SUPPORTING INFORMATION

(NMR SPECTRA)

FOR

Strained Polycycles by H^5C^{5x} Free Radical Cascades

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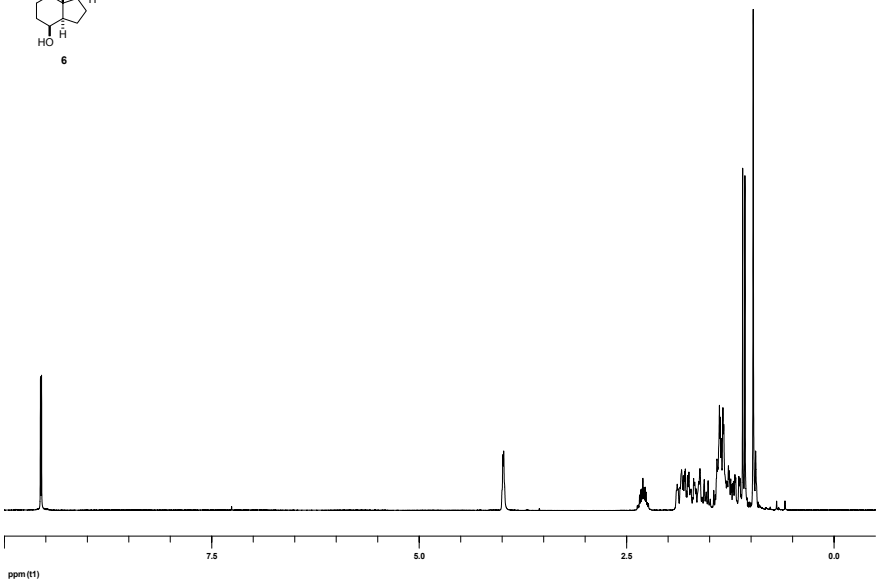
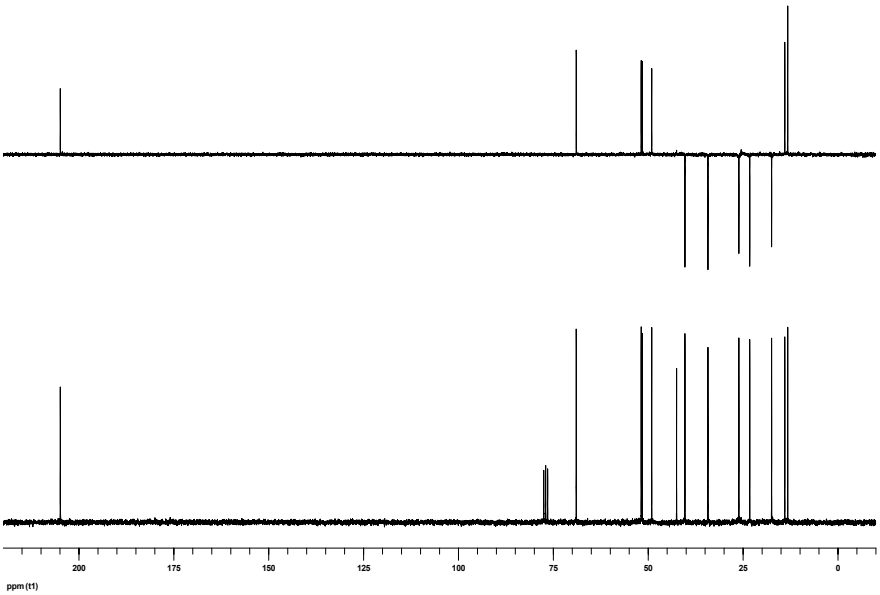
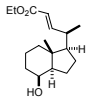
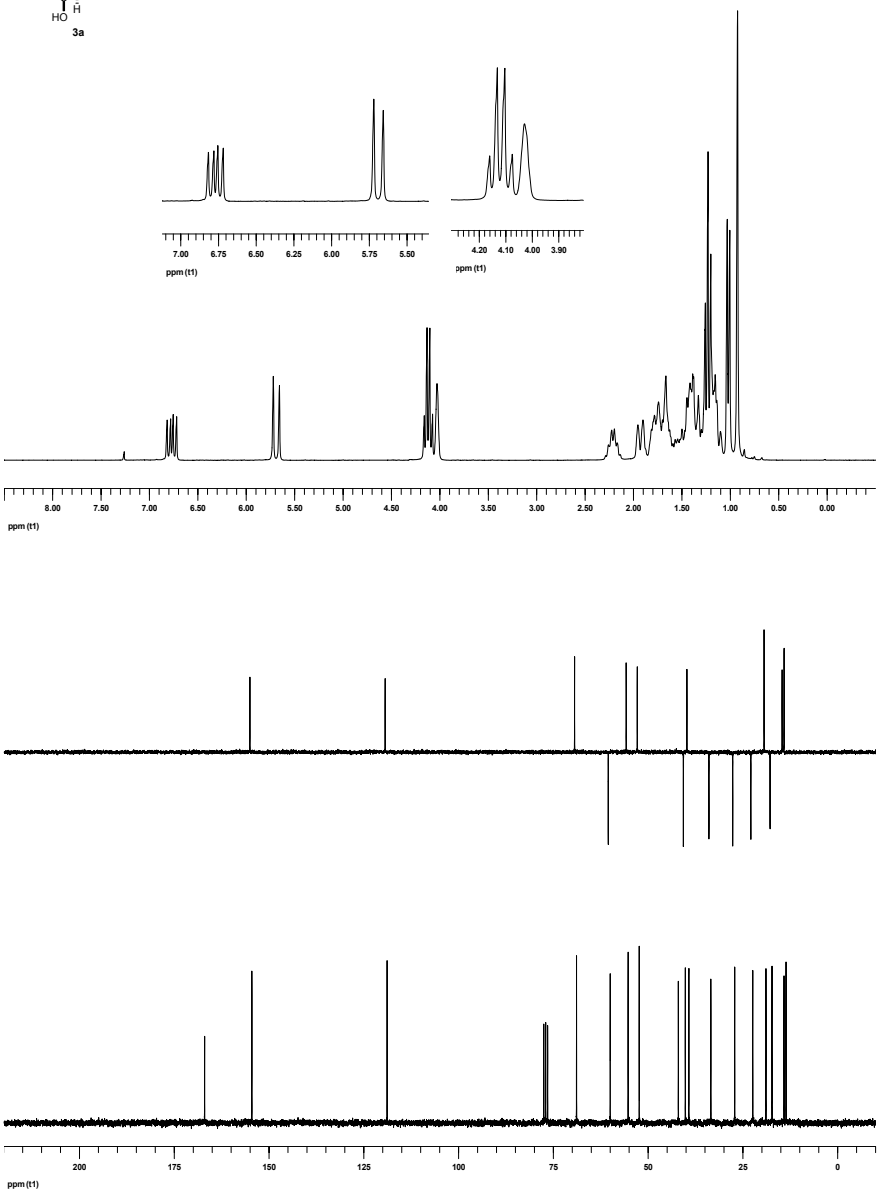
6





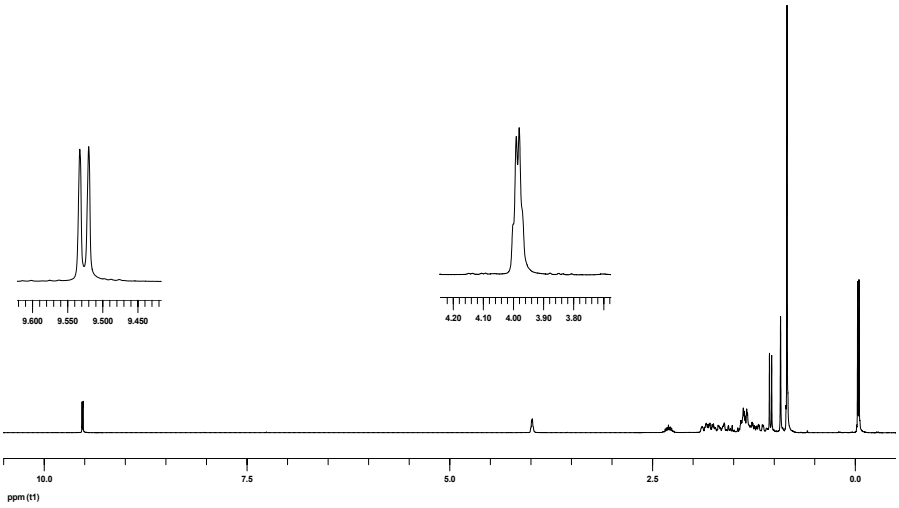

EtO2C
H
HO
H

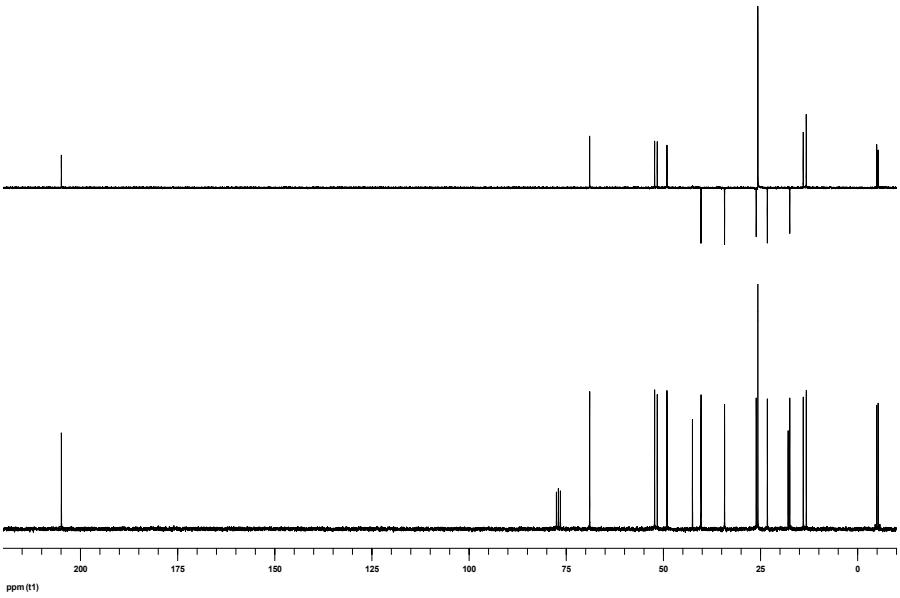
3a

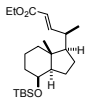

7.00 6.75 6.50 6.25 6.00 5.75 5.50
ppm (t1)
4.20 4.10 4.00 3.90
ppm (t1)
8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)
200 175 150 125 100 75 50 25 0
ppm (t1)

O
H
TBSO
H

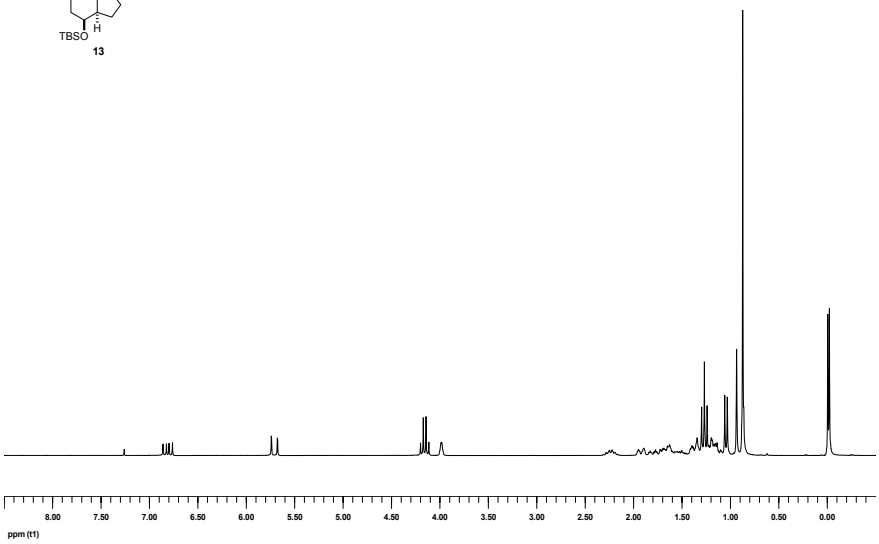
7

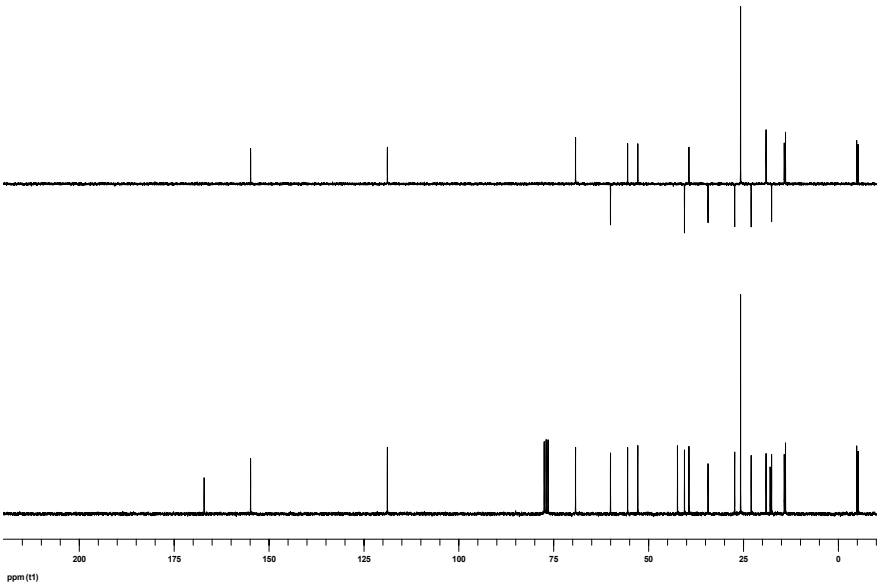

9.600
9.550
9.500
9.450
4.20
4.10
4.00
3.90
3.80
10.0
7.5
5.0
2.5
0.0
ppm (t1)

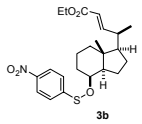

200
175
150
125
100
75
50
25
0
ppm (t1)


EtO2C
H
TBSO
H

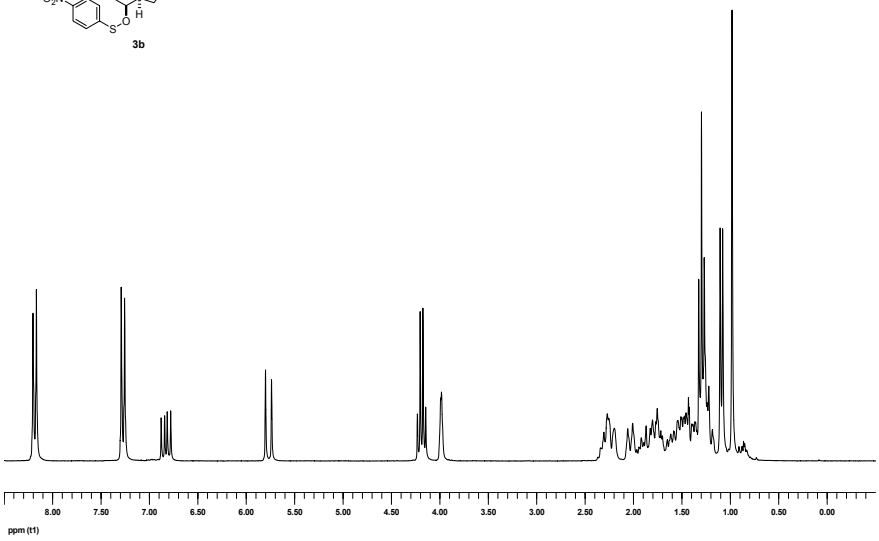
13

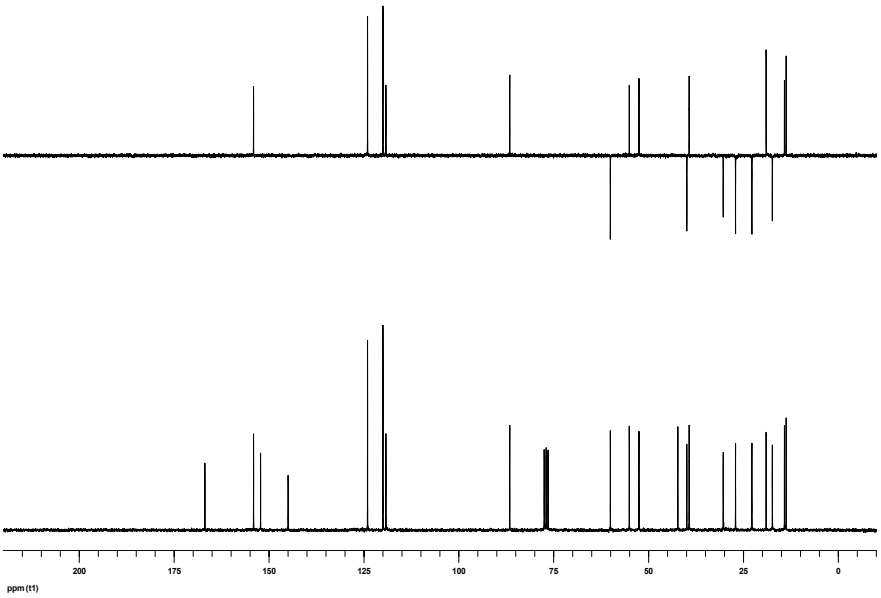

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)


200
175
150
125
100
75
50
25
0
ppm (t1)


EtO2C
O2N
S
O
H
H
H

3b

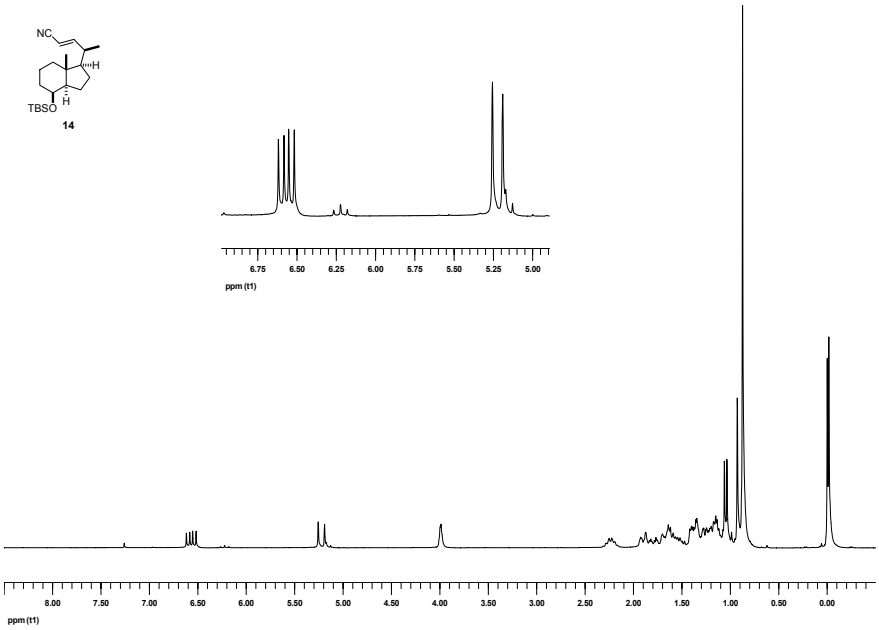

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

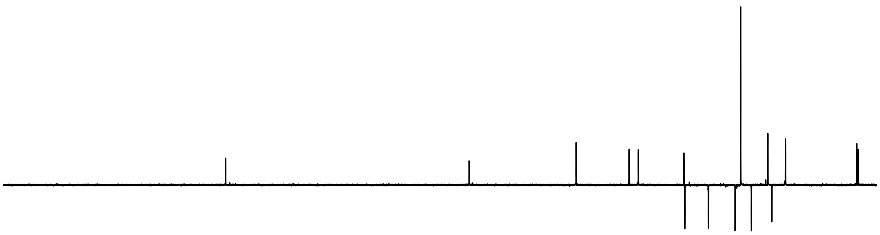

200
175
150
125
100
75
50
25
0
ppm (t1)

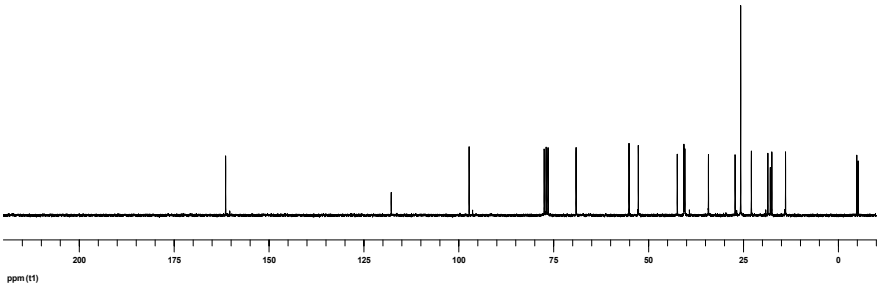
NC
H
H
TBSO

14

6.75
6.50
6.25
6.00
5.75
5.50
5.25
5.00
ppm (t1)

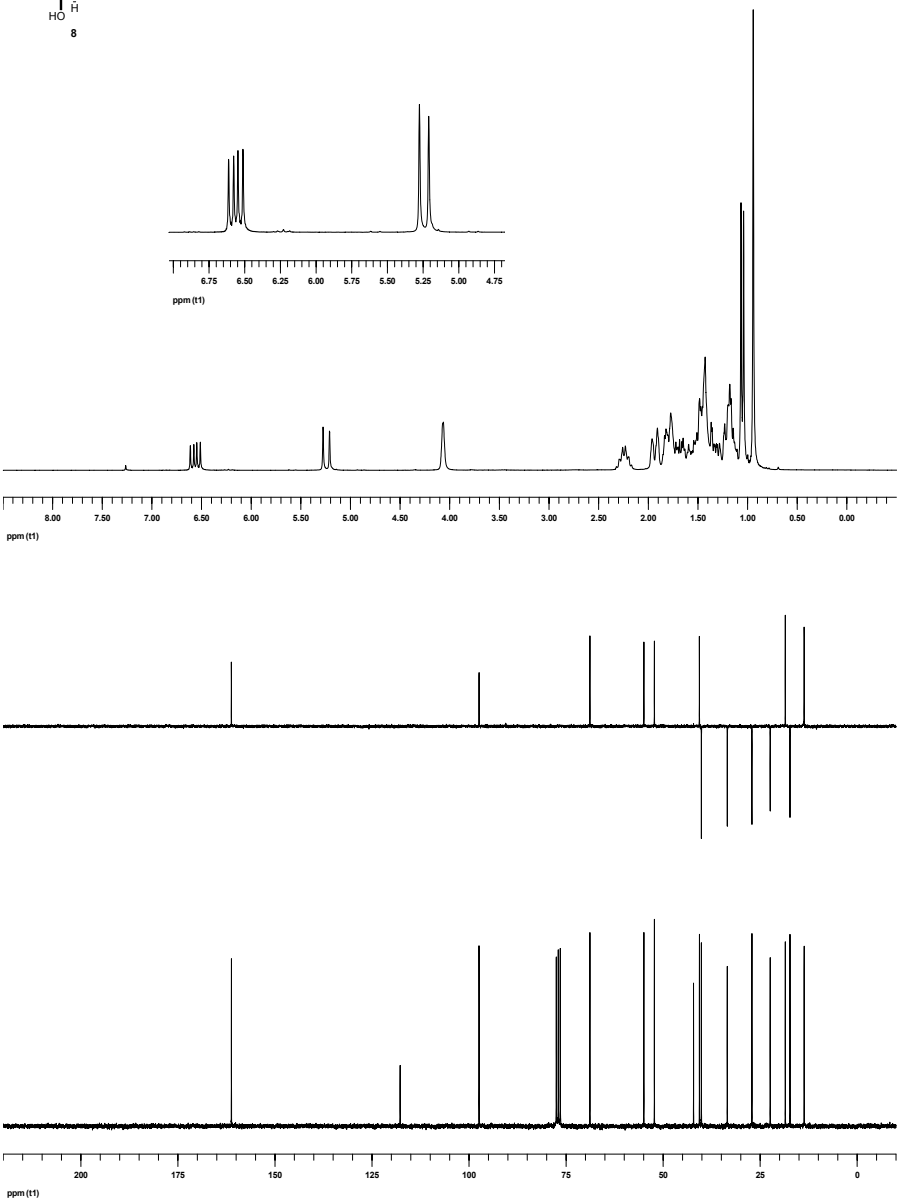

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

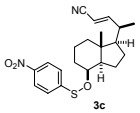



200
175
150
125
100
75
50
25
0
ppm (t1)

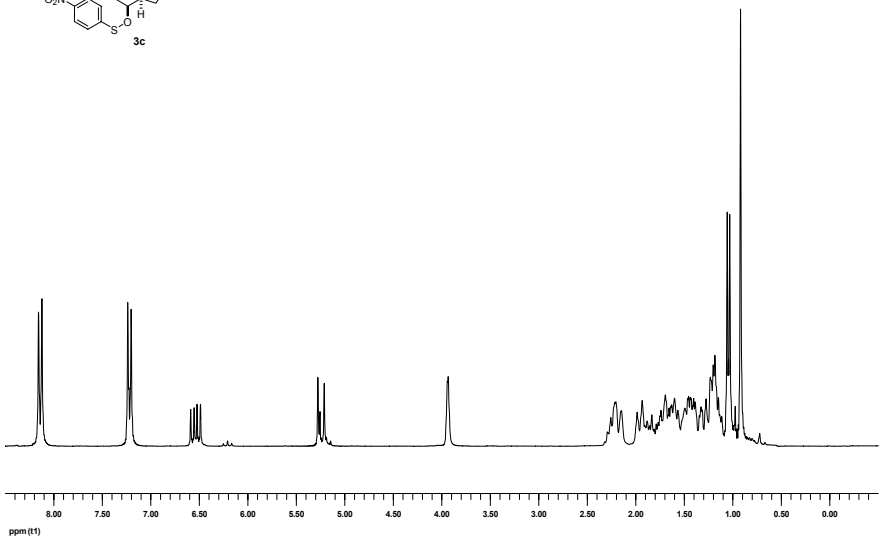
NC
H
HO
H

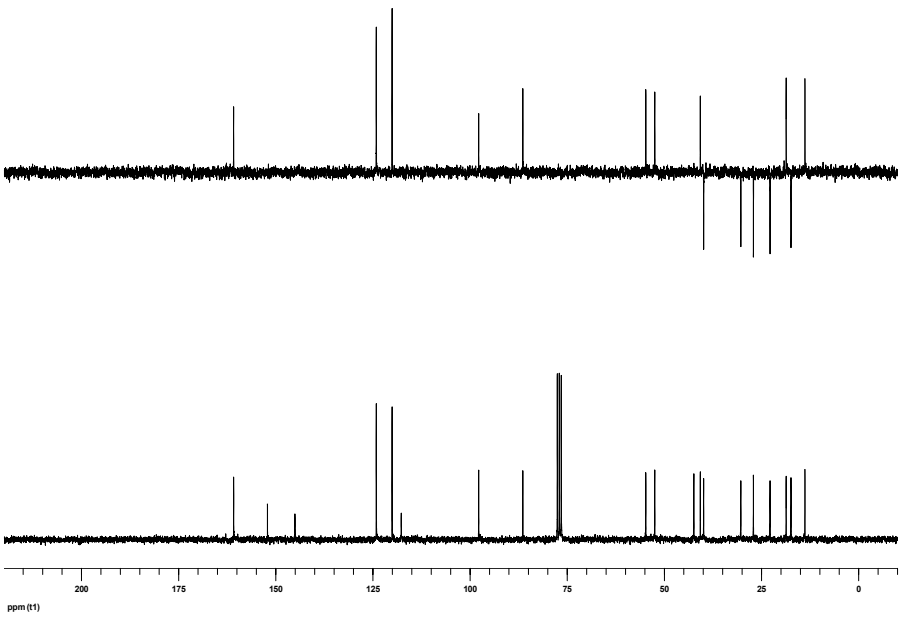
8


6.75 6.50 6.25 6.00 5.75 5.50 5.25 5.00 4.75
ppm (t1)
8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)
200 175 150 125 100 75 50 25 0
ppm (t1)


NC
H
O_2N
H
O
S

3c

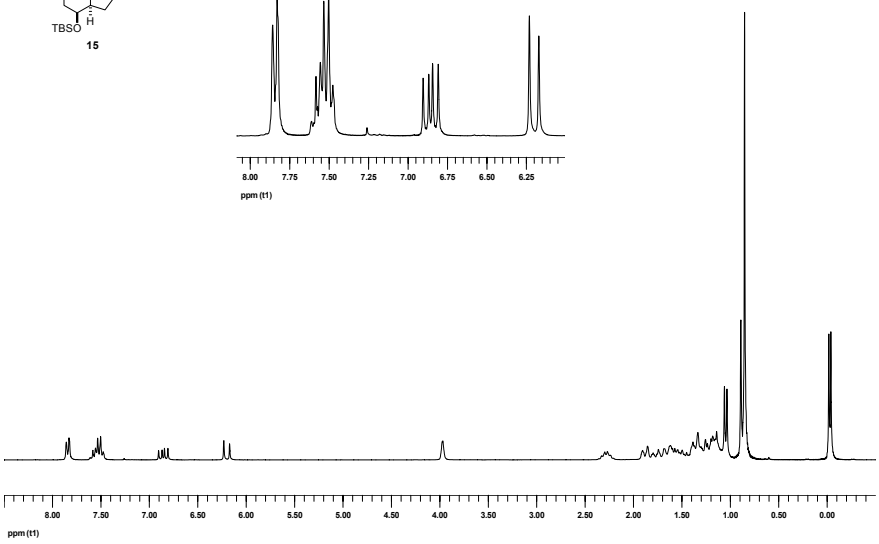

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

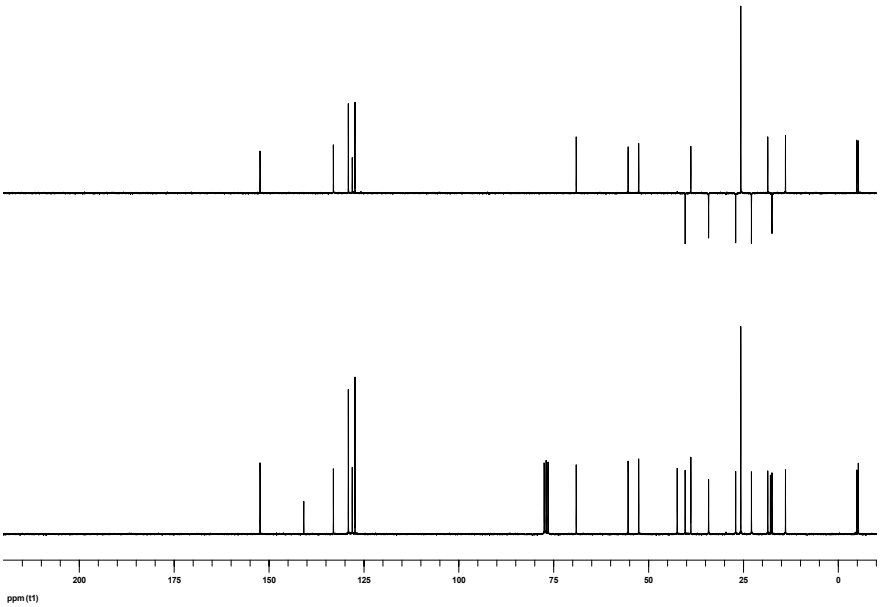

200
175
150
125
100
75
50
25
0
ppm (t1)

PhO2S
H
TBSO
H

15

8.00
7.75
7.50
7.25
7.00
6.75
6.50
6.25
ppm (t1)

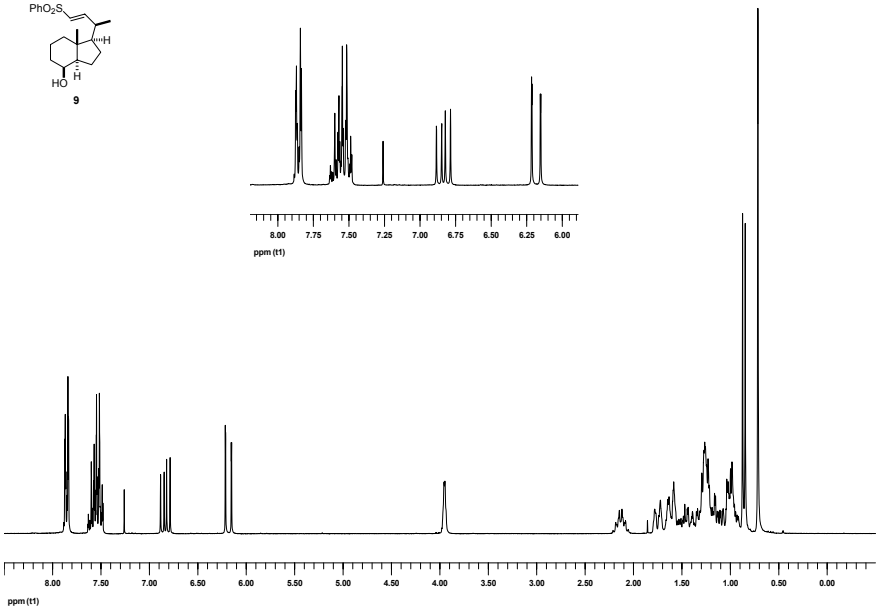

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

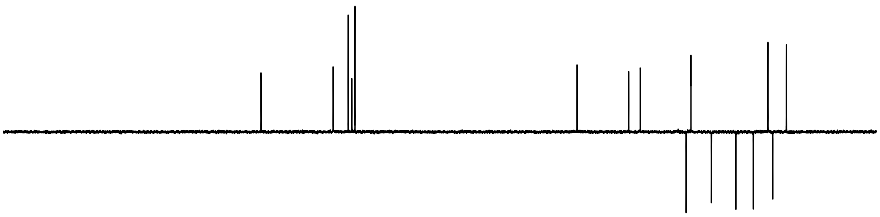

200
175
150
125
100
75
50
25
0
ppm (t1)

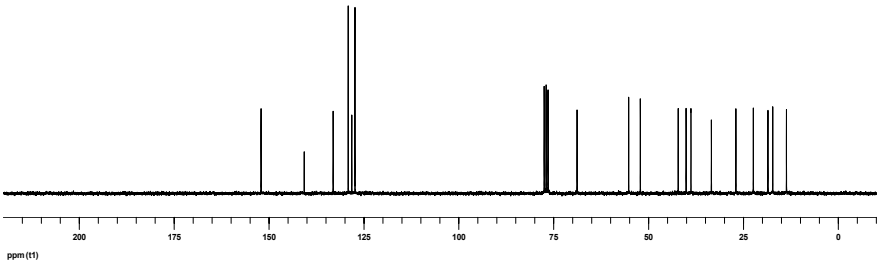
PhO2S
H
HO
H

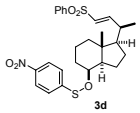
9

8.00 7.75 7.50 7.25 7.00 6.75 6.50 6.25 6.00
ppm (t1)

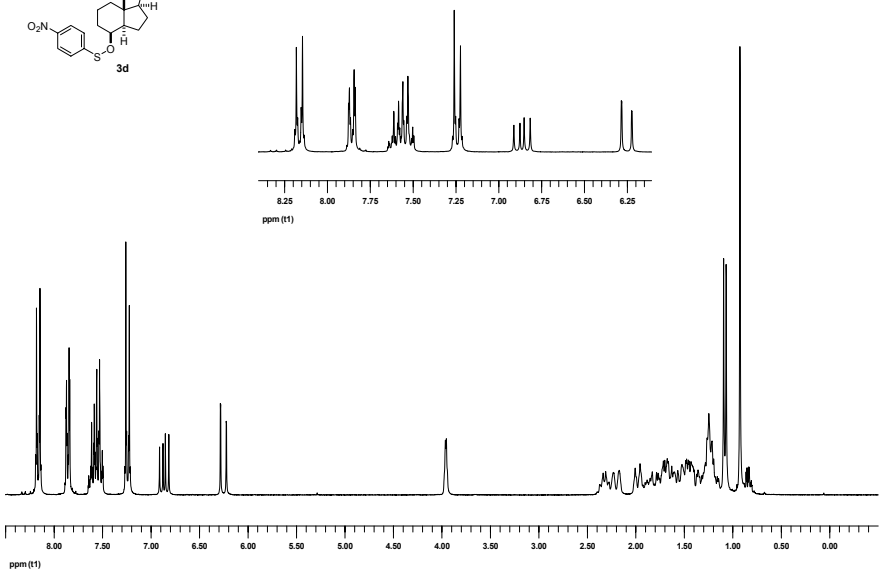

8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)

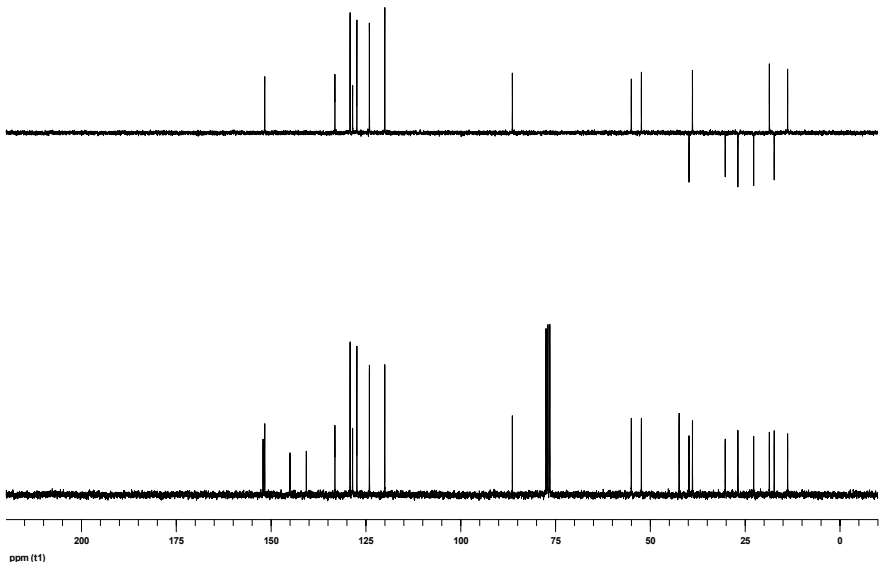



200 175 150 125 100 75 50 25 0
ppm (t1)


PhO2S
O2N
S
O
H
H

3d


8.25 8.00 7.75 7.50 7.25 7.00 6.75 6.50 6.25
ppm (t1)
8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)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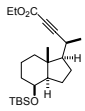
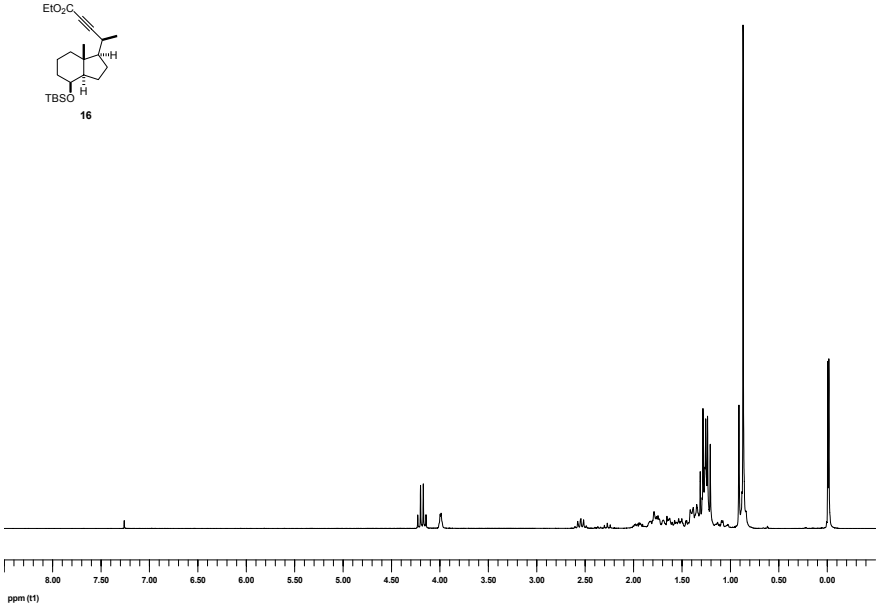
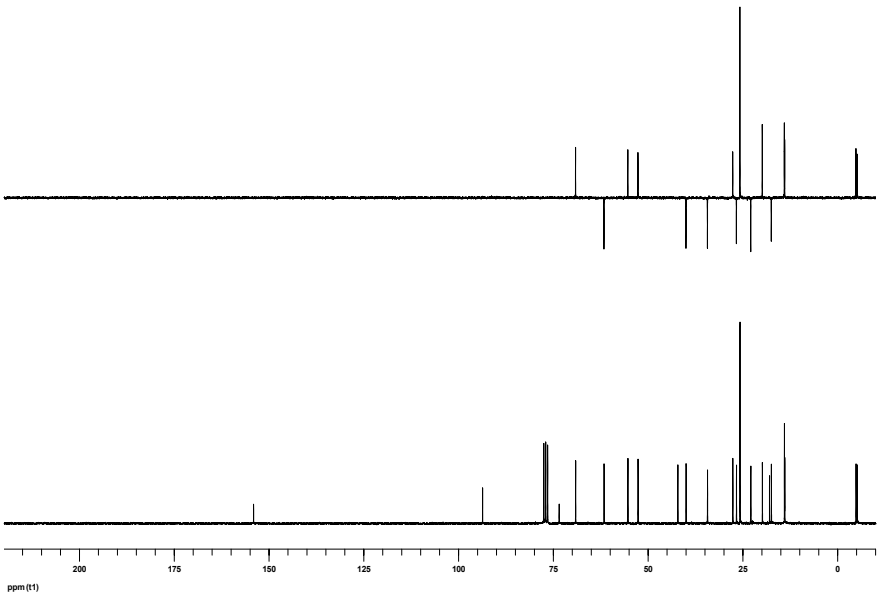
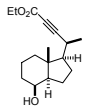
ppm (t1)


EtO2C
H
TBSO
H

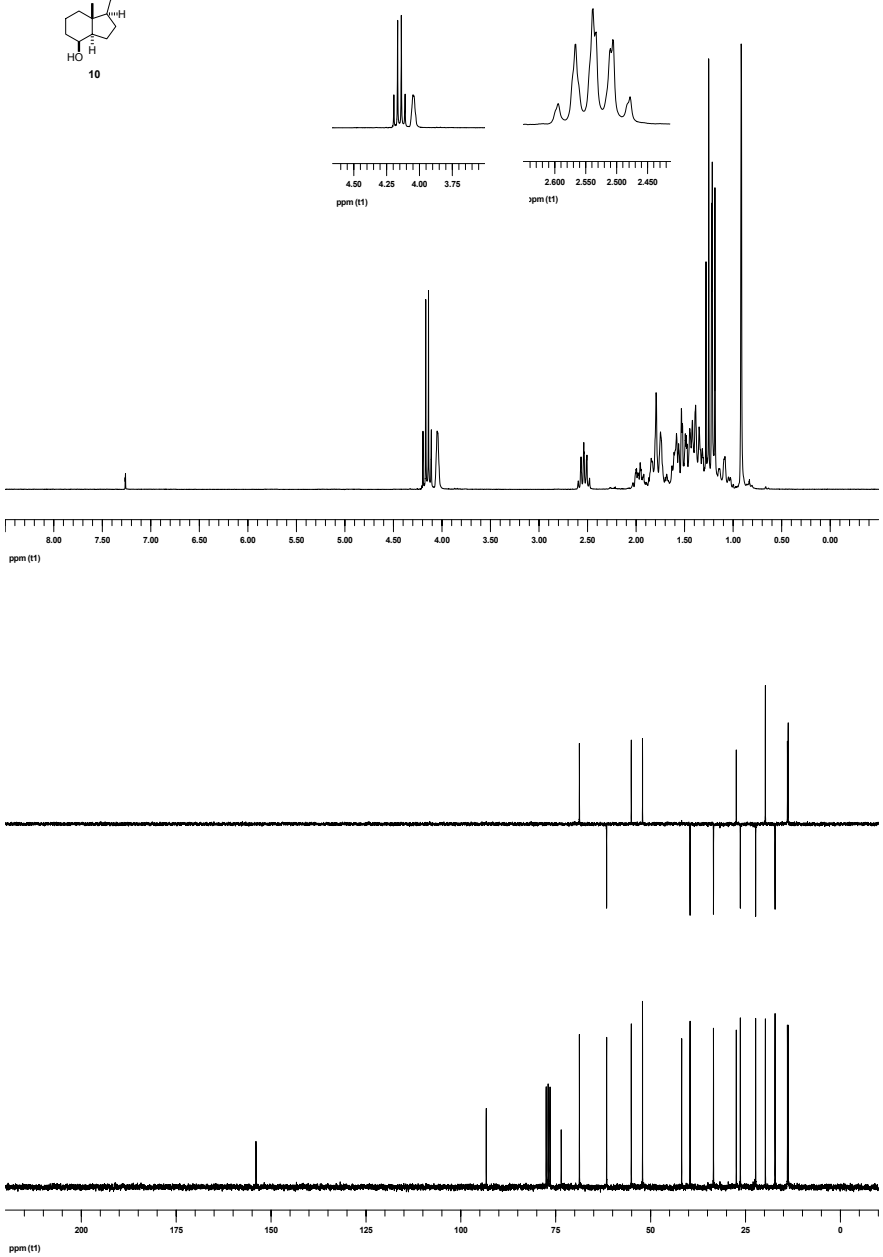
16

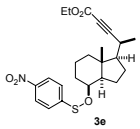

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)


200
175
150
125
100
75
50
25
0
ppm (t1)

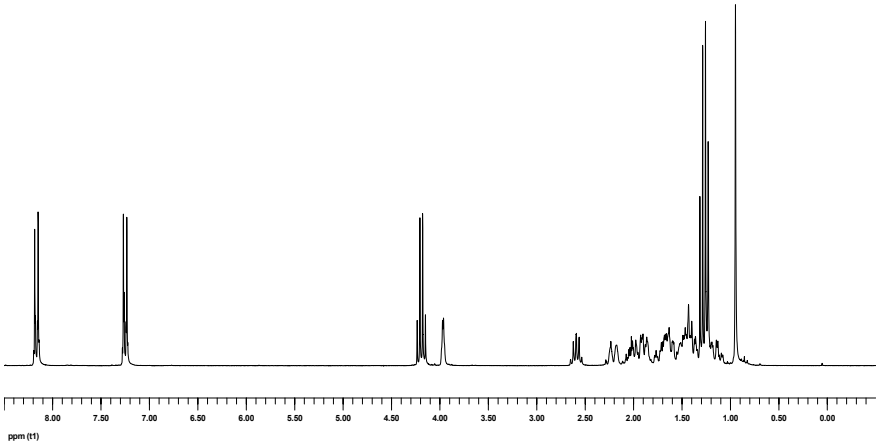

EtO2C
H
HO
H

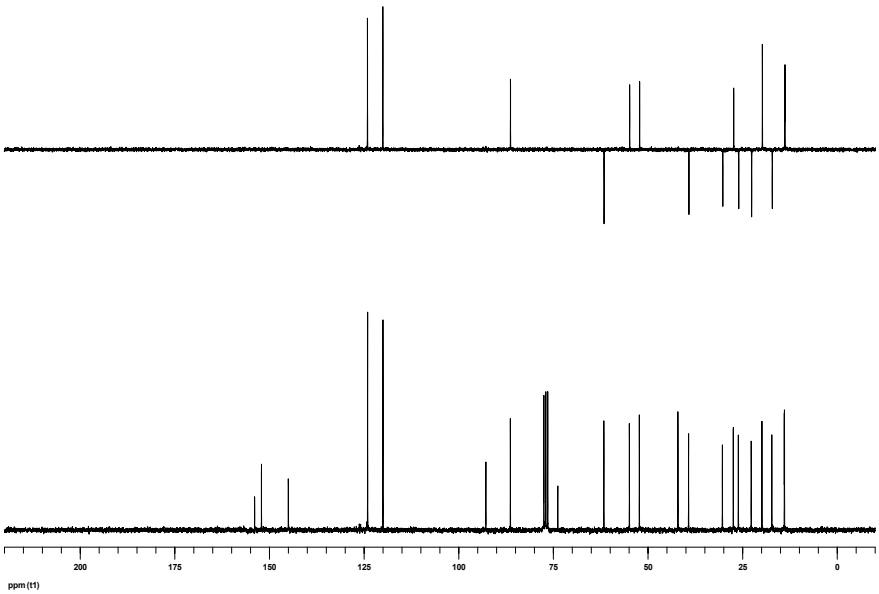
10


4.50 4.25 4.00 3.75
ppm (t1)
2.600 2.550 2.500 2.450
ppm (t1)
8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)
200 175 150 125 100 75 50 25 0
ppm (t1)


EtO2C
O2N
S
O
H
H

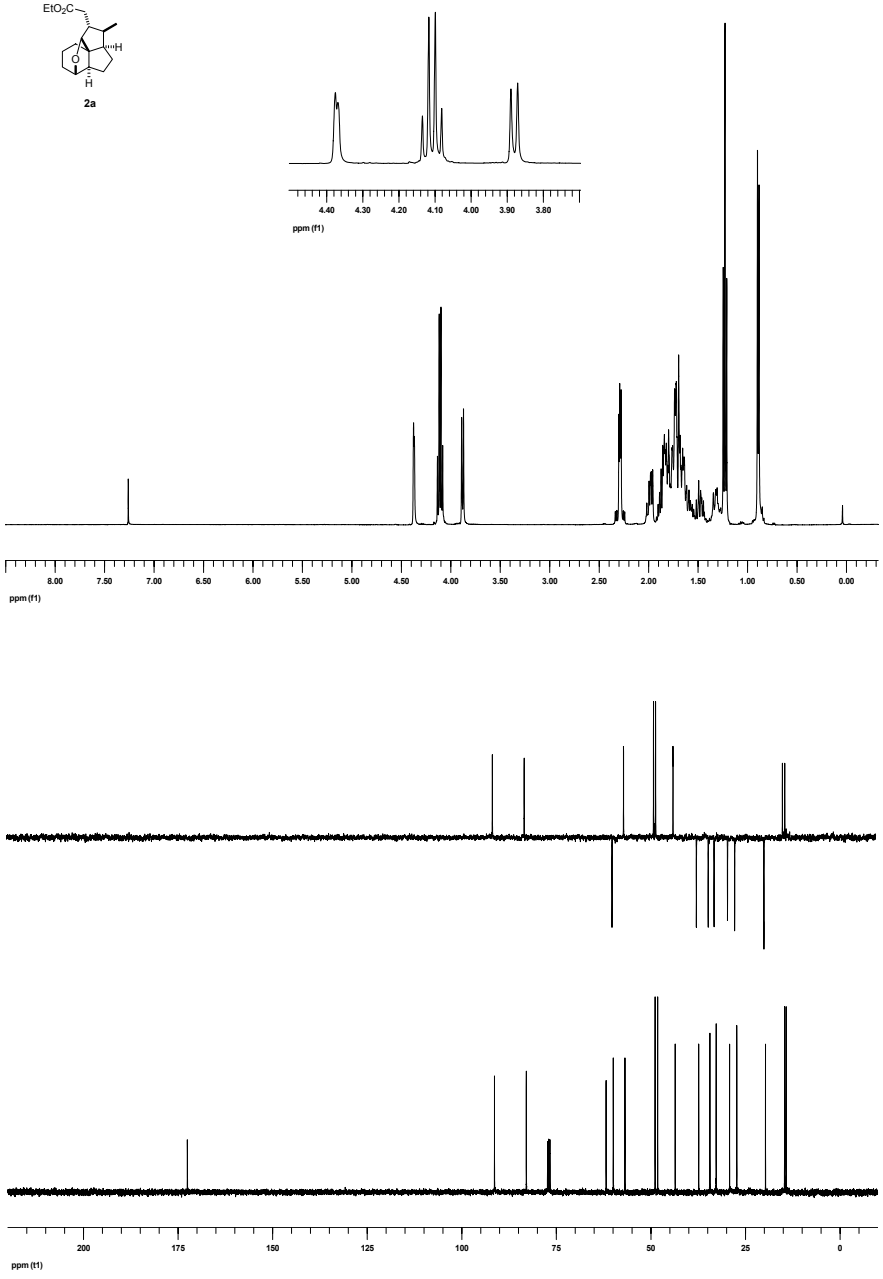
3e


8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)


200
175
150
125
100
75
50
25
0
ppm (t1)

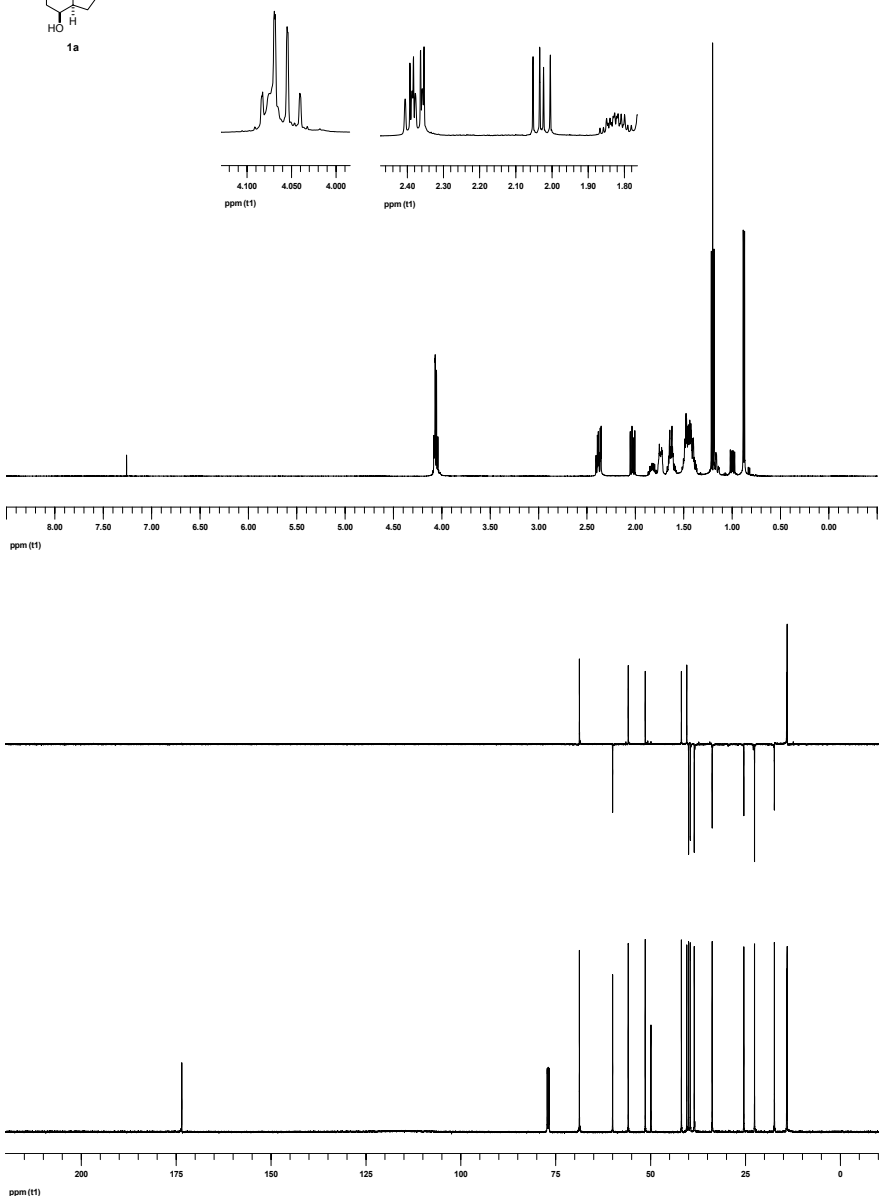
EtO2C
H
O
S
H

2a


4.40 4.30 4.20 4.10 4.00 3.90 3.80
ppm (f1)
8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (f1)
200 175 150 125 100 75 50 25 0
ppm (t1)

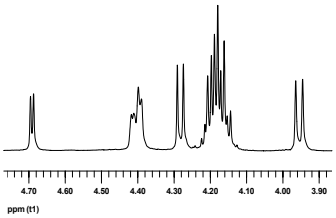
EtO2C
H
HO
H

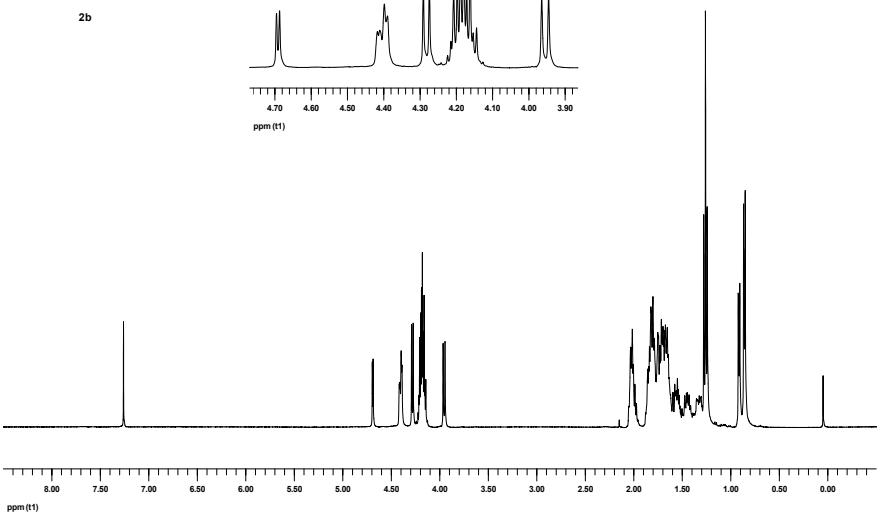
1a

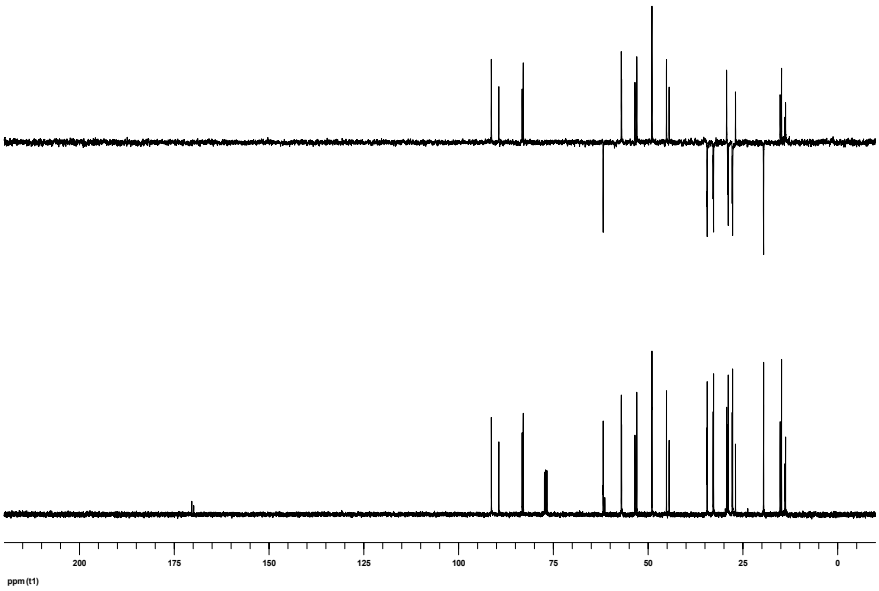

4.100
4.050
4.000
ppm (t1)
2.40
2.30
2.20
2.10
2.00
1.90
1.80
ppm (t1)
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)
200
175
150
125
100
75
50
25
0
ppm (t1)

EtO2C
23
H
O
H
H

2b

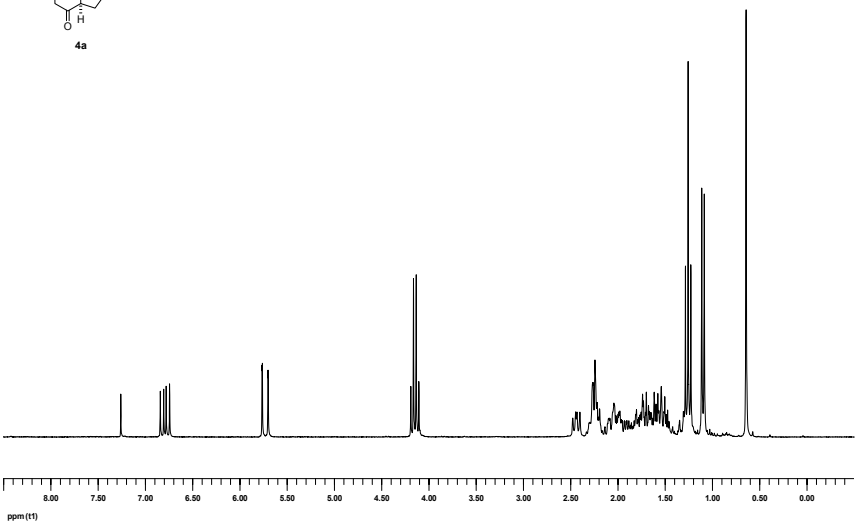

4.70 4.60 4.50 4.40 4.30 4.20 4.10 4.00 3.90
ppm (t1)

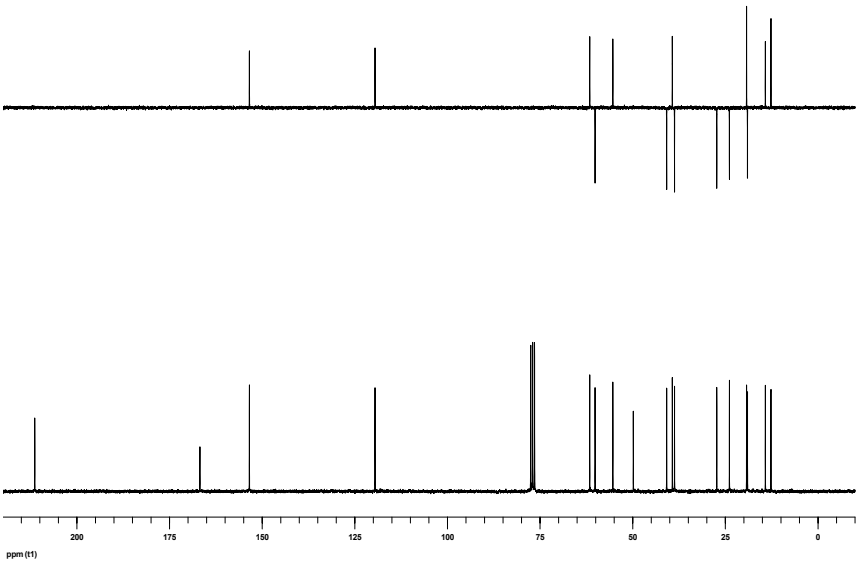

8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)

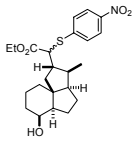

200 175 150 125 100 75 50 25 0
ppm (t1)

EtO2C
H
O
H

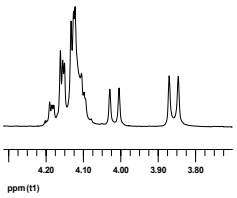
4a

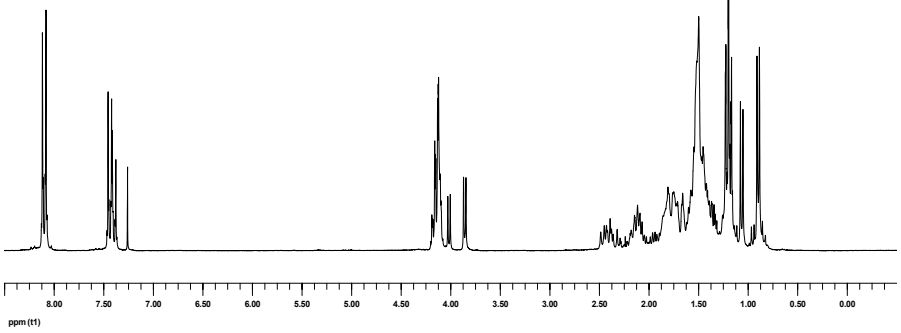

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

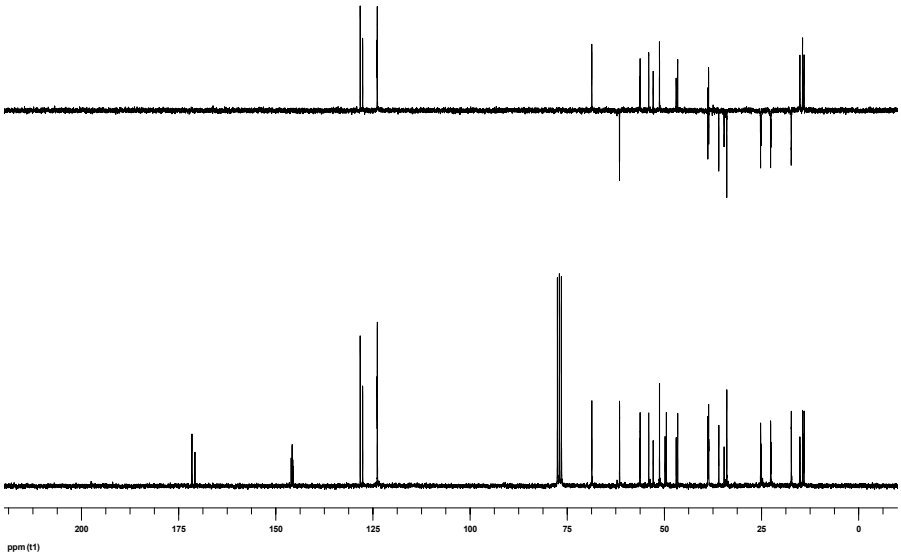

200
175
150
125
100
75
50
25
0
ppm (t1)


NO2
EtO2C
S
H
H
HO
H

1b


4.20
4.10
4.00
3.90
3.80
ppm (t1)


8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

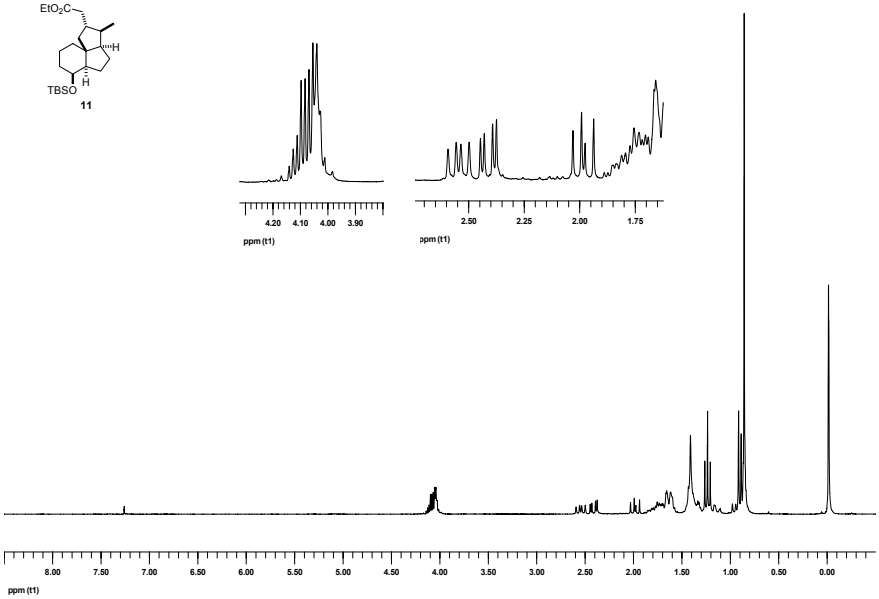

200
175
150
125
100
75
50
25
0
ppm (t1)

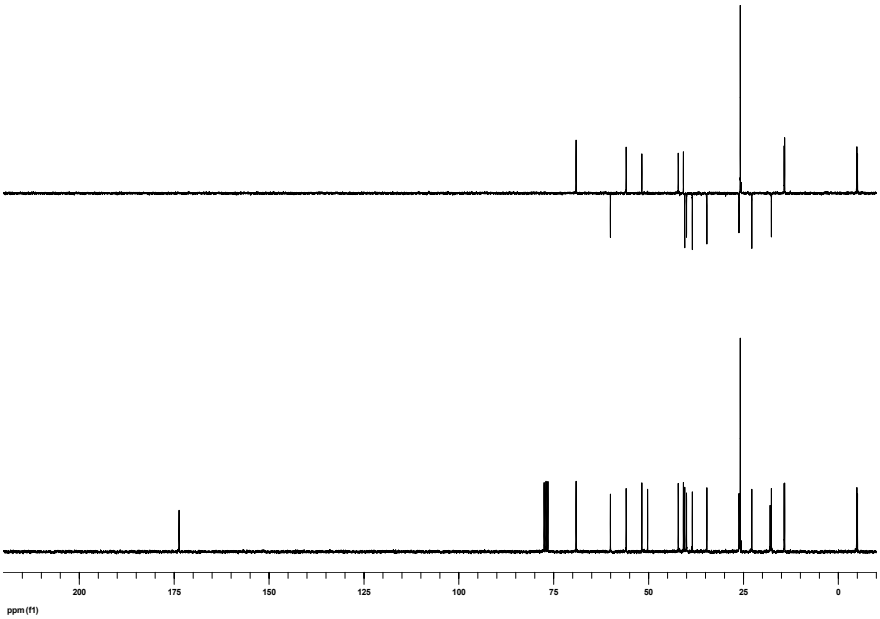
EtO2C
H
TBSO
H

11

4.20 4.10 4.00 3.90
ppm (t1)

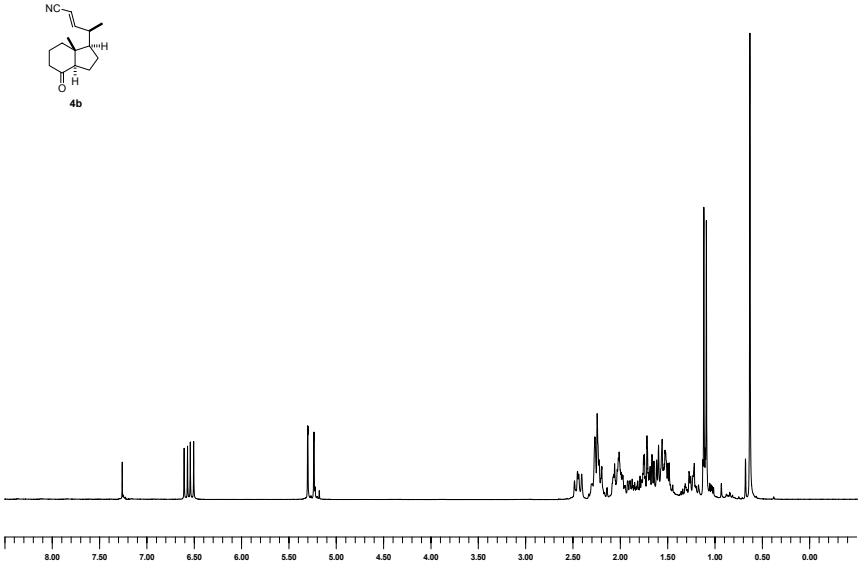
2.50 2.25 2.00 1.75
ppm (t1)

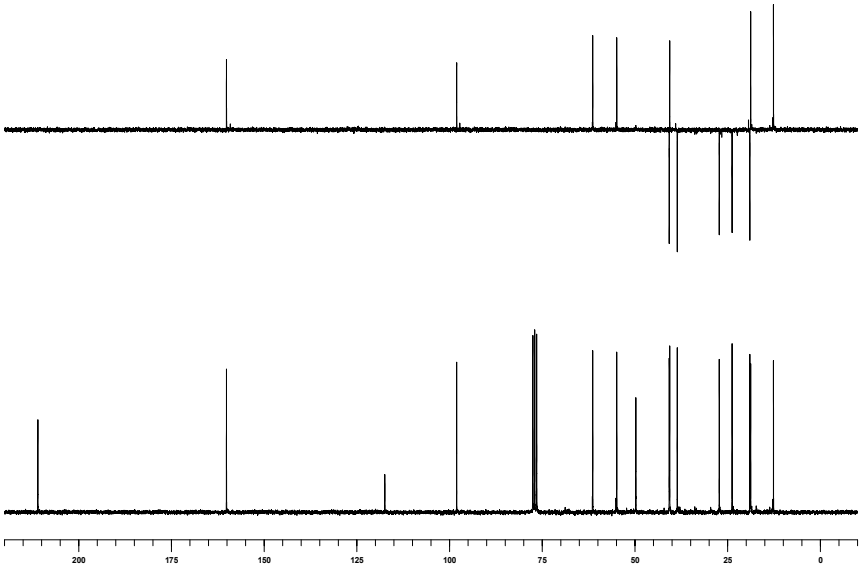

8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)

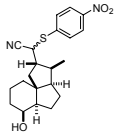

200 175 150 125 100 75 50 25 0
ppm (f1)

NC
H
H
O

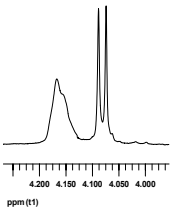
4b

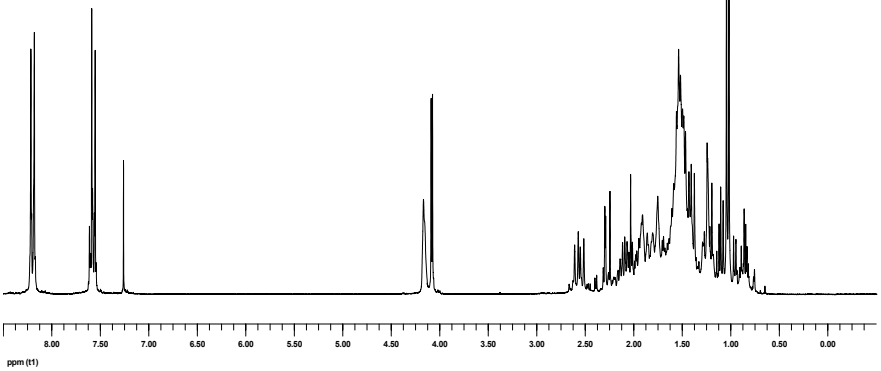

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

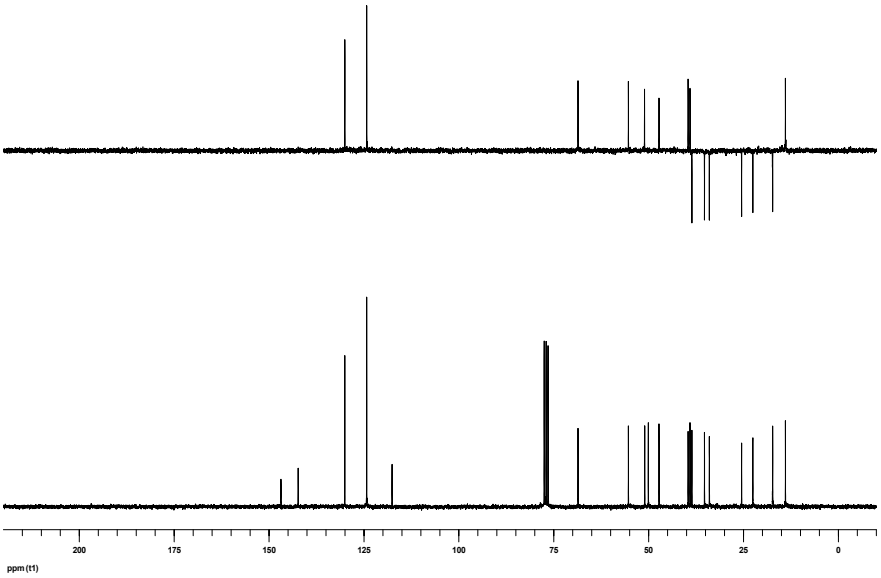

200
175
150
125
100
75
50
25
0

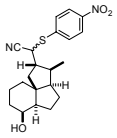

NO2
NC
S
H
H
HO
H

1d
cyano A

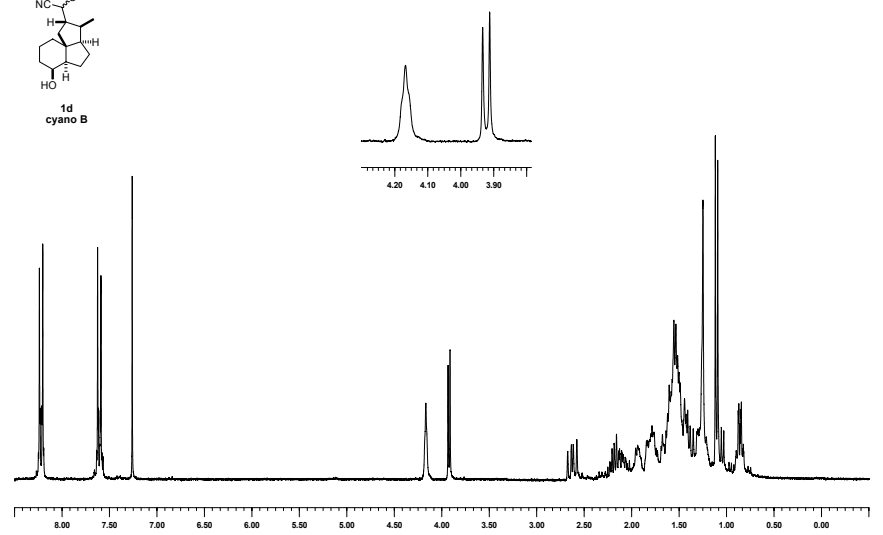

4.200 4.150 4.100 4.050 4.000
ppm (t1)

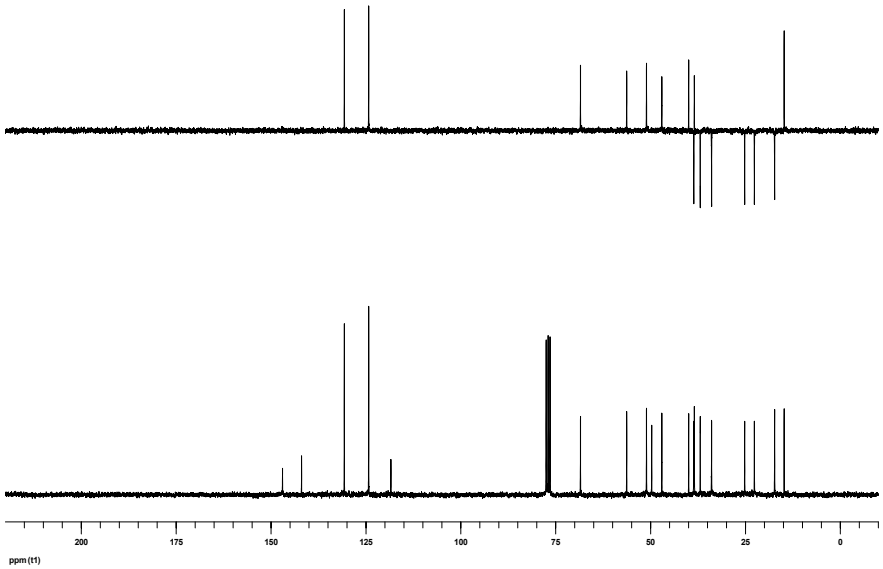

8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
ppm (t1)

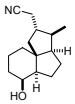

200 175 150 125 100 75 50 25 0
ppm (t1)


NO2
NC
S
H
H
H
HO

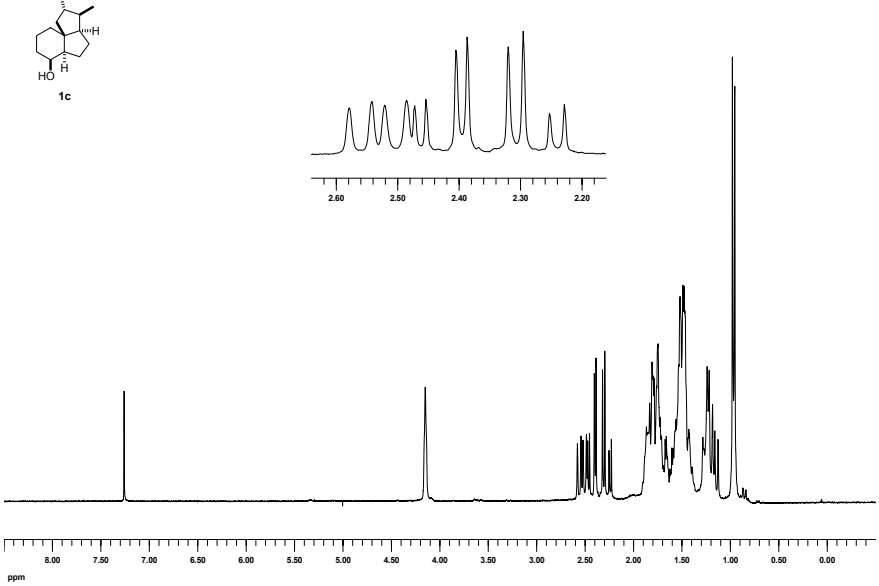
1d
cyano B

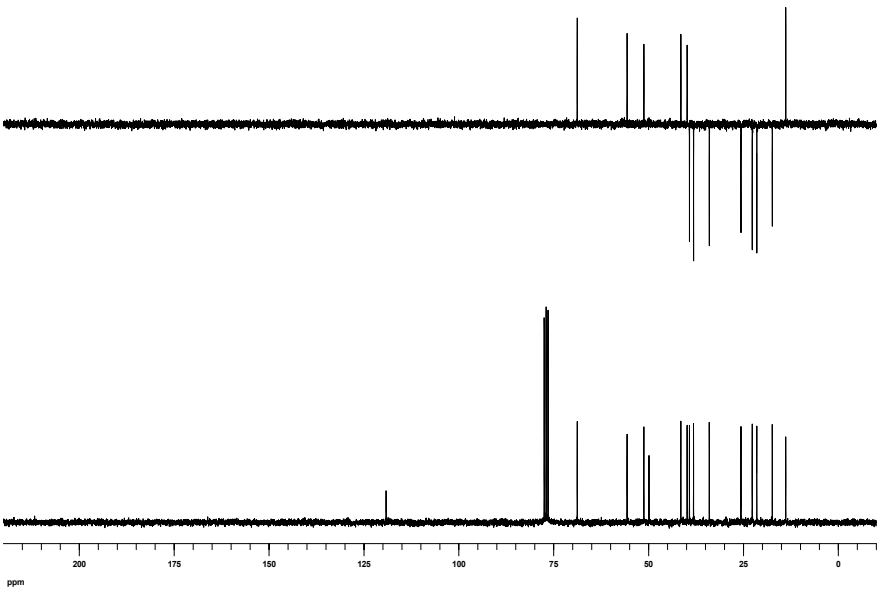

4.20
4.10
4.00
3.90
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

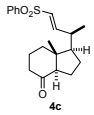

200
175
150
125
100
75
50
25
0
ppm (t1)


NC
H
HO
H

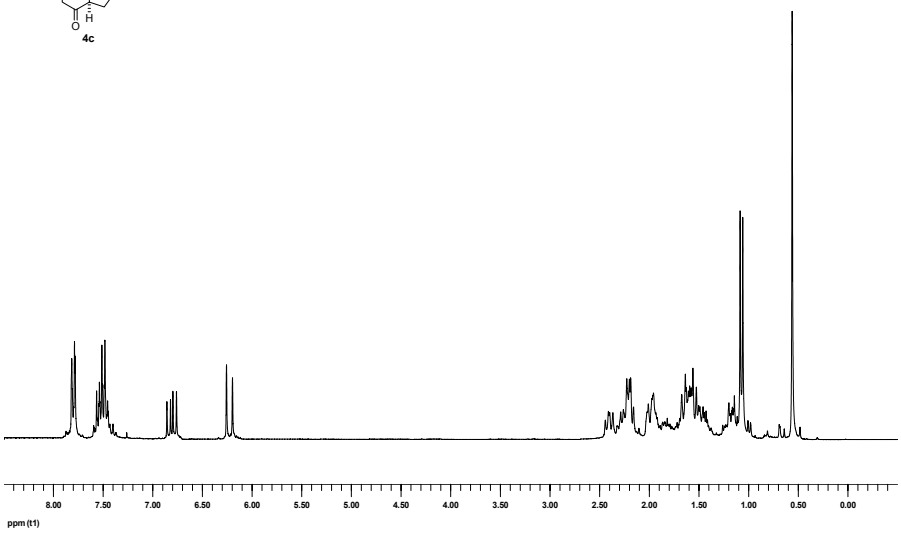
1c

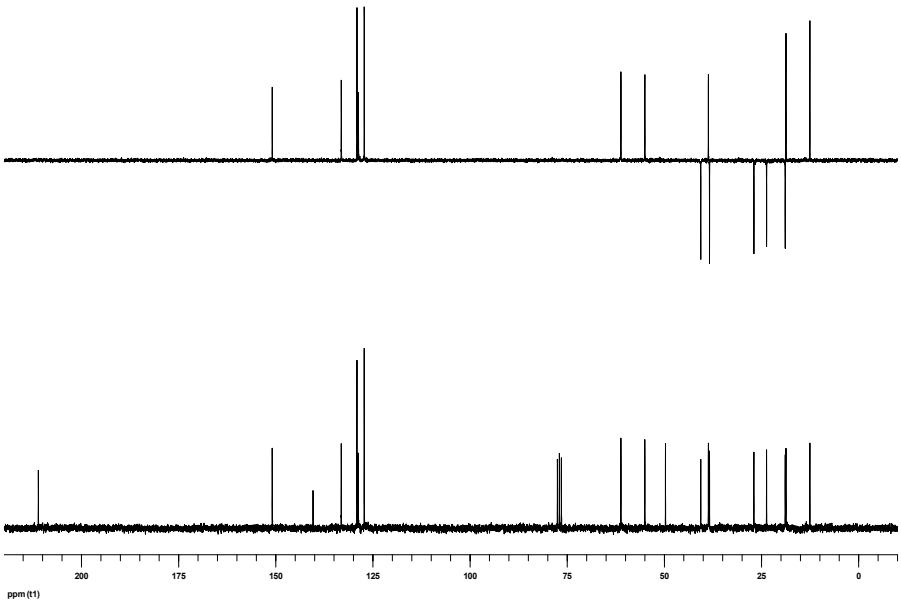

2.60
2.50
2.40
2.30
2.20
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm

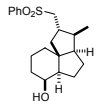

200
175
150
125
100
75
50
25
0
ppm


PhO2S
H
O
H

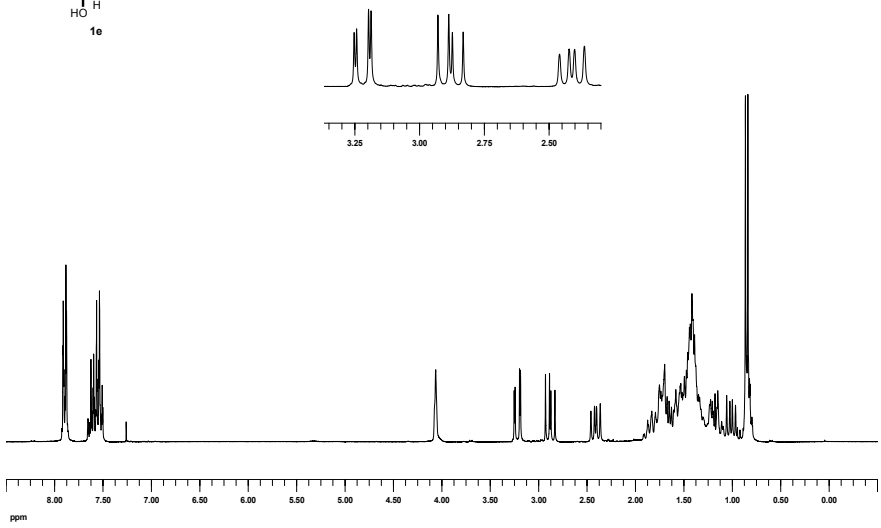
4c

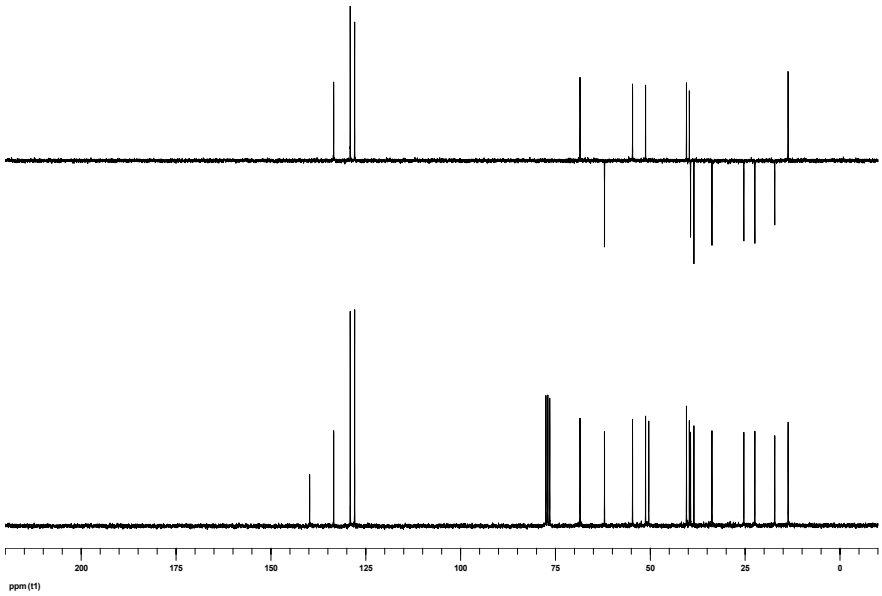

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)

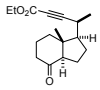

200
175
150
125
100
75
50
25
0
ppm (t1)


PhO2S
H
HO
H

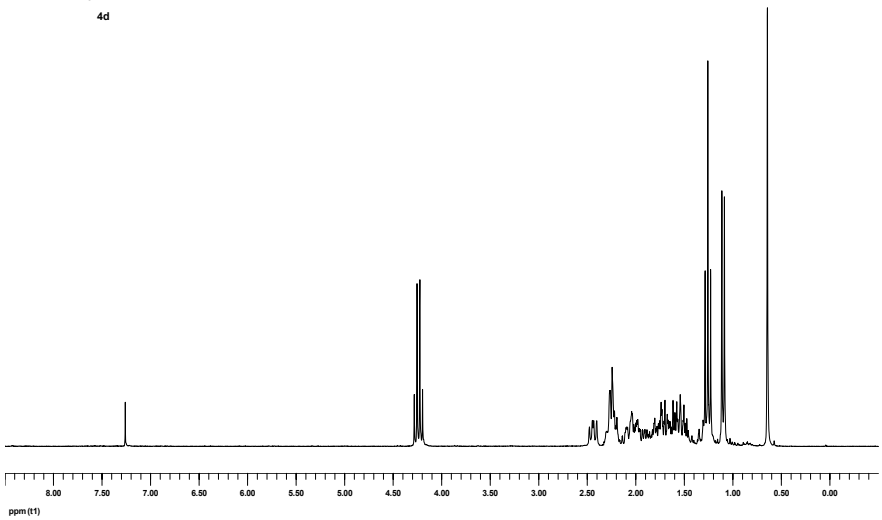
1e

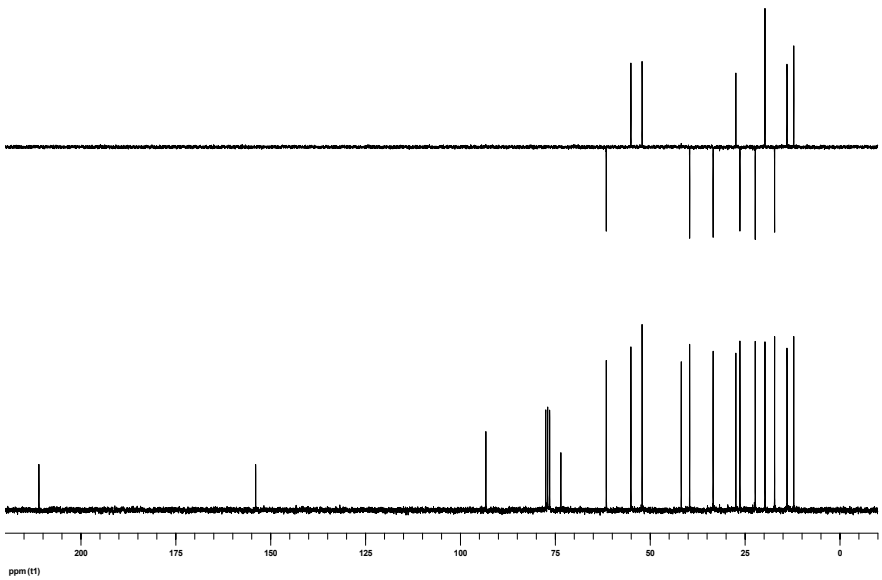

3.25
3.00
2.75
2.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm


200
175
150
125
100
75
50
25
0
ppm (t1)


EtO2C
H
H
O

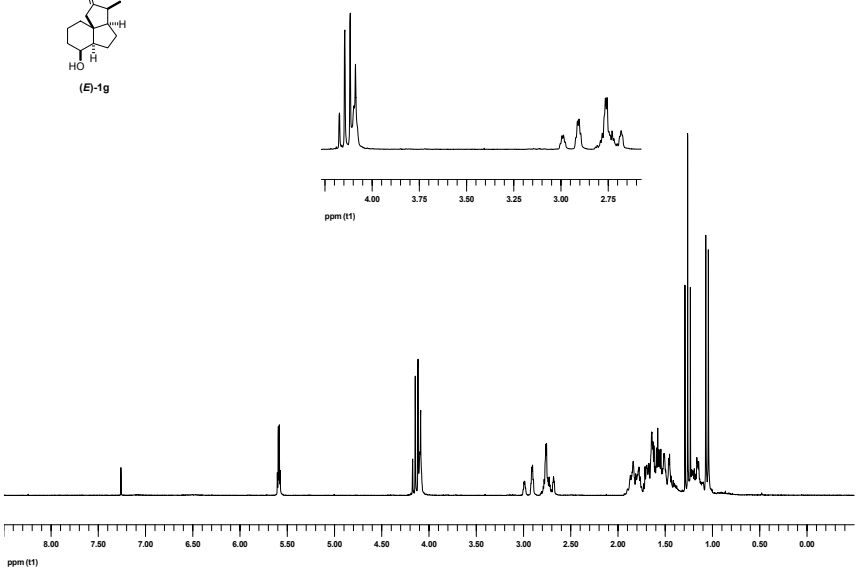
4d

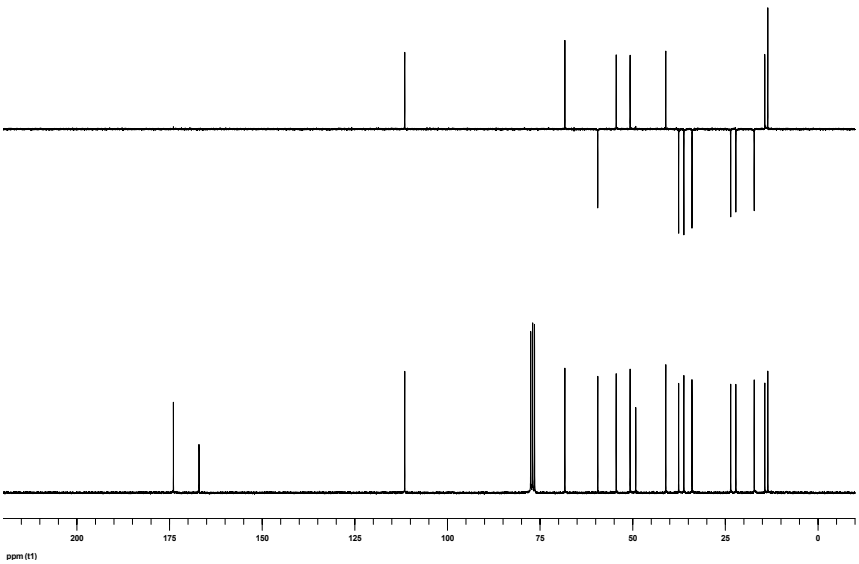

8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
ppm (t1)


200
175
150
125
100
75
50
25
0
ppm (t1)

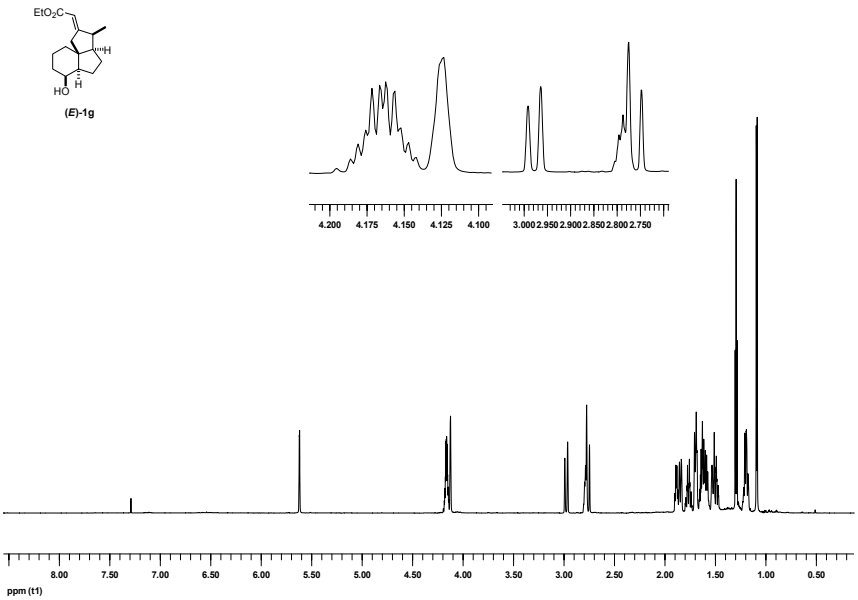
^{1}H-NMR 250 MHz

(*E*)-1g

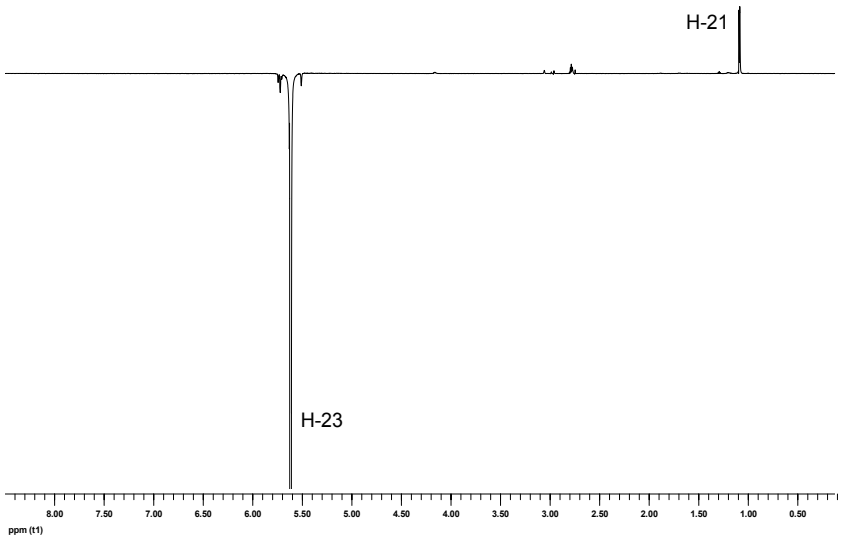




^{1}H-NMR 750 MHZ

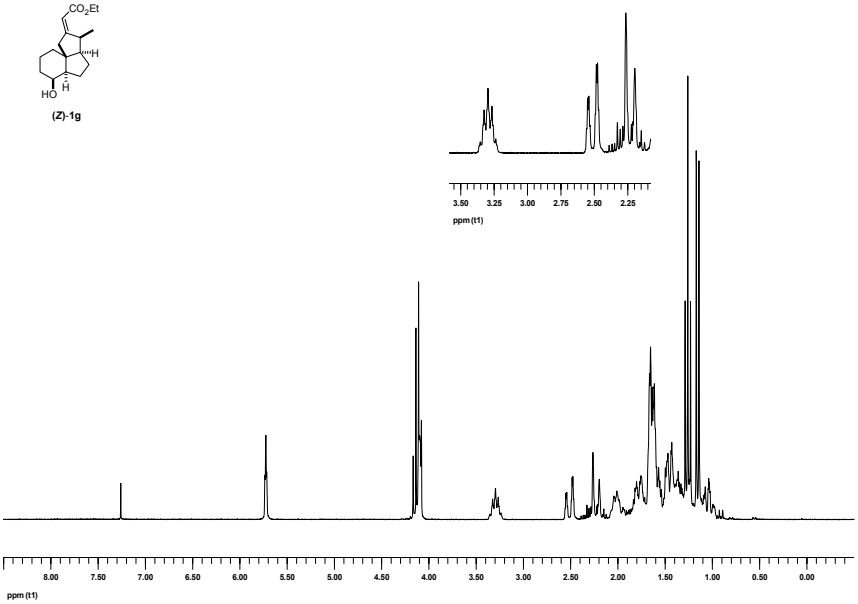


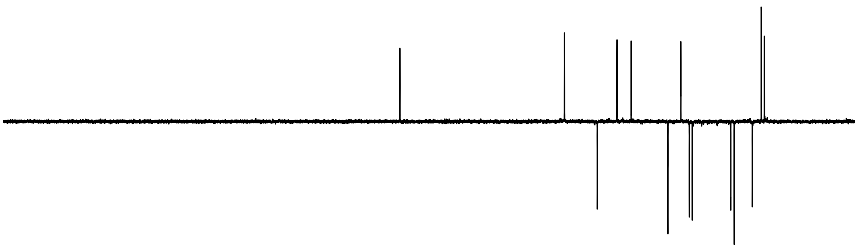
1H-DPFGSE-NOESY mix 400ms between H-23 and H-21 (NMR 750 MHZ)

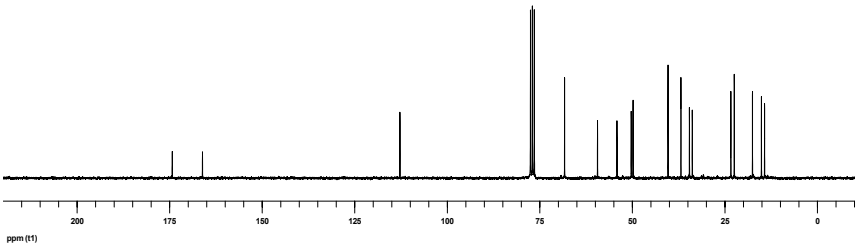


^{1}H-NMR 250 MHz

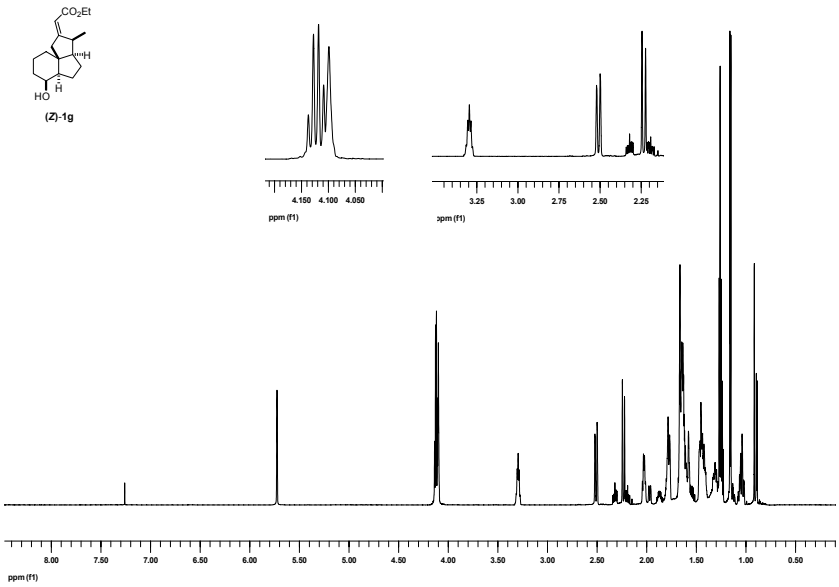
(Z)-1g



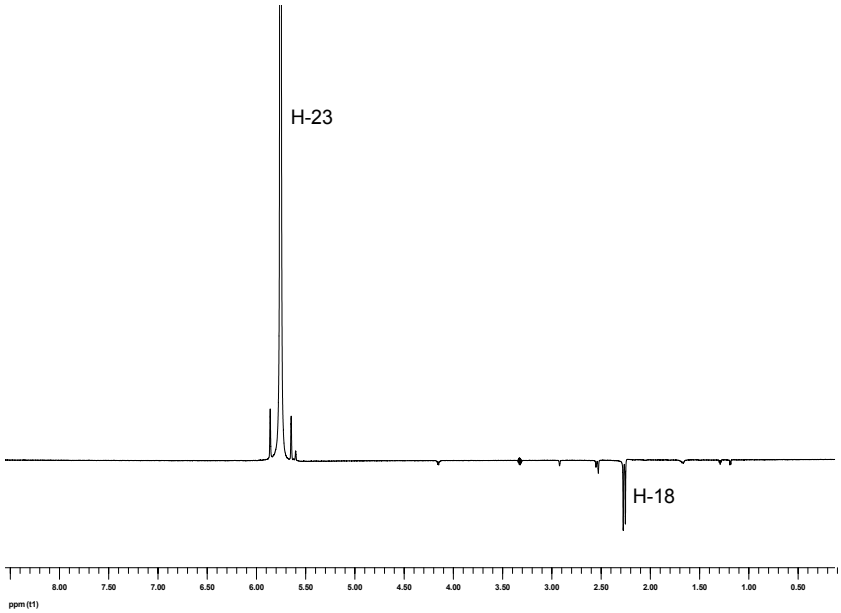




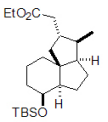
^{1}H-NMR 750 MHz



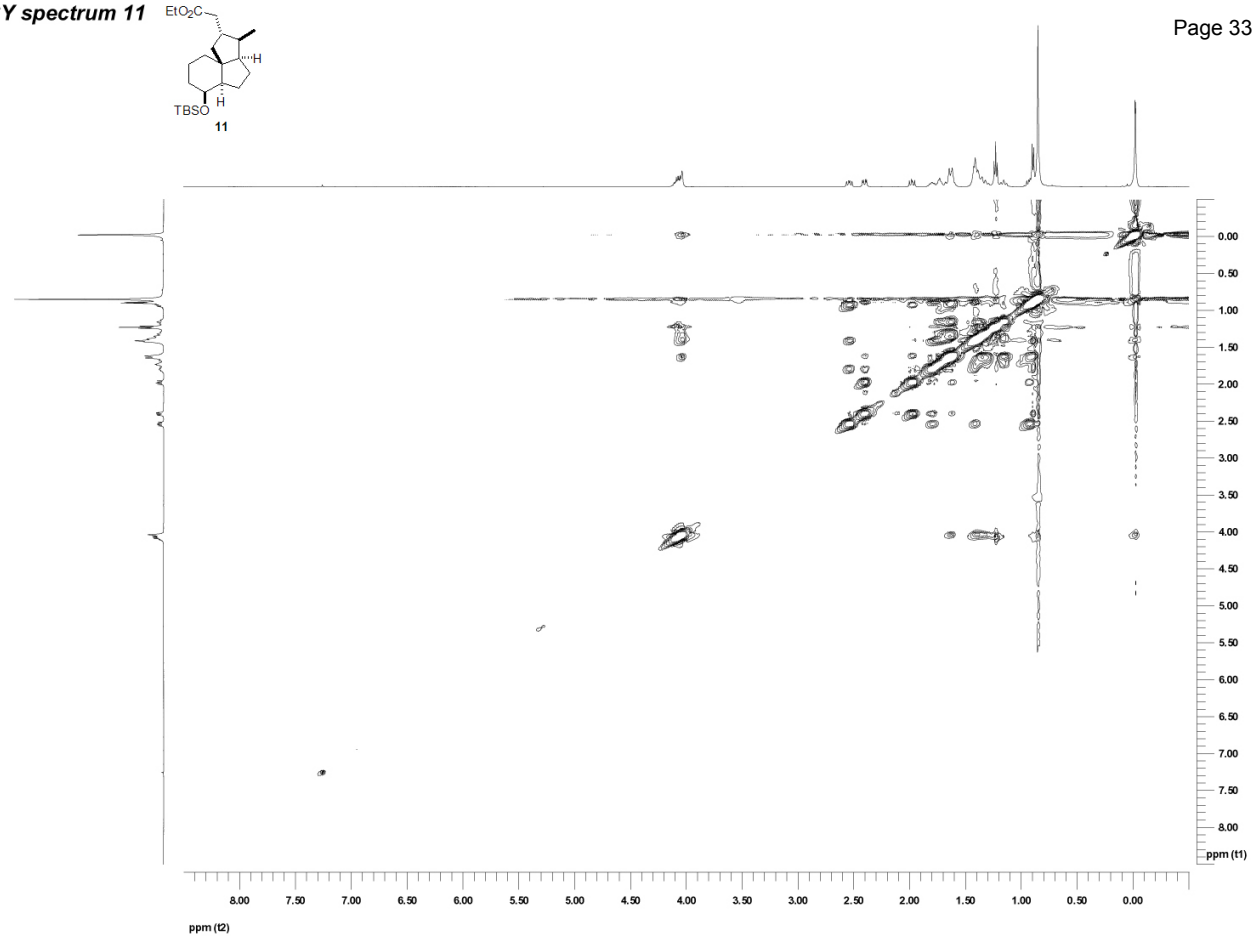
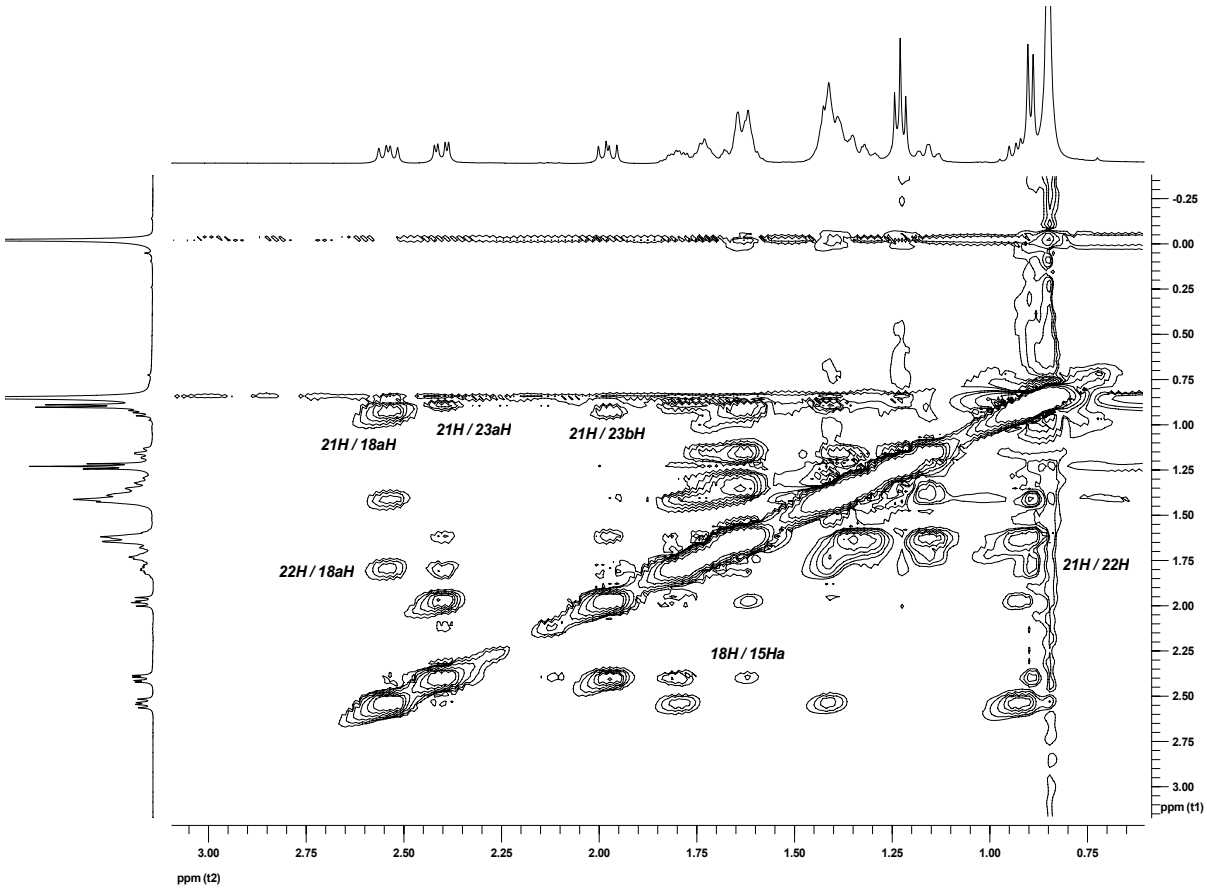
1H_DPFGSE_NOESY mix 400ms between H-18 and H-23 (NMR 750 MHz)



NOESY spectrum 11



11



NOESY spectrum of 11's expansion