Supporting Information for:

Alkenyl Exchange of Allyamines via Nickel(0)-Catalyzed C–C Bond Cleavage

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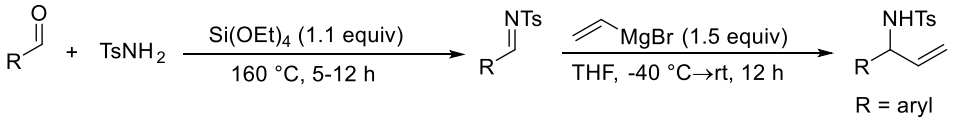
1. General Information

Unless mentioned otherwise, all manipulations were performed in an argon-filled glove box MBRAUN LABstar or using standard Schlenk techniques. NMR spectra were recorded on a Bruker AV 400 spectrometer at 400 MHz (^{1}H NMR), 101 MHz (^{13}C NMR). Chemical shifts were reported in ppm related to internal TMS for ^{1}H NMR data, deuterated solvent for ^{13}C NMR data, respectively. Data are presented in the following space: chemical shift, multiplicity, coupling constant in hertz (Hz), and signal area integration in natural numbers. High-resolution mass spectra were recorded on an IonSpec FT-ICR mass spectrometer with ESI or MALDI resource. GC analysis was performed using Agilent Technologies 7890A GC System. All the solvents used for reactions were distilled under argon after drying over an appropriate drying agent. $Ni(COD)_2$ and PCy_3 was purchased from Strem Chemicals. Other commercially available reagents were purchased from Acros, Sigma-Adrich and Alfa Aesar Chemical Company. All of the liquid alkenes were distilled before use. All of the solid allylamine substrates were recrystallized before use.

2. Preparation and Analysis of Allylamine Substrates

Procedure A[1]

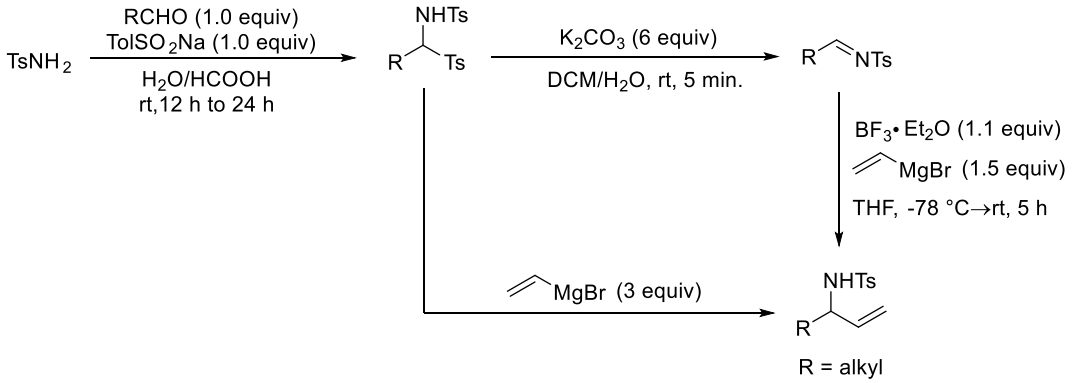


A 50 mL round bottom flask was charged with aldehyde (10 mmol), $TsNH_2$ (10 mmol), $Si(OEt)_4$ (4.7 mL), and a magnet stirring bar. The flask was equipped with a short condenser and a receiving bottle to collect EtOH. The reaction mixture was heated at 160 °C for 5 to 12 hours and then cooled to rt. 10 mL Et_2O was added and imine products were precipitated in a short period of time. Precipitates was then washed with hexane and collected.

A 25 mL Schlenk tube was charged with crude imine (1 mmol) and a magnet stirring bar. 4 mL THF was added and the solution was cooled to -40 °C under an argon balloon. Vinylmagnesium bromide (1.5 mL, 1M in THF) was added dropwise and the reaction mixture was allowed to warm to rt. After quenching with diluted HCl (1N) the reaction mixture was extracted with Et_2O three times. Organic layer was collected and dried with Na_2SO_4. The ether was removed under vacuum and the residue was purified by

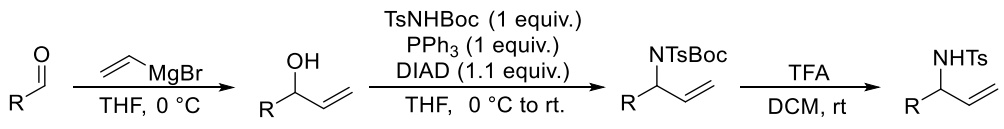
recrystallization or flash column chromatography (PE/EA = 10:1).

Procedure B[2]



Alkyl substituted *N*-tosyl allylamines were prepared in an alternative way. To a 100 mL round bottom flask charged with $TsNH_2$ (10 mmol), *p*-$TolSO_2Na$ (10 mmol) and a magnet stirring bar, HCOOH and H_2O (15 mL each) were added, and then alkyl aldehyde (10 mmol) was added. The mixture was stirred at rt for 12 hours to 24 hours. White precipitate was collected and washed with water and petroleum ether (100 mL each), and dissolved in 50 mL DCM. The solution was shaken with 50 mL saturated K_2CO_3 solution for 5 min. The water phase was separated and extracted with DCM (3 x 10 mL). The organic phase was collected and dried with Na_2SO_4. After removing solvent under vacuum the crude imine was obtained, which are pure enough to be used in reactions. From these imines, the alkyl substituted *N*-tosyl allylamines were prepared by using the same procedure as that described in **Procedure A**. In particular cases (R = Me, cyclopropyl), imine intermediates would be hydrolyzed during the shaking process. Alternatively, the corresponding *N*-tosyl allylamines were prepared by treating the adduct with 3 equivalent vinylmagnesium bromide in THF at 0 °C.

Procedure C[3]

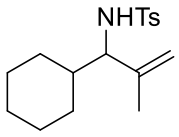


The *N*-tosyl allylamines containing 5-hexeneyl and CH_2OCH_2Ph were prepared by Mitsunobu reaction. A solution of the aldehyde (10 mmol, 0.3 M) in THF was treated with 2 equivalent vinylmagesnism bromide at 0 °C. After addition of vinylmagesnism bromide, the reaction mixture was allowed to warm to room temperature and quenched with diluted HCl (1N), and extracted with Et_2O three times. Organic layer was collected

and dried with Na_2SO_4. After removing the solvent under vacuum the crude ally alcohol was obtained, which was dissolved in 50 mL THF. TsNHBoc (10 mmol) and PPh_3 (10 mmol) were added, and the mixture was cooled to 0 °C and DIAD (11 mmol) was added over 20 min. The reaction mixture was allowed to warm to room temperature and stirred for 6 h. Solvents was removed and the residue was purified by flash column chromatography (PE/EA = 20:1). The Boc group was removed by treatment with 10 equivalent TFA in 10 mL DCM for 3 h. The pure *N*-tosyl allylamines was obtained by purification with flash column chromatography (PE/EA = 10:1).

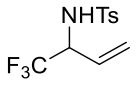
The analytical data for new *N*-tosyl allylamines are listed below.

_N_-(1-cyclohexyl-2-methylallyl)-4-methylbenzenesulfonamide (2d)



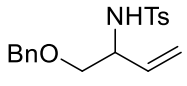
White solid. Mp: 134-135 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 8.3 Hz, 2H), 7.24 (d, *J* = 8.0 Hz, 2H), 4.67 (p, *J* = 1.5 Hz, 1H), 4.63 (s, 1H), 4.56 (d, *J* = 8.3 Hz, 1H), 3.47 (t, *J* = 8.5 Hz, 1H), 2.41 (s, 3H), 1.91 – 1.81 (m, 1H), 1.77 – 1.59 (m, 3H), 1.48 – 1.41 (m, 4H), 1.35 – 1.25 (m, 1H), 1.21 – 1.08 (m, 3H), 0.93 – 0.78 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 142.9, 142.1, 138.1, 129.2, 127.2, 114.1, 64.8, 39.6, 30.0, 29.1, 26.1, 26.0, 25.9, 21.5, 17.7. HRMS (ESI) Calcd for $[C_{17}H_{25}NNaO_2S, M+Na]^+$: 330.1504, Found: 330.1501.

4-methyl-_N_-(1,1,1-trifluorobut-3-en-2-yl)benzenesulfonamide (2j)



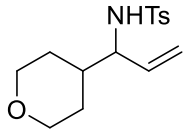
White solid. Mp: 85-86 ºC. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 8.3 Hz, 2H), 7.30 (d, *J* = 8.1 Hz, 2H), 5.74 (ddd, *J* = 16.7, 10.4, 5.8 Hz, 1H), 5.37 (d, *J* = 5.3 Hz, 1H), 5.34 (s, 1H), 5.24 (d, *J* = 9.5 Hz, 1H), 4.46 (dq, *J* = 14.7, 7.3 Hz, 1H), 2.43 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 144.0, 137.3, 129.7, 127.9, 127.0, 123.7 (q, *J* = 282.8), 121.8, 57.3 (q, *J* = 31.9), 21.6. HRMS (ESI) Calcd for $[C_{11}H_{12}F_3NNaO_2S, M+Na]^+$: 302.0439, Found: 302.0438.

_N_-(1-(benzyloxy)but-3-en-2-yl)-4-methylbenzenesulfonamide (2l)



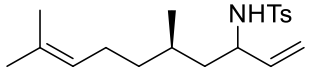
White semi-solid. ^{1}H NMR (400 MHz, Chloroform-d) δ 7.71 (d, J = 8.3 Hz, 2H), 7.47 – 7.12 (m, 7H), 5.69 (ddd, J = 17.0, 10.4, 6.3 Hz, 1H), 5.25 – 5.04 (m, 2H), 5.01 – 4.92 (m, 1H), 4.41 (s, 2H), 3.92 (ddd, J = 6.5, 5.0, 1.5 Hz, 1H), 3.40 (m, 2H), 2.41 (s, 3H). ^{13}C NMR (101 MHz, CDCl3) δ 143.3, 137.6, 137.4, 135.1, 129.5, 128.4, 127.9, 127.7, 127.2, 117.5, 73.2, 71.8, 55.7, 21.5. HRMS (ESI) Calcd for $[C_{18}H_{20}NO_3S, M-H]^-$: 330.1164, Found: 330.1166.

4-methyl-_N_-(1-(tetrahydro-2H-pyran-4-yl)allyl)benzenesulfonamide (2m)



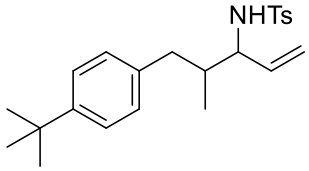
White solid. Mp: 107-108 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.3 Hz, 2H), 7.28 (d, *J* = 8.1 Hz, 2H), 5.50 (ddd, *J* = 17.4, 10.4, 7.2 Hz, 1H), 4.98 (d, *J* = 10.4 Hz, 1H), 4.89 (d, *J* = 17.1 Hz, 1H), 4.62 (d, *J* = 6.9 Hz, 1H), 3.95 (dt, *J* = 11.2, 5.5 Hz, 2H), 3.60 (q, *J* = 7.2 Hz, 1H), 3.29 (tdd, *J* = 11.7, 5.6, 2.1 Hz, 2H), 2.42 (s, 3H), 1.66 – 1.57 (m, 1H), 1.53 – 1.43 (m, 1H), 1.37 – 1.21 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.3, 137.2, 135.2, 129.5, 127.2, 117.4, 67.7, 67.6, 60.8, 39.9, 28.9, 28.8, 21.5. HRMS (ESI) Calcd for [$C_{15}H_{21}NNaO_3S$, M+Na]$^+$: 318.1140, Found: 318.1142.

***N*-((5*R*)-5,9-dimethyldeca-1,8-dien-3-yl)-4-methylbenzenesulfonamide (2p)**



Colorless oil. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.73 (d, *J* = 8.1 Hz, 2H), 7.28 (d, *J* = 9.8 Hz, 2H), 5.60 – 5.43 (m, 1H), 5.08 – 4.89 (m, 3H), 4.31 (dd, *J* = 18.4, 7.8 Hz, 1H), 3.81 (dt, *J* = 14.3, 6.9 Hz, 1H), 2.42 (s, 3H), 2.00 – 1.75 (m, 2H), 1.68 (d, *J* = 7.6 Hz, 3H), 1.58 (d, *J* = 4.1 Hz, 3H), 1.49 – 1.36 (m, 2H), 1.32 – 1.17 (m, 2H), 1.16 – 1.01 (m, 1H), 0.79 (dd, *J* = 18.5, 6.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 138.5, 138.1, 137.8, 131.5, 131.4, 129.7, 129.5, 129.5, 127.2, 124.5, 116.1, 115.4, 54.7, 54.3, 43.2, 36.9, 36.8, 28.8, 28.6, 25.7, 25.7, 25.2, 21.5, 19.3, 19.1, 17.7, 17.7. HRMS (ESI) Calcd for [$C_{19}H_{29}NNaO_2S$, M+Na]$^+$: 358.1817, Found: 358.1816.

***N*-(5-(4-(tert-butyl)phenyl)-4-methylpent-1-en-3-yl)-4-methylbenzenesulfonamide (2q)**



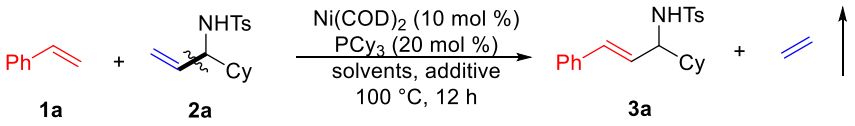
White solid. Mp: 150-150 °C. *dr* = 1.2:1. ^{1}H NMR (400 MHz, Chloroform-d) δ 7.78 – 7.70 (m, 1H), 7.67 (d, J = 8.2 Hz, 1H), 7.31 – 7.24 (m, 4H), 6.98 (m, 2H), 5.71 – 5.47 (m, 1H), 5.14 – 4.87 (m, 2H), 4.75 (dd, J = 23.9, 8.5 Hz, 1H), 3.92 – 3.80 (m, 0.45H), 3.74 – 3.66 (m, 0.55H), 2.66 (ddd, J = 23.5, 13.6, 5.5 Hz, 1H), 2.41 (s, 3H), 2.25 (s, 1H), 1.92 (dd, J = 6.2, 2.0 Hz, 1H), 1.31 (d, J = 3.8 Hz, 9H), 0.79 (dd, J = 11.3, 6.8 Hz, 3H). ^{13}C NMR (101 MHz, CDCl3) δ 148.8, 143.2, 143.1, 138.1, 137.7, 137.2, 136.8, 136.02, 134.7, 129.5, 129.5, 128.7, 128.6, 127.2, 125.2, 117.4, 116.6, 60.3, 59.8, 39.8, 39.6, 38.5, 38.5, 34.4, 31.4, 21.6, 14.8, 14.7. HRMS (ESI) Calcd for [$C_{23}H_{31}NNaO_2S$, M+Na]$^+$: 408.1973, Found: 408.1972.

3. General Procedure and Optimization

In an argon-filled glove-box, an oven-dried sealed tube was charged with a stir bar,

catalyst precursor $Ni(COD)_2$, ligand PCy_3, and *N*-tosyl allylamine. The styrene and solvent were injected into the tube. For liquid allyamines, they were added in the end otherwise it would cause the formation of nickel black. The mixture was stirred at room temperature for 5 min and heated at 100 °C for 12 h. After cooling to room temperature, the reaction mixture was quenched with 100 μL HCl (1 N) and passed through a short silica gel column eluted with ethyl acetate. The pure product was obtained by column chromatography on silica gel (PE/EA = 10:1, v/v) or recrystallization. NMR yields were listed in parentheses.

Table S1. Optimization of reaction condition A

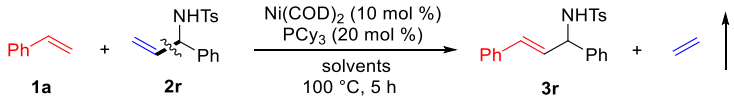


1a **2a** **3a**

entry	solvents	additive (10 mol%)	temperature (℃)	yield (%)[b]
1	toluene	--	100	68
2	toluene	$TsNH_2$	100	77
3	toluene	Ts_FNH_2	100	74
4	toluene	$PhCO_2H$	100	<5
5	toluene	saccharin	100	--
6	THF	$TsNH_2$	100	80
7	hexane	$TsNH_2$	100	95
8	hexane	--	100	>99
9[c]	hexane	--	100	40
10	hexane	--	80	65
11	hexane	--	120	85

[a] Reaction condition: **1a** (0.25 mmol), **2a** (0.30 mmol), solvent (1 mL). [b] Yields were determined by ^1H NMR analysis using diphenylmethane as internal standard. [c] 5 mol % catalyst was used.

Table S2. Optimization of reaction condition B



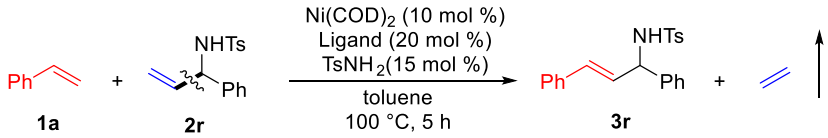
1a **2r** **3r**

entry	**2m** (x equiv.)	solvents	$TsNH_2$	temperature (°C)	yield (%)[b]
1	0.5	toluene	15 mol %	100	59
2	0.5	hexane	15 mol %	100	37
3	0.5	THF	15 mol %	100	21

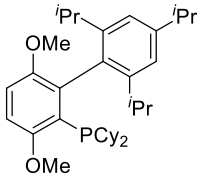
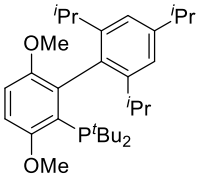
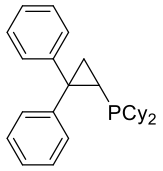
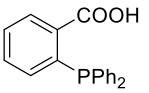
4	0.5	toluene	15 mol %	90	51
5	0.5	toluene	15 mol %	110	49
6	1.5	toluene	15 mol %	100	45
7[c]	1.5	toluene	30 mol %	100	54
8[c]	2.0	toluene	30 mol %	100	76
9[c]	2.2	toluene	30 mol %	100	68
10[c]	2.5	toluene	30 mol %	100	61

[a] Reaction condition: **1a** (0.5 mmol), **2r** (0.25 mmol), $Ni(COD)_2$ (10 mol %), PCy_3 (20 mol %), solvent (1.0 mL) at 100 °C for 5 h. [b] NMR yield, diphenylmethane as internal standard. For entries 1-5, yields were based on **2r**. For entries 6-10, yields were based on **1a**. [c] $Ni(COD)_2$ (20 mol %) and PCy_3 (40 mol %) were used.

Scheme S1. Ligands screening [a,b]

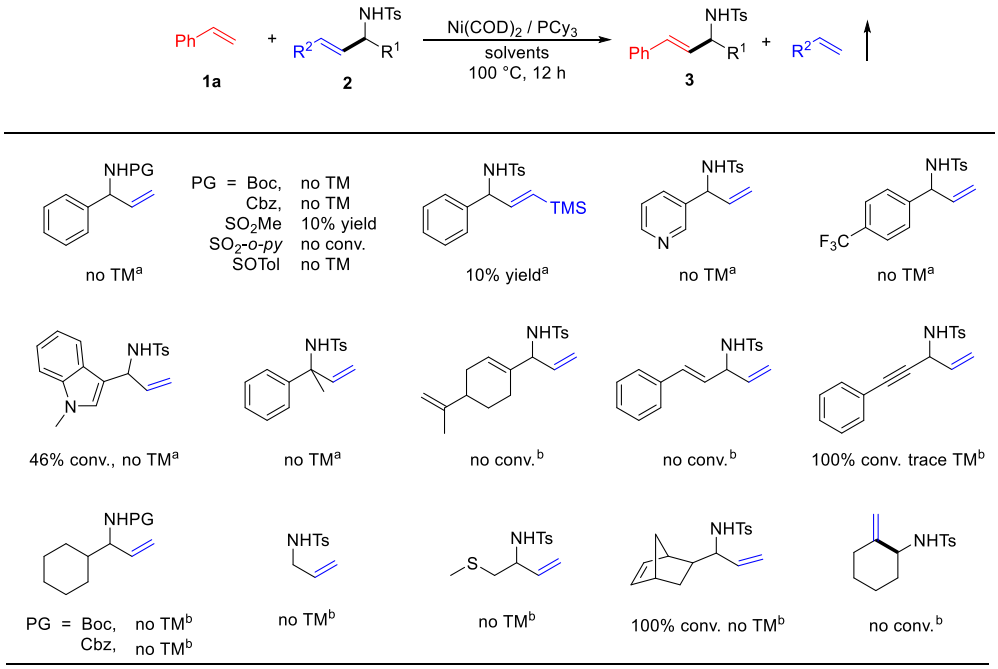


1a **2r** **3r**

PCy_3 59% 96% conversion	$PCyp_3$ 54% 96% conversion	PCy_2Ph 14% 20% conversion	$PCy_2(p\text{-}NMe_2C_6H_4)$ 13% 20% conversion
$PCy_2{}^tBu$ 30% 54% conversion	PMe_3 no TM 84% conversion	P^nBu_3 no TM 84% conversion	P^nOct_3 no TM 80% conversion
P^tBu_3 trace TM < 10% conversion	PPh_3 < 5% conversion	$P(OPh)_3$ no conversion	dcype no TM 100% conversion
 no conversion	 < 5% conversion	 < 5% conversion	 no conversion
dppe no TM 94% conversion	IPr no conversion	dtbpy no conversion	 no conversion

[a] Reaction condition: **1a** (0.5 mmol), **2r** (1.0 mmol), $Ni(COD)_2$ (0.05 mmol), ligand (Ni/P = 1:2), $TsNH_2$ (0.075 mmol), toluene (1 mL). 100 °C, 5 h. [b] Yields were determined by ^1H NMR analysis using diphenylmethane as internal standard.

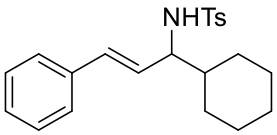
Scheme S2. Unsuccessful substrates[a,b,c]



[a] Condition **A**: **1a** (0.25 mmol), **2** (0.3 mmol), $Ni(COD)_2$ (10 mol %), PCy_3 (20 mol %) in hexane (1 mL) at 100 °C for 12 h. [b] Condition **B**: **1** (0.5 mmol), **2** (1.0 mmol), $Ni(COD)_2$ (20 mol %), PCy_3 (40 mol %), $TsNH_2$ (30 mol %) in toluene (1 mL) at 100 °C for 5 h. [c] NMR yields. Diphenylmethane was used as internal standards.

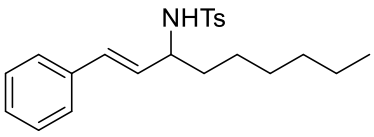
4. Charateration of products

(*E*)-*N*-(1-cyclohexyl-3-phenylallyl)-4-methylbenzenesulfonamide (3a)[4]



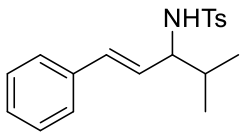
White solid, 88% yield (99% NMR yield). Mp: 158–160 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.71 (d, *J*= 8.1 Hz, 2H), 7.28–7.16 (m, 3H), 7.14 (d, *J*= 8.0 Hz, 2H), 7.05 (d, *J*= 7.1 Hz, 2H), 6.04 (d, *J*= 15.9 Hz, 1H), 5.69 (dd, *J*= 15.8, 8.1 Hz, 1H), 4.93 (d, *J*= 8.4 Hz, 1H), 3.71 (dd, *J*= 14.7, 7.9 Hz, 1H), 1.81 (d, *J*= 12.6 Hz, 2H), 1.74–1.61 (m, 4H), 1.47–1.41 (m, 1H), 1.23–1.08 (m, 3H), 1.05–0.94 (m, 2H). ^{13}C NMR (101 MHz, CDCl3) δ 143.2, 138.3, 136.5, 132.2, 129.5, 128.4, 127.7, 127.4, 126.4, 61.6, 43.1, 29.2, 29.2, 26.4, 26.1, 21.4.

(*E*)-4-methyl-*N*-(1-phenylnon-1-en-3-yl)benzenesulfonamide (3e)



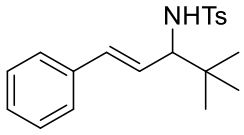
White solid, 98% yield. Mp: 123–124 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.73 (d, *J* = 7.9 Hz, 2H), 7.28–7.13 (m, 5H), 7.10 (d, *J* = 7.3 Hz, 2H), 6.19 (d, *J* = 15.8 Hz, 1H), 5.71 (dd, *J* = 15.9, 7.6 Hz, 1H), 4.87 (d, *J* = 7.8 Hz, 1H), 3.90 (p, *J* = 7.3 Hz, 1H), 2.28 (s, 3H), 1.53 (hept, *J* = 7.1, 6.4 Hz, 2H), 1.35–1.10 (m, 8H), 0.85 (t, *J* = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 138.1, 136.3, 131.3, 129.5, 129.0, 128.4, 127.6, 127.3, 126.3, 56.4, 35.9, 31.6, 28.9, 25.4, 22.5, 21.4, 14.1. HRMS (ESI) Calcd for $[C_{22}H_{29}NNaO_2S, M+Na]^+$: 394.1817, Found: 394.1815.

(*E*)-4-methyl-*N*-(4-methyl-1-phenylpent-1-en-3-yl)benzenesulfonamide (3f)[4]



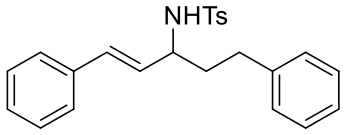
White crystal, 95% yield. Mp: 137-138 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 8.2 Hz, 2H), 7.26–7.16 (m, 3H), 7.13 (d, *J* = 8.0 Hz, 2H), 7.05 (d, *J* = 8.0 Hz, 2H), 6.06 (d, *J* = 15.9 Hz, 1H), 5.71 (dd, *J* = 15.9, 8.0 Hz, 1H), 5.31 (d, *J* = 8.5 Hz, 1H), 3.70 (q, *J* = 7.8 Hz, 1H), 2.23 (s, 3H), 1.80 (dt, *J* = 13.1, 6.5 Hz, 1H), 0.92 (d, *J* = 6.8 Hz, 3H), 0.88 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.2, 138.2, 136.5, 132.2, 129.5, 128.4, 127.6, 127.4, 127.0, 126.4, 62.1, 33.3, 21.4, 18.6, 18.5.

(*E*)-*N*-(4,4-dimethyl-1-phenylpent-1-en-3-yl)-4-methylbenzenesulfonamide (3g)[4]



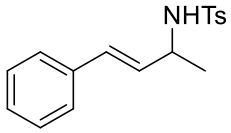
White crystal, 97% yield. Mp: 126-128 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 8.2 Hz, 2H), 7.26–7.11 (m, 3H), 7.07 (d, *J* = 8.1 Hz, 2H), 6.99 (d, *J* = 6.9 Hz, 2H), 5.89 (d, *J* = 15.8 Hz, 1H), 5.69 (dd, *J* = 15.8, 8.8 Hz, 1H), 5.54 (d, *J* = 9.5 Hz, 1H), 3.54 (t, *J* = 9.1 Hz, 1H), 2.14 (s, 3H), 0.93 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.1, 138.1, 136.4, 132.9, 129.4, 128.3, 127.5, 127.4, 126.3, 125.5, 65.7, 35.0, 26.5, 21.3.

(*E*)-*N*-(1,5-diphenylpent-1-en-3-yl)-4-methylbenzenesulfonamide (3h)[4]



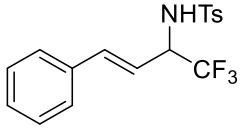
White solid, 92% yield. Mp: 97-99°C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 8.1 Hz, 2H), 7.29–7.15 (m, 6H), 7.12–7.02 (m, 6H), 6.15 (d, *J* = 15.9 Hz, 1H), 5.79–5.65 (m, 1H), 5.52 (d, *J* = 8.2 Hz, 1H), 3.93 (p, *J* = 7.3 Hz, 1H), 2.71–2.53 (m, 2H), 2.21 (s, 3H), 1.93–1.76 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 141.1, 138.1, 136.3, 131.7, 129.6, 128.5, 128.5, 128.4, 128.4, 127.7, 127.3, 126.4, 126.0, 56.1, 37.4, 31.7, 21.4.

(*E*)-4-methyl-*N*-(4-phenylbut-3-en-2-yl)benzenesulfonamide (3i)



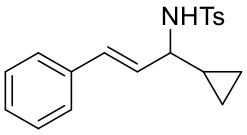
White crystal, 95% yield. Mp: 80–82 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.76 (d, *J* = 8.2 Hz, 2H), 7.29–7.17 (m, 5H), 7.14 (d, *J* = 7.0 Hz, 2H), 6.28 (d, *J* = 15.9 Hz, 1H), 5.83 (dd, *J* = 15.9, 6.7 Hz, 1H), 4.87 (d, *J* = 7.6 Hz, 1H), 4.08 (h, *J* = 6.9 Hz, 1H), 2.33 (s, 3H), 1.27 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.3, 138.0, 136.2, 130.5, 130.1, 129.6, 128.4, 127.7, 127.3, 126.4, 51.7, 21.9, 21.4. HRMS (ESI) Calcd for $[C_{17}H_{19}NNaO_2S, M+Na]^+$: 324.1034, Found: 324.1032.

(*E*)-4-methyl-*N*-(1,1,1-trifluoro-4-phenylbut-3-en-2-yl)benzenesulfonamide (3j)



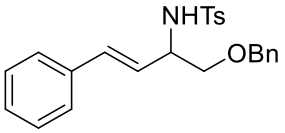
White solid. Mp: 112-113 °C. 63% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.76 (d, *J* = 8.1 Hz, 2H), 7.39 – 7.16 (m, 7H), 6.49 (d, *J* = 15.9 Hz, 1H), 5.90 (dd, *J* = 15.9, 7.0 Hz, 1H), 5.26 (d, *J* = 9.3 Hz, 1H), 4.58 (h, *J* = 7.1 Hz, 1H), 2.34 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 144.1, 137.3, 136.9, 134.9, 129.8, 128.8, 128.6, 127.2, 126.8, 123.9 (q, *J* = 282.2 Hz), 118.2, 57.49 (q, *J* = 32.2 Hz), 21.5. HRMS (ESI) Calcd for $[C_{17}H_{16}F_3NNaO_2S, M+Na]^+$: 378.0752, Found: 378.0750.

(*E*)-*N*-(1-cyclopropyl-3-phenylallyl)-4-methylbenzenesulfonamide (3k)



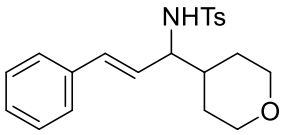
White crystal, 36% yield. Mp: 80–82 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 8.1 Hz, 2H), 7.29–7.11 (m, 7H), 6.29 (d, *J* = 15.9 Hz, 1H), 5.84 (dd, *J* = 15.8, 7.1 Hz, 1H), 5.27 (d, *J* = 6.7 Hz, 1H), 3.36 (q, *J* = 7.3 Hz, 1H), 2.31 (s, 3H), 1.01–0.89 (m, 1H), 0.53–0.39 (m, 2H), 0.30–0.15 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 136.4, 131.3, 129.5, 128.4, 127.9, 127.6, 127.4, 126.4, 60.4, 21.5, 16.4, 3.7, 3.3. HRMS (ESI) Calcd for [$C_{19}H_{20}NO_2S$, M-H]$^-$: 326.1215, Found: 326.1218.

(*E*)-*N*-(1-(benzyloxy)-4-phenylbut-3-en-2-yl)-4-methylbenzenesulfonamide (3l)



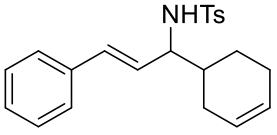
Colorless oil, 58% yield (64% NMR yield). ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 8.3 Hz, 2H), 7.35–7.20 (m, 9H), 7.18–7.13 (m, 3H), 6.36 (dd, *J* = 16.0, 1.0 Hz, 1H), 5.88 (dd, *J* = 16.0, 7.3 Hz, 1H), 5.22 (d, *J* = 6.6 Hz, 1H), 4.43 (s, 2H), 4.14–4.07 (m, 1H), 3.53–3.41 (m, 2H), 2.30 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.3, 137.8, 137.4, 136.2, 132.6, 129.5, 128.5, 128.4, 127.9, 127.8, 127.8, 127.4, 126.5, 126.1, 73.3, 72.1, 55.8, 21.5. HRMS (ESI) Calcd for [$C_{24}H_{25}NNaO_3S$, M+Na]$^-$. 430.1453, Found: 430.1450.

(*E*)-4-methyl-*N*-(3-phenyl-1-(tetrahydro-2H-pyran-4-yl)allyl)benzenesulfonamide (3m)



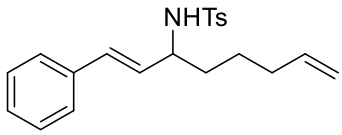
White foam, 61% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.1 Hz, 2H), 7.27–7.17 (m, 3H), 7.14 (d, *J* = 8.1 Hz, 2H), 7.04 (d, *J* = 7.0 Hz, 2H), 6.03 (d, *J* = 15.8 Hz, 1H), 5.66 (dd, *J* = 15.8, 8.4 Hz, 1H), 5.33 (d, *J* = 8.7 Hz, 1H), 3.93 (td, *J* = 11.5, 3.2 Hz, 2H), 3.67 (q, *J* = 8.2 Hz, 1H), 3.28 (q, *J* = 10.6 Hz, 2H), 2.23 (s, 3H), 1.78–1.60 (m, 2H), 1.56–1.46 (m, 1H), 1.41–1.22 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.3, 138.0, 136.0, 132.8, 129.5, 128.4, 127.7, 127.3, 126.3, 126.2, 67.7, 67.5, 61.2, 40.2, 29.4, 29.2, 27.9, 21.3. HRMS (ESI) Calcd for [$C_{21}H_{24}NO_3S$, M-H]$^-$: 370.1477, Found: 370.1480.

(*E*)-*N*-(1-(cyclohex-3-en-1-yl)-3-phenylallyl)-4-methylbenzenesulfonamide (3n)



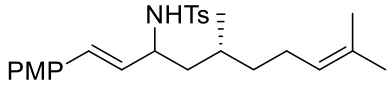
White solid, 79% yield (82% NMR yield). Mp: 142–143 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.0 Hz, 2H), 7.28–7.11 (m, 5H), 7.09–7.01 (m, 2H), 6.05 (dd, *J* = 15.8, 10.3 Hz, 1H), 5.74–5.57 (m, 3H), 4.97 (dd, *J* = 12.7, 8.6 Hz, 1H), 3.78 (qd, *J* = 8.0, 4.9 Hz, 1H), 2.24 (d, *J* = 4.1 Hz, 3H), 2.20–1.67 (m, 6H), 1.37–1.22 (m, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 143.2, 138.1, 136.2, 132.6, 132.2, 129.5, 128.3, 127.6, 127.6, 127.3, 127.3, 127.1, 126.9, 126.8, 126.3, 126.3, 125.7, 125.6, 60.9, 60.6, 38.8, 28.0, 27.9, 24.9, 24.9, 24.9, 24.7, 21.3, 21.3. HRMS (ESI) Calcd for [$C_{22}H_{25}NNaO_2S$, M+Na]$^+$: 390.1504, Found: 390.1507.

(*E*)-4-methyl-*N*-(1-phenylocta-1,7-dien-3-yl)benzenesulfonamide (3o)



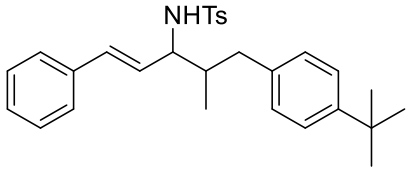
Colorless oil, 42% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.73 (d, *J* = 8.2 Hz, 2H), 7.28–7.14 (m, 5H), 7.09 (d, *J* = 6.8 Hz, 2H), 6.19 (d, *J* = 15.8 Hz, 1H), 5.78–5.62 (m, 2H), 5.01–4.85 (m, 2H), 4.73 (d, *J* = 7.9 Hz, 1H), 3.92 (p, *J* = 7.2 Hz, 1H), 2.29 (s, 3H), 2.00 (qt, *J* = 7.1, 1.4 Hz, 2H), 1.63–1.50 (m, 2H), 1.46–1.32 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 138.1, 136.2, 131.4, 129.5, 128.7, 128.4, 127.7, 127.3, 126.3, 114.9, 56.3, 35.3, 33.2, 24.7, 21.4. HRMS (ESI) Calcd for $[C_{21}H_{25}NNaO_2S, M+Na]^+$: 378.1504, Found: 378.1501.

***N*-((5*R*,*E*)-1-(4-methoxyphenyl)-5,9-dimethyldeca-1,8-dien-3-yl)-4-methylbenzenesulfonamide (3p)**



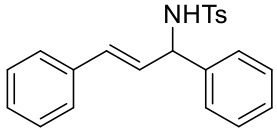
Colorless oil, 48% yield. *dr* = 1:1. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.71 (d, *J* = 8.1 Hz, 2H), 7.17 (d, *J* = 8.0 Hz, 2H), 7.03 (t, *J* = 7.8 Hz, 2H), 6.78 (dd, *J* = 8.7, 2.3 Hz, 2H), 6.14 (dd, *J* = 15.8, 7.1 Hz, 1H), 5.51 (dt, *J* = 15.6, 7.1 Hz, 1H), 5.04 (q, *J* = 7.0 Hz, 1H), 4.46 (dd, *J* = 20.1, 7.6 Hz, 1H), 3.97 (h, *J* = 7.1 Hz, 1H), 3.80 (s, 3H), 2.30 (s, 3H), 2.03 – 1.88 (m, 2H), 1.88 – 1.73 (m, 2H), 1.66 (d, *J* = 9.7 Hz, 3H), 1.58 (d, *J* = 9.1 Hz, 3H), 1.51 – 1.35 (m, 2H), 1.17 – 1.06 (m, 1H), 0.89 – 0.78 (m, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 159.2, 159.2, 143.1, 138.3, 131.4, 131.3, 131.1, 130.5, 129.4, 129.1, 129.0, 127.5, 127.5, 127.3, 127.2, 126.6, 124.5, 113.8, 55.3, 54.9, 54.5, 43.5, 43.4, 36.9, 36.8, 35.6, 35.0, 31.2, 31.1, 29.7, 28.9, 28.7, 27.7, 27.6, 27.0, 26.9, 26.6, 26.4, 26.3, 26.2, 25.7, 25.2, 21.4, 19.3, 19.3, 17.7. HRMS (ESI) Calcd for $[C_{26}H_{35}NNaO_3S, M+Na]^+$: 464.2235, Found: 464.2230.

(*E*)-*N*-(5-(4-(tert-butyl)phenyl)-4-methyl-1-phenylpent-1-en-3-yl)-4-methylbenzeneesulfon-amide (3q)



White solid, 95% yield. *dr* = 1:1. Mp: 150-152 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.71 (dd, *J* = 19.8, 8.0 Hz, 2H), 7.33–6.95 (m, 11H), 6.11 (d, *J* = 15.8 Hz, 1H), 5.76 (dd, *J* = 15.8, 8.0 Hz, 1H), 5.05 (d, *J* = 8.2 Hz, 0.8H), 4.97 (d, *J* = 8.6 Hz, 0.2H), 3.95 (td, *J* = 8.1, 4.4 Hz, 0.2H), 3.85 (td, *J* = 8.0, 5.0 Hz, 0.8H), 2.83–2.71 (m, 1H), 2.39–2.20 (m, 4H), 2.01 (h, *J* = 6.2 Hz, 1H), 1.31 (s, 9H), 0.86 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, CDCl3) δ 148.8, 143.2, 137.9, 137.1, 136.8, 136.3, 132.8, 132.2, 129.5, 128.8, 128.7, 128.4, 127.7, 127.3, 126.3, 126.3, 125.9, 125.2, 60.5, 60.3, 40.4, 40.1, 38.8, 38.6, 34.4, 31.4, 21.4, 15.2. HRMS (ESI) Calcd for $[C_{29}H_{34}NO_2S, M-H]^-$. 460.2311, Found: 460.2313.

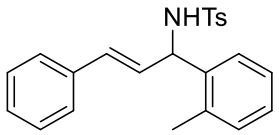
(*E*)-*N*-(1,3-diphenylallyl)-4-methylbenzenesulfonamide (3r)[5]



White solid, 76% yield. Mp: 129-131 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.65 (d, *J* = 7.9 Hz, 2H), 7.34–6.98 (m, 12H), 6.35 (d, *J* = 15.9 Hz, 1H), 6.07 (dd, *J* = 15.8, 6.7 Hz, 1H), 5.11 (t, *J* = 6.8 Hz, 1H), 5.00 (d, *J* = 7.0 Hz, 1H), 2.32 (s, 3H). ^{13}C

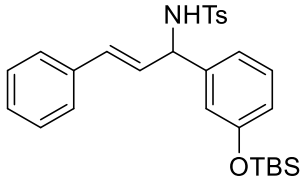
NMR (101 MHz, $CDCl_3$) δ 143.4, 139.8, 137.9, 136.2, 132.3, 129.6, 128.9, 128.6, 128.3, 128.0, 128.0, 127.5, 127.2, 126.7, 59.9, 21.6.

(*E*)-4-methyl-*N*-(3-phenyl-1-(o-tolyl)allyl)benzenesulfonamide (3s)[5]



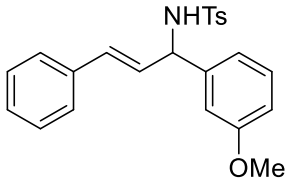
White solid, 62% yield. Mp: 137-139 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.62 (d, *J* = 8.2 Hz, 2H), 7.24–7.00 (m, 12H), 6.24 (d, *J* = 15.9 Hz, 1H), 6.07 (dd, *J* = 15.9, 6.3 Hz, 1H), 5.45 (d, *J* = 7.1 Hz, 1H), 5.35 (d, *J* = 6.7 Hz, 1H), 2.28 (s, 3H), 2.27 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.2, 137.9, 137.7, 136.2, 135.5, 131.8, 130.7, 129.4, 128.5, 128.1, 127.9, 127.7, 127.3, 126.9, 126.6, 126.4, 56.4, 21.5, 19.3.

(*E*)-*N*-(1-(3-((tert-butyldimethylsilyl)oxy)phenyl)-3-phenylallyl)-4-methylbenzenesulfonamide (3t)



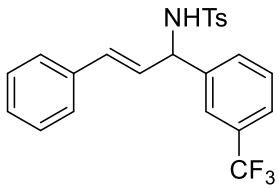
Colorless viscous oil, 69% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.66 (d, *J* = 8.3 Hz, 2H), 7.28–7.03 (m, 8H), 6.78 (d, *J* = 7.7 Hz, 1H), 6.71–6.62 (m, 3H), 6.33 (d, *J* = 15.8 Hz, 1H), 6.06 (dd, *J* = 15.8, 6.7 Hz, 1H), 5.26 (d, *J* = 7.4 Hz, 1H), 5.04 (t, *J* = 7.0 Hz, 1H), 2.30 (s, 3H), 0.95 (s, 9H), 0.14 (s, 6H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 155.9, 143.2, 141.2, 136.1, 132.0, 129.7, 129.4, 128.4, 128.3, 127.8, 127.3, 126.5, 119.9, 119.4, 118.8, 59.6, 25.7, 21.5, 18.2, -4.4. HRMS (ESI) Calcd for $[C_{28}H_{34}NO_3SSi, M-H]^-$: 492.2029, Found: 492.2030

(*E*)-*N*-(1-(3-methoxyphenyl)-3-phenylallyl)-4-methylbenzenesulfonamide (3u)



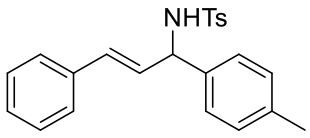
Off-white solid, 62% yield. Mp: 102–103 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.65 (d, *J* = 7.6 Hz, 2H), 7.28–7.08 (m, 8H), 6.82–6.67 (m, 3H), 6.34 (d, *J* = 15.8 Hz, 1H), 6.06 (dd, *J* = 15.8, 6.5 Hz, 1H), 5.33 (d, *J* = 7.4 Hz, 1H), 5.07 (t, *J* = 7.0 Hz, 1H), 3.70 (s, 3H), 2.30 (s, 3H). ^{13}C NMR (101 MHz, CDCl3) δ 159.8, 143.3, 141.2, 137.7, 136.1, 132.1, 129.8, 129.4, 128.5, 128.0, 127.9, 127.3, 126.5, 119.3, 113.5, 112.5, 59.7, 55.2, 21.4. HRMS (ESI) Calcd for $[C_{23}H_{22}NO_3S, M-H]^-$: 392.1321, Found: 392.1323.

(*E*)-4-methyl-*N*-(3-phenyl-1-(3-(trifluoromethyl)phenyl)allyl)benzenesulfonamide (3v)



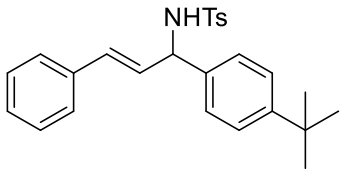
Yellow solid , 65% yield. Mp: 120–121 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.65 (d, *J* = 8.1 Hz, 2H), 7.31–7.10 (m, 8H), 6.82–6.72 (m, 2H), 6.70 (s, 1H), 6.36 (d, *J* = 15.8 Hz, 1H), 6.06 (dd, *J* = 15.8, 6.2 Hz, 1H), 5.15–5.04 (m, 2H), 3.71 (s, 3H), 2.32 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.6, 140.6, 137.3, 135.6, 133.0, 130.6, 129.5, 129.2, 128.5, 128.2, 127.2, 127.1, 126.6, 123.8, 59.4, 21.4. HRMS (ESI) Calcd for $[C_{23}H_{19}F_3NO_2S, M-H]^-$: 430.1089, Found: 430.1092.

(*E*)-4-methyl-*N*-(3-phenyl-1-(p-tolyl)allyl)benzenesulfonamide (3w)[5]



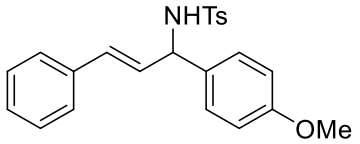
White solid, 66% yield. Mp: 135-136 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.65 (d, *J* = 8.0 Hz, 2H), 7.28–7.20 (m, 3H), 7.14 (dd, *J* = 11.7, 8.1 Hz, 4H), 7.06 (q, *J* = 8.1 Hz, 4H), 6.33 (d, *J* = 15.8 Hz, 1H), 6.06 (dd, *J* = 15.8, 6.6 Hz, 1H), 5.13 (d, *J* = 7.1 Hz, 1H), 5.06 (t, *J* = 6.9 Hz, 1H), 2.31 (s, 3H), 2.29 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.3, 137.9, 137.7, 136.8, 136.3, 132.0, 129.5, 129.5, 128.5, 128.5, 127.9, 127.5, 127.1, 126.6, 59.7, 21.5, 21.2.

(*E*)-*N*-(1-(4-(tert-butyl)phenyl)-3-phenylallyl)-4-methylbenzenesulfonamide (3x)[4]



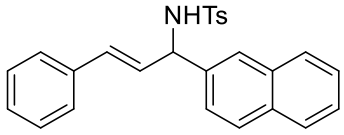
White solid, 72% yield. Mp: 143-145 °C. ^{1}H NMR (400 MHz, Chloroform-*d*)) δ 7.63 (d, *J* = 7.1 Hz, 2H), 7.26–7.00 (m, 11H), 6.35 (d, *J* = 15.7 Hz, 1H), 6.08 (dd, *J* = 15.4, 6.0 Hz, 1H), 5.35 (d, *J* = 6.4 Hz, 1H), 5.17–5.00 (m, 1H), 2.28 (s, 3H), 1.26 (s, 9H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 150.9, 143.1, 138.0, 136.7, 136.3, 131.9, 129.4, 128.5, 128.5, 127.9, 127.4, 126.9, 126.6, 125.6, 59.7, 34.6, 31.4, 21.5.

(*E*)-*N*-(1-(4-methoxyphenyl)-3-phenylallyl)-4-methylbenzenesulfonamide (3y)[4]



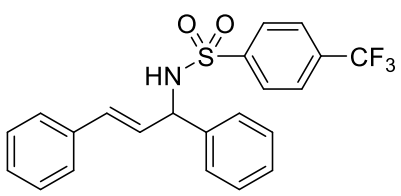
White solid, 44% yield. Mp: 134-136 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.64 (d, *J* = 8.3 Hz, 2H), 7.27–7.18 (m, 3H), 7.17–7.07 (m, 6H), 6.74 (d, *J* = 8.7 Hz, 2H), 6.31 (d, *J* = 15.8 Hz, 1H), 6.05 (dd, *J* = 15.8, 6.7 Hz, 1H), 5.34 (d, *J* = 7.4 Hz, 1H), 5.05 (t, *J* = 7.0 Hz, 1H), 3.73 (s, 3H), 2.29 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 159.2, 143.2, 137.9, 136.2, 131.9, 131.8, 129.5, 128.5, 128.5, 128.4, 127.9, 127.4, 126.6, 114.1, 59.3, 55.3, 21.5.

(*E*)-4-methyl-*N*-(1-(naphthalen-2-yl)-3-phenylallyl)benzenesulfonamide (3z)[5]



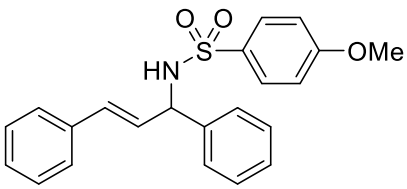
White solid, 36% yield. Mp: 164-166 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.73–7.49 (m, 6H), 7.55 (d, *J* = 8.3 Hz, 2H), 7.25–7.11 (m, 6H), 6.95 (d, *J* = 8.3 Hz, 2H), 6.33 (d, *J* = 16.0 Hz, 1H), 6.14 (dd, *J* = 16.0, 6.7 Hz, 1H), 5.22 (d, *J* = 7.3 Hz, 1H), 5.05 (t, *J* = 7.0 Hz, 1H), 2.15 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.4, 137.7, 136.7, 136.1, 133.0, 132.9, 132.5, 129.4, 128.6, 128.5, 128.1, 128.1, 128.0, 127.6, 127.3, 126.6, 126.3, 126.2, 126.1, 124.9, 59.9, 21.3.

(*E*)-*N*-(1,3-diphenylallyl)-4-trifluoromethylbenzenesulfonamide (3aa)[4]



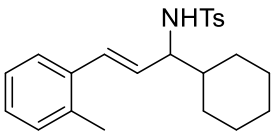
White solid, 46% yield. Mp: 128-129 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.80 (d, *J* = 8.2 Hz, 2H), 7.45 (d, *J* = 8.3 Hz, 2H), 7.23–7.05 (m, 10H), 6.33 (d, *J* = 15.8 Hz, 1H), 6.05 (dd, *J* = 15.8, 6.9 Hz, 1H), 5.98 (d, *J* = 7.8 Hz, 1H), 5.18 (t, *J* = 7.2 Hz, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 144.3, 138.9, 135.7, 133.9 (q, *J* = 33.0 Hz), 132.6, 128.8, 128.6, 128.2, 128.1, 127.7, 127.7, 127.1, 126.5, 125.9 (q, *J* = 3.5 Hz), 123.2 (q, *J* = 272.9 Hz), 60.2.

(*E*)-*N*-(1,3-diphenylallyl)-4-methoxybenzenesulfonamide (3ab)[5]



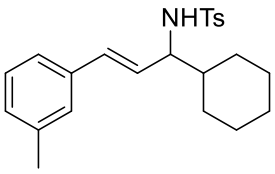
Semi-solid, 69% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.68 (d, *J* = 8.9 Hz, 2H), 7.30–7.13 (m, 10H), 6.77 (d, *J* = 8.9 Hz, 2H), 6.33 (d, *J* = 15.9 Hz, 1H), 6.07 (dd, *J* = 15.9, 6.9 Hz, 1H), 5.46 (d, *J* = 7.6 Hz, 1H), 5.08 (t, *J* = 7.1 Hz, 1H). 3.74 (s, 3H) ^{13}C NMR (100 MHz, $CDCl_3$) δ 163.0, 139.8, 136.4, 133.0, 132.9, 129.5, 128.9, 128.8, 128.5, 128.0, 127.9, 127.3, 126.5, 113.5, 60.0, 55.6.

(*E*)-*N*-(1-cyclohexyl-3-(*o*-tolyl)allyl)-4-methylbenzenesulfonamide (4a)



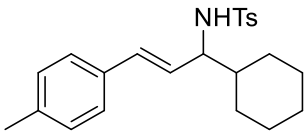
White solid, 74% yield (80% NMR yield). Mp: 169–172 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 7.9 Hz, 2H), 7.15 (d, *J* = 8.0 Hz, 2H), 7.15–6.95 (m, 4H), 6.30 (d, *J* = 15.7 Hz, 1H), 5.60 (dd, *J* = 15.7, 8.1 Hz, 1H), 5.25–5.13 (m, 1H), 3.74 (q, *J* = 7.7 Hz, 1H), 2.26 (s, 3H), 2.15 (s, 3H), 1.83 (d, *J* = 12.9 Hz, 1H), 1.75–1.55 (m, 4H), 1.52–1.41 (m, 1H), 1.25–0.93 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.1, 138.3, 135.5, 135.2, 130.1, 129.8, 129.4, 128.8, 127.4, 127.2, 125.8, 125.6, 61.6, 43.0, 29.1, 29.0, 26.3, 26.0, 26.0, 21.4, 19.6. HRMS (ESI) Calcd for $[C_{23}H_{29}NNaO_2S, M+Na]^+$: 406.1817, Found: 406.1818.

(*E*)-*N*-(1-cyclohexyl-3-(*m*-tolyl)allyl)-4-methylbenzenesulfonamide (4b)



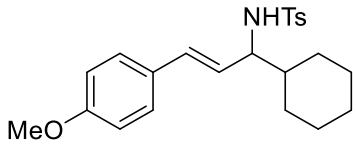
White solid, 82% yield (94% NMR yield). Mp: 145–147 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 7.9 Hz, 2H), 7.13 (dd, *J* = 12.7, 7.7 Hz, 3H), 7.00 (d, *J* = 7.5 Hz, 1H), 6.86 (d, *J* = 7.4 Hz, 2H), 6.00 (d, *J* = 15.9 Hz, 1H), 5.69 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.29 (d, *J* = 8.6 Hz, 1H), 3.70 (q, *J* = 7.8 Hz, 1H), 2.30 (s, 3H), 2.26 (s, 3H), 1.84 (d, *J* = 12.8 Hz, 1H), 1.78–1.57 (m, 4H), 1.52–1.39 (m, 1H), 1.24–0.91 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.2, 137.8, 136.4, 132.1, 129.4, 128.3, 128.2, 127.3, 127.1, 126.9, 123.5, 61.6, 42.9, 29.1, 29.1, 26.3, 26.0, 26.0, 21.4. HRMS (ESI) Calcd for $[C_{23}H_{29}NNaO_2S, M+Na]^+$: 406.1817, Found: 406.1816.

(*E*)-*N*-(1-cyclohexyl-3-(*p*-tolyl)allyl)-4-methylbenzenesulfonamide (4c)



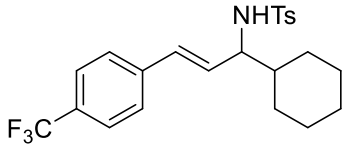
White solid, 76% yield (92% NMR yield). Mp: 130–131 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 8.0 Hz, 2H), 7.13 (d, *J* = 7.9 Hz, 2H), 7.04 (d, *J* = 7.8 Hz, 2H), 6.95 (d, *J* = 7.9 Hz, 2H), 5.99 (d, *J* = 15.8 Hz, 1H), 5.65 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.22 (d, *J* = 8.6 Hz, 1H), 3.69 (q, *J* = 7.8 Hz, 1H), 2.31 (s, 3H), 2.25 (s, 3H), 1.83 (d, *J* = 12.7 Hz, 1H), 1.76–1.56 (m, 4H), 1.51–1.38 (m, 1H), 1.27–0.91 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.2, 137.3, 133.6, 131.9, 129.4, 129.0, 127.3, 126.2, 126.2, 61.6, 42.9, 29.1, 29.0, 26.2, 26.0, 26.0, 21.4, 21.2. HRMS (ESI) Calcd for $[C_{23}H_{29}NNaO_2S, M+Na]^+$: 406.1817, Found: 406.1815.

(*E*)-*N*-(1-cyclohexyl-3-(4-methoxyphenyl)allyl)-4-methylbenzenesulfonamide (4d)



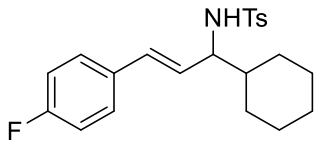
Colorless solid, 90% yield. Mp: 50–51 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.2 Hz, 2H), 7.13 (d, *J* = 8.0 Hz, 2H), 7.04–6.93 (m, 2H), 6.83–6.73 (m, 2H), 5.96 (d, *J* = 15.8 Hz, 1H), 5.55 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.12 (d, *J* = 8.5 Hz, 1H), 3.78 (s, 3H), 3.67 (td, *J* = 8.2, 6.1 Hz, 1H), 2.26 (s, 3H), 1.81 (d, *J* = 12.9 Hz, 1H), 1.73–1.58 (m, 4H), 1.50 – 1.37 (m, 1H), 1.20–0.92 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 159.1, 142.9, 138.3, 131.4, 129.3, 129.2, 127.4, 127.3, 125.1, 113.7, 61.6, 55.3, 42.9, 29.1, 29.0, 26.3, 26.0, 21.4. HRMS (ESI) Calcd for $[C_{23}H_{29}NNaO_3S, M+Na]^+$: 422.1766, Found: 422.1765.

(*E*)-*N*-(1-cyclohexyl-3-(4-(trifluoromethyl)phenyl)allyl)-4-methylbenzenesulfonamide (4e)



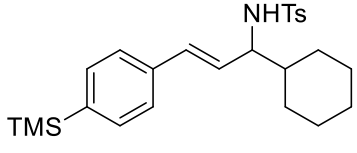
Colorless solid, 90% yield. Mp: 120–121 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.78–7.69 (m, 2H), 7.47 (d, *J* = 8.1 Hz, 2H), 7.14 (t, *J* = 7.9 Hz, 4H), 6.10 (d, *J* = 15.9 Hz, 1H), 5.81 (dd, *J* = 15.9, 8.0 Hz, 1H), 5.20 (d, *J* = 8.5 Hz, 1H), 3.73 (td, *J* = 8.2, 6.2 Hz, 1H), 2.23 (s, 3H), 1.81 (d, *J* = 13.0 Hz, 1H), 1.74–1.58 (m, 4H), 1.52–1.40 (m, 1H), 1.21 – 0.92 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.2, 138.1, 130.6, 130.2, 129.4, 127.3, 126.4, 125.3, 125.2, 61.3, 42.7, 29.1, 29.0, 26.2, 25.9, 21.3. HRMS (ESI) Calcd for $[C_{23}H_{26}F_3NNaO_2S, M+Na]^+$: 460.1534, Found: 460.1530.

(*E*)-*N*-(1-cyclohexyl-3-(4-fluorophenyl)allyl)-4-methylbenzenesulfonamide (4f)



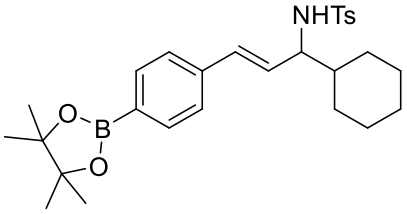
White powder, 80% yield (93% NMR yield). Mp: 161–162 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75–7.70 (m, 2H), 7.13 (d, *J* = 8.1 Hz, 2H), 7.04–6.98 (m, 2H), 6.90 (t, *J* = 8.7 Hz, 2H), 5.99 (d, *J* = 15.8 Hz, 1H), 5.61 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.27 (d, *J* = 8.6 Hz, 1H), 3.67 (td, *J* = 8.3, 6.2 Hz, 1H), 2.24 (s, 3H), 1.81 (d, *J* = 12.6 Hz, 1H), 1.74–1.56 (m, 4H), 1.49–1.37 (m, 1H), 1.21–0.90 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 163.4, 160.9, 143.0, 138.2, 132.6, 132.5, 130.7, 129.4, 127.8, 127.7, 127.3, 127.1, 127.1, 61.5, 42.8, 29.1, 29.0, 26.2, 25.9, 21.3. HRMS (ESI) Calcd for $[C_{22}H_{26}FNNaO_2S, M+Na]^+$: 410.1566, Found: 410.1570.

(*E*)-*N*-(1-cyclohexyl-3-(4-(trimethylsilyl)phenyl)allyl)-4-methylbenzenesulfonamide (4g)



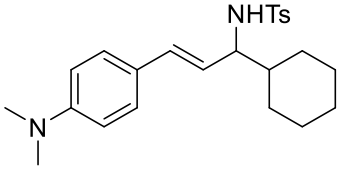
Colorless solid, 88% yield. Mp: 101–102 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.80–7.69 (m, 2H), 7.45–7.34 (m, 2H), 7.14 (d, *J* = 8.1 Hz, 2H), 7.09–7.01 (m, 2H), 6.03 (d, *J* = 15.8 Hz, 1H), 5.73 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.19 (d, *J* = 8.5 Hz, 1H), 3.71 (td, *J* = 8.3, 6.2 Hz, 1H), 2.23 (s, 3H), 1.83 (d, *J* = 13.0 Hz, 1H), 1.74–1.59 (m, 4H), 1.52–1.40 (m 1H), 1.19–0.92 (m, 5H), 0.26 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 144.2, 140.9, 139.3, 137.9, 134.5, 133.1, 130.6, 128.7, 128.4, 126.7, 62.6, 44.0, 30.2, 30.1, 27.4, 27.1, 27.1, 22.4, 0.0. HRMS (ESI) Calcd for $[C_{25}H_{35}NNaO_2SSi, M+Na]^+$: 464.2055, Found: 464.2053.

(*E*)-*N*-(1-cyclohexyl-3-(4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)allyl)-4-methylbenzenesulfonamide (4h)



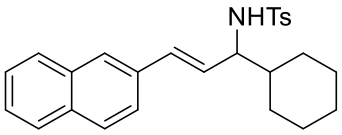
Colorless solid, 94% yield. Mp: 176–177 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.68 (dd, *J* = 16.5, 8.0 Hz, 4H), 7.12 (d, *J* = 8.0 Hz, 2H), 7.04 (d, *J* = 7.8 Hz, 2H), 6.01 (d, *J* = 15.8 Hz, 1H), 5.75 (dd, *J* = 15.9, 8.1 Hz, 1H), 5.07 (dd, *J* = 11.5, 8.4 Hz, 1H), 3.71 (td, *J* = 8.2, 6.1 Hz, 1H), 2.24 (s, 3H), 1.82 (d, *J* = 12.8 Hz, 1H), 1.77–1.57 (m, 4H), 1.52–1.37 (m, 1H), 1.34 (s, 12H), 1.21–0.93 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.1, 139.0, 138.1, 134.8, 132.0, 129.4, 128.4, 127.3, 125.5, 83.8, 61.4, 42.9, 29.1, 29.0, 26.2, 26.0, 24.8, 21.4. HRMS (ESI) Calcd for $[C_{28}H_{38}BNNaO_4S, M+Na]^+$: 518.2512, Found: 518.2513.

(*E*)-*N*-(1-cyclohexyl-3-(4-(dimethylamino)phenyl)allyl)-4-methylbenzenesulfonamide (4i)



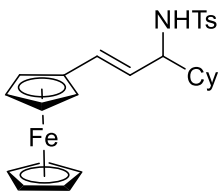
Orange solid, 93% yield. Mp: 146–147 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 8.1 Hz, 2H), 7.15 (d, *J* = 7.9 Hz, 2H), 7.00–6.88 (m, 2H), 6.64–6.54 (m, 2H), 5.91 (d, *J* = 15.8 Hz, 1H), 5.47 (dd, *J* = 15.8, 8.2 Hz, 1H), 4.76 (dd, *J* = 8.3, 5.9 Hz, 1H), 3.66 (td, *J* = 8.2, 6.0 Hz, 1H), 2.93 (s, 6H), 2.28 (s, 3H), 1.80 (d, *J* = 12.9 Hz, 1H), 1.74–1.58 (m, 4H), 1.48–1.37 (m, 1H), 1.21–0.91 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 150.0, 142.9, 138.2, 132.0, 129.4, 127.3, 127.2, 124.9, 122.7, 112.2, 61.7, 43.1, 40.5, 29.2, 28.9, 26.3, 26.0, 26.0, 21.4. HRMS (ESI) Calcd for $[C_{24}H_{32}N_2NaO_2S, M+Na]^+$: 435.2082, Found: 435.2080.

(*E*)-*N*-(1-cyclohexyl-3-(naphthalen-2-yl)allyl)-4-methylbenzenesulfonamide (4j)



White crystal, 98% yield. Mp: 98–99 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.81–7.62 (m, 5H), 7.42 (ddd, *J* = 11.9, 4.7, 1.8 Hz, 3H), 7.23 (dd, *J* = 8.5, 1.8 Hz, 1H), 7.09 (d, *J* = 8.0 Hz, 2H), 6.17 (d, *J* = 15.8 Hz, 1H), 5.80 (dd, *J* = 15.8, 8.2 Hz, 1H), 5.22 (d, *J* = 8.5 Hz, 1H), 3.76 (q, *J* = 7.8 Hz, 1H), 2.12 (s, 3H), 1.86 (d, *J* = 12.7 Hz, 1H), 1.78–1.56 (m, 4H), 1.53–1.43 (m, 1H), 1.24–0.94 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.3, 133.9, 133.4, 132.9, 132.1, 129.4, 127.8, 127.8, 127.6, 127.3, 126.2, 126.2, 125.8, 123.5, 61.6, 42.9, 29.1, 26.3, 26.0, 21.3. HRMS (ESI) Calcd for $[C_{26}H_{29}NNaO_2S, M+Na]^+$: 442.1817, Found: 442.1815.

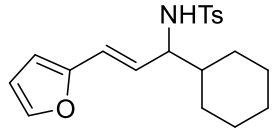
(*E*)-*N*-(1-cyclohexyl-3-(ferrocenyl)allyl)-4-methylbenzenesulfonamide (4k)



Orange solid, 95% yield. Mp: 116–117 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 8.0 Hz, 2H), 7.23 (d, *J* = 8.0 Hz, 2H), 5.87 (d, *J* = 15.7 Hz, 1H), 5.40 (dd, *J* = 15.7, 7.8 Hz, 1H), 4.87 (d, *J* = 8.2 Hz, 1H), 4.14 (s, 3H), 4.10 (s, 1H), 4.00 (s, 5H), 3.59 (q, *J* = 7.5 Hz, 1H), 2.35 (s, 3H), 1.81–1.57 (m, 5H), 1.46–1.35 (m, 1H), 1.24–0.90 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.3, 129.5, 129.5, 127.2, 124.5, 82.2, 69.0, 68.6, 68.6, 67.1, 66.1, 61.3, 42.9, 29.1, 28.9, 26.3, 26.0, 26.0, 21.5.

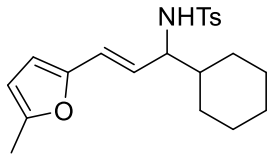
HRMS (ESI) Calcd for $[C_{26}H_{31}FeNNaO_2S, M+Na]^+$: 500.1323, Found: 500.1320.

(*E*)-*N*-(1-cyclohexyl-3-(furan-2-yl)allyl)-4-methylbenzenesulfonamide (4l)



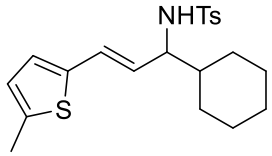
Viscous liquid, 60% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 8.3 Hz, 2H), 7.26 (d, *J* = 5.2 Hz, 1H), 7.18 (d, *J* = 8.1 Hz, 2H), 6.31 (dd, *J* = 3.2, 1.8 Hz, 1H), 6.03 (d, *J* = 3.2 Hz, 1H), 5.91 (d, *J* = 15.8 Hz, 1H), 5.69 (dd, *J* = 15.8, 7.8 Hz, 1H), 4.70 (d, *J* = 8.4 Hz, 1H), 3.67 (q, *J* = 7.9 Hz, 1H), 2.32 (s, 3H), 1.79–1.56 (m, 5H), 1.49–1.37 (m, 1H), 1.23–0.84 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 151.8, 143.1, 141.8, 138.0, 129.4, 127.3, 125.9, 120.3, 111.2, 107.9, 61.0, 42.9, 28.9, 28.9, 26.2, 25.9, 25.9, 21.4. HRMS (ESI) Calcd for $[C_{20}H_{25}NNaO_3S, M+Na]^+$: 382.1453, Found: 382.1450.

(*E*)-*N*-(1-cyclohexyl-3-(5-methylfuran-2-yl)allyl)-4-methylbenzenesulfonamide (4m)



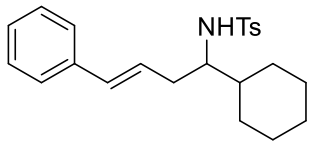
White solid, 90% yield. Mp: 141–142 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.0 Hz, 2H), 7.16 (d, *J* = 7.9 Hz, 2H), 5.88 (q, *J* = 3.5 Hz, 2H), 5.80 (d, *J* = 15.7 Hz, 1H), 5.59 (dd, *J* = 15.8, 8.0 Hz, 1H), 5.13 (d, *J* = 8.5 Hz, 1H), 3.63 (q, *J* = 7.7 Hz, 1H), 2.31 (s, 3H), 2.22 (s, 3H), 1.81–1.73 (m, 1H), 1.72–1.54 (m, 4H), 1.42 (tdt, *J* = 12.0, 6.5, 3.2 Hz, 1H), 1.19–0.90 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 146.4, 145.1, 137.6, 132.9, 124.0, 122.0, 118.9, 115.1, 103.8, 101.9, 56.0, 37.6, 23.7, 23.6, 20.9, 20.7, 20.7, 16.0, 8.3. HRMS (ESI) Calcd for $[C_{21}H_{27}NNaO_3S, M+Na]^+$: 396.1609, Found: 396.1610.

(*E*)-*N*-(1-cyclohexyl-3-(5-methylthiophen-2-yl)allyl)-4-methylbenzenesulfonamide (4n)



Yellow powder, 45% yield. Mp: 107–108 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.3 Hz, 2H), 7.21 (d, *J* = 8.0 Hz, 2H), 6.60–6.49 (m, 2H), 6.10 (d, *J* = 15.6 Hz, 1H), 5.41 (dd, *J* = 15.6, 8.0 Hz, 1H), 4.65 (d, *J* = 8.4 Hz, 1H), 3.67 (td, *J* = 8.1, 6.1 Hz, 1H), 2.44 (s, 3H), 2.34 (s, 3H), 1.84–1.59 (m, 5H), 1.43 (s, 1H), 1.26–0.90 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.1, 139.3, 139.0, 138.1, 129.4, 127.3, 125.9, 125.6, 125.5, 125.3, 61.2, 42.9, 29.0, 29.0, 26.2, 25.9, 21.4, 15.5. HRMS (ESI) Calcd for $[C_{21}H_{27}NNaO_2S_2, M+Na]^+$: 412.1381, Found: 412.1380.

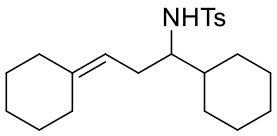
(*E*)-*N*-(1-cyclohexyl-4-phenylbut-3-en-1-yl)-4-methylbenzenesulfonamide (4o)



White solid, 83% yield. Mp: 152–153 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.71 (d, *J* = 8.2 Hz, 2H), 7.30–7.24 (m, 2H), 7.21 (d, *J* = 7.1 Hz, 1H), 7.19–7.13 (m, 4H), 6.22 (d, *J* = 15.8 Hz, 1H), 5.76 (dt, *J* = 15.3, 7.4 Hz, 1H), 4.62 (d, *J* = 8.4 Hz, 1H), 3.17 (p, *J* = 6.2, 5.6 Hz, 1H), 2.35 (s, 3H), 2.22 (qt, *J* = 14.4, 6.6 Hz, 2H), 1.78–1.67 (m, 3H), 1.67–1.60 (m, 2H), 1.54–1.43 (m, 1H), 1.24–0.85 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.2, 137.0, 133.3, 129.5, 128.4, 127.3, 127.0, 126.1,

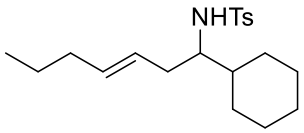
125.5, 58.6, 41.4, 35.2, 28.9, 28.7, 26.3, 26.1, 21.5. HRMS (ESI) Calcd for $[C_{23}H_{28}NO_2S, M-H]^-$: 382.1841, Found: 382.1843.

_N_-(1-cyclohexyl-3-cyclohexylidenepropyl)-4-methylbenzenesulfonamide (4p)



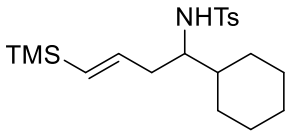
White solid, 38% yield. Mp: 108–109 °C. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.74 (d, *J* = 8.2 Hz, 2H), 7.28 (d, *J* = 8.0 Hz, 2H), 4.72 (t, *J* = 7.3 Hz, 1H), 4.44 (d, *J* = 8.4 Hz, 1H), 3.01 (dt, *J* = 12.0, 6.0 Hz, 1H), 2.42 (s, 3H), 2.10–1.85 (m, 6H), 1.78–1.33 (m, 12H), 1.23–0.80 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.1, 142.9, 138.3, 129.5, 127.1, 115.8, 58.9, 40.6, 37.2, 29.2, 29.0, 28.7, 28.5, 28.4, 27.8, 26.7, 26.4, 26.2, 21.5. HRMS (ESI) Calcd for $[C_{22}H_{34}NO_2S, M+H]^+$: 376.2310, Found: 376.2306.

(*E*)-*N*-(1-cyclohexylhept-3-en-1-yl)-4-methylbenzenesulfonamide (4q)



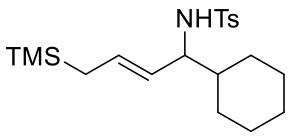
Colorless oil, 36% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.73 (d, *J* = 8.1 Hz, 2H), 7.29 (d, *J* = 8.0 Hz, 2H), 5.28 (dt, *J* = 14.0, 6.7 Hz, 1H), 5.00 (dt, *J* = 14.8, 7.2 Hz, 1H), 4.39 (d, *J* = 8.3 Hz, 1H), 3.12–2.99 (m, 1H), 2.42 (s, 3H), 1.98 (q, *J* = 6.4 Hz, 2H), 1.84 (q, *J* = 7.2 Hz, 2H), 1.75–1.65 (m, 3H), 1.65–1.55 (m, 2H), 1.45–1.35 (m, 1H), 1.29 (q, *J* = 7.0 Hz, 2H), 1.17–1.05 (m, 3H), 1.02–0.90 (m, 2H), 0.86 (t, *J* = 7.3 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 143.0, 138.4, 134.7, 129.4, 127.1, 124.9, 58.4, 40.8, 34.6, 34.5, 29.0, 28.7, 26.3, 26.2, 22.5, 21.5, 13.6. HRMS (ESI) Calcd for $[C_{20}H_{32}NO_2S, M+H]^+$: 350.2154, Found: 350.2151.

(*E*)-*N*-(1-cyclohexyl-4-(trimethylsilyl)but-3-en-1-yl)-4-methylbenzenesulfonamide (4r-H)



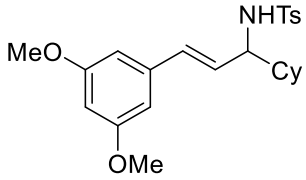
Colorless liquid, 15% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.83 (d, *J* = 8.2 Hz, 2H), 7.39 (d, *J* = 8.1 Hz, 2H), 5.77 (dt, *J* = 18.4, 6.5 Hz, 1H), 5.65 (d, *J* = 18.5 Hz, 1H), 4.43 (d, *J* = 8.2 Hz, 1H), 3.21 (dt, *J* = 12.1, 6.0 Hz, 1H), 2.52 (s, 3H), 2.22 (t, *J* = 6.3 Hz, 2H), 1.84–1.64 (m, 5H), 1.58–1.46 (m, 1H), 1.22 (dq, *J* = 21.6, 12.5 Hz, 3H), 1.11–0.90 (m, 2H), 0.09 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 144.4, 142.8, 139.6, 136.5, 130.9, 128.4, 59.3, 42.3, 40.2, 30.1, 30.0, 27.7, 27.5, 22.8, 0.0. HRMS (ESI) Calcd for $[C_{20}H_{33}NNaO_2SSi, M+Na]^+$: 402.1899, Found: 402.1898.

(*E*)-*N*-(1-cyclohexyl-4-(trimethylsilyl)but-3-en-1-yl)-4-methylbenzenesulfonamide (4r-A)



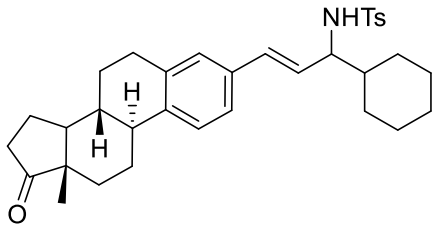
Colorless liquid, 42% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.71 (d, *J* = 8.2 Hz, 2H), 7.25 (d, *J* = 8.1 Hz, 2H), 5.19 (dt, *J* = 15.6, 8.1 Hz, 1H), 4.90 (dd, *J* = 15.2, 8.0 Hz, 1H), 4.64 (d, *J* = 8.1 Hz, 1H), 3.49 (q, *J* = 7.9 Hz, 1H), 2.40 (s, 3H), 1.76–1.57 (m, 5H), 1.39–1.29 (m, 1H), 1.26–0.82 (m, 7H), –0.10 (s, 9H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 144.8, 140.5, 131.8, 131.3, 129.2, 127.9, 63.4, 45.1, 31.1, 30.6, 28.3, 28.0, 28.0, 24.7, 23.5, 0.0. HRMS (ESI) Calcd for $[C_{20}H_{33}NNaO_2SSi, M+Na]^+$: 402.1899, Found: 402.1897.

(*E*)-*N*-(1-cyclohexyl-3-(3,5-dimethoxyphenyl)allyl)-4-methylbenzenesulfonamide (4s)



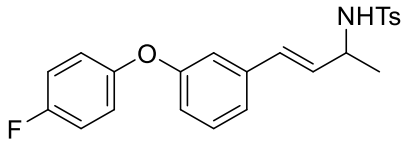
White solid. Mp: 137-138 ºC. 78% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.72 (d, *J* = 8.0 Hz, 2H), 7.15 (d, *J* = 7.9 Hz, 2H), 6.31 (s, 1H), 6.21 (s, 2H), 5.98 (d, *J* = 15.8 Hz, 1H), 5.68 (dd, *J* = 15.8, 8.1 Hz, 1H), 5.23 (d, *J* = 8.5 Hz, 1H), 3.75 (s, 7H), 2.27 (s, 3H), 1.80 (d, *J* = 7.3 Hz, 1H), 1.75 – 1.56 (m, 4H), 1.50 – 1.38 (m, 1H), 1.22 – 0.89 (m, 5H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 160.7, 143.1, 138.5, 138.3, 132.0, 129.4, 127.9, 127.3, 104.5, 99.7, 61.4, 55.3, 42.9, 29.1, 29.1, 26.2, 26.0, 21.3. HRMS (ESI) Calcd for $[C_{24}H_{31}NNaO_4S, M+Na]^+$: 452.1871, Found: 452.1870.

***N*-((*E*)-1-cyclohexyl-3-((8*R*,9*S*,13*S*)-13-methyl-17-oxo-7,8,9,11,12,13,14,15,16,17-decahydro-6H-cyclopenta[a]phenanthren-3-yl)allyl)-4-methylbenzenesulfonamide (4t)**



White foam. Mp: 134-135 ºC. 97% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.70 (d, *J* = 8.2 Hz, 2H), 7.20 – 7.09 (m, 3H), 6.84 (d, *J* = 8.1 Hz, 1H), 6.79 (s, 1H), 5.98 (d, *J* = 15.8 Hz, 1H), 5.66 (dd, *J* = 16.5, 8.6 Hz, 1H), 4.88 – 4.80 (m, 1H), 3.67 (q, *J* = 7.4 Hz, 1H), 2.91 – 2.76 (m, 2H), 2.49 (dd, *J* = 18.8, 8.6 Hz, 1H), 2.42 – 2.35 (m, 1H), 2.30 – 2.20 (m, 4H), 2.18 – 1.89 (m, 4H), 1.77 (d, *J* = 12.6 Hz, 1H), 1.72 – 1.35 (m, 12H), 1.22 – 0.90 (m, 5H), 0.88 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 220.8, 142.9, 139.3, 138.3, 136.4, 134.0, 131.7, 129.4, 127.3, 127.0, 126.8, 125.4, 123.9, 123.7, 100.0, 61.4, 50.5, 48.0, 44.4, 43.0, 38.2, 35.9, 31.6, 29.4, 29.1, 29.0, 26.5, 26.3, 26.0, 25.7, 21.6, 21.4, 13.8. HRMS (ESI) Calcd for $[C_{34}H_{43}NNaO_3S, M+Na]^+$: 568.2861, Found: 568.2860.

(*E*)-*N*-(4-(3-(4-fluorophenoxy)phenyl)but-3-en-2-yl)-4-methylbenzenesulfonamide (4u)

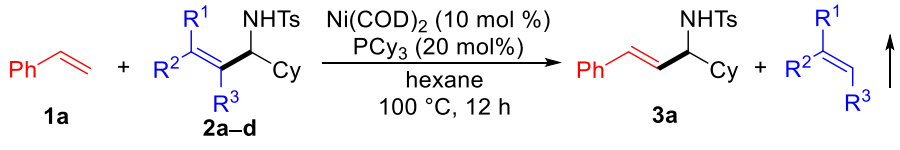


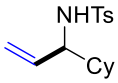
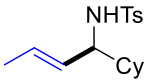
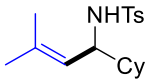
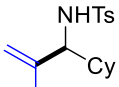
Colorless oil. 62% yield (72% yield for gram scale). ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.75 (d, *J* = 8.2 Hz, 2H), 7.27 – 7.16 (m, 3H), 7.02 (t, *J* = 8.6 Hz, 2H), 6.98 – 6.92 (m, 2H), 6.89 (d, *J* = 7.7 Hz, 1H), 6.82 – 6.74 (m, 2H), 6.25 (d, *J* = 15.9 Hz, 1H), 5.82 (dd, *J* = 15.9, 6.7 Hz, 1H), 5.03 (d, *J* = 7.6 Hz, 1H), 4.05 (q, *J* = 6.8 Hz, 1H), 2.34 (s, 3H), 1.23 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 160.0, 157.7, 157.6, 152.8, 143.3, 138.3, 138.0, 131.2, 129.8, 129.8, 129.6, 127.3, 121.5, 120.4, 120.3, 117.5, 116.5, 116.2, 116.2, 51.6, 21.8, 21.4. HRMS (ESI) Calcd for $[C_{23}H_{22}FNNaO_3S, M+Na]^+$: 434.1202, Found: 434.1200.

5. Mechanism study

5.1 Exclusion of alkene metathesis mechanism

Table S3 Alkenyl exchange of styrene with allylamines containing different vinyl groups



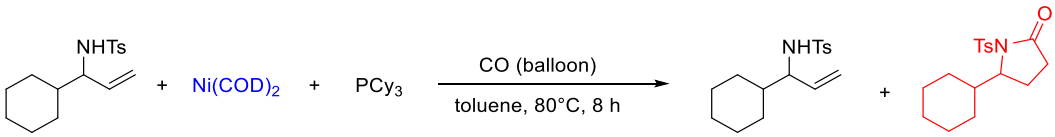
Allylamines **2**	 **2a**	 **2b**	 **2c**	 **2d***
Conversion and yield of **3a**	100% conv. 99% yield	89% conv. 86% yield	67% conv. 64% yield	20% conv. 18% yield

* 15 mol% of $TsNH_2$ was added

Reaction was conducted under condition A. Products were analyzed by NMR using diphenylmethane as internal standard. The allylamine substrates containing different vinyl group (**2a-d**) afforded the same product **3a**, which shows that the reaction proceeds via alkenyl exchange mechanism, instead of alkene metathesis mechanism.

5.2 Quenching experiment

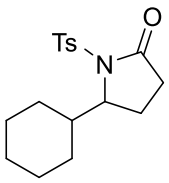
Scheme S3 Capture intermediate by CO



2a 0.45 mmol | $Ni(COD)_2$ 0.225 mmol | PCy_3 0.225 mmol | **2a** 0.30 mmol | **5 (68%)** 0.15 mmol

In an argon-filled glove-box, an oven-dried Schlenk tube was charged with a stir bar, catalyst precursor $Ni(COD)_2$ (61.8 mg, 0.225 mmol), ligand PCy_3 (69 mg, 0.225 mmol), and 2 mL toluene was added subsequently. The catalytic system was stirred 15 minutes until nickel precursor was completely dissolved. Then **2a** (0.45 mmol, 131.9 mg) was added to the solution and kept stirring at 80 °C for 0.5 h. The solution's color turned to bright red and no precipitate appeared. Then Argon balloon was replaced fast with a CO balloon. CO was allowed to diffuse slowly into the tube. The reaction mixture was hold still in the 80 °C oil bath for additional 7.5 hours. The color of the reaction mixture turned gradually from red to pale yellow and it was then quenched with diluted HCl and extracted with Et_2O (15 mL, 3 times). Combined organic phase was dried with Na_2SO_4. Then it was filtered and the solvent were removed under vacuum. The pure product **5** was obtained by column chromatography on silica gel (PE/EA = 10:1, v/v). The yield for **5** is 68% based on the amount of nickel catalyst.

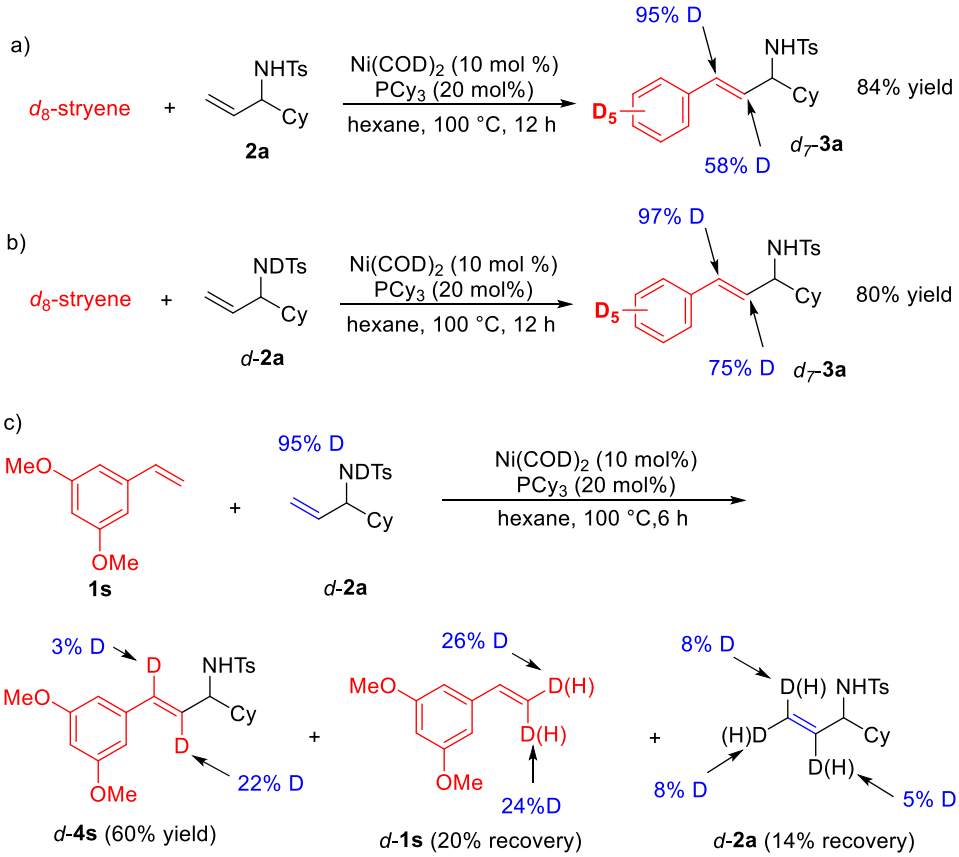
5-cyclohexyl-1-tosylpyrrolidin-2-one[6] **(5)**



White solid, 68% yield. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.96 (d, *J* = 8.3 Hz, 2H), 7.33 (d, *J* = 8.1 Hz, 2H), 4.34 (dd, *J* = 9.1, 2.6 Hz, 1H), 2.49 – 2.29 (m, 5H), 2.17 – 2.02 (m, 2H), 1.96 – 1.88 (m, 1H), 1.85 – 1.76 (m, 1H), 1.75 – 1.62 (m, 3H), 1.38 – 1.24 (m, 2H), 1.15 – 0.98 (m, 3H), 0.88 – 0.82 (m, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 173.99, 144.88, 135.97, 129.38, 128.38, 64.78, 41.62, 31.79, 29.52, 26.34, 26.15, 25.80, 25.74, 21.67, 19.77.

5.3 Deuterium-labeling experiment

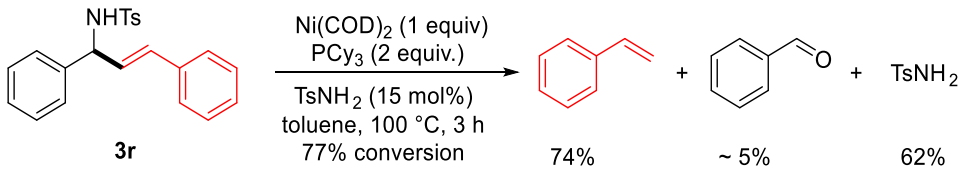
Scheme S4 The alkenyl exchange reactions with deuterium-labeled styrene, deuterium-labeled **2a**



The reactions in Scheme S4 were carried out under the standard conditions while substrates ratios are 1:1. Deuterium ratios were determined by NMR. Reaction was stopped ahead of standard time in order to track all separable deuterated substances.

5.4 Decomposition experiment

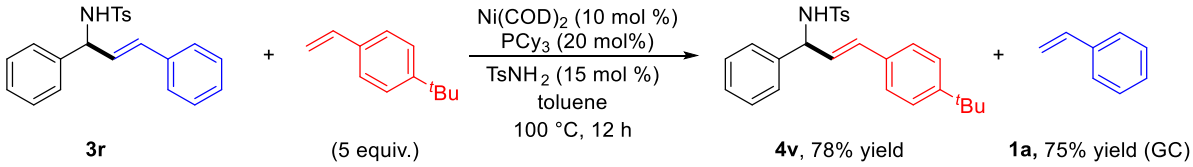
Scheme S5. Decomposition of **3r**



The decomposition of **3r** was carried out under the standard condition. After quenching reaction, styrene and benzaldehyde were detected by GC, $TsNH_2$ and remained **3r** were detected by NMR.

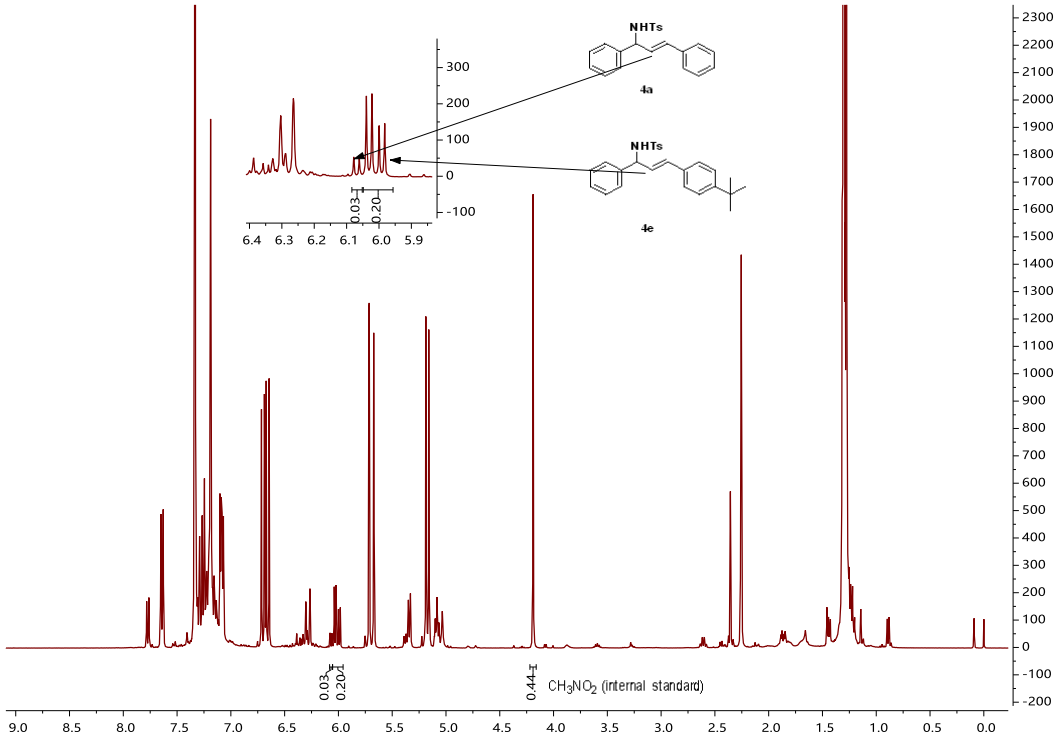
5.5 Reversible evidence

Scheme S6 Reaction **3r** and 4-^{t}Bu-styrene



Under our previous standard conditions, **3r** was used as starting material and reacted with 5 equiv. of 4-^{t}Bu-styrene (Scheme S6). After 12 hours, the reaction mixture was quenched and analyzed by GC and NMR using CH_3NO_2 as internal standard (Fig. S1). **4v** was obtained in 78% yield. There is no 1-phenyl-2-(4-^{t}Bu-phenyl)ethene was observed. This experiment shows a fully reversible mechanism of alkenyl exchange reaction, instead of a metathesis reaction.

Fig. S1. Crude NMR spectrum of scheme S6

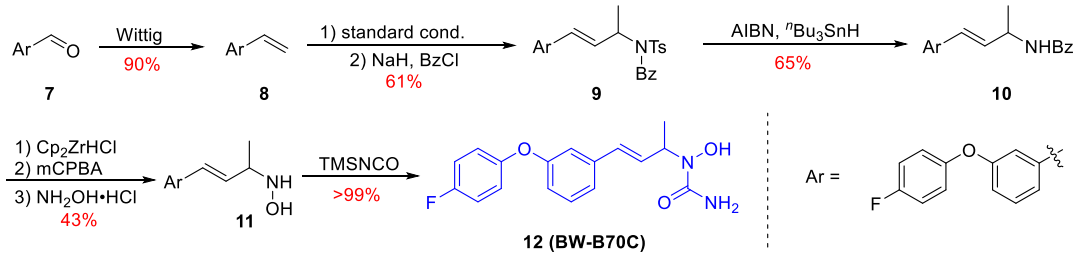


6. Synthesis of BW B70C

Gram scale experiment to acquire 4u

In an argon-filled glove-box, an oven-dried 120 mL sealed tube was charged with a stir bar, catalyst precursor $Ni(COD)_2$, ligand PCy_3. 20 mL hexane was injected into the tube and the mixture was stirred for 5 min at room temperature. 6 mmol of the corresponding alkene was added and the yellow solution turned red instantly. 8 mmol of liquid **2i** was added in one portion when all the catalyst precursors were dissolved. (Attention: liquid allylamine would deactivate solid $Ni(COD)_2$ instantly by direct contact.) The tube was sealed and heated at 100 °C for 16 h. After cooling to room temperature, the reaction mixture was diluted with ethyl acetate and quenched with 0.5 mL HCl (1 N). It was passed through a shot pad of silica gel and dried with Na_2SO_4. Crude product was obtained when solvent was removed under vacuum. Yield was determined by NMR using CH_2Br_2 as internal standard. It was used without further purification.

Scheme S7 Synthesis route of BW B70C



Aldehyde **7** was purchased from Alfa Aeser or prepared by the literature procedure.[7] Corresponding alkene **8** was synthesized by Wittig reaction following our previous protocal.[4]

(*E*)-*N*-(4-(3-(4-fluorophenoxy)phenyl)but-3-en-2-yl)benzamide (9)

The titled compound was synthesized from crude **4u** which was prepared in the gram scale experiment**.** An oven-dried 100 mL Schlenk bottle equipped with magnetic stir bar was charged with NaH (10 mmol, 2.4 g) and 30 mL THF. Crude **4u** was dissolved in 10 mL THF and transferred to the NaH suspension via a syringe. Benzoyl chloride was added. The mixture was stirred for additional 2 h and monitored by TLC (PE:EA=5:1, RF = 0.65). It was then quenched with saturated NH_4Cl and extract with EA. Crude product was purified by flash column chromatography to afford sticky colorless liquid (2.3 g, 61% for two steps). Attention, remaining **2i** from the last step would form amide as well and hard to exclude them all. However, it would be easier to separate when obtaining the hydroxylamine. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.68 (d, *J* = 8.2 Hz, 2H), 7.48 (t, *J* = 6.7 Hz, 3H), 7.35 (t, *J* = 7.7 Hz, 2H), 7.25 (t, *J* = 7.9 Hz, 1H), 7.20 (d, *J* = 8.0 Hz, 2H), 7.08 – 7.00 (m, 3H), 7.02 – 6.93 (m, 2H), 6.90 (s, 1H), 6.84 (d, *J* = 8.1 Hz, 1H), 6.50 (dd, *J* = 16.0, 7.4 Hz, 1H), 6.25 (d, *J* = 16.0 Hz, 1H), 4.89 (p, *J* = 6.7 Hz, 1H), 2.35 (s, 3H), 1.66 (d, *J* = 6.9 Hz, 3H). ^{13}C NMR (101 MHz,

$CDCl_3$) δ 172.0, 161.3, 160.0, 157.8, 157.6, 152.9, 144.7, 138.4, 136.7, 136.3, 131.7, 131.6, 130.1, 129.9, 129.5, 128.5, 128.3, 128.1, 121.5, 120.4, 120.4, 117.7, 116.6, 116.5, 116.2, 58.8, 21.6, 20.1. HRMS (ESI) Calcd for $[C_{30}H_{26}FNNaO_4S, M+Na]^+$: 538.1464, Found: 538.1465.

(*E*)-*N*-(4-(3-(4-fluorophenoxy)phenyl)but-3-en-2-yl)hydroxylamine (11)

Desulfonylation was conducted according to literature.[8] A solution of crude **9** (1.8 g, 3 mmol) in degassed toluene (100 mL) was heated to reflux and freshly distilled Bu_3SnH (2.18 g, 7.5 mmol) and AIBN (98 mg, 0.6 mmol) were added in one portion as a solution in toluene (20 ml) under an nitrogen atmosphere. 0.1 Equivalents of AIBN was added portionwise in toluene (2 mL) every 0.5h until the reaction had gone to completion (2.5 h) as indicated by TLC analysis (PE:EA=5:1, RF = 0.18). The toluene was then removed in vacuo and diethyl ether (100 mL) and aqueous potassium fluoride (8%, 50ml) were added to the residue and the mixture stirred for 2 h. The organic layer was separated, washed with water and brine, dried ($MgSO_4$) and evaporated under reduced pressure to afford crude benzamide **10**. ^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.79 (d, *J* = 7.1 Hz, 2H), 7.53 – 7.48 (m, 1H), 7.44 (t, *J* = 7.3 Hz, 2H), 7.26 (d, *J* = 15.7 Hz, 1H), 7.10 (d, *J* = 7.6 Hz, 1H), 7.07 – 6.92 (m, 5H), 6.84 (d, *J* = 8.1 Hz, 1H), 6.53 (d, *J* = 15.9 Hz, 1H), 6.23 (dd, *J* = 16.0, 5.7 Hz, 1H), 6.13 (d, *J* = 7.8 Hz, 1H), 4.95 (h, *J* = 7.2 Hz, 2H), 1.44 (d, *J* = 6.8 Hz, 3H).

Hydroxylamine was synthesized according to literature[9] with slight modification. A solution of crude benzamide **10** (1 mmol, 1equiv.) in anhydrous DCM (3.0 mL) was added dropwise to a suspension of Cp_2ZrHCl (2.5 mmol) in anhydrous DCM (20 mL) at -20 °C under argon atmosphere. After 10 minutes, the mixture is gradually warmed to RT, and stirred 50 min. at rt. The solution[10] was concentrated to around 3 mL and 50 mL anhydrous hexane was added. The mixture was then passed through a pad of basic alumina and washed with hexane. The filtrate (crude imine, PE:EA = 20:1, RF = 0.8) was concentrated and dissolved in 5 mL DCM. A solution of meta-chloroperbenzoic acid (85%, 1 mmol) in DCM (6 mL) was added dropwise at 0 ℃ over 1.5 h. The mixture was stirred for 30 min and the white precipitate was then filtered off. The filtrate was washed with a 10% solution of K_2CO_3 (70 mL), dried with $MgSO_4$, and concentrated under reduced pressure to give a pale yellow oil (crude oxaziridine, PE:EA = 20:1, RF = 0.85, unstable on silica gel). The oxaziridine was dissolved in methanol (2 mL) and hydroxylamine hydrochloride (5 mmol) was added. The mixture was stirred overnight. 4N hydrochloric acid (2 mL) was added and the mixture was concentrated under reduced pressure. The residue was dissolved in water and ether and the aqueous phase was washed with diethyl ether until no nonpolar compounds were observed by TLC analysis (crude hydroxylamine, DCM:MeOH = 20:1, RF = 0.3). The aqueous phase was neutralized with sodium carbonate, saturated with sodium chloride, and then extracted with chloroform (8 x 5 mL). The organic phases were combined, dried with $MgSO_4$, and concentrated under reduced pressure to afford crude product which was purified by flash column chromatography (colorless oil, 77 mg, from **9** to **11**, 28% yield).^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.37 – 7.19 (m, 1H), 7.09 (d, *J* = 7.6 Hz, 1H), 7.04 – 6.90 (m, 5H), 6.82 (d, *J* = 7.9 Hz, 1H), 6.47 (d, *J* = 15.9 Hz, 1H), 6.12 (dd,

J = 15.9, 7.5 Hz, 1H), 3.68 (p, *J* = 6.5 Hz, 1H), 1.22 (d, *J* = 6.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 160.0, 157.9, 157.6, 152.9, 152.9, 138.8, 131.5, 131.2, 129.9, 121.4, 120.5, 120.5, 117.6, 116.5, 116.2, 116.2, 59.7, 18.0. The free hydroxylamine obtained decomposes in a few hours and HRMS was not successful.

(*E*)-1-(4-(3-(4-fluorophenoxy)phenyl)but-3-en-2-yl)-1-hydroxyurea (12)

Hydroxylamine was synthesized according to literature[11] with slight modification. To a solution of hydroxylamine **11** (77 mg, 0.28 mmol) in degassed THF (2 mL) was added TMSNCO (1.5 mmol) at room temperature, and the resulting solution was heated to 60ºC and stirred for 2 h. Several drops of water were then introduced, and the resulting mixture was stirred for an additional 30 min (TLC, DCM:MeOH=20:1, RF = 0.4). The mixture was concentrated in *vacuo*, and the residue was loaded to silica gel and purified by flash column chromatography (white solid, 89 mg, 99% yield, Mp: 130-131 ºC). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.05 (s, 1H), 7.33 (t, *J* = 7.9 Hz, 1H), 7.28 – 7.15 (m, 3H), 7.11 – 7.04 (m, 2H), 7.01 (s, 1H), 6.85 (dd, *J* = 7.9, 2.2 Hz, 1H), 6.47 (d, *J* = 16.2 Hz, 1H), 6.38 (s, 2H), 6.29 (dd, *J* = 16.2, 6.2 Hz, 1H), 4.81 (p, *J* = 6.3 Hz, 1H), 1.21 (d, *J* = 6.8 Hz, 3H). ^{13}C NMR (101 MHz, DMSO) δ 161.5, 161.5, 159.3, 157.3, 156.9, 152.6, 139.0, 131.5, 130.2, 128.9, 121.2, 120.6, 120.5, 117.1, 116.7, 116.4, 115.7, 54.1, 16.5. HRMS (ESI) Calcd for $[C_{17}H_{17}FN_2NaO_3, M+Na]^+$: 339.1121, Found: 339.1120.

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10. Final product could also be prepared by a stepwise fashion starting from hydrolyzed amine. See: Tokuyama, H.; Kuboyama, T.; Amano, A.; Yamashita, T.; Fukuyama, T. A novel transformation of primary amines to *N*-Monoalkylhydroxylamines *Synthesis* **2000**, *9*, 1299.
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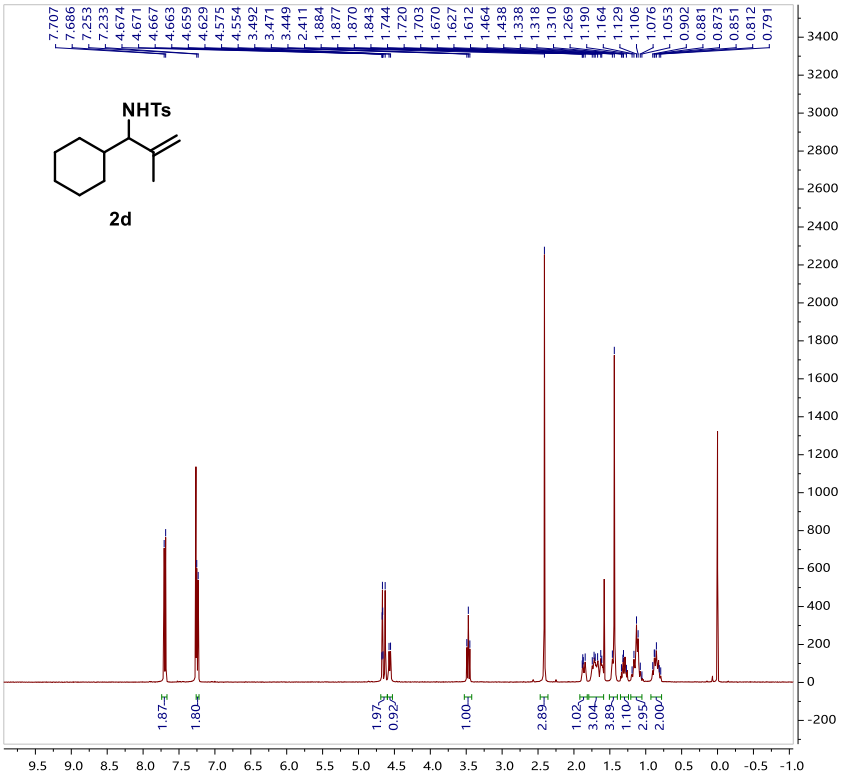
7. NMR Spectra of New Compounds



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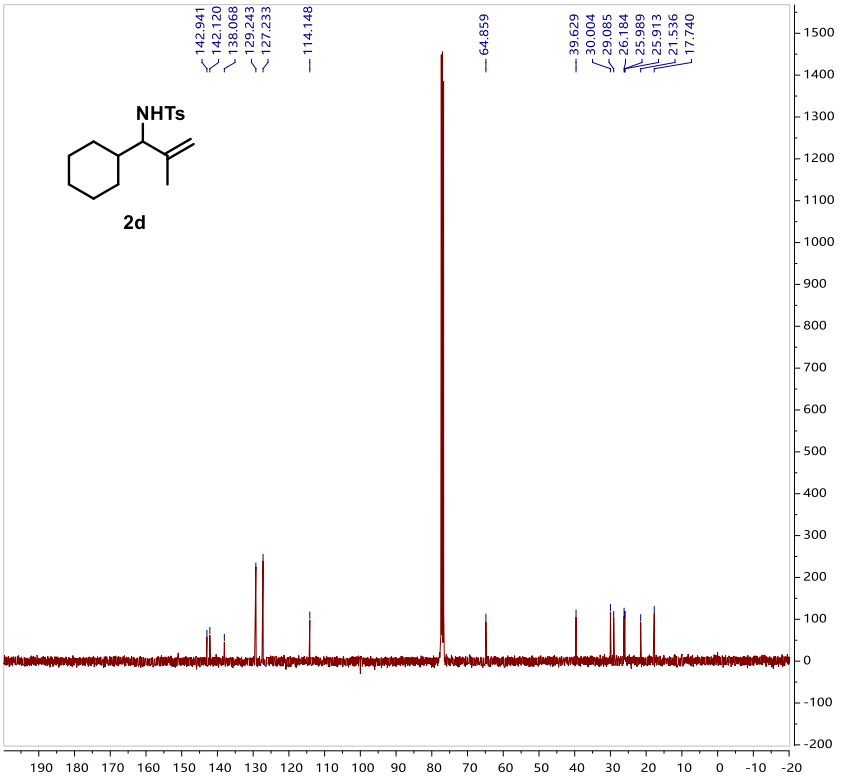

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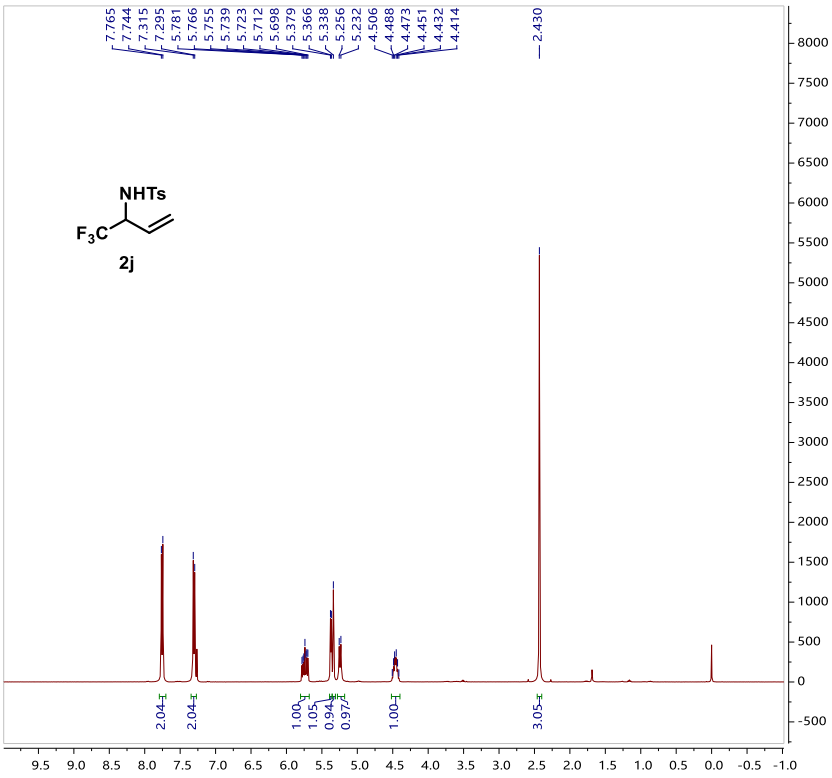

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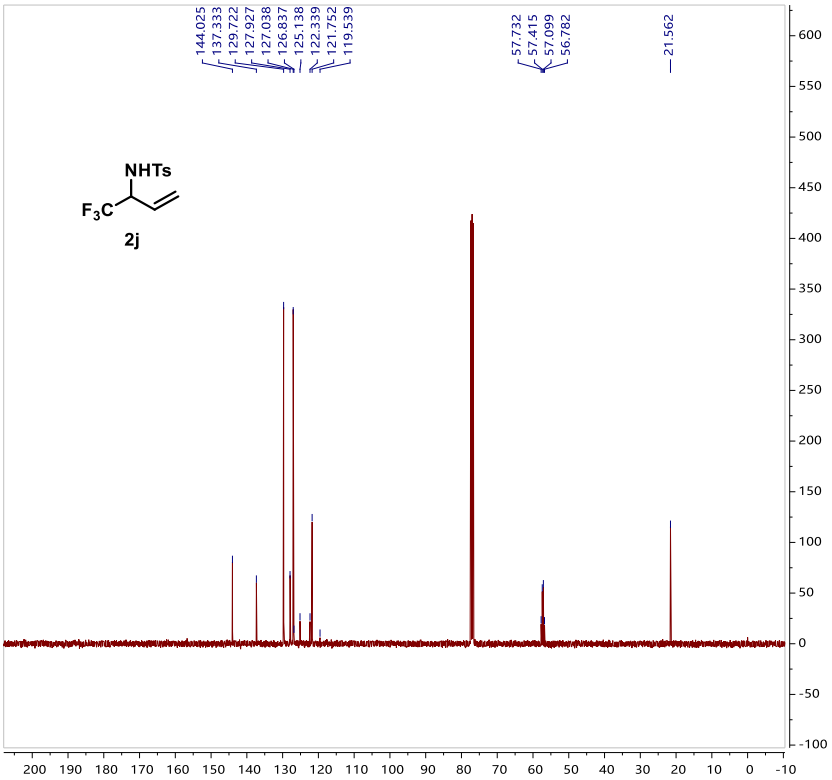
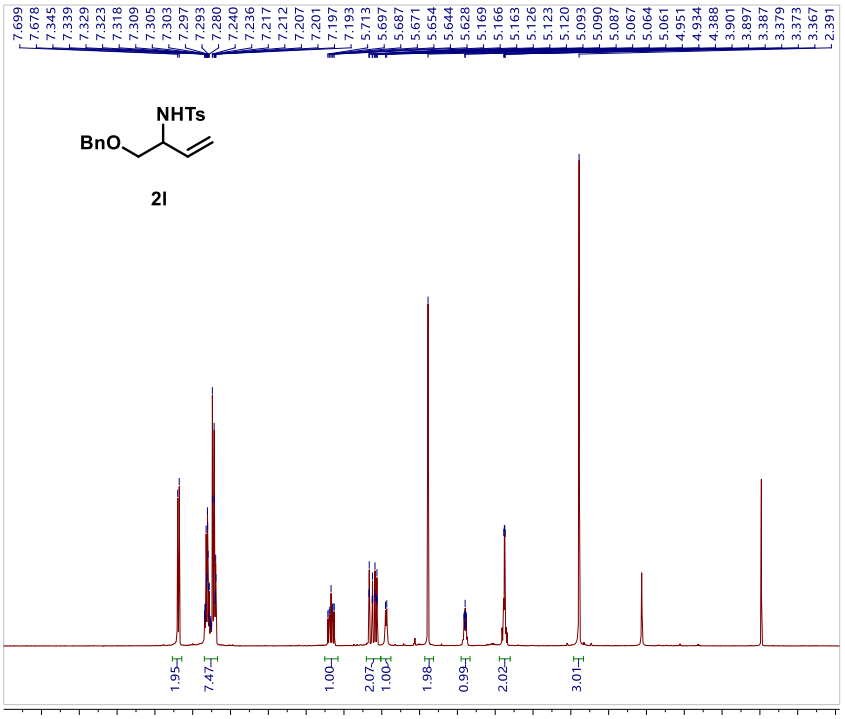
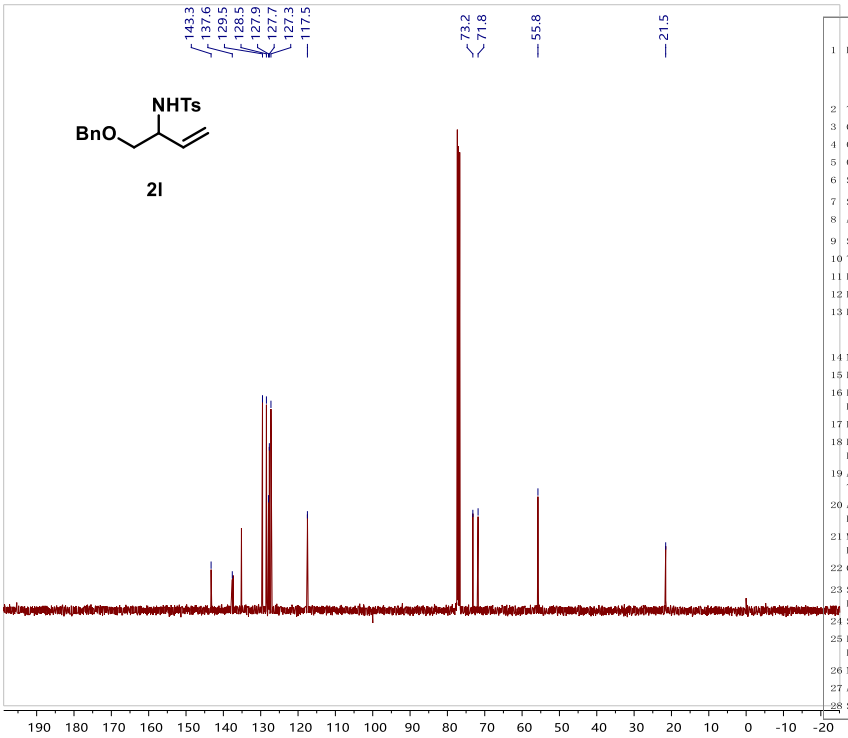
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.0
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	8
15 Receiver Gain	64
16 Relaxation Delay	1.0000
17 Pulse Width	9.1200
18 Presaturation Frequency	
19 Acquisition Time	4.0894
20 Acquisition Date	2018-11-20T21:46:52
21 Modification Date	2018-11-20T21:47:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1543.6
26 Nucleus	1H
27 Acquired Size	32768
28 Spectral Size	65536



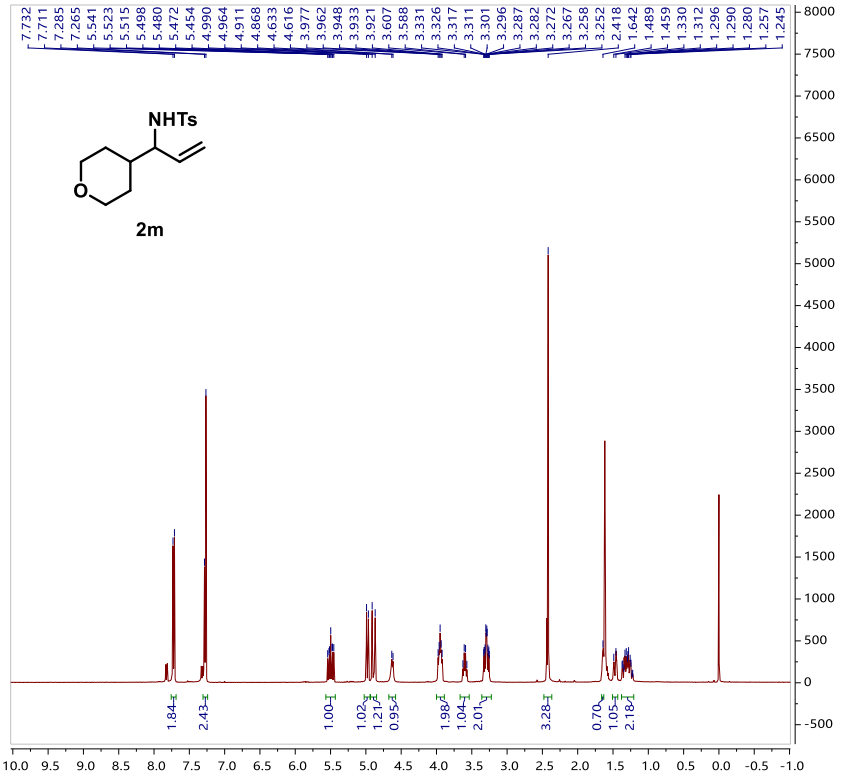
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-61-C13/ 2/ fid
2 Title	fc-5-61-C13/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.5
11 Pulse Sequence	zgdc30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	746
15 Receiver Gain	36
16 Relaxation Delay	1.0000
17 Pulse Width	9.4000
18 Presaturation Frequency	
19 Acquisition Time	1.1010
20 Acquisition Date	2018-11-20T21:50:18
21 Modification Date	2018-11-20T22:14:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4820.6
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



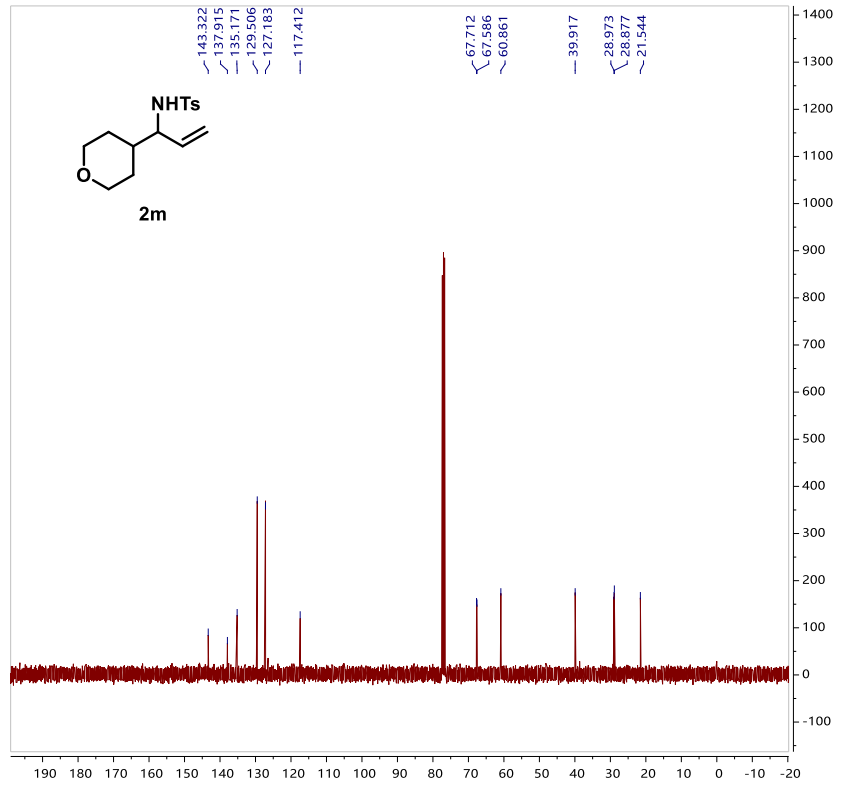
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ fc-4-3ai-sm-C13/ 1/ fid
2 Title	fc-4-3ai-sm-C13/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.8
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	174
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.4999
20 Acquisition Date	2018-05-20T16:00:16
21 Modification Date	2018-05-20T16:00:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1552.9
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



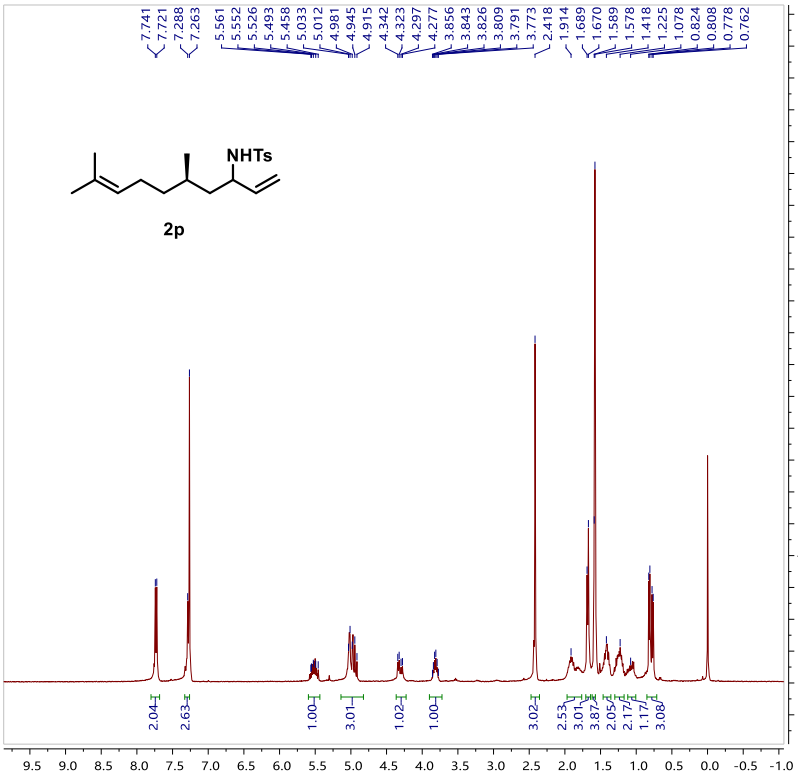
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ fc-4-3ai-sm-C13/ 2/ fid
2 Title	fc-4-3ai-sm-C13/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.5
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	1024
15 Receiver Gain	57
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-05-20T16:04:24
21 Modification Date	2018-05-20T16:27:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



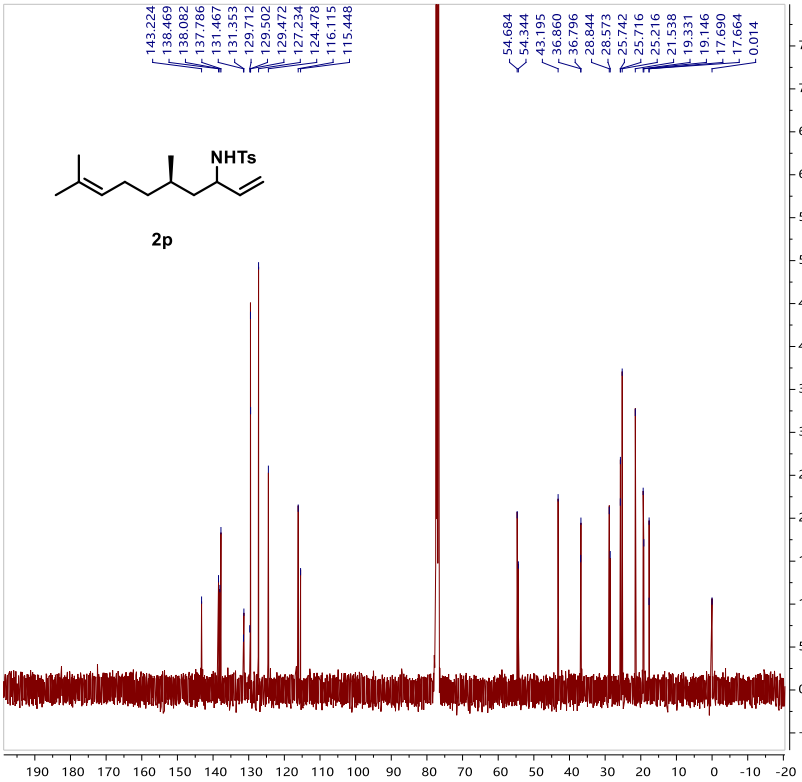
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-179-2-tm/ 1/ fid
2	Title	fc-4-179-2-tm/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.2
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	127
16	Relaxation Delay	2.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-07-12T15:34:38
21	Modification Date	2018-07-12T15:34:00
22	Class	
23	Spectrometer Frequency	400.15
24	Spectral Width	8012.8
25	Lowest Frequency	-2133.3
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



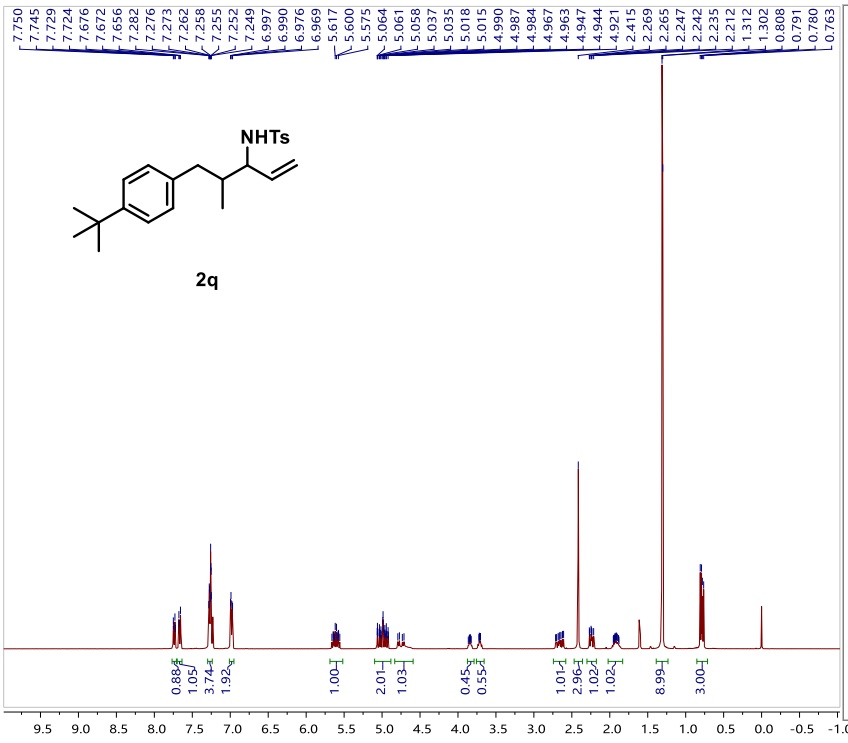
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-179-2-tm/ 2/ fid
2	Title	fc-4-179-2-tm/ 2
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.8
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	268
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.8999
20	Acquisition Date	2018-07-12T15:45:17
21	Modification Date	2018-07-12T15:45:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	29761.9
25	Lowest Frequency	-3813.0
26	Nucleus	13C
27	Acquired Size	26784
28	Spectral Size	65536



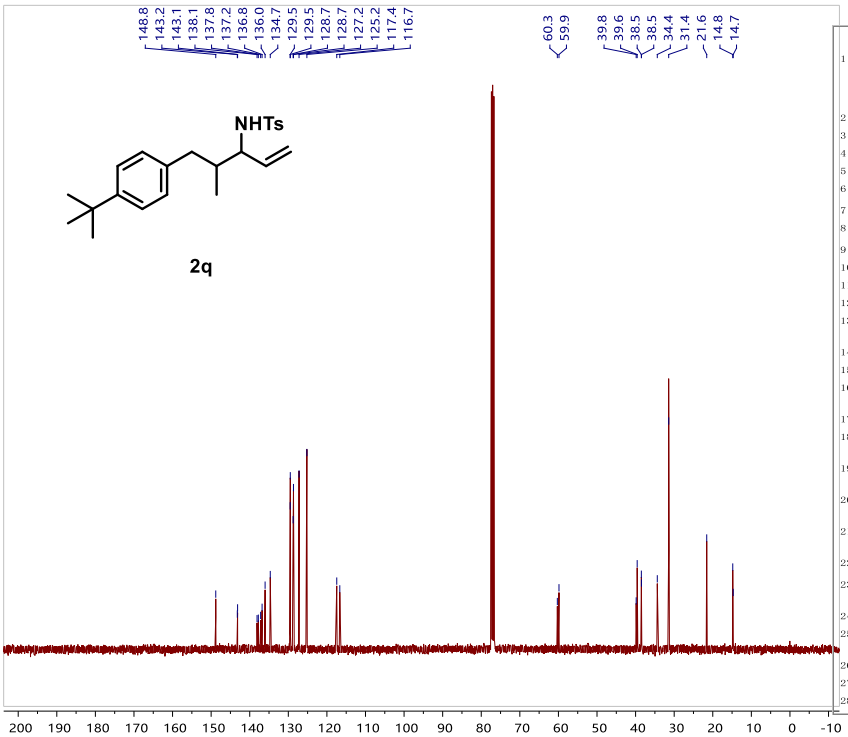
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-109-2-21/ 1/ fid
2 Title	fc-5-109-2-21/ 1
3 Comment	
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.1
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z116098/ 0225
14 Number of Scans	8
15 Receiver Gain	91
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	4.0894
20 Acquisition Date	2018-11-01T23:35:32
21 Modification Date	2018-11-01T23:35:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1535.4
26 Nucleus	1H
27 Acquired Size	32768
28 Spectral Size	65536



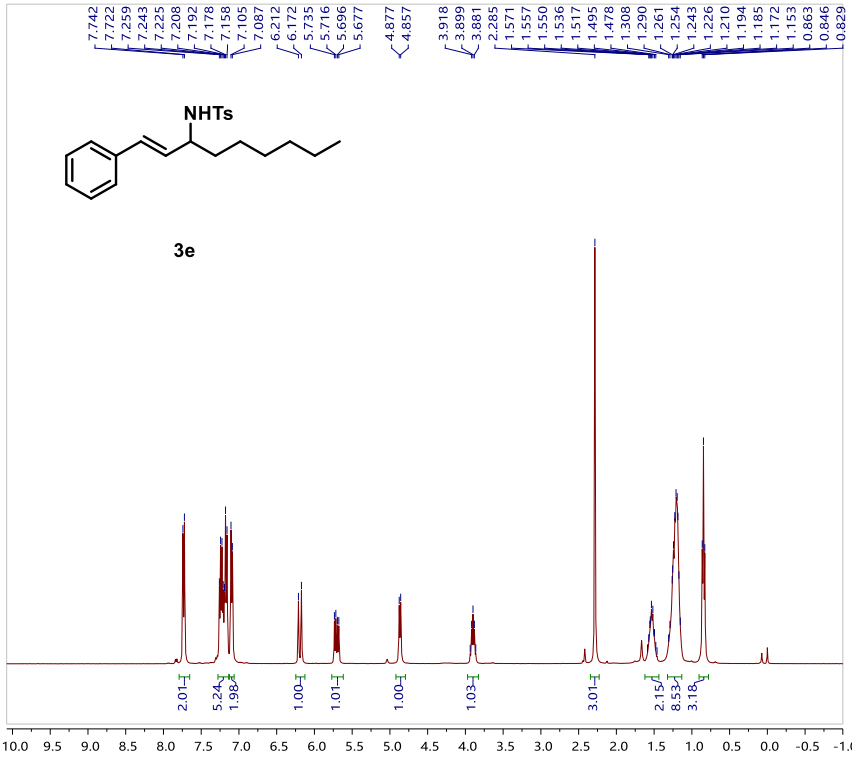
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-109-2-21/ 2/ fid
2 Title	fc-5-109-2-21/ 2
3 Comment	13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.8
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z116098/ 0225
14 Number of Scans	16089
15 Receiver Gain	205
16 Relaxation Delay	1.0000
17 Pulse Width	9.3000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-11-02T07:57:09
21 Modification Date	2018-11-02T07:57:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-15349.8
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



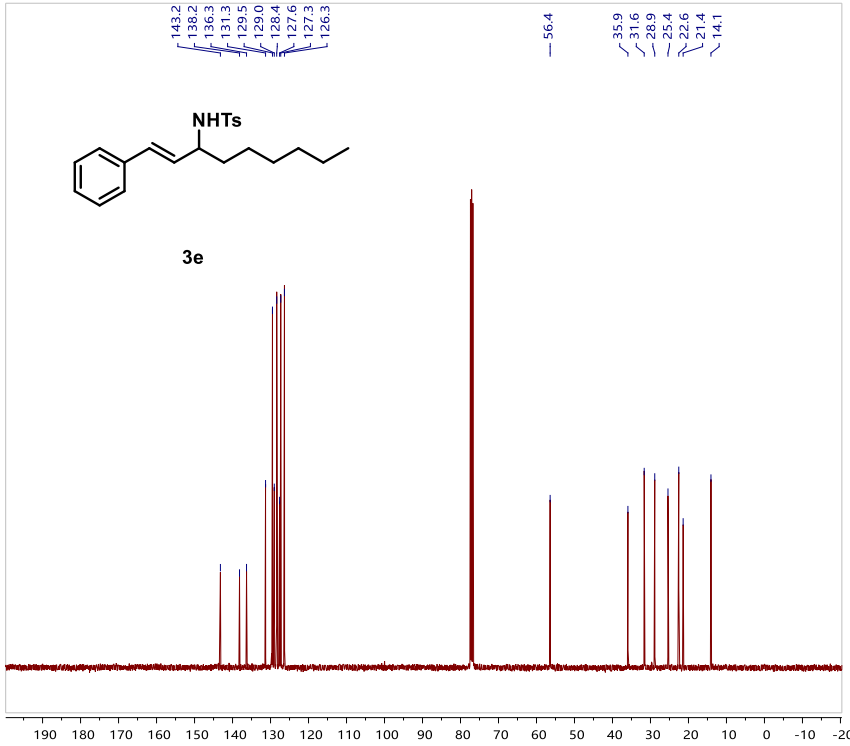
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-3ah0-SM-C13/ 1/ fid
2 Title	fc-4-3ah0-SM-C13/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	8
15 Receiver Gain	57
16 Relaxation Delay	1.0000
17 Pulse Width	9.1200
18 Presaturation Frequency	
19 Acquisition Time	4.0894
20 Acquisition Date	2018-05-20T16:18:06
21 Modification Date	2018-05-20T16:18:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1546.7
26 Nucleus	1H
27 Acquired Size	32768
28 Spectral Size	65536



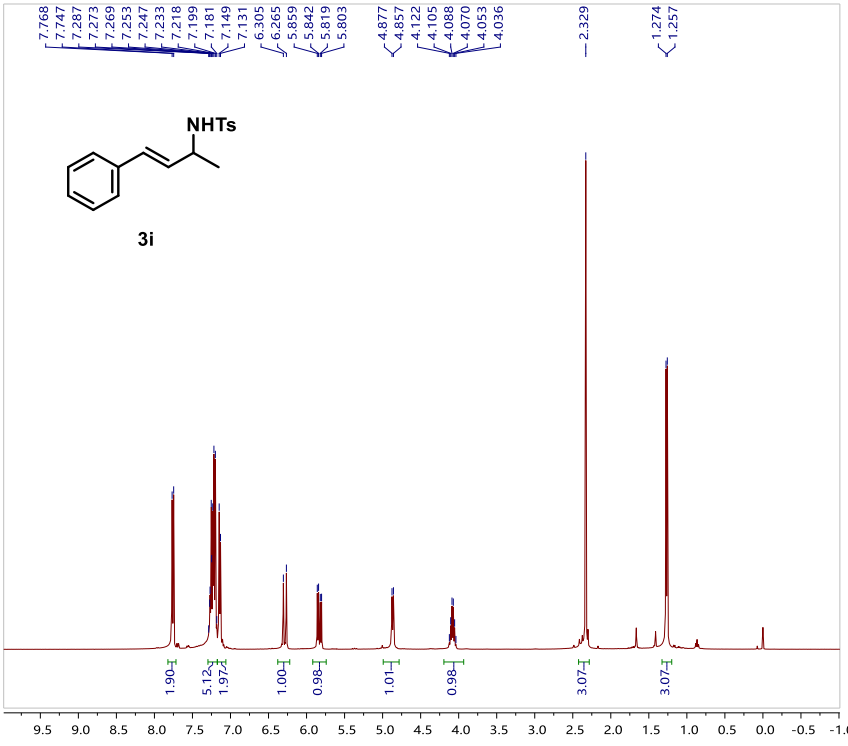
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ fc-4-3ah0-SM-C13/ 2/ fid
2 Title	fc-4-3ah0-SM-C13/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zgdc30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	727
15 Receiver Gain	33
16 Relaxation Delay	1.0000
17 Pulse Width	9.4000
18 Presaturation Frequency	
19 Acquisition Time	1.1010
20 Acquisition Date	2018-05-20T16:23:33
21 Modification Date	2018-05-20T16:45:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4820.6
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



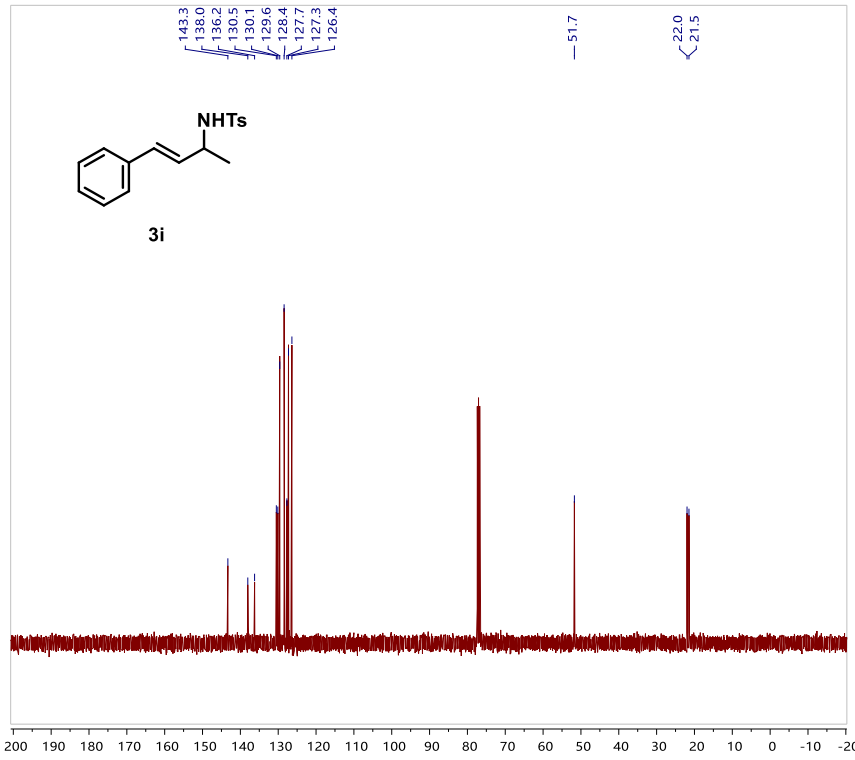
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-4ae/ 1/ fid
2	Title	fc-4-4ae/ 1
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	0.0
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14	Number of Scans	8
15	Receiver Gain	47
16	Relaxation Delay	1.0000
17	Pulse Width	9.1200
18	Presaturation Frequency	
19	Acquisition Time	4.0894
20	Acquisition Date	2018-05-31T22:53:09
21	Modification Date	2018-05-31T22:53:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8012.8
25	Lowest Frequency	-1547.4
26	Nucleus	1H
27	Acquired Size	32768
28	Spectral Size	65536



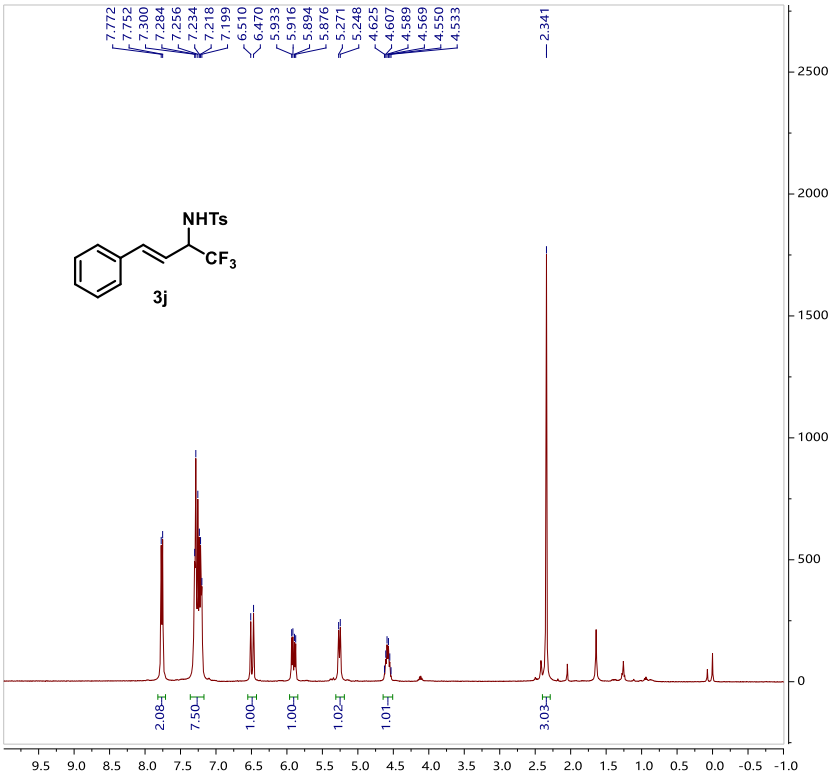
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-4ae/ 2/ fid
2	Title	fc-4-4ae/ 2
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	0.0
11	Pulse Sequence	zgdc30
12	Experiment	1D
13	Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14	Number of Scans	974
15	Receiver Gain	29
16	Relaxation Delay	1.0000
17	Pulse Width	9.4000
18	Presaturation Frequency	
19	Acquisition Time	1.1010
20	Acquisition Date	2018-05-31T23:29:56
21	Modification Date	2018-05-31T23:29:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	29761.9
25	Lowest Frequency	-4820.6
26	Nucleus	13C
27	Acquired Size	32768
28	Spectral Size	65536



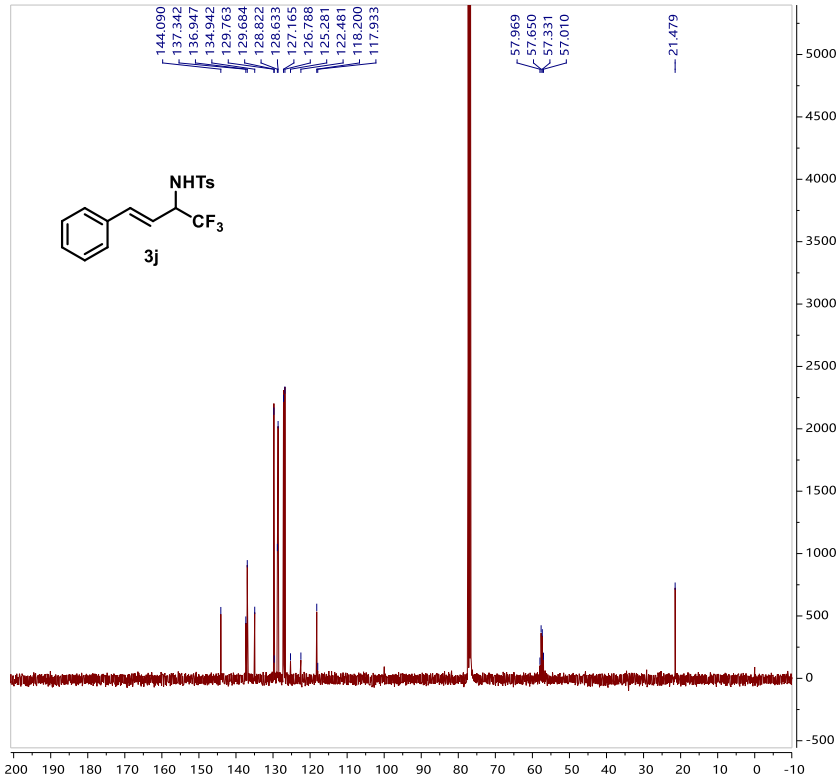
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ FC-4-90-2/ 1/ fid
2	Title	FC-4-90-2/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.0
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	46
16	Relaxation Delay	2.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-04-04T15:10:55
21	Modification Date	2018-04-04T15:10:00
22	Class	
23	Spectrometer Frequency	400.15
24	Spectral Width	8012.8
25	Lowest Frequency	-2136.8
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



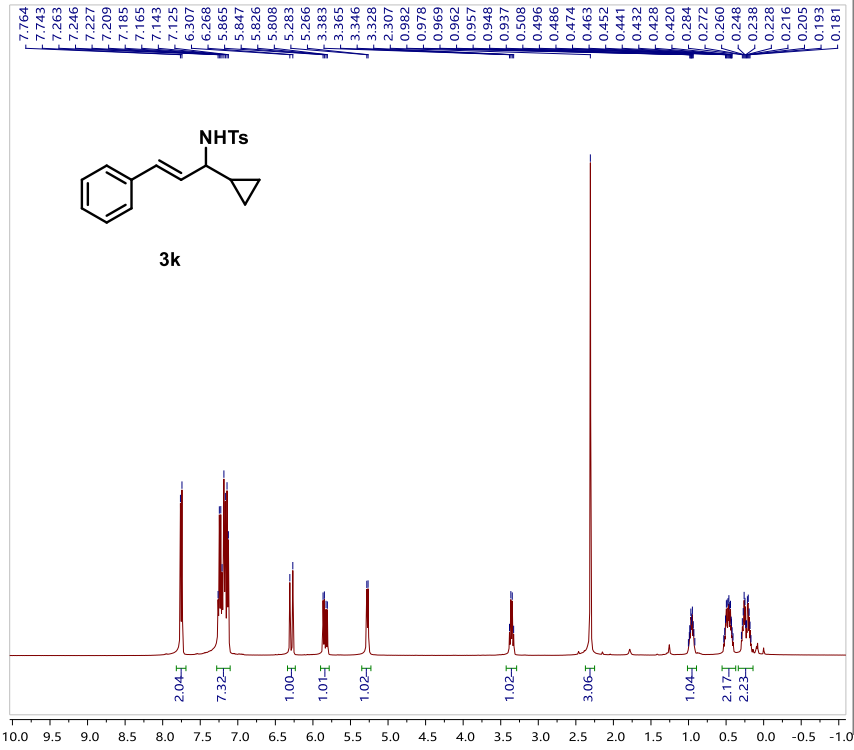
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ FC-4-90-2/ 2/ fid
2	Title	FC-4-90-2/ 2
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.5
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	59
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.8999
20	Acquisition Date	2018-04-04T15:14:27
21	Modification Date	2018-04-04T15:14:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	29761.9
25	Lowest Frequency	-3813.0
26	Nucleus	13C
27	Acquired Size	26784
28	Spectral Size	65536



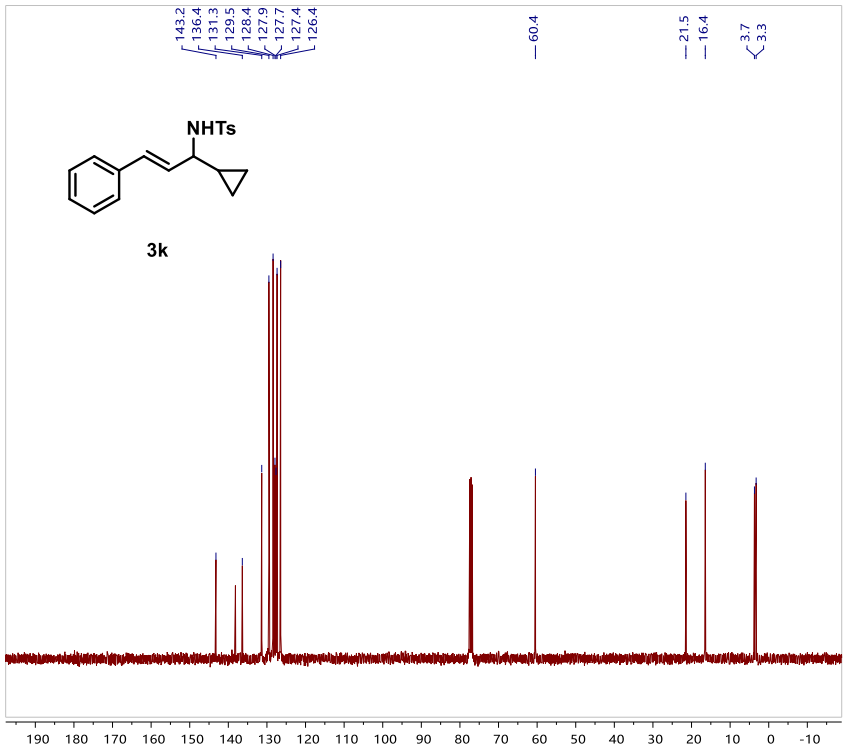
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-84-2-plc/ 1/ fid
2	Title	fc-5-84-2-plc.1.fid
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	-547.5
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14	Number of Scans	8
15	Receiver Gain	128
16	Relaxation Delay	1.0000
17	Pulse Width	13.5000
18	Presaturation Frequency	
19	Acquisition Time	1.9923
20	Acquisition Date	2018-11-08T23:33:00
21	Modification Date	2018-11-08T23:33:00
22	Class	
23	Spectrometer Frequency	400.23
24	Spectral Width	8223.7
25	Lowest Frequency	-1640.3
26	Nucleus	1H
27	Acquired Size	16384
28	Spectral Size	65536



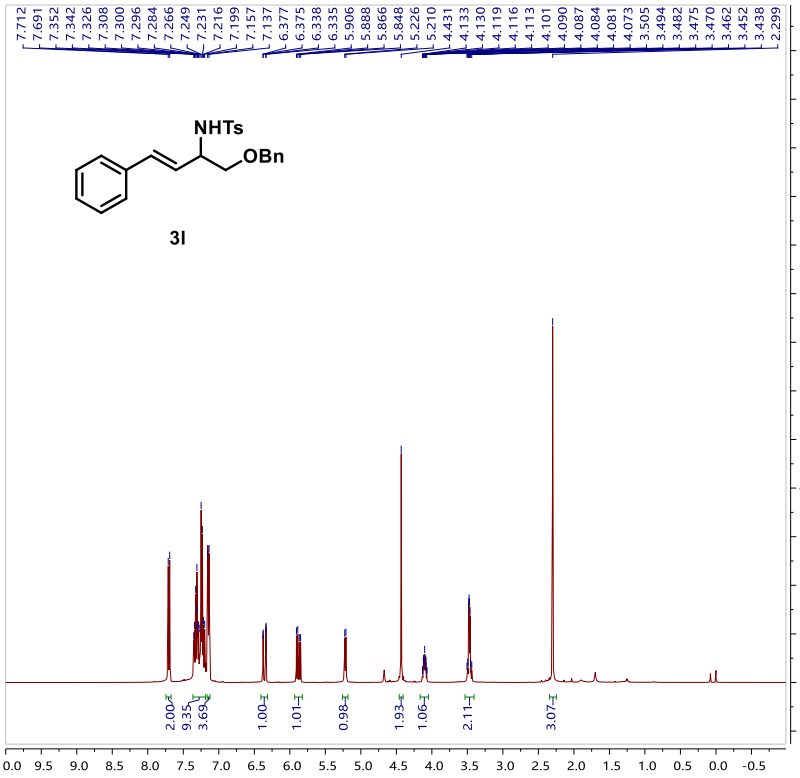
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-84-2-plc/ 2/ fid
2	Title	fc-5-84-2-plc.2.fid
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	-546.3
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14	Number of Scans	1558
15	Receiver Gain	203
16	Relaxation Delay	1.0000
17	Pulse Width	12.0000
18	Presaturation Frequency	
19	Acquisition Time	0.5506
20	Acquisition Date	2018-11-09T00:16:00
21	Modification Date	2018-11-09T00:16:00
22	Class	
23	Spectrometer Frequency	100.65
24	Spectral Width	29761.9
25	Lowest Frequency	-4817.6
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



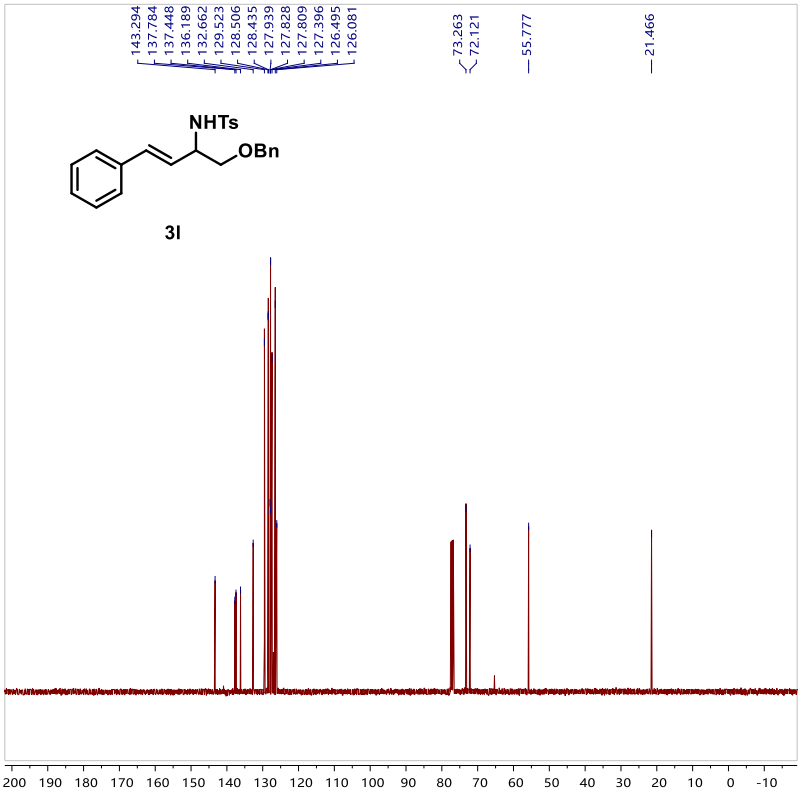
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-117-1-again/ fc-4-201-2-again1/ 1/ fid
2 Title	fc-4-201-2-again1/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	8
15 Receiver Gain	29
16 Relaxation Delay	1.0000
17 Pulse Width	9.1200
18 Presaturation Frequency	
19 Acquisition Time	4.0894
20 Acquisition Date	2018-05-19T11:59:54
21 Modification Date	2018-05-19T12:00:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1632.4
26 Nucleus	1H
27 Acquired Size	32768
28 Spectral Size	65536



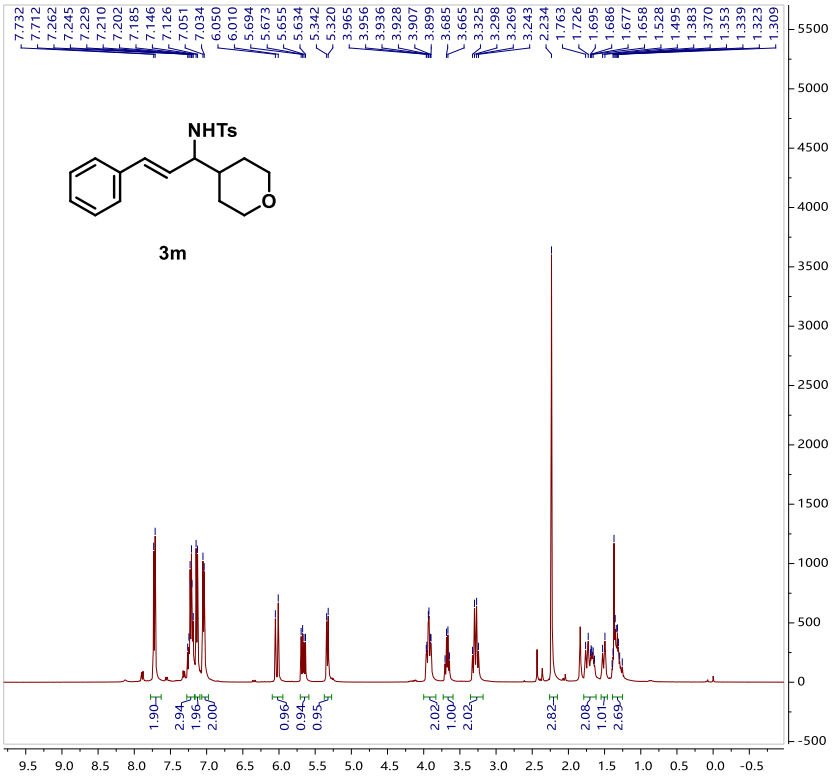
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-201-2-again1/ 2/ fid
2 Title	fc-4-201-2-again1/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zgdc30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	80
15 Receiver Gain	33
16 Relaxation Delay	1.0000
17 Pulse Width	9.4000
18 Presaturation Frequency	
19 Acquisition Time	1.1010
20 Acquisition Date	2018-05-19T12:02:20
21 Modification Date	2018-05-19T12:04:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4820.6
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



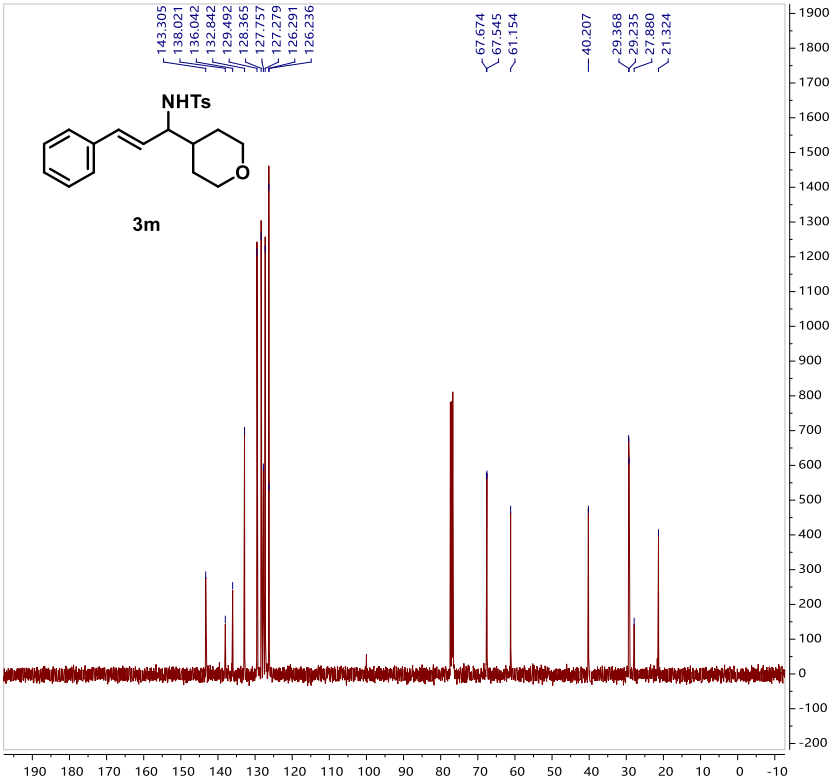
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-195/ 1/ fid
2	Title	fc-4-195/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.6
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	32
16	Relaxation Delay	2.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-06-28T16:18:41
21	Modification Date	2018-06-28T16:18:00
22	Class	
23	Spectrometer Frequency	400.15
24	Spectral Width	8012.8
25	Lowest Frequency	-2145.1
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



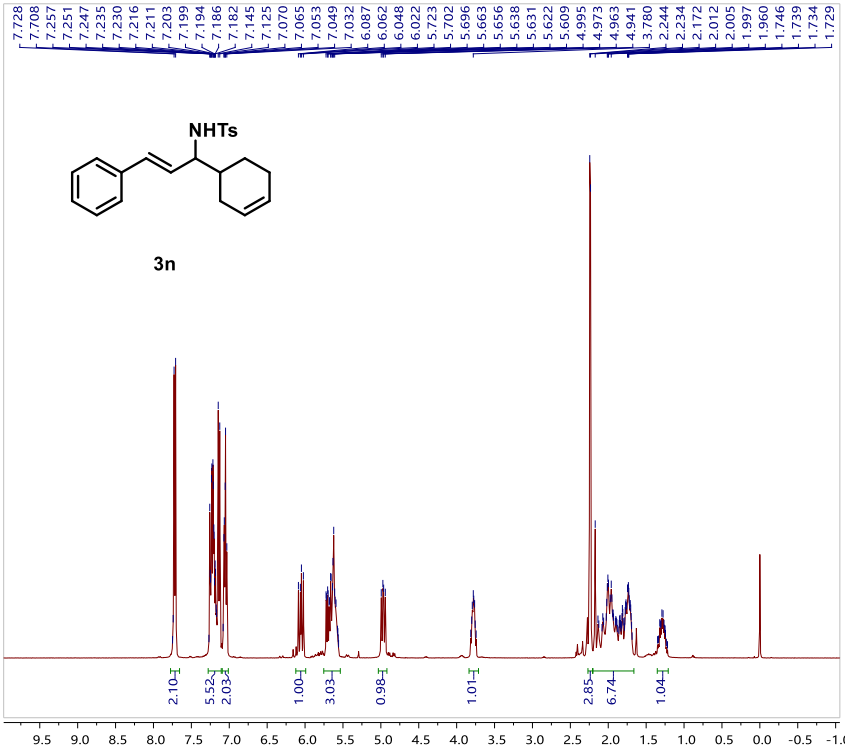
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-195/ 2/ fid
2	Title	fc-4-195/ 2
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.9
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	295
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.8999
20	Acquisition Date	2018-06-28T16:29:34
21	Modification Date	2018-06-28T16:29:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	29761.9
25	Lowest Frequency	-3813.0
26	Nucleus	13C
27	Acquired Size	26784
28	Spectral Size	65536



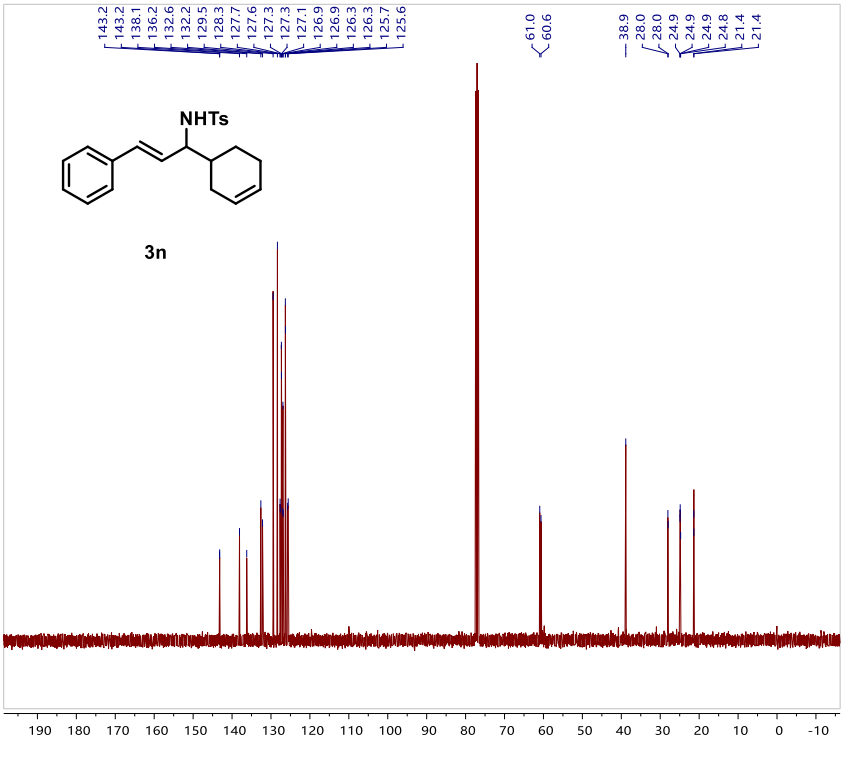
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-1-2/ 1/ fid
2 Title	fc-4-186-1-2.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.7
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	8
15 Receiver Gain	72
16 Relaxation Delay	1.0000
17 Pulse Width	13.7000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-07-20T07:44:00
21 Modification Date	2018-07-20T07:44:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8223.7
25 Lowest Frequency	-1650.7
26 Nucleus	1H
27 Acquired Size	16446
28 Spectral Size	65536



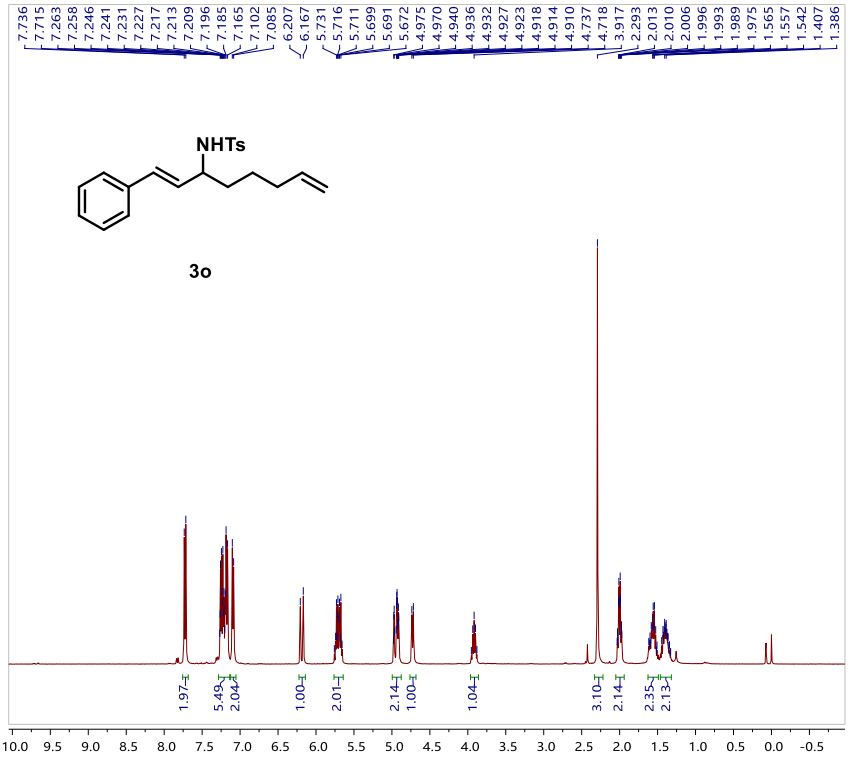
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-1-2/ 2/ fid
2 Title	fc-4-186-1-2.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	299.2
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	254
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-07-20T07:51:00
21 Modification Date	2018-07-20T07:52:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7795.9
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



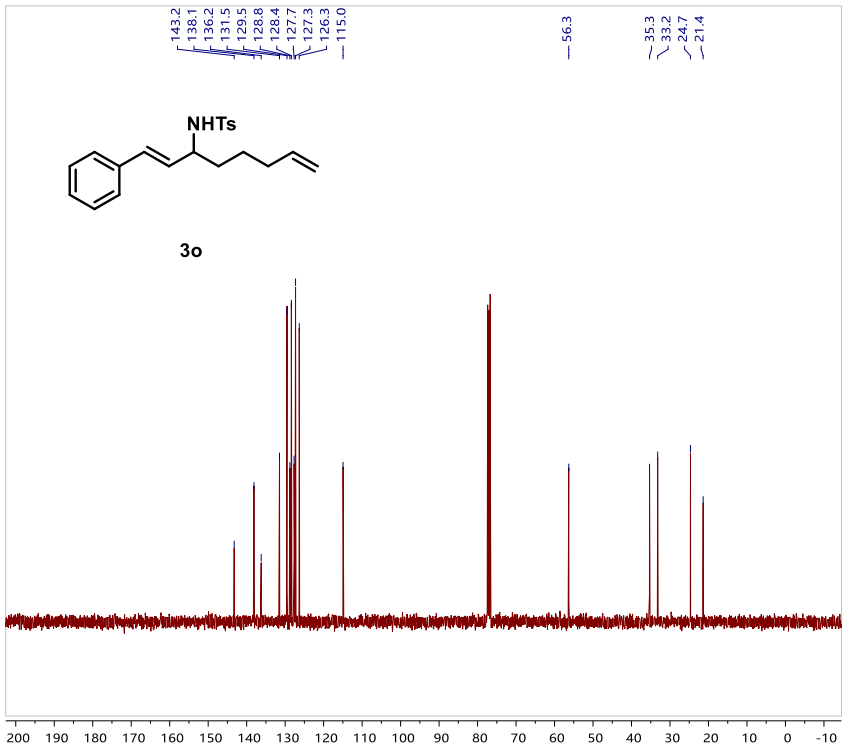
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-90-4-rec/ 1/ fid
2	Title	fc-4-90-4-rec/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.1
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	49
16	Relaxation Delay	2.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-04-04T16:10:51
21	Modification Date	2018-04-04T16:10:00
22	Class	
23	Spectrometer Frequency	400.15
24	Spectral Width	8012.8
25	Lowest Frequency	-2136.1
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



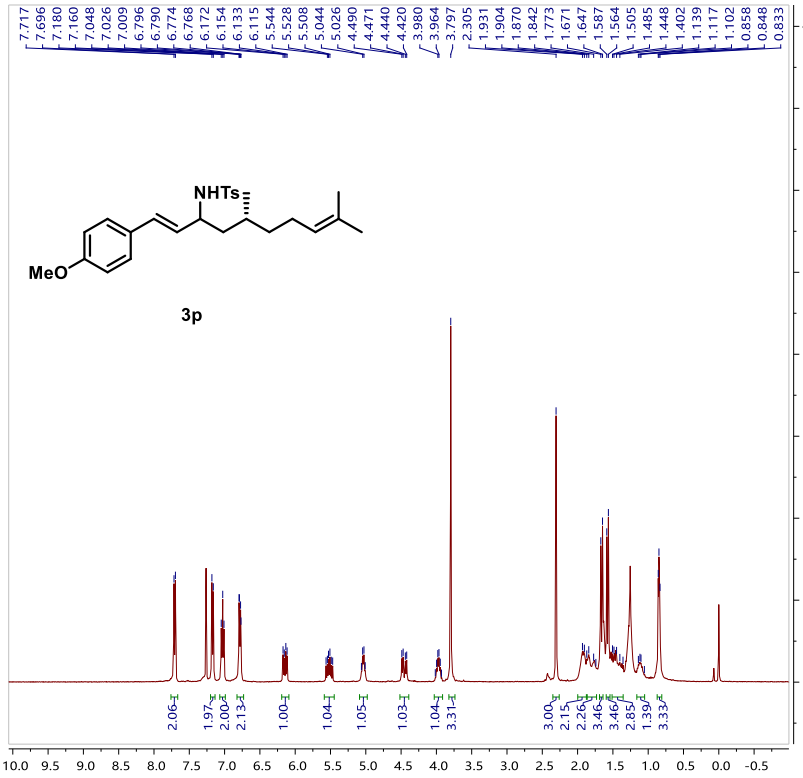
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-90-4-rec/ 2/ fid
2	Title	fc-4-90-4-rec/ 2
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.6
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	487
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.8999
20	Acquisition Date	2018-04-04T16:28:59
21	Modification Date	2018-04-04T16:29:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	29761.9
25	Lowest Frequency	-3813.0
26	Nucleus	13C
27	Acquired Size	26784
28	Spectral Size	65536



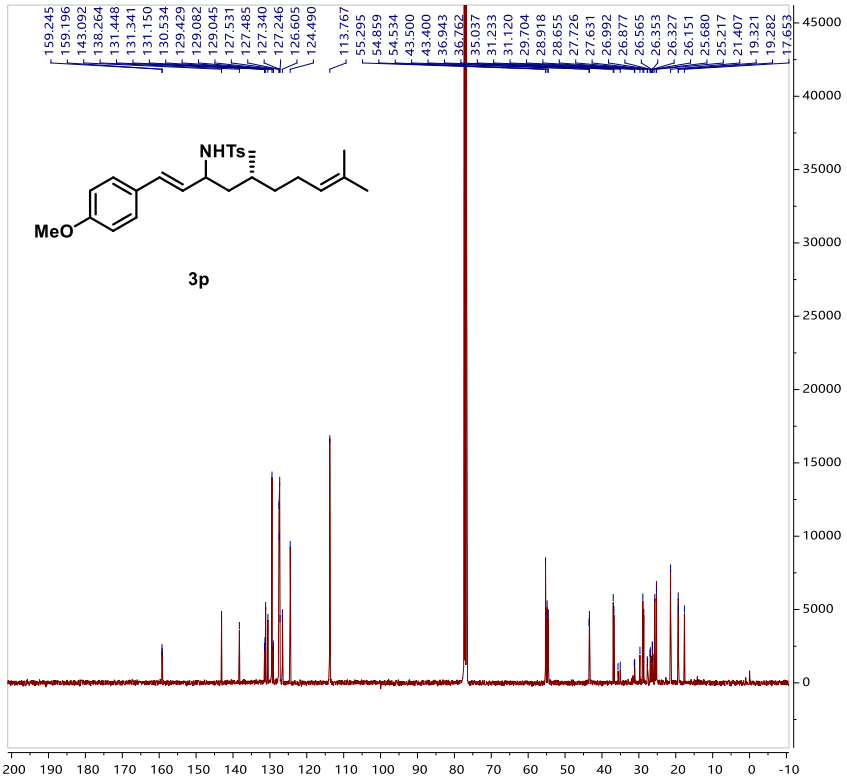
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-201-1-0522/ 1/ fid
2 Title	fc-4-201-1-0522/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.6
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	119
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.4999
20 Acquisition Date	2018-05-22T23:03:22
21 Modification Date	2018-05-22T23:03:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1523.6
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



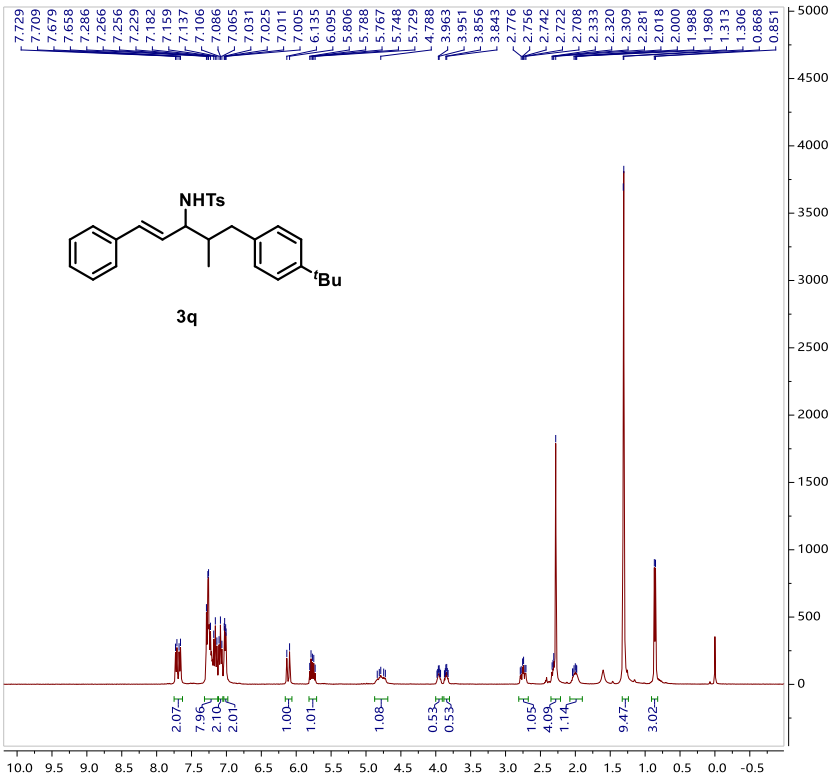
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-201-1-0522/ 2/ fid
2 Title	fc-4-201-1-0522/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.1
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	215
15 Receiver Gain	87
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-05-30T09:00:33
21 Modification Date	2018-05-30T09:05:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



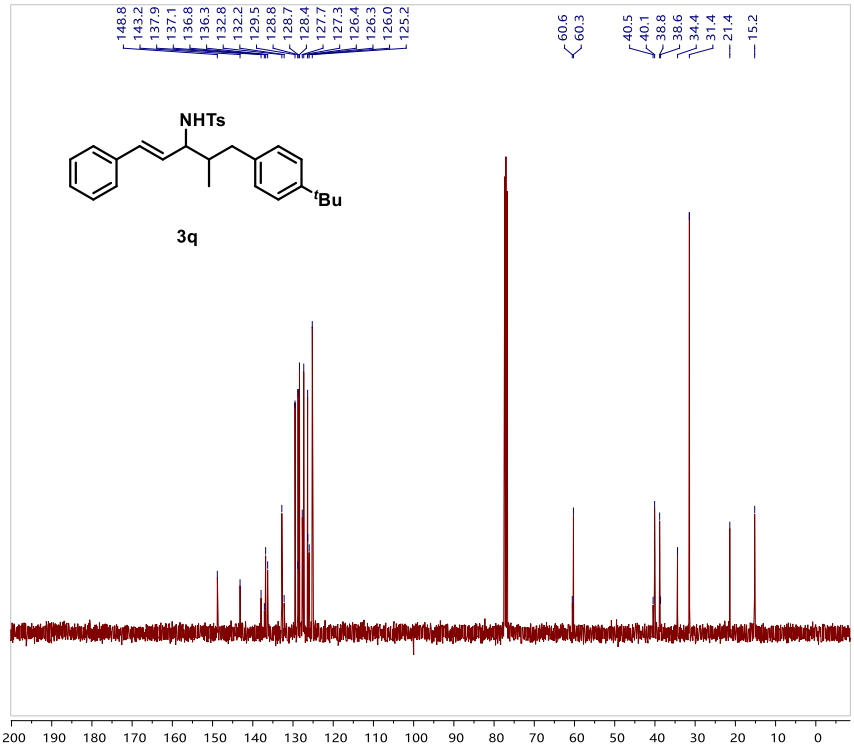
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-125/ 1/ fid
2	Title	fc-5-125.1.fid
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	292.2
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0263
14	Number of Scans	8
15	Receiver Gain	181
16	Relaxation Delay	1.0000
17	Pulse Width	13.5000
18	Presaturation Frequency	
19	Acquisition Time	2.9999
20	Acquisition Date	2018-11-02T23:36:00
21	Modification Date	2018-11-02T23:36:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8223.7
25	Lowest Frequency	-1649.0
26	Nucleus	1H
27	Acquired Size	24670
28	Spectral Size	65536



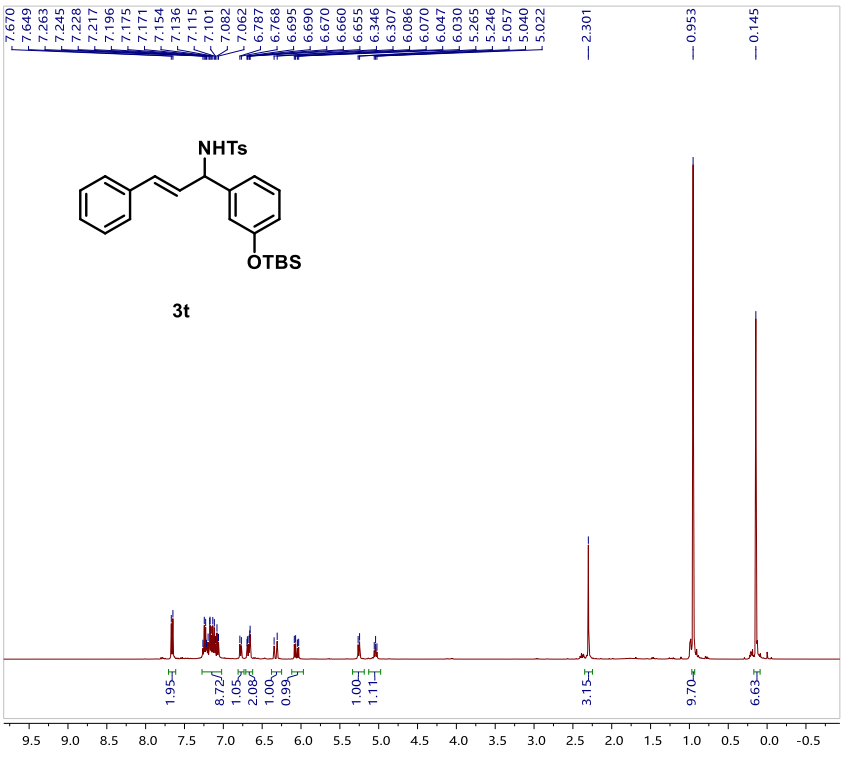
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-125/ 2/ fid
2	Title	fc-5-125.2.fid
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	293.7
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0263
14	Number of Scans	19705
15	Receiver Gain	203
16	Relaxation Delay	1.0000
17	Pulse Width	12.5000
18	Presaturation Frequency	
19	Acquisition Time	0.5506
20	Acquisition Date	2018-11-03T08:27:00
21	Modification Date	2018-11-03T08:27:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	29761.9
25	Lowest Frequency	-4820.4
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



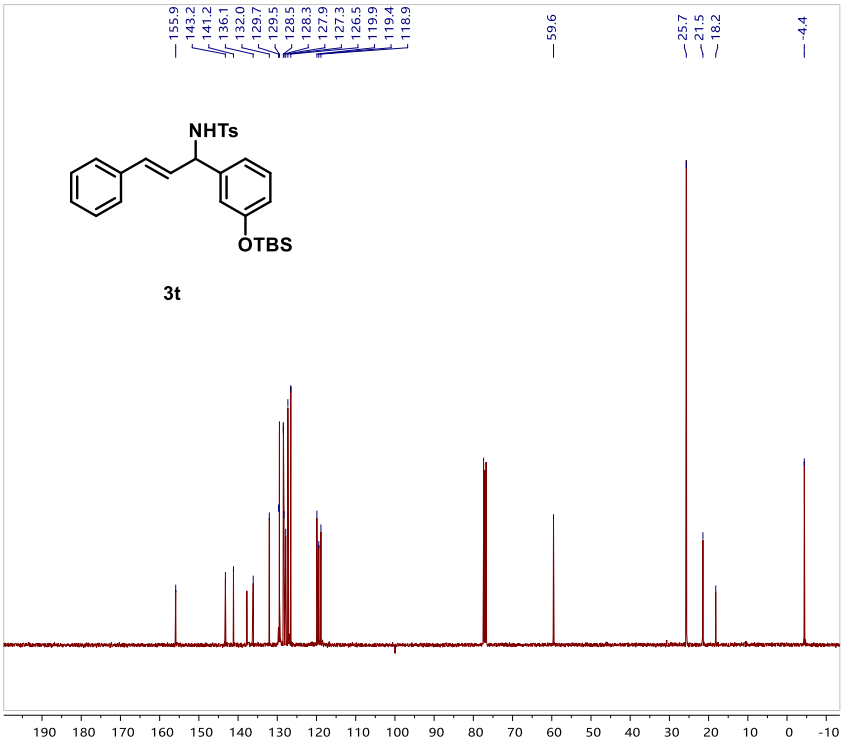
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-77-1-special/ 1/ fid
2	Title	fc-4-77-1-special/ 1
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	293.4
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14	Number of Scans	8
15	Receiver Gain	87
16	Relaxation Delay	1.0000
17	Pulse Width	9.1200
18	Presaturation Frequency	
19	Acquisition Time	4.0894
20	Acquisition Date	2018-09-29T22:29:38
21	Modification Date	2018-09-29T22:30:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8012.8
25	Lowest Frequency	-1547.2
26	Nucleus	1H
27	Acquired Size	32768
28	Spectral Size	65536



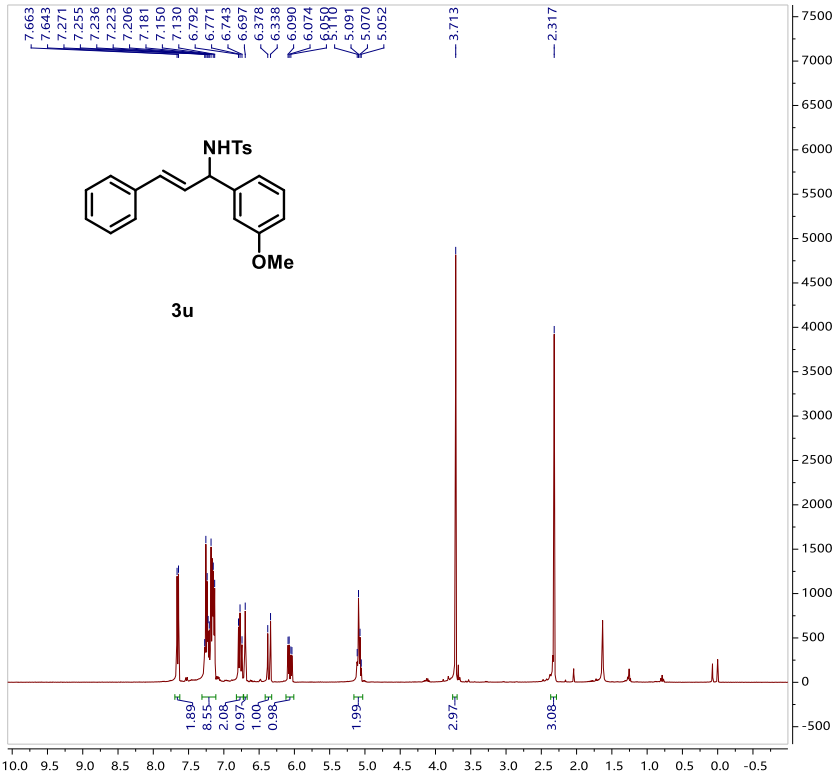
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-77-1-rec/ 2/ fid
2	Title	fc-4-77-1-rec.2.fid
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	298.9
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14	Number of Scans	123
15	Receiver Gain	203
16	Relaxation Delay	1.0000
17	Pulse Width	12.0000
18	Presaturation Frequency	
19	Acquisition Time	0.4588
20	Acquisition Date	2018-03-14T22:38:00
21	Modification Date	2018-03-14T22:39:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	35714.3
25	Lowest Frequency	-7795.9
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



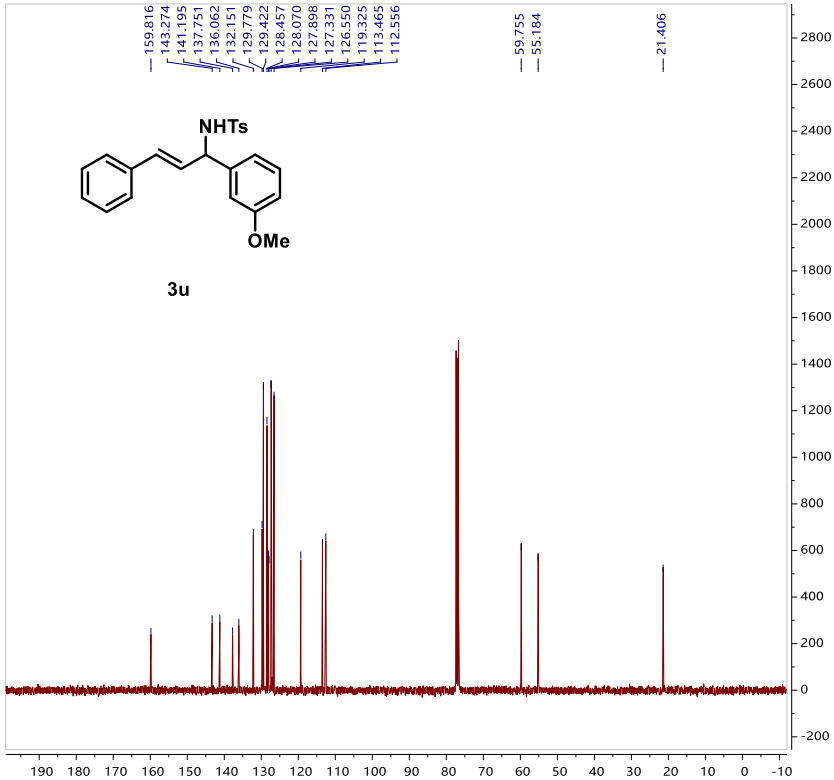
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-61-C13/ 1/ fid
2 Title	fc-4-61-C13/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.6
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	51
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.4999
20 Acquisition Date	2018-05-20T15:21:10
21 Modification Date	2018-05-20T15:21:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1523.3
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



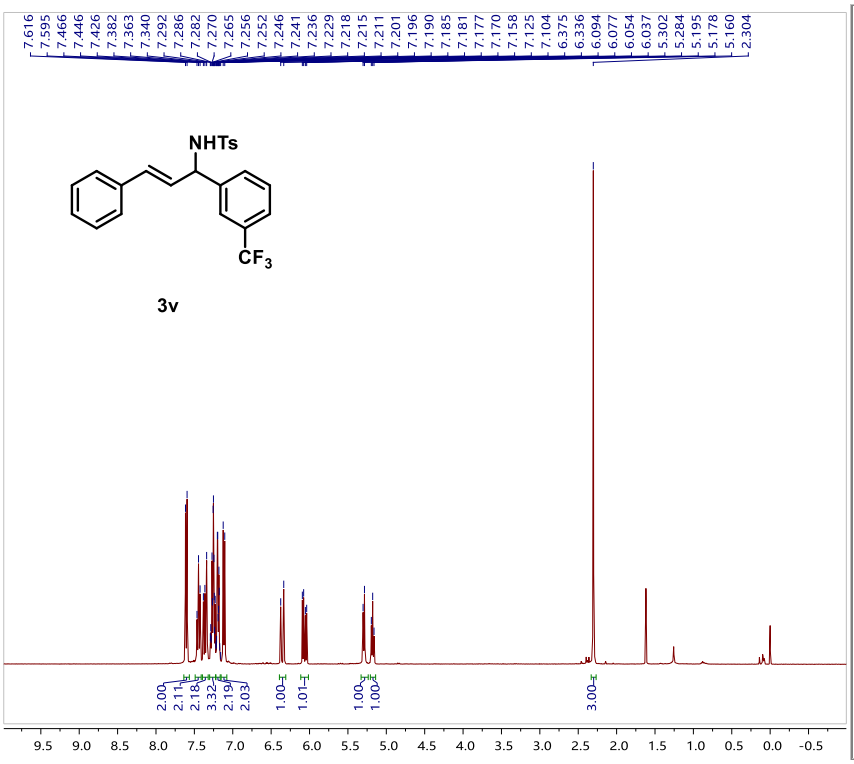
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-61-C13/ 2/ fid
2 Title	fc-4-61-C13/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.6
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	677
15 Receiver Gain	57
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-05-20T15:39:34
21 Modification Date	2018-05-20T15:39:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



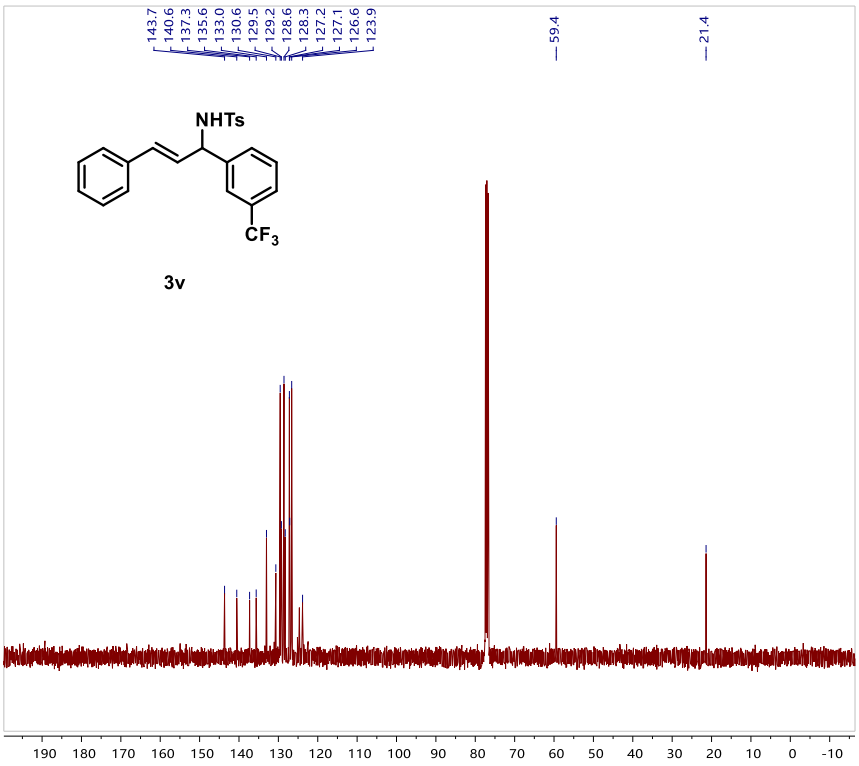
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-117-1-0810/ 1/ fid
2	Title	fc-4-117-1-0810/ 1
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	297.9
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14	Number of Scans	8
15	Receiver Gain	119
16	Relaxation Delay	1.0000
17	Pulse Width	15.0000
18	Presaturation Frequency	
19	Acquisition Time	2.4999
20	Acquisition Date	2018-08-10T18:07:34
21	Modification Date	2018-08-10T18:07:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8012.8
25	Lowest Frequency	-1552.6
26	Nucleus	1H
27	Acquired Size	20031
28	Spectral Size	65536



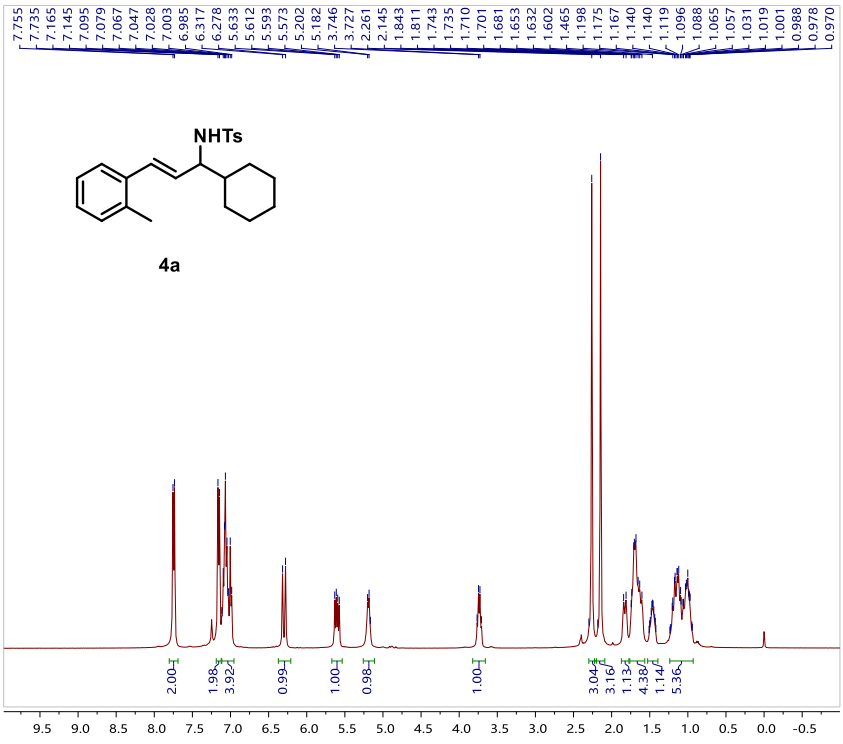
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-117-1-0810/ 2/ fid
2	Title	fc-4-117-1-0810/ 2
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	299.1
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14	Number of Scans	817
15	Receiver Gain	77
16	Relaxation Delay	1.0000
17	Pulse Width	9.8000
18	Presaturation Frequency	
19	Acquisition Time	0.4588
20	Acquisition Date	2018-08-10T18:30:51
21	Modification Date	2018-08-10T18:30:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	35714.3
25	Lowest Frequency	-7796.8
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



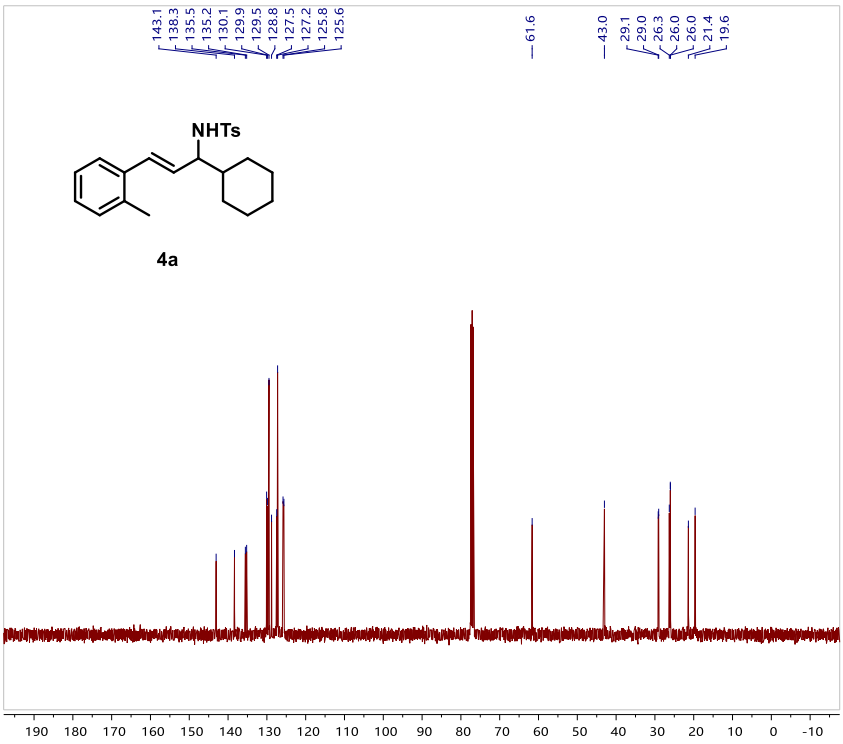
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ FC-4-117-4-05201/ 1/ fid
2 Title	FC-4-117-4-05201.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	2430.2
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	8
15 Receiver Gain	114
16 Relaxation Delay	1.0000
17 Pulse Width	13.5000
18 Presaturation Frequency	
19 Acquisition Time	1.9923
20 Acquisition Date	2018-05-19T17:30:00
21 Modification Date	2018-05-19T17:30:00
22 Class	
23 Spectrometer Frequency	400.23
24 Spectral Width	8223.7
25 Lowest Frequency	-1640.3
26 Nucleus	1H
27 Acquired Size	16384
28 Spectral Size	65536



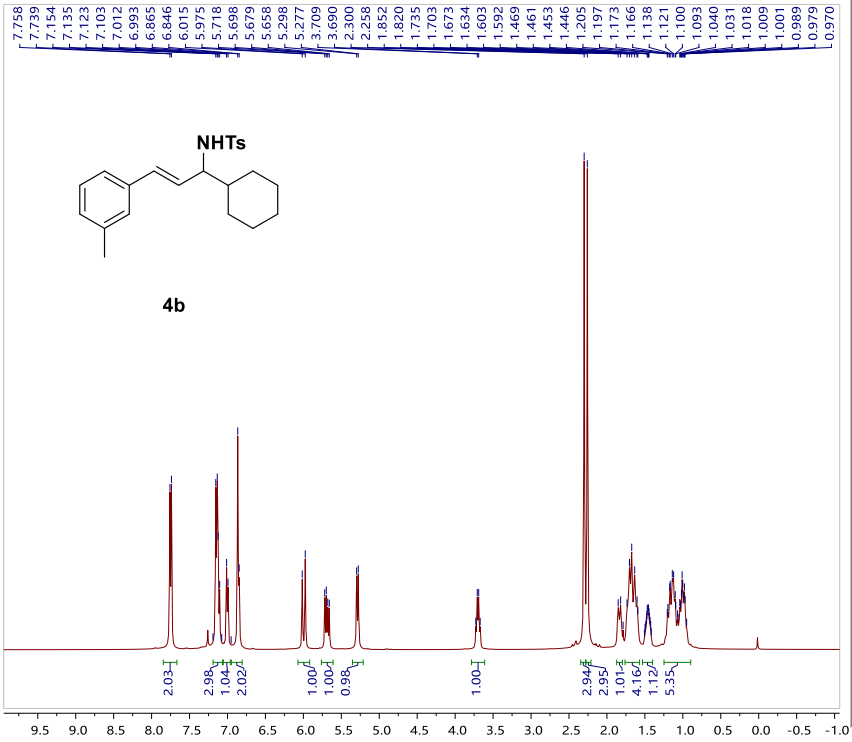
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ FC-4-117-4-05201/ 3/ fid
2 Title	FC-4-117-4-05201/ 3
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zgdc30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	191
15 Receiver Gain	29
16 Relaxation Delay	1.0000
17 Pulse Width	9.4000
18 Presaturation Frequency	
19 Acquisition Time	1.1010
20 Acquisition Date	2018-05-19T22:11:58
21 Modification Date	2018-05-19T22:15:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4820.6
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



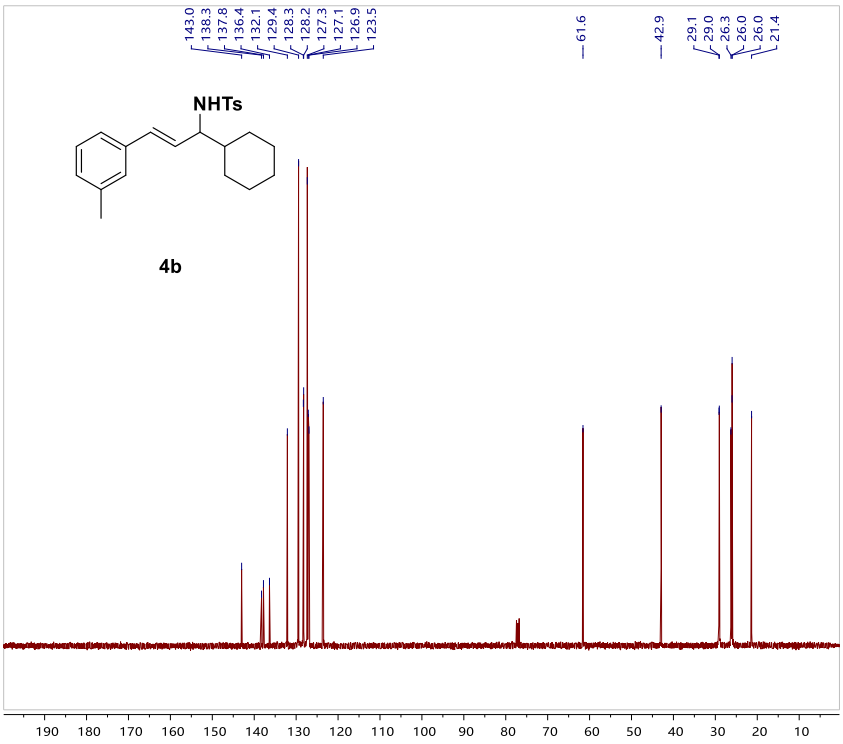
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3b-0304/ 1/ fid
2 Title	fc-4-71-3b-0304/ 1
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	293.8
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	32
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-04T20:52:26
21 Modification Date	2018-03-04T20:52:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1535.4
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



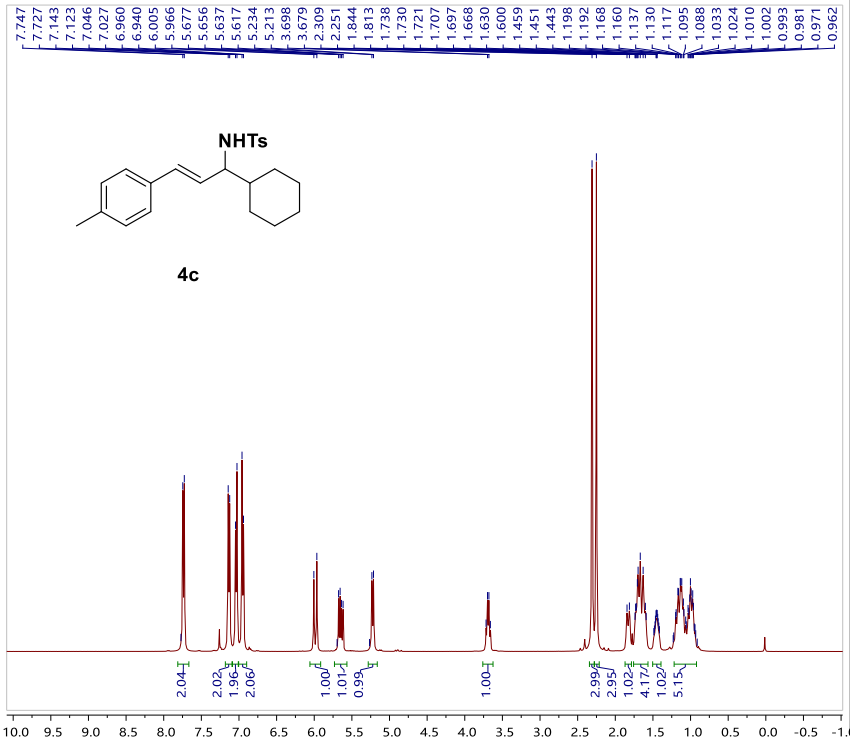
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3b-0304/ 2/ fid
2 Title	fc-4-71-3b-0304/ 2
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.4
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	153
15 Receiver Gain	111
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-03-04T20:55:05
21 Modification Date	2018-03-04T20:57:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10320.1
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



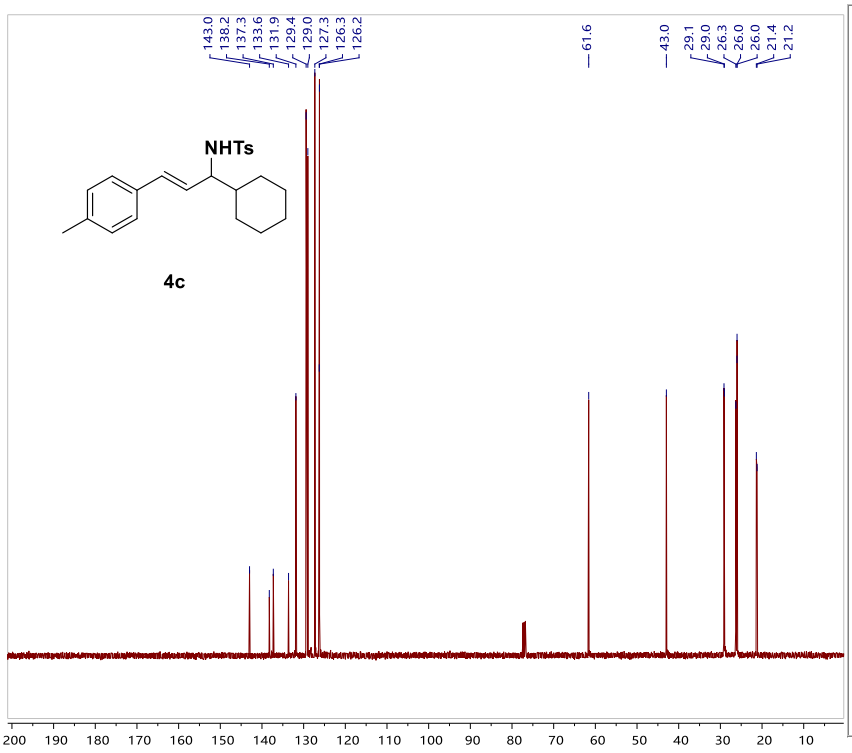
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3c-0304/ 1/ fid
2 Title	fc-4-71-3c-0304/ 1
3 Comment	H1
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.1
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	8
15 Receiver Gain	20
16 Relaxation Delay	2.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-04T20:56:20
21 Modification Date	2018-03-04T20:56:00
22 Class	
23 Spectrometer Frequency	400.15
24 Spectral Width	8012.8
25 Lowest Frequency	-2141.1
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



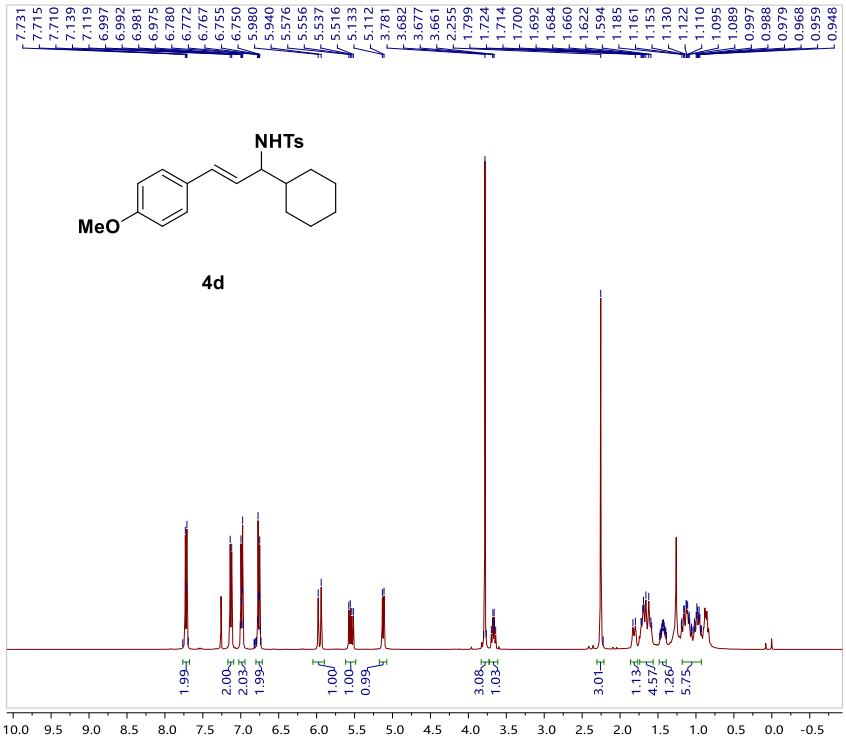
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3c-0304/ 2/ fid
2 Title	fc-4-71-3c-0304/ 2
3 Comment	1D 13C with H decoupling
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.7
11 Pulse Sequence	zgdc
12 Experiment	1D
13 Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	113
15 Receiver Gain	201
16 Relaxation Delay	1.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	0.7427
20 Acquisition Date	2018-03-04T21:01:09
21 Modification Date	2018-03-04T21:01:00
22 Class	
23 Spectrometer Frequency	100.63
24 Spectral Width	22058.8
25 Lowest Frequency	38.5
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



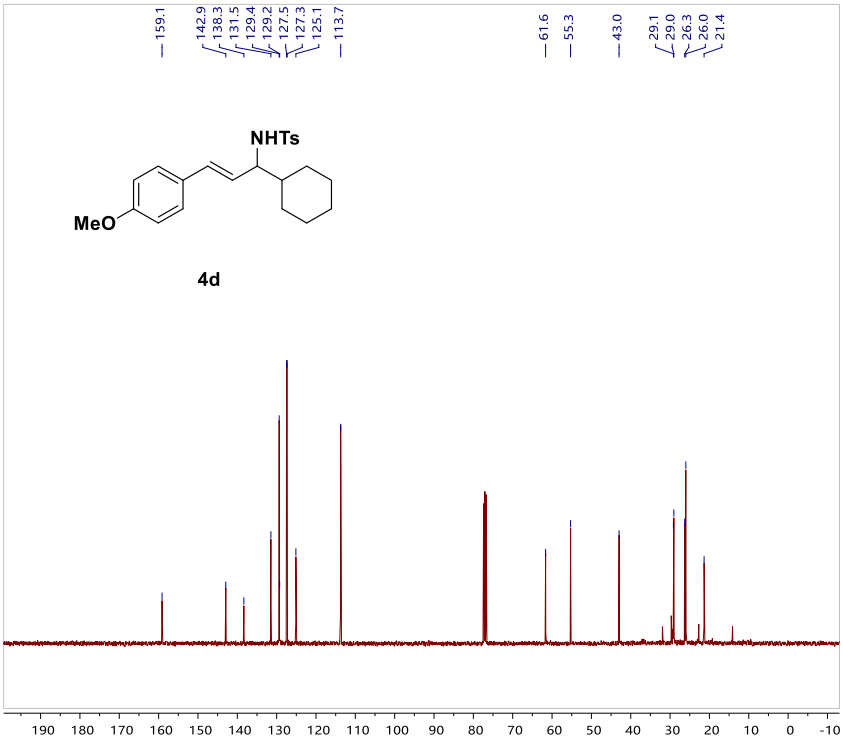
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3d-0304/ 1/ fid
2 Title	fc-4-71-3d-0304/ 1
3 Comment	HI
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.0
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	8
15 Receiver Gain	20
16 Relaxation Delay	2.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-04T21:05:13
21 Modification Date	2018-03-04T21:05:00
22 Class	
23 Spectrometer Frequency	400.15
24 Spectral Width	8012.8
25 Lowest Frequency	-2140.3
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



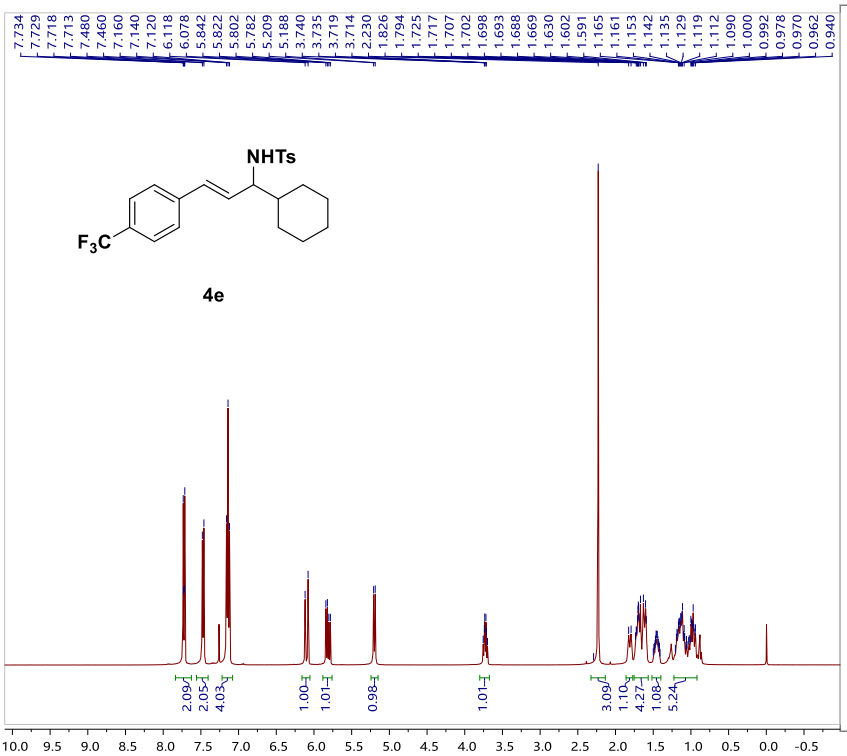
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ fc-4-71-3d-0304/ 2/ fid
2 Title	fc-4-71-3d-0304/ 2
3 Comment	1D 13C with H decoupling
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.6
11 Pulse Sequence	zgdc
12 Experiment	1D
13 Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	132
15 Receiver Gain	201
16 Relaxation Delay	1.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	0.7427
20 Acquisition Date	2018-03-04T21:10:29
21 Modification Date	2018-03-04T21:10:00
22 Class	
23 Spectrometer Frequency	100.63
24 Spectral Width	22058.8
25 Lowest Frequency	38.5
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



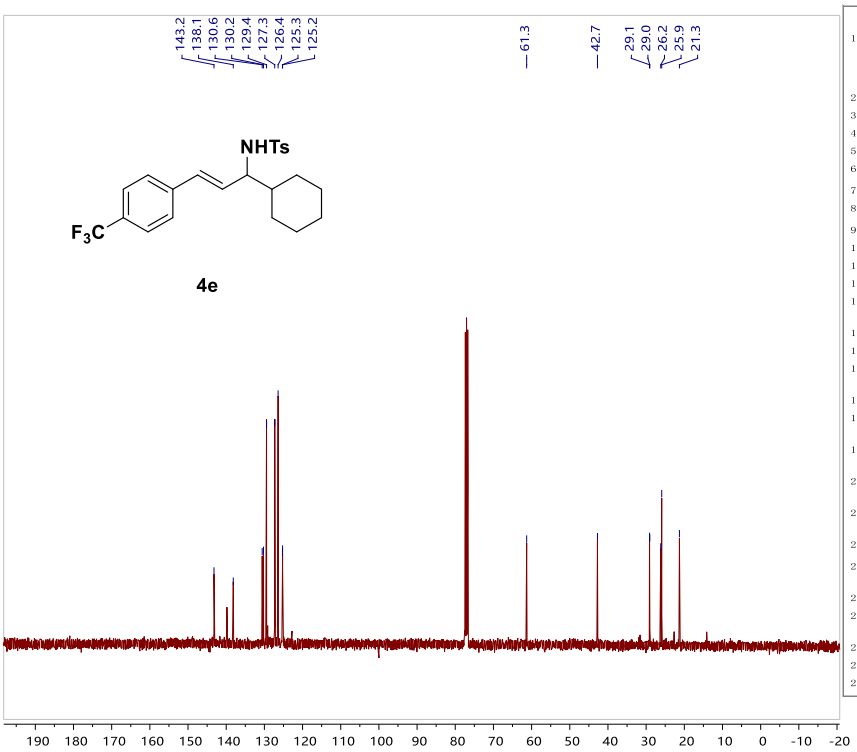
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3e-H/ 1/ fid
2 Title	fc-4-71-3e-H/ 1
3 Comment	H1
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.4
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	8
15 Receiver Gain	20
16 Relaxation Delay	2.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-01T16:24:34
21 Modification Date	2018-03-01T16:24:00
22 Class	
23 Spectrometer Frequency	400.15
24 Spectral Width	8012.8
25 Lowest Frequency	-2136.2
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



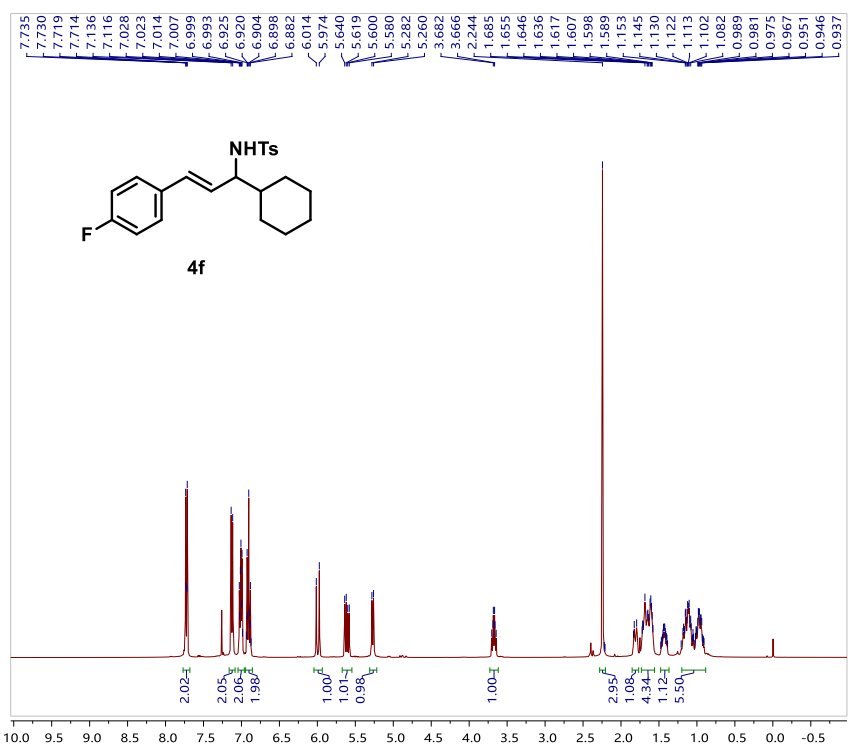
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-68-3e/ 2/ fid
2 Title	fc-4-68-3e.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.3
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	249
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-02-28T22:23:00
21 Modification Date	2018-02-28T22:27:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7795.9
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



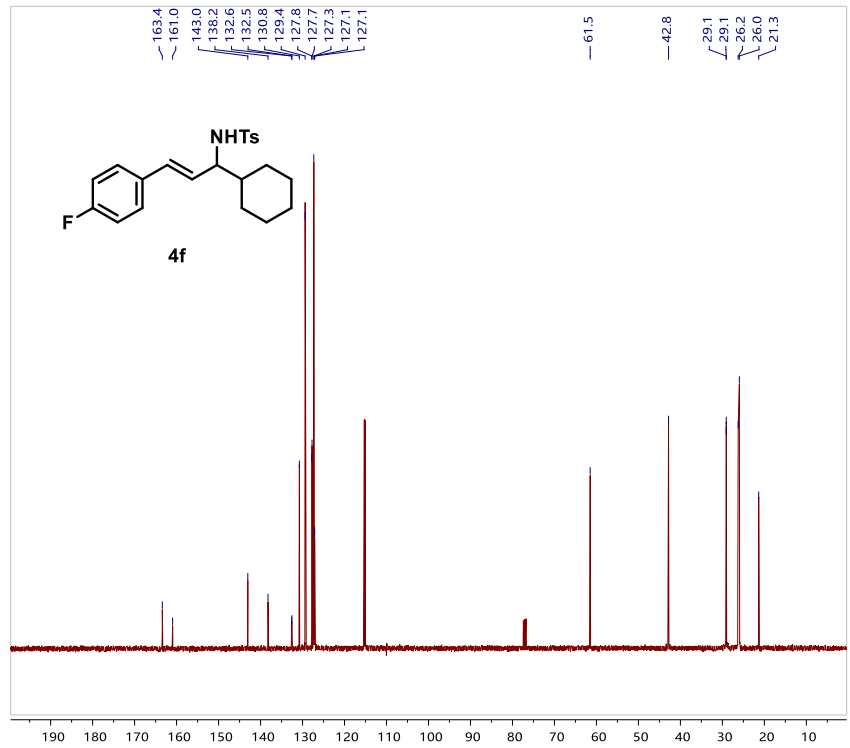
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-72-3f-rec/ 1/ fid
2 Title	fc-4-72-3f-rec/ 1
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.6
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	63
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-09T22:14:17
21 Modification Date	2018-03-09T22:14:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1544.2
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



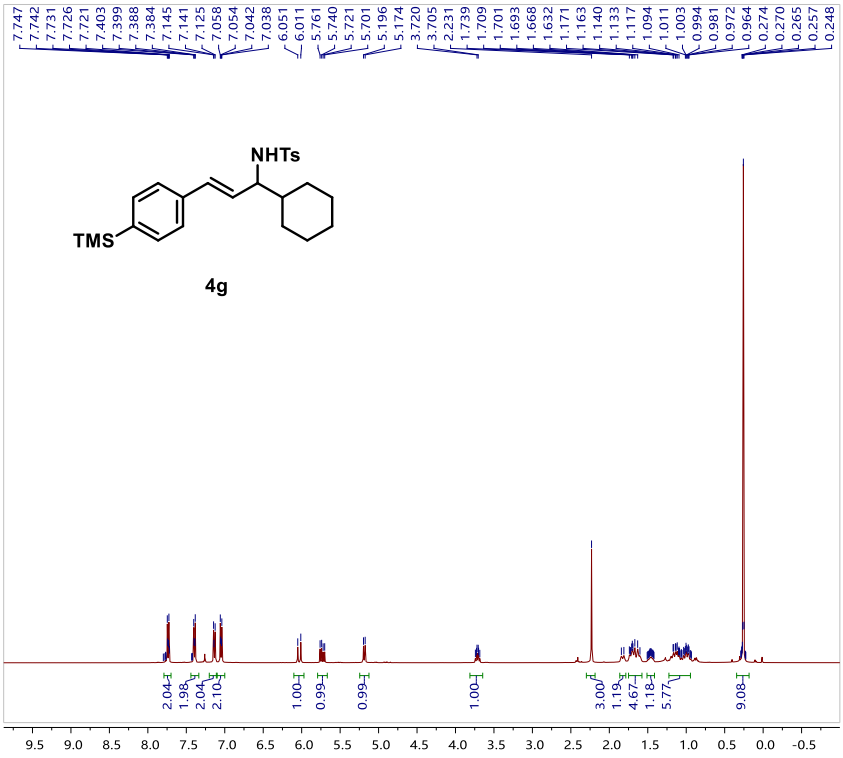
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18备份/ 谱图/ fc-4-72-3f-rec/ 2/ fid
2 Title	fc-4-72-3f-rec/ 2
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.4
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	223
15 Receiver Gain	78
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-03-09T22:22:46
21 Modification Date	2018-03-09T22:22:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10320.1
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



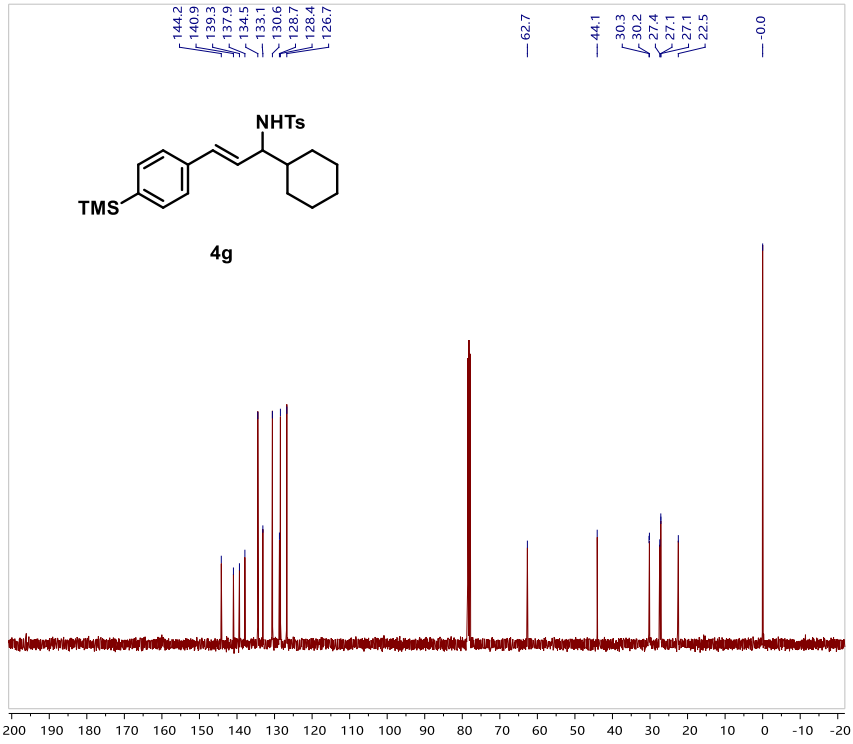
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3n-0304/ 1/ fid
2	Title	fc-4-71-3n-0304/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	293.9
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	26
16	Relaxation Delay	2.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-03-04T21:15:07
21	Modification Date	2018-03-04T21:15:00
22	Class	
23	Spectrometer Frequency	400.15
24	Spectral Width	8012.8
25	Lowest Frequency	-2133.8
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



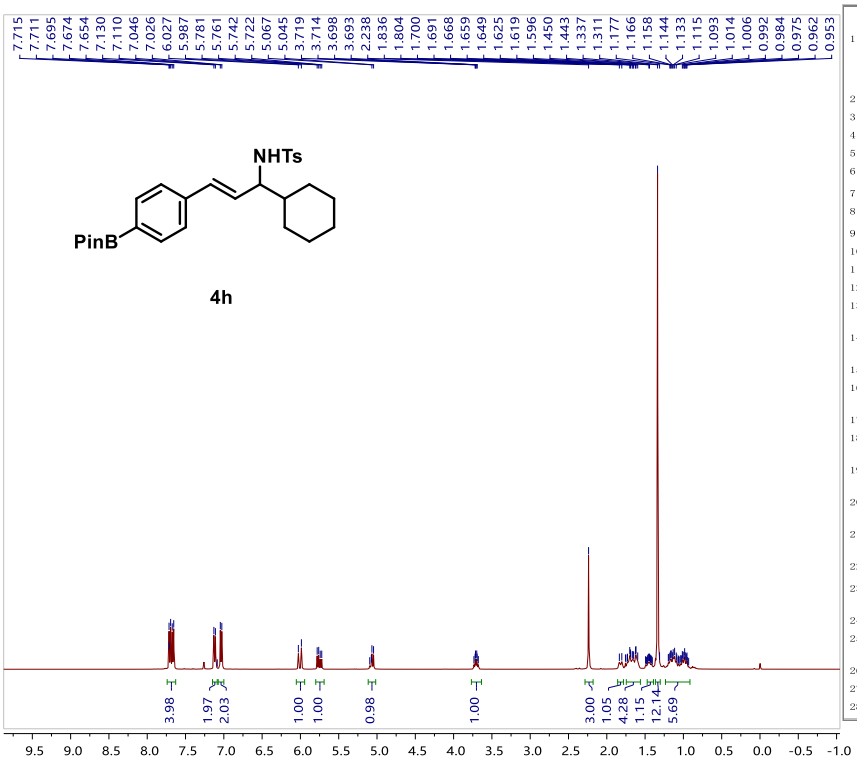
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3n-0304/ 2/ fid
2	Title	fc-4-71-3n-0304/ 2
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.6
11	Pulse Sequence	zgdc
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	149
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.7427
20	Acquisition Date	2018-03-04T21:21:23
21	Modification Date	2018-03-04T21:21:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	22058.8
25	Lowest Frequency	38.5
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



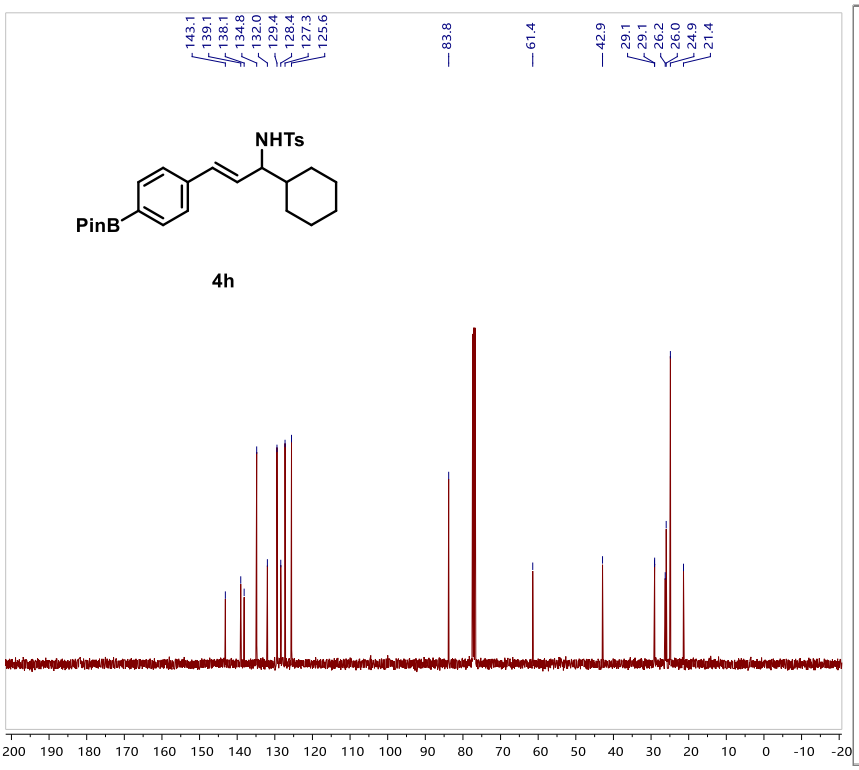
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-76-3g/ 1/ fid
2 Title	fc-4-76-3g/ 1
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.6
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	32
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-09T22:34:44
21 Modification Date	2018-03-09T22:34:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1535.4
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



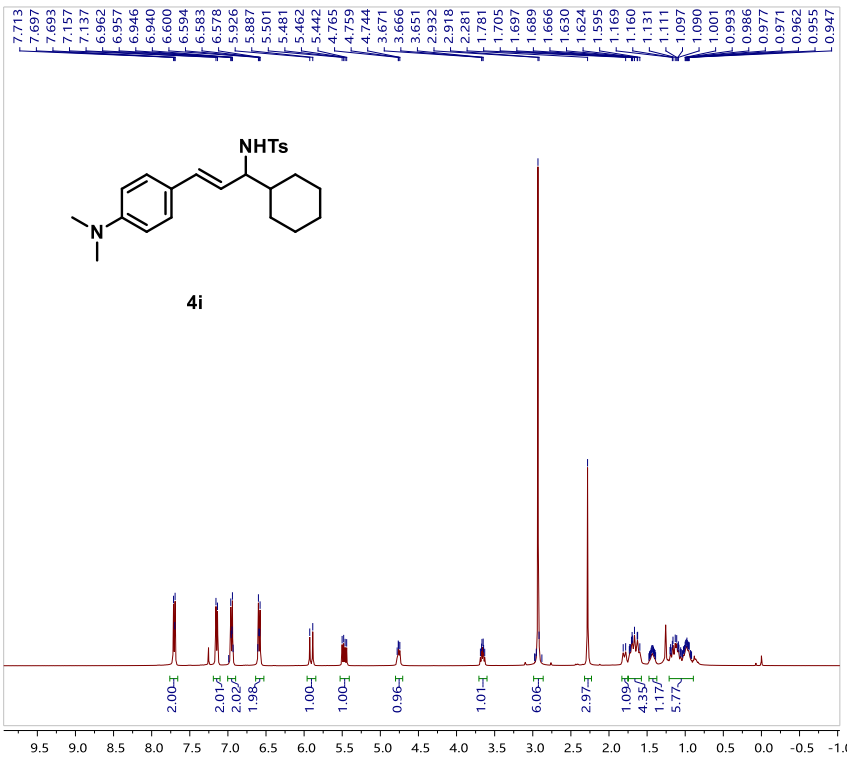
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-76-3g/ 2/ fid
2 Title	fc-4-76-3g/ 2
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.3
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	116
15 Receiver Gain	174
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-03-09T22:39:12
21 Modification Date	2018-03-09T22:39:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10206.4
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



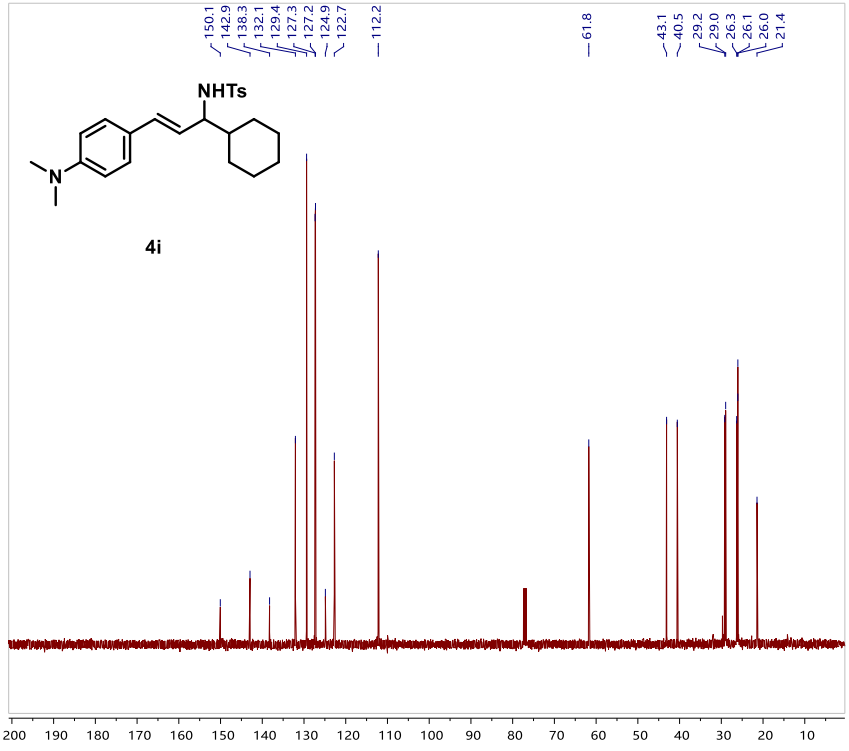
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-76-3h/ 3/ fid
2 Title	fc-4-76-3h/ 3
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.1
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	32
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-11T21:11:01
21 Modification Date	2018-03-11T21:11:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1544.4
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



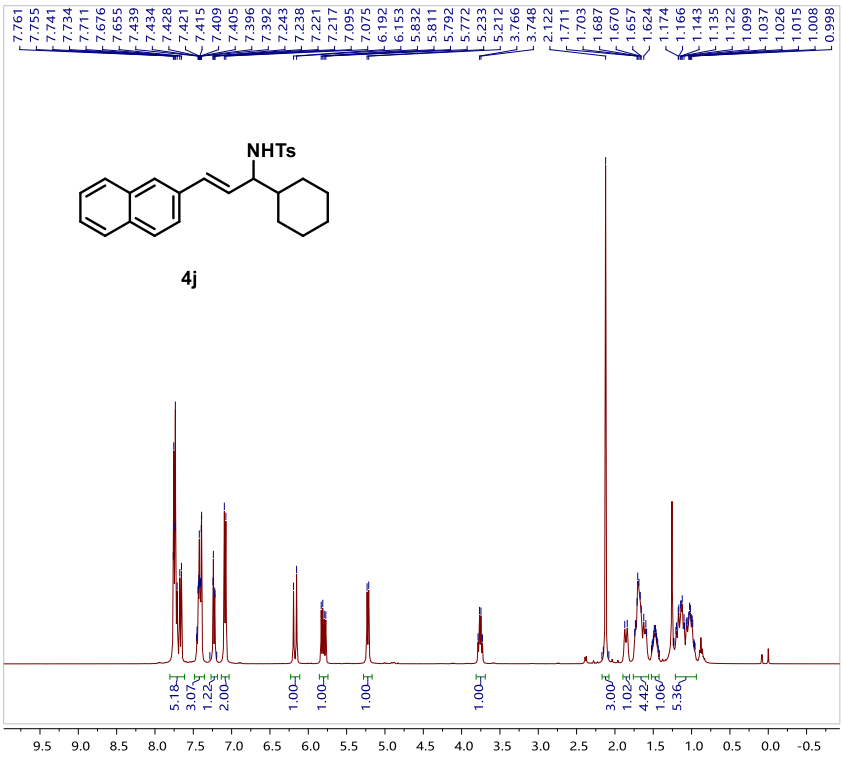
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-76-3h/ 4/ fid
2 Title	fc-4-76-3h/ 4
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.8
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	187
15 Receiver Gain	194
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-03-11T21:16:04
21 Modification Date	2018-03-11T21:17:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10320.1
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



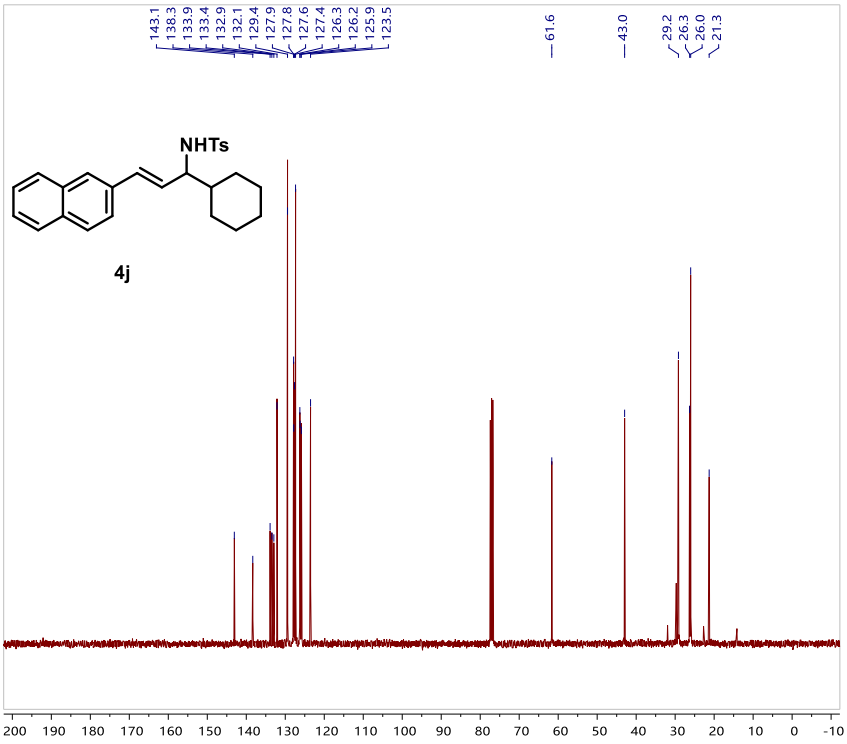
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3i/ 1/ fid
2 Title	fc-4-71-3i/ 1
3 Comment	H1
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	294.5
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	Z116098_0688 (PABBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	8
15 Receiver Gain	35
16 Relaxation Delay	2.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-03-01T16:39:52
21 Modification Date	2018-03-01T16:39:00
22 Class	
23 Spectrometer Frequency	400.15
24 Spectral Width	8012.8
25 Lowest Frequency	-2137.7
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



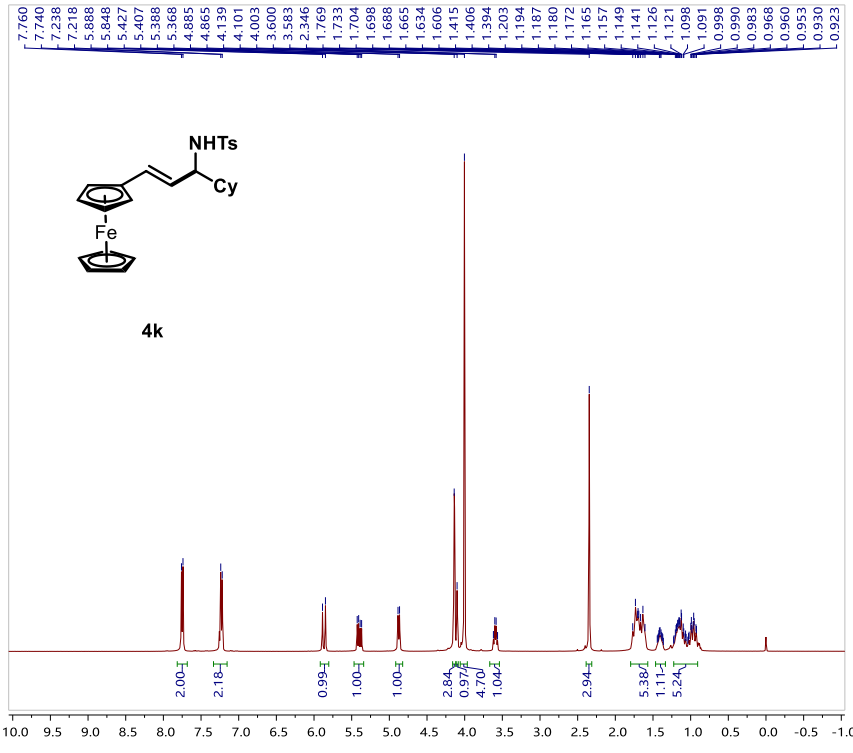
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-71-3i/ 2/ fid
2 Title	fc-4-71-3i/ 2
3 Comment	1D 13C with H decoupling
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	295.0
11 Pulse Sequence	zgdc
12 Experiment	1D
13 Probe	Z116098_0688 (PABBO 400S1 BBF-H-D-05 Z SP)
14 Number of Scans	239
15 Receiver Gain	201
16 Relaxation Delay	1.0000
17 Pulse Width	10.0000
18 Presaturation Frequency	
19 Acquisition Time	0.7427
20 Acquisition Date	2018-03-01T16:49:06
21 Modification Date	2018-03-01T16:49:00
22 Class	
23 Spectrometer Frequency	100.63
24 Spectral Width	22058.8
25 Lowest Frequency	38.5
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



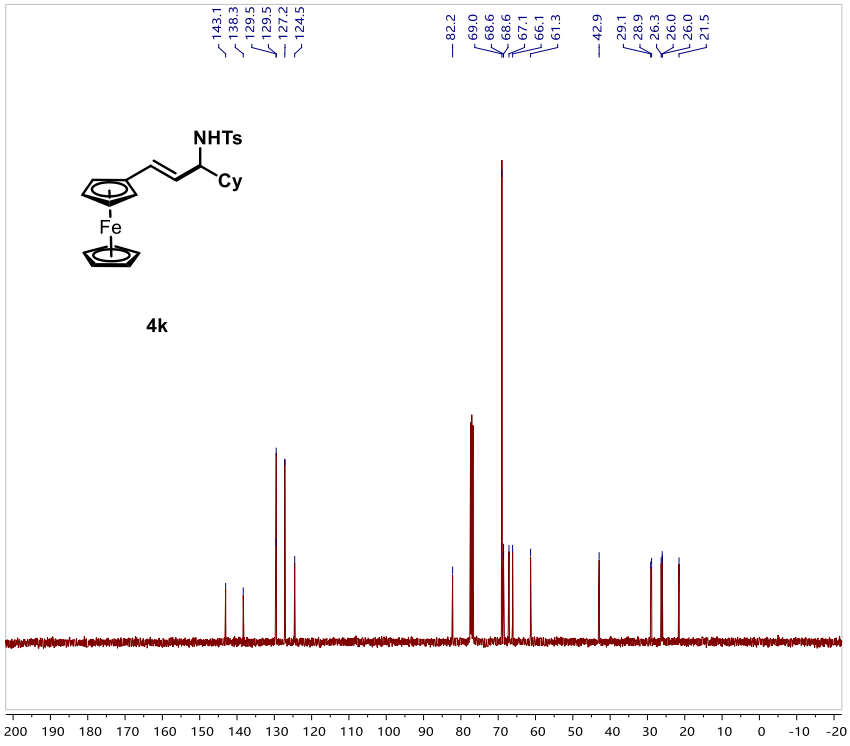
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-68-3j/ 1/ fid
2 Title	fc-4-68-3j.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.4
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	8
15 Receiver Gain	51
16 Relaxation Delay	1.0000
17 Pulse Width	13.7000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-02-28T22:31:00
21 Modification Date	2018-02-28T22:31:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8223.7
25 Lowest Frequency	-1659.4
26 Nucleus	1H
27 Acquired Size	16446
28 Spectral Size	65536



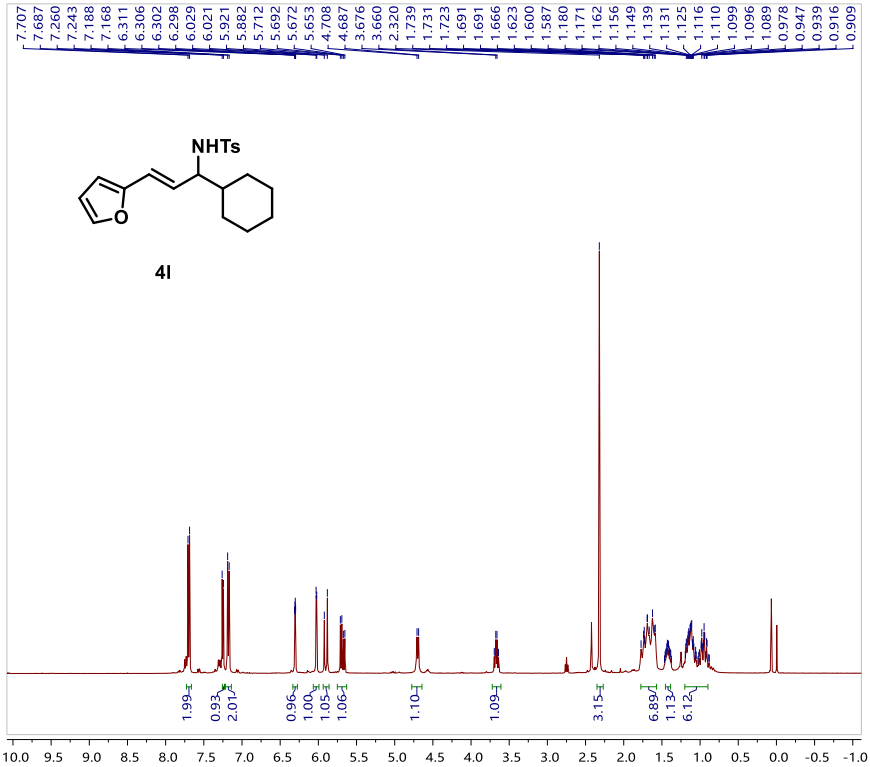
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-68-3j/ 2/ fid
2 Title	fc-4-68-3j.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.8
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	508
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-02-28T22:34:00
21 Modification Date	2018-02-28T22:45:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7795.9
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



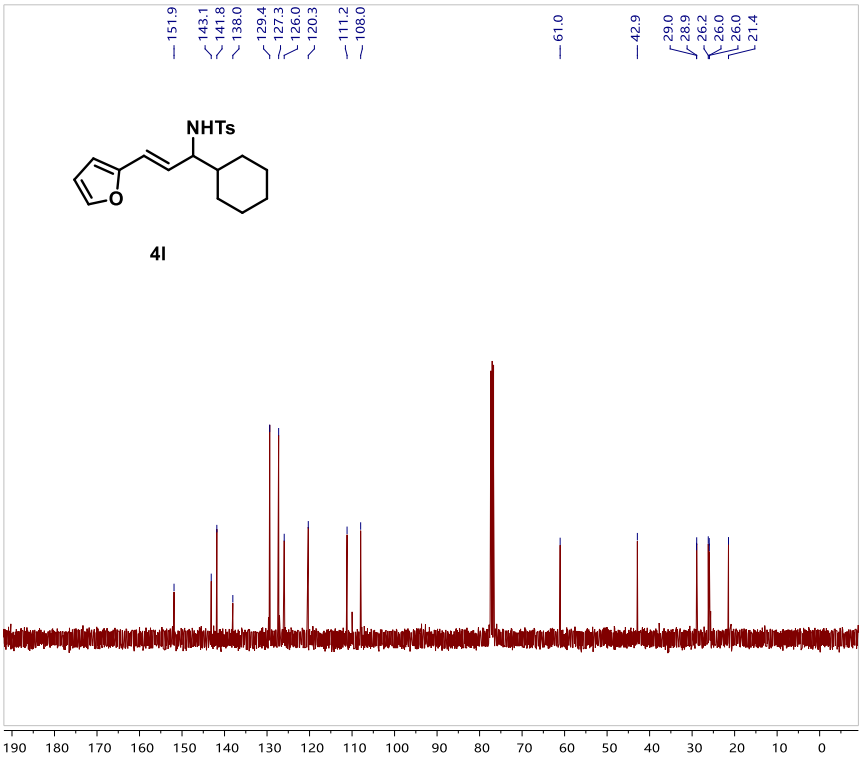
Parameter		Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-72-3k-rec/ 1/ fid
2	Title	fc-4-72-3k-rec/ 1
3	Comment	test
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.5
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14	Number of Scans	8
15	Receiver Gain	50
16	Relaxation Delay	1.0000
17	Pulse Width	9.8000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-03-09T22:04:25
21	Modification Date	2018-03-09T22:04:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8012.8
25	Lowest Frequency	-1546.6
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



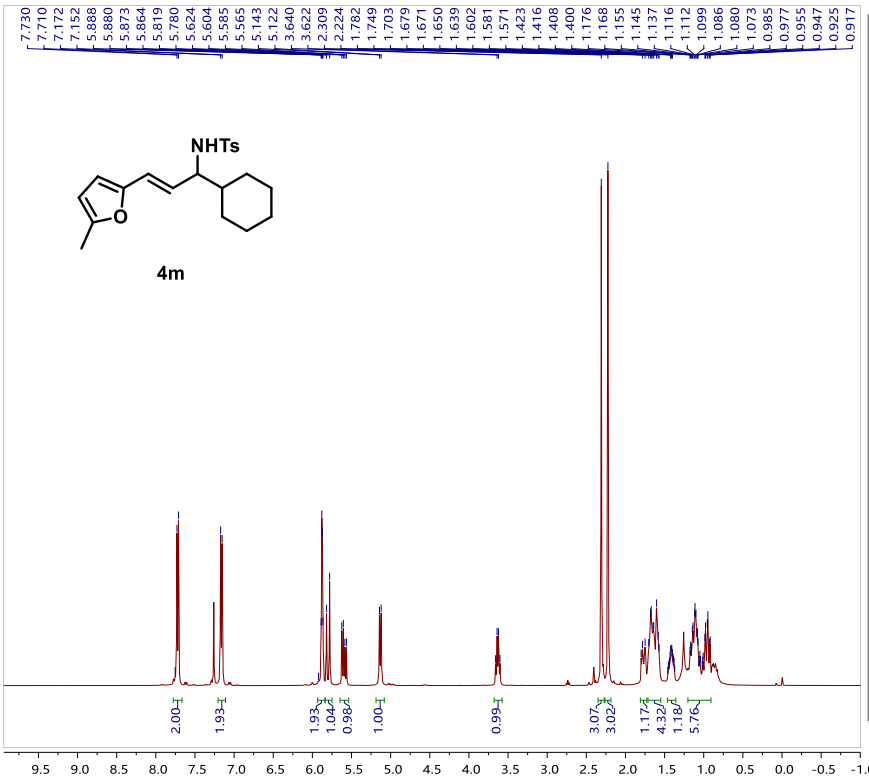
Parameter		Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-72-3k-rec/ 2/ fid
2	Title	fc-4-72-3k-rec/ 2
3	Comment	test
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	295.1
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14	Number of Scans	154
15	Receiver Gain	111
16	Relaxation Delay	1.0000
17	Pulse Width	9.8000
18	Presaturation Frequency	
19	Acquisition Time	0.8039
20	Acquisition Date	2018-03-09T22:07:47
21	Modification Date	2018-03-09T22:10:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	40760.9
25	Lowest Frequency	-10320.1
26	Nucleus	13C
27	Acquired Size	32768
28	Spectral Size	65536



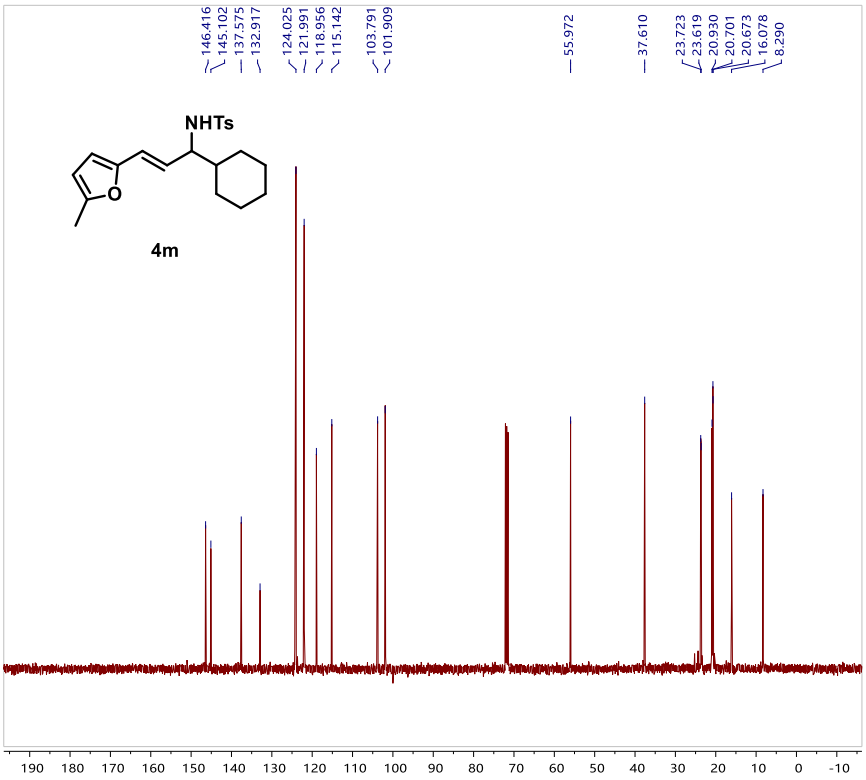
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-106-1/ 1/ fid
2	Title	fc-4-106-1/ 1
3	Comment	test
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	294.2
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14	Number of Scans	8
15	Receiver Gain	97
16	Relaxation Delay	1.0000
17	Pulse Width	9.8000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-04-20T08:42:04
21	Modification Date	2018-04-20T08:42:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8012.8
25	Lowest Frequency	-1535.4
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



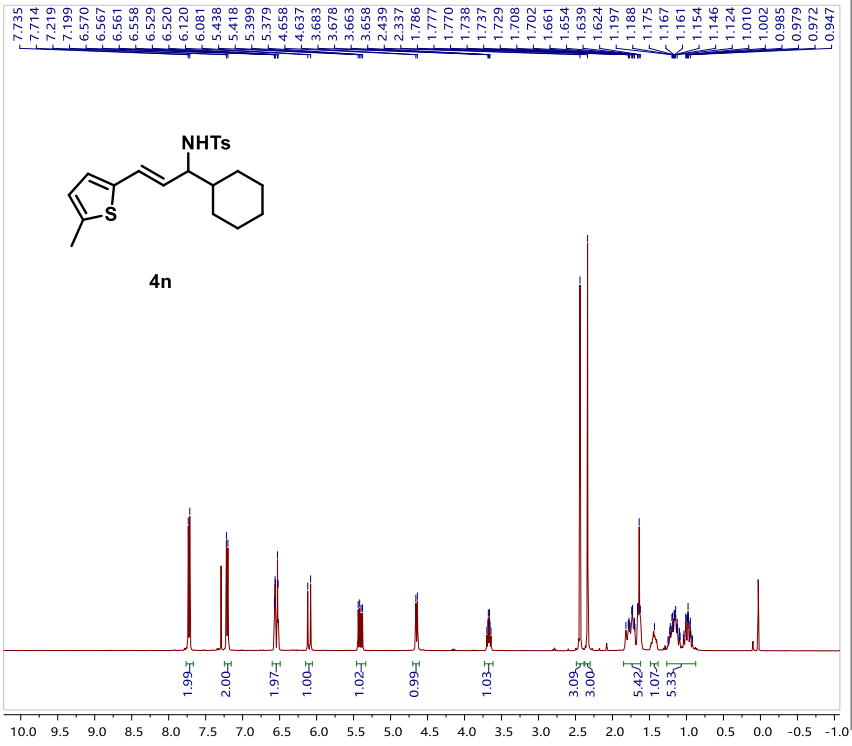
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-106-1/ 3/ fid
2	Title	fc-4-106-1/ 3
3	Comment	1D 13C with H decoupling
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	296.0
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	152
15	Receiver Gain	201
16	Relaxation Delay	1.0000
17	Pulse Width	10.0000
18	Presaturation Frequency	
19	Acquisition Time	0.8999
20	Acquisition Date	2018-04-20T08:57:09
21	Modification Date	2018-04-20T08:57:00
22	Class	
23	Spectrometer Frequency	100.63
24	Spectral Width	29761.9
25	Lowest Frequency	-3813.0
26	Nucleus	13C
27	Acquired Size	26784
28	Spectral Size	65536



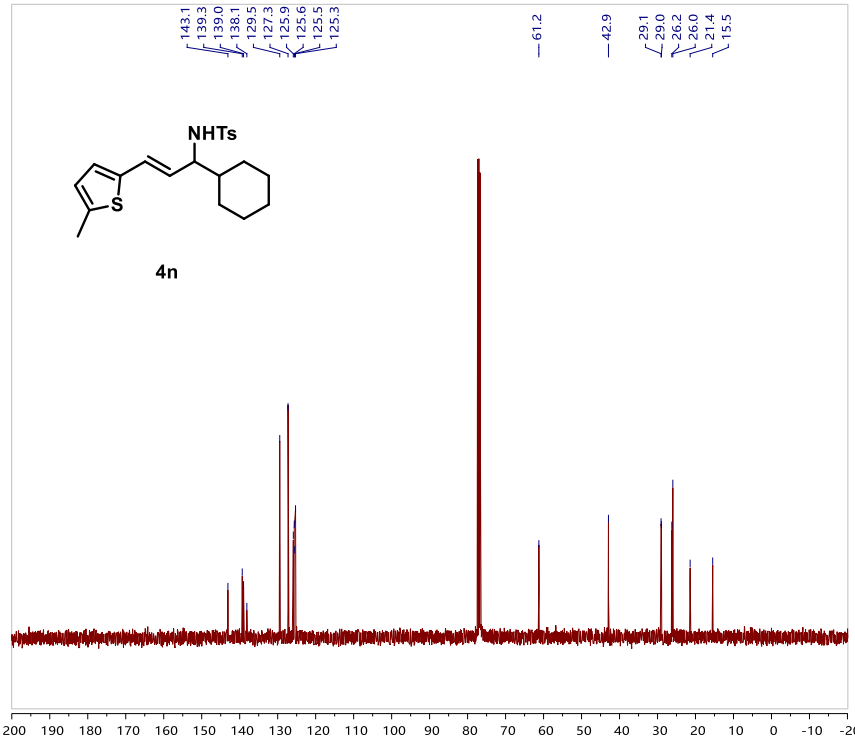
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-31-0604/ 4/ fid
2 Title	fc-31-0604.4.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CD3CN_SPE
10 Temperature	298.3
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	8
15 Receiver Gain	40
16 Relaxation Delay	1.0000
17 Pulse Width	13.7000
18 Presaturation Frequency	
19 Acquisition Time	1.0263
20 Acquisition Date	2018-06-04T22:53:00
21 Modification Date	2018-06-04T22:53:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	16025.6
25 Lowest Frequency	-5541.9
26 Nucleus	1H
27 Acquired Size	16446
28 Spectral Size	131072



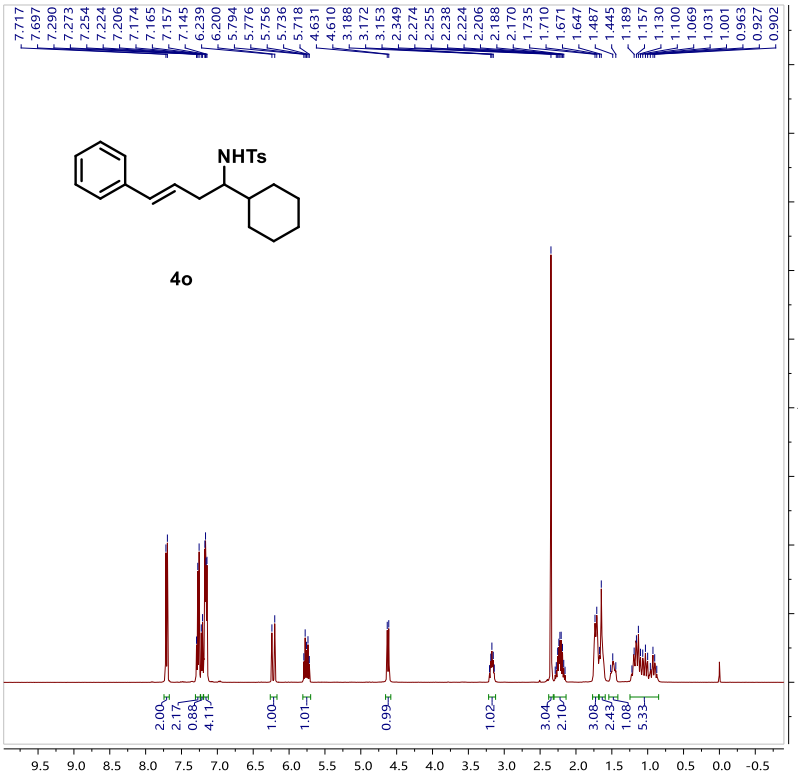
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-31-0604/ 2/ fid
2 Title	fc-31-0604.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CD3CN_SPE
10 Temperature	298.5
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14 Number of Scans	132
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-06-04T22:51:00
21 Modification Date	2018-06-04T22:51:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7795.9
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



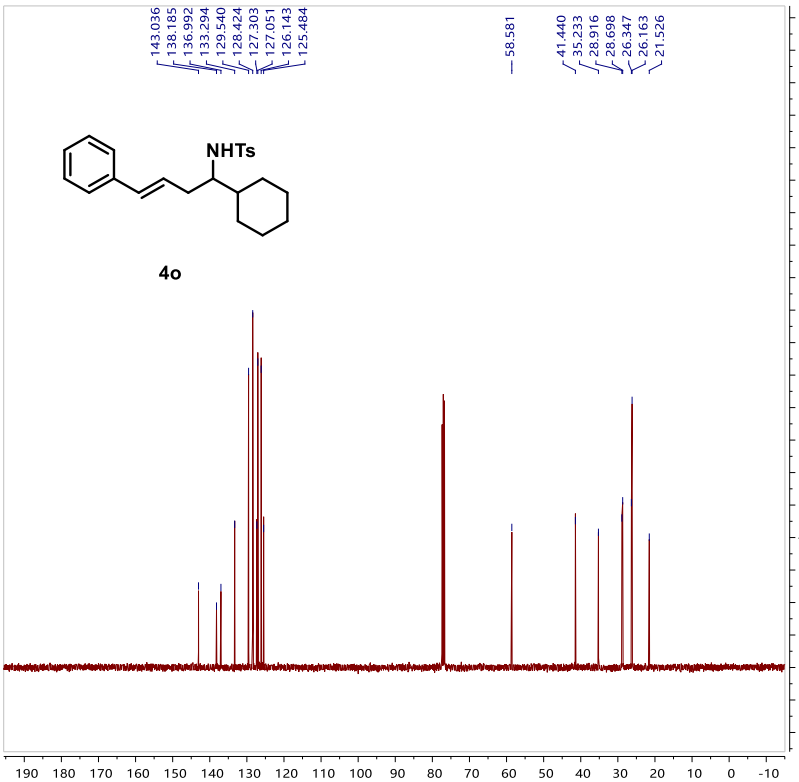
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-106-2/ 1/ fid
2 Title	fc-4-106-2.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-556.1
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	8
15 Receiver Gain	128
16 Relaxation Delay	1.0000
17 Pulse Width	13.5000
18 Presaturation Frequency	
19 Acquisition Time	1.9923
20 Acquisition Date	2018-04-19T21:45:00
21 Modification Date	2018-04-19T21:45:00
22 Class	
23 Spectrometer Frequency	400.23
24 Spectral Width	8223.7
25 Lowest Frequency	-1640.3
26 Nucleus	1H
27 Acquired Size	16384
28 Spectral Size	65536



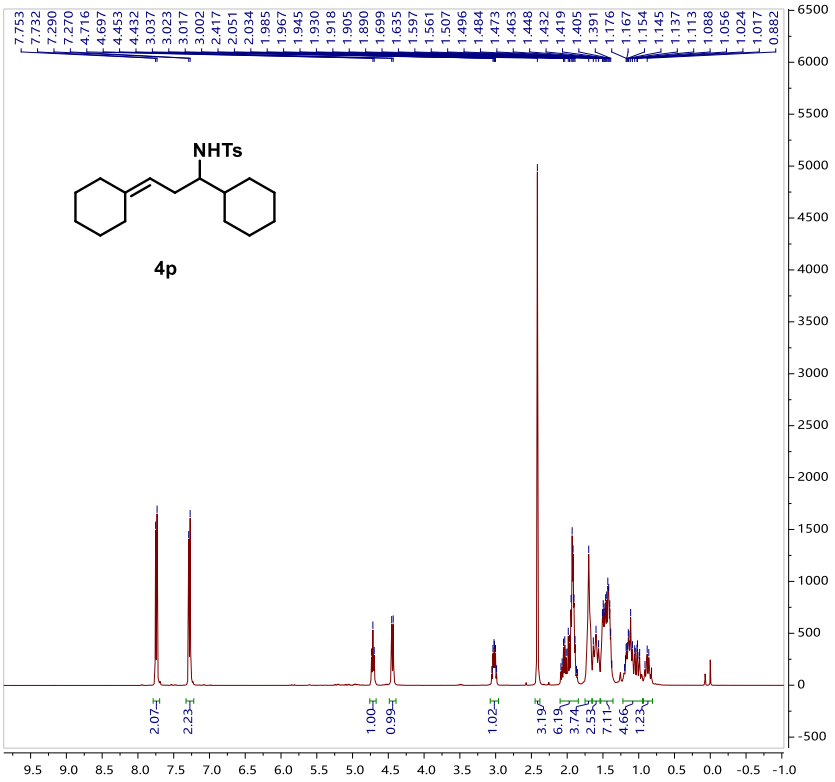
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-106-2/ 2/ fid
2 Title	fc-4-106-2.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-556.0
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	361
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.5506
20 Acquisition Date	2018-04-19T21:53:00
21 Modification Date	2018-04-19T21:56:00
22 Class	
23 Spectrometer Frequency	100.65
24 Spectral Width	29761.9
25 Lowest Frequency	-4817.6
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



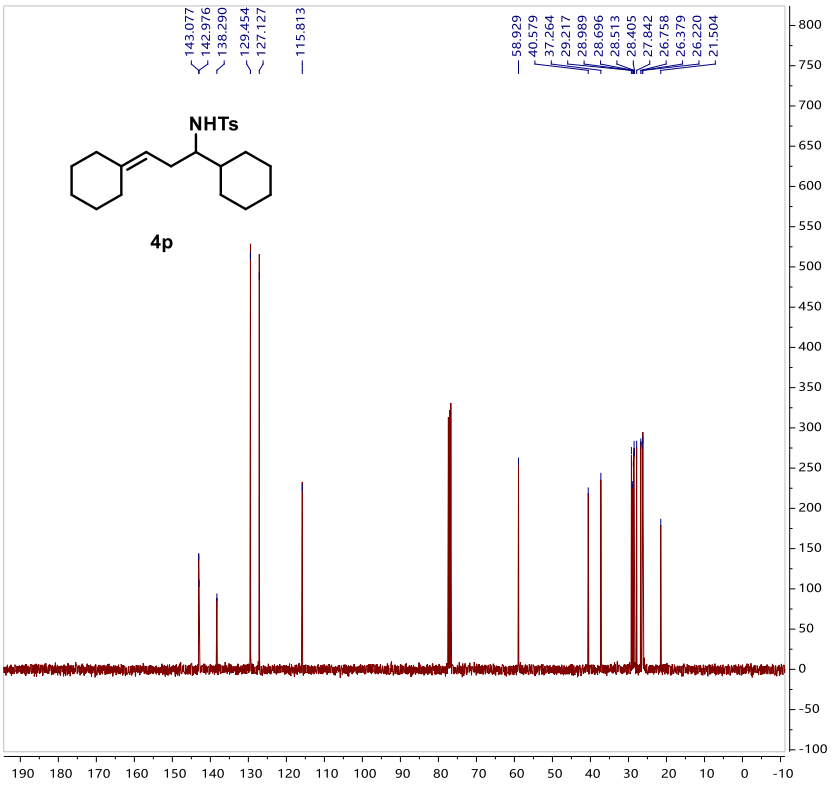
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-2/ 1/ fid
2 Title	fc-4-186-2/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.4
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	77
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.4999
20 Acquisition Date	2018-07-17T17:11:11
21 Modification Date	2018-07-17T17:11:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1517.0
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



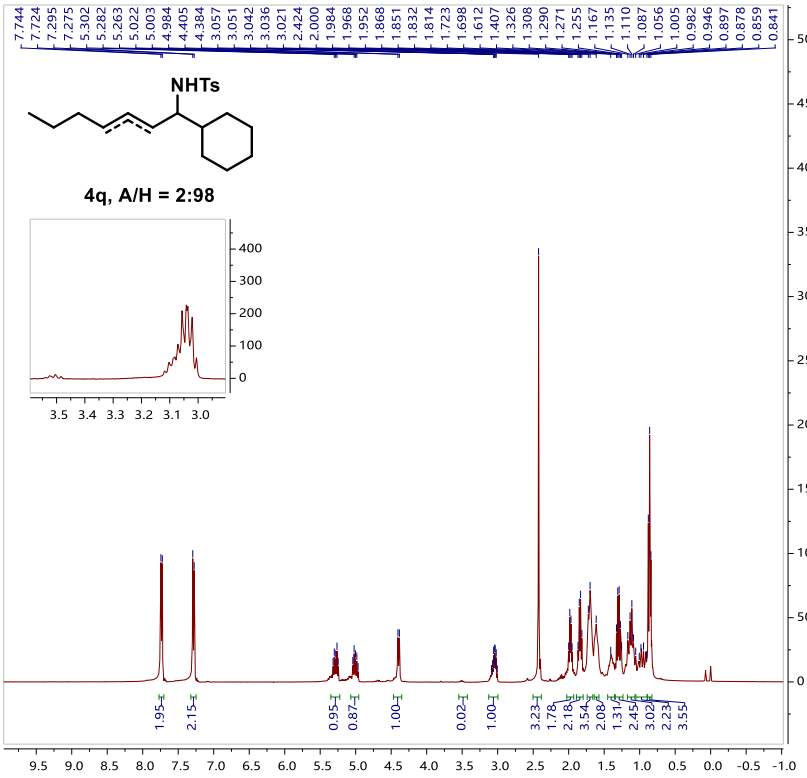
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-2/ 2/ fid
2 Title	fc-4-186-2/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.9
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	385
15 Receiver Gain	71
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-07-17T17:13:26
21 Modification Date	2018-07-17T17:22:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



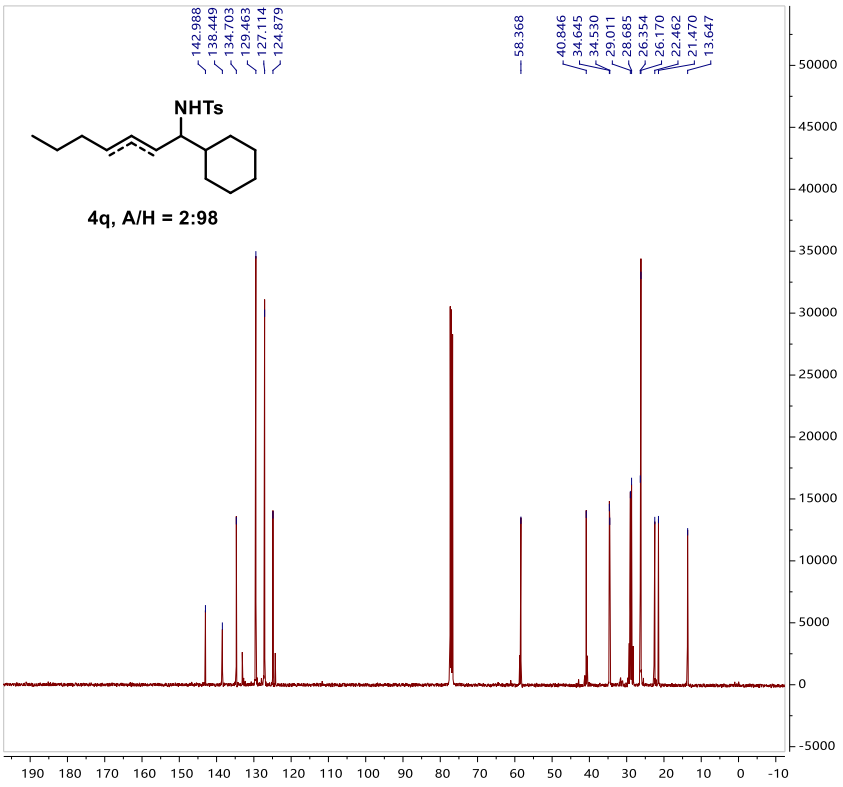
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-1-1/ 1/ fid
2 Title	fc-4-182-1-1/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.3
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	51
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.4999
20 Acquisition Date	2018-07-14T22:54:19
21 Modification Date	2018-07-14T22:54:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1552.7
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



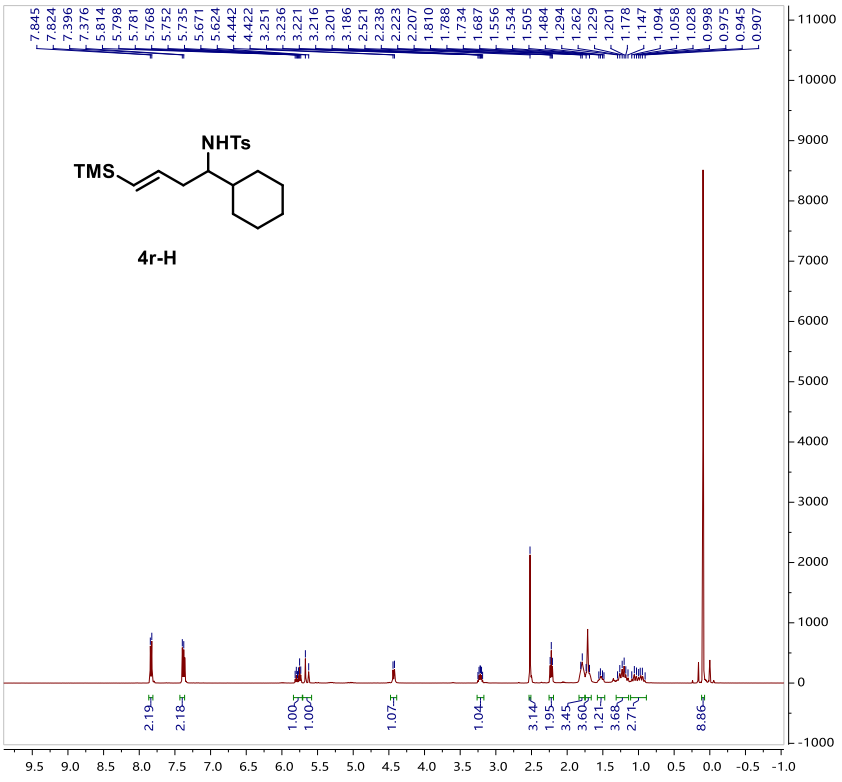
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-1-1/ 2/ fid
2 Title	fc-4-182-1-1/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.1
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	191
15 Receiver Gain	57
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.4588
20 Acquisition Date	2018-07-14T23:00:09
21 Modification Date	2018-07-14T23:00:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



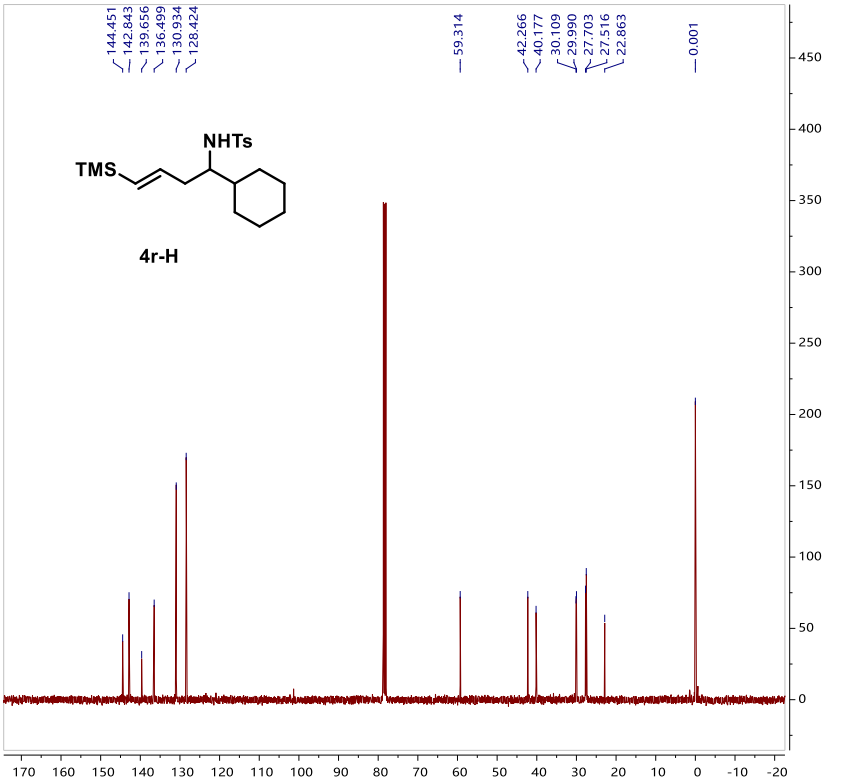
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-4-0722/ 1/ fid
2	Title	fc-4-186-4-0722.1.fid
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	298.4
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14	Number of Scans	8
15	Receiver Gain	90
16	Relaxation Delay	1.0000
17	Pulse Width	13.7000
18	Presaturation Frequency	
19	Acquisition Time	1.9999
20	Acquisition Date	2018-07-22T14:57:00
21	Modification Date	2018-07-22T14:57:00
22	Class	
23	Spectrometer Frequency	400.13
24	Spectral Width	8223.7
25	Lowest Frequency	-1647.9
26	Nucleus	1H
27	Acquired Size	16446
28	Spectral Size	65536



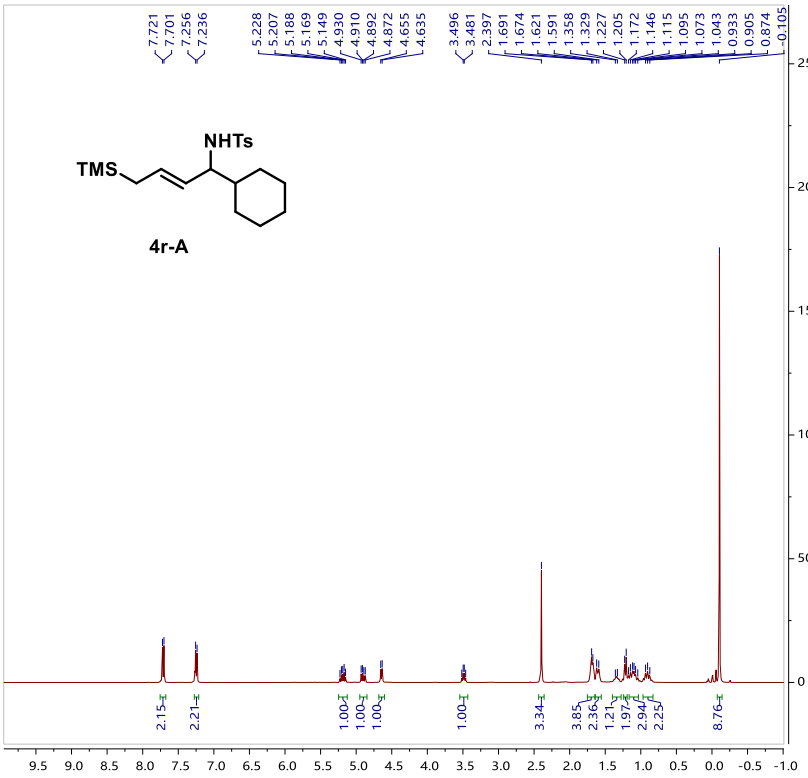
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-186-4-0722/ 2/ fid
2	Title	fc-4-186-4-0722.2.fid
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	299.9
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14	Number of Scans	8177
15	Receiver Gain	203
16	Relaxation Delay	1.0000
17	Pulse Width	12.0000
18	Presaturation Frequency	
19	Acquisition Time	0.4588
20	Acquisition Date	2018-07-22T18:26:00
21	Modification Date	2018-07-22T18:26:00
22	Class	
23	Spectrometer Frequency	100.62
24	Spectral Width	35714.3
25	Lowest Frequency	-7795.9
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



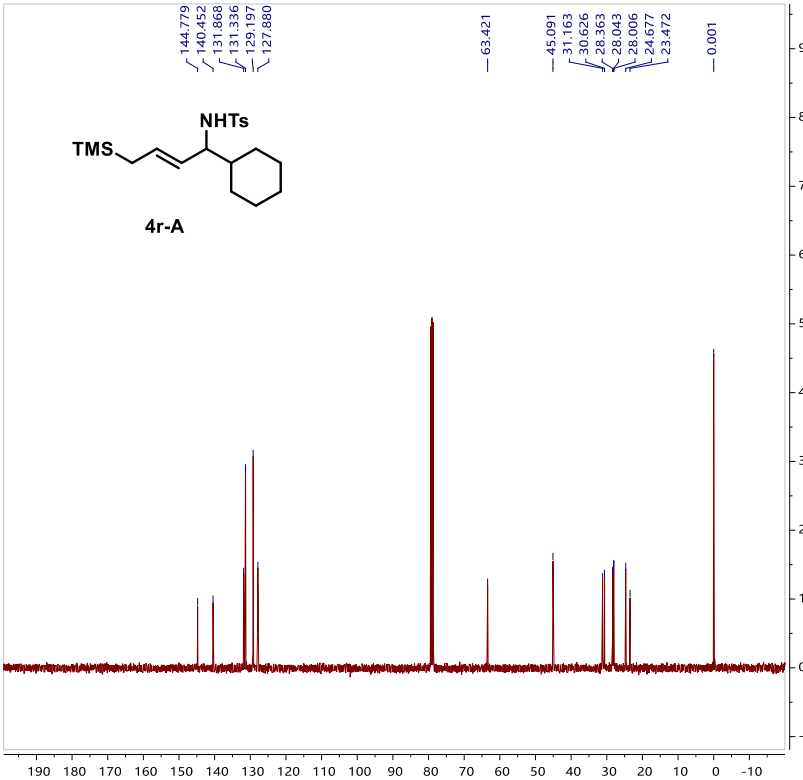
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-4-1/ 1/ fid
2 Title	fc-4-182-4-1/ 1
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	8
15 Receiver Gain	47
16 Relaxation Delay	1.0000
17 Pulse Width	9.1200
18 Presaturation Frequency	
19 Acquisition Time	4.0894
20 Acquisition Date	2018-07-16T16:05:38
21 Modification Date	2018-07-16T16:06:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1543.8
26 Nucleus	1H
27 Acquired Size	32768
28 Spectral Size	65536



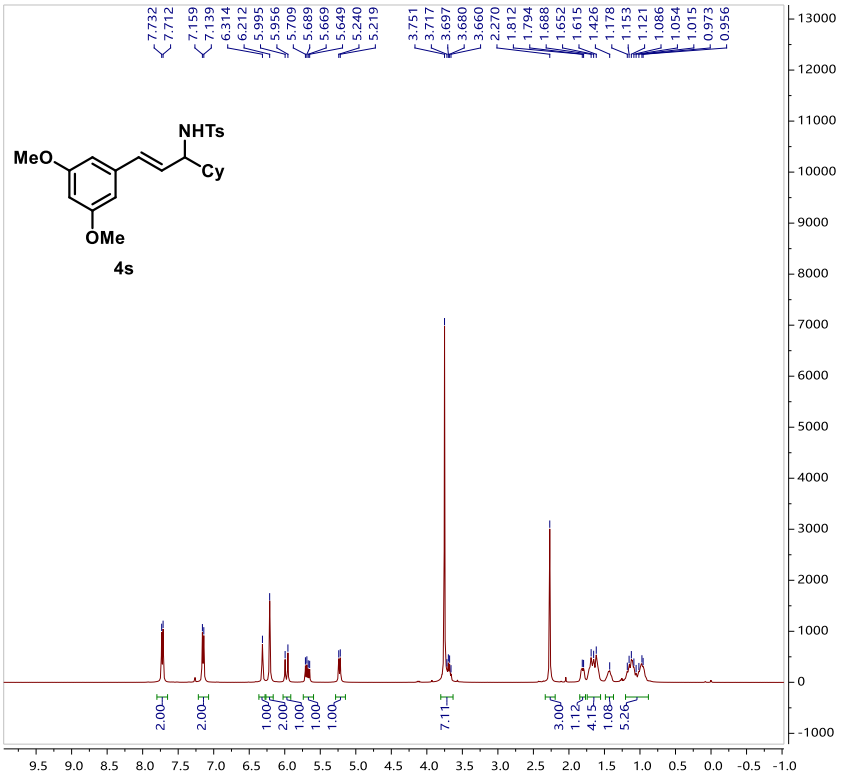
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-4-1/ 2/ fid
2 Title	fc-4-182-4-1/ 2
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	0.0
11 Pulse Sequence	zgdc30
12 Experiment	1D
13 Probe	5 mm DUL 13C-1H/ D Z-GRD Z108620/ 0010
14 Number of Scans	542
15 Receiver Gain	36
16 Relaxation Delay	1.0000
17 Pulse Width	9.4000
18 Presaturation Frequency	
19 Acquisition Time	1.1010
20 Acquisition Date	2018-07-16T16:14:19
21 Modification Date	2018-07-16T16:26:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4685.2
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



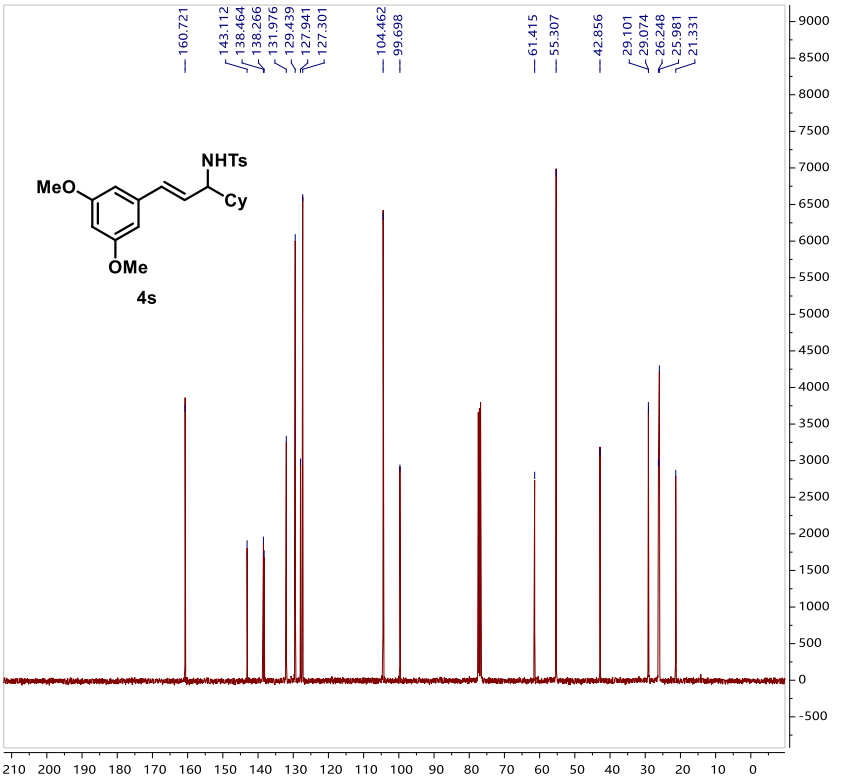
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-4-2/ 1/ fid
2 Title	fc-4-182-4-2/ 1
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.2
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	55
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-07-16T13:55:40
21 Modification Date	2018-07-16T13:55:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1535.4
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



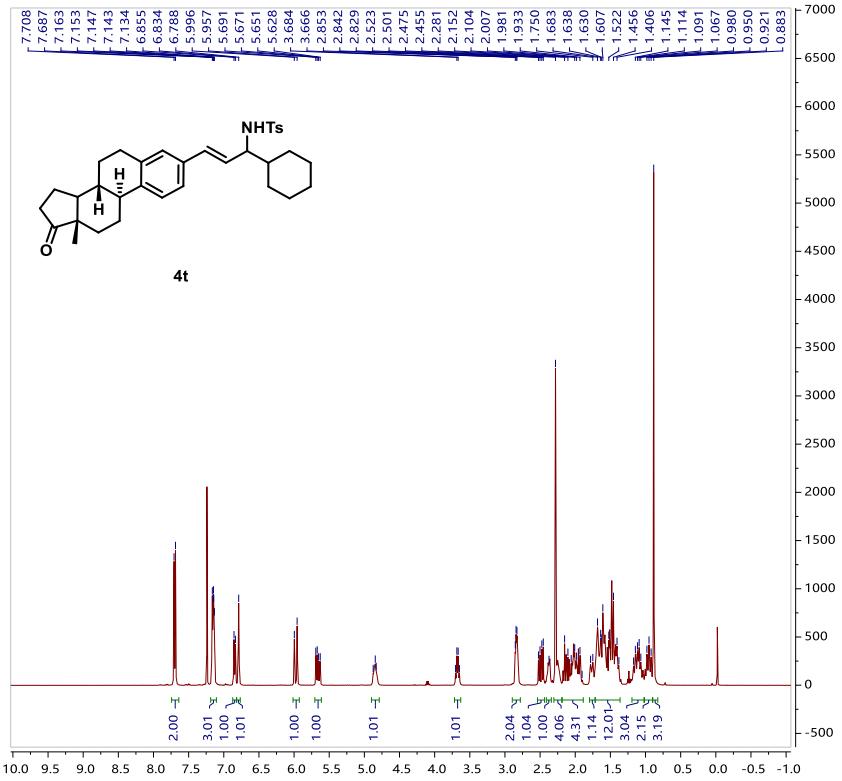
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-4-182-4-2/ 2/ fid
2 Title	fc-4-182-4-2/ 2
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.7
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	257
15 Receiver Gain	111
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-07-16T14:00:35
21 Modification Date	2018-07-16T14:04:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10119.4
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



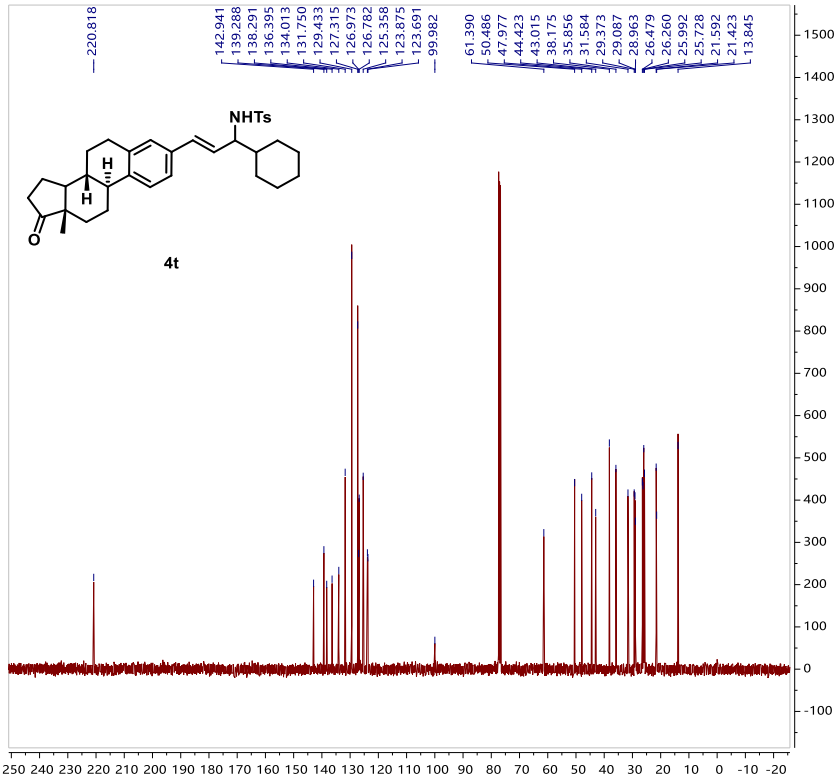
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-149-ND/ 1/ fid
2	Title	fc-5-149-ND.1.fid
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	-49.8
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14	Number of Scans	8
15	Receiver Gain	64
16	Relaxation Delay	1.0000
17	Pulse Width	13.5000
18	Presaturation Frequency	
19	Acquisition Time	1.9923
20	Acquisition Date	2018-11-23T08:14:00
21	Modification Date	2018-11-23T08:14:00
22	Class	
23	Spectrometer Frequency	400.23
24	Spectral Width	8223.7
25	Lowest Frequency	-1640.3
26	Nucleus	1H
27	Acquired Size	16384
28	Spectral Size	65536



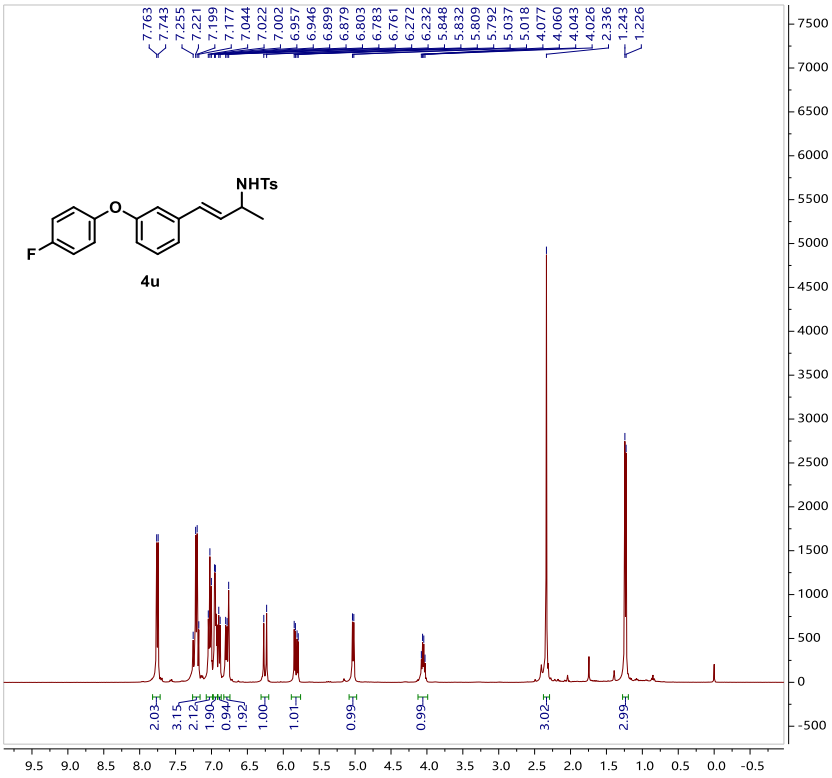
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-149-ND/ 2/ fid
2	Title	fc-5-149-ND.2.fid
3	Comment	C13CPD
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	-1232.4
11	Pulse Sequence	zgpg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14	Number of Scans	1113
15	Receiver Gain	203
16	Relaxation Delay	1.0000
17	Pulse Width	12.0000
18	Presaturation Frequency	
19	Acquisition Time	0.5506
20	Acquisition Date	2018-11-23T08:45:00
21	Modification Date	2018-11-23T08:45:00
22	Class	
23	Spectrometer Frequency	100.65
24	Spectral Width	29761.9
25	Lowest Frequency	-4817.6
26	Nucleus	13C
27	Acquired Size	16384
28	Spectral Size	32768



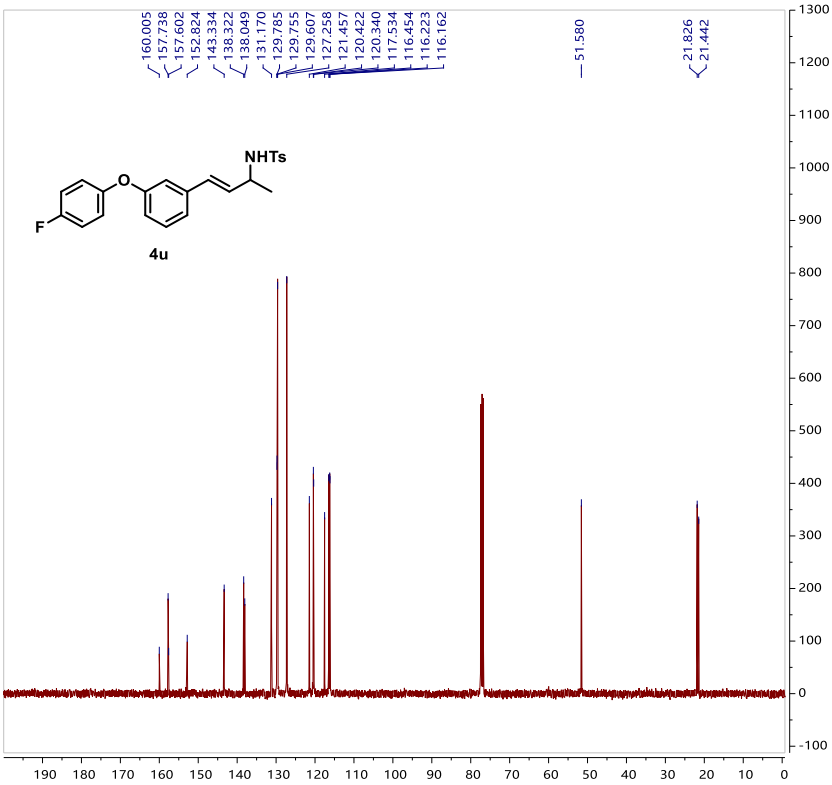
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-52-1/ 1/ fid
2 Title	fc-5-52-1.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	297.4
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	8
15 Receiver Gain	71
16 Relaxation Delay	1.0000
17 Pulse Width	15.0000
18 Presaturation Frequency	
19 Acquisition Time	2.9999
20 Acquisition Date	2018-09-26T23:10:00
21 Modification Date	2018-09-27T09:43:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1553.0
26 Nucleus	1H
27 Acquired Size	20031
28 Spectral Size	65536



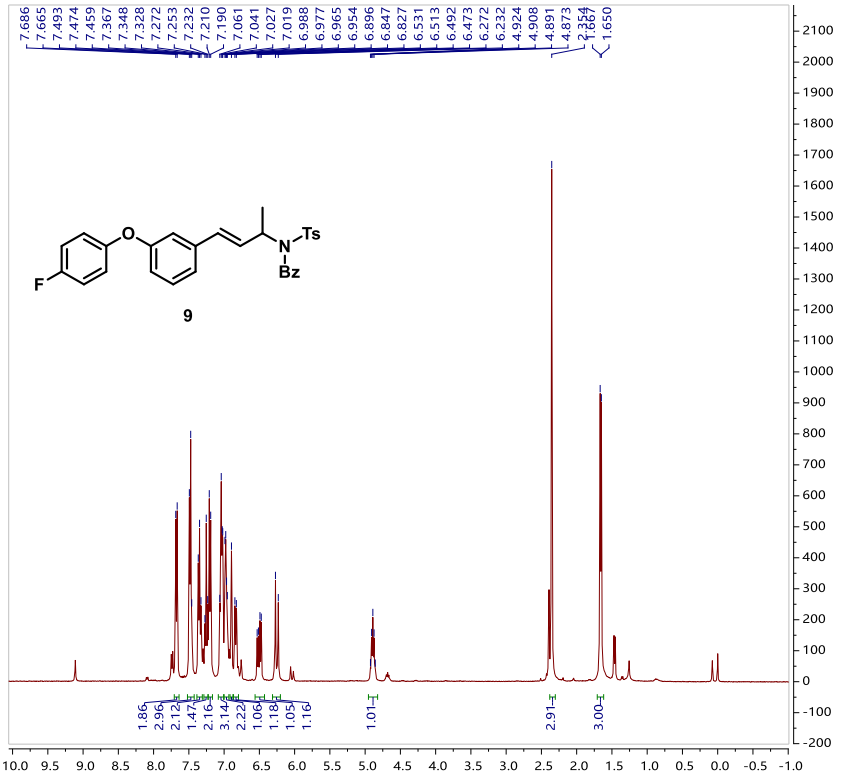
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-52-1/ 2/ fid
2 Title	fc-5-52-1.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	298.3
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB/ 19F-1H/ D Z-GRD Z108618/ 0526
14 Number of Scans	568
15 Receiver Gain	71
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.5506
20 Acquisition Date	2018-09-26T23:48:00
21 Modification Date	2018-09-27T09:59:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	35714.3
25 Lowest Frequency	-7796.8
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



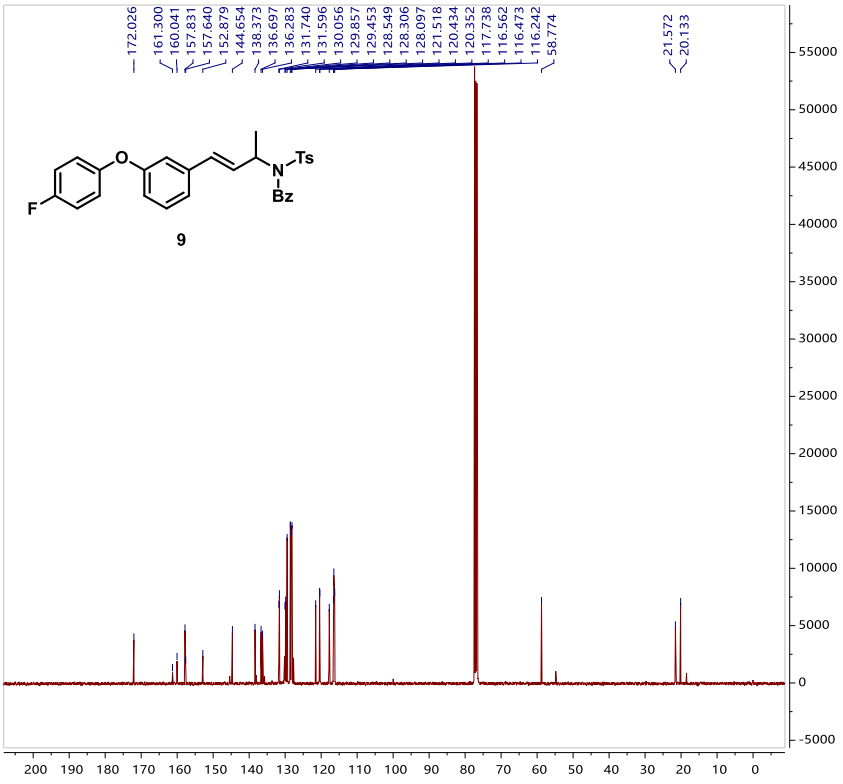
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-135-2-pure/ 1/ fid
2 Title	fc-5-135-2-pure/ 1
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.1
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	8
15 Receiver Gain	55
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	1.9999
20 Acquisition Date	2018-11-07T22:01:55
21 Modification Date	2018-11-07T22:01:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8012.8
25 Lowest Frequency	-1535.4
26 Nucleus	1H
27 Acquired Size	16025
28 Spectral Size	65536



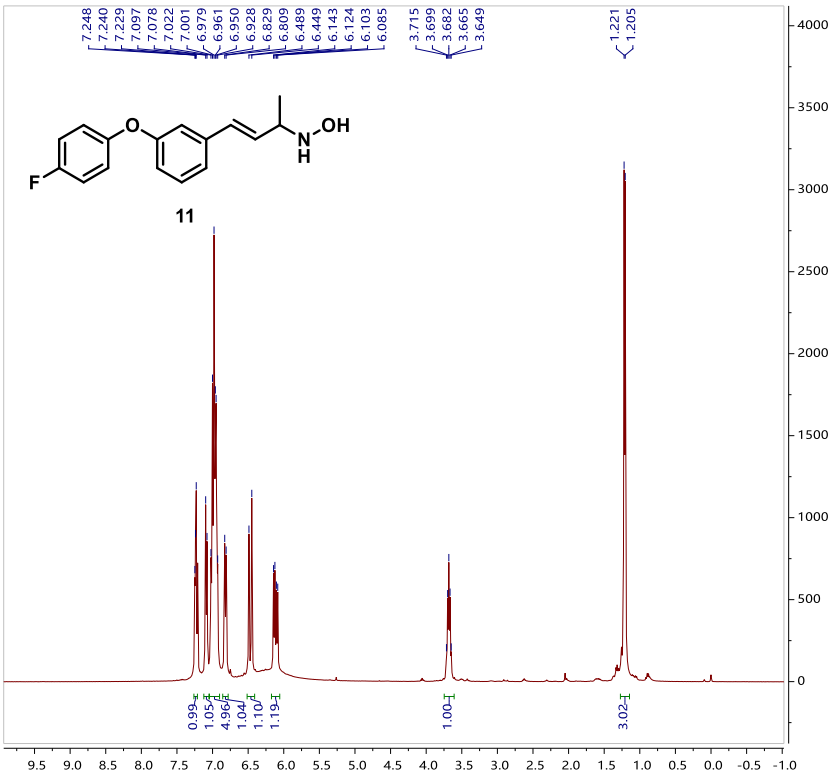
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-135-2-pure/ 2/ fid
2 Title	fc-5-135-2-pure/ 2
3 Comment	test
4 Origin	Bruker BioSpin GmbH
5 Owner	nmr
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	296.4
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PADUL 13C-1H/ D Z-GRD Z108621/ 0036
14 Number of Scans	307
15 Receiver Gain	111
16 Relaxation Delay	1.0000
17 Pulse Width	9.8000
18 Presaturation Frequency	
19 Acquisition Time	0.8039
20 Acquisition Date	2018-11-07T22:03:18
21 Modification Date	2018-11-07T22:12:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	40760.9
25 Lowest Frequency	-10320.1
26 Nucleus	13C
27 Acquired Size	32768
28 Spectral Size	65536



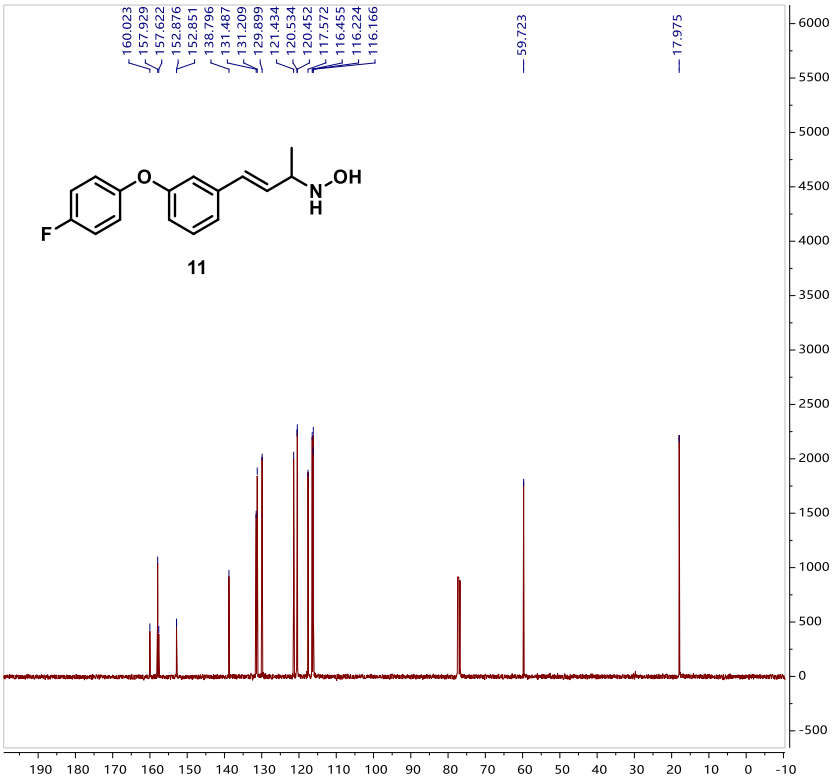
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-136-pure-PLC/ 1/ fid
2 Title	fc-5-136-pure-PLC.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-546.4
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	8
15 Receiver Gain	114
16 Relaxation Delay	1.0000
17 Pulse Width	13.5000
18 Presaturation Frequency	
19 Acquisition Time	1.9923
20 Acquisition Date	2018-11-10T00:59:00
21 Modification Date	2018-11-10T00:59:00
22 Class	
23 Spectrometer Frequency	400.23
24 Spectral Width	8223.7
25 Lowest Frequency	-1640.3
26 Nucleus	1H
27 Acquired Size	16384
28 Spectral Size	65536



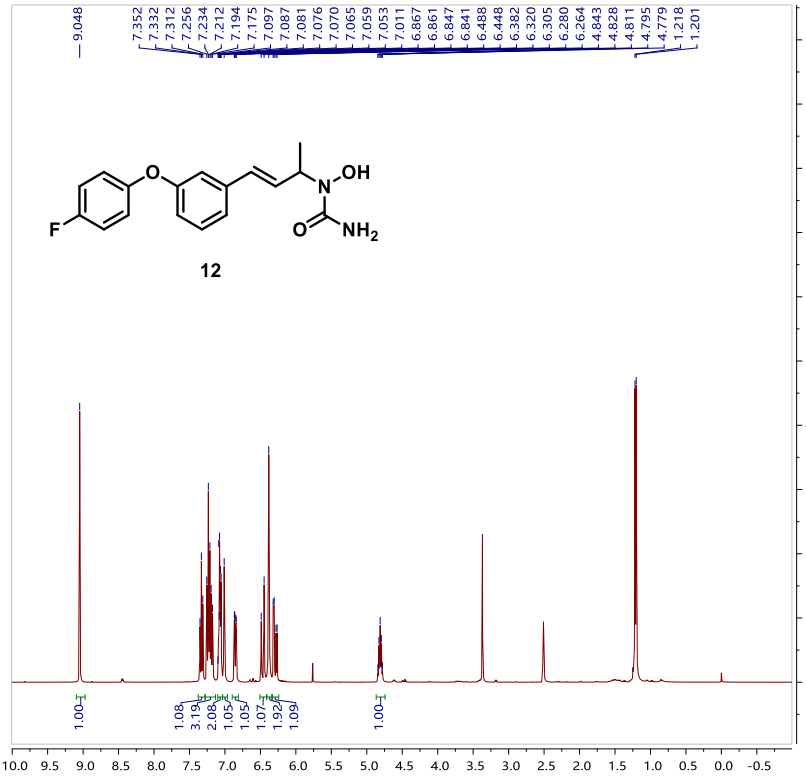
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-136-pure-PLC/ 2/ fid
2 Title	fc-5-136-pure-PLC.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-546.4
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	12449
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.5506
20 Acquisition Date	2018-11-10T06:36:00
21 Modification Date	2018-11-10T06:36:00
22 Class	
23 Spectrometer Frequency	100.65
24 Spectral Width	29761.9
25 Lowest Frequency	-4817.6
26 Nucleus	13C
27 Acquired Size	16384



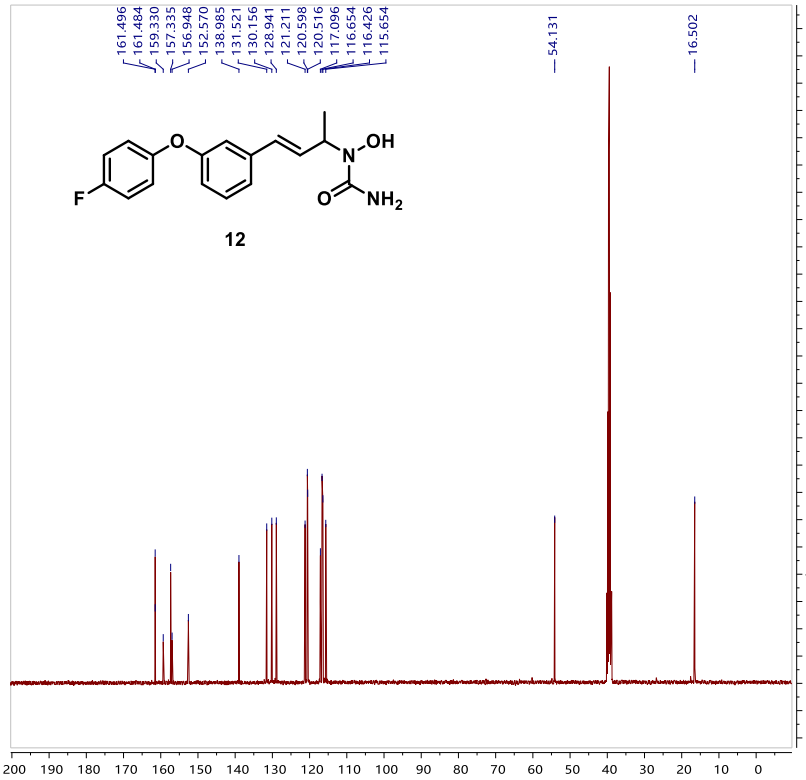
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-140-1/ 1/ fid
2 Title	fc-5-140-1.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-546.9
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	8
15 Receiver Gain	57
16 Relaxation Delay	1.0000
17 Pulse Width	13.5000
18 Presaturation Frequency	
19 Acquisition Time	1.9923
20 Acquisition Date	2018-11-11T15:36:00
21 Modification Date	2018-11-11T15:36:00
22 Class	
23 Spectrometer Frequency	400.23
24 Spectral Width	8223.7
25 Lowest Frequency	-1640.3
26 Nucleus	1H
27 Acquired Size	16384
28 Spectral Size	65536



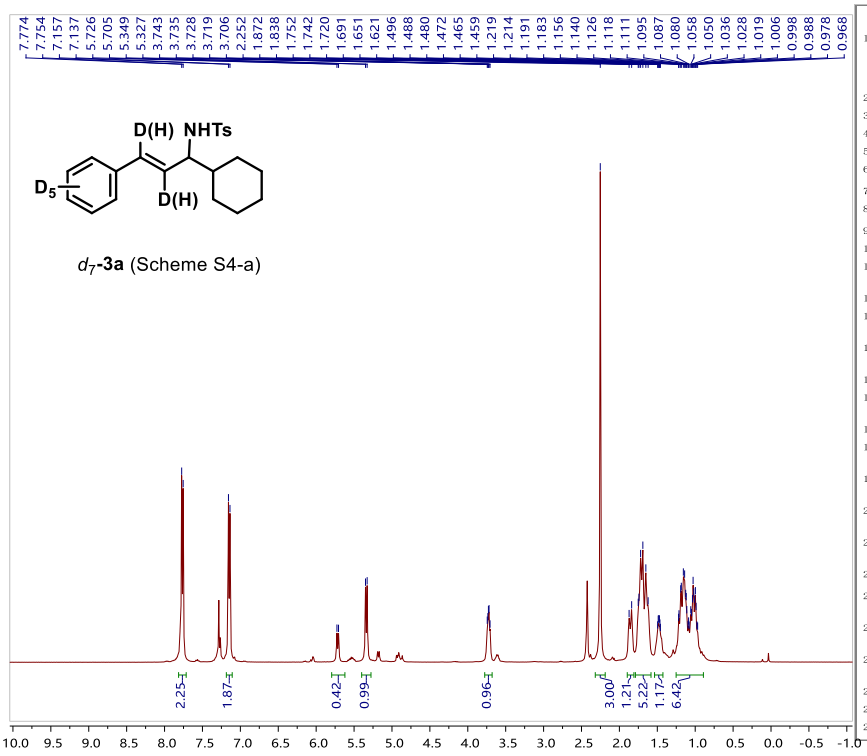
Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-140-1/ 2/ fid
2 Title	fc-5-140-1.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	CDCl3
10 Temperature	-547.1
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0277
14 Number of Scans	305
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.0000
18 Presaturation Frequency	
19 Acquisition Time	0.5506
20 Acquisition Date	2018-11-11T15:41:00
21 Modification Date	2018-11-11T15:45:00
22 Class	
23 Spectrometer Frequency	100.65
24 Spectral Width	29761.9
25 Lowest Frequency	-4817.6
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-140-2/ 1/ fid
2 Title	fc-5-140-2.1.fid
3 Comment	PROTON
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	DMSO
10 Temperature	292.3
11 Pulse Sequence	zg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0263
14 Number of Scans	8
15 Receiver Gain	144
16 Relaxation Delay	1.0000
17 Pulse Width	13.5000
18 Presaturation Frequency	
19 Acquisition Time	2.9999
20 Acquisition Date	2018-11-13T08:07:00
21 Modification Date	2018-11-13T08:07:00
22 Class	
23 Spectrometer Frequency	400.13
24 Spectral Width	8223.7
25 Lowest Frequency	-1639.6
26 Nucleus	1H
27 Acquired Size	24670
28 Spectral Size	65536

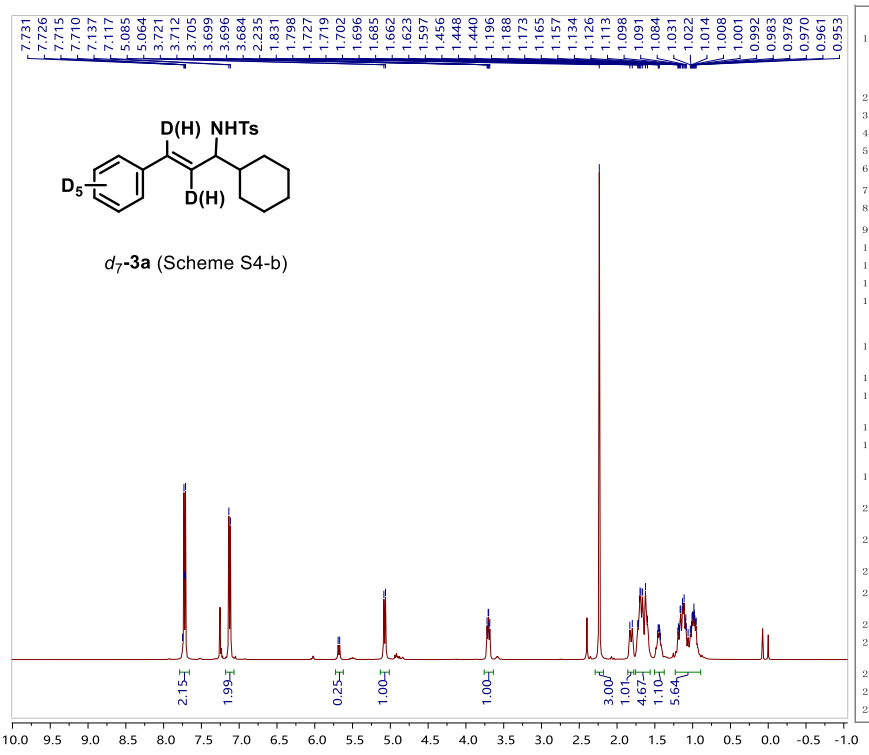


Parameter	Value
1 Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18/ 谱图/ fc-5-140-2/ 2/ fid
2 Title	fc-5-140-2.2.fid
3 Comment	C13CPD
4 Origin	Bruker BioSpin GmbH
5 Owner	common
6 Site	
7 Spectrometer	spect
8 Author	
9 Solvent	DMSO
10 Temperature	293.2
11 Pulse Sequence	zgpg30
12 Experiment	1D
13 Probe	5 mm PABBO BB-1H/ D Z-GRD Z104450/ 0263
14 Number of Scans	2847
15 Receiver Gain	203
16 Relaxation Delay	1.0000
17 Pulse Width	12.5000
18 Presaturation Frequency	
19 Acquisition Time	0.5506
20 Acquisition Date	2018-11-13T08:36:00
21 Modification Date	2018-11-13T09:25:00
22 Class	
23 Spectrometer Frequency	100.62
24 Spectral Width	29761.9
25 Lowest Frequency	-4870.5
26 Nucleus	13C
27 Acquired Size	16384
28 Spectral Size	32768



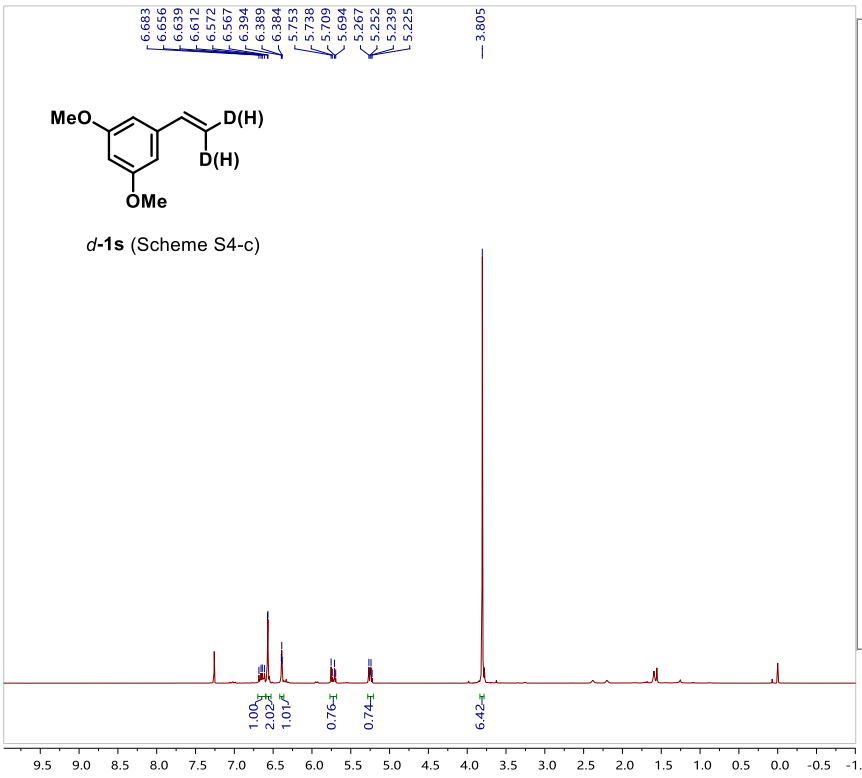
d_7-**3a** (Scheme S4-a)

	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-75-2/ 1/ fid
2	Title	fc-4-75-2, 1. fid
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	297. 8
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	5 mm PABBO BB-1H/ D Z-GRD Z108618/ 0258
14	Number of Scans	8
15	Receiver Gain	51
16	Relaxation Delay	1. 0000
17	Pulse Width	13. 7000
18	Presaturation Frequency	
19	Acquisition Time	1. 9999
20	Acquisition Date	2018-03-12T22:33:00
21	Modification Date	2018-03-12T22:33:00
22	Class	
23	Spectrometer Frequency	400. 13
24	Spectral Width	8223. 7
25	Lowest Frequency	-1640. 9
26	Nucleus	1H
27	Acquired Size	16446
28	Spectral Size	65536

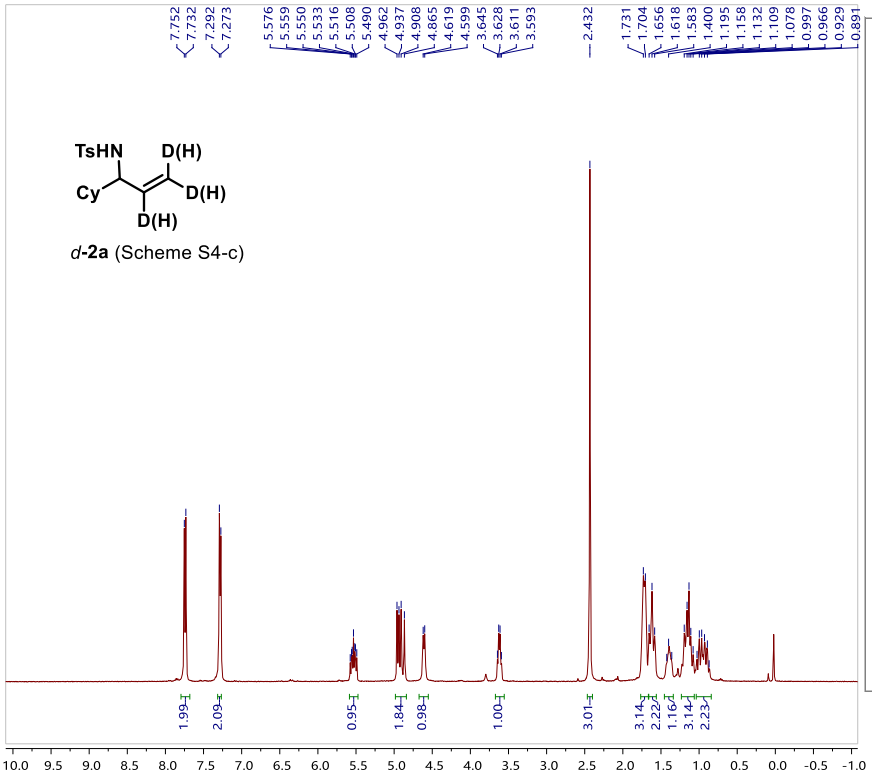


d_7-**3a** (Scheme S4-b)

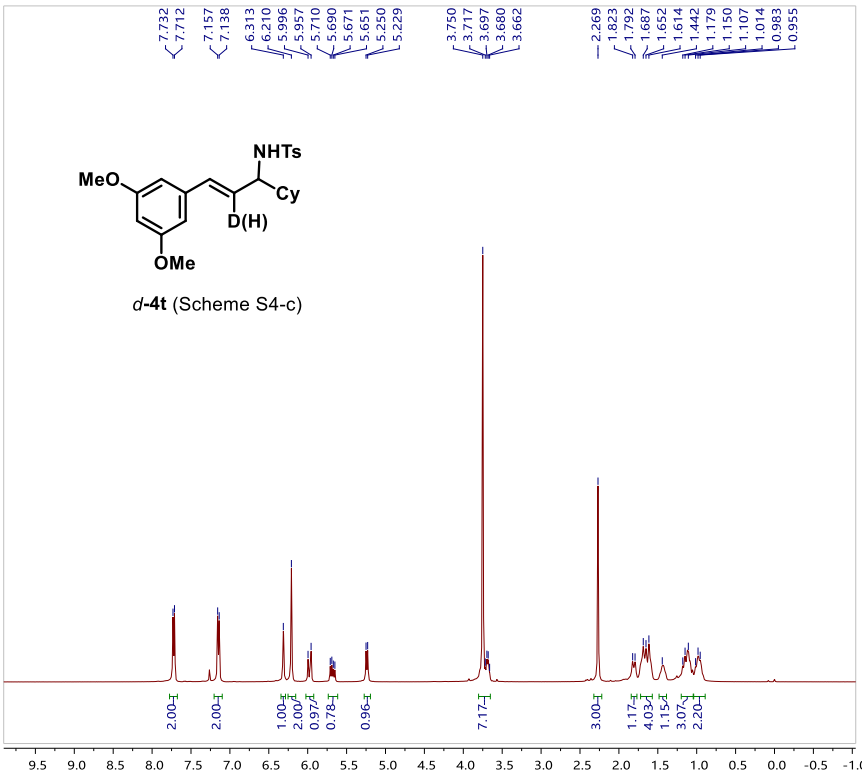
	Parameter	Value
1	Data File Name	C:/ Users/ Charlie/ Desktop/ 2018-01-18 备份/ 谱图/ fc-4-75-isolate/ 1/ fid
2	Title	fc-4-75-isolate/ 1
3	Comment	H1
4	Origin	Bruker BioSpin GmbH
5	Owner	nmr
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	296. 0
11	Pulse Sequence	zg30
12	Experiment	1D
13	Probe	Z116098_0688 (PA BBO 400S1 BBF-H-D-05 Z SP)
14	Number of Scans	8
15	Receiver Gain	40
16	Relaxation Delay	2. 0000
17	Pulse Width	10. 0000
18	Presaturation Frequency	
19	Acquisition Time	1. 9999
20	Acquisition Date	2018-03-06T20:02:55
21	Modification Date	2018-03-06T20:02:00
22	Class	
23	Spectrometer Frequency	400. 15
24	Spectral Width	8012. 8
25	Lowest Frequency	-2167. 3
26	Nucleus	1H
27	Acquired Size	16025
28	Spectral Size	65536



	Parameter	Value
1	Data File Name	C:/ Users/ Asymm/ Desktop/ 谱图/ fc-5-149-ene/ 1/ fid
2	Title	fc-5-149-ene
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	291.9
11	Pulse Sequence	zg30
12	Experiment	1D
13	Number of Scans	8
14	Receiver Gain	203
15	Relaxation Delay	1.0000
16	Pulse Width	13.5000
17	Acquisition Time	2.9999
18	Acquisition Date	2018-11-20T14:08:00
19	Modification Date	2018-11-20T14:08:00
20	Spectrometer Frequency	400.13
21	Spectral Width	8223.7
22	Lowest Frequency	-1650.5
23	Nucleus	1H
24	Acquired Size	24670
25	Spectral Size	65536



	Parameter	Value
1	Data File Name	C:/ Users/ Asymm/ Desktop/ 谱图/ fc-5-149-sm/ 1/ fid
2	Title	fc-5-149-sm
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	297.4
11	Pulse Sequence	zg30
12	Experiment	1D
13	Number of Scans	8
14	Receiver Gain	203
15	Relaxation Delay	1.0000
16	Pulse Width	13.7000
17	Acquisition Time	1.9999
18	Acquisition Date	2018-11-20T14:10:00
19	Modification Date	2018-11-20T14:10:00
20	Spectrometer Frequency	400.13
21	Spectral Width	8223.7
22	Lowest Frequency	-1640.9
23	Nucleus	1H
24	Acquired Size	16446
25	Spectral Size	65536



	Parameter	Value
1	Data File Name	C:/ Users/ Asymm/ Desktop/ 谱图/ fc-5-149-tm/ 1/ fid
2	Title	fc-5-149-tm
3	Comment	PROTON
4	Origin	Bruker BioSpin GmbH
5	Owner	common
6	Site	
7	Spectrometer	spect
8	Author	
9	Solvent	CDCl3
10	Temperature	297.4
11	Pulse Sequence	zg30
12	Experiment	1D
13	Number of Scans	8
14	Receiver Gain	57
15	Relaxation Delay	1.0000
16	Pulse Width	13.7000
17	Acquisition Time	1.9999
18	Acquisition Date	2018-11-20T14:14:00
19	Modification Date	2018-11-20T14:14:00
20	Spectrometer Frequency	400.13
21	Spectral Width	8223.7
22	Lowest Frequency	-1649.4
23	Nucleus	1H
24	Acquired Size	16446
25	Spectral Size	65536