

## Supporting Information

# Novel $\alpha$ -Amino Acid-derived Phase-Transfer Catalysts Bearing Multiple Hydrogen Bonding Donors: Synthesis and Application to Highly Enantio- and diastereoselective Nitro-Mannich Reaction

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#### 1. Supplementary experiment

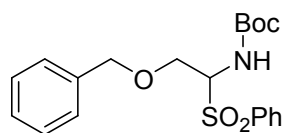
Preparation and characterization unknown amidosulfones

General Procedure

To a solution of aldehyde (1.0 eq.),  $\text{PhSO}_2\text{Na}$  (1.0 eq.) and  $\text{BocNH}_2$  in THF/ $\text{H}_2\text{O}$  (1:2.5, 0.7 M), was added  $\text{HCO}_2\text{H}$  (6.4 eq.) at rt. The mixture was stirred at rt for 72-96h. The resulting mixture was then diluted with  $\text{H}_2\text{O}$  and extracted with ethyl acetate. The combined organic layers were washed with saturated aqueous  $\text{NaHCO}_3$ , dried over

anhydrous Na<sub>2</sub>SO<sub>4</sub>, and evaporated under reduced pressure. The residue was washed with hexane/ ether (4:1) or hexane/THF (4:1). The corresponding  $\alpha$ -phenylsulfonylcarbamate.

Amidosulfones **4q** derived from 2-(benzyloxy)acetaldehyde



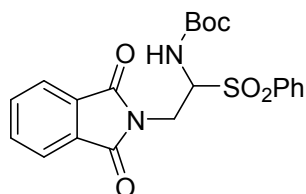
White solid, 424mg, 33% yield, mp = 127-128 °C

<sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>)  $\delta$  7.97 – 7.85 (m, 2H), 7.69 – 7.59 (m, 1H), 7.57 – 7.46 (m, 2H), 7.40 – 7.27 (m, 5H), 5.51 (d,  $J$  = 11.2 Hz, 1H), 5.13 – 4.93 (m, 1H), 4.66 – 4.50 (m, 2H), 4.19 (dd,  $J$  = 10.7, 3.8 Hz, 1H), 3.91 (dd,  $J$  = 11.0, 4.3 Hz, 1H), 1.27 (s, 9H).

<sup>13</sup>C NMR (126 MHz, CDCl<sub>3</sub>)  $\delta$  153.88, 137.65, 137.19, 134.03, 129.37, 129.16, 128.62, 128.13, 128.00, 81.05, 73.78, 70.28, 65.71, 28.15.

**HRMS** (ESI): calculated for C<sub>20</sub>H<sub>25</sub>NNaO<sub>5</sub>S [M+Na]<sup>+</sup>: 414.1346 found 414.1346

Amidosulfones **4r** derived from 2-(1,3-dioxisoindolin-2-yl)acetaldehyde



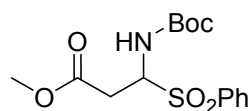
White solid, 230mg, 20% yield, mp = 158-159 °C

<sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>)  $\delta$  8.01 – 7.82 (m, 4H), 7.78 – 7.50 (m, 5H), 5.45 (d,  $J$  = 11.5 Hz, 1H), 5.33 – 5.13 (m, 1H), 4.43 – 4.20 (m, 2H), 1.12 (s, 9H).

<sup>13</sup>C NMR (126 MHz, CDCl<sub>3</sub>)  $\delta$  193.51, 167.80, 153.80, 136.66, 134.31, 131.76, 129.32, 129.23, 123.64, 81.07, 68.51, 35.28, 27.82.

**HRMS** (ESI): calculated for C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>NaO<sub>6</sub>S [M+Na]<sup>+</sup>: 453.1091 found 414.1346

Amidosulfones **4s** derived from methyl 3-oxopropanoate



White solid, 467mg, 28% yield, mp = 132-133 °C

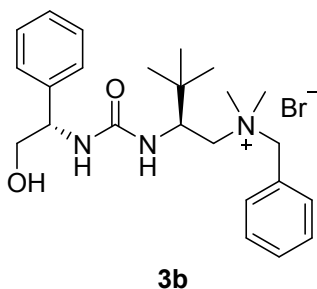
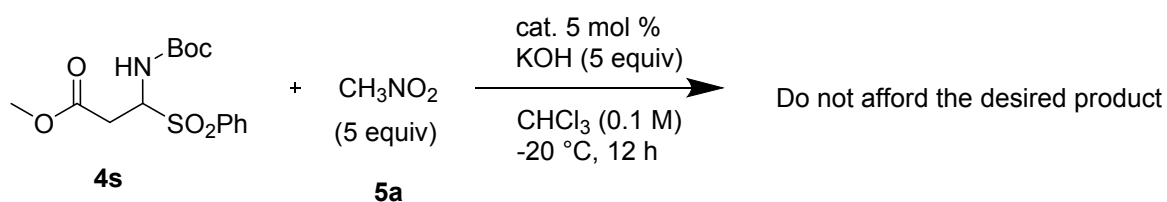
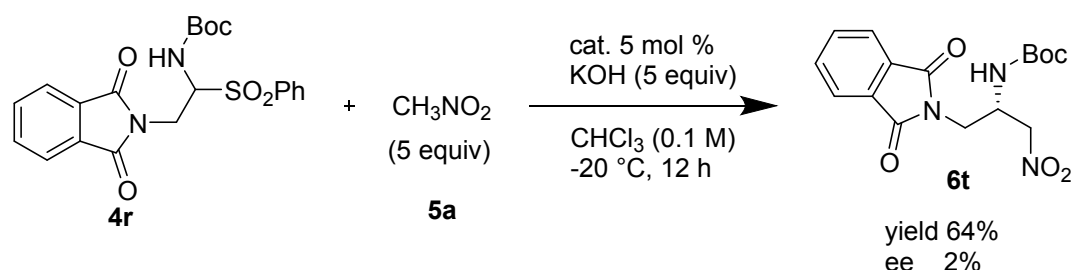
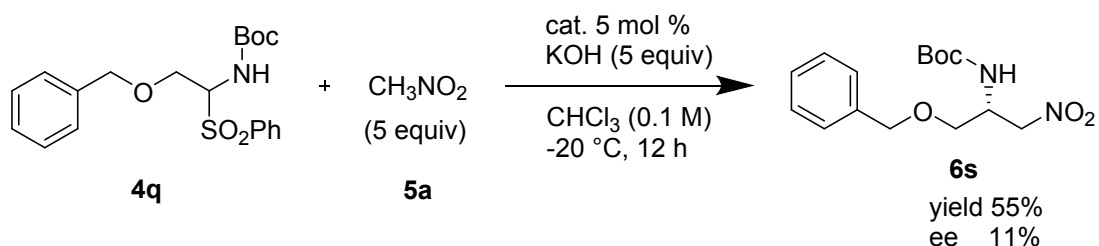
<sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>)  $\delta$  7.97 – 7.88 (m, 2H), 7.70 – 7.49 (m, 3H), 5.72 (d,  $J$  = 10.3 Hz, 1H), 5.38 – 5.18 (m, 1H), 3.74 (s, 3H), 3.13 (dd,  $J$  = 16.4, 4.7 Hz, 1H), 2.94 (dd,  $J$  = 16.4, 7.5 Hz, 1H), 1.21 (s, 9H).

<sup>13</sup>C NMR (126 MHz, CDCl<sub>3</sub>)  $\delta$  169.61, 153.48, 136.37, 134.27, 129.58, 129.23, 81.04, 67.84, 52.55, 31.96, 28.05.

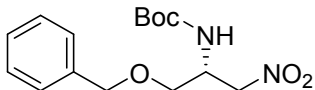
**HRMS** (ESI): calculated for C<sub>15</sub>H<sub>21</sub>NNaO<sub>6</sub>S [M+Na]<sup>+</sup>: 366.0982 found 366.0982.

### General procedure for enantioselective nitro-Mannich reaction

Without protection of inert gases, catalyst **3b** (5mol%) and amidosulfones (0.15 mmol) were dissolved in dry chloroform (1.5ml), nitroalkane (0.75 mmol, 5 eq.) was added, the mixture was cooled to  $-20\text{ }^{\circ}\text{C}$ , freshly grounded KOH (42.1 mg, 5 eq.) was added in one portion, the resulting suspension was vigorously stirred at  $-20\text{ }^{\circ}\text{C}$ . After 12 h, 2 ml sat. aq.  $\text{NaHCO}_3$  was added and the solution was allowed to warm to room temperature, the aqueous was extracted with ethylacetate (3x5ml), then the organic layer was dried over  $\text{Na}_2\text{SO}_4$ , filtered and concentrated under reduced pressure. The crude product was purified by flash chromatography (PE/EA).



**Tert-butyl (R)-(1-(benzyloxy)-3-nitropropan-2-yl)carbamate (6s)**

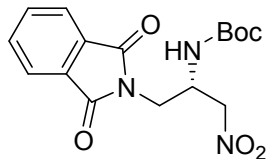
 Colorless oil, 24.6 mg, 55% yield,  $[a]_D^{25} = 32.4$  ( $c = 0.5$ ,  $\text{CHCl}_3$ ), the ee value was 11% (Chiralpak AS-H, hexane/*i*-PrOH = 95:5, 214 nm, 1mL/min,  $t_{\text{major}} = 19.614$ ,  $t_{\text{minor}} = 22.830$  min).

$^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.42 – 7.27 (m, 5H), 5.09 (br, 1H), 4.67 – 4.54 (m, 2H), 4.52 (s, 2H), 4.42 (br, 1H), 3.68 – 3.52 (m, 2H), 1.44 (s, 9H).

$^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  154.91, 137.19, 128.58, 128.11, 127.80, 80.46, 75.34, 73.59, 68.81, 48.76, 28.26.

**HRMS** (ESI): calculated for  $\text{C}_{15}\text{H}_{22}\text{N}_2\text{NaO}_5$   $[\text{M}+\text{Na}]^+$ : 333.1421, found 333.1421.

**tert-butyl (S)-(1-(1,3-dioxisoindolin-2-yl)-3-nitropropan-2-yl)carbamate(6t)**

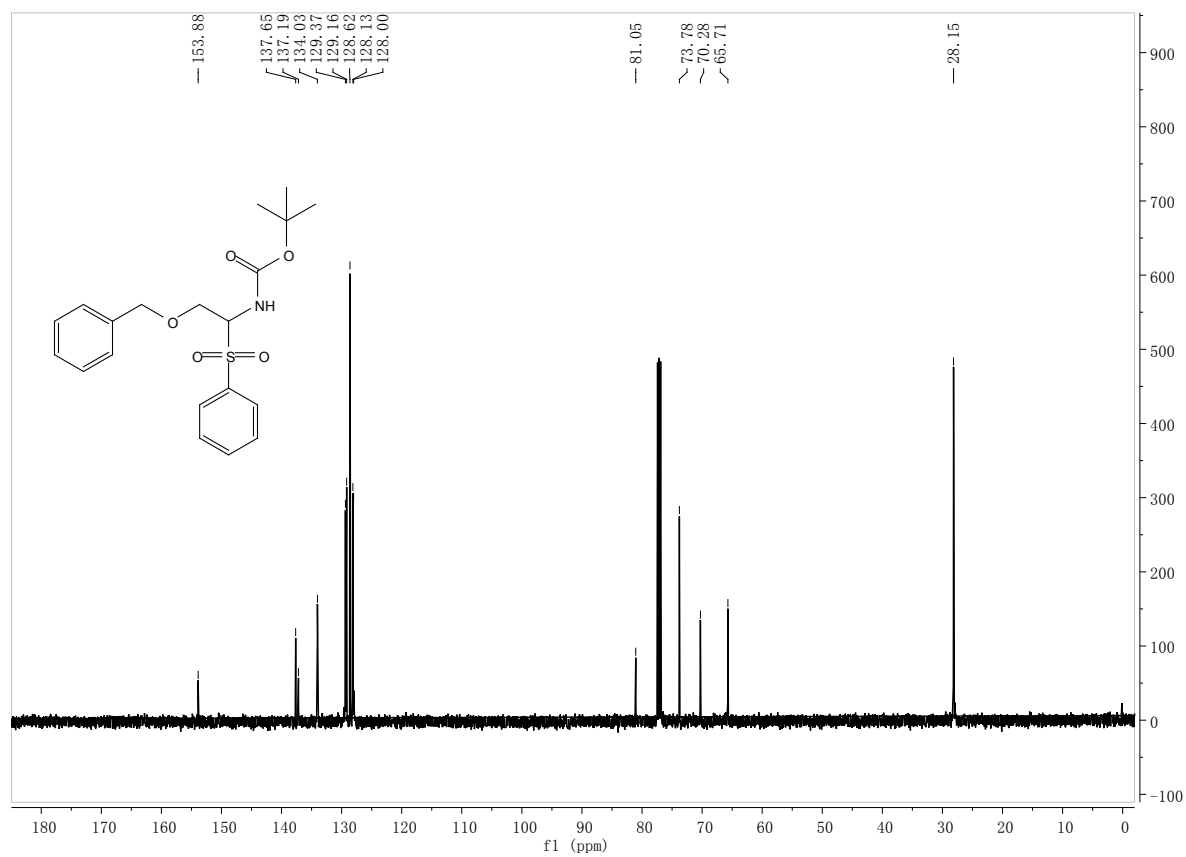
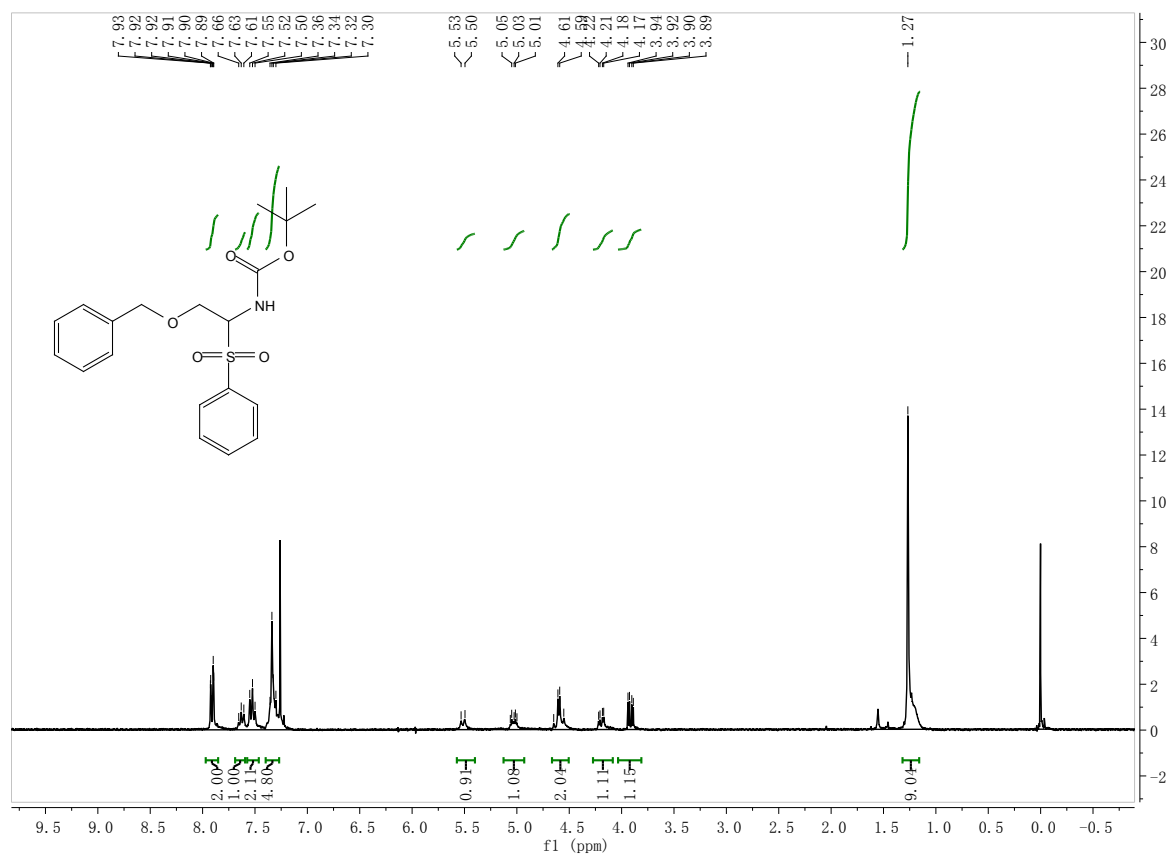
 White solid, 34.6 mg, 64% yield, mp = 156-157 °C,  $[a]_D^{25} = 22$  ( $c = 0.5$ ,  $\text{CHCl}_3$ ), the ee value was 2% (Chiralpak OD-H, hexane/*i*-PrOH = 80:20, 214 nm, 1mL/min,  $t_{\text{major}} = 14.008$  min,  $t_{\text{minor}} = 17.009$  min).

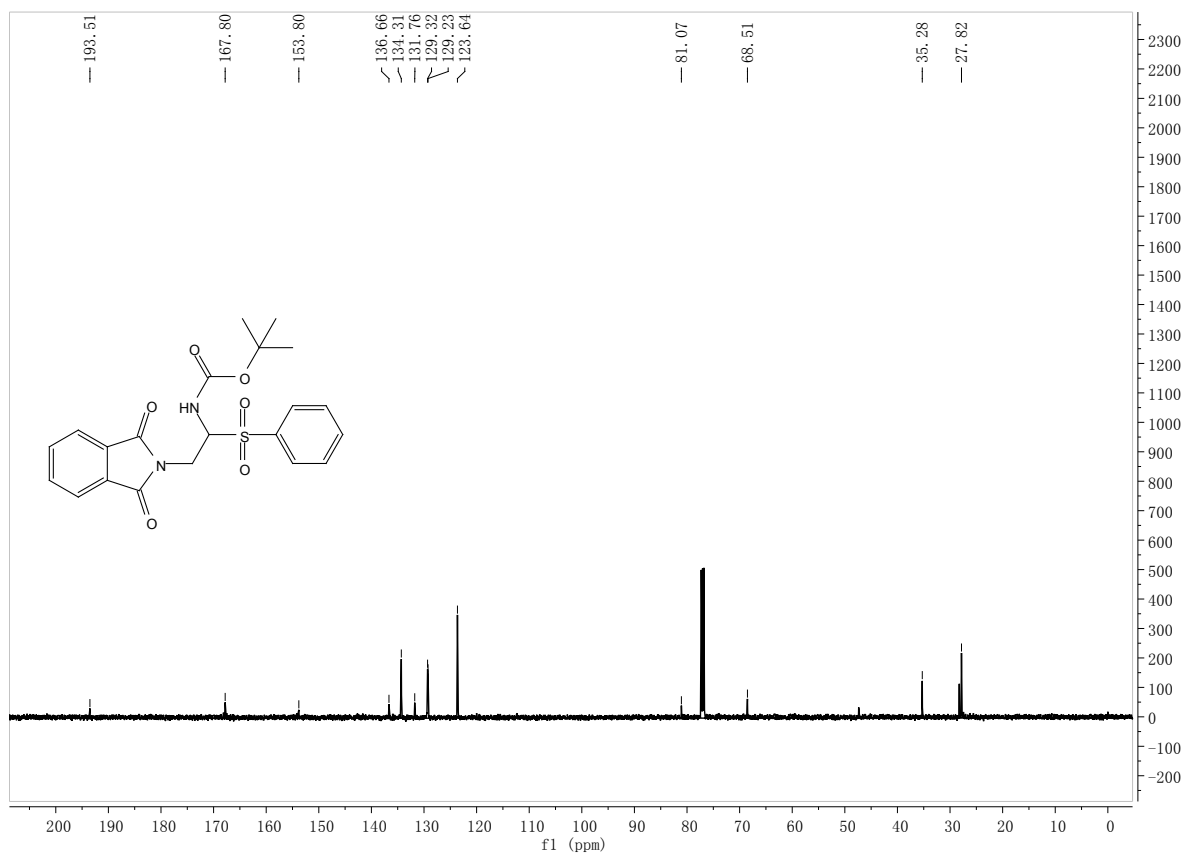
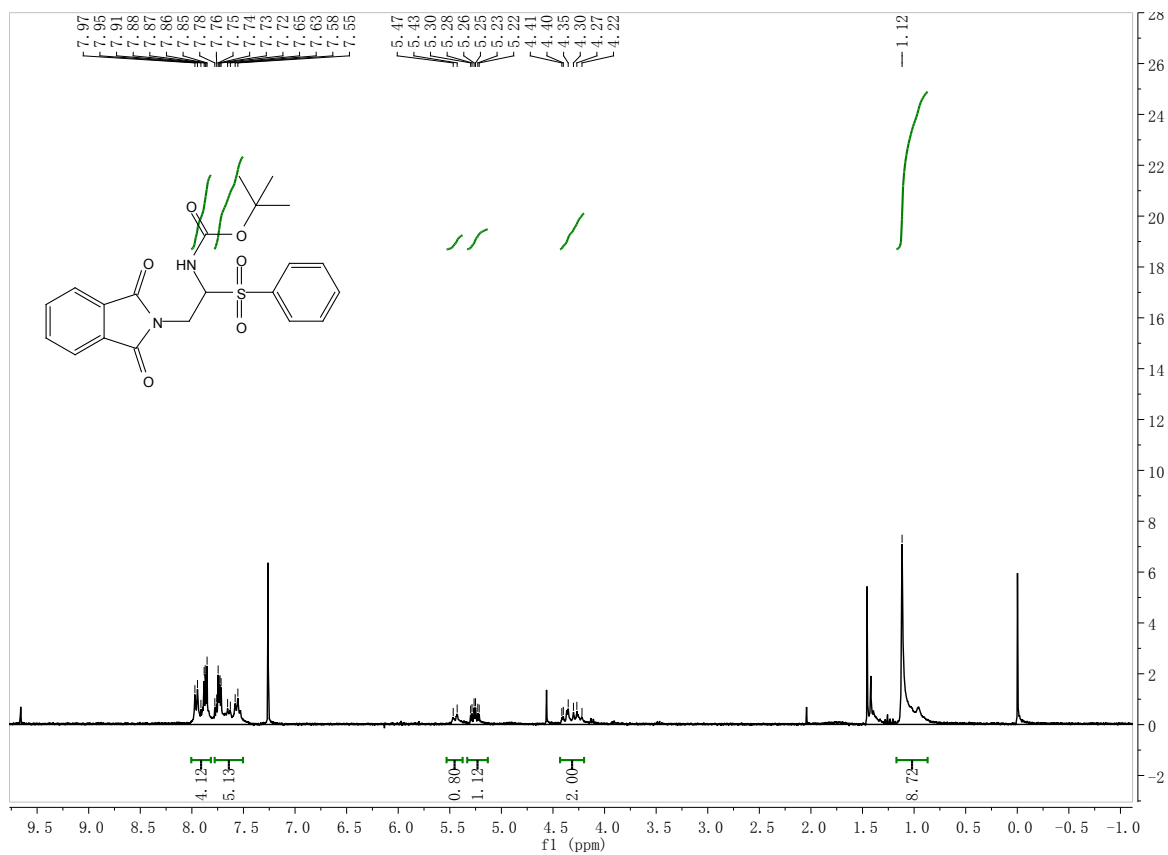
$^1\text{H NMR}$  (500 MHz,  $\text{CDCl}_3$ )  $\delta$  7.94 – 7.86 (m, 2H), 7.81 – 7.72 (m, 2H), 5.26 (br, 1H), 4.77 – 4.60 (m, 2H), 4.52 (br, 1H), 4.14 – 4.01 (m, 1H), 4.00 – 3.85 (m, 1H), 1.35 (s, 9H).

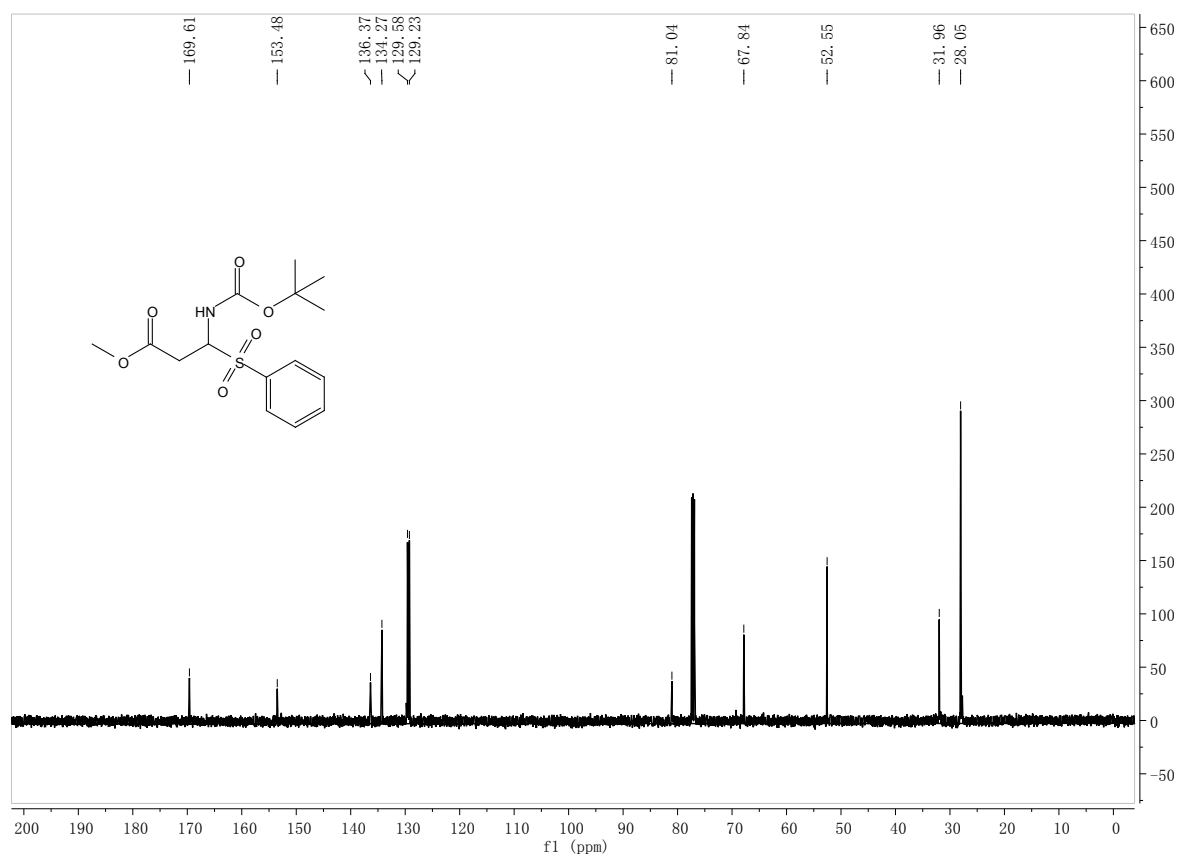
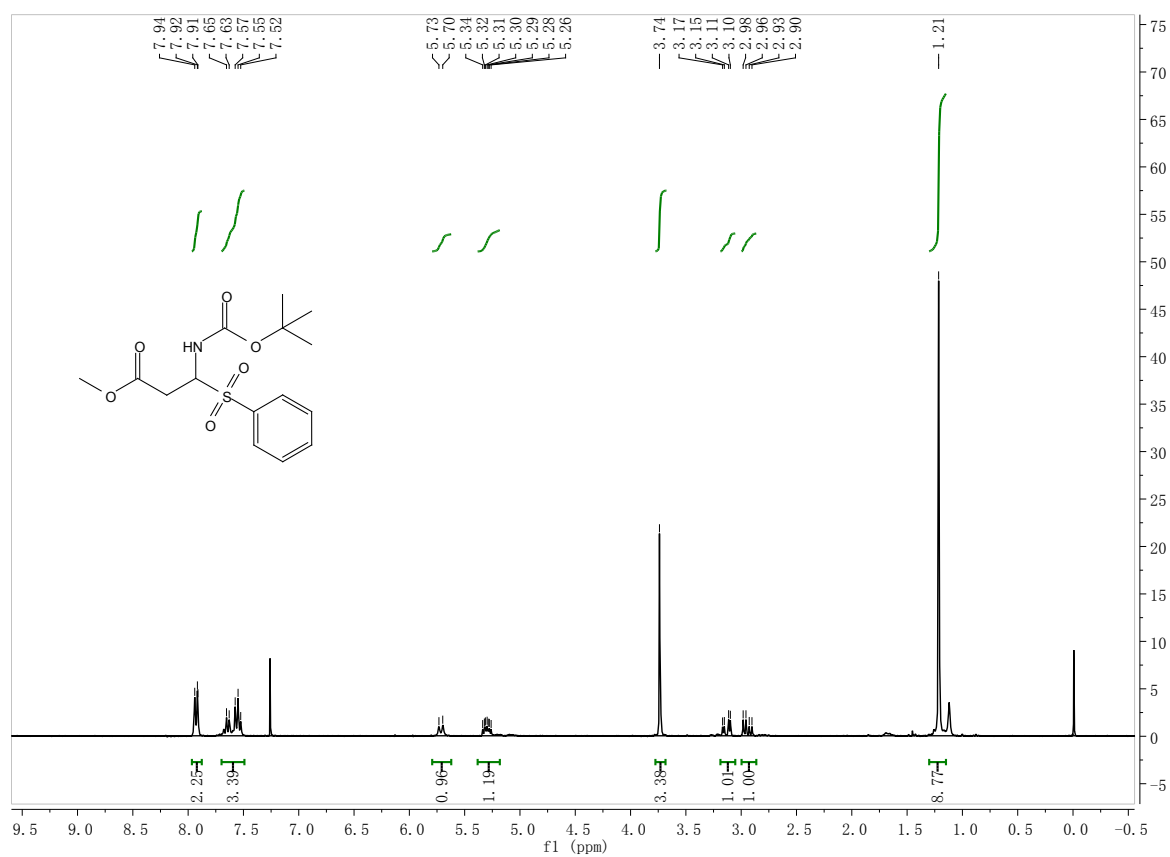
$^{13}\text{C NMR}$  (126 MHz,  $\text{CDCl}_3$ )  $\delta$  168.22, 134.36, 131.74, 123.66, 80.58, 75.89, 48.51, 39.25, 28.07.

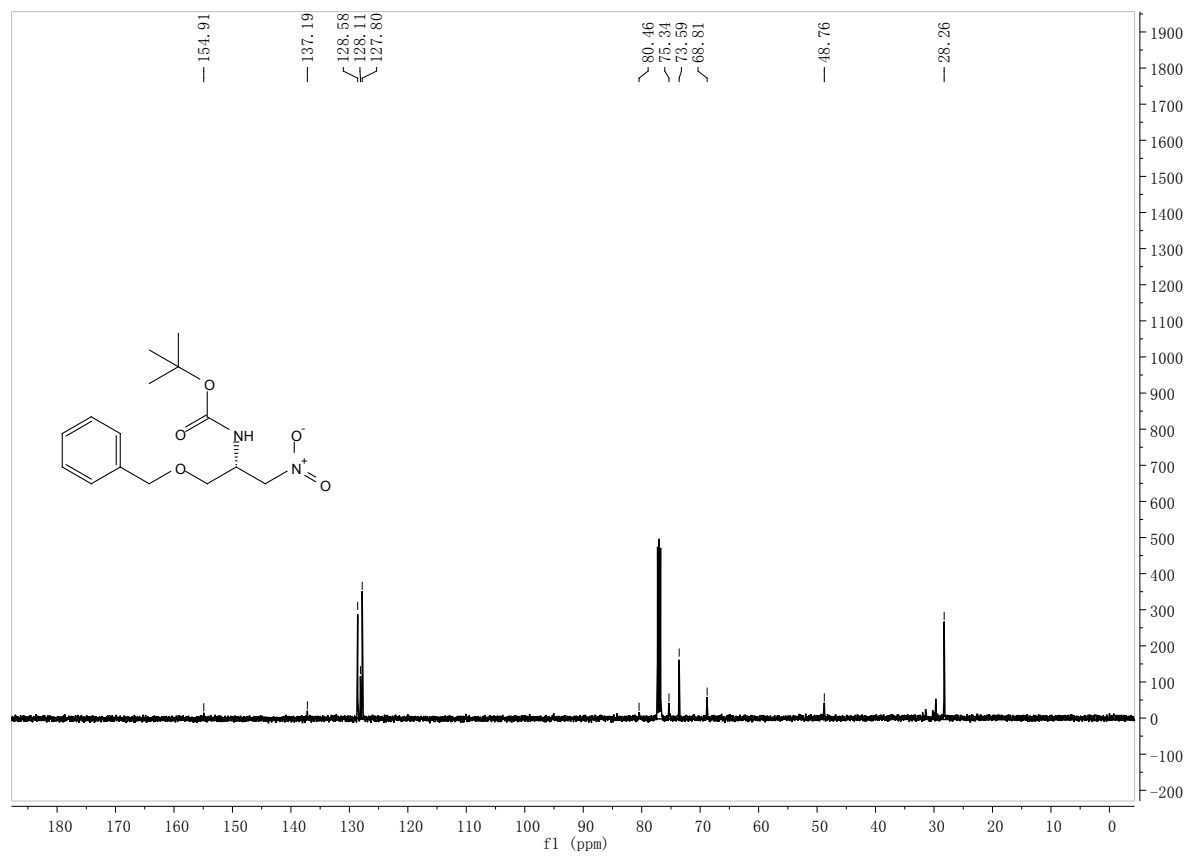
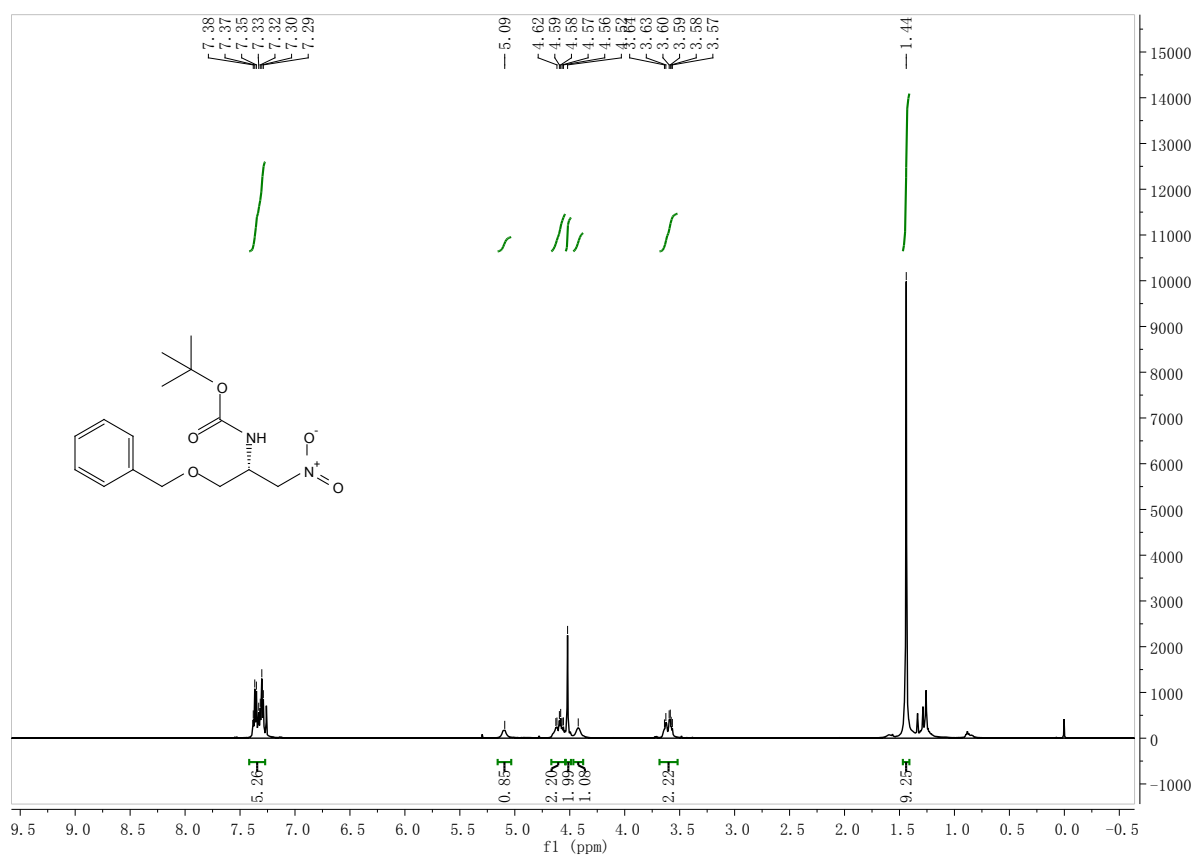
**HRMS** (ESI): calculated for  $\text{C}_{16}\text{H}_{19}\text{N}_3\text{NaO}_6$   $[\text{M}+\text{Na}]^+$ : 372.1166, found 372.1165.

## 2. NMR of supplementary experiment

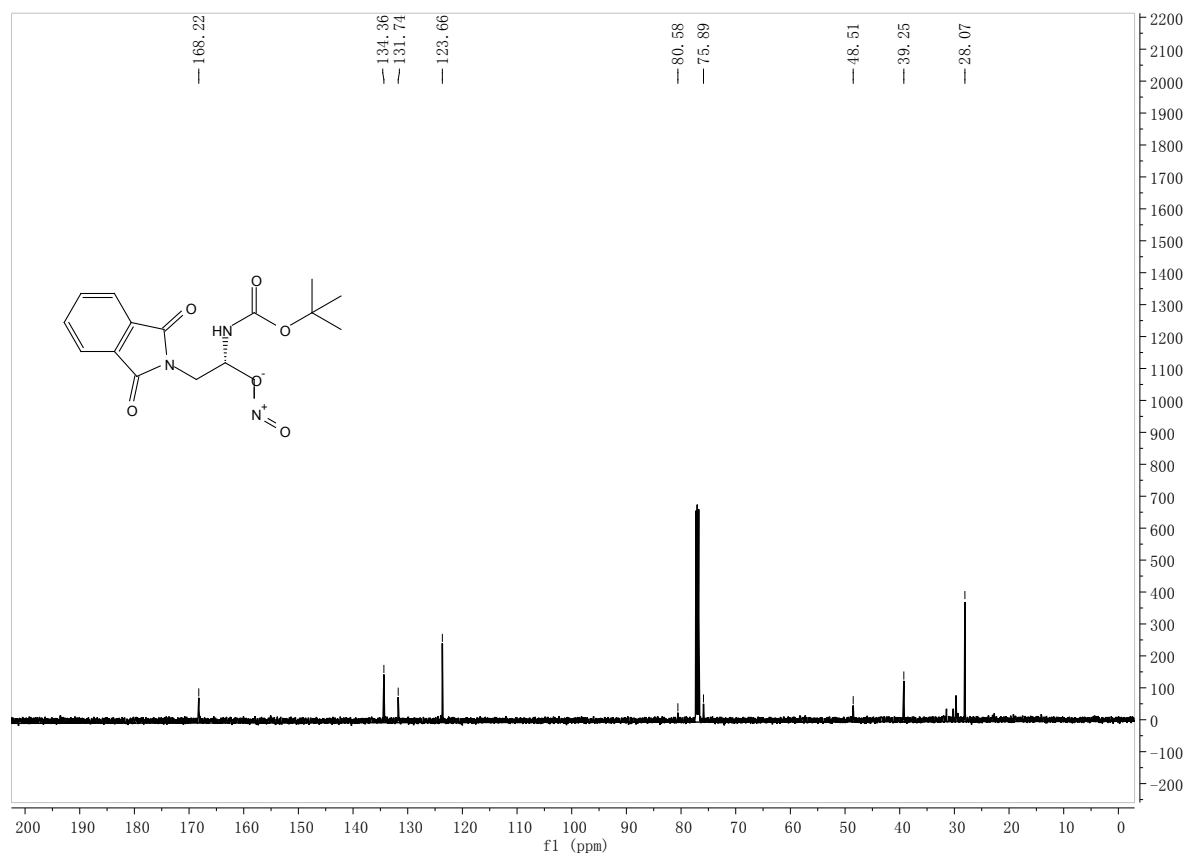
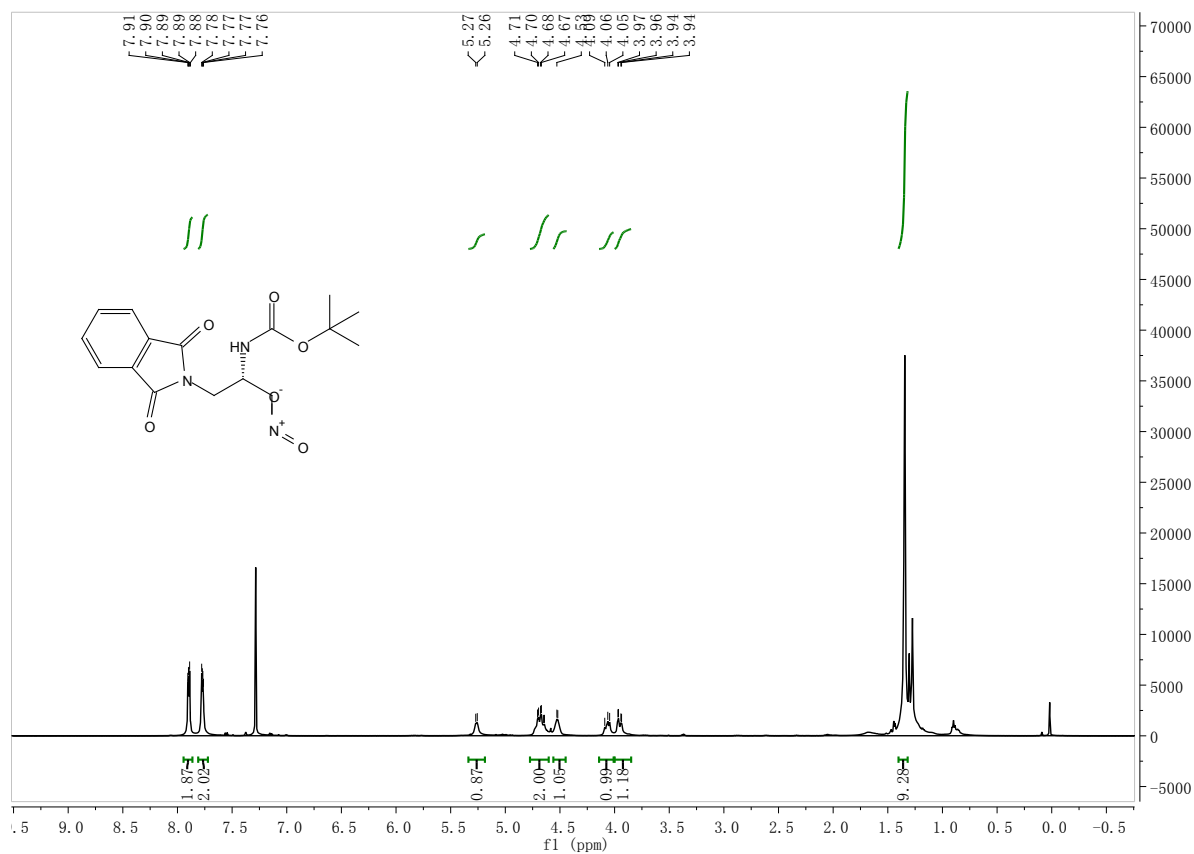




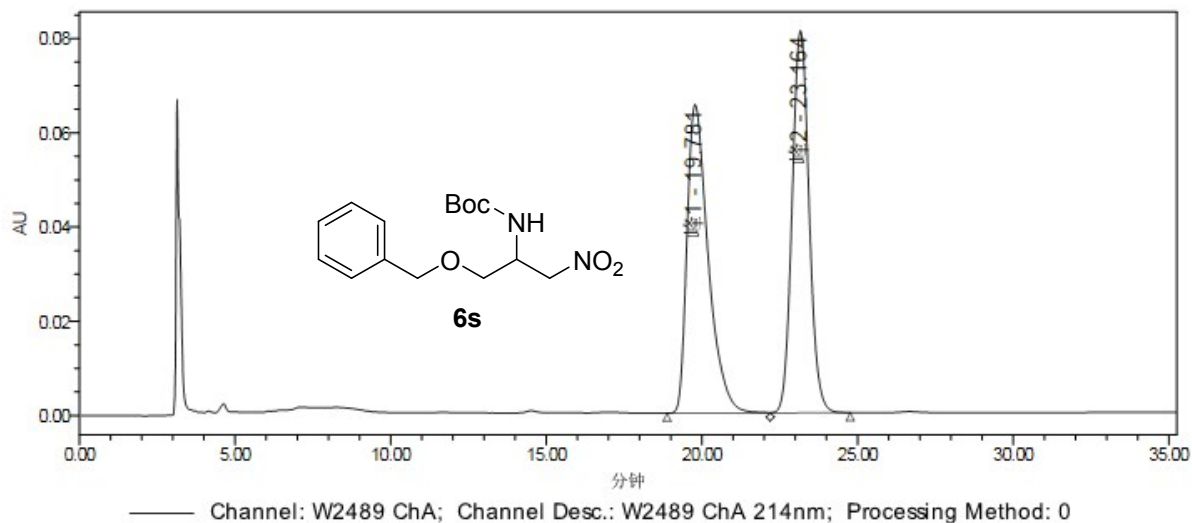




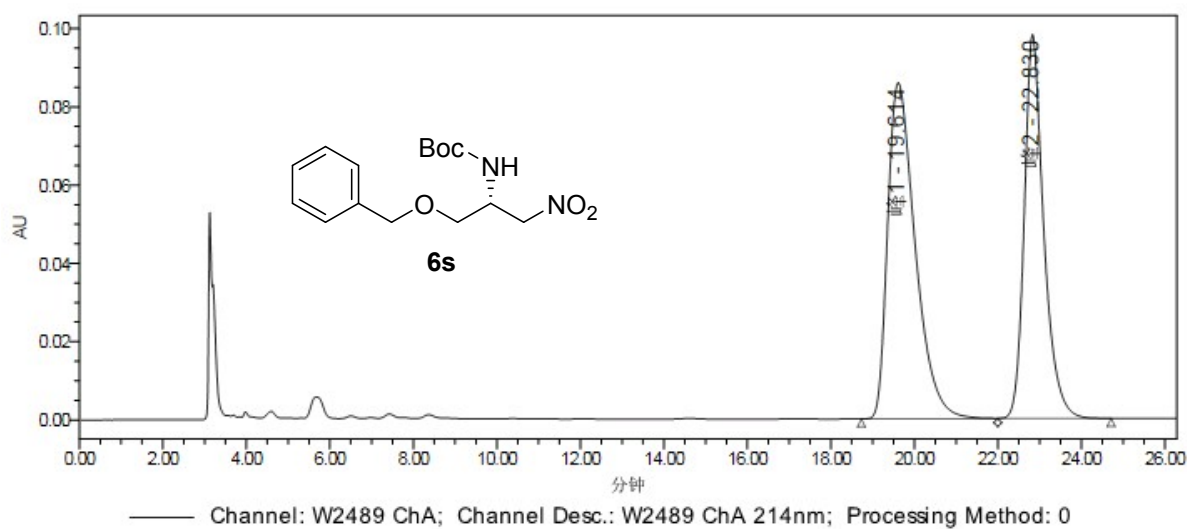




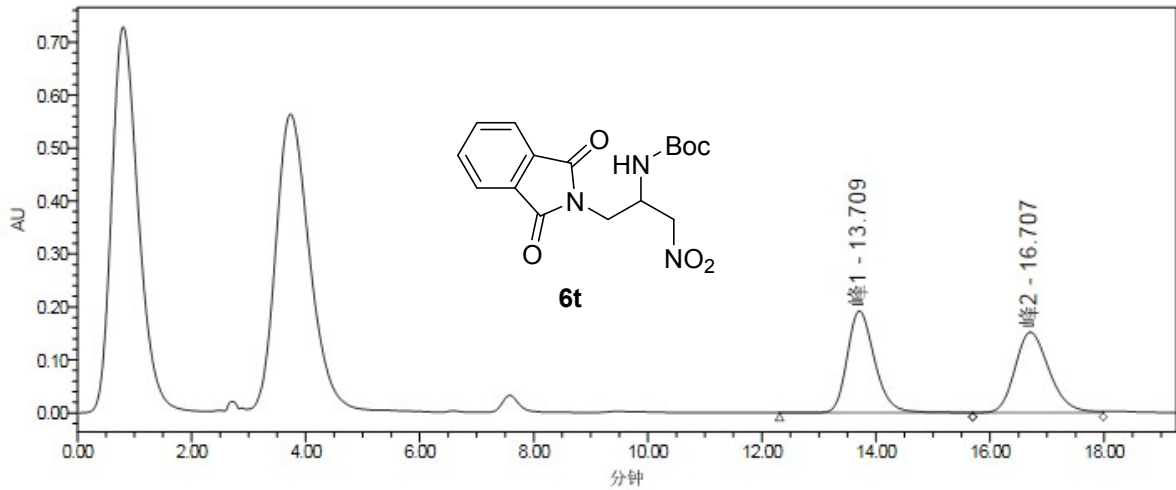
### 3. HPLC traces of supplementary experiment



	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	19.781	3097815	50.24	65467
2	W2489 ChA 214nm	峰2	23.164	3067733	49.76	81022

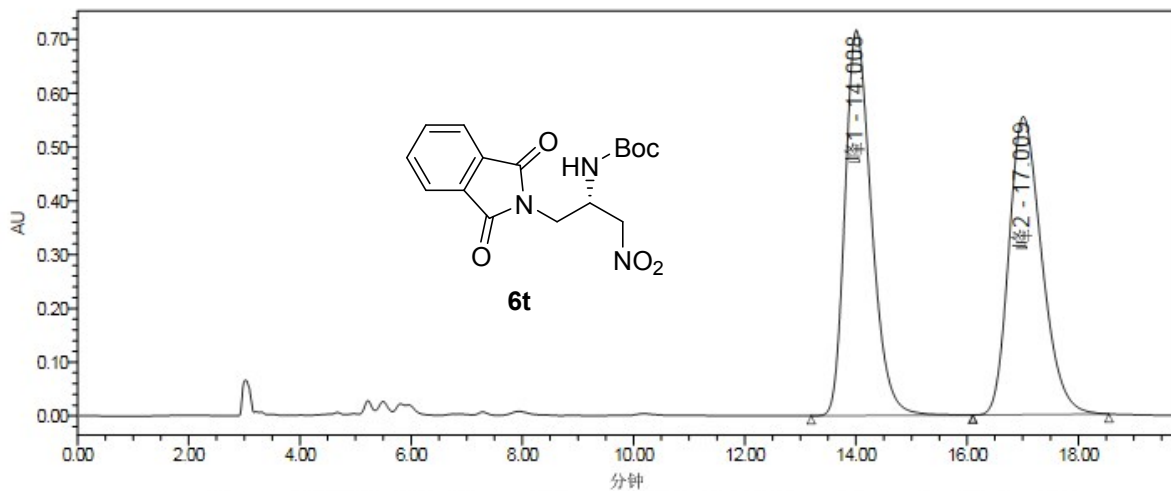


	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	19.614	3940908	55.29	85850
2	W2489 ChA 214nm	峰2	22.830	3186760	44.71	98098



Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	13.709	6413642	50.30	192124
2	W2489 ChA 214nm	峰2	16.707	6337694	49.70	152072



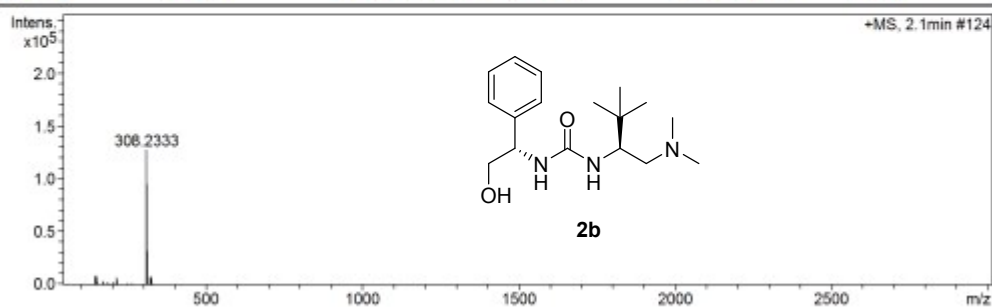
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	14.008	23667548	50.99	716839
2	W2489 ChA 214nm	峰2	17.009	22750453	49.01	554260

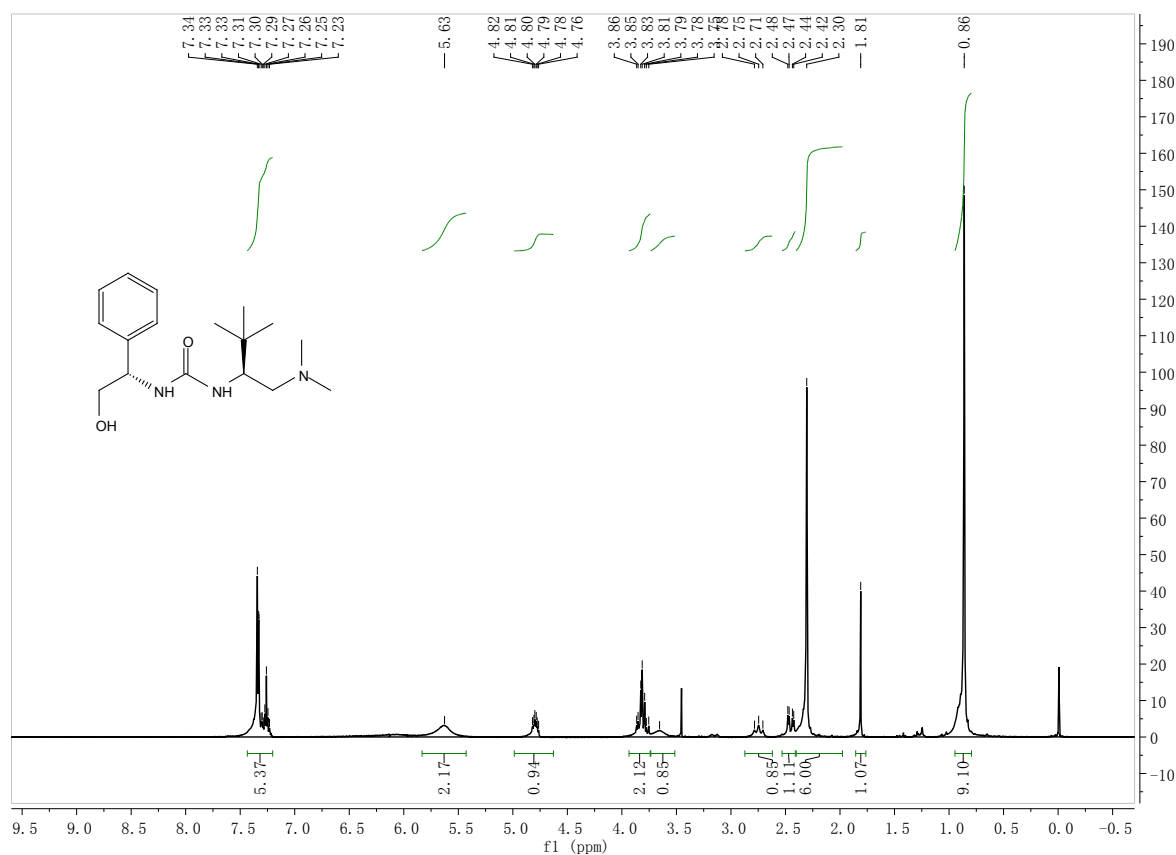
#### 4. NMR and HRMS spectra of asymmetric phase-transfer catalysts

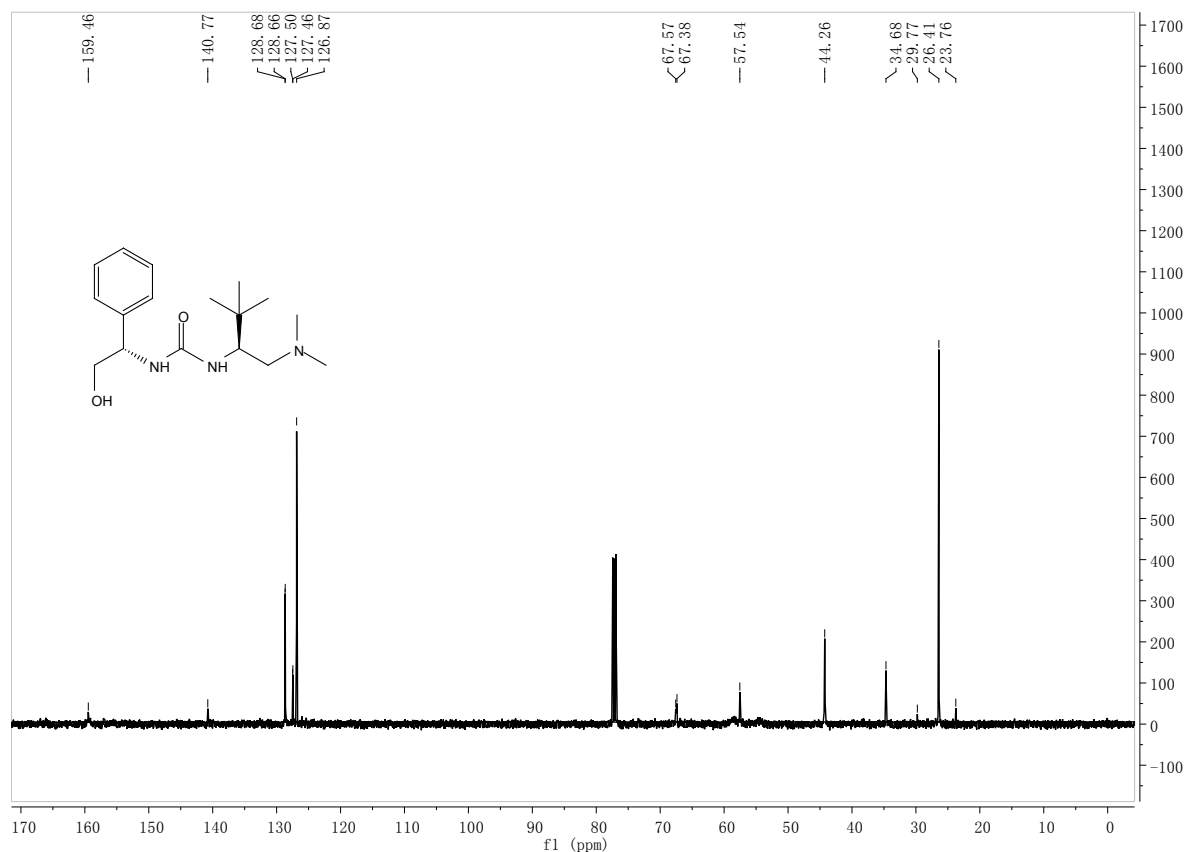
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Method	lc-ms3-hr-low.m		Instrument / Ser#	microTOF-Q II 10351	
Sample Name	LYX-0615-N		Comment		

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Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e Conf	N-Rule
308.2333	C 17 H 30 N 3 O 2	308.2333	-0.2	0.3	29.44	4.5	even	ok





## Mass Spectrum SmartFormula Report

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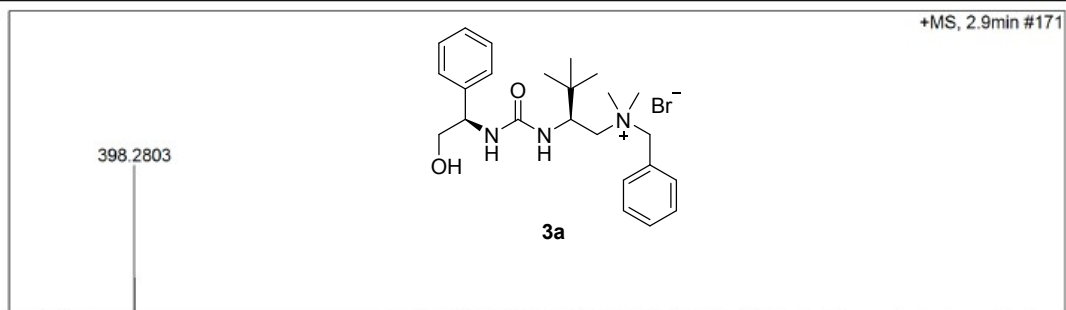
Acquisition Date 2016/6/16 13:46:50

Operator Zhonglin Wei

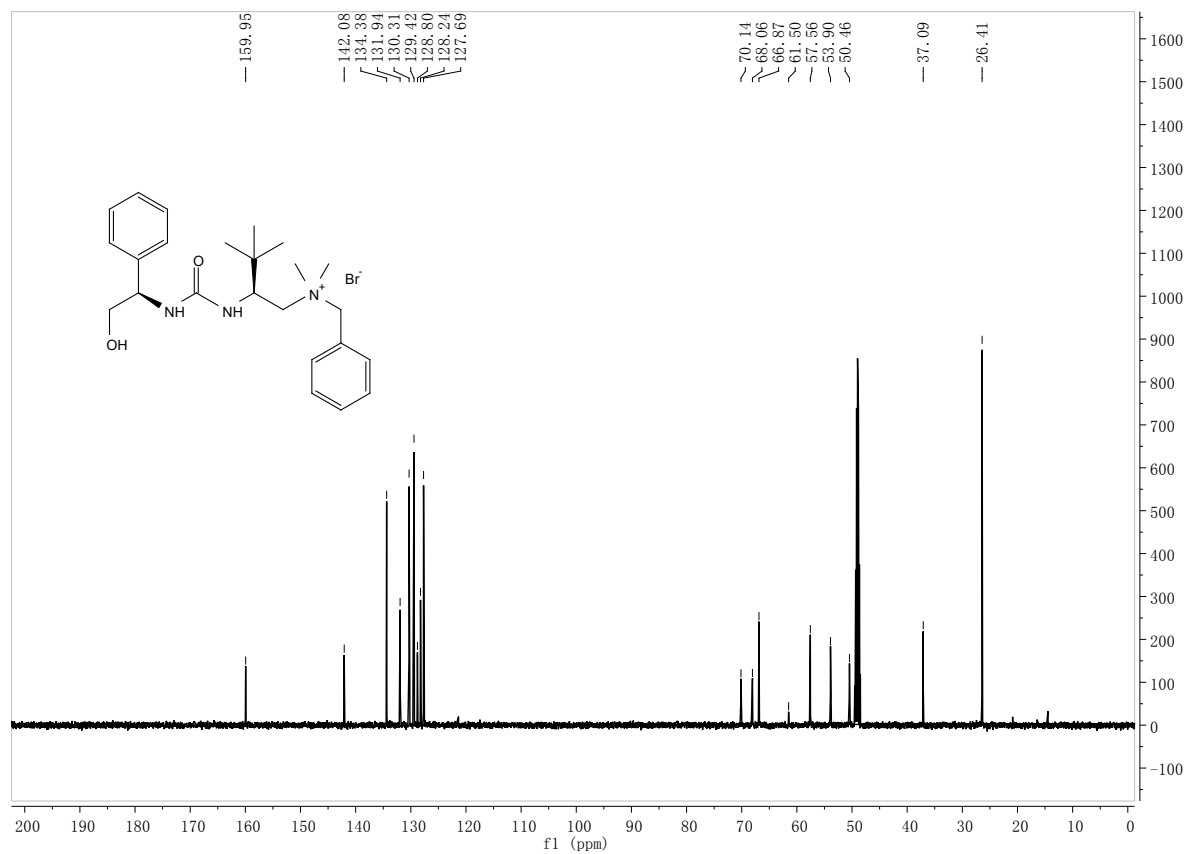
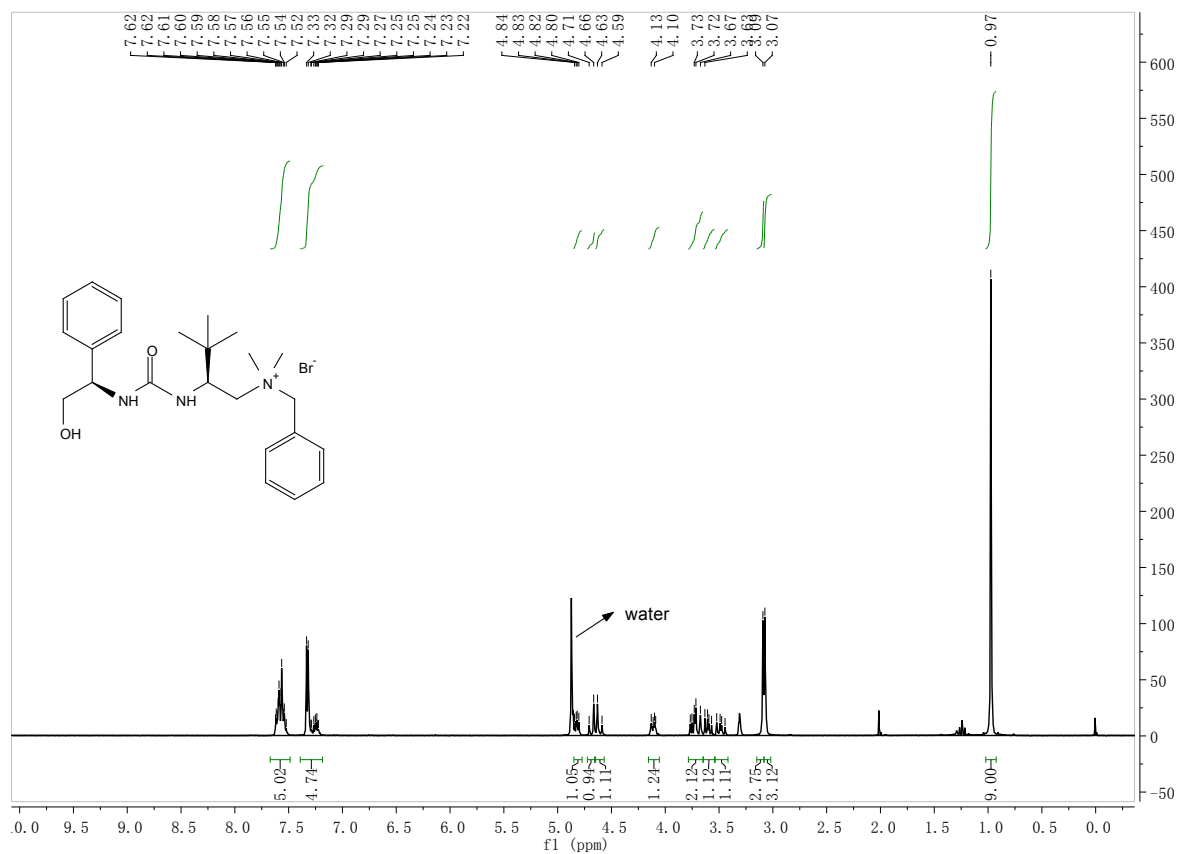
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Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e <sup>-</sup> Conf	N-Rule
398.2803	C <sub>24</sub> H <sub>36</sub> N <sub>3</sub> O <sub>2</sub>	398.2802	-0.3	1.8	5.08	8.5	even	ok



# Mass Spectrum SmartFormula Report

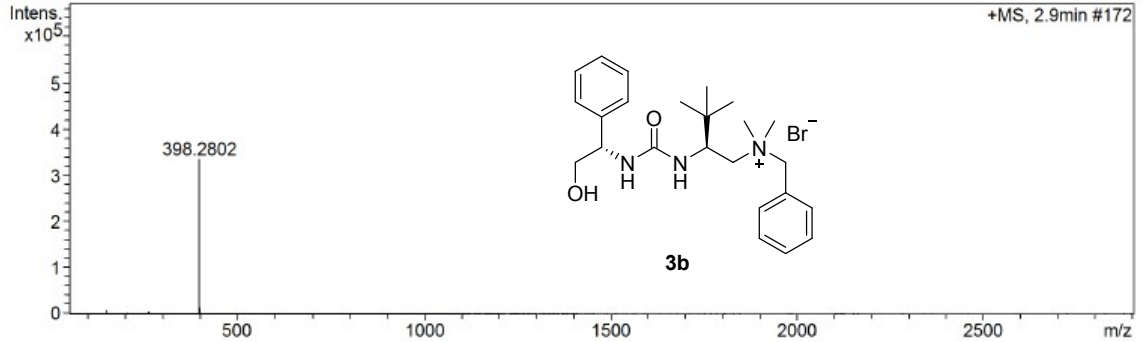
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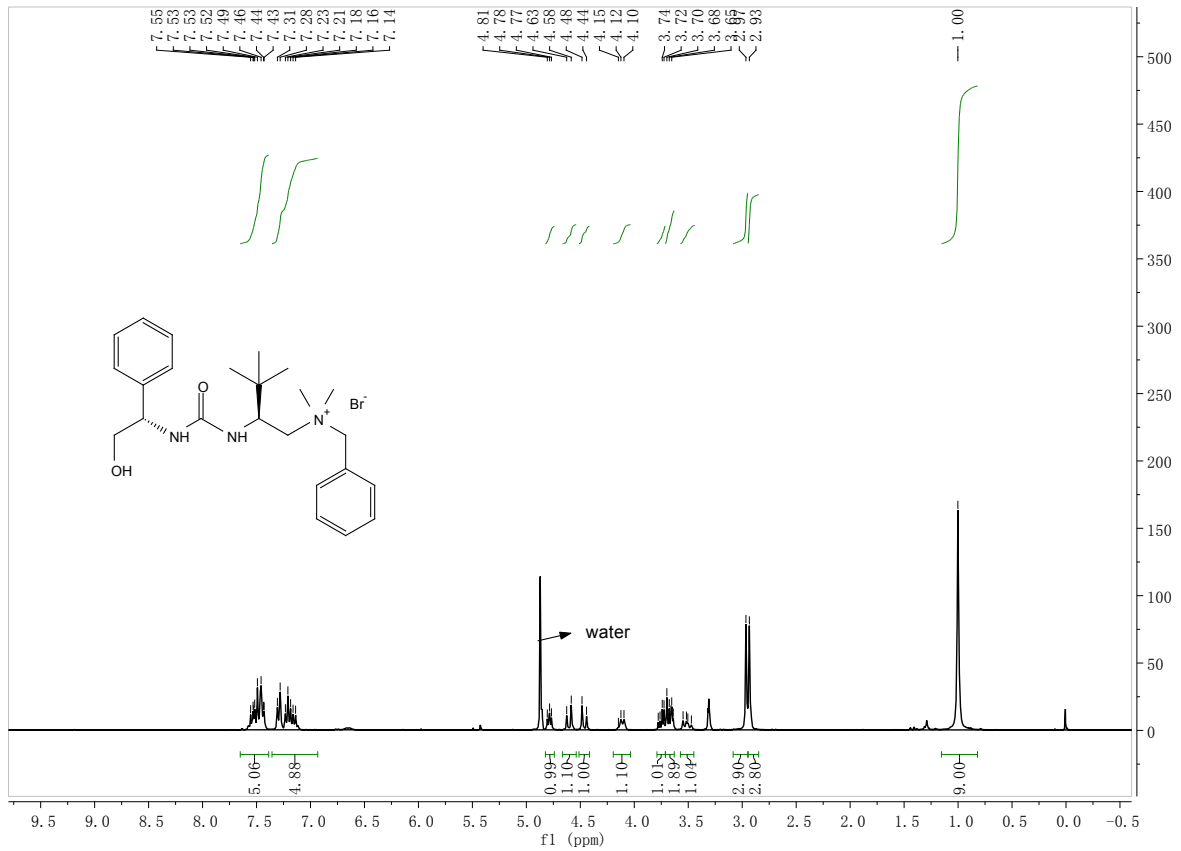
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 Instrument / Ser#: microTOF-Q II 10351

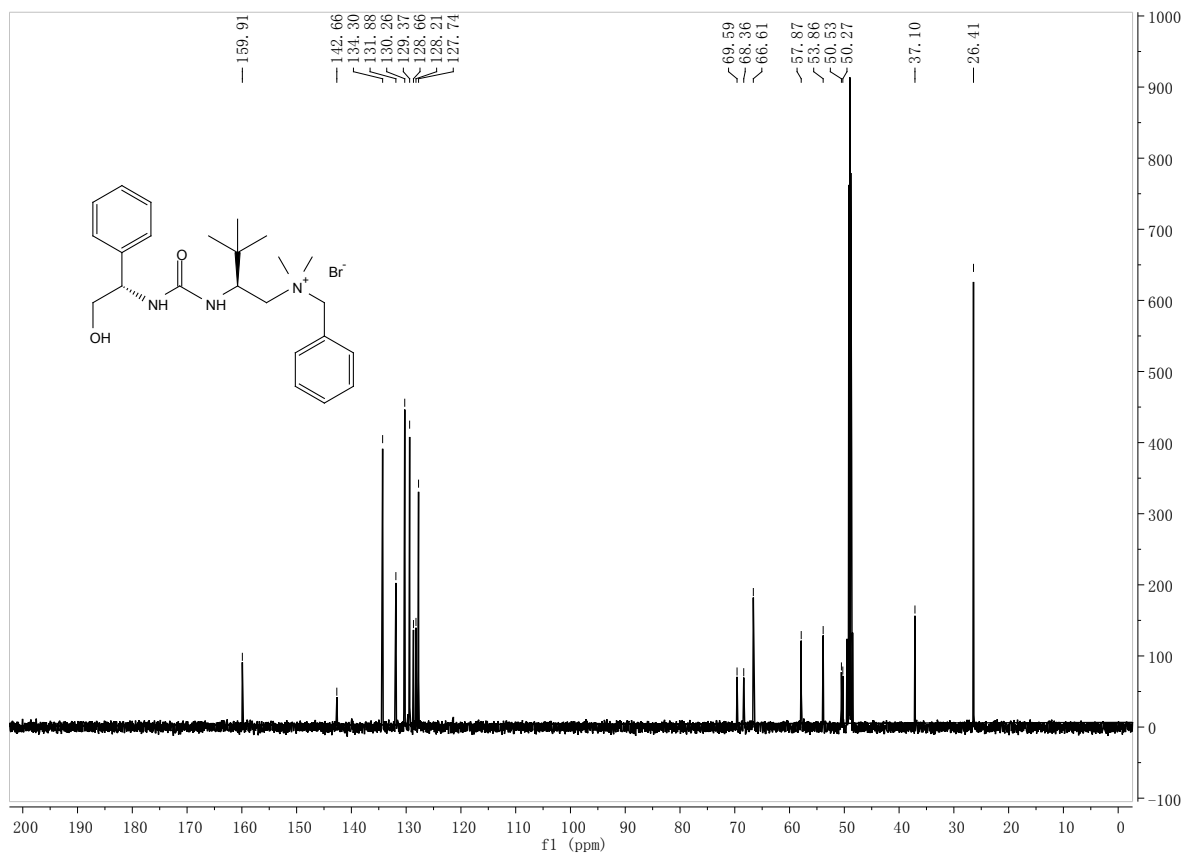
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Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e <sup>-</sup> Conf	N-Rule
398.2802	C <sub>24</sub> H <sub>36</sub> N <sub>3</sub> O <sub>2</sub>	398.2802	-0.0	2.0	4.64	8.5	even	ok





## Mass Spectrum SmartFormula Report

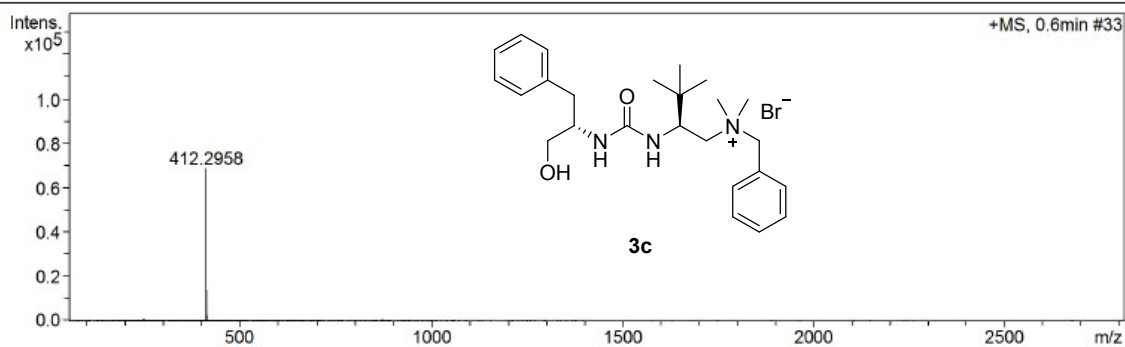
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 Instrument / Ser# micrOTOF-Q II 10351

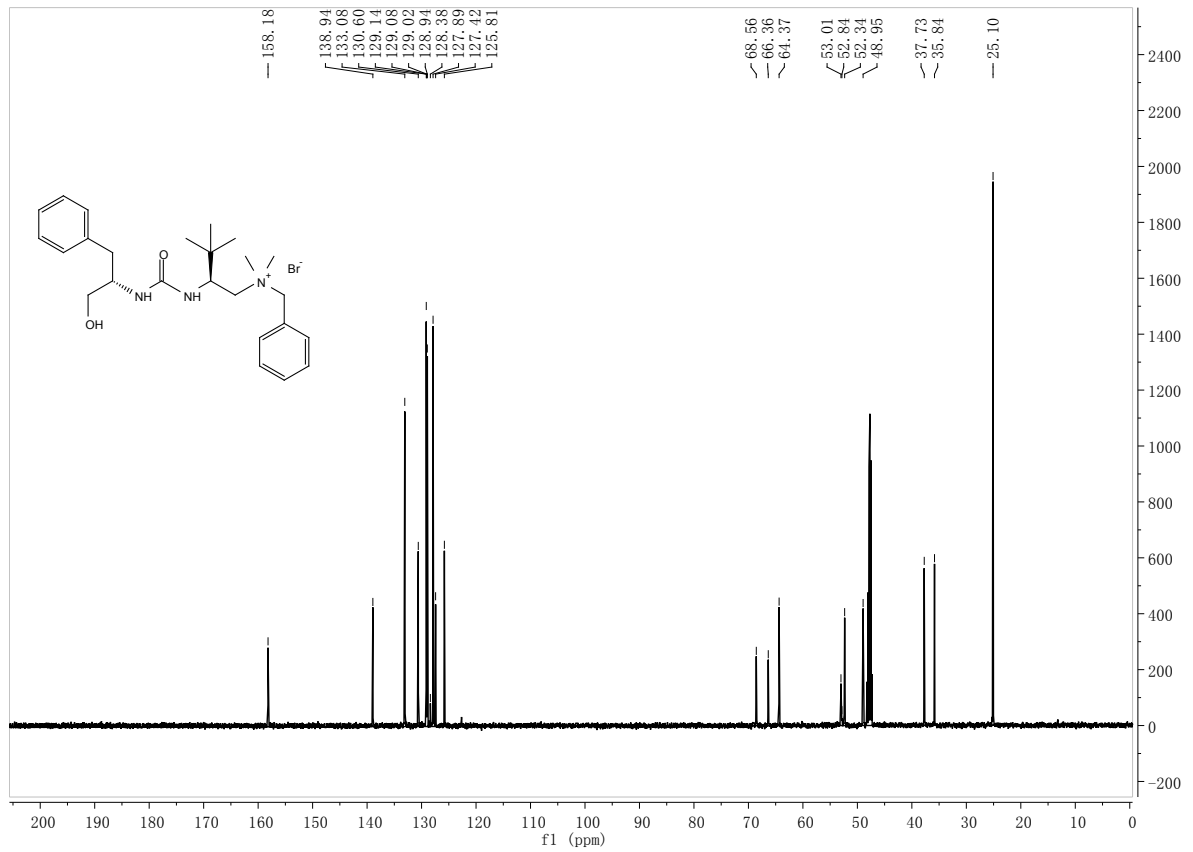
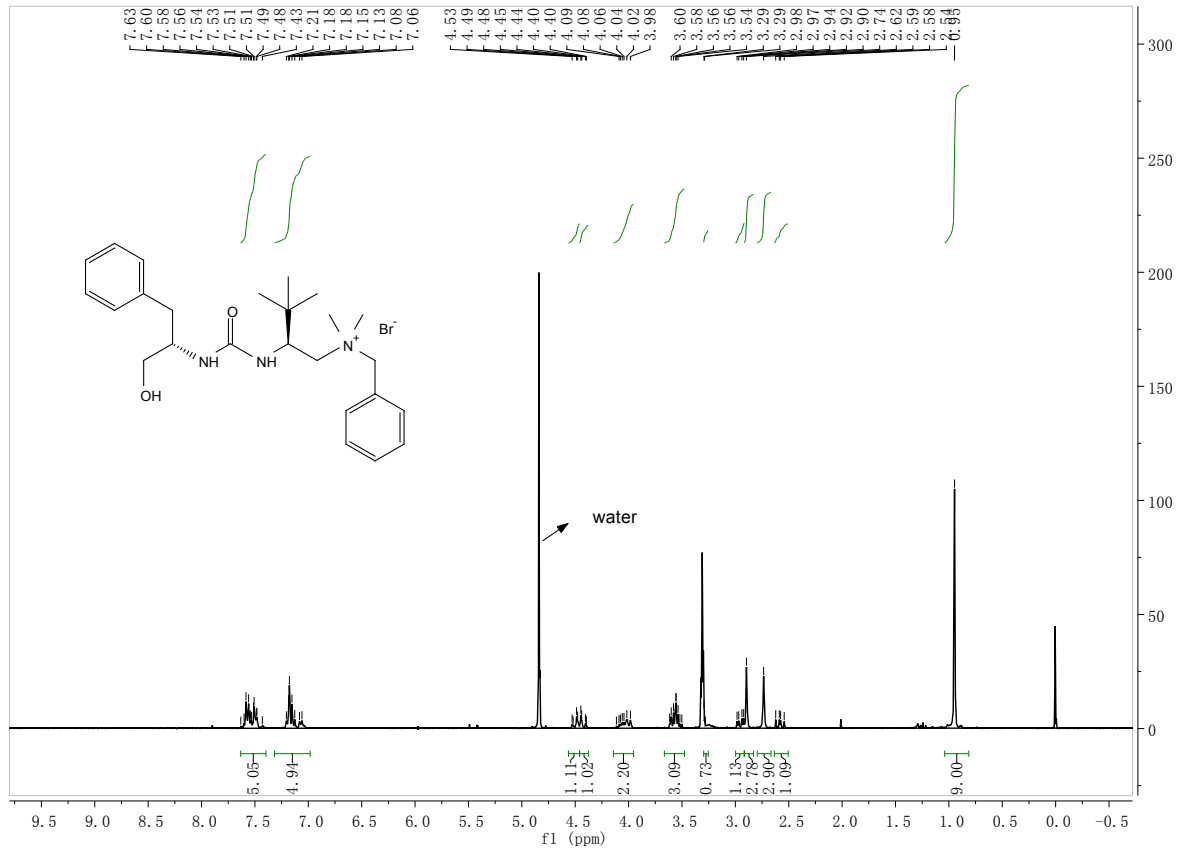
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Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e <sub>1</sub> Conf	N-Rule
412.2958	C <sub>25</sub> H <sub>38</sub> N <sub>3</sub> O <sub>2</sub>	412.2959	0.2	0.5	51.53	8.5	even	ok





## Mass Spectrum SmartFormula Report

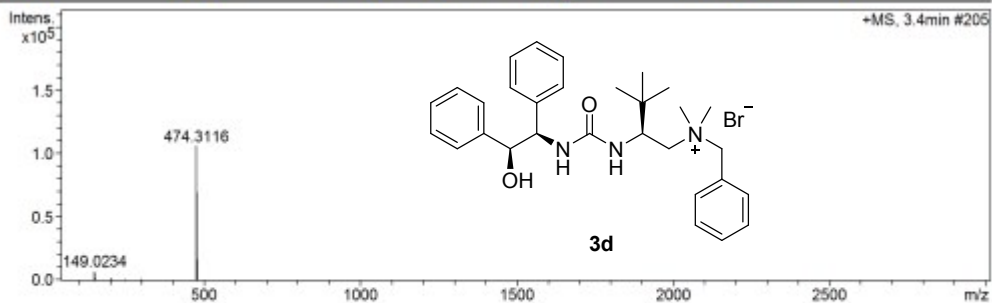
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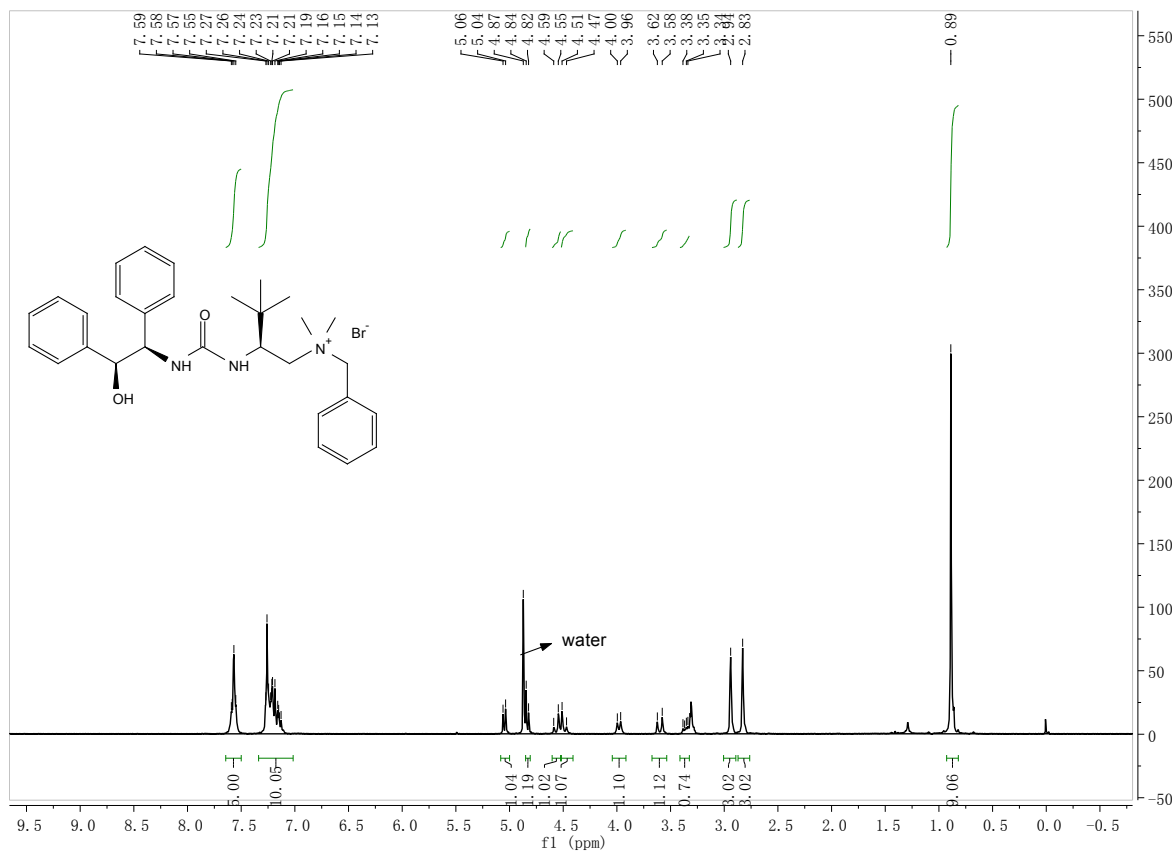
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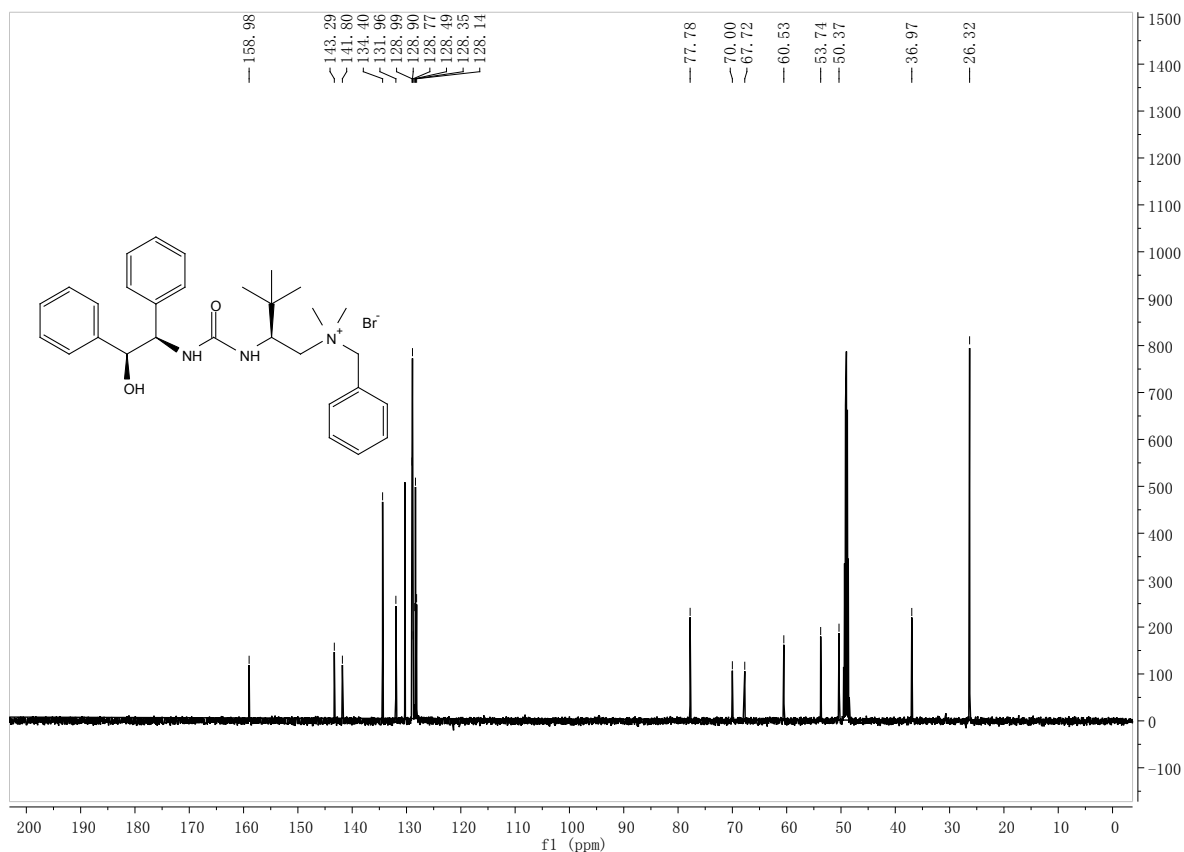
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Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e N Conf	N-Rule
474.3116	C <sub>30</sub> H <sub>40</sub> N <sub>3</sub> O <sub>2</sub>	474.3115	-0.2	0.4	24.30	12.5	even	ok





## Mass Spectrum SmartFormula Report

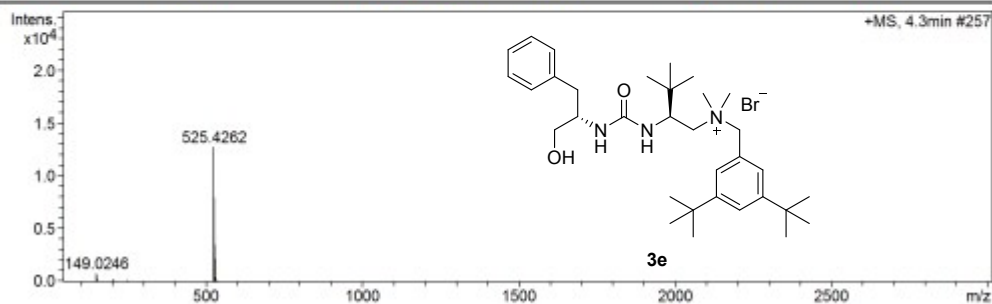
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 Operator Zhonglin Wei  
 Instrument / Ser# micrOTOF-Q II 10351

### Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	0.4 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	180 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e Conf	N-Rule
524.4210	C 33 H 54 N 3 O 2	524.4211	0.0	-2.2	330.42	8.5	even	ok

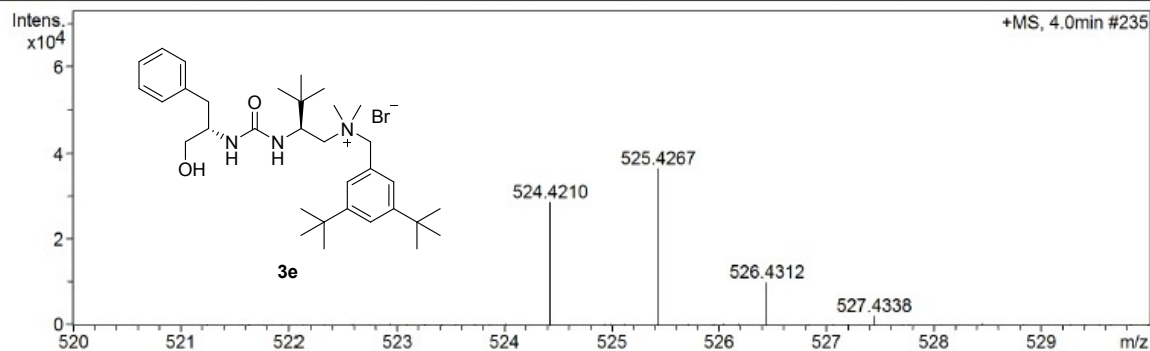
**Analysis Info**

Analysis Name E:\00000000\000000\LYX-0615-2SHU\_P1-A-7\_01\_23766.d  
 Method lc-ms3-hr-low.m  
 Sample Name LYX-0615-2SHU  
 Comment

Acquisition Date 2016/6/16 13:39:49  
 Operator Zhonglin Wei  
 Instrument / Ser# microTOF-Q II 10351

**Acquisition Parameter**

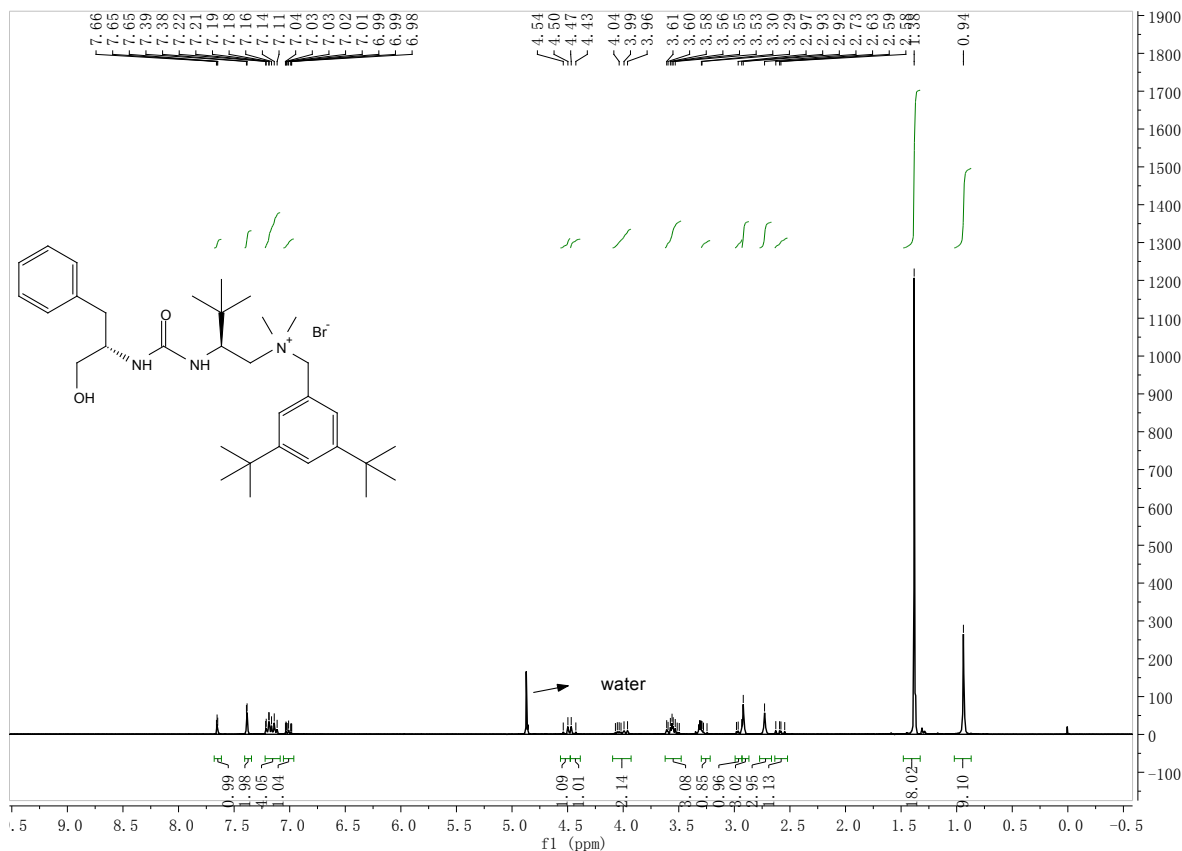
Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	0.4 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	180 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste

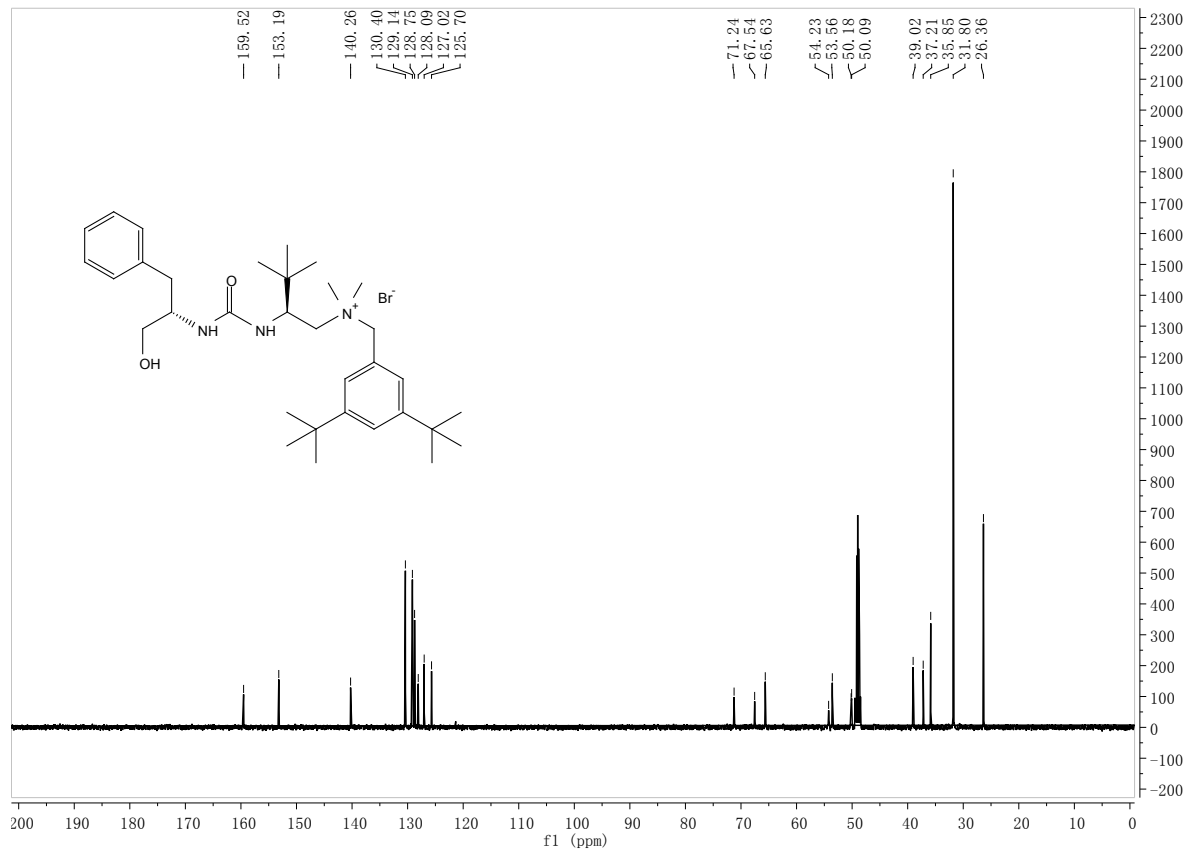


Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e <sub>1</sub> Conf	N-Rule
524.4210	C <sub>33</sub> H <sub>54</sub> N <sub>3</sub> O <sub>2</sub>	524.4211	0.0	-3.1	346.07	8.5	even	ok

**Mass Spectrum SmartFormula Report**

7CH11 D1.A.





## Mass Spectrum SmartFormula Report

### Analysis Info

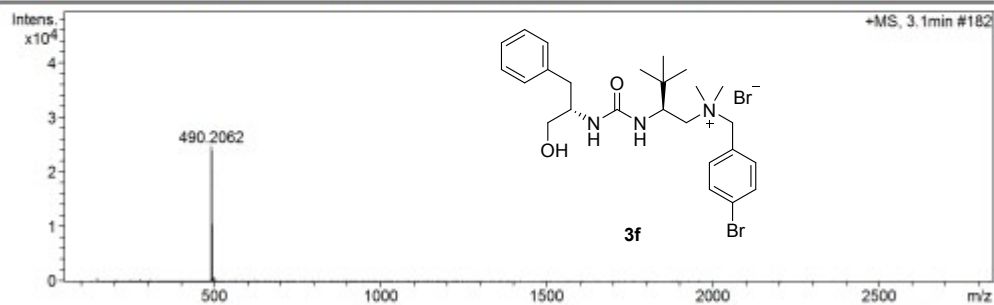
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 Sample Name: LYX-0615-BPBR  
 Comment:

Acquisition Date: 2016/6/16 14:00:52

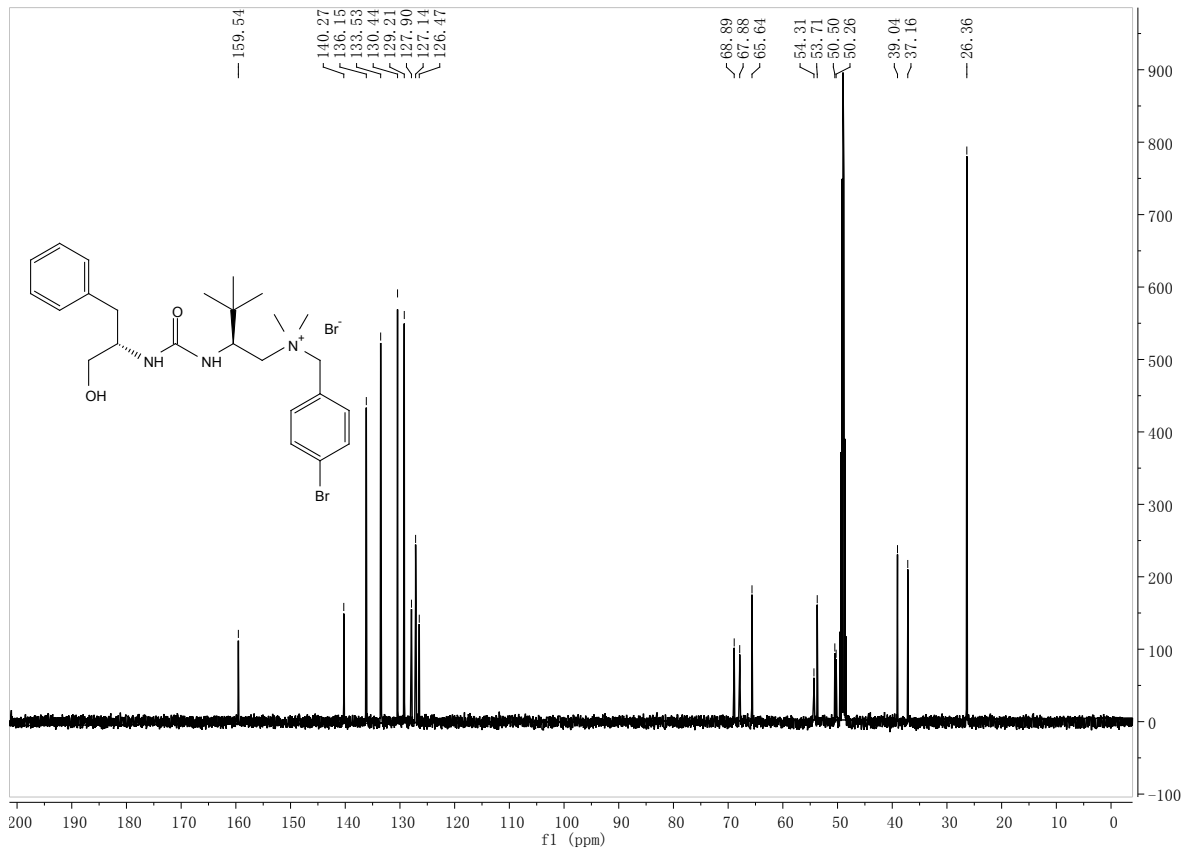
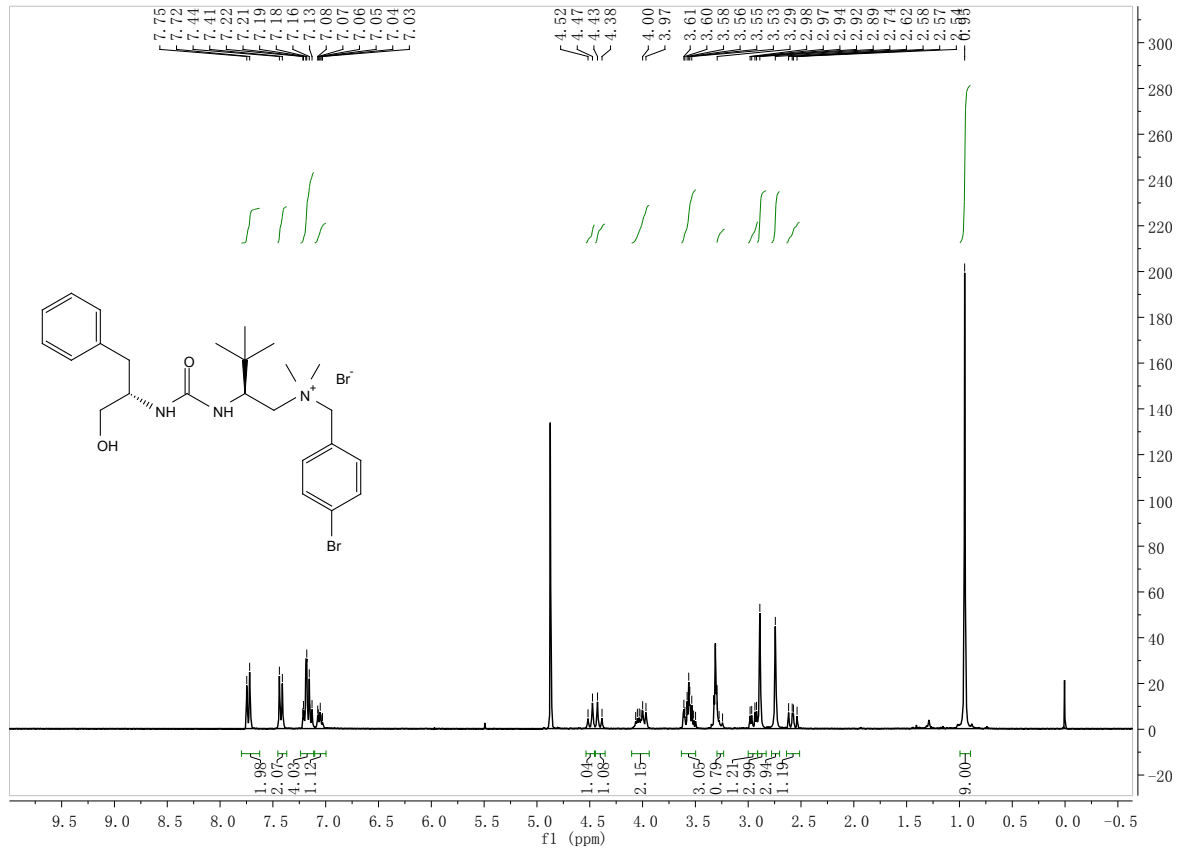
Operator: Zhonglin Wei  
 Instrument / Ser#: microTOF-Q II 10351

### Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	0.4 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	180 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	e Conf	N-Rule
490.2062	C <sub>25</sub> H <sub>37</sub> BrN <sub>3</sub> O <sub>2</sub>	490.2064	0.2	-2.2	97.48	8.5	even	ok



# Mass Spectrum SmartFormula Report

## Analysis Info

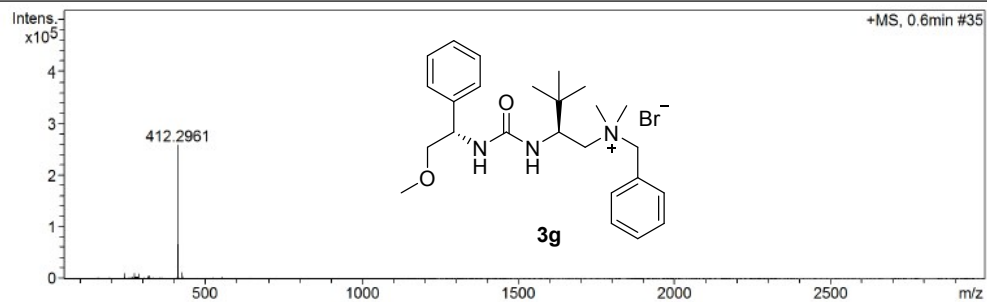
Analysis Name: E:\00EEÿ%4ÿµÙpÖÄ\lyx-0321-Me\_P1-B-1\_01\_1616.d  
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Sample Name: lyx-0321-Me  
Comment:

Acquisition Date: 2017/3/31 13:37:14

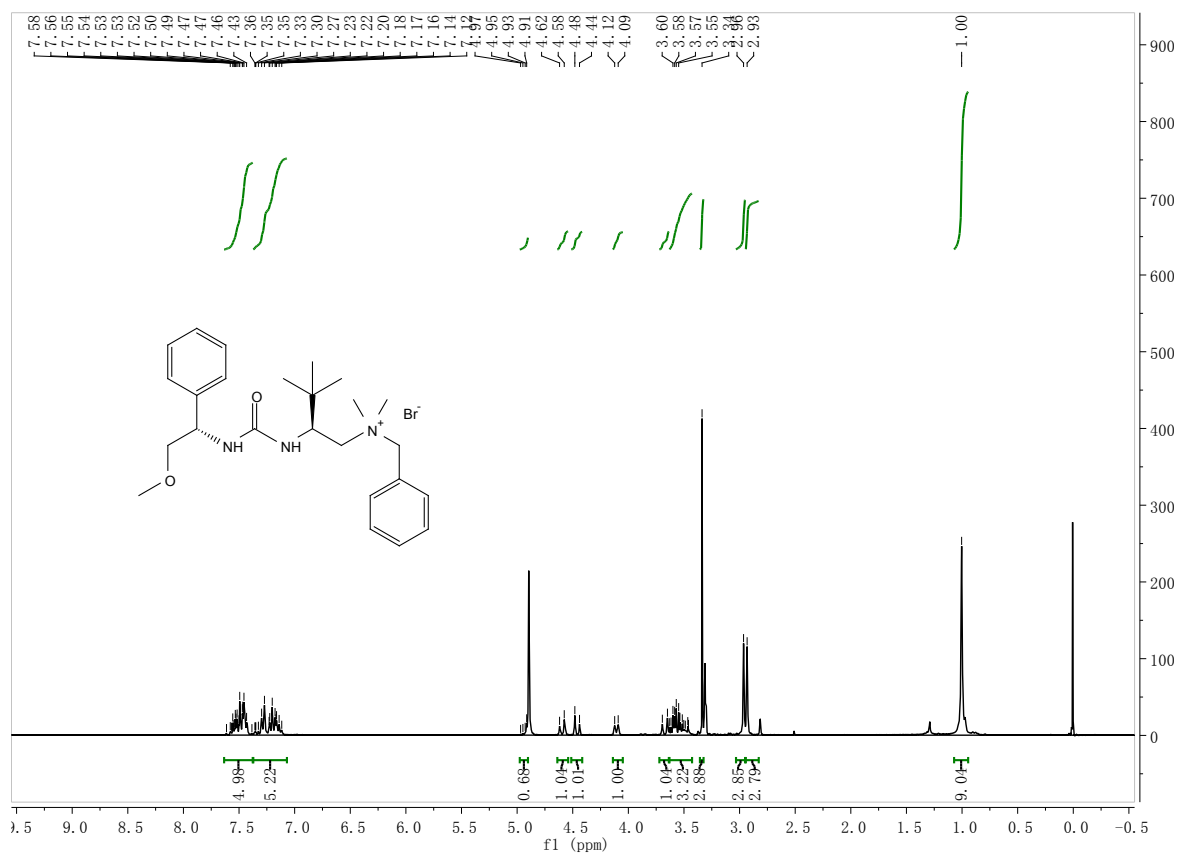
Operator: zlwei  
Instrument / Ser#: microTOF-Q II 10351

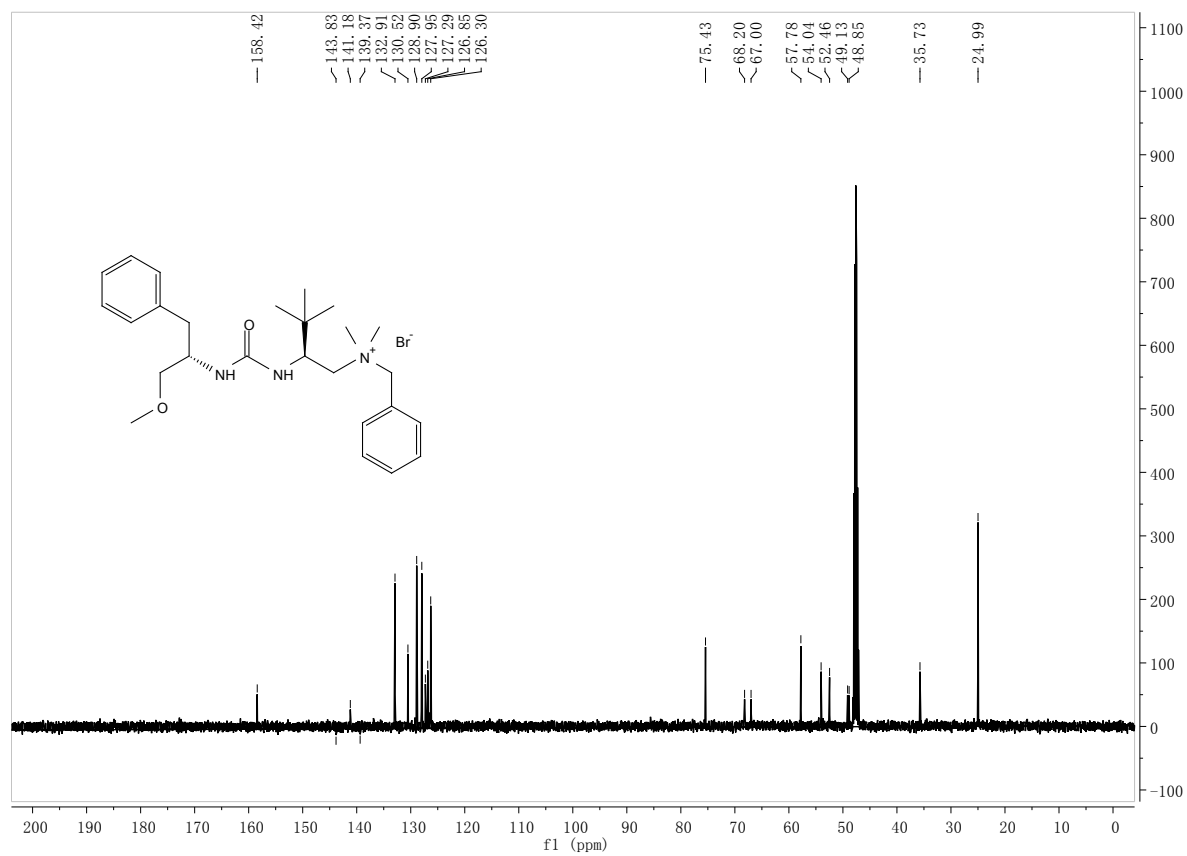
## Acquisition Parameter

Source Type	ESI	Ion Polarity	Positive	Set Nebulizer	0.4 Bar
Focus	Active	Set Capillary	4500 V	Set Dry Heater	180 °C
Scan Begin	50 m/z	Set End Plate Offset	-500 V	Set Dry Gas	4.0 l/min
Scan End	3000 m/z	Set Collision Cell RF	150.0 Vpp	Set Divert Valve	Waste



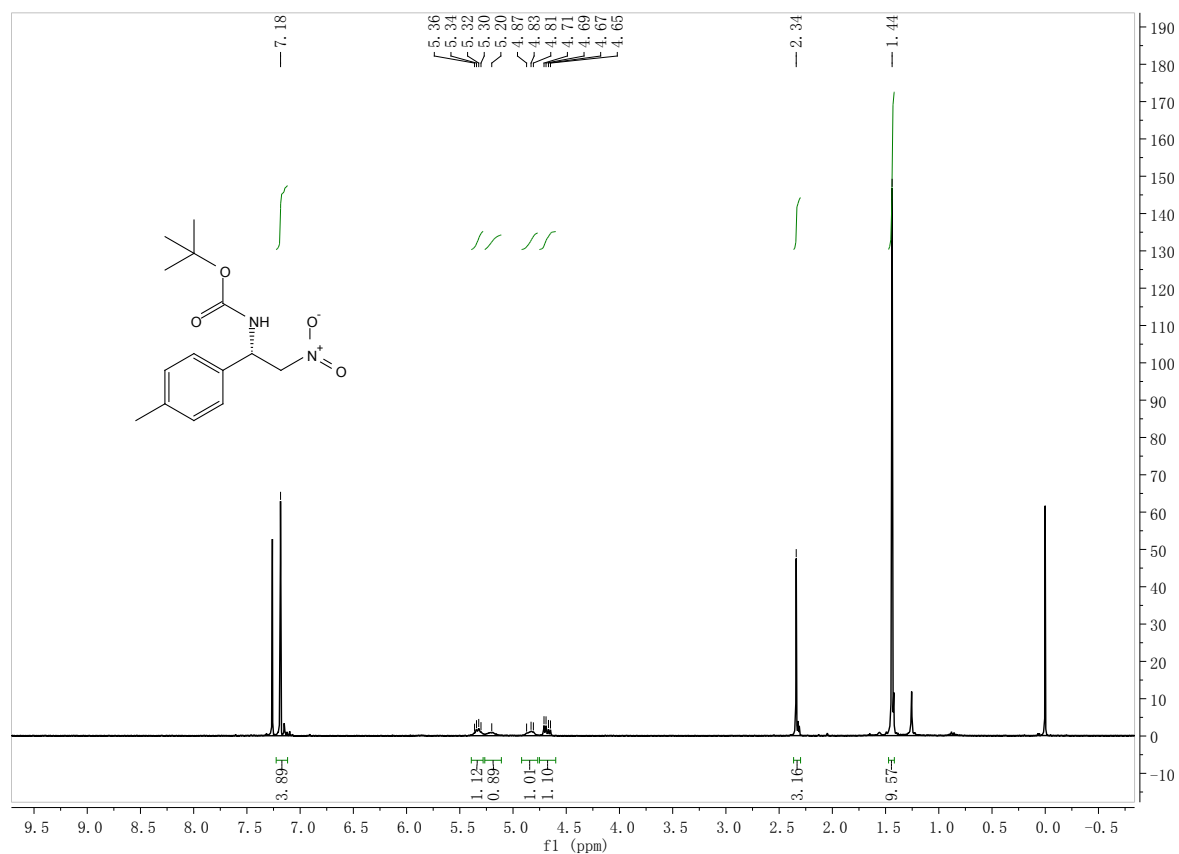
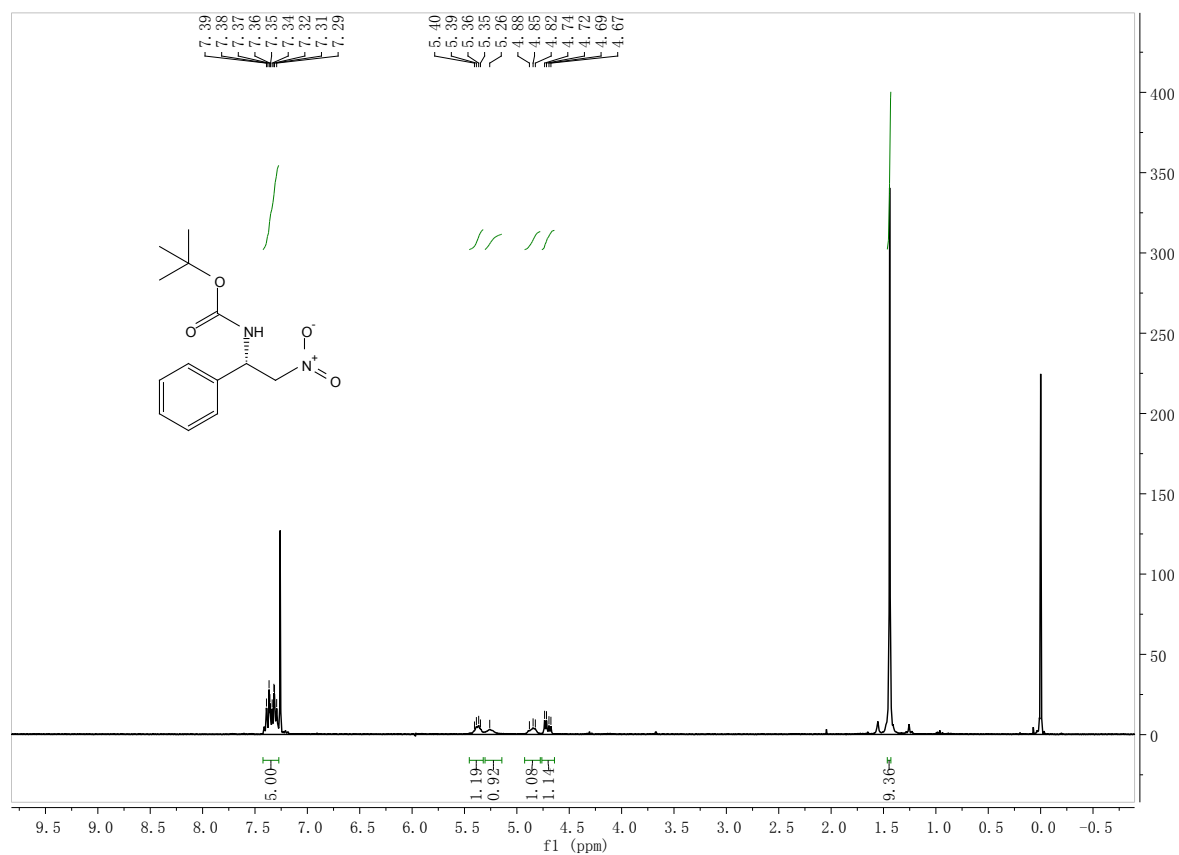
Meas. m/z	Formula	m/z	err [ppm]	Mean err [ppm]	mSigma	rdb	ej	Conf	N-Rule
412.2961	C <sub>25</sub> H <sub>38</sub> N <sub>3</sub> O <sub>2</sub>	412.2959	-0.7	-0.5	19.04	8.5	even		ok

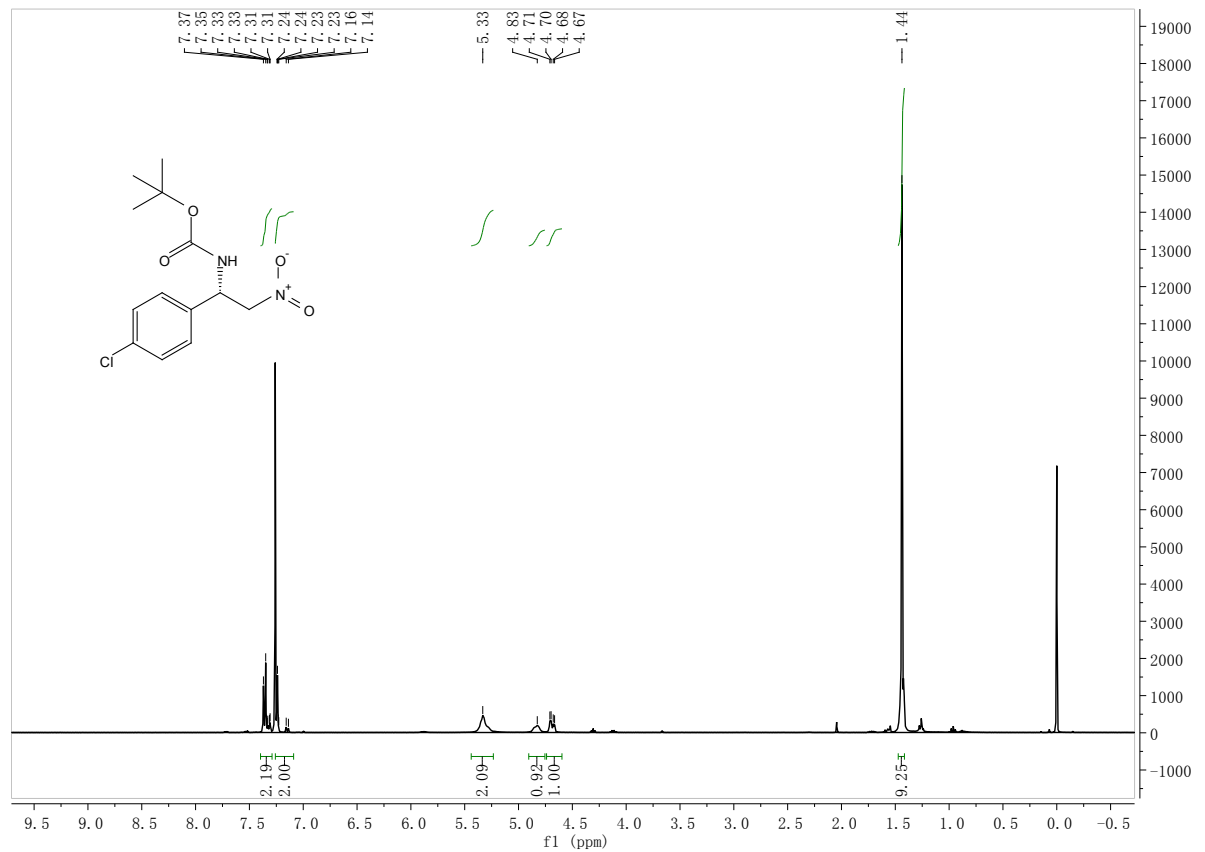
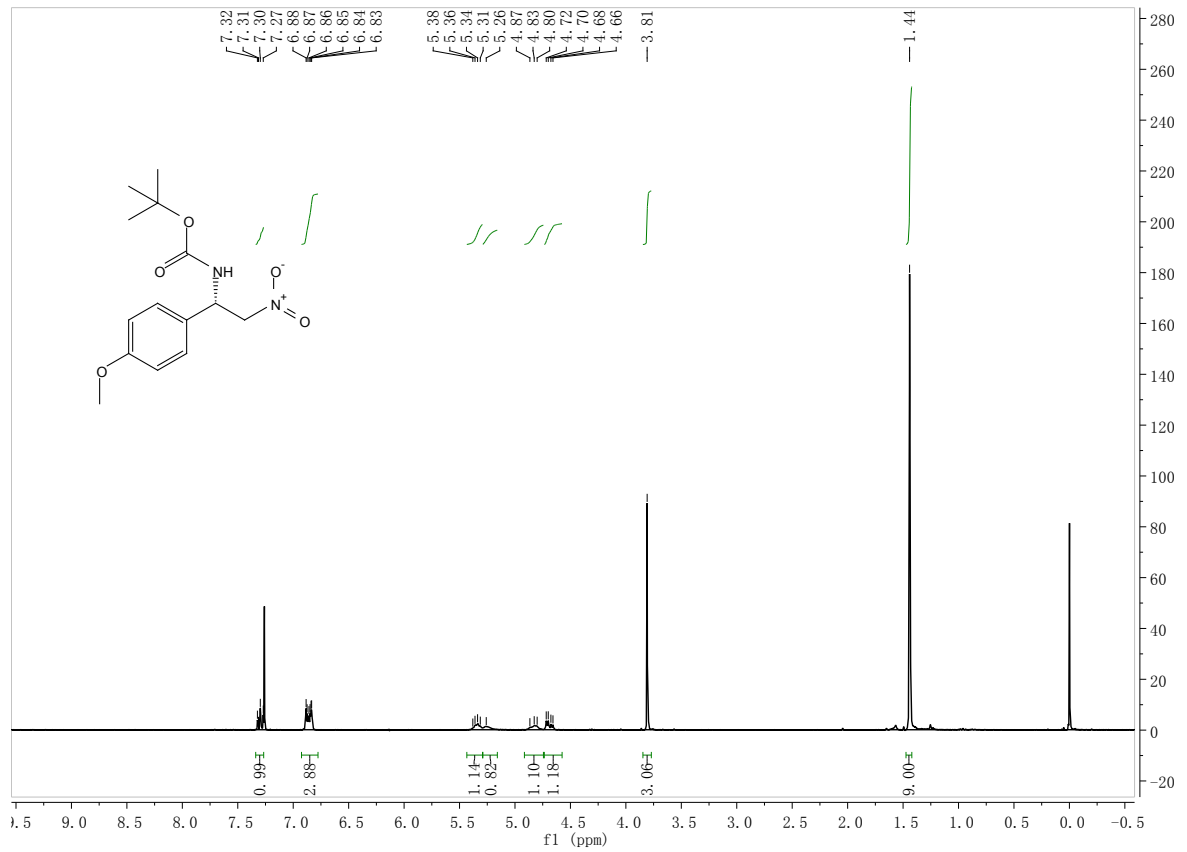


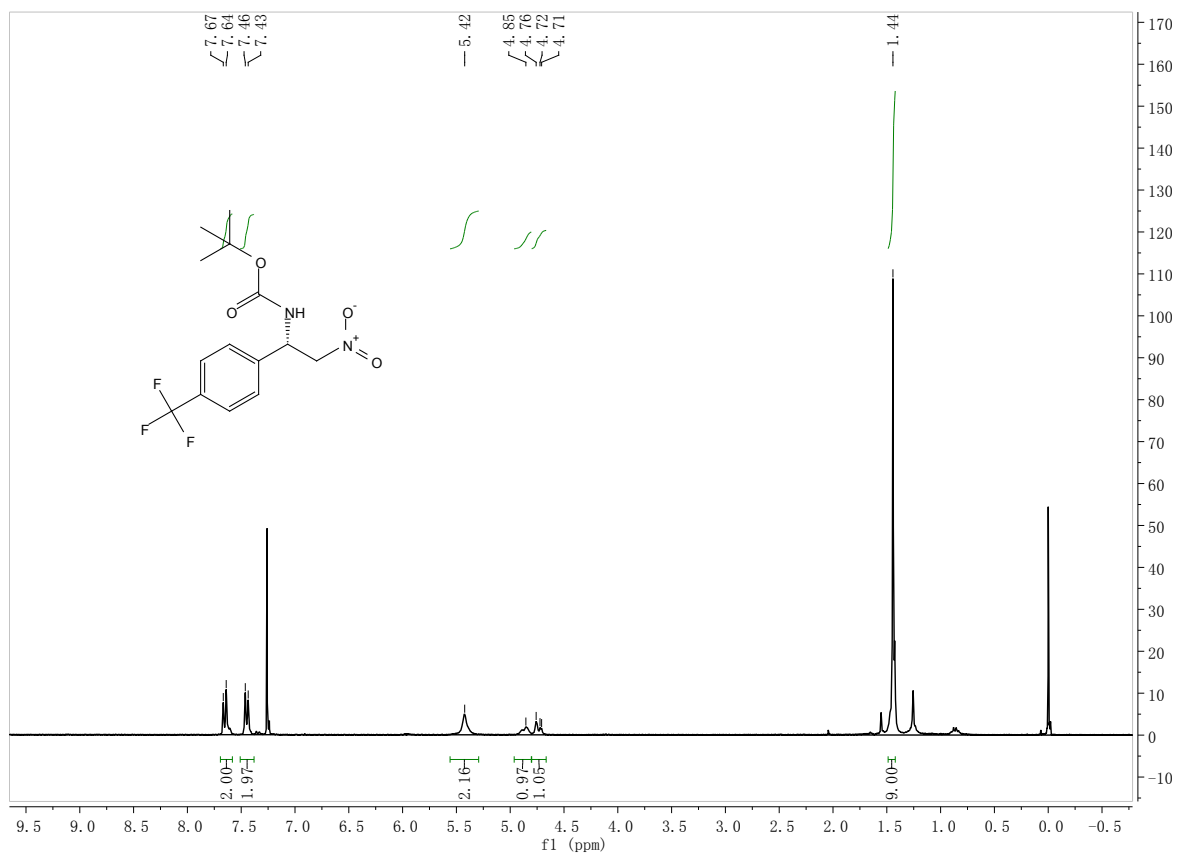
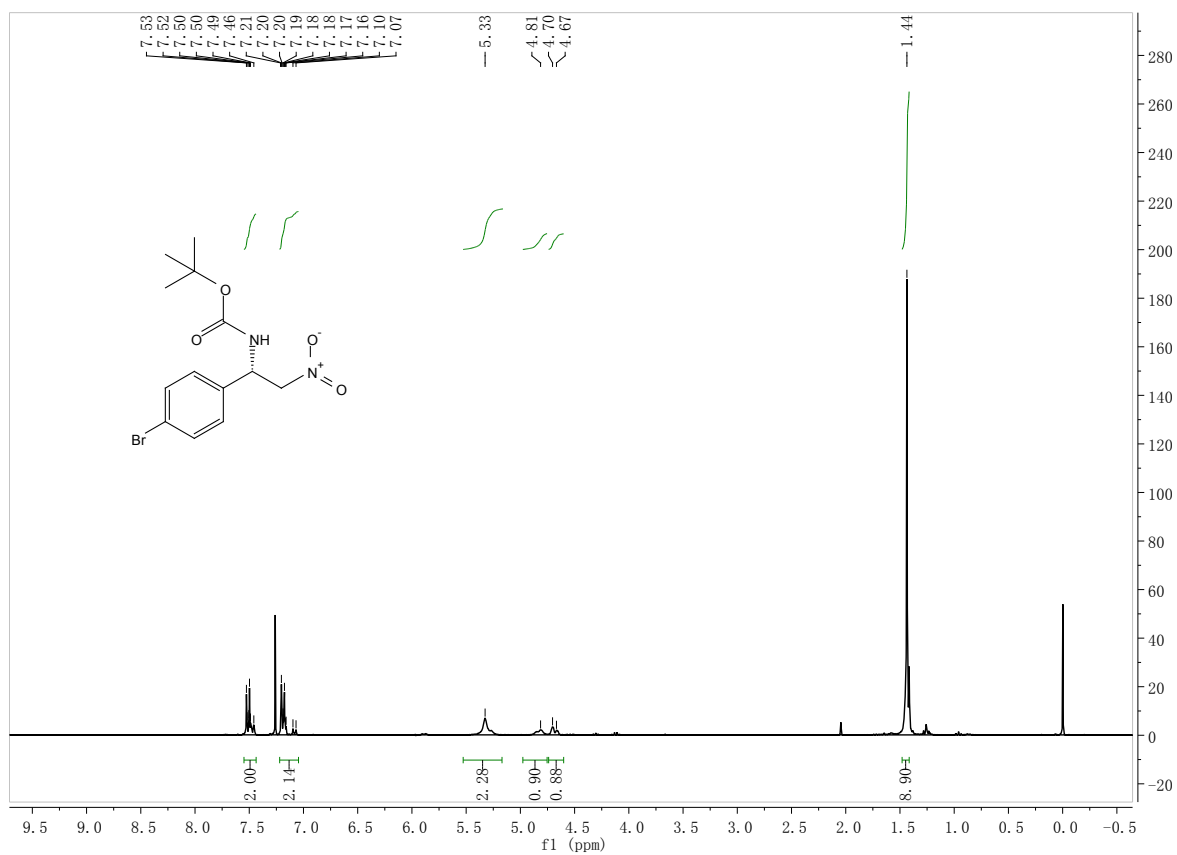


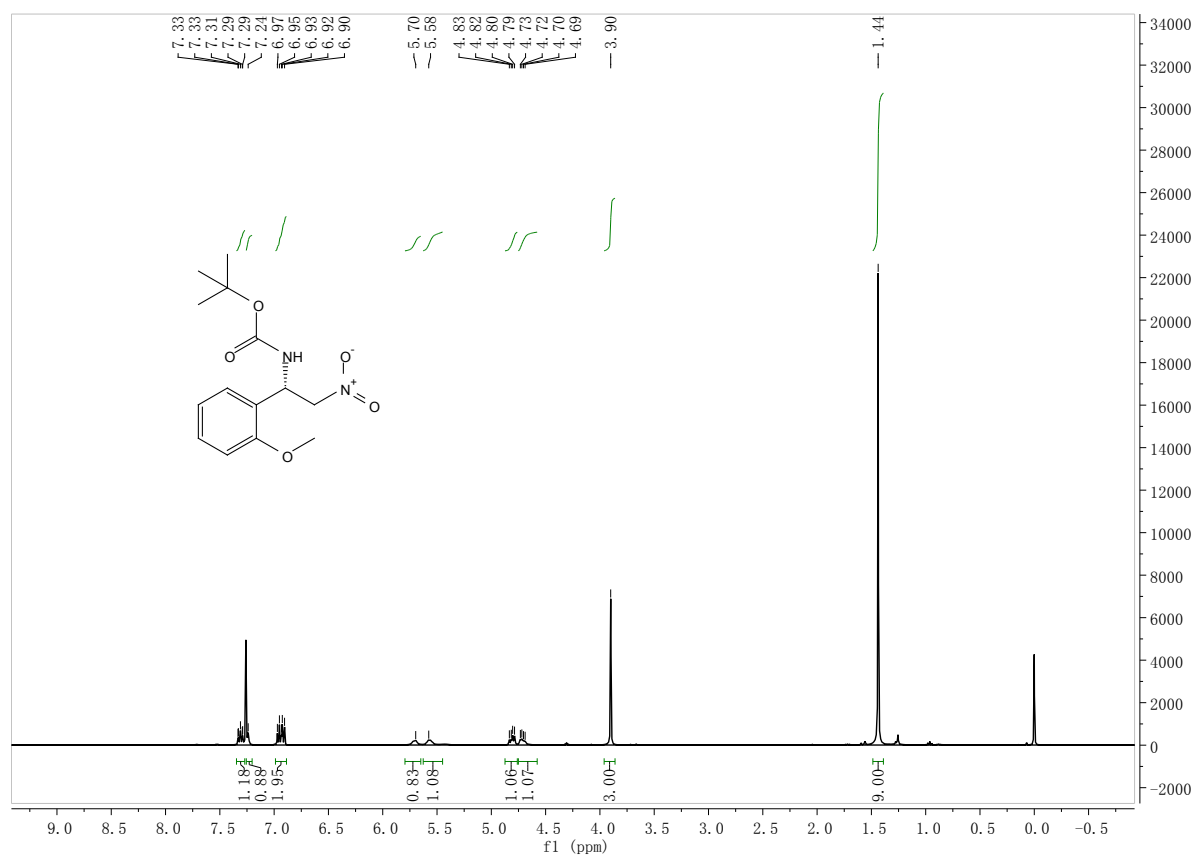
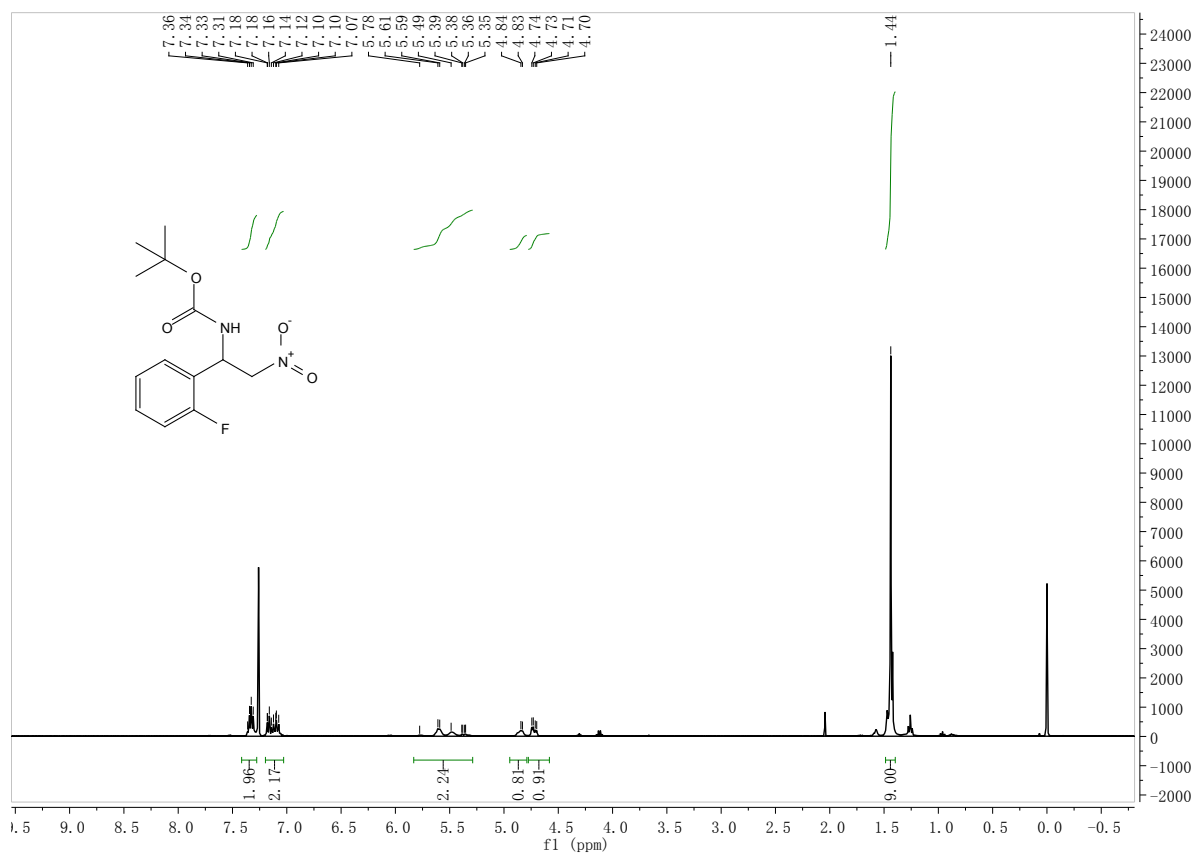


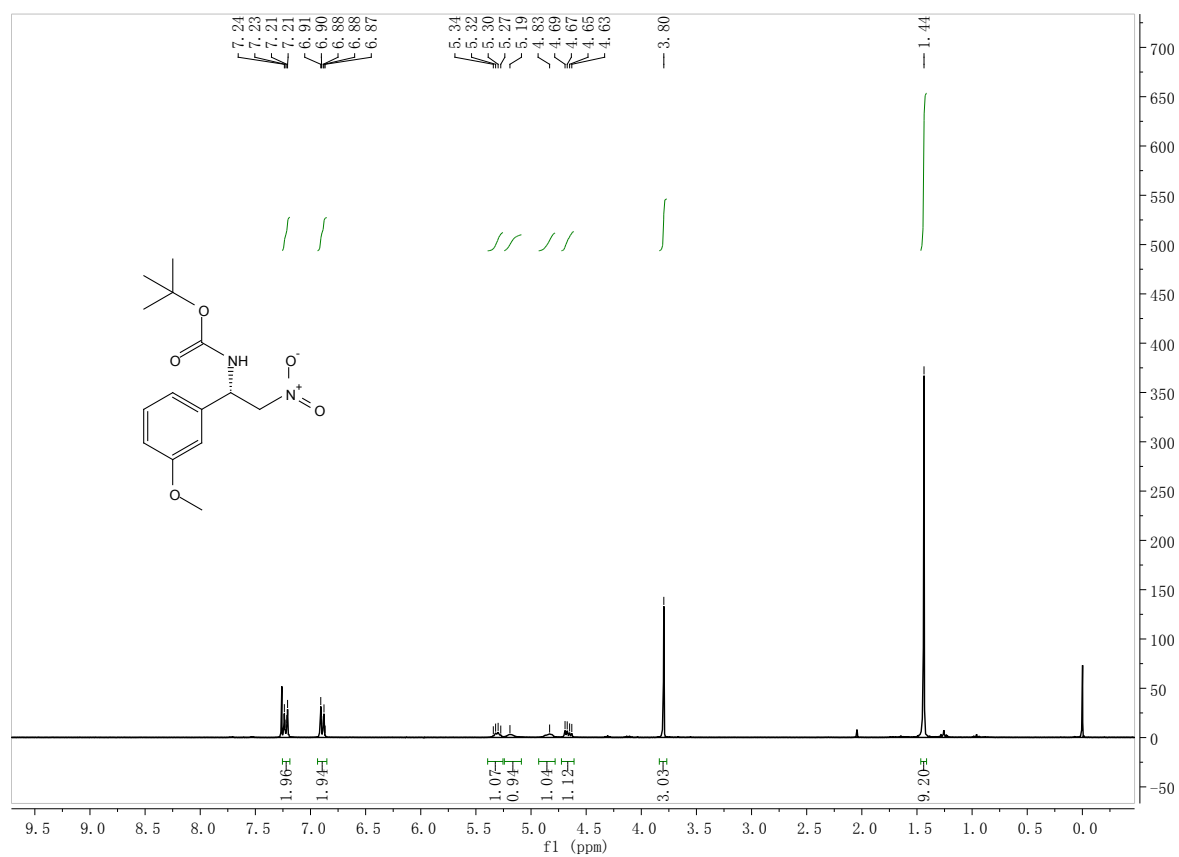
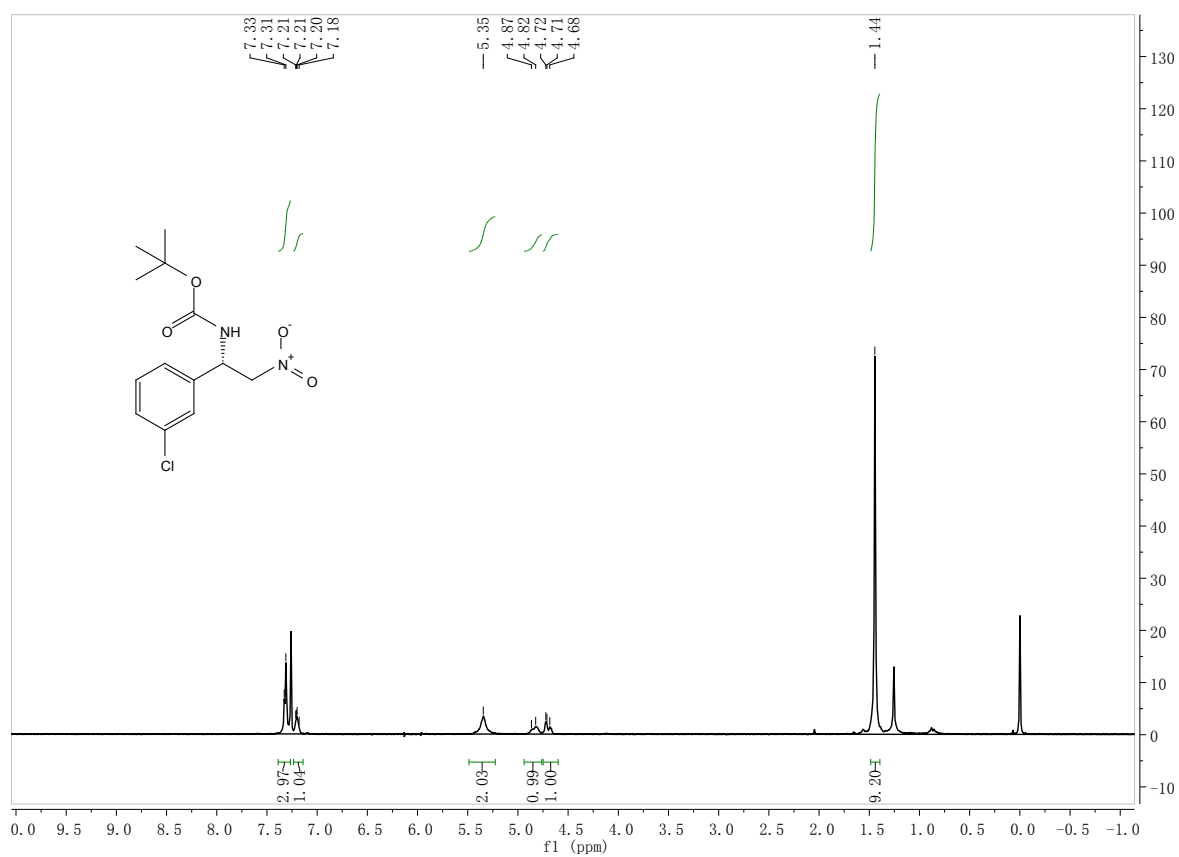
## 5. NMR spectra of addition products

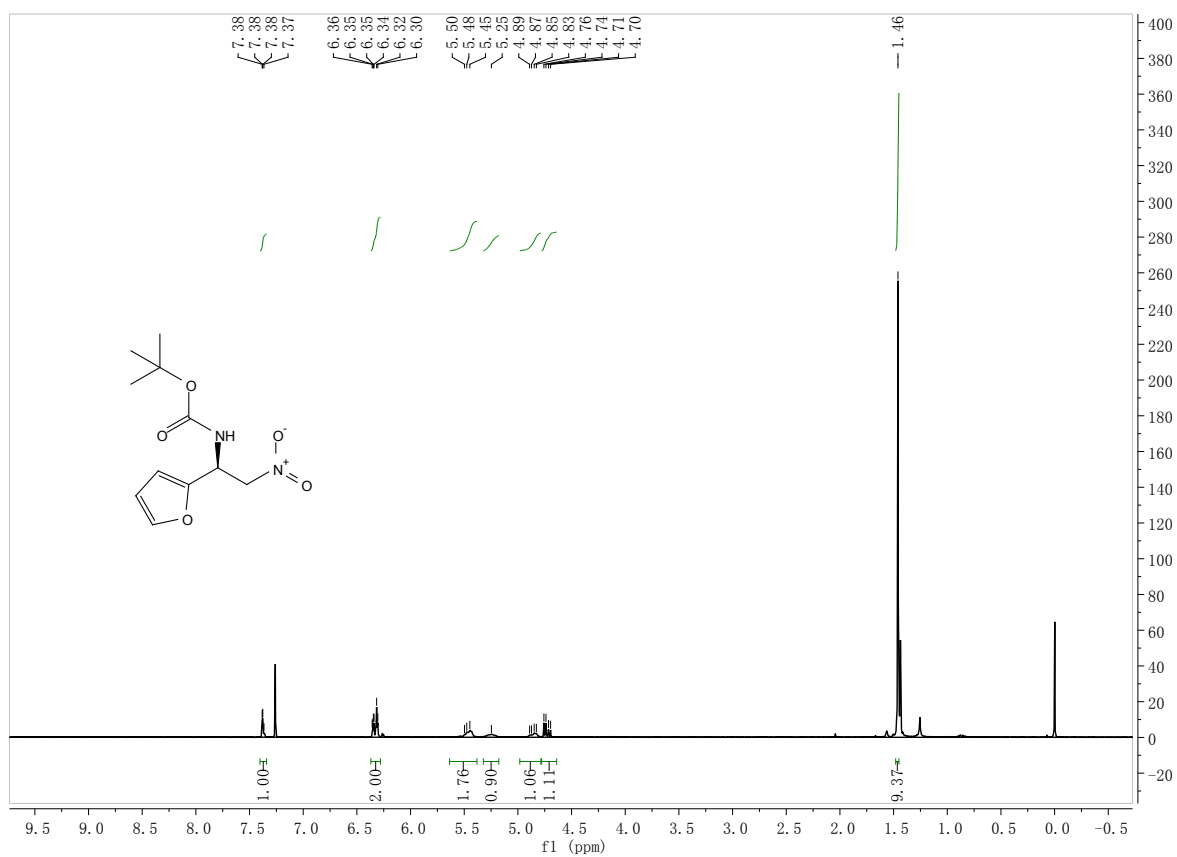
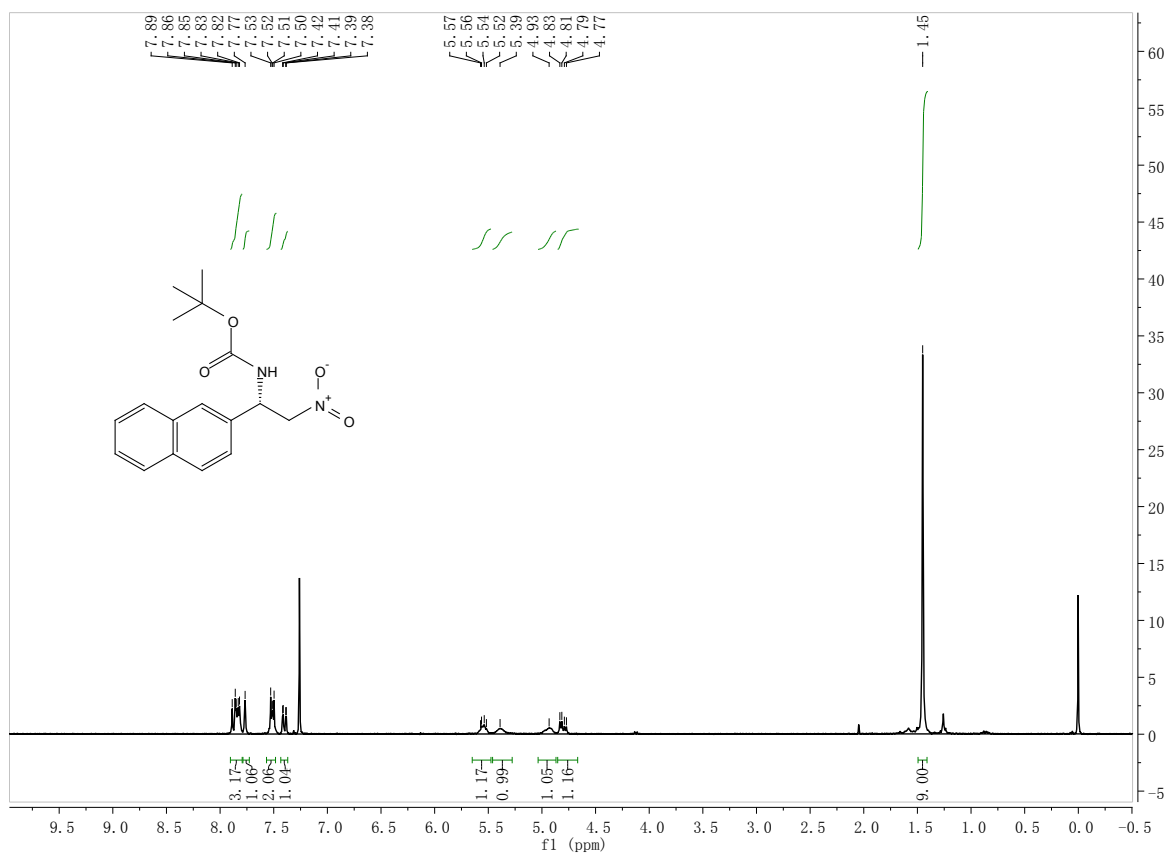


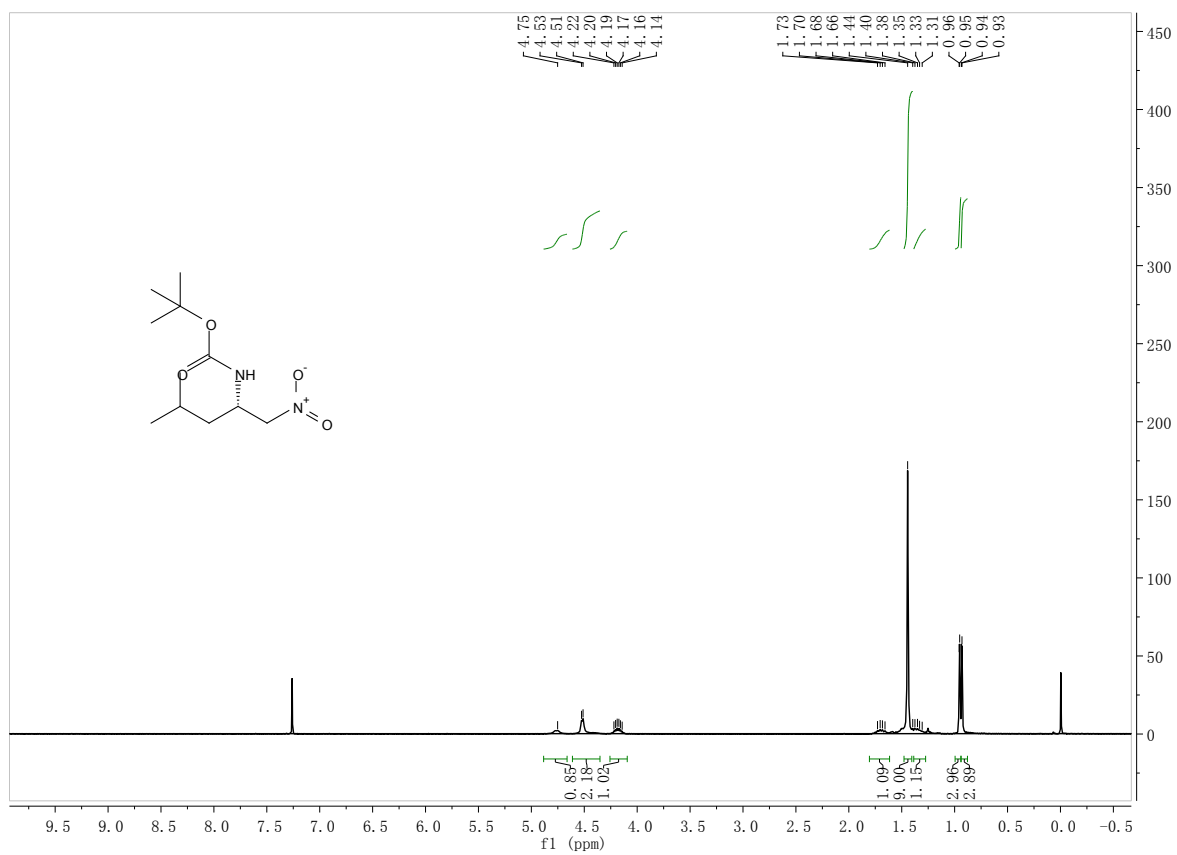
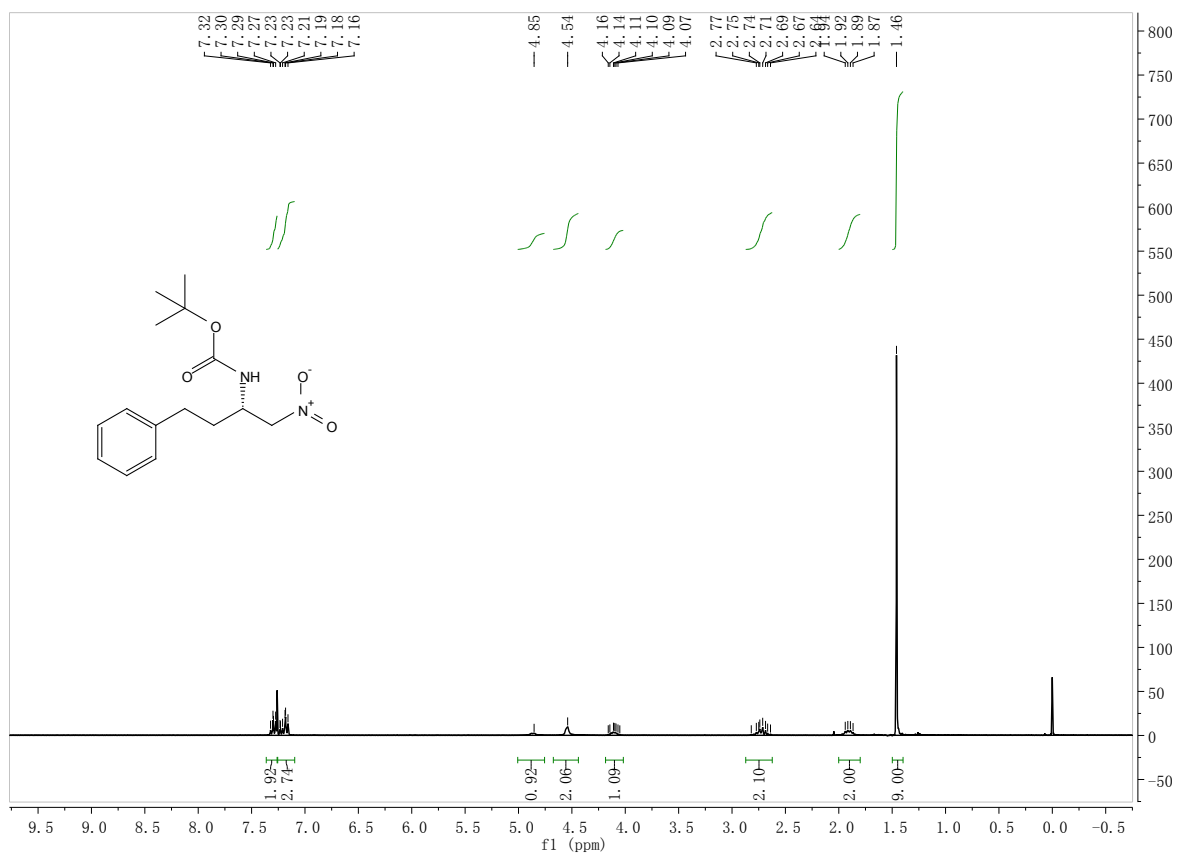


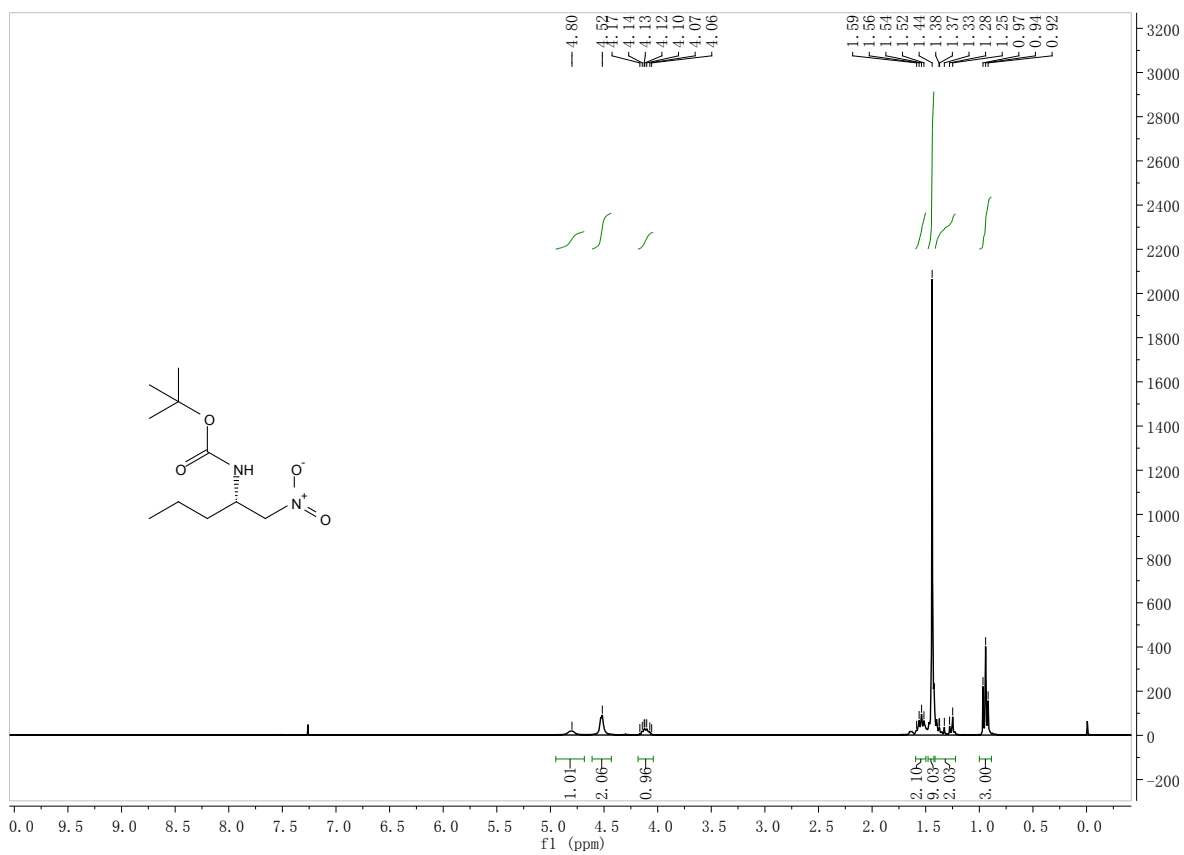
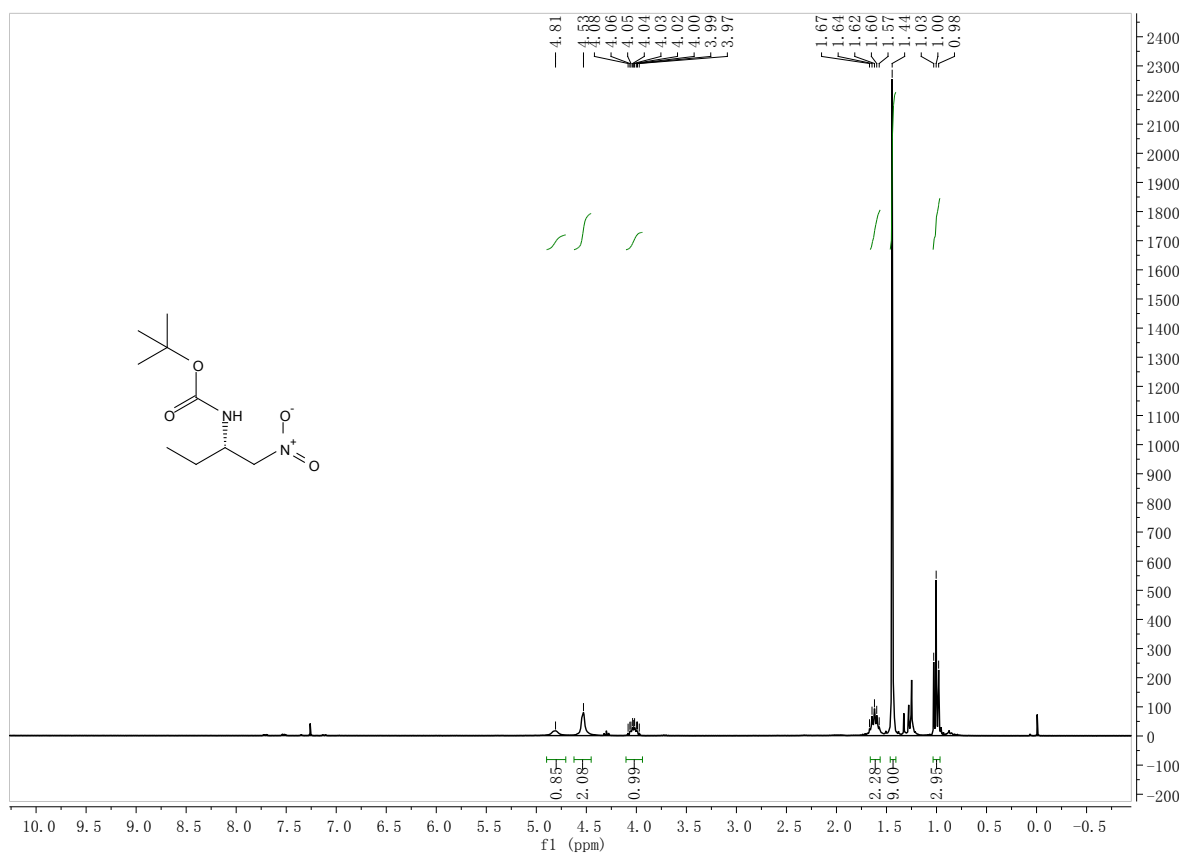




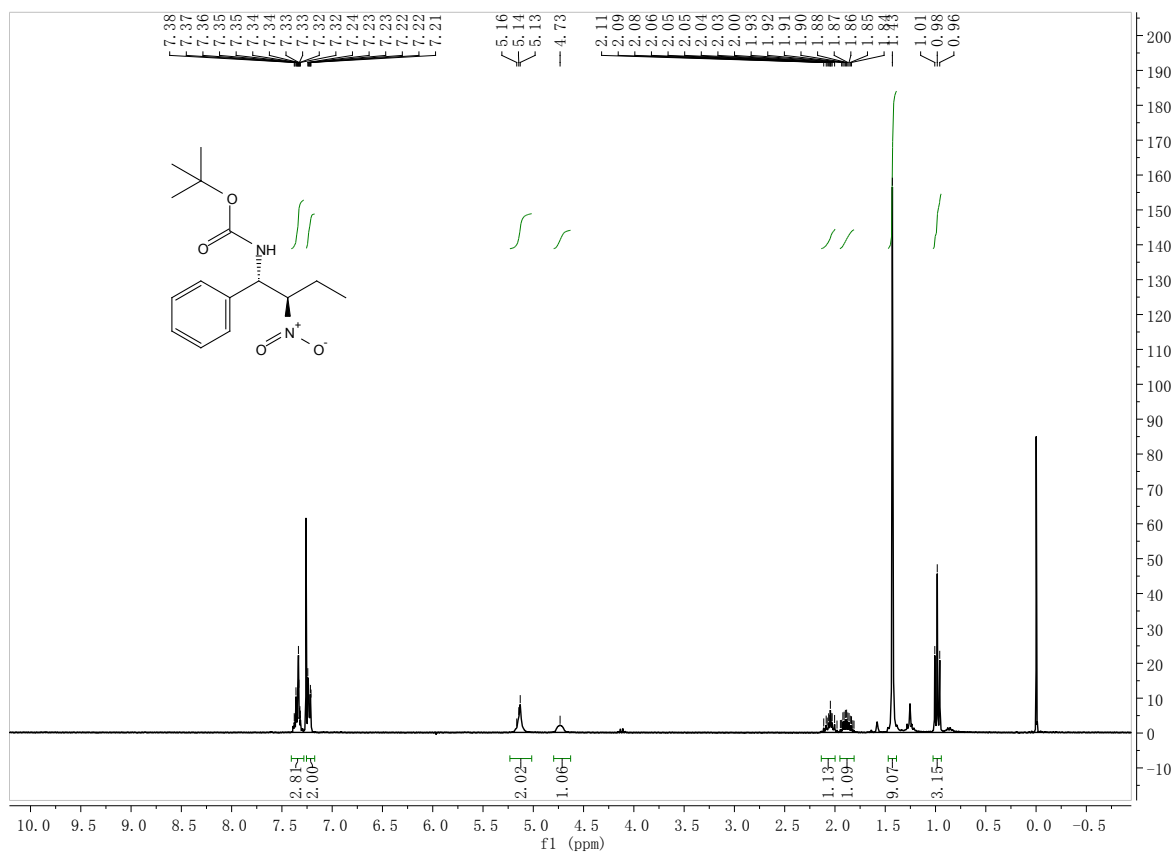
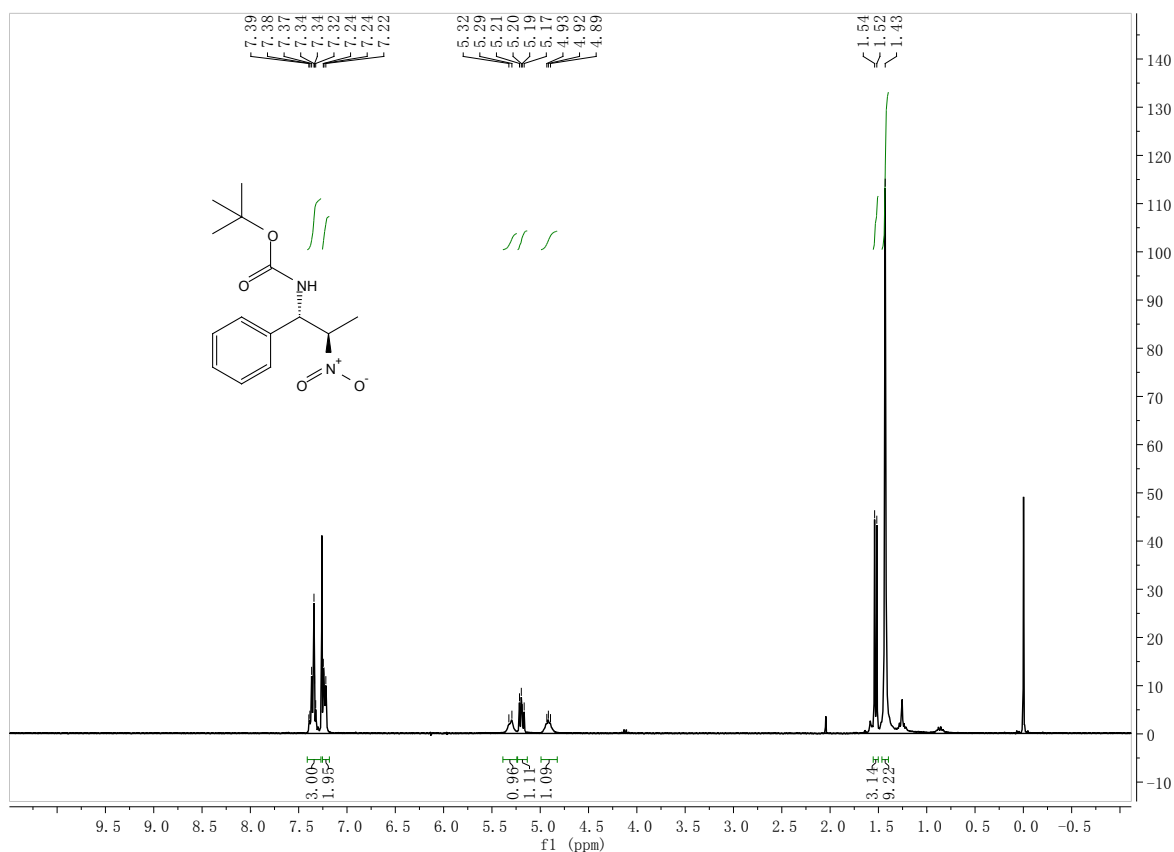


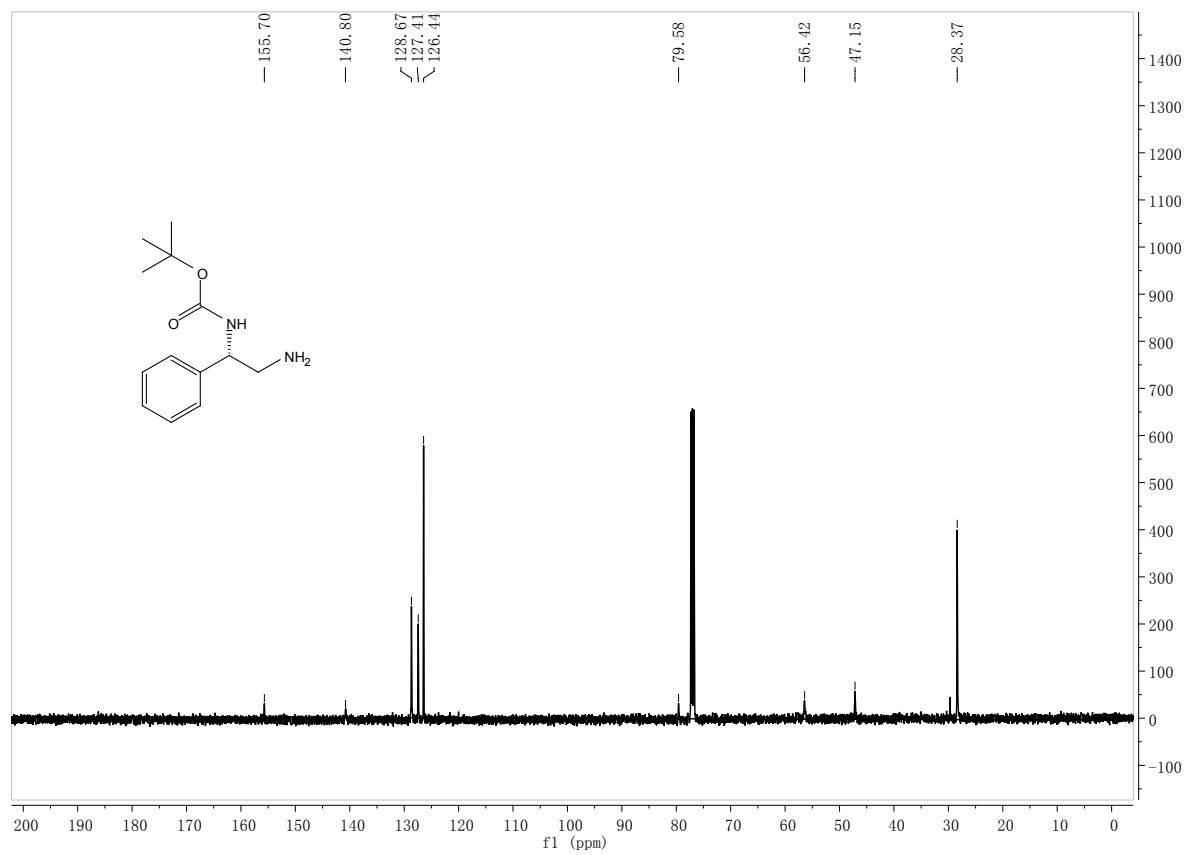
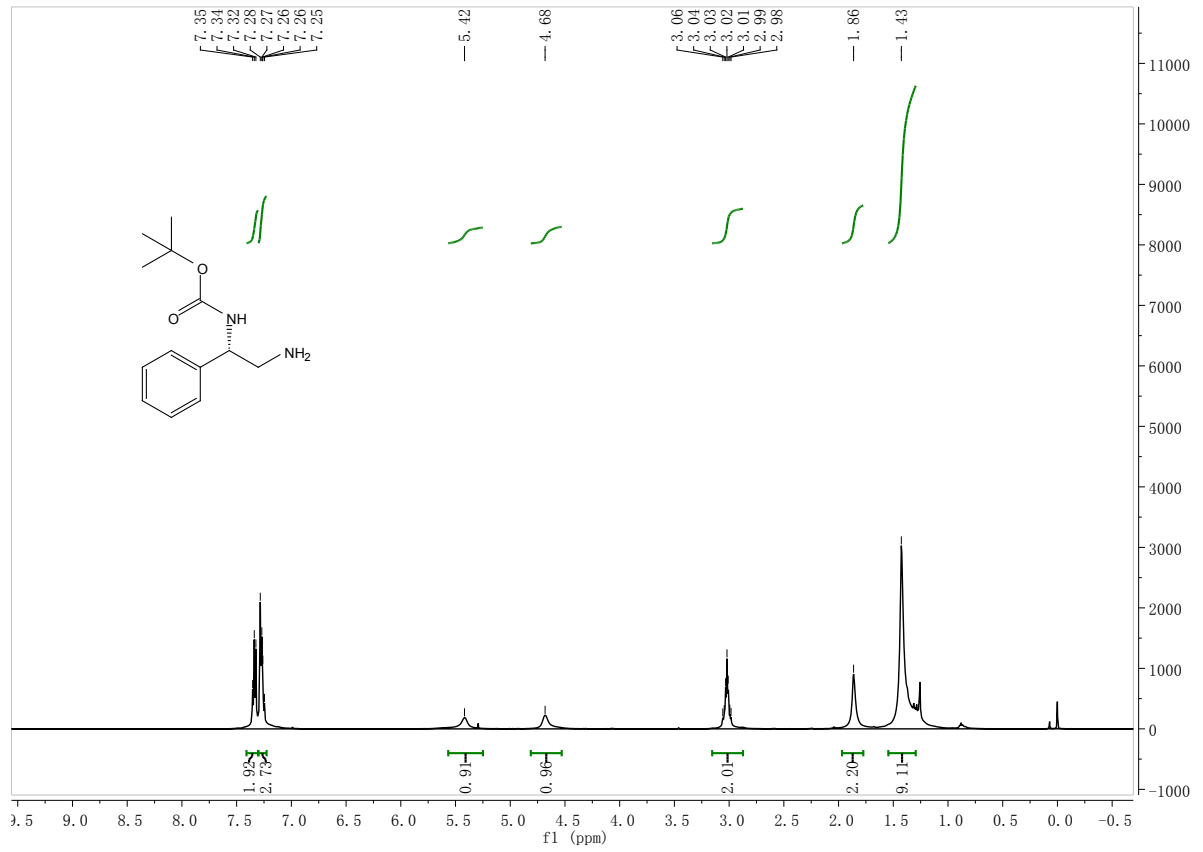


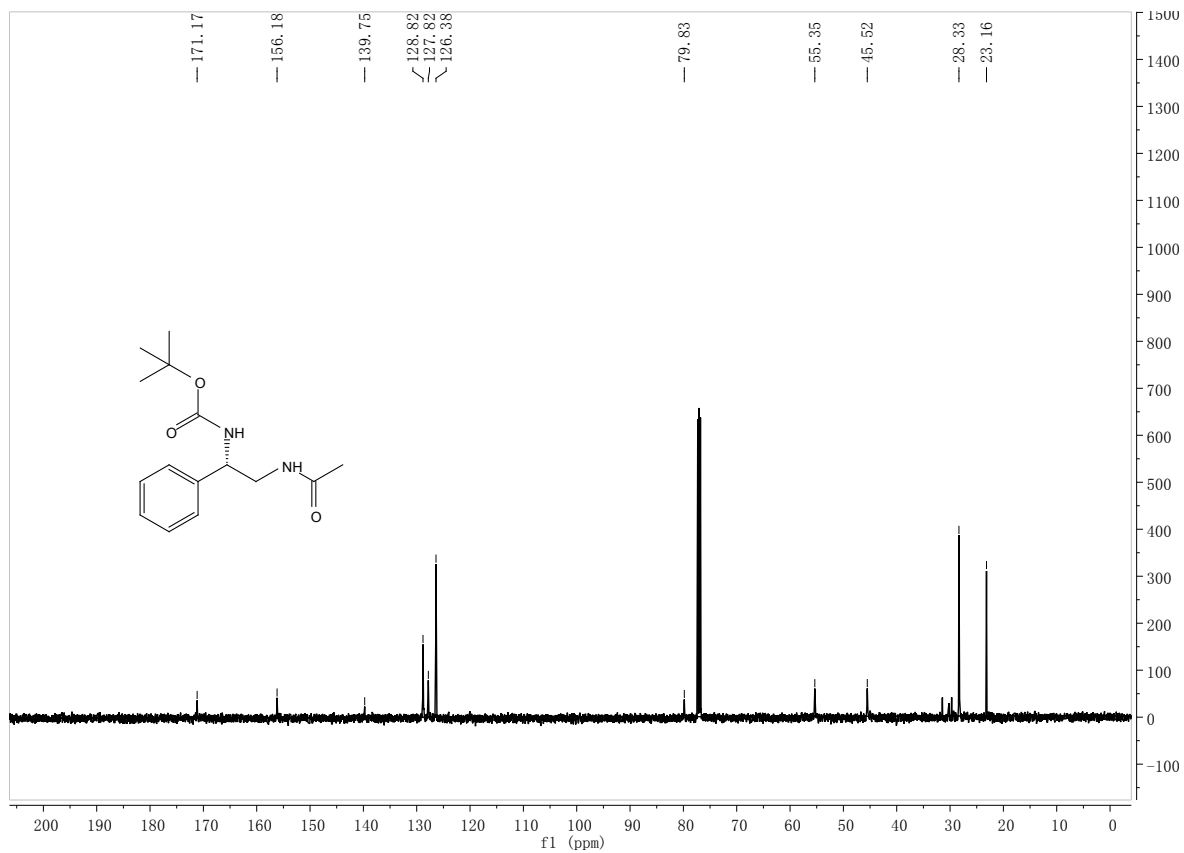
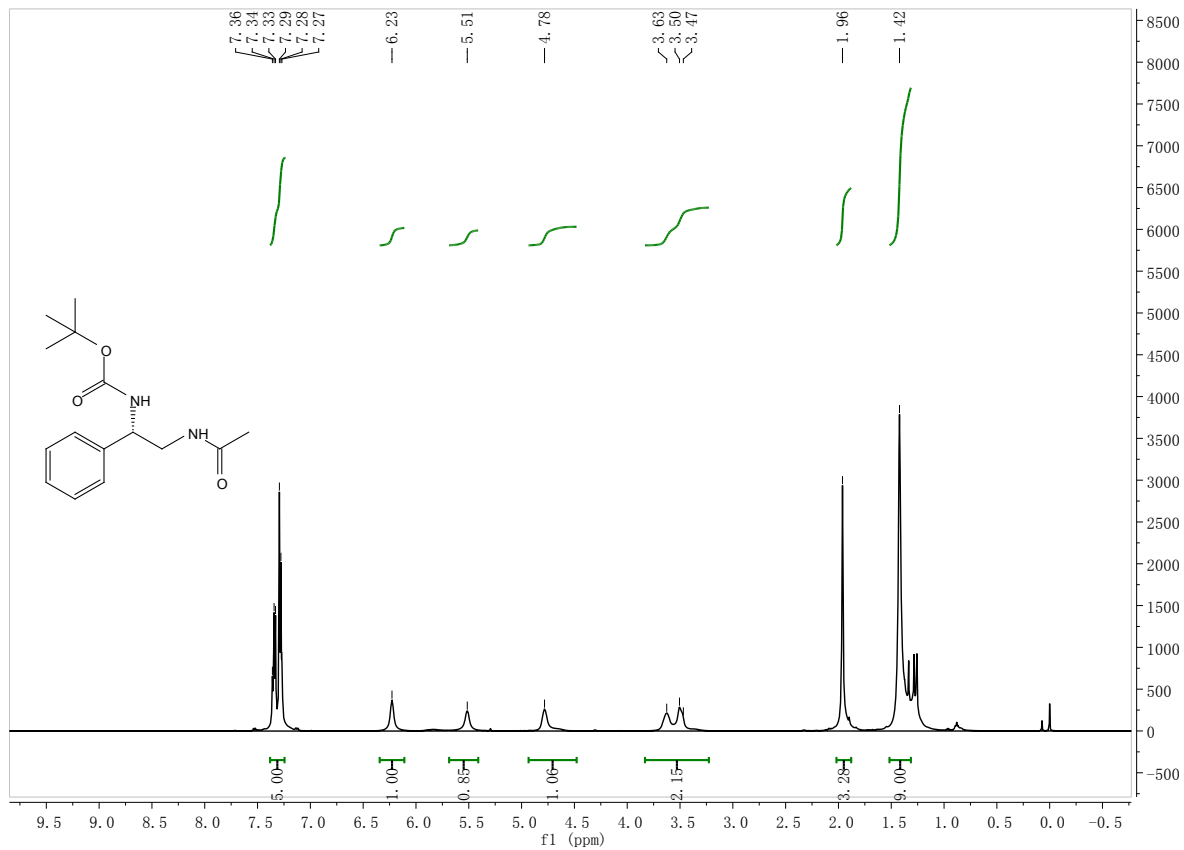


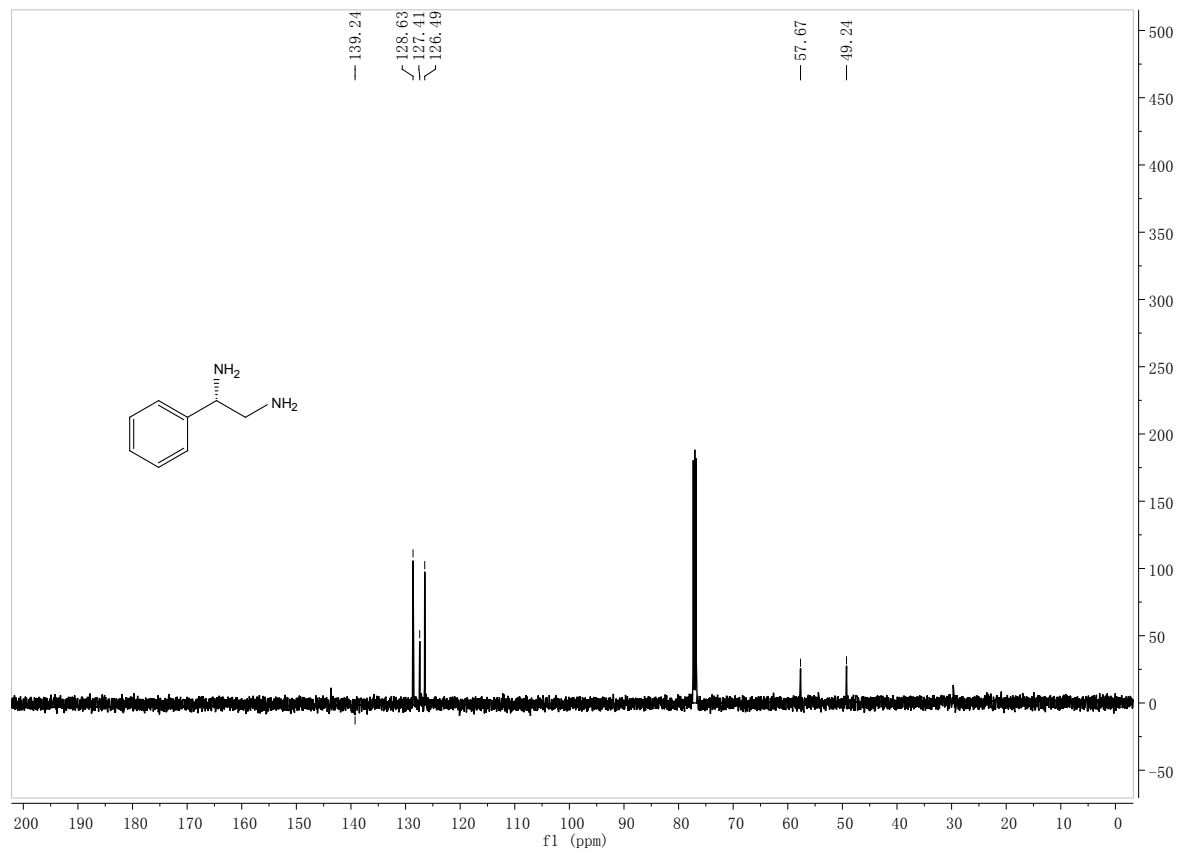
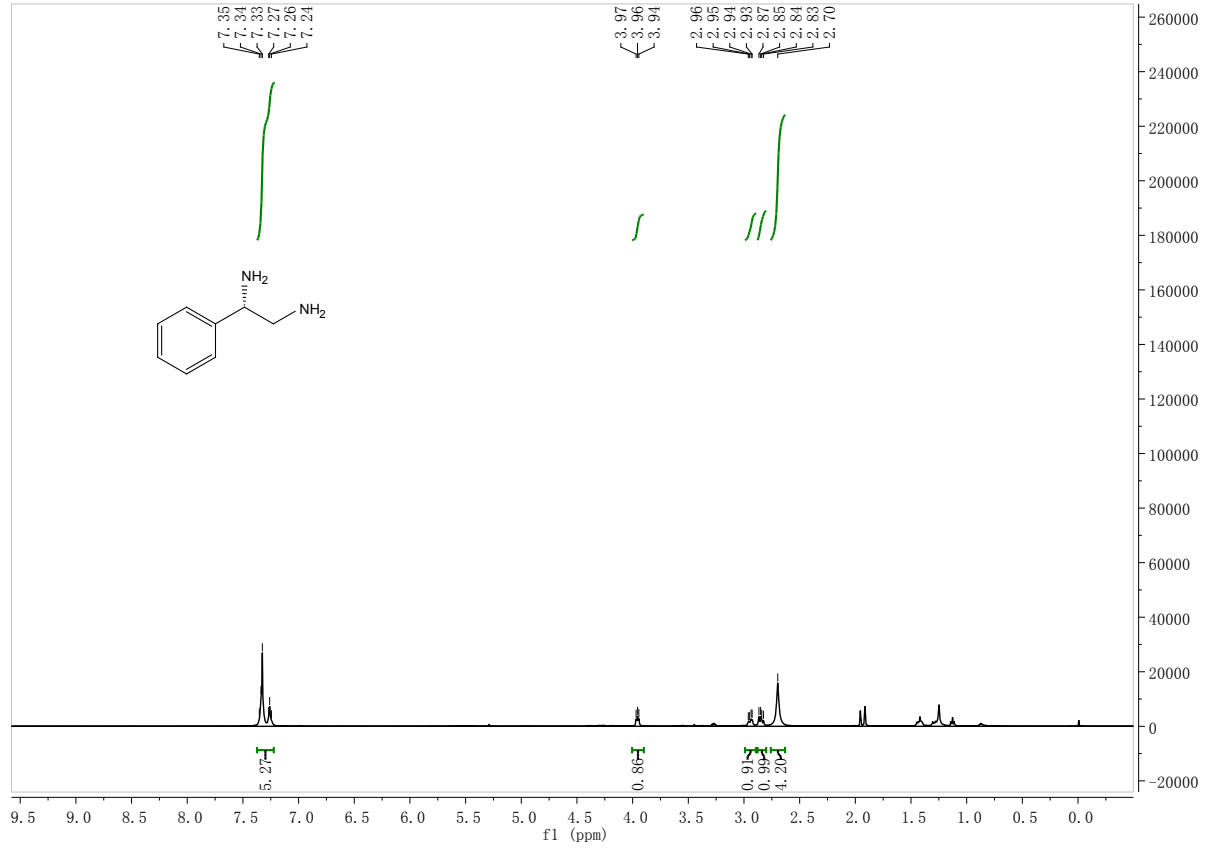




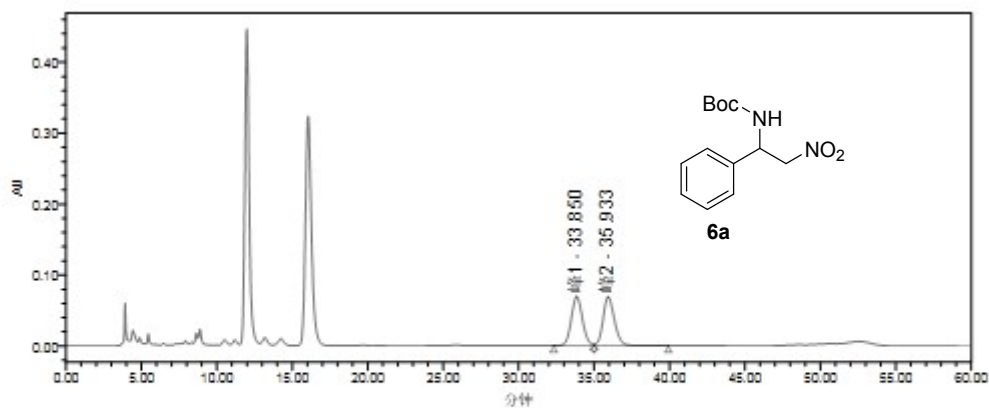






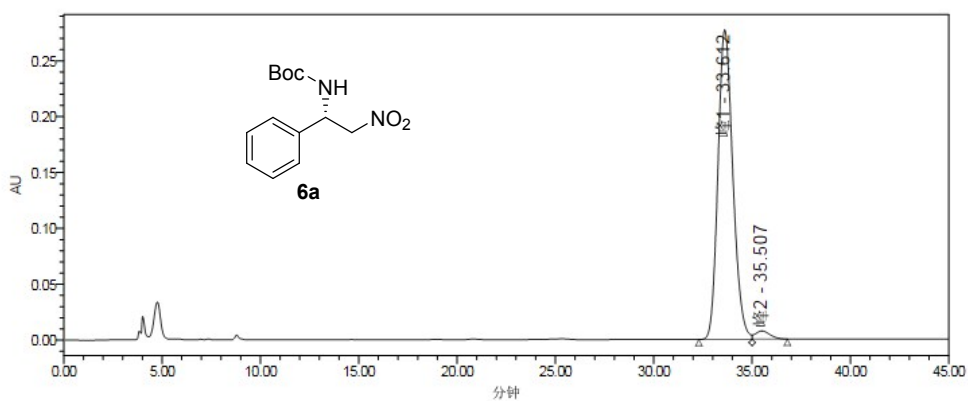


## 6. HPLC traces of all compounds



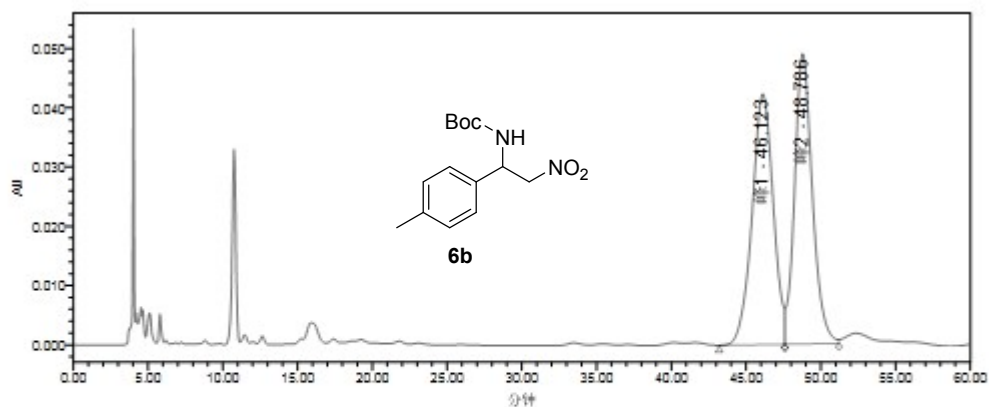
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: wb

	Channel Description	Peak Name	RT (min)	Area (面积*sec)	% Area	Height (面积)
1	W2489 ChA 214nm	峰1	33.850	3546867	49.57	69082
2	W2489 ChA 214nm	峰2	35.933	3608471	50.43	68827



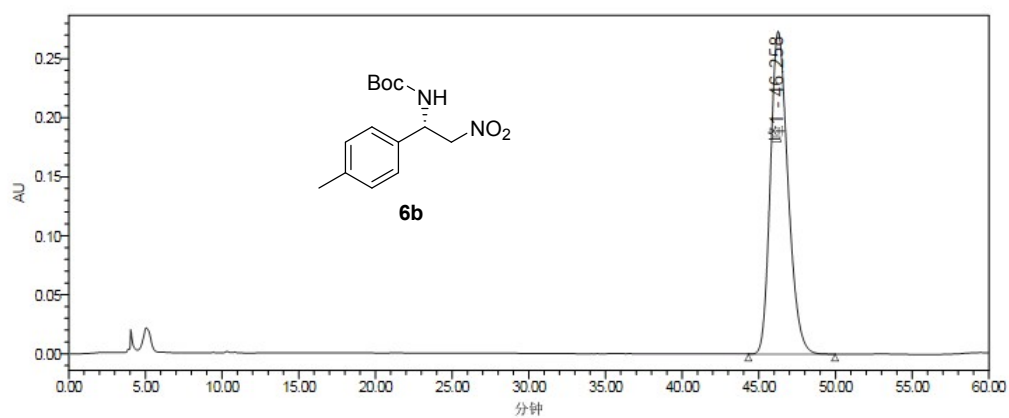
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (面积*sec)	% Area	Height (面积)
1	W2489 ChA 214nm	峰1	33.612	14549792	97.40	276812
2	W2489 ChA 214nm	峰2	35.507	388259	2.60	7448



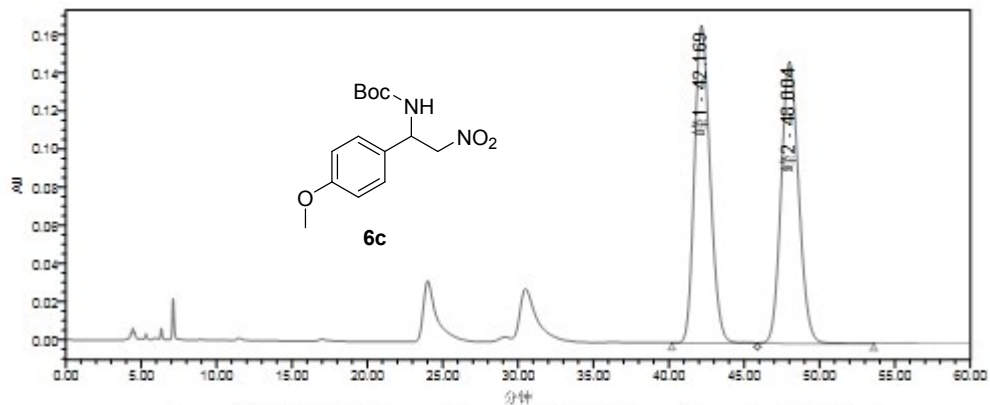
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: wb

	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	46.123	4149392	50.67	42239
2	W2489 ChA 214nm	峰2	48.786	4039337	49.33	48882



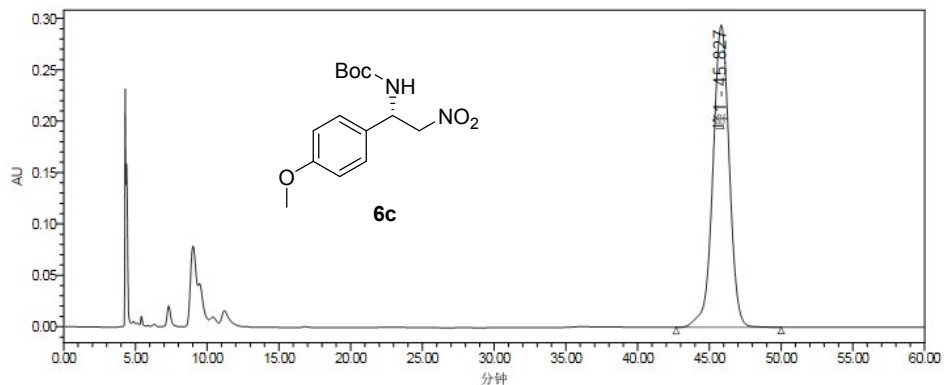
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	46.258	21817664	100.00	273294



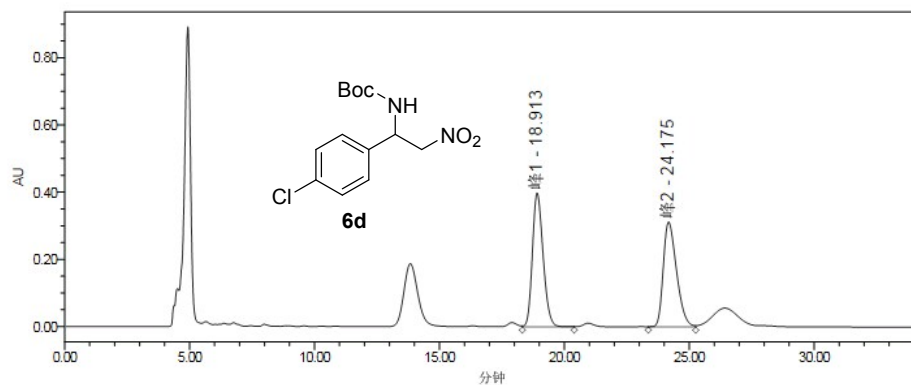
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: wb

Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
W2489 ChA 214nm	峰1	42.169	11990348	50.08	168053
W2489 ChA 214nm	峰2	48.004	11950824	49.92	147368



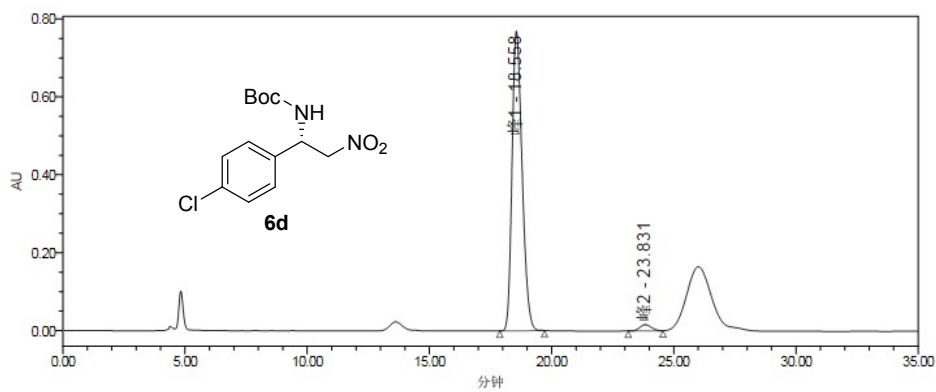
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
W2489 ChA 214nm	峰1	45.827	23337495	100.00	293991



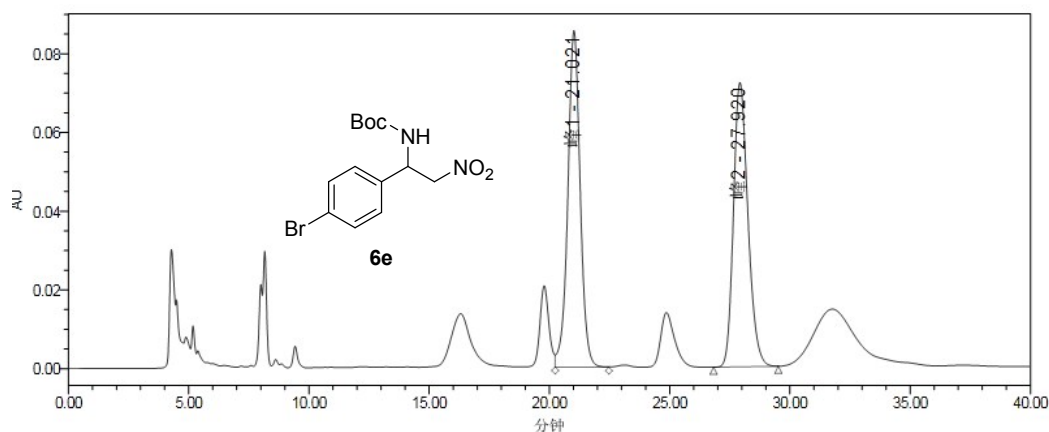
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
W2489 ChA 214nm	峰1	18.913	11847971	50.69	397442
W2489 ChA 214nm	峰2	24.175	11523649	49.31	311609



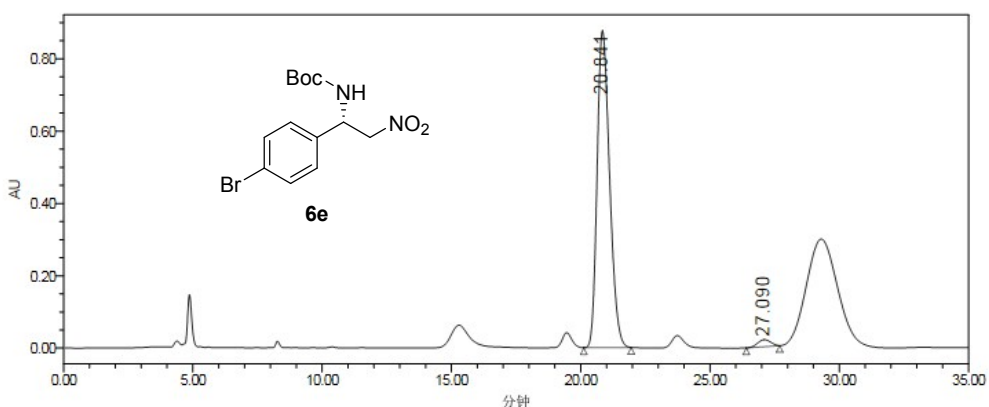
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (礦*sec)	% Area	Height (礦)
1	W2489 ChA 214nm	峰1	18.558	21983635	97.65	768769
2	W2489 ChA 214nm	峰2	23.831	530105	2.35	16196



Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: wb

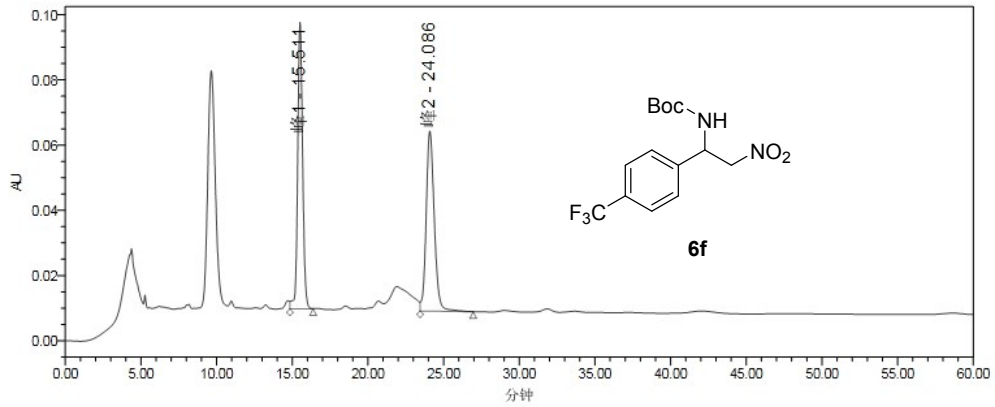
	Channel Description	Peak Name	RT (min)	Area (礦*sec)	% Area	Height (礦)
1	W2489 ChA 214nm	峰1	21.021	3045724	50.22	85445
2	W2489 ChA 214nm	峰2	27.920	3018560	49.78	72215



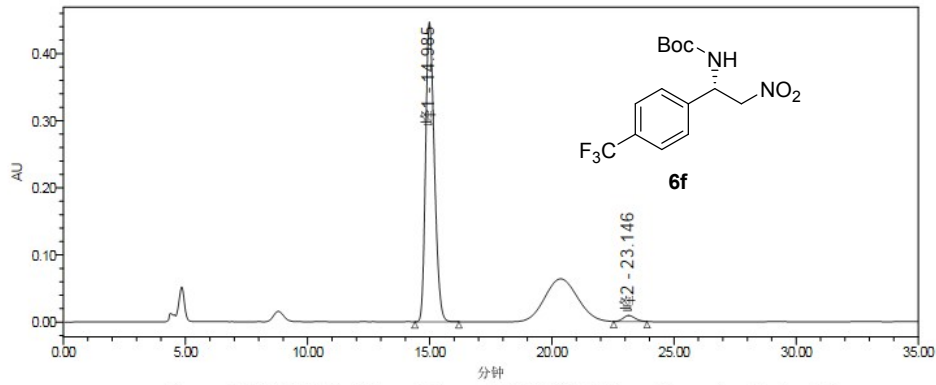
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	RT (min)	Area (礦*sec)	% Area	Height (礦)
1	W2489 ChA 214nm	20.841	29305028	97.72	876509
2	W2489 ChA 214nm	27.090	682610	2.28	19429

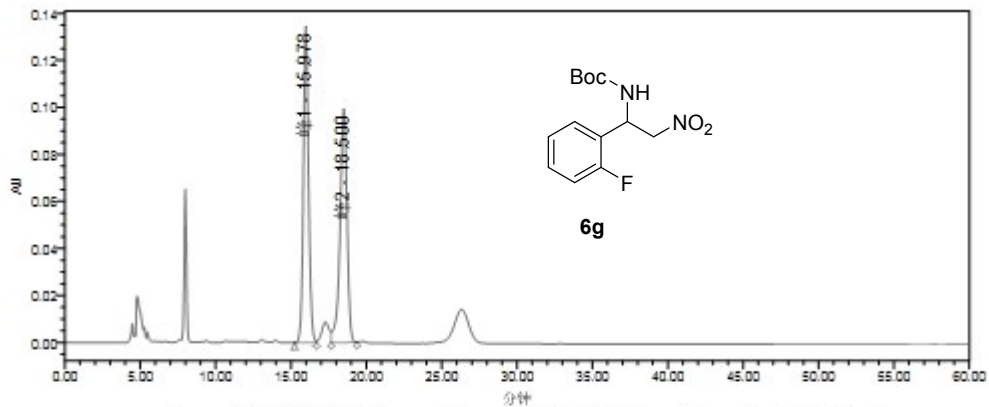




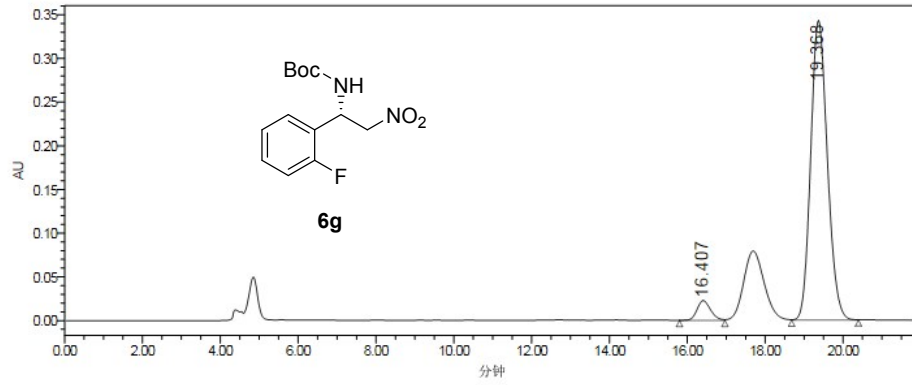
	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	15.511	1983950	49.17	87756
2	W2489 ChA 214nm	峰2	24.086	2050568	50.83	55160



	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	14.985	11127945	97.35	446424
2	W2489 ChA 214nm	峰2	23.146	303188	2.65	8955

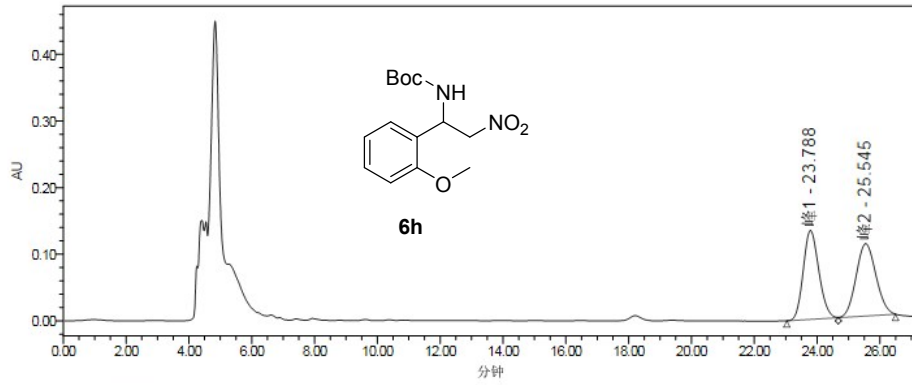


	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	15.978	3188626	49.96	134239
2	W2489 ChA 214nm	峰2	18.500	3194203	50.04	99036



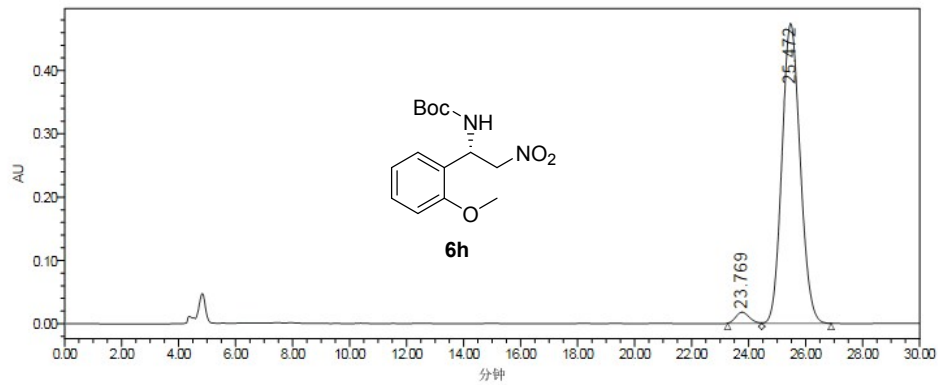
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	16.407	540015	5.04	22515
2	W2489 ChA 214nm	19.368	10177408	94.96	342540



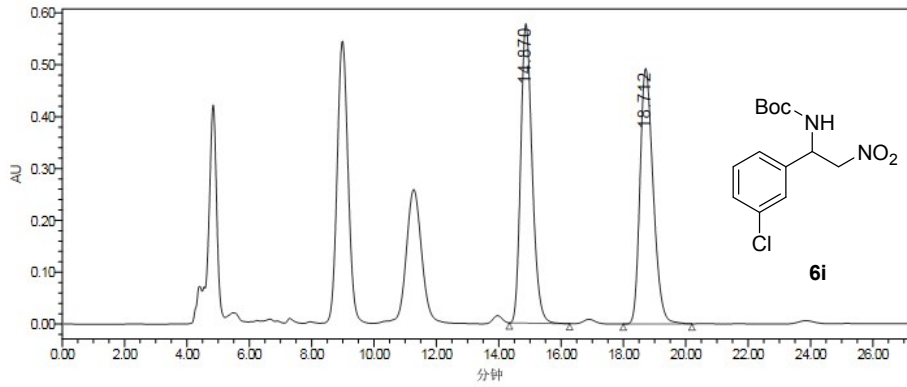
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	23.788	4608209	49.18	133607
2	W2489 ChA 214nm	峰2	25.545	4762282	50.82	108613

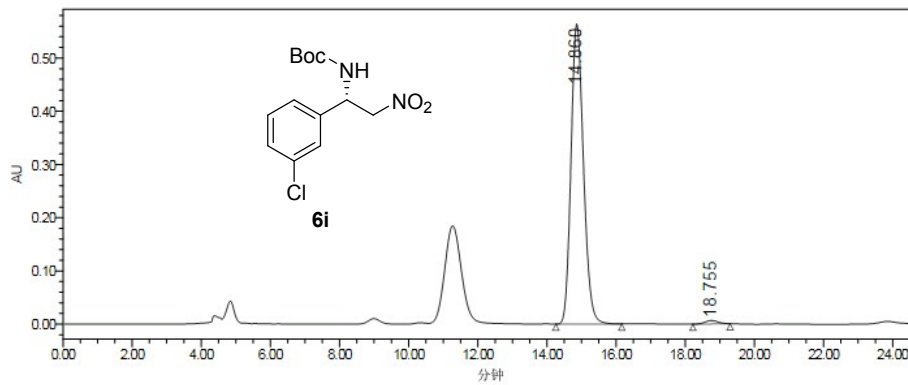


Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

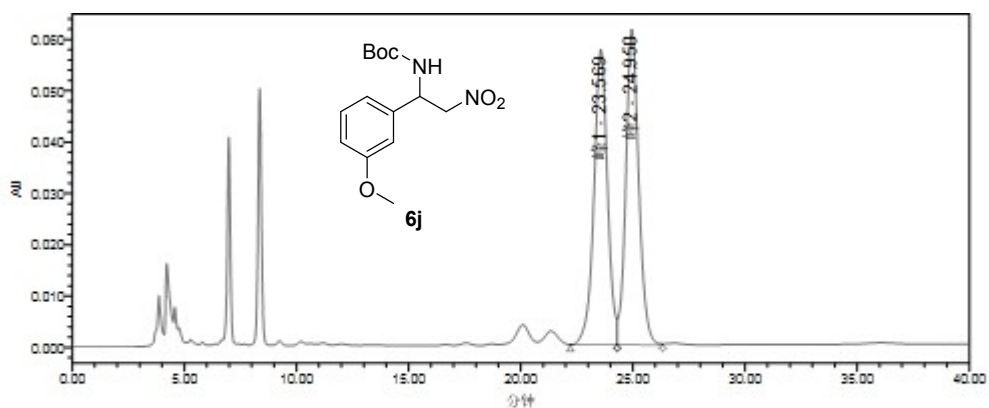
	Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	23.769	571495	2.64	17499
2	W2489 ChA 214nm	25.472	21082572	97.36	473571



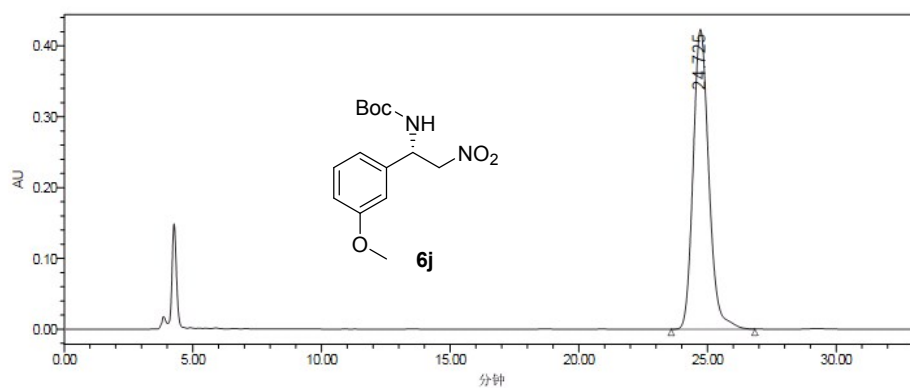
	Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	14.870	14747139	50.36	576902
2	W2489 ChA 214nm	18.712	14535749	49.64	492603



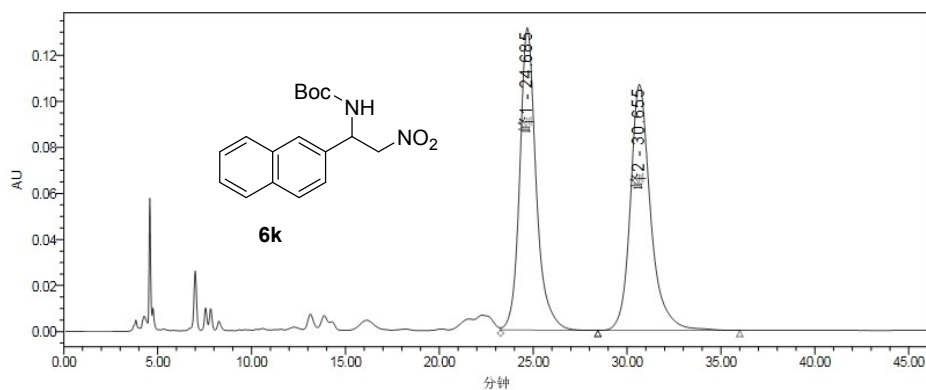
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1	W2489 ChA 214nm	14.860	14111214	98.80	563256
2	W2489 ChA 214nm	18.755	170968	1.20	6423



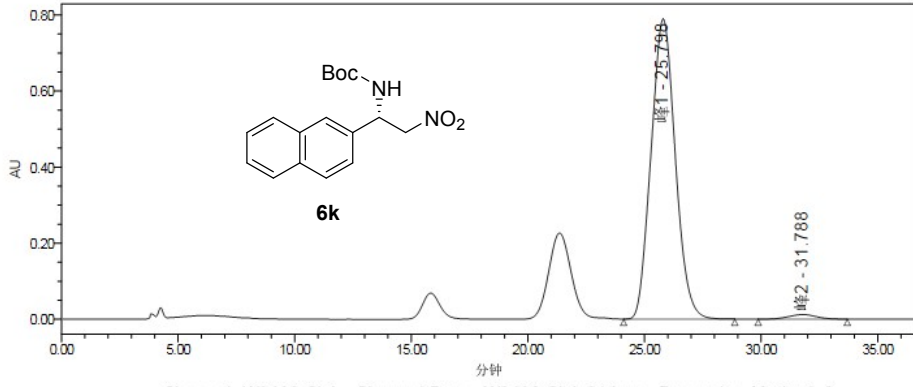
Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1 W2489 ChA 214nm	峰1	23.569	2412474	49.81	57390
2 W2489 ChA 214nm	峰2	24.950	2450031	50.39	61332



Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1 W2489 ChA 214nm	24.725	17908798	100.00	423129

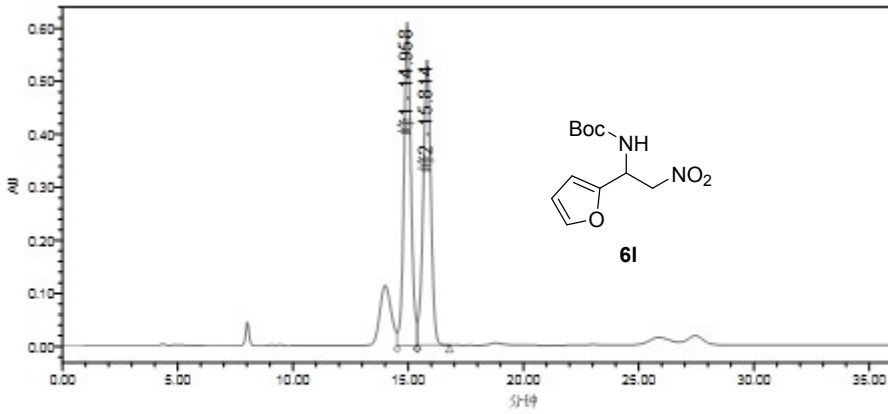


Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1 W2489 ChA 214nm	峰1	24.685	7978981	49.90	131219
2 W2489 ChA 214nm	峰2	30.655	8009634	50.10	106769



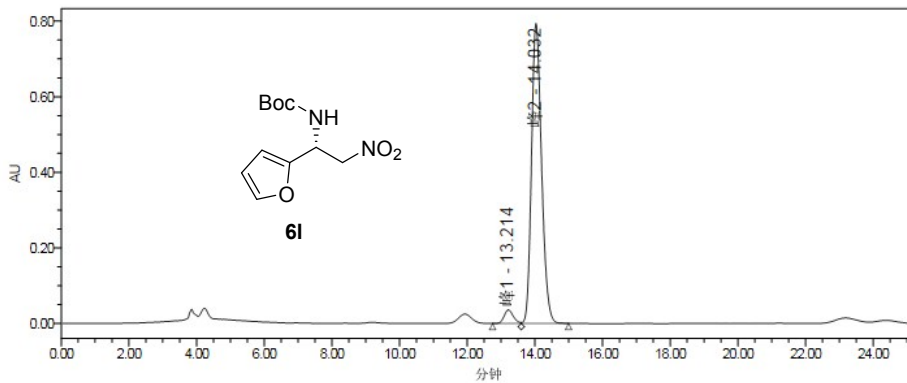
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
W2489 ChA 214nm	峰1	25.798	57092152	98.25	789215
W2489 ChA 214nm	峰2	31.788	1014975	1.75	12168



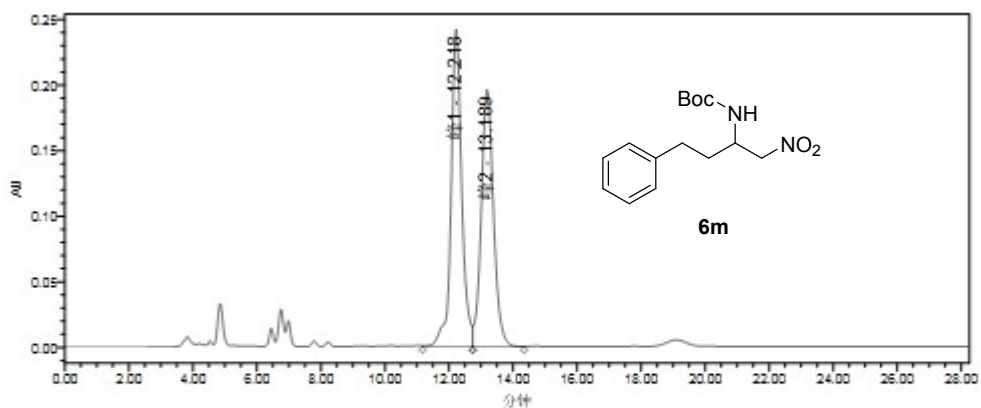
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: w

Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
W2489 ChA 214nm	峰1	14.958	12878928	50.84	607398
W2489 ChA 214nm	峰2	15.814	12450909	49.16	537097

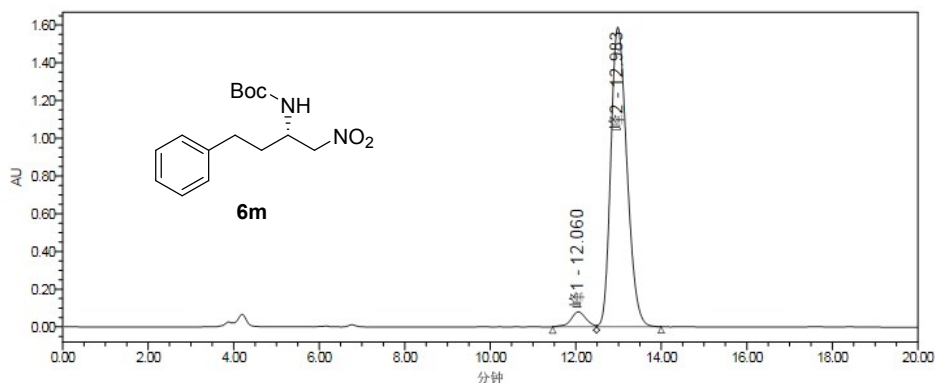


Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

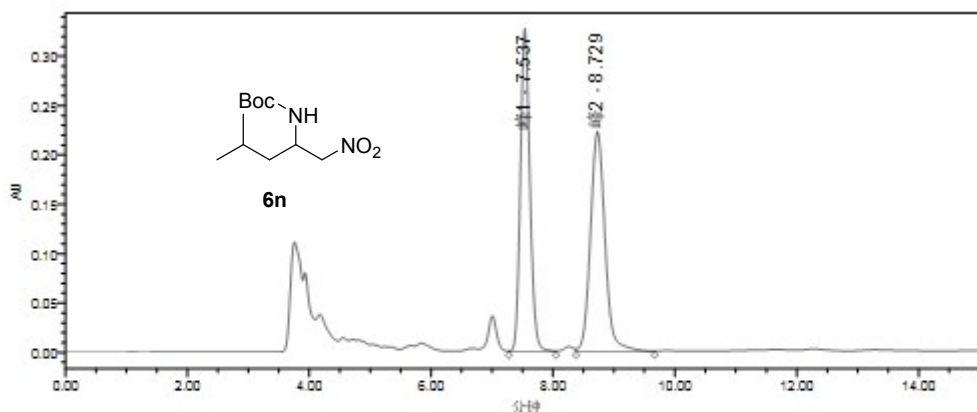
Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
W2489 ChA 214nm	峰1	13.214	677036	3.98	35791
W2489 ChA 214nm	峰2	14.032	16352937	96.02	793479



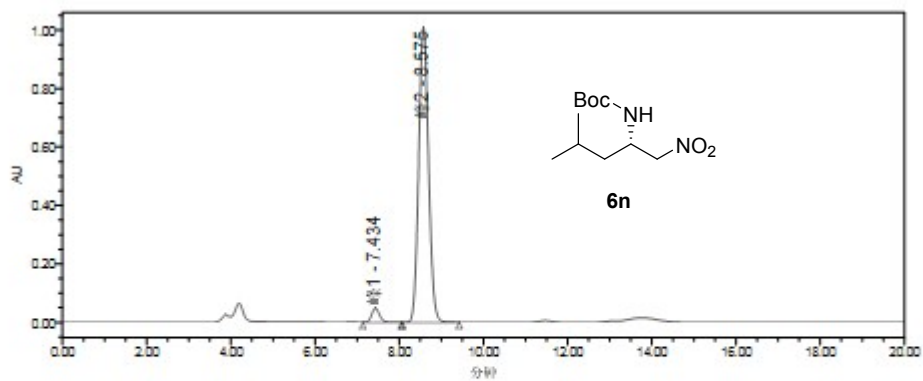
	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	12.218	5598939	51.81	241508
2	W2489 ChA 214nm	峰2	13.189	5207897	48.19	195538



	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	12.060	1952477	4.48	79298
2	W2489 ChA 214nm	峰2	12.983	41663204	95.52	1587773

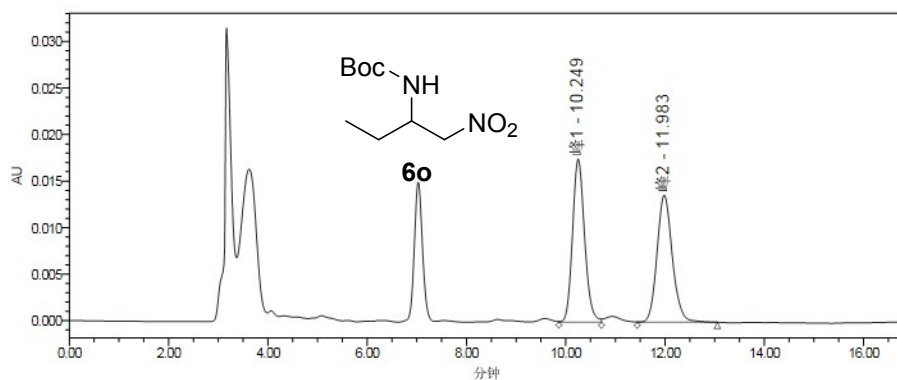


	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	7.537	3548424	48.93	326494
2	W2489 ChA 214nm	峰2	8.729	3700904	51.07	222461



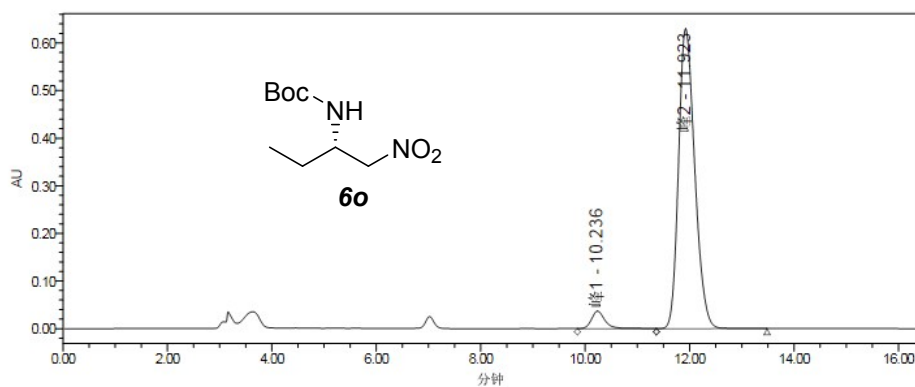
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (AU*sec)	% Area	Height (AU)
1	W2489 ChA 214nm	峰1	7.434	827251	3.69	49134
2	W2489 ChA 214nm	峰2	8.575	1639111	96.31	1009428



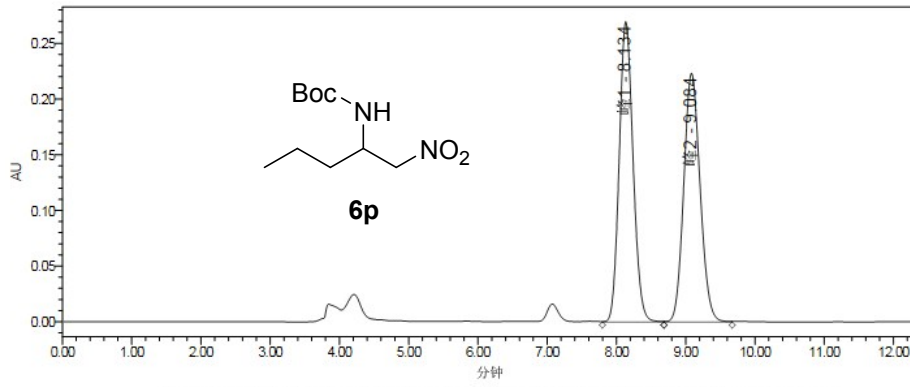
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (AU*sec)	% Area	Height (AU)
1	W2489 ChA 214nm	峰1	10.249	294759	50.15	17510
2	W2489 ChA 214nm	峰2	11.983	293020	49.85	

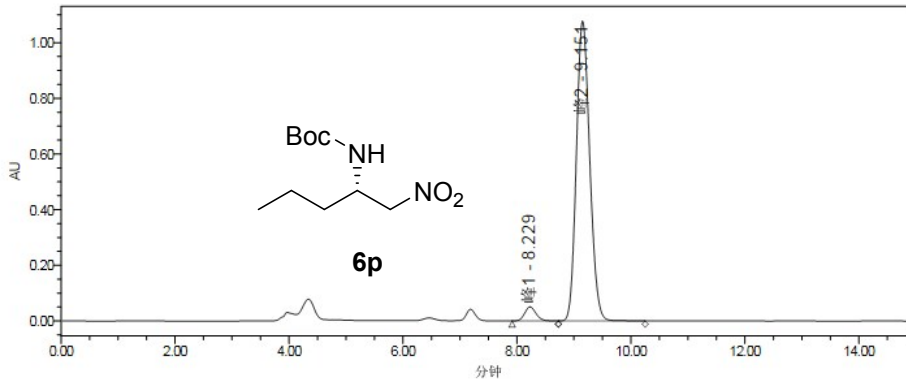


Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

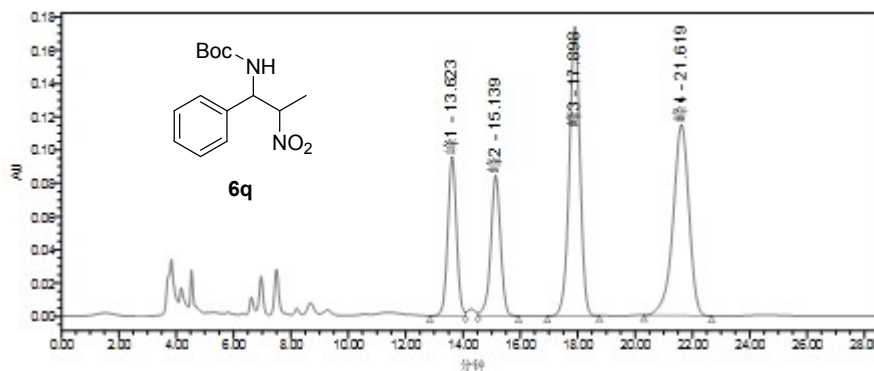
	Channel Description	Peak Name	RT (min)	Area (AU*sec)	% Area	Height (AU)
1	W2489 ChA 214nm	峰1	10.236	668001	4.70	36638
2	W2489 ChA 214nm	峰2	11.923	13537102	95.30	629958



	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	8.134	3737139	50.55	269360
2	W2489 ChA 214nm	峰2	9.084	3655324	49.45	223213

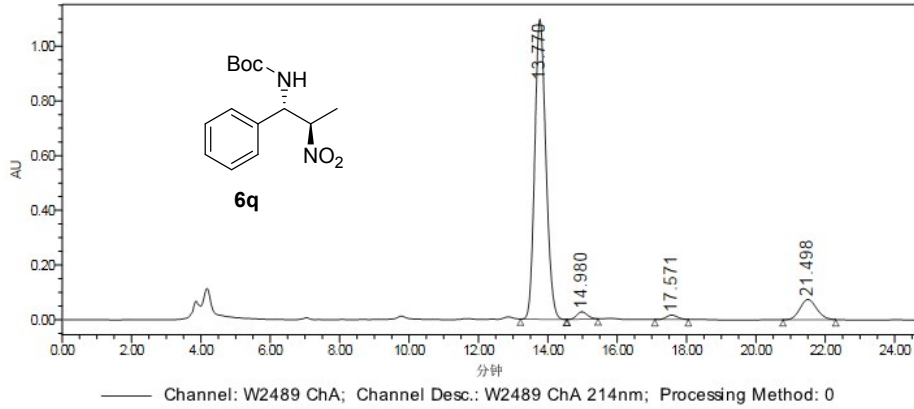


	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	8.229	699098	3.83	50684
2	W2489 ChA 214nm	峰2	9.151	17534173	96.17	1076759

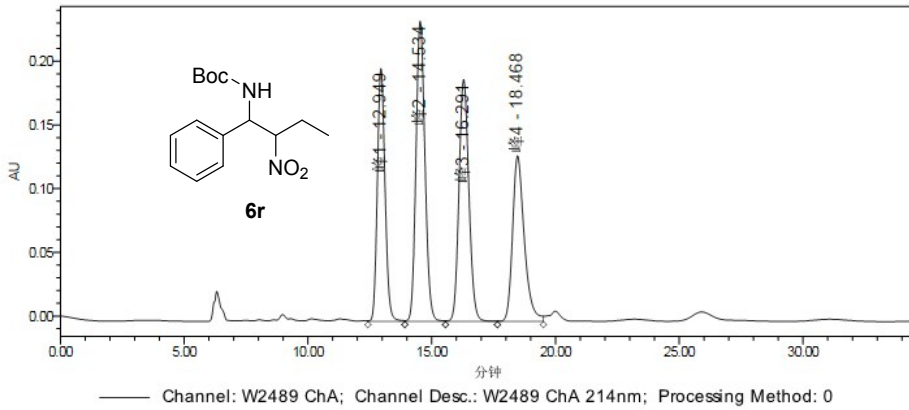


	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	13.623	2038341	15.72	95317
2	W2489 ChA 214nm	峰2	15.139	2010203	15.51	84058
3	W2489 ChA 214nm	峰3	17.898	4493610	34.66	173560
4	W2489 ChA 214nm	峰4	21.619	4420828	34.10	114607

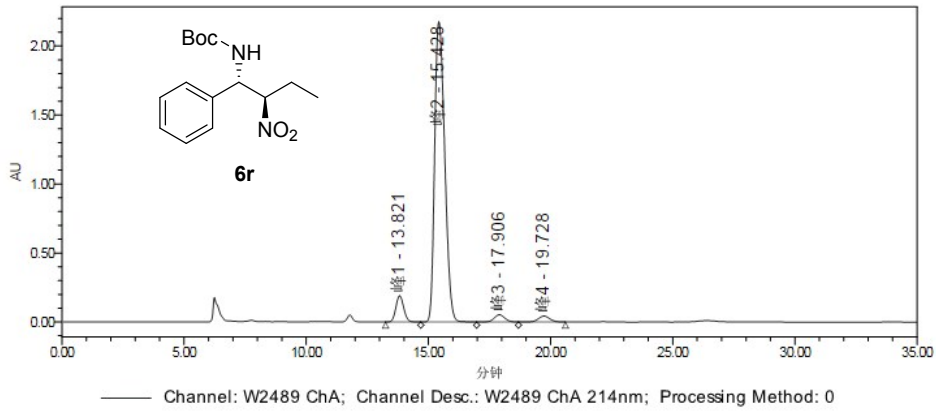




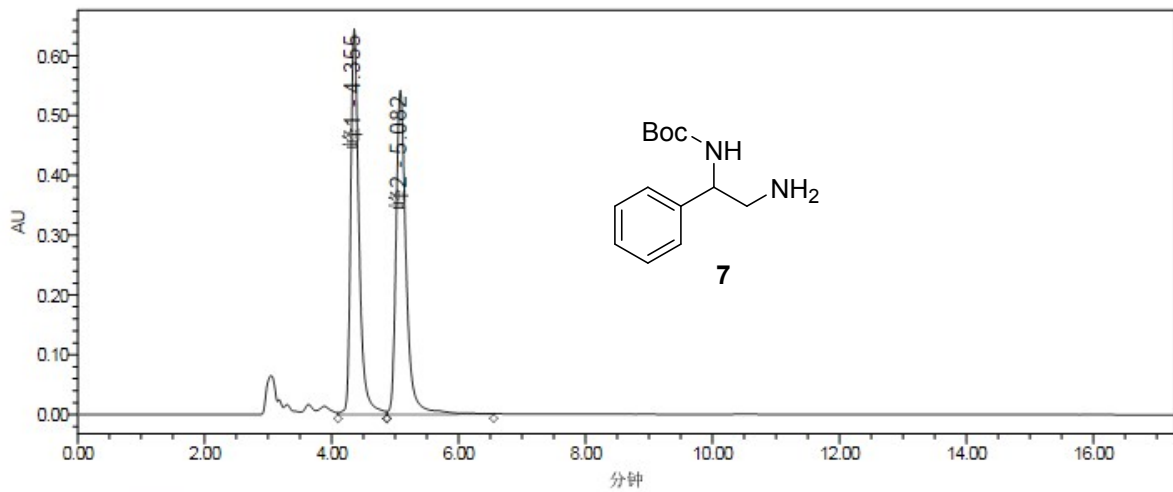
	Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	13.770	24375527	87.66	1095021
2	W2489 ChA 214nm	14.980	564101	2.03	26934
3	W2489 ChA 214nm	17.571	378142	1.36	16355
4	W2489 ChA 214nm	21.498	2487944	8.95	74068



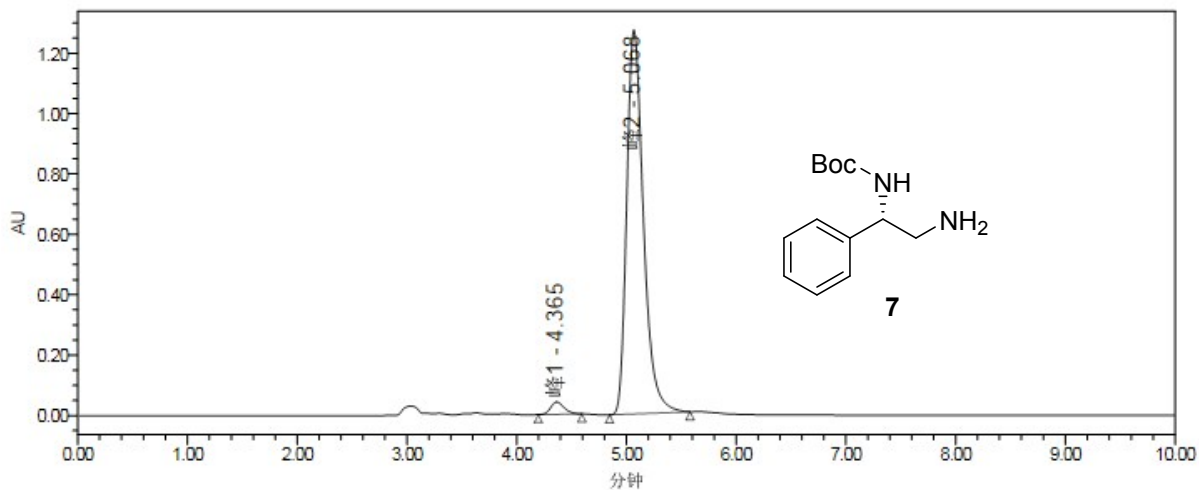
	Channel Description	Peak Name	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	峰1	12.949	4281457	21.62	198366
2	W2489 ChA 214nm	峰2	14.534	5947774	30.03	235440
3	W2489 ChA 214nm	峰3	16.294	5283408	26.67	189869
4	W2489 ChA 214nm	峰4	18.468	4294314	21.68	129961



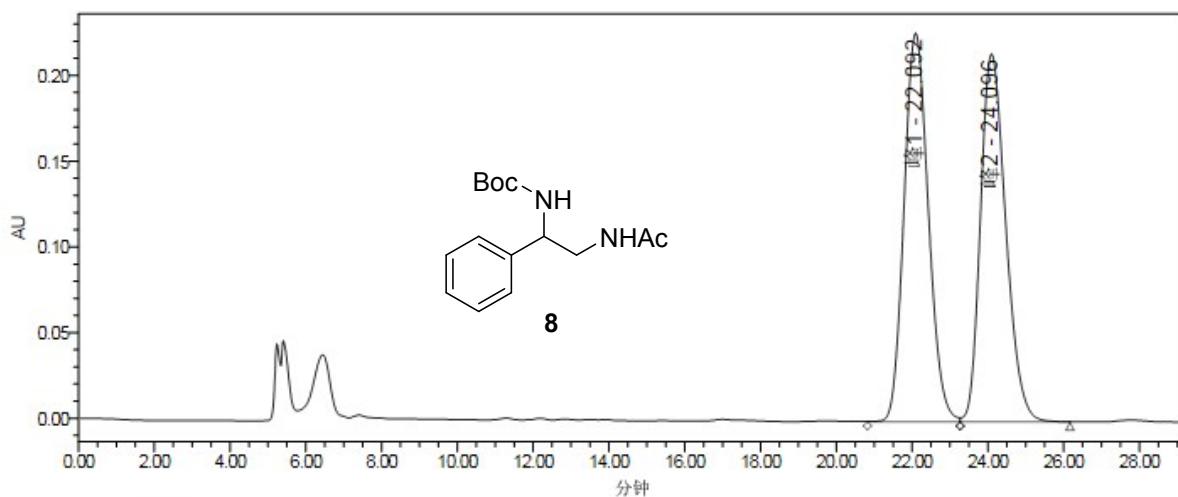
	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	13.821	4225795	6.11	189568
2	W2489 ChA 214nm	峰2	15.428	62003894	89.60	2175472
3	W2489 ChA 214nm	峰3	17.906	1575954	2.28	52256
4	W2489 ChA 214nm	峰4	19.728	1395783	2.02	42596



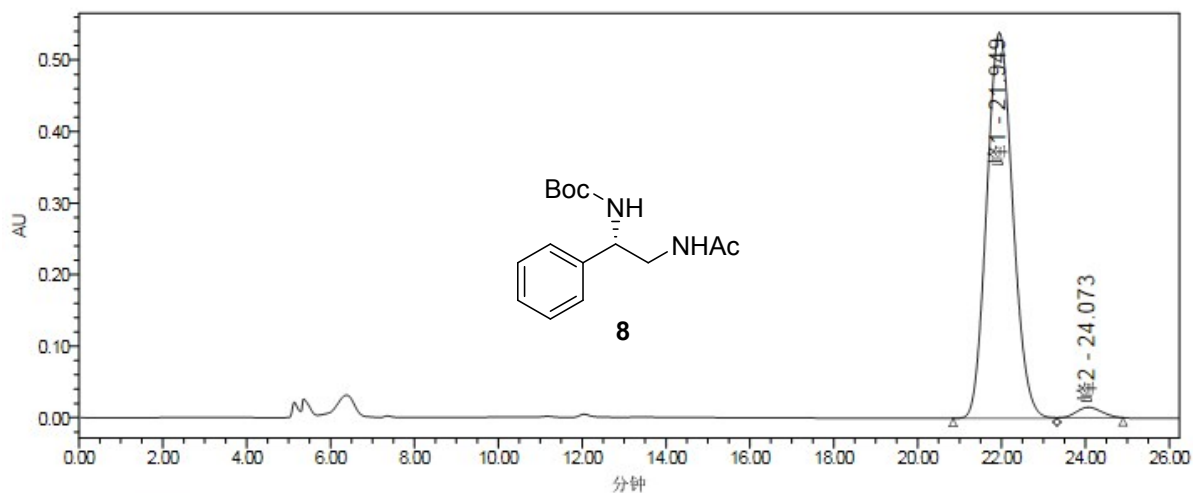
	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	4.355	5888809	49.55	643613
2	W2489 ChA 214nm	峰2	5.082	5994805	50.45	541266



	Channel Description	Peak Name	RT (min)	Area (礦*sec)	% Area	Height (礦)
1	W2489 ChA 214nm	峰1	4.365	345541	2.51	40708
2	W2489 ChA 214nm	峰2	5.068	13433747	97.49	1270712

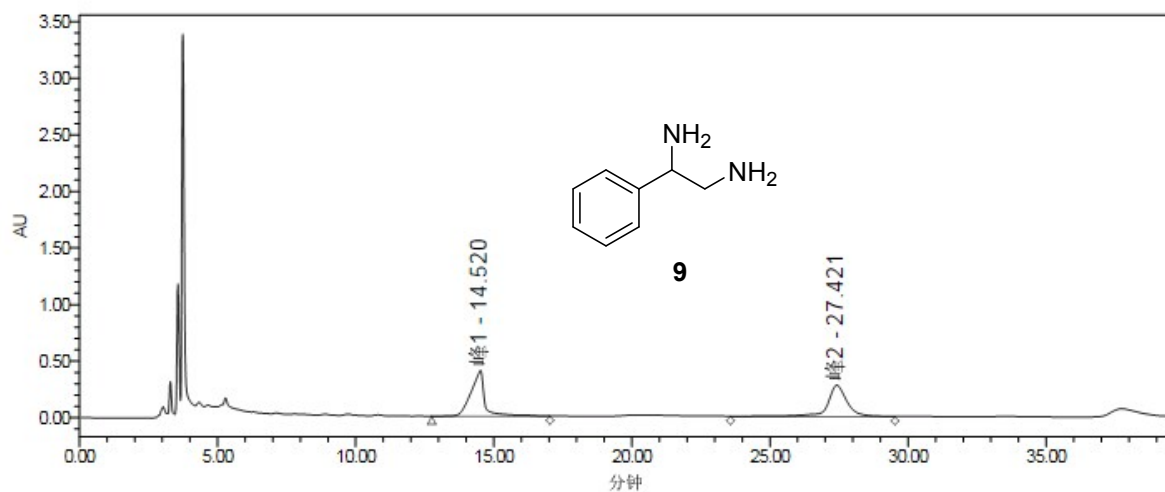


	Channel Description	Peak Name	RT (min)	Area (礦*sec)	% Area	Height (礦)
1	W2489 ChA 214nm	峰1	22.092	10075855	50.37	226569
2	W2489 ChA 214nm	峰2	24.096	9929233	49.63	214540



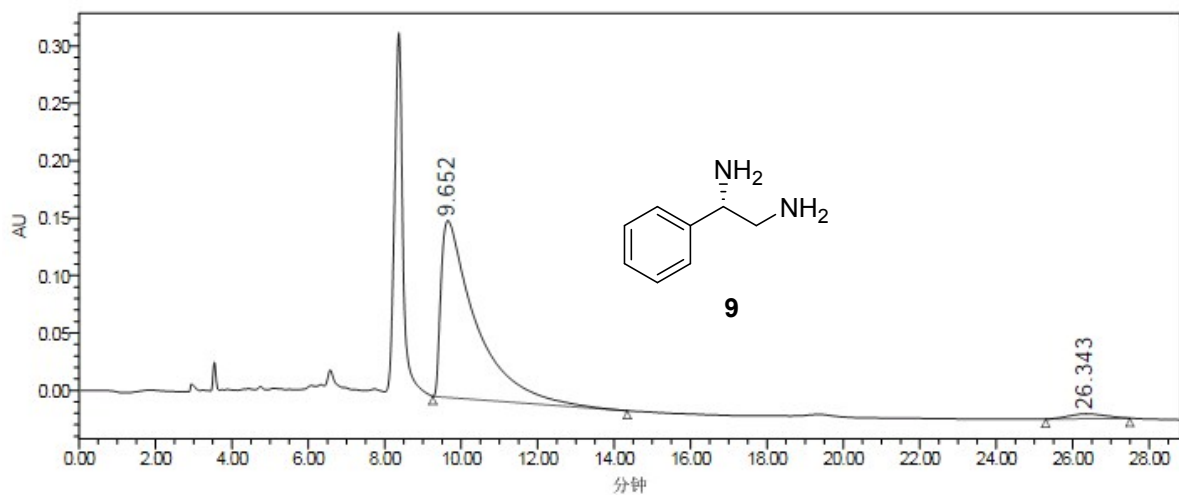
Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	21.949	23320592	97.41	538804
2	W2489 ChA 214nm	峰2	24.073	620238	2.59	14683



Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	Peak Name	RT (min)	Area (磺*sec)	% Area	Height (磺)
1	W2489 ChA 214nm	峰1	14.520	14484626	50.20	402724
2	W2489 ChA 214nm	峰2	27.421	14370527	49.80	278180



Channel: W2489 ChA; Channel Desc.: W2489 ChA 214nm; Processing Method: 0

	Channel Description	RT (min)	Area (峰*sec)	% Area	Height (峰)
1	W2489 ChA 214nm	9.652	9794284	97.25	154084
2	W2489 ChA 214nm	26.343	276799	2.75	4105