– Supporting Information (Part 2) –

Rationally Improved Chiral Brønsted Acid for Catalytic Enantio-selective Allylboration of Aldehydes with an Expanded Reagent Scope

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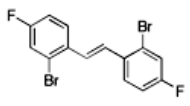
Vivek VRH-7-36A
499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

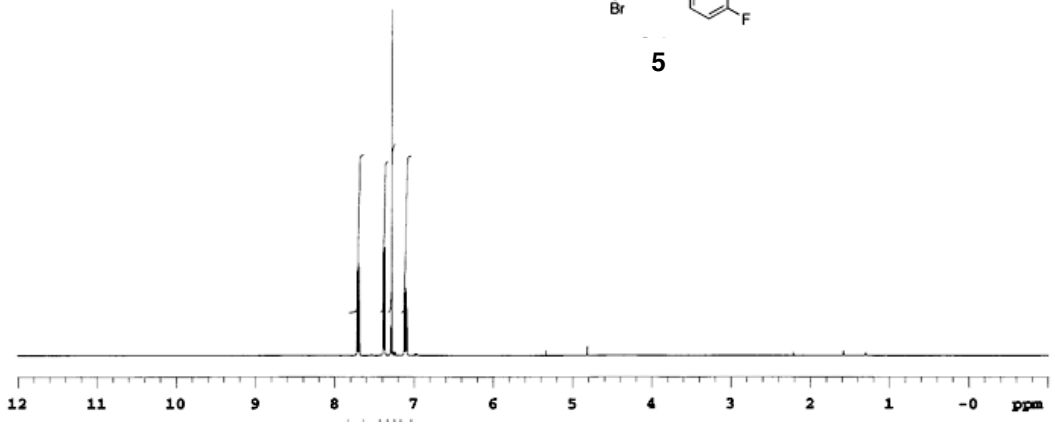
File: 2009.02.09.u5_VRH-7-36A_H1_1D

Pulse Sequence: s2pul

500 MHz, $CDCl_3$



5

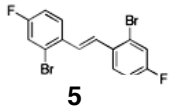


Vivek VRH-7-36A
125.693 MHz C13{H1} apt in cdcl3 (ref. t
o CDCl3 @ 77.06 ppm)
Temp 26.1 C -> actual temp = 27.0 C, aut
oxdb probe
C & CH2 same, CH & CH3 opposite side of
solvent signal

exp2 apt

SAMPLE		DEC. & VT	
date	Feb 9 2009	dn	H1
solvent	cdcl3	dof	0
file	/mnt/d600/hom-	dm	yny
e12/gennmr/marda	te-	dmm	w
/NALL/VIVEK/2009.	6-	dmf	8200
2/2009.02.09.u5_VR-		dpwr	42
H-7-36A_C13_apt.fi-		temp	26.1
d		PROCESSING	
ACQUISITION		lb	not used
sfrq	125.694	wtfile	
tn	C13	proc	ft
at	2.000	fn	524288
np	135136	math	f
sw	33783.8		
fb	15000	werr	
bs	8	wexp	
ss	8	wbs	
tpwr	55	wnt	
pw	9.3	DISPLAY	
p1	20.0	sp	-628.5
d1	0.100	wp	23250.7
d2	0.007	vs	2684
d3	0.001	sc	0
tof	2560.0	wc	185
nt	100000	hzmm	125.68
ct	256	is	500.00
alock	n	rfl	12164.8
gain	48	rfp	9584.5
FLAGS		th	8
il	n	ins	100.000
in	n	al ph	
dp	y		
hs	nn		

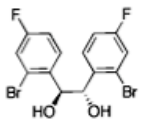
125.6 MHz, $CDCl_3$



5

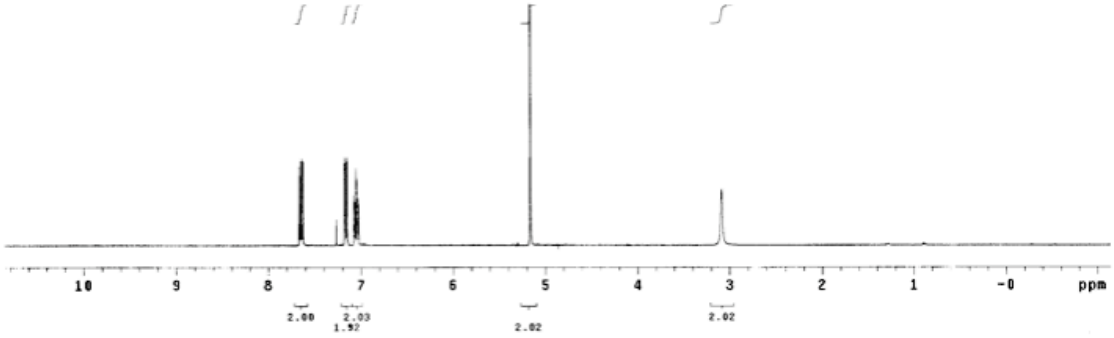
VRH-6-204-diol-1

Pulse Sequence: s2pul



500 MHz, $CDCl_3$

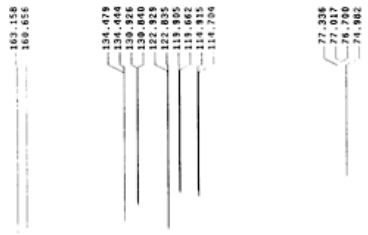
6

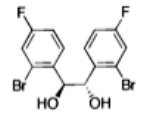


VRH-6-204-diol-1-13C

Pulse Sequence: s2pul

125.7 MHz, $CDCl_3$





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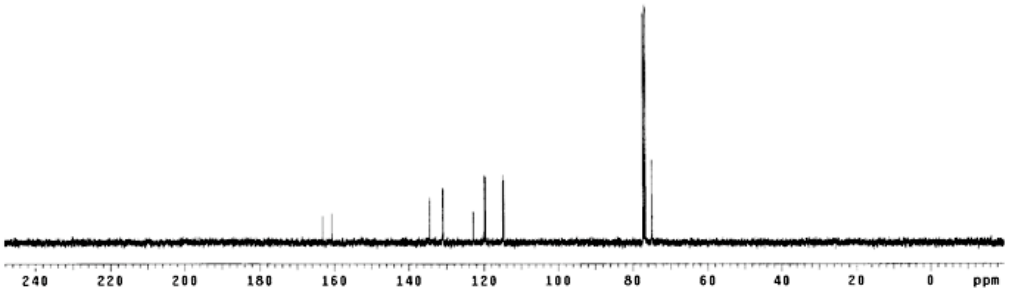
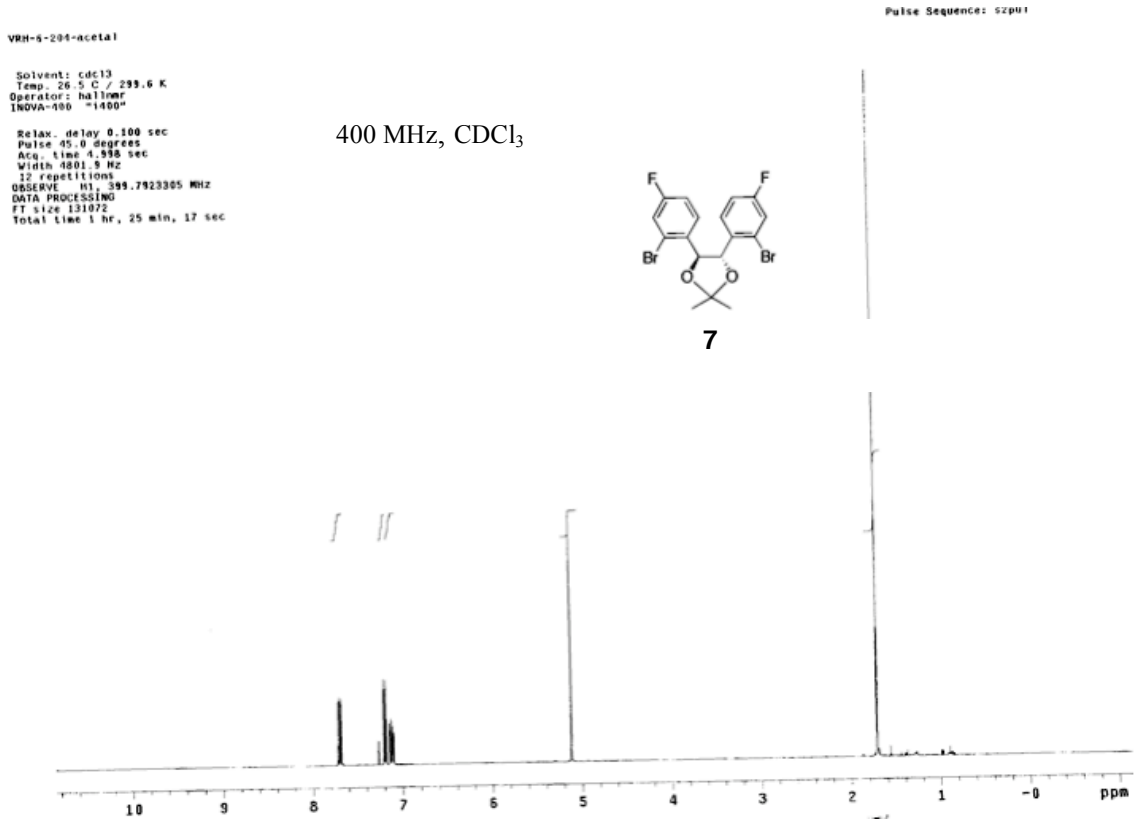
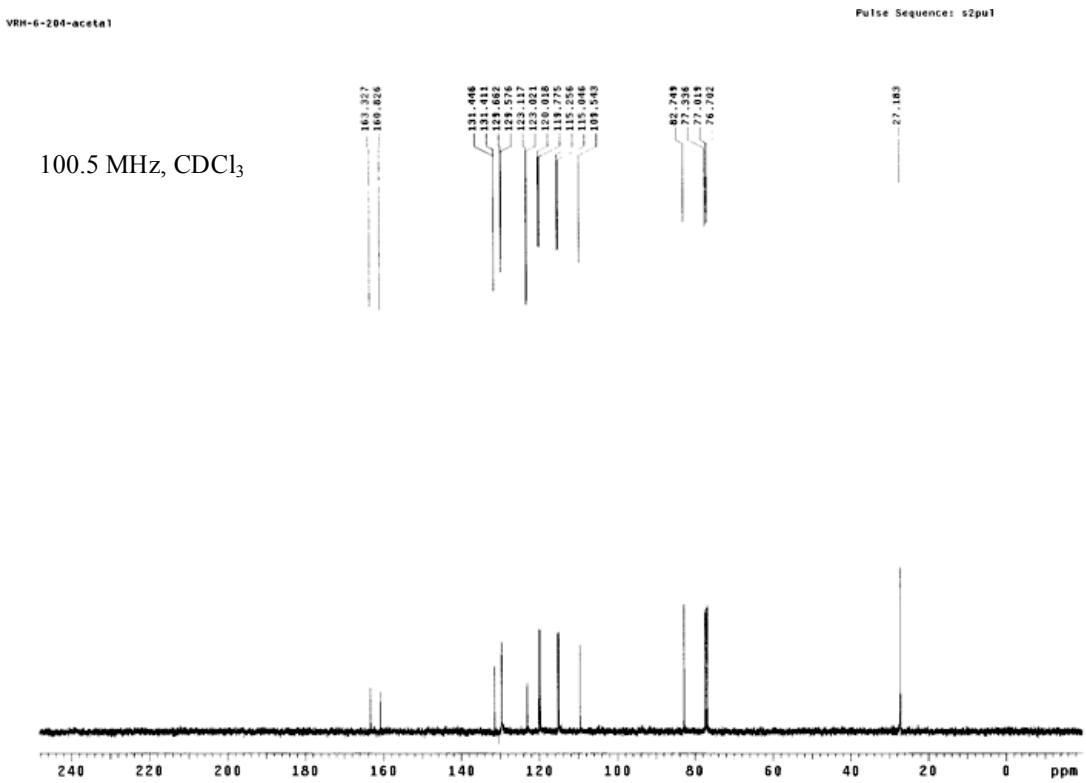




400 MHz, $CDCl_3$

7

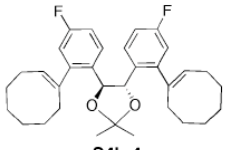


100.5 MHz, $CDCl_3$

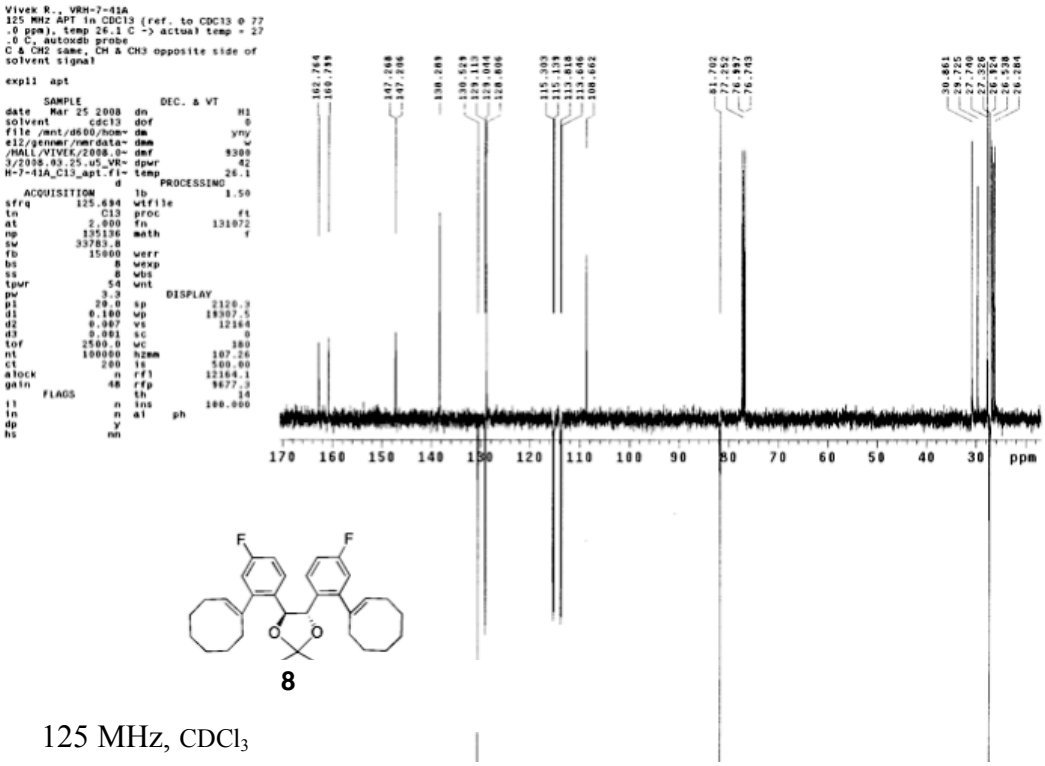
VRH-7-41A-recrystallize-from-MeOH/DCM

Pulse Sequence: s2pul

500 MHz, $CDCl_3$



8



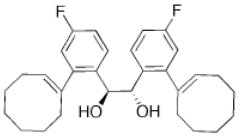
8

125 MHz, $CDCl_3$

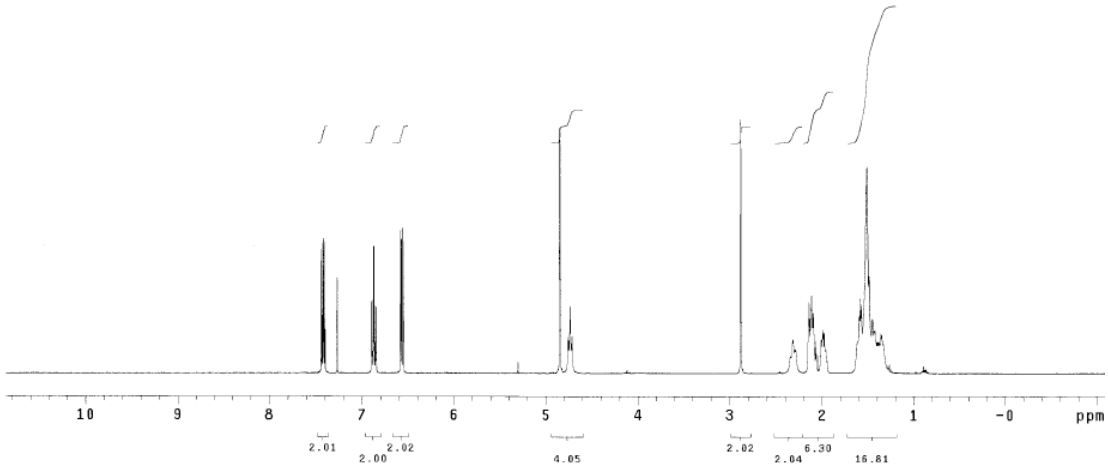
VRH-7-41B-recrystallized-solid

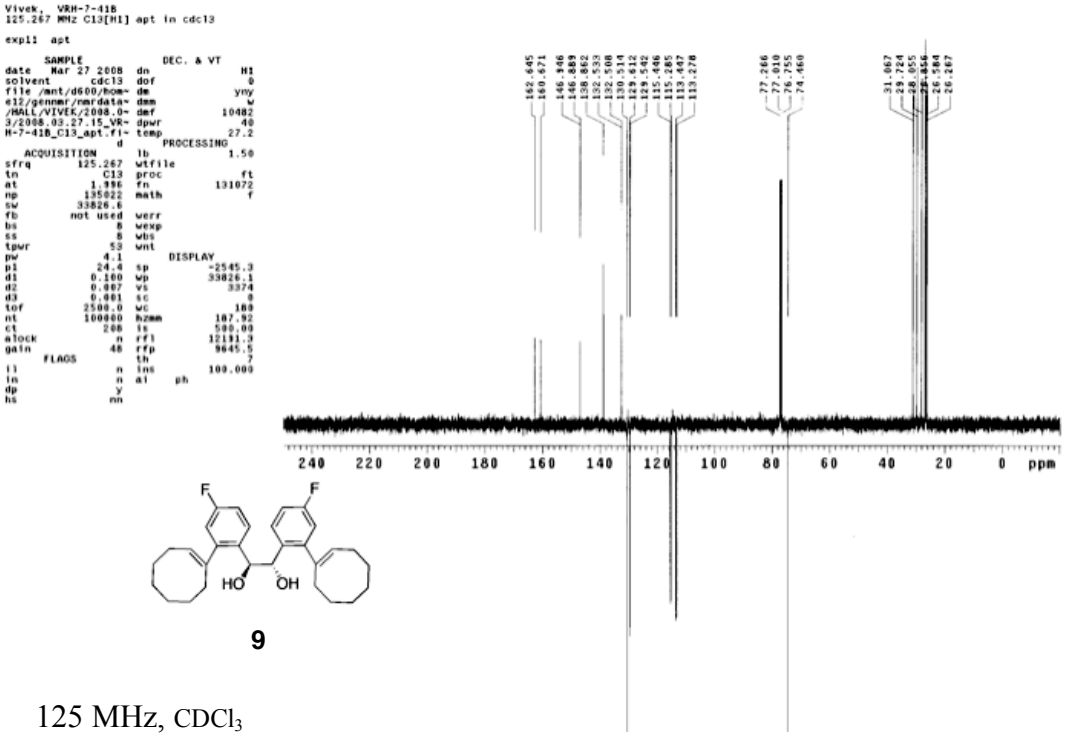
Pulse Sequence: s2pul

500 MHz, $CDCl_3$



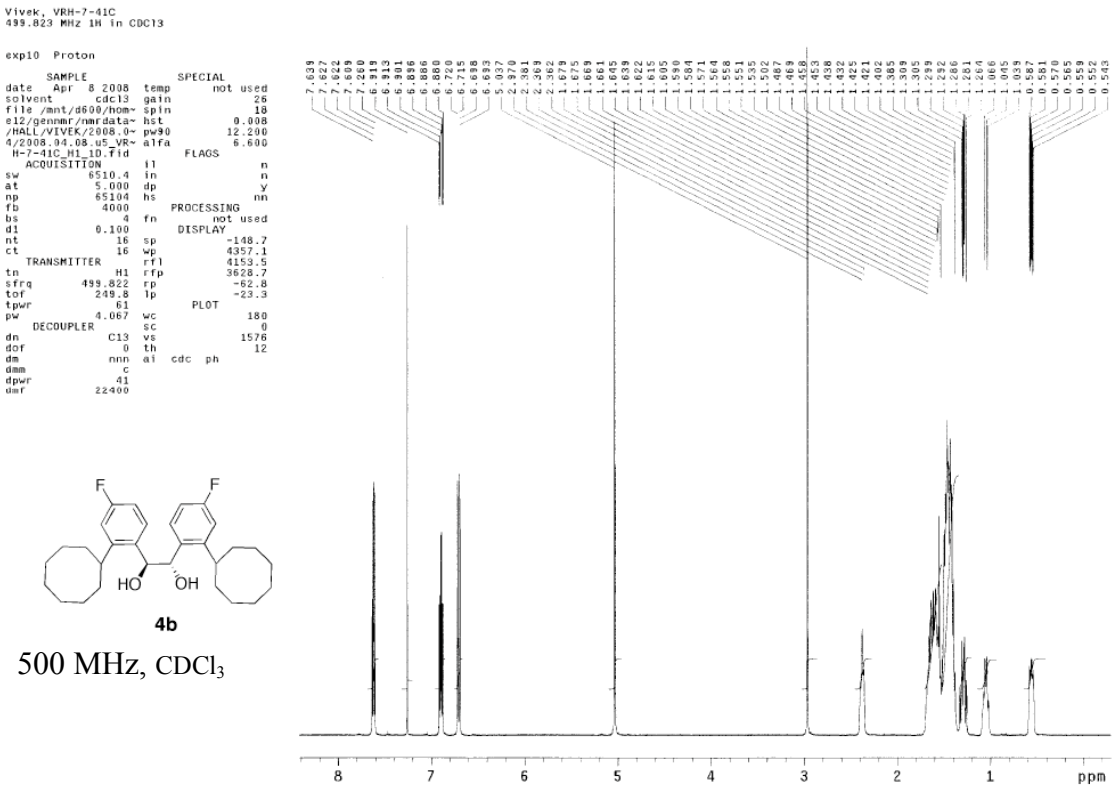
9



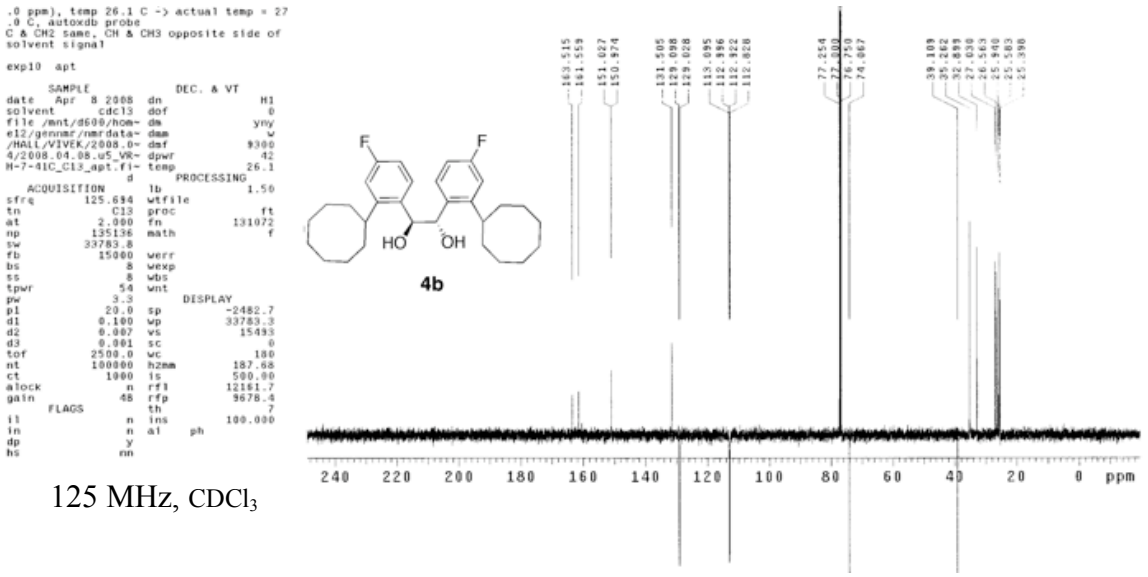


9

125 MHz, $CDCl_3$



500 MHz, $CDCl_3$



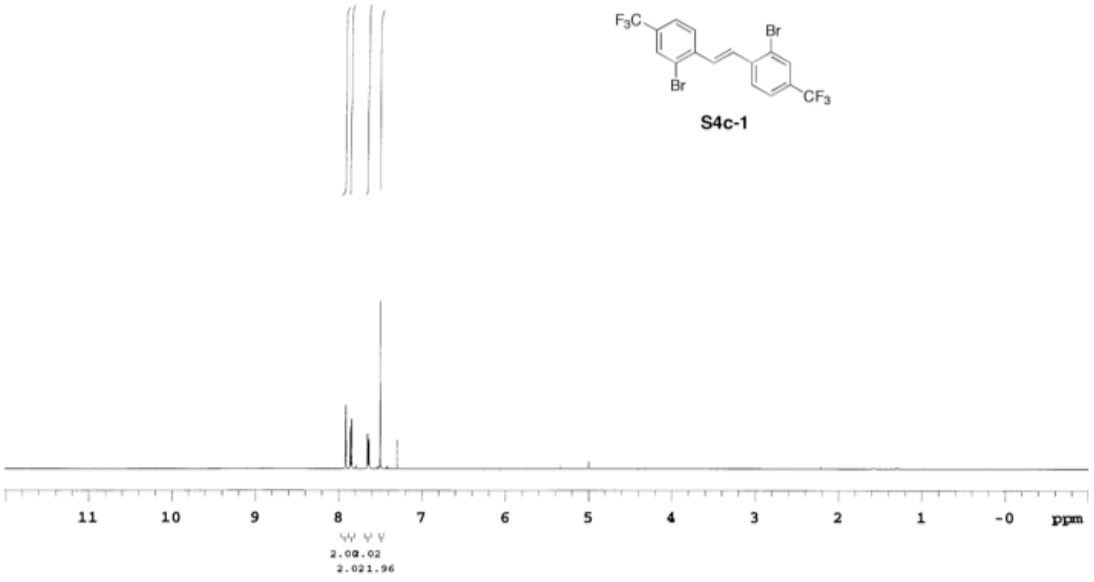
125 MHz, $CDCl_3$

Vivek VRH-CF3-Stilbene
499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

File: 2009.02.09.u5_VRH-CF3-Stilbene_H1_1D

Pulse Sequence: s2pul

500 MHz, $CDCl_3$

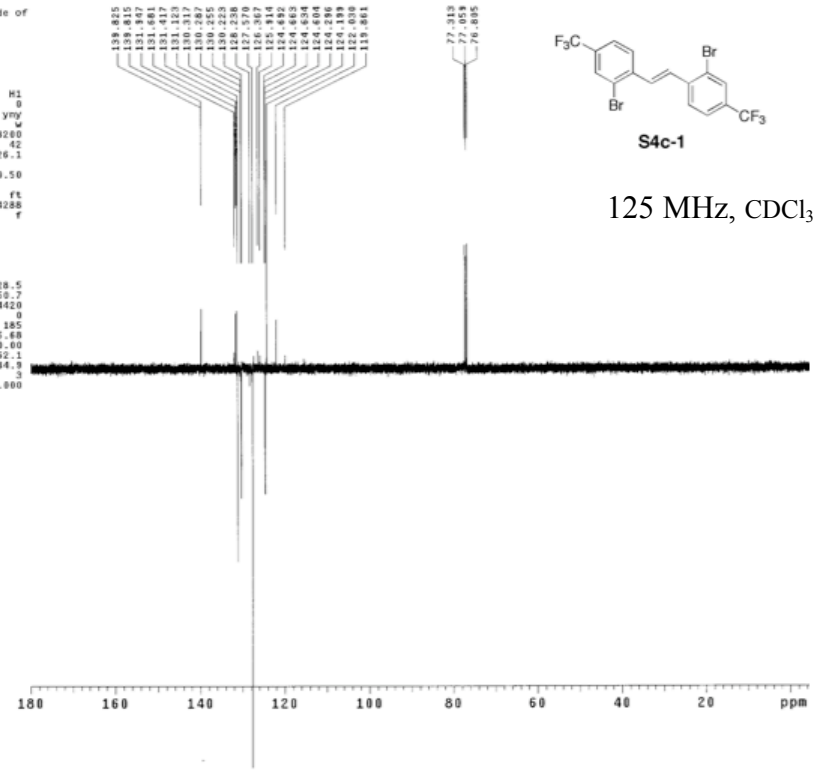


Vivek VRH-CF3-Stilbene
125.693 MHz C13[H1] apt in cdcl3 (ref. t
o CDCl3 @ 77.06 ppm)
Temp 26.1 C -> actual temp = 27.0 C, aut
oxdb probe
C & CH2 same, CH & CH3 opposite side of
solvent signal

5 Hz/cm

exp2 apt

SAMPLE		DEC. & VT	
date	Feb 9 2009	dn	H1
solvent	cdcl3	dof	0
file	/mnt/d600/hom~	dm	yny
e12/gemmar/nmrdata~		dmm	w
/HALL/VIVEK/2009.0~		dmf	8200
2/2009.02.09.u5_VR~		dpwr	42
H-CF3-Stilbene_C13~		temp	26.1
apt.fid		PROCESSING	
ACQUISITION		lb	0.50
sfrq	125.694	wtfile	
tn	C13	proc	ft
at	2.000	fn	524288
np	135136	math	f
sw	33783.8		
fb	15800	werr	
bs	8	wexp	
ss	8	wbs	
tpwr	55	wnt	
pw	3.3	DISPLAY	
p1	20.0	sp	-628.5
d1	0.100	wp	23250.7
d2	0.007	vs	4420
d3	0.001	sc	0
tof	2500.0	wc	185
nt	100000	hzmm	125.68
ct	240	is	500.60
alock	n	rfl	12162.1
gain	48	rfp	9684.9
FLAGS		th	3
il	n	ins	100.000
in	n	al ph	
dp	y		
hs	nn		

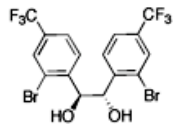


125 MHz, $CDCl_3$

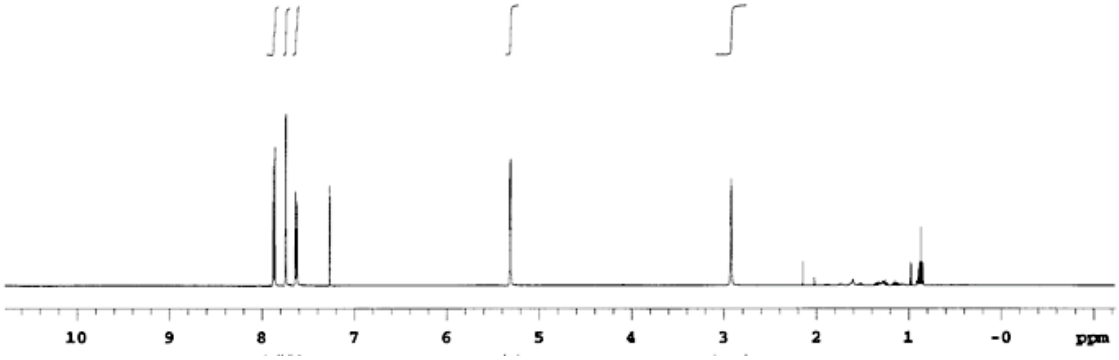
Vivek VRH-CF3-DIOL
499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

Pulse Sequence: s2pul

500 MHz, $CDCl_3$



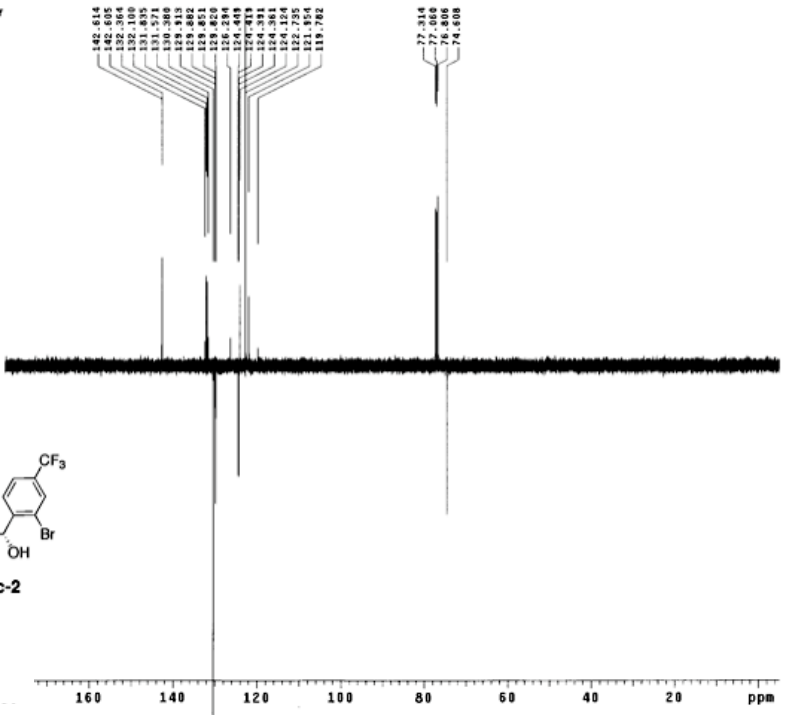
S4c-2

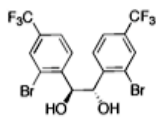


Vivek VRH-CF3-DIOL
125.693 MHz C13[H1] apt in cdcl3 (ref. to CDCl3 @ 77.06 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
C & CH2 same, CH & CH3 opposite side of solvent signal

exp2 apt

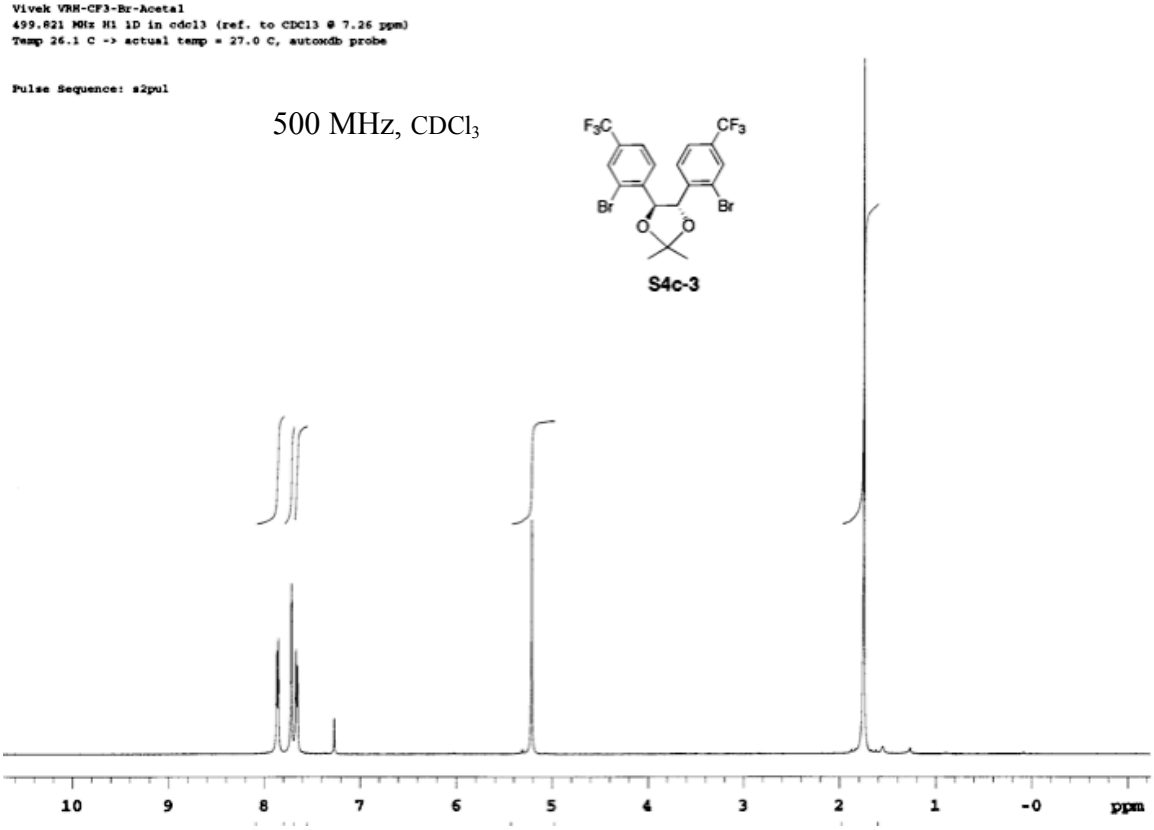
SAMPLE		DEC. & VT	
date	Feb 10 2009	dn	H1
solvent	cdcl3	dof	0
file	/mnt/d600/hom~	dm	yny
e12/gennmr/nmrdata~		dmm	w
/HALL/VIVEK/2009.0~		dmf	8208
2/2009.02.10.u5_CF~		dpwr	42
3-Br-Diol_C13_apt.~		temp	26.1
fid		PROCESSING	
ACQUISITION		lb	0.20
sfrq	125.694	wtfile	
tn	C13	proc	ft
at	2.000	fn	524288
np	135136	math	f
sw	33783.8		
fb	15000	werr	
bs	8	wexp	
ss	8	wbs	
tpwr	55	wnt	
pw	3.3	DISPLAY	
p1	29.0	sp	-628.5
d1	0.100	wp	23250.7
d2	0.007	vs	4722
d3	0.001	sc	0
tof	2500.0	wc	185
nt	100000	hzmm	9.16
ct	400	is	580.00
alock	n	rf1	12162.2
gain	48	rfp	9684.9
FLAGS		th	4
il	n	ins	100.000
in	n	ai ph	
dp	y		
hs	nn		





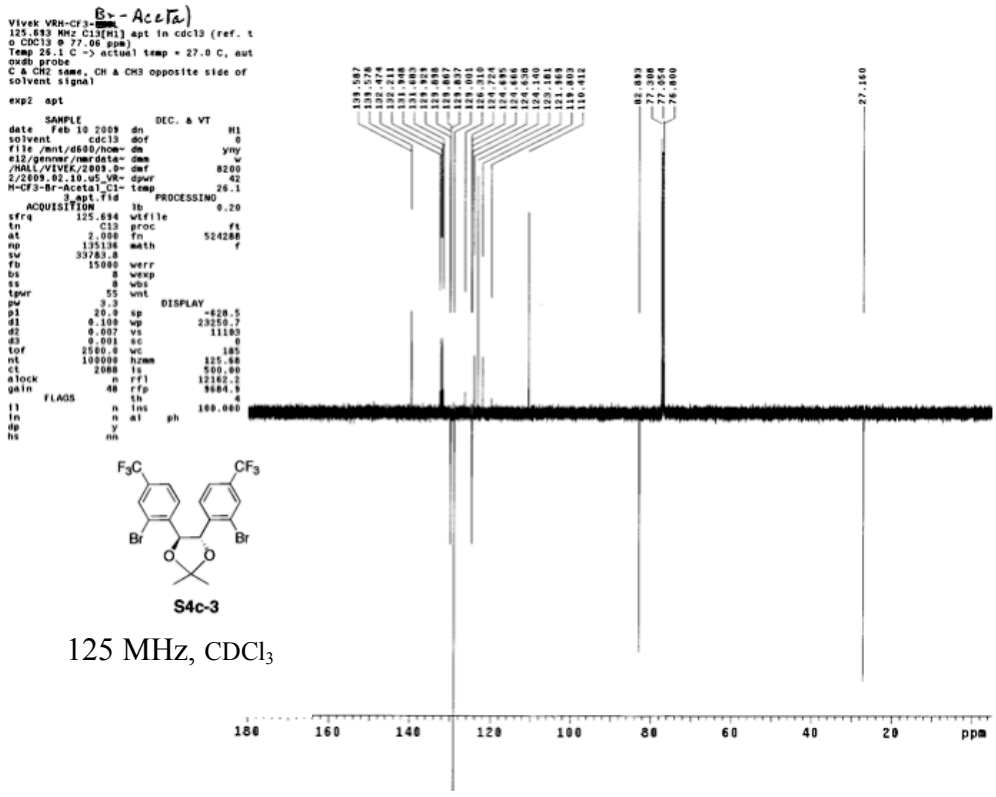
S4c-2

125 MHz, $CDCl_3$



500 MHz, $CDCl_3$

S4c-3



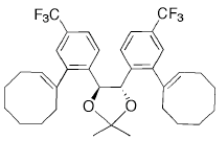
S4c-3

125 MHz, $CDCl_3$

Vivek VRH-CF3-Cycloalkene-acetal
499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

Pulse Sequence: s2pul

500 MHz, $CDCl_3$

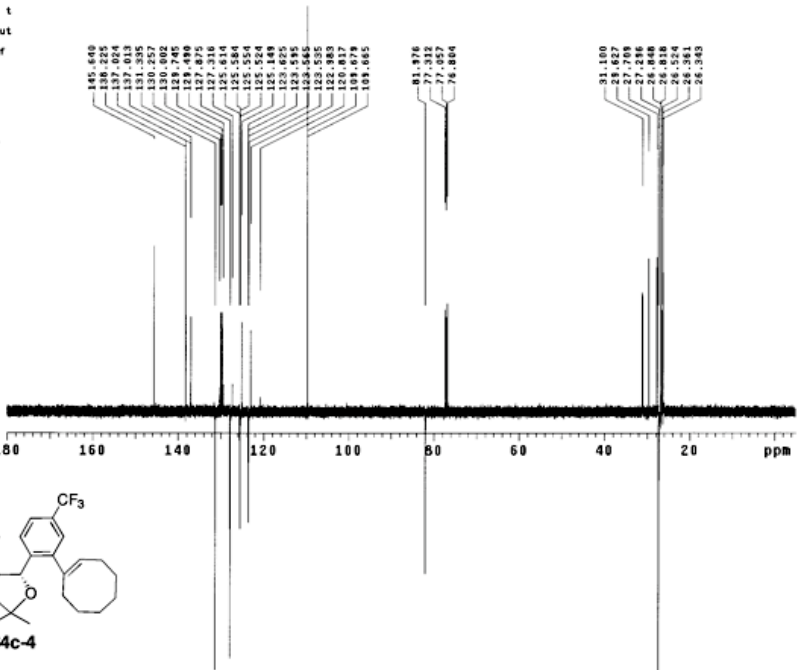


S4c-4

Vivek VRH-CF3-Cycloalkene-acetal
125.693 MHz C13[H1] apt in cdcl3 (ref. to CDCl3 @ 77.06 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
C & CH2 same, CH & CH3 opposite side of solvent signal

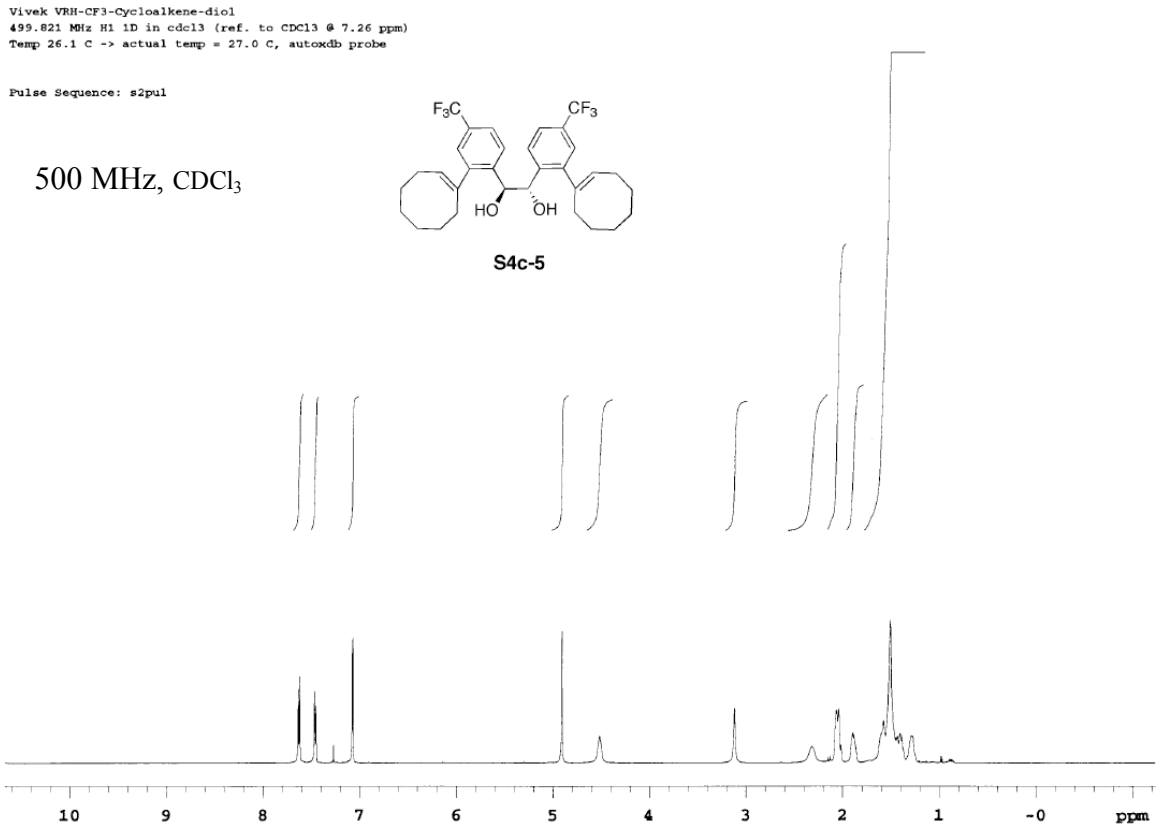
exp2 apt

SAMPLE		DEC. & VT	
date	Feb 10 2009	dn	H1
solvent	cdcl3	dof	0
file	/mnt/d600/hcm-s12/gennmr/nmrdata-/HALL/VIVEK/2009.0-2/2009.02.10.u5_VR-H-CF3-Cycloalkene--acetal_C13_apt.fid	dm	yny
		dmm	w
		dmf	8208
		dpwr	42
		temp	26.1
ACQUISITION		PROCESSING	
sfrq	125.694	lb	0.20
tn	C13	wtfile	
at	2.000	proc	ft
np	135136	fn	524288
sw	33783.8	math	f
fb	15080	werr	
bs	8	wexp	
ss	8	wbs	
tpwr	55	wnt	
pw	3.3	DISPLAY	
p1	20.0	sp	-628.5
d1	0.100	wp	23250.7
d2	0.007	vs	3221
d3	0.001	sc	0
tof	2500.0	wc	185
nt	100000	hzmm	19.84
ct	304	is	500.00
alock	n	rfl	12162.2
gain	48	rfp	9684.9
FLAGS		th	3
il	n	ins	100.000
in	n	ai ph	
dp	y		
hs	nn		



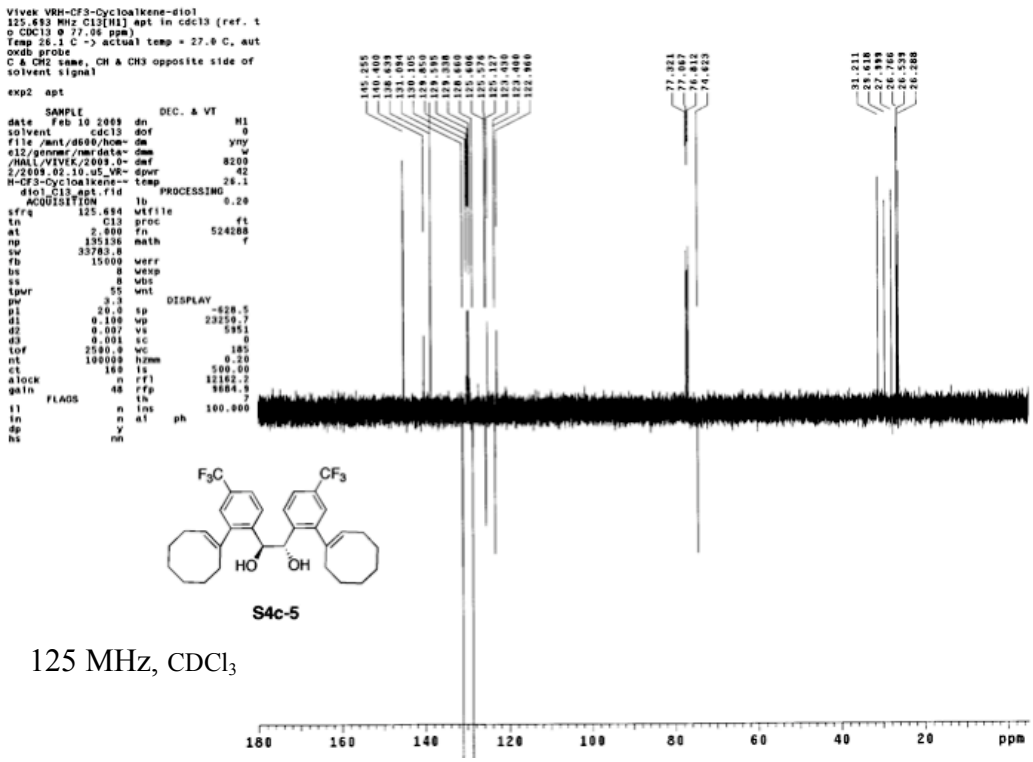
S4c-4

125 MHz, $CDCl_3$



500 MHz, $CDCl_3$

S4c-5



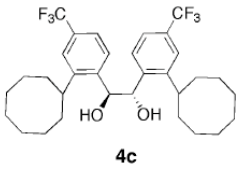
S4c-5

125 MHz, $CDCl_3$

499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

Pulse Sequence: s2pul

500 MHz, $CDCl_3$

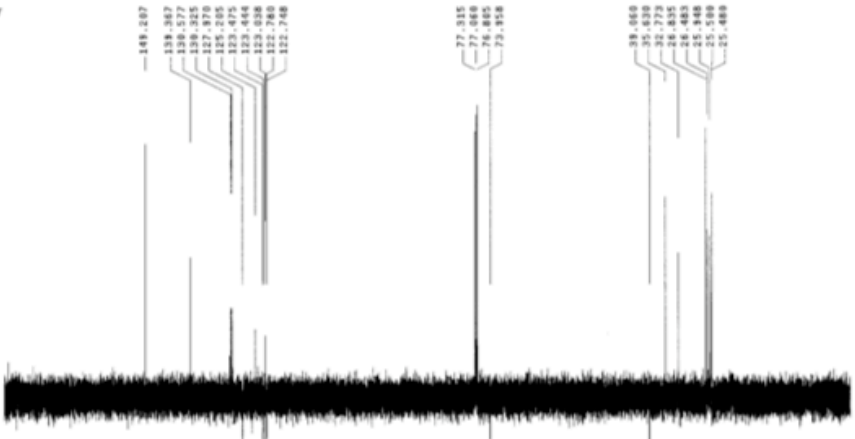


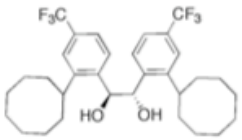
4c

Vivek VRH-CF3-VIVOL
125.693 MHz C13{H1} apt in cdcl3 (ref. to CDCl3 @ 77.06 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
C & CH2 same, CH & CH3 opposite side of solvent signal

exp2 apt

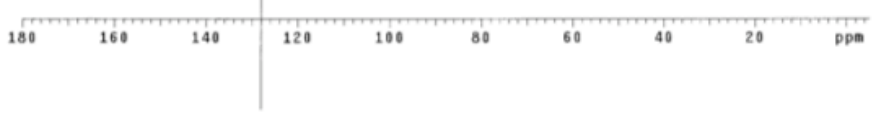
SAMPLE		DEC. & VT	
date	Feb 10 2009	dn	H1
solvent	cdcl3	dof	0
file	/mnt/d600/hom~	dm	yny
e12/gennmr/nmrdata~		dmm	w
/HALL/VIVEK/2009.0~		dmf	8200
2/2009.02.10.u5_VR~		dpwr	42
H-CF3-VIVOL_C13_ap~		temp	26.1
t.fid		PROCESSING	
ACQUISITION		lb	0.20
sfrq	125.694	wtfile	
tn	C13	proc	ft
at	2.009	fn	524288
np	135136	math	f
sw	33783.8		
fb	15009	werr	
bs	8	wexp	
ss	8	wbs	
tpwr	55	wnt	
pw	3.3	DISPLAY	
p1	20.0	sp	-628.5
d1	0.100	wp	23250.7
d2	0.007	vs	10996
d3	0.001	sc	0
tof	2500.0	wc	185
nt	100000	hzmm	10.55
ct	280	is	500.00
alock	n	rf1	12162.2
gain	48	rfp	9684.9
FLAGS		th	10
il	n	ins	100.000
in	n	al ph	
dp	y		
hs	nn		





4c

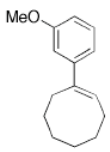
125 MHz, $CDCl_3$



VRH-8-100-2-cycloalkene

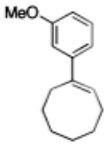
Pulse Sequence: s2pul

400 MHz, $CDCl_3$

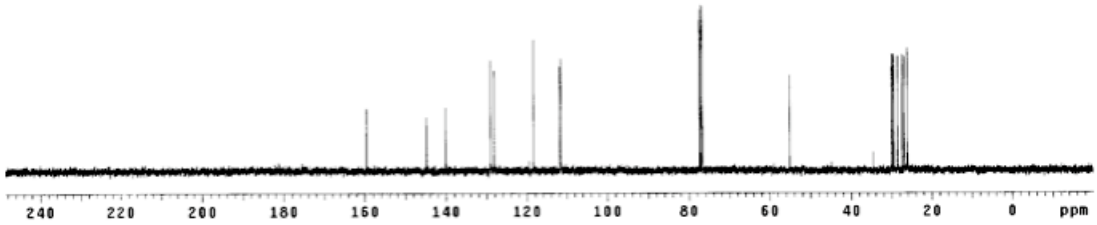


S4d-1

100.5 MHz, $CDCl_3$



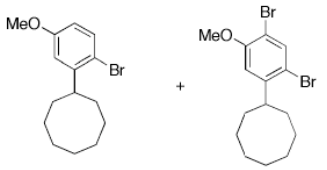
S4d-1



VRH-8-100-4-bromoalkane

Pulse Sequence: s2pul

400 MHz, $CDCl_3$



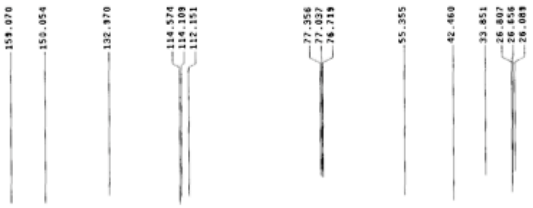
10 : 1

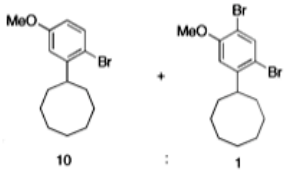
S4d-2

VRH-8-100-4-bromo-cycloalkane

Pulse Sequence: s2pul

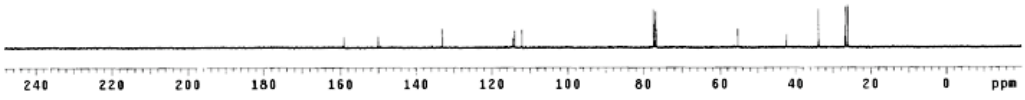
100.5 MHz, $CDCl_3$





10 : 1

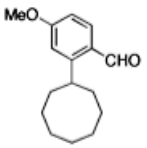
S4d-2



VRH-8-102-aldehyde

Pulse Sequence: s2pul

300 MHz, $CDCl_3$

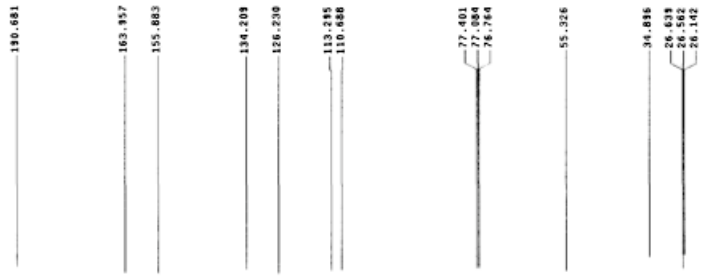


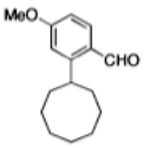
S4d-3

VRH-8-101-aldehdye

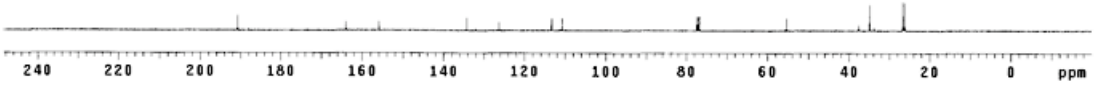
Pulse Sequence: s2pul

100.5 MHz
$CDCl_3$

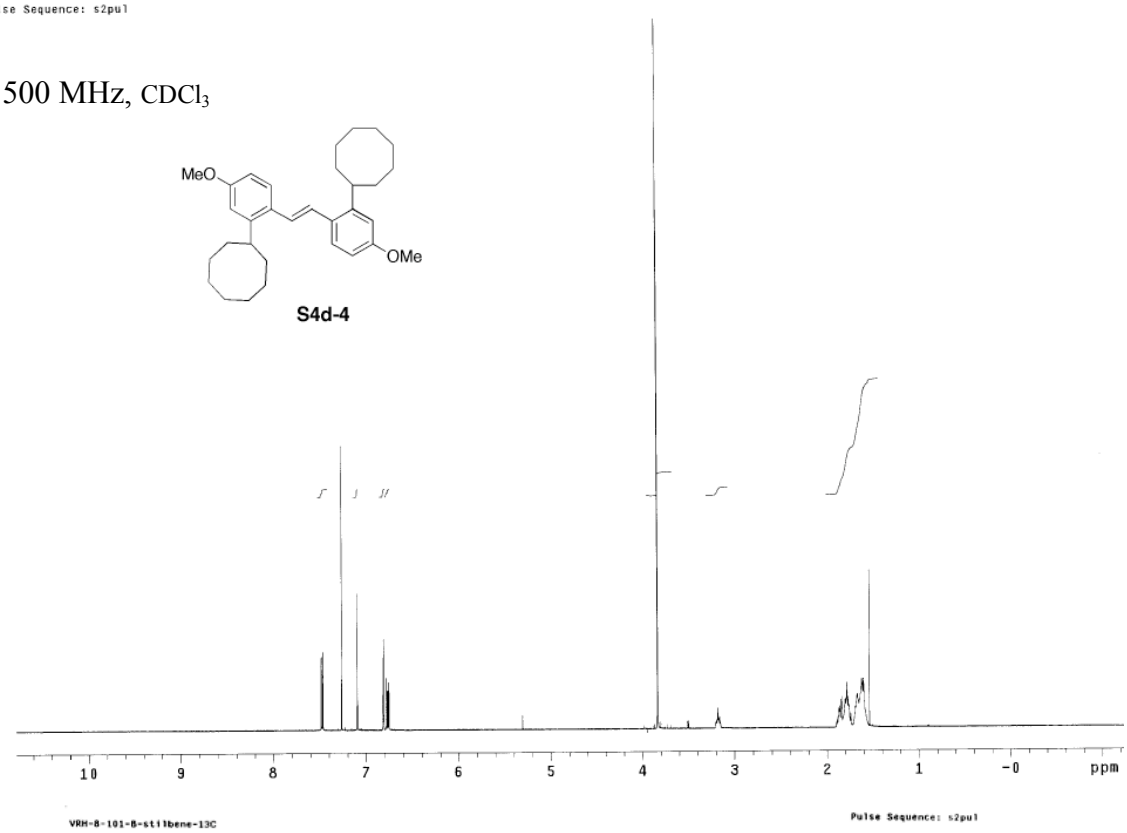




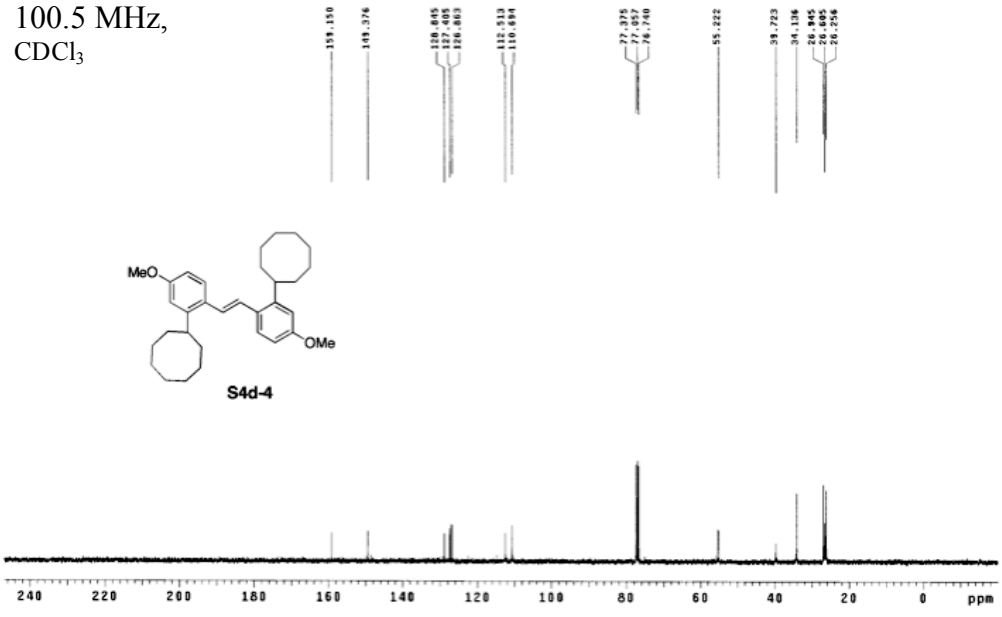
S4d-3



500 MHz, $CDCl_3$



100.5 MHz, $CDCl_3$

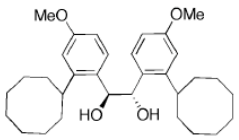


Vivek VRH-4-MeO-VIVOL
499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm)
Temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

File: 2009.02.09.u5_VRH-4-MeO-VIVOL_H1_1D

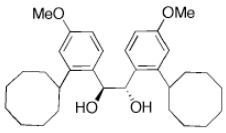
Pulse Sequence: s2pul

500 MHz, $CDCl_3$

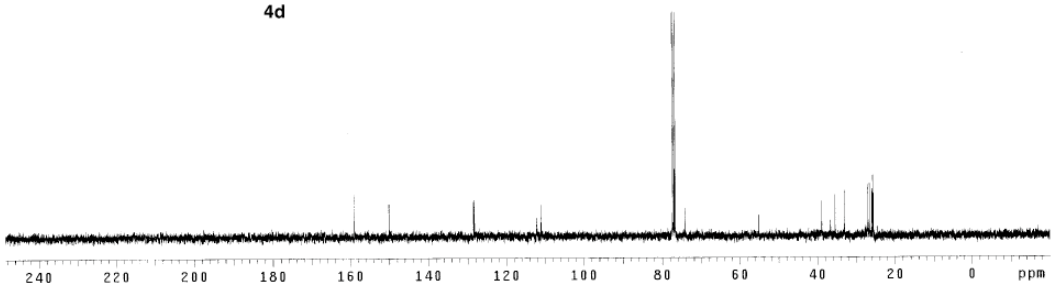


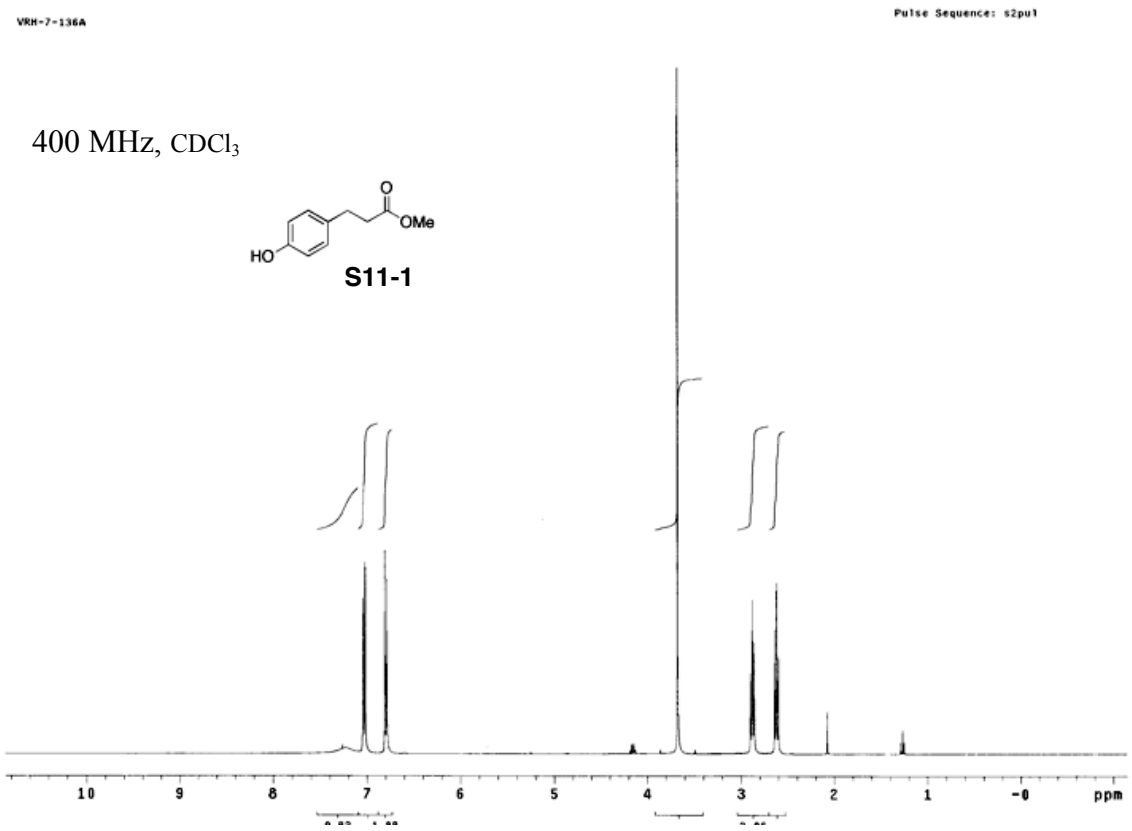
4d

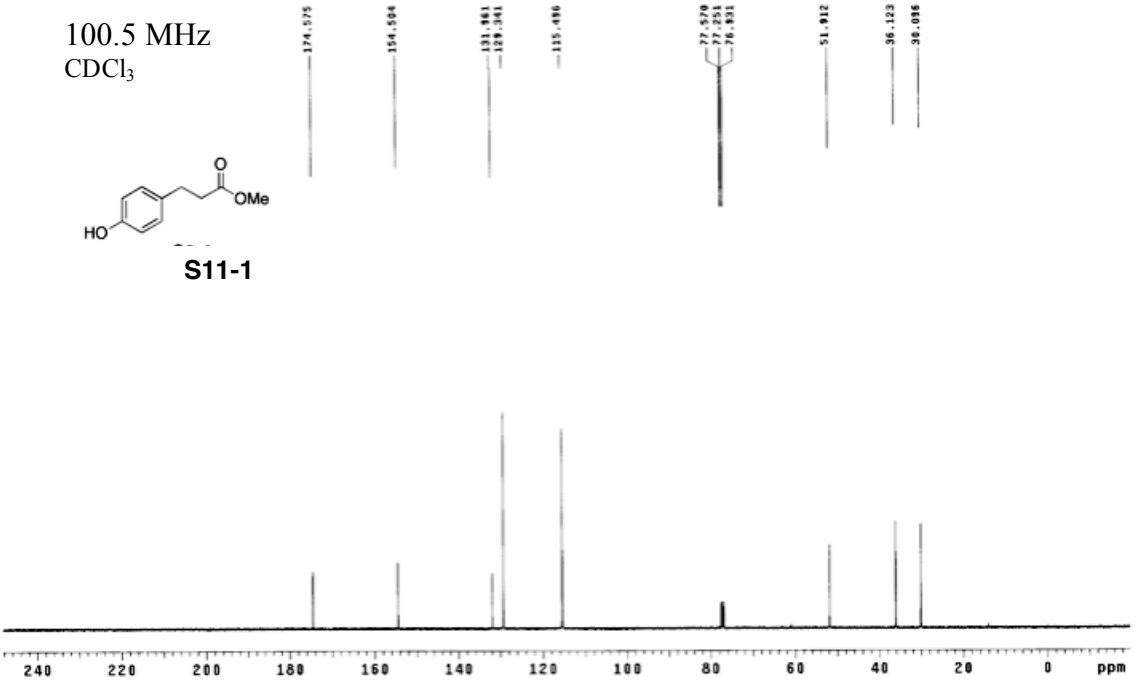
100.5 MHz, $CDCl_3$



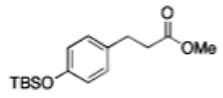
4d




VRH-7-136A
Pulse Sequence: s2pul
400 MHz, CDCl3
O
OMe
HO
S11-1
10
9
8
7
6
5
4
3
2
1
-0
ppm

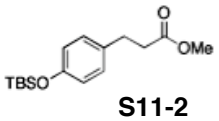

100.5 MHz
CDCl3
174.575
154.584
131.961
129.341
115.496
77.570
77.251
76.931
51.912
36.123
30.036
O
OMe
HO
S11-1
240
220
200
180
160
140
120
100
80
60
40
20
0
ppm

400 MHz, $CDCl_3$

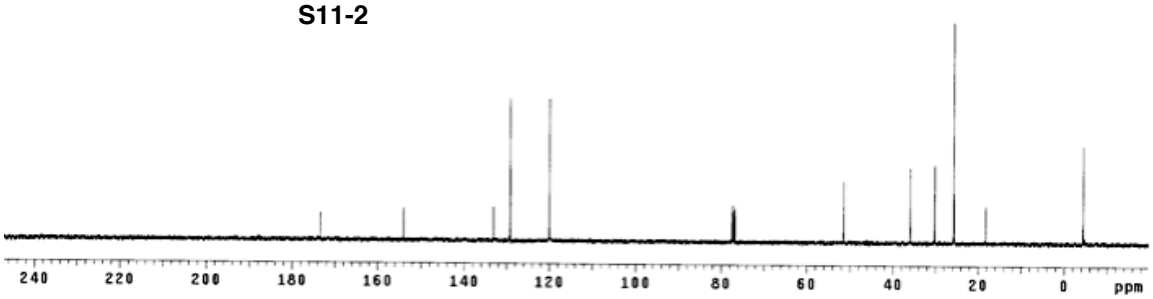


S11-2

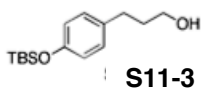
100.5 MHz, $CDCl_3$



S11-2

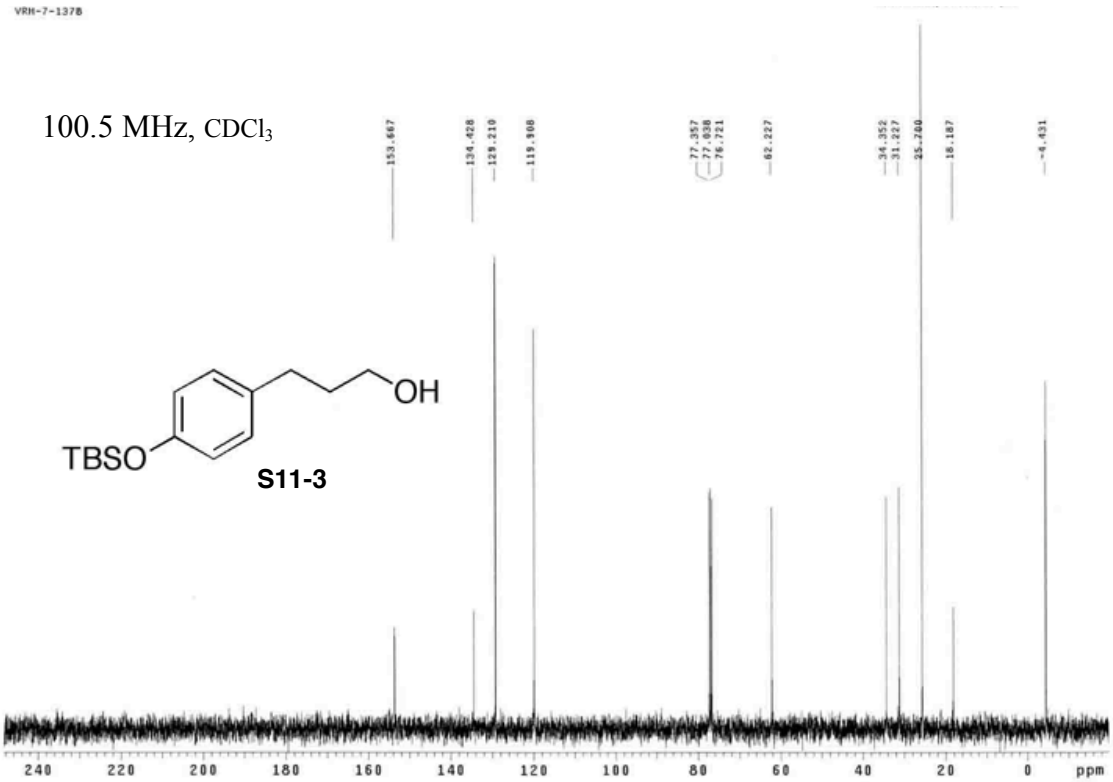


400 MHz, $CDCl_3$

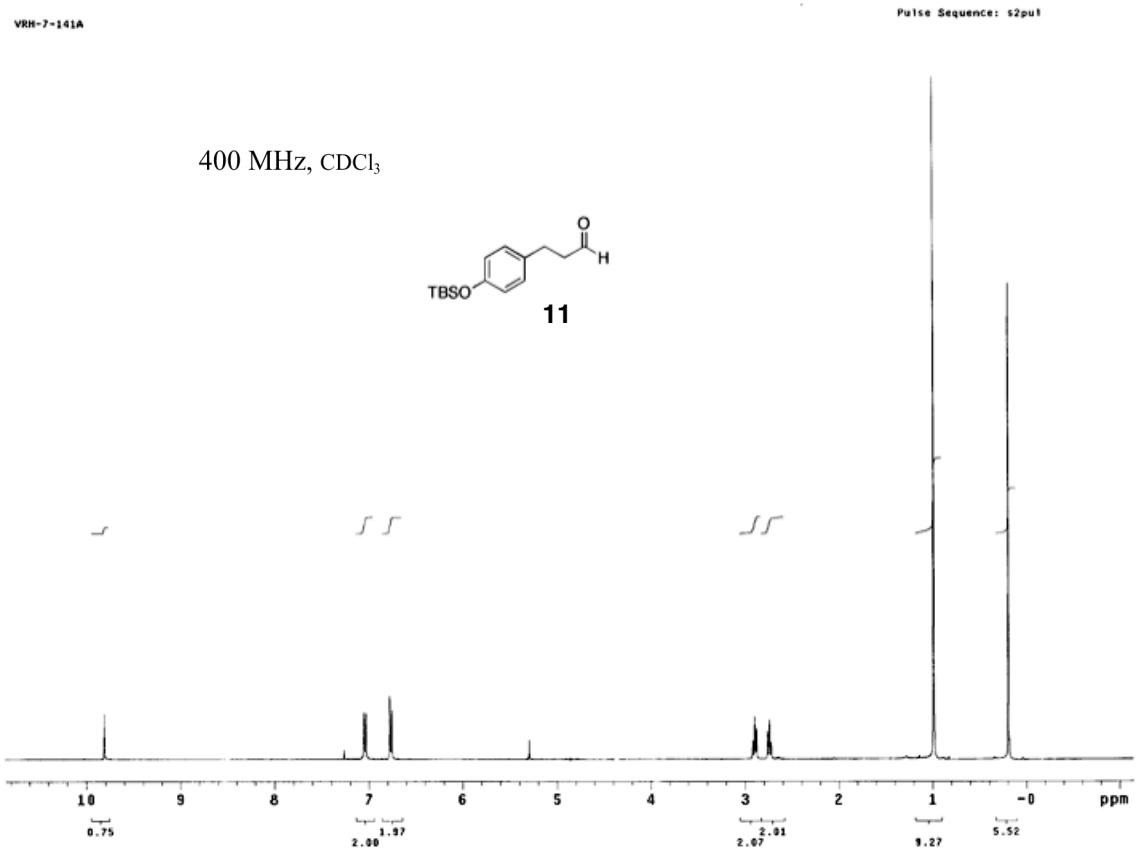


S11-3

100.5 MHz, $CDCl_3$

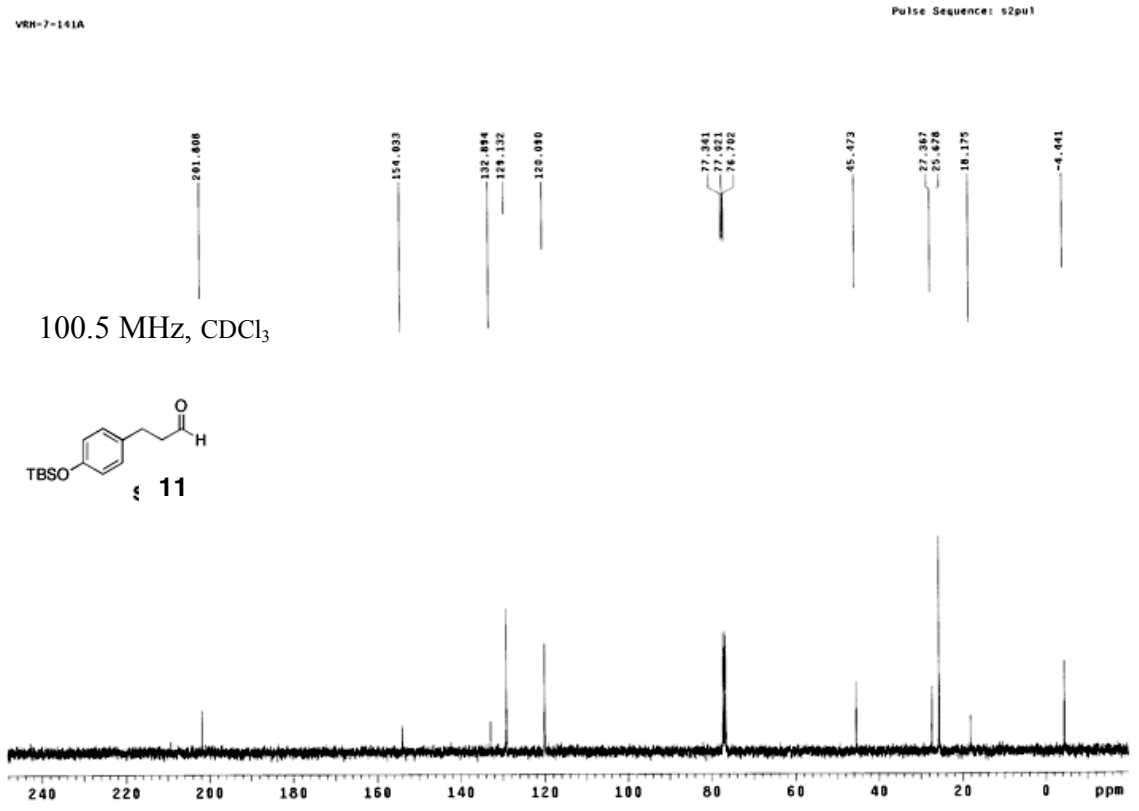


S11-3



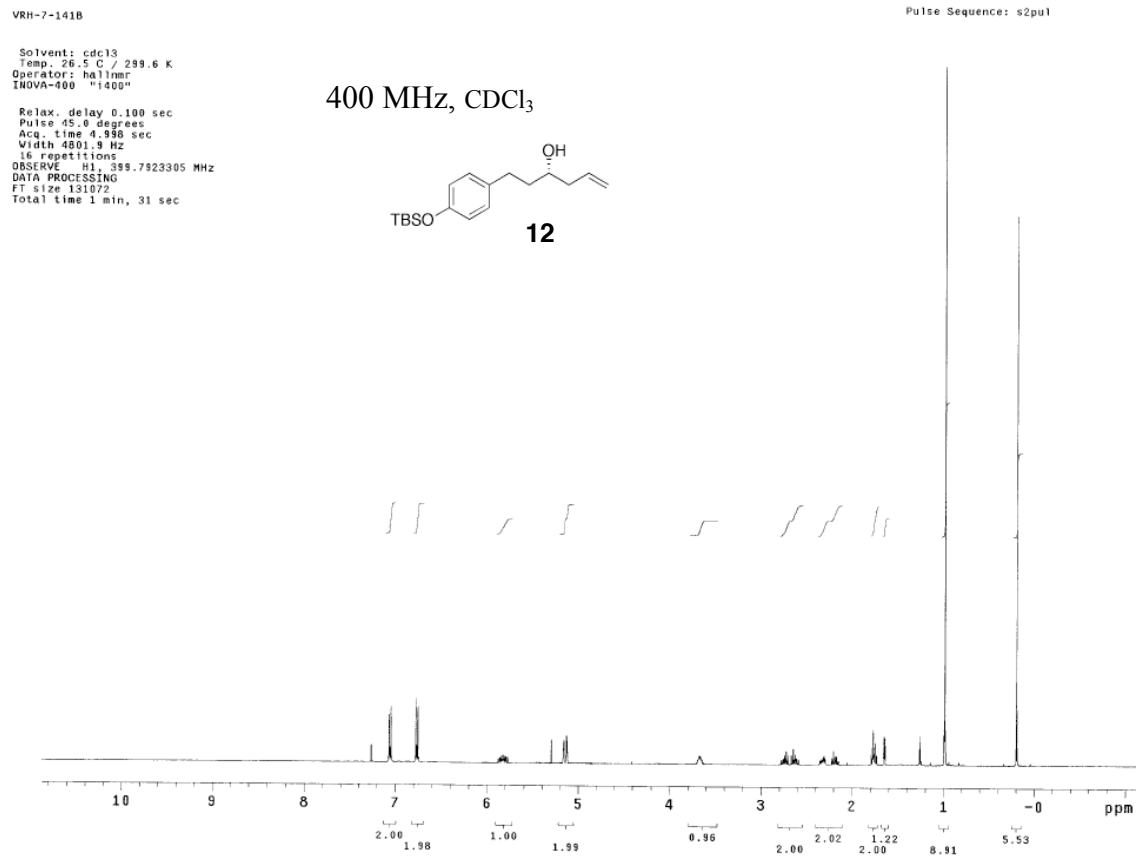
400 MHz, $CDCl_3$

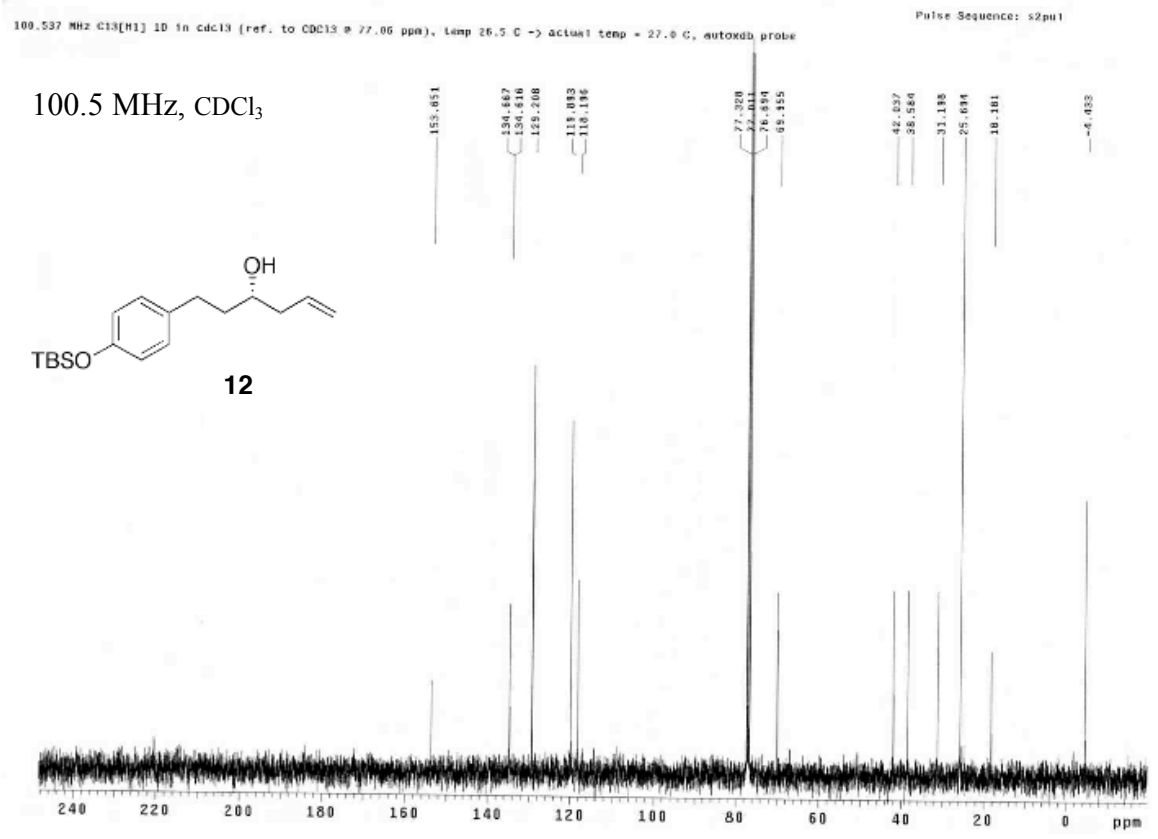
11



100.5 MHz, $CDCl_3$

11

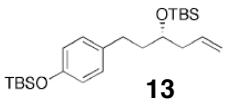

VRH-7-141B
Pulse Sequence: s2pul
Solvent: cdcl3
Temp. 26.5 C / 299.6 K
Operator: hallnmr
INOVA-400 "i400"
Relax. delay 0.100 sec
Pulse 45.0 degrees
Acq. time 4.998 sec
Width 4801.9 Hz
16 repetitions
OBSERVE H1, 399.7923305 MHz
DATA PROCESSING
FT size 131072
Total time 1 min, 31 sec
400 MHz, CDCl3
OH
TBSO
12
10
9
8
7
6
5
4
3
2
1
-0
ppm
2.00
1.98
1.00
1.99
0.96
2.00
2.02
1.22
2.00
8.91
5.53


100.537 MHz C13[H1] 1D in cdcl3 (ref. to CDCl3 @ 77.00 ppm), temp 26.5 C -> actual temp = 27.0 C, autoxdb probe
Pulse Sequence: s2pul
100.5 MHz, CDCl3
OH
TBSO
12
153.651
134.667
134.616
129.208
118.053
118.196
77.320
77.011
76.694
69.455
42.037
38.584
31.138
25.694
18.101
-4.433
240
220
200
180
160
140
120
100
80
60
40
20
0
ppm

VRH-7-142

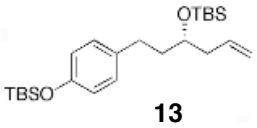
Pulse Sequence: s2pul

500 MHz, $CDCl_3$



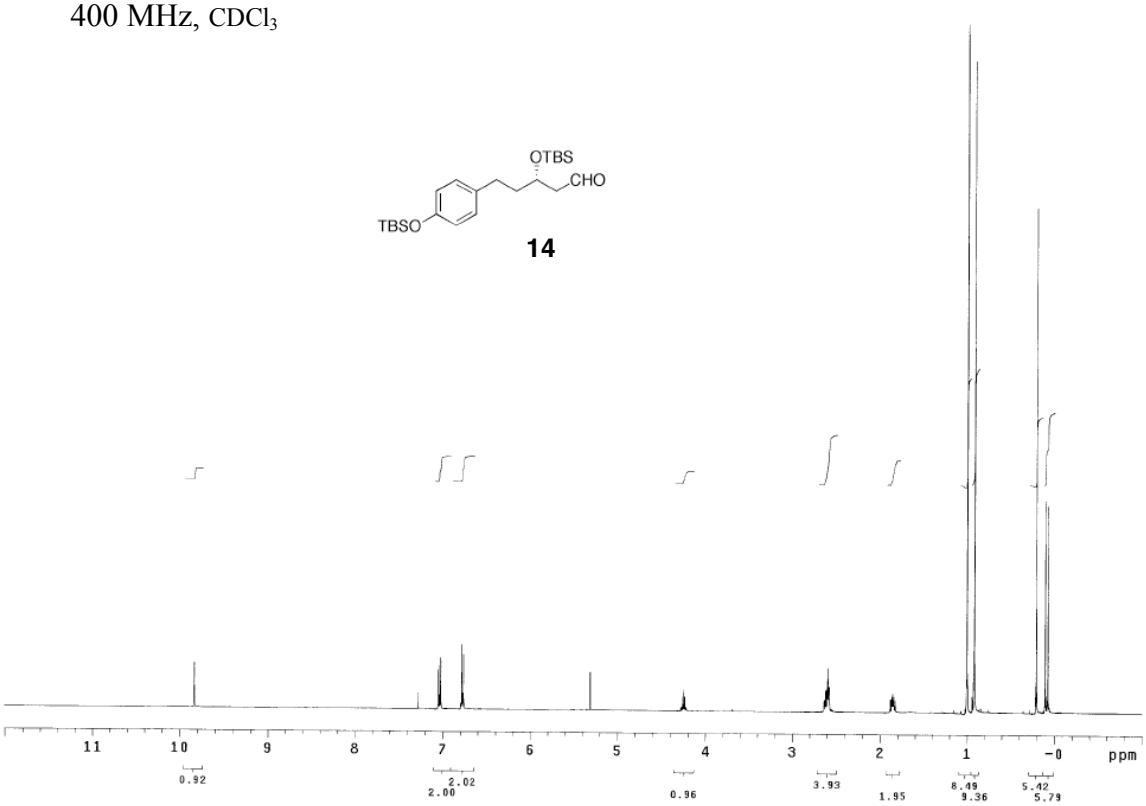
13

125 MHz, $CDCl_3$

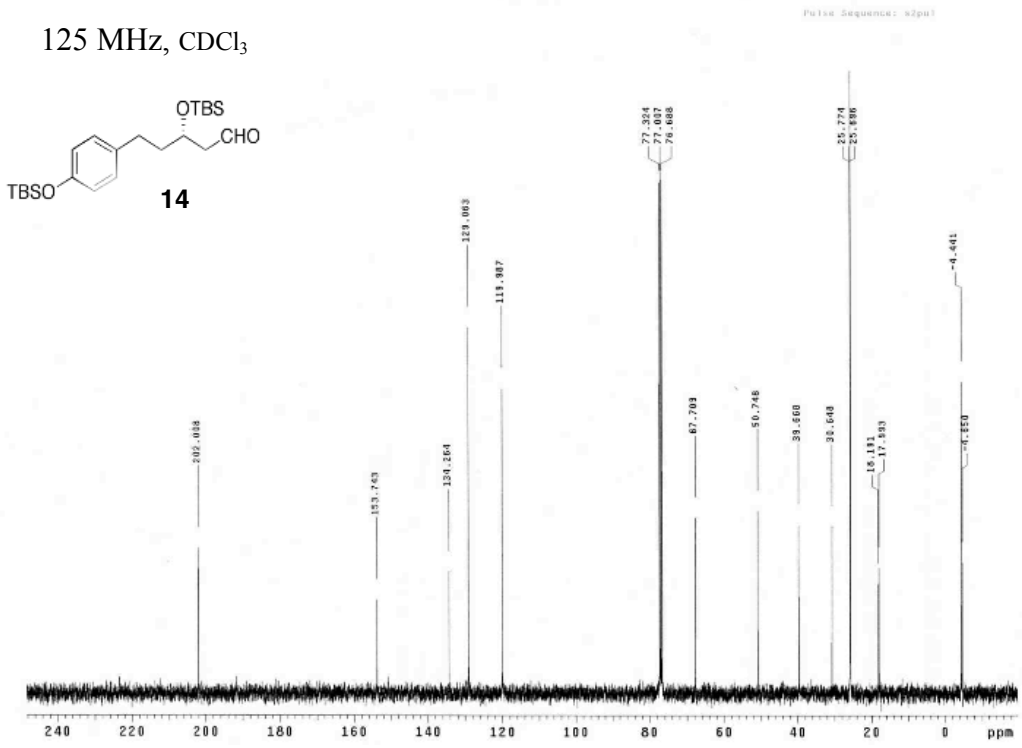


13

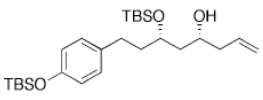
400 MHz, $CDCl_3$



125 MHz, $CDCl_3$



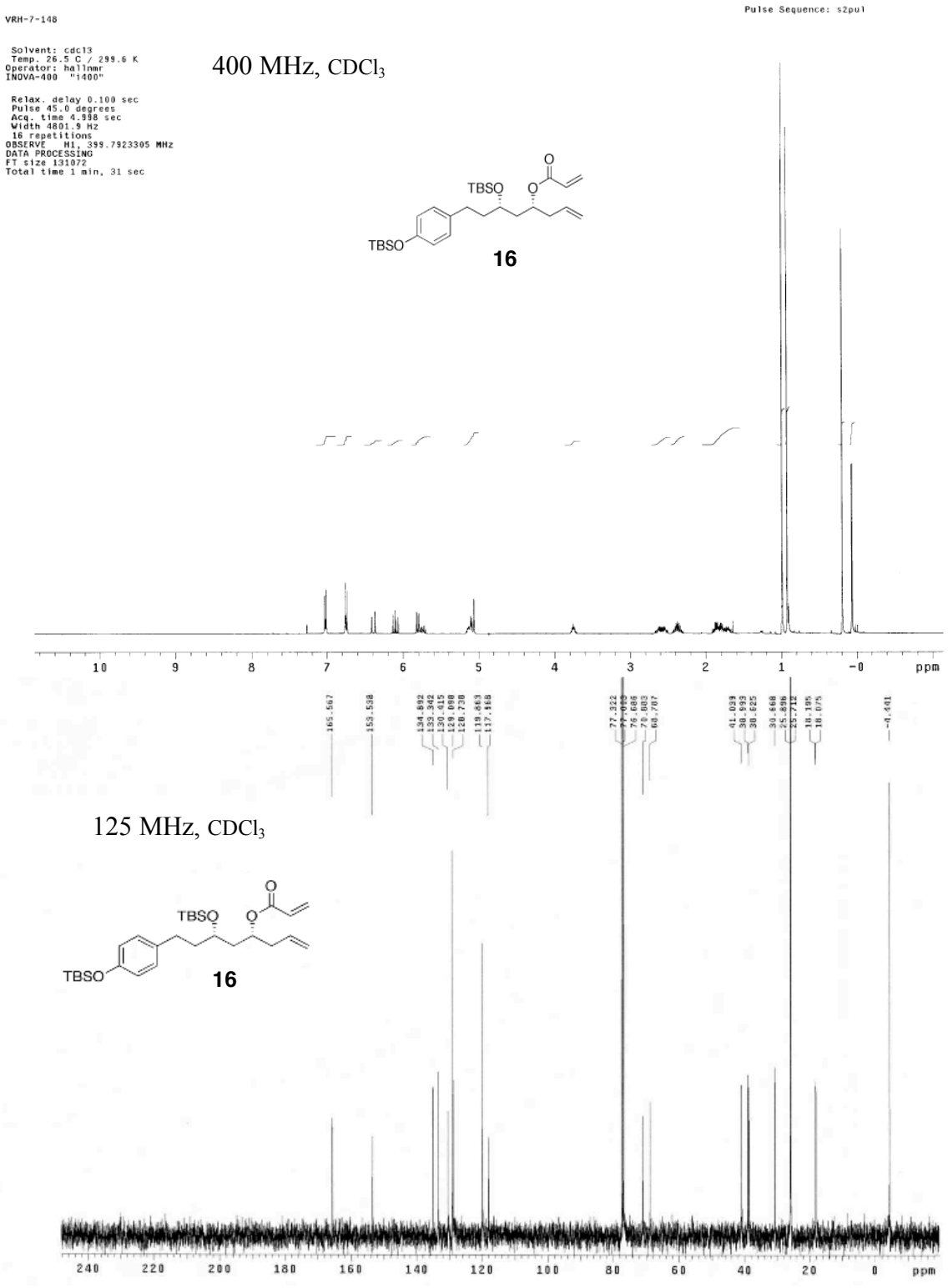
400 MHz, $CDCl_3$



15

125 MHz, $CDCl_3$

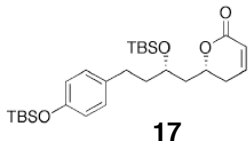
15


VRH-7-148
Solvent: cdcl3
Temp. 26.5 C / 299.6 K
Operator: hallnmr
INOVA-400 "I400"
Relax. delay 0.100 sec
Pulse 45.0 degrees
Acq. time 4.998 sec
Width 4801.9 Hz
16 repetitions
OBSERVE H1, 399.7923305 MHz
DATA PROCESSING
FT size 131072
Total time 1 min, 31 sec
Pulse Sequence: s2pul
400 MHz, CDCl3
TBSO
TBSO
16
10 9 8 7 6 5 4 3 2 1 -0 ppm
165.567
153.538
134.892
133.342
130.415
129.988
128.738
119.669
117.168
77.322
77.003
76.688
76.003
68.707
41.083
38.993
38.625
30.668
25.896
25.712
18.195
18.075
-4.441
125 MHz, CDCl3
TBSO
TBSO
16
240 220 200 180 160 140 120 100 80 60 40 20 0 ppm

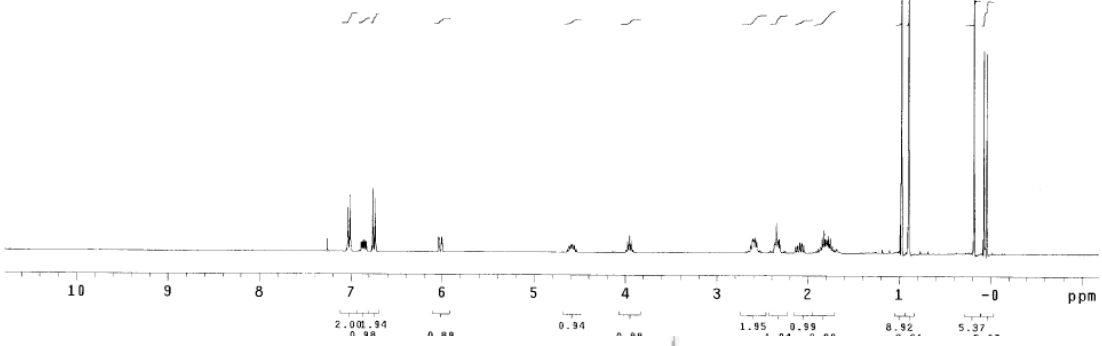
VRH-7-149-pyranone

Pulse Sequence: s2pul

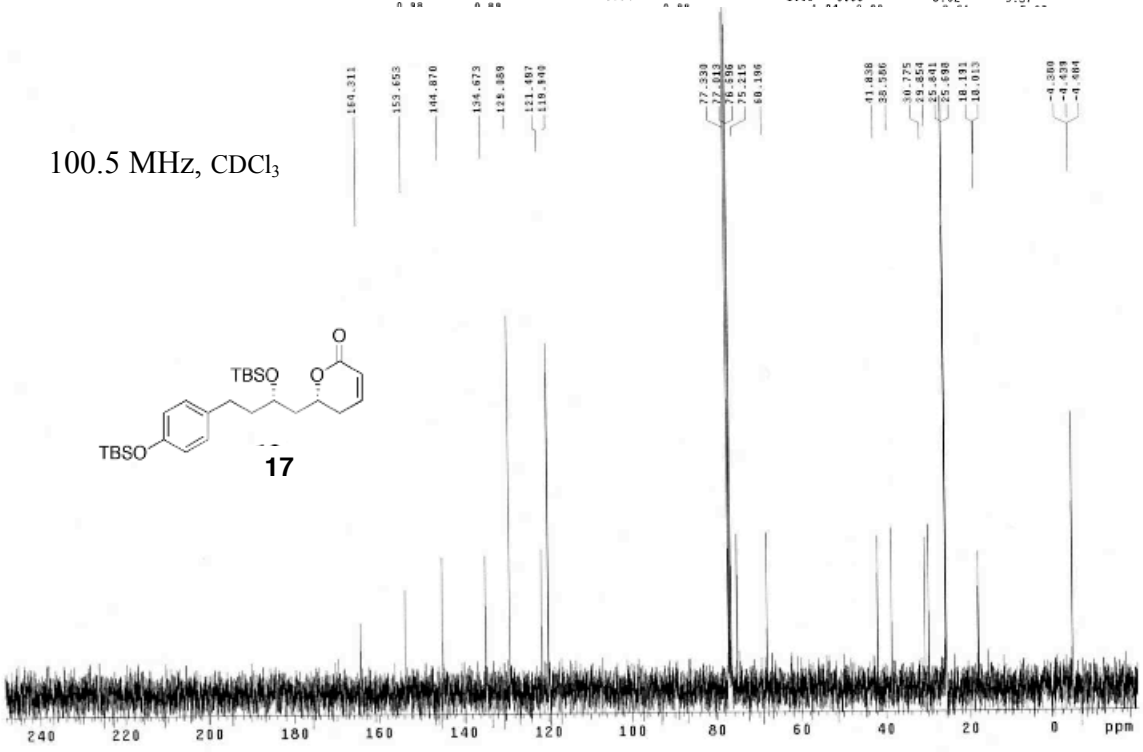
400 MHz, $CDCl_3$



17



100.5 MHz, $CDCl_3$

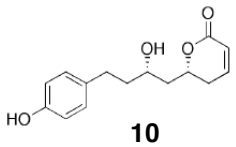


17

499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.1 C -> actual temp = 27.0 C, autoxdb probe

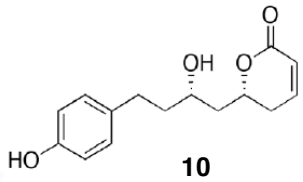
Pulse Sequence: s2pul

500 MHz, $CDCl_3$

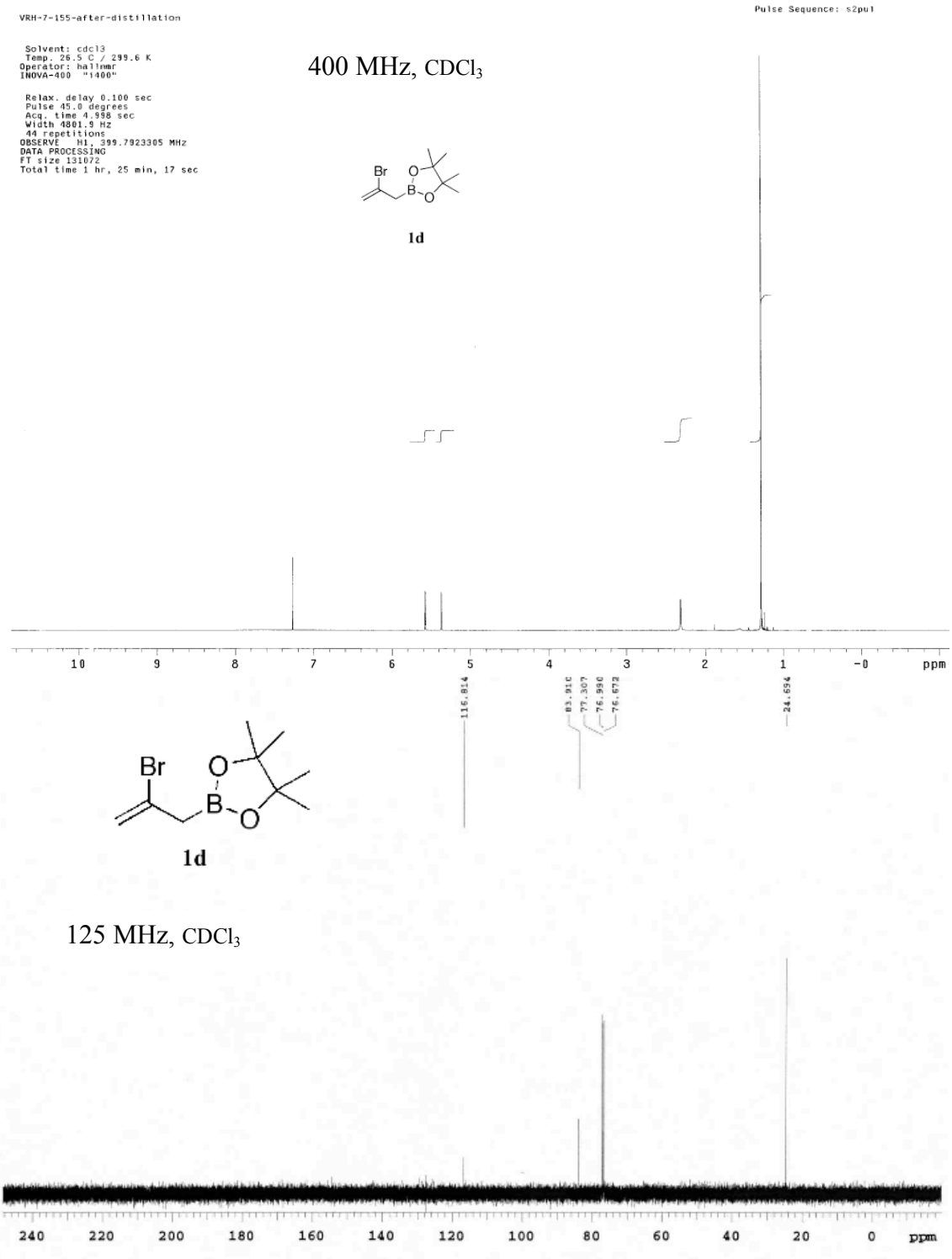


10

125 MHz $CDCl_3$



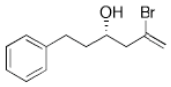
10


VRH-7-155-after-distillation
Solvent: cdcl3
Temp. 26.5 C / 299.6 K
Operator: hallnmr
INOVA-400 "i400"
Relax. delay 0.100 sec
Pulse 45.0 degrees
Acq. time 4.998 sec
Width 4801.9 Hz
44 repetitions
OBSERVE H1, 399.7923305 MHz
DATA PROCESSING
FT size 131072
Total time 1 hr, 25 min, 17 sec
Pulse Sequence: s2pul
400 MHz, CDCl3
Br
O
B
O
1d
10
9
8
7
6
5
4
3
2
1
-0
ppm
116.814
83.910
77.307
76.990
76.672
24.694
Br
O
B
O
1d
125 MHz, CDCl3
240
220
200
180
160
140
120
100
80
60
40
20
0
ppm

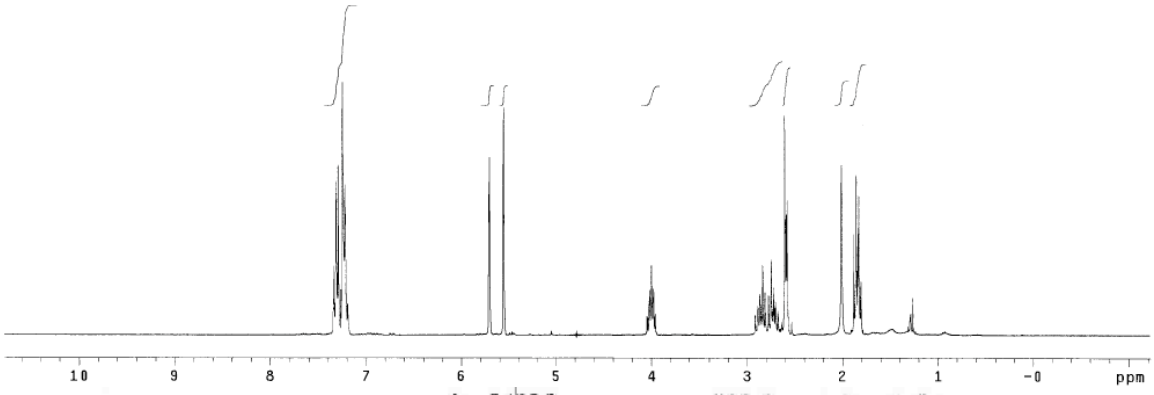
VRH-7-159

Pulse Sequence: s2pul

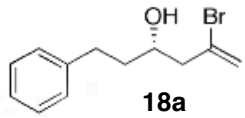
400 MHz, $CDCl_3$



18a

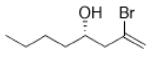


125 MHz, $CDCl_3$

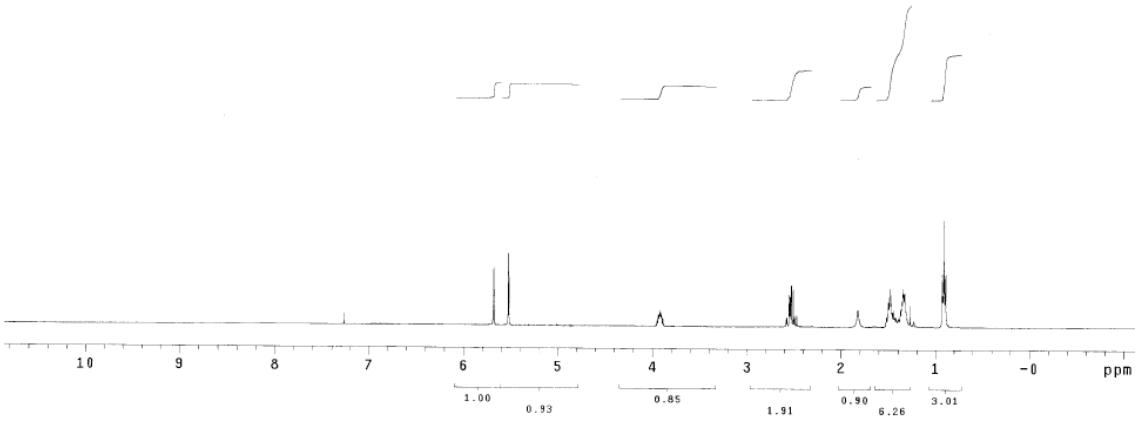


18a

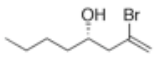
400 MHz, $CDCl_3$



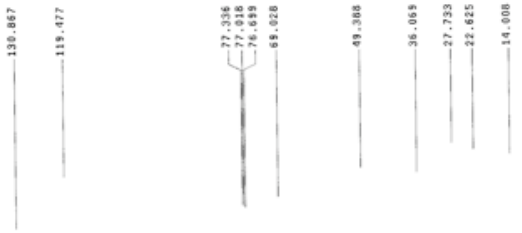
18b

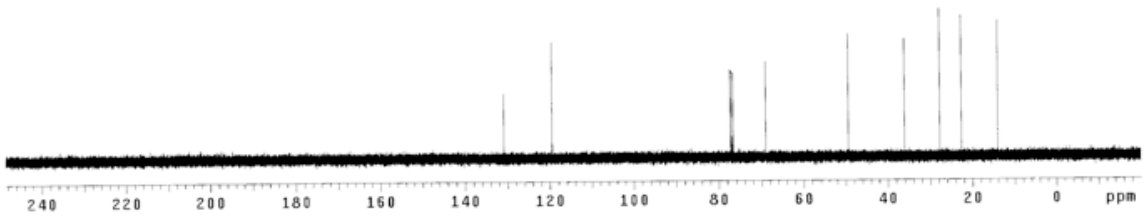


125 MHz, $CDCl_3$



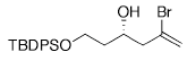
18b





499.821 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
Pulse Sequence: s2pul

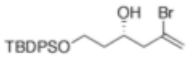
500 MHz, $CDCl_3$



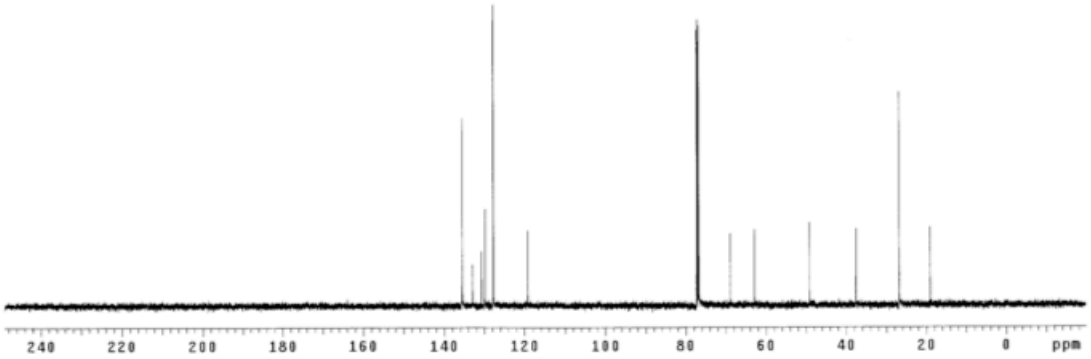
18c

125.691 MHz C13[H1] 1D in cdcl3 (ref. to CDCl3 @ 77.06 ppm), temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
Pulse Sequence: s2pul

125 MHz, $CDCl_3$

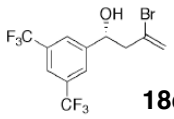


18c

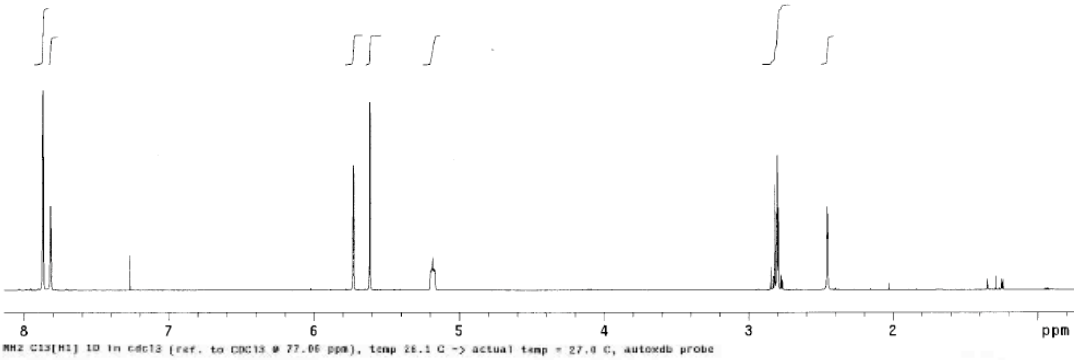


VRH-8-95A-1H
Pulse Sequence: s2pul

500 MHz, $CDCl_3$



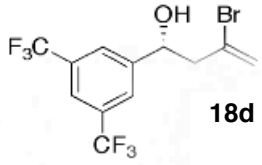
18d



125.691 MHz C13[H1] 10 in cdcl3 (ref. to CDCl3 @ 77.06 ppm), temp 26.1 C -> actual temp = 27.0 C, autoxdb probe
Pulse Sequence: s2pul

145.218
132.202
131.930
131.671
131.405
128.647
126.500
126.322
126.252
122.165
121.724
121.695
121.464
121.180
119.353
77.226
76.982
76.729
70.405
51.451

125 MHz
$CDCl_3$



18d

150
140
130
120
110
100
90
80
70
60
50
ppm

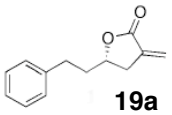
VRH-7-162

Pulse Sequence: s2pul

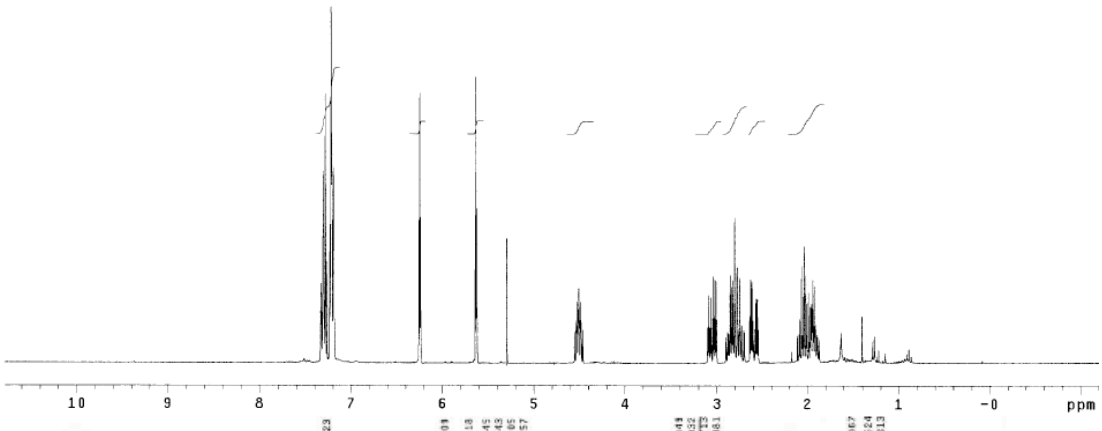
Solvent: cdcl3
Temp. 27.5 C / 300.6 K
Operator: hallnmr
File: vrh-7-162
INOVA-400 "i400"

Relax. delay 0.100 sec
Pulse 45.0 degrees
Acq. time 4.999 sec
Width 3800.7 Hz
28 repetitions
OBSERVE H1, 299.9696605 MHz
DATA PROCESSING
Gauss window 0.500 sec
center at 0.400 sec
FT size 131072
Total time 1 hr, 25 min, 18 sec

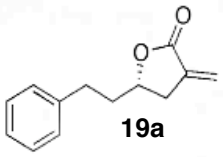
400 MHz, $CDCl_3$



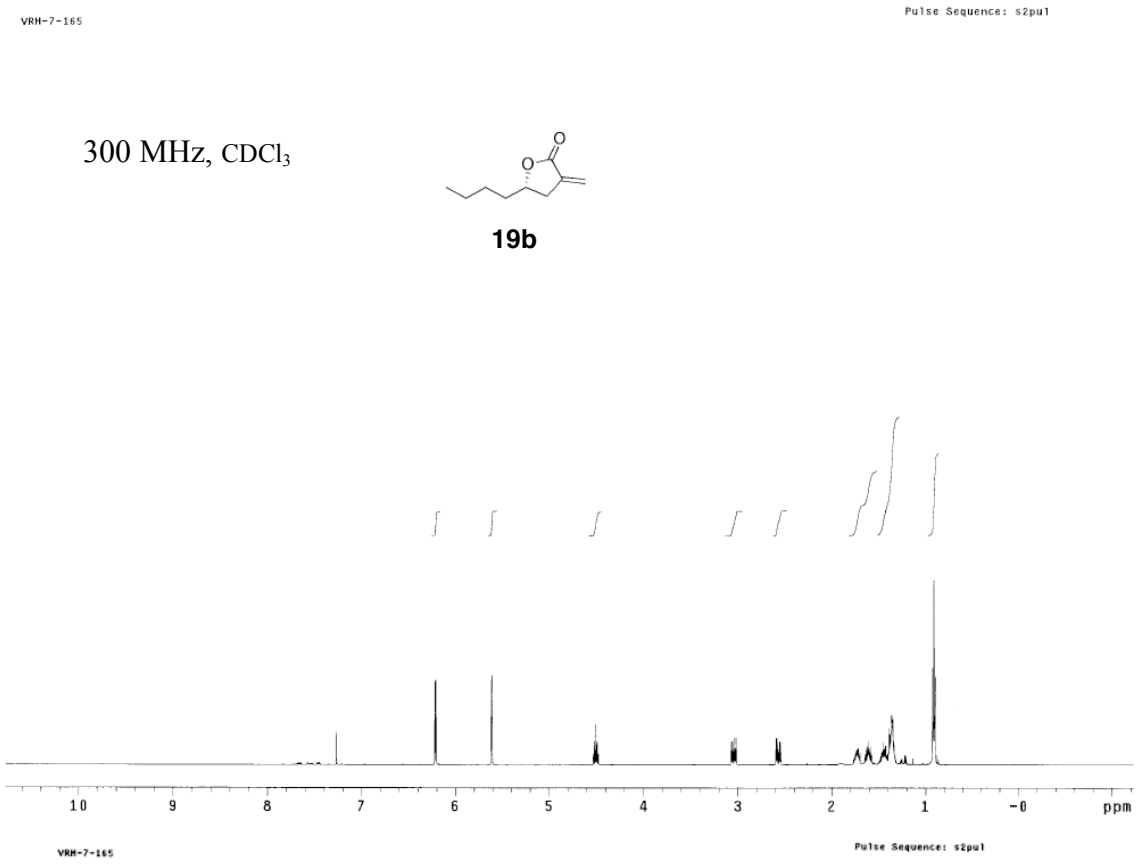
19a



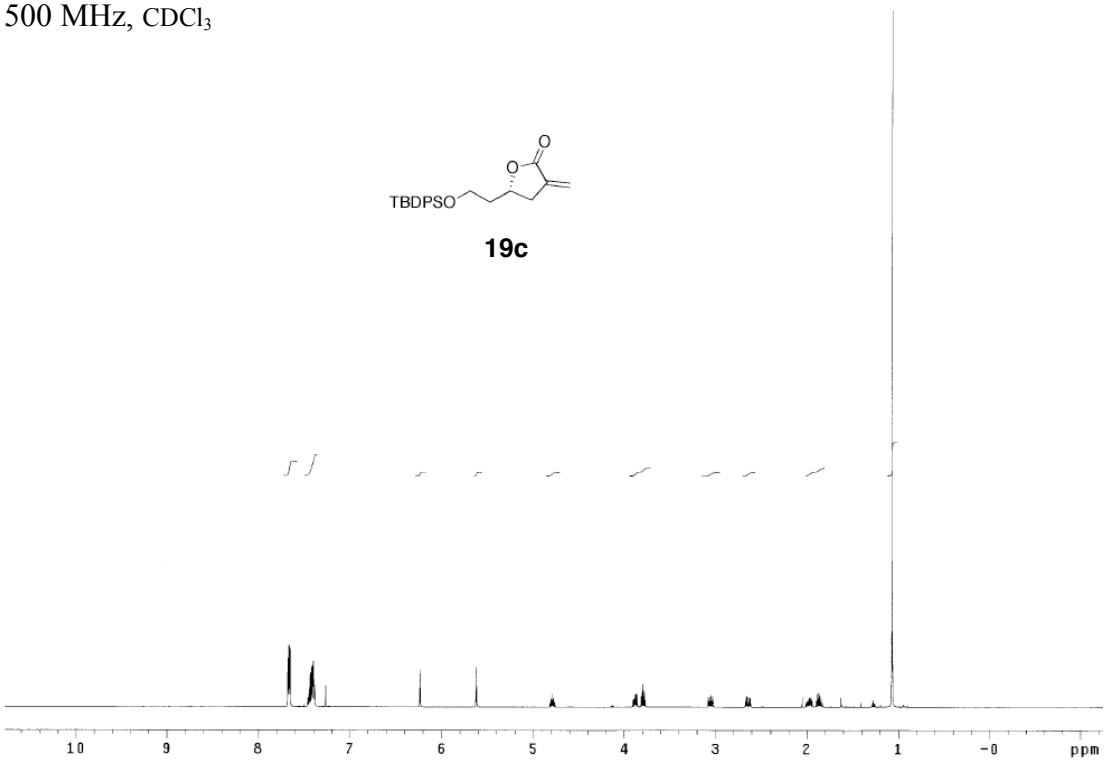
125 MHz, $CDCl_3$



19a

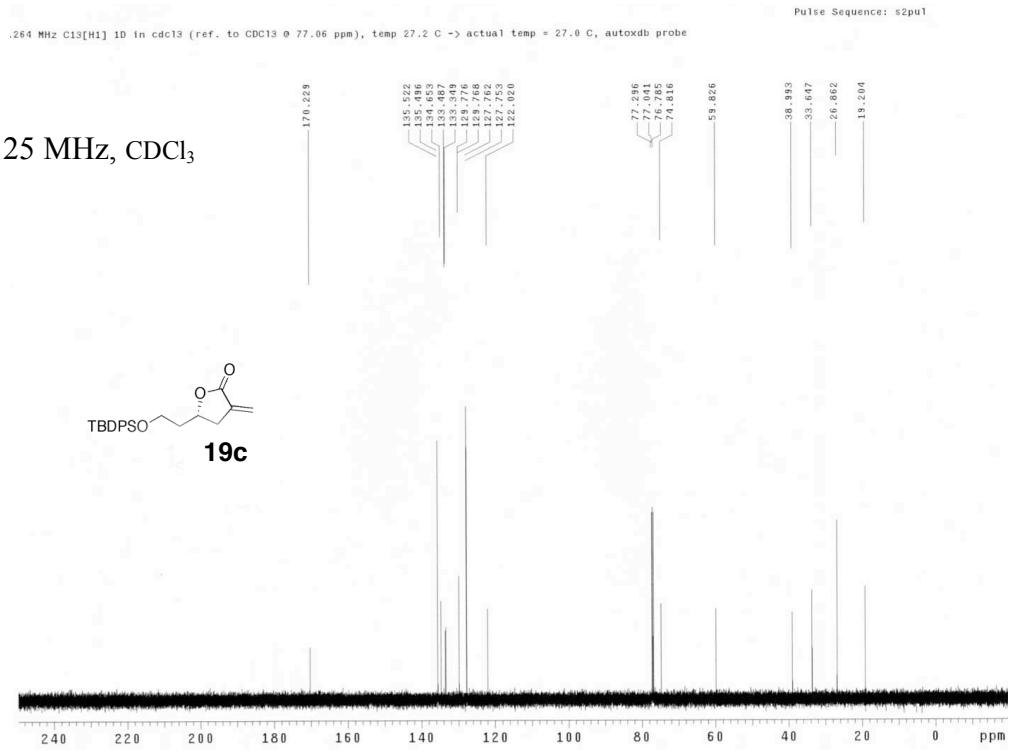

VRH-7-165
Pulse Sequence: s2pul
300 MHz, CDCl3
19b
10
9
8
7
6
5
4
3
2
1
-0
ppm
VRH-7-165
Pulse Sequence: s2pul
125 MHz, CDCl3
121.643
77.568
77.282
77.027
76.771
35.960
33.562
26.955
22.387
13.895
19b
240
220
200
180
160
140
120
100
80
60
40
20
0
ppm

500 MHz, $CDCl_3$



19c

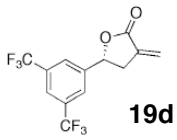
125 MHz, $CDCl_3$



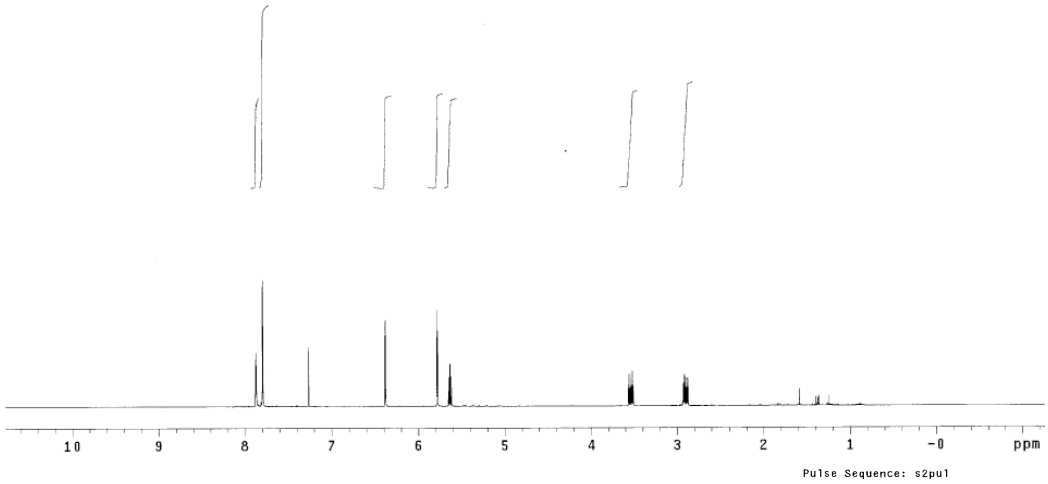
19c

VRH-8-103B

500 MHz, $CDCl_3$



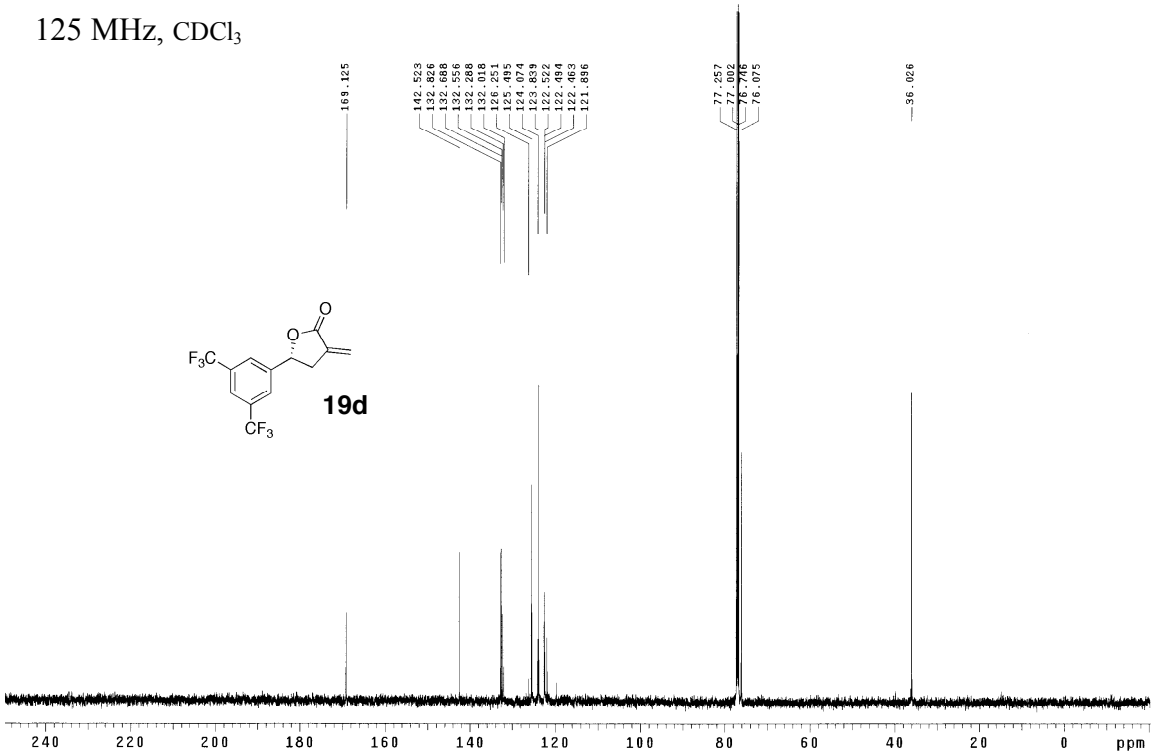
19d



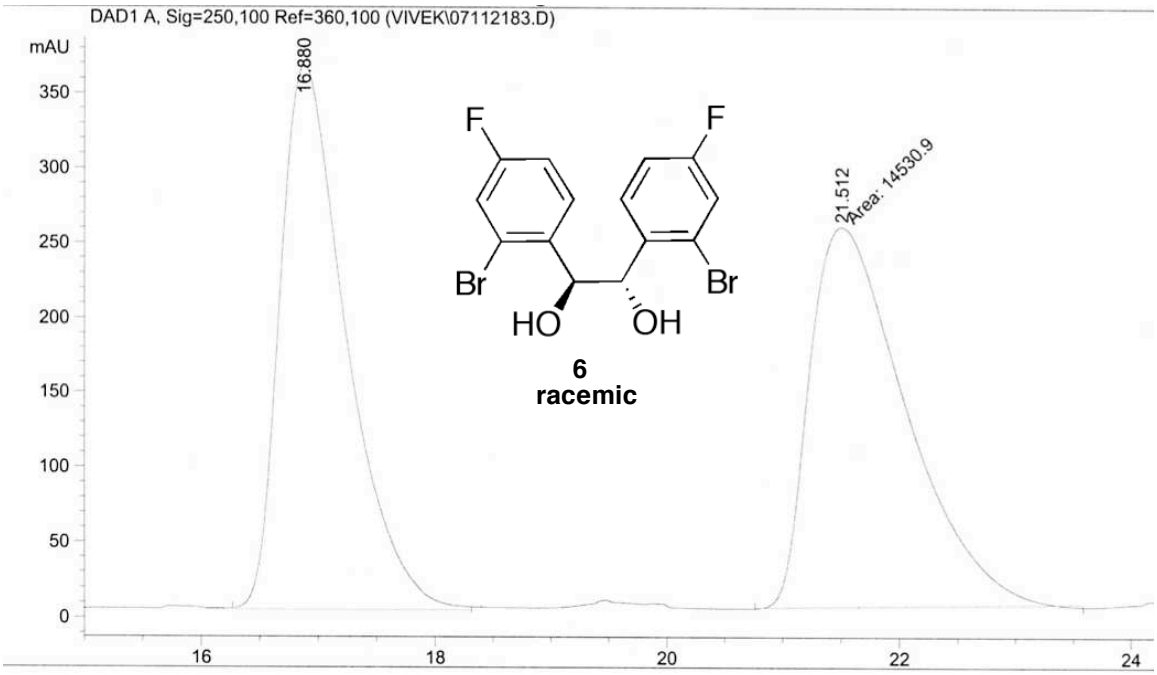
Pulse Sequence: s2pul

125.264 MHz C13[H1] 1D in cdcl3 (ref. to CDCl3 @ 77.06 ppm), temp 27.2 C -> actual temp = 27.0 C, autoxdb probe

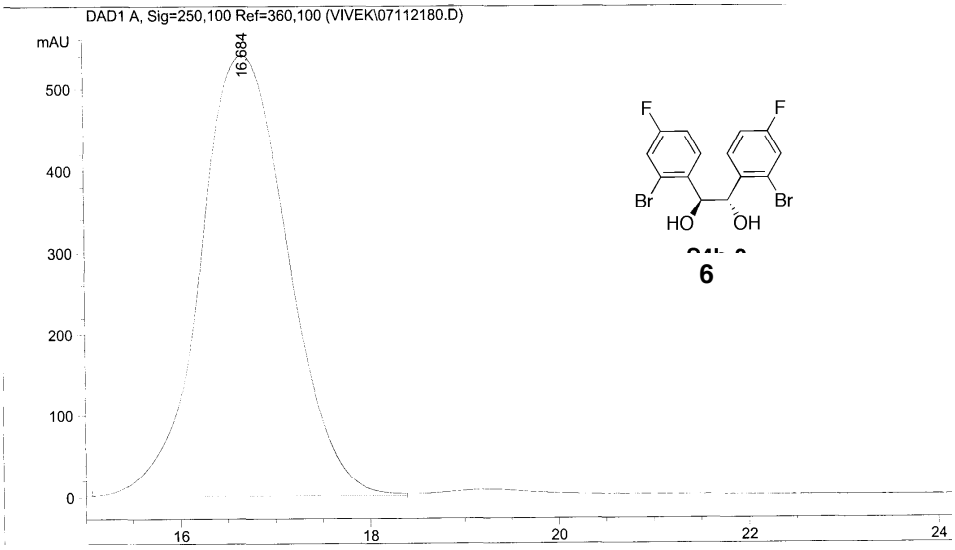
125 MHz, $CDCl_3$



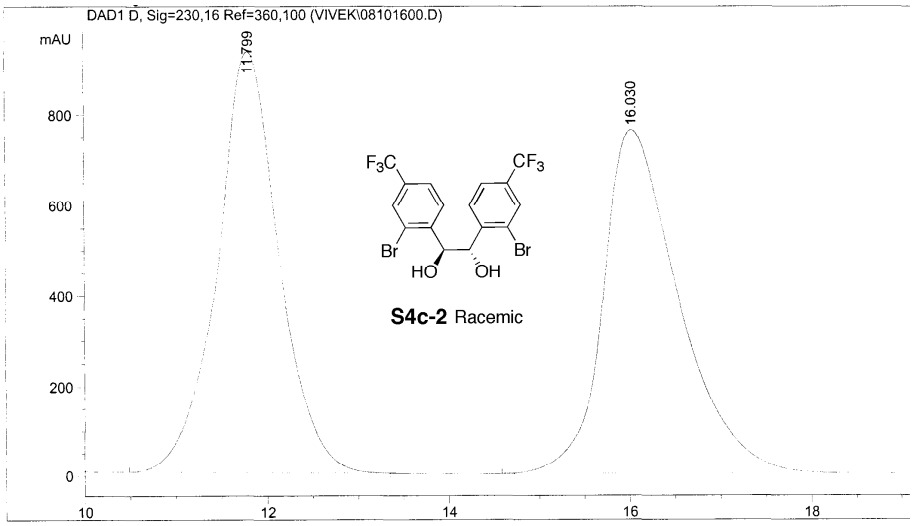
19d



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.880	HH	0.5925	1.42880e4	363.55612	49.5785
2	21.512	MM	0.9549	1.45309e4	253.61821	50.4215

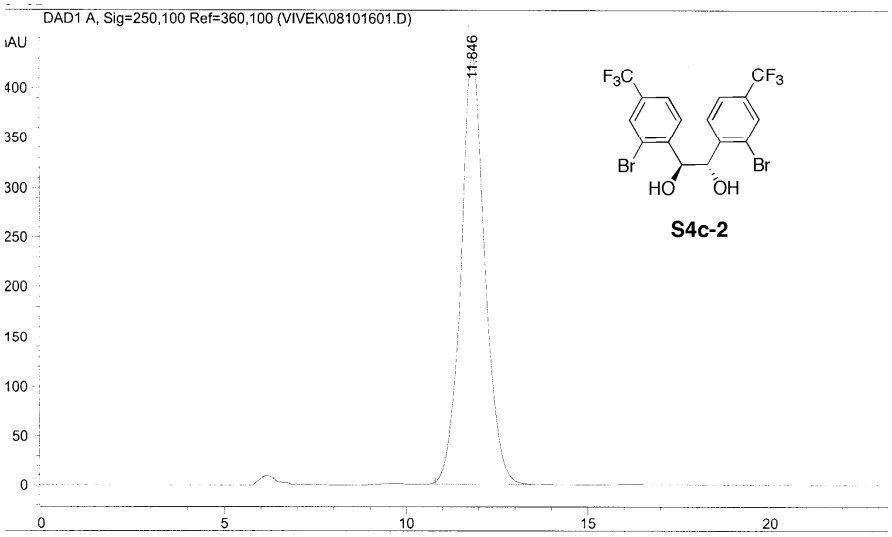


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	16.684	HH	0.8288	3.46918e4	540.52716	100.0000



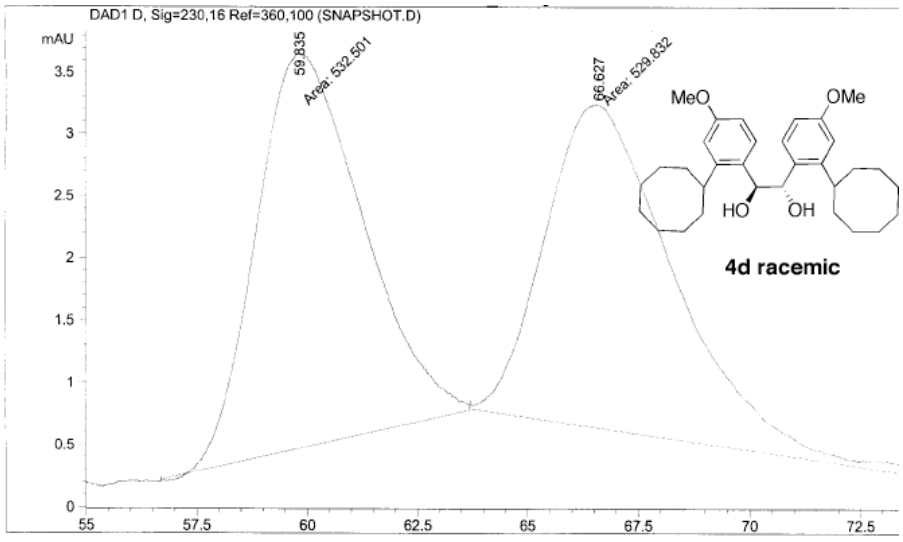
S4c-2 Racemic

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.799	BB	0.6955	4.39238e4	932.61749	49.7726
2	16.030	BB	0.8714	4.43253e4	763.37067	50.2274

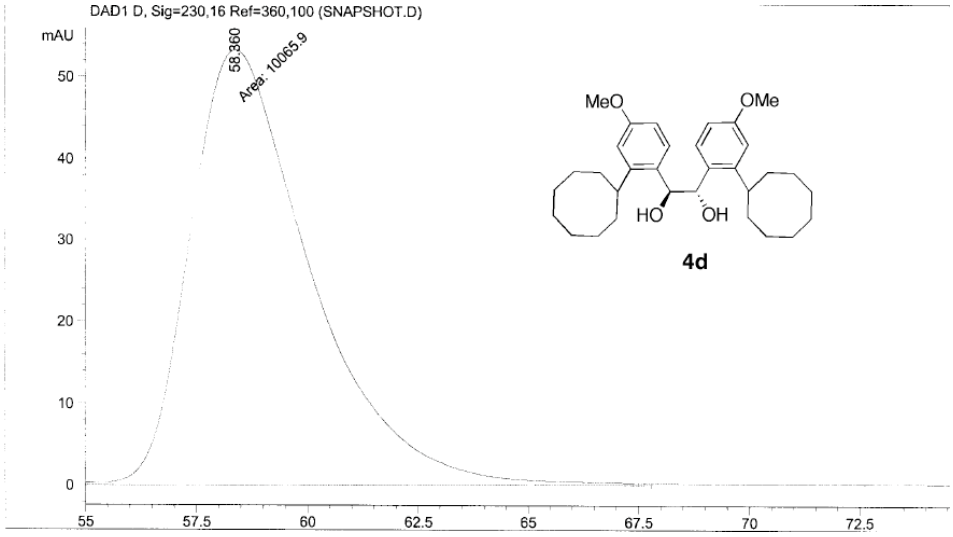


S4c-2

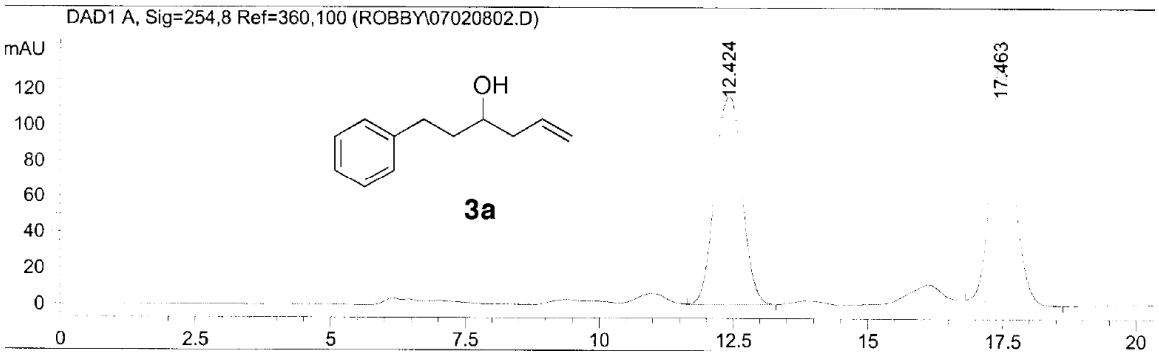
RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
11.846	BB	0.6890	1.98583e4	431.39435	100.0000



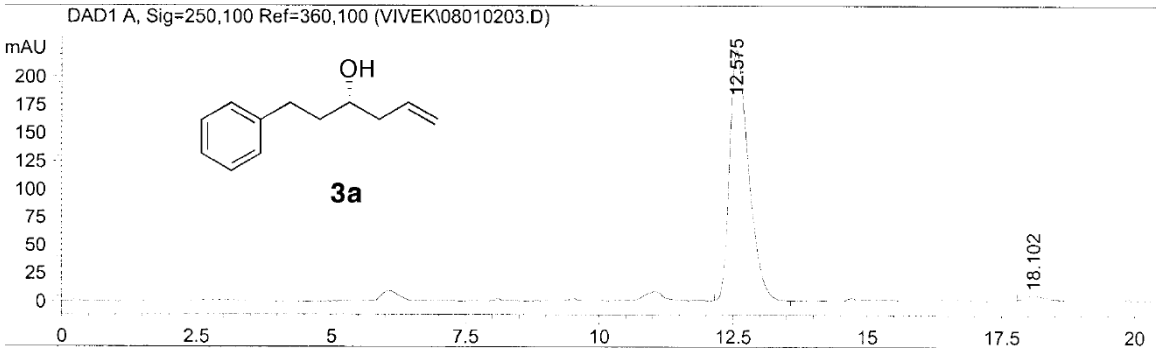
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	59.835	MM	2.7869	532.50055	3.18460	50.1256
2	66.627	MM	3.3910	529.83240	2.60409	49.8744



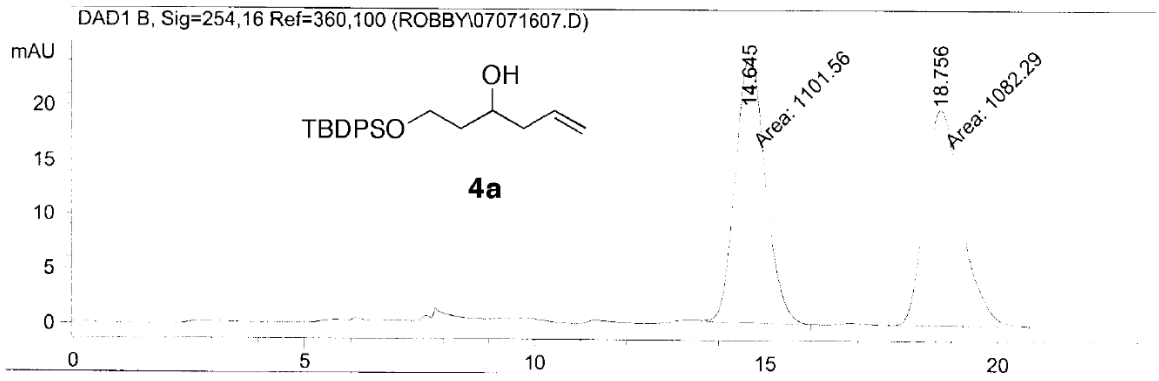
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	58.360	MM	3.1493	1.00659e4	53.27106	100.0000



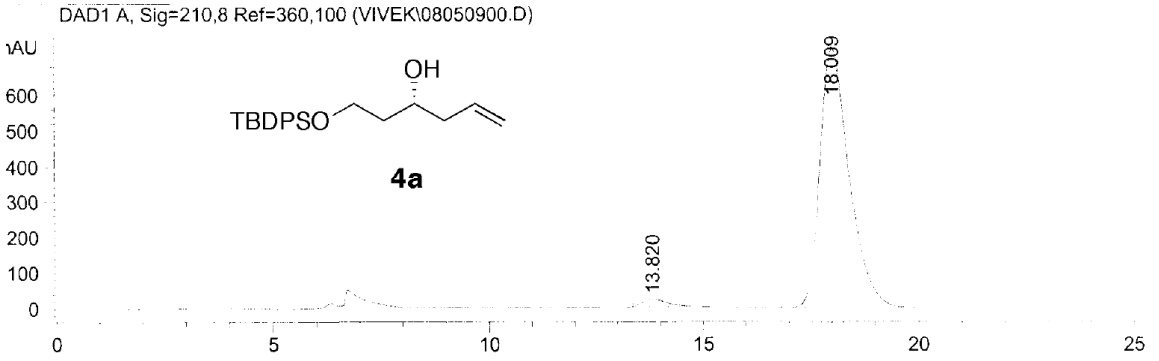
k	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.424	VBA	0.5623	4075.71582	115.89481	50.6680
2	17.463	BP	0.4339	3968.24341	138.64215	49.3320



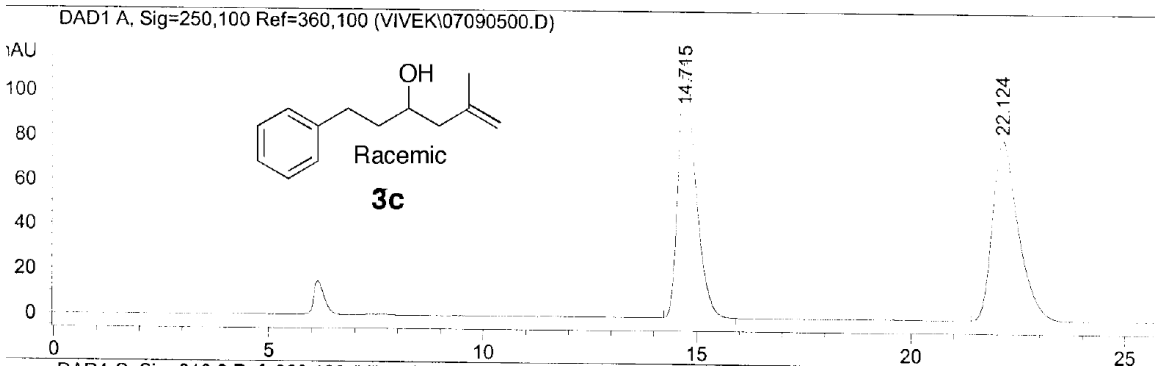
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	12.575	BB	0.3771	5488.06543	223.00400	98.2760
2	18.102	BBA	0.3656	96.27657	3.67493	1.7240



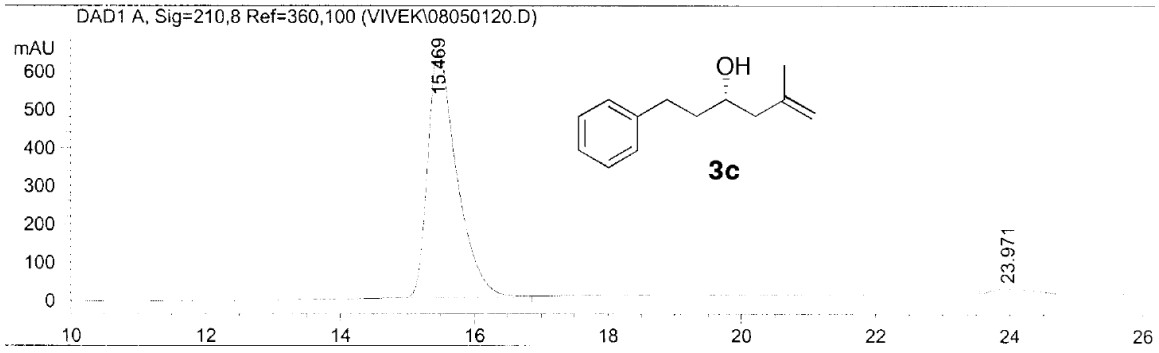
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.645	MM	0.7576	1101.56250	24.23255	50.4412
2	18.756	MM	0.9102	1082.29102	19.81870	49.5588



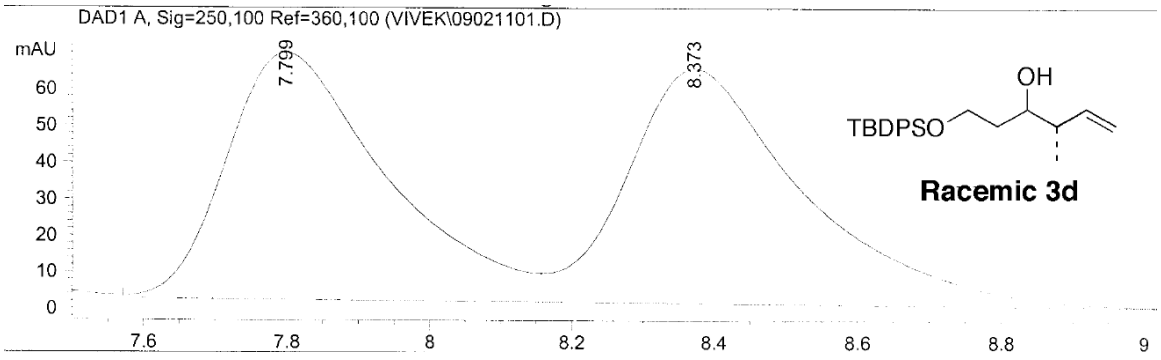
<	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	13.820	BBA	0.6002	819.63556	21.14736	2.3348
2	18.009	BB	0.7178	3.42852e4	727.57269	97.6652



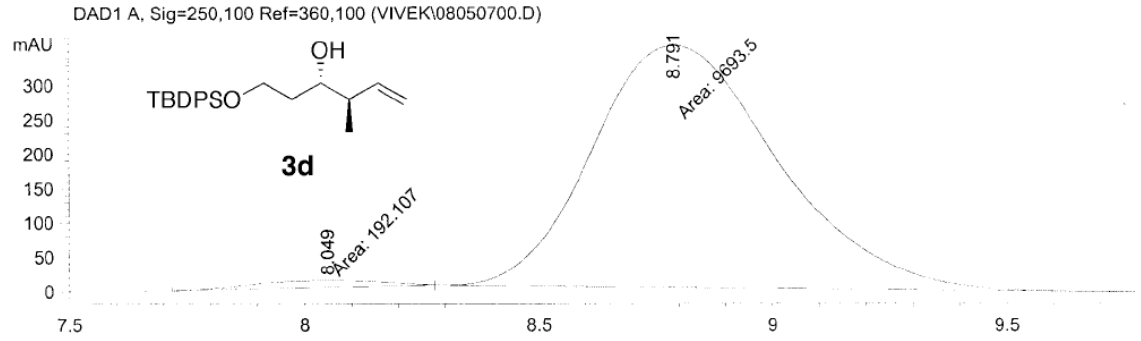
RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
14.715	BB	0.4256	3282.81909	116.18489	49.3926
22.124	BB	0.6139	3363.56348	80.76607	50.6074



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.469	BB	0.4452	1.96508e4	649.03888	97.7181
2	23.971	BBA	0.5864	458.88187	12.10097	2.2819



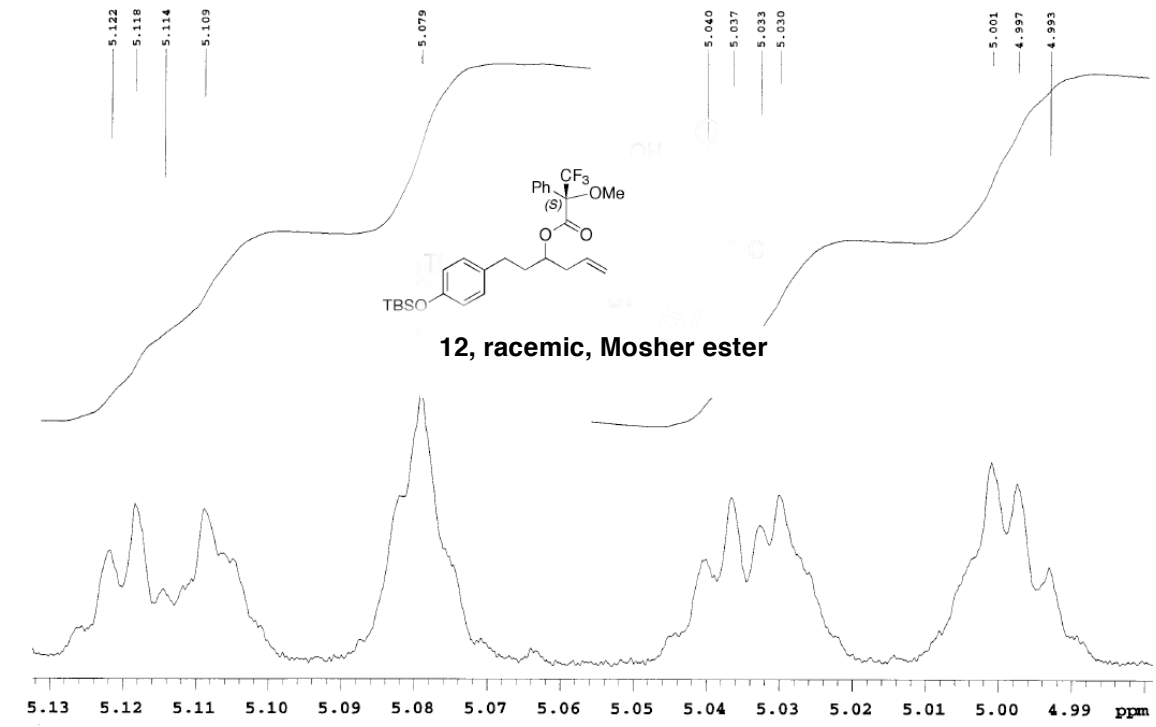
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.799	VV	0.2298	1057.54297	67.84789	48.7791
2	8.373	VB	0.2491	1110.48364	64.42460	51.2209



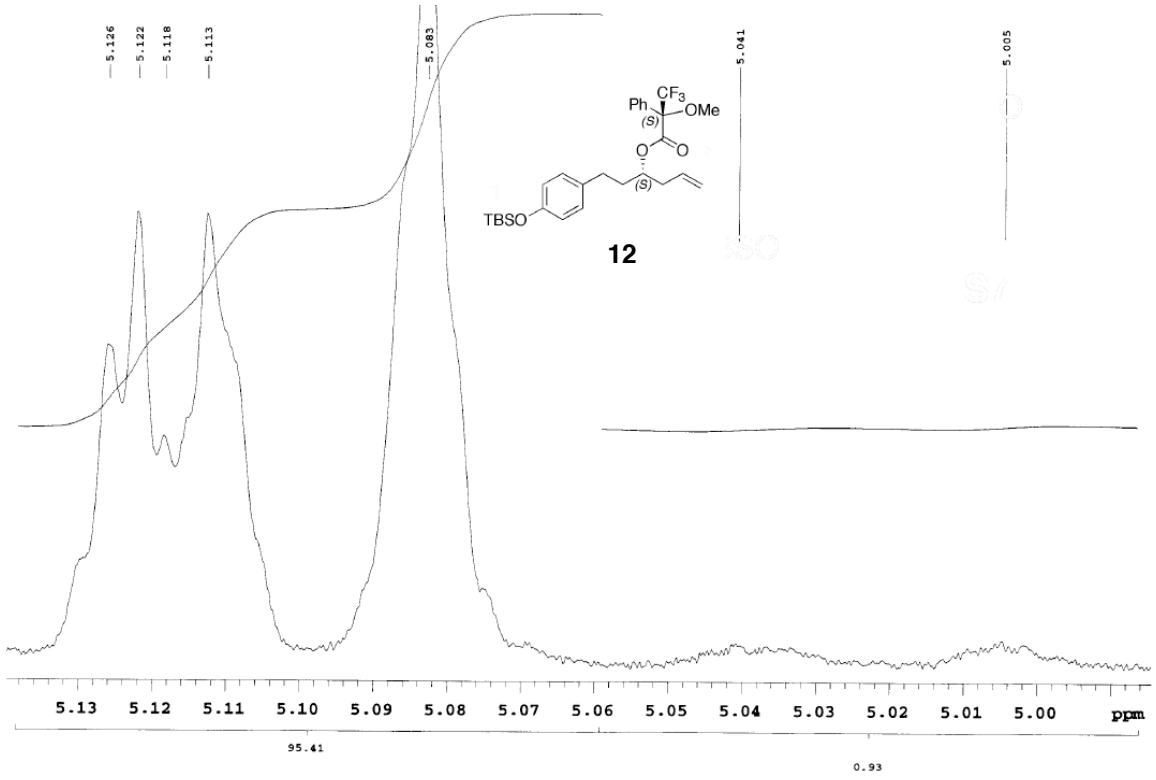
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	8.049	MM	0.3167	192.10703	10.10999	1.9433
2	8.791	MM	0.4582	9693.49902	352.60538	98.0567

VRH-7-141B-R-Mosher-ester-Racemic

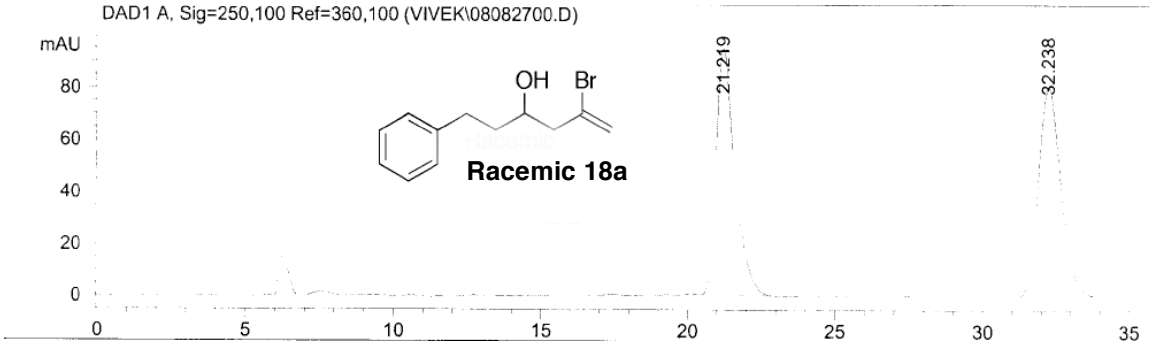
Pulse Sequence: s2pul



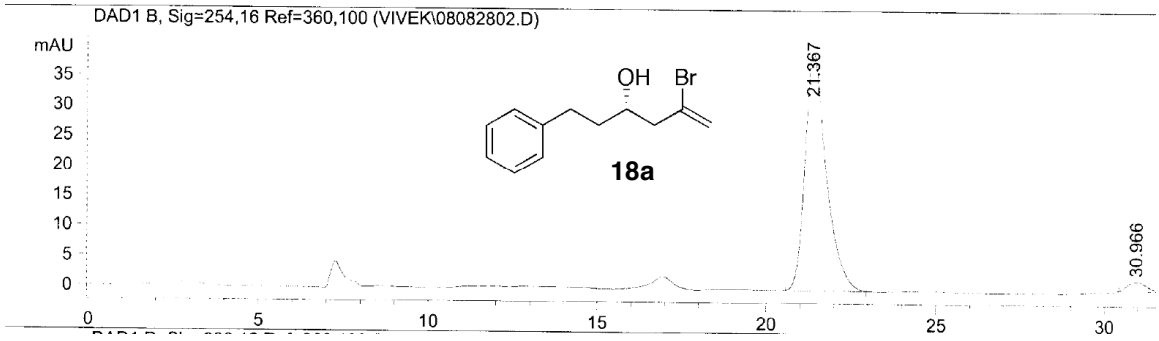
12, racemic, Mosher ester



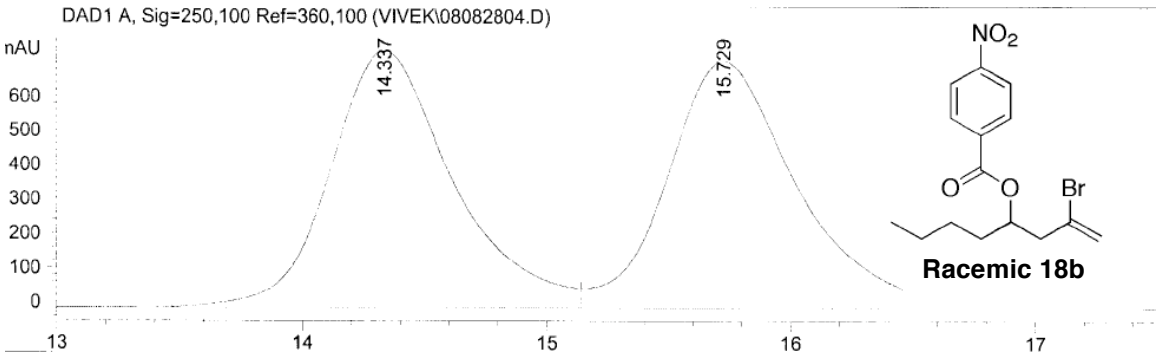
12



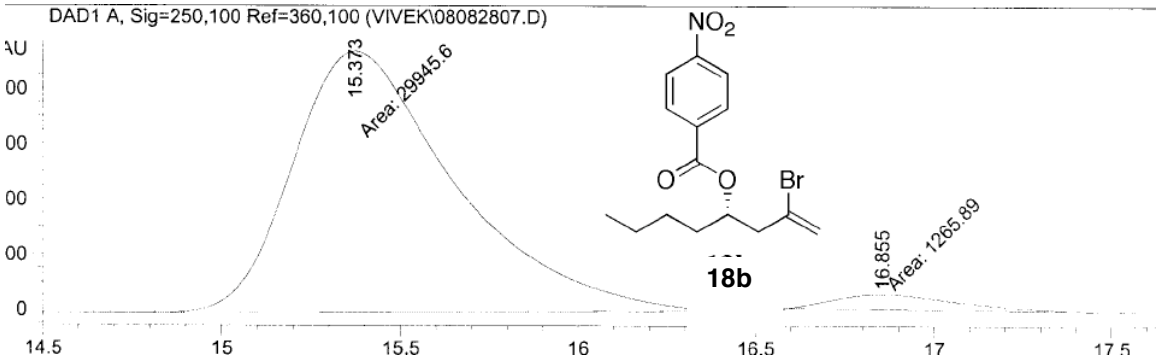
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.219	PB	0.6684	4238.57910	94.65417	49.9276
2	32.238	BB	0.8144	4250.86523	79.94146	50.0724



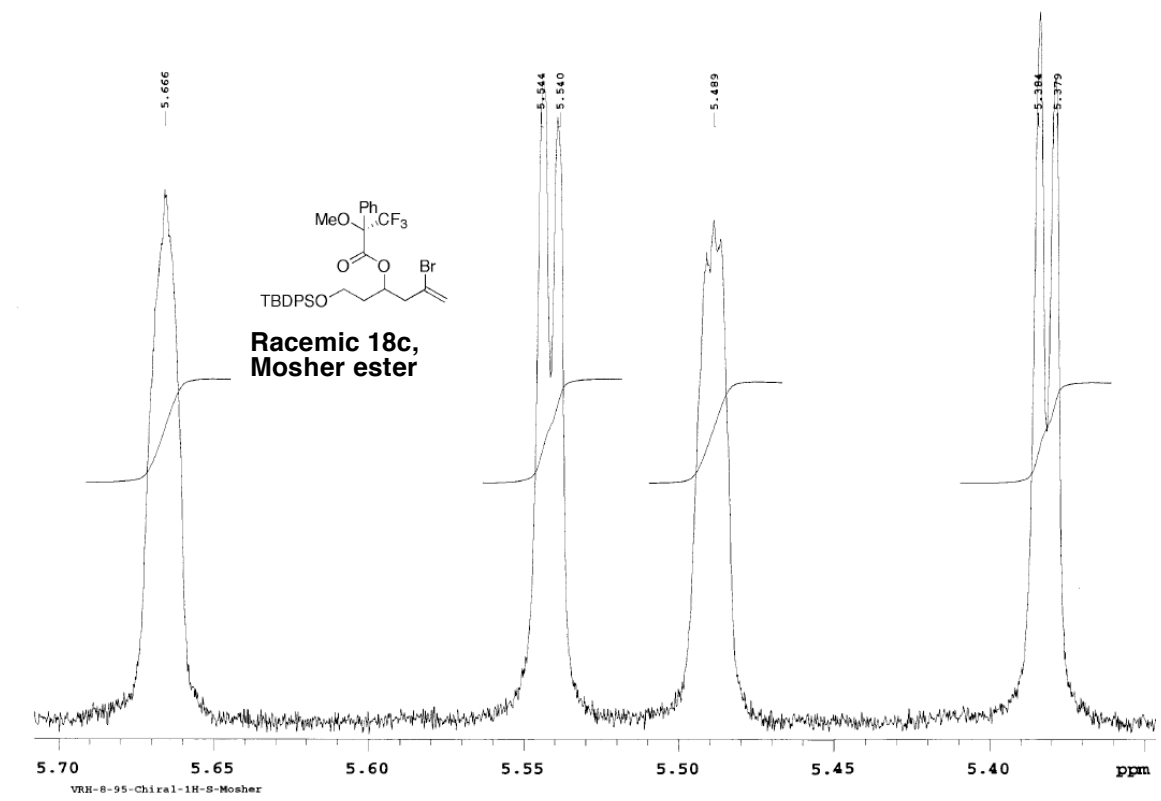
eak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.367	BB	0.6330	1715.52869	39.47300	96.5278
2	30.966	BBA	0.4750	61.70845	1.55483	3.4722

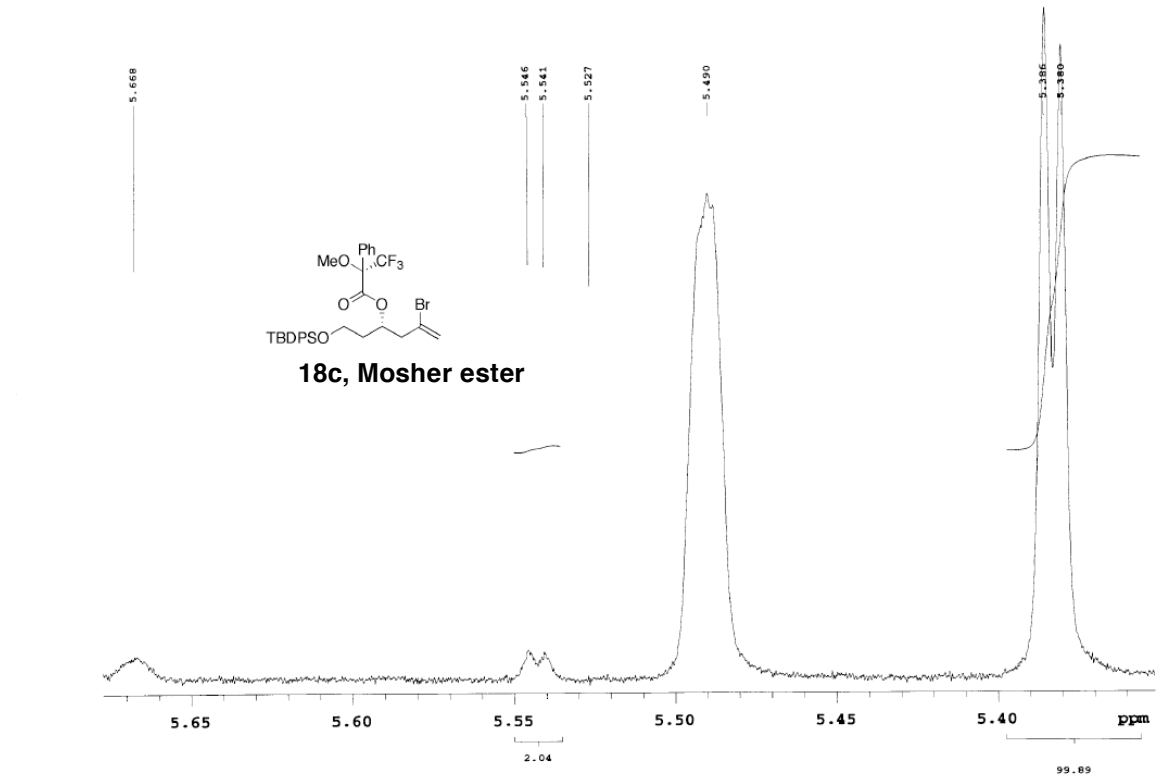


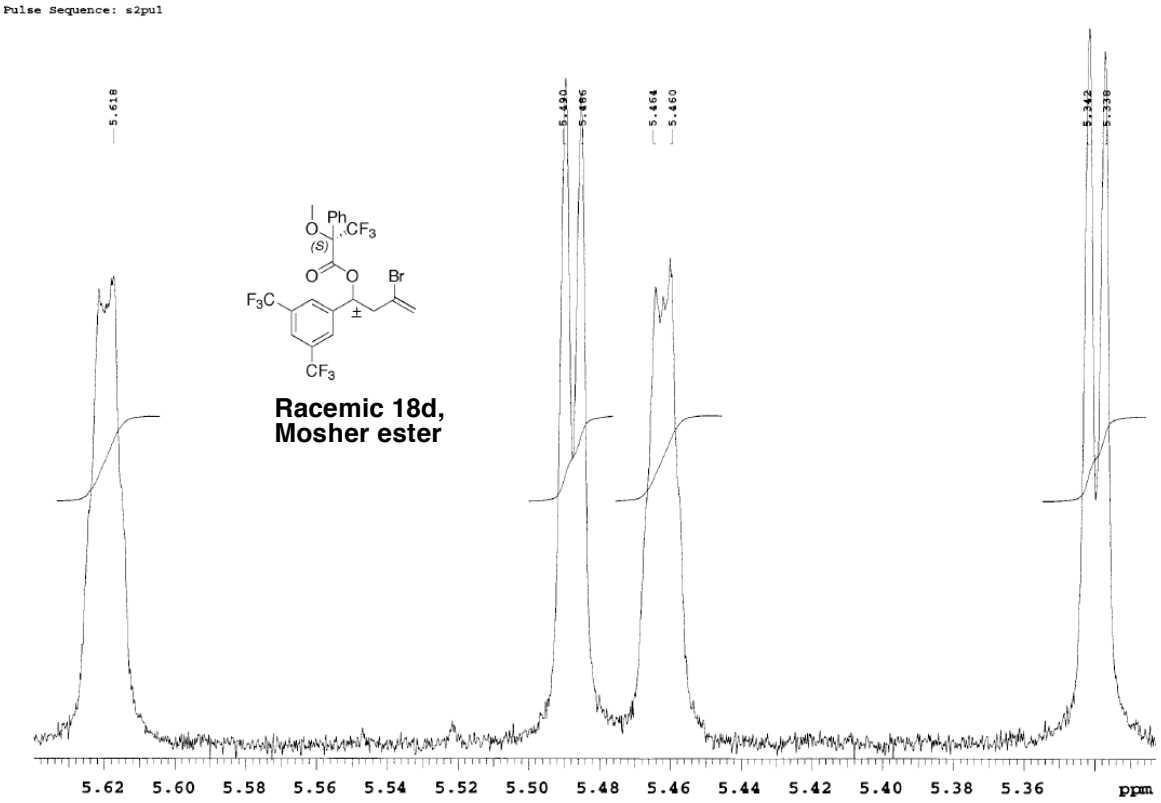
c	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	14.337	BV	0.5277	2.62381e4	750.78644	50.0036
2	15.729	VBA	0.5515	2.62343e4	722.75531	49.9964



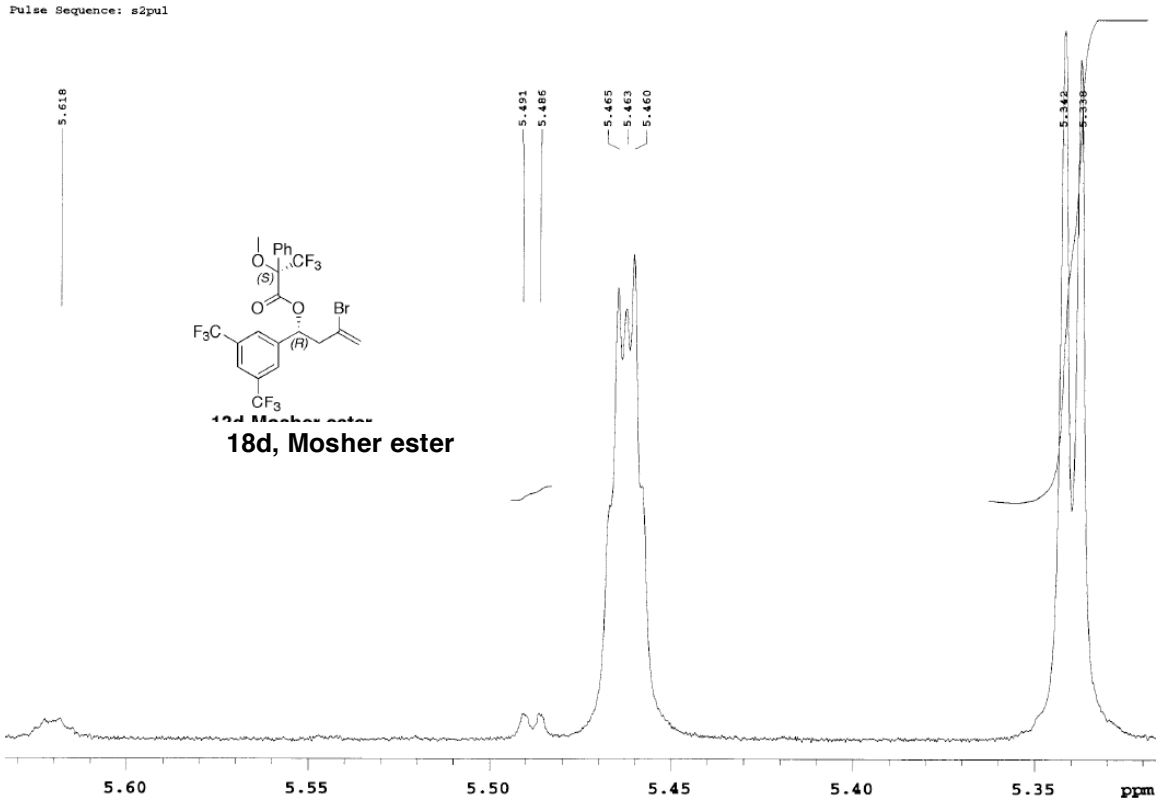
RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
15.373	MM	0.5268	2.99456e4	947.35559	95.9441
16.855	MM	0.3957	1265.89136	53.32430	4.0559


VRH-8-95A-S-Mosher-RACEMIC
Pulse Sequence: s2pul
5.666
5.544
5.540
5.489
5.384
5.379
MeO
Ph
CF3
O
O
Br
TBDPSO
Racemic 18c,
Mosher ester
5.70
5.65
5.60
5.55
5.50
5.45
5.40
ppm

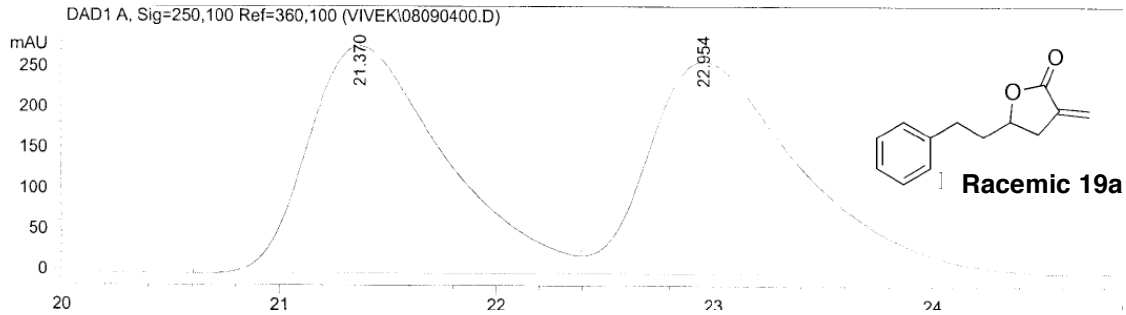

VRH-8-95-Chiral-1H-S-Mosher
Pulse Sequence: s2pul
5.668
5.546
5.541
5.527
5.490
5.386
5.380
MeO
Ph
CF3
O
O
Br
TBDPSO
18c, Mosher ester
5.65
5.60
5.55
5.50
5.45
5.40
ppm
2.04
99.89



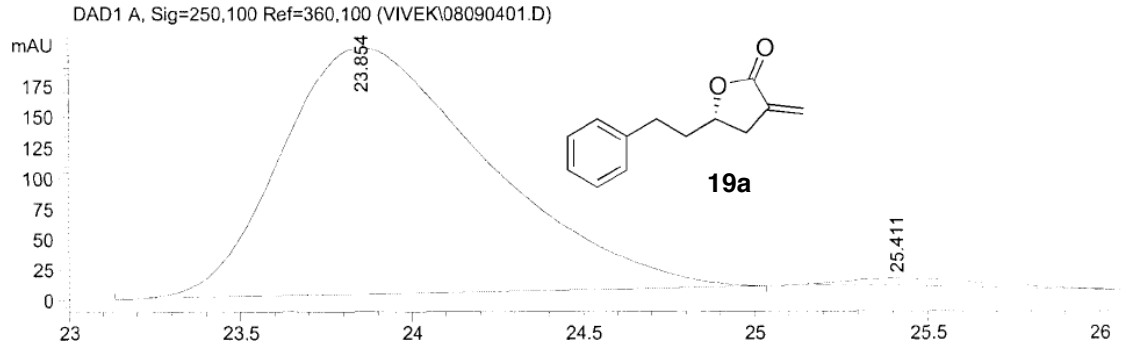
Racemic 18d, Mosher ester



18d, Mosher ester



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.370	VV	0.6544	1.22958e4	281.05505	49.3313
2	22.954	VB	0.7210	1.26292e4	261.72470	50.6687



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	23.854	PBA	0.6346	8494.29199	201.98326	97.9461
2	25.411	BBA	0.4265	178.11966	6.36471	2.0539