

Palladium/H⁺-Cocatalyzed Kinetic Resolution of tertiary Propargylic Alcohols

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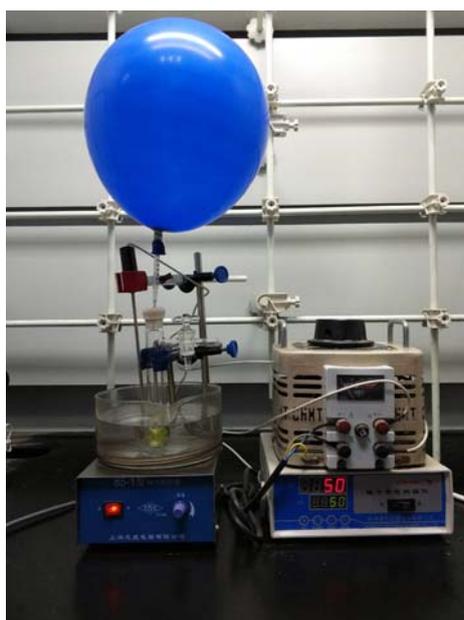
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General information	S2
English translation table for the Chinese words used in HPLC spectra	S3
Schemes S1 and S2	S4-S5
Calculation of selectivity factor <i>s</i>	S6
Tables S1, S2, and S3	S7-S9
Experimental details and analytical data	S10-S27
Mechanistic studies	S28-S32
Synthetic applications	S33-S36
References	S37
¹ H and ¹³ C NMR and HPLC spectra of the products	S38-S171

General Information. NMR spectra were taken with an Agilent-400 spectrometer (400 MHz for ^1H NMR and 100 MHz for ^{13}C NMR) in CDCl_3 . Chemical shifts were recorded in ppm in relative to the TMS in CDCl_3 and coupling constants were reported in Hz. All reactions were carried out in flame-dried Schlenk tubes. $[\text{PdCl}(\pi\text{-allyl})]_2$ was purchased from J&K Chemicals; (*R*) and (*S*)-DTBM-Segphos were purchased from Strem Chemicals Inc.; $(\text{PhO})_2\text{POOH}$ was purchased from Energy Chemical and purified through stirring with 1 N HCl, extracting with dichloromethane, and removing the solvent under vacuum; Anhydrous MeOH was purchased from Sinopharm Chemical Reagent Co., Ltd; Petroleum ether (b.p. 60-90 $^\circ\text{C}$) was purchased from Shanghai Titan Scientific Co., Ltd. Toluene was dried over sodium wire with benzophenone as the indicator and distilled freshly before use. The reaction should be conducted in a hood working efficiently due to the toxicity of CO gas. All the temperatures are referred to the oil baths used. The NMR yields of allenates and propargylic alcohols were determined by ^1H NMR analysis using 1,3,5-trimethylbenzene or dibromomethane as the internal standard. The starting propargylic alcohols were synthesized according to the reported procedures.¹ The apparatus used in this study is shown as follows:

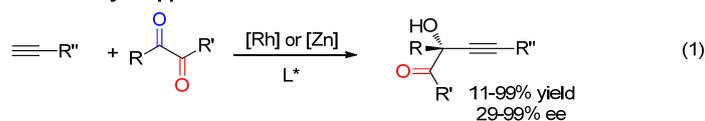


Chinese and English comparison table for the HPLC spectra (Translations have been made in all the HPLC spectra presented here)

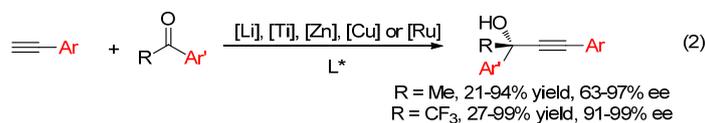
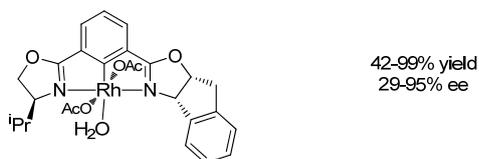
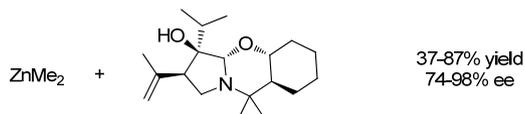
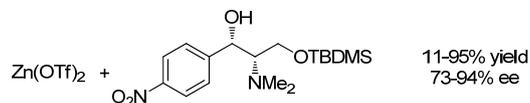
Chinese words	Corresponding English words
实验内容简介	Brief introduction of experimental conditions
色谱图	Chromatogram Figure
电压 (mV)	Voltage (mV)
时间 (min)	Time (min)
峰号	Peak No.
峰名	Peak name
保留时间	Retention time
峰高	Peak height
峰面积	Peak area
含量	Content

Scheme S1 Known approaches to optically active tertiary propargylic alcohols-Part I

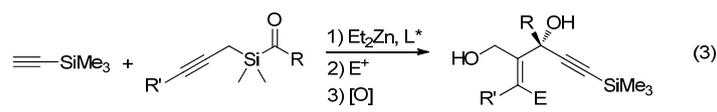
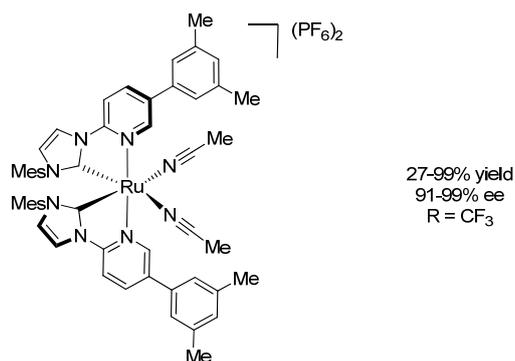
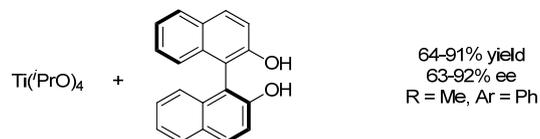
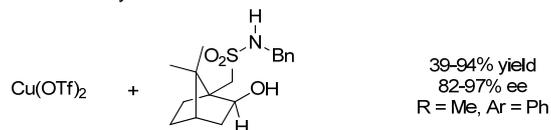
a) Terminal alkyne approaches



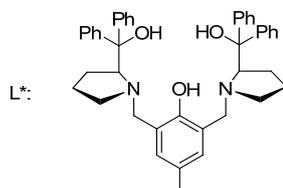
selected chiral catalysts:



selected chiral catalysts:

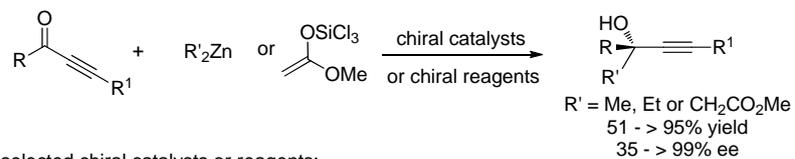


R = alkyl, R' = H or SiMe₃, E = H or I
54-71% yield, 92-96% ee

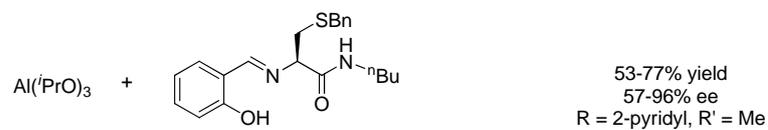
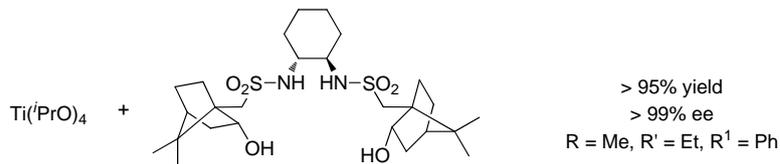


Scheme S2 Known approaches to optically active tertiary propargylic alcohols-Part II

b) Alkynyl ketone approach

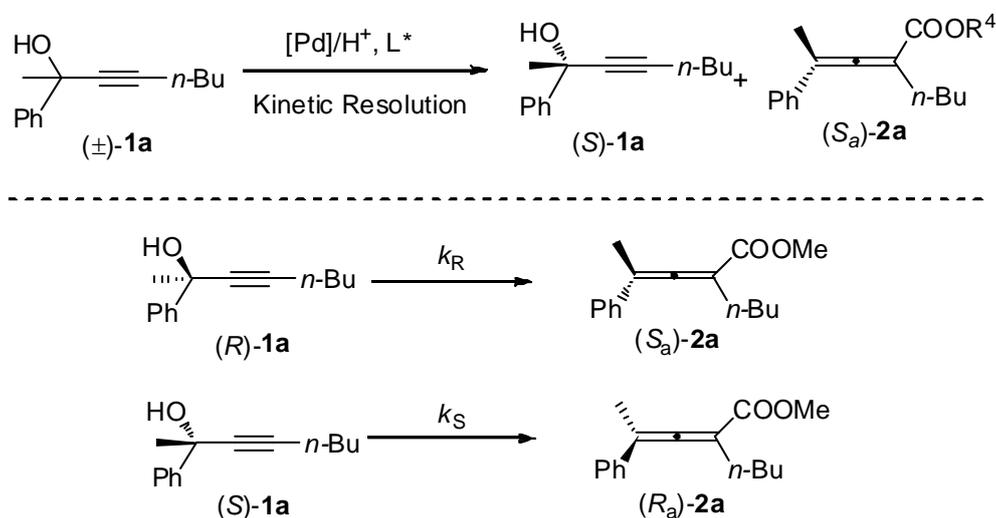


selected chiral catalysts or reagents:



Calculation of selectivity factor s^2

In the kinetic resolution process, the selectivity factor s is related to the rate constants of the reaction of R - and S -enantiomers, k_R and k_S , respectively, by $s = k_R/k_S$, for $k_R > k_S$.



Basically, s can be established by the following equation for a first order reaction, in which C is the conversion and ee is the enantiomeric excess value of recovered substrate:

$$s = \frac{\ln [(1-C)(1-ee)]}{\ln [(1-C)(1+ee)]}$$

Besides, C can be calculated from the enantiomeric excess values of recovered substrate and product, ee and ee' , respectively, through the equation $C = ee/(ee+ee')$ if (R) -**1a** was stereospecifically transferred to (S_a) -**2a** and (S) -**1a** was completely transferred to (R_a) -**2a** in this kinetic resolution process.

However, in the current study, when (R) -**1a** was introduced into the standard reaction conditions with 98% ee , the product was obtained with only 90% ee , which makes the equation mentioned before not suitable here, thus, the conversion was determined by 1H NMR analysis.

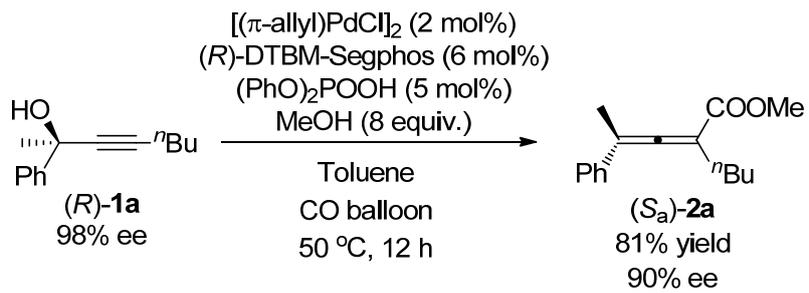
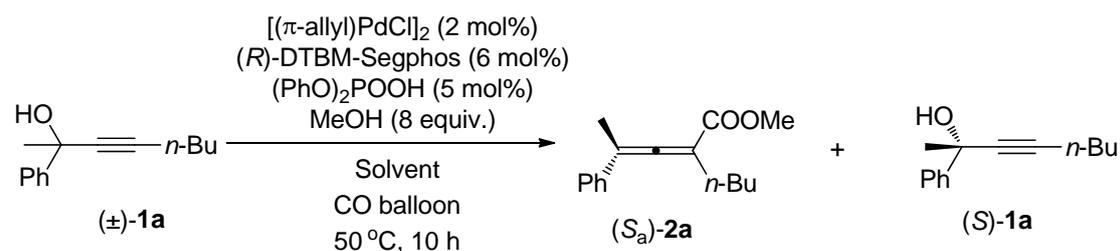


Table S1 Solvent effect in this kinetic resolution process ^a



entry	Solvent	<i>(S_a)-2a</i>		Recovery of 1a		<i>s</i> ^e
		Yield / % ^b	ee / % ^c	NMR Yield / % ^d	ee / % ^c	
1	toluene	60	48	36 (35)	99	16.9
2	1,4-dioxane	21	49	74 (73)	25	7.6
3	CH ₃ CN	-	-	100 (-)	-	-
4	DME	-	-	100 (-)	-	-
5	THF	-	-	99 (-)	-	-
6 ^f	toluene	-	-	100 (-)	-	-

^a Reaction conditions: (±)-**1a** (0.2 mmol), [(π-allyl)PdCl]₂ (2 mol%), (*R*)-DTBM-Segphos (6 mol%), (PhO)₂POOH (5 mol%), and MeOH (8 equiv.) in toluene (2 mL) at 50 °C under 1 atm of CO unless otherwise noted, DME = 1,2-dimethoxyethane, THF = tetrahydrofuran. ^b Isolated yields. ^c ee values of 2,3-allenoates and chiral propargylic alcohols were determined by HPLC. ^d NMR yields were determined by ¹H NMR analysis using 1,3,5-trimethylbenzene as the internal standard, the data in the parenthesis are isolated yields based on (±)-**1a**. ^e $s = k_{\text{fast}}/k_{\text{slow}} = \ln[(\text{recovery})(1-\text{ee})]/\ln[(\text{recovery})(1+\text{ee})]$, (recovery) is the recovery of **1a** determined by ¹H NMR analysis, ee is the enantioselectivity value of recovered substrate. ^f 4 mol% PdCl₂ was used instead of 2 mol% [(π-allyl)PdCl]₂.

Table S2 Screening of reaction temperature in the kinetic resolution process ^a

Reaction scheme: $(\pm)\text{-1a} \xrightarrow[\text{Toluene, CO balloon, 10 h}]{[(\pi\text{-allyl)PdCl}]_2 (2 \text{ mol\%}), (R)\text{-DTBM-Segphos} (6 \text{ mol\%}), (\text{PhO})_2\text{POOH} (5 \text{ mol\%}), \text{MeOH} (8 \text{ equiv.})} (S_a)\text{-2a} + (S)\text{-1a}$

entry	T / °C	$(S_a)\text{-2a}$		Recovery of 1a		
		Yield / % ^b	ee / % ^c	NMR Yield / % ^d	ee / % ^c	<i>s</i> ^e
1	40	41	78	53 (50)	78	36.8
2	45	52	54	39 (40)	91	11.4
3 ^f	50	60	48	36 (35)	99	16.9
4	55	72	38	14 (13)	99	5.1

^a Reaction conditions: $(\pm)\text{-1a}$ (0.5 mmol), $[(\pi\text{-allyl)PdCl}]_2$ (2 mol%), $(R)\text{-DTBM-Segphos}$ (6 mol%), $(\text{PhO})_2\text{POOH}$ (5 mol%), and MeOH (8 equiv.) in toluene (2.5 mL) under 1 atm of CO unless otherwise noted. ^b Isolated yields. ^c ee values of 2,3-allenoates and chiral propargylic alcohols were determined by HPLC. ^d NMR yields were determined by ¹H NMR analysis using 1,3,5-trimethylbenzene or dibromomethane as the internal standard, the data in the parenthesis are isolated yields based on $(\pm)\text{-1a}$. ^e $s = k_{\text{fast}}/k_{\text{slow}} = \ln[(\text{recovery})(1-\text{ee})]/\ln[(\text{recovery})(1+\text{ee})]$, (recovery) is the recovery of **1a** determined by ¹H NMR analysis, ee is the enantioselective excess value of recovered substrate. ^f The reaction was carried out in 0.2 mmol scale.

Table S3 Screening of phosphoric acid and alcohol in the kinetic resolution process ^a

Reaction scheme: $(\pm)\text{-1a} \xrightarrow[\text{Toluene, CO balloon, 50 }^\circ\text{C, 10 h}]{[(\pi\text{-allyl)PdCl}]_2 (2 \text{ mol\%}), (R)\text{-DTBM-Segphos} (6 \text{ mol\%}), [\text{POOH}] (5 \text{ mol\%}), \text{ROH} (8 \text{ equiv.})} (S_a)\text{-2} + (S)\text{-1a}$

BINOL-[PO₂H]

(PhO)₂POOH

Ph₂POOH

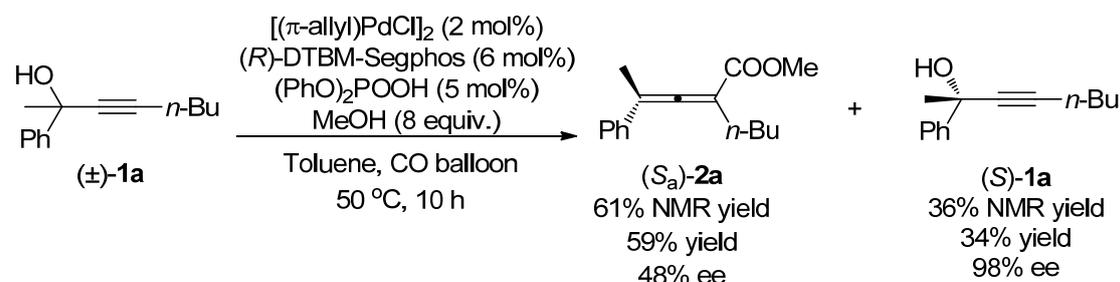
entry	[POOH]	ROH	<i>(S_a)</i> -2		Recovery of 1a		
			Yield / % ^b	ee / % ^c	NMR Yield / % ^d	ee / % ^c	<i>s</i> ^e
1	BINOL-[PO ₂ H]	MeOH	62	53	37 (34)	95	12.2
2	Ph ₂ POOH	MeOH	48	51	50 (47)	82	25.5
3 ^f	(PhO) ₂ POOH	MeOH	60	48	36 (35)	99	16.9
4	(PhO) ₂ POOH	EtOH	59	41	22 (20)	99	7.4
5	(PhO) ₂ POOH	ⁱ PrOH	34	58	34 (31)	99	12.0

^a Reaction conditions: $(\pm)\text{-1a}$ (0.5 mmol), $[(\pi\text{-allyl)PdCl}]_2$ (2 mol%), $(R)\text{-DTBM-Segphos}$ (6 mol%), $(\text{PhO})_2\text{POOH}$ (5 mol%), and MeOH (8 equiv.) in toluene (2.5 mL) at 50 °C under 1 atm of CO unless otherwise noted. ^b Isolated yields. ^c ee values of 2,3-allenoates and chiral propargylic alcohols were determined by HPLC. ^d NMR yields were determined by ¹H NMR analysis using 1,3,5-trimethylbenzene or dibromomethane as the internal standard, the data in the parenthesis are isolated yields based on $(\pm)\text{-1a}$. ^e $s = k_{\text{fast}}/k_{\text{slow}} = \ln[(\text{recovery})(1-\text{ee})]/\ln[(\text{recovery})(1+\text{ee})]$, (recovery) is the recovery of **1a** determined by ¹H NMR analysis, ee is the enantioselectivity value of recovered substrate. ^f The reaction was carried out in 0.2 mmol scale.

Experimental details and analytical data

1. Preparation of optically active tertiary propargylic alcohols and tetra-substituted allenates

(1) Preparation of (*S_a*)-methyl 4-phenyl-2-butyl-2,3-pentadienoate ((*S_a*)-**2a**) (zwl-11-41-1) and (*S*)-2-phenyloct-3-yn-2-ol ((*S*)-**1a**) (zwl-11-41-2)



Typical Procedure: To a flame-dried Schlenk tube were added $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (72.3 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.4 mg, 0.05 mmol), (±)-**1a** (202.4 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) sequentially under argon. The resulting mixture was then frozen with a liquid nitrogen bath, degassed to remove the argon inside completely, and refilled with CO by a balloon of CO for three times. Then the liquid nitrogen bath was removed and the mixture was warmed up to room temperature and vigorously stirred at 50 °C with a balloon of CO for 10 h. The reaction mixture was then diluted with 5 mL of ethyl acetate, filtered through a short column silica gel (3.5 cm), eluted with ethyl acetate (20 mL), and concentrated. The residue was purified by column chromatography on silica gel to afford (*S_a*)-**2a** (144.2 mg, 59%) as an oil and (*S*)-**1a**³ (68.8 mg, 34%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)].

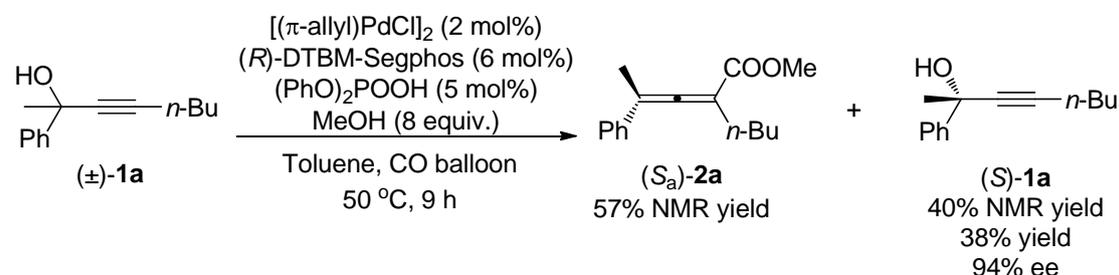
(*S_a*)-**2a**: 48% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 8.0 min, t_R (minor) = 9.3 min); $[\alpha]_D^{22} = +9.1$ ($c = 1.57$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 7.43\text{-}7.30$ (m, 4 H, Ar-H), 7.28-7.20 (m, 1 H, Ar-H), 3.72 (s, 3 H, OCH₃), 2.35 (t, $J = 7.6$ Hz, 2 H, CH₂), 2.18 (s, 3 H, CH₃), 1.51-1.41 (m, 2 H, CH₂), 1.41-1.30 (m, 2 H, CH₂), 0.88 (t, $J = 7.4$ Hz, 3 H, CH₃ from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 211.1, 167.8, 135.4, 128.5, 127.3,$

125.9, 104.6, 102.0, 52.1, 30.2, 28.7, 22.3, 16.4, 13.9; MS (70 eV, EI) m/z (%): 244 (M^+ , 1.63), 143 (100); IR (neat): $\nu = 2954, 2928, 2860, 1943, 1712, 1494, 1434, 1262, 1206, 1119, 1087, 1067, 1026 \text{ cm}^{-1}$; HRMS calcd for $C_{16}H_{20}O_2$ [M^+]: 244.1463, found: 244.1466.

(*S*)-**1a**:³ 98% ee (HPLC conditions: OD-H column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214 \text{ nm}$, t_R (minor) = 22.9 min, t_R (major) = 26.0 min); $[\alpha]_D^{23} = -0.5$ ($c = 1.10$, $CHCl_3$) [90% ee, $[\alpha]_D^{30} = -0.3$ ($c = 1.2$, $CHCl_3$)];² 1H NMR (400 MHz, $CDCl_3$): $\delta = 7.71\text{-}7.62$ (m, 2 H, Ar-H), 7.41-7.31 (m, 2 H, Ar-H), 7.31-7.23 (m, 1 H, Ar-H), 2.38-2.22 (m, 3 H, OH and CH_2), 1.74 (s, 3 H, CH_3), 1.62-1.49 (m, 2 H, CH_2), 1.49-1.37 (m, 2 H, CH_2), 0.93 (t, $J = 7.4 \text{ Hz}$, 3 H, CH_3 from *n*-Bu); ^{13}C NMR (100 MHz, $CDCl_3$): $\delta = 146.2, 128.2, 127.5, 124.9, 85.7, 83.7, 70.0, 33.5, 30.7, 22.0, 18.4, 13.6$; MS (70 eV, EI) m/z (%): 202 (M^+ , 1.18), 187 (100); IR (neat): $\nu = 3393, 2958, 2931, 2872, 1493, 1447, 1365, 1327, 1232, 1180, 1093, 1063, 1027 \text{ cm}^{-1}$; Raman : $\nu = 2240 \text{ cm}^{-1}$.

The following compounds were prepared according to **Typical Procedure**.

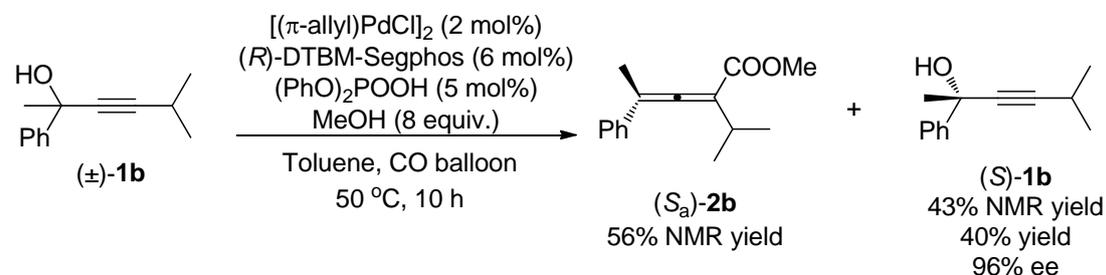
(2) Preparation of (*S*)-2-phenyloct-3-yn-2-ol ((*S*)-**1a**) (zwl-10-130)



The reaction of $[(\pi\text{-allyl})PdCl]_2$ (7.5 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(PhO)_2POOH$ (12.6 mg, 0.05 mmol), (\pm)-**1a** (202.2 mg, 1 mmol), MeOH (256.6 mg, 8.0 mmol), and toluene (5 mL) left (*S*)-**1a** (76.8 mg, 38%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 94% ee (HPLC conditions: OD-H column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214 \text{ nm}$, t_R (minor) = 21.2 min, t_R (major) = 24.9 min); $[\alpha]_D^{21} = -0.4$ ($c = 1.00$, $CHCl_3$) [90% ee, $[\alpha]_D^{30} = -0.3$ ($c = 1.2$, $CHCl_3$)];³ 1H NMR (400 MHz, $CDCl_3$): $\delta = 7.69\text{-}7.62$ (m, 2 H, Ar-H), 7.40-7.32 (m, 2 H, Ar-H), 7.32-7.24 (m, 1 H, Ar-H), 2.32-2.25 (m, 3 H, OH and CH_2), 1.74 (s, 3 H,

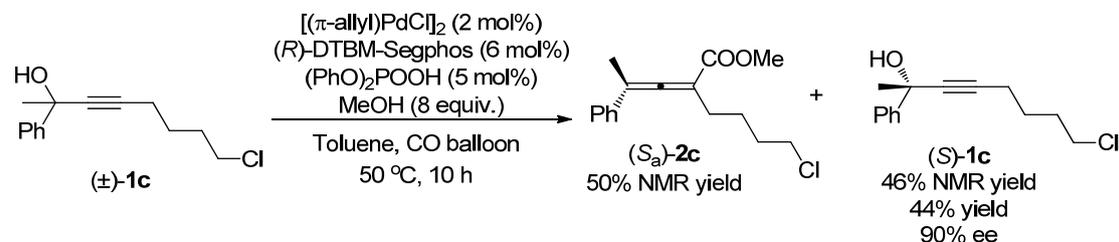
CH₃), 1.61-1.49 (m, 2 H, CH₂), 1.49-1.38 (m, 2 H, CH₂), 0.93 (t, *J* = 7.4 Hz, 3 H, CH₃ from *n*-Bu); ¹³C NMR (100 MHz, CDCl₃): δ = 146.2, 128.1, 127.5, 124.9, 85.6, 83.6, 70.0, 33.5, 30.7, 22.0, 18.4, 13.6.

(3) Preparation of (*S*)-5-methyl-2-phenylhex-3-yn-2-ol ((*S*)-**1b**) (zwl-11-51)



The reaction of [(π -allyl)PdCl]₂ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (72.4 mg, 0.06 mmol), (PhO)₂POOH (12.5 mg, 0.05 mmol), (\pm)-**1b** (188.4 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1b** (75.4 mg, 40%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 96% ee (HPLC conditions: Regis (*R,R*) Whelk-O column, hexane/*i*-PrOH = 100/1, 1.0 mL/min, λ = 214 nm, *t_R* (minor) = 8.1 min, *t_R* (major) = 10.1 min); [α]_D²⁵ = +4.6 (*c* = 1.15, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.70-7.60 (m, 2 H, Ar-H), 7.41-7.31 (m, 2 H, Ar-H), 7.31-7.23 (m, 1 H, Ar-H), 2.72-2.58 (m, 1 H, CH), 2.43-2.32 (m, 1 H, OH), 1.73 (s, 3 H, CH₃), 1.21 (d, *J* = 7.2 Hz, 6 H, 2 x CH₃); ¹³C NMR (100 MHz, CDCl₃): δ = 146.2, 128.1, 127.4, 124.9, 91.0, 82.9, 69.9, 33.6, 22.9, 20.5; MS (70 eV, EI) *m/z* (%): 188 (M⁺, 1.70), 173 (100); IR (neat): ν = 3292, 2972, 2926, 2872, 2241, 1447, 1366, 1318, 1234, 1186, 1089, 1048 cm⁻¹; HRMS calcd for C₁₃H₁₆O [M⁺]: 188.1201, found: 188.1203.

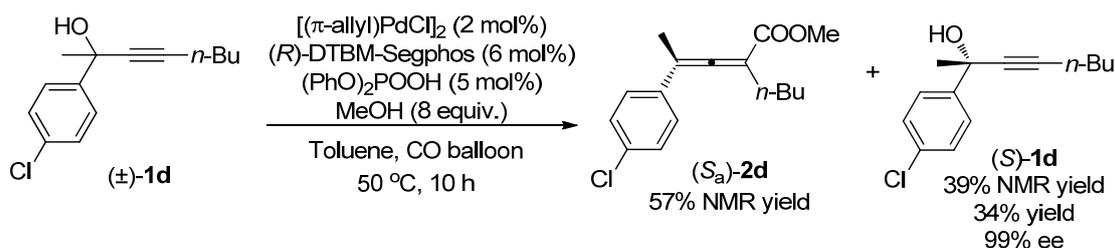
(4) Preparation of (*S*)-8-chloro-2-phenyloct-3-yn-2-ol ((*S*)-**1c**) (zwl-11-53)



The reaction of [(π -allyl)PdCl]₂ (7.4 mg, 0.02 mmol), (*R*)-DTBM-Segphos (72.3 mg, 0.06 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (\pm)-**1c** (236.6 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1c** (104.1 mg, 44%) as an oil

[eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 90% ee (HPLC conditions: Regis (*R,R*) Whelk-O column, hexane/*i*-PrOH = 100/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (minor) = 16.0 min, t_R (major) = 20.4 min); $[\alpha]_D^{24} = +0.7$ ($c = 1.69$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.69$ -7.59 (m, 2 H, Ar-H), 7.42-7.32 (m, 2 H, Ar-H), 7.32-7.22 (m, 1 H, Ar-H), 3.57 (t, $J = 6.6$ Hz, 2 H, CH₂), 2.38 (brs, 1 H, OH), 2.33 (t, $J = 6.8$ Hz, 2 H, CH₂), 1.98-1.83 (m, 2 H, CH₂), 1.80-1.60 (m, 5 H, CH₂ and CH₃); ¹³C NMR (100 MHz, CDCl₃): $\delta = 146.0$, 128.2, 127.5, 124.9, 84.6, 84.4, 70.0, 44.5, 33.4, 31.5, 25.7, 18.0; MS (70 eV, EI) m/z (%): 238 (M⁺(³⁷Cl), 0.45), 236 (M⁺(³⁵Cl), 1.30), 221 (100); IR (neat): $\nu = 3394$, 2938, 2865, 2238, 1492, 1444, 1323, 1230, 1174, 1066 cm⁻¹; HRMS calcd for C₁₄H₁₇O³⁵Cl [M⁺]: 236.0968, found: 236.0970.

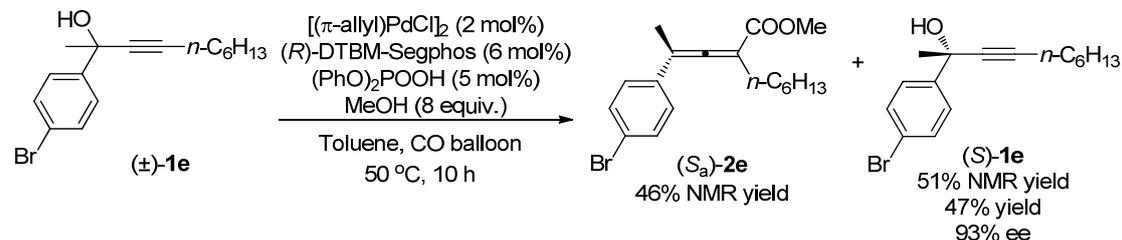
(5) Preparation of (*S*)-2-(4-chlorophenyl)oct-3-yn-2-ol ((*S*)-**1d**) (zwl-8-72)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.5 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.8 mg, 0.06 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (\pm)-**1d** (236.7 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1d** (80.4 mg, 34%) as an oil [eluent: petroleum ether/ethyl acetate = 100/1 (1.5 L) to petroleum ether/ethyl acetate = 50/1]: 99% ee (HPLC conditions: Regis (*R,R*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (minor) = 9.2 min, t_R (major) = 11.7 min); $[\alpha]_D^{20} = -0.6$ ($c = 1.20$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.61$ -7.54 (m, 2 H, Ar-H), 7.34-7.28 (m, 2 H, Ar-H), 2.42-2.38 (m, 1 H, OH), 2.27 (t, $J = 7.2$ Hz, 2 H, CH₂), 1.71 (s, 3 H, CH₃), 1.57-1.47 (m, 2 H, CH₂), 1.47-1.37 (m, 2 H, CH₂), 0.92 (t, $J = 7.4$ Hz, 3 H, CH₃ from *n*-Bu); ¹³C NMR (100 MHz, CDCl₃): $\delta = 144.8$, 133.2, 128.2, 126.5, 86.0, 83.3, 69.6, 33.6, 30.6, 22.0, 18.3, 13.6; MS (70 eV, EI) m/z (%): 238 (M⁺(³⁷Cl), 0.67), 236 (M⁺(³⁵Cl), 1.88), 221 (100); IR (neat): $\nu = 3357$, 2958, 2932, 2872, 1488, 1399, 1366, 1327, 1229, 1177, 1090, 1054, 1014 cm⁻¹; HRMS calcd for C₁₄H₁₇O³⁵Cl

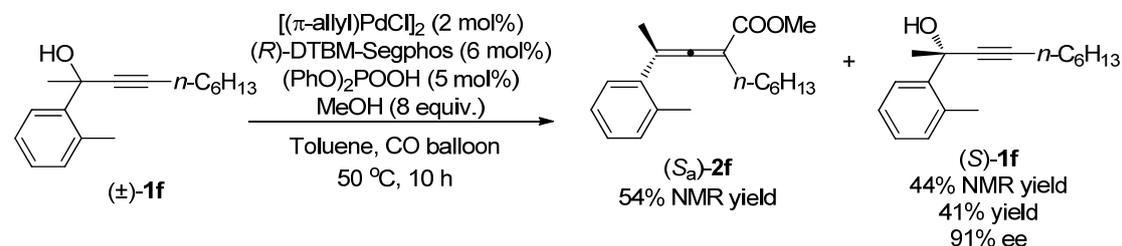
[M⁺]: 236.0968, found: 236.0970.

(6) Preparation of (*S*)-2-(4-bromophenyl)dec-3-yn-2-ol ((*S*)-1e) (zwl-8-189)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.5 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-1e (309.1 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-1e (145.3 mg, 47%) as an oil [eluent: petroleum ether/ethyl acetate = 100/1 (1.5 L) to petroleum ether/ethyl acetate = 50/1]: 93% ee (HPLC conditions: Regis (*R,R*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 8.8 min, t_R (major) = 11.8 min); $[\alpha]_D^{20}$ = -1.6 (c = 1.21, CHCl_3); ^1H NMR (400 MHz, CDCl_3): δ = 7.55-7.49 (m, 2 H, Ar-H), 7.48-7.42 (m, 2 H, Ar-H), 2.43-2.35 (m, 1 H, OH), 2.25 (t, J = 7.2 Hz, 2 H, CH_2), 1.70 (s, 3 H, CH_3), 1.58-1.48 (m, 2 H, CH_2), 1.45-1.35 (m, 2 H, CH_2), 1.35-1.22 (m, 4 H, 2 x CH_2), 0.89 (t, J = 6.8 Hz, 3 H, CH_3 from $n\text{-C}_6\text{H}_{13}$); ^{13}C NMR (100 MHz, CDCl_3): δ = 145.3, 131.2, 126.9, 121.4, 86.1, 83.2, 69.6, 33.6, 31.2, 28.5, 22.5, 18.7, 14.0; MS (70 eV, EI) m/z (%): 310 (M^+ (^{81}Br), 2.31), 308 (M^+ (^{79}Br), 2.12), 293 (100); IR (neat): ν = 3385, 2955, 2929, 2858, 1681, 1589, 1485, 1466, 1394, 1365, 1271, 1228, 1177, 1074, 1010 cm^{-1} ; HRMS calcd for $\text{C}_{16}\text{H}_{21}\text{O}^{79}\text{Br}$ [M^+]: 308.0776, found: 308.0773.

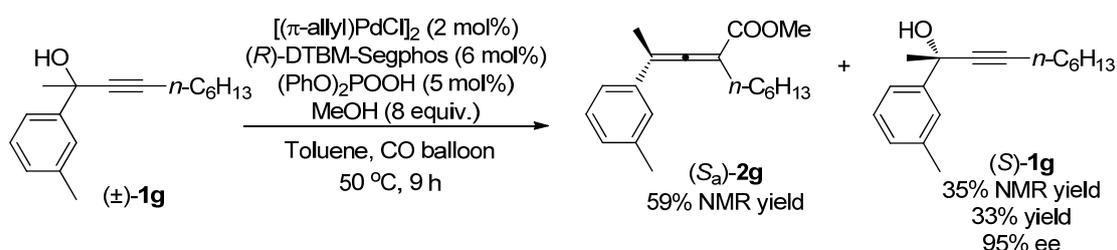
(7) Preparation of (*S*)-2-(2-methylphenyl)dec-3-yn-2-ol ((*S*)-1f) (zwl-8-187)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-1f (244.1 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-1f (100.0 mg, 41%) as an oil [eluent: petroleum ether/ethyl acetate = 100/1 (1.5 L) to petroleum ether/ethyl acetate

= 50/1]: 91% ee (HPLC conditions: OJ-H column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 9.7 min, t_R (minor) = 10.4 min); $[\alpha]_D^{20} = -2.0$ ($c = 1.70$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.72$ -7.65 (m, 1 H, Ar-H), 7.20-7.12 (m, 3 H, Ar-H), 2.61 (s, 3 H, Ar-CH₃), 2.44 (s, 1 H, OH), 2.22 (t, $J = 7.4$ Hz, 2 H, CH₂), 1.79 (s, 3 H, CH₃), 1.56-1.45 (m, 2 H, CH₂), 1.45-1.20 (m, 6 H, 3 x CH₂), 0.88 (t, $J = 7.2$ Hz, 3 H, CH₃ from *n*-C₆H₁₃); ¹³C NMR (100 MHz, CDCl₃): $\delta = 142.8$, 135.6, 132.2, 127.4, 125.6, 124.9, 85.3, 84.0, 69.7, 31.3, 31.1, 28.6, 28.5, 22.5, 21.2, 18.7, 14.0; MS (70 eV, EI) m/z (%): 244 (M⁺, 2.80), 229 (100); IR (neat): $\nu = 3406$, 2955, 2930, 2858, 1484, 1456, 1367, 1328, 1287, 1223, 1164, 1131, 1079, 1047 cm⁻¹; HRMS calcd for C₁₇H₂₄O [M⁺]: 244.1827, found: 244.1824.

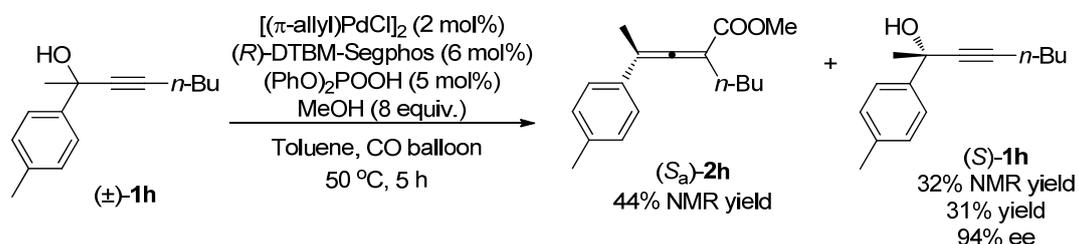
(8) Preparation of (*S*)-2-(3-methylphenyl)dec-3-yn-2-ol ((*S*)-**1g**) (zwl-10-129)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-**1g** (244.2 mg, 1 mmol), MeOH (256.4 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1g** (80.6 mg, 33%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 95% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 8.5 min, t_R (minor) = 10.7 min); $[\alpha]_D^{22} = -1.3$ ($c = 0.98$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.51$ -7.41 (m, 2 H, Ar-H), 7.29-7.19 (m, 1 H, Ar-H), 7.08 (d, $J = 7.6$ Hz, 1 H, Ar-H), 2.37 (s, 3 H, Ar-CH₃), 2.32 (brs, 1 H, OH), 2.27 (t, $J = 7.2$ Hz, 2 H, CH₂), 1.73 (s, 3 H, CH₃), 1.60-1.49 (m, 2 H, CH₂), 1.48-1.37 (m, 2 H, CH₂), 1.37-1.23 (m, 4 H, 2 x CH₂), 0.90 (t, $J = 6.8$ Hz, 3 H, CH₃ from *n*-C₆H₁₃); ¹³C NMR (100 MHz, CDCl₃): $\delta = 146.1$, 137.8, 128.2, 128.1, 125.6, 122.0, 85.6, 83.8, 70.0, 33.5, 31.3, 28.6, 28.5, 22.5, 21.5, 18.37, 14.0; MS (70 eV, EI) m/z (%): 244 (M⁺, 2.27), 229 (100); IR (neat): $\nu = 3403$, 2955, 2929, 2858, 1607, 1485, 1457, 1365, 1329, 1255, 1199, 1158,

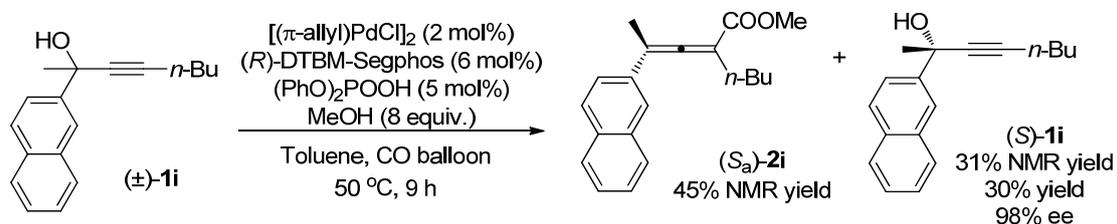
1084, 1062 cm^{-1} ; HRMS calcd for $\text{C}_{17}\text{H}_{24}\text{O}$ [M^+]: 244.1827, found: 244.1825.

(9) Preparation of (*S*)-2-(4-methylphenyl)oct-3-yn-2-ol ((*S*)-**1h**) (zwl-10-101)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-**1h** (216.2 mg, 1 mmol), MeOH (256.2 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1h** (67.1 mg, 31%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 94% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (major) = 9.3 min, t_R (minor) = 13.0 min); $[\alpha]_D^{23}$ = -0.4 (c = 0.96, CHCl_3); ^1H NMR (400 MHz, CDCl_3): δ = 7.53 (d, J = 8.4 Hz, 2 H, Ar-H), 7.15 (d, J = 8.4 Hz, 2 H, Ar-H), 2.40-2.30 (m, 4 H, OH and Ar- CH_3), 2.27 (t, J = 7.2 Hz, 2 H, CH_2), 1.72 (s, 3 H, CH_3), 1.58-1.48 (m, 2 H, CH_2), 1.48-1.36 (m, 2 H, CH_2), 0.92 (t, J = 7.4 Hz, 3 H, CH_3 from *n*-Bu); ^{13}C NMR (100 MHz, CDCl_3): δ = 143.4, 137.1, 128.8, 124.9, 85.4, 83.9, 69.8, 33.4, 30.7, 21.9, 21.0, 18.4, 13.6; MS (70 eV, EI) m/z (%): 216 (M^+ , 2.20), 201 (100); IR (neat): ν = 3384, 2957, 2930, 2863, 1509, 1456, 1405, 1365, 1327, 1234, 1184, 1089, 1052, 1020 cm^{-1} ; HRMS calcd for $\text{C}_{15}\text{H}_{20}\text{O}$ [M^+]: 216.1514, found: 216.1516.

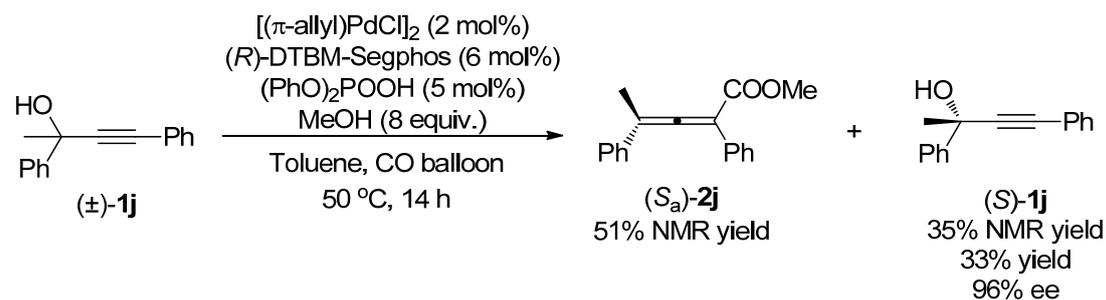
(10) Preparation of (*S*)-2-(2-naphthyl)oct-3-yn-2-ol ((*S*)-**1i**) (zwl-10-124)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.5 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-**1i** (252.5 mg, 1 mmol), MeOH (256.4 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1i** (75.8 mg, 30%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum

ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 98% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 22.0 min, t_R (minor) = 40.2 min); $[\alpha]_D^{23} = -11.8$ ($c = 1.55$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 8.11$ (s, 1 H, Ar-H), 7.88-7.77 (m, 3 H, Ar-H), 7.77-7.70 (m, 1 H, Ar-H), 7.52-7.42 (m, 2 H, Ar-H), 2.47 (brs, 1 H, OH), 2.30 (t, $J = 7.0$ Hz, 2 H, CH_2), 1.82 (s, 3 H, CH_3), 1.63-1.51 (m, 2 H, CH_2), 1.51-1.39 (m, 2 H, CH_2), 0.94 (t, $J = 7.2$ Hz, 3 H, CH_3 from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 143.5$, 133.0, 132.7, 128.3, 128.0, 127.5, 126.1, 125.9, 123.6, 123.3, 85.9, 83.7, 70.1, 33.4, 30.7, 22.0, 18.4, 13.6; MS (70 eV, EI) m/z (%): 253 ($\text{M}^+ + 1$, 2.05), 252 (M^+ , 7.42), 155 (100); IR (neat): $\nu = 3387$, 3057, 2957, 2930, 2861, 1673, 1601, 1506, 1465, 1354, 1326, 1271, 1194, 1162, 1127, 1084, 1052, 1018 cm^{-1} ; HRMS calcd for $\text{C}_{18}\text{H}_{20}\text{O}$ [M^+]: 252.1514, found: 252.1516.

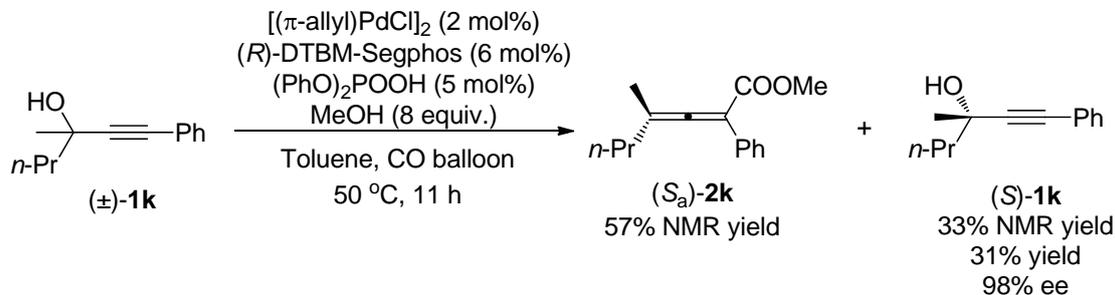
(11) Preparation of (*S*)-2,4-diphenylbut-3-yn-2-ol ((*S*)-**1j**) (zwl-10-115)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.5 mg, 0.05 mmol), (\pm)-**1j** (222.2 mg, 1 mmol), MeOH (256.4 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1j**² (73.3 mg, 33%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 96% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 17.2 min, t_R (minor) = 28.7 min); $[\alpha]_D^{23} = -7.2$ ($c = 1.23$, CHCl_3) [96% ee, $[\alpha]_D^{30} = -7.4$ ($c = 1.3$, CHCl_3)²]; $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 7.79$ -7.68 (m, 2 H, Ar-H), 7.55-7.44 (m, 2 H, Ar-H), 7.44-7.35 (m, 2 H, Ar-H), 7.35-7.26 (m, 4 H, Ar-H), 2.50 (s, 1 H, OH), 1.87 (s, 3 H, CH_3); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 145.6$, 131.7, 128.4, 128.30, 128.26, 127.7, 125.0, 122.5, 92.4, 84.9, 70.3, 33.3; MS (70 eV, EI) m/z (%):

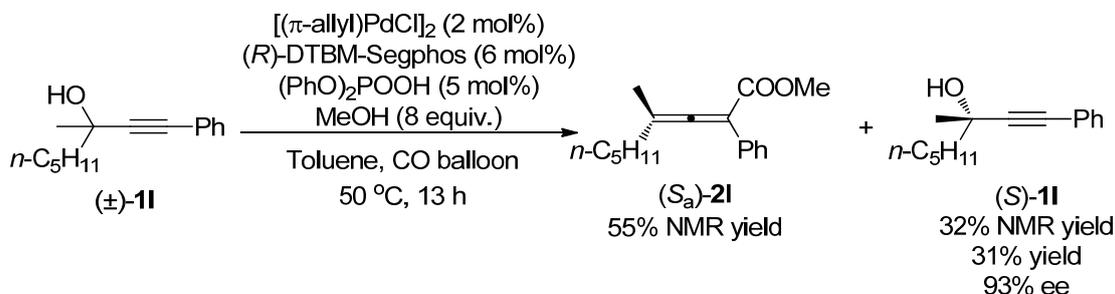
223 ($M^+ + 1$, 4.20), 222 (M^+ , 30.84), 207 (100); IR (neat): $\nu = 3298, 2978, 1597, 1488, 1442, 1402, 1365, 1270, 1212, 1140, 1088, 1073, 1050, 1027 \text{ cm}^{-1}$.

(12) Preparation of (*S*)-3-methyl-1-phenylhex-1-yn-3-ol ((*S*)-1k**) (zwl-10-118)**



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.5 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-**1k** (188.4 mg, 1 mmol), MeOH (256.6 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1k** (58.4 mg, 31%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 98% ee (HPLC conditions: AD-H column, hexane/*i*-PrOH = 95/5, 1.0 mL/min, $\lambda = 214 \text{ nm}$, t_R (major) = 6.8 min, t_R (minor) = 7.2 min); $[\alpha]_D^{23} = -0.5$ ($c = 1.05$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 7.46\text{--}7.38$ (m, 2 H, Ar-H), 7.35–7.27 (m, 3 H, Ar-H), 2.04 (s, 1 H, OH), 1.80–1.69 (m, 2 H, CH_2), 1.65–1.53 (m, 5 H, CH_3 and CH_2), 0.99 (t, $J = 7.2 \text{ Hz}$, 3 H, CH_3 from *n*-Pr); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 131.6, 128.21, 128.18, 122.8, 92.9, 83.2, 68.6, 46.0, 29.8, 18.1, 14.2$; MS (70 eV, EI) m/z (%): 188 (M^+ , 4.96), 145 (100); IR (neat): $\nu = 3354, 2959, 2933, 2873, 1598, 1489, 1444, 1369, 1286, 1155, 1130, 1018 \text{ cm}^{-1}$; HRMS calcd for $\text{C}_{13}\text{H}_{16}\text{O}$ [M^+]: 188.1201, found: 188.1198.

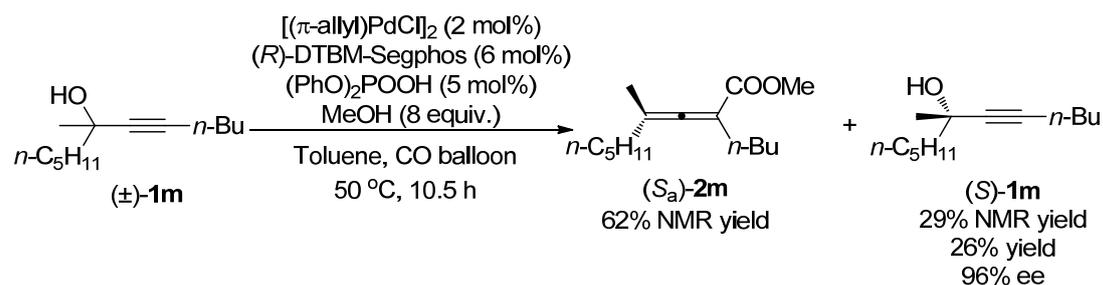
(13) Preparation of (*S*)-3-methyl-1-phenyloct-1-yn-3-ol ((*S*)-1l**) (zwl-10-116)**



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-**1l** (216.3 mg, 1 mmol),

MeOH (256.4 mg, 8 mmol), and toluene (5 mL) left (*S*)-**11** (67.1 mg, 31%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 93% ee (HPLC conditions: IC column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 14.8 min, t_R (major) = 16.0 min); $[\alpha]_D^{22}$ = -1.0 (c = 1.00, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.46-7.38 (m, 2 H, Ar-H), 7.35-7.27 (m, 3 H, Ar-H), 2.11-2.02 (m, 1 H, OH), 1.82-1.67 (m, 2 H, CH₂), 1.67-1.50 (m, 5 H, CH₃ and CH₂), 1.42-1.30 (m, 4 H, 2 x CH₂), 0.91 (t, J = 7.0 Hz, 3 H, CH₃ from *n*-C₅H₁₁); ¹³C NMR (100 MHz, CDCl₃): δ = 131.6, 128.21, 128.18, 122.8, 93.0, 83.2, 68.7, 43.7, 31.9, 29.8, 24.4, 22.6, 14.0; MS (70 eV, EI) m/z (%): 216 (M⁺, 2.07), 145 (100); IR (neat): ν = 3356, 2955, 2932, 2861, 1599, 1489, 1465, 1370, 1129, 1092, 1041 cm⁻¹; HRMS calcd for C₁₅H₂₀O [M⁺]: 216.1514, found: 216.1512.

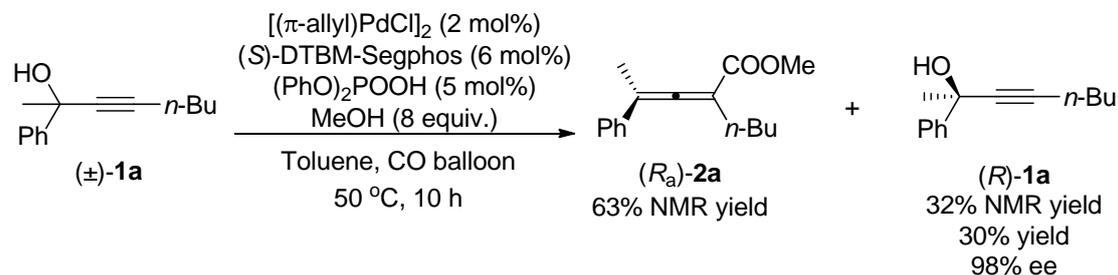
(14) Preparation of (*S*)-6-methyldodec-7-yn-6-ol ((*S*)-**1m**) (zwl-11-25)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.6 mg, 0.02 mmol), (*R*)-DTBM-Segphos (72.4 mg, 0.06 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (\pm)-**1m** (196.1 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) left (*S*)-**1m** (51.0 mg, 26%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 96% ee (HPLC conditions: AD-H column, hexane/*i*-PrOH = 100/1, 1.0 mL/min, λ = 214 nm, t_R (major) = 16.4 min, t_R (minor) = 18.0 min); $[\alpha]_D^{25}$ = -0.3 (c = 1.20, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 2.19 (t, J = 6.8 Hz, 2 H, CH₂), 1.93-1.82 (brs, 1 H, OH), 1.72-1.57 (m, 2 H, CH₂), 1.54-1.21 (m, 13 H, CH₃ and 5 x CH₂), 1.00-0.83 (m, 6 H, 2 x CH₃); ¹³C NMR (100 MHz, CDCl₃): δ = 84.1, 83.7, 68.3, 43.9, 31.9, 30.8, 30.1, 24.4, 22.6, 21.9, 18.3, 14.0, 13.6; MS (ESI) m/z (%): 211 (M - OH+MeOH)⁺; IR (neat): ν = 3367, 2957, 2932, 2862, 2238, 1461, 1371, 1329, 1130, 1055 cm⁻¹; HRMS calcd for C₁₃H₂₄O [M⁺]:

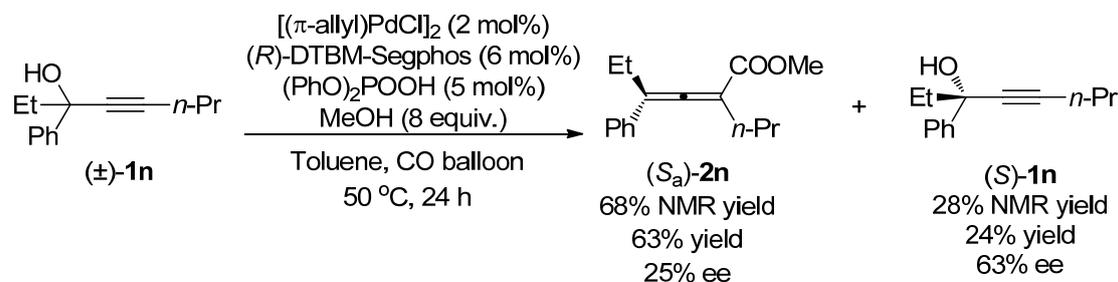
196.1827, found: 196.1830.

(15) Preparation of (*R*)-2-phenyloct-3-yn-2-ol ((*R*)-1a) (zwl-10-24)



The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.5 mg, 0.02 mmol), (*S*)-DTBM-Segphos (70.9 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm)-1a (202.2 mg, 1 mmol), MeOH (256.1 mg, 8.0 mmol), and toluene (5 mL) left (*R*)-1a (60.7 mg, 30%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 98% ee (HPLC conditions: OD-H column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (major) = 17.4 min, t_R (minor) = 19.3 min); $[\alpha]_D^{20}$ = +0.4 (c = 2.18, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 7.69-7.61 (m, 2 H, Ar-H), 7.39-7.31 (m, 2 H, Ar-H), 7.31-7.23 (m, 1 H, Ar-H), 2.33 (s, 1 H, OH), 2.28 (t, J = 7.2 Hz, 2 H, CH_2), 1.74 (s, 3 H, CH_3), 1.59-1.49 (m, 2 H, CH_2), 1.49-1.37 (m, 2 H, CH_2), 0.93 (t, J = 7.2 Hz, 3 H, CH_3 from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): δ = 146.2, 128.2, 127.5, 124.9, 85.7, 83.7, 70.0, 33.5, 30.7, 22.0, 18.4, 13.6; MS (70 eV, EI) m/z (%): 202 (M^+ , 1.33), 187 (100); IR (neat): ν = 3386, 2958, 2931, 2862, 2238, 1447, 1365, 1327, 1231, 1179, 1093, 1062, 1027 cm^{-1} ; Raman : ν = 2240 cm^{-1} ; HRMS calcd for $\text{C}_{14}\text{H}_{18}\text{O}$ [M^+]: 202.1358, found: 202.1361.

(16) Preparation of (*S_a*)-methyl 2-propyl-4-phenyl-2,3-hexadienoate ((*S_a*)-2n) (zwl-8-173-1) and (*S*)-3-phenyloct-4-yn-3-ol ((*S*)-1n) (zwl-8-173-2)



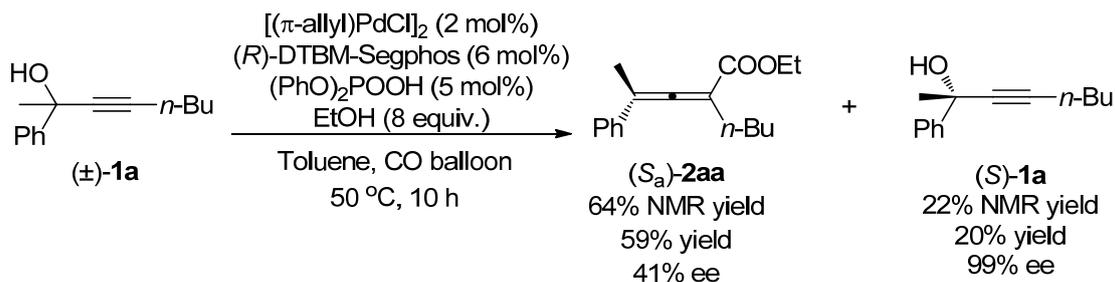
The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.4 mg, 0.02 mmol), (*R*)-DTBM-Segphos (70.9

mg, 0.06 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (±)-**1n** (202.4 mg, 1 mmol), MeOH (256.1 mg, 8.0 mmol), and toluene (5 mL) afforded (*S*_a)-**2n** (154.0 mg, 63%) as an oil and left (*S*)-**1n** (48.6 mg, 24%) as an oil [eluent: petroleum ether/ethyl acetate = 100/1 (1.5 L) to petroleum ether/ethyl acetate = 50/1].

(*S*_a)-**2n**: 25% ee (HPLC conditions: IC column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (major) = 6.5 min, t_R (minor) = 6.8 min); ¹H NMR (400 MHz, CDCl₃): δ = 7.41-7.28 (m, 4 H, Ar-H), 7.28-7.20 (m, 1 H, Ar-H), 3.72 (s, 3 H, OCH₃), 2.54 (q, J = 7.2 Hz, 2 H, CH₂), 2.34 (t, J = 7.6 Hz, 2 H, CH₂), 1.57-1.43 (m, 2 H, CH₂), 1.15 (t, J = 7.6 Hz, 3 H, CH₃), 0.94 (t, J = 7.4 Hz, 3 H, CH₃); ¹³C NMR (100 MHz, CDCl₃): δ = 210.9, 168.0, 135.2, 128.5, 127.3, 126.2, 111.5, 103.8, 52.0, 31.1, 23.1, 21.5, 13.9, 12.3; MS (70 eV, EI) m/z (%): 245 (M⁺+1, 10.43), 244 (M⁺, 55.55), 229 (100); IR (neat): ν = 2958, 2919, 2873, 1936, 1703, 1493, 1453, 1435, 1377, 1269, 1230, 1216, 1135, 1088, 1067, 1032 cm⁻¹; HRMS calcd for C₁₆H₂₀O₂ [M⁺]: 244.1463, found: 244.1466.

(*S*)-**1n**: 63% ee (HPLC conditions: Regis (*R,R*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 6.2 min, t_R (major) = 7.5 min); ¹H NMR (400 MHz, CDCl₃): δ = 7.66-7.57 (m, 2 H, Ar-H), 7.38-7.30 (m, 2 H, Ar-H), 7.30-7.22 (m, 1 H, Ar-H), 2.41-2.32 (m, 1 H, OH), 2.27 (t, J = 7.0 Hz, 2 H, CH₂), 2.02-1.80 (m, 2 H, CH₂), 1.64-1.52 (m, 2 H, CH₂), 1.02 (t, J = 7.4 Hz, 3 H, CH₃), 0.94 (t, J = 7.2 Hz, 3 H, CH₃); ¹³C NMR (100 MHz, CDCl₃): δ = 145.1, 127.9, 127.4, 125.5, 86.6, 82.6, 73.9, 38.5, 22.1, 20.7, 13.5, 9.1; MS (ESI) m/z (%): 185 (M-OH)⁺; IR (neat): ν = 3418, 2965, 2934, 2874, 2242, 1448, 1378, 1328, 1209, 1166, 1051, 1017 cm⁻¹; HRMS calcd for C₁₄H₁₈O [M⁺]: 202.1358, found: 202.1361.

(17) Preparation of (*S*_a)-ethyl 2-butyl-4-phenyl-2,3-pentadienoate ((*S*_a)-2aa**) (zwl-11-18-1) and (*S*)-2-phenyloct-3-yn-2-ol ((*S*)-**1a**) (zwl-11-18-2)**

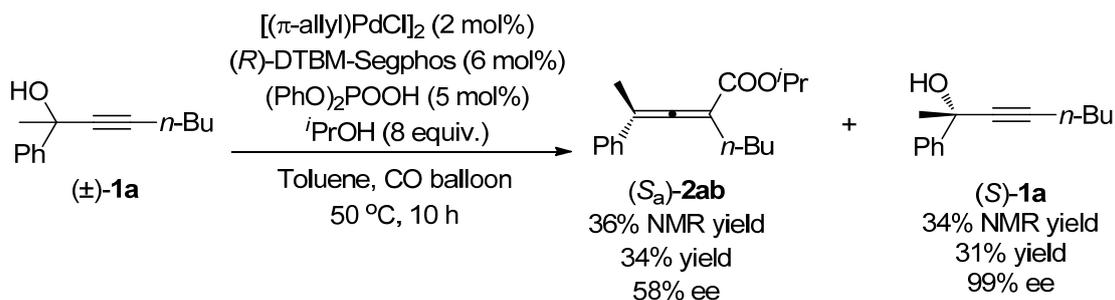


The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.5 mg, 0.01 mmol), (R) -DTBM-Segphos (36.2 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (6.4 mg, 0.05 mmol), (\pm) -**1a** (101.1 mg, 0.5 mmol), EtOH (184.1 mg, 4 mmol), and toluene (2.5 mL) afforded (S_a) -**2aa** (75.7 mg, 59%) as an oil and left (S) -**1a** (20.1 mg, 20%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)].

(S_a) -**2aa**: 41% ee (HPLC conditions: Regis (R,R) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 7.8 min, t_R (major) = 9.0 min; $[\alpha]_D^{26} = +28.2$ (c = 1.17, CHCl_3); ^1H NMR (400 MHz, CDCl_3): δ = 7.44-7.28 (m, 4 H, Ar-H), 7.28-7.18 (m, 1 H, Ar-H), 4.19 (q, J = 7.2 Hz, 2 H, OCH_2), 2.34 (t, J = 7.4 Hz, 2 H, CH_3), 2.17 (s, 3 H, CH_3), 1.51-1.40 (m, 2 H, CH_2), 1.40-1.29 (m, 2 H, CH_2), 1.25 (t, J = 7.2 Hz, 3 H, CH_3), 0.88 (t, J = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (100 MHz, CDCl_3): δ = 211.1, 167.4, 135.7, 128.4, 127.2, 126.0, 104.5, 102.3, 60.8, 30.2, 28.7, 22.3, 16.4, 14.3, 13.9; MS (70 eV, EI) m/z (%): 258 (M^+ , 2.07), 143 (100); IR (neat): ν = 2956, 2928, 2859, 1943, 1707, 1598, 1494, 1462, 1444, 1368, 1257, 1118, 1086, 1067, 1025 cm^{-1} ; HRMS calcd for $\text{C}_{17}\text{H}_{22}\text{O}_2$ [M^+]: 258.1620, found: 258.1623.

(S) -**1a**: 99% ee (HPLC conditions: Regis (S,S) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (major) = 13.7 min, t_R (minor) = 17.7 min); ^1H NMR (400 MHz, CDCl_3): δ = 7.69-7.62 (m, 2 H, Ar-H), 7.40-7.32 (m, 2 H, Ar-H), 7.32-7.24 (m, 1 H, Ar-H), 2.33-2.24 (m, 3 H, OH and CH_2), 1.74 (s, 3 H, CH_3), 1.61-1.49 (m, 2 H, CH_2), 1.49-1.37 (m, 2 H, CH_2), 0.93 (t, J = 7.4 Hz, 3 H, CH_3 from *n*-Bu). For full characterization, see experiment No. 1. (1) at Page S9.

(18) Preparation of (S_a) -isopropyl 2-butyl-4-phenyl-2,3-pentadienoate ((S_a) -2ab**) (zwl-11-19-1) and (S) -2-phenyloct-3-yn-2-ol ((S) -**1a**) (zwl-11-19-2)**



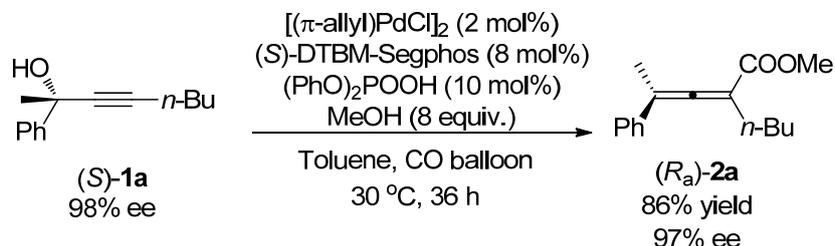
The reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.6 mg, 0.01 mmol), (R) -DTBM-Segphos (36.2 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (6.4 mg, 0.05 mmol), (\pm) -**1a** (101.2 mg, 0.5 mmol), $i\text{PrOH}$ (240.1 mg, 4 mmol), and toluene (2.5 mL) afforded (S_a) -**2ab** (46.3 mg, 34%) as an oil and left (S) -**1a** (31.4 mg, 31%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L) to petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)].

(S_a) -**2ab**: 58% ee (HPLC conditions: Regis (R,R) Whelk-O column, hexane/ i -PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (minor) = 7.3 min, t_R (major) = 8.6 min; $[\alpha]_D^{26} = +51.2$ ($c = 1.20$, CHCl_3); ^1H NMR (400 MHz, CDCl_3): $\delta = 7.43\text{--}7.29$ (m, 4 H, Ar-H), 7.28–7.20 (m, 1 H, Ar-H), 5.13–4.99 (m, 1 H, OCH), 2.33 (t, $J = 7.4$ Hz, 2 H, CH_2), 2.17 (s, 3 H, CH_3), 1.50–1.38 (m, 2 H, CH_2), 1.38–1.28 (m, 2 H, CH_2), 1.28–1.17 (m, 6 H, 2 x CH_3), 0.88 (t, $J = 7.4$ Hz, 3 H, CH_3); ^{13}C NMR (100 MHz, CDCl_3): $\delta = 211.1$, 166.9, 135.9, 128.4, 127.2, 126.0, 104.4, 102.7, 68.1, 30.2, 28.6, 22.3, 21.9, 21.8, 16.4, 13.9; MS (70 eV, EI) m/z (%): 272 (M^+ , 1.62), 143 (100); IR (neat): $\nu = 2957$, 2928, 2860, 1944, 1704, 1494, 1463, 1373, 1260, 1105, 1066 cm^{-1} ; HRMS calcd for $\text{C}_{18}\text{H}_{24}\text{O}_2$ [M^+]: 272.1776, found: 272.1773.

(S) -**1a**: 99% ee (HPLC conditions: Regis (S,S) Whelk-O column, hexane/ i -PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 13.8 min, t_R (minor) = 18.4 min); ^1H NMR (400 MHz, CDCl_3): $\delta = 7.72\text{--}7.61$ (m, 2 H, Ar-H), 7.42–7.32 (m, 2 H, Ar-H), 7.32–7.23 (m, 1 H, Ar-H), 2.35–2.20 (m, 3 H, OH and CH_2), 1.74 (s, 3 H, CH_3), 1.60–1.49 (m, 2 H, CH_2), 1.49–1.38 (m, 2 H, CH_2), 0.93 (t, $J = 7.4$ Hz, 3 H, CH_3 from n -Bu). For full characterization, see experiment No. 1. (1) at Page S9.

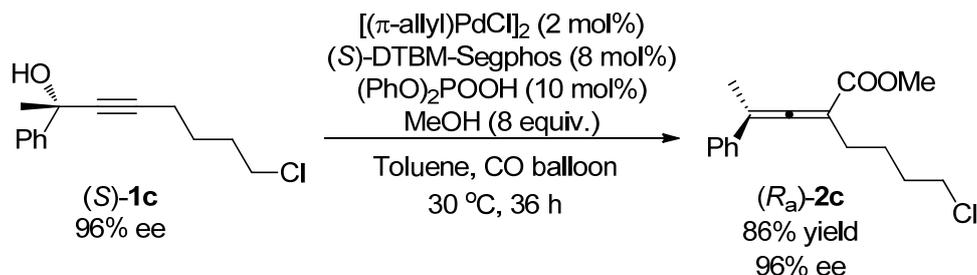
Synthesis of optically active 2,3-allenoates

(1) Preparation of (*R_a*)-methyl 4-phenyl-2-butyl-2,3-pentadienoate ((*R_a*)-2a) (zwl-11-65)



Following **Typical Procedure I**, the reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.6 mg, 0.01 mmol), (*S*)-DTBM-Segphos (48.3 mg, 0.04 mmol), $(\text{PhO})_2\text{POOH}$ (12.4 mg, 0.05 mmol), (*S*)-1a (101.2 mg, 0.5 mmol, 98% ee), MeOH (128.4 mg, 4 mmol), and toluene (5 mL) afforded (*R_a*)-2a (105.1 mg, 86%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1]: 97% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (minor) = 7.3 min, t_R (major) = 8.6 min); $[\alpha]_D^{20} = -35.8$ ($c = 1.25$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 7.44\text{--}7.29$ (m, 4 H, Ar-H), 7.29–7.20 (m, 1 H, Ar-H), 3.72 (s, 3 H, OCH₃), 2.35 (t, $J = 7.6$ Hz, 2 H, CH₂), 2.18 (s, 3 H, CH₃), 1.52–1.41 (m, 2 H, CH₂), 1.41–1.30 (m, 2 H, CH₂), 0.88 (t, $J = 7.4$ Hz, 3 H, CH₃ from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 211.1, 167.8, 135.4, 128.5, 127.3, 125.9, 104.6, 102.0, 52.0, 30.2, 28.7, 22.3, 16.4, 13.8$; MS (70 eV, EI) m/z (%): 244 (M^+ , 2.19), 143 (100); IR (neat): $\nu = 2954, 2927, 2861, 1943, 1712, 1436, 1260, 1124, 1067$ cm^{-1} ; HRMS calcd for $\text{C}_{16}\text{H}_{20}\text{O}_2$ [M^+]: 244.1463, found: 244.1460.

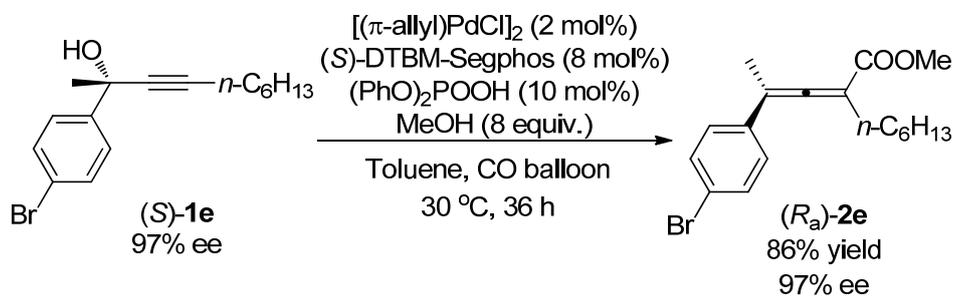
(2) Preparation of (*R_a*)-methyl 2-(4-chlorobutyl)-4-phenyl-2,3-pentadienoate ((*R_a*)-2c) (zwl-11-71)



Following **Typical Procedure I**, the reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.6 mg, 0.01

mmol), (*S*)-DTBM-Segphos (48.2 mg, 0.04 mmol), (PhO)₂POOH (12.4 mg, 0.05 mmol), (*S*)-**1c** (118.2 mg, 0.5 mmol, 96% ee), MeOH (128.6 mg, 4 mmol), and toluene (5 mL) afforded (*R_a*)-**2c** (119.7 mg, 86%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1]: 96% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 100/1, 1.0 mL/min, λ = 214 nm, *t_R* (minor) = 9.4 min, *t_R* (major) = 10.6 min); [α]²¹_D = -4.5 (*c* = 1.35, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.43-7.30 (m, 4 H, Ar-H), 7.30-7.21 (m, 1 H, Ar-H), 3.73 (s, 3 H, OCH₃), 3.50 (t, *J* = 6.6 Hz, 2 H, CH₂), 2.39 (t, *J* = 7.4 Hz, 2 H, CH₂), 2.19 (s, 3 H, CH₃), 1.87-1.75 (m, 2 H, CH₂), 1.70-1.56 (m, 2 H, CH₂); ¹³C NMR (100 MHz, CDCl₃): δ = 213.7, 166.5, 134.5, 132.9, 128.7, 128.30, 128.28, 127.8, 127.7, 126.1, 106.0, 104.3, 52.3, 16.3; MS (70 eV, EI) *m/z* (%): 280 (M⁺(³⁷Cl), 1.75), 278 (M⁺(³⁵Cl), 5.10), 143 (100); IR (neat): ν = 2950, 2864, 1942, 1710, 1493, 1436, 1251, 1099 cm⁻¹; HRMS calcd for C₁₆H₁₉O₂³⁵Cl [M⁺]: 278.1074, found: 278.1078.

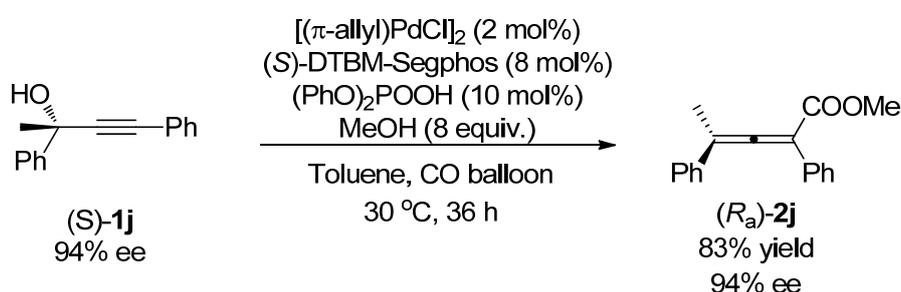
(3) Preparation of (*R_a*)-methyl 2-(*n*-hexyl)-4-(4-bromophenyl)-2,3-pentadienoate ((*R_a*)-2e**) (zwl-11-73)**



Following **Typical Procedure I**, the reaction of [(π -allyl)PdCl]₂ (3.6 mg, 0.01 mmol), (*S*)-DTBM-Segphos (48.2 mg, 0.04 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (*S*)-**1e** (154.4 mg, 0.5 mmol, 97% ee), MeOH (128.1 mg, 4 mmol), and toluene (5 mL) afforded (*R_a*)-**2e** (138.8 mg, 86%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1]: 97% ee (HPLC conditions: Regis (*S,S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, *t_R* (minor) = 7.9 min, *t_R* (major) = 8.7 min); [α]²¹_D = -18.0 (*c* = 1.89, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.45 (dt, *J*₁ = 8.9 Hz, *J*₂ = 2.2 Hz, 2 H, Ar-H), 7.23 (dt, *J*₁ = 8.8 Hz, *J*₂ = 2.3 Hz, 2 H, Ar-H), 3.73 (s, 3 H, OCH₃), 2.34 (t, *J* = 7.4 Hz, 2 H, CH₂), 2.15 (s, 3 H,

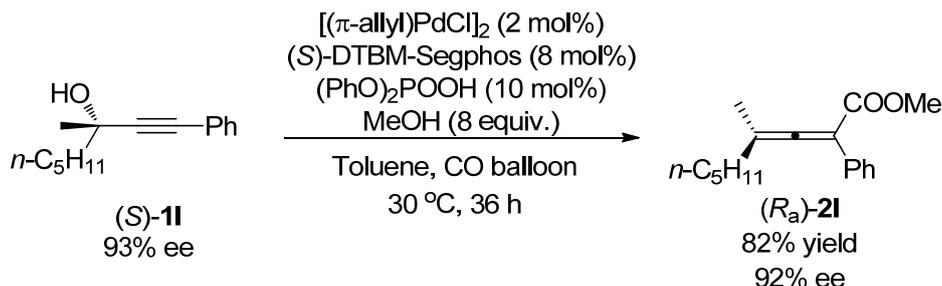
CH₃), 1.50-1.38 (m, 2 H, CH₂), 1.37-1.18 (m, 6 H, 3 x CH₂), 0.85 (t, *J* = 6.8 Hz, 3 H, CH₃ from *n*-C₆H₁₃); ¹³C NMR (100 MHz, CDCl₃): δ = 211.0, 167.5, 134.5, 131.5, 127.5, 121.3, 103.9, 102.4, 52.1, 31.6, 28.9, 28.8, 27.9, 22.6, 16.3, 14.0; MS (70 eV, EI) *m/z* (%): 352 (M⁺(⁸¹Br), 1.27), 350 (M⁺(⁷⁹Br), 1.19), 142 (100); IR (neat): ν = 1935, 1703, 1461, 1435, 1249, 1219, 1079, 1006 cm⁻¹; HRMS calcd for C₁₈H₂₃O₂⁷⁹Br [M⁺]: 350.0881, found: 350.0880.

(4) Preparation of (*R*_a)-methyl 2,4-diphenyl-2,3-pentadienoate ((*R*_a)-2j**) (zwl-11-69)**



Following **Typical Procedure I**, the reaction of [(π -allyl)PdCl]₂ (3.6 mg, 0.01 mmol), (*S*)-DTBM-Segphos (48.2 mg, 0.04 mmol), (PhO)₂POOH (12.6 mg, 0.05 mmol), (*S*)-**1j** (111.0 mg, 0.5 mmol, 94% ee), MeOH (128.3 mg, 4 mmol), and toluene (5 mL) afforded (*R*_a)-**2j** (109.6 mg, 83%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1]: 94% ee (HPLC conditions: PC-2 column, hexane/*i*-PrOH = 100/1, 1.0 mL/min, λ = 214 nm, *t*_R (minor) = 7.6 min, *t*_R (major) = 8.8 min); [α]_D²⁰ = +219.1 (*c* = 1.47, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.61-7.50 (m, 2 H, Ar-H), 7.50-7.40 (m, 2 H, Ar-H), 7.40-7.21 (m, 6 H, Ar-H), 3.80 (s, 3 H, OCH₃), 2.28 (s, 3 H, CH₃); ¹³C NMR (100 MHz, CDCl₃): δ = 213.6, 166.5, 134.5, 132.9, 128.7, 128.29, 128.27, 127.8, 127.6, 126.1, 106.0, 104.3, 52.3, 16.2; MS (70 eV, EI) *m/z* (%): 265 (M⁺+1, 16.85), 264 (M⁺, 75.94), 205 (100); IR (neat): ν = 3026, 2950, 1931, 1715, 1491, 1436, 1270, 1241, 1194, 1169, 1019 cm⁻¹; HRMS calcd for C₁₈H₁₆O₂ [M⁺]: 264.1150, found: 264.1152.

(5) Preparation of (*R*_a)-methyl 2-phenyl-4-methyl-2,3-nonadienoate ((*R*_a)-2l**) (zwl-11-70)**

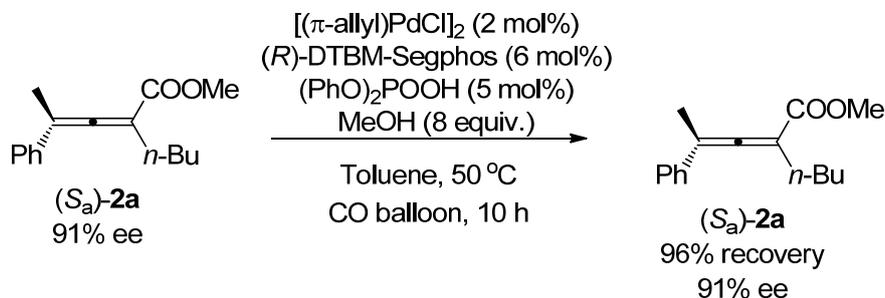


Following **Typical Procedure I**, the reaction of $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.6 mg, 0.01 mmol), (S)-DTBM-Segphos (48.3 mg, 0.04 mmol), (PhO)₂POOH (12.4 mg, 0.05 mmol), (S)-**11** (108.0 mg, 0.5 mmol, 93% ee), MeOH (128.1 mg, 4 mmol), and toluene (5 mL) afforded (R_a)-**21** (105.7 mg, 82%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1]: 92% ee (HPLC conditions: Regis (S,S) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 11.3 min, t_R (major) = 12.3 min); $[\alpha]_D^{20} = +64.7$ ($c = 1.80$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.52\text{--}7.41$ (m, 2 H, Ar-H), 7.37–7.27 (m, 2 H, Ar-H), 7.27–7.19 (m, 1 H, Ar-H), 3.78 (s, 3 H, OCH₃), 2.23–2.07 (m, 2 H, CH₂), 1.87 (s, 3 H, CH₃), 1.58–1.44 (m, 2 H, CH₂), 1.38–1.20 (m, 4 H, 2 x CH₂), 0.85 (t, $J = 6.8$ Hz, 3 H, CH₃ from *n*-Bu); ¹³C NMR (100 MHz, CDCl₃): $\delta = 209.4, 167.4, 134.0, 128.3, 128.1, 127.1, 105.1, 101.8, 52.0, 33.6, 31.3, 26.8, 22.4, 18.0, 14.0$; MS (70 eV, EI) m/z (%): 259 (M⁺+1, 2.68), 258 (M⁺, 14.64), 143 (100); IR (neat): $\nu = 2926, 2858, 1948, 1715, 1435, 1272, 1196, 1175, 1021$ cm⁻¹; HRMS calcd for C₁₇H₂₂O₂ [M⁺]: 258.1620, found: 258.1624.

2. Mechanistic studies

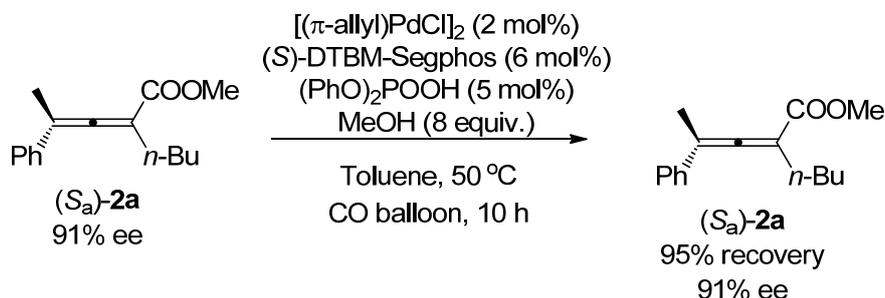
(1) Subjecting optically active allenolate to the standard reaction conditions

(zwl-11-22)



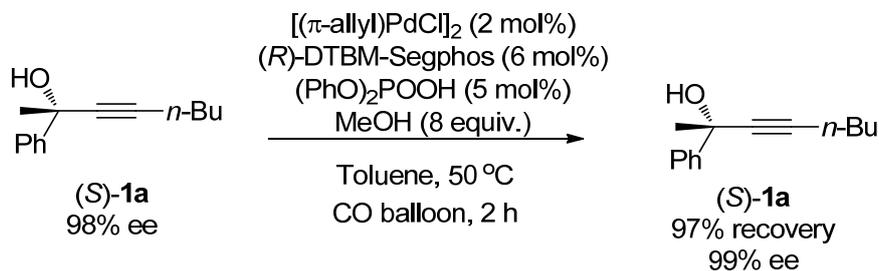
To a flame-dried Schlenk tube were added [(π-allyl)PdCl]₂ (3.6 mg, 0.01 mmol), (R)-DTBM-Segphos (36.0 mg, 0.03 mmol), (PhO)₂POOH (6.4 mg, 0.025 mmol), (S_a)-2a (122.0 mg, 0.5 mmol, 91% ee), MeOH (128.0 mg, 4 mmol), and toluene (2.5 mL) sequentially under argon. The resulting mixture was then frozen with a liquid nitrogen bath, degassed to remove the argon inside completely, and refilled with CO by a balloon of CO for three times. Then the liquid nitrogen bath was removed and the resulting mixture was warmed up to room temperature and vigorously stirred at 50 °C with a balloon of CO for 10 h. The reaction mixture was then diluted with ethyl acetate (5 mL), filtered through a short column silica gel (3.5 cm), eluted with ethyl acetate (20 mL), and concentrated. The residue was purified by column chromatography on silica gel to afford (S_a)-2a (117.0 mg, 96%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 100/1/1 (0.5 L)]: 91% ee (HPLC conditions: Regis (S,S) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, *t*_R (major) = 12.1 min, *t*_R (minor) = 14.4 min); ¹H NMR (400 MHz, CDCl₃): δ = 7.44-7.31 (m, 4 H, Ar-H), 7.30-7.22 (m, 1 H, Ar-H), 3.73 (s, 3 H, OCH₃), 2.35 (t, *J* = 7.4 Hz, 2 H, CH₂), 2.18 (s, 3 H, CH₃), 1.51-1.41 (m, 2 H, CH₂), 1.41-1.29 (m, 2 H, CH₂), 0.88 (t, *J* = 7.4 Hz, 3 H, CH₃ from *n*-Bu). For full characterization, see experiment No. 1. (1) at Page S8.

(2) Subjecting optically active allenolate to the reaction conditions applying (S)-DTBM-Segphos (zwl-11-67)



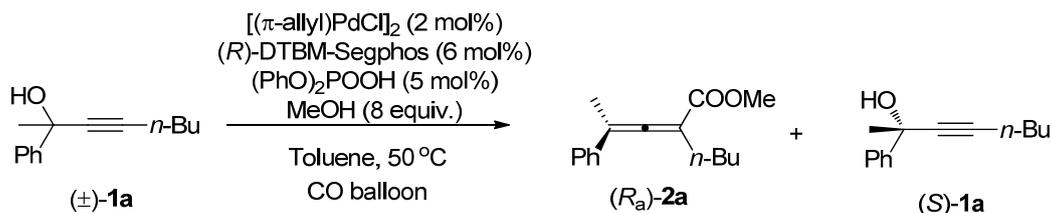
To a flame-dried Schlenk tube were added $[(\pi\text{-allyl})\text{PdCl}]_2$ (3.6 mg, 0.01 mmol), (S)-DTBM-Segphos (36.0 mg, 0.03 mmol), $(\text{PhO})_2\text{POOH}$ (6.3 mg, 0.025 mmol), (S_a) -**2a** (122.0 mg, 0.5 mmol, 91% ee), MeOH (128.4 mg, 4 mmol), and toluene (2.5 mL) sequentially under argon. The resulting mixture was then frozen with a liquid nitrogen bath, degassed to remove the argon inside completely, and refilled with CO by a balloon of CO for three times. Then the liquid nitrogen bath was removed and the mixture was warmed up to room temperature and vigorously stirred at 50 °C with a balloon of CO for 10 h. The reaction mixture was then diluted with ethyl acetate (5 mL), filtered through a short column silica gel (3.5 cm), eluted with ethyl acetate (20 mL), and concentrated. The residue was purified by column chromatography on silica gel to afford (S_a) -**2a** (115.9 mg, 95%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 50/1/1 (0.5 L)]: 91% ee (HPLC conditions: Regis (S,S) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 7.6 min, t_R (minor) = 8.8 min); $[\alpha]_D^{24} = +31.6$ ($c = 1.10$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 7.43\text{--}7.29$ (m, 4 H, Ar-H), 7.28–7.20 (m, 1 H, Ar-H), 3.72 (s, 3 H, OCH₃), 2.35 (t, $J = 7.6$ Hz, 2 H, CH₂), 2.18 (s, 3 H, CH₃), 1.52–1.41 (m, 2 H, CH₂), 1.41–1.29 (m, 2 H, CH₂), 0.88 (t, $J = 7.4$ Hz, 3 H, CH₃ from *n*-Bu). For full characterization, see experiment No. 1. (1) at Page S8.

**(3) Subjecting optically active propargylic alcohol to the standard conditions
(zwl-11-42)**



To a flame-dried Schlenk tube were added [(π -allyl)PdCl]₂ (0.7 mg, 0.002 mmol), (R)-DTBM-Segphos (7.3 mg, 0.006 mmol), (PhO)₂POOH (1.2 mg, 0.005 mmol), (S)-**1a** (20.2 mg, 0.1 mmol, 98% ee), MeOH (25.7 mg, 0.8 mmol), and toluene (1 mL) sequentially under argon. The resulting mixture was then frozen with a liquid nitrogen bath, degassed to remove the argon inside completely, and refilled with CO by a balloon of CO for three times. Then the liquid nitrogen bath was removed and the resulting mixture was warmed up to room temperature and vigorously stirred at 50 °C with a balloon of CO for 2 h. The resulting mixture was then filtered through a short column of silica gel (3.5 cm), eluted with ethyl acetate (20 mL), and concentrated. The residue was purified by column chromatography on silica gel to afford (S)-**1a** (19.5 mg, 97%) as an oil [eluent: petroleum ether/ethyl ether/dichloromethane = 20/1/1 (0.5 L)]: 99% ee (HPLC conditions: OD-H column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 22.6 min, t_R (major) = 25.3 min); ¹H NMR (400 MHz, CDCl₃): δ = 7.72-7.62 (m, 2 H, Ar-H), 7.42-7.32 (m, 2 H, Ar-H), 7.32-7.23 (m, 1 H, Ar-H), 2.35-2.23 (m, 3 H, OH and CH₂), 1.74 (s, 3 H, CH₃), 1.60-1.49 (m, 2 H, CH₂), 1.49-1.38 (m, 2 H, CH₂), 0.93 (t, J = 7.4 Hz, 3 H, CH₃ from *n*-Bu). For full characterization, see experiment No. 1. (1) on page S9.

(4) Kinetic experiments (zwl-11-33)

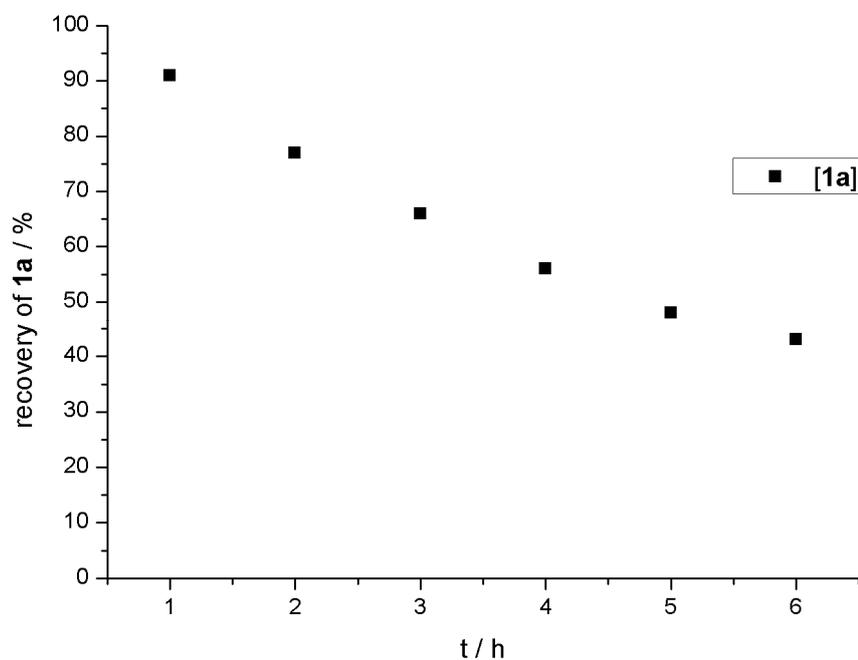


To a flame-dried Schlenk tube were added $[(\pi\text{-allyl})\text{PdCl}]_2$ (7.4 mg, 0.02 mmol), (R) -DTBM-Segphos (72.3 mg, 0.06 mmol), $(\text{PhO})_2\text{POOH}$ (12.6 mg, 0.05 mmol), (\pm) -**1a** (202.1 mg, 1 mmol), MeOH (256.1 mg, 8 mmol), and toluene (5 mL) sequentially under argon. The resulting mixture was then frozen with a liquid nitrogen bath, degassed to remove the argon inside completely, and refilled with CO by a balloon of CO for three times. Then the liquid nitrogen bath was removed and the mixture was warmed up to room temperature. Then the resulting mixture was stirred at 50 °C with a balloon of CO. 0.5 mL each of the aliquot was taken with an Ar-purged syringes after 1 h, 2 h, 3 h, 4 h, 5 h, 6 h. Each aliquot was immediately filtered through a short column silica gel (3.5 cm), eluted with ethyl acetate (20 mL), and concentrated. To the crude product was added 3.5 μL CH_2Br_2 as the internal standard. Then the mixture was analyzed by $^1\text{H-NMR}$ spectra to determine the recovery data of **1a**. All the data acquired were analyzed by Origin 8.0.

Table S4 Kinetic studies with the standard catalytic formula

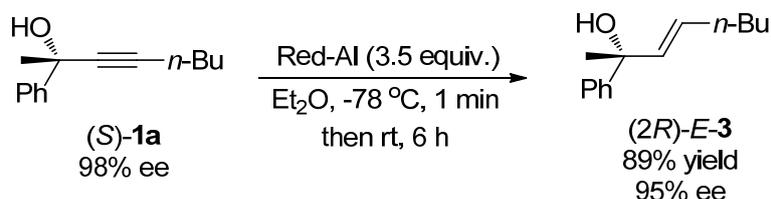
Entry	Time / h	NMR yield of 2a / %	Recovery of 1a / %
1	1	8	91
2	2	20	77
3	3	30	66
4	4	40	56
5	5	45	48
6	6	48	43

Figure S1 Recovery of **1a** vs. time



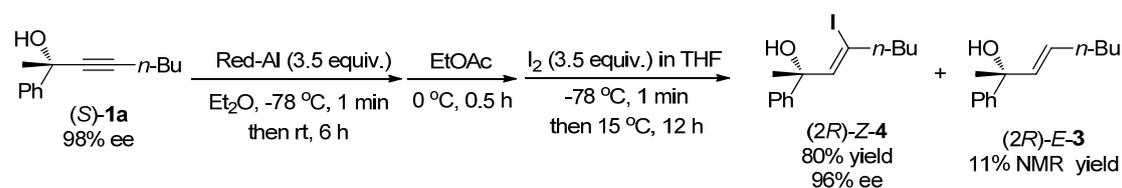
3. Synthetic applications

(1) Preparation of (2*R*)-2-phenyl-3-(*E*)-octen-2-ol ((2*R*)-*E*-3)⁴ (zwl-10-37)



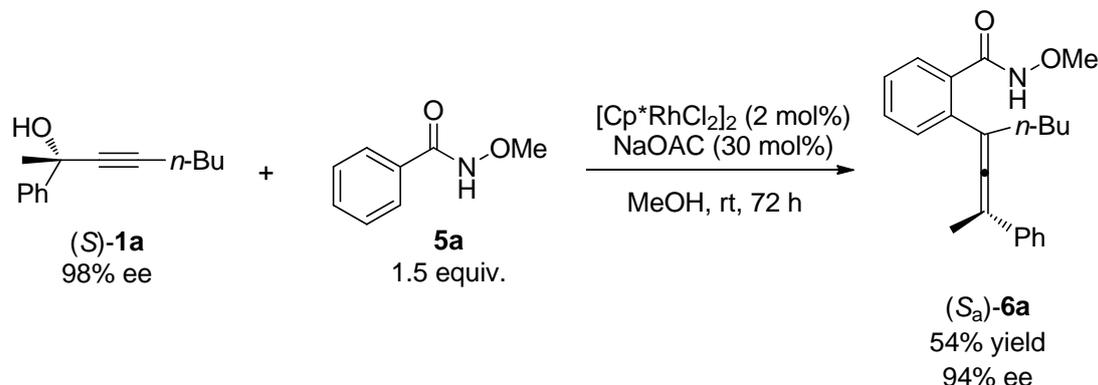
To a flame-dried Schlenk tube were added (*S*)-**1a** (40.3 mg, 0.2 mmol, 98% ee) and ethyl ether (1 mL) under argon. The resulting mixture was then cooled down to -78 °C. To the reaction mixture was added a solution of Red-Al (3.5 M in toluene, 0.2 mL, 0.7 mmol) dropwise in 1 minute at -78 °C. Then the reaction mixture was stirred for 6 h at room temperature and subsequently quenched by dropwise addition of MeOH (2 mL) at -78 °C. To the mixture was added a saturated aqueous solution of potassium sodium tartrate (Rochelle's salt) (2 mL). After extraction with ethyl acetate (2 mL x 3), the organic layer was washed with brine (5 mL) and dried over anhydrous Na₂SO₄. After filtration and concentration under reduced pressure, the crude product was purified by column chromatography on silica gel to afford (2*R*)-*E*-**3**⁵ (36.2 mg, 89%) as an oil [eluent: petroleum ether /ethyl ether/dichloromethane = 10/1/1]: 95% ee (HPLC conditions: AS-H column, hexane/*i*-PrOH = 98/2, 1.0 mL/min, $\lambda = 214$ nm, t_R (minor) = 10.7 min, t_R (major) = 11.3 min); $[\alpha]_D^{20} = +0.5$ ($c = 1.25$, CHCl₃); ¹H NMR (400 MHz, CDCl₃): $\delta = 7.49$ -7.42 (m, 2 H, Ar-H), 7.38-7.29 (m, 2 H, Ar-H), 7.29-7.20 (m, 1 H, Ar-H), 5.78 (dt, $J_1 = 15.6$ Hz, $J_2 = 1.2$ Hz, 1 H, =CH), 5.67 (dt, $J_1 = 15.6$ Hz, $J_2 = 6.5$ Hz, 1 H, =CH), 2.11-2.01 (m, 2 H, CH₂), 1.91-1.84 (m, 1 H, OH), 1.63 (s, 3 H, CH₃), 1.42-1.25 (m, 4 H, 2 x CH₂), 0.89 (t, $J = 7.0$ Hz, 3 H, CH₃ from *n*-Bu); ¹³C NMR (100 MHz, CDCl₃): $\delta = 147.3$, 136.8, 129.2, 128.1, 126.7, 125.2, 74.4, 31.9, 31.4, 29.9, 22.2, 13.9; MS (70 eV, EI) m/z (%): 204 (M⁺, 0.98), 147 (100); IR (neat): $\nu = 3383$, 2957, 2926, 2857, 1493, 1446, 1369, 1136, 1091, 1061, 1028 cm⁻¹. This reaction could not be monitored by TLC since the R_f values of starting material and product are the same. Prolonging reaction time would be necessary if the propargylic alcohol remains.

(2) Preparation of (2R)-4-iodo-2-phenyl-3-(E)-octen-2-ol ((2R)-Z-4) (zwl-11-38)



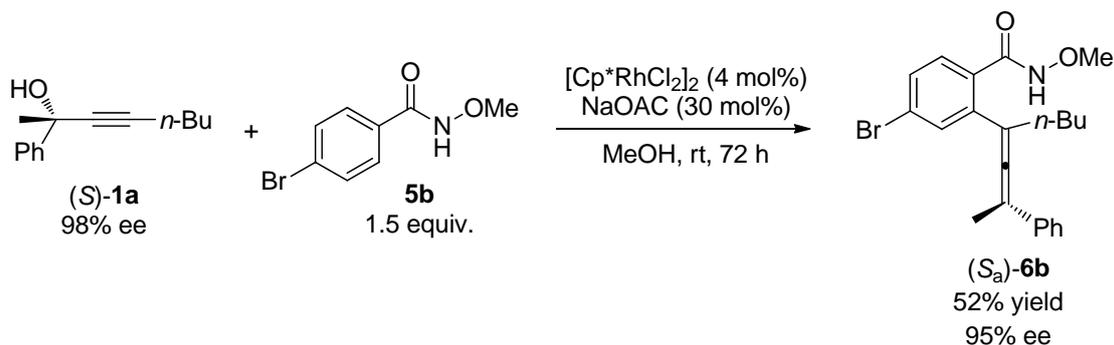
To a flame-dried Schlenk tube were added (S)-1a (40.4 mg, 0.2 mmol, 98% ee) and ethyl ether (1 mL) under argon. The resulting mixture was then cooled down to -78 °C. To the reaction mixture was added a solution of Red-Al (3.5 M in toluene, 0.2 mL, 0.7 mmol) dropwise in 1 minute at -78 °C. Then the cooling bath was removed and the mixture was stirred for 6 h at room temperature. After being cooled down to 0 °C, ethyl acetate (0.04 mL) was added and the resulting mixture was stirred at 0 °C for 0.5 h and then cooled down to -78 °C. A solution of I₂ (177.4 mg, 0.7 mmol) in THF (0.4 mL) was added dropwise in 1 minute. Then the reaction mixture was stirred for 12 h at 15 °C and quenched with dropwise addition of a saturated aqueous solution of NaS₂O₃ (5 mL) at 0 °C. After extraction with ethyl acetate (5 mL x 3), the organic layer was washed with brine (10 mL) and dried over anhydrous Na₂SO₄. After filtration and concentration under reduced pressure, the crude product was purified by column chromatography on silica gel to afford (2R)-Z-4 (52.6 mg, 80%) as an oil [eluent: petroleum ether /ethyl acetate/dichloromethane = 40/1/1]: 96% ee (HPLC conditions: IC column, hexane/*i*-PrOH = 400/1, 1.0 mL/min, λ = 214 nm, *t*_R (major) = 21.8 min, *t*_R (minor) = 25.4 min); [α]_D²⁴ = +0.3 (*c* = 1.00, CHCl₃); ¹H NMR (400 MHz, CDCl₃): δ = 7.52-7.40 (m, 2 H, Ar-H), 7.38-7.29 (m, 2 H, Ar-H), 7.29-7.21 (m, 1 H, Ar-H), 6.53 (s, 1 H, =CH), 3.19 (s, 1 H, OH), 2.55 (t, *J* = 7.2 Hz, 2 H, CH₂), 1.64 (s, 3 H, CH₃), 1.58-1.46 (m, 2 H, CH₂), 1.41-1.27 (m, 2 H, CH₂), 0.93 (t, *J* = 7.4 Hz, 3 H, CH₃ from *n*-Bu); ¹³C NMR (100 MHz, CDCl₃): δ = 147.1, 140.3, 128.1, 126.8, 125.8, 108.6, 74.8, 46.4, 32.9, 31.5, 21.3, 13.8; MS (ESI) *m/z* (%): 185 (M - I - H₂O)⁺; IR (neat): ν = 3444, 2956, 2928, 2858, 1627, 1492, 1446, 1370, 1336, 1113, 1090, 1065, 1028 cm⁻¹; HRMS calcd for C₁₄H₁₉OI [M⁺]: 330.0481, found: 330.0484. Prolonging reaction time at room temperature would be necessary before the addition of ethyl acetate if the propargylic alcohol remains.

(3) Preparation of (*S_a*)-*N*-methoxy-2-(2-phenyl-2,3-octadien-4-yl)benzamide ((*S_a*)-6a**)⁶ (zwl-10-18)**



To a Schlenk tube were added $[\text{Cp}^*\text{RhCl}_2]_2$ (2.5 mg, 0.004 mmol), *N*-methoxybenzamide **5a**⁶ (45.1 mg, 0.3 mmol), NaOAc (4.9 mg, 0.06 mmol), (*S*)-**1a** (40.6 mg, 0.2 mmol, 98% ee), and MeOH (1.2 mL) sequentially at room temperature. After being stirred for 72 h at room temperature, the reaction was complete as monitored by TLC. After filtration through a short column of silica gel (eluent: ethyl acetate 20 mL) and evaporation under reduced pressure, the crude product was purified by flash column chromatography on silica gel to afford (*S_a*)-**6a** (39.0 mg, 54%, 93% purity) as an oil [eluent: petroleum ether/ethyl acetate/dichloromethane = 10/1/0.5]: 94% ee (HPLC conditions: IC column, hexane/*i*-PrOH = 90/10, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 10.4 min, t_R (minor) = 11.4 min); $[\alpha]_D^{26} = +309.4$ ($c = 1.67$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 8.83$ (brs, 1 H, NH), 7.55-7.11 (m, 9 H, Ar-H), 3.79 (s, 3 H, OCH_3), 2.59-2.28 (m, 2 H, CH_2), 2.18 (s, 3 H, CH_3), 1.57-1.43 (m, 2 H, CH_2), 1.43-1.31 (m, 2 H, CH_2), 0.87 (t, $J = 7.4$ Hz, 3 H, CH_3 from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 203.7, 167.5, 137.5, 137.2, 131.6, 130.6, 129.4, 128.8, 128.7, 128.33, 128.25, 127.1, 126.7, 125.6, 107.4, 102.6, 64.2, 33.8, 30.0, 22.3, 16.7, 13.8$; MS (70 eV, EI) m/z (%): 336 ($\text{M}^+ + 1$, 3.67), 335 (M^+ , 14.94), 260 (100); IR (neat): $\nu = 3195, 2955, 2930, 2870, 2242, 1944, 1651, 1597, 1493, 1462, 1440, 1371, 1299, 1027$ cm^{-1} ; HRMS calcd for $\text{C}_{22}\text{H}_{25}\text{NO}_2$ [M^+]: 335.1885, found: 335.1886.

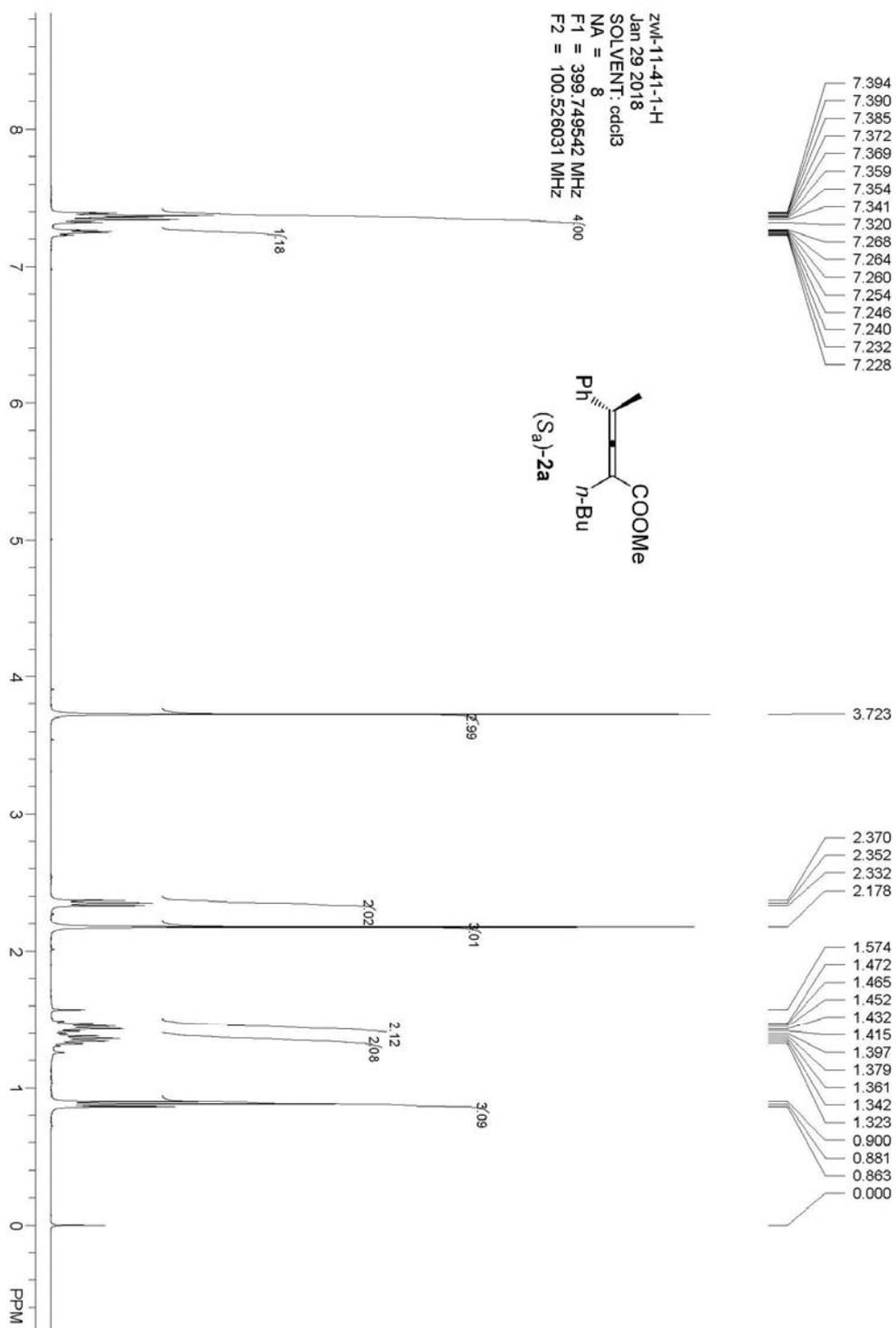
(4) Preparation of (*S_a*)-*N*-methoxy-4-bromo-2-(2-phenyl-2,3-octadien-4-yl)-benzamide ((*S_a*)-6b**)⁶ (zwl-10-50)**

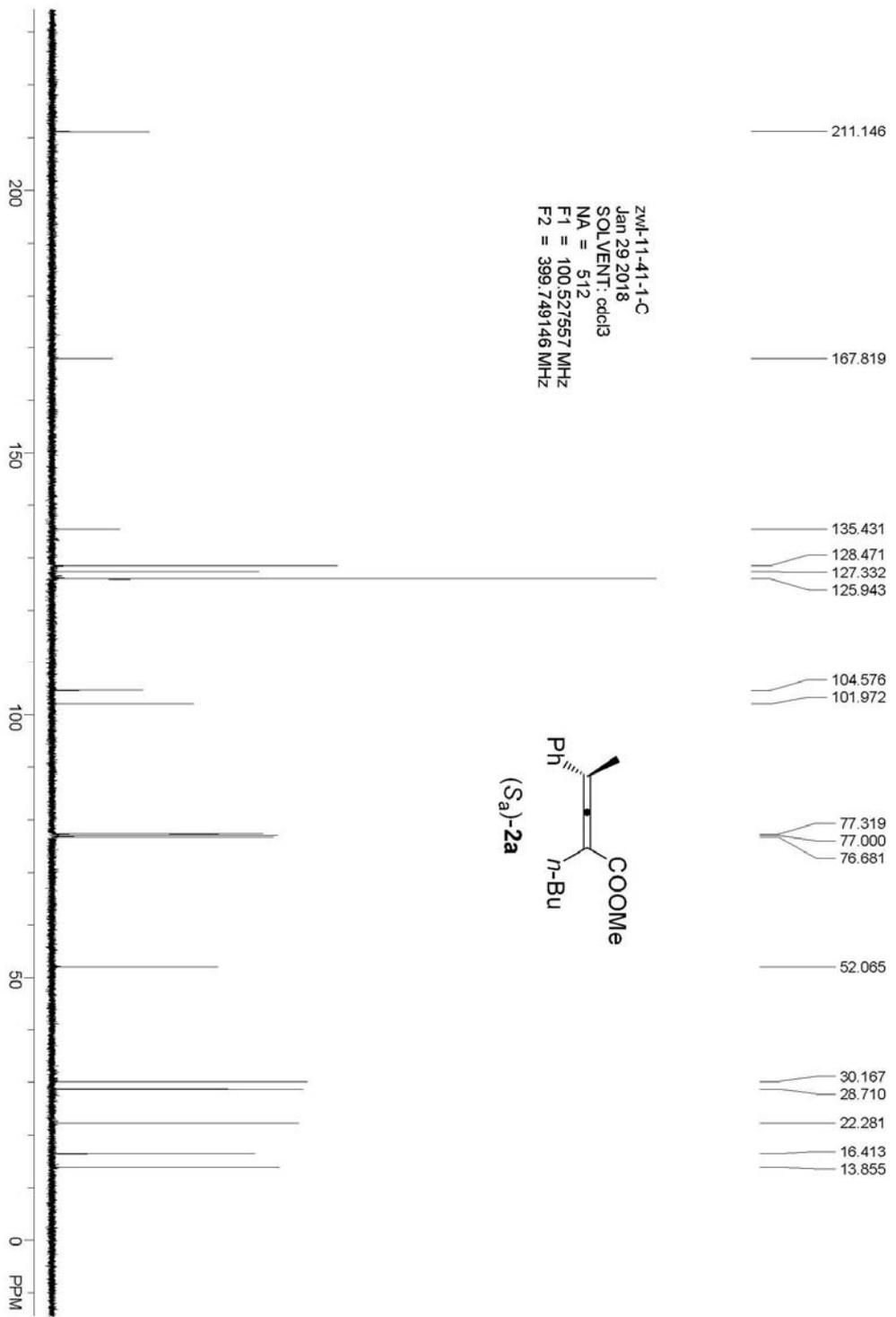


To a Schlenk tube were added $[\text{Cp}^*\text{RhCl}_2]_2$ (4.9 mg, 0.008 mmol), *N*-methoxy-4-bromobenzamide **5b**⁶ (69.2 mg, 0.3 mmol), NaOAc (5.0 mg, 0.06 mmol), (*S*)-**1a** (40.6 mg, 0.2 mmol, 98% ee), and MeOH (1.2 mL) sequentially at room temperature. After being stirred for 72 h at room temperature, the reaction was complete as monitored by TLC. After filtration through a short column of silica gel (eluent: ethyl acetate 20 mL) and evaporation under reduced pressure, the crude product was purified by flash column chromatography on silica gel to afford (*S_a*)-**6b** (47.3 mg, 52%, 91% purity) as an oil [eluent: petroleum ether/ethyl acetate/dichloromethane = 10/1/0.5]: 95% ee (HPLC conditions: IC column, hexane/*i*-PrOH = 95/5, 1.0 mL/min, $\lambda = 214$ nm, t_R (major) = 11.6 min, t_R (minor) = 12.5 min); $[\alpha]_D^{26} = +198.4$ ($c = 0.62$, CHCl_3); $^1\text{H NMR}$ (400 MHz, CDCl_3): $\delta = 8.93$ (brs, 1 H, NH), 7.48 (s, 1 H, Ar-H), 7.43-7.23 (m, 6 H, Ar-H), 7.23-7.14 (m, 1 H, Ar-H), 3.77 (s, 3 H, OCH_3), 2.65-2.30 (m, 2 H, CH_2), 2.17 (s, 3 H, CH_3), 1.59-1.43 (m, 2 H, CH_2), 1.43-1.31 (m, 2 H, CH_2), 0.88 (t, $J = 7.6$ Hz, 3 H, CH_3 from *n*-Bu); $^{13}\text{C NMR}$ (100 MHz, CDCl_3): $\delta = 203.9, 166.6, 139.6, 136.8, 132.0, 130.6, 130.2, 130.0, 128.4, 127.7, 127.0, 126.3, 125.7, 124.8, 106.4, 103.5, 64.3, 33.5, 29.9, 22.3, 16.6, 13.8$; MS (70 eV, EI) m/z (%): 415 ($\text{M}^+(\text{}^{81}\text{Br})$, 9.12), 413 ($\text{M}^+(\text{}^{79}\text{Br})$, 9.39), 43 (100); IR (neat): $\nu = 3179, 2955, 2929, 2859, 1737, 1655, 1579, 1556, 1493, 1462, 1441, 1372, 1240, 1079, 1028$ cm^{-1} ; HRMS calcd for $\text{C}_{22}\text{H}_{24}\text{NO}_2$ ⁷⁹Br [M^+]: 413.0990, found: 413.0995.

References:

1. S. Ma, B. Wu, X. Jiang and S. Zhao, *J. Org. Chem.*, 2005, **70**, 2568.
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3. S. Kotani, K. Kukita, K. Tanaka, T. Ichibakase and M. Nakajima, *J. Org. Chem.*, **2014**, *79*, 4817.
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5. Y. Li, S. Chakrabarty and A. Studer, *Angew. Chem. Int. Ed.*, **2015**, *54*, 3587.
6. S. Wu, X. Huang, C. Fu and S. Ma, *Org. Chem. Front.*, **2017**, *4*, 2002.





zw1-11-41-1

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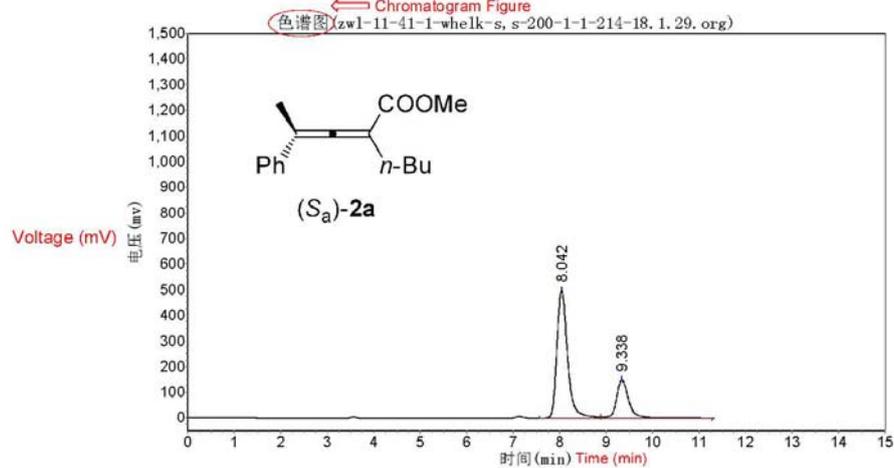
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← Brief introduction of experimental conditions

实验内容简介:

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← Chromatogram Figure



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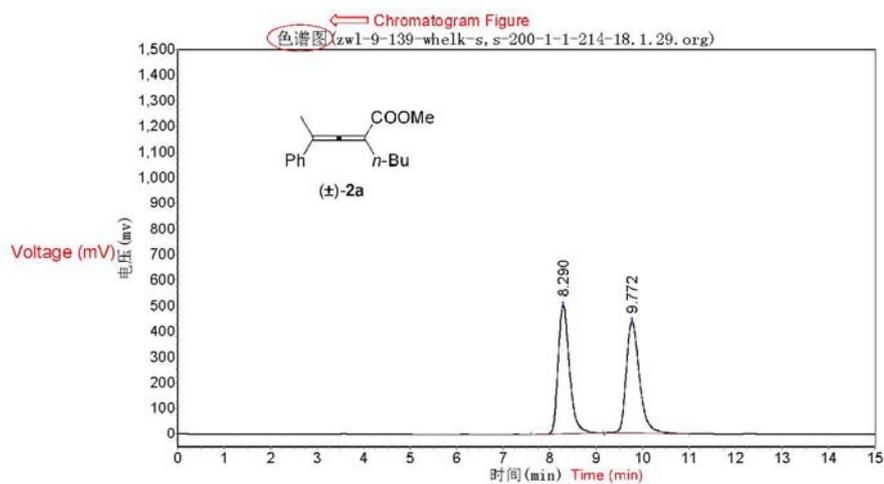
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zw1-9-139

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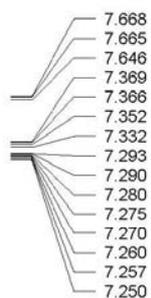
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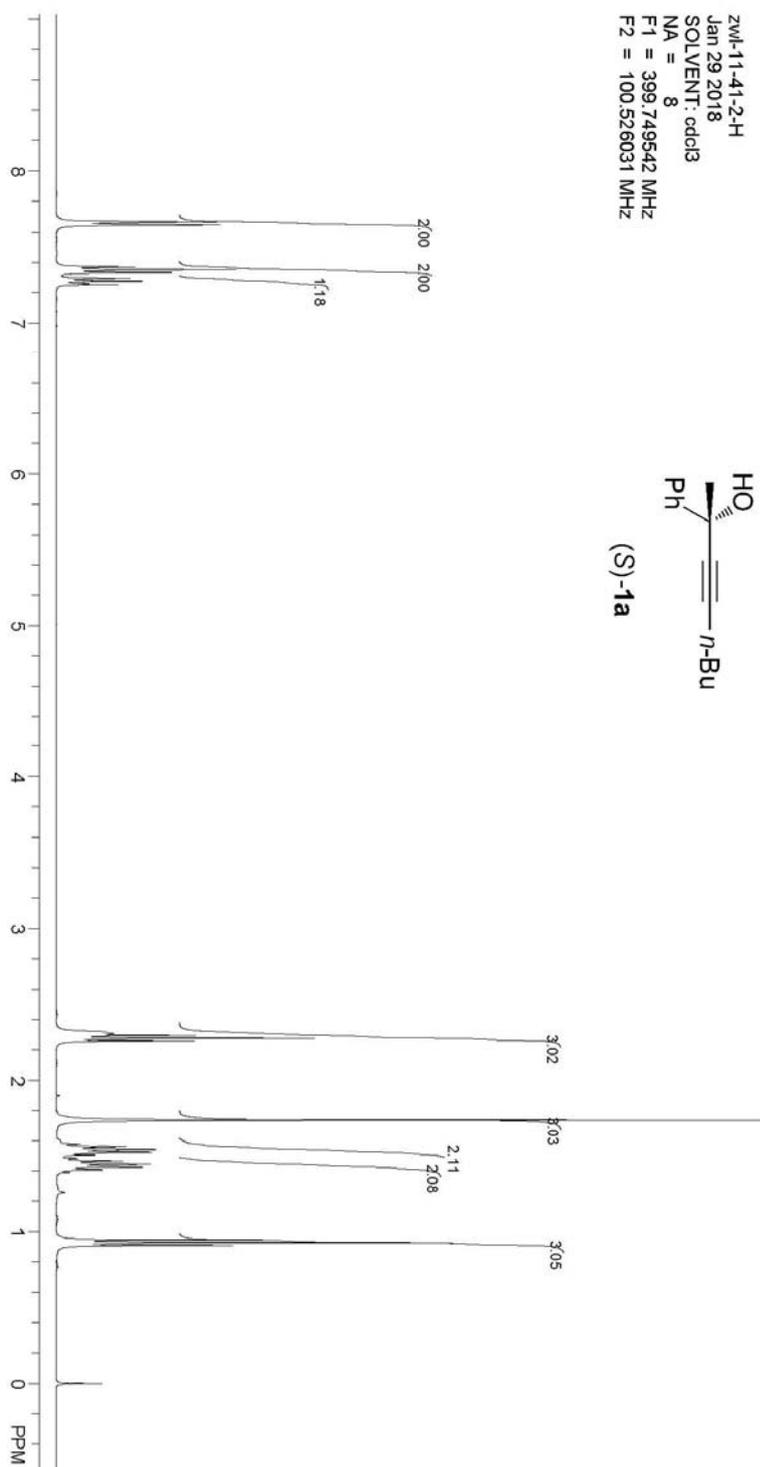
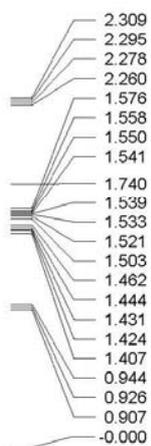
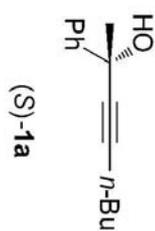


分析结果表

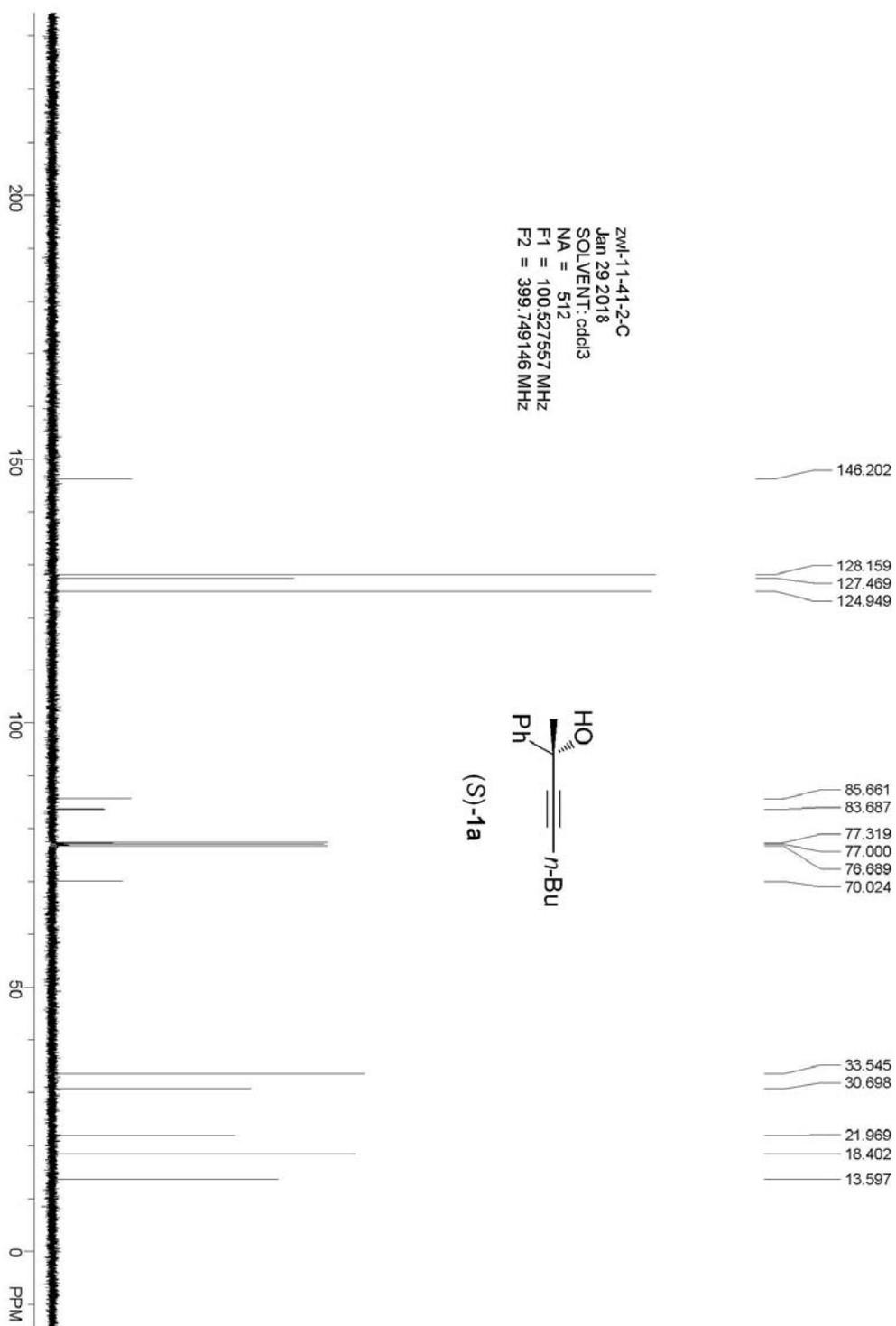
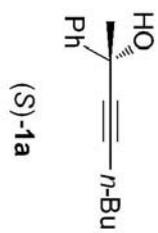
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.290	500491.938	8495500.000	49.6469
2		9.772	434477.281	8616346.000	50.3531
总计			934969.219	17111846.000	100.0000



zwl-11-41-2-H
Jan 29 2018
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



zwl-11-41-2-C
Jan 29 2018
SOLVENT: cdcl3
NA = 512
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zw1-11-41-2

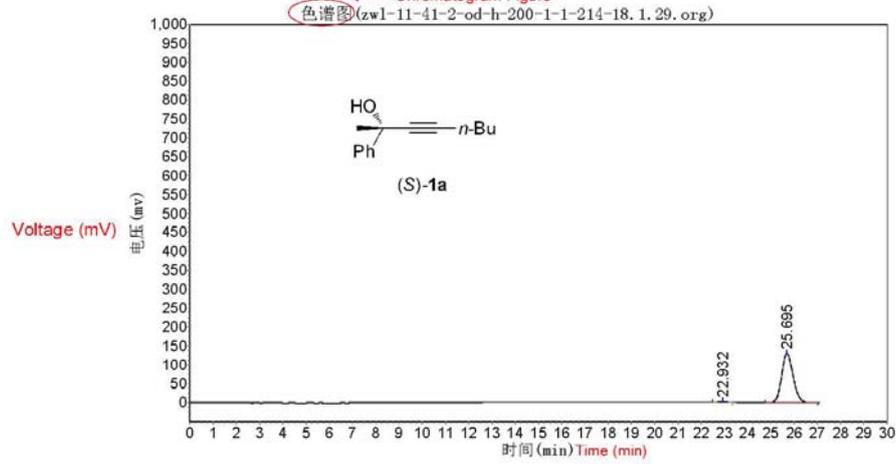
实验时间: 2018-01-29, 10:08:44
谱图文件: E:\data\zw1\zw1-11-41-2-od-h-200-1-1-214-18.1.29.org

报告时间: 2018-01-29, 10:40:34

← Brief introduction of experimental conditions

实验内容简介:
zw1-11-41-2-od-h-200-1-1-214

← Chromatogram Figure



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		22.932	1823.750	47134.945	1.0650
2		25.695	128680.680	4378590.000	98.9350
总计			130504.429	4425724.945	100.0000

zw1-10-177

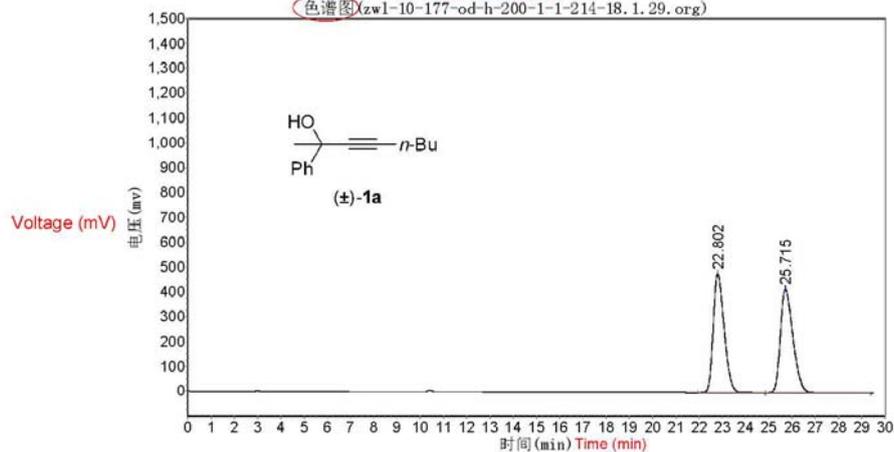
实验时间: 2018-01-29, 9:09:05
谱图文件: E:\data\zw1\zw1-10-177-od-h-200-1-1-214-18.1.29.org

报告时间: 2018-01-29, 9:42:01

← Brief introduction of experimental conditions

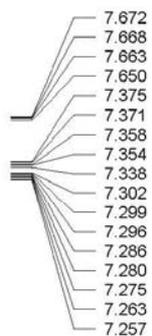
实验内容简介:
zw1-10-177-od-h-200-1-1-214

← Chromatogram Figure
色谱图(zw1-10-177-od-h-200-1-1-214-18.1.29.org)

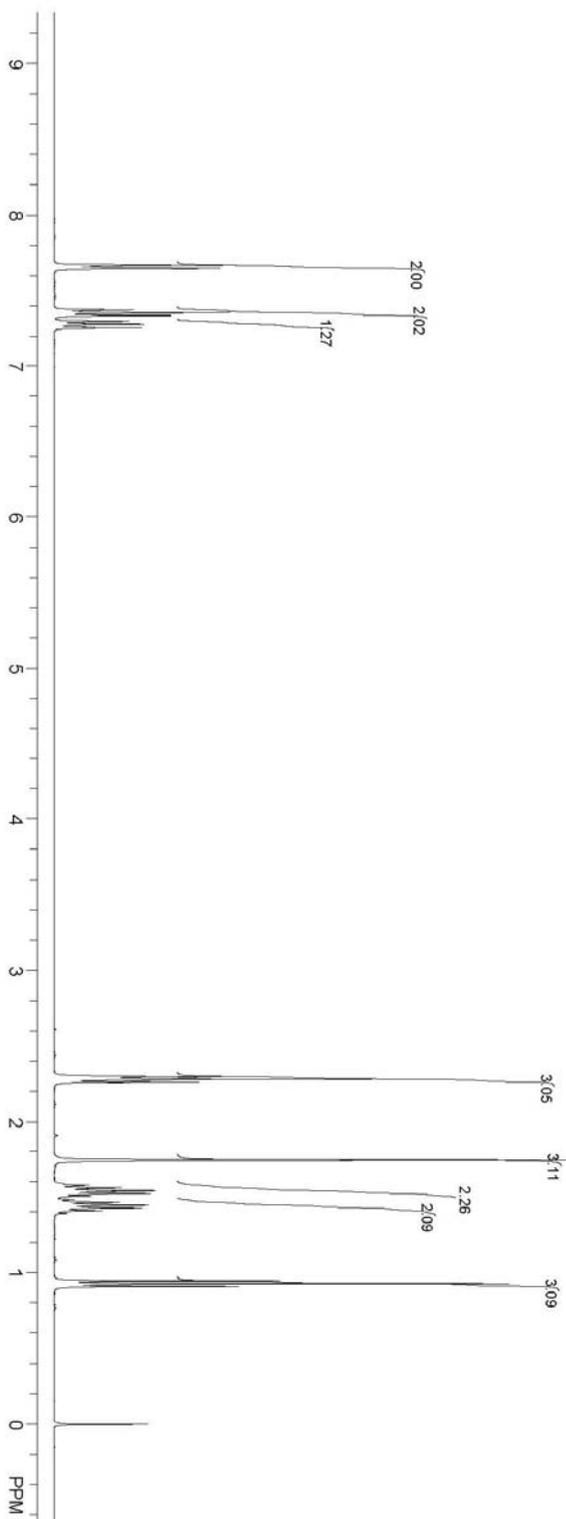
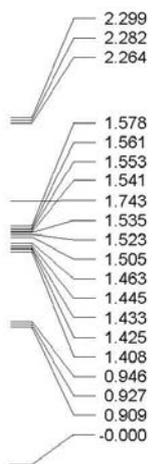
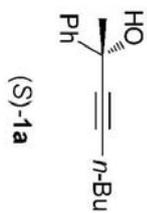


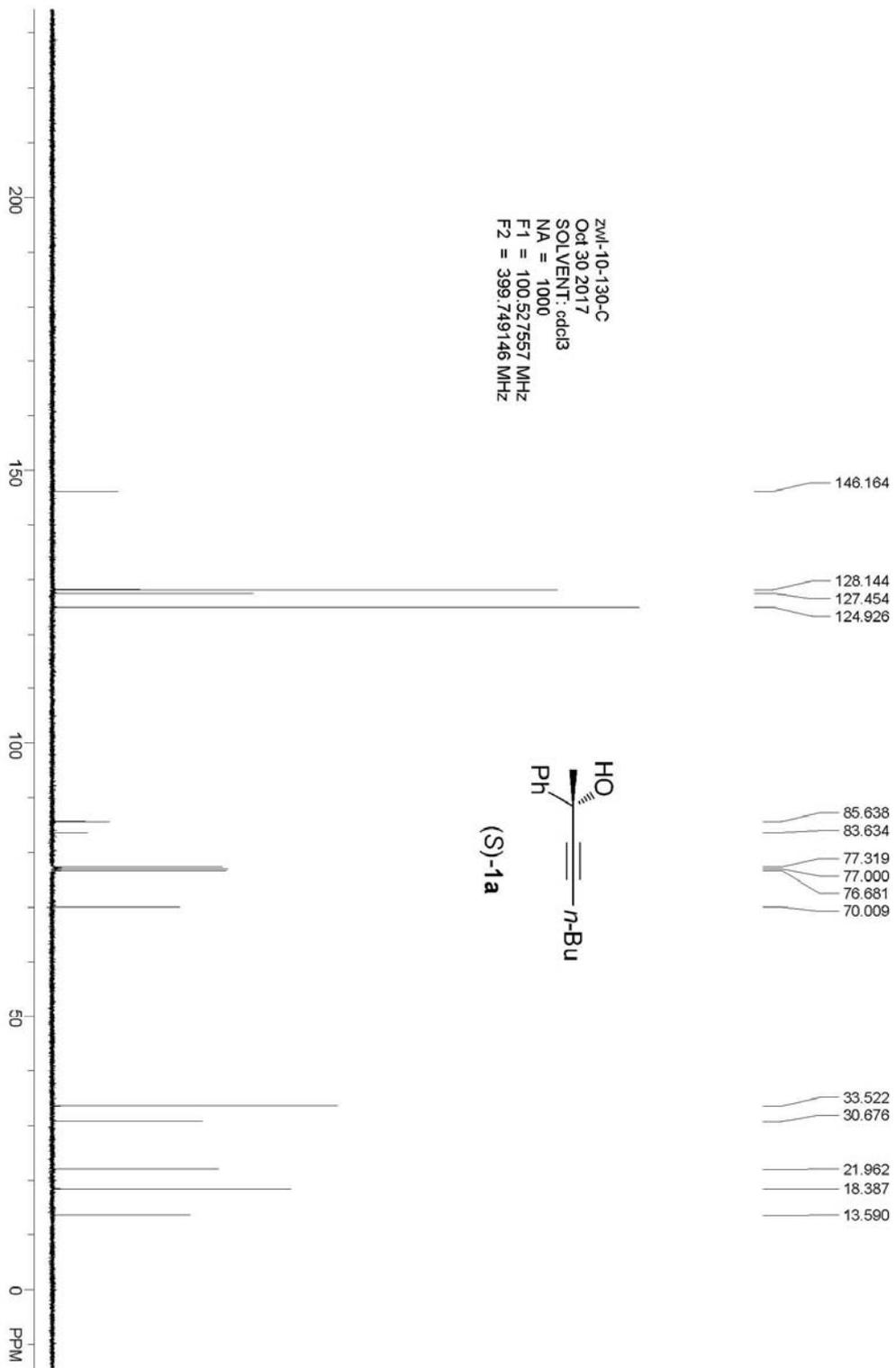
分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		22.802	477322.750	15513478.000	49.9342
2		25.715	416485.000	15554379.000	50.0658
总计			893807.750	31067857.000	100.0000



ZM-10-130-H
Oct 30 2017
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz





zwl-10-130

实验时间: 2017-10-29, 14:01:42

报告时间: 2017-10-29, 14:33:50

谱图文件: E:\data\zwl\zwl-10-130-od-h-200-1-1-214.org

方法文件: E:\data\zwl\zwl.mtd

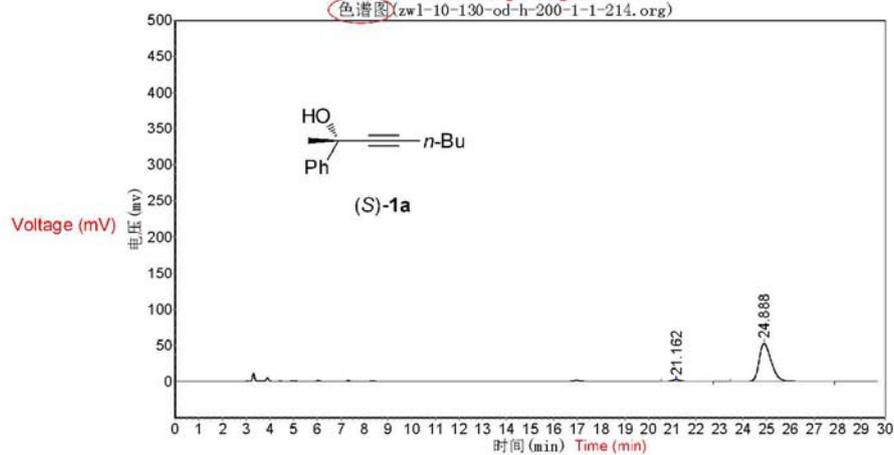
← Brief introduction of experimental conditions

实验内容简介:

zwl-10-130-od-h-200-1-1-214

← Chromatogram Figure

色谱图(zwl-10-130-od-h-200-1-1-214.org)



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		21.162	1963.569	56631.250	2.9201
2		24.888	52727.469	1882736.125	97.0799
总计			54691.038	1939367.375	100.0000

zw1-9-184

实验时间: 2017-10-29, 13:33:24

报告时间: 2017-10-29, 14:03:16

谱图文件: E:\data\zw1\zw1-9-184-od-h-200-1-1-214-17.10.29.org

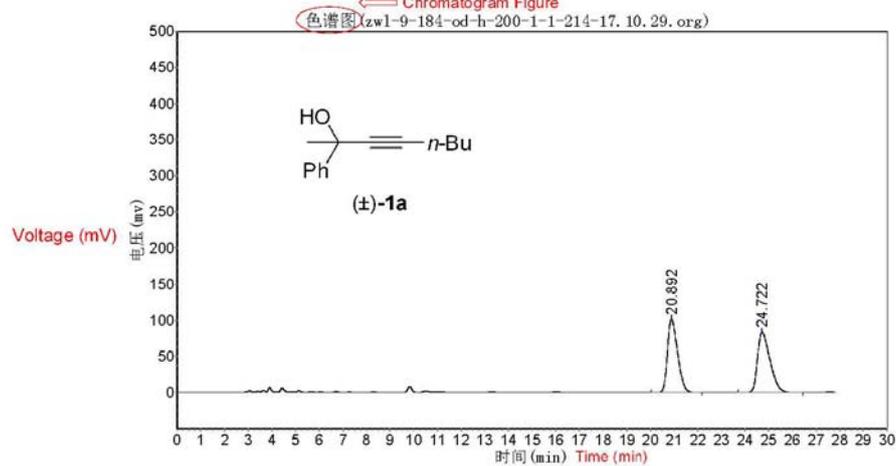
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

zw1-9-184-od-h-200-1-1-214

← Chromatogram Figure

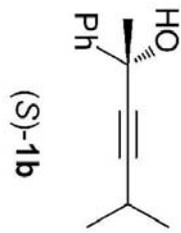


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		20.892	101460.320	3007729.750	49.6040
2		24.722	83459.898	3055757.750	50.3960
总计			184920.219	6063487.500	100.0000

7.665
7.662
7.643
7.366
7.348
7.328
7.289
7.276
7.272
7.253
7.243

zwl-11-51-H
Mar 1 2018
SOLVENT: odd3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz

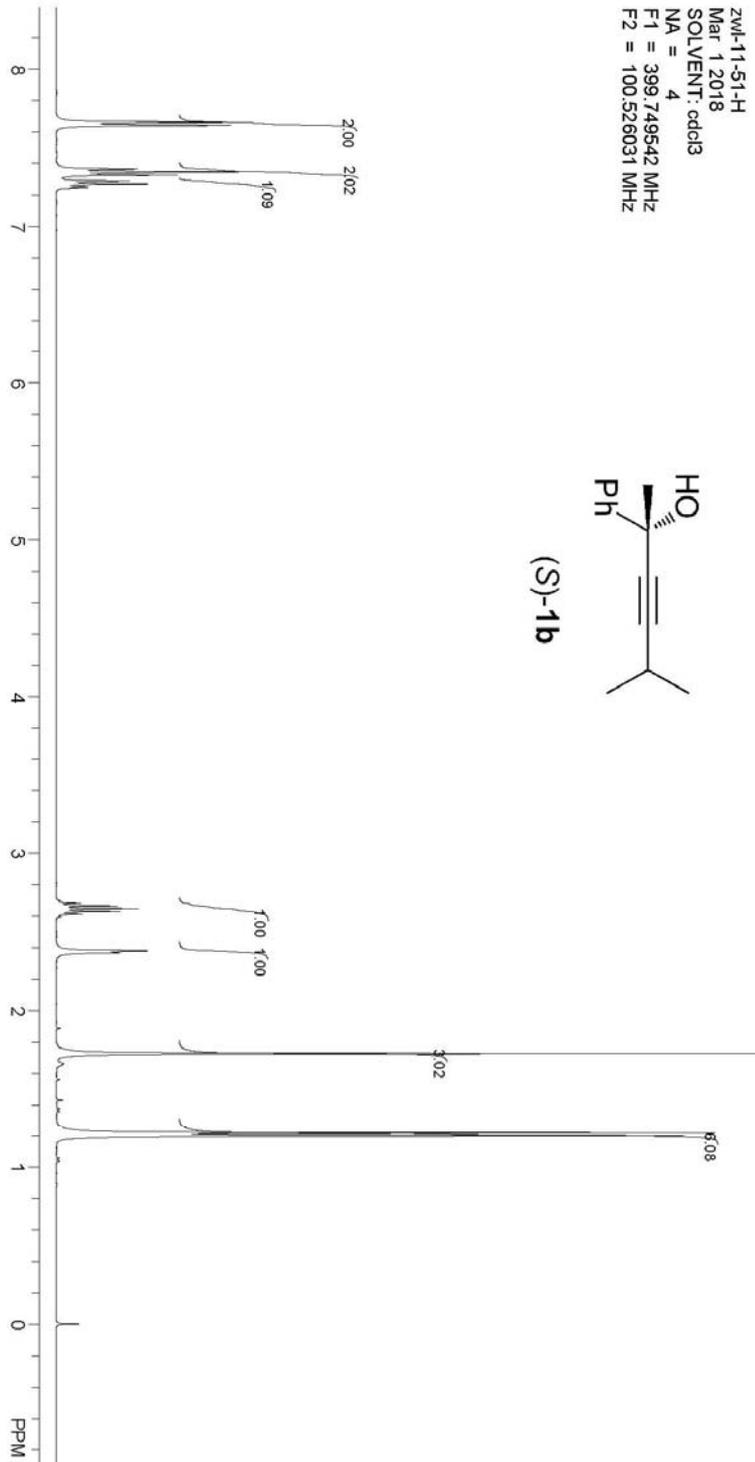


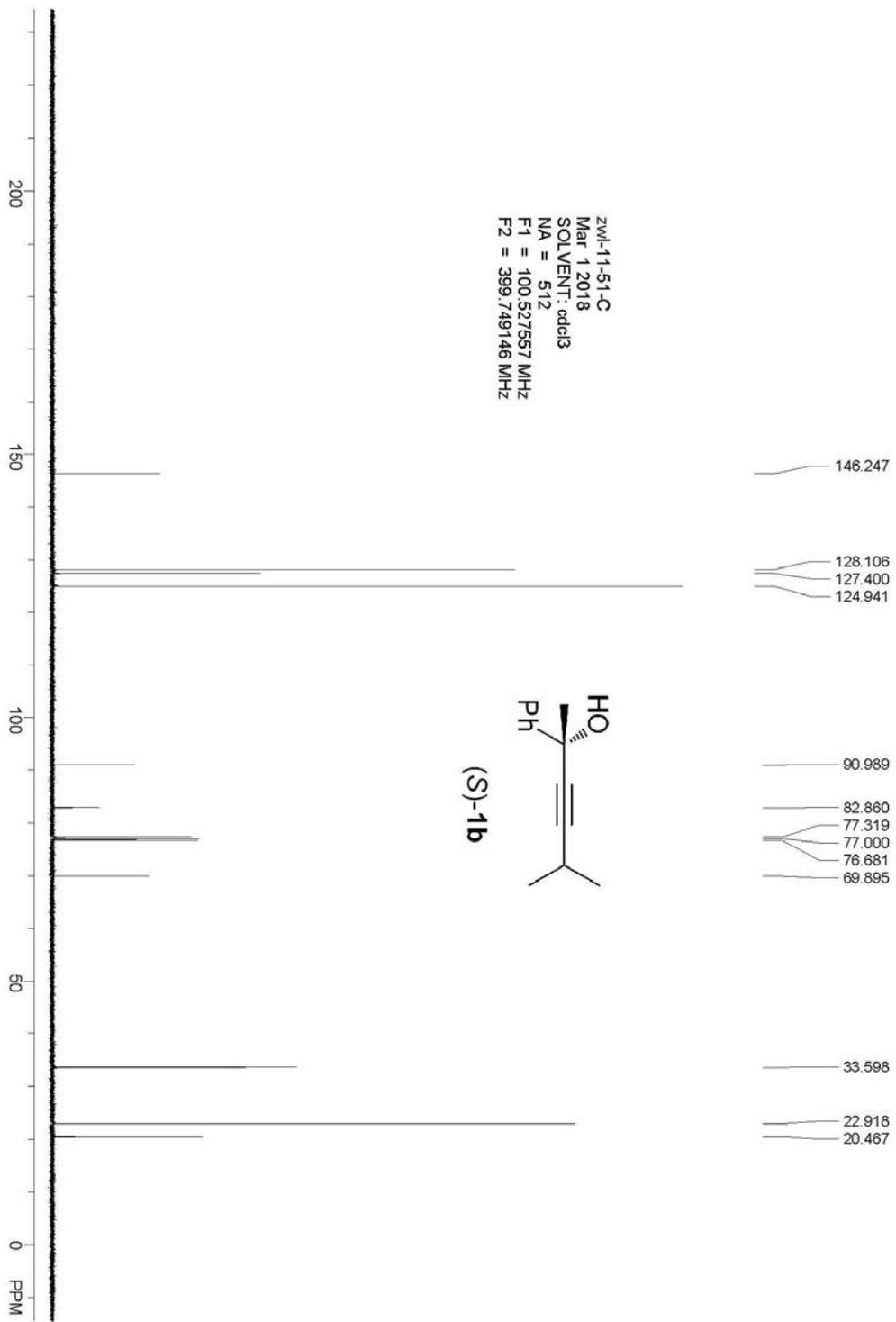
2.681
2.663
2.647
2.629
2.612
2.379
2.368

1.727

1.217
1.199

-0.000





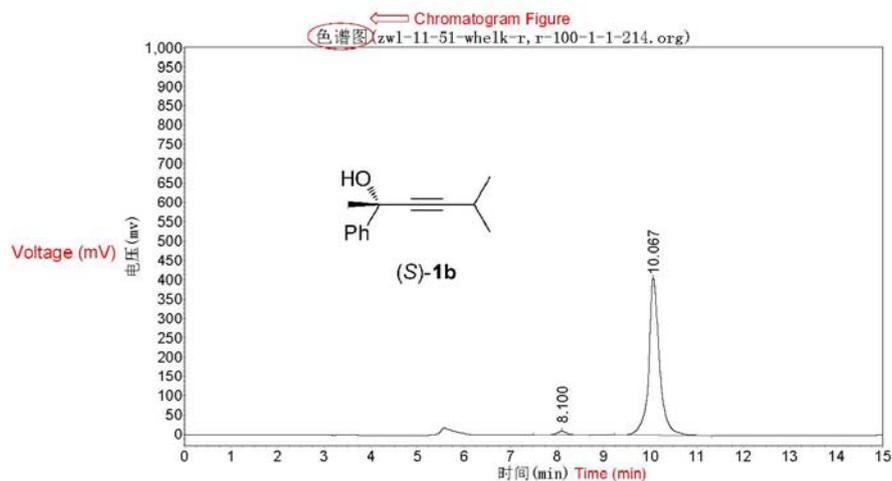
zw1-11-51-whe1k-r, r-100-1-1-214

实验时间: 2018-03-05, 17:54:12

报告时间: 2018-03-05, 19:29:56

谱图文件: D:\zhuguangjiang\zw1\20180305\zw1-11-51-whe1k-r, r-100-1-1-214. org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.100	10248.888	142264.516	2.1192
2		10.067	406127.938	6570812.500	97.8808
总计			416376.825	6713077.016	100.0000

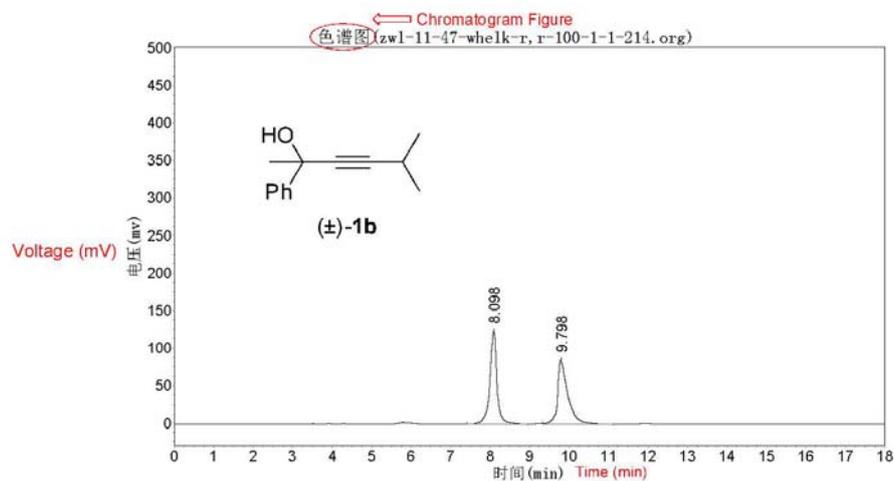
zw1-11-47-whe1k-r, r-100-1-1-214

实验时间: 2018-03-05, 17:34:13

报告时间: 2018-03-05, 19:26:45

谱图文件: D:\zhuguangjiang\zw1\20180305\zw1-11-47-whe1k-r, r-100-1-1-214.org

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		8.098	122880.539	1531053.875	50.2793
2		9.798	84950.438	1514043.500	49.7207
总计			207830.977	3045097.375	100.0000

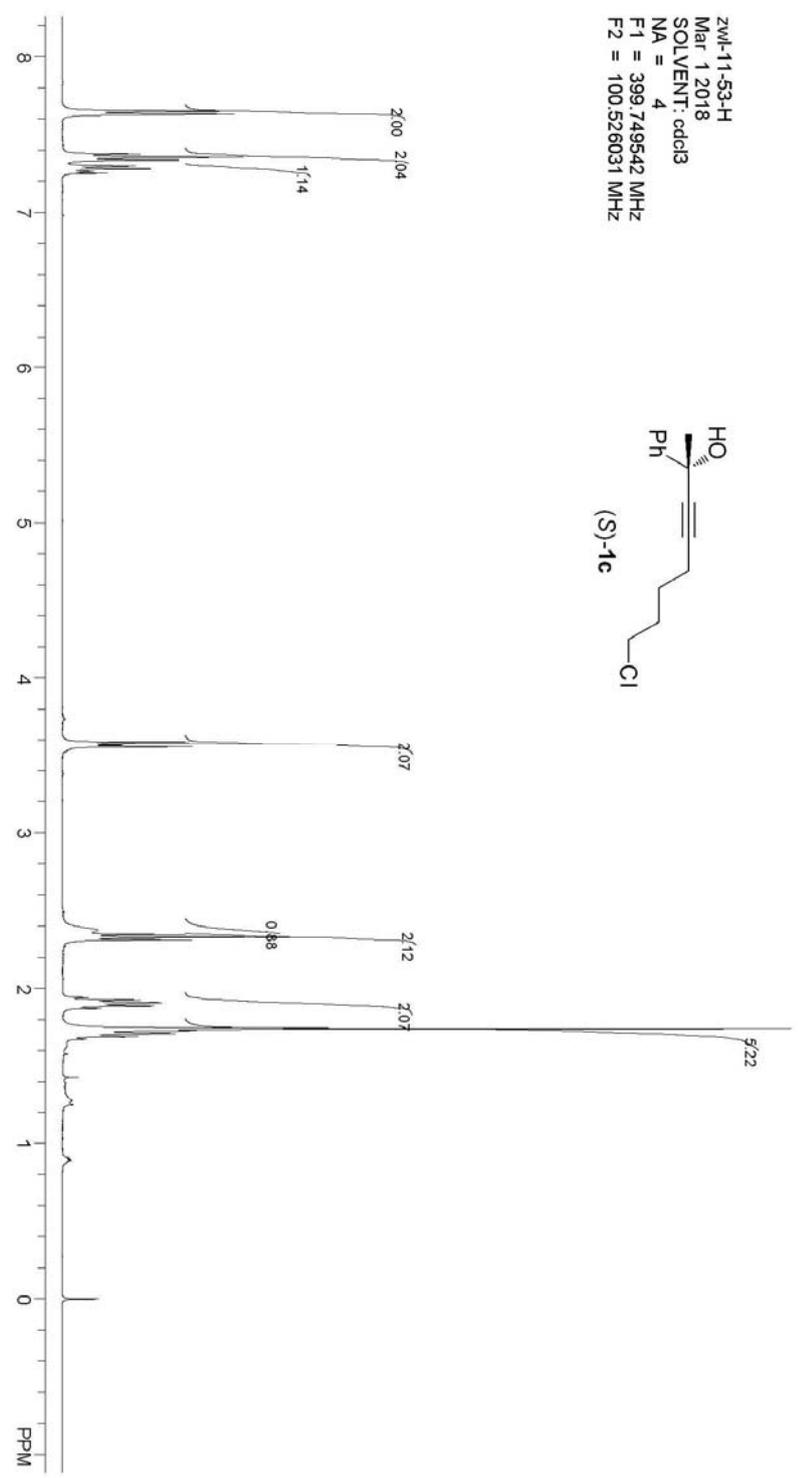
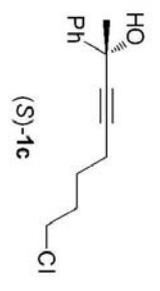
7.653
7.650
7.632
7.373
7.369
7.356
7.336
7.299
7.280
7.252

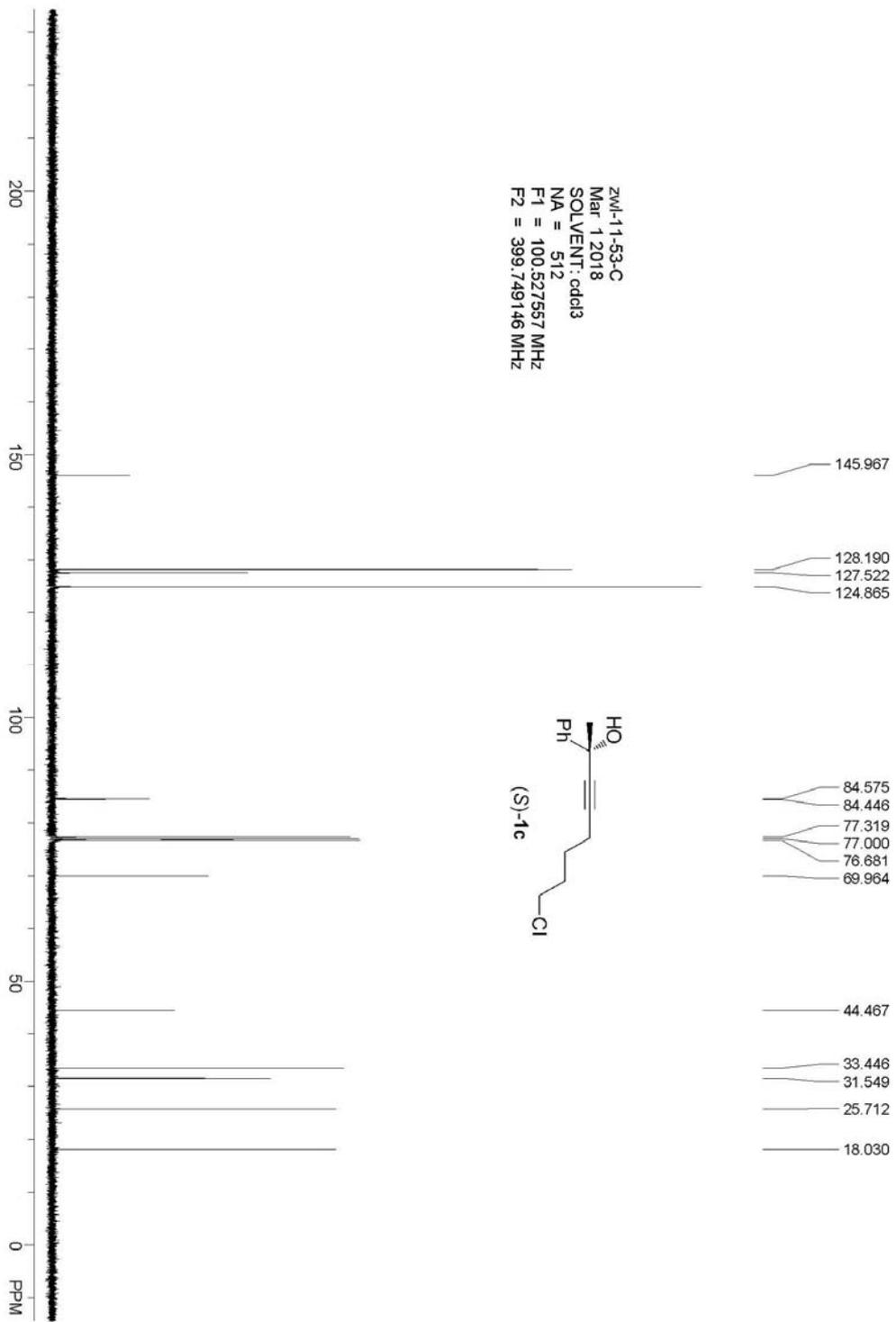
3.586
3.570
3.553

2.375
2.346
2.330
2.312
1.925
1.917
1.909
1.888
1.871
1.742
1.730
1.710
1.692

-0.000

ZW-11-53-H
Mar 1 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz





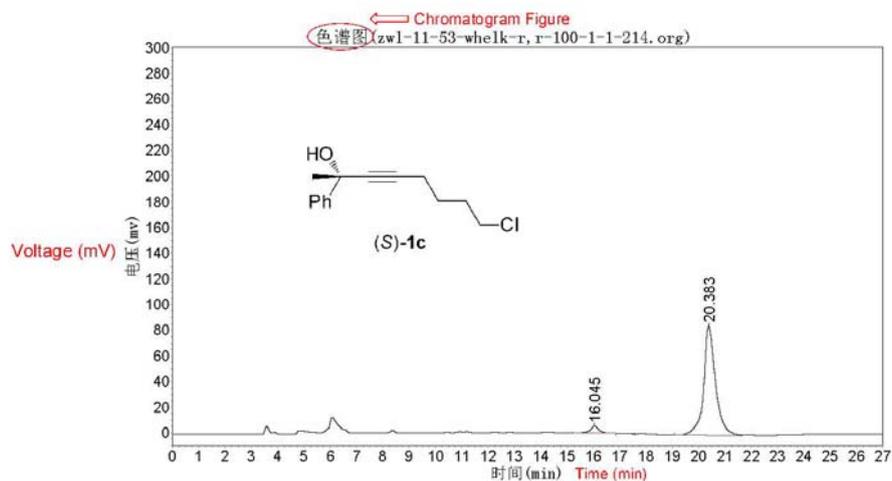
zw1-11-53-whe1k-r, r-100-1-1-214

实验时间: 2018-03-05, 9:50:11

报告时间: 2018-03-05, 19:33:41

谱图文件: D:\zhuguangjiang\zw1\20180305\zw1-11-53-whe1k-r, r-100-1-1-214.org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		16.045	5581.602	136916.781	4.8496
2		20.383	85107.570	2686343.500	95.1504
总计			90689.172	2823260.281	100.0000

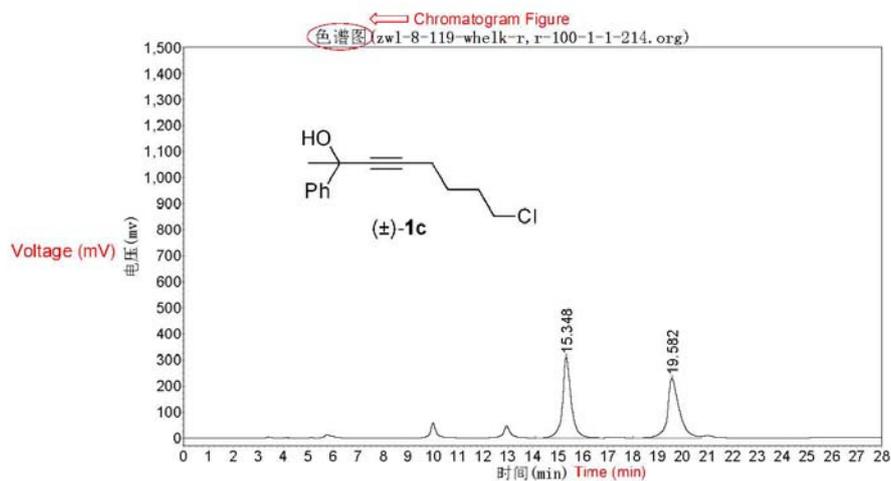
zw1-8-119-whe1k-r, r-100-1-1-214

实验时间: 2018-03-05, 10:46:32

报告时间: 2018-03-05, 19:31:22

谱图文件: D:\zhuguangjiang\zw1\20180305\zw1-8-119-whe1k-r, r-100-1-1-214.org

实验内容简介:

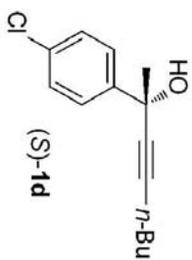


分析结果表

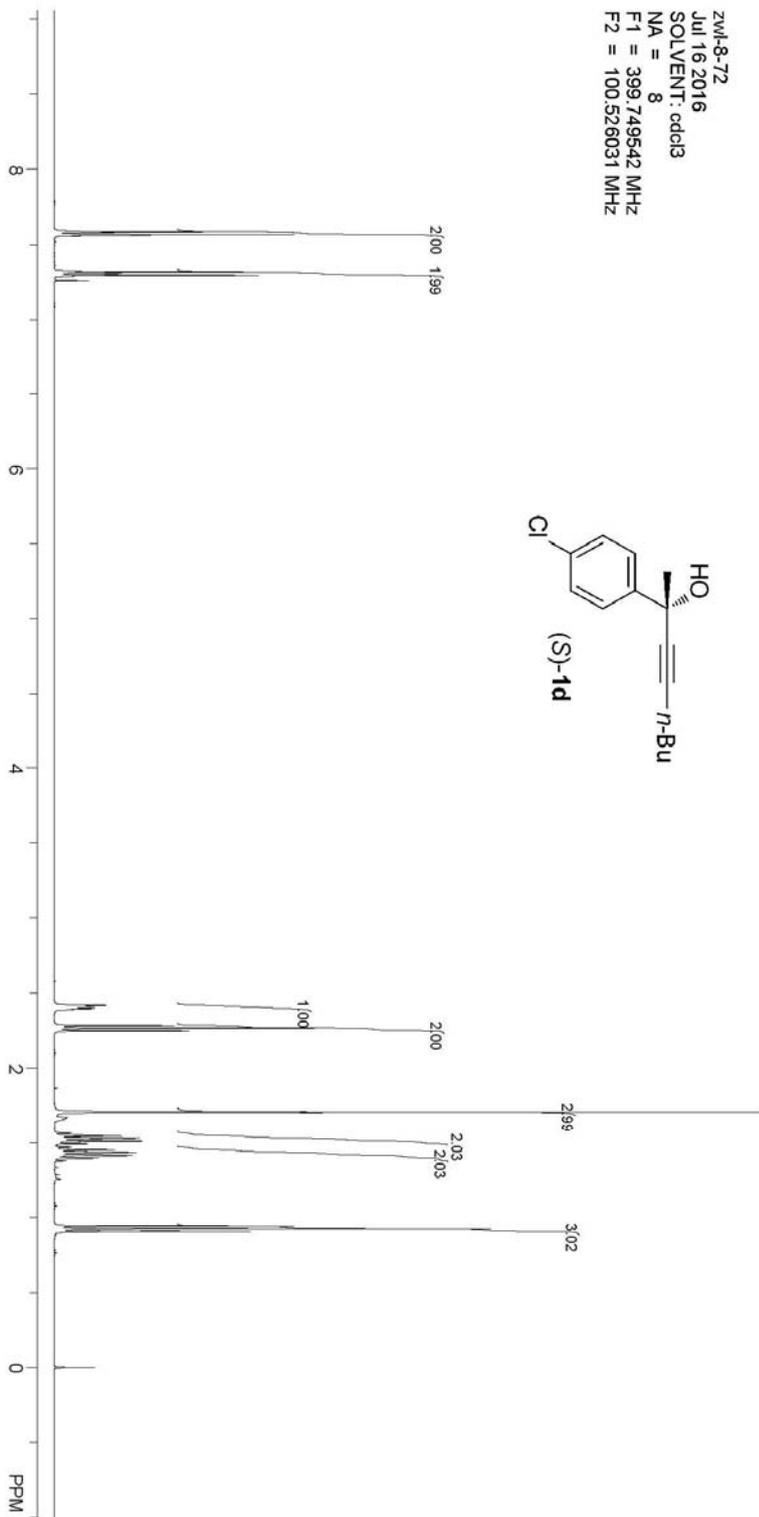
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		15.348	310365.969	7532668.000	49.9841
2		19.582	228387.781	7537453.000	50.0159
总计			538753.750	15070121.000	100.0000

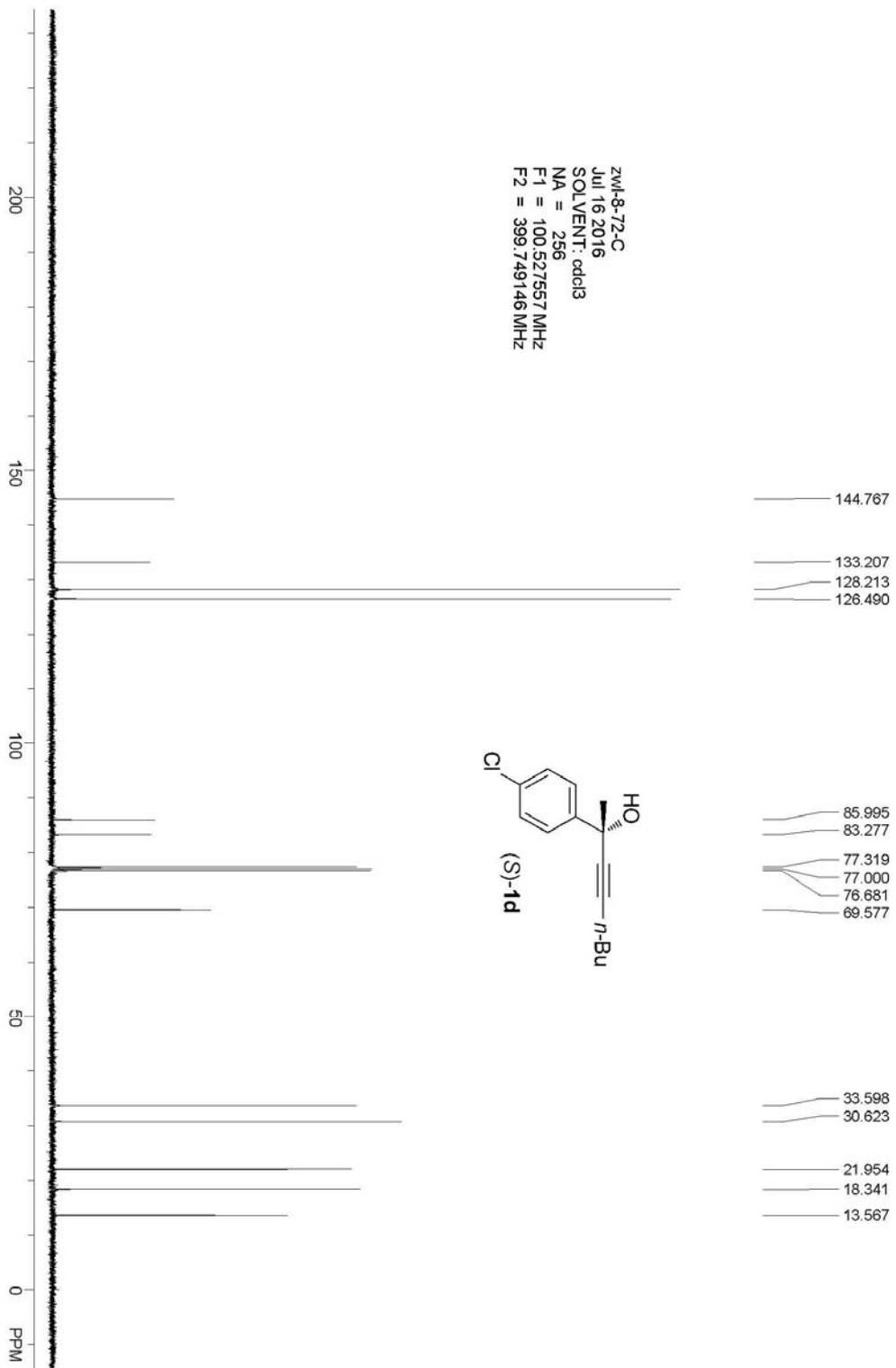
7.587
7.582
7.570
7.565
7.322
7.317
7.312
7.300
7.295
7.259

zwl-8-72
Jul 16 2016
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



2.419
2.407
2.397
2.285
2.267
2.249
1.708
1.547
1.540
1.530
1.528
1.522
1.509
1.492
1.451
1.438
1.432
1.419
1.411
1.394
0.942
0.923
0.905
-0.000





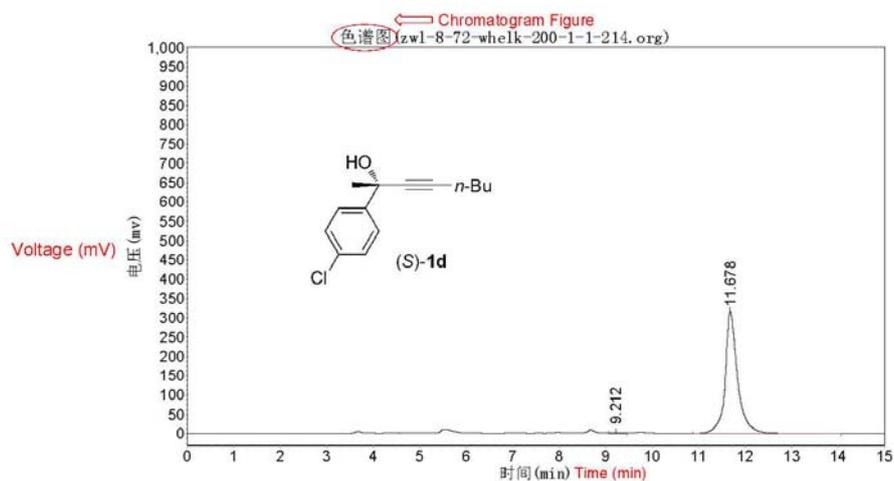
zw1-8-72-whelk-200-1-1-214

实验时间: 2016-04-05, 12:08:52

报告时间: 2016-04-05, 14:57:10

谱图文件: D:\zhuguangjiang\zw1\20160405\zw1-8-72-whelk-200-1-1-214.org

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		9.212	2170.168	32412.957	0.5475
2		11.678	317154.500	5888037.500	99.4525
总计			319324.668	5920450.457	100.0000

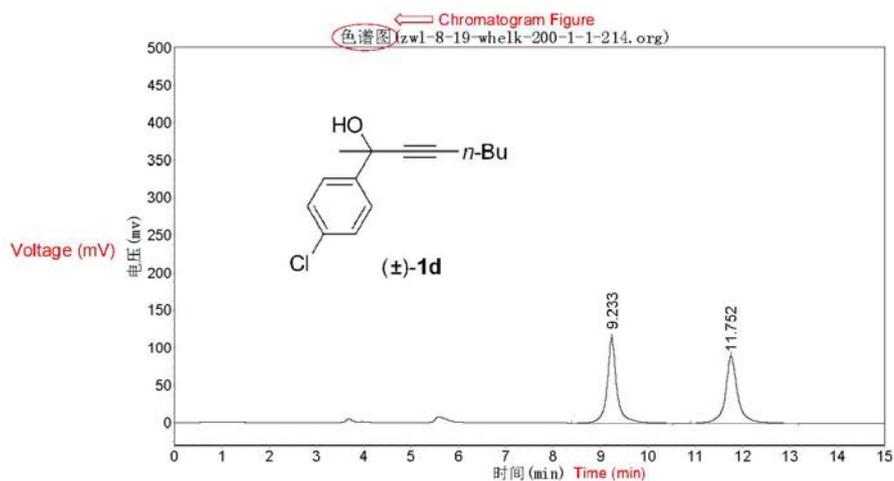
zw1-8-19-whelk-200-1-1-214

实验时间: 2016-04-05, 12:42:42

报告时间: 2016-04-05, 14:55:18

谱图文件: D:\zhuguangjiang\zw1\20160405\zw1-8-19-whelk-200-1-1-214.org

实验内容简介:



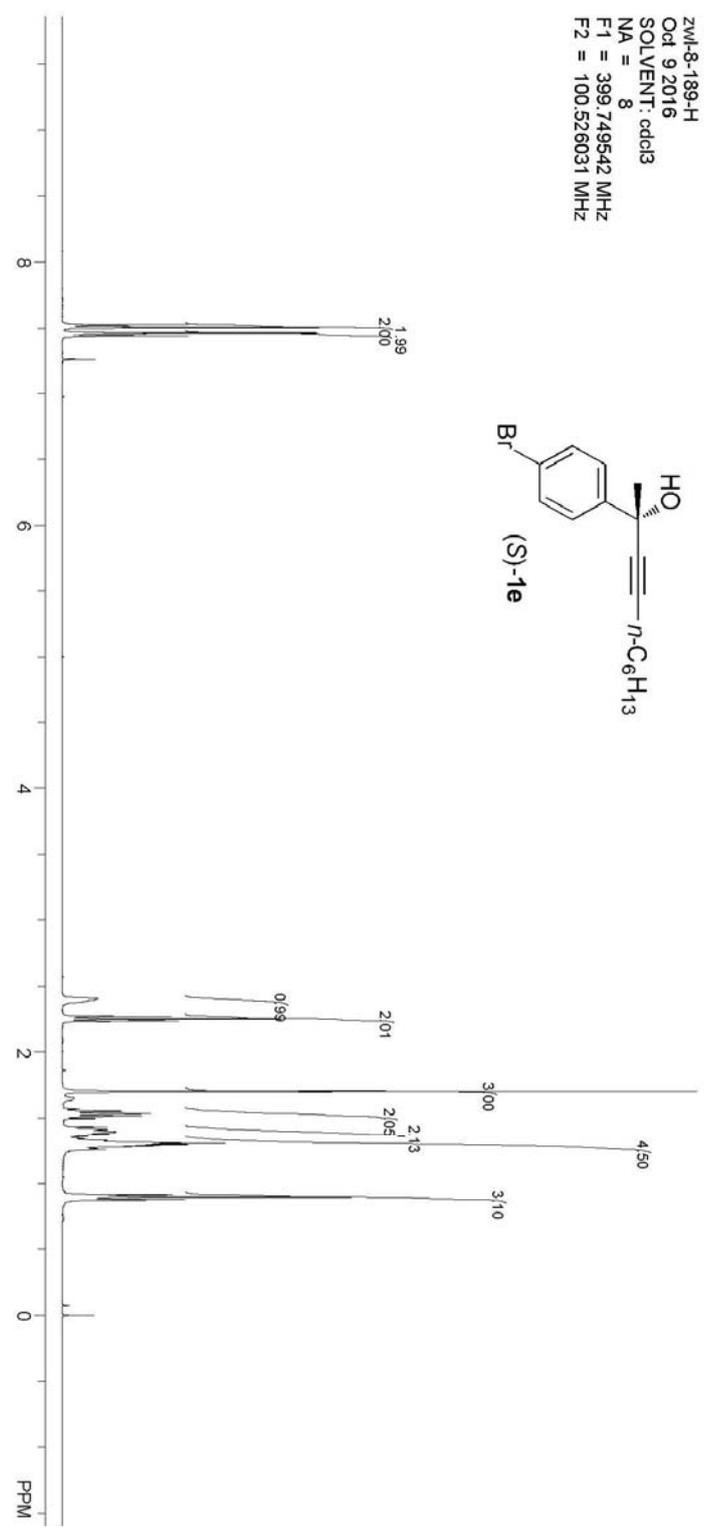
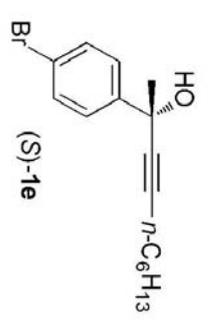
分析结果表

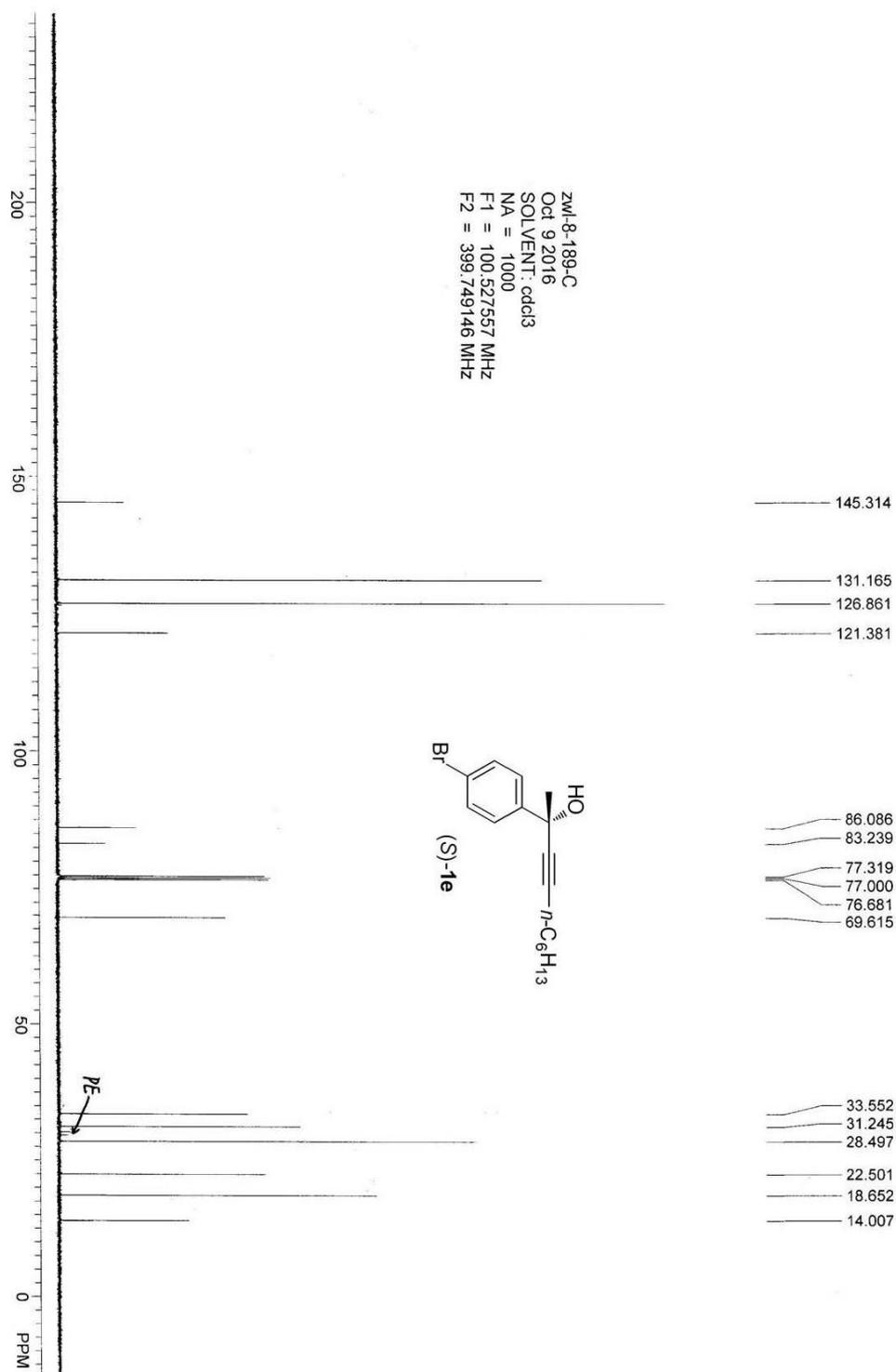
峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		9.233	113819.242	1617175.125	50.1100
2		11.752	89607.492	1610075.500	49.8900
总计			203426.734	3227250.625	100.0000

7.534
7.528
7.524
7.512
7.506
7.470
7.465
7.460
7.449
7.444
7.257

2.395
2.272
2.254
2.236
1.703
1.570
1.553
1.535
1.516
1.498
1.430
1.413
1.396
1.376
1.348
1.303
1.295
1.279
1.265
1.257
0.910
0.894
0.876
-0.000

zwl-8-189-H
Oct 9 2016
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.528031 MHz





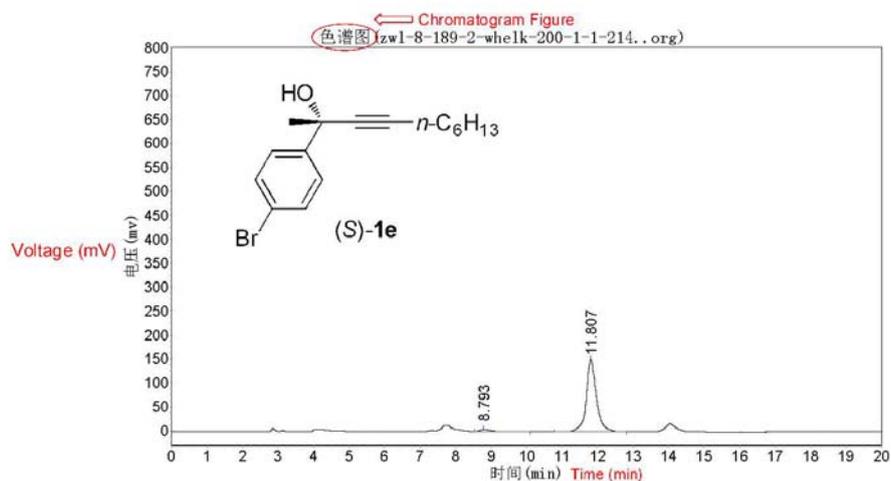
zwl-8-189-2-whe1k-200-1-1-214

实验时间: 2016-06-29, 15:02:56

报告时间: 2016-06-29, 15:33:13

谱图文件: D:\zhuguangjiang\zwl\20160628\zwl-8-189-2-whe1k-200-1-1-214..org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.793	4195.861	115529.656	3.6861
2		11.807	150679.828	3018661.500	96.3139
总计			154875.689	3134191.156	100.0000

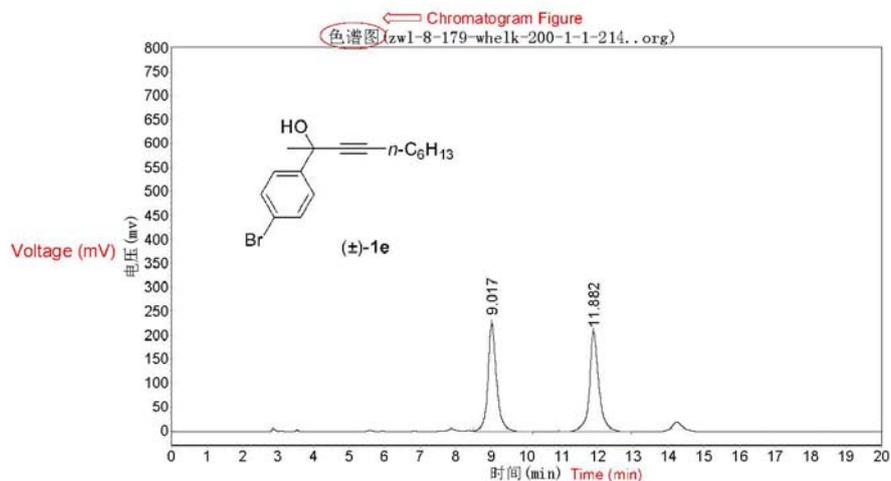
zw1-8-179-whe1k-200-1-1-214

实验时间: 2016-06-29, 14:36:15

报告时间: 2016-06-29, 15:32:21

谱图文件: D:\zhuguangjiang\zw1\20160628\zw1-8-179-whe1k-200-1-1-214..org

实验内容简介:



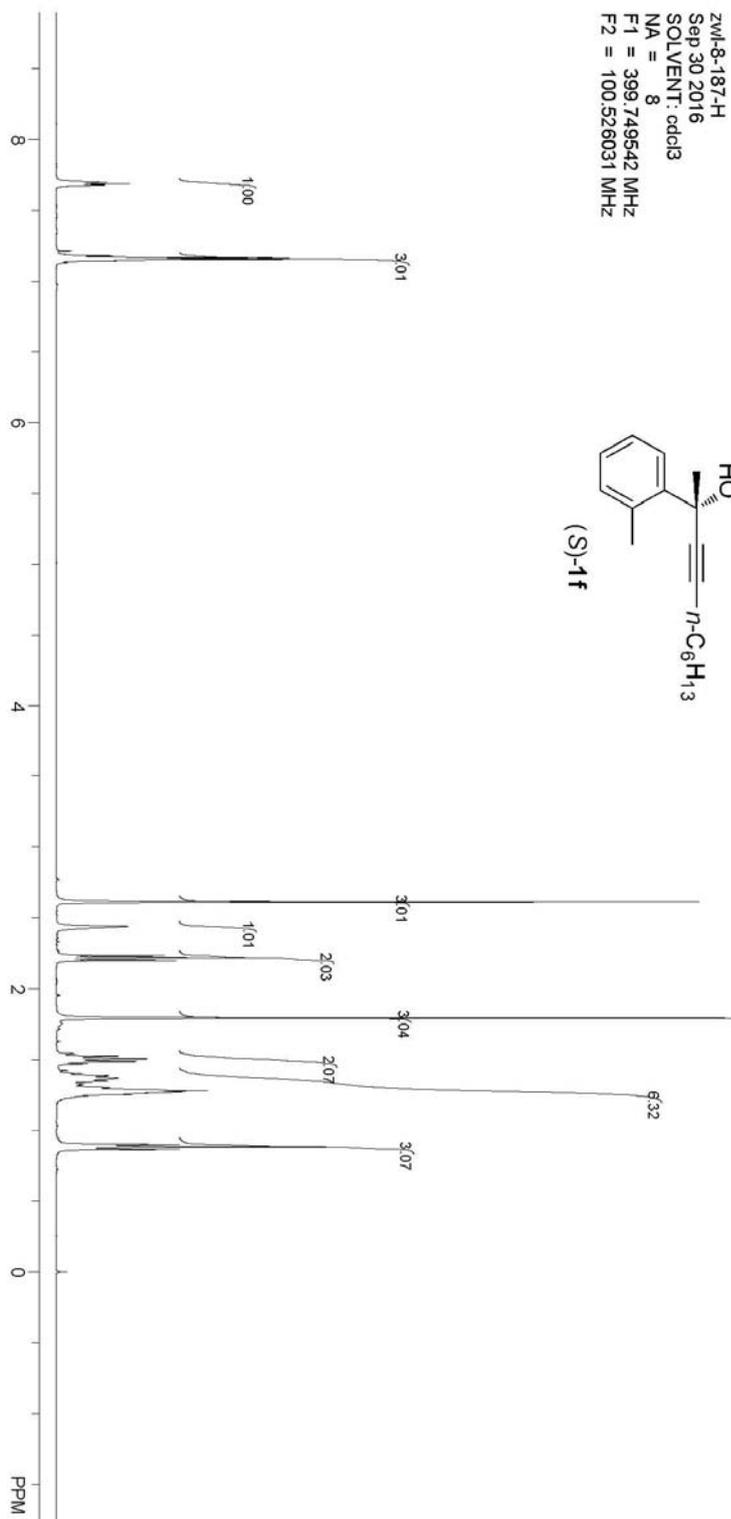
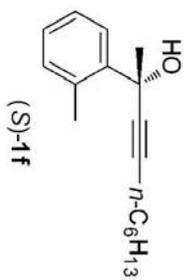
分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		9.017	225030.719	3837817.500	49.6912
2		11.882	208576.016	3885510.250	50.3088
总计			433606.734	7723327.750	100.0000

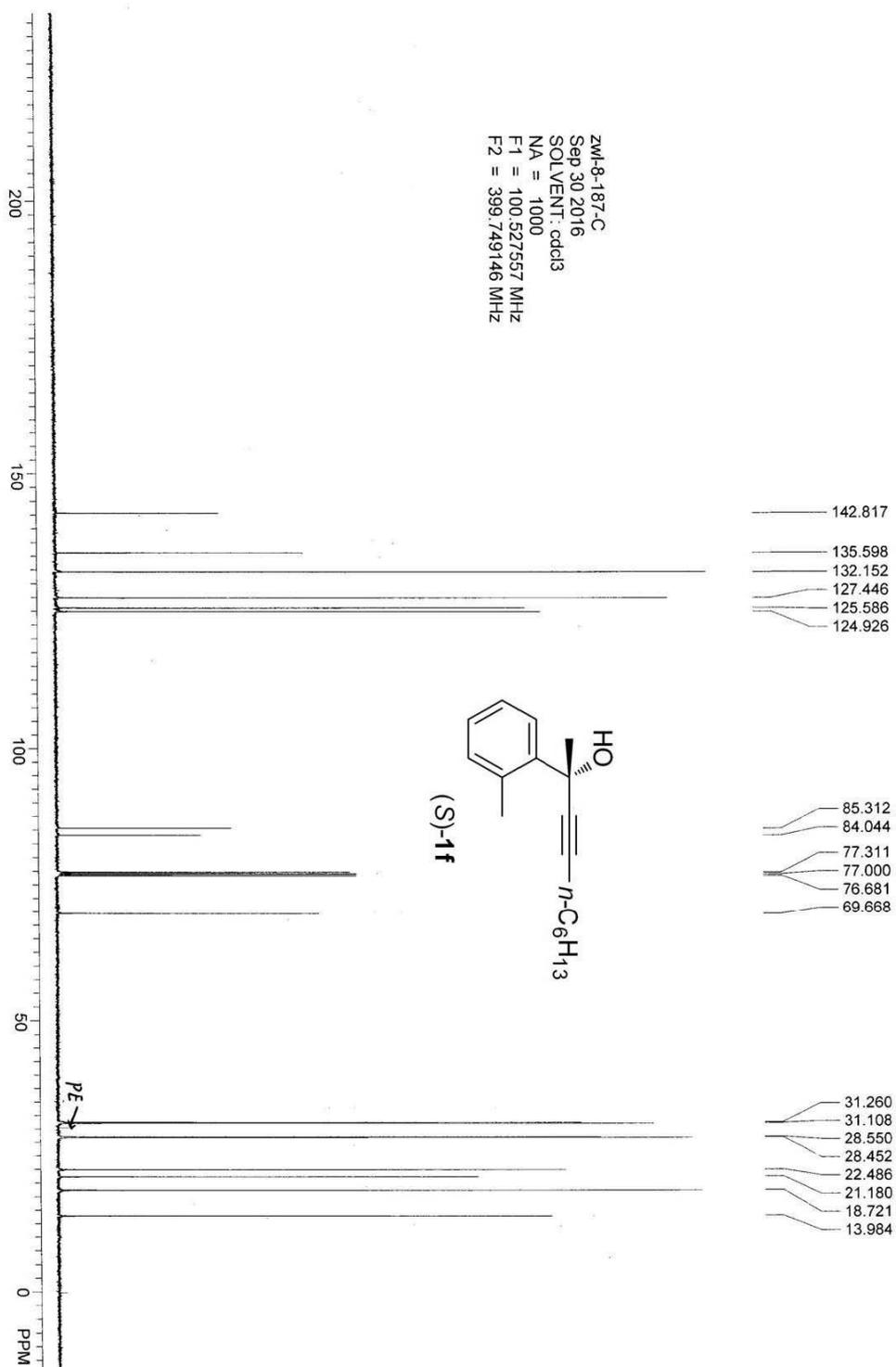
7.701
7.687
7.680
7.669
7.214
7.180
7.167
7.156
7.147
7.134

2.611
2.440
2.235
2.217
2.198
1.794
1.543
1.526
1.507
1.488
1.470
1.425
1.406
1.388
1.368
1.350
1.328
1.303
1.281
1.273
1.256
1.246
1.232
0.897
0.879
0.861
0.000

zwl-8-187-H
Sep 30 2016
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.528031 MHz



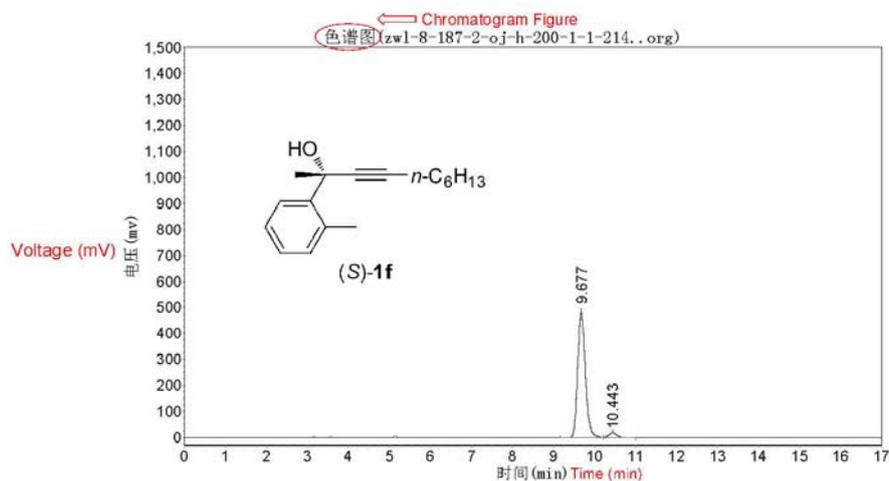
zwl-8-187-C
Sep 30 2016
SOLVENT: cdcl3
NA = 1000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zw1-8-187-2-oj-h-200-1-1-214

实验时间: 2016-06-29, 17:23:58 报告时间: 2016-06-29, 17:45:23
 谱图文件: D:\zhuguangjiang\zw1\20160628\zw1-8-187-2-oj-h-200-1-1-214..org

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		9.677	482537.094	6328731.000	95.5790
2		10.443	18904.176	292732.063	4.4210
总计			501441.270	6621463.063	100.0000

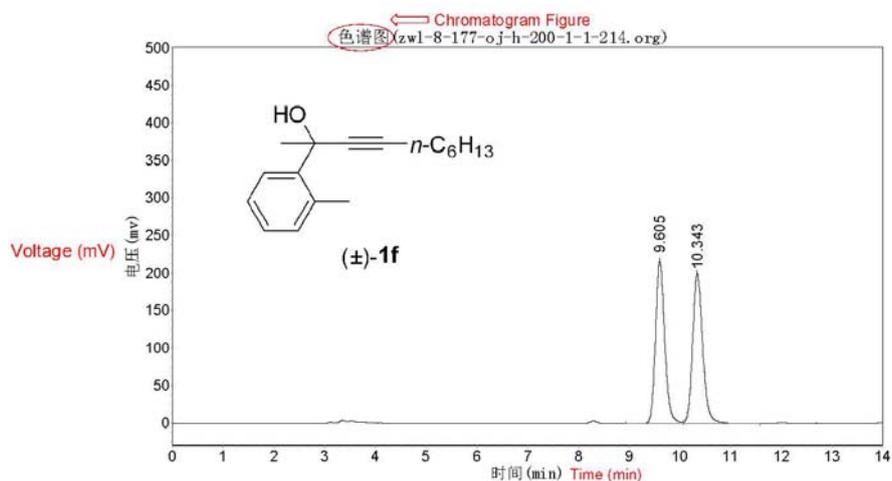
zw1-8-177-oj-h-200-1-1-214

实验时间: 2016-06-29, 16:56:01

报告时间: 2016-06-29, 17:26:43

谱图文件: D:\zhuguangjiang\zw1\20160628\zw1-8-177-oj-h-200-1-1-214.org

实验内容简介:

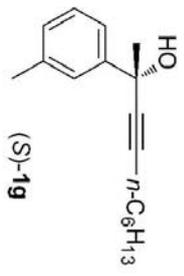


分析结果表

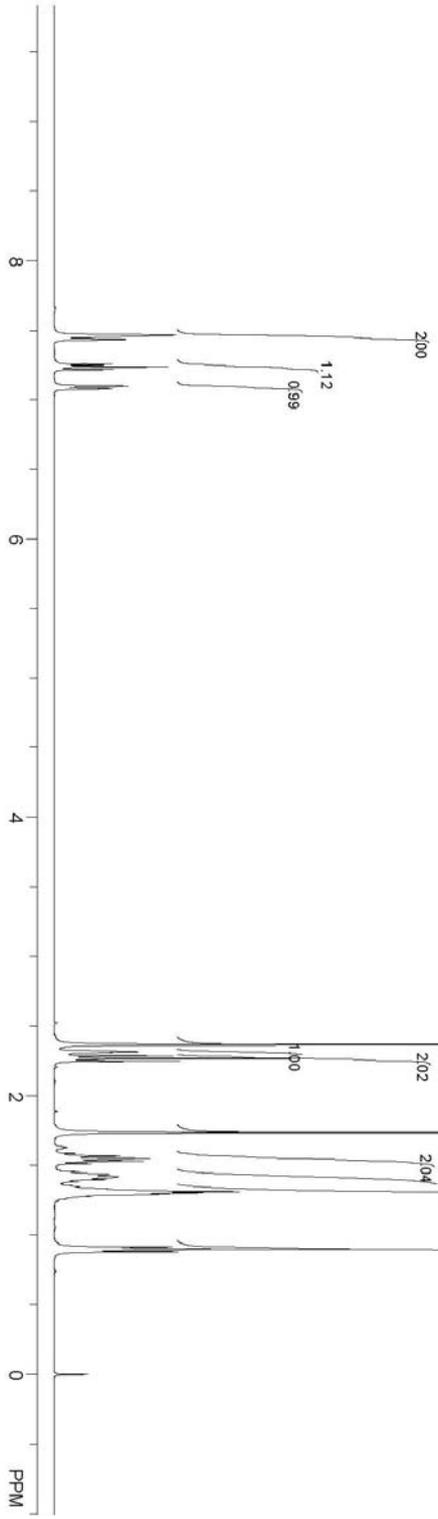
峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		9.605	216347.641	2735003.000	49.7589
2		10.343	200223.797	2761504.250	50.2411
总计			416571.438	5496507.250	100.0000

7.470
7.468
7.439
7.253
7.244
7.234
7.215
7.097
7.078

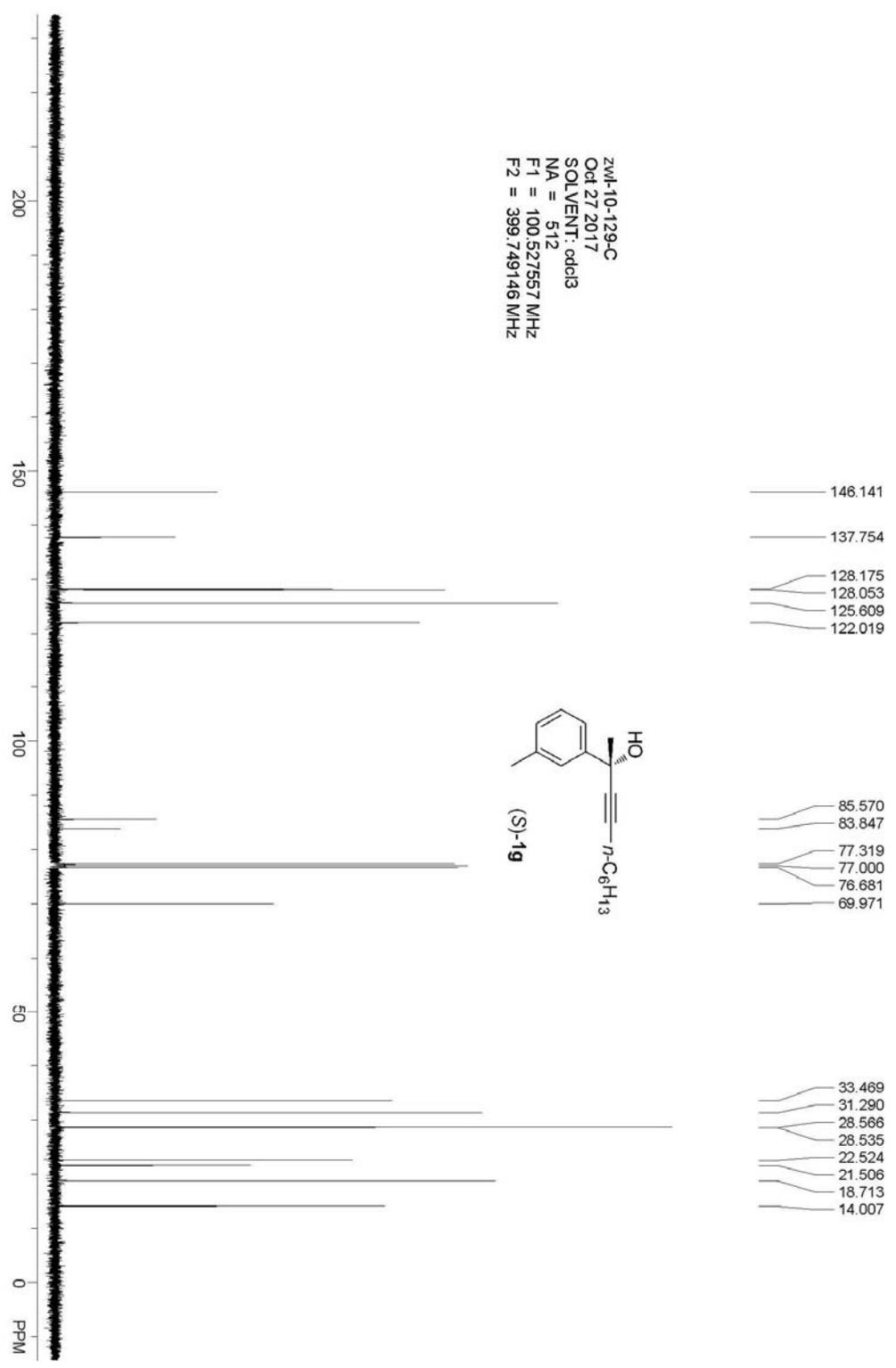
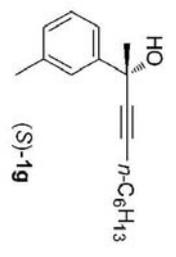
zwl-10-129-H
Oct 26 2017
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



2.368
2.316
2.286
2.269
2.250
1.732
1.582
1.565
1.547
1.528
1.510
1.452
1.434
1.416
1.396
1.379
1.353
1.329
1.309
1.301
1.291
1.275
1.268
0.911
0.895
0.877
-0.000



zwl-10-129-C
Oct 27 2017
SOLVENT: cdcl3
NA = 512
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zwl-10-129

实验时间: 2017-10-25, 21:24:18

报告时间: 2017-10-25, 21:38:47

谱图文件: E:\data\zwl\zwl-10-129-whehk-s, s-200-1-1-214.org

方法文件: E:\data\zwl\zwl.mtd

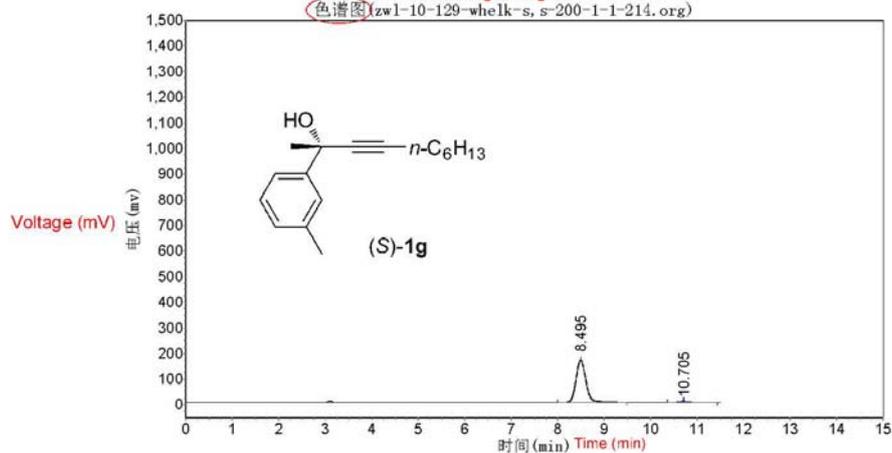
Brief introduction of experimental conditions

实验内容简介:

zwl-10-129-whehk-s, s-200-1-1-214

Chromatogram Figure

色谱图 (zwl-10-129-whehk-s, s-200-1-1-214.org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.495	164122.281	2422488.750	97.3211
2		10.705	3391.566	66683.594	2.6789
总计			167513.847	2489172.344	100.0000

zw1-10-61

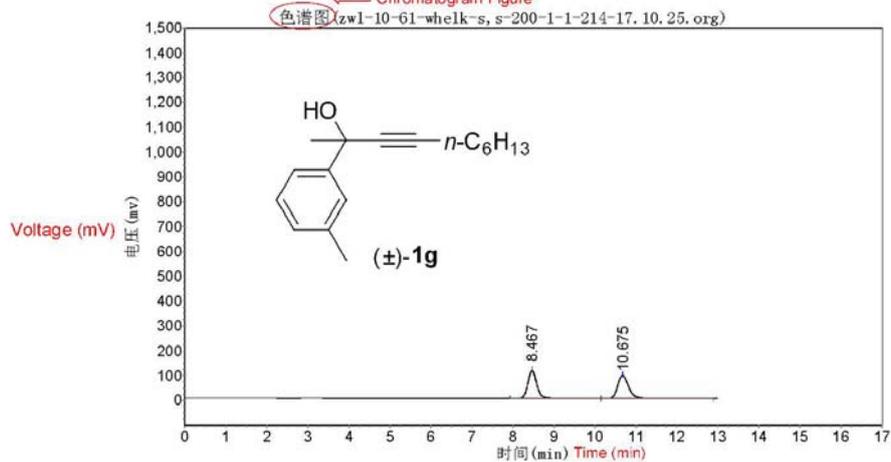
实验时间: 2017-10-25, 21:10:46
谱图文件: E:\data\zw1\zw1-10-61-wheelk-s, s-200-1-1-214-
17.10.25.org
方法文件: E:\data\zw1\zw1.mtd

报告时间: 2017-10-25, 21:25:20

← Brief introduction of experimental conditions

实验内容简介:
zw1-10-61-wheelk-s, s-200-1-1-214

← Chromatogram Figure

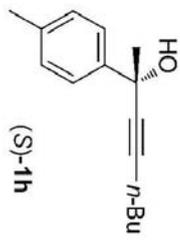


分析结果表

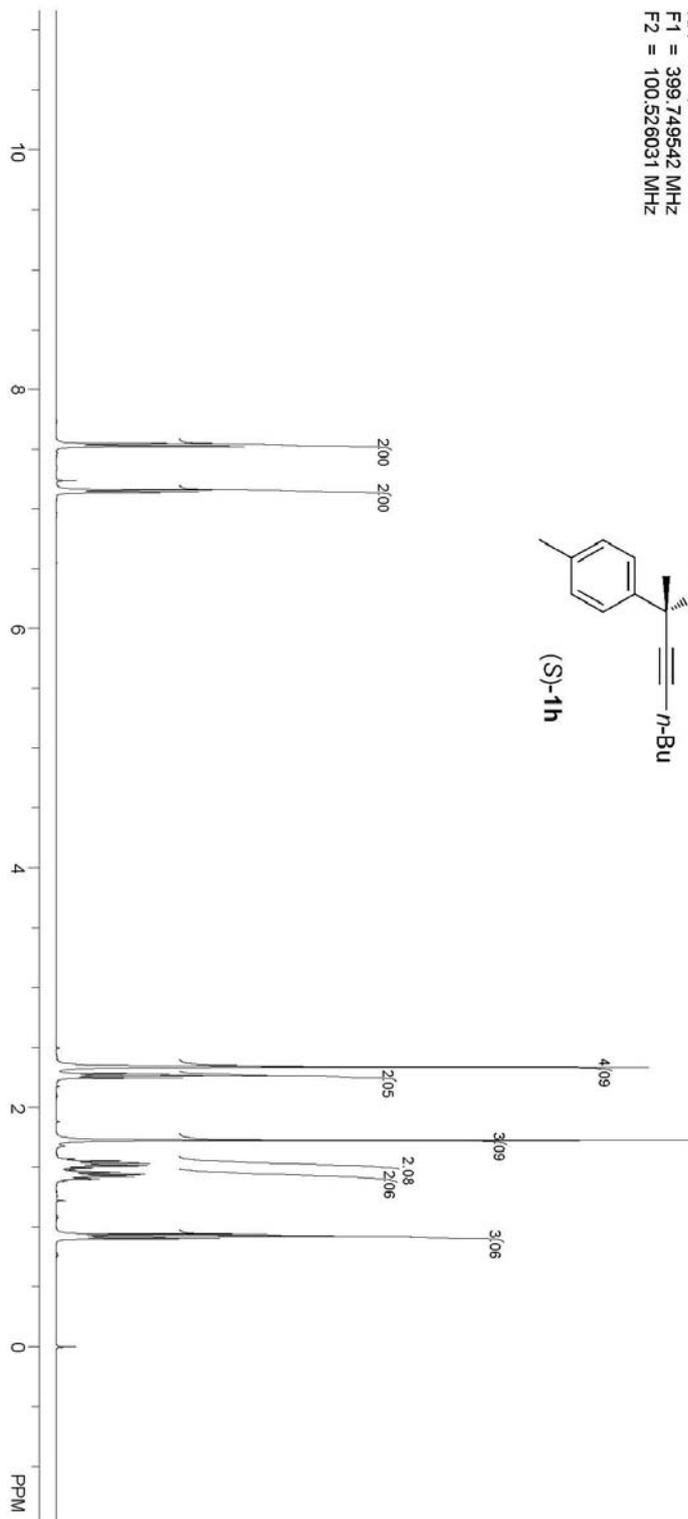
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.467	110892.078	1724765.625	50.0332
2		10.675	91118.008	1722478.000	49.9668
总计			202010.086	3447243.625	100.0000

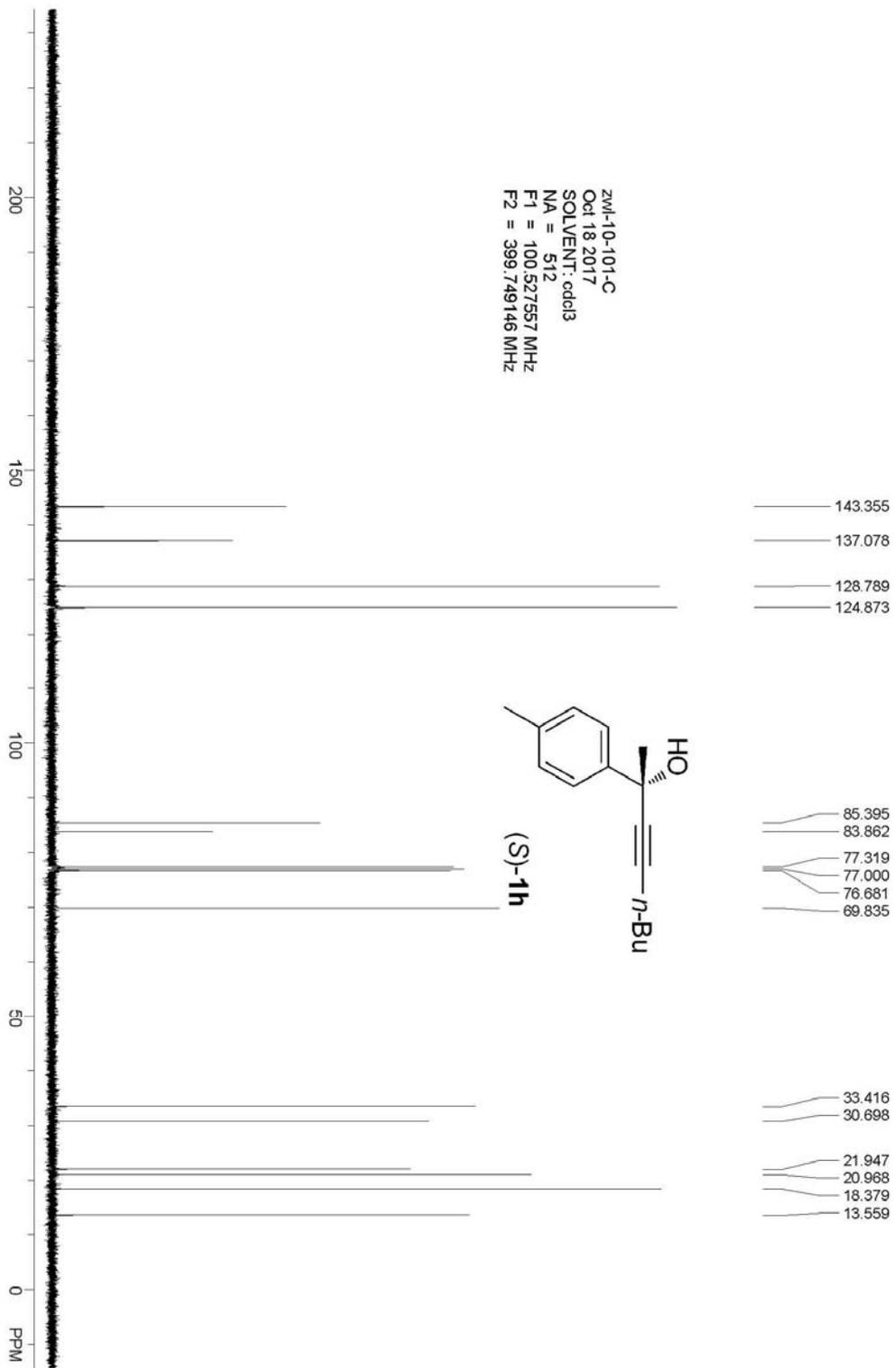
zwl-10-101-H
Oct 18 2017
SOLVENT: cddcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz

7.543
7.522
7.235
7.160
7.139



2.339
2.283
2.266
2.247
1.722
1.563
1.548
1.529
1.511
1.494
1.473
1.455
1.438
1.418
1.400
0.939
0.921
0.902
0.000





zwl-10-101

实验时间: 2017-10-14, 10:12:49

报告时间: 2017-10-17, 14:08:31

谱图文件: E:\data\zwl\zwl-10-101-whehk-s, s-200-1-1-214.org

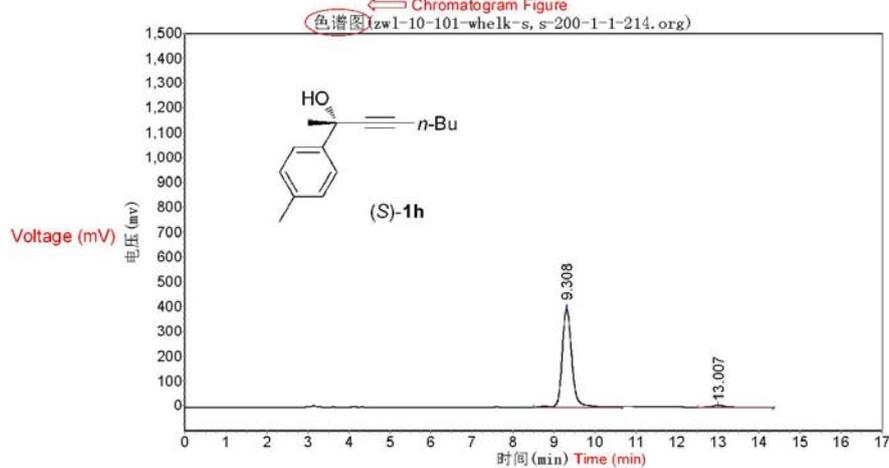
方法文件: E:\data\zwl\zwl.mtd

← Brief introduction of experimental conditions

实验内容简介:

zwl-10-101-whehk-s, s-200-1-1-214

← Chromatogram Figure



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		9.308	395926.438	6607310.000	97.1977
2		13.007	7925.763	190493.828	2.8023
总计			403852.200	6797803.828	100.0000

zw1-8-20

实验时间: 2017-10-14, 9:54:41
谱图文件: E:\data\zw1\zw1-8-20-wheelk-s, s-200-1-1-214-
17.10.14.org
方法文件: E:\data\zw1\zw1.mtd

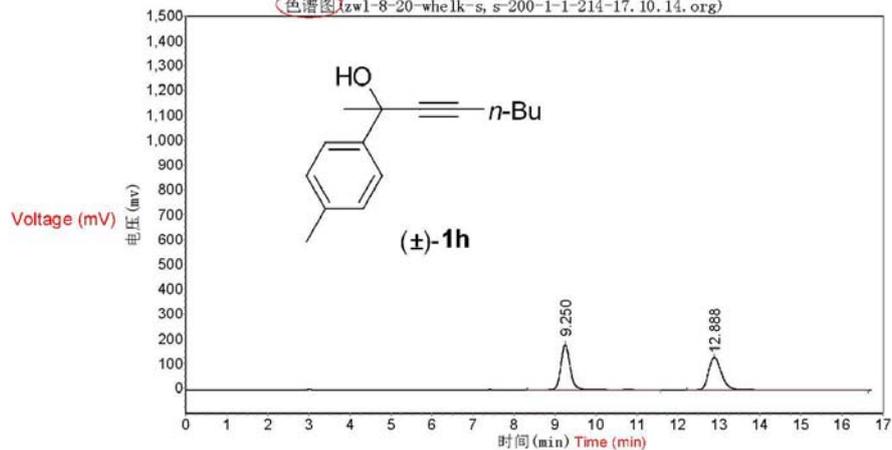
报告时间: 2017-10-14, 10:14:18

← Brief introduction of experimental conditions

实验内容简介:
zw1-8-20-wheelk-s, s-200-1-1-214

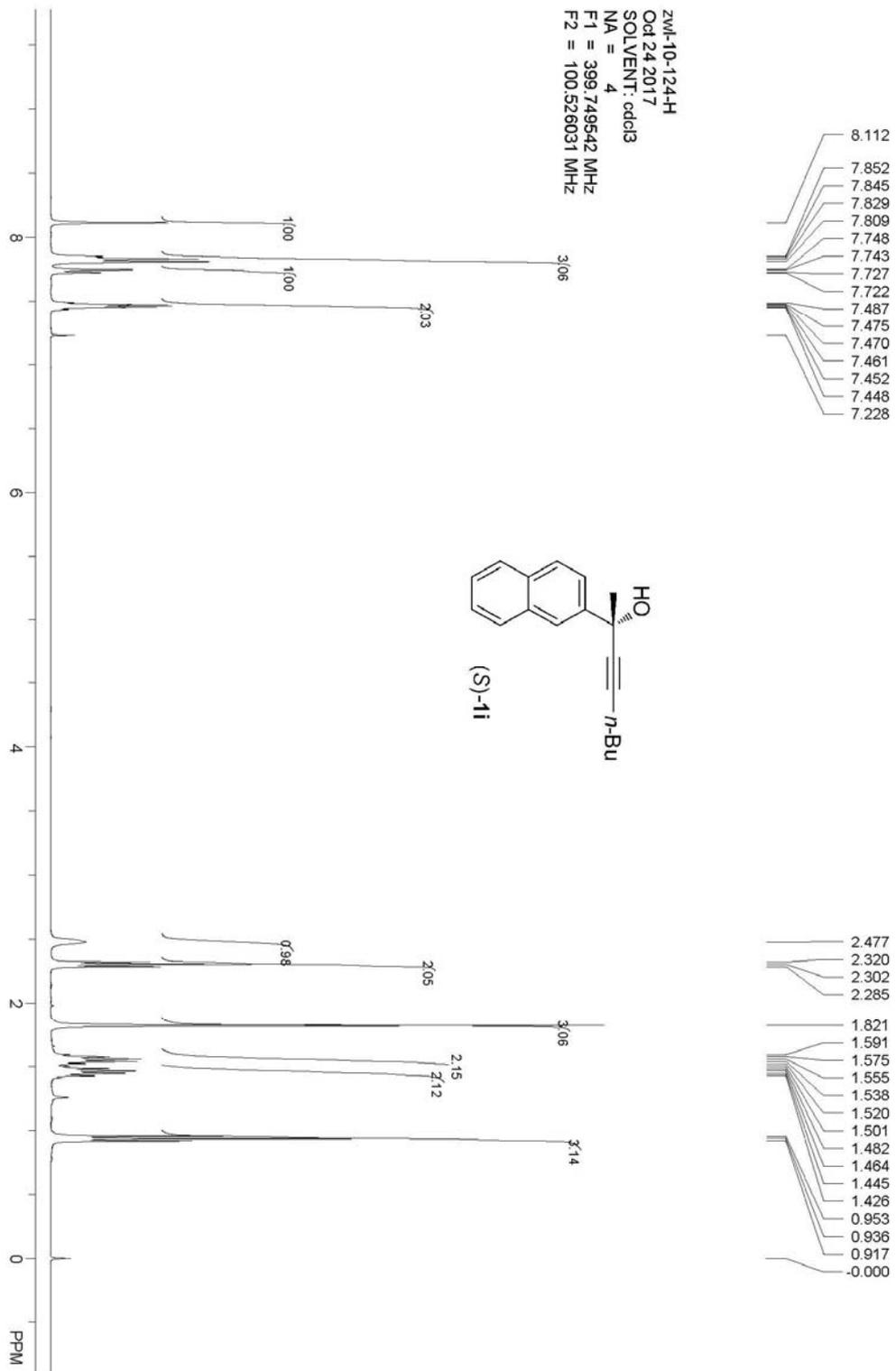
← Chromatogram Figure

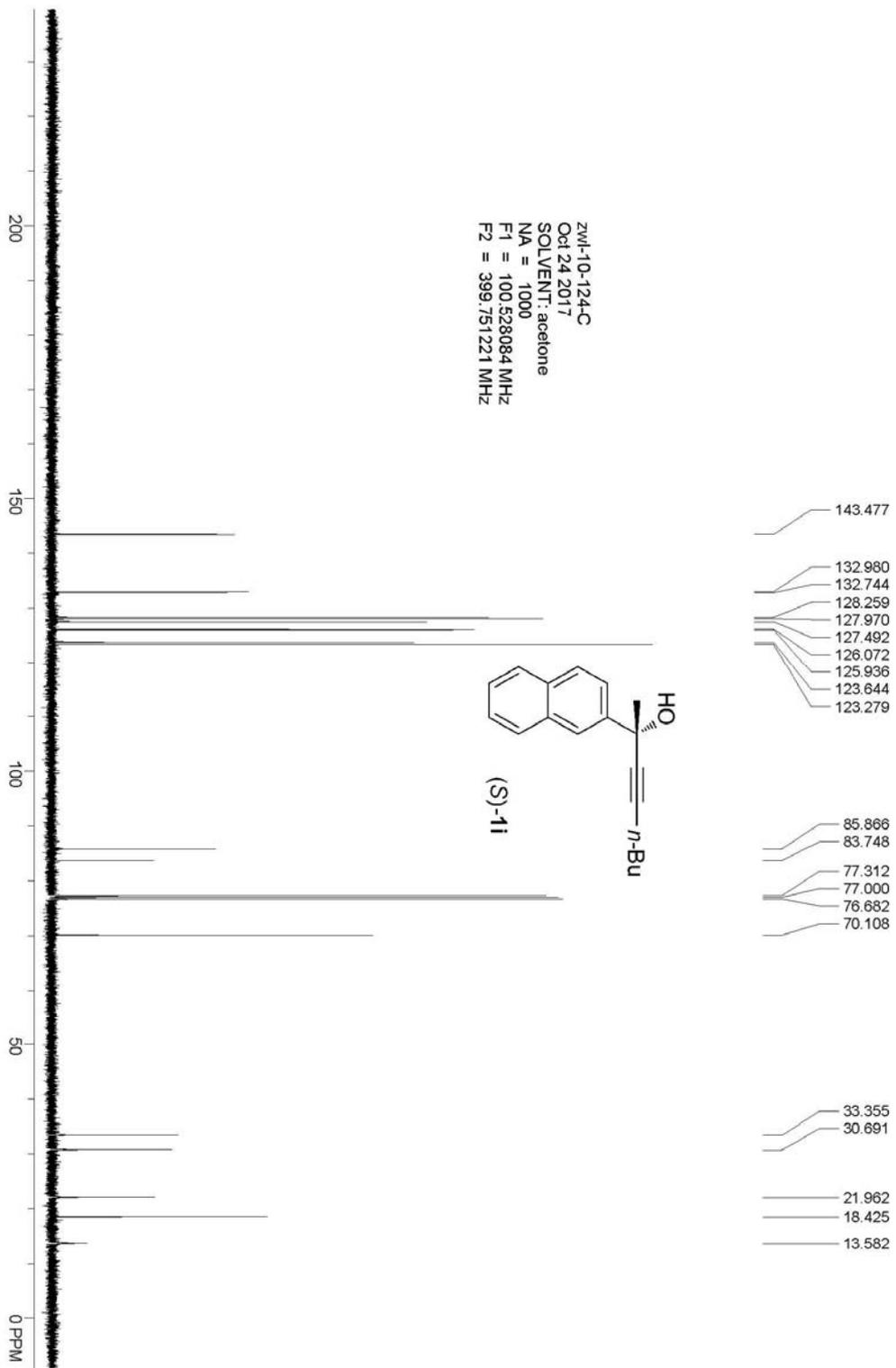
色谱图 (zw1-8-20-wheelk-s, s-200-1-1-214-17.10.14.org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		9.250	182265.719	3016561.000	50.0861
2		12.888	130924.500	3006188.000	49.9139
总计			313190.219	6022749.000	100.0000





zwl-10-124

实验时间: 2017-10-23, 20:37:26

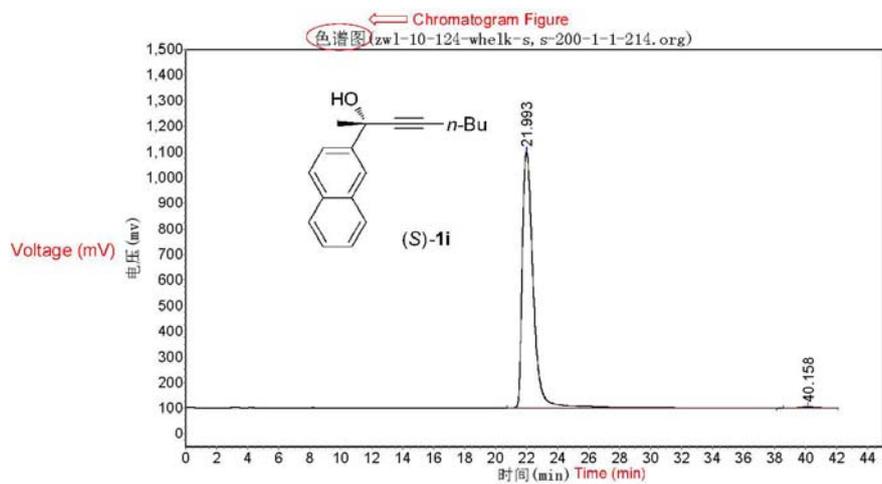
报告时间: 2017-10-23, 21:20:54

谱图文件: E:\data\zwl\zwl-10-124-wheelk-s, s-200-1-1-214.org

方法文件: E:\data\zwl\zwl.mtd

实验内容简介:

zwl-10-124



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		21.993	1001682.188	50106052.000	99.1194
2		40.158	6194.592	445155.594	0.8806
总计			1007876.779	50551207.594	100.0000

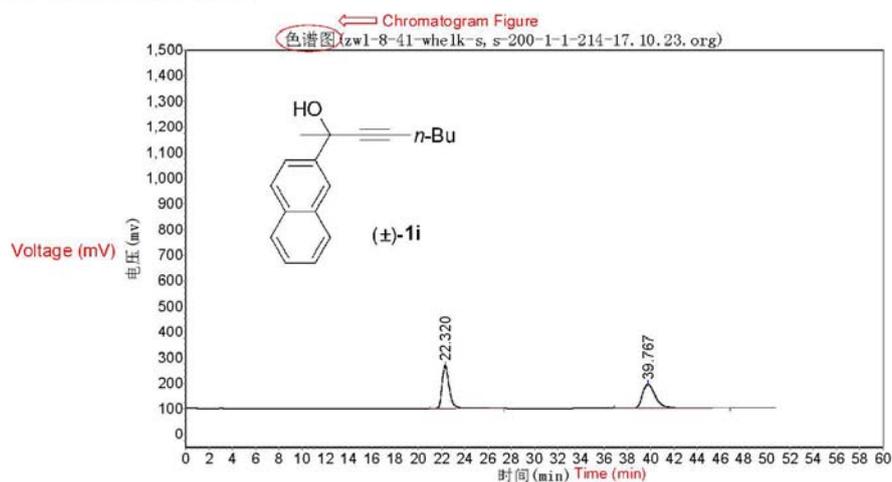
zwl-8-41

实验时间: 2017-10-23, 19:24:28
谱图文件: E:\data\zwl\zwl-8-41-wheelk-s, s-200-1-1-214-
17.10.23.org
方法文件: E:\data\zwl\zwl.mtd

报告时间: 2017-10-23, 20:39:15

实验内容简介: Brief introduction of experimental conditions

zwl-8-41-wheelk-s, s-200-1-1-214

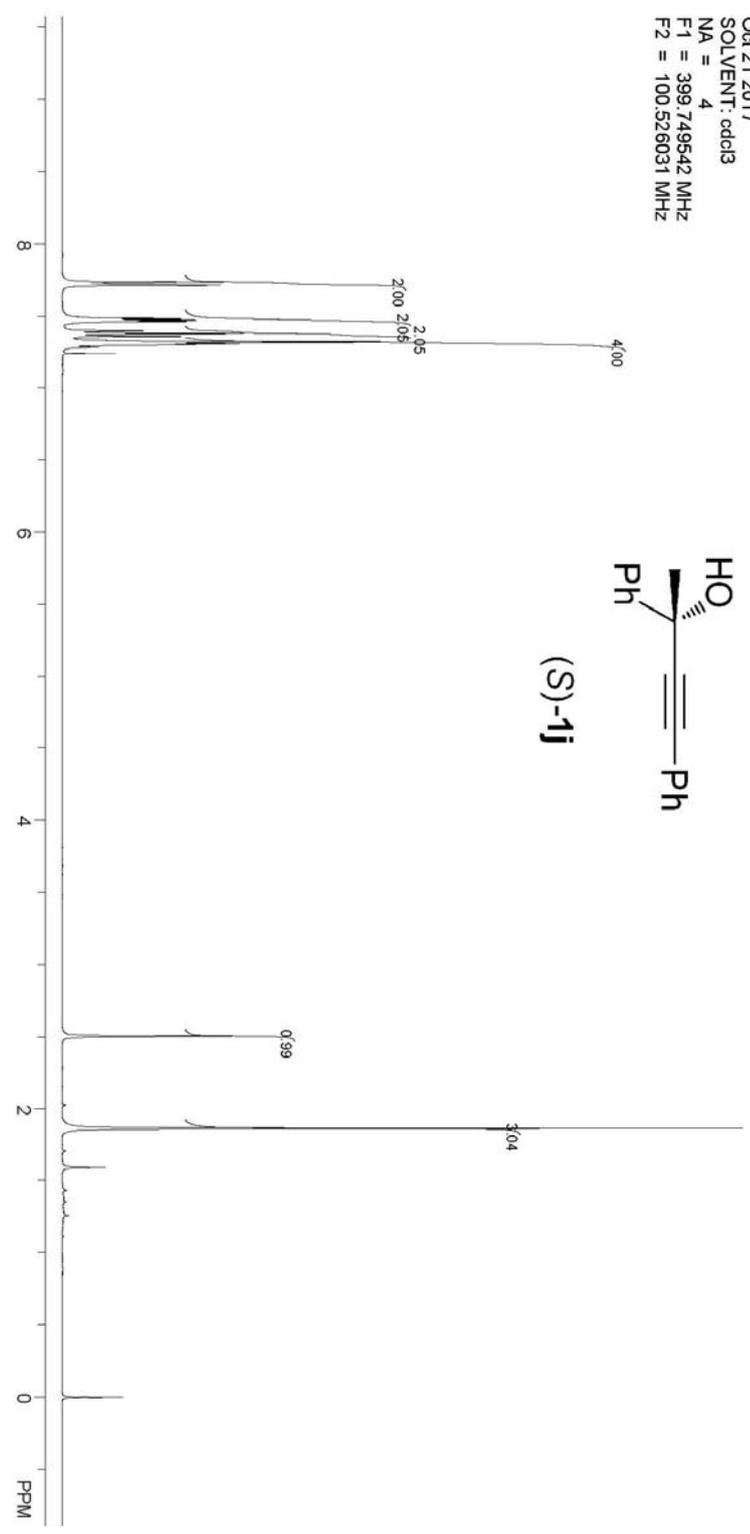
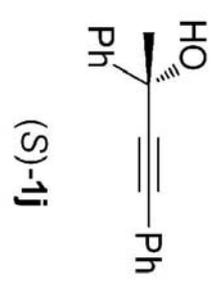


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		22.320	167572.578	7365807.000	49.8083
2		39.767	93770.930	7422519.500	50.1917
总计			261343.508	14788326.500	100.0000

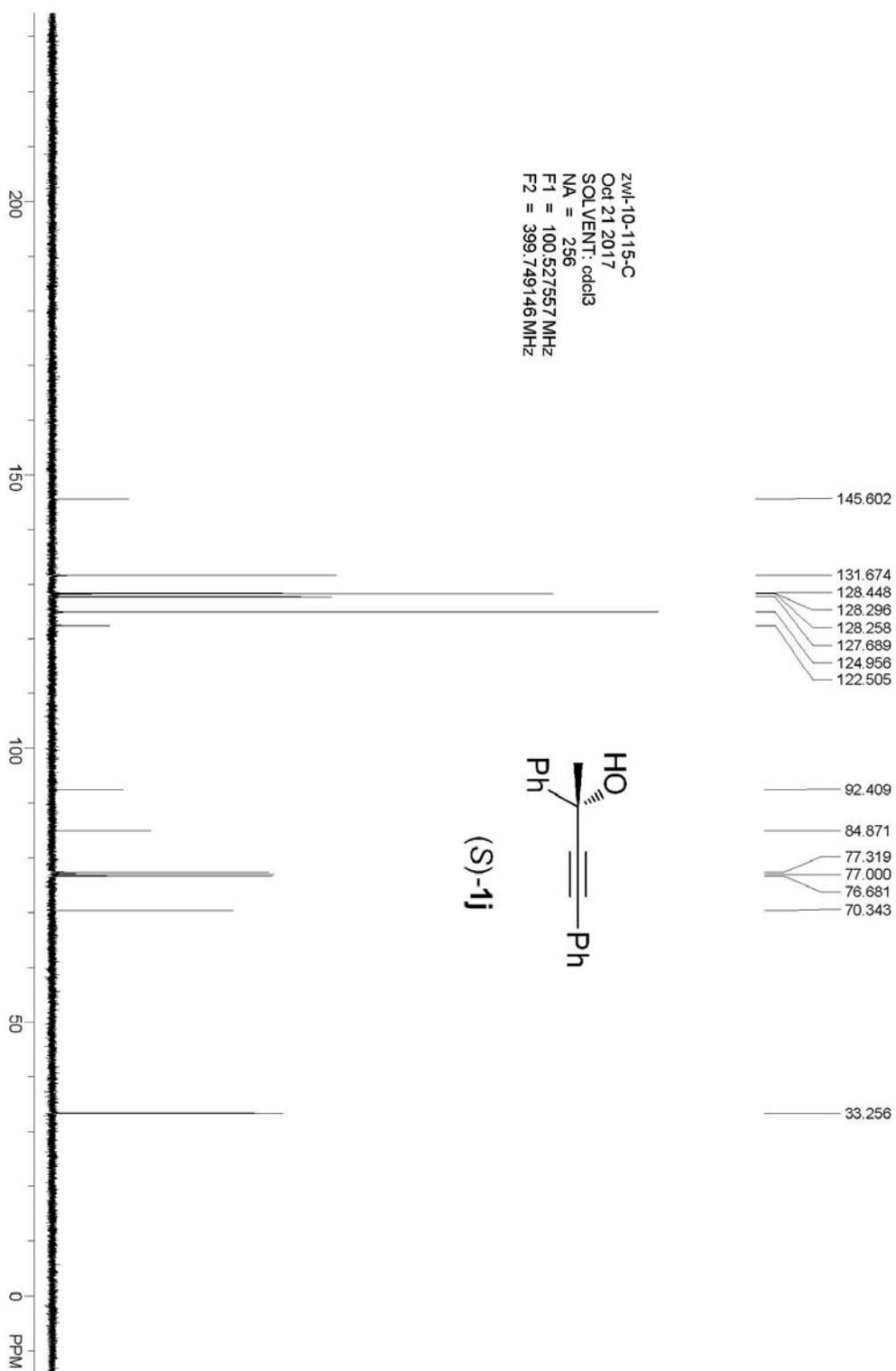
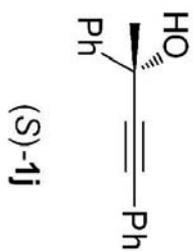
7.740
7.737
7.733
7.719
7.491
7.485
7.475
7.466
7.402
7.384
7.380
7.365
7.337
7.328
7.322
7.312
7.306
7.288
7.243

zwl-10-115-H
Oct 21 2017
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



2.503
1.867
0.000

zw/-10-115-C
Oct 21 2017
SOLVENT: cddcl3
NA = 256
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zwl-10-115

实验时间: 2017-10-18, 19:19:10

报告时间: 2017-10-18, 19:50:52

谱图文件: E:\data\zwl\zwl-10-115-whelk-s, s-200-1-1-214.org

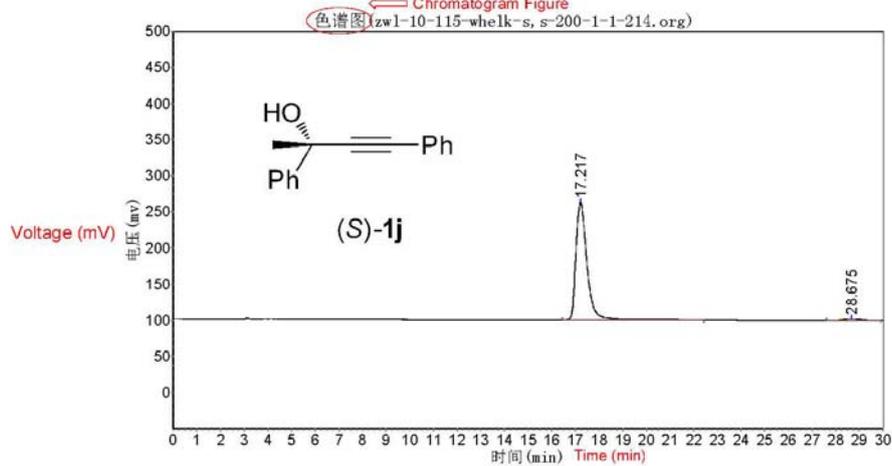
方法文件: E:\data\zwl\zwl.mtd

← Brief introduction of experimental conditions

实验内容简介:

zwl-10-115-whelk-s, s-200-1-1-214

← Chromatogram Figure



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		17.217	162836.984	5330285.000	98.2242
2		28.675	1968.247	96368.727	1.7758
总计			164805.231	5426653.727	100.0000

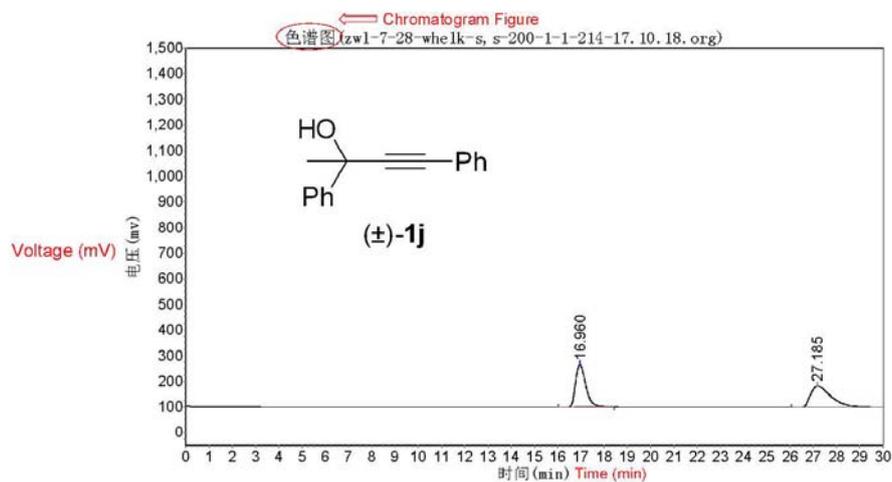
zwl-7-28

实验时间: 2017-10-18, 18:17:25
谱图文件: E:\data\zwl\zwl-7-28-wheelk-s, s-200-1-1-214-
17.10.18.org
方法文件: E:\data\zwl\zwl.mtd

报告时间: 2017-10-18, 18:49:50

实验内容简介: Brief introduction of experimental conditions

zwl-7-28-wheelk-s, s-200-1-1-214

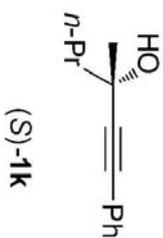


分析结果表

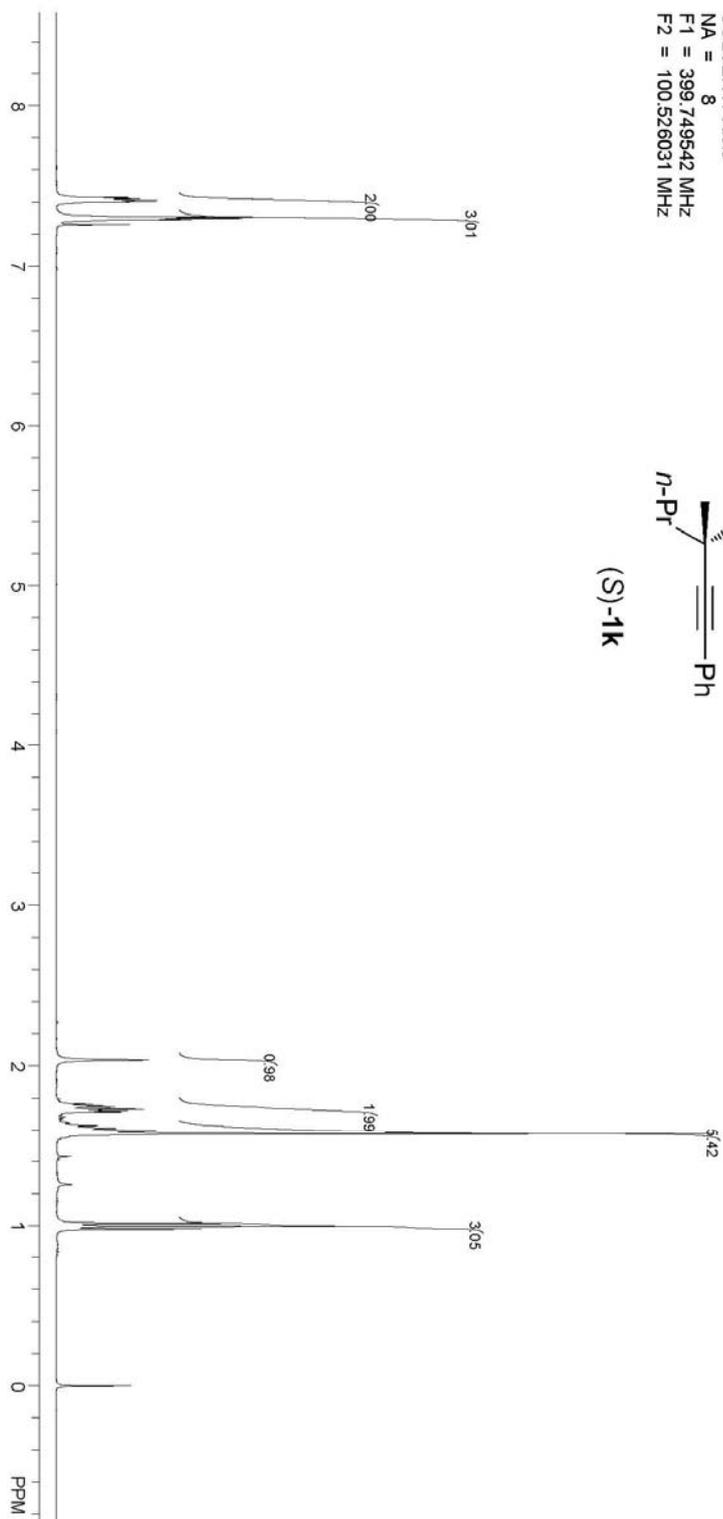
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		16.960	166608.766	5118363.500	49.7273
2		27.185	84653.508	5174505.000	50.2727
总计			251262.273	10292868.500	100.0000

7.428
7.421
7.416
7.412
7.410
7.404
7.315
7.306
7.298
7.289
7.258

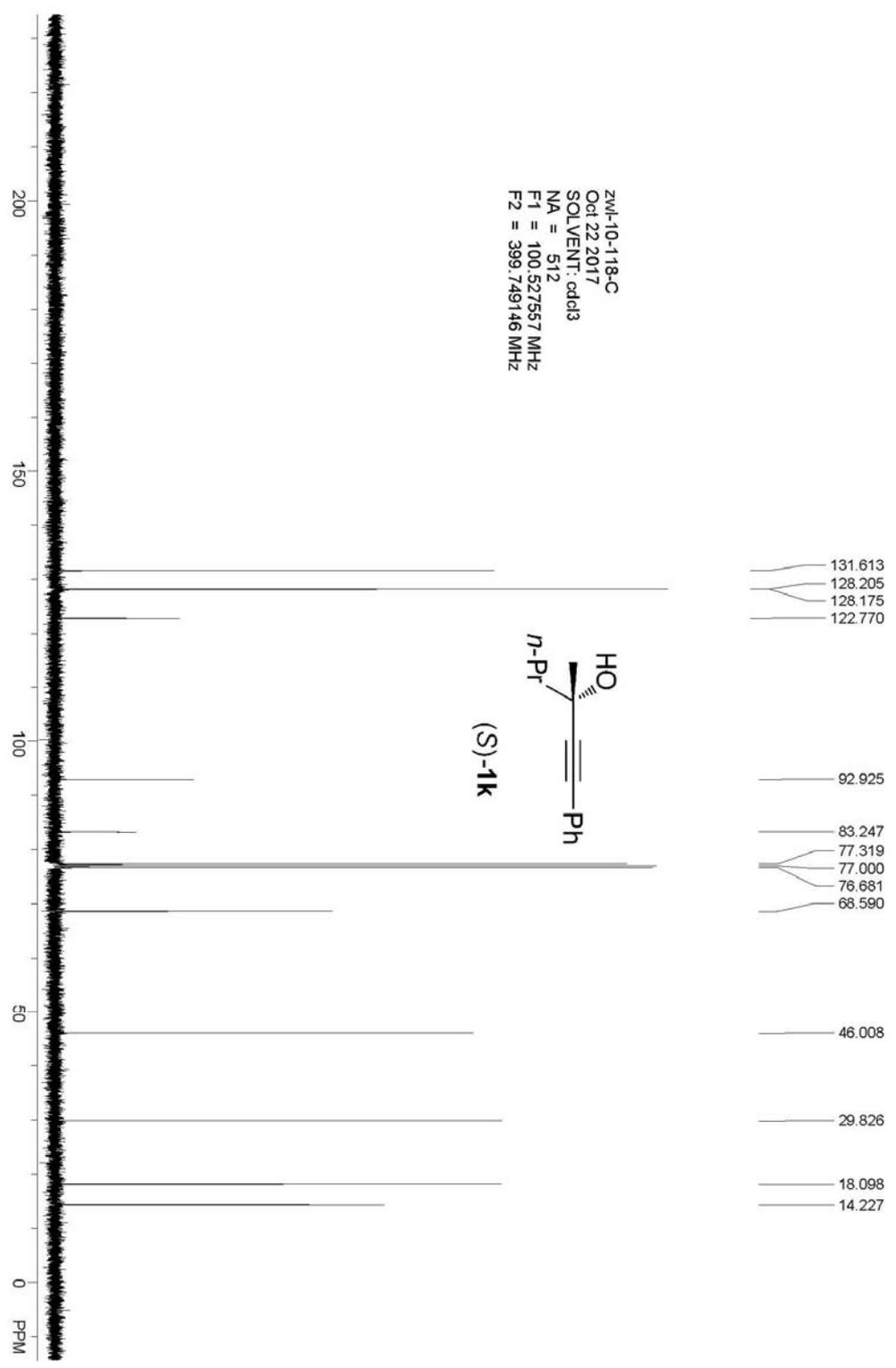
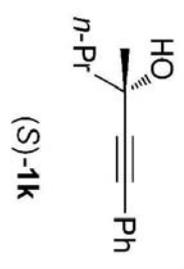
zw/-10-118-H
Oct 22 2017
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



1.763
1.753
2.037
1.746
1.744
1.731
1.721
1.714
1.628
1.609
1.593
1.574
1.013
0.994
0.977
-0.000



zwl-10-118-C
Oct 22 2017
SOLVENT: cdcl3
NA = 512
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zwl-10-118

实验时间: 2017-10-21, 10:13:16

报告时间: 2017-10-21, 10:23:23

谱图文件: E:\data\zwl\zwl-10-118-ad-h-95-5-1-214.org

方法文件: E:\data\zwl\zwl.mtd

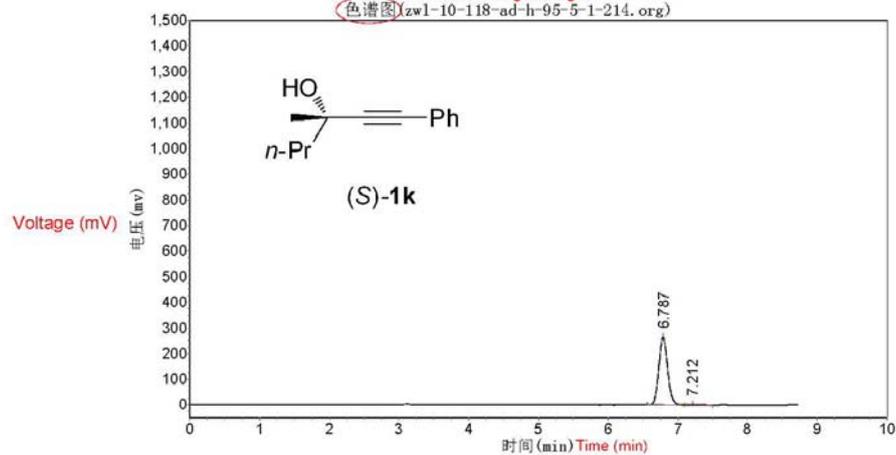
← Brief introduction of experimental conditions

实验内容简介:

zwl-10-118-ad-h-95-5-1-214

← Chromatogram Figure

色谱图(zwl-10-118-ad-h-95-5-1-214.org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		6.787	263738.281	2291700.609	99.1329
2		7.212	1161.604	20045.147	0.8671
总计			264899.886	2311745.756	100.0000

hcf-1-4

实验时间: 2017-10-21, 9:52:30

报告时间: 2017-10-21, 10:13:52

谱图文件: E:\data\zwl\hcf-1-4-ad-h-95-5-1-214-17. 10. 21. org

方法文件: E:\data\zwl\zwl. mtd

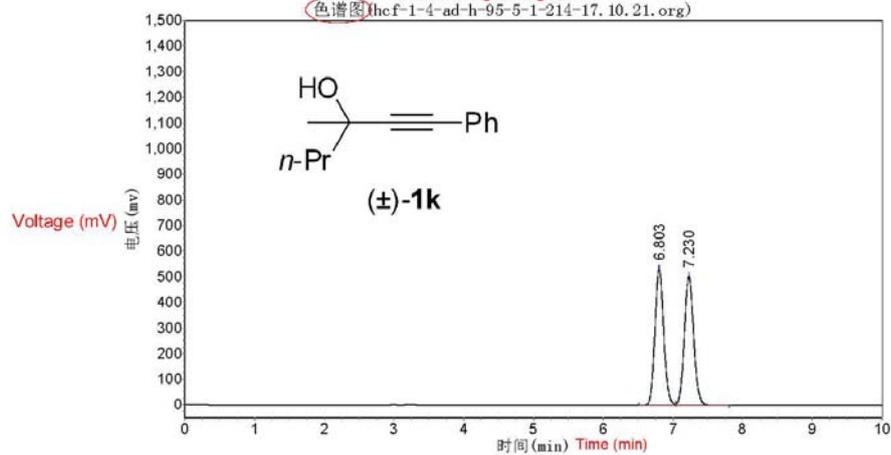
Brief introduction of experimental conditions

实验内容简介:

hcf-1-4-ad-h-95-5-1-214

Chromatogram Figure

色谱图 (hcf-1-4-ad-h-95-5-1-214-17. 10. 21. org)

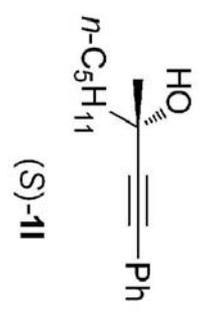


分析结果表

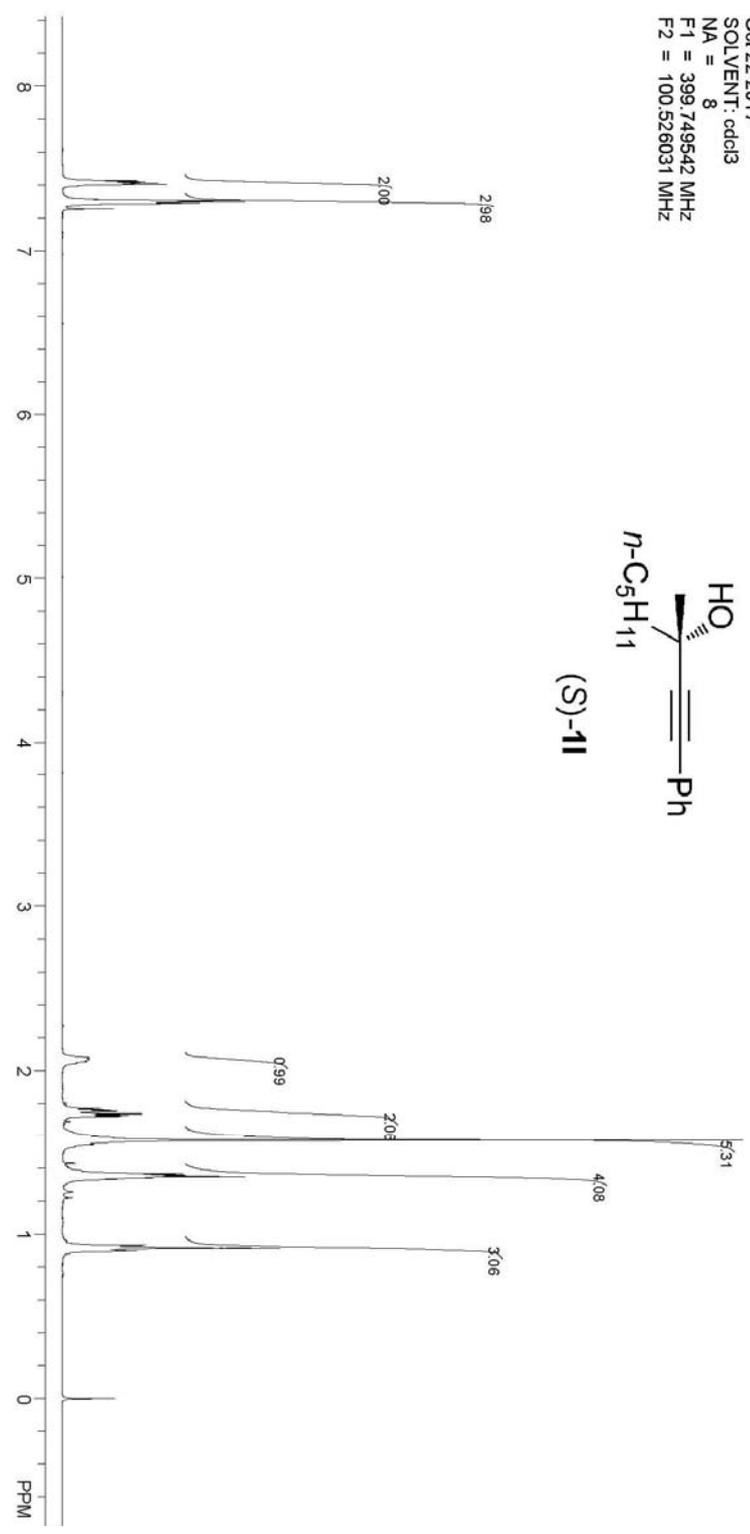
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		6.803	530138.438	4628235.000	49.9353
2		7.230	503045.531	4640231.000	50.0647
总计			1033183.969	9268466.000	100.0000

7.427
7.420
7.415
7.412
7.409
7.407
7.403
7.314
7.305
7.297
7.288
7.256

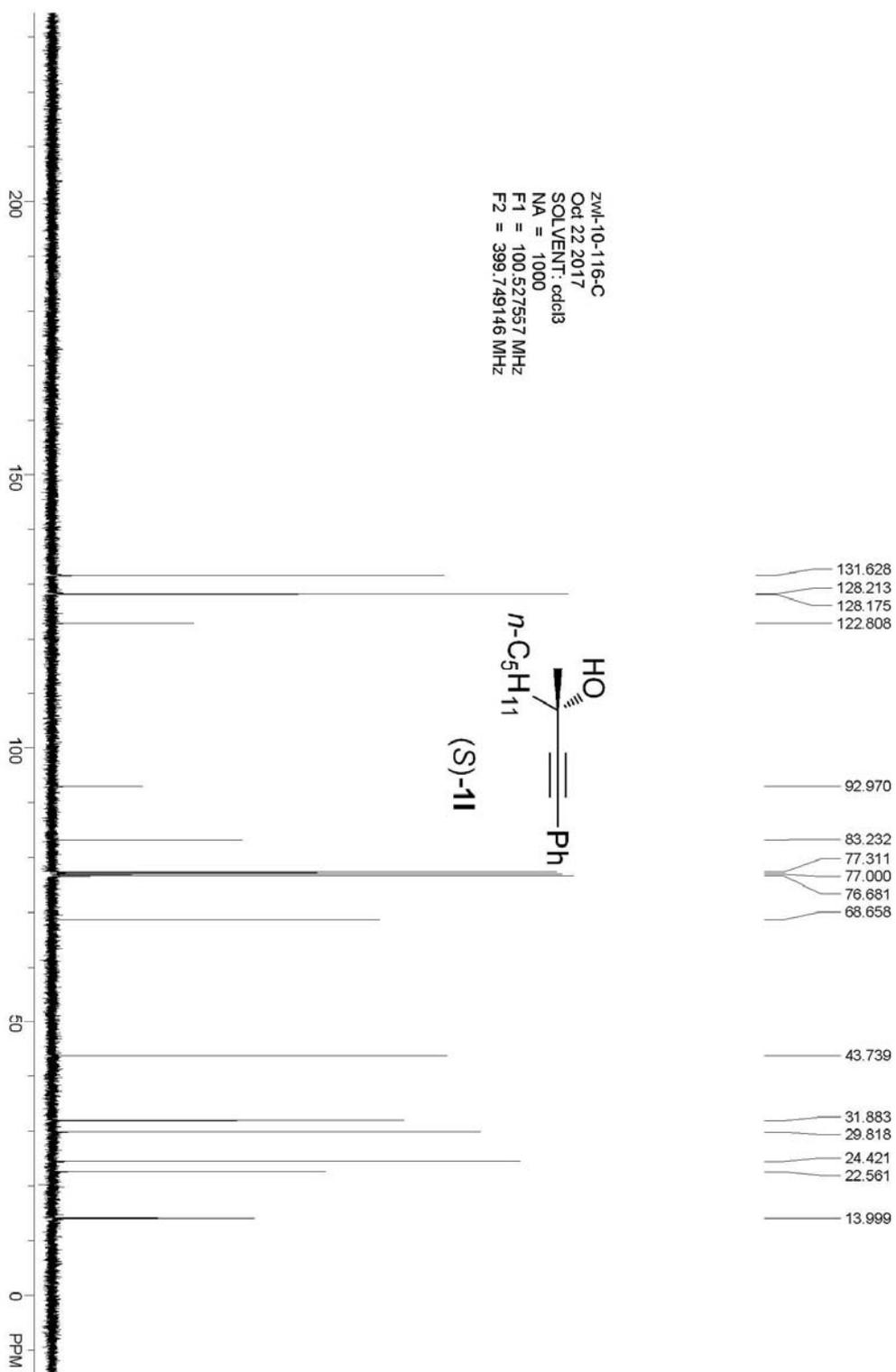
ZWL-10-116-H
Oct 22 2017
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



2.079
2.055
1.771
1.761
1.751
1.737
1.729
1.722
1.605
1.589
1.573
1.547
1.384
1.367
1.350
1.342
1.332
0.932
0.914
0.897
-0.000



zwl-10-116-C
Oct 22 2017
SOLVENT: cdcl3
NA = 1000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zwl-10-116

实验时间: 2017-10-18, 20:22:30

报告时间: 2017-10-18, 20:56:37

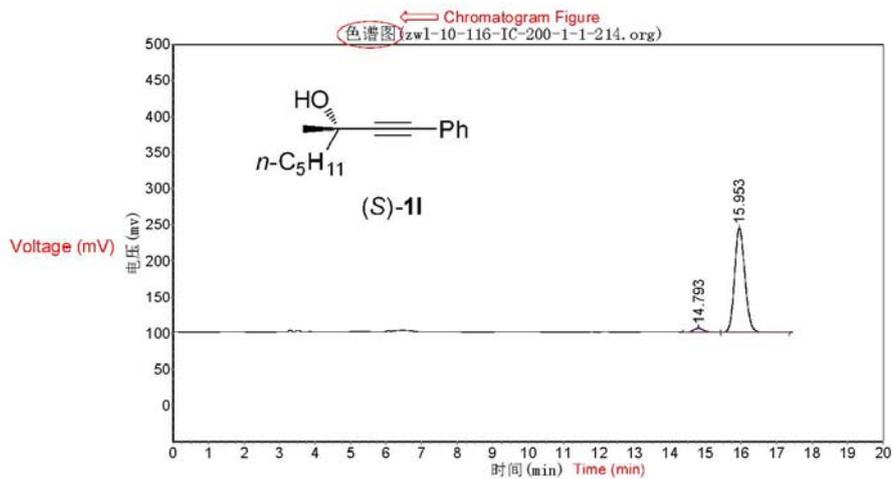
谱图文件: E:\data\zwl\zwl-10-116-IC-200-1-1-214.org

方法文件: E:\data\zwl\zwl.mtd

← Brief introduction of experimental conditions

实验内容简介:

zwl-10-116-ic-200-1-1-214



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		14.793	5519.999	105694.281	3.5168
2		15.953	144096.719	2899716.500	96.4832
总计			149616.718	3005410.781	100.0000

zw1-10-63

实验时间: 2017-10-18, 20:02:08

报告时间: 2017-10-18, 20:57:42

谱图文件: E:\data\zw1\zw1-10-63-IC-200-1-1-214-17.10.18.org

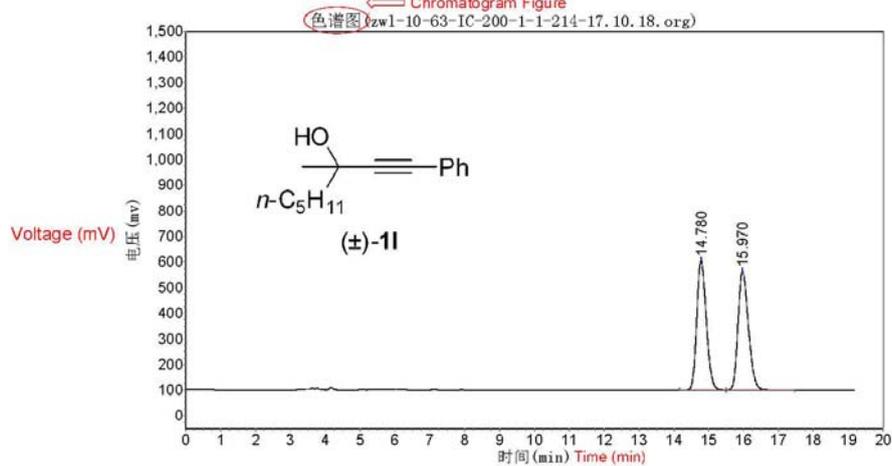
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

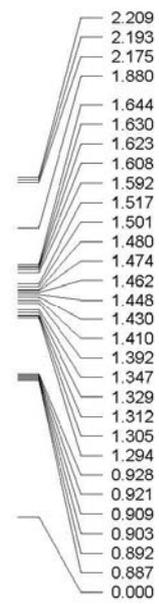
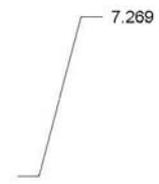
zw1-10-63-ic-200-1-1-214

← Chromatogram Figure

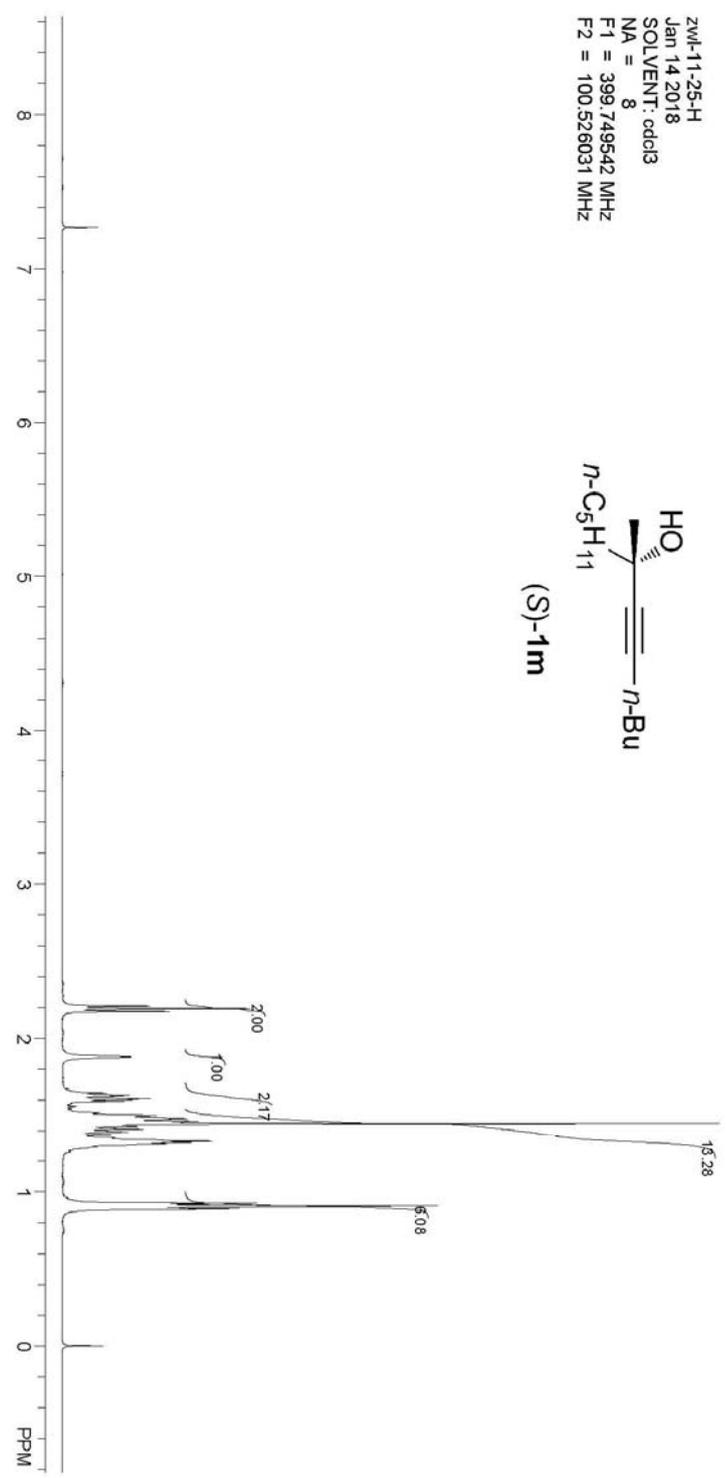
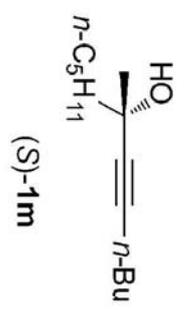


分析结果表

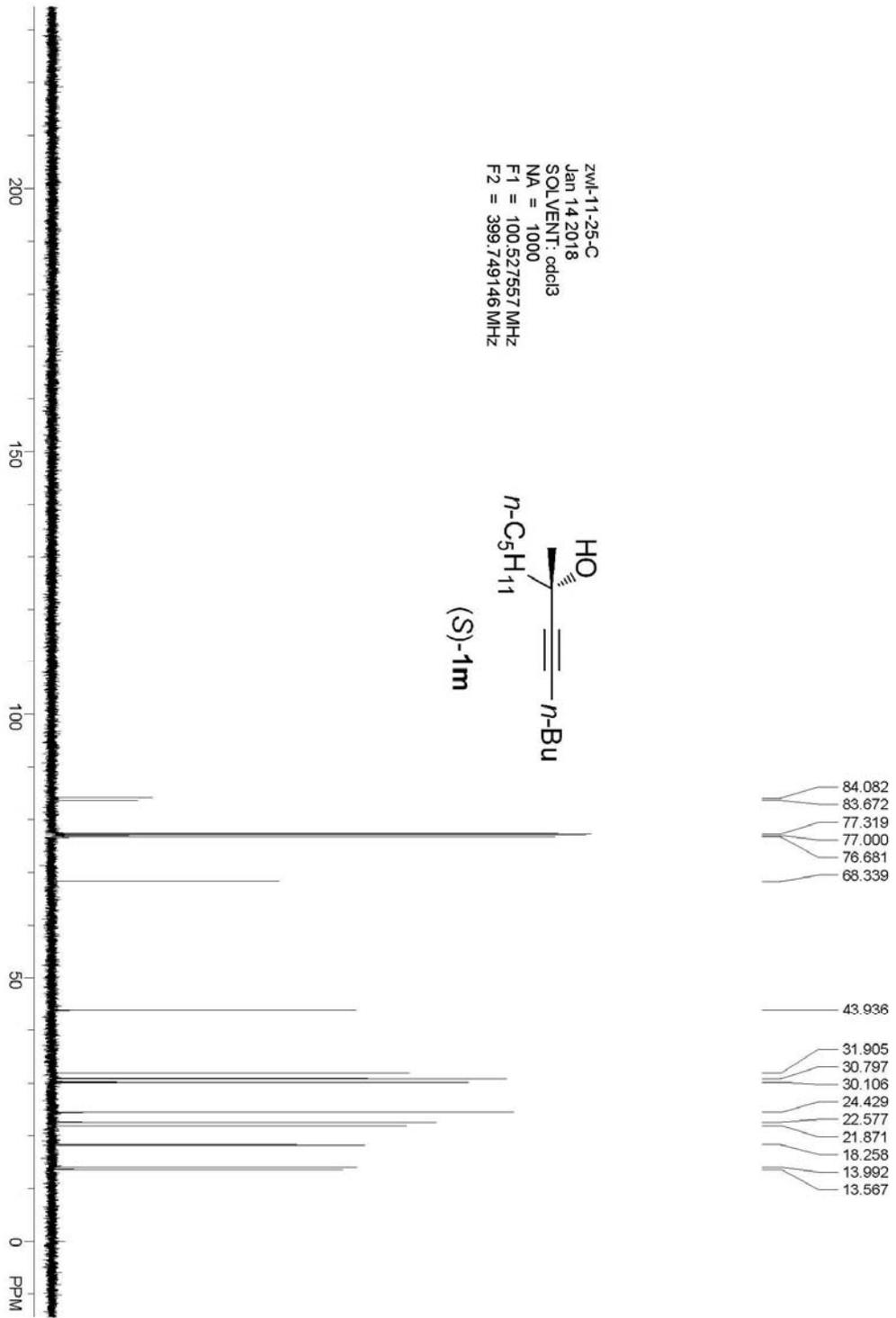
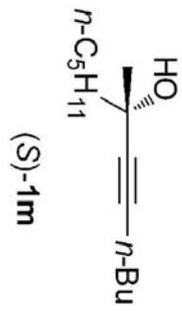
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		14.780	506005.750	9542713.000	49.9286
2		15.970	462844.156	9569991.000	50.0714
总计			968849.906	19112704.000	100.0000



zwl-11-25-H
Jan 14 2018
SOLVENT: odol3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



zwl-11-25-C
Jan 14 2018
SOLVENT: cdcl3
NA = 1000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zw1-11-25

实验时间: 2018-01-10, 19:30:17

报告时间: 2018-01-10, 20:18:16

谱图文件: E:\data\zw1\zw1-11-25-ad-h-100-1-1-214-18.1.10.org

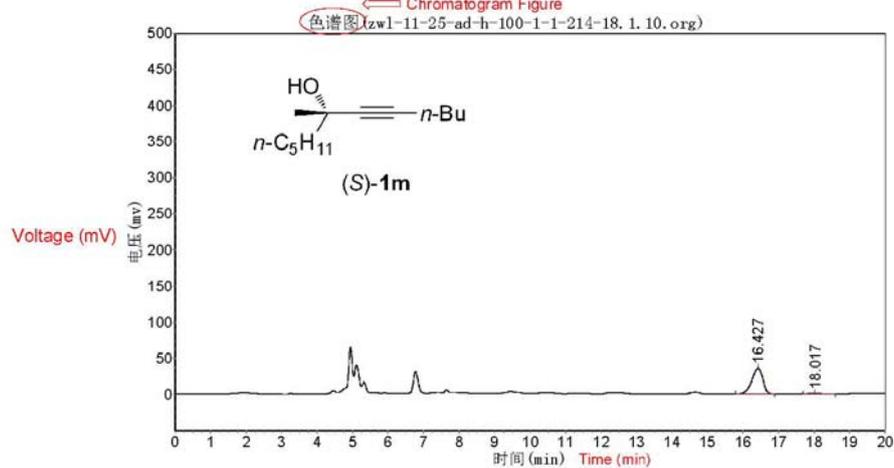
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

zw1-11-25-ad-h-100-1-1-214

← Chromatogram Figure



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		16.427	35815.621	763236.188	98.0941
2		18.017	785.474	14828.752	1.9059
总计			36601.095	778064.939	100.0000

zw1-6-130

实验时间: 2018-01-10, 20:16:41

报告时间: 2018-01-10, 20:38:18

谱图文件: E:\data\zw1\zw1-6-130-ad-h-100-1-1-214-18.1.10.org

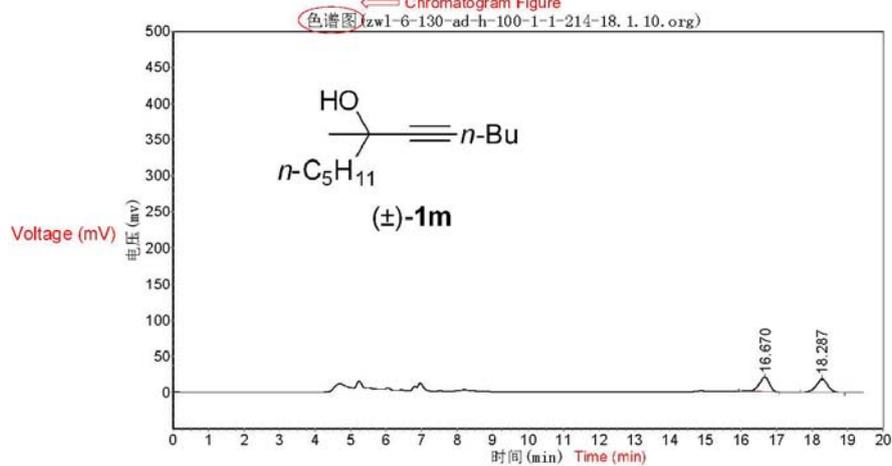
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

zw1-6-130-ad-h-100-1-1-214

← Chromatogram Figure

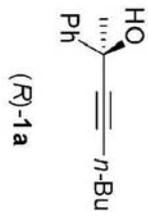


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		16.670	20019.238	408204.313	50.4626
2		18.287	18316.678	400720.000	49.5374
总计			38335.916	808924.313	100.0000

7.668
7.665
7.661
7.647
7.645
7.371
7.367
7.353
7.349
7.334
7.297
7.295
7.292
7.282
7.276
7.258
7.253

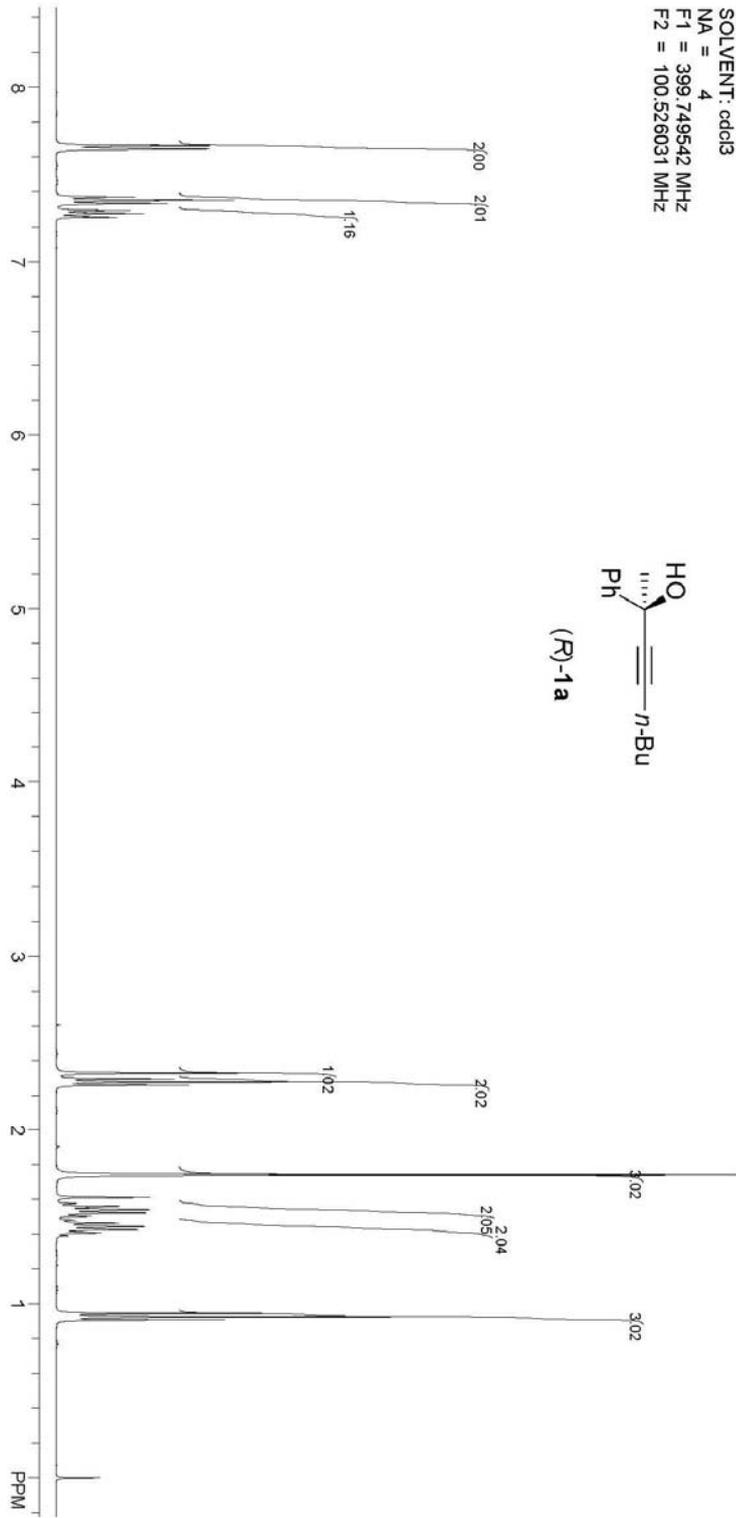
zwl-10-24-H
Jul 4 2017
SOLVENT: odd3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz

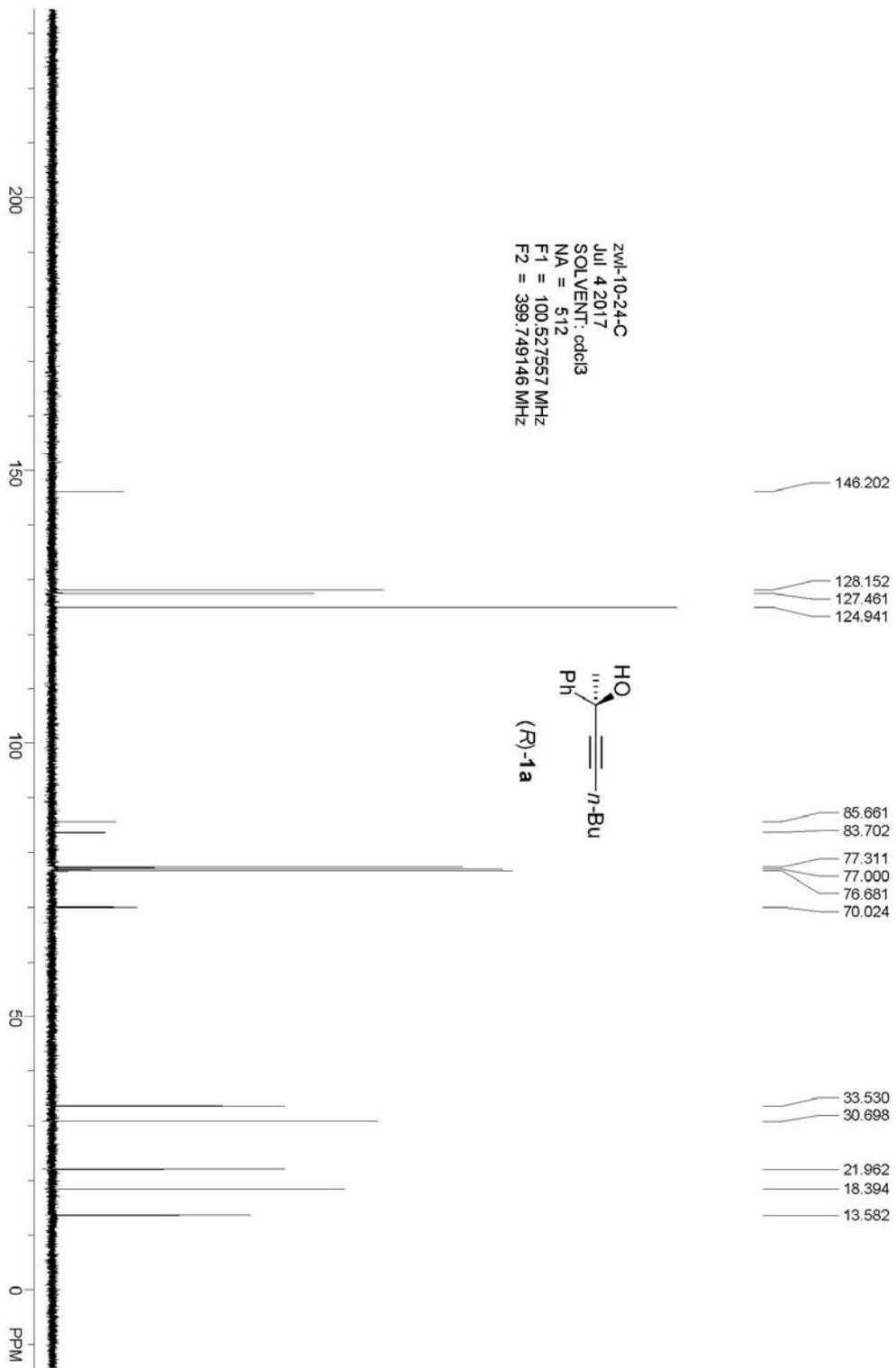


2.328
2.297
2.279
2.261

1.560
1.552
1.741
1.540
1.534
1.522
1.504
1.463
1.444
1.425
1.407
0.945
0.926
0.909

0.000





zw1-10-24

实验时间: 2017-06-19, 21:05:41

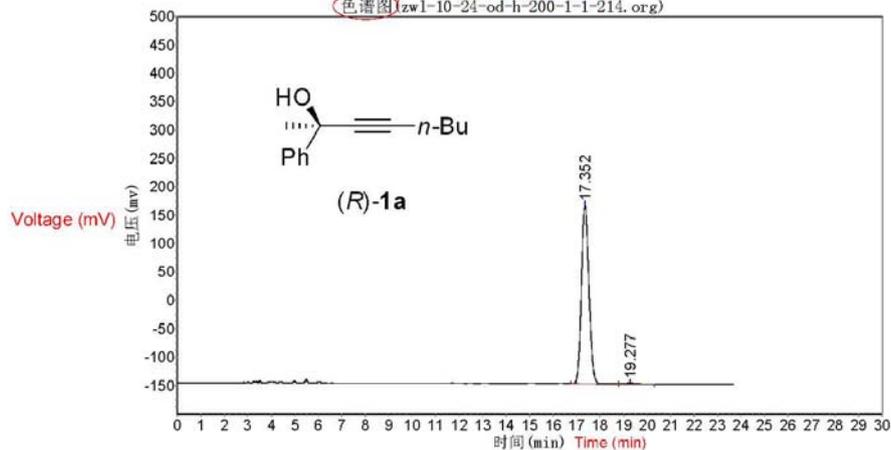
报告时间: 2017-06-19, 21:33:07

谱图文件: D:\data\zw1\zw1-10-24-od-h-200-1-1-214.org

← Brief introduction of experimental conditions

实验内容简介:
zw1-10-24-od-h-200-1-1-214

← Chromatogram Figure
色谱图(zw1-10-24-od-h-200-1-1-214.org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		17.352	314792.344	6976912.500	99.1730
2		19.277	2288.860	58176.422	0.8269
总计			317081.204	7035088.922	100.0000

zw1-9-184

实验时间: 2017-06-19, 20:30:18

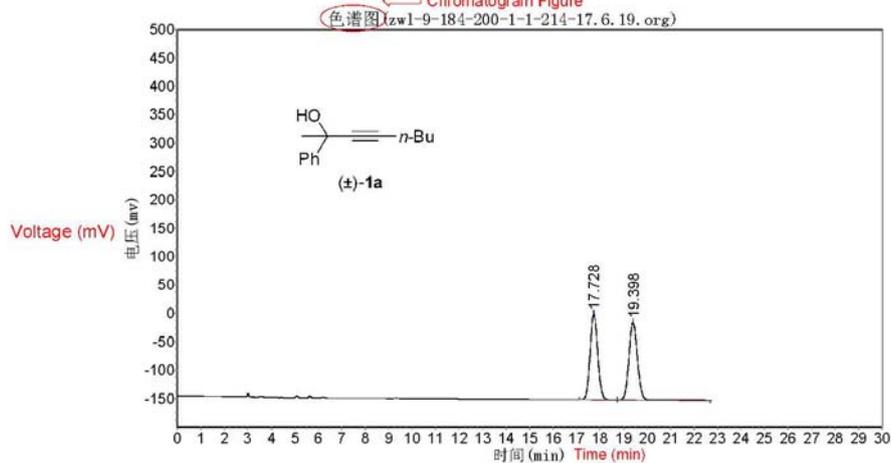
报告时间: 2017-06-19, 21:09:51

谱图文件: D:\data\zw1\zw1-9-184-200-1-1-214-17.6.19.org

← Brief introduction of experimental conditions

实验内容简介:
zw1-9-184-od-h-200-1-1-214

← Chromatogram Figure

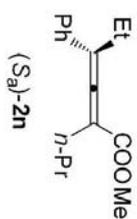


分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		17.728	150981.813	3379982.000	49.9012
2		19.398	136656.313	3393361.250	50.0988
总计			287638.125	6773343.250	100.0000

7.389
7.385
7.366
7.346
7.327
7.308
7.251
7.247
7.244
7.232
7.215

zwl-8-173-1-H
Jul 17 2016
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz

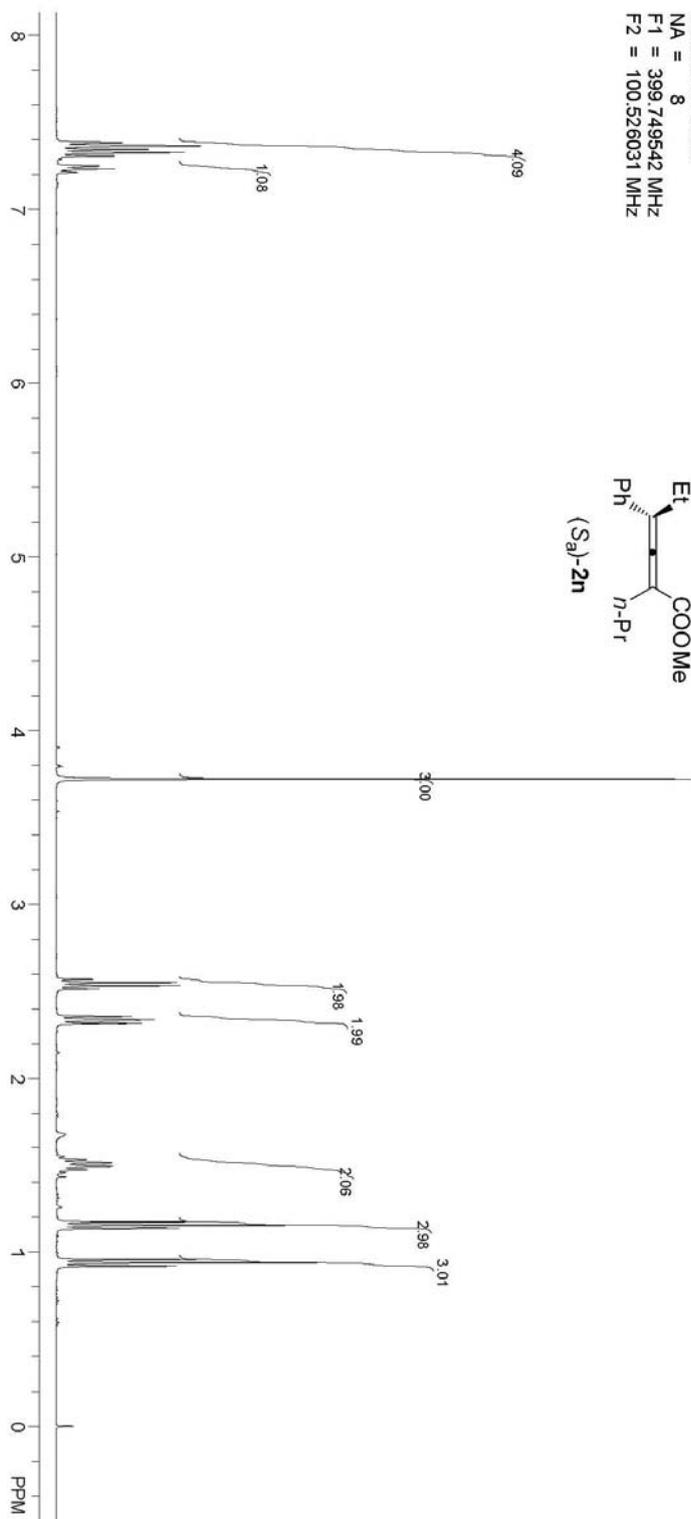


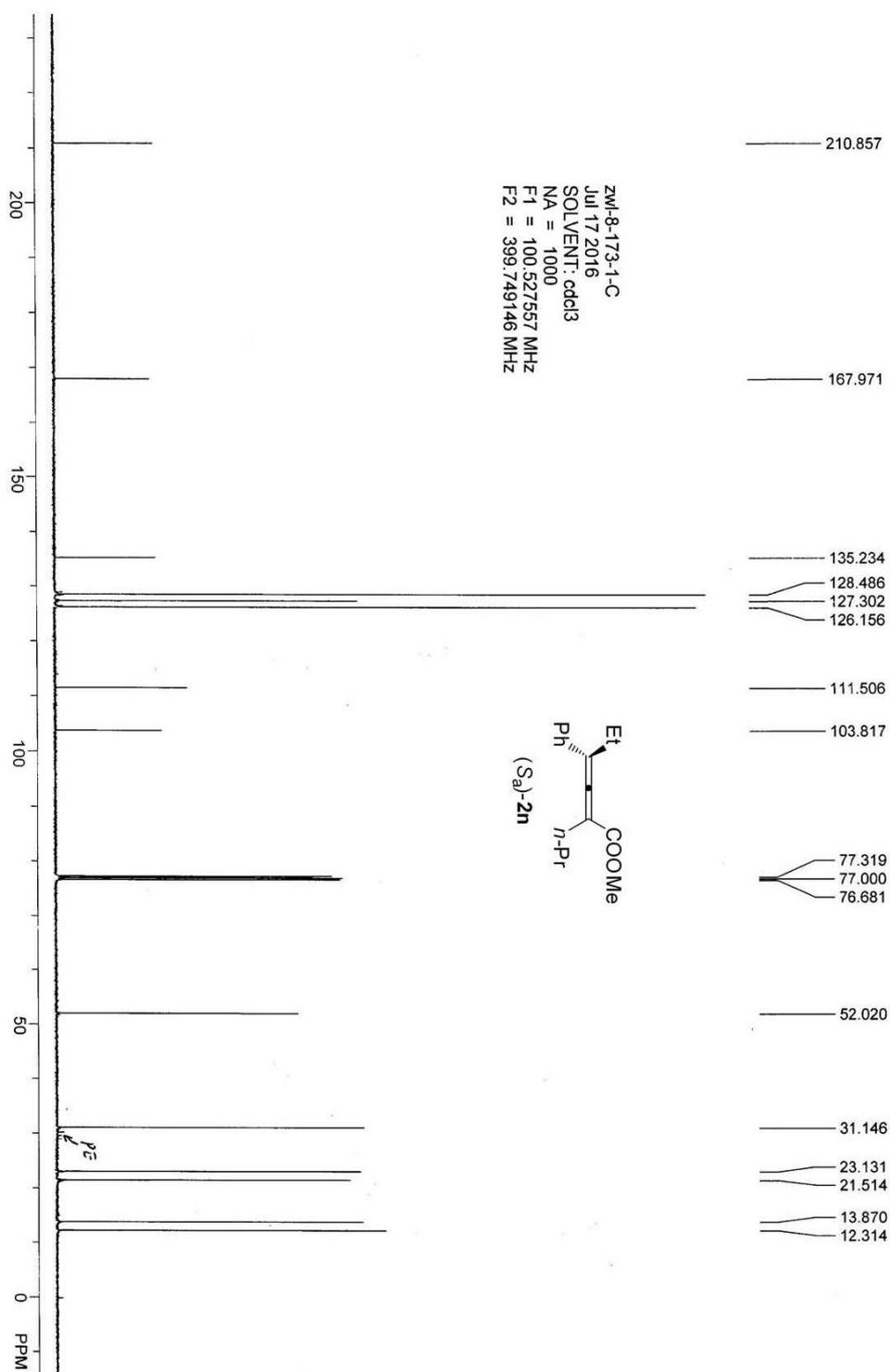
3.719

2.570
2.552
2.533
2.516
2.357
2.338
2.319

1.529
1.511
1.493
1.473
1.173
1.154
1.135
0.956
0.938
0.919

0.000





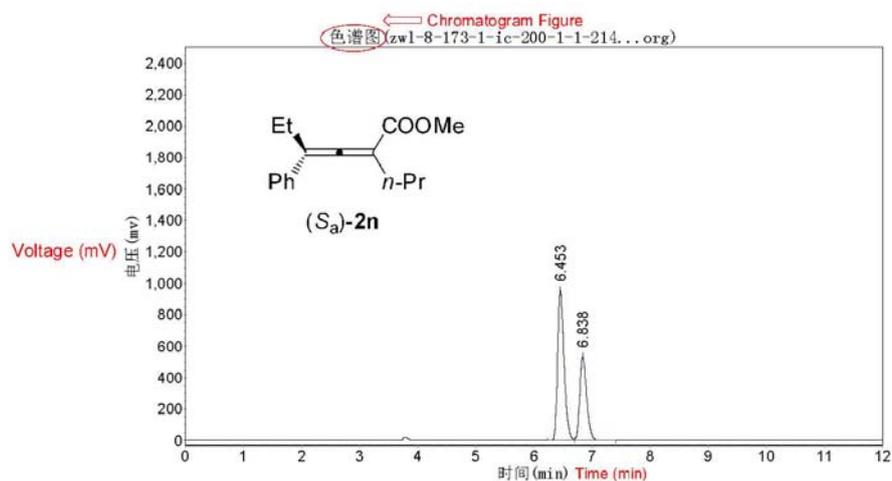
zw1-8-173-1-ic-200-1-1-214

实验时间: 2016/6/17, 13:06:41

报告时间: 2016/6/17, 18:22:24

谱图文件: D:\zhuguangji\zw1\20160616\zw1-8-173-1-ic-200-1-1-214...org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		6.453	956853.938	7425737.000	62.5994
2		6.838	536793.813	4436579.000	37.4006
总计			1493647.750	11862316.000	100.0000

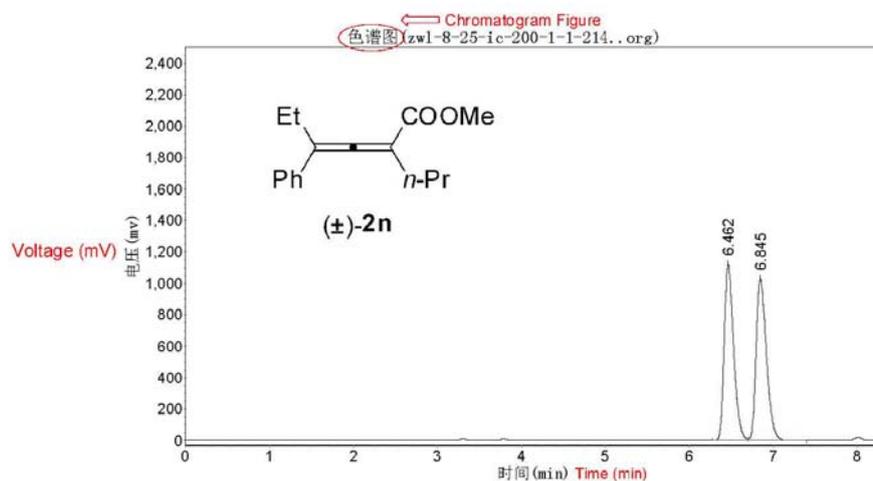
zwl-8-25-ic-200-1-1-214

实验时间: 2016/6/17, 12:48:06

报告时间: 2016/6/17, 18:21:40

谱图文件: D:\zhuguangji\zwl\20160616\zwl-8-25-ic-200-1-1-214..org

实验内容简介:

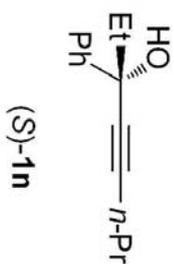


分析结果表

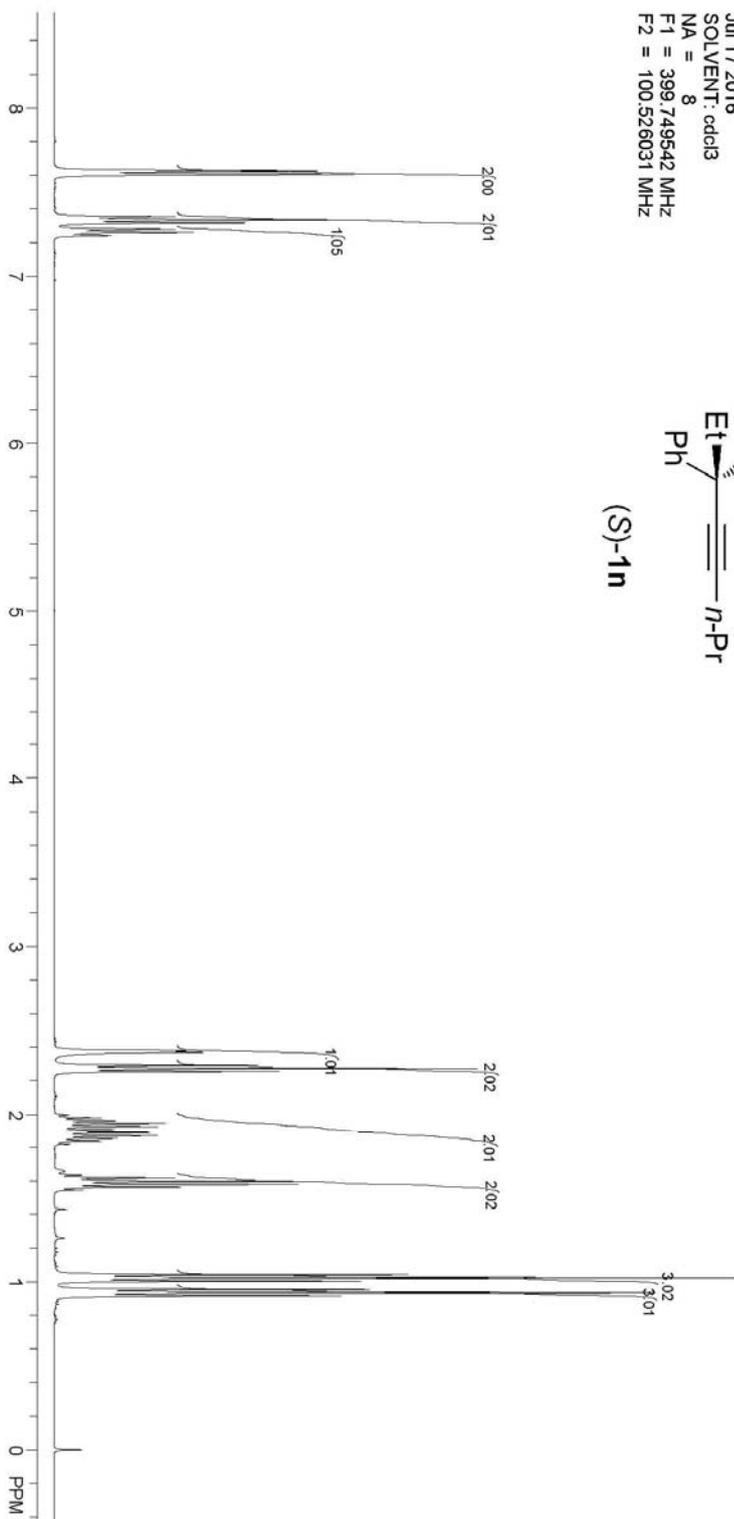
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		6.462	1121451.125	8762396.000	49.8890
2		6.845	1028698.438	8801383.000	50.1110
总计			2150149.563	17563779.000	100.0000

7.628
7.624
7.606
7.354
7.335
7.317
7.279
7.262
7.243
7.240

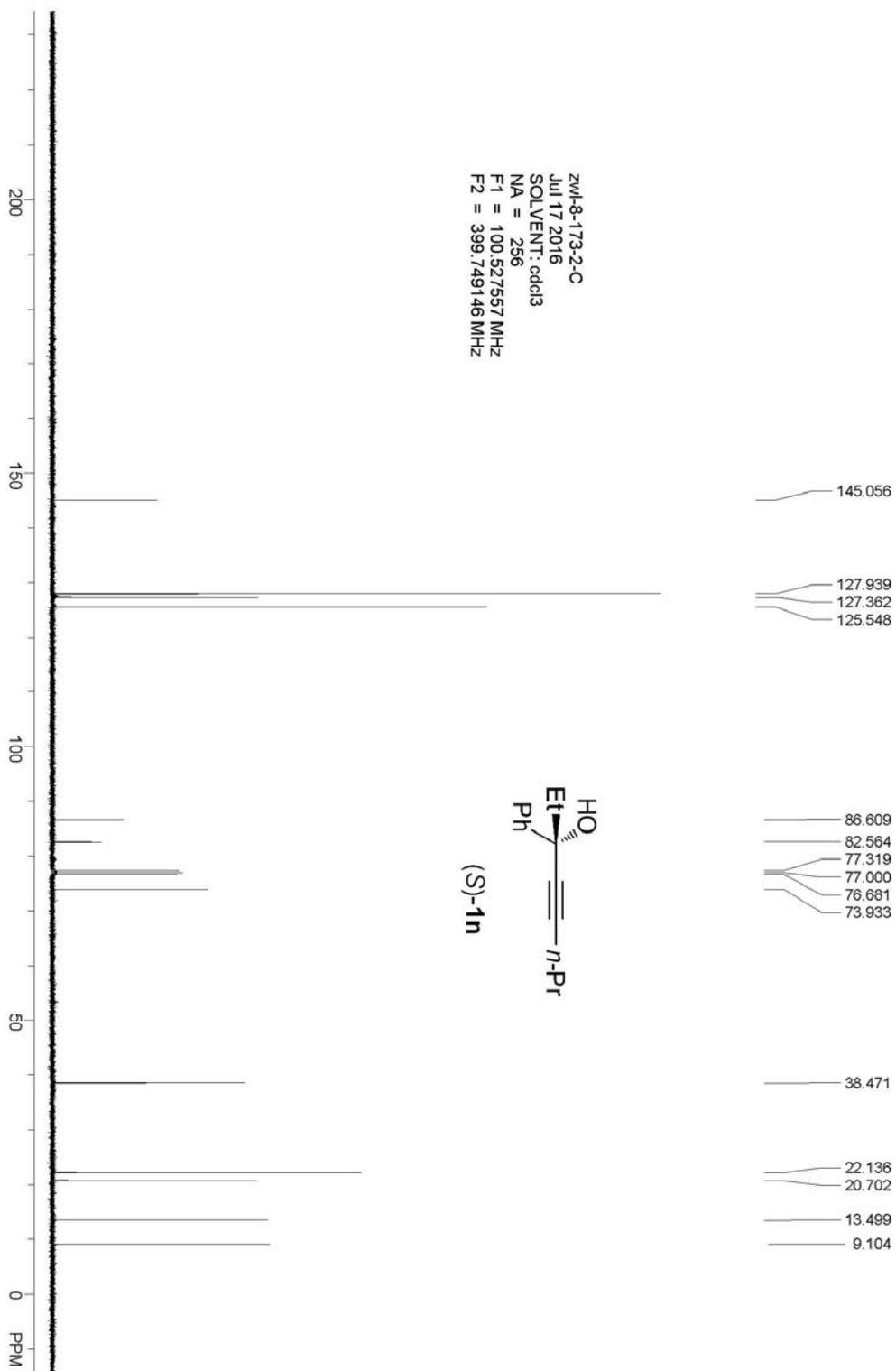
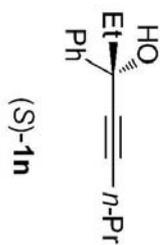
zwl-8-173-2-H
Jul 17 2016
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



2.378
2.370
2.291
2.274
2.256
1.978
1.963
1.945
1.928
1.908
1.888
1.870
1.855
1.836
1.634
1.616
1.597
1.580
1.561
1.544
1.040
1.022
1.003
0.952
0.935
0.916
0.000



ZWL-8-173-2-C
Jul 17 2016
SOLVENT: cdcl3
NA = 256
F1 = 100.527557 MHz
F2 = 399.749146 MHz



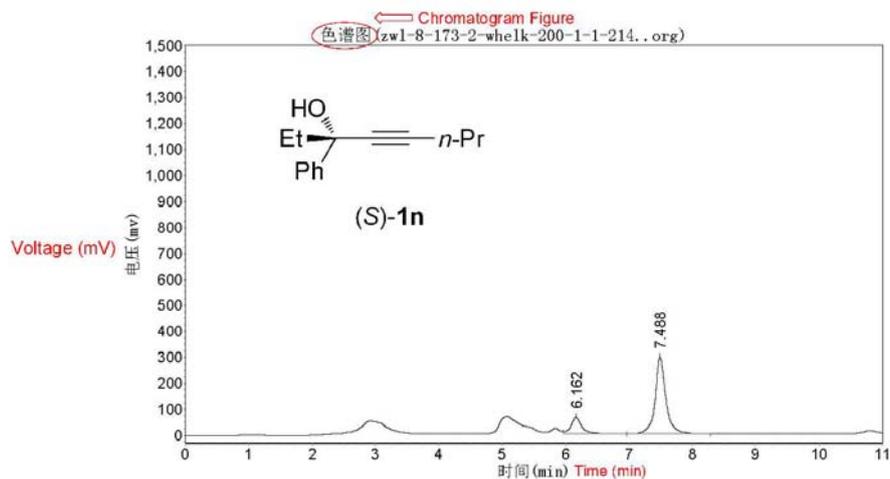
zwl-8-173-2-whe1k-200-1-1-214

实验时间: 2016/6/17, 9:02:41

报告时间: 2016/6/17, 18:20:38

谱图文件: D:\zhuguangjiang\zwl\20160616\zwl-8-173-2-whe1k-200-1-1-214..org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		6.162	63770.379	796828.250	18.4311
2		7.488	295348.969	3526455.750	81.5689
总计			359119.348	4323284.000	100.0000

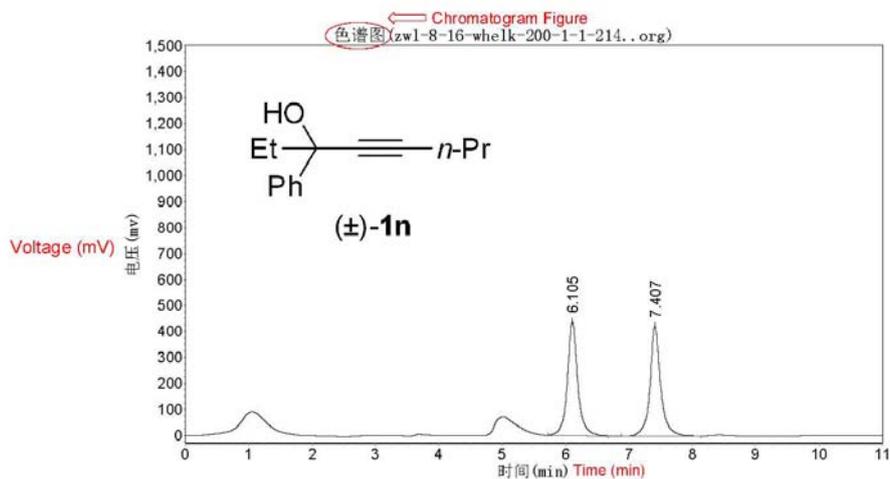
zw1-8-16-whelk-200-1-1-214

实验时间: 2016/6/17, 9:23:33

报告时间: 2016/6/17, 18:19:48

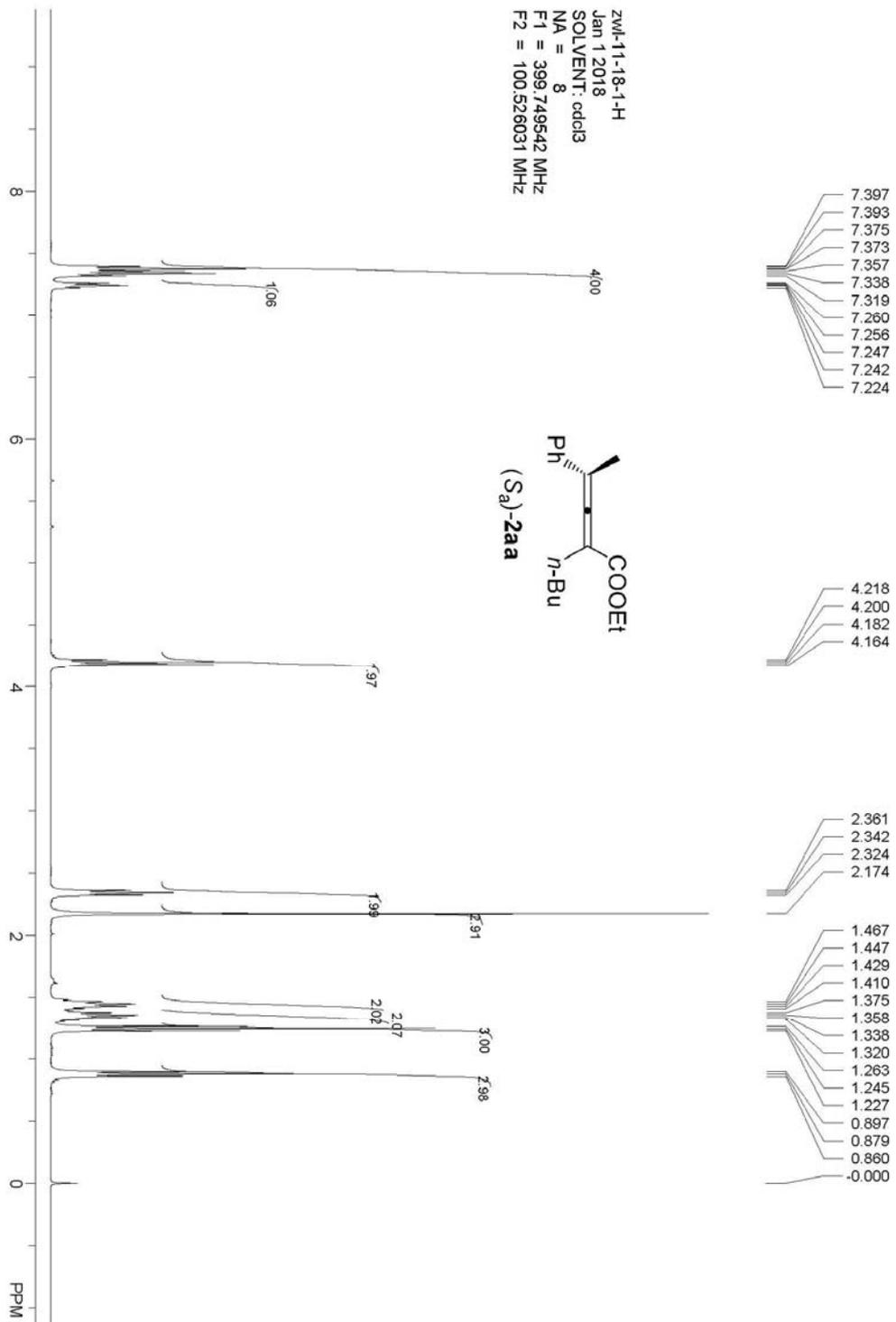
谱图文件: D:\zhuguangjiang\zw1\20160616\zw1-8-16-whelk-200-1-1-214..org

实验内容简介:

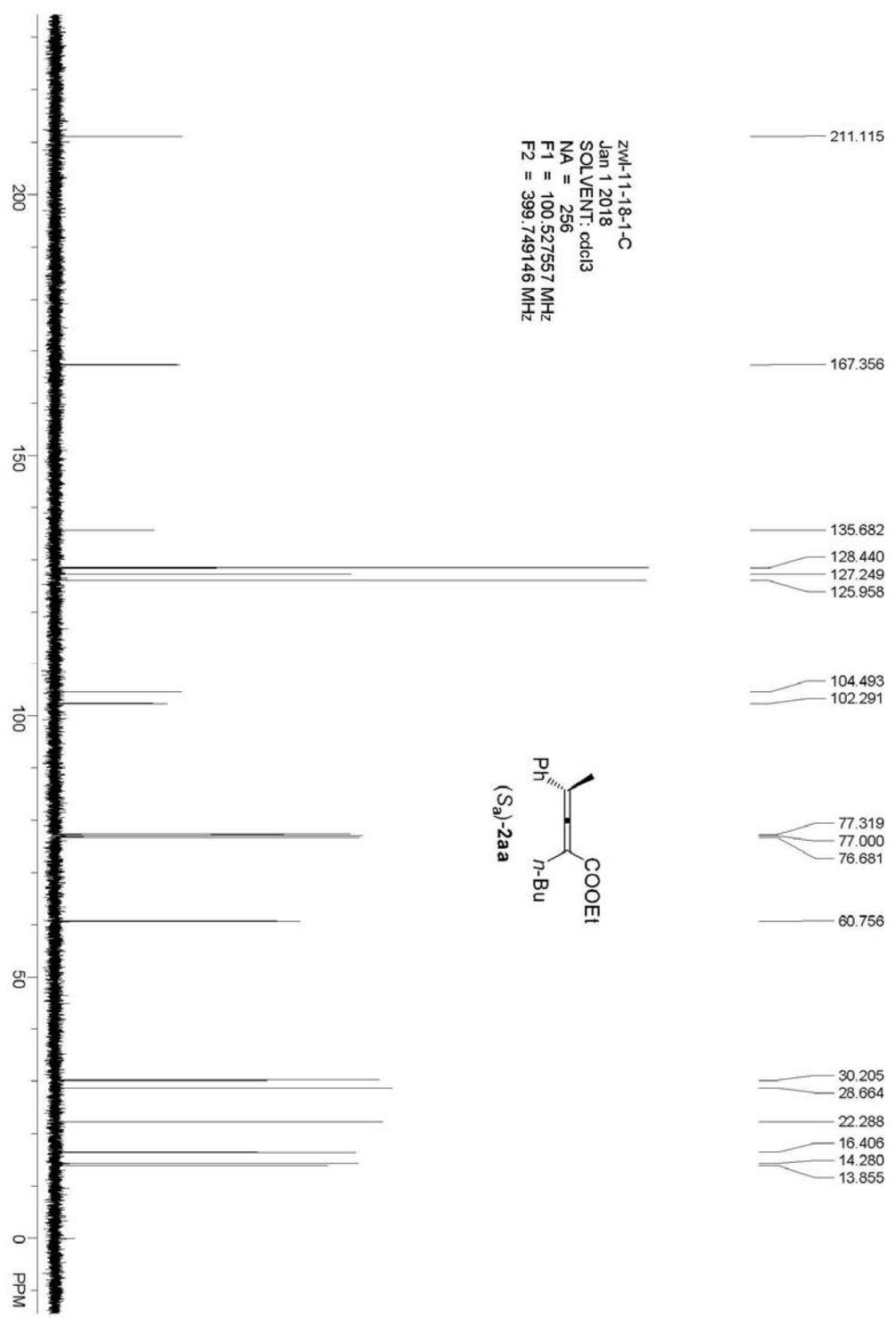
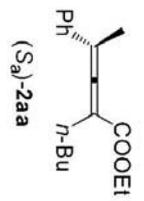


分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		6.105	437453.531	5007110.500	49.8224
2		7.407	423874.688	5042801.500	50.1776
总计			861328.219	10049912.000	100.0000



zwl-11-18-1-C
Jan 1 2018
SOLVENT: cdcl3
NA = 256
F1 = 100.527557 MHz
F2 = 399.749146 MHz



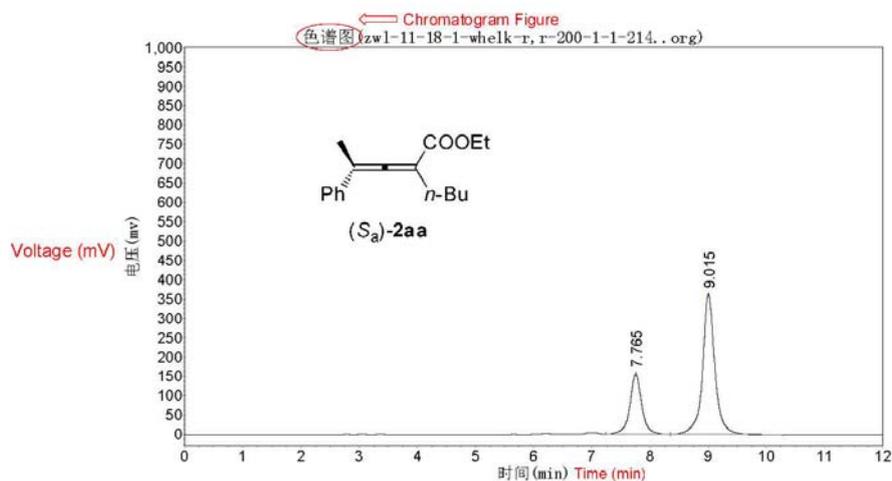
zwl-11-18-1-wheelk-r, r-200-1-1-214

实验时间: 2018-01-09, 13:35:56

报告时间: 2018-01-19, 14:23:23

谱图文件: D:\zhuguangjiang\zwl\20180109\zwl-11-18-1-wheelk-r, r-200-1-1-214. . org

实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.765	155384.359	2273376.000	29.6115
2		9.015	361441.781	5403972.500	70.3885
总计			516826.141	7677348.500	100.0000

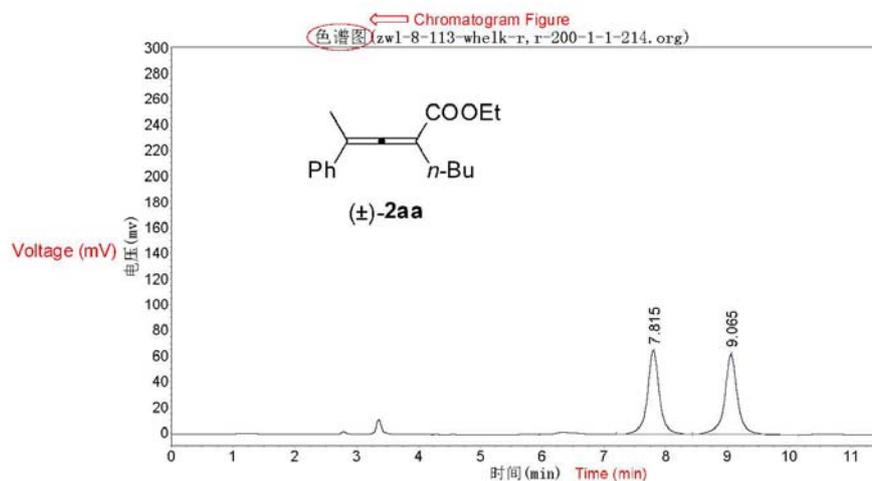
zw1-8-113-whe1k-r, r-200-1-1-214

实验时间: 2018-01-09, 13:06:36

报告时间: 2018-01-19, 14:21:00

谱图文件: D:\zhuguangjiang\zw1\20180109\zw1-8-113-whe1k-r, r-200-1-1-214.org

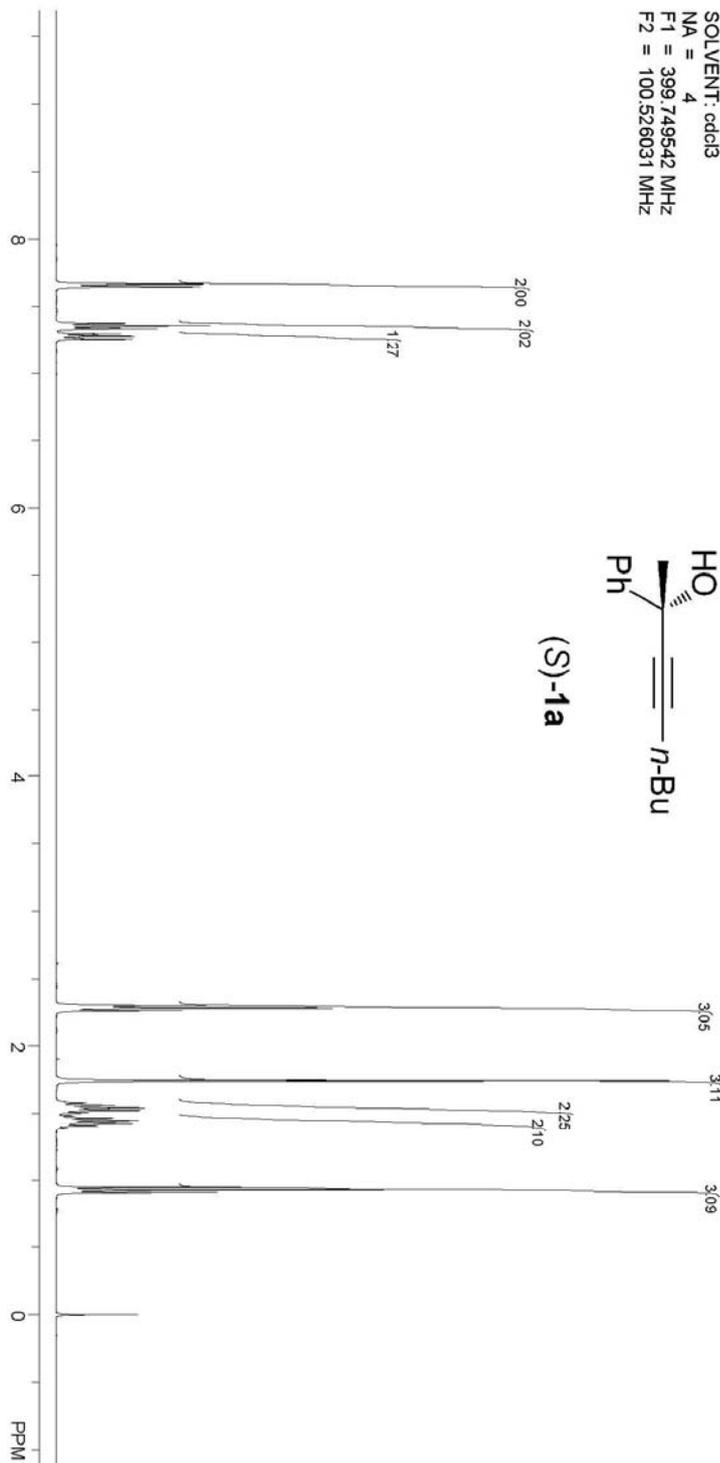
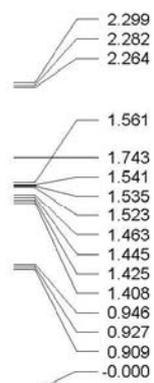
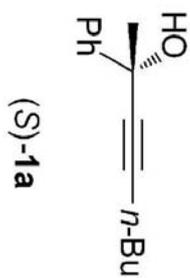
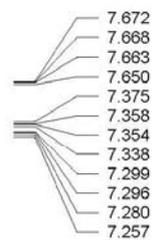
实验内容简介:



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.815	64914.402	905980.188	49.7961
2		9.065	61993.223	913399.500	50.2039
总计			126907.625	1819379.688	100.0000

zwl-11-18-2-H
Jan 3 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



zw1-11-18-2

实验时间: 2018-01-03, 16:10:23

报告时间: 2018-01-03, 16:41:02

谱图文件: E:\data\zw1\zw1-11-18-2-wheelk-s, s-200-1-1-214. org

方法文件: E:\data\zw1\zw1. mtd

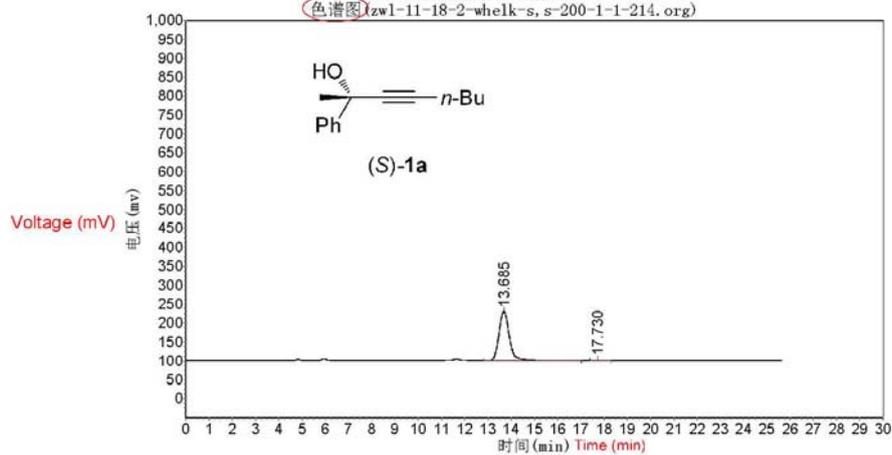
Brief introduction of experimental conditions

实验内容简介:

zw1-11-18-2-wheelk-s, s-200-1-1-214

Chromatogram Figure

色谱图(zw1-11-18-2-wheelk-s, s-200-1-1-214. org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		13.685	129390.258	4035790.750	99.7614
2		17.730	370.315	9653.605	0.2386
总计			129760.572	4045444.355	100.0000

zwl-10-177

实验时间: 2018-01-03, 14:58:04

报告时间: 2018-01-03, 15:56:13

谱图文件: E:\data\zwl\zwl-10-177-wheelk-s, s-200-1-1-214-

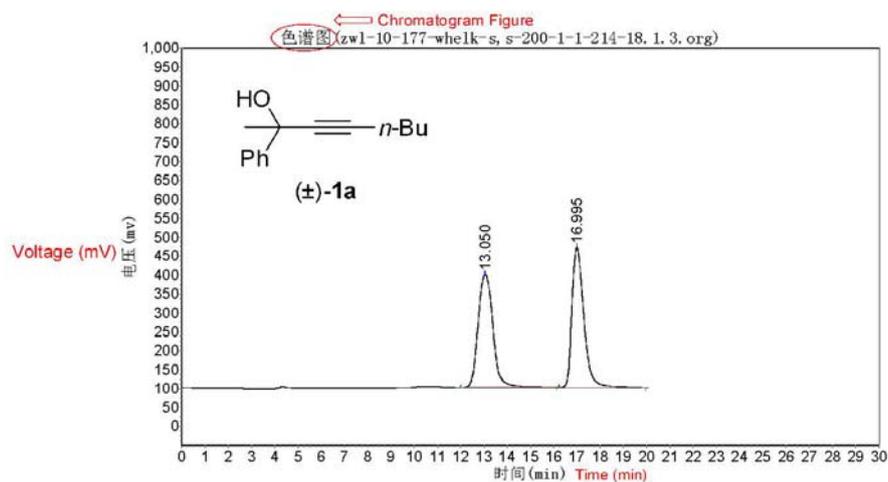
18.1.3.org

方法文件: E:\data\zwl\zwl.mtd

← Brief introduction of experimental conditions

实验内容简介:

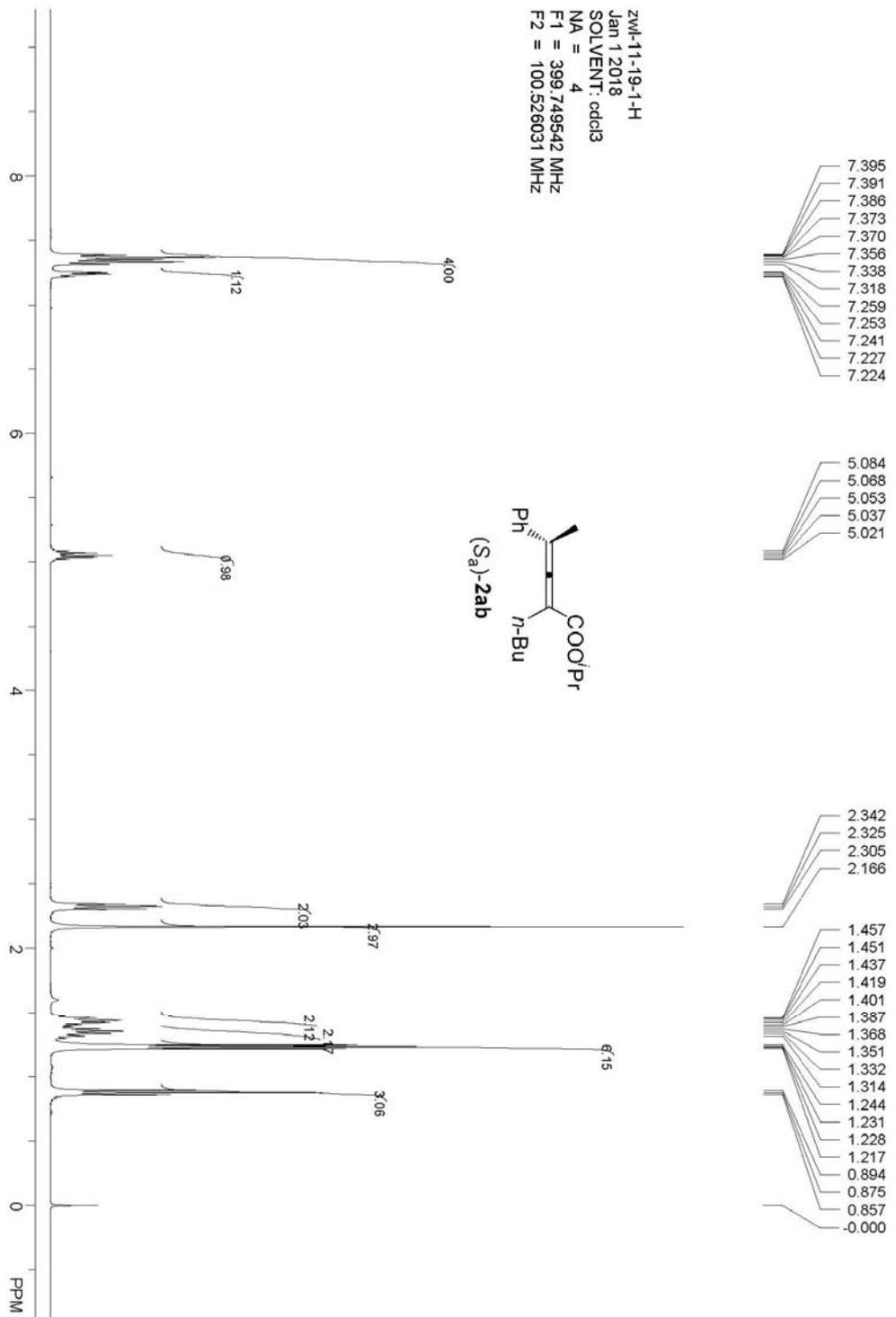
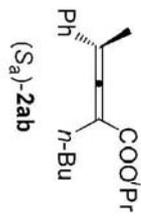
zwl-10-177-wheelk-s, s-200-1-1-214

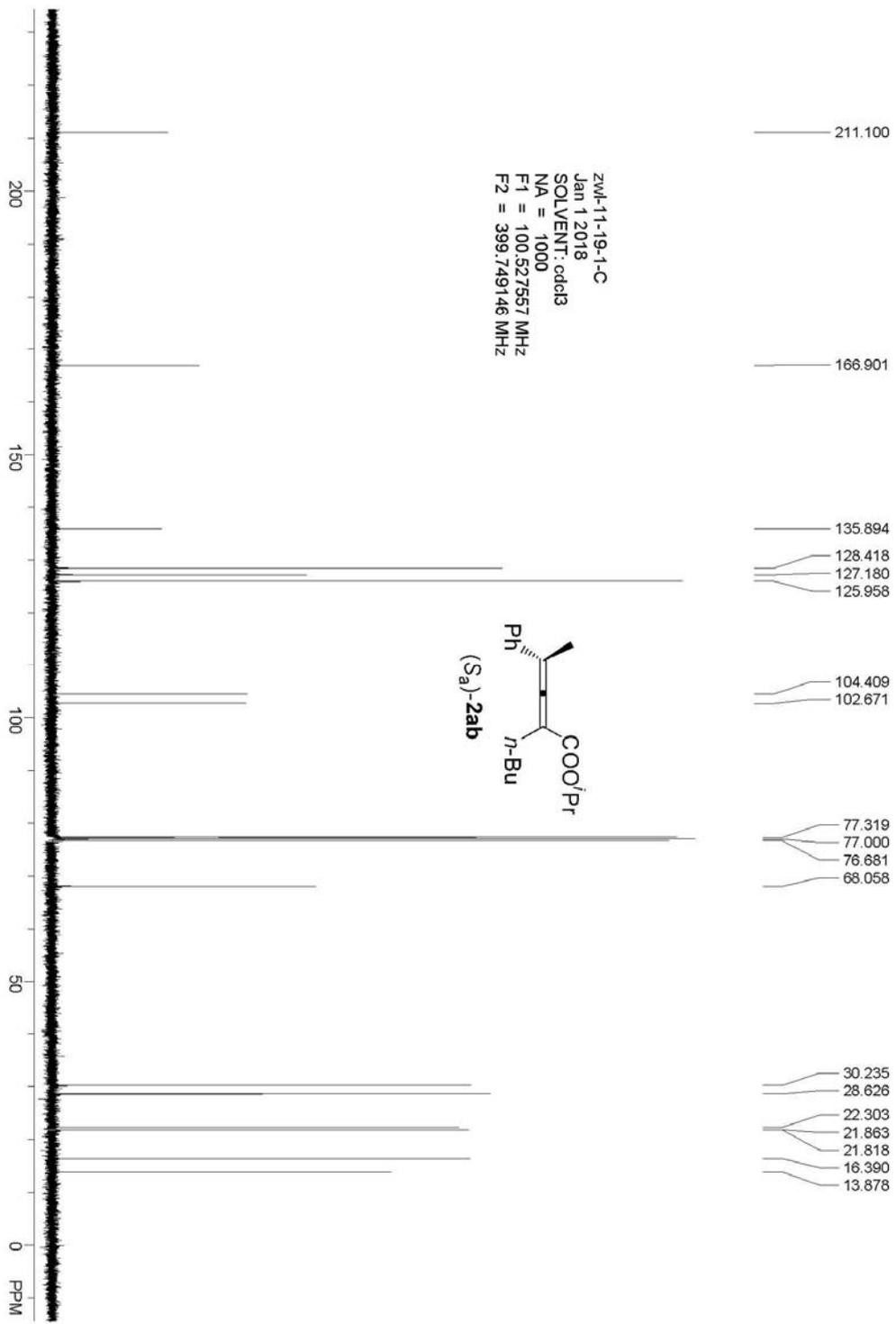


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		13.050	298480.719	13337632.000	50.2526
2		16.995	370224.250	13203545.000	49.7474
总计			668704.969	26541177.000	100.0000

zwl-11-19-1-H
 Jan 1 2018
 SOLVENT: odd3
 NA = 4
 F1 = 399.749542 MHz
 F2 = 100.526031 MHz



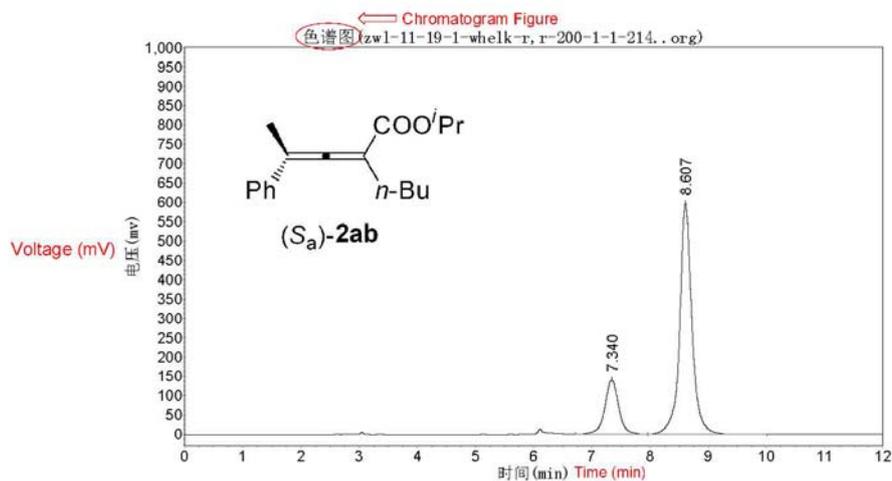


zwl-11-19-1-whelk-r, r-200-1-1-214

实验时间: 2018-01-09, 15:37:43
谱图文件: D:\zhuguangjiang\zwl\20180109\zwl-11-19-1-
whelk-r, r-200-1-1-214. . org

报告时间: 2018-01-19, 14:24:17

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		7.340	141313.141	2368081.750	21.2115
2		8.607	597790.563	8796077.000	78.7885
总计			739103.703	11164158.750	100.0000

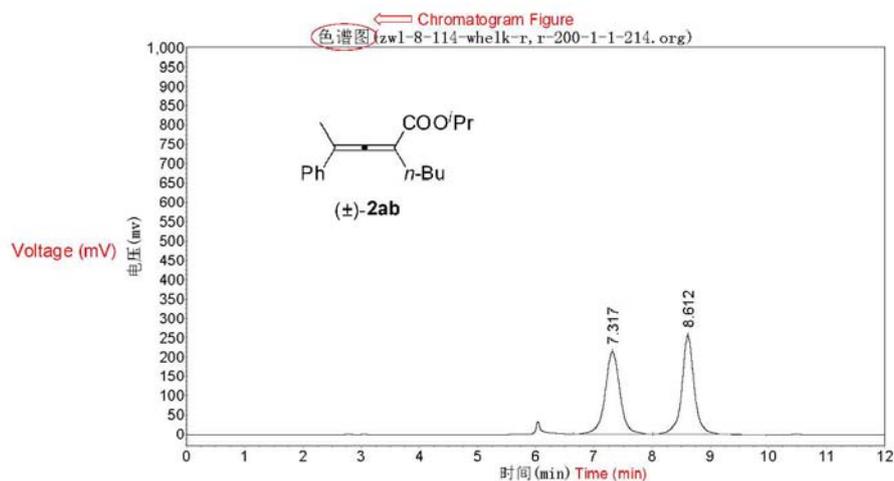
zw1-8-114-whe1k-r, r-200-1-1-214

实验时间: 2018-01-09, 15:09:31

报告时间: 2018-01-19, 14:21:53

谱图文件: D:\zhuguangjiang\zw1\20180109\zw1-8-114-whe1k-r, r-200-1-1-214.org

实验内容简介:

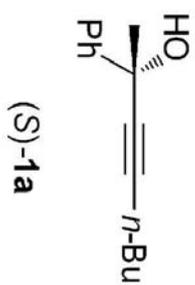


分析结果表

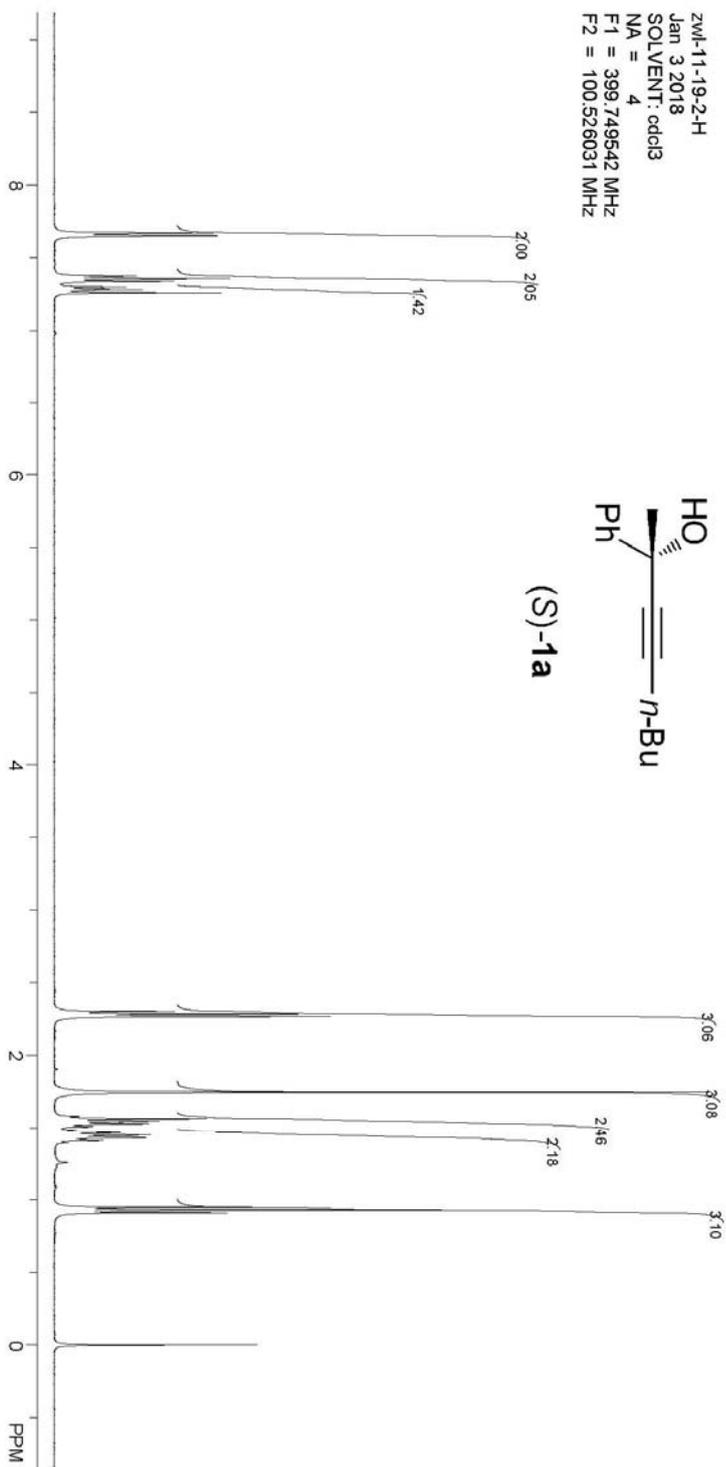
峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		7.317	212267.281	3824037.000	50.0884
2		8.612	255875.906	3810538.000	49.9116
总计			468143.188	7634575.000	100.0000

7.673
7.669
7.651
7.376
7.359
7.355
7.339
7.303
7.300
7.296
7.281
7.259

zwl-11-19-2-H
Jan 3 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.528031 MHz



2.300
2.283
2.266
1.560
1.543
1.744
1.537
1.524
1.507
1.464
1.446
1.426
1.409
0.947
0.928
0.910
-0.000



zw1-11-19-2

实验时间: 2018-01-03, 16:36:32

报告时间: 2018-01-03, 17:03:14

谱图文件: E:\data\zw1\zw1-11-19-2-wheelk-s, s-200-1-1-214. org

方法文件: E:\data\zw1\zw1. mtd

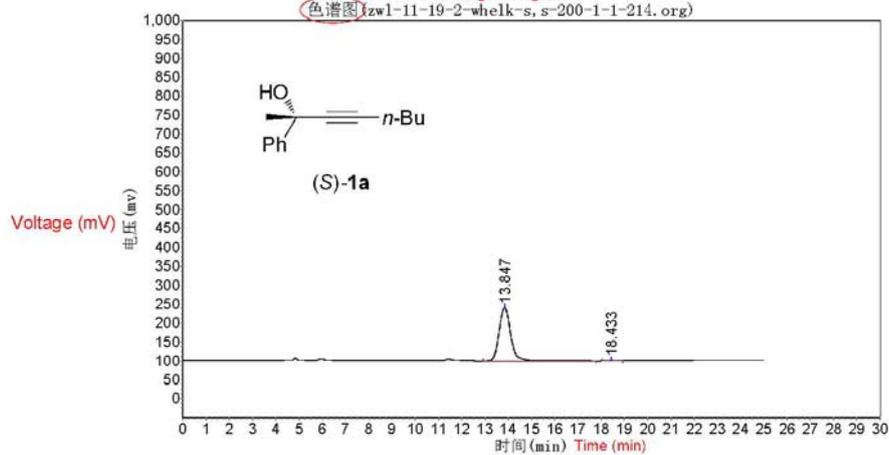
Brief introduction of experimental conditions

实验内容简介:

zw1-11-19-2-wheelk-s, s-200-1-1-214

Chromatogram Figure

色谱图 (zw1-11-19-2-wheelk-s, s-200-1-1-214. org)



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		13.847	139892.453	4895737.500	99.7662
2		18.433	423.490	11471.078	0.2338
总计			140315.943	4907208.578	100.0000

zw1-10-177

实验时间: 2018-01-03, 14:58:04

报告时间: 2018-01-03, 15:56:13

谱图文件: E:\data\zw1\zw1-10-177-wheelk-s, s-200-1-1-214-

18.1.3.org

方法文件: E:\data\zw1\zw1.mtd

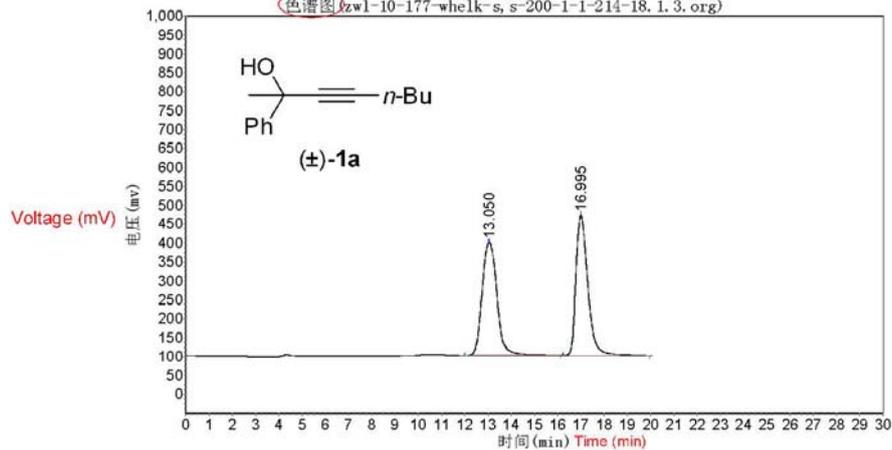
← Brief introduction of experimental conditions

实验内容简介:

zw1-10-177-wheelk-s, s-200-1-1-214

← Chromatogram Figure

色谱图(zw1-10-177-wheelk-s, s-200-1-1-214-18.1.3.org)

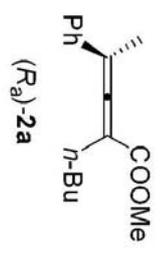


分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		13.050	298480.719	13337632.000	50.2526
2		16.995	370224.250	13203545.000	49.7474
总计			668704.969	26541177.000	100.0000

7.392
7.388
7.370
7.367
7.354
7.336
7.316
7.258
7.254
7.240
7.226
7.223

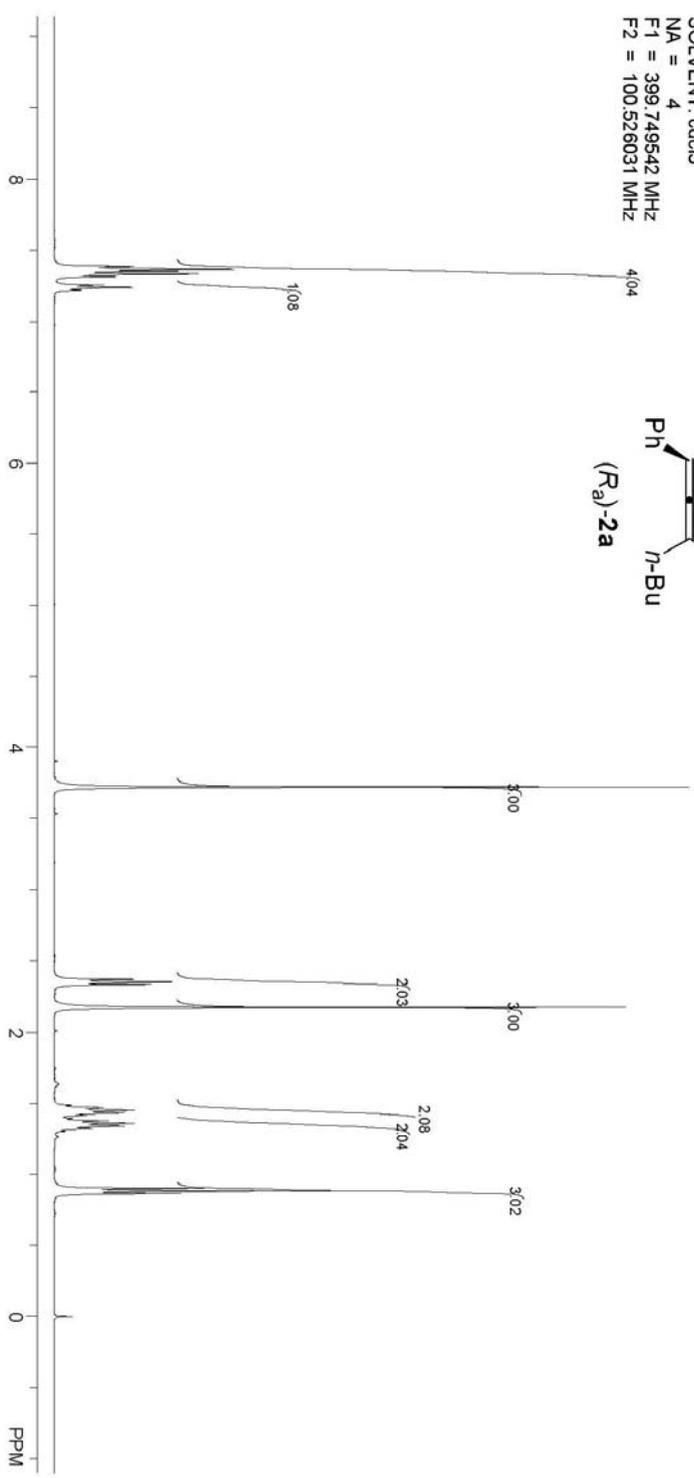
zwl-11-65-H
Apr 12 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz

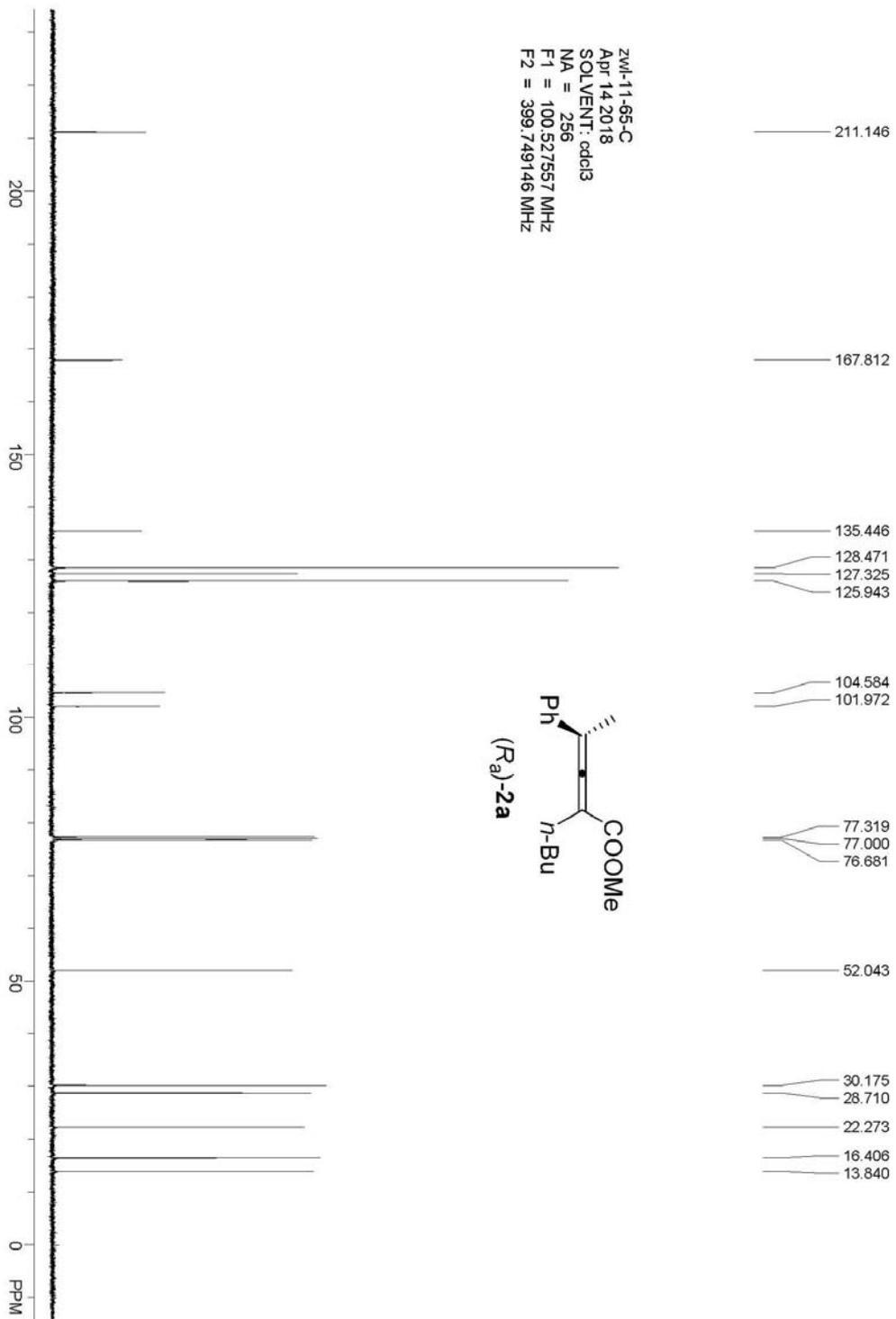


3.718

2.372
2.353
2.334
2.175

1.490
1.473
1.467
1.454
1.435
1.416
1.397
1.379
1.361
1.341
1.323
0.900
0.881
0.863
-0.000





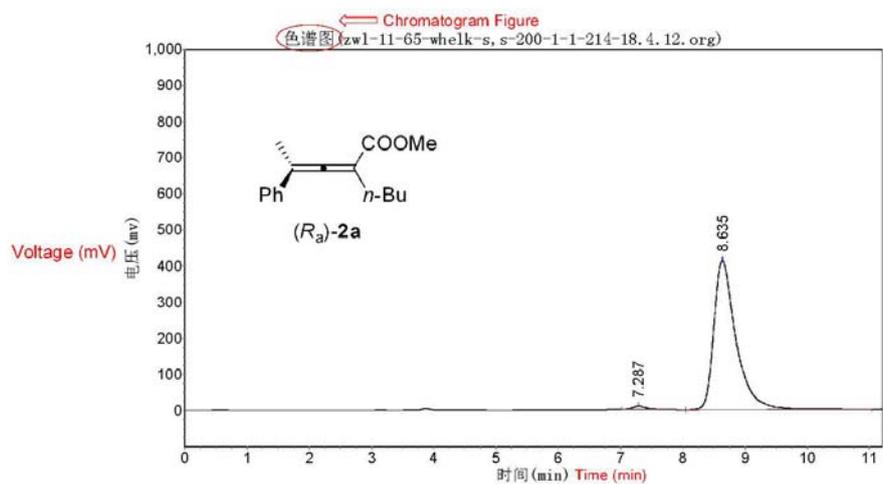
zw1-11-65

实验时间: 2018-04-12, 17:48:02
谱图文件: E:\data\zw1\zw1-11-65-wheelk-s, s-200-1-1-214-18.4.12.org

报告时间: 2018-04-12, 18:02:52

Brief introduction of experimental conditions

实验内容简介:
zw1-11-65-wheelk-s, s-200-1-1-214



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.287	9732.876	158619.156	1.5224
2		8.635	412723.813	10260651.000	98.4776
总计			422456.688	10419270.156	100.0000

zw1-9-139

实验时间: 2018-04-12, 18:50:54
谱图文件: E:\data\zw1\zw1-9-139-wheelk-s, s-200-1-1-214-18.4.12.org

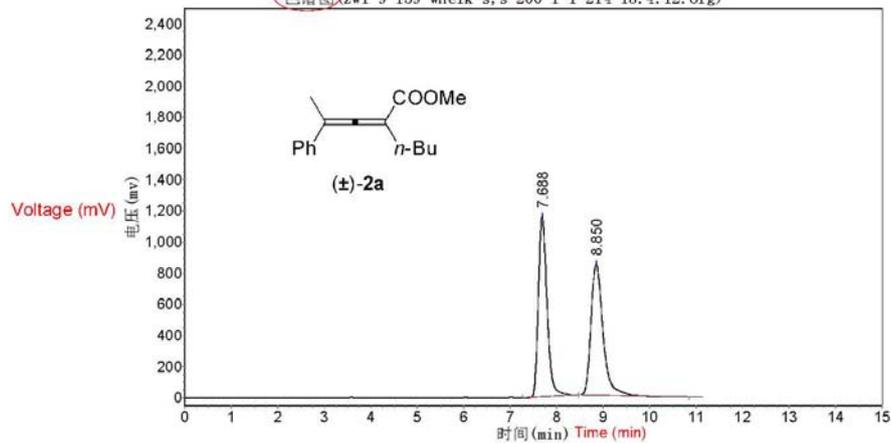
报告时间: 2018-04-12, 19:03:18

← Brief introduction of experimental conditions

实验内容简介:
zw1-9-139-wheelk-s, s-200-1-1-214

← Chromatogram Figure

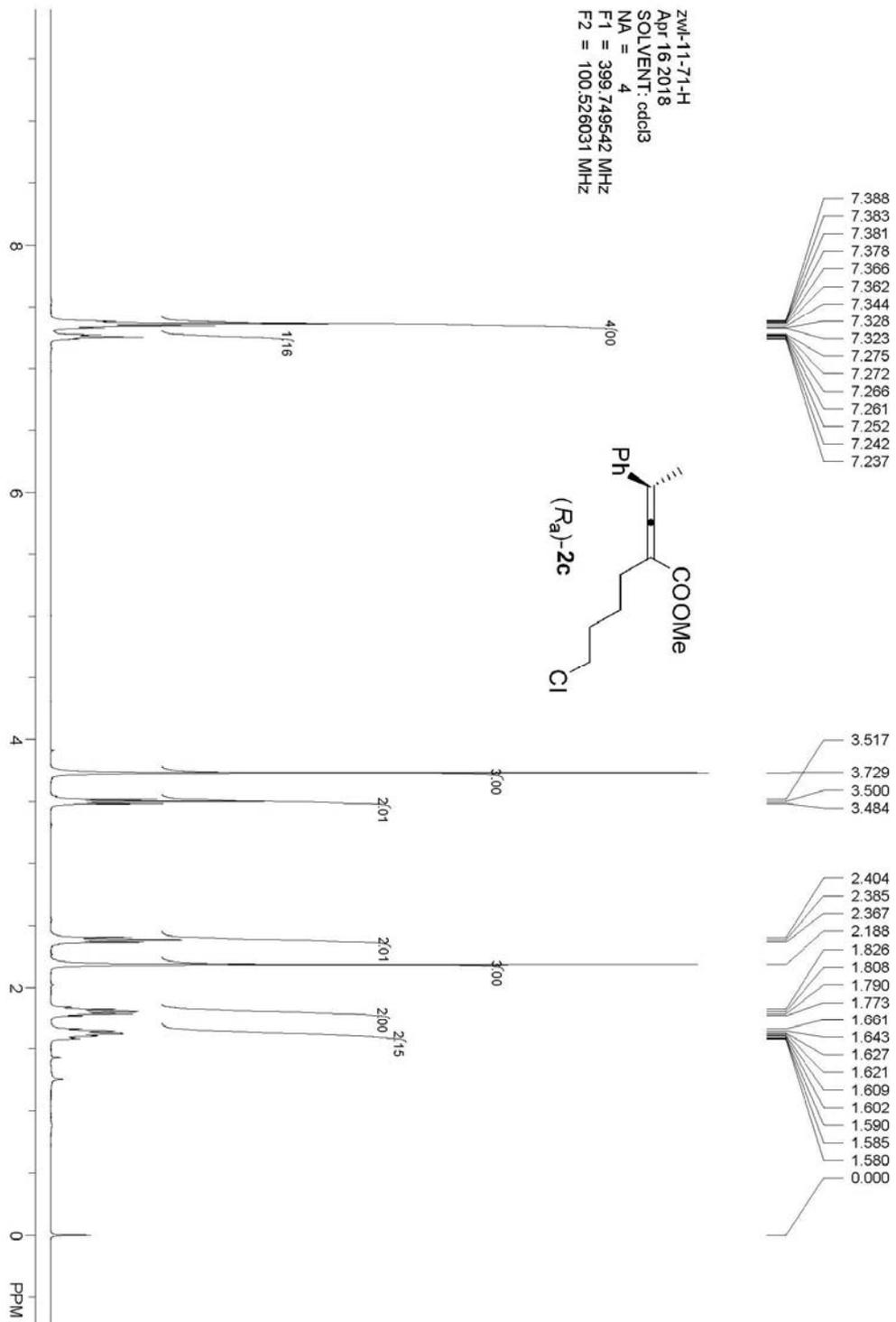
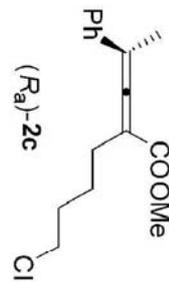
色谱图 (zw1-9-139-wheelk-s, s-200-1-1-214-18.4.12.org)

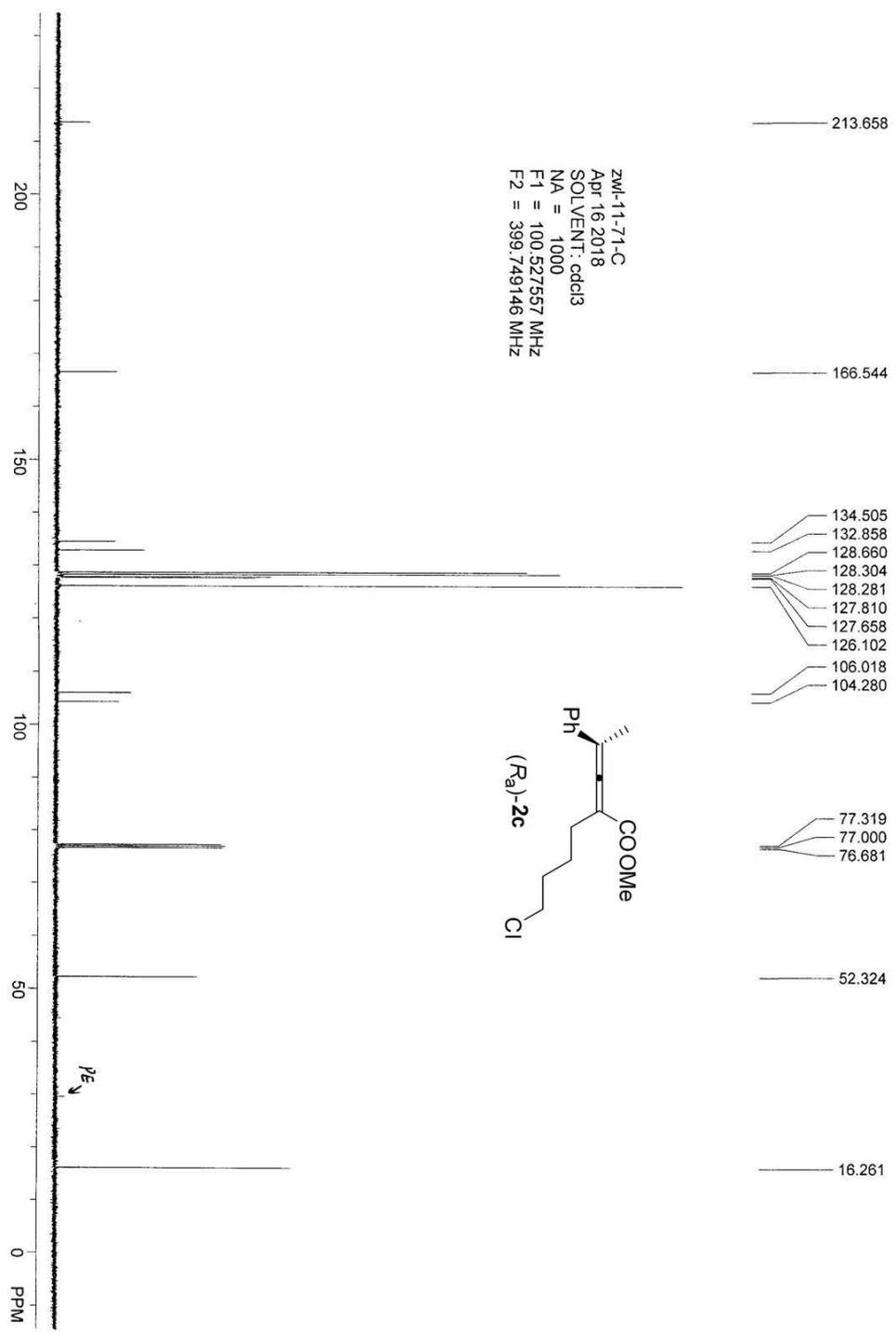


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.688	1155792.375	15057648.000	49.6680
2		8.850	841111.750	15258977.000	50.3320
总计			1996904.125	30316625.000	100.0000

zw-11-71-H
Apr 16 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz





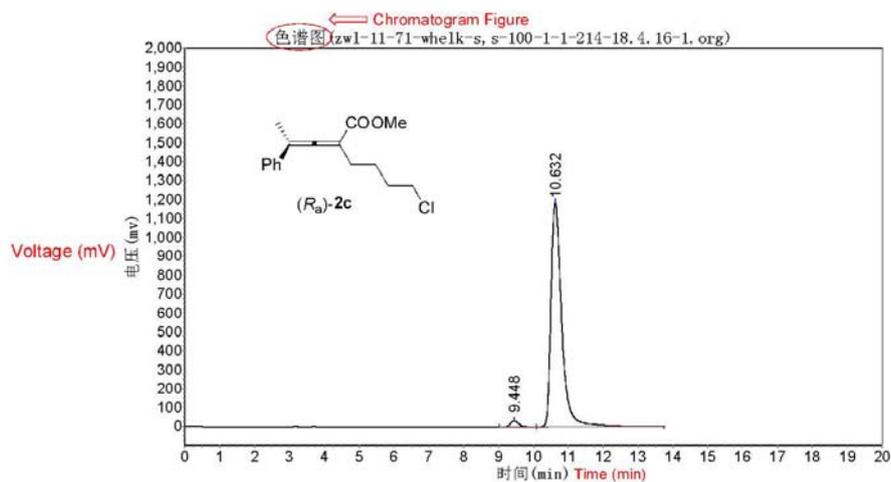
zw1-11-71

实验时间: 2018-04-16, 21:55:07
谱图文件: E:\data\zw1\zw1-11-71-whe1k-s, s-100-1-1-214-
18.4.16-1.org
方法文件: E:\data\yaoyuan\0414.mtd

报告时间: 2018-04-17, 18:08:59

← Brief introduction of experimental conditions

实验内容简介:
zw1-11-71-whe1k-s, s-100-1-1-214



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		9.448	30770.469	534250.500	2.0541
2		10.632	1185332.625	25474468.000	97.9459
总计			1216103.094	26008718.500	100.0000

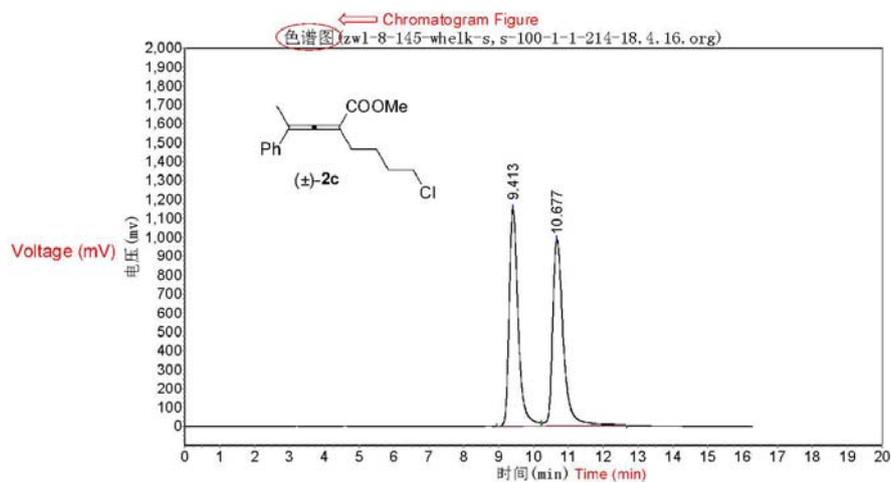
zw1-8-145

实验时间: 2018-04-16, 21:11:37
谱图文件: E:\data\zw1\zw1-8-145-whe1k-s, s-100-1-1-214-
18.4.16.org
方法文件: E:\data\yaoyuan\0414.mtd

报告时间: 2018-04-17, 18:08:23

实验内容简介: Brief introduction of experimental conditions

zw1-8-145-whe1k-s, s-100-1-1-214

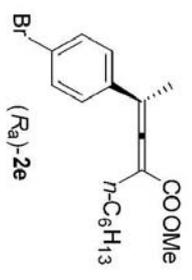


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		9.413	1151041.125	20616230.000	49.6995
2		10.677	985227.375	20865558.000	50.3005
总计			2136268.500	41481788.000	100.0000

7.466
7.460
7.456
7.444
7.439
7.432
7.260
7.248
7.241
7.236
7.225
7.220
7.214

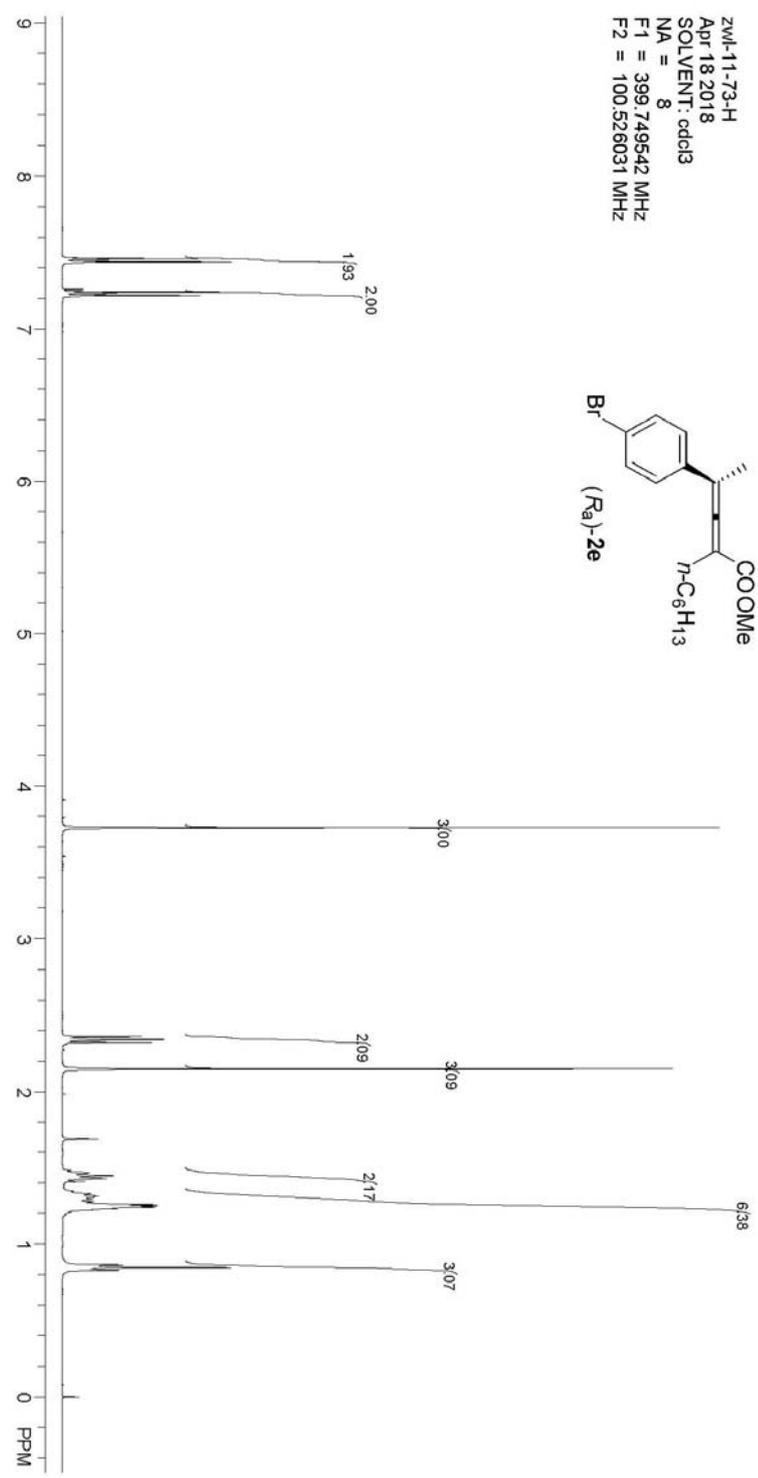
zwl-11-73-H
Apr 18 2018
SOLVENT: odd3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz

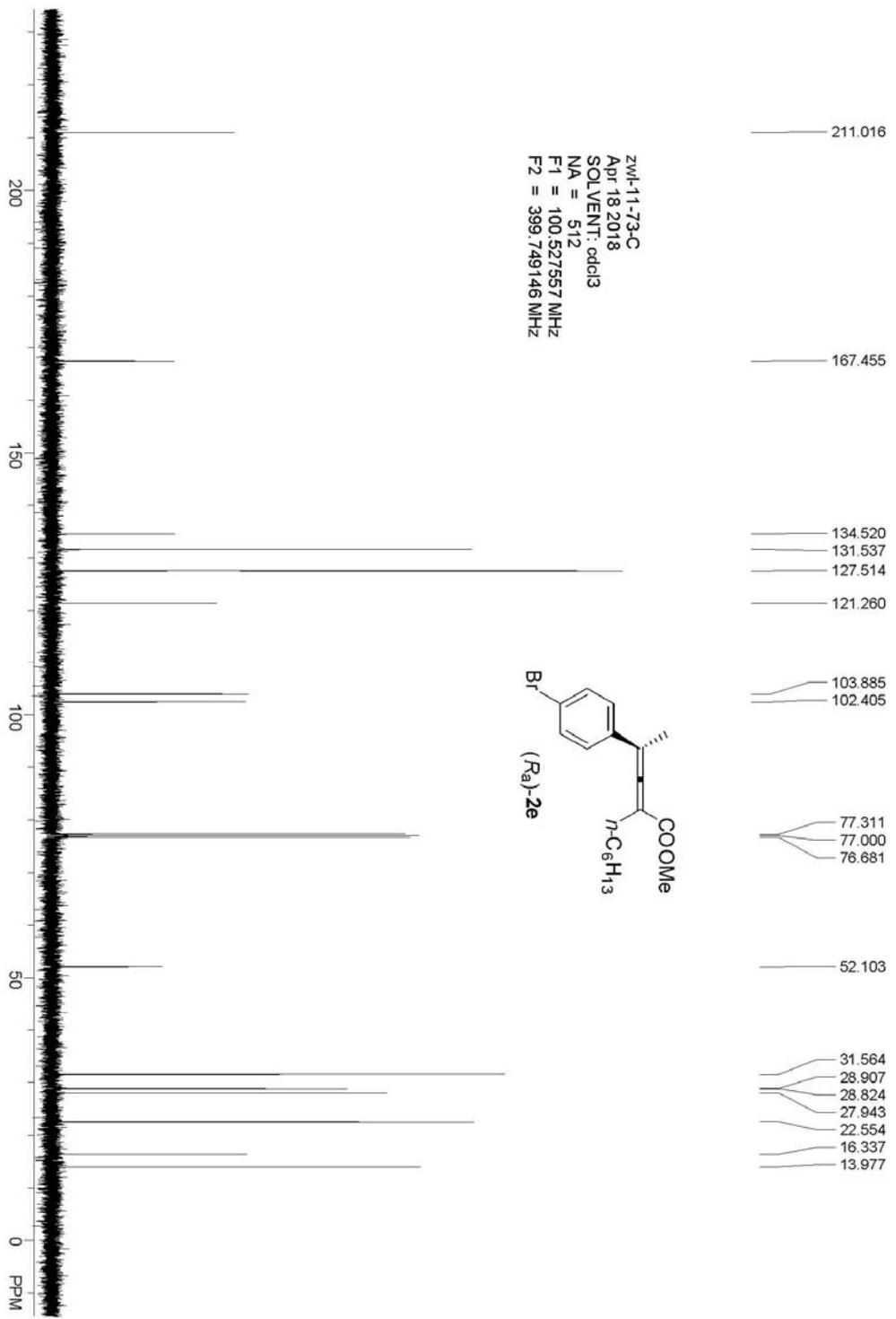


3.726

2.360
2.341
2.323
2.149

1.464
1.445
1.431
1.425
1.408
1.312
1.306
1.297
1.289
1.247
1.239
1.222
0.862
0.845
0.828
0.000





zw1-11-73

实验时间: 2018-04-17, 17:03:47

报告时间: 2018-04-19, 20:42:18

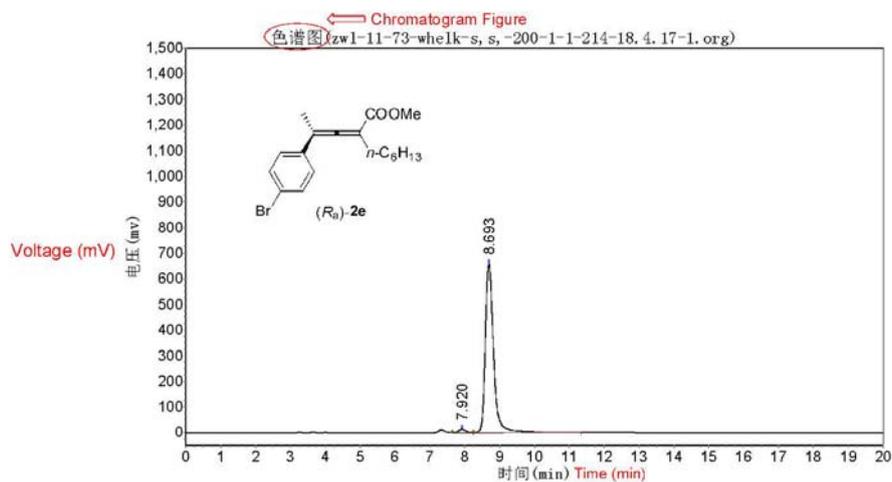
谱图文件: E:\data\zw1\zw1-11-73-whe1k-s, s, -200-1-1-214-

18.4.17-1.org

方法文件: E:\data\yaoyuan\0414.mtd

实验内容简介: Brief introduction of experimental conditions

zw1-11-73-whe1k-s, s-200-1-1-214



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.920	13356.616	191971.297	1.7227
2		8.693	660292.250	10951710.000	98.2773
总计			673648.866	11143681.297	100.0000

zw1-8-200

实验时间: 2018-04-17, 16:10:49

报告时间: 2018-04-17, 16:26:10

谱图文件: E:\data\zw1\zw1-8-200-wheelk-s, s, -200-1-1-214-

18.4.17.org

方法文件: E:\data\yaoyuan\0414.mtd

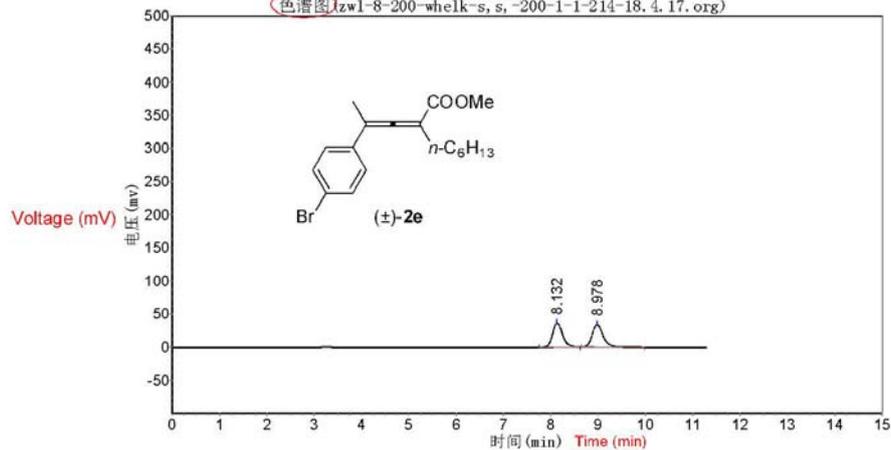
← Brief introduction of experimental conditions

实验内容简介:

zw1-8-200-wheelk-s, s-200-1-1-214

← Chromatogram Figure

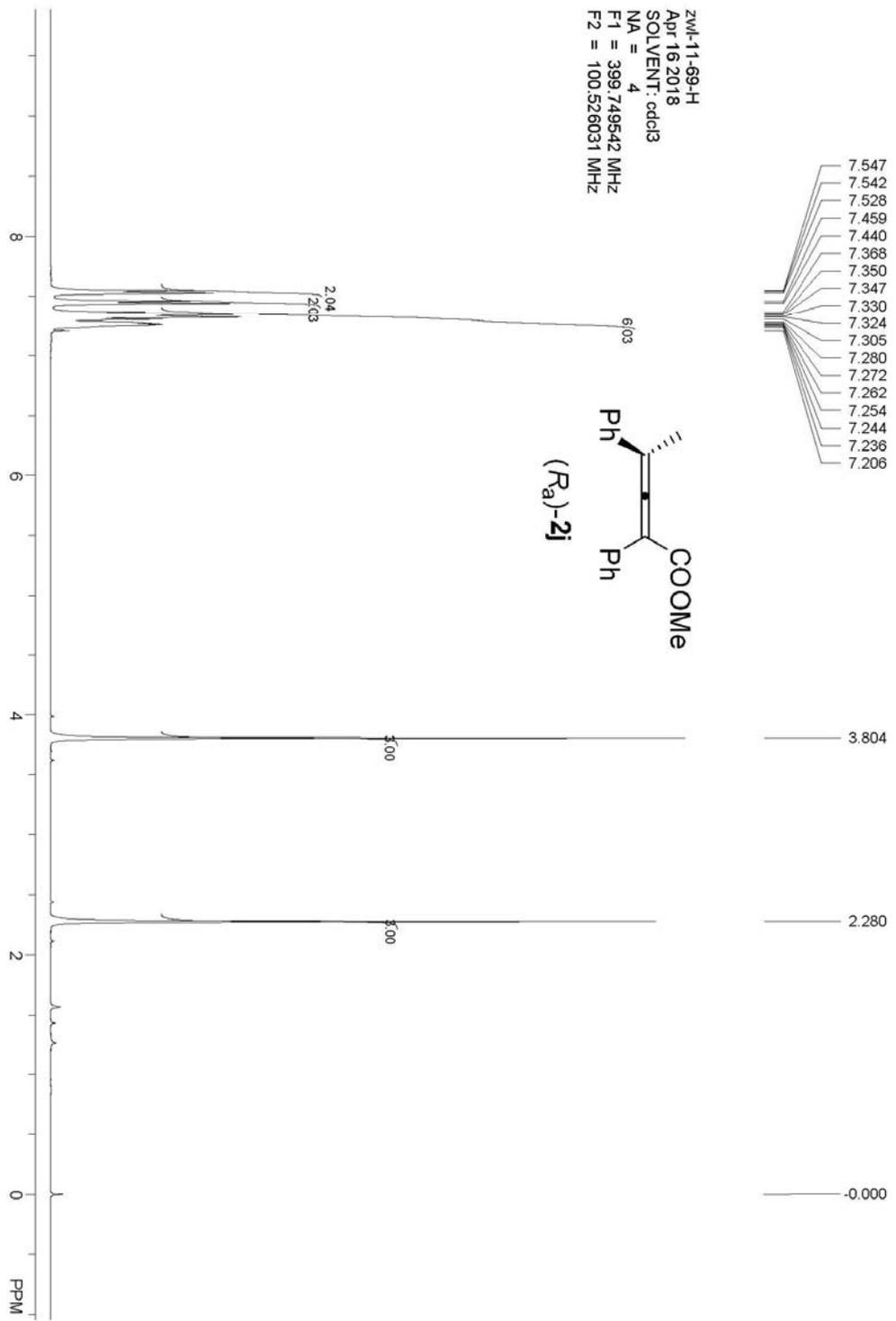
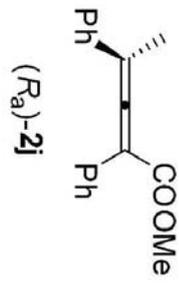
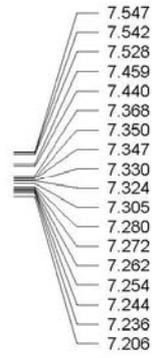
色谱图(zw1-8-200-wheelk-s, s, -200-1-1-214-18.4.17.org)

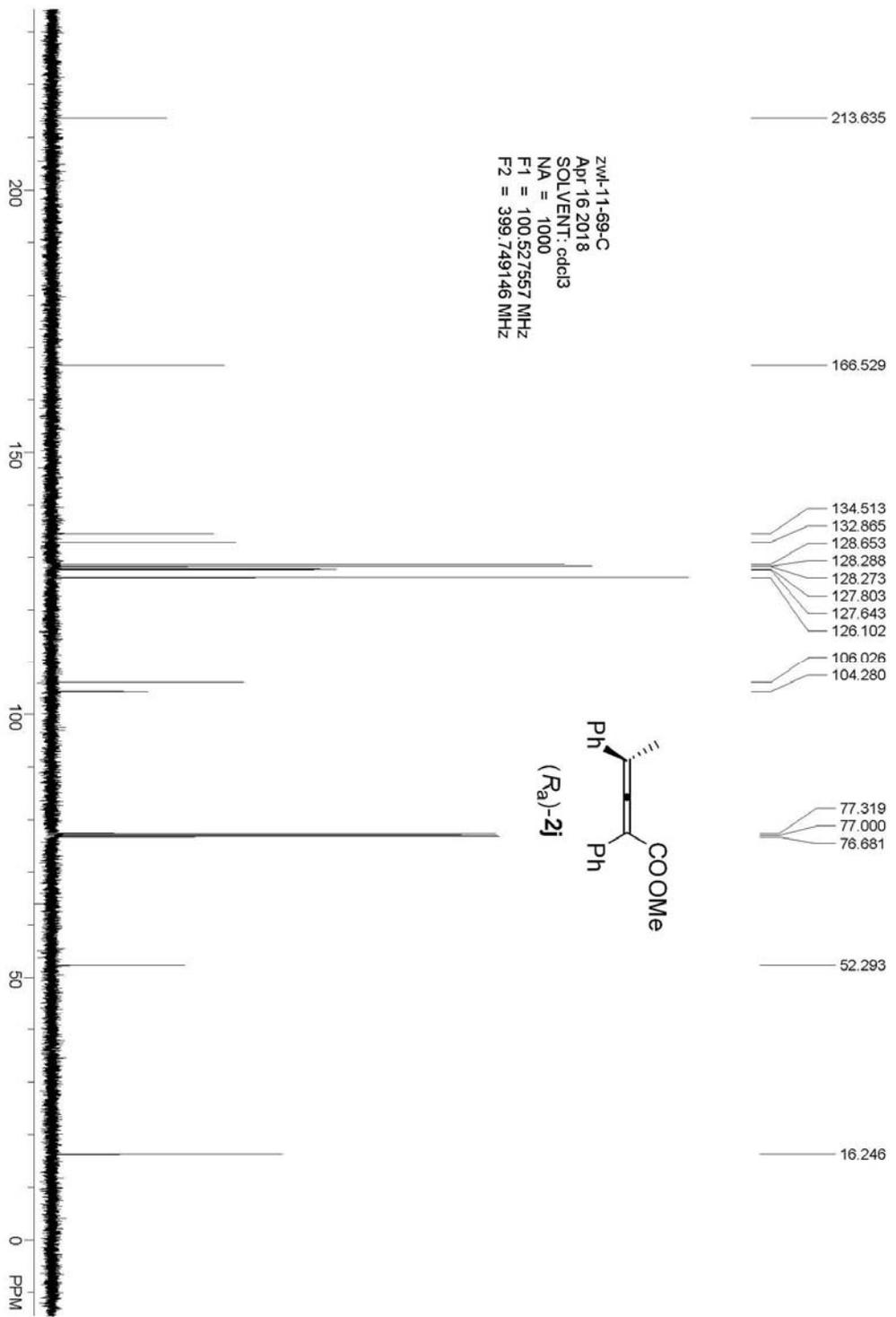


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		8.132	36212.492	533018.250	49.8637
2		8.978	33533.133	535932.188	50.1363
总计			69745.625	1068950.438	100.0000

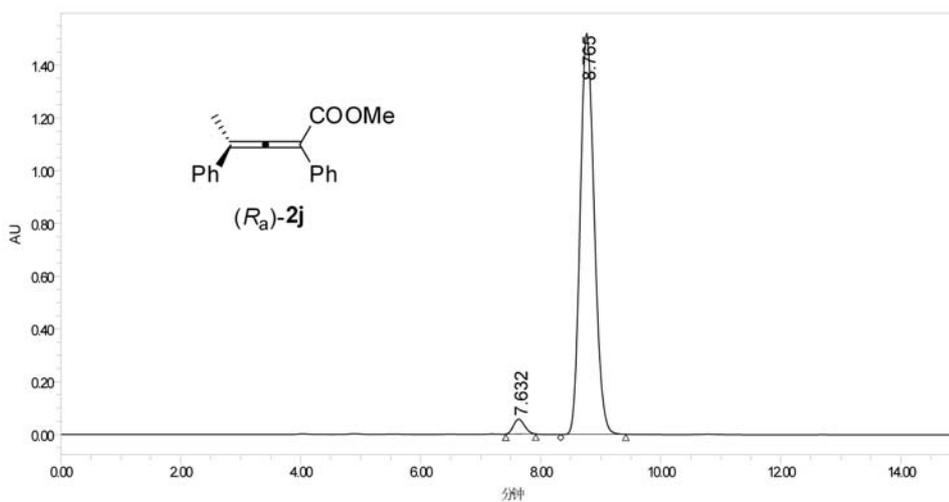
zwl-11-69-H
Apr 16 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz





SAMPLE INFORMATION

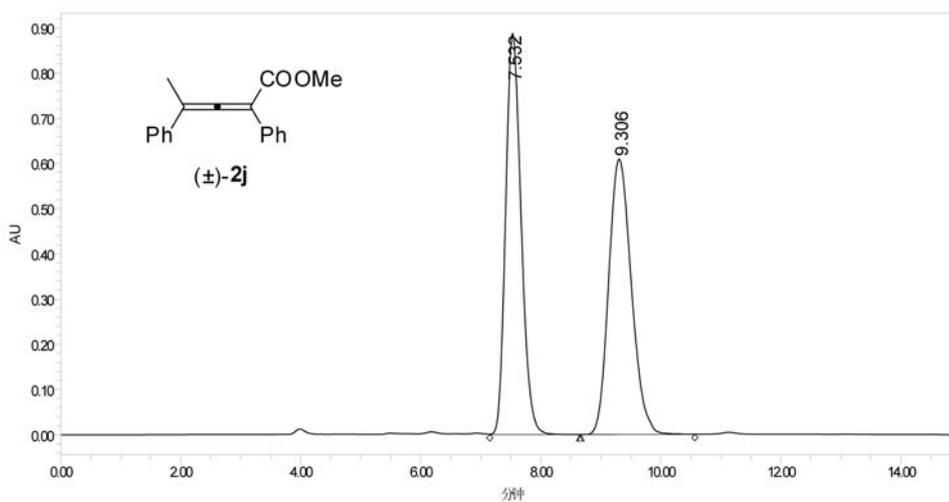
Sample Name:	zw-11-69-po-2-100-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2018/4/17 19:43:55 CST
Vial:	999	Acq. Method:	zj1001
Injection #:	71	Date Processed:	2018/4/17 20:45:04 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	15.00 Minutes	Channel Desc.:	V2489 ChA 230nm
Column Type:		Sample Set Name:	



	RT (min)	Area (AU#sec)	%Area	Height (AU)	% Height
1	7.632	71740E	2.8E	53441	3.5E
2	8.76E	2475142E	97.1E	152002E	96.4E

SAMPLE INFORMATION

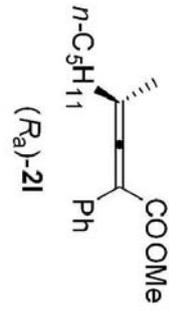
Sample Name:	zwl-7-135-po-2-100-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2018/4/17 18:59:03 CST
Vial:	999	Acq. Method:	zlj1001
Injection #:	69	Date Processed:	2018/4/17 20:44:39 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	15.00 Minutes	Channel Desc.:	V2489 ChA 230nm
Column Type:		Sample Set Name:	



	RT (min)	Area (intsec)	%Area	Height (int)	% Height
1	7.532	15876841	49.82	887215	59.25
2	9.306	15991546	50.18	609144	40.71

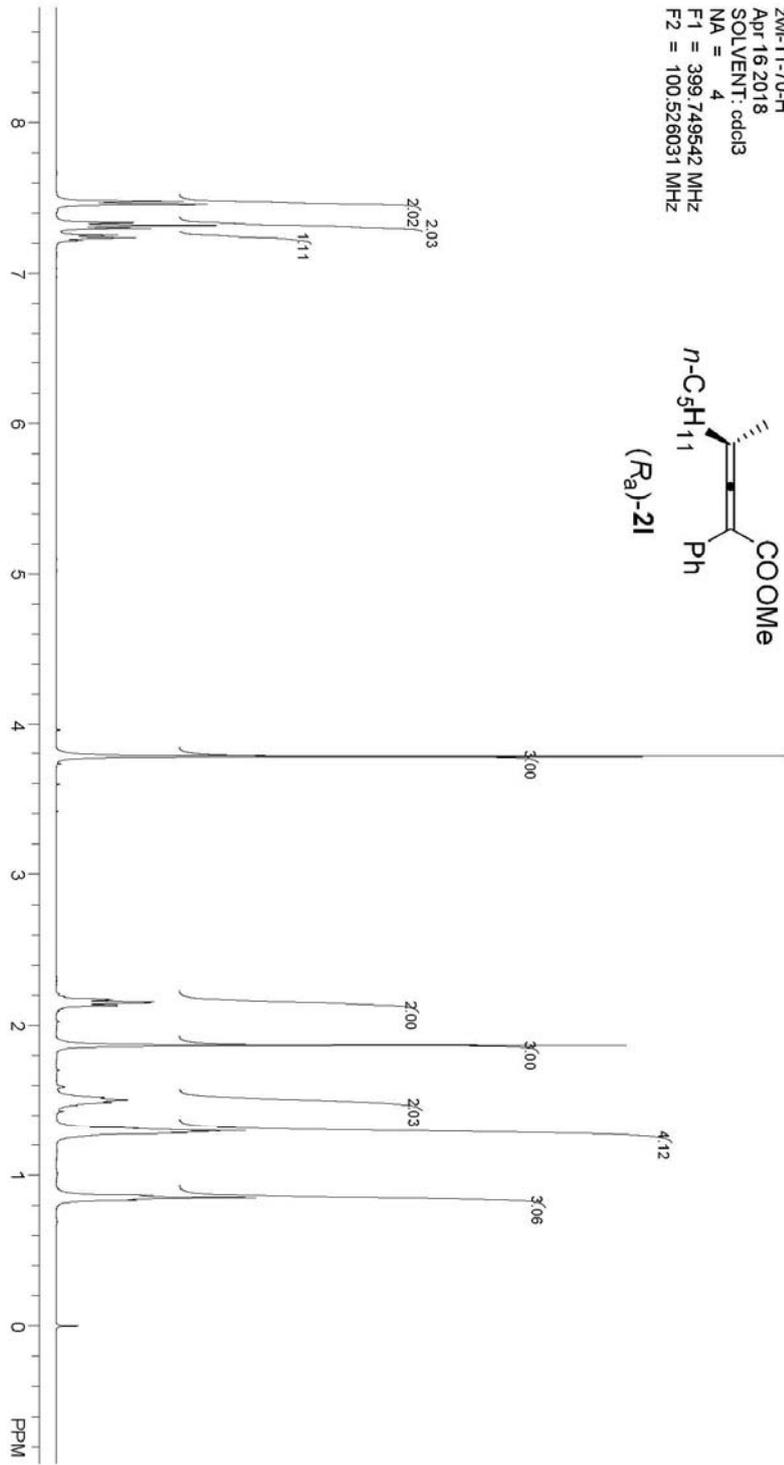
7.480
7.477
7.459
7.336
7.332
7.319
7.299
7.254
7.240
7.236
7.221
7.218

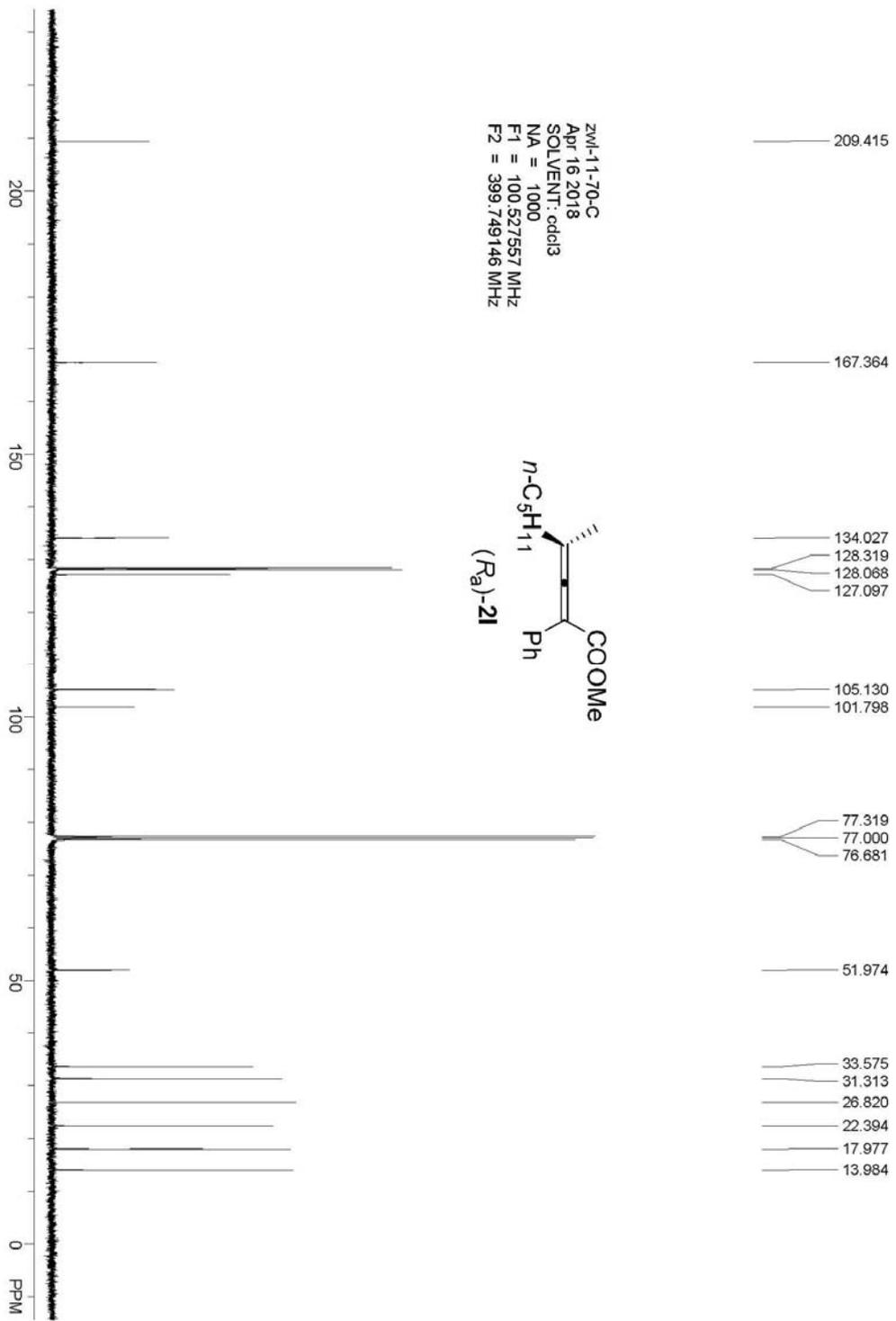
zwl-11-70-H
Apr 16 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



3.782

2.172
2.167
2.153
2.148
2.134
2.131
1.867
1.521
1.504
1.486
1.469
1.332
1.315
1.306
1.298
1.289
1.280
0.868
0.852
0.834
0.000





zw1-11-70

实验时间: 2018-04-16, 20:31:05

报告时间: 2018-04-17, 18:11:30

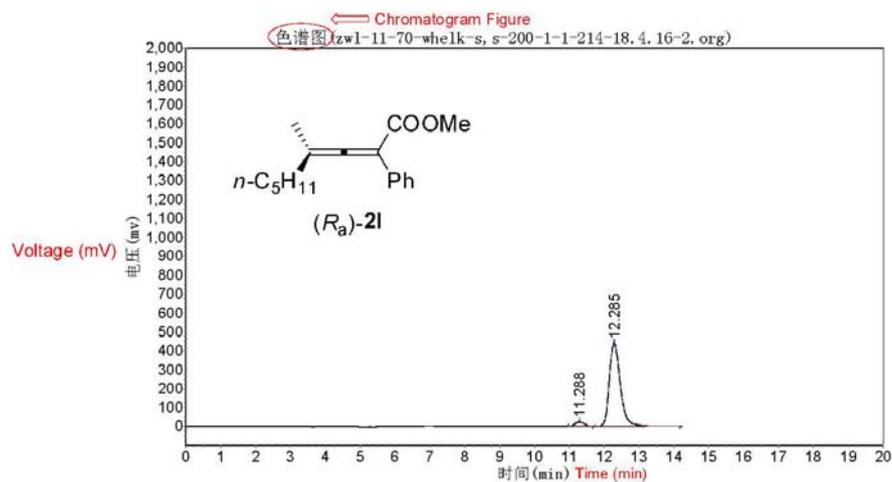
谱图文件: E:\data\zw1\zw1-11-70-whe1k-s, s-200-1-1-214-

18.4.16-2.org

方法文件: E:\data\yaoyuan\0414.mtd

实验内容简介: Brief introduction of experimental conditions

zw1-11-70-whe1k-s, s-200-1-1-214



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		11.288	23293.891	422110.094	4.2103
2		12.285	438309.594	9603543.000	95.7897
总计			461603.484	10025653.094	100.0000

zw1-8-147

实验时间: 2018-04-16, 19:28:42

报告时间: 2018-04-20, 15:20:43

谱图文件: E:\data\zw1\zw1-8-147-whe1k-s, s-200-1-1-214-

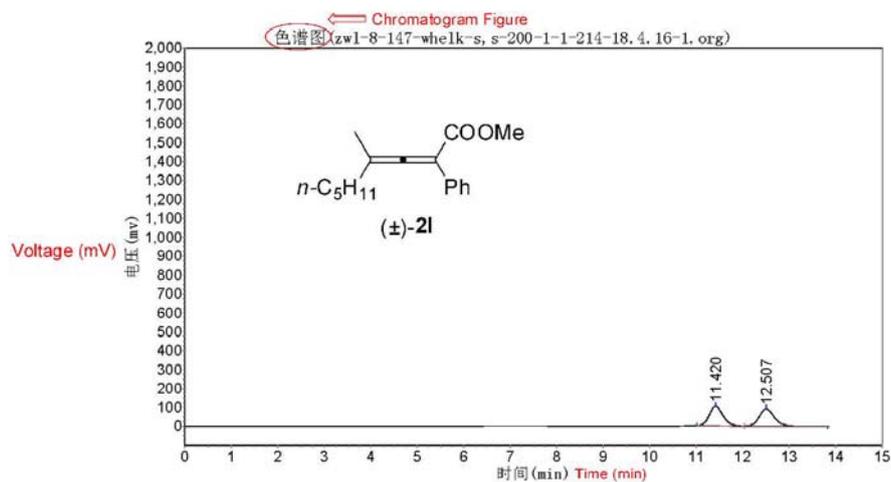
18.4.16-1.org

方法文件: E:\data\yaoyuan\0414.mtd

← Brief introduction of experimental conditions

实验内容简介:

zw1-8-147-whe1k-s, s-200-1-1-214

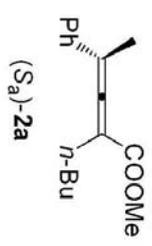


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		11.420	101879.672	2118019.500	50.0813
2		12.507	91350.055	2111141.750	49.9187
总计			193229.727	4229161.250	100.0000

7.396
7.392
7.387
7.374
7.371
7.363
7.345
7.325
7.268
7.260
7.251
7.233

zw-11-22-H
Jan 3 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz

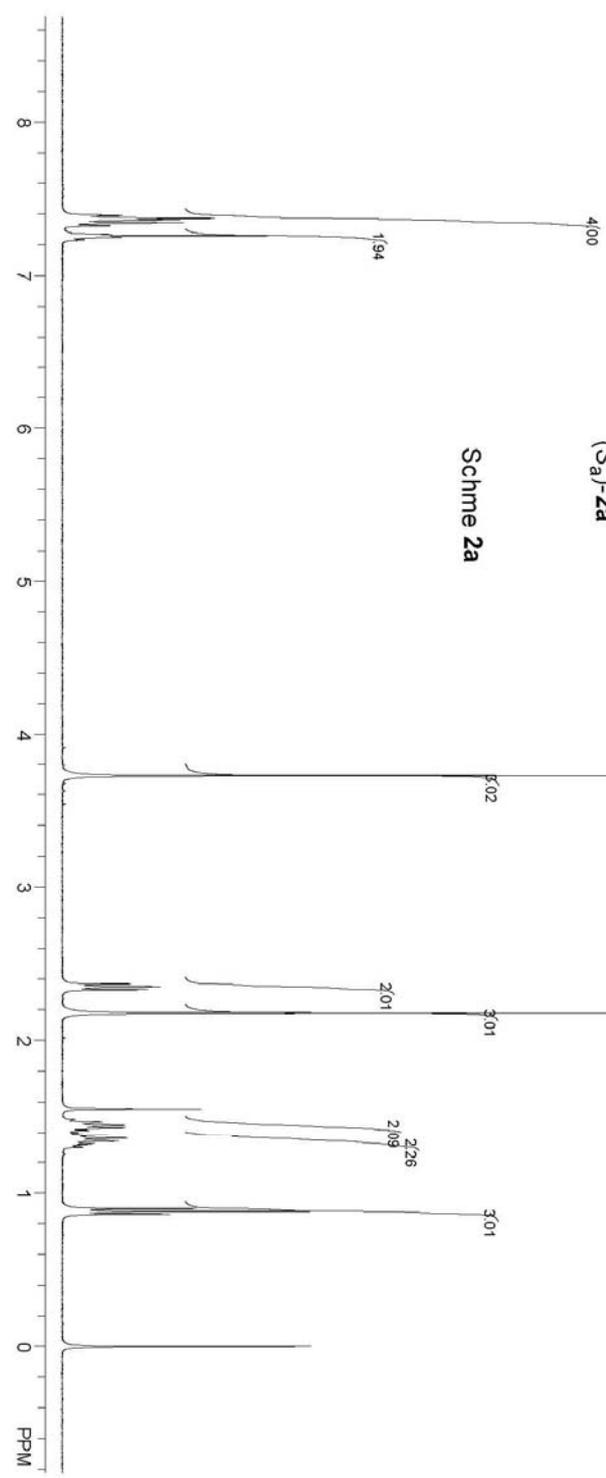


Schme 2a

3.725

2.368
2.350
2.331
2.180

1.555
1.550
1.469
1.449
1.432
1.412
1.378
1.361
1.341
1.322
1.315
1.300
0.900
0.881
0.863
0.000



zw1-11-22

实验时间: 2018-01-03, 11:09:13

报告时间: 2018-01-04, 13:08:31

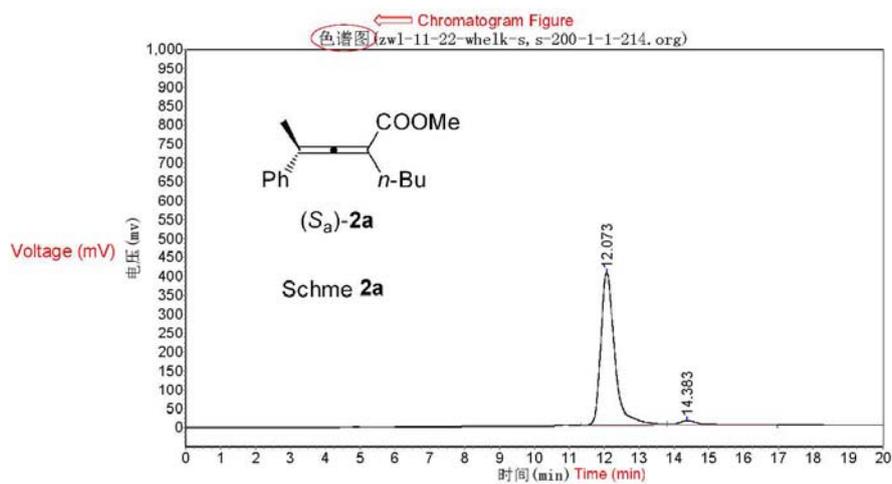
谱图文件: E:\data\zw1\zw1-11-22-wheelk-s, s-200-1-1-214. org

方法文件: E:\data\zw1\zw1. mtd

Brief introduction of experimental conditions

实验内容简介:

zw1-11-22-wheelk-s, s-200-1-1-214



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		12.073	403891.813	11379891.000	95.2917
2		14.383	12924.046	562267.938	4.7083
总计			416815.858	11942158.938	100.0000

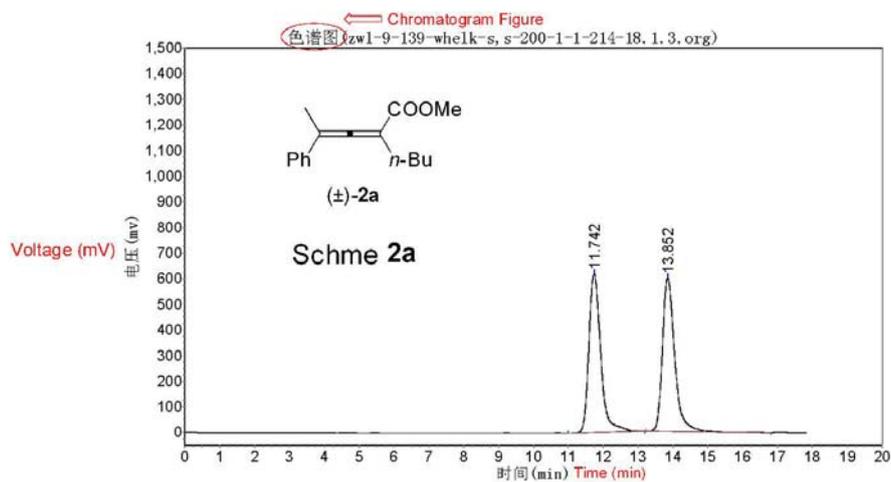
zw1-9-139

实验时间: 2018-01-03, 9:32:37
谱图文件: E:\data\zw1\zw1-9-139-whe1k-s, s-200-1-1-214-
18.1.3.org
方法文件: E:\data\zw1\zw1.mtd

报告时间: 2018-01-03, 9:54:10

实验内容简介: Brief introduction of experimental conditions

zw1-9-139-whe1k-s, s-200-1-1-214

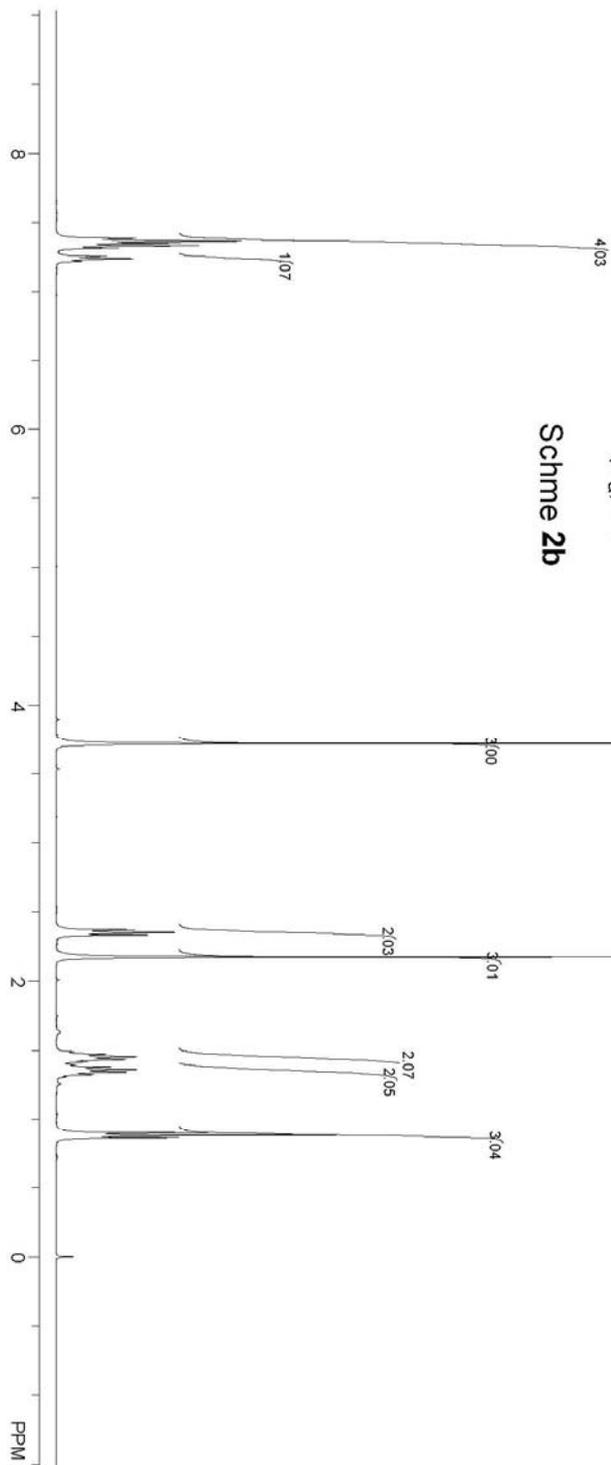
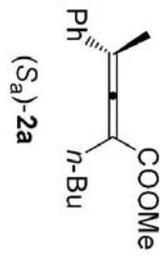


分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		11.742	619896.125	14716571.000	50.0764
2		13.852	599002.500	14671686.000	49.9236
总计			1218898.625	29388257.000	100.0000

7.387
7.367
7.354
7.335
7.316
7.257
7.240
7.226
7.222

zwl-11-67-H
Apr 11 16:20:18
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.528031 MHz



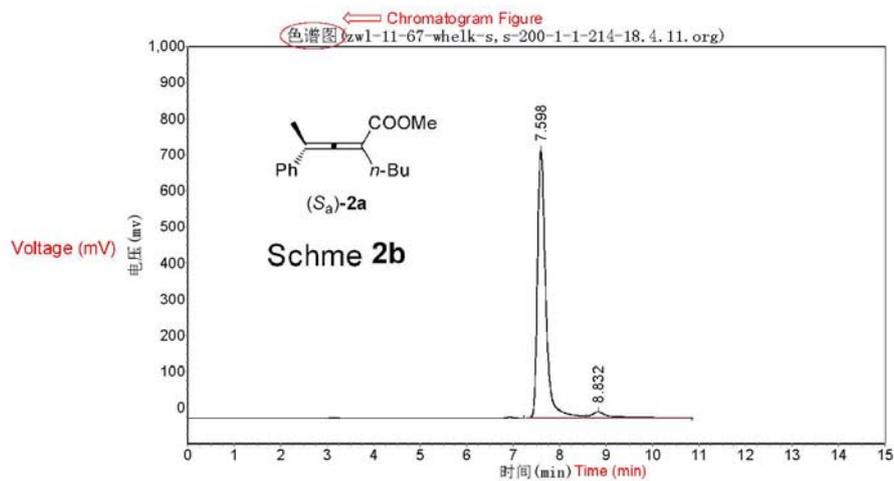
zw1-11-67

实验时间: 2018-04-11, 16:46:54
谱图文件: E:\data\zw1\zw1-11-67-wheelk-s, s-200-1-1-214-18.4.11.org

报告时间: 2018-04-11, 19:28:52

Brief introduction of experimental conditions

实验内容简介:
zw1-11-67-wheelk-s, s-200-1-1-214



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		7.598	741111.063	9224980.000	95.3200
2		8.832	16986.834	452923.063	4.6800
总计			758097.896	9677903.063	100.0000

zw1-9-139

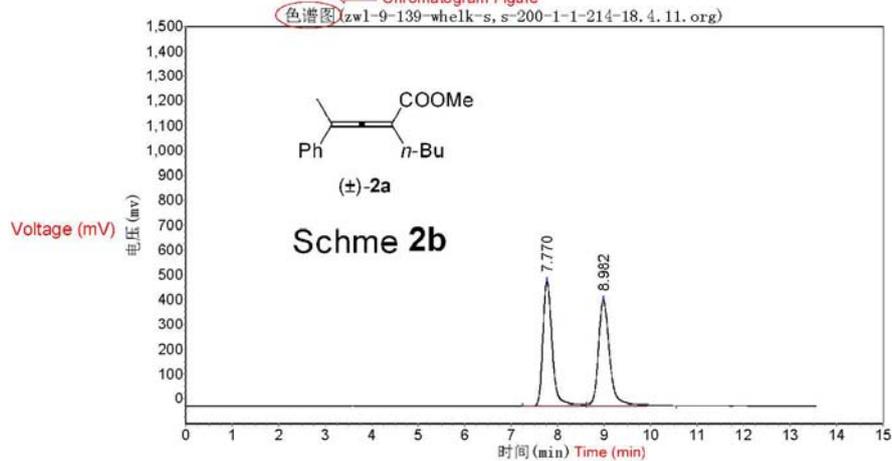
实验时间: 2018-04-11, 16:15:33
谱图文件: E:\data\zw1\zw1-9-139-whelk-s, s-200-1-1-214-
18.4.11.org

报告时间: 2018-04-11, 16:32:17

Brief introduction of experimental conditions

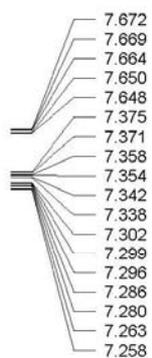
实验内容简介:
zw1-9-139-whelk-s, s-200-1-1-214

Chromatogram Figure

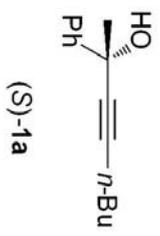


分析结果表

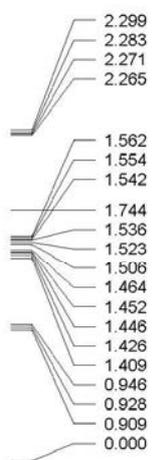
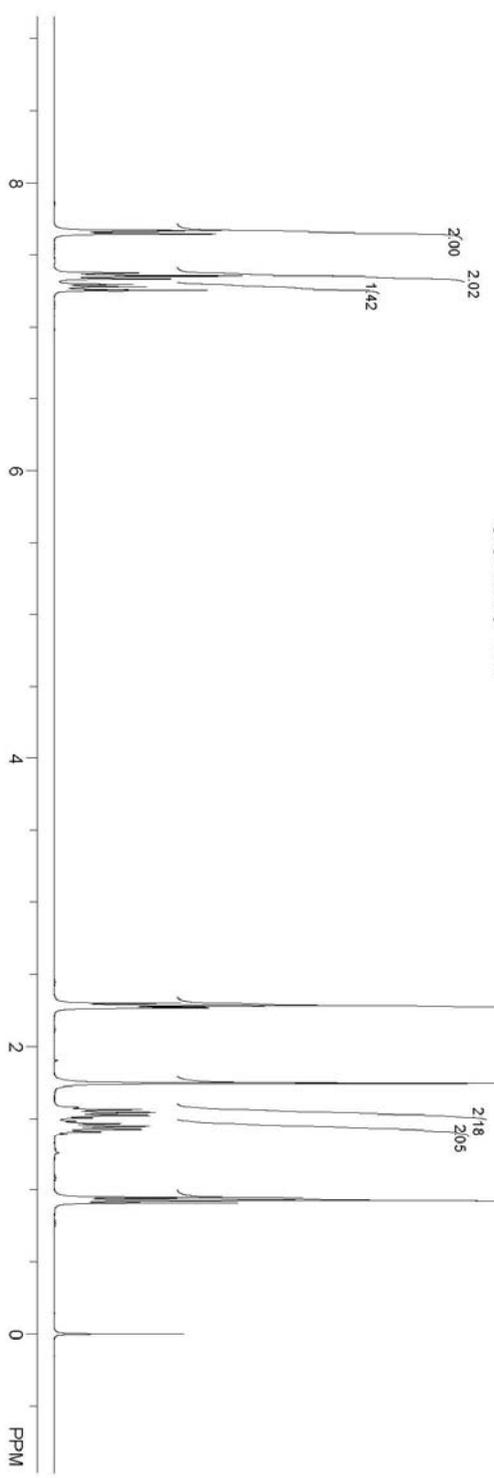
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		7.770	502055.188	7019085.000	49.5363
2		8.982	426594.656	7150499.500	50.4637
总计			928649.844	14169584.500	100.0000



zwl-11-42-H
Jan 29 2018
SOLVENT: cdcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



Schme 2c



zw1-11-42

实验时间: 2018-01-29, 10:37:25

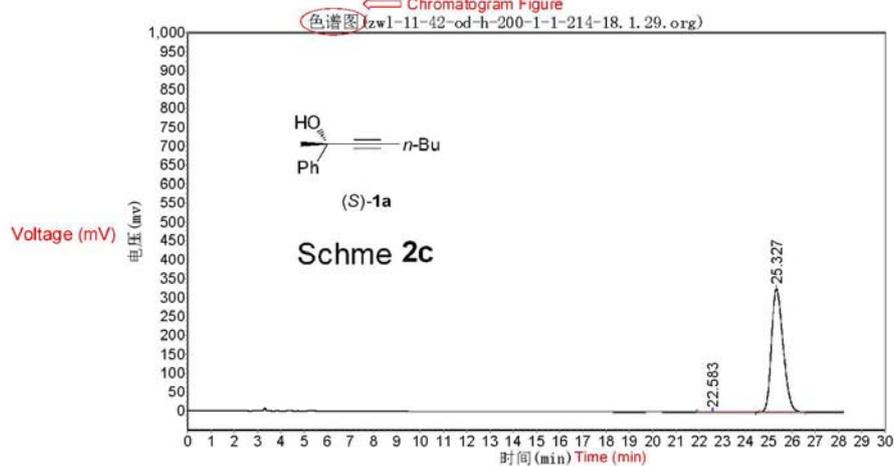
报告时间: 2018-01-29, 13:27:28

谱图文件: E:\data\zw1\zw1-11-42-od-h-200-1-1-214-18.1.29.org

← Brief introduction of experimental conditions

实验内容简介:
zw1-11-42-od-h-200-1-1-214

← Chromatogram Figure



分析结果表

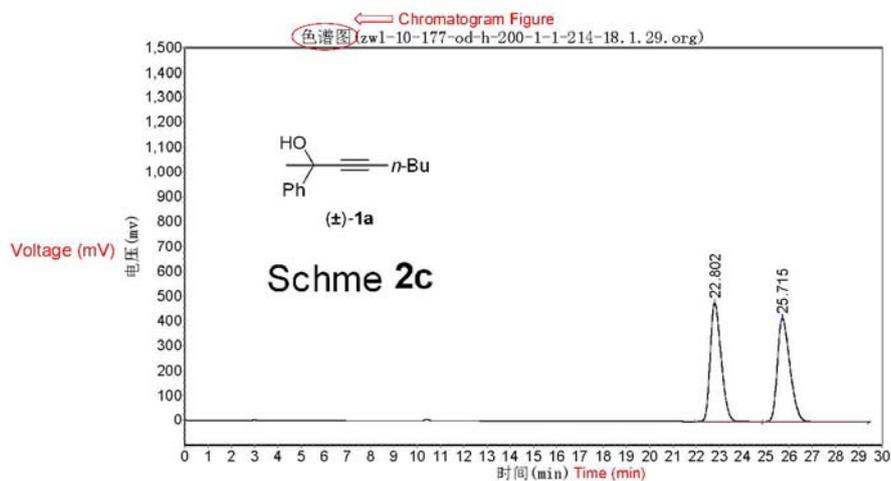
峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		22.583	1442.024	47599.824	0.4186
2		25.327	326420.031	11324125.000	99.5814
总计			327862.055	11371724.824	100.0000

zw1-10-177

实验时间: 2018-01-29, 9:09:05
谱图文件: E:\data\zw1\zw1-10-177-od-h-200-1-1-214-18.1.29.org

报告时间: 2018-01-29, 9:42:01

← Brief introduction of experimental conditions
实验内容简介:
zw1-10-177-od-h-200-1-1-214

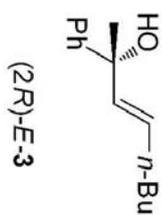


分析结果表

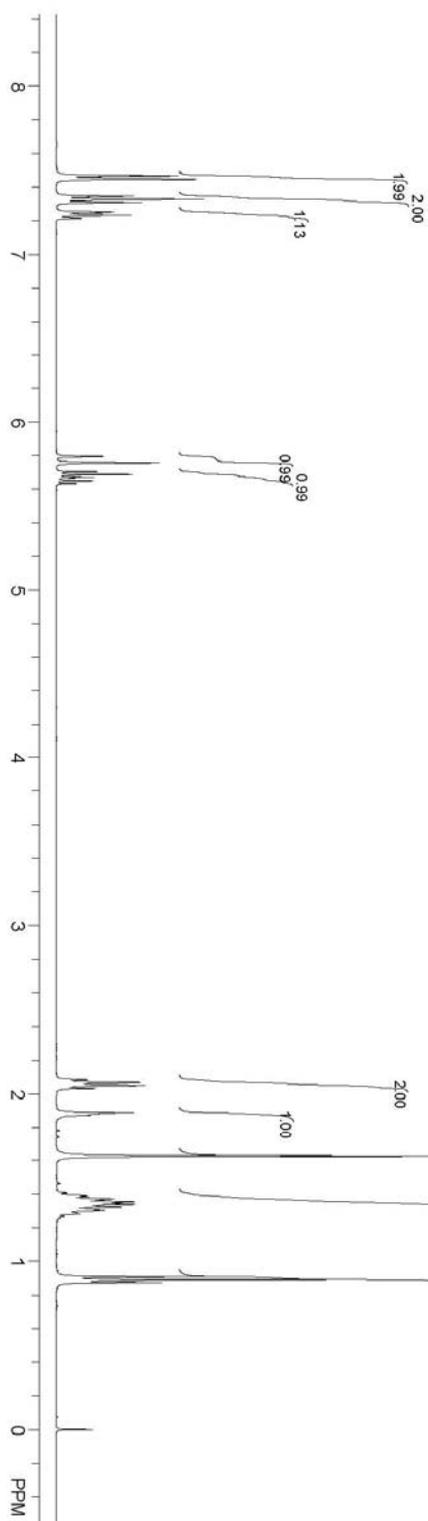
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		22.802	477322.750	15513478.000	49.9342
2		25.715	416485.000	15554379.000	50.0658
总计			893807.750	31067857.000	100.0000

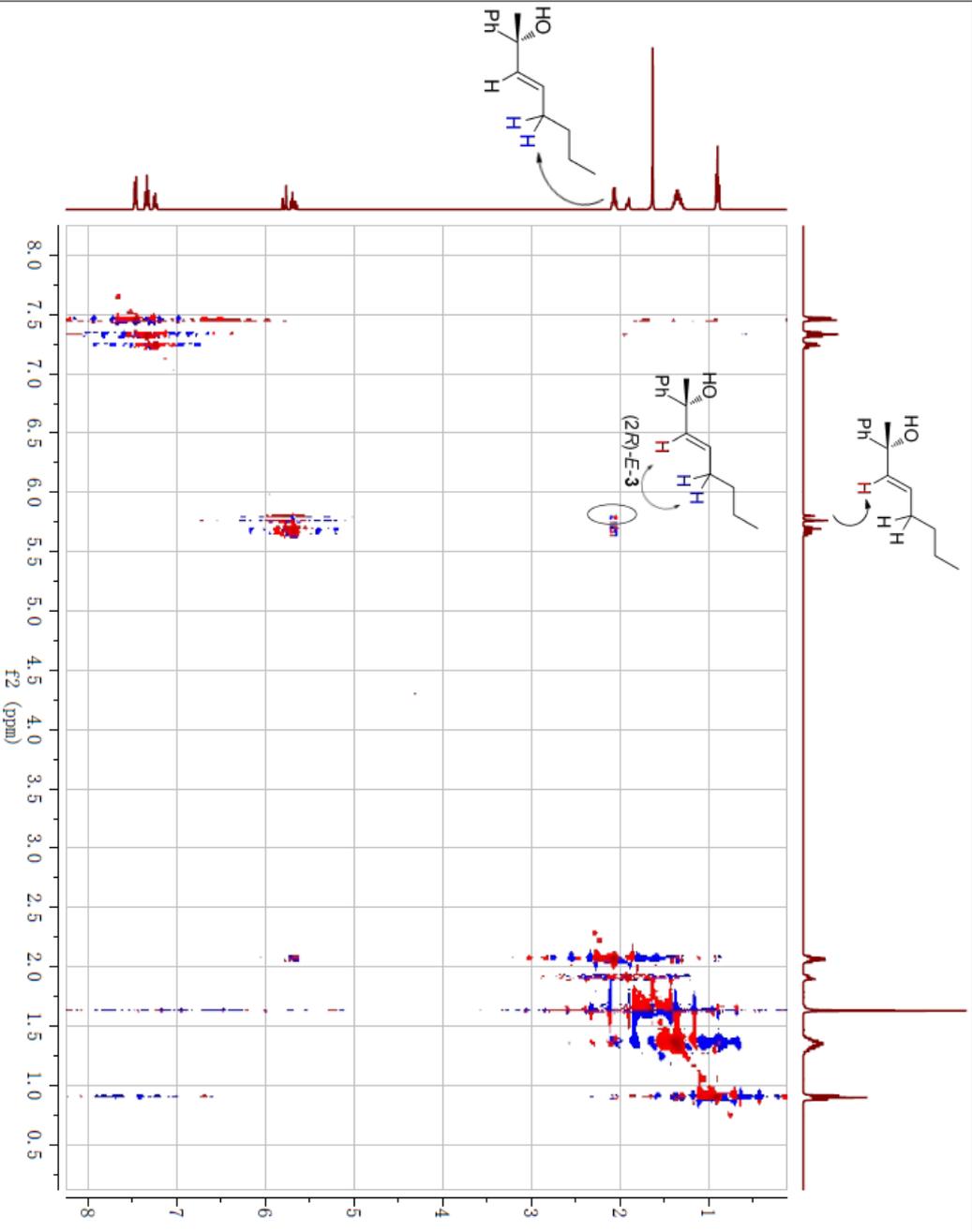
7.489
7.466
7.461
7.449
7.446
7.347
7.343
7.329
7.309
7.255
7.252
7.248
7.246
7.238
7.233
7.228
7.215
5.795
5.756
5.704
5.687
5.671
5.664
5.649
5.632

zwl-10-37-H
Jul 1 2017
SOLVENT: cddcl3
NA = 8
F1 = 399.749542 MHz
F2 = 100.526031 MHz



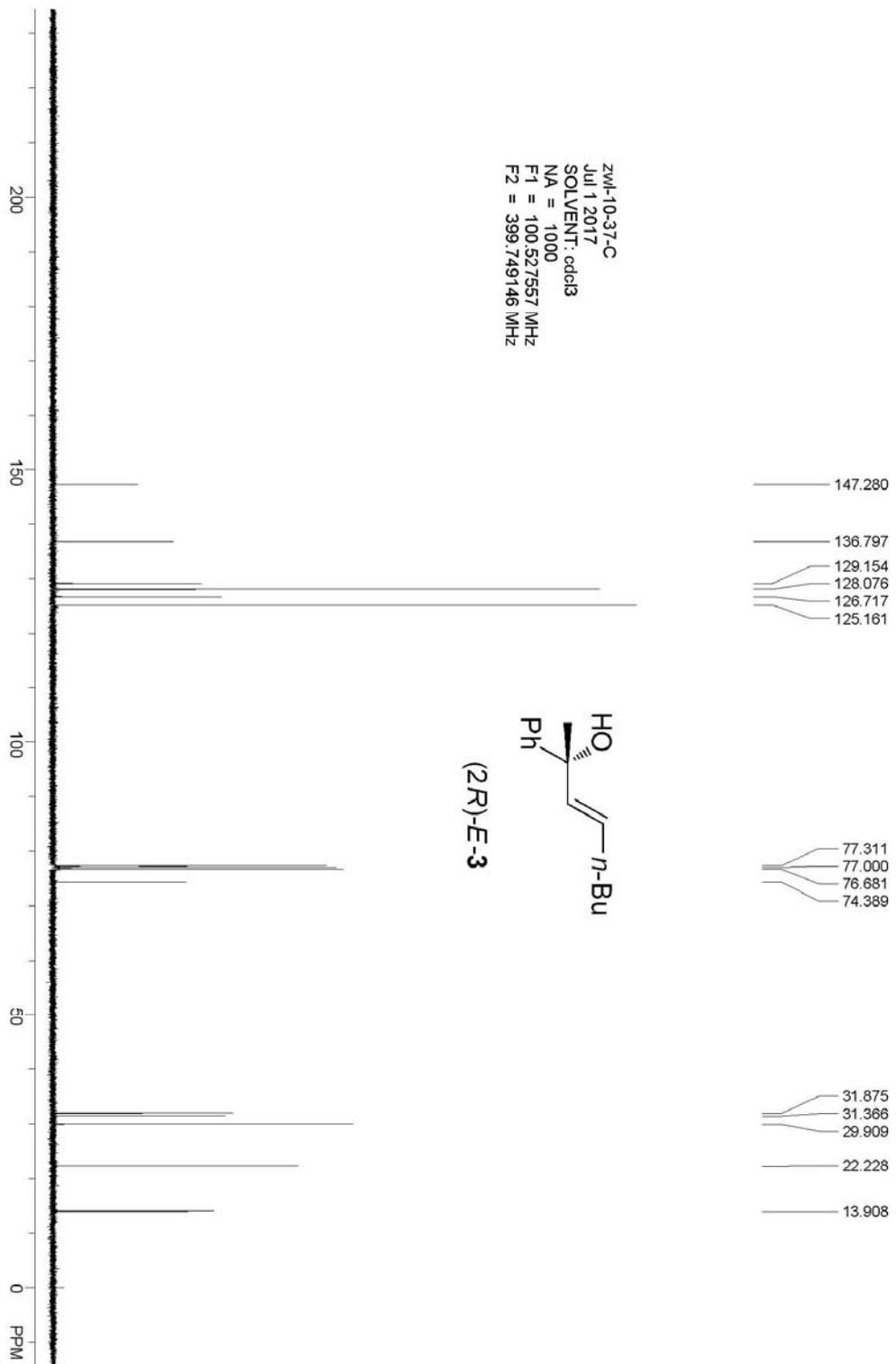
2.084
2.067
2.051
2.034
1.888
1.881
1.873
1.625
1.390
1.382
1.371
1.362
1.353
1.346
1.338
1.320
1.303
1.288
1.283
0.909
0.892
0.874
0.000





Parameter	Value (F2, F1)
1 Title	zwl-10-37-NOE
2 Origin	Varian
3 Solvent	cdcl3
4 Temperature	26.0
5 Pulse Sequence	NOESY
6 Experiment	2D-NOESY
7 Number of Scans	16
8 Receiver Gain	38
9 Relaxation Delay	1.0000
10 Pulse Width	0.0000
11 Acquisition Time	0.1499
12 Acquisition Date	2017-08-23T16:41:01
13 Modification Date	2017-08-23T20:05:06
14 Spectrometer Frequency	(399.75, 399.75)
15 Spectral Width	(3255.2, 3255.2)
16 Lowest Frequency	(41.2, 41.2)
17 Nucleus	(1H, 1H)
18 Acquired Size	(488, 200)
19 Spectral Size	(512, 512)

ZWH-10-37-C
Jul 1 2017
SOLVENT: cdcl3
NA = 1000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



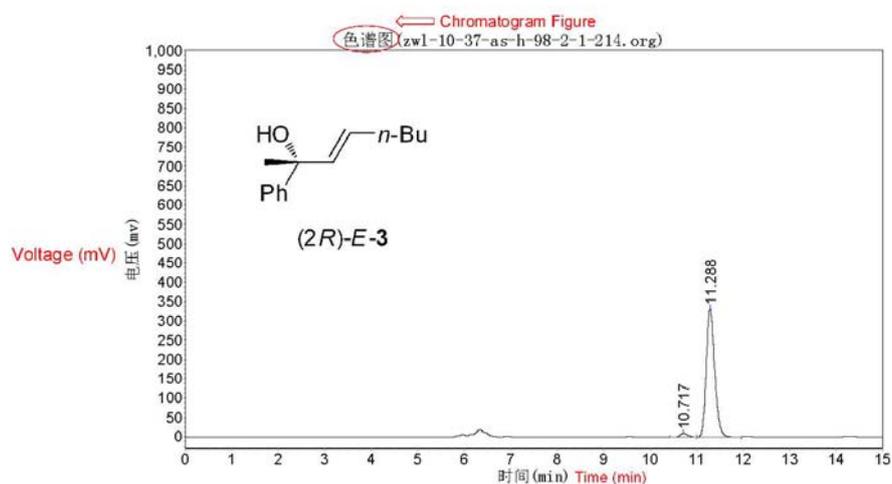
zwl-10-37-as-h-98-2-1-214

实验时间: 2017-07-06, 17:08:56

报告时间: 2017-07-06, 17:32:56

谱图文件: D:\zhuguangji\zwl\20170706\zwl-10-37-as-h-98-2-1-214.org

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		10.717	9781.789	113525.742	2.6545
2		11.288	331645.469	4163275.250	97.3455
总计			341427.258	4276800.992	100.0000

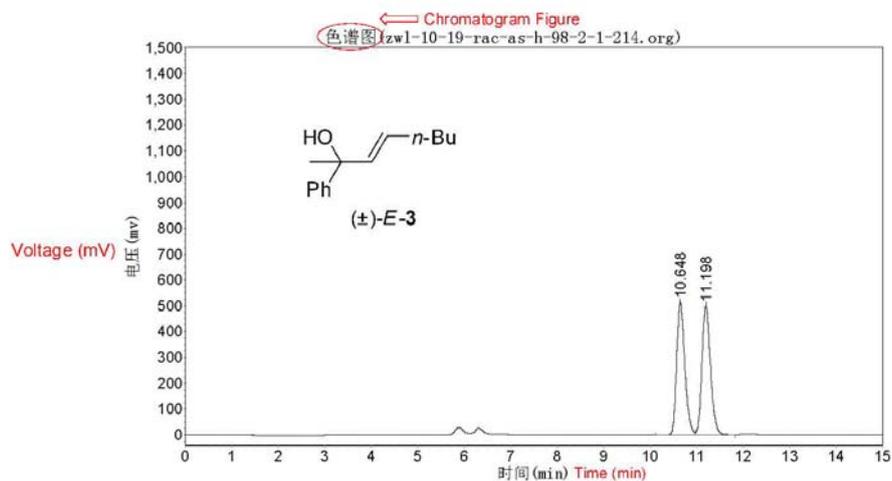
zwl-10-19-rac-as-h-98-2-1-214

实验时间: 2017-07-06, 16:30:02

报告时间: 2017-07-06, 17:31:30

谱图文件: D:\zhuguangjiang\zwl\20170706\zwl-10-19-rac-as-h-98-2-1-214.org

实验内容简介:



分析结果表

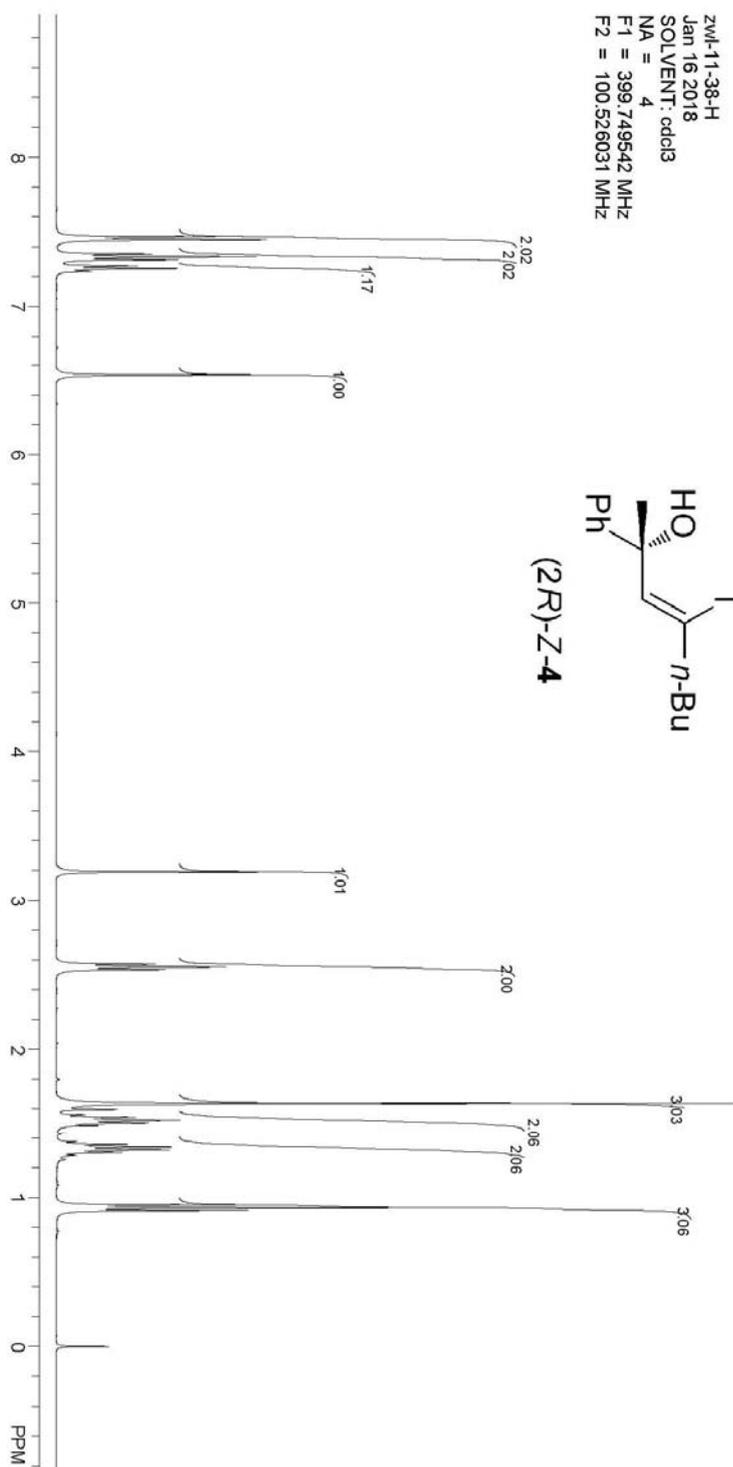
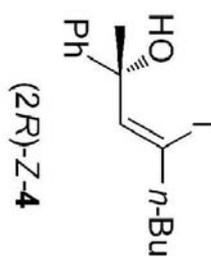
峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		10.648	513380.281	6305159.500	49.4812
2		11.198	499607.563	6437378.000	50.5188
总计			1012987.844	12742537.500	100.0000

7.469
7.466
7.448
7.350
7.332
7.313
7.271
7.254
7.234
6.534

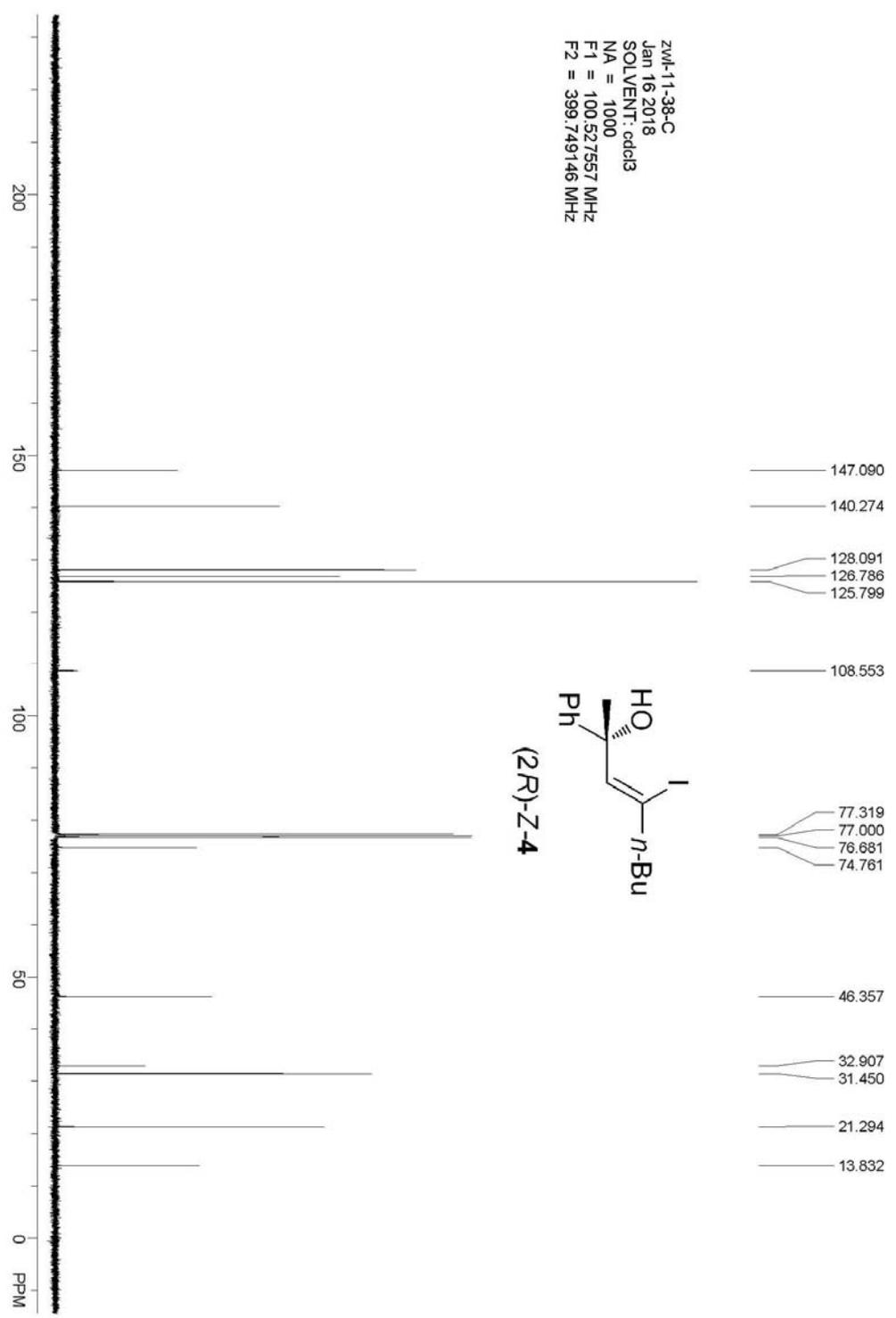
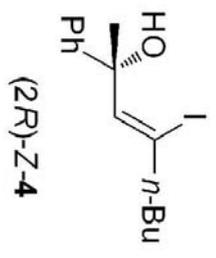
3.190
2.571
2.554
2.535

1.638
1.561
1.544
1.524
1.506
1.487
1.357
1.338
1.319
1.301
0.950
0.932
0.913
-0.000

zwl-11-38-H
Jan 16 2018
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



zwl-11-38-C
Jan 16 2018
SOLVENT: cdcl3
NA = 1000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



zw1-11-38

实验时间: 2018-01-16, 20:51:53

报告时间: 2018-01-16, 21:52:06

谱图文件: E:\data\zw1\zw1-11-38-ic-400-1-1-214-18.1.16.org

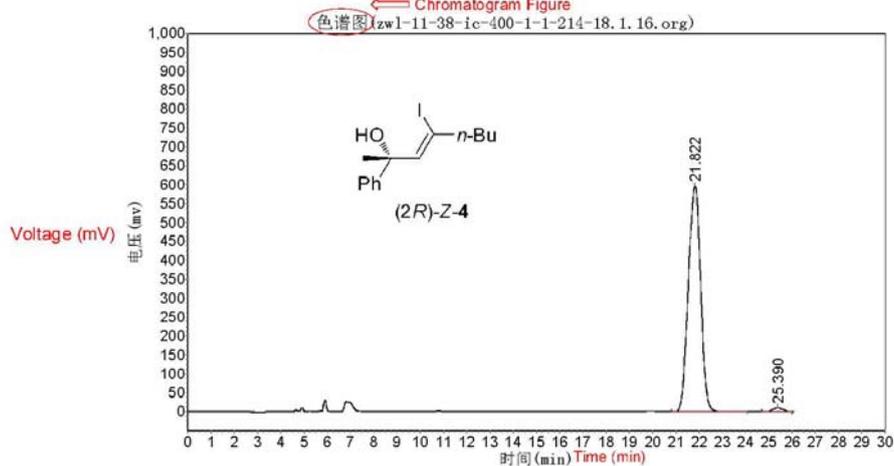
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

zw1-11-38-ic-400-1-1-214

← Chromatogram Figure



分析结果表

峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		21.822	595813.625	21841568.368	97.8551
2		25.390	9618.172	478748.476	2.1449
总计			605431.797	22320316.844	100.0000

zw1-10-30

实验时间: 2018-01-16, 21:47:18

报告时间: 2018-01-16, 22:16:32

谱图文件: E:\data\zw1\zw1-10-30-ic-400-1-1-214-18.1.16.org

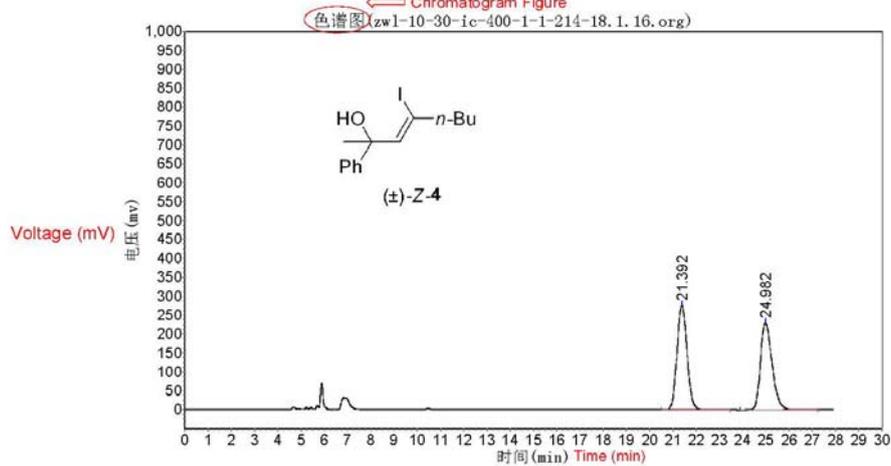
方法文件: E:\data\zw1\zw1.mtd

← Brief introduction of experimental conditions

实验内容简介:

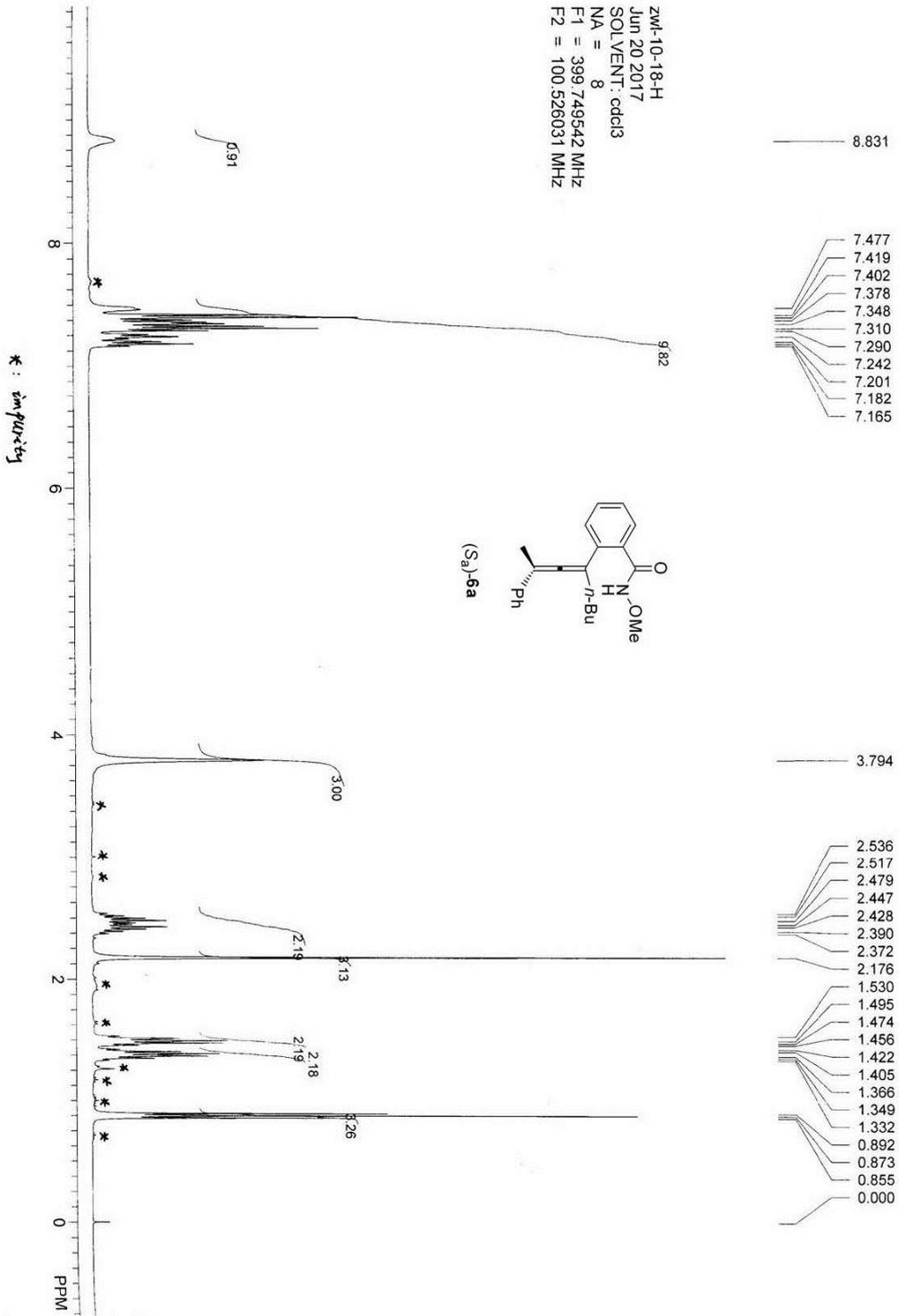
zw1-10-30-ic-400-1-1-214

← Chromatogram Figure

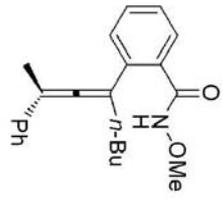


分析结果表

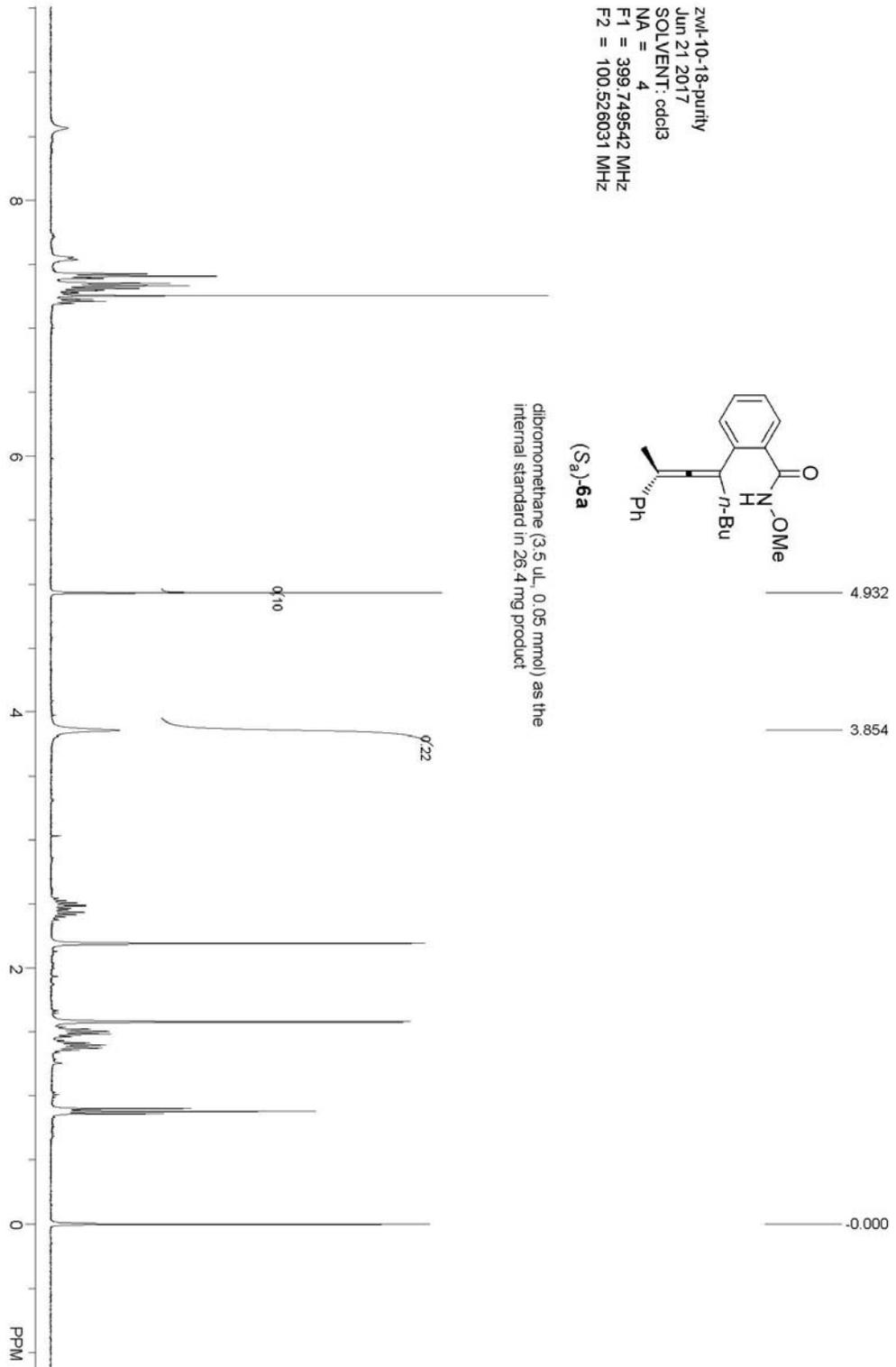
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		21.392	275902.938	8311843.500	50.0182
2		24.982	230701.609	8305795.000	49.9818
总计			506604.547	16617638.500	100.0000

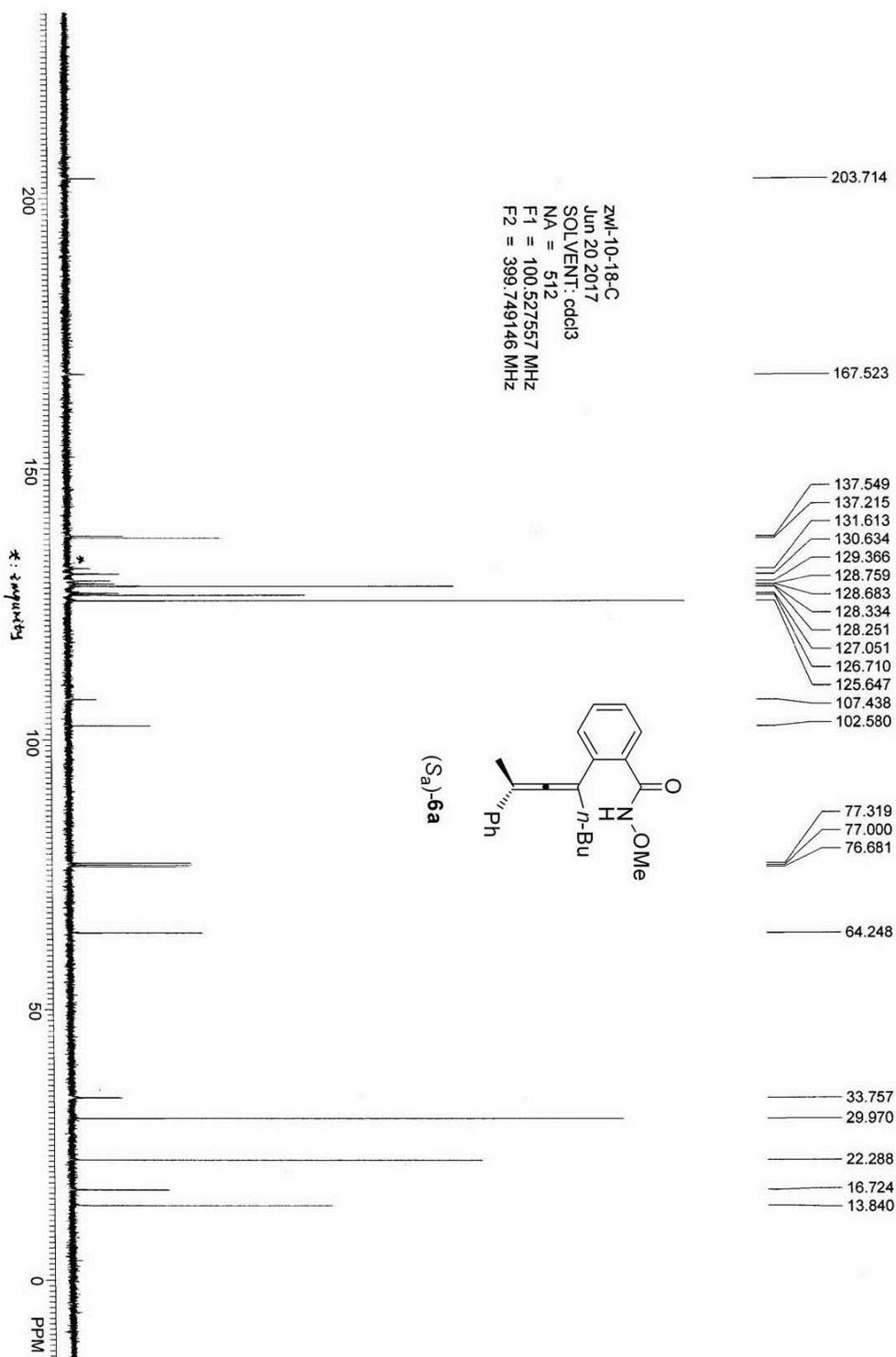


zwl-10-18-purity
Jun 21 2017
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



chloroform-d₃ (3.5 uL, 0.05 mmol) as the
internal standard in 26.4 mg product





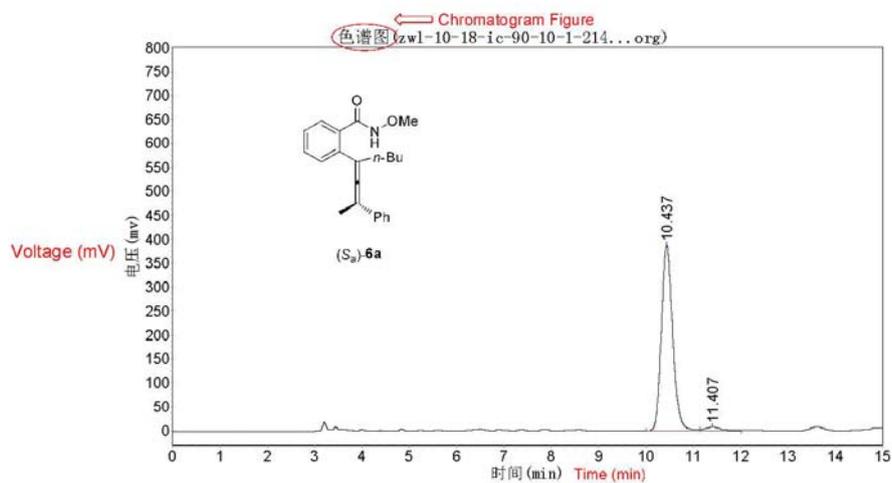
zwl-10-18-ic-90-10-1-214

实验时间: 2017-06-23, 11:03:40

报告时间: 2017-06-23, 14:33:20

谱图文件: D:\zhuguangjiang\zwl\20170622\zwl-10-18-ic-90-10-1-214...org

实验内容简介:



分析结果表

峰号(Peak No.)	峰名(Peak name)	保留时间(Retention time)	峰高(Peak height)	峰面积(Peak area)	含量(Content)
1		10.437	387483.156	6427971.500	97.2336
2		11.407	8051.422	182880.094	2.7664
总计			395534.579	6610851.594	100.0000

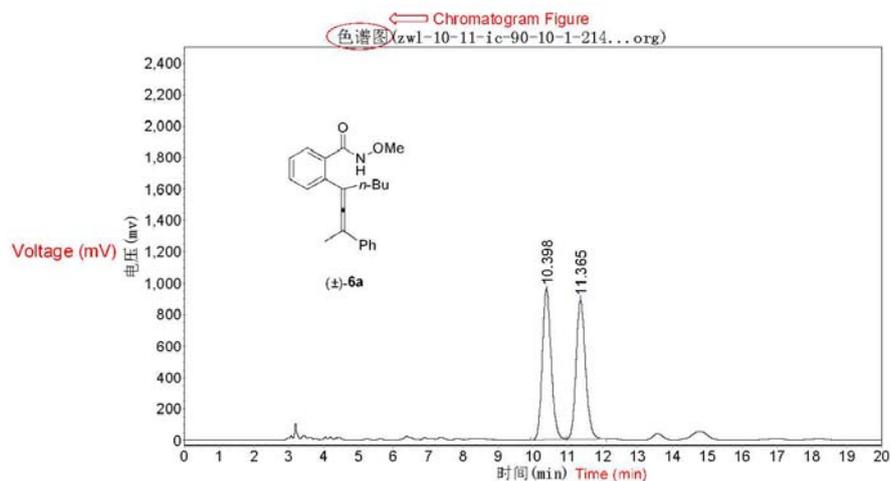
zwl-10-11-ic-90-10-1-214

实验时间: 2017-06-23, 11:20:28

报告时间: 2017-06-23, 14:32:09

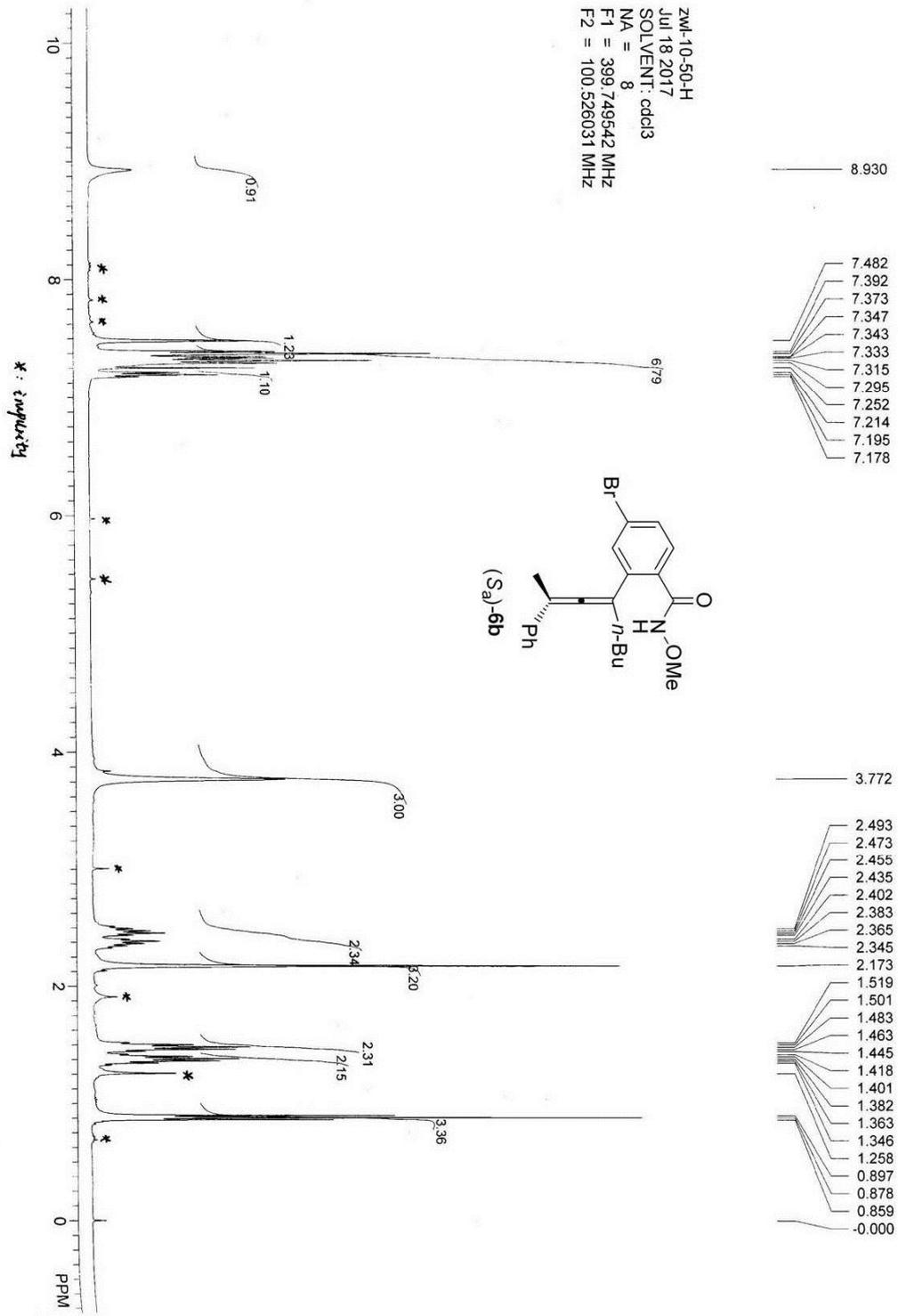
谱图文件: D:\zhuguangjiang\zwl\20170622\zwl-10-11-ic-90-10-1-214...org

实验内容简介:

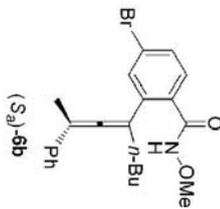


分析结果表

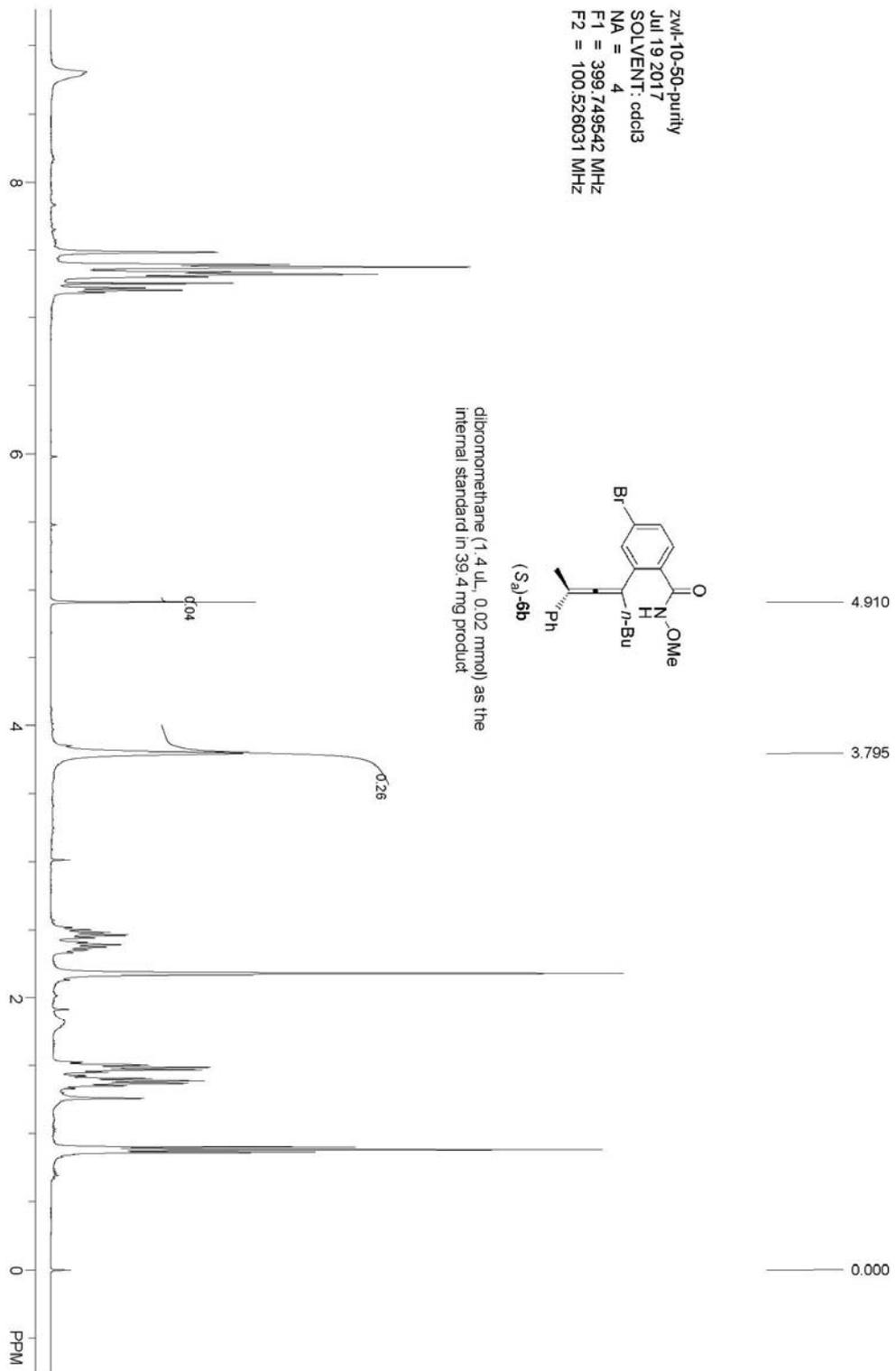
峰号 (Peak No.)	峰名 (Peak name)	保留时间 (Retention time)	峰高 (Peak height)	峰面积 (Peak area)	含量 (Content)
1		10.398	961972.500	17275850.000	50.1575
2		11.365	887794.125	17167346.000	49.8425
总计			1849766.625	34443196.000	100.0000



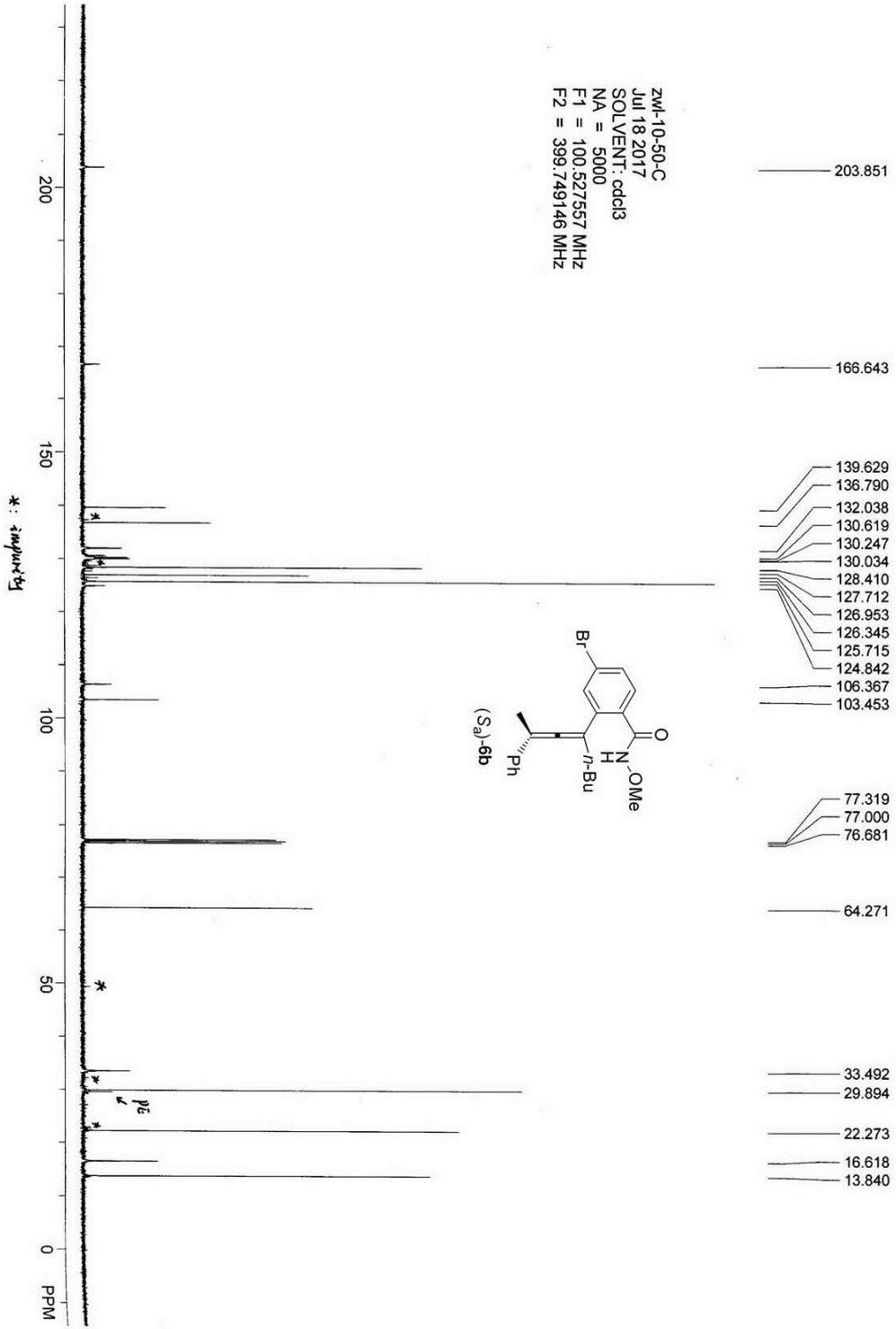
zwl-10-50-purity
Jul 19 2017
SOLVENT: cdcl3
NA = 4
F1 = 399.749542 MHz
F2 = 100.526031 MHz



dibromomethane (1.4 μ L, 0.02 mmol) as the
internal standard in 39.4 mg product

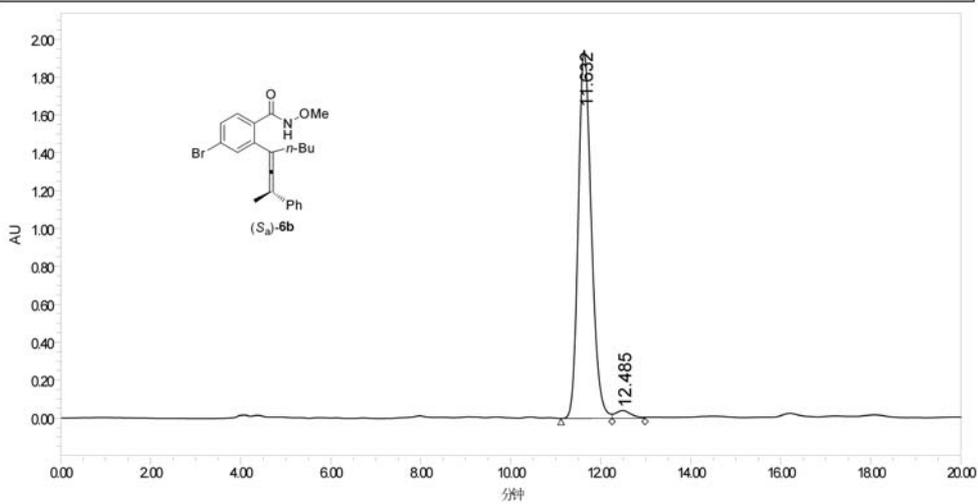


ZM-10-50-C
Jul 18 2017
SOLVENT: cdcl3
NA = 5000
F1 = 100.527557 MHz
F2 = 399.749146 MHz



SAMPLE INFORMATION

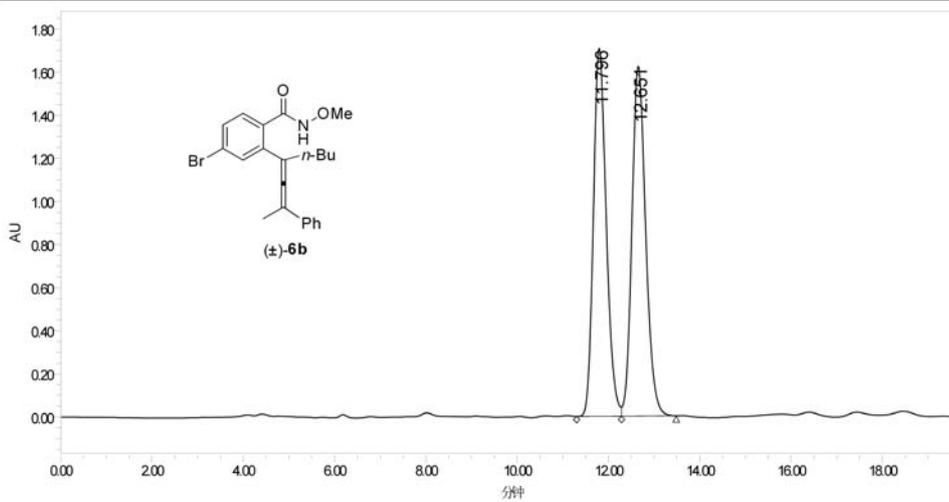
Sample Name:	zw-10501c-95-5-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2017/7/13 17:10:27 CST
Vial:	999	Acq. Method:	zj95
Injection #:	191	Date Processed:	2017/7/13 18:22:04 CST
Injection Volume:	10.00 uL	Channel Name:	V0489 ChA
Run Time:	20.00 Minutes	Channel Desc.:	V0489 ChA.214nm
Column Type:		Sample Set Name:	



	RT (min)	Area (AU*sec)	%Area	Height (AU)	% Height
1	11.632	33313384	97.56	1942947	97.96
2	12.485	965271	2.44	40052	2.02

SAMPLE INFORMATION

Sample Name:	zw-1049ic-95-5-1214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2017/7/13 16:00:50 CST
Vial:	999	Acq. Method:	zj95
Injection #:	189	Date Processed:	2017/7/13 16:43:49 CST
Injection Volume:	10.00 ul	Channel Name:	V2489 ChA
Run Time:	65.00 Minutes	Channel Desc.:	V2489 ChA.214nm
Column Type:		Sample Set Name:	



	RT (min)	Area (AU*sec)	%Area	Height (AU)	% Height
1	11.796	3329082E	49.53	1707801	51.27
2	12.651	3391982E	50.47	1623272	48.73