Supporting Information for

A Simple Primary-Tertiary Diamine-Brønsted Acid Catalyst for Asymmetric Direct Aldol Reaction of Linear Aliphatic Ketones

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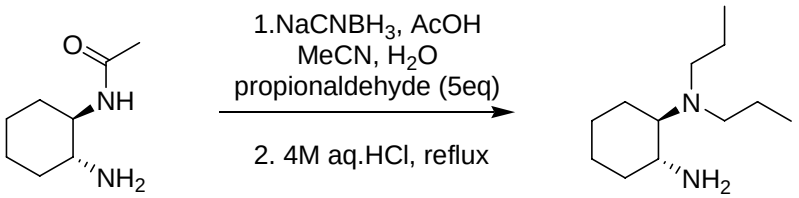
General Information: Commercial reagents were used as received, unless otherwise stated. Chemical shifts are reported in ppm from tetramethylsilane with the solvent resonance as the internal standard. The following abbreviations were used to designate chemical shift mutiplicities: s = singlet, d= doublet, t= triplet, q= quartet, h= heptet, m= multiplet, br= broad. All first-order splitting patterns were assigned on the basis of the appearance of the multiplet. Splitting patterns that could not be easily interpreted are designated as multiplet (m) or broad (br). Mass spectra were obtained using fast-atom bombard (FAB) spectrometer or electrospray ionization (ESI) mass spectrometer. Optical rotations were measured using a 1 mL cell with a 1 dm path length on a Perkin-Elmer 341 digital polarimeter and are reported as follows: $[\alpha]_D^{rt}$ (*c* in g per 100 mL of solvent). HPLC analysis was performed using ChiralPak columns purchased.

Representative procedure for the synthesis of catalysts:

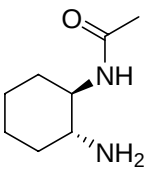
Synthesis of catalyst **1d:**



1a **1d**

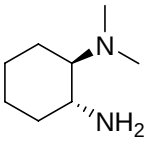
1a [T. L. 2000, *41*, 8431-8434] (3.40 g, 21.8 mmol, 1 eq), propionaldehyde (7.68 mL, 109.0 mmol, 5 eq), and H_2O (6 mL) were mixed in a 100-mL round bottomed flask with acetonitrile (120 mL) and stirred for 15 minutes. Sodium cyanoborohydride (2.87 g, 45.8 mmol, 2.1 eq) was added followed by AcOH (6 mL) 15 minutes later. After 2 hours, the volatiles were removed in vacuo and the resulting residue transferred to a separatory funnel with ethyl acetate (200 mL) and 1M NaOH (50 mL). The organic layer was washed twice with 1M NaOH (50 mL), brine (50 mL), and dried (Na_2SO_4). The ethyl acetate was removed in vacuo and the crude residue was taken up in 4M HCl (100 mL). The resulting solution was refluxed for 12 hours and after cooling to ambient temperature was made basic to pH≈13 with 4M NaOH. The aqueous layer was extracted three

times with CH_2Cl_2 (100 mL), and dried (Na_2SO_4). Solvent removal in vacuo afforded crude **1d** as a pale yellow oil which was distilled in *vacuo* to afford pure **1d** (3.2 g, 74% yield over all steps) as a colorless oil. $[\alpha]^{20}_D$ = -137.0 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.82 (6H, t, *J*= 7.2 Hz), 0.96-1.10 (4H, m), 1.23-1.38 (4H, m), 1.45-1.48 (1H, m), 1.69-1.71 (4H, m), 1.87-2.06 (2H, m), 2.17-2.41 (4H, m), 2.43-2.55 (1H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 11.8, 22.5, 22.8, 25.1, 26.0, 35.1, 51.3, 52.0, 66.9, 76.6, 77.1, 77.5; HRMS for $C_{12}H_{26}N_2$ (M), calcd. 198.2096, found 198.2098.



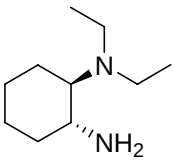
1a

The title product was prepared according to the procedure of Finney [1] as yellow solid. $[\alpha]^{20}_D$ = +10.8 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.02-1.25 (4H, m), 1.61-1.64 (2H, m), 1.72 (3H, s), 1.90-1.92 (4H, m), 2.28-2.35 (1H, m), 3.32-3.42 (1H, m), 6.24 (1H, br); ^{13}C NMR ($CDCl_3$, 75MHz): δ 23.4, 25.0, 32.4, 35.4, 55.2, 56.0, 57.6, 170.5; HRMS for $C_8H_{17}N_2O$ $(M+1)^+$, calcd. 157.1335, found 157.1336.



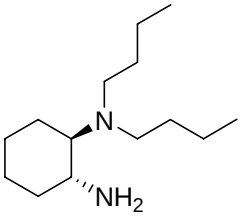
1b

The title product was prepared according to the general procedure as colorless oil in 70% yield. $[\alpha]^{20}_D$ = -29.7 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.10-1.18 (4H, m), 1.72-1.77 (4H, m), 1.88-2.00 (2H, m), 2.22 (6H, s), 2.50-2.56 (1H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 20.7, 25.1, 25.7, 35.3, 40.2, 51.5, 69.9; HRMS for $C_8H_{18}N_2$ (M), calcd. 142.1472, found 142.1470.



1c

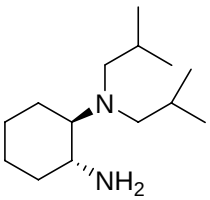
The title product was prepared according to the general procedure as colorless oil in 85% yield. $[\alpha]^{20}_D$ = -112.9 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.91-1.00 (6H, m), 1.00-1.10 (3H, m), 1.62-1.70 (6H, m), 1.86-2.14 (2H, m), 2.27-2.30 (2H, m), 2.49-2.56 (3H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 15.0, 23.1, 25.1, 26.1, 35.2, 43.4, 51.2, 66.4; HRMS for $C_{10}H_{22}N_2$ (M), calcd. 170.1783, found 170.1785.



1e

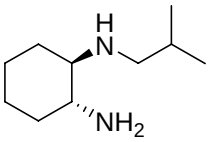
The title product was prepared according to the general procedure as colorless oil in 83% yield. $[\alpha]^{20}_D$ = -108.6 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz,

$CDCl_3$): δ 0.80-0.85 (6H, m), 1.07-1.33 (12H, m), 1.60-1.70 (5H, m), 1.82-2.00 (2H, m), 2.20-2.22 (2H, m), 2.31-2.38 (3H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 14.0, 20.6, 22.8, 25.1, 26.0, 31.7, 35.2, 49.8, 51.3, 66.8; HRMS for $C_{14}H_{31}N_2$ $(M+1)^+$, calcd. 227.2482, found 198.224.2479.



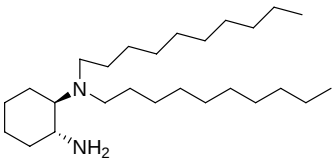
1f

The title product was prepared according to the general procedure as colorless oil in 63% yield. $[\alpha]^{20}_D$ = -148.1 (c= 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ 0.77-0.91 (12H, m), 1.00-1.29 (4H, m), 1.60-1.80 (7H, m), 1.88-2.11 (4H, m), 2.11-2.20 (2H, m), 2.48-2.57 (1H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 20.8, 21.2, 22.1, 25.2, 26.0, 26.7, 35.3, 51.2, 66.9; HRMS for $C_{14}H_{30}N_2$ (M), calcd. 226.2409, found 198.226.2407.



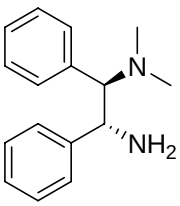
1g

The title product was prepared according to the general procedure as colorless oil in 23% yield. $[\alpha]^{20}_D$ = -83.3 (c= 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ 0.85-0.87 (6H, dd, *J* = 1.3Hz, 1.3Hz, 6.6Hz), 1.00-1.21 (4H, m), 1.30-1.50 (1H, br), 1.61-1.68 (4H, m), 1.78-1.88 (1H, m), 1.88-2.00 (2H, m), 2.20-2.26 (2H, m), 2.49-2.53 (1H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 20.6, 20.7, 25.3, 25.4, 28.8, 31.6, 36.0, 55.2, 55.4, 64.1; HRMS for $C_{10}H_{22}N_2$ (M), calcd. 170.1783, found 170.1785.



1h

The title product was prepared according to the general procedure as colorless oil in 87% yield. $[\alpha]^{20}_D$ = -59.3 (c= 1.0, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ 0.83-0.88 (6H, m), 1.24 (36H, br s), 1.50-1.59 (1H, m), 1.59-1.68 (1H, m), 1.68-1.80 (3H, m), 1.80-2.17 (3H, m), 2.17-2.35 (2H, m), 2.35-2.50 (3H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 14.1, 22.7, 22.8, 25.2, 26.1, 27.5, 29.4, 29.5, 29.6, 29.7, 31.9, 35.1, 50.1, 51.3, 66.9; HRMS for $C_{26}H_{54}N_2$ (M), calcd. 394.4287, found 394.4291.

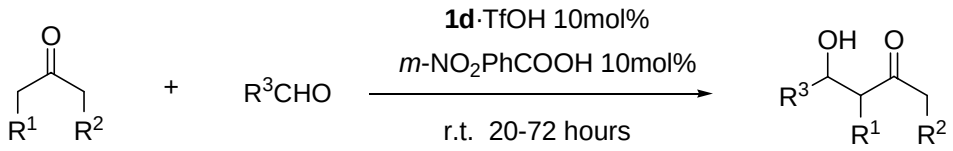


2

The title product was prepared according to the general procedure as pale yellow oil in 40% yield.$[\alpha]^{20}_D$ = 86.4 (c= 0.5, $CHCl_3$); ^1H NMR (300 MHz, $CDCl_3$): δ 2.08-2.13 (2H, br), 2.20 (6H, s), 3.62 (1H, d, *J* = 10.6 Hz), 4.41 (1H, d, *J* = 10.4

Hz), 6.93-7.04 (3H, m), 7.04-7.13 (5H, m), 7.18-7.25 (2H, d, J = 7.9 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 41.0, 55.7, 75.4, 126.8, 126.9, 127.3, 128.0, 128.1, 129.8, 134.0, 143.4; HRMS for $C_{16}H_{20}N_2$ (M), calcd. 240.1626, found 240.1628.

General procedure for aldol reaction:

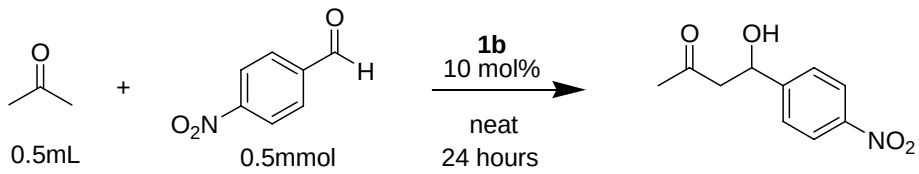


To a given anhydrous ketone (20. equiv.) was added the corresponding aldehyde (0.25 mmol), 3-nitrobenzoic acid (0.025 mmol) and catalyst **1d·TfOH** (0.025 mmol) (prepared in CH_2Cl_2 with 1 eq. **1d** and 1 eq. TfOH). The resulting mixture was stirred under room temperature for 20-72 hours and then directly purified through flash column chromatography on a silica gel to afford the pure products.

Products **3a-3h** [2] and **4a-4b** [2c, 2d, 3], **4e** (anti isomer)[4] and **4m**[2]are known compounds. **4g-4i** could be transformed into known compound by simple deprotection of benzyl group. [5]

Optimization of Conditions:

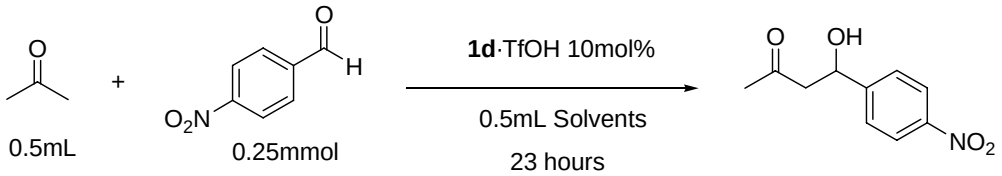
The first Acid screening:



Acid	Yield (%) [a]	*Ee* (%)
CF_3SO_3H	86	70
TFA	47	69
AcOH	9	43
m-NO_2PhCOOH	16	59
PTSA	33	63
Camphor sulfonic acid	34	60
PhCOOH	13	41
$Cl_2CHCOOH$	36	62

[a] isolated yields

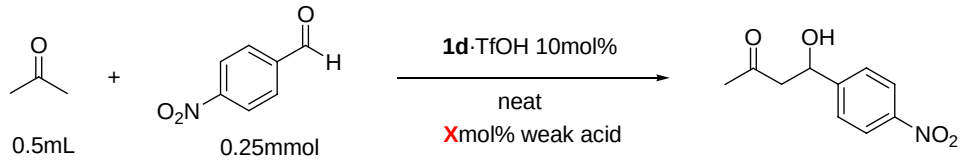
Solvent screening:



Solvents	Yield (%) [b]	*Ee* (%)
neat	83	94
neat[a]	40	92.4
Dioxane	61	93.2
CH_3CN	27	94.9
Toluene	88	91.7
MeOH	73	95.2
CH_2Cl_2	73	93.4
$CHCl_3$	63	93.2
$ClCH_2CH_2Cl$	61	94.0
Et_2O	79	93.2
DMSO	33	94.8
DMF	29	95.8
Hexane	59	93.4

[a] 10 eq H_2O was added. [b] isolated yields.

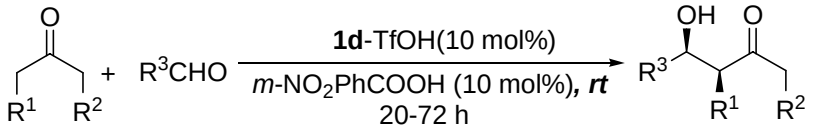
Screening of the second acid:

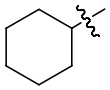


Weak acid[a]	**X**	**Time** (hour)	**Yield** (%)	***Ee*** (%)
PhCOOH	5	19	73	94.9
PhCOOH	10	19	80	94.9
PhCOOH	20	19	78	94.5
m-NO_2PhCOOH	10	19	94	95.2
PTSA	10	19	19	95.3
CPSA	10	19	2	n.d.
AcOH	10	19	59	95.1
TfOH	10	19	4	95.7
H_2O	100	19	42	95.5
H_2O	500	19	44	95.0

a: PTSA: p-Toluenesulfonic acid; CPSA: D-Camphor-10-Sulfonic Acid.

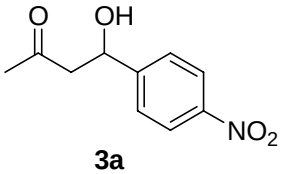
Full list of substrates [a]



entry	R^1, R^2	R^3	Yield (%) [b]	rr[c] *b:l*	dr[c] *syn:anti*	ee [d] (%)
1	H, H	2-NO_2Ph	92	----	----	94
2	H, H	3-NO_2Ph	96	----	----	94
3	H, H	4-CNPh	95	----	----	94
4	H, H	4-CF_3Ph	83	----	----	95
5	H, H	1-Napth	93	----	----	97
6	H, H	4-ClPh	63	----	----	94
7	H, H	2-ClPh	97	----	----	95
8	H, H	3-BrPh	92	----	----	92
9	H, H	2-BrPh	84	----	----	93
10	H, H	Ph	56	----	----	94
11	H, H	4-MeOPh	21	----	----	93
12	H, H		20	----	----	89
13[e]	Me, H	4-NO_2Ph	95	9:1	10:1	96
14[e]	Me, H	2-NO_2Ph	97	8:1	9:1	96
15[e]	Me, H	2-ClPh	85	>10:1	12:1	87
16	Me, H	1-Napth	53	4:1	5:1	92
17[e]	Me, Me	4-NO_2Ph	78	----	9:1	>95
18	Me, Et	4-NO_2Ph	75	>20:1	4:1	96
19	H, Et	4-NO_2Ph	92	1:5	----	88
20	H, ^{i}Pr	4-NO_2Ph	56	1:>20	----	85
21	BnO, H	4-NO_2Ph	98	>20:1	9:1	97
22	BnO, H	4-ClPh	91	>20:1	10:1	92
23	BnO, H	1-Napth	99	>10:1	5:1	>99
24	BnO, H	Ph	76	>20:1	5:1	86
25	-$(CH_2)_3$-	4-NO_2Ph	99	----	1:9	98[f]

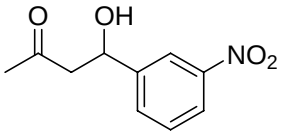
[a] Reaction with 20 equiv. of ketones under neat conditions. [b] Isolated yields. [c] Determined by ^{1}H NMR, rr: regioisomer ratio; b:l: the ratio of branched and linear products. [d] Determined by HPLC. [e] Reactions under 4 ^{o}C with 20 mol% of catalyst. [f] ee of the *anti* isomer, reaction with 2.0 equiv. of cyclohexanone in CH_2Cl_2 in 12 h.

Spectra data for all the Aldol products



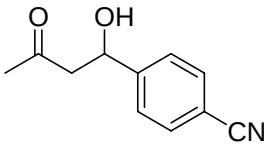
3a

Yield: 94%; Enantiomeric excess: 95%; [α]$^{20}_{D}$ = -61.8 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.22 (3H, s), 2.83-2.92 (2H, m), 3.56 (2H, d, *J* = 3.2 Hz), 5.24-5.29 (1H, m), 7.53 (2H, d, *J* = 8.9 Hz), 8.22 (2H, d, *J* = 8.9 Hz).



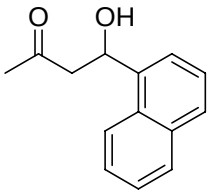
3b

Yield: 96%; Enantiomeric excess: 94%; [α]$^{20}_{D}$ = -66.1 (c= 2.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.23 (3H, s), 2.86-2.96 (2H, m), 3.58 (1H, br, s), 5.24-5.26 (1H, m), 7.50-7.57 (1H, t, *J* = 8.1 Hz), 7.70-7.76 (1H, m), 8.12-8.24 (2H, m).



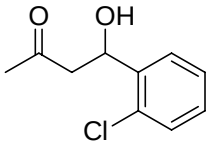
3c

Yield: 95%; Enantiomeric excess: 94%; [α]$^{20}_{D}$ = -70.2 (c= 0.5, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.19 (3H, s), 2.81 (2H, d, *J* = 6.2 Hz), 3.62-3.64 (1H, m), 5.16-5.21 (1H, m), 7.50(2H, d, *J* = 7.7 Hz), 7.60 (2H, d, *J* = 8.3 Hz).



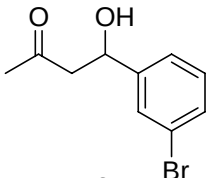
3d

Yield: 93%; Enantiomeric excess: 97%; [α]$^{20}_{D}$ = -84.0 (c= 0.5, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.23 (3H, s), 2.97-3.04 (2H, m), 3.38 (1H, br), 5.94-5.98 (1H, m), 7.46-7.52 (3H, m), 7.69 (1H, d , *J* = 7.2 Hz), 7.79 (1H, d, *J* = 8.3 Hz), 7.86-7.89 (1H, m), 8.01-8.02 (1H, m).



3e

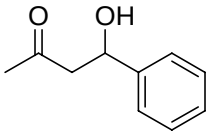
Yield: 97%; Enantiomeric excess: 95%; [α]$^{20}_{D}$ = -86.5 (c= 2.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.17 (3H, s), 2.56-2.63 (1H, dd, *J* = 9.6 Hz, 9.6 Hz, 17.7 Hz), 2.90-2.97 (1H, dd, *J* = 2.3 Hz, 2.3 Hz, 17.7 Hz), 3.55 (1H, d, *J* = 3.4 Hz), 5.42-5.48 (1H, m), 7.12-7.29 (3H, m), 7.58-7.59 (1H, m).



3f

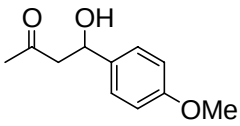
Yield: 92%; Enantiomeric excess: 92%; [α]$^{20}_{D}$ = -51.7 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.20 (3H, s), 2.82 (1H, s), 2.82-2.86 (1H, d, *J* = 2.6 Hz), 3.35-3.41 (1H, m), 5.06-5.16 (1H, m), 7.16-7.31 (2H, m), 7.37-7.44 (1H, m),

7.53 (1H, s).



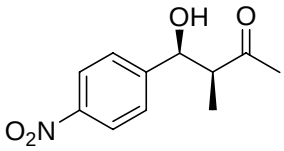
3g

Yield: 56%; Enantiomeric excess: 94%; [α]$^{20}_{D}$ = -62.9 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.20 (3H, s), 2.82-2.91 (2H, m), 3.25 (1H, br), 5.14-5.18 (1H, dd, *J* = 3.8 Hz, 3.6 Hz, 8.7 Hz), 7.28-7.33 (1H, m), 7.34-7.36 (4H, d, *J* = 4.2 Hz).



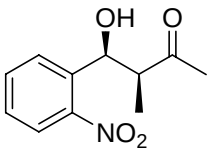
3h

Yield: 21%; Enantiomeric excess: 93%; ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.17 (3H, s), 2.75-2.92 (2H, m), 3.22 (1H, br), 3.79 (3H, s), 5.07-5.11 (1H, dd, *J* = 3.4 Hz, 3.4 Hz, 8.6 Hz), 6.85-6.89 (2H, m), 7.24-7.28 (2H, m).



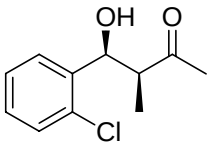
4a

Yield: 95%; *For syn isomer*: enantiomeric excess : 96%; [α]$^{20}_{D}$ = -50.6 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.04 (3H, d, *J* = 7.4 Hz), 2.24 (3H, s), 2.78-2.87 (1H, m), 3.43 (1H, d, *J* = 2.6 Hz), 5.28 (1H, t, *J* = 2.5 Hz), 7.52 (2H, d, *J* = 9.0 Hz), 8.20 (2H, d, *J* = 8.7 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 9.5, 29.1, 52.4, 71.7, 123.5, 126.7, 147.2, 149.0, 213.2; HRMS for $C_{11}H_{14}N_2O_4$ $(M+1)^+$, calcd. 224.0917, found 224.0918.



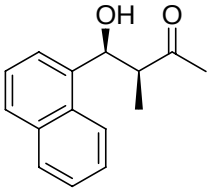
4b

Yield: 97%; *For syn isomer*: enantiomeric excess : 96%; [α]$^{20}_{D}$ = +45.6 (c= 0.25, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.05 (3H, d, *J* = 7.5 Hz), 2.30 (3H, s), 3.03-3.12 (1H, m), 5.78 (1H, d, *J* = 1.9 Hz), 7.41-7.51 (1H, m), 7.61-7.75 (1H, m), 7.88 (1H, d, *J* = 7.9 Hz), 8.04 (1H, dd, *J* = 1.1 Hz, 1.1 Hz, 8.3 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 9.2, 28.9, 49.9, 67.9, 124.8, 128.2, 129.4, 133.4, 137.0, 147.1, 213.9; HRMS for $C_{11}H_{14}N_2O_4$ $(M+1)^+$, calcd. 224.0917, found 224.0917.



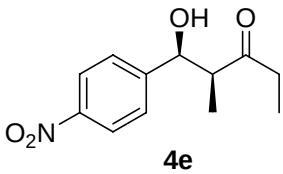
4c

Yield: 85%; *For syn isomer*: enantiomeric excess : 87%; Product containing inseparable linear isomer. ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.94-0.99 (3H, d, *J* = 7.4 Hz), 2.24 (3H, s), 2.93-3.06 (1H, m), 3.25 (1H, d, *J* = 2.6 Hz), 5.44-5.49 (1H, m), 7.14-7.34 (3H, m), 7.51-7.62 (1H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 8.8, 29.0, 49.1, 69.2, 126.7, 128.3, 128.4, 129.3, 131.0, 138.6, 213.9; HRMS for $C_{11}H_{14}ClO_2$ $(M+1)^+$, calcd. 213.0677, found 213.0678.



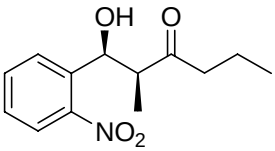
4d

Yield: 53%; *For syn isomer*: enantiomeric excess: 92%; [α]$^{20}_{D}$ = -66.0 (c= 0.5, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.05-1.12 (3H, m), 2.25 (3H, s), 2.98-3.07 (1H, m), 3.17 (1H, d, *J* = 2.5 Hz), 5.99 (1H, s), 7.49-7.54 (3H, m), 7.71-7.76 (1H, d, *J* = 7.2 Hz), 7.76-7.84 (1H, d, *J* = 8.1 Hz), 7.87-7.90 (2H, m) ; ^{13}C NMR ($CDCl_3$, 75MHz): δ 9.8, 29.1, 51.3, 69.1, 122.3, 124.1, 125.3, 125.4, 126.1, 127.8, 129.1, 129.6, 133.7, 136.7, 213.7; HRMS for $C_{15}H17O_2$ $(M+1)^+$, calcd. 229.1223, found 229.1223.



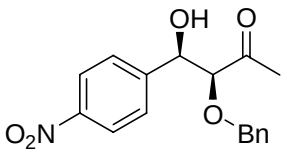
4e

Yield: 78%; *For syn isomer*: enantiomeric excess : >95%; [α]$^{20}_{D}$ = -19.4 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.01-1.09 (6H, m), 2.41-2.65 (2H, m), 2.82-2.85 (1H, m), 3.56 (1H, d, *J* = 2.3 Hz), 5.23 (1H, t, *J* = 2.5 Hz), 7.50 (2H, d, *J* = 8.3 Hz), 8.18-8.22 (2H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 7.5, 9.9, 29.7, 35.1, 51.4, 71.9, 123.5, 126.8, 147.2, 149.1, 216.1; HRMS for $C_{12}H_{16}NO_4$ $(M+1)^+$, calcd. 238.1074, found 238.1075.



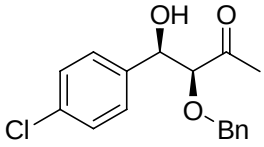
4f

Yield: 75%; *For syn isomer*: enantiomeric excess : 96%; [α]$^{20}_{D}$ = -23.6 (c= 0.5, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.88-0.94 (3H, t, *J* = 7.4 Hz), 1.01-1.04 (3H, d, *J* = 7.4 Hz), 1.58-1.65 (2H, m), 2.44-2.54 (2H, m), 2.81-2.83 (1H, m), 3.57 (1H, d, *J* = 2.3 Hz), 5.23 (1H, t, *J* = 2.6 Hz), 7.51 (2H, d, *J* = 8.9 Hz), 8.20 (2H, d, *J* = 8.9 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 9.7, 13.7, 16.9, 43.8, 51.5, 71.9, 123.5, 126.8, 134.8, 149.1, 215.7; HRMS for $C_{13}H_{18}NO_4$ $(M+1)^+$, calcd. 252.1230, found 252.1231.



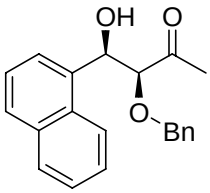
4g

Yield: 98%; *For syn isomer*: enantiomeric excess : 97%; [α]$^{20}_{D}$ = -72.4 (c= 0.25, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.21 (3H, s), 3.13-3.15 (1H, br), 3.96 (1H, d, *J* = 3.6 Hz), 4.35(1H, d, *J* = 11.5 Hz), 4.58 (1H, d, *J* = 11.5 Hz), 5.06-5.10 (1H, m), 7.03-7.10 (2H, m), 7.22-7.30 (3H, m), 7.49 (2H, d, *J* = 8.9 Hz), 8.17 (2H, d, *J* = 8.9 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 27.8, 73.5, 73.8, 87.0, 123.5, 127.1, 128.2, 128.5, 128.6, 136.0, 147.5, 147.6, 209.8; HRMS for $C_{17}H_{18}NO_5$ $(M+1)^+$, calcd. 316.1174, found 316.1181.



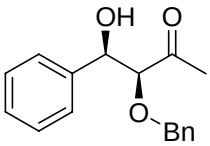
4h

Yield: 91%; *For syn isomer*: enantiomeric excess : 92%; [α]$^{20}_{D}$ = -59.8 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.12 (3H, s), 3.03 (1H, br), 3.90 (1H, d, *J* = 4.1 Hz), 4.32-4.59 (2H, AB, *J* = 27 Hz, 11.6 Hz), 4.91 (1H, d, *J* = 4.0Hz), 7.09-7.12 (2H, m), 7.21-7.31 (7H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 27.8, 73.6, 73.7, 87.8, 127.6, 128.1, 128.3, 128.5, 133.8, 136.3, 138.3, 209.8; HRMS for $C_{17}H_{18}ClO_3$ $(M+1)^+$, calcd. 305.0939, found 305.0940.



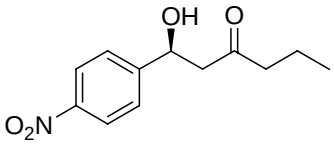
4i

Yield: 99%; *For syn isomer*: enantiomeric excess : >99%; [α]$^{20}_{D}$ = -95.5 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.21 (3H, s), 3.05 (1H, br), 4.01-4.39 (3H, m), 5.80 (1H, s), 6.90-7.06 (2H, m), 7.13-7.30 (5H, m), 7.47-7.52 (3H, m), 7.69 (1H, d, *J* = 7.0 Hz), 7.80-7.88 (2H, m), 7.96-8.01 (2H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 27.9, 71.7, 74.0, 86.5, 122.4, 124.1, 125.2, 125.6, 126.4, 128.0, 128.3, 128.5, 129.0, 129.8, 133.7, 135.6, 136.3, 210.5; HRMS for $C_{21}H_{21}NO_3$ $(M+1)^+$, calcd. 321.1485, found 321.1487.



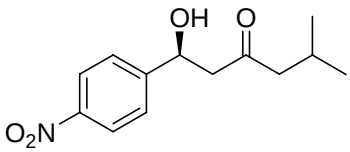
4j

Yield: 76%; *For syn isomer*: enantiomeric excess :86%; [α]$^{20}_{D}$ = -68.0 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 2.08 (3H, s), 2.9 (1H, br), 3.94 (1H, d, *J* = 4.3 Hz), 4.30-4.59 (2H, AB, *J* = 46.7 Hz, 11.7 Hz), 4.94 (1H, d, *J* = 4.0 Hz), 7.15-7.17 (2H, m), 7.28-7.35 (8H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 27.8, 73.5, 74.4, 88.2, 126.3, 128.1, 128.2, 128.4, 128.5, 136.6, 139.7, 209.8; HRMS for $C_{17}H_{19}O_3$ $(M+1)^+$, calcd. 271.1329, found 271.1332



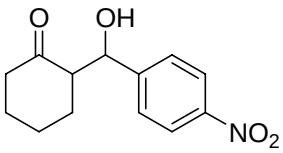
4k

Yield: 92%; Enantiomeric excess : 88%; [α]$^{20}_{D}$ = -53.4 (c= 0.5, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.91 (3H, t, *J* = 7.5 Hz), 1.57-1.69 (2H, m), 2.42 (2H, t, *J* = 7.4 Hz), 2.79-2.86 (2H, m), 3.70 (1H, s), 5.23-5.28 (1H, m), 7.53 (2H, d, *J*= 8.7 hz), 8.18 (2H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 13.6, 17.0, 45.5, 50.6, 69.0, 123.7, 126.4, 147.3, 150.2, 211.0; HRMS for $C_{12}H_{16}NO_4$ $(M+1)^+$, calcd. 238.1074, found 238.1072.



4l

Yield: 56%; Enantiomeric excess : 85%; [α]$^{20}_{D}$ = -42.5 (c= 1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.83-0.91 (6H, d, *J* = 6.8 Hz), 2.08-2.15 (1H, m), 2.30 (2H, d, *J* = 7.0 Hz), 2.77-2.79 (2H, m), 3.75 (1H, d, *J* = 3.2 Hz), 5.24-5.27 (1H, m), 7.52 (2H, d, *J* = 8.5 Hz), 8.18 (2H, d, *J* = 8.7 Hz); ^{13}C NMR ($CDCl_3$, 75MHz): δ 22.5, 24.6, 51.1, 52.5, 68.9, 123.7, 126.4, 147.3, 150.2, 210.7; HRMS for $C_{13}H_{18}NO_4$ $(M+1)^+$, calcd. 252.1225, found 252.1227.



4m

Yield: 99%; *For anti isomer*: enantiomeric excess: 98%; [α]$^{20}_{D}$ = -9.6 (c=1.0, $CHCl_3$); ^{1}H NMR (300 MHz, $CDCl_3$): δ 1.32-1.46 (1H, m), 1.46-1.76 (2H, m), 1.76-1.91 (1H, m), 2.04-2.19 (1H, m), 2.28-2.44 (1H, m), 2.44-2.72 (2H, m), 4.06 (1H, d, *J* = 3.0 Hz), 4.81-4.91 (1H, dd, *J* = 3.0 Hz, 3.2 Hz, 8.3 Hz), 7.43-7.67 (2H, m), 8.10-8.37 (2H, m); ^{13}C NMR ($CDCl_3$, 75MHz): δ 24.7, 27.6, 30.7, 42.6, 57.1, 74.0, 123.5, 127.8, 147.6, 148.3, 214.6.

References:

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2. (a) Samanta, S.; Liu, J.; Dodda, R.; Zhao, C.-G. *Org. Lett.* **2005**, *7*, 5321. (b) Chen, J.-R.; Lu, H.-H.; Li, X.-Y.; Chen, L.; Wan, J.; Xiao, W.-J. *Org. Lett.* **2005**, *7*, 4543. (c) Tang, Z.; Yang, Z.-H.; Chen, X.-H.; Cun, L.-F.; Mi, A.-Q.; Jiang, Y.-Z.; Gong, L.-Z. *J. Am. Chem. Soc.* **2005**, *127*, 9285. (d) Kano, T.; Tokuda, O.; Takai, J.; Maruoka, K. *Chem.-Asian. J.* **2006**, 210-215.
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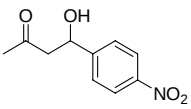
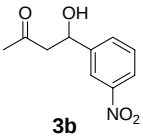
5. Ramasastry, S. S. V.; Zhang, H.; Tanaka, F.; Barbas, C. F., III. *J. Am. Chem. Soc.* **2007**, *129*, 288-289.

HPLC conditions & ^{1}HNMR determination of diastereoselectivity:



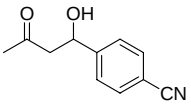
3a

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.5 mL/min; t_R= 28.817 (minor), t_S= 33.852 (major).



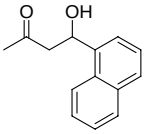
3b

The enantiomeric excess was determined by HPLC with an OJ-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.8 mL/min; t_R= 22.355 (minor), t_S= 24.083 (major).



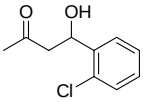
3c

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.5 mL/min; t_R= 25.689 (minor), t_S= 43.574 (major).



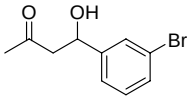
3d

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 15:85), 25℃, 0.8 mL/min; t_S = 12.105 (major), t_R= 13.192 (minor).



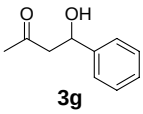
3e

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 10:90), 25℃, 0.6 mL/min; t_S= 24.087 (major) t_R= 34.623 (minor),.



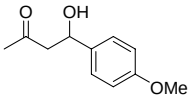
3f

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 10:90), 25℃, 0.8 mL/min; t_R= 16.956 (minor), t_S= 17.488 (major).



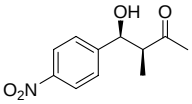
3g

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 15:85), 25℃, 0.8 mL/min; t_R= 11.661 (minor), t_S= 12.857 (major).



3h

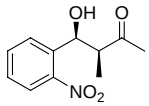
The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 10:90), 25℃, 0.8 mL/min; t_R= 37.701 (minor), t_S= 41.043 (major).



4a

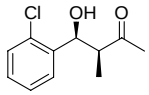
The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.5 mL/min; for *syn* isomer: t_R= 19.009

(minor), t_S= 21.750 (major); HOC<u>H</u>(Ar): δ 5.28 (*syn*, d, *J* = 2.8Hz), 4.87 (*anti*, d, *J* = 7.9Hz).



4b

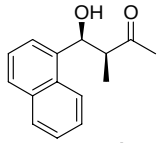
The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.6 mL/min; for *syn* isomer: t_R= 14.598 (minor), t_S= 15.097 (major); HOC<u>H</u>(Ar): δ 5.78 (*syn*, d, *J* = 1.9Hz), 5.67 (*anti*, dd, *J* = 9.4Hz, 1.9Hz).



4c

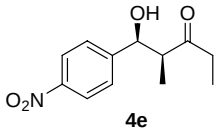
The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 10:90), 25℃, 0.6 mL/min; for *syn* isomer: t_R= 17.379 (minor), t_S= 20.310 (major); HOC<u>H</u>(Ar): δ 5.48 (*syn*, d, *J* = 1.7Hz), 5.45 (*anti*, d, *J* = 2.3Hz)

.



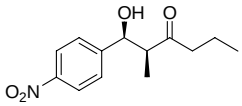
4d

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.8 mL/min; for *syn* isomer: t_R= 11.41 (minor), t_S= 12.15 (major); HOC<u>H</u>(Ar): δ 5.94 (*syn*, d, *J* = 3.0Hz), 5.49 (*anti*, d, *J* = 8.1Hz).



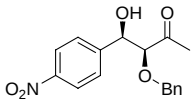
4e

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 5:95), 20℃, 0.8 mL/min; for *syn* isomer: t_S= 40.549 (major) t_R= 43.244 (minor); HOC<u>H</u>(Ar): δ 5.23 (*syn*, t, *J* = 2.6Hz), 4.88 (*anti*, dd, *J* = 7.5Hz, 5.5Hz) [4].



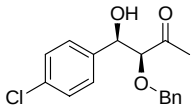
4f

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 5:95), 25℃, 0.8 mL/min; for *syn* isomer: t_R= 38.606 (minor), t_S= 43.452 (major); HOC<u>H</u>(Ar): δ 5.23 (*syn*, br s), 4.88 (*anti*, dd, *J* = 7.2Hz, 4.9Hz).



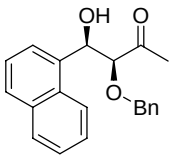
4g

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.5 mL/min; for *syn* isomer: t_R= 17.258 (minor), t_S= 27.337 (major); HOC<u>H</u>(Ar): δ 5.09 (*syn*, d, *J* = 3.6Hz), 5.04 (*anti*, d, *J* = 6.4Hz).



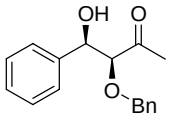
4h

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.8 mL/min; for *syn* isomer: t_R= 9.05 (minor), t_S= 15.07 (major); HOC<u>H</u>(Ar): δ 4.92 (*syn*, d, *J* = 4.1Hz), 4.88 (*anti*, d, *J* = 6.4Hz).



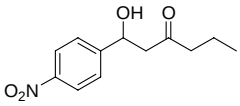
4i

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.8 mL/min; for *syn* isomer: t_R= 7.51 (minor), t_S= 10.30 (major); HOC<u>H</u>(Ar): δ 5.82 (*syn*, d, *J* = 2.5Hz), 5.74 (*anti*, d, *J* = 6.2Hz).



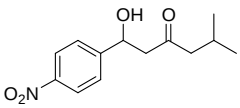
4j

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.8 mL/min; for *syn* isomer: t_R= 9.42 (minor), t_S= 15.65 (major); HOC<u>H</u>(Ar): δ 4.97 (*syn*, d, *J* = 4.1Hz), 4.90 (*anti*, d, *J* = 6.6Hz).



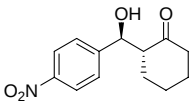
4k

The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.5 mL/min; t_R= 18.478 (minor), t_S= 27.158 (major).



4l

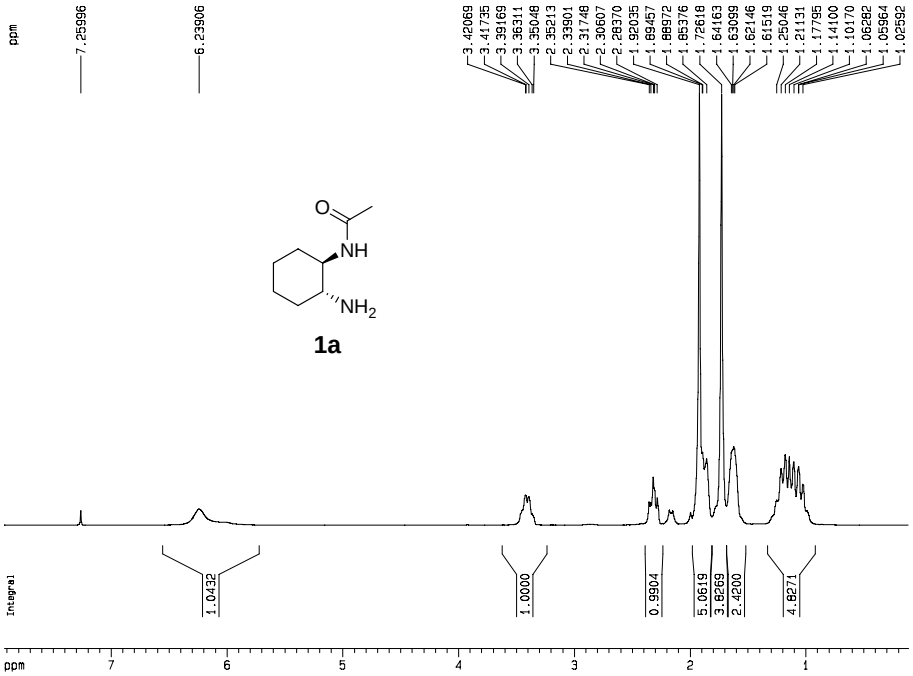
The enantiomeric excess was determined by HPLC with an AS-H column at 254 nm (2-propanol: Hexane = 30:70), 25℃, 0.6 mL/min; t_R= 13.727 (minor), t_S= 14.524 (major).



4m

The enantiomeric excess was determined by HPLC with an AD-H column at 254 nm (2-propanol: Hexane = 20:80), 25℃, 0.5 mL/min; t_S = 22.443 (major), t_R= 28.598 (minor). HOC<u>H</u>(Ar): δ 5.46 (*syn*, d, J= 1.9 Hz), 4.88 (*anti*, d, *J* = 8.3Hz).

NMR spectra for catalysts 1 and 2



1a

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Current Data Parameters
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EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20060719
Time                13.31
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ             5.3084660 sec
RG                   80.6
DW                81.000 usec
DE                 6.00 usec
TE                302.1 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300066 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  11.00 cm
F1P                  7.924 ppm
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F2P                  0.115 ppm
F2                  34.49 Hz
PPMCM             0.35496 ppm/cm
HZCM            106.53506 Hz/cm
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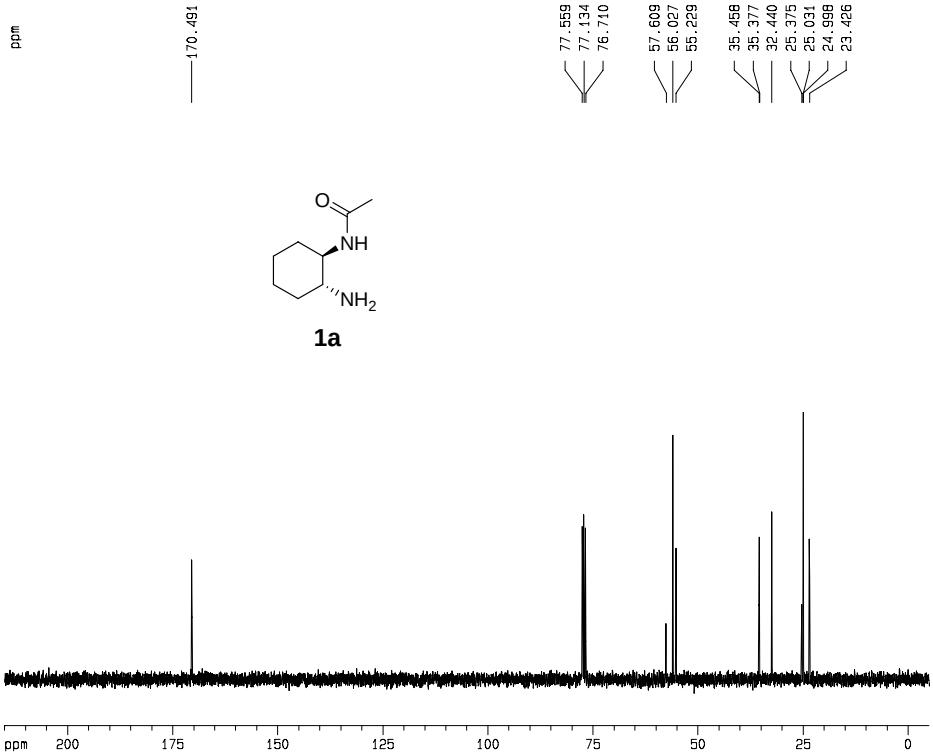

1a

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Current Data Parameters
NAME      Luo-N-AcCylodia
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
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Time                13.36
INSTRUM            av300
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PULPROG          zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     57
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ             1.8219508 sec
RG                  456.1
DW                27.800 usec
DE                 6.00 usec
TE                302.4 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                   6.00 cm
F1P                215.000 ppm
F1                16225.57 Hz
F2P                 -5.000 ppm
F2                 -377.34 Hz
PPMCM             11.00000 ppm/cm
HZCM             830.14520 Hz/cm
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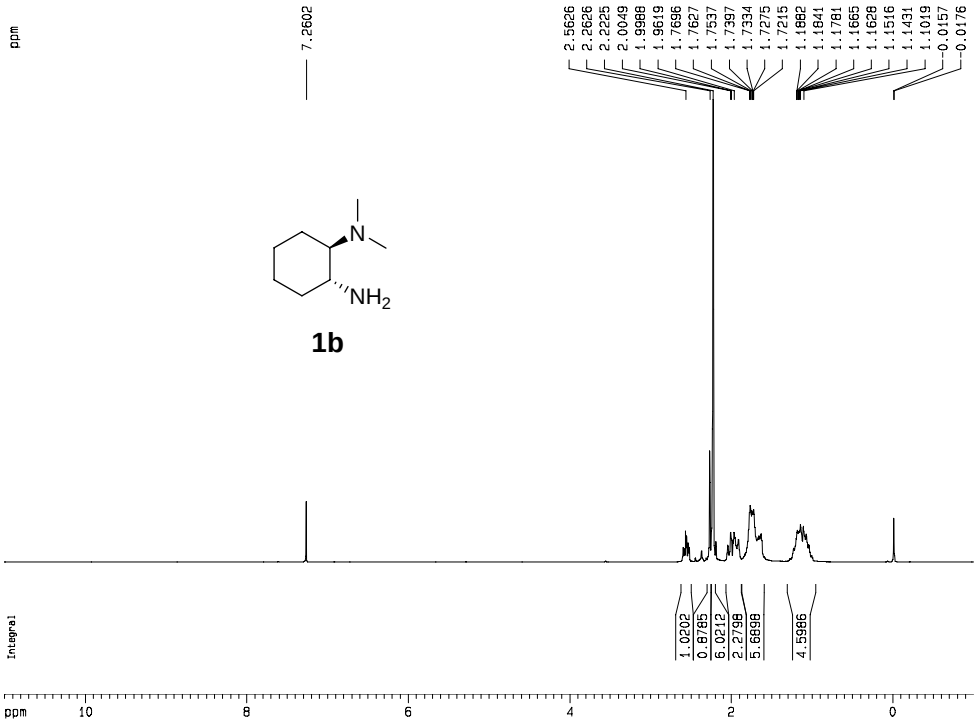


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Current Data Parameters
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EXPNO                  10
PROCNO                  1

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Time                13.34
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ            5.3084660 sec
RG                 228.1
DW                81.000 usec
DE                  6.00 usec
TE                 302.0 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300064 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  20.00 cm
F1P                11.000 ppm
F1                3301.43 Hz
F2P                -1.000 ppm
F2                -300.13 Hz
PPMCM             0.54545 ppm/cm
HZCM            163.70728 Hz/cm
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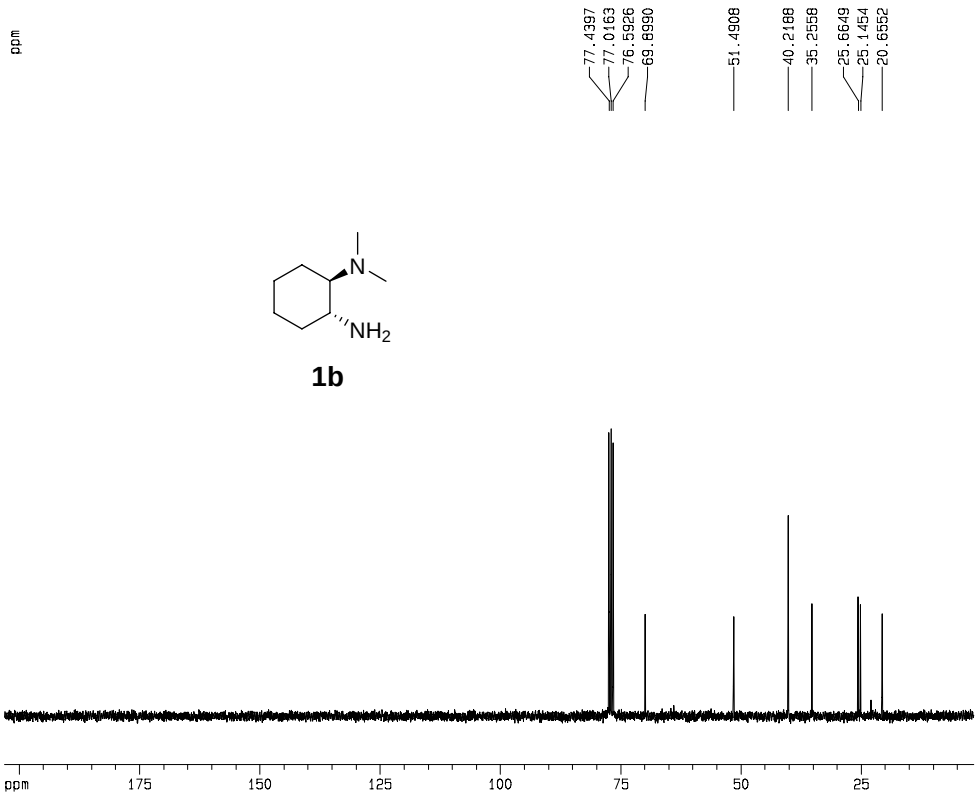


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Current Data Parameters
NAME          XH-060828-3
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
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Time                13.48
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PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    185
DS                      4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ            1.8219508 sec
RG                1448.2
DW                27.800 usec
DE                  6.00 usec
TE                 302.5 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                   6.00 cm
F1P               203.109 ppm
F1               15328.15 Hz
F2P                1.614 ppm
F2                121.77 Hz
PPMCM            10.07475 ppm/cm
HZCM            760.31891 Hz/cm
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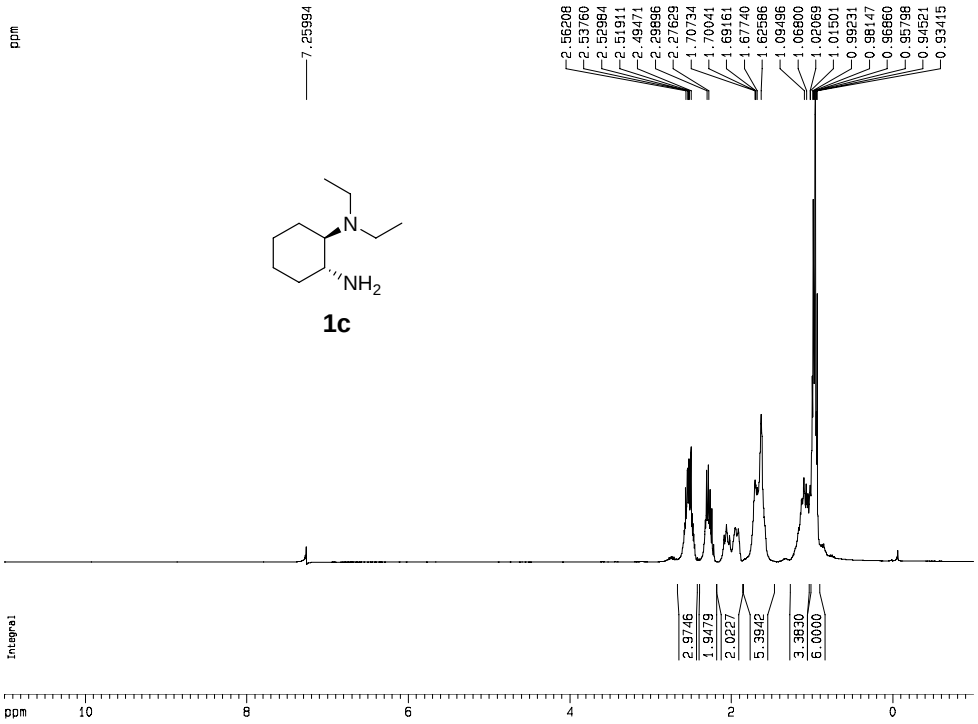


```
Current Data Parameters
NAME          XH-061108-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061109
Time                12.48
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                    64
DW                81.000 usec
DE                  6.00 usec
TE                 298.5 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF            300.1300064 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                 11.00 cm
F1P               11.000 ppm
F1               3301.43 Hz
F2P               -1.000 ppm
F2               -300.13 Hz
PPMCM            0.54545 ppm/cm
HZCM           163.70728 Hz/cm
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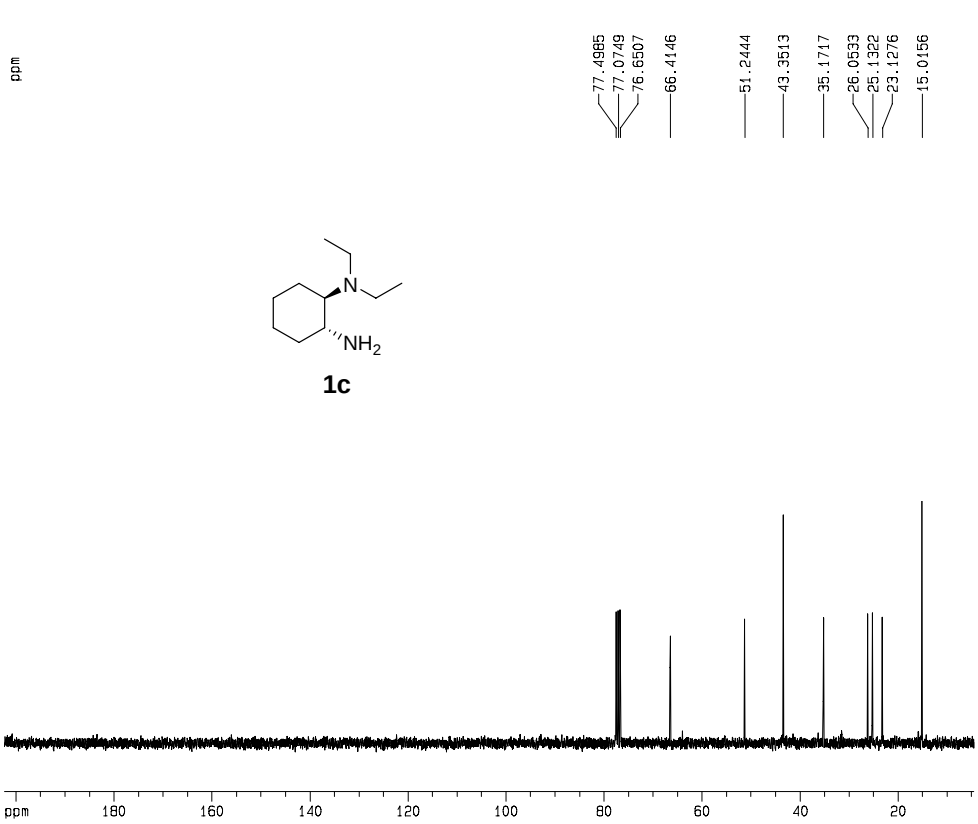


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EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
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Time                12.51
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PULPROG           zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    52
DS                     4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ            1.8219508 sec
RG                   362
DW                27.800 usec
DE                  6.00 usec
TE                 298.7 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2         300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF            75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                  5.00 cm
F1P              202.319 ppm
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F2P                4.507 ppm
F2               340.14 Hz
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HZCM           746.42273 Hz/cm
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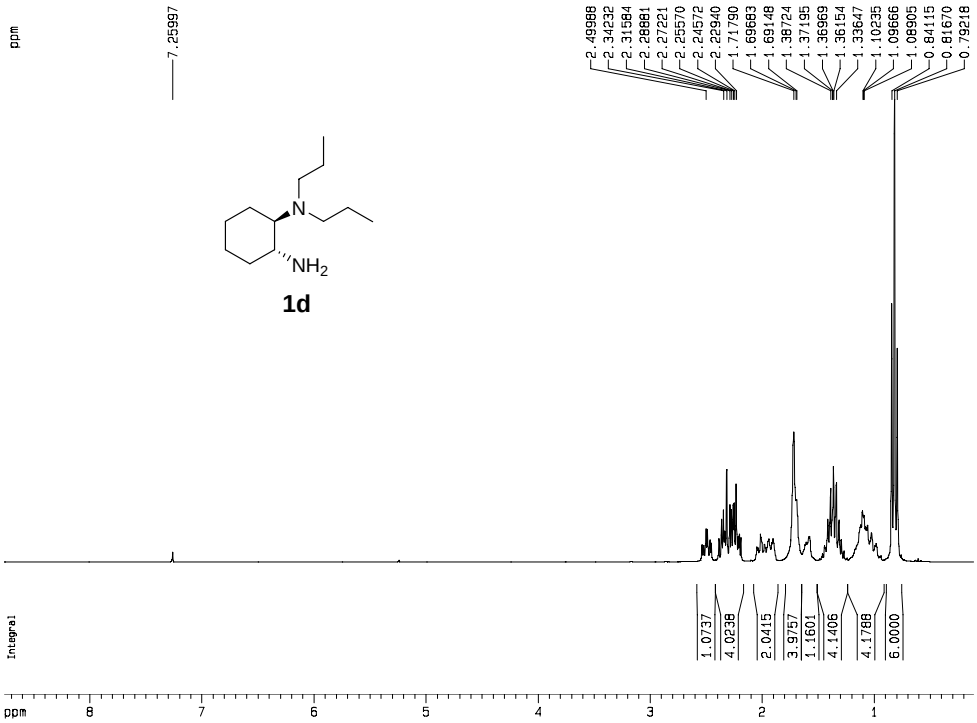

1d

```
Current Data Parameters
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EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061030
Time               21.27
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PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                 50.8
DW               81.000 usec
DE                6.00 usec
TE                298.4 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF           300.1300066 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                 11.00 cm
F1P                8.764 ppm
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HZCM          117.99377 Hz/cm
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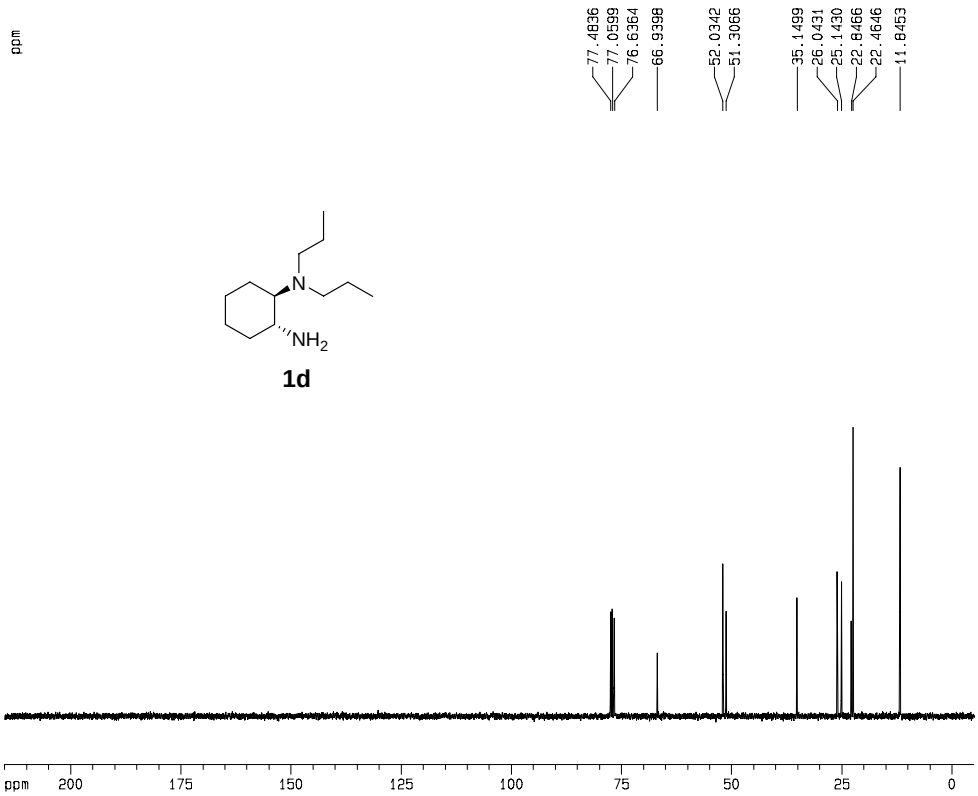

1d

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Current Data Parameters
NAME          XH-061030-4
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061030
Time               21.31
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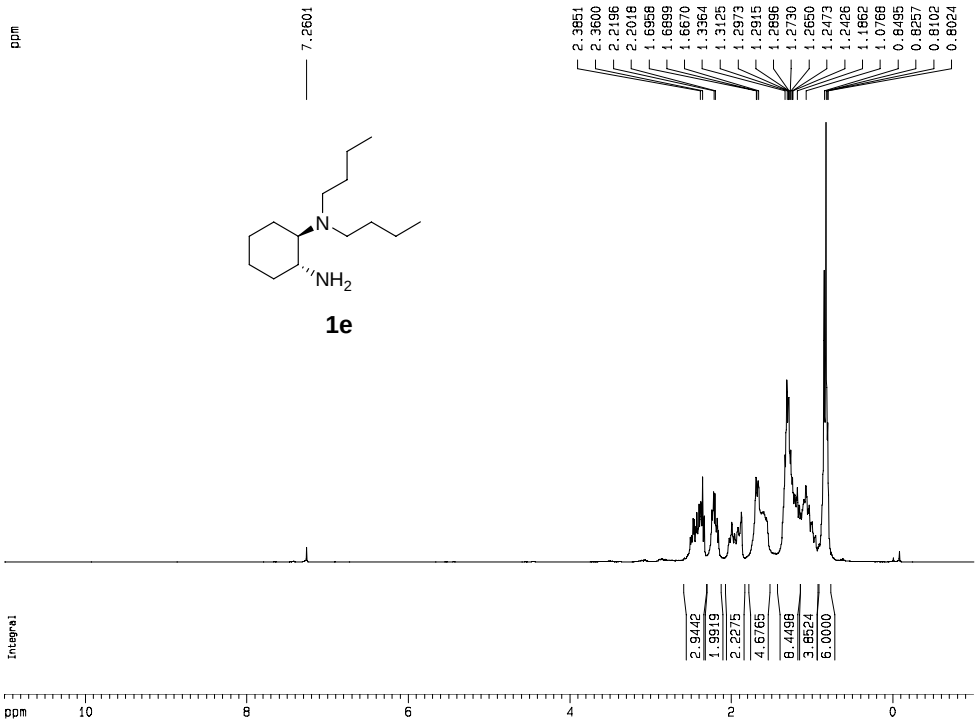
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   60
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                456.1
DW               27.800 usec
DE                6.00 usec
TE                298.8 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF           75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                  6.00 cm
F1P              215.000 ppm
F1             16225.57 Hz
F2P               -5.000 ppm
F2              -377.34 Hz
PPMCM          11.00000 ppm/cm
HZCM          830.14520 Hz/cm
```



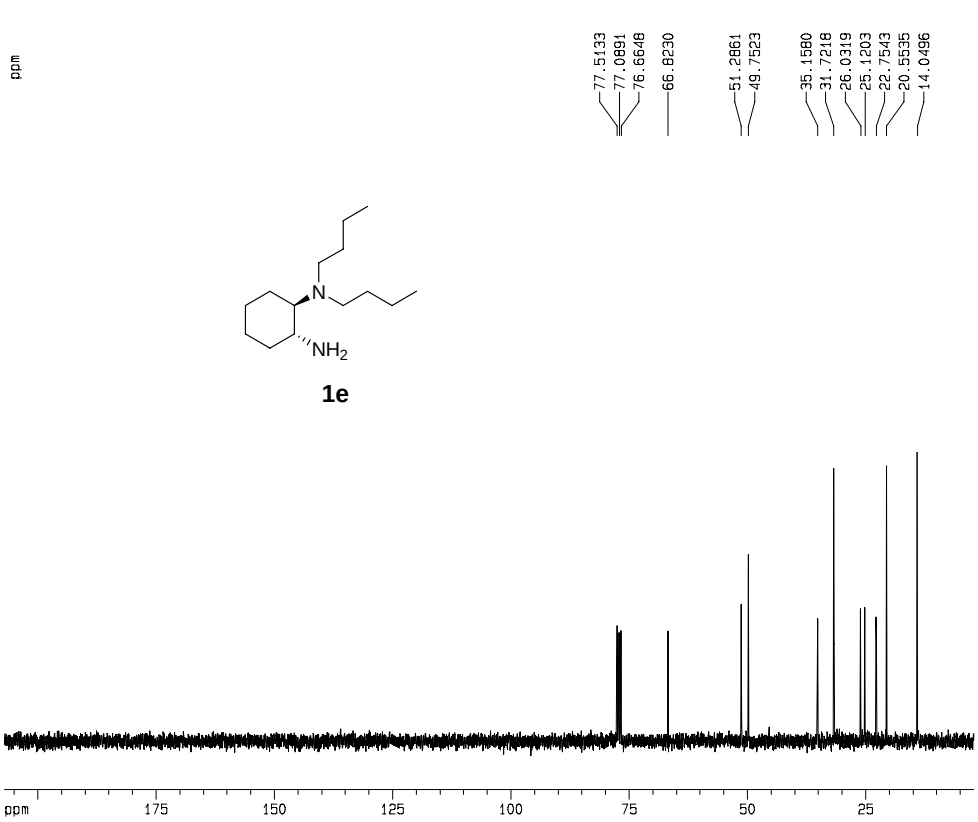

```
Current Data Parameters
NAME          XH-061127-3
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061127
Time                19.19
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                      7
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                   35.9
DW                81.000 usec
DE                  6.00 usec
TE                 298.4 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300066 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  10.00 cm
F1P                11.000 ppm
F1                3301.43 Hz
F2P                -1.000 ppm
F2                -300.13 Hz
PPMCM             0.54545 ppm/cm
HZCM            163.70728 Hz/cm
```




```
Current Data Parameters
NAME          XH-061127-3
EXPNO                  11
PROCNO                  1

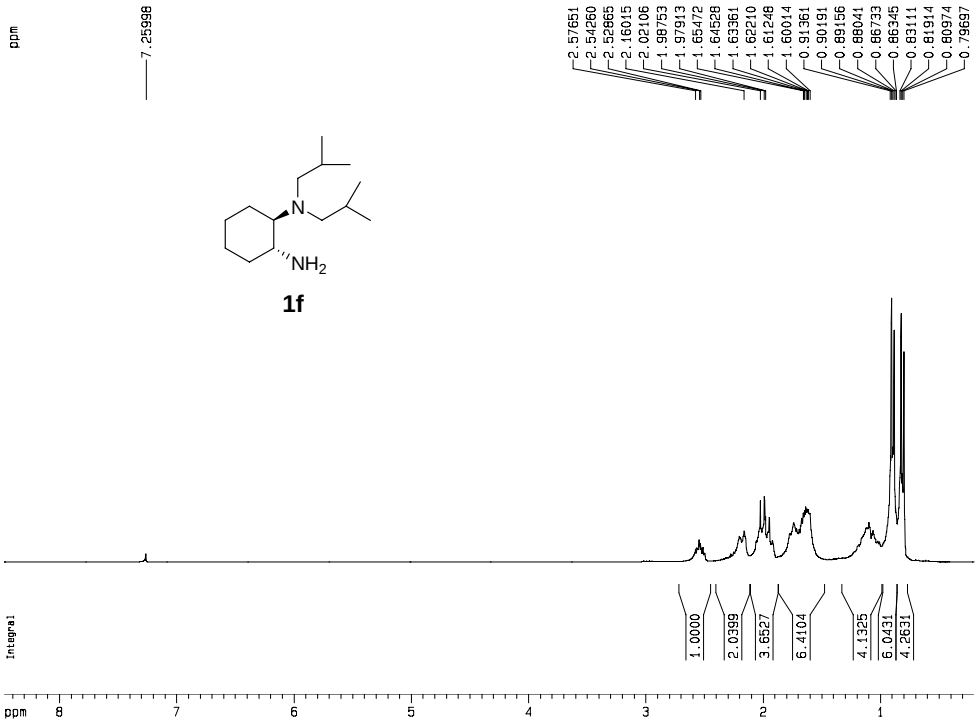
F2 - Acquisition Parameters
Date_            20061127
Time                19.21
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     12
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ            1.8219508 sec
RG                  456.1
DW                27.800 usec
DE                  6.00 usec
TE                 298.6 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                   6.00 cm
F1P               207.054 ppm
F1               15625.93 Hz
F2P                2.140 ppm
F2                 161.48 Hz
PPMCM            10.24573 ppm/cm
HZCM            773.22253 Hz/cm
```



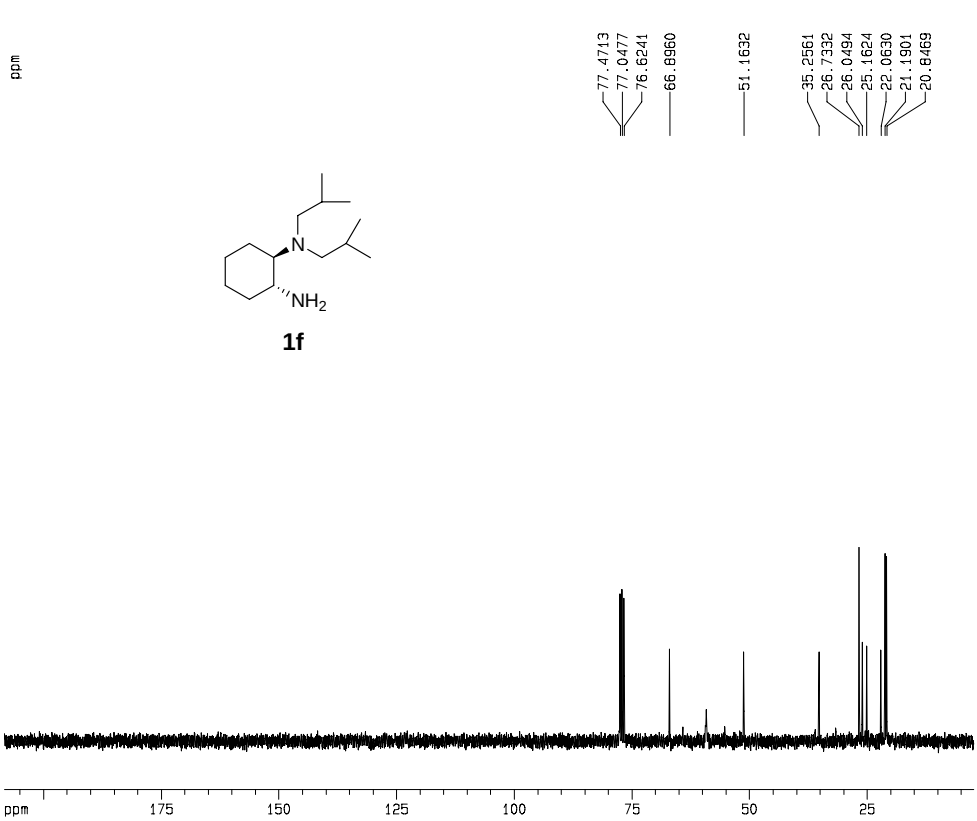

```
Current Data Parameters
NAME          xh-061110-3
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061110
Time               13.58
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                     6
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                71.8
DW               81.000 usec
DE                6.00 usec
TE               298.5 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300062 MHz
WDW                  EM
SSB                   0
LB                 0.30 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P               8.470 ppm
F1             2542.16 Hz
F2P               0.207 ppm
F2               62.12 Hz
PPMCM          0.37560 ppm/cm
HZCM         112.72897 Hz/cm
```




```
Current Data Parameters
NAME          xh-061110-3
EXPNO                  11
PROCNO                  1

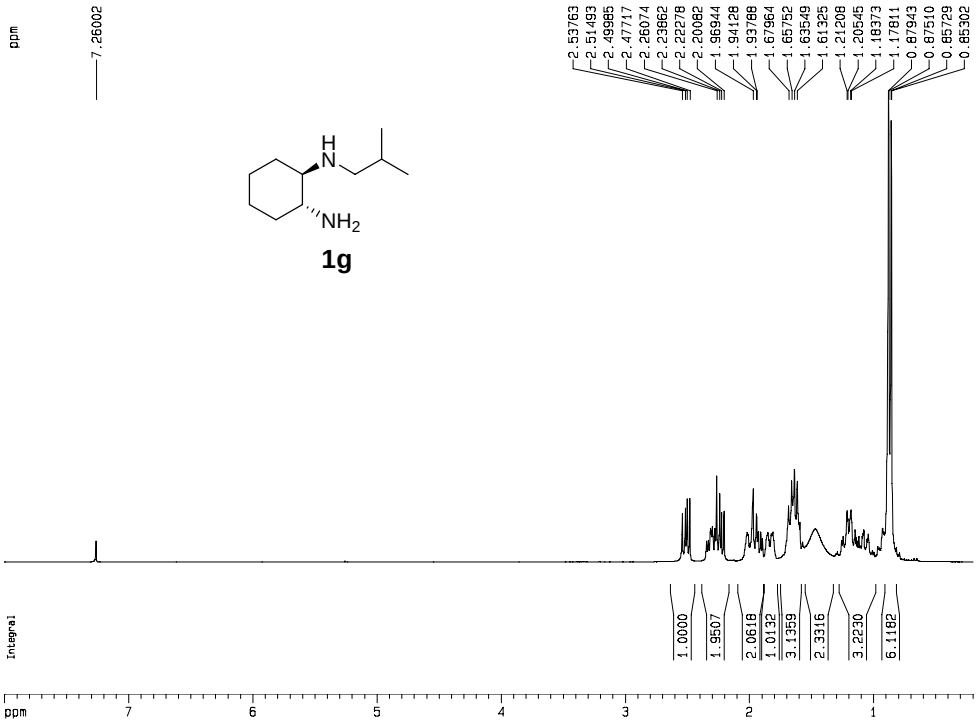
F2 - Acquisition Parameters
Date_           20061110
Time               14.01
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                    41
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                574.7
DW               27.800 usec
DE                6.00 usec
TE               298.7 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                 4.00 cm
F1P             208.370 ppm
F1            15725.19 Hz
F2P               2.403 ppm
F2              181.33 Hz
PPMCM          10.29834 ppm/cm
HZCM         777.19287 Hz/cm
```



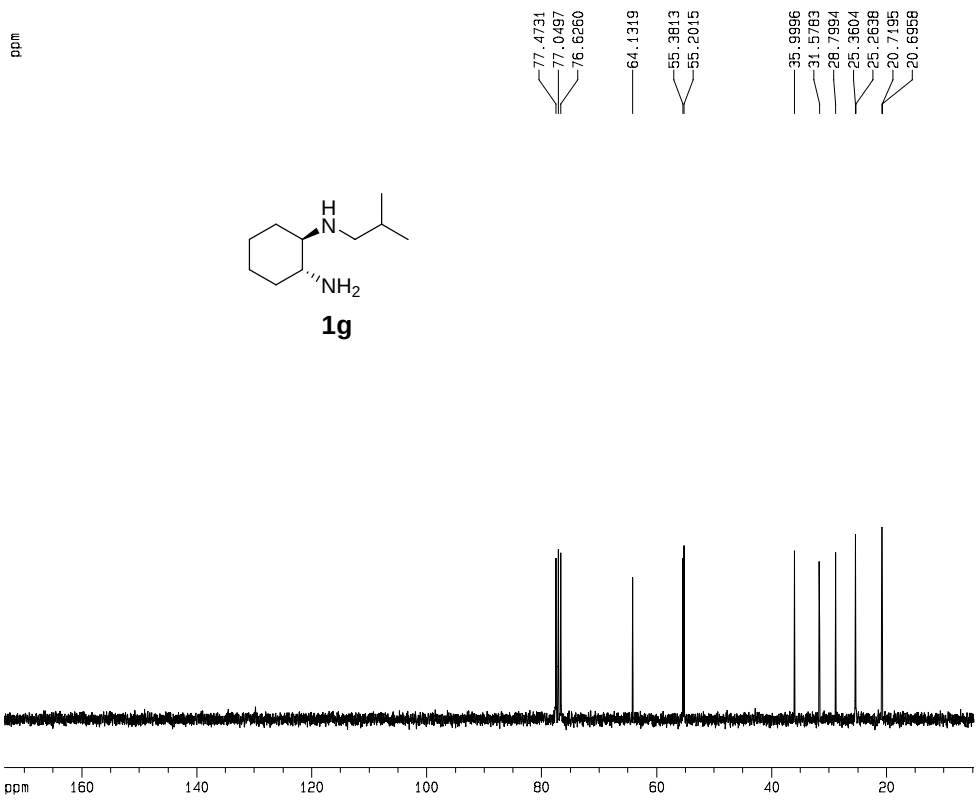

```
Current Data Parameters
NAME          XH-060901-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20060901
Time                12.21
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                   71.8
DW                81.000 usec
DE                  6.00 usec
TE                 300.9 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300064 MHz
WDW                    EM
SSB                     0
LB                   0.30 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  11.00 cm
F1P                 8.002 ppm
F1                 2401.60 Hz
F2P                 0.196 ppm
F2                  58.76 Hz
PPMCM            0.35482 ppm/cm
HZCM           106.49268 Hz/cm
```




```
Current Data Parameters
NAME          XH-060901-2
EXPNO                  11
PROCNO                  1

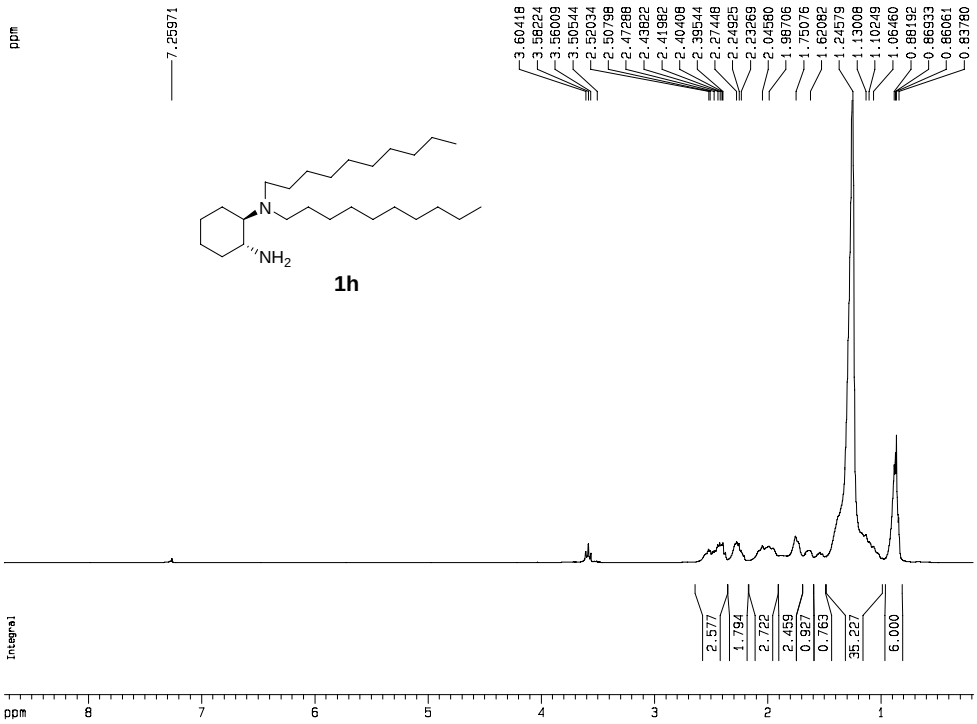
F2 - Acquisition Parameters
Date_            20060901
Time                12.26
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     35
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ            1.8219508 sec
RG                  645.1
DW                27.800 usec
DE                  6.00 usec
TE                 301.1 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                   4.00 cm
F1P                173.436 ppm
F1               13088.79 Hz
F2P                 4.771 ppm
F2                 360.06 Hz
PPMCM            8.43323 ppm/cm
HZCM           636.43658 Hz/cm
```



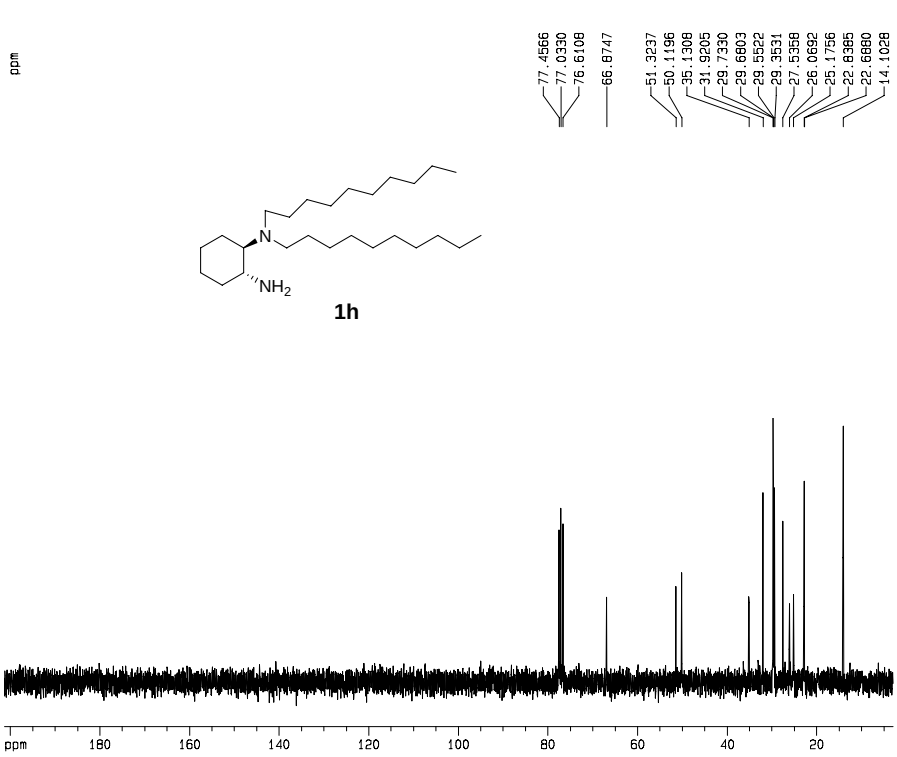

```
Current Data Parameters
NAME          XH-061106-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061106
Time                 13.57
INSTRUM              av300
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                   65536
SOLVENT              CDCl3
NS                      16
DS                       2
SWH              6172.839 Hz
FIDRES           0.094190 Hz
AQ             5.3084660 sec
RG                    45.3
DW                 81.000 usec
DE                   6.00 usec
TE                  297.2 K
D1             2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                   32768
SF            300.1300062 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00

1D NMR plot parameters
CX                   22.00 cm
CY                   11.00 cm
F1P                  8.743 ppm
F1                 2623.92 Hz
F2P                  0.184 ppm
F2                   55.31 Hz
PPMCM             0.38901 ppm/cm
HZCM            116.75500 Hz/cm
```




```
Current Data Parameters
NAME          XH-061106-2
EXPNO                  11
PROCNO                  1

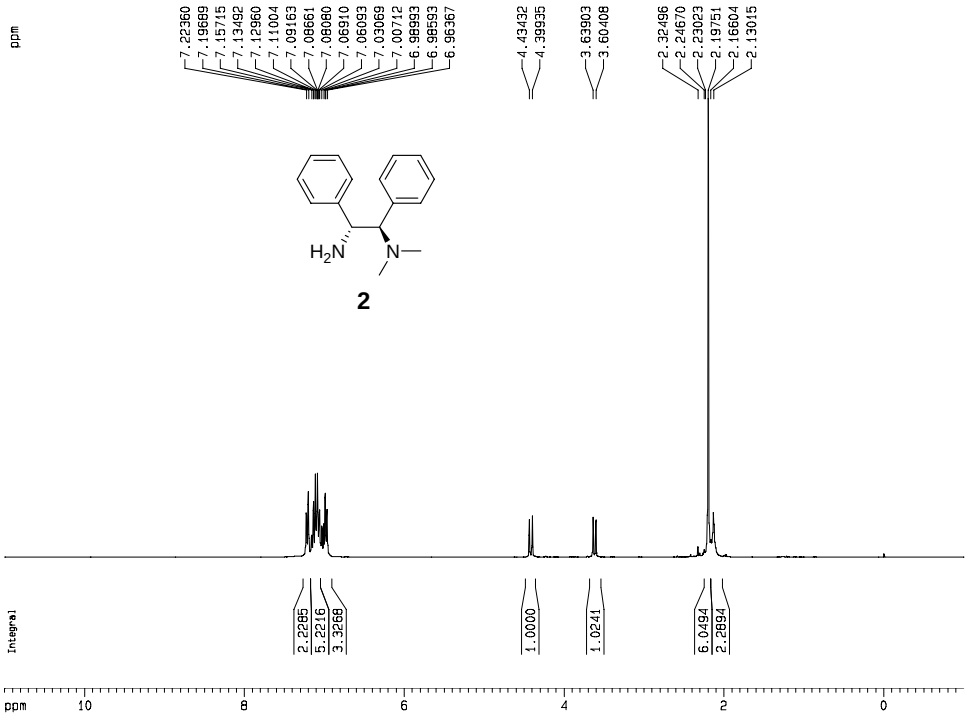
F2 - Acquisition Parameters
Date_            20061106
Time                 14.00
INSTRUM              av300
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                   65536
SOLVENT              CDCl3
NS                      15
DS                       4
SWH             17985.611 Hz
FIDRES           0.274439 Hz
AQ             1.8219508 sec
RG                   322.5
DW                 27.800 usec
DE                   6.00 usec
TE                  297.4 K
D1             2.00000000 sec
d11            0.03000000 sec
d12            0.00002000 sec

======== CHANNEL f1 ========
NUC1                   13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                   32768
SF            75.4677490 MHz
WDW                     EM
SSB                      0
LB                    1.00 Hz
GB                       0
PC                    1.40

1D NMR plot parameters
CX                   20.00 cm
CY                    6.00 cm
F1P                 201.267 ppm
F1                15189.19 Hz
F2P                  2.929 ppm
F2                 221.03 Hz
PPMCM             9.91692 ppm/cm
HZCM            748.40790 Hz/cm
```



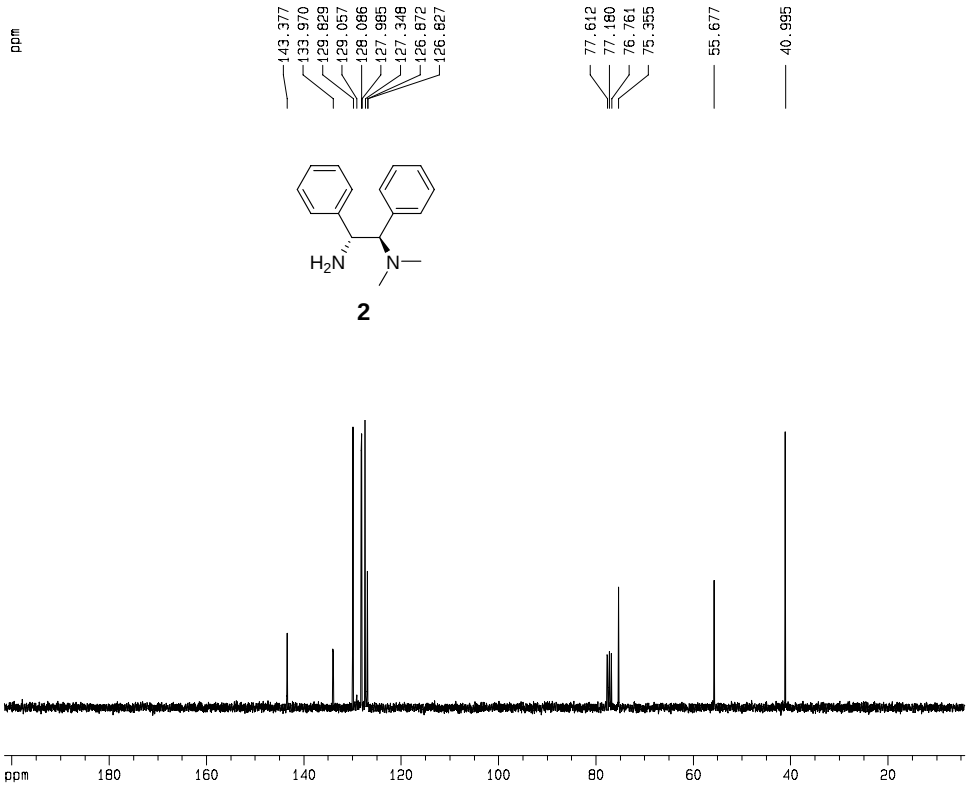

```
Current Data Parameters
NAME        XH-061117-2
EXPNO              10
PROCNO              1

F2 - Acquisition Parameters
Date_         20061117
Time             14.02
INSTRUM          av300
PROBHD   5 mm DUL 13C-1
PULPROG           zg30
TD               65536
SOLVENT          CDCl3
NS                   7
DS                   2
SWH           6172.839 Hz
FIDRES        0.094190 Hz
AQ           5.3084660 sec
RG               50.8
DW             81.000 usec
DE               6.00 usec
TE              300.5 K
D1          2.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1               9.30 usec
PL1             -1.00 dB
SFO1       300.1318534 MHz

F2 - Processing parameters
SI               32768
SF         300.1300166 MHz
WDW                 EM
SSB                  0
LB              0.35 Hz
GB                   0
PC               1.00

1D NMR plot parameters
CX              22.00 cm
CY              11.00 cm
F1P            11.000 ppm
F1            3301.43 Hz
F2P            -1.000 ppm
F2            -300.13 Hz
PPMCM         0.54545 ppm/cm
HZCM         163.70728 Hz/cm
```




```
Current Data Parameters
NAME        XH-061117-2
EXPNO              11
PROCNO              1

F2 - Acquisition Parameters
Date_         20061117
Time             14.04
INSTRUM          av300
PROBHD   5 mm DUL 13C-1
PULPROG         zgpg30
TD               65536
SOLVENT          CDCl3
NS                  19
DS                   4
SWH          17985.611 Hz
FIDRES        0.274439 Hz
AQ           1.8219508 sec
RG             1149.4
DW             27.800 usec
DE               6.00 usec
TE              300.6 K
D1          2.00000000 sec
d11         0.03000000 sec
d12         0.00002000 sec

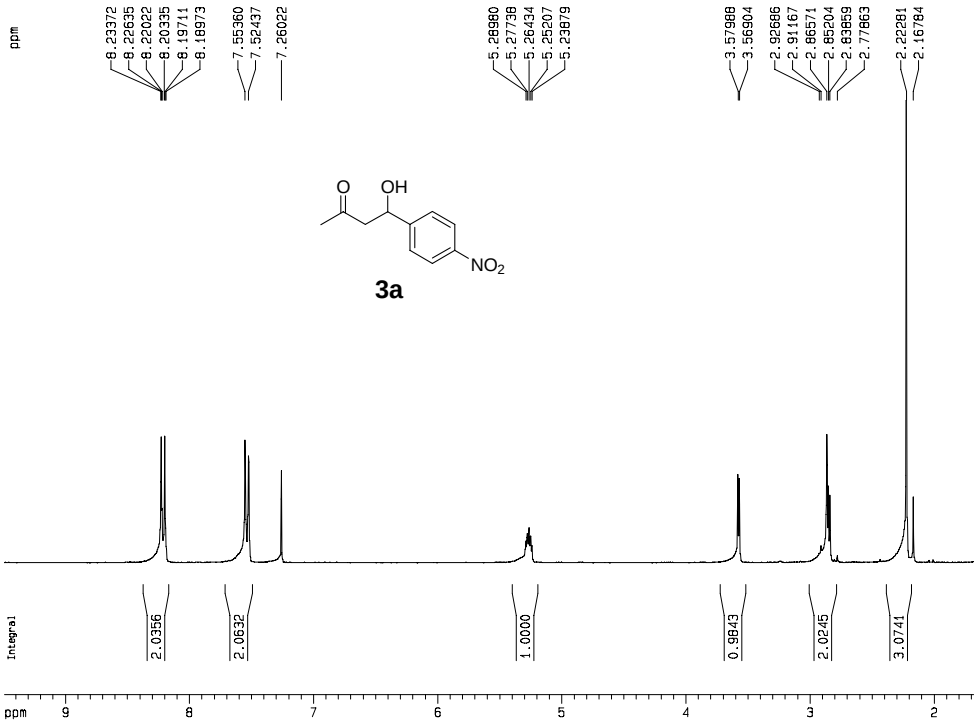
======== CHANNEL f1 ========
NUC1                13C
P1               9.40 usec
PL1             -1.00 dB
SFO1        75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                1H
PCPD2           80.00 usec
PL2             -1.00 dB
PL12            18.00 dB
PL13            18.00 dB
SFO2       300.1312005 MHz

F2 - Processing parameters
SI               32768
SF          75.4677490 MHz
WDW                 EM
SSB                  0
LB              1.00 Hz
GB                   0
PC               1.40

1D NMR plot parameters
CX              20.00 cm
CY               6.00 cm
F1P            201.530 ppm
F1            15209.04 Hz
F2P              4.244 ppm
F2             320.29 Hz
PPMCM          9.86431 ppm/cm
HZCM         744.43762 Hz/cm
```

NMR spectra for all the Aldol products



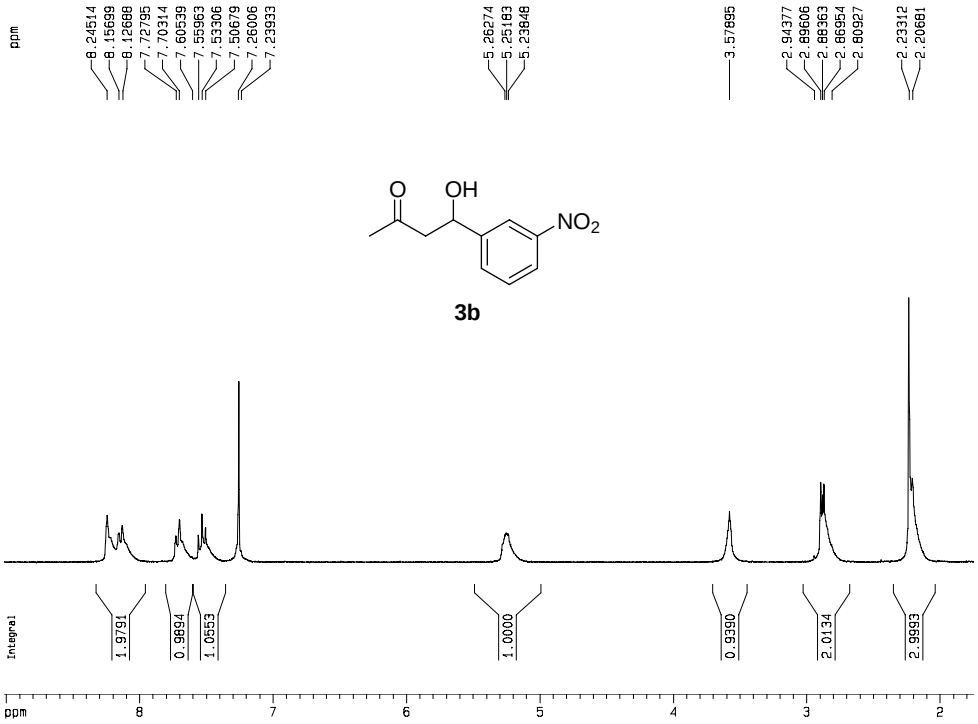

```
Current Data Parameters
NAME        XH-061225-2
EXPNO              10
PROCNO              1

F2 - Acquisition Parameters
Date_          20061225
Time              12.12
INSTRUM           av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                322.5
DW               81.000 usec
DE                 6.00 usec
TE                296.7 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1                9.30 usec
PL1              -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300060 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                11.00 cm
F1P               9.492 ppm
F1              2848.95 Hz
F2P               1.683 ppm
F2               505.18 Hz
PPMCM           0.35496 ppm/cm
HZCM          106.53506 Hz/cm
```



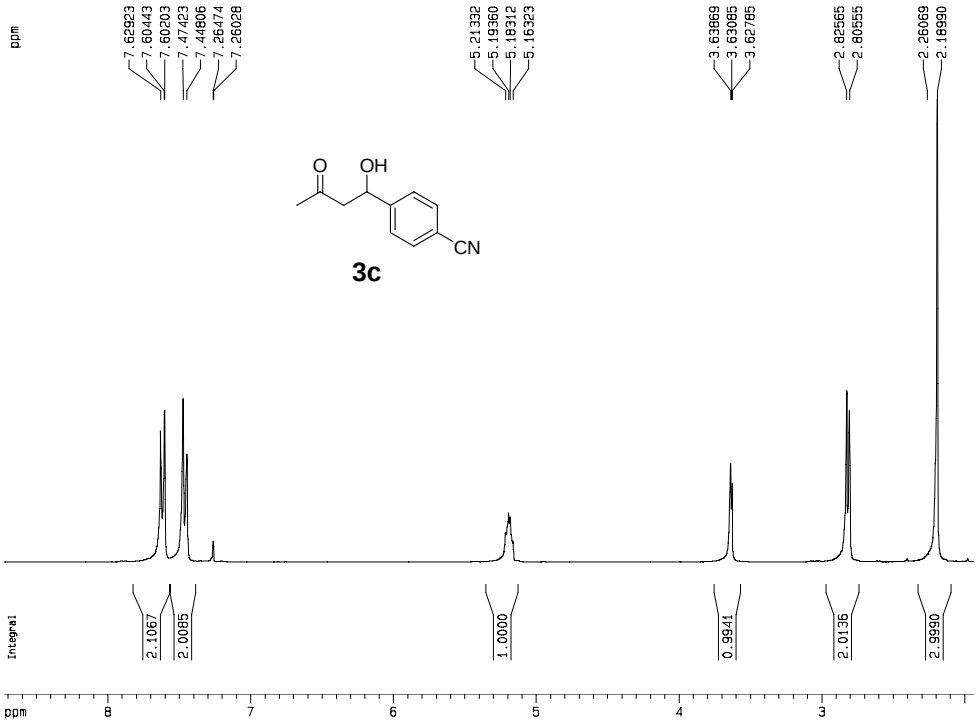

```
Current Data Parameters
NAME        XH-061223-7
EXPNO              10
PROCNO              1

F2 - Acquisition Parameters
Date_          20061223
Time              22.00
INSTRUM           av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                406.4
DW               81.000 usec
DE                 6.00 usec
TE                297.0 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                1H
P1                9.30 usec
PL1              -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300064 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P               9.014 ppm
F1              2705.49 Hz
F2P               1.750 ppm
F2               525.24 Hz
PPMCM           0.33020 ppm/cm
HZCM           99.10238 Hz/cm
```



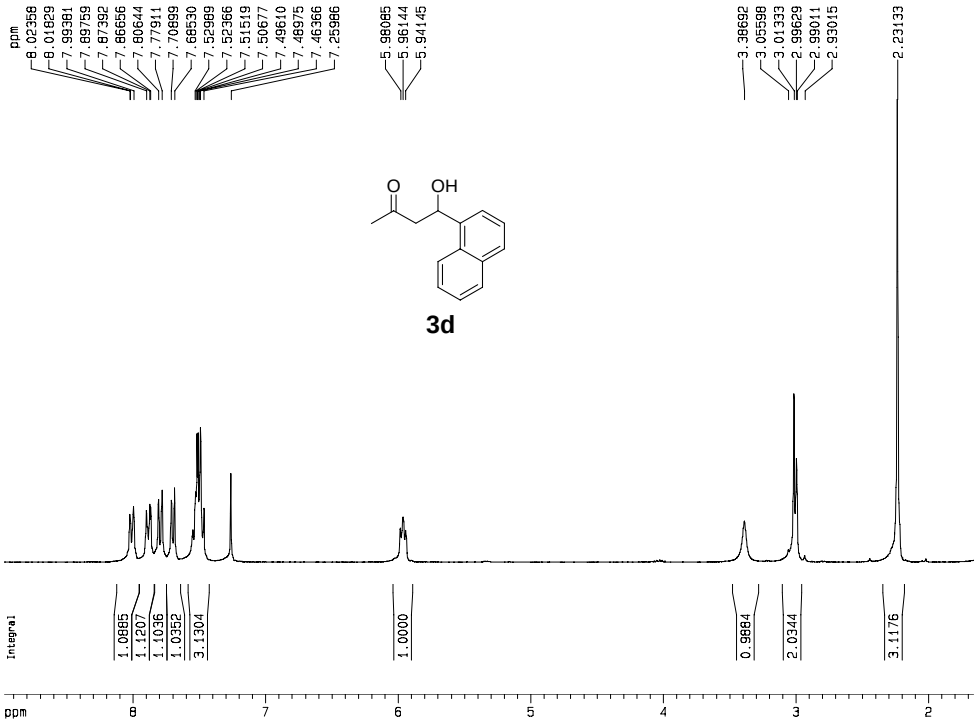

```
Current Data Parameters
NAME          XH-061106-3
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061206
Time                13.45
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                  143.7
DW                 81.000 usec
DE                   6.00 usec
TE                  294.6 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF           300.1300051 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  11.00 cm
F1P                 8.724 ppm
F1                 2618.24 Hz
F2P                 1.936 ppm
F2                  581.06 Hz
PPMCM             0.30853 ppm/cm
HZCM             92.59879 Hz/cm
```



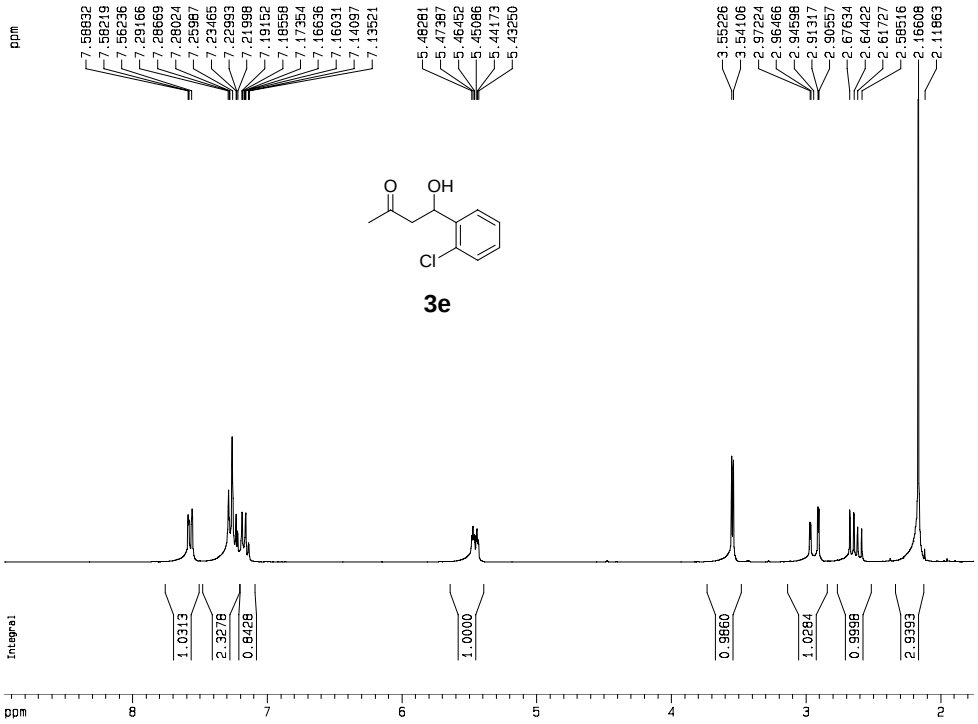

```
Current Data Parameters
NAME          XH-061223-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061223
Time                21.44
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                  322.5
DW                 81.000 usec
DE                   6.00 usec
TE                  297.1 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF           300.1300060 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  12.00 cm
F1P                 8.970 ppm
F1                 2692.24 Hz
F2P                 1.660 ppm
F2                  498.36 Hz
PPMCM             0.33226 ppm/cm
HZCM             99.72177 Hz/cm
```



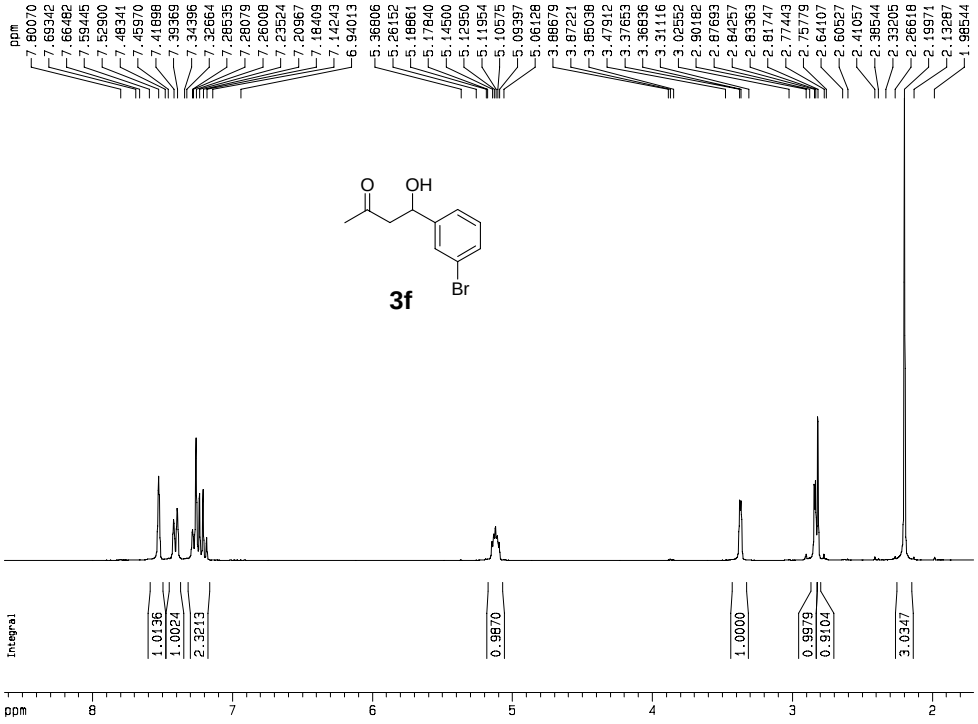

```
Current Data Parameters
NAME          XH-061225-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061225
Time                12.06
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                   181
DW                81.000 usec
DE                  6.00 usec
TE                 296.7 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF            300.1300181 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                 12.00 cm
F1P                8.953 ppm
F1              2687.00 Hz
F2P                1.757 ppm
F2               527.19 Hz
PPMCM            0.32710 ppm/cm
HZCM            98.17329 Hz/cm
```



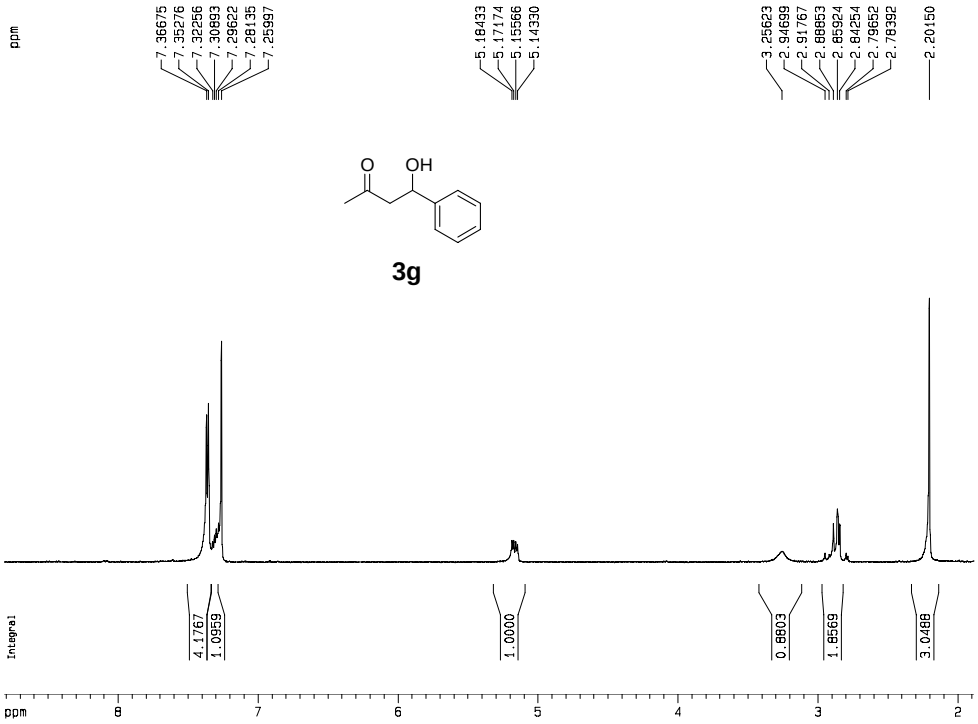

```
Current Data Parameters
NAME          XH-061226-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061226
Time                13.43
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    14
DS                     2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                 406.4
DW                81.000 usec
DE                  6.00 usec
TE                 298.0 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1         300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF            300.1300060 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                 11.00 cm
F1P                8.630 ppm
F1              2590.04 Hz
F2P                1.706 ppm
F2               511.99 Hz
PPMCM            0.31472 ppm/cm
HZCM            94.45696 Hz/cm
```



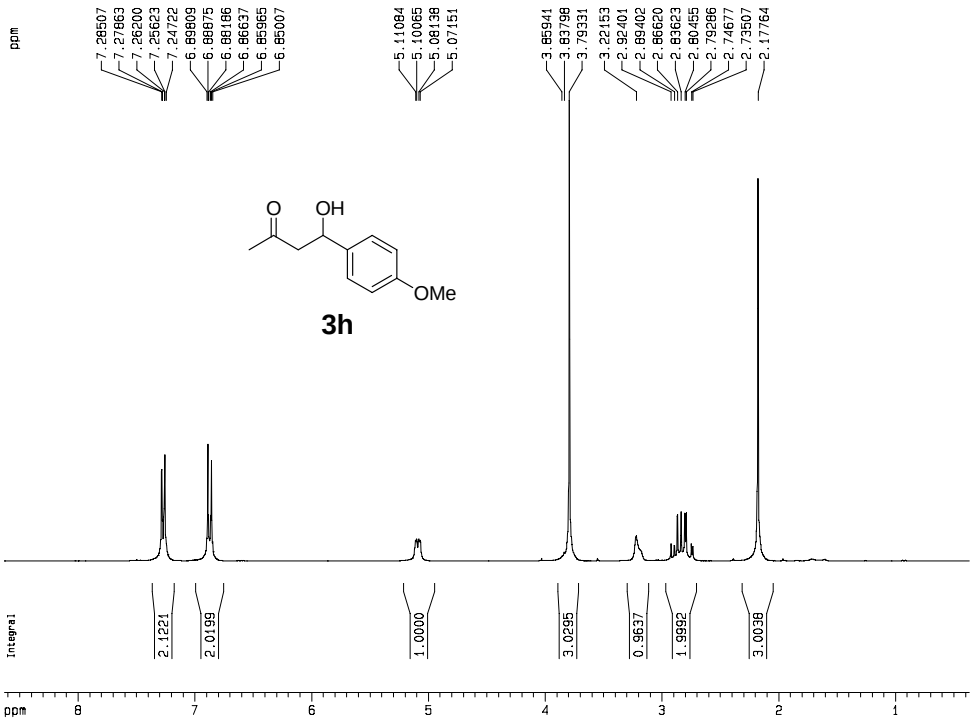

```
Current Data Parameters
NAME        XH-061223-12
EXPNO               10
PROCNO               1

F2 - Acquisition Parameters
Date_          20061223
Time              21.52
INSTRUM           av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ            5.3084660 sec
RG                574.7
DW               81.000 usec
DE                 6.00 usec
TE                297.0 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                9.30 usec
PL1              -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF           300.1300058 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P               8.812 ppm
F1             2644.74 Hz
F2P               1.888 ppm
F2              566.68 Hz
PPMCM           0.31472 ppm/cm
HZCM           94.45696 Hz/cm
```



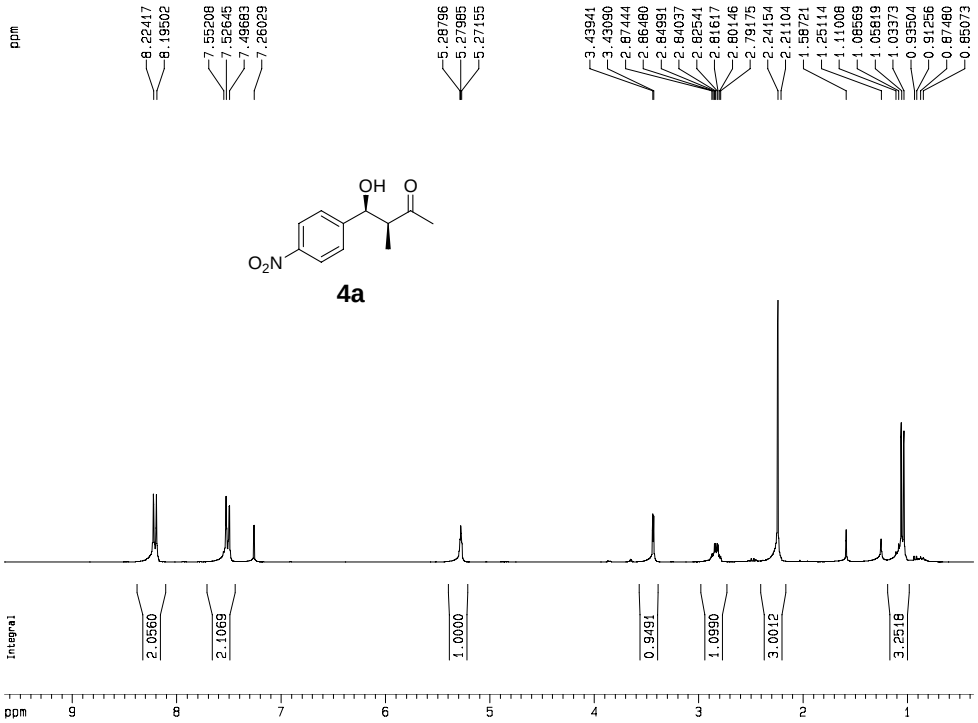

```
Current Data Parameters
NAME        XH-061230-1
EXPNO               10
PROCNO               1

F2 - Acquisition Parameters
Date_          20061230
Time              12.06
INSTRUM           av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ            5.3084660 sec
RG                287.4
DW               81.000 usec
DE                 6.00 usec
TE                298.0 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                9.30 usec
PL1              -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF           300.1300053 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                11.00 cm
F1P               8.632 ppm
F1             2590.77 Hz
F2P               0.369 ppm
F2              110.73 Hz
PPMCM           0.37560 ppm/cm
HZCM          112.72897 Hz/cm
```



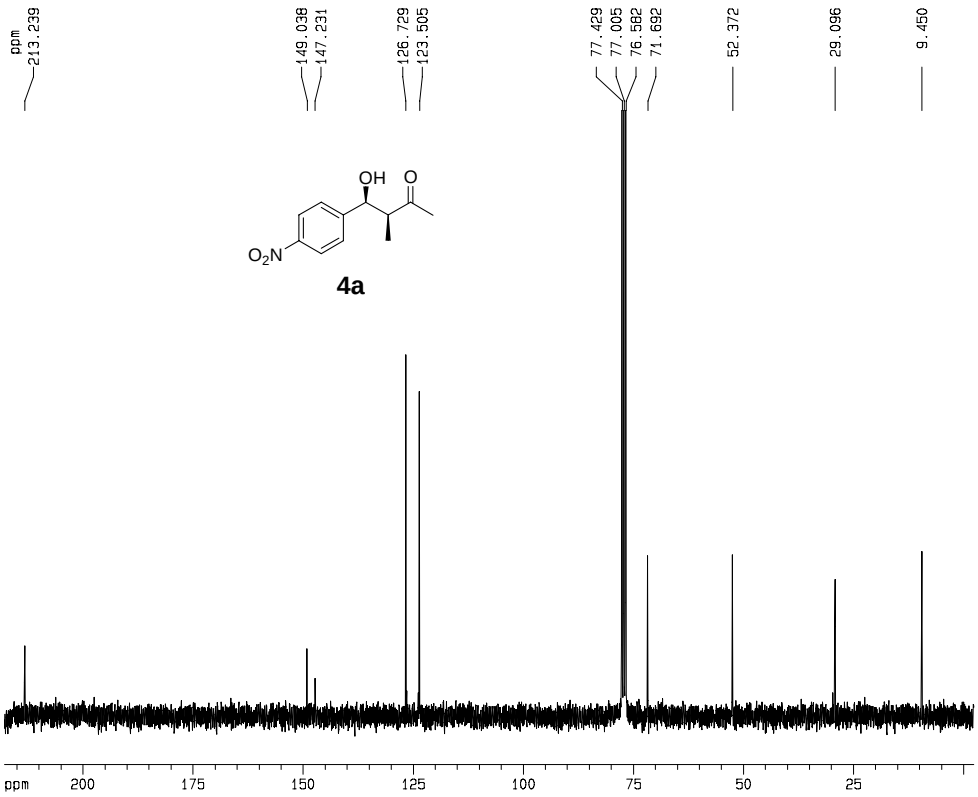

```
Current Data Parameters
NAME          XH-061223-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061223
Time                23.04
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                  322.5
DW                 81.000 usec
DE                   6.00 usec
TE                  297.1 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300058 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                   6.00 cm
F1P                 9.652 ppm
F1                 2896.83 Hz
F2P                  0.367 ppm
F2                  110.19 Hz
PPMCM              0.42203 ppm/cm
HZCM             126.66524 Hz/cm
```




```
Current Data Parameters
NAME          XH-061223-2
EXPNO                  11
PROCNO                  1

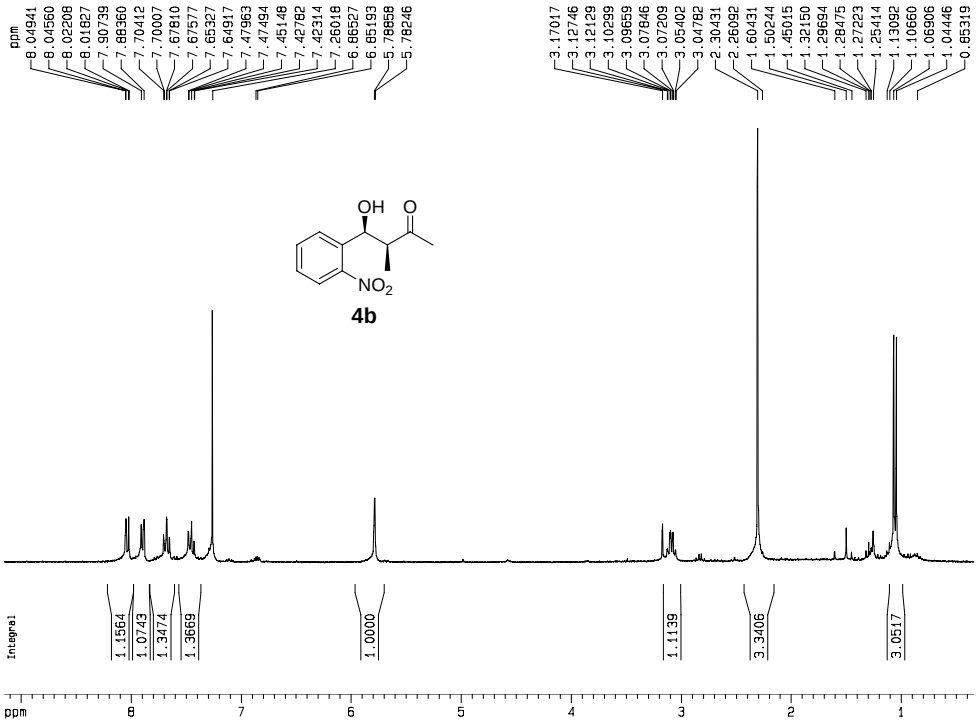
F2 - Acquisition Parameters
Date_            20061223
Time                23.07
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    629
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ            1.8219508 sec
RG                  406.4
DW                 27.800 usec
DE                   6.00 usec
TE                  297.3 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2               80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                  20.00 cm
F1P                217.839 ppm
F1                16439.85 Hz
F2P                 -2.332 ppm
F2                 -176.00 Hz
PPMCM             11.00857 ppm/cm
HZCM            830.79236 Hz/cm
```



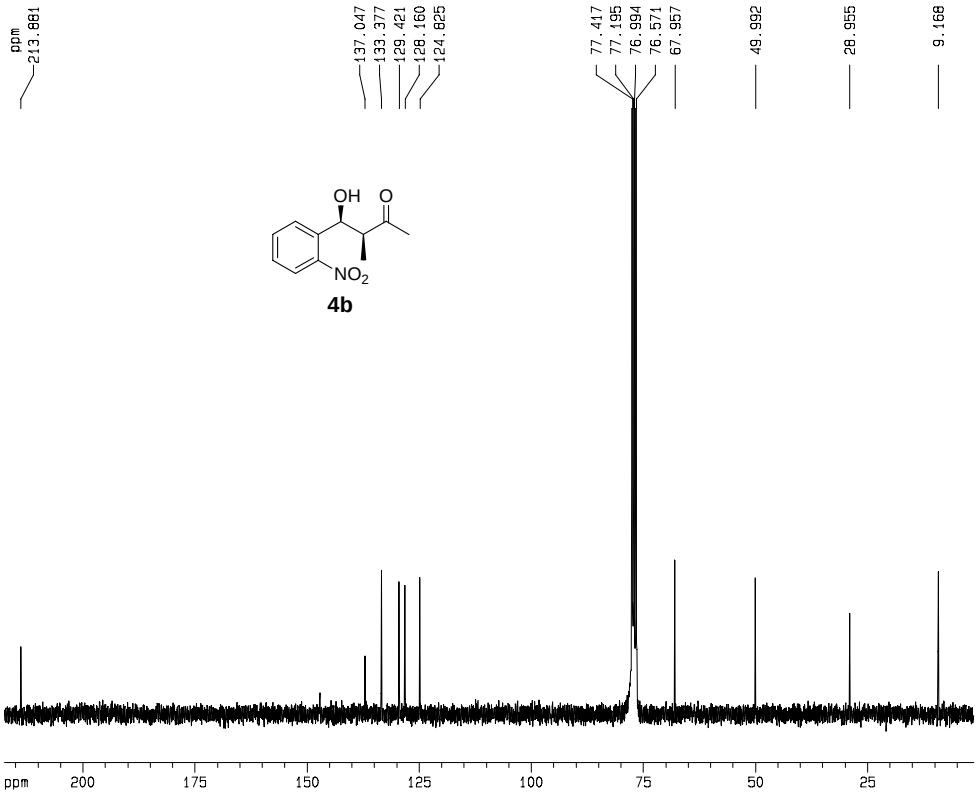

```
Current Data Parameters
NAME          XH-061223-4
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061223
Time               22.58
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG               406.4
DW              81.000 usec
DE               6.00 usec
TE              297.1 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                 9.30 usec
PL1               -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300060 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                10.00 cm
F1P               9.152 ppm
F1             2746.75 Hz
F2P               0.344 ppm
F2              103.19 Hz
PPMCM           0.40037 ppm/cm
HZCM          120.16164 Hz/cm
```




```
Current Data Parameters
NAME          XH-061223-4
EXPNO                  20
PROCNO                  1

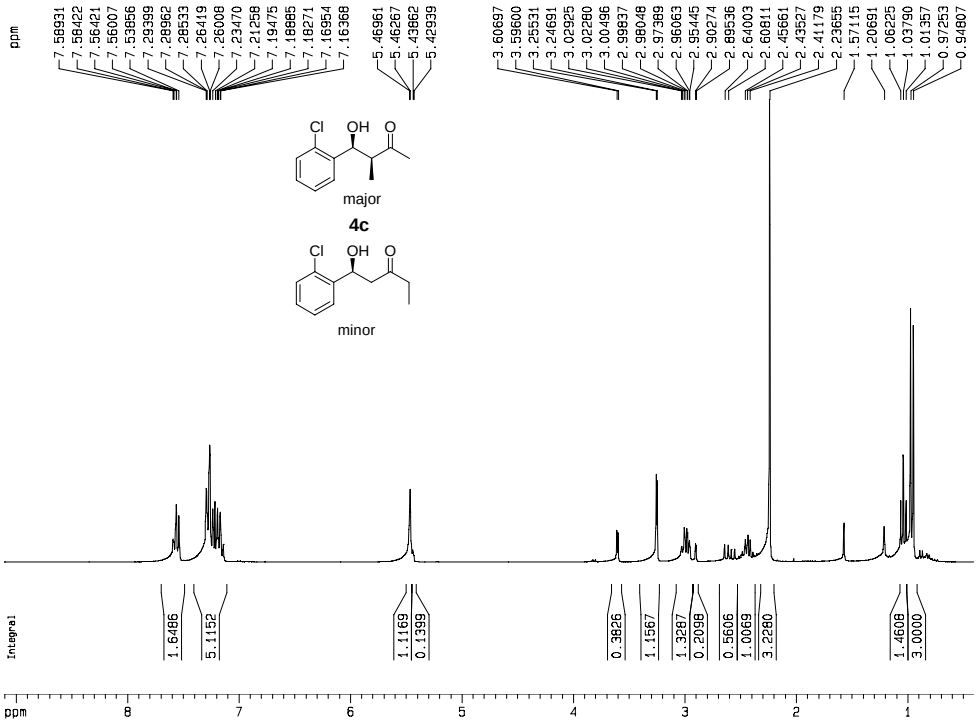
F2 - Acquisition Parameters
Date_           20061224
Time               10.24
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                 9741
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG               322.5
DW              27.800 usec
DE               6.00 usec
TE              298.3 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2               -1.00 dB
PL12              18.00 dB
PL13              18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF           75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                60.00 cm
F1P             217.576 ppm
F1            16419.99 Hz
F2P               1.351 ppm
F2              101.92 Hz
PPMCM          10.81129 ppm/cm
HZCM          815.90356 Hz/cm
```



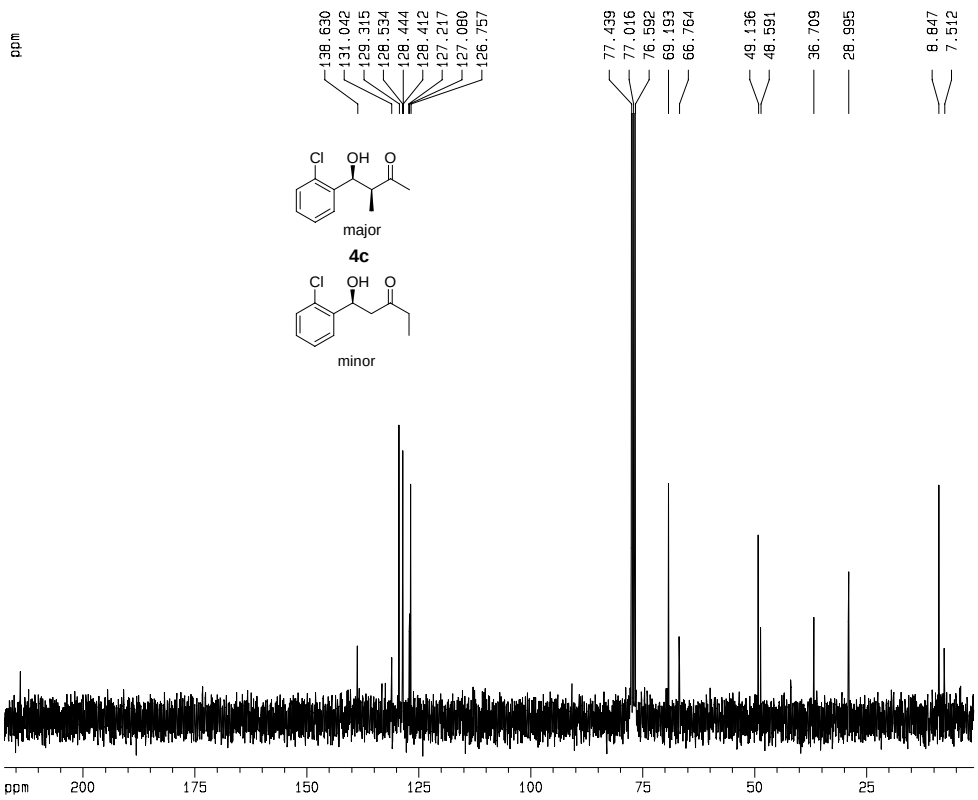

```
Current Data Parameters
NAME          XH-061223-5
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061223
Time               22.28
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG               287.4
DW              81.000 usec
DE               6.00 usec
TE              296.9 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                 9.30 usec
PL1               -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300202 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                11.00 cm
F1P               9.105 ppm
F1              2732.62 Hz
F2P               0.410 ppm
F2              123.13 Hz
PPMCM           0.39521 ppm/cm
HZCM          118.61317 Hz/cm
```




```
Current Data Parameters
NAME          XH-061223-5
EXPNO                  11
PROCNO                  1

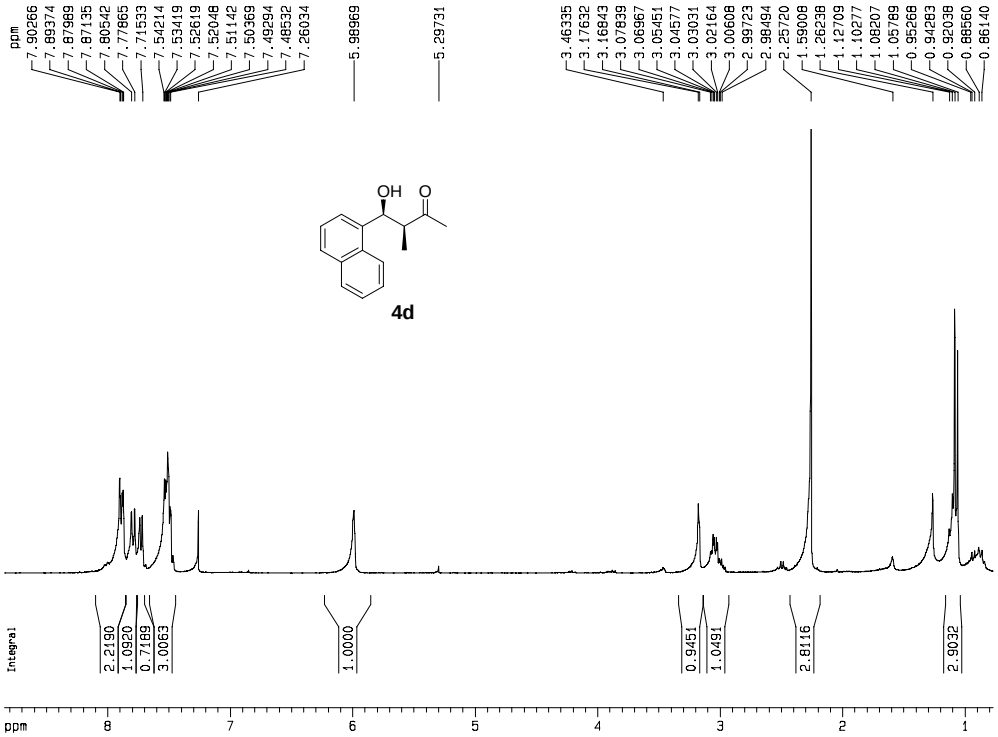
F2 - Acquisition Parameters
Date_           20061223
Time               22.33
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  187
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG               645.1
DW              27.800 usec
DE               6.00 usec
TE              297.6 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2               -1.00 dB
PL12              18.00 dB
PL13              18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                20.00 cm
F1P             217.576 ppm
F1            16420.00 Hz
F2P               1.088 ppm
F2               82.07 Hz
PPMCM          10.82444 ppm/cm
HZCM         816.89618 Hz/cm
```



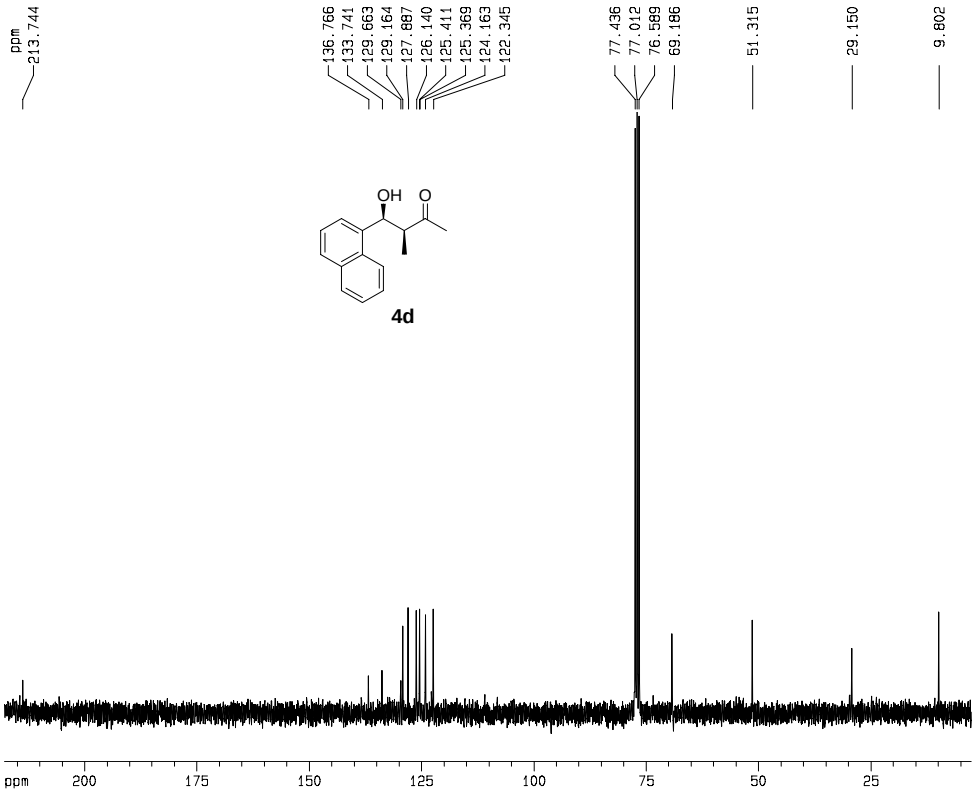

```
Current Data Parameters
NAME          XH-070206-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20070206
Time                16.12
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG              zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ             5.3084660 sec
RG                    256
DW                 81.000 usec
DE                  6.00 usec
TE                 297.3 K
D1             2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300055 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                  10.00 cm
F1P                 8.842 ppm
F1                2653.89 Hz
F2P                 0.769 ppm
F2                 230.75 Hz
PPMCM             0.36698 ppm/cm
HZCM            110.14270 Hz/cm
```




```
Current Data Parameters
NAME          XH-070206-2
EXPNO                  21
PROCNO                  1

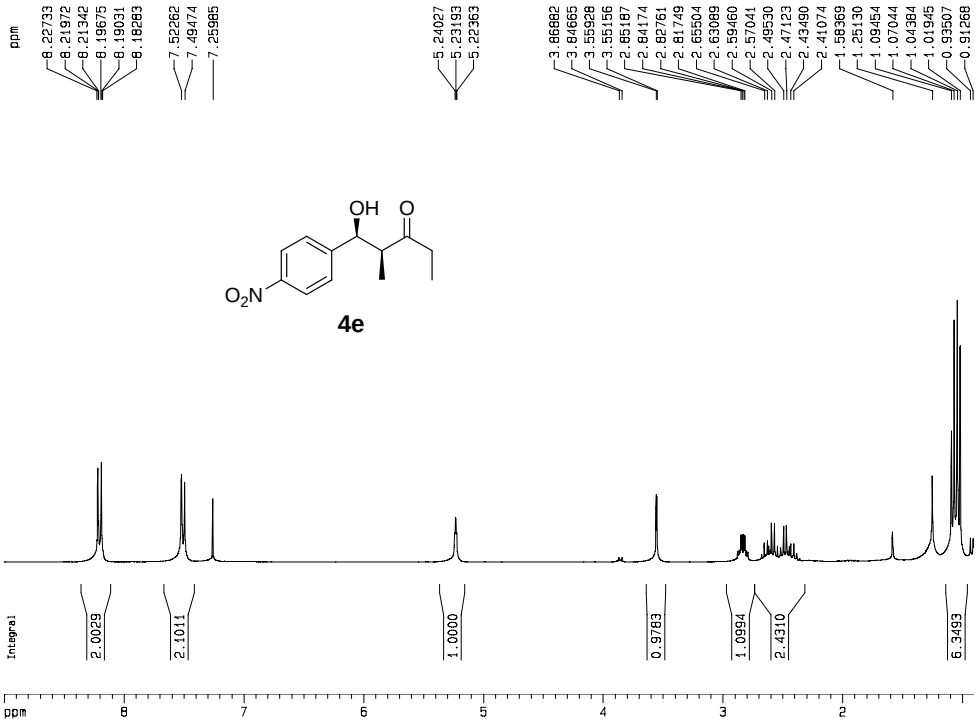
F2 - Acquisition Parameters
Date_            20070207
Time                21.21
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG            zgpg30
TD                  65536
SOLVENT             CDCl3
NS                    252
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ             1.8219508 sec
RG                  406.4
DW                 27.800 usec
DE                  6.00 usec
TE                 298.4 K
D1             2.00000000 sec
d11            0.03000000 sec
d12            0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2            waltz16
NUC2                   1H
PCPD2                80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                  12.50 cm
F1P                217.839 ppm
F1               16439.85 Hz
F2P                 2.666 ppm
F2                 201.18 Hz
PPMCM            10.75868 ppm/cm
HZCM            811.93323 Hz/cm
```



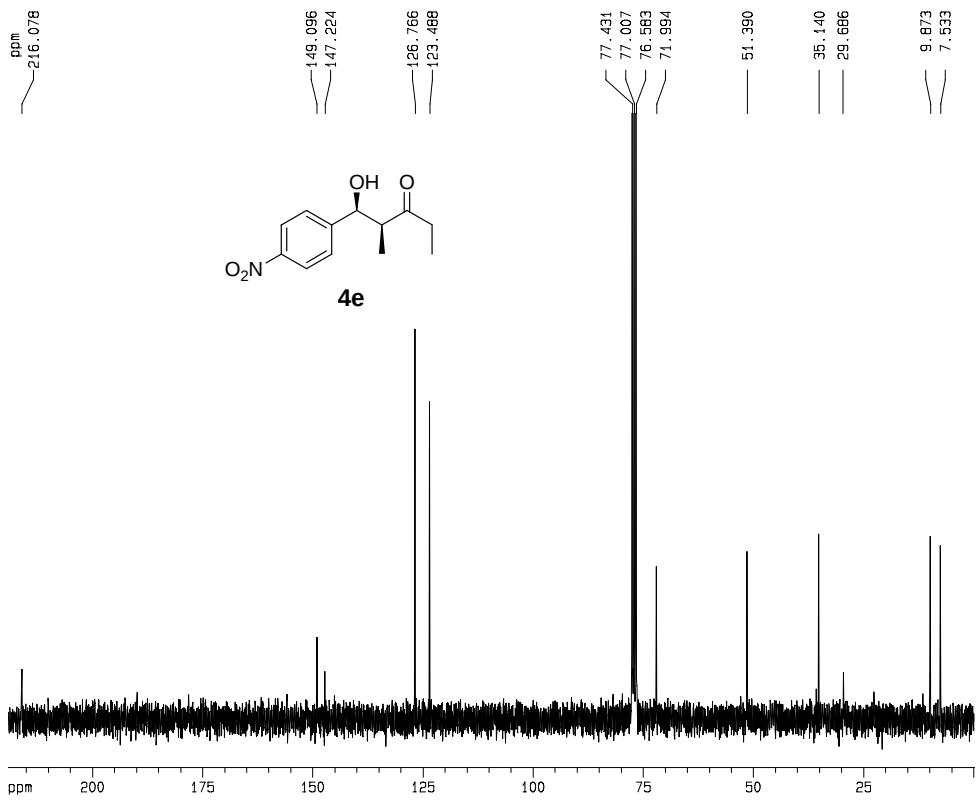

```
Current Data Parameters
NAME          XH-061223-9
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061223
Time               22.53
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                  362
DW               81.000 usec
DE                6.00 usec
TE                297.3 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                 9.30 usec
PL1               -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300062 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P               9.001 ppm
F1              2701.61 Hz
F2P               0.910 ppm
F2              273.12 Hz
PPMCM           0.36779 ppm/cm
HZCM          110.38621 Hz/cm
```




```
Current Data Parameters
NAME          XH-061223-9
EXPNO                  20
PROCNO                  1

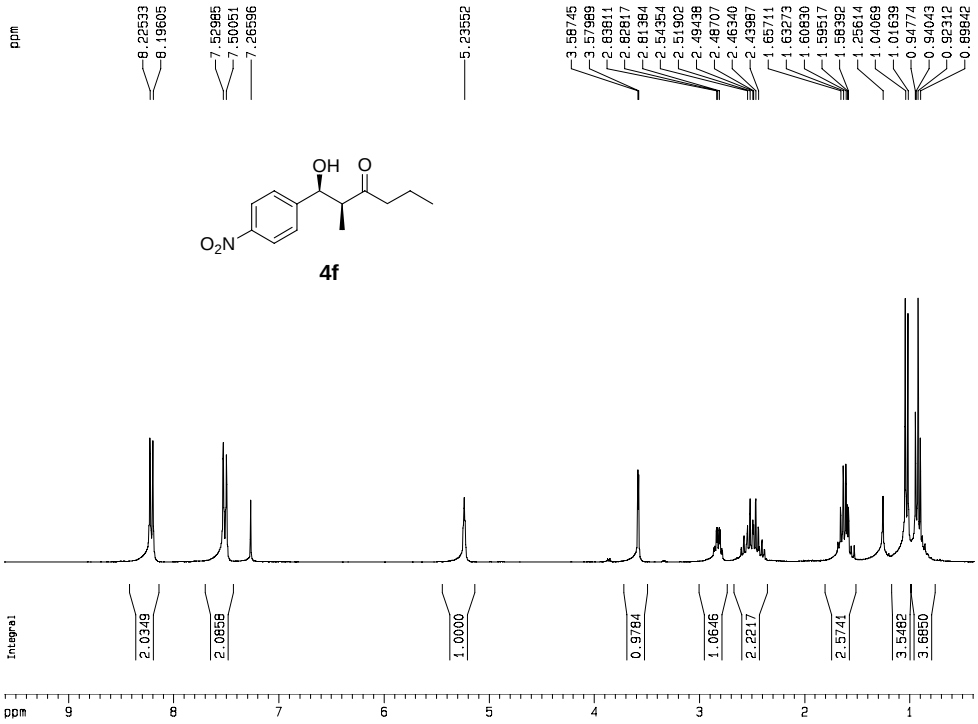
F2 - Acquisition Parameters
Date_           20061224
Time               14.35
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  386
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                645.1
DW               27.800 usec
DE                6.00 usec
TE                296.8 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2            80.00 usec
PL2               -1.00 dB
PL12              18.00 dB
PL13              18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                20.00 cm
F1P             220.000 ppm
F1            16602.90 Hz
F2P               0.000 ppm
F2                 0.00 Hz
PPMCM          11.00000 ppm/cm
HZCM          830.14520 Hz/cm
```



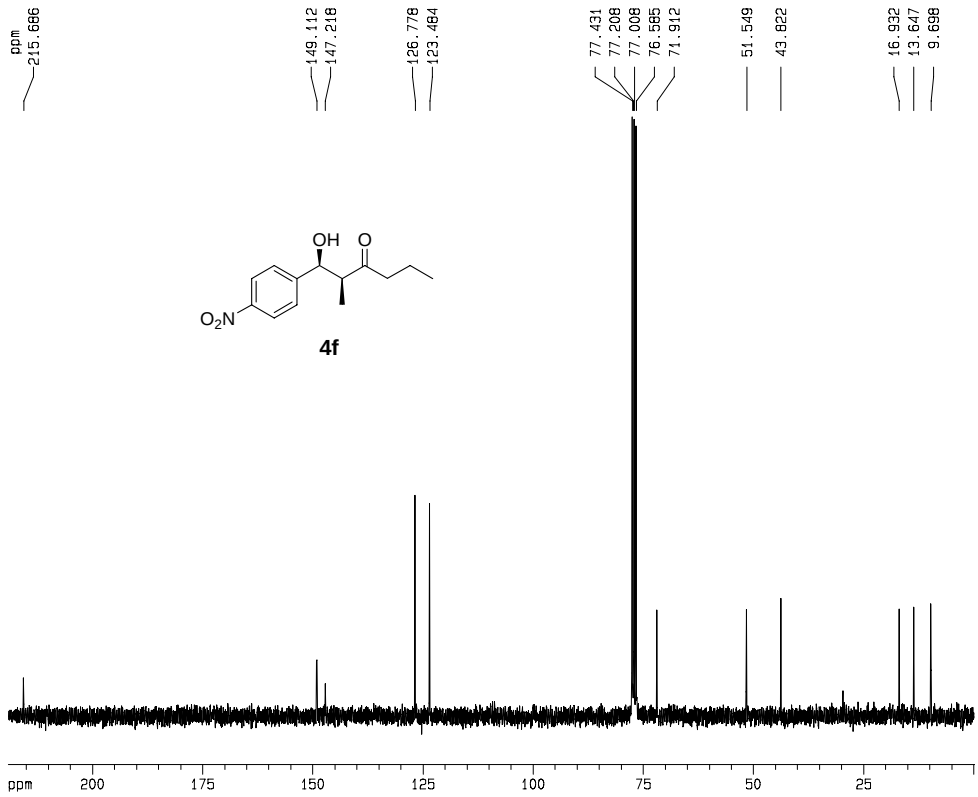

```
Current Data Parameters
NAME      3-hexanone--p-m
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061221
Time               12.21
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    16
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                 322.5
DW               81.000 usec
DE                 6.00 usec
TE                296.1 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF           300.1300041 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                  6.00 cm
F1P                 9.612 ppm
F1               2884.92 Hz
F2P                 0.396 ppm
F2                118.73 Hz
PPMCM            0.41894 ppm/cm
HZCM           125.73615 Hz/cm
```




```
Current Data Parameters
NAME        XH-061226-1
EXPNO                11
PROCNO                1

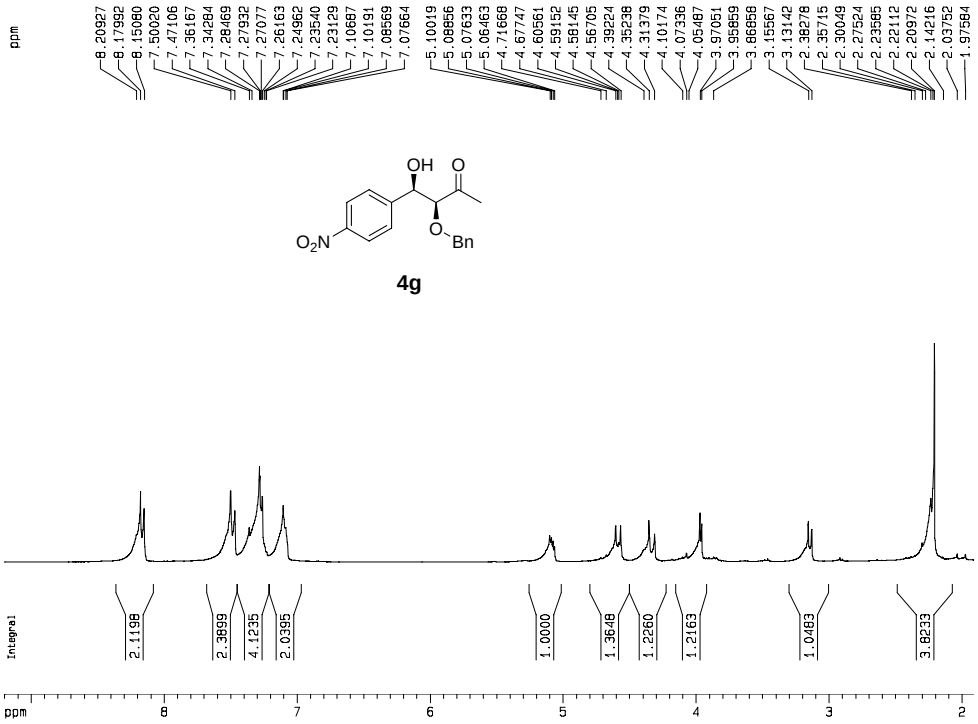
F2 - Acquisition Parameters
Date_           20061226
Time               12.16
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   468
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                1448.2
DW               27.800 usec
DE                 6.00 usec
TE                296.9 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                 12.50 cm
F1P               220.000 ppm
F1              16602.90 Hz
F2P                 0.000 ppm
F2                  0.00 Hz
PPMCM           11.00000 ppm/cm
HZCM           830.14520 Hz/cm
```



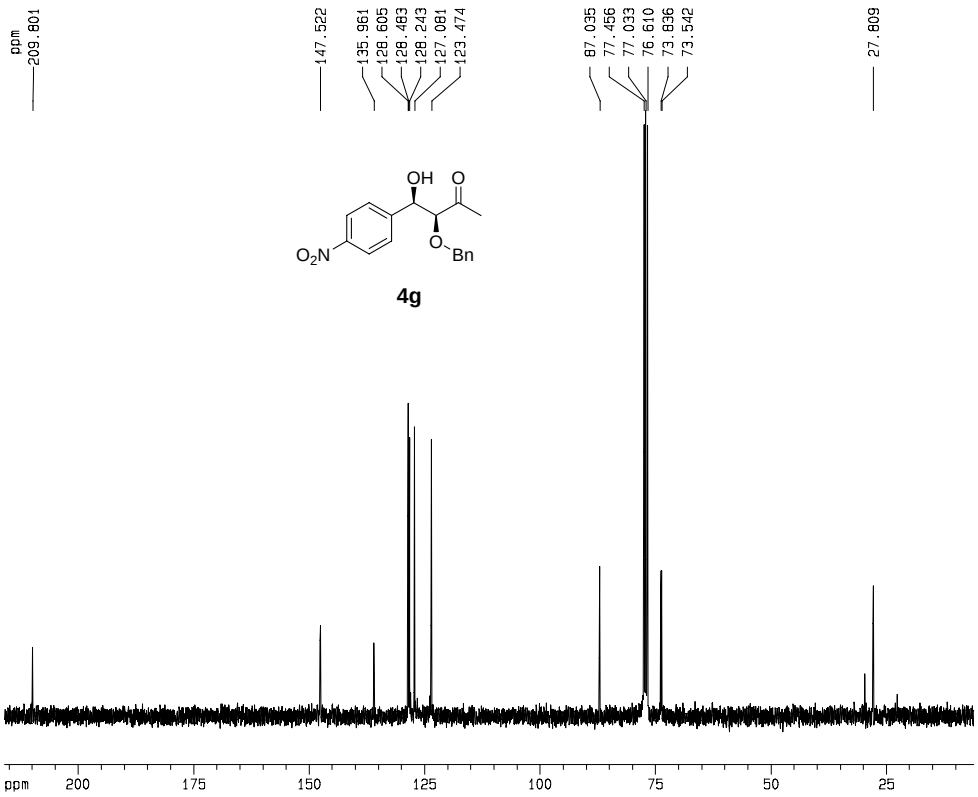

```
Current Data Parameters
NAME          XH-061222-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061222
Time               12.47
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                203.2
DW               81.000 usec
DE                6.00 usec
TE               296.8 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                 1H
P1                9.30 usec
PL1              -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300047 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 5.00 cm
F1P               9.202 ppm
F1             2761.72 Hz
F2P               1.915 ppm
F2              574.66 Hz
PPMCM           0.33123 ppm/cm
HZCM           99.41208 Hz/cm
```




```
Current Data Parameters
NAME          XH-061222-1
EXPNO                  11
PROCNO                  1

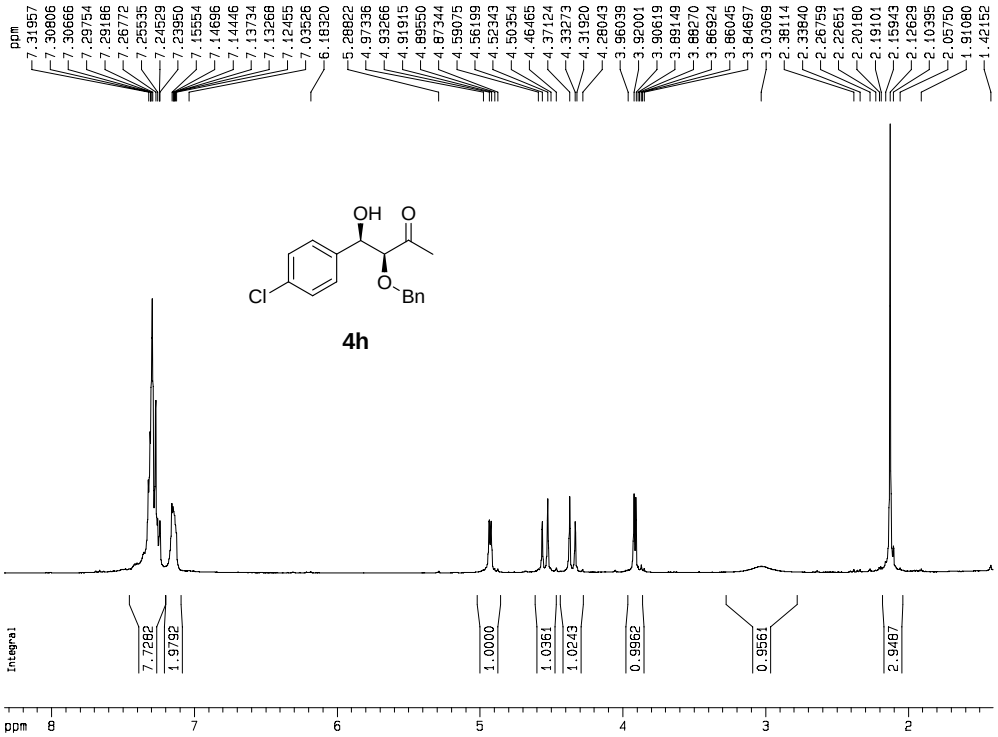
F2 - Acquisition Parameters
Date_           20061222
Time               12.51
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  860
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                406.4
DW               27.800 usec
DE                6.00 usec
TE               297.2 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                13C
P1                9.40 usec
PL1              -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                 1H
PCPD2            80.00 usec
PL2              -1.00 dB
PL12             18.00 dB
PL13             18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                12.50 cm
F1P             215.998 ppm
F1            16300.88 Hz
F2P               6.085 ppm
F2              459.25 Hz
PPMCM          10.49563 ppm/cm
HZCM          792.08160 Hz/cm
```



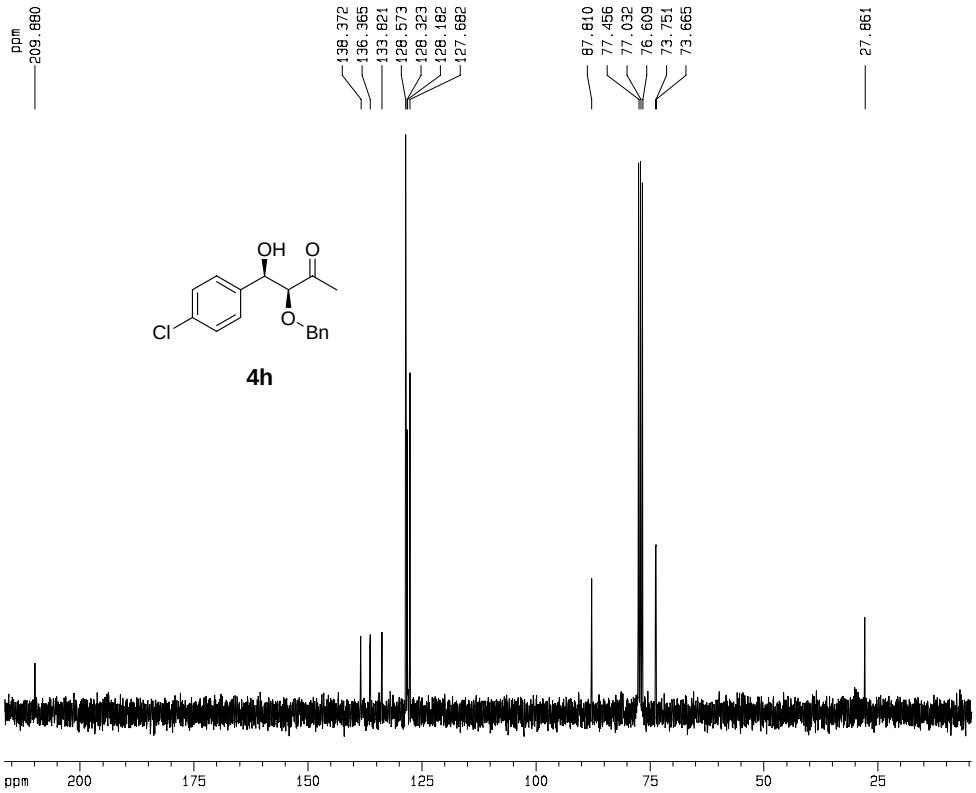

```
Current Data Parameters
NAME        XH-070206-4
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20070206
Time               16.27
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ             5.3084660 sec
RG                 203.2
DW               81.000 usec
DE                6.00 usec
TE                297.3 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300076 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                 10.00 cm
F1P                8.329 ppm
F1               2499.92 Hz
F2P                1.406 ppm
F2                421.87 Hz
PPMCM           0.31472 ppm/cm
HZCM           94.45696 Hz/cm
```




```
Current Data Parameters
NAME        XH-070206-4
EXPNO                 20
PROCNO                 1

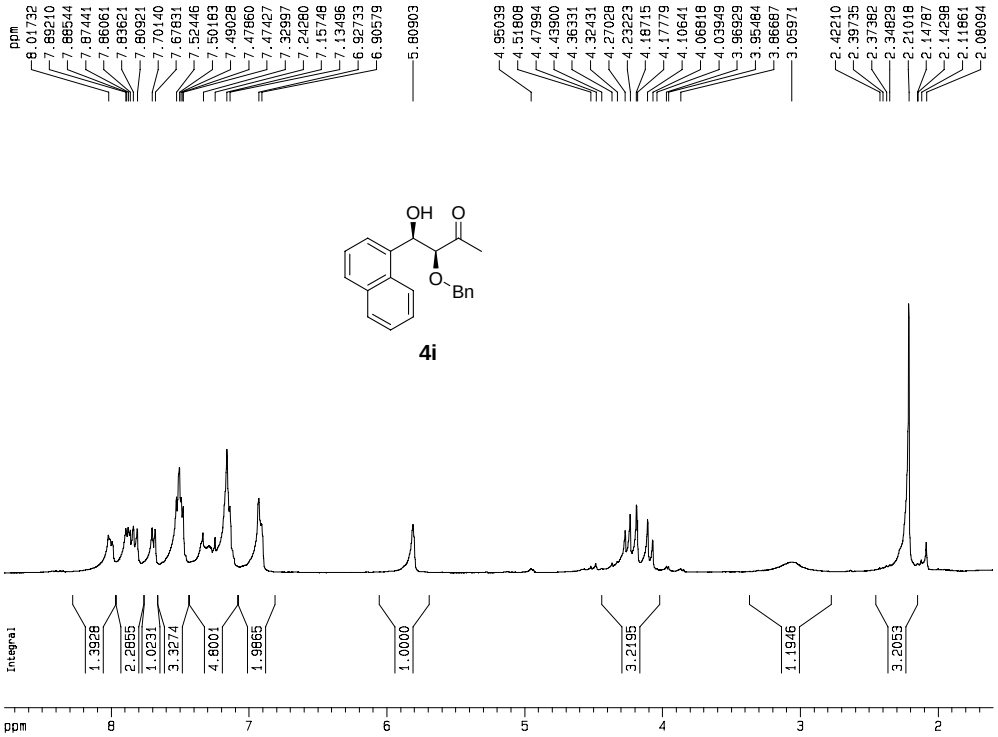
F2 - Acquisition Parameters
Date_           20070207
Time               20.50
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   141
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ             1.8219508 sec
RG                 287.4
DW               27.800 usec
DE                6.00 usec
TE                297.4 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                 12.50 cm
F1P              216.524 ppm
F1             16340.59 Hz
F2P                4.507 ppm
F2               340.14 Hz
PPMCM          10.60085 ppm/cm
HZCM          800.02228 Hz/cm
```



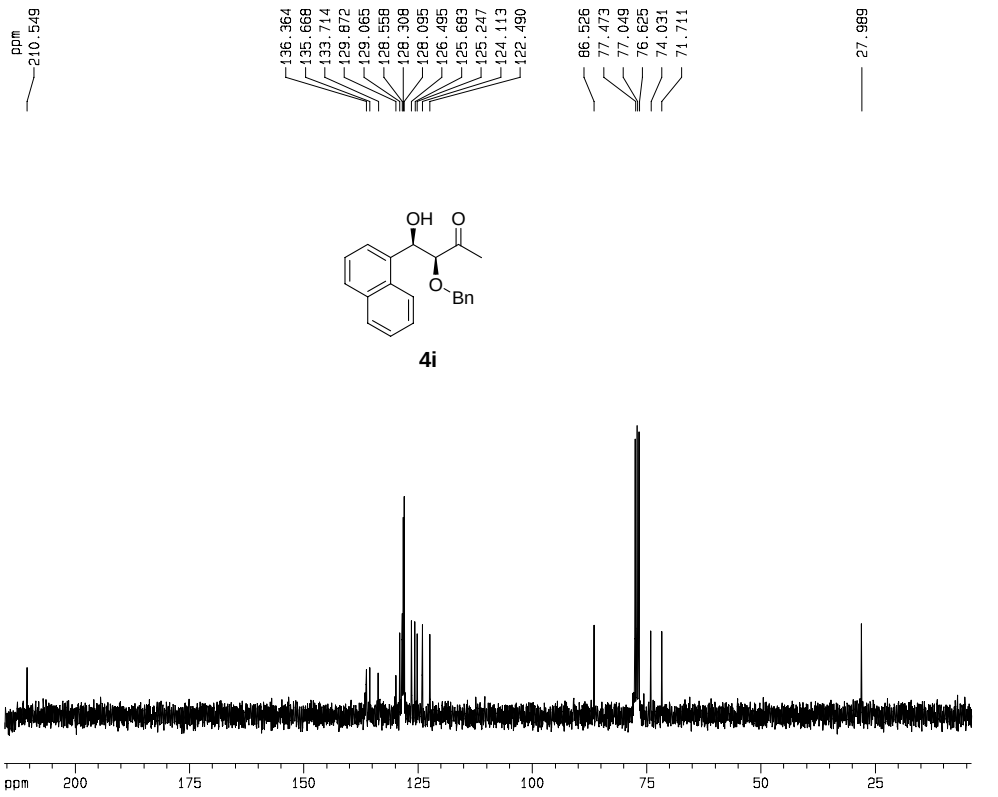

```
Current Data Parameters
NAME        XH-070206-6
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20070206
Time               16.53
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AG             5.3084660 sec
RG                   181
DW               81.000 usec
DE                6.00 usec
TE                298.4 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300099 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                  6.00 cm
F1P               8.776 ppm
F1               2633.83 Hz
F2P               1.602 ppm
F2                480.83 Hz
PPMCM            0.32607 ppm/cm
HZCM            97.86360 Hz/cm
```




```
Current Data Parameters
NAME        XH-070206-6
EXPNO                 20
PROCNO                 1

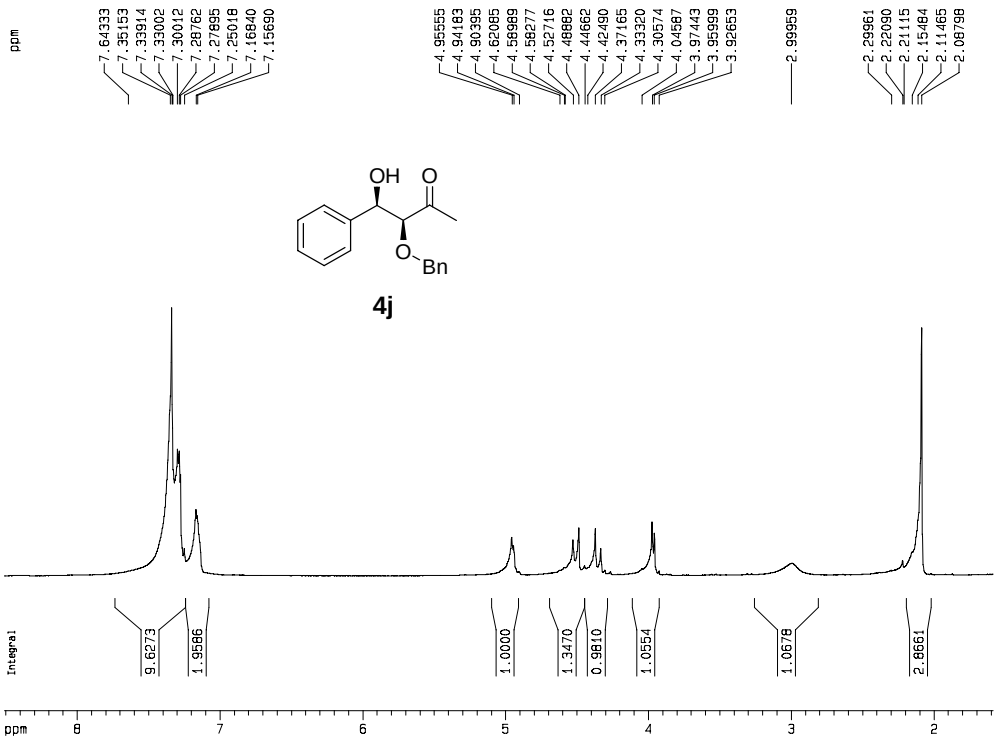
F2 - Acquisition Parameters
Date_           20070207
Time               16.14
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                    81
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AG             1.8219508 sec
RG                 456.1
DW               27.800 usec
DE                6.00 usec
TE                298.5 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1        75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                  6.00 cm
F1P             215.472 ppm
F1             16261.18 Hz
F2P               3.981 ppm
F2                300.44 Hz
PPMCM          10.57454 ppm/cm
HZCM          798.03711 Hz/cm
```



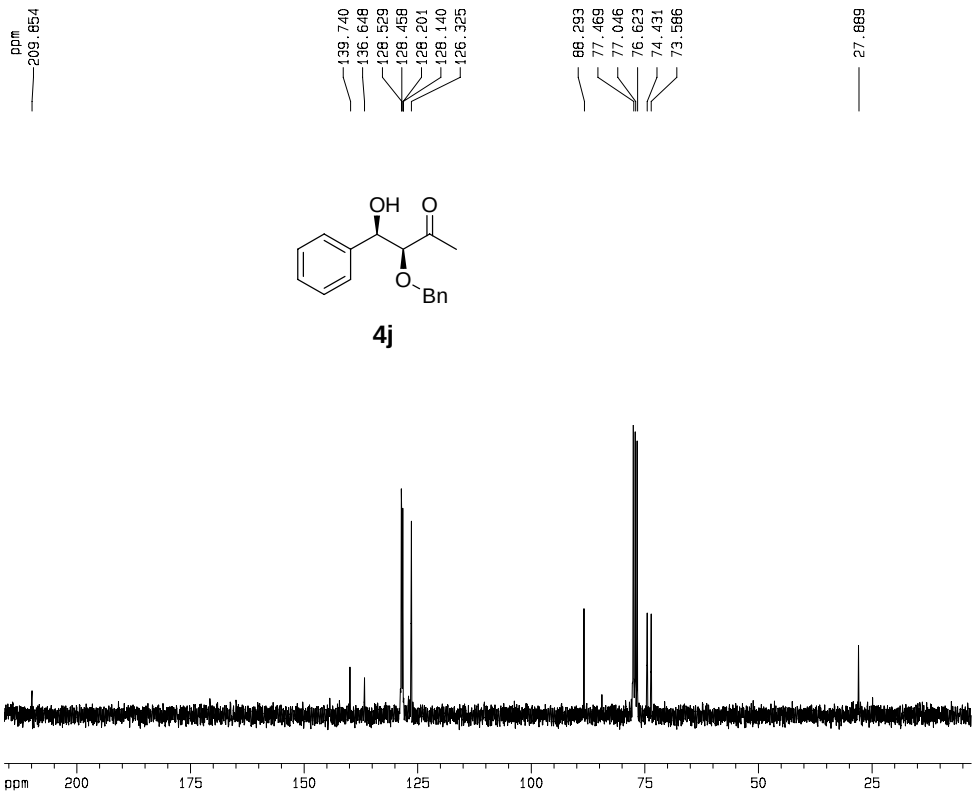

```
Current Data Parameters
NAME        XH-070206-5
EXPNO                 10
PROCNO                 1

F2 - Acquisition Parameters
Date_           20070206
Time               16.34
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                    16
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ            5.3084660 sec
RG                   181
DW               81.000 usec
DE                6.00 usec
TE                297.4 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                 9.30 usec
PL1               -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                 32768
SF          300.1300078 MHz
WDW                   EM
SSB                    0
LB                  0.35 Hz
GB                     0
PC                  1.00

1D NMR plot parameters
CX                 22.00 cm
CY                  6.00 cm
F1P                8.510 ppm
F1               2554.21 Hz
F2P                1.587 ppm
F2                476.16 Hz
PPMCM           0.31472 ppm/cm
HZCM           94.45696 Hz/cm
```




```
Current Data Parameters
NAME        XH-070206-5
EXPNO                 11
PROCNO                 1

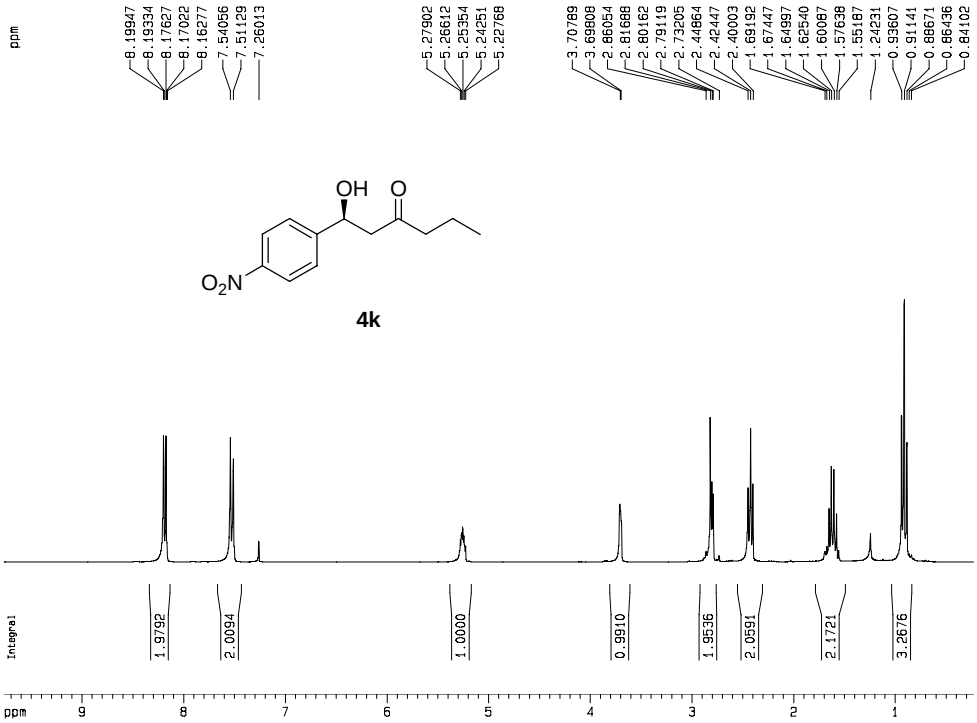
F2 - Acquisition Parameters
Date_           20070206
Time               16.37
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                 65536
SOLVENT            CDCl3
NS                   176
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ            1.8219508 sec
RG                 287.4
DW               27.800 usec
DE                6.00 usec
TE                297.6 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2         waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2               -1.00 dB
PL12              18.00 dB
PL13              18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                 32768
SF          75.4677490 MHz
WDW                   EM
SSB                    0
LB                  1.00 Hz
GB                     0
PC                  1.40

1D NMR plot parameters
CX                 20.00 cm
CY                  6.00 cm
F1P              215.998 ppm
F1             16300.88 Hz
F2P                3.192 ppm
F2               240.88 Hz
PPMCM          10.64031 ppm/cm
HZCM          803.00000 Hz/cm
```



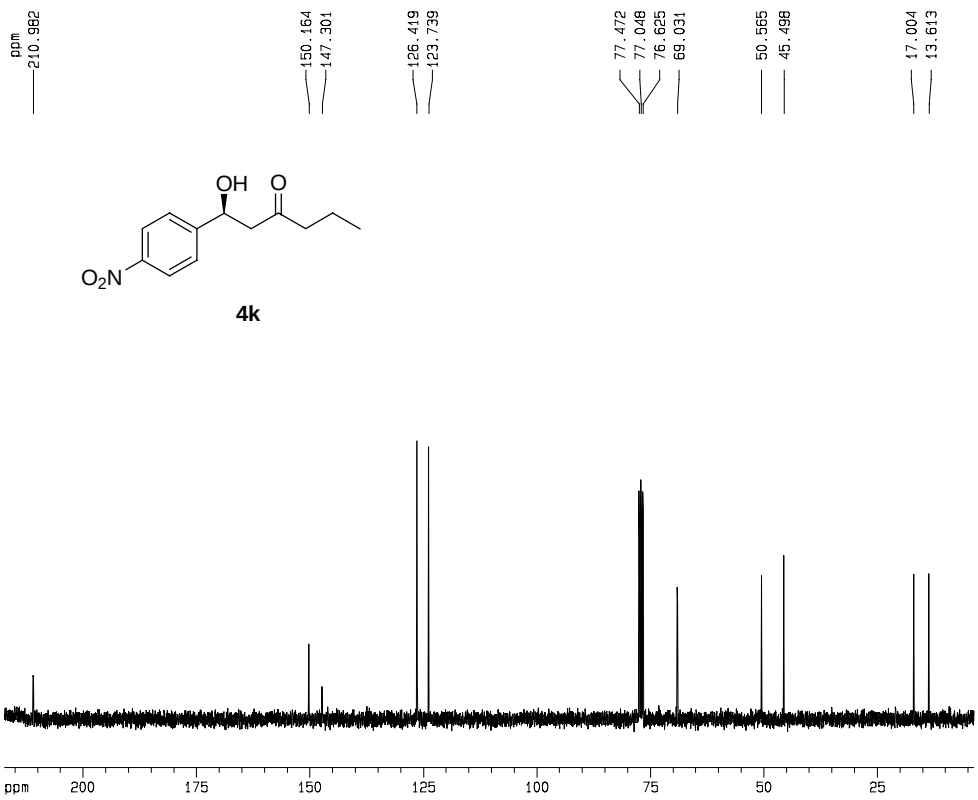

```
Current Data Parameters
NAME          XH-061219-1
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_            20061219
Time                12.40
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG             zg30
TD                  65536
SOLVENT             CDCl3
NS                     16
DS                      2
SWH             6172.839 Hz
FIDRES          0.094190 Hz
AQ            5.3084660 sec
RG                    181
DW                 81.000 usec
DE                   6.00 usec
TE                  296.1 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                   1H
P1                   9.30 usec
PL1                 -1.00 dB
SFO1          300.1318534 MHz

F2 - Processing parameters
SI                  32768
SF            300.1300058 MHz
WDW                    EM
SSB                     0
LB                   0.35 Hz
GB                      0
PC                   1.00

1D NMR plot parameters
CX                  22.00 cm
CY                   6.00 cm
F1P                 9.765 ppm
F1                 2930.90 Hz
F2P                 0.231 ppm
F2                 69.31 Hz
PPMCM             0.43339 ppm/cm
HZCM            130.07188 Hz/cm
```




```
Current Data Parameters
NAME          XH-061219-1
EXPNO                  11
PROCNO                  1

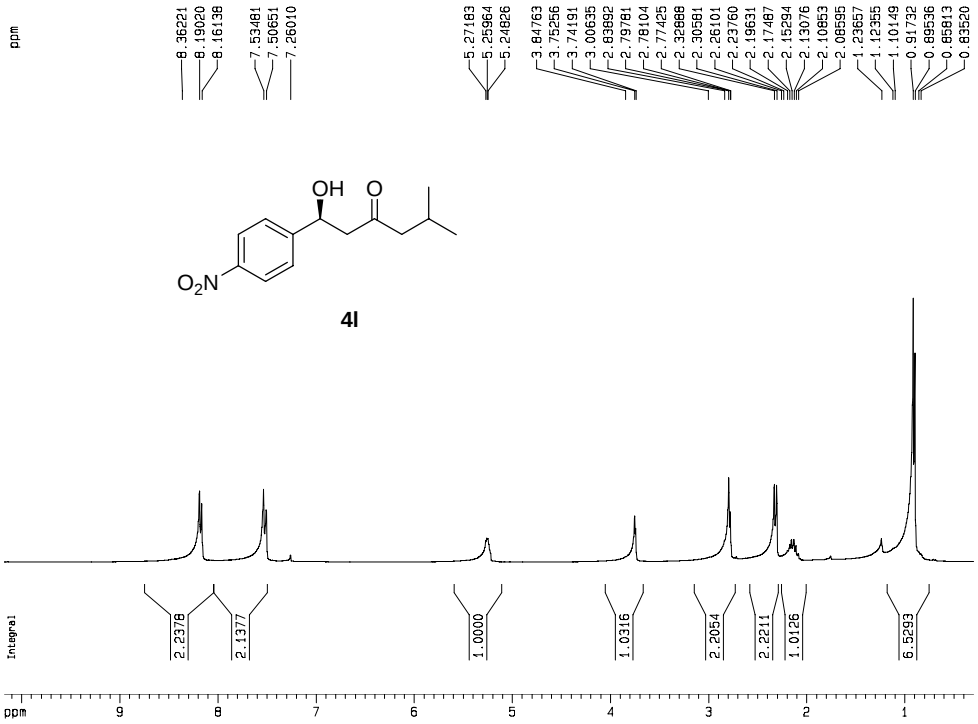
F2 - Acquisition Parameters
Date_            20061219
Time                12.45
INSTRUM             av300
PROBHD   5 mm DUL 13C-1
PULPROG           zgpg30
TD                  65536
SOLVENT             CDCl3
NS                     60
DS                      4
SWH            17985.611 Hz
FIDRES          0.274439 Hz
AQ            1.8219508 sec
RG                  406.4
DW                 27.800 usec
DE                   6.00 usec
TE                  296.1 K
D1            2.00000000 sec
d11           0.03000000 sec
d12           0.00002000 sec

======== CHANNEL f1 ========
NUC1                  13C
P1                   9.40 usec
PL1                 -1.00 dB
SFO1          75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                   1H
PCPD2              80.00 usec
PL2                 -1.00 dB
PL12                18.00 dB
PL13                18.00 dB
SFO2          300.1312005 MHz

F2 - Processing parameters
SI                  32768
SF            75.4677490 MHz
WDW                    EM
SSB                     0
LB                   1.00 Hz
GB                      0
PC                   1.40

1D NMR plot parameters
CX                  20.00 cm
CY                   6.00 cm
F1P               217.313 ppm
F1              16400.14 Hz
F2P                 3.718 ppm
F2                280.59 Hz
PPMCM            10.67976 ppm/cm
HZCM            805.97772 Hz/cm
```



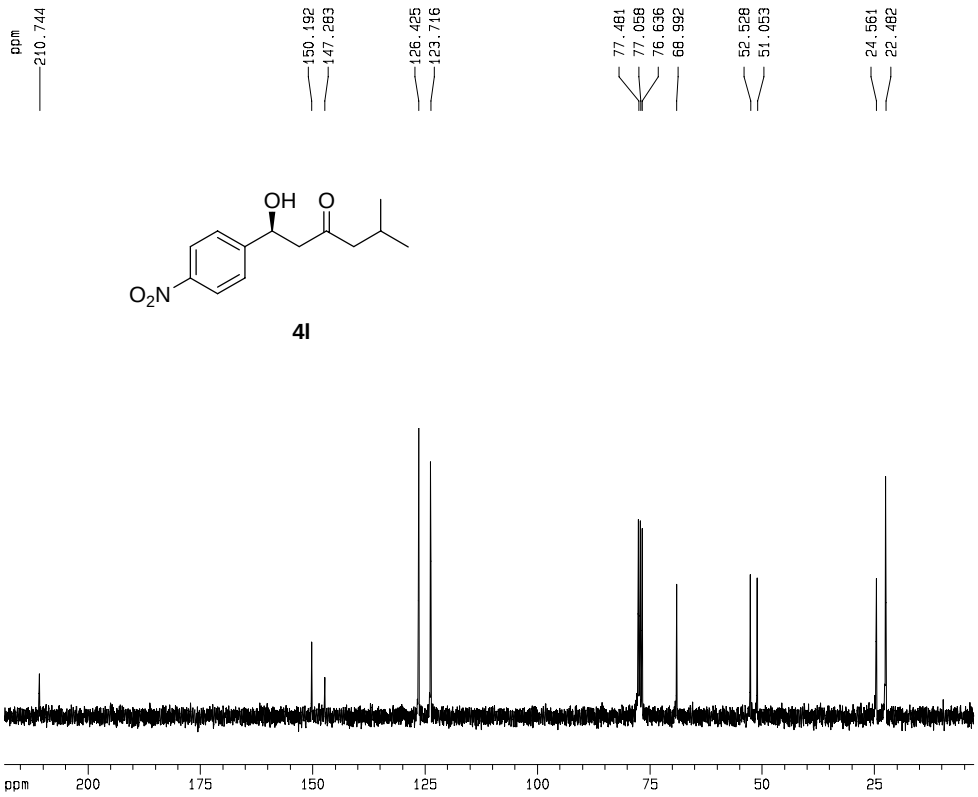

```
Current Data Parameters
NAME          XH-061215-2
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061215
Time               12.31
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                   16
DS                    2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG                  114
DW               81.000 usec
DE                6.00 usec
TE                295.2 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                  9.30 usec
PL1                -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300047 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P              10.178 ppm
F1             3054.67 Hz
F2P               0.303 ppm
F2               90.88 Hz
PPMCM          0.44886 ppm/cm
HZCM         134.71730 Hz/cm
```




```
Current Data Parameters
NAME          XH-061215-2
EXPNO                  11
PROCNO                  1

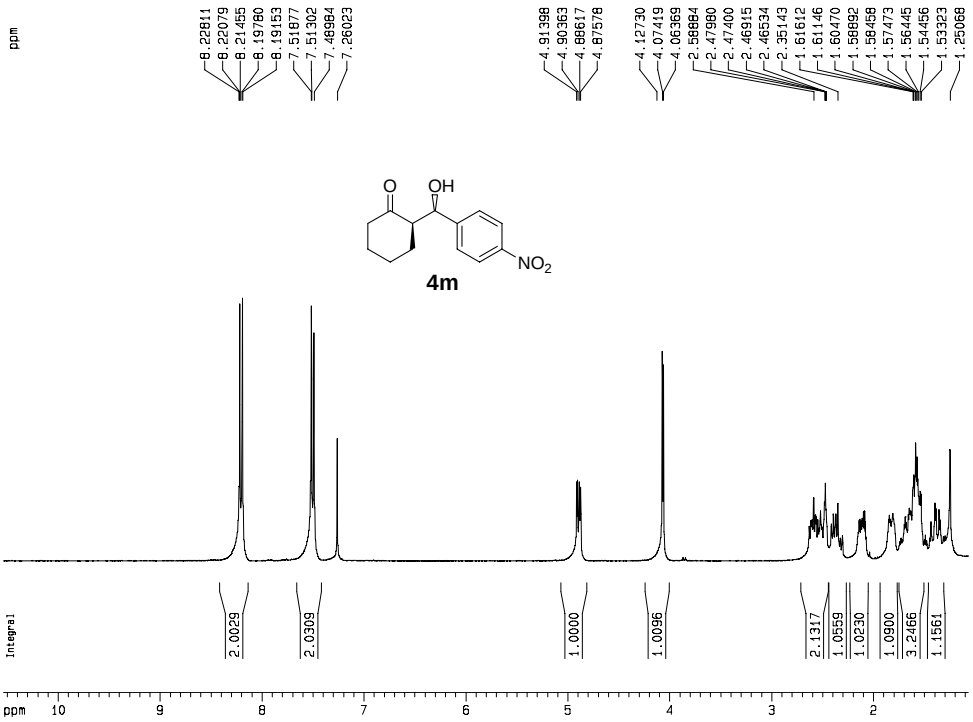
F2 - Acquisition Parameters
Date_           20061215
Time               12.34
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                  128
DS                    4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG                456.1
DW               27.800 usec
DE                6.00 usec
TE                295.4 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

======== CHANNEL f1 ========
NUC1                 13C
P1                  9.40 usec
PL1                -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2                -1.00 dB
PL12               18.00 dB
PL13               18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                 6.00 cm
F1P             218.629 ppm
F1            16499.40 Hz
F2P               2.929 ppm
F2              221.03 Hz
PPMCM          10.78498 ppm/cm
HZCM         813.91846 Hz/cm
```



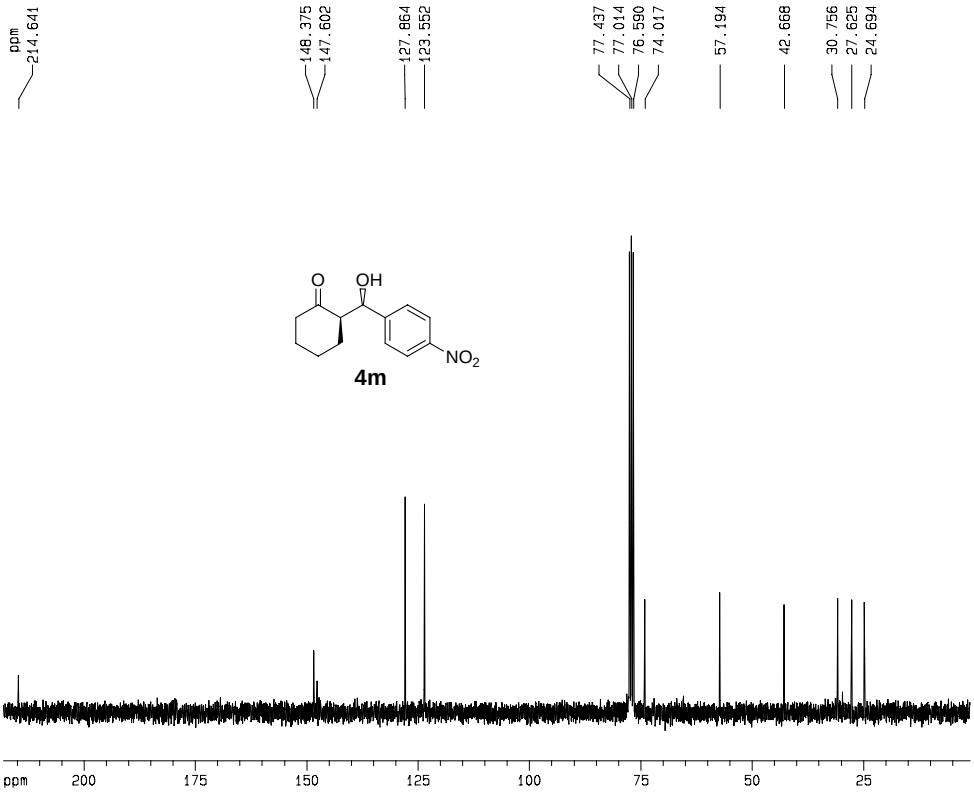

```
Current Data Parameters
NAME          XH-061229-3
EXPNO                  10
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061229
Time               12.42
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    16
DS                     2
SWH            6172.839 Hz
FIDRES         0.094190 Hz
AQ           5.3084660 sec
RG               322.5
DW              81.000 usec
DE               6.00 usec
TE               297.4 K
D1           2.00000000 sec

======== CHANNEL f1 ========
NUC1                  1H
P1                 9.30 usec
PL1               -1.00 dB
SFO1        300.1318534 MHz

F2 - Processing parameters
SI                32768
SF          300.1300060 MHz
WDW                  EM
SSB                   0
LB                 0.35 Hz
GB                    0
PC                 1.00

1D NMR plot parameters
CX                22.00 cm
CY                 6.00 cm
F1P               10.537 ppm
F1              3162.36 Hz
F2P                1.070 ppm
F2               321.22 Hz
PPMCM           0.43029 ppm/cm
HZCM          129.14279 Hz/cm
```




```
Current Data Parameters
NAME          XH-061229-3
EXPNO                  11
PROCNO                  1

F2 - Acquisition Parameters
Date_           20061229
Time               12.45
INSTRUM            av300
PROBHD   5 mm DUL 13C-1
PULPROG          zgpg30
TD                65536
SOLVENT           CDCl3
NS                   249
DS                     4
SWH           17985.611 Hz
FIDRES         0.274439 Hz
AQ           1.8219508 sec
RG               287.4
DW              27.800 usec
DE               6.00 usec
TE               297.9 K
D1           2.00000000 sec
d11          0.03000000 sec
d12          0.00002000 sec

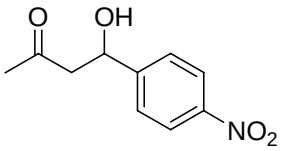
======== CHANNEL f1 ========
NUC1                 13C
P1                 9.40 usec
PL1               -1.00 dB
SFO1         75.4752953 MHz

======== CHANNEL f2 ========
CPDPRG2          waltz16
NUC2                  1H
PCPD2             80.00 usec
PL2               -1.00 dB
PL12              18.00 dB
PL13              18.00 dB
SFO2        300.1312005 MHz

F2 - Processing parameters
SI                32768
SF          75.4677490 MHz
WDW                  EM
SSB                   0
LB                 1.00 Hz
GB                    0
PC                 1.40

1D NMR plot parameters
CX                20.00 cm
CY                10.00 cm
F1P              218.102 ppm
F1             16459.70 Hz
F2P                1.087 ppm
F2               82.07 Hz
PPMCM          10.85075 ppm/cm
HZCM          818.88141 Hz/cm
```

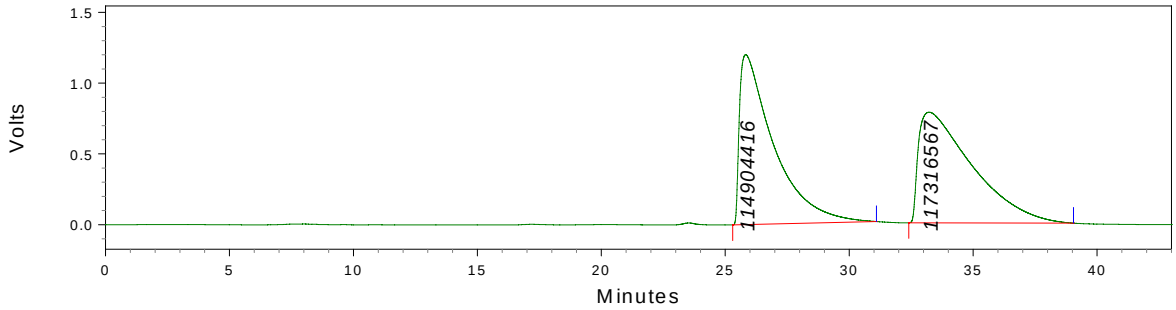
3a



Racemic

Sample ID : AS-H/3:7/0.5/25/254
User Name : System
Filename : E:\429\xh\061227\racemic-acetone-pNO2
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-27 21:09:11

Data Graph

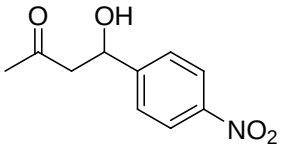


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
25.820	114904416	49.48
33.219	117316567	50.52
Totals	232220983	100.00

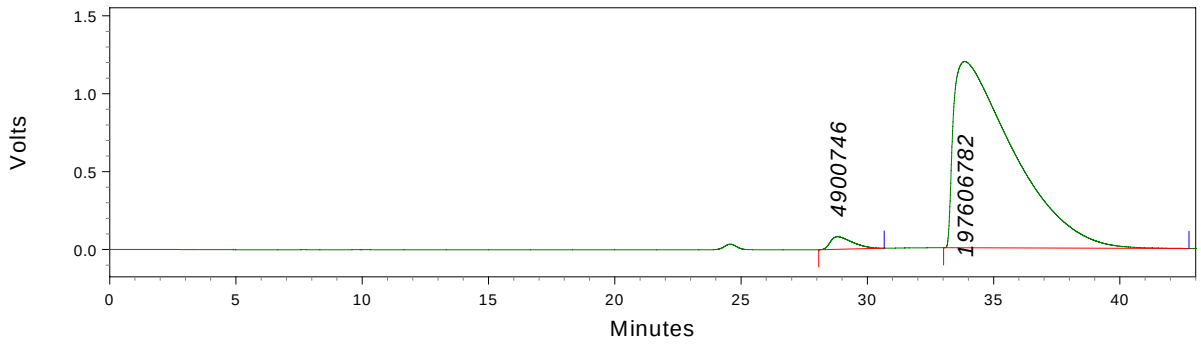
3a



95% ee

Sample ID : AS-H/7:3/20/0.5
User Name : System
Filename : E:\429\xh\061206\4-m-NO2PhCOOH
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-6 10:39:06

Data Graph

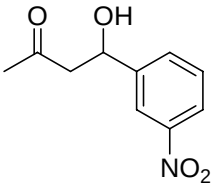


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
28.817	4900746	2.42
33.852	197606782	97.58
Totals	202507528	100.00

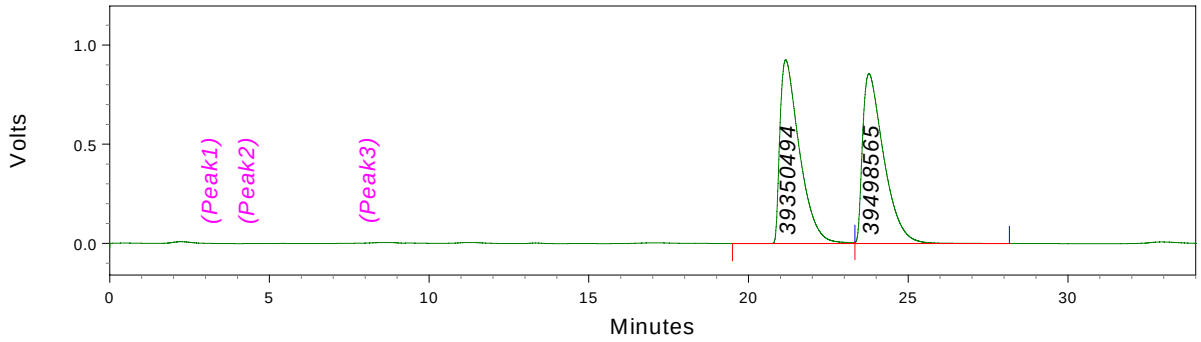
3b



Racemic

Sample ID : OJ-H/1:4/25/0.8
User Name : System
Filename : E:\429\xh\061211\racemic-3-NO2-acetone-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-11 19:39:28

Data Graph

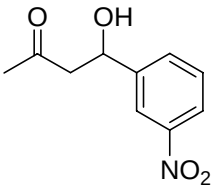


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
21.188	39350494	49.91
23.798	39498565	50.09
Totals	78849058	100.00

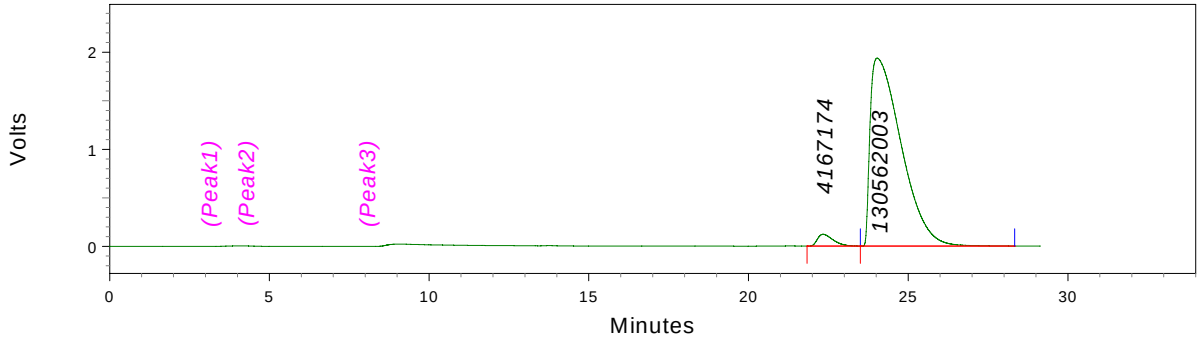
3b



94% ee

Sample ID : OJ-H/1:4/25/0.8
User Name : System
Filename : E:\429\xh\061211\4-3NO2-3NO2PhCOOH
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-11 20:45:13

Data Graph

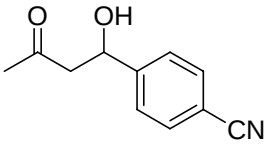


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
22.355	4167174	3.09
24.083	130562003	96.91
Totals	134729176	100.00

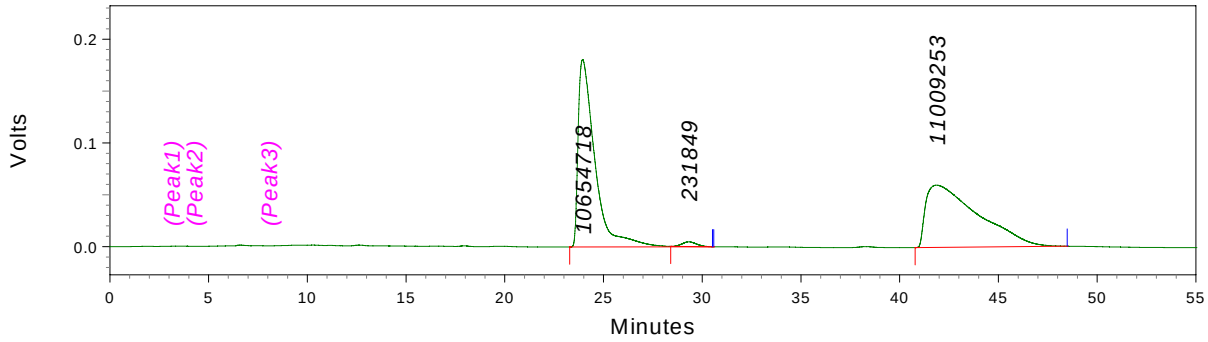
3c



Racemic

Sample ID : AS-H/3:7/25/0.6
User Name : System
Filename : E:\429\xh\061204\racemic-p-CN-actone-aldol2
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-4 19:46:38

Data Graph

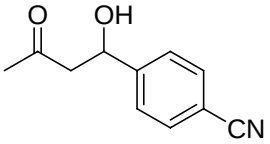


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
23.936	10654718	48.66
29.318	231849	1.06
41.865	11009253	50.28
Totals	21895820	100.00

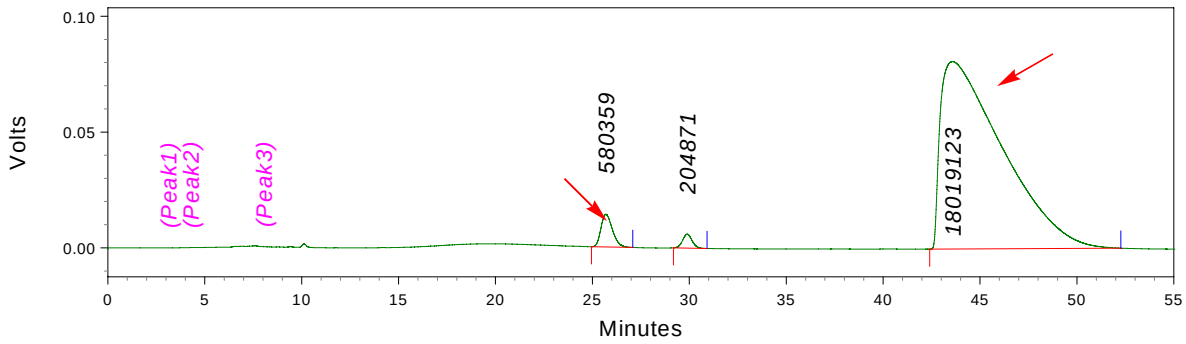
3c



94% ee

Sample ID : AS-H/3:7/25/0.5
User Name : System
Filename : E:\429\xh\061204\4-p-CN-actone-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-4 17:06:30

Data Graph

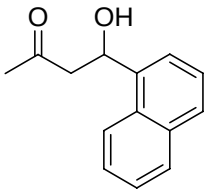


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
25.689	580359	3.09
29.888	204871	1.09
43.574	18019123	95.82
Totals	18804353	100.00

3d

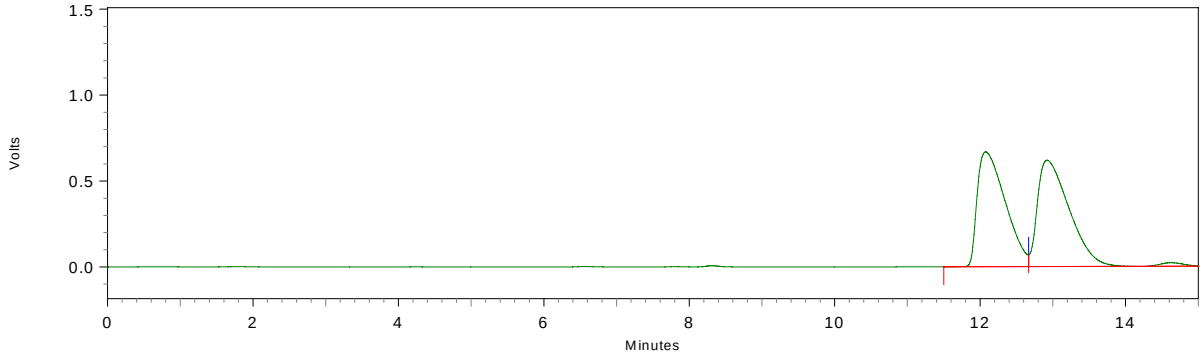


Racemic

Sample ID : AS-H/15:85/25/0.8
User Name : System
Filename : E:\429\xh\061211\racemic-1-Nap-acetone-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-12 19:11:59

Run

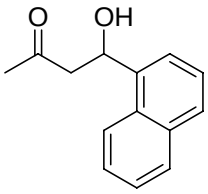
Report



Detector A (254nm)

Retention Time	Area	Area Percent
12.072	35856969	48.95
12.916	37399682	51.05
Totals	73256651	100.00

3d

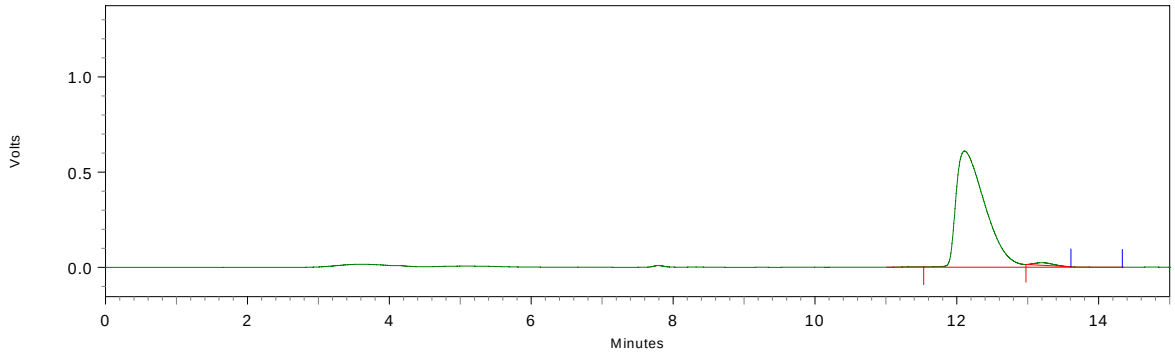


97% ee

Sample ID : AS-H/15:85/25/0.8
User Name : System
Filename : E:\429\xh\061211\18-1-Nap-m-NO2PhCOOH
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-12 19:29:14

Run

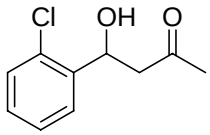
Report



Detector A (254nm)

Retention Time	Area	Area Percent
12.105	35131073	98.64
13.192	483885	1.36
Totals	35614958	100.00

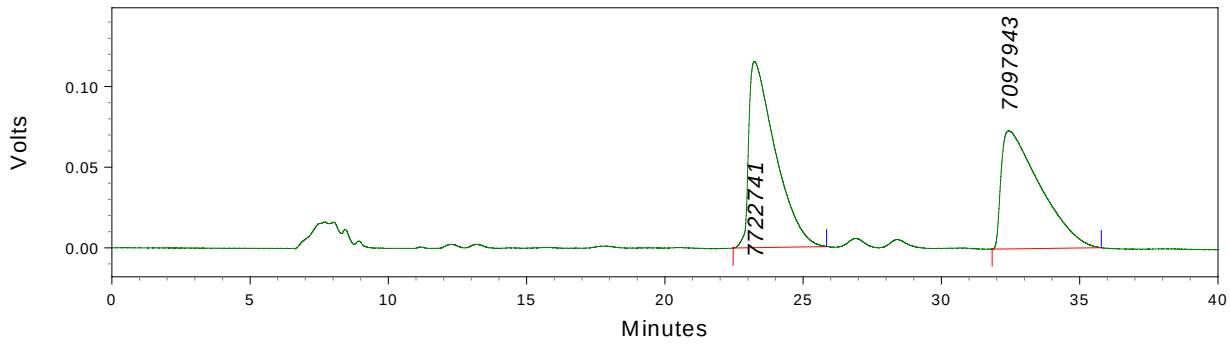
3e



racemic

Sample ID : AS-H/0.6/25/254/1:9
User Name : System
Filename : E:\429\xh\061229\racemic-acetone-o-Cl
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-29 20:14:55

Data Graph

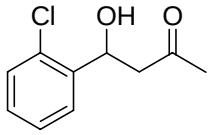


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
23.235	7722741	52.11
32.432	7097943	47.89
Totals	14820684	100.00

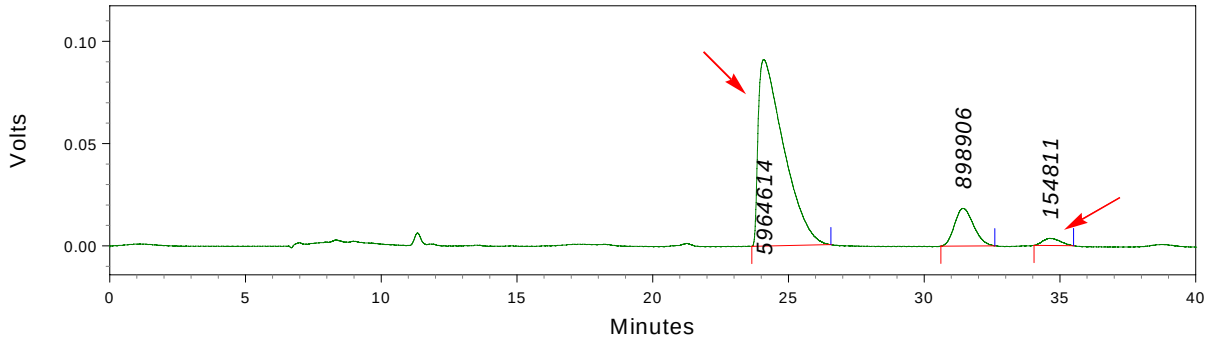
3e



95% ee

Sample ID : AS-H/0.6/25/254/1:9
User Name : System
Filename : E:\429\xh\061229\acetone-o-Cl-mNO2PhCOOH
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-29 20:57:04

Data Graph

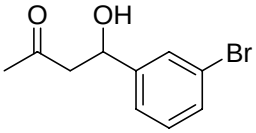


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
24.087	5964614	84.99
31.422	898906	12.81
34.623	154811	2.21
Totals	7018330	100.00

3f

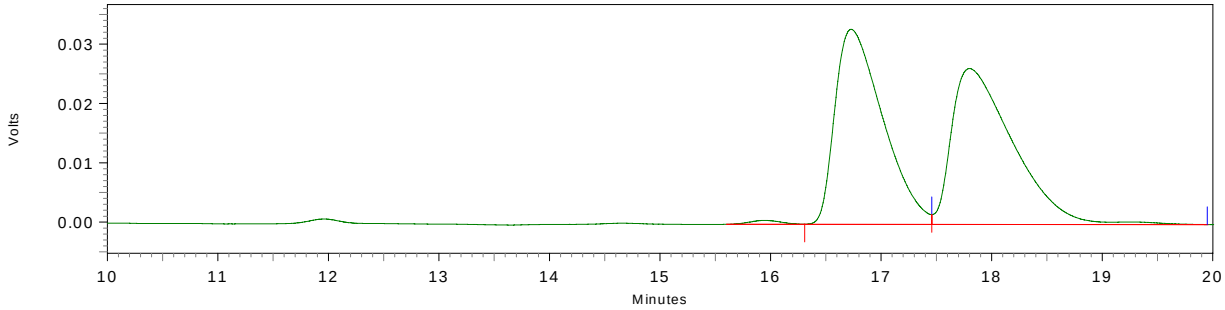


Racemic

Sample ID : AS-H/1:9/25/0.8
User Name : System
Filename : E:\429\xh\061211\racemic-3-Br-acetone-aldol-2
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-12 16:40:51

Run

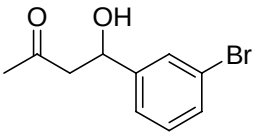
Report



Detector A (254nm)

Retention Time	Area	Area Percent
16.724	989831	49.42
17.796	1012884	50.58
Totals	2002716	100.00

3f

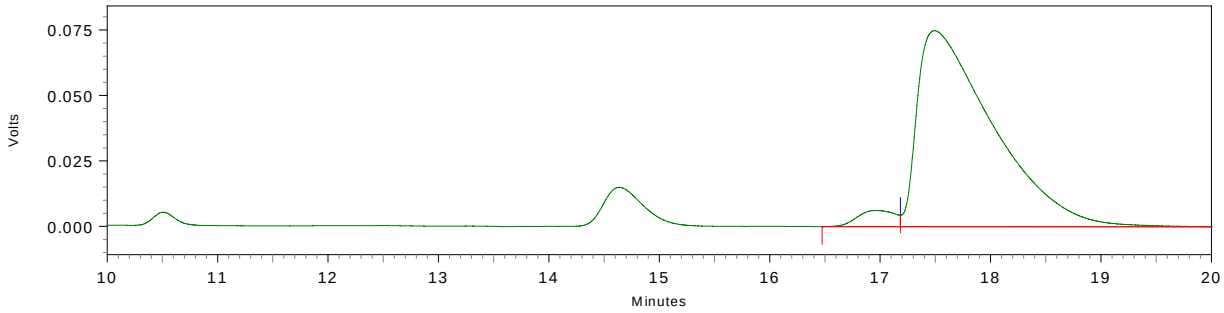


92% ee

Sample ID : AS-H/1:9/25/0.8
User Name : System
Filename : E:\429\xh\061211\16-3-Br-m-NO2PhCOOH
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-12 15:52:11

Run

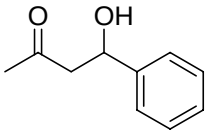
Report



Detector A (254nm)

Retention Time	Area	Area Percent
16.956	145317	3.92
17.488	3561126	96.08
Totals	3706443	100.00

3g

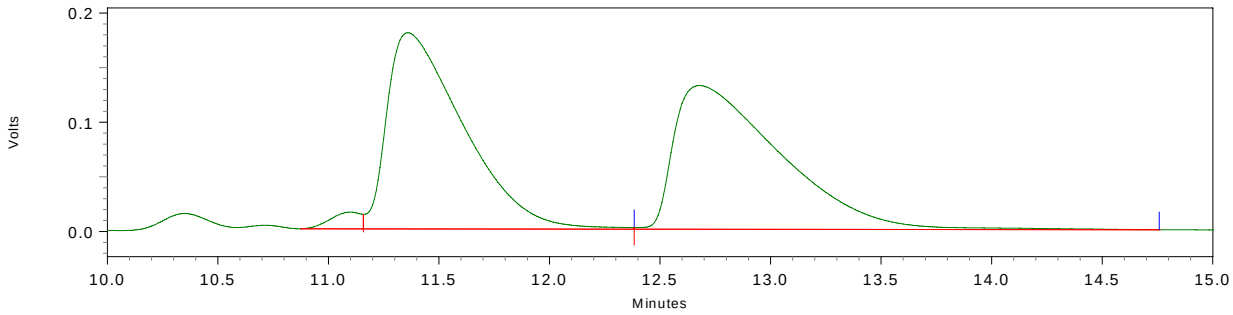


Racemic

Sample ID : AS-H/15:85/25/0.8
User Name : System
Filename : E:\429\xh\061211\racemic-4-H-acetone-aldol
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-12 18:37:32

Run

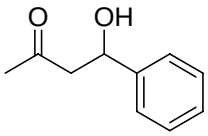
Report



Detector A (254nm)

Retention Time	Area	Area Percent
11.355	4310419	49.56
12.674	4387555	50.44
Totals	8697974	100.00

3g

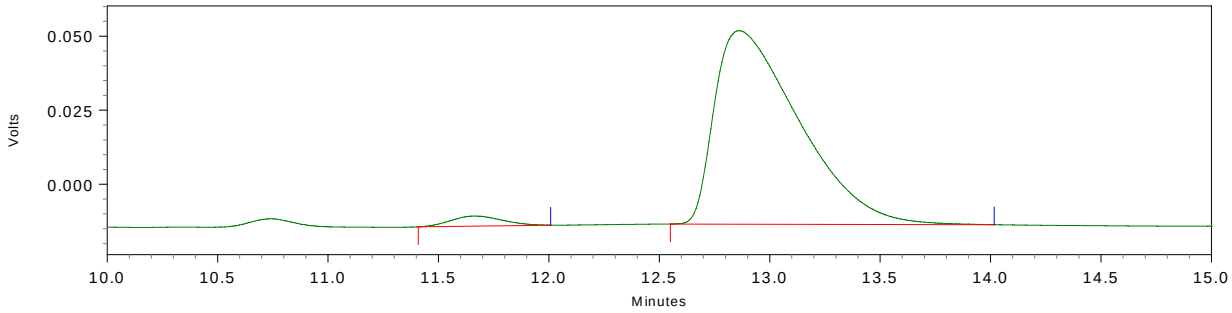


94% ee

Sample ID : AS-H/15:85/25/0.8
User Name : System
Filename : E:\429\xh\061211\17-4-H m-NO2PhCOOH
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-12 18:55:08

Run

Report

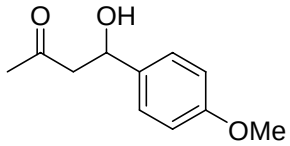


Detector A (254nm)

Retention Time	Area	Area Percent
11.661	54833	3.06
12.857	1738465	96.94

Totals	1793299	100.00

3h

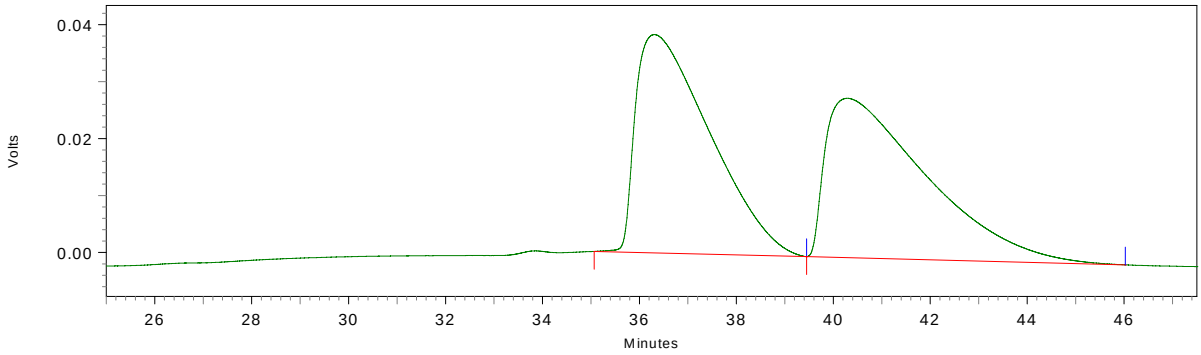


Racemic

Sample ID : AS-H/1:9/25/0.8
User Name : System
Filename : E:\429\xh\061211\racemic-4-MeO-acetone-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-12 13:31:27

Run

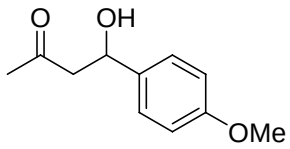
Report



Detector A (254nm)

Retention Time	Area	Area Percent
36.304	4066058	50.15
40.284	4041858	49.85
Totals	8107916	100.00

3h

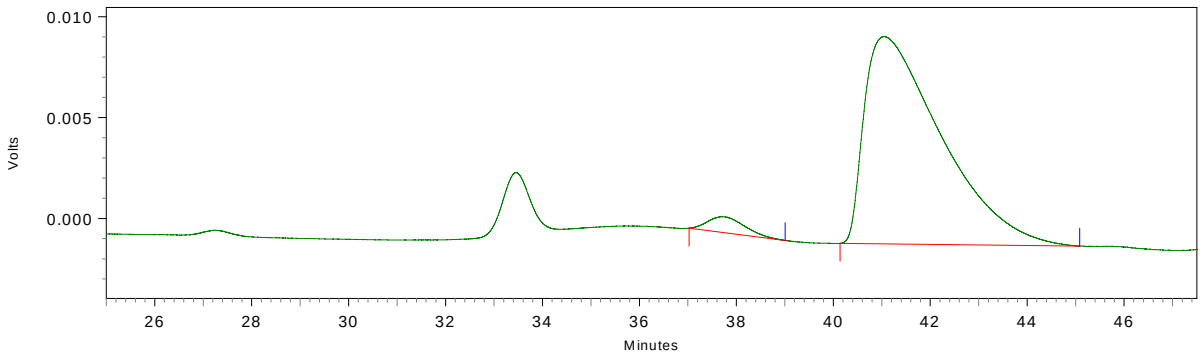


93% ee

Sample ID : AS-H/1:9/25/0.8
User Name : System
Filename : E:\429\xh\061211\14-p-MeO-m-NO2PhCOOH
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-12 14:25:09

Run

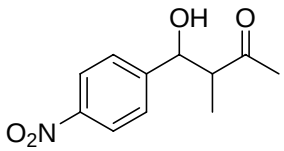
Report



Detector A (254nm)

Retention Time	Area	Area Percent
37.701	41529	3.53
41.043	1133667	96.47
Totals	1175196	100.00

4a

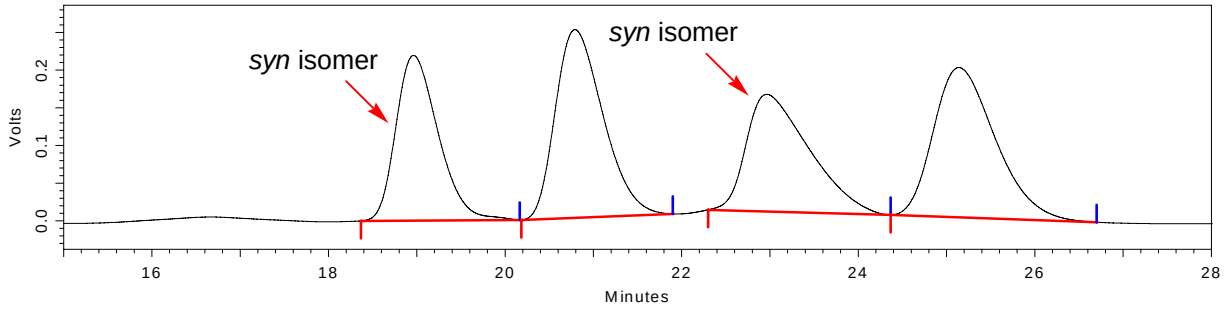


Racemic

Sample ID : AS-H/3:7/25/0.5/254
User Name : System
Filename : E:\429\xh\061217\racemic-butone-p-NO2-aldol
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-17 11:32:30

Run

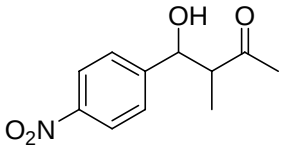
Report



Detector A (254nm)

Retention Time	Area	Area Percent
18.959	7290933	21.43
20.787	9357750	27.51
22.960	7690166	22.61
25.136	9676077	28.45
Totals	34014927	100.00

4a

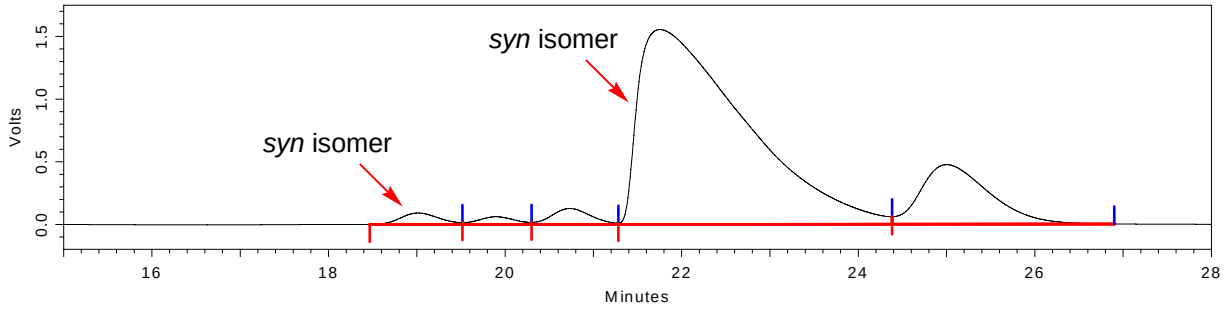


for syn isomer: 96% ee

Sample ID : AS-H/3:7/25/0.5/254
User Name : System
Filename : E:\429\xh\061217\3-butone-p-NO2-aldol-cool
Method Name : E:\wzj\11.met
Sequence Name: C:\CLASS-VP\Sequence\LC_Multical_pac.seq
Run Time : 06-12-17 12:02:03

Run

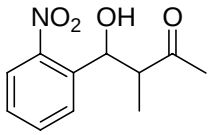
Report



Detector A (254nm)

Retention Time	Area	Area Percent
19.009	2724633	1.66
19.894	1727267	1.05
20.727	3814778	2.33
21.750	130223504	79.42
24.998	25481892	15.54
Totals	163972074	100.00

4b

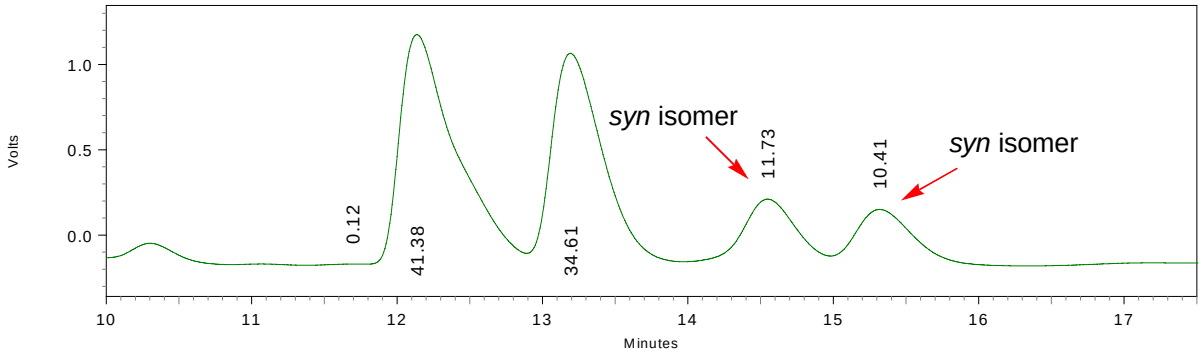


Racemic

Sample ID : AS-H/3:7/25/0.6/254
User Name : System
Filename : E:\429\xh\061217\racemic-butone-o-NO2-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-17 12:43:24

Run

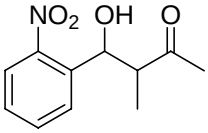
Report



Detector A (254nm)

Retention Time	Area	Area Percent
11.688	107970	0.12
12.132	36585461	41.38
13.188	30598253	34.61
14.544	10369683	11.73
15.314	9206119	10.41
18.125	1315176	1.49
20.290	229666	0.26
Totals	88412327	100.00

4b

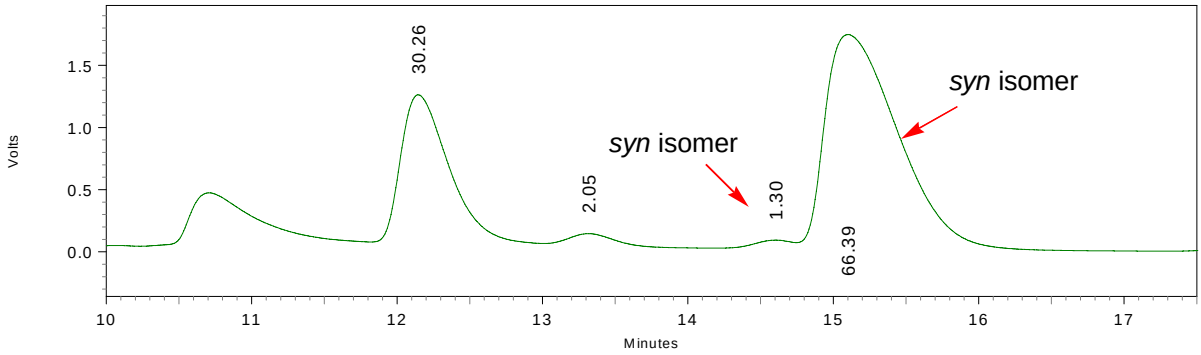


for syn isomer: 96% ee

Sample ID : AS-H/3:7/25/0.6/254
User Name : System
Filename : E:\429\xh\061217\4-butone-o-NO2-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-17 13:05:01

Run

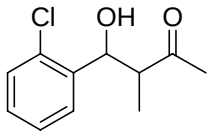
Report



Detector A (254nm)

Retention Time	Area	Area Percent
12.141	27088272	30.26
13.312	1834701	2.05
14.598	1166060	1.30
15.097	59430295	66.39
Totals	89519327	100.00

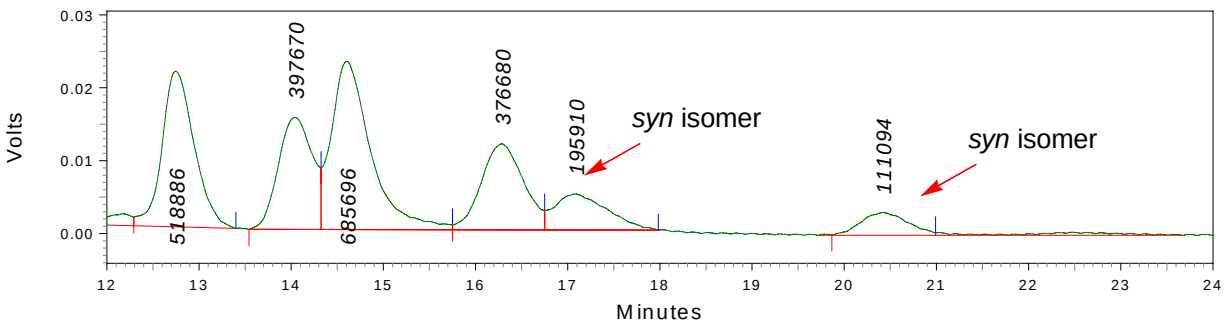
4c



racemic

Sample ID : AS-H/0.5/25/254/1:9
User Name : System
Filename : E:\429\xh\061229\racemic-butone-o-Cl-again-2
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-29 18:24:04

Data Graph

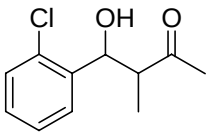


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
12.742	518886	22.70
14.038	397670	17.40
14.600	685696	30.00
16.280	376680	16.48
17.078	195910	8.57
20.410	111094	4.86
Totals	2285935	100.00

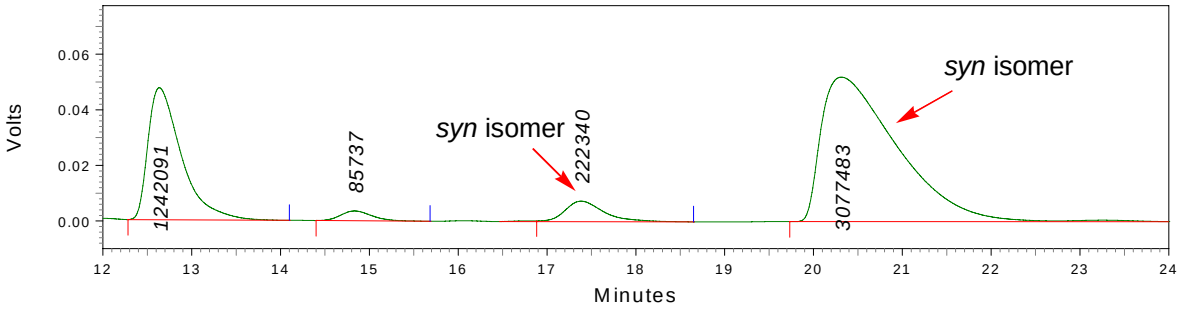
4c



for syn isomer 87% ee

Sample ID : AS-H/1:9/0.6/25/254
User Name : System
Filename : E:\429\xh\061227\butone-2-Cl-syn-again
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-27 23:03:38

Data Graph



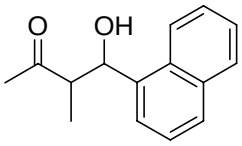
Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
12.631	1242091	26.84
14.829	85737	1.85
17.379	222340	4.80
20.310	3077483	66.50
Totals	4627650	100.00

ICCAS

4d

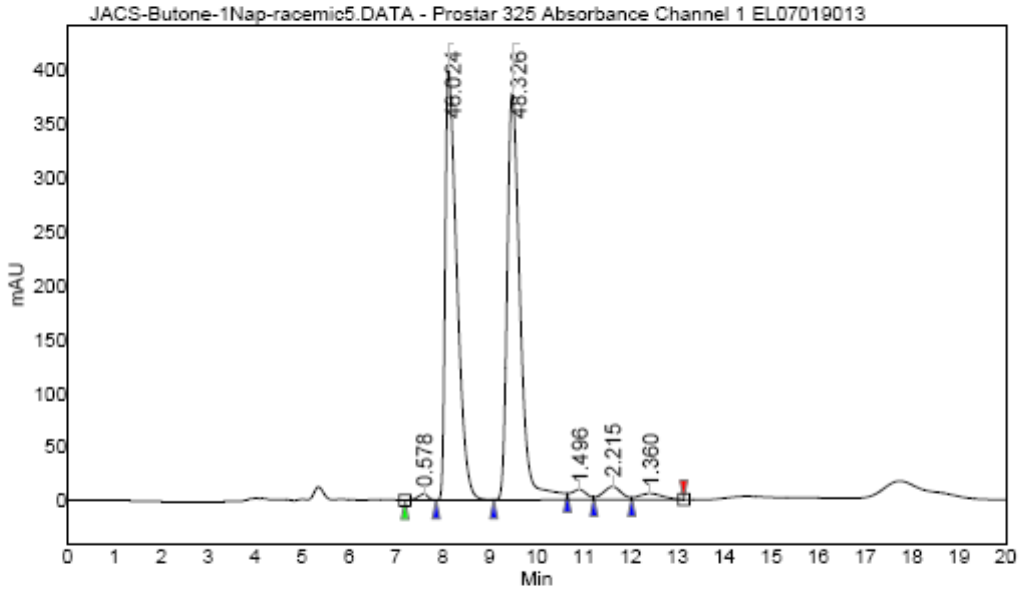


Racemic

Chromatogram : JACS-Butone-1Nap-racemic5_channel1

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-7 10:50:19
Processed : 2007-2-7 12:18:33
Printed : 2007-2-8 12:19:38

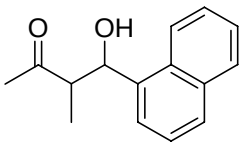


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	7.60	0.58	6.0	1.4	0.578
2	UNKNOWN	8.12	46.02	400.2	114.8	46.024
3	UNKNOWN	9.48	48.33	377.6	120.5	48.326
4	UNKNOWN	10.90	1.50	9.5	3.7	1.496
5	UNKNOWN	11.62	2.22	12.3	5.5	2.215
6	UNKNOWN	12.41	1.36	5.7	3.4	1.360
Total			100.00	811.2	249.4	100.000

ICCAS

4d

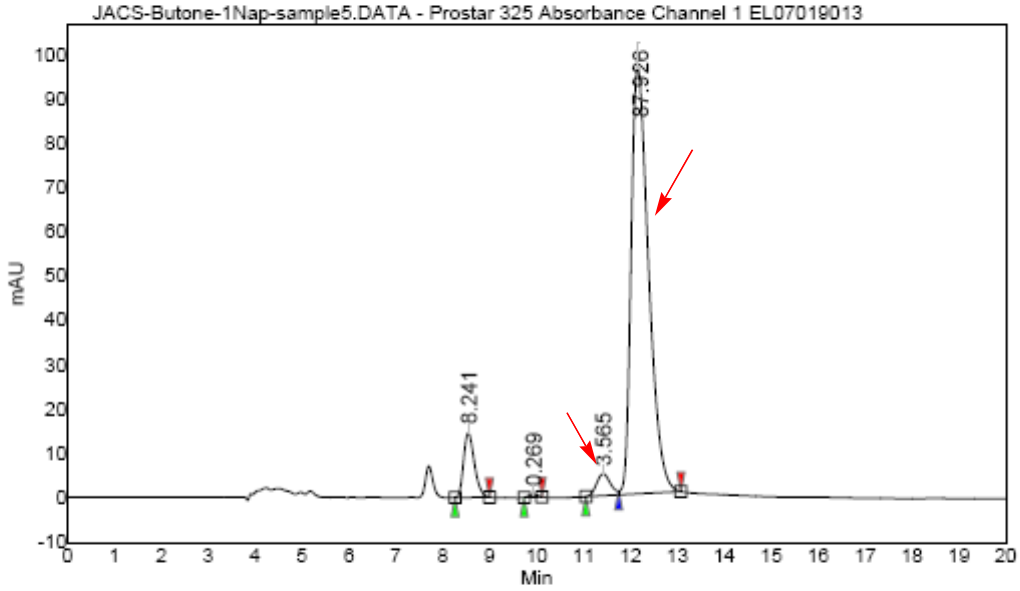


for syn isomer 92% ee

Chromatogram : JACS-Butone-1Nap-sample5_channel1

System : HPLC
Method : XH-1-4
User : XH

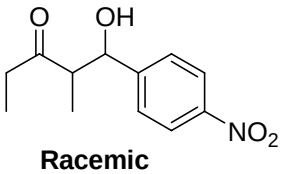
Acquired : 2007-2-7 11:46:47
Processed : 2007-2-7 12:15:16
Printed : 2007-2-8 12:17:02



Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	8.54	8.24	14.6	3.9	8.241
2	UNKNOWN	9.93	0.27	0.6	0.1	0.269
3	UNKNOWN	11.41	3.56	4.9	1.7	3.565
4	UNKNOWN	12.15	87.93	96.1	41.4	87.926
Total			100.00	116.2	47.1	100.000

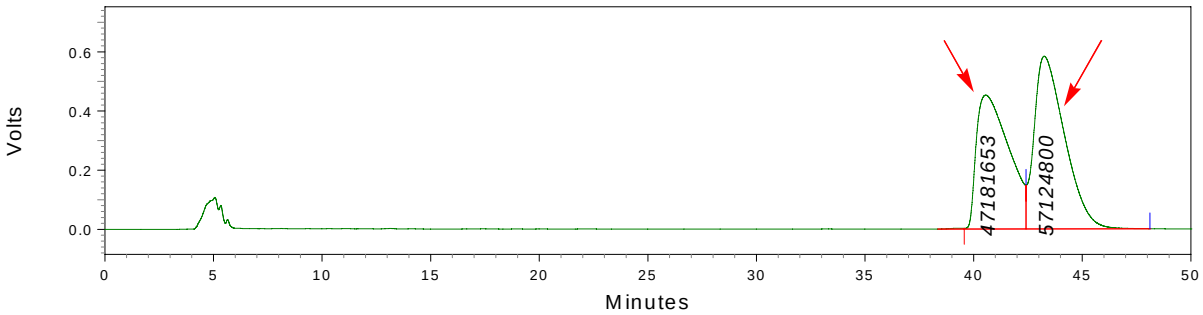
4e



Racemic

Sample ID : As-H/0.8/20/254/5:95
User Name : System
Filename : E:\429\xh\061230\racemic-3wutong-ASH-1`
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-30 21:31:44

Data Graph

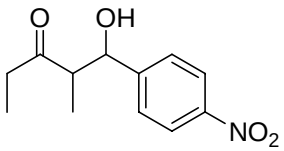


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
40.549	47181653	45.23
43.244	57124800	54.77
Totals	104306453	100.00

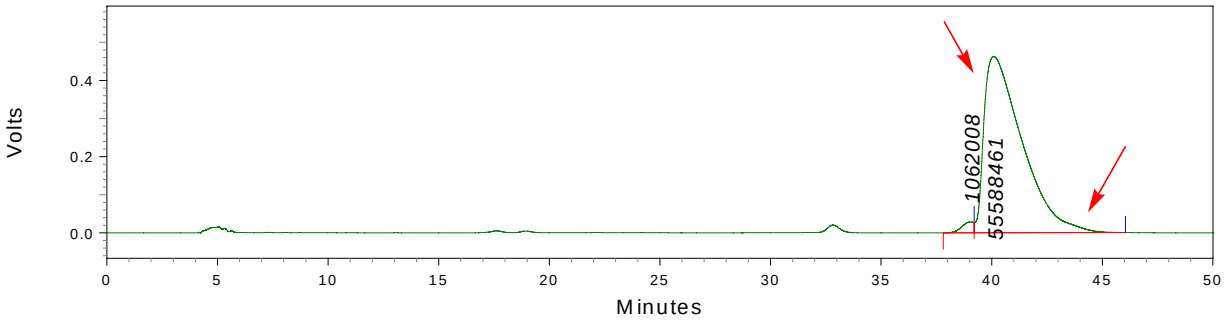
4e



for syn isomer >95% ee

Sample ID : As-H/0.8/20/254/5:95
User Name : System
Filename : E:\429\xh\061230\3wutong-ASH-1
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-30 22:32:03

Data Graph

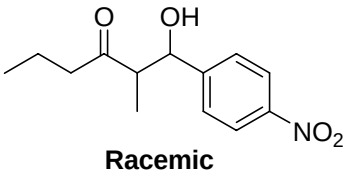


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
39.034	1062008	1.87
40.085	55588461	98.13
Totals	56650468	100.00

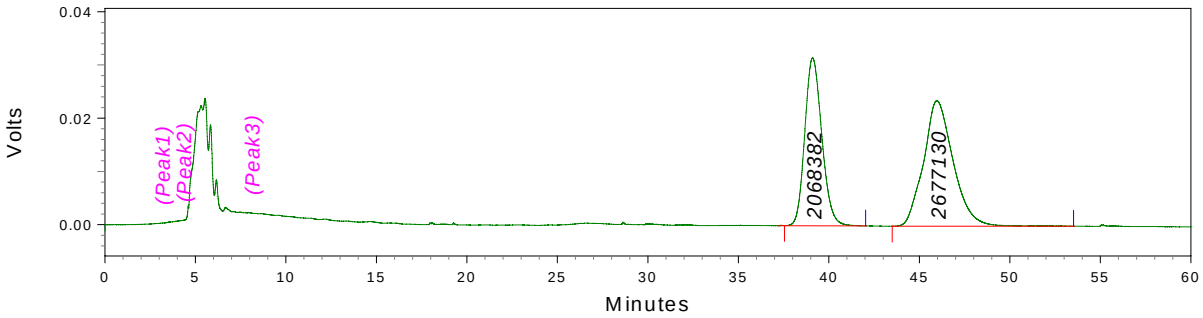
4f



Racemic

Sample ID : AS-H/5:95/0.8/25/254
User Name : System
Filename : E:\429\xh\061220\racemic-3hexanone-2ed-final
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-21 7:46:51

Data Graph

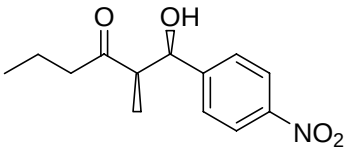


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
39.097	2068382	43.59
45.963	2677130	56.41
Totals	4745512	100.00

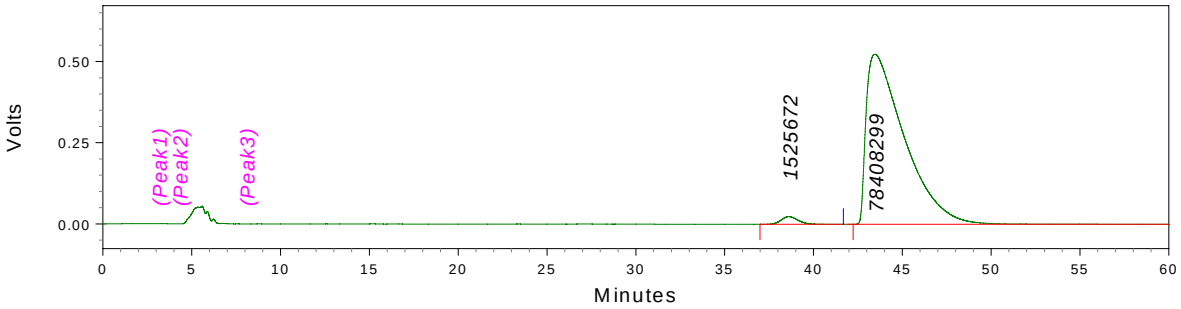
4f



for syn isomer 96% ee

Sample ID : AS-H/5:95/0.8/25/254
User Name : System
Filename : E:\429\xh\061220\3hexanone-sample1
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-21 6:05:06

Data Graph

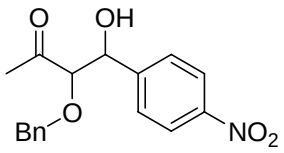


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
38.606	1525672	1.91
43.452	78408299	98.09
Totals	79933971	100.00

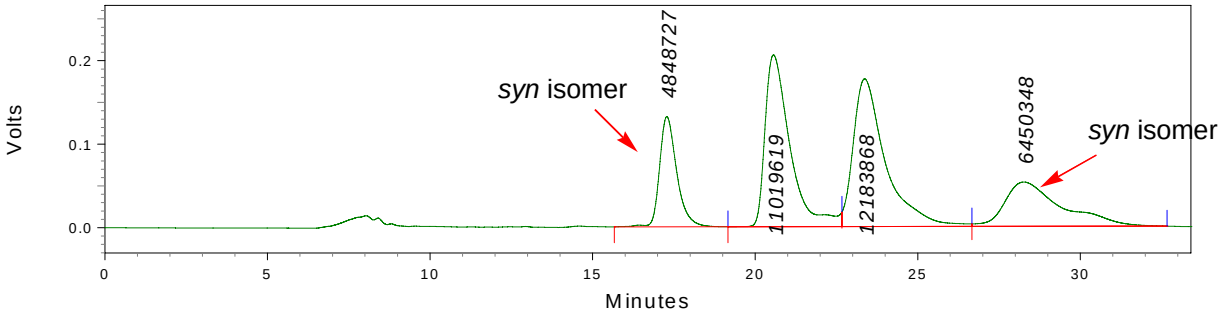
4g



Racemic

Sample ID : AS-H/3:7/0.5/25/254
User Name : System
Filename : E:\429\xh\061227\racemic-BnOacetone-pNO2-anti and syn
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-27 20:34:47

Data Graph

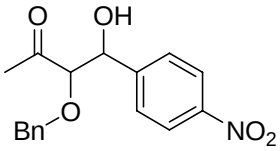


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
17.287	4848727	14.05
20.584	11019619	31.94
23.375	12183868	35.31
28.266	6450348	18.70
Totals	34502561	100.00

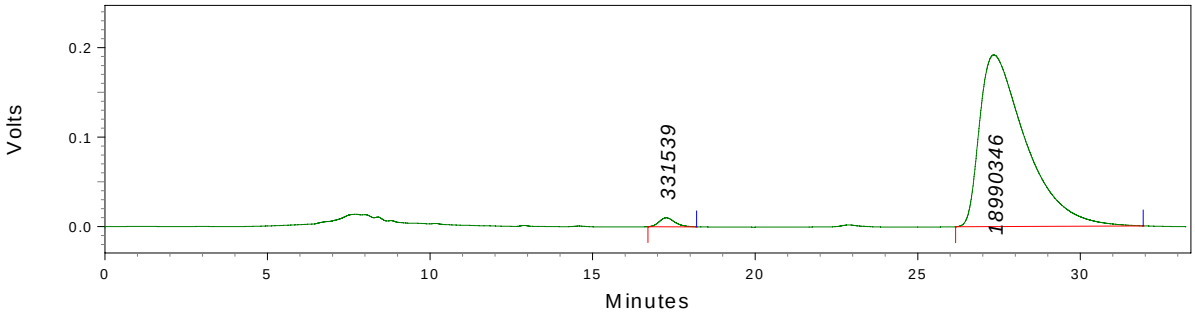
4g



for syn isomer 97% ee

Sample ID : AS-H/3:7/0.5/25/254
User Name : System
Filename : E:\429\xh\061227\BnOacetone-pNO2-syn-again-1
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-27 19:59:13

Data Graph



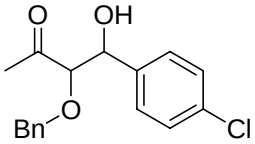
Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
17.258	331539	1.72
27.337	18990346	98.28
Totals	19321884	100.00

ICCAS

4h

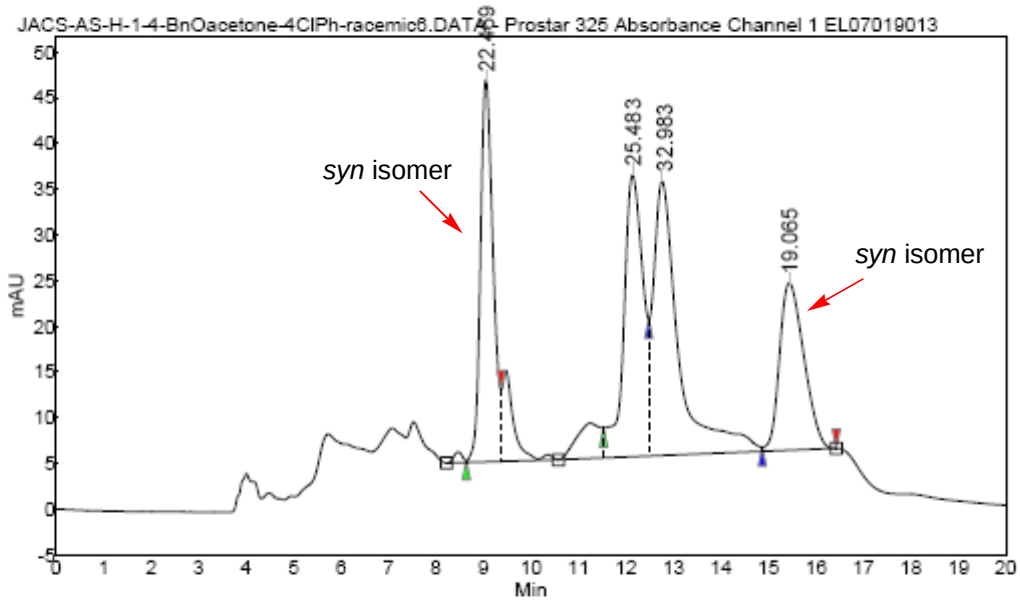


Racemic

Chromatogram : JACS-AS-H-1-4-BnOacetone-4ClPh-racemic6_channel1

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-7 13:39:29
Processed : 2007-2-7 15:03:37
Printed : 2007-2-8 12:14:58

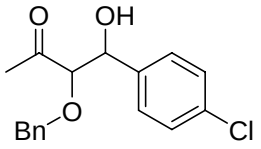


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	9.05	22.47	41.8	12.8	22.469
2	UNKNOWN	12.14	25.48	30.8	14.6	25.483
3	UNKNOWN	12.76	32.98	30.0	18.8	32.983
4	UNKNOWN	15.44	19.06	18.3	10.9	19.065
Total			100.00	120.9	57.1	100.000

ICCAS

4h



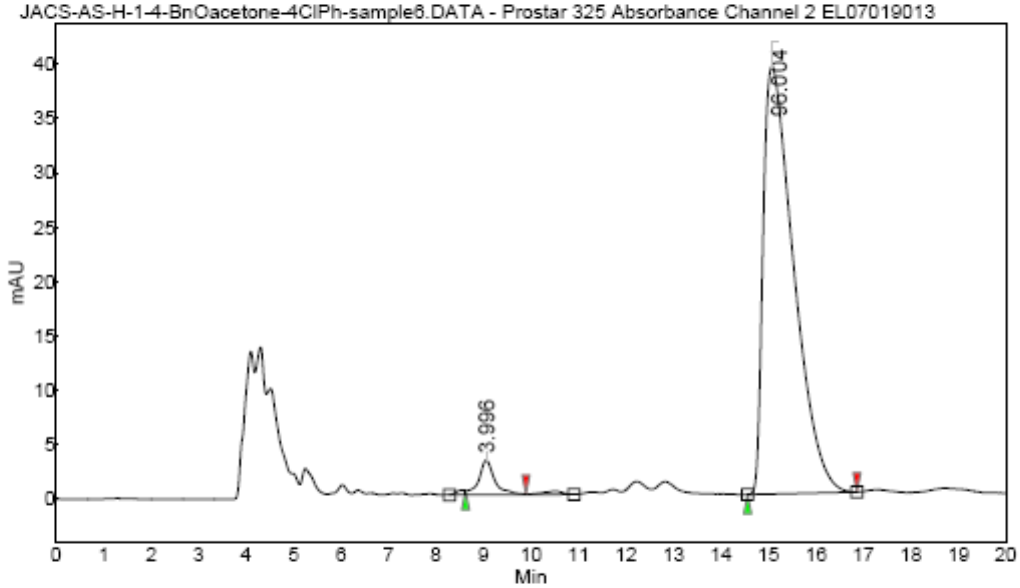
for syn isomer 92% ee

Chromatogram : JACS-AS-H-1-4-BnOacetone-4ClPh-sample6_channel2

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-7 14:28:36
Processed : 2007-2-7 15:01:15
Printed : 2007-2-8 12:14:23

JACS-AS-H-1-4-BnOacetone-4ClPh-sample6.DATA - Prostar 325 Absorbance Channel 2 EL07019013

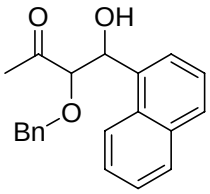


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	9.05	4.00	3.2	1.2	3.996
2	UNKNOWN	15.07	96.00	39.3	29.3	96.004
Total			100.00	42.5	30.5	100.000

ICCAS

4i

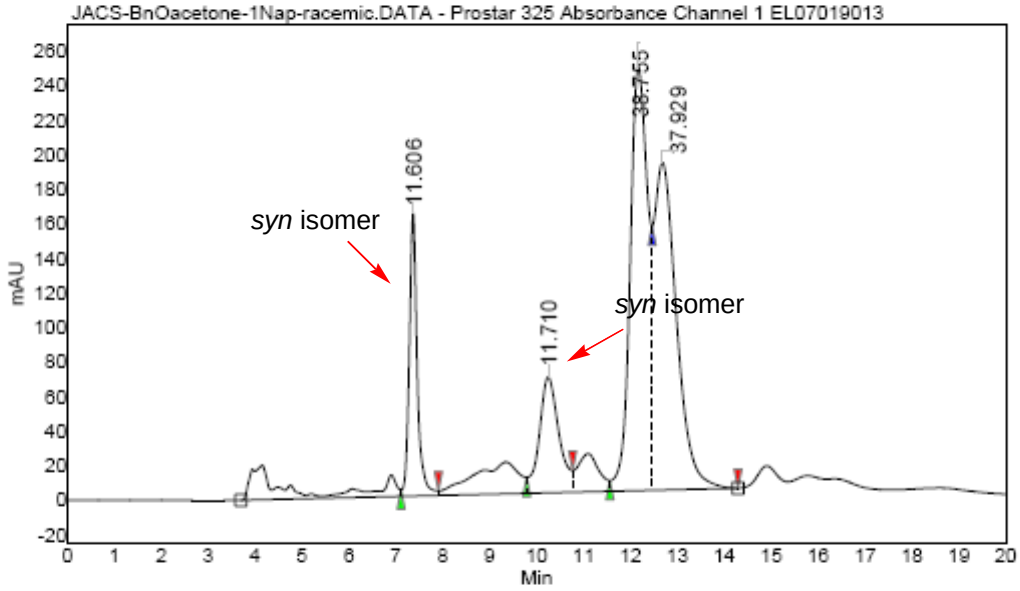


Racemic

Chromatogram : JACS-BnOacetone-1Nap-racemic_channel1

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-7 9:53:47
Processed : 2007-2-7 15:28:03
Printed : 2007-2-8 12:13:18

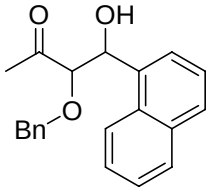


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	7.37	11.61	163.7	32.2	11.606
2	UNKNOWN	10.25	11.71	67.1	32.5	11.710
3	UNKNOWN	12.17	38.75	244.9	107.7	38.755
4	UNKNOWN	12.68	37.93	189.7	105.4	37.929
Total			100.00	665.4	277.8	100.000

ICCAS

4i



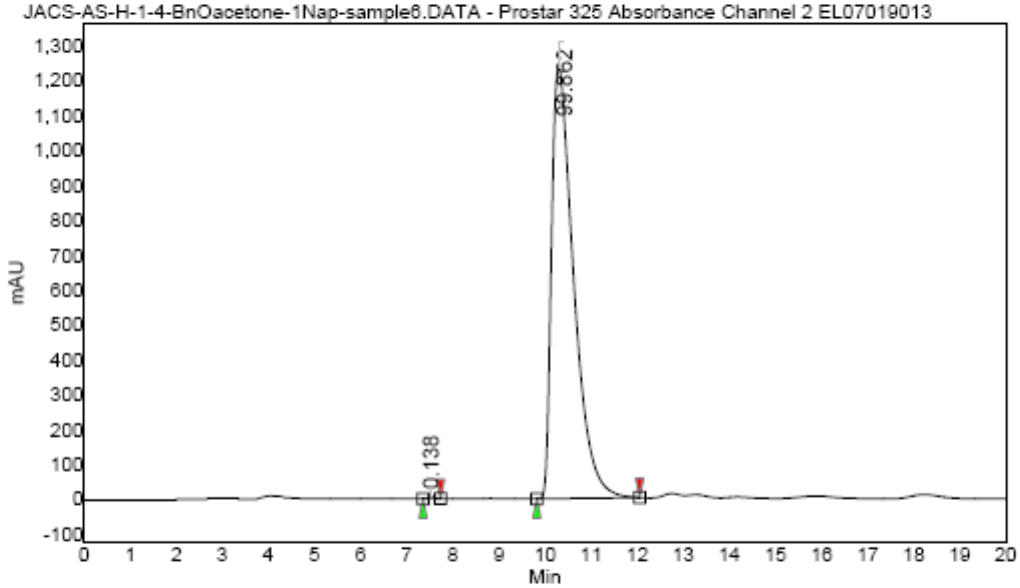
for syn isomer >99% ee

Chromatogram : JACS-AS-H-1-4-BnOacetone-1Nap-sample6_channel2

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-7 14:56:32
Processed : 2007-2-7 15:32:33
Printed : 2007-2-8 12:12:31

JACS-AS-H-1-4-BnOacetone-1Nap-sample6.DATA - Prostar 325 Absorbance Channel 2 EL07019013

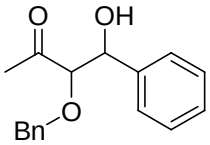


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	7.51	0.14	6.7	1.0	0.138
2	UNKNOWN	10.30	99.86	1238.4	687.6	99.862
Total			100.00	1245.1	688.6	100.000

ICCAS

4j



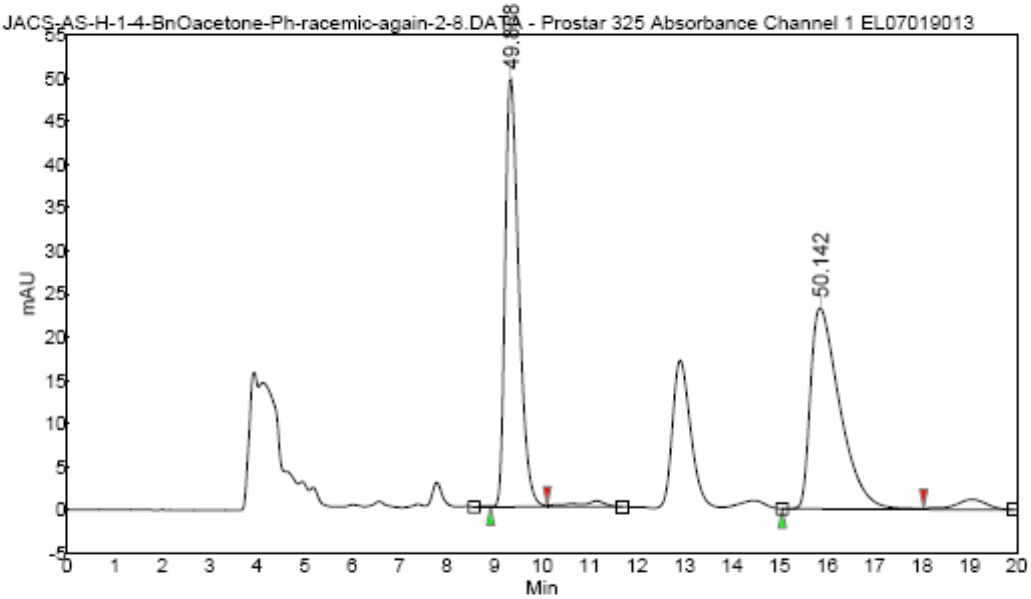
Racemic

Chromatogram : JACS-AS-H-1-4-BnOacetone-Ph-racemic-again-2-8_channel1

System : HPLC
Method : XH-1-4
User : XH

Acquired : 2007-2-8 11:07:11
Processed : 2007-2-8 12:09:35
Printed : 2007-2-8 12:09:38

JACS-AS-H-1-4-BnOacetone-Ph-racemic-again-2-8.DATA - Prostar 325 Absorbance Channel 1 EL07019013

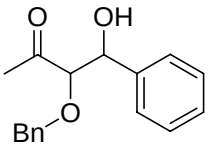


Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	9.34	49.86	49.8	16.6	49.858
2	UNKNOWN	15.86	50.14	23.3	16.7	50.142
Total			100.00	73.1	33.3	100.000

ICCAS

4j

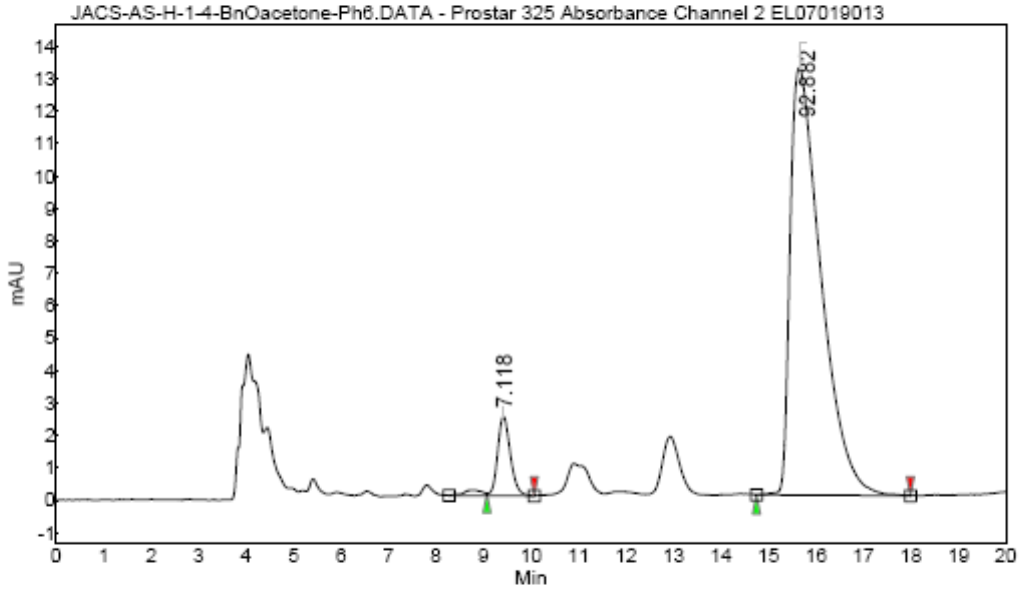


for syn isomer 86% ee

Chromatogram : JACS-AS-H-1-4-BnOacetone-Ph6_channel2

System : HPLC
Method : XH-1-4
User : XH

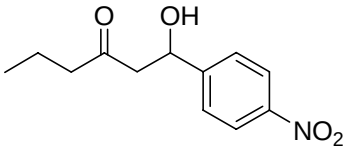
Acquired : 2007-2-7 16:47:48
Processed : 2007-2-8 11:54:17
Printed : 2007-2-8 12:10:20



Peak results :

Index	Name	Time [Min]	Quantity [% Area]	Height [mAU]	Area [mAU.Min]	Area % [%]
1	UNKNOWN	9.42	7.12	2.5	0.8	7.118
2	UNKNOWN	15.65	92.88	13.2	9.9	92.882
Total			100.00	15.6	10.7	100.000

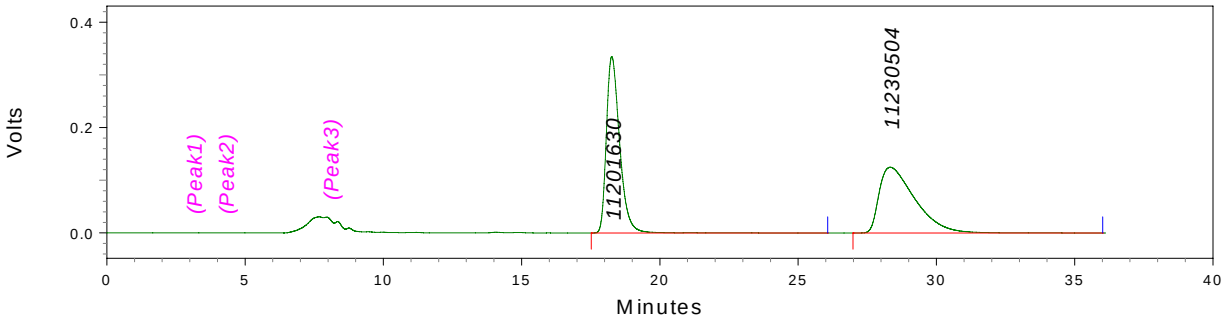
4k



Racemic

Sample ID : AS-H/3:7/0.5/25
User Name : System
Filename : E:\429\xh\061219\racemic-2wutong - 1
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-19 20:18:44

Data Graph

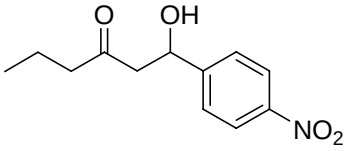


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
18.255	11201630	49.94
28.325	11230504	50.06
Totals	22432134	100.00

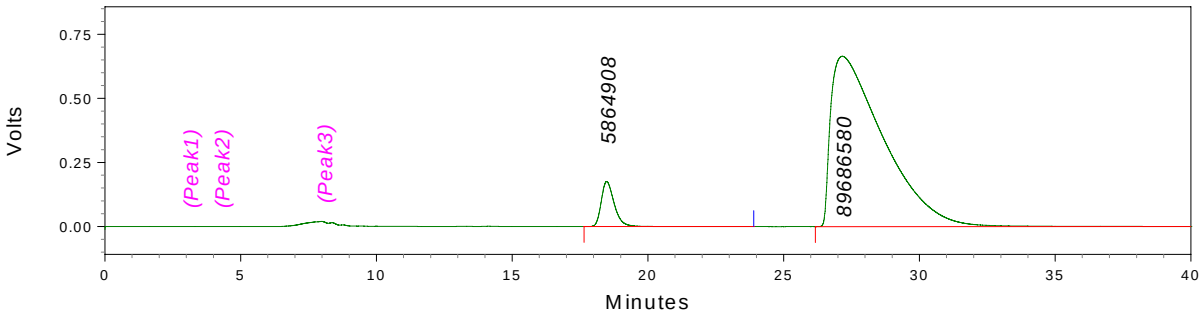
4k



88% ee

Sample ID : AS-H/3:7/0.5/25
User Name : System
Filename : E:\429\xh\061219\2wutong - 1
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-19 19:00:53

Data Graph

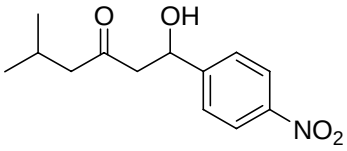


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
18.478	5864908	6.14
27.158	89686580	93.86
Totals	95551488	100.00

4l

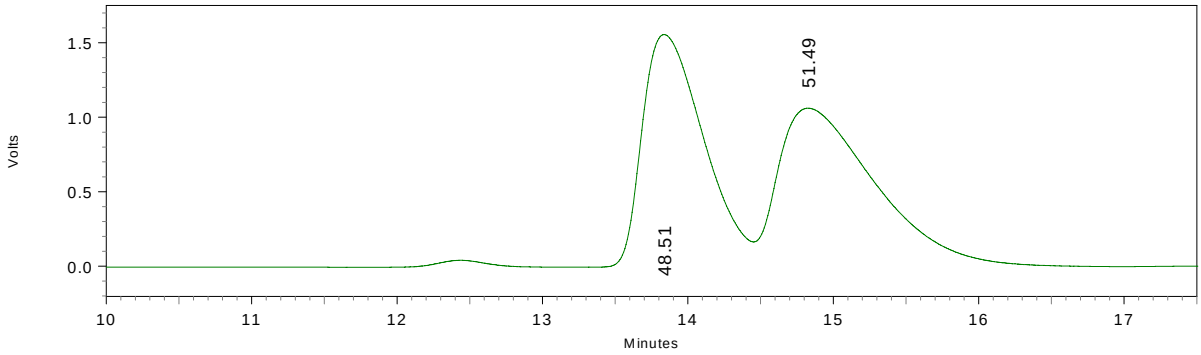


Racemic

Sample ID : AS-H/3:7/25/0.6/254
User Name : System
Filename : E:\429\xh\061217\racemic-4methyl-wutong
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-17 13:28:14

Run

Report

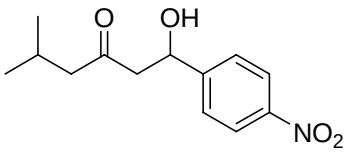


Detector A (254nm)

Retention Time	Area	Area Percent
13.832	45601467	48.51
14.823	48403851	51.49

Totals	94005319	100.00

4l

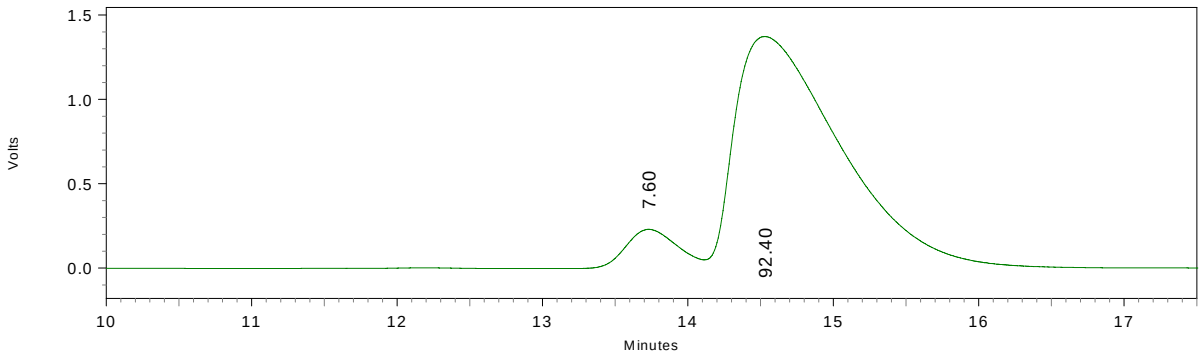


85% ee

Sample ID : AS-H/3:7/25/0.6/254
User Name : System
Filename : E:\429\xh\061217\5--4methyl-wutong-aldol
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-17 13:48:22

Run

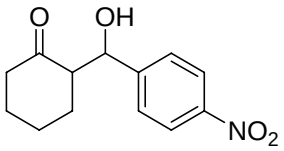
Report



Detector A (254nm)

Retention Time	Area	Area Percent
13.727	5615281	7.60
14.524	68274932	92.40
Totals	73890213	100.00

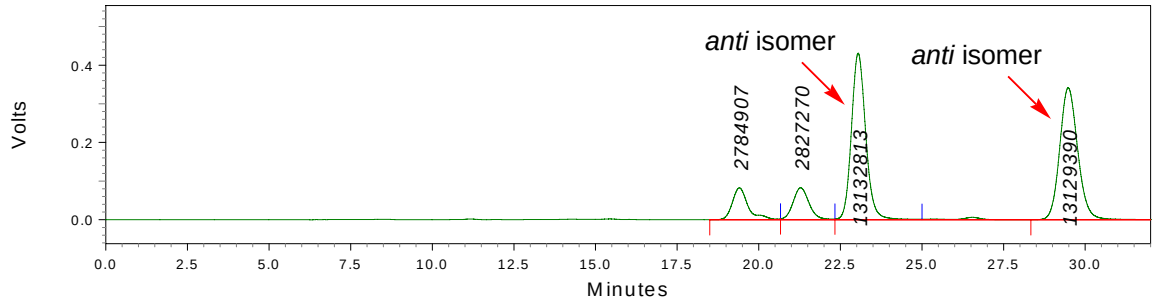
4m



Racemic

Sample ID : AD-H/1:4/0.5/25/254
User Name : System
Filename : E:\429\xh\061227\racemic-cyclohexanone-pNO2-anti
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-12-27 10:55:24

Data Graph

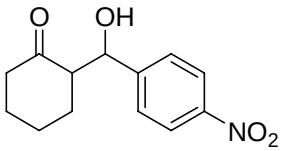


Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
19.406	2784907	8.74
21.279	2827270	8.87
23.050	13132813	41.20
29.474	13129390	41.19
Totals	31874379	100.00

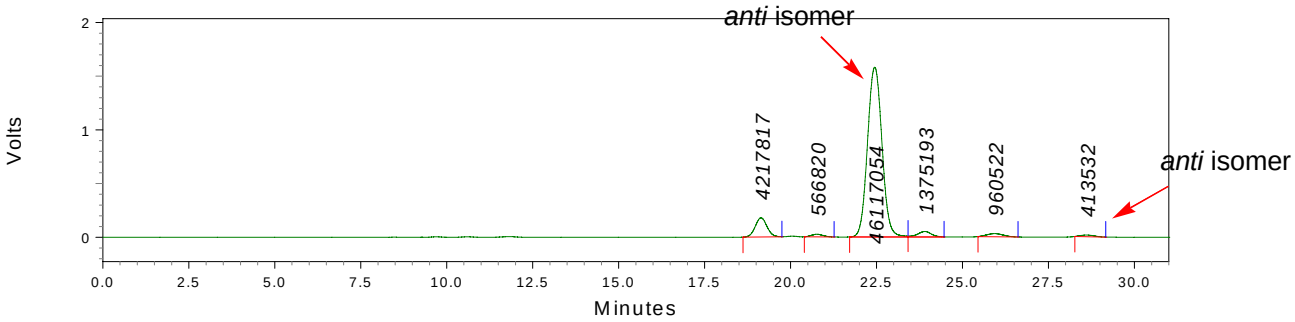
4m



for anti isomer 98% ee

Sample ID : AD-H-0.5-25-1:4
User Name : System
Filename : E:\429\xh\060825\1-CH2Cl2
Method Name : E:\gchl\m-4.met
Sequence Name: {Sequence Name}
Run Time : 06-8-25 15:50:51

Data Graph



Run Report

Detector A (254nm)

Retention Time	Area	Area Percent
19.136	4217817	7.86
20.760	566820	1.06
22.443	46117054	85.96
23.898	1375193	2.56
25.928	960522	1.79
28.598	413532	0.77
Totals	53650938	100.00