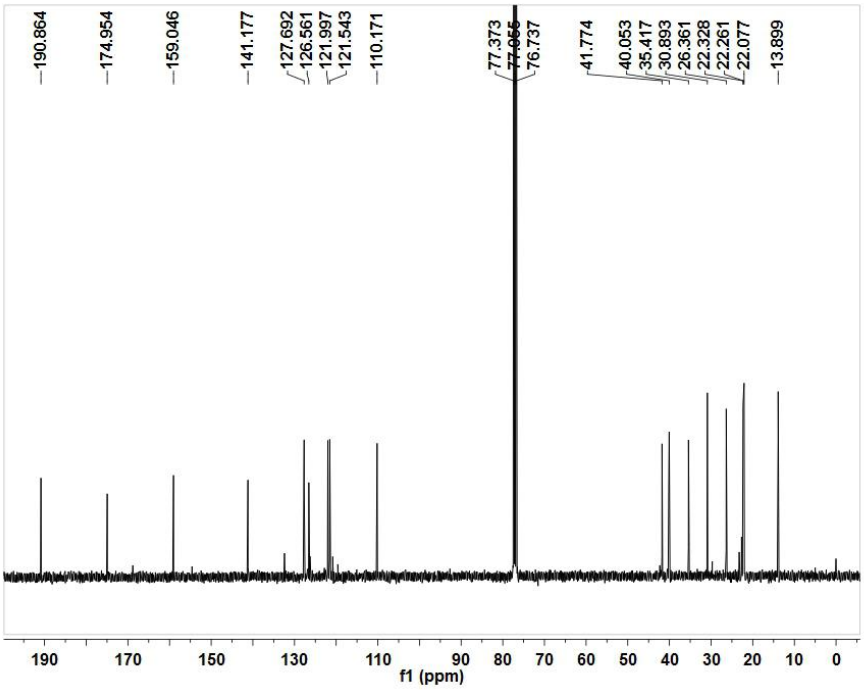
4at

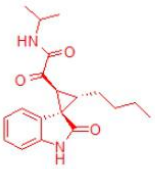
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-05T03:16:16
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 92.28
Ph1: 19.82





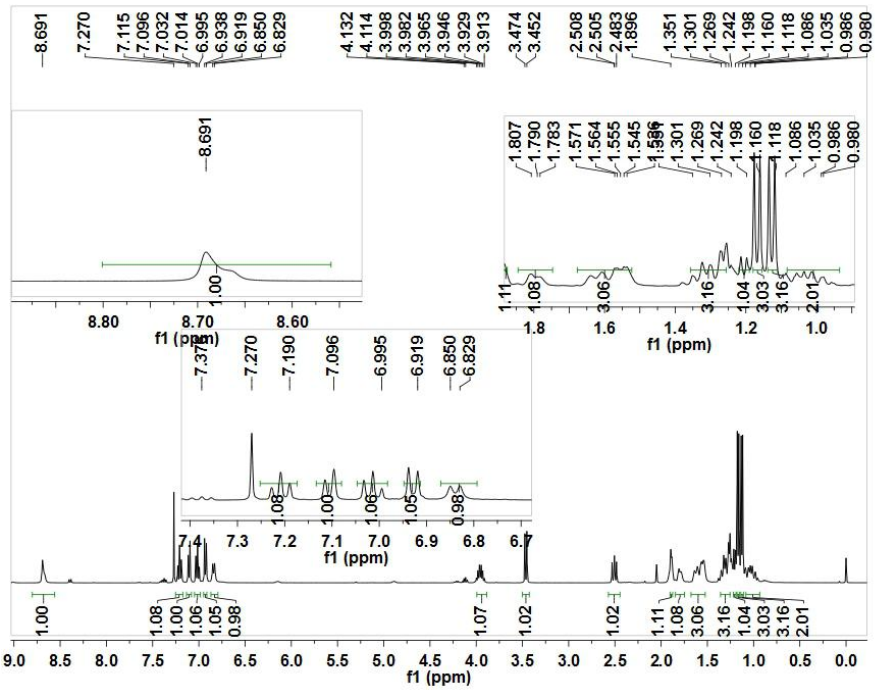
4at

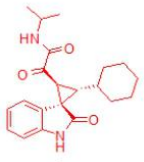
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-05T03:46:28
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -71.82
Ph1: 65.94





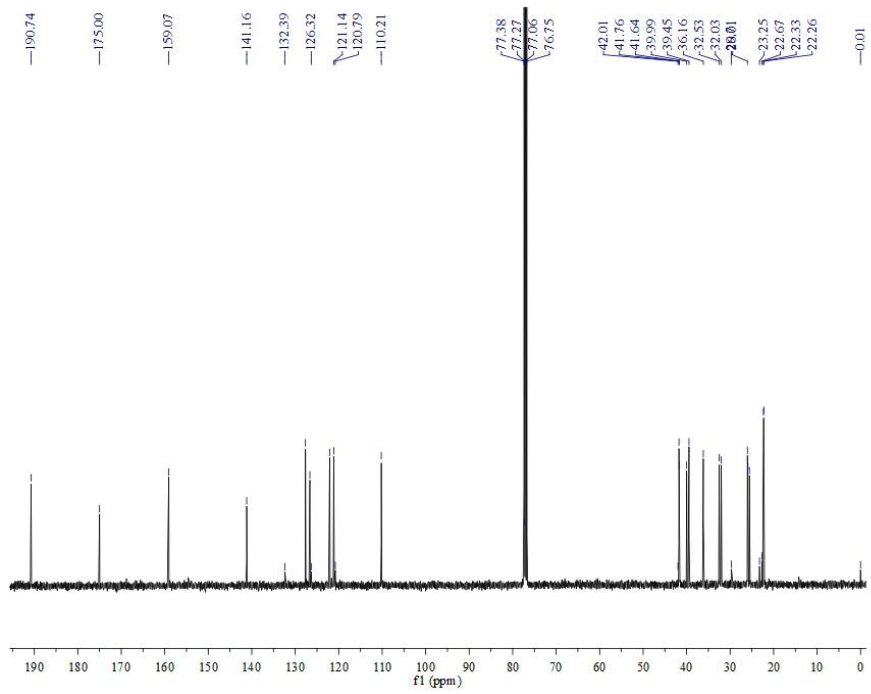
4au

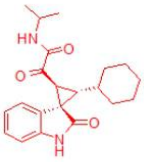
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-05T04:33:36
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 293.7 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -268.12
Ph1: 23.78





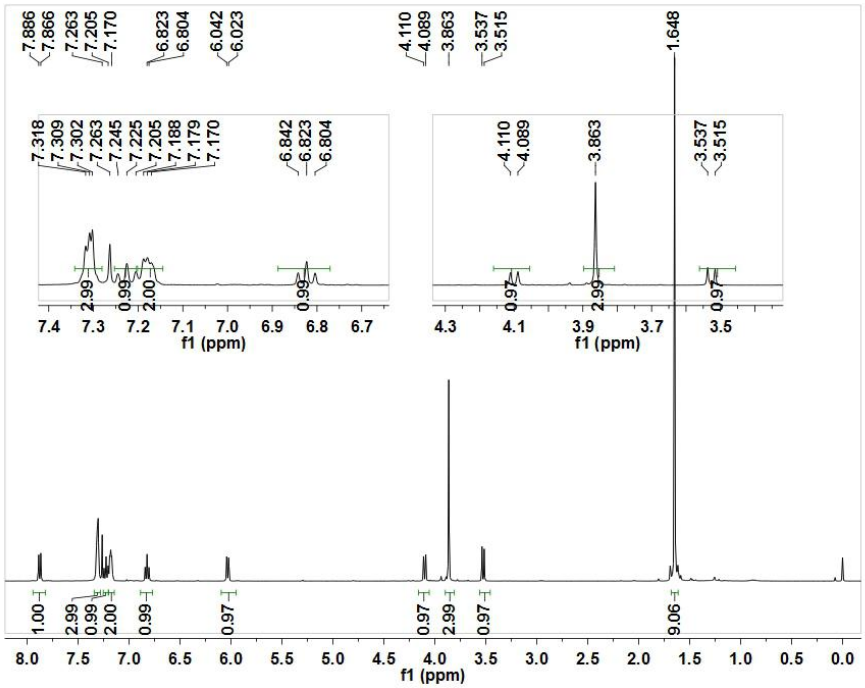
4au

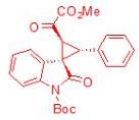
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-02-05T05:03:48
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -61.56
Ph1: 55.08





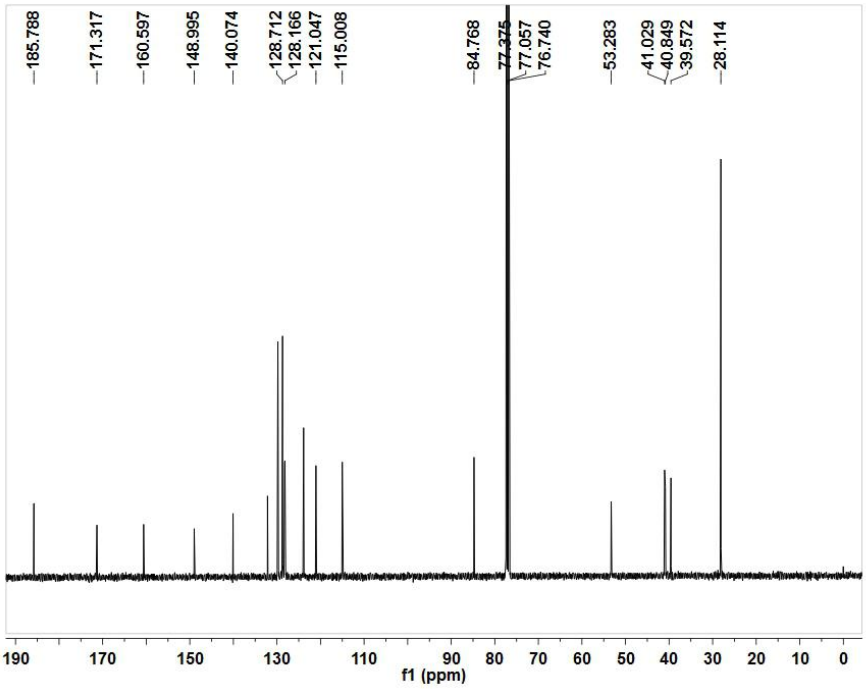
5aa

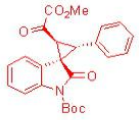
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-31T03:11:13
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 294.2 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 93.46
Ph1: 16.52





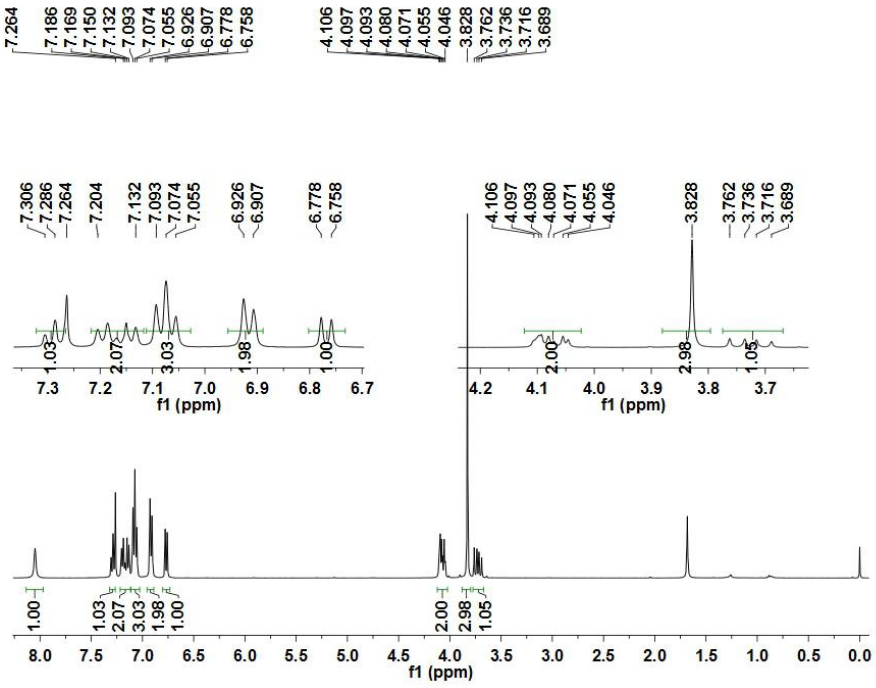
5aa

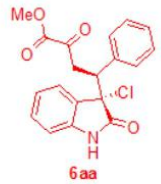
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-01-31T03:41:23
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 512
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 294.3 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -67.88
Ph1: 67.26





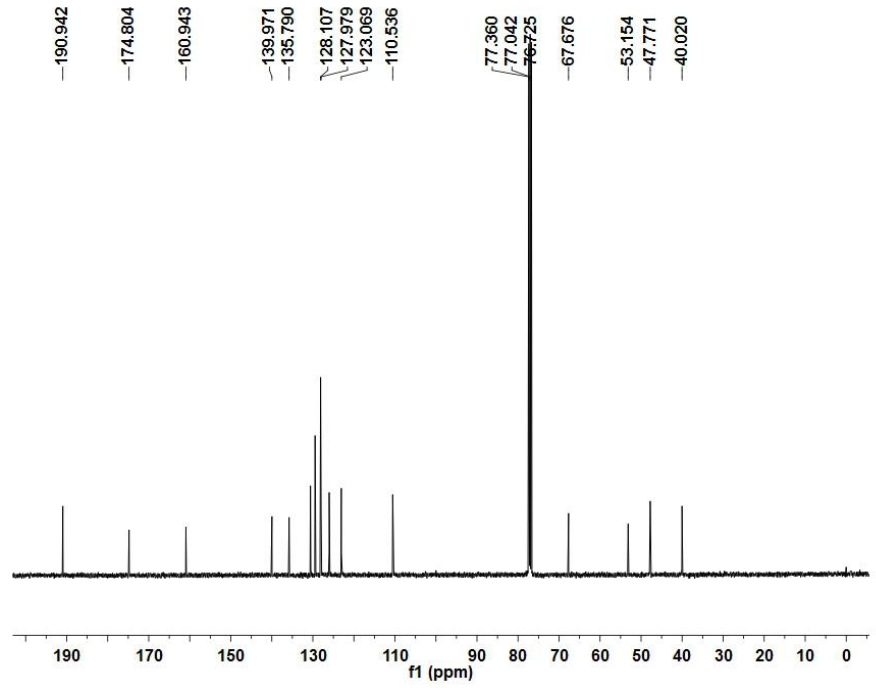
6aa

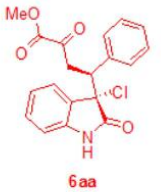
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-06-15T20:47:02
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 295.5 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 94.06
Ph1: 16.62





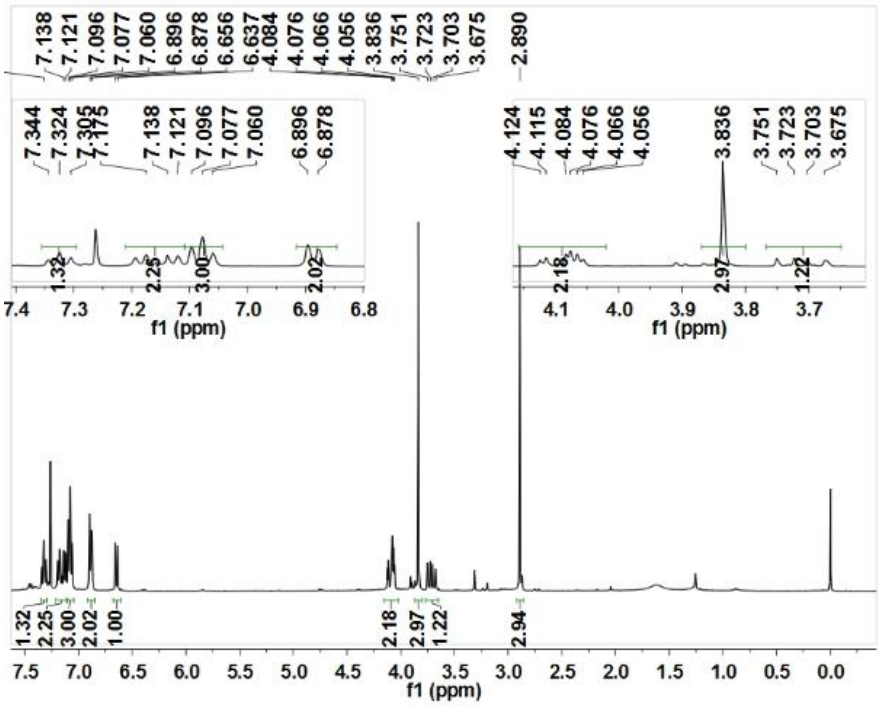
6aa

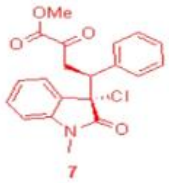
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2015-06-16T19:32:45
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 296.2 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -78.06
Ph1: 96.29



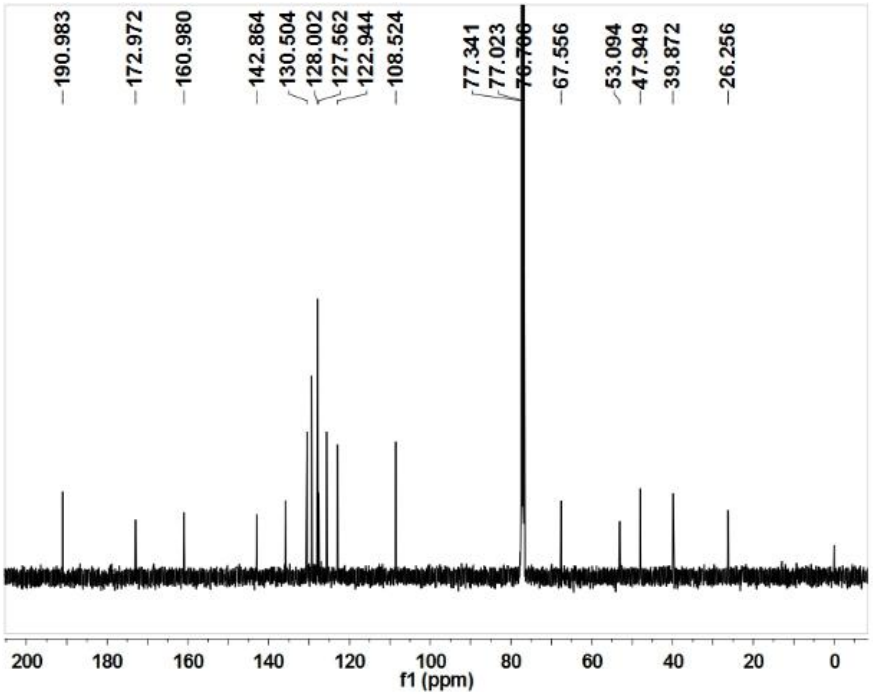


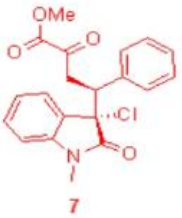
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-22T21:02:16
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 298.1 C

CHANNEL f1
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.60
FT: Hyper Quadrature
Phase: Manual
Ph0: 87.36
Ph1: 20.24



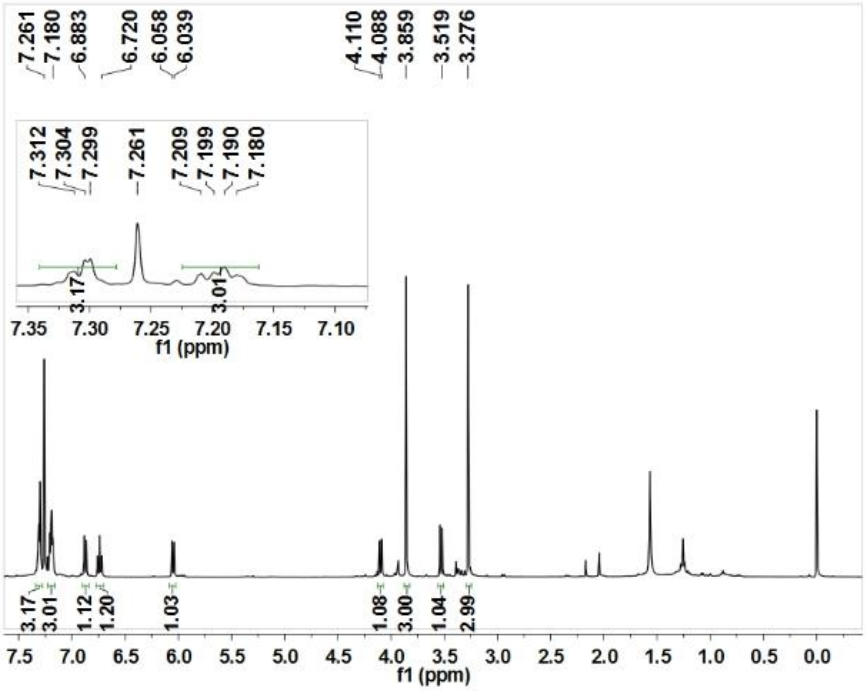


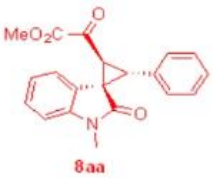
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-22T22:01:39
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 298.5 C

CHANNEL f1
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -77.19
Ph1: 73.25





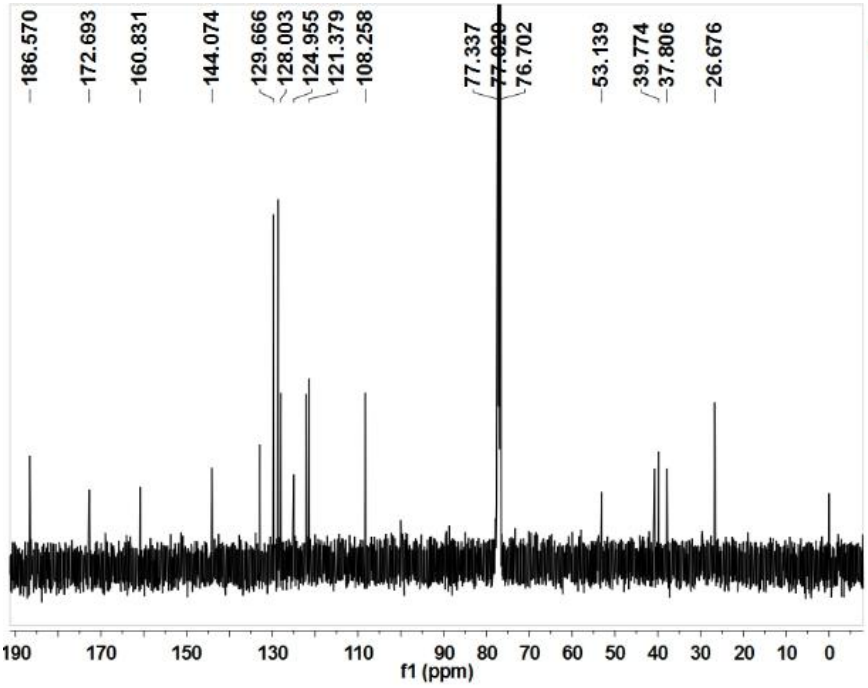
8aa

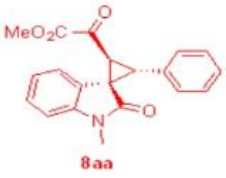
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-22T22:09:50
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 64
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 298.1 C

CHANNEL f1
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 90.93
Ph1: 7.30





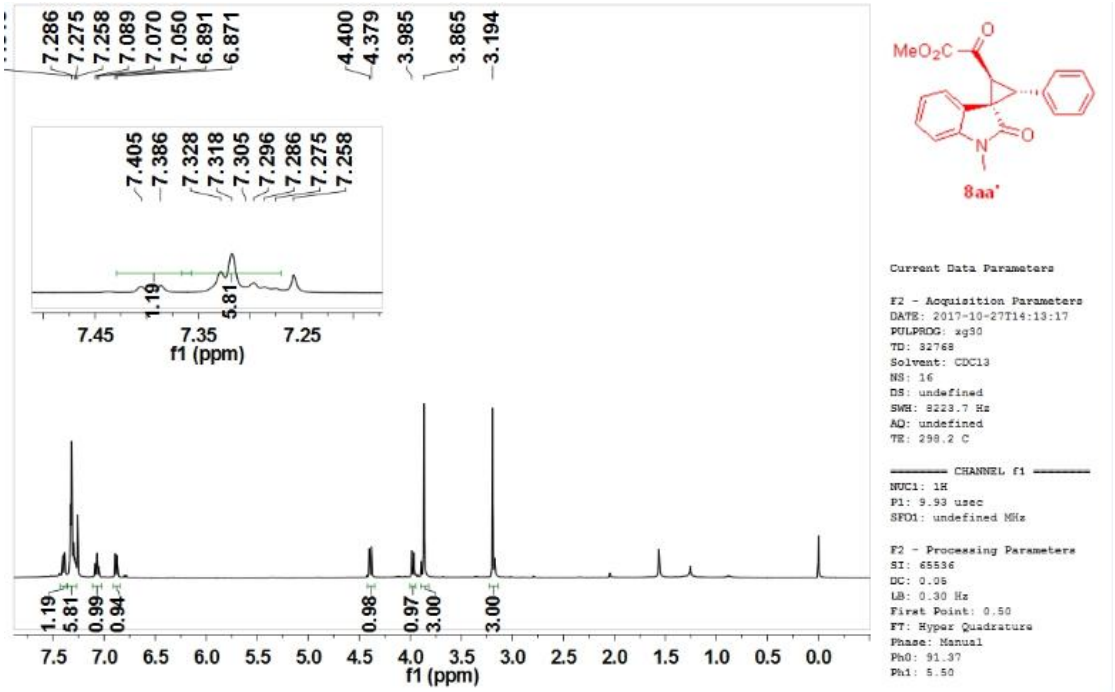
8aa

Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-22T23:09:14
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 1024
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 298.5 C

CHANNEL f1
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -97.33
Ph1: 103.90

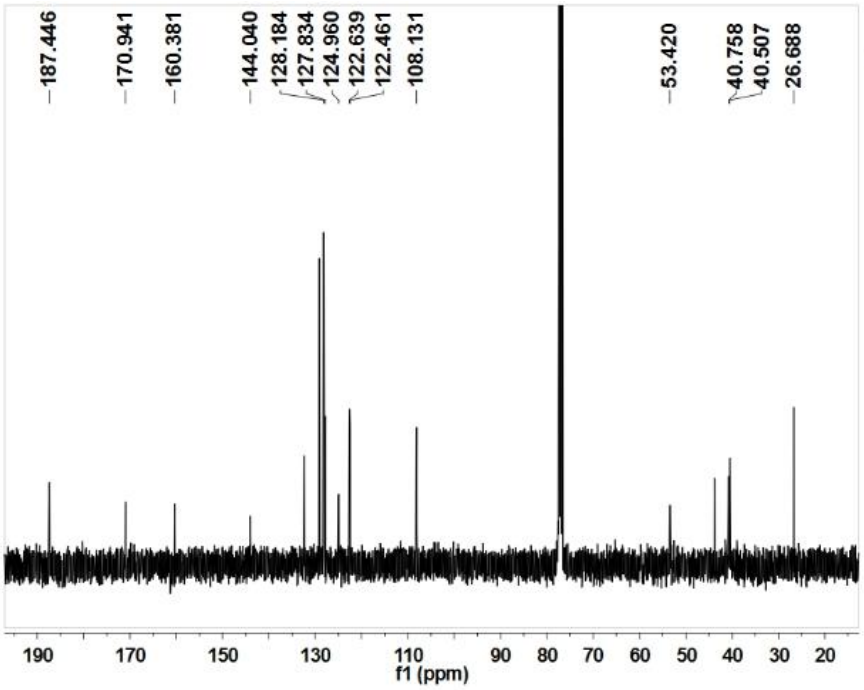


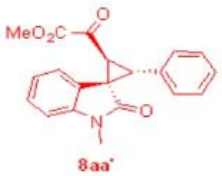
Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-27T14:13:17
PULPROG: zg30
TD: 32768
Solvent: CDCl3
NS: 16
DS: undefined
SWH: 8223.7 Hz
AQ: undefined
TE: 298.2 C

======== CHANNEL f1 ========
NUC1: 1H
P1: 9.93 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 0.30 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: 91.37
Ph1: 5.50





Current Data Parameters

F2 - Acquisition Parameters
DATE: 2017-10-27T14:28:50
PULPROG: zgpg30
TD: 32768
Solvent: CDCl3
NS: 256
DS: undefined
SWH: 24038.5 Hz
AQ: undefined
TE: 298.6 C

======== CHANNEL f1 ========
NUC1: 13C
P1: 9.63 usec
SFO1: undefined MHz

F2 - Processing Parameters
SI: 65536
DC: 0.05
LB: 1.00 Hz
First Point: 0.50
FT: Hyper Quadrature
Phase: Manual
Ph0: -61.00
Ph1: 39.30