

***Supplementary Information for***

**Biotransamination with racemic amines as amine donors:  
Kill three birds with one stone through a dual-enzyme  
cascade**

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## 1. General information

All racemic amines used as the amino donors, were commercially available and purchased from Aladdin (Shanghai, China) without additional purification. All  $\alpha$ -ketoamides were synthesized referencing our previous work.<sup>1</sup> All chemicals used here are of analytical grade. <sup>1</sup>H- and <sup>13</sup>C- NMR were recorded on a Bruker Avance-400 instrument with CDCl<sub>3</sub>, CD<sub>3</sub>OD or DMSO-*d*<sub>6</sub> as solvent in all cases. All chemical shifts ( $\delta$ ) were reported in parts per million (ppm) relative to an internal tetramethylsilane (TMS,  $\delta$  0.00) standard. Multiple abbreviations were used to define the multiplicities: br, broad; s, singlet; d, doublet; t, triplet; q, quartet; p, pentet and m, multiplet. Product yields were measured by HPLC analysis equipped with a C18 column, while the ee values of the desired chiral amines were measured by HPLC analysis equipped with a coating Silicagel Crownpak CR(+) (0.4 cm x 15 cm) column. Both the conversions and ees were recorded with a SHIMADZU instrument. The absolute configurations of products were determined by comparing with the standard pure products.

## 2. General procedures

### 2.1 General procedure for cloning, expression of transaminase

The  $\omega$ -transaminase gene was inserted in the plasmid pET28a(+) with an N-terminal His6-tag. After digestion (NheI, HindIII) and sequence verification, the construct was transformed into *E. coli* BL21 (DE). Expression was initiated by combining a 20 mL overnight culture with 180 mL of Luria-Bertoni (LB) medium with 50 mg/L Kanamycin and 0.4 mM IPTG and incubating for 24 h at 25 °C (150 rpm, baffled flask). Then, the cells were separated from the medium by centrifugation and resuspended in IMAC binding buffer (20 mM sodium phosphate, 500 mM sodium chloride, pH 8.2). The cells were disrupted by addition of BugBuster® 10X (Merck), followed by centrifugation, and the supernatant was isolated. An excess of cofactor (PLP) was added before desalting on a PD10 column (GE Healthcare). The addition of PLP before changing the buffer ensures a balanced ratio of cofactor to enzyme concentration, assuming minimal apo form during the desalting.

### 2.2 General procedure for the synthesis of $\alpha$ -ketoamides

A mixture comprising aryl methyl ketone (0.1 mmol), amine or aqueous ammonia (0.25 mmol), and NIS (0.02 mmol, 20 mol%) was added into a 5 mL round-bottom flask filled with 2 mL of water under ultraviolet light (1W). Air was flushed into a balloon, which was then sealed along with the flask, and the mixture was stirred at room temperature until all substrates disappeared. Then, the reaction mixture was extracted with 50 mL of ethyl acetate for 3 times. The organic layers were separated, combined, and washed with a brine solution. After drying over anhydrous MgSO<sub>4</sub> and filtration through a cotton pad, ethyl acetate was evaporated under vacuum. The residue was then purified by column chromatography in hexane/ethyl acetate eluents (5:1).

### 2.3 General procedure for preparing three chiral compounds in one reaction kit

The reaction was performed in 50 mM HEPES buffer solution on a 2 mL scale, with the optimal pH for  $\omega$ -transaminases. Each constituent was individually dissolved in the buffer, and the pH was adjusted accordingly.

These solutions were then combined to final concentration of 10 mM substituted phenethylamines, 5.5 mM substituted 2-oxo-2-phenylacetamide, 1.0 U *EbSDR8* G94A/S153L and 0.8 U transaminase. The mixture was reacted in shaker for 24 h at 30 °C. After the reaction, 100 µL of perchloric (70%) was added to acidify the solution, and the reaction solution was centrifuged for 5 minutes to remove the precipitate. The supernatant was combined with 50 mL of ethyl acetate, mixed, and subjected to three extractions. The organic solution was isolated and combined, followed by distillation under evacuation to remove the organic solvent. The residue was then purified by column chromatography in hexane/ethyl acetate eluents (5:1).

## 2.4 Determination of substrate conversions

The samples were subjected to high-pressure liquid chromatography (HPLC) with a C18 column with mobile phases composed of H<sub>2</sub>O and methanol (7:3), following filtration (0.22 µm) and acidification by perchloric acid.

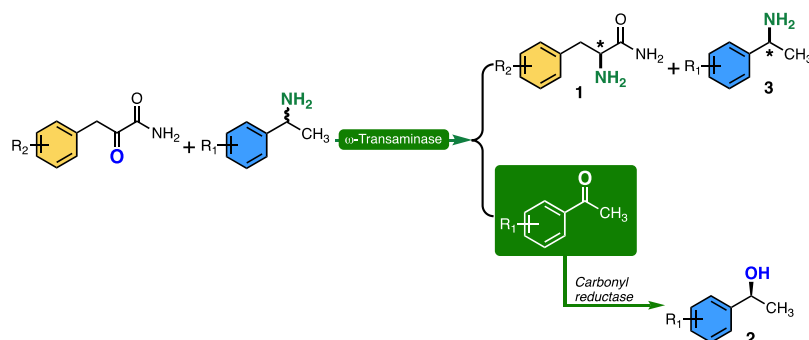
## 2.5 Determination of enantiomeric excess of chiral amines

The samples were subjected to high-pressure liquid chromatography (HPLC) with a CrownpakCR(+) column (Daicel), after filtration (0.22 µm) and acidification by perchloric acid. Ultrapure water, with addition of perchloric acid to pH 1.6, served as mobile phase at a flow rate of 0.5 mL/min with detection at 210 nm.

$$ee_S = \frac{[S] - [R]}{[S] + [R]} \quad \text{or} \quad ee_R = \frac{[R] - [S]}{[R] + [S]}$$

## 3. Conditions optimization

**Table S1.** Conditions optimization



Entry	loading of EbSDR8 G94A/S153L	loading of Cv-ω-TA WT	Yield / ee(Config.) (%/%)		
			1	2	3
1	0.6 U	0.6 U	64/>99 (S)	37/>99 (R)	36/78 (R)
2	0.8 U	0.8 U	77/>99 (S)	42/>99 (R)	43/88 (R)
3	1.0 U	1.0 U	87/>99 (S)	49/>99 (R)	49/99 (R)
4	1.2 U	1.0 U	88/>99 (S)	>49/>99 (R)	50/>99 (R)
5	1.0 U	0.8 U	80/>99 (S)	47/>99 (R)	48/96 (R)
6 <sup>b</sup>	1.0 U	0.8 U	68/>99 (S)	38/>99 (R)	37/80 (R)
7 <sup>c</sup>	1.0 U	0.8 U	88/>99 (S)	>49/>99 (R)	50/>99 (R)

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<sup>a</sup>All reactions were performed on a 2 mL scale, with the following conditions: substituted phenethylamines, 10 mM; 2-oxo-2-phenylacetamide, 5 mM; pH = 8.2; EbSDR8 G94A/S153L, 1.0U; transaminase, 0.8U; alcohol and cosolvent DMSO, 5%(v/v); temperature, 30 °C and reaction time, 24h; The evaluations of *ees* and conversions were determined by HPLC analysis equipped with a CrownpakCR(+) column (Daicel). <sup>b</sup> $\alpha$ -Ketoamides: amino donor, 1:2.2; <sup>c</sup> $\alpha$ -Ketoamides: amino donor, 1:1.8.

## 4. <sup>1</sup>H NMR and <sup>13</sup>C NMR spectrum of chiral amines

### 4.1 (R)- or (S)- 1-phenylethanamine

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  = 7.29-7.17 (m, 5H), 4.06-4.01 (m, 1H), 1.66 (s, 2H), 1.34 (d, *J* = 4.0 Hz, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  = 147.79, 128.49, 126.81, 125.71, 51.31, 25.70.

### 4.2 (R)- or (S)- 1-(4-fluorophenyl)ethylamine (C-F decoupled)

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  = 7.32-7.28 (m, 2H), 7.02-6.97 (m, 2H), 4.13-4.08 (m, 1H), 1.63 (s, 2H), 1.36 (d, *J* = 4.0 Hz, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  = 162.91 (d, *J* = 243.0 Hz), 143.38 (d, *J* = 3.0 Hz), 127.25 (d, *J* = 7.0 Hz), 115.23 (d, *J* = 21.0 Hz), 50.65, 25.81.

### 4.3 (R)- or (S)- 1-(p-tolyl)ethanamine

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  = 7.23 (d, *J* = 8.0 Hz, 2H), 7.14 (d, *J* = 8.0 Hz, 2H), 4.09 (q, *J* = 8.0 Hz, 1H), 2.32 (s, 3H), 1.77 (s, 2H), 1.37 (d, *J* = 8.0 Hz, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  = 144.76, 136.37, 129.17, 125.61, 51.04, 25.63, 21.03.

### 4.4 (R)- or (S)- 1-(3-methylphenyl)ethylamine

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  = 7.26-7.20 (m, 1H), 7.14 (t, *J* = 8.0 Hz, 2H), 7.06 (d, *J* = 8.0 Hz, 1H), 4.10 (q, *J* = 8.0 Hz, 1H), 2.35 (s, 3H), 1.82 (s, 2H), 1.39 (d, *J* = 8.0 Hz, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  = 147.61, 138.11, 128.42, 127.59, 126.44, 122.73, 51.30, 25.55, 21.47.

### 4.5 (R)- or (S)- $\alpha$ -Amino benzeneacetamide

<sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD)  $\delta$  = 7.43-7.26 (m, 5H), 4.44 (s, 1H); <sup>13</sup>C NMR (100 MHz, CD<sub>3</sub>OD)  $\delta$  = 176.87, 141.15, 128.38, 127.61, 126.67, 58.63.

### 4.6 (R)- or (S)- $\alpha$ -Amino-4-fluoro-benzeneacetamide

<sup>1</sup>H NMR (400 MHz, CD<sub>3</sub>OD)  $\delta$  = 7.50 (dd, *J* = 4.0 Hz, 2H); 7.11 (t, *J* = 8.0 Hz, 2H); 4.50 (s, 1H); <sup>13</sup>C NMR (100 MHz, CD<sub>3</sub>OD)  $\delta$  = 176.78, 163.60, 161.17, 137.30 (d, *J* = 1.0 Hz), 128.50 (d, *J* = 4.0 Hz), 114.86 (d, *J* = 10.0 Hz), 57.88.

### 4.7 (R)- or (S)- $\alpha$ -Amino-4-methyl-benzeneacetamide

<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)  $\delta$  = 7.23 (d, *J* = 8.0 Hz, 2H), 7.14 (d, *J* = 8.0 Hz, 2H), 4.09 (q, *J* = 8.0 Hz, 1H), 2.32 (s, 3H), 1.77 (s, 2H), 1.37 (d, *J* = 8.0 Hz, 3H); <sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)  $\delta$  = 144.76, 136.37, 129.17, 125.61, 51.04, 25.63, 21.03.

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#### 4.8 (R)- or (S)- $\alpha$ -Amino-4-ethyl-benzeneacetamide

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.31 (d,  $J$  = 8.0 Hz, 2H), 7.18 (d,  $J$  = 8.0 Hz, 2H), 6.85 (brs, 1H), 6.05 (brs, 1H), 4.48 (s, 1H), 2.63 (q,  $J$  = 8.0 Hz, 2H), 1.87 (s, 2H), 1.22 (t,  $J$  = 4.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 176.27, 144.22, 138.16, 128.40, 126.89, 59.60, 28.52, 15.50.

#### 4.9 (R)- or (S)- $\alpha$ -Amino-3-methyl-benzeneacetamide

$^1\text{H}$  NMR (400MHz  $\text{CDCl}_3$ )  $\delta$  = 7.24-7.10 (m, 4H), 6.86 (s, 1H), 6.09 (s, 1H), 4.46 (s, 1H), 2.34 (s, 3H), 1.92 (s, 3H);  $^{13}\text{C}$  NMR (100MHz  $\text{CDCl}_3$ )  $\delta$  = 176.20, 140.81, 138.65, 128.89, 128.82, 127.65, 123.97, 59.81, 21.39

#### 4.10 (R)- or (S)- 1-phenylethanol

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.37-7.25 (m, 5H), 4.89-4.85 (m, 1H), 2.11 (s, 1H), 1.49 (d,  $J$  = 8.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 145.90, 128.45, 127.57, 125.51, 70.49, 25.26.

#### 4.11 (R)- or (S)- 1-(3-methylphenyl)ethanol

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.26-7.07 (m, 4H), 4.87-4.82 (m, 1H), 2.36 (s, 3H), 2.11 (s, 1H), 1.49 (d,  $J$  = 8.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 145.87, 138.26, 128.52, 128.32, 126.21, 122.53, 70.52, 25.21, 21.58.

#### 4.12 (R)- or (S)- 1-(4-fluorophenyl)ethanol

$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.32-7.25 (m, 2H), 7.03-6.98 (m, 2H), 4.87-4.82 (m, 1H), 2.14 (s, 1H), 1.45 (d,  $J$  = 4.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 163.39 (d,  $J$  = 244.0 Hz), 141.61 (d,  $J$  = 3.0 Hz), 127.10, 115.44 (d,  $J$  = 22.0 Hz), 69.83, 25.36.

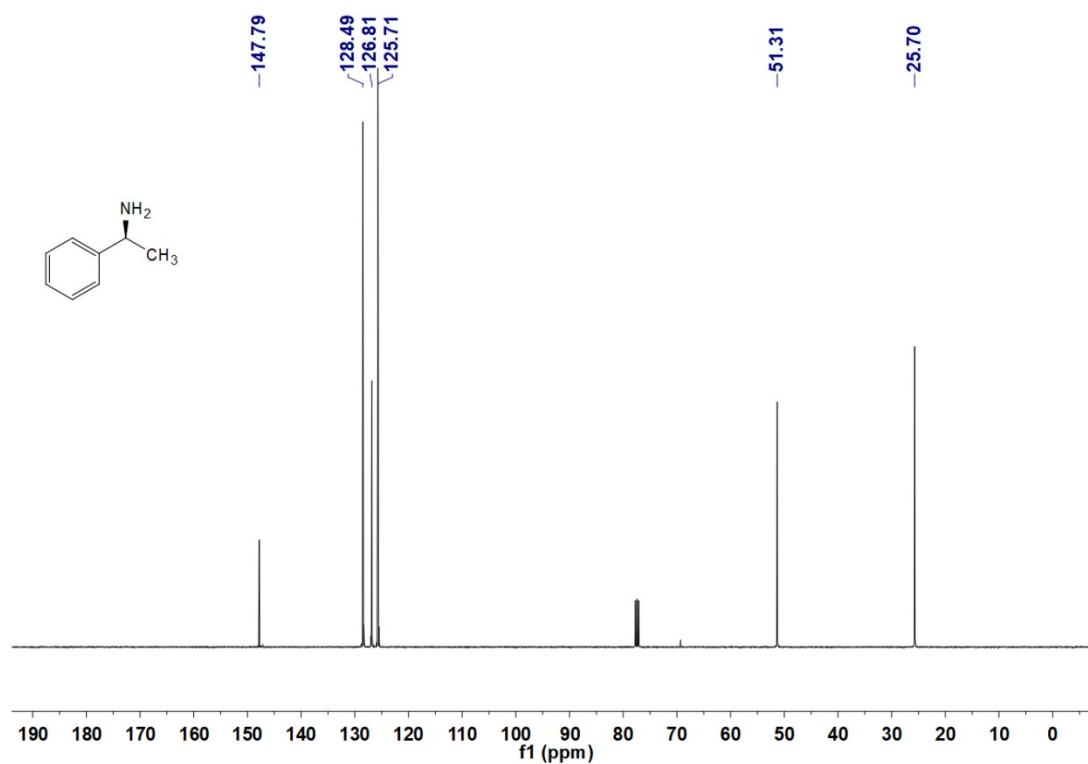
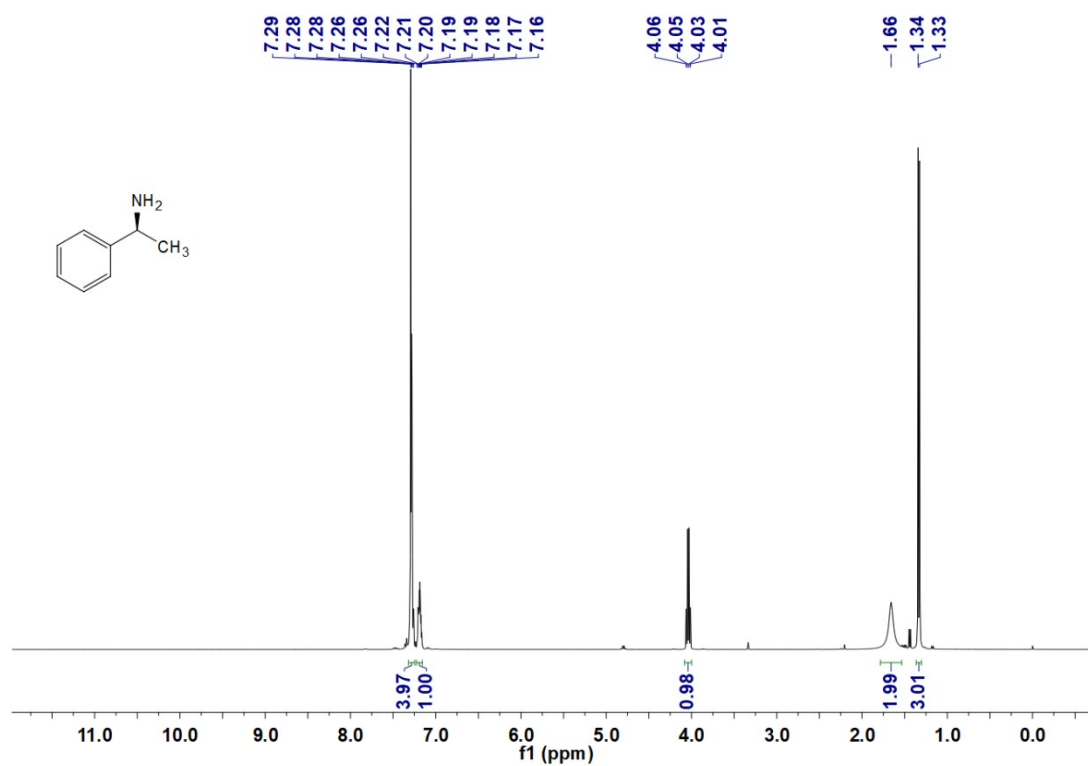
#### 4.13 (R)- or (S)- 1-(4-methylphenyl)ethanol

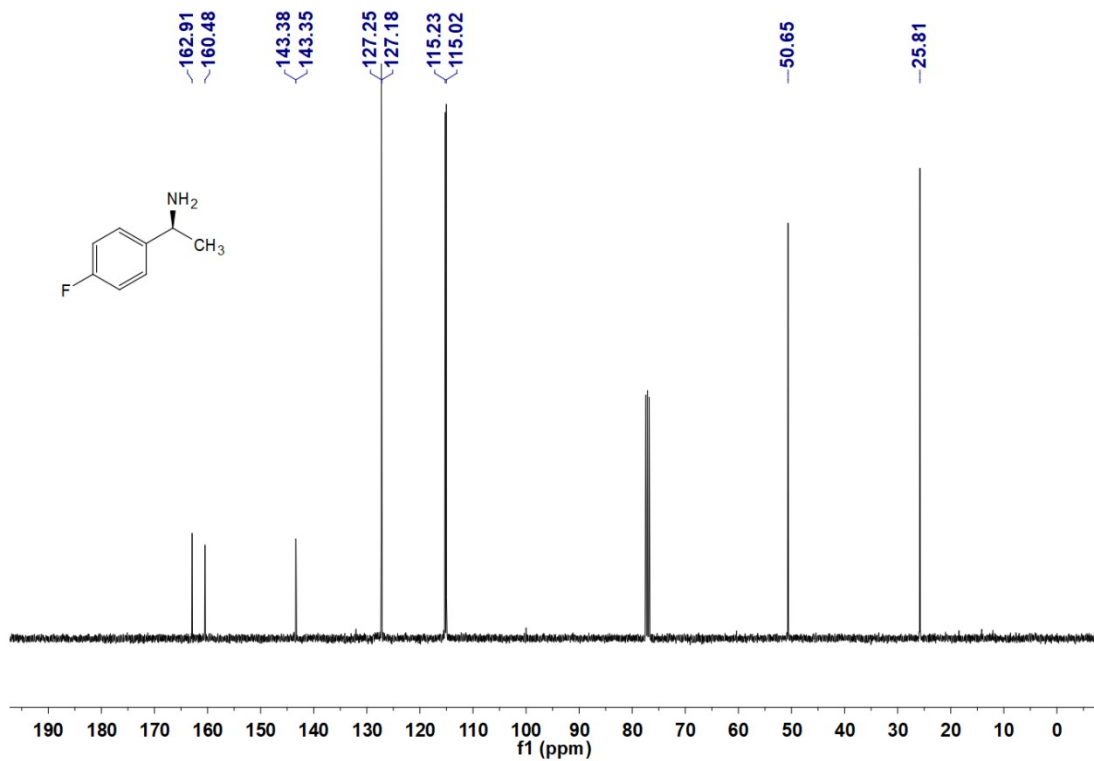
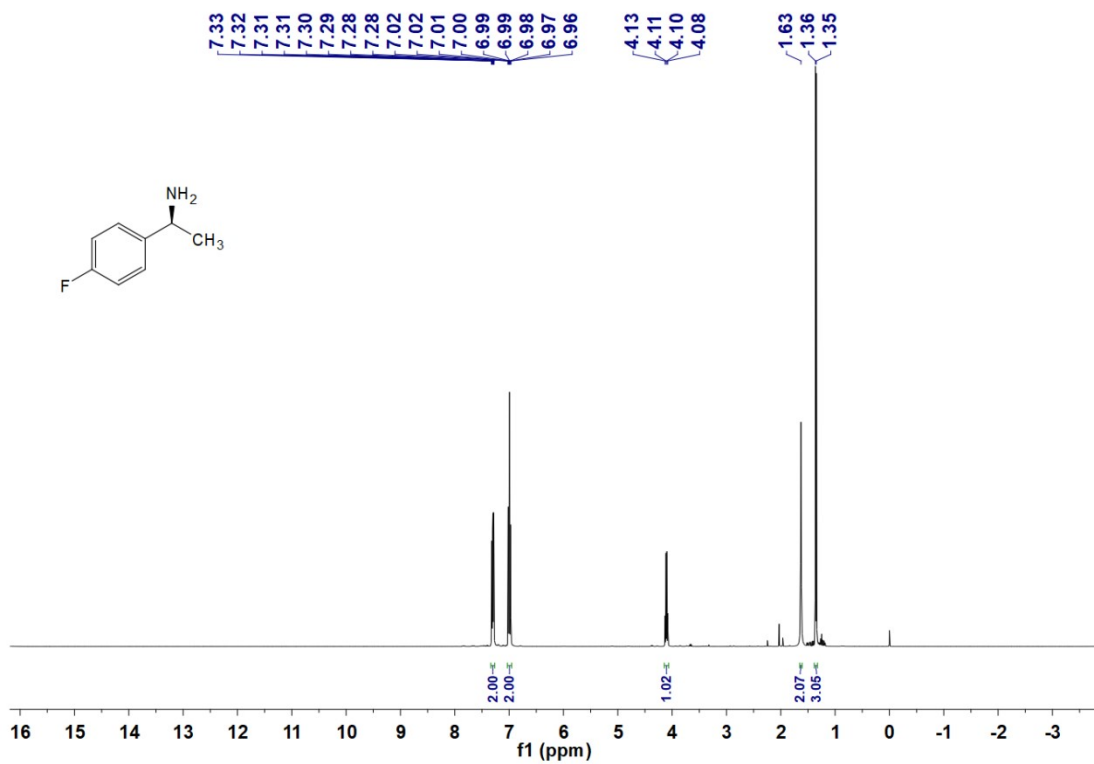
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.27 (d,  $J$  = 8.0 Hz, 2H), 7.17 (d,  $J$  = 8.0 Hz, 2H), 4.87-4.83 (m, 1H), 2.34 (s, 1H), 1.98 (s, 1H), 1.48 (d,  $J$  = 8.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 142.96, 137.25, 129.26, 125.47, 70.33, 25.18, 21.21.

#### 4.14 (R)- or (S)- 1-(4-chlorophenyl)ethanol

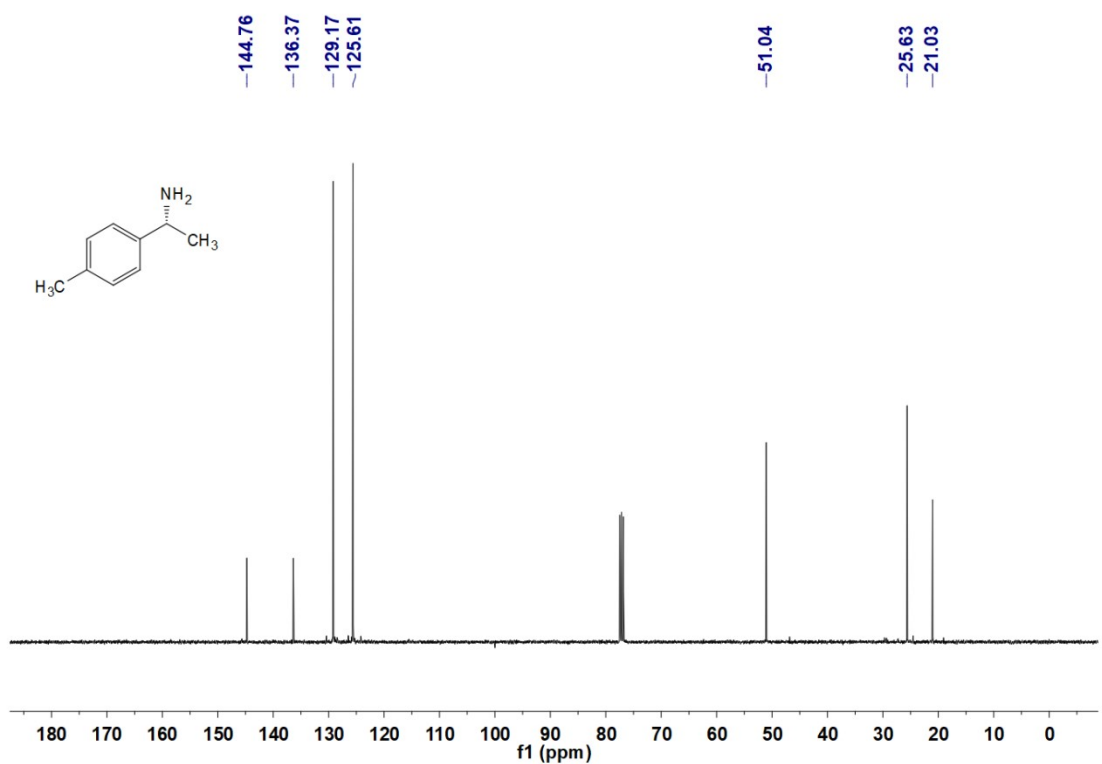
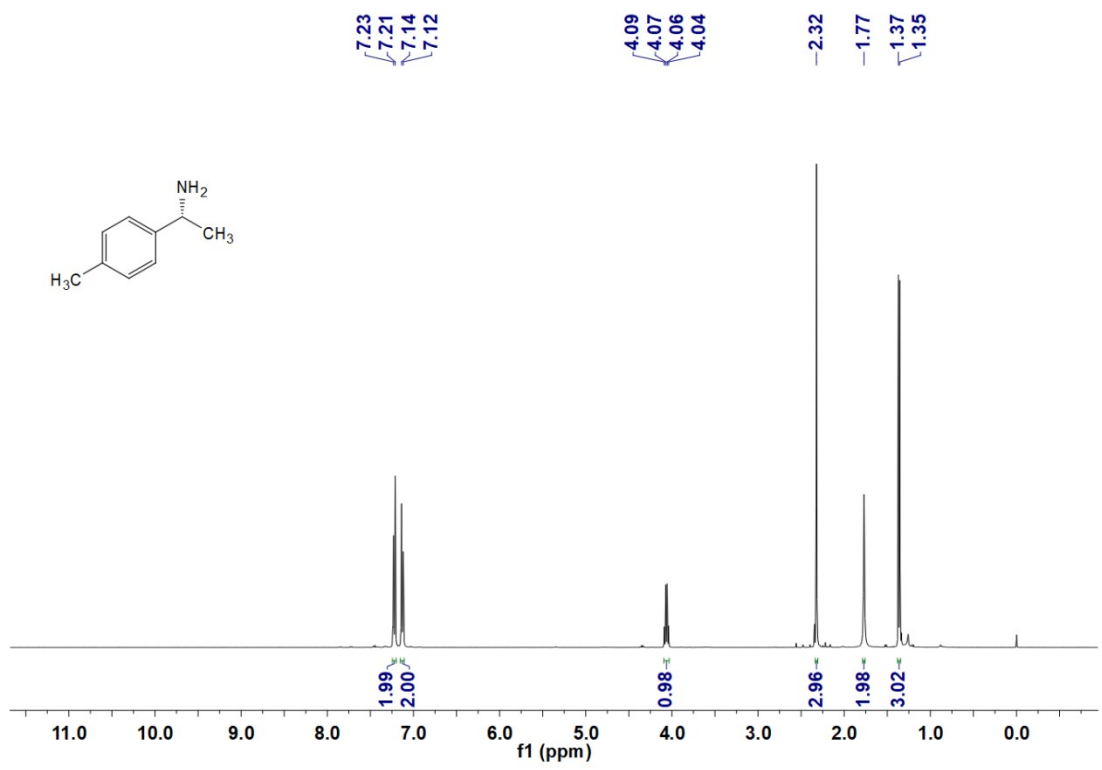
$^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ )  $\delta$  = 7.31-7.25 (m, 4H), 4.86-4.81 (m, 1H), 2.18 (s, 1H), 1.44 (d,  $J$  = 4.0 Hz, 3H);  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ )  $\delta$  = 144.32, 133.11, 128.68, 126.92, 69.80, 25.35.

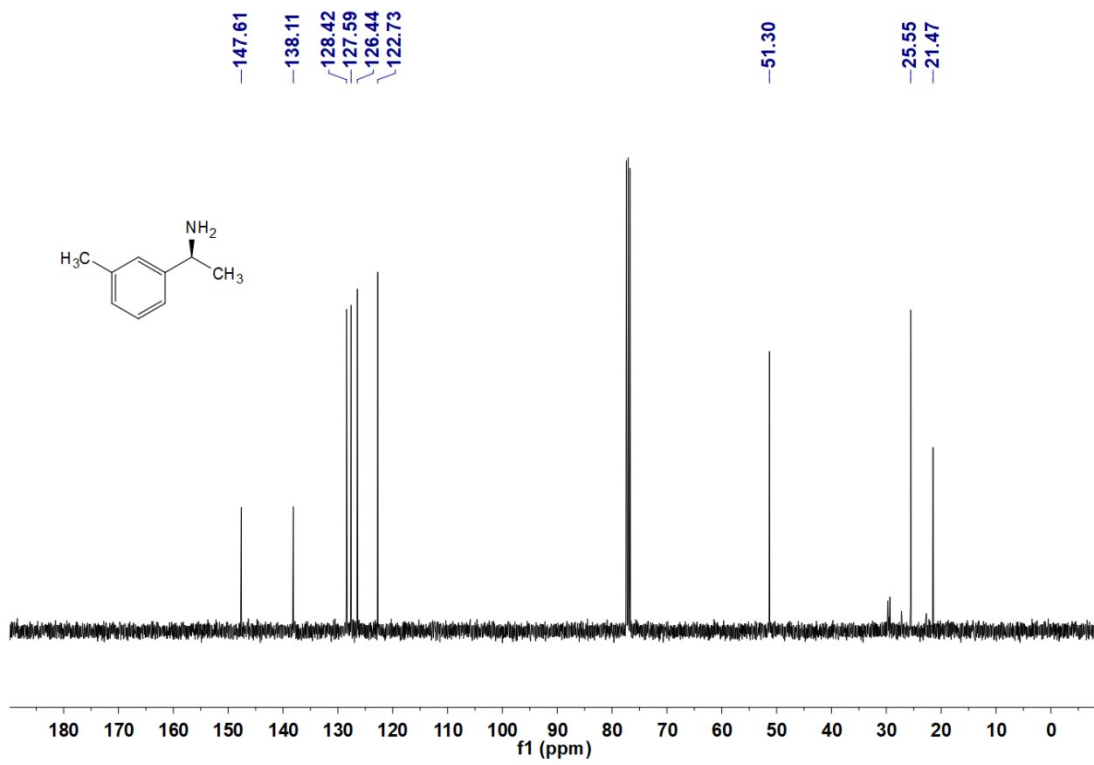
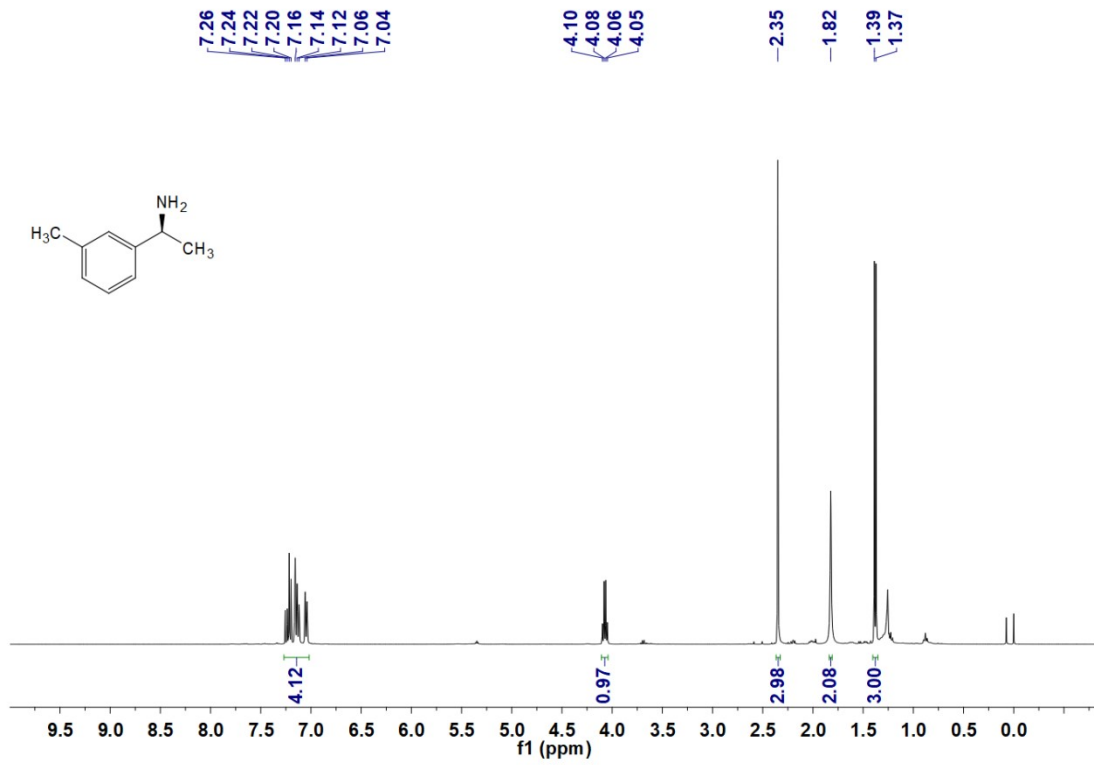
## 5. $^1\text{H}$ NMR and $^{13}\text{C}$ NMR spectra of product alcohols and chiral amines

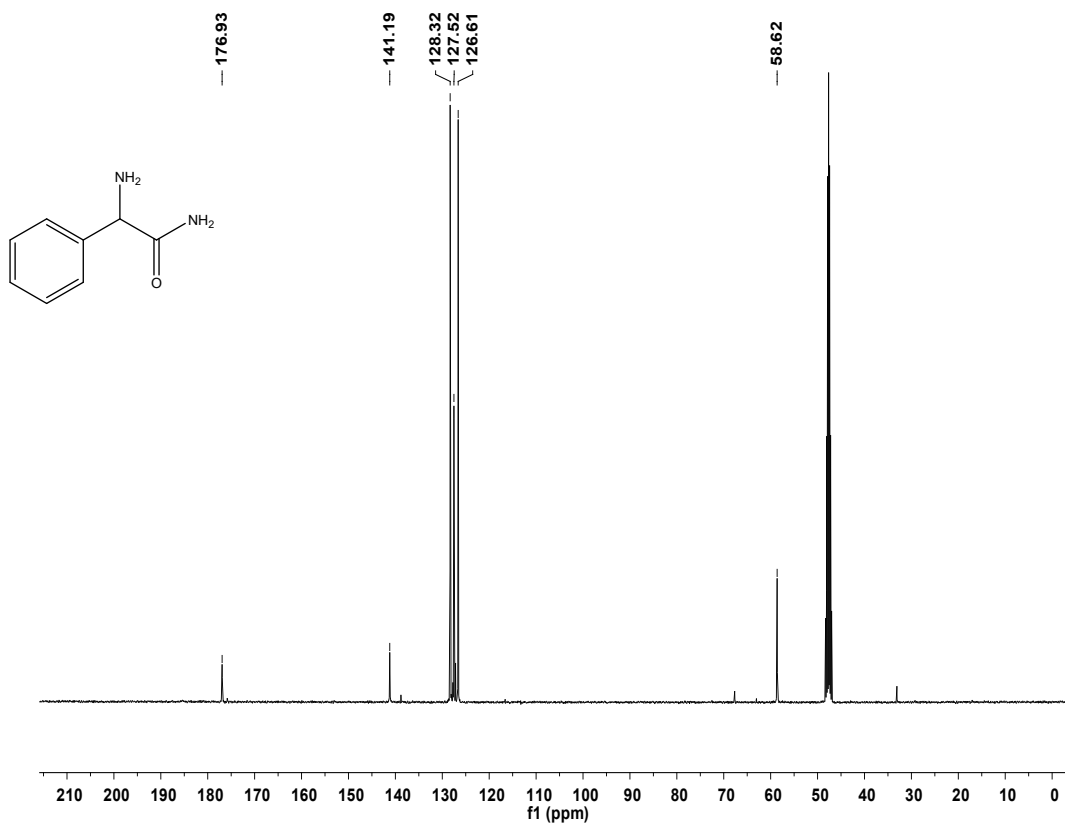
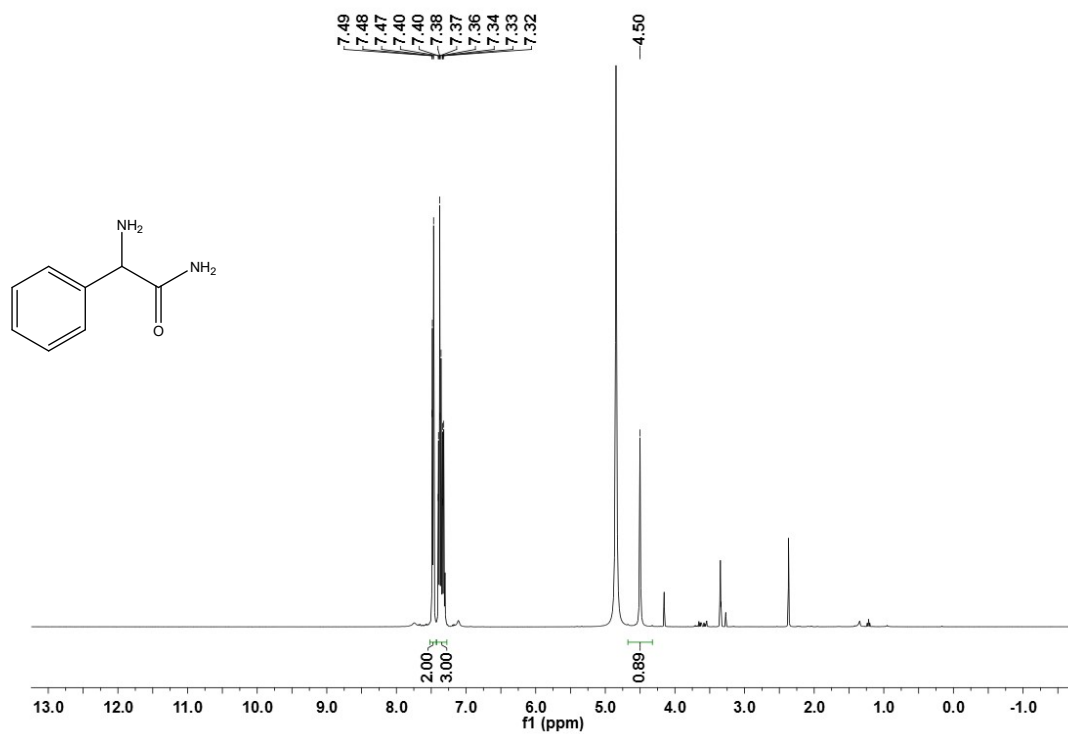


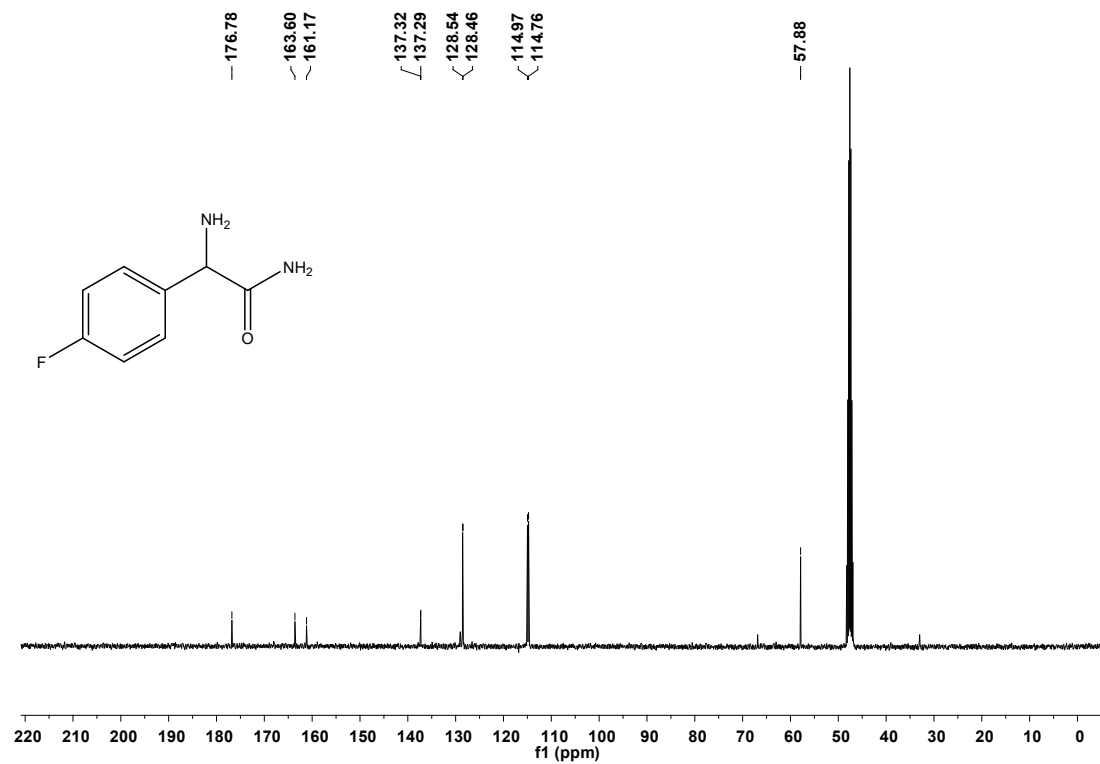
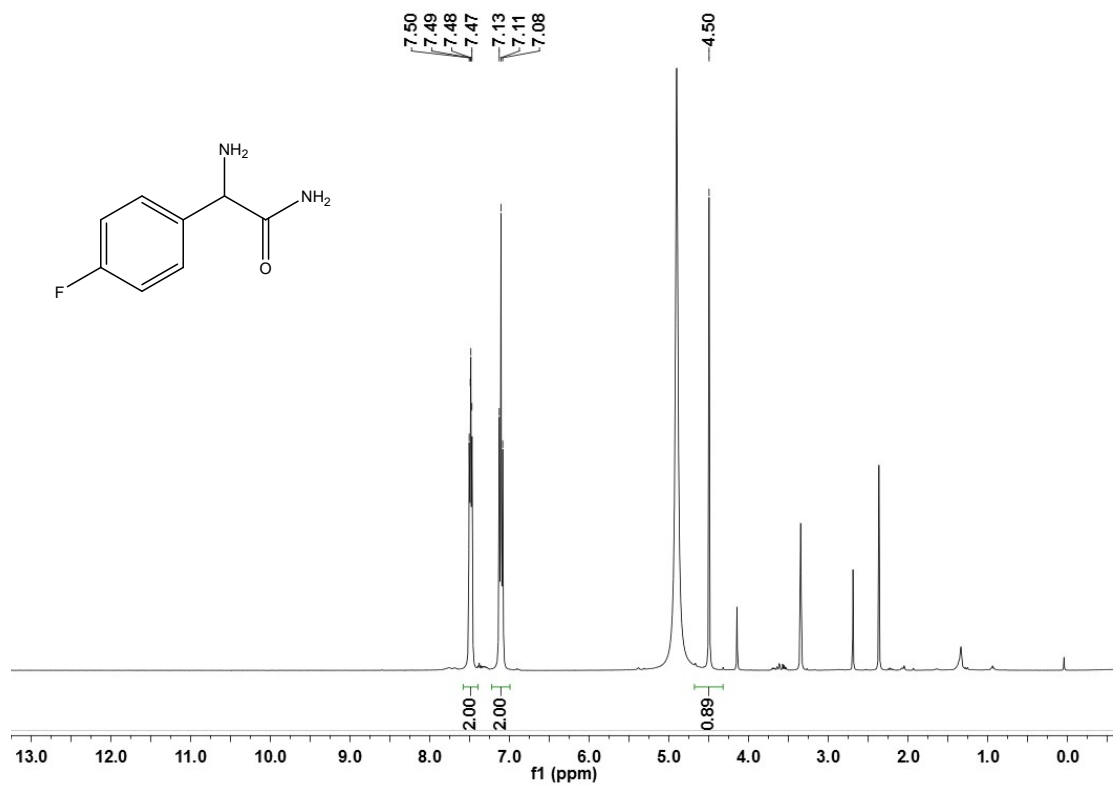


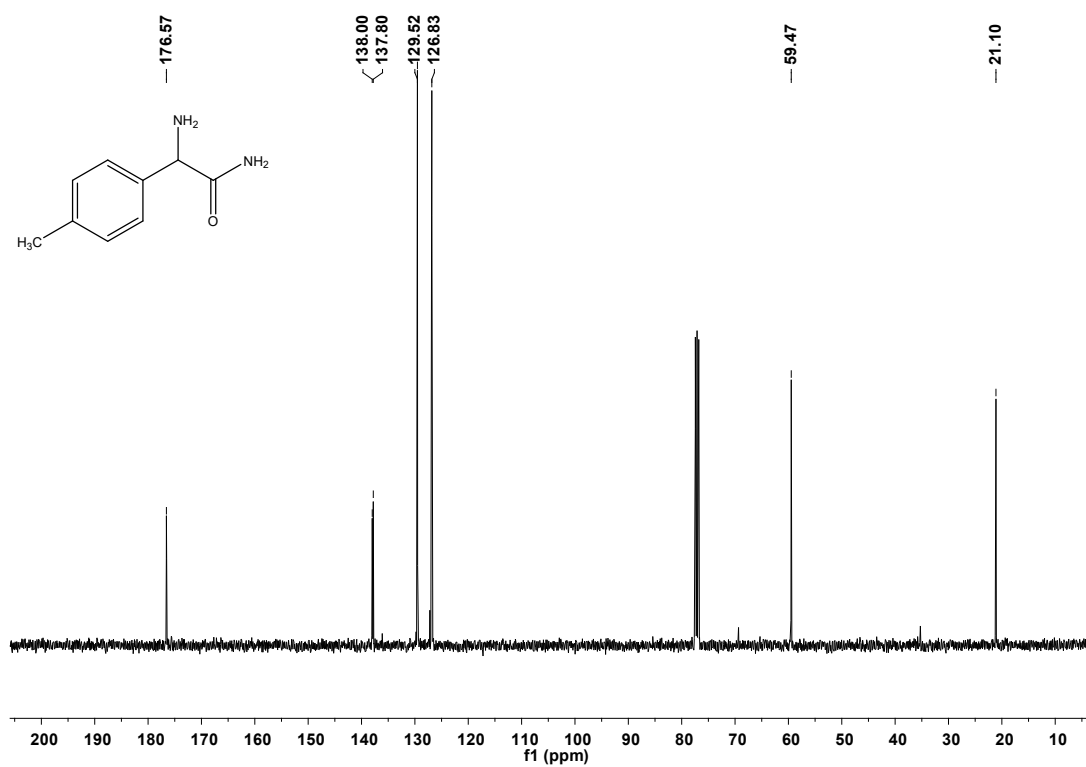
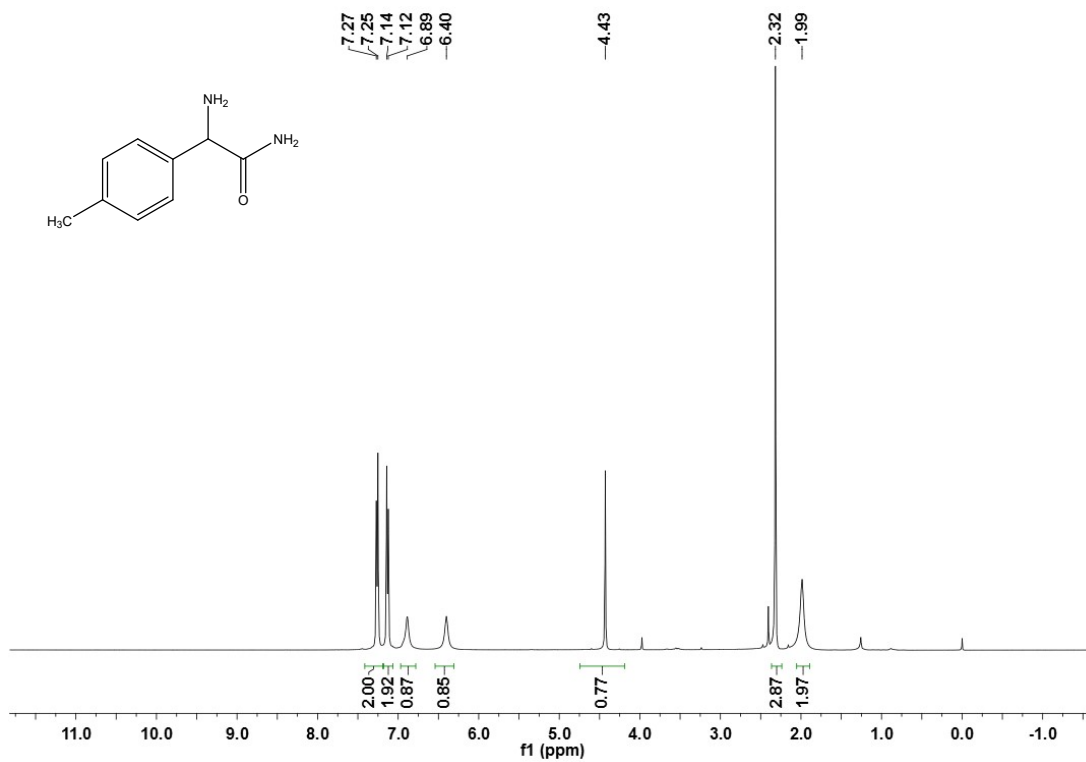


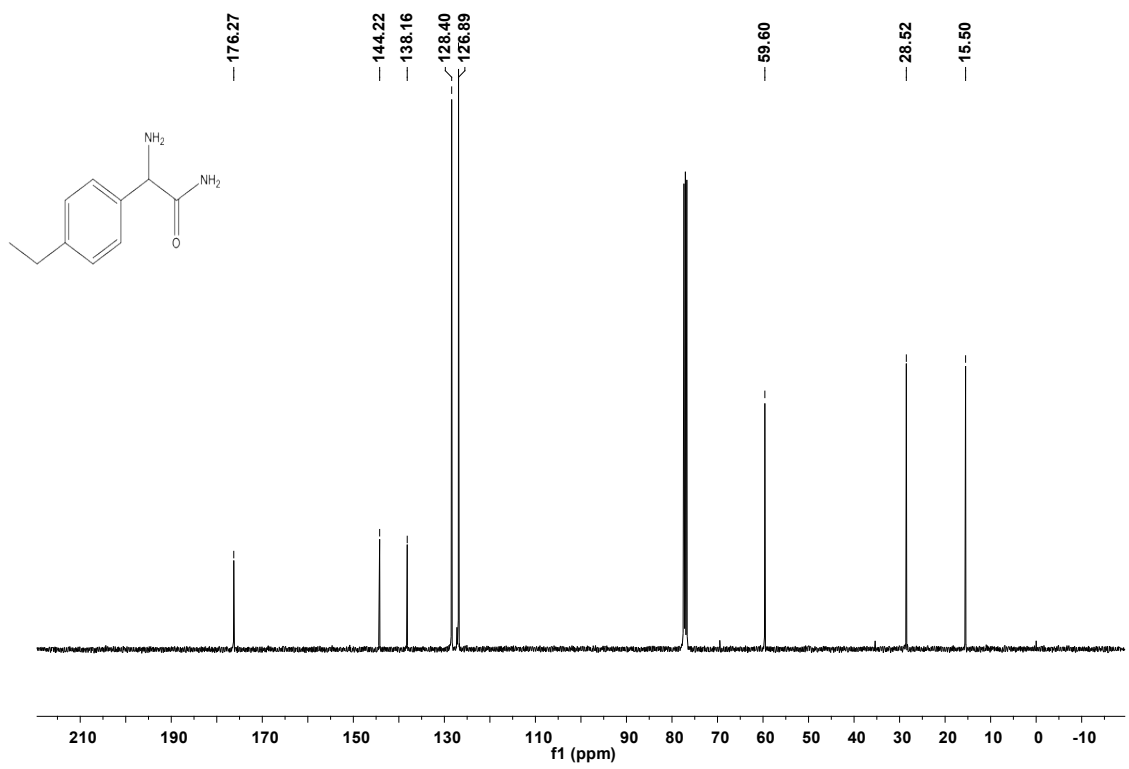
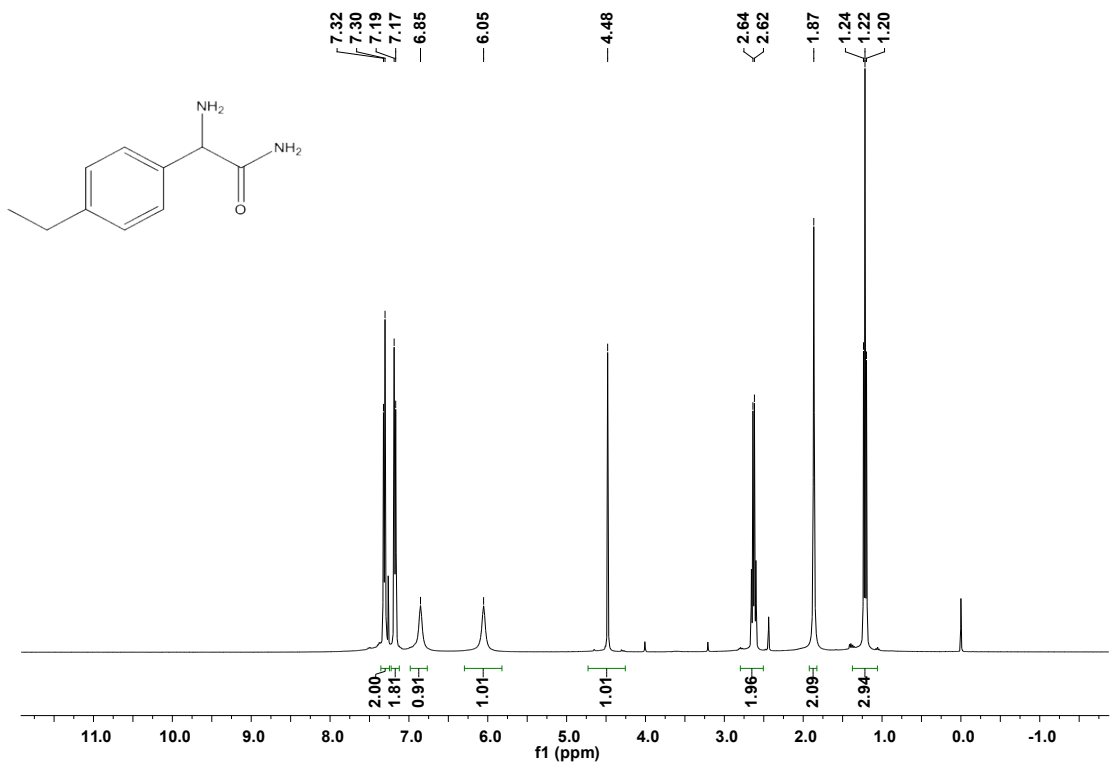


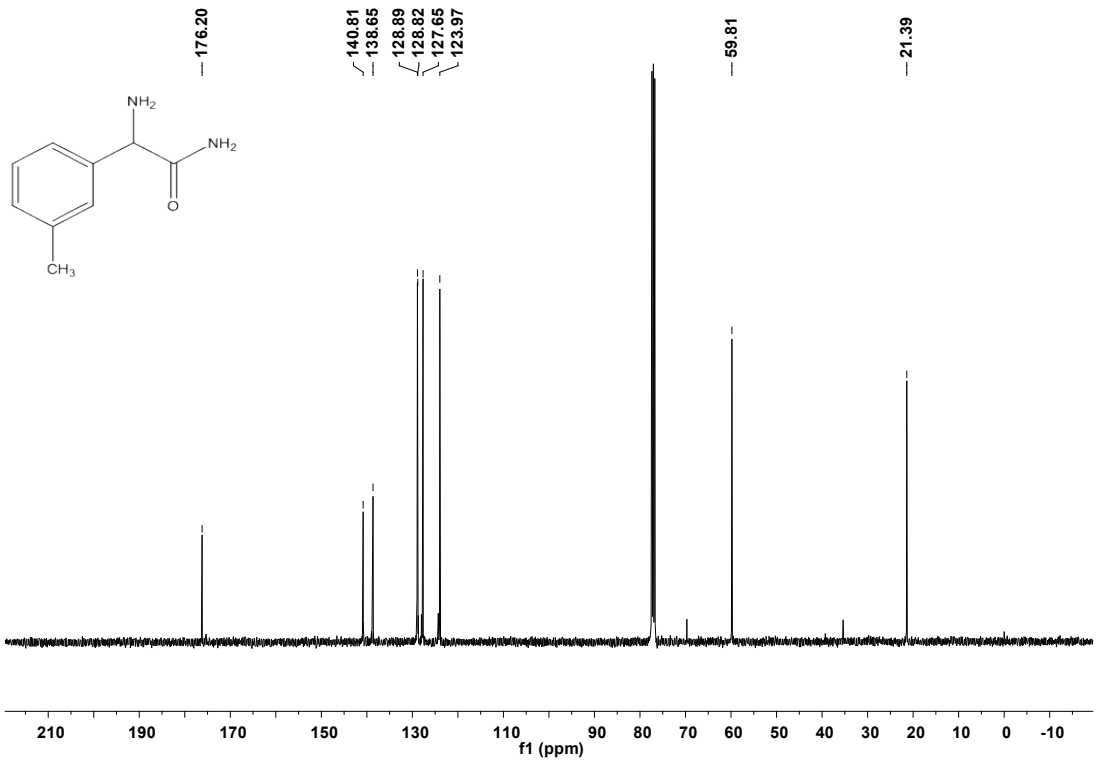
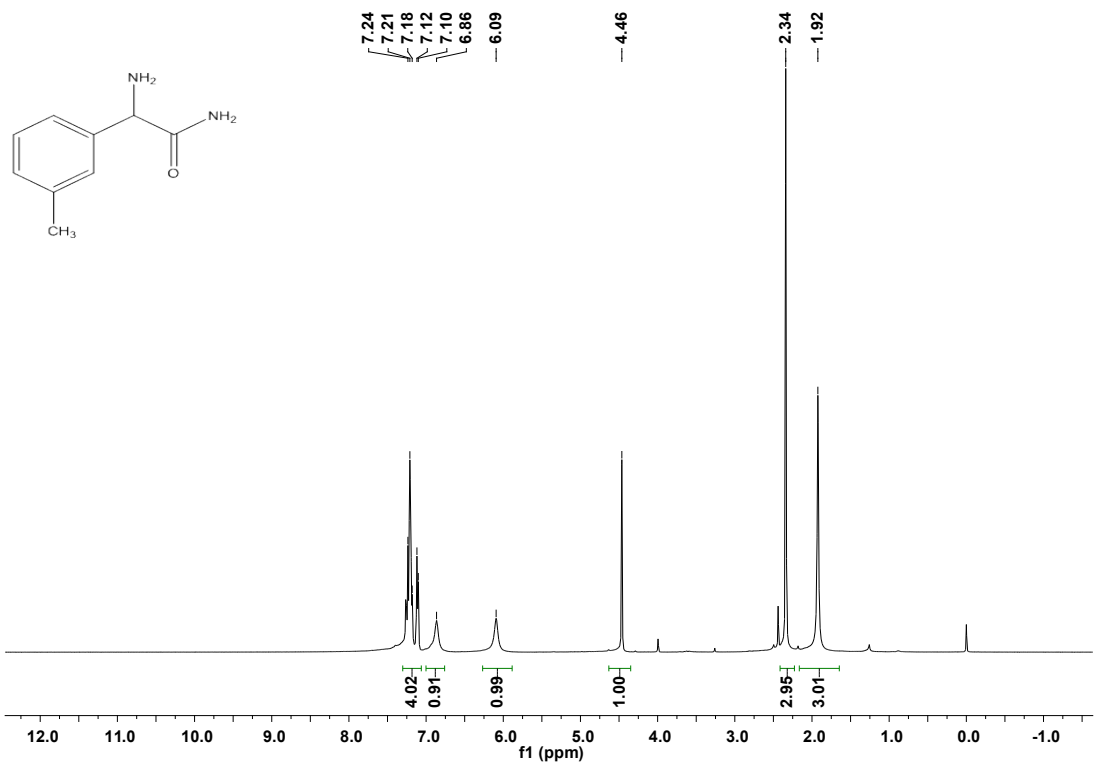


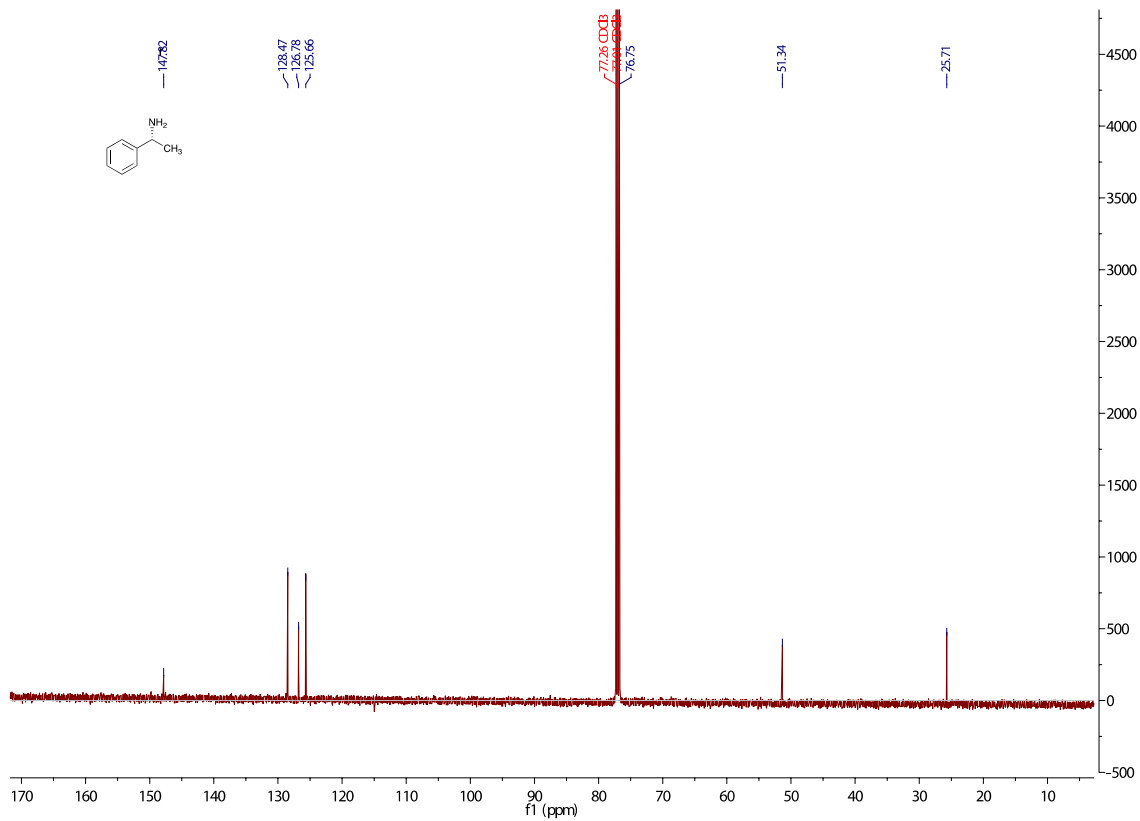
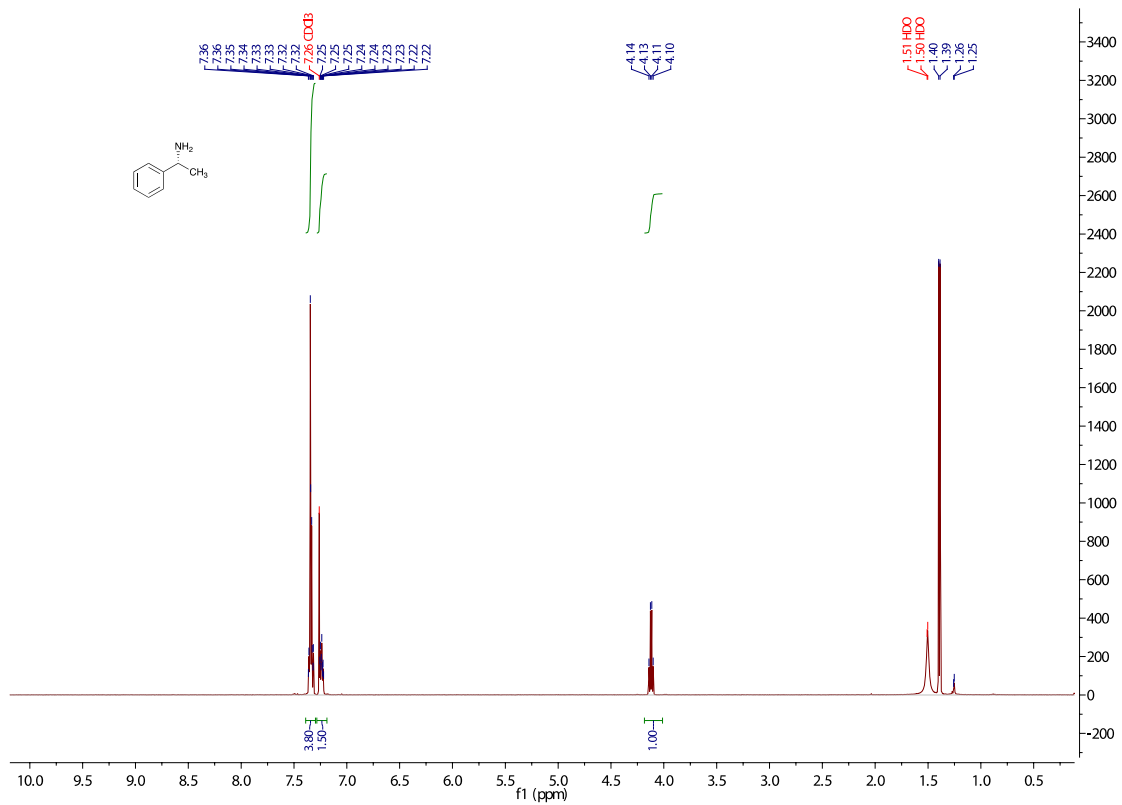




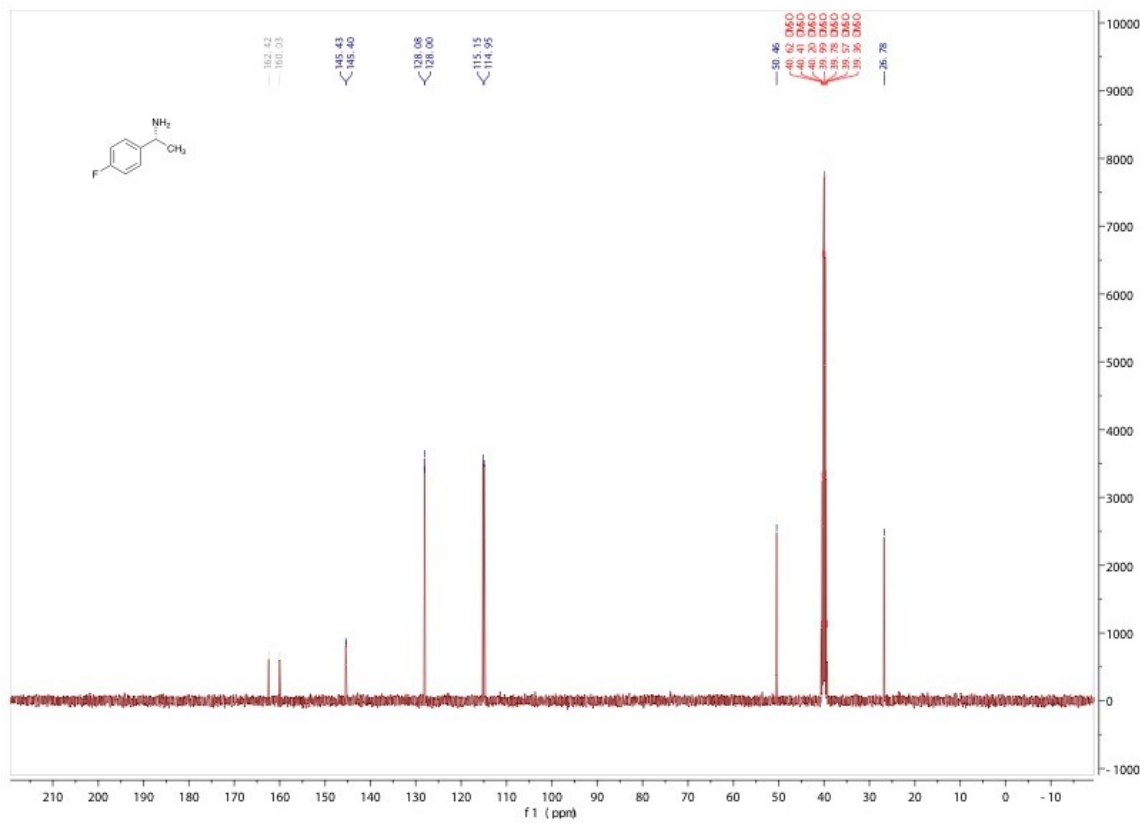
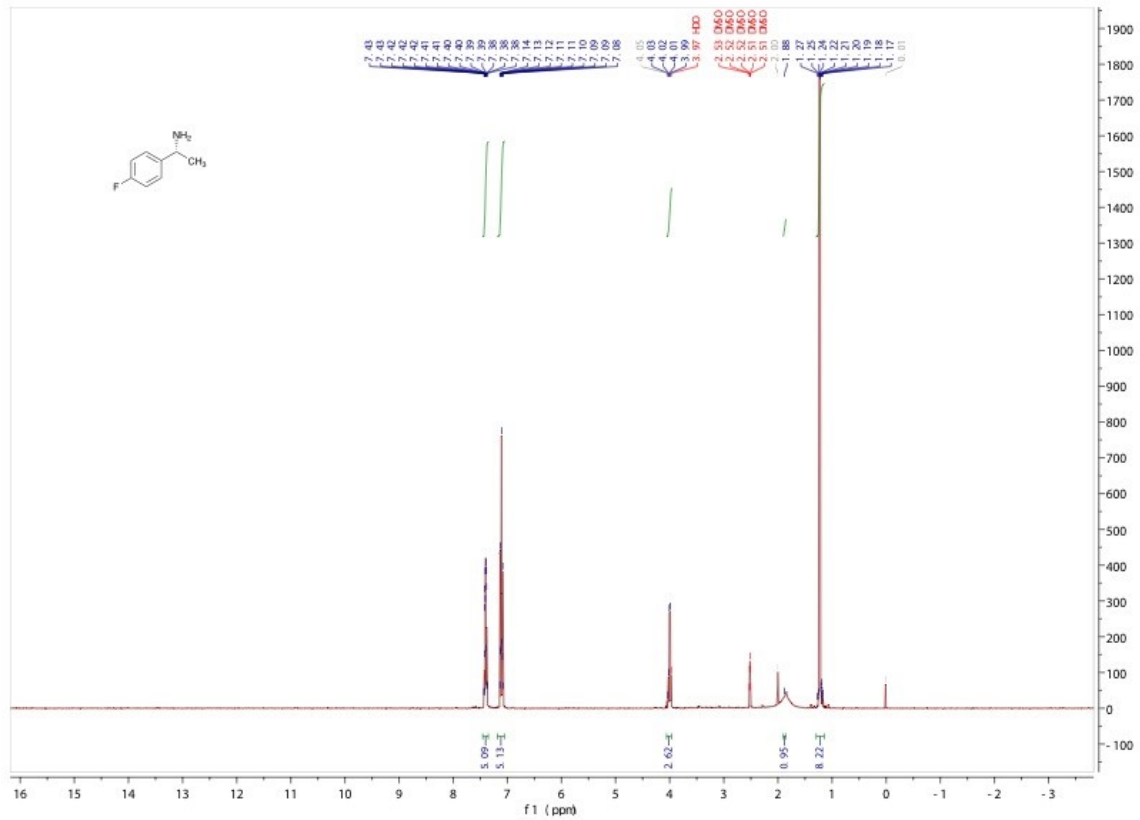


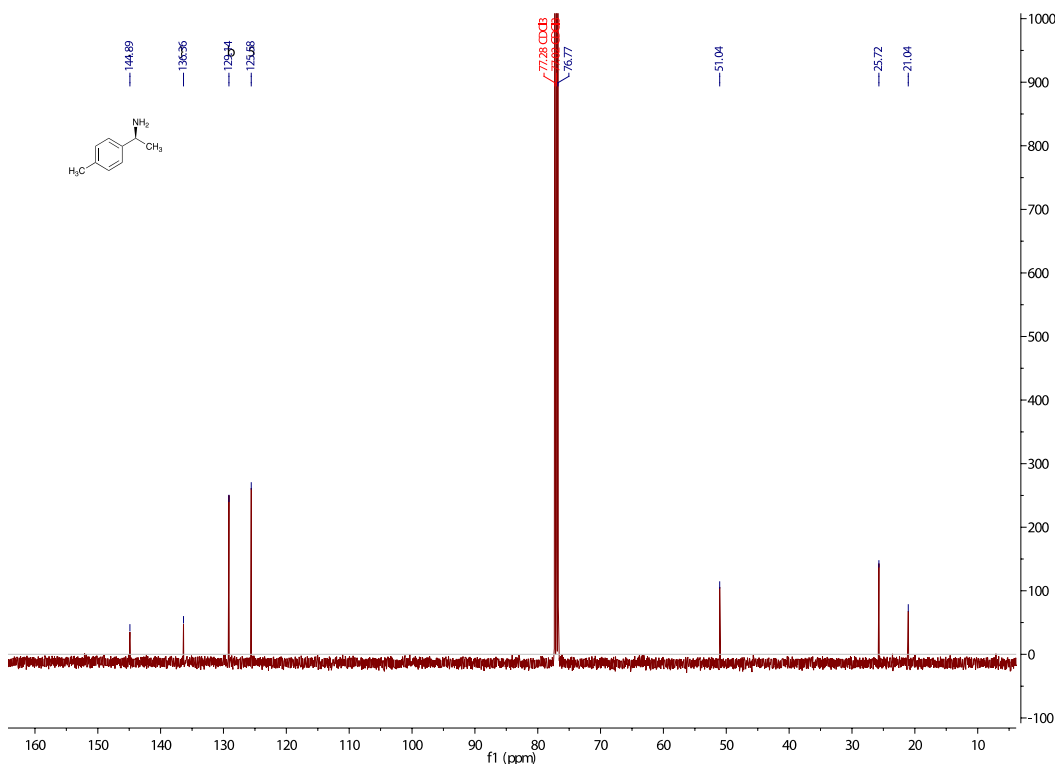
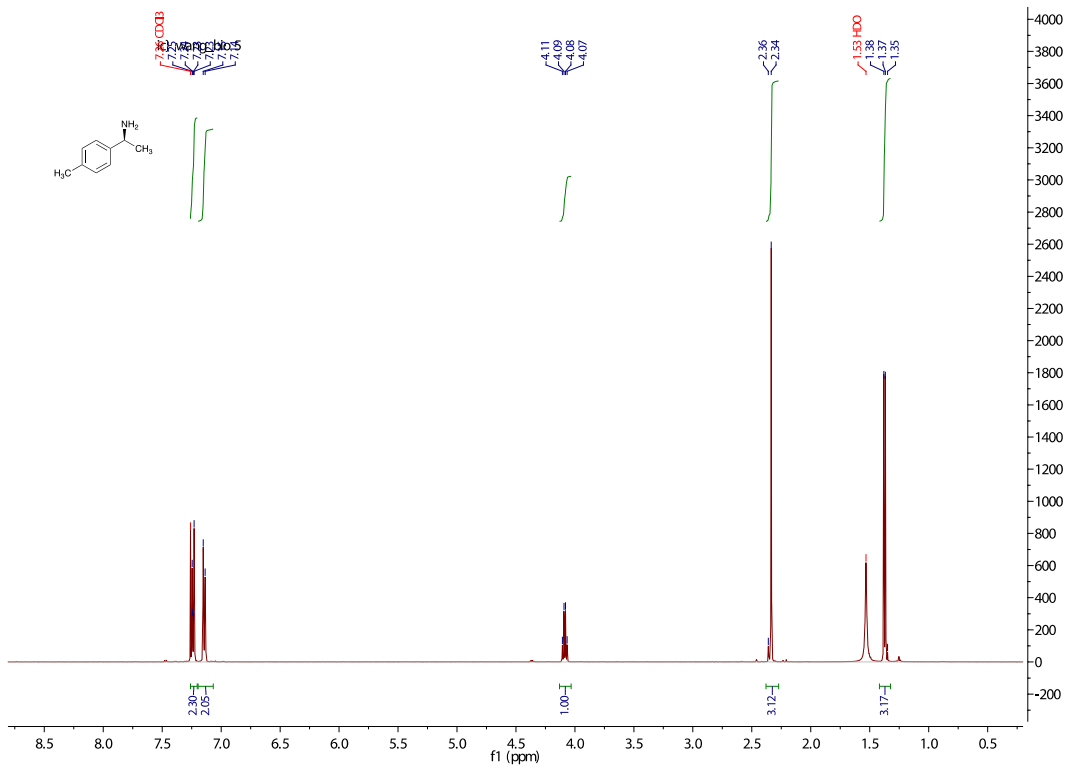








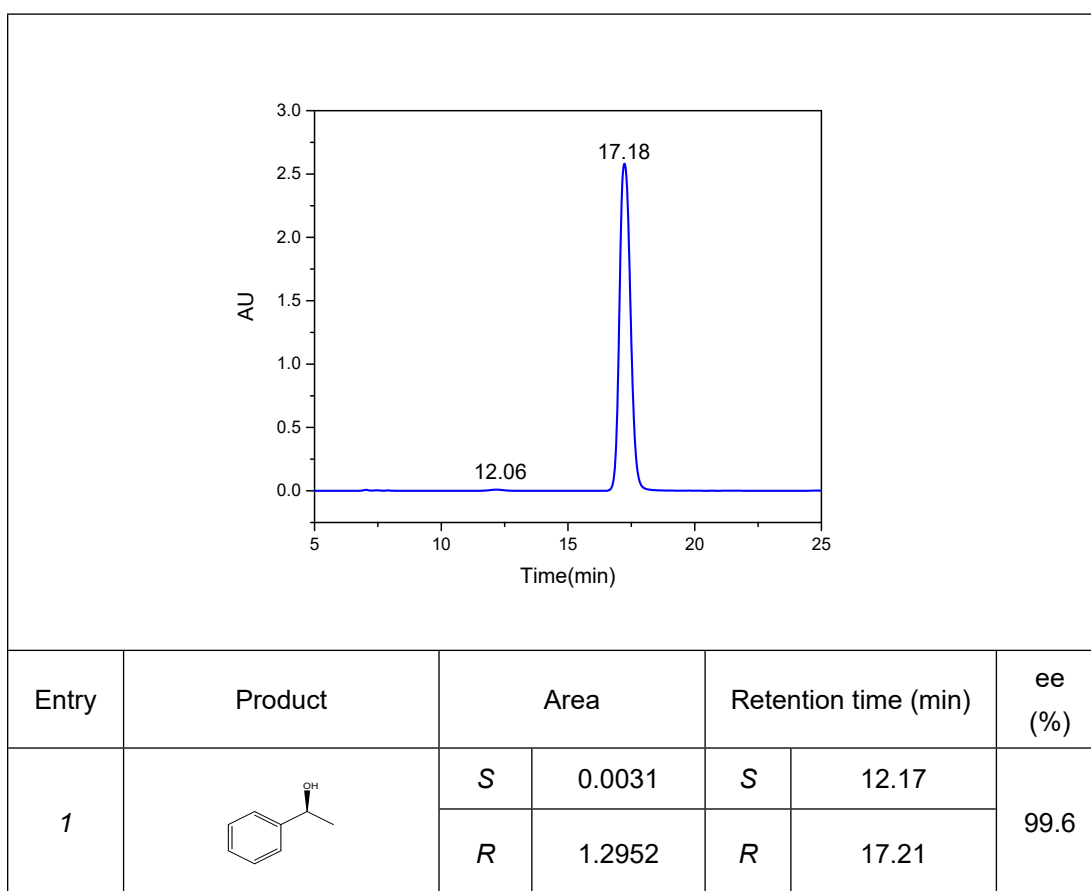


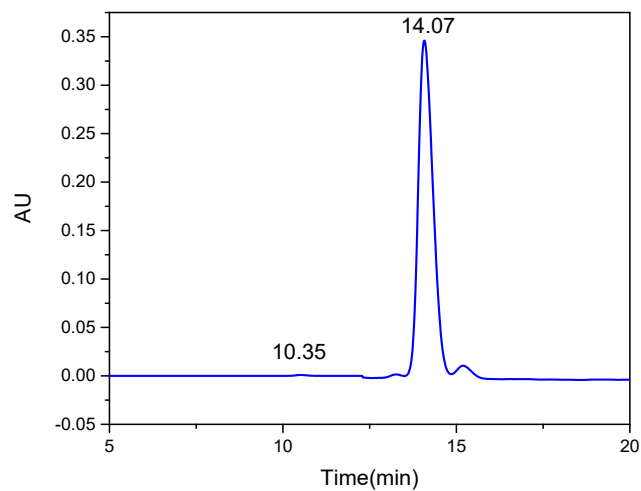





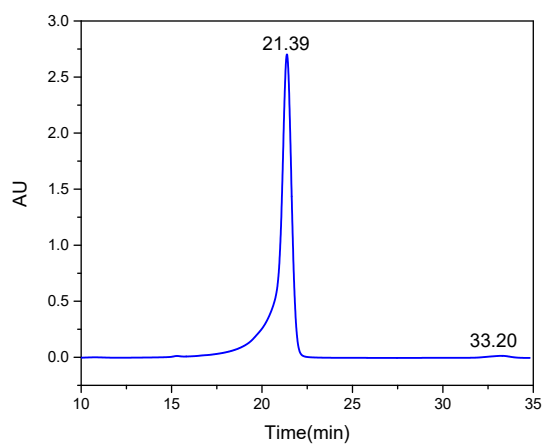
## 6. HPLC chromatogram

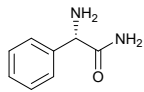
Table 1

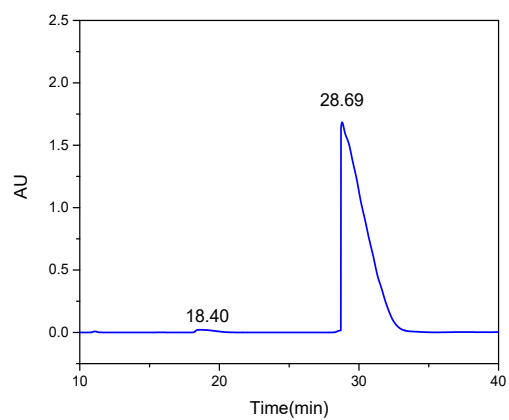


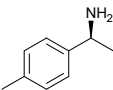


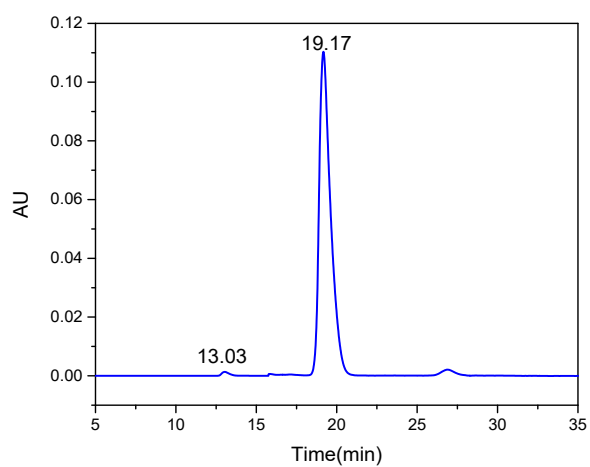
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
1		S	$3.47 \cdot 10^{-4}$	S	10.35	99.6
		R	0.1687	R	14.07	

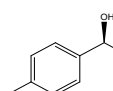


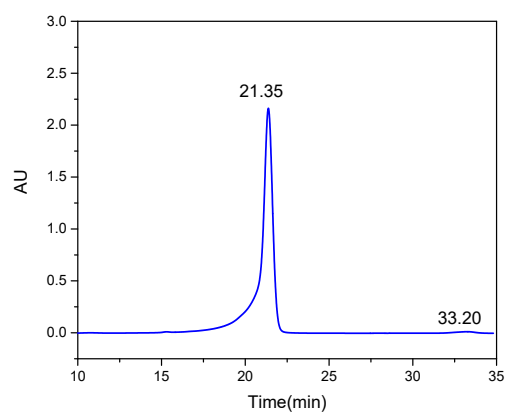
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
1		S	1.7813	S	21.39	99.6
		R	0.0031	R	33.20	

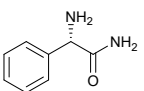


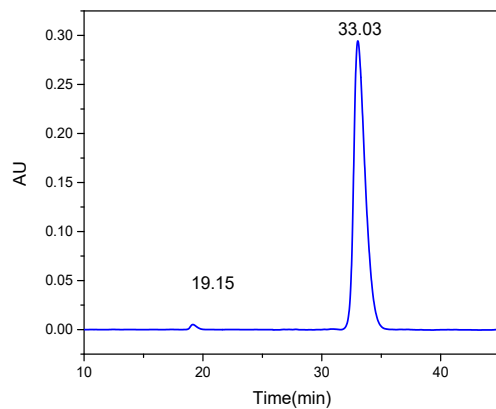
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
2		S	0.016	S	18.40	99.1
		R	3.5640	R	28.69	

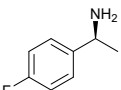


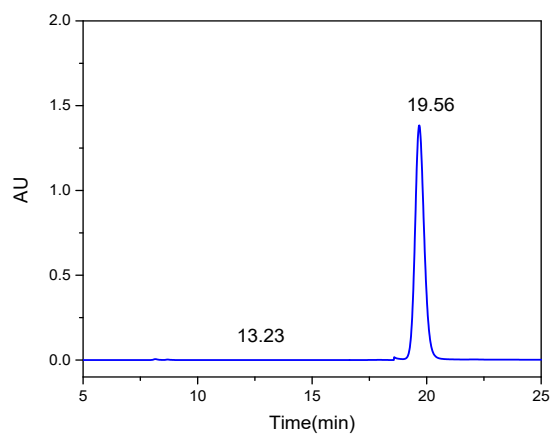
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
2		S	0.0001	S	13.03	99.4
		R	0.1009	R	19.17	

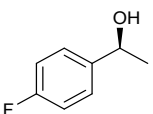


Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
2		<i>S</i>	1.425	<i>S</i>	7.44	99.4
		<i>R</i>	0.0041	<i>R</i>	10.05	

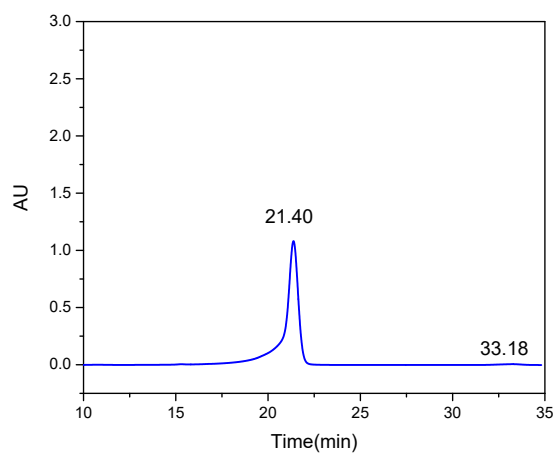


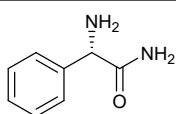
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
3		S	0.0012	S	19.15	99.5
		R	0.312	R	33.03	

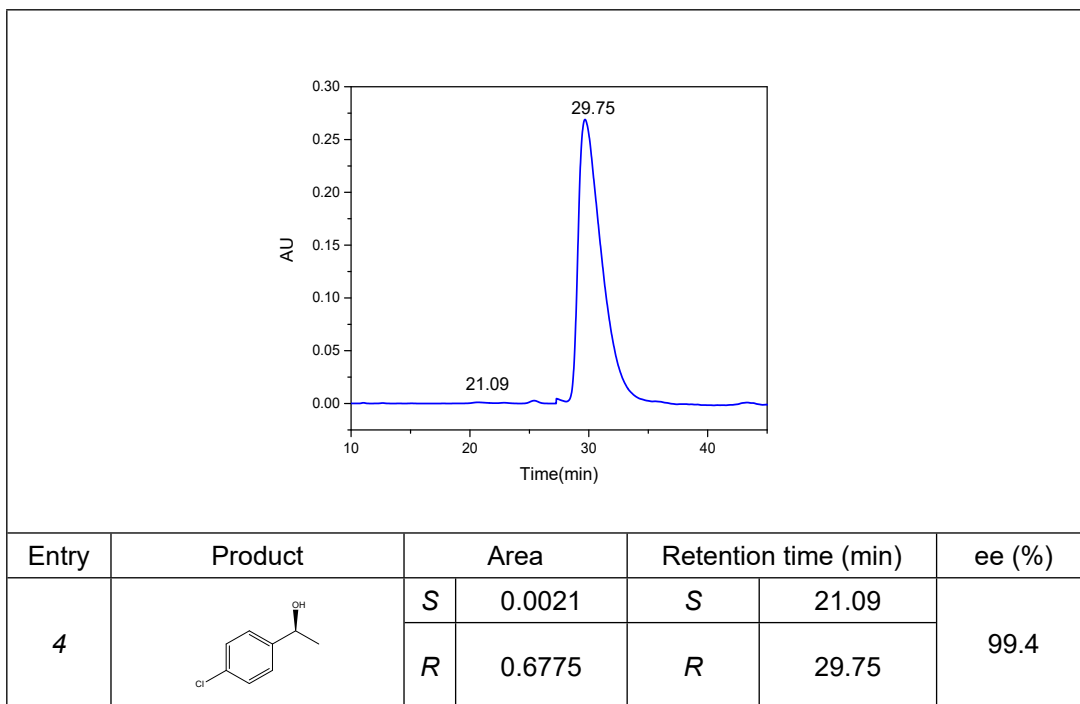
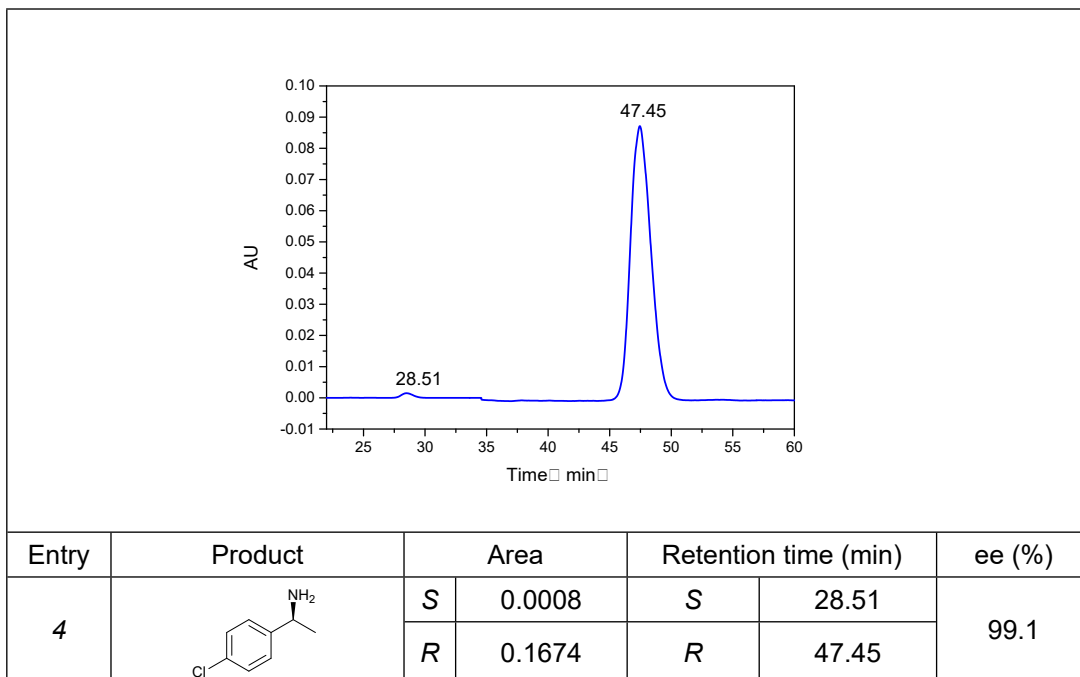


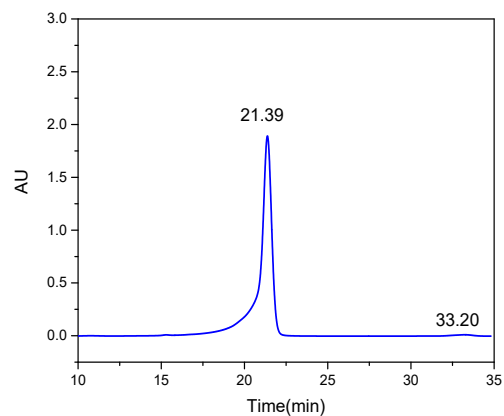
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
3		S	0.0023	S	13.23	99.3
		R	0.6568	R	19.56	

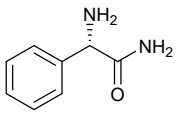


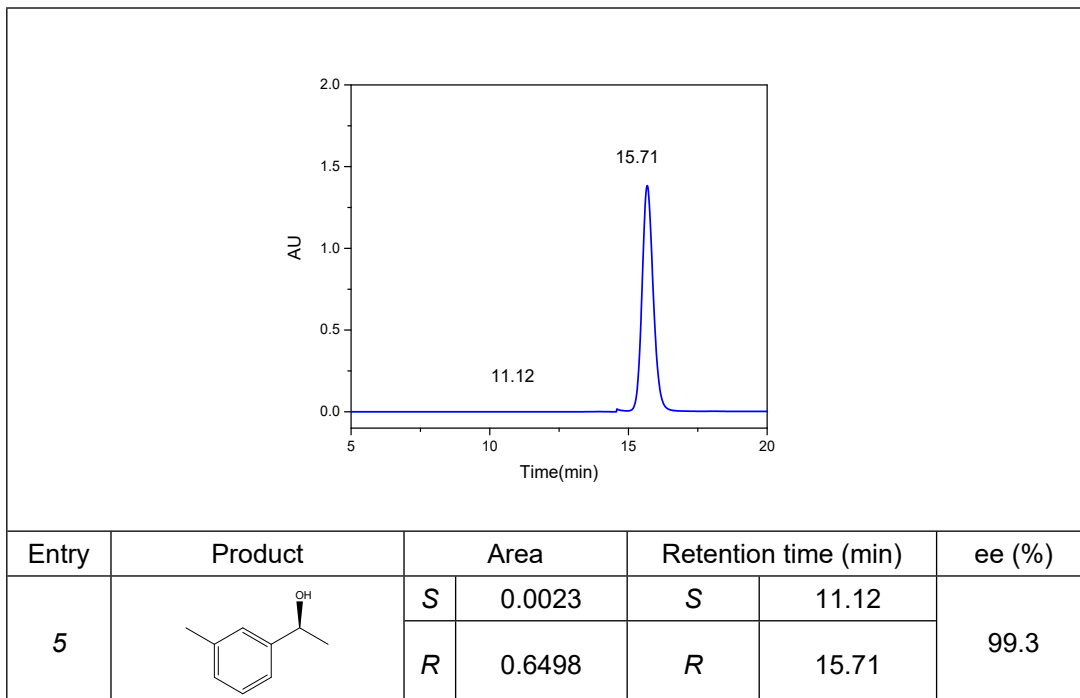
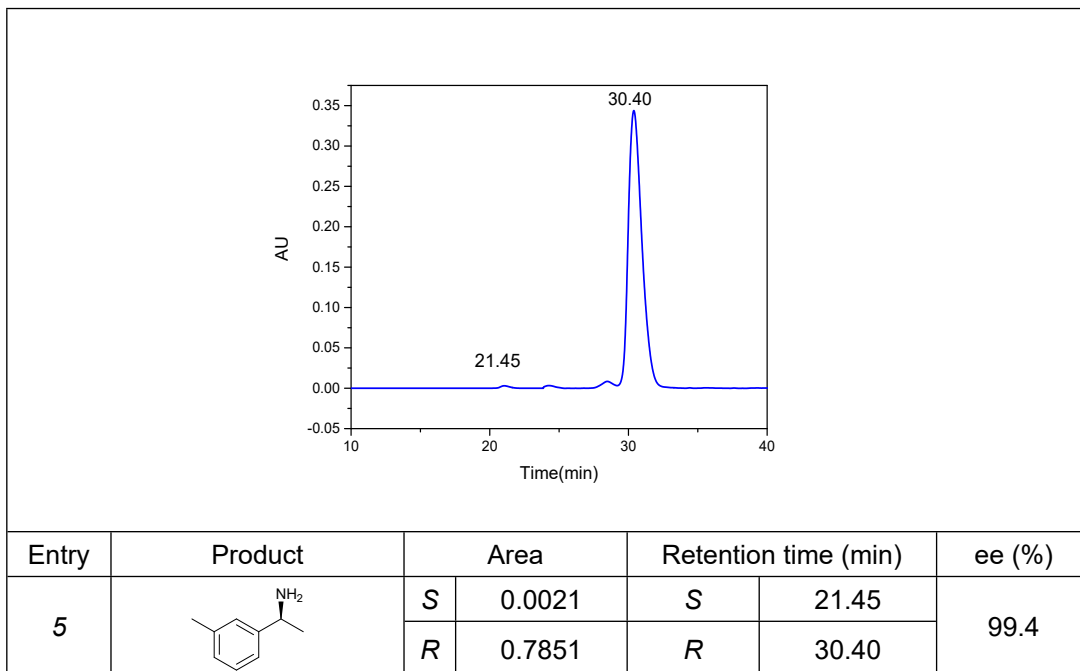


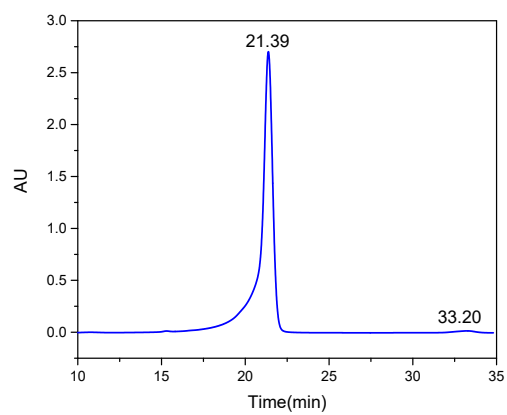
Entry	Product	Area		Retention time (min)		ee (%)
3		S	0.9975	S	20.74	99.3
		R	0.0032	R	25.50	



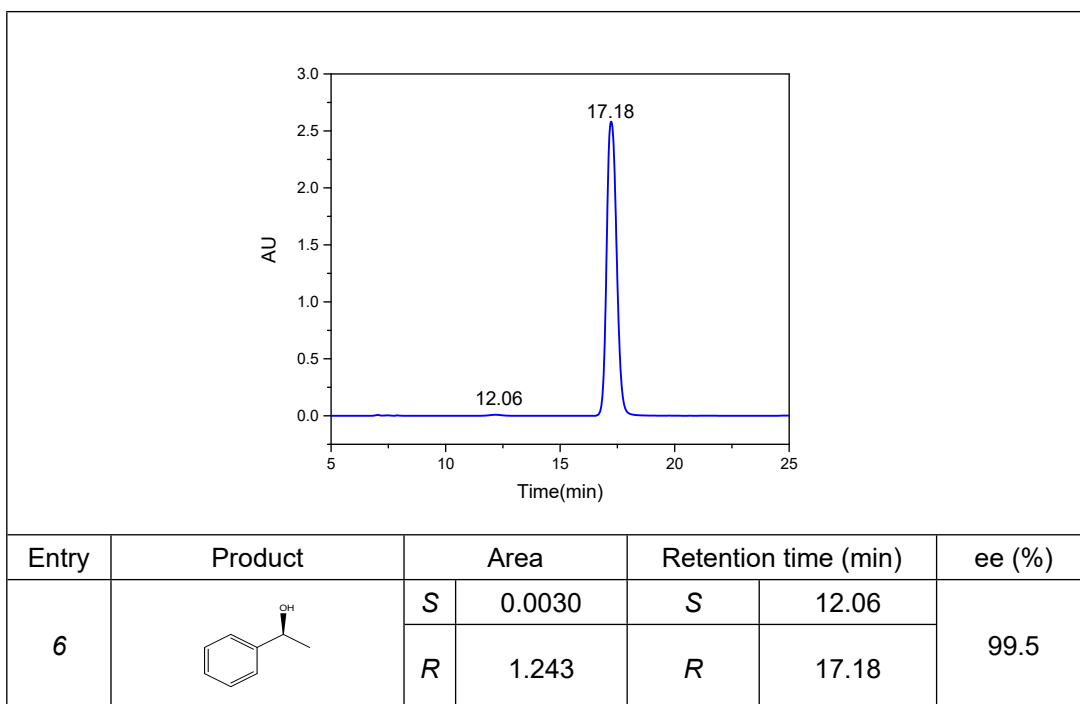
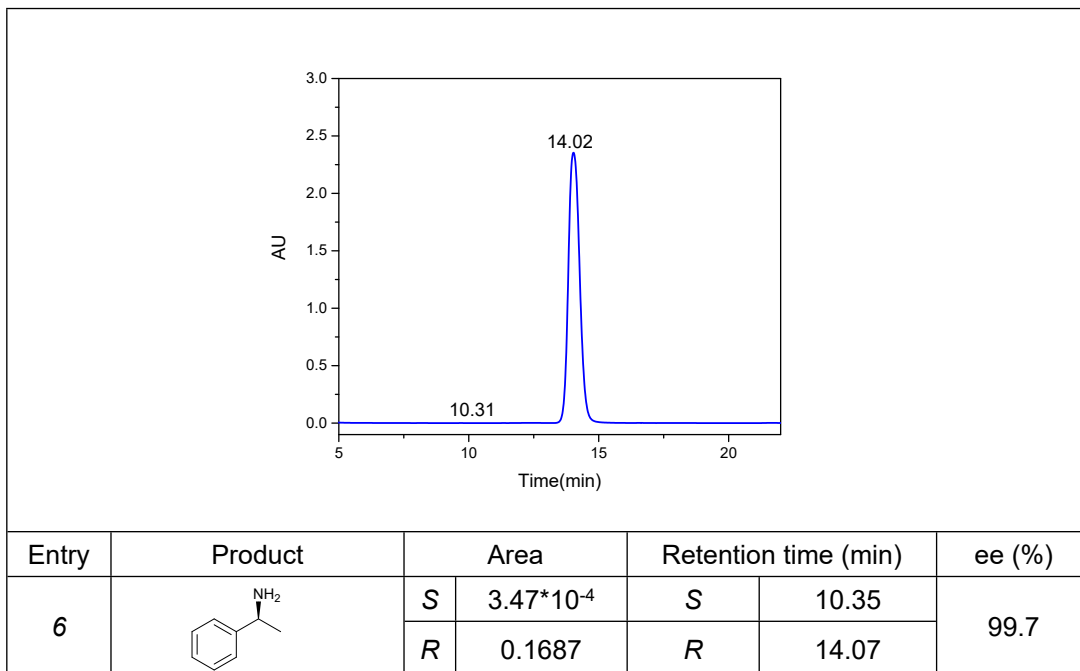


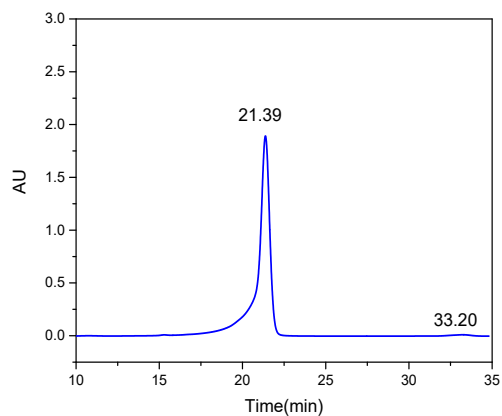
Entry	Product	Area		Retention time (min)		ee (%)
4		S	1.246	S	16.82	99.3
		R	0.0043	R	23.60	

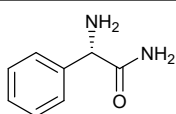


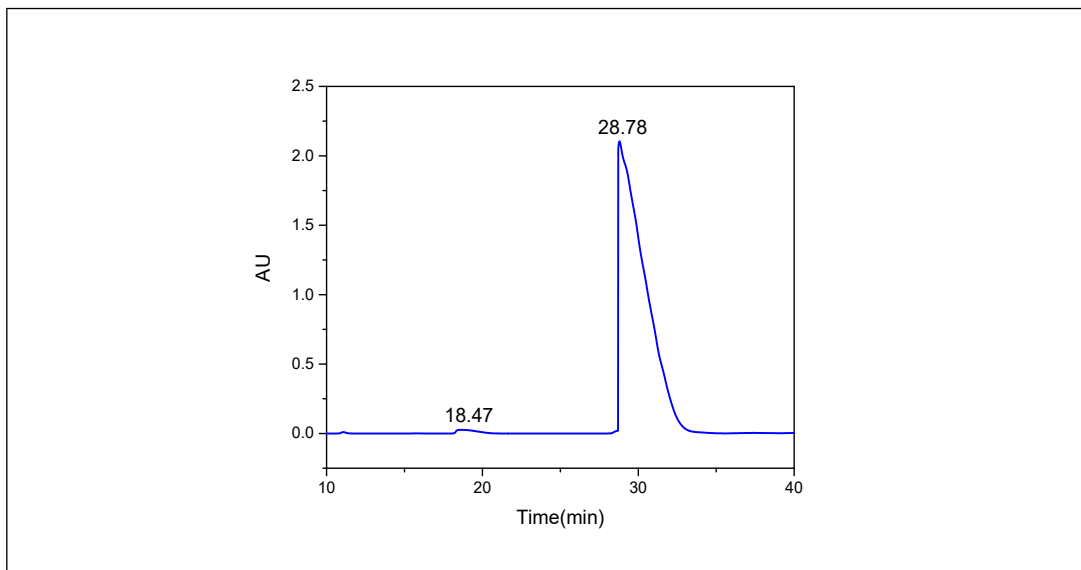


Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
5	<chem>NC(=O)[C@H](N)c1ccccc1</chem>	1.7813	0.0031	21.39	33.20	99.6

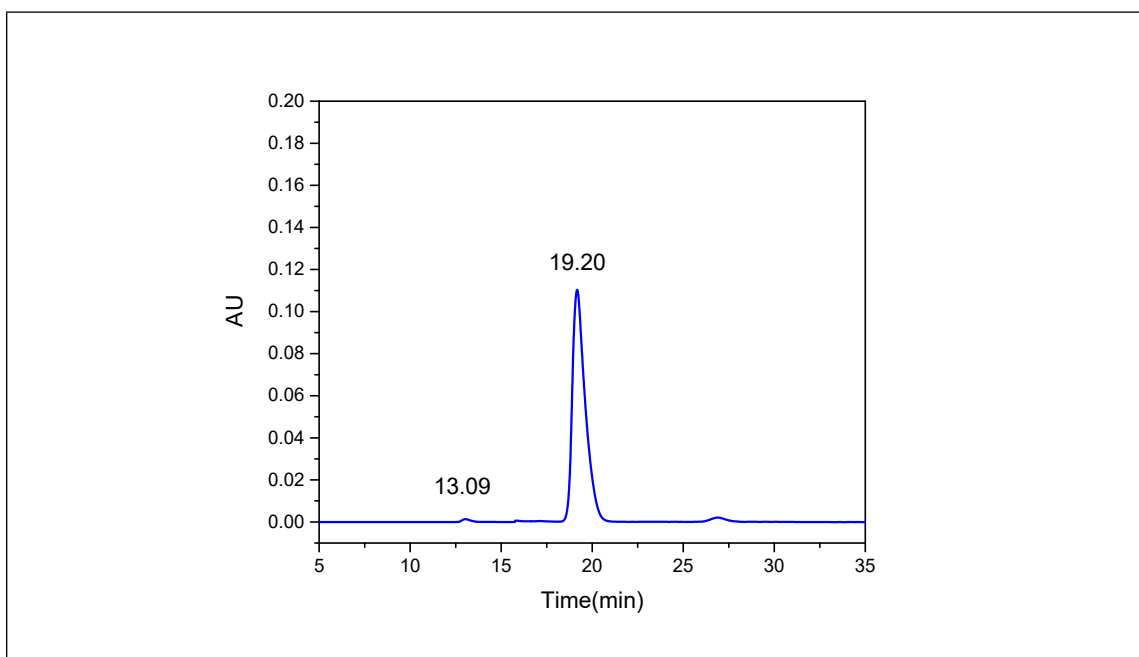




Entry	Product	Area		Retention time (min)		ee (%)
6	 <chem>NC(=O)C(N)Cc1ccccc1</chem>	S	1.246	S	16.82	99.3
		R	0.0043	R	23.60	

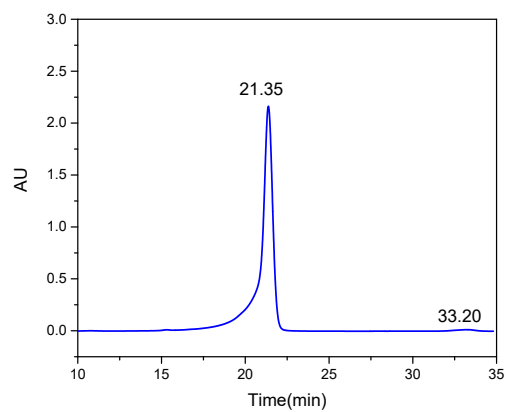


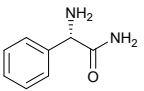
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
7	<chem>CC(N)C1=CC=C(C)C=C1</chem>	0.015	3.8721	18.47	28.78	99.2

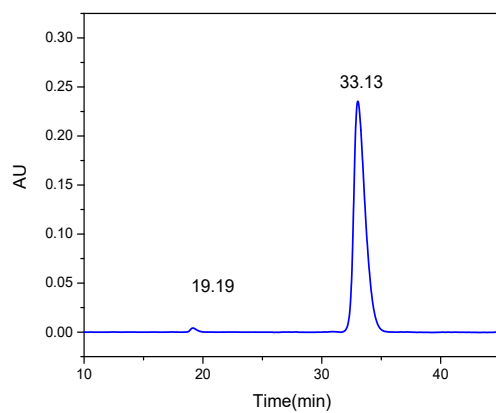


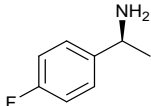
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
7	<chem>CC(O)C1=CC=C(C)C=C1</chem>	0.0004	0.1009	13.09	19.20	99.2

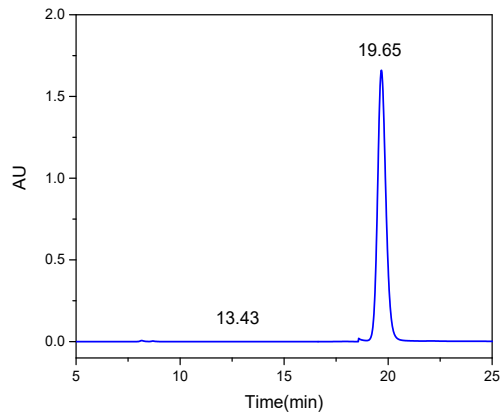


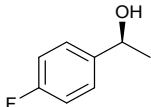


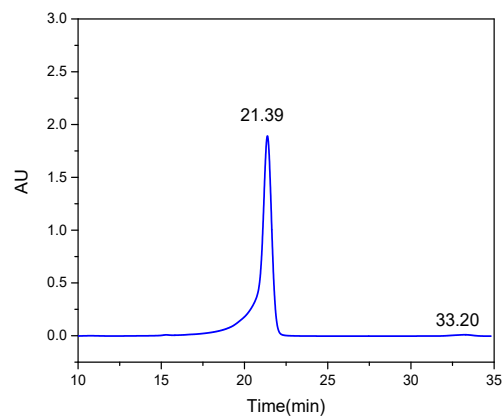
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
7	 <chem>N[C@@H](c1ccccc1)C(=O)N</chem>	1.4256	0.0041	21.36	33.20	99.4

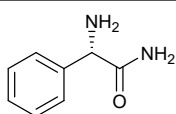


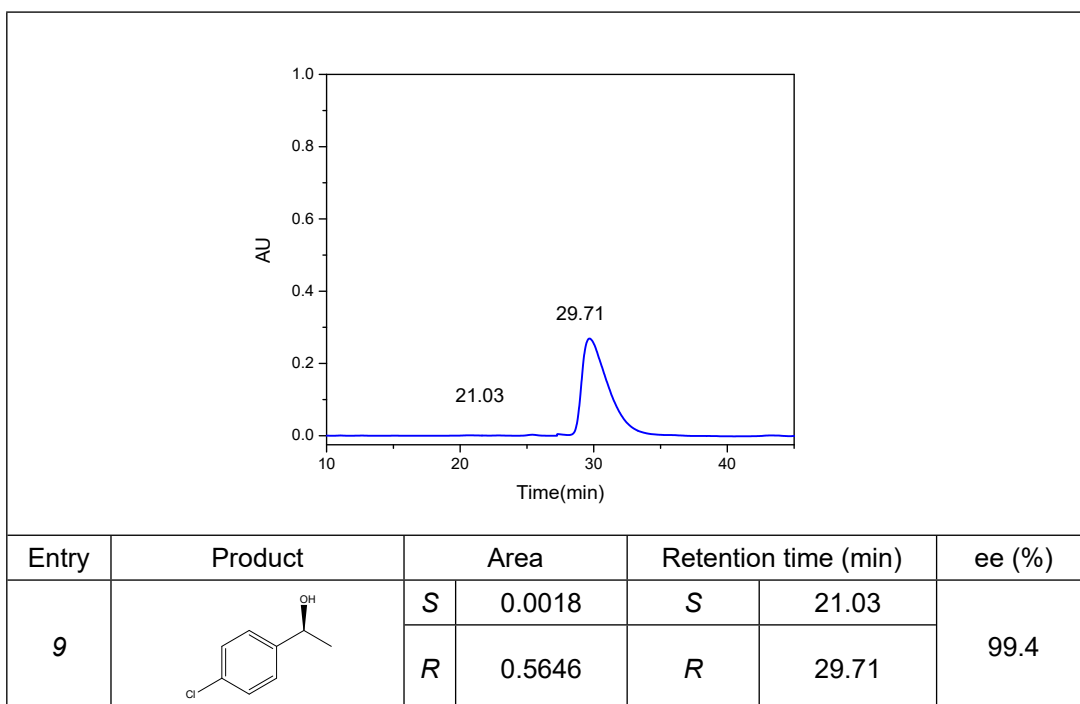
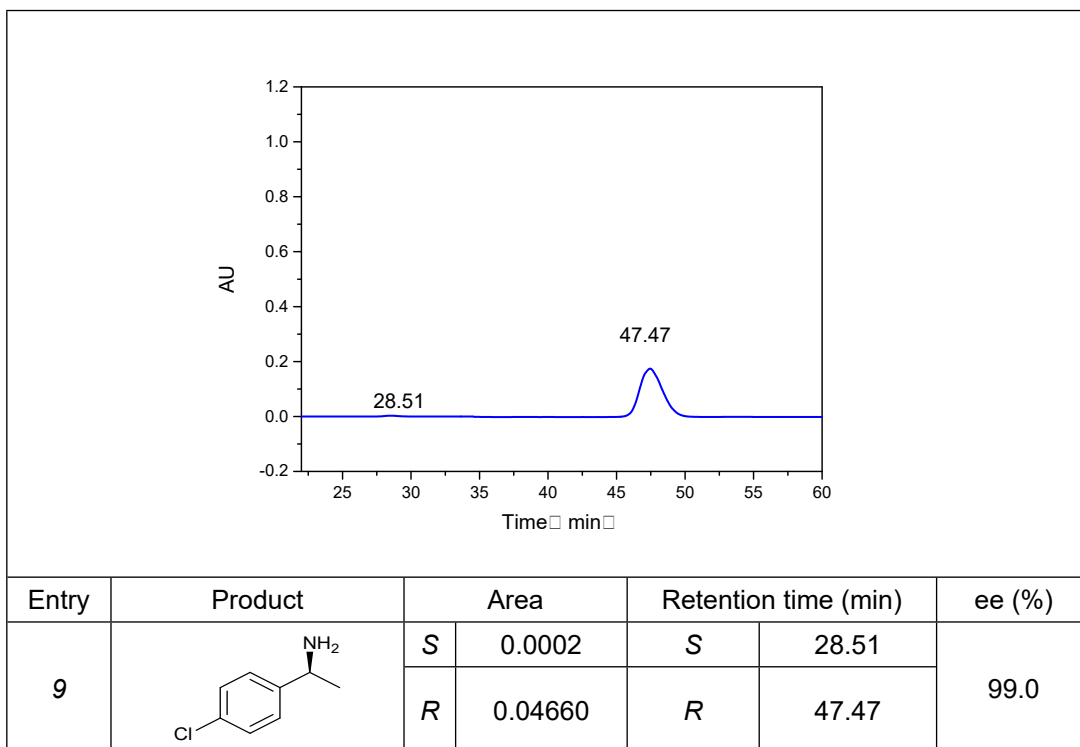
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
8		S	0.0012	S	19.19	99.1
		R	0.2652	R	33.13	

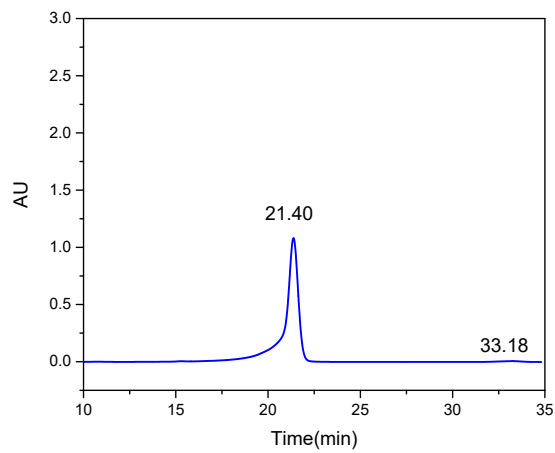


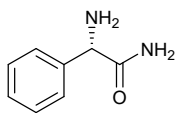
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
8		S	0.0023	S	13.43	99.5
		R	0.7882	R	19.65	

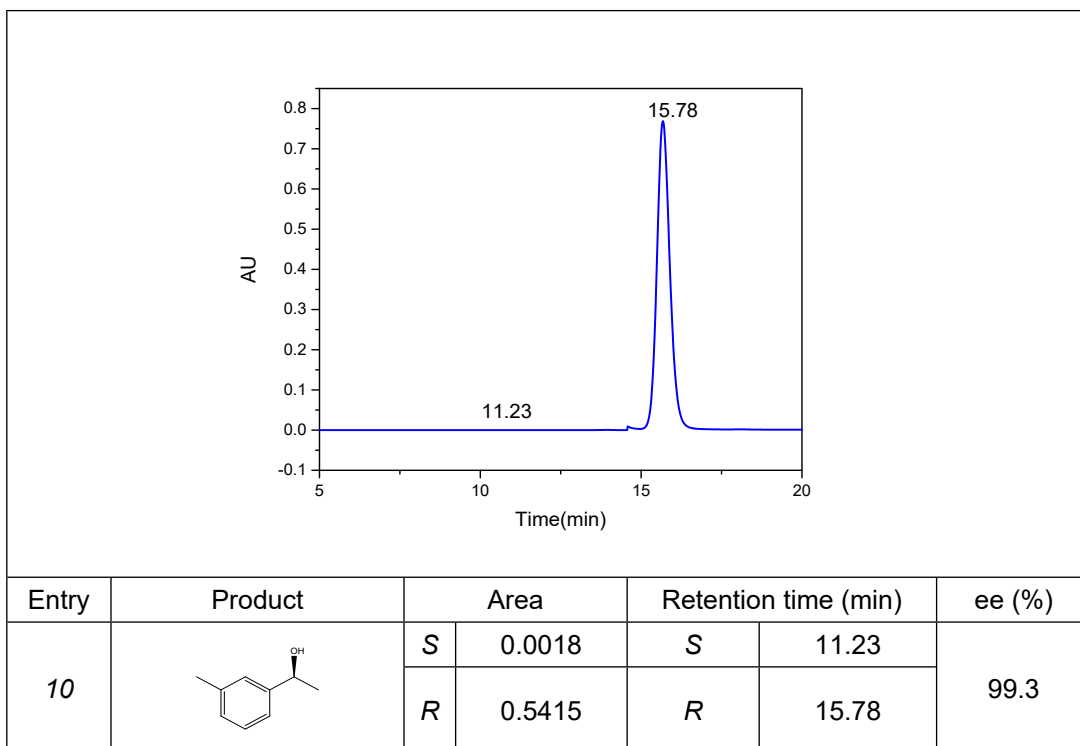
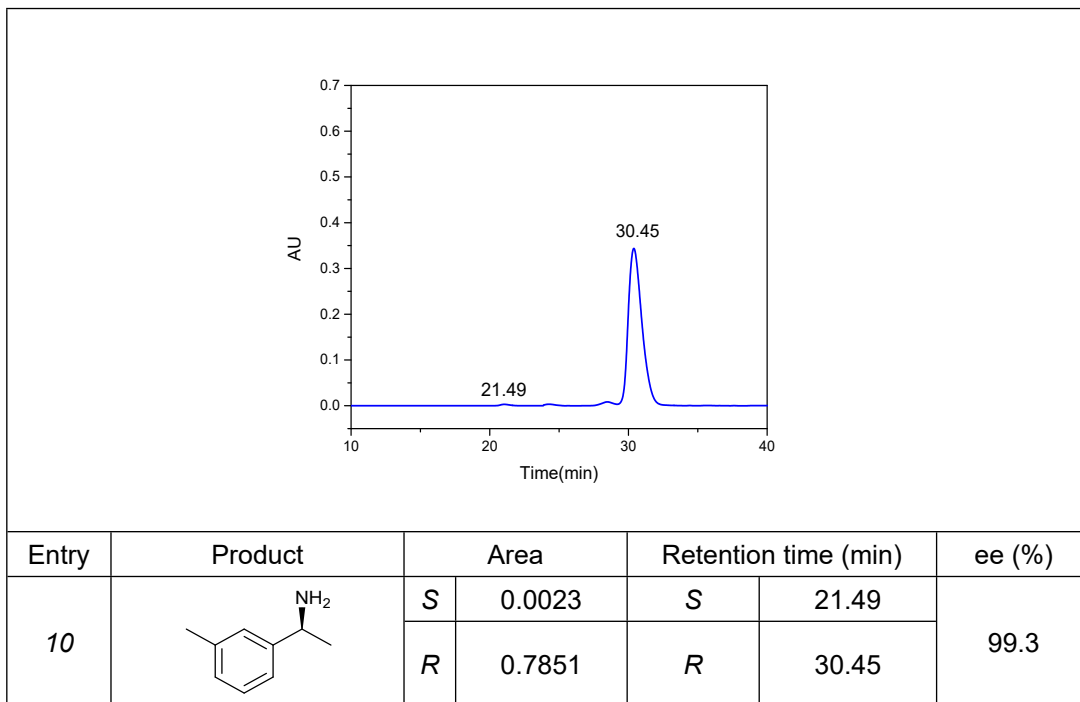


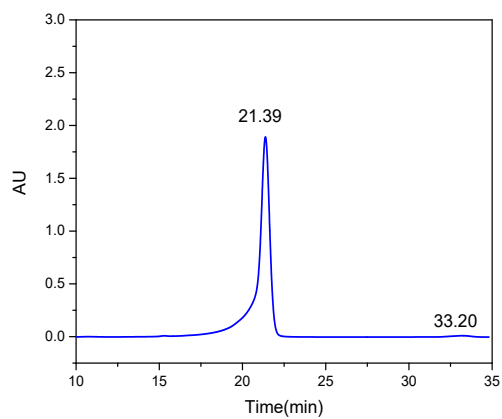
Entry	Product	Area		Retention time (min)		ee (%)
8	 <chem>NC(=O)[C@H](c1ccccc1)N</chem>	S	1.246	S	21.39	99.3
		R	0.0043	R	33.20	

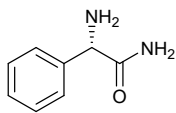


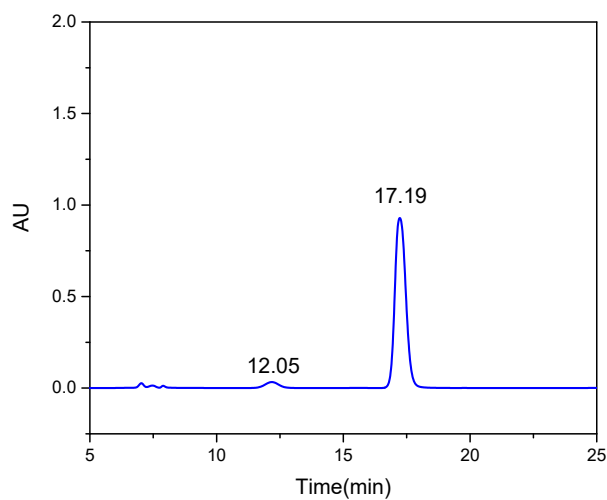


Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
9		<i>S</i>	0.9975	<i>S</i>	21.40	99.3
		<i>R</i>	0.0032	<i>R</i>	33.18	

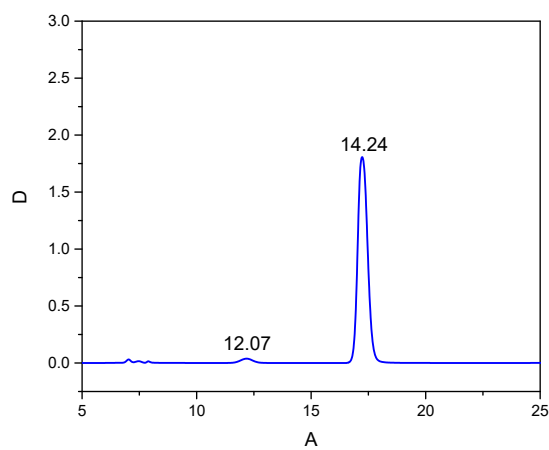




Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
10	 <chem>NC(=O)[C@H](N)c1ccccc1</chem>	1.246	0.0043	21.39	33.20	99.3

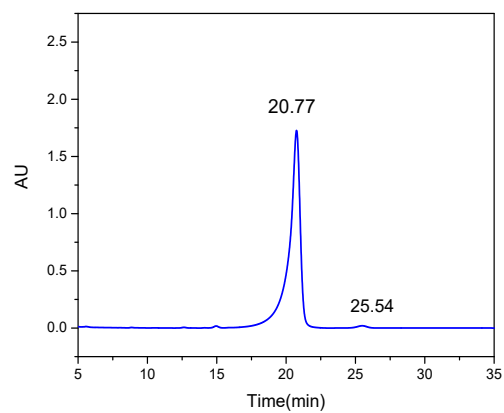


Entry	Product	Area		Retention time (min)		ee (%)
11	<chem>CC(N)Cc1ccccc1</chem>	S	$3.47 \times 10^{-4}$	S	10.35	99.7
		R	0.1687	R	14.07	

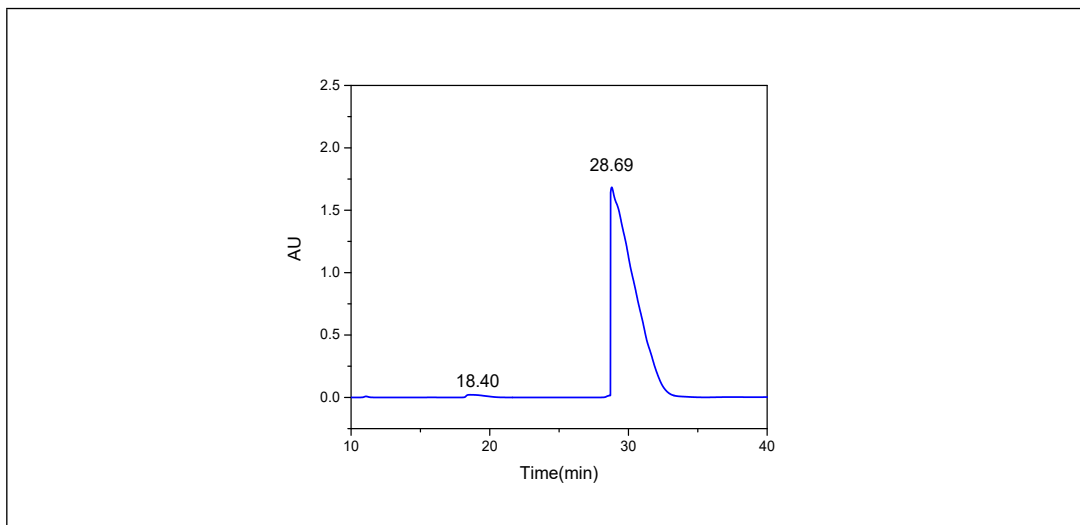


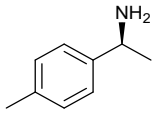
Entry	Product	Area		Retention time (min)		ee (%)
11	<chem>CC(O)Cc1ccccc1</chem>	S	0.0034	S	12.07	99.3
		R	1.0361	R	17.24	

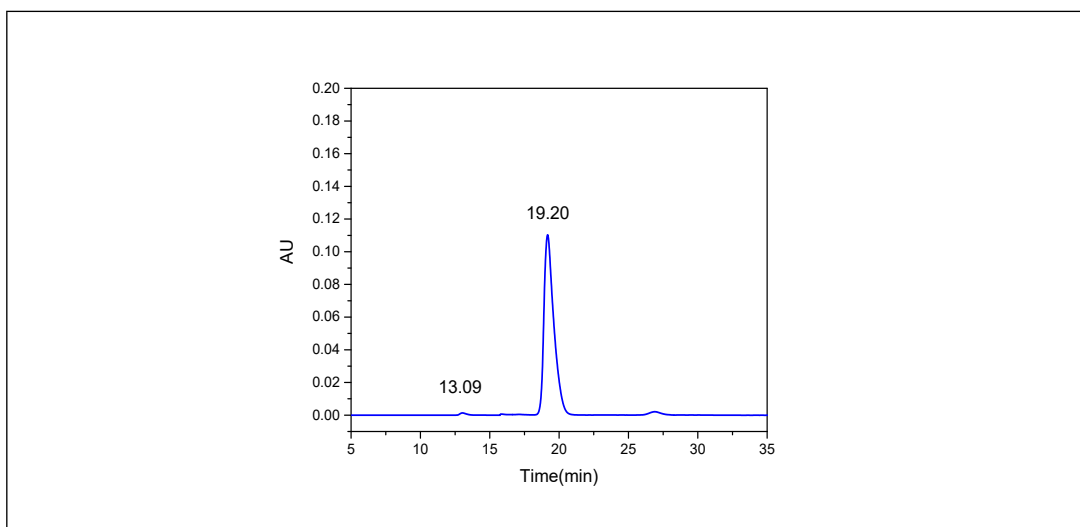


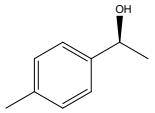


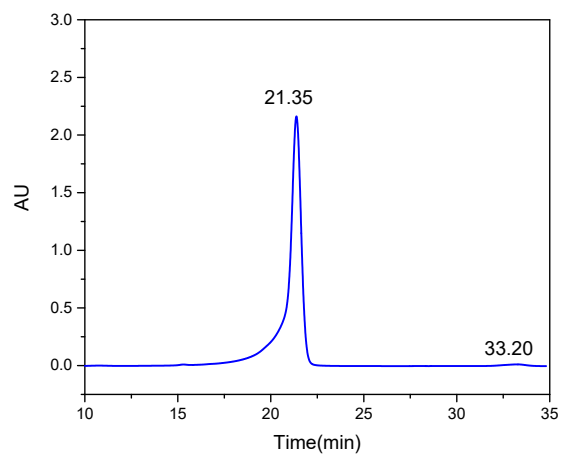
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
11		S	0.840	S	20.77	99.5
		R	0.0021	R	25.54	

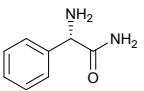


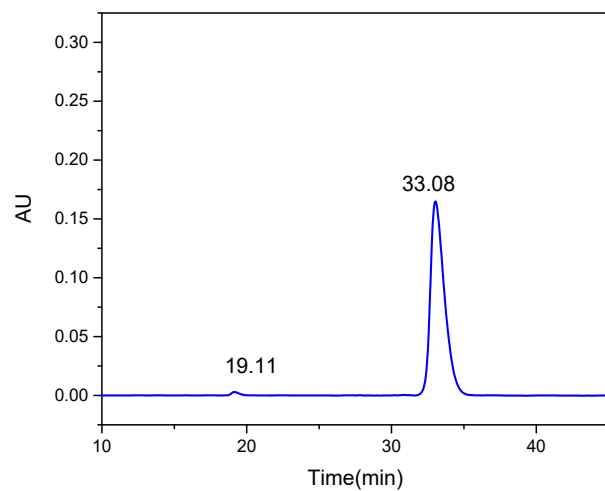
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
12		S	0.010	S	18.40	99.3
		R	3.1667	R	28.89	



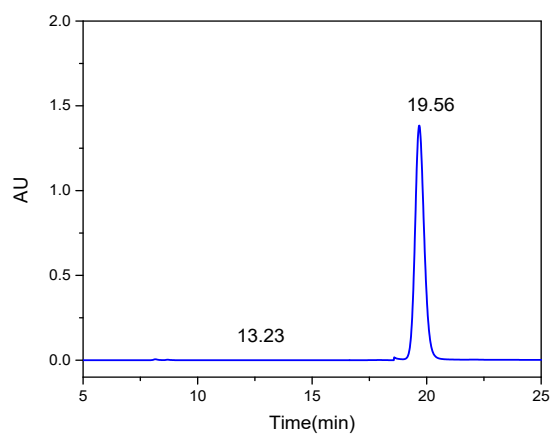
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
12		S	0.0003	S	13.09	99.4
		R	0.1021	R	19.20	



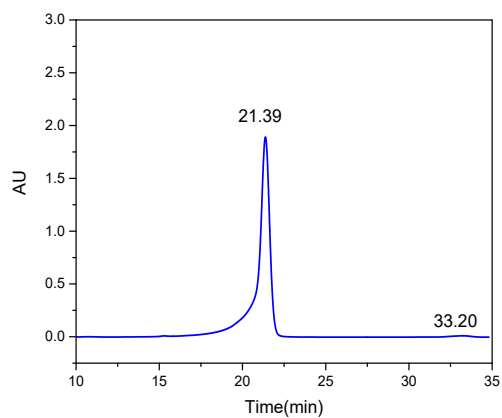
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
12		1.4251	0.0056	21.35	33.20	99.4

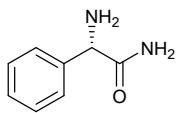


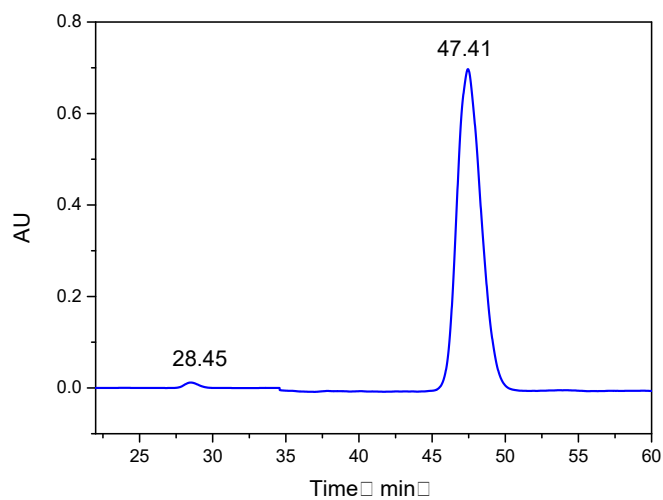
Entry	Product	Area		Retention time (min)		ee (%)
13		S	0.0497	S	19.11	99.5
		R	0.0001	R	33.08	

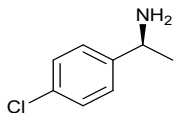


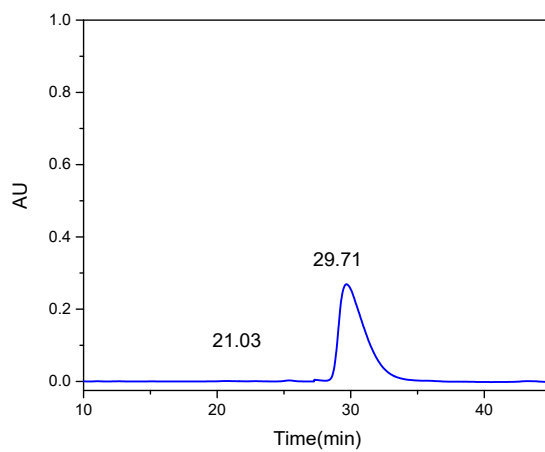
Entry	Product	Area		Retention time (min)		ee (%)
13		S	0.0023	S	13.23	99.3
		R	0.6568	R	19.56	

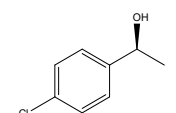


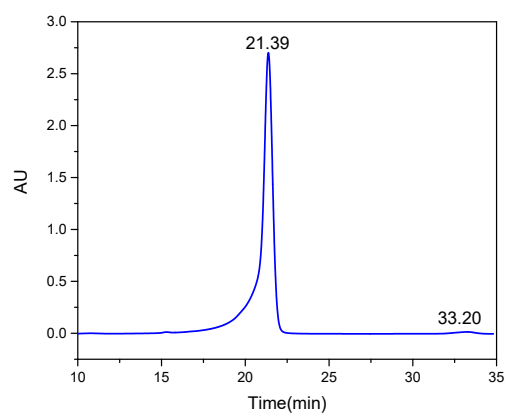
Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
13	 <chem>N[C@@H](c1ccccc1)C(=O)N</chem>	1.246	0.0043	21.39	33.20	99.3

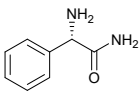


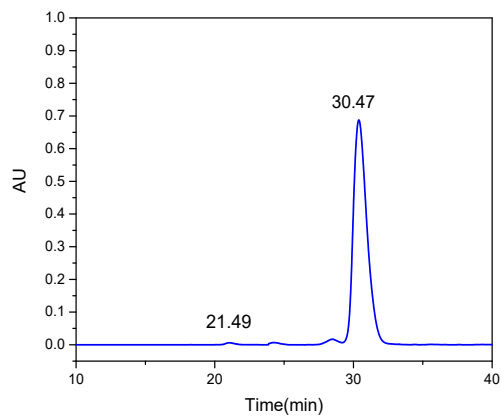
Entry	Product	Area		Retention time (min)		ee (%)
14		S	0.0009	S	28.45	99.0
		R	0.1687	R	47.41	

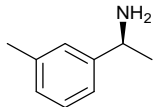


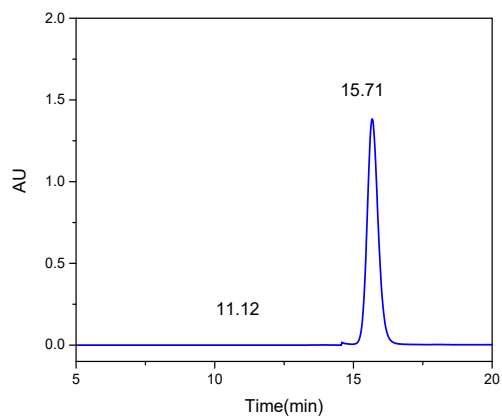
Entry	Product	Area		Retention time (min)		ee (%)
14		S	0.0018	S	21.03	99.4
		R	0.5646	R	29.71	

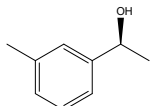


Entry	Product	Area		Retention time (min)		ee (%)
14		S	1.788	S	21.39	99.5
		R	0.0041	R	33.20	

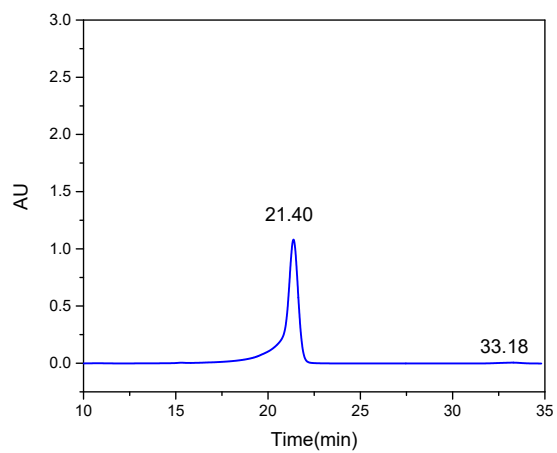


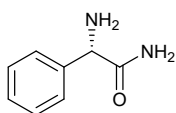
Entry	Product	Area		Retention time (min)		ee (%)
15		S	0.0024	S	21.49	99.3
		R	0.7865	R	30.47	

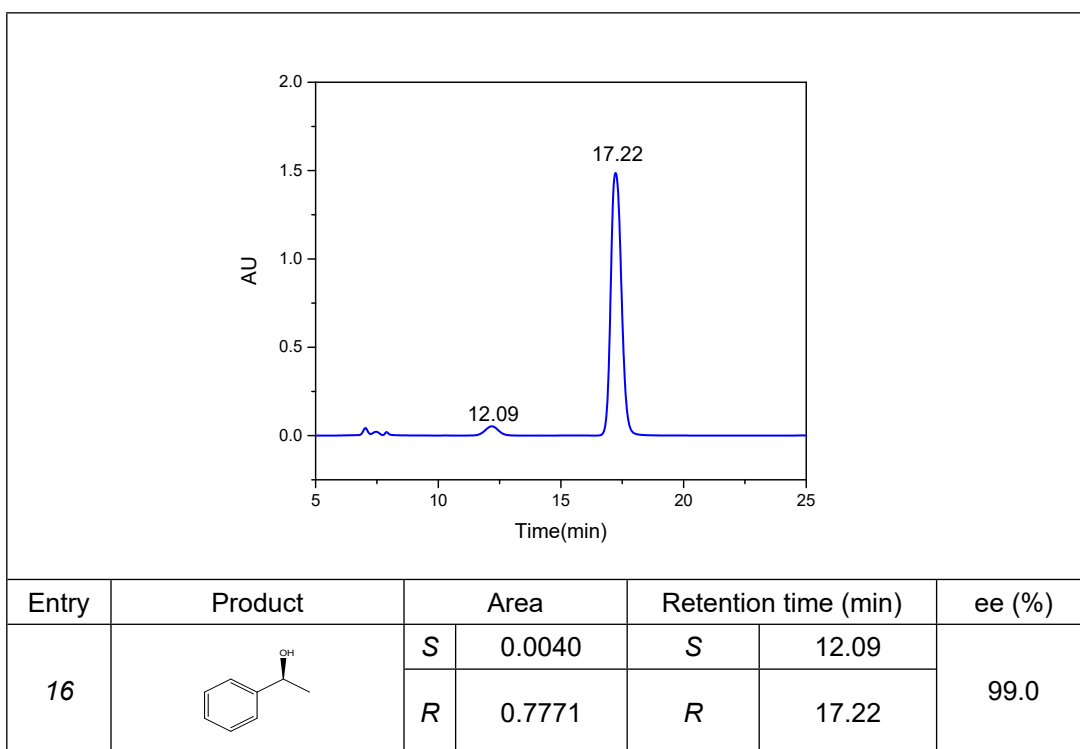
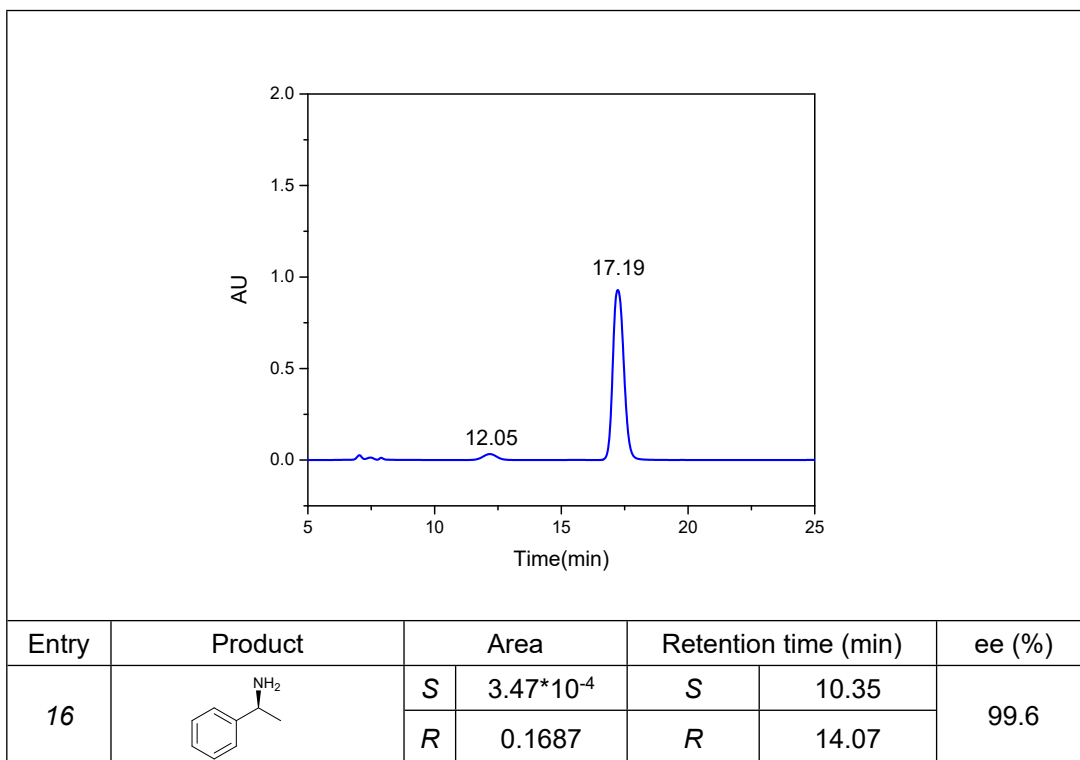


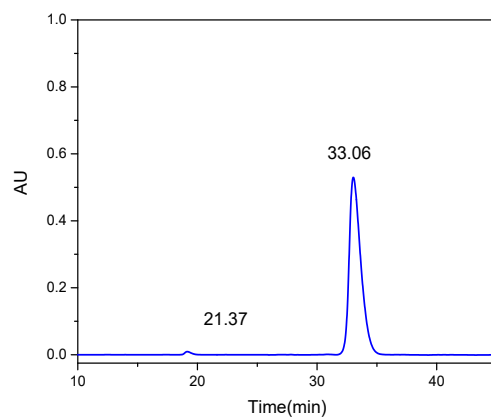
Entry	Product	Area		Retention time (min)		ee (%)
15		S	0.0023	S	11.12	99.3
		R	0.6498	R	15.71	

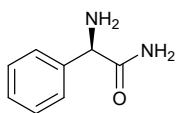


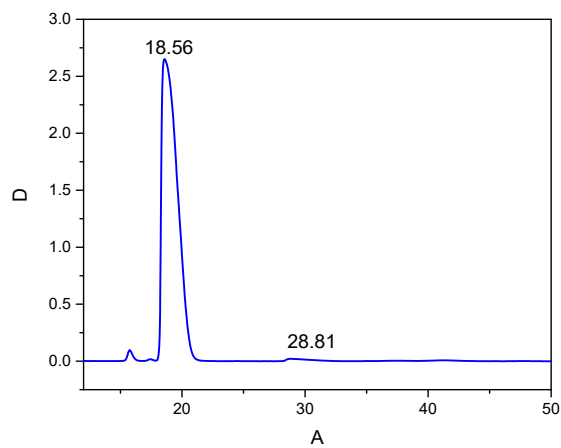


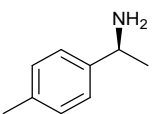
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
15	 <chem>NC(=O)[C@H](N)c1ccccc1</chem>	0.9975	0.0032	21.40	33.18	99.3

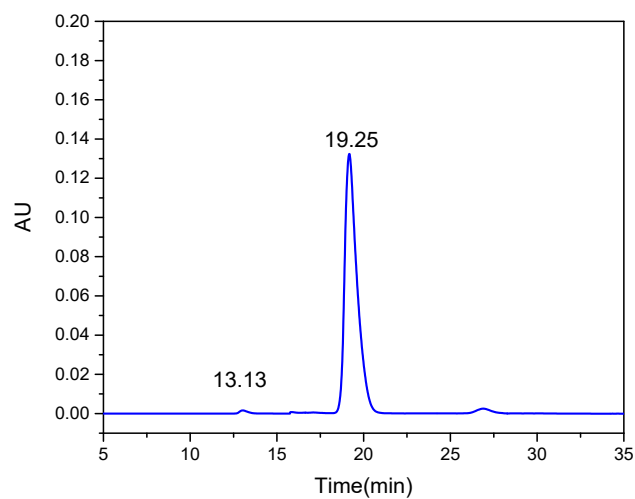


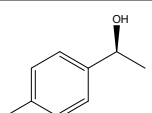


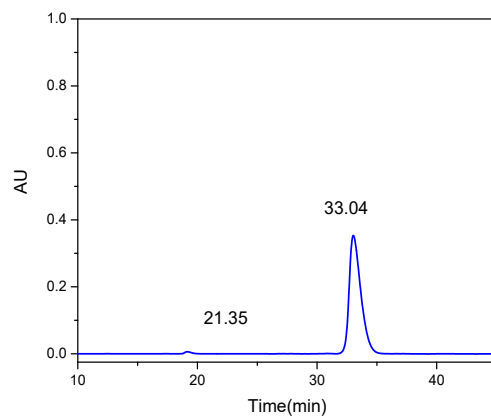
Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
16		<i>S</i>	0.0019	<i>S</i>	21.05	99.4
		<i>R</i>	0.5651	<i>R</i>	33.06	

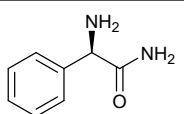


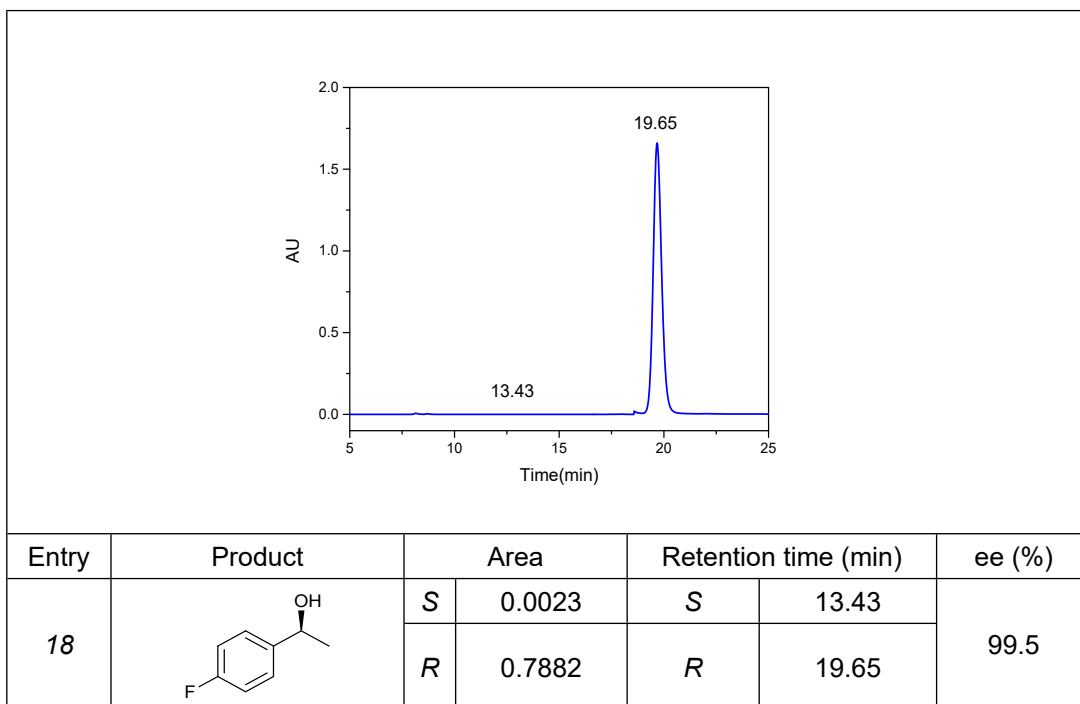
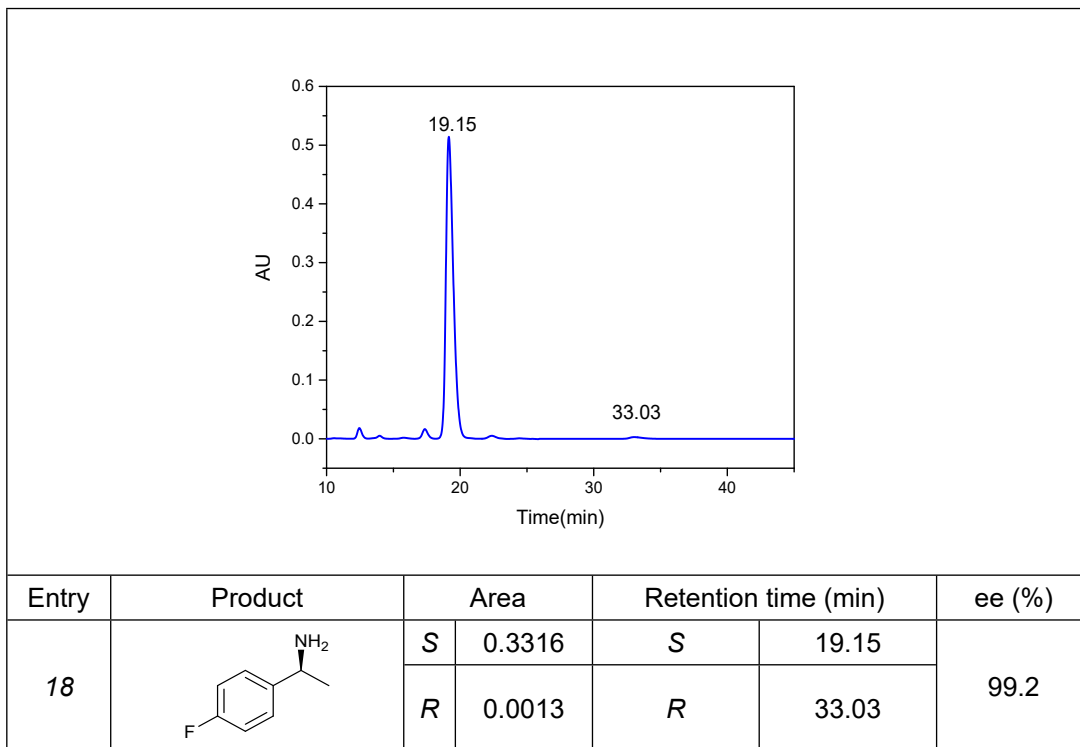
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
17		S	3.9584	S	18.56	99.4
		R	0.0120	R	28.81	

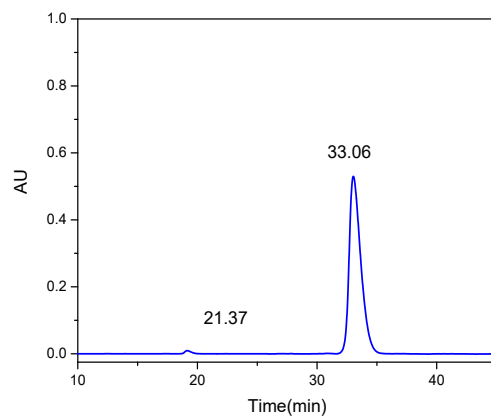


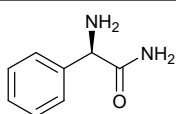
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
17		S	0.0004	S	13.13	99.3
		R	0.1095	R	19.25	

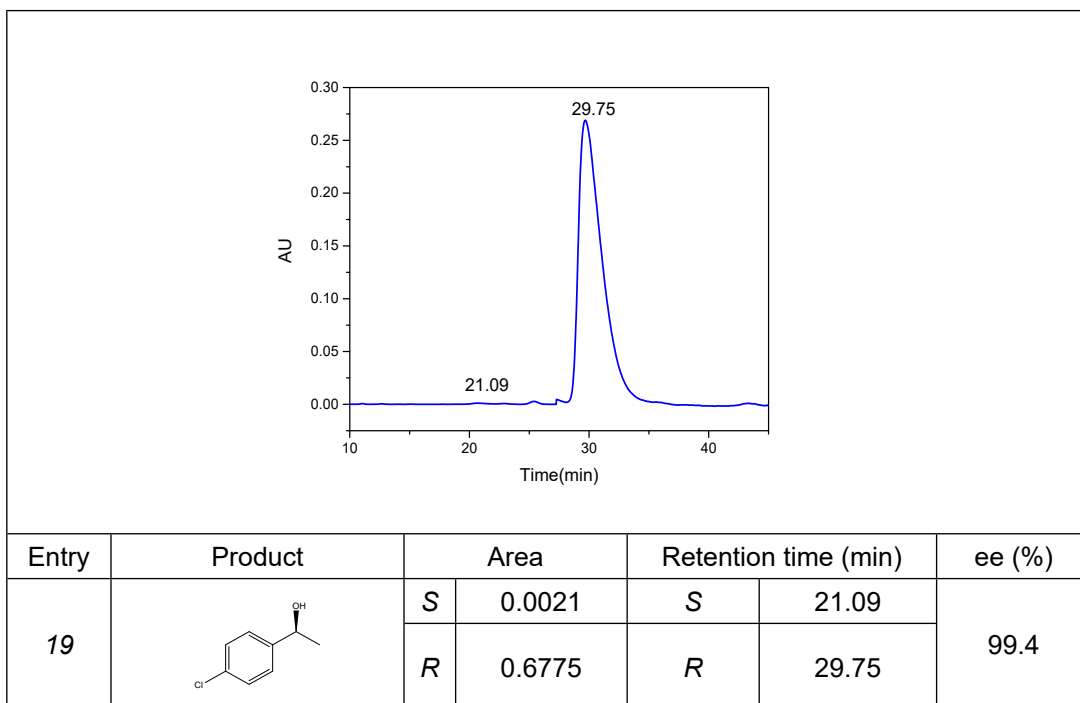
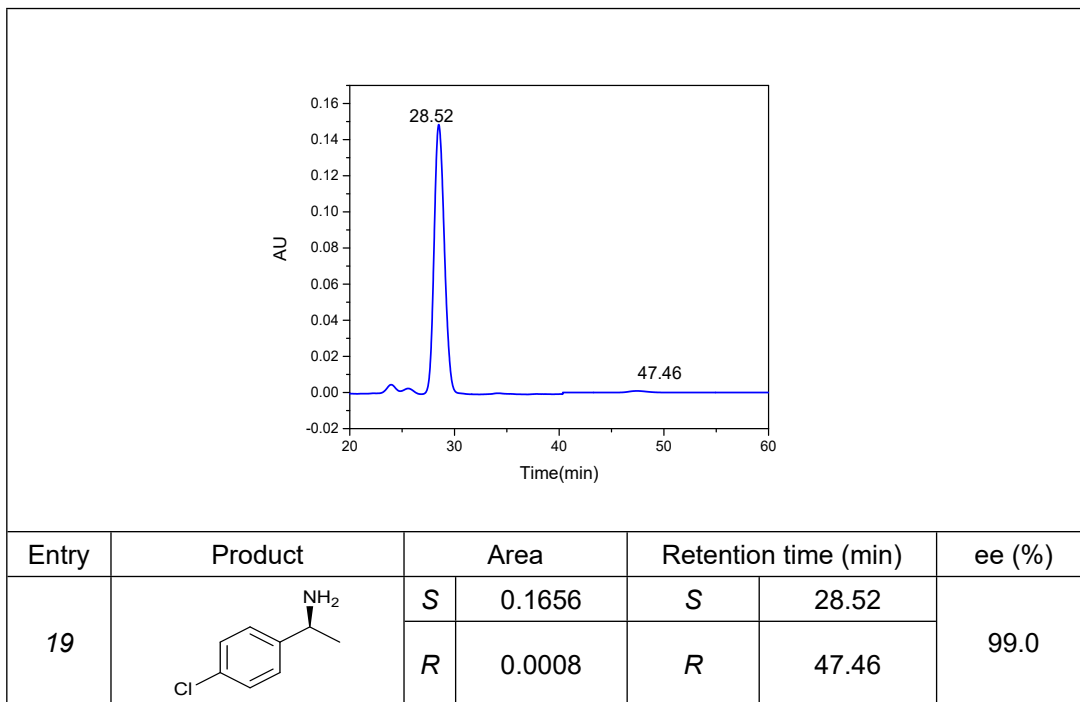


Entry	Product	Area		Retention time (min)		ee (%)
17		S	0.0009	S	21.35	99.4
		R	0.3984	R	33.04	

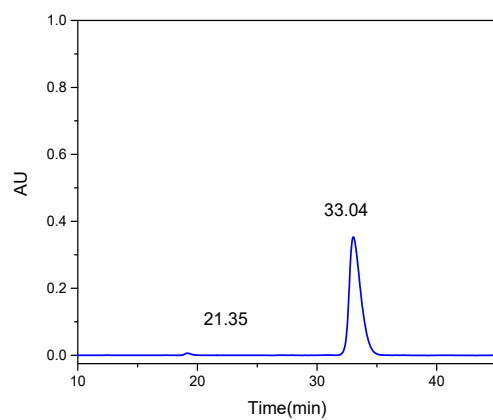


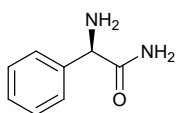


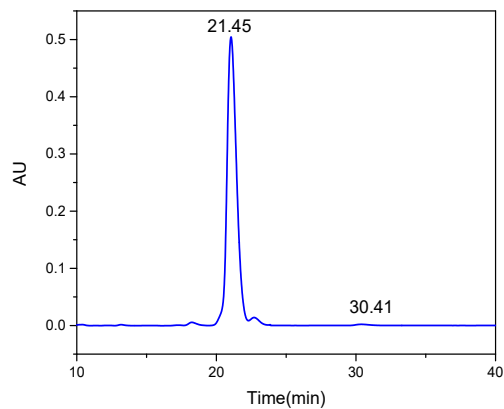
Entry	Product	Area		Retention time (min)		ee (%)
18		S	0.0017	S	21.05	99.4
		R	0.5969	R	33.06	

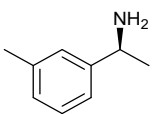


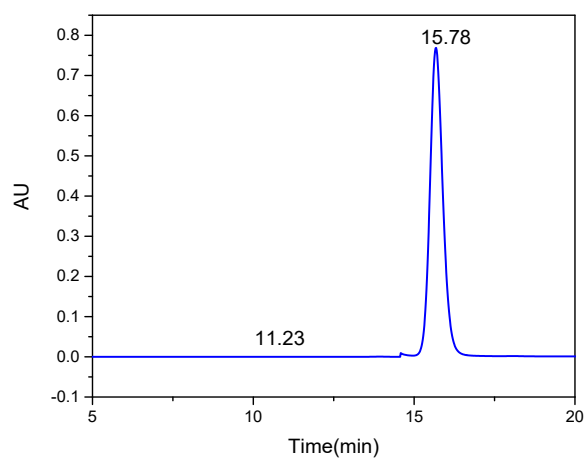


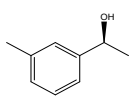


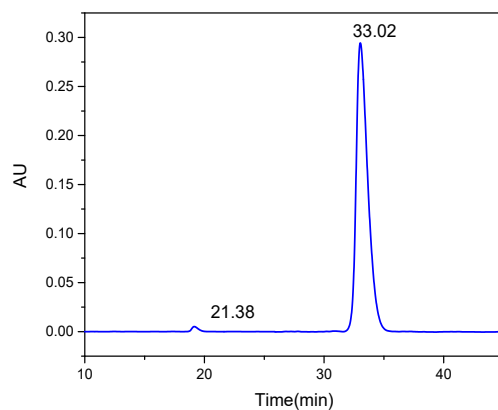
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
19	 <chem>NC(=O)[C@H](N)c1ccccc1</chem>	S	0.0010	S	21.35	99.4
		R	0.3979	R	33.04	



Entry	Product	Area		Retention time (min)		ee (%)
20		S	0.4001	S	21.45	99.3
		R	0.0012	R	30.41	



Entry	Product	Area		Retention time (min)		ee (%)
20		S	0.0018	S	11.23	99.3
		R	0.5415	R	15.78	



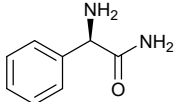
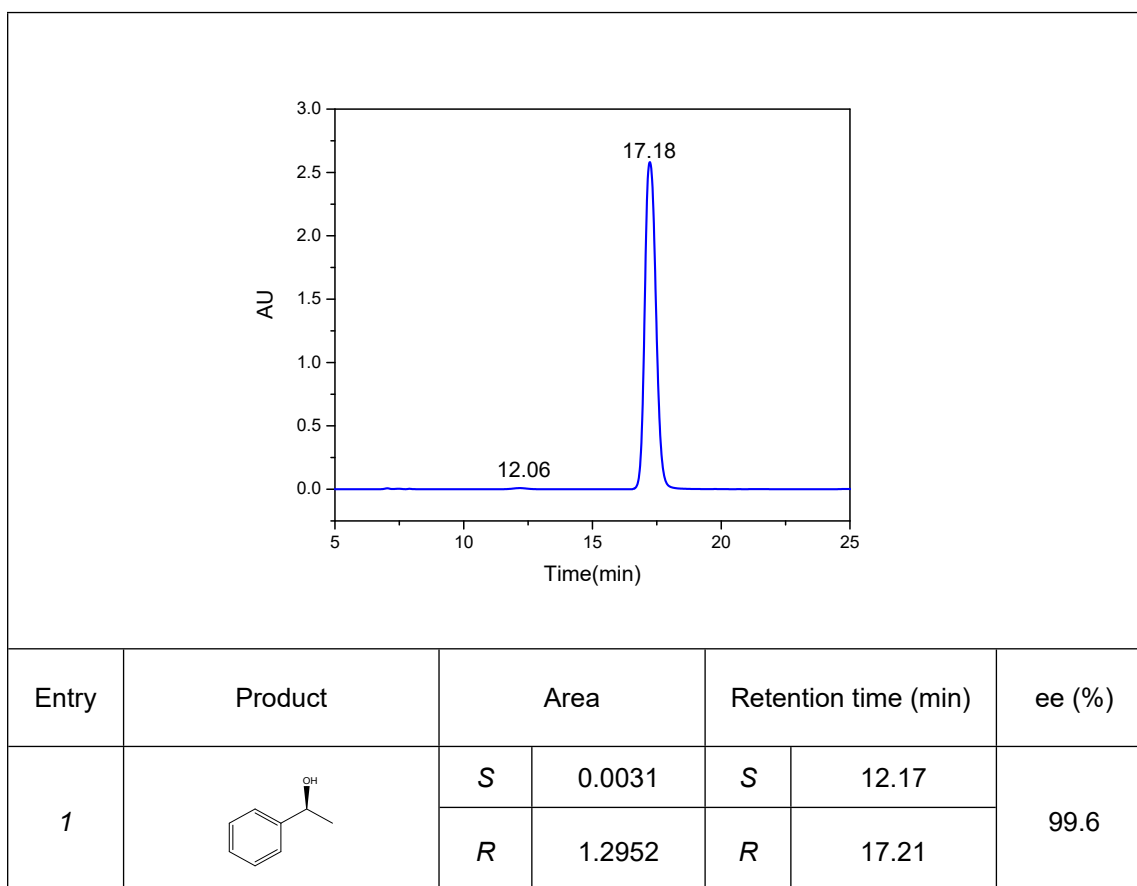
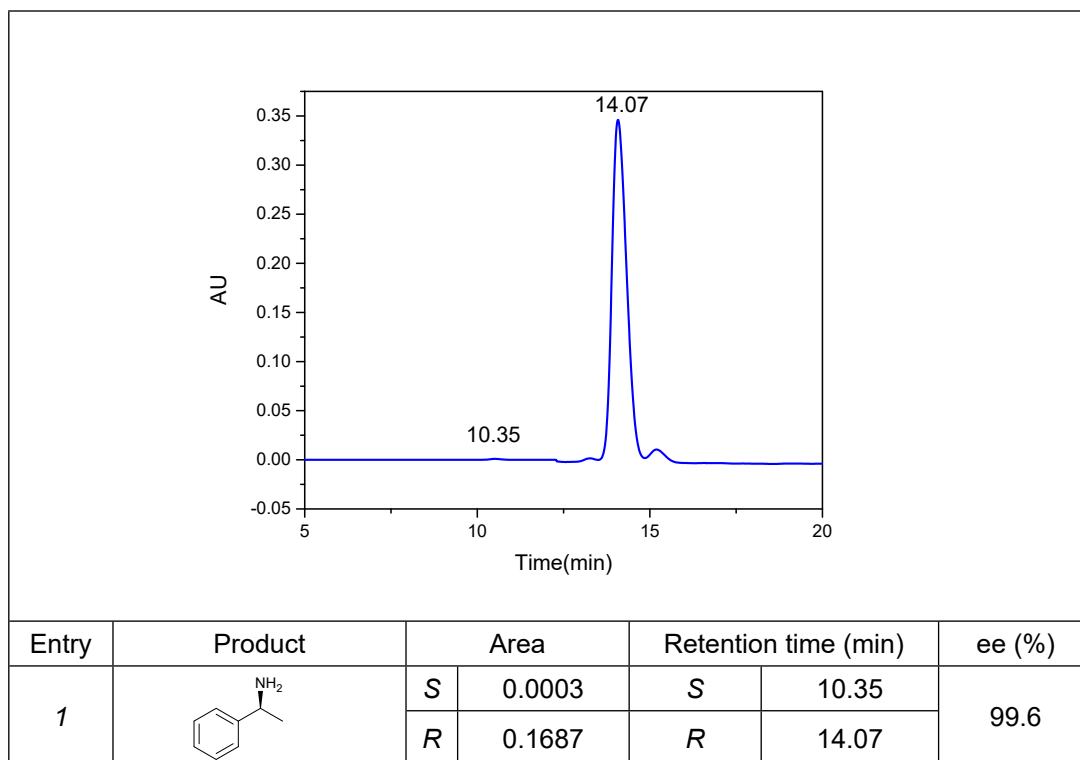
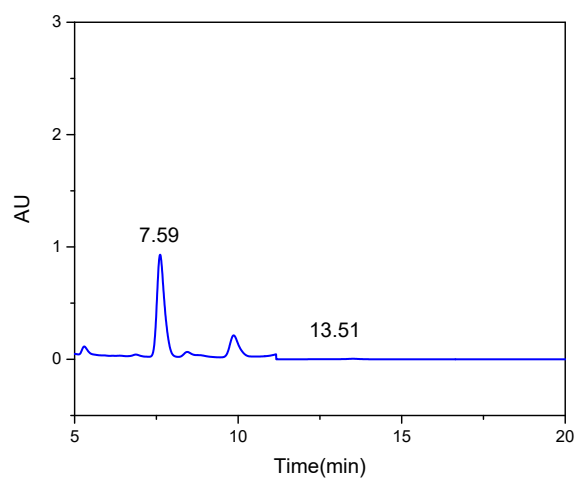
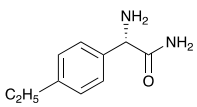
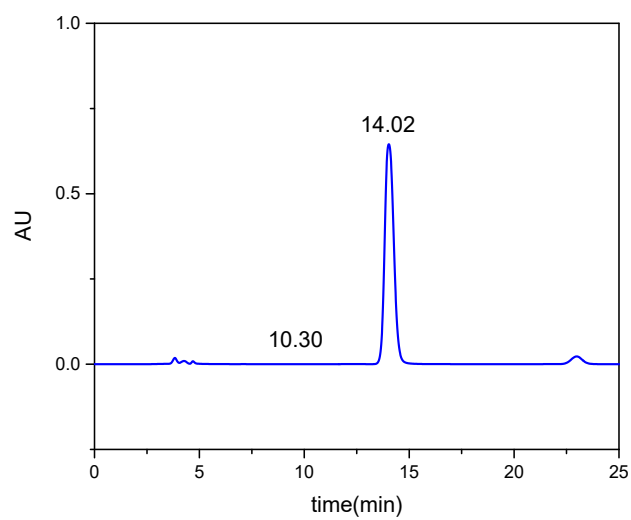
Entry	Product	Area		Retention time (min)		ee (%)
20		S	0.0006	S	21.38	99.5
		R	0.3316	R	33.02	


Table 2

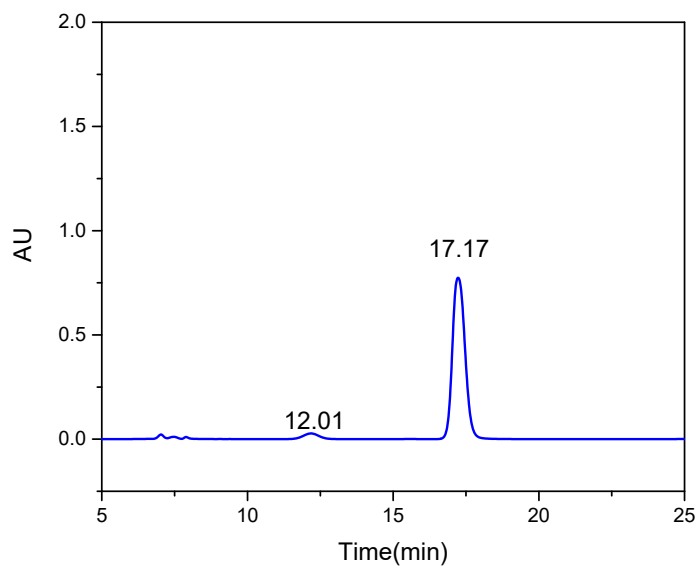


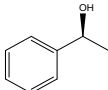


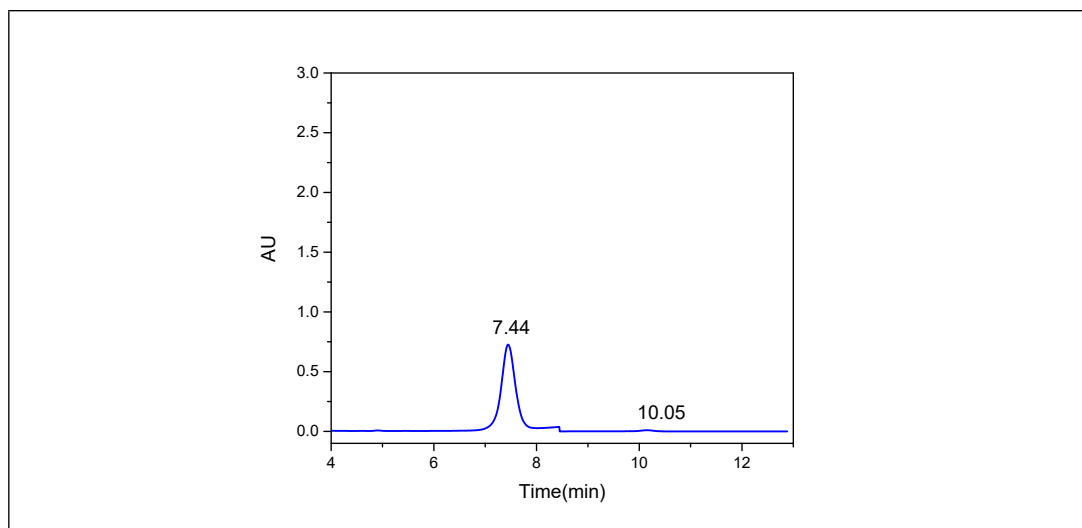
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
1	 <chem>CC1=CC=C(C=C1)C(N)C(=O)N</chem>	0.2717	0.0007	7.59	13.51	99.5

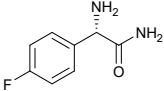


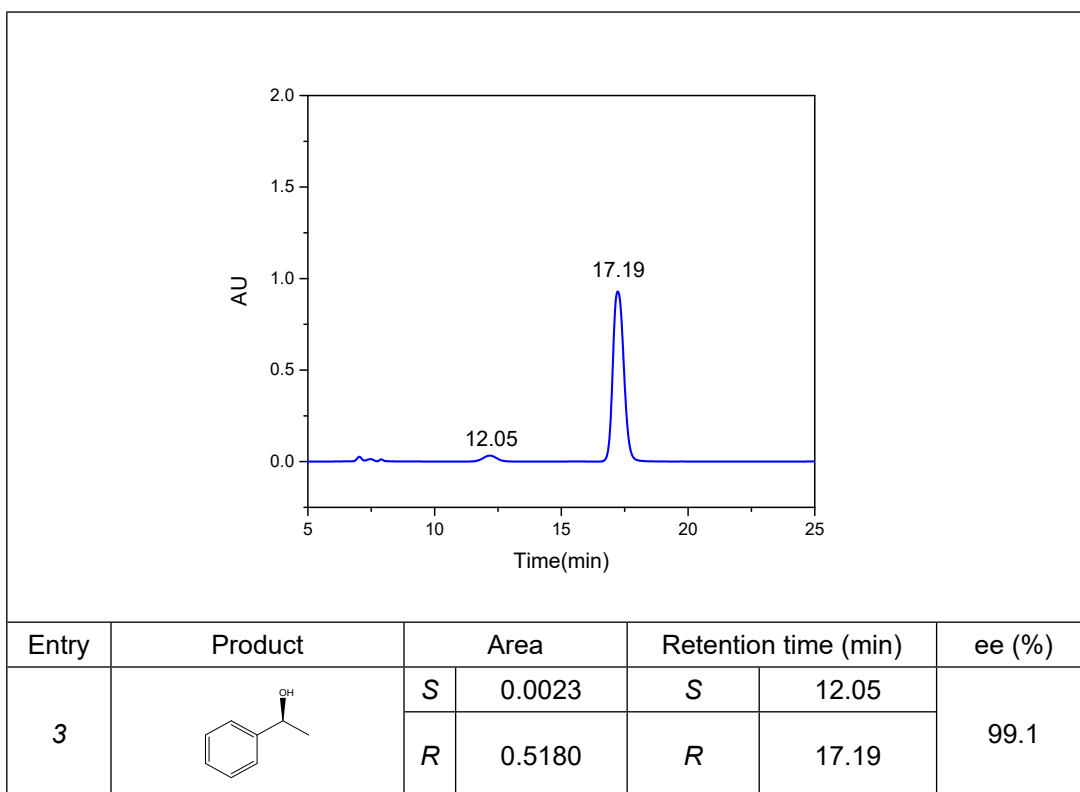
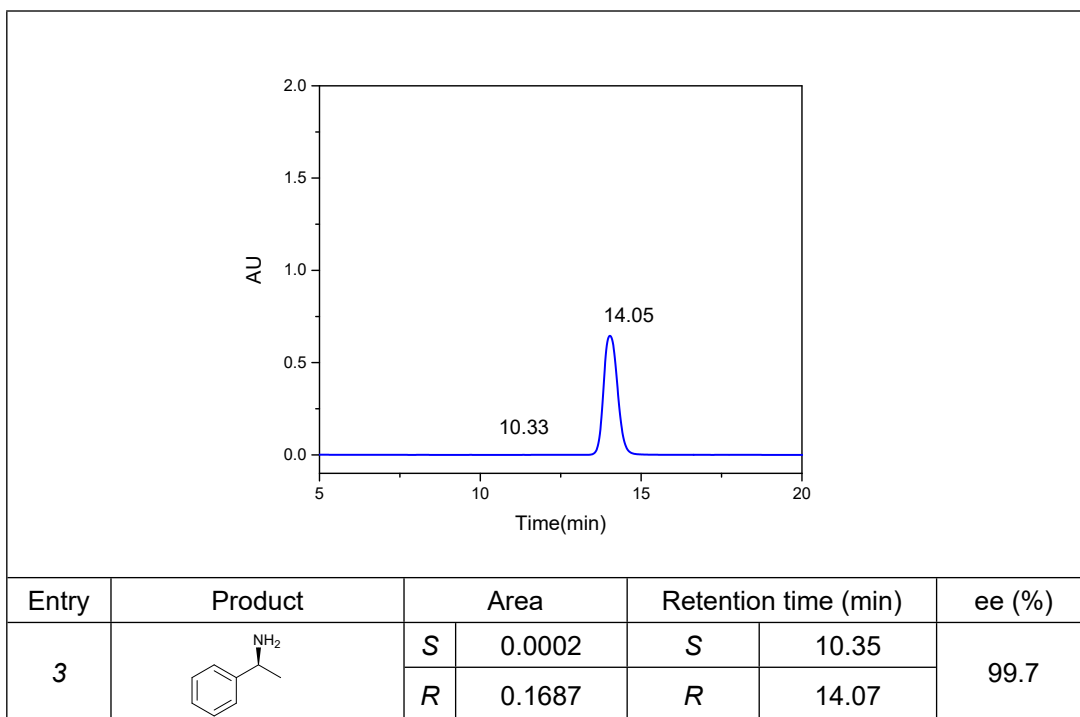
Entry	Product	Area		Retention time (min)		ee (%)
2		S	0.0009	S	10.30	99.4
		R	0.3247	R	14.02	



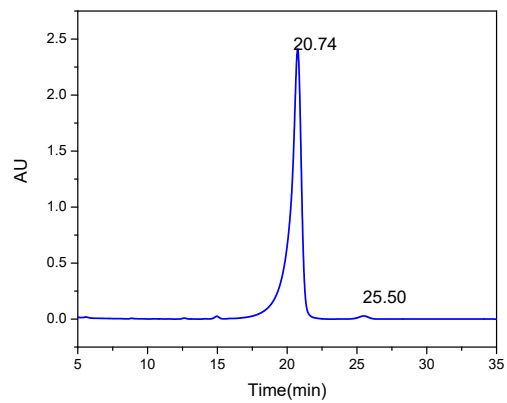
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
2		S	0.0019	S	12.01	99.1
		R	0.4145	R	17.17	

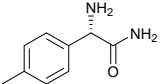


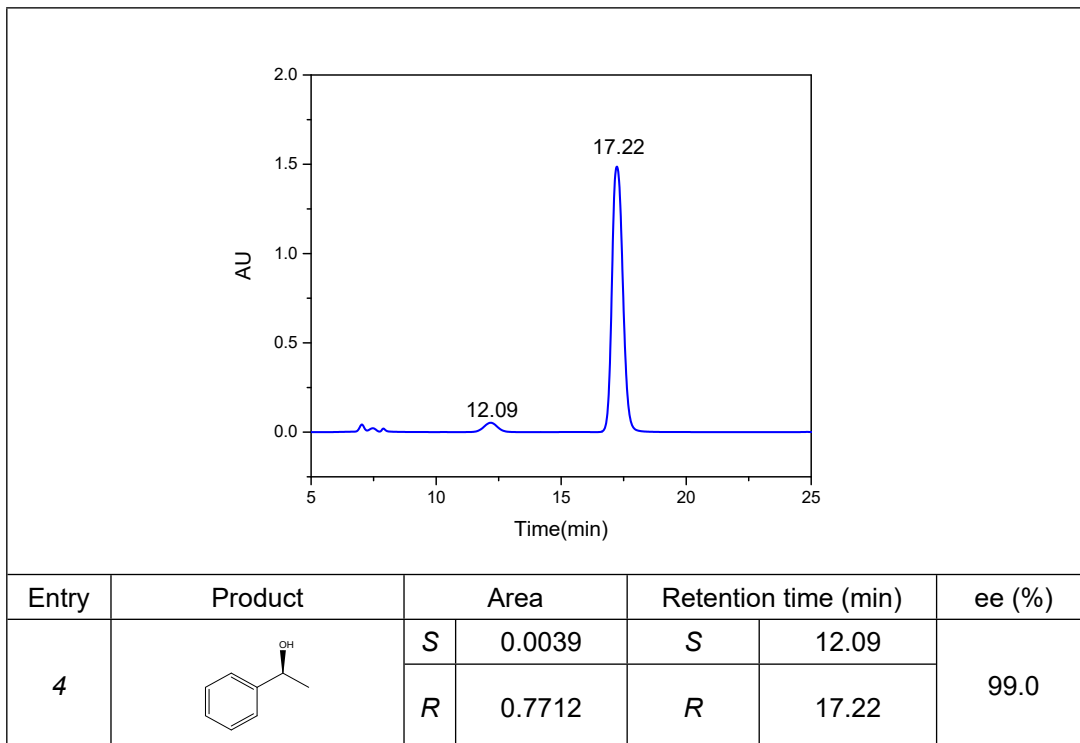
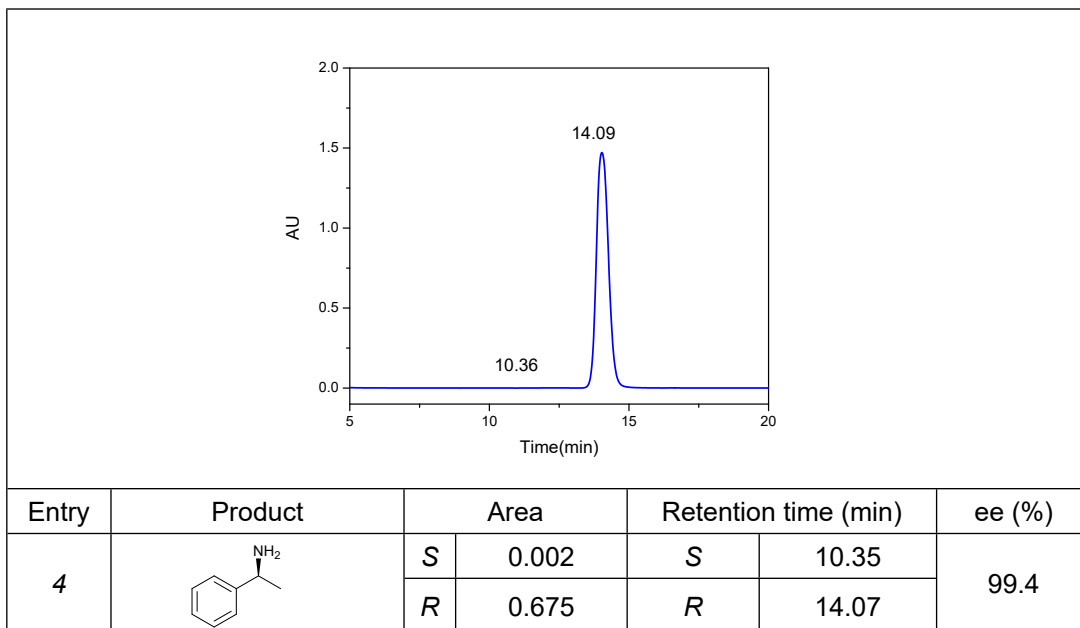
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
2		S	0.2758	S	7.44	99.6
		R	0.0005	R	10.05	

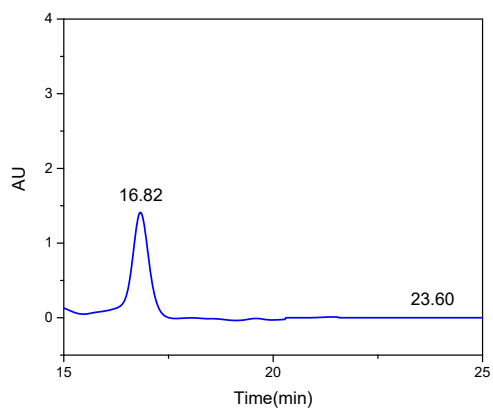


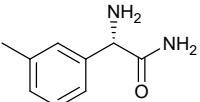


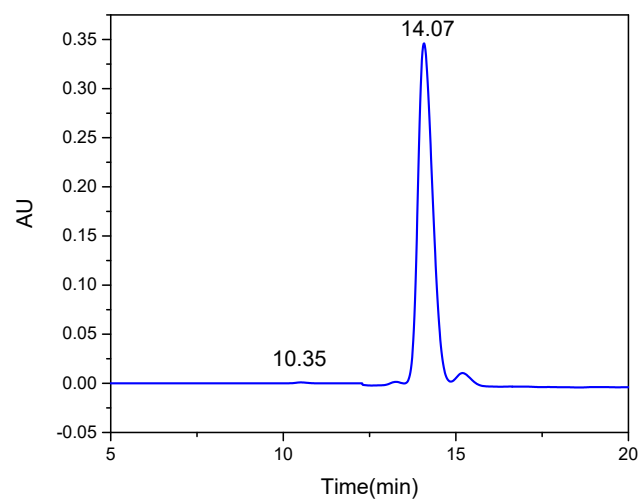


Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
3		S	1.620	S	20.74	99.6
		R	0.0031	R	25.50	

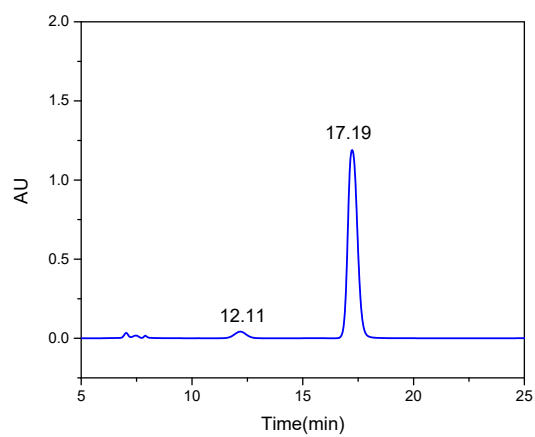




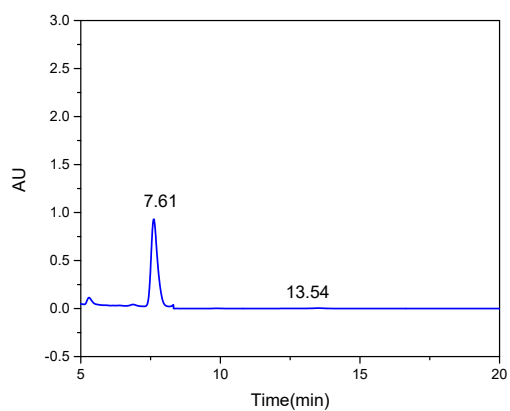
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
4		S	0.4876	S	16.82	99.3
		R	0.0017	R	23.60	



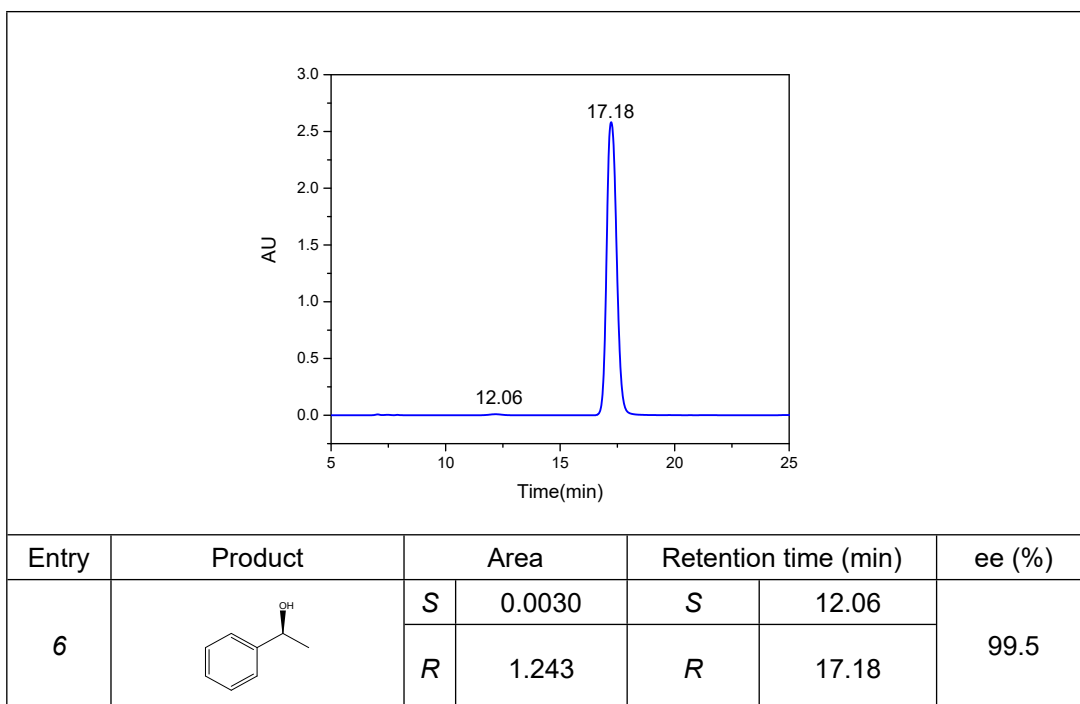
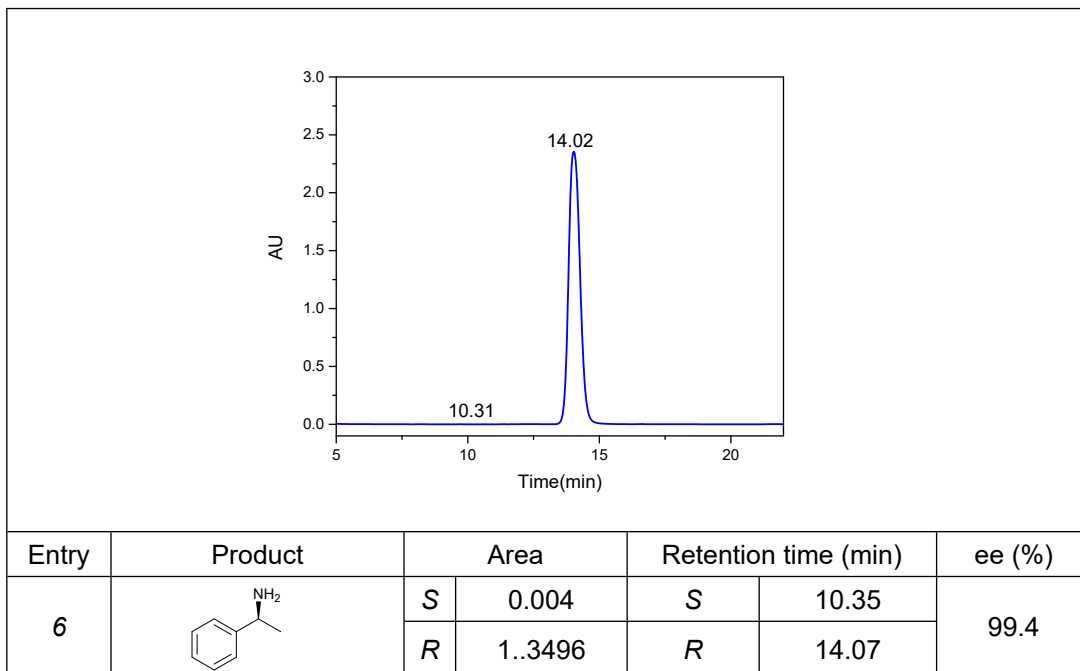
Entry	Product	Area		Retention time (min)		ee (%)
5	<chem>CC(N)Cc1ccccc1</chem>	S	0.0003	S	10.35	99.5
		R	0.1576	R	14.07	

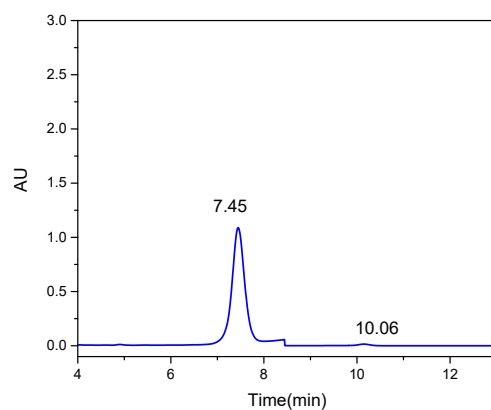


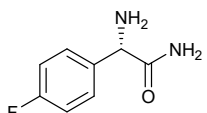
Entry	Product	Area		Retention time (min)		ee (%)
5	<chem>CC(O)Cc1ccccc1</chem>	S	0.0028	S	12.11	99.1
		R	0.6735	R	17.19	

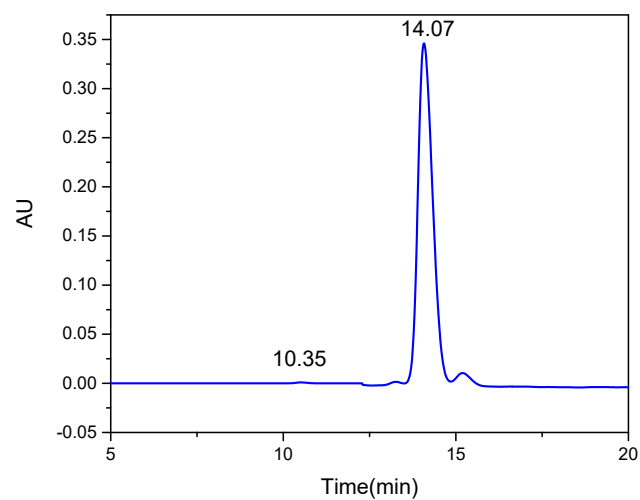


Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
5		S	0.2743	S	7.61	99.3
		R	0.0009	R	13.54	

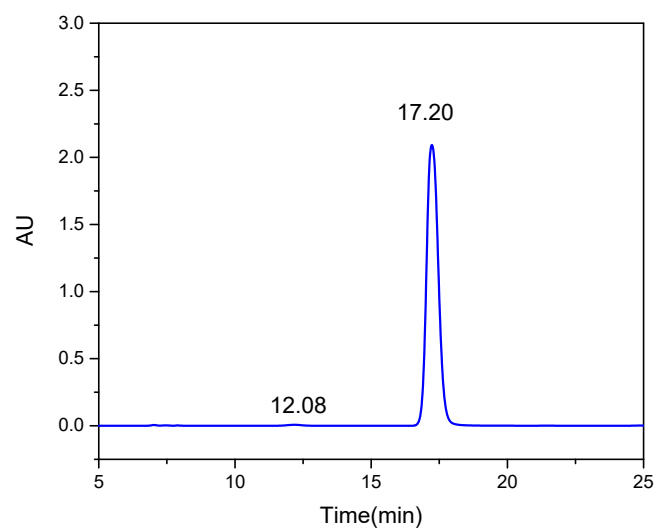




Entry	Product	Area		Retention time (min)		ee (%)
6		S	0.5576	S	7.45	99.5
		R	0.0012	R	10.06	

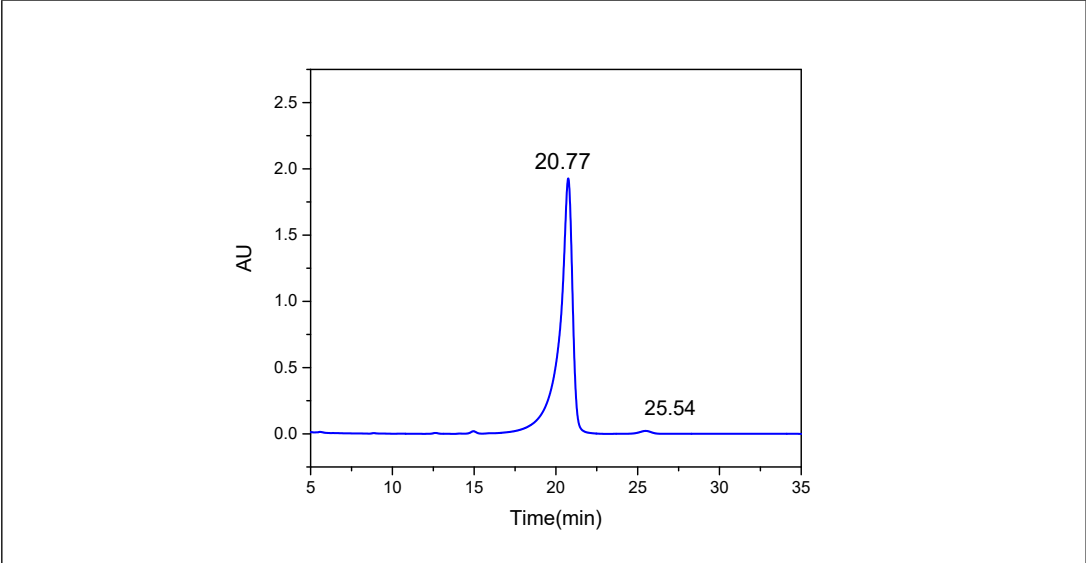


Entry	Product	Area		Retention time (min)		ee (%)
7	<chem>CC(N)Cc1ccccc1</chem>	S	0.0006	S	10.35	99.3
		R	0.1687	R	14.07	

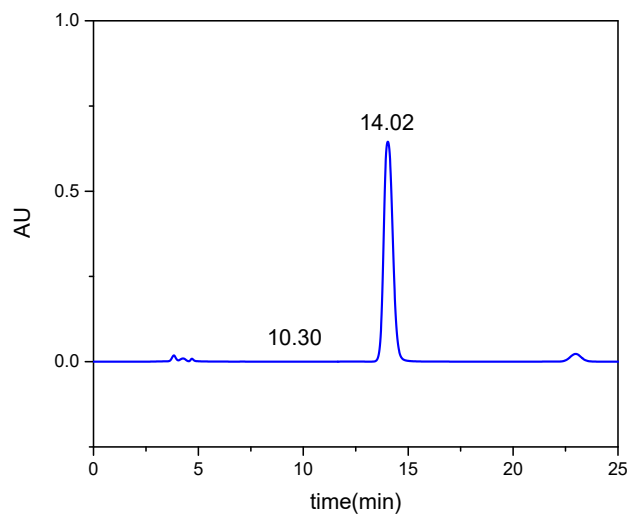



Entry	Product	Area		Retention time (min)		ee (%)
7	<chem>CC(O)Cc1ccccc1</chem>	S	0.0029	S	12.08	99.4
		R	1.0361	R	17.20	

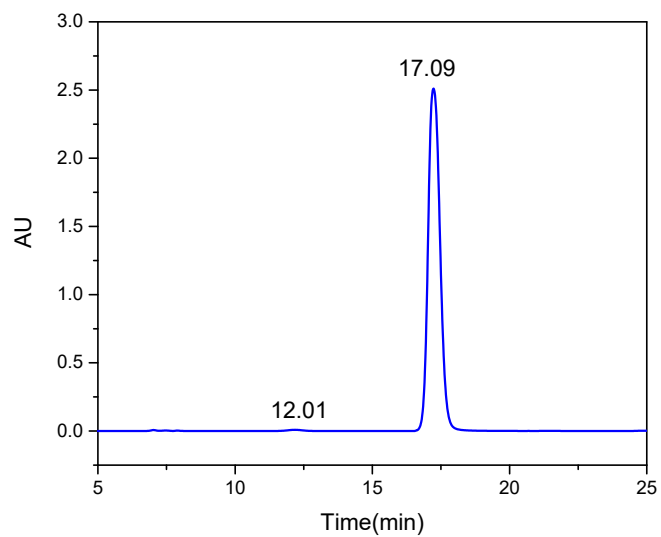


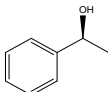


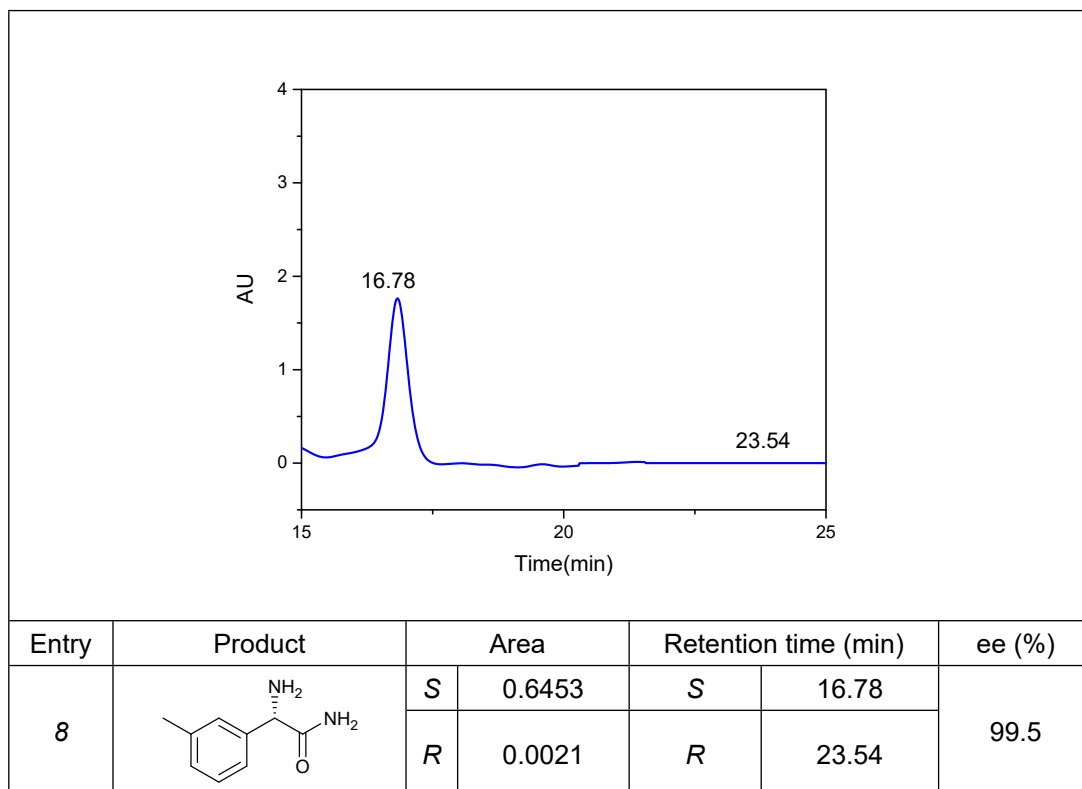
Entry	Product	Area		Retention time (min)		ee (%)
7		<i>S</i>	1.081	<i>S</i>	20.77	99.4
		<i>R</i>	0.0032	<i>R</i>	25.54	

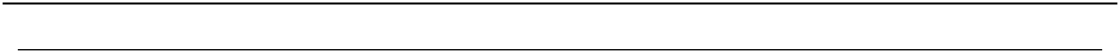


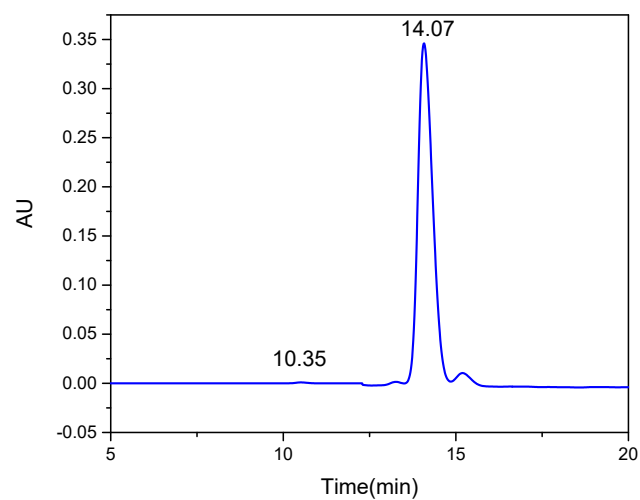
Entry	Product	Area		Retention time (min)		ee (%)
8		S	0.0009	S	10.30	99.4
		R	0.3247	R	14.02	



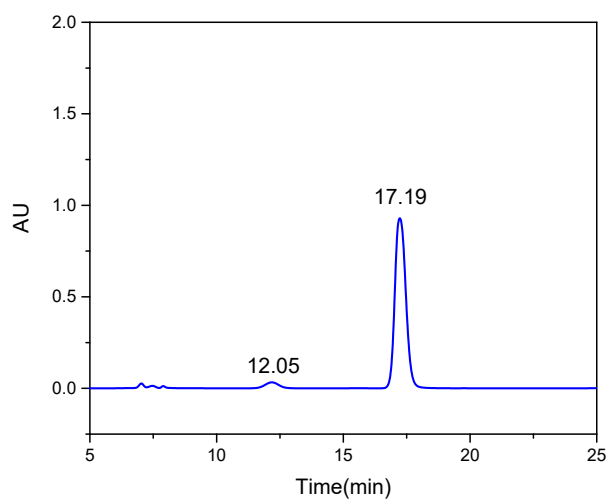
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
8		S	0.0023	S	12.01	99.6
		R	1.2949	R	17.09	



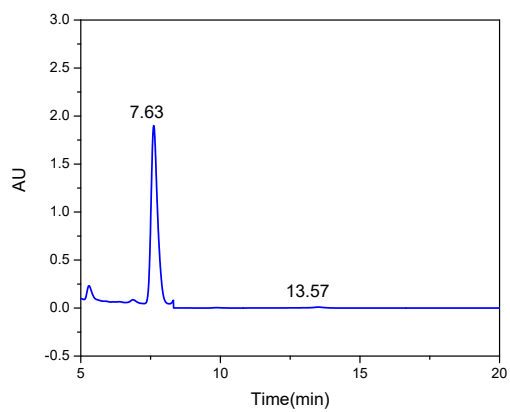




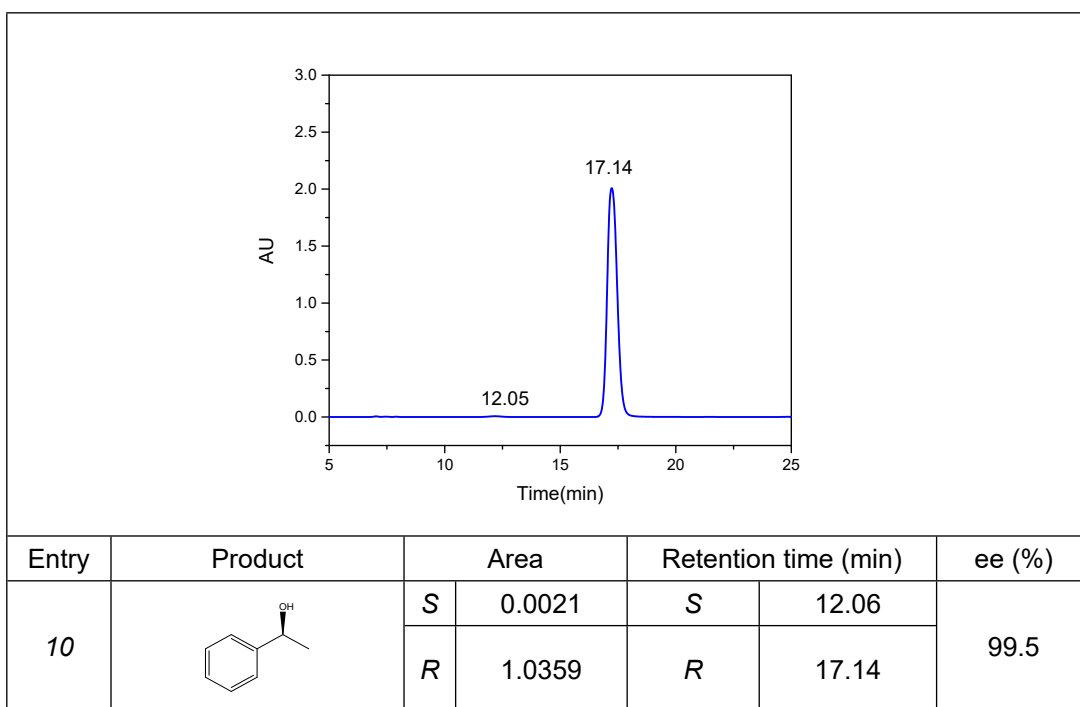
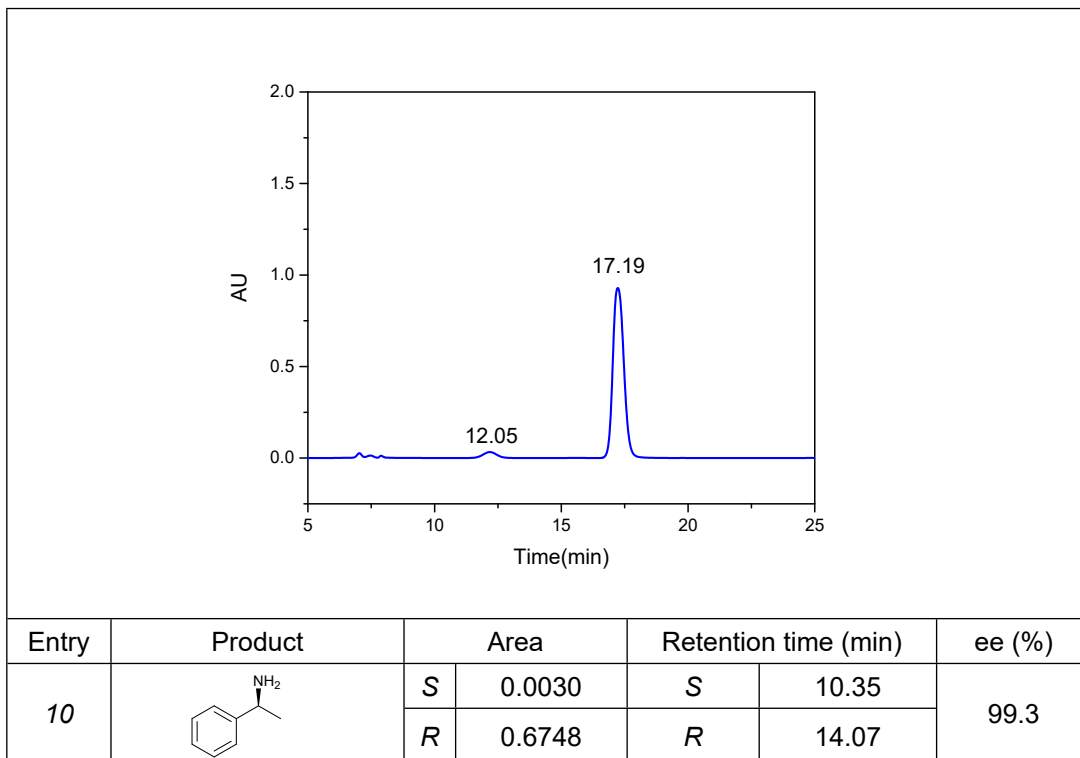
Entry	Product	Area		Retention time (min)		ee (%)
9	<chem>CC(N)c1ccccc1</chem>	S	$3.47 \times 10^{-4}$	S	10.35	99.7
		R	0.1687	R	14.07	

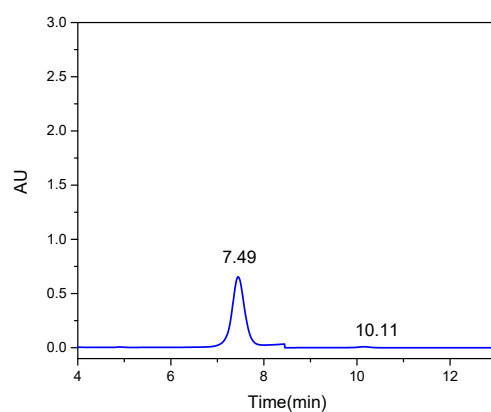


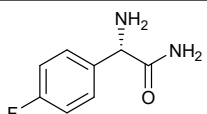
Entry	Product	Area		Retention time (min)		ee (%)
9	<chem>CC(O)c1ccccc1</chem>	S	0.0029	S	12.05	99.0
		R	0.4662	R	17.19	



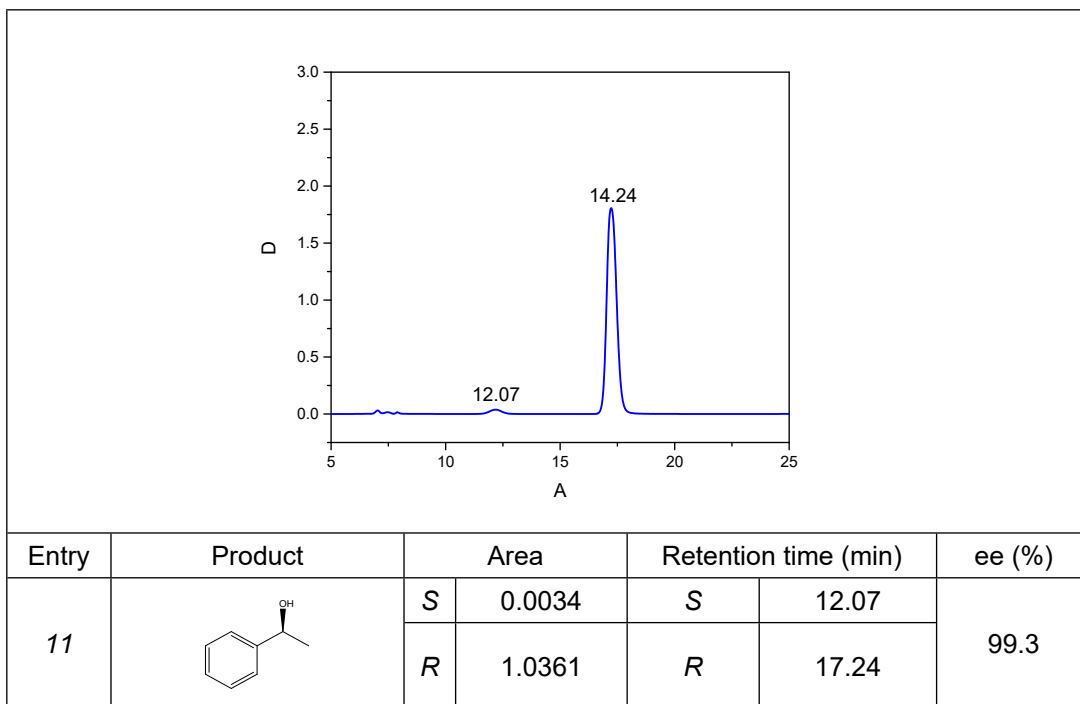
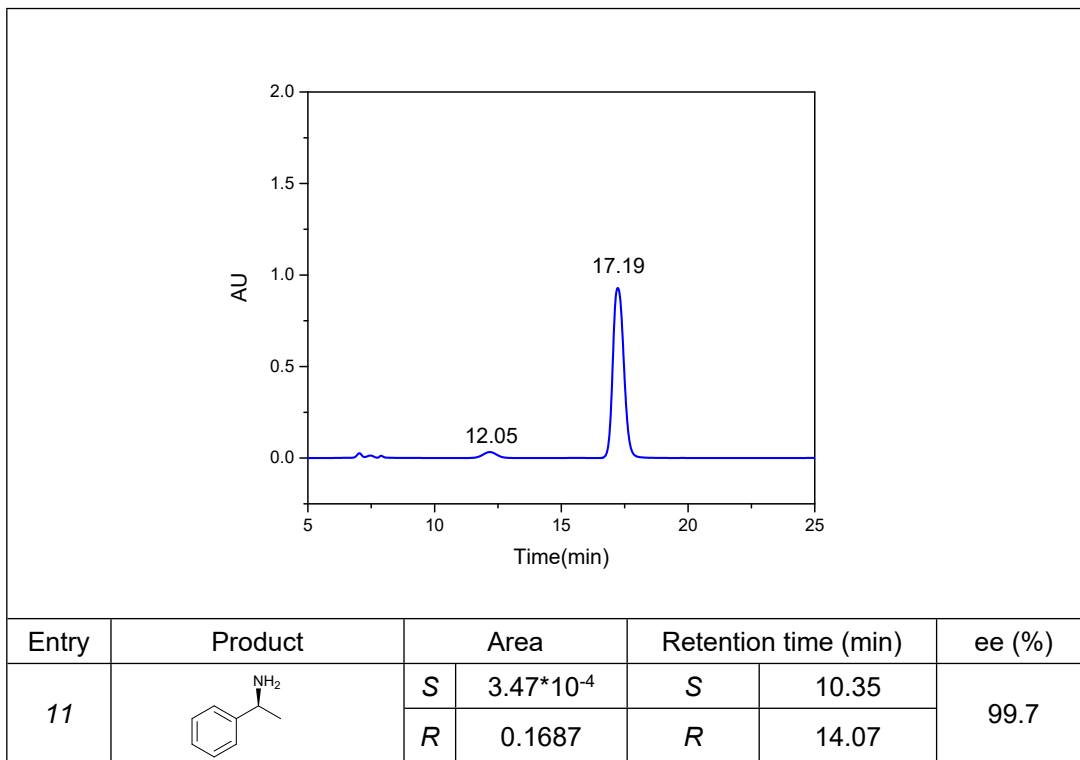
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
9	<chem>CC1=CC=C(C=C1)C(N)C(=O)N</chem>	S	0.4663	S	7.63	99.5
		R	0.0012	R	13.57	

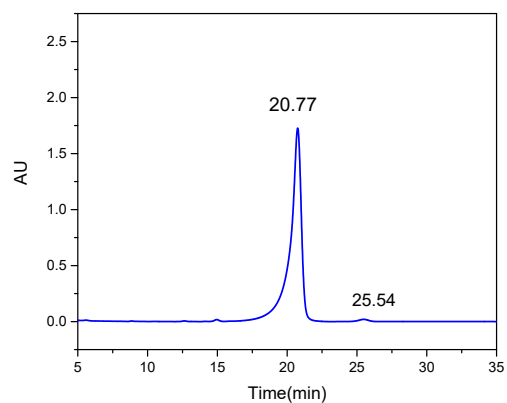




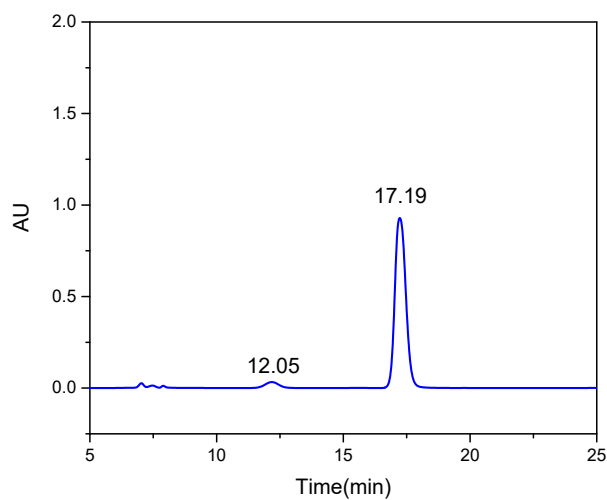
Entry	Product	Area		Retention time (min)		ee (%)
10		S	0.3309	S	7.49	99.3
		R	0.0010	R	10.11	



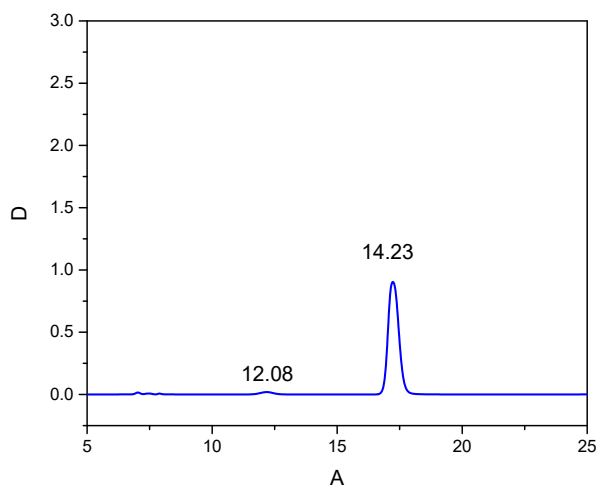




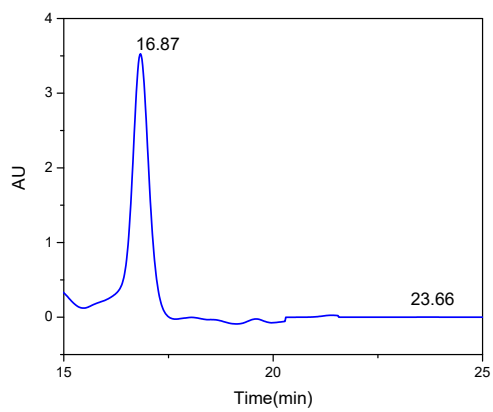
Entry	Product	Area		Retention time (min)		ee (%)
11		S	0.840	S	20.77	99.5
		R	0.0021	R	25.54	

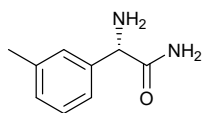


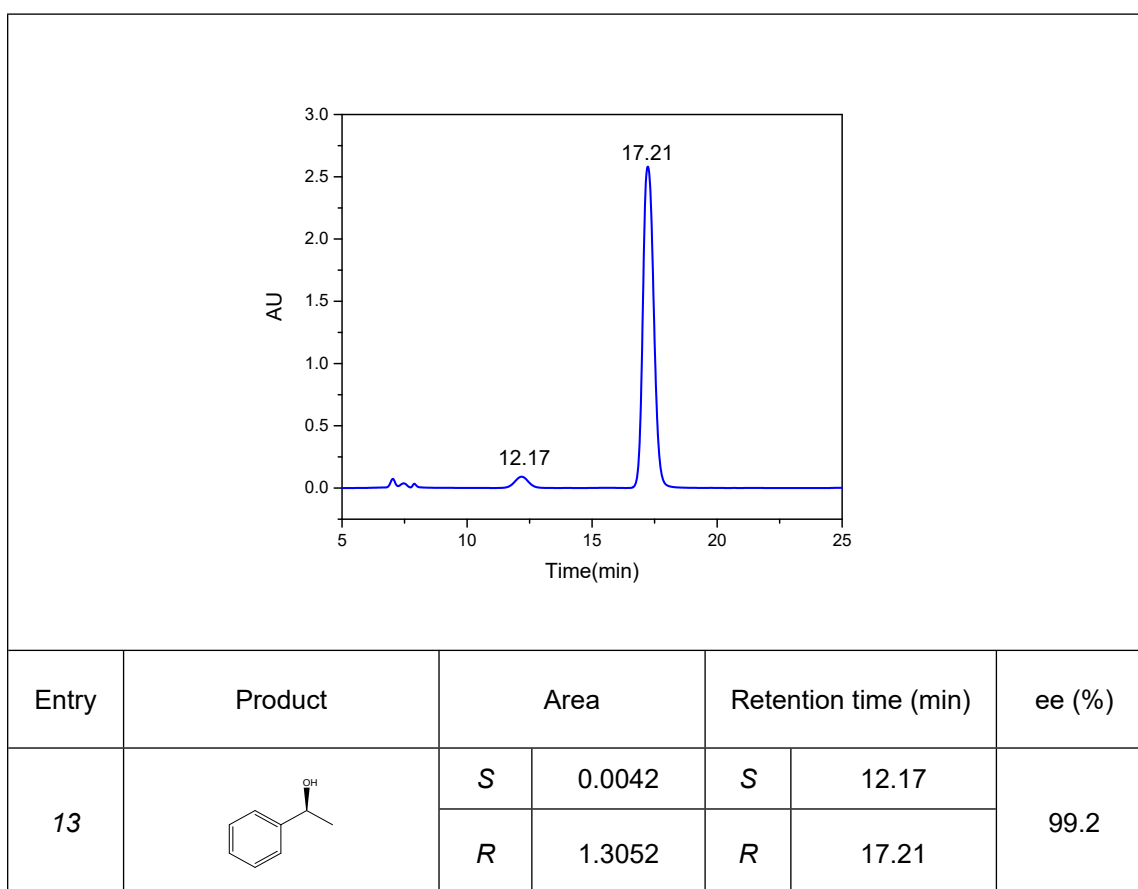
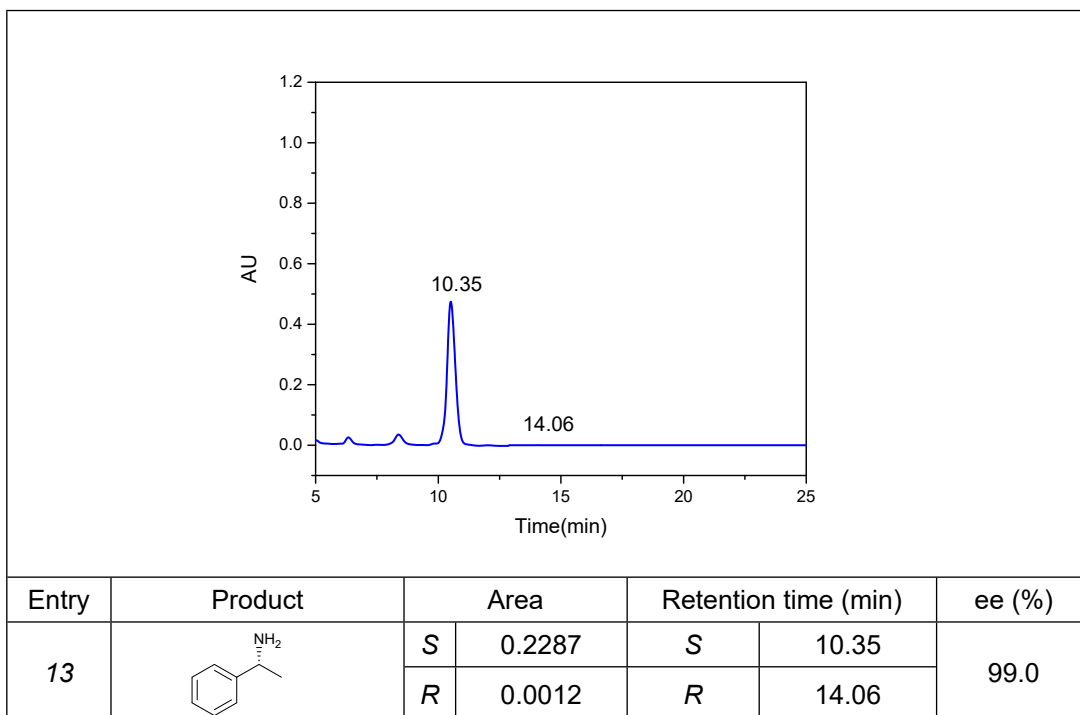
Entry	Product	Area		Retention time (min)		ee (%)
12	<chem>CC(N)Cc1ccccc1</chem>	S	0.0021	S	10.35	99.5
		R	0.5674	R	14.07	

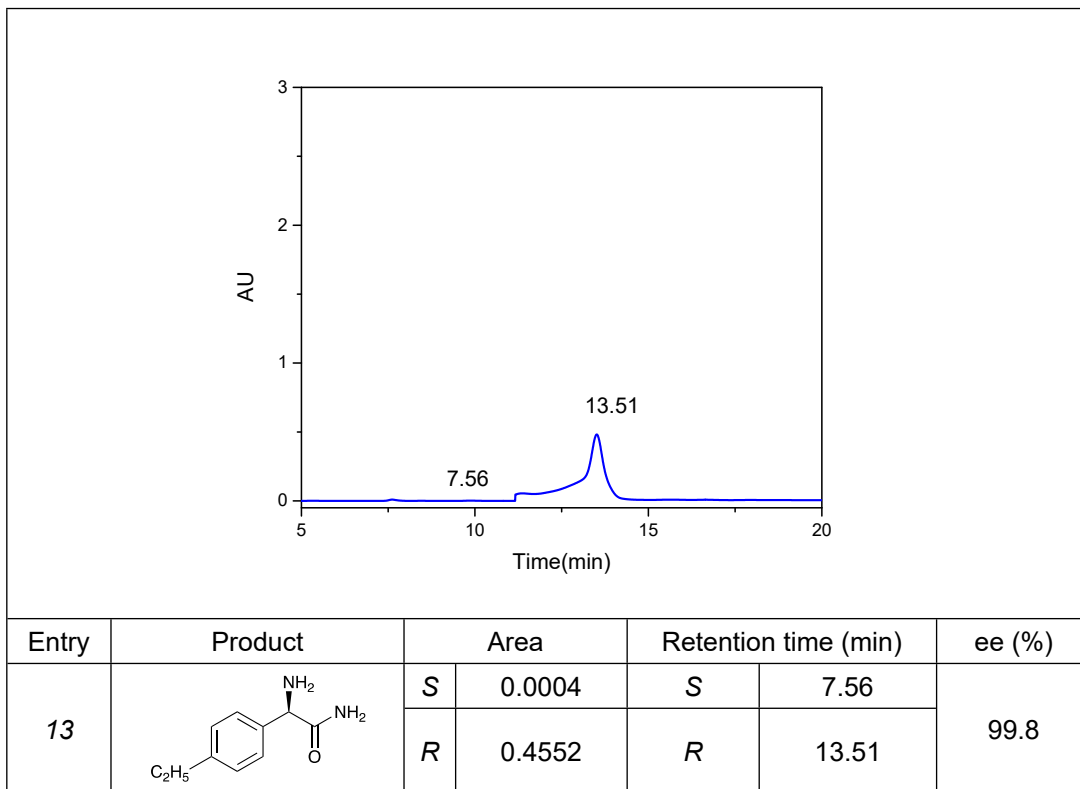


Entry	Product	Area		Retention time (min)		ee (%)
12	<chem>CC(O)Cc1ccccc1</chem>	S	0.0020	S	10.35	99.2
		R	0.5180	R	14.07	

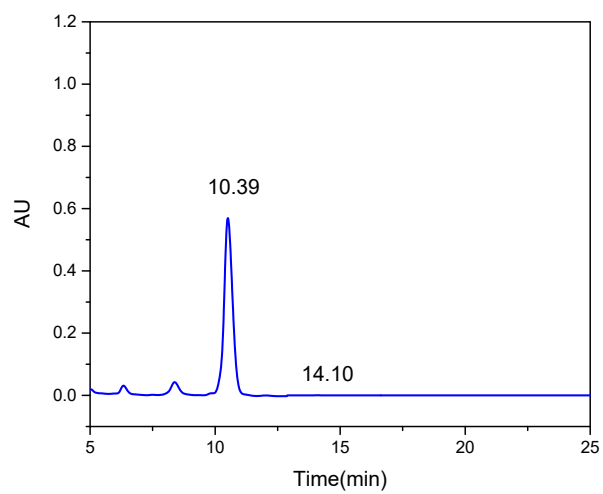


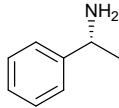
Entry	Product	Area		Retention time (min)		ee (%)
		S	R	S	R	
12		S	1.2343	S	16.87	99.7
		R	0.0020	R	23.06	

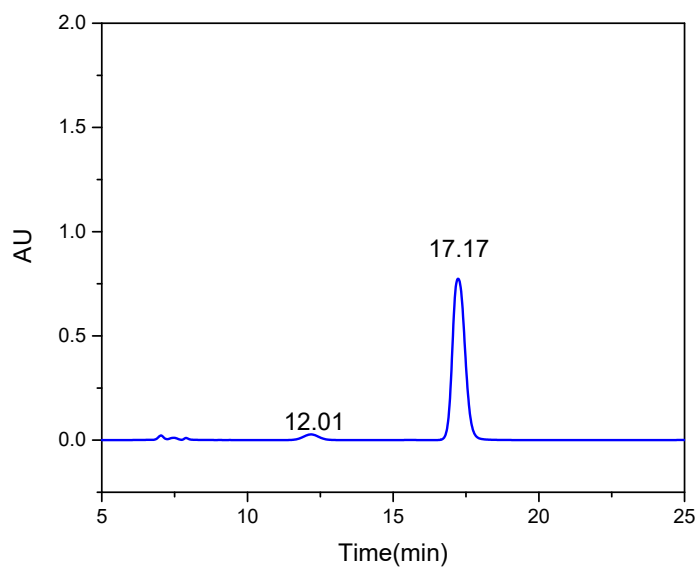


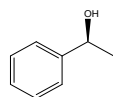


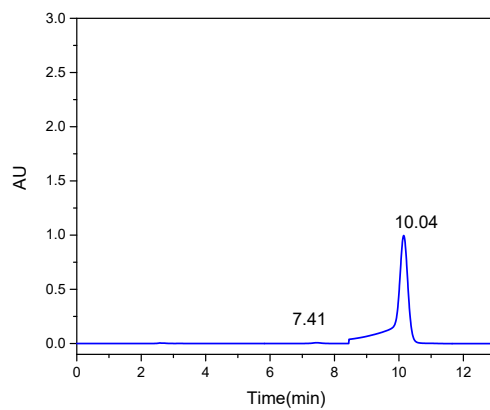
Entry	Product	Area		Retention time (min)		ee (%)
13		S	0.0004	S	7.56	99.8
		R	0.4552	R	13.51	

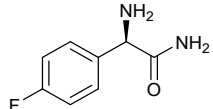


Entry	Product	Area		Retention time (min)		ee (%)
14		S	0.3465	S	10.39	99.3
		R	0.0012	R	14.10	

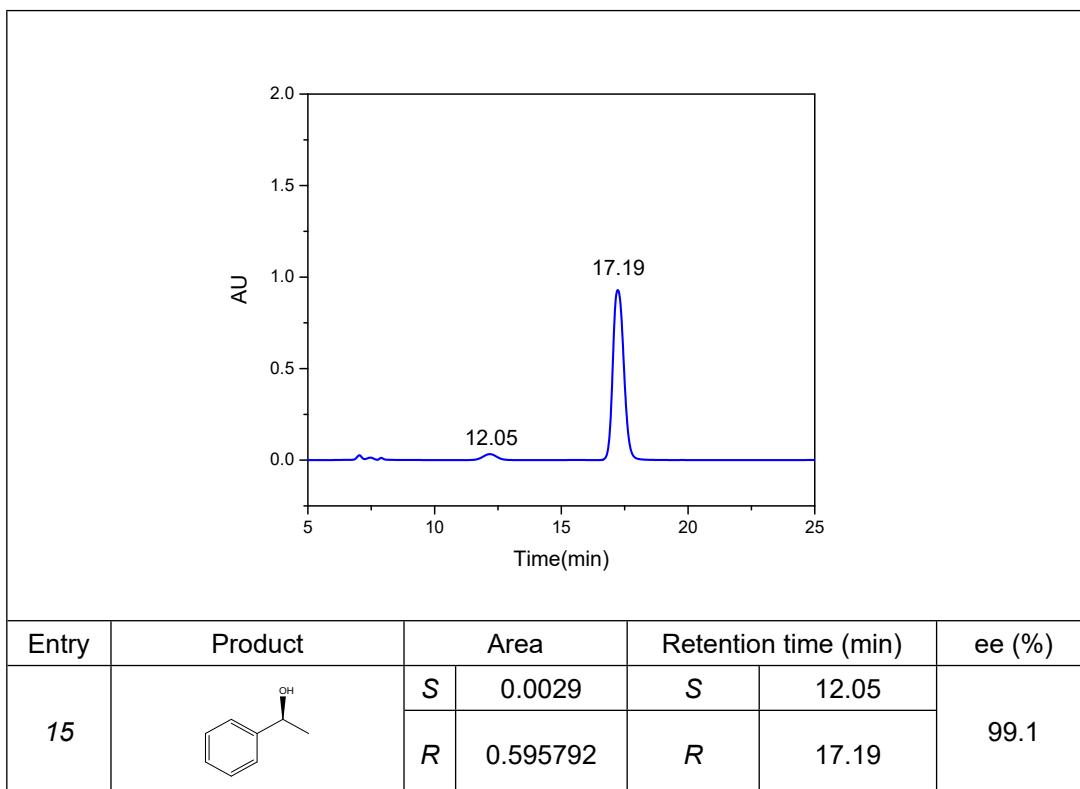
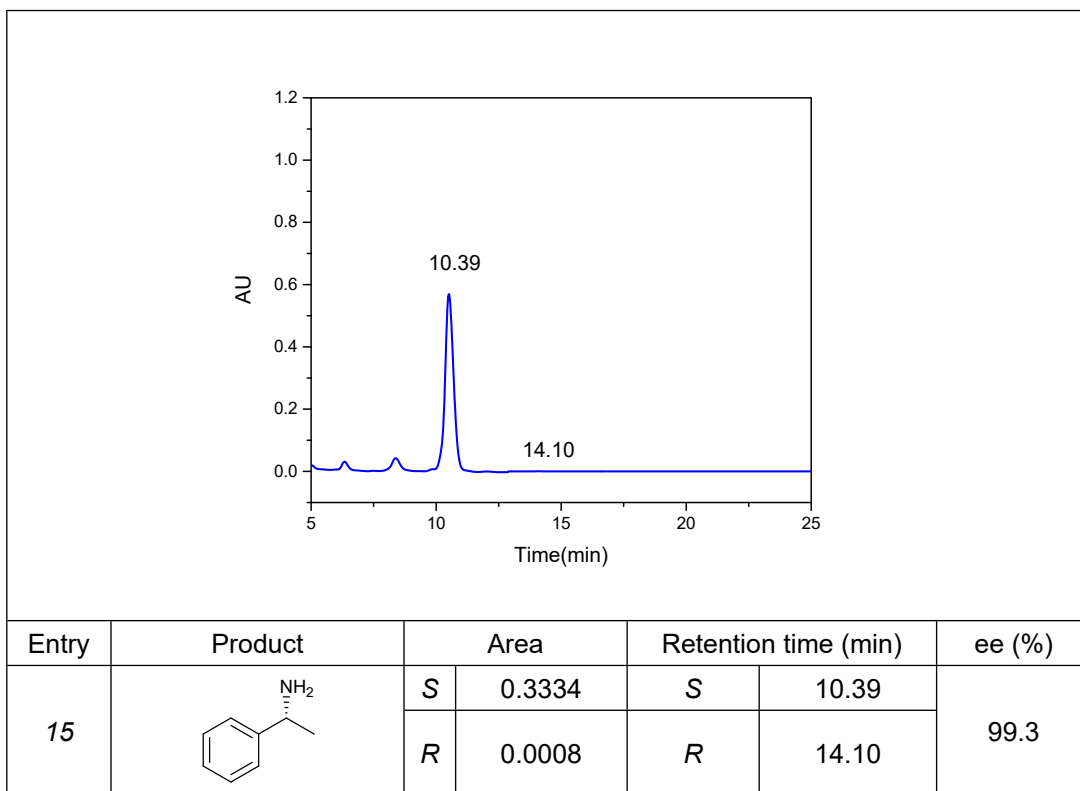


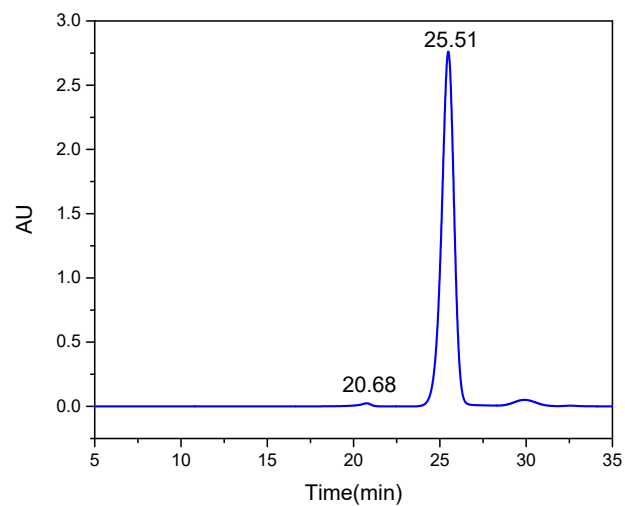
Entry	Product	Area		Retention time (min)		ee (%)
14		S	0.0025	S	12.21	99.2
		R	0.6061	R	17.17	



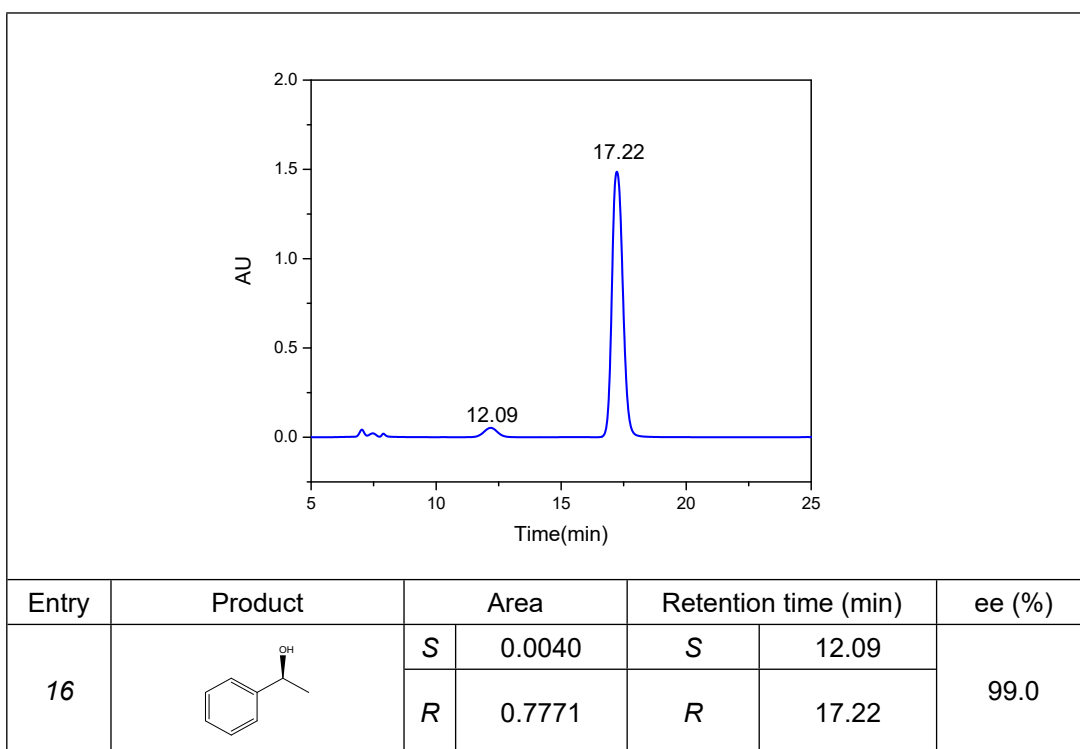
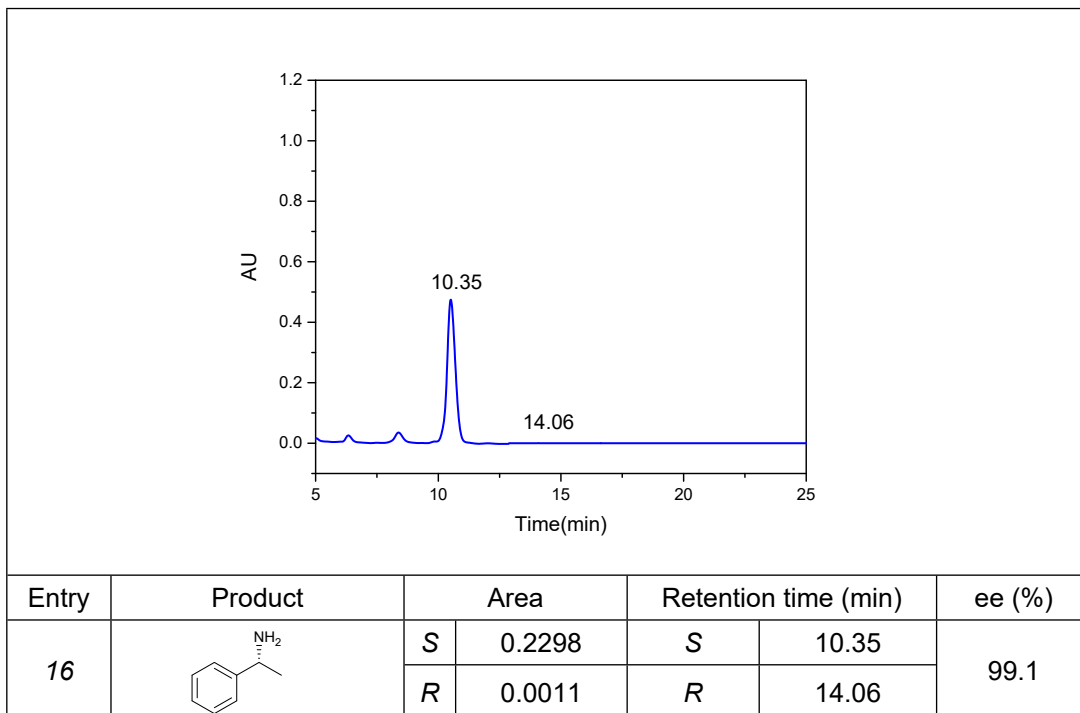
Entry	Product	Area		Retention time (min)		ee (%)
14		S	0.0013	S	7.41	99.4
		R	0.4361	R	10.07	

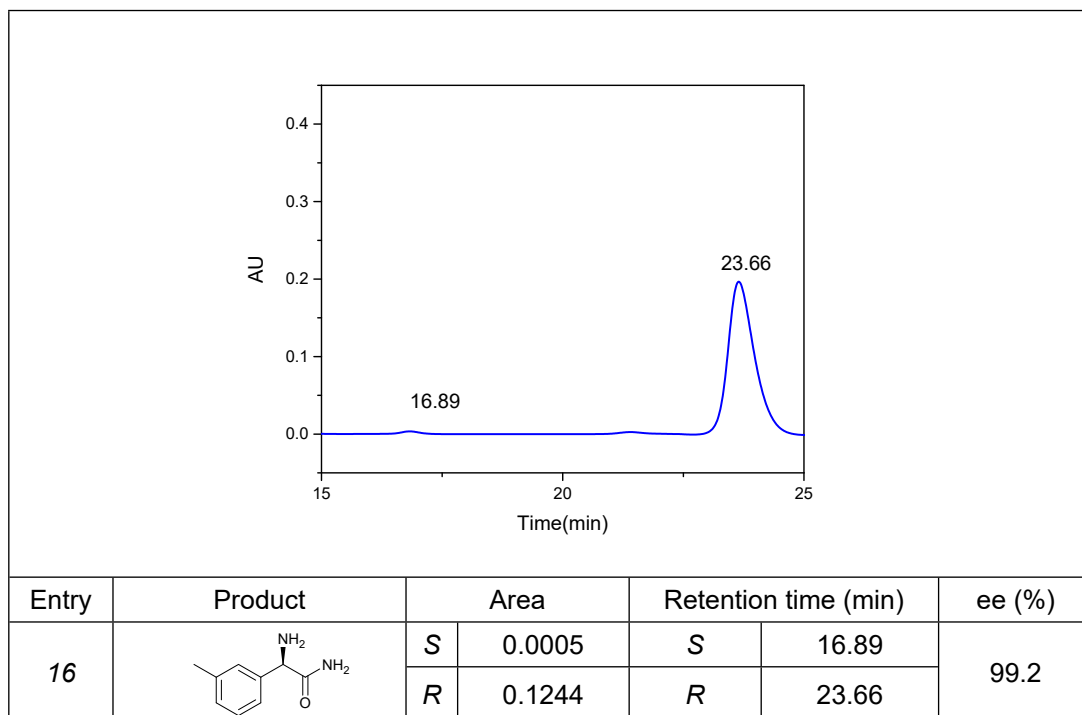






Entry	Product	Area		Retention time (min)		ee (%)
		<i>S</i>	<i>R</i>	<i>S</i>	<i>R</i>	
15	<chem>Cc1ccc(cc1)[C@H](N)C(=O)N</chem>	0.0041	1.687	25.51	20.68	99.5





## 7. References

- [1] J. H. Li, S. P. He, K. Zhang, Z. Y. Quan, Q. H. Shan, Z. L. Sun, B. Wang, UV Assisted High-efficient Synthesis of  $\alpha$ -Ketoamides Using Air Promoted by A Non-metal Catalyst in Aqueous Solution. *ChemCatChem* **2018**, *10*, 4868-4873.