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APPENDICES

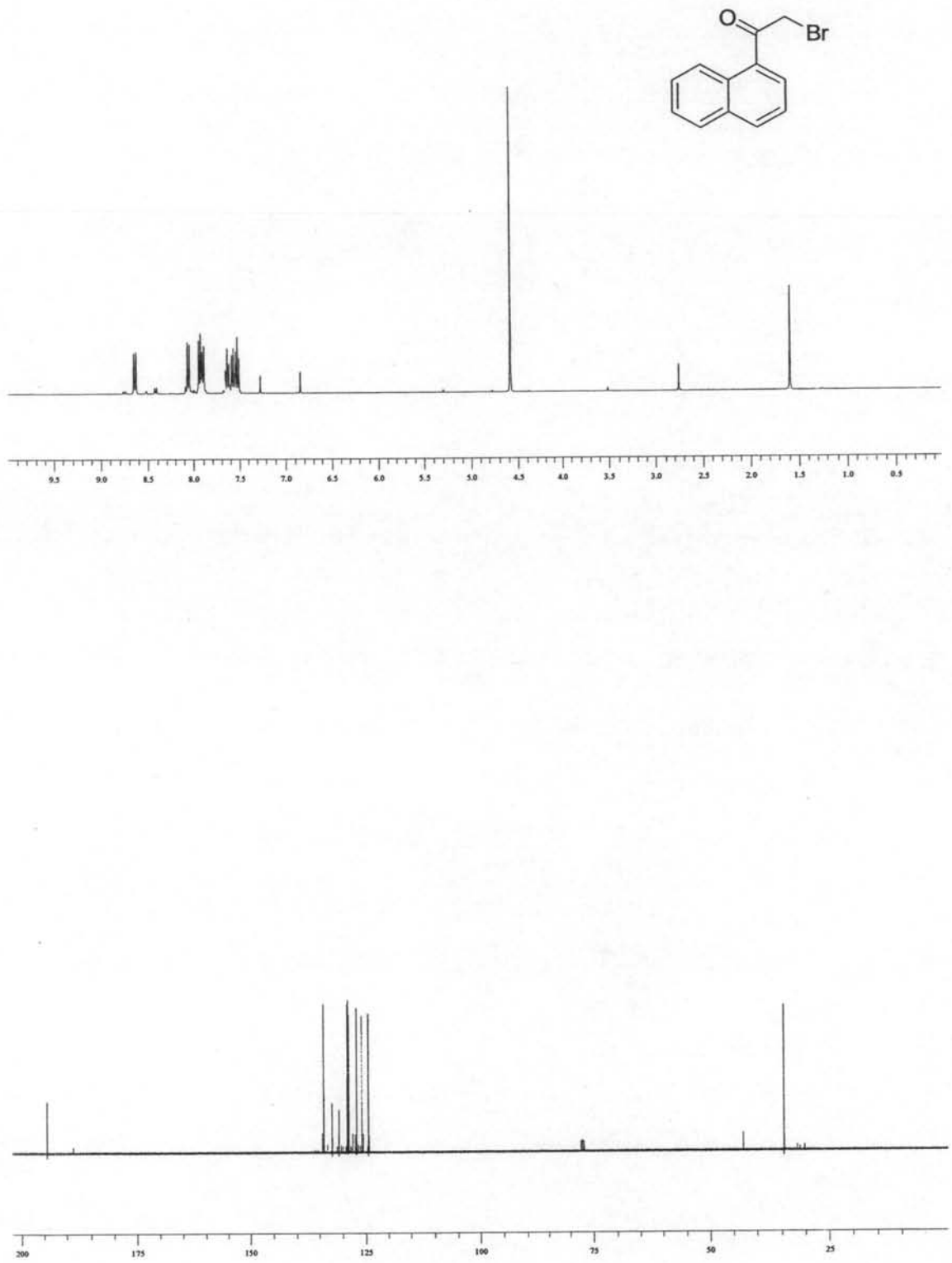

Figure A.1 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of 2-bromo-1-(naphthalen-1-yl)ethanone (**42a**) .

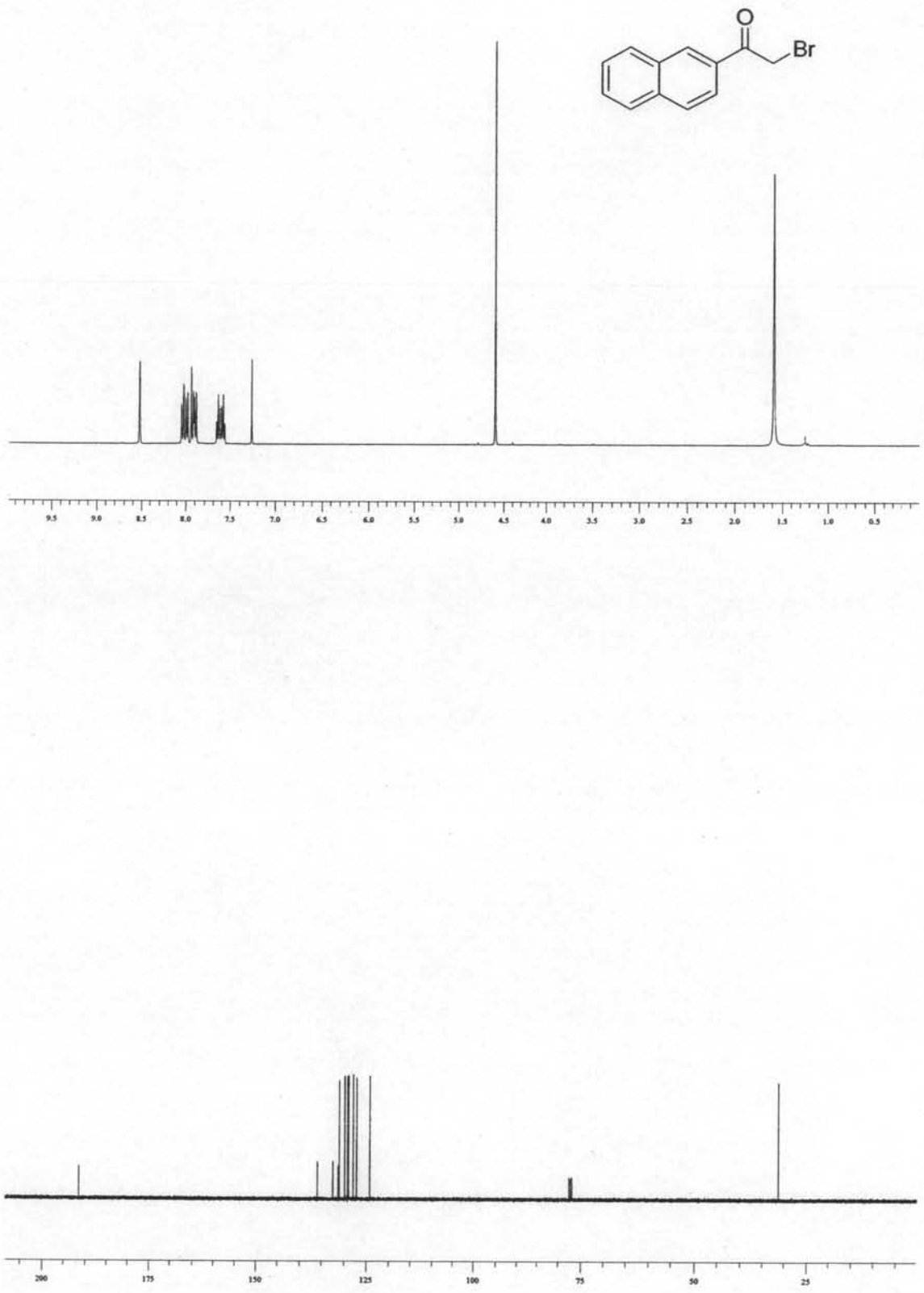

Figure A.2 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of 2-bromo-1-(naphthalene-2-yl)ethanone (**42b**).

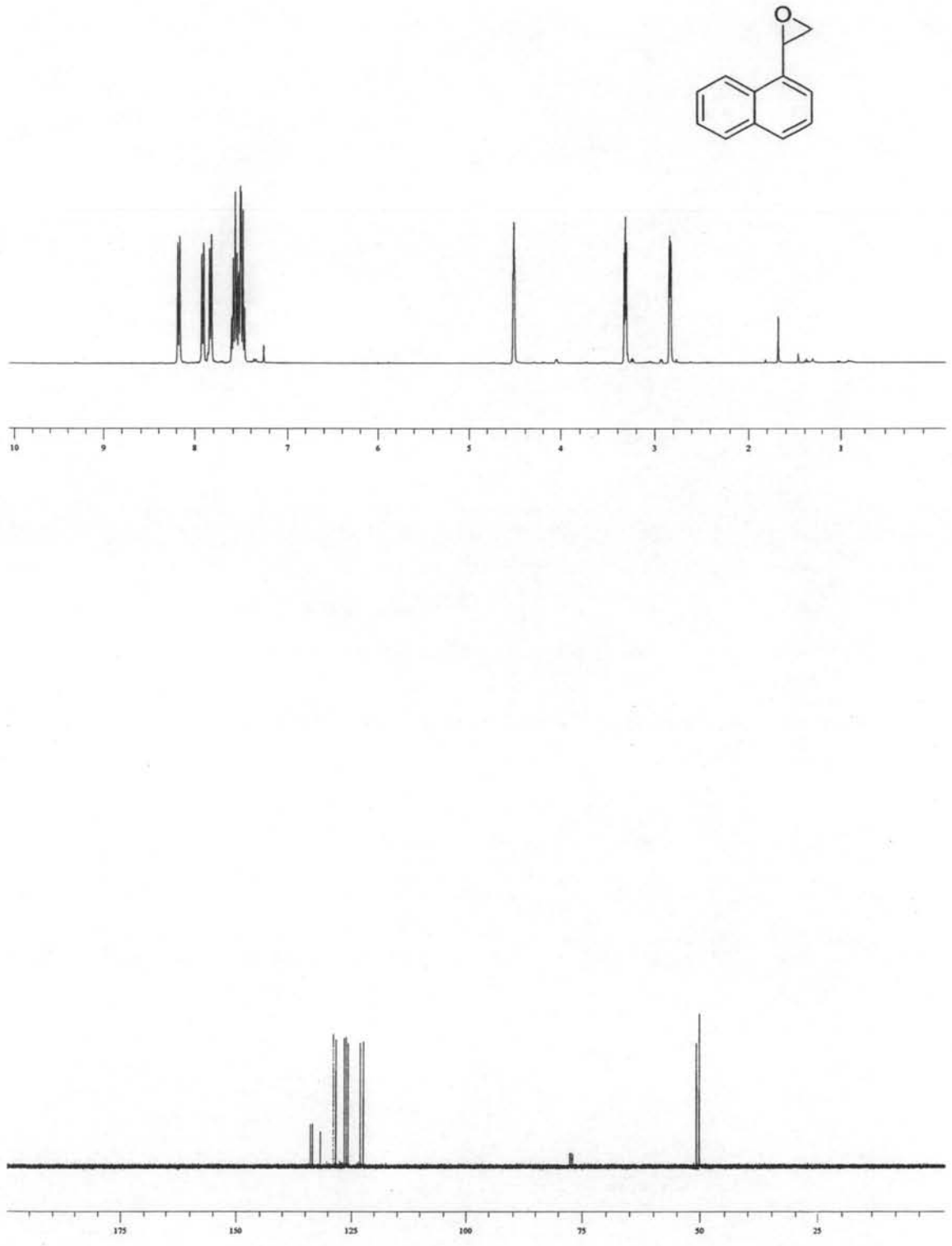

Figure A.3 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of racemic-2-(naphthalen-1-yl)oxirane (**43a**) and (*R*)-2-(naphthalen-1-yl)oxirane (**44a**)

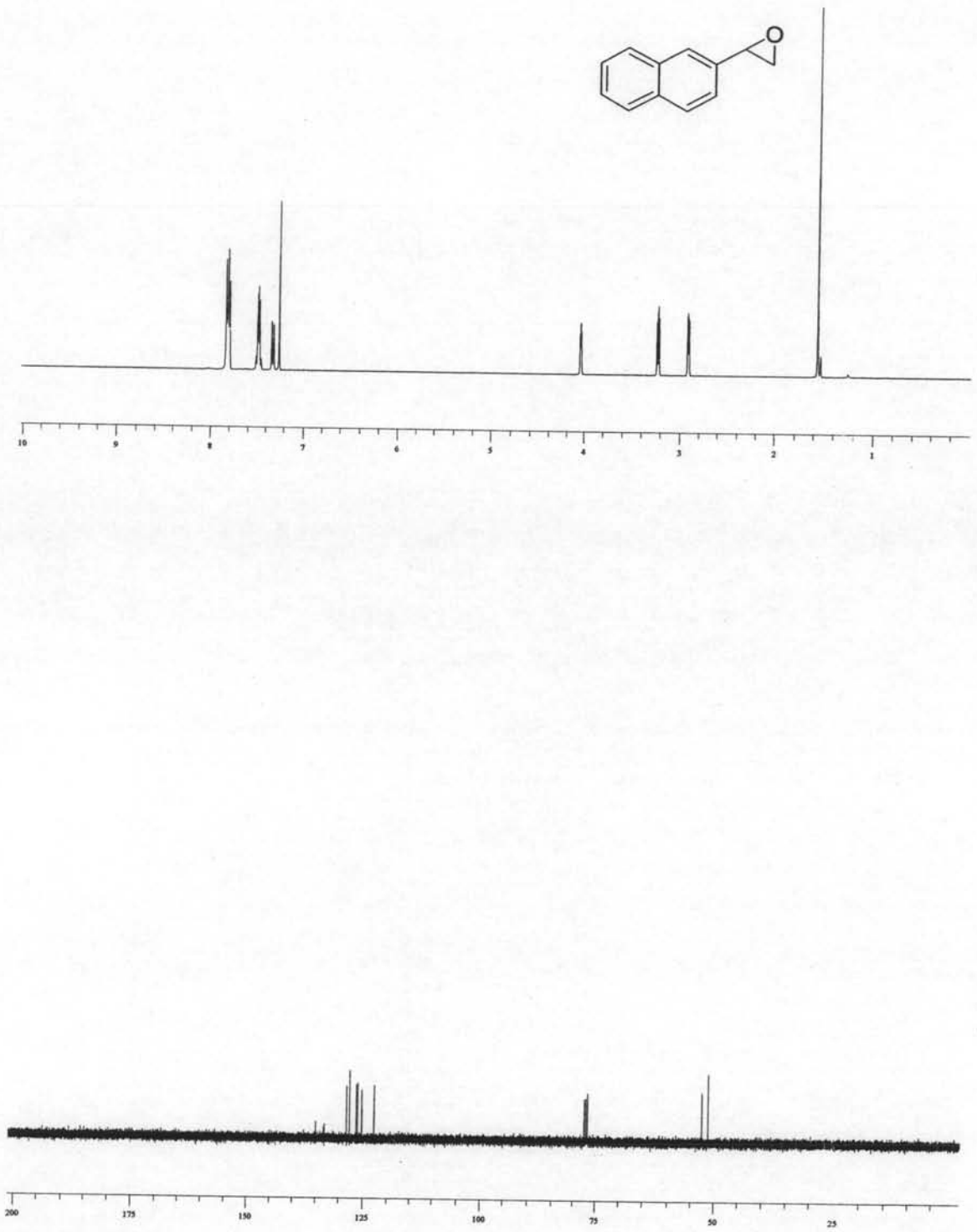

Figure A.4 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of racemic-2-(naphthalen-2-yl)oxirane (**43b**) and (*R*)-2-(naphthalen-2-yl)oxirane (**44b**)

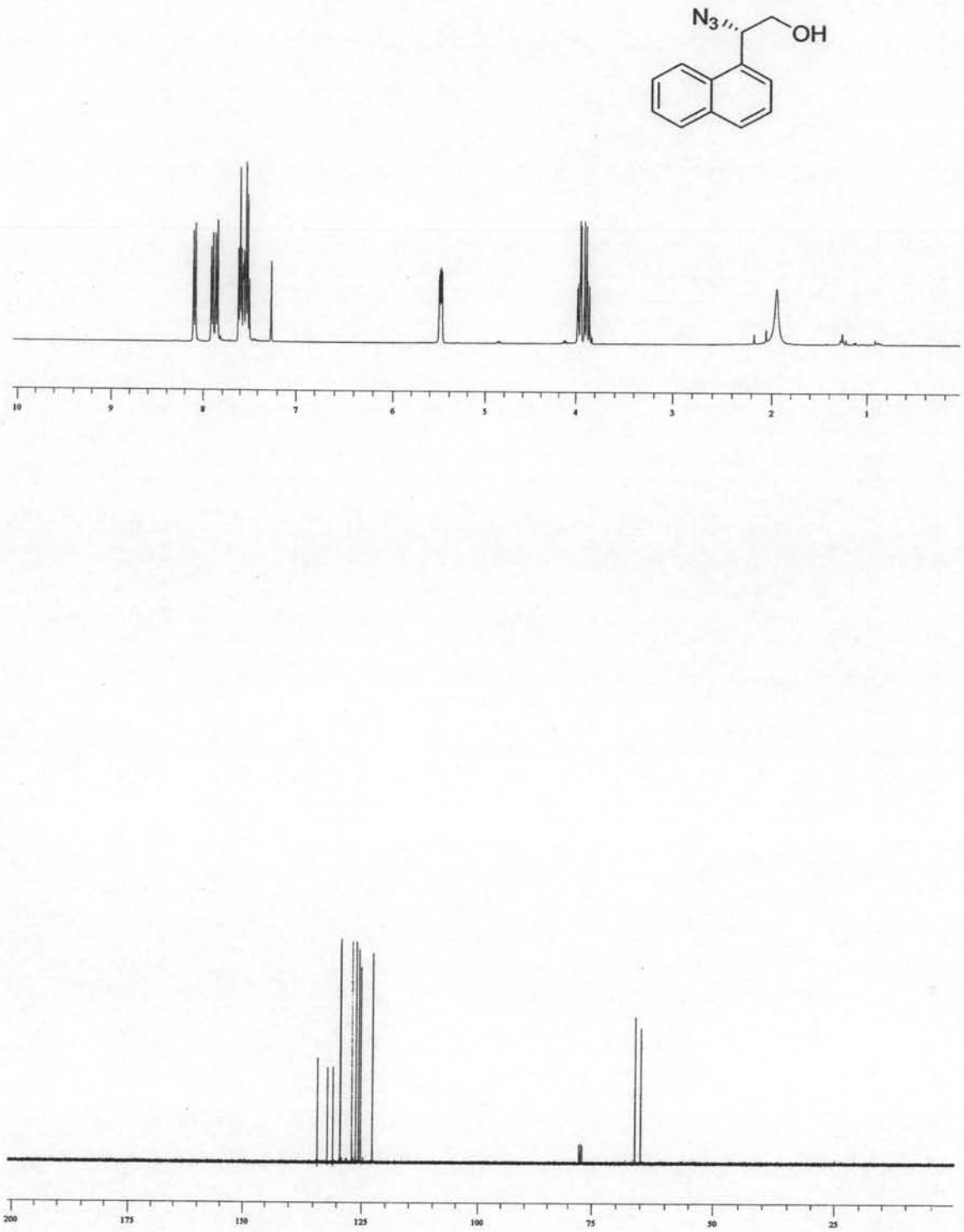

Figure A.5 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-azido-2-(naphthalen-1-yl)ethanol (**45a**)

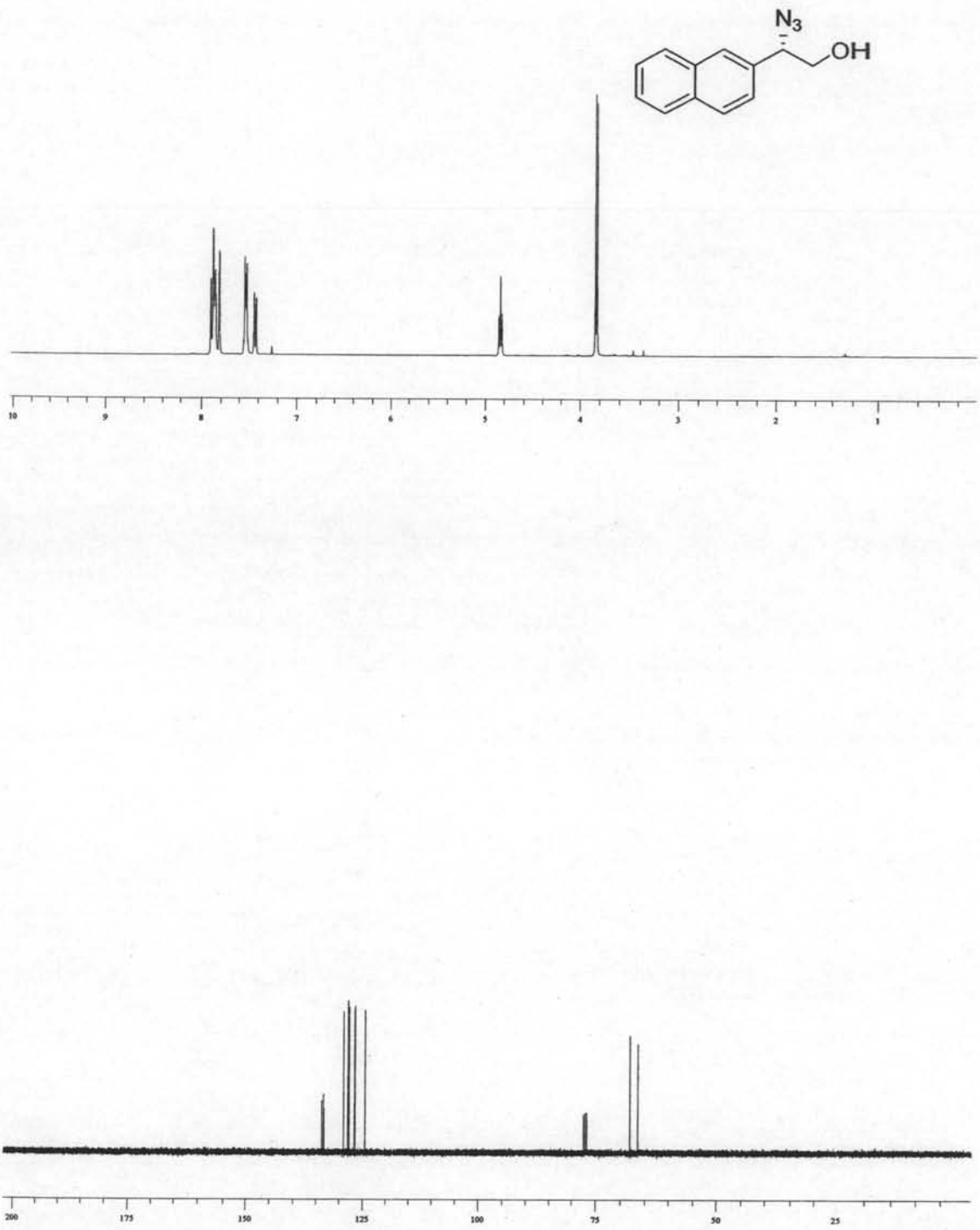

Figure A.6 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-azido-2-(naphthalen-2-yl)ethanol (**45b**)

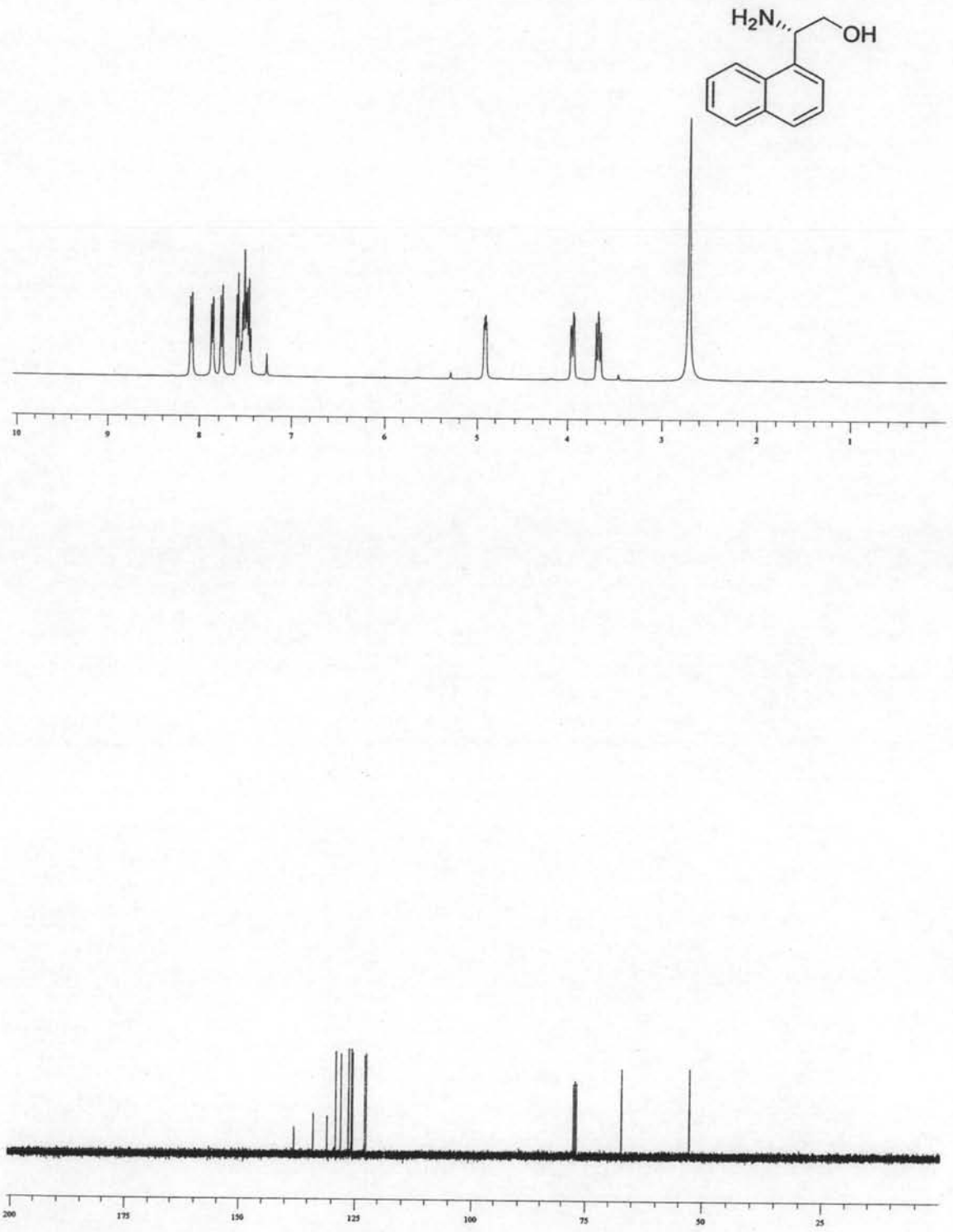

Figure A.7 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-amino-2-(naphthalen-1-yl)ethanol (**46a**)

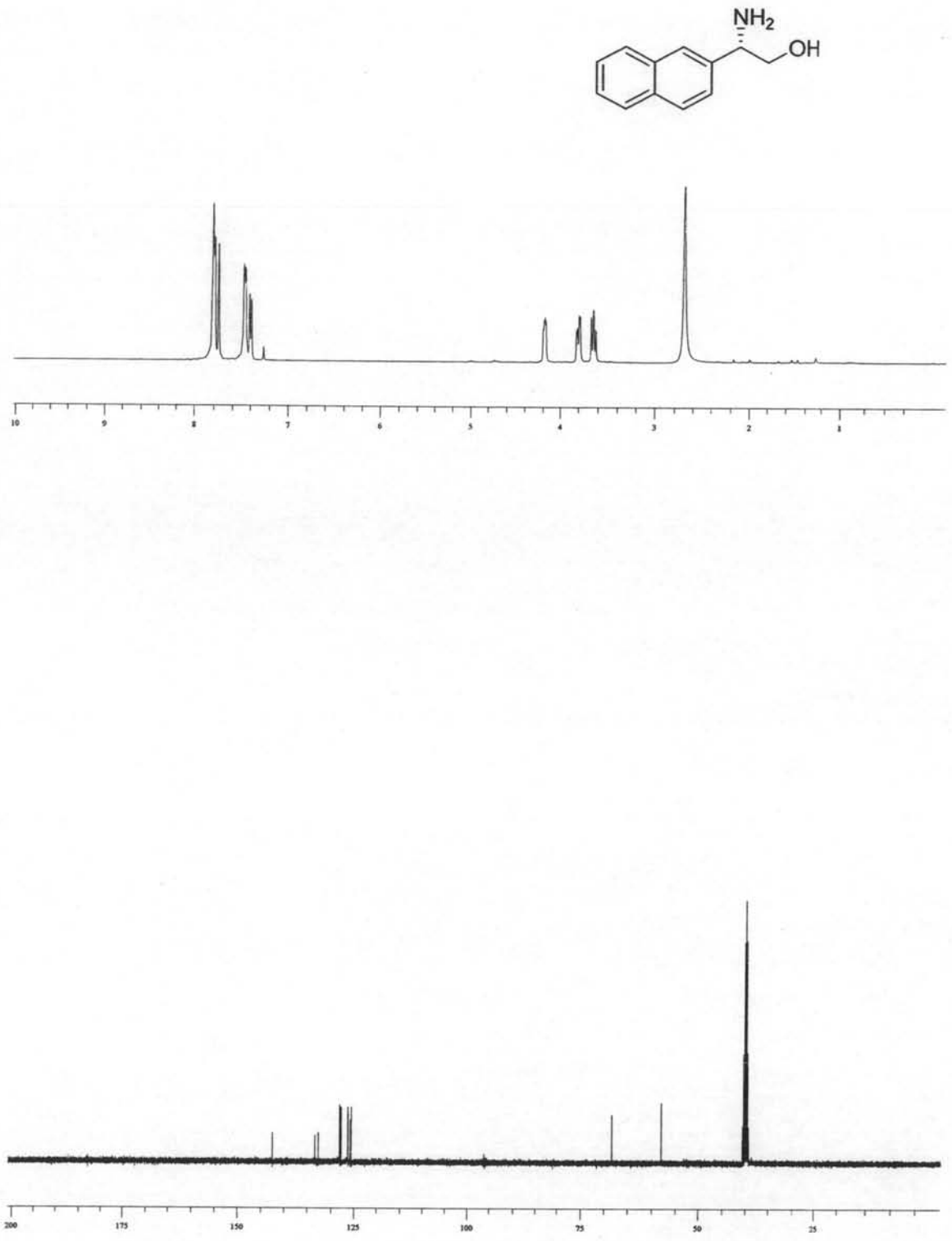

Figure A.8 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-amino-2-(naphthalen-2-yl)ethanol (**46b**)

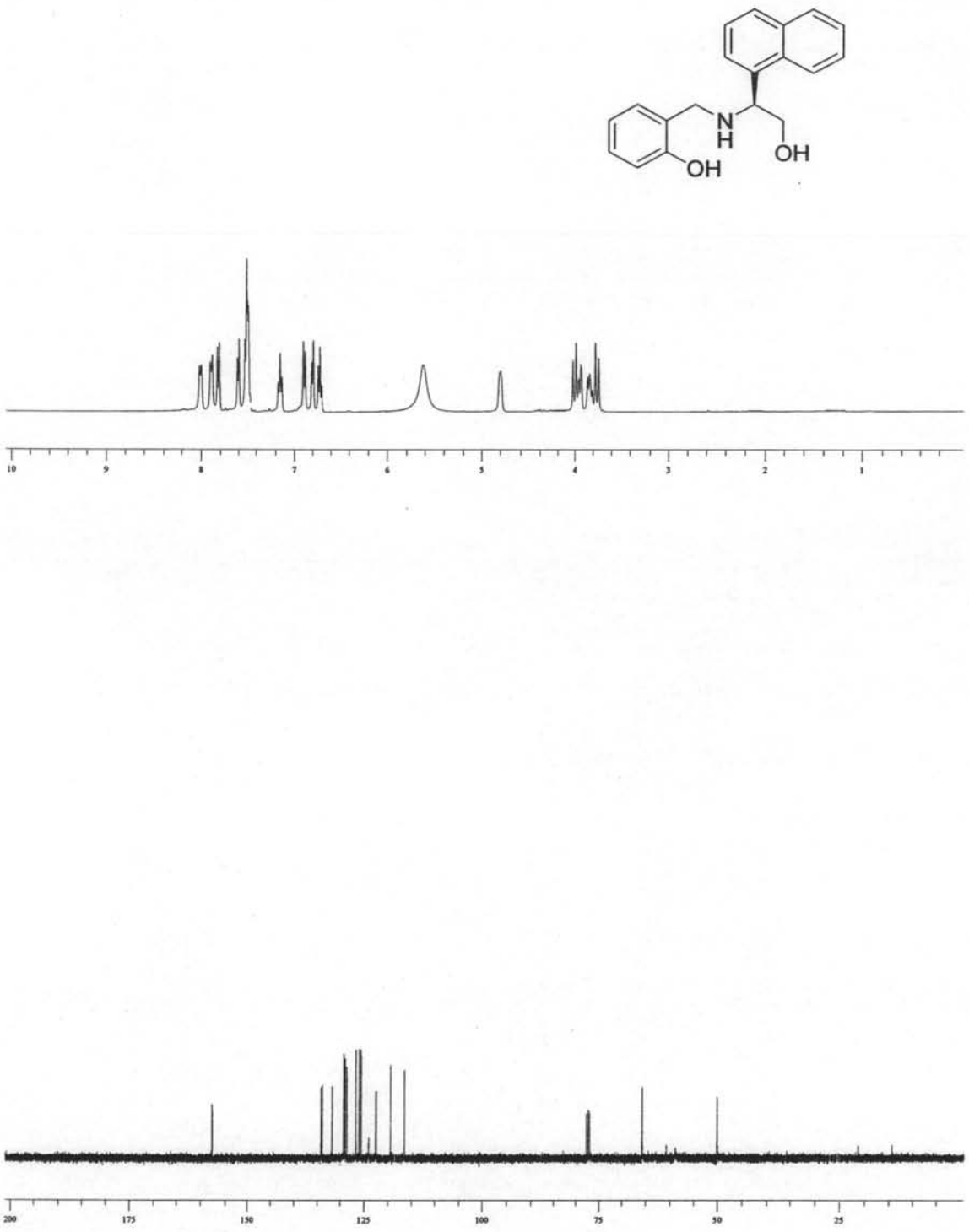

Figure A.9 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-((2-hydroxy-1-(naphthalen-1-yl)ethylamino)methyl)phenol (**47a**)

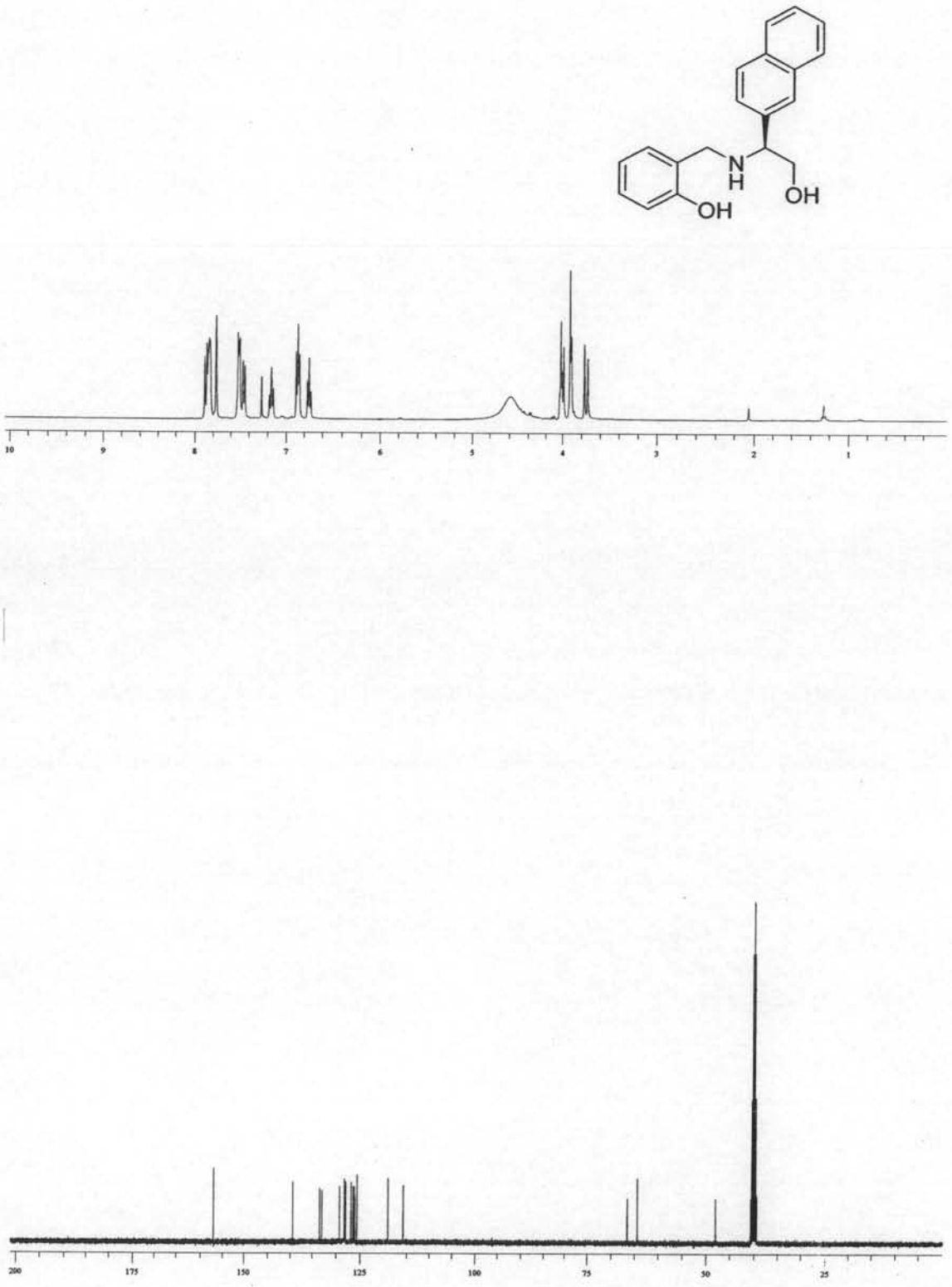

Figure A.10 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR (DMSO-d_6, 100 MHz,) spectra of (*S*)-2-((2-hydroxy-1-(naphthalen-2-yl)ethylamino)methyl)phenol (**47b**)

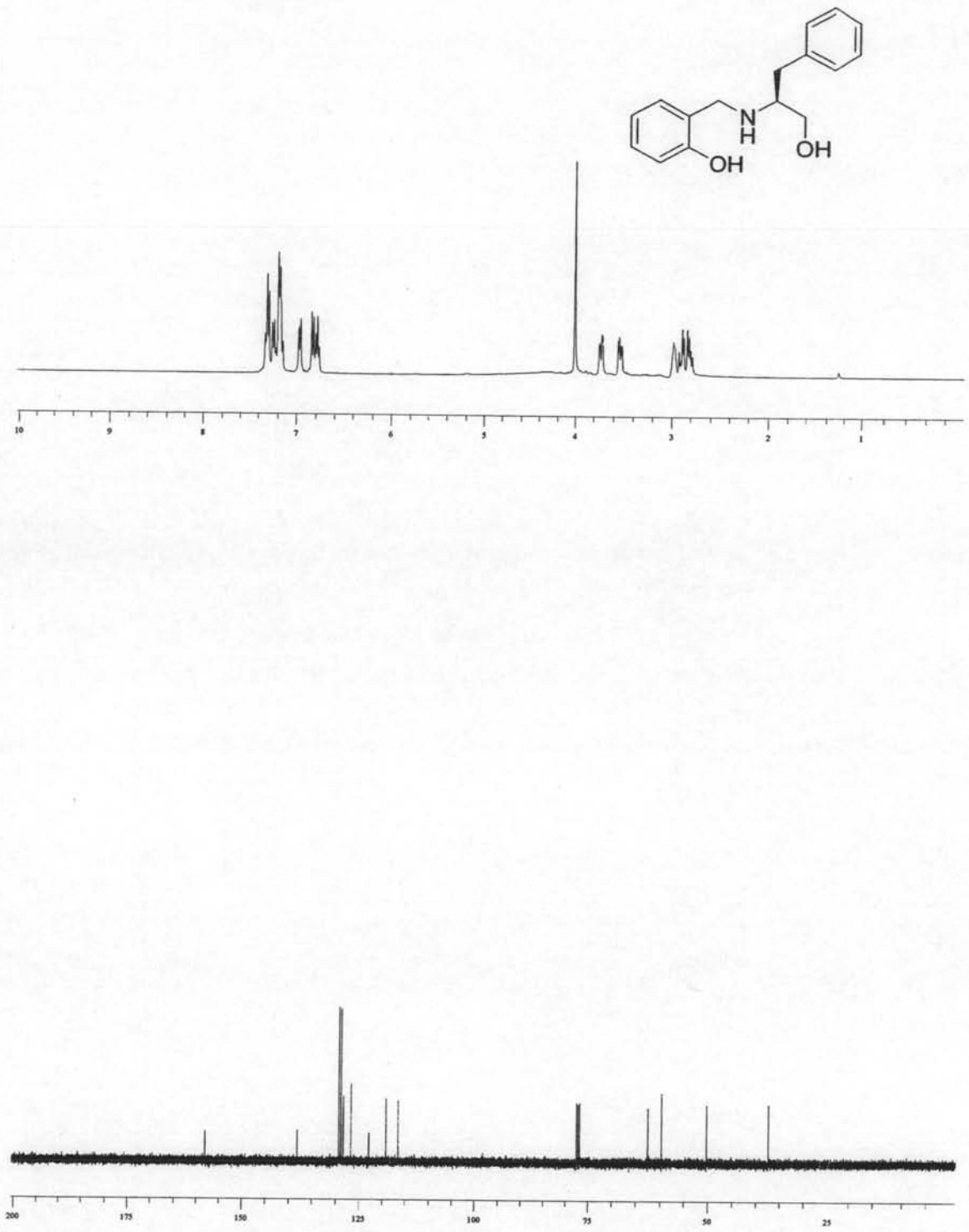

Figure A.11 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of ((*S*)-2-((1-hydroxy-3-phenylpropan-2-ylamino)methyl)phenol (**26**)

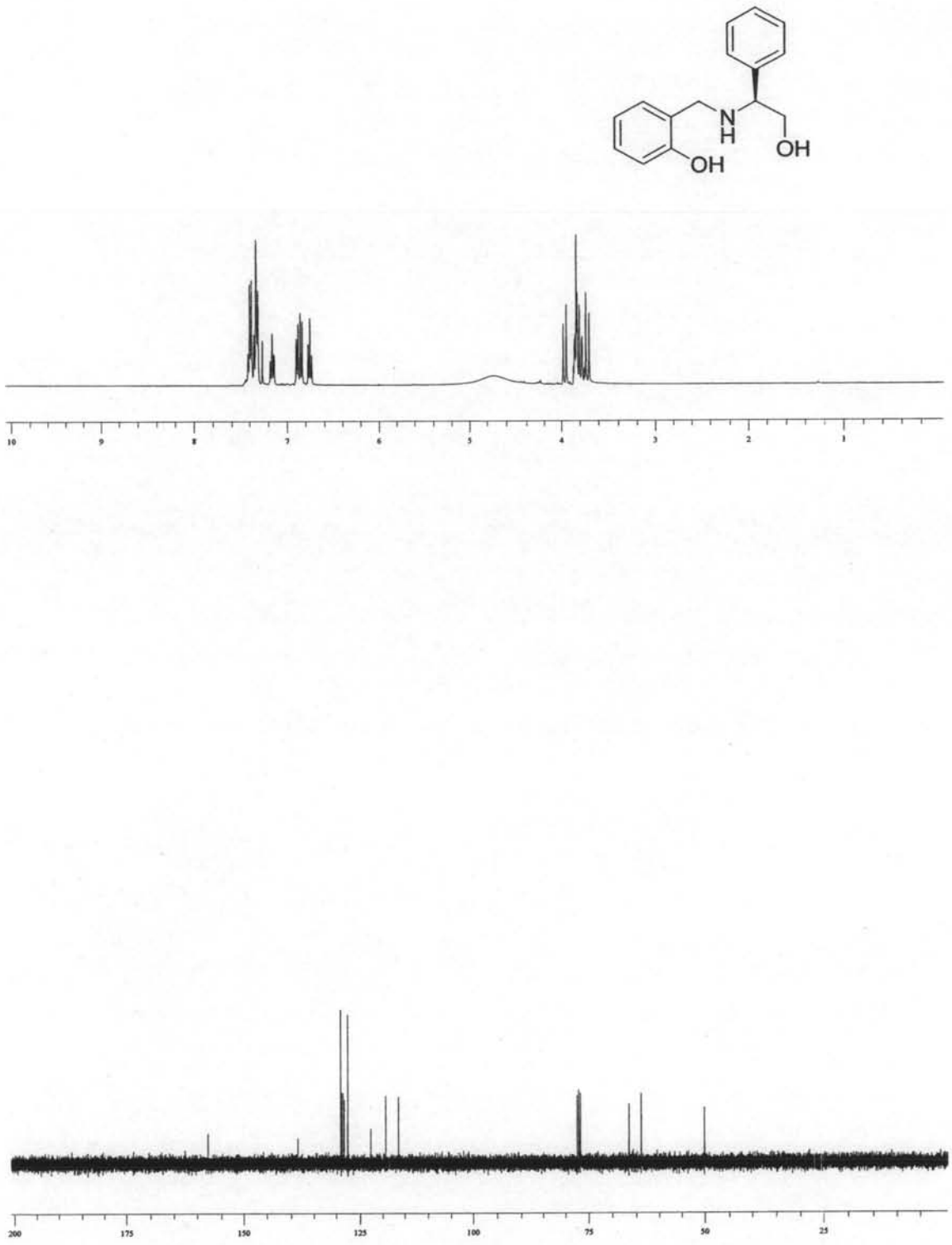

Figure A.12 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-((2-hydroxy-1-phenylethylamino)methyl)phenol (**47c**)

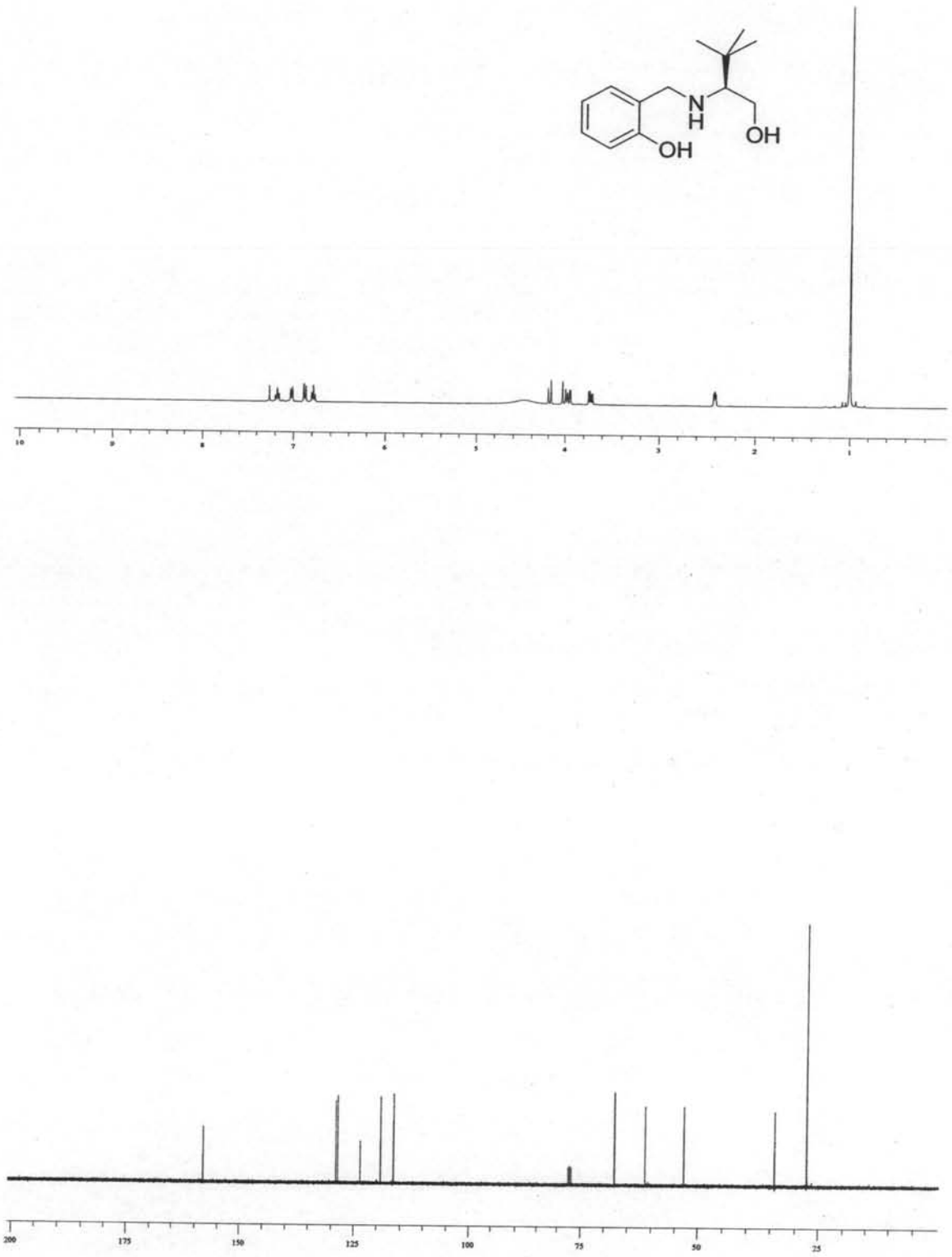

Figure A.13 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-2-((1-hydroxy-3,3-dimethylbutan-2-ylamino)methyl)phenol (**25**)

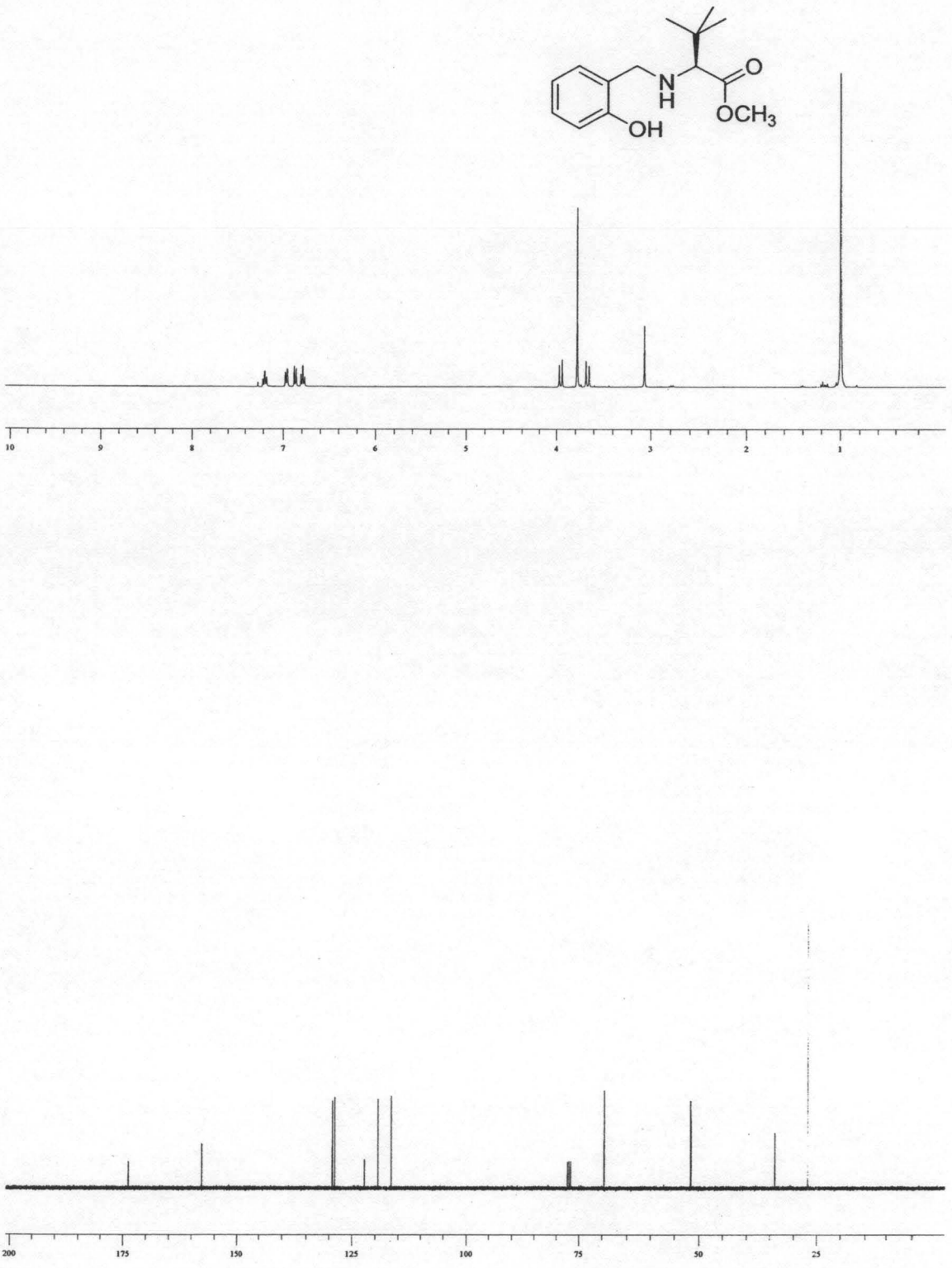

Figure A.14 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of (*S*)-methyl 2-(2-hydroxybenzylamino)-3,3-dimethylbutanoate (**48**)

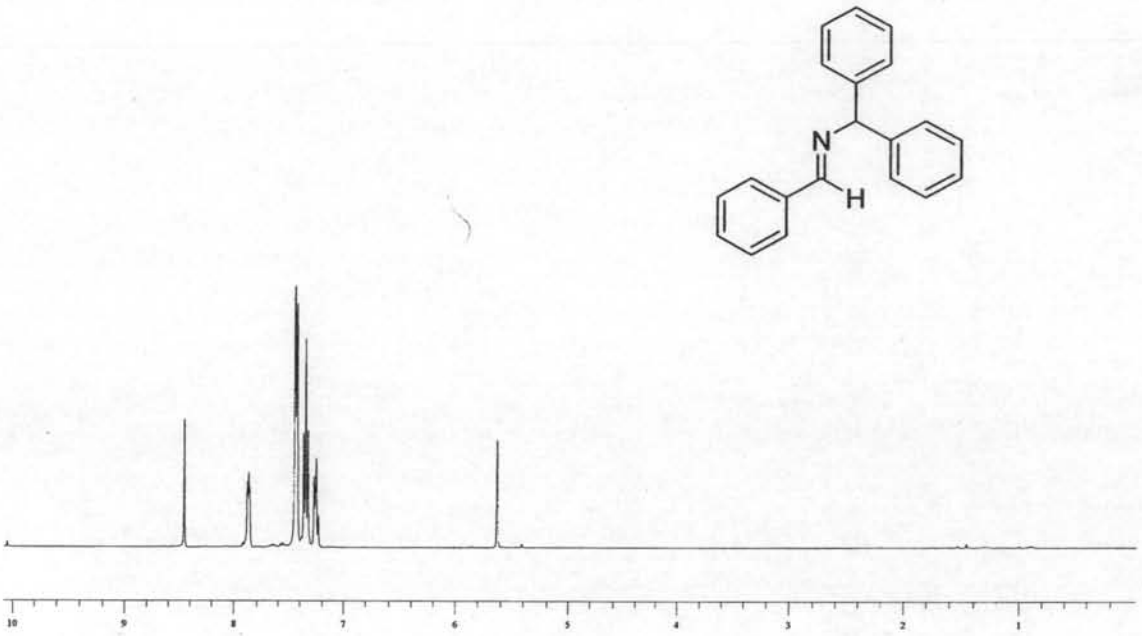

Figure A.15 ^{1}H NMR ($CDCl_3$, 400 MHz) spectrum of (*E*)-*N*-benzylidenediphenylmethanamine (**49**)

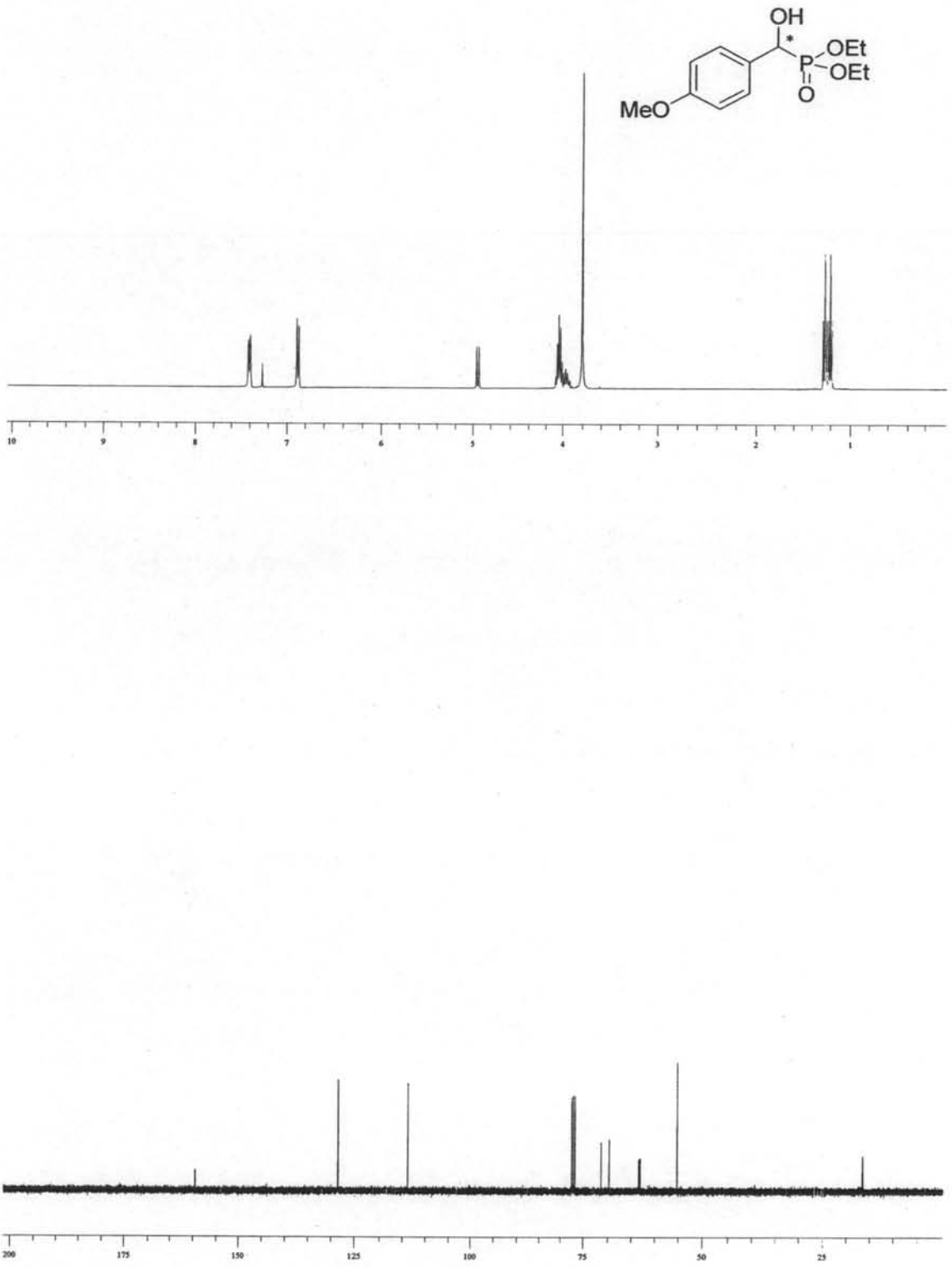

Figure A.16 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of Diethyl 1-hydroxy-(4-methoxyphenyl)methylphosphonate (**50**)

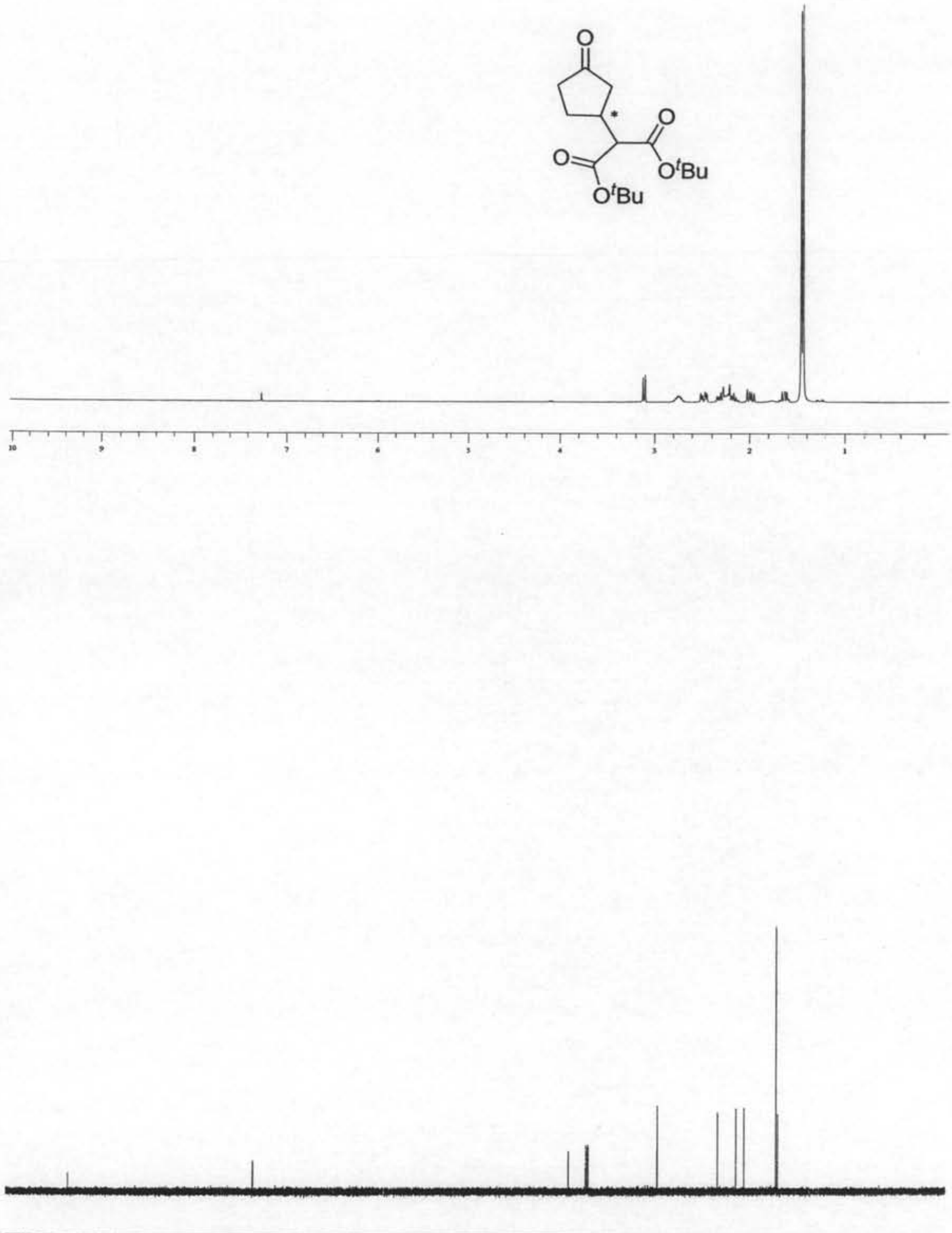

Figure A.17 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of di-*tert*-butyl 2-(3-oxocyclopentyl)malonate (**51a**)

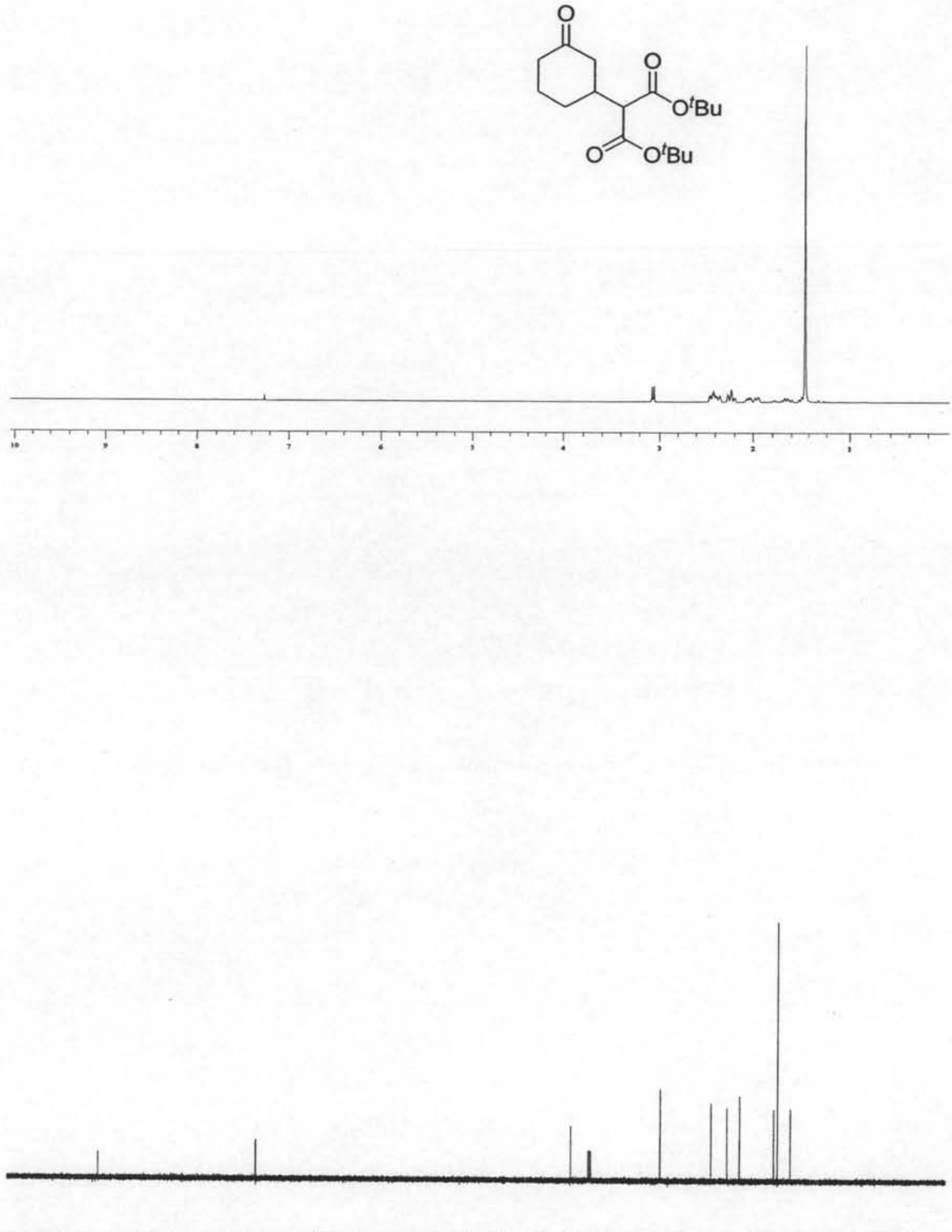

Figure A.18 ^{1}H NMR ($CDCl_3$, 400 MHz) and ^{13}C NMR ($CDCl_3$, 100 MHz) spectra of di-*tert*-butyl 2-(3-oxocyclohexyl)malonate (**51b**)

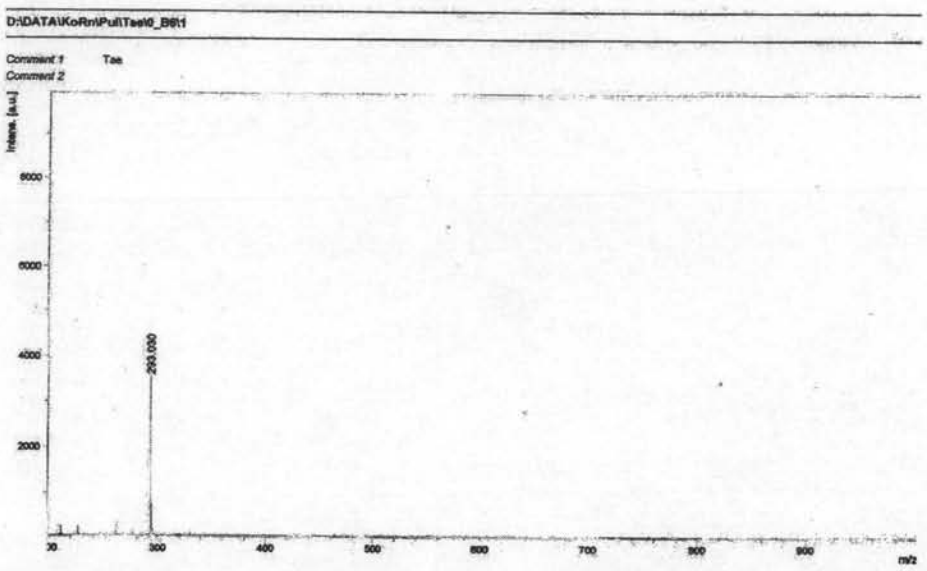

Figure A.19 MALDI-TOF spectrum of (*S*)-2-((2-hydroxy-1-(naphthalen-1-yl)ethylamino)methyl)phenol (**47a**)

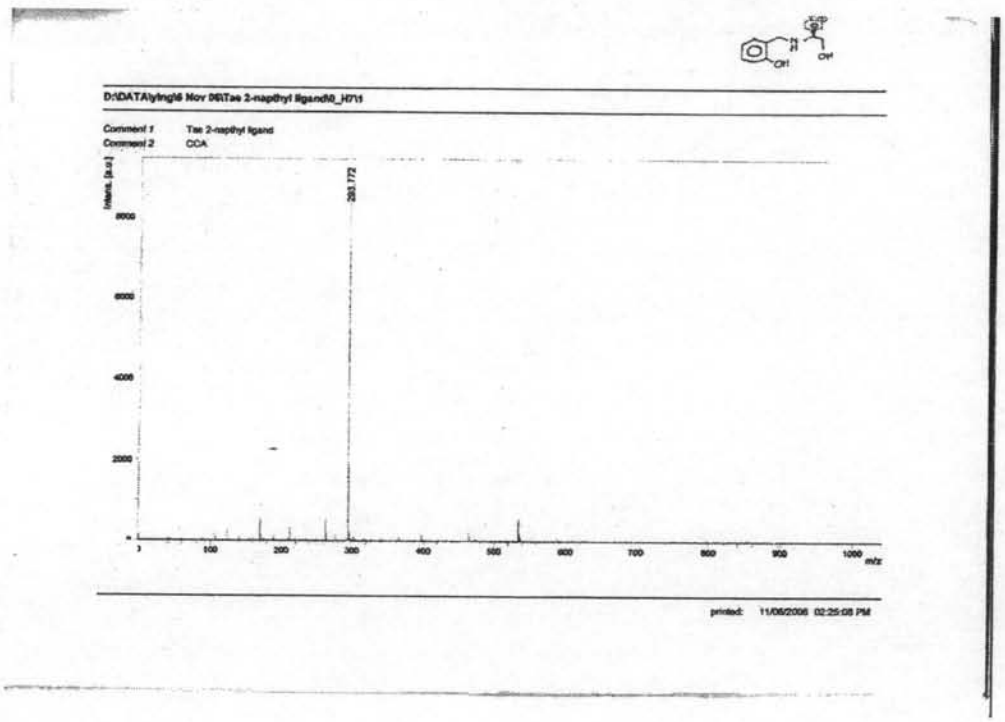

Figure A.20 MALDI-TOF spectrum of (*S*)-2-((2-hydroxy-1-(naphthalen-2-yl)ethylamino)methyl)phenol (**47b**)

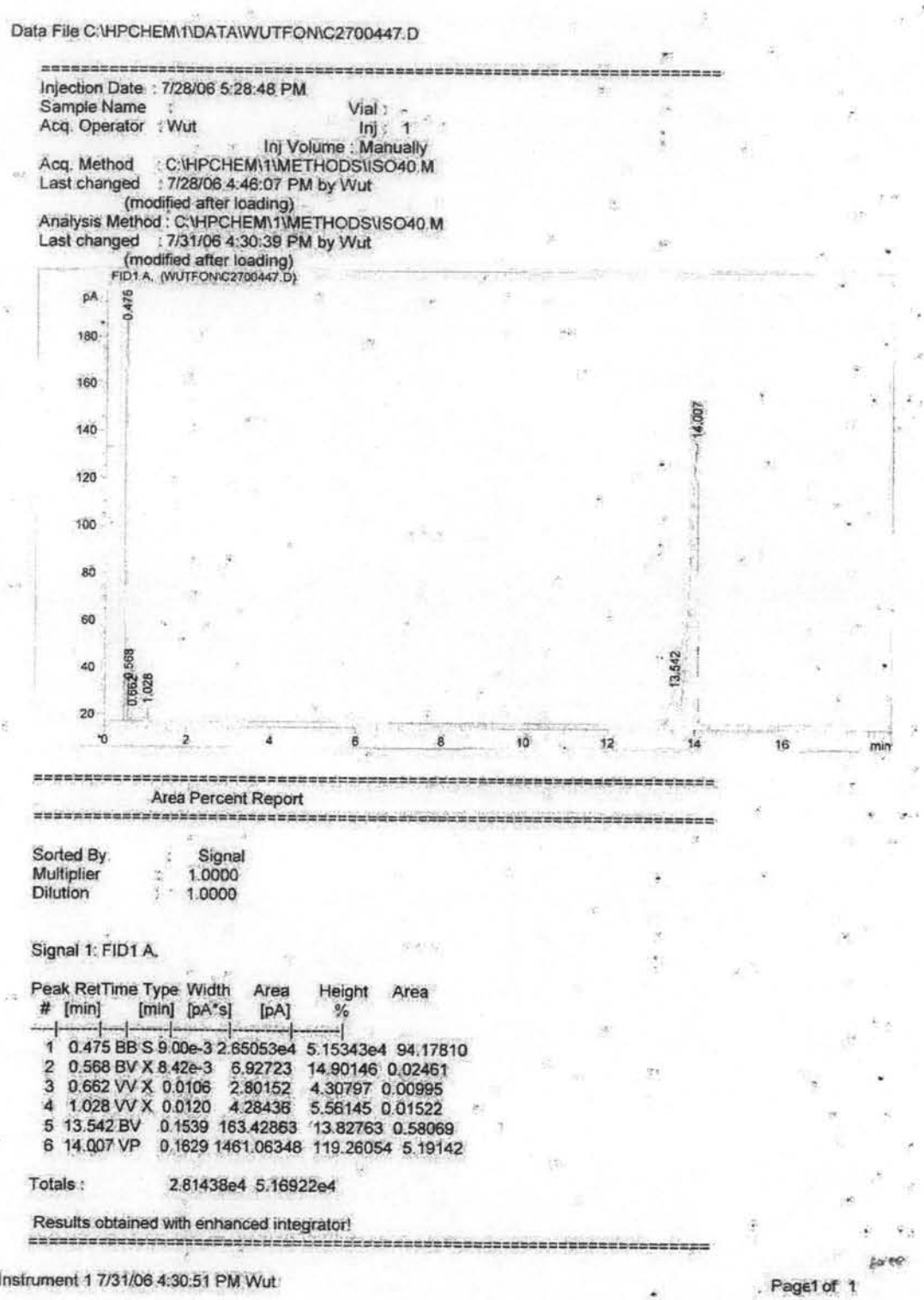

Figure A.21 GC Chromatogram of (*R*)-**51b** (80 %*ee* from using **25** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700375.D

Injection Date : 3/20/06 2:10:23 PM
Sample Name : Vial : -
Acq. Operator : wut Inj : 1
Inj Volume : Manually
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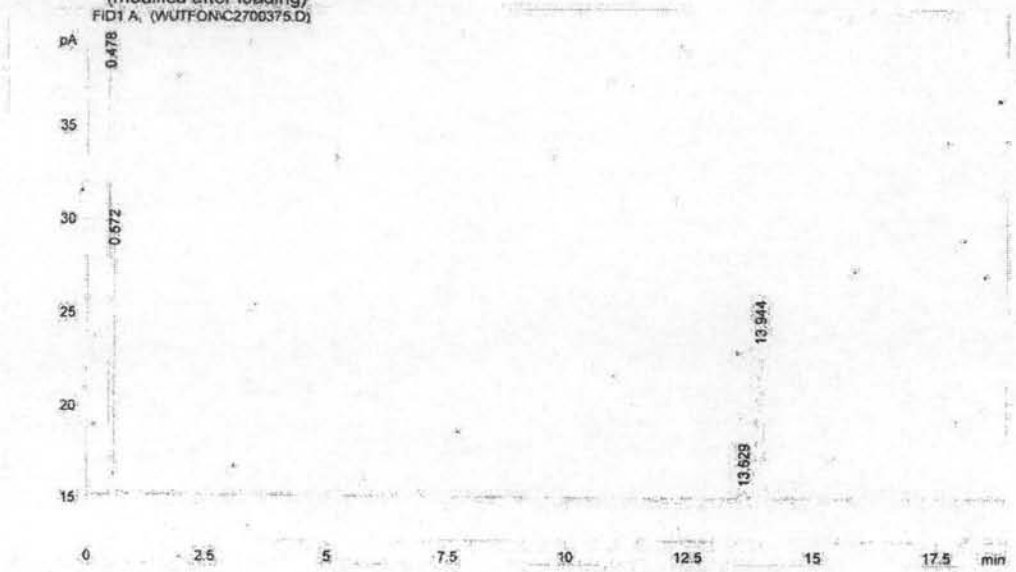
Last changed : 3/20/06 1:59:54 PM by wut
(modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 3/20/06 4:02:38 PM by wut
(modified after loading)



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.478	BB S	8.61e-3	1.34830e4	2.80263e4	99.37638
2	0.572	BV X	7.90e-3	5.93667	12.52309	0.04376
3	13.629	BV	0.1070	3.55795	4.14971e-1	0.02622
4	13.944	VB	0.1242	75.11564	8.09810	0.55364
Totals :				1.35676e4	2.80473e4	

Results obtained with enhanced integrator!

*** End of Report ***

Instrument 1 3/20/06 4:02:51 PM wut

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Figure A.22 GC Chromatogram of (*R*)-**51b** (91 %*ee* from using **47a** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700377.D

Injection Date : 3/20/06 2:50:30 PM
Sample Name : Vial : -
Acq. Operator : wut Inj : 1
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 3/20/06 1:59:54 PM by wut
(modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 3/20/06 4:04:10 PM by wut
(modified after loading)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.479	BB S	8.92e-3	1.55020e4	3.05463e4	98.23233
2	0.573	BV X	8.30e-3	5.69778	11.44421	0.03611
3	1.039	BP	0.0125	5.04122e-1	6.15998e-1	0.00319
4	13.634	BV	0.1194	17.88722	1.94338	0.11335
5	13.981	VB	0.1268	254.86694	27.32519	1.61503
Totals :				1.57810e4	3.05876e4	

Results obtained with enhanced integrator!

*** End of Report ***

Instrument 1 3/20/06 4:04:15 PM wut

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Figure A.23 GC Chromatogram of (*R*)-**51b** (87 %*ee* from using **47b** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700430.D

Injection Date : 5/26/06 3:19:21 PM
Sample Name : Vial : -
Acq. Operator : wutfon Inj : 1
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 5/26/06 1:49:05 PM by wutfon
(modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 5/26/06 5:07:20 PM by wutfon
(modified after loading)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.480	BB S	8.64e-3	2.10946e4	4.06893e4	99.11435
2	0.575	BB X	8.87e-3	7.28379	14.47647	0.03422
3	13.672	BV	0.1162	140.56395	15.29068	0.66045
4	13.961	VP	0.1262	40.64538	4.50828	0.19098

Totals : 2.12831e4 4.07235e4

Results obtained with enhanced integrator!

*** End of Report ***

Instrument 1 5/26/06 5:12:38 PM wutfon Page1 of 1

Figure A.24 GC Chromatogram of (*R*)-**51b** (55 %*ee* from using **48** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700396.D

IS 231

Injection Date : 4/27/06 11:23:04 AM
Sample Name :
Vial : -
Acq. Operator : Wut
Inj : 1
Inj Volume : Manually
Acq. Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 4/27/06 11:16:57 AM by Wut
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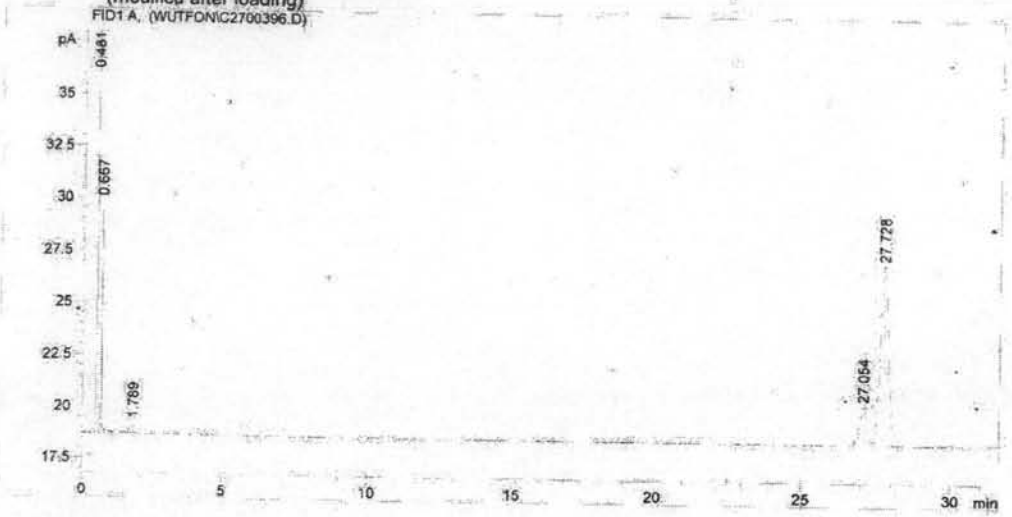
Analysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 4/28/06 12:41:49 PM by Wut
(modified after loading)



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.481	BB S	8.99e-3	2.31039e4	4.50369e4	99.14151
2	0.667	BB T	7.96e-3	5.52272	10.81826	0.02370
3	1.789	BP	0.0216	6.84693e-1	5.11720e-1	0.00294
4	27.054	BV	0.2100	33.20890	1.87181	0.14250
5	27.728	VB	0.2239	160.64743	8.64063	0.68936
Totals :				2.33040e4	4.50587e4	

Results obtained with enhanced integrator!

*** End of Report ***

Instrument 1 4/28/06 12:41:55 PM Wut

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Figure A.25 GC Chromatogram of (*S*)-**51a** (66 %*ee* from using **47a** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700477.D

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Inj Volume : Manually
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Last changed : 9/1/06 5:23:44 PM by WUT
(modified after loading)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [pA*s]	Area [pA]	Height	Area %
1	0.476	BB S	8.32e-3	2.35528e4	4.71643e4	98.97970
2	26.715	BV	0.2103	62.62929	3.55832	0.26320
3	27.379	VB	0.2239	180.15704	9.82674	0.75710
Totals :				2.37956e4	4.71776e4	

Results obtained with enhanced integrator!

Instrument 1 9/1/06 5:23:52 PM WUT

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Figure A.26 GC Chromatogram of (*S*)-**51a** (48 %*ee* from using **25** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700379.D

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Sample Name : Vial : -
Acq. Operator : wut Inj : 1
Inj Volume : Manually
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Last changed : 3/20/06 3:07:30 PM by wut
(modified after loading)
Anlysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 3/20/06 4:04:56 PM by wut
(modified after loading)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	0.477	PB S	8.80e-3	2.43557e4	4.89517e4	98.83817
2	0.538	BV X	7.72e-3	7.10523	15.34604	0.02883
3	0.572	VB X	8.65e-3	74.16885	142.84396	0.30099
4	0.982	BB	0.0114	139.76581	192.97353	0.56719
5	10.194	BP	0.1075	32.76448	4.68880	0.13296
6	10.572	BB	0.0950	32.49281	4.68038	0.13186
Totals :				2.46420e4	4.93123e4	

Results obtained with enhanced integrator!

Instrument 1 3/20/06 4:05:21 PM wut

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Figure A.27 GC Chromatogram of **50** (0 %*ee* from using **47a** as a chiral ligand)

Data File C:\HPCHEM\1\DATA\WUTFON\C2700380.D

Injection Date : 3/20/06 3:39:30 PM
Sample Name : Vial : -
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Inj Volume : Manually
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Last changed : 3/20/06 3:07:30 PM by wut
(modified after loading)
Analysis Method : C:\HPCHEM\1\METHODS\ISO40.M
Last changed : 3/20/06 4:04:56 PM by wut
(modified after loading)

Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [pA*s]	Area [pA]	Height	Area %
1	0.477	PB S	8.47e-3	2.80713e4	5.52309e4	98.33550
2	0.538	BV X	8.46e-3	7.91159	16.90996	0.02771
3	0.572	VB X	8.83e-3	130.31720	260.85913	0.45651
4	0.982	BB	0.0115	243.27515	333.90021	0.85221
5	10.206	BB	0.0922	46.17417	6.25184	0.16175
6	10.589	BB	0.1051	47.47813	6.74736	0.16632
Totals :				2.85465e4	5.58555e4	

Results obtained with enhanced integrator!

Instrument 1 3/20/06 4:05:47 PM wut Page1 of 1

Figure A.28 GC Chromatogram of **50** (0 %*ee* from using **47b** as a chiral ligand)

VITA

Mr. Ittiphol Saengswang was born on June 6th, 1981 in Bangkok, Thailand. He was received a Bachelor's Degree of Science, majoring in chemistry from Chulalongkorn University in 2003. Since 2003, he has been a graduate student studying Organic chemistry as his major course at Chulalongkorn University. During his studies, he was promoted by a research grant and the teaching assistant fellowship from the graduate school, Chulalongkorn University.

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