SUPPORTING INFORMATION

Enantioselective Synthesis of 3-Fluoro-3-allyl-oxindoles via Phos-phine-Catalyzed Asymmetric γ-addition of 3-Fluoro-Oxindoles to 2,3-Butadienoates

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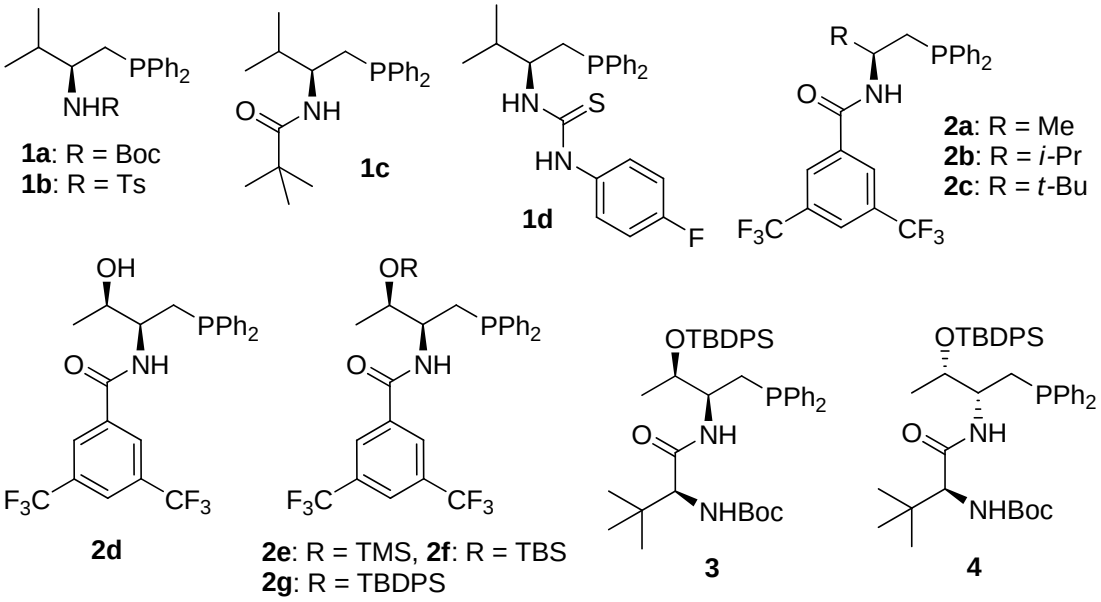
1. General Information

All the starting materials were obtained from commercial sources and used without further purification unless otherwise noted. ^{1}H and ^{13}C NMR spectra were recorded at ambient temperature in $CDCl_3$ or D_2O on a Bruker ACF300 or AMX500 (500 MHz) spectrometer. The chemical shifts are reported in parts permillion (ppm) relative to CDC_3 (δ = 7.26) for ^{1}H-NMR and relative to the central resonances of $CDCl_3$ (δ = 77.0) for ^{13}C-NMR. Multiplicity was indicated as follows: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet), dd (doublet of doublet), br s (broad singlet). Coupling constants (*J*) were reported in Hertz (Hz). Low resolution mass spectra were obtained on a Finnigan/MAT LCQ pectrometer in ESI mode, and a Finnigan/MAT 95–T mass spectrometer in FAB mode. All high resolution mass spectra were obtained on a Finnigan/MAT 95XL–T spectrometer. For thin layer chromatography (TLC), Merck pre-coated TLC plates (Merck 60 F254) were used, and compounds were visualized with a UV light at 254 nm. Further visualization was achieved by staining with iodine, or ceric ammonium molybdate followed by heating on a hot plate. Flash chromatographic separations were performed on 200-300 mesh silica gel. Enantiomeric excess was determined by HPLC analysis using chiral column described below in detail. Optical rotations were measured with polarimeter.

All the chiral phosphine catalysts were prepared by following our previously reported procedures.[1] All the 3-fluoro-substituted oxindoles were synthesized based on known methods reported in literature.[2]

The absolute configuration of **7a$_1$** was assigned by comparing optical rotation of the corresponding derivative **9** (Scheme S3) with the value reported in the literature,[3] and the configuration of other γ-addition products were assigned by analogy.

2. Optimization of Reaction Conditions

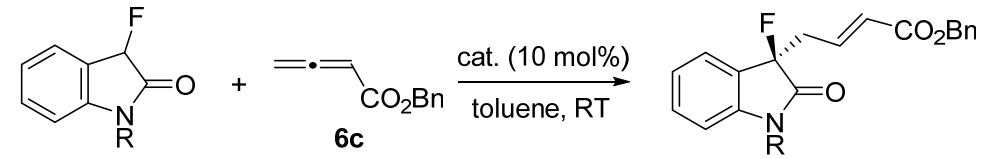


Scheme S1: Chiral phosphine catalysts used in this study.

(TBDPS = *tert*-butyldiphenylsilyl, TBS = *tert*-butyldimethylsilyl, TMS = trimethylsilyl, Ts = 4-toluenesulfonyl)

A. Optimization of conditions for γ-Addition of 3-fluoro-oxindoles

***Table S1*:** Asymmetric γ-addition of 3-fluoro-oxindole **5a** with allenoate **6c** catalyzed by different chiral phosphines in toluene [a]



5a$_1$: R = Boc, **5a$_2$**: R = Cbz
5a$_3$: R = Ac, **5a$_4$**: R = Me

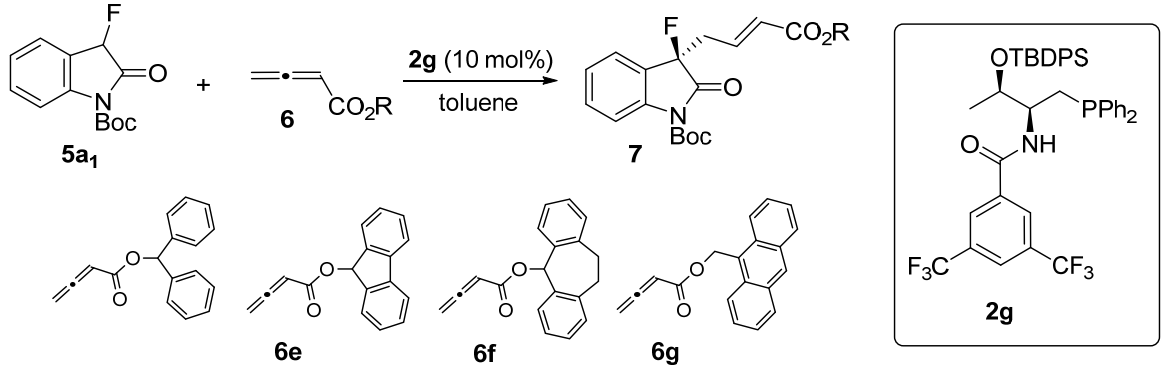
7a$_1$-3: R = Boc, **7a$_2$**: R = Cbz
7a$_3$: R = Ac, **7a$_4$**: R = Me

Entry	Cat.	R(**5a**)	*t* [h]	Yield [%][b]	ee [%][c]
1	**1a**	Boc(**5a$_1$**)	1	88	32
2	**1b**	Boc(**5a$_1$**)	0.5	95	55
3	**1c**	Boc(**5a$_1$**)	1	88	41
4	**1d**	Boc(**5a$_1$**)	0.5	98	77

5	**2a**	Boc(**5a$_1$**)	1	95	90
6	**2b**	Boc(**5a$_1$**)	1	93	90
7	**2c**	Boc(**5a$_1$**)	2	88	88
8	**2d**	Boc(**5a$_1$**)	2	89	64
9	**2e**	Boc(**5a$_1$**)	2	93	93
10	**2f**	Boc(**5a$_1$**)	2	92	92
11	**2g**	**Boc(5a$_1$)**	**2**	**95**	**93**
12	**3**	Boc(**5a$_1$**)	2	90	6
13	**4**	Boc(**5a$_1$**)	2	90	-9
14	**2g**	Cbz(**5a$_2$**)	2	86	93
15	**2g**	Ac(**5a$_3$**)	4	82	83
16	**2g**	Me(**5a$_4$**)	4	<5	--

[a] Reactions were performed with **5a** (0.05 mmol), **6c** (0.06 mmol) and catalyst (0.005 mmol) in toluene (0.5 mL) at room temperature. [b] Yields of isolated products. [c] Determined by HPLC analysis on a chiral stationary phase.

***Table S2*:** Asymmetric γ-addition of 3-fluoro-oxindole (**5a$_1$**) with different allenoates (**6**) catalyzed by phosphine catalyst **2g** in toluene [a]

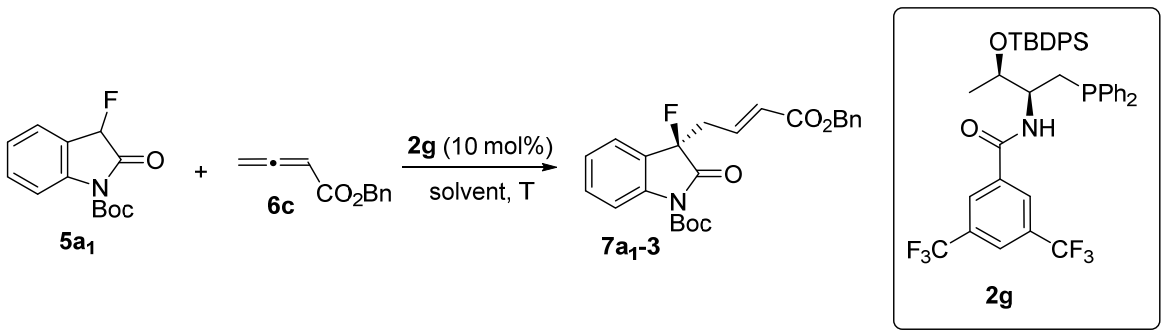


Entry	R (**6**)	**7**	Yield [%][b]	*ee* [%][c]
1	Me(**6a**)	**7a$_1$-1**	92	91
2	*t*-Bu(**6b**)	**7a$_1$-2**	90	91

3	Bn(**6c**)	**7a$_1$-3**	95	93
4	**6d**	**7a$_1$-4**	91	93
5	**6e**	**7a$_1$-5**	92	93
6	**6f**	**7a$_1$-6**	89	92
7	**6g**	**7a$_1$-7**	85	86
8	Ph(**6h**)	**7a$_1$-8**	88	77

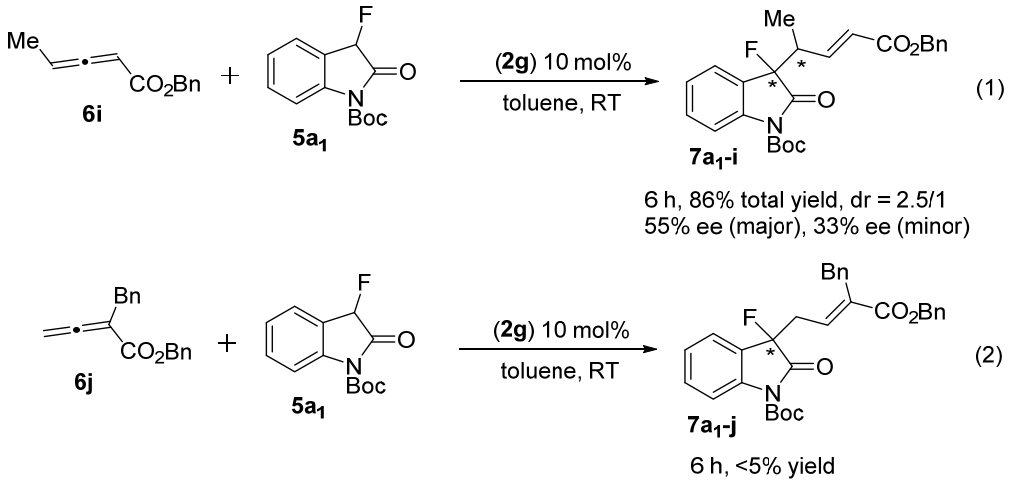
[a] Reaction conditions: **5a$_1$** (0.05 mmol), **6** (0.06 mmol), and the catalyst **2g** (0.005 mmol) in toluene (0.5 mL). [b] Yields of isolated products. [c] Determined by HPLC analysis on a chiral stationary phase.

***Table S3*:** Asymmetric γ-addition oxindole 5**a$_1$** with allenoate **6c** catalyzed by **2g**: optimizing the solvents and other reaction conditions [a]



Entry	Solvent	T [^{o}C]	*t* [h]	Yield [%][b]	*ee* [%][c]
1	toluene	RT	2	95	93
2	xylene	RT	2	95	90
3	Et_2O	RT	2	88	73
4	$CHCl_3$	RT	4	90	88
5	CH_2Cl_2	RT	4	92	92
6	EA	RT	6	81	45
7	toluene	0	12	83	69

[a] Reaction conditions: **5a$_1$** (0.05 mmol), **6c** (0.06 mmol), and the catalyst **2g** (0.005 mmol) in solvent (0.5 mL). [b] Yields of isolated products. [c] Determined by HPLC analysis on a chiral stationary phase.



Scheme S2: Reactions of α-substituted and γ-substituted allenoates (**6i** and **6j**) with *N*-Boc-3-fluoro-oxindole (**5a$_1$**) by catalyst **2g**.

3. Proposed Reaction Cycle

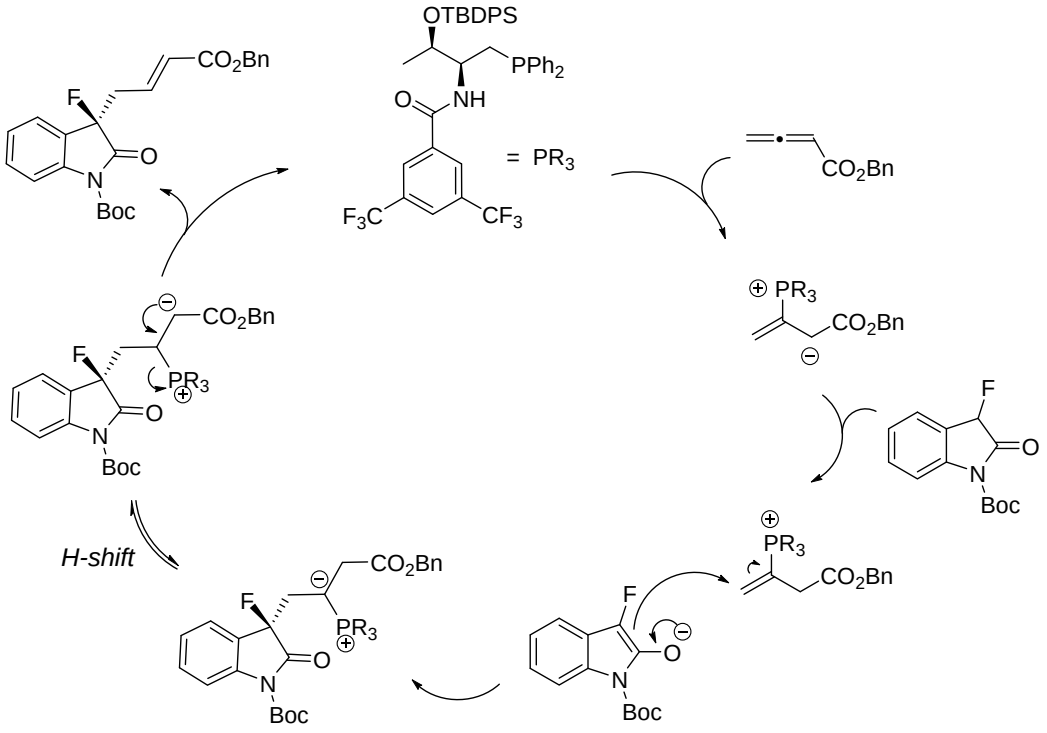


Figure S1: Proposed catalytic cycle.

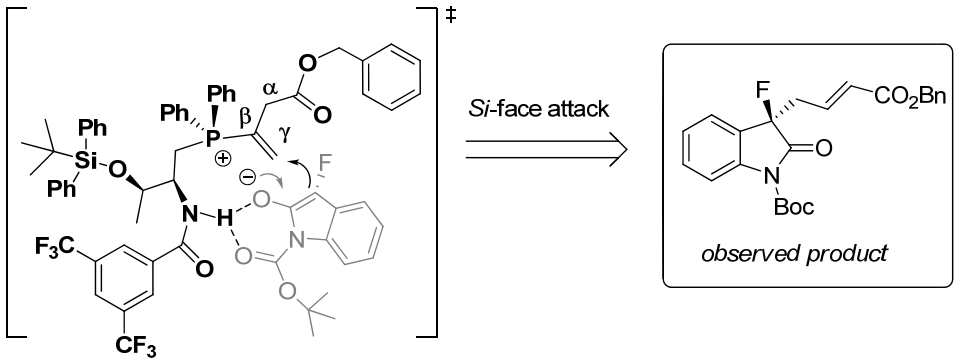
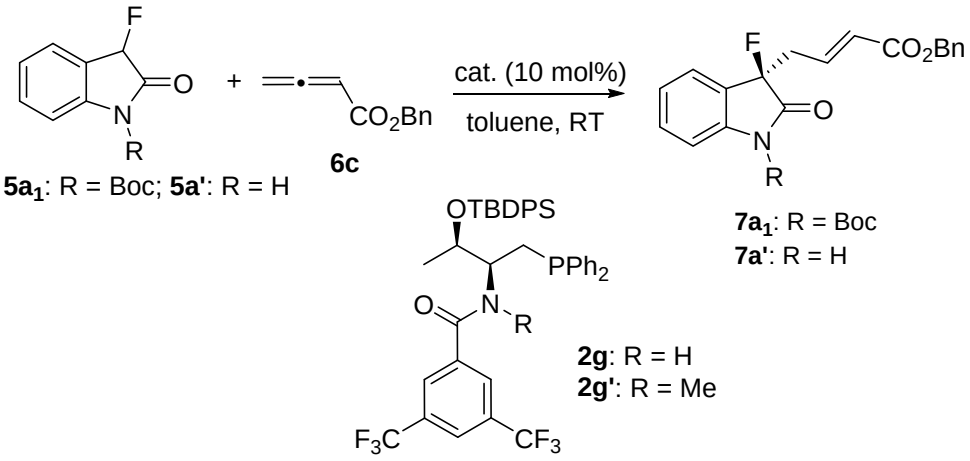


Figure S2. Proposed transition-state model.

Table S4. Asymmetric γ-addition promoted by different phosphine catalysts: investigating the H-bonding effect.[a]

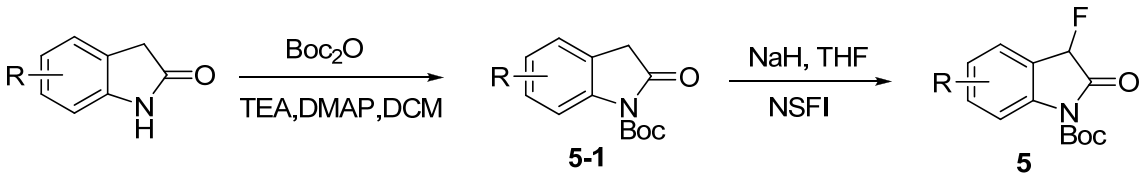


Entry	Sub.	Cat.	*t* [h]	**7**/Yield [%][b]	ee [%][c]
1	**5a$_1$**	**2g**	2	**7a**/95	93
2	**5a$_1$**	**2g'**	4	**7a**/85	37
3	**5a'**	**2g**	2	**7a'**/81	43

[a] Reaction conditions: substrate (0.05 mmol), **6c** (0.06 mmol), and catalyst (0.005 mmol) in toluene (0.5 mL) at room terature. [b] Isolated yield. [c] Determined by HPLC analysis on a chiral stationary phase.

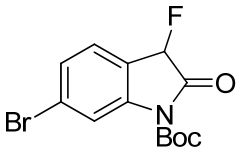
4. Preparation of the 3-fluoro-substituted oxindoles

General procedure for preparing 3-fluoro-substituted oxindoles 5:[2]



All 3-fluoro-substituted oxindoles **5** were prepared from compounds **5-1** via known fluorination using NFSI as F-source following literature procedure (16-48% yields).[2] Substrates **5a-c** and **5f-h** are known compounds, and their characterization data were in agreement with those reported in the literature.[2] Unknown compounds **5d**, **5e** and **5a'** were fully characterized.

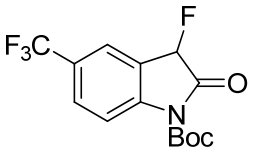
***tert*-Butyl 6-bromo-3-fluoro-2-oxoindoline-1-carboxylate (5d)**



5d

A white sold; ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.13 (s, 1H), 7.40-7.35 (m, 2H), 5.70 (d, J = 51.1 Hz, 1H), 1.64 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 168.34 (d, J = 18.2 Hz), 148.40, 141.89 (d, J = 4.6 Hz), 128.14 (d, J = 2.7 Hz), 127.08, 125.81 (d, J = 3.6 Hz), 119.23, 85.62, 85.23 (d, J = 189.5 Hz), 27.99; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -187.10 (d, J = 51.5 Hz); HRMS (ESI) *m/z* calcd $C_{13}H_{13}BrFNNaO_3$ $[M+Na]^+$ = 351.9955, found = 351.9950.

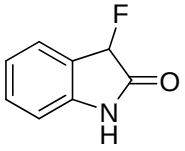
***tert*-Butyl 3-fluoro-2-oxo-5-(trifluoromethyl)indoline-1-carboxylate (5e)**



5e

A white sold; ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.95 (d, *J* = 8.8 Hz, 1H), 7.39 (s, 1H), 7.31 (d, *J* = 8.9 Hz, 1H), 5.71 (d, *J* = 50.4 Hz, 1H), 1.63 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 168.17 (d, *J* = 17.3 Hz) 148.45, 146.10, 139.35 (d, *J* = 4.6 Hz), 124.61, 123.15 (d, *J* = 17.3 Hz), 121.43, 119.24 (d, *J* = 32.8 Hz), 116.99, 85.54, 85.19 (d, *J* = 190.4 Hz), 27.98; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -58.28, -188.44 (d, *J* = 50.5 Hz); HRMS (ESI) *m/z* calcd $C_{14}H_{13}F_4NNaO_3$ $[M+Na]^+$ = 342.0729, found = 342.0720.

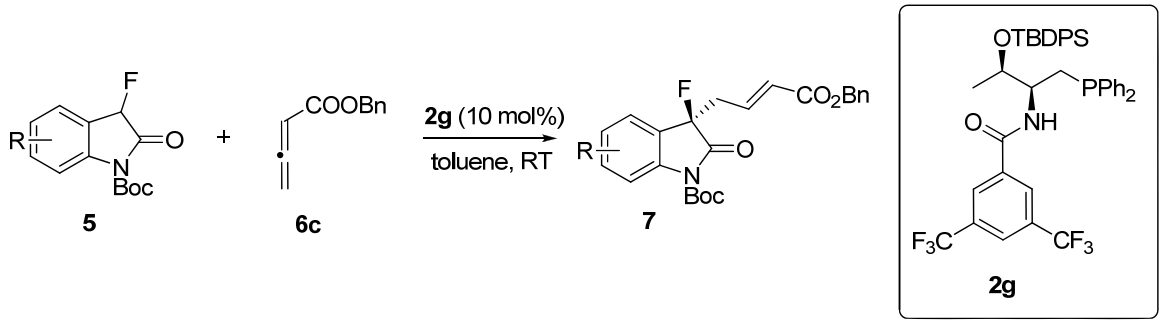
3-Fluoroindolin-2-one (5a')



5a'

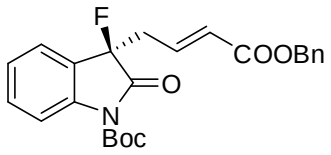
A white sold; ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.07 (s, 1H), 7.45 (d, *J* = 7.6 Hz, 1H), 7.34 (t, *J* = 7.6 Hz, 1H), 7.09 (t, *J* = 7.6 Hz, 1H), 6.94 (d, *J* = 8.2 Hz, 1H), 5.74 (d, *J* = 51.1 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 173.87 (d, *J* = 18.2 Hz), 141.96 (d, *J* = 5.5 Hz), 131.51 (d, *J* = 2.7 Hz), 126.27, 123.32 (d, *J* = 2.7 Hz), 123.26 (d, *J* = 16.4 Hz), 110.90, 86.67 (d, *J* = 188.6 Hz); ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -193.68 (d, *J* = 50.5 Hz); HRMS (ESI) *m/z* calcd C_8H_6FNNaO $[M+H]^+$ = 174.0331, found = 174.0229.

5. Representative Procedure for γ-Addition of 3-Fluorinated Oxindoles



To dried schlenk tube equipped with a stirrer bar were added 3-fluoro-oxindole **5a$_1$** (12.5 mg, 0.05 mmol) and catalyst **2g** (3.8 mg, 0.005 mmol), followed by the addition of dry toluene (0.5 mL). Allenoate **6c** (10.5 mg, 0.06 mmol) was slowly added via syringe, and the reaction mixture was stirred at room temperature for 2 h. Then, the solvent of toluene was removed under reduced pressure, and the residue was purified by column chromatography on silica gel (hexane/ethyl acetate = 15:1) to afford **7a$_1$** (20.3 mg, 95% yield) as a white foam.

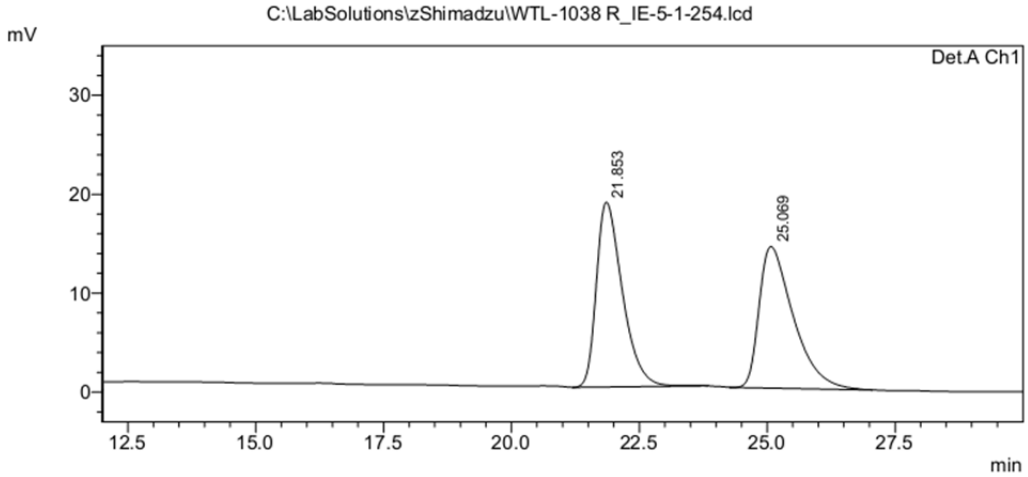
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-3-fluoro-2-oxoindoline-1-carboxylate ($7a_1$)



$7a_1$

A white foam; $[\alpha]^{25}_D$ = +25.5 (*c* 0.40, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.91 (d, *J* = 8.2 Hz, 1H), 7.47-7.41 (m, 2H), 7.38-7.31 (m, 5H), 7.22 (d, *J* = 7.6 Hz, 1H), 6.90-6.83 (m, 1H), 5.97 (d, *J* = 15.8 Hz, 1H), 5.17 (s, 2H), 3.15-3.09 (m, 1H), 2.97-2.88 (m, 1H), 1.63 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 170.01 (d, *J* = 21.0 Hz), 165.25, 148.51, 140.11 (d, *J* = 4.6 Hz), 138.78 (d, *J* = 7.3 Hz), 135.74, 131.83 (d, *J* = 3.6 Hz), 128.53, 128.23, 128.12, 126.71, 125.09 (d, *J* = 2.7 Hz), 124.86, 123.92 (d, *J* = 19.1 Hz), 115.72, 91.69 (d, *J* = 189.5 Hz), 85.19, 66.31, 38.34 (d, *J* = 30.1 Hz), 27.98; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.02 (dd, $J_{1,2}$ = 12.4 Hz, $J_{1,3}$ = 18.6 Hz); HRMS (ESI) *m/z* calcd for $C_{24}H_{24}FNNaO_5$ $[M+Na]^+$ = 448.1531, found = 448.1543; The ee value was 93%, t_R (major) = 25.3 min, t_R (minor) = 22.4 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



1 Det.A Ch1/254nm

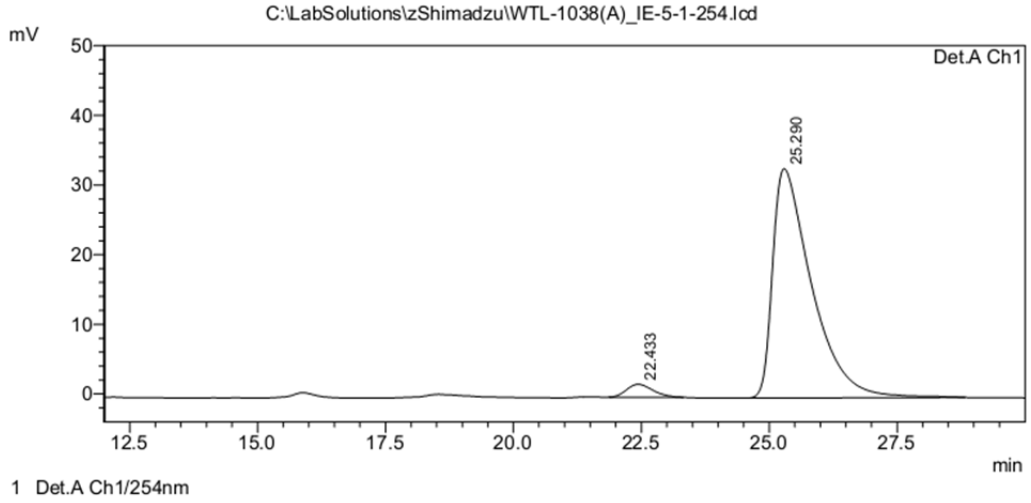
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	21.853	662268	18680	49.820	56.644
2	25.069	667055	14298	50.180	43.356
Total		1329323	32979	100.000	100.000

Racemic **7a**

<Chromatogram>



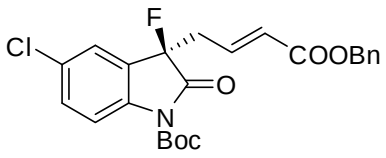
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	22.433	66991	1856	3.694	5.340
2	25.290	1746754	32907	96.306	94.660
Total		1813745	34763	100.000	100.000

Enantiomerically enriched **7a**

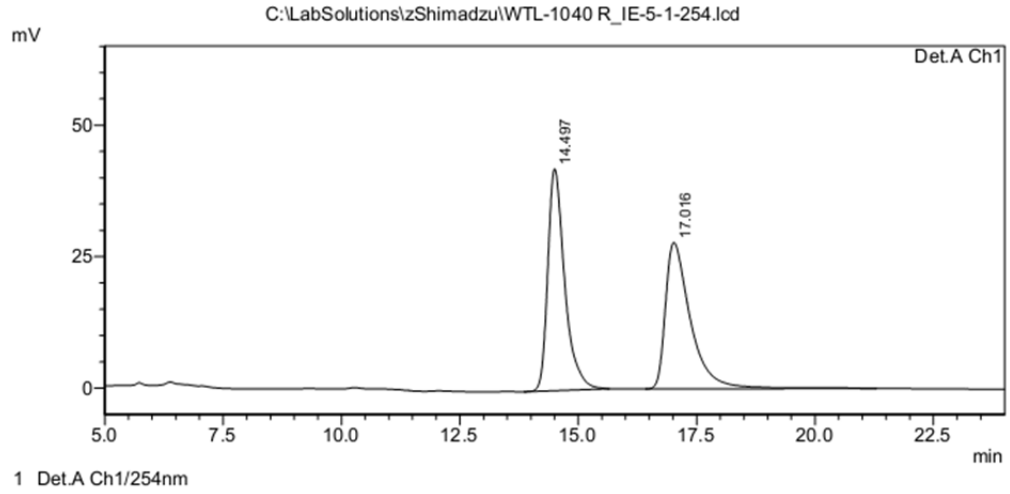
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-5-chloro-3-fluoro-2-oxoindoline-1-carboxylate (7b)



7b

A white foam; $[\alpha]^{25}_{D}$ = +29.8 (*c* 0.64, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.88 (d, *J* = 8.8 Hz, 1H), 7.43 (dt, $J_{1,2}$ = 1.9 Hz, $J_{1,3}$ = 8.9 Hz, 1H), 7.40-7.37 (m, 1H), 7.35-7.31 (m, 5H), 6.84-6.78 (m, 1H), 5.98 (d, *J* = 15.8 Hz, 1H), 5.17 (s, 2H), 3.12-3.05 (m, 1H), 2.98-2.90 (m, 1H), 1.62 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 169.33 (d, *J* = 21.0 Hz), 165.12, 148.34, 138.63 (d, *J* = 5.5 Hz), 138.00 (d, *J* = 7.4 Hz), 135.70, 131.87 (d, *J* = 2.7 Hz), 130.73 (d, *J* = 2.7 Hz), 128.58, 128.28, 128.15, 127.13, 125.54 (d, *J* = 19.1 Hz), 125.01, 117.15, 91.34 (d, *J* = 191.3 Hz), 85.60, 66.42, 38.23 (d, *J* = 29.2 Hz), 27.97; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.61 (t, *J* = 14.4 Hz); HRMS (ESI) *m/z* calcd for $C_{24}H_{23}FClNNaO_5$ $[M+Na]^+$ = 482.1141, found = 482.1150; The ee value was 83%, t_R (major) = 16.9 min, t_R (minor) = 14.6 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



1 Det.A Ch1/254nm

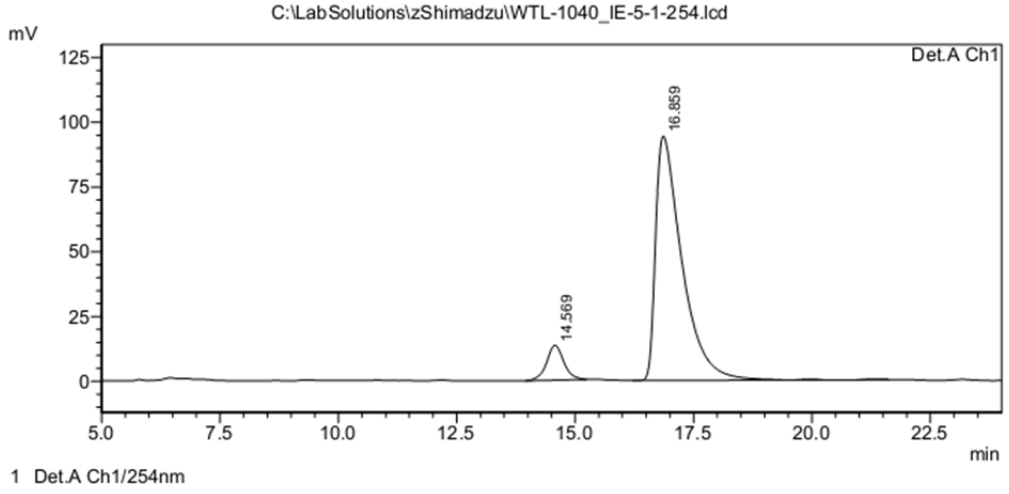
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	14.497	1047554	42149	50.344	60.232
2	17.016	1033247	27829	49.656	39.768
Total		2080802	69978	100.000	100.000

Racemic **7b**

<Chromatogram>



1 Det.A Ch1/254nm

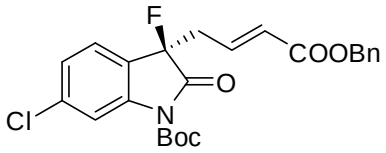
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	14.569	339868	13433	8.520	12.462
2	16.859	3649168	94358	91.480	87.538
Total		3989036	107792	100.000	100.000

Enantiomerically enriched **7b**

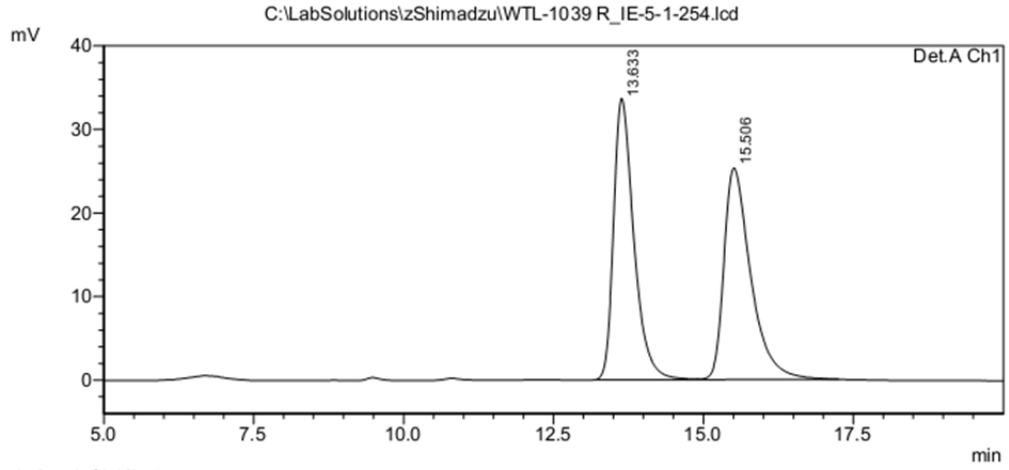
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-6-chloro-3-fluoro-2-oxoindoline-1-carboxylate (7c)



7c

A white foam; $[\alpha]^{25}_{D}$ = +43.4 (*c* 0.47, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.99 (s, 1H), 7.38-7.32 (m, 6H), 7.21 (dd, $J_{1,2}$ = 1.3 Hz, $J_{1,3}$ = 8.2 Hz, 1H), 6.86-6.80 (m, 1H), 5.98 (d, *J* = 15.1 Hz, 1H), 5.17 (s, 2H), 3.14-3.07 (m, 1H), 2.94-2.85 (m, 1H), 1.63 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 169.57 (d, *J* = 21.0 Hz), 165.17, 148.27, 141.06 (d, *J* = 5.5 Hz), 138.23 (d, *J* = 7.3 Hz), 137.87 (d, *J* = 3.7 Hz), 135.67, 128.58, 128.31, 128.19, 127.02, 125.82, 125.28 (d, *J* = 2.8 Hz), 122.08, 116.60, 91.27 (d, *J* = 190.5 Hz), 85.78, 66.43, 38.21 (d, *J* = 29.2 Hz), 27.95; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -148.82 (dd, $J_{1,2}$ = 12.4 Hz, $J_{1,3}$ = 19.6 Hz); HRMS (ESI) *m/z* calcd for $C_{24}H_{23}FClNNaO_5$ $[M+Na]^+$ = 482.1141, found = 482.1147; The ee value was 94%, t_R (major) = 15.3 min, t_R (minor) = 13.7 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



1 Det.A Ch1/254nm

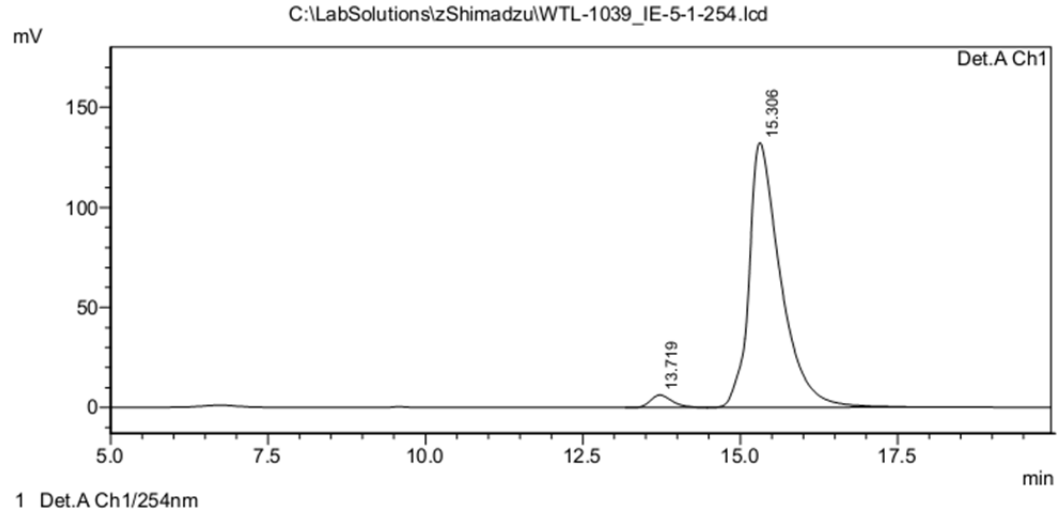
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	13.633	793056	33674	50.105	57.069
2	15.506	789727	25332	49.895	42.931
Total		1582783	59006	100.000	100.000

Racemic **7c**

<Chromatogram>



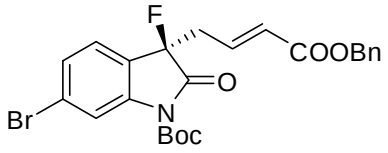
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	13.719	151912	6282	3.179	4.533
2	15.306	4627221	132303	96.821	95.467
Total		4779132	138585	100.000	100.000

Enantiomerically enriched **7c**

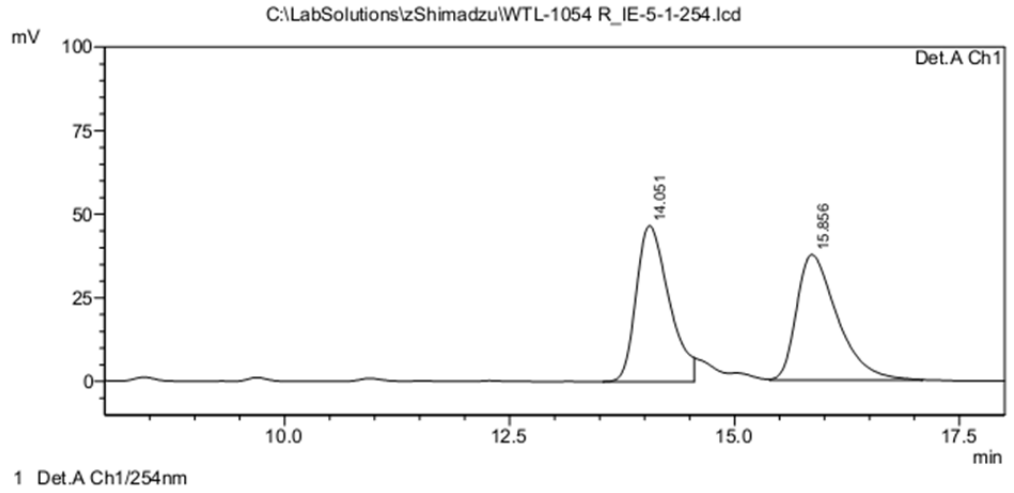
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-6-bromo-3-fluoro-2-oxoindoline-1-carboxylate (7d)



7d

A white foam; $[\alpha]^{25}_{D}$ = +34.6 (*c* 0.77, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.16 (s, 1H), 7.39-7.33 (m, 7H), 6.85-6.79 (m, 1H), 5.98 (d, *J* = 15.8 Hz, 1H), 5.17 (s, 2H), 3.13-3.06 (m, 1H), 2.93-2.85 (m, 1H), 1.63 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 169.50 (d, *J* = 21.0 Hz), 165.17, 148.29, 141.09 (d, *J* = 4.6 Hz), 138.27 (d, *J* = 7.3 Hz), 135.69, 128.60 (d, *J* = 12.8 Hz), 128.33, 128.20, 128.02, 127.85, 127.07, 126.06, 122.75 (d, *J* = 19.1 Hz), 119.39, 91.33 (d, *J* = 190.4 Hz), 85.80, 66.44, 38.18 (d, *J* = 29.2 Hz), 27.97; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.24 (dd, $J_{1,2}$ = 12.4 Hz, $J_{1,3}$ = 19.6 Hz); HRMS (ESI) *m/z* calcd for $C_{24}H_{23}BrFNNaO_5$ $[M+Na]^+$ = 526.0636, found = 526.0645; The ee value was 94%, t_R (major) = 15.8 min, t_R (minor) = 14.1 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



1 Det.A Ch1/254nm

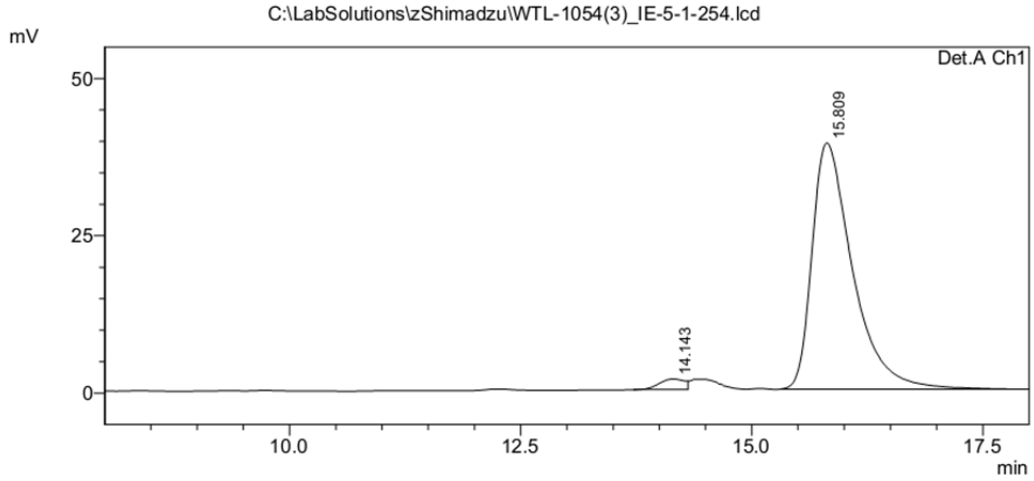
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	14.051	1188842	46658	50.085	55.425
2	15.856	1184820	37524	49.915	44.575
Total		2373661	84182	100.000	100.000

Racemic **7d**

<Chromatogram>



1 Det.A Ch1/254nm

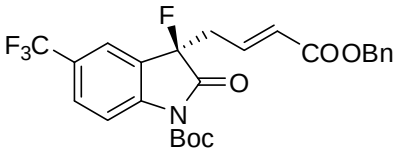
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	14.143	32090	1685	2.615	4.127
2	15.809	1195056	39130	97.385	95.873
Total		1227146	40814	100.000	100.000

Enantiomerically enriched **7d**

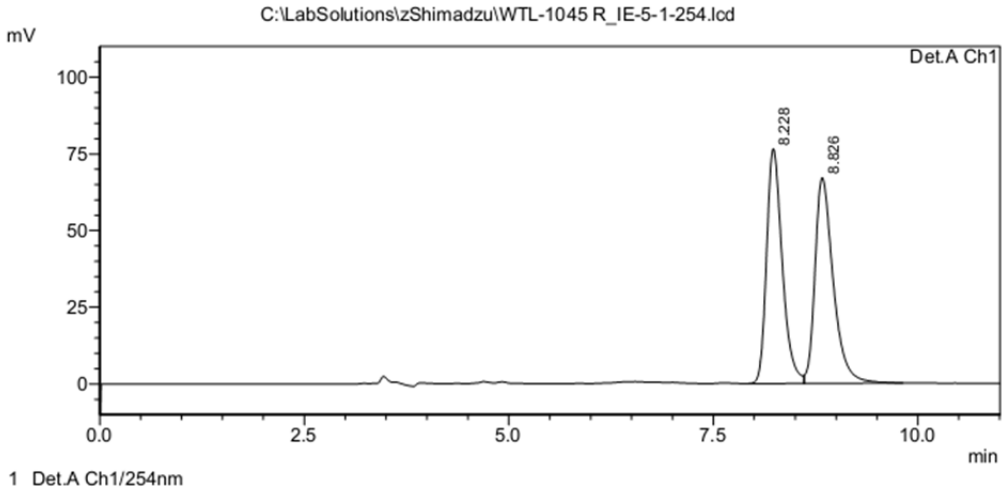
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-3-fluoro-2-oxo-5-(trifluoromethyl)indoline-1-carboxylate (7e)



7e

A white foam; $[\alpha]^{25}_{D}$ = +26.7 (*c* 0.27, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.98 (d, *J* = 8.8 Hz, 1H), 7.37-7.31 (m, 6H), 7.27 (d, *J* = 8.2 Hz, 1H), 6.87-6.81 (m, 1H), 5.99 (d, *J* = 15.8 Hz, 1H), 5.17 (s, 2H), 3.15-3.08 (m, 1H), 2.95-2.86 (m, 1H), 1.63 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 169.44 (d, *J* = 21.0 Hz), 165.06, 148.34, 146.07, 138.55 (d, *J* = 5.5 Hz), 137.87 (d, *J* = 6.4 Hz), 135.69, 128.57, 128.29 (d, *J* = 16.2 Hz), 127.32, 125.45 (d, *J* = 19.1 Hz), 124.68, 121.40, 119.35, 118.16, 117.18, 91.30 (d, *J* = 192.2 Hz), 85.73, 66.45, 38.32 (d, *J* = 29.2 Hz), 27.97; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -58.28, -150.80 (dd, $J_{1,2}$ = 13.4 Hz, $J_{1,3}$ = 20.6 Hz); HRMS (ESI) *m/z* calcd for $C_{25}H_{23}F_4NKO_5$ $[M+K]^+$ = 532.1149, found = 532.1143; The ee value was 92%, t_R (major) = 8.8 min, t_R (minor) = 8.2 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



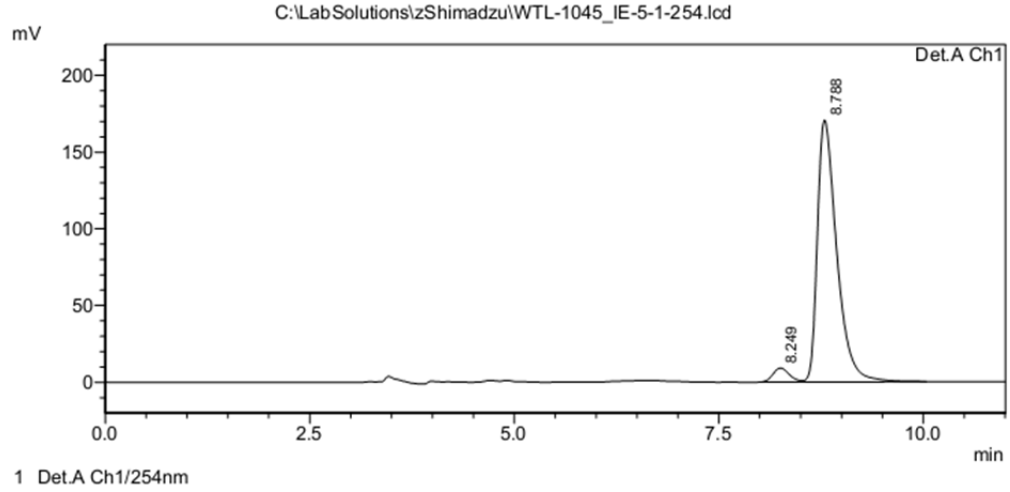
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	8.228	1018655	76568	49.417	53.314
2	8.826	1042694	67048	50.583	46.686
Total		2061350	143615	100.000	100.000

Racemic **7e**

<Chromatogram>



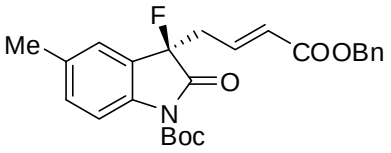
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	8.249	126296	9143	4.297	5.079
2	8.788	2812956	170864	95.703	94.921
Total		2939251	180008	100.000	100.000

Enantiomerically enriched **7e**

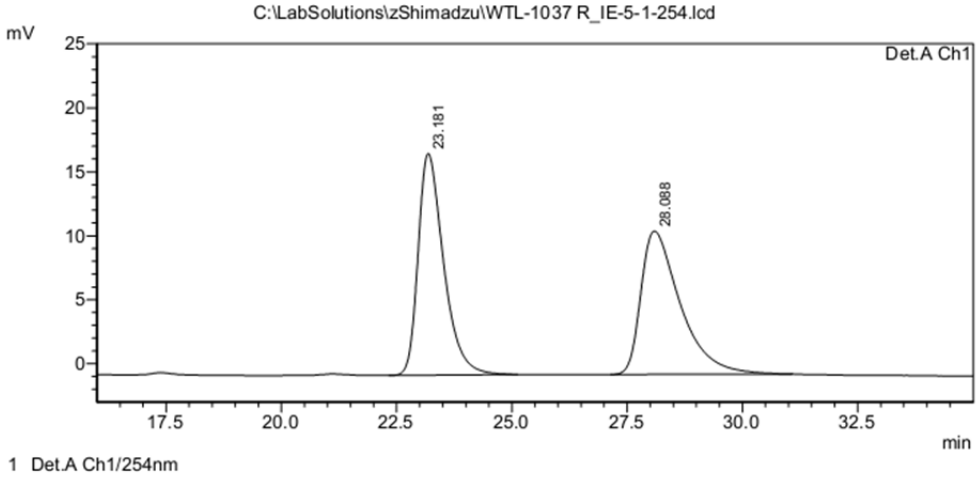
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-3-fluoro-5-methyl-2-oxoindoline-1-carboxylate (7f)



7f

A white foam; $[\alpha]^{25}_{D}$ = +17.1 (*c* 0.88, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.76 (d, *J* = 8.2 Hz, 1H), 7.38-7.31 (m, 5H), 7.25-7.21 (m, 2H), 6.86-6.80 (m, 1H), 5.99 (d, *J* = 15.5 Hz, 1H), 5.17 (s, 2H), 3.12-3.05 (m, 1H), 2.97-2.91 (m, 1H), 2.35 (s, 3H), 1.62 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 170.26 (d, *J* = 21.0 Hz), 165.31, 148.59, 138.91 (d, *J* = 7.3 Hz), 137.76 (d, *J* = 5.5 Hz), 135.79, 134.97 (d, *J* = 2.7 Hz), 132.35 (d, *J* = 2.7 Hz), 128.56, 128.26, 128.13, 126.63, 125.27, 123.86 (d, *J* = 18.2 Hz), 115.55, 91.86 (d, *J* = 189.5 Hz), 85.02, 66.31, 38.36 (d, *J* = 30.1 Hz), 28.02, 20.98; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -148.47 (dd, $J_{1,2}$ = 13.4 Hz, $J_{1,3}$ = 18.6 Hz); HRMS (ESI) *m/z* calcd for $C_{25}H_{26}FNNaO_5$ $[M+Na]^+$ = 462.1687, found = 462.1701; The ee value was 90%, t_R (major) = 27.9 min, t_R (minor) = 23.3 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



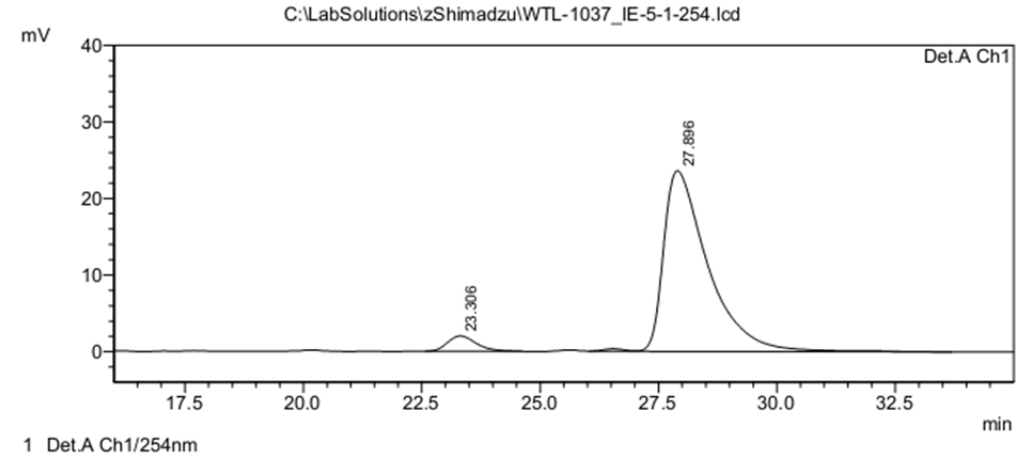
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	23.181	668231	17336	49.995	60.721
2	28.088	668365	11215	50.005	39.279
Total		1336596	28551	100.000	100.000

Racemic **7f**

<Chromatogram>



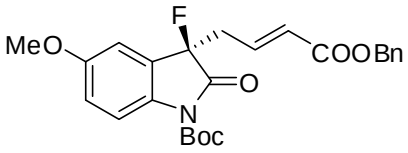
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	23.306	85735	2019	5.256	7.880
2	27.896	1545369	23599	94.744	92.120
Total		1631104	25618	100.000	100.000

Enantiomerically enriched **7f**

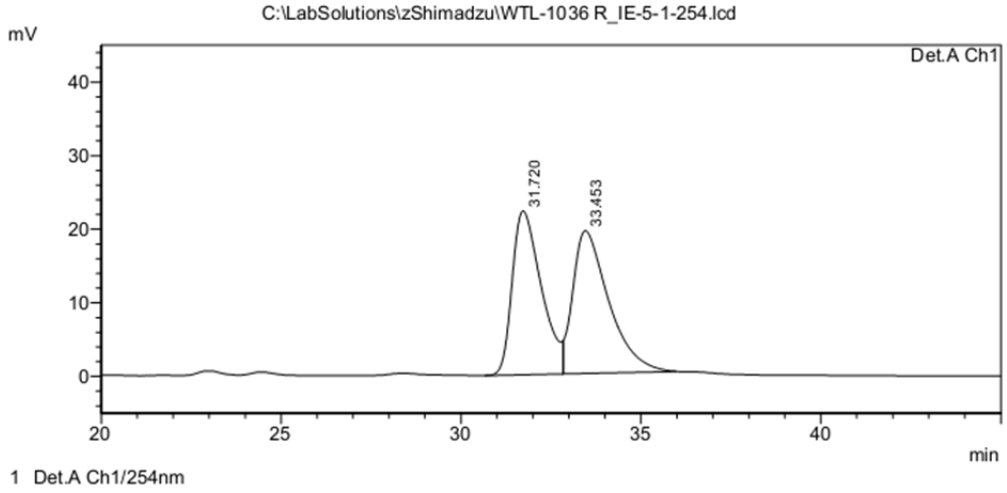
(*R*,*E*)-*tert*-Butyl 3-(4-(benzyloxy)-4-oxobut-2-enyl)-3-fluoro-5-methoxy-2-oxoindoline-1-carboxylate (7g)



7g

A white foam; $[\alpha]^{25}_{D}$ = +15.6 (*c* 0.40, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.82 (d, *J* = 8.8 Hz, 1H), 7.38-7.31 (m, 5H), 6.98-6.94 (m, 2H), 6.88-6.82 (m, 1H), 5.99 (d, *J* = 15.8 Hz, 1H), 5.16 (s, 2H), 3.77 (s, 3H), 3.13-3.06 (m, 1H), 2.95-2.86 (m, 1H), 1.62 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 170.19 (d, *J* = 21.0 Hz), 165.25, 157.15 (d, *J* = 2.7 Hz), 148.61, 138.75 (d, *J* = 7.3 Hz), 135.76, 133.24 (d, *J* = 5.5 Hz), 128.56, 128.27 (d, *J* = 10.9 Hz), 126.79, 124.97 (d, *J* = 18.2 Hz), 117.02, 117.00, 116.88, 110.46, 91.92 (d, *J* = 190.5 Hz), 84.99, 66.34, 55.67, 38.42 (d, *J* = 29.2 Hz), 28.03; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.56 (dd, $J_{1,2}$ = 14.4 Hz, $J_{1,3}$ = 19.6 Hz); HRMS (ESI) *m/z* calcd for $C_{25}H_{26}FNNaO_6$ $[M+Na]^+$ = 478.1636, found = 478.1647; The ee value was 94%, t_R (major) = 33.0 min, t_R (minor) = 31.7 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



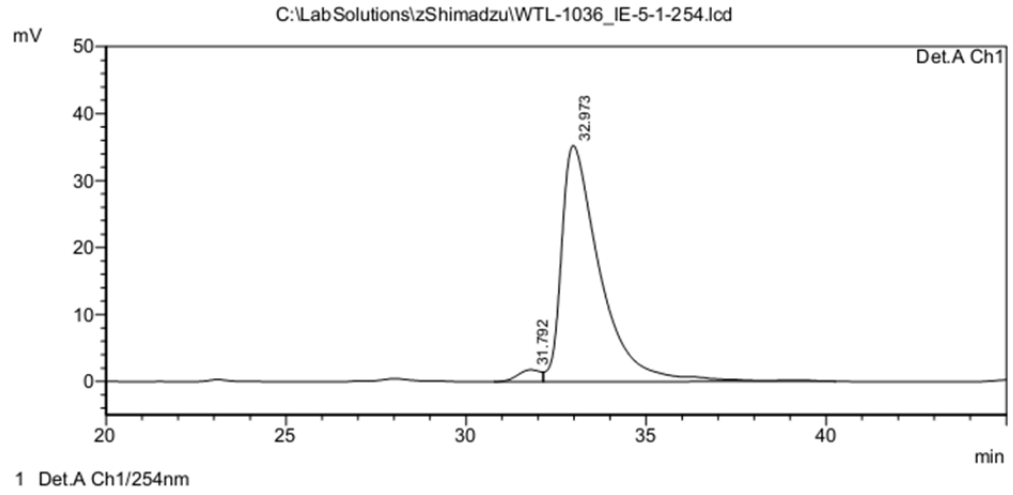
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	31.720	1258281	22182	49.550	53.678
2	33.453	1281161	19142	50.450	46.322
Total		2539442	41323	100.000	100.000

Racemic **7g**

<Chromatogram>



PeakTable

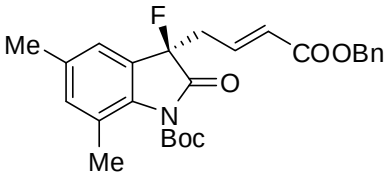
Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	31.792	77738	1766	2.875	4.769
2	32.973	2625807	35270	97.125	95.231
Total		2703545	37037	100.000	100.000

Enantiomerically enriched **7g**

(*R*,*E*)-*tert*-Butyl

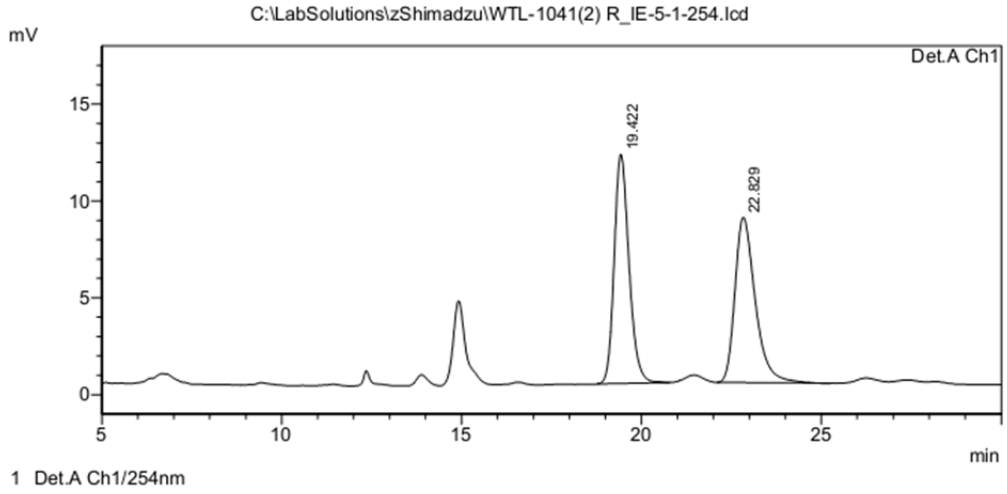
3-(4-(benzyloxy)-4-oxobut-2-enyl)-3-fluoro-5,7-dimethyl-2-oxoindoline-1-carboxylate (7h)



7h

A white foam; $[\alpha]^{25}_{D}$ = +12.4 (*c* 0.36, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.37-7.32 (m, 5H), 7.05 (s, 2H), 6.85-6.79 (m, 1H), 5.97 (d, *J* = 15.8 Hz, 1H), 5.16 (s, 2H), 3.08-3.01 (m, 1H), 2.97-2.88 (m, 1H), 2.31 (s, 1H), 2.19 (s, 1H), 1.60 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 171.25 (d, *J* = 21.0 Hz), 165.29, 148.41, 139.05 (d, *J* = 7.3 Hz), 136.14 (d, *J* = 5.5 Hz), 135.86, 135.28 (d, *J* = 3.7 Hz), 134.96 (d, *J* = 2.7 Hz), 128.54, 128.21, 128.11, 126.50, 125.26 (d, *J* = 18.2 Hz), 124.55, 122.79, 92.61 (d, *J* = 190.4 Hz), 85.28, 66.26, 38.57 (d, *J* = 30.1 Hz), 27.76, 20.85, 19.48; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.29 (t, *J* = 12.4 Hz); HRMS (ESI) *m/z* calcd for $C_{26}H_{28}FNNaO_5$ $[M+Na]^+$ = 476.1844, found = 476.1858; The ee value was 90%, t_R (major) = 22.2 min, t_R (minor) = 19.1 min (Chiralcel IE, λ = 254 nm, 5% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



1 Det.A Ch1/254nm

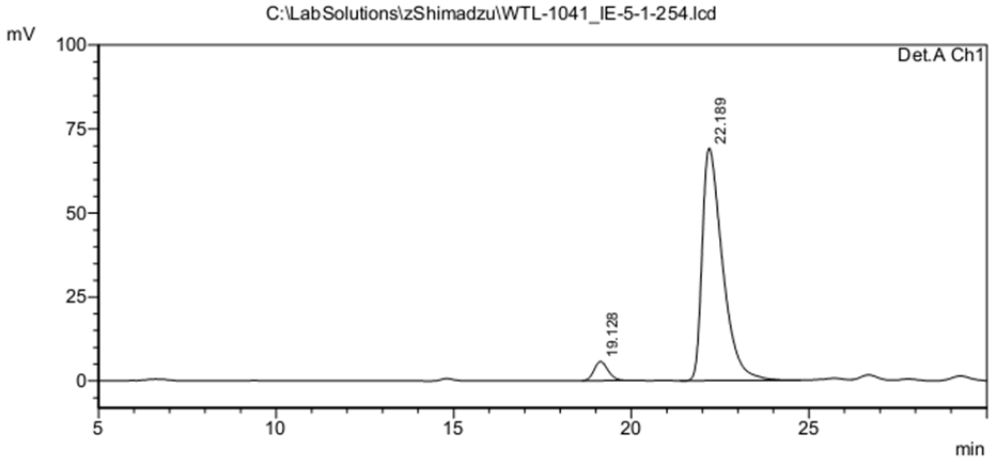
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	19.422	339283	11837	50.253	58.095
2	22.829	335873	8538	49.747	41.905
Total		675156	20375	100.000	100.000

Racemic **7h**

<Chromatogram>



1 Det.A Ch1/254nm

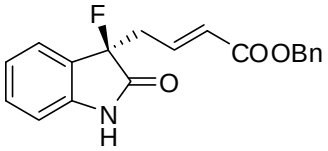
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	19.128	155331	5679	5.327	7.578
2	22.189	2760546	69264	94.673	92.422
Total		2915876	74943	100.000	100.000

Enantiomerically enriched **7h**

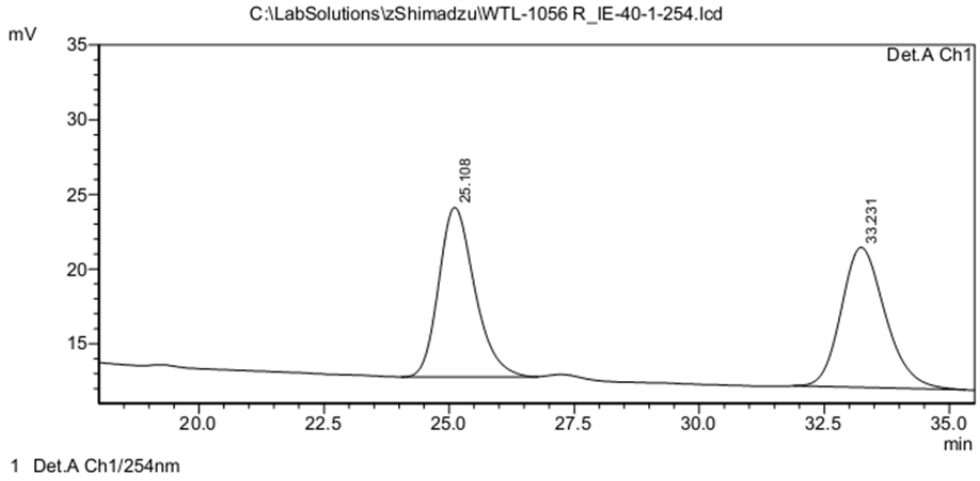
(*R*,*E*)- Benzyl 4-(3-fluoro-2-oxoindolin-3-yl)but-2-enoate (7a')



7a'

A white foam; $[\alpha]^{25}_{D}$ = +5.6 (*c* 0.22, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.50 (d, *J* = 7.0 Hz, 1H), 7.38-7.32 (m, 5H), 7.13 (t, *J* = 7.6 Hz, 1H), 6.97 (dt, $J_{1,2}$ = 4.4 Hz, $J_{1,3}$ = 15.8 Hz, 1H), 6.75 (d, *J* = 8.2 Hz, 1H), 5.97 (dt, $J_{1,2}$ = 1.9 Hz, $J_{1,3}$ = 15.8 Hz, 1H), 5.78 (d, *J* = 51.1 Hz, 1H), 5.16 (s, 2H), 4.55-4.50 (m, 1H), 4.42-4.37 (m, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 170.85 (d, *J* = 18.2 Hz), 165.17, 143.26 (d, *J* = 4.6 Hz), 140.53, 135.53, 131.58 (d, *J* = 2.7 Hz), 128.60, 128.40 (d, *J* = 2.7 Hz), 126.40, 123.67 (d, *J* = 2.7 Hz), 123.10, 122.75 (d, *J* = 16.4 Hz), 109.28, 85.97 (d, *J* = 188.6 Hz), 66.63, 40.62; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -192.47 (d, *J* = 50.5 Hz); HRMS (ESI) *m/z* calcd for $C_{19}H_{16}FNNaO_3$ $[M+Na]^+$ = 348.1012, found = 348.1017; The ee value was 43%, t_R (major) = 32.5 min, t_R (minor) = 24.5 min (Chiralcel IE, λ = 254 nm, 40% *i*-PrOH/hexanes, flow rate = 1.0 mL/min).

<Chromatogram>



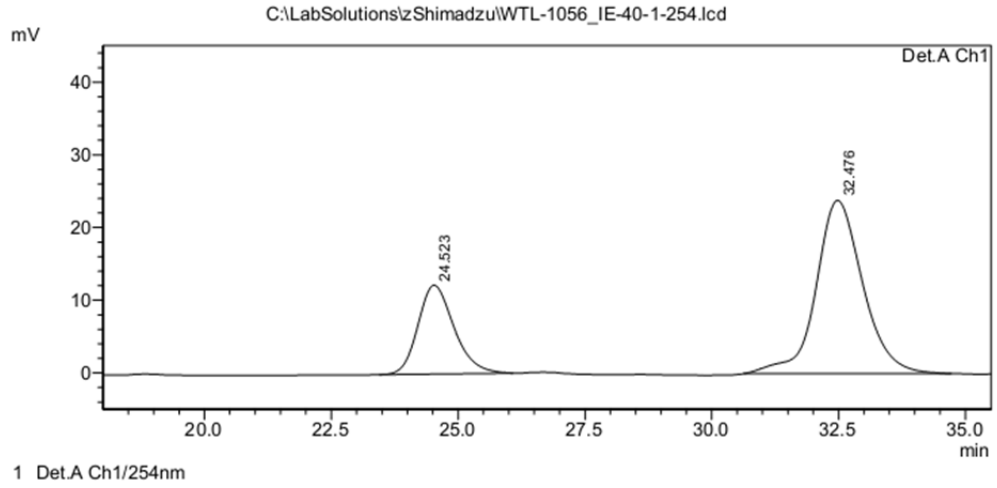
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	25.108	569067	11349	49.738	54.767
2	33.231	575058	9374	50.262	45.233
Total		1144126	20723	100.000	100.000

Racemic **7a'**

<Chromatogram>



1 Det.A Ch1/254nm

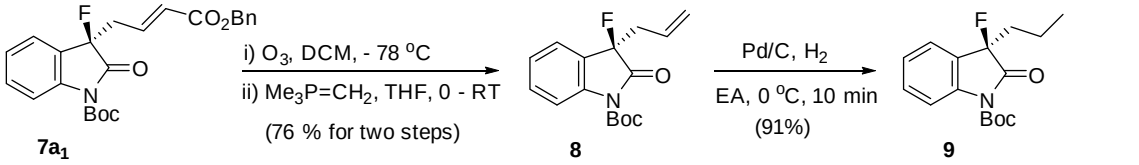
PeakTable

Detector A Ch1 254nm

Peak#	Ret. Time	Area	Height	Area %	Height %
1	24.523	604596	12222	28.379	33.915
2	32.476	1525804	23816	71.621	66.085
Total		2130400	36038	100.000	100.000

Enantiomerically enriched **7a'**

6. Asymmetric Synthesis of Chiral 3-Fluoro-3-allyl Oxindole Derivatives



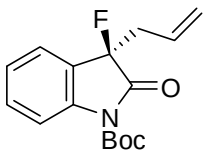
7a$_1$ **8** **9**

Found: $[\alpha]_D^{25}$ = +15.5 (*c* 0.46 $CHCl_3$)

Reported[3]: (*R*)-**9** with 91% ee
$[\alpha]_D^{20}$ = +12.9 (*c* 1.09 $CHCl_3$)

Scheme S3: Syntheis chiral 3-fluoro-3-allyl oxindole and its derivatives.

(*R*)-*tert*-Butyl 3-allyl-3-fluoro-2-oxoindoline-1-carboxylate (8)

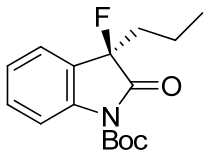


8

To a solution of **7a$_1$** (85 mg, 0.20 mmol) in CH_2Cl_2 (3.0 mL) at -78 ^oC, O_3 was bubbled until the reaction was complete (monitored by TLC). Ph_3P was added to quench the reaction at -78 ^oC, and then kept stirring for another 10 min. The reaction mixture was warmed to room temperature and passed through a short pad of silica gel, and eluted with EtOAc. The filtrate was concentrated and the residue was purified by flash column chromatography on silical gel (hexane/ethyl acetate = 5:1) to afford the corresponding aldehyde as a white foam, which was used directly in the next step.

To a solution of methyltrimethylphosphonium iodide (54 mg, 0.30 mmol) in dry THF (3.0 mL) at -78 ^oC, *n*-BuLi (133 μL, 2.0 M in hexane, 0.30 mmol) was slowly added and the mixture was kept stirring at -78 ^oC for 1 h. Then, the mixture was warmed to 0 ^oC and stirred for another 1 h. The above crude aldehyde in dry THF (2.0 mL) was introduced dropwise, and the resulting mixture was stirred at 0 ^oC until the reaction was completed (monitored by TLC). The reaction mixture was filtrated by a short pad of silica gel, and eluted with CH_2Cl_2. The filtrate was concentrated and the residue was purified by flash column chromatography (hexane/ethyl acetate = 20:1) to afford pure compound **8** as a white foam-oil (44.1 mg, 76% total yield). $[\alpha]^{25}_D$ = +13.5 (*c* 0.22, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.89 (d, *J* = 8.2 Hz, 1H), 7.47-7.41 (m, 2H), 7.22 (t, *J* = 7.6 Hz, 1H), 5.60-5.53 (m, 1H), 5.16 (d, *J* = 6.3 Hz, 1H), 5.13 (s, 1H), 3.01-2.94 (m, 1H), 2.88-2.80 (m, 1H), 1.64 (s, 9H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 170.78 (d, *J* = 21.0 Hz), 148.71, 140.21 (d, *J* = 4.6 Hz), 131.40 (d, *J* = 2.7 Hz), 128.44 (d, *J* = 8.2 Hz), 124.84, 124.68, 124.52, 121.50, 115.47, 92.50 (d, *J* = 188.6 Hz), 84.93, 40.06 (d, *J* = 28.2 Hz), 28.04; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -149.45 (dd, $J_{1,2}$ = 11.4 Hz, $J_{1,3}$ = 16.5 Hz); HRMS (ESI) *m/z* calcd for $C_{16}H_{18}FNNaO_3$ $[M+Na]^+$ = 314.1170, found = 314.1168.

(*R*)-*tert*-Butyl 3-fluoro-2-oxo-3-propylindoline-1-carboxylate (9)



9

To a mixture of compound **8** (29 mg, 0.10 mmol) and 10% Pd/C (3 mg) in EtOAc (1.0 mL) at 0 ^oC, H_2 was bubbled about 5 min, and the TLC shows that the reaction is completed. The catalyst Pd/C was removed by filtration. The filtrate was concentrated and further purified by flash column chromatography (hexane/ethyl acetate = 20:1) to give the known compound **9** as a white foam-solid (26.5 mg, 91% yield). $[\alpha]^{25}_D$ = +15.5 (*c* 0.46, $CHCl_3$); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.90 (d, *J* = 8.8 Hz, 1H), 7.44-7.41 (m, 2H), 7.23 (t, *J* = 7.6 Hz, 1H), 2.23-2.07 (m, 2H), 1.64 (s, 9H), 1.33-1.25 (m, 1H), 1.21-1.13 (m, 1H), 0.90 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 171.41 (d, *J* = 21.9

Hz), 148.81, 140.29 (d, J = 5.5 Hz), 131.27 (d, J = 2.7 Hz), 125.28 (d, J = 19.1 Hz), 124.95 (d, J = 2.7 Hz), 124.42, 115.50, 93.57 (d, J = 184.9 Hz), 84.90, 37.80 (d, J = 27.3 Hz), 28.05, 16.15 (d, J = 6.4 Hz), 13.95; ^{19}F NMR (282.38 MHz, $CDCl_3$) δ -148.30 (t, J = 13.4 Hz).

(*R*)-**9** was reported in literature[3]: 91% ee, $[\alpha]^{20}_D$ = +12.9 (*c* 1.09, $CHCl_3$). The above obtained compound **9** was found to have an $[\alpha]^{25}_D$ = +15.5 (*c* 0.46, $CHCl_3$). Therefore, the absolute configuration of oxindole $\mathbf{7a_1}$ was deduced to be *R*.

7. References

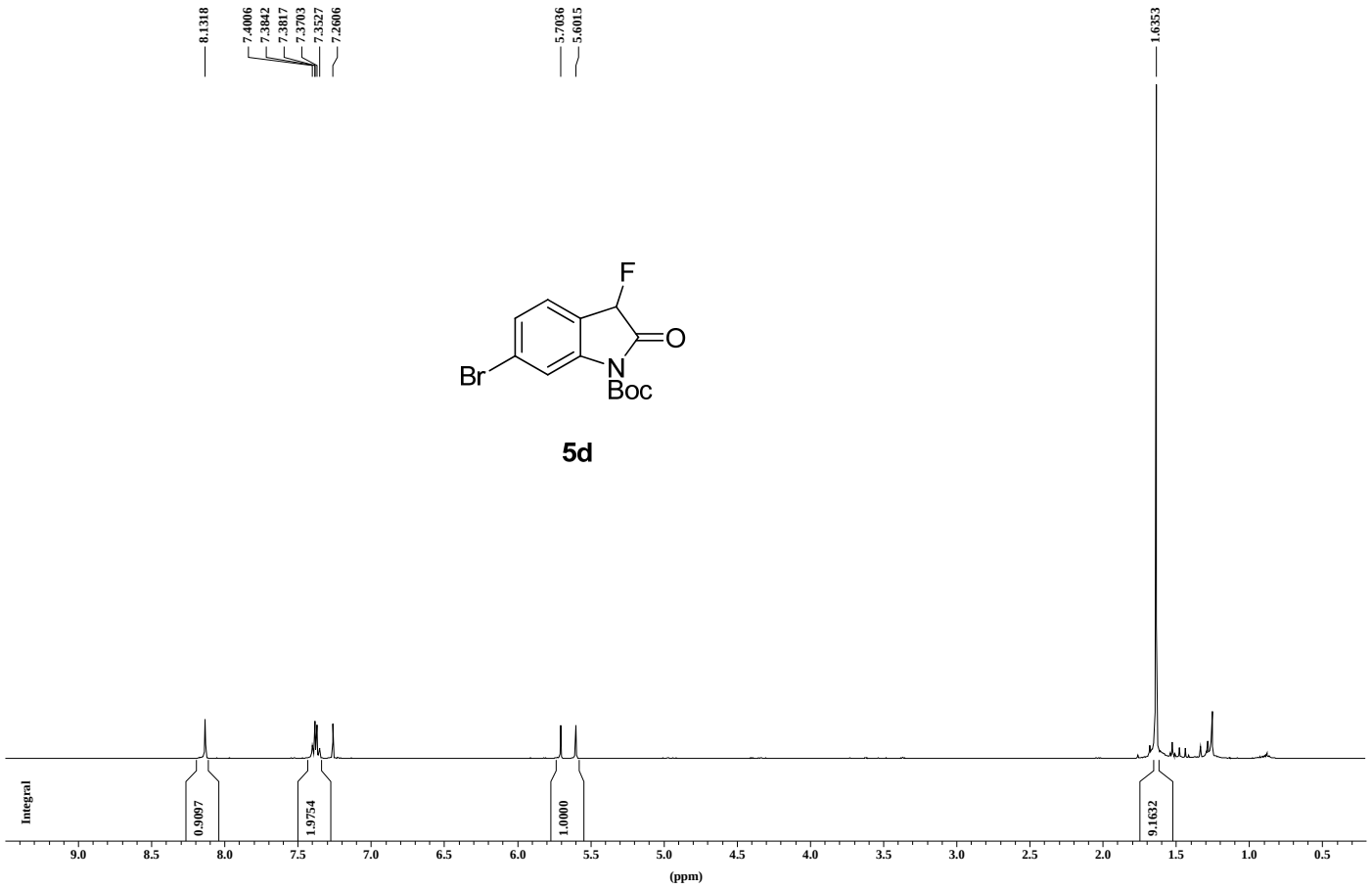
[1] (a) X. Han, Y. Wang, F. Zhong, Y. Lu, *J. Am. Chem. Soc.* 2011, **133**, 1726; (b) X. Han, F. Zhong, Y. Wang, Y. Lu, *Angew. Chem. Int. Ed.* 2012, **51**, 767; (c) F. Zhong, X. Han, Y. Wang, Y. Lu, *Chem. Sci.* 2012, **3**, 1231; (d) F. Zhong, X. Han, Y. Wang, Y. Lu, *Angew. Chem. Int. Ed*. 2011, **50**, 7837; (e) F. Zhong, J. Luo, G.-Y. Chen, X. Dou, Y. Lu, *J. Am. Chem. Soc.* 2012, **134**, 10222; (f) F. Zhong, X. Dou, X. Han, W. Yao, Q, Zhu, Y. Meng, Y. Lu, *Angew. Chem. Int. Ed.* 2013, **52**, 943; (g) T. Wang, W. Yao, F. Zhong, G. H. Pang, Y. Lu, *Angew. Chem. Int. Ed.* 2014, **53**, 2964.

[2] X. Dou, Y. Lu, *Org. Biomol. Chem.*, 2013, **11**, 5217.

[3] X. Gu, Y. Zhang, Z.-J. Xu, C.-M. Che, *Chem. Commun.*, 2014, **50**, 7870.

8. NMR Spectra of the Products

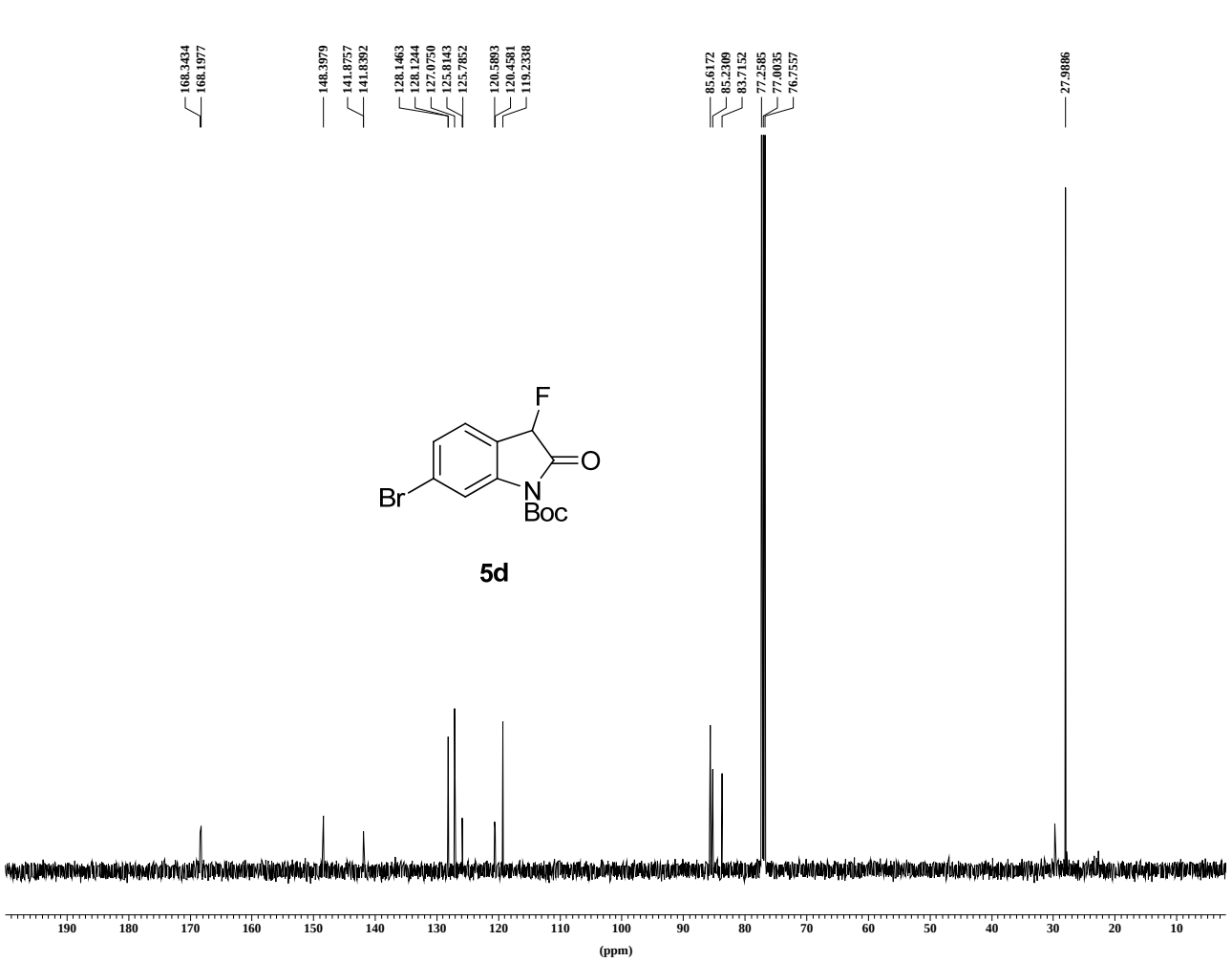
1H AMX500
HDL-75



***** Current Data Parameters *****
NAME : wtl-1114
EXPNO : 3
PROCNO : 1
***** Acquisition Parameters *****
LOCNUC : 2H
NS : 37
NUCLEUS : off
O1 : 3088.51 Hz
PULPROG : zg30
SFO1 : 500.1330885 MHz
SOLVENT : CDCl3
SW : 20.6557 ppm
TD : 32768
TE : 297.9 K
***** Processing Parameters *****
LB : 0.30 Hz
SF : 500.1300134 MHz
***** 1D NMR Plot Parameters *****
NUCLEUS : off

13C AMX500

HDL-75



***** Current Data Parameters *****

NAME	**:**	**wtl-1114**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**415**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**298.5 K**

***** Processing Parameters *****

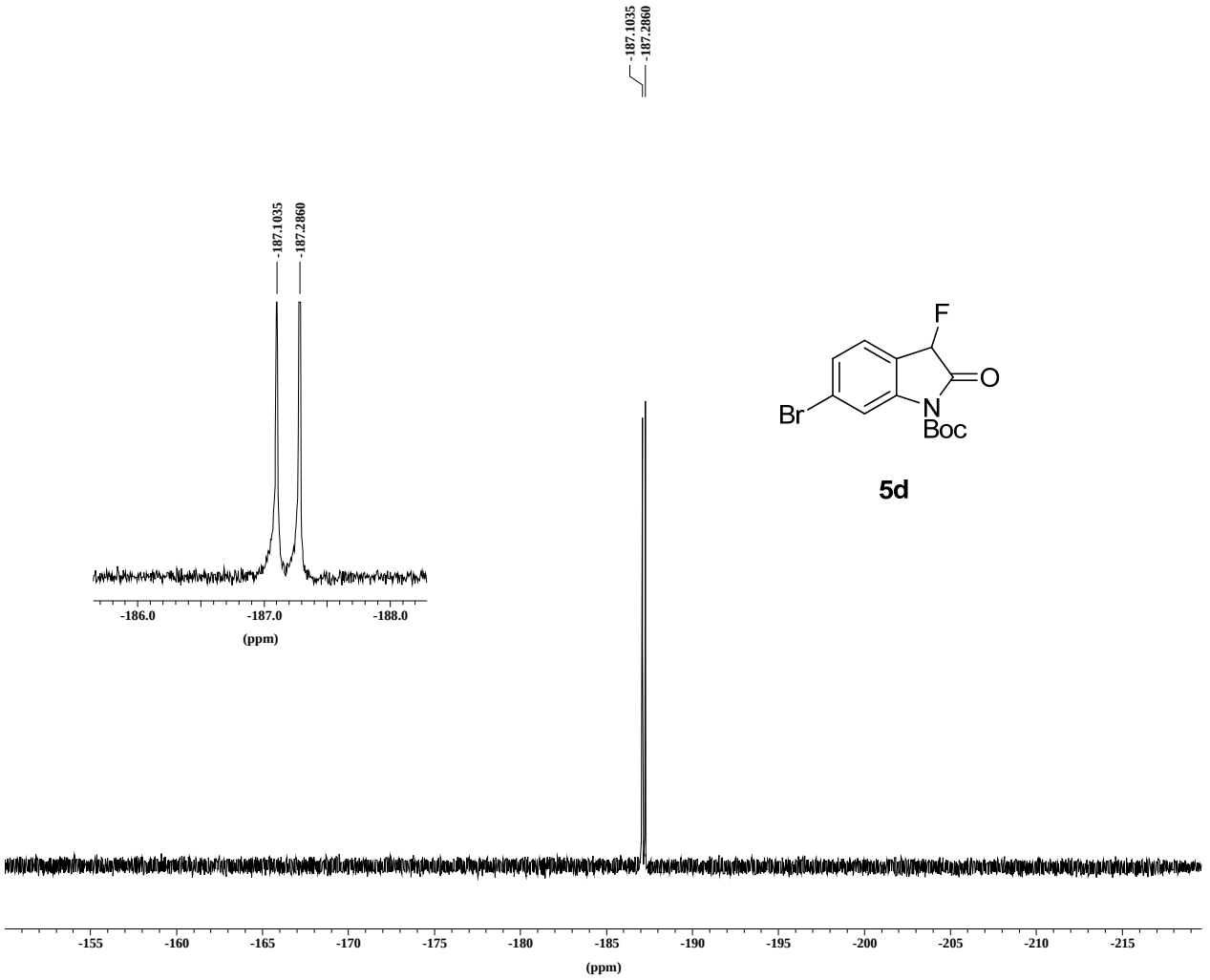
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577906 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

F19(no decoupled)

HDL-75



5d

*** Current Data Parameters ***

NAME : nov14-~1

EXPNO : 4

PROCNO : 1

*** Acquisition Parameters ***

LOCNUC : 2H

NS : 43

NUCLEUS : off

O1 : -28240.22 Hz

PULPROG : zg

SFO1 : 282.3761148 MHz

SOLVENT : DMSO

SW : 239.2822 ppm

TD : 131072

TE : 296.3 K

*** Processing Parameters ***

LB : 0.30 Hz

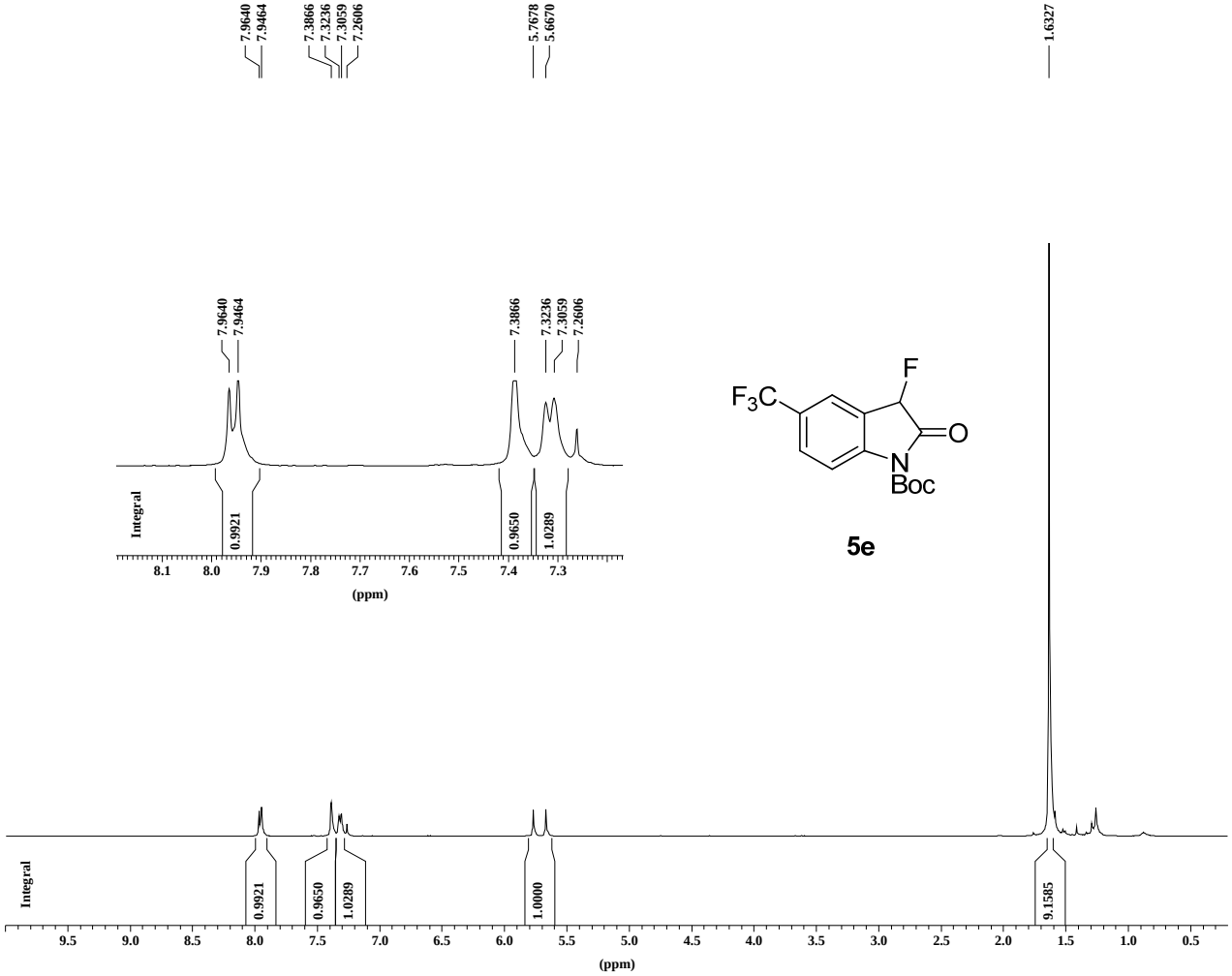
SF : 282.4043550 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS : off

1H AMX500

hdl-70(5-CF3 sub)



5e

***** Current Data Parameters *****

NAME	**:**	**wtl-1108**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**34**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**300.0 K**

***** Processing Parameters *****

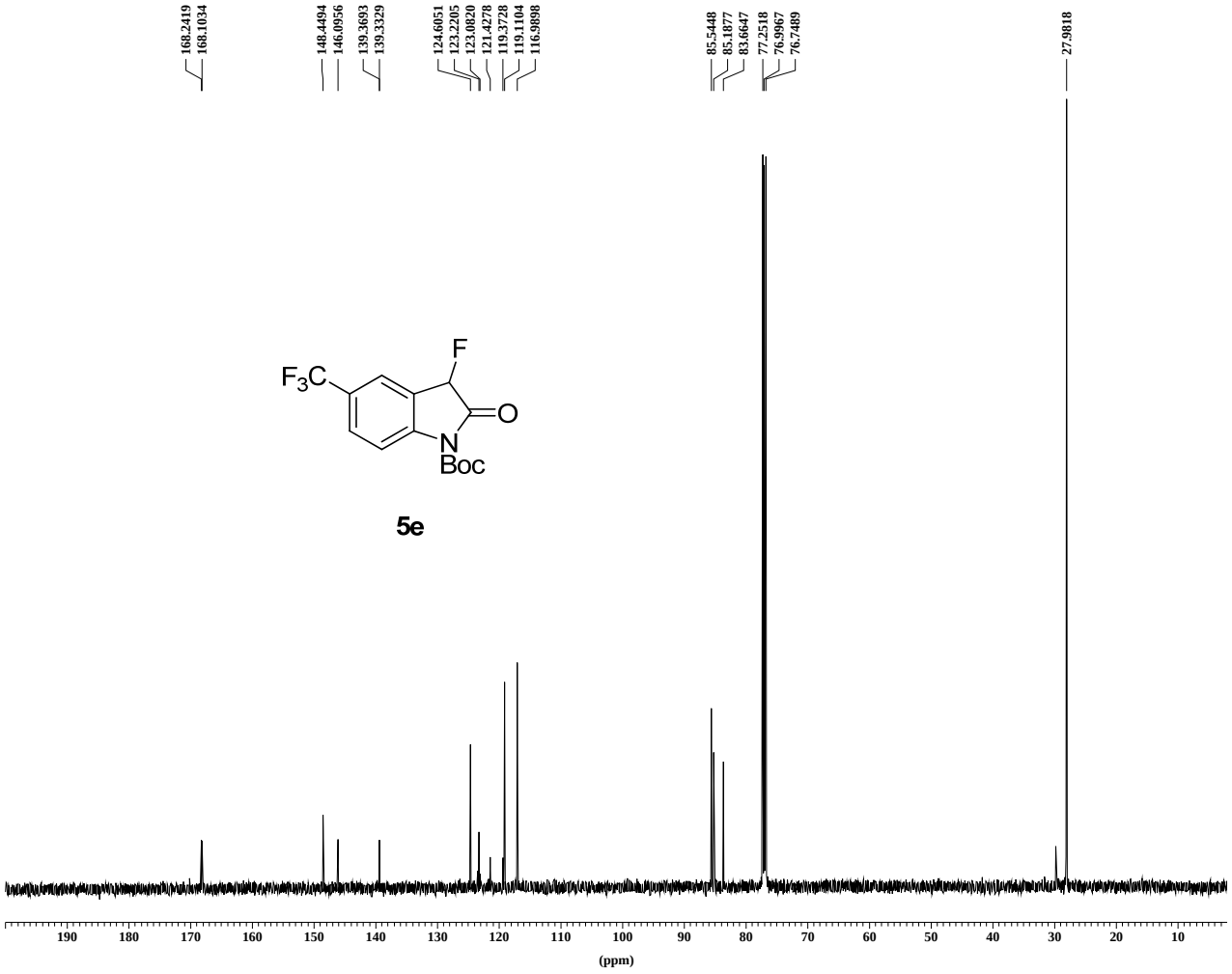
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

13C AMX500

hdl-70(5-CF3 sub)



5e

***** Current Data Parameters *****

NAME	**:**	**wtl-1108**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**743**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**300.2 K**

***** Processing Parameters *****

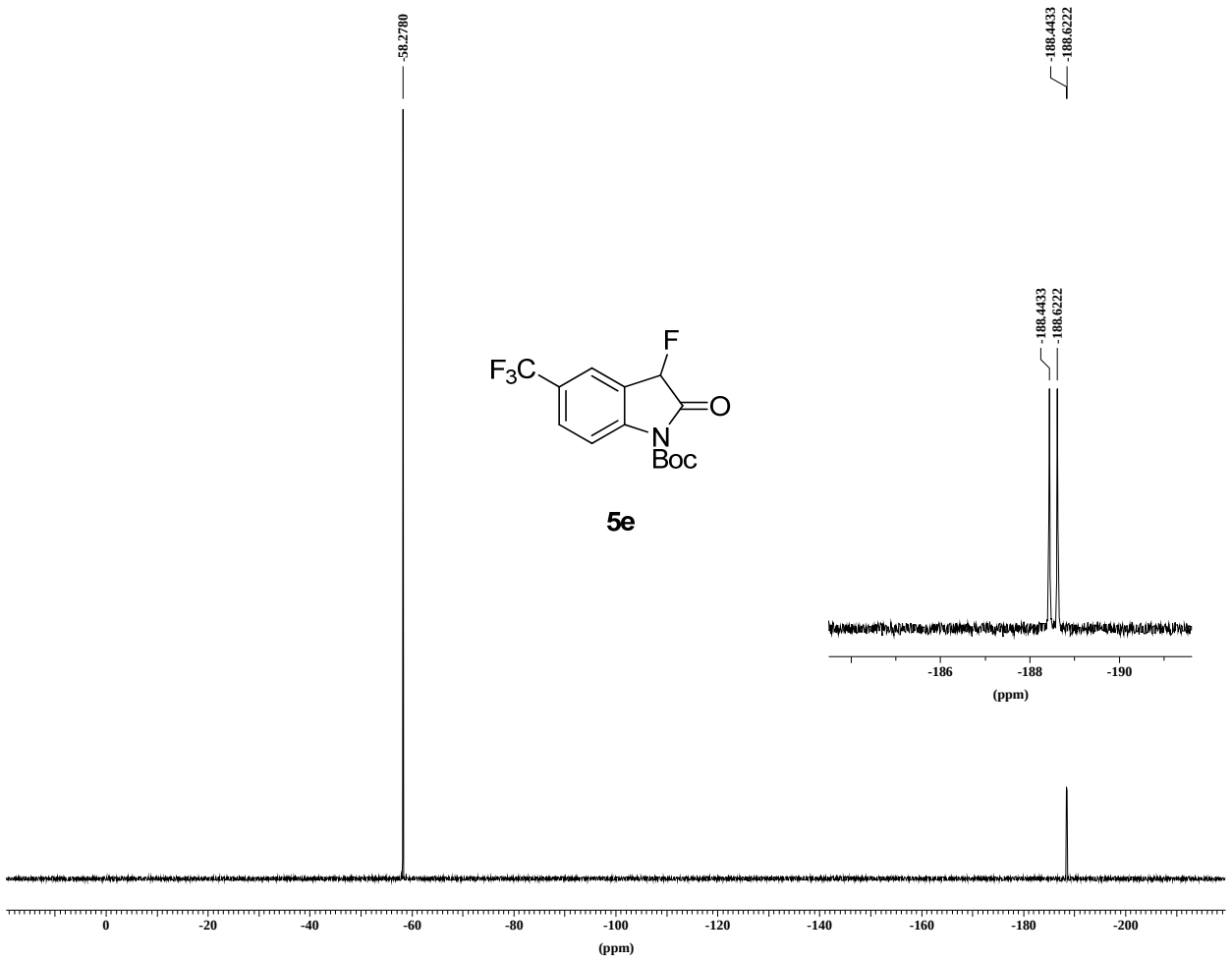
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577906 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

F19(no decoupled)

hdl-70(5-CF3 sub)



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**8**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**14**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.5 K**

***** Processing Parameters *****

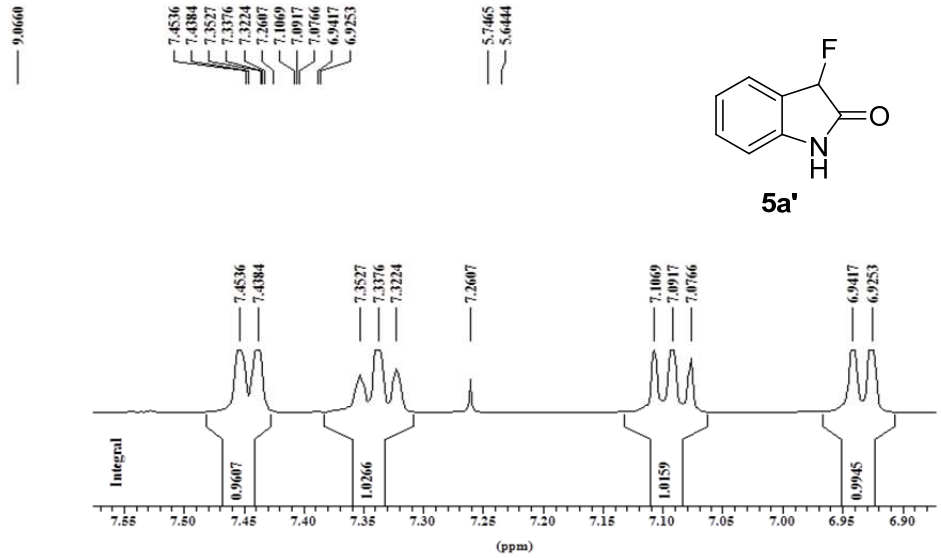
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

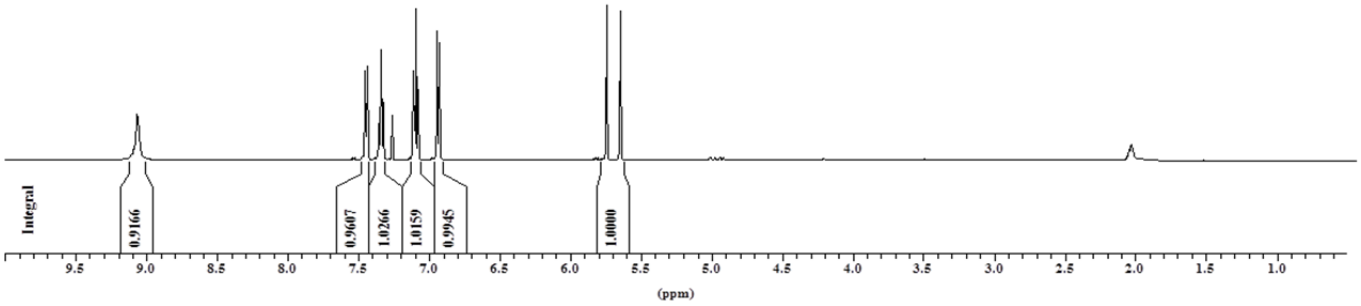
NUCLEUS	**:**	**off**

1H AMX500

wtl-1051



5a'



*** Current Data Parameters ***

NAME	:	wtl-1120
EXPNO	:	2
PROCNO	:	1

*** Acquisition Parameters ***

LOCNUC	:	2H
NS	:	21
NUCLEUS	:	off
O1	:	3088.51 Hz
PULPROG	:	zg30
SFO1	:	500.1330885 MHz
SOLVENT	:	CDCl3
SW	:	20.6557 ppm
TD	:	32768
TE	:	298.5 K

*** Processing Parameters ***

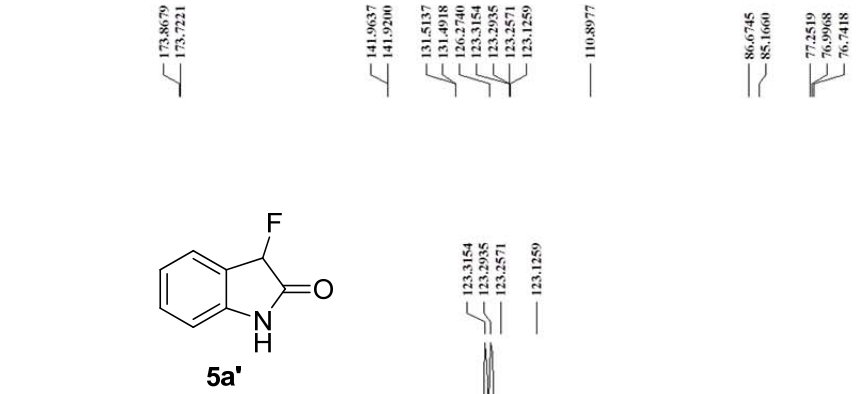
LB	:	0.30 Hz
SF	:	500.1300134 MHz

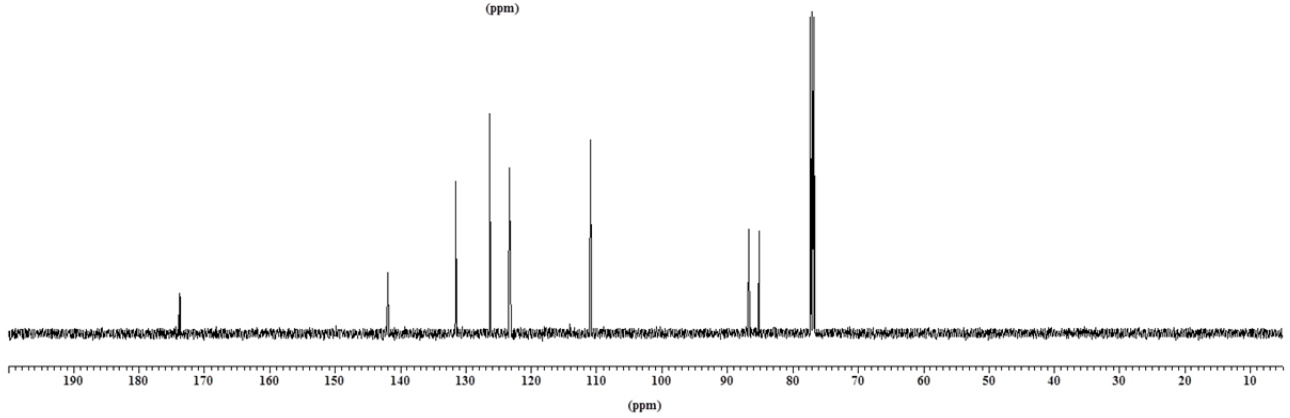
*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

13C AMX500

wtl-1051





*** Current Data Parameters ***

NAME	:	wtl-1120
EXPNO	:	3
PROCNO	:	1

*** Acquisition Parameters ***

LOCNUC	:	2H
NS	:	96
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	298.6 K

*** Processing Parameters ***

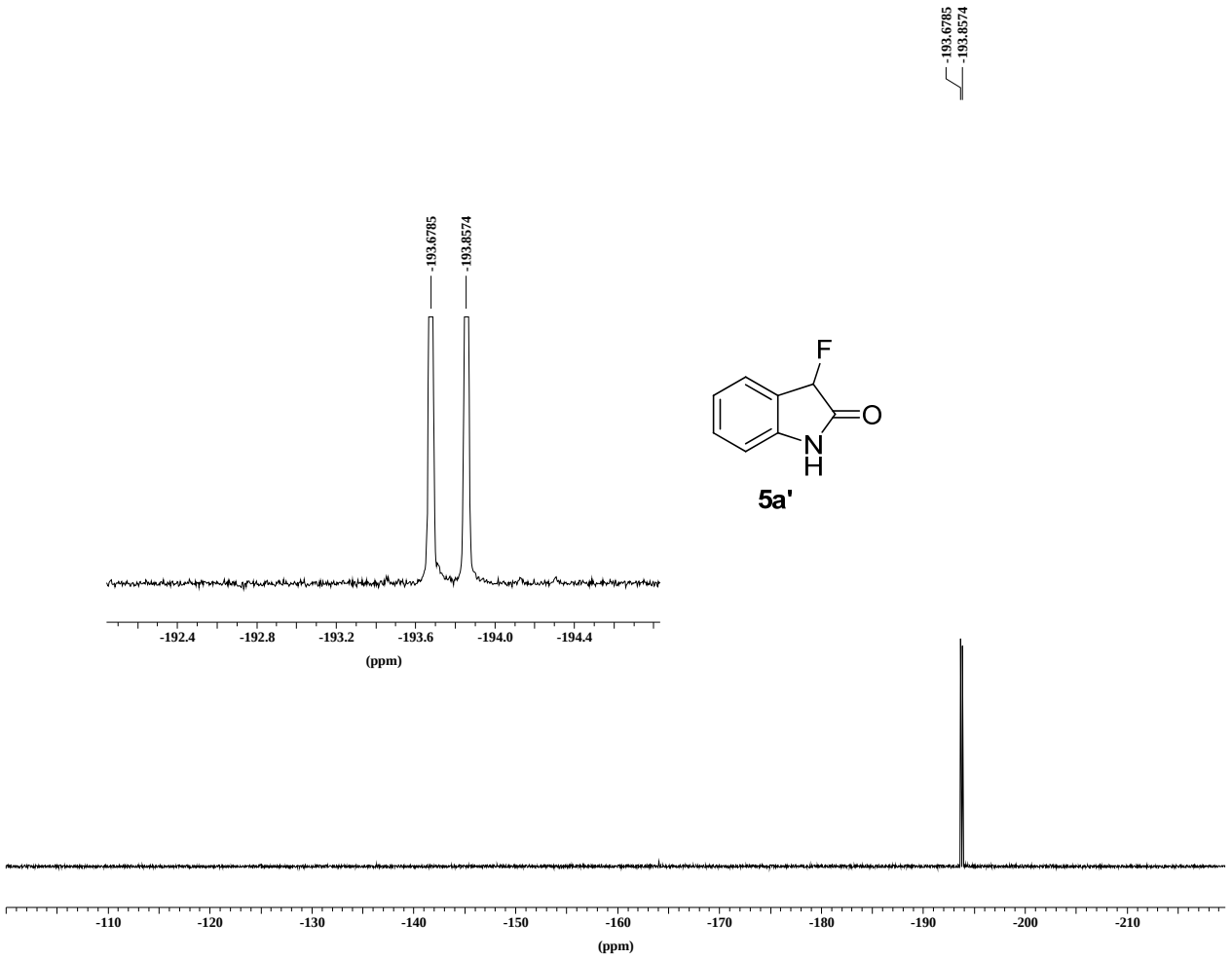
LB	:	1.00 Hz
SF	:	125.7577961 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

F19(no decoupled)

wtl-1051



***** Current Data Parameters *****

NAME	**:**	**nov20-~1**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**17**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**299.1 K**

***** Processing Parameters *****

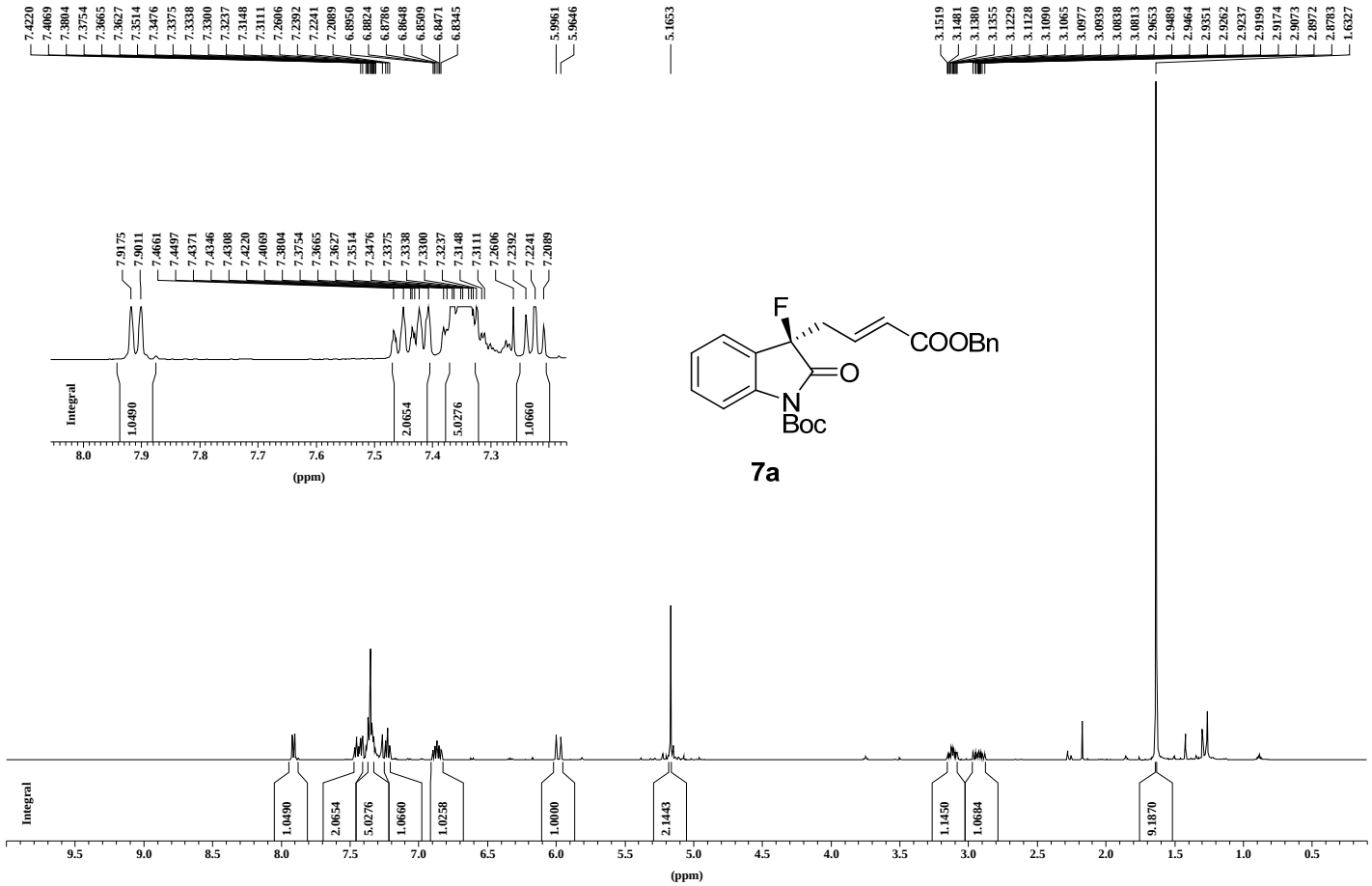
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1038

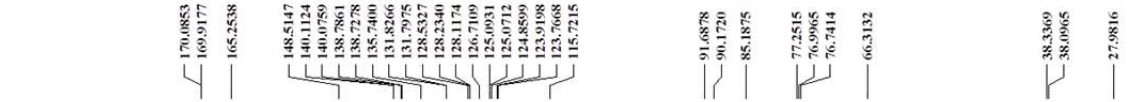


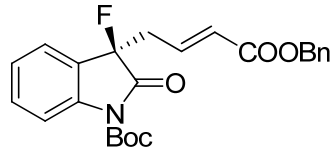
***** Current Data Parameters *****

NAME	**:**	**wtl-1101**
EXPNO	**:**	**3**
PROCNO	**:**	**1**
***** Acquisition Parameters *****		
LOCNUC	**:**	**2H**
NS	**:**	**30**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**297.8 K**
***** Processing Parameters *****		
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**
***** 1D NMR Plot Parameters *****		
NUCLEUS	**:**	**off**

13C AMX500

wtl-1038





7a

*** Current Data Parameters ***

NAME : wtl-1101

EXPNO : 4

PROCNO : 1

*** Acquisition Parameters ***

LOCNUC : 2H

NS : 172

NUCLEUS : off

O1 : 13204.57 Hz

PULPROG : zgpg30

SFO1 : 125.7709936 MHz

SOLVENT : CDCl3

SW : 238.7675 ppm

TD : 65536

TE : 297.9 K

*** Processing Parameters ***

LB : 1.00 Hz

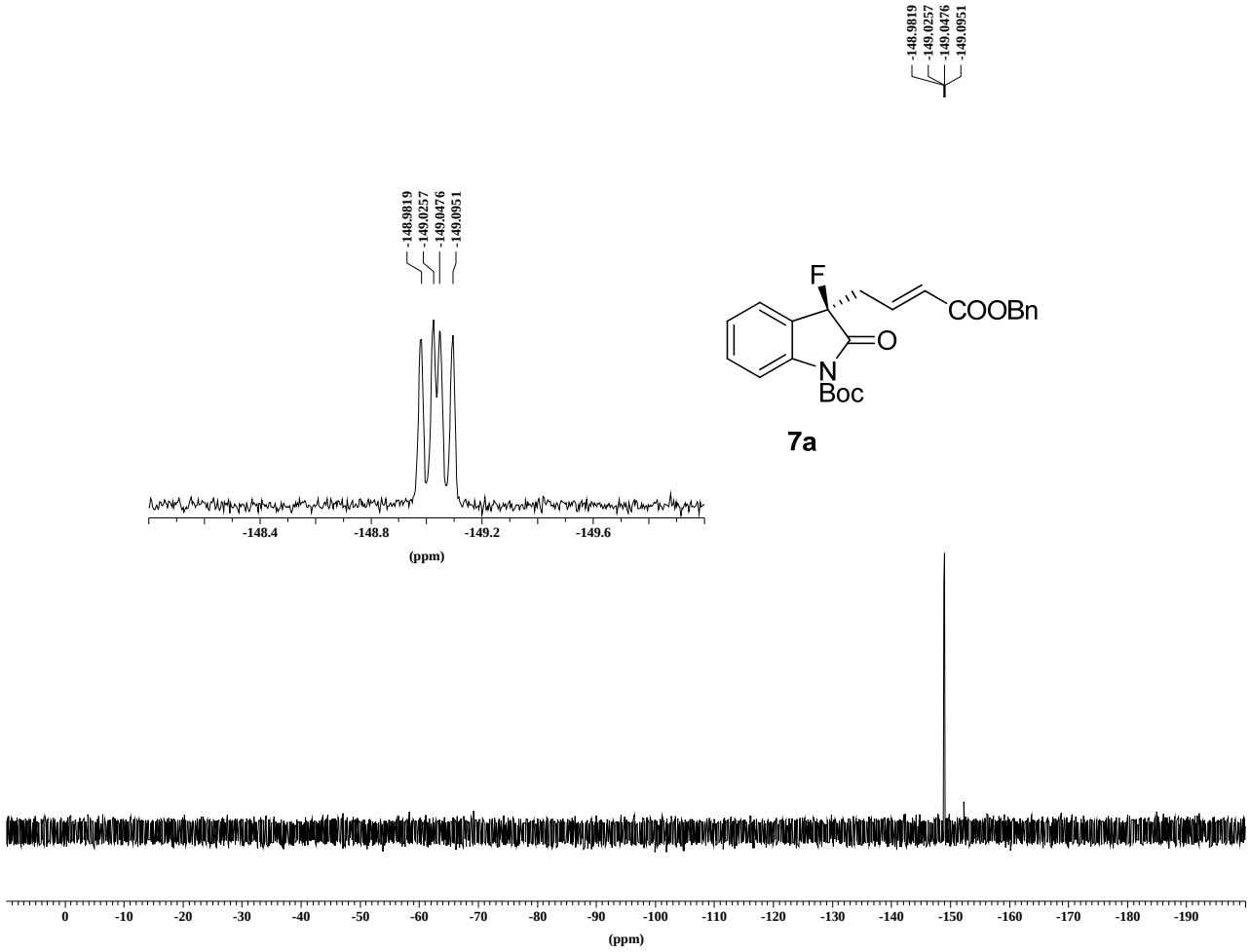
SF : 125.7577952 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS : off

F19(no decoupled)

wtl-1038



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**4**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**6**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.5 K**

***** Processing Parameters *****

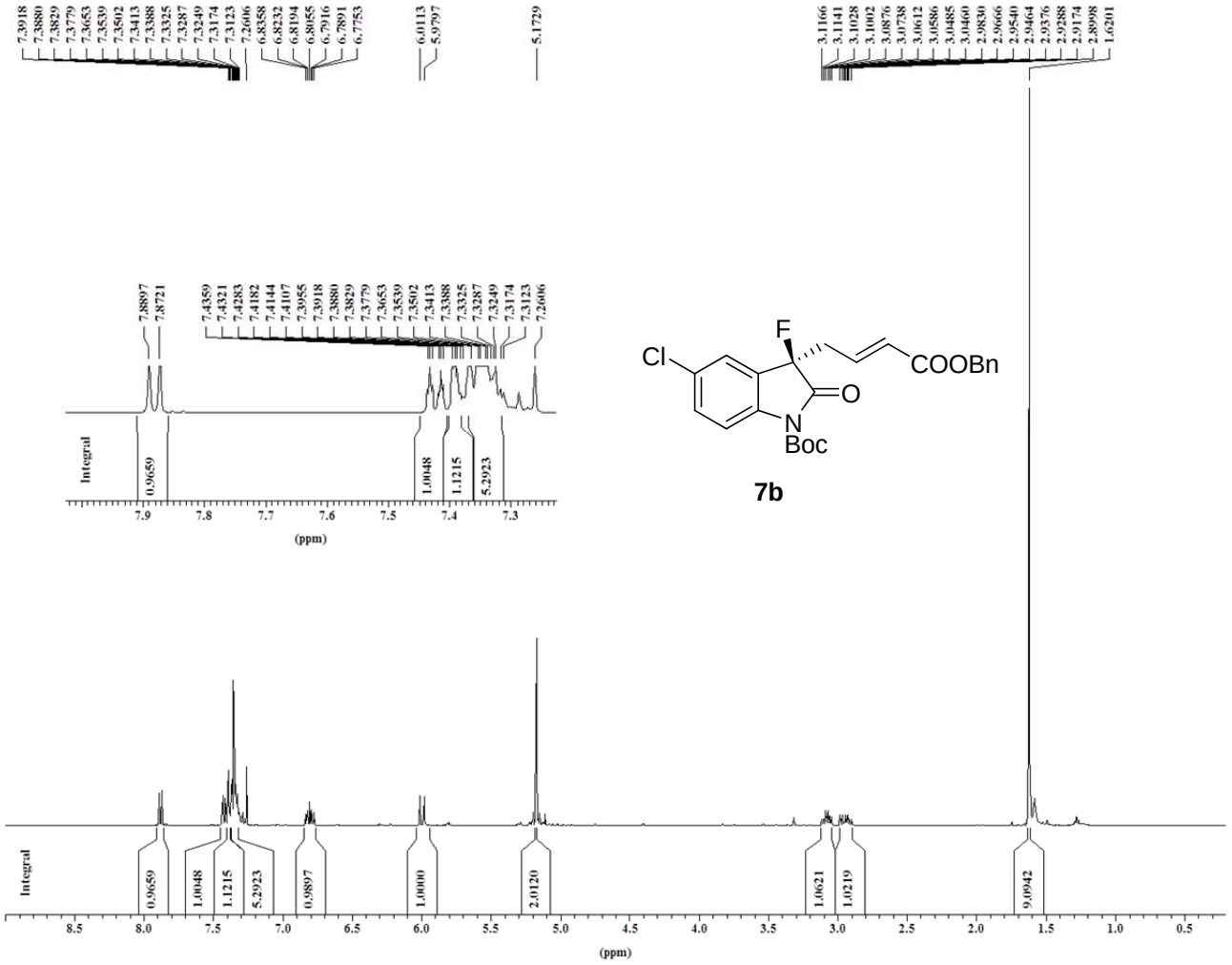
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1040



7b

*** Current Data Parameters ***

NAME : wtl-1101

EXPNO : 5

PROCNO : 1

*** Acquisition Parameters ***

LOCNUC : 2H

NS : 21

NUCLEUS : off

O1 : 3088.51 Hz

PULPROG : zg30

SFO1 : 500.1330885 MHz

SOLVENT : CDCl3

SW : 20.6557 ppm

TD : 32768

TE : 297.7 K

*** Processing Parameters ***

LB : 0.30 Hz

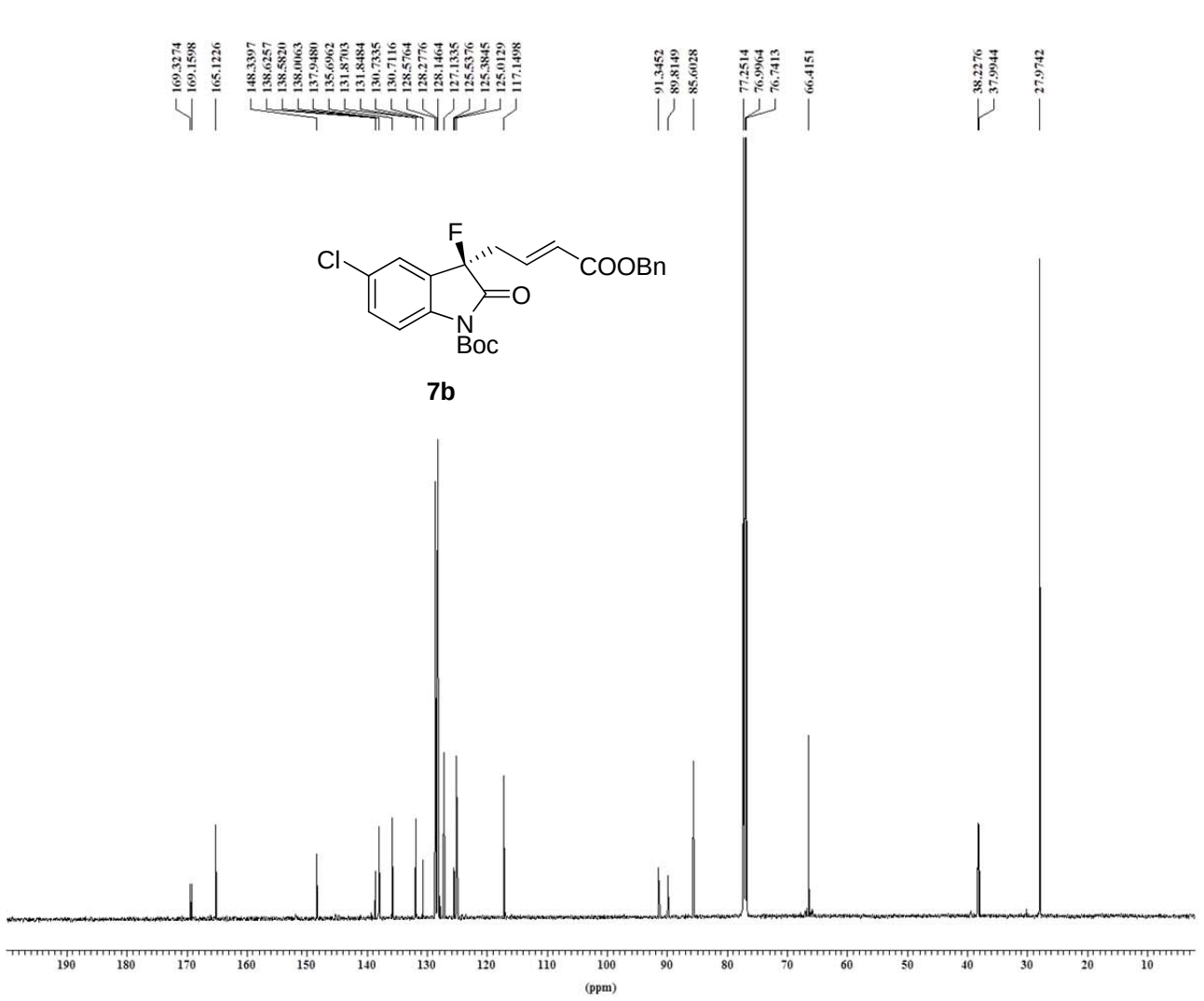
SF : 500.1300134 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS : off

13C AMX500

wtl-1040



*** Current Data Parameters ***

NAME	:	wtl-1101
EXPNO	:	6
PROCNO	:	1

*** Acquisition Parameters ***

LOCNUC	:	2H
NS	:	17345
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	297.8 K

*** Processing Parameters ***

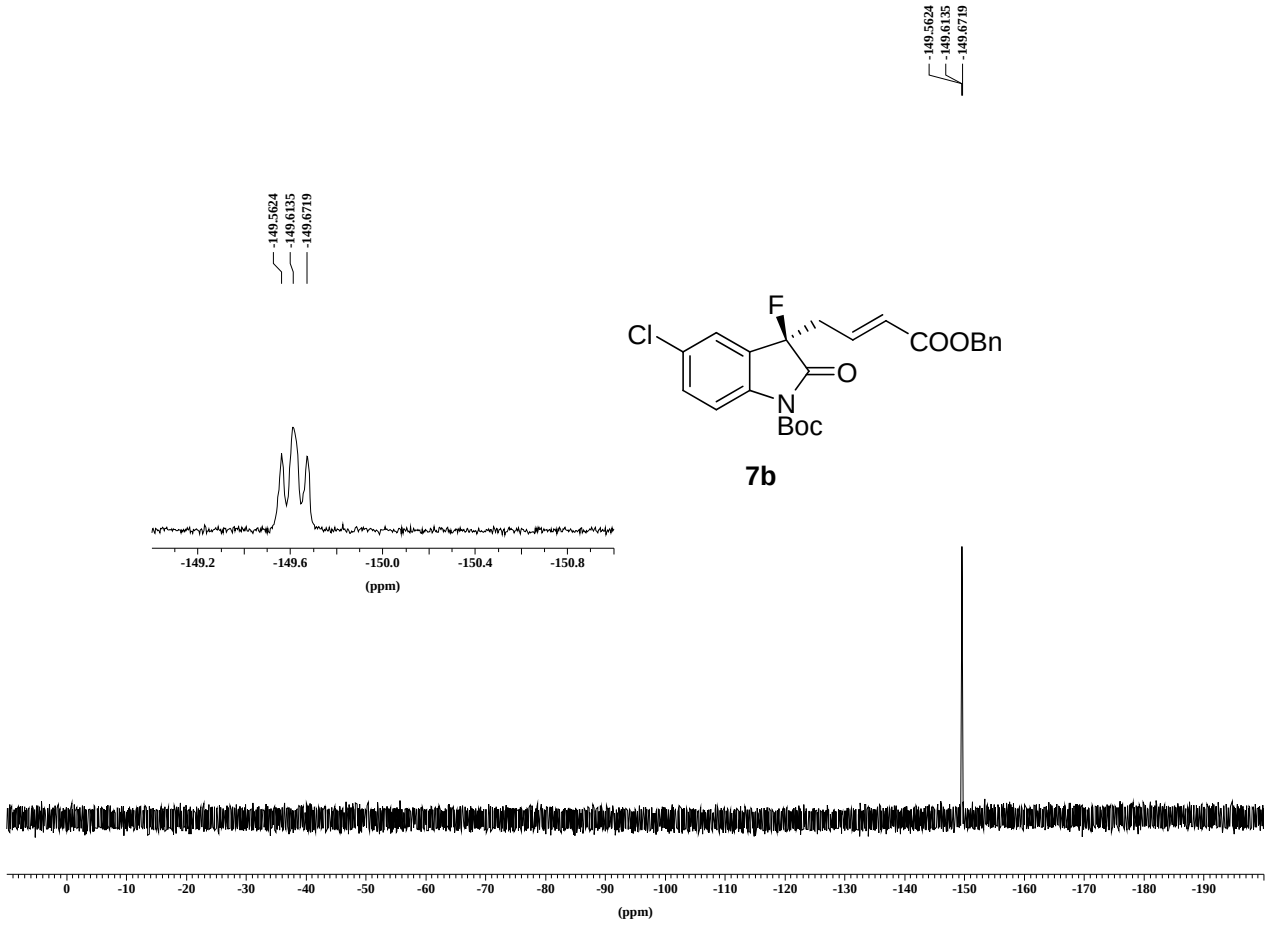
LB	:	1.00 Hz
SF	:	125.7577924 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

F19(no decoupled)

wtl-1040



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**35**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.6 K**

***** Processing Parameters *****

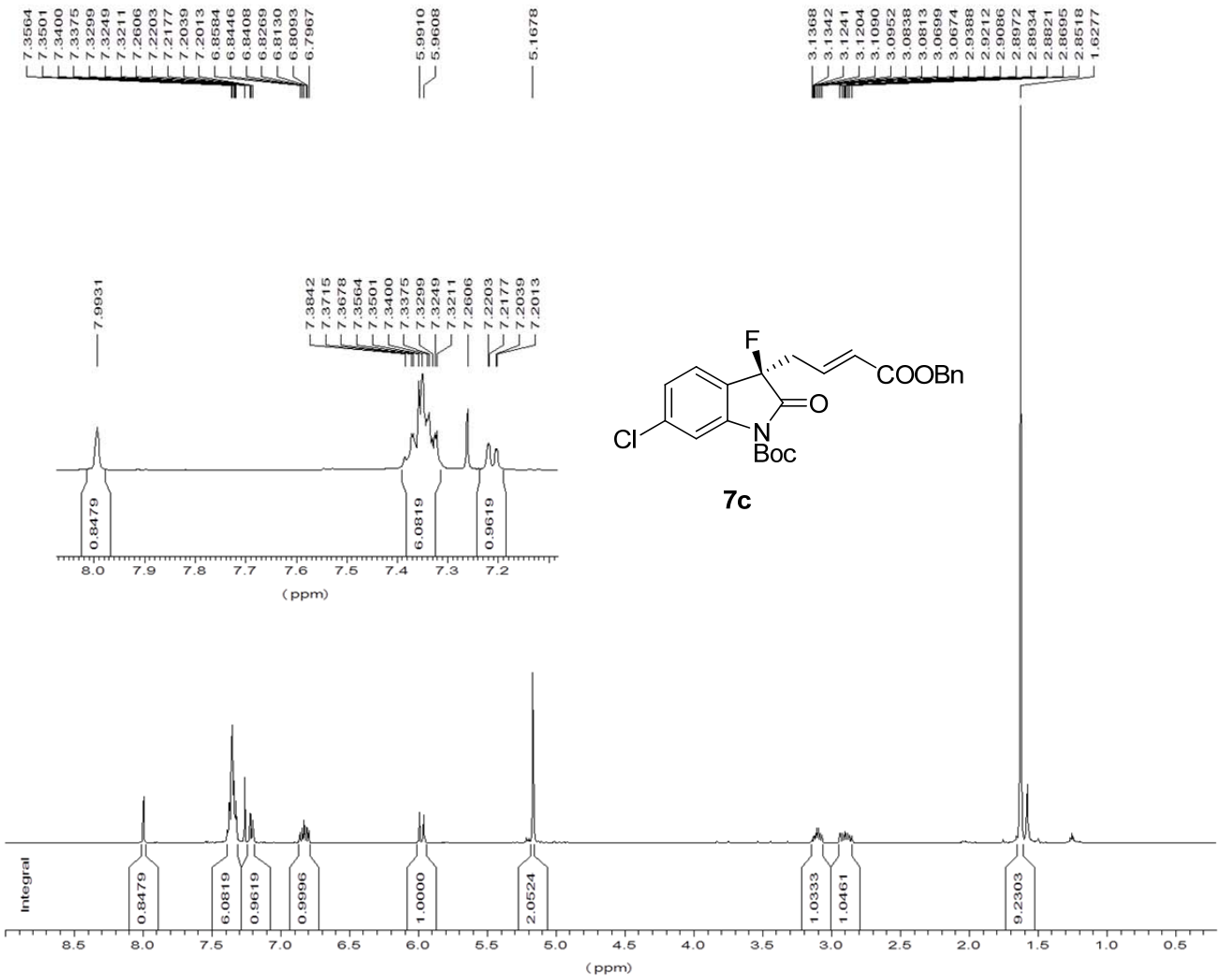
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1039



*** Current Data Parameters ***

NAME	:	wtl-1029
EXPNO	:	2
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	23
NUCLEUS	:	off
O1	:	3088.51 Hz
PULPROG	:	zg30
SFO1	:	500.1330885 MHz
SOLVENT	:	CDCl3
SW	:	20.6557 ppm
TD	:	32768
TE	:	296.6 K

*** Processing Parameters ***

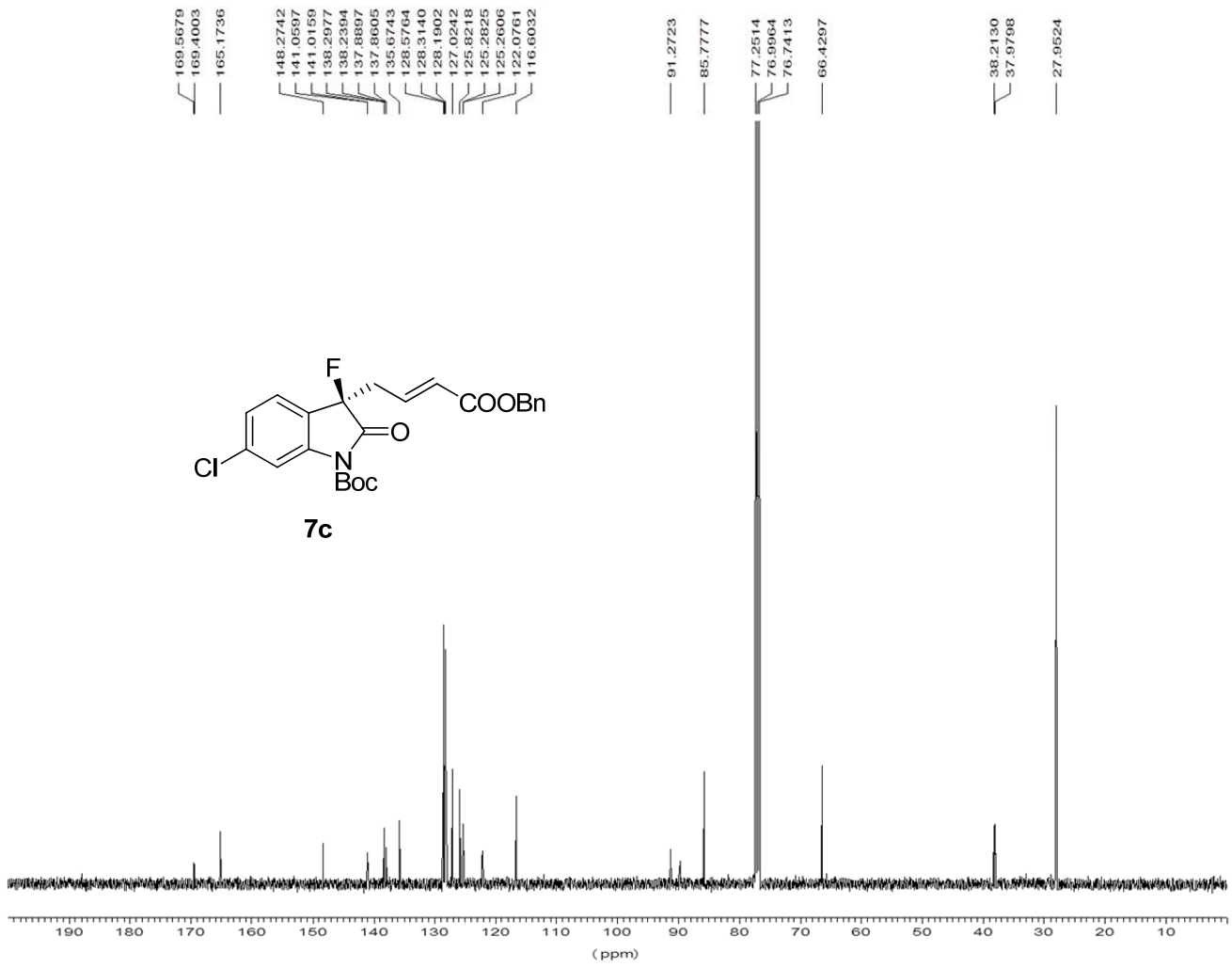
LB	:	0.30 Hz
OFFSET	:	16.477 ppm
SI	:	16384

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

13C AMX500

wtl-1039



*** Current Data Parameters ***

NAME	:	wtl-1029
EXPNO	:	3
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	884
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	296.7 K

*** Processing Parameters ***

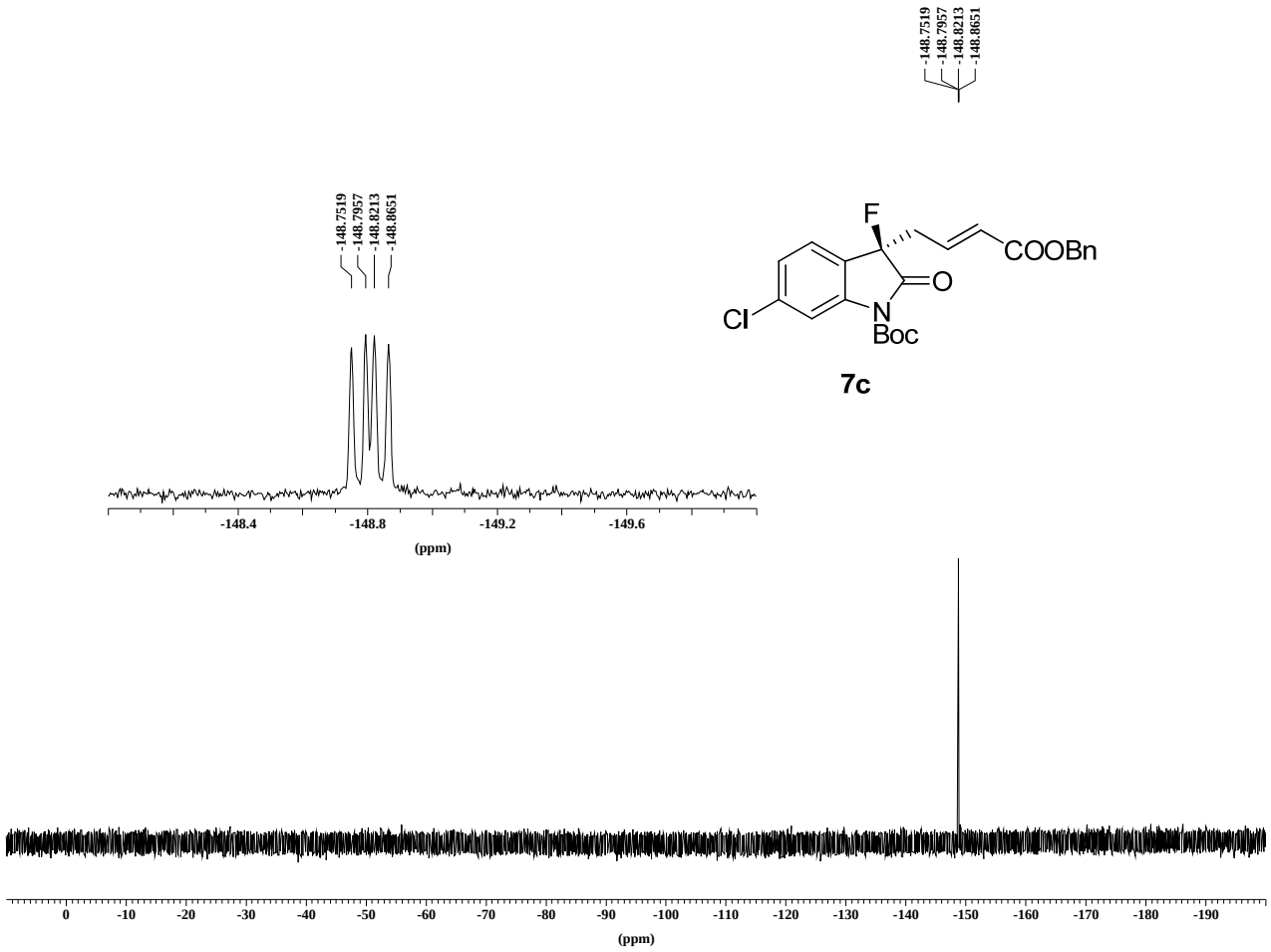
LB	:	1.00 Hz
OFFSET	:	224.369 ppm
SI	:	32768

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

F19(no decoupled)

wtl-1039



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**3**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**37**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.5 K**

***** Processing Parameters *****

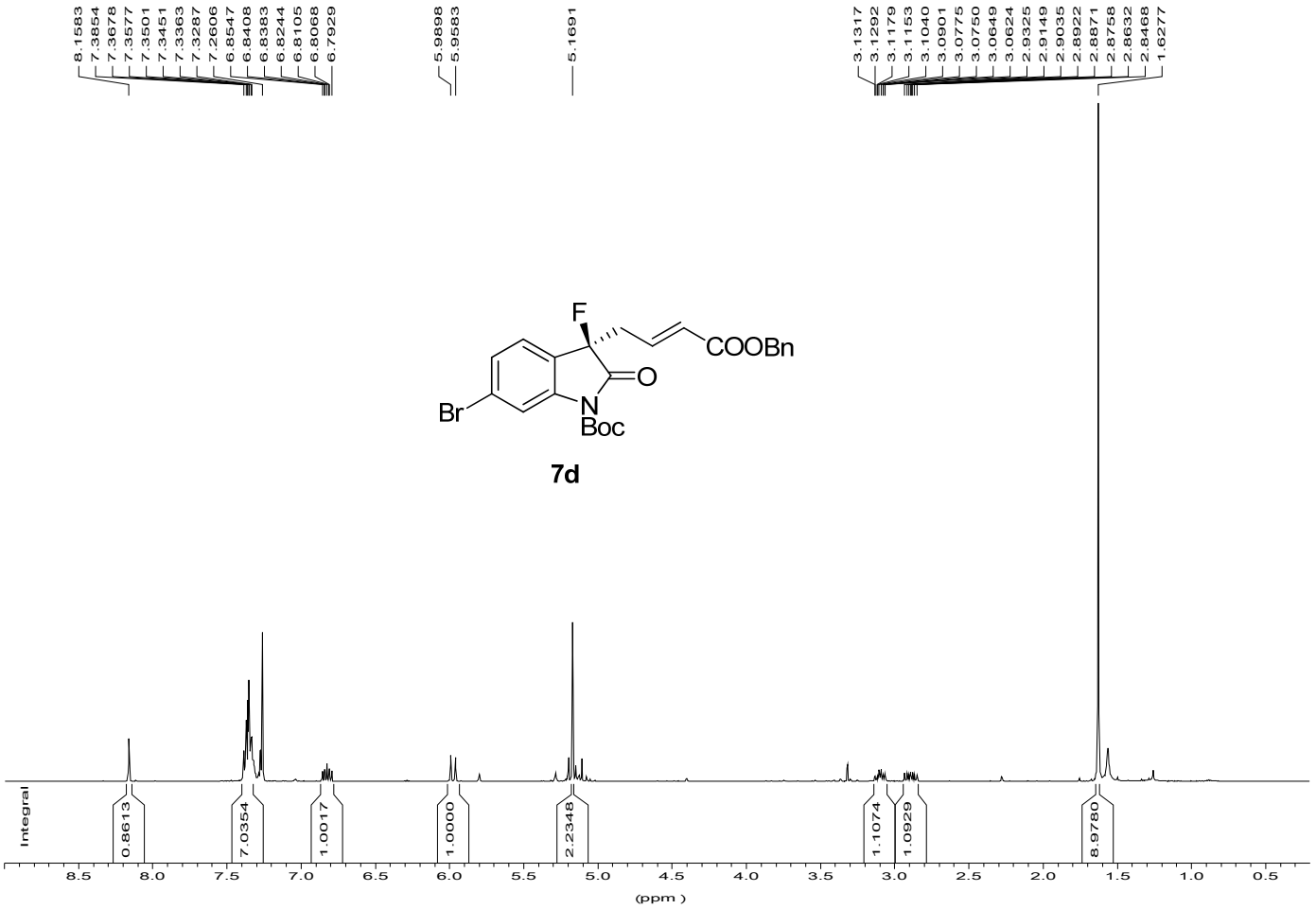
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1054



7d

*** Current Data Parameters ***

NAME	:	wtl-1115
EXPNO	:	1
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	30
NUCLEUS	:	off
O1	:	3088.51 Hz
PULPROG	:	zg30
SFO1	:	500.1330885 MHz
SOLVENT	:	CDCl3
SW	:	20.6557 ppm
TD	:	32768
TE	:	297.8 K

*** Processing Parameters ***

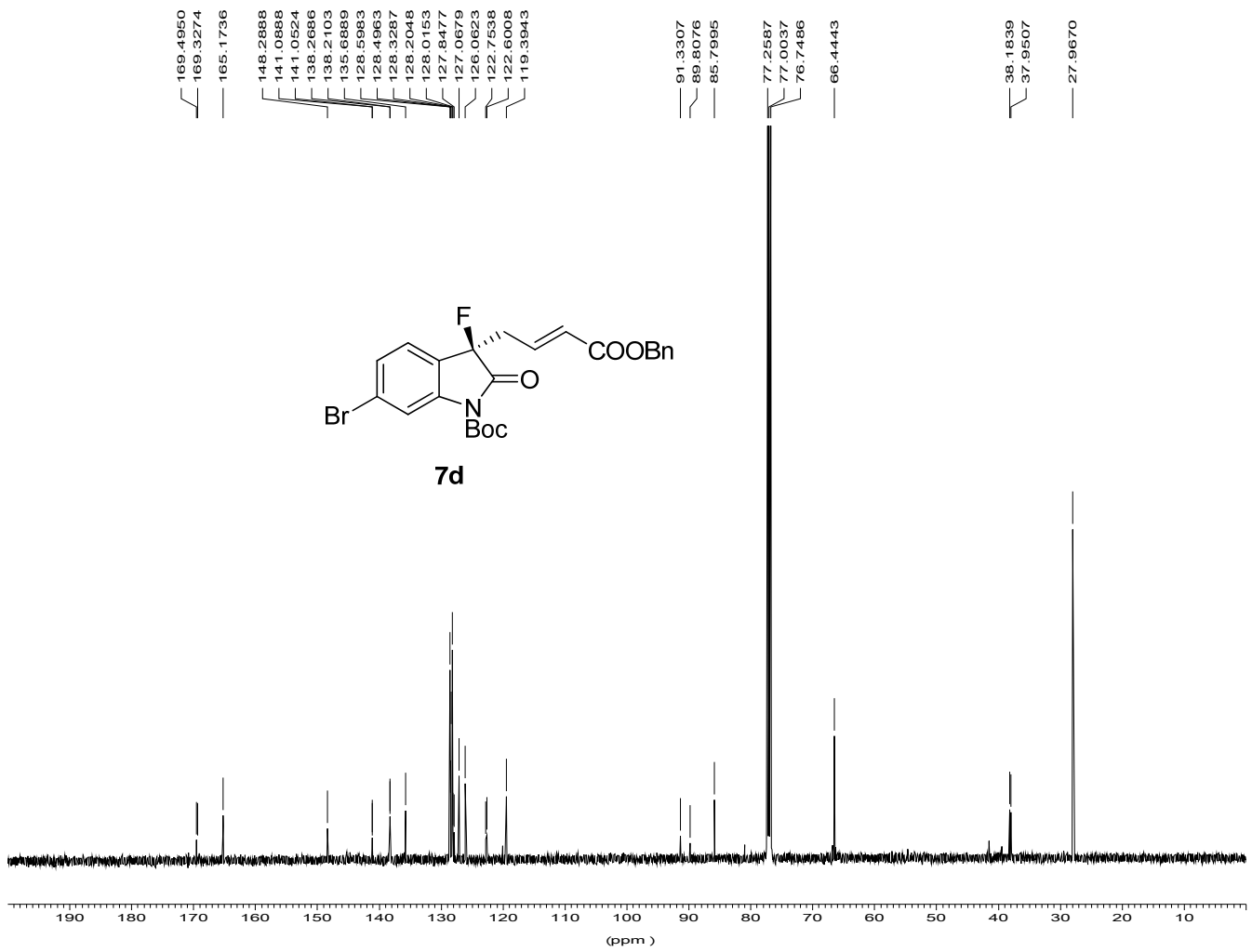
LB	:	0.30 Hz
OFFSET	:	16.477 ppm
SI	:	16384

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

13C AMX500

wtl-1054

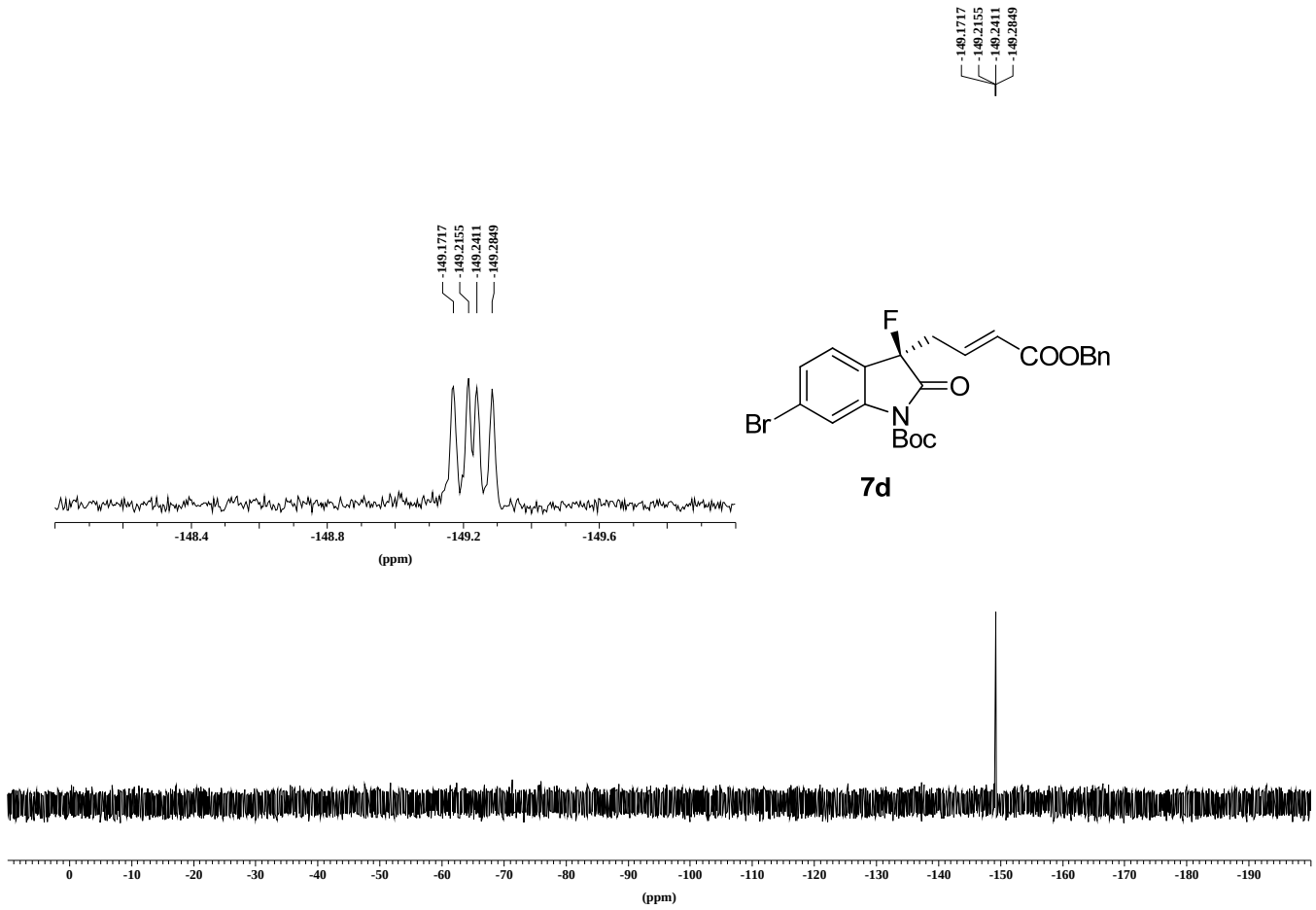


*** Current Data Parameters ***

NAME	:	wtl-1115
EXPNO	:	2
PROCNO	:	1
*** Acquisition Parameters ***		
DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	3577
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	298.1 K
*** Processing Parameters ***		
LB	:	1.00 Hz
OFFSET	:	224.383 ppm
SI	:	32768
*** 1D NMR Plot Parameters ***		
NUCLEUS	:	off

F19(no decoupled)

wtl-1054

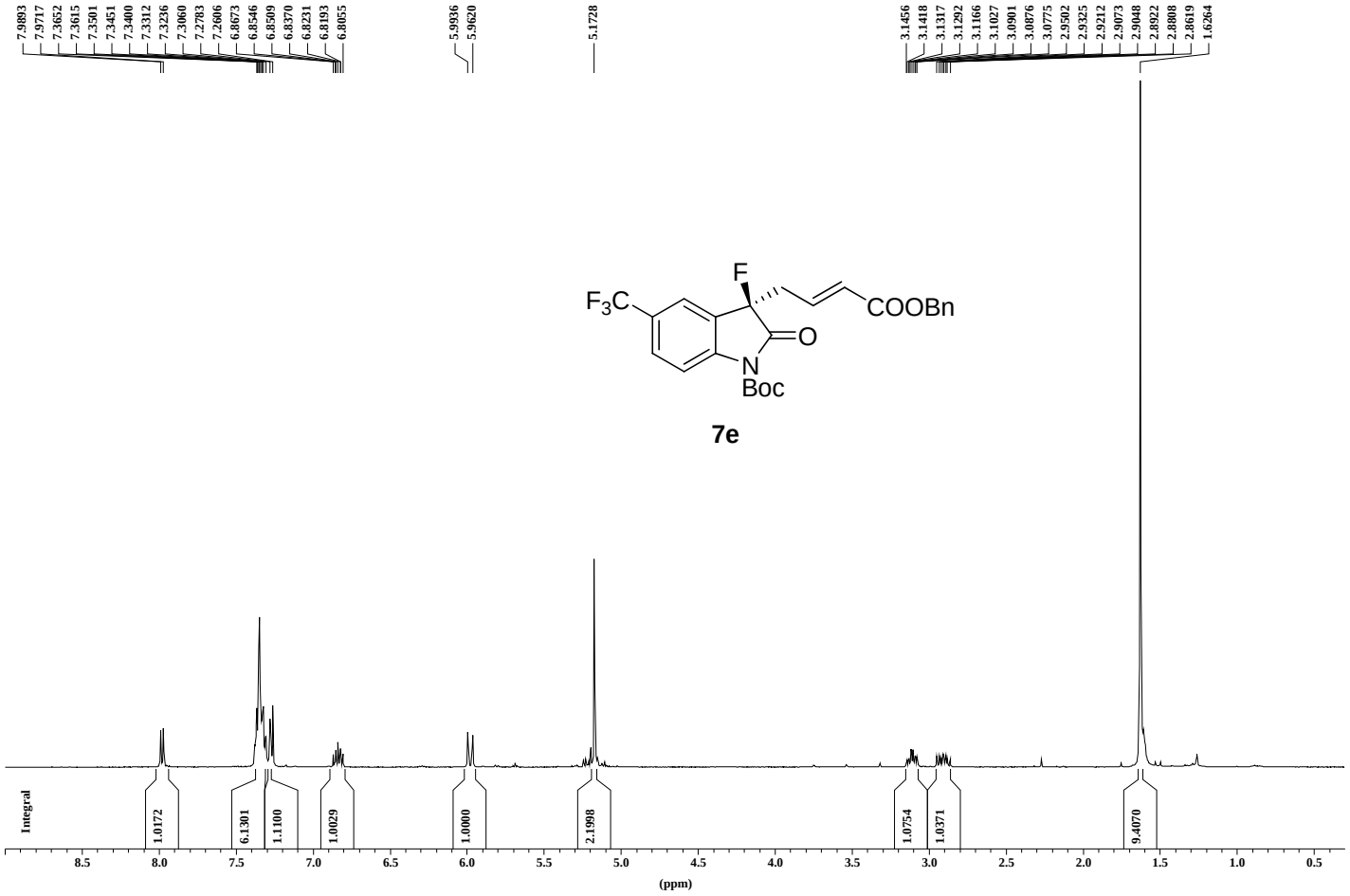


***** Current Data Parameters *****

NAME	**:**	**nov17-~1**
EXPNO	**:**	**1**
PROCNO	**:**	**1**
***** Acquisition Parameters *****		
LOCNUC	**:**	**2H**
NS	**:**	**93**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**299.2 K**
***** Processing Parameters *****		
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**
***** 1D NMR Plot Parameters *****		
NUCLEUS	**:**	**off**

1H AMX500

wtl-1045



7e

***** Current Data Parameters *****

NAME : wtl-1110

EXPNO : 1

PROCNO : 1

***** Acquisition Parameters *****

LOCNUC : 2H

NS : 34

NUCLEUS : off

O1 : 3088.51 Hz

PULPROG : zg30

SFO1 : 500.1330885 MHz

SOLVENT : CDCl3

SW : 20.6557 ppm

TD : 32768

TE : 299.9 K

***** Processing Parameters *****

LB : 0.30 Hz

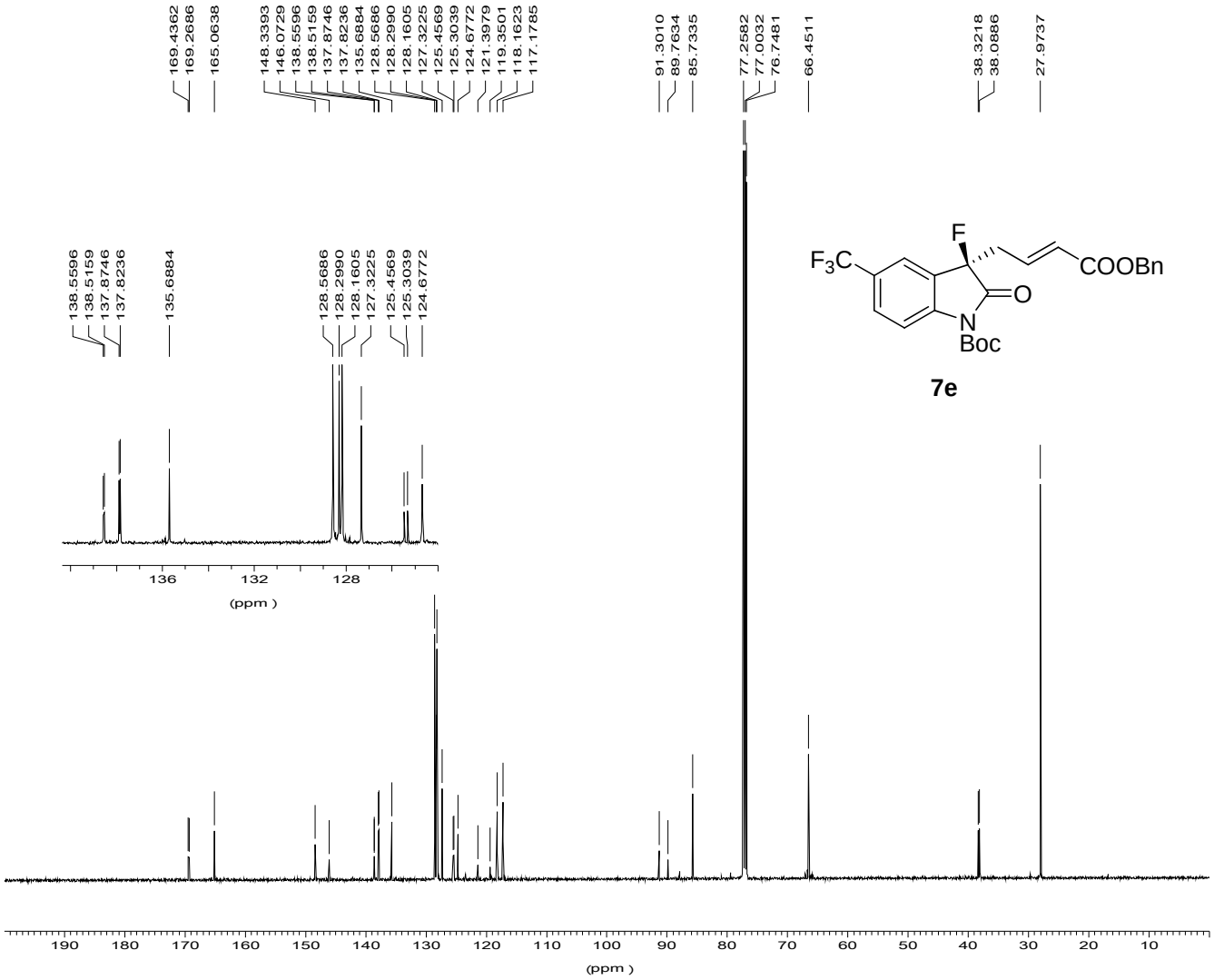
SF : 500.1300134 MHz

***** 1D NMR Plot Parameters *****

NUCLEUS : off

13C AMX500

wtl-1045



7e

*** Current Data Parameters ***

NAME	:	wtl-1110
EXPNO	:	2
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	12547
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	300.2 K

*** Processing Parameters ***

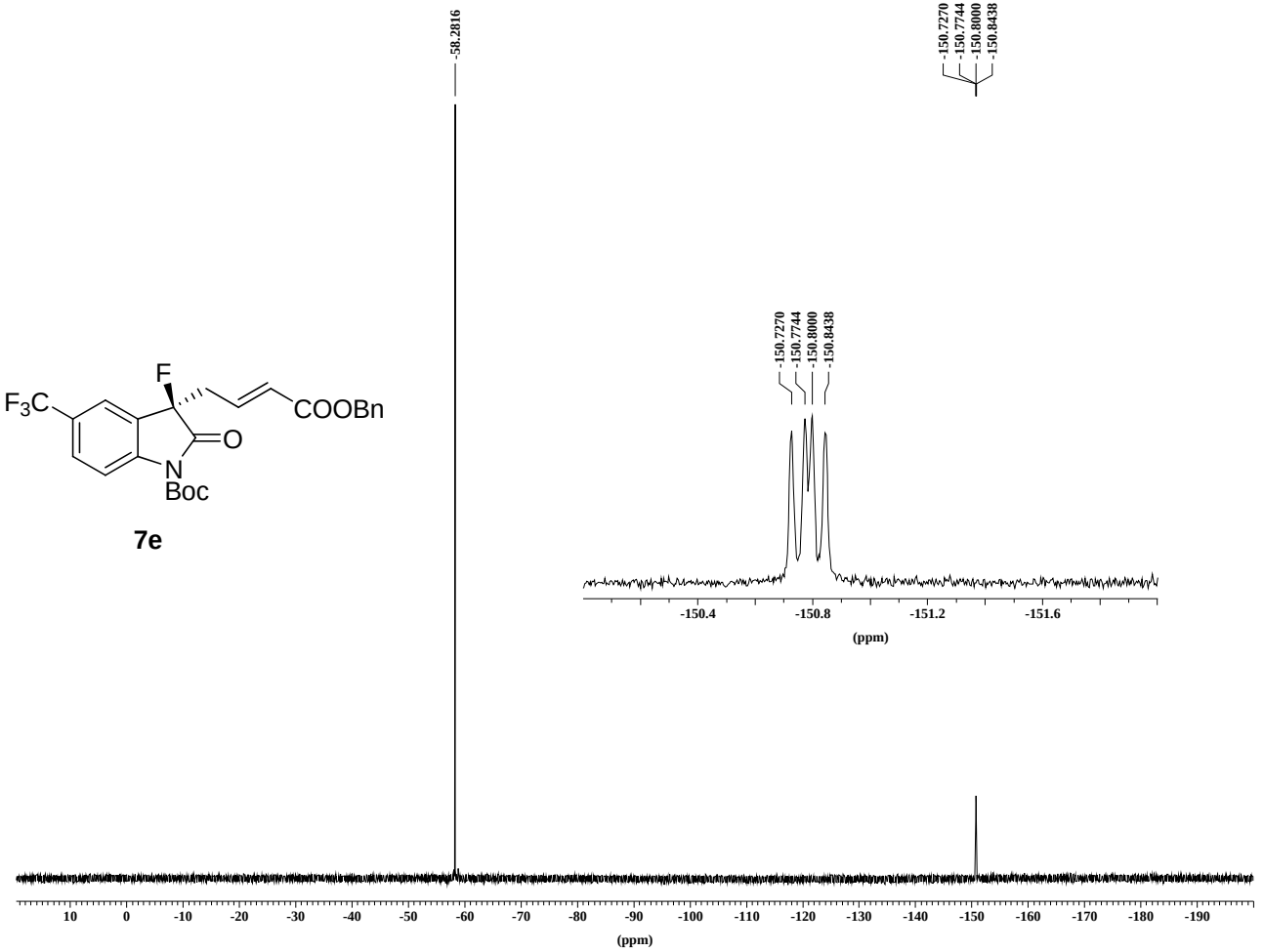
LB	:	1.00 Hz
OFFSET	:	224.383 ppm
SI	:	32768

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

F19(no decoupled)

wtl-1045



7e

***** Current Data Parameters *****

NAME	**:**	**nov10-~1**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**40**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.8 K**

***** Processing Parameters *****

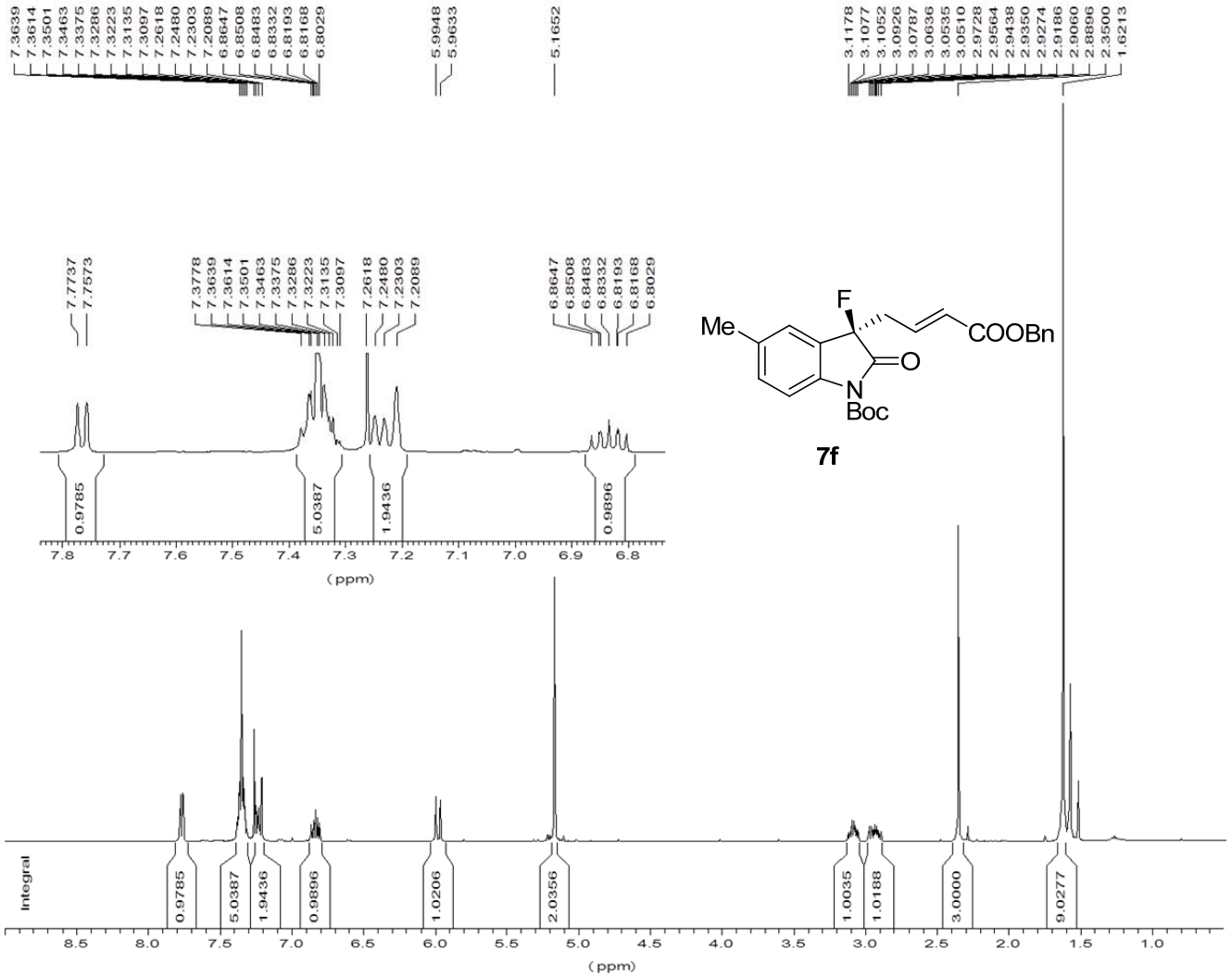
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1037



7f

*** Current Data Parameters ***

NAME	:	wtl-1028
EXPNO	:	3
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	87
NUCLEUS	:	off
O1	:	3088.51 Hz
PULPROG	:	zg30
SFO1	:	500.1330885 MHz
SOLVENT	:	CDCl3
SW	:	20.6557 ppm
TD	:	32768
TE	:	297.6 K

*** Processing Parameters ***

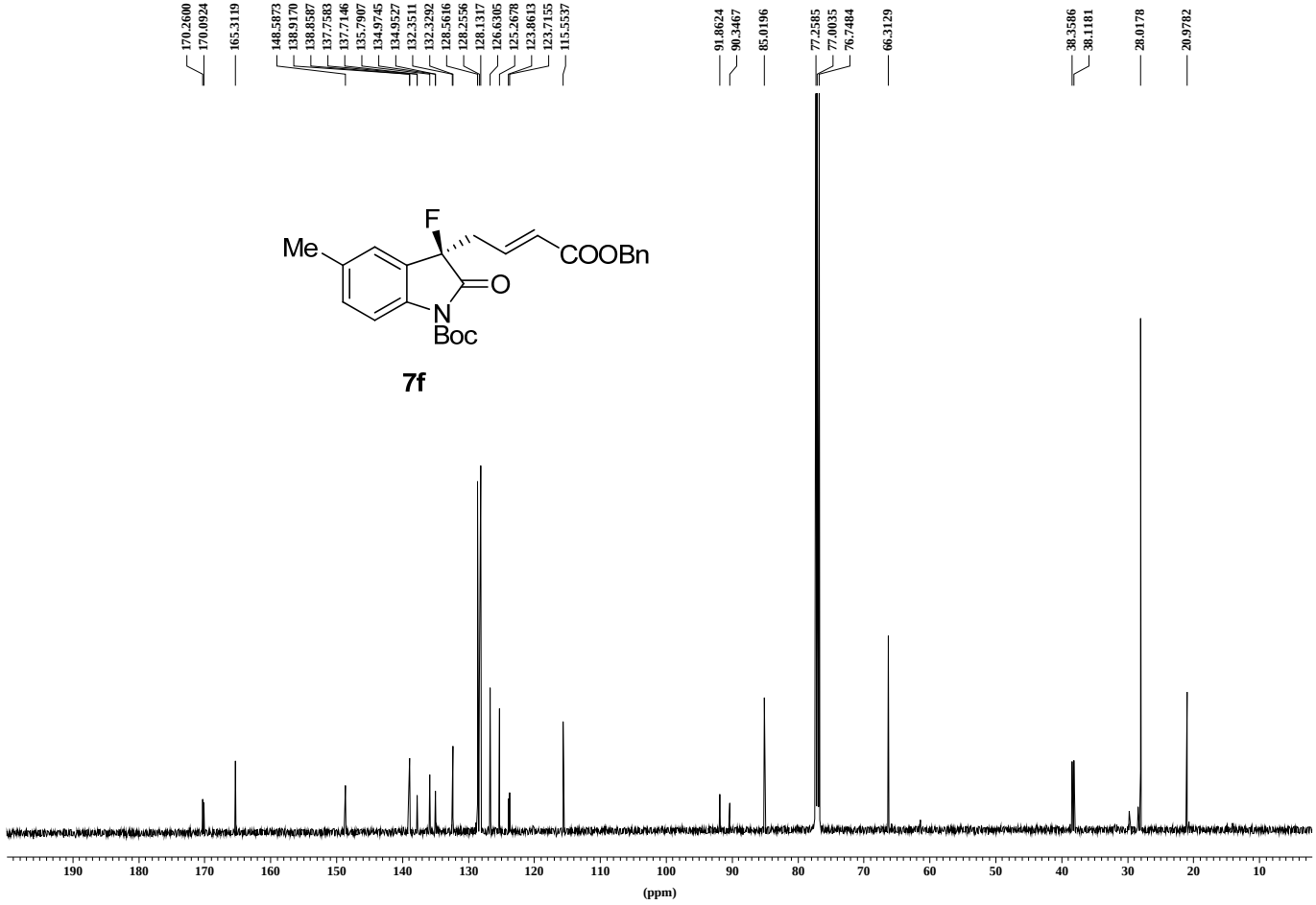
LB	:	0.30 Hz
OFFSET	:	16.476 ppm
SI	:	16384

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

13C AMX500

wtl-1037

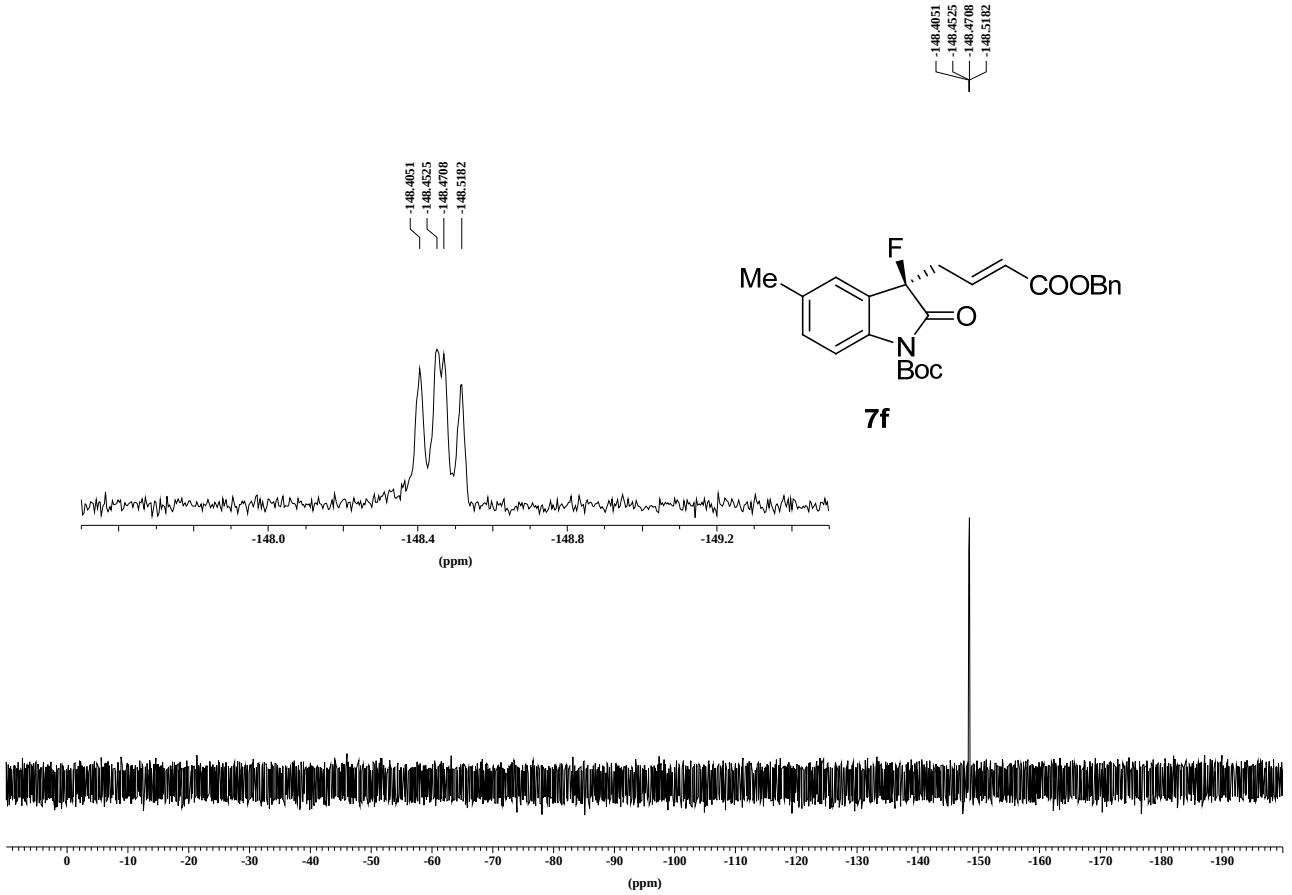


***** Current Data Parameters *****

NAME	**:**	**wtl-1101**
EXPNO	**:**	**2**
PROCNO	**:**	**1**
***** Acquisition Parameters *****		
LOCNUC	**:**	**2H**
NS	**:**	**6825**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**298.1 K**
***** Processing Parameters *****		
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577916 MHz**
***** 1D NMR Plot Parameters *****		
NUCLEUS	**:**	**off**

F19(no decoupled)

wtl-1037



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**6**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**30**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.5 K**

***** Processing Parameters *****

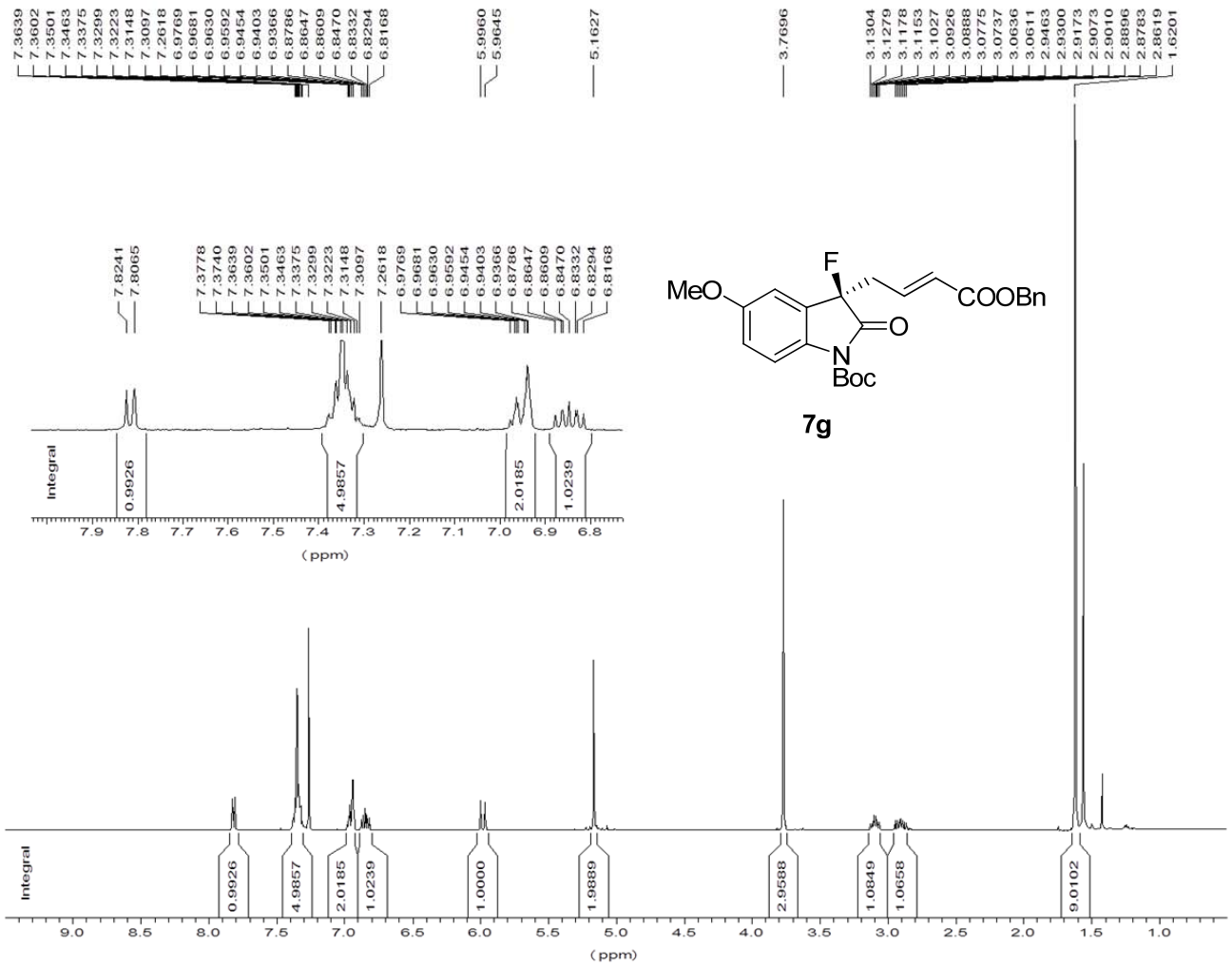
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1036



7g

*** Current Data Parameters ***

NAME	:	wtl-1028
EXPNO	:	1
PROCNO	:	1

*** Acquisition Parameters ***

DS	:	0
INSTRUM	:	spect
LOCNUC	:	2H
NS	:	41
NUCLEUS	:	off
O1	:	3088.51 Hz
PULPROG	:	zg30
SFO1	:	500.1330885 MHz
SOLVENT	:	CDCl3
SW	:	20.6557 ppm
TD	:	32768
TE	:	296.9 K

*** Processing Parameters ***

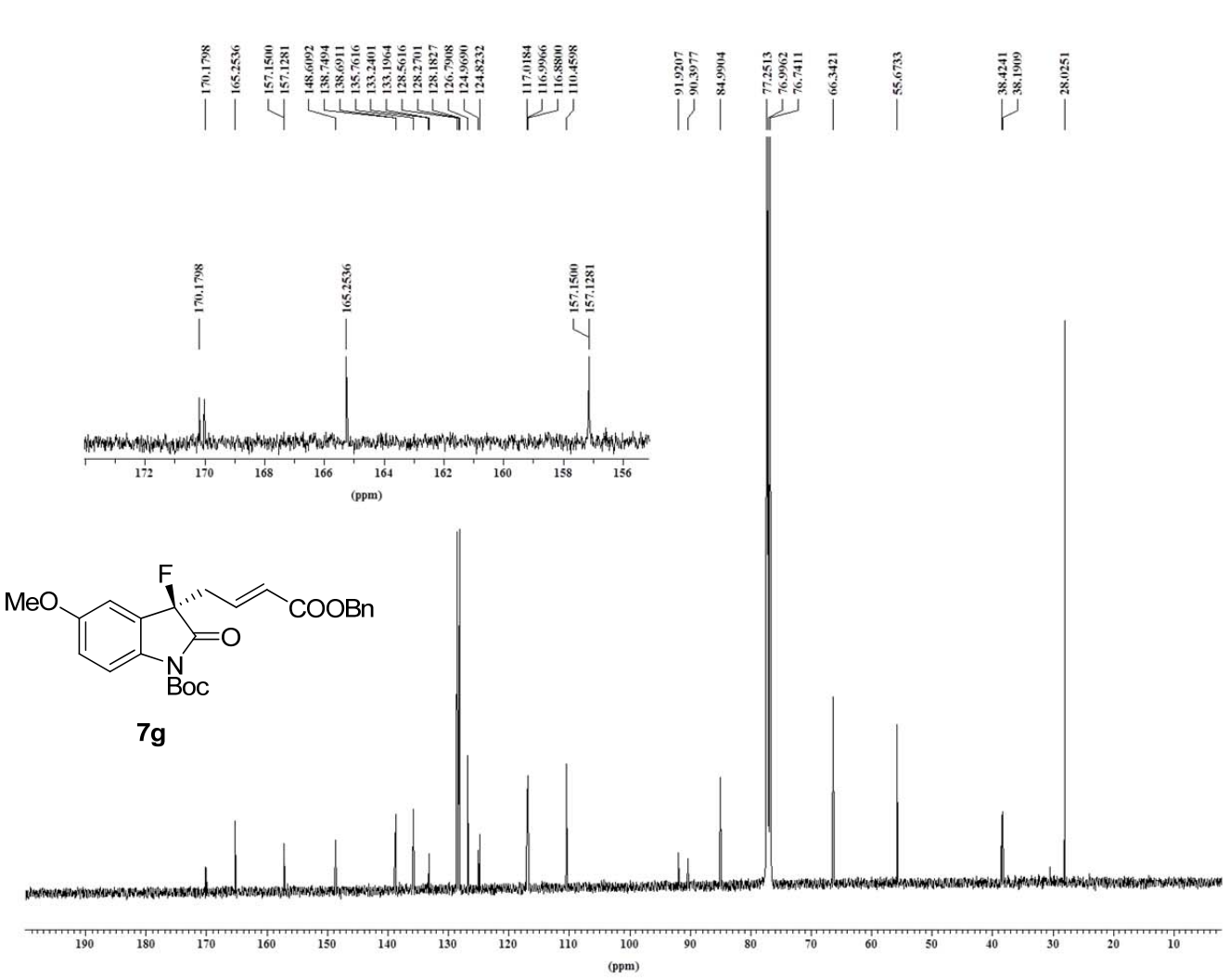
LB	:	0.30 Hz
OFFSET	:	16.476 ppm
SI	:	16384

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

13C AMX500

wtl-1036



7g

*** Current Data Parameters ***

NAME	:	wtl-1101
EXPNO	:	1
PROCNO	:	1

*** Acquisition Parameters ***

LOCNUC	:	2H
NS	:	18299
NUCLEUS	:	off
O1	:	13204.57 Hz
PULPROG	:	zgpg30
SFO1	:	125.7709936 MHz
SOLVENT	:	CDCl3
SW	:	238.7675 ppm
TD	:	65536
TE	:	297.9 K

*** Processing Parameters ***

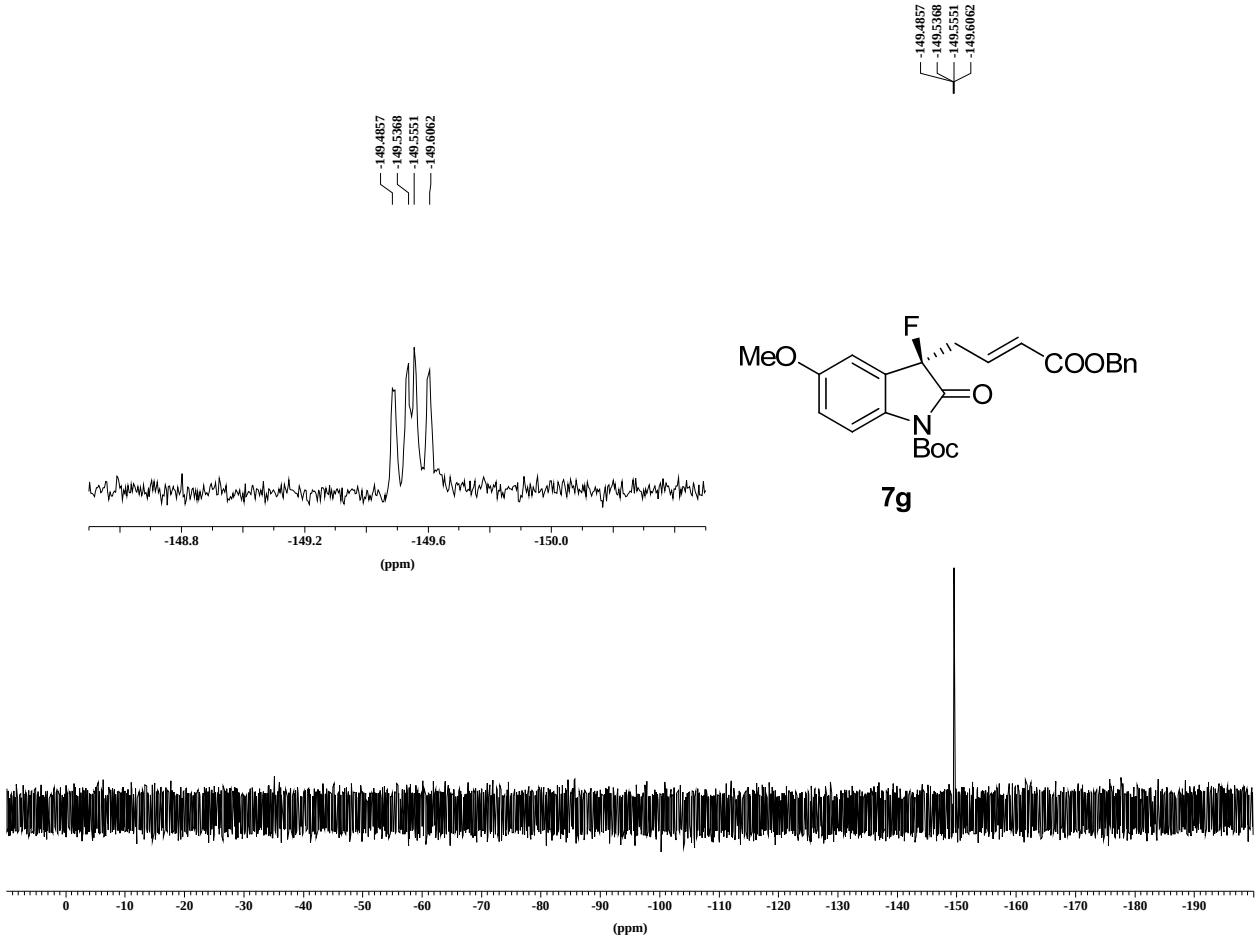
LB	:	1.00 Hz
SF	:	125.7577916 MHz

*** 1D NMR Plot Parameters ***

NUCLEUS	:	off

F19(no decoupled)

wtl-1036



***** Current Data Parameters *****

NAME	**:**	**nov08-~1**
EXPNO	**:**	**7**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**75**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**298.5 K**

***** Processing Parameters *****

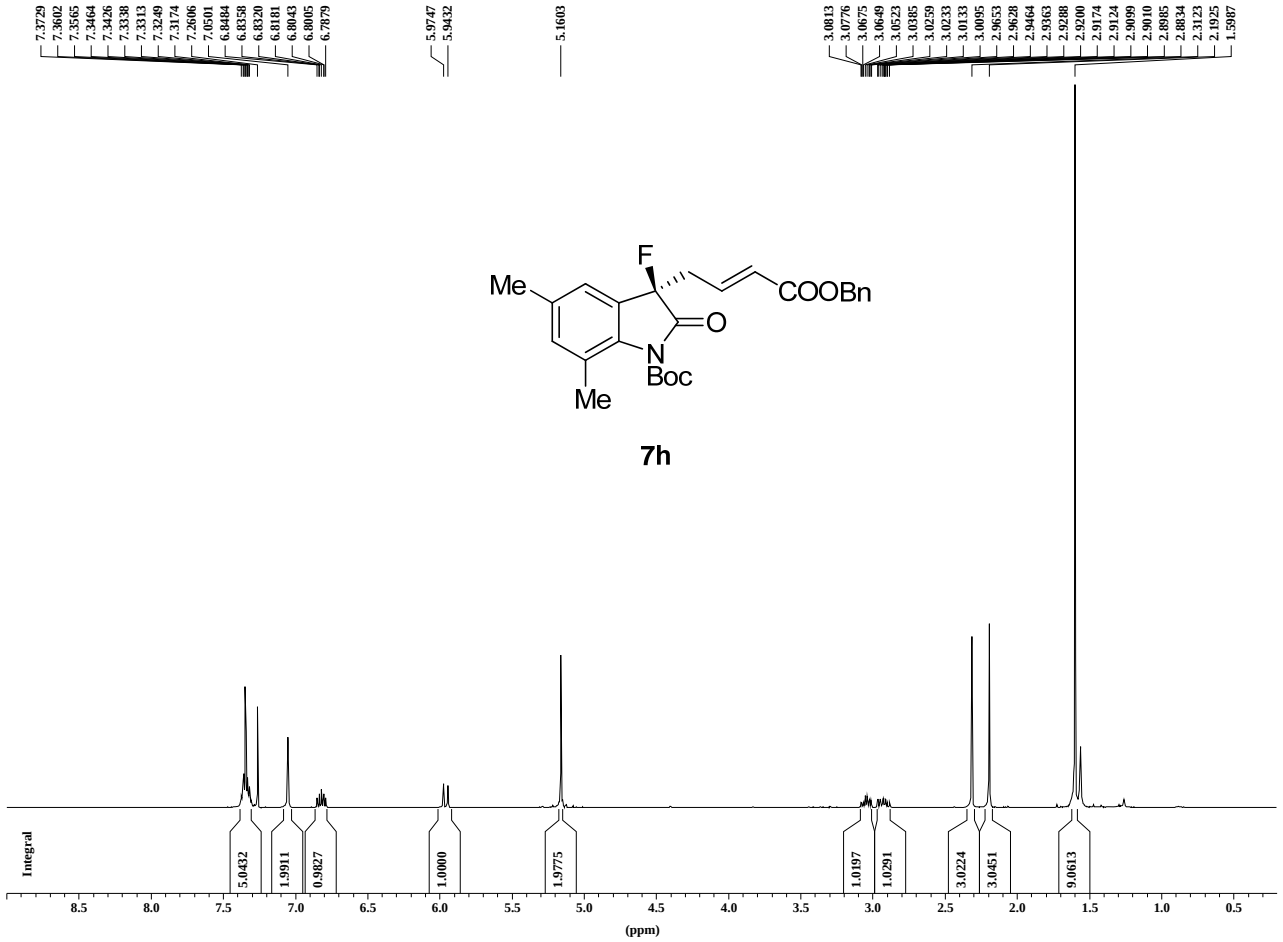
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1041



7h

***** Current Data Parameters *****

NAME	**:**	**wtl-1105**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**38**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**300.1 K**

***** Processing Parameters *****

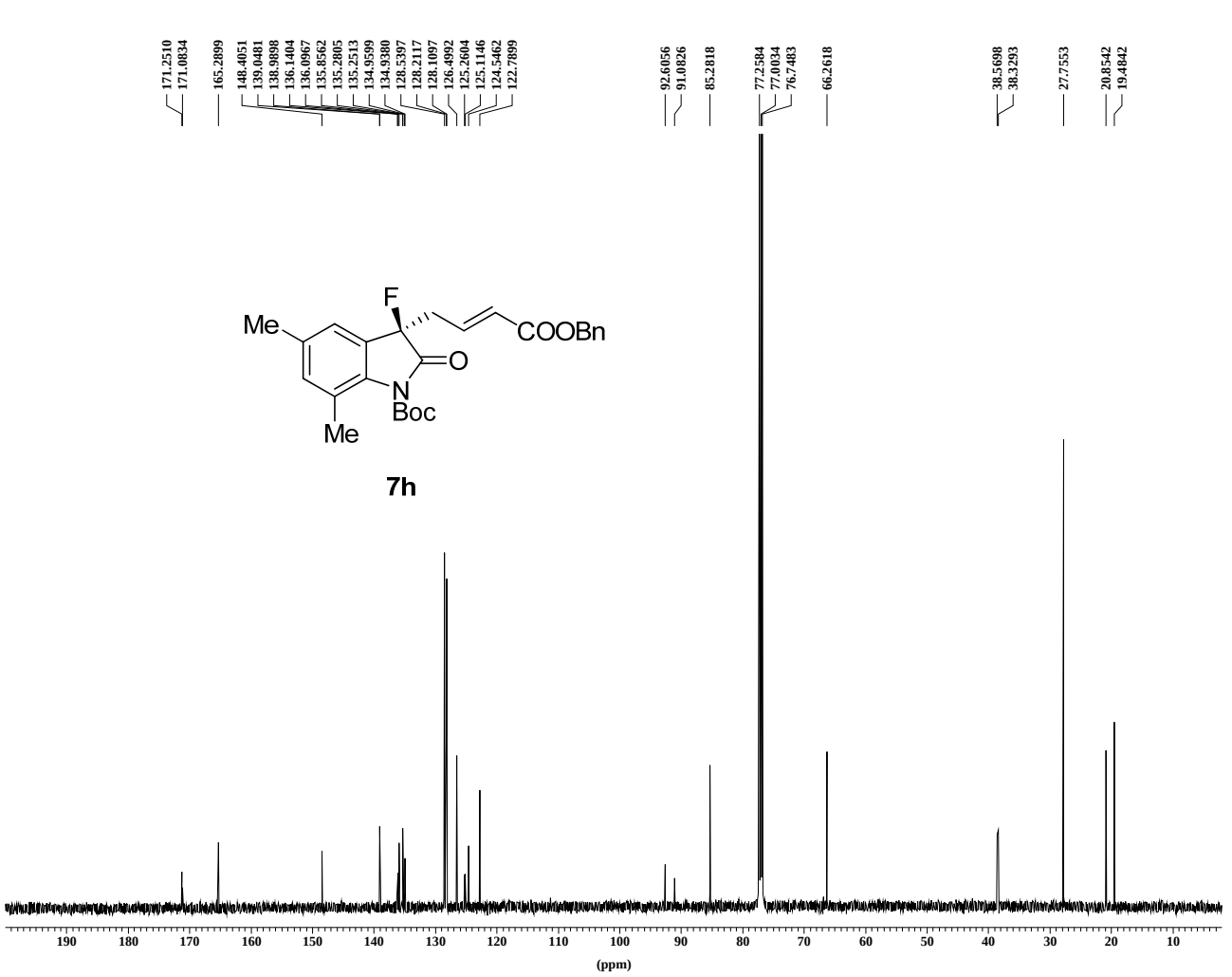
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

13C AMX500

wtl-1041



***** Current Data Parameters *****

NAME	**:**	**wtl-1108**
EXPNO	**:**	**3**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**3932**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**300.1 K**

***** Processing Parameters *****

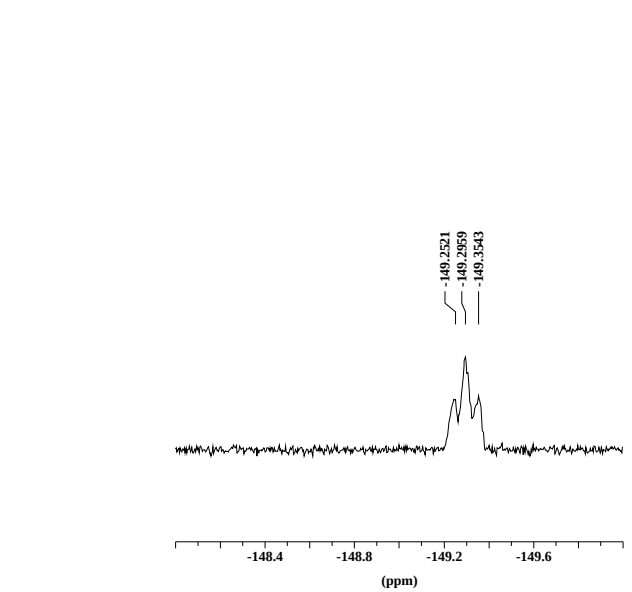
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577906 MHz**

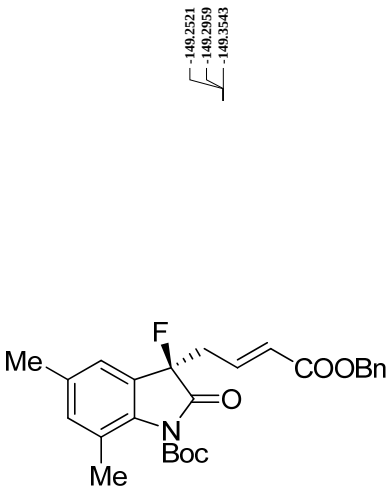
***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

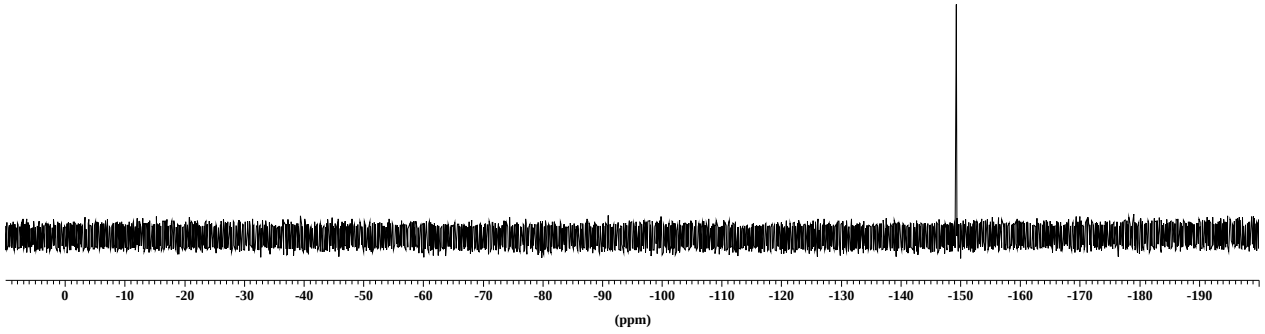
F19(no decoupled)

wtl-1041





7h



***** Current Data Parameters *****

NAME : nov08-~1

EXPNO : 1

PROCNO : 1

***** Acquisition Parameters *****

LOCNUC : 2H

NS : 68

NUCLEUS : off

O1 : -28240.22 Hz

PULPROG : zg

SFO1 : 282.3761148 MHz

SOLVENT : CDCl3

SW : 239.2822 ppm

TD : 131072

TE : 298.6 K

***** Processing Parameters *****

LB : 0.30 Hz

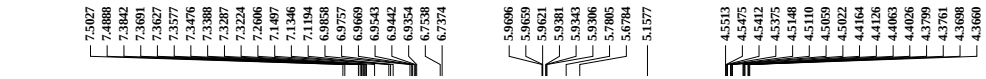
SF : 282.4043550 MHz

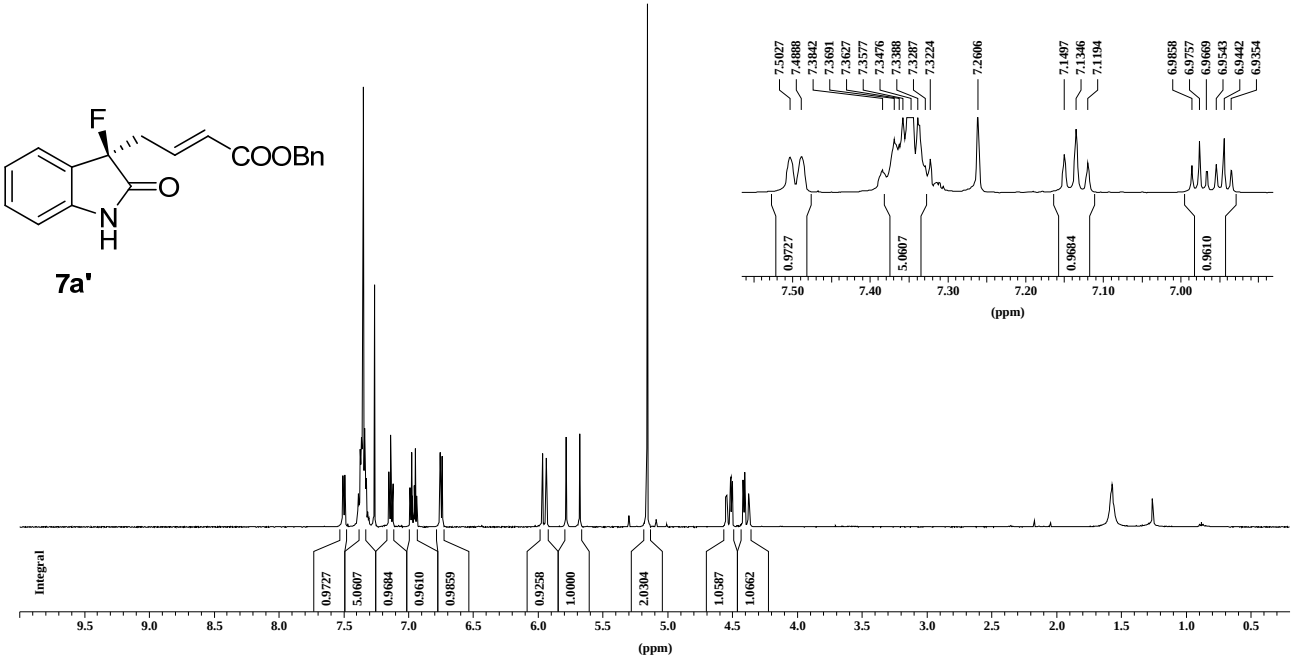
***** 1D NMR Plot Parameters *****

NUCLEUS : off

1H AMX500

wtl-1056





***** Current Data Parameters *****

NAME	**:**	**wtl-1125**
EXPNO	**:**	**3**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**26**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**299.3 K**

***** Processing Parameters *****

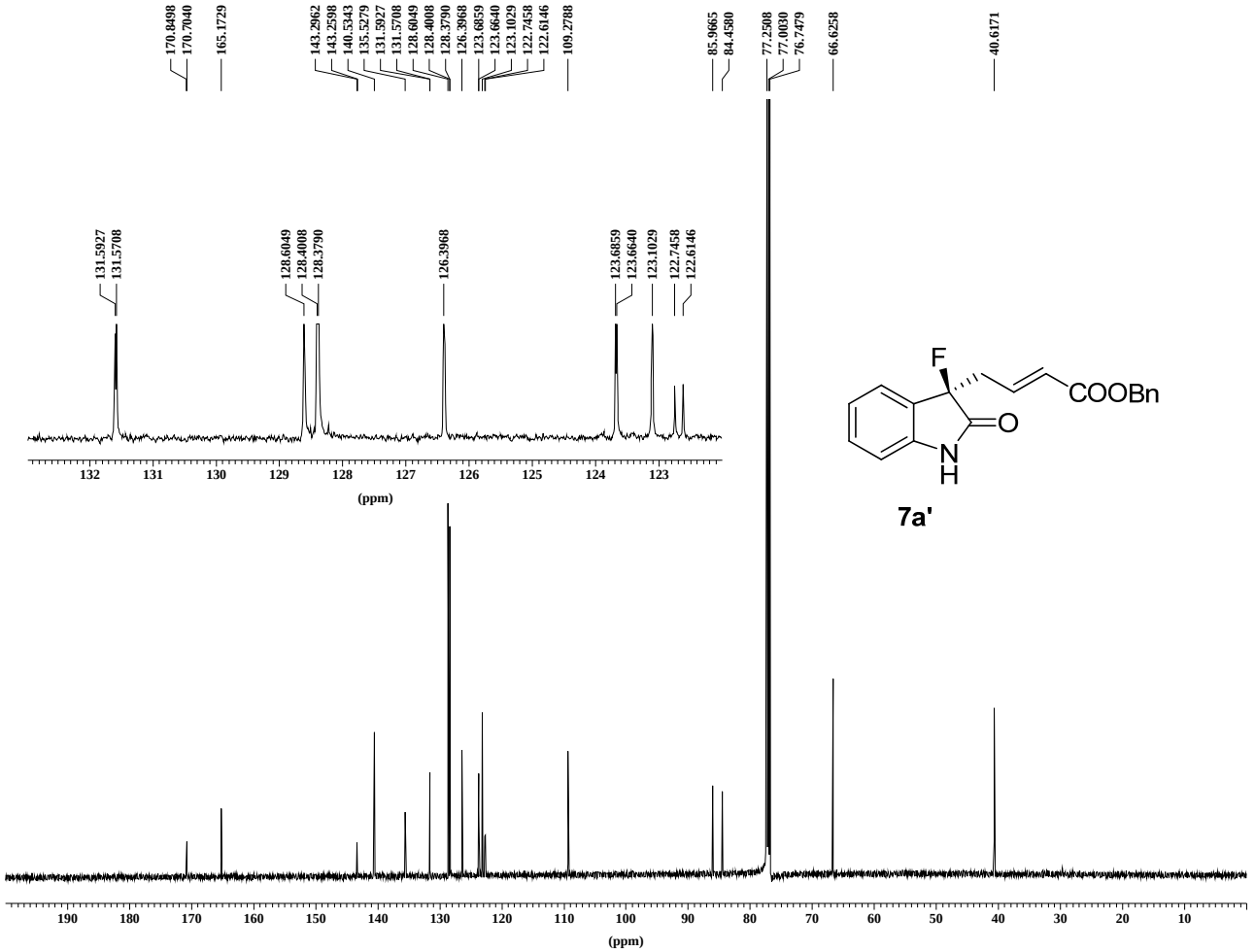
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

13C AMX500

wtl-1056



***** Current Data Parameters *****

NAME	**:**	**wtl-1125**
EXPNO	**:**	**4**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**12100**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**299.2 K**

***** Processing Parameters *****

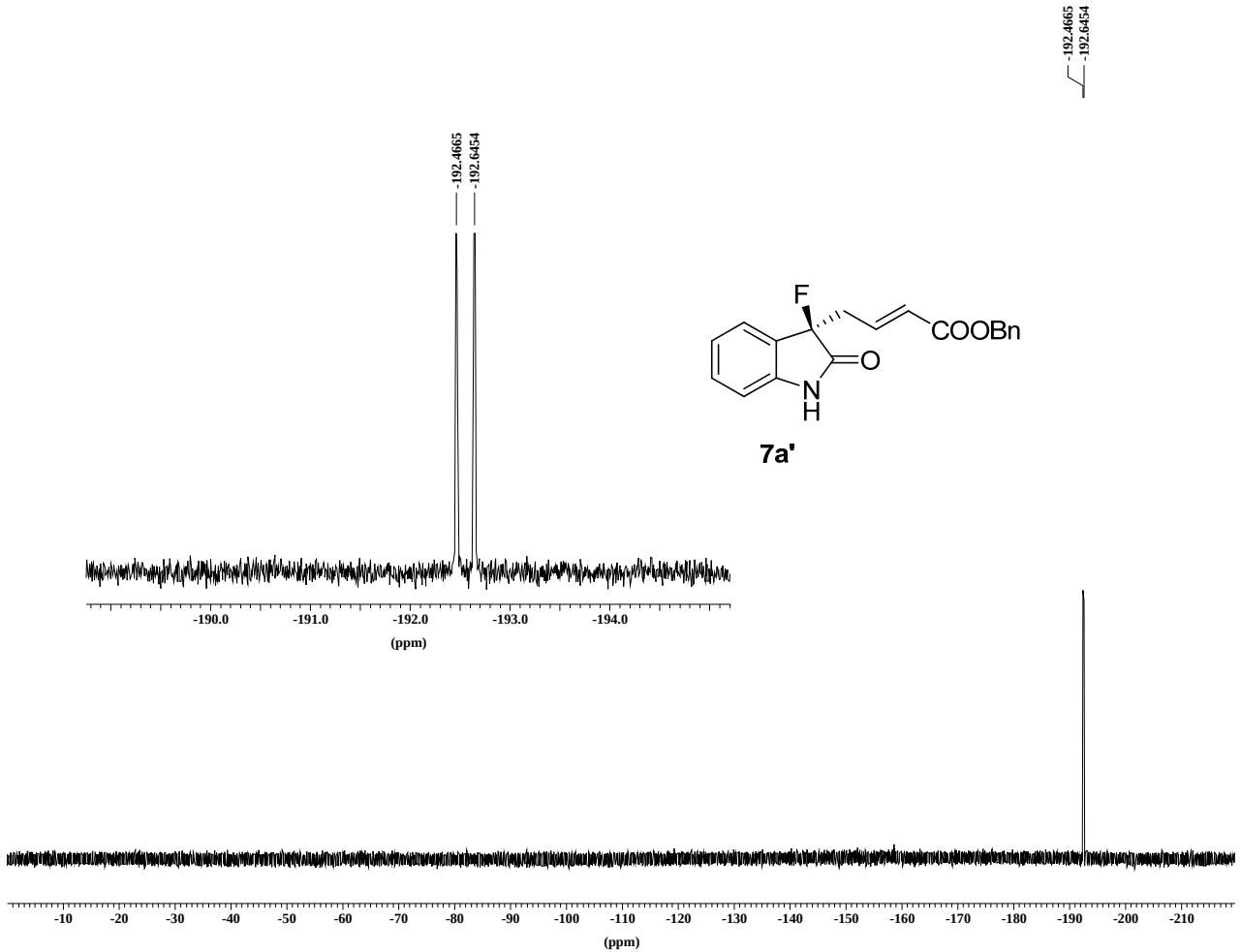
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577907 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

F19(no decoupled)

wtl-1056



***** Current Data Parameters *****

NAME	**:**	**nov24wtl**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**56**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**299.3 K**

***** Processing Parameters *****

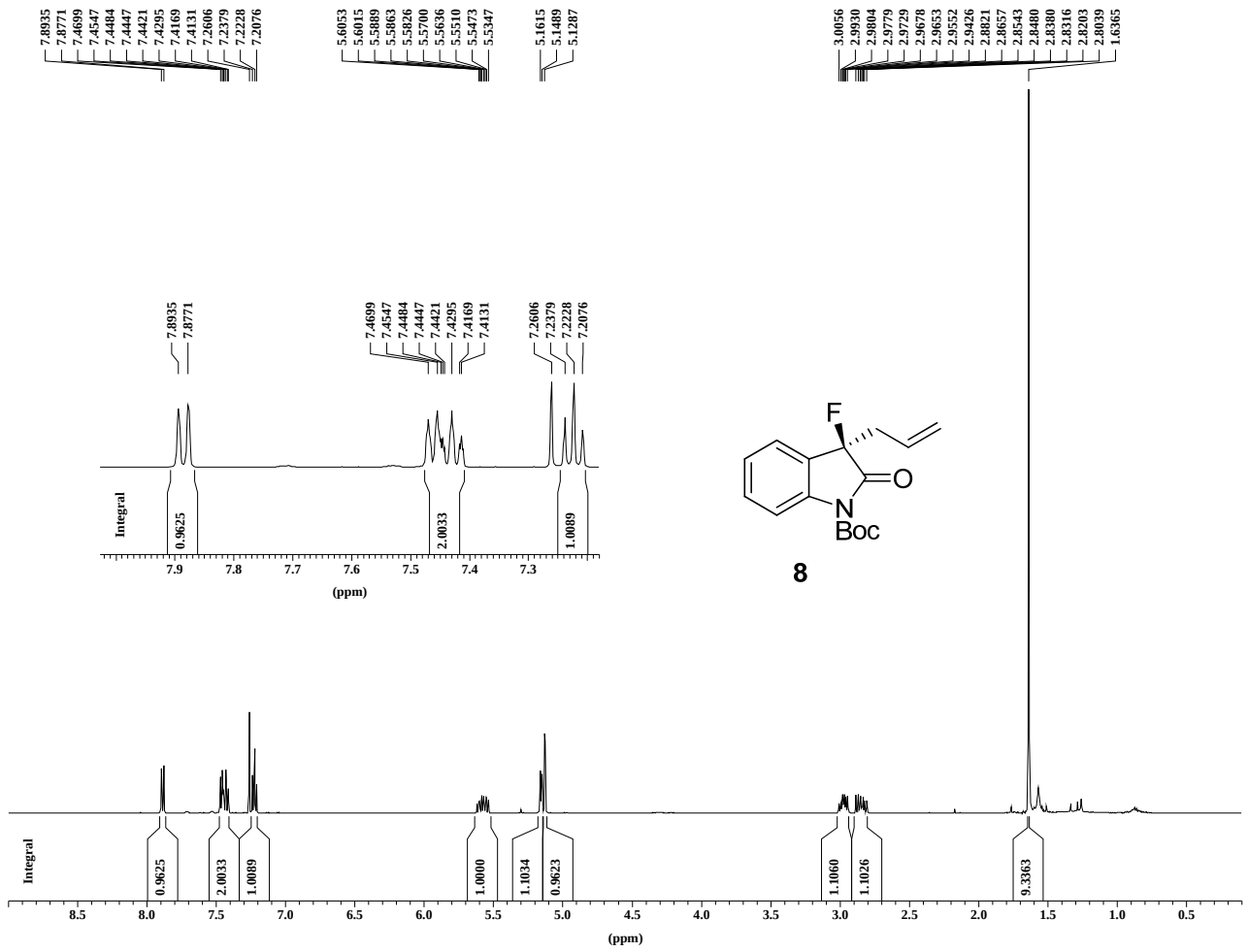
LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500

wtl-1057-2



***** Current Data Parameters *****

NAME	**:**	**wtl-1125**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**30**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**298.8 K**

***** Processing Parameters *****

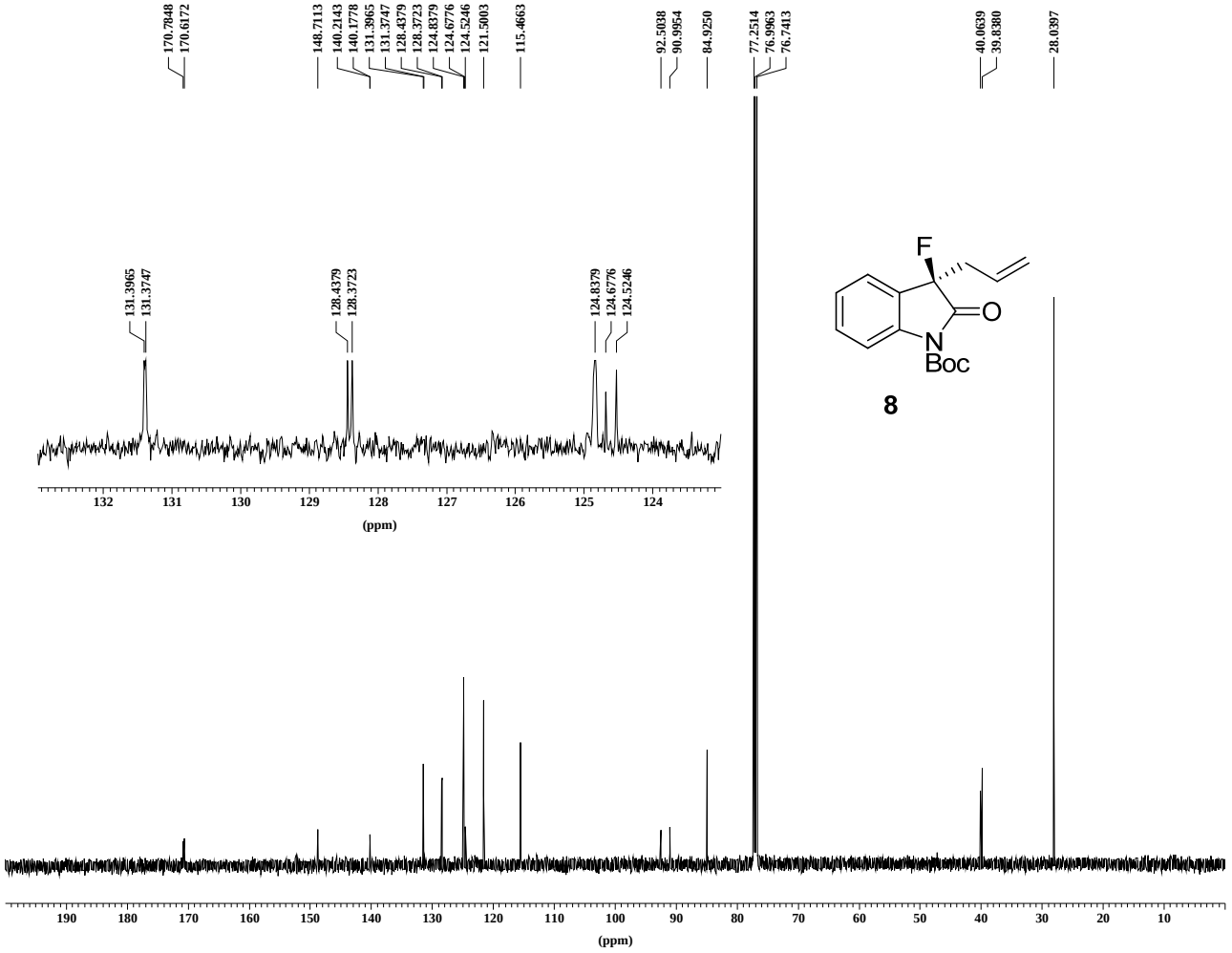
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

13C AMX500

wtl-1057-2



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***** Current Data Parameters *****

NAME	**:**	**wtl-1125**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**766**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**299.5 K**

***** Processing Parameters *****

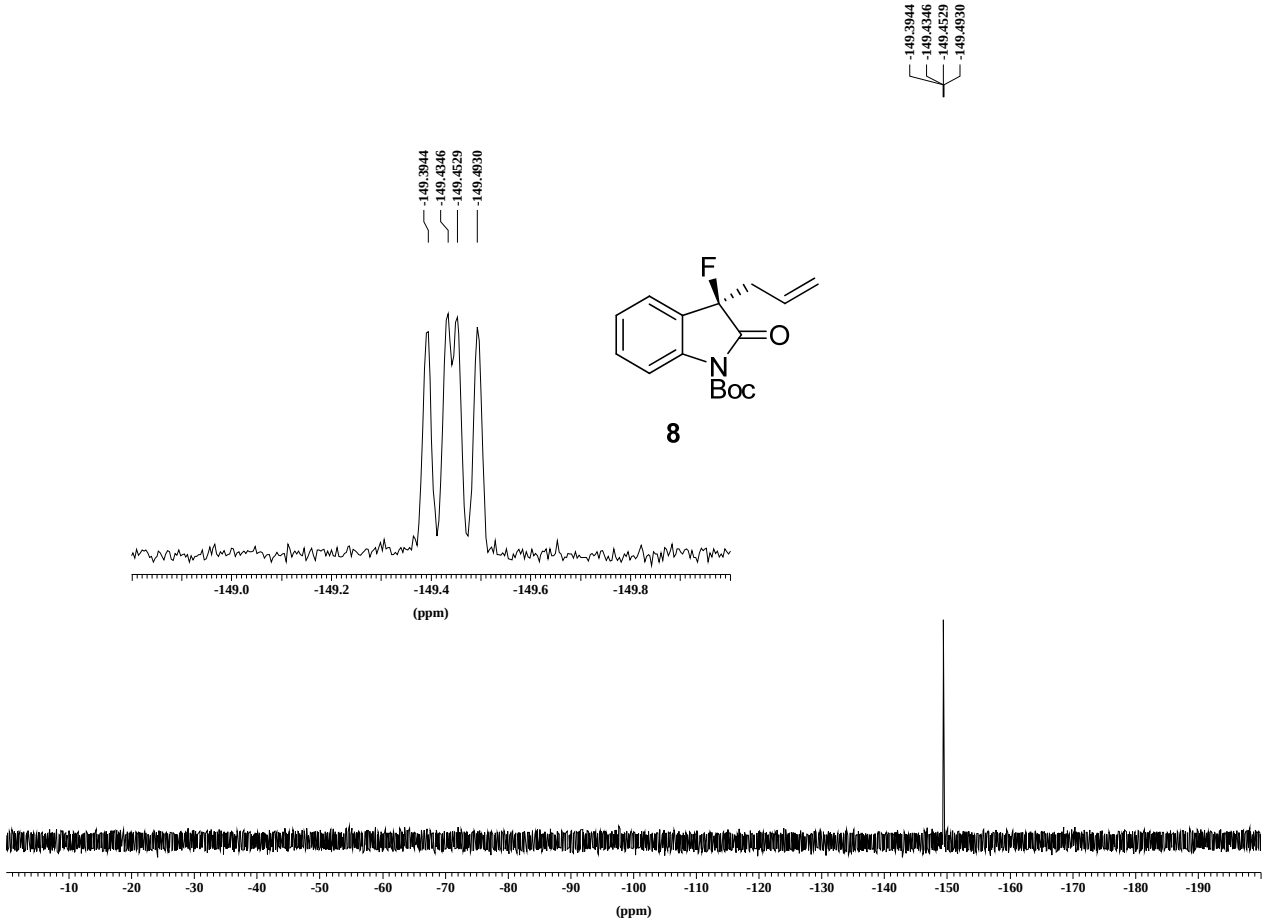
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577906 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

F19(no decoupled)

wtl-1057-2



***** Current Data Parameters *****

NAME	**:**	**nov24wtl**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**204**
NUCLEUS	**:**	**off**
O1	**:**	**-28240.22 Hz**
PULPROG	**:**	**zg**
SFO1	**:**	**282.3761148 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**239.2822 ppm**
TD	**:**	**131072**
TE	**:**	**299.3 K**

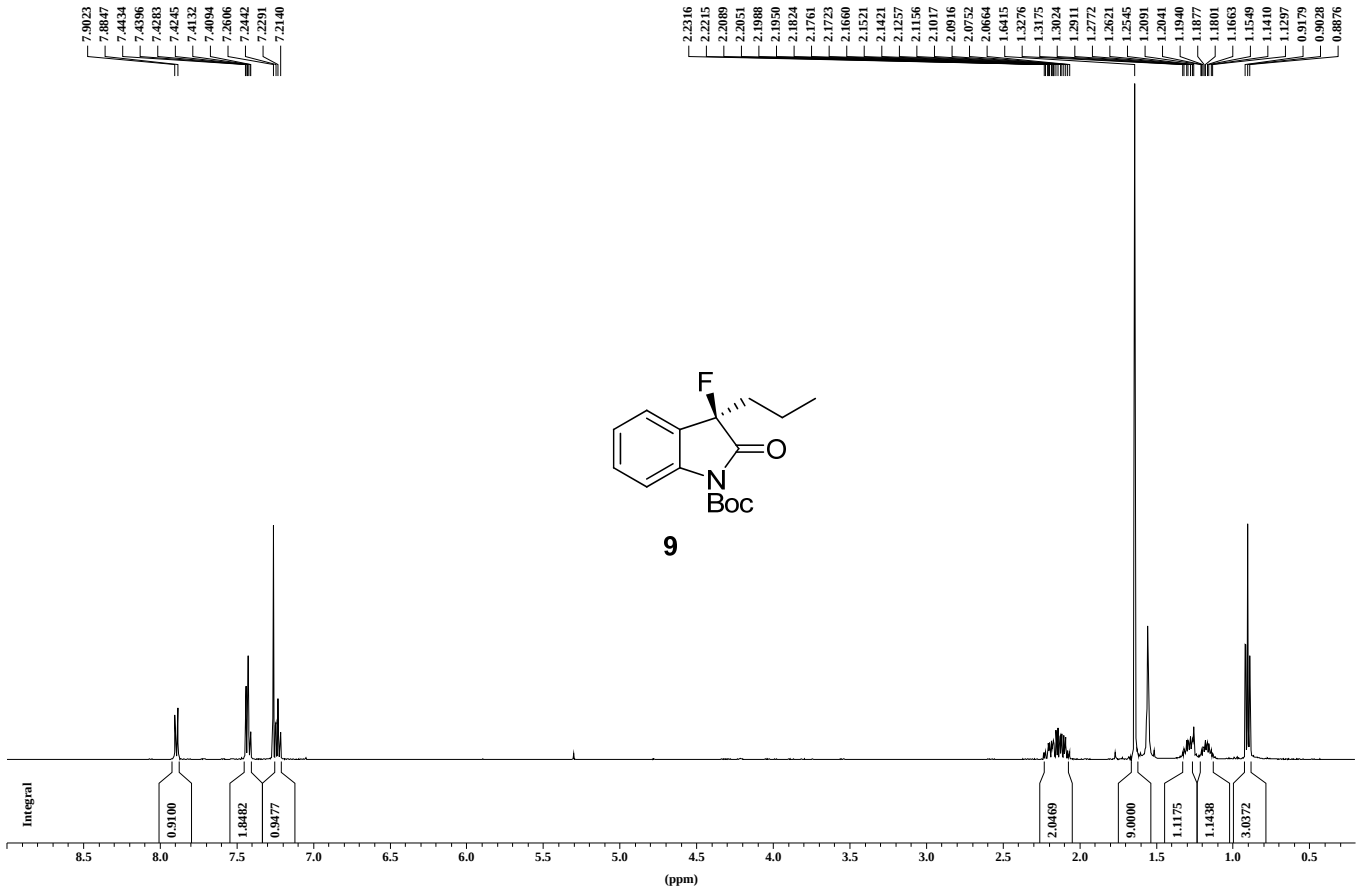
***** Processing Parameters *****

LB	**:**	**0.30 Hz**
SF	**:**	**282.4043550 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

1H AMX500
wtl-1057-3(a)



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***** Current Data Parameters *****

NAME	**:**	**wtl-1127**
EXPNO	**:**	**2**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**29**
NUCLEUS	**:**	**off**
O1	**:**	**3088.51 Hz**
PULPROG	**:**	**zg30**
SFO1	**:**	**500.1330885 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**20.6557 ppm**
TD	**:**	**32768**
TE	**:**	**298.8 K**

***** Processing Parameters *****

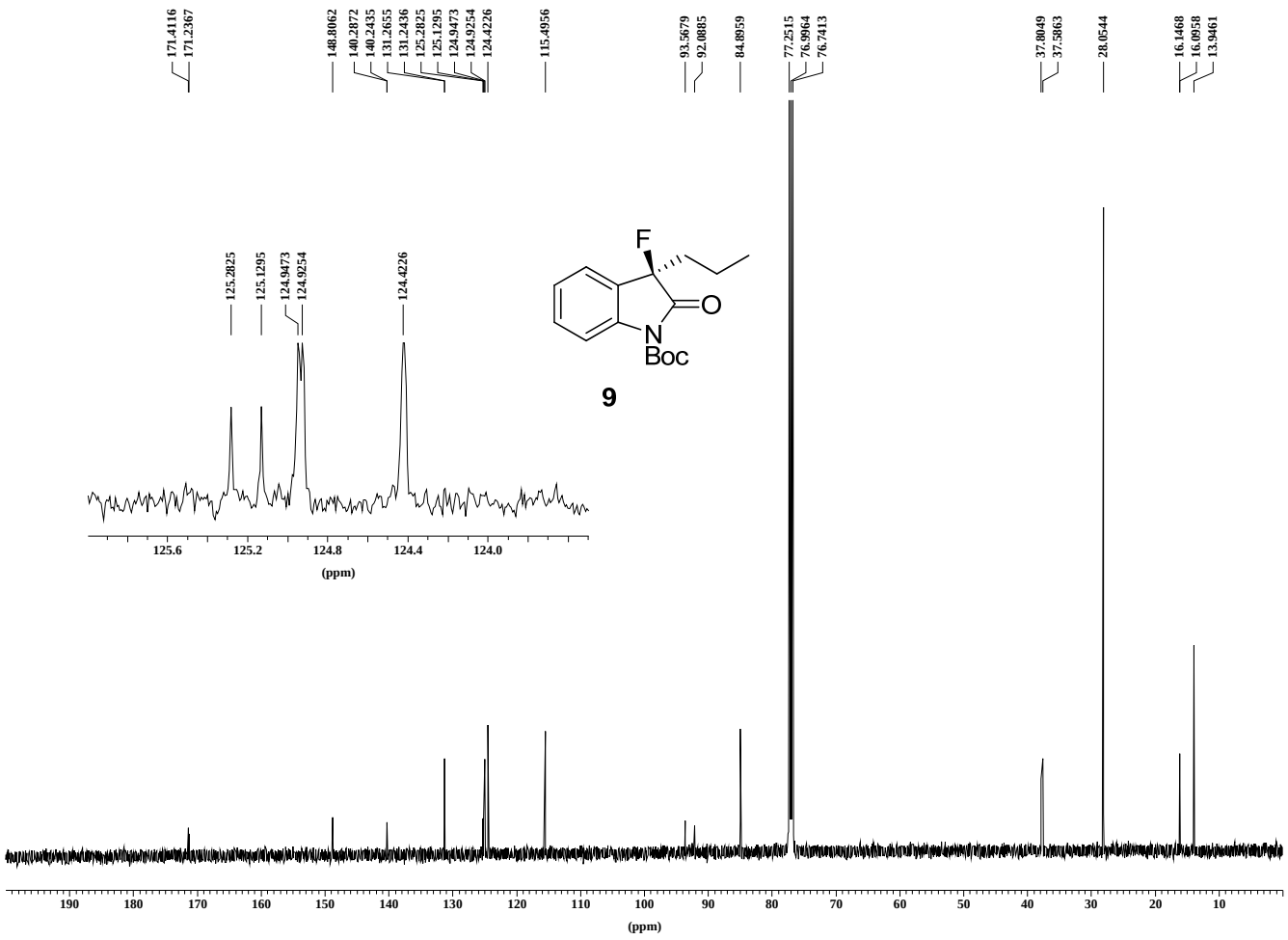
LB	**:**	**0.30 Hz**
SF	**:**	**500.1300134 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

13C AMX500

wtl-1057-3(a)



***** Current Data Parameters *****

NAME	**:**	**wtl-1129**
EXPNO	**:**	**1**
PROCNO	**:**	**1**

***** Acquisition Parameters *****

LOCNUC	**:**	**2H**
NS	**:**	**3660**
NUCLEUS	**:**	**off**
O1	**:**	**13204.57 Hz**
PULPROG	**:**	**zgpg30**
SFO1	**:**	**125.7709936 MHz**
SOLVENT	**:**	**CDCl3**
SW	**:**	**238.7675 ppm**
TD	**:**	**65536**
TE	**:**	**299.6 K**

***** Processing Parameters *****

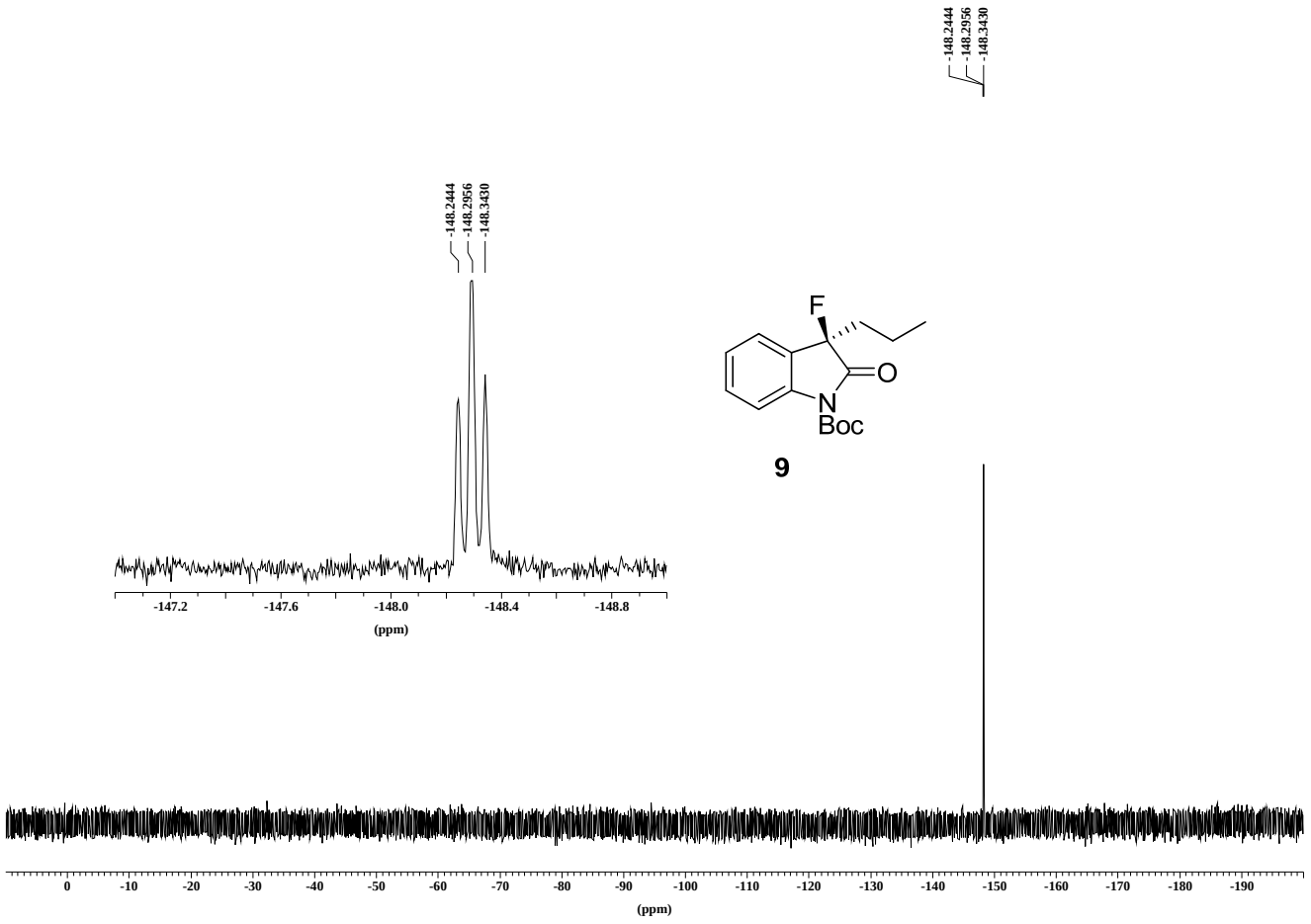
LB	**:**	**1.00 Hz**
SF	**:**	**125.7577906 MHz**

***** 1D NMR Plot Parameters *****

NUCLEUS	**:**	**off**

F19(no decoupled)

wtl-1057-3(a)



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***** Current Data Parameters *****

NAME : nov27wtl

EXPNO : 1

PROCNO : 1

***** Acquisition Parameters *****

LOCNUC : 2H

NS : 93

NUCLEUS : off

O1 : -28240.22 Hz

PULPROG : zg

SFO1 : 282.3761148 MHz

SOLVENT : CDCl3

SW : 239.2822 ppm

TD : 131072

TE : 298.9 K

***** Processing Parameters *****

LB : 0.30 Hz

SF : 282.4043550 MHz

***** 1D NMR Plot Parameters *****

NUCLEUS : off