Supporting Information

Identifying a Non-Chiral Ligand for the Efficient Chirality Transfer in Carbonylation of Propargylic Mesylates

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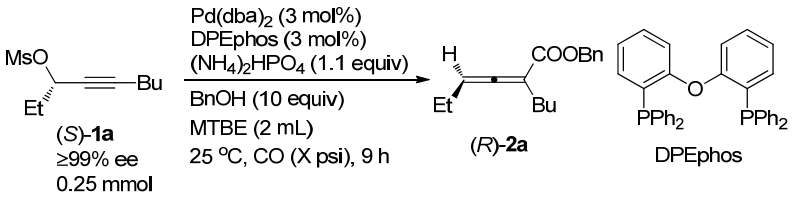
General Information. NMR spectra were taken with Bruker-300 spectrometer (300 MHz for ^{1}H NMR, 75.4 MHz for ^{13}C NMR) and Bruker-400 spectrometer (400 MHz for ^{1}H NMR, 100 MHz for ^{13}C NMR) in $CDCl_3$. Chemical shifts were recorded in ppm relative to the residue of $CHCl_3$ in $CDCl_3$ and coupling constants were reported in Hz. All reactions were carried out in oven-dried tubes. $(NH_4)_2HPO_4$ was purchased from Sinopharm Chemical Reagent Co., Ltd; DPEphos was purchased from Acros Chemicals. MTBE was dried over sodium wire with benzophenone as indicator and distilled freshly before use. The enantioenriched propargylic mesylates were synthesized from the corresponding enantiopure propargylic alcohols, and used without further purification. Purification by column chromatography was performed using Haiyang (Shandong, China) silica gel (10-40 μ).

Table S1 Pressure effect in DPEphos-assisted carboxylation of enantioenriched (*S*)-1a

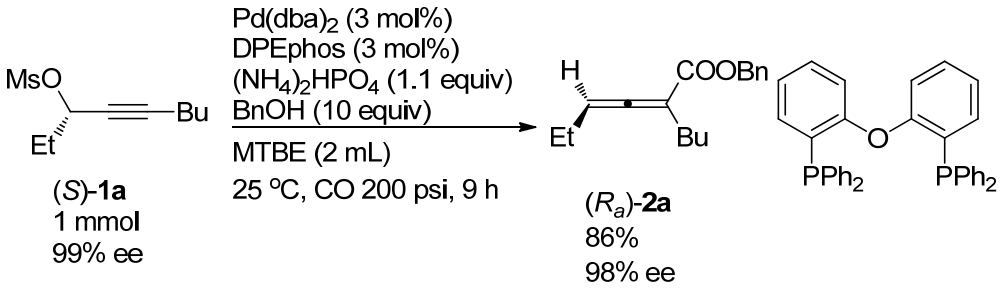


Entry	X (psi)	Yield% of (R_a)-**2a** [a)]	Ee% of (R_a)-**2a** [b)]
1	15	75	87
2	40	74	86
3	60	79	95
4	80	76	96
5	100	74	97
6	200	82	97

[a)] Isolated yield. [b)] ee value of the product as determined by HPLC.

Experimental details and analytical data

(1) Preparation of (R_a)-benzyl 2-butyl-2,3-hexadienoate ((R_a)-2a) (zwl-1-92)



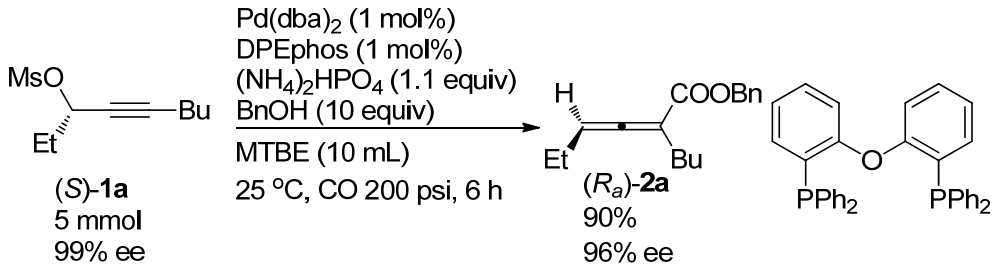
Typical procedure 1: To a flame-dried Schlenk tube were added $Pd(dba)_2$ (17.5 mg, 0.03 mmol) and DPEphos (16.6 mg, 0.03 mmol). Then the tube was degassed and refilled with Ar for three times to ensure the complete exclusion of air. Freshly distilled MTBE (1 mL) was subsequently added under argon. The resulting Pd(0) mixture was stirred for 1 hour at room temperature.

To a flame-dried tube filled with argon were added (*S*)-**1a** (218.2 mg, 1.0 mmol) / MTBE (0.5 mL), BnOH (1.0815 g, 10 mmol) / MTBE (0.5 mL) and $(NH_4)_2HPO_4$ (145.8 mg, 1.1 mmol). After the Pd(0) mixture was transferred by syringe to the tube, it was placed into the Parr reactor. The air in the reactor was replaced by CO gas three times sequentially, the Parr reactor was charged to 200 psi with CO gas. The mixture was stirred at room temperature till the reaction ended, then the gas was vented in the hood safely. The resulting mixture was diluted with Et_2O (10 mL), washed with brine (10 mL), and dried over Na_2SO_4. After filtration and concentration under reduced pressure, the crude product was purified by flash chromatography on silica gel to afford (R_a)-**2a** (223.3 mg, 86%) as an oil [eluent: petroleum ether (b.p. 60-90 ^oC)/ethyl ether = 250/1]: 98% ee (HPLC onditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 0.5 mL/min, λ = 214 nm, t_R (minor) = 16.1 min, t_R (major) = 18.1 min); $[\alpha]^{25}_D$ = -38.5 (c = 1.17, $CHCl_3$) [96% ee, $[\alpha]^{24}_D$ = -38.0 (*c* = 1.17, $CHCl_3$)][1]; ^1H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.23 (m, 5 H, Ar-H), 5.63-5.54 (m, 1 H, =CH), 5.22 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 5.14 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 2.32-2.18 (m, 2 H, CH_2), 2.18-2.05 (m, 2 H, CH_2), 1.50-1.27 (m, 4 H, 2 x CH_2), 1.04 (t, *J* = 7.2 Hz, 3 H, CH_3), 0.90 (t, *J* = 7.1 Hz, 3 H, CH_3); ^{13}C NMR

(75 MHz, $CDCl_3$): δ = 209.8, 167.6, 136.4, 128.3, 127.8, 127.5, 101.1, 96.7, 66.1, 30.3, 28.1, 22.2, 21.3, 13.9, 13.2.

The following compounds ((*R*$_a$)-**2b**-(*R*$_a$)-**2l** and (*S*$_a$)-**2m**) in Table 4 were prepared according to this **Typical Procedure 1**.

Reaction on gram scale:

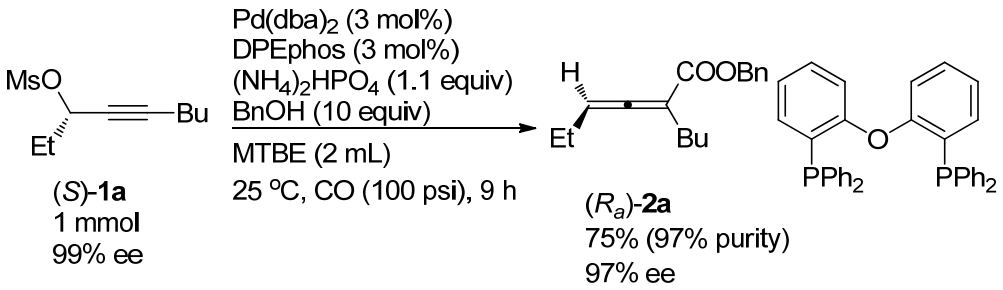


To a flame-dried Schlenk tube were added $Pd(dba)_2$ (28.8 mg, 0.05 mmol) and DPEphos (27.9 mg, 0.05 mmol). Then the tube was degassed and refilled with Ar for three times to ensure the complete exclusion of air. Freshly distilled MTBE (2 mL) was subsequently added under argon. The resulting Pd(0) mixture was stirred for 1 hour at room temperature.

To a flame-dried tube filled with argon were added $(NH_4)_2HPO_4$ (0.7260 g, 5.5 mmol), (*S*)-**1a** (1.1021 g, 5 mmol) / MTBE (4 mL), and BnOH (5.4088 g, 50 mmol) / MTBE (4 mL). After the Pd(0) mixture was transferred by syringe to the tube, it was placed into the Parr reactor. The air in the reactor was replaced by CO gas three times sequentially, the Parr reactor was charged to 200 psi with CO gas. The mixture was stirred at room temperature till the reaction ended, then the gas was vented in the hood safely. The resulting mixture was diluted with Et_2O (20 mL), washed with brine (20 mL), and dried over Na_2SO_4. After filtration and concentration under reduced pressure, the crude product was purified by flash chromatography on silica gel to afford (*R*$_a$)-**2a** (1.1750 g, 90%) as an oil [eluent: petroleum ether (b.p. 60-90 ^oC)/ethyl ether = 250/1]: 96% ee (HPLC onditions: 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) = 13.0 min); $[\alpha]^{21}_D$ = -37.8 (c = 1.21, $CHCl_3$) [96% ee, $[\alpha]^{24}_D$ = -38.0 (*c* = 1.17, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.39-7.23 (m, 5 H, Ar-H), 5.63-5.54 (m, 1 H, =CH), 5.22 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 5.14 (d, *J* = 12.6 Hz, 1 H,

one proton from Bn), 2.32-2.18 (m, 2 H, CH_2), 2.18-2.06 (m, 2 H, CH_2), 1.49-1.23 (m, 4 H, 2 x CH_2), 1.04 (t, J = 7.4 Hz, 3 H, CH_3), 0.90 (t, J = 6.9 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.8, 167.6, 136.5, 128.4, 127.8, 127.5, 101.1, 96.7, 66.1, 30.3, 28.1, 22.2, 21.4, 13.9, 13.2.

(2) Preparation of (R_a)-benzyl 2-butyl-2,3-hexadienoate ((R_a)-2a) (wyl-17-64)



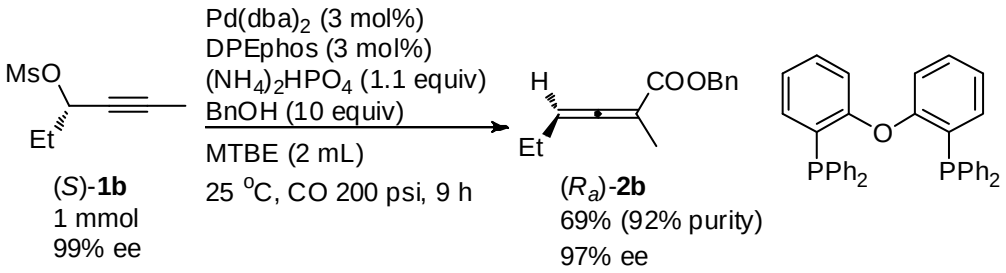
Typical procedure 2: To a flame-dried Schlenk tube were added $Pd(dba)_2$ (17.3 mg, 0.03 mmol) and DPEphos (16.8 mg, 0.03 mmol). Then the tube was degassed and refilled with Ar for three times to ensure the complete exclusion of air. Freshly distilled MTBE (1 mL) was subsequently added under argon. The resulting Pd(0) mixture was stirred for 1 hour at room temperature.

To a flame-dried tube filled with argon were added $(NH_4)_2HPO_4$ (144.9 mg, 1.1 mmol), (*S*)-**1a** (218.9 mg, 1.0 mmol) / MTBE (0.5 mL), and BnOH (1.0808 g, 10 mmol) / MTBE (0.5 mL). After the Pd(0) mixture was transferred by syringe to the tube, it was placed into the Parr reactor. The air in the reactor was replaced by CO gas three times sequentially, the Parr reactor was charged to 100 psi with CO gas. The mixture was stirred at room temperature till the reaction ended, then the gas was vented in the hood safely. The resulting mixture was diluted with Et_2O (10 mL), washed with brine (10 mL), and dried over Na_2SO_4. After filtration and concentration under reduced pressure, the crude product was purified by flash chromatography on silica gel to afford (R_a)-**2a** (201.3 mg, 75%, 97% purity) as an oil [eluent: petroleum ether (b.p. 60-90 ^{o}C)/ethyl ether = 250/1]: 97% ee (HPLC onditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 10.8 min, t_R (major) = 12.5 min); $[\alpha]^{19}_D$ = -38.2 (c = 1.25, $CHCl_3$) [96% ee, $[\alpha]^{24}_D$ = -38.0 (*c* = 1.17, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.25 (m, 5 H, Ar-H),

5.63-5.55 (m, 1 H, =CH), 5.22 (d, J = 12.9 Hz, 1 H, one proton from Bn), 5.15 (d, J = 12.9 Hz, 1 H, one proton from Bn), 2.32-2.18 (m, 2 H, CH_2), 2.18-2.06 (m, 2 H, CH_2), 1.48-1.28 (m, 4 H, 2 x CH_2), 1.04 (t, J = 7.4 Hz, 3 H, CH_3), 0.90 (t, J = 7.2 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.8, 167.5, 136.4, 128.3, 127.8, 127.5, 101.1, 96.7, 66.1, 30.2, 28.1, 22.2, 21.3, 13.8, 13.2.

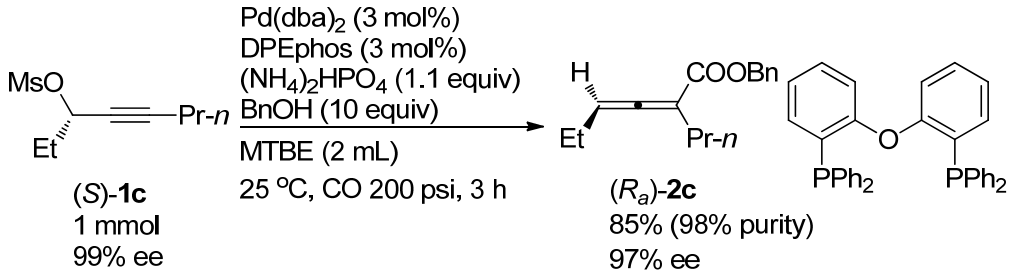
The following compounds ((R_a)-**2j**-(R_a)-**2l** and (S_a)-**2n**) in Table 4 were prepared according to this **Typical Procedure 2**.

(3) Preparation of (R_a)-benzyl 2-methyl-2,3-hexadienoate ((R_a)-2b) (zwl-2-111)



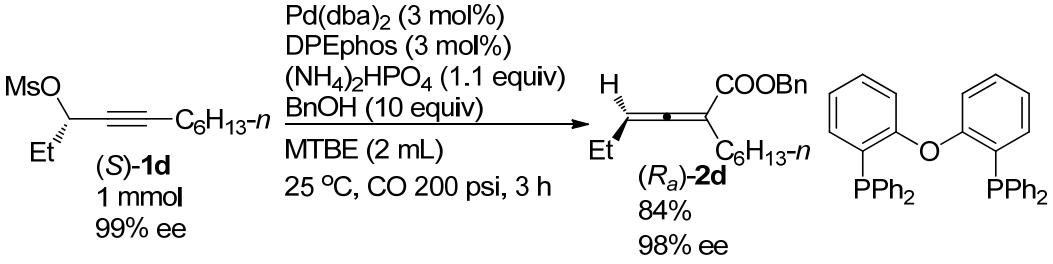
Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.4 mg, 0.03 mmol), DPEphos (16.9 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.5 mg, 1.1 mmol), (*S*)-**1b** (176.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0811 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2b** (162.3 mg, 69%, 92% purity) as an oil: 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) = 10.6 min, t_R (major) = 12.3 min); $[\alpha]^{22}_D$ = -62.4 (c = 1.40, $CHCl_3$) [90% ee, $[\alpha]^{20}_D$ = -65.6 (c = 1.17, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.41-7.22 (m, 5 H, Ar-H), 5.57-5.48 (m, 1 H, =CH), 5.22 (d, J = 12.3 Hz, 1 H, one proton from Bn), 5.14 (d, J = 12.6 Hz, 1 H, one proton from Bn), 2.18-2.05 (m, 2 H, CH_2 from Et), 1.89 (d, J = 3.0 Hz, 3 H, CH_3 from Me), 1.03 (t, J = 7.5 Hz, 3 H, CH_3 from Et); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.1, 167.8, 136.4, 128.4, 127.8, 127.5, 96.1, 95.6, 66.2, 21.2, 15.2, 13.2.

(4) Preparation of (R_a)-benzyl 2-propyl-2,3-hexadienoate ((R_a)-2c) (zwl-2-90)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.0 mg, 1.1 mmol), (*S*)-**1c** (205.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0800 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2c** (213.3 mg, 85%, 98% purity) as an oil: 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) = 11.8 min, t_R (major) = 13.5 min); $[\alpha]^{24}_D$ = -44.3 (*c* = 1.22, $CHCl_3$) [97% ee, $[\alpha]^{22}_D$ = -44.2 (*c* = 1.08, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.22 (m, 5 H, Ar-H), 5.63-5.53 (m, 1 H, =CH), 5.21 (d, *J* = 12.3 Hz, 1 H, one proton from Bn), 5.14 (d, *J* = 12.3 Hz, 1 H, one proton from Bn), 2.32-2.17 (m, 2 H, CH_2), 2.17-2.05 (m, 2 H, CH_2), 1.55-1.40 (m, 2 H, CH_2), 1.04 (t, *J* = 7.2 Hz, 3 H, CH_3), 0.93 (t, *J* = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.9, 167.6, 136.4, 128.4, 127.8, 127.5, 101.0, 96.7, 66.1, 30.5, 21.3, 13.6, 13.2.

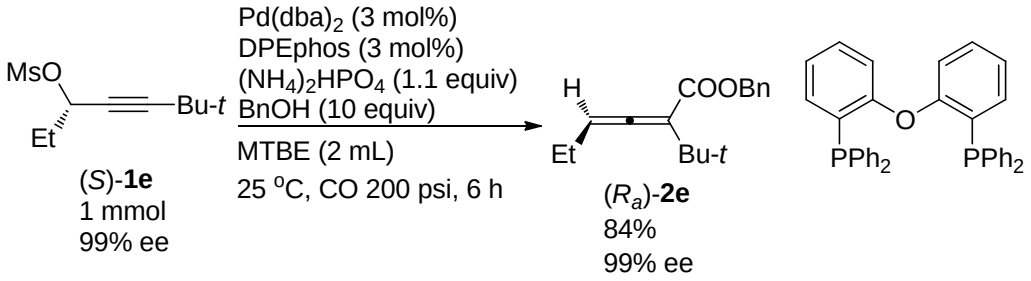
(5) Preparation of (R_a)-benzyl 2-*n*-hexyl-2,3-hexadienoate ((R_a)-2d) (zwl-2-47)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.4 mg, 0.03 mmol), DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.3 mg, 1.1 mmol), (*S*)-**1d** (246.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0814 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2d** (240.1 mg, 84%) as an oil: 98% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 0.5 mL/min, λ = 214 nm, t_R (minor) = 12.1 min, t_R (major) = 13.8 min); $[\alpha]^{30}_D$ = -33.6 (c = 1.48, $CHCl_3$) [95% ee, $[\alpha]^{24}_D$ = -33.3 (*c* = 1.21, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.24 (m, 5

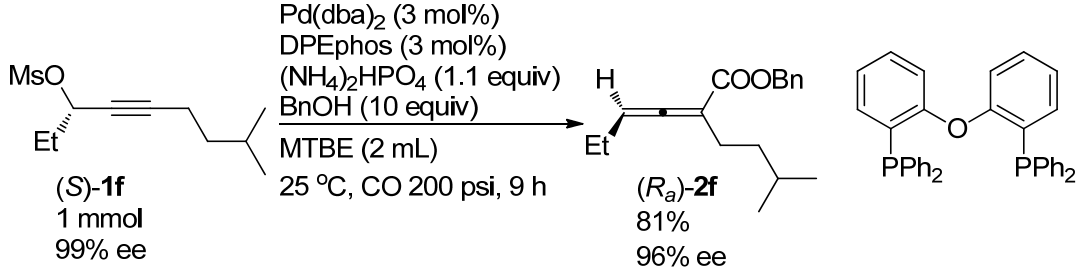
H, Ar-H), 5.63-5.54 (m, 1 H, =CH), 5.22 (d, J = 12.9 Hz, 1 H, one proton from Bn), 5.15 (d, J = 12.6 Hz, 1 H, one proton from Bn), 2.32-2.18 (m, 2 H, CH_2), 2.18-2.06 (m, 2 H, CH_2), 1.50-1.20 (m, 8 H, 4 x CH_2), 1.04 (t, J = 7.4 Hz, 3 H, CH_3), 0.88 (t, J = 6.9 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.8, 167.6, 136.5, 128.4, 127.8, 127.5, 101.2, 96.7, 66.1, 31.6, 28.8, 28.4, 28.1, 22.6, 21.4, 14.0, 13.3.

(6) Preparation of (R_a)-benzyl 2-*t*-butyl-2,3-hexadienoate ((R_a)-2e) (zwl-1-176)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.2 mg, 0.03 mmol), DPEphos (16.6 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.4 mg, 1.1 mmol), (*S*)-**1e** (218.5 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0807 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2e** (216.8 mg, 84%) as an oil: 99% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200:1, 0.3 mL/min, λ = 214 nm, t_R (minor) = 20.4 min, t_R (major) = 22.2 min); $[\alpha]^{22}_D$ = -43.1 (c = 1.70, $CHCl_3$) [97% ee, $[\alpha]^{23}_D$ = -38.4 (*c* = 1.01, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.37-7.22 (m, 5 H, Ar-H), 5.55 (t, J = 6.2 Hz, 1 H, =CH), 5.19 (d, J = 12.9 Hz, 1 H, one proton from Bn), 5.12 (d, J = 12.9 Hz, 1 H, one proton from Bn), 2.16-2.05 (m, 2 H, CH_2), 1.20 (s, 9 H, 3 x CH_3 from *t*-Bu), 1.03 (t, J = 7.5 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 208.6, 166.5, 136.5, 128.3, 127.7, 127.3, 110.0, 96.5, 65.6, 33.0, 29.5, 21.3, 13.0.

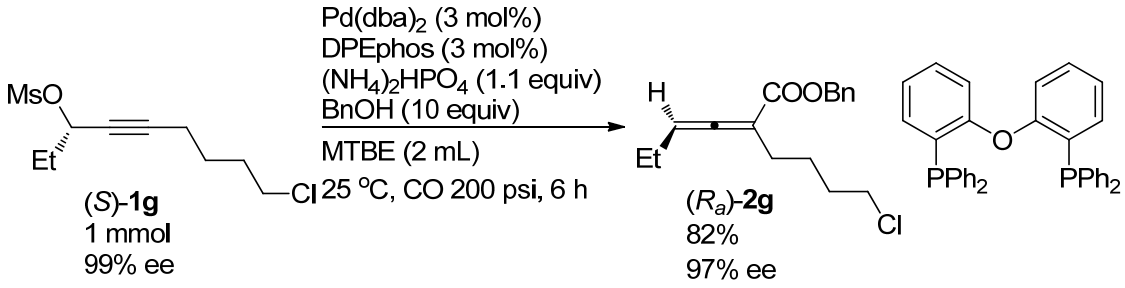
(7) Preparation of (R_a)-benzyl 2-(3-methylbutyl)-2,3-hexadienoate ((R_a)-2f) (wyl-16-113)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol),

DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (144.9 mg, 1.1 mmol), (*S*)-**1f** (232.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0807 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2f** (220.4 mg, 81%) as an oil: 96% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 300/1, 0.7 mL/min, λ = 214 nm, t_R (minor) = 19.1 min, t_R (major) = 22.1 min); $[\alpha]^{24}_D$ = -34.9 (*c* = 1.24, $CHCl_3$) [94% ee, $[\alpha]^{22}_D$ = -33.0 (*c* = 1.01, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.23 (m, 5 H, Ar-H), 5.63-5.55 (m, 1 H, =CH), 5.22 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 5.15 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 2.29-2.18 (m, 2 H, CH_2), 2.18-2.06 (m, 2 H, CH_2), 1.66-1.51 (m, 1 H, CH), 1.37-1.24 (m, 2 H, CH_2), 1.04 (t, *J* = 7.4 Hz, 3 H, CH_3), 0.89 (d, *J* = 6.6 Hz, 6 H, 2 x CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.7, 167.6, 136.4, 128.3, 127.8, 127.5, 101.3, 96.8, 66.1, 37.2, 27.5, 26.4, 22.5, 21.3, 13.2.

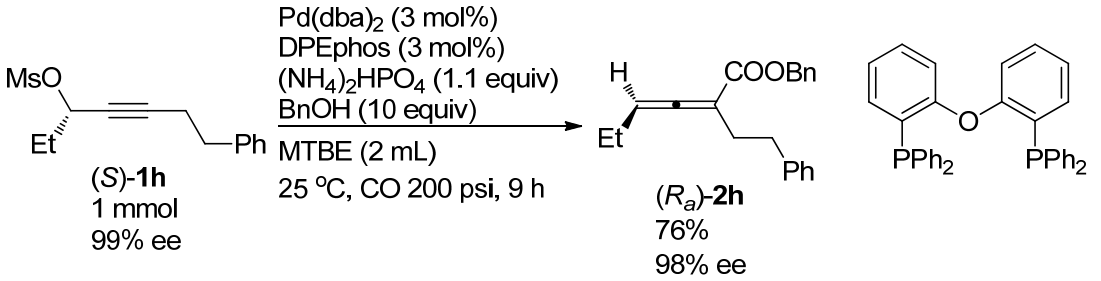
(8) Preparation of (R_a)-benzyl 2-(4-chlorobutyl)-2,3-hexadienoate ((R_a)-2g) (wyl-16-116)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.4 mg, 0.03 mmol), DPEphos (16.7 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.0 mg, 1.1 mmol), (*S*)-**1g** (253.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0807 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2g** (240.2 mg, 82%) as an oil: 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) = 16.8 min, t_R (major) = 18.8 min); $[\alpha]^{27}_D$ = -29.7 (*c* = 1.10, $CHCl_3$) [95% ee, $[\alpha]^{22}_D$ = -29.3 (*c* = 1.17, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.23 (m, 5 H, Ar-H), 5.66-5.58 (m, 1 H, =CH), 5.22 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 5.15 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 3.53 (t, *J* = 6.8 Hz, 2 H, CH_2), 2.36-2.19 (m, 2 H, CH_2), 2.19-2.07 (m, 2 H, CH_2), 1.90-1.74 (m, 2 H, CH_2), 1.68-1.53 (m, 2 H, CH_2), 1.05 (t, *J* = 7.4 Hz, 3 H, CH_3 from Et); ^{13}C NMR (75 MHz, $CDCl_3$): δ

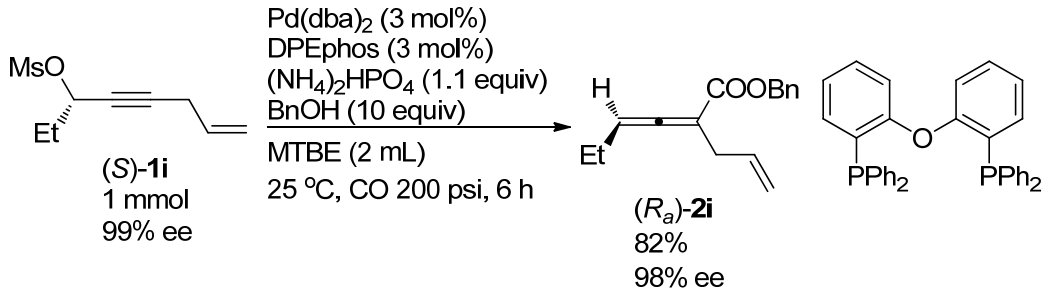
= 209.7, 167.4, 136.3, 128.4, 127.9, 127.5, 100.5, 97.2, 66.2, 44.7, 31.9, 27.6, 25.3, 21.3, 13.2.

(9) Preparation of (R_a)-benzyl 2-(2-phenylethyl)-2,3-hexadienoate ((R_a)-2h) (zwl-1-114)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.6 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.5 mg, 1.1 mmol), (*S*)-**1h** (266.4 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0813 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2h** (232.2 mg, 76%) as an oil: 98% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 300/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 26.0 min, t_R (major) = 29.0 min); $[\alpha]^{26}_D$ = -14.4 (c = 1.50, $CHCl_3$) [92% ee, $[\alpha]^{24}_D$ = -13.8 (*c* = 1.48, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.45-7.10 (m, 10 H, Ar-H), 5.59-5.50 (m, 1 H, =CH), 5.22 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 5.15 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 2.83-2.68 (m, 2 H, CH_2), 2.68-2.47 (m, 2 H, CH_2), 2.10-1.96 (m, 2 H, CH_2), 0.96 (t, *J* = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 209.9, 167.2, 141.4, 136.3, 128.4, 128.3, 128.2, 127.8, 127.5, 125.8, 100.3, 97.0, 66.1, 34.3, 30.2, 21.2, 13.1.

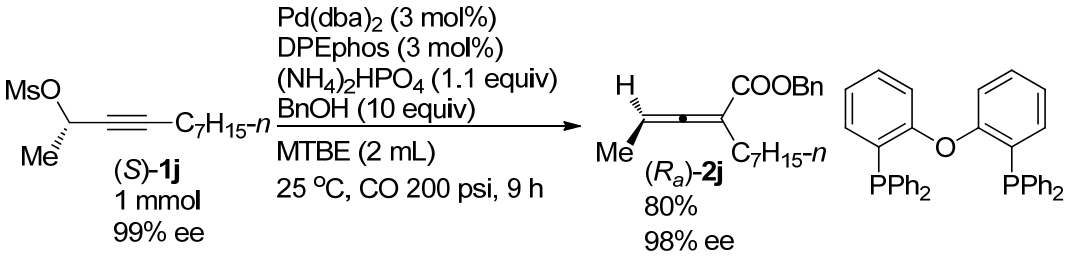
(10) Preparation of (R_a)-benzyl 2-(2-proprylenyl)-2,3-hexadienoate ((R_a)-2i) (zwl-2-142)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.0 mg, 1.1 mmol),

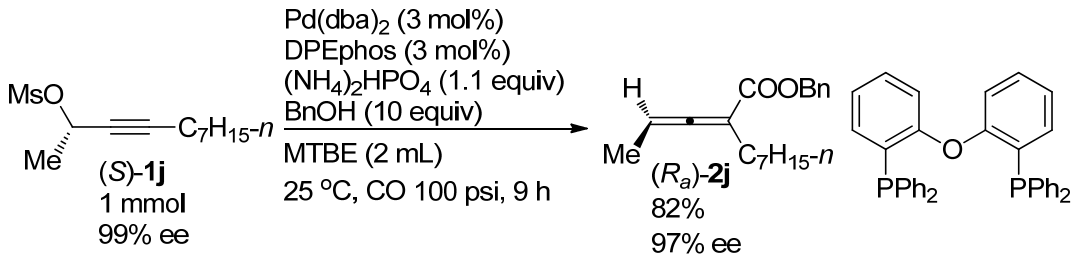
(*S*)-**1i** (202.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0809 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2i** (198.7 mg, 82%) as an oil: 98% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 12.9 min, t_R (major) = 15.0 min); $[\alpha]^{21}_D$ = -41.7 (*c* = 1.57, $CHCl_3$) [91% ee, $[\alpha]^{26}_D$ = -38.0 (*c* = 1.21, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.25 (m, 5 H, Ar-H), 5.91-5.75 (m, 1 H, CH=), 5.67-5.59 (m, 1 H, =CH), 5.22 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 5.15 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 5.13-4.99 (m, 2 H, $=CH_2$), 3.09-2.93 (m, 2 H, CH_2), 2.18-2.06 (m, 2 H, CH_2), 1.03 (t, *J* = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.1, 167.0, 136.3, 135.2, 128.3, 127.8, 127.5, 116.0, 99.6, 97.1, 66.2, 33.1, 21.2, 13.1.

(11) Preparation of (R_a)-benzyl 2-*n*-heptyl-2,3-pentadienoate ((R_a)-2j) (zwl-1-129)



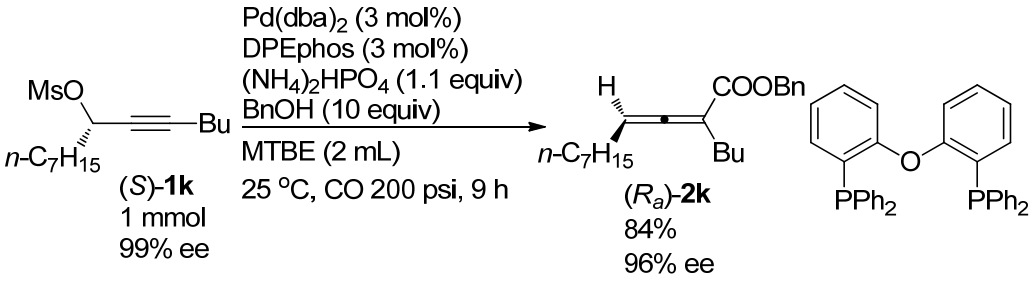
Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (17.0 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.5 mg, 1.1 mmol), (*S*)-**1j** (246.6 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0820 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2j** (229.3 mg, 80%) as an oil: 98% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 0.5 mL/min, λ = 214 nm, t_R (minor) = 14.2 min, t_R (major) = 17.0 min); $[\alpha]^{26}_D$ = -29.8 (*c* = 1.24, $CHCl_3$) [93% ee, $[\alpha]^{23}_D$ = -27.0 (*c* = 1.15, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.43-7.23 (m, 5 H, Ar-H), 5.56-5.44 (m, 1 H, =CH), 5.18 (s, 2 H, CH_2 from Bn), 2.32-2.13 (m, 2 H, CH_2), 1.76 (d, *J* = 7.2 Hz, 3 H, CH_3), 1.52-1.16 (m, 10 H, 5 x CH_2), 0.88 (t, *J* = 6.3 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.7, 167.5, 136.4, 128.4, 127.8, 127.6, 100.0, 89.7, 66.1, 31.8, 29.1, 29.0, 28.4, 28.0, 22.6, 14.1, 13.3.

(12) Preparation of (R_a)-benzyl 2-*n*-heptyl-2,3-pentadienoate ((R_a)-2j) (wyl-17-62)



Following **Typical procedure 2**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.7 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.5 mg, 1.1 mmol), (*S*)-**1j** (246.9 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0807 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2j** (234.8 mg, 82%) as an oil: 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) = 10.2 min, t_R (major) = 12.2 min); $[\alpha]^{19}_D$ = -29.5 (*c* = 0.97, $CHCl_3$) [93% ee, $[\alpha]^{23}_D$ = -27.0 (*c* = 1.15, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.25 (m, 5 H, Ar-H), 5.55-5.45 (m, 1 H, =CH), 5.18 (s, 2 H, CH_2 from Bn), 2.32-2.14 (m, 2 H, CH_2), 1.76 (d, *J* = 6.9 Hz, 3 H, CH_3), 1.50-1.15 (m, 10 H, 5 x CH_2), 0.88 (t, *J* = 6.8 Hz, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 210.7, 167.6, 136.4, 128.4, 127.8, 127.6, 99.9, 89.7, 66.1, 31.8, 29.1, 29.0, 28.4, 28.0, 22.6, 14.1, 13.3.

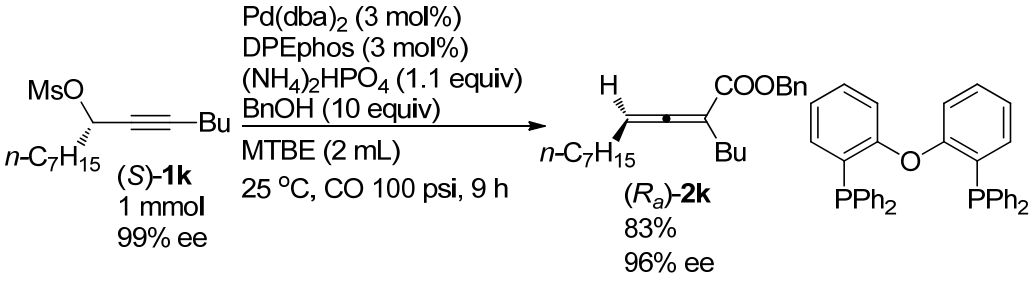
(13) Preparation of (R_a)-benzyl 2-butyl-2,3-undecadienoate ((R_a)-2k) (zwl-2-95)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.0 mg, 1.1 mmol), (*S*)-**1k** (288.6 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0809 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2k** (276.1 mg, 84%) as an oil: 96% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 10.3 min, t_R (major) = 11.9 min); $[\alpha]^{21}_D$ = -43.3 (*c* = 1.06, $CHCl_3$) [94% ee, $[\alpha]^{24}_D$ = -42.6 (*c* = 1.32, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.21 (m, 5 H, Ar-H), 5.58-5.47 (m, 1 H, =CH), 5.21 (d, *J* = 12.9 Hz, 1 H, one proton from Bn),

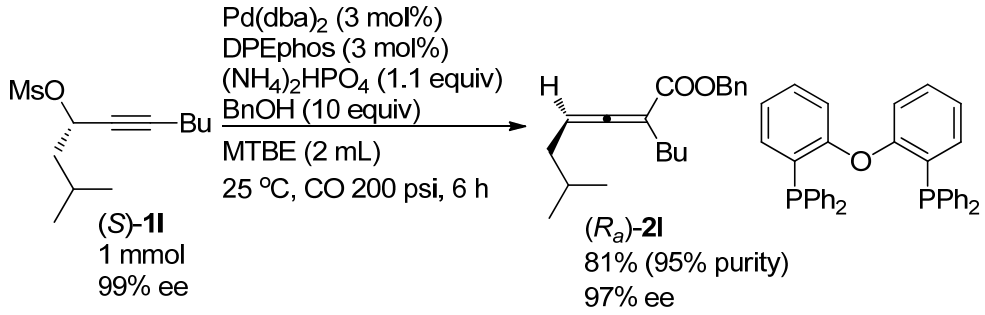
5.15 (d, J = 12.9 Hz, 1 H, one proton from Bn), 2.33-2.15 (m, 2 H, CH_2), 2.10 (q, J = 7.1 Hz, 2 H, CH_2), 1.51-1.12 (m, 14 H, 7 x CH_2), 0.90 (t, J = 7.4 Hz, 3 H, CH_3), 0.88 (t, J = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.0, 167.6, 136.4, 128.4, 127.8, 127.6, 100.4, 95.1, 66.1, 31.7, 30.3, 29.05, 28.97, 28.2, 28.1, 22.6, 22.2, 14.1, 13.9.

(14) Preparation of (R_a)-benzyl 2-butyl-2,3-undecadienoate ((R_a)-2k) (wyl-17-61)



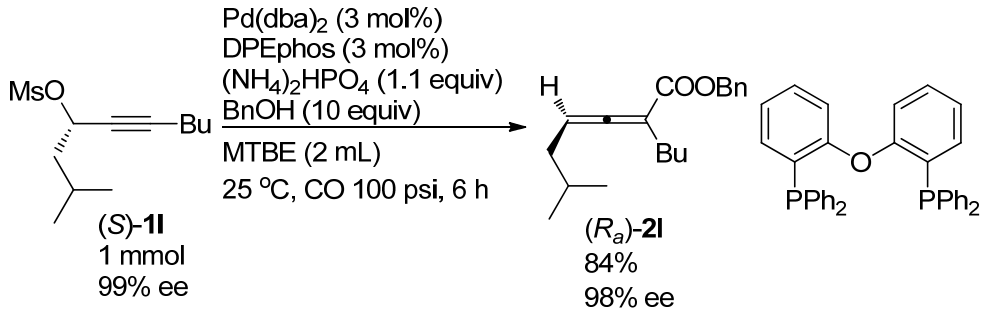
Following **Typical procedure 2**. The reaction of $Pd(dba)_2$ (17.4 mg, 0.03 mmol), DPEphos (16.6 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.0 mg, 1.1 mmol), (*S*)-**1k** (288.9 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0811 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2k** (272.5 mg, 83%) as an oil: 96% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R (minor) = 9.3 min, t_R (major) = 11.1 min); $[\alpha]^{21}_D$ = -43.3 (c = 1.03, $CHCl_3$) [94% ee, $[\alpha]^{24}_D$ = -42.6 (c = 1.32, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.24 (m, 5 H, Ar-H), 5.56-5.47 (m, 1 H, =CH), 5.21 (d, J = 12.9 Hz, 1 H, one proton from Bn), 5.15 (d, J = 13.2 Hz, 1 H, one proton from Bn), 2.30-2.15 (m, 2 H, CH_2), 2.10 (q, J = 7.2 Hz, 2 H, CH_2), 1.49-1.17 (m, 14 H, 7 x CH_2), 0.90 (t, J = 7.2 Hz, 3 H, CH_3), 0.88 (t, J = 7.4 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.0, 167.6, 136.4, 128.3, 127.8, 127.6, 100.4, 95.1, 66.1, 31.7, 30.3, 29.04, 28.96, 28.2, 28.1, 22.6, 22.2, 14.1, 13.9.

(15) Preparation of (R_a)-benzyl 2-butyl-6-methyl-2,3-heptadienoate ((R_a)-2l) (wyl-16-154)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.4 mg, 0.03 mmol), DPEphos (16.7 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.6 mg, 1.1 mmol), (*S*)-**1l** (246.6 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0817 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2l** (243.7 mg, 81%, 95% purity) as an oil: 97% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 400/1, 0.5 mL/min, λ = 214 nm, t_R (minor) = 14.9 min, t_R (major) = 16.9 min); $[\alpha]^{22}_D$ = -42.2 (*c* = 1.75, $CHCl_3$) [97% ee, $[\alpha]^{24}_D$ = -42.5 (*c* = 1.13, $CHCl_3$)][1]; ^1H NMR (300 MHz, $CDCl_3$): δ = 7.41-7.21 (m, 5 H, Ar-H), 5.51-5.41 (m, 1 H, =CH), 5.19 (d, *J* = 12.3 Hz, 1 H, one proton from Bn), 5.13 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 2.30-2.18 (m, 2 H, CH_2), 1.99 (t, *J* = 7.2 Hz, 2 H, CH_2), 1.78-1.60 (m, 1 H, CH), 1.50-1.25 (m, 4 H, 2 x CH_2), 0.97-0.77 (m, 9 H, 3 x CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.3, 167.6, 136.3, 128.3, 127.8, 99.7, 93.5, 66.2, 37.4, 30.2, 28.4, 28.2, 22.14, 22.09, 13.8.

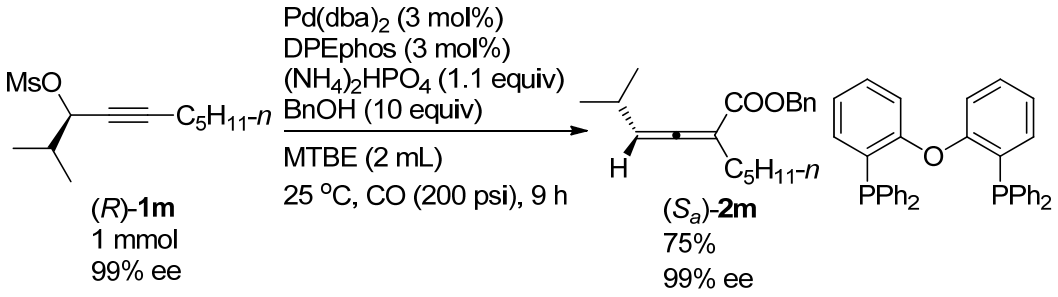
(16) Preparation of (R_a)-benzyl 2-butyl-6-methyl-2,3-heptadienoate ((R_a)-2l) (wyl-17-60)



Following **Typical procedure 2**. The reaction of $Pd(dba)_2$ (17.2 mg, 0.03 mmol), DPEphos (16.6 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (146.0 mg, 1.1 mmol), (*S*)-**1l** (247.0 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0820 g, 10 mmol) / MTBE (0.5 mL) afforded (R_a)-**2l** (240.3 mg, 84%) as an oil: 98% ee (HPLC conditions: Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 400/1, 1.0 mL/min, λ = 214 nm, t_R

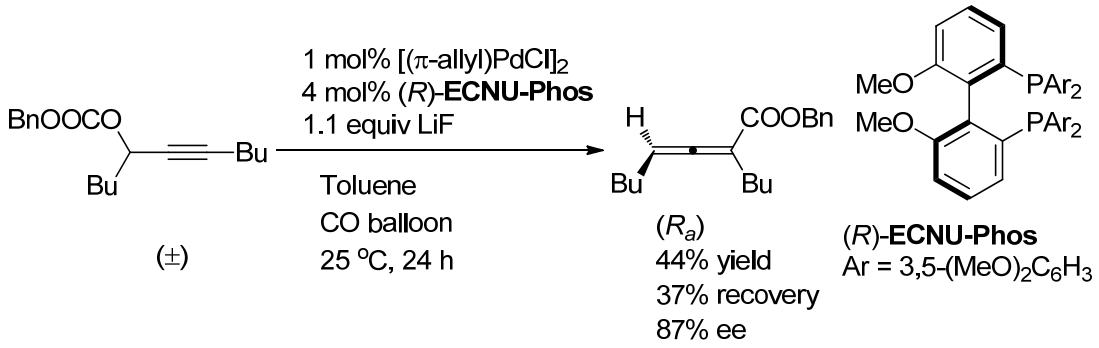
(minor) = 9.4 min, t_R (major) = 10.7 min); $[\alpha]^{19}_D$ = -42.2 (*c* = 1.32, $CHCl_3$) [97% ee, $[\alpha]^{24}_D$ = -42.5 (*c* = 1.13, $CHCl_3$)][1]; ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.24 (m, 5 H, Ar-H), 5.51-5.41 (m, 1 H, =CH), 5.20 (d, *J* = 12.3 Hz, 1 H, one proton from Bn), 5.14 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 2.30-2.15 (m, 2 H, CH_2), 2.00 (t, *J* = 7.2 Hz, 2 H, CH_2), 1.77-1.61 (m, 1 H, CH), 1.50-1.27 (m, 4 H, 2 x CH_2), 0.97-0.82 (m, 9 H, 3 x CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.3, 167.6, 136.3, 128.3, 127.8, 99.7, 93.5, 66.2, 37.4, 30.2, 28.4, 28.2, 22.2, 22.1, 13.9.

(17) Preparation of (S_a)-benzyl 2-pentyl-5-methyl-2,3-hexadienoate ((S_a)-2m) (zwl-1-158)



Following **Typical procedure 1**. The reaction of $Pd(dba)_2$ (17.3 mg, 0.03 mmol), DPEphos (16.8 mg, 0.03 mmol) / MTBE (1 mL), $(NH_4)_2HPO_4$ (145.5 mg, 1.1 mmol), (*R*)-**1m** (246.5 mg, 1 mmol) / MTBE (0.5 mL), BnOH (1.0808 g, 10 mmol) / MTBE (0.5 mL) afforded (S_a)-**2m** (214.9 mg, 75%) as an oil: 99% ee (HPLC conditions: Regis (*S*, *S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 0.5 mL/min, λ = 214 nm, t_R (minor) = 19.9 min, t_R (major) = 21.9 min); $[\alpha]^{21}_D$ = -39.3 (c = 1.22, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.40-7.22 (m, 5 H, Ar-H), 5.58-5.50 (m, 1 H, =CH), 5.23 (d, *J* = 12.9 Hz, 1 H, one proton from Bn), 5.12 (d, *J* = 13.2 Hz, 1 H, one proton from Bn), 2.52-2.34 (m, 1 H, CH), 2.33-2.15 (m, 2 H, CH_2), 1.52-1.23 (m, 6 H, 3 x CH_2), 1.05 (d, *J* = 6.9 Hz, 6 H, 2 x CH_3), 0.88 (t, *J* = 6.9 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 208.8, 167.5, 136.4, 128.3, 127.8, 127.5, 102.2, 101.6, 66.1, 31.3, 28.3, 28.1, 27.8, 22.4, 22.34, 22.31, 14.0; MS (ESI *m/z*): 341 $(M+Na+MeOH)^+$, 325 $(M+K)^+$, 309 $(M+Na)^+$, 287 $(M+H)^+$; IR (neat): *v* = 2967, 1956, 1711, 1253, 1193, 1121, 1057 cm^{-1}; HRMS calcd. for $C_{19}H_{26}O_2$ $[M^+]$: 286.1933, found: 286.1935.

(18) Preparation of (R_a)-benzyl 2-butyl-2,3-octadienoate (wyl-16-65)

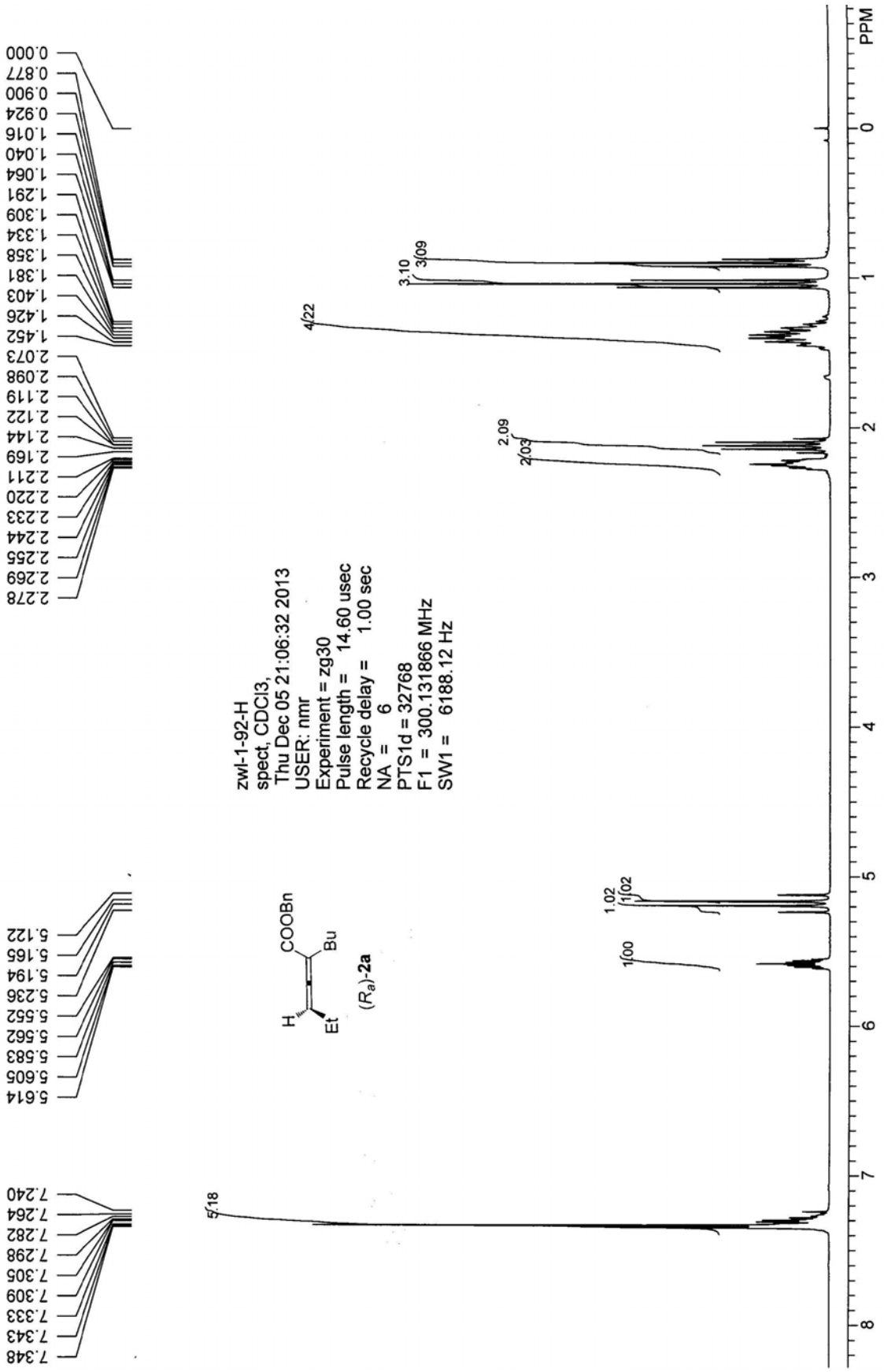


To a flame-dried Schlenk bottle (50 mL) were added $[(\pi\text{-allyl})PdCl]_2$ (3.8 mg, 0.01 mmol) and (*R*)-**ECNU-Phos** (33.3 mg, 0.04 mmol). After addition of each of chemical, the bottle was degassed and refilled with Ar for three times to ensure the complete exclusion of air. Then freshly distilled toluene (2 mL) was added under argon. The resulting mixture was stirred for 1 hour at room temperature, which was followed by the addition of anhydrous LiF (28.5 mg, 1.1 mmol) (kept in a glove box) and (±)-**1a** (302.6 mg, 1.0 mmol)/toluene (3 mL) sequentially. The 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 (about 1 L) for three times. Then the resulting mixture was stirred at 25 ^{o}C for 24 h. After that, the resulting mixture was diluted with 20 mL of Et_2O, washed with brine (20 mL), and dried over anhydrous Na_2SO_4. The resulting mixture was filtered through a short pad of silica gel (1.5 cm) eluted with Et_2O (20 mL), and concentrated. The residue was purified by chromatography on silica gel to afford (R_a)-benzyl 2-butyl-2,3-octadienoate (126.8 mg, 44%; 37% recovery determined by ^{1}H NMR spectrum using 1,3,5-trimethylbenzene as internal standard) as an oil [eluent: petroleum ether (b.p. 60-90 ^{o}C)/ethyl ether = 250/1]: 87% ee (Regis (*S*,*S*) Whelk-O column, hexane/*i*-PrOH = 200/1, 1.0 mL/min, λ = 214 nm, t_R(minor) = 12.5 min, t_R(major) = 14.6 min); $[\alpha]^{30}_D$ = -21.4 (*c* = 1.10, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ = 7.42-7.23 (m, 5 H, Ar-H), 5.56-5.46 (m, 1 H, =CH), 5.21 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 5.14 (d, *J* = 12.6 Hz, 1 H, one proton from Bn), 2.34-2.15 (m, 2 H, CH_2), 2.10 (q, *J* = 7.0 Hz, 2 H, CH_2), 1.50-1.24 (m, 8 H, 4 x CH_2), 0.90 (t, *J* = 7.1 Hz, 3 H, CH_3), 0.87 (t, *J* = 7.2 Hz, 3 H, CH_3); ^{13}C NMR (75 MHz, $CDCl_3$): δ = 210.0, 167.6, 136.4, 128.3, 127.8, 127.6, 100.4, 95.0, 66.1, 31.0, 30.2, 28.1, 27.7, 22.2, 22.0, 13.9, 13.8; MS (ESI *m/z*): 341

$(M+Na+MeOH)^+$, 309 $(M+Na)^+$; IR (neat): ν = 2970, 2925, 2903, 1957, 1711, 1262, 1054 cm^{-1}; HRMS calcd. for $C_{19}H_{26}O_2$ $[M^+]$: 286.1933, found: 286.1932.

Reference：

1. Wang, Y.; Ma, S. *Adv. Synth. Catal.* 2013, 355, 741.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Thu Dec 05 21:06:32 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
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SW1 = 6188.12 Hz
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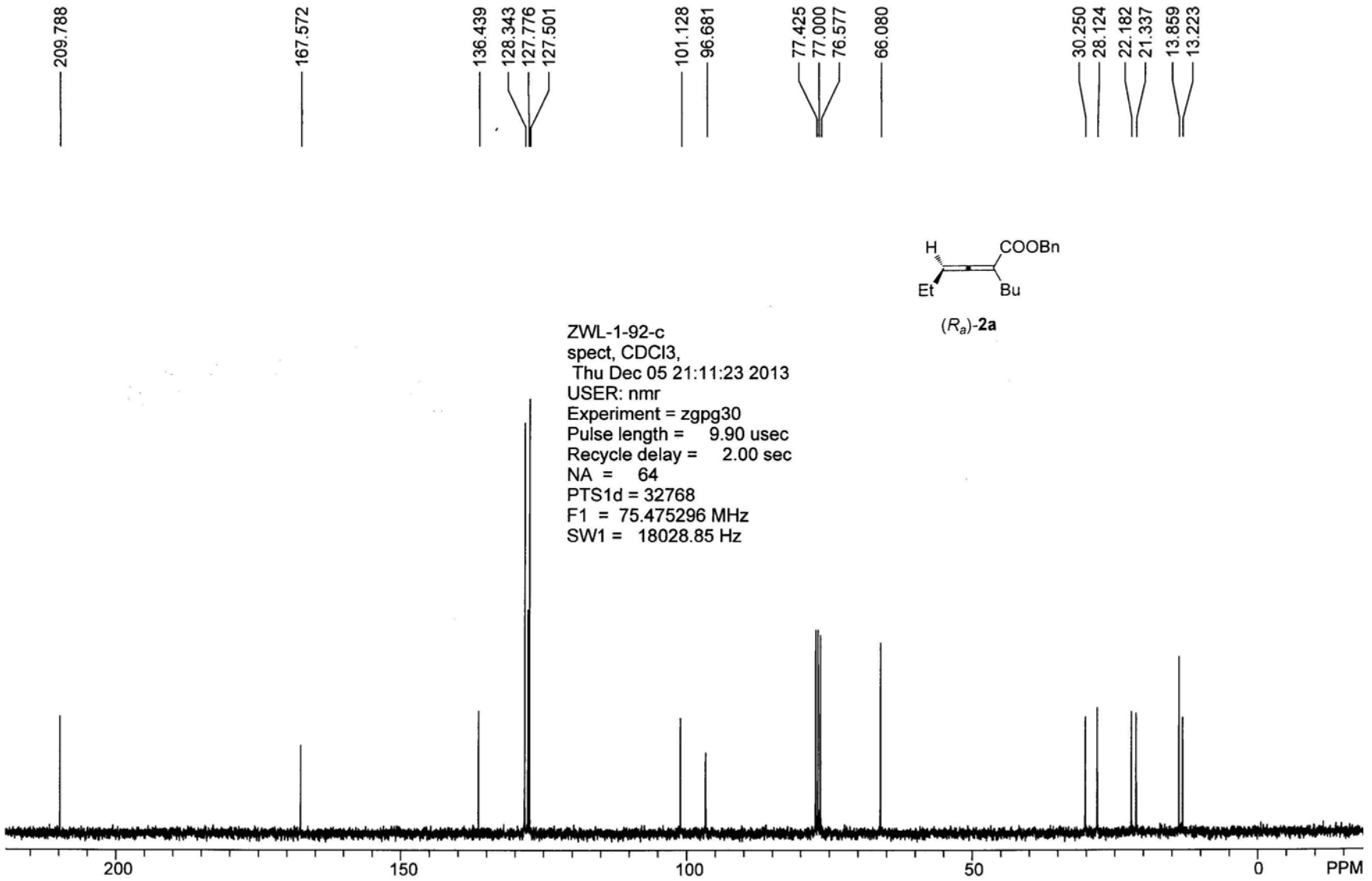
H
Et
(Ra)-2a
PPM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167.572
136.439
128.343
127.776
127.501
101.128
96.681
77.425
77.000
76.577
66.080
30.250
28.124
22.182
21.337
13.859
13.223
H
COOBn
Et
Bu
(R_a)-2a
ZWL-1-92-c
spect, CDCl3,
Thu Dec 05 21:11:23 2013
USER: nmr
Experiment = zgpg30
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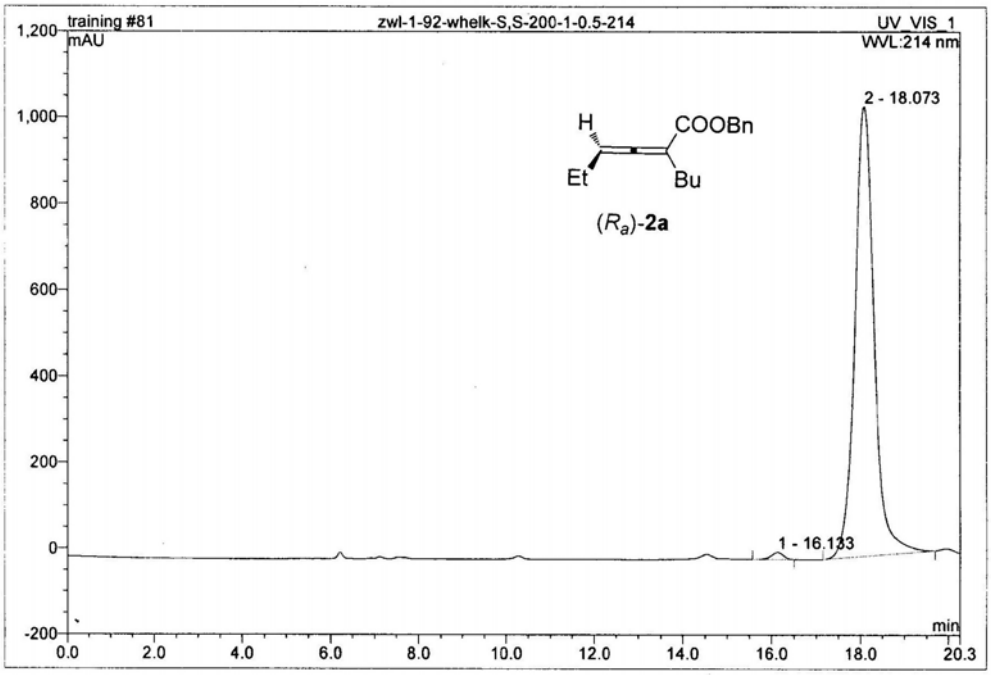
NA = 64
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
200
150
100
50
0
PPM

81 zwl-1-92-whelk-S,S-200-1-0.5-214

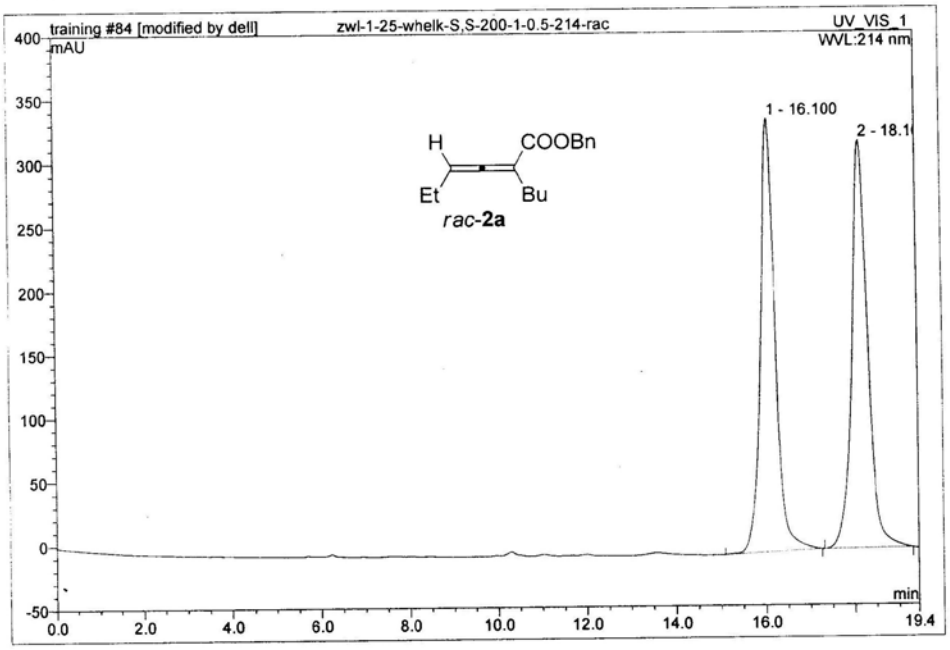
Sample Name:	**zwl-1-92-whelk-S,S-200-1-0.5-214**	*Injection Volume:*	**20.0**
Vial Number:	**81**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**zwl-allenoate**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-3-16 14:56**	*Sample Weight:*	**1.0000**
Run Time (min):	**20.27**	*Sample Amount:*	**1.0000**



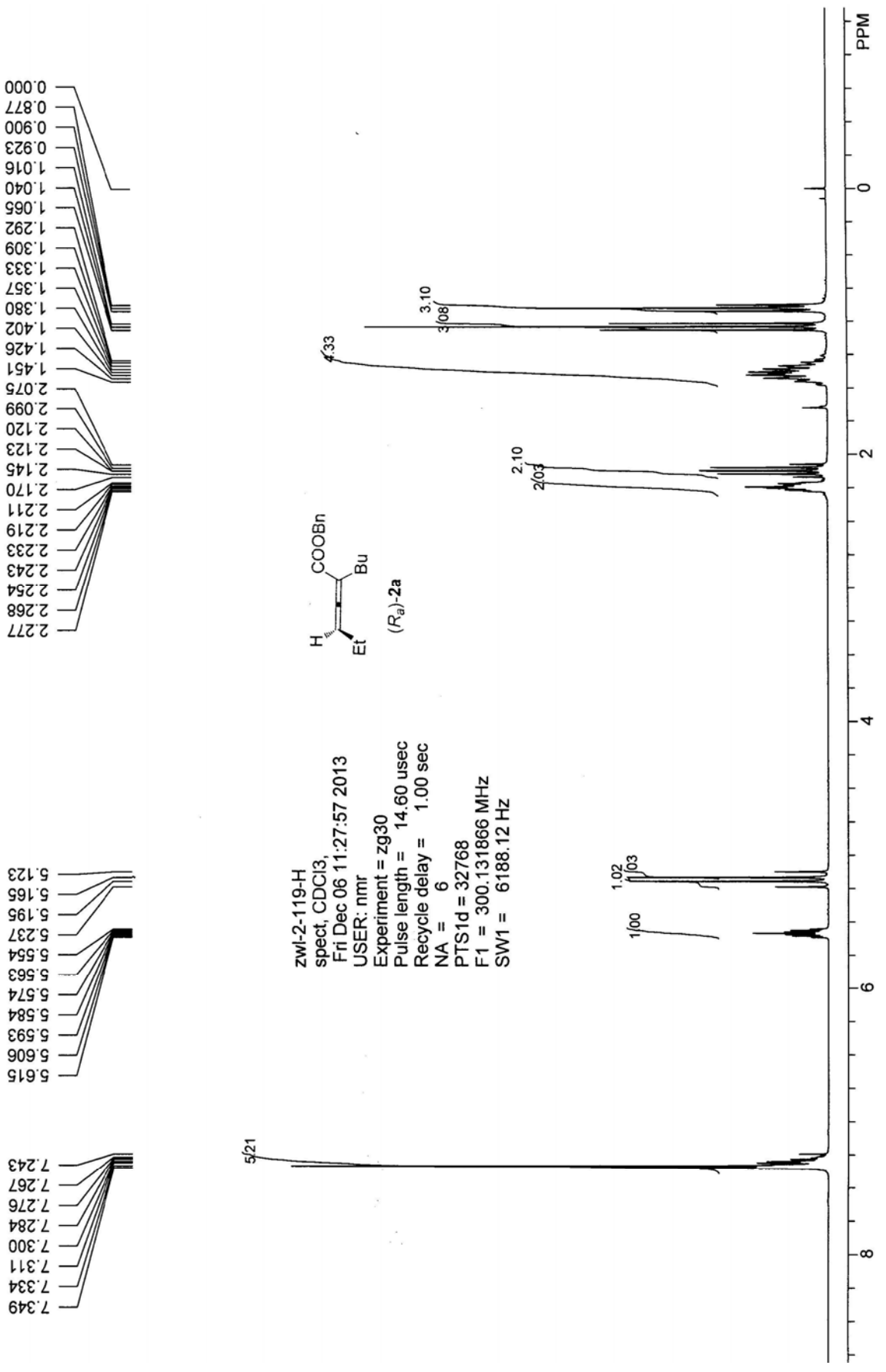
No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	16.13	n.a.	16.606	5.302	1.00	n.a.	BMB
2	18.07	n.a.	1042.303	526.108	99.00	n.a.	BMB
Total:			1058.909	531.410	100.00	0.000	

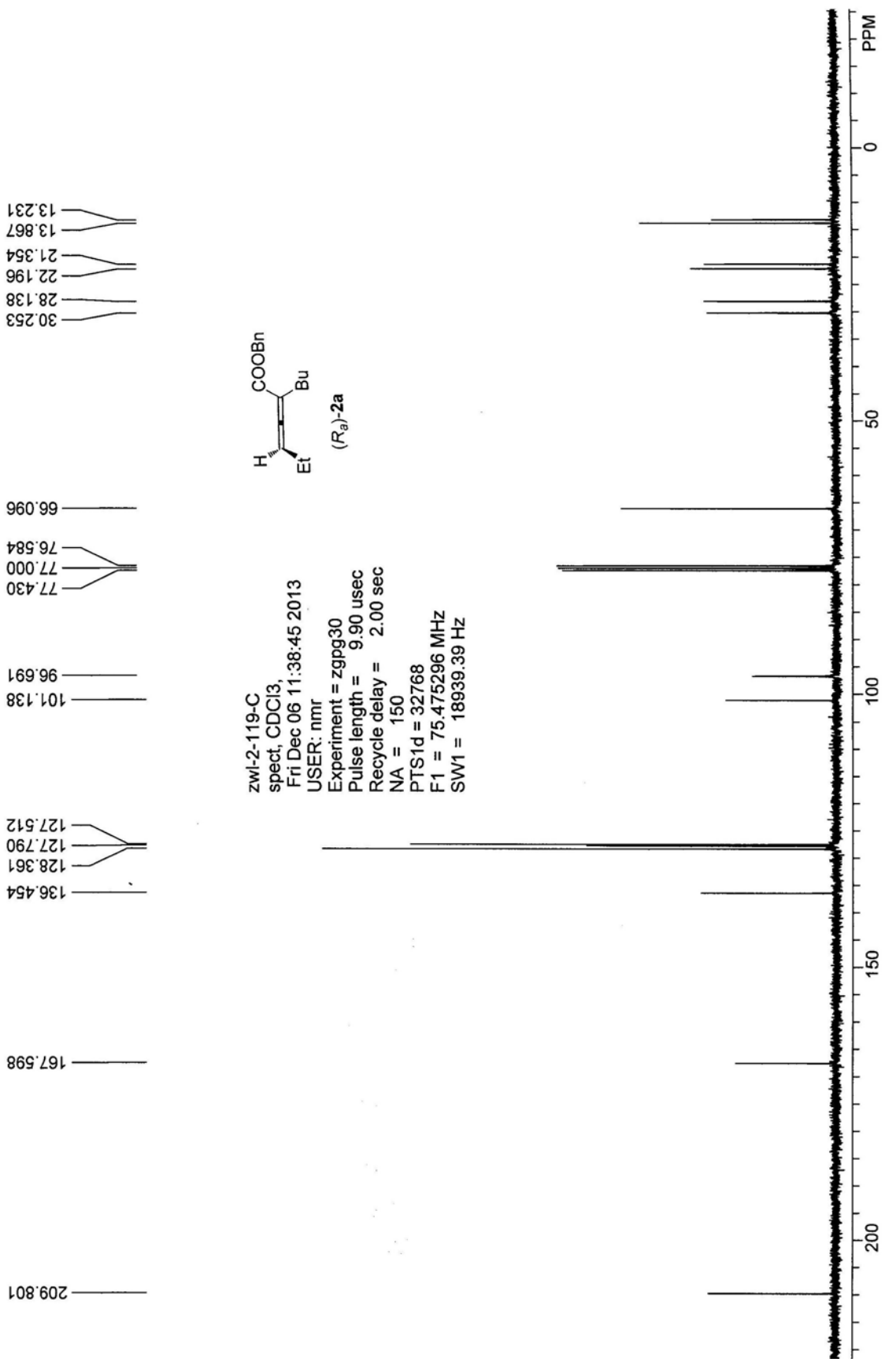
84 zwl-1-25-whelk-S,S-200-1-0.5-214-rac

Sample Name:	**zwl-1-25-whelk-S,S-200-1-0.5-214-rac**	*Injection Volume:*	**20.0**
Vial Number:	**84**	*Channel:*	**UV_VIS_1**
Sample Type:	**unknown**	*Wavelength:*	**214**
Control Program:	**zwl-allenoate**	*Bandwidth:*	**n.a.**
Quantif. Method:	**test**	*Dilution Factor:*	**1.0000**
Recording Time:	**2013-3-16 15:59**	*Sample Weight:*	**1.0000**
Run Time (min):	**19.44**	*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height mAU	Area mAU*min	Rel.Area %	Amount	Type
1	16.10	n.a.	340.382	129.324	49.69	n.a.	BMB*
2	18.16	n.a.	320.346	130.924	50.31	n.a.	BMB*
Total:			660.728	260.248	100.00	0.000	


zwl-2-119-H
spect, CDCl3,
Fri Dec 06 11:27:57 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
Bu
H
Et
(Ra)-2a
PPM


13.231
13.867
21.354
22.196
28.138
30.253
66.096
76.584
77.000
77.430
96.691
101.138
127.512
127.790
128.361
136.454
167.598
209.801
zwl-2-119-C
spect, CDCl3,
Fri Dec 06 11:38:45 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 150
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18939.39 Hz
COOBn
Bu
H
Et
(Ra)-2a
PPM
0
50
100
150
200

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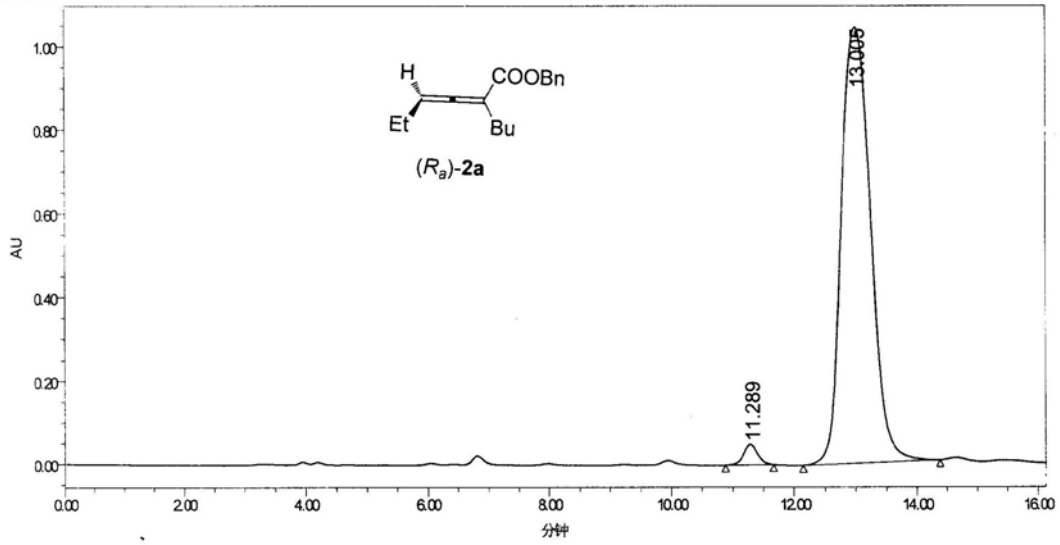
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-119-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/10/23 13:05:06 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	17	Date Processed:	2013/10/23 13:40:29 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	20.00 Minutes	Sample Set Name:	



	RT (min)	Area (微sec)	%Area	Height (微	% Height
1	11.28	783852	2.21	49414	4.52
2	13.00	34656380	97.79	1044698	95.48

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/10/23 13:41:59 PRC

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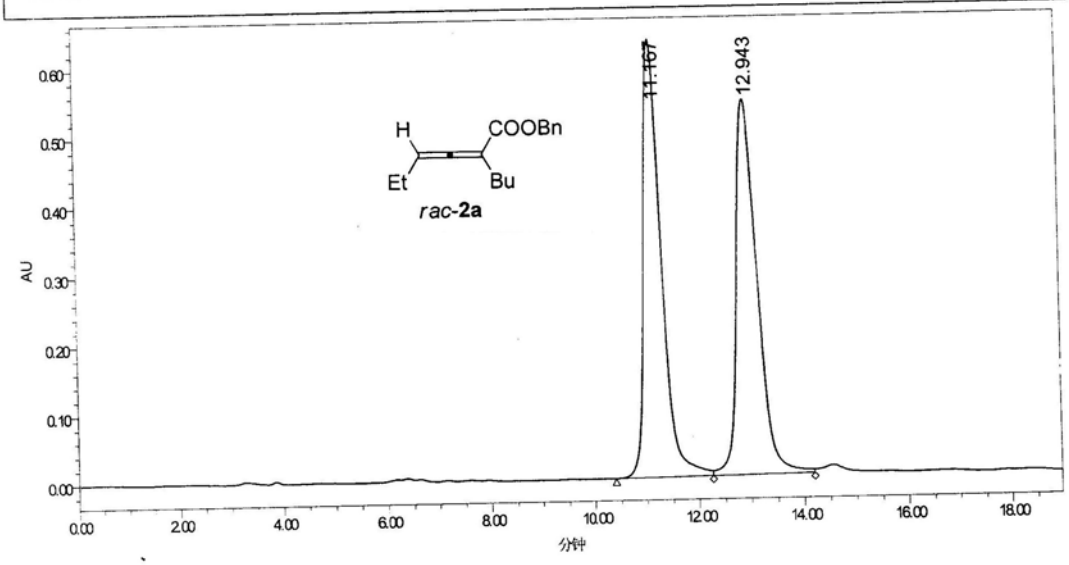
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-1-25-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/10/23 12:06:48 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	14	Date Processed:	2013/10/23 13:39:27 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	160.00 Minutes	Sample Set Name:	

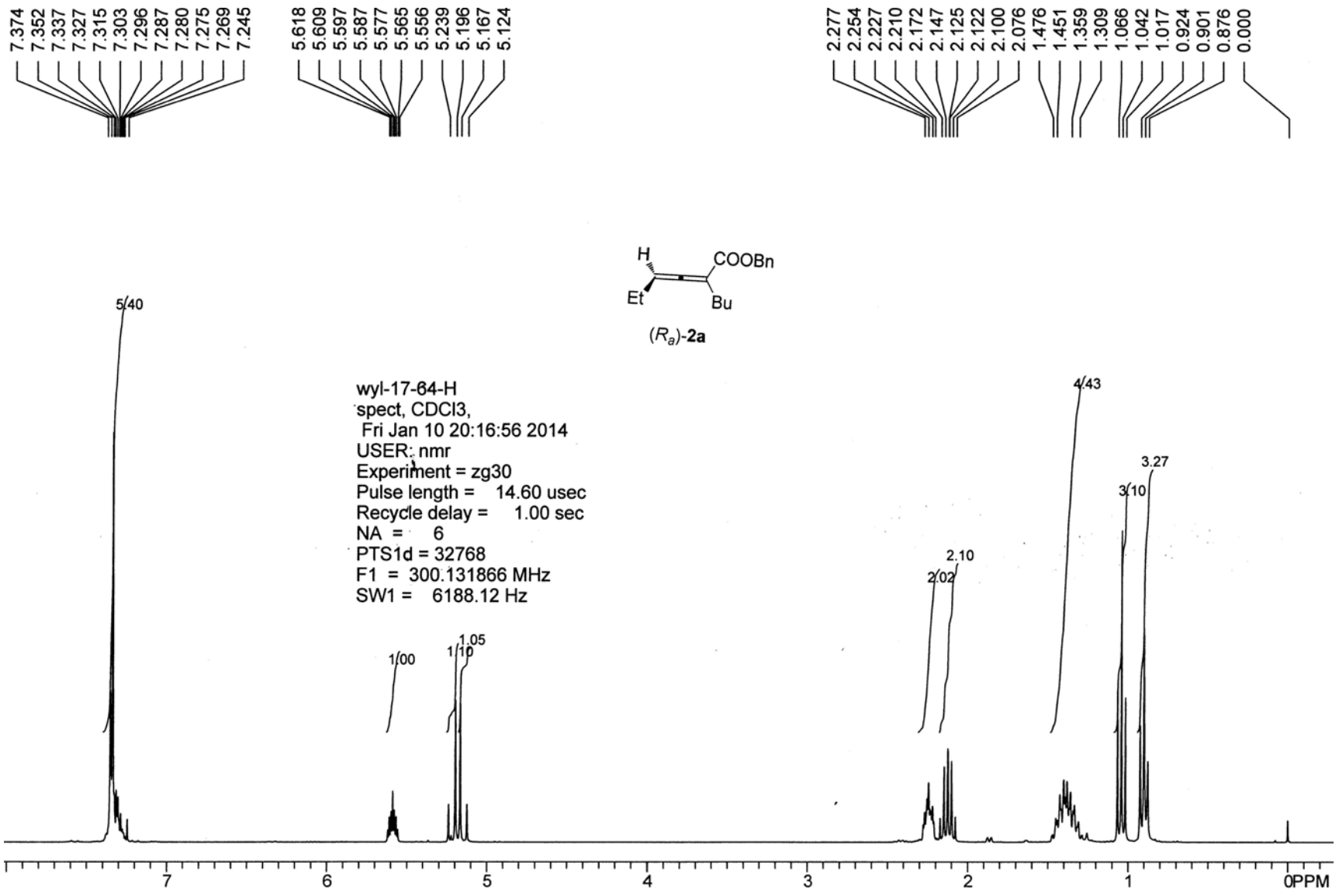


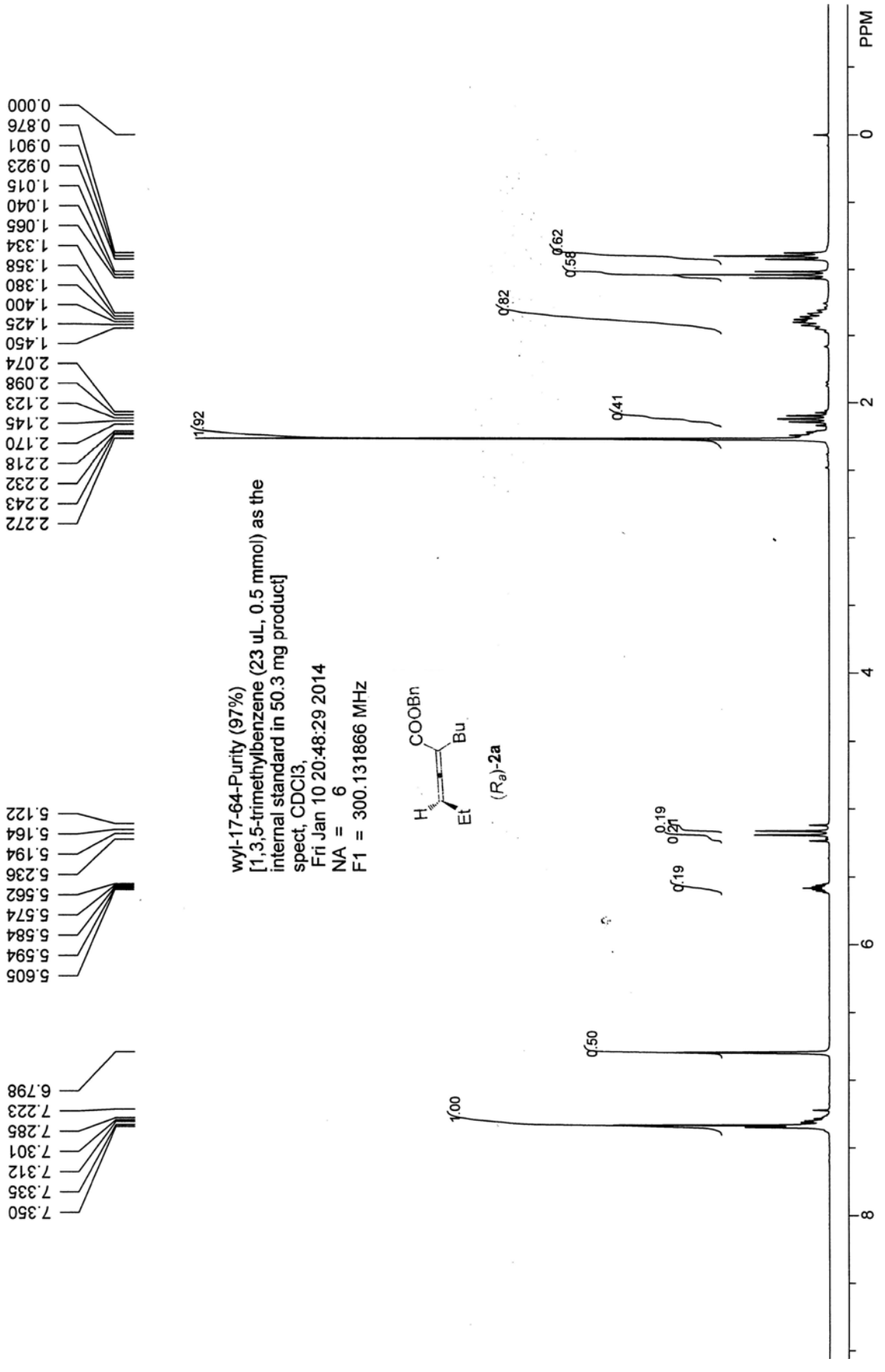
	RT (min)	Area (微sec)	%Area	Height (微	% Height
1	11.167	15160646	50.03	635354	53.88
2	12.943	15142193	49.97	543942	46.12

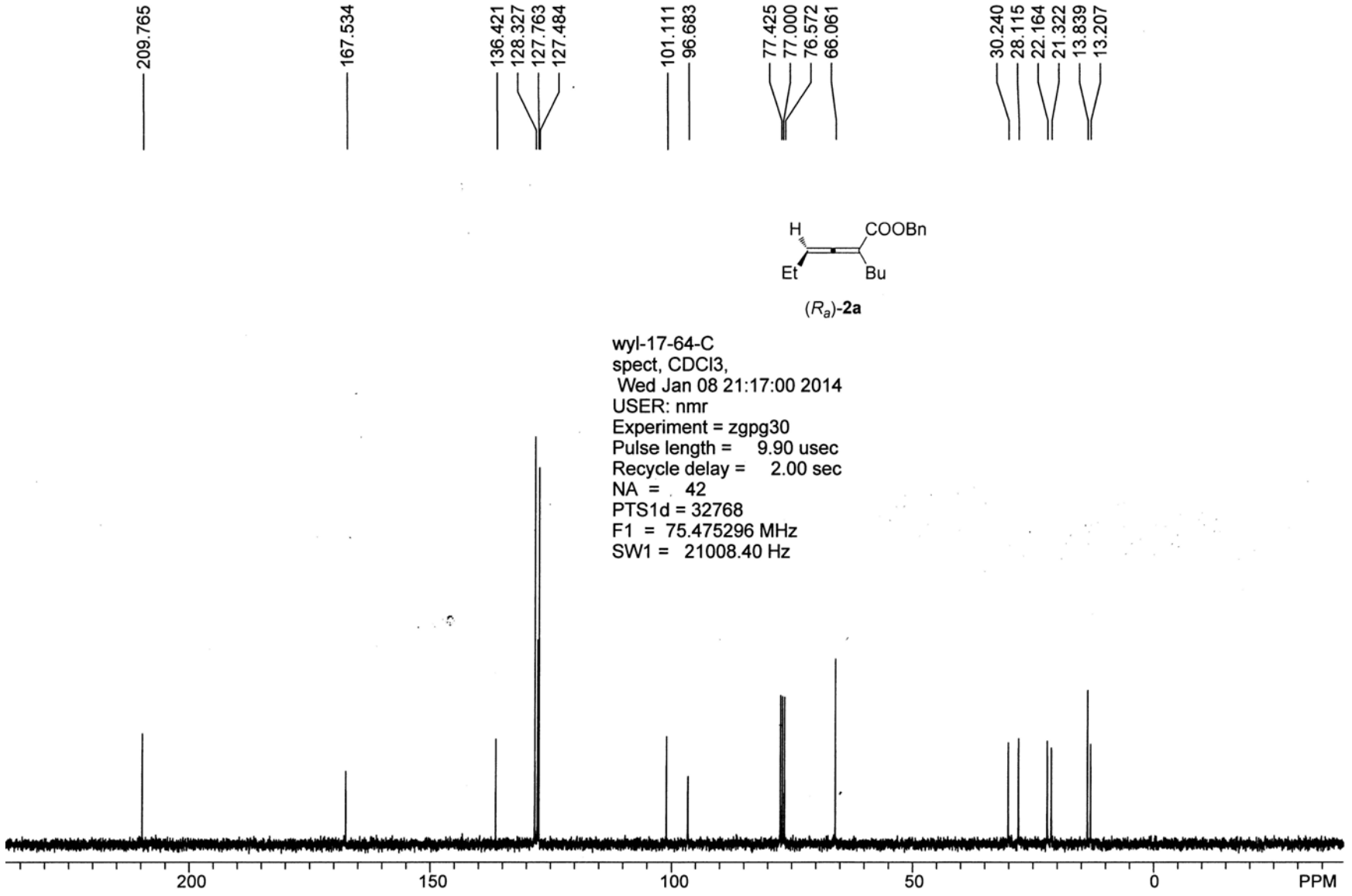
Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/10/23 13:41:35 PRC

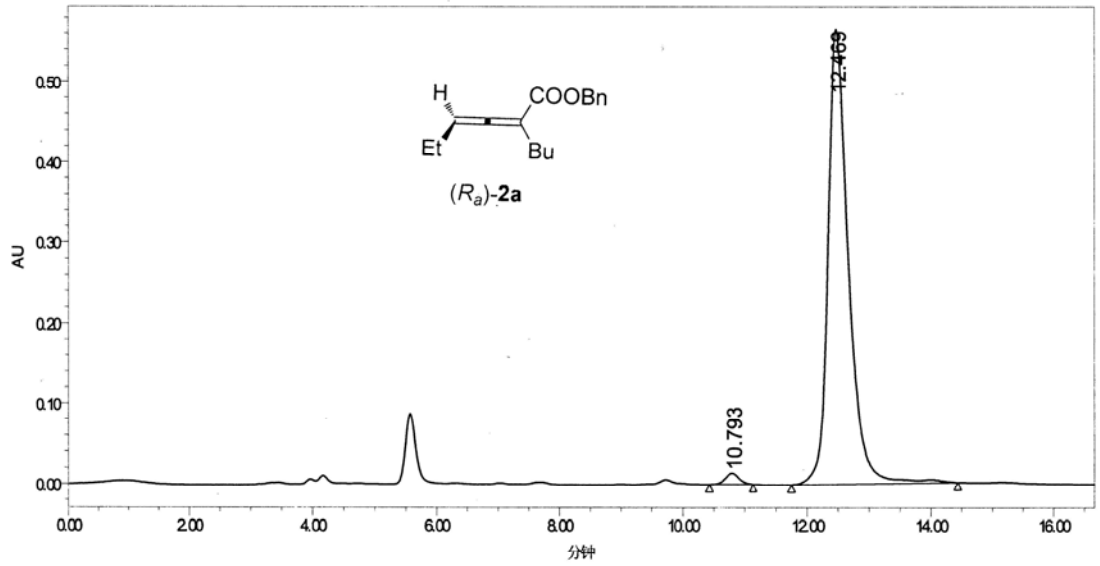

7.374
7.352
7.337
7.327
7.315
7.303
7.296
7.287
7.280
7.275
7.269
7.245
5.618
5.609
5.597
5.587
5.577
5.565
5.556
5.239
5.196
5.167
5.124
2.277
2.254
2.227
2.210
2.172
2.147
2.125
2.122
2.100
2.076
1.476
1.451
1.359
1.309
1.066
1.042
1.017
0.924
0.901
0.876
0.000
H
COOBn
Et
Bu
(Ra)-2a
wyl-17-64-H
spect, CDCl3,
Fri Jan 10 20:16:56 2014
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.40
1.00
1.10
1.05
2.02
2.10
4.43
3.10
3.27
7
6
5
4
3
2
1
0PPM


wyl-17-64-Purity (97%)
[1,3,5-trimethylbenzene (23 uL, 0.5 mmol) as the internal standard in 50.3 mg product]
spect, CDCl3,
Fri Jan 10 20:48:29 2014
NA = 6
F1 = 300.131866 MHz
COOBn
Bu
H
Et
(Ra)-2a
PPM


209.765
167.534
136.421
128.327
127.763
127.484
101.111
96.683
77.425
77.000
76.572
66.061
30.240
28.115
22.164
21.322
13.839
13.207
H
COOBn
Et
Bu
(Ra)-2a
wyl-17-64-C
spect, CDCl3,
Wed Jan 08 21:17:00 2014
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 42
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 21008.40 Hz
200
150
100
50
0
PPM

SAMPLE INFORMATION

Sample Name:	wyl-17-64-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/3 14:57:26 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	22	Date Processed:	2014/1/3 16:48:20 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	100.00 Minutes	Sample Set Name:	



	RT (min)	Area (微sec)	%Area	Height (微)	% Height
1	10.793	217533	1.65	14194	2.45
2	12.469	12962557	98.35	566829	97.55

Project Name: defaults for copy
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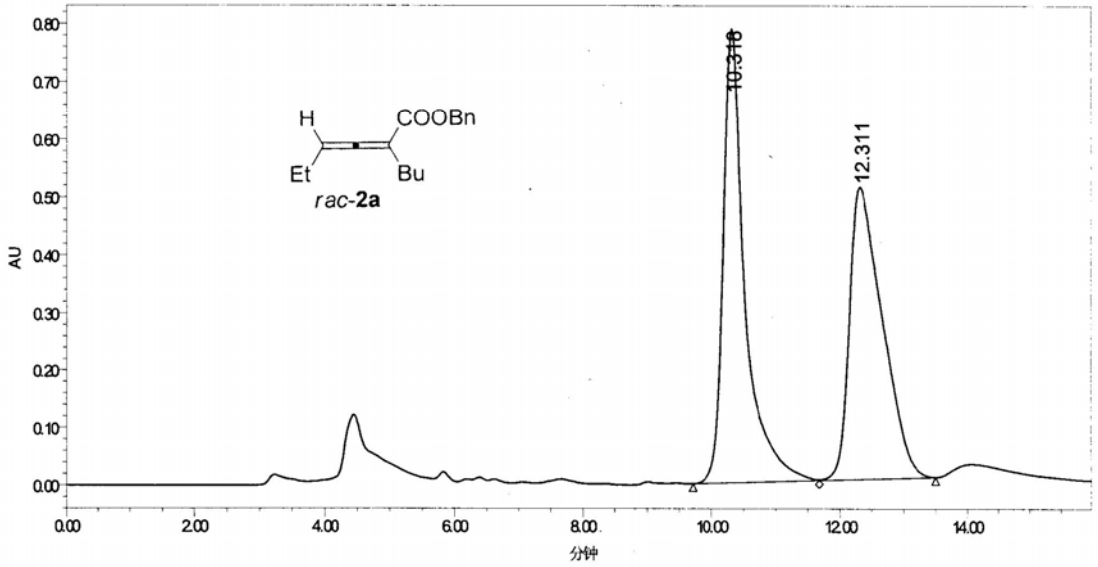
Breeze 2 HPLC System

SAMPLE INFORMATION

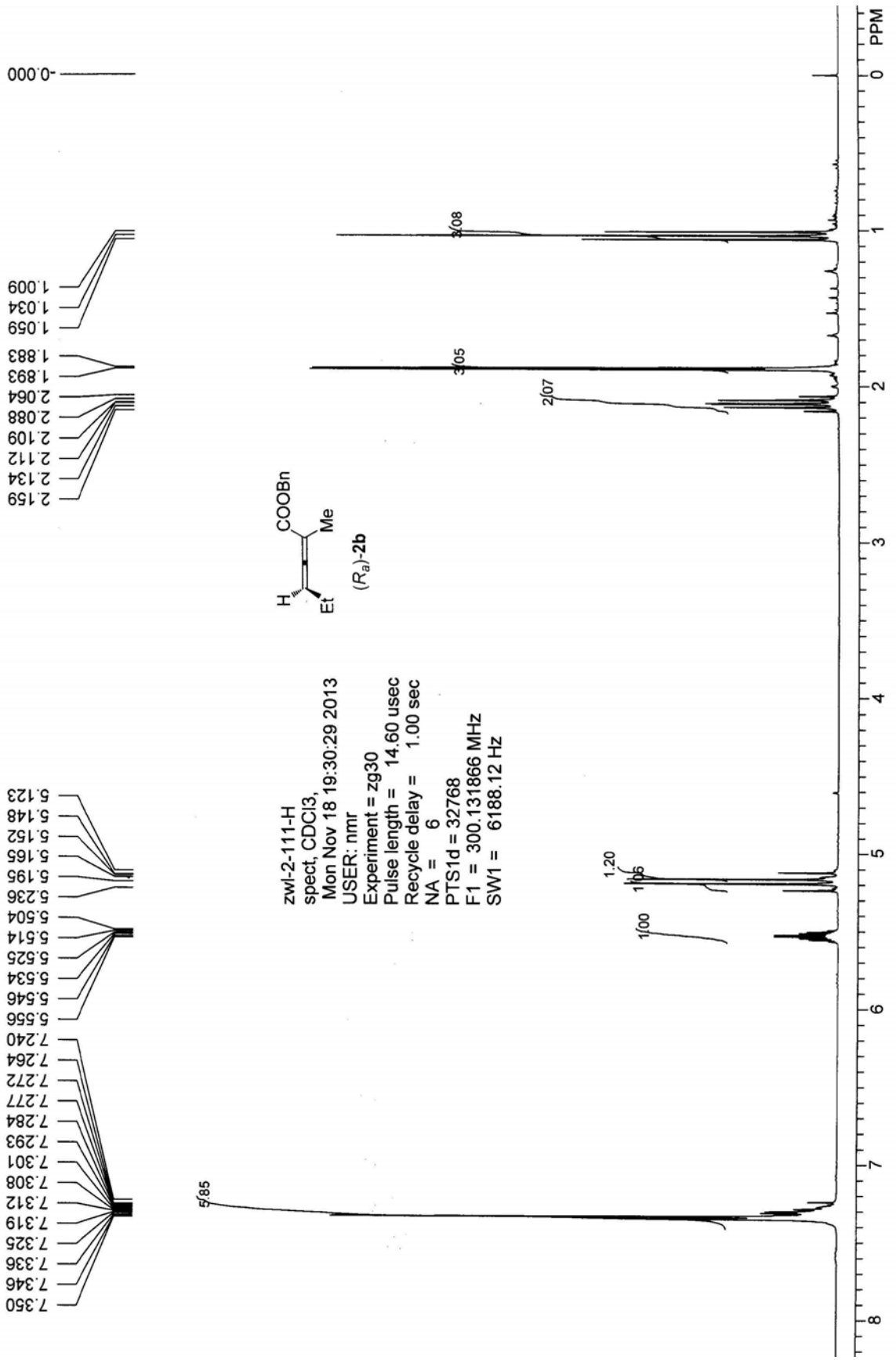
Sample Name:	zwl-1-25-whalk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2014/1/3 15:36:15 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	24	Date Processed:	2014/1/3 16:46:51 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	100.00 Minutes	Sample Set Name:	

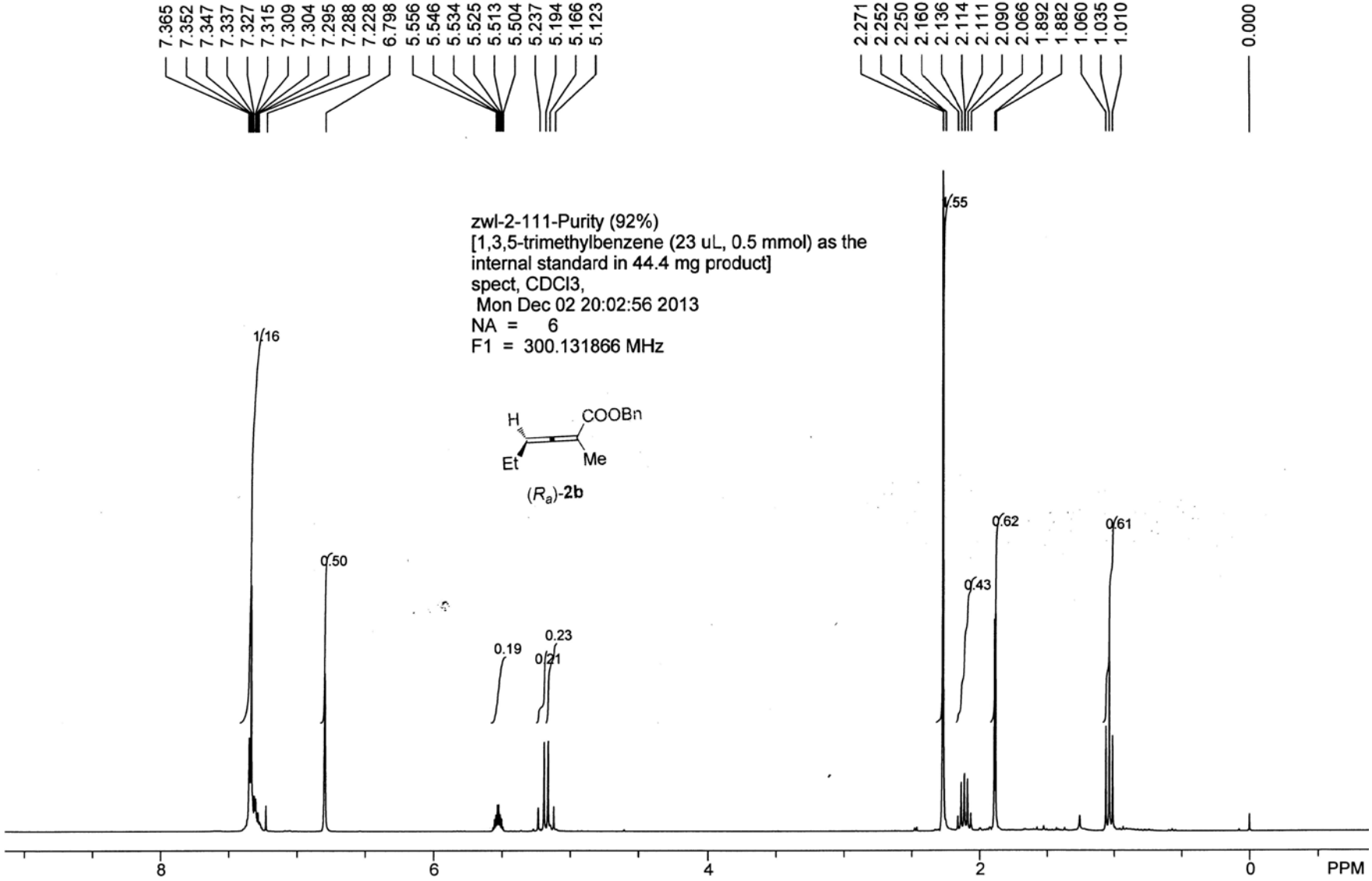


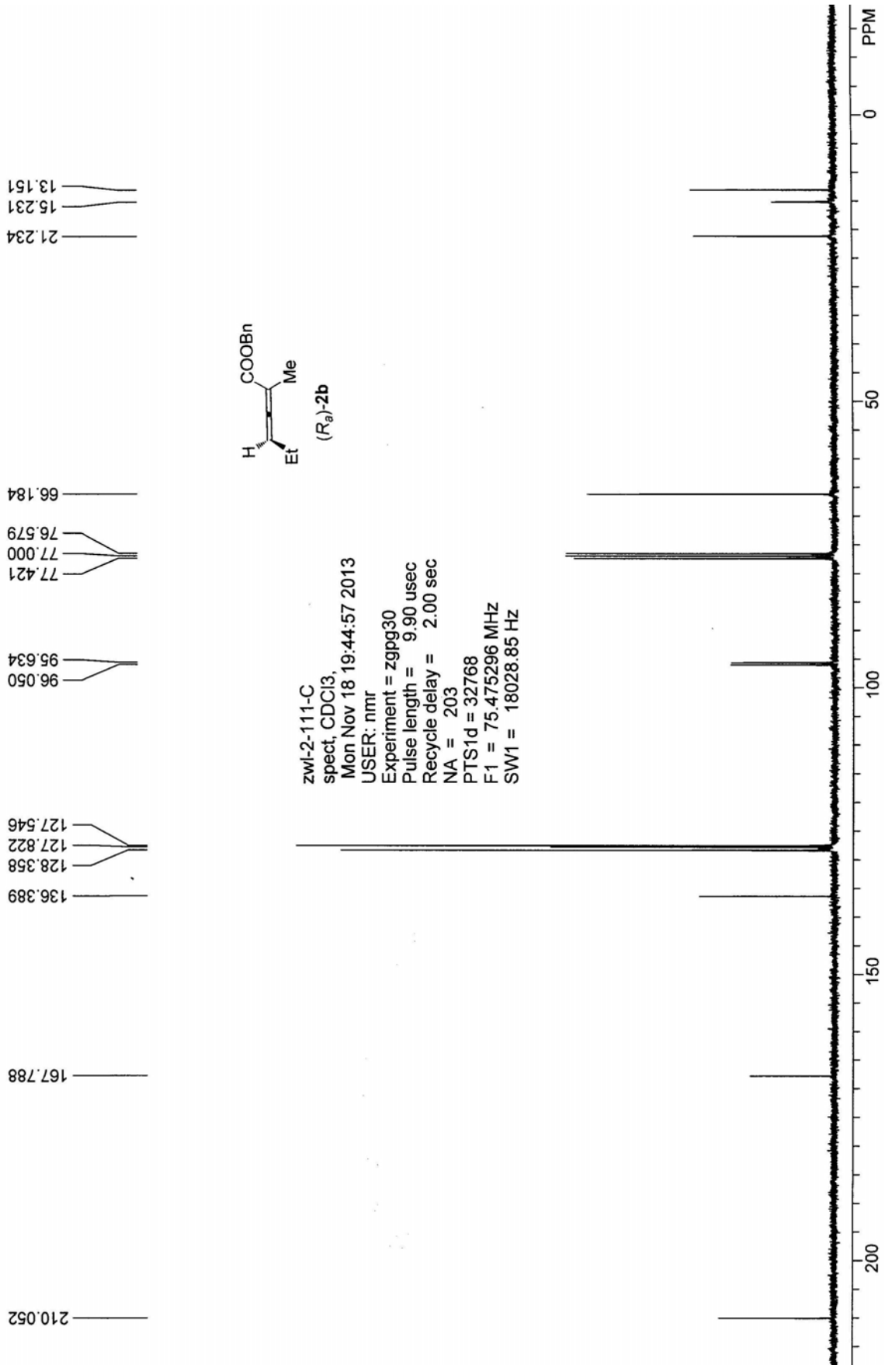
	RT (min)	Area (毫伏sec)	%Area	Height (毫伏)	% Height
1	10.318	18399438	50.21	786667	60.82
2	12.311	18237239	49.79	506832	39.18

Report Method: 无标题
Page: 1 (共计 1)

Printed: 2014/1/3 16:54:35 PRC


zwl-2-111-H
spect, CDCl3,
Mon Nov 18 19:30:29 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
Me
H
Et
(Ra)-2b
PPM


7.365
7.352
7.347
7.337
7.327
7.315
7.309
7.304
7.295
7.288
7.228
6.798
5.556
5.546
5.534
5.525
5.513
5.504
5.237
5.194
5.166
5.123
2.271
2.252
2.250
2.160
2.136
2.114
2.111
2.090
2.066
1.892
1.882
1.060
1.035
1.010
0.000
zwl-2-111-Purity (92%)
[1,3,5-trimethylbenzene (23 uL, 0.5 mmol) as the internal standard in 44.4 mg product]
spect, CDCl3,
Mon Dec 02 20:02:56 2013
NA = 6
F1 = 300.131866 MHz
H
COOBn
Et
Me
(Ra)-2b
1.16
0.50
0.19
0.23
0.21
1.55
0.43
0.62
0.61
8
6
4
2
0
PPM


zwl-2-111-C
spect, CDCl3,
Mon Nov 18 19:44:57 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 203
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
COOBn
Me
H
Et
(Ra)-2b
210.052
167.788
136.389
128.358
127.822
127.546
96.050
95.634
77.421
77.000
76.579
66.184
21.234
15.231
13.151
PPM
200
150
100
50
0

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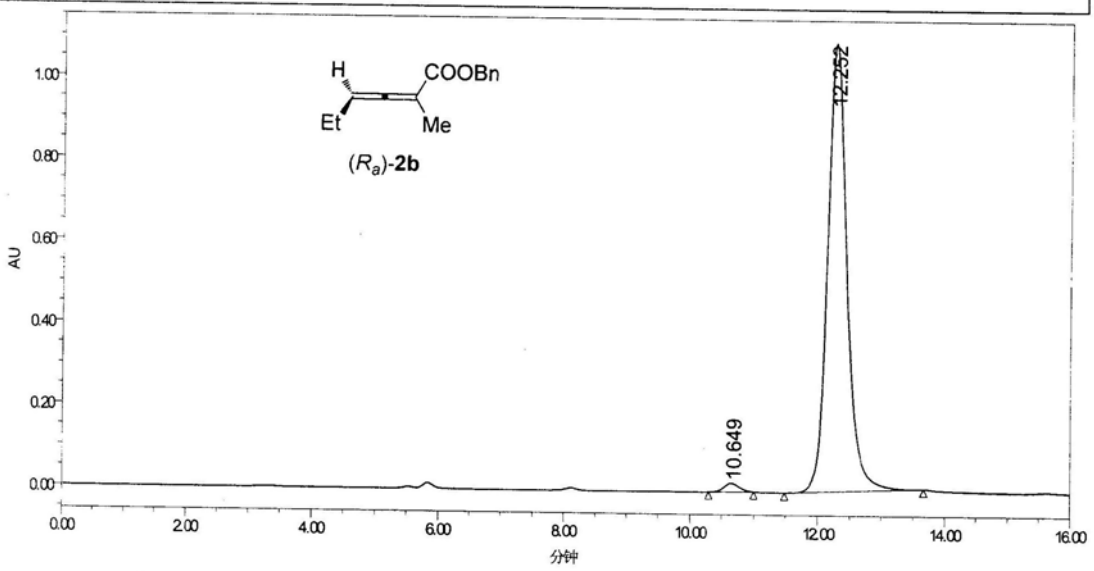
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-111-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/10/17 11:02:23 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	54	Date Processed:	2013/10/17 17:18:59 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	16.00 Minutes	Sample Set Name:	



	RT (min)	Area (微sec)	%Area	Height (微)	% Height
1	10.649	361224	1.56	21320	1.92
2	12.252	22866192	98.44	1091875	98.08

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/10/17 17:45:44 PRC

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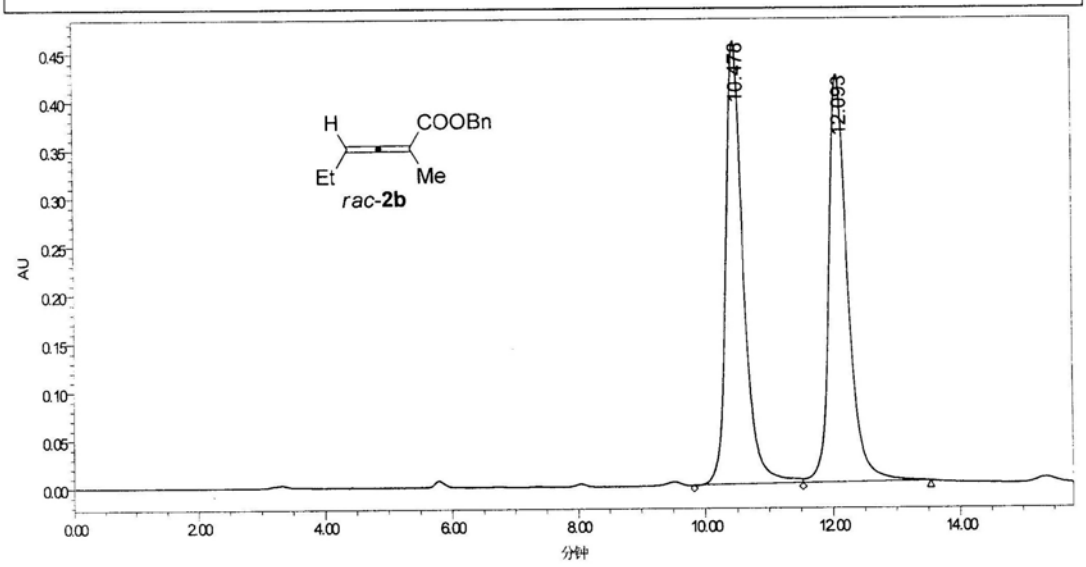
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-110-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/10/17 10:44:03 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	52	Date Processed:	2013/10/17 17:18:23 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	35.00 Minutes	Sample Set Name:	

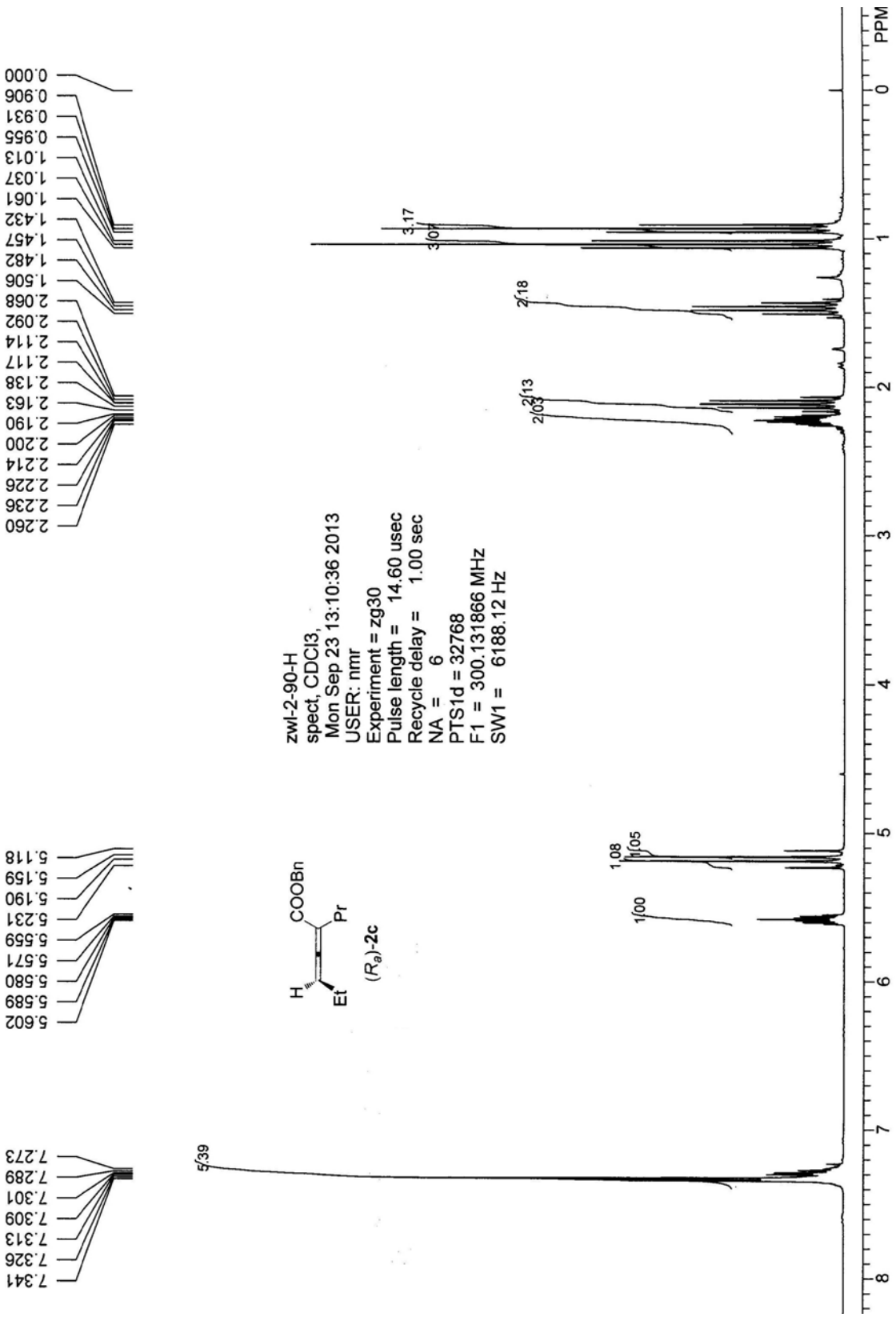


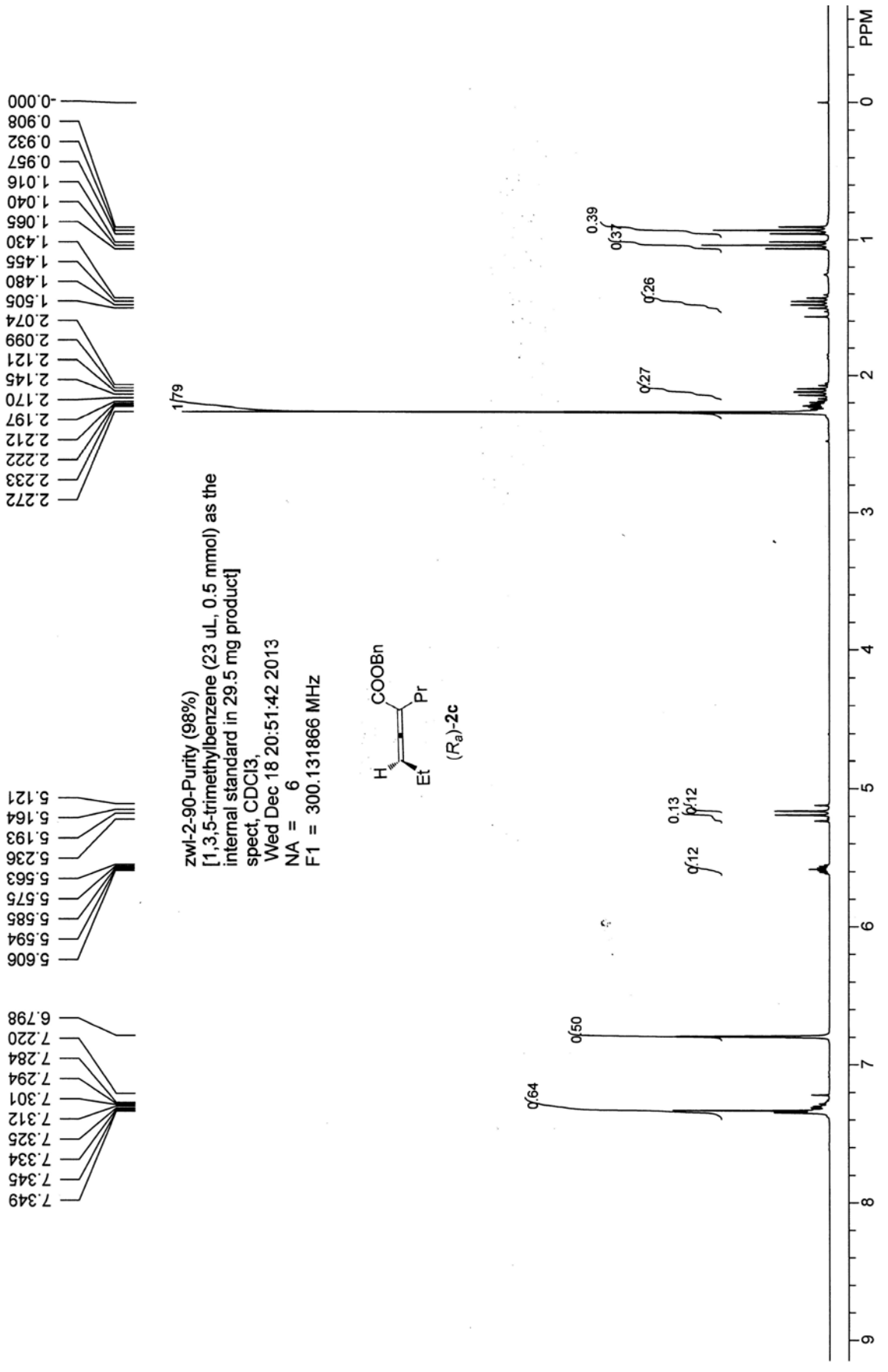
	RT (min)	Area (微sec)	%Area	Height (微)	% Height
1	10.478	8747774	50.18	459668	52.08
2	12.093	8685717	49.82	422981	47.92

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/10/17 17:45:57 PRC

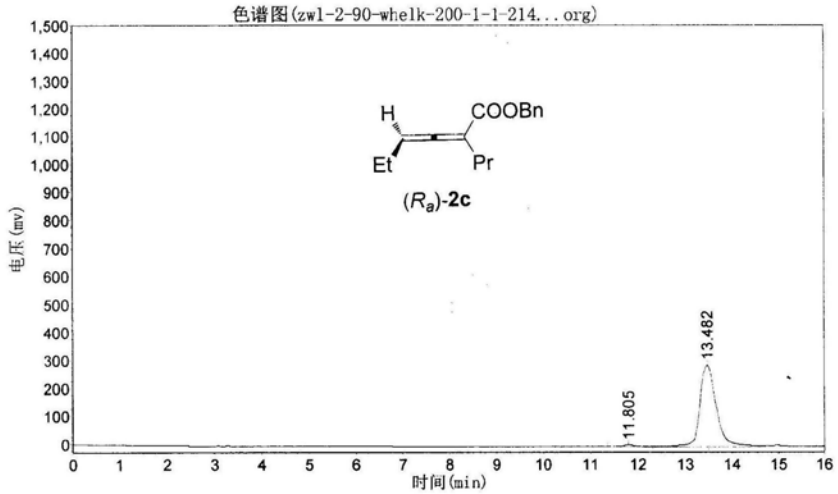

zwl-2-90-H
spect, CDCl3,
Mon Sep 23 13:10:36 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
Pr
H
Et
(Rg)-2c
PPM


zwl-2-90-Purity (98%)
[1,3,5-trimethylbenzene (23 uL, 0.5 mmol) as the internal standard in 29.5 mg product]
spect, CDCl3,
Wed Dec 18 20:51:42 2013
NA = 6
F1 = 300.131866 MHz
COOBn
Pr
H
Et
(Ra)-2c
PPM

zwl-2-90-whelk-200-1-1-214

实验时间：2013/9/24,10:59:21　　报告时间：2013/9/24,11:25:35
谱图文件:D:\zhuguangjiong\zwl\20130924\zwl-2-90-whelk-200-1-1-214...org

实验内容简介：



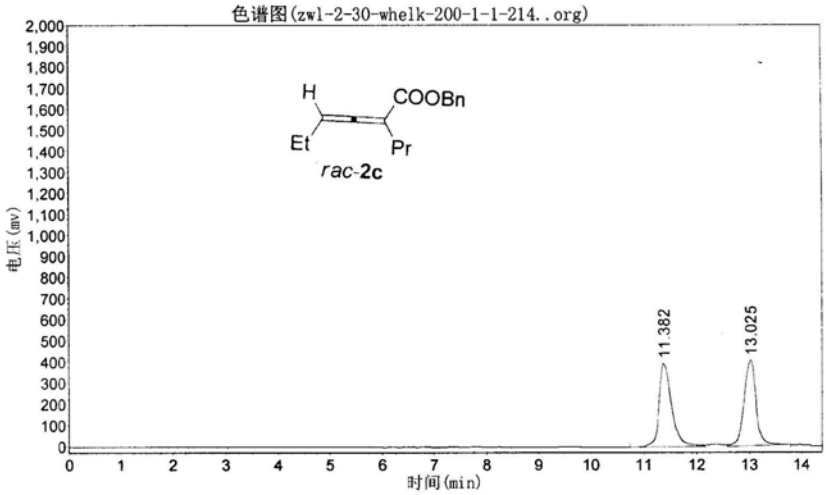
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		11.805	5360.698	89576.852	1.2682
2		13.482	291471.531	6973487.500	98.7318
总计			296832.229	7063064.352	100.0000

zwl-2-30-whelk-200-1-1-214

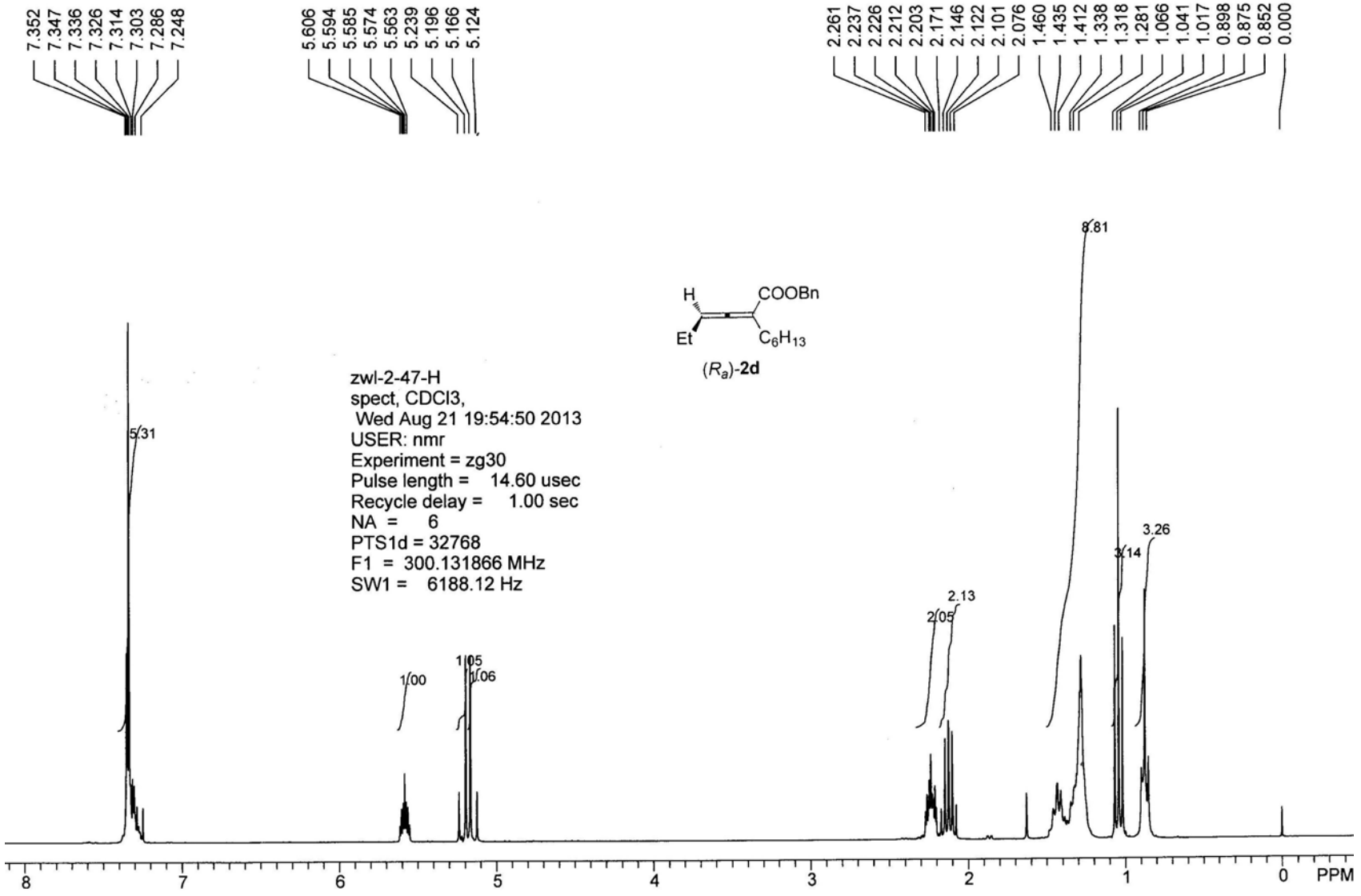
实验时间：2013/9/24,10:26:45　　报告时间：2013/9/24,11:26:41
谱图文件:D:\zhuguangjiong\zwl\20130924\zwl-2-30-whelk-200-1-1-214..org

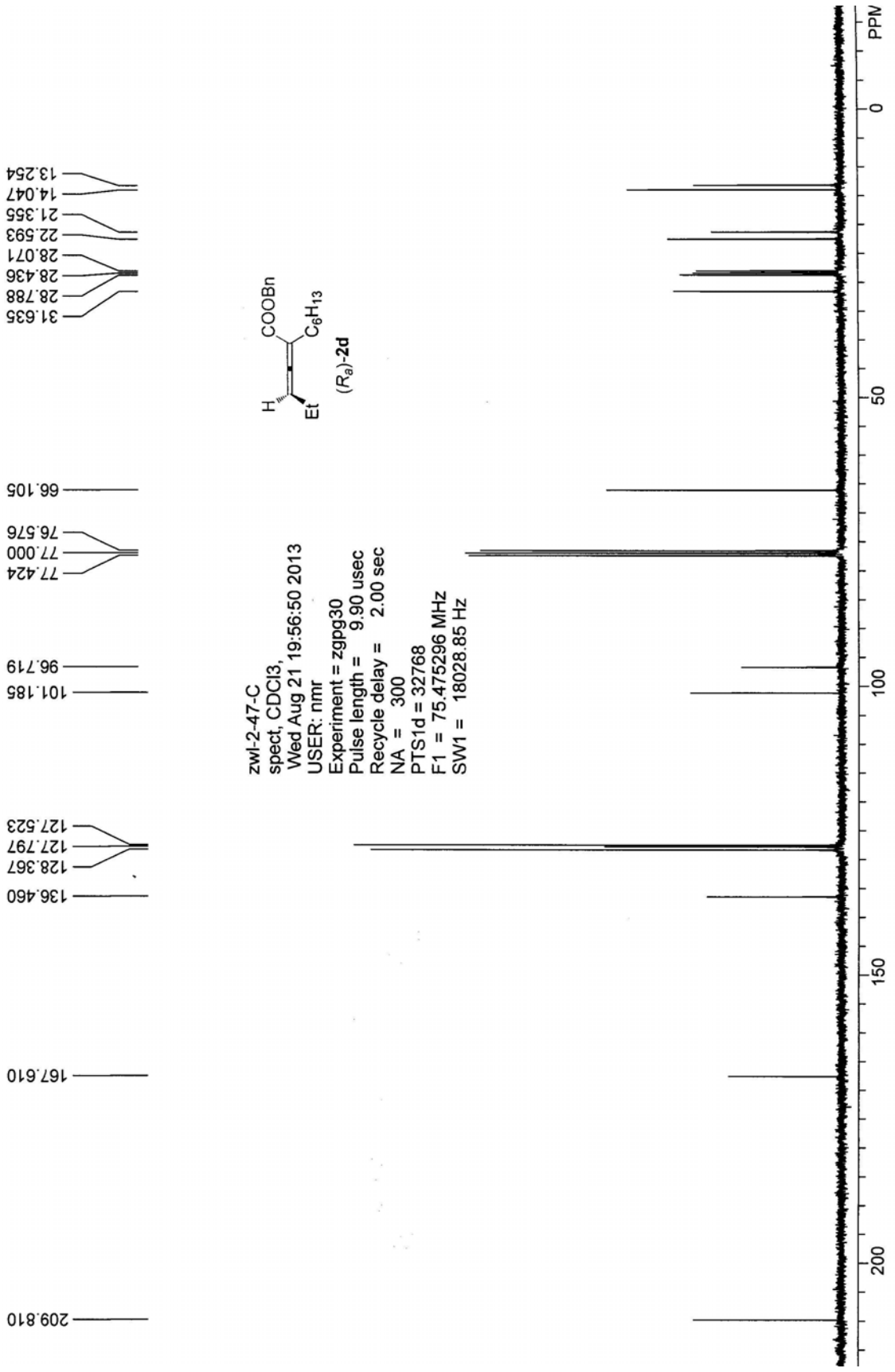
实验内容简介：



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		11.382	391553.875	6489409.500	50.2369
2		13.025	403771.500	6428203.500	49.7631
总计			795325.375	12917613.000	100.0000


7.352
7.347
7.336
7.326
7.314
7.303
7.286
7.248
5.606
5.594
5.585
5.574
5.563
5.239
5.196
5.166
5.124
2.261
2.237
2.226
2.212
2.203
2.171
2.146
2.122
2.101
2.076
1.460
1.435
1.412
1.338
1.318
1.281
1.066
1.041
1.017
0.898
0.875
0.852
0.000
H
COOBn
Et
C6H13
(Ra)-2d
zwl-2-47-H
spect, CDCl3,
Wed Aug 21 19:54:50 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.31
1.00
1.05
1.06
2.05
2.13
8.81
3.14
3.26
8
7
6
5
4
3
2
1
0
PPM


13.254
14.047
21.355
22.593
28.071
28.436
28.788
31.635
66.105
76.576
77.000
77.424
96.719
101.185
127.523
127.797
128.367
136.460
167.610
209.810
COOBn
C_6H_{13}
H
Et
(R_a)-2d
zwl-2-47-C
spect, CDCl3,
Wed Aug 21 19:56:50 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 300
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
PPM
0
50
100
150
200

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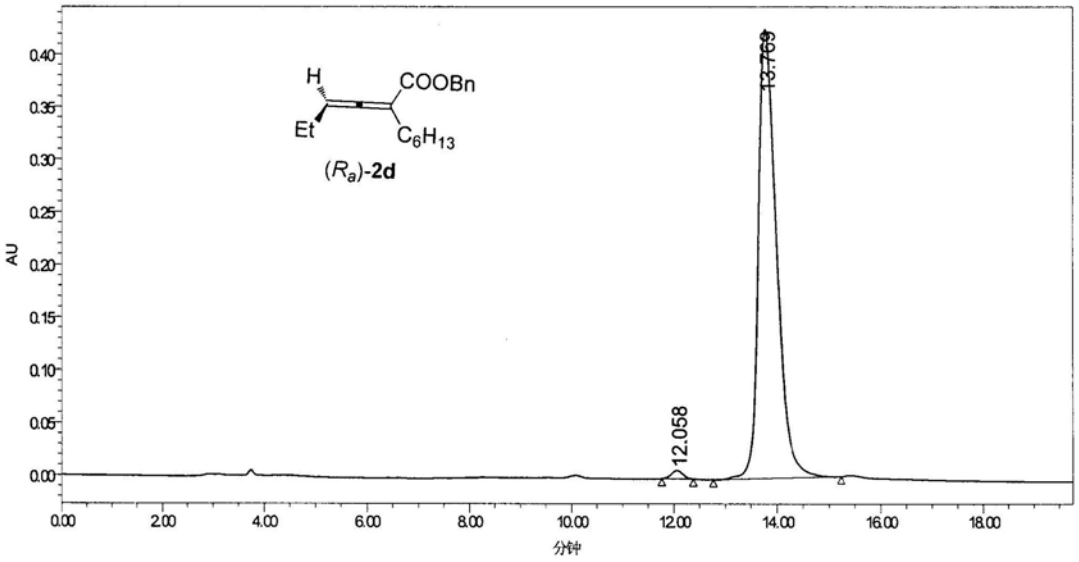
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-47-whelk-s,s-200-1-0.5-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/9/3 15:12:23 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	19	Date Processed:	2013/9/3 15:51:22 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	35.00 Minutes	Sample Set Name:	



	RT (min)	Area (微sec)	%Area	Height (微	% Height
1	12.058	125130	1.20	8004	1.84
2	13.769	10323491	98.80	426883	98.16

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/9/3 15:53:13 FRC

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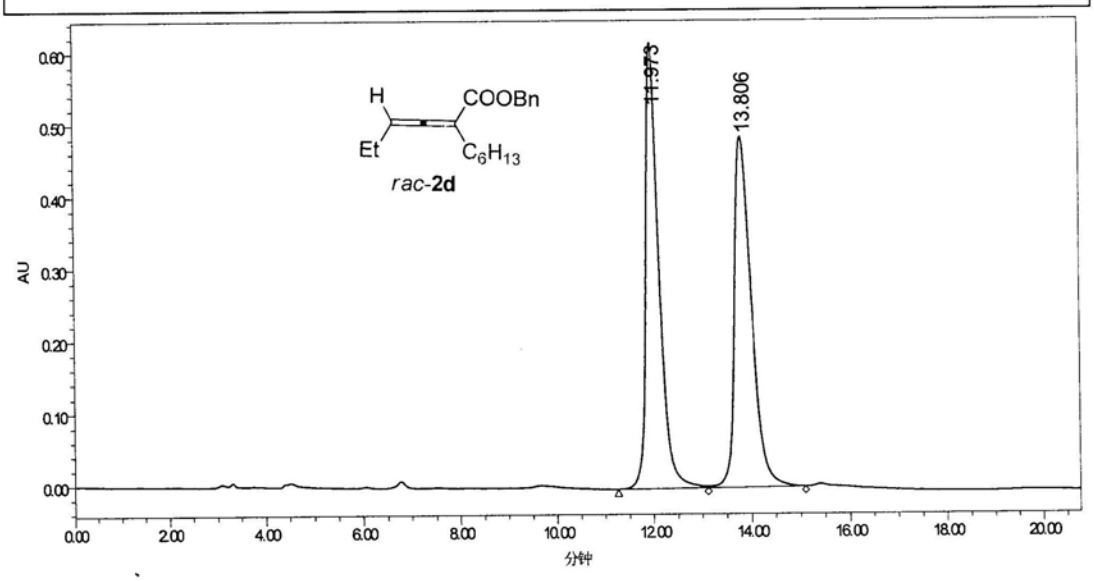
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-5-whelk-s,s-200-1-0.5-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/9/3 14:27:39 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	16	Date Processed:	2013/9/3 15:52:21 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	35.00 Minutes	Sample Set Name:	

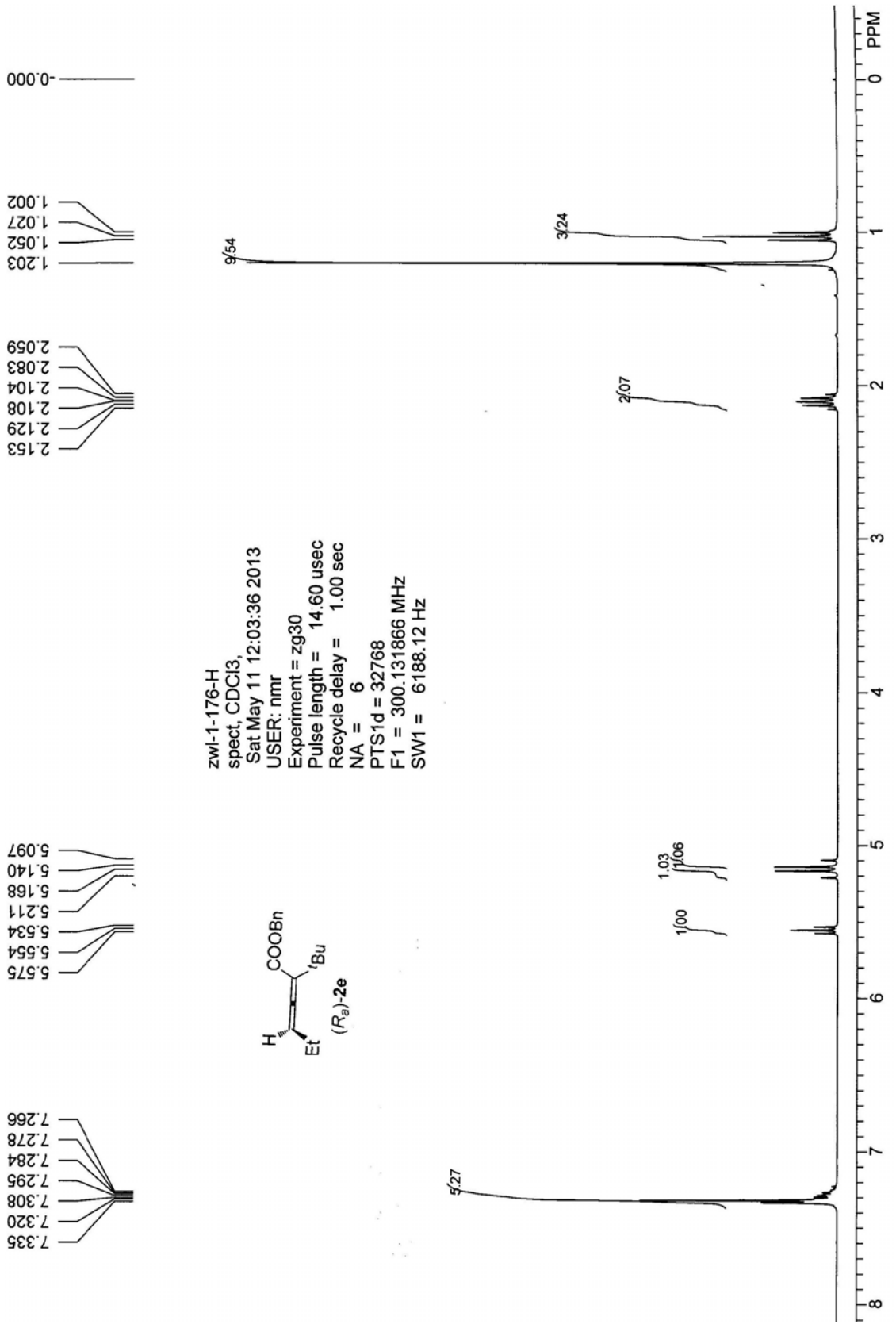


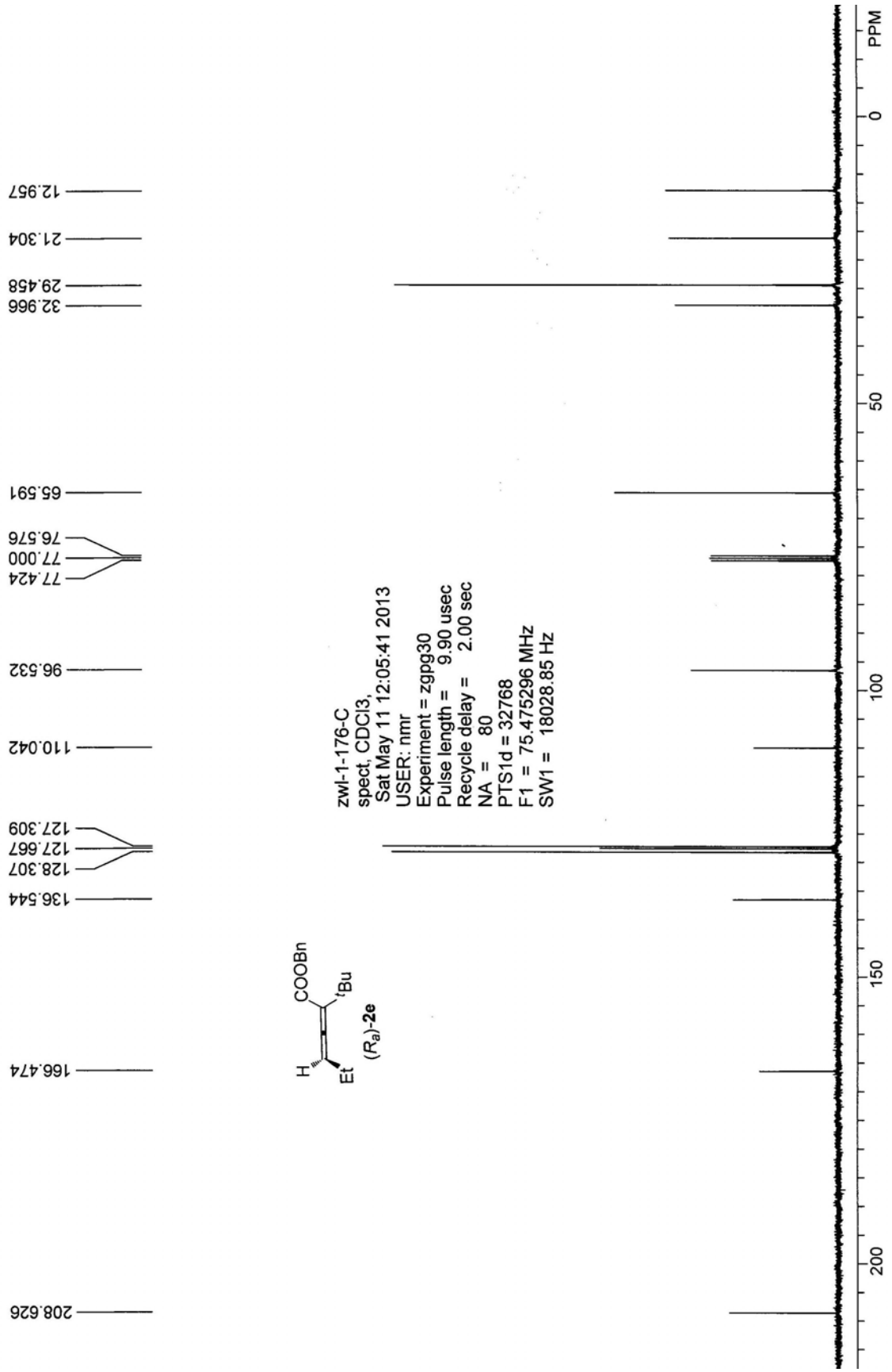
	RT (min)	Area (微sec)	%Area	Height (微)	% Height
1	11.973	1195267	50.31	620860	56.04
2	13.806	1180308	49.69	486963	43.96

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/9/3 15:52:33 PRC

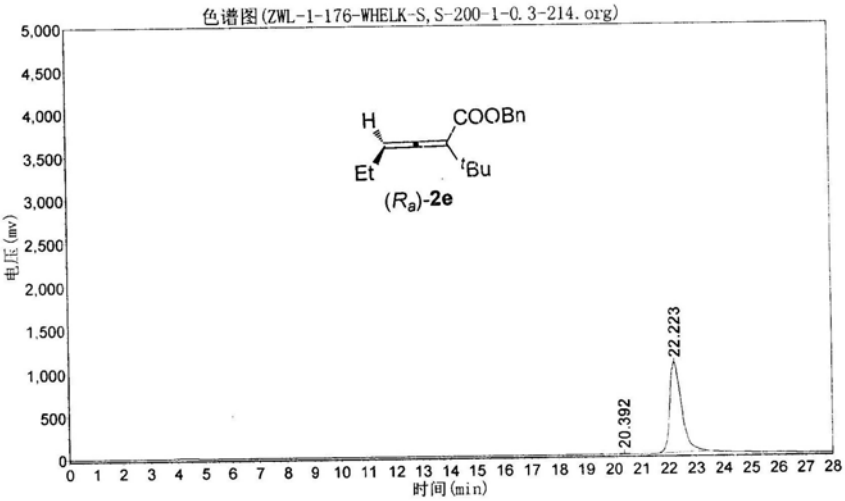

zwl-1-176-H
spect, CDCl3,
Sat May 11 12:03:36 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
tBu
H
Et
(Ra)-2e
9.54
5.27
3.24
2.07
1.03
1.06
1.00
PPM


zwl-1-176-C
spect, CDCl3,
Sat May 11 12:05:41 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 80
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
12.957
21.304
29.458
32.966
65.591
76.576
77.000
77.424
96.532
110.042
127.309
127.667
128.307
136.544
166.474
208.626
COOBn
tBu
Et
H
(Ra)-2e
PPM
0
50
100
150
200

zwl-1-176-whelk-s, s-200-1-0.3-214

实验时间：2013-05-15,9:40:01　　报告时间：2013-05-15,16:31:07
谱图文件:D:\zhuguangjiong\zwl\20130515\ZWL-1-176-WHELK-S,S-200-1-0.3-214.org

实验内容简介：
whelk-s,s 200+1
0.3ml/min 214nm



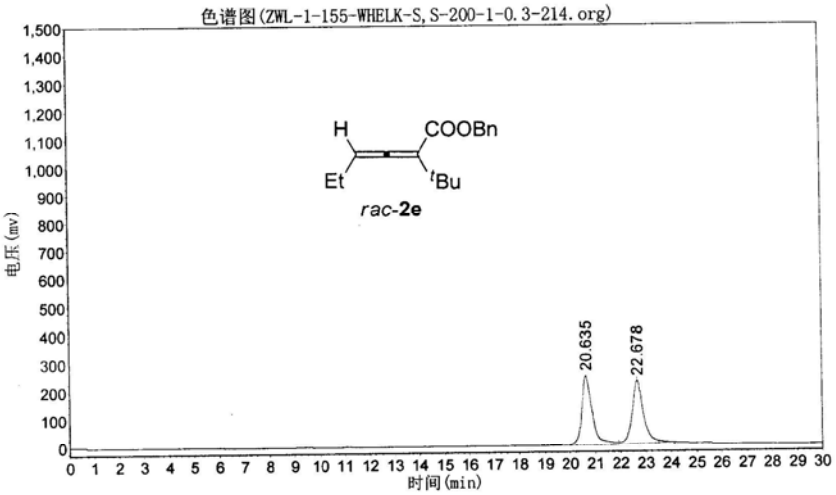
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		20.392	8943.304	230134.391	0.7233
2		22.223	1052257.500	31587076.000	99.2767
总计			1061200.804	31817210.391	100.0000

zwl-1-155-whelk-s, s-200-1-0.3-214

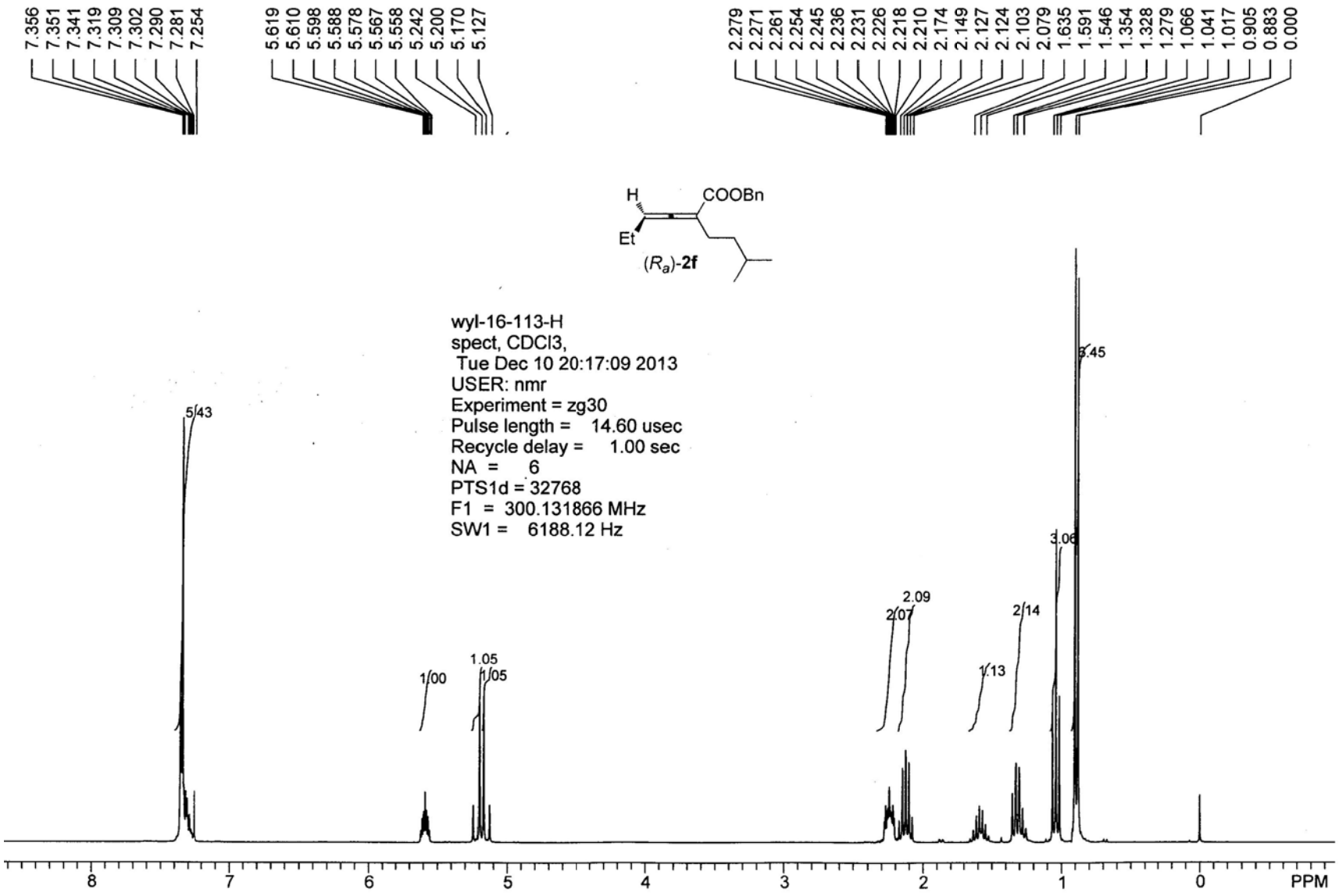
实验时间：2013-05-15,9:02:14　　报告时间：2013-05-15,16:29:23
谱图文件:D:\zhuguangjiong\zwl\20130515\ZWL-1-155-WHELK-S,S-200-1-0.3-214.org

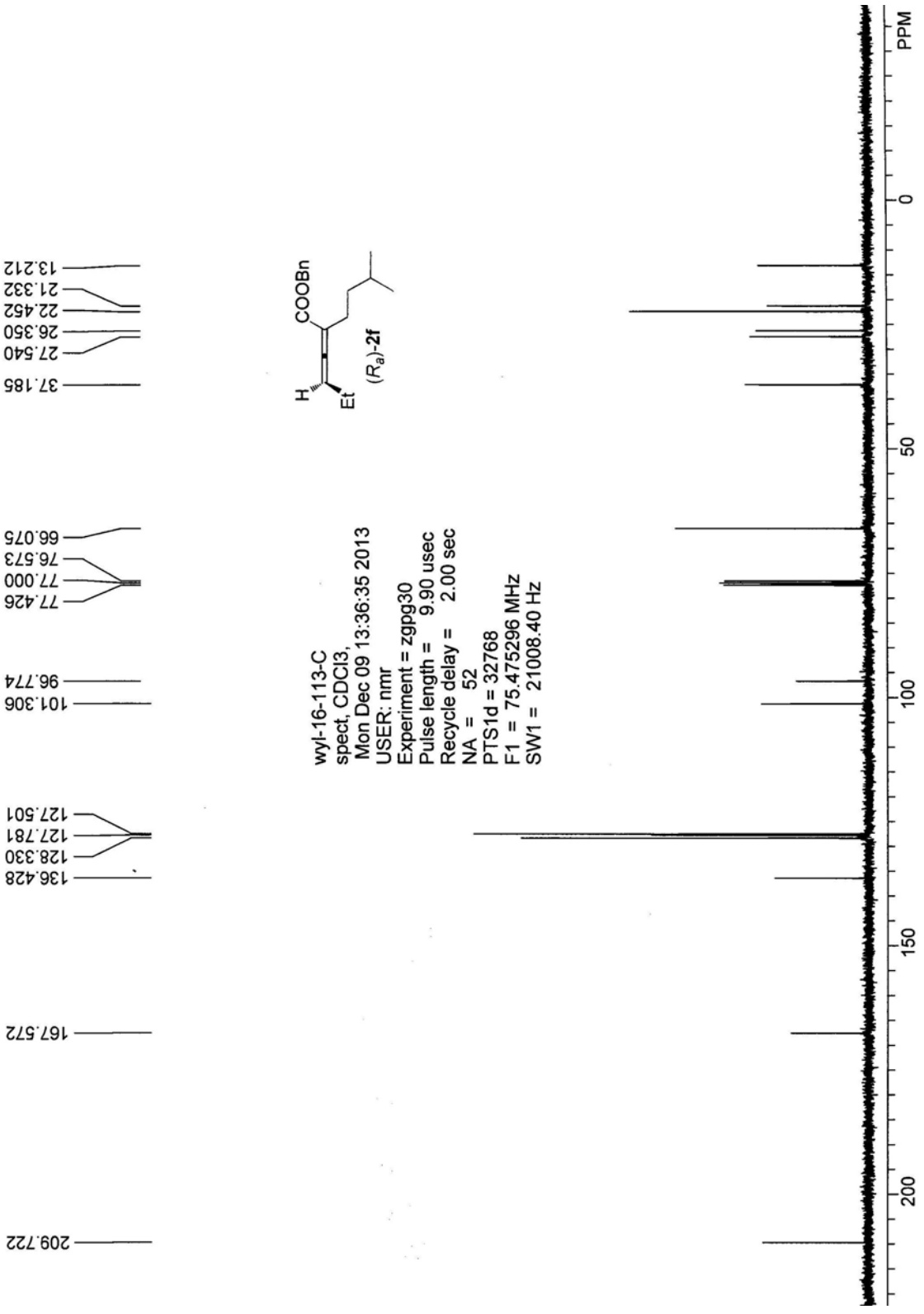
实验内容简介：
whelk-s,s　200+1
0.3ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		20.635	247871.281	7089518.000	50.0137
2		22.678	227785.813	7085625.000	49.9863
总计			475657.094	14175143.000	100.0000

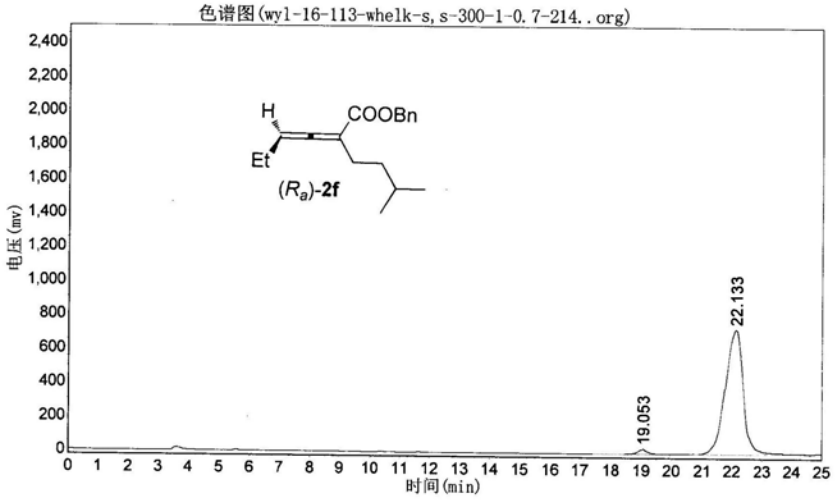

7.356
7.351
7.341
7.319
7.309
7.302
7.290
7.281
7.254
5.619
5.610
5.598
5.588
5.578
5.567
5.558
5.242
5.200
5.170
5.127
2.279
2.271
2.261
2.254
2.245
2.236
2.231
2.226
2.218
2.210
2.174
2.149
2.127
2.124
2.103
2.079
1.635
1.591
1.546
1.354
1.328
1.279
1.066
1.041
1.017
0.905
0.883
0.000
H
COOBn
Et
(Ra)-2f
wyl-16-113-H
spect, CDCl3,
Tue Dec 10 20:17:09 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.43
1.00
1.05
1.05
2.09
2.07
1.13
2.14
3.06
3.45
8
7
6
5
4
3
2
1
0
PPM


209.722
167.572
136.428
128.330
127.781
127.501
101.306
96.774
77.426
77.000
76.573
66.075
37.185
27.540
26.350
22.452
21.332
13.212
COOBn
H
Et
(Ra)-2f
wyl-16-113-C
spect, CDCl3,
Mon Dec 09 13:36:35 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 52
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 21008.40 Hz
PPM
200
150
100
50
0

wyl-16-113-whelk-s, s-300-1-0.7-214

实验时间：2013-06-13,15:48:06　　报告时间：2013-06-13,16:47:35
谱图文件:D:\zhuguangjiong\wyl\20130613\wyl-16-113-whelk-s, s-300-1-0.7-214..org

实验内容简介：
whelk-s, s 300+1
0.7ml/min 214nm



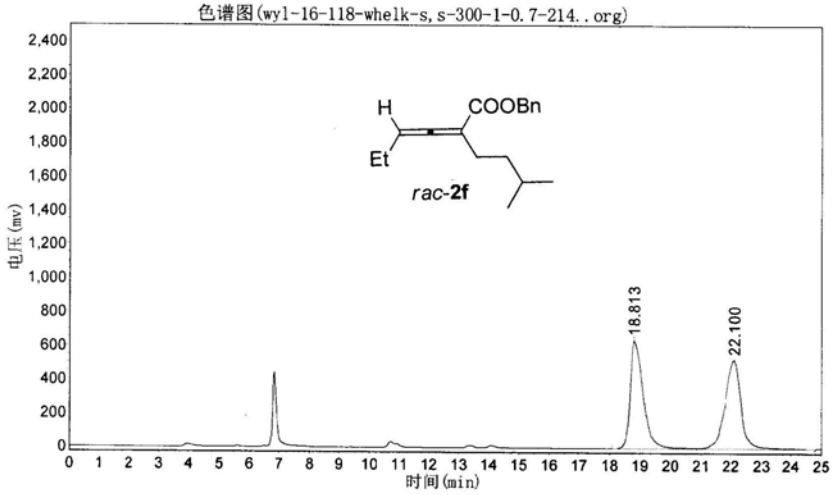
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		19.053	24829.750	618617.000	1.9914
2		22.133	729771.188	30445266.000	98.0086
总计			754600.938	31063883.000	100.0000

wyl-16-118-whelk-s, s-300-1-0.7-214

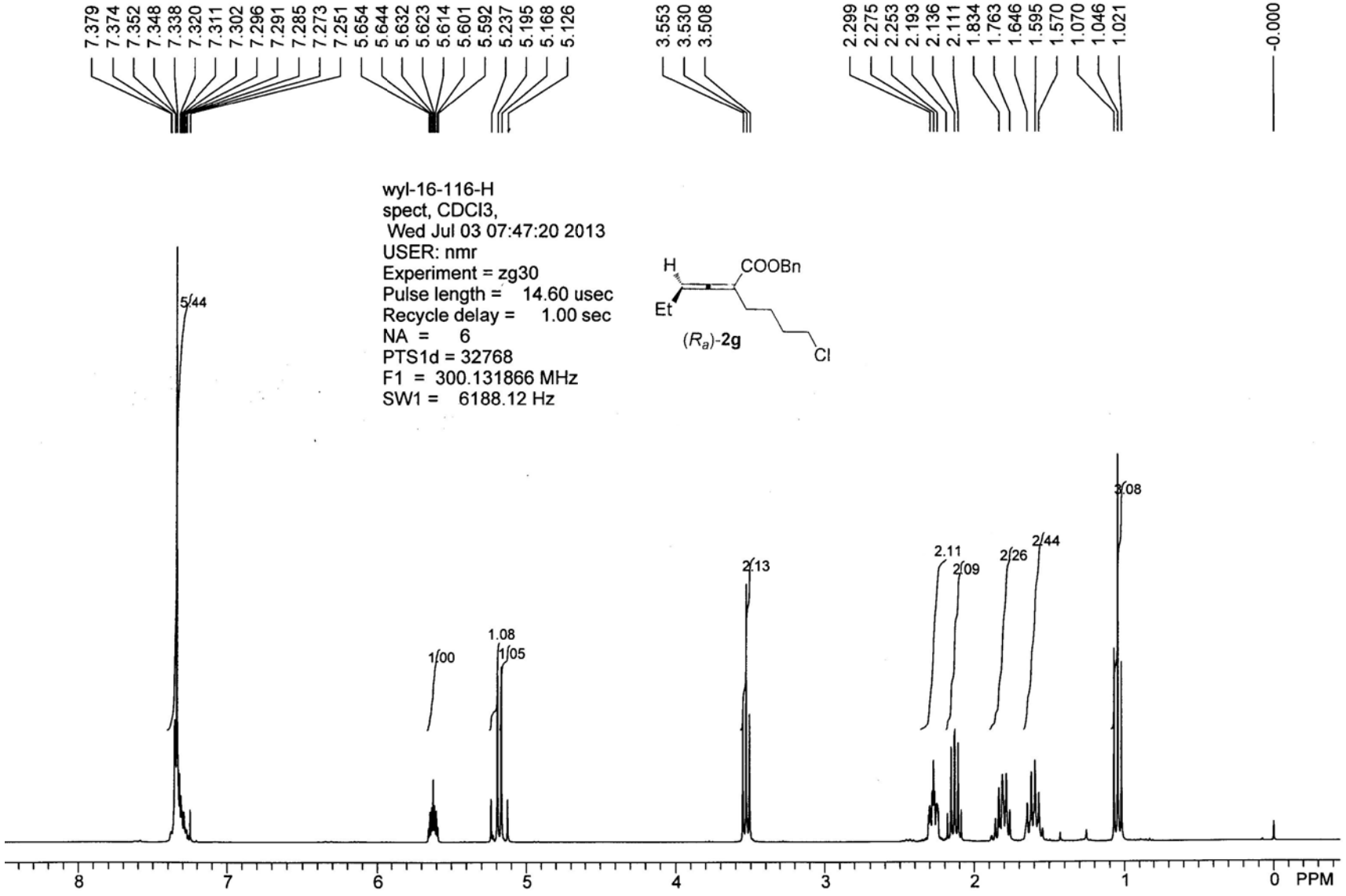
实验时间：2013-06-13,15:20:35　　报告时间：2013-06-13,16:45:34
谱图文件:D:\zhuguangjiong\wyl\20130613\wyl-16-118-whelk-s, s-300-1-0.7-214..org

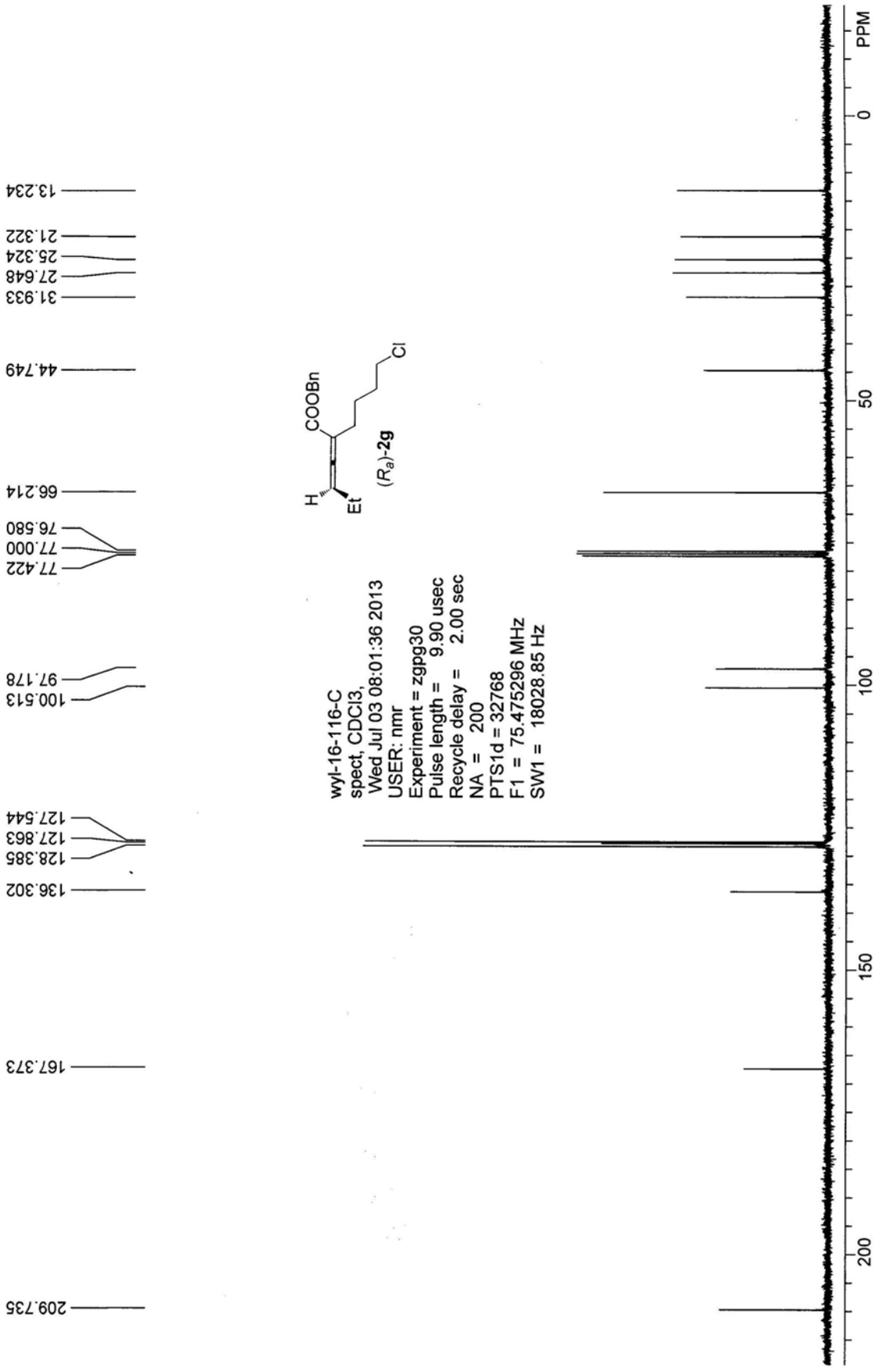
实验内容简介：
whelk-s, s 300+1
0.7ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		18.813	641433.000	19134010.000	49.5780
2		22.100	524517.750	19459710.000	50.4220
总计			1165950.750	38593720.000	100.0000


7.379
7.374
7.352
7.348
7.338
7.320
7.311
7.302
7.296
7.291
7.285
7.273
7.251
5.654
5.644
5.632
5.623
5.614
5.601
5.592
5.237
5.195
5.168
5.126
3.553
3.530
3.508
2.299
2.275
2.253
2.193
2.136
2.111
1.834
1.763
1.646
1.595
1.570
1.070
1.046
1.021
-0.000
wyl-16-116-H
spect, CDCl3,
Wed Jul 03 07:47:20 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
H
COOBn
Et
(Ra)-2g
Cl
5.44
1.00
1.08
1.05
2.13
2.11
2.09
2.26
2.44
3.08
8
7
6
5
4
3
2
1
0
PPM


wyl-16-116-C
spect, CDCl3,
Wed Jul 03 08:01:36 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 200
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
COOBn
Cl
H
Et
(Ra)-2g
209.735
167.373
136.302
128.385
127.863
127.544
100.513
97.178
77.422
77.000
76.580
66.214
44.749
31.933
27.648
25.324
21.322
13.234
PPM
200
150
100
50
0

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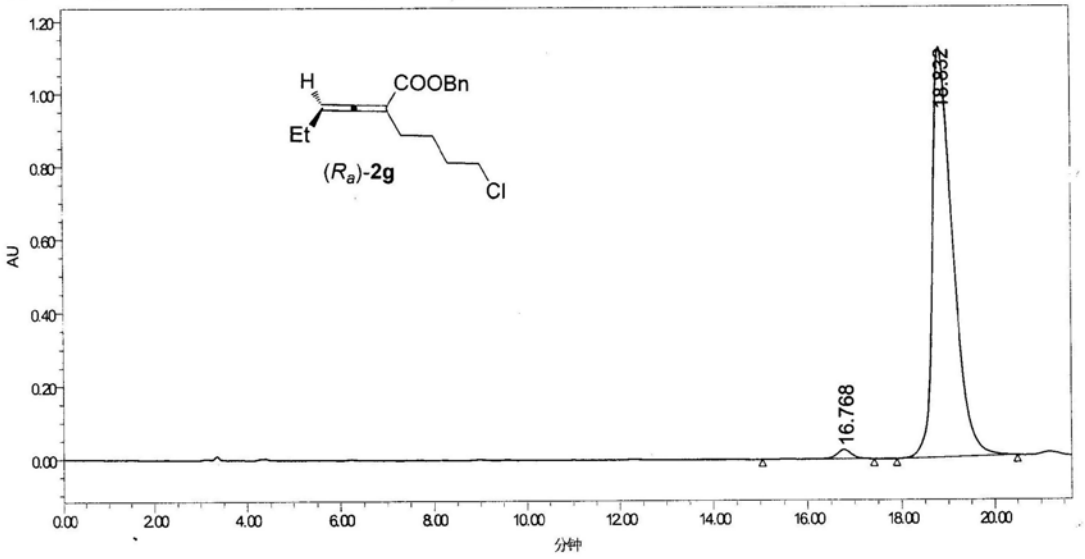
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	wyl-16-116-whelk-s,s-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/6/14 13:57:40 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	19	Date Processed:	2013/6/14 17:18:39 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	200.00 Minutes	Channel Desc.:	W2489 ChA 214nm
Column Type:		Sample Set Name:	



	RT (min)	Area (磷sec)	%Area	Height (磷	% Height
1	16.768	599057	1.74	25980	2.26
2	18.832	33922444	98.26	1123185	97.74

Report Method: Individual Report HP

Page: 1 (共计 1)

Printed: 2013/6/14 17:19:49 PRC

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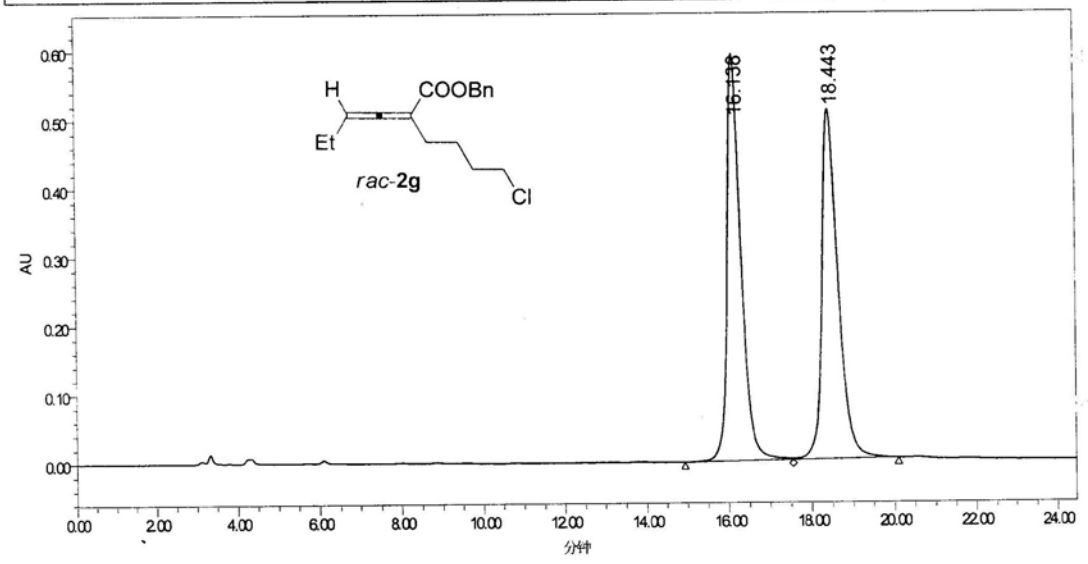
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-2-11-whelk-s,s-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/6/14 10:26:52 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	15	Date Processed:	2013/6/14 17:18:20 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	200.00 Minutes	Channel Desc.:	W2489 ChA 214nm
Column Type:		Sample Set Name:	

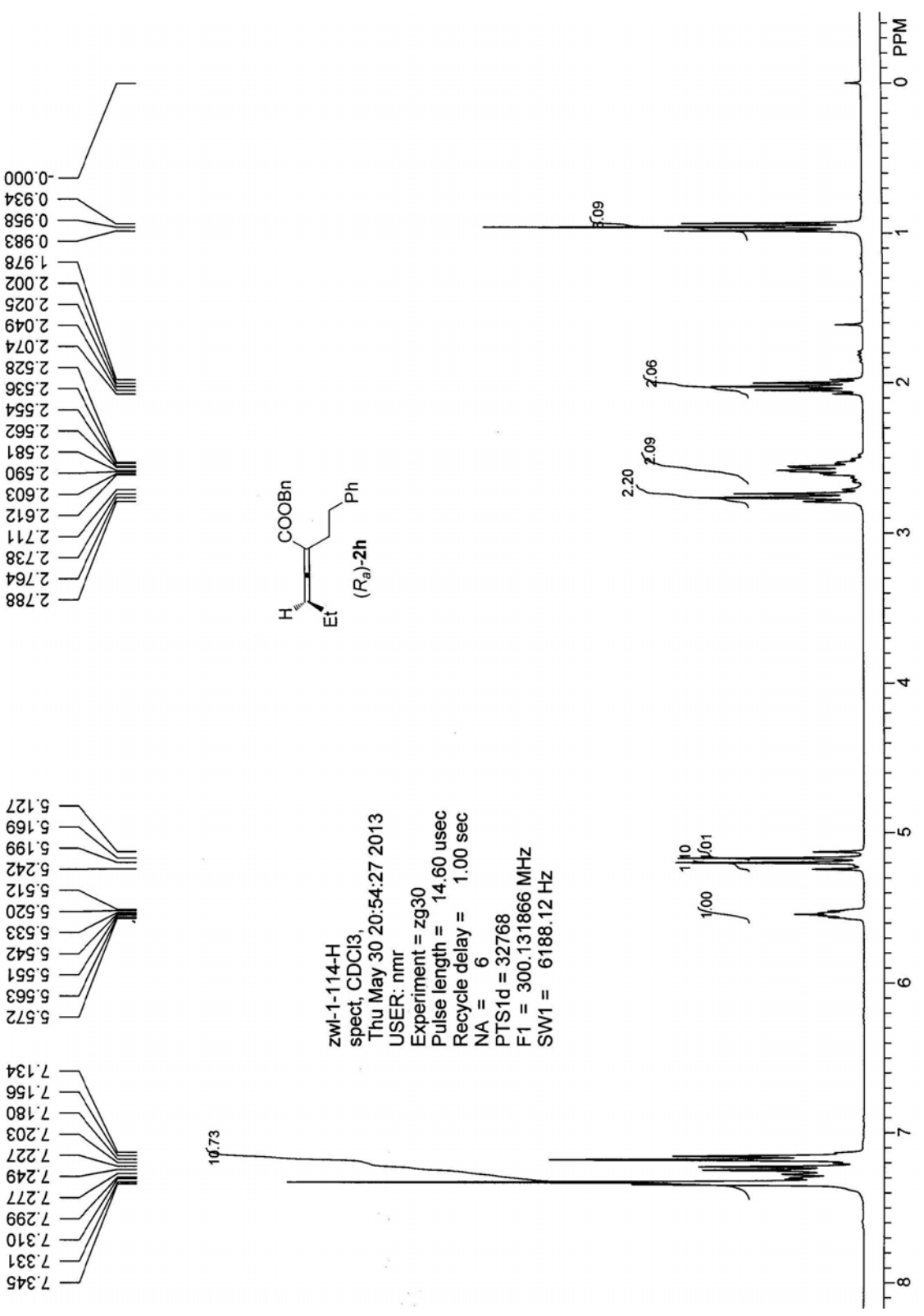


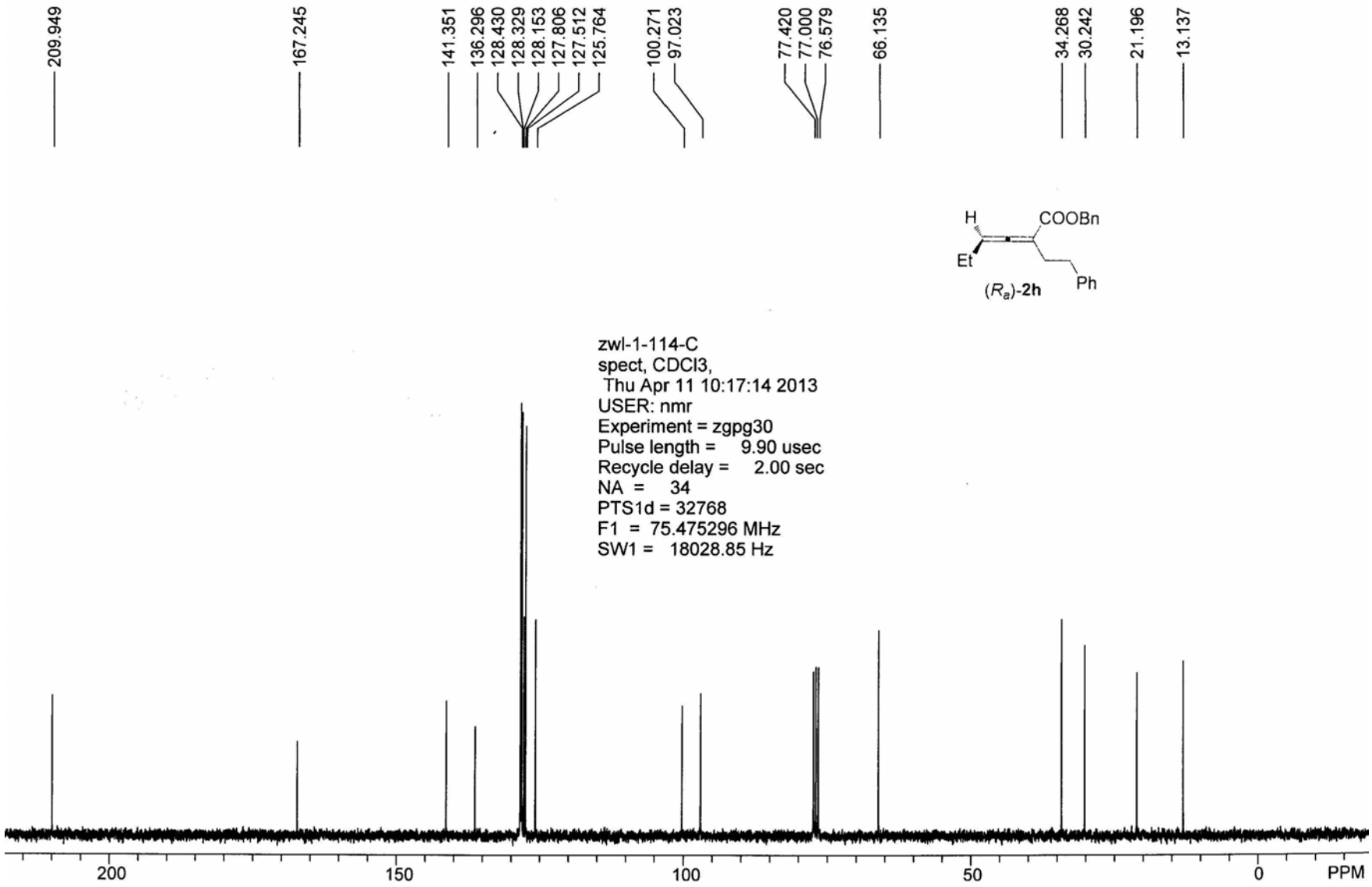
	RT (min)	Area (碘sec)	%Area	Height (碘)	% Height
1	16.136	13694479	50.01	599010	53.79
2	18.443	13688914	49.99	509347	46.21

Report Method: Individual Report HP

Page: 1 (共计 1)

Printed: 2013/6/14 17:19:32 PRC

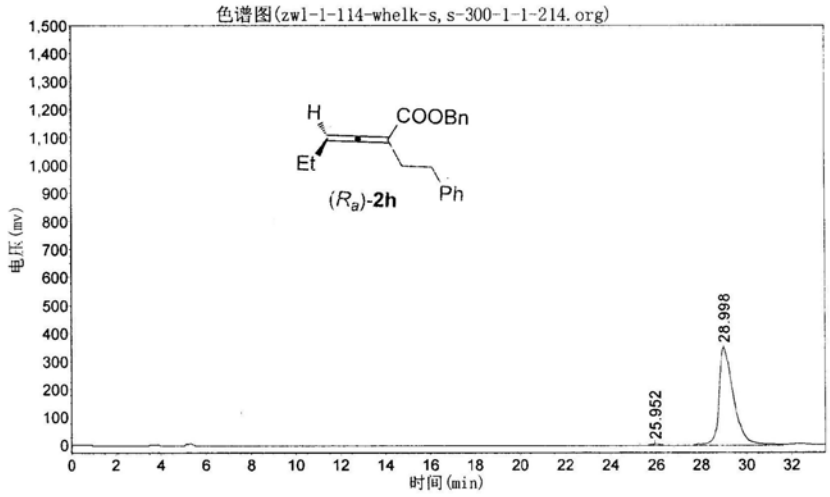

zwl-1-114-H
spect, CDCl3,
Thu May 30 20:54:27 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
Ph
H
Et
(Ra)-2h
10.73
6.09
2.20
2.09
2.06
1.10
1.01
1.00
7.345
7.331
7.310
7.299
7.277
7.249
7.227
7.203
7.180
7.156
7.134
5.572
5.563
5.551
5.542
5.533
5.520
5.512
5.242
5.199
5.169
5.127
2.788
2.764
2.738
2.711
2.612
2.603
2.590
2.581
2.562
2.554
2.536
2.528
2.074
2.049
2.025
2.002
1.978
0.983
0.958
0.934
-0.000
PPM


209.949
167.245
141.351
136.296
128.430
128.329
128.153
127.806
127.512
125.764
100.271
97.023
77.420
77.000
76.579
66.135
34.268
30.242
21.196
13.137
H
COOBn
Et
Ph
(Ra)-2h
zwl-1-114-C
spect, CDCl3,
Thu Apr 11 10:17:14 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 34
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
200
150
100
50
0
PPM

zwl-1-114-whelk-s, s-300-1-1-214

实验时间：2013-05-10, 12:12:00　　报告时间：2013-05-10, 12:47:58
谱图文件:D:\zhuguangjiong\zwl\20130510\zwl-1-114-whelk-s, s-300-1-1-214.org

实验内容简介:
whelk-s, s 300+1
1ml/min 214nm



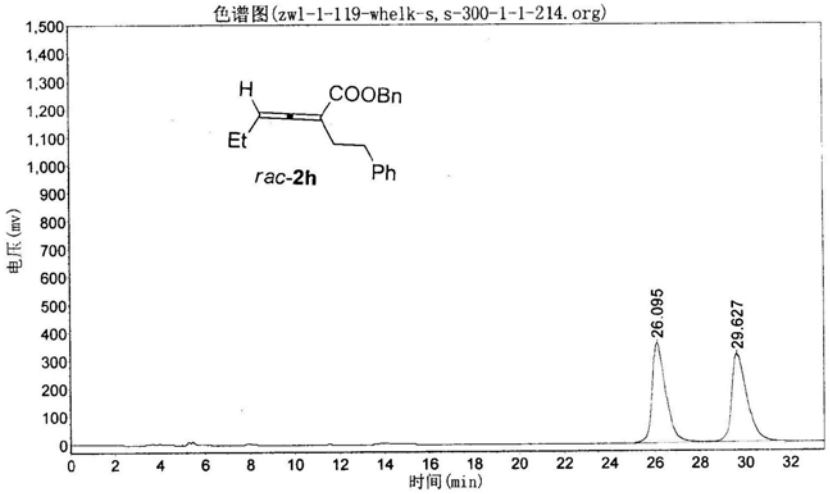
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		25.952	4517.988	149698.406	0.9257
2		28.998	351228.844	16021067.000	99.0743
总计			355746.832	16170765.406	100.0000

zwl-1-119-whelk-s, s-300-1-1-214

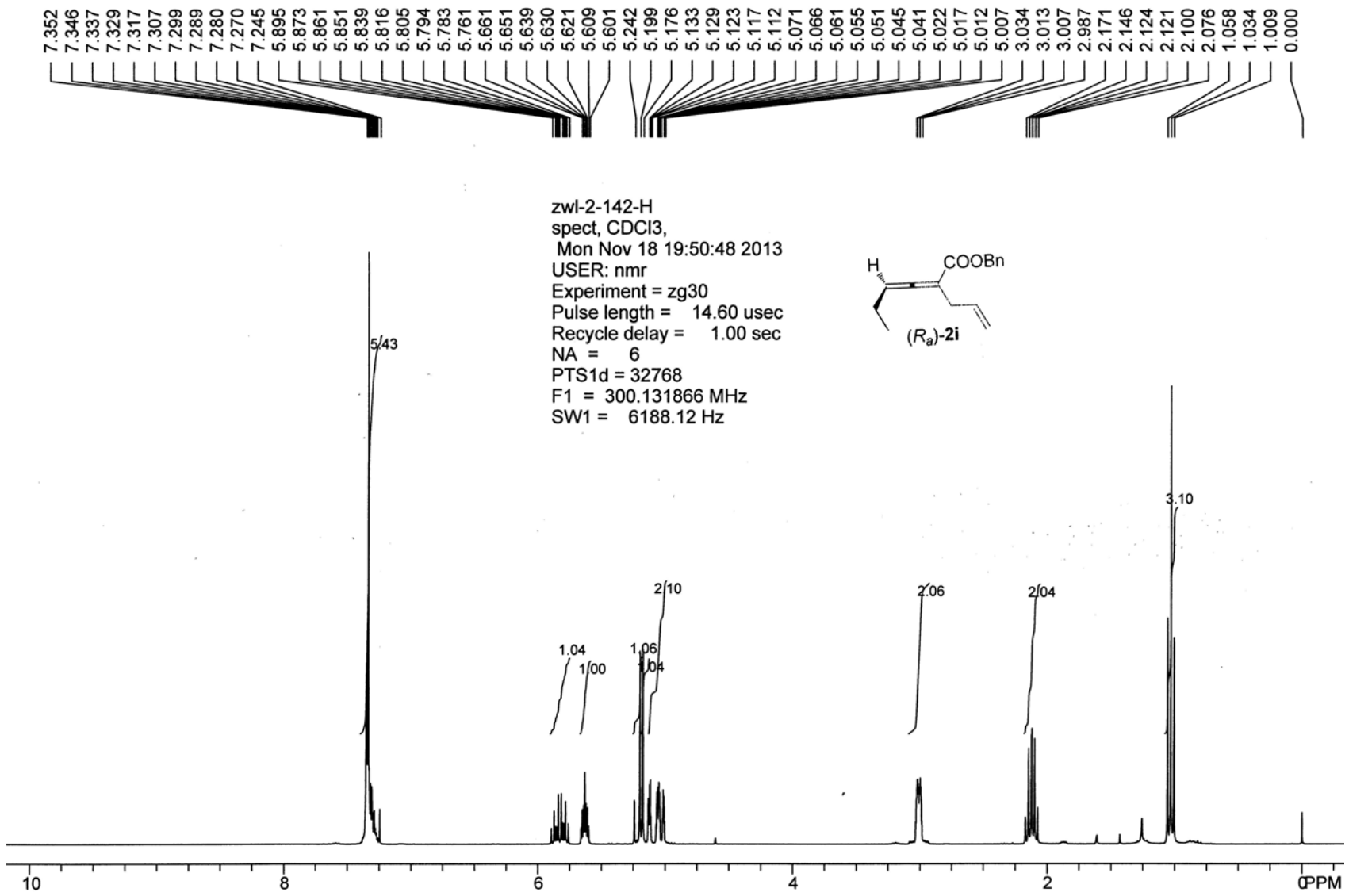
实验时间：2013-05-10,11:32:44　　报告时间：2013-05-10,12:46:52
谱图文件:D:\zhuguangjiong\zwl\20130510\zwl-1-119-whelk-s, s-300-1-1-214.org

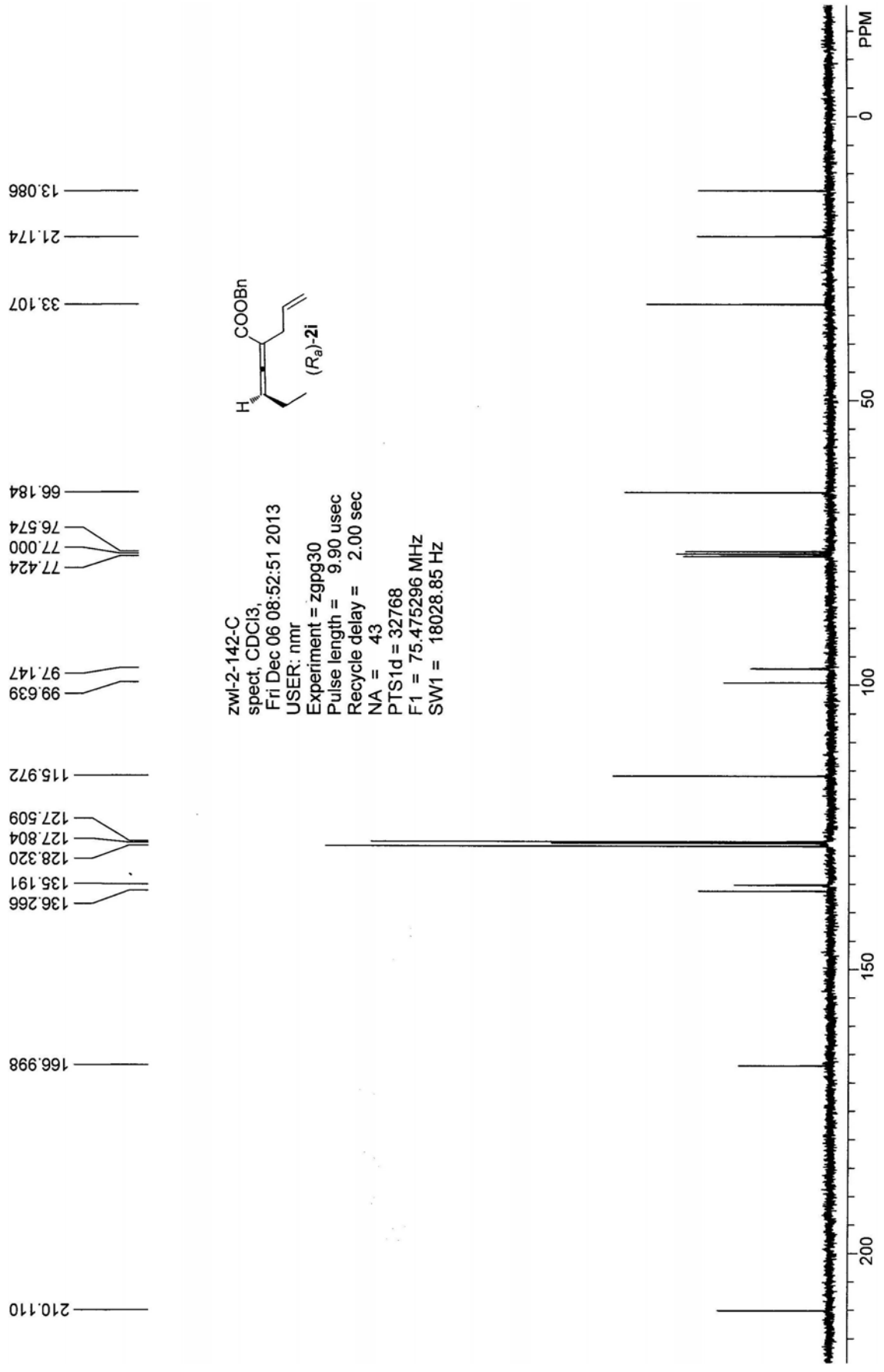
实验内容简介：
whelk-s, s　300+1
1ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		26.095	357798.969	15080448.000	50.2131
2		29.627	315047.281	14952478.000	49.7869
总计			672846.250	30032926.000	100.0000

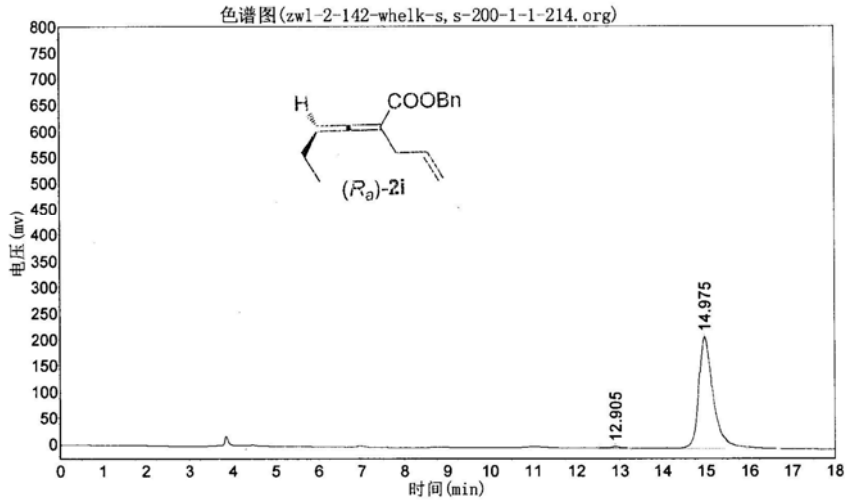

7.352
7.346
7.337
7.329
7.317
7.307
7.299
7.289
7.280
7.270
7.245
5.895
5.873
5.861
5.851
5.839
5.816
5.805
5.794
5.783
5.761
5.661
5.651
5.639
5.630
5.621
5.609
5.601
5.242
5.199
5.176
5.133
5.129
5.123
5.117
5.112
5.071
5.066
5.061
5.055
5.051
5.045
5.041
5.022
5.017
5.012
5.007
3.034
3.013
3.007
2.987
2.171
2.146
2.124
2.121
2.100
2.076
1.058
1.034
1.009
0.000
zwl-2-142-H
spect, CDCl3,
Mon Nov 18 19:50:48 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
H
COOBn
(Ra)-2i
5.43
1.04
1.00
1.06
1.04
2.10
2.06
2.04
3.10
10
8
6
4
2
0
PPM


210.110
166.998
136.266
135.191
128.320
127.804
127.509
115.972
99.639
97.147
77.424
77.000
76.574
66.184
33.107
21.174
13.086
COOBn
H
(Ra)-2i
zwl-2-142-C
spect, CDCl3,
Fri Dec 06 08:52:51 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 43
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
PPM
200
150
100
50
0

zwl-2-142-whelk-s, s-200-1-1-214

实验时间：2013-11-14,14:43:41　　报告时间：2013-11-14,15:47:01
谱图文件:D:\zhuguangjiong\zwl\20131114\zwl-2-142-whelk-s, s-200-1-1-214.org

实验内容简介：



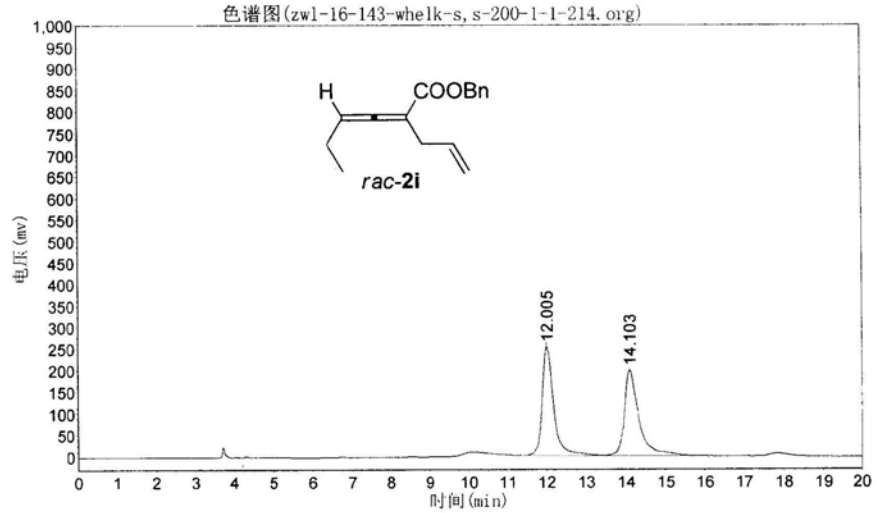
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		12.905	3443.599	58046.414	1.1443
2		14.975	213389.750	5014817.500	98.8557
总计			216833.349	5072863.914	100.0000

zwl-16-143-whelk-s, s-200-1-1-214

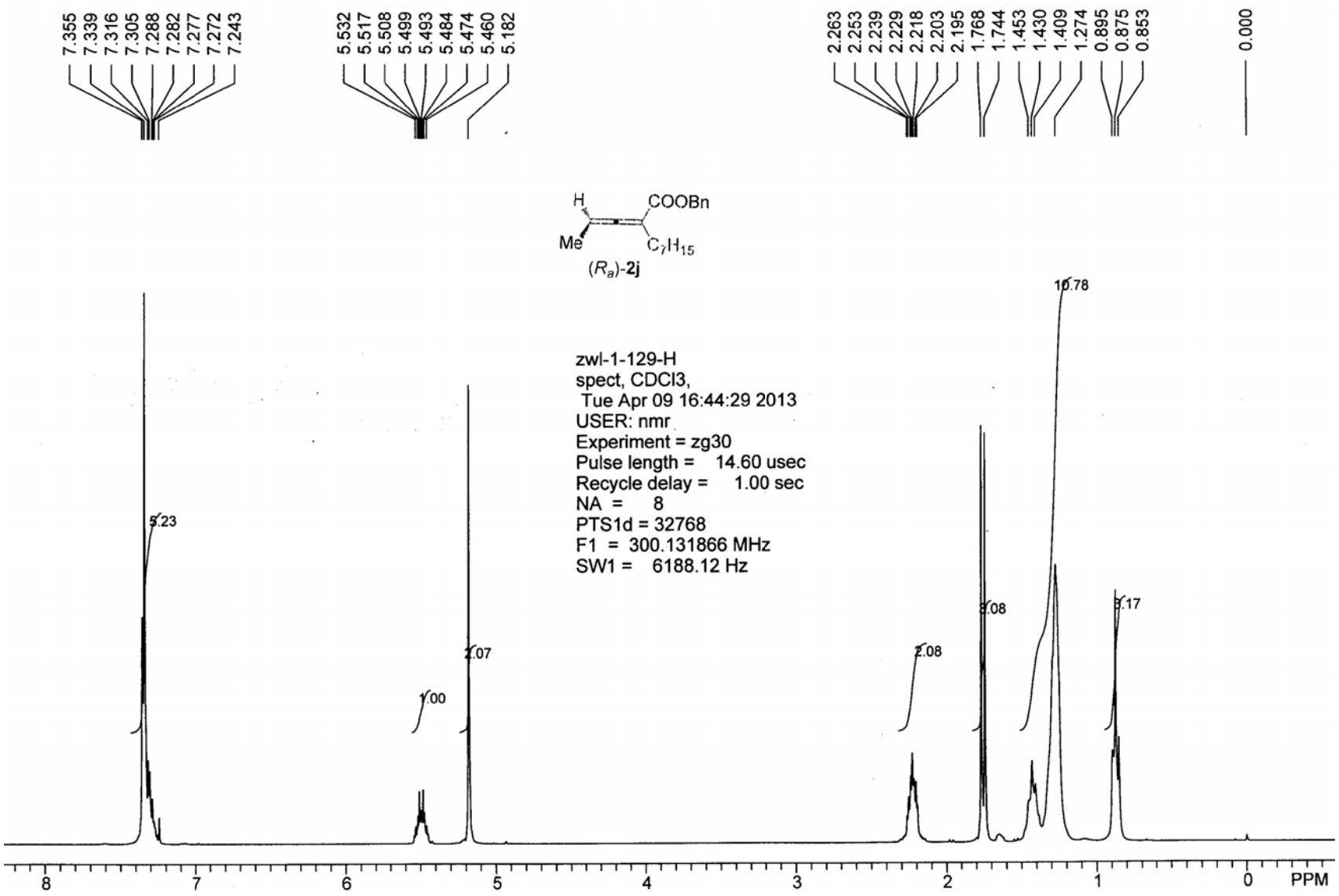
实验时间：2013-11-14, 13:59:37　　报告时间：2013-11-14, 15:45:39
谱图文件:D:\zhuguangjiong\zwl\20131114\zwl-16-143-whelk-s, s-200-1-1-214.org

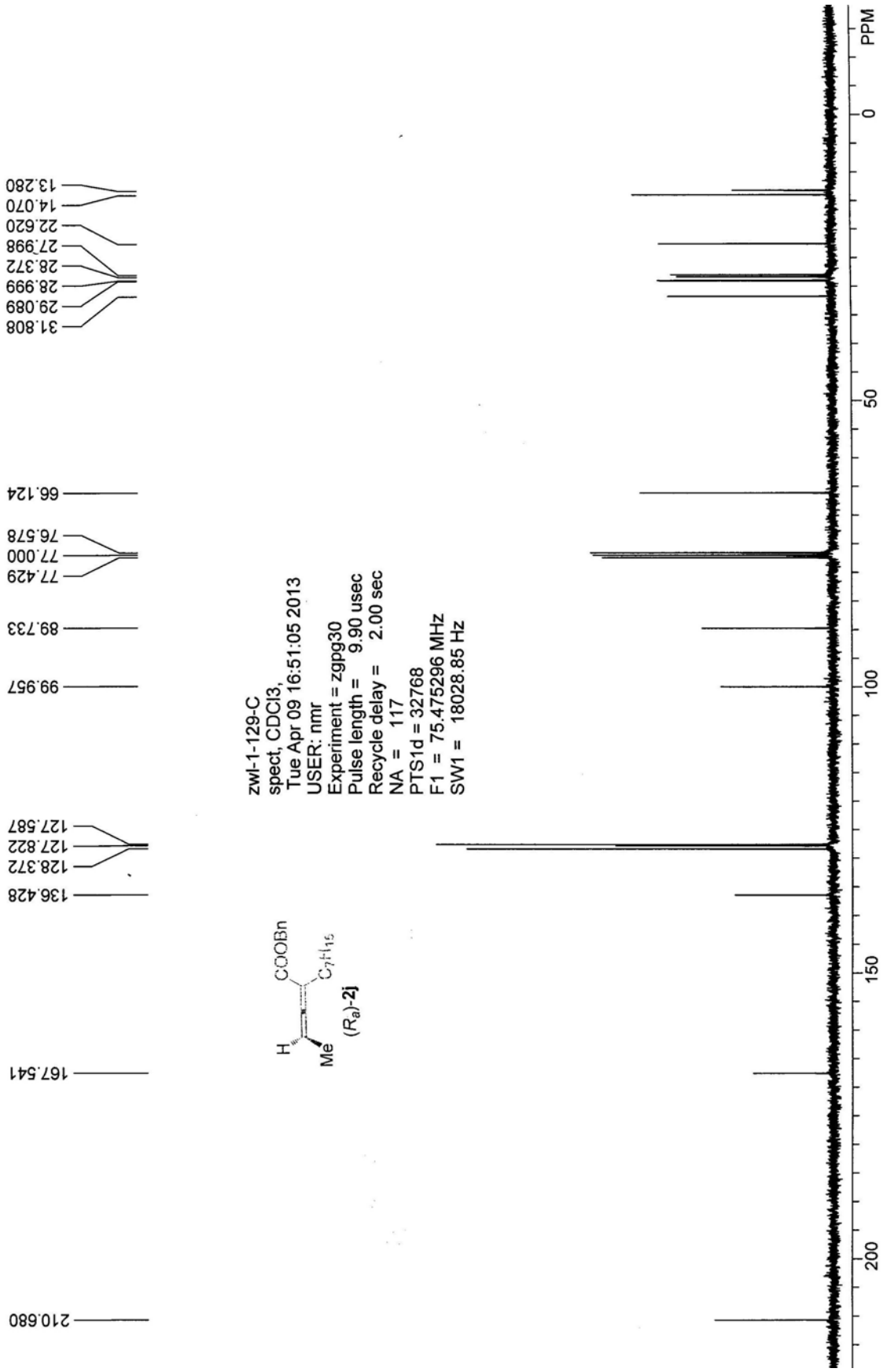
实验内容简介：



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		12.005	251432.641	5090092.000	49.7997
2		14.103	197256.656	5131036.500	50.2003
总计			448689.297	10221128.500	100.0000


7.355
7.339
7.316
7.305
7.288
7.282
7.277
7.272
7.243
5.532
5.517
5.508
5.499
5.493
5.484
5.474
5.460
5.182
2.263
2.253
2.239
2.229
2.218
2.203
2.195
1.768
1.744
1.453
1.430
1.409
1.274
0.895
0.875
0.853
0.000
H
COOBn
Me
C7H15
(Ra)-2j
zwl-1-129-H
spect, CDCl3,
Tue Apr 09 16:44:29 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.23
1.00
2.07
2.08
3.08
10.78
3.17
8
7
6
5
4
3
2
1
0
PPM


210.680
167.541
136.428
128.372
127.822
127.587
99.957
89.733
77.429
77.000
76.578
66.124
31.808
29.089
28.999
28.372
27.998
22.620
14.070
13.280
zwl-1-129-C
spect, CDCl3,
Tue Apr 09 16:51:05 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 117
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
COOBn
H
Me
C_7H_{15}
(R_a)-2j
PPM
200
150
100
50
0

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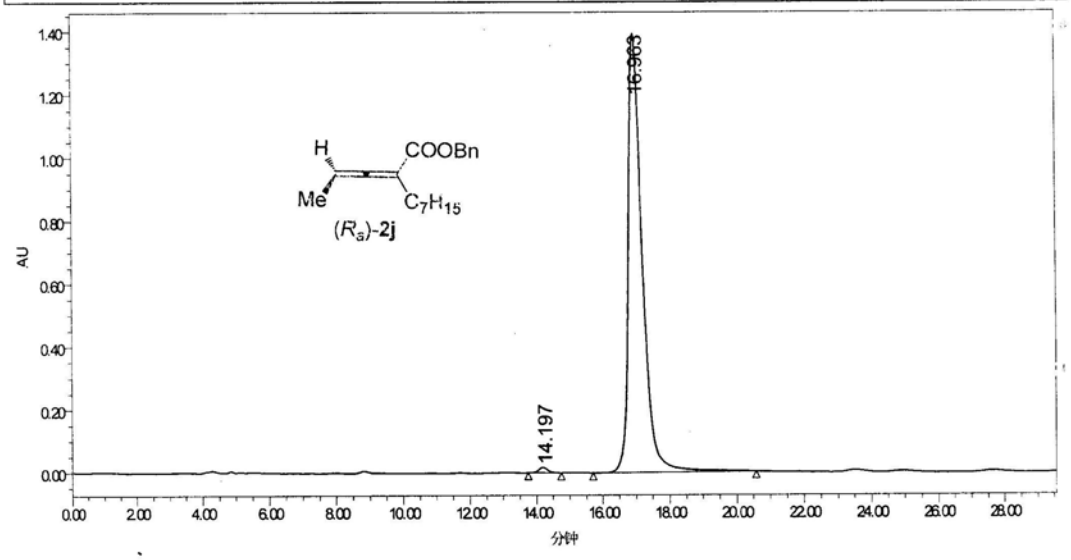
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-1-129-whelk-200-1-0.5-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/11/5 10:20:14 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	4	Date Processed:	2013/11/5 15:18:11 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (微sec)	%Area	Height (微	% Height
1	14.197	343930	0.83	17755	1.26
2	16.963	40940710	99.17	1393857	98.74

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/11/5 15:23:38 PRC

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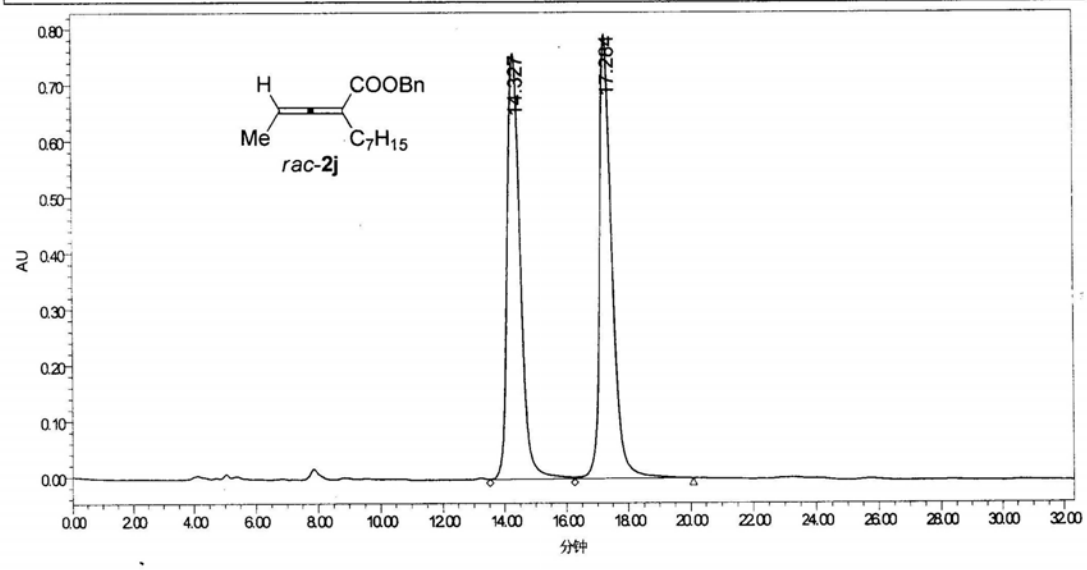
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-1-130-whelk-200-1-0.5-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/11/5 11:36:35 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	6	Date Processed:	2013/11/5 15:16:24 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	

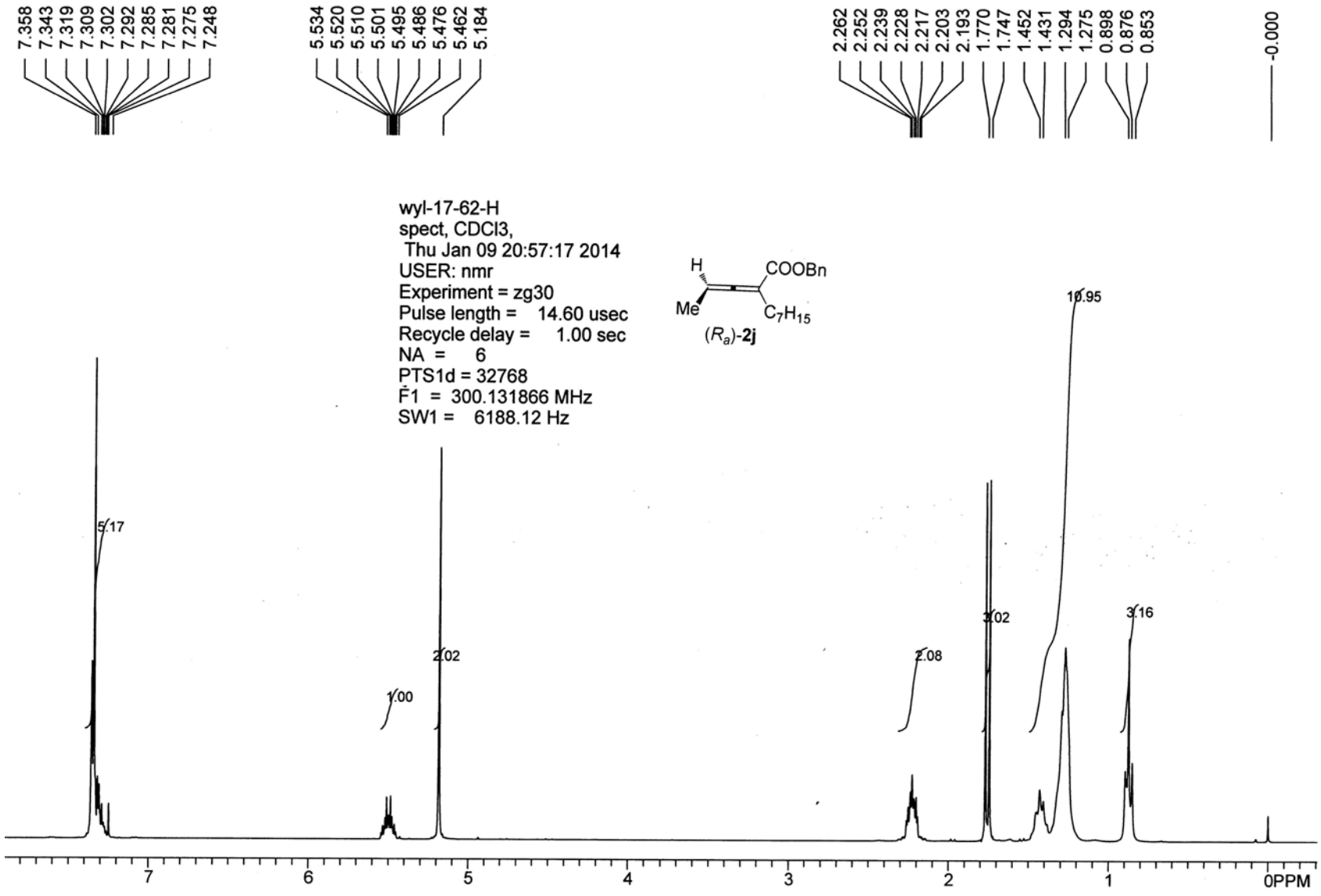


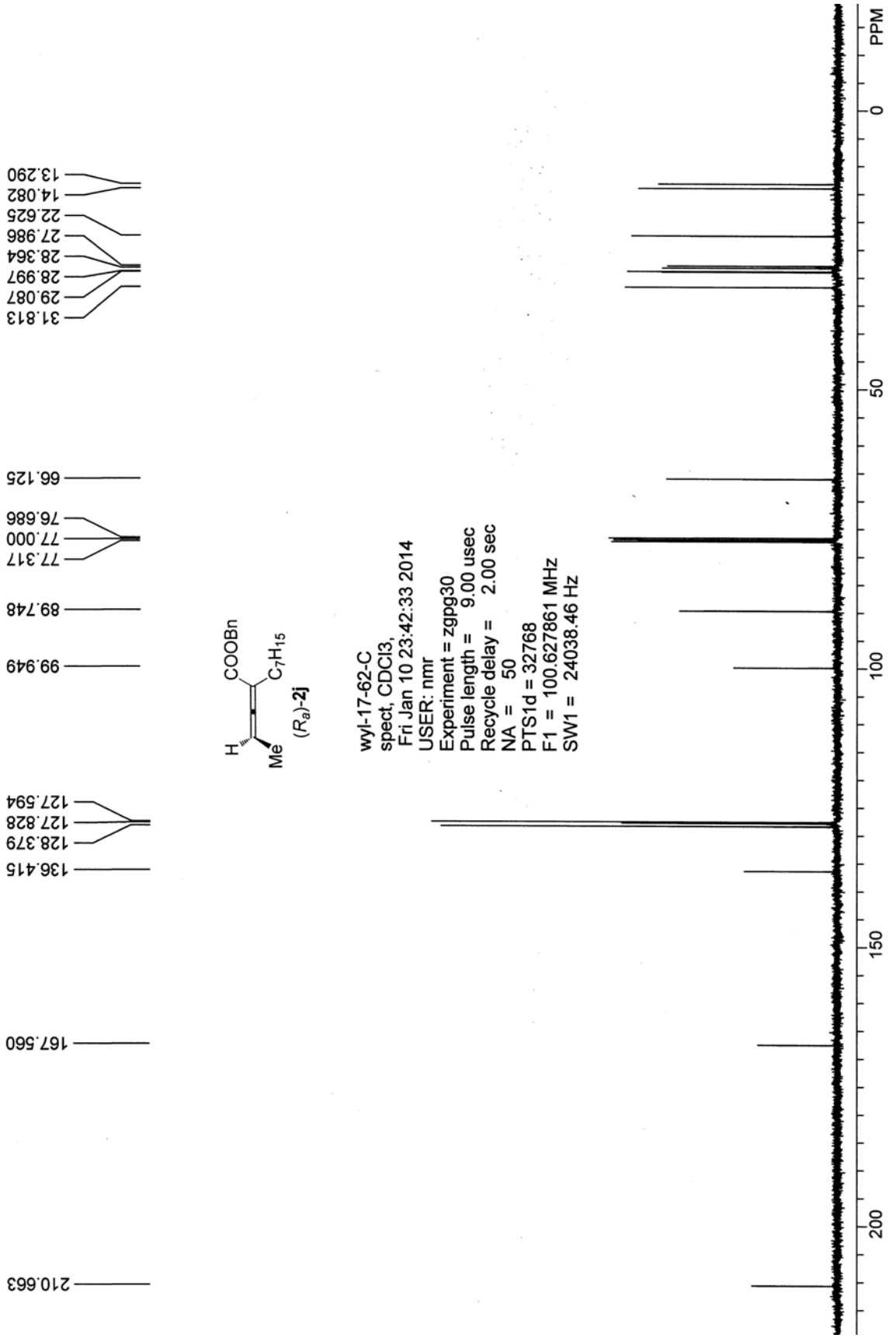
	RT (min)	Area (微伏*sec)	%Area	Height (微伏)	% Height
1	14.327	22230999	49.79	760131	48.93
2	17.284	22415126	50.21	793233	51.07

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/11/5 15:23:26 PRC


7.358
7.343
7.319
7.309
7.302
7.292
7.285
7.281
7.275
7.248
5.534
5.520
5.510
5.501
5.495
5.486
5.476
5.462
5.184
2.262
2.252
2.239
2.228
2.217
2.203
2.193
1.770
1.747
1.452
1.431
1.294
1.275
0.898
0.876
0.853
-0.000
wyl-17-62-H
spect, CDCl3,
Thu Jan 09 20:57:17 2014
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
H
COOBn
Me
C7H15
(Ra)-2j
5.17
1.00
2.02
2.08
3.02
10.95
3.16
7
6
5
4
3
2
1
0PPM

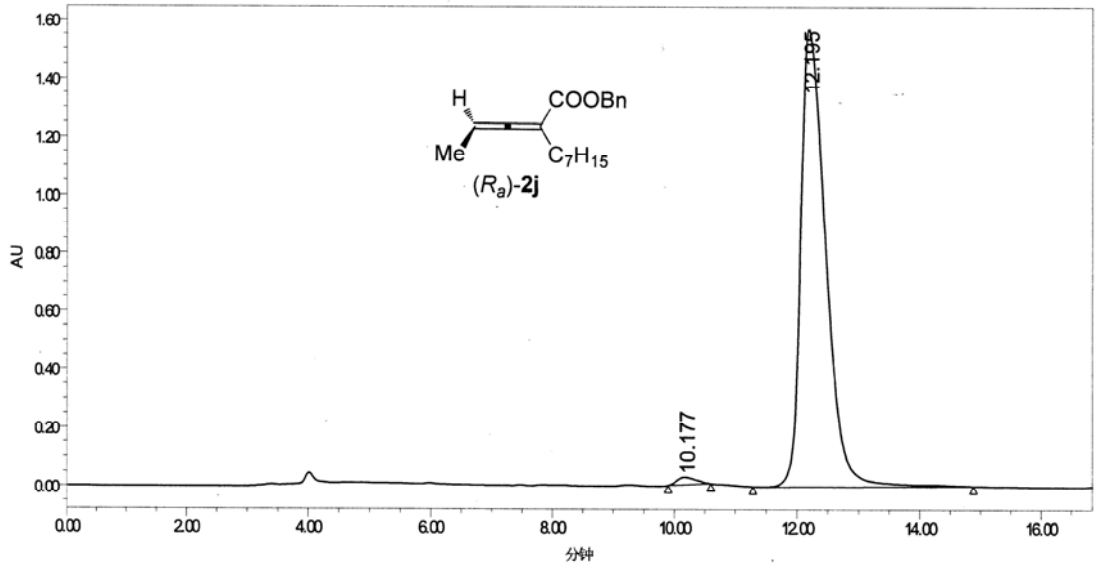

210.663
167.560
136.415
128.379
127.828
127.594
99.949
89.748
77.317
77.000
76.686
66.125
31.813
29.087
28.997
28.364
27.986
22.625
14.082
13.290
PPM
0
50
100
150
200
wyl-17-62-C
spect, CDCl3,
Fri Jan 10 23:42:33 2014
USER: nmr
Experiment = zgpg30
Pulse length = 9.00 usec
Recycle delay = 2.00 sec
NA = 50
PTS1d = 32768
F1 = 100.627861 MHz
SW1 = 24038.46 Hz
COOBn
C7H15
H
Me
(Ra)-2j

Project Name: defaults for copy
Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	wyl-17-62-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 12:41:58 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	16	Date Processed:	2013/12/31 13:55:17 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (碘sec)	%Area	Height (碘	% Height
1	10.177	579242	1.29	26623	1.67
2	12.195	44349320	98.71	1567396	98.33

Report Method: 无标题
Page: 1 (共计 1)

Printed: 2013/12/31 16:48:12 PRC

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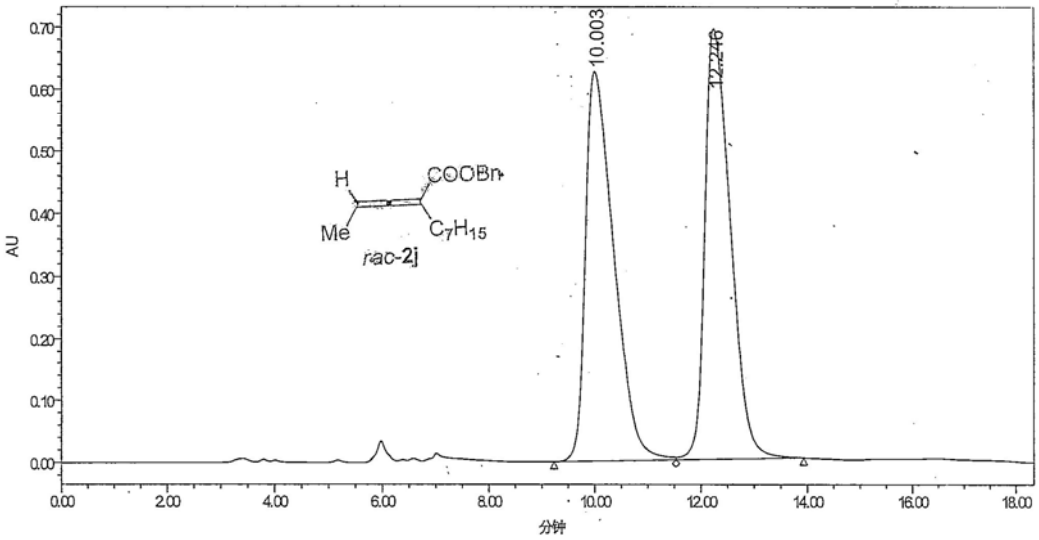
Project Name: defaults for copy

Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	zwl-1-130-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 11:59:56 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	14	Date Processed:	2013/12/31 16:46:25 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	

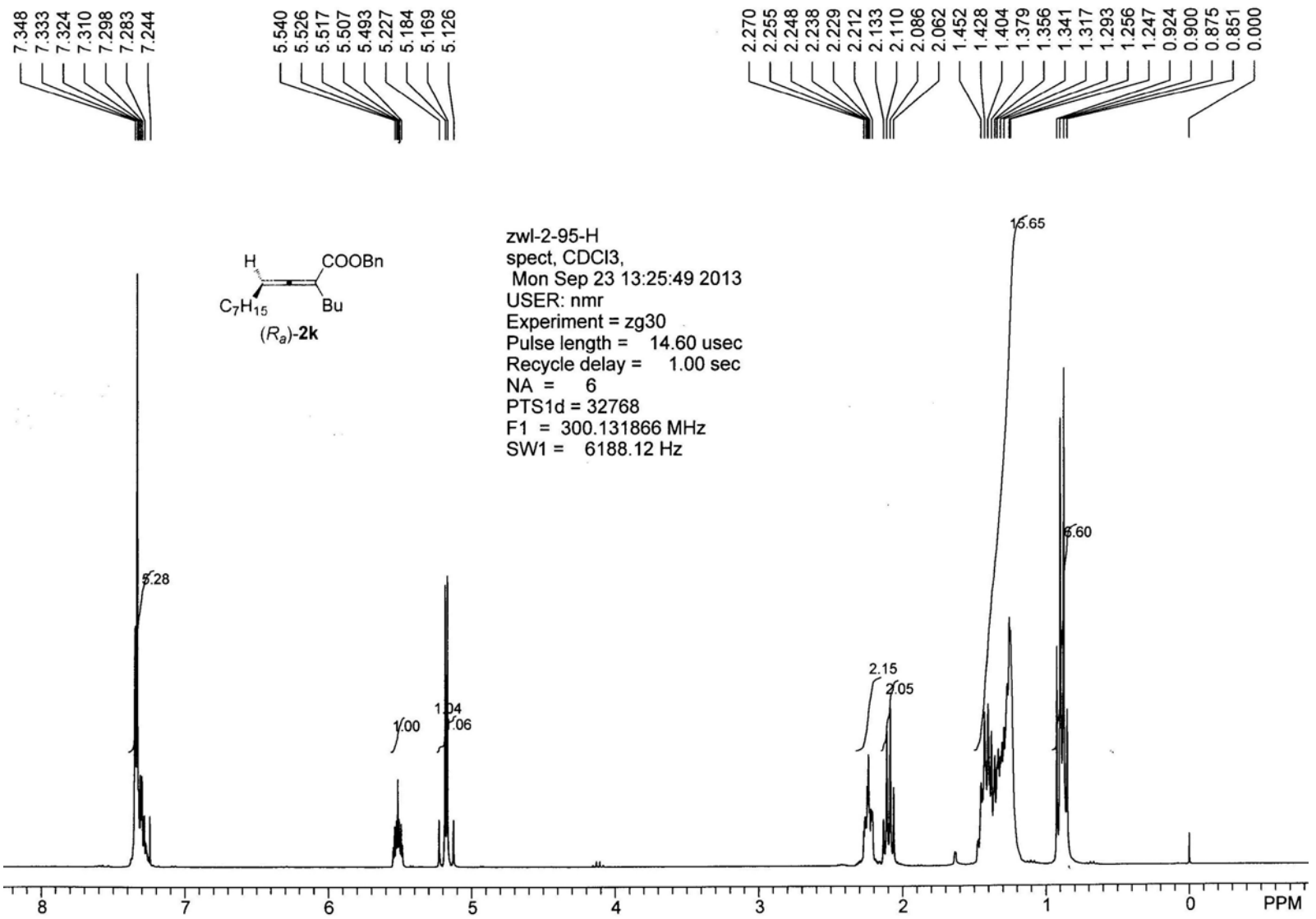


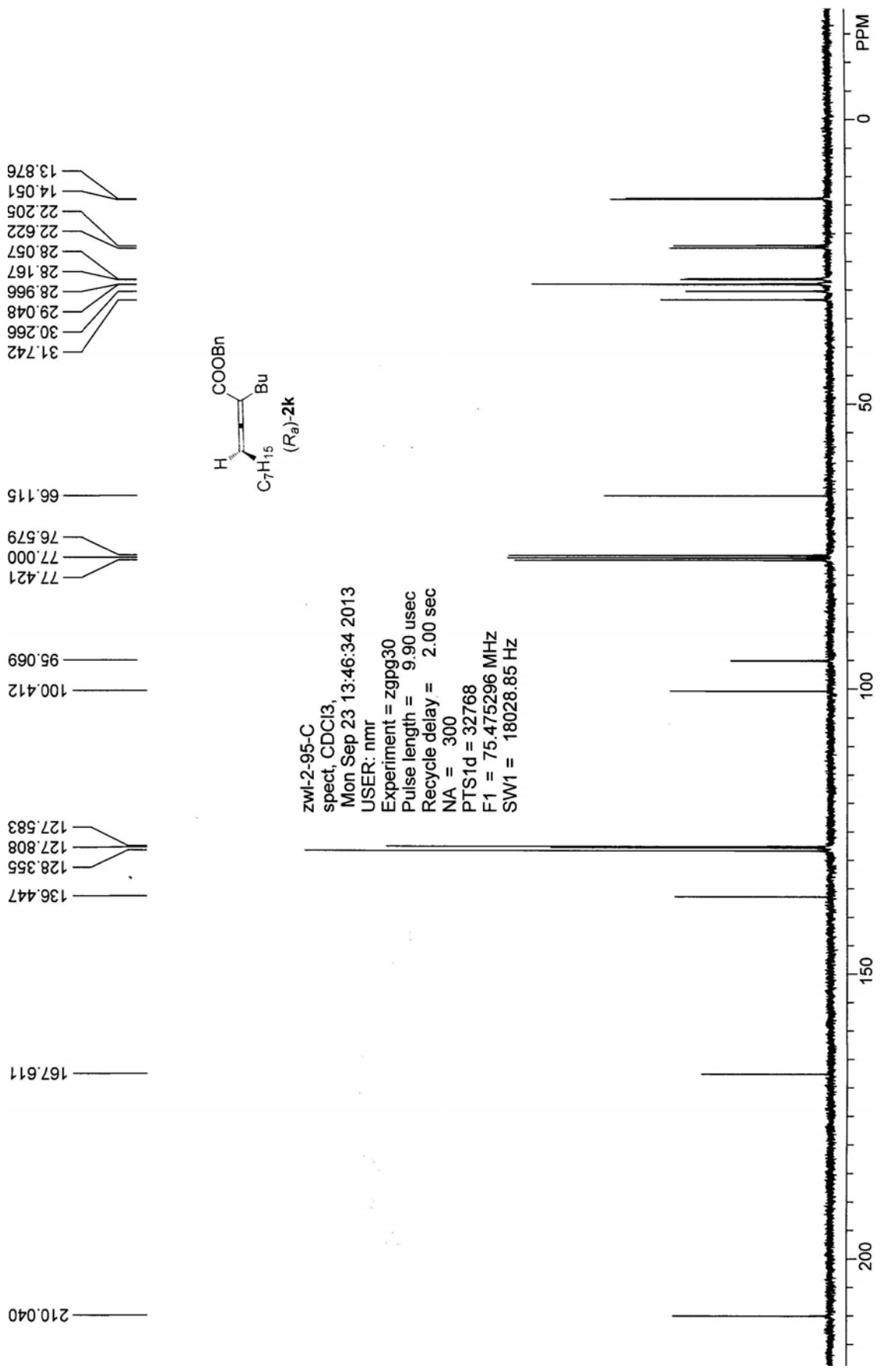
--	RT (min)	Area (微sec)	%Area	Height (微)	% Height
1	10.003	23241379	50.18	626142	47.51
2	12.246	23076326	49.82	691879	52.49

Report Method: 无标题

Page: 1 (共计 1)

Printed: 2013/12/31 16:47:58 PRC

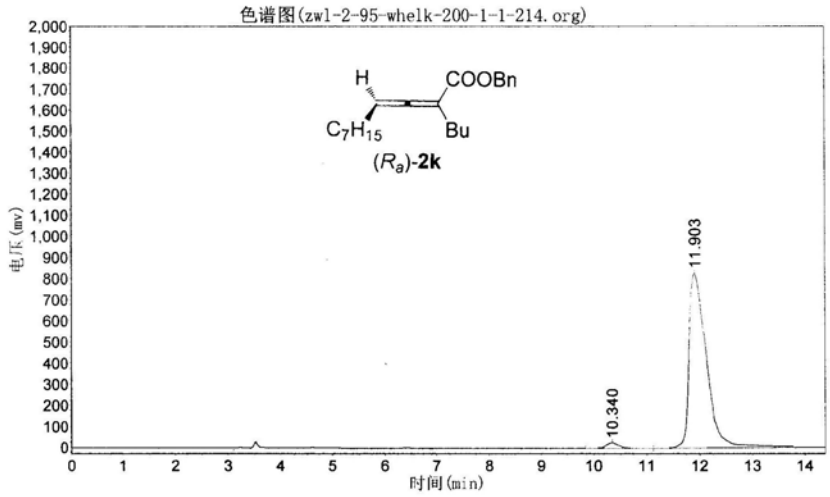

7.348
7.333
7.324
7.310
7.298
7.283
7.244
5.540
5.526
5.517
5.507
5.493
5.227
5.184
5.169
5.126
2.270
2.255
2.248
2.238
2.229
2.212
2.133
2.110
2.086
2.062
1.452
1.428
1.404
1.379
1.356
1.341
1.317
1.293
1.256
1.247
0.924
0.900
0.875
0.851
0.000
H
COOBn
C7H15
Bu
(Ra)-2k
zwl-2-95-H
spect, CDCl3,
Mon Sep 23 13:25:49 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
15.65
6.60
5.28
2.15
2.05
1.04
1.00
1.06
8
7
6
5
4
3
2
1
0
PPM


13.876
14.051
22.205
22.622
28.057
28.167
28.966
29.048
30.266
31.742
66.115
76.579
77.000
77.421
95.069
100.412
127.583
127.808
128.355
136.447
167.611
210.040
COOBn
Bu
H
C7H15
(Ra)-2k
zwl-2-95-C
spect, CDCl3,
Mon Sep 23 13:46:34 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 300
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
PPM
200
150
100
50
0

zwl-2-95-whelk-200-1-1-214

实验时间：2013/9/24,9:54:02　　报告时间：2013/9/24,11:27:38
谱图文件:D:\zhuguangjiong\zwl\20130924\zwl-2-95-whelk-200-1-1-214.org

实验内容简介：



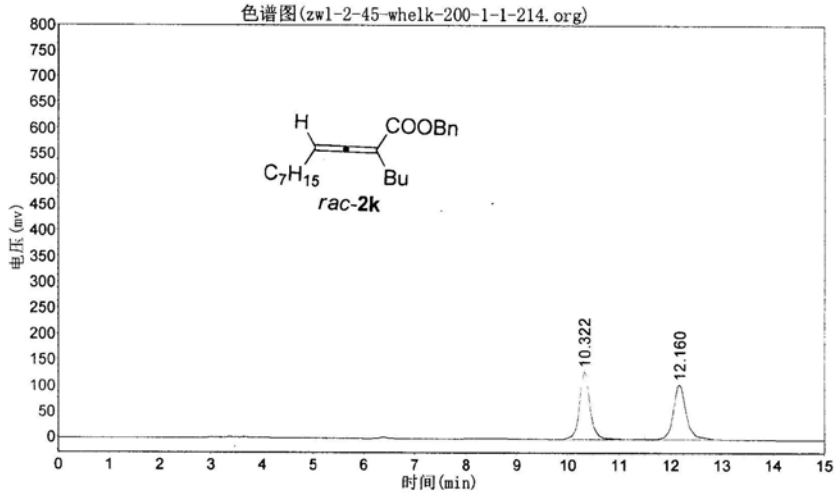
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		10.340	26013.137	398905.344	2.1085
2		11.903	824633.313	18519628.000	97.8915
总计			850646.449	18918533.344	100.0000

zwl-2-45-whelk-200-1-1-214

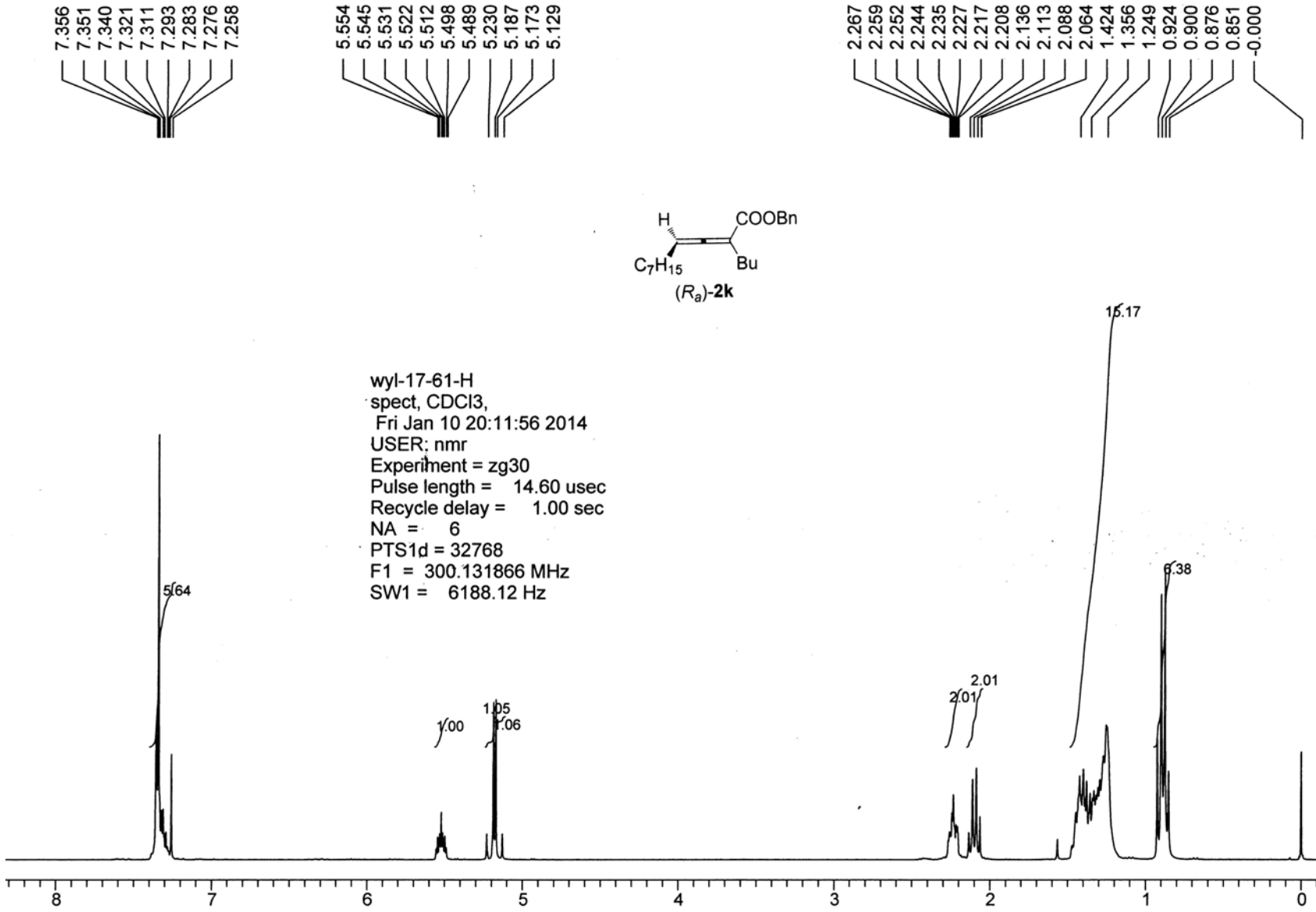
实验时间：2013/9/24,9:35:48　　报告时间：2013/9/24,11:29:02
谱图文件:D:\zhuguangjiong\zwl\20130924\zwl-2-45-whelk-200-1-1-214.org

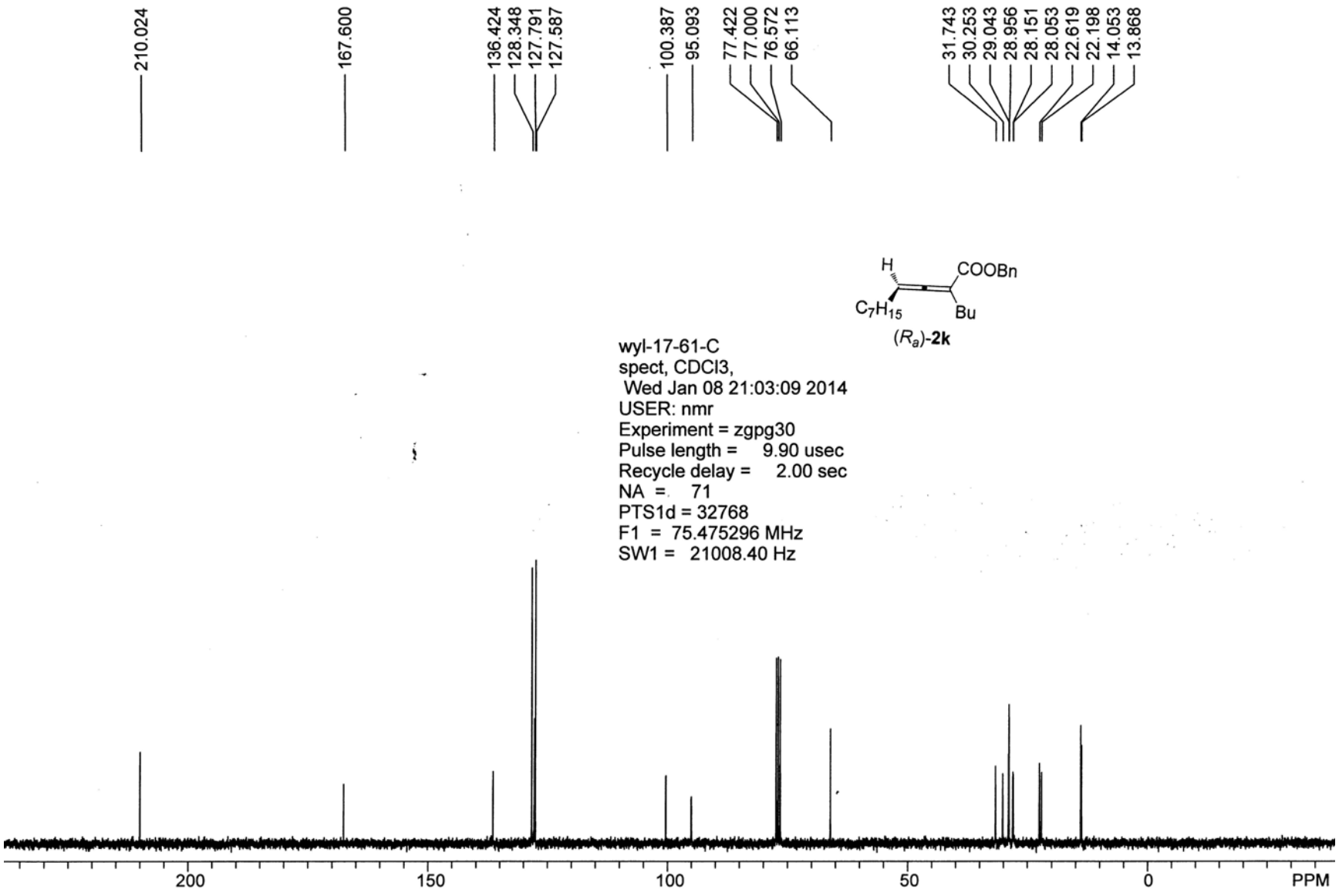
实验内容简介：



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		10.322	129877.438	1893951.375	50.1008
2		12.160	105808.227	1886327.500	49.8992
总计			235685.664	3780278.875	100.0000


7.356
7.351
7.340
7.321
7.311
7.293
7.283
7.276
7.258
5.554
5.545
5.531
5.522
5.512
5.498
5.489
5.230
5.187
5.173
5.129
2.267
2.259
2.252
2.244
2.235
2.227
2.217
2.208
2.136
2.113
2.088
2.064
1.424
1.356
1.249
0.924
0.900
0.876
0.851
-0.000
H
COOBn
C7H15
Bu
(Ra)-2k
wyl-17-61-H
spect, CDCl3,
Fri Jan 10 20:11:56 2014
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.64
1.00
1.05
1.06
2.01
2.01
15.17
6.38
8
7
6
5
4
3
2
1
0
PPM

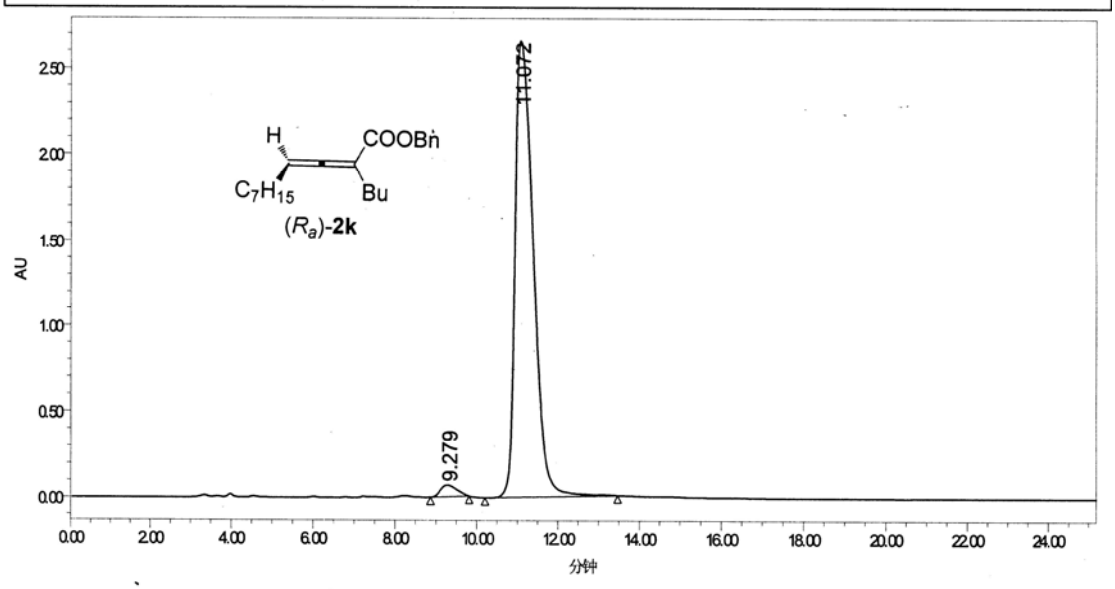

210.024
167.600
136.424
128.348
127.791
127.587
100.387
95.093
77.422
77.000
76.572
66.113
31.743
30.253
29.043
28.956
28.151
28.053
22.619
22.198
14.053
13.868
H
COOBn
C7H15
Bu
(Ra)-2k
wyl-17-61-C
spect, CDCl3,
Wed Jan 08 21:03:09 2014
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 71
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 21008.40 Hz
200
150
100
50
0
PPM

Project Name: defaults for copy
Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	wyl-17-61-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 10:07:13 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	8	Date Processed:	2013/12/31 12:34:16 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	



	RT (min)	Area (碘sec)	%Area	Height (碘)	% Height
1	9.279	1883123	2.22	68076	2.50
2	11.072	82828456	97.78	2654040	97.50

Report Method: 无标题
Page: 1 (共计 1)

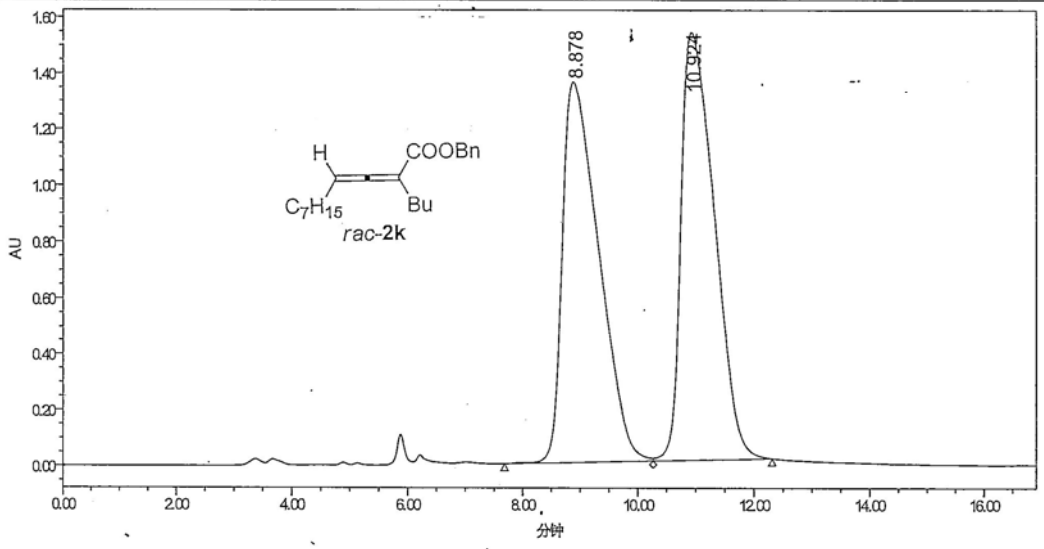
Printed: 2013/12/31 16:48:43 PRC

中国科学院上海有机化学研究所
Project Name: defaults for copy
Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

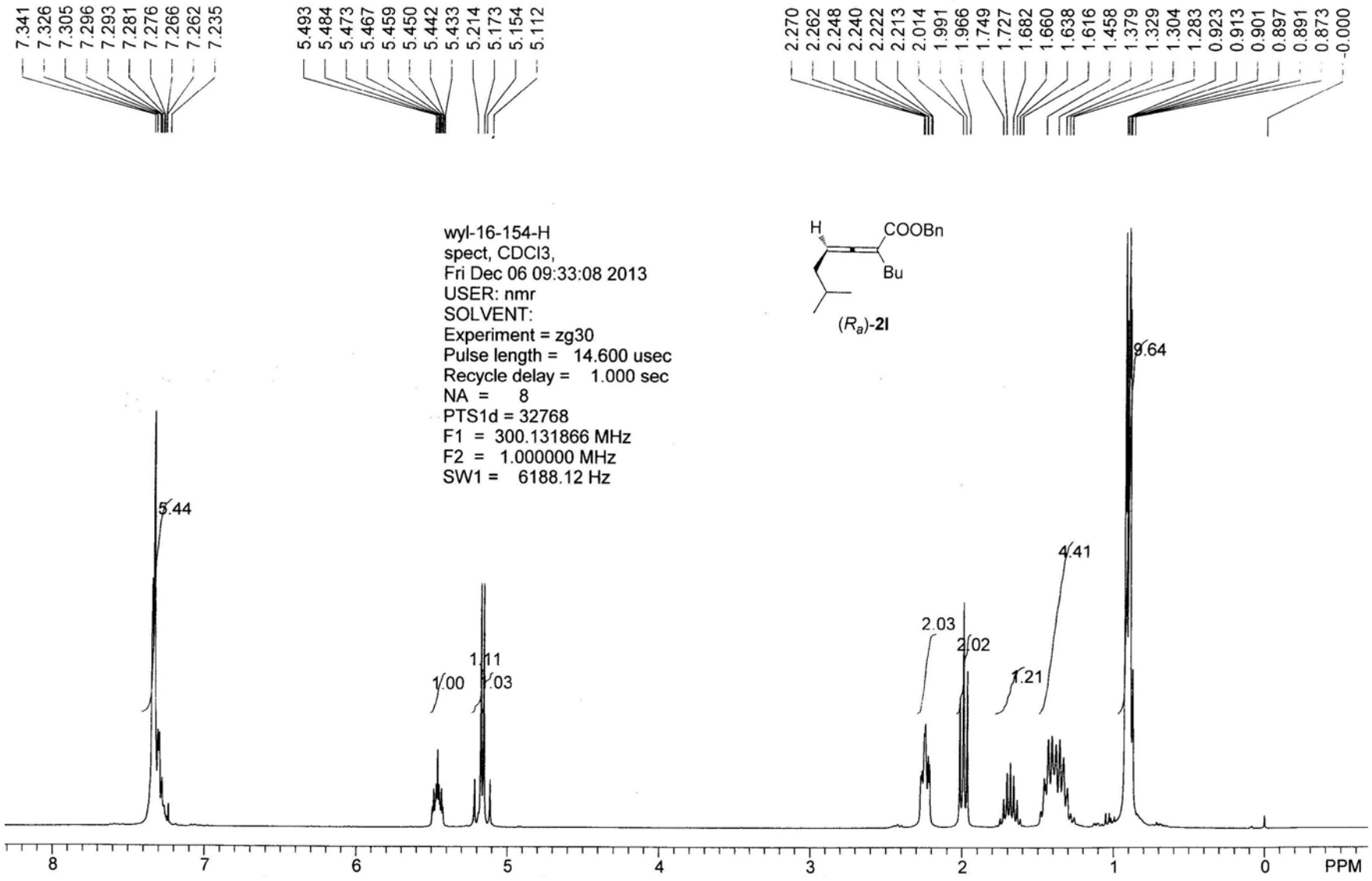
Sample Name:	zwl-2-45-whelk-200-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 9:28:30 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	6	Date Processed:	2013/12/31 16:47:05 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	

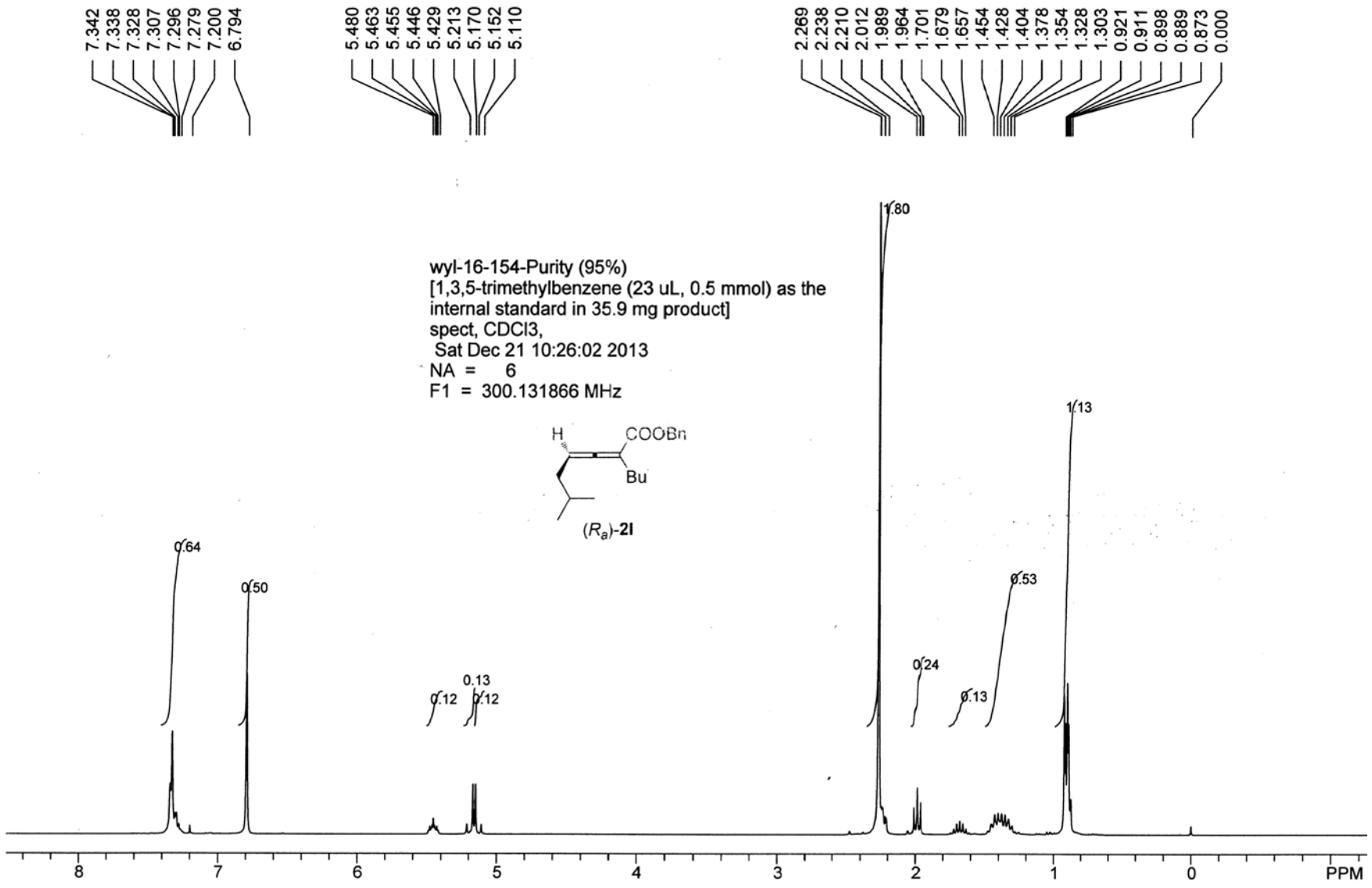


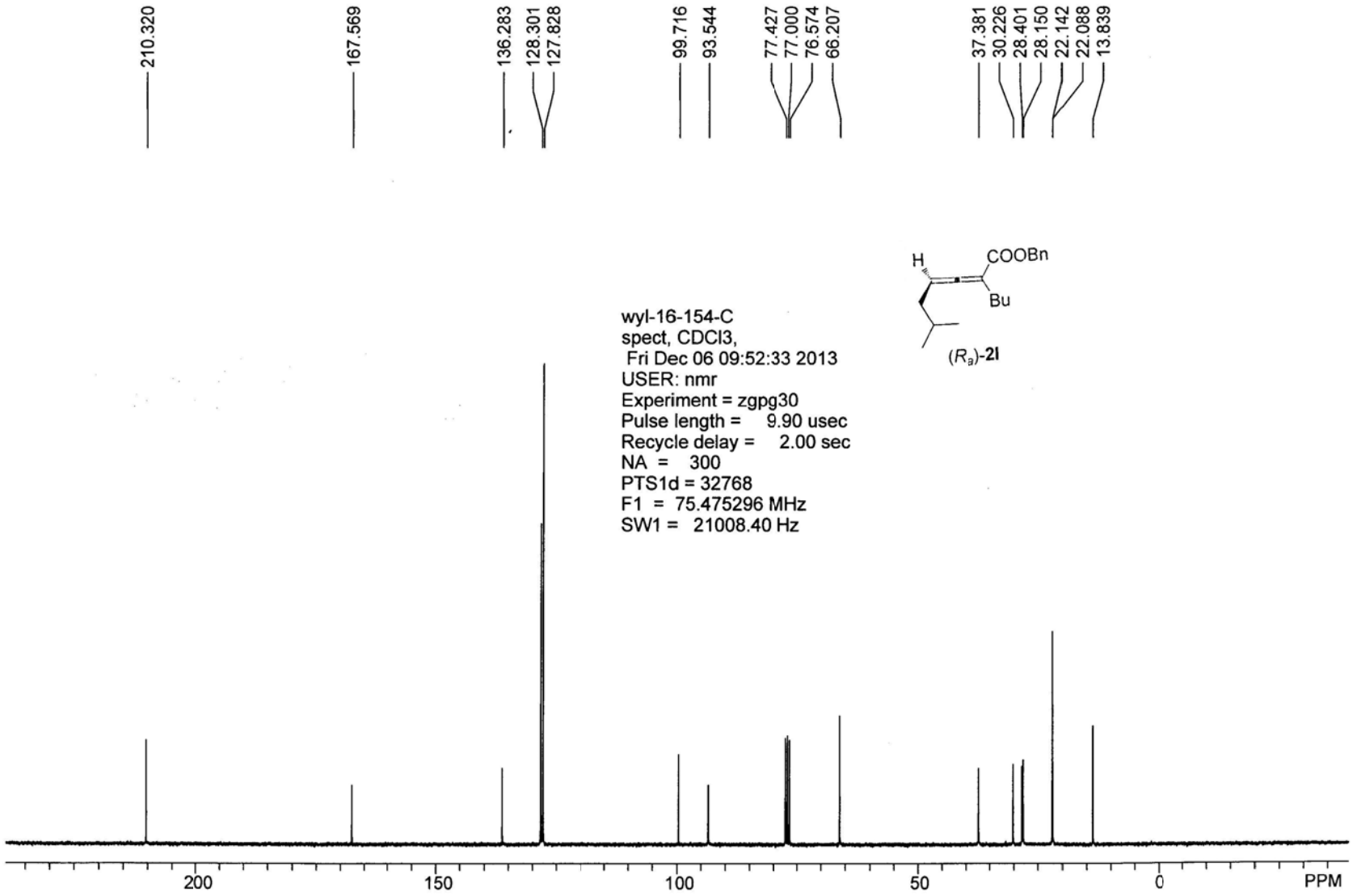
	RT (min)	Area (碘sec)	%Area	Height (碘)	% Height
1	8.878	59740630	49.51	1357028	47.05
2	10.924	60920528	50.49	1527175	52.95

Report Method: 无标题
Page: 1 (共计 1)

Printed: 2013/12/31 16:47:18 FRC


7.341
7.326
7.305
7.296
7.293
7.281
7.276
7.266
7.262
7.235
5.493
5.484
5.473
5.467
5.459
5.450
5.442
5.433
5.214
5.173
5.154
5.112
2.270
2.262
2.248
2.240
2.222
2.213
2.014
1.991
1.966
1.749
1.727
1.682
1.660
1.638
1.616
1.458
1.379
1.329
1.304
1.283
0.923
0.913
0.901
0.897
0.891
0.873
-0.000
wyl-16-154-H
spect, CDCl3,
Fri Dec 06 09:33:08 2013
USER: nmr
SOLVENT:
Experiment = zg30
Pulse length = 14.600 usec
Recycle delay = 1.000 sec
NA = 8
PTS1d = 32768
F1 = 300.131866 MHz
F2 = 1.000000 MHz
SW1 = 6188.12 Hz
H
COOBn
Bu
(Ra)-2l
5.44
1.00
1.11
1.03
2.03
2.02
1.21
4.41
9.64
8
7
6
5
4
3
2
1
0
PPM


7.342
7.338
7.328
7.307
7.296
7.279
7.200
6.794
5.480
5.463
5.455
5.446
5.429
5.213
5.170
5.152
5.110
2.269
2.238
2.210
2.012
1.989
1.964
1.701
1.679
1.657
1.454
1.428
1.404
1.378
1.354
1.328
1.303
0.921
0.911
0.898
0.889
0.873
0.000
wyl-16-154-Purity (95%)
[1,3,5-trimethylbenzene (23 uL, 0.5 mmol) as the internal standard in 35.9 mg product]
spect, CDCl3,
Sat Dec 21 10:26:02 2013
NA = 6
F1 = 300.131866 MHz
H
COOBn
Bu
(Ra)-2l
1.80
1.13
0.64
0.50
0.53
0.24
0.13
0.13
0.12
0.12
8
7
6
5
4
3
2
1
0
PPM

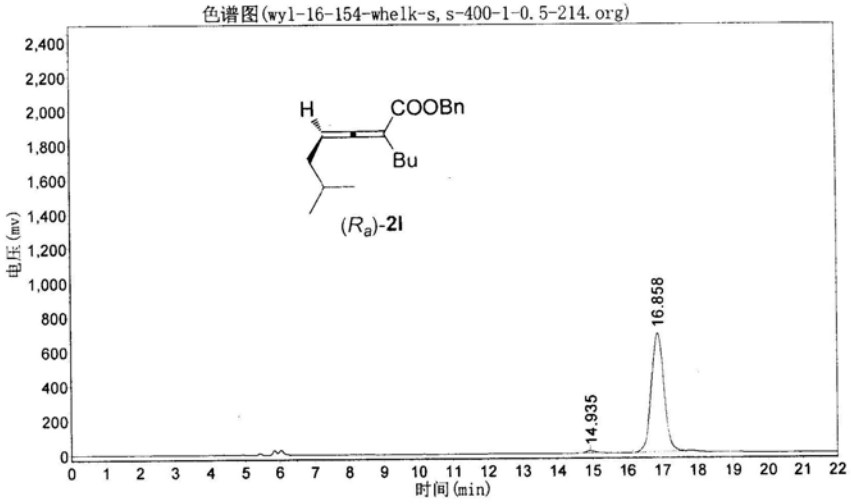

210.320
167.569
136.283
128.301
127.828
99.716
93.544
77.427
77.000
76.574
66.207
37.381
30.226
28.401
28.150
22.142
22.088
13.839
H
COOBn
Bu
(Ra)-2l
wyl-16-154-C
spect, CDCl3,
Fri Dec 06 09:52:33 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 300
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 21008.40 Hz
200
150
100
50
0
PPM

wyl-16-154-whelk-s, s-400-1-0.5-214

实验时间：2013/6/28, 15:16:47　　报告时间：2013/6/28, 15:57:30
谱图文件:D:\zhuguangjiong\wyl\20130628\wyl-16-154-whelk-s, s-400-1-0.5-214.org

实验内容简介：
whelk-s, s 400+1
0.5ml/min 214nm

色谱图(wyl-16-154-whelk-s, s-400-1-0.5-214.org)



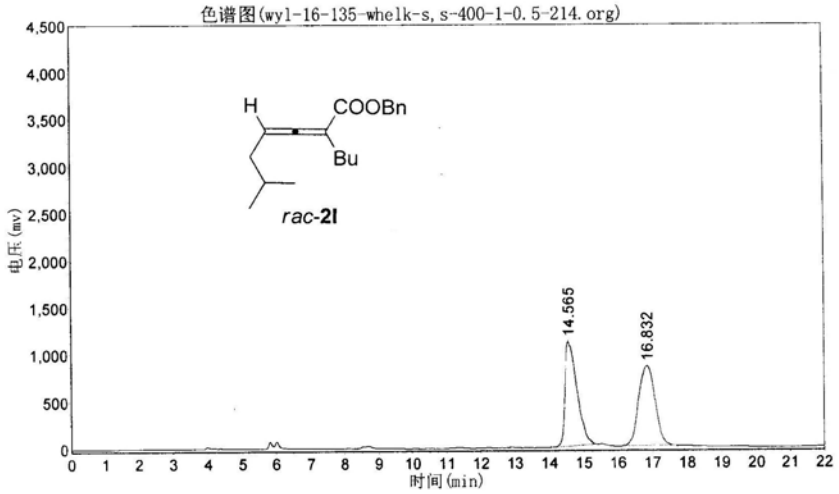
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		14.935	13307.122	215480.500	1.2561
2		16.858	690324.813	16939586.000	98.7439
总计			703631.935	17155066.500	100.0000

wyl-16-135-whelk-s, s-400-1-0.5-214

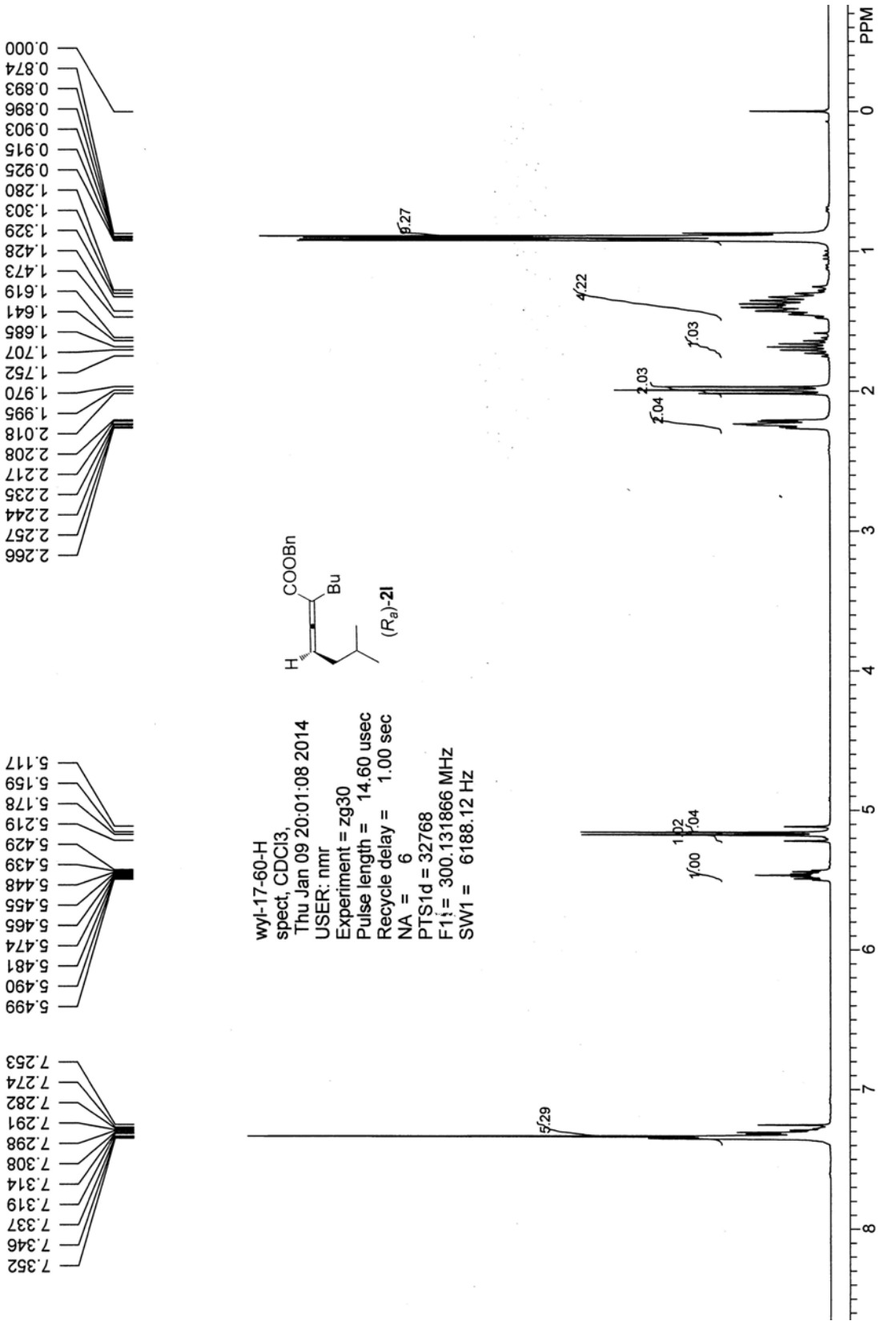
实验时间：2013/6/28, 15:53:16　　报告时间：2013/6/28, 16:18:54
谱图文件:D:\zhuguangjiong\wyl\20130628\wyl-16-135-whelk-s, s-400-1-0.5-214.org

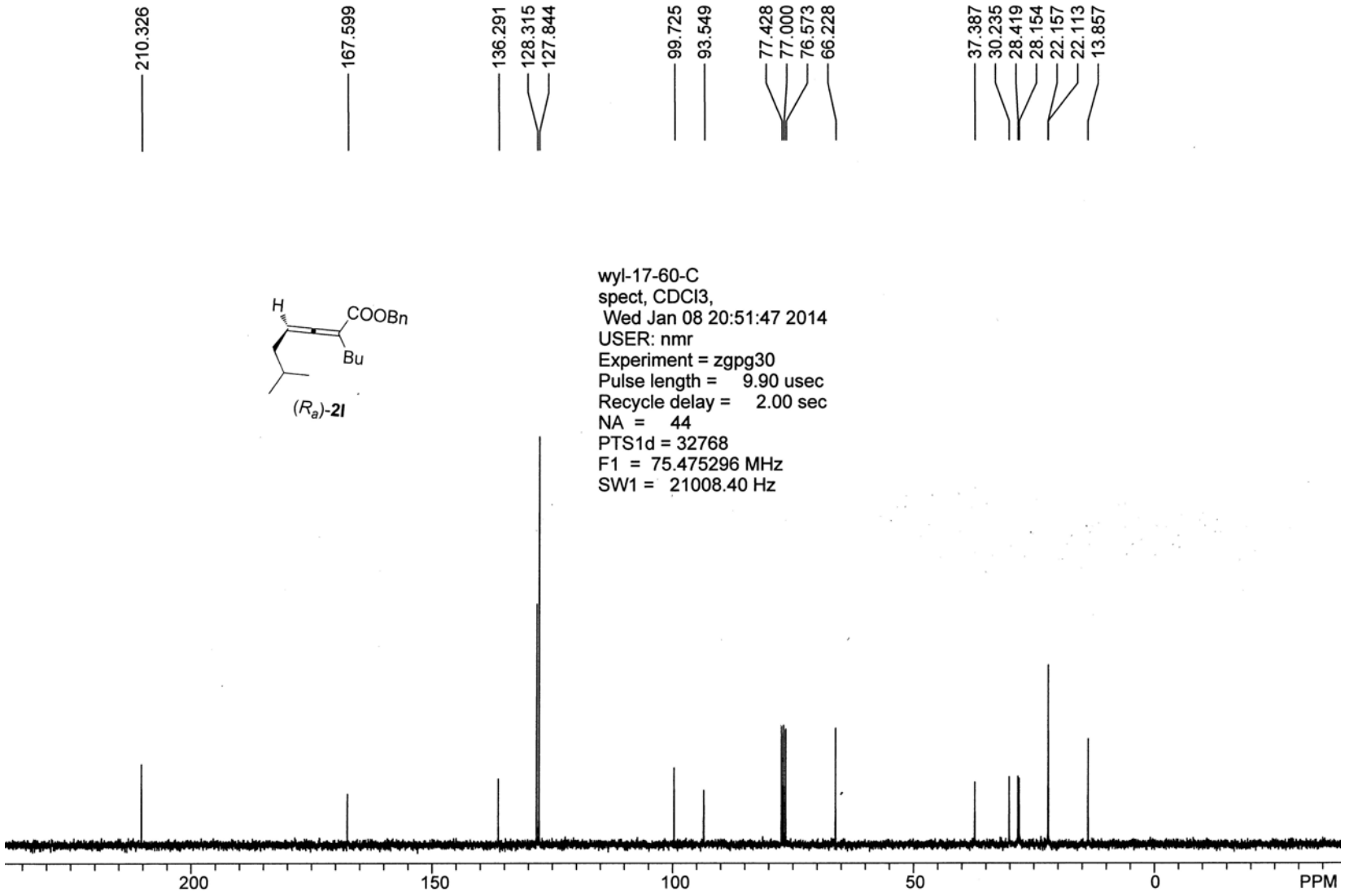
实验内容简介：
whelk-s, s　400+1
0.5ml/min　214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		14.565	1107220.375	27030012.000	49.5097
2		16.832	842960.688	27565426.000	50.4903
总计			1950181.063	54595438.000	100.0000


wyl-17-60-H
spect, CDCl3,
Thu Jan 09 20:01:08 2014
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
Bu
H
(Ra)-2l
PPM

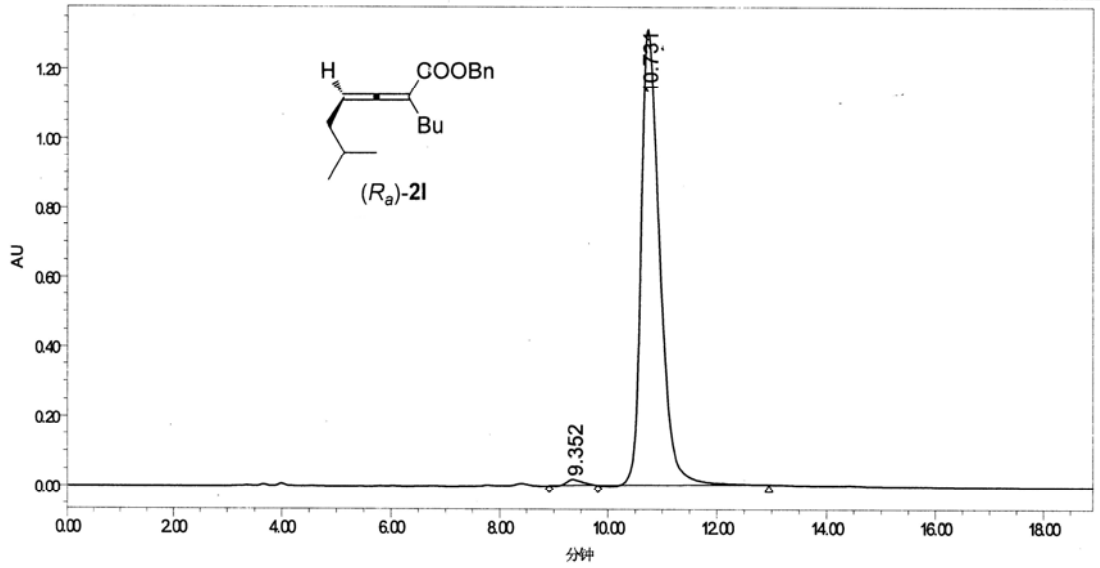

210.326
167.599
136.291
128.315
127.844
99.725
93.549
77.428
77.000
76.573
66.228
37.387
30.235
28.419
28.154
22.157
22.113
13.857
H
COOBn
Bu
(Ra)-2l
wyl-17-60-C
spect, CDCl3,
Wed Jan 08 20:51:47 2014
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 44
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 21008.40 Hz
200
150
100
50
0
PPM

Project Name: defaults for copy
Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

Sample Name:	wyl-17-60-whalk-400-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 11:37:04 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	12	Date Processed:	2013/12/31 12:35:33 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	20.00 Minutes	Sample Set Name:	



	RT (min)	Area (碘sec)	%Area	Height (碘	% Height
1	9.352	344067	1.08	16448	1.24
2	10.731	31370880	98.92	1307711	98.76

Report Method: 无标题
Page: 1 (共计 1)

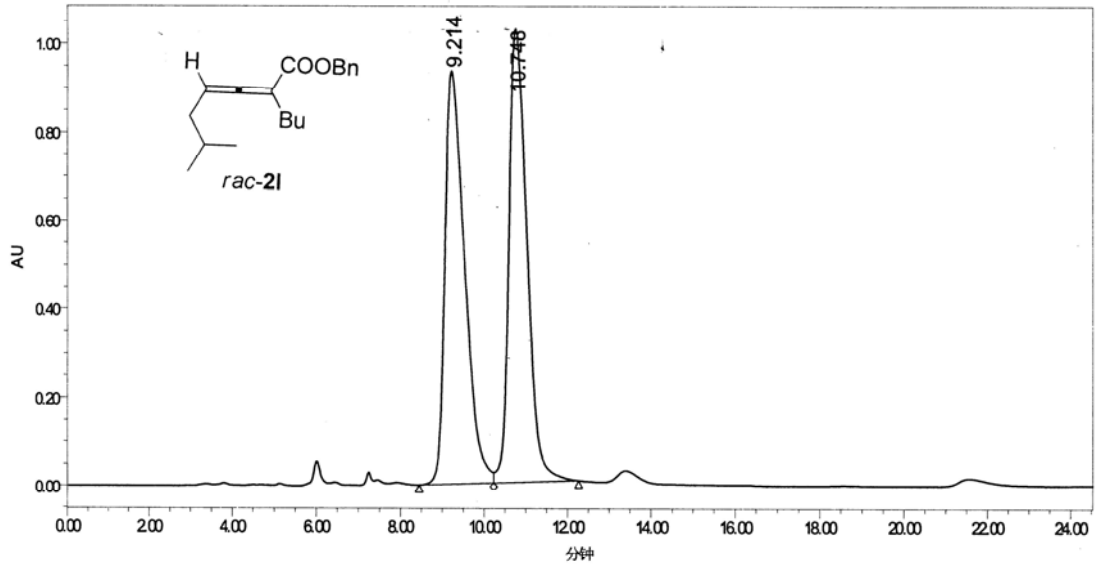
Printed: 2013/12/31 16:49:11 PRC

Project Name: defaults for copy
Reported by User: Breeze user (Breeze)

Breeze 2 HPLC System

SAMPLE INFORMATION

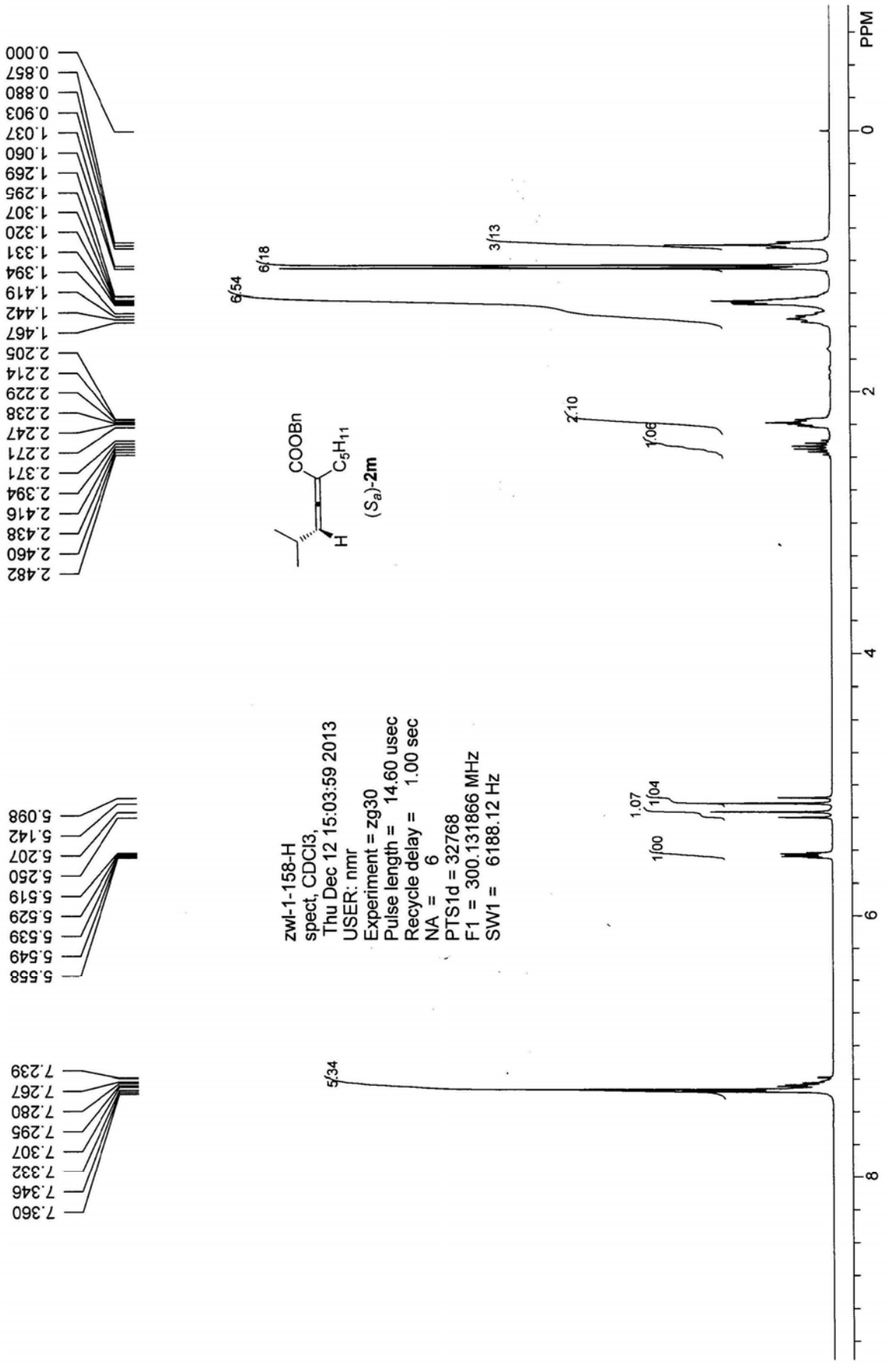
Sample Name:	wyt-16-135-whelk-400-1-1-214	Acquired By:	Breeze
Sample Type:	未知	Date Acquired:	2013/12/31 10:33:43 CST
Vial:	1	Acq. Method:	zgj100
Injection #:	9	Date Processed:	2013/12/31 16:46:47 CST
Injection Volume:	10.00 ul	Channel Name:	W2489 ChA
Run Time:	60.00 Minutes	Sample Set Name:	

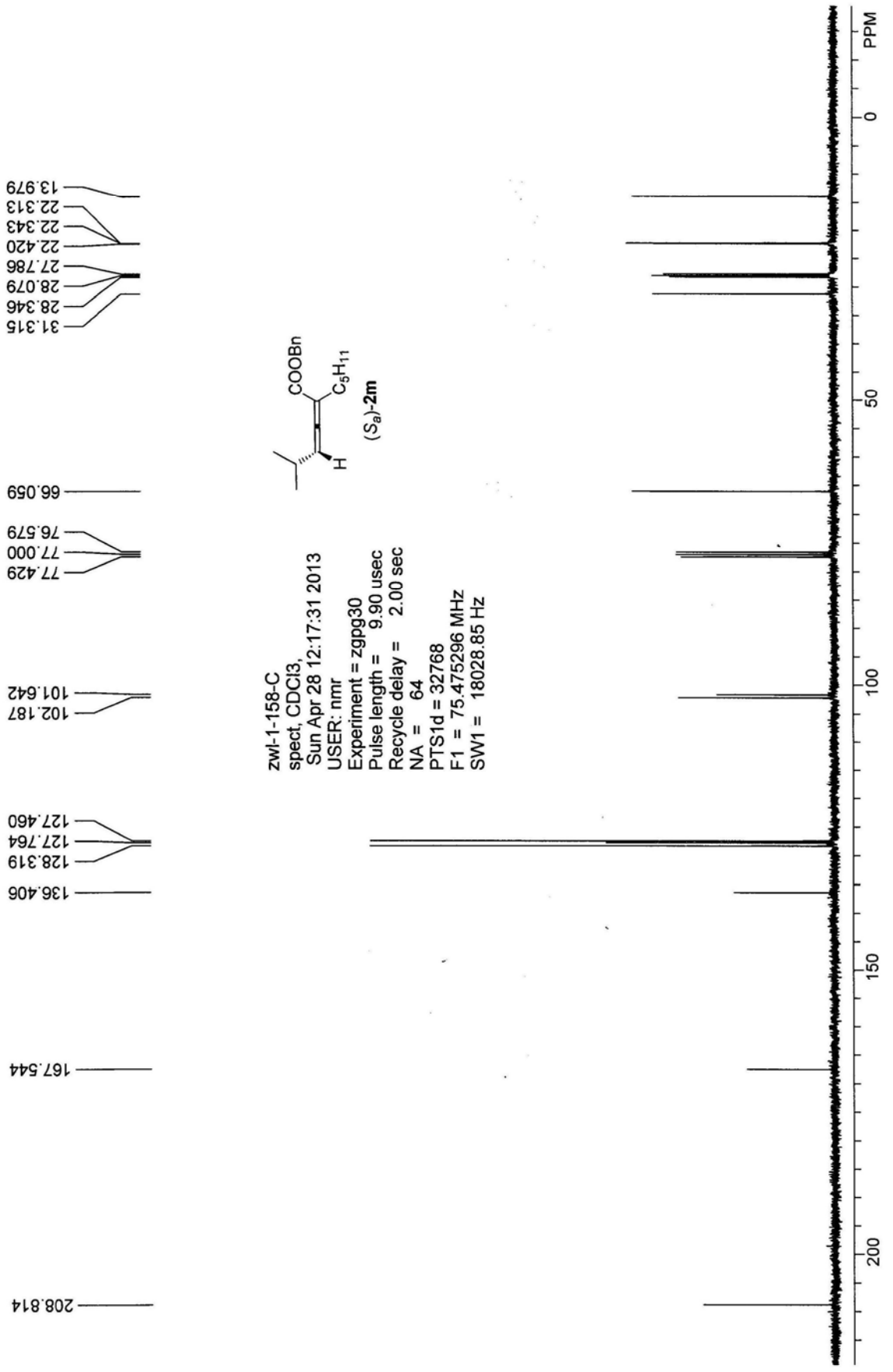


	RT (min)	Area (碘sec)	%Area	Height (碘	% Height
1	9.214	30809681	49.79	935143	47.70
2	10.748	30870899	50.21	1025188	52.30

Report Method: 无标题
Page: 1 (共计 1)

Printed: 2013/12/31
16:48:55 PRC

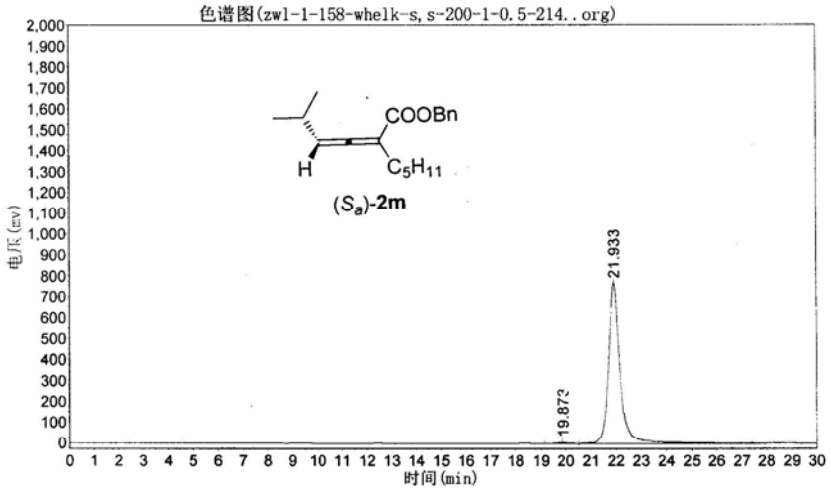

zwl-1-158-H
spect, CDCl3,
Thu Dec 12 15:03:59 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
COOBn
C_5H_{11}
H
(S_a)-2m
PPM


208.814
167.544
136.406
128.319
127.764
127.460
102.187
101.642
77.429
77.000
76.579
66.059
31.315
28.346
28.079
27.786
22.420
22.343
22.313
13.979
COOBn
C_5H_{11}
H
(S_a)-2m
zwl-1-158-C
spect, CDCl3,
Sun Apr 28 12:17:31 2013
USER: nmr
Experiment = zgpg30
Pulse length = 9.90 usec
Recycle delay = 2.00 sec
NA = 64
PTS1d = 32768
F1 = 75.475296 MHz
SW1 = 18028.85 Hz
PPM
200
150
100
50
0

zwl-1-158-whelk-s, s-200-1-0.5-214

实验时间：2013-04-28,13:51:31　　报告时间：2013-04-28,14:28:39
谱图文件:D:\zhuguangjiong\zwl\20130428\zwl-1-158-whelk-s, s-200-1-0.5-214..org

实验内容简介：
whelk-s, s　200+1
0.5ml/min　214nm



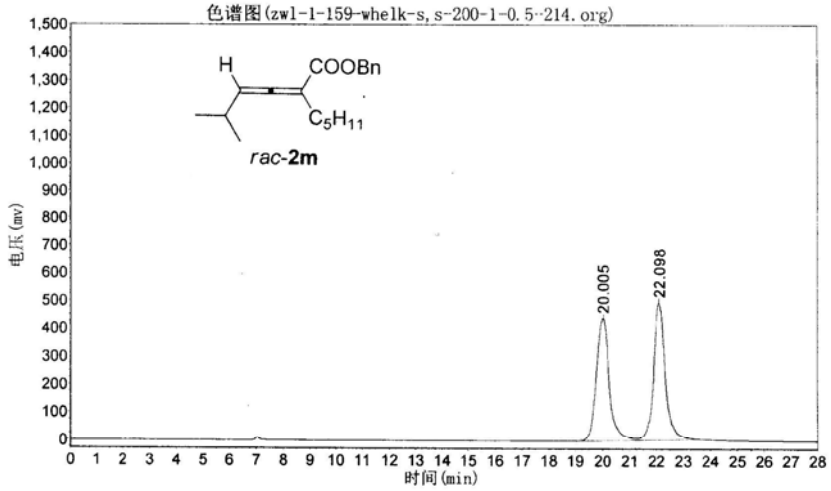
分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		19.873	6011.043	160463.172	0.6266
2		21.933	767171.063	25447982 000	99.3734
总计			773182.105	25608445.172	100.0000

zwl-1-159-whelk-s, s-200-1-0.5-214

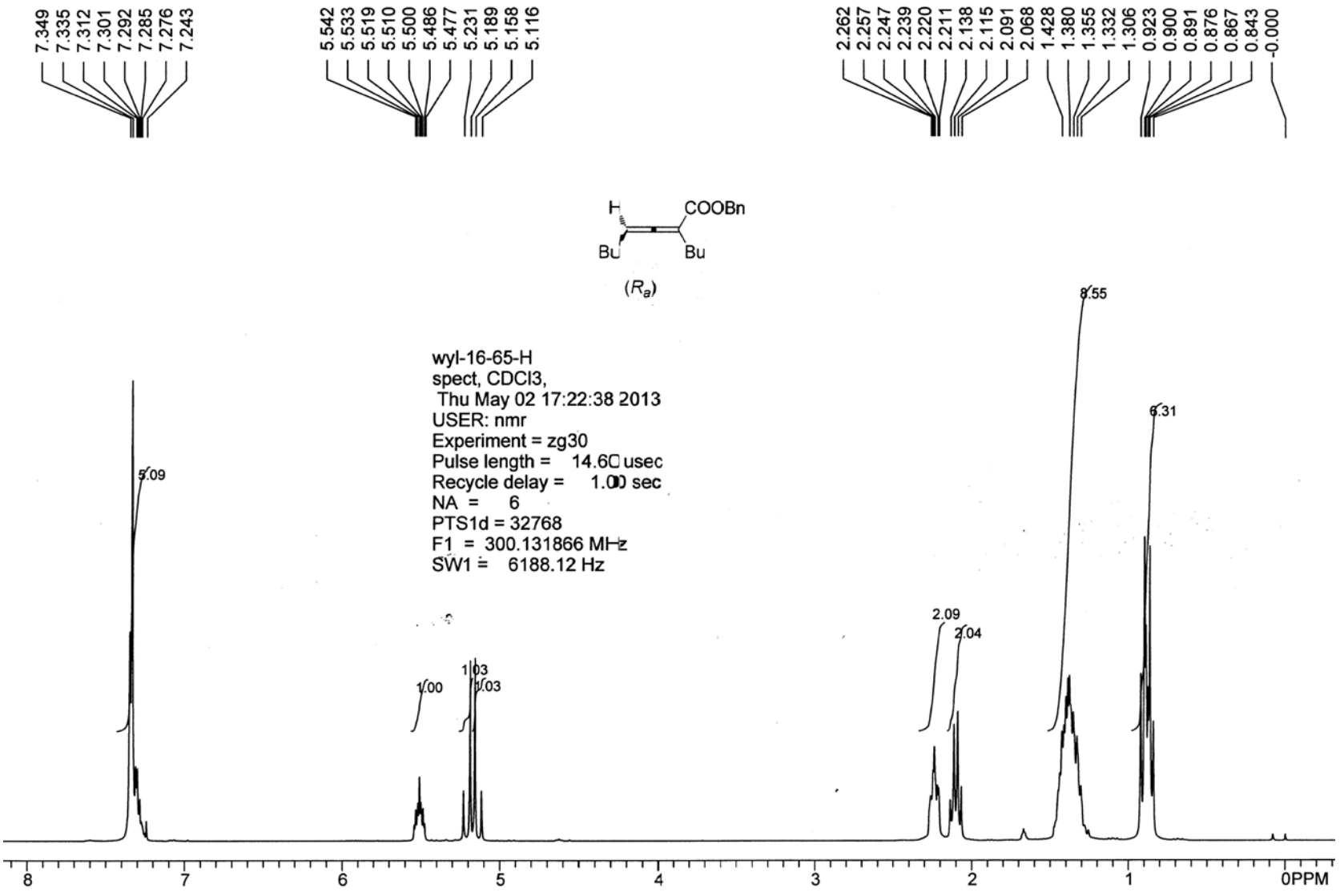
实验时间：2013-04-28,12:43:50　　报告时间：2013-04-28,13:42:19
谱图文件:D:\zhuguangjiong\zwl\20130428\zwl-1-159-whelk-s, s-200-1-0.5-214.org

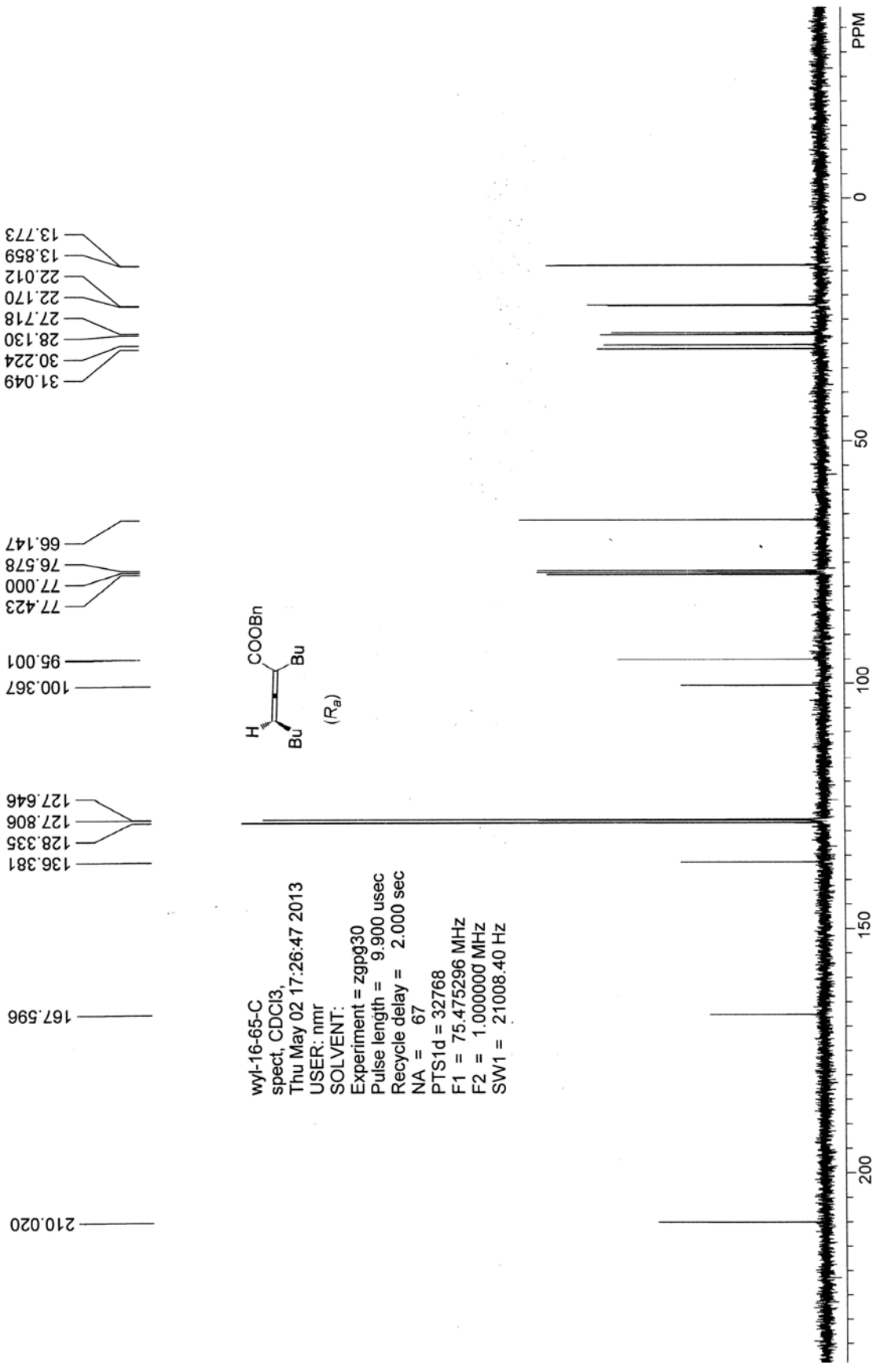
实验内容简介：
whelk-s,s 200+1
0.5ml/min 214nm



分析结果表

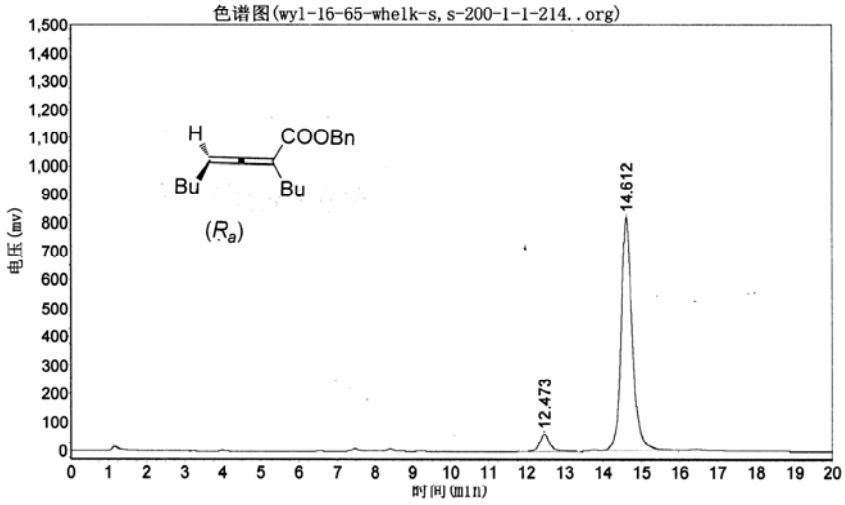
峰号	峰名	保留时间	峰高	峰面积	含量
1		20.005	439468.469	14792792.000	49.5197
2		22.098	492610.281	15079771.000	50.4803
总计			932078.750	29872563.000	100.0000


7.349
7.335
7.312
7.301
7.292
7.285
7.276
7.243
5.542
5.533
5.519
5.510
5.500
5.486
5.477
5.231
5.189
5.158
5.116
2.262
2.257
2.247
2.239
2.220
2.211
2.138
2.115
2.091
2.068
1.428
1.380
1.355
1.332
1.306
0.923
0.900
0.891
0.876
0.867
0.843
-0.000
H
COOBn
Bu
Bu
(Ra)
wyl-16-65-H
spect, CDCl3,
Thu May 02 17:22:38 2013
USER: nmr
Experiment = zg30
Pulse length = 14.60 usec
Recycle delay = 1.00 sec
NA = 6
PTS1d = 32768
F1 = 300.131866 MHz
SW1 = 6188.12 Hz
5.09
1.00
1.03
1.03
2.09
2.04
8.55
6.31
8
7
6
5
4
3
2
1
0PPM


wyl-16-65-C
spect, CDCl3,
Thu May 02 17:26:47 2013
USER: nmr
SOLVENT:
Experiment = zgpg30
Pulse length = 9.900 usec
Recycle delay = 2.000 sec
NA = 67
PTS1d = 32768
F1 = 75.475296 MHz
F2 = 1.000000 MHz
SW1 = 21008.40 Hz
COOBn
Bu
H
Bu
(Ra)
210.020
167.596
136.381
128.335
127.806
127.646
100.367
95.001
77.423
77.000
76.578
66.147
31.049
30.224
28.130
27.718
22.170
22.012
13.859
13.773
PPM
0
50
100
150
200

实验时间：2013-05-02,11:28:26　　报告时间：2013-05-02,13:31:47
谱图文件:D:\zhuguangjiong\wyl\20130502\wyl-16-65-whelk-s,s-200-1-1-214..org

实验内容简介：
whelk-s,s　200+1
1ml/min 214nm

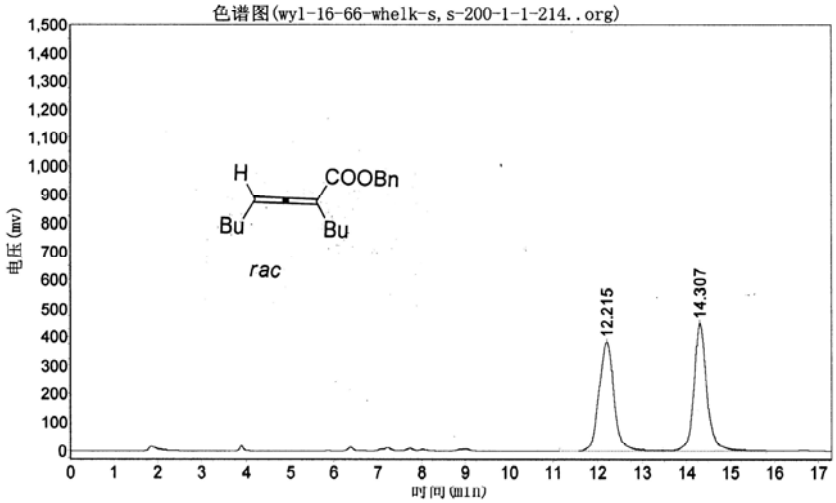


分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		12.473	63753.641	1192039.375	6.6915
2		14.612	818372.250	16622253.000	93.3085
总计			882125.891	17814292.375	100.0000

实验时间：2013-05-02,12:10:06　　报告时间：2013-05-02,13:30:09
谱图文件:D:\zhuguangjiong\wyl\20130502\wyl-16-66-whelk-s,s-200-1-1-214..org

实验内容简介：
whelk-s,s　200+1
1ml/min 214nm



分析结果表

峰号	峰名	保留时间	峰高	峰面积	含量
1		12.215	381762.719	9162743.000	49.9487
2		14.307	449652.094	9181581.000	50.0513
总计			831414.813	18344324.000	100.0000