Supporting Information

Iron Catalyzed Asymmetric Hydrogenation of Ketones

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This PDF file includes:

Materials and Methods

Tables S1 to S4

Figure S1

NMR Data

NMR Spectra

GC/HPLC Traces

Table of Contents

1. Materials and Methods **pp S3**

2. Tables **pp S7**

3. Figures **pp S10**

4. NMR data of hydrogenation products **pp S12**

5. NMR spectra of hydrogenation products **pp S22**

6. GC/HPLC traces of hydrogenation products **pp S78**

1. Materials and methods

1.1. General

Autoclaves were used for hydrogenation. Solvents were dried and purified according to standard methods before use. Hydrogen gas (99.9995%) was purchased from Boc Gas and $Fe_3(CO)_{12}$ from Alfa Asia. All the ketone substrates were purchased from Aldrich, and used directly without further purification. Ligand **1** was synthesized in two steps according the procedure reported before.[1] Bis(*o*-formylphenyl)phenylphosphane was prepared as previously described.[1,2] NMR spectra were recorded on a Bruker Advance Ⅱ 400 MHz spectrometer. Mass spectra were obtained on Bruker En Apex ultra 7.0T FT-MS. GC traces were obtained on Varian CP-3380 equipped with a Chrompack Chirasil-Dex CB column (25 m x 0.25 mm) and HPLC traces were recorded on Agilent 1260 equipped with a chiral OB, OB-H, OJ-H or OD-H column. All melting points were measured using an X-4 digital melting point apparatus and uncorrected. Optical rotation values were measured on a Perkin-Elmer 341 polarimeter.

1.2. Methods

1.2.1 Typical procedure for AH: A dried glassliner **(**20 mL) was charged with $Fe_3(CO)_{12}$ (2.5 mg, 0.005 mmol) and **1** (4.0 mg, 0.005 mmol) under N_2 and then loaded into an dried autoclave. After the addition of fresh distilled MeOH (5 mL), the autoclave was purged with H_2 (1 bar) three times. The mixture was then stirred at 45

°C under 5 bar H_2 for 1 h. After releasing the H_2 gas in a fumehood, KOH in MeOH (0.5 M, 0.4 mL) and acetophenone (1 mmol) were sequentially introduced through an injection port. The autoclave was then pressurized to 50 bar H_2 and the reaction mixture stirred at 45 °C for 5 h. After cooling down to room temperature and subsequently releasing the H_2 pressure in a fumehood, the mixture was concentrated and purified by chromatograph on a silica-gel column with ethyl acetate/hexane (v/v = 5:95), affording 1-phenylethanol in 97% isolated yield. The enantioselectivity of the product was determined by GC equipped with a chiral Chrompack Chirasil-Dex CB column (25 m x 0.25 mm).

1.2.2. Procedure for larger-scale AH of acetophenone: The procedure was similar to that above, using a 125 mL glassliner charged with $Fe_3(CO)_{12}$ (101.0 mg, 0.2 mmol), **1** (160.0 mg, 0.2 mmol), and MeOH (50 mL). Following stirring for 1 h at 45 °C under 5 bar H_2, an MeOH solution of KOH (0.5 M, 16 mL) and acetophenone (12.00 g, 100.0 mmol) were introduced. The mixture was then stirred for 12 h at 45 °C under 50 bar H_2 pressure. Purification by chromatograph on a silica-gel column with ethyl acetate/hexane (v/v = 5:95) afforded the corresponding chiral alcohol in 98% isolated yield (11.93 g) with 96.3% ee.

1.2.3. Procedure for AH of acetophenone in the presence of a poison additive: A dried glassliner (20 mL) was charged with $Fe_3(CO)_{12}$ (5 mg, 0.01 mmol) and **1** (8.0 mg, 0.01 mmol) under N_2 and then loaded into an dried autoclave. After the addition of freshly distilled MeOH (8 mL), the autoclave was purged with H_2 (1 bar) three times. The mixture was then stirred at 45 °C under 5 bar H_2 for 1 h. After releasing the

H_2 gas in a fumehood, KOH in MeOH (0.5 M, 0.8 mL), acetophenone (1 mmol) and an additive (triphenylphosphine, 1,10-phenanthroline, or mercury, 0.001-0.03 mmol) (see Table 6 or Table S4) were sequentially introduced through an injection port. The autoclave was then pressurized to 50 bar H_2 and the reaction mixture stirred at 45 °C for a certain period of time (see Table 6 or Table S4). After cooling down to room temperature and subsequently releasing the H_2 pressure in a fumehood, the sample was analyzed as above. In the case of using mercury, the sample was carefully taken at the top of the reaction mixture, the rest of which was quenched with sulfur and collected in a special bottle for disposal.

1.2.4. Procedure for dynamic light scattering (DLS) experiments: (a) Without base: A dried glassliner (20 mL) was charged with $Fe_3(CO)_{12}$ (5 mg, 0.01 mmol) and **1** (8.0 mg, 0.01 mmol) under N_2 and then loaded into a dried autoclave. After the addition of freshly distilled MeOH (8 mL), the autoclave was purged with H_2 (1 bar) three times. The mixture was then stirred at 45 °C under 5 bar H_2 for 1 h. After cooling down to room temperature and releasing the H_2 in a fumehood to slightly >1 bar, the autoclave was moved into an Ar-filled glove box and the remaining H_2 released. The sample was then taken out from the autoclave and filtered with a 200 nm microfilter, and the resulting pink solution (1 mL) was put into a DLS silica vial (2 mL) which was subsequently sealed in the same glove box. Following transferring out from the glove-box, the sample was scanned on a Malvern DLS instrument at 25 °C. (b) With base: the procedure was similar to the above, except that KOH in MeOH (0.5 M, 0.8

mL) was added into the autoclave after the initial 1 h stirring. Following a further 1 h stirring at 45 °C under 5 bar H_2, the sample was analyzed.

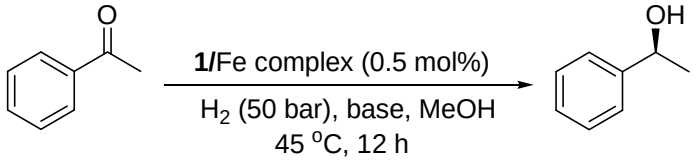
1.3. References

[1] Yu, S. L., Shen W. Y., Li, Y. Y., Dong, Z. R., Xu, Y. Q., Li, Q., Zhang, J. N. and Gao, J. X., *Adv. Synth. Catal.* 2012, **354**, 818-822.

[2] Rancurel, C., Daro, N. O., Borobia, B., Herdtweck, E. and Sutter, J. P., *Eur. J. Org. Chem.* 2003, 167-171.

2. Tables

Table S1. Screening of catalysts for and effect of base on Fe-catalysed AH of acetophenone[a]



Entry	Iron source	Base	Tempt. [°C]	Conv. [%][b]	Ee [%][b]
1	$Fe_3(CO)_{12}$	KOH	45	>99	97
2	$[Et_3NH][HFe_3(CO)_{11}]$	KOH	45	<1	-
3	$[PPN][HFe_3(CO)_{11}]$	KOH	45	<1	-
4	$[CpFe(CO)_2]_2$	KOH	45	-	-
5	$[CpFe(CO)_2I]$	KOH	45	<1	-
6	$Fe(CO)_4(PPh_3)_2$	KOH	45	1	-
7	*trans*-$Fe(CO)_3(PPh_3)_2$	KOH	45	<1	-
8	$Fe(acac)_3$	KOH	45	-	-
9	$FeCl_2 \cdot 4H_2O$	KOH	45	<1	-
10	$Fe_3(CO)_{12}$	KOH	25	26	97
11	$Fe_3(CO)_{12}$	KOH	35	34	97
12	$Fe_3(CO)_{12}$	KOH	40	97	94
13	$Fe_3(CO)_{12}$	*t*BuOK	45	>99	96
14	$Fe_3(CO)_{12}$	NaOH	45	78	97
15	$Fe_3(CO)_{12}$	K_2CO_3	45	20	96
16[c]	$Fe_3(CO)_{12}$	KOH	45	3	37

[a] Reaction conditions: acetophenone (1 mmol) with ketone : Fe : (*R*,*R*,*R*,*R*)-**1** : base = 200 : 1 : 1 : 20 (molar ratio), MeOH (5 mL), initial H_2 pressure 50 bar, 12 h. [b] Conversion and ee were determined by GC analysis with a chiral CP-Chriasil-Dex CB column. [c] (*R*,*R*,*R*,*R*)-**2** was used.

Table S2. Effect of the amount of base on AH of acetophenone with **1**/$Fe_3(CO)_{12}$ [a]

Entry	KOH [mol%]	Time [h]	Conv. [%] [b]	Ee [%] [b]
1	0	5	<1	-
2	10	5	82	97
3	20	5	>99	97
4	30	5	>99	97
5	50	5	99	97

[a] Reaction conditions: acetophenone (1 mmol) with ketone : Fe : (*R,R,R,R*)-**1** = 200 : 1 : 1 (molar ratio), MeOH (5 mL), initial H_2 pressure 50 bar, 45 °C. [b] Conversion and ee were determined by GC analysis with a chiral CP-Chriasil-Dex CB column.

Table S3. AH of acetophenone with **1**/$Fe_3(CO)_{12}$ at higher S/C ratios[a]

Entry	S/C	KOH [mol%]	Time [h]	Conv. [%][b]	Ee [%][b]
1	500/1	8	5	53	96
2	500/1	8	10	>99	96
3	1000/1	4	5	20	95
4	1000/1	8	24	84	92

[a] Reaction conditions: acetophenone (1 mmol), MeOH (5 mL), initial H_2 (50 bar), 45 °C. [b] Conversion and ee were determined by GC analysis with a chiral CP-Chirasil-Dex CB column.

Table S4. Effect of poisoning additives on the AH of acetophenone with **1**/$Fe_3(CO)_{12}$ [a]

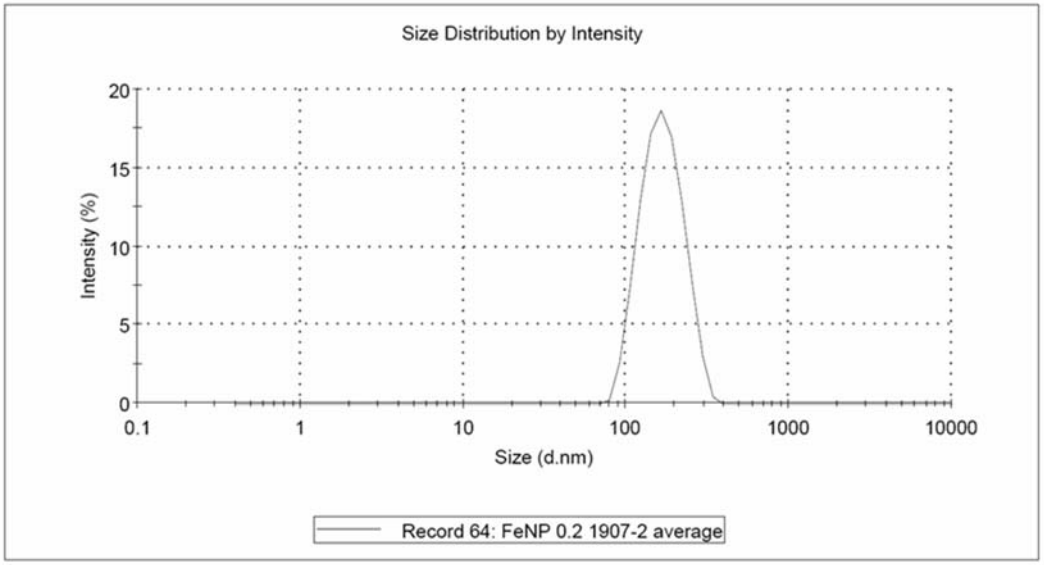
Entry	Additives	Quantity [b]	Time [h]	Conv. [%][c]	Ee [%][c]
1	None		3	>99	97
2	PPh_3	1	10	8	56
3	PPh_3	0.3	10	20	84
4	PPh_3	0.1	10	98	92
5	1,10-Phenanthroline	1	10	<1	-
6	1,10-Phenanthroline	0.3	10	11	75
7	1,10-Phenanthroline	0.1	10	92	83
8	Mercury	3	10	<1	-
9	Mercury	1	10	4	45

[a] Reaction conditions: ketone (1 mmol), with ketone : $Fe_3(CO)_{12}$: (*R*,*R*,*R*,*R*)-**1** : KOH = 100 : 1 : 1 : 40 (molar ratio), 50 bar H_2, 45 °C in MeOH. [b] Equivalent, relative to the catalyst. [c] Conversion and ee were determined by GC analysis with a chiral CP-Chriasil-Dex CB column.

3. Figures

a)

		Size (d.nm):	% Intensity	Width (d.nm):
Z-Average (d.nm): 158.2	Peak 1:	171.7	100.0	49.79
PdI: 0.075	Peak 2:	0.000	0.0	0.000
Intercept: 0.920	Peak 3:	0.000	0.0	0.000
Result quality : Good				



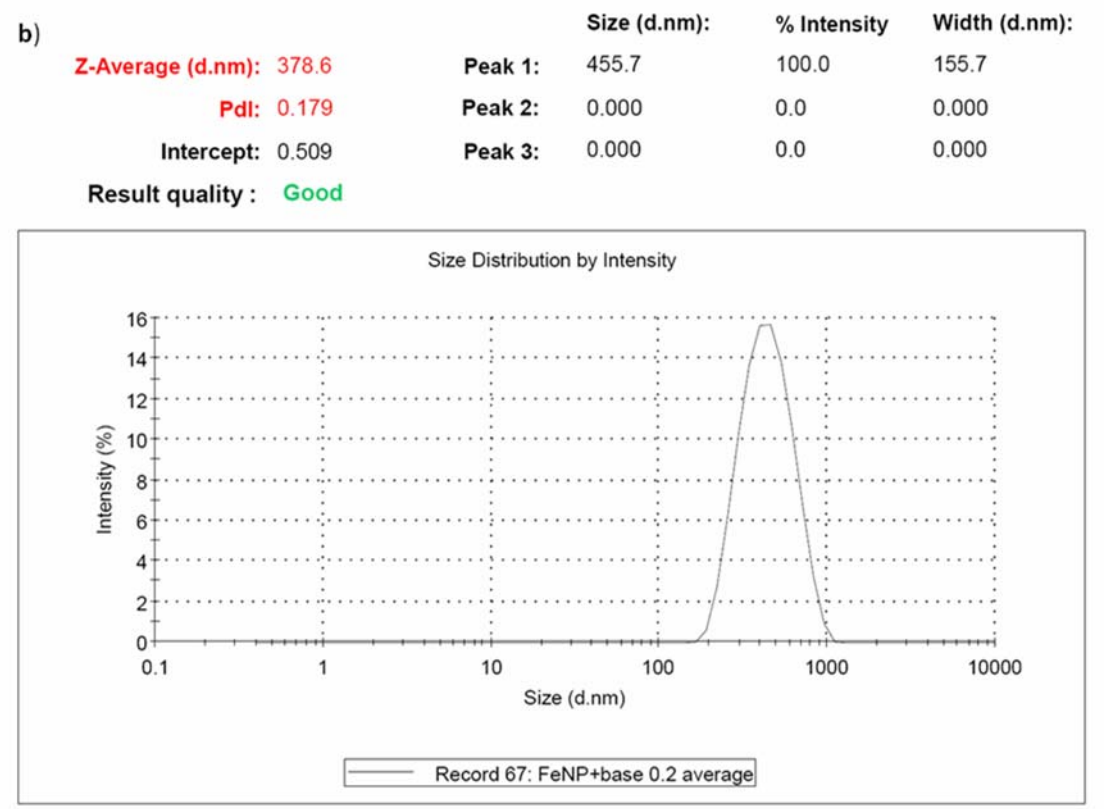


Figure S1. Results of DLS of **1**/$Fe_3(CO)_{12}$ solution in MeOH: a) **1**/ $Fe_3(CO)_{12}$ in MeOH, 5 bar H_2 at 45 °C for 1 h and the solution was filtered with a 0.2 µm microfilter under Ar atmosphere before being subjected to DLS; b) **1**/Fe in MeOH, 5 bar H_2 at 45 °C for 1 h, then KOH (40 eqv.) in MeOH introduced, stirred under the same conditions for another 1 h, and analyzed in the same way as above.

4. NMR data of hydrogenation products

(*S*)-1-Phenylethanol (**4a**)

Colorless oil; yield: 118 mg (97%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.20–7.35 (m, 5 H, Ar-H), 4.85 (q, *J* = 6.4 Hz, 1 H, $PhCHCH_3$), 2.18 (br s, 1 H, OH), 1.46 ppm (d, *J* = 6.4 Hz, 1 H, CH_3). ^{13}C NMR (100 MHz, $CDCl_3$): δ 145.9, 128.5, 127.5, 125.4 (Ar-C), 70.4 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -55.3 (*c* 0.88, $CHCl_3$).

(*S*)-1-(2-Chlorophenyl)ethanol (***o*-4b**)

Colorless oil; yield: 139 mg (89%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.57 (dd, 1 H, *J* = 7.6 Hz and 1.6 Hz, Ar-H), 7.34-7.15 (m, 2 H, Ar-H), 7.18 (td, 1 H, *J* = 7.6 Hz and 1.6 Hz, Ar-H), 5.27 (dq, 1 H, *J* = 6.4 Hz and 2.8 Hz, $PhCHCH_3$), 2.24 (br s, 1 H, OH), 1.47 ppm (d, 3 H, *J* = 6.4 Hz, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ 143.1, 131.6, 129.4, 128.4, 127.2, 126.4 (Ar-C), 67.0 (CH), 23.5 ppm (CH_3).

$[\alpha]_D^{20}$ = -63.6 (*c* 0.91, $CHCl_3$).

(*S*)-1-(3-Chlorophenyl)ethanol (***m*-4b**)

Colorless oil; yield: 150 mg (96%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.35 (br s, 1 H, Ar-H), 7.30-7.20 (m, 3 H, Ar-H), 4.84 (dq, 1 H, *J* = 6.4 Hz and 3.6 Hz, $PhCHCH_3$), 2.22 (br d, 1 H, *J* = 3.2 Hz, OH), 1.45 ppm (d, 3 H, *J* = 6.4 Hz, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ 147.9, 134.4, 129.8, 127.5, 125.6, 123.6 (Ar-C), 69.8 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -39.8 (*c* 1.17, $CHCl_3$).

(*S*)-1-(4-Chlorophenyl)ethanol (***p*-4b**)

Colorless oil; yield: 155 mg (99%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.32-7.25 (m, 4 H, Ar-H), 4.86 (dq, 1 H, *J* = 6.5 Hz and 3.5 Hz, $PhCHCH_3$), 1.96 (br d, 1 H, *J* = 3.5 Hz, OH), 1.46 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 144.3, 133.1, 128.6, 126.8 (Ar-C), 69.7 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -46.0 (*c* 1.37, $CHCl_3$).

(*S*)-1-(2-Methylphenyl)ethanol (***o*-4c**)

Colorless oil; yield: 112 mg (82%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.51-7.47 (m, 1 H, Ar-H), 7.26-7.09 (m, 3 H, Ar-H), 5.11 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.33 (s, 3 H, CH_3), 1.88 (br s, 1 H, OH), 1.45 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.8, 134.2, 130.4, 127.2, 126.4, 124.5 (Ar-C), 66.8 (CH), 23.9 (CH_3), 18.9 ppm (CH_3).

$[\alpha]_D^{20}$ = -73.8 (*c* 0.90, $CHCl_3$).

(*S*)-1-(3-Methylphenyl)ethanol (***m*-4c**)

Colorless oil; yield: 126 mg (93%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.26-7.05 (m, 4 H, Ar-H), 4.84 (dq, 1 H, *J* = 6.5 Hz and 3.5 Hz, $PhCHCH_3$), 2.35 (s, 3 H, CH_3), 1.91 (br d, 1 H, *J* = 3.5 Hz, OH), 1.47 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 145.8, 138.1, 128.4, 128.2, 126.1, 122.4 (Ar-C), 70.4 (CH), 25.1 (CH_3), 21.4 ppm (CH_3).

$[\alpha]_D^{20}$ = -47.2 (*c* 1.09, $CHCl_3$).

(*S*)-1-(4-Methylphenyl)ethanol (***p*-4c**)

Colorless oil; yield: 124 mg (91%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.26-7.22 (m, 2 H, Ar-H), 7.16-7.11 (m, 2 H, Ar-H), 4.82 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.33 (s, 3 H, CH_3), 2.03 (br s, 1 H, OH), 1.46 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 142.9, 137.1, 129.2, 128.4, 125.4 (Ar-C), 70.2 (CH), 25.1 (CH_3), 21.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -53.4 (*c* 0.85, $CHCl_3$).

(*S*)-1-(2-Methoxyphenyl)ethanol (***o*-4d**)

Colorless oil; yield: 111 mg (73%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.35-7.32 (m, 1 H, Ar-H), 7.25-7.21 (m, 1 H, Ar-H), 6.97-6.93 (m, 1 H, Ar-H), 6.87-6.85 (m, 1 H, Ar-H), 5.08 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 3.84 (s, 3H, OCH_3), 2.77 (br s, 1 H, OH), 1.48 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 156.5, 133.6, 128.3, 126.1, 120.8, 110.5 (Ar-C), 66.4 (CH), 55.3 (OCH_3), 22.9 ppm (CH_3).

$[\alpha]_D^{20}$ = -15.5 (*c* 0.8, $CHCl_3$).

(*S*)-1-(3-Methoxyphenyl)ethanol (***m*-4d**)

Colorless oil; yield: 148 mg (97%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.27-7.21 (m, 1 H, Ar-H), 6.94-6.90 (m, 2 H, Ar-H), 6.79 (ddd, 1 H, *J* = 8.5 Hz, 1.5 Hz and 1.0 Hz, Ar-H), 4.84 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 3.79 (s, 3 H, OCH_3), 2.16 (br s, 1 H, OH), 1.46 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 159.8, 147.6, 129.5, 117.7, 112.9, 111.0 (Ar-C), 70.3 (CH), 55.2 (OCH_3), 25.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -38.9 (*c* 1.27, $CHCl_3$).

(*S*)-1-(4-Methoxyphenyl)ethanol (***p*-4d**)

Colorless oil; yield: 151 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.30-7.24 (m, 2 H, Ar-H), 6.89-6.85 (m, 2 H, Ar-H), 4.83 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 3.79 (s, 3 H, OCH_3), 1.99 (br s, 1 H, OH), 1.46 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 159.0, 138.1, 126.6, 113.9 (Ar-C), 69.9 (CH), 55.3 (OCH_3), 25.0 ppm (CH_3).

$[\alpha]_D^{20}$ = -49.1 (*c* 1.29, $CHCl_3$).

(*S*)-1-(2-Bromophenyl)ethanol (***o*-4e**)

Colorless oil; yield: 198 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.58-7.55 (m, 1 H, Ar-H), 7.50-7.48 (m, 1 H, Ar-H), 7.34-7.30 (m, 1 H, Ar-H), 7.13-7.08 (m, 1 H, Ar-H), 5.21 (q, 1 H, *J* =

6.5 Hz, $PhCHCH_3$), 2.35 (br s, 1 H, OH), 1.46 ppm (d, 3 H, J = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 144.7, 132.7, 128.7, 127.8, 126.7, 121.7 (Ar-C), 69.2 (CH), 23.6 ppm (CH_3).

$[\alpha]_D^{20}$ = -54.5 (*c* 1.65, $CHCl_3$).

(*S*)-1-(3-Bromophenyl)ethanol (***m*-4e**)
Colorless oil; yield: 198 mg (98%); ^1H NMR (500 MHz, $CDCl_3$): δ 7.51-7.50 (m, 1 H, Ar-H), 7.39-7.36 (m, 1 H, Ar-H), 7.27-7.24 (m, 1 H, Ar-H), 7.21-7.17 (m, 1 H, Ar-H), 4.82 (q, 1 H, J = 6.5 Hz, $PhCHCH_3$), 2.32 (br s, 1 H, OH), 1.45 ppm (d, 3 H, J = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 148.2, 130.4, 130.1, 128.6, 124.0, 122.6 (Ar-C), 69.7 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -32.6 (*c* 1.57, $CHCl_3$).

(*S*)-1-(4-Bromophenyl)ethanol (***p*-4e**)
Colorless oil; yield: 199 mg (99%); ^1H NMR (500 MHz, $CDCl_3$): δ 7.45 (d, 2 H, J = 8.0 Hz, Ar-H), 7.22 (d, 2 H, J = 8.0 Hz, Ar-H), 4.83 (q, 1 H, J = 6.0 Hz, $PhCHCH_3$), 2.16 (br s, 1 H, OH), 1.44 ppm (d, 3 H, J = 6.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 144.8 (ArC-Br), 131.5, 127.2, 121.1 (Ar-C), 69.7 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -72.1 (*c* 1.66, $CHCl_3$).

(*S*)-1-(2-Trifluoromethylphenyl)ethanol (***o*-4f**)
Colorless oil; yield: 114 mg (60%); ^1H NMR (500 MHz, $CDCl_3$): δ 7.81 (d, 1 H, J = 8.0 Hz, Ar-H), 7.61-7.55 (m, 2 H, Ar-H), 7.35 (t, 1 H, J = 7.5 Hz, Ar-H), 5.32 (q, 1 H, J = 6.5 Hz, $PhCHCH_3$), 2.20 (br s, 1 H, OH), 1.47 ppm (d, 3 H, J = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 145.1, 132.4, 127.3, 127.1, 125.5, 125.3 (q, J = 6.3 Hz), 123.3, 65.7 (q, J = 2.5 Hz, CH), 25.4 ppm (CH_3).

$[\alpha]_D^{20}$ = -39.1 (*c* 1.44, MeOH).

(*S*)-1-(3-Trifluoromethylphenyl)ethanol (***m*-4f**)
Colorless oil; yield: 156 mg (82%); ^1H NMR (500 MHz, $CDCl_3$): δ 7.63-7.25 (m, 4 H, Ar-H), 4.91 (q, 1 H, J = 6.5 Hz, $PhCHCH_3$), 2.45 (br s, 1 H, OH), 1.48 ppm (d, 3 H, J = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 146.7, 130.8 (q, J = 32.5 Hz), 128.9, 128.8, 124.2 (q, J = 4.6 Hz), 124.1 (q, J = 270.8 Hz), 122.2 (q, J = 4.4 Hz), 69.8 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -27.6 (*c* 1.05, $CHCl_3$).

(*S*)-1-(4-Trifluoromethylphenyl)ethanol (***p*-4f**)
Colorless oil; yield: 125 mg (66%); ^1H NMR (500 MHz, $CDCl_3$): δ 7.58 (d, 2 H, J = 8.0 Hz, Ar-H), 7.45 (d, 2 H, J = 8.0 Hz, Ar-H), 4.92 (q, 1 H, J = 6.5 Hz, $PhCHCH_3$), 2.41 (br s, 1 H, OH), 1.48 ppm (3 H, J = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 149.7, 129.6 (q, J = 32.0 Hz), 125.6, 125.4 (q, J = 3.9 Hz), 123.1, 69.8 (CH), 25.3 ppm (CH_3).

$[\alpha]_D^{20}$ = -32.0 (*c* 0.86, $CHCl_3$).

(*S*)-1-(4-Fluorophenyl)ethanol (**4g**)

Colorless oil; yield: 138 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.33-7.30 (m, 2 H, Ar-H), 7.04-6.99 (m, 2 H, Ar-H), 4.85 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.16 (br s, 1 H, OH), 1.45 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 162.1 (d, *J* = 242.5 Hz), 141.6 (d, *J* = 2.5 Hz), 127.0 (d, *J* = 8.8 Hz), 115.2 (d, *J* = 20.0 Hz, Ar-C), 69.7 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -81.5 (*c* 1.58, $CHCl_3$).

(*S*)-1-(4-Iodophenyl)ethanol (**4h**)

Pinkish solid; yield: 170 mg (69%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.67-7.63 (m, 2 H, Ar-H), 7.09 (d, 2 H, *J* = 8.0 Hz, Ar-H), 4.80 (q, 1 H, *J* = 6.0 Hz, $PhCHCH_3$), 2.22 (br s, 1 H, OH), 1.43 ppm (d, 3 H, *J* = 6.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 145.5, 137.5, 127.4, 92.7, 69.8 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -33.1 (*c* 1.25, $CHCl_3$).

(*S*)-1-(4-Nitrilephenyl)ethanol (**4i**)

Colorless oil; yield: 144 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.61 (d, 2 H, *J* = 8.5 Hz, Ar-H), 7.48 (d, 2 H, *J* = 8.0 Hz, Ar-H), 4.94 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.72 (br s, 1 H, OH), 1.48 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 151.3, 132.3, 126.1, 118.9, 110.9, 69.5 (CH), 25.3 ppm (CH_3).

$[\alpha]_D^{20}$ = -46.4 (*c* 2.40, $CHCl_3$).

(*S*)-1-(4-Ethylphenyl)ethanol (**4j**)

Colorless oil; yield: 150 mg (99%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.28-7.21 (m, 2 H, Ar-H), 7.18-7.14 (m, 2 H, Ar-H), 4.82 (dq, 1 H, *J* = 6.5 Hz and 2.0 Hz, $PhCHCH_3$), 2.63 (q, 2 H, *J* = 7.5 Hz, CH_2), 2.08 (br d, 1 H, *J* = 2.0 Hz, OH), 1.46 (d, 3 H, *J* = 6.5 Hz, CH_3), 1.22 ppm (t, 3 H, *J* = 7.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.5, 143.2, 128.0, 125.5 (Ar-C), 70.2 (CH), 28.5 (CH_2), 25.0 (CH_3), 15.6 ppm (CH_3).

$[\alpha]_D^{20}$ = -45.3 (*c* 1.13, $CHCl_3$).

(*S*)-1-(3,4-Dimethoxyphenyl)ethanol (**4k**)

Colorless oil; yield: 161 mg (88%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 6.92 (d, 1 H, *J* = 2.0 Hz, Ar-H), 6.86 (dd, 1 H, *J* = 8.0 Hz and 2.0 Hz, Ar-H), 6.81 (d, 1 H, *J* = 8.0 Hz, Ar-H), 4.81 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 3.87 (s, 3 H, OCH_3), 3.85 (s, 3 H, OCH_3), 2.31 (br s, 1 H, OH), 1.46 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 149.1, 148.3, 138.7, 117.5, 111.1, 108.8 (Ar-C), 70.1 (CH), 55.9 (CH_3), 55.8 (CH_3), 25.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -37.2 (*c* 1.09, $CHCl_3$).

(*S*)-1-(3,4-Dichlorophenyl)ethanol (**4l**)

Pale yellow oil; yield: 183 mg (96%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.44 (d, 1 H, *J* = 2.0 Hz, Ar-H), 7.38 (d, 1 H, *J* = 8.5 Hz, Ar-H), 7.16 (dd, 1 H, *J* = 8.5 Hz and 2.0, Ar-H), 4.82 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.36 (br s, 1 H, OH), 1.44 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 146.0, 132.5, 131.1, 130.4, 127.5, 124.8, 69.2 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -33.7 (*c* 1.44, $CHCl_3$).

(*S*)-1-(2-Naphthyl)ethanol (**4m**)

White solid; yield: 169 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.83-7.78 (m, 4 H), 7.50-7.43 (m, 3 H), 5.04 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.04 (br s, 1 H, OH), 1.56 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.2, 133.4, 133.0, 128.3, 128.0, 127.7, 126.1, 125.8, 123.8, 123.7, 70.5 (CH), 25.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -46.4 (*c* 1.61, $CHCl_3$).

(*S*)-1-(1-Naphthyl)ethanol (**4n**)

White solid; yield: 163 mg (95%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.04-8.02 (m, 1 H), 7.84-7.81 (m, 1 H), 7.72 (d, 1 H, *J* = 8.5 Hz), 7.60 (d, 1 H, *J* = 7.0 Hz), 7.48-7.40 (m, 3 H), 5.56 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 2.33 (br s, 1 H, OH), 1.59 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 141.4, 133.8, 130.3, 128.9, 127.9, 126.0, 125.6, 123.2, 122.0, 67.1 (CH), 24.4 ppm (CH_3).

$[\alpha]_D^{20}$ = -69.4 (*c* 1.18, $CHCl_3$).

(*S*)-1-(Anthracen-2-yl)ethanol (**4o**)

White solid; yield: 216 mg (97%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.27-8.32 (m, 5 H, Ar-H), 7.79-7.85 (m, 3 H, Ar-H), 5.10 (q, 1 H, *J* = 6.5 Hz, $PhCHCH_3$), 1.59 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ 152.6, 134.5, 134.2, 134.1, 133.6, 132.6, 127.8, 127.2, 124.0, 69.8 (CH), 25.3 ppm (CH_3).

(*R*)-1,1-Diphenyl-2-propanol (**4p**)

White solid; yield: 144 mg (68%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.32-7.14 (m, 10 H, Ar-H), 4.55-4.48 (m, 1 H), 3.79 (d, 1 H, *J* = 9.0 Hz), 1.73 (br s, 1 H, OH), 1.17 ppm (d, 3 H, *J* = 6.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 142.6, 141.6, 128.9, 128.7, 128.6, 128.3, 126.9, 126.6, 70.1 (CH), 60.6 (CH), 21.5 ppm (CH_3).

$[\alpha]_D^{20}$ = +14.5 (*c* 1.94, $CHCl_3$).

(*S*)-1-Phenylpropan-1-ol (**6a**)

Colorless oil; yield: 109 mg (80%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.35-7.22 (m, 5 H, Ar-H), 4.54 (t, 1 H, *J* = 6.5 Hz, $PhCHCH_2$), 2.20 (br s, 1 H, OH), 1.83-1.68 (m, 2 H, CH_2), 0.89 ppm (t, 3 H, *J* = 7.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 144.6, 128.4, 127.5, 126.0 (Ar-C), 76.0 (CH), 31.9 (CH_2), 10.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -47.2 (*c* 0.72, $CHCl_3$).

(*S*)-1-*p*-Tolylpropan-1-ol (**6b**)

Colorless oil; yield: 150 mg (99%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.25-7.19 (m, 2 H, Ar-H), 7.15-7.11 (m, 2 H, Ar-H), 4.52 (t, 1 H, *J* = 6.5 Hz, $PhCHCH_2$), 2.33 (s, 3 H, CH_3), 1.96 (br s, 1 H, OH), 1.84-1.67 (m, 2 H, CH_2), 0.89 ppm (t, 3 H, *J* = 7.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 141.7, 137.1, 129.1, 126.0 (Ar-C), 75.9 (CH), 31.8 (CH_2), 21.1 (CH_3), 10.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -43.4 (*c* 1.20, $CHCl_3$).

(*R*)-1-Phenylbutan-1-ol (**6c**)

White solid; yield: 140 mg (93%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.34-7.32 (m, 4 H, Ar-H), 7.27-7.24 (m, 1 H, Ar-H), 4.66 (t, 1 H, *J* = 6.5 Hz, $PhCHCH_2$), 1.93 (br s, 1 H, OH), 1.80-1.63 (m, 2 H, CH_2), 1.46-1.27 (m, 2 H, CH_2), 0.92 ppm (t, 3 H, *J* = 7.5Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 145.0, 128.4, 127.5, 125.9 (Ar-C), 74.4 (CH), 41.2 (CH_2), 19.0 (CH_2), 13.9 ppm (CH_3).

$[\alpha]_D^{20}$ = +50.2 (*c* 2.38, $CHCl_3$).

(*R*)-1-Phenylpentan-1-ol (**6d**)

Colorless oil; yield: 160 mg (97%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.35-7.30 (m, 4 H, Ar-H), 7.27-7.23 (m, 1 H, Ar-H), 4.64 (t, 1 H, *J* = 6.5 Hz, $PhCHCH_2$), 2.03 (br s, 1 H, OH), 1.81-1.66 (m, 2 H, CH_2), 1.40-1.21 (m, 4H, CH_2), 0.88 ppm (t, 3 H, *J* = 7.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 145.0, 128.4, 127.4, 125.9 (Ar-C), 74.7 (CH), 38.8 (CH_2), 28.0 (CH_2), 22.6 (CH_2), 14.0 ppm (CH_3).

$[\alpha]_D^{20}$ = +40.3 (*c* 1.32, $CHCl_3$).

(*S*)-2-Methyl-1-phenylpropan-1-ol (**6e**)

Colorless oil; yield: 140 mg (92%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.34-7.24 (m, 5 H, Ar-H), 4.35 (d, 1 H, *J* = 7.0 Hz), 1.98-1.91 (m, 2 H), 1.00 (d, 3 H, *J* = 7.0 Hz, CH_3), 0.79 ppm (d, 3 H, *J* = 7.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.7, 128.2, 127.4, 126.6, 80.0, 35.3, 19.0 (CH_3), 18.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -28.0 (*c* 0.55, $CHCl_3$).

(*S*)-Cyclopropyl phenyl methanol (**6f**)

Colorless oil; yield: 148 mg (99%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.41-7.25 (m, 5 H, Ar-H), 3.97 (d, 1 H, *J* = 8.5 Hz), 2.23 (br s, 1 H, OH), 1.21-1.16 (m, 1 H), 0.62-0.33 ppm (m, 4 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.9, 128.4, 127.5, 126.1, 78.5, 19.1, 3.6, 2.8 ppm.

$[\alpha]_D^{20}$ = +24.7 (*c* 1.04, $CHCl_3$).

(*R*)-Cyclohexyl phenyl methanol (**6g**)

White solid; yield: 120 mg (63%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.35-7.24 (m, 5 H, Ar-H), 4.35 (q, 1 H, *J* = 4.5 Hz, CH), 1.99-1.96 (m, 1 H), 1.86 (br s, 1 H, OH), 1.78-1.74 (m, 1 H), 1.66-1.59

(m, 3 H), 1.39-1.35 (m, 1 H), 1.22-0.91 ppm (m, 5 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.6, 128.2, 127.4, 126.6, 79.4 (CH), 45.0 (CH), 29.3 (CH_2), 28.8 (CH_2), 26.4 (CH_2), 26.1 (CH_2), 26.0 ppm (CH_2).

$[\alpha]_D^{20}$ = +73.8 (*c* 1.04, $CHCl_3$).

(*R*)-α-(Trifluoromethyl)-benzenemethanol (**6h**)
Colorless oil; yield: 145 mg (82%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.46-7.36 (m, 5 H, Ar-H), 4.98 (q, 1 H, *J* = 6.5 Hz, CH), 3.02 ppm (br s, 1 H, OH); ^{13}C NMR (125 MHz, $CDCl_3$): δ 134.1, 129.5, 128.6, 127.4, 124.3 (d, *J* = 275 Hz), 72.8 ppm (q, *J* = 32.5 Hz).

$[\alpha]_D^{20}$ = -26.4 (*c* 0.5, $CHCl_3$).

(*S*)-1,2-Diphenylethanol (**6i**)
Colorless solid; yield: 94 mg (95%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.35-7.17 (m, 10 H, Ar-H), 4.91-4.87 (m, 1 H), 3.06-2.96 (m, 2 H), 2.00 ppm (br d, 1 H, *J* = 3.0 Hz, OH); ^{13}C NMR (125 MHz, $CDCl_3$): δ 143.8, 138.1, 129.5, 128.5, 128.4, 127.6, 126.6, 125.9, 75.4, 46.1 ppm.

$[\alpha]_D^{20}$ = -15.0 (*c* 0.77, $CHCl_3$).

(*S*)-(*E*)-1,3-Diphenyl-2-propen-1-ol (**6j**)
Colorless oil; yield: 103 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.32-7.19 (m, 10 H, Ar-H), 6.64 (d, 1 H, *J* = 16.0 Hz), 6.35 (dd, 1 H, *J* = 16.0 Hz and 9.5 Hz), 5.33 (d, 1 H, *J* = 6.0 Hz), 2.33 ppm (br d, 1 H, *J* = 3.0 Hz, OH); ^{13}C NMR (125 MHz, $CDCl_3$): δ 142.9, 136.6, 131.6, 130.6, 128.7, 128.6, 127.8, 126.7, 126.4, 75.1 ppm.

$[\alpha]_D^{20}$ = -25.4 (*c* 0.56, $CHCl_3$).

(*S*)-1-(Pyridin-4-yl)ethanol (**8a**)
White solid; yield: 98 mg (80%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.46 (d, 2 H, *J* = 5.5 Hz), 7.30 (d, 2 H, *J* = 5.5 Hz), 4.89 (q, 1 H, *J* = 7.0 Hz, CH), 3.20 (br s, 1 H, OH), 1.48 ppm (d, 3 H, *J* = 7.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 155.4, 149.4, 120.5, 68.6 (CH), 25.0 ppm (CH_3).

$[\alpha]_D^{20}$ = -39.2 (*c* 0.86, C_2H_5OH).

(*S*)-1-(Pyridin-3-yl)ethanol (**8b**)
Colorless oil; yield: 121 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.46-8.33 (m, 2 H), 7.75-7.70 (m, 1 H), 7.24 (dd, 1 H, *J* = 8.0 Hz and 5.0 Hz), 4.90 (q, 1 H, *J* = 6.5 Hz, CH), 4.49 (br s, 1 H, OH), 1.49 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 148.0, 147.0, 141.8, 133.5, 123.5, 67.5 (CH), 25.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -39.0 (*c* 0.93, C_2H_5OH).

(*S*)-1-(Pyridin-2-yl)ethanol (**8c**)

Colorless oil; yield: 120 mg (97%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.52 (d, 1 H, *J* = 5.0 Hz), 7.70-7.66 (m, 1 H), 7.30 (d, 1 H, *J* = 8.0 Hz), 7.20-7.17 (m, 1 H), 4.89 (q, 1 H, *J* = 6.5 Hz, CH), 4.47 (br s, 1 H, OH), 1.50 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 163.3, 148.1, 136.8, 122.2, 119.8, 69.0 (CH), 24.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -36.4 (*c* 1.90, $CHCl_3$).

(*S*)-1-(Thiophen-2-yl)ethanol (**8d**)

Colorless oil; yield: 118 mg (92%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.25-7.18 (m, 1 H), 6.95-6.92 (m, 2 H), 5.07 (q, 1 H, *J* = 6.5 Hz, CH), 2.54 (br s, 1 H, OH), 1.56 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 150.0, 126.6, 124.4, 123.2, 66.2 (CH), 25.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -23.2 (*c* 0.79, $CHCl_3$).

(*S*)-1-(5-Chlorothiophen-2-yl)ethanol (**8e**)

Colorless oil; yield: 153 mg (94%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 6.74 (d, 1 H, *J* = 4.0 Hz), 6.71 (dd, 1 H, *J* = 4.0 Hz and 0.5 Hz), 5.01-4.96 (m, 1 H, CH), 2.24 (br s, 1 H, OH), 1.54 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 148.6, 129.0, 125.6, 122.4, 66.4 (CH), 25.0 ppm (CH_3).

$[\alpha]_D^{20}$ = -19.8 (*c* 1.30, $CHCl_3$).

(*S*)-1-(Thiophen-2-yl)propan-1-ol (**8f**)

Colorless oil; yield: 140 mg (98%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.25-7.21 (m, 1 H), 6.97-6.93 (m, 2 H), 4.81 (td, 1 H, *J* = 6.5 Hz and 4.5 Hz, CH), 2.27 (br d, 1 H, *J* = 4.5 Hz, OH), 1.92-1.78 (m, 2 H, CH_2), 0.95 ppm (t, 3 H, *J* = 7.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 148.7, 126.6, 124.4, 123.7, 71.7 (CH), 32.2 (CH_2), 10.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -26.1 (*c* 1.13, $CHCl_3$).

(*R*)-1-(Thiophen-2-yl)butan-1-ol (**8g**)

Colorless oil; yield: 150 mg (96%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.21 (d, 1 H, *J* = 3.5 Hz), 6.95-6.93 (m, 2 H), 4.88 (t, 1 H, *J* = 6.5 Hz, CH), 2.32 (br s, 1 H, OH), 1.88-1.74 (m, 2 H, CHCH_2), 1.48-1.32 (m, 2 H, CH_2CH$_3$), 0.94 ppm (t, 3 H, *J* = 7.5 Hz, CH_3). ^{13}C NMR (125 MHz, $CDCl_3$): δ 149.0, 126.6, 124.4, 123.6, 70.0 (CH), 41.4 (CH_2), 19.0 (CH_2), 13.8 ppm (CH_3).

$[\alpha]_D^{20}$ = +27.0 (*c* 1.27, $CHCl_3$).

(*S*)-1-(2,5-Dimethylthiophen-3-yl)ethanol (**8h**)

White solid; yield: 138 mg (88%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 6.68 (s, 1 H), 4.90 (q, 1 H, *J* = 6.5 Hz, CH), 2.39 (s, 3 H, CH_3), 2.35 (s, 3 H, CH_3), 1.64 (br s, 1 H, OH), 1.44 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 141.2, 136.1, 131.6, 123.5, 64.5 (CH), 23.9 (CH_3), 15.1 (CH_3), 12.6 ppm (CH_3).

$[\alpha]_D^{20}$ = -78.7 (*c* 1.31, $CHCl_3$).

(*S*)-1-(Furan-2-yl)ethanol (**8i**)

Colorless oil; yield: 100 mg (90%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.36 (dd, 1 H, *J* = 2.0 Hz and 1.0 Hz), 6.32 (dd, 1 H, *J* = 3.0 Hz and 2.0 Hz), 6.22 (d, 1 H, *J* = 3.0 Hz), 4.86 (q, 1 H, *J* = 6.5 Hz, CH), 2.35 (br s, 1 H, OH), 1.52 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 157.7, 141.8, 110.1, 105.1, 63.6 (CH), 21.2 ppm (CH_3).

$[\alpha]_D^{20}$ = -13.6 (*c* 0.55, $CHCl_3$).

(*S*)-1-(5-Methylfuran-2-yl)ethanol (**8j**)

Colorless oil; yield: 119 mg (95%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 6.08 (d, 1 H, *J* = 3.0 Hz), 5.89 (dd, 1 H, *J* = 3.0 Hz and 1.0 Hz), 4.80 (q, 1 H, *J* = 7.0 Hz, CH), 2.27 (s, 3 H, CH_3), 2.17 (br s, 1 H, OH), 1.51 ppm (d, 3 H, *J* = 7.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 155.9, 151.6, 105.9, 105.8, 63.6 (CH), 21.2 (CH_3), 13.4 ppm (CH_3).

$[\alpha]_D^{20}$ = -6.0 (*c* 0.81, $CHCl_3$).

(–)-1-(2,5-Dimethylfuran-3-yl)ethanol (**8k**)

Pale yellow oil; yield: 105 mg (75%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 5.93 (s, 1 H), 4.74 (q, 1 H, *J* = 6.5 Hz, CH), 2.22 (s, 6 H, CH_3), 2.12 (br s, 1 H, OH), 1.39 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 149.7, 145.4, 124.0, 104.1, 62.6 (CH), 23.7 (CH_3), 13.3 (CH_3), 11.5 ppm (CH_3).

$[\alpha]_D^{20}$ = -13.1 (*c* 1.34, $CHCl_3$).

(*S*)-1-(Benzofuran-2-yl)ethanol (**8l**)

Brown yellow oil, yield: 147 mg (90%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.53 (m, 1 H), 7.45 (m, 1 H), 7.26 (ddd, *J* = 8.0 Hz, 1.6 Hz, 1 H), 7.20 (ddd, J = 7.5 Hz, 1.1 Hz, 1 H), 6.61 (s, 1 H), 5.02 (m, 1 H), 2.17 (br s, 1 H), 1.63 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ 160.6, 155.0, 128.2, 124.2, 122.8, 121.1, 111.3, 101.9, 64.0, 21.5 ppm.

(*S*)-1-(2-Thiazolyl)ethanol (**8m**)

Pale yellow oid; yield: 100 mg (77%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.65-7.63 (m, 1 H), 7.26-7.25 (m, 1 H), 5.14 (q, 1 H, *J* = 6.5 Hz, CH), 4.97 (br s, 1 H, OH), 1.61 ppm (d, 3 H, *J* = 6.5 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 177.1, 142.0, 118.8, 67.7 (CH), 24.1 ppm (CH_3).

$[\alpha]_D^{20}$ = -11.4 (*c* 0.60, $CHCl_3$).

(-)-1-(2,4-Dimethylthiazol-5-yl)ethanol (**8n**)

Colorless oil; yield: 150 mg (95%); ^{1}H NMR (500 MHz, $CDCl_3$): δ 5.09 (q, 1 H, *J* = 6.0 Hz, CH), 3.95 (br s, 1 H, OH), 2.56 (s, 3 H, CH_3), 2.25 (s, 3 H, CH_3), 1.49 ppm (d, 3 H, *J* = 6.0 Hz, CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ 163.4, 146.1, 137.0, 63.2 (CH), 25.5 (CH_3), 18.9 (CH_3), 14.8 ppm (CH_3).

$[\alpha]_D^{20}$ = -86.3 (*c* 1.08, $CHCl_3$).

(*S*)-Ethyl-3-hydroxy-3-phenylpropanoate (**10a**)

Colorless oil; yield: 184 mg (95%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.12-7.28 (m, 5 H), 4.93 (dd, *J* = 8.0, 4.0 Hz, 1H), 4.20 (q, *J* = 7.0 Hz, 2H), 2.71-2.76 (m, 2 H), 1.29 ppm (t, *J* = 7.0 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 172.6, 144.5, 126.6, 122.6, 70.4, 61.3, 43.4, 14.2 ppm (CH_3).

(*S*)-Ethyl-3-hydroxy-3-(4-methylphenyl)propanoate (**10b**)

White solid; yield: 202 mg (97%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.25-7.29 (m, 2 H), 7.16-7.19 (m, 2H), 5.11 (m, 1H), 4.18 (q, *J* = 7.0 Hz, 2H), 2.66-2.80 (m, 2 H), 2.36 (s, 3 H), 1.28 ppm (t, *J* = 7.0 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 172.5, 139.9, 137.5, 129.3, 126.7, 70.2, 61.3, 43.4, 21.1, 14.1 ppm.

(*S*)-Ethyl-3-hydroxy-3-(4-fluorophenyl)propanoate (**10c**)

White solid; yield: 197 mg (93%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.28-7.35 (m, 2 H), 7.02-7.05 (m, 2H), 5.10 (m, 1H), 4.18 (m, 2H), 2.68-2.75 (m, 2 H), 1.26 ppm (t, *J* = 7.0 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 172.4, 162.3 (d, $^{1}J_{C\text{-}F}$ = 258.6 Hz), 140.1 (d, $^{2}J_{C\text{-}F}$ = 172.4 Hz), 127.4, 116.6, 69.6, 61.2, 43.3, 14.0 ppm.

(*S*)-Ethyl-3-hydroxy-3-(4-iodophenyl)propanoate (**10d**)

White solid; yield: 288 mg (90%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.57-7.60 (m, 2 H), 6.99-7.02 (m, 2H), 4.79 (dd, *J* = 8.4, 4.4 Hz, 1H), 4.08 (q, *J* = 7.2 Hz, 2H), 3.70-3.74 (m, 2 H), 1.18 ppm (t, *J* = 7.2 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 172.3, 144.0, 137.6, 127.5, 92.3, 73.6, 61.2, 43.2, 14.2 ppm.

(*S*)-Ethyl-3-hydroxy-3-(3,4,5-trimethoxylphenyl)propanoate (**10e**)

White solid; yield: 270 mg (95%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 6,59 (m, 2H), 4.88 (dd, *J* = 8.8, 3.6 Hz, 1H), 3.86 (s, 9H), 3.70 (q, *J* = 6.8 Hz, 2H), 1.88-2.02 (m, 2 H), 1.23 ppm (t, *J* = 6.8 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 163.3, 143.4, 137.1, 102.6, 74.4, 61.6, 56.1, 40.6, 14.1 ppm.

(*S*)-Ethyl-3-hydroxy-3-(3-nitrophenyl)propanoate (**10f**)

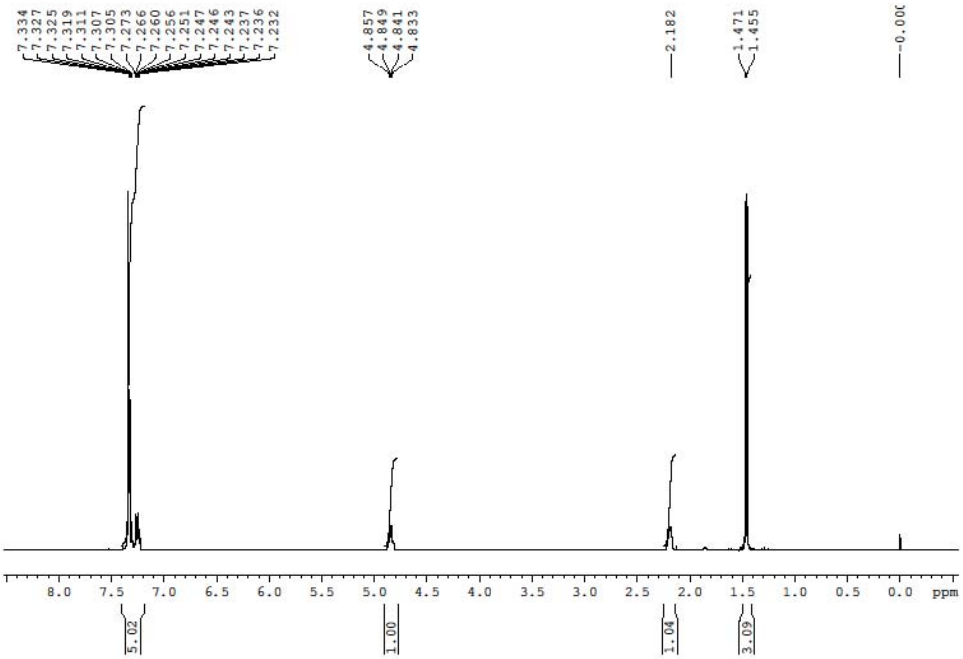
White solid; yield: 213 mg (89%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.17-8.18 (m, 1H), 8.03-8.06 (m, 1 H), 7.63-7.65 (d, *J* = 7.7 Hz, 1H), 7.43-7.47 (m, 1H), 5.02 (m, 1H), 3.83 (q, *J* = 7.0 Hz, 2H), 2.85 (m, 2 H), 1.92 ppm (m, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 148.4, 146.6, 131.8, 129.2, 122.4, 120.7, 73.2, 61.3, 40.3, 14.2 ppm.

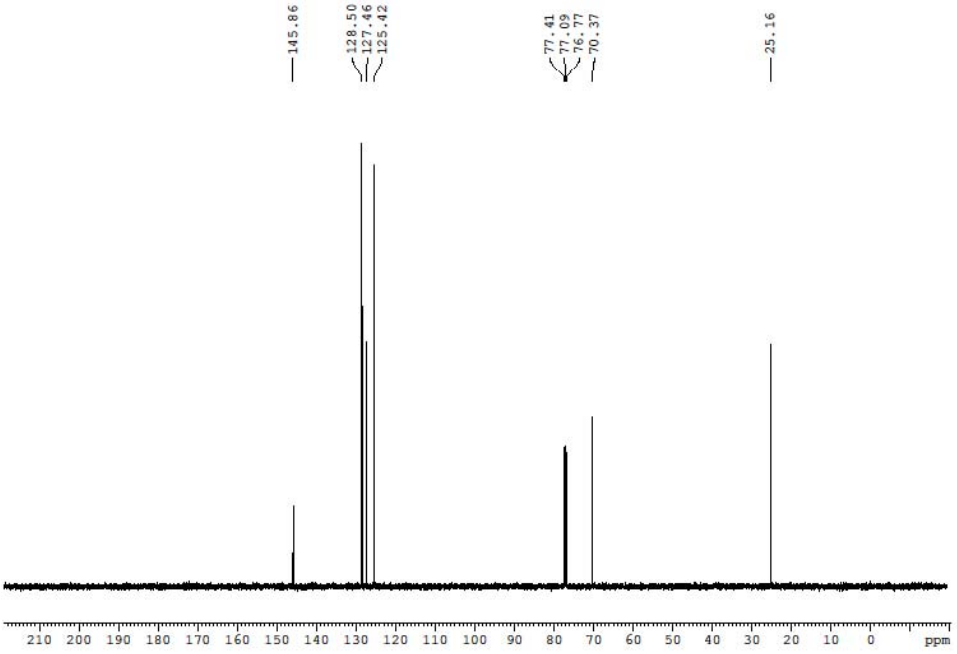
(*S*)-Ethyl-3-hydroxy-3-(3-methylphenyl)propanoate (**10g**)

White solid; yield: 200 mg (96%); ^{1}H NMR (400 MHz, $CDCl_3$): δ 7.12-7.28 (m, 4 H), 5.11 (dd, *J* = 8.8, 3.9 Hz, 1H), 4.18 (q, *J* = 7.2 Hz, 2H), 2.38 (s, 3 H), 1.91-2.02 (m, 2H), 1.29 ppm (t, *J* = 7.2 Hz, 3 H); ^{13}C NMR (125 MHz, $CDCl_3$): δ 172.5, 144.4, 142.5, 138.2, 126.4, 122.8, 70.3, 60.9, 43.3, 21.3, 14.0 ppm.

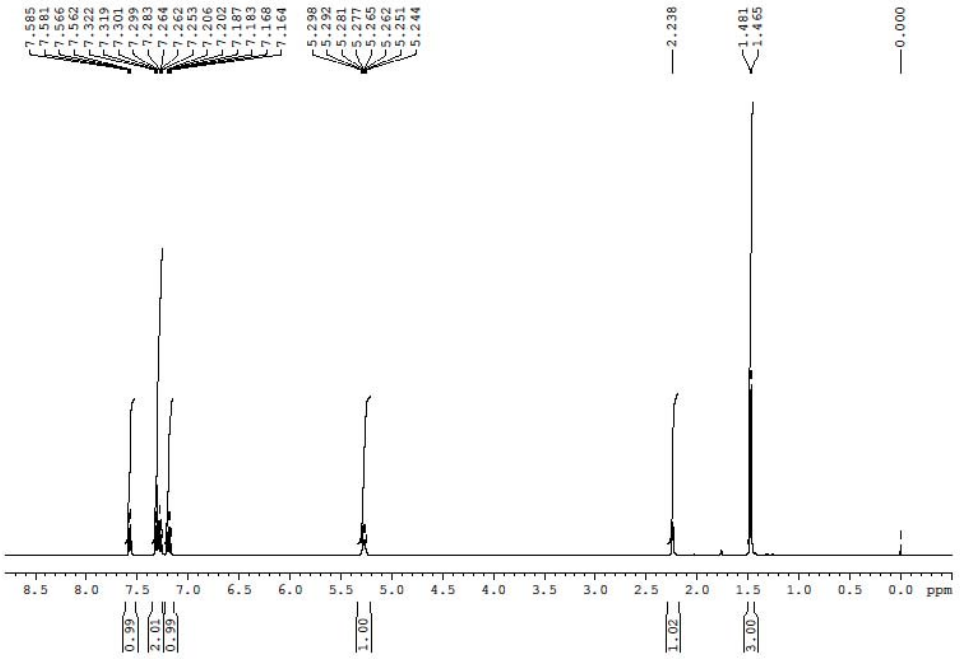
5. NMR spectra of hydrogenation products

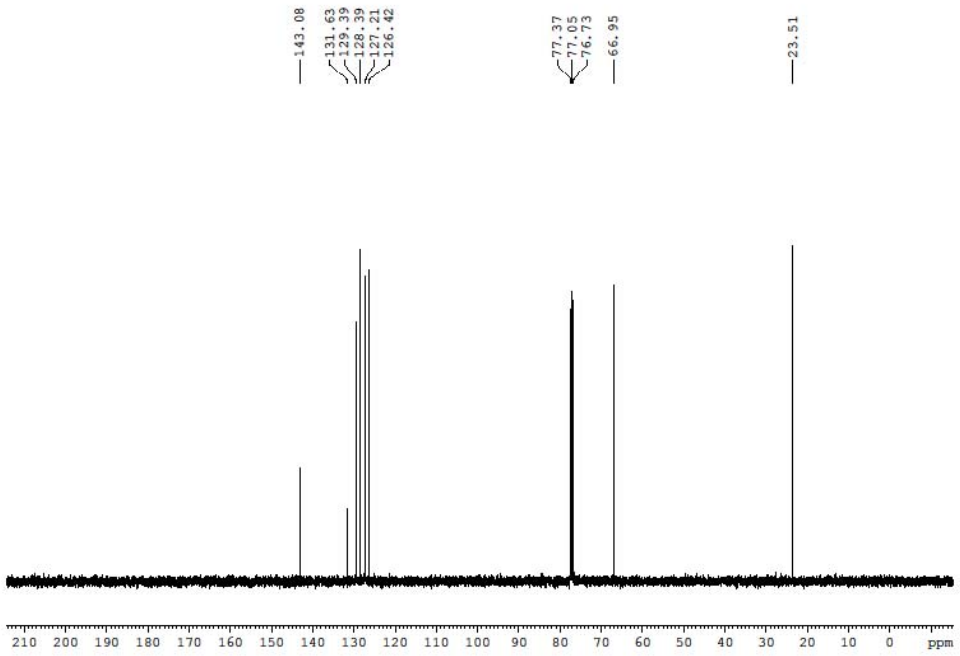
(*S*)-1-Phenylethanol (**4a**)



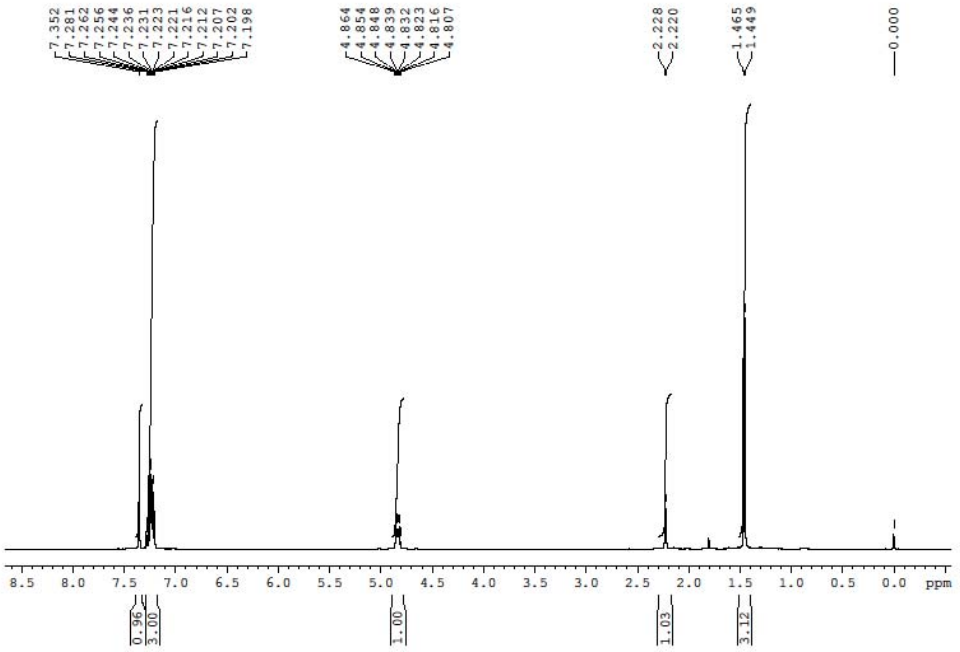


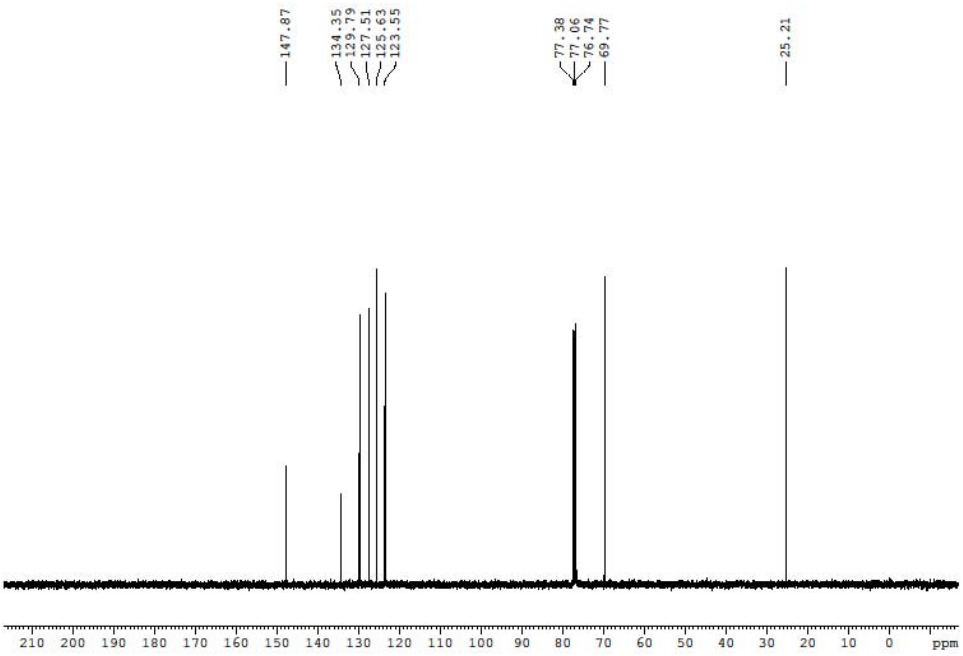
(*S*)-1-(2-Chlorophenyl)ethanol (***o*-4b**)



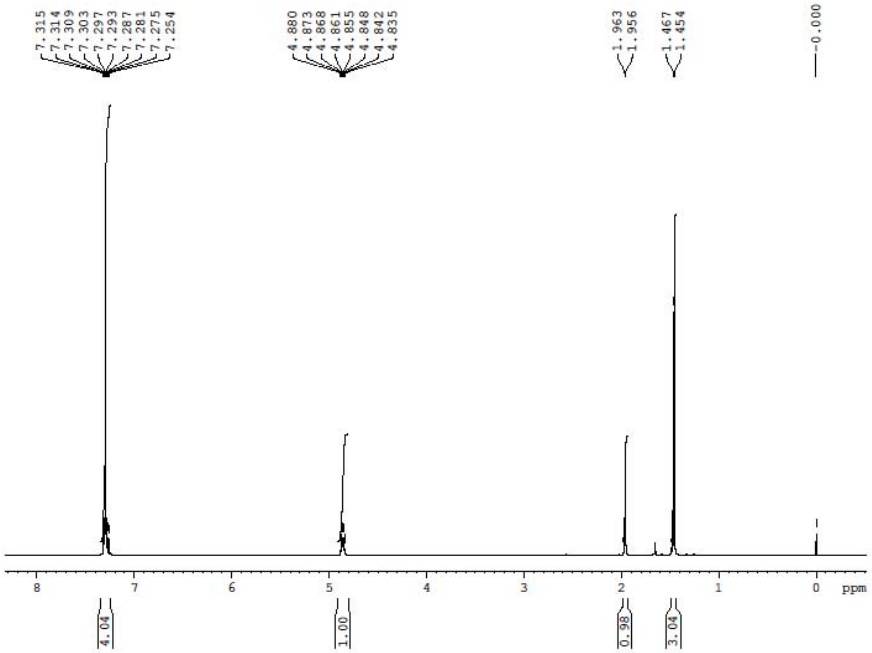


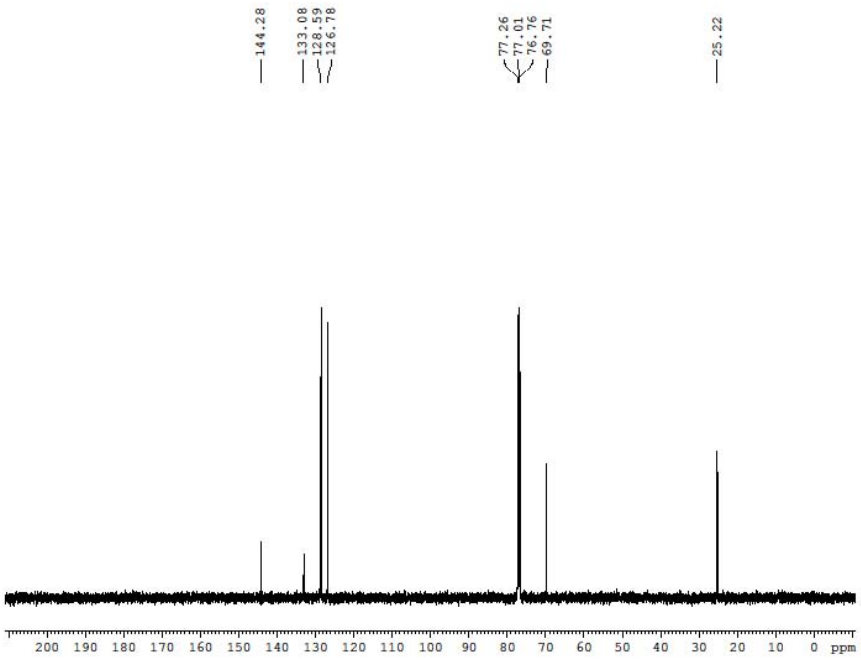
(*S*)-1-(3-Chlorophenyl)ethanol (***m*-4b**)



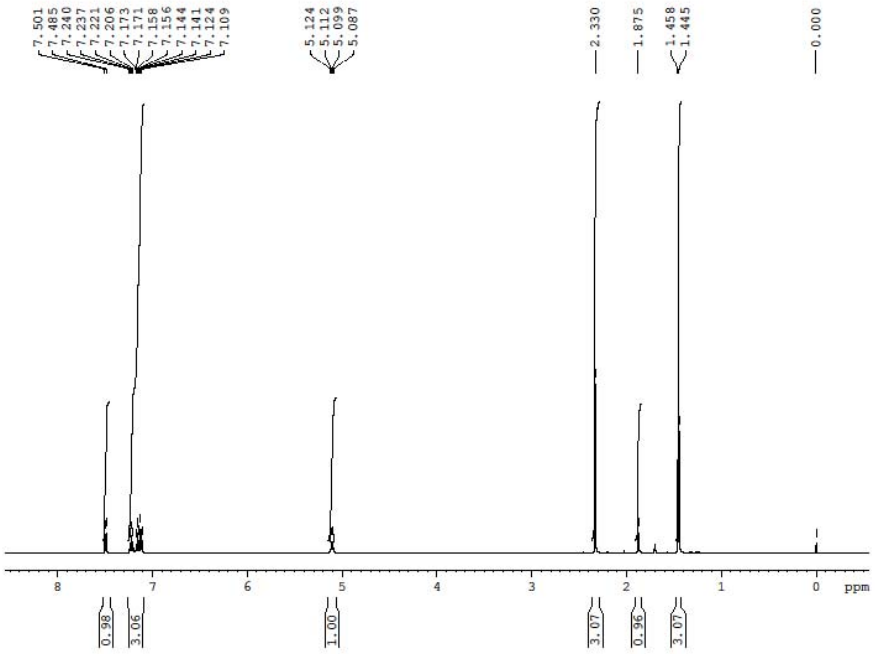


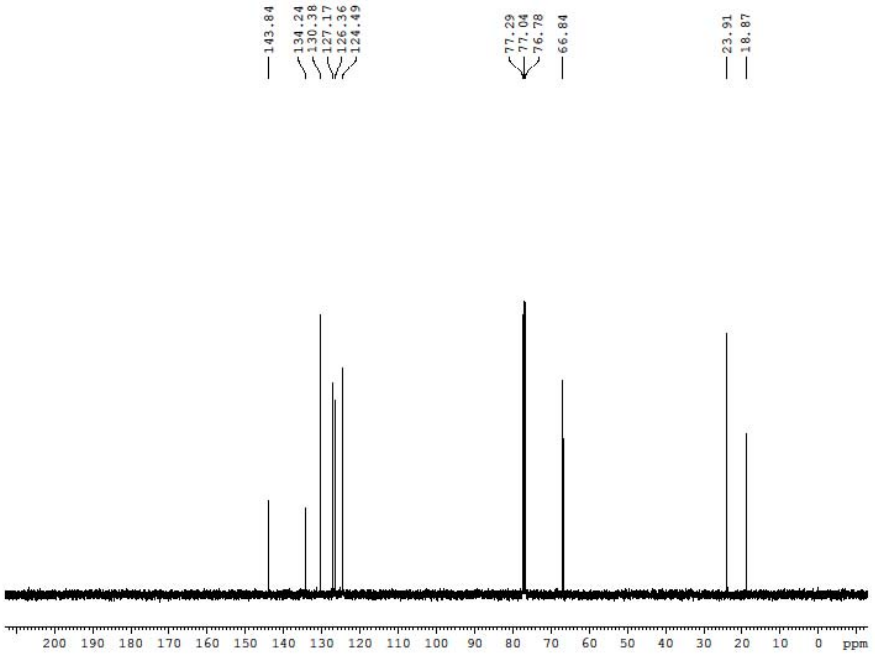
(*S*)-1-(4-Chlorophenyl)ethanol (***p*-4b**)



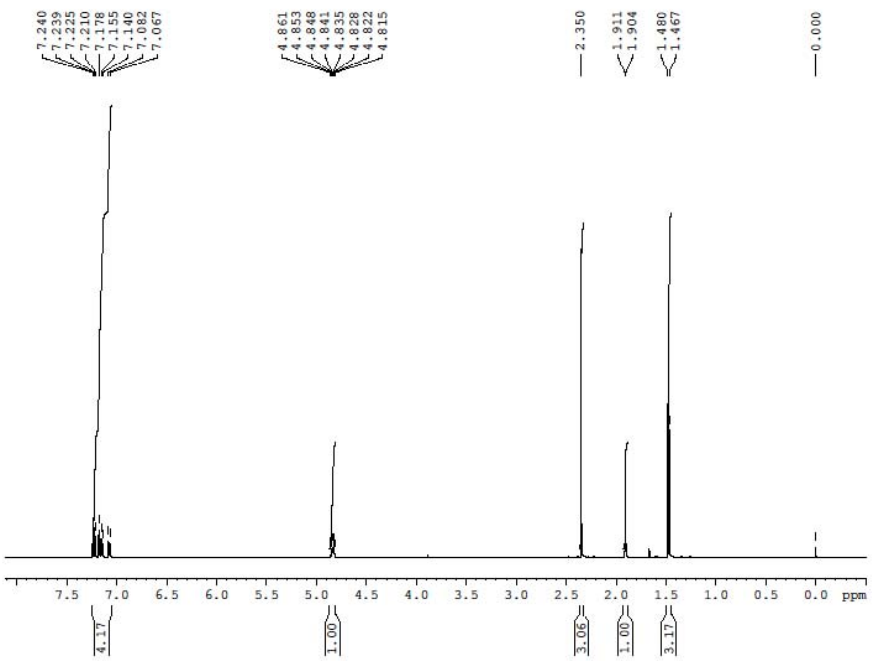


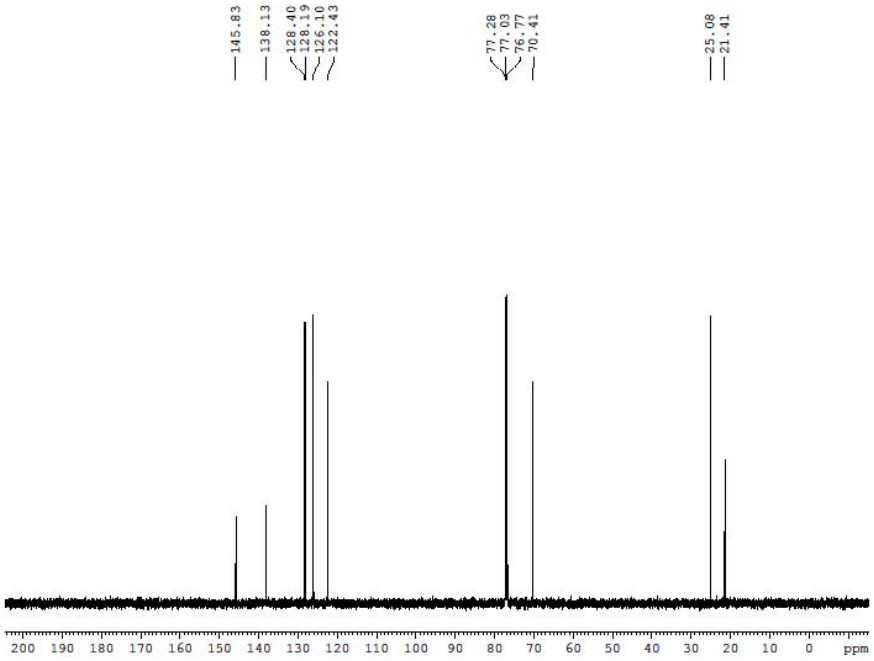
(*S*)-1-(2-Methylphenyl)ethanol (***o*-4c**)



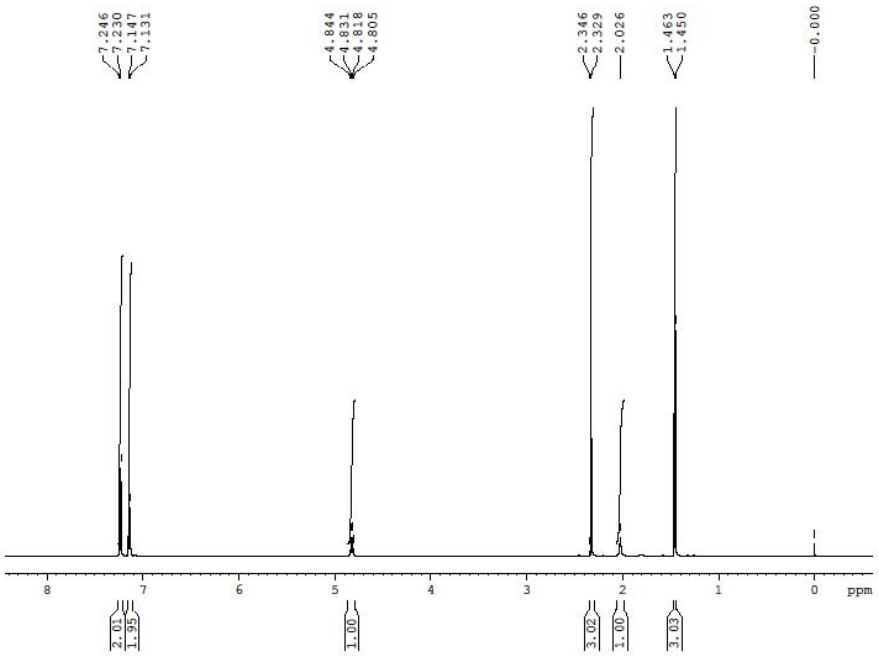


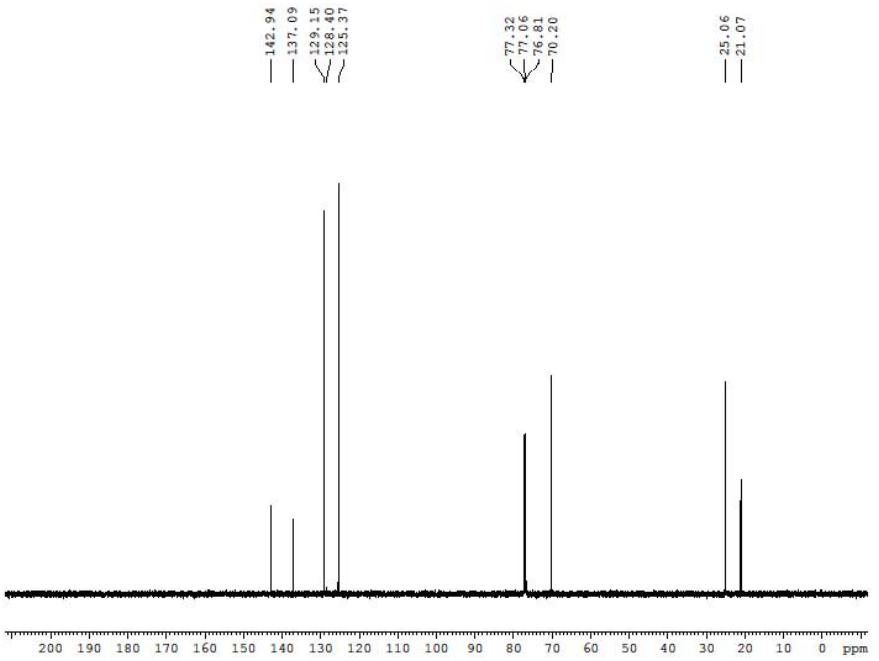
(*S*)-1-(3-Methylphenyl)ethanol (***m*-4c**)



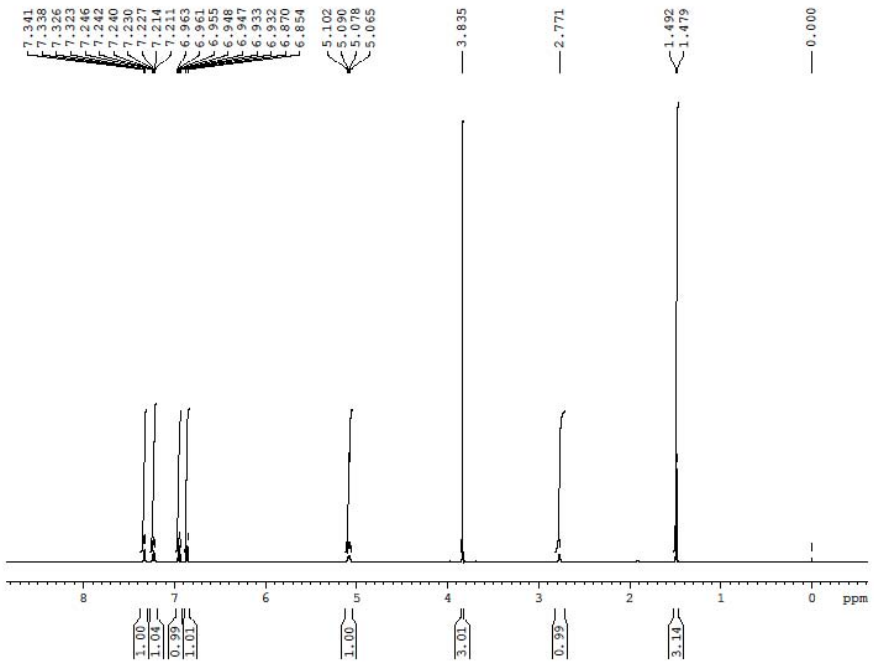


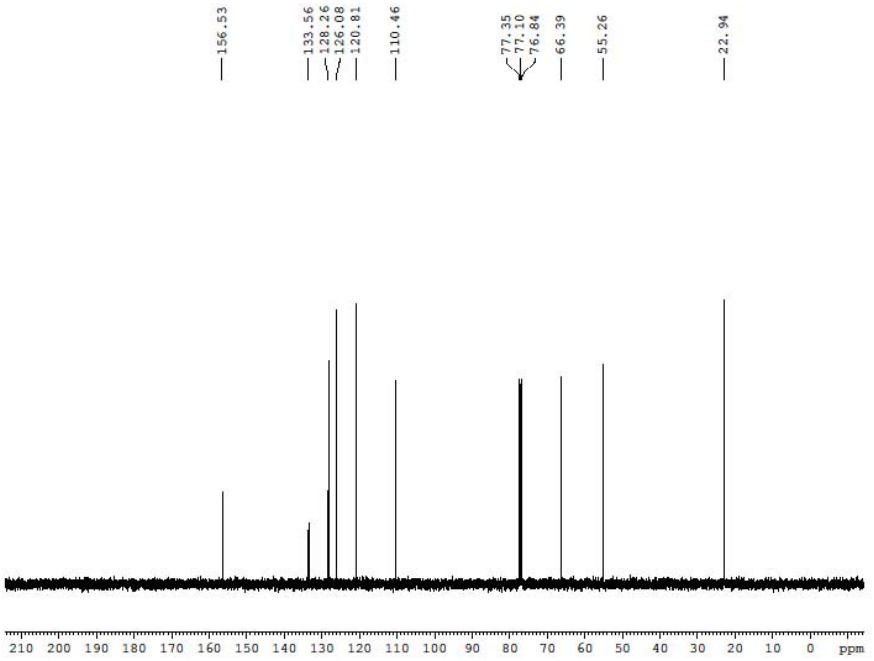
(*S*)-1-(4-Methylphenyl)ethanol (*p*-4c)



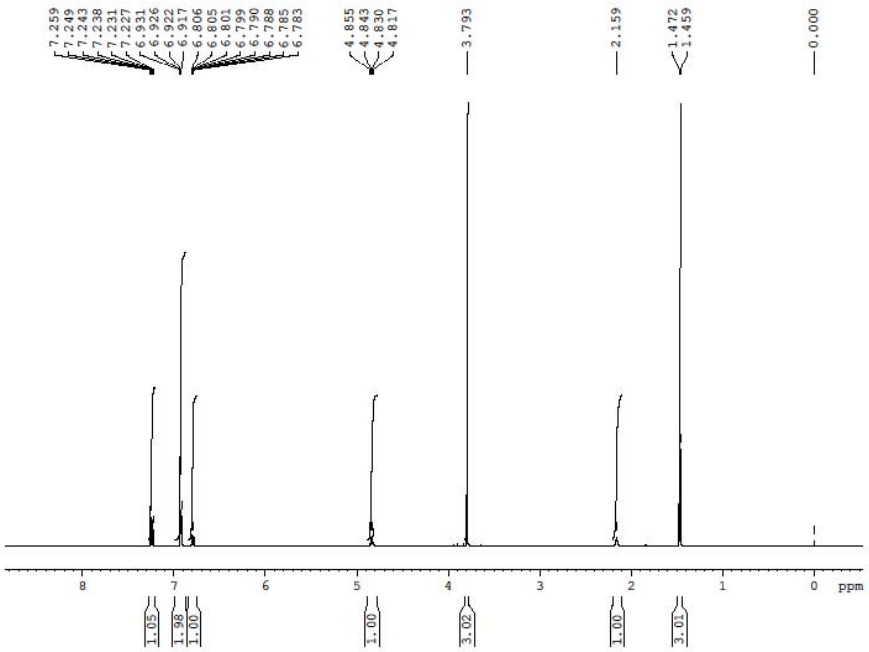


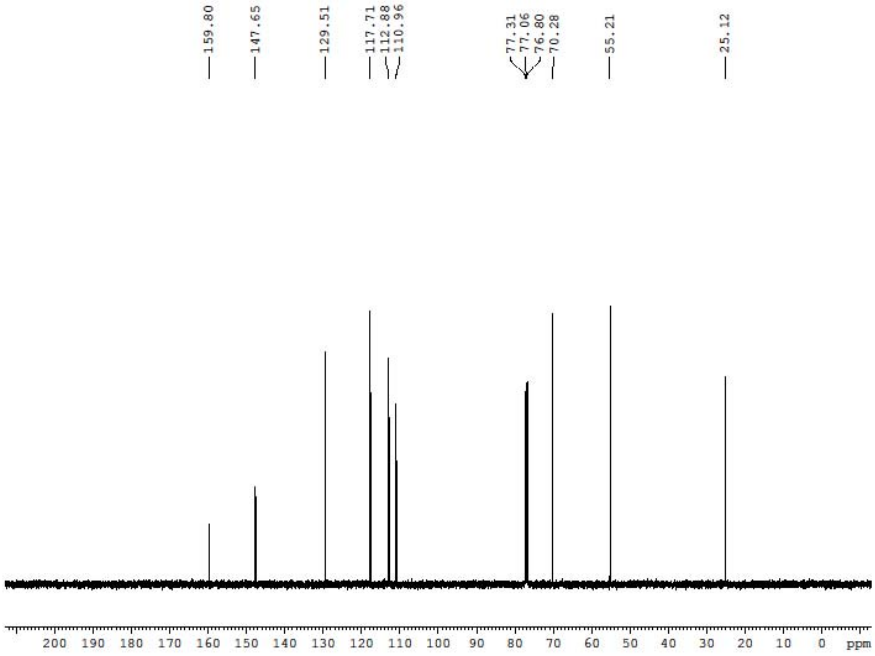
(*S*)-1-(2-Methoxyphenyl)ethanol (***o*-4d**)



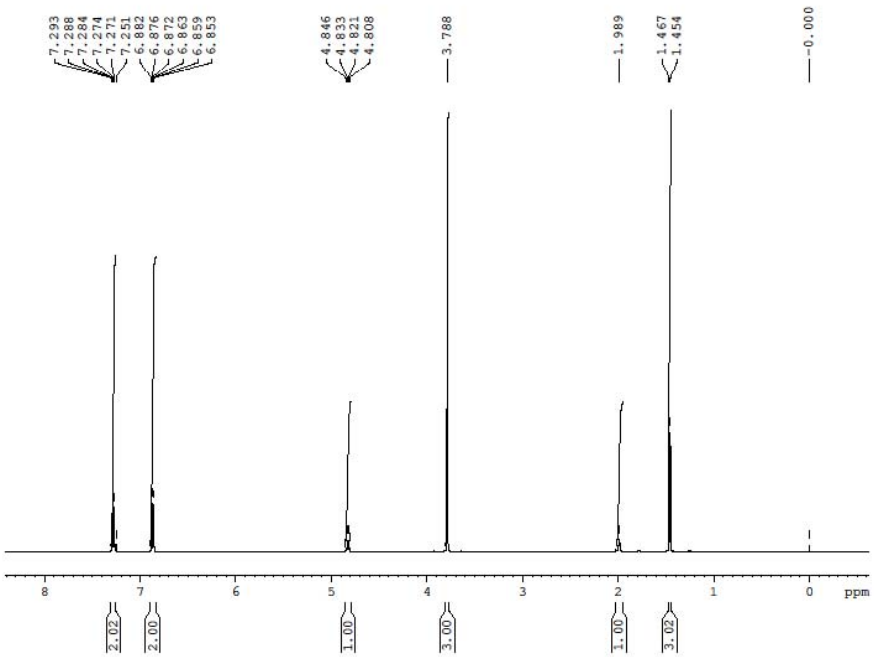


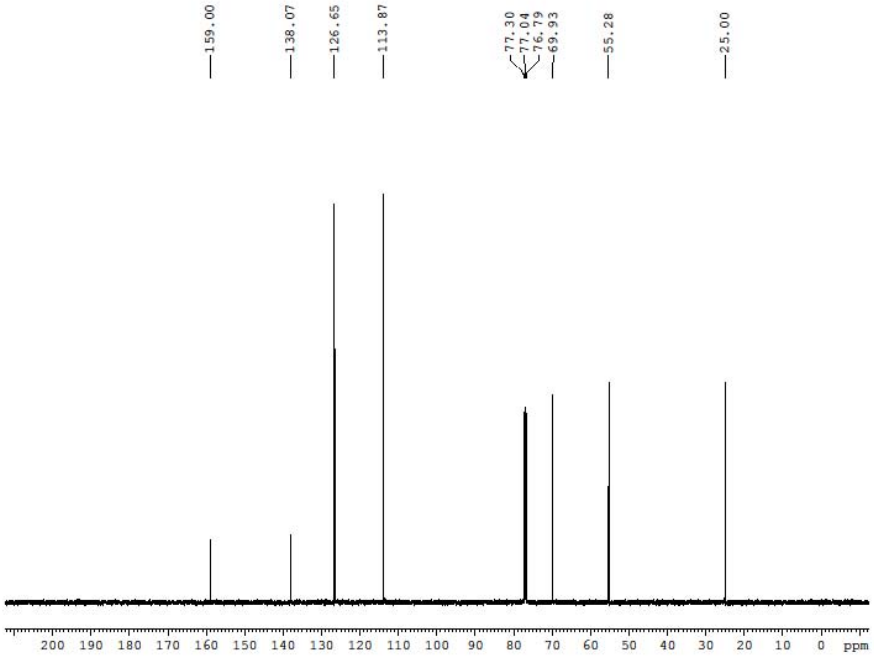
(*S*)-1-(3-Methoxyphenyl)ethanol (***m*-4d**)



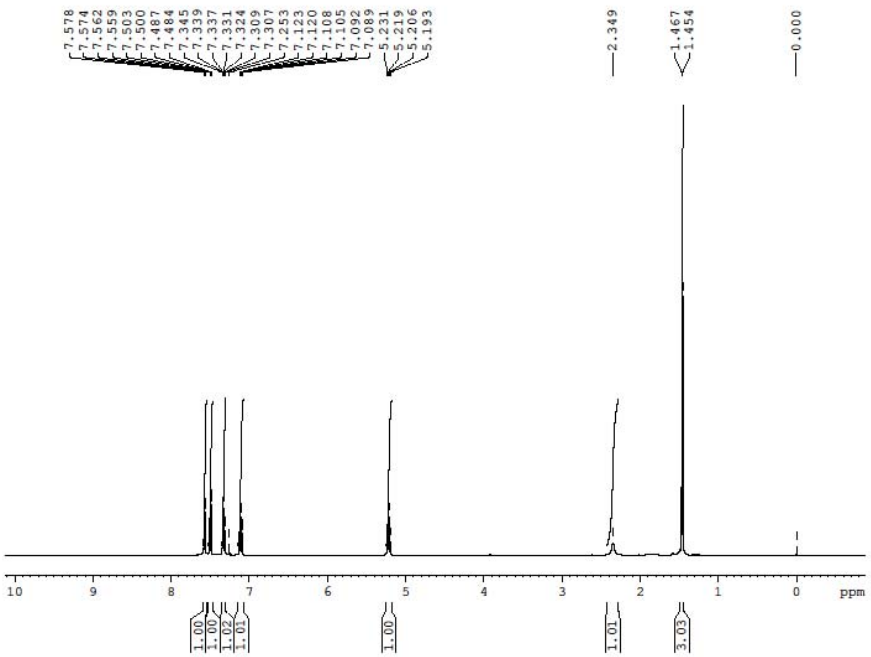


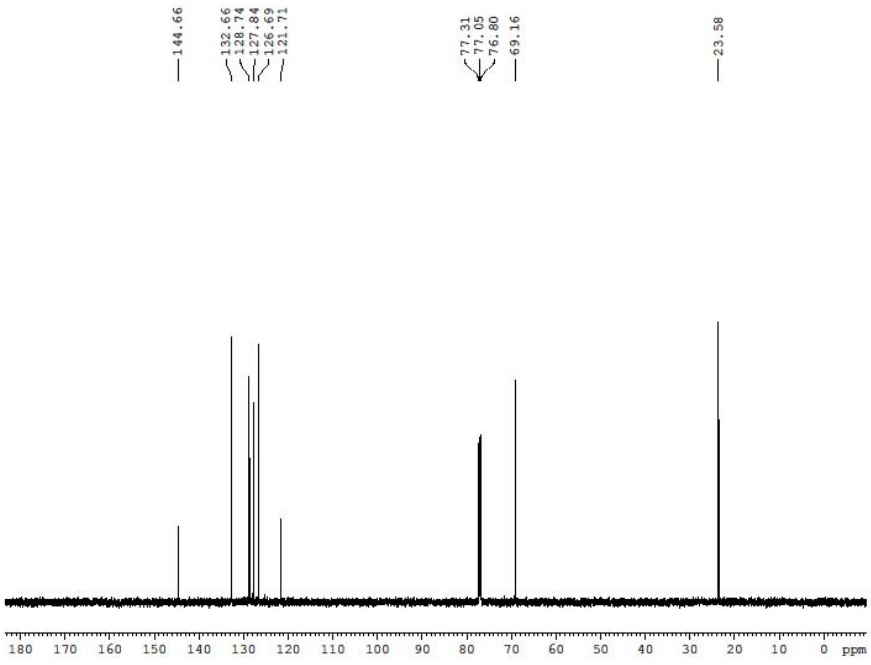
(*S*)-1-(4-Methoxyphenyl)ethanol (***p*-4d**)



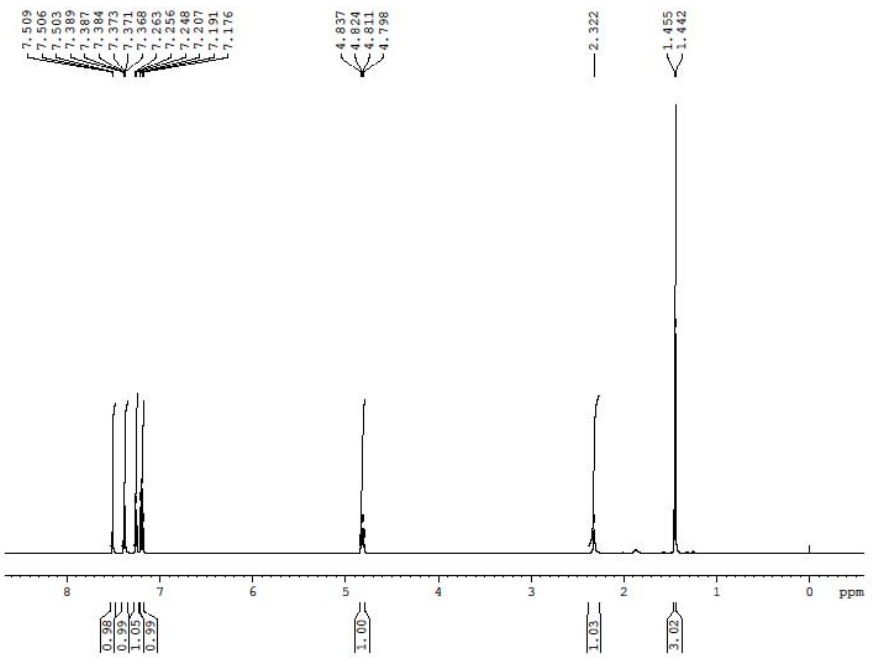


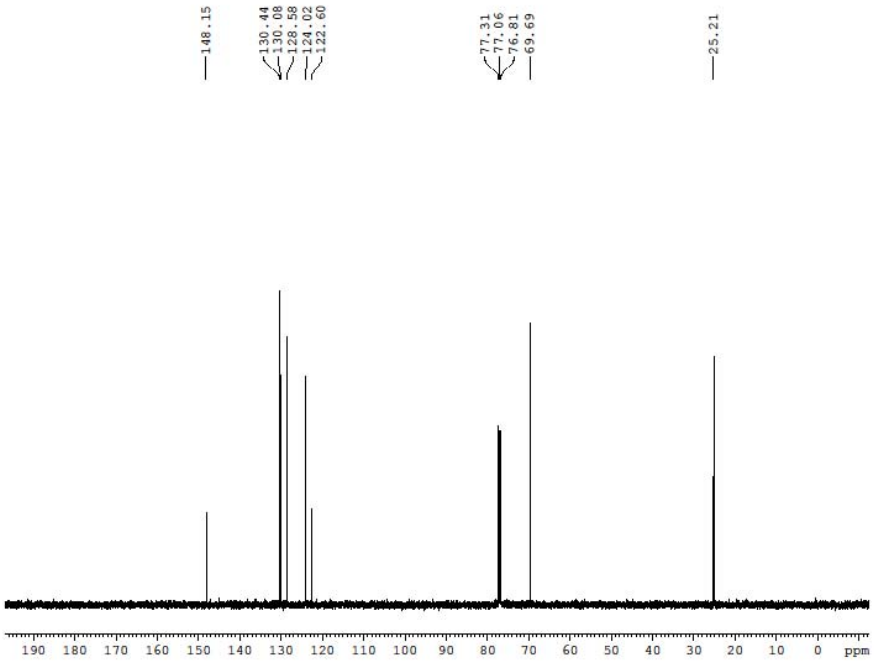
(*S*)-1-(2-Bromophenyl)ethanol (***o*-4e**)



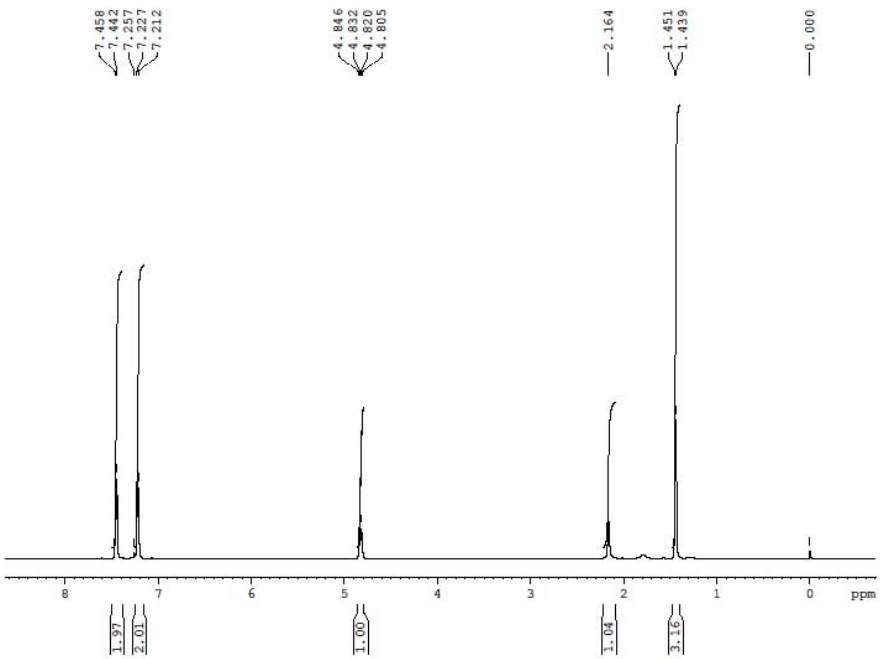


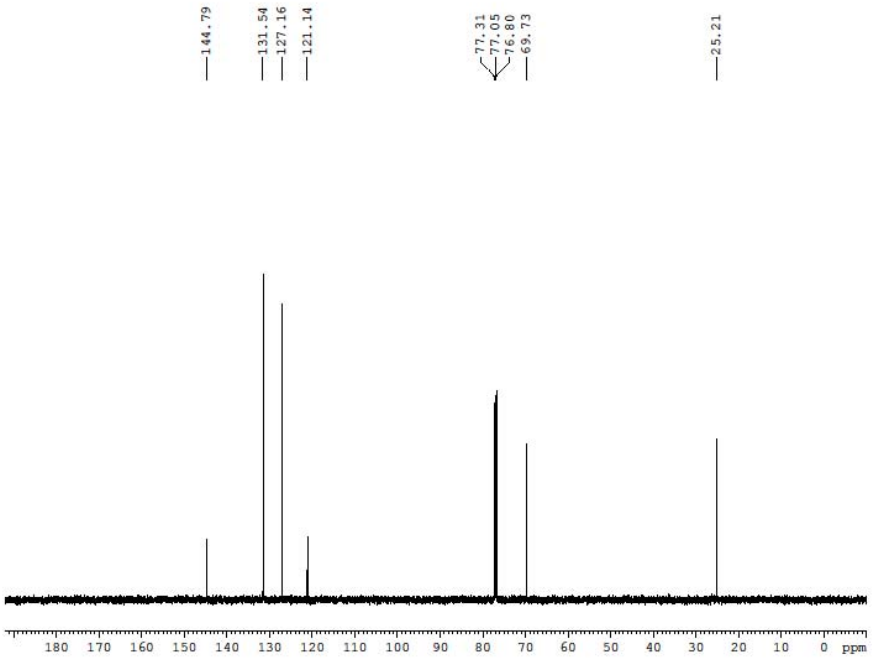
(*S*)-1-(3-Bromophenyl)ethanol (***m*-4e**)



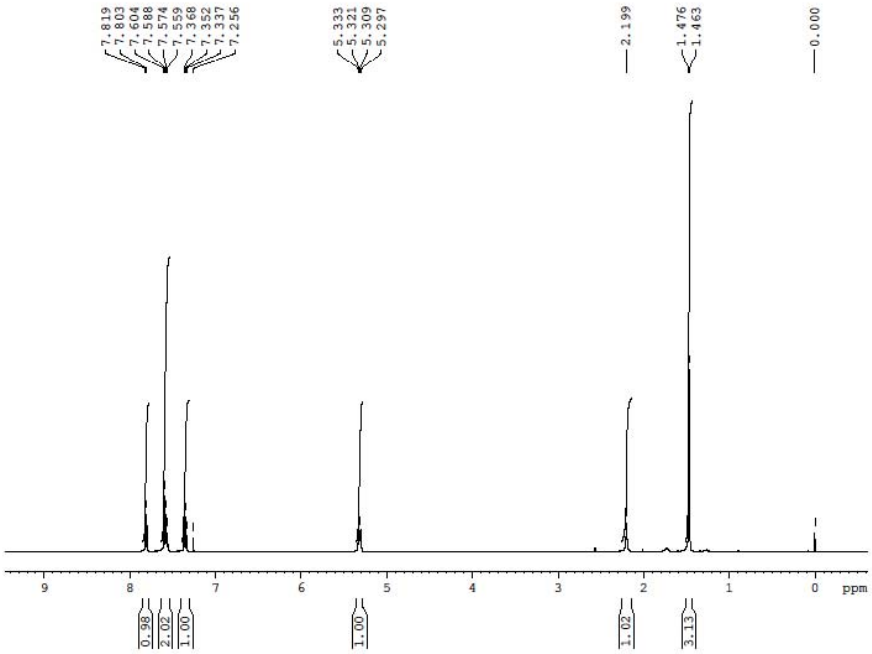


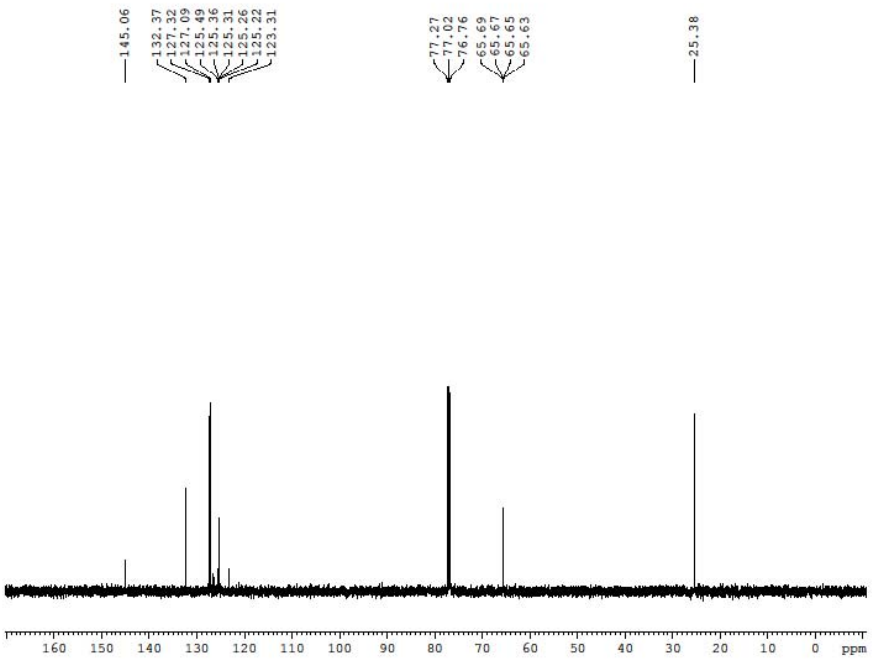
(*S*)-1-(4-Bromophenyl)ethanol (***p*-4e**)



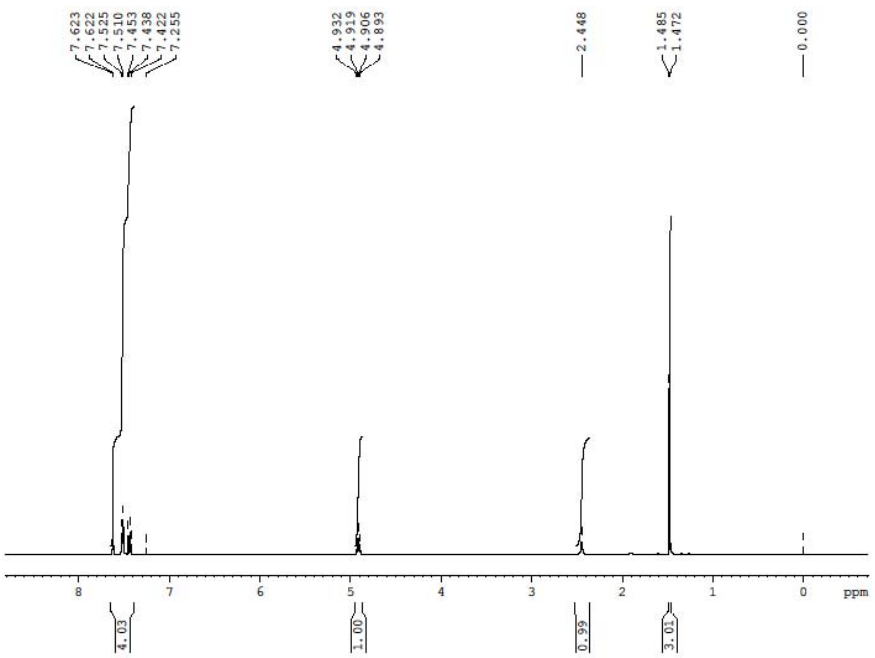


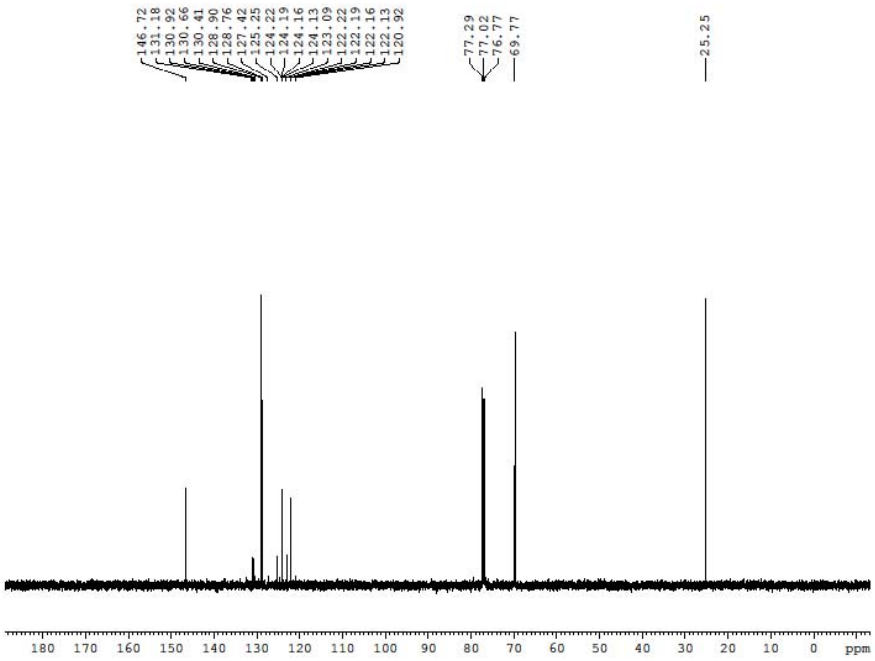
(*S*)-1-(2-Trifluoromethylphenyl)ethanol (***o*-4f**)



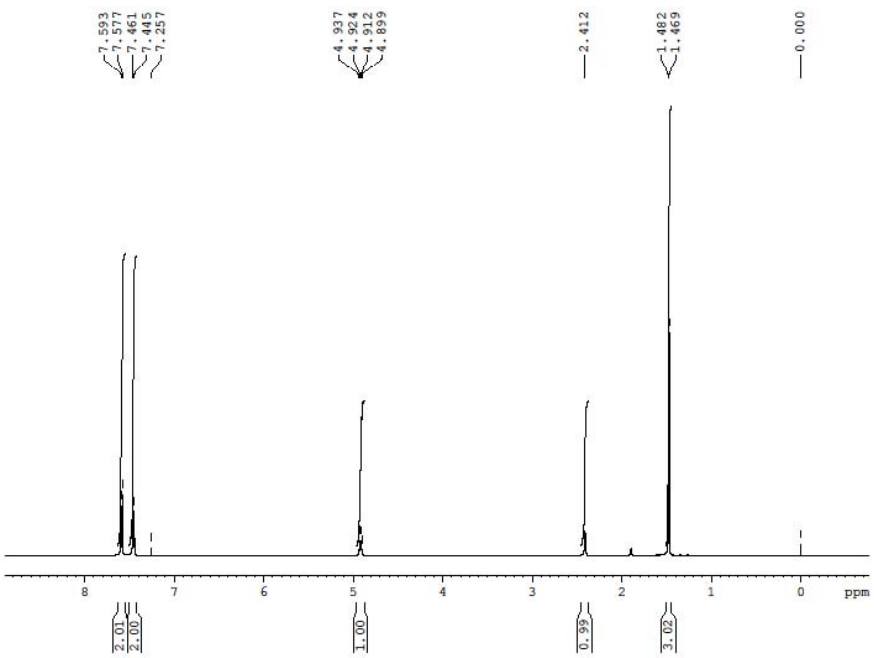


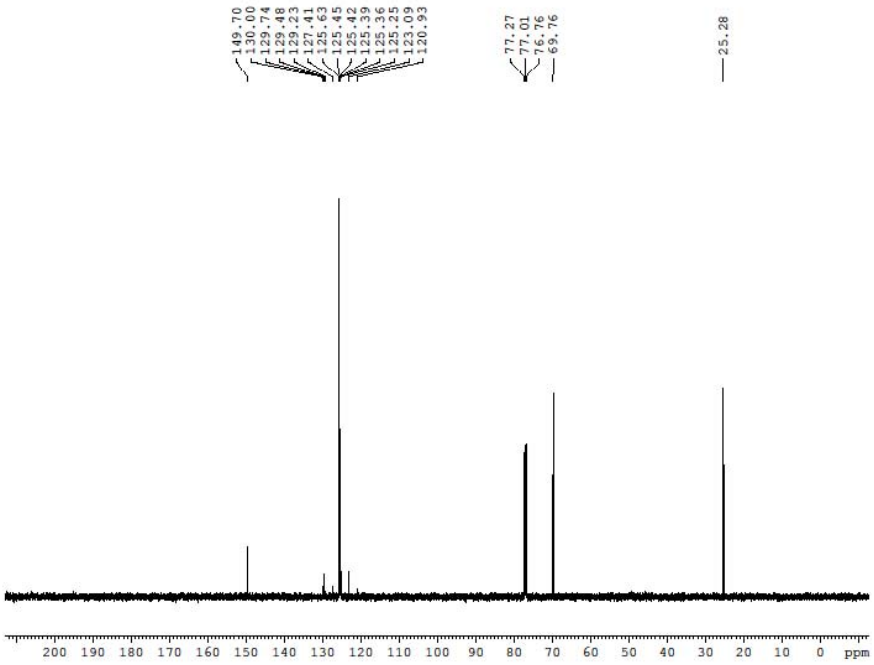
(*S*)-1-(3-Trifluoromethylphenyl)ethanol (***m*-4f**)



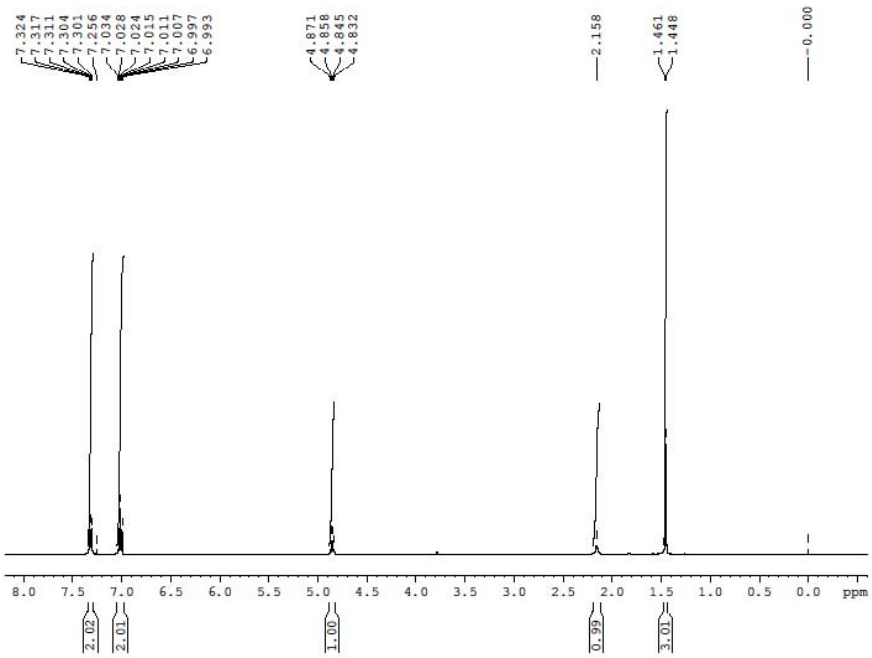


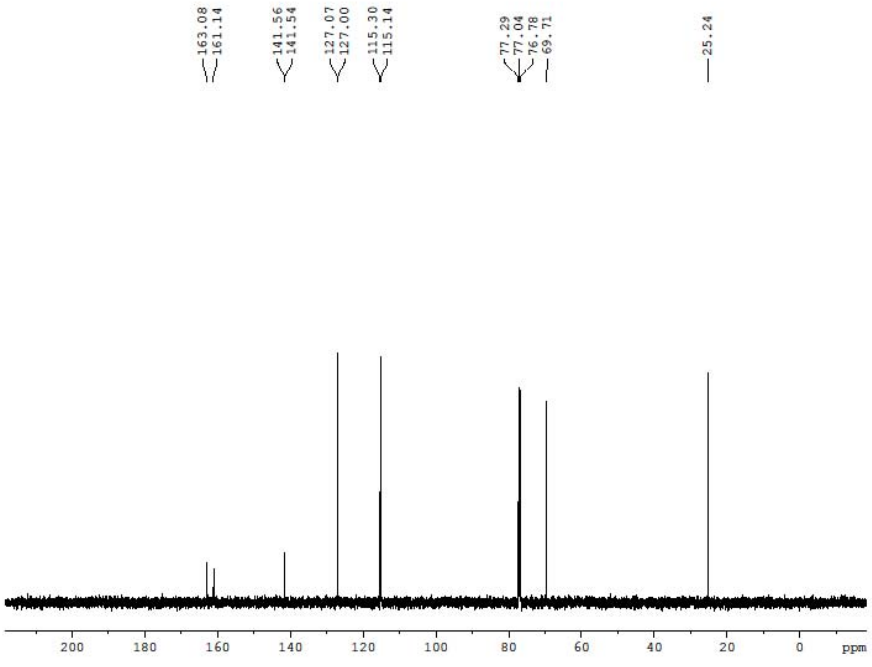
(*S*)-1-(4-Trifluoromethylphenyl)ethanol (*p*-4f)



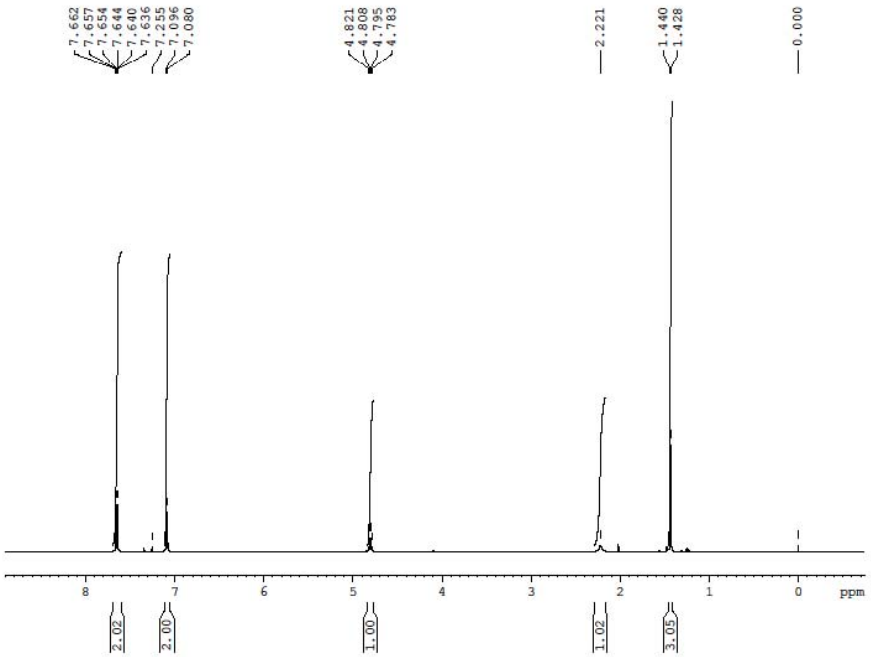


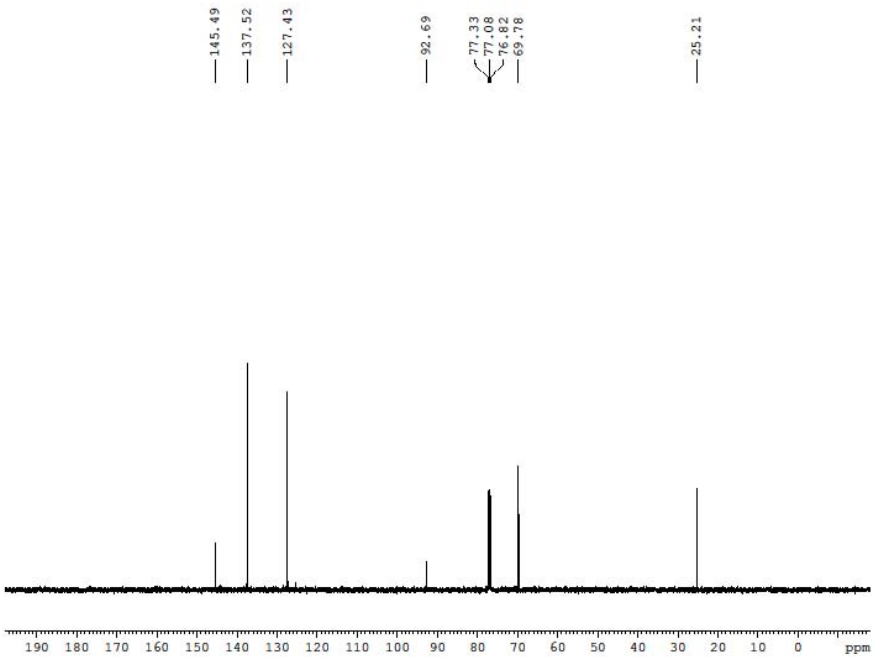
(*S*)-1-(4-Fluorophenyl)ethanol (**4g**)



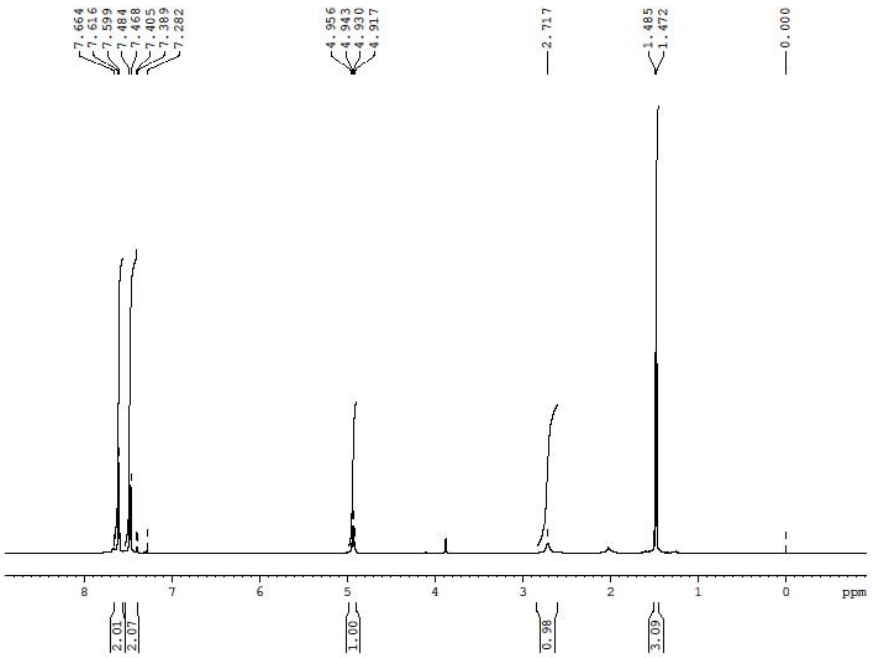


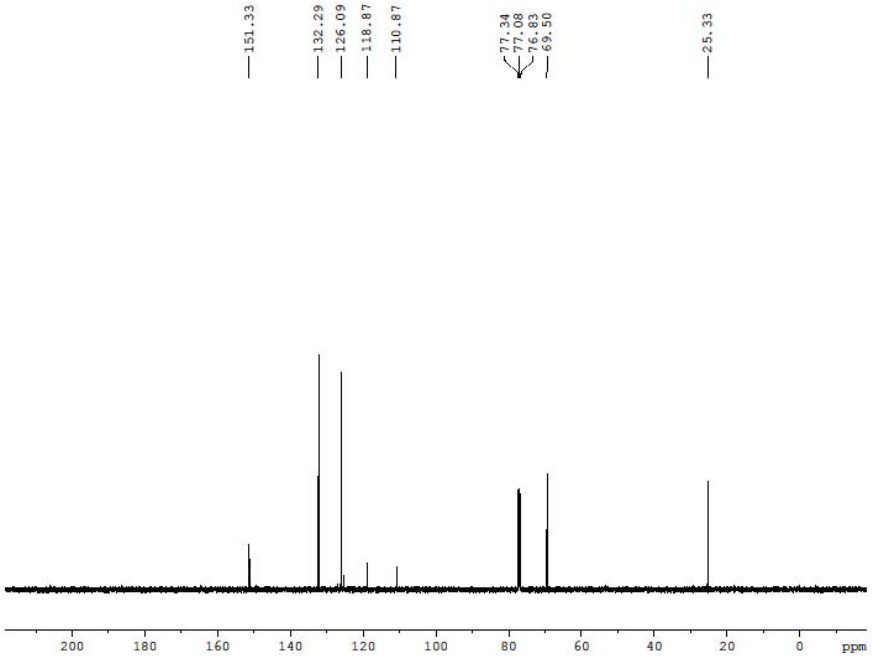
(*S*)-1-(4-Iodophenyl)ethanol (**4h**)



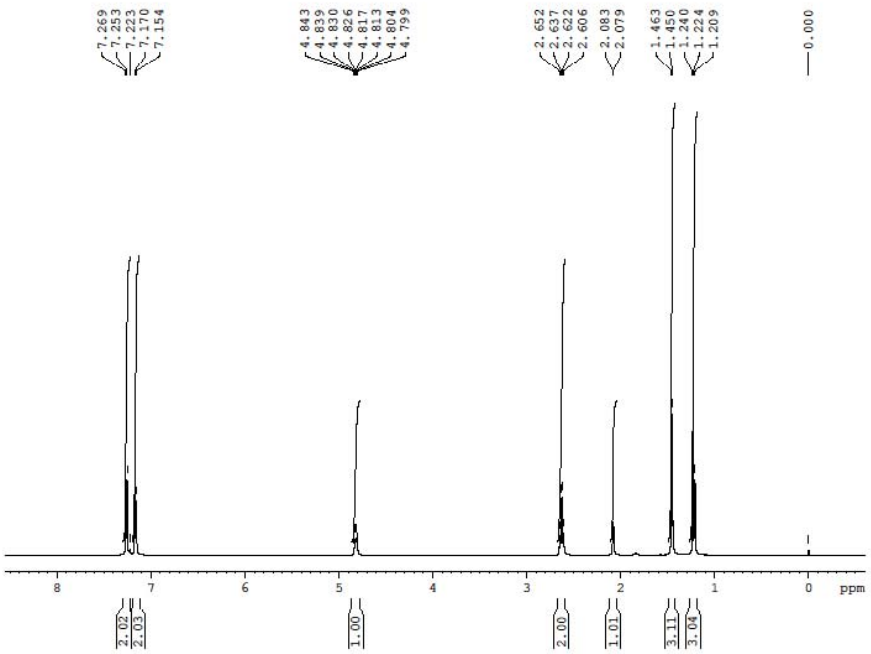


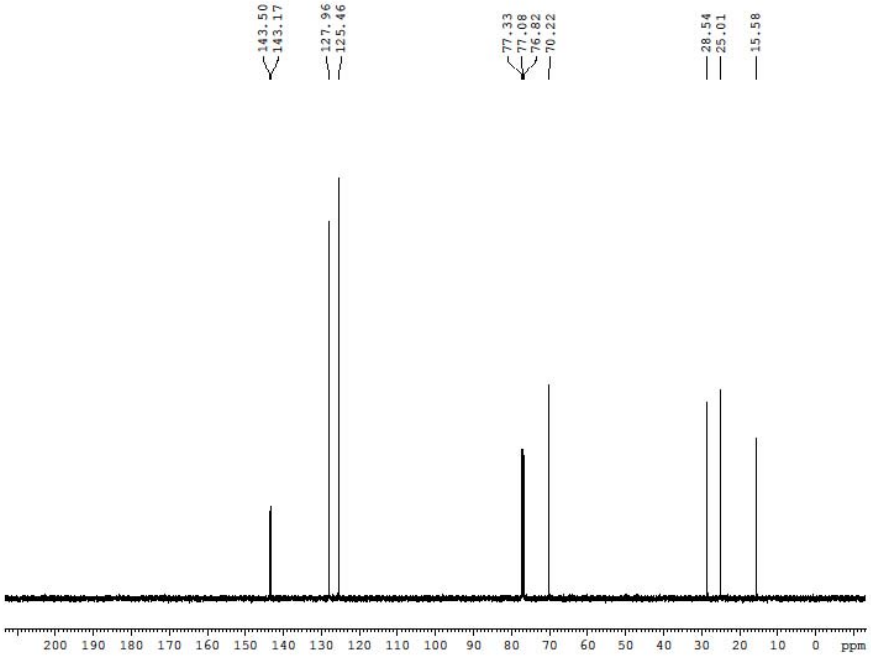
(*S*)-1-(4-Nitrilephenyl)ethanol (**4i**)



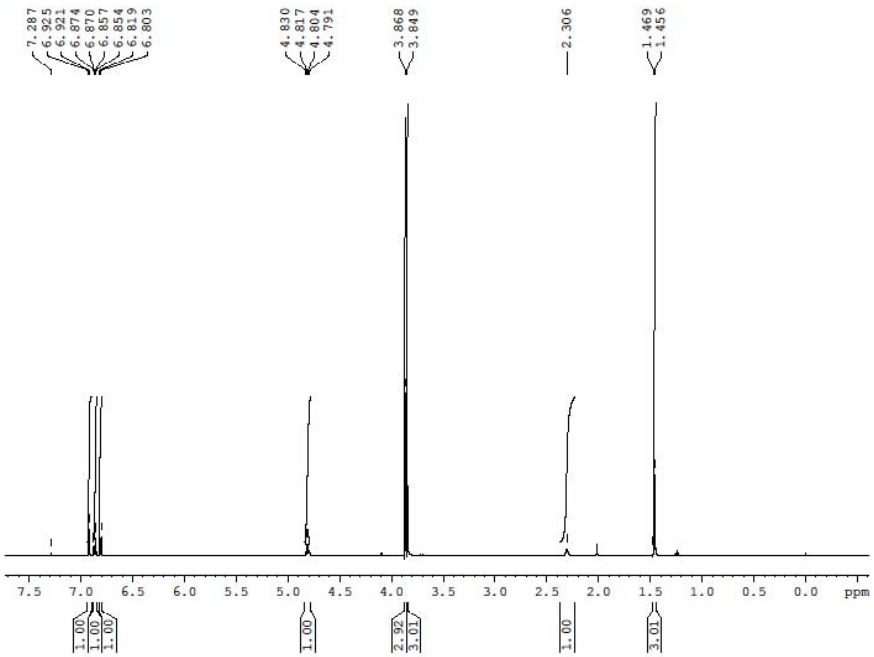


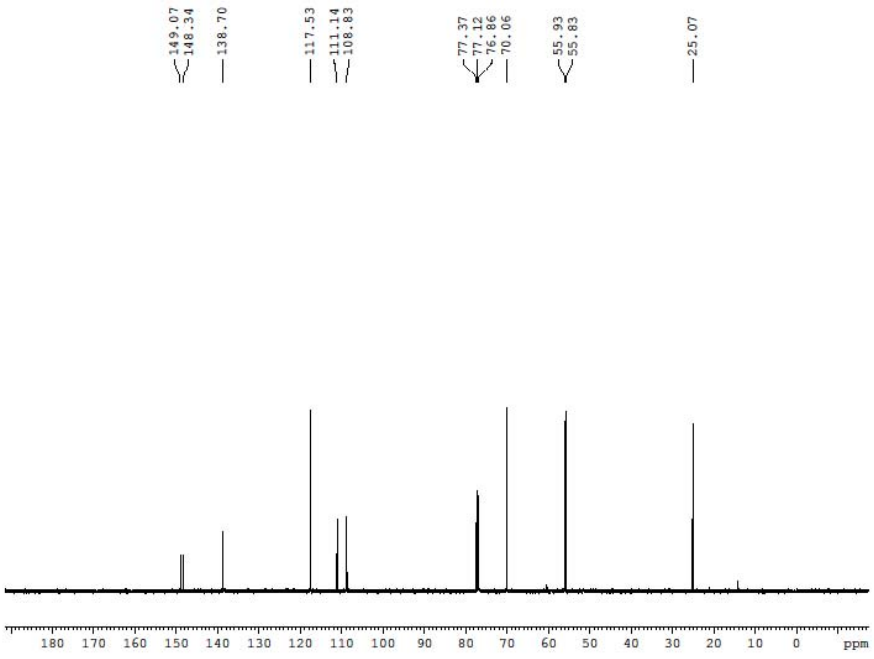
(*S*)-1-(4-Ethylphenyl)ethanol (**4j**)



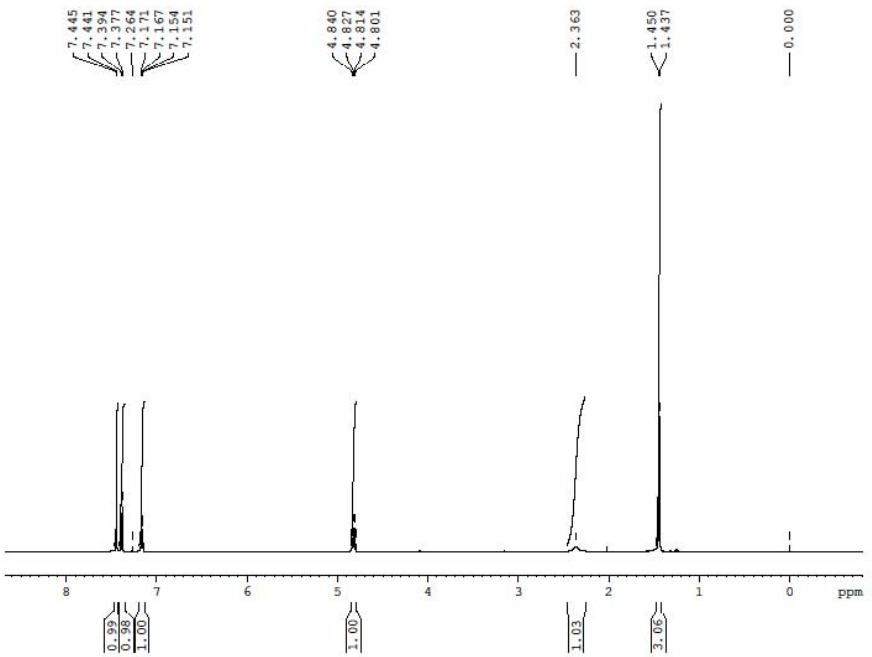


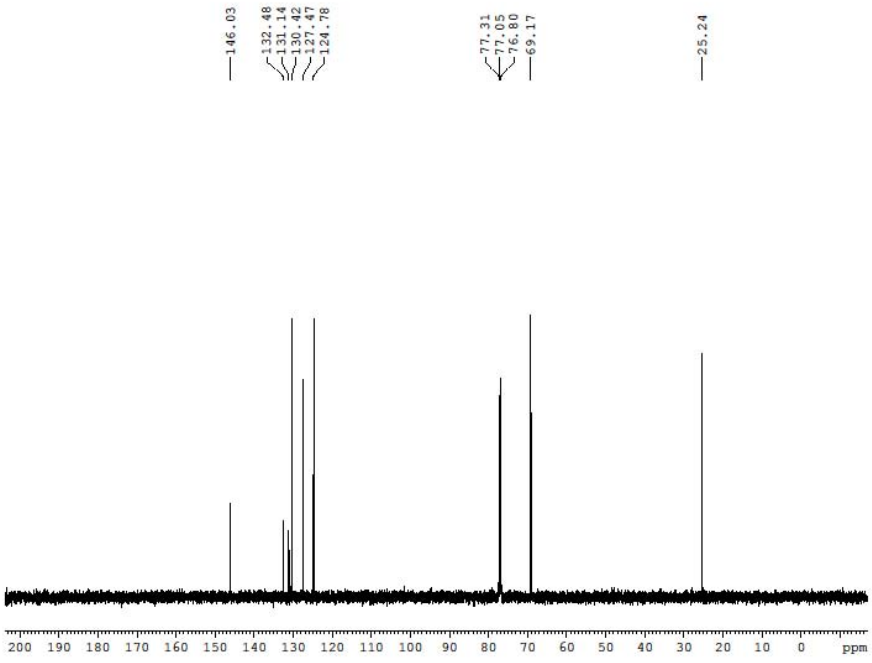
(*S*)-1-(3,4-Dimethoxyphenyl)ethanol (**4k**)



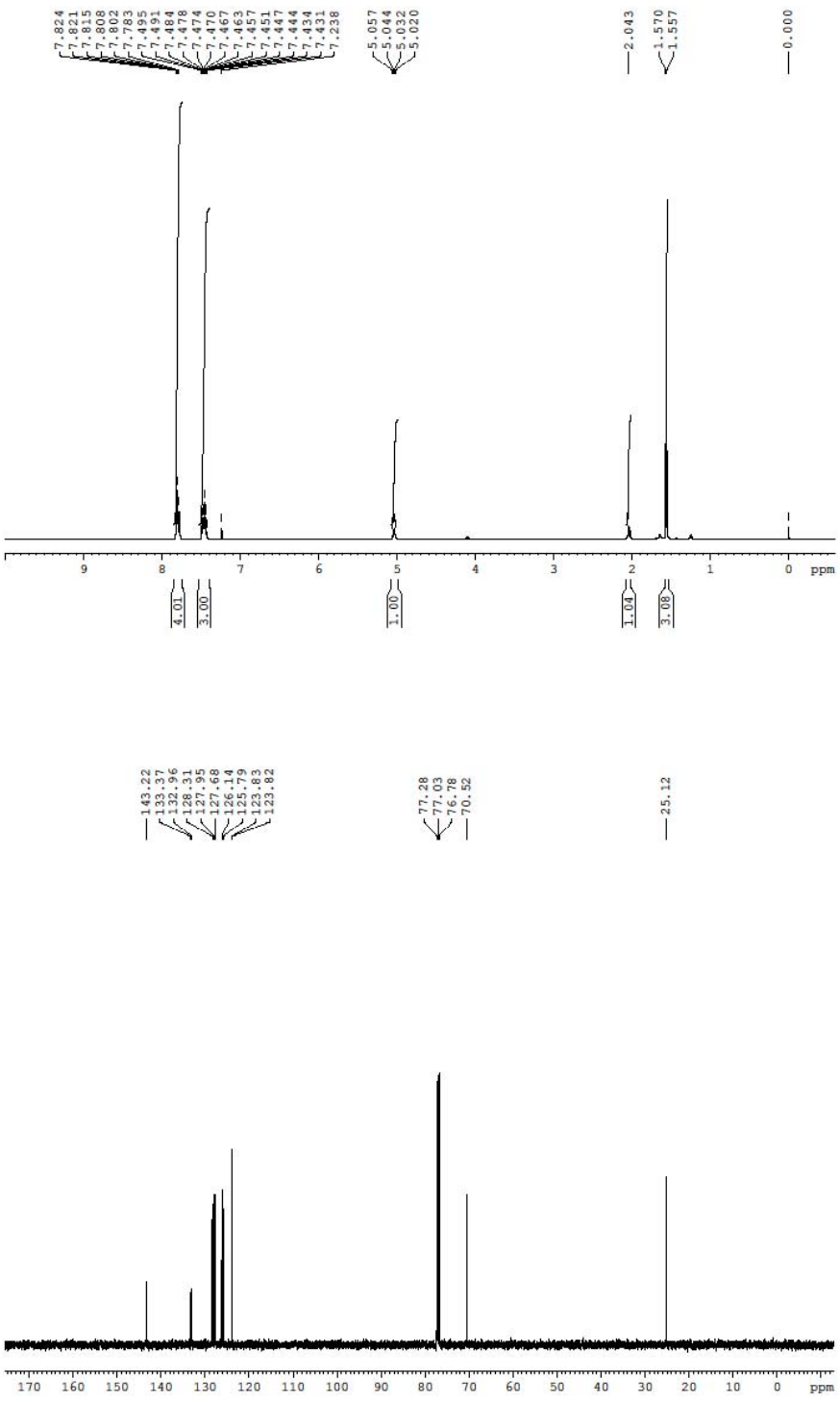


(*S*)-1-(3,4-Dichlorophenyl)ethanol (**4l**)

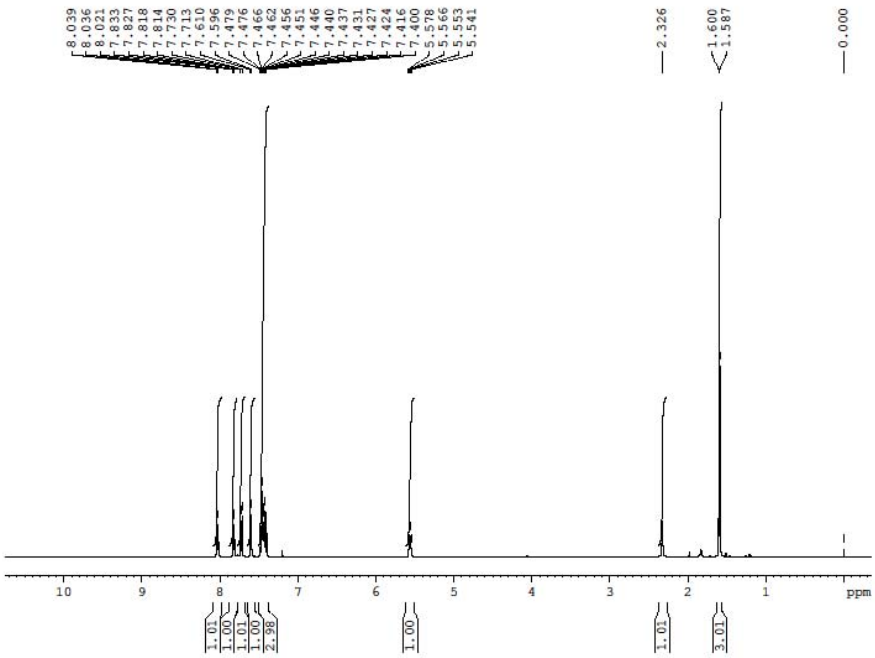


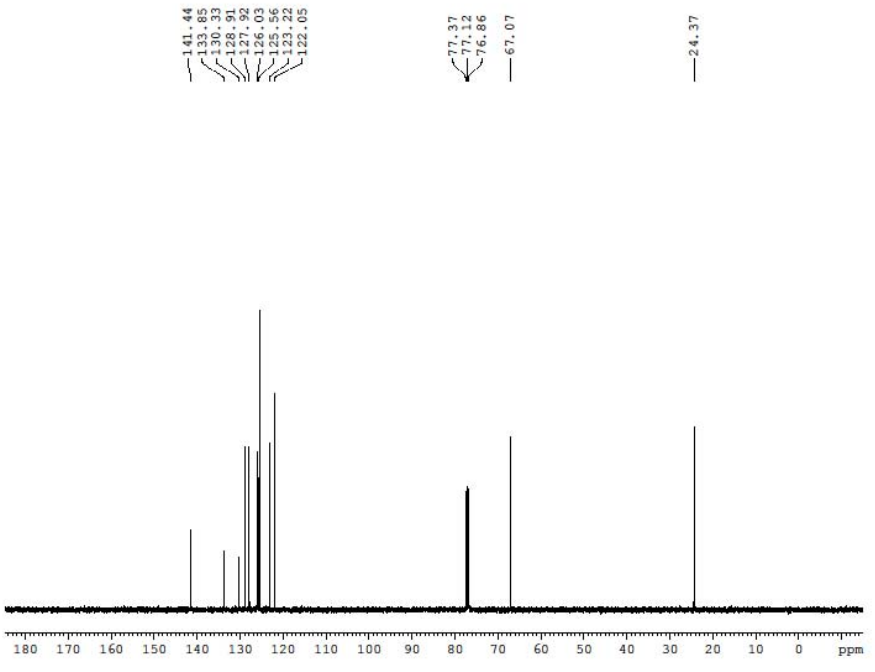


(*S*)-1-(2-Naphthyl)ethanol (**4m**)

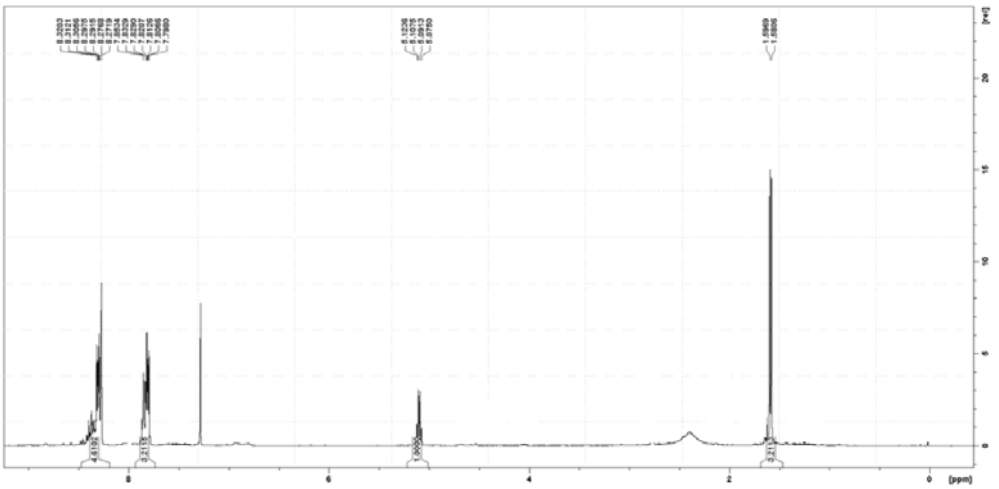


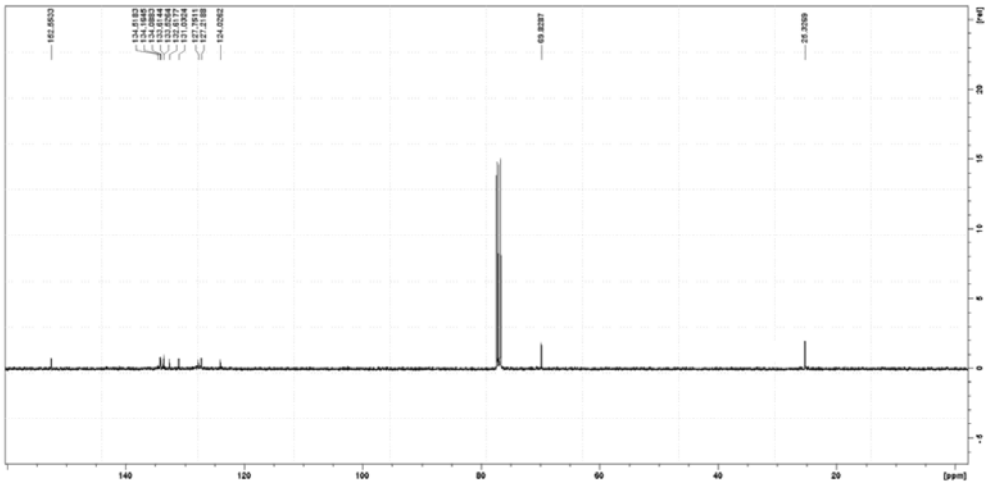
(*S*)-1-(1-Naphthyl)ethanol (**4n**)



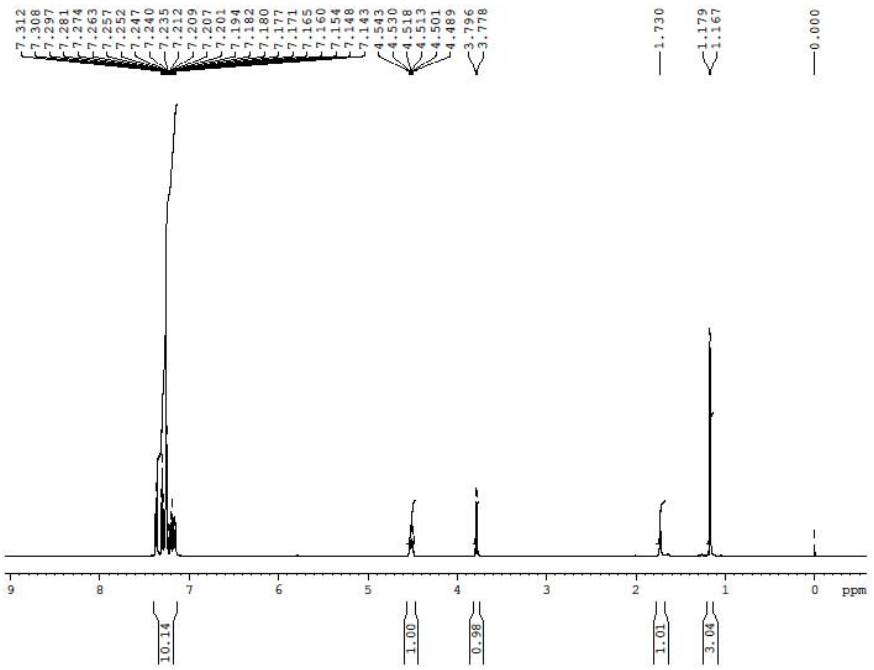


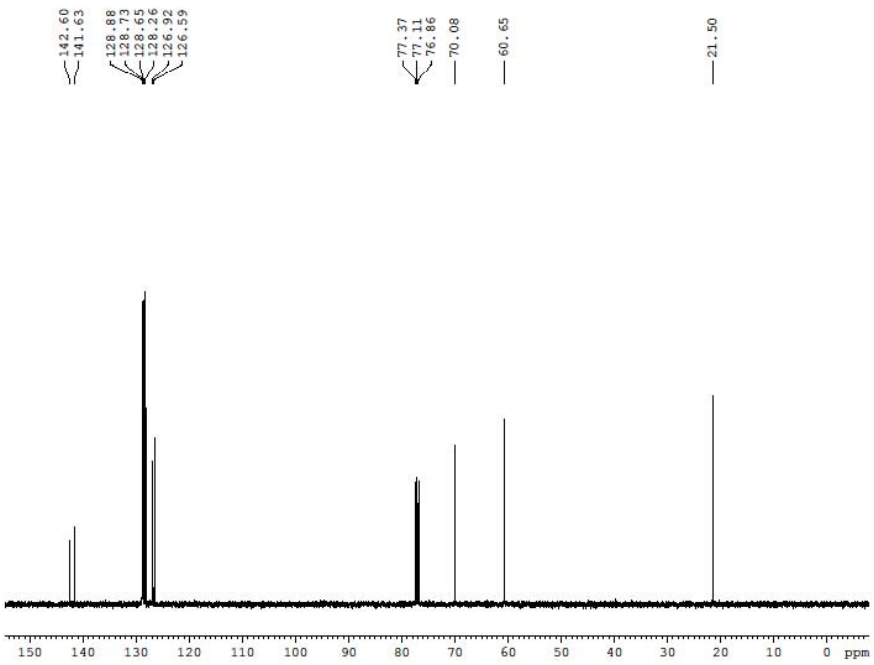
(*S*)-1-(anthracen-2-yl)ethanol (**4o**)



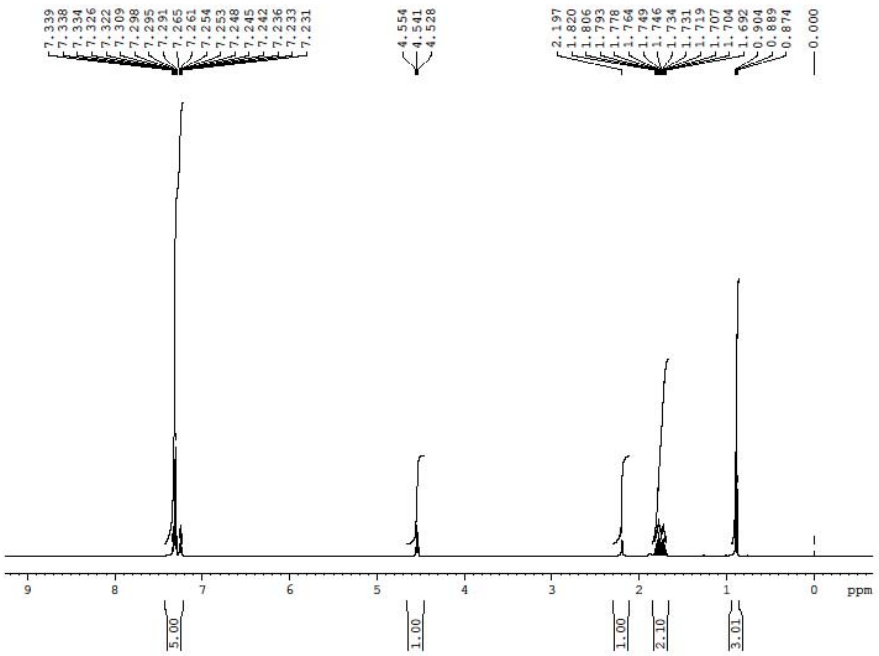


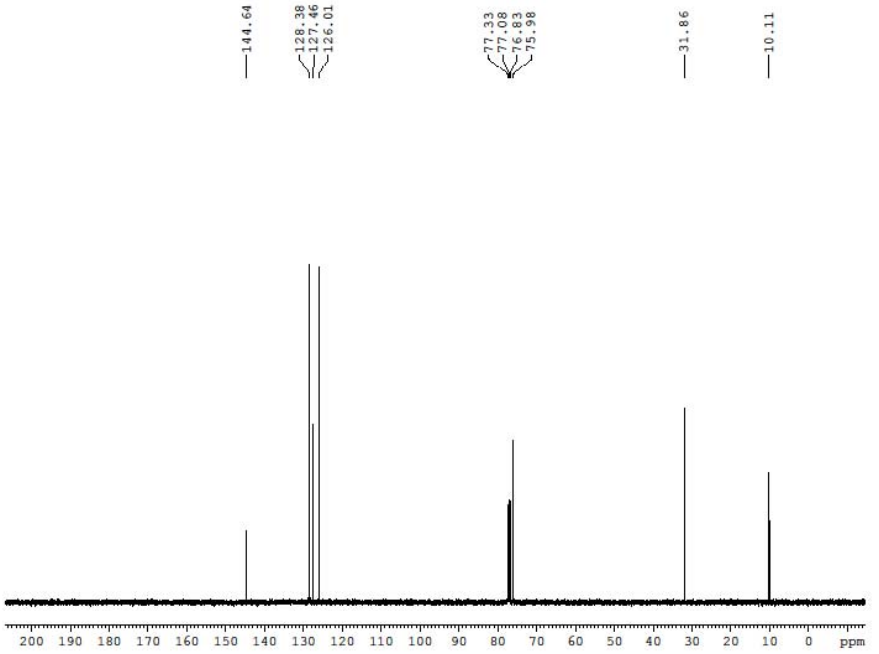
(*R*)-1,1-Diphenyl-2-propanol (**4p**)



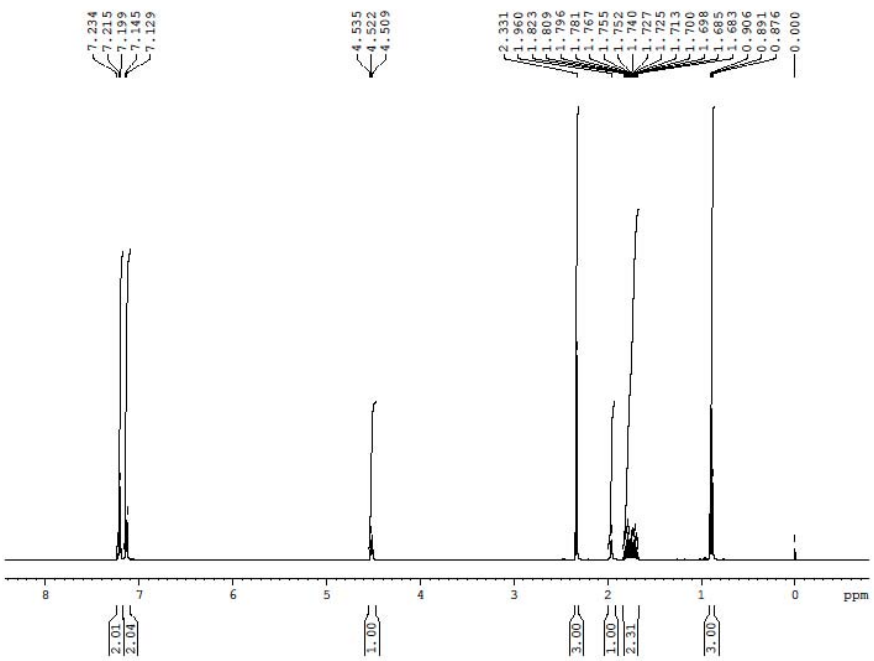


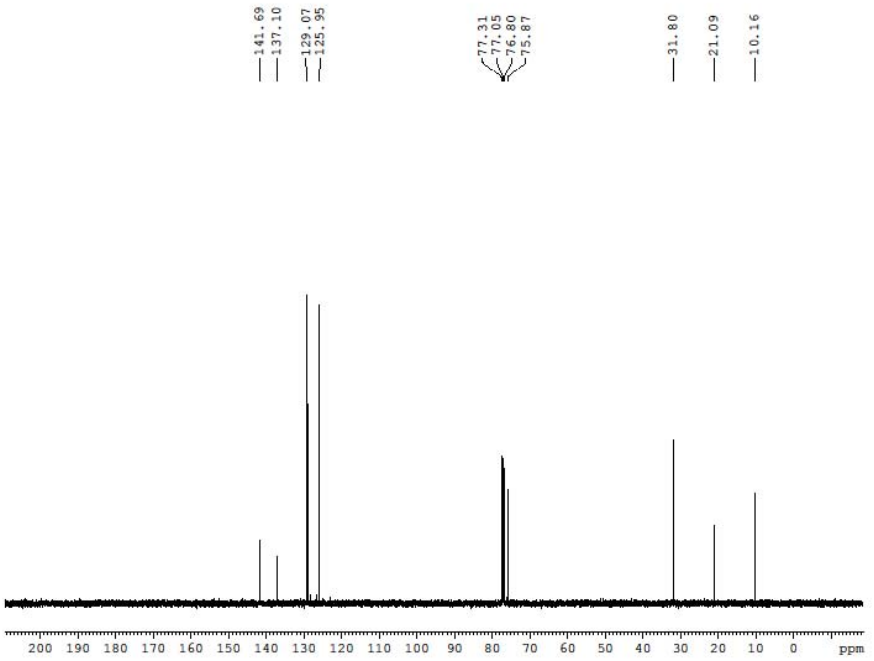
(*S*)-1-Phenylpropan-1-ol (**6a**)



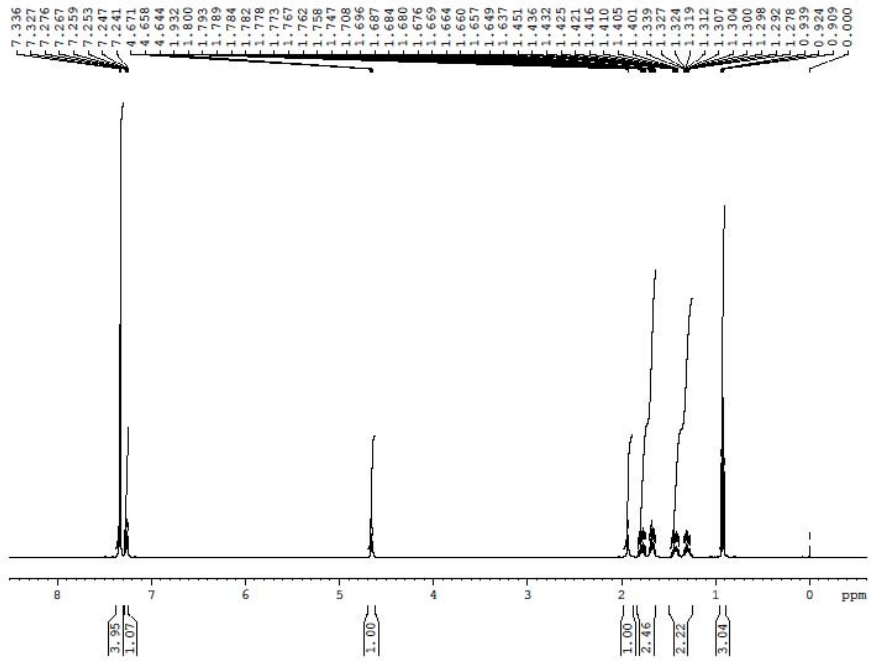


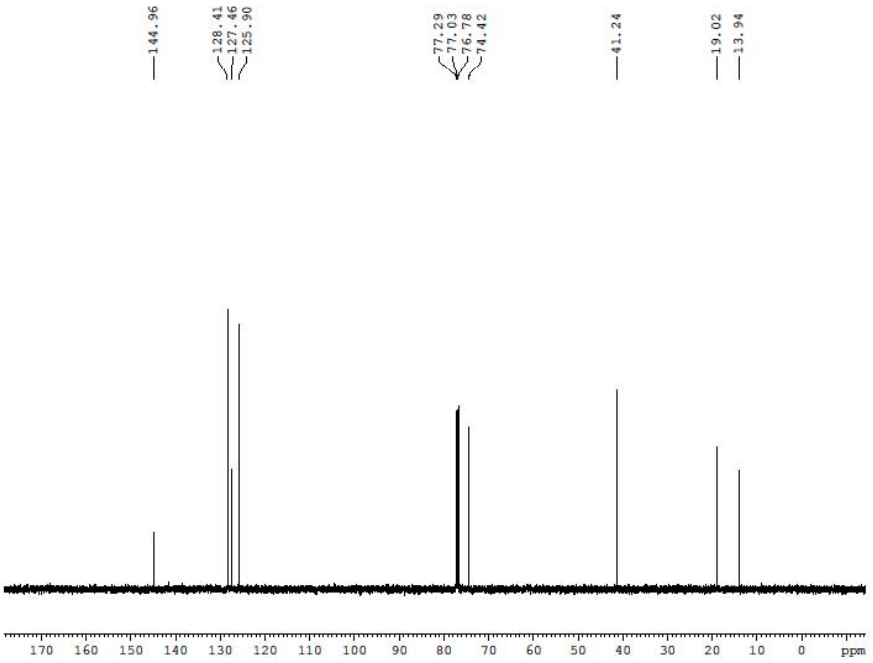
(*S*)-1-*p*-Tolylpropan-1-ol (**6b**)



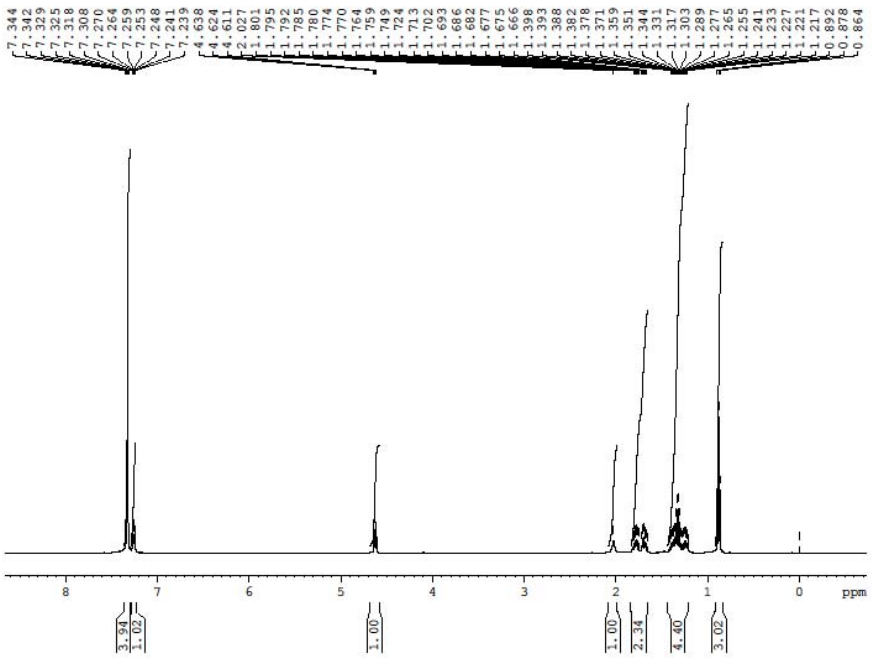


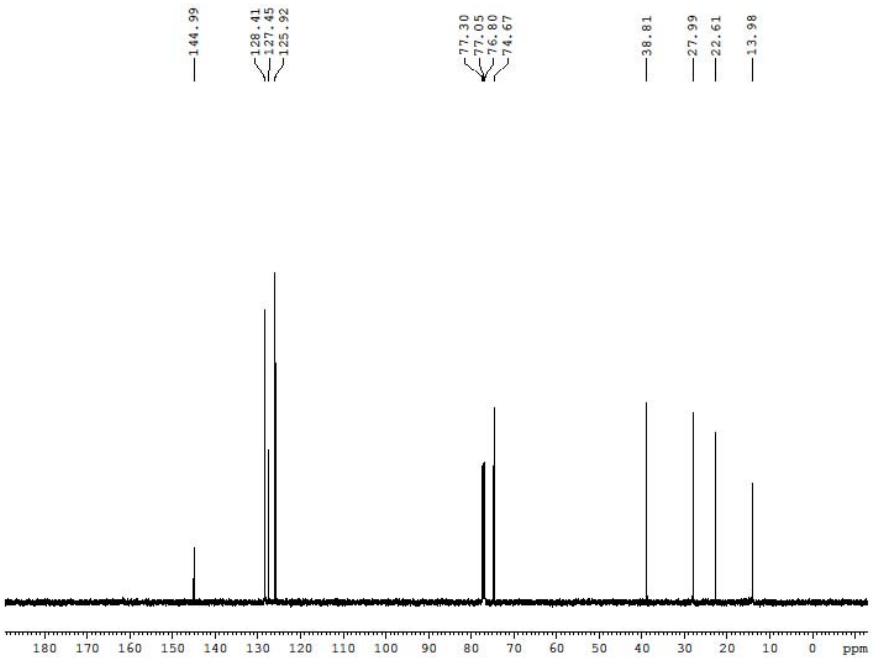
(*R*)-1-Phenylbutan-1-ol (**6c**)



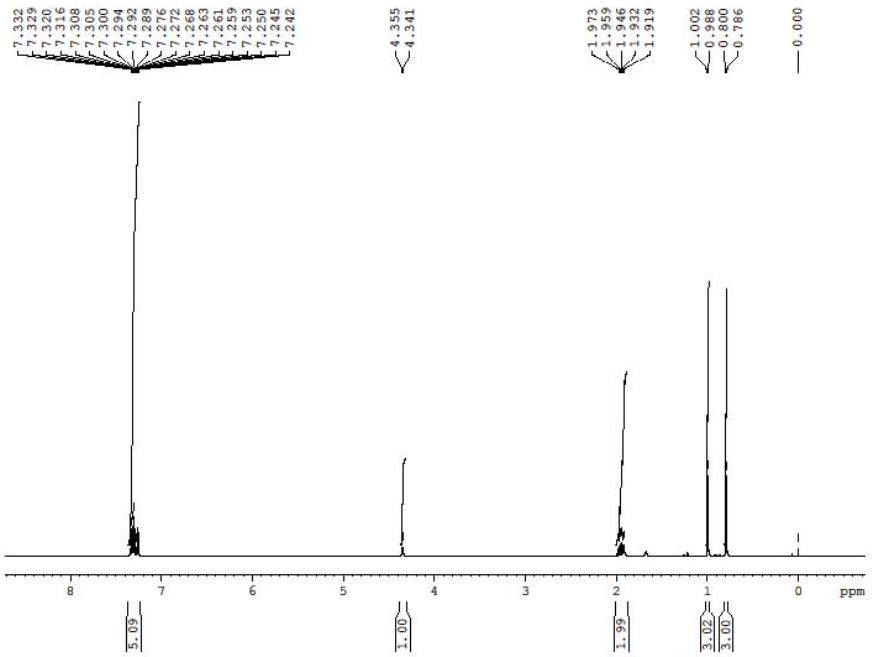


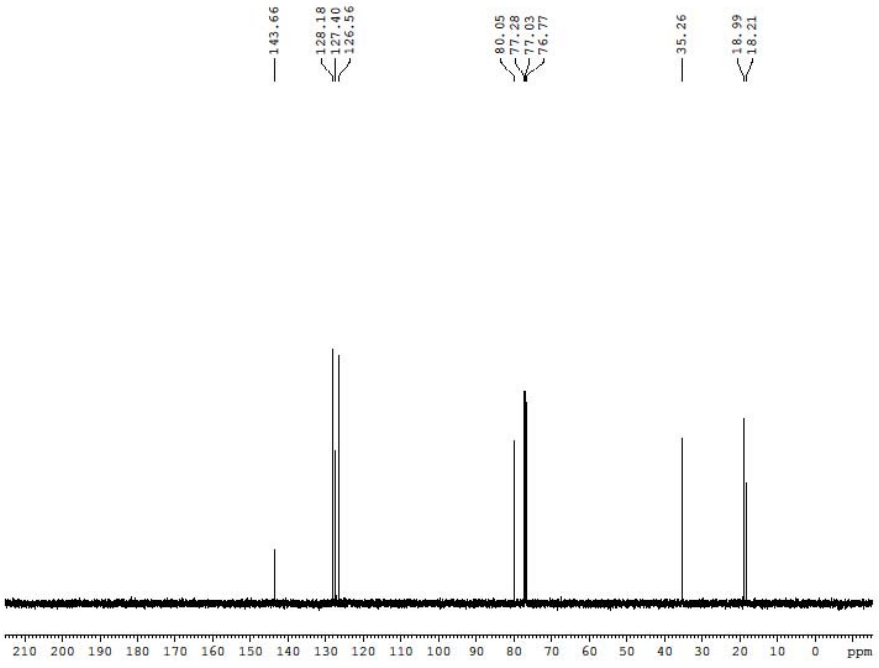
(*R*)-1-Phenylpentan-1-ol (**6d**)



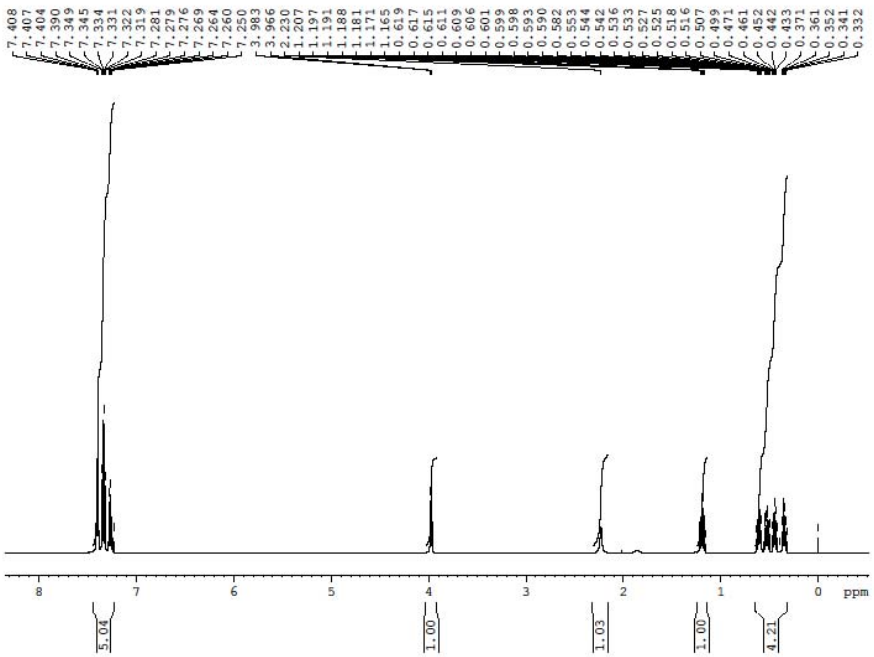


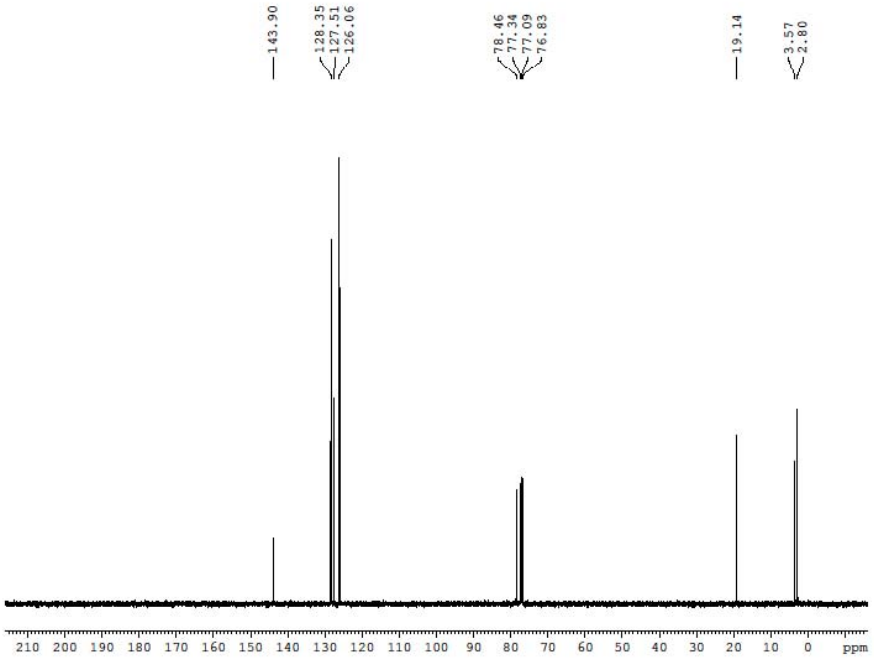
(*S*)-2-Methyl-1-phenylpropan-1-ol (**6e**)



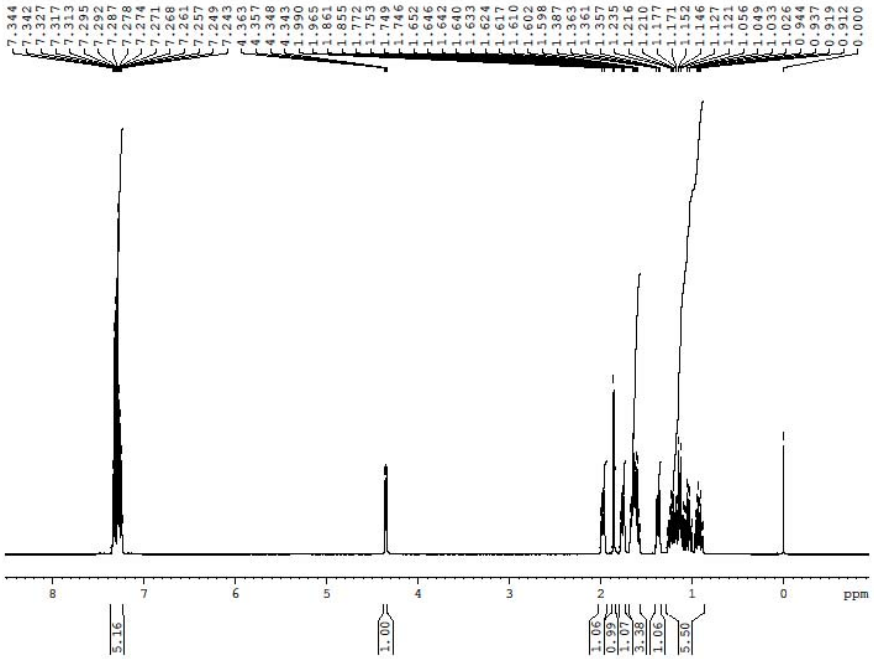


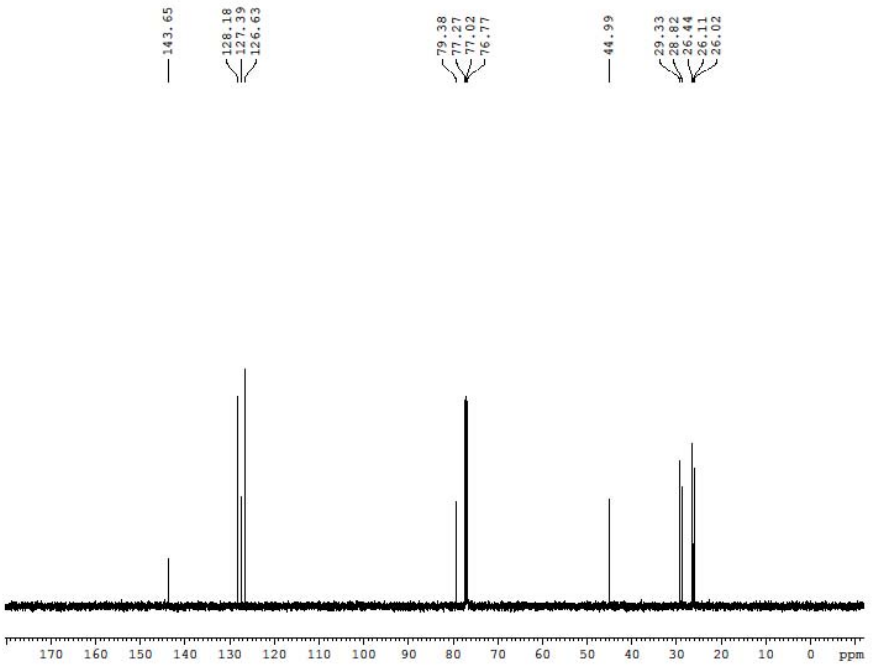
(*S*)-Cyclopropyl phenyl methanol (**6f**)



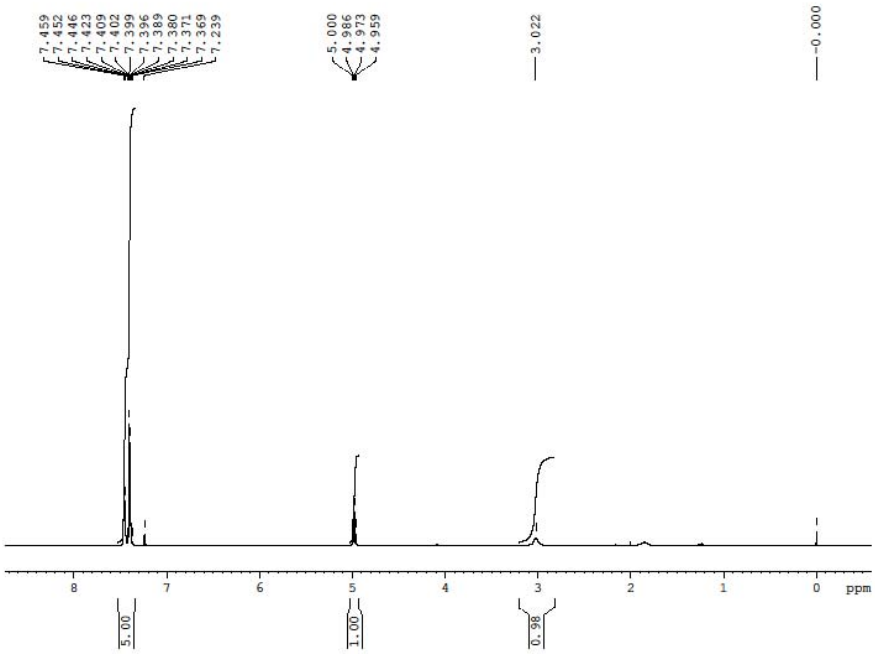


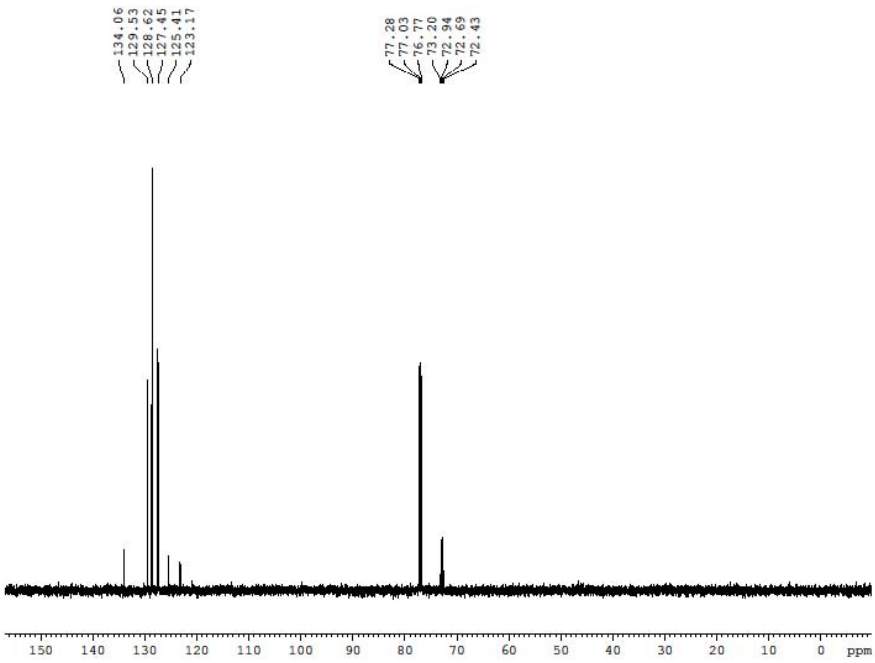
(*R*)-Cyclohexyl phenyl methanol (**6g**)



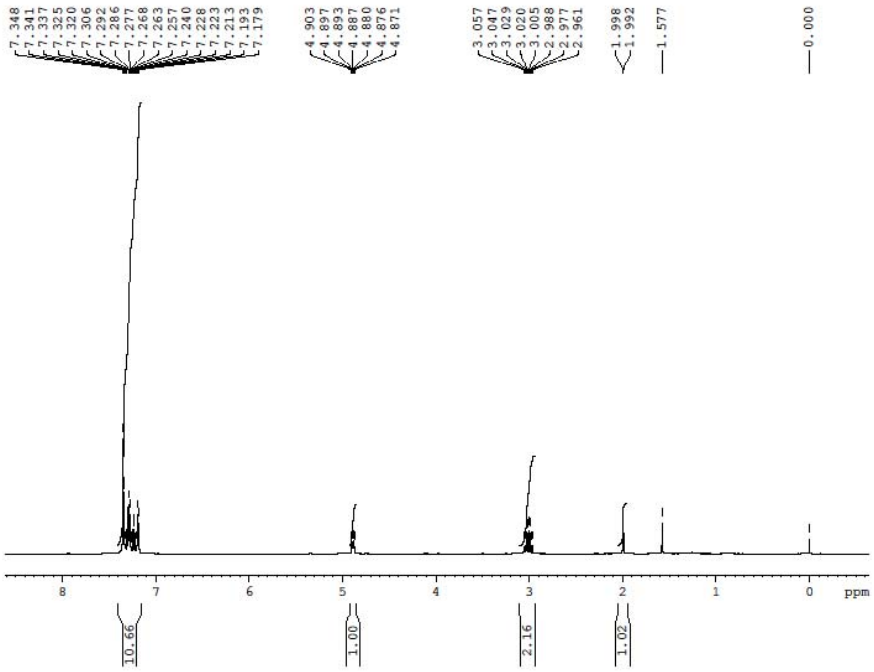


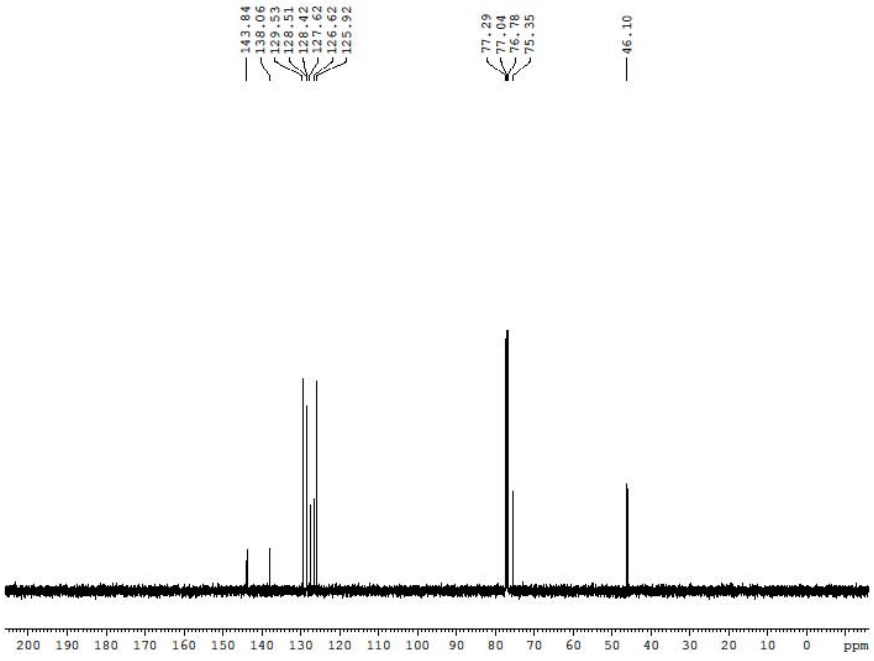
(*R*)-α-(Trifluoromethyl)-benzenemethanol (**6h**)



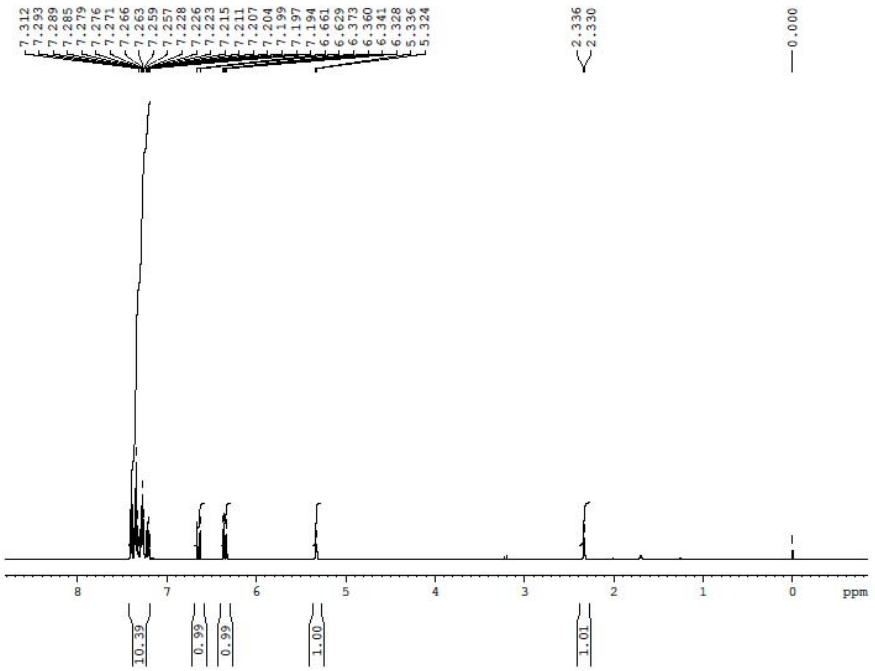


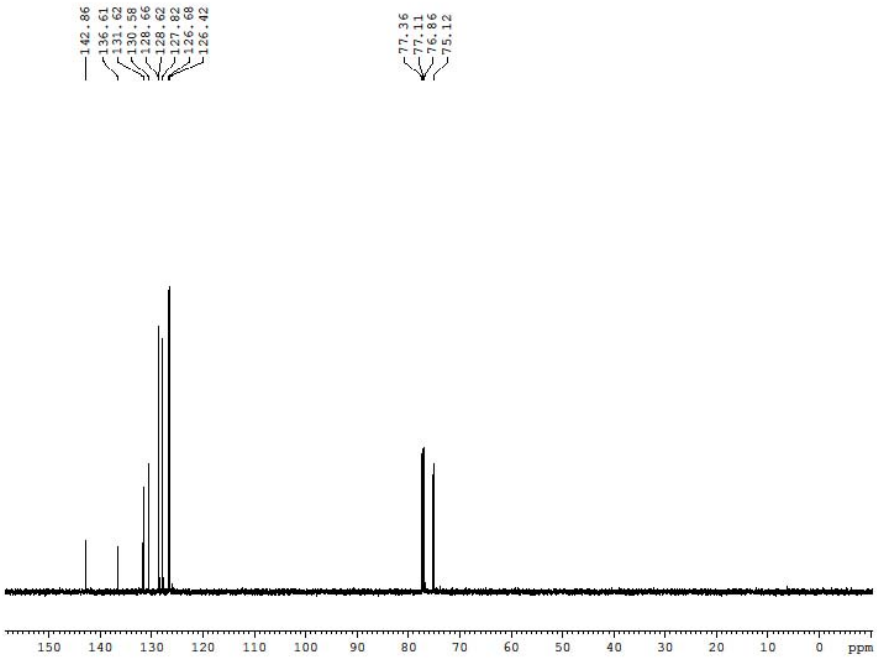
(*S*)-1,2-Diphenylethanol (**6i**)



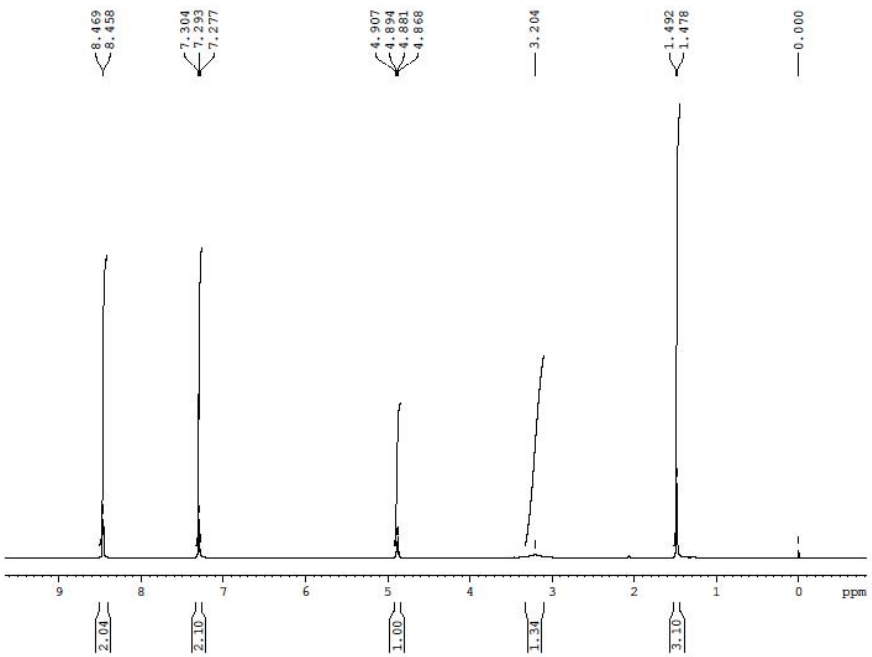


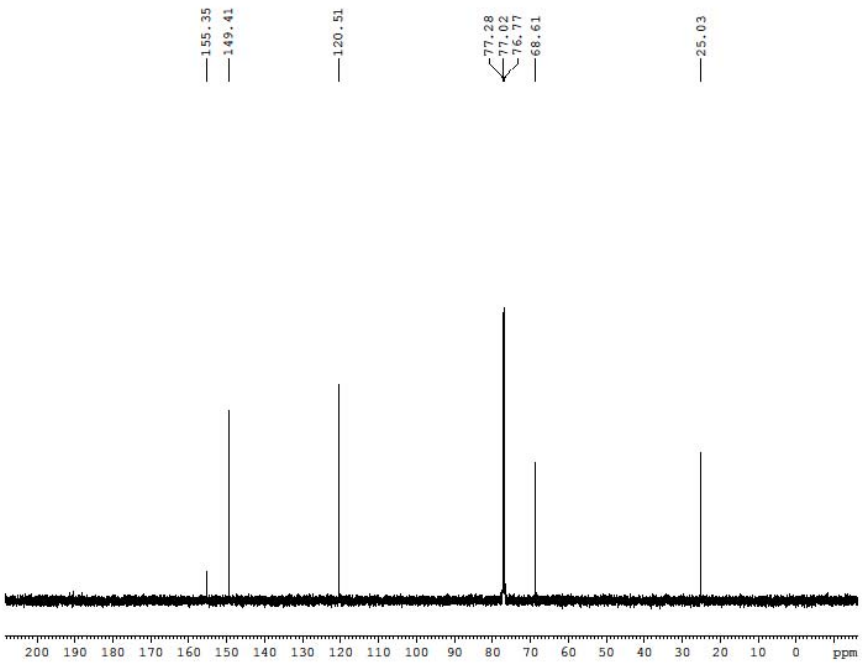
(*S*)-(*E*)-1,3-Diphenyl-2-propen-1-ol (**6j**)



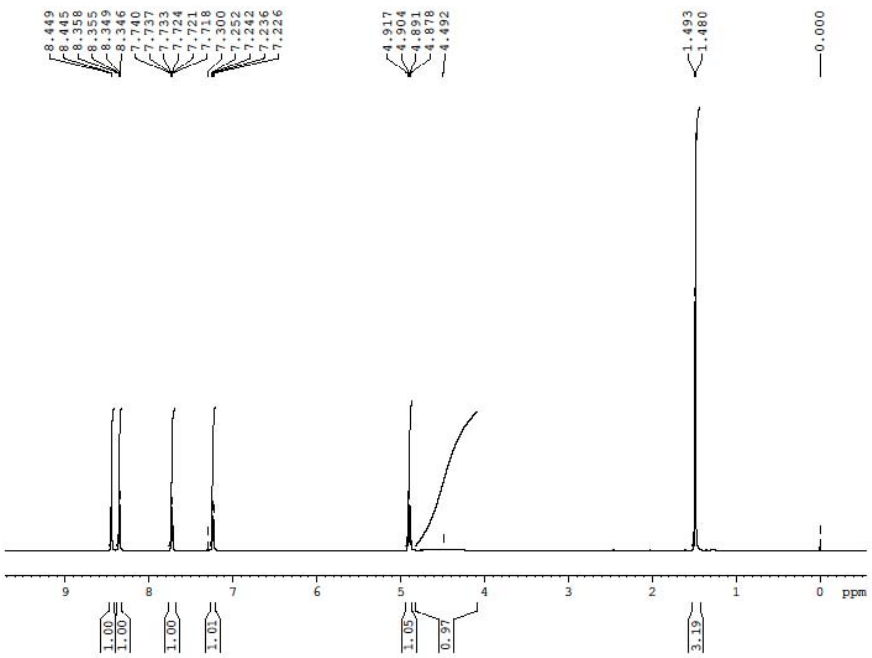


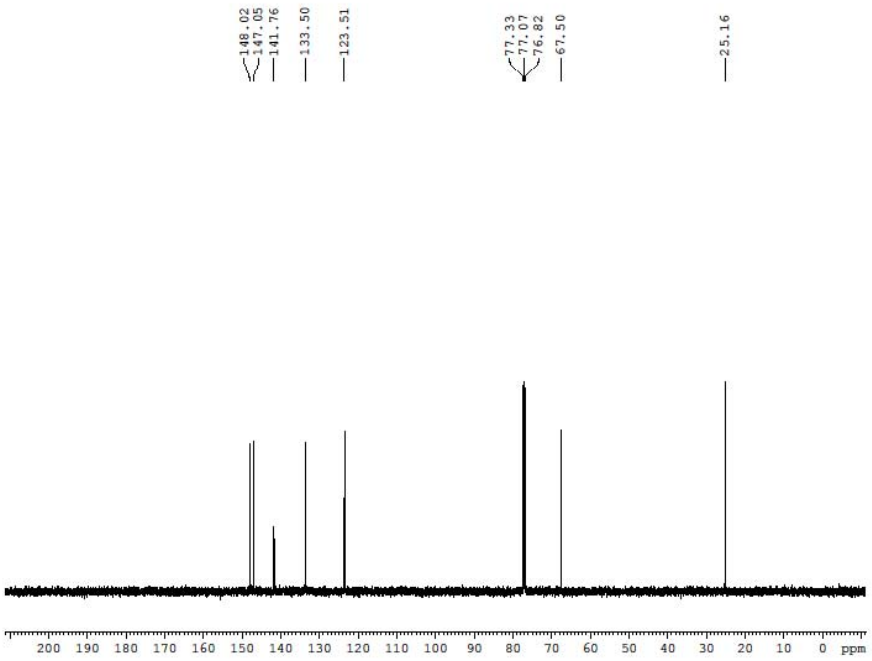
(*S*)-1-(Pyridin-4-yl)ethanol (**8a**)



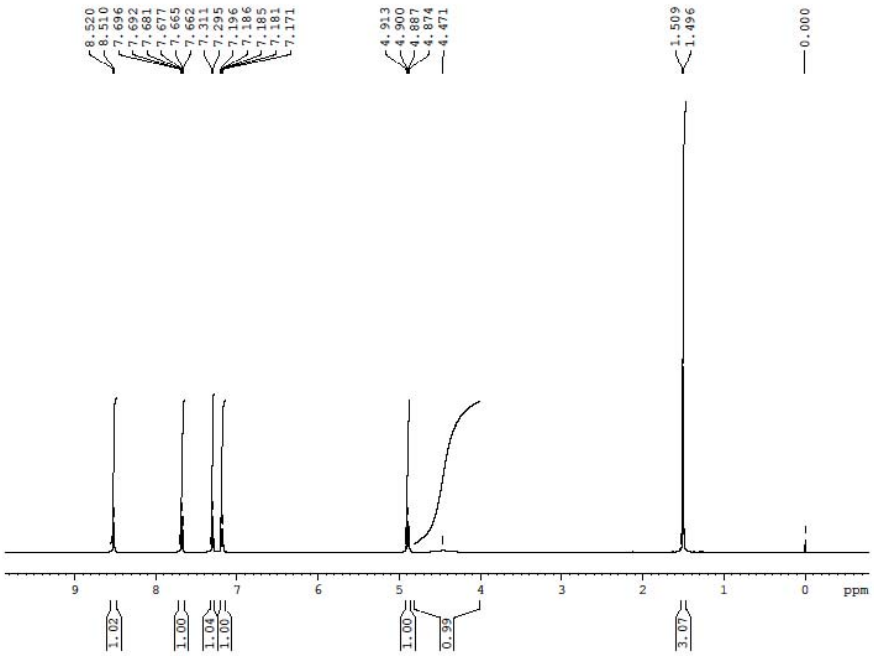


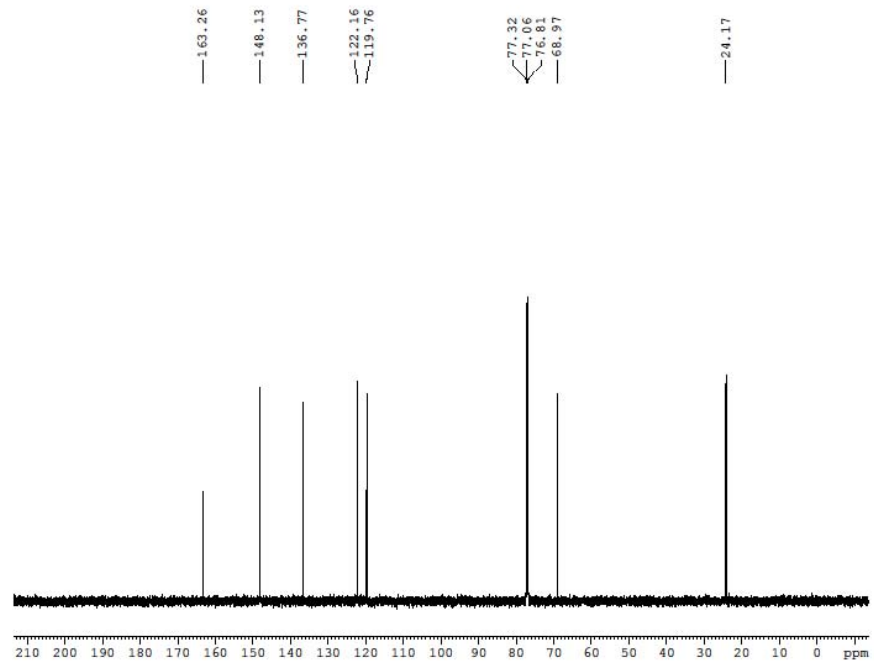
(*S*)-1-(Pyridin-3-yl)ethanol (**8b**)



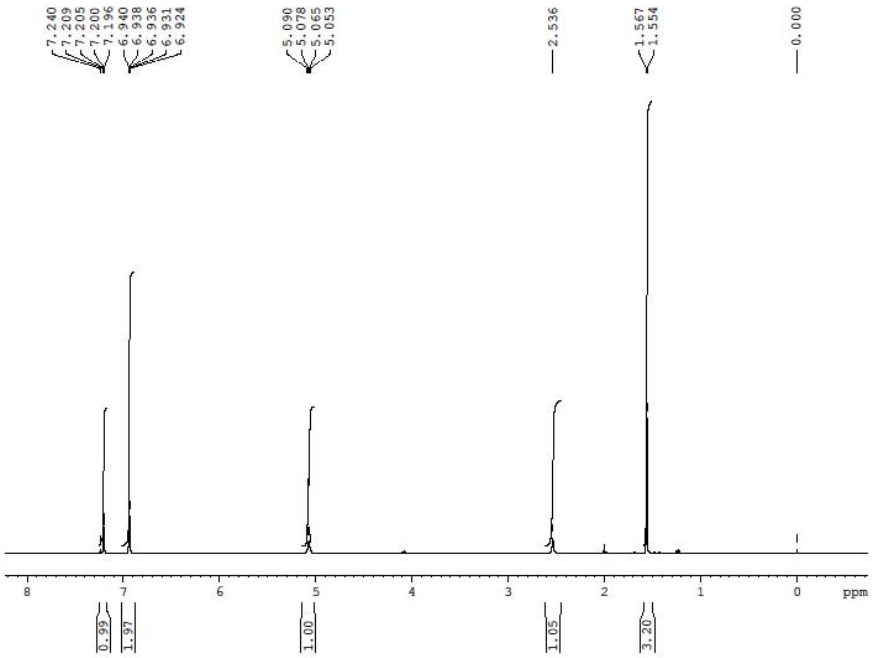


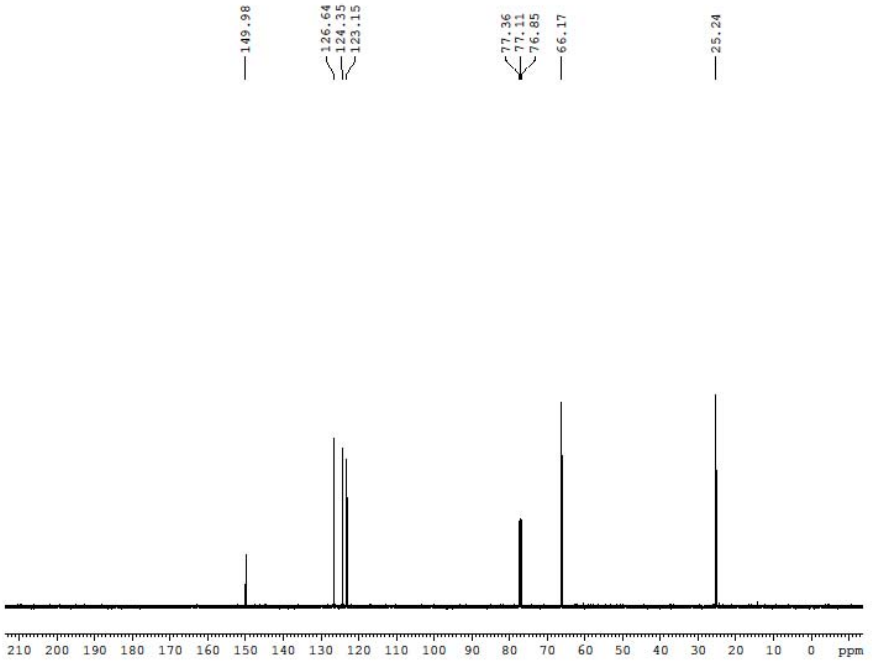
(*S*)-1-(Pyridin-2-yl)ethanol (**8c**)



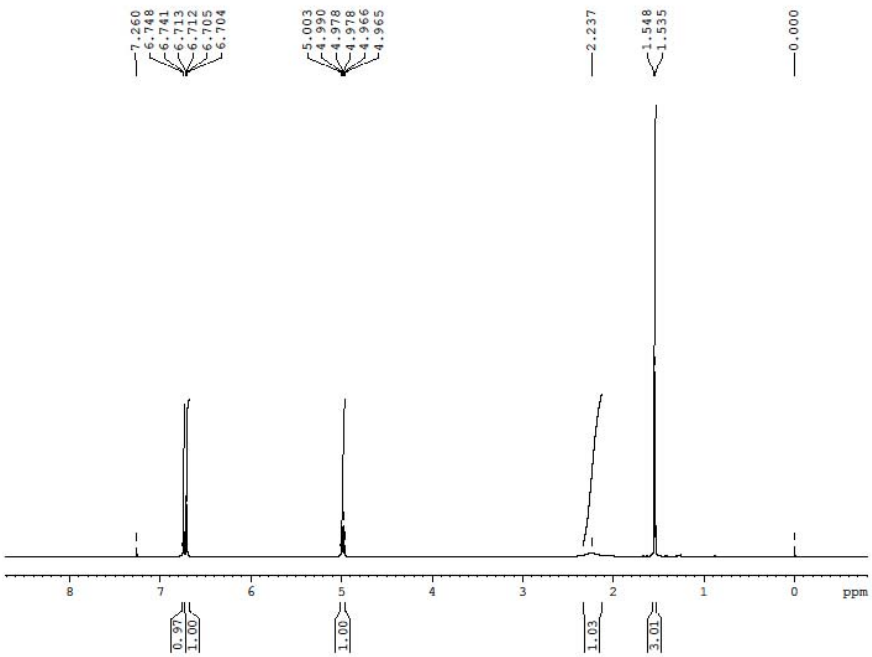


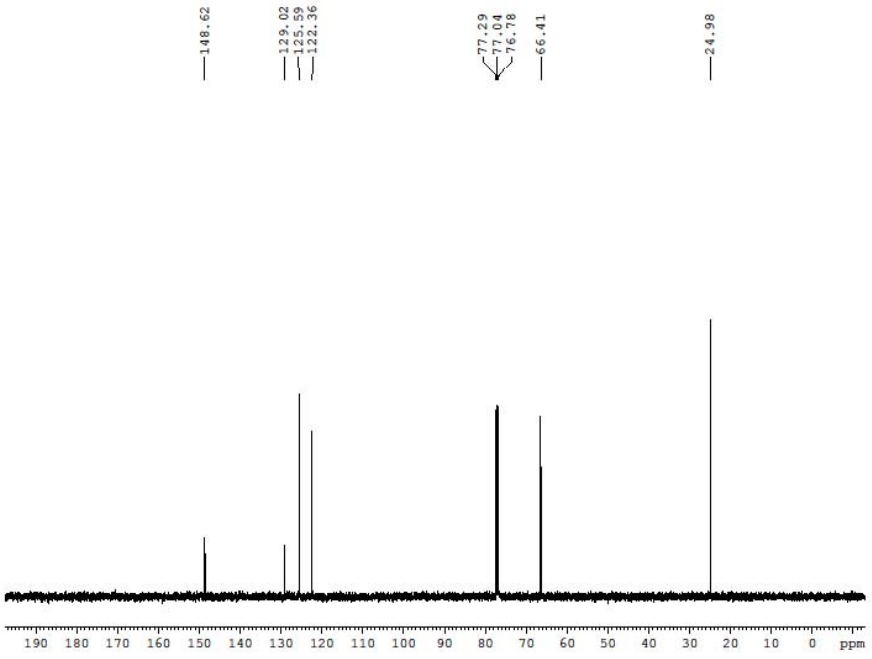
(*S*)-1-(Thiophen-2-yl)ethanol (**8d**)



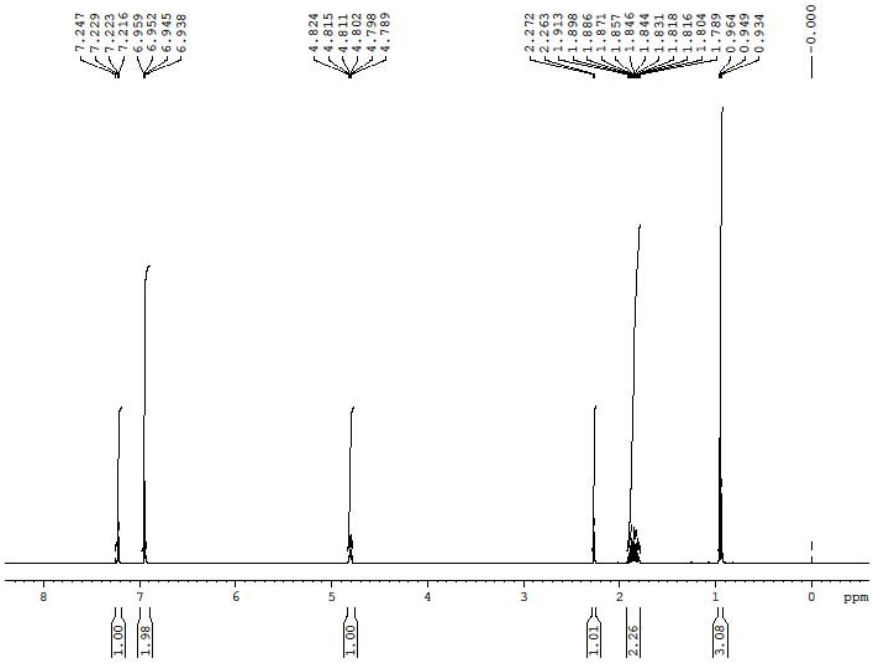


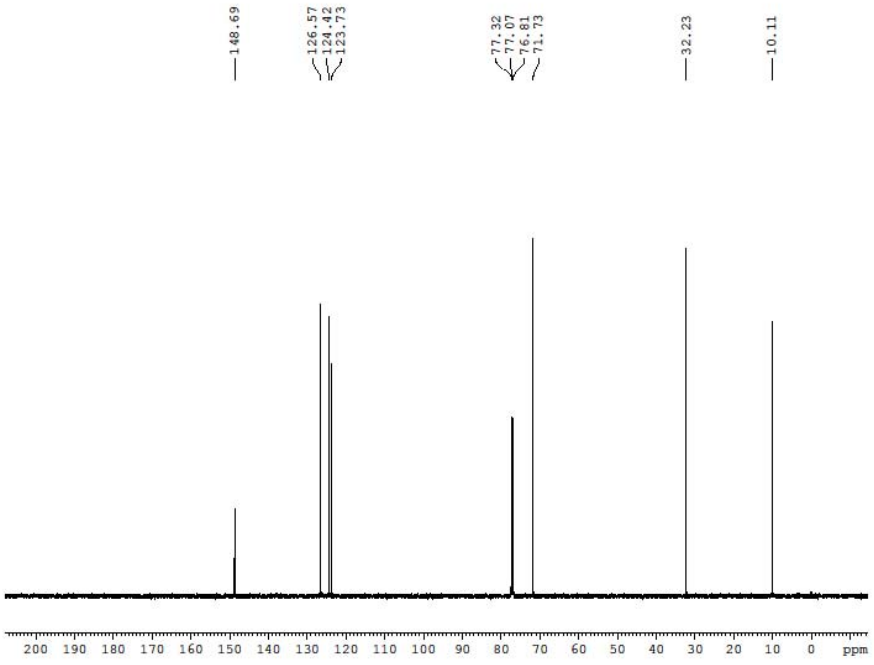
(*S*)-1-(5-Chlorothiophen-2-yl)ethanol (**8e**)



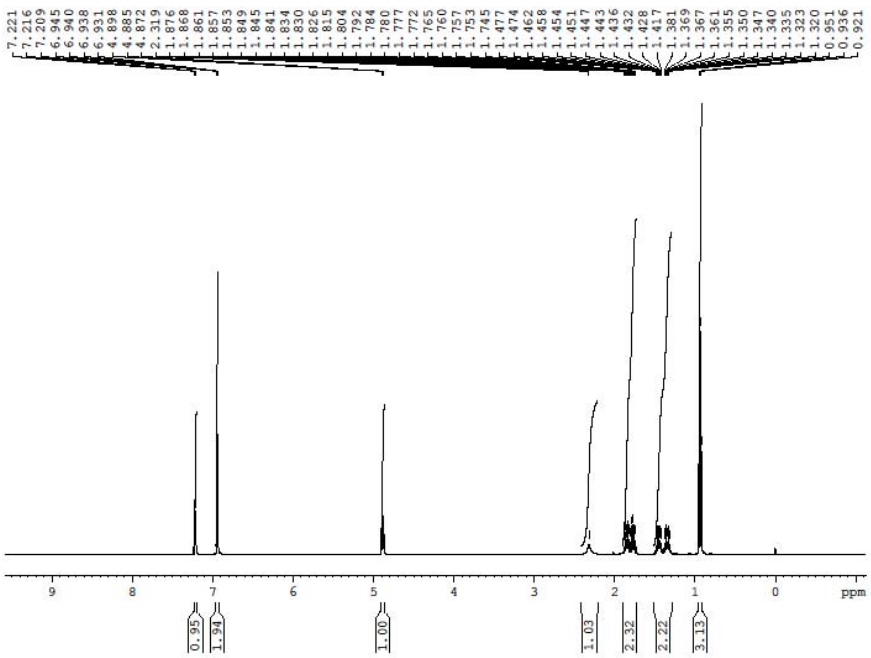


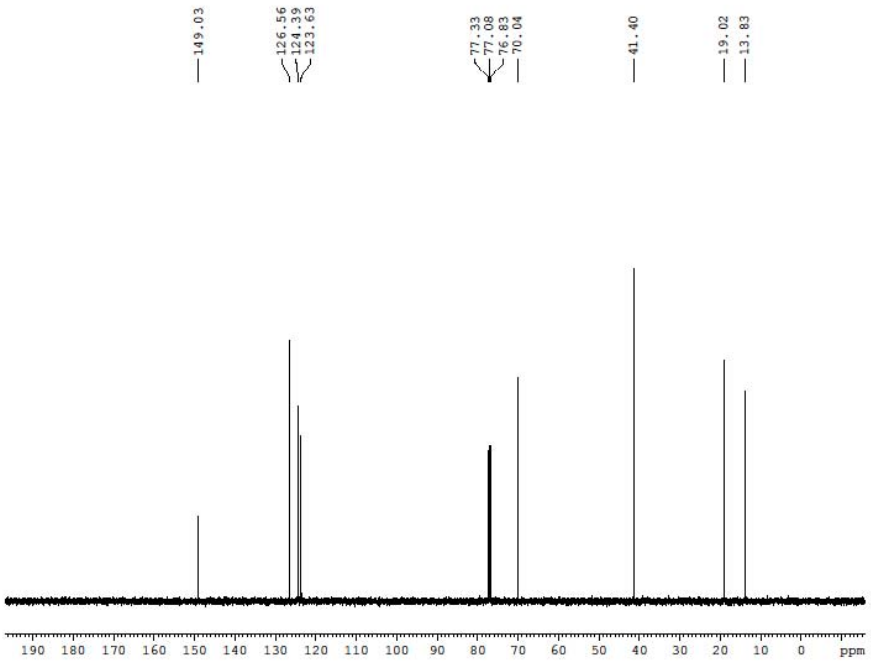
(*S*)-1-(Thiophen-2-yl)propan-1-ol (**8f**)



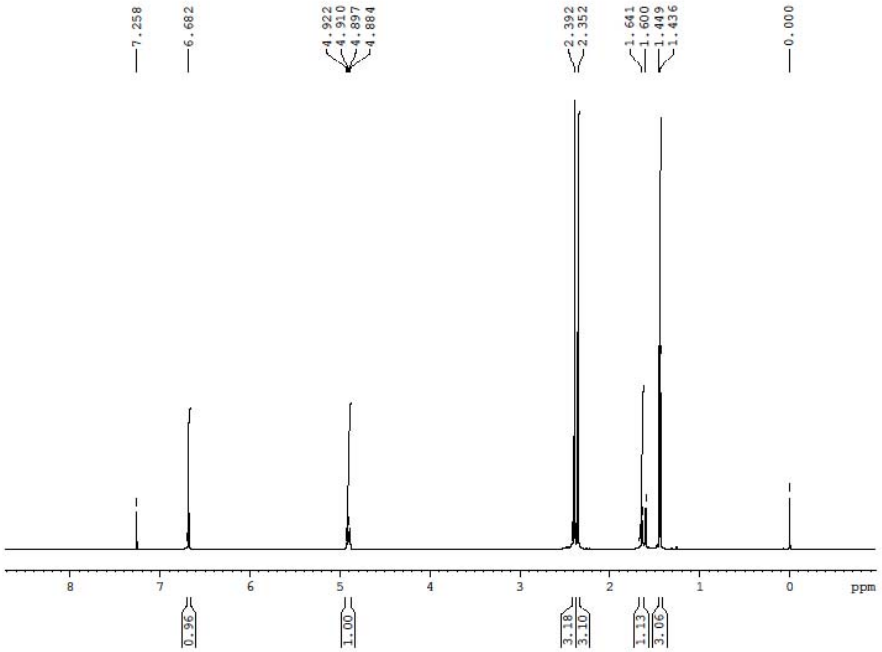


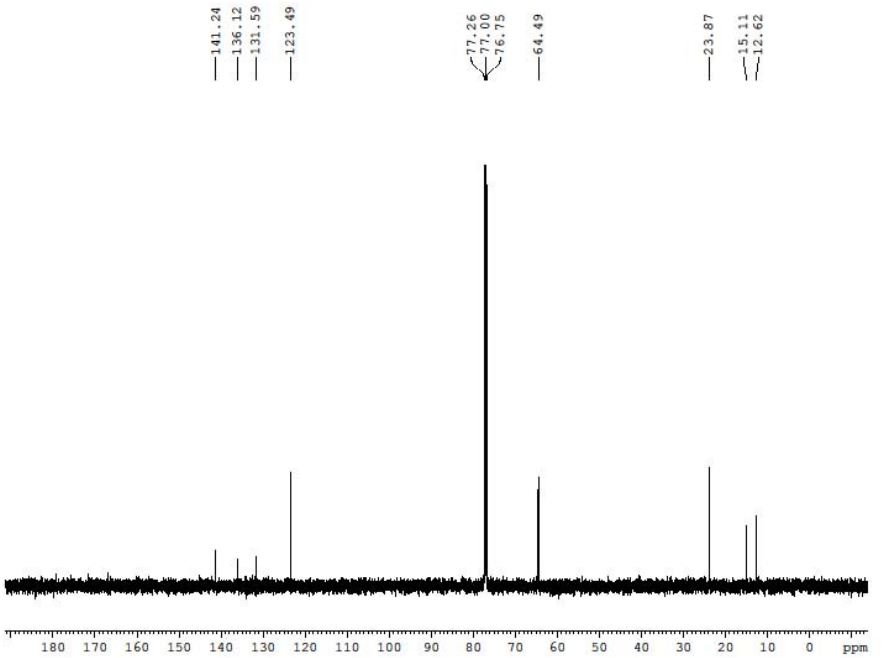
(*R*)-1-(Thiophen-2-yl)butan-1-ol (**8g**)



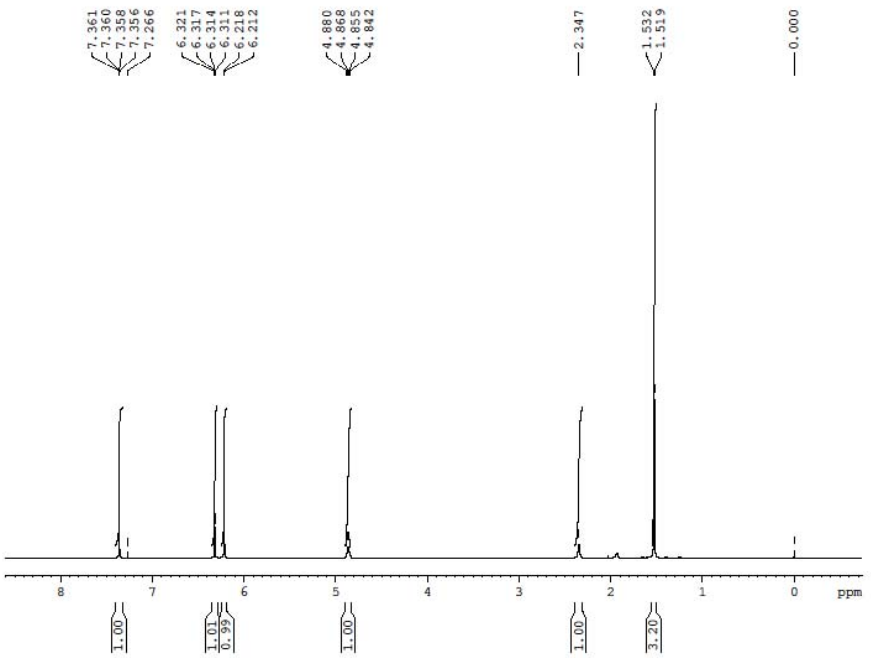


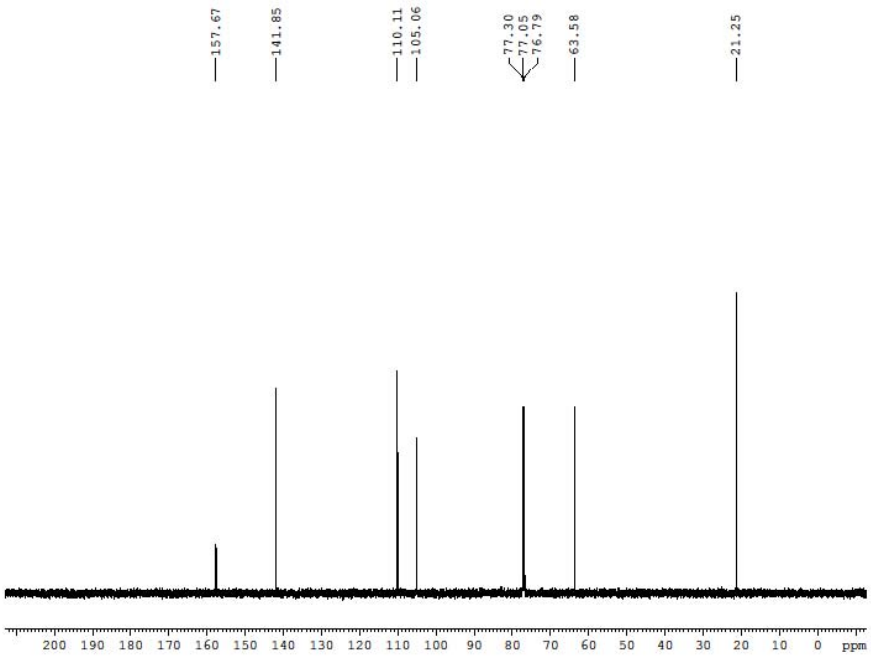
(*S*)-1-(2,5-Dimethylthiophen-3-yl)ethanol (**8h**)



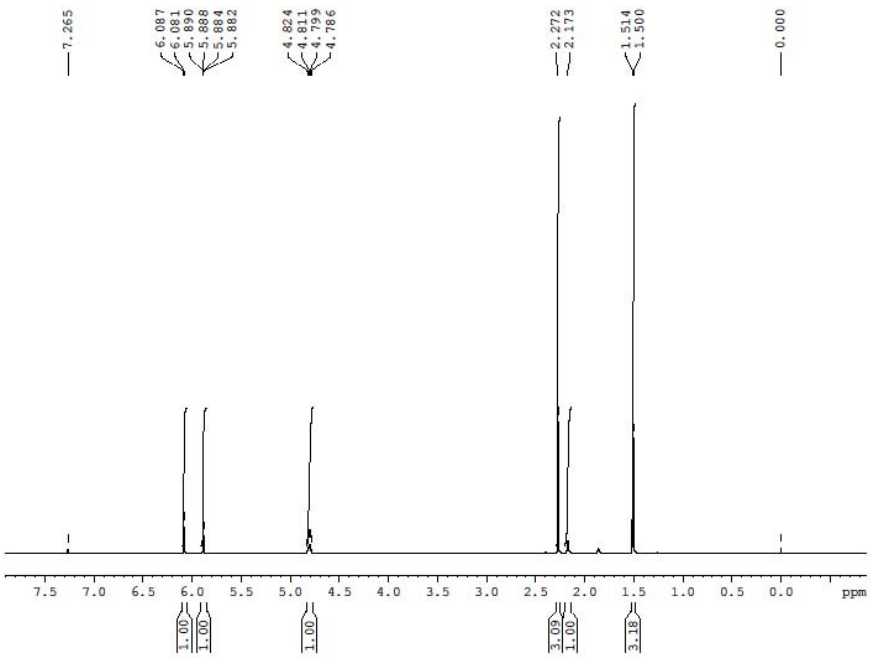


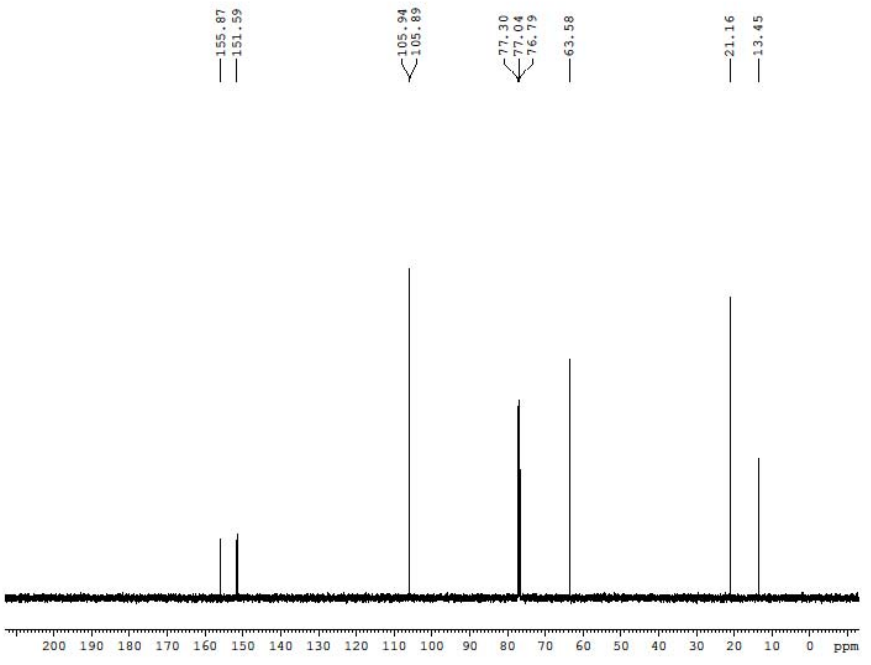
(*S*)-1-(Furan-2-yl)ethanol (**8i**)



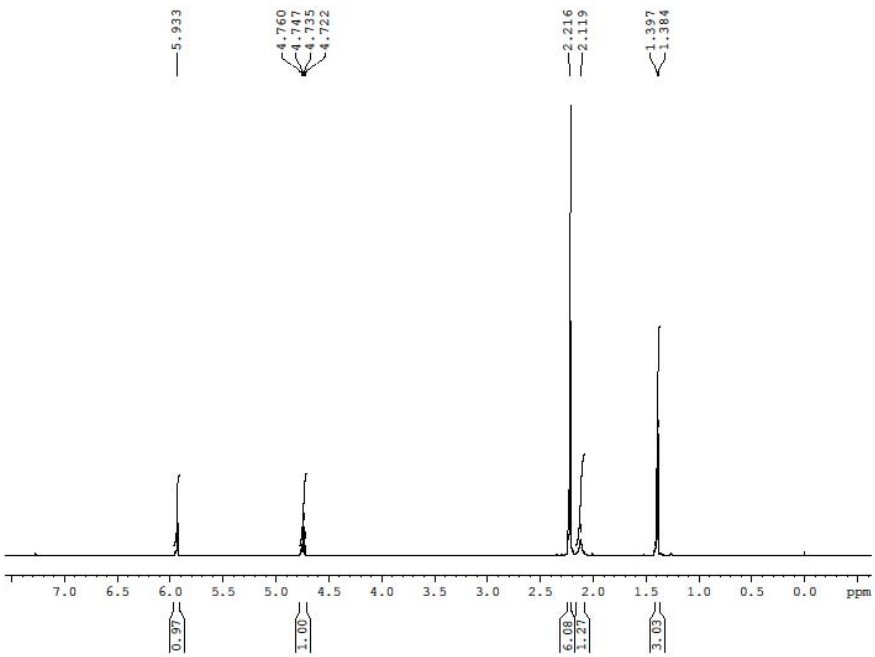


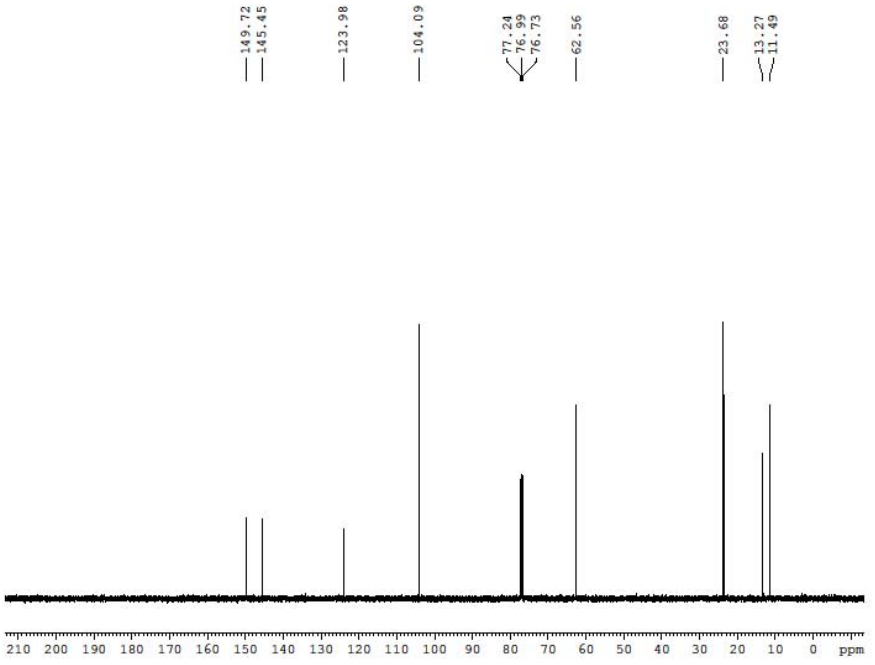
(*S*)-1-(5-Methylfuran-2-yl)ethanol (**8j**)



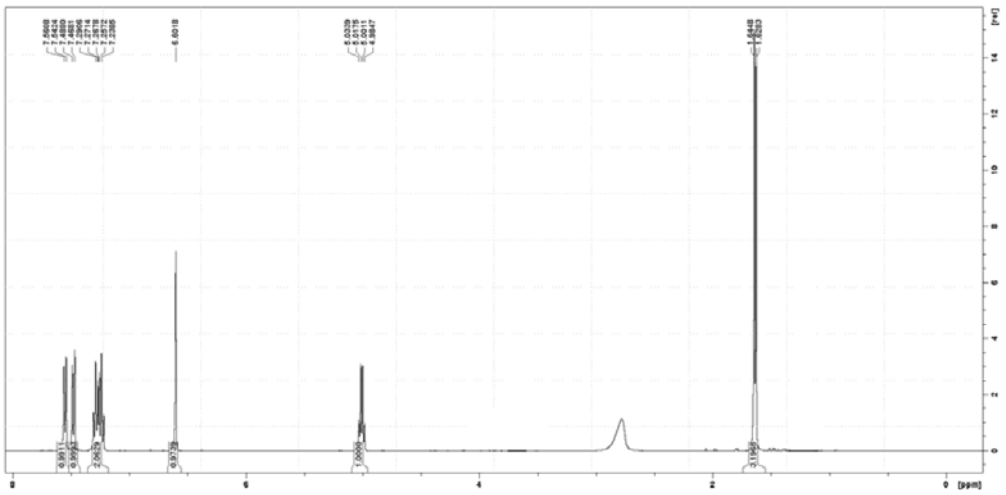


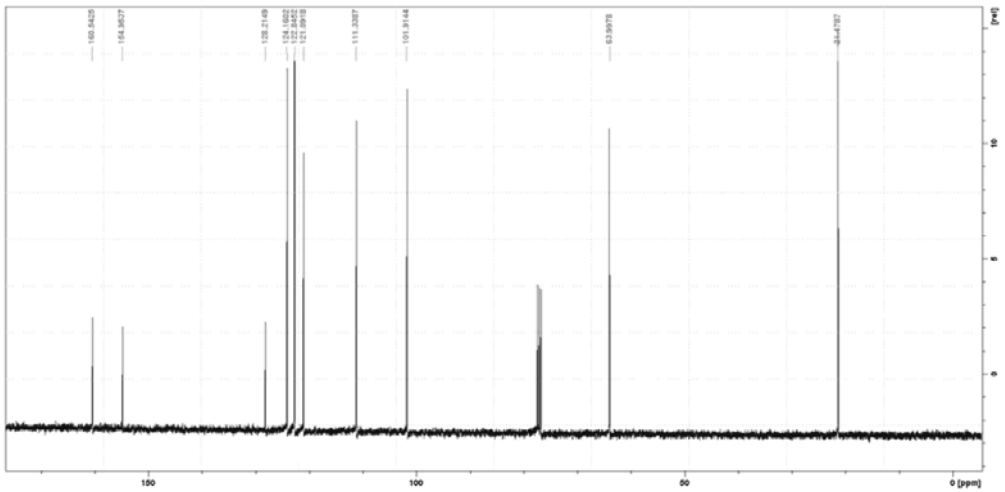
(-)-1-(2,5-Dimethylfuran-3-yl)ethanol (**8k**)



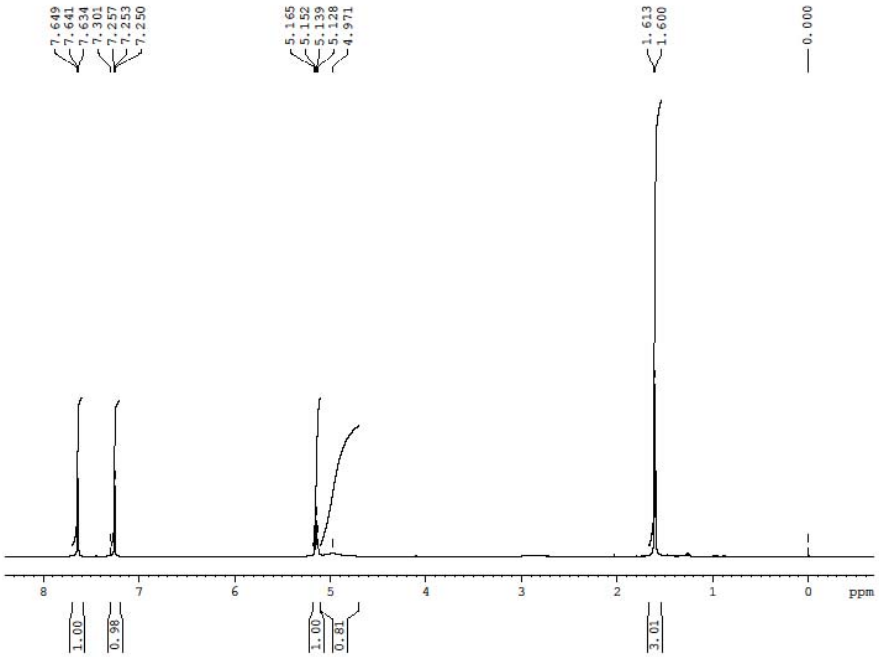


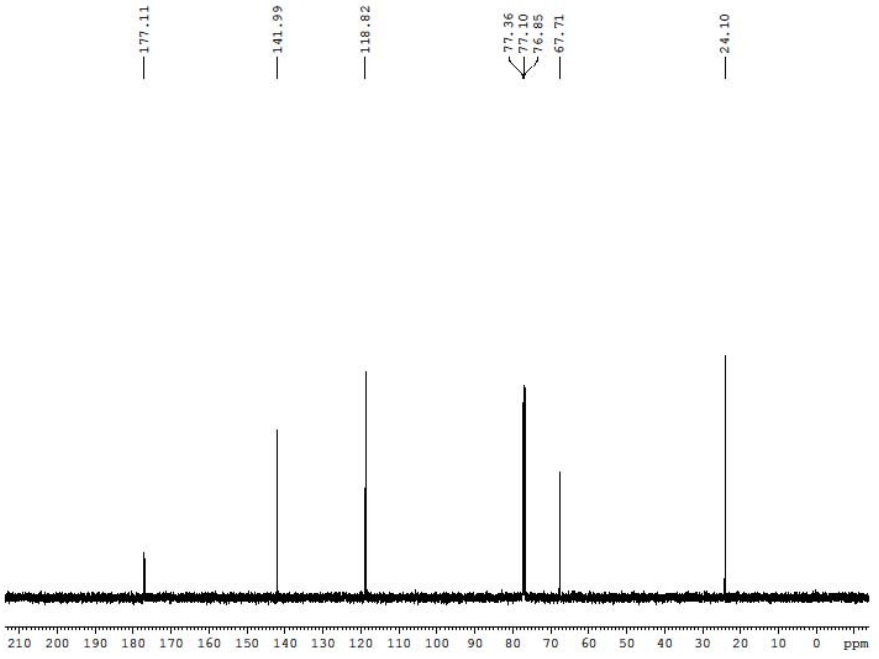
(*S*)-1-(Benzofuran-2-yl)ethanol (**8l**)



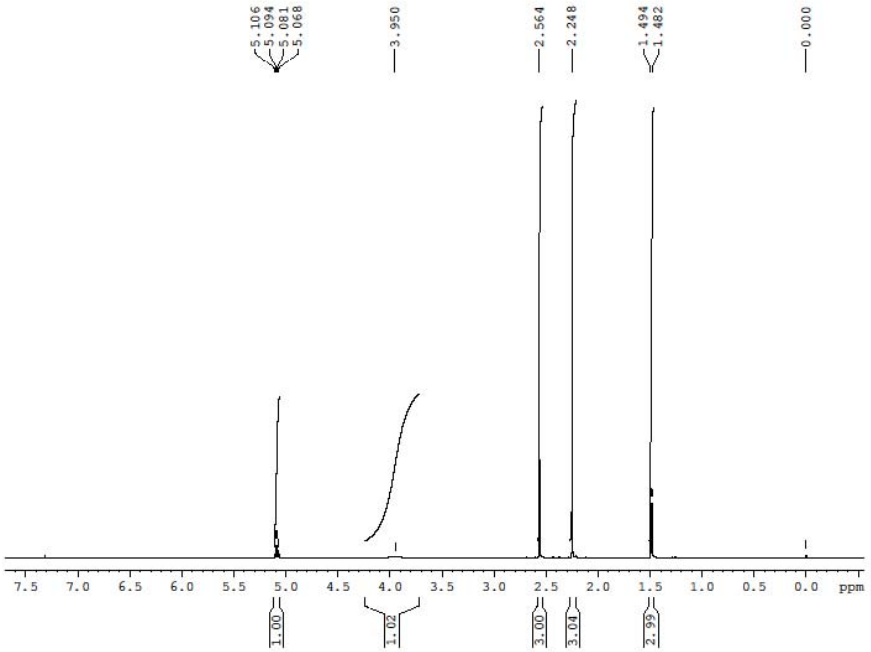


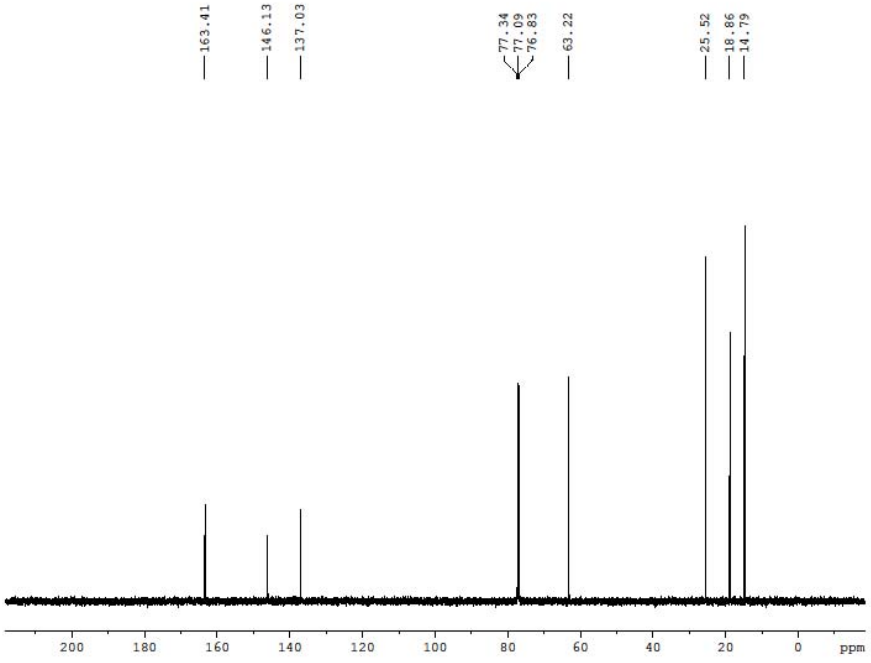
(*S*)-1-(2-Thiazolyl)ethanol (**8m**)



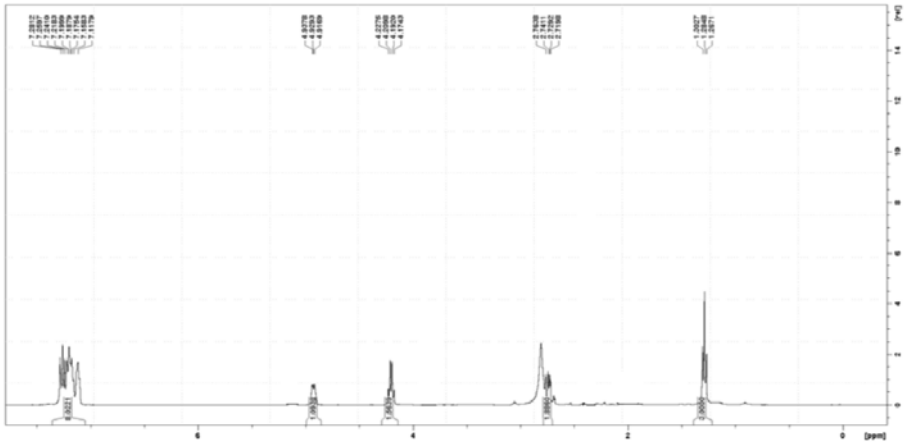


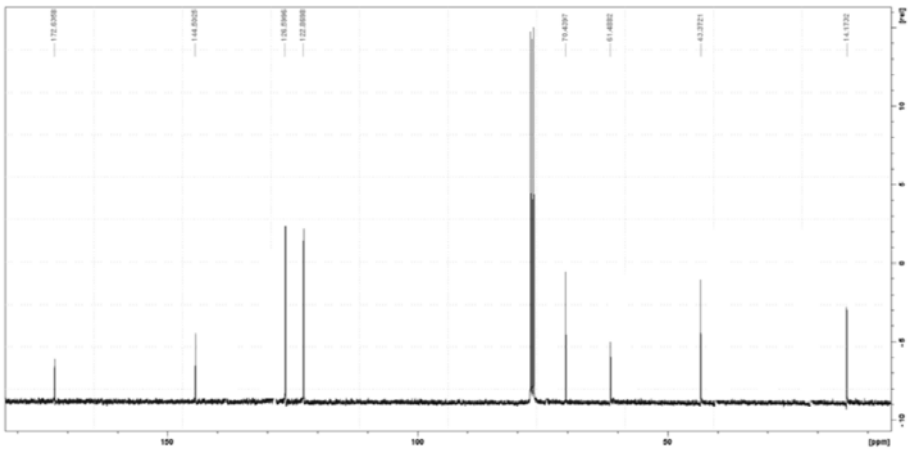
(-)-1-(2,4-Dimethylthiazol-5-yl)ethanol (**8n**)



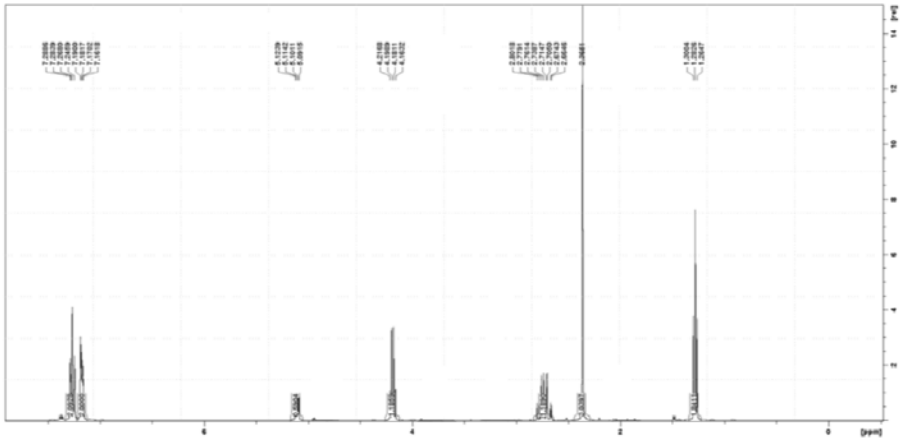


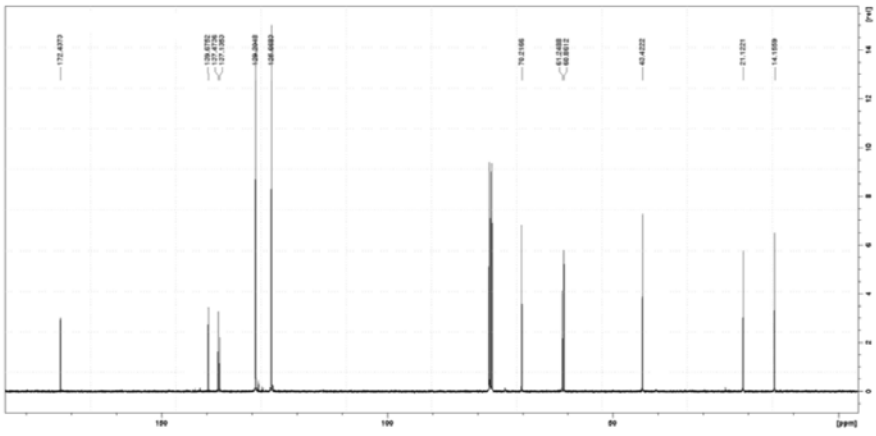
(*S*)-Ethyl-3-hydroxy-3-phenylpropanoate (**10a**)



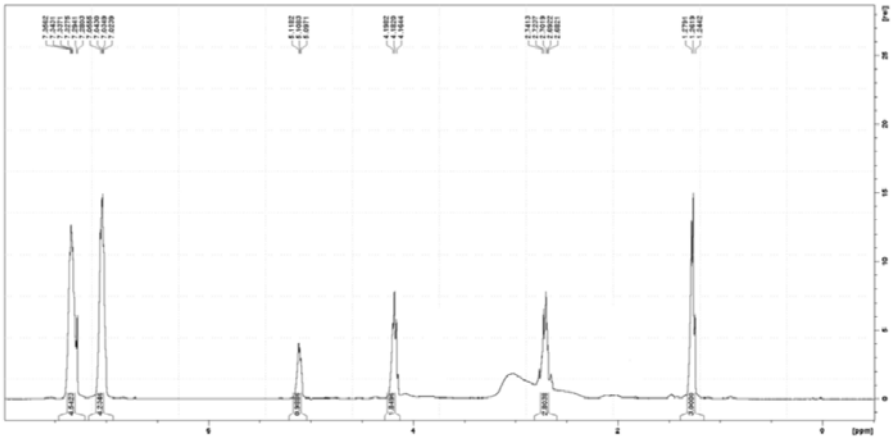


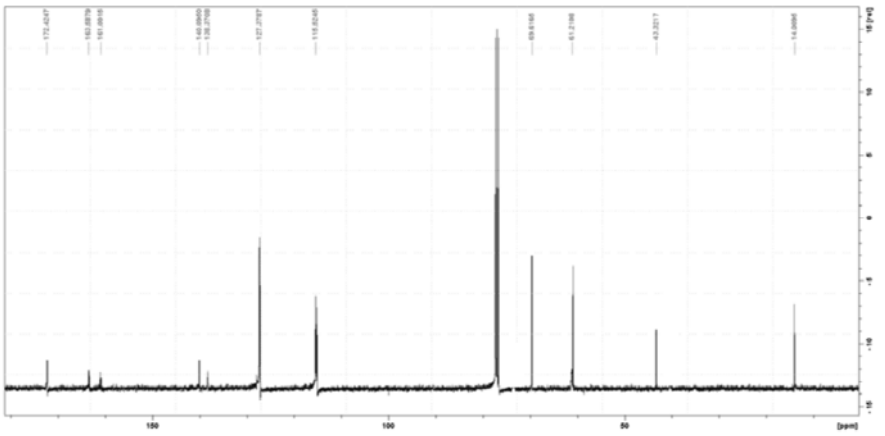
(*S*)-Ethyl-3-hydroxy-3-(4-methylphenyl)propanoate (**10b**)



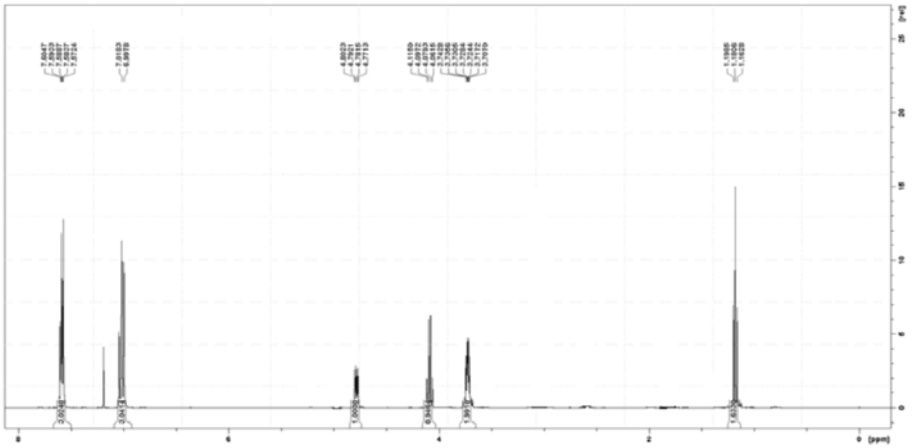


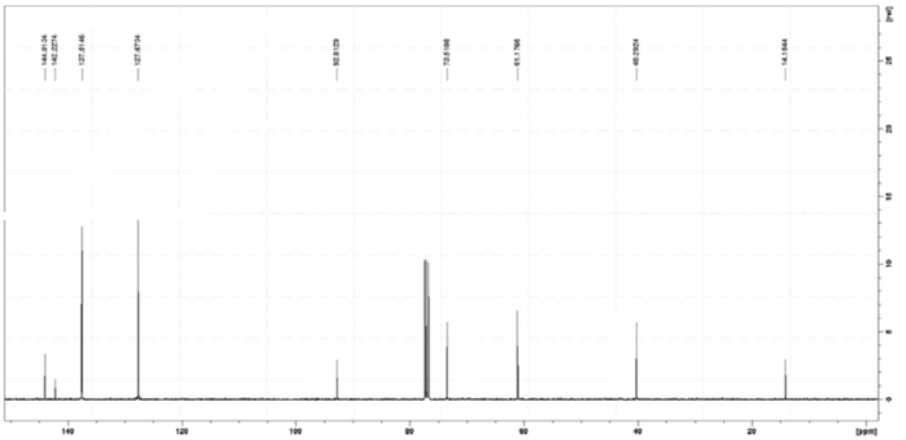
(*S*)-Ethyl-3-hydroxy-3-(4-fluorophenyl)propanoate (**10c**)



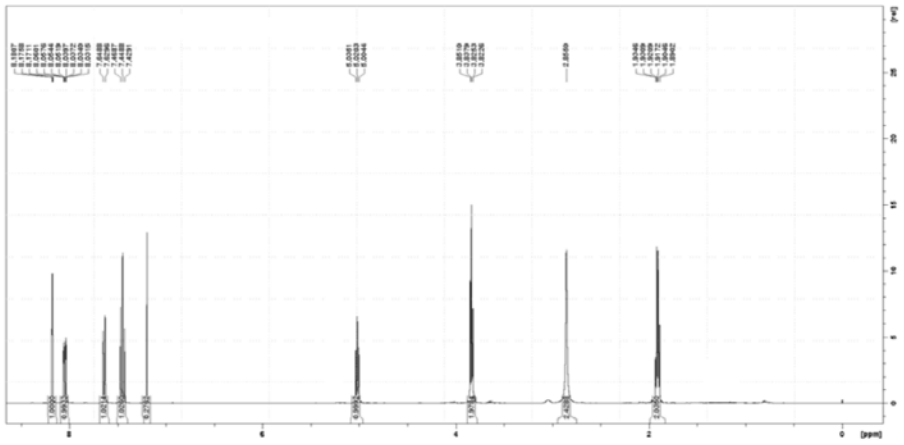


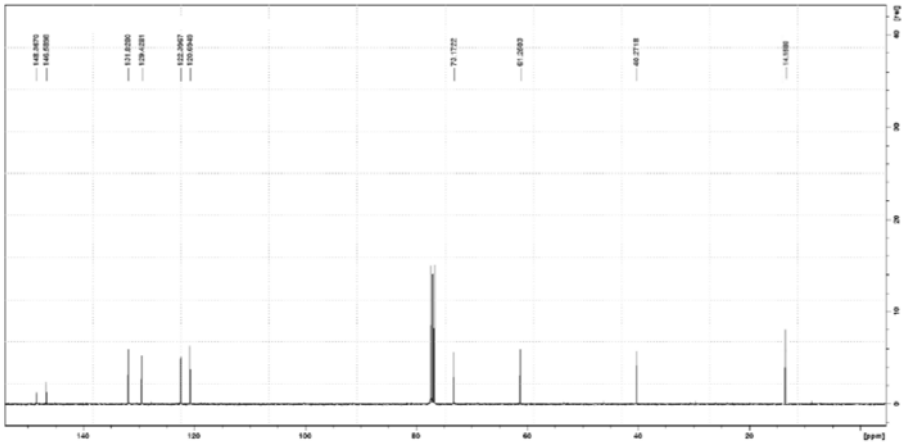
(*S*)-Ethyl-3-hydroxy-3-(4-iodophenyl)propanoate (**10d**)



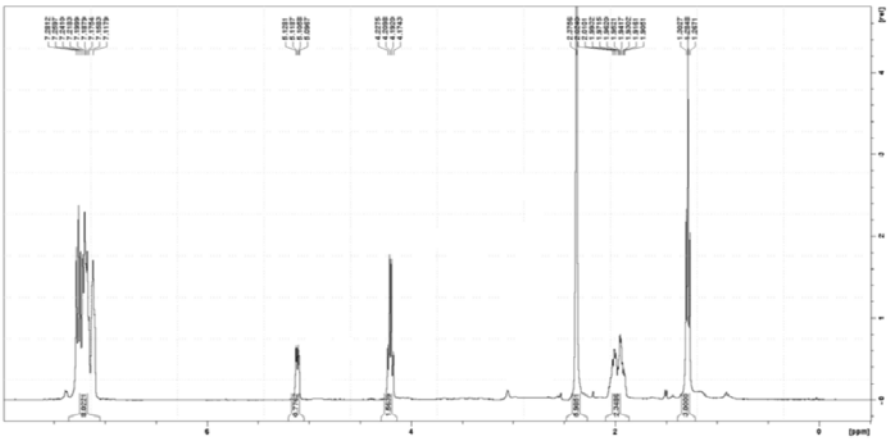


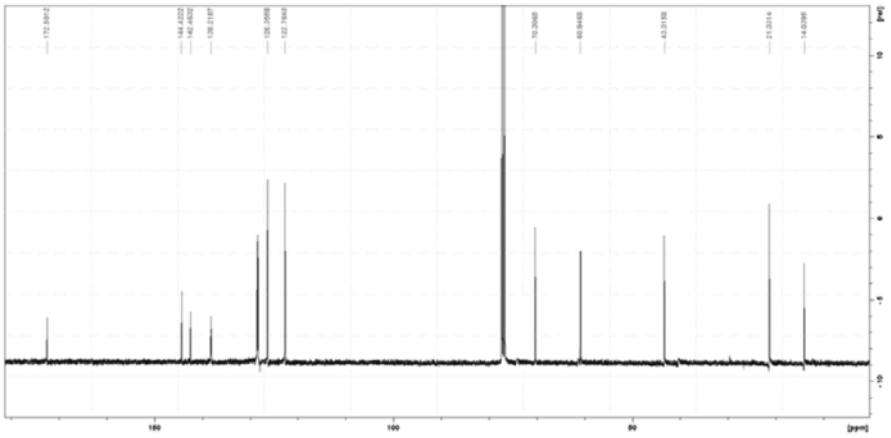
(*S*)-Ethyl-3-hydroxy-3-(3-nitrophenyl)propanoate (**10f**)





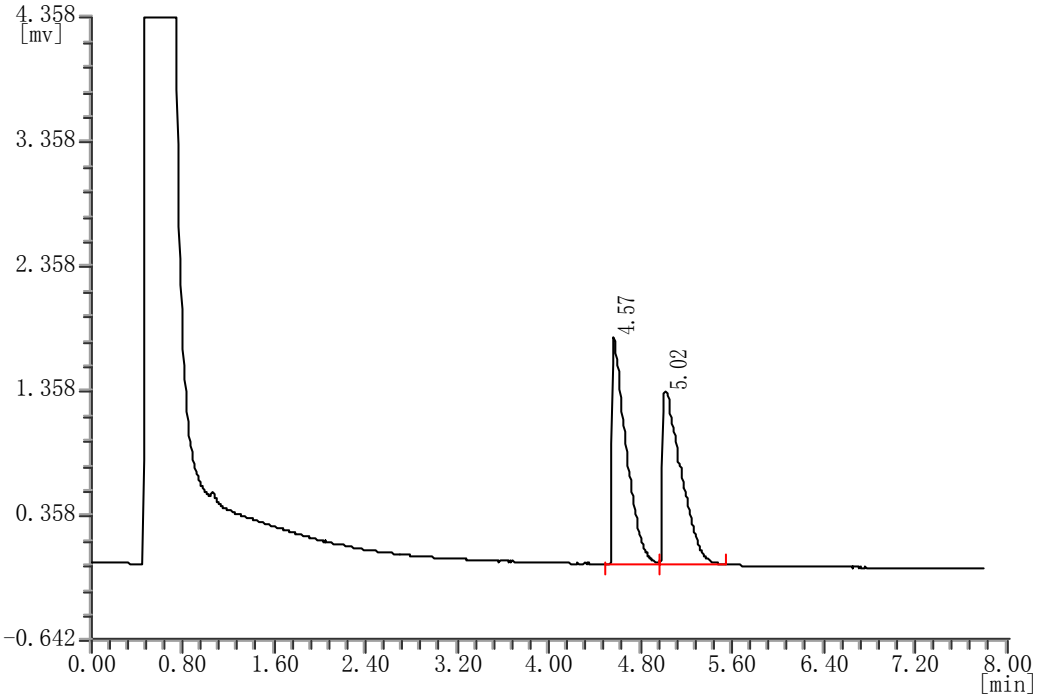
(*S*)-Ethyl-3-hydroxy-3-(3-methylphenyl)propanoate (**10g**)



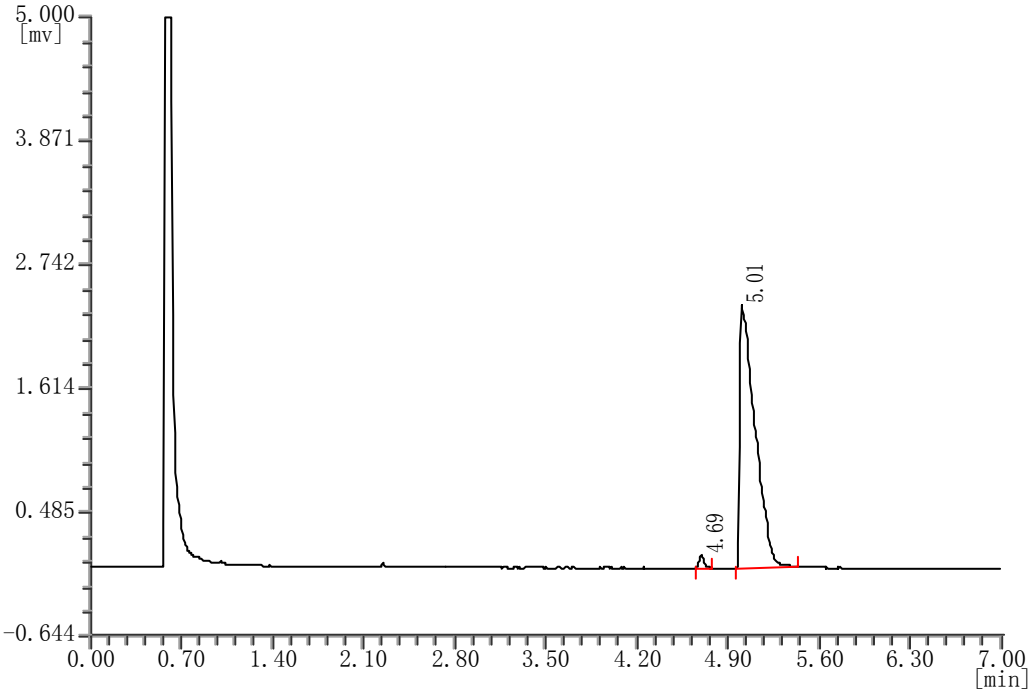


6. GC and HPLC traces of hydrogenation products

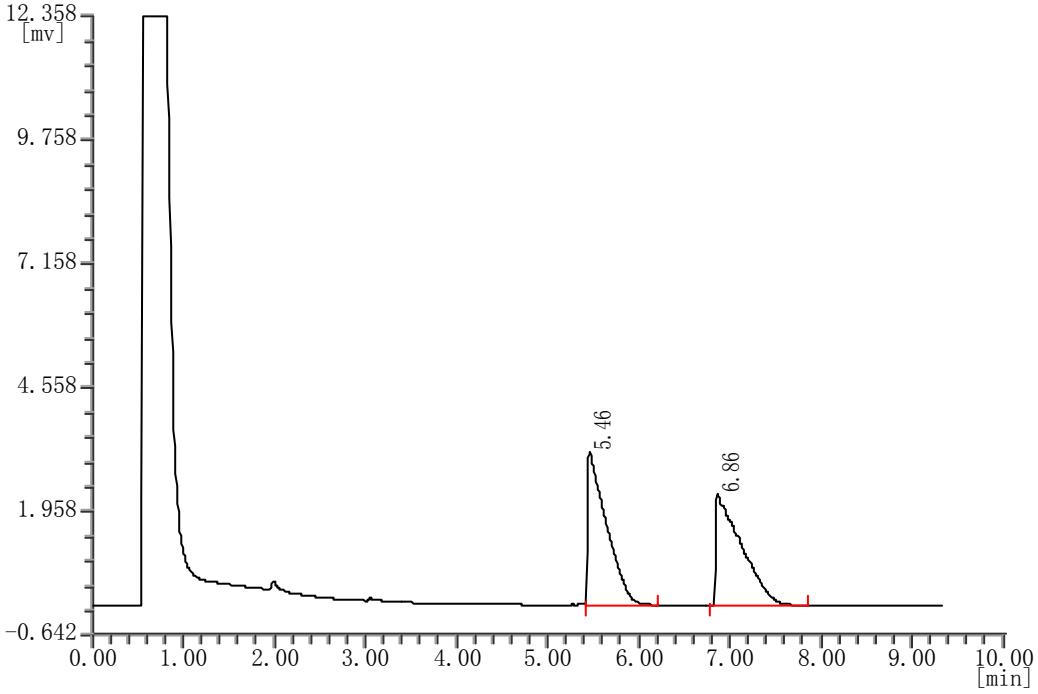
(±)-1-Phenylethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



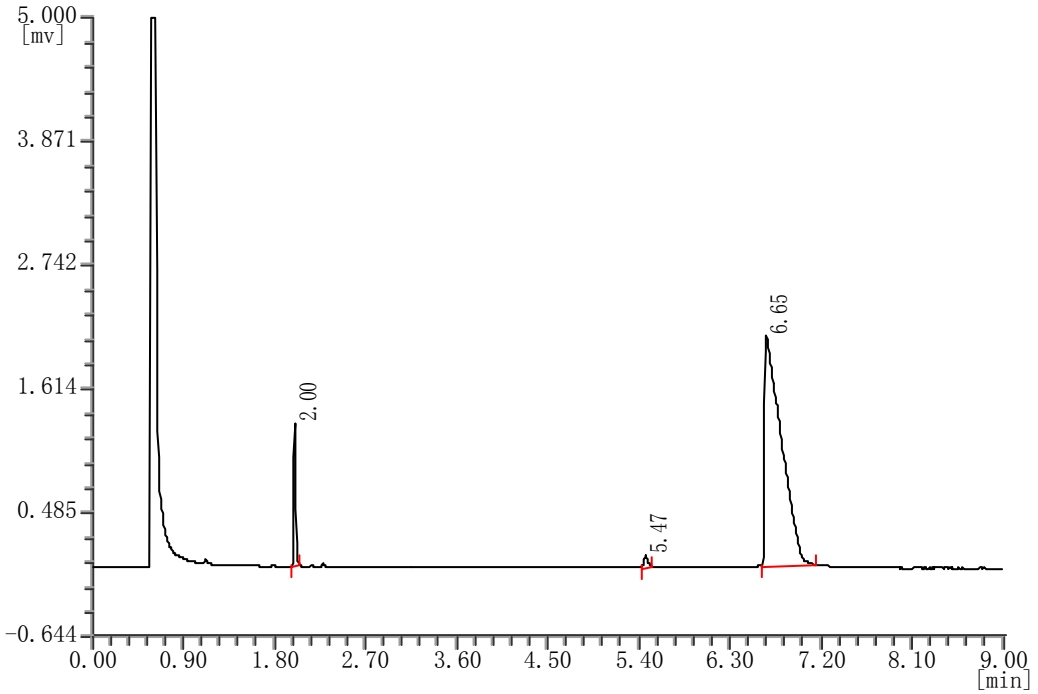
(*S*)-1-Phenylethanol (**4a**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 97% ee.



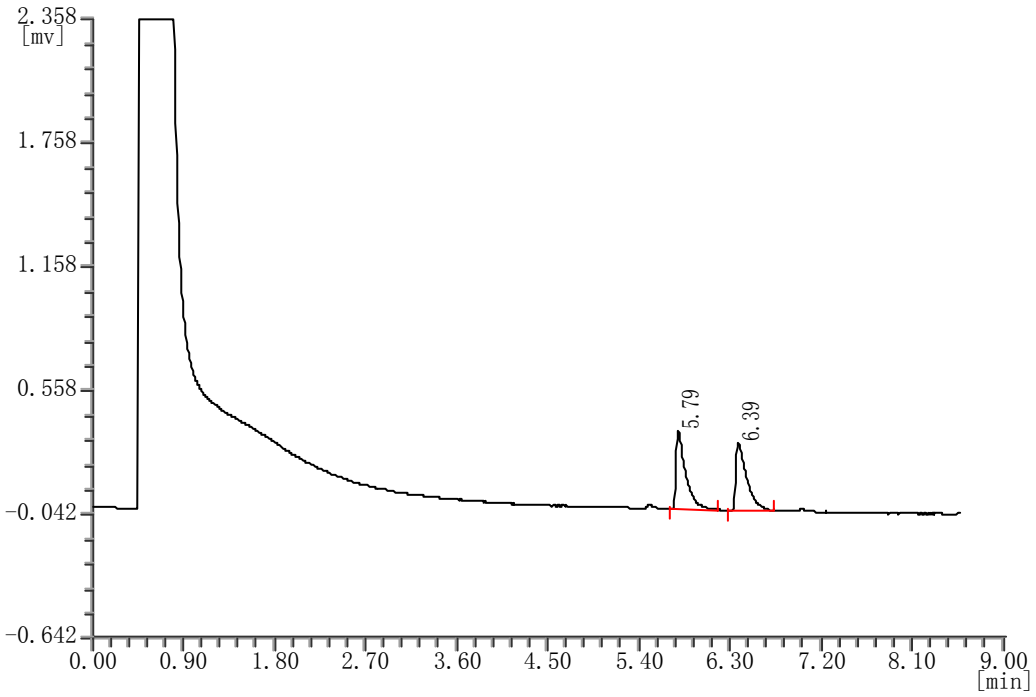
(±)-1-(2-Chlorophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



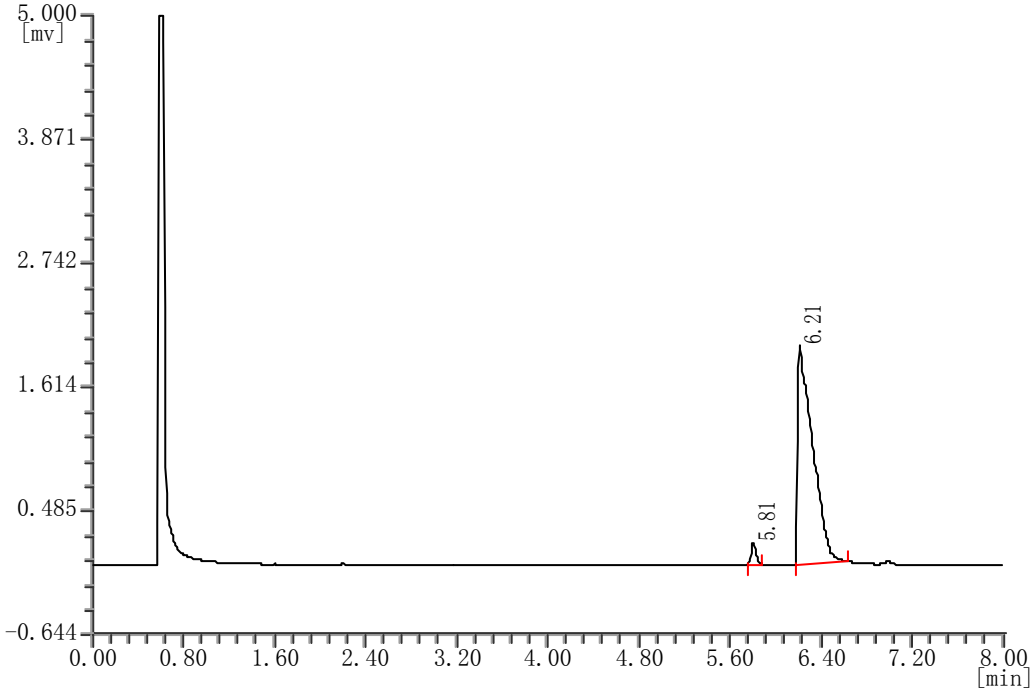
(*S*)-1-(2-Chlorophenyl)ethanol (***o*-4b**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 97% ee.



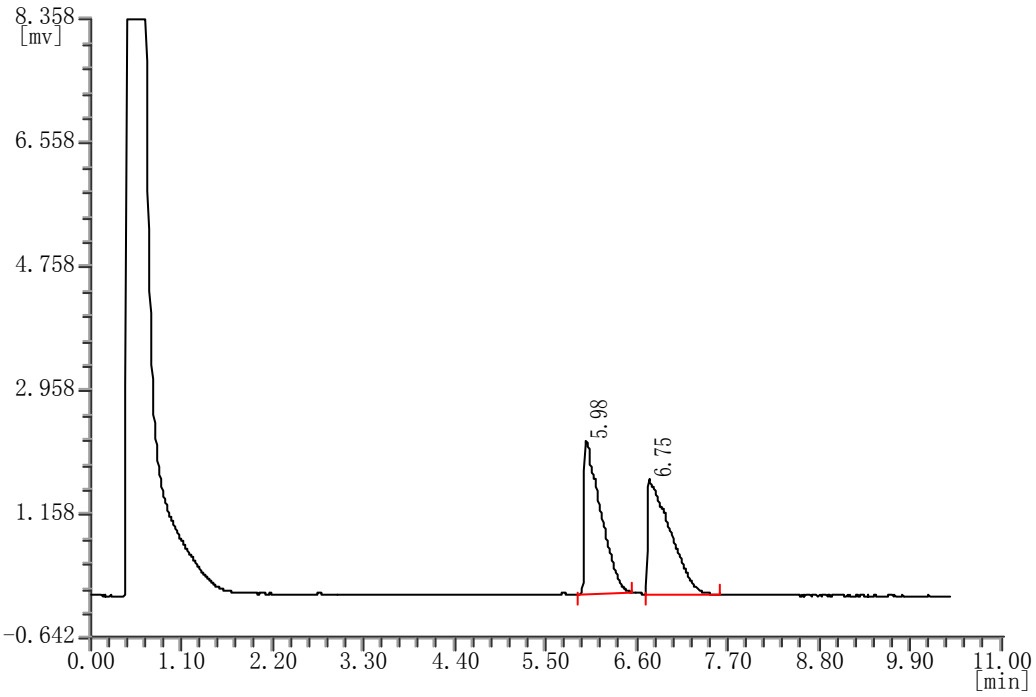
(±)-1-(3-Chlorophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



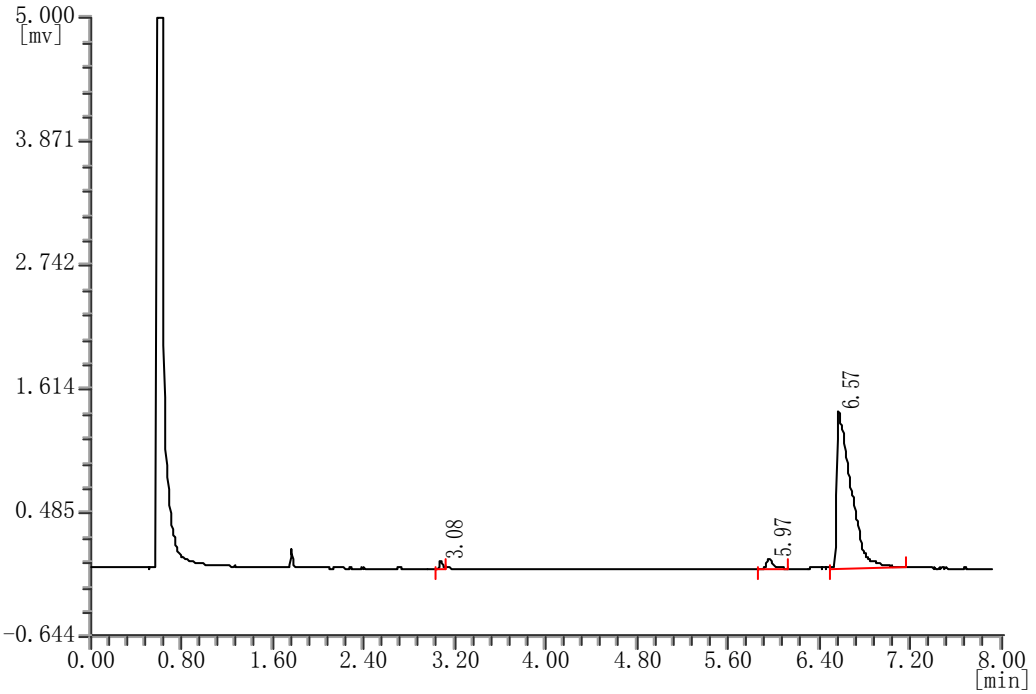
(*S*)-1-(3-Chlorophenyl)ethanol (***m*-4b**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 94% ee.



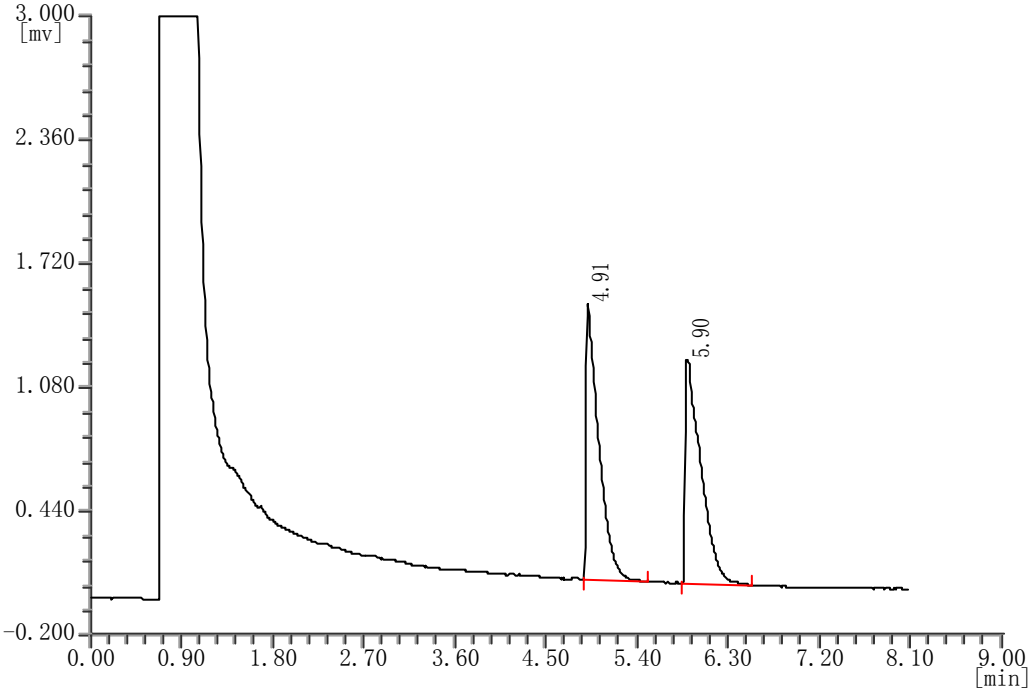
(±)-1-(4-Chlorophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



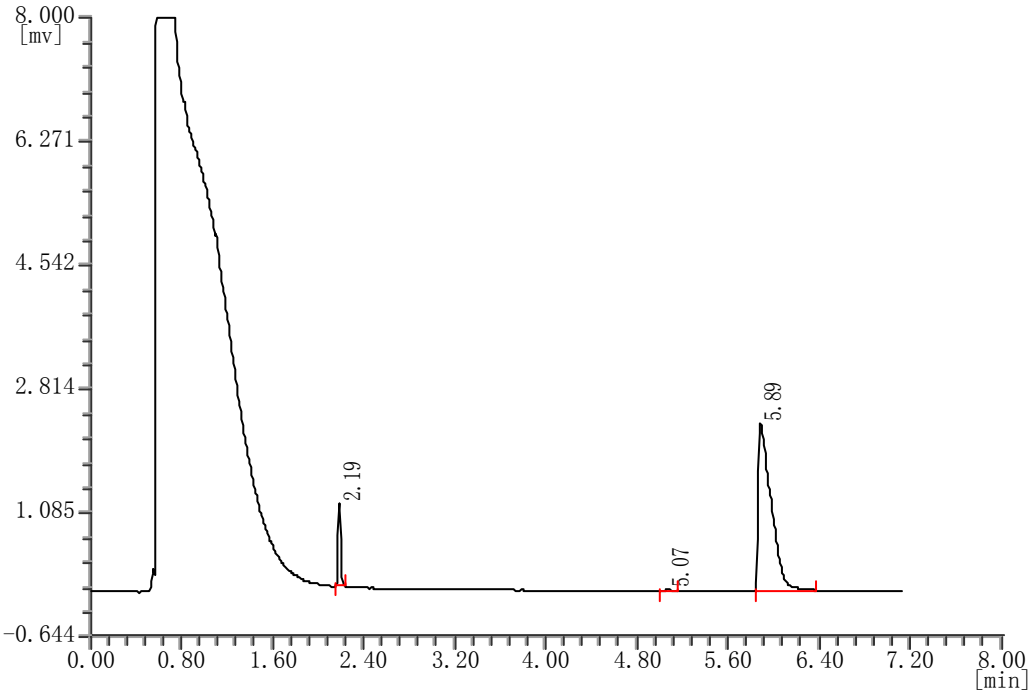
(*S*)-1-(4-Chlorophenyl)ethanol (***p*-4b**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 95% ee.



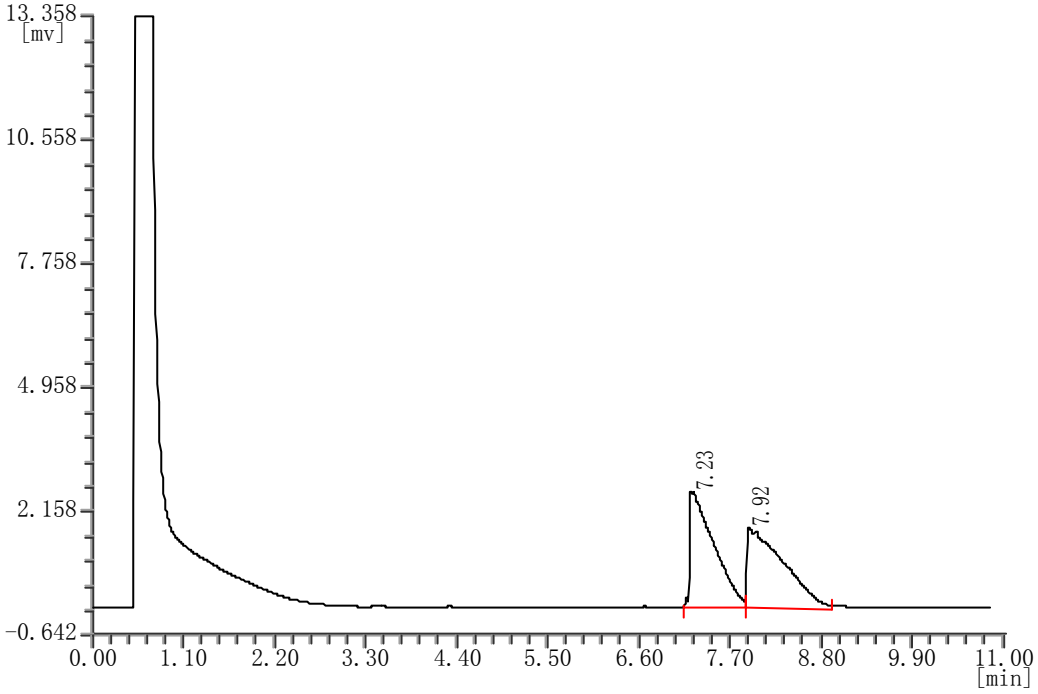
(±)-1-(2-Methylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C.



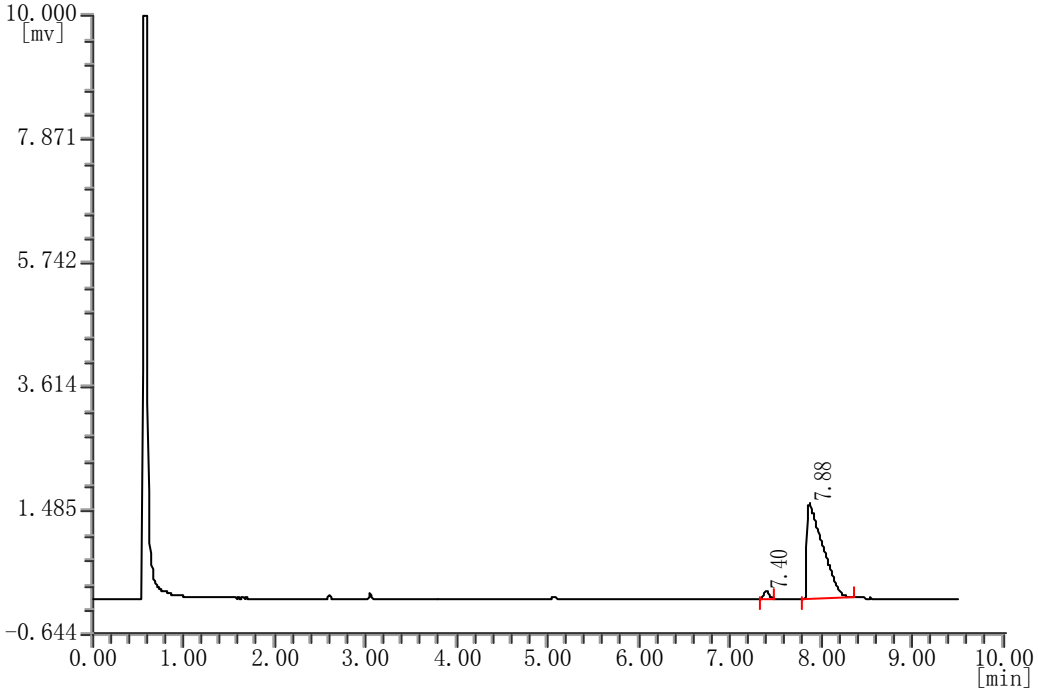
(*S*)-1-(2-Methylphenyl)ethanol (***o*-4c**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C; 99% ee.



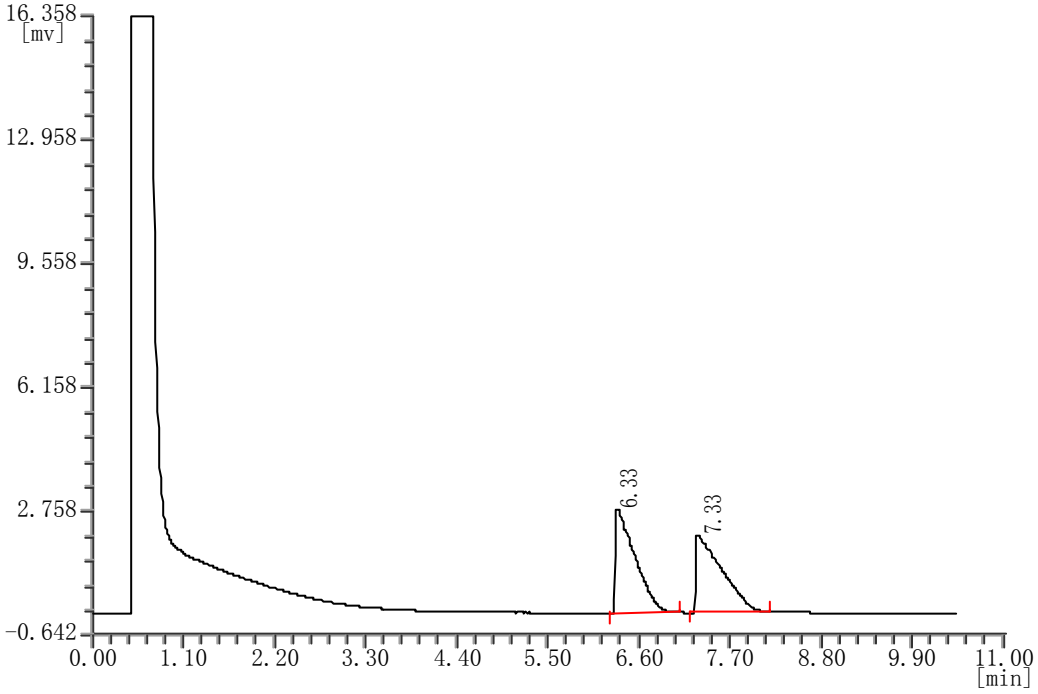
(±)-1-(3-Methylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



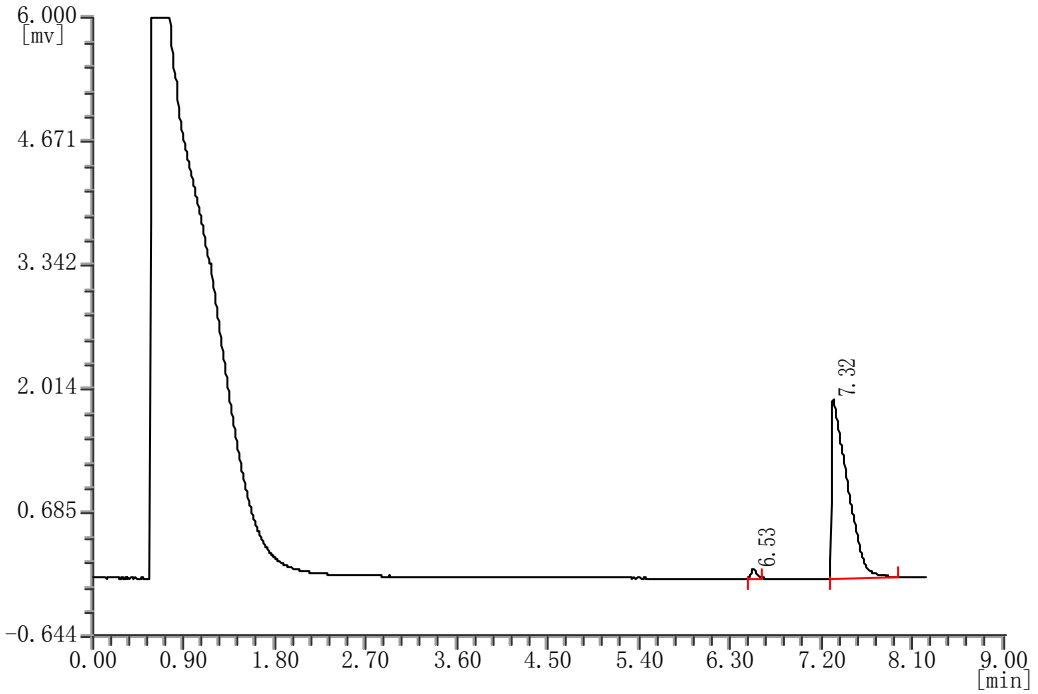
(*S*)-1-(3-Methylphenyl)ethanol (***m*-4c**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 95% ee.



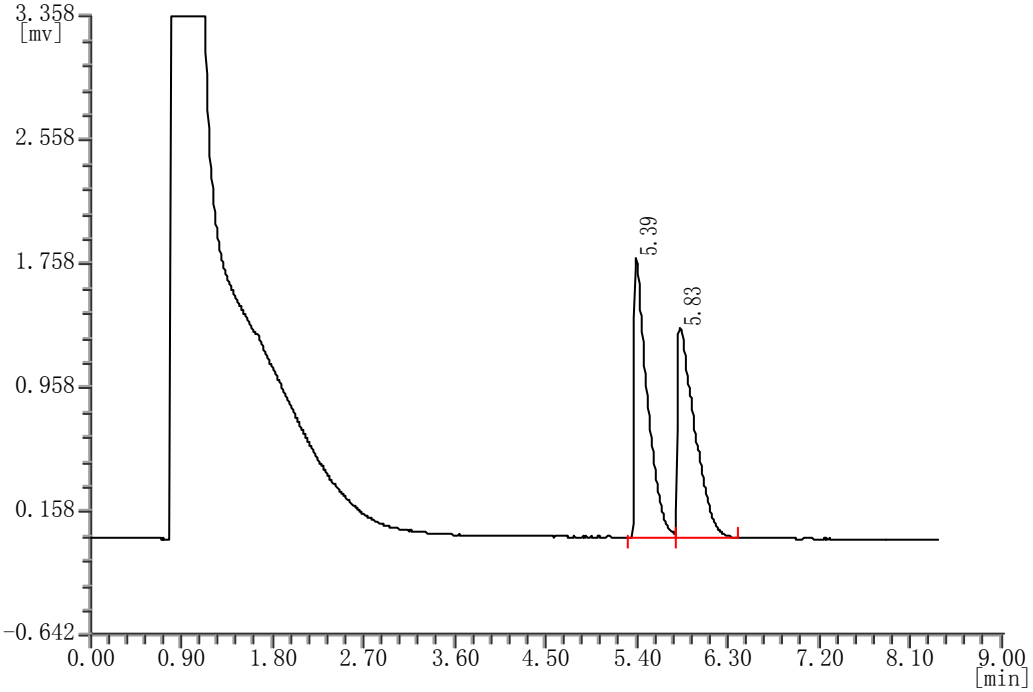
(±)-1-(4-Methylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



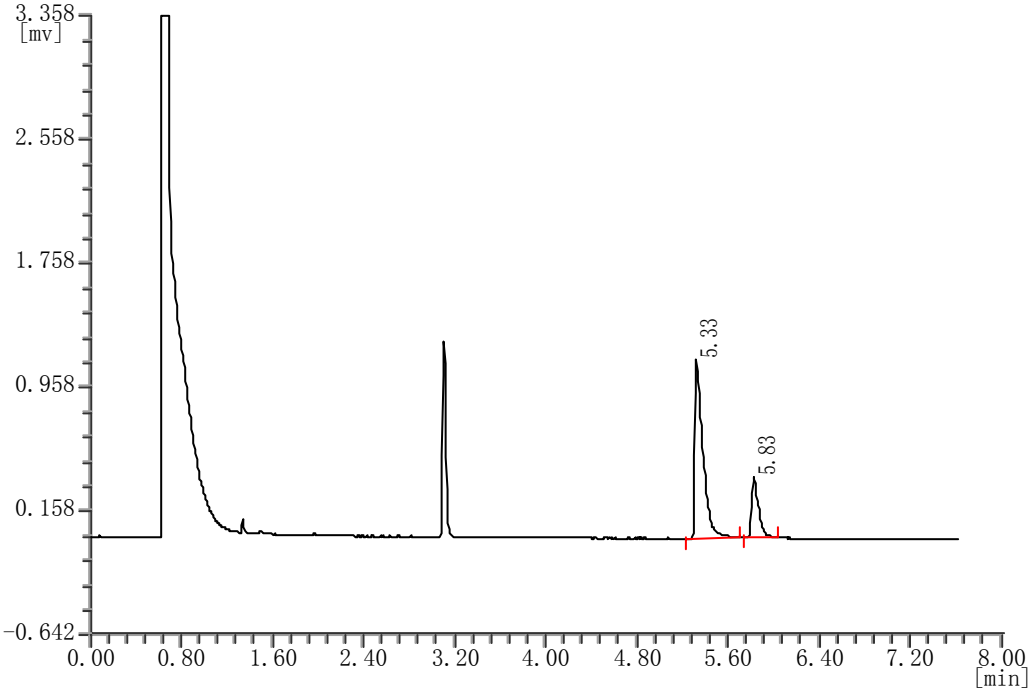
(*S*)-1-(4-Methylphenyl)ethanol (***p*-4c**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 97% ee.



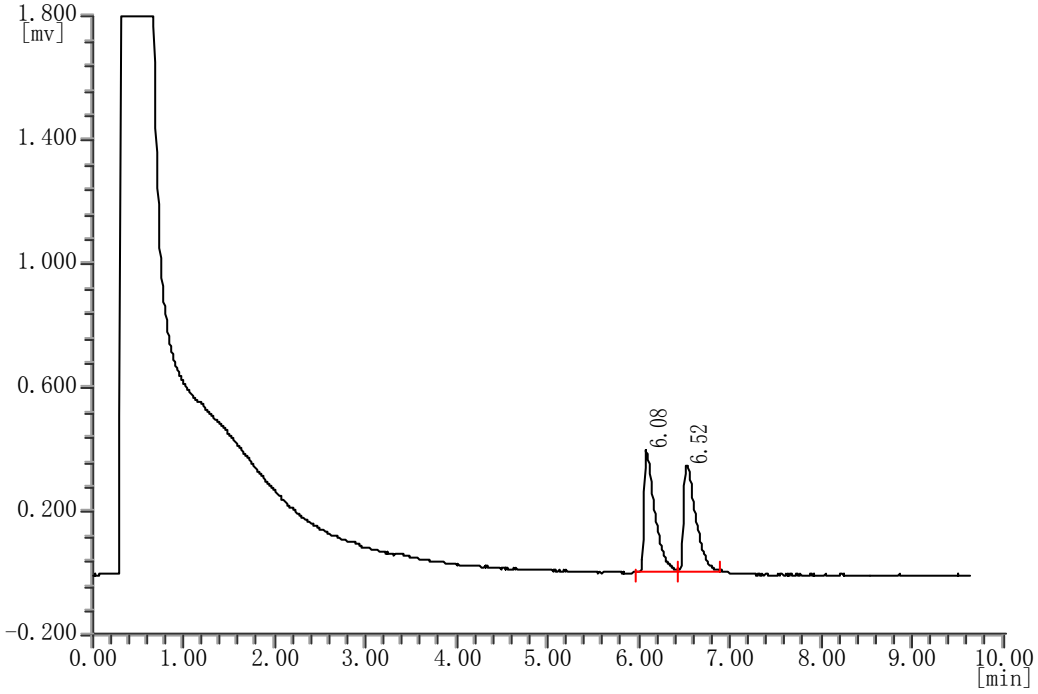
(±)-1-(2-Methoxyphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



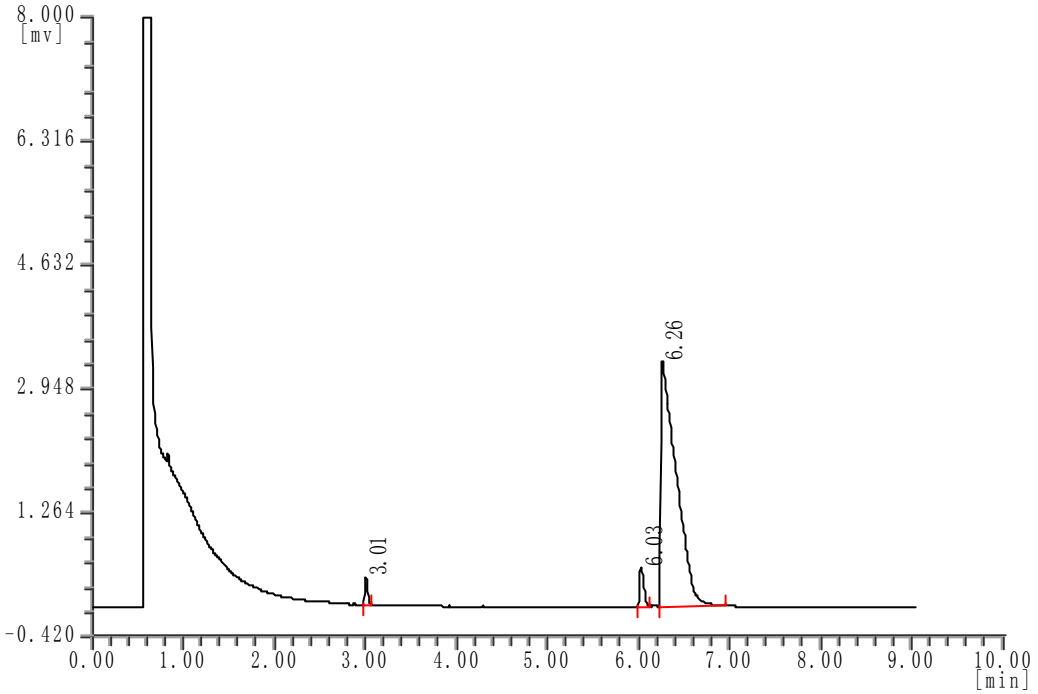
(*S*)-1-(2-Methoxyphenyl)ethanol (***o*-4d**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 60% ee.



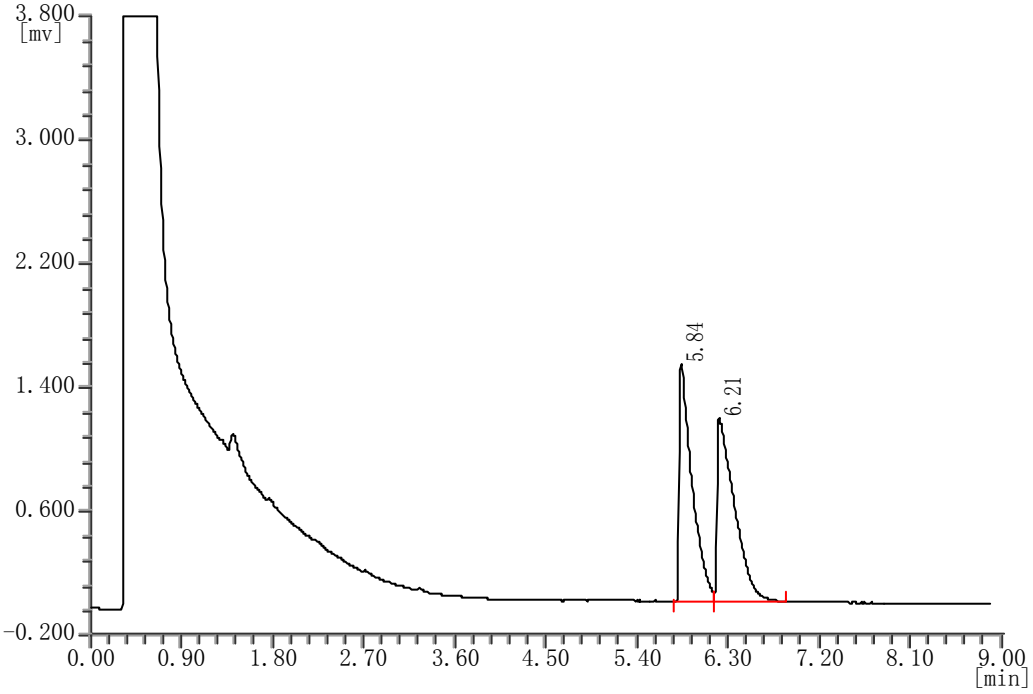
(±)-1-(3-Methoxyphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



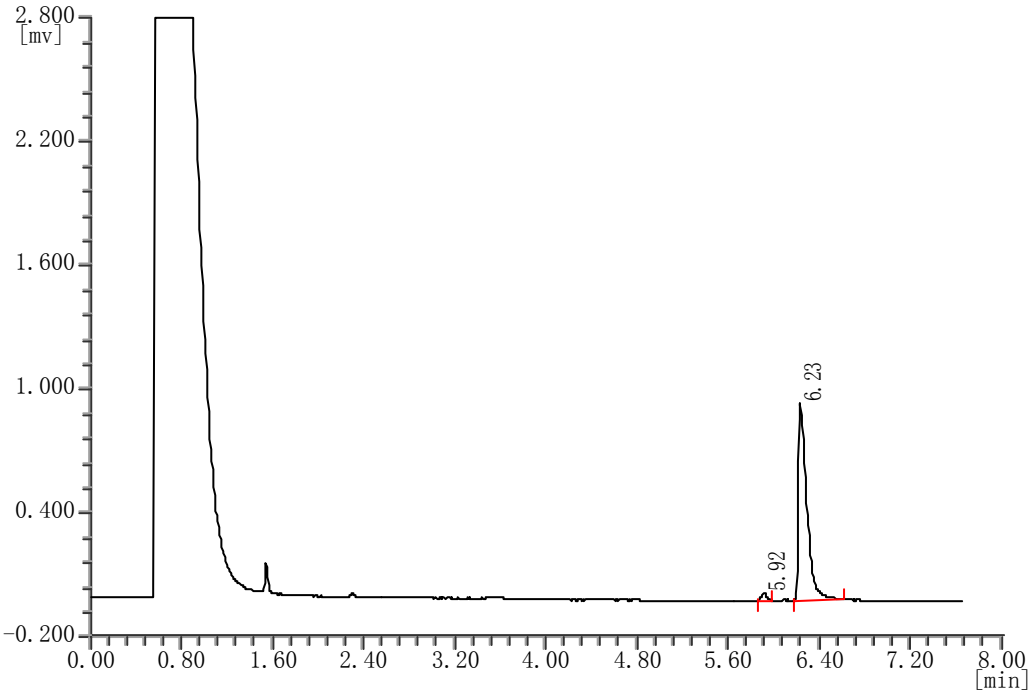
(*S*)-1-(3-Methoxyphenyl)ethanol (***m*-4d**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 91% ee.



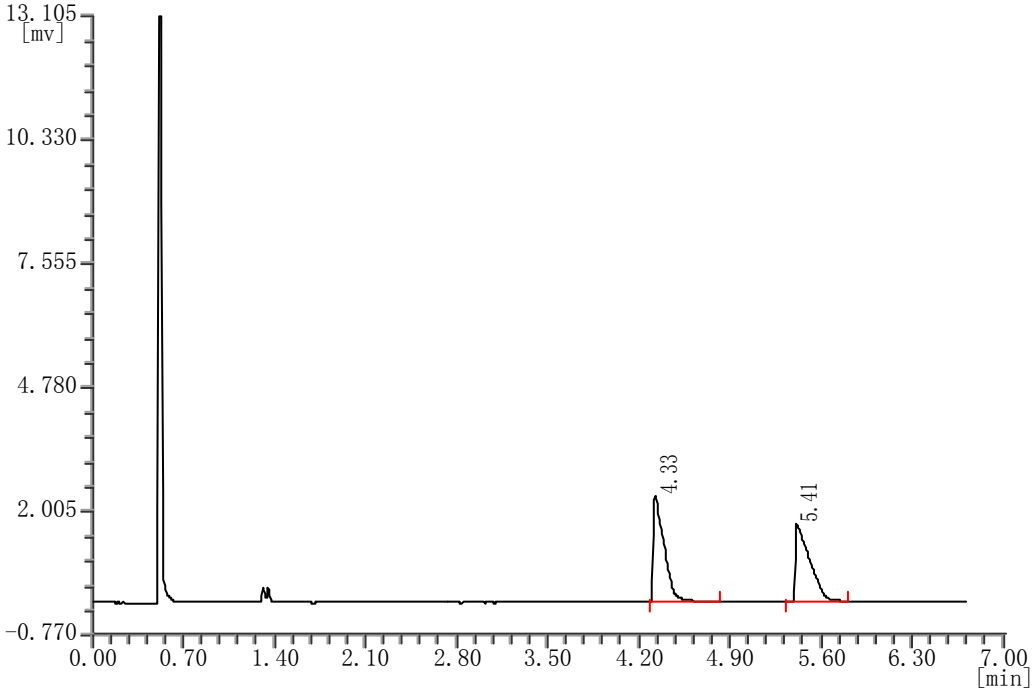
(±)-1-(4-Methoxyphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



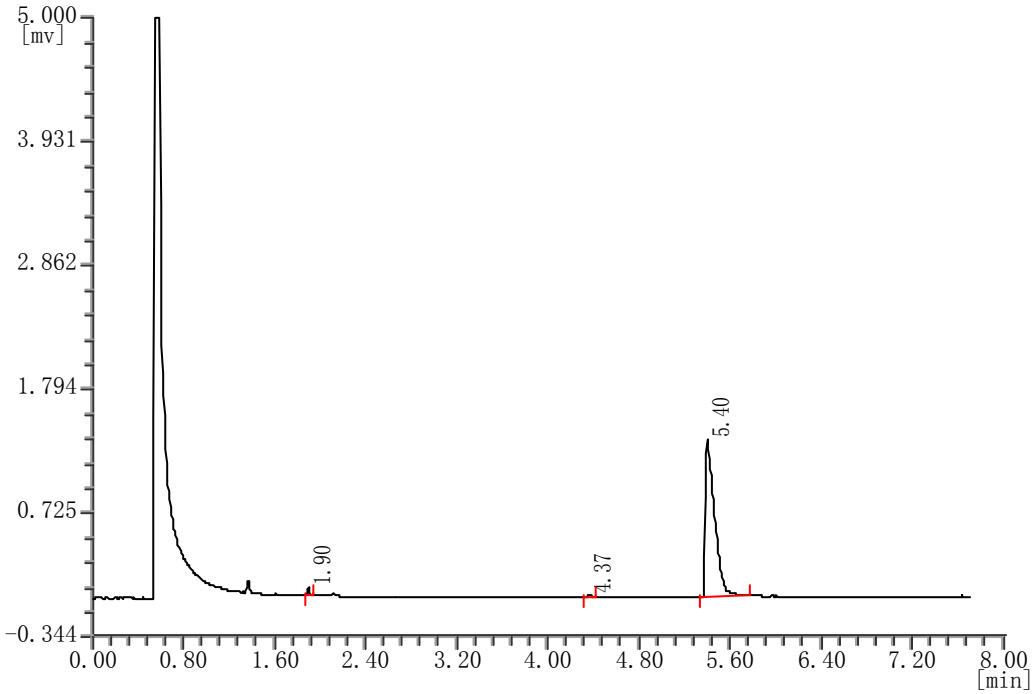
(*S*)-1-(4-Methoxyphenyl)ethanol (***p*-4d**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 96% ee.



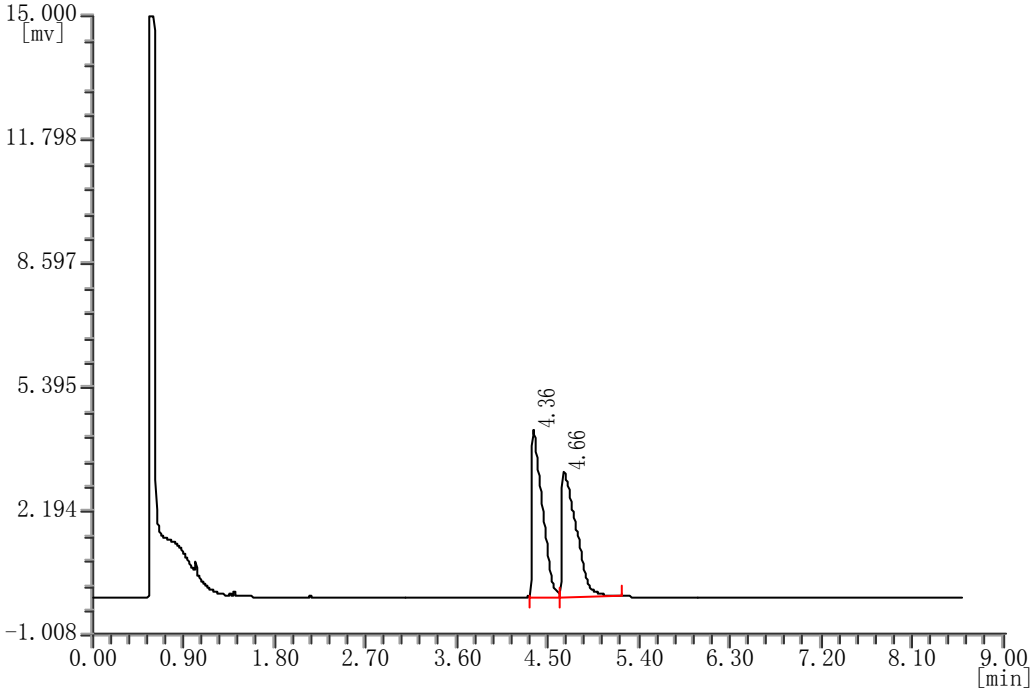
(±)-1-(2-Bromophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C.



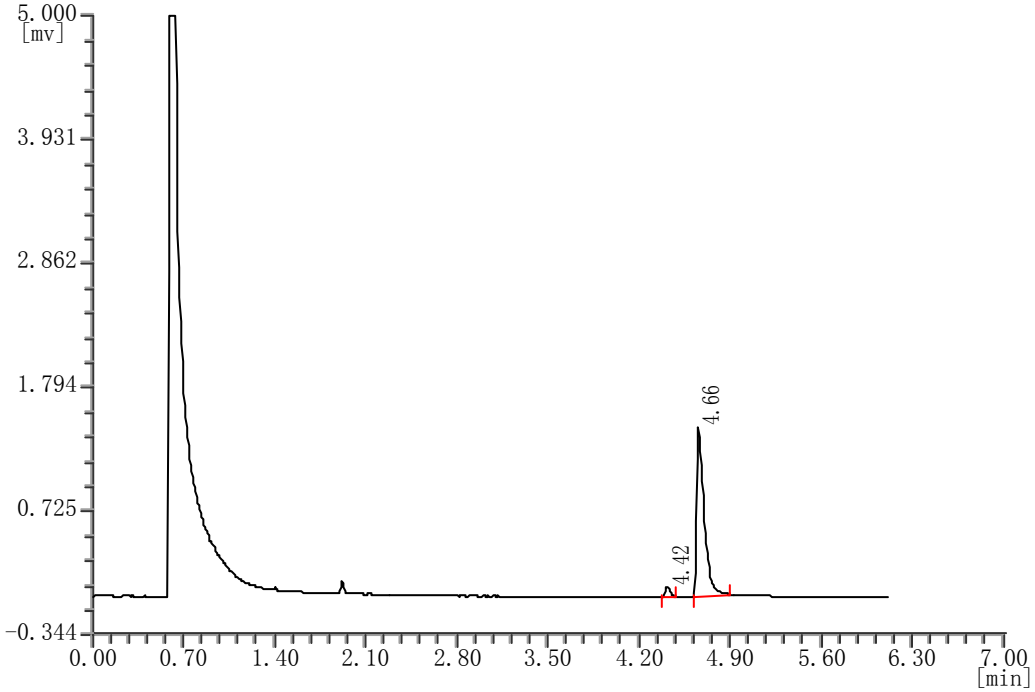
(*S*)-1-(2-Bromophenyl)ethanol (***o*-4e**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C; 99% ee.



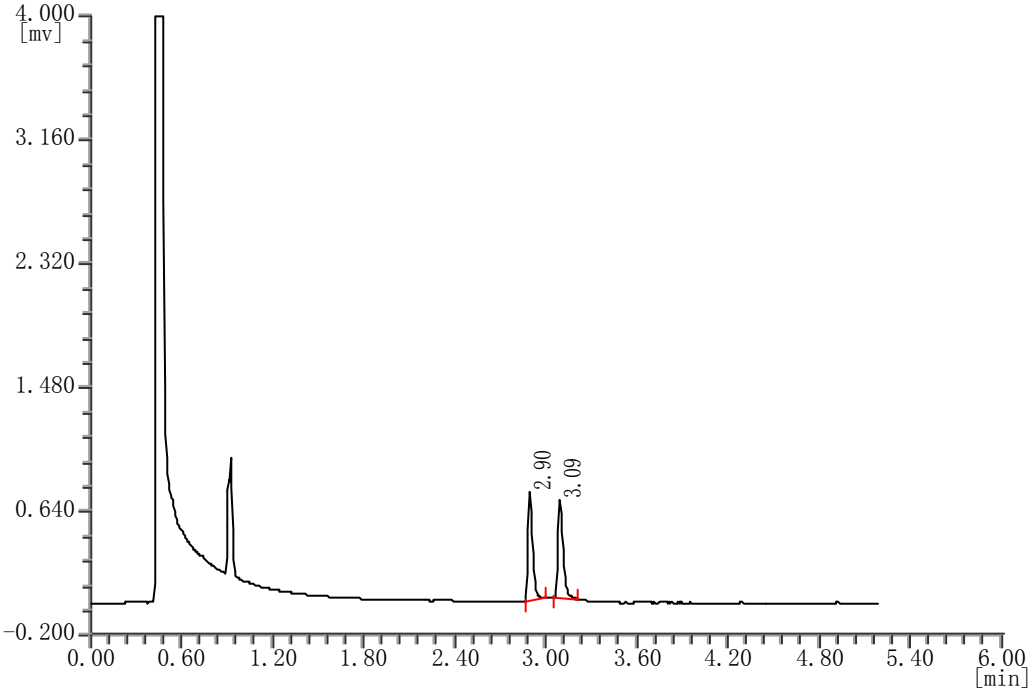
(±)-1-(3-Bromophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C.



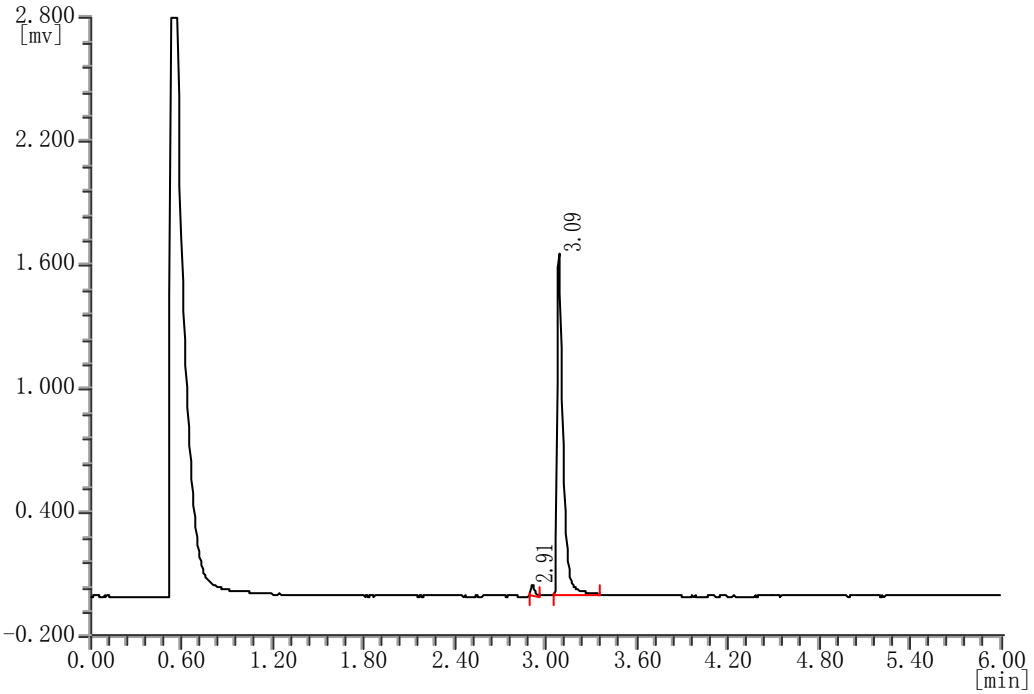
(*S*)-1-(3-Bromophenyl)ethanol (***m*-4e**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C; 93% ee.



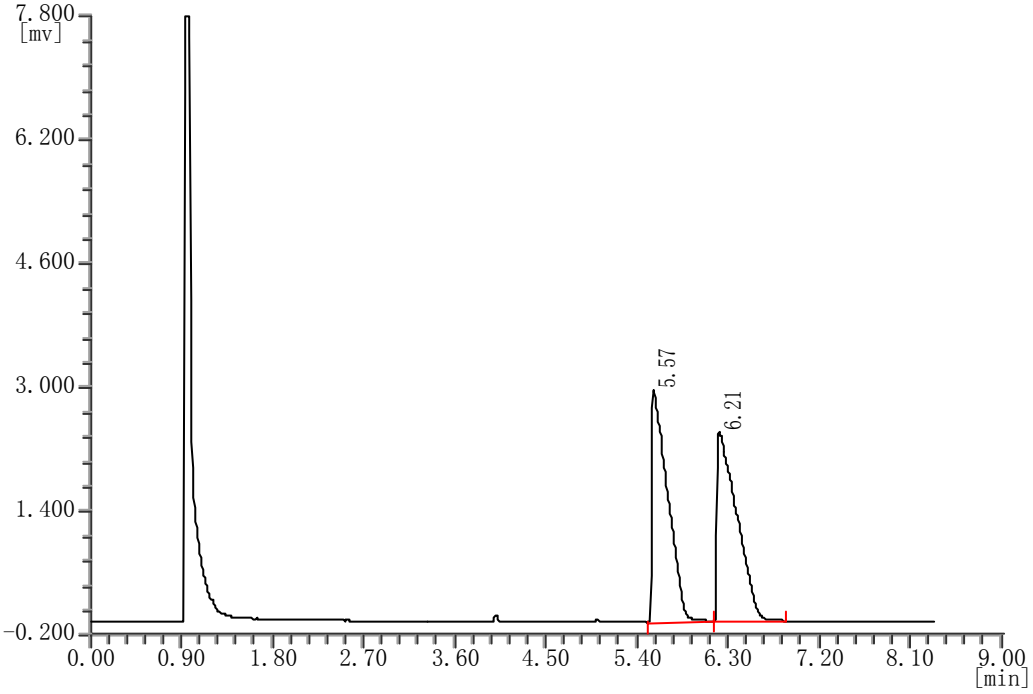
(±)-1-(4-Bromophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C.



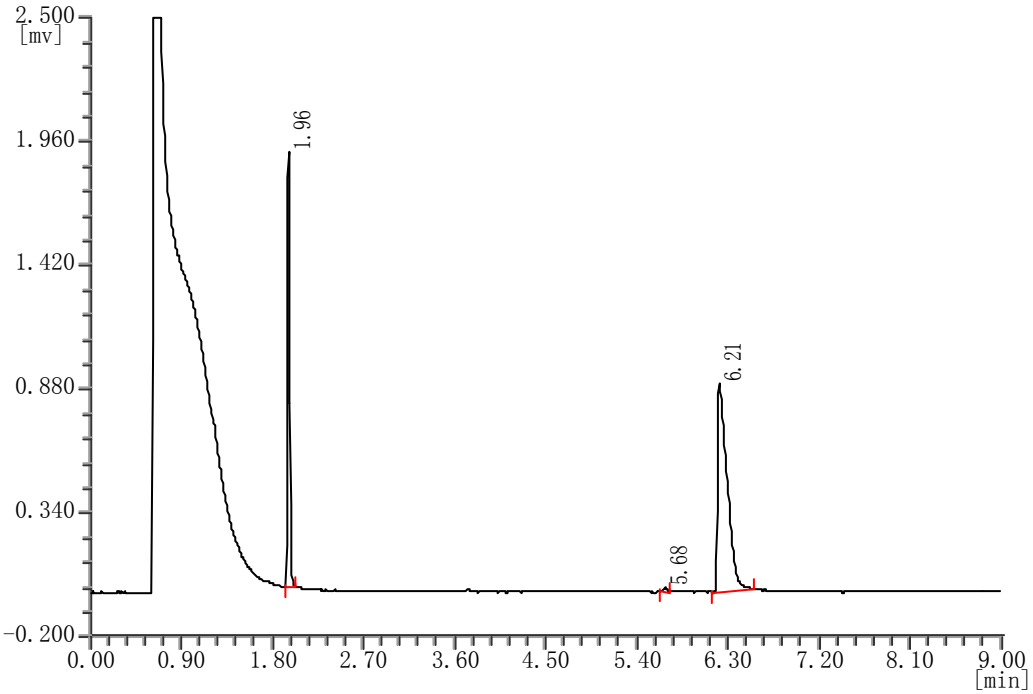
(*S*)-1-(4-Bromophenyl)ethanol (***p*-4e**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C; 96% ee.



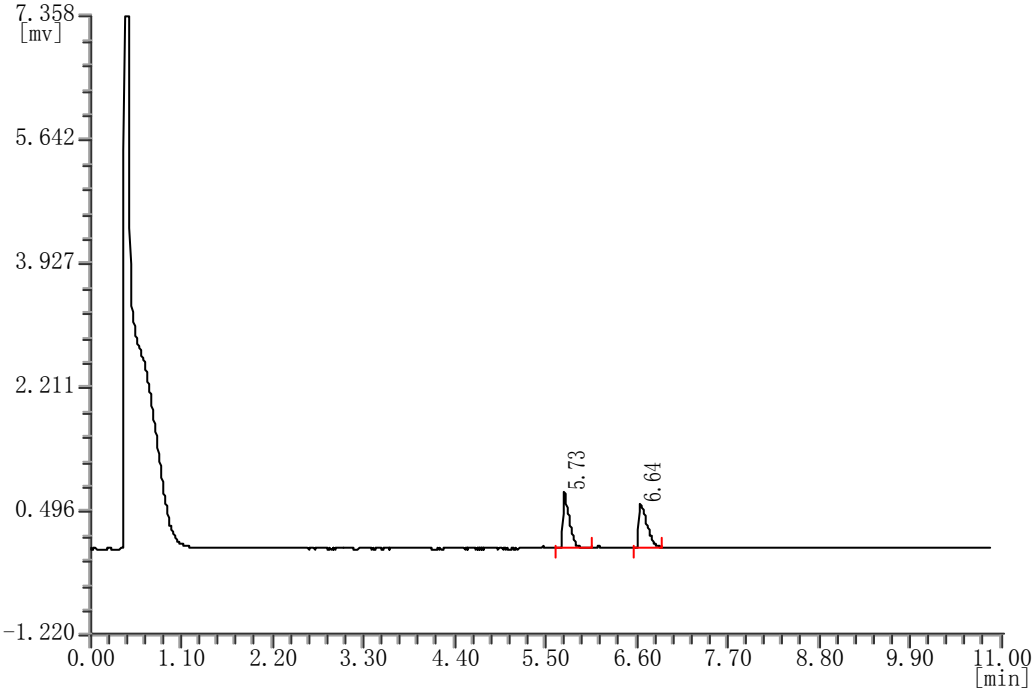
(±)-1-(2-Trifluoromethylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



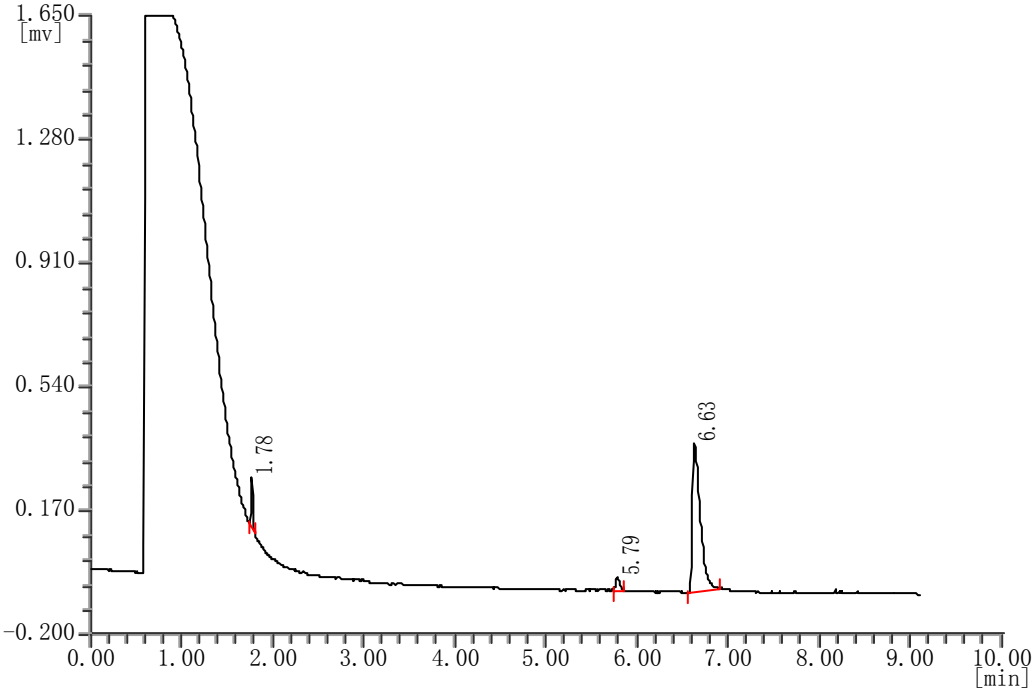
(*S*)-1-(2-Trifluoromethylphenyl)ethanol (***o*-4f**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 98% ee.



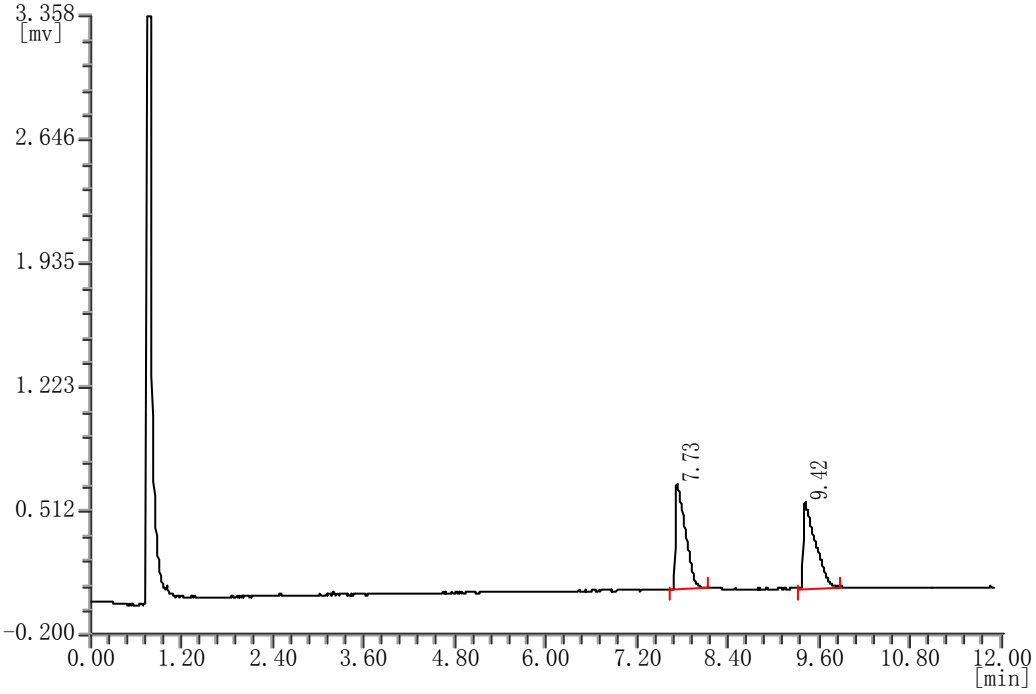
(±)-1-(3-Trifluoromethylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



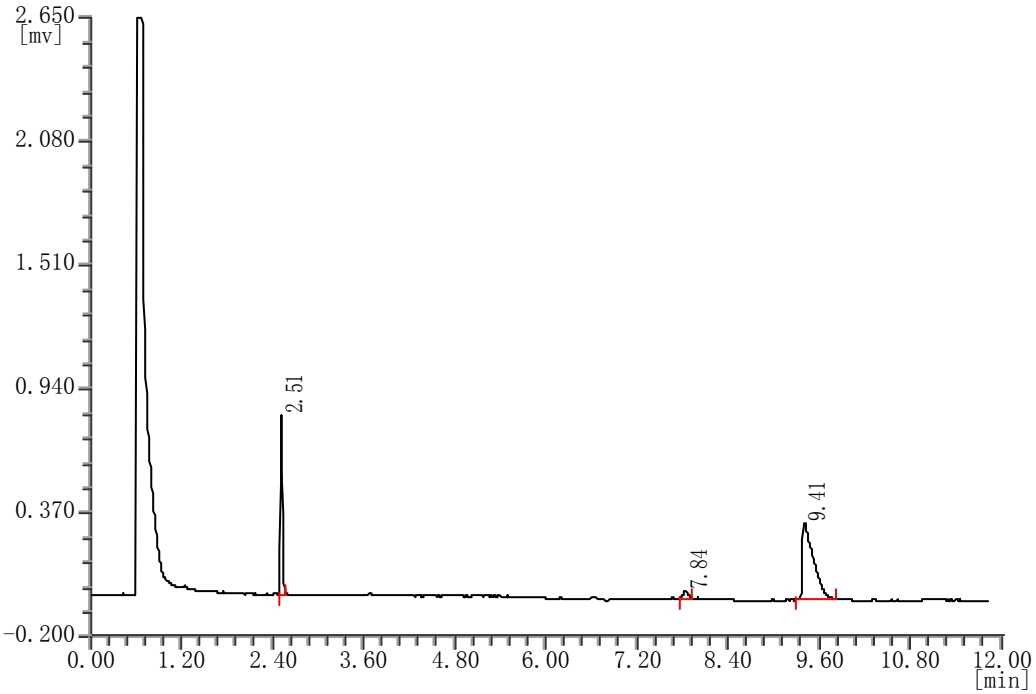
(*S*)-1-(3-Trifluoromethylphenyl)ethanol (***m*-4f**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 91% ee.



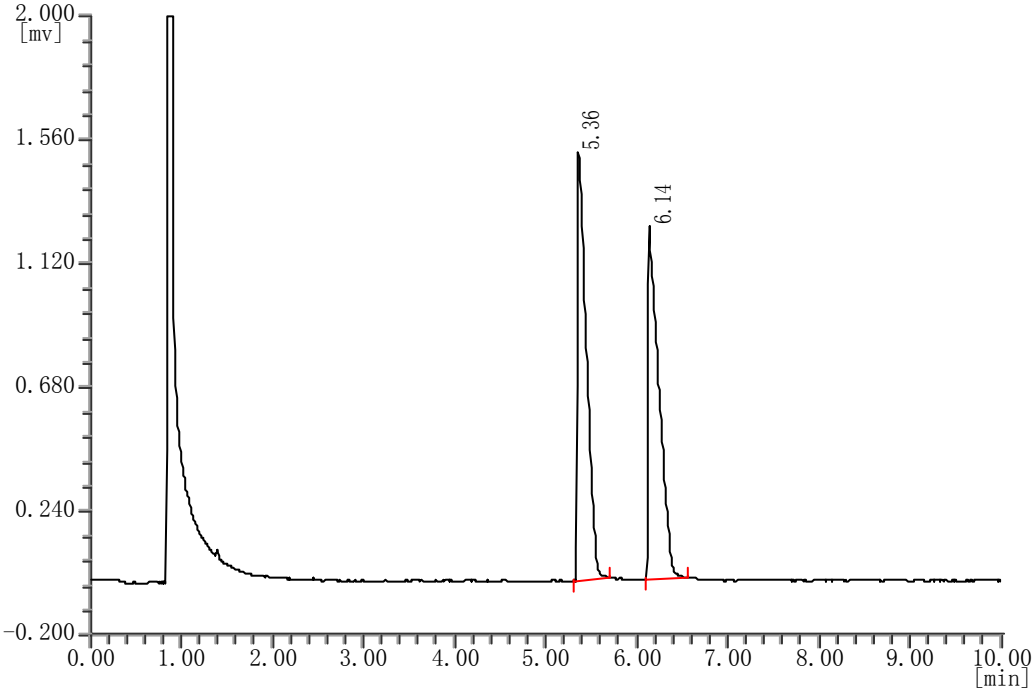
(±)-1-(4-Trifluoromethylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



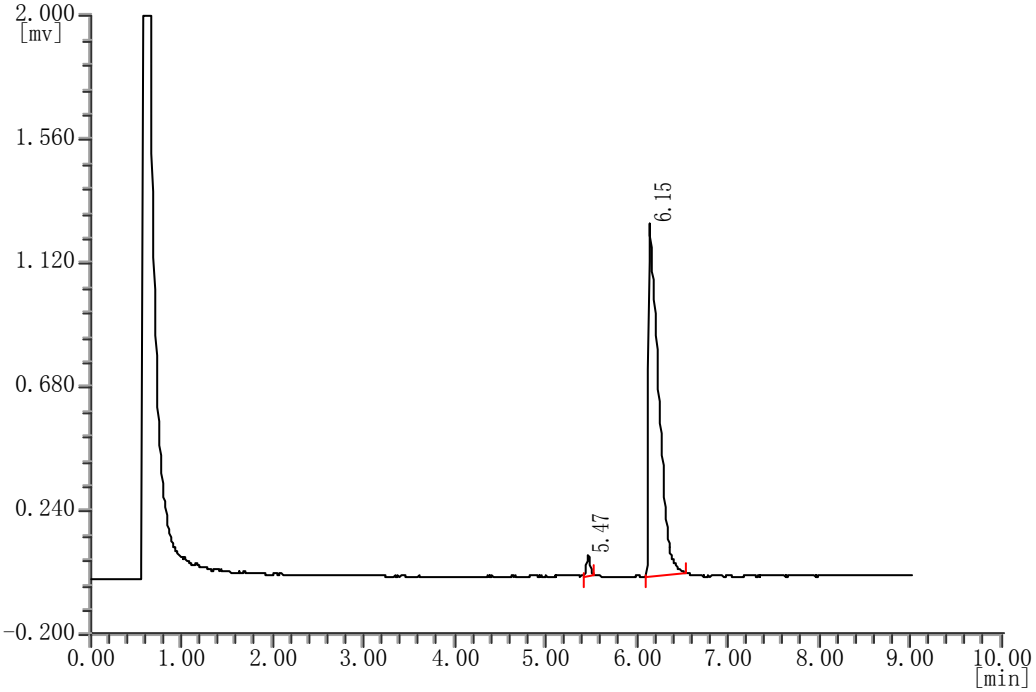
(*S*)-1-(4-Trifluoromethylphenyl)ethanol (***p*-4f**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 91% ee.



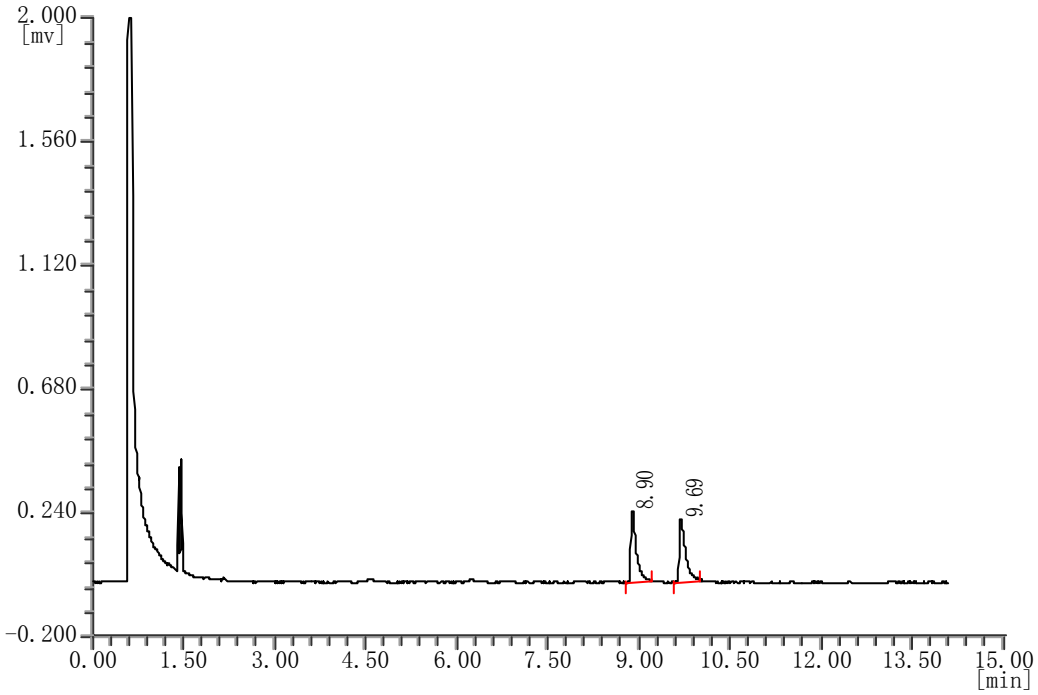
(±)-1-(4-Fluorophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



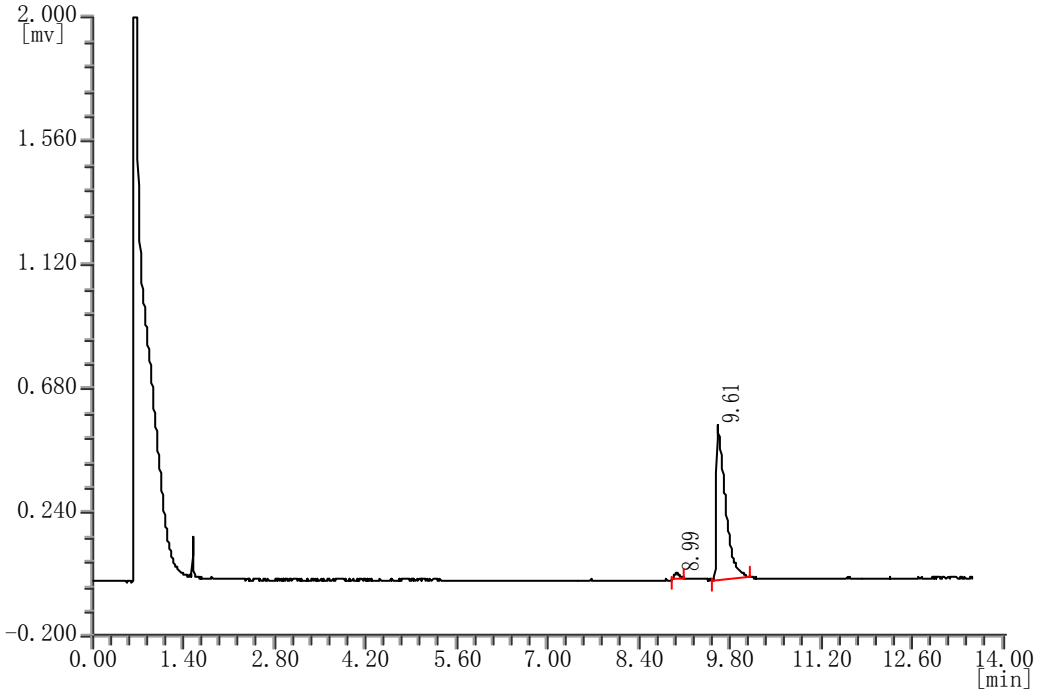
(*S*)-1-(4-Fluorophenyl)ethanol (**4g**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 96% ee.



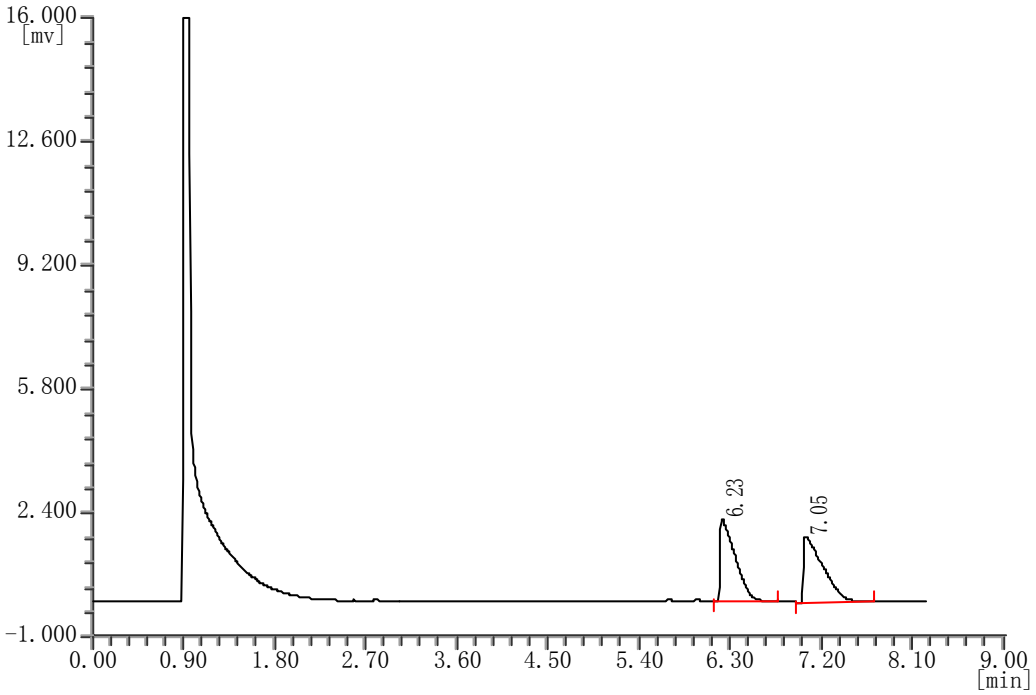
(±)-1-(4-Iodophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C.



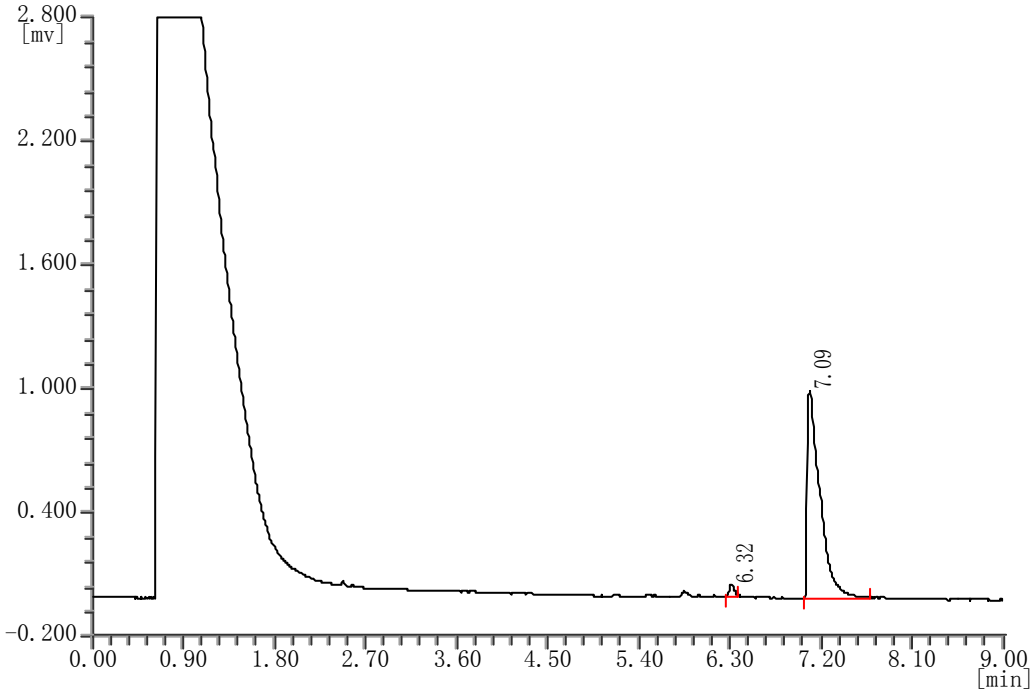
(*S*)-1-(4-Iodophenyl)ethanol (**4h**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C; 96% ee.



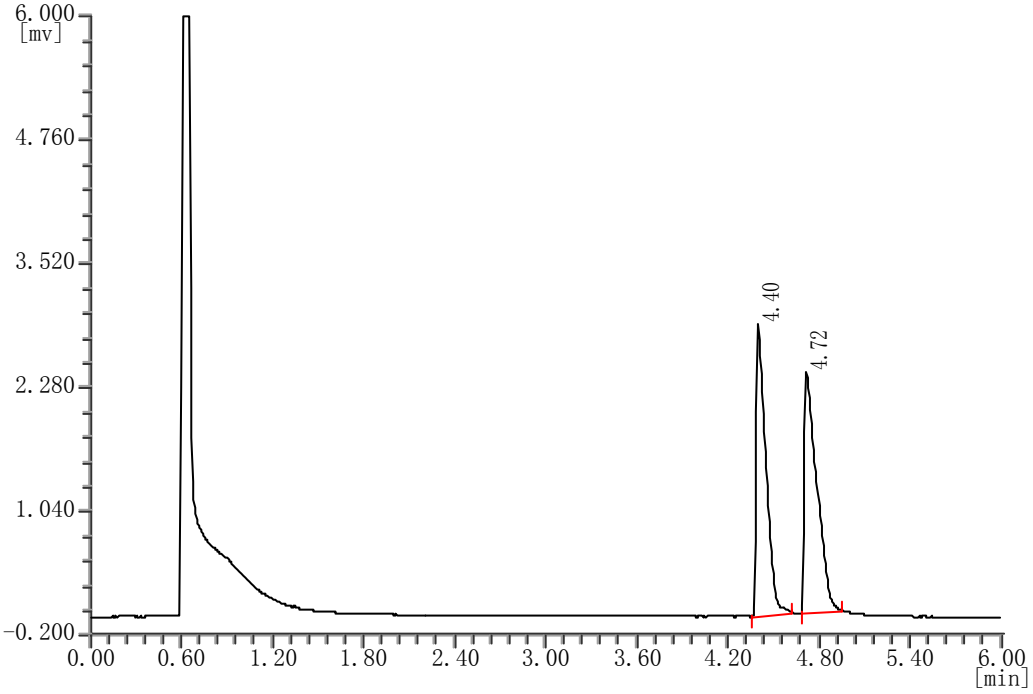
(±)-1-(4-Nitrilephenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C.



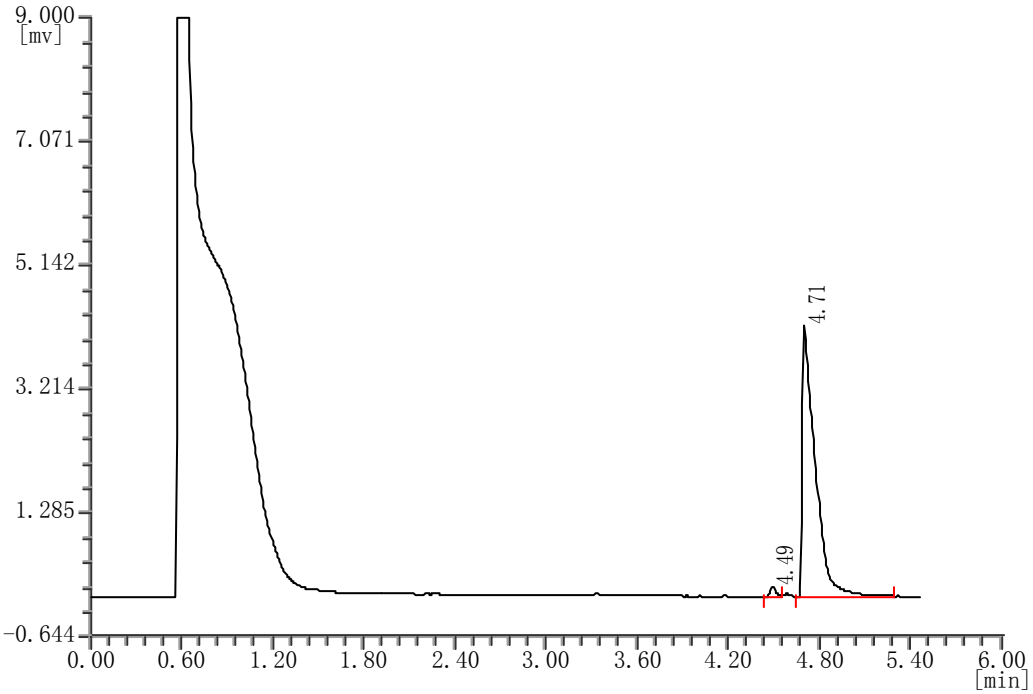
(*S*)-1-(4-Nitrilephenyl)ethanol (**4i**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C; 96% ee.



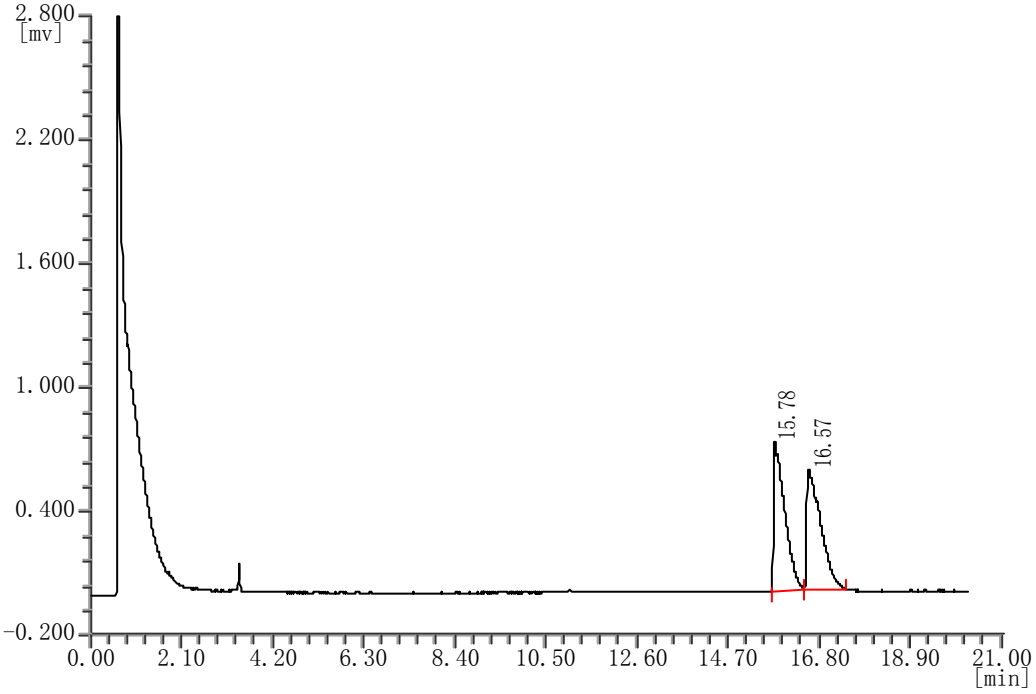
(±)-1-(4-Ethylphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



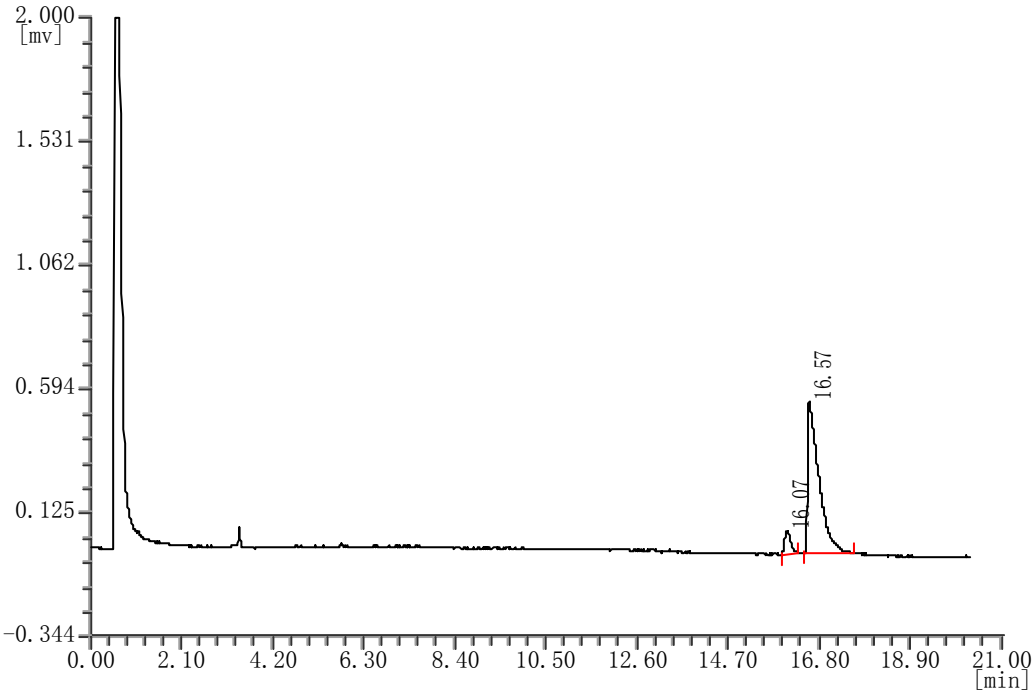
(*S*)-1-(4-Ethylphenyl)ethanol (**4j**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 97% ee.



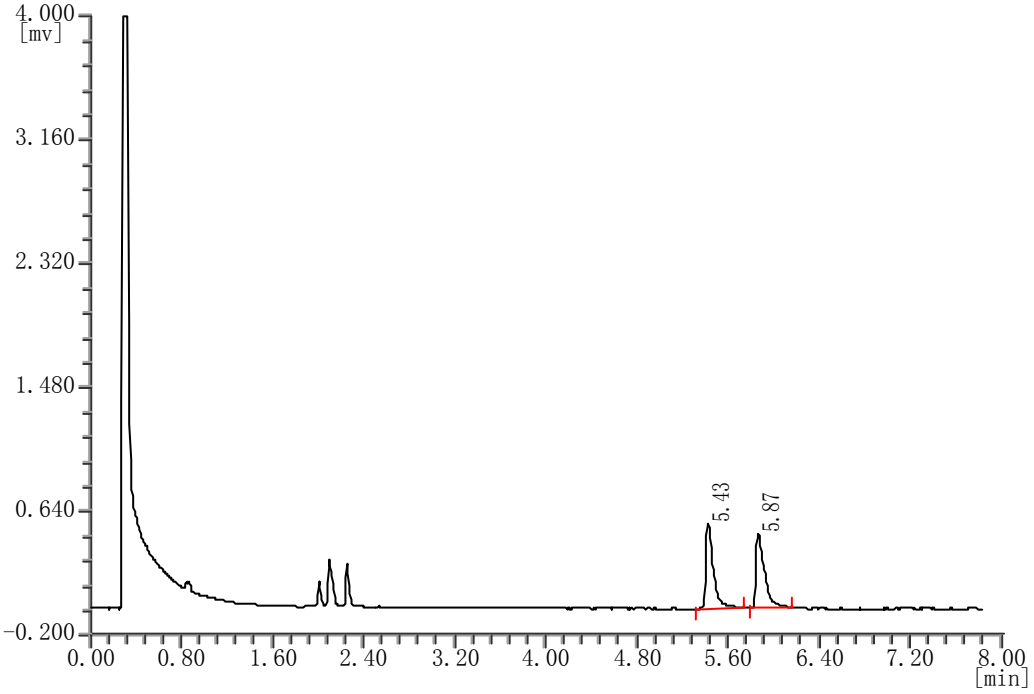
(±)-1-(3,4-Dimethoxyphenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



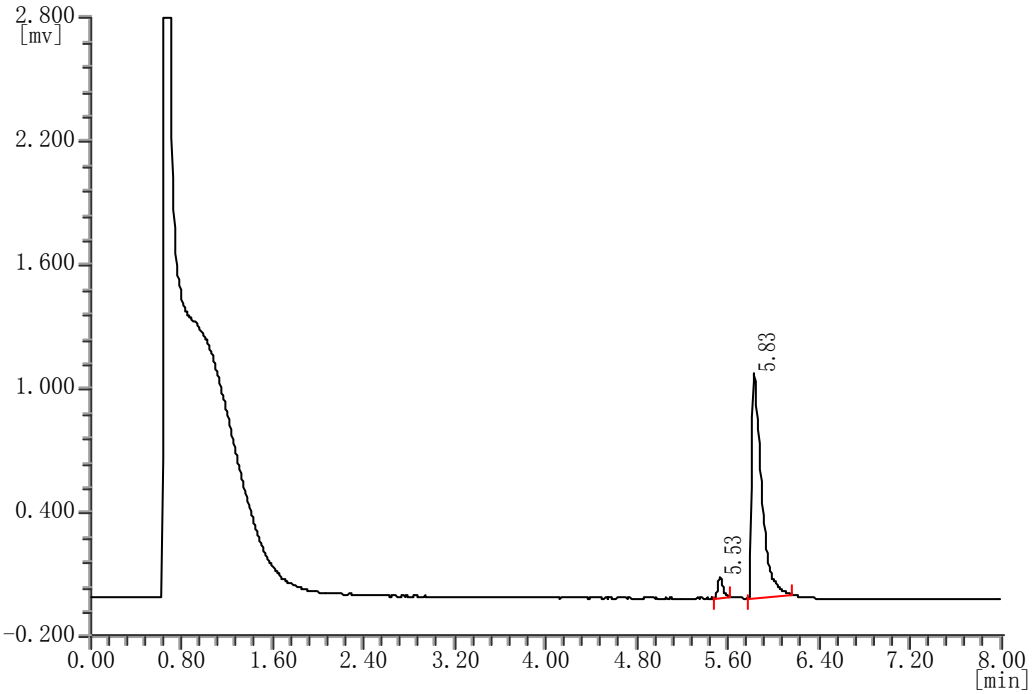
(*S*)-1-(3,4-Dimethoxyphenyl)ethanol (**4k**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 85% ee.



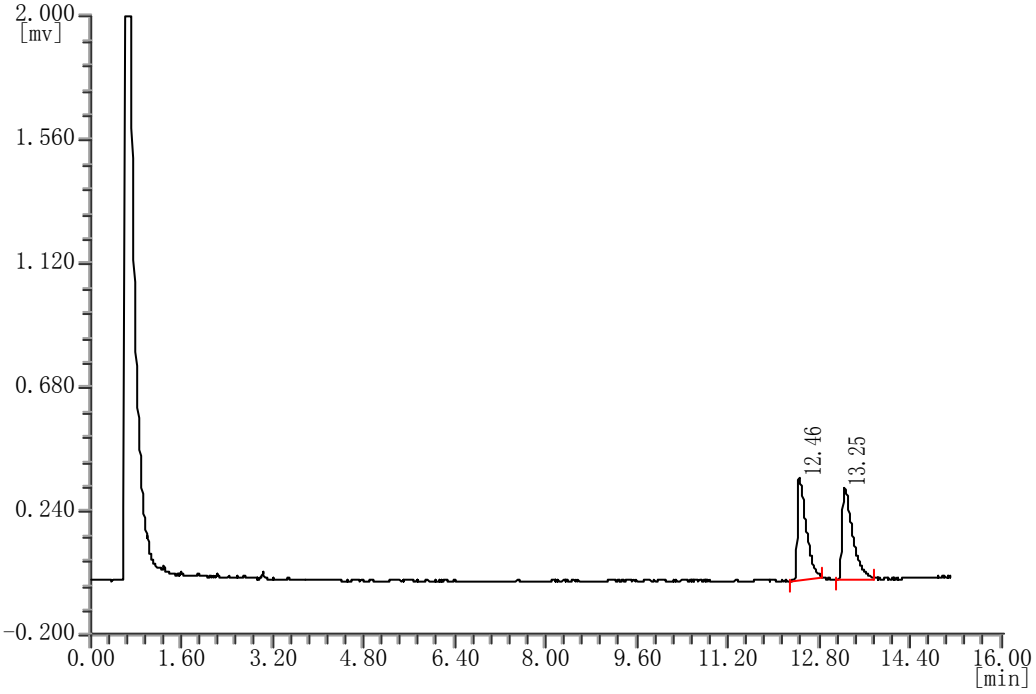
(±)-1-(3,4-Dichlorophenyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C.



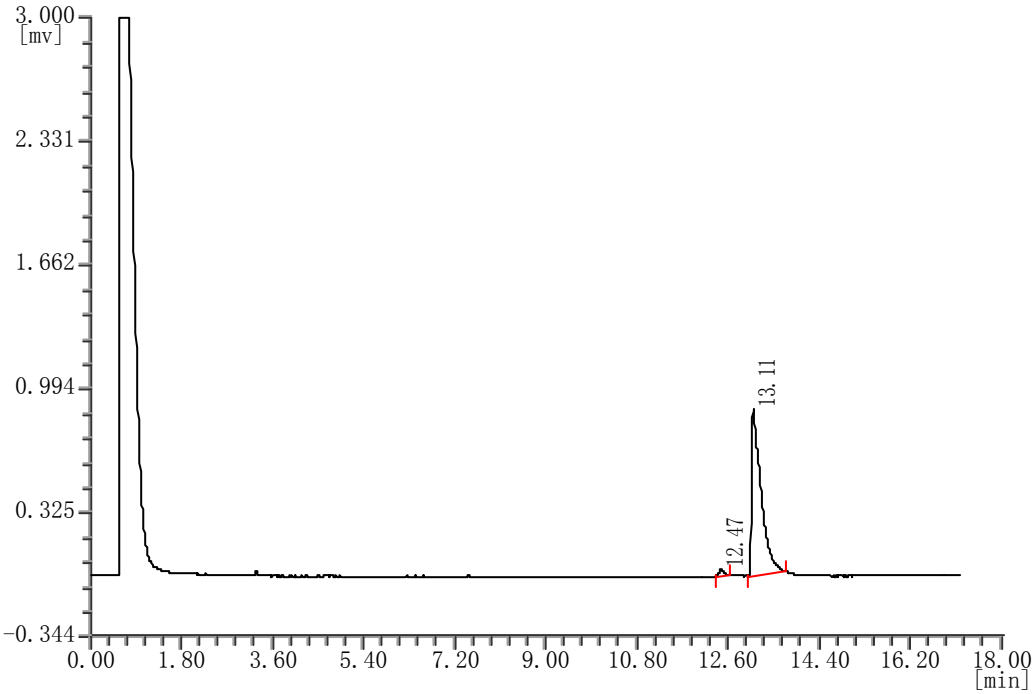
(*S*)-1-(3,4-Dichlorophenyl)ethanol (**4l**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C; 91% ee.



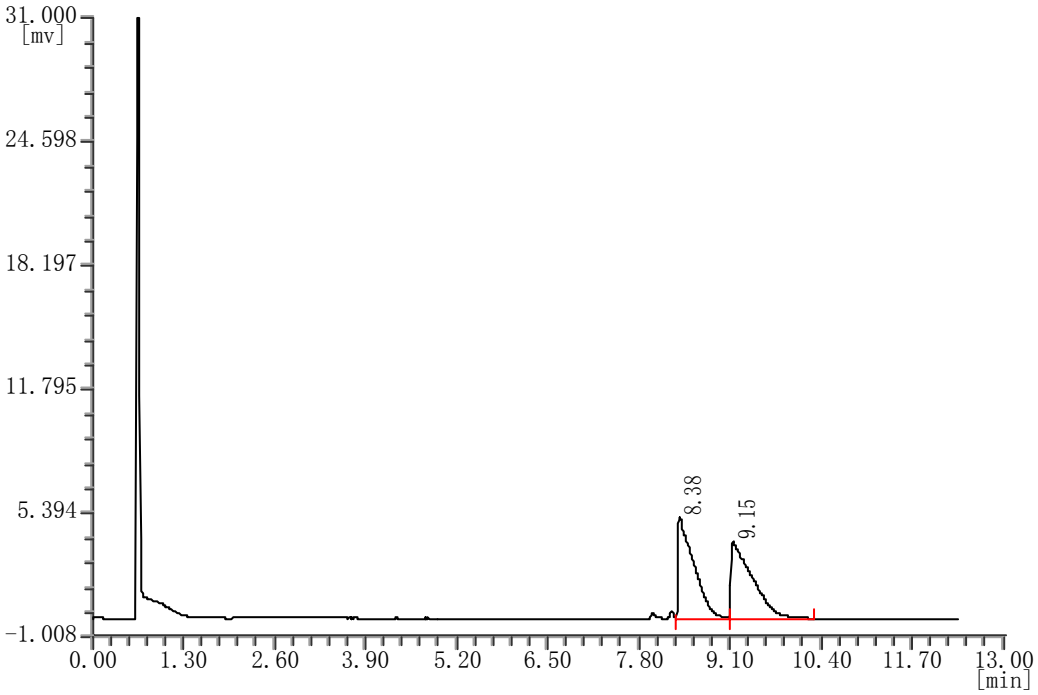
(±)-1-(2-Naphthyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C.



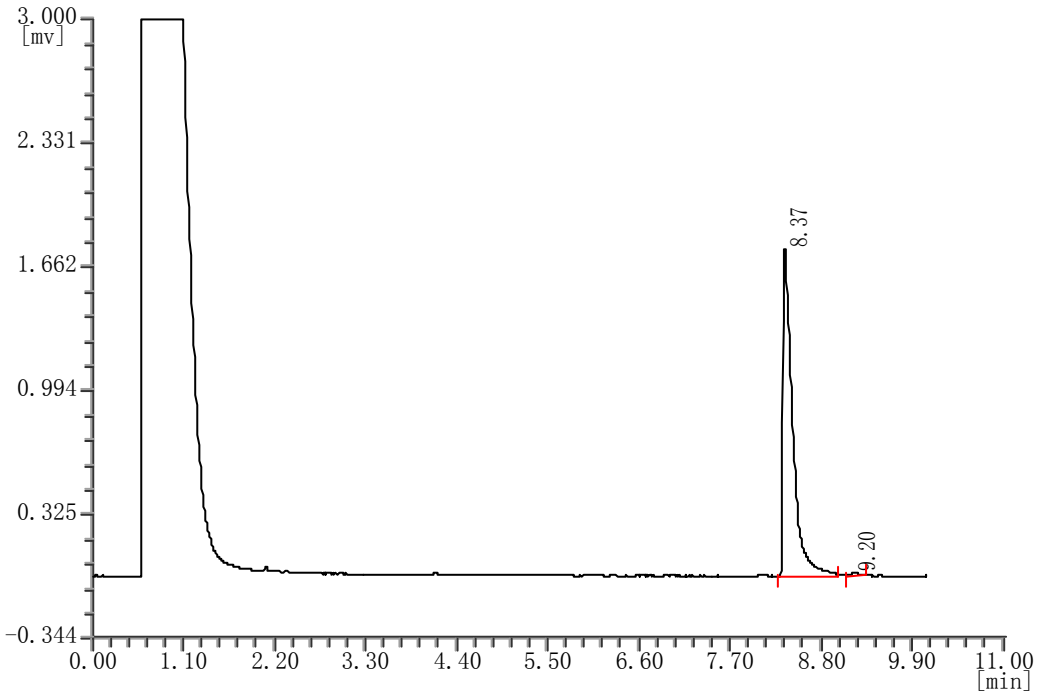
(*S*)-1-(2-Naphthyl)ethanol (**4m**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C; 96% ee.



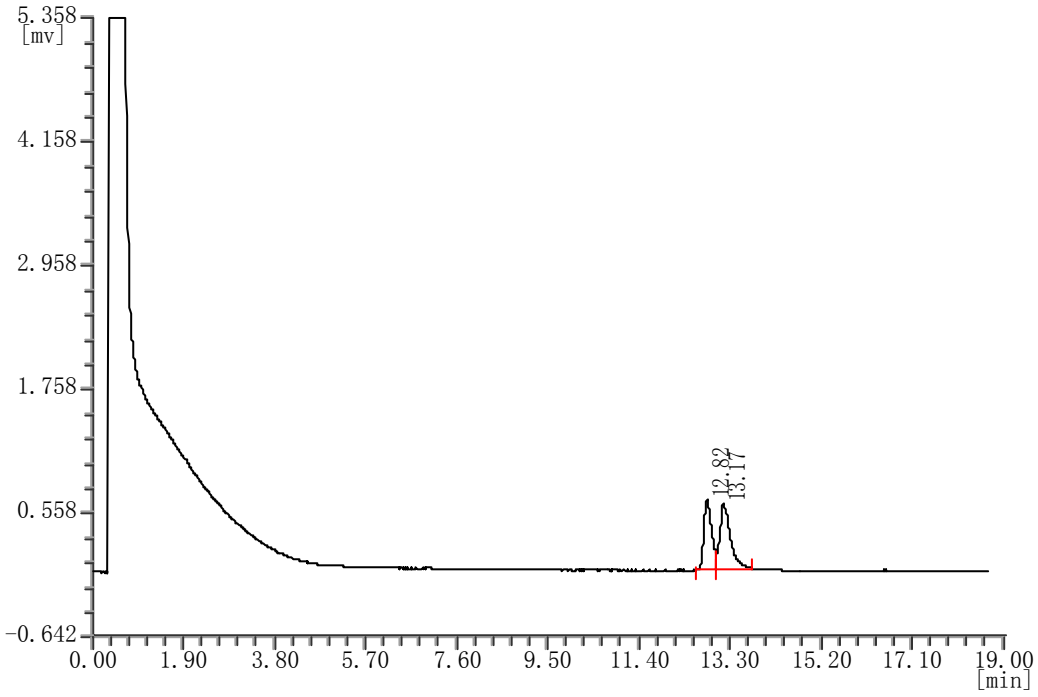
(±)-1-(1-Naphthyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C.



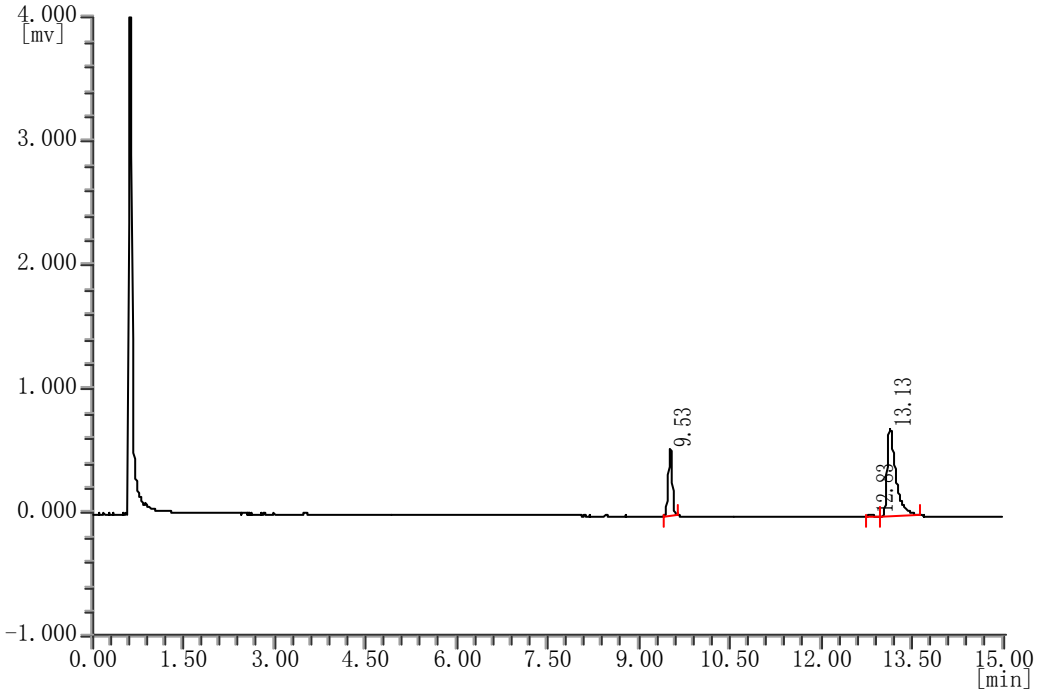
(*S*)-1-(1-Naphthyl)ethanol (**4n**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C; 98% ee.



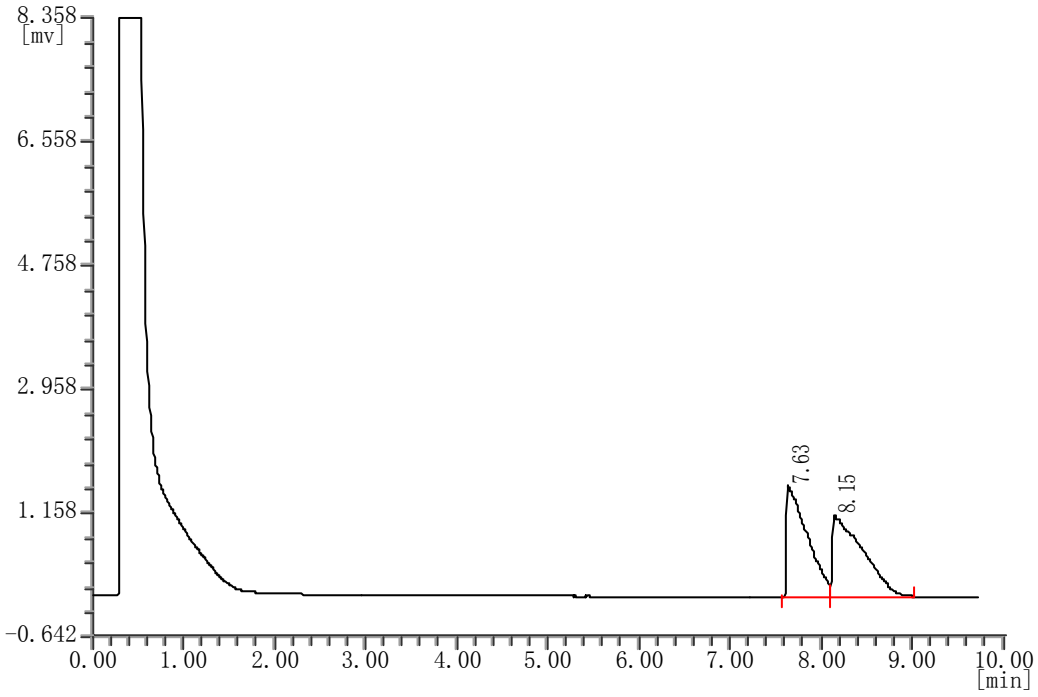
(±)-1,1-Diphenyl-2-propanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C.



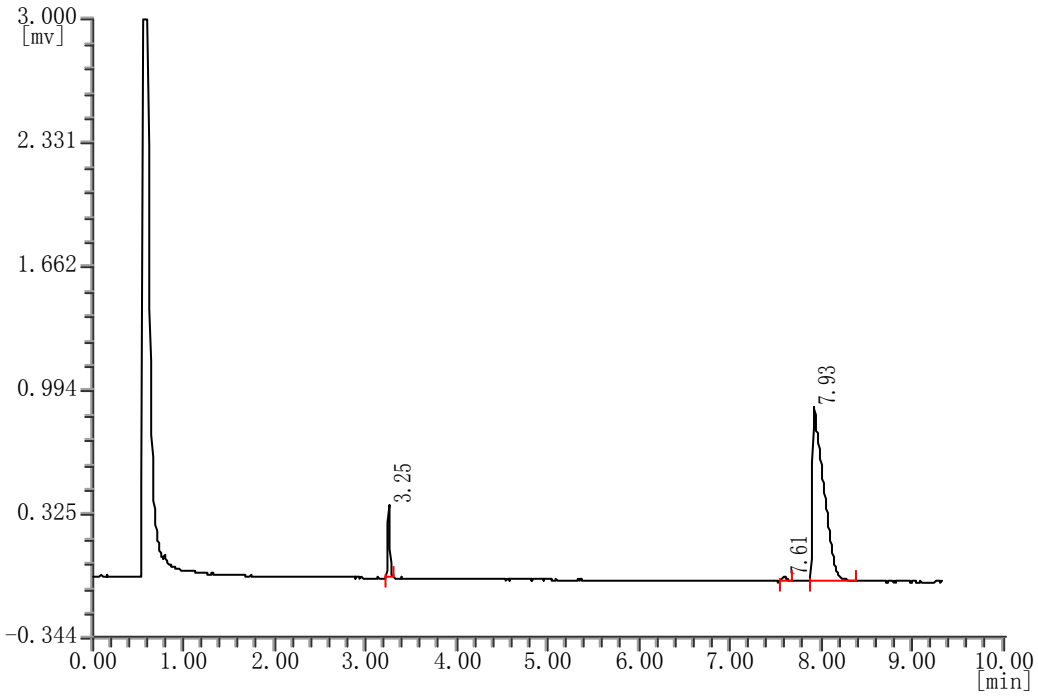
(*R*)-1,1-Diphenyl-2-propanol (**4p**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 150 °C; 99% ee.



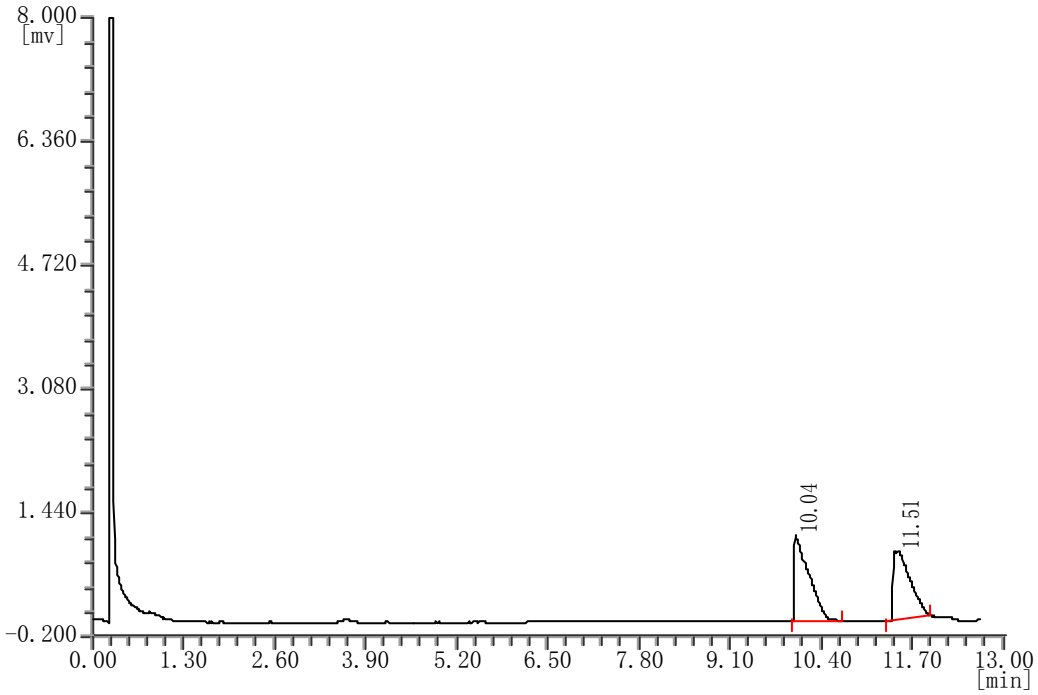
(±)-1-Phenylpropan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



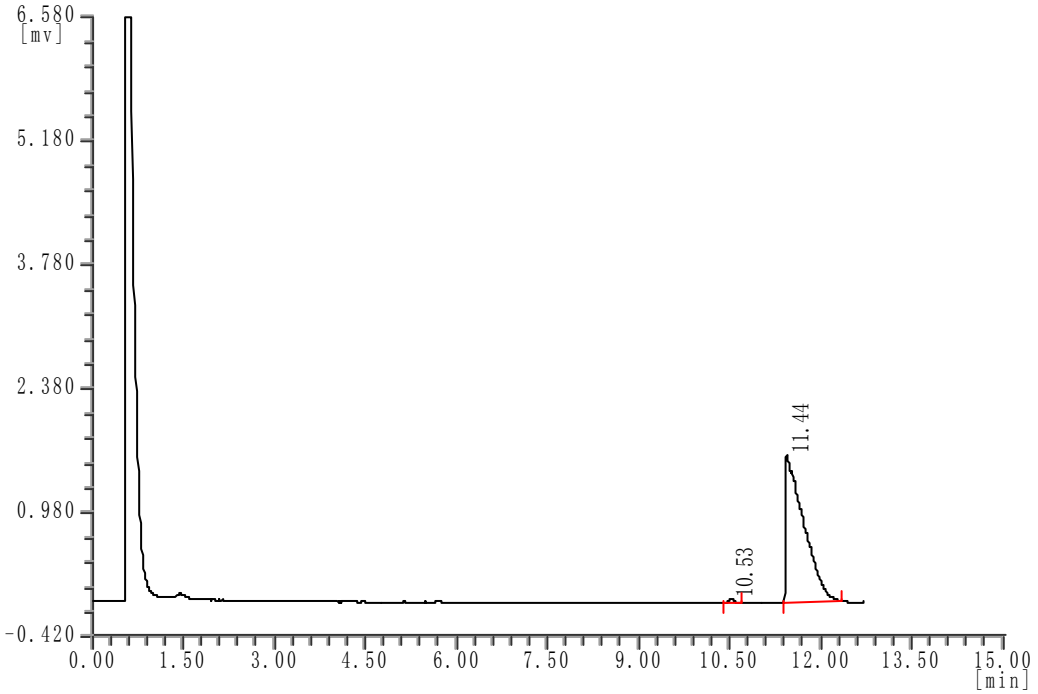
(*S*)-1-Phenylpropan-1-ol (**6a**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 98% ee.



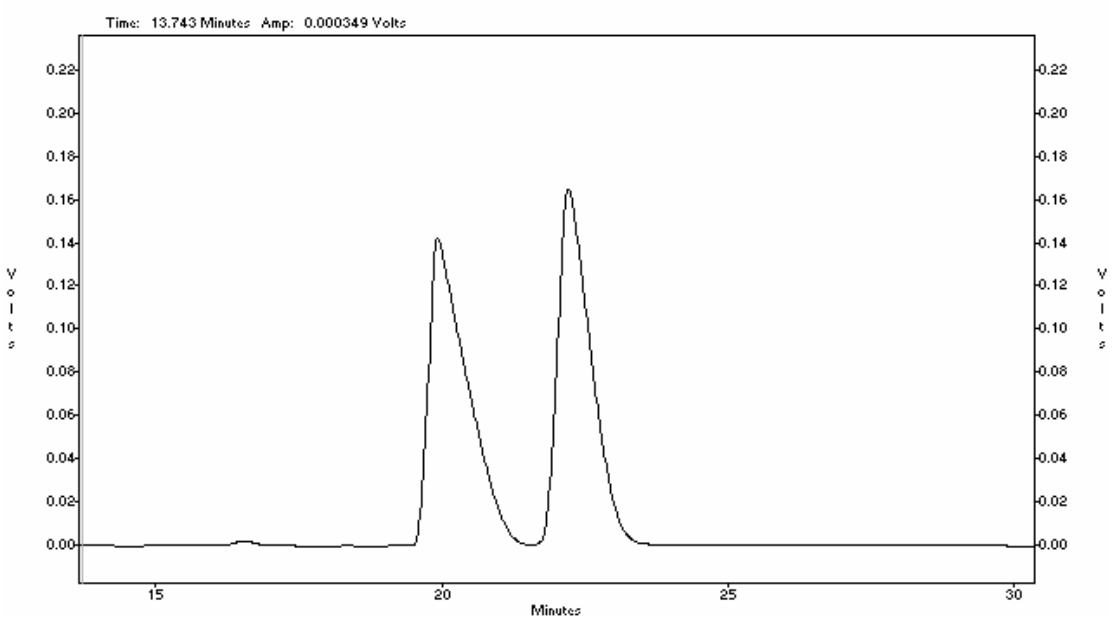
(±)-1-*p*-Tolylpropan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



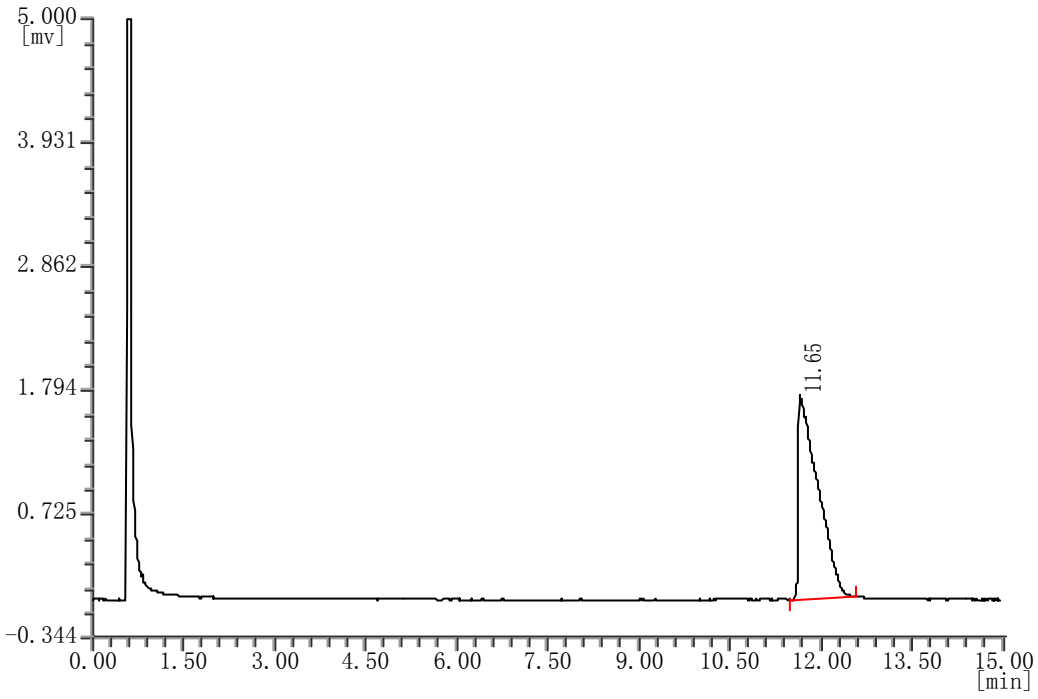
(*S*)-1-*p*-Tolylpropan-1-ol (**6b**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 98% ee.



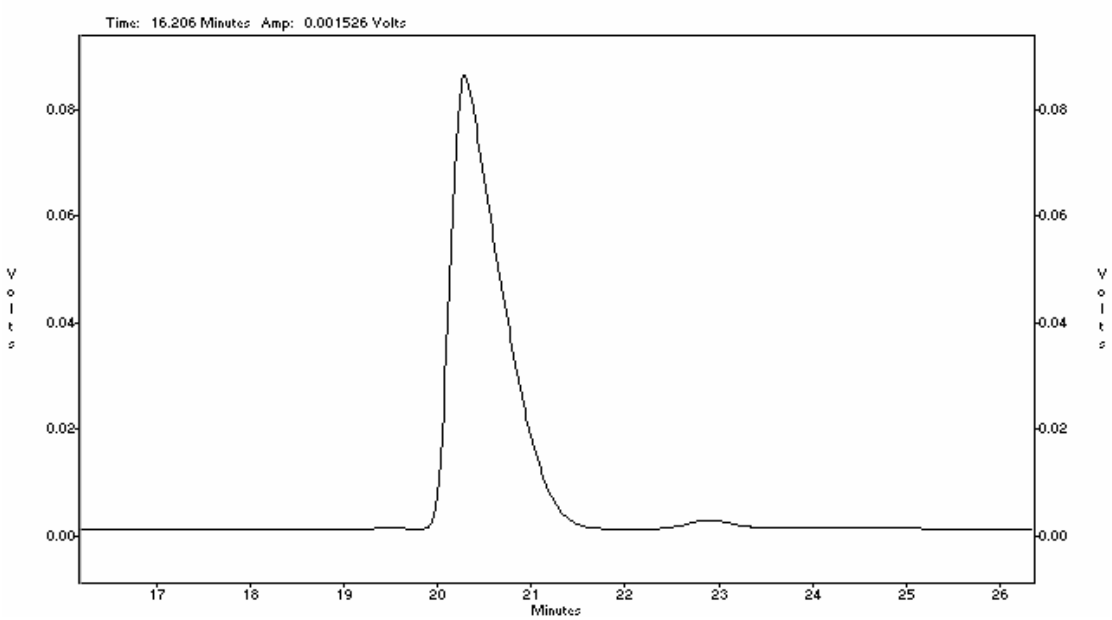
(±)-1-Phenylbutan-1-ol Daicel Chiralcel OD column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 99/1; flow rate, 0.9 ml/min; temp, 30 °C; detection, 254 nm.



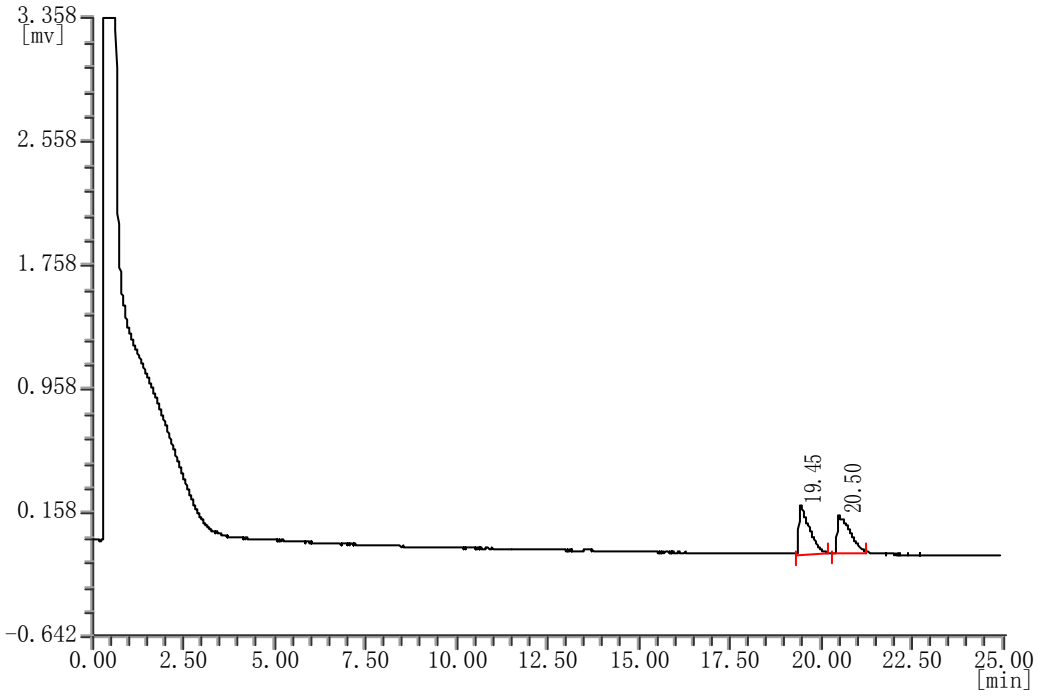
(*R*)-1-Phenylbutan-1-ol (**6c**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



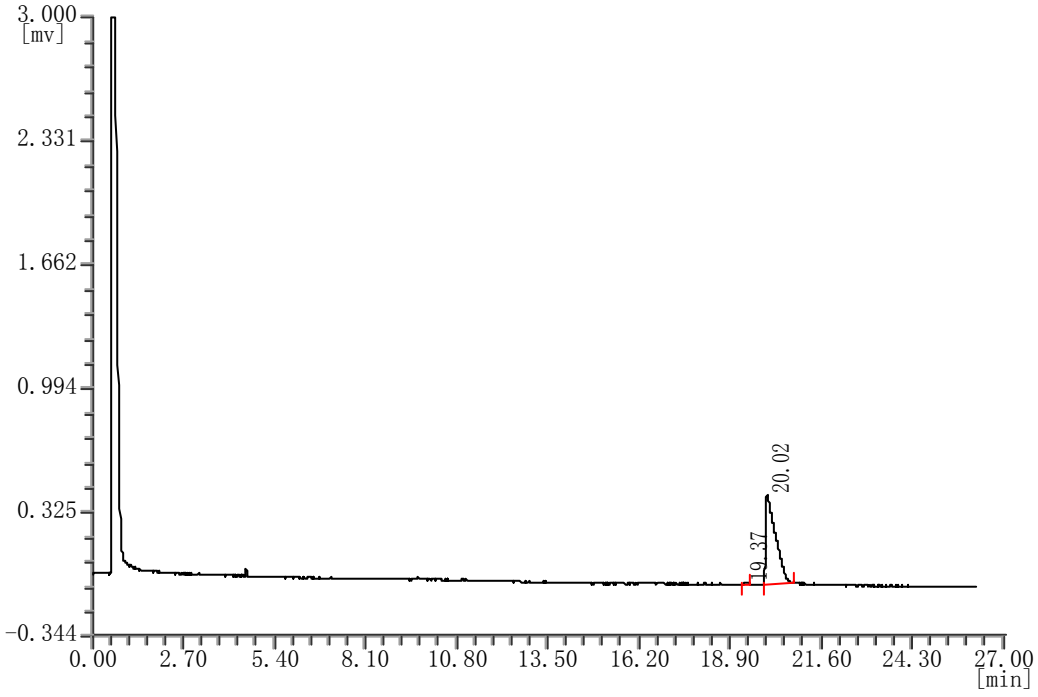
(*R*)-1-Phenylbutan-1-ol (**6c**) Daicel Chiralcel OD column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 99/1; flow rate, 0.9 ml/min; temp, 30 °C; detection, 254 nm, (*R*)-enantiomer 20.33 min, (*S*)-enantiomer 22.93 min, 98% ee.



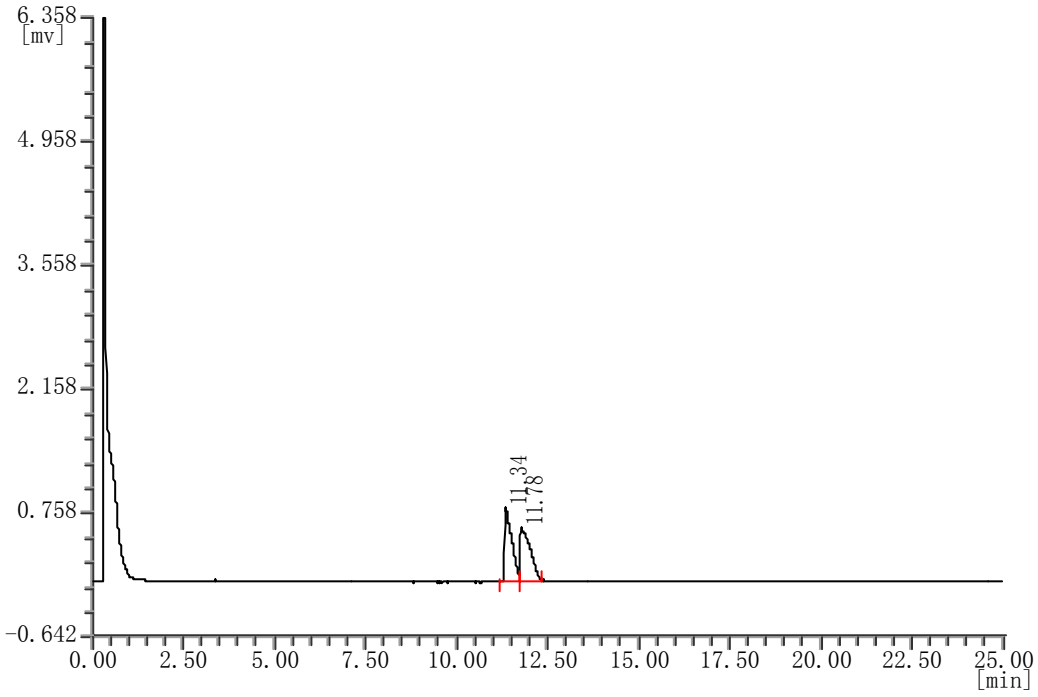
(±)-1-Phenylpentan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



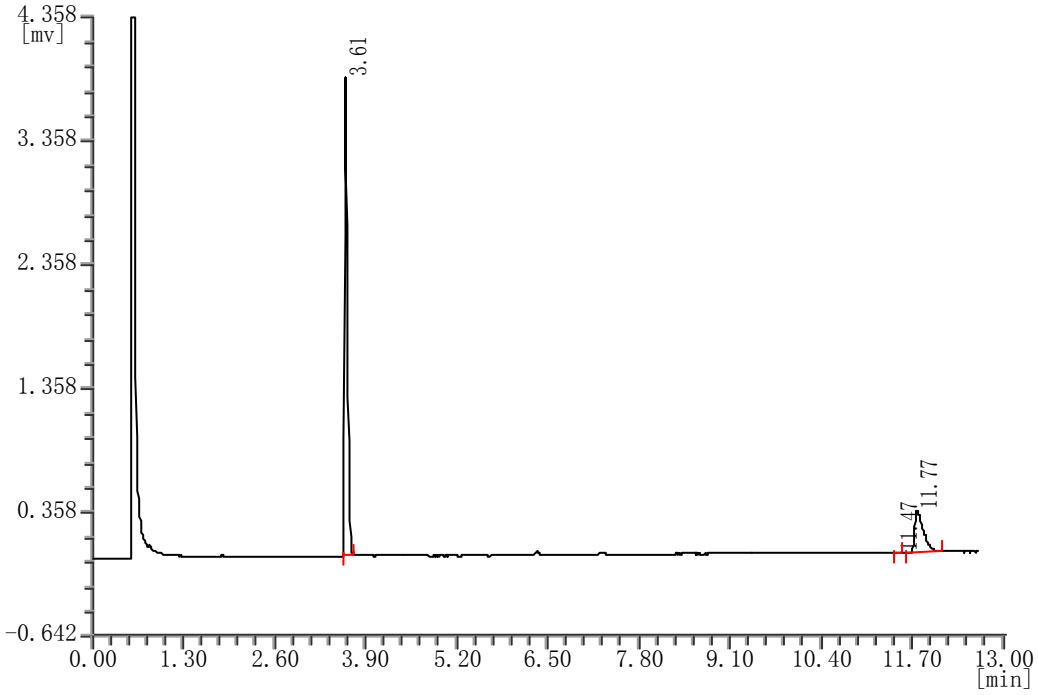
(*R*)-1-Phenylpentan-1-ol (**6d**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 99% ee.



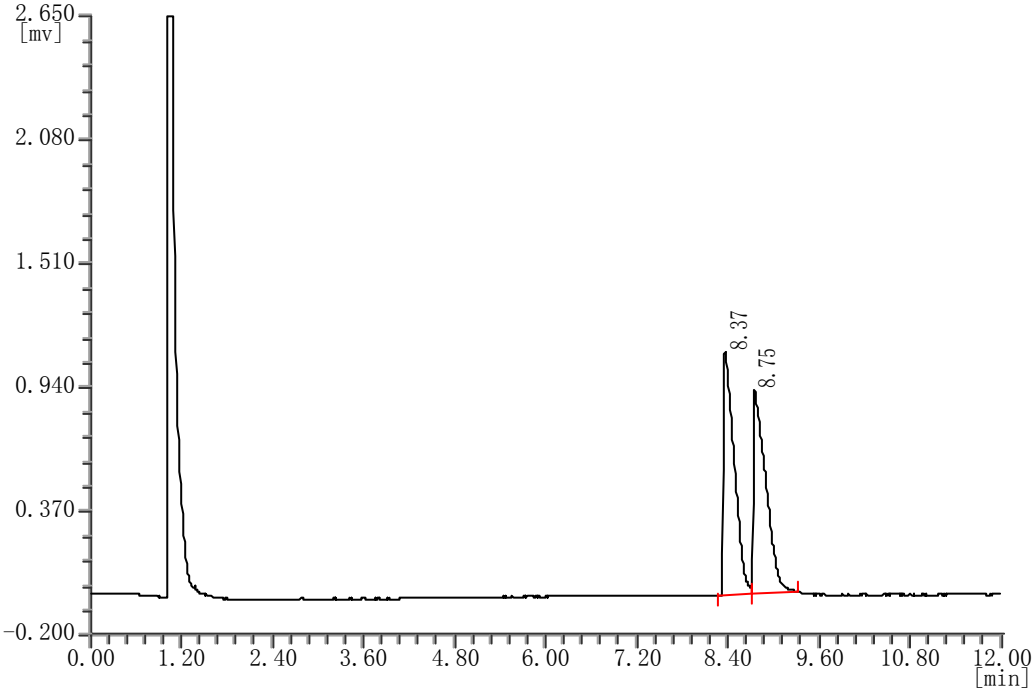
(±)-2-Methyl-1-phenylpropan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



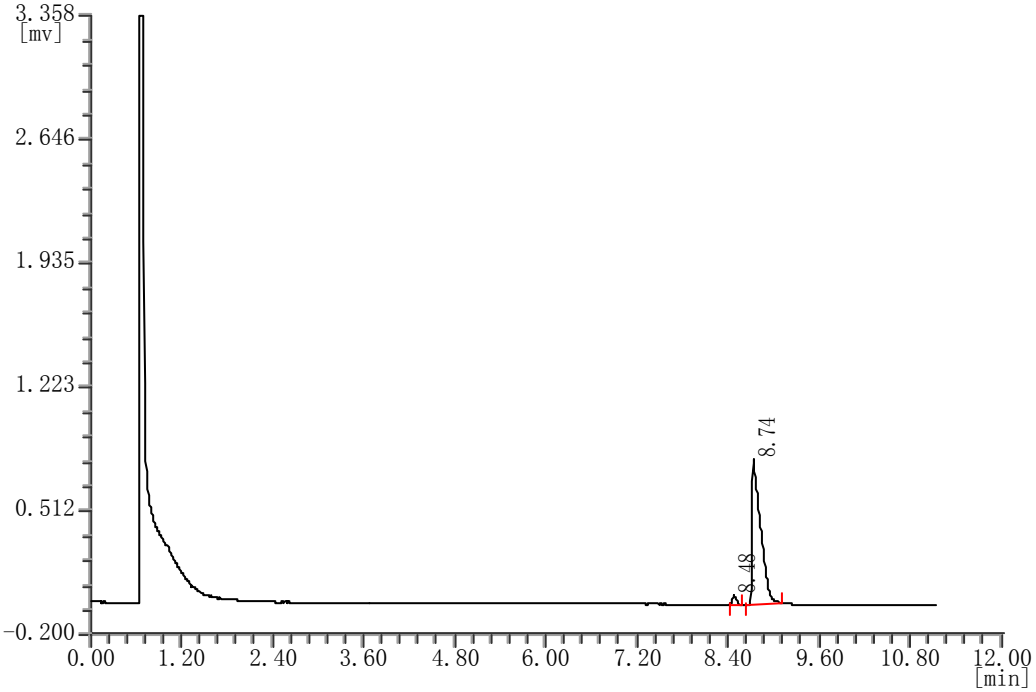
(*S*)-2-Methyl-1-phenylpropan-1-ol (**6e**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 99% ee.



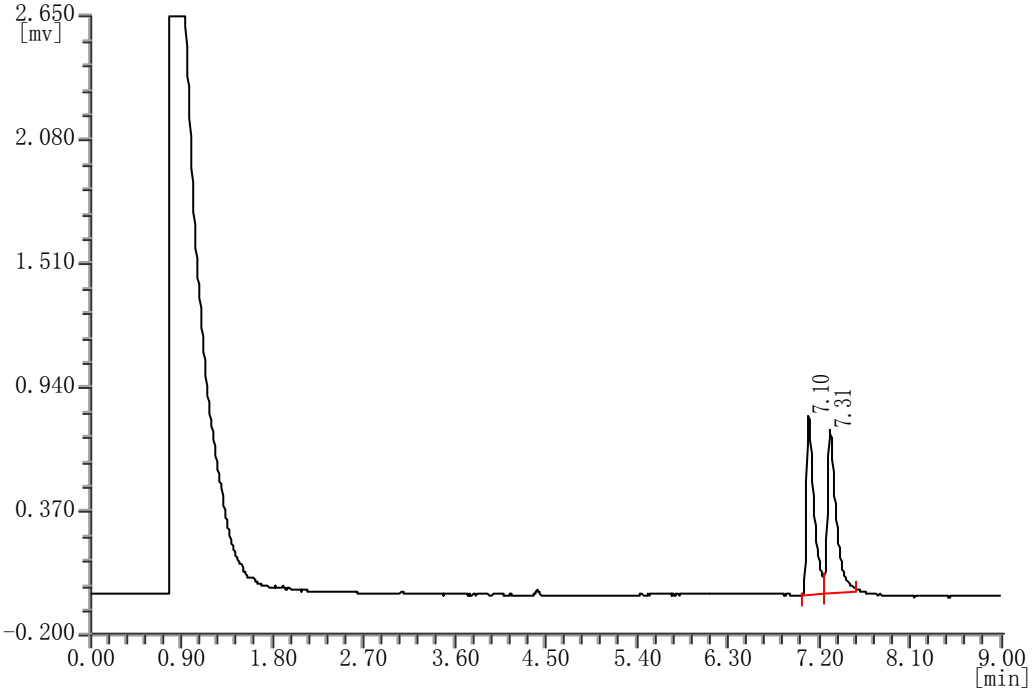
(±)-Cyclopropyl phenyl methanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C.



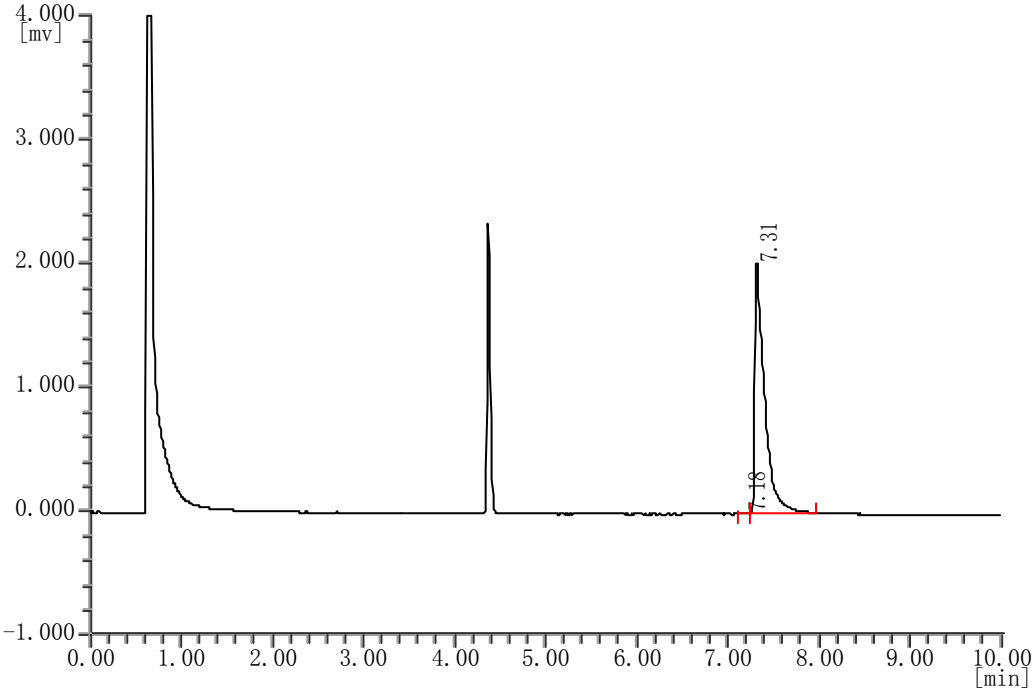
(*S*)-Cyclopropyl phenyl methanol (**6f**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C; 93% ee.



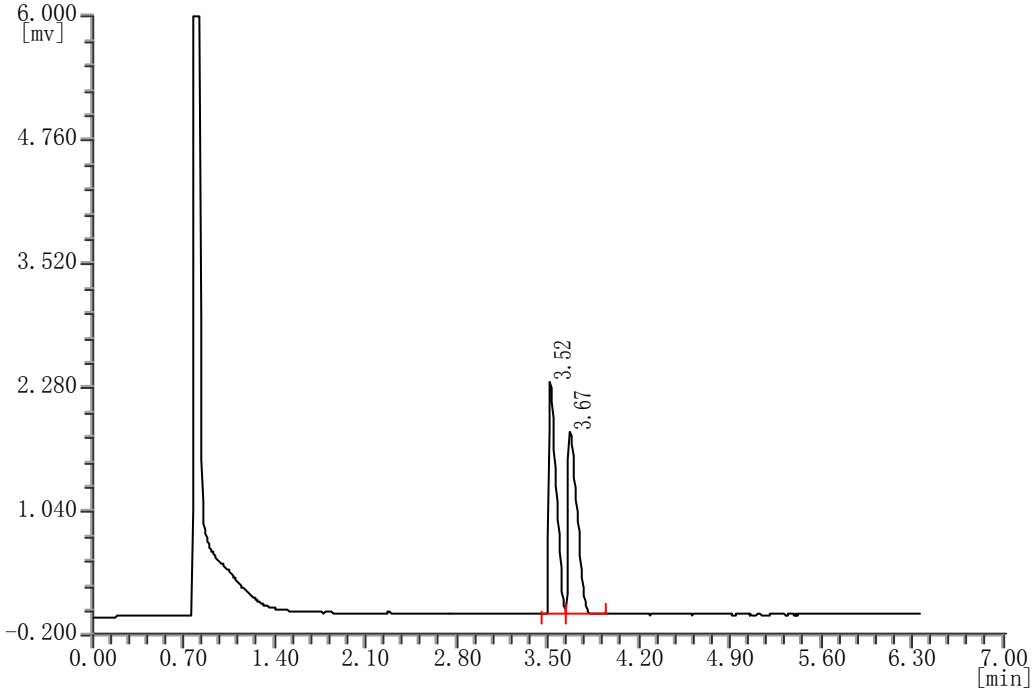
(±)-Cyclohexyl phenyl methanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C.



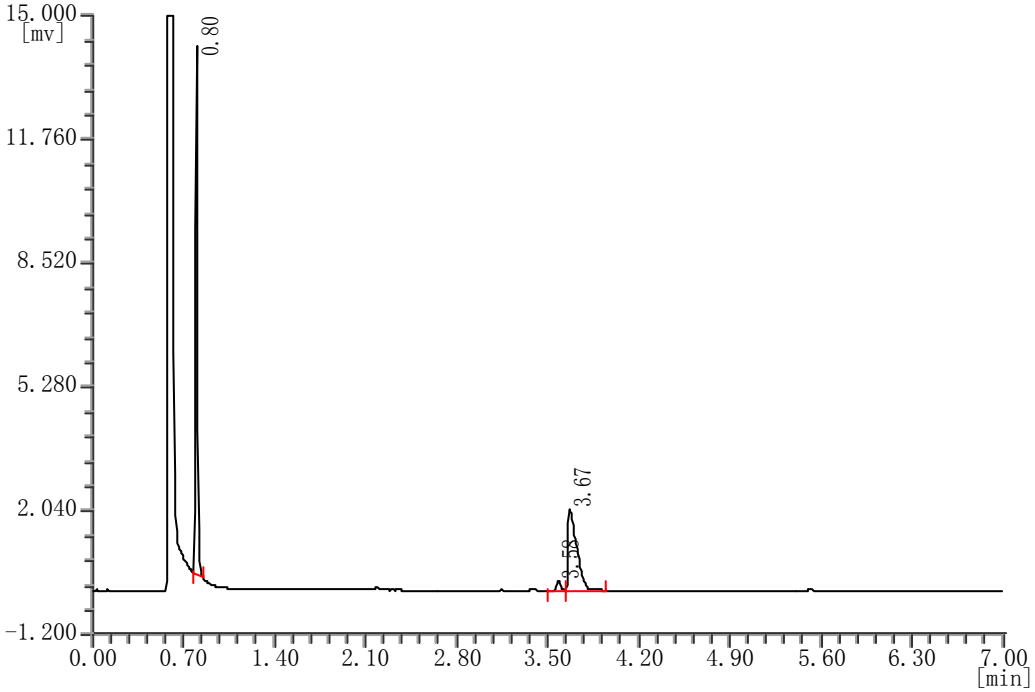
(*R*)-Cyclohexyl phenyl methanol (**6g**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 160 °C; 99% ee.



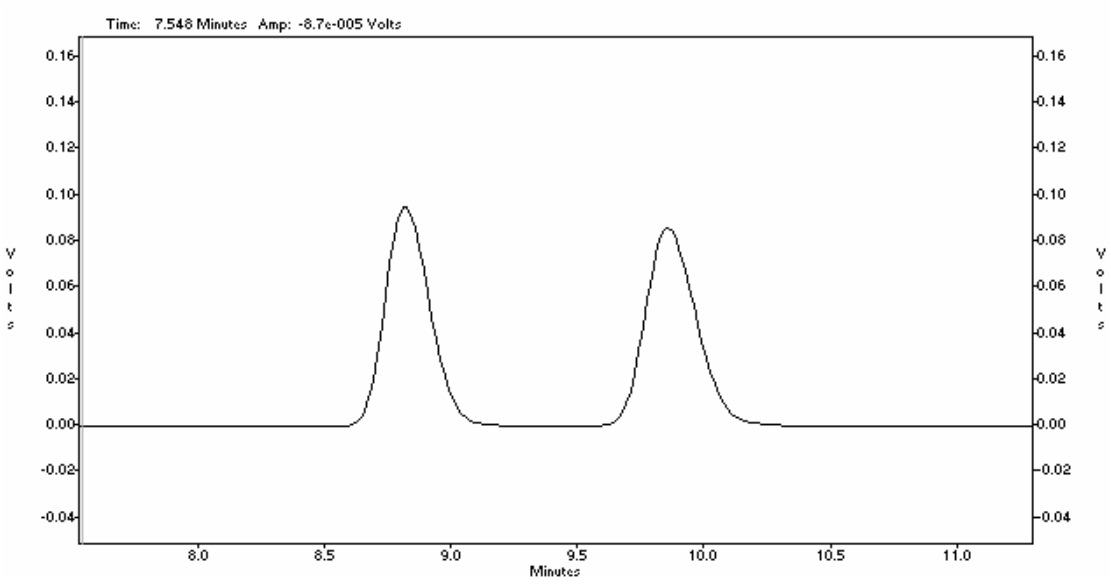
(±)-α-(Trifluoromethyl)-benzenemethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



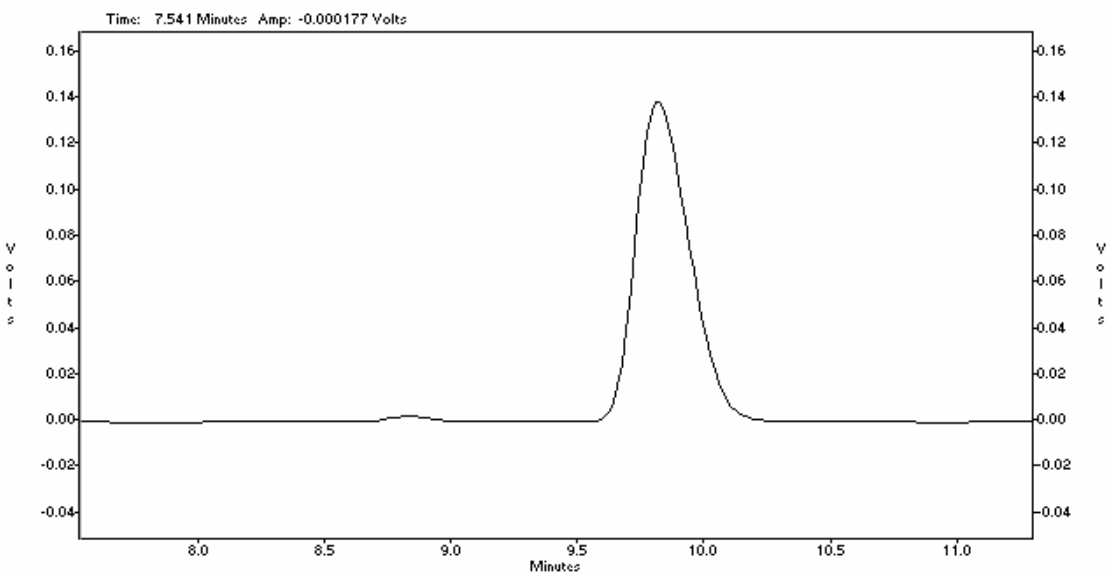
(*R*)-α-(Trifluoromethyl)-benzenemethanol (**6h**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 92% ee.



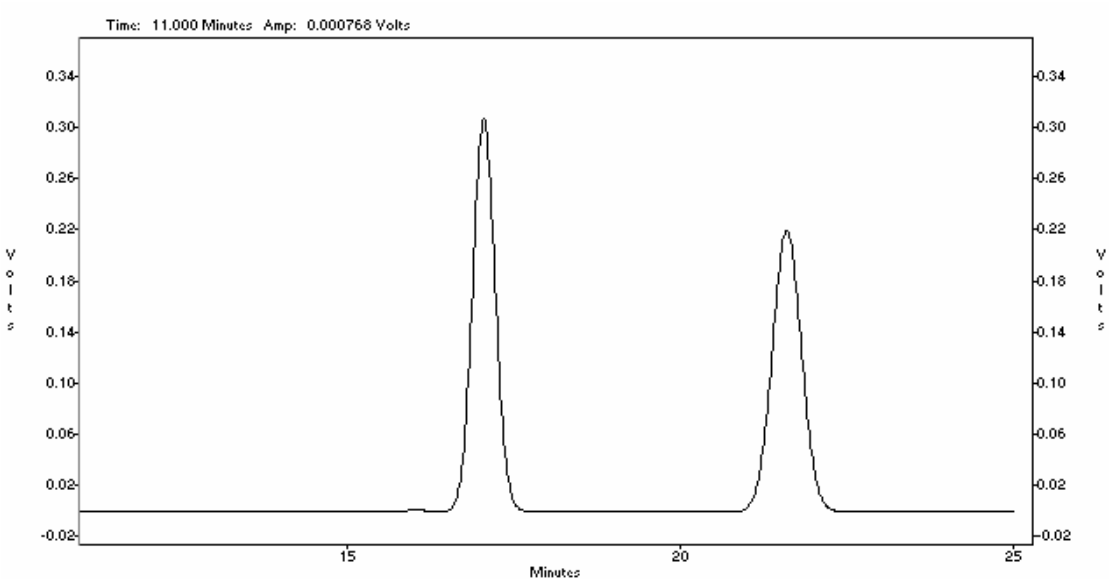
(±)-1,2-Diphenylethanol Daicel Chiralcel OD-H column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0.9 ml/min; temp, 30 °C; detection, 230 nm.



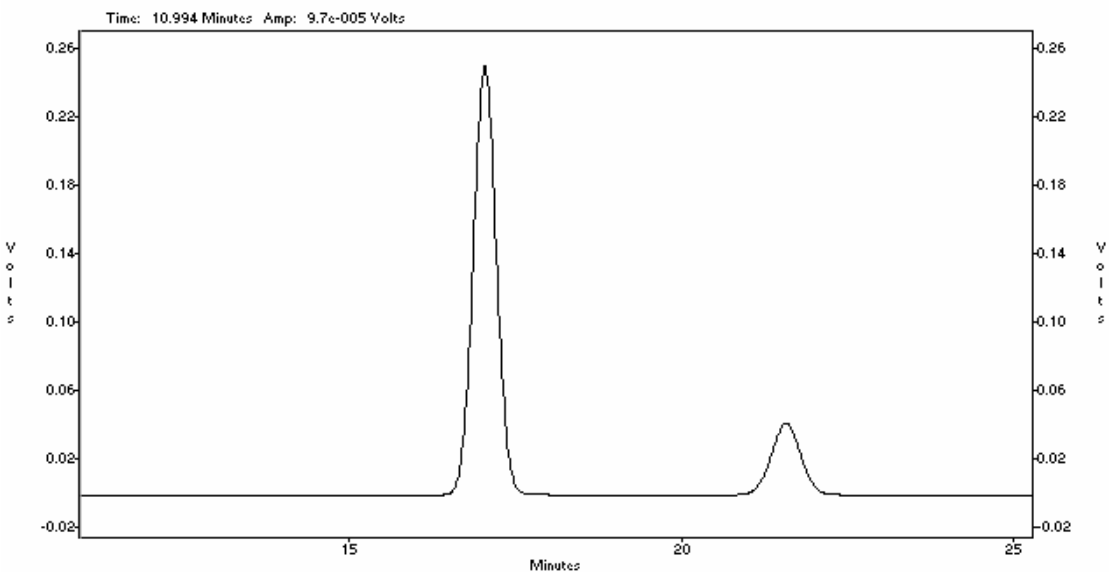
(*S*)-1,2-Diphenylethanol (**6i**) Daicel Chiralcel OD-H column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0.9 ml/min; temp, 30 °C; detection, 230 nm, (*R*)-enantiomer 8.85 min, (*S*)-enantiomer 9.82 min, 98% ee.



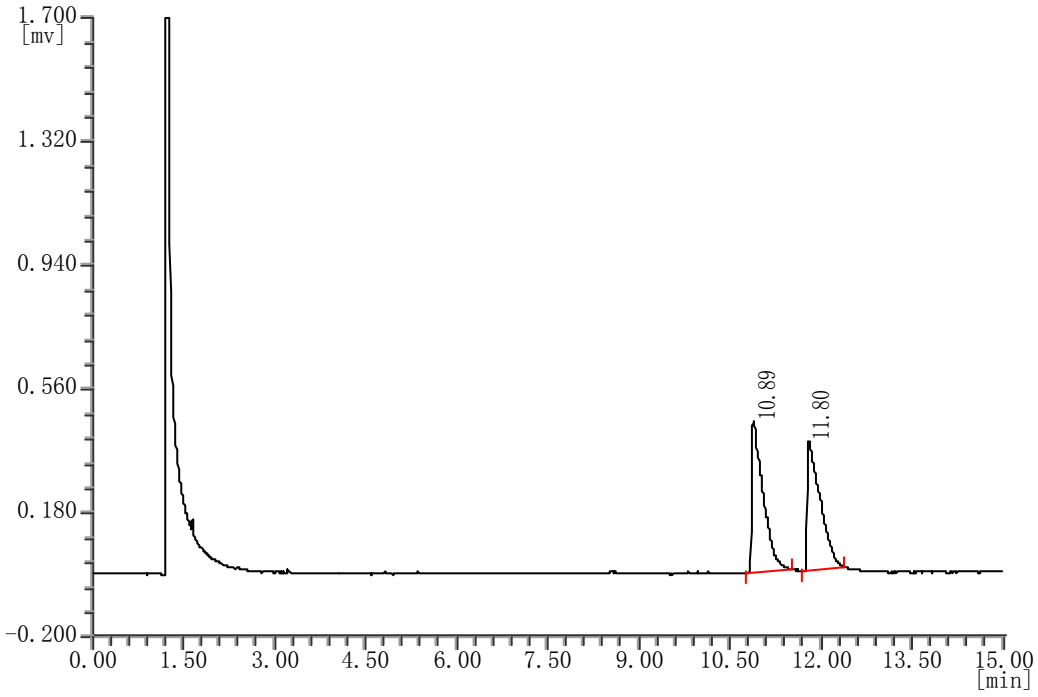
(±)-(*E*)-1,3-Diphenyl-2-propen-1-ol Daicel Chiralcel OD-H column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0.9 ml/min; temp, 30 °C; detection, 254 nm.



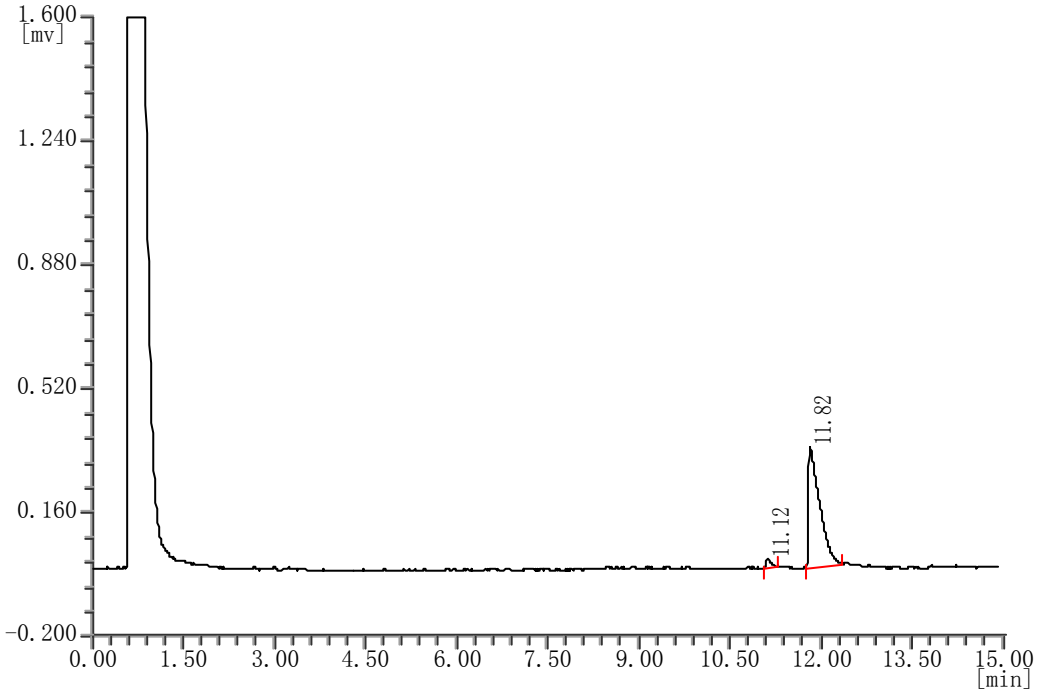
(*S*)-(*E*)-1,3-Diphenyl-2-propen-1-ol (**6j**) Daicel Chiralcel OD-H column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0.9 ml/min; temp, 30 °C; detection, 254 nm, (*S*)-enantiomer 17.06 min, (*R*)-enantiomer 21.57 min, 65% ee.



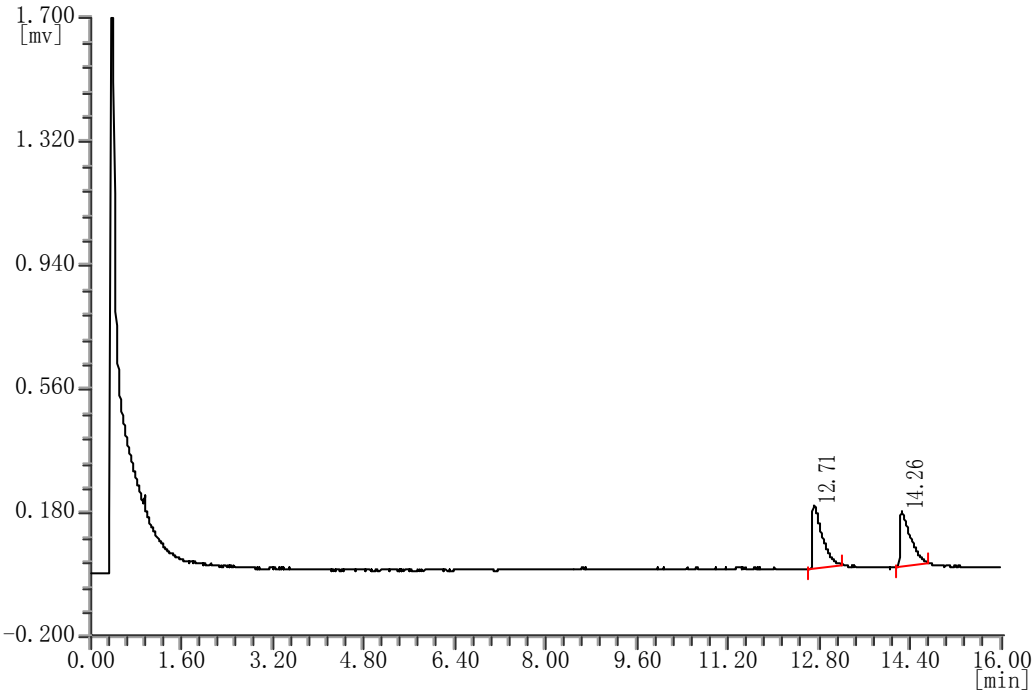
(±)-1-(Pyridin-4-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 120 °C.



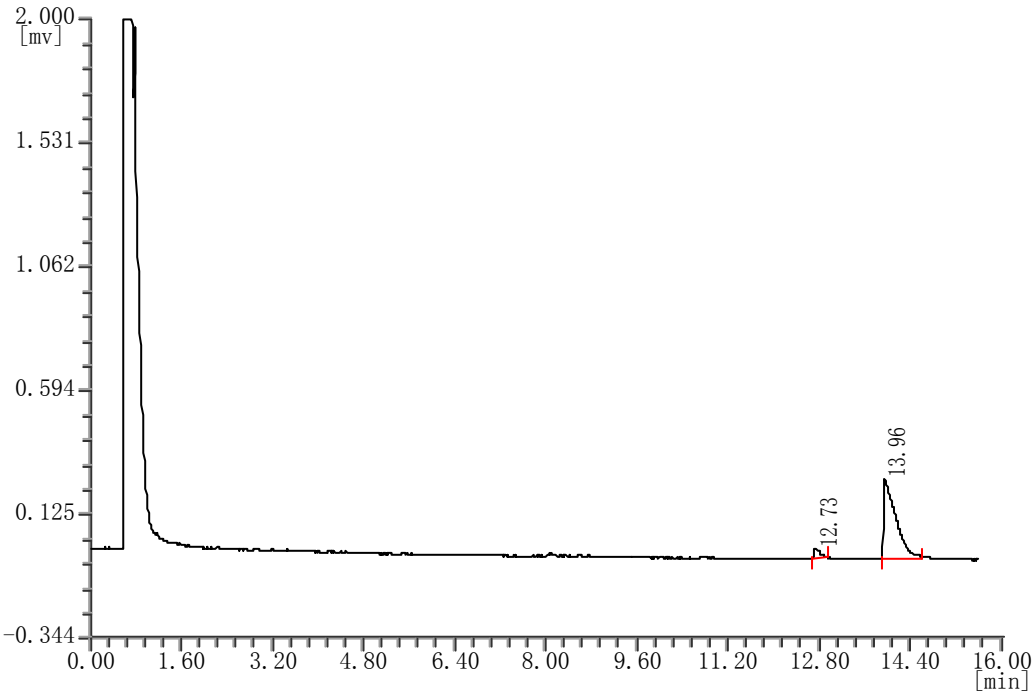
(*S*)-1-(Pyridin-4-yl)ethanol (**8a**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 120 °C; 94% ee.



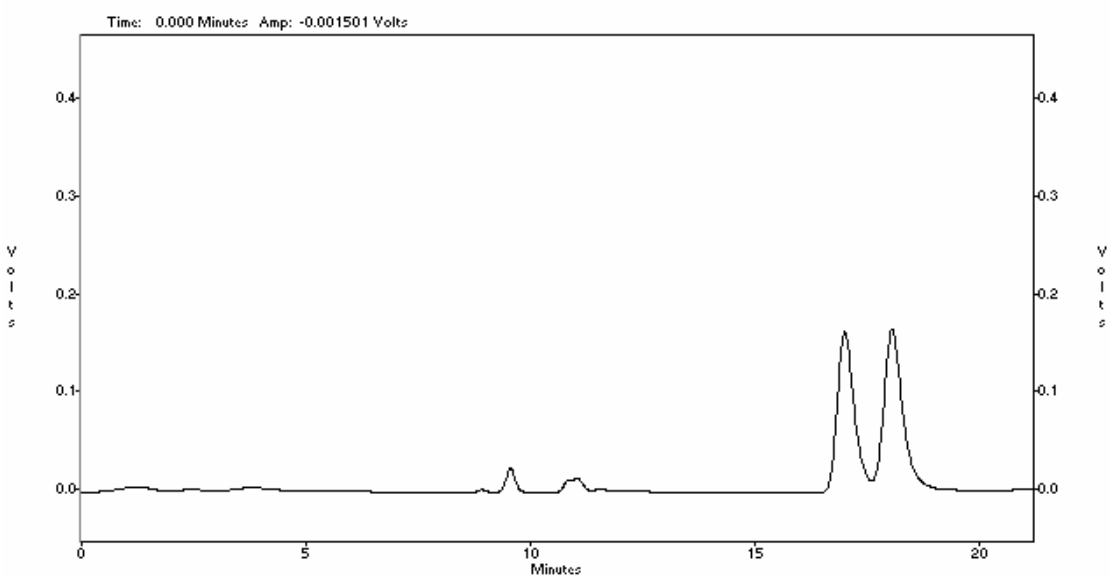
(±)-1-(Pyridin-3-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



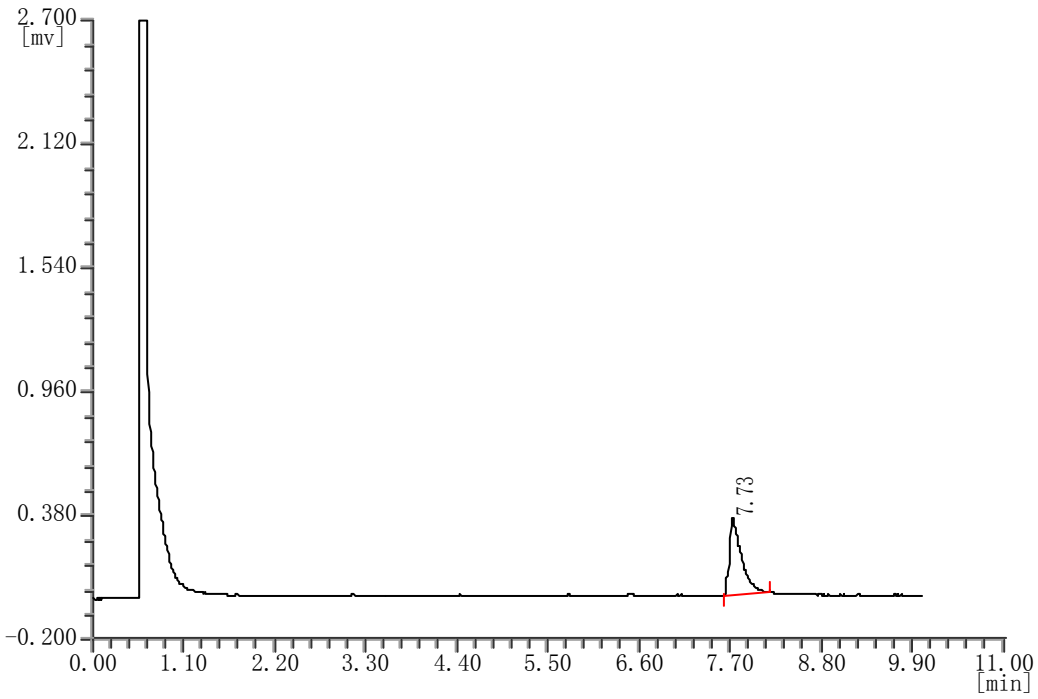
(*S*)-1-(Pyridin-3-yl)ethanol (**8b**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 90% ee.



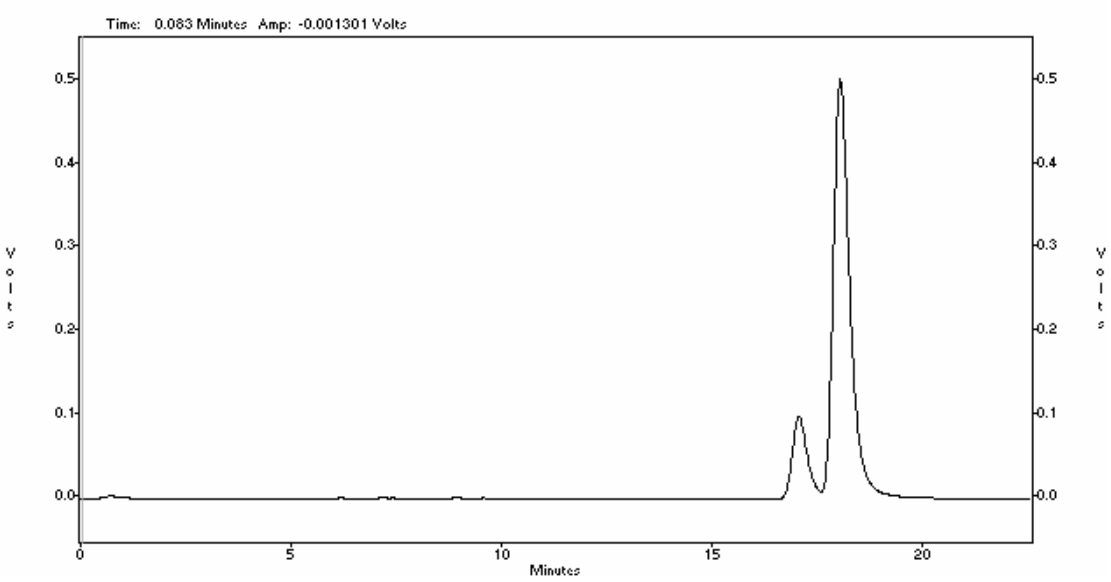
(±)-1-(Pyridin-2-yl)ethanol Daicel Chiralcel OD column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.5 ml/min; temp, 30 °C; detection, 254 nm.



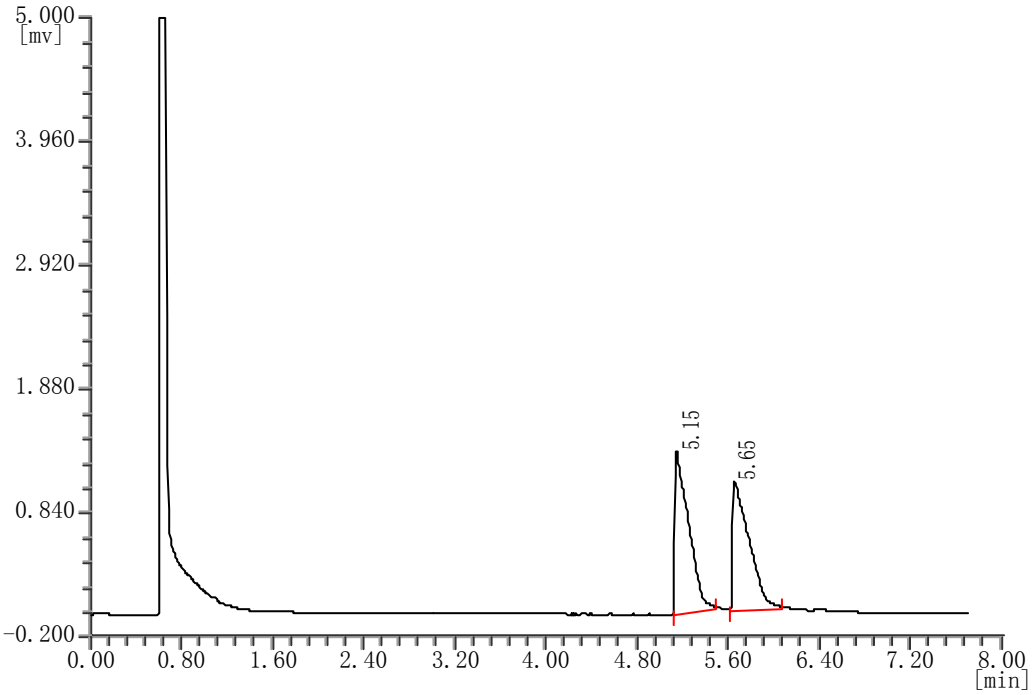
(*S*)-1-(Pyridin-2-yl)ethanol (**8c**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 100 °C.



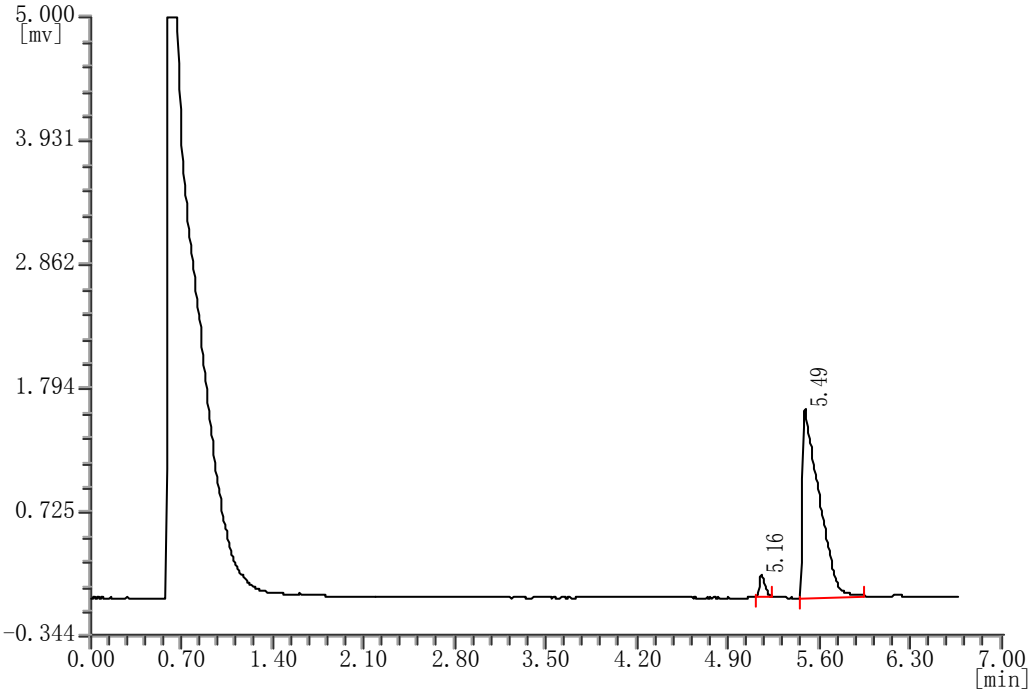
(*S*)-1-(Pyridin-2-yl)ethanol (**8c**) Daicel Chiralcel OD column, 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.5 ml/min; temp, 30 °C; detection, 254 nm, (*R*)-enantiomer 17.13 min, (*S*)-enantiomer 18.08 min, 72% ee.



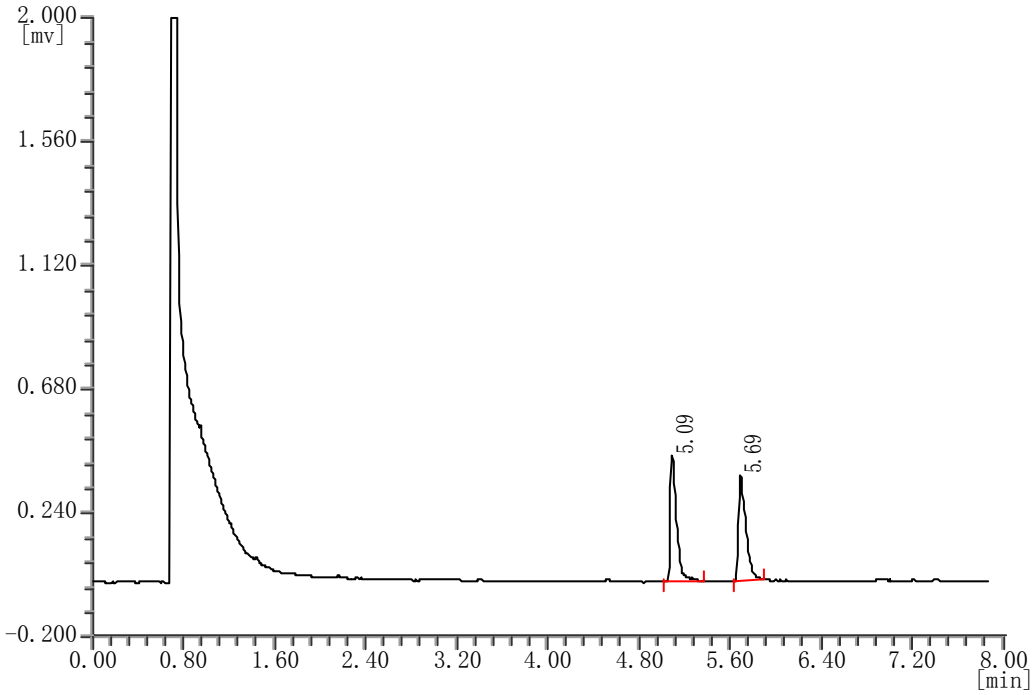
(±)-1-(Thiophen-2-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



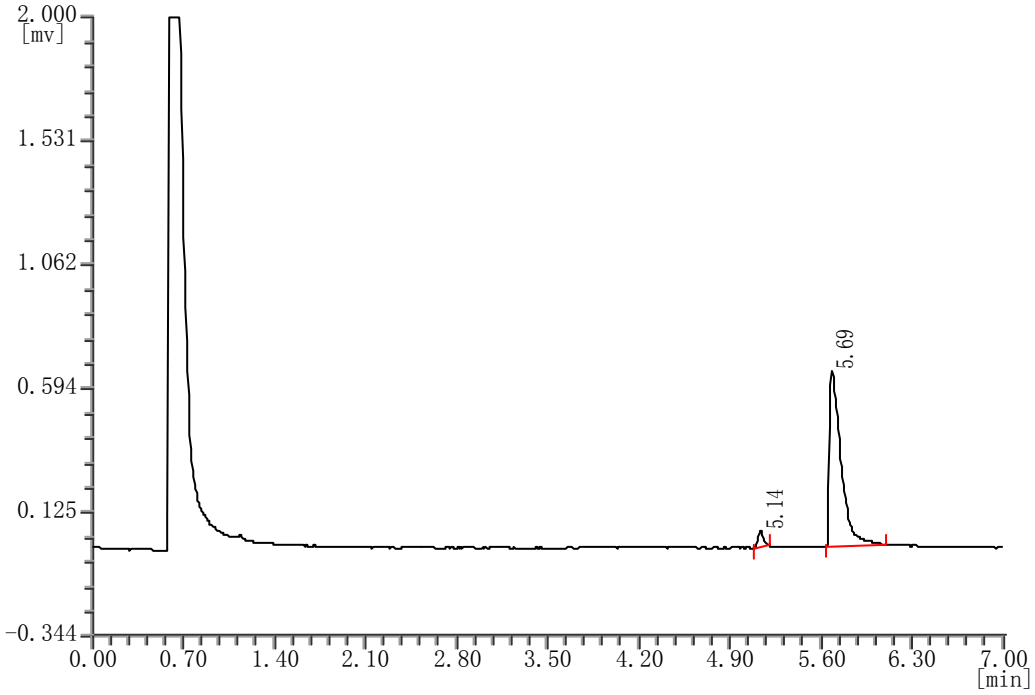
(*S*)-1-(Thiophen-2-yl)ethanol (**8d**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 93% ee.



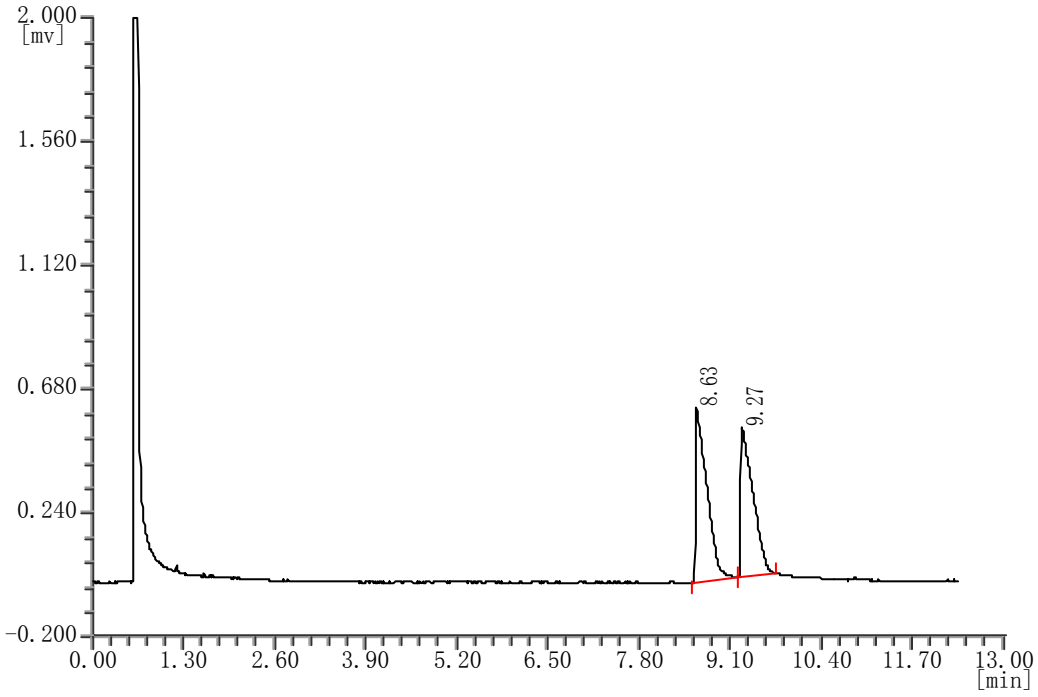
(±)-1-(5-Chlorothiophen-2-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C.



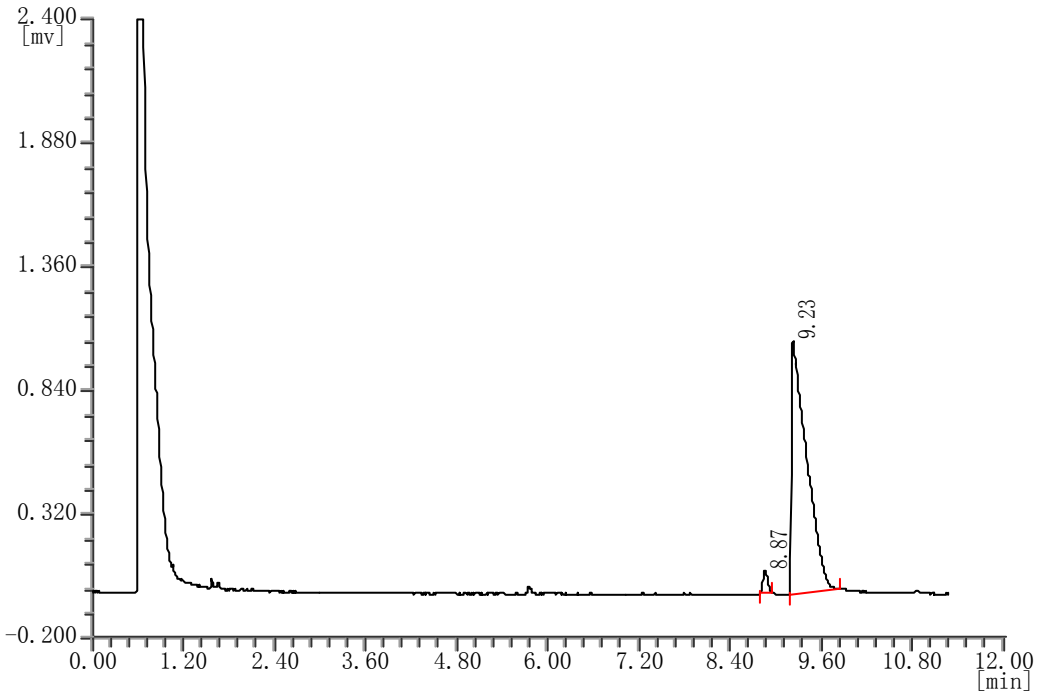
(*S*)-1-(5-Chlorothiophen-2-yl)ethanol (**8e**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 135 °C; 92% ee.



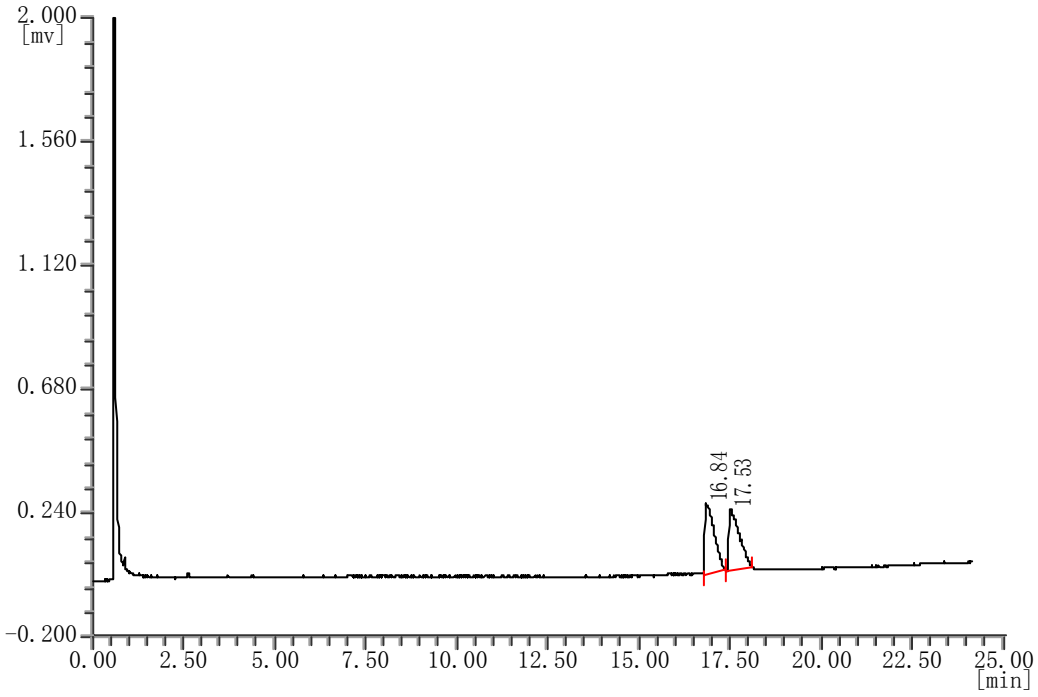
(±)-1-(Thiophen-2-yl)propan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



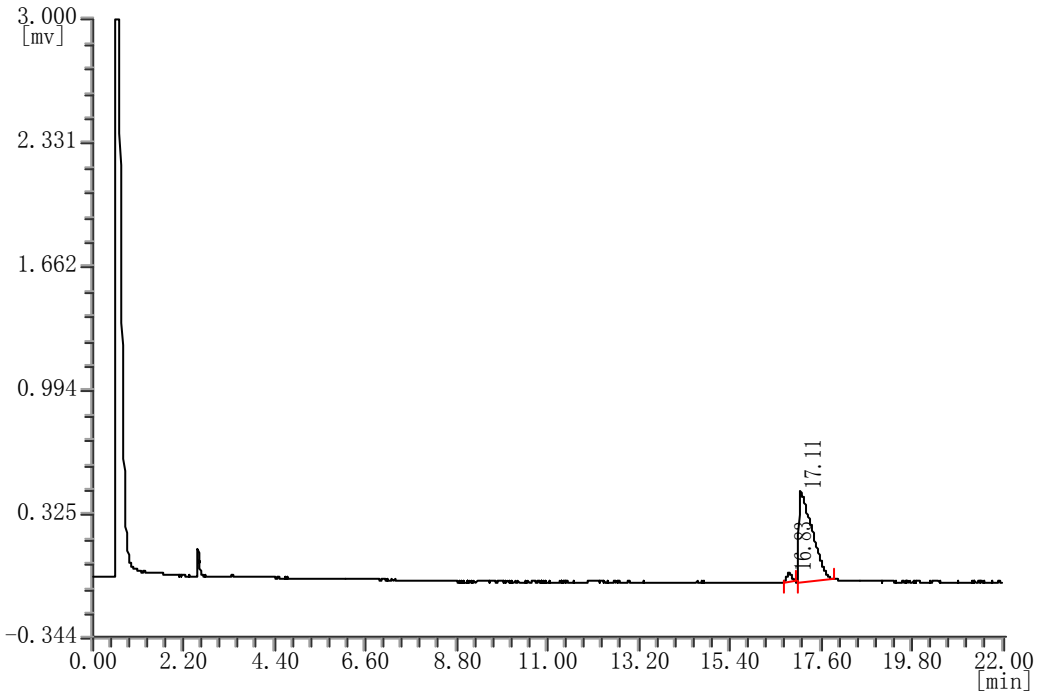
(*S*)-1-(Thiophen-2-yl)propan-1-ol (**8f**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 95% ee.



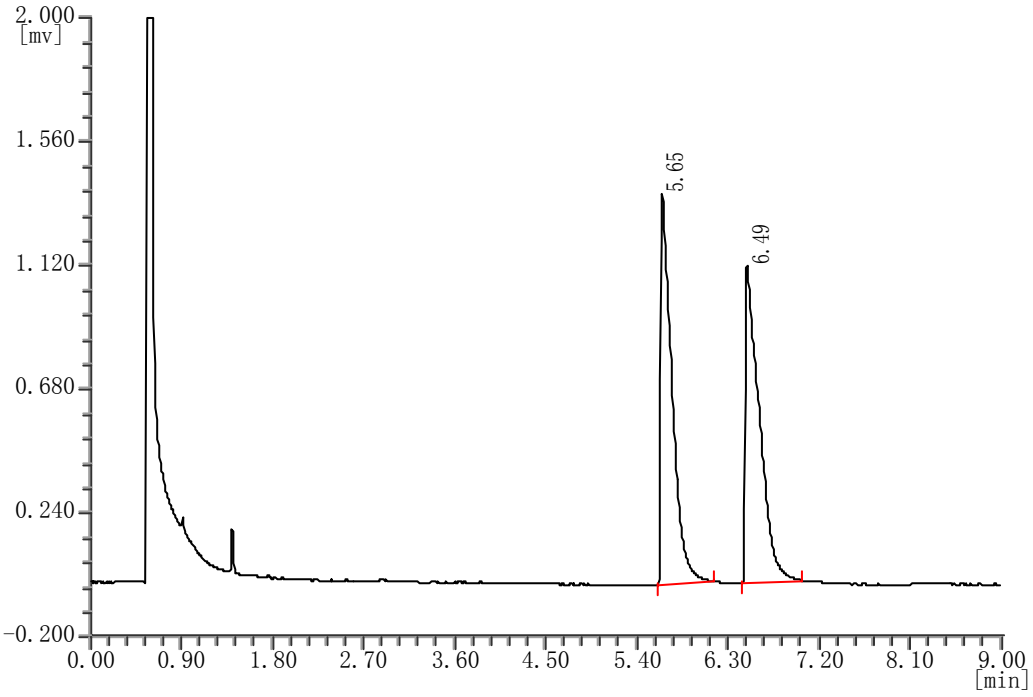
(±)-1-(Thiophen-2-yl)butan-1-ol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 110 °C.



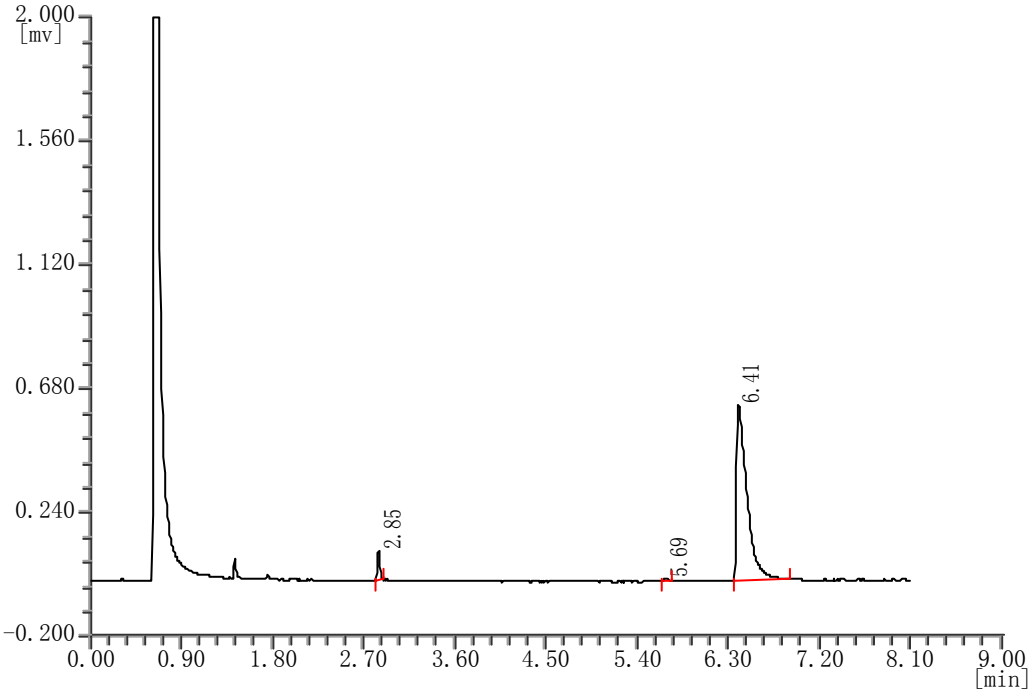
(*R*)-1-(Thiophen-2-yl)butan-1-ol (**8g**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 110 °C; 93% ee.



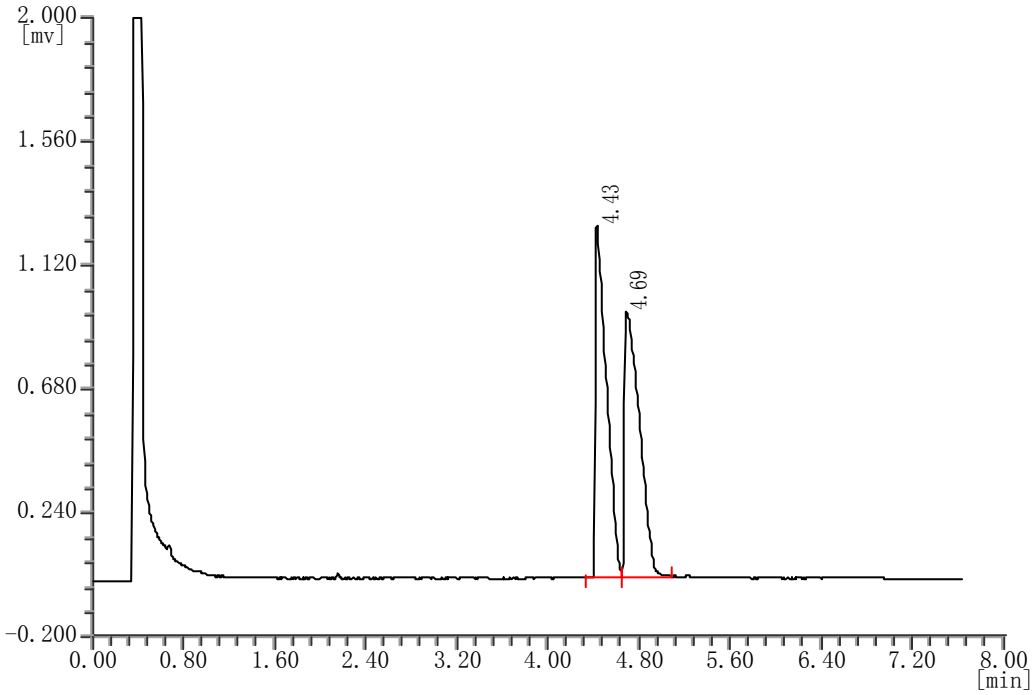
(±)-1-(2,5-Dimethylthiophen-3-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C.



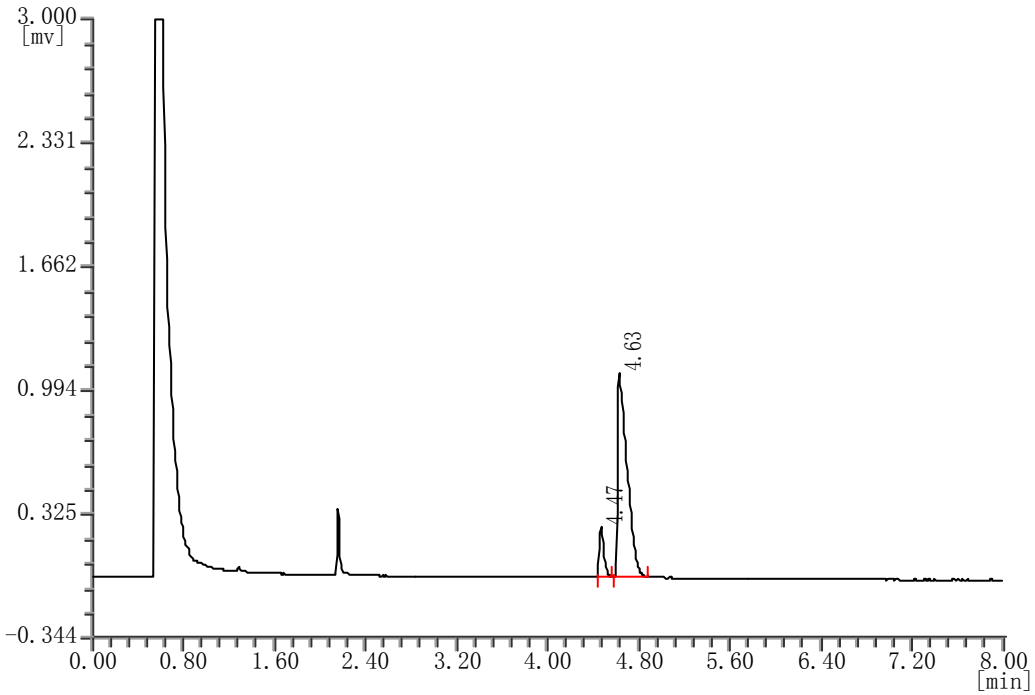
(*S*)-1-(2,5-Dimethylthiophen-3-yl)ethanol (**8h**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C; 99% ee.



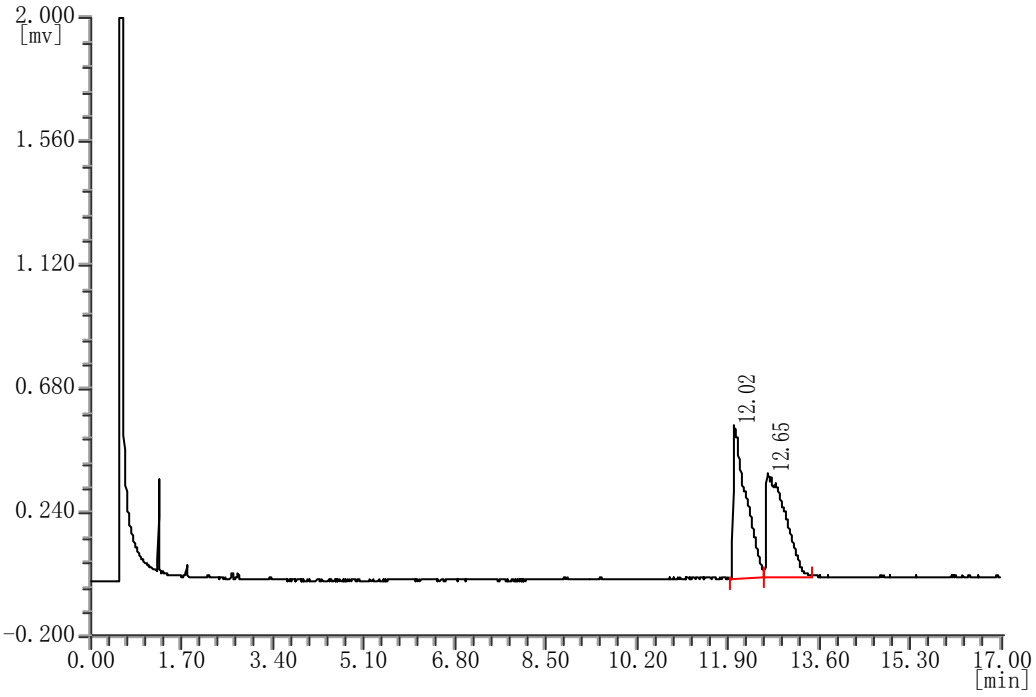
(±)-1-(Furan-2-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 90 °C.



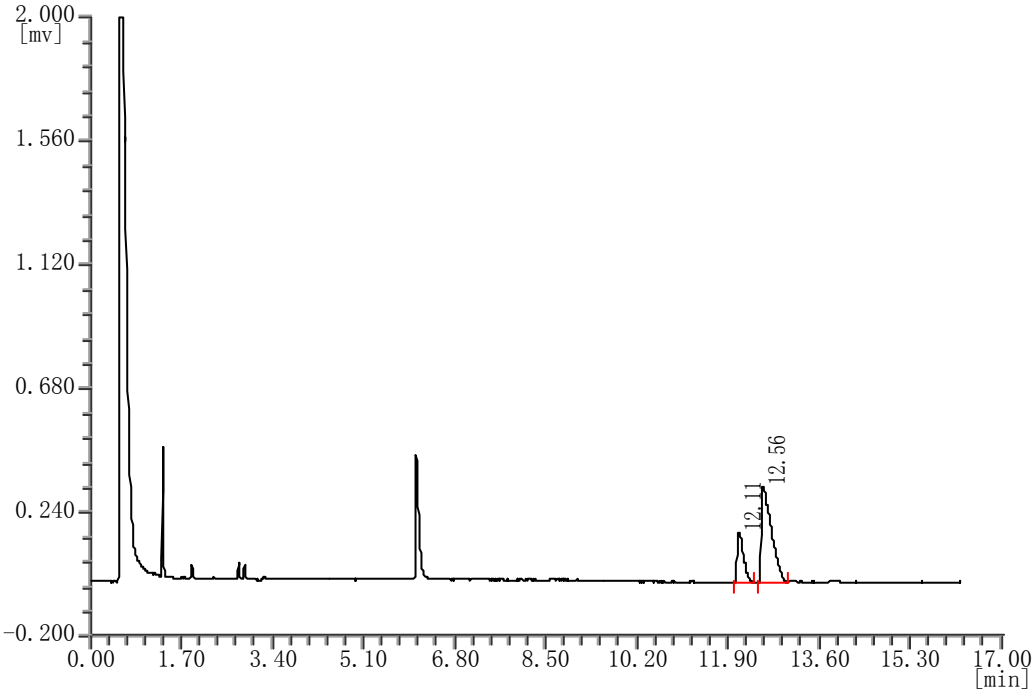
(*S*)-1-(Furan-2-yl)ethanol (**8i**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 90 °C; 79% ee.



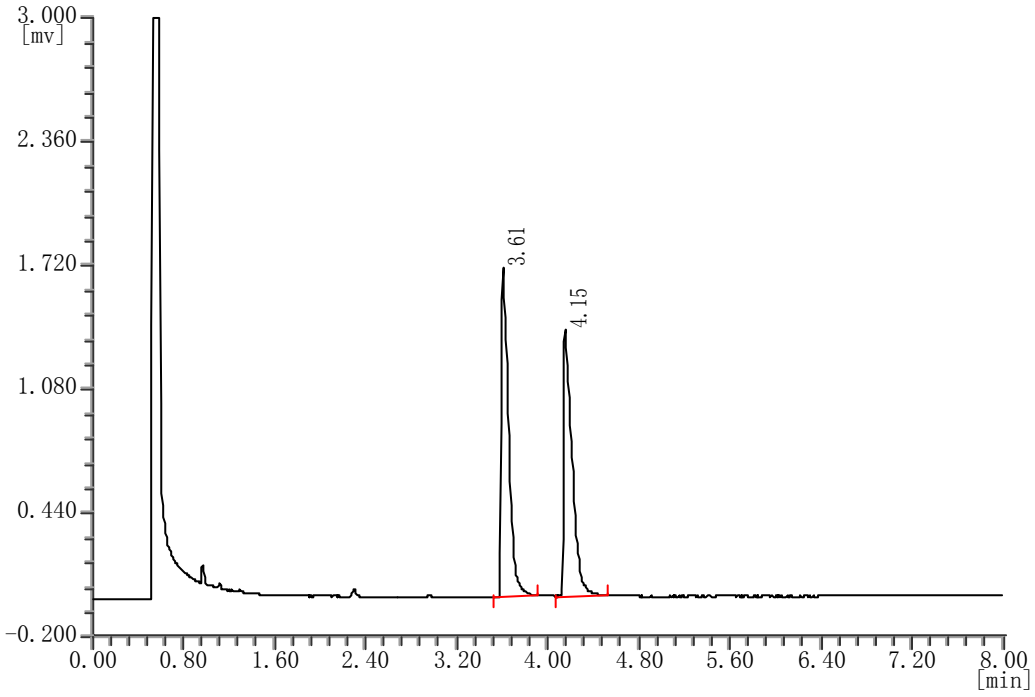
(±)-1-(5-Methylfuran-2-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 80 °C.



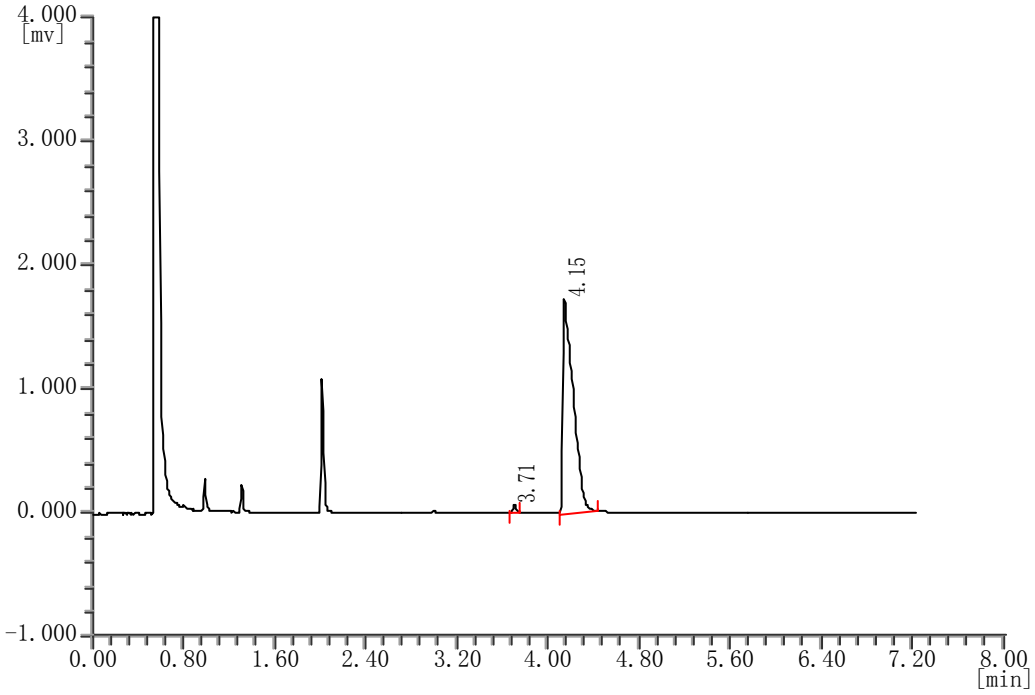
(*S*)-1-(5-Methylfuran-2-yl)ethanol (**8j**) 120418A Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 80 °C; 51% ee.



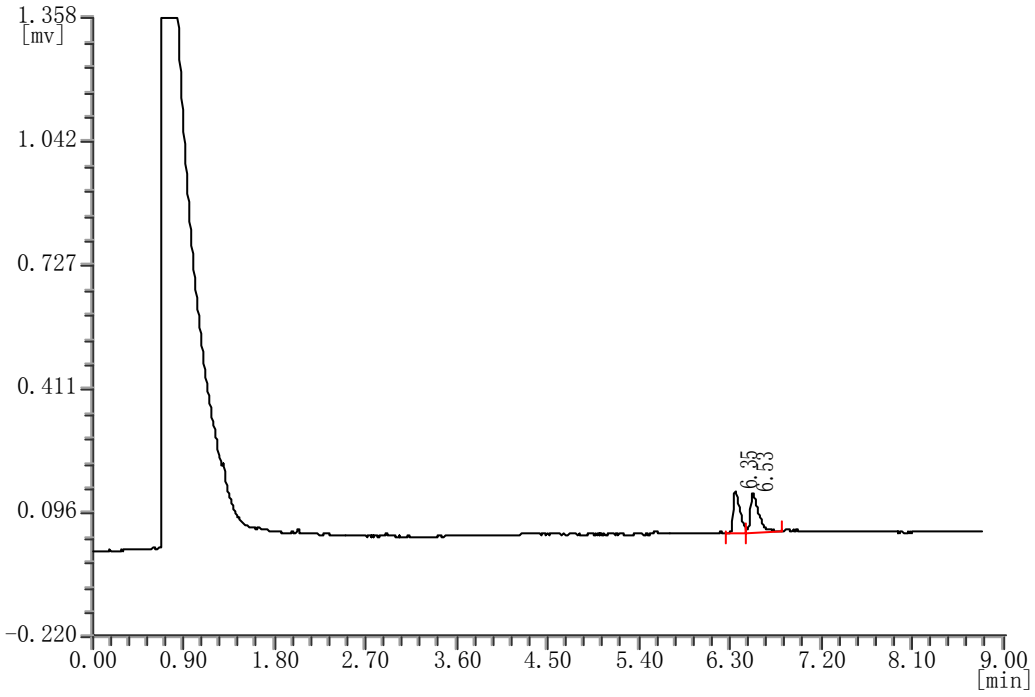
(±)-1-(2,5-Dimethylfuran-3-yl)ethanol 120505B Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



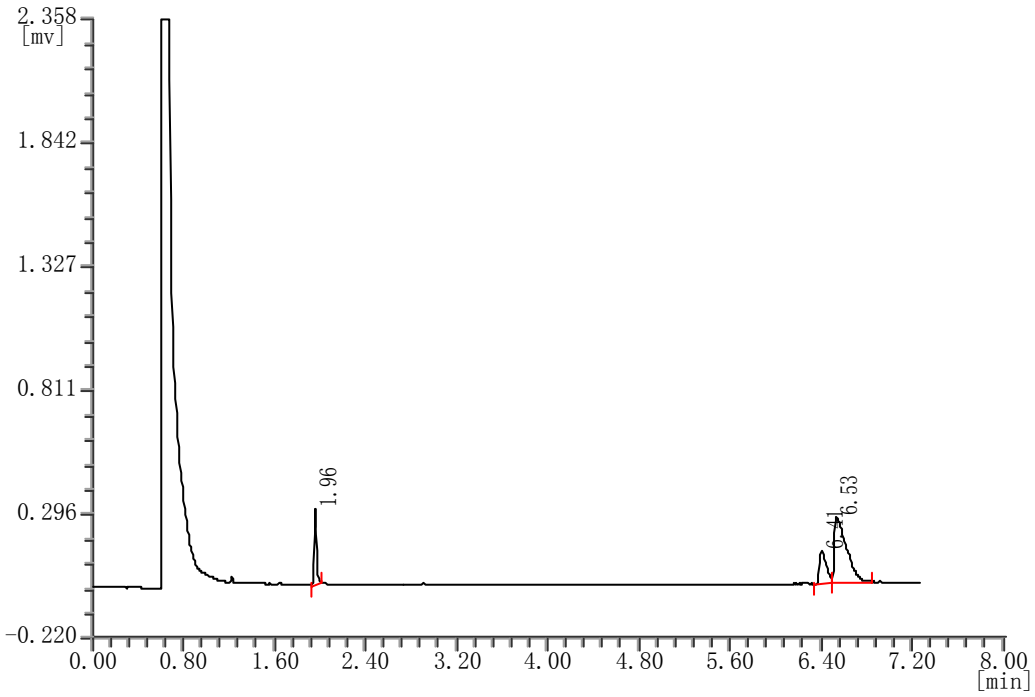
(–)-1-(2,5-Dimethylfuran-3-yl)ethanol (**8k**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 97% ee.



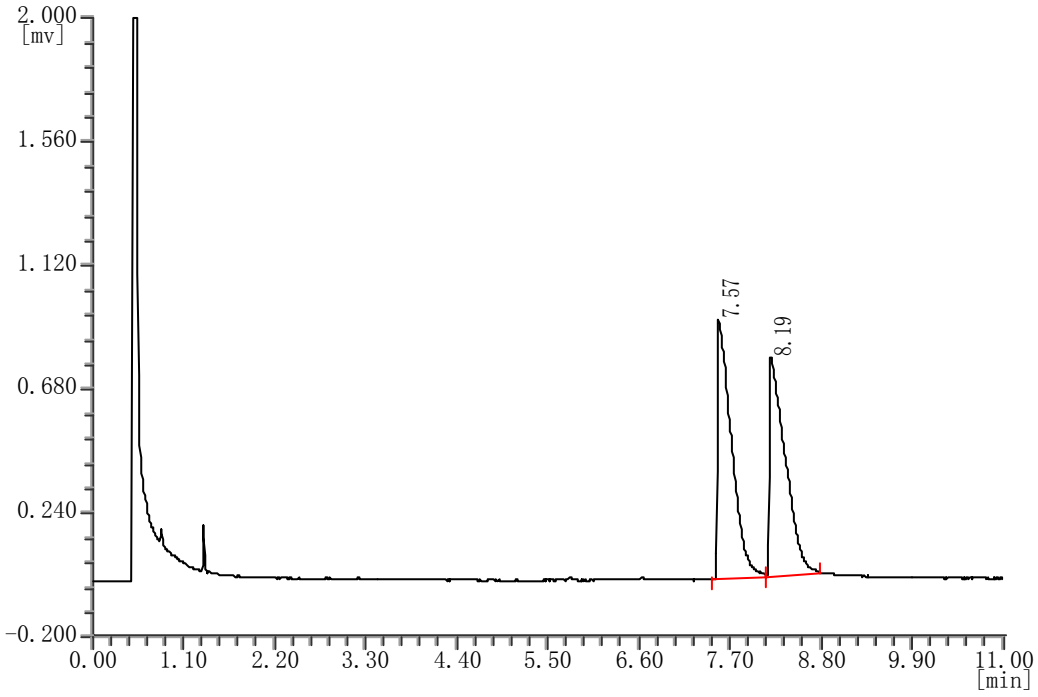
(±)-1-(2-Thiazolyl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C.



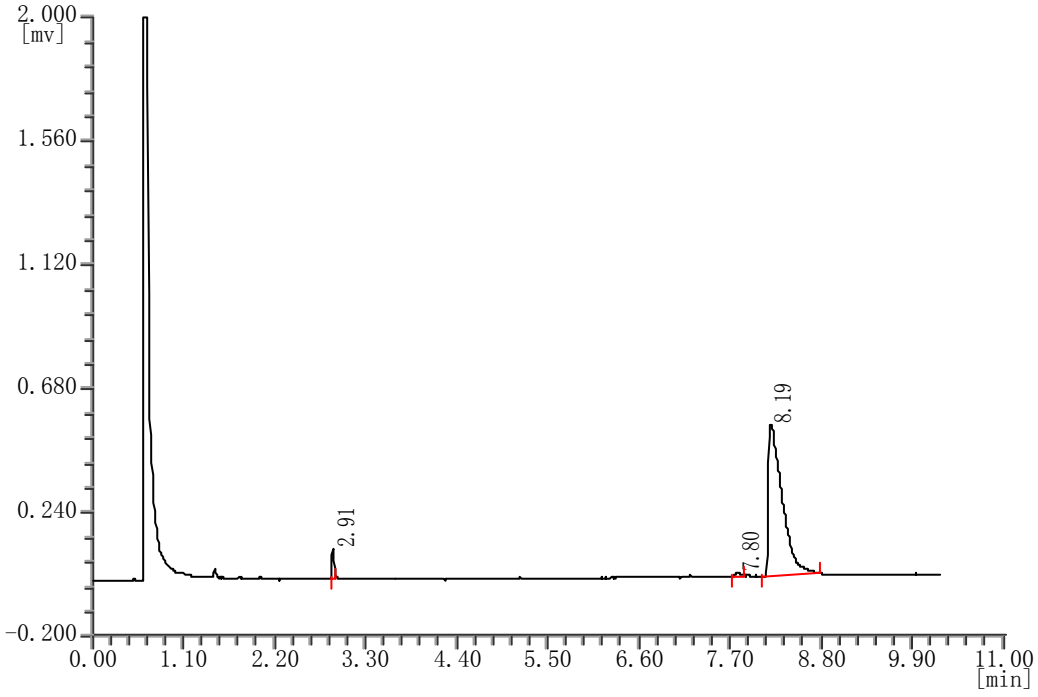
(*S*)-1-(2-Thiazolyl)ethanol (**8m**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 115 °C; 55% ee.



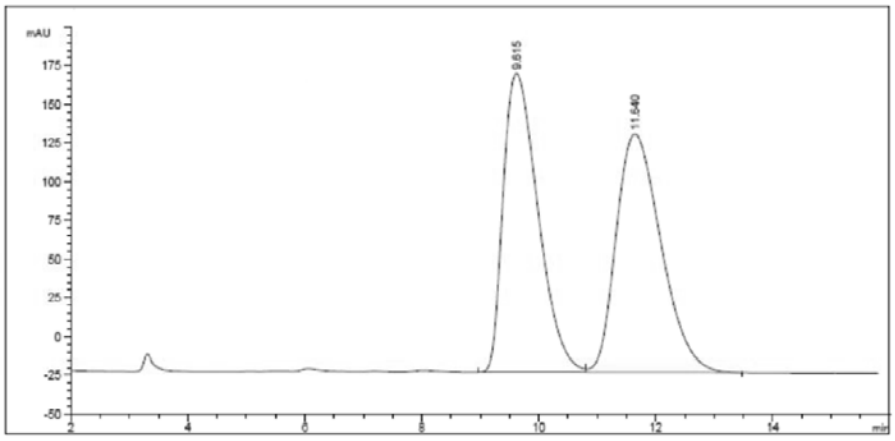
(±)-1-(2,4-dimethylthiazol-5-yl)ethanol Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C.



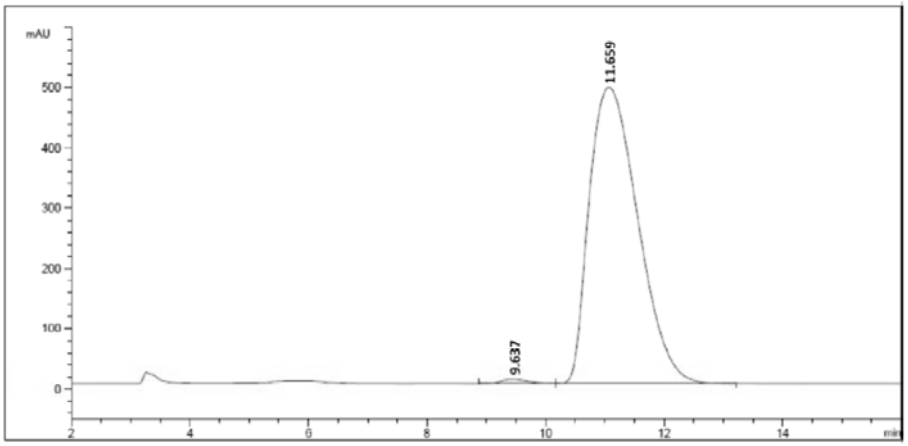
(–)-1-(2,4-dimethylthiazol-5-yl)ethanol (**8n**) Chiral CP-Chirasil-Dex CB column, 25 m×0.25 mm; inject temperature = 250 °C; detector temperature = 250 °C; inlet pressure = 0.12 MPa; column temperature = 130 °C; 98% ee.



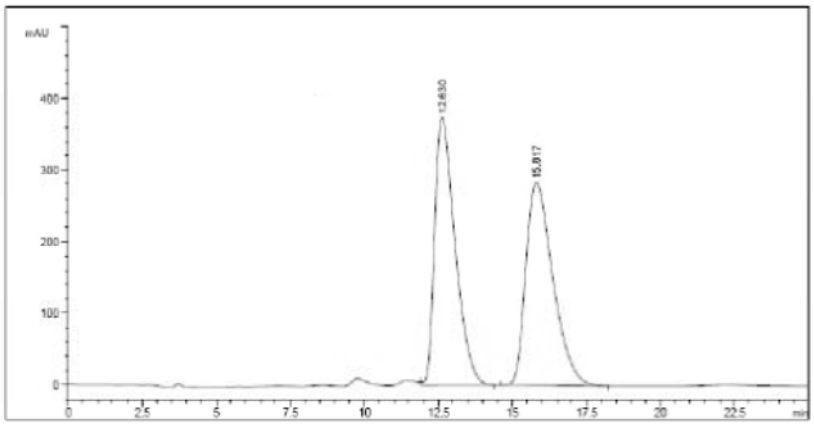
(±)-Ethyl-3-hydroxy-3-phenylpropanoate HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 1.0 ml/min; temp, r.t.; detection, 220 nm.



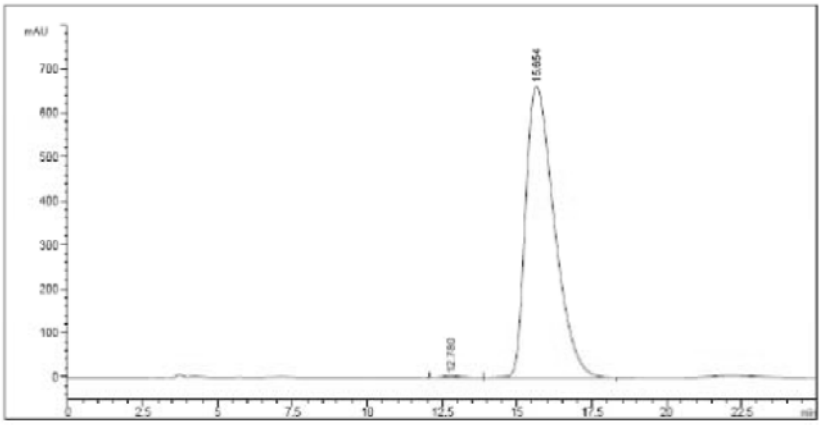
(*S*)-Ethyl-3-hydroxy-3-phenylpropanoate (**10a**) HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 1.0 ml/min; temp, r.t.; detection, 220 nm, (*R*)-enantiomer 9.64 min, (*S*)-enantiomer 11.66 min, 97% ee.



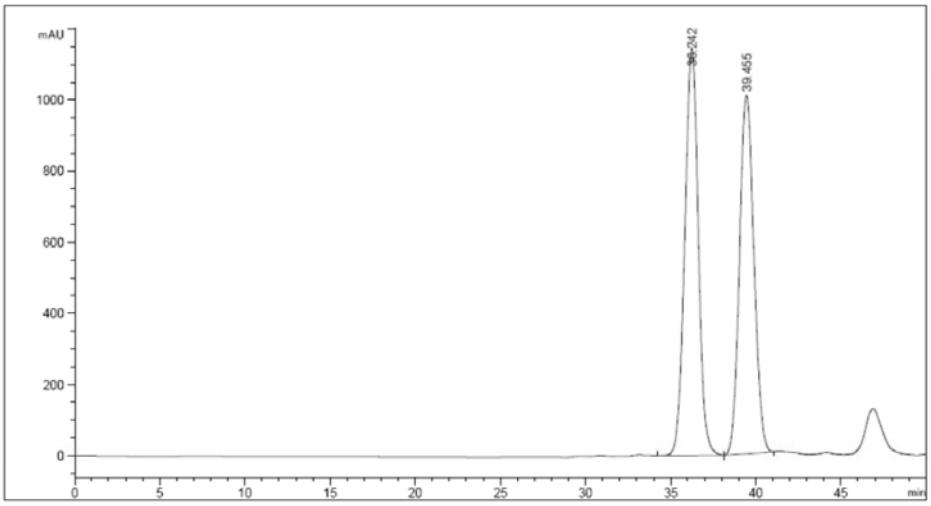
(±)-Ethyl-3-hydroxy-3-(4-methylphenyl)propanoate HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 1.0 ml/min; temp, r.t.; detection, 220 nm.



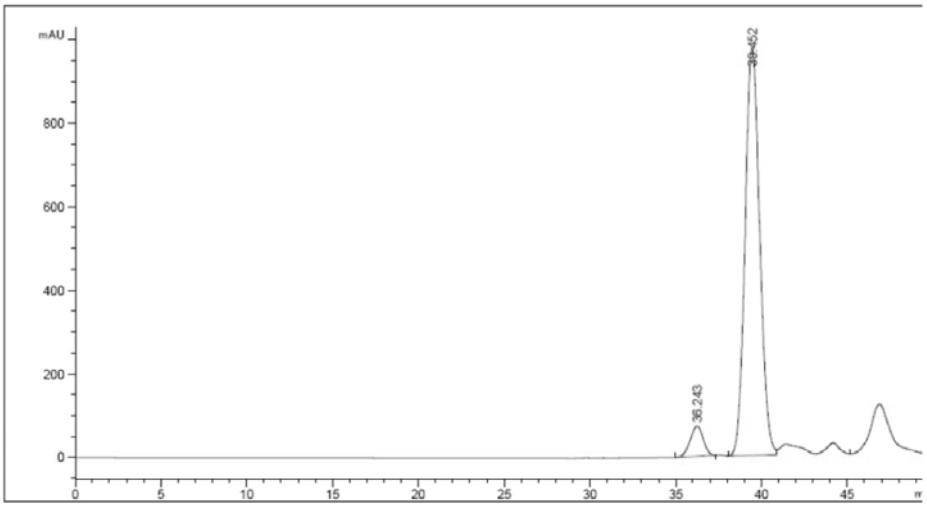
(*S*)-Ethyl-3-hydroxy-3-(4-methylphenyl)propanoate (**10b**) HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 1.0 ml/min; temp, r.t.; detection, 220 nm, (*R*)-enantiomer 12.78 min, (*S*)-enantiomer 15.65 min, 99% ee.



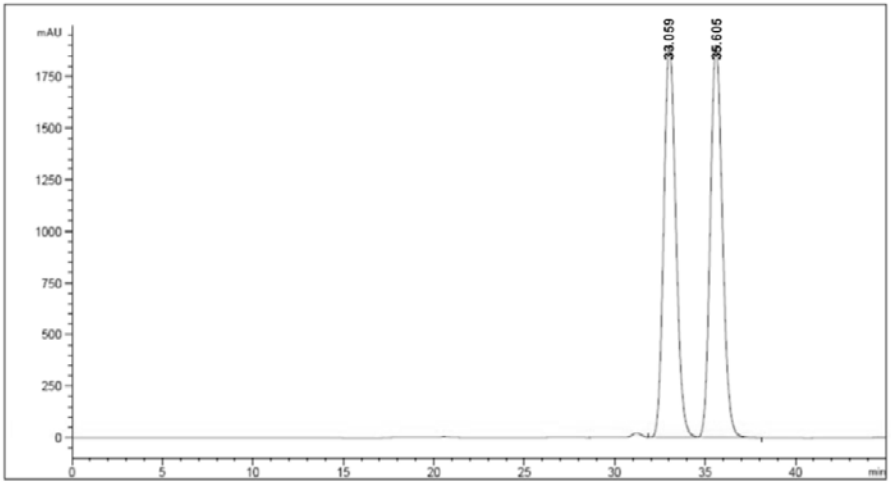
(±)-Ethyl-3-hydroxy-3-(4-fluorophenyl)propanoate HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.75 ml/min; temp, r.t.; detection, 220 nm.



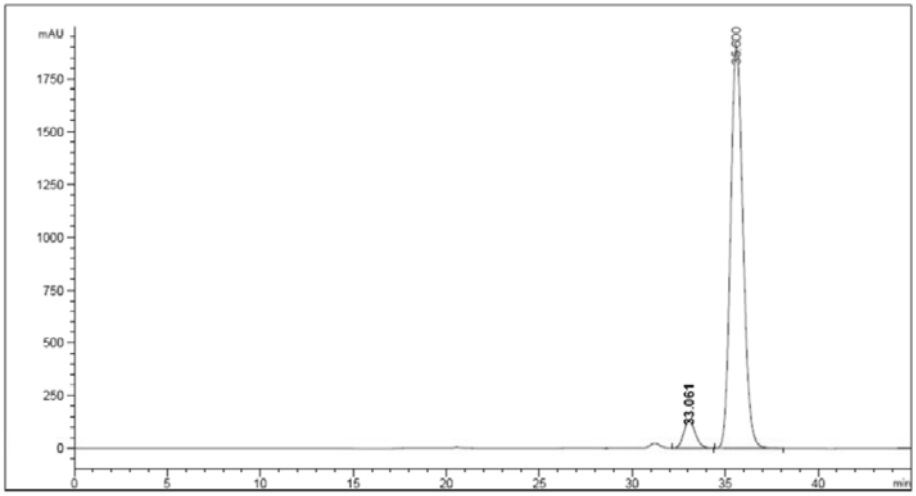
(*S*)-Ethyl-3-hydroxy-3-(4-fluorophenyl)propanoate (**10c**) HPLC Chiralcel OB column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.75 ml/min; temp, r.t.; detection, 220 nm, (*R*)-enantiomer 36.24 min, (*S*)-enantiomer 39.45 min, 94% ee.



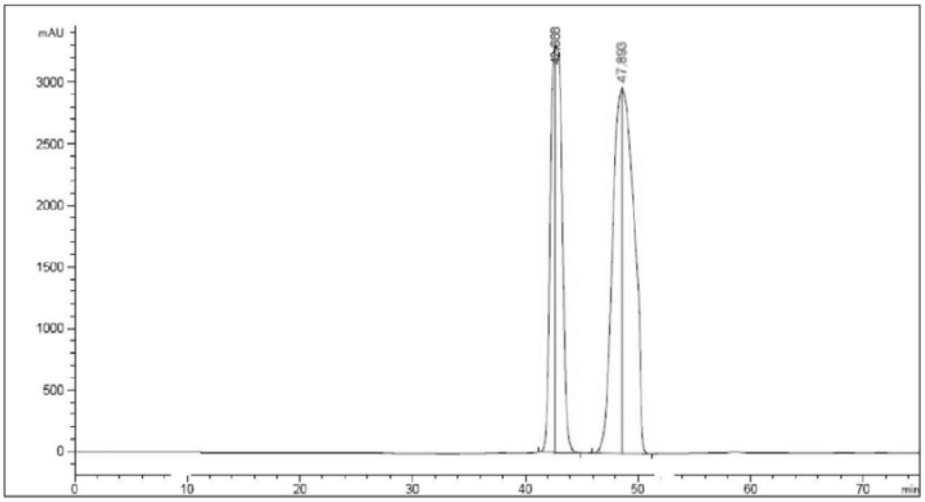
(±)-Ethyl-3-hydroxy-3-(4-iodophenyl)propanoate HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.75 ml/min; temp, r.t.; detection, 220 nm.



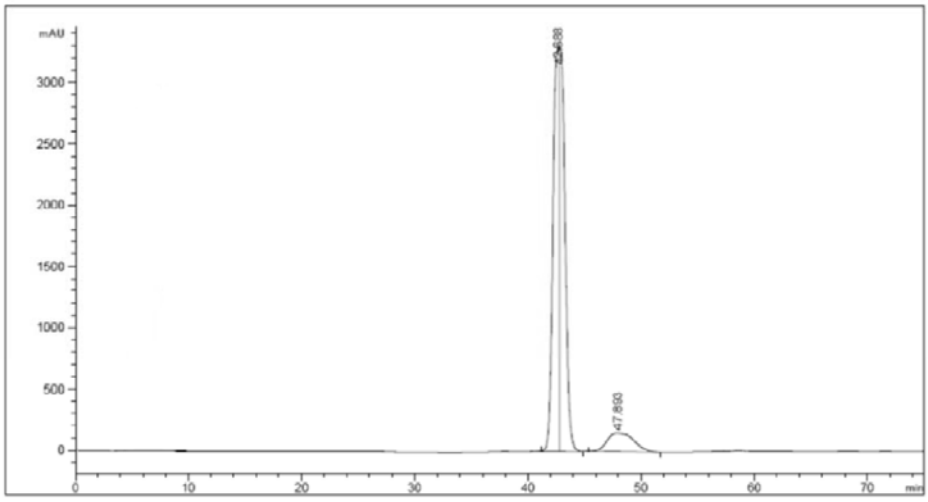
(*S*)-Ethyl-3-hydroxy-3-(4-iodophenyl)propanoate (**10d**) HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0.75 ml/min; temp, r.t.; detection, 220 nm, (*R*)-enantiomer 33.06 min, (*S*)-enantiomer 35.60 min, 93% ee.



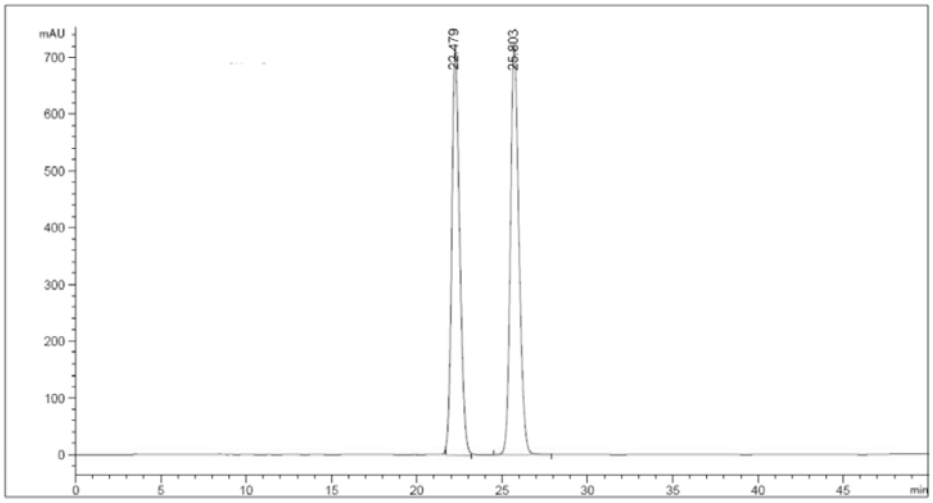
(±)-Ethyl-3-hydroxy-3-(3,4,5-trimethoxyphenyl)propanoate HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0. 5 ml/min; temp, r.t.; detection, 220 nm.



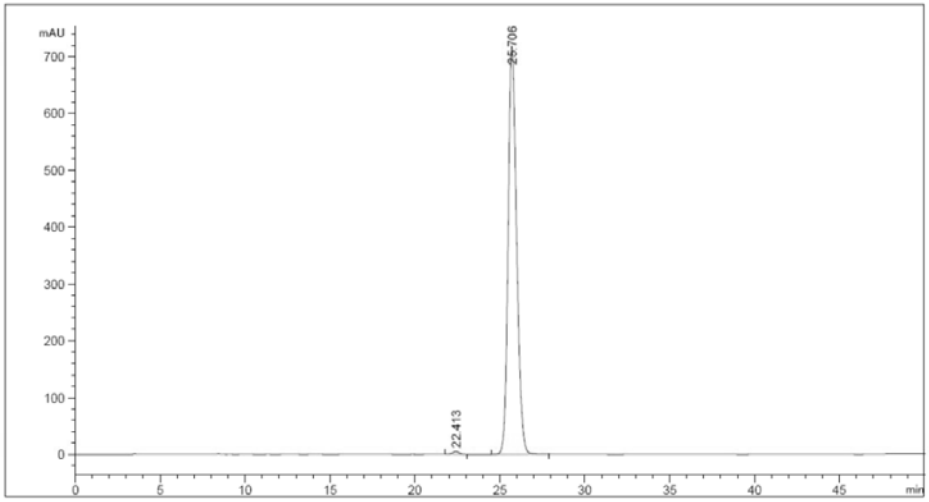
(*S*)-Ethyl-3-hydroxy-3-(3,4,5-trimethoxyphenyl)propanoate (**10e**) HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 95/5; flow rate, 0. 5 ml/min; temp, r.t.; detection, 220 nm, (*S*)-enantiomer 42.69 min, (*R*)-enantiomer 47.89 min, 98% ee.



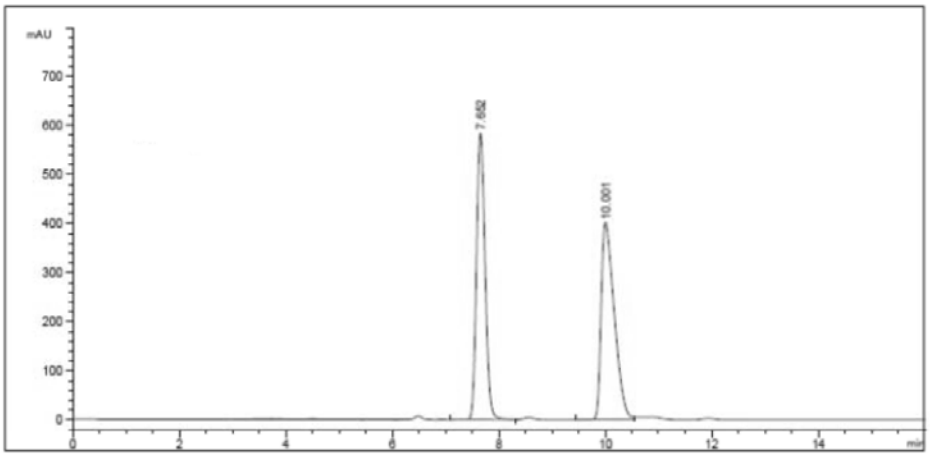
(±)-Ethyl-3-hydroxy-3-(3-nitrophenyl)propanoate HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0. 75 ml/min; temp, r.t.; detection, 220 nm.



(*S*)-Ethyl-3-hydroxy-3-(3-nitrophenyl)propanoate (**10f**) HPLC Chiralpak IA-3 column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 0. 75 ml/min; temp, r.t.; detection, 220 nm, (*R*)-enantiomer 22.41 min, (*S*)-enantiomer 25.71 min, 98% ee.



(±)-Ethyl-3-hydroxy-3-(3-methylphenyl)propanoate HPLC Chiralcel OD-H column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 1. 0 ml/min; temp, r.t.; detection, 220 nm.



(*S*)-Ethyl-3-hydroxy-3-(3-methylphenyl)propanoate (**10g**) HPLC Chiralcel OD-H column; 4.6 mm i. d. × 250 mm; Eluent: *n*-hexane/*iso*-PrOH, 90/10; flow rate, 1. 0 ml/min; temp, r.t.; detection, 220 nm, (*S*)-enantiomer 7.58 min, (*R*)-enantiomer 10.06 min, 97% ee.