Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

For

Pyrolysis of azetidinone derivatives: A versatile route toward electron-rich alkenes, C-1 allylation and/or homologation of aldehydes

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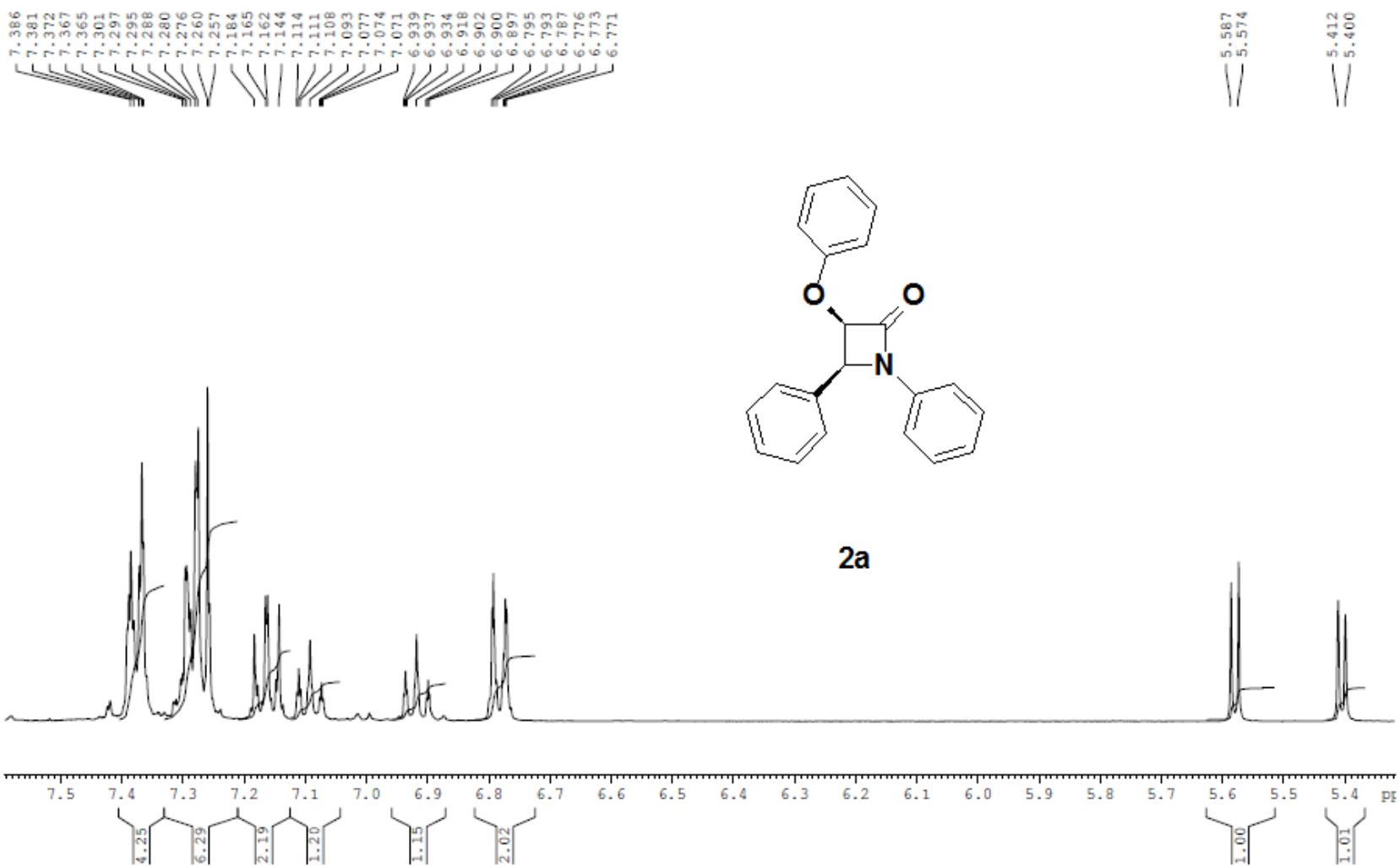
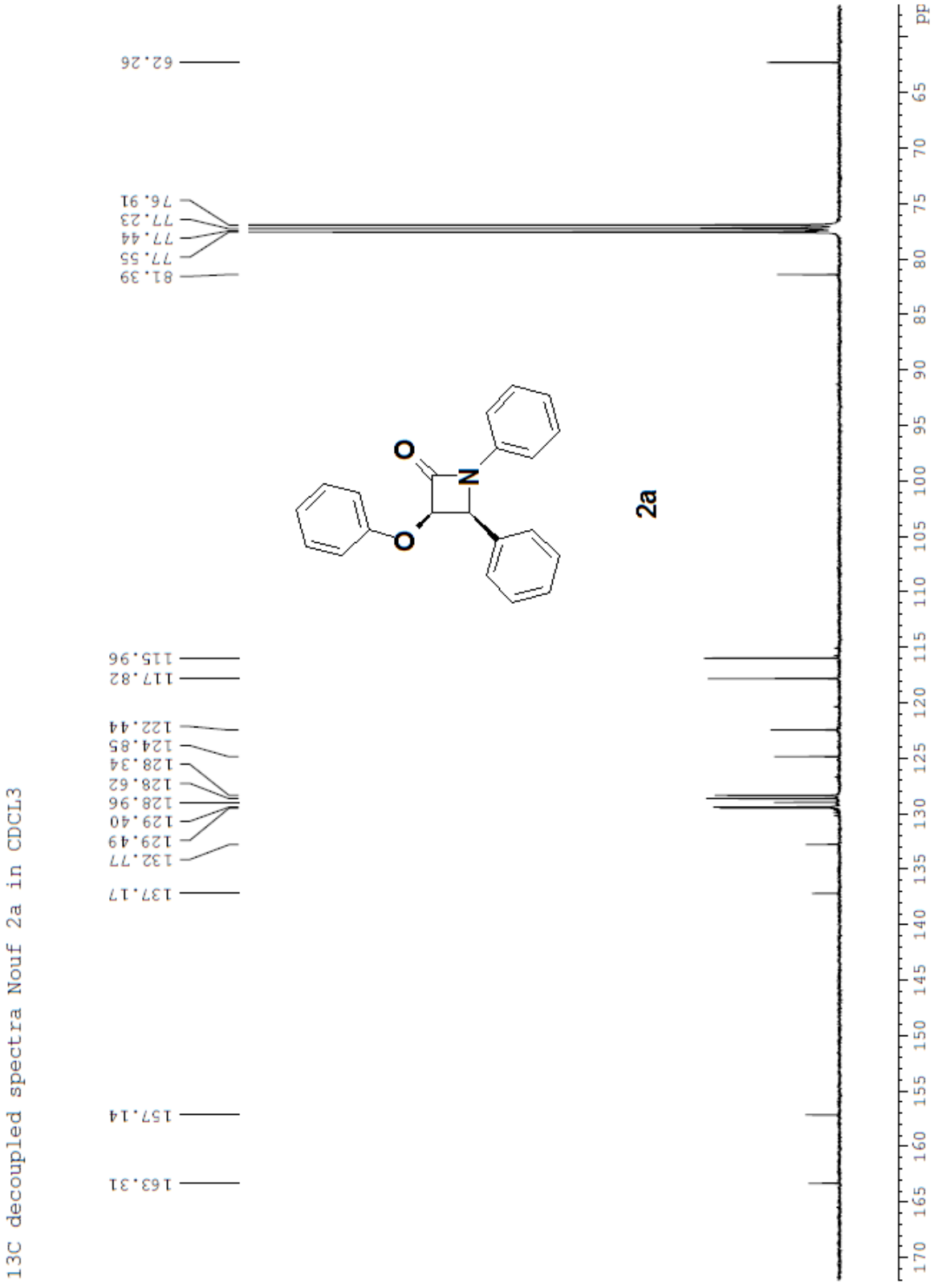
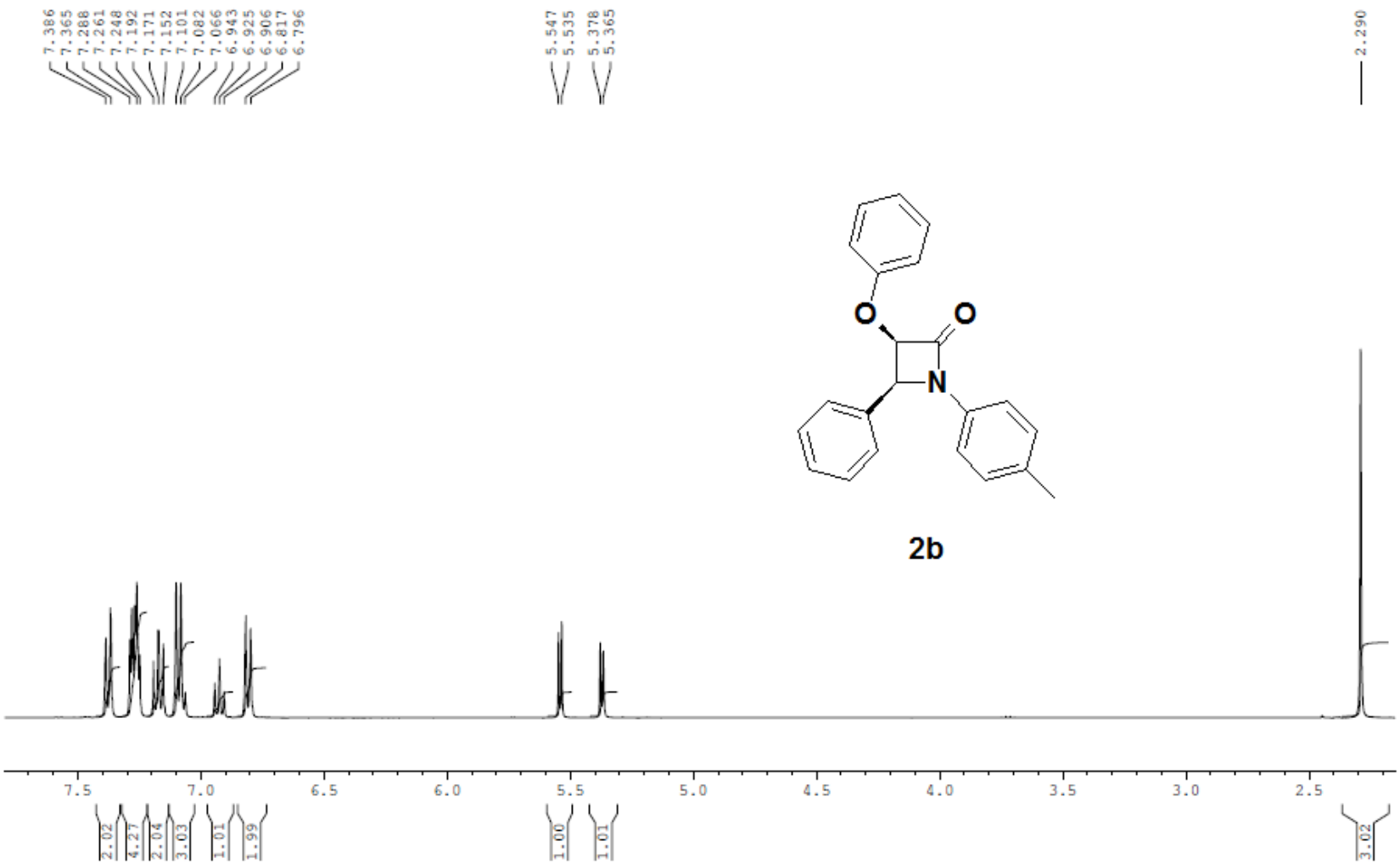
Tel: (+) 96524985537; Fax: (+) 96524816482

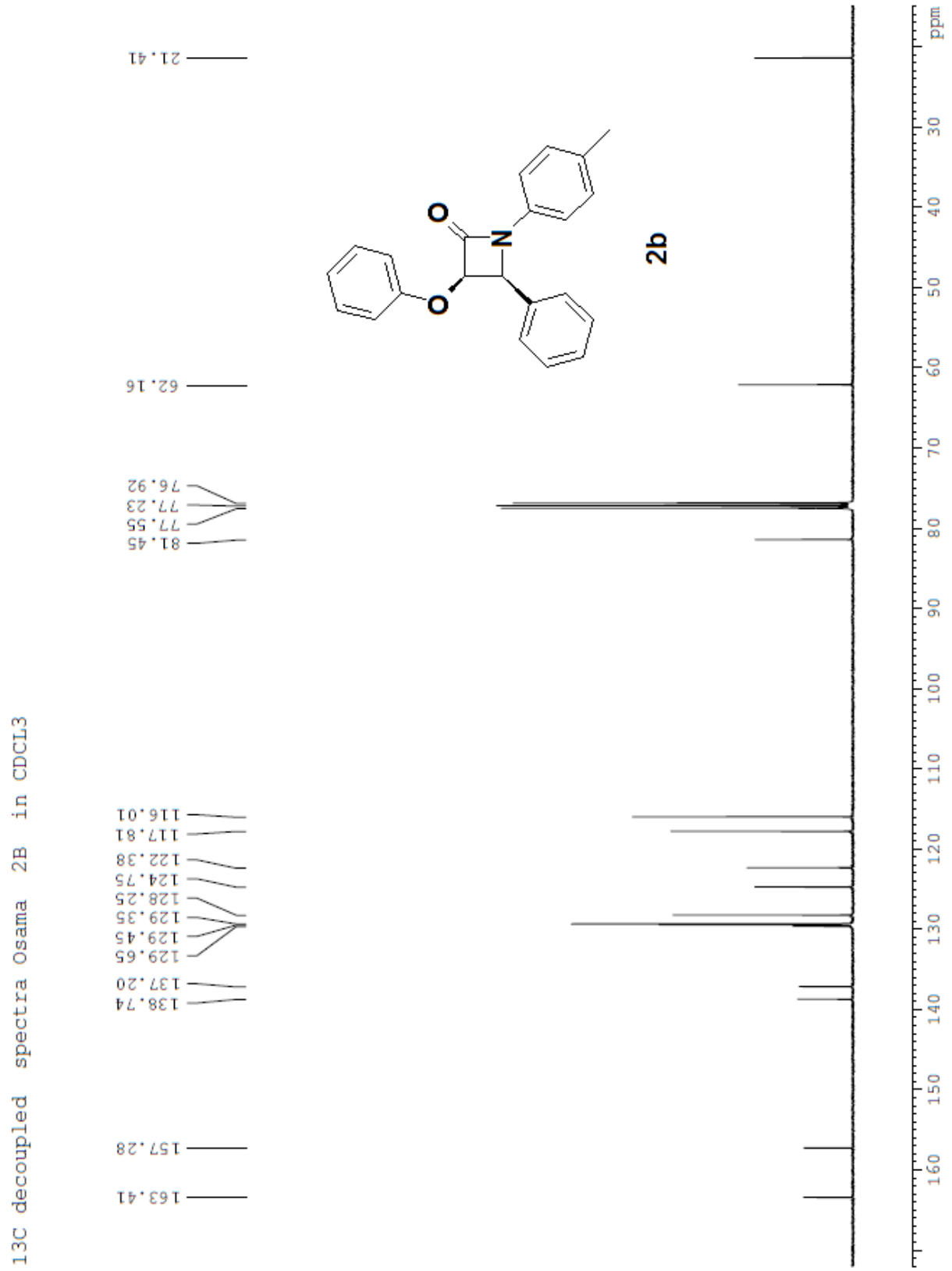
1H spectrum Nouf 2a in CDCl3

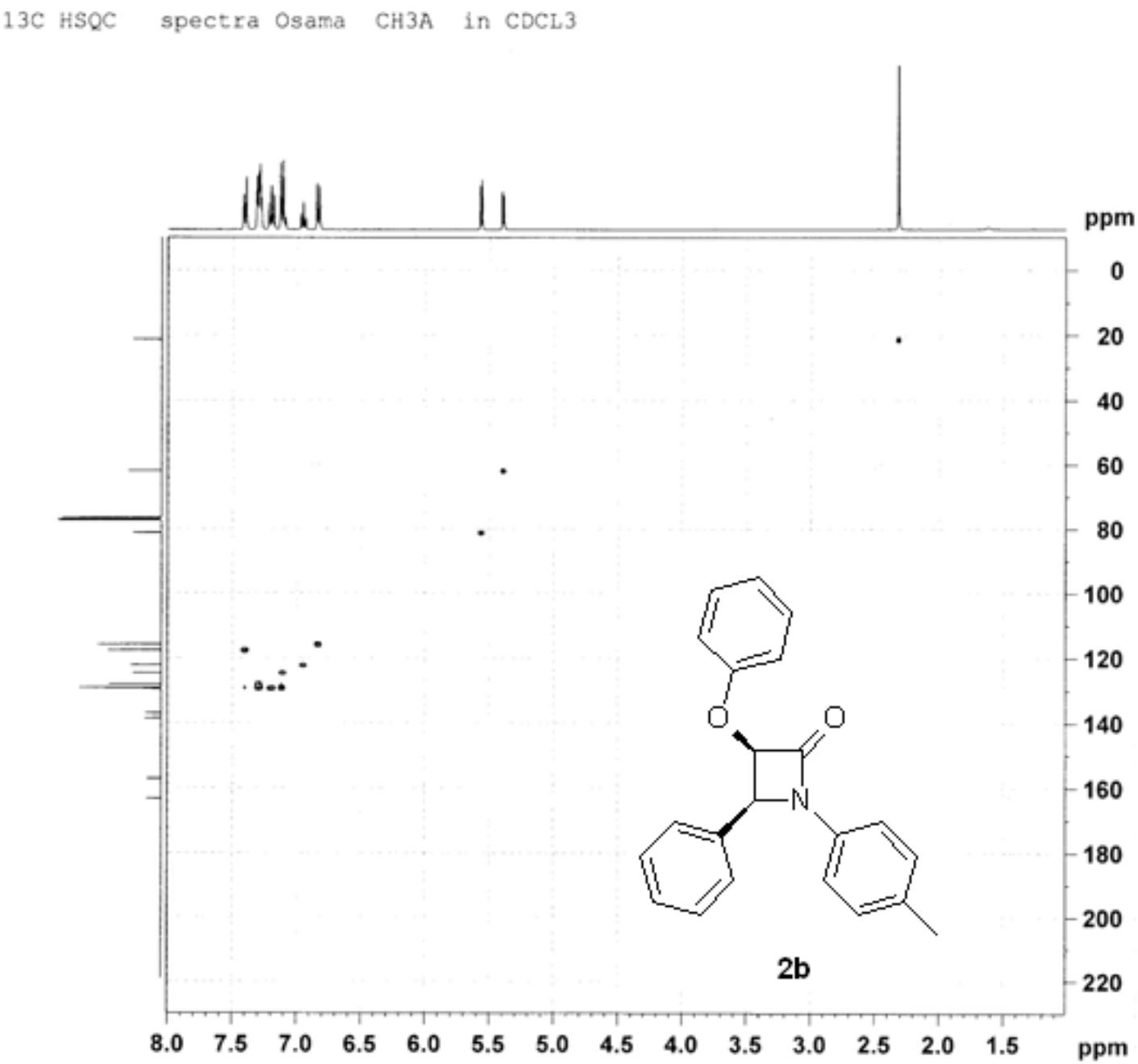


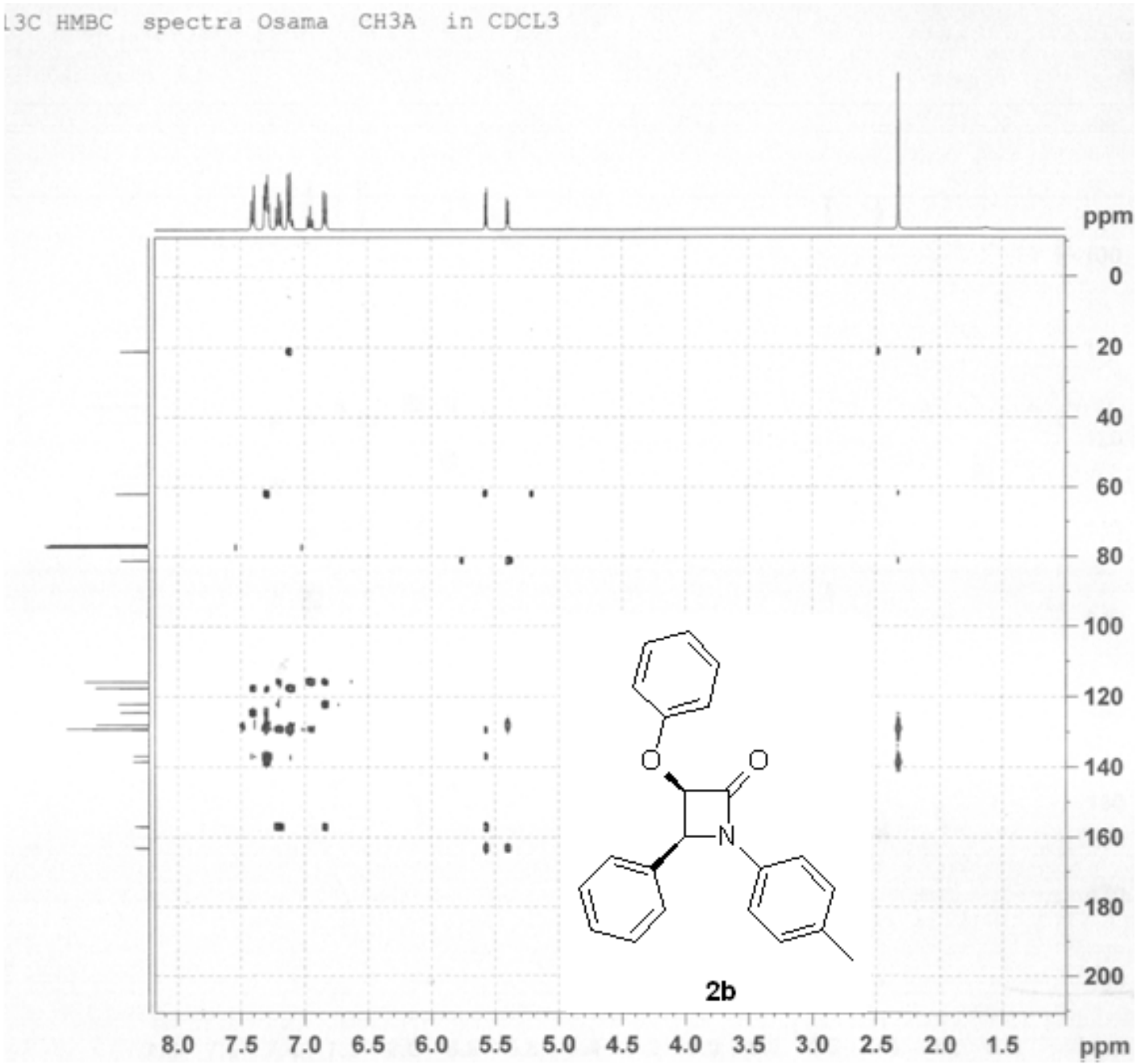

13C decoupled spectra Nouf 2a in CDCl3
62.26
76.91
77.23
77.44
77.55
81.39
115.96
117.82
122.44
124.85
128.34
128.62
128.96
129.40
129.49
132.77
137.17
157.14
163.31
O
N
O
2a
ppm

1H spectra Osama 2B in CDCL3

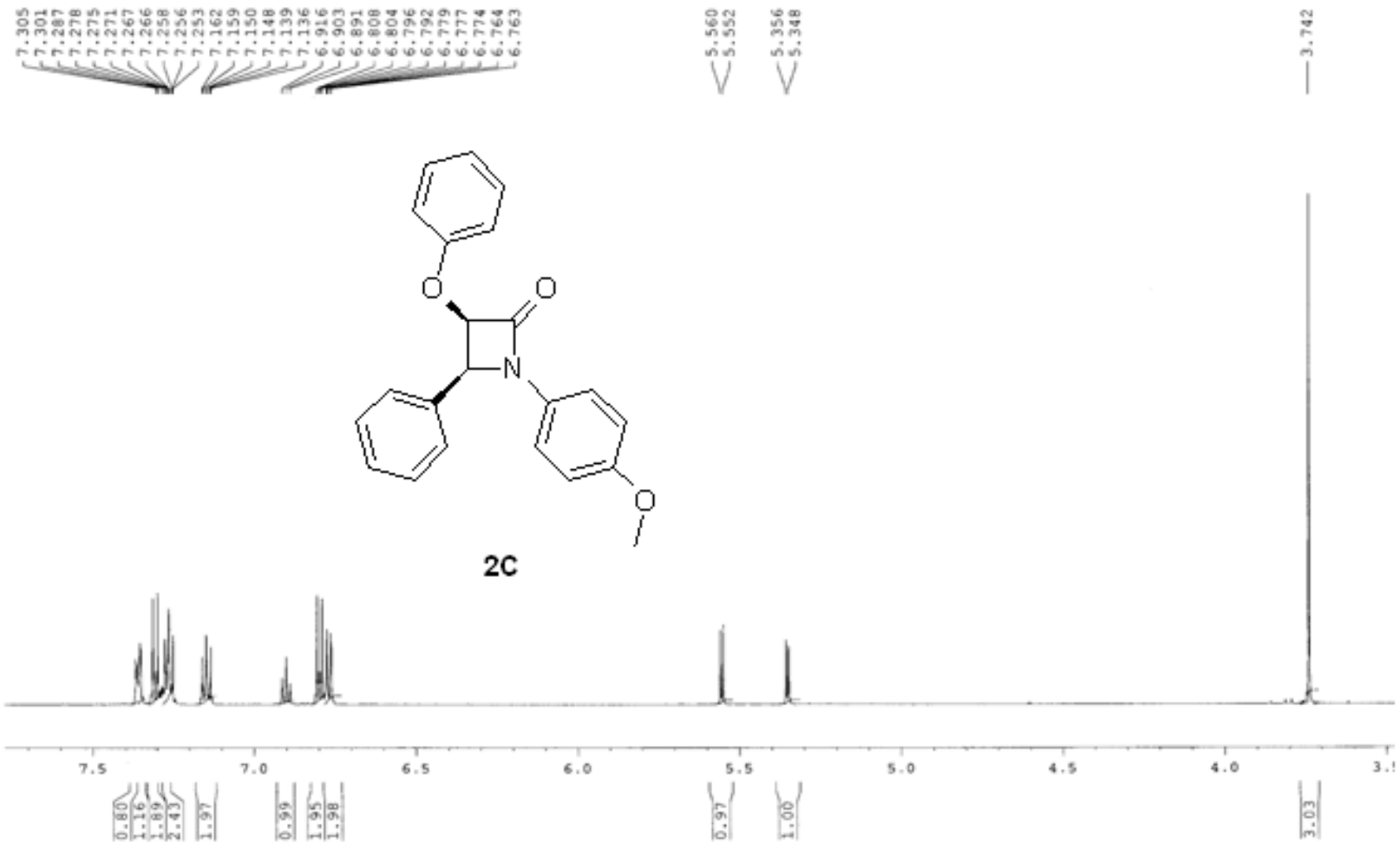



13C decoupled spectra Osama 2B in CDCL3
21.41
62.16
76.92
77.23
77.55
81.45
116.01
117.81
122.38
124.75
128.25
129.35
129.45
129.65
137.20
138.74
157.28
163.41
O
N
O
2b
ppm

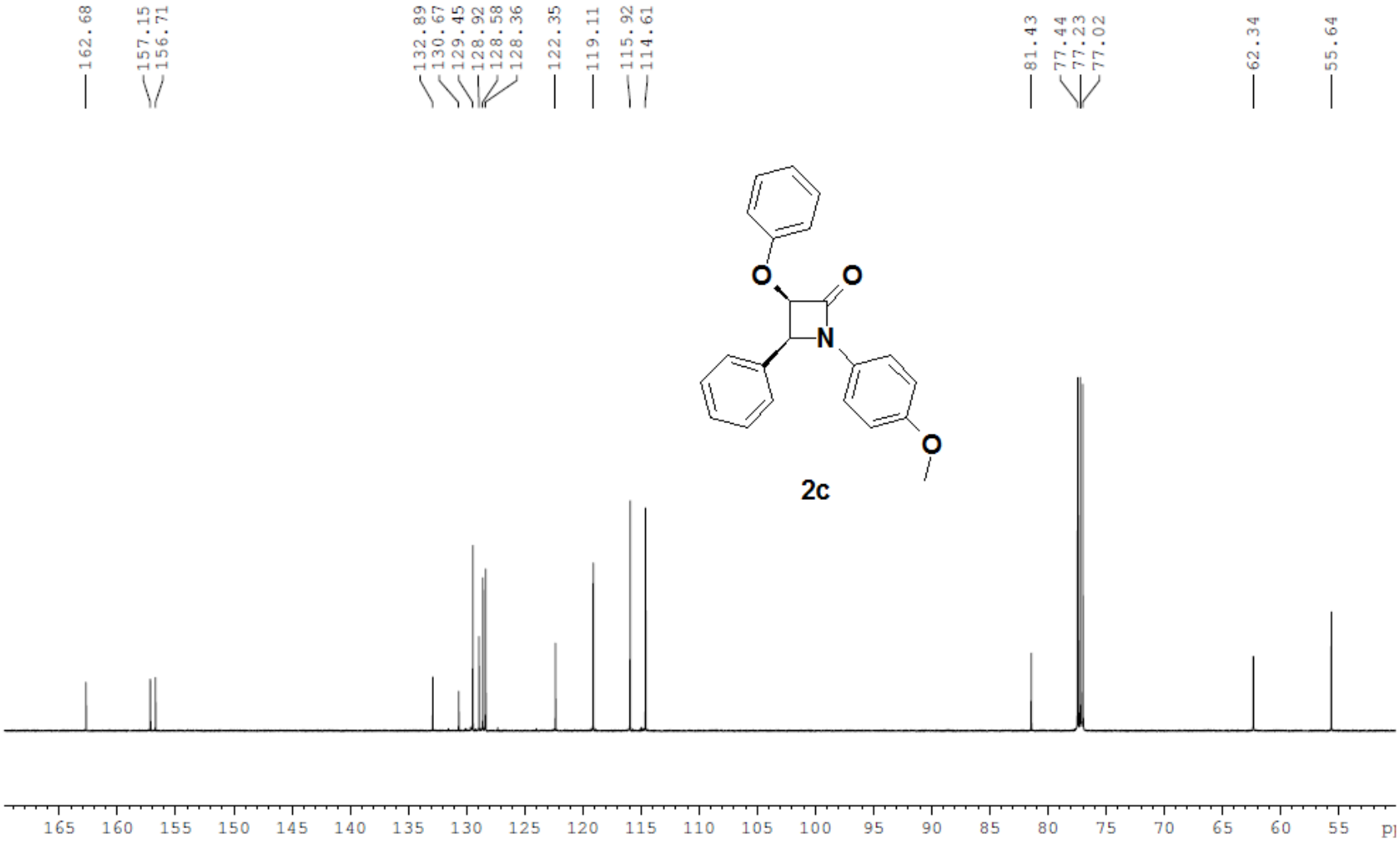

13C HSQC spectra Osama CH3A in CDCL3
ppm
0
20
40
60
80
100
120
140
160
180
200
220
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
ppm
O
O
N
2b

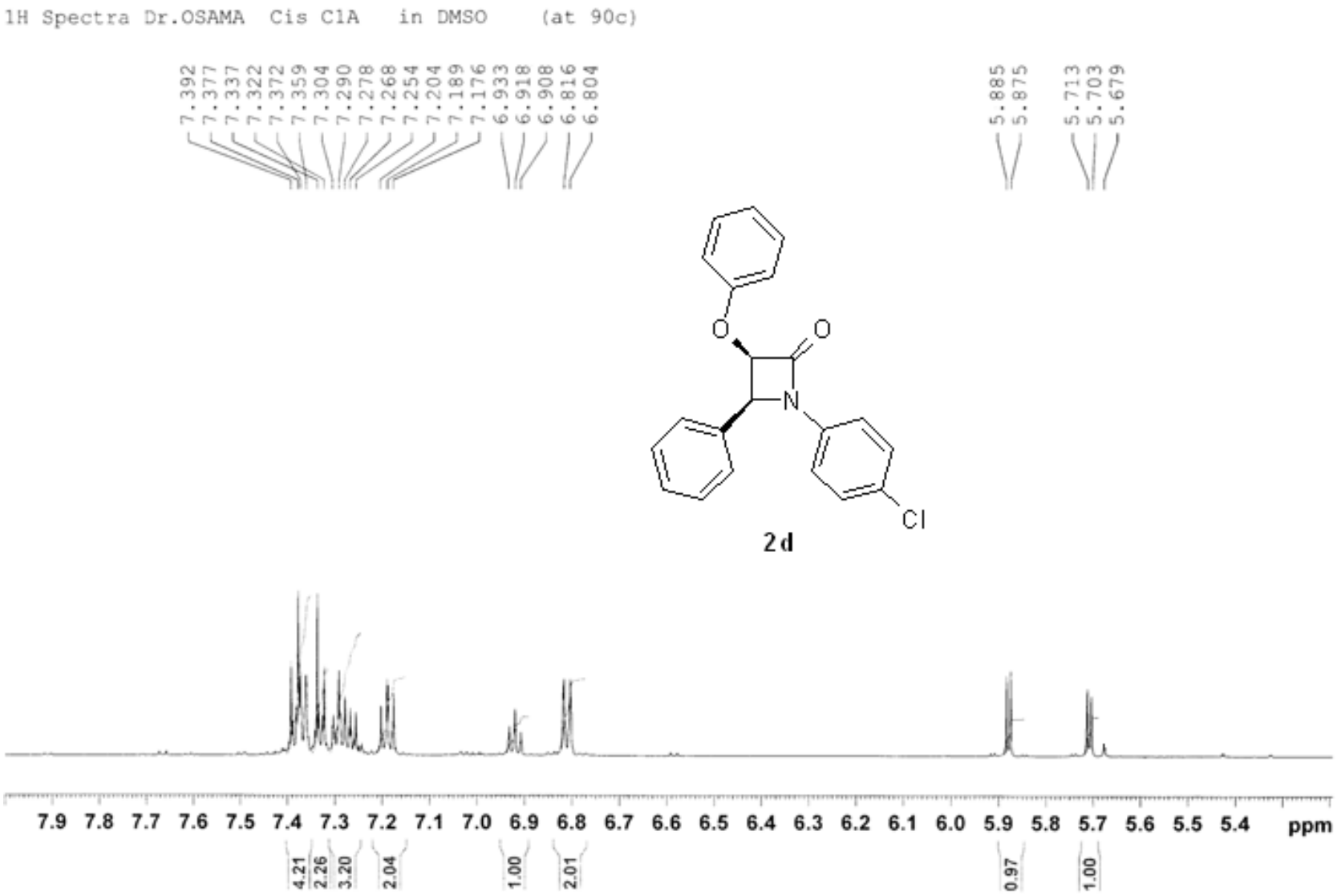

L3C HMBC spectra Osama CH3A in CDCL3
ppm
0
20
40
60
80
100
120
140
160
180
200
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
ppm
O
O
N
2b

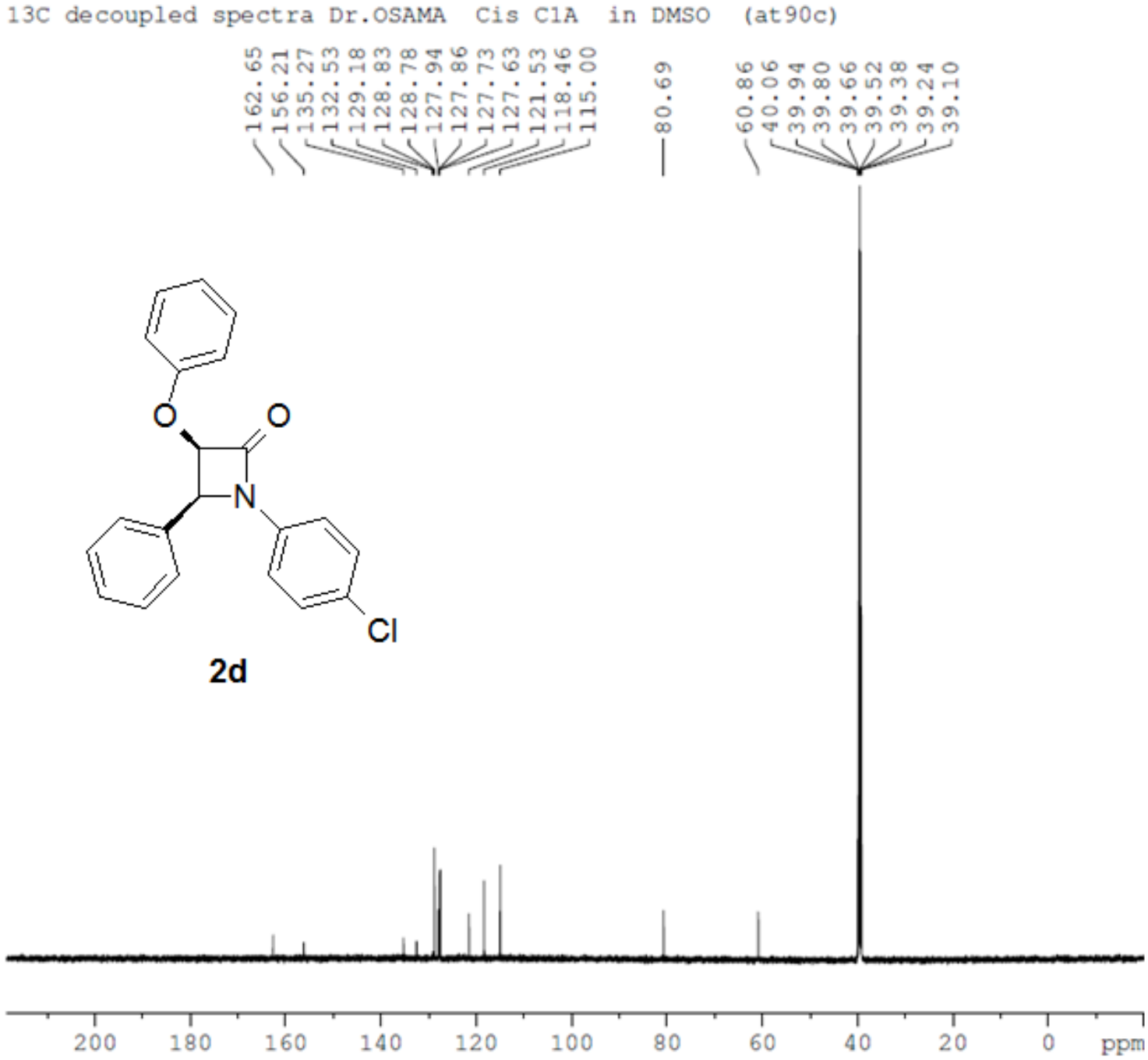
1H spectrum Osama 2C in CDCl3



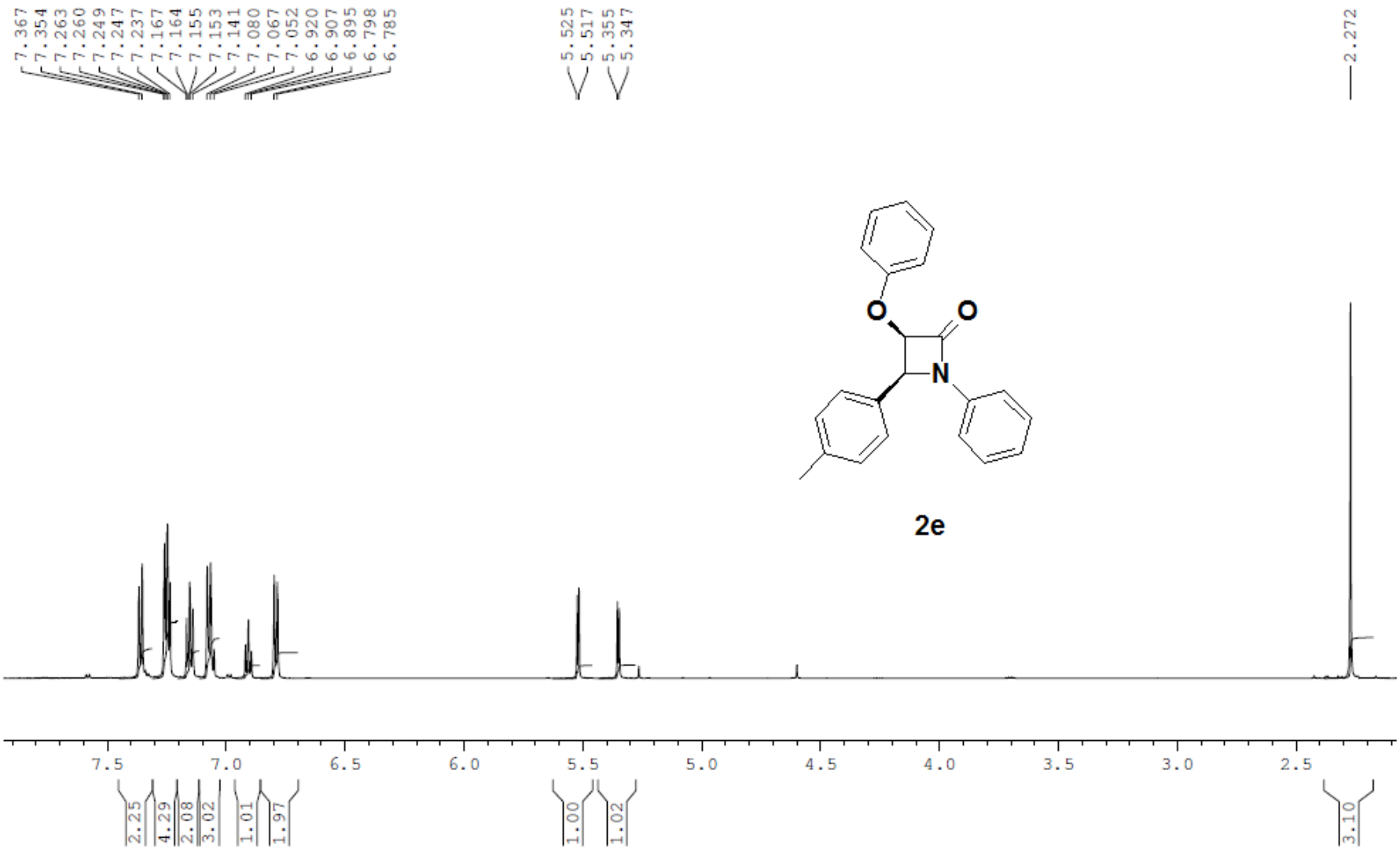
13C decoupled spectrum Osama 2C in CDCl3



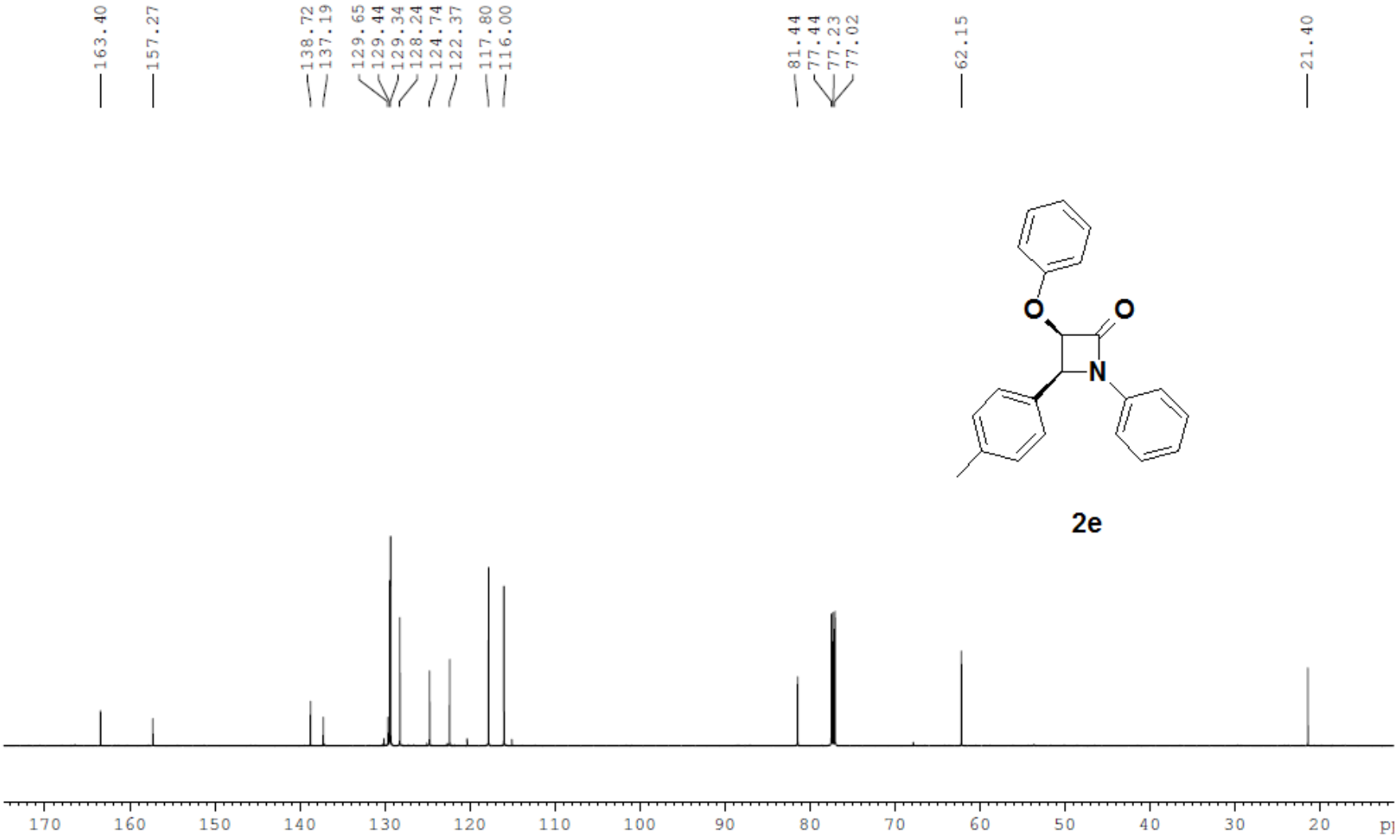

1H Spectra Dr.OSAMA Cis C1A in DMSO (at 90c)
7.392
7.377
7.337
7.322
7.372
7.359
7.304
7.290
7.278
7.268
7.254
7.204
7.189
7.176
6.933
6.918
6.908
6.816
6.804
5.885
5.875
5.713
5.703
5.679
O
O
N
Cl
2d
7.9 7.8 7.7 7.6 7.5 7.4 7.3 7.2 7.1 7.0 6.9 6.8 6.7 6.6 6.5 6.4 6.3 6.2 6.1 6.0 5.9 5.8 5.7 5.6 5.5 5.4 ppm
4.21
2.26
3.20
2.04
1.00
2.01
0.97
1.00


13C decoupled spectra Dr.OSAMA Cis C1A in DMSO (at90c)
162.65
156.21
135.27
132.53
129.18
128.83
128.78
127.94
127.86
127.73
127.63
121.53
118.46
115.00
80.69
60.86
40.06
39.94
39.80
39.66
39.52
39.38
39.24
39.10
O
O
N
Cl
2d
200
180
160
140
120
100
80
60
40
20
0
ppm

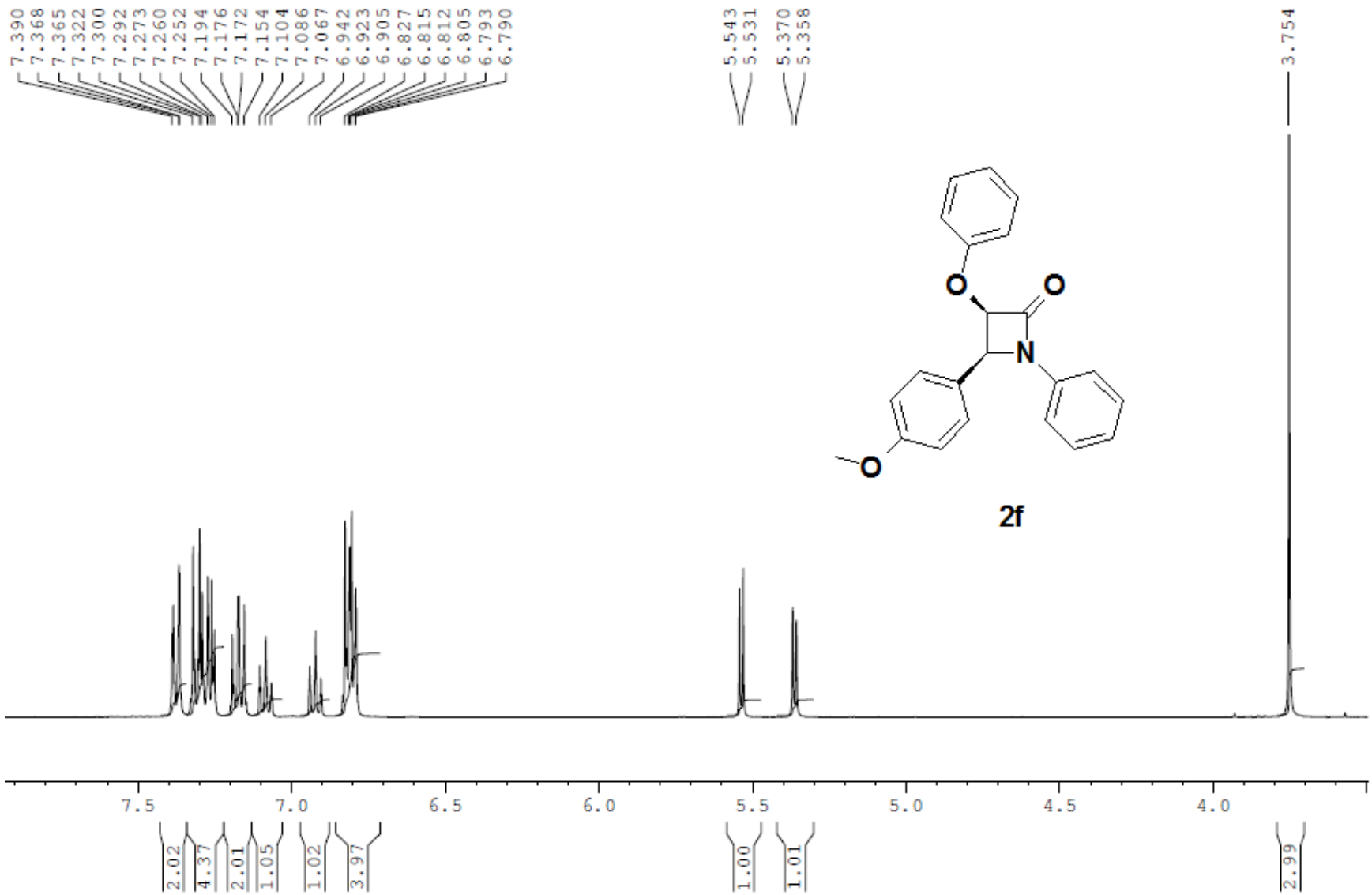
1H spectrum Osama 2e in CDCl3



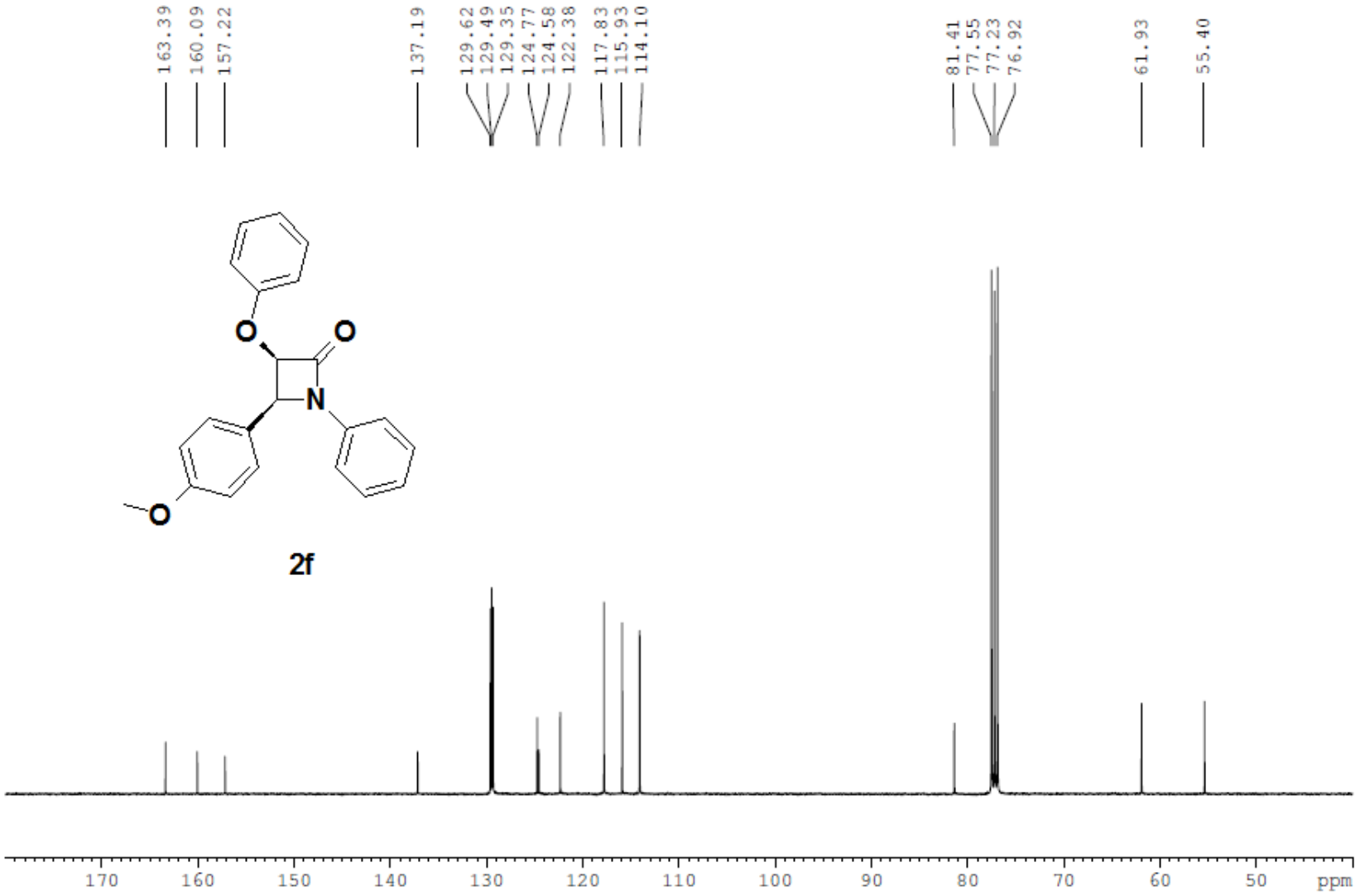
13C decoupled spectrum Osama 2e in CDCl3



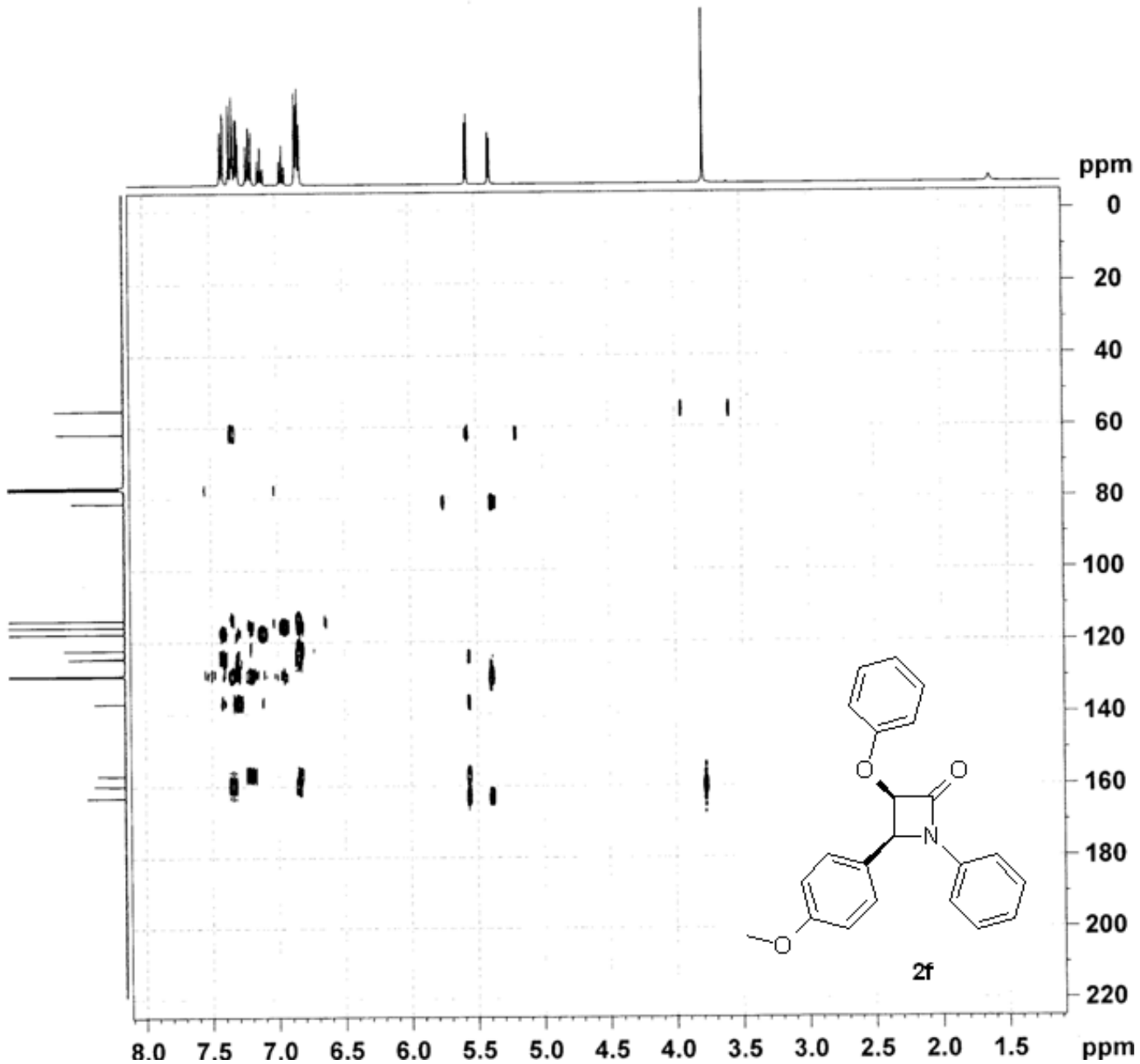
1H spectra Osama methoxy B in CDCL3



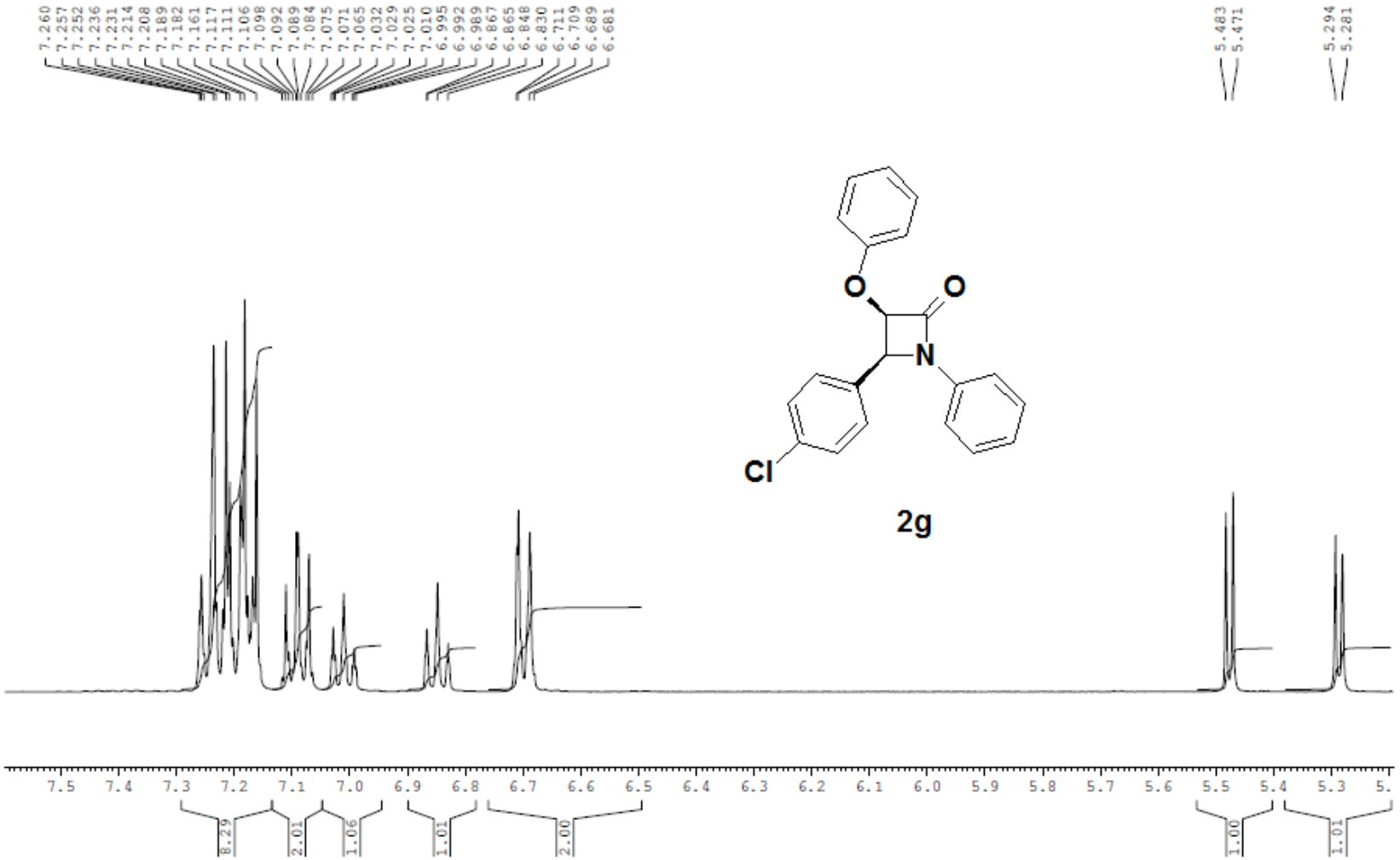
13C decoupled spectra Osama methoxyB in CDCl3

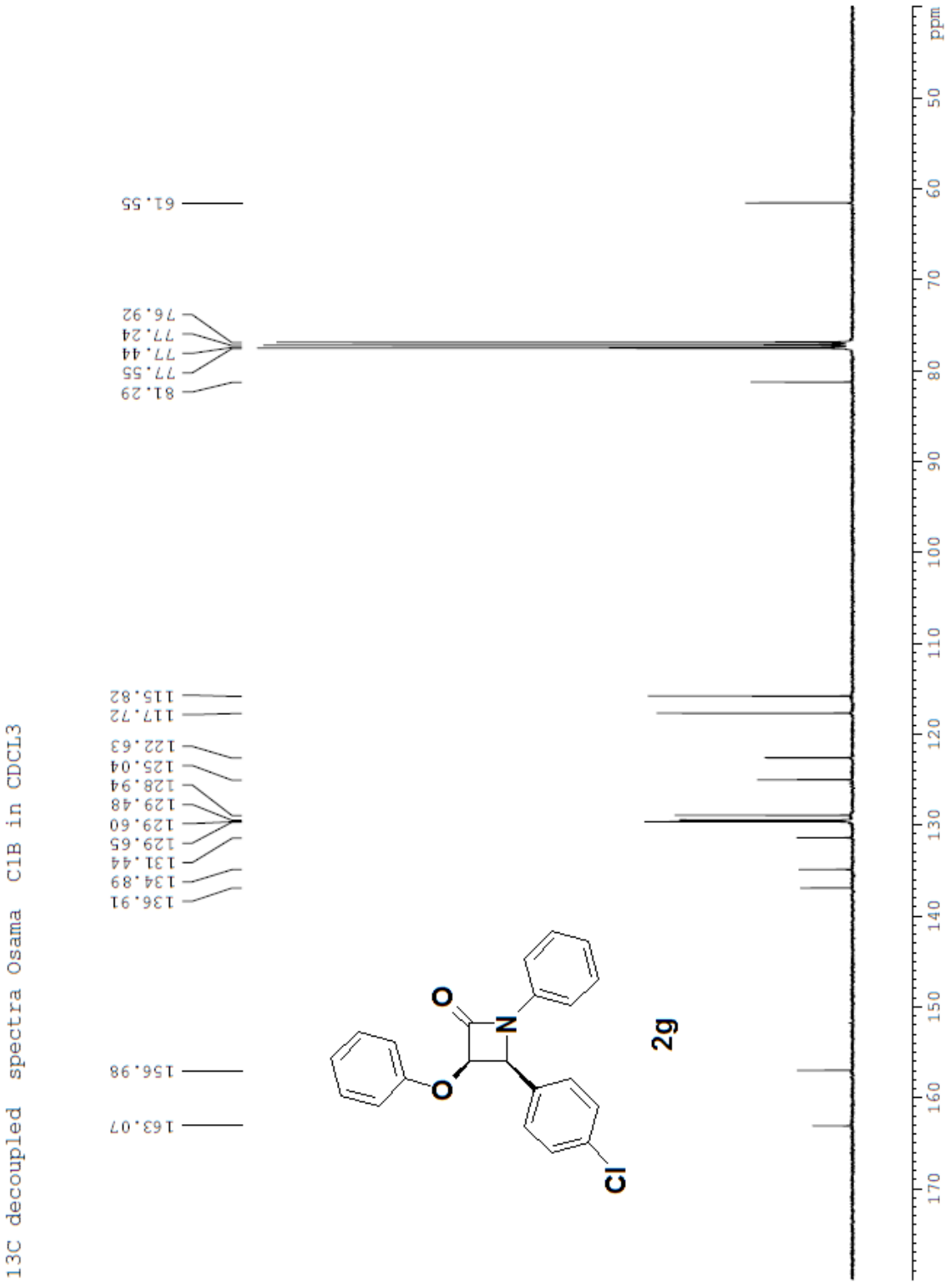


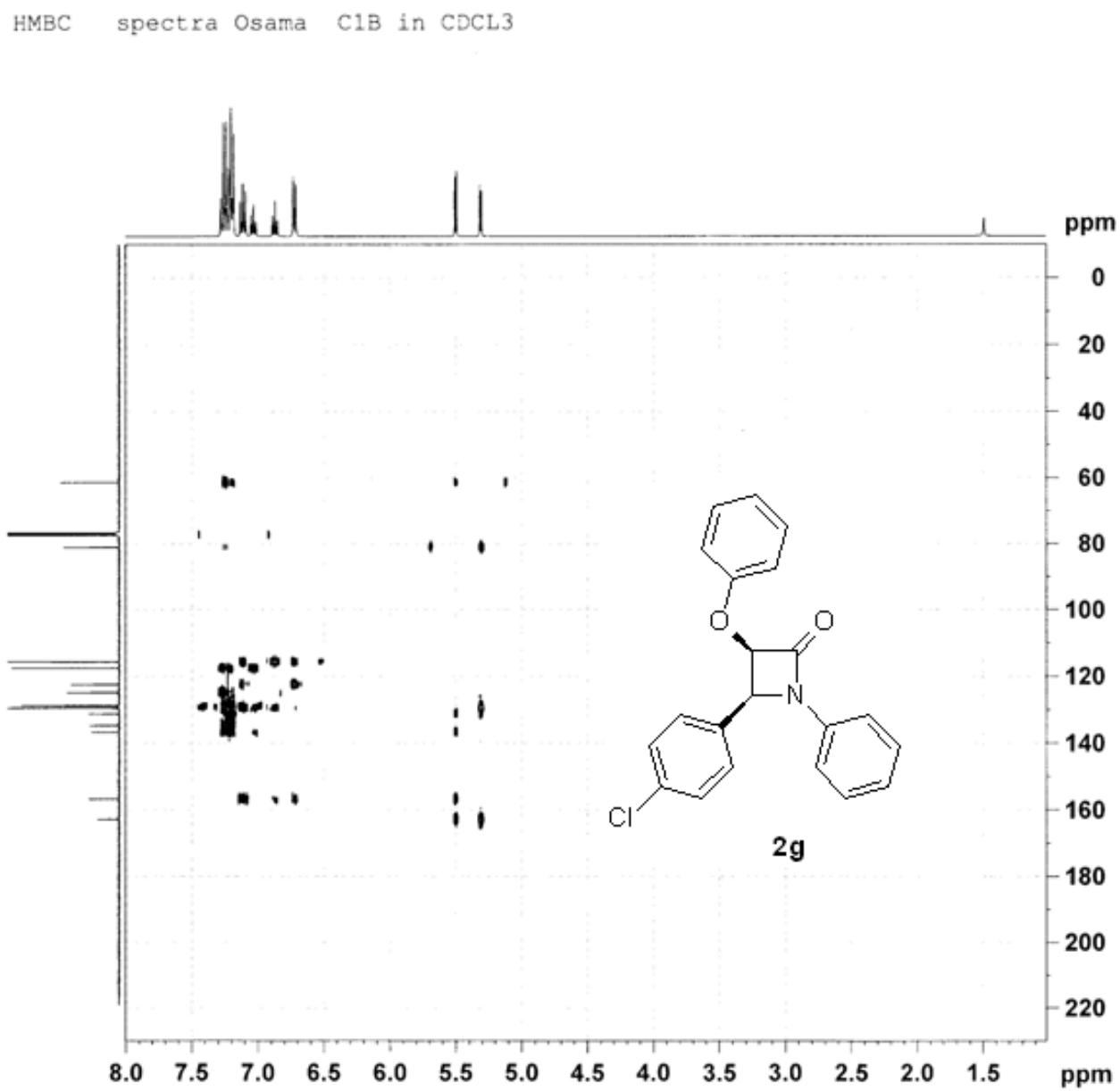
13C HMBC spectra Methoxy B in CDCl3

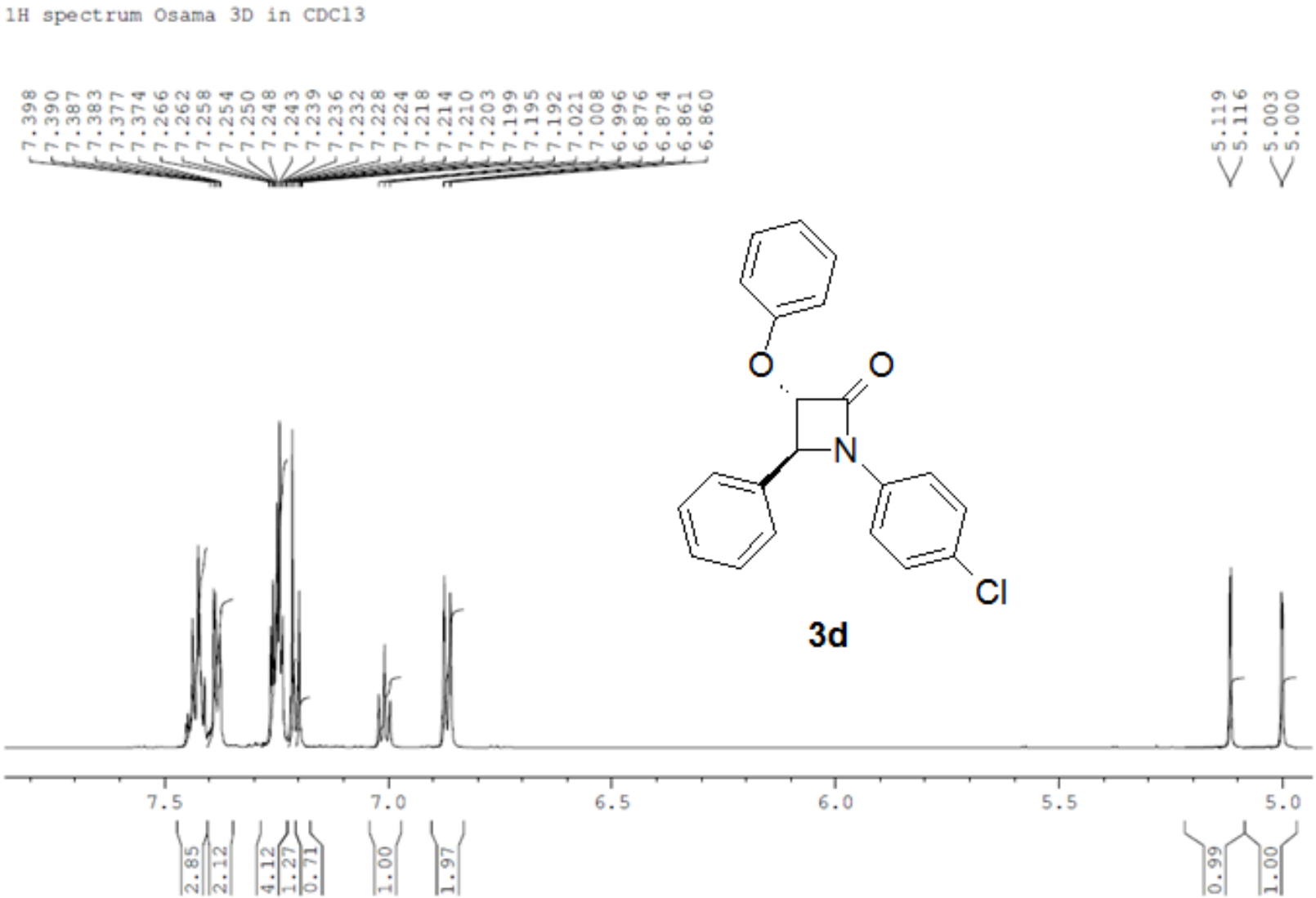


1H spectra Osama C1B in CDCL3

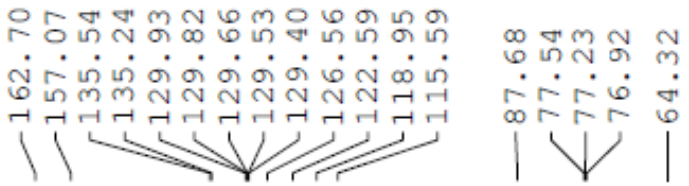


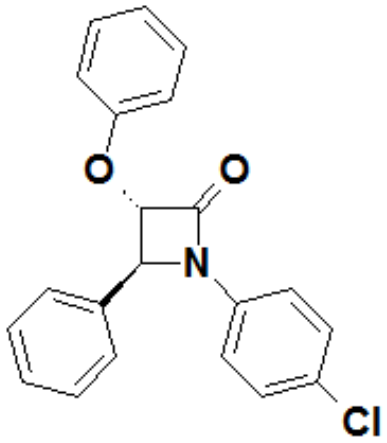

13C decoupled spectra Osama C1B in CDCL3
61.55
76.92
77.24
77.44
77.55
81.29
115.82
117.72
122.63
125.04
128.94
129.48
129.60
129.65
131.44
134.89
136.91
156.98
163.07
O
N
O
Cl
2g
ppm
50
60
70
80
90
100
110
120
130
140
150
160
170


13C HMBC spectra Osama C1B in CDCL3
ppm
0
20
40
60
80
100
120
140
160
180
200
220
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
ppm
O
O
N
Cl
2g

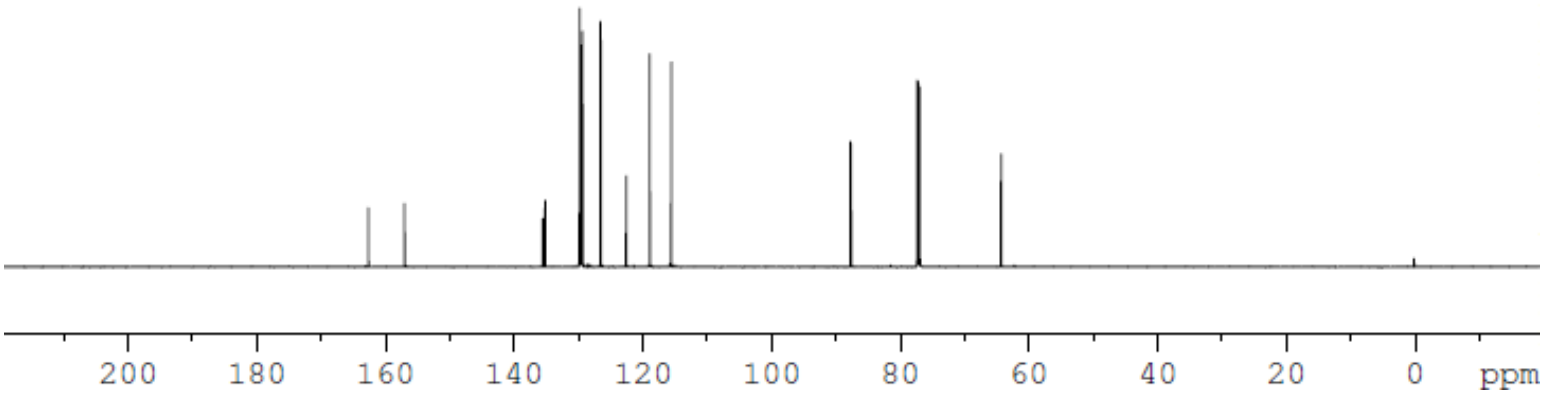

1H spectrum Osama 3D in CDCl3
7.398
7.390
7.387
7.383
7.377
7.374
7.266
7.262
7.258
7.254
7.250
7.248
7.243
7.239
7.236
7.232
7.228
7.224
7.218
7.214
7.210
7.203
7.199
7.195
7.192
7.021
7.008
6.996
6.876
6.874
6.861
6.860
5.119
5.116
5.003
5.000
O
O
N
Cl
3d
7.5
7.0
6.5
6.0
5.5
5.0
2.85
2.12
4.12
1.27
0.71
1.00
1.97
0.99
1.00

13C decoupled spectrum Osama 3D in CDCl3

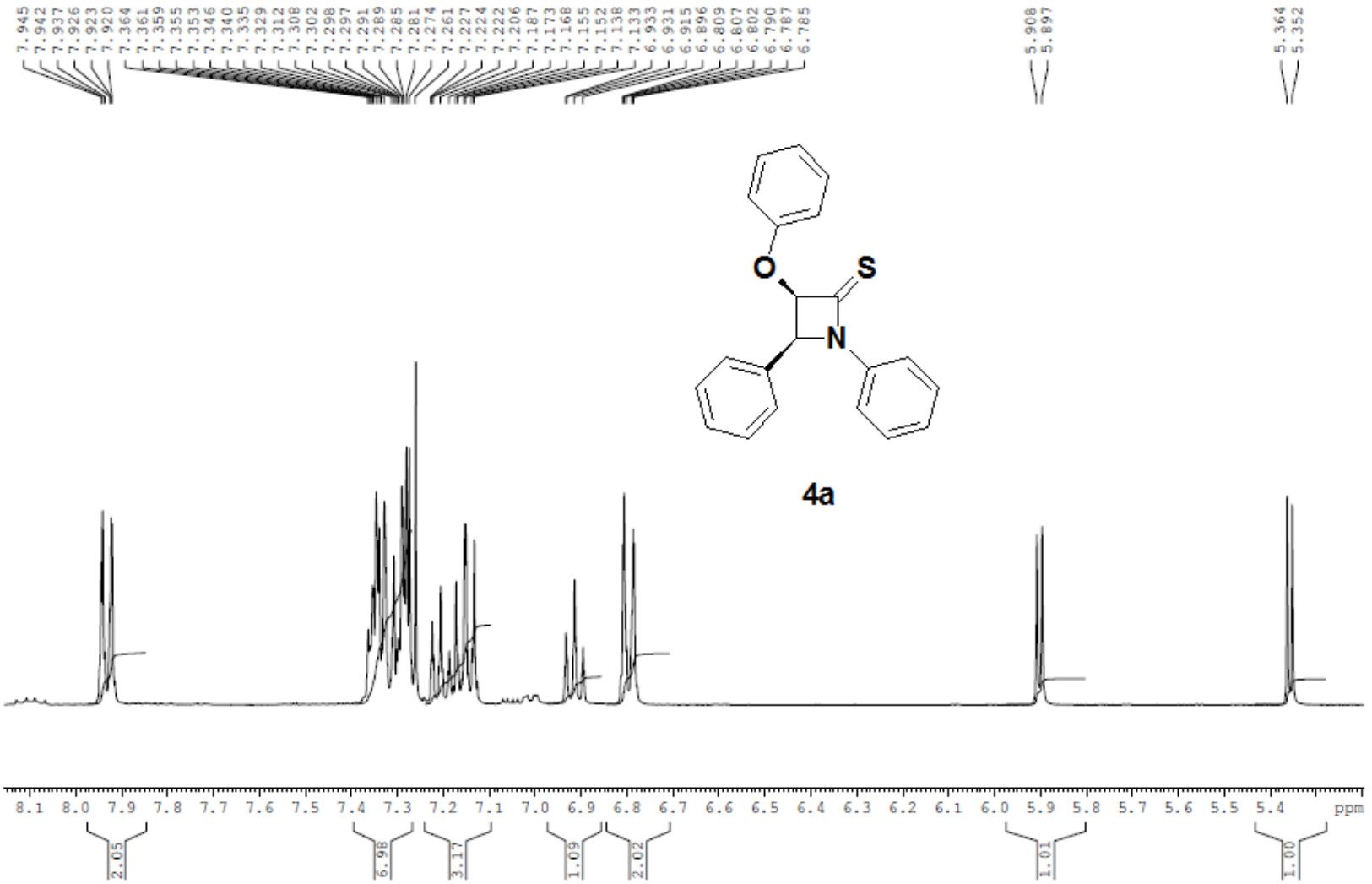




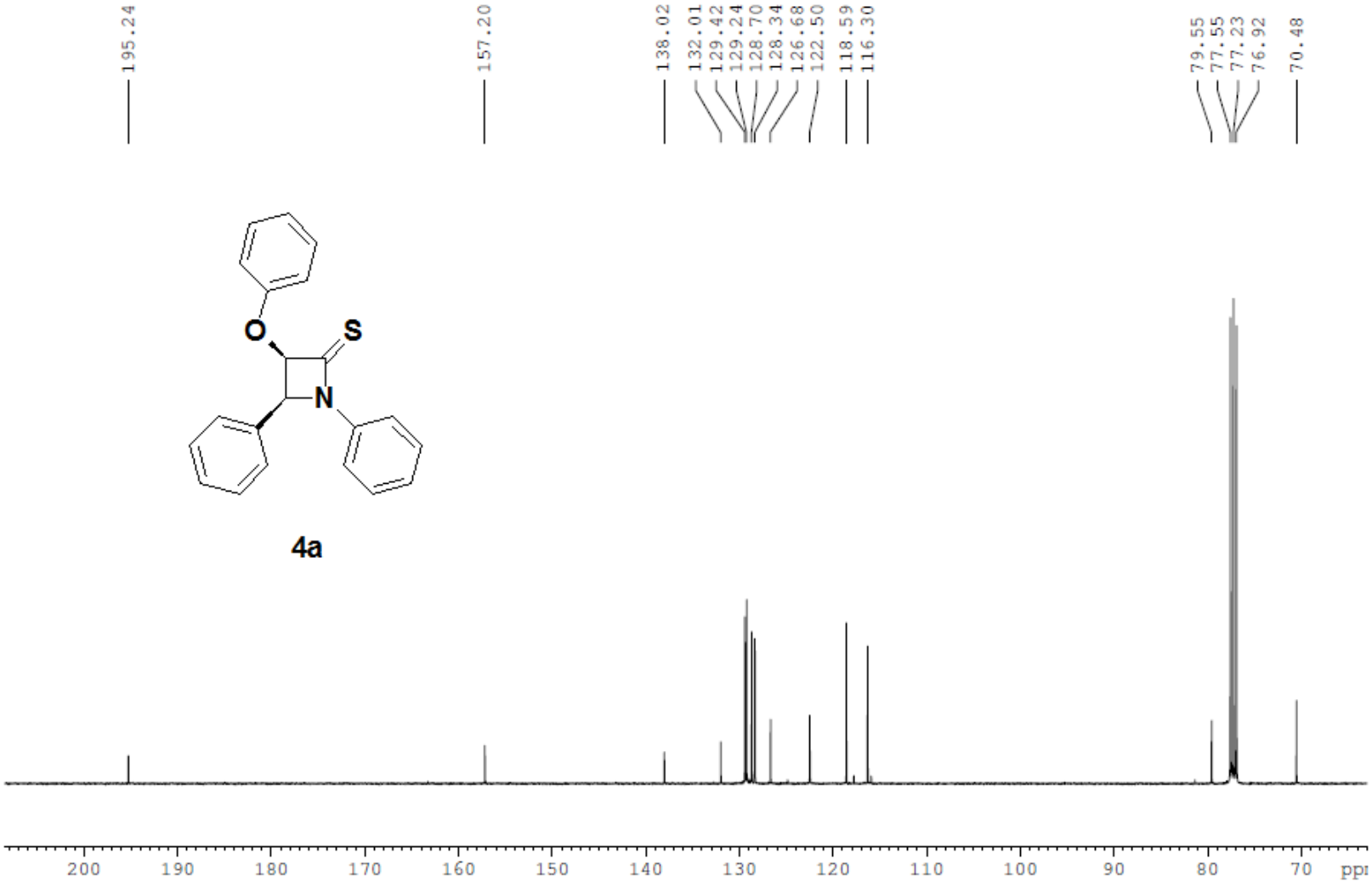
3d



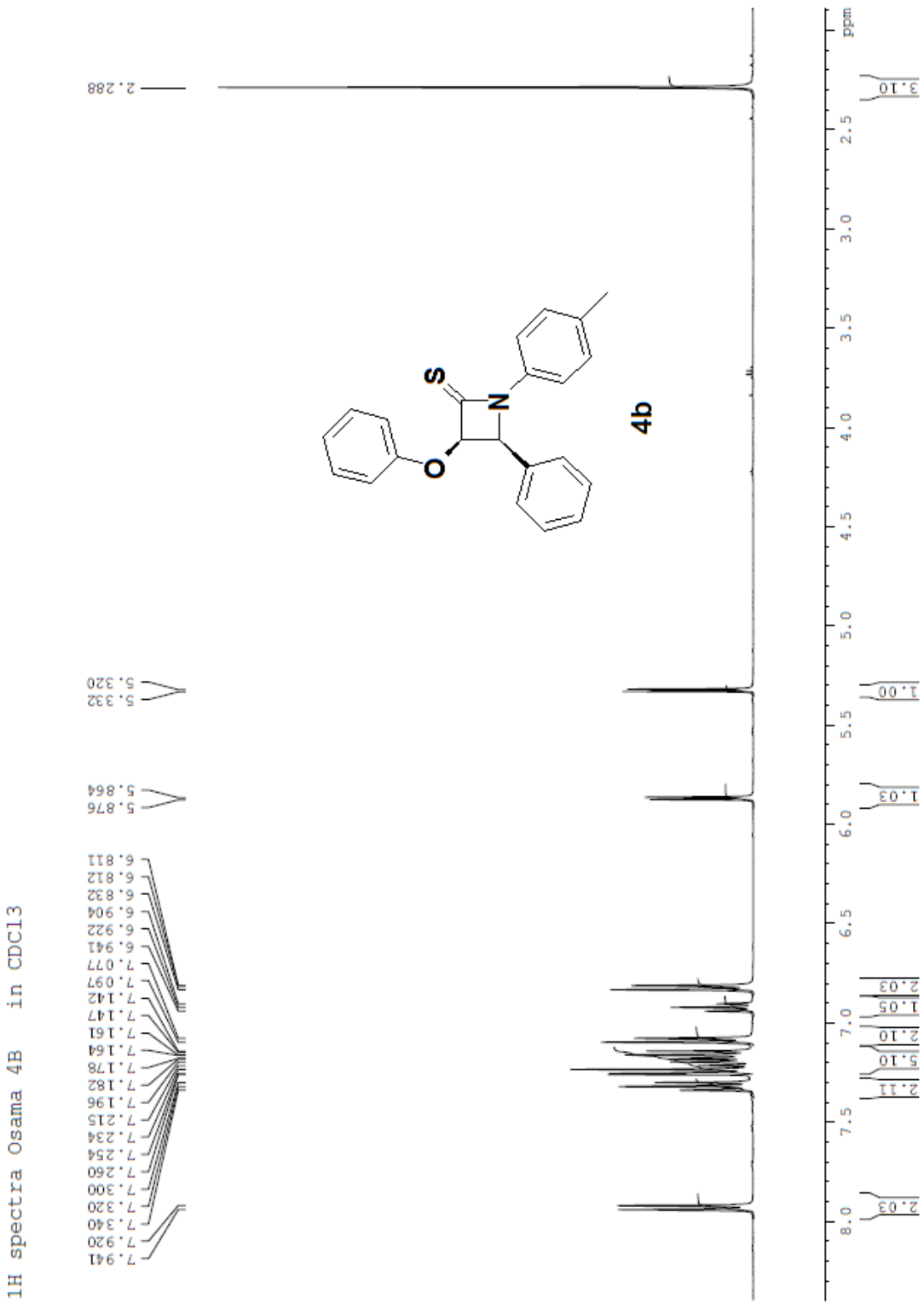
1H spectra Nouf thio in CDCl3

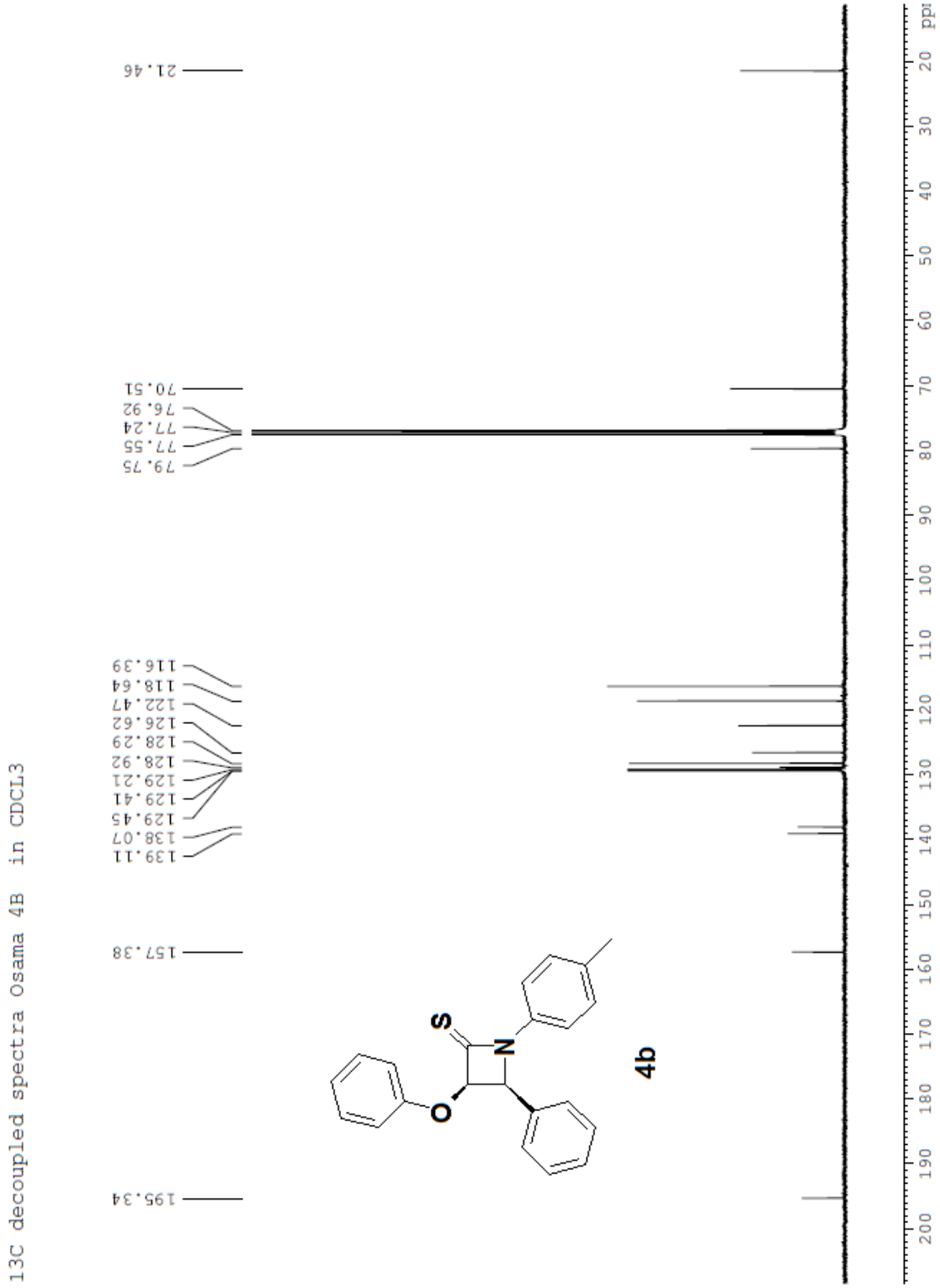


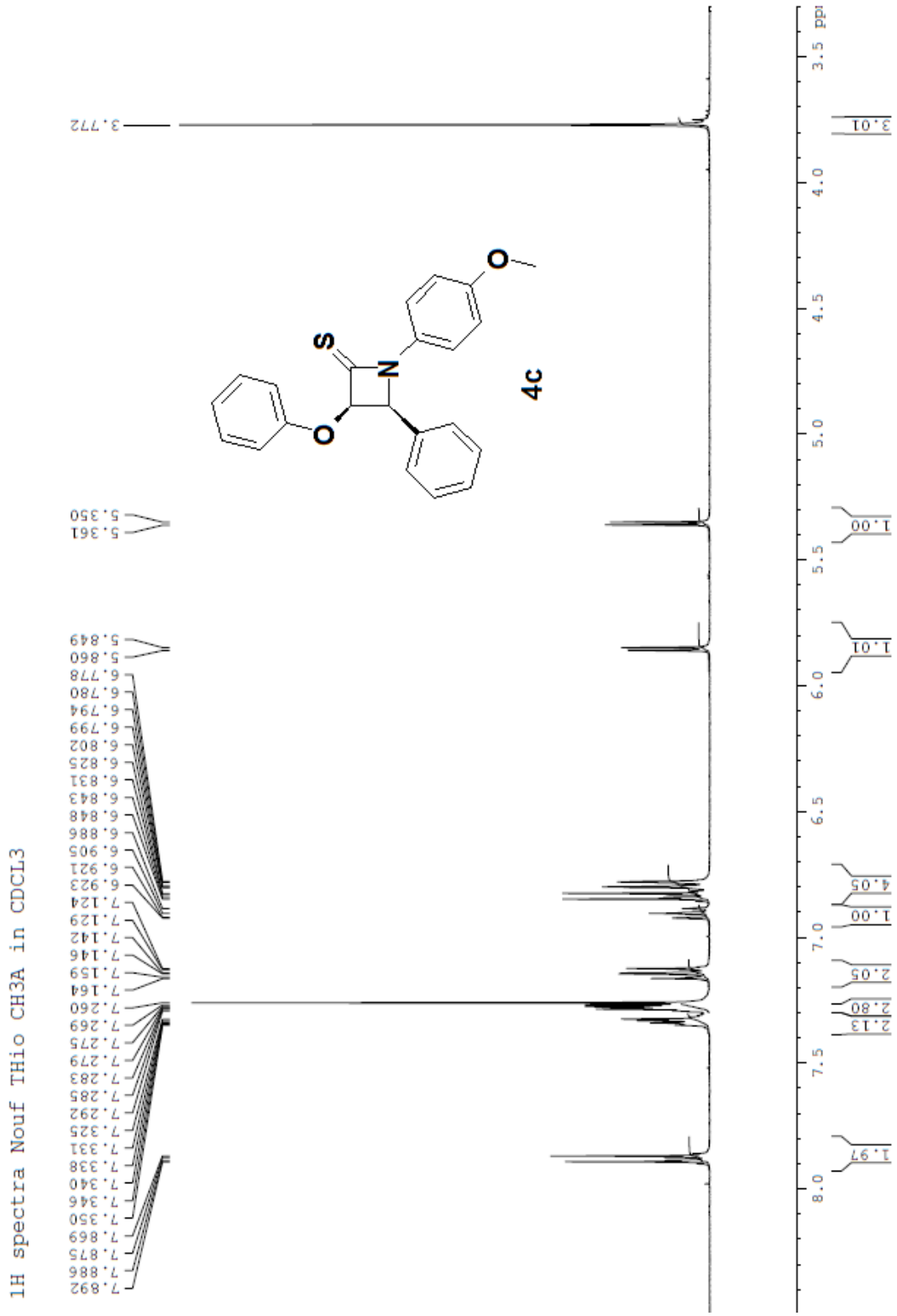
13C decoupled spectra Nouf T phenyl in CDCL3

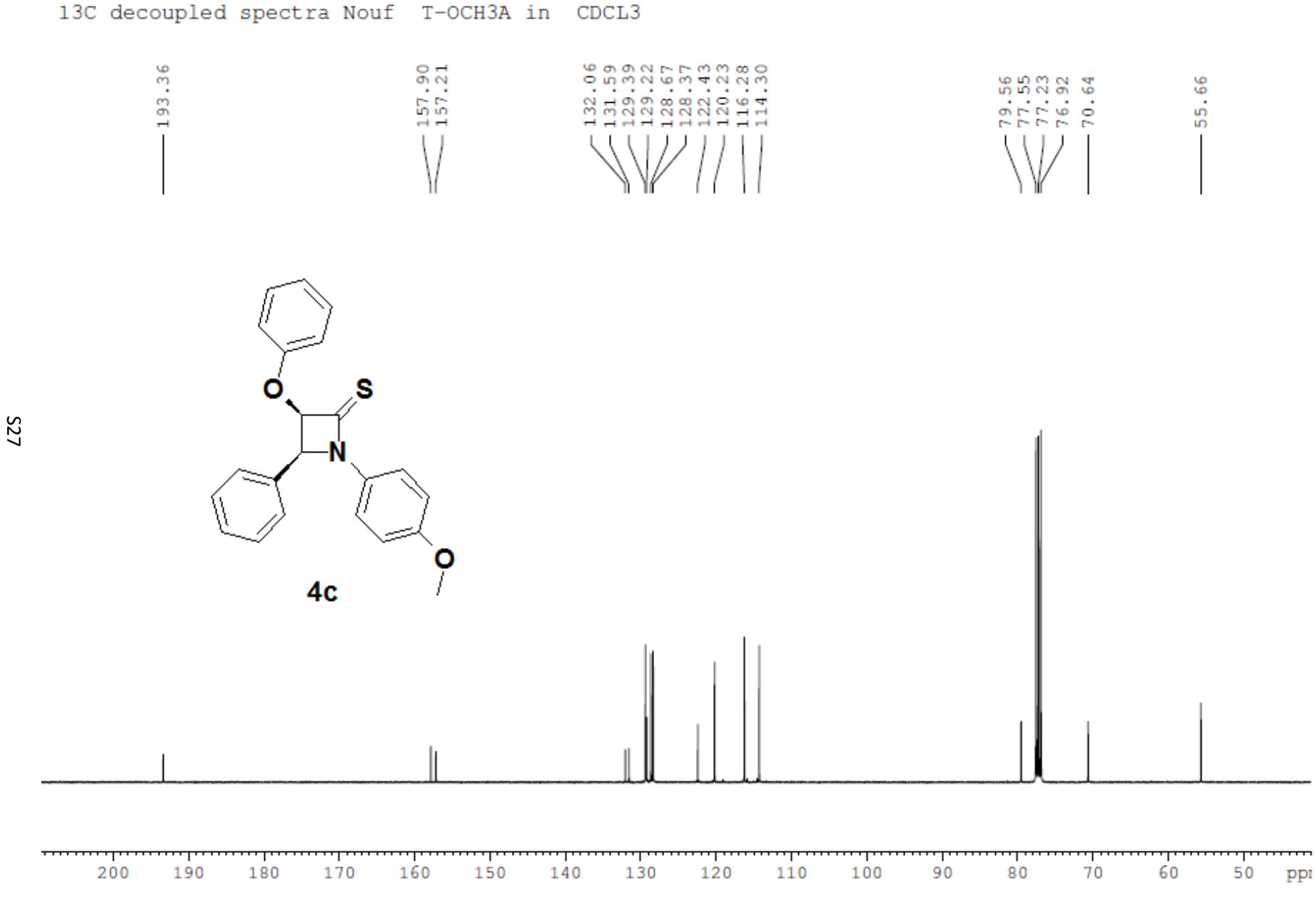


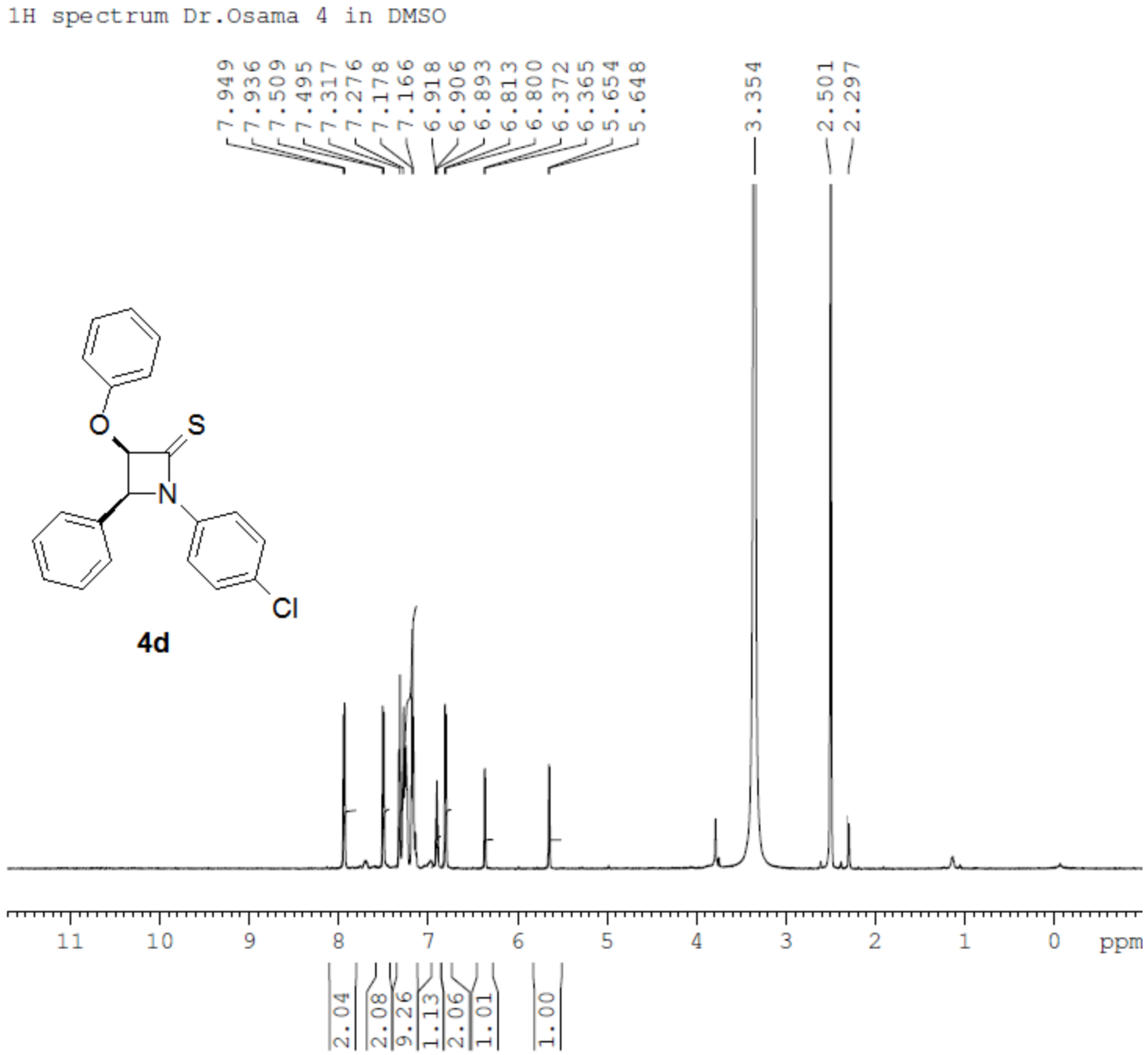
4a


1H spectra Osama 4B in CDCl3
2.288
5.320
5.332
5.864
5.876
6.811
6.812
6.832
6.904
6.922
6.941
7.077
7.097
7.142
7.147
7.161
7.164
7.178
7.182
7.196
7.215
7.234
7.254
7.260
7.300
7.320
7.340
7.920
7.941
S
N
O
4b
ppm
3.10
1.00
1.03
2.03
1.05
2.10
5.10
2.11
2.03

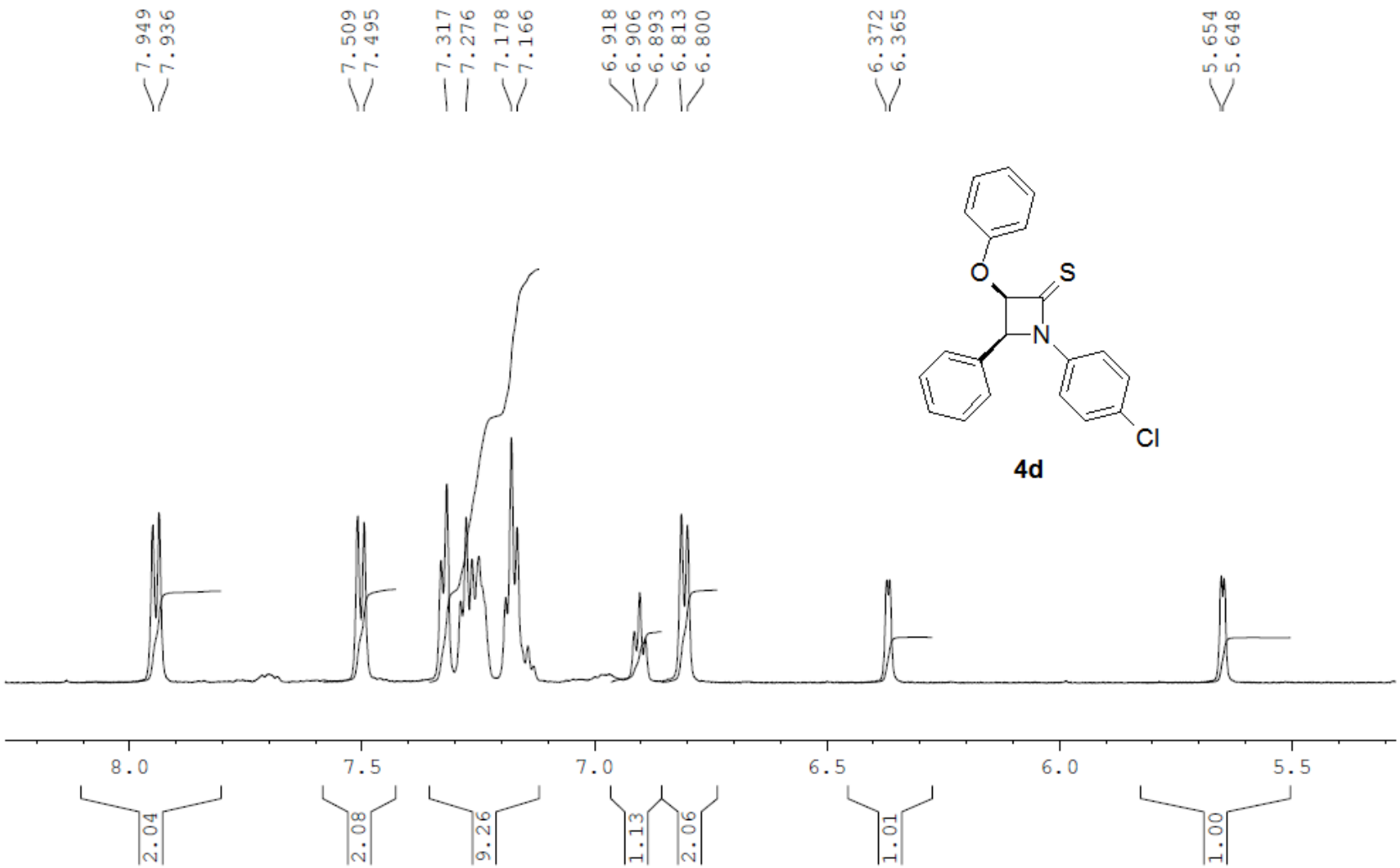

13C decoupled spectra Osama 4B in CDCL3
195.34
157.38
139.11
138.07
129.45
129.41
129.21
128.92
128.29
126.62
122.47
118.64
116.39
79.75
77.55
77.24
76.92
70.51
21.46
S
N
O
4b
ppm

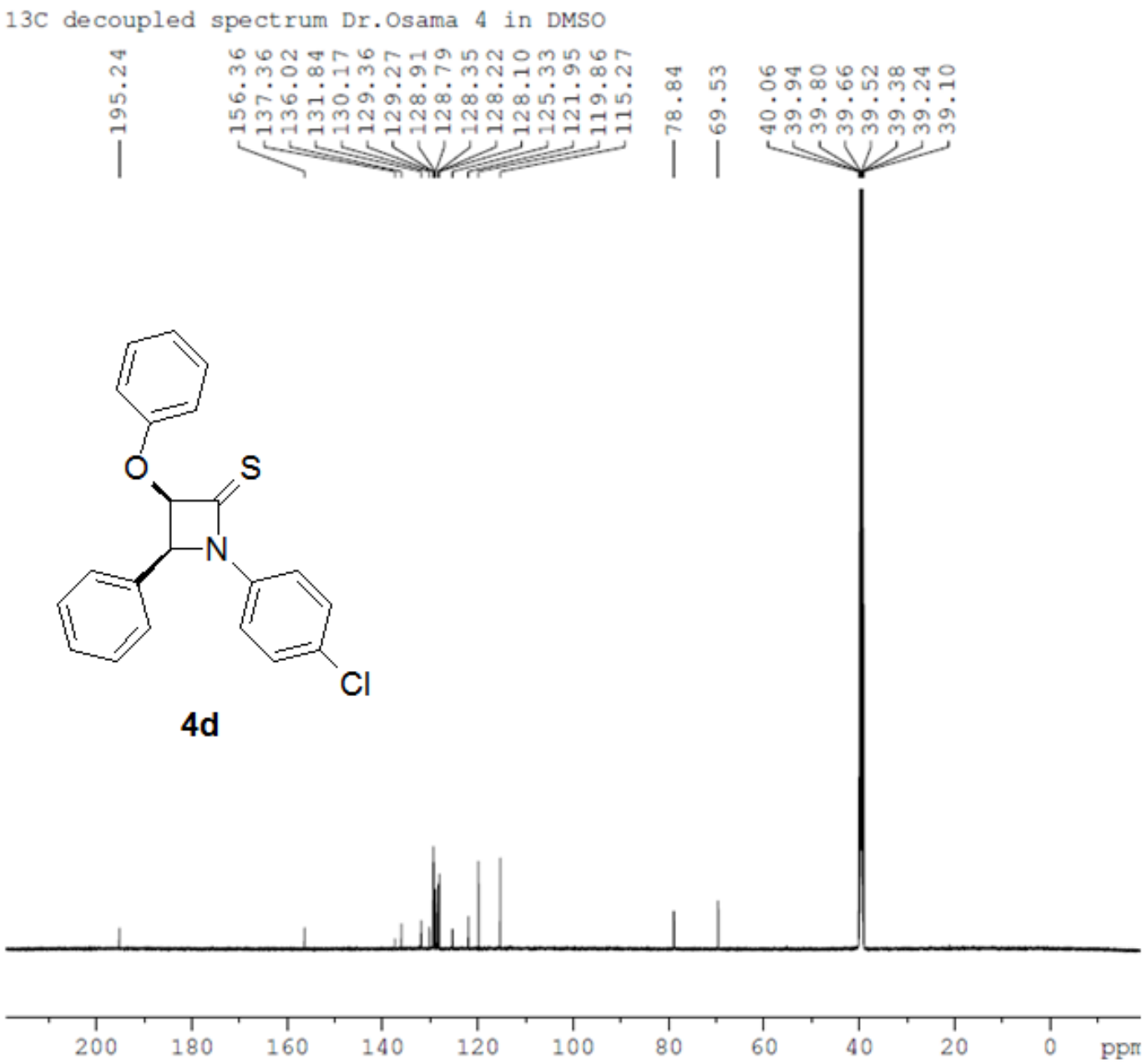

1H spectra Nouf THio CH3A in CDCL3
4c
3.772
5.361
5.350
5.849
5.860
6.778
6.780
6.794
6.799
6.802
6.825
6.831
6.843
6.848
6.886
6.905
6.921
6.923
7.124
7.129
7.142
7.146
7.159
7.164
7.260
7.269
7.275
7.279
7.283
7.285
7.292
7.325
7.331
7.338
7.340
7.346
7.350
7.869
7.875
7.886
7.892
3.01
1.00
1.01
4.05
1.00
2.05
2.80
2.13
1.97
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
ppm


13C decoupled spectra Nouf T-OCH3A in CDCL3
193.36
157.90
157.21
132.06
131.59
129.39
129.22
128.67
128.37
122.43
120.23
116.28
114.30
79.56
77.55
77.23
76.92
70.64
55.66
O
S
N
O
4c
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
ppm

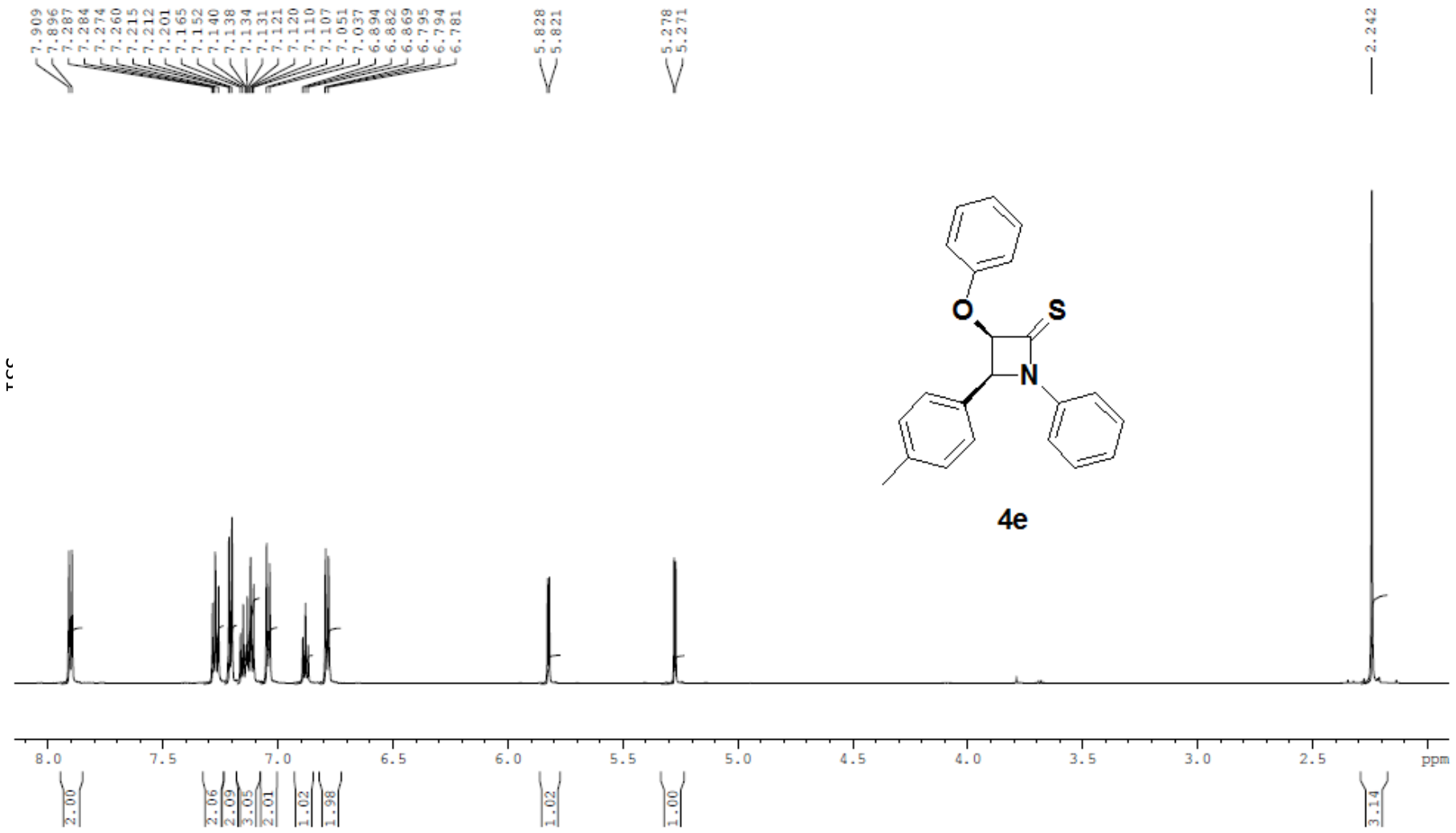

1H spectrum Dr.Osama 4 in DMSO
7.949
7.936
7.509
7.495
7.317
7.276
7.178
7.166
6.918
6.906
6.893
6.813
6.800
6.372
6.365
5.654
5.648
3.354
2.501
2.297
O
S
N
Cl
4d
11
10
9
8
7
6
5
4
3
2
1
0
ppm
2.04
2.08
9.26
1.13
2.06
1.01
1.00

1H spectrum Dr.Osama 4 in DMSO

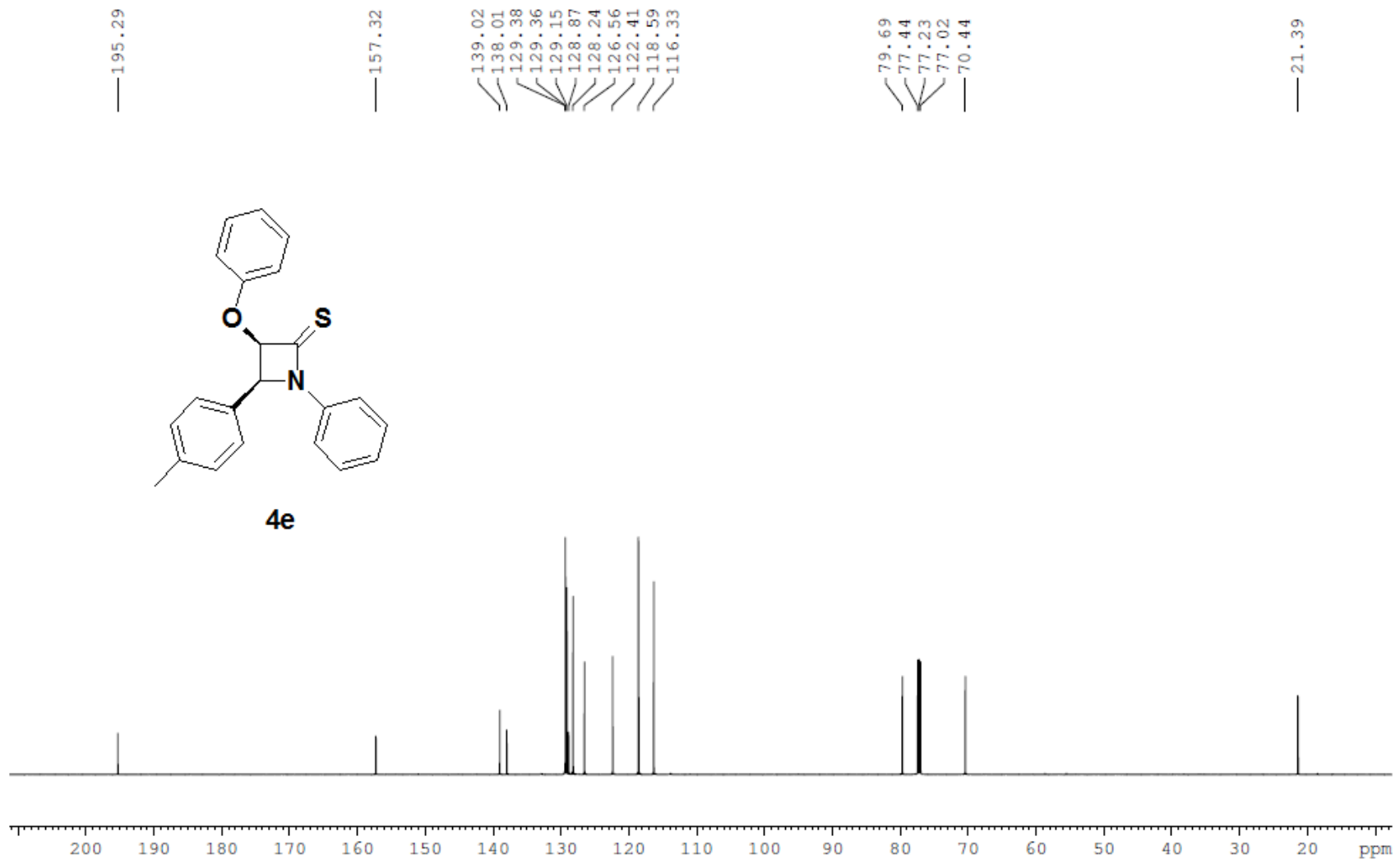



13C decoupled spectrum Dr.Osama 4 in DMSO
195.24
156.36
137.36
136.02
131.84
130.17
129.36
129.27
128.91
128.79
128.35
128.22
128.10
125.33
121.95
119.86
115.27
78.84
69.53
40.06
39.94
39.80
39.66
39.52
39.38
39.24
39.10
O
S
N
Cl
4d
200
180
160
140
120
100
80
60
40
20
0
ppm

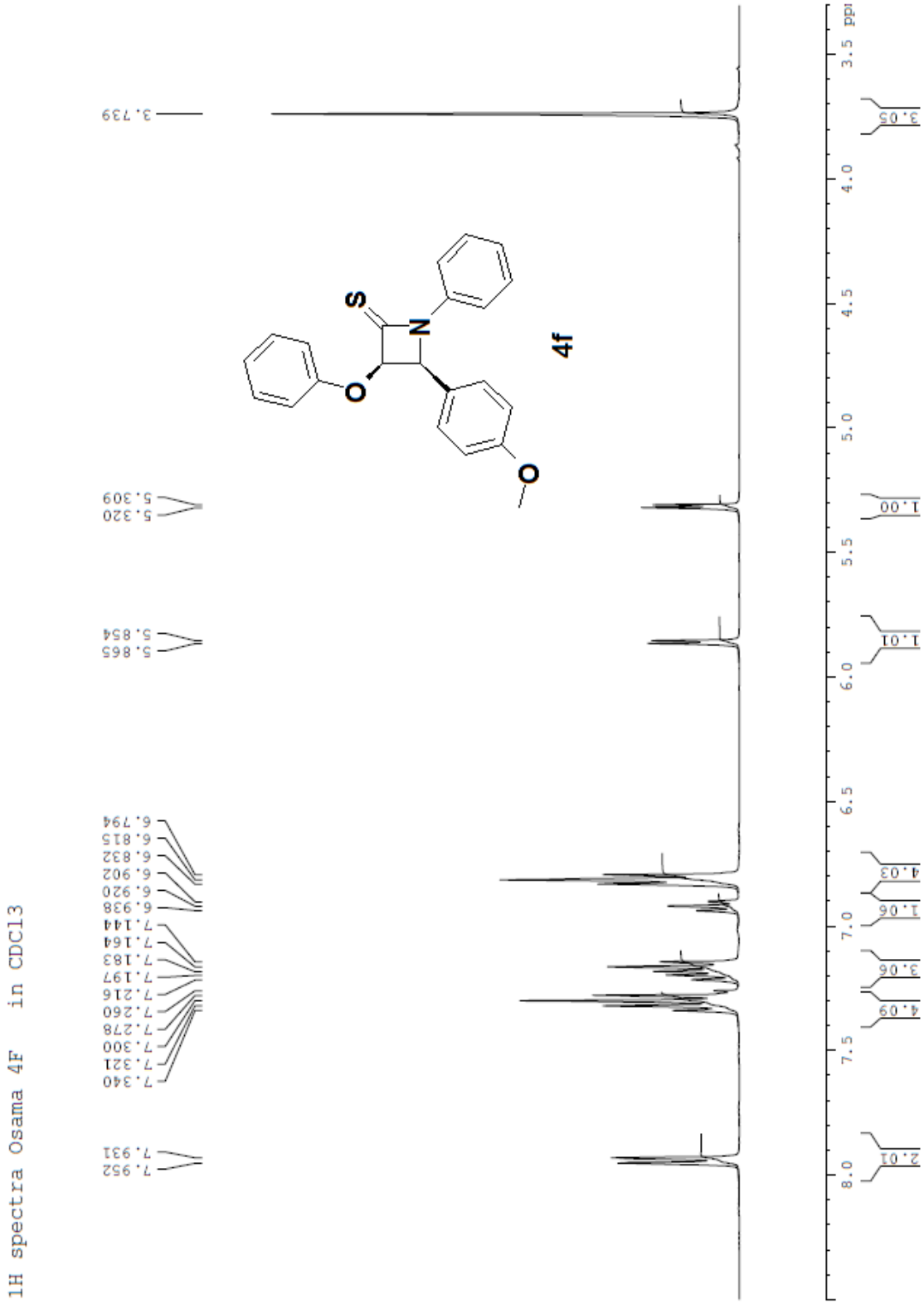
1H spectrum Dr.Osama 3 in CDCl3

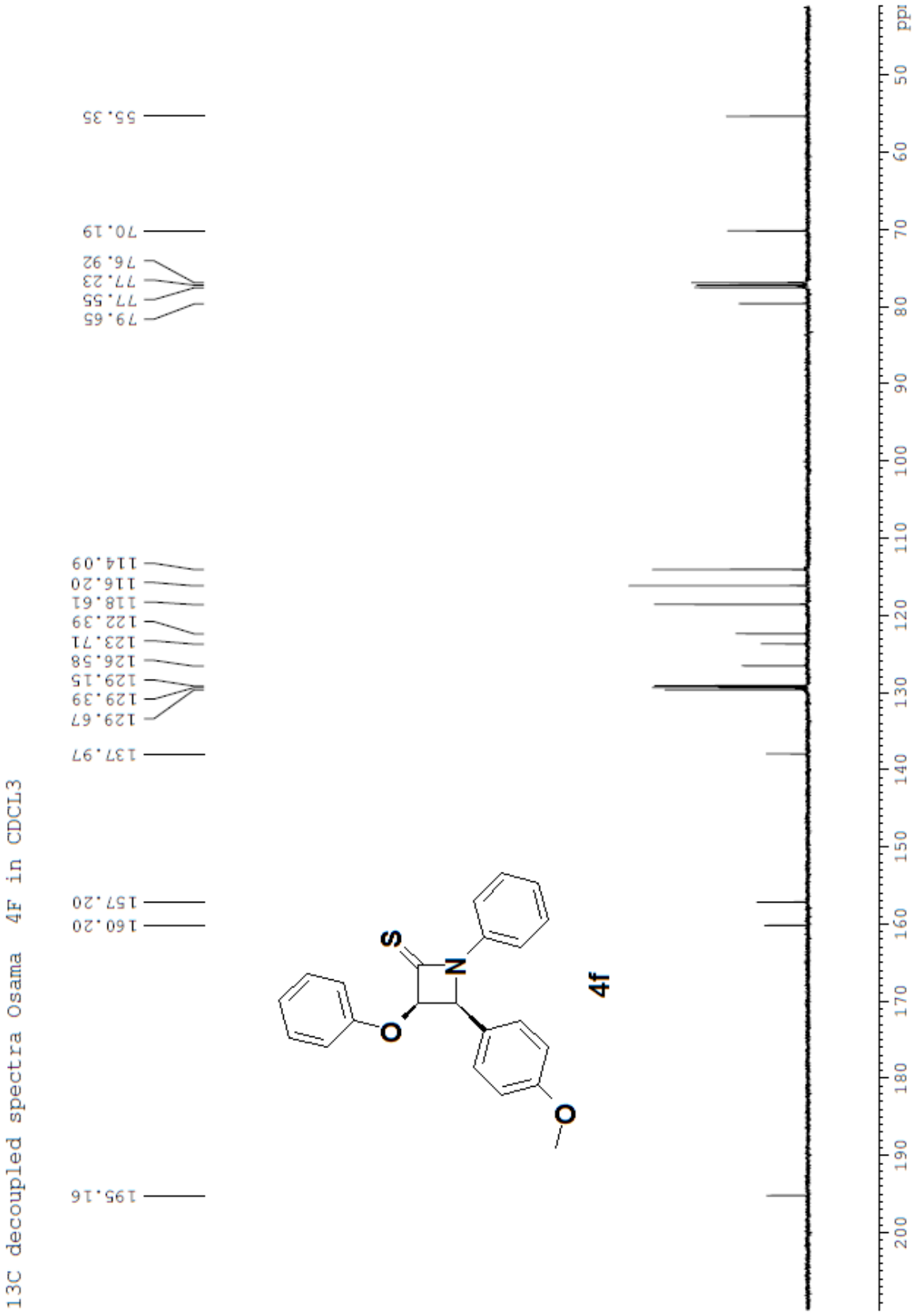


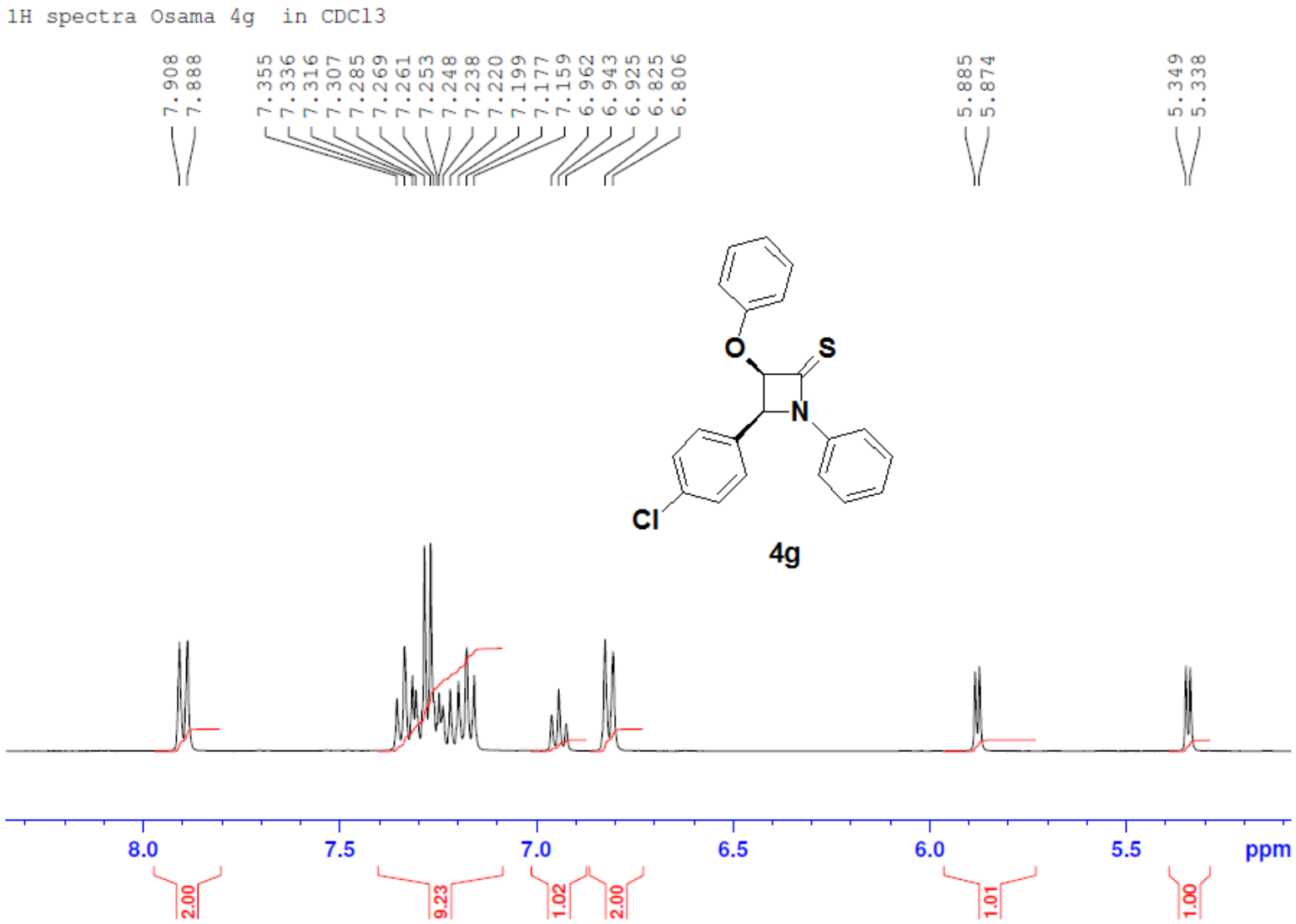
13C decoupled spectrum Dr.Osama 3 in CDCl3



4e


1H spectra Osama 4F in CDCl3
4f
3.739
5.309
5.320
5.854
5.865
6.794
6.815
6.832
6.902
6.920
6.938
7.144
7.164
7.183
7.197
7.216
7.260
7.278
7.300
7.321
7.340
7.931
7.952
3.05
1.00
1.01
4.03
1.06
3.06
4.09
2.01
ppm


13C decoupled spectra Osama 4F in CDCL3
55.35
70.19
76.92
77.23
77.55
79.65
114.09
116.20
118.61
122.39
123.71
126.58
129.15
129.39
129.67
137.97
157.20
160.20
195.16
S
N
O
O
4f
ppm


1H spectra Osama 4g in CDCl3
7.908
7.888
7.355
7.336
7.316
7.307
7.285
7.269
7.261
7.253
7.248
7.238
7.220
7.199
7.177
7.159
6.962
6.943
6.925
6.825
6.806
5.885
5.874
5.349
5.338
O
S
N
Cl
4g
8.0
7.5
7.0
6.5
6.0
5.5
ppm
2.00
9.23
1.02
2.00
1.01
1.00

13C decoupled spectra Osama 4G in CDCL3

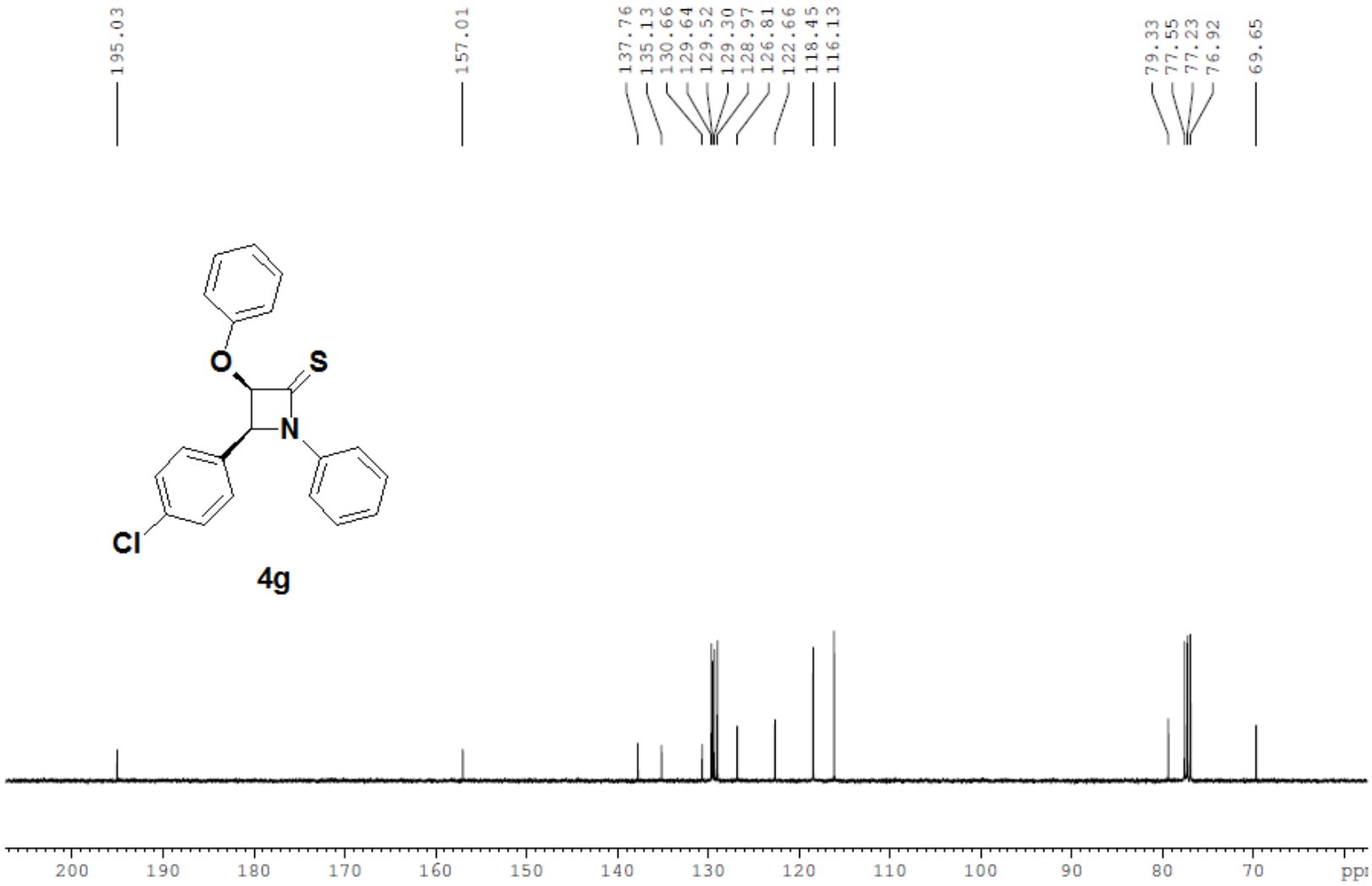
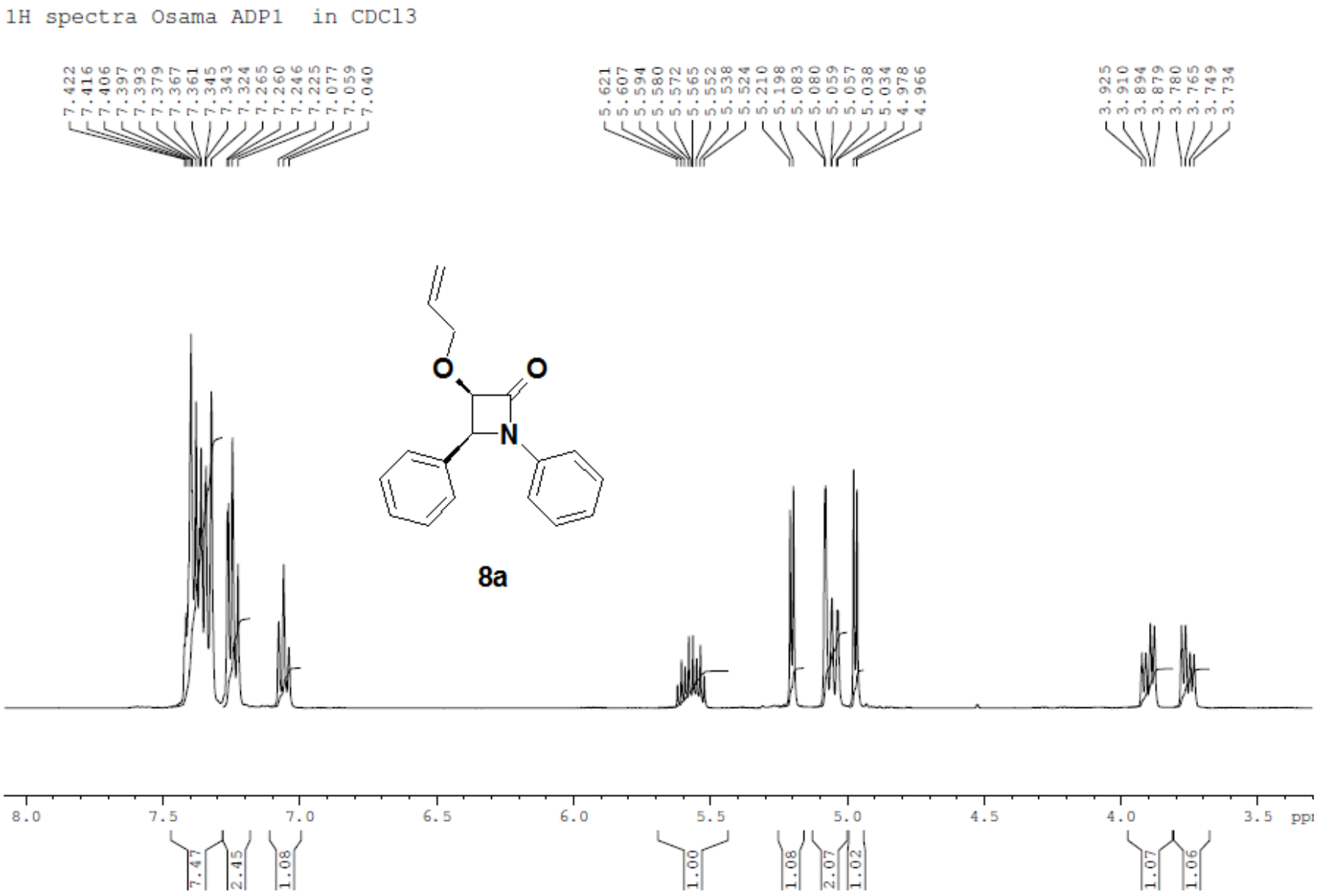


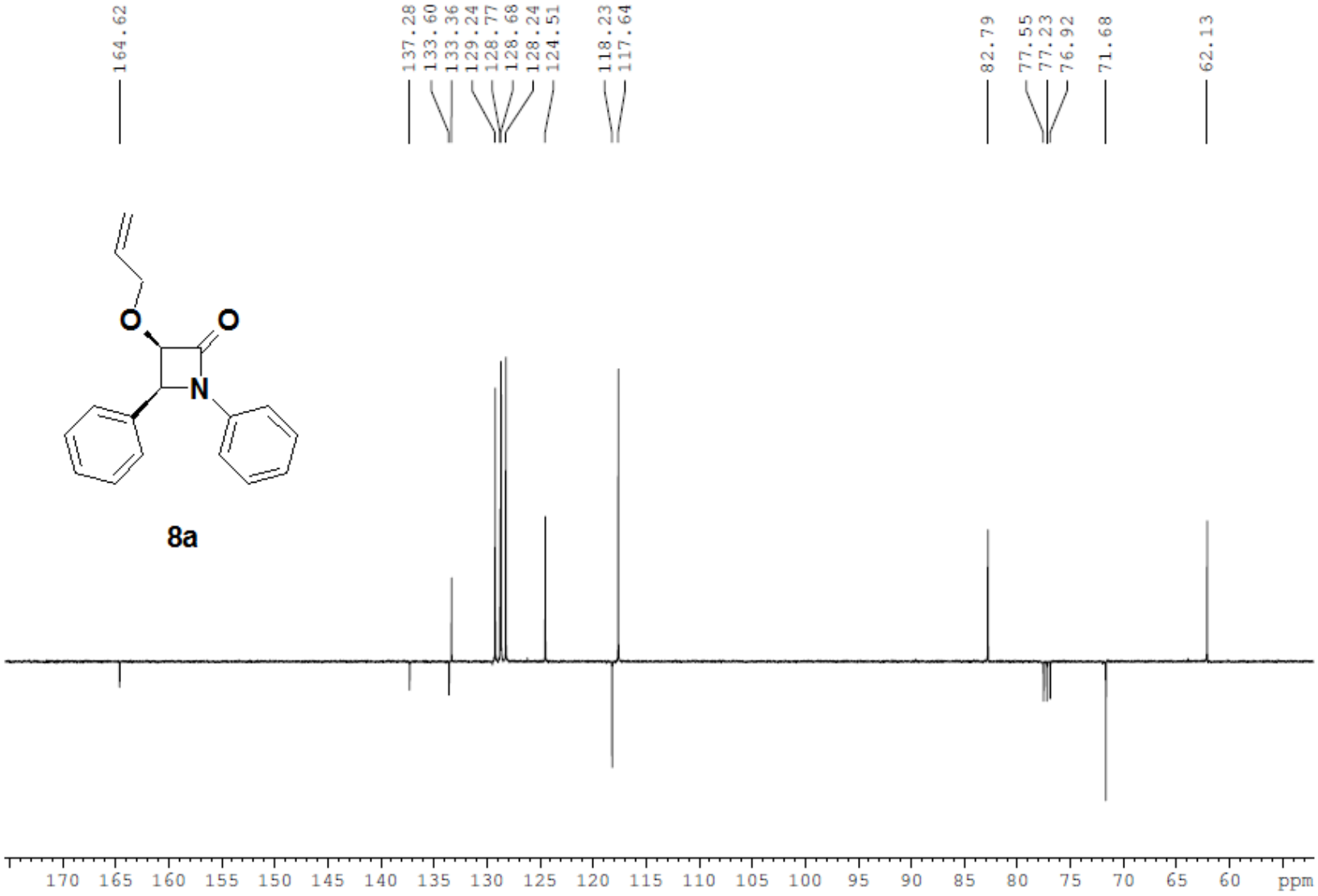
Table 1. Yield, ^{1}H-NMR and ^{13}C-NMR of azetidinones **2a-g**, **3d** and **4a-g** (H-3/C-3 and H-4/C-4)

Comp.	%yield	H3/C3	H4/C4
2a	67%,	5.60 (d, *J* 4.8)/81.1	5.43 (d, *J* 4.8)/62.1
2b	60%,	5.60 (d, *J* 4.8)/81.0	5.40 (d, *J* 4.8)/61.9
2c	60%,	5.67 (d, *J* 4.8)/81.2	5.40 (d, *J* 4.8)/62.2
2d	30%	5.58 (d, *J* 4.8)/81.4	5.38 (d, *J* 4.8)/62.2
2e	74%	5.57 (d, *J* 4.8)/81.2	5.40 (d, *J* 4.8)/61.9
2f	61%	5.56 (d, *J* 4.8)/81.2	5.40 (d, *J* 4.8)/61.7
2g	58%	5.60 (d, *J* 4.8)/81.0	5.40 (d, *J* 4.8)/61.1
3d	45%	5.11(d, *J* 1.8)/87.5	5.00 (d, *J* 1.8)/64.1
4a	67%	5.93 (d, *J* 4.8)/79.3	5.38 (d, *J* 4.8)/70.3
4b	69%	5.89 (d, *J* 4.4)/79.5	5.35 (d, *J* 4.4)/70.2
4c	71%	5.87 (d, *J* 4.4)/79.3	5.35 (d, *J* 4.4)/70.4
4d	77%	5.90 (d, *J* 4.8)/79.3	5.38 (d, *J* 4.8)/70.2
4e	65%	5.89 (d, *J* 4.4)/79.5	5.35 (d, *J* 4.4)/70.2
4f	73%	5.87 (d, *J* 4.4)/79.4	5.34 (d, *J* 4.4)/69.9
4g	72%	5.88 (d, *J* 4.8)/79.1	5.35 (d, *J* 4.8)/69.4

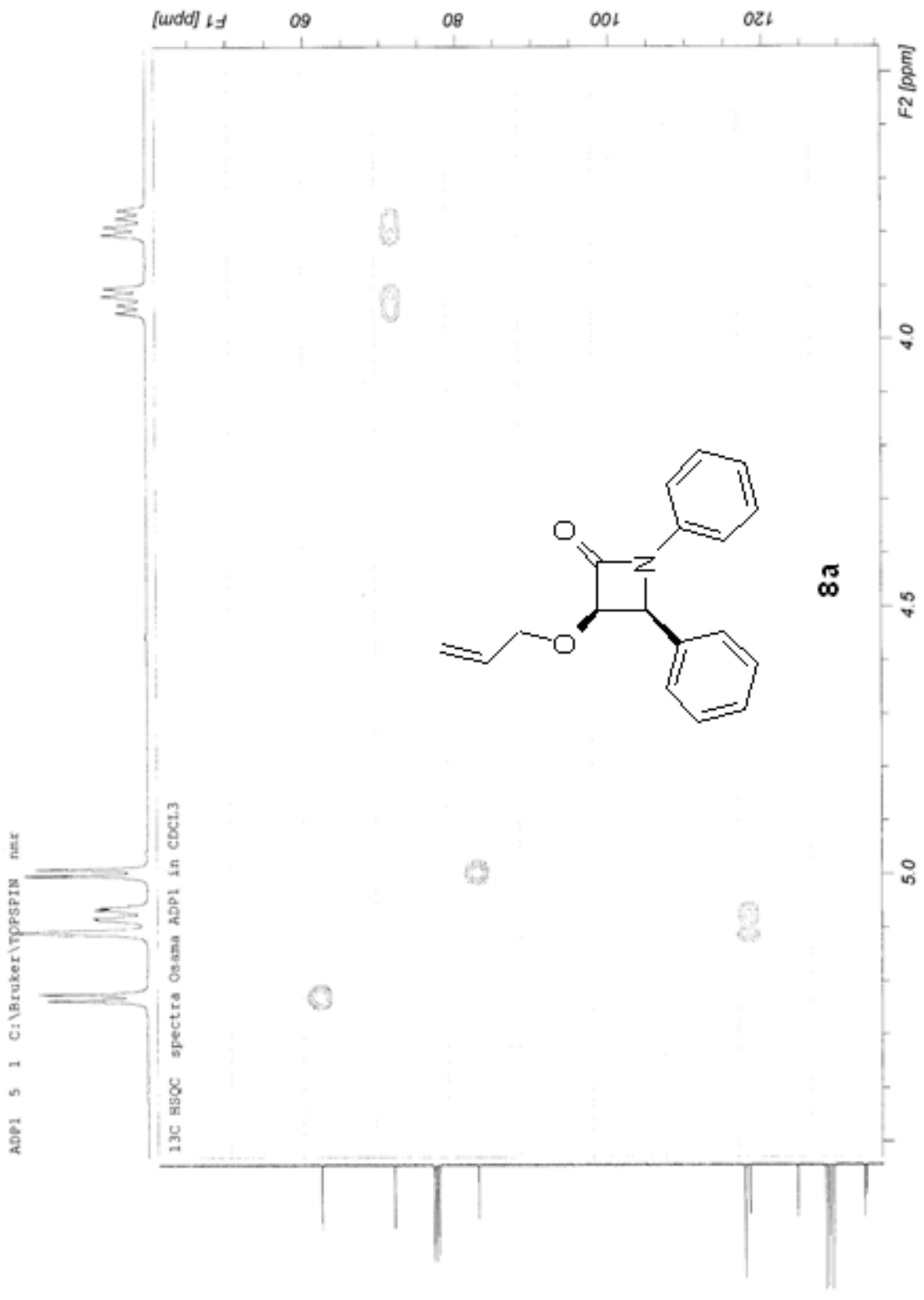
Assignment of H3, H4 proton signals is based on their cross correlations with their respective carbon signals in the 2D-HSQC NMR spectra.

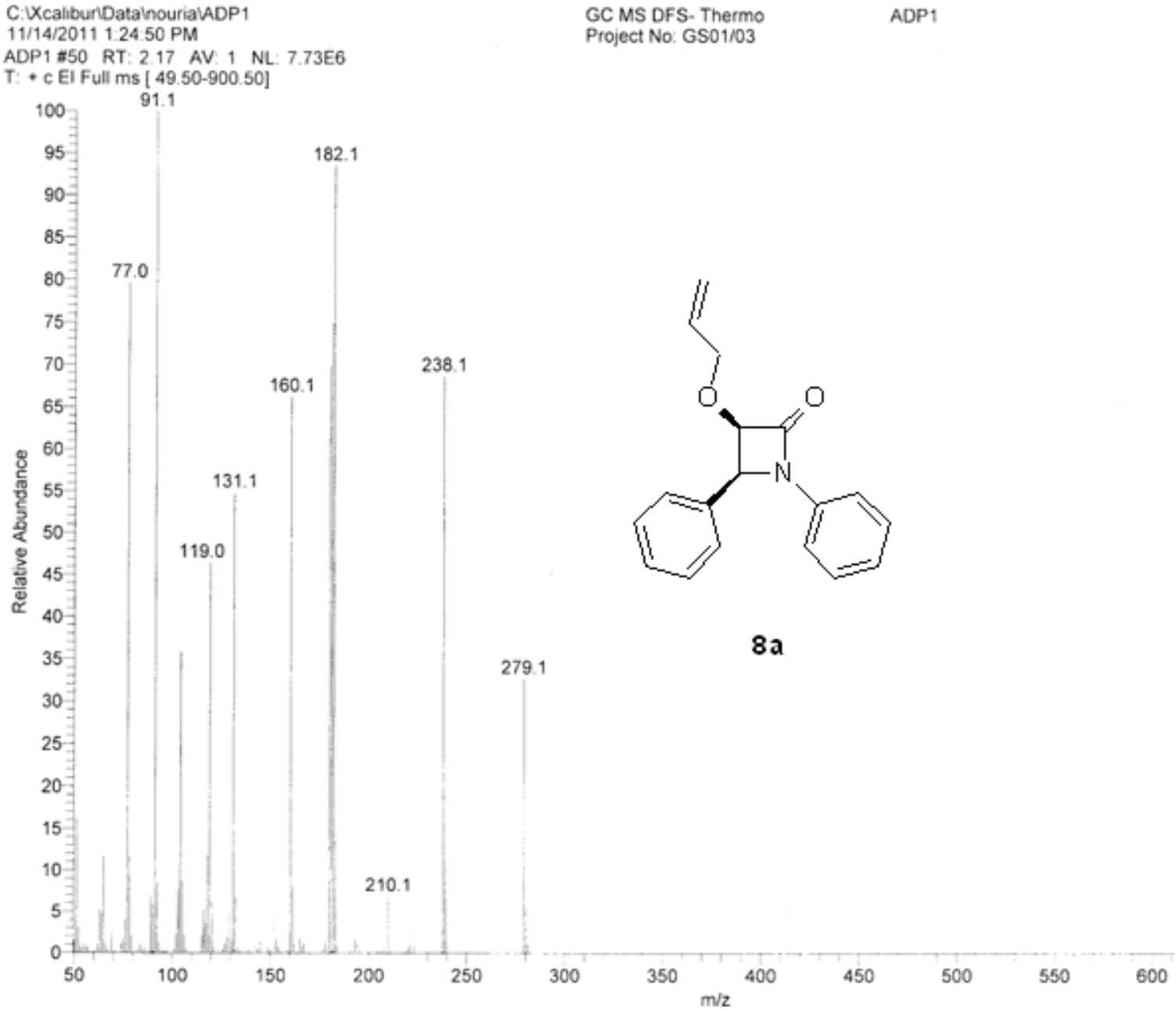

1H spectra Osama ADP1 in CDCl3
7.422
7.416
7.406
7.397
7.393
7.379
7.367
7.361
7.345
7.343
7.324
7.265
7.260
7.246
7.225
7.077
7.059
7.040
5.621
5.607
5.594
5.580
5.572
5.565
5.552
5.538
5.524
5.210
5.198
5.083
5.080
5.059
5.057
5.038
5.034
4.978
4.966
3.925
3.910
3.894
3.879
3.780
3.765
3.749
3.734
O
O
N
8a
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
ppm
7.47
2.45
1.08
1.00
1.08
2.07
1.02
1.07
1.06

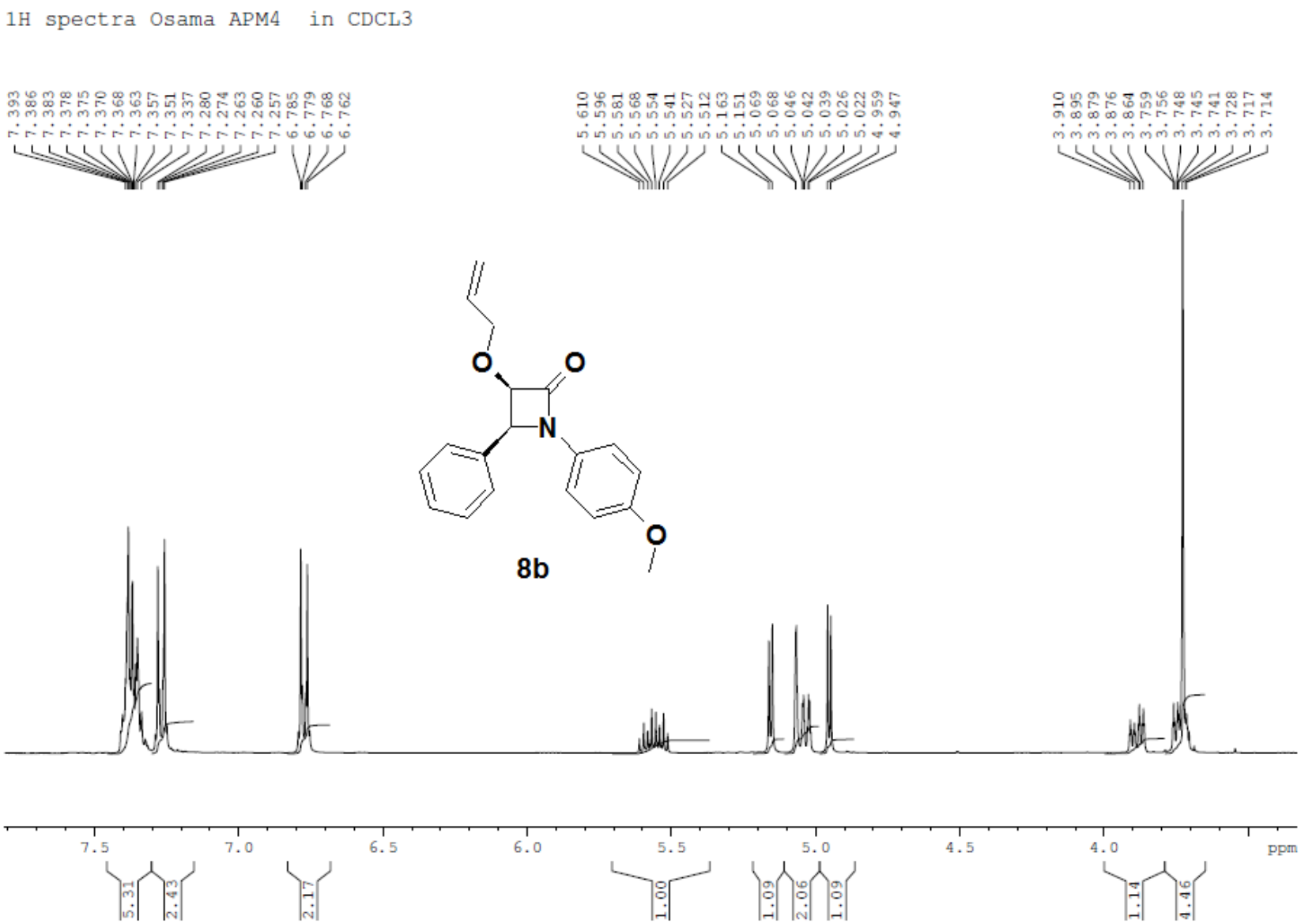
13C APT spectra Osama ADP1 in CDCL3

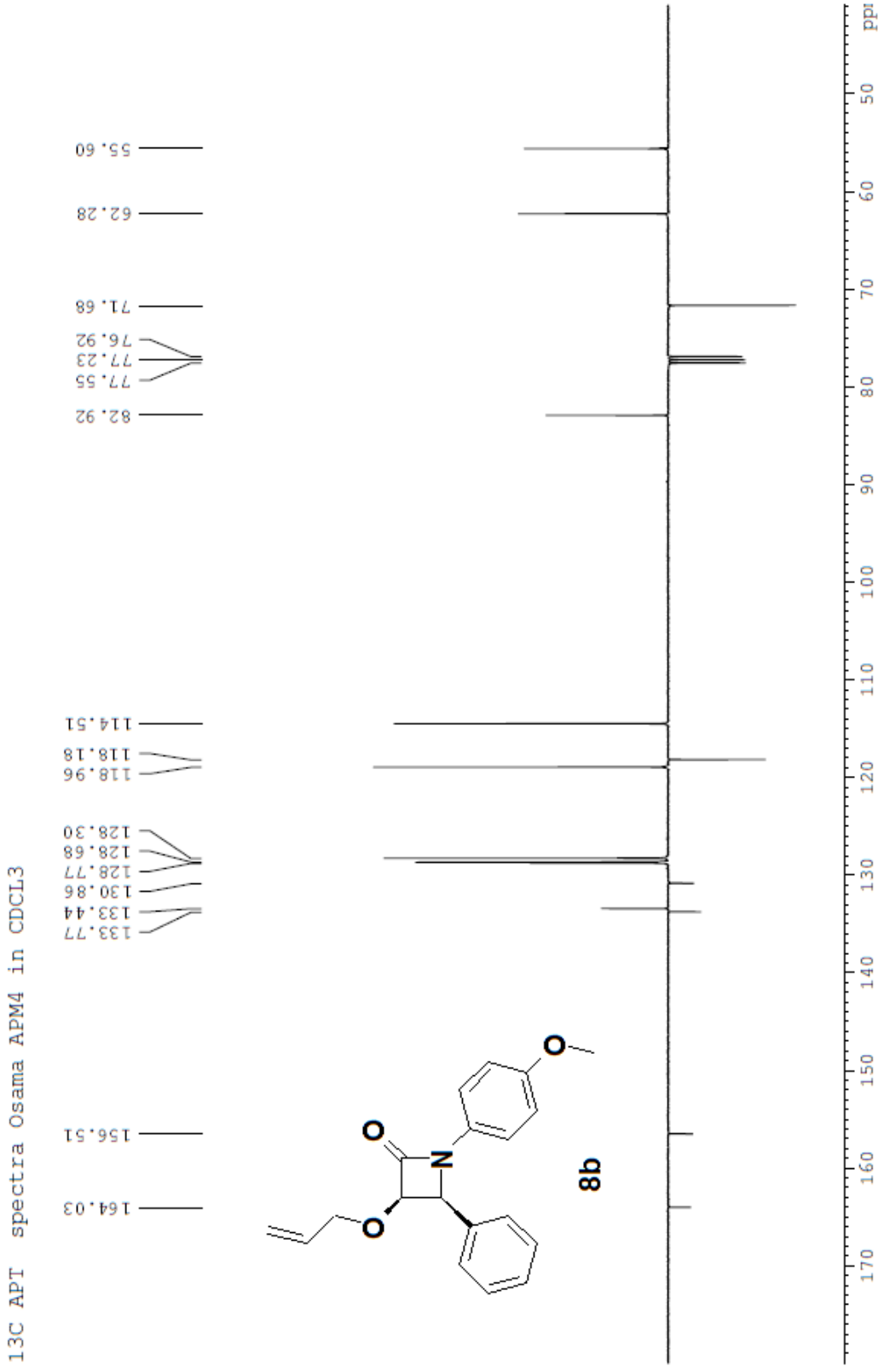


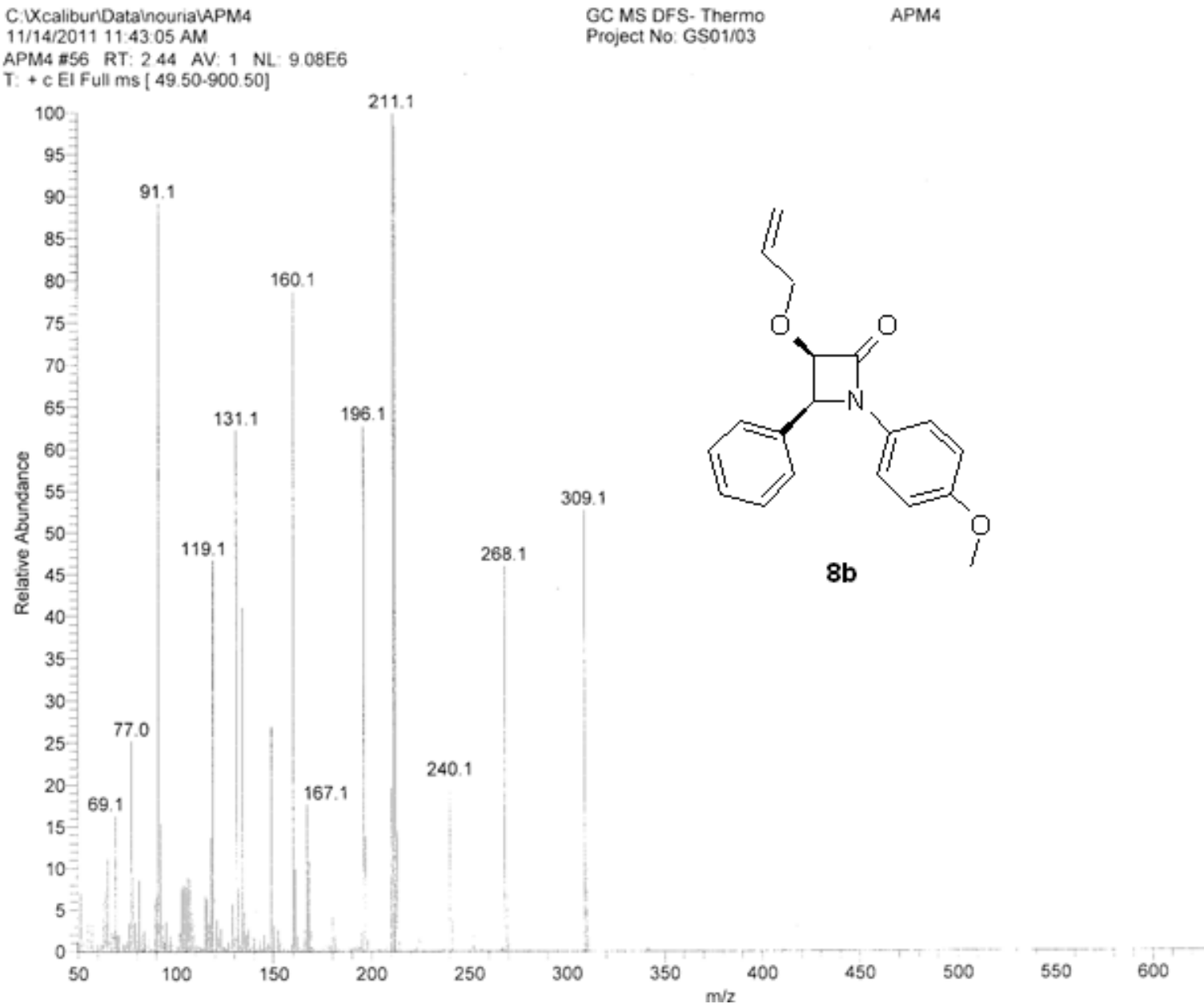
8a


ADP1 5 1 C:\Bruker\TOPSPIN nmr
13C HSQC spectra Osama ADP1 in CDCl3
F1 [ppm]
F2 [ppm]
60
80
100
120
4.0
4.5
5.0
O
N
O
8a


C:\Xcalibur\Data\nouria\ADP1
11/14/2011 1.24.50 PM
ADP1 #50 RT: 2.17 AV: 1 NL: 7.73E6
T: + c EI Full ms [49.50-900.50]
GC MS DFS- Thermo
Project No: GS01/03
ADP1
Relative Abundance
m/z
91.1
182.1
77.0
238.1
160.1
131.1
119.0
279.1
210.1
O
O
N
8a


1H spectra Osama APM4 in CDCL3
7.393
7.386
7.383
7.378
7.375
7.370
7.368
7.363
7.357
7.351
7.337
7.280
7.274
7.263
7.260
7.257
6.785
6.779
6.768
6.762
5.610
5.596
5.581
5.568
5.554
5.541
5.527
5.512
5.163
5.151
5.069
5.068
5.046
5.042
5.039
5.026
5.022
4.959
4.947
3.910
3.895
3.879
3.876
3.864
3.759
3.756
3.748
3.745
3.741
3.728
3.717
3.714
O
O
N
O
8b
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
ppm
5.31
2.43
2.17
1.00
1.09
2.06
1.09
1.14
4.46


13C APT spectra Osama APM4 in CDCL3
55.60
62.28
71.68
76.92
77.23
77.55
82.92
114.51
118.18
118.96
128.30
128.68
128.77
130.86
133.44
133.77
156.51
164.03
8b
ppm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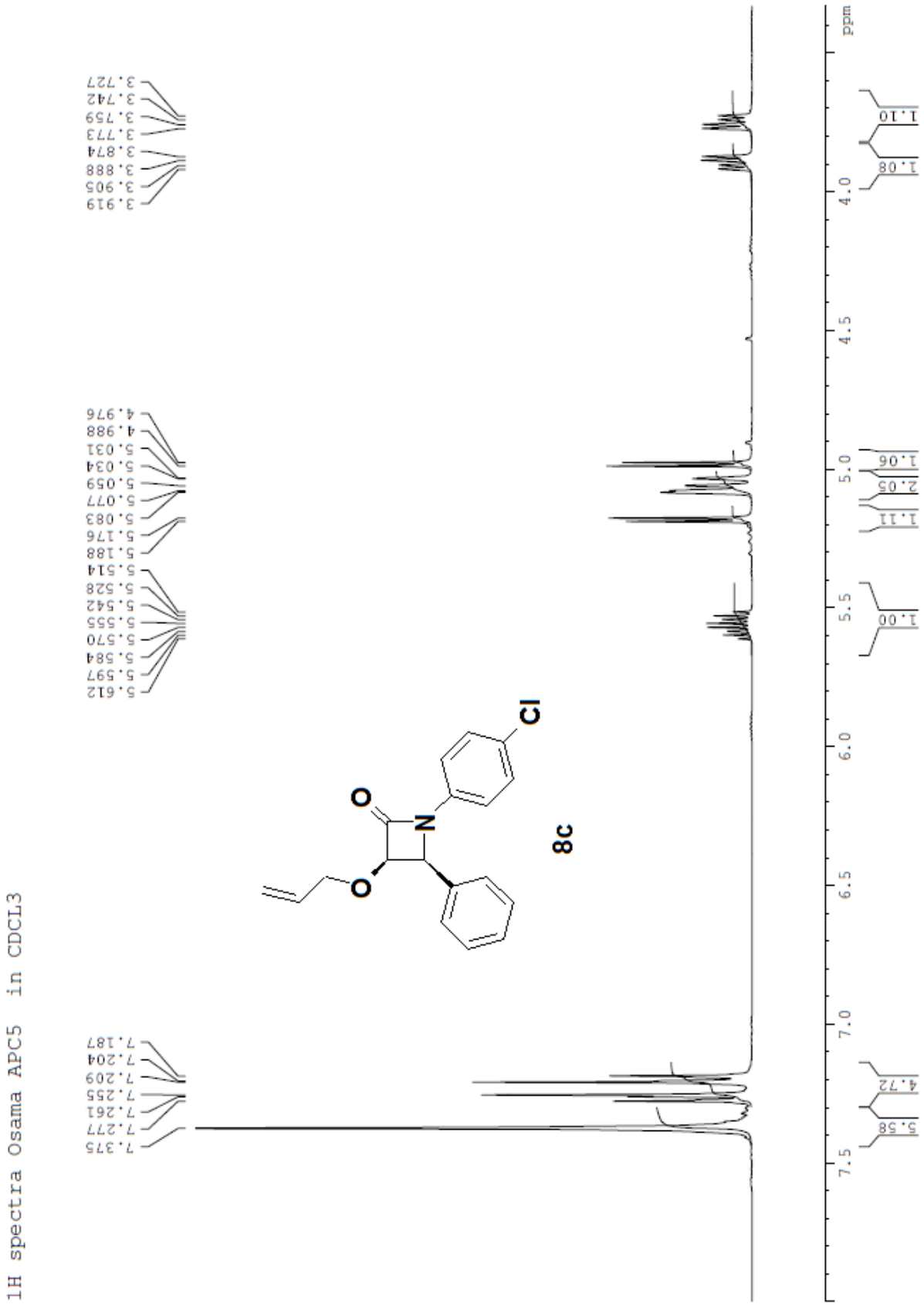
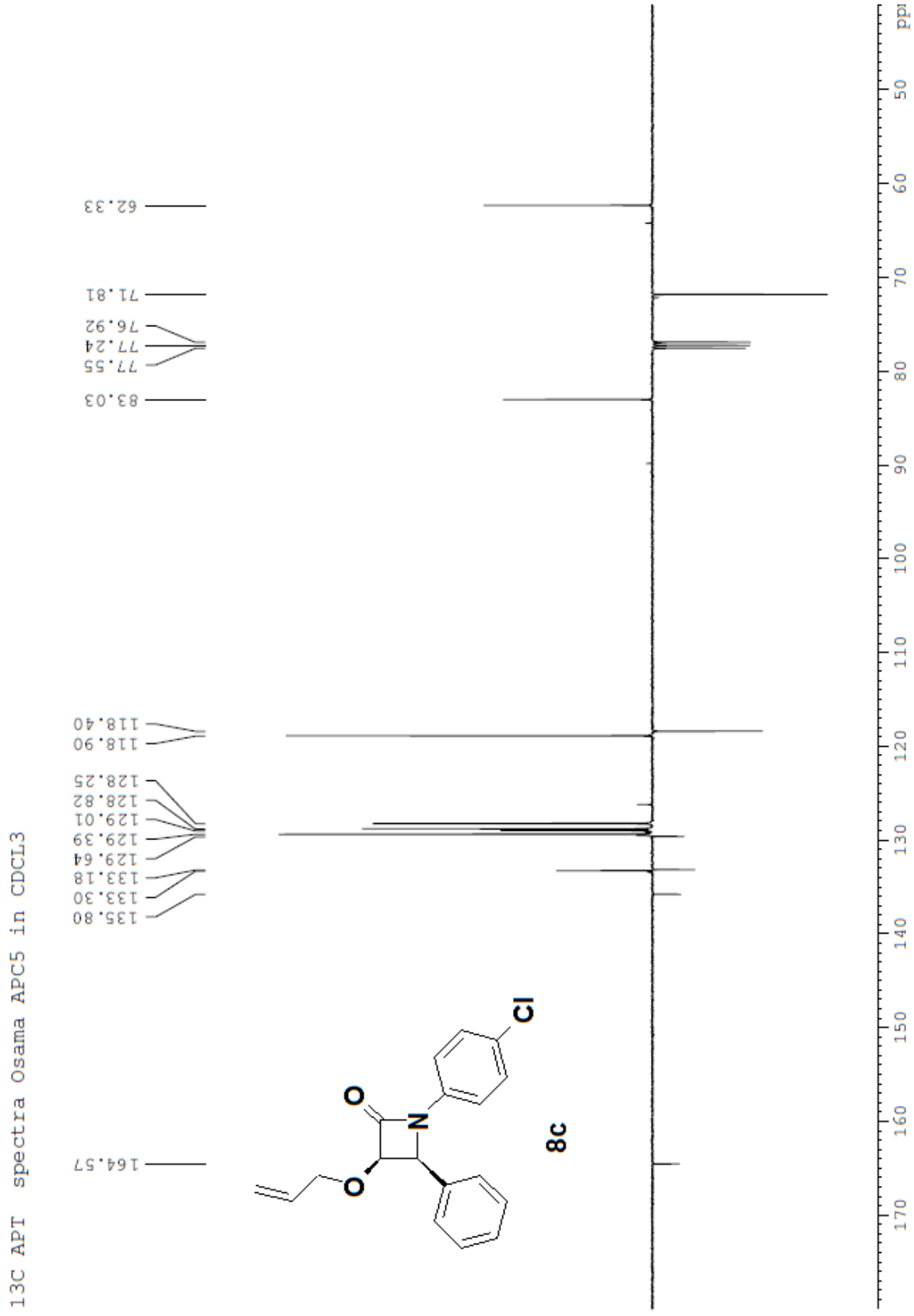
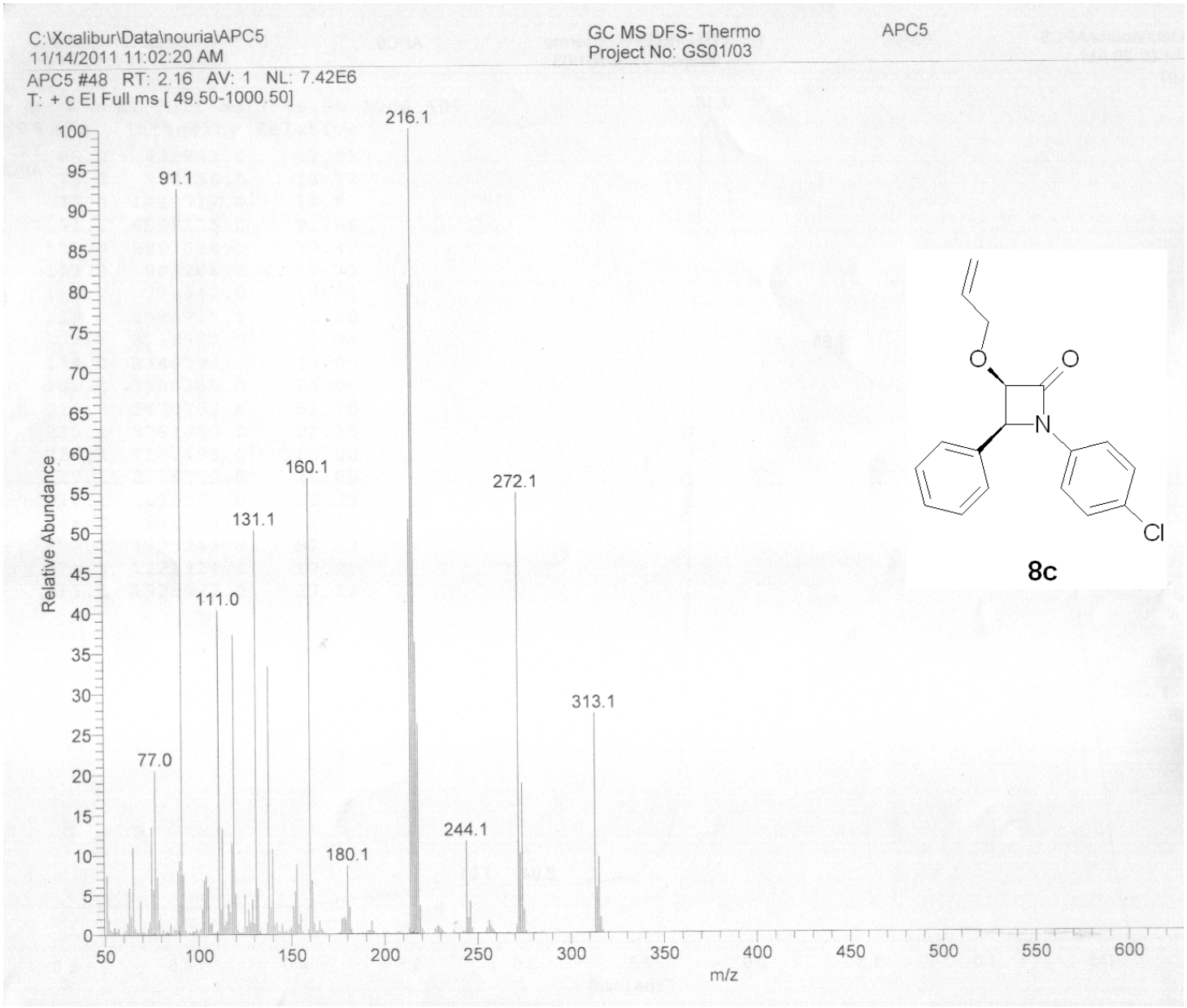
11/14/2011 11:43:05 AM
APM4 #56 RT: 2.44 AV: 1 NL: 9.08E6
T: + c EI Full ms [49.50-900.50]
GC MS DFS- Thermo
Project No: GS01/03
APM4
Relative Abundance
m/z
211.1
91.1
160.1
131.1
196.1
309.1
119.1
268.1
77.0
240.1
69.1
167.1
8b


1H spectra Osama APC5 in CDCL3
7.375
7.277
7.261
7.255
7.209
7.204
7.187
5.612
5.597
5.584
5.570
5.555
5.542
5.528
5.514
5.188
5.176
5.083
5.077
5.059
5.034
5.031
4.988
4.976
3.919
3.905
3.888
3.874
3.773
3.759
3.742
3.727
O
N
O
Cl
8c
ppm
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
5.58
4.72
1.00
1.11
2.05
1.06
1.08
1.10


13C APT spectra Osama APC5 in CDCL3
164.57
135.80
133.30
133.18
129.64
129.39
129.01
128.82
128.25
118.90
118.40
83.03
77.55
77.24
76.92
71.81
62.33
O
N
O
Cl
8c
ppm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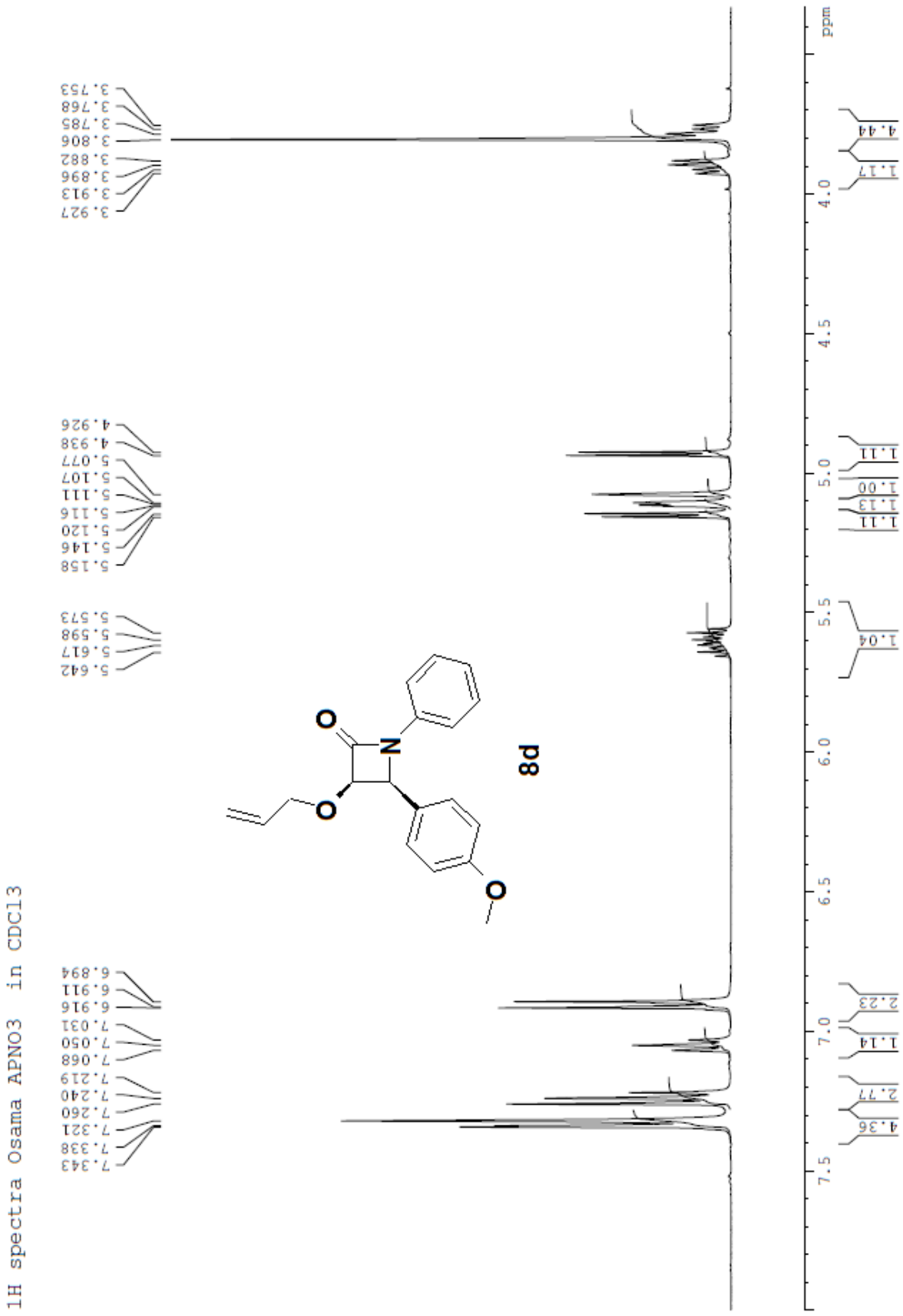
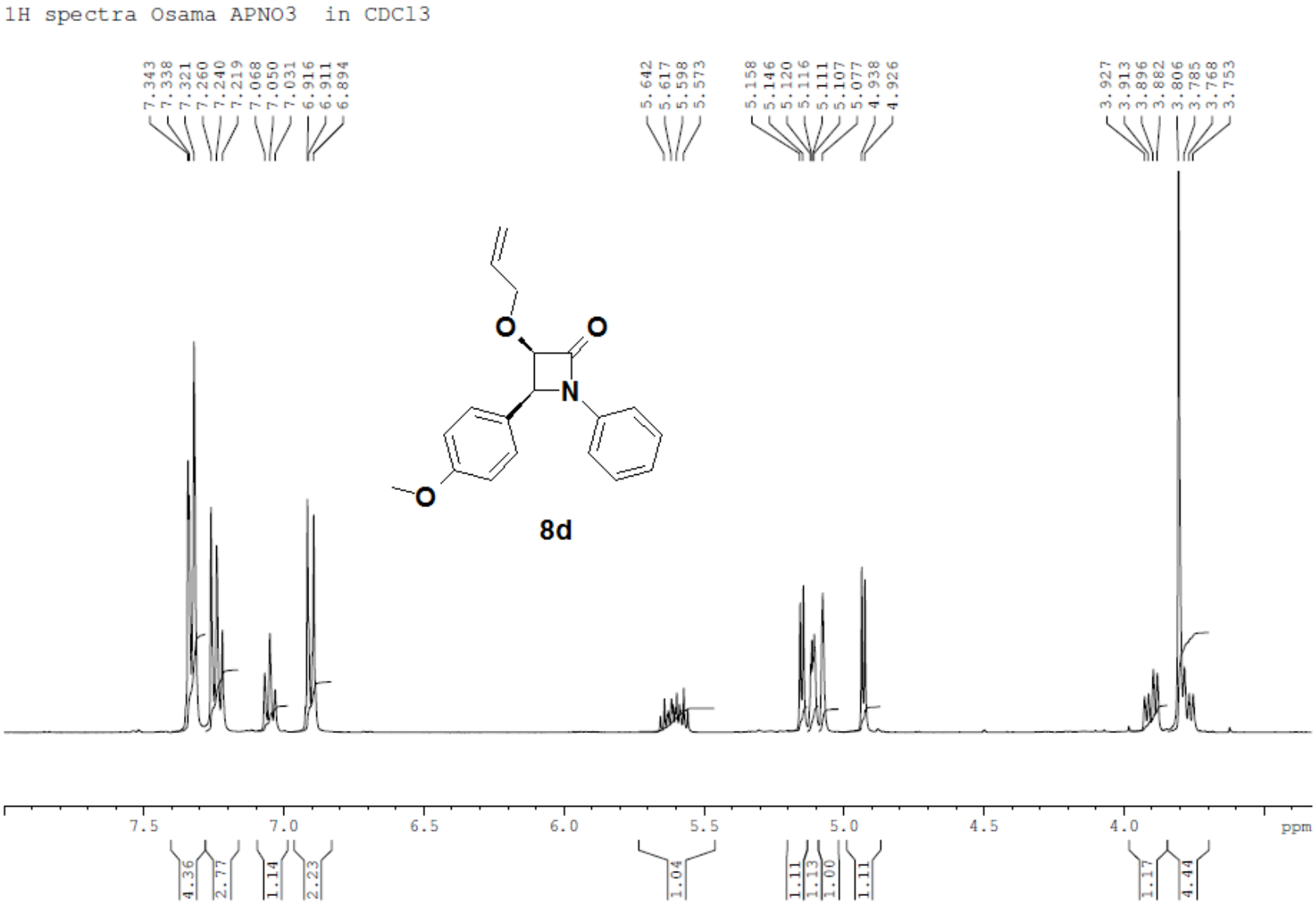
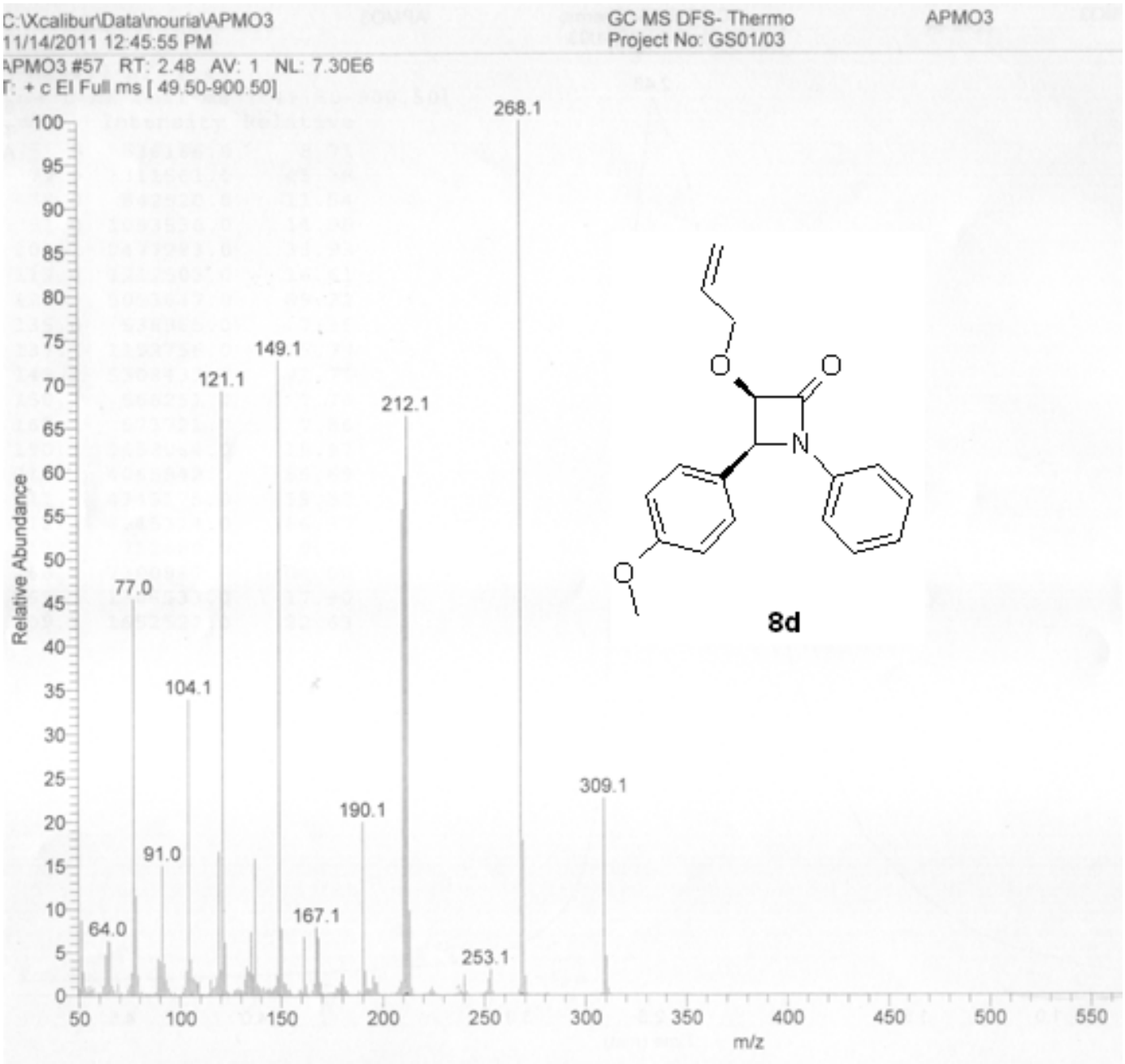
11/14/2011 11:02:20 AM
APC5 #48 RT: 2.16 AV: 1 NL: 7.42E6
T: + c EI Full ms [49.50-1000.50]
GC MS DFS- Thermo
Project No: GS01/03
APC5
Relative Abundance
m/z
216.1
91.1
160.1
272.1
131.1
111.0
313.1
77.0
244.1
180.1
O
O
N
Cl
8c


1H spectra Osama APNO3 in CDCl3
8d
7.343
7.338
7.321
7.260
7.240
7.219
7.068
7.050
7.031
6.916
6.911
6.894
5.642
5.617
5.598
5.573
5.158
5.146
5.120
5.116
5.111
5.107
5.077
4.938
4.926
3.927
3.913
3.896
3.882
3.806
3.785
3.768
3.753
ppm
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
4.36
2.77
1.14
2.23
1.04
1.11
1.13
1.00
1.11
1.17
4.44


1H spectra Osama APNO3 in CDCl3
7.343
7.338
7.321
7.260
7.240
7.219
7.068
7.050
7.031
6.916
6.911
6.894
5.642
5.617
5.598
5.573
5.158
5.146
5.120
5.116
5.111
5.107
5.077
4.938
4.926
3.927
3.913
3.896
3.882
3.806
3.785
3.768
3.753
O
O
N
O
8d
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
ppm
4.36
2.77
1.14
2.23
1.04
1.11
1.13
1.00
1.11
1.17
4.44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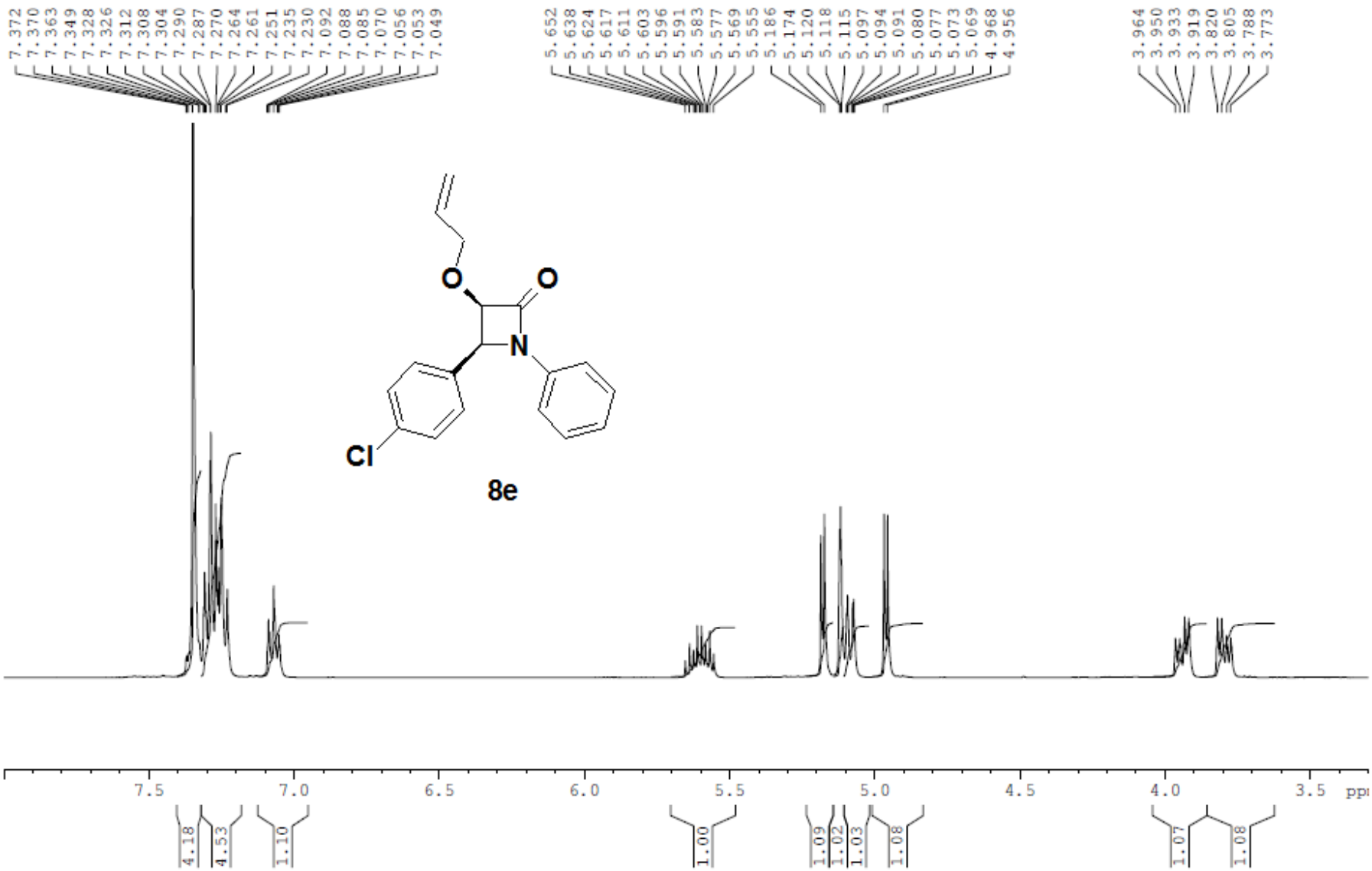
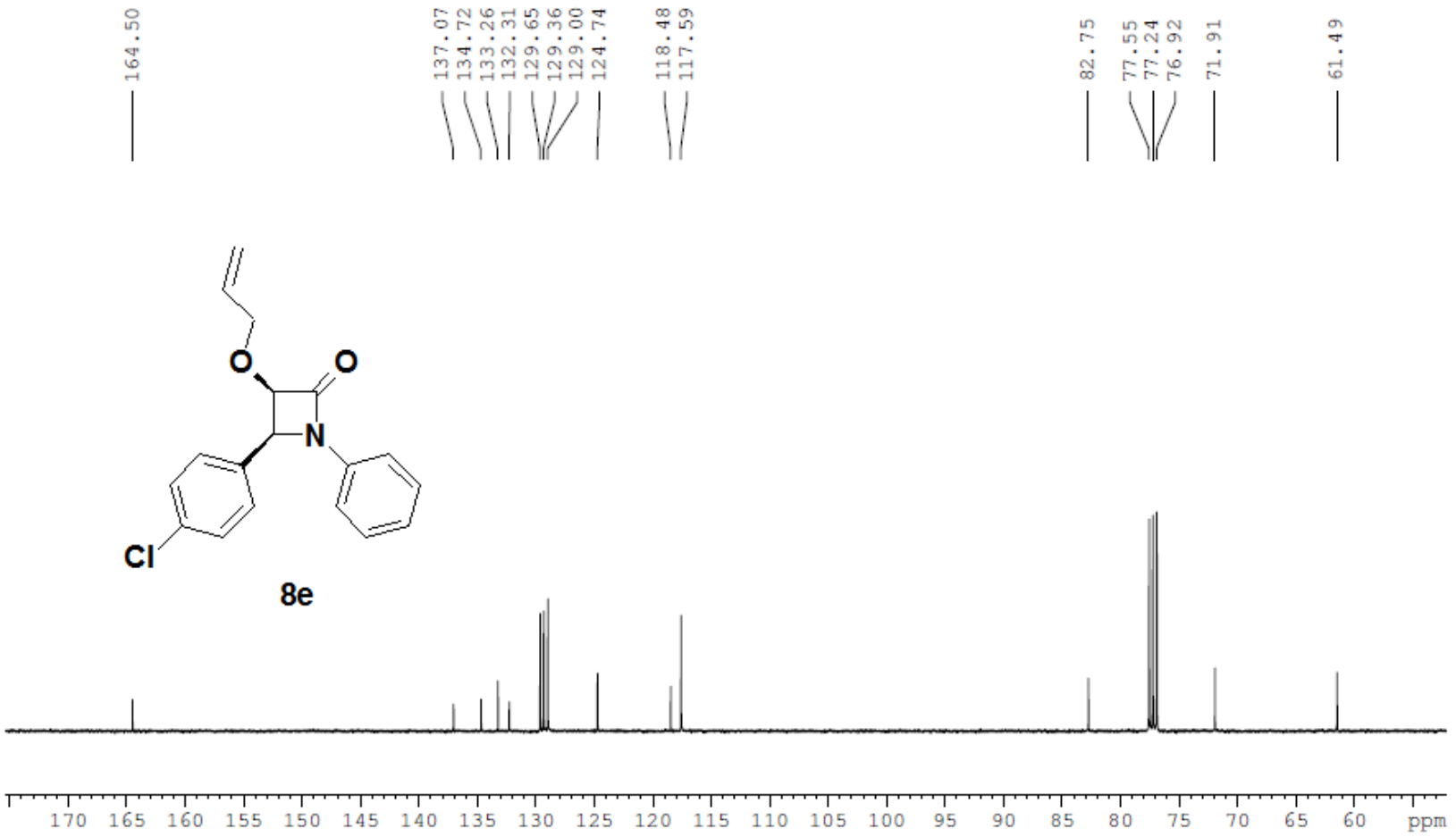
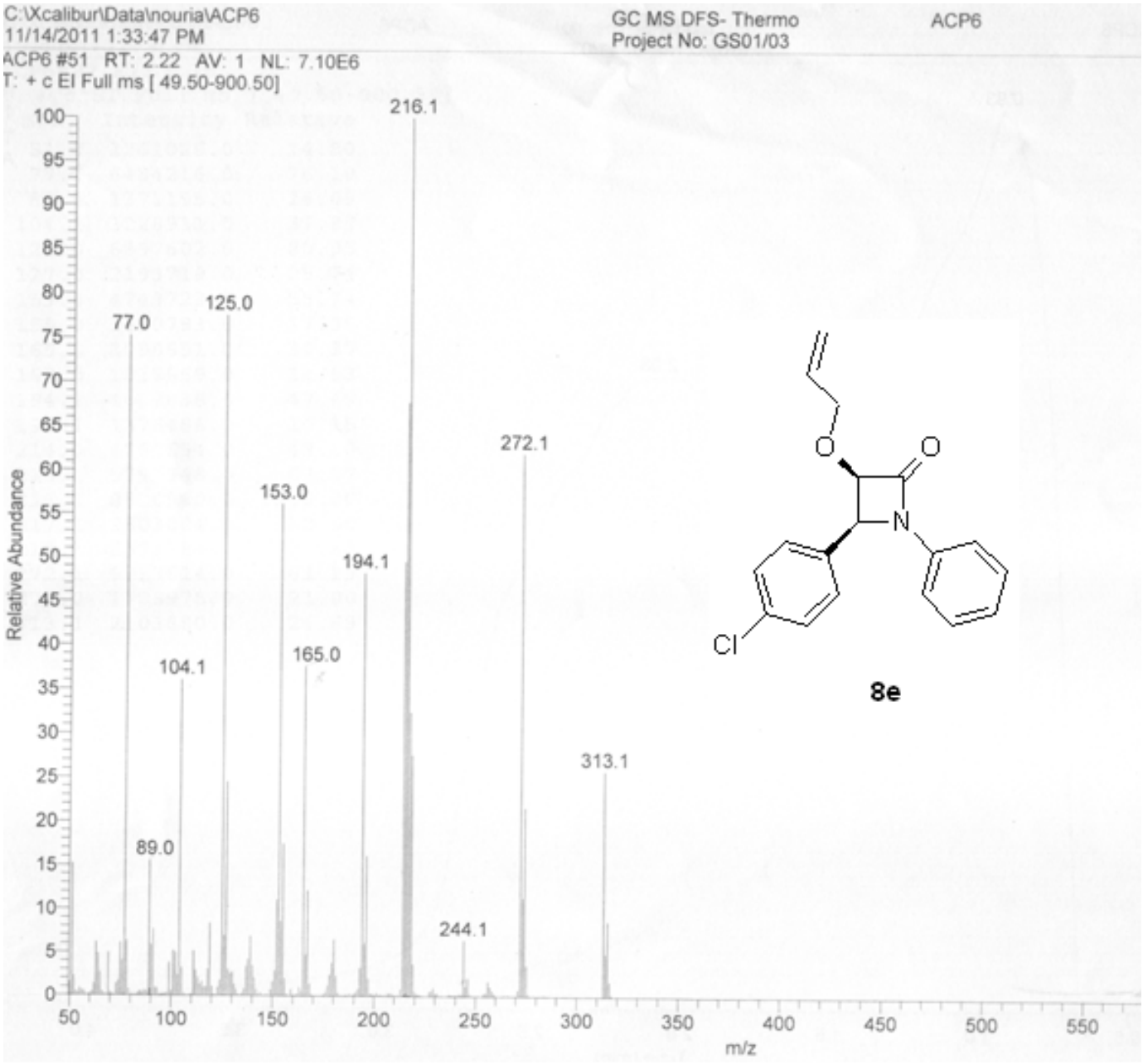
11/14/2011 12:45:55 PM
APMO3 #57 RT: 2.48 AV: 1 NL: 7.30E6
T: + c EI Full ms [49.50-900.50]
GC MS DFS- Thermo
Project No: GS01/03
APMO3
Relative Abundance
m/z
268.1
149.1
121.1
212.1
77.0
104.1
190.1
309.1
91.0
167.1
64.0
253.1
8d

1H spectra Osama ACP6 in CDCL3

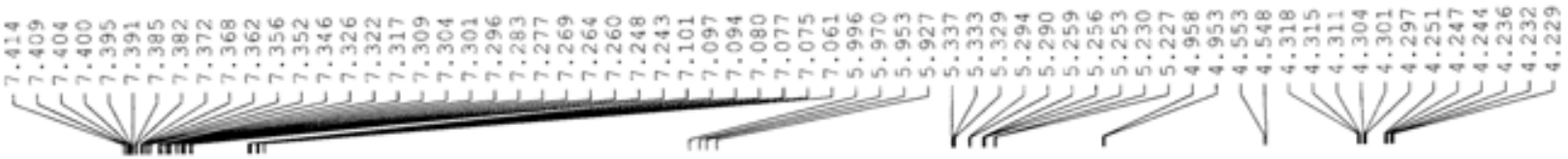


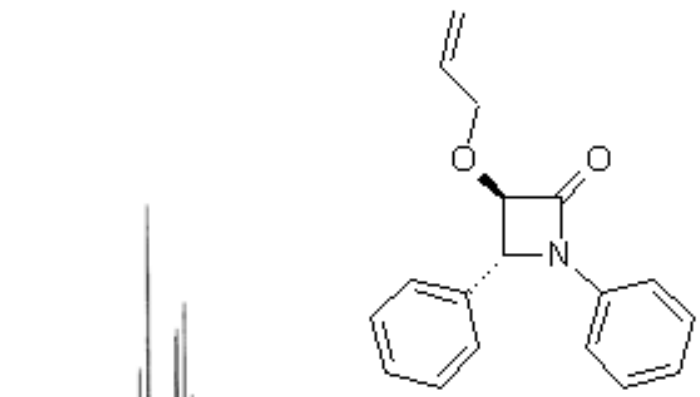
13C decoupled spectra Osama ACP6 in CDCL3



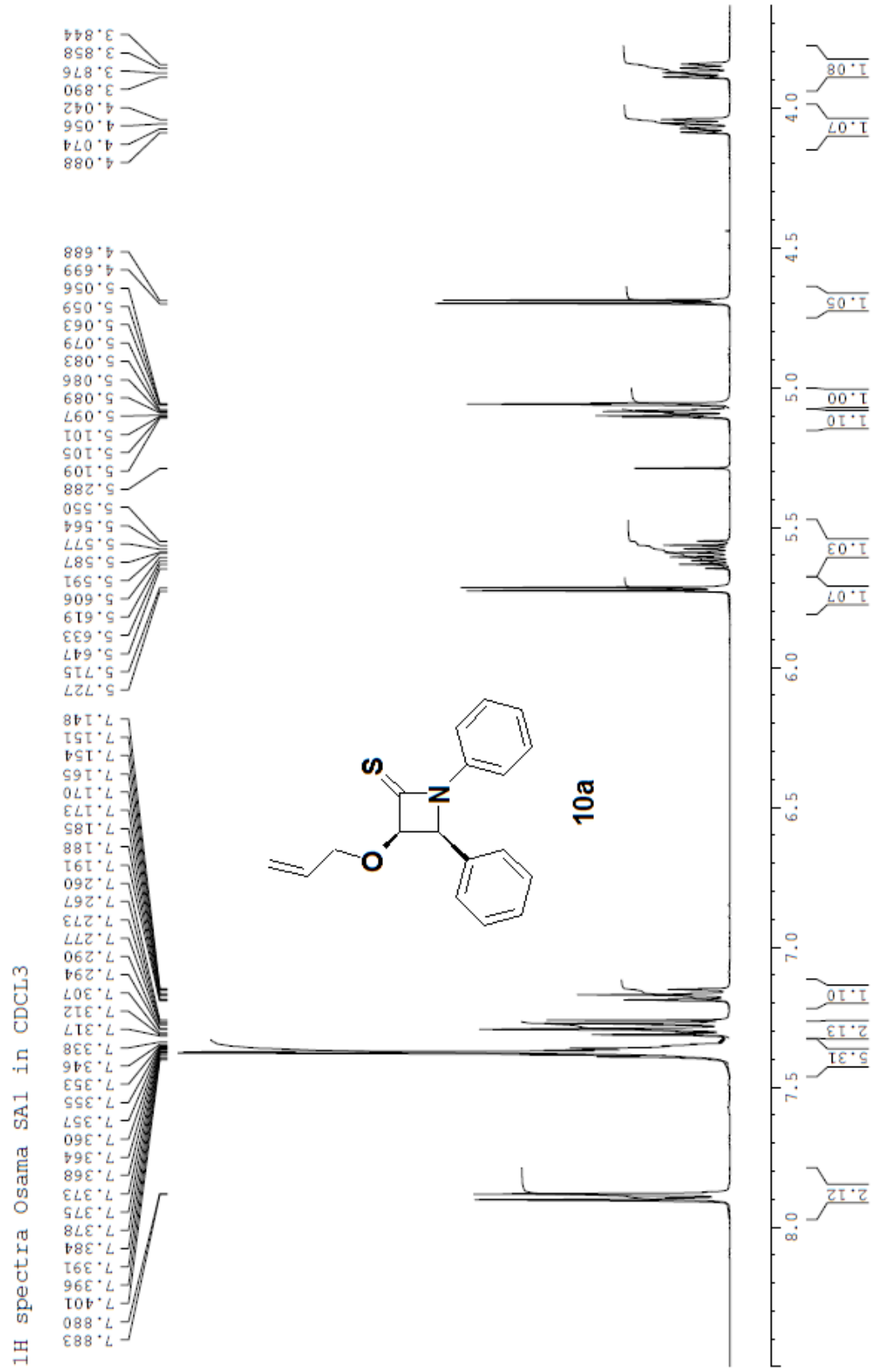

C:\Xcalibur\Data\nouria\ACP6
11/14/2011 1:33:47 PM
GC MS DFS- Thermo
Project No: GS01/03
ACP6
ACP6 #51 RT: 2.22 AV: 1 NL: 7.10E6
T: + c EI Full ms [49.50-900.50]
Relative Abundance
m/z
216.1
77.0
125.0
272.1
153.0
194.1
104.1
165.0
313.1
89.0
244.1
O
O
N
Cl
8e

1H spectra Osama F2 in CDCL3





9a


1H spectra Osama SA1 in CDCL3
10a
S
N
O
3.844
3.858
3.876
3.890
4.042
4.056
4.074
4.088
4.688
4.699
5.056
5.059
5.063
5.079
5.083
5.086
5.089
5.097
5.101
5.105
5.109
5.288
5.550
5.564
5.577
5.587
5.591
5.606
5.619
5.633
5.647
5.715
5.727
7.148
7.151
7.154
7.165
7.170
7.173
7.185
7.188
7.191
7.260
7.267
7.273
7.277
7.290
7.294
7.307
7.312
7.317
7.338
7.346
7.353
7.355
7.357
7.360
7.364
7.368
7.373
7.375
7.378
7.384
7.391
7.396
7.401
7.880
7.883
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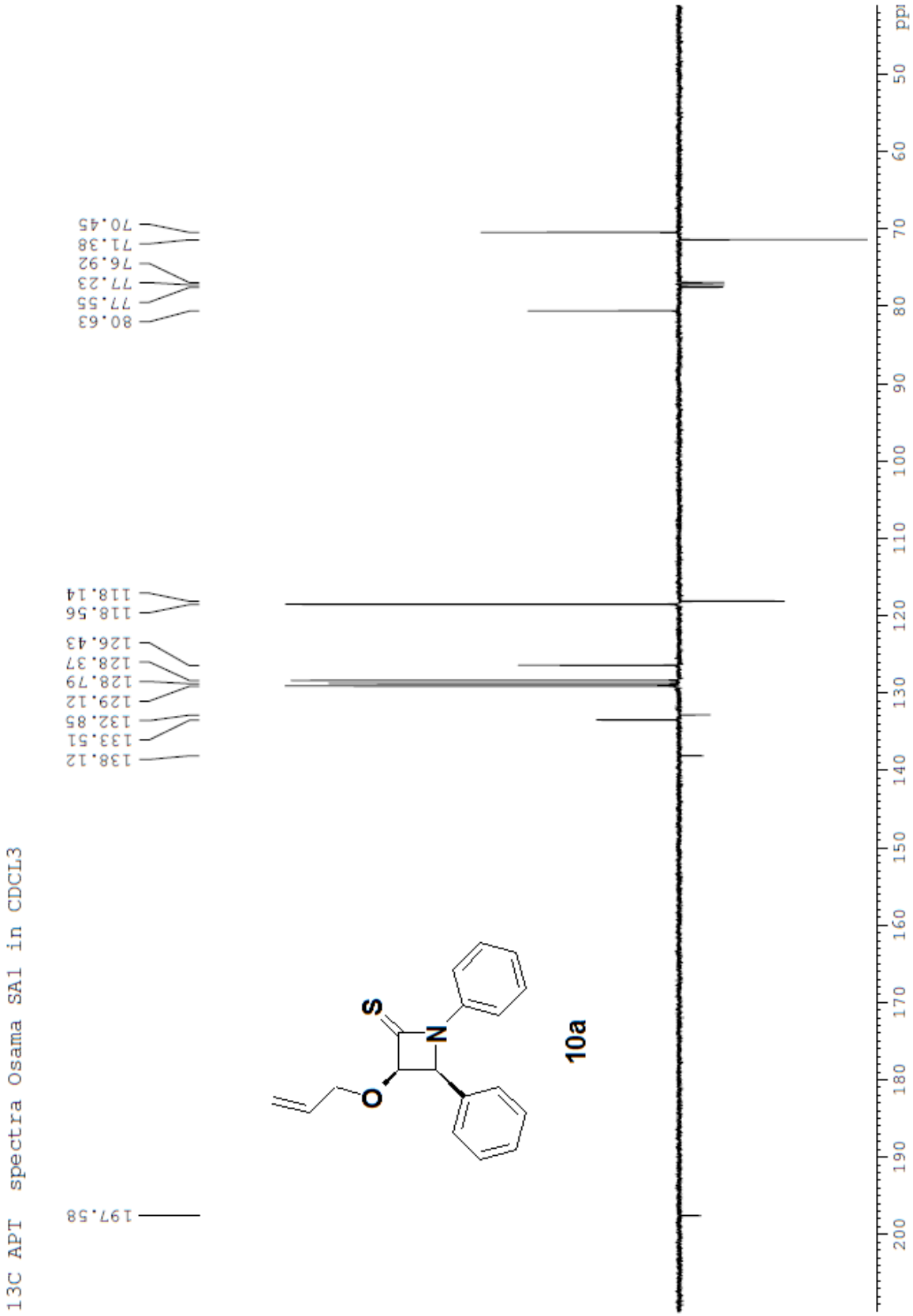
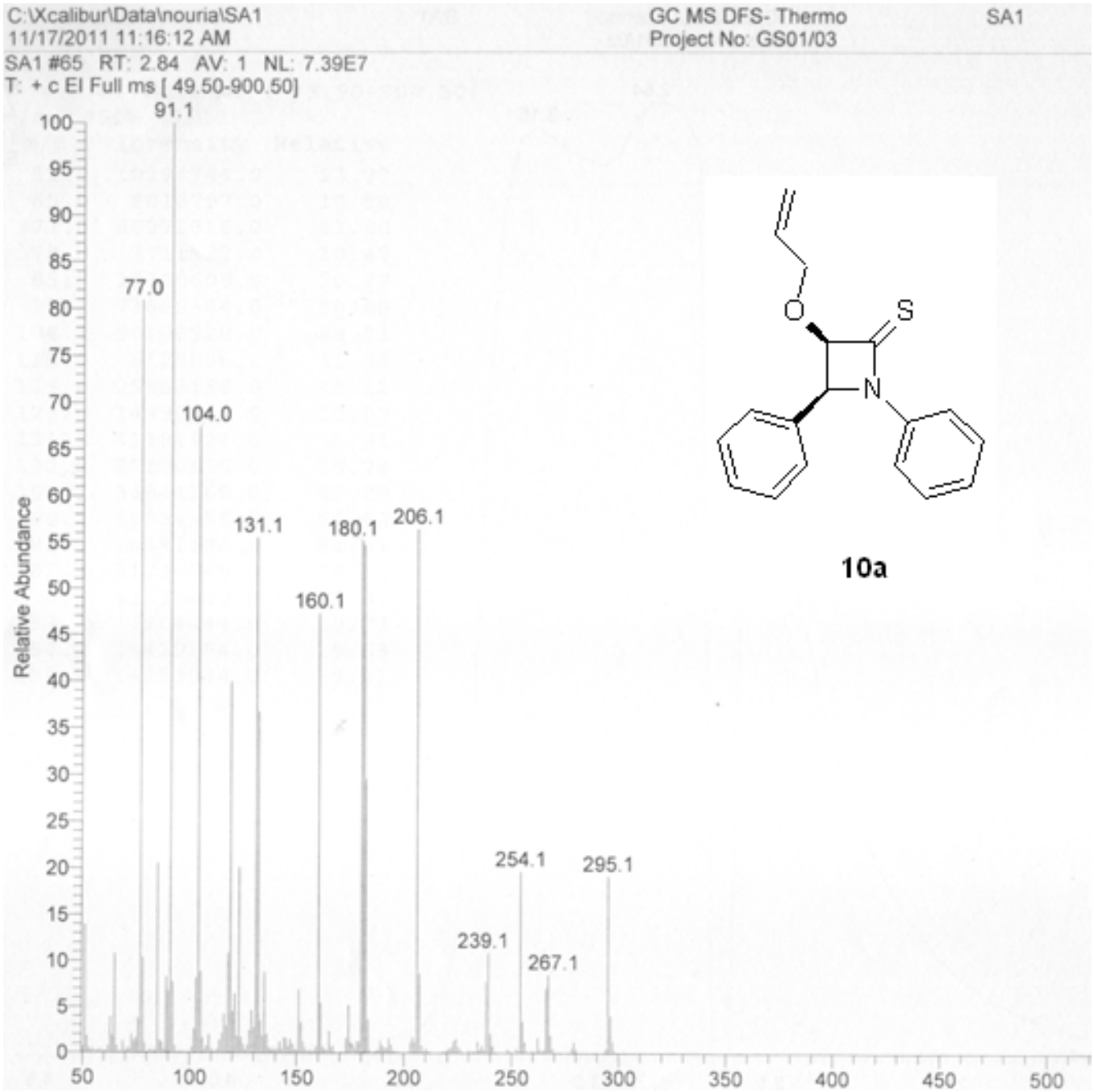
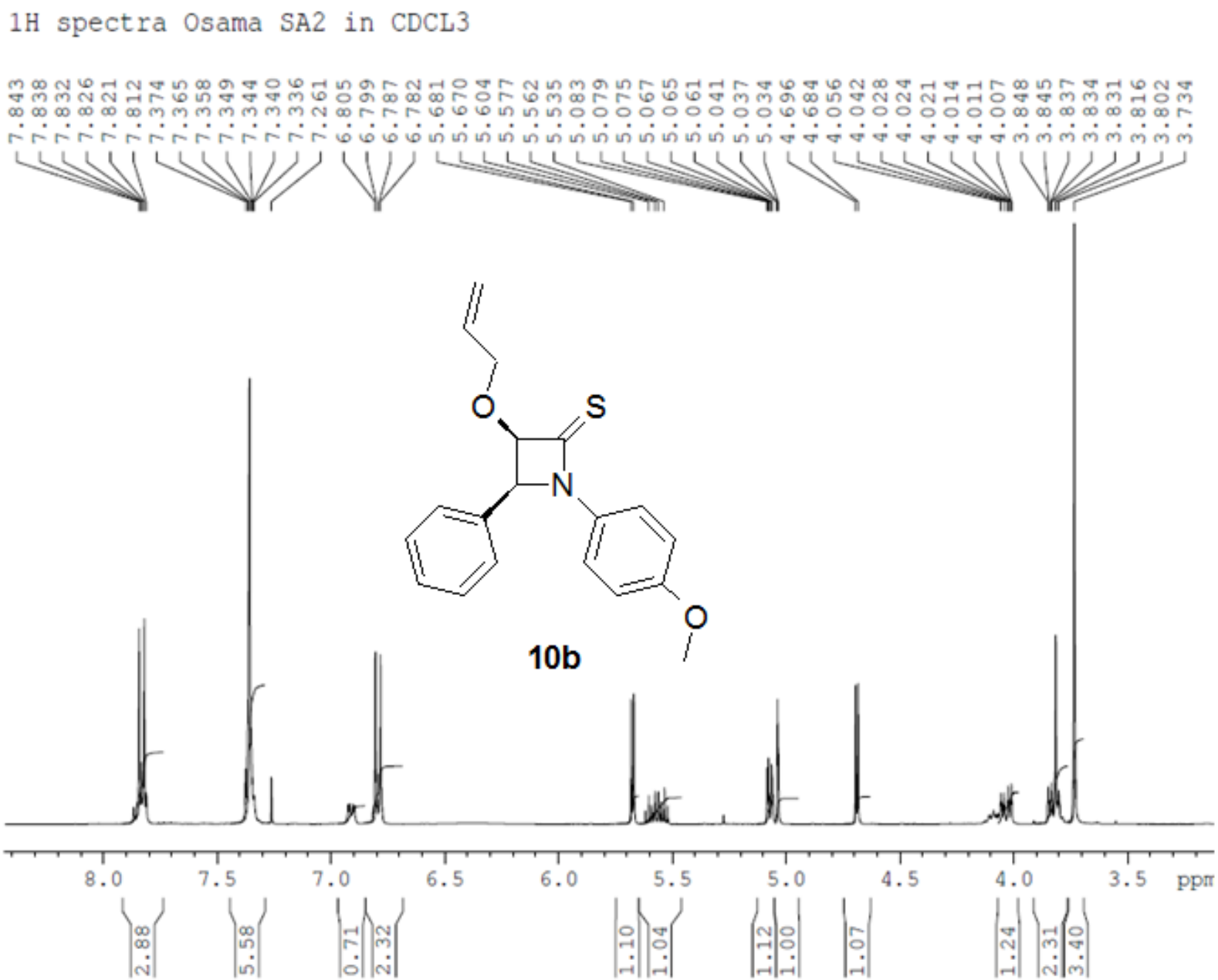
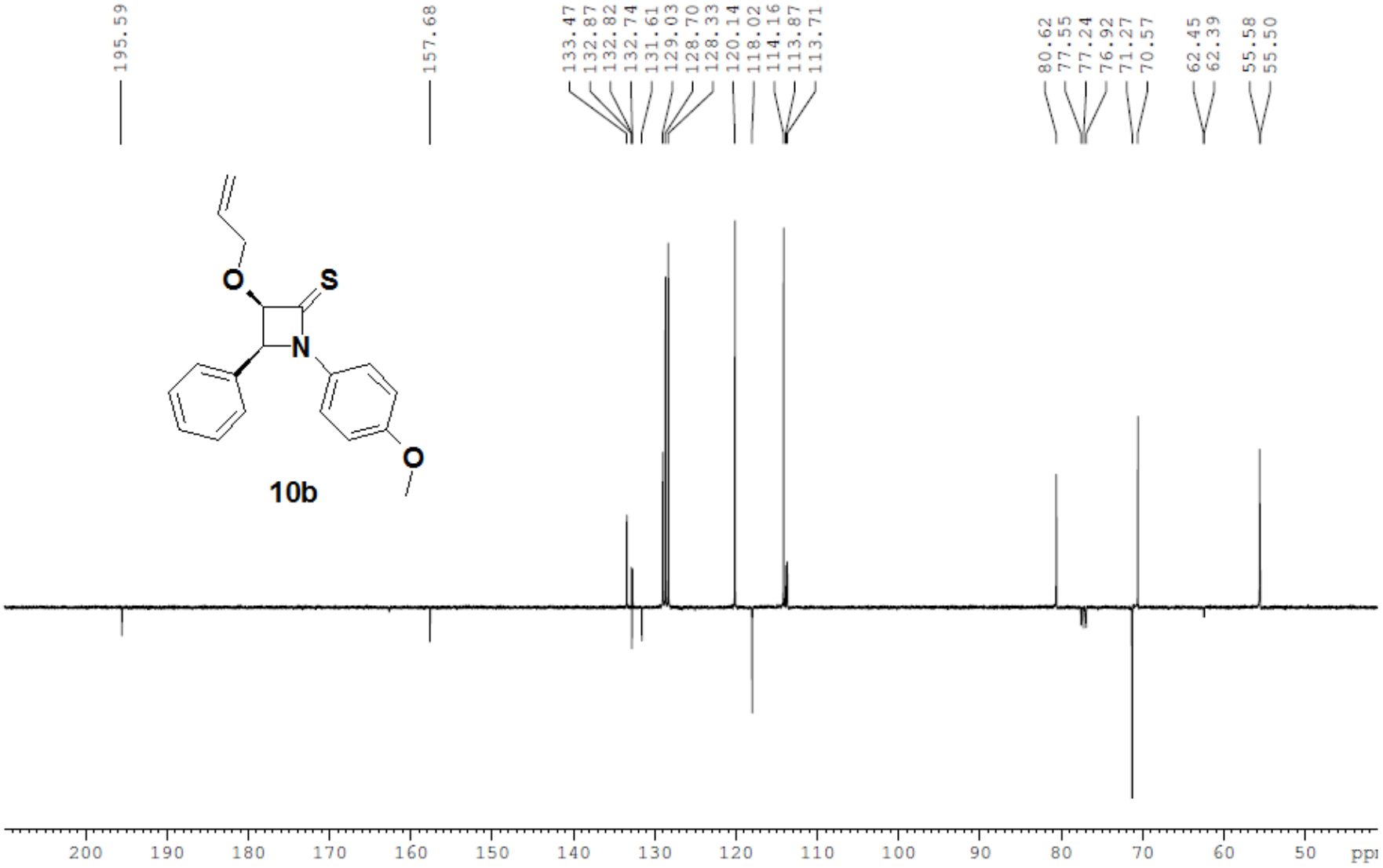
1.03
1.07
1.10
5.31
2.13
2.12

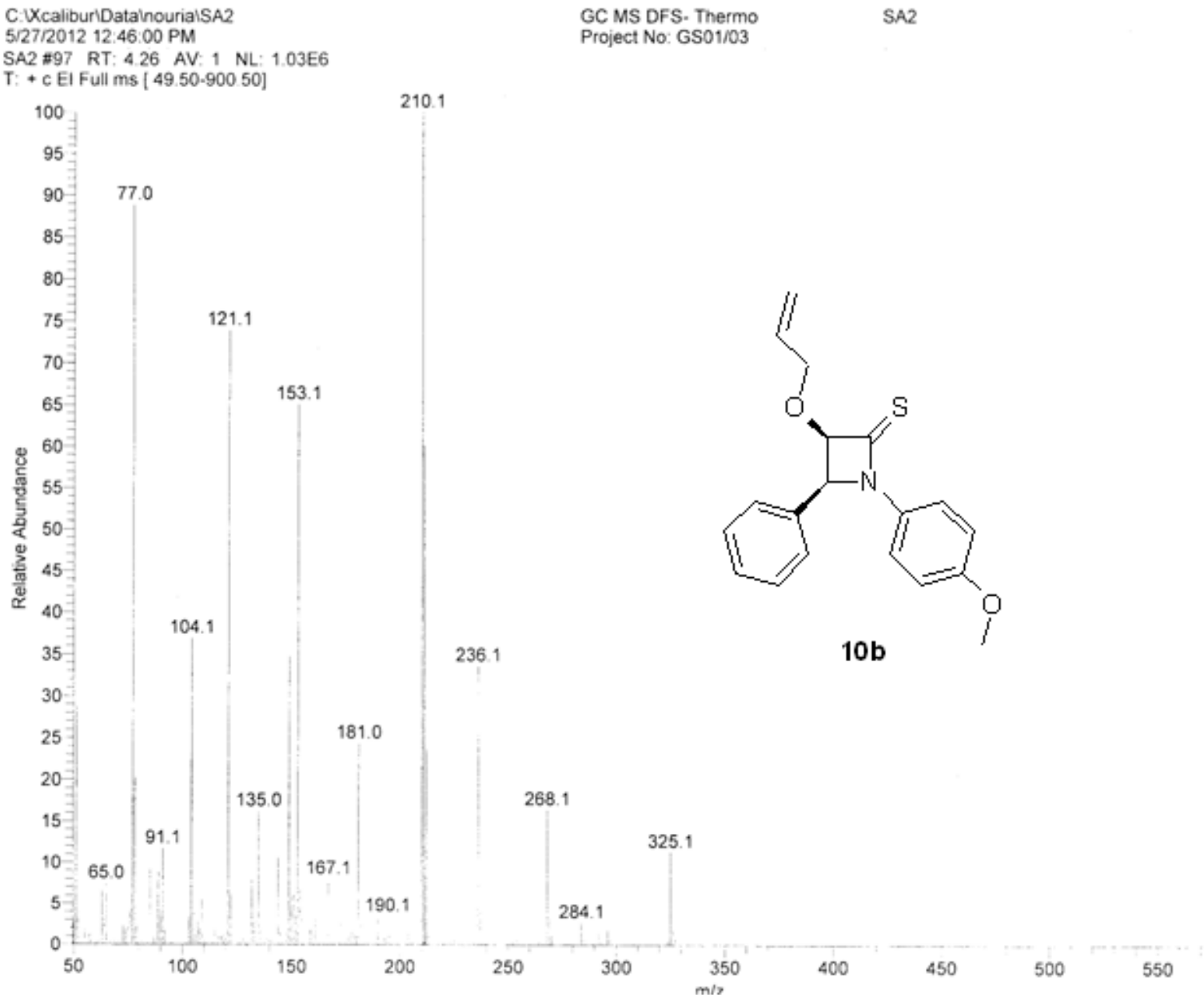

13C APT spectra Osama SA1 in CDCL3
197.58
138.12
133.51
132.85
129.12
128.79
128.37
126.43
118.56
118.14
80.63
77.55
77.23
76.92
71.38
70.45
S
N
O
10a
ppm


C:\Xcalibur\Data\nouria\SA1
11/17/2011 11:16:12 AM
GC MS DFS- Thermo
Project No: GS01/03
SA1
SA1 #65 RT: 2.84 AV: 1 NL: 7.39E7
T: + c EI Full ms [49.50-900.50]
Relative Abundance
91.1
77.0
104.0
131.1
180.1
206.1
160.1
254.1
295.1
239.1
267.1
O
S
N
10a

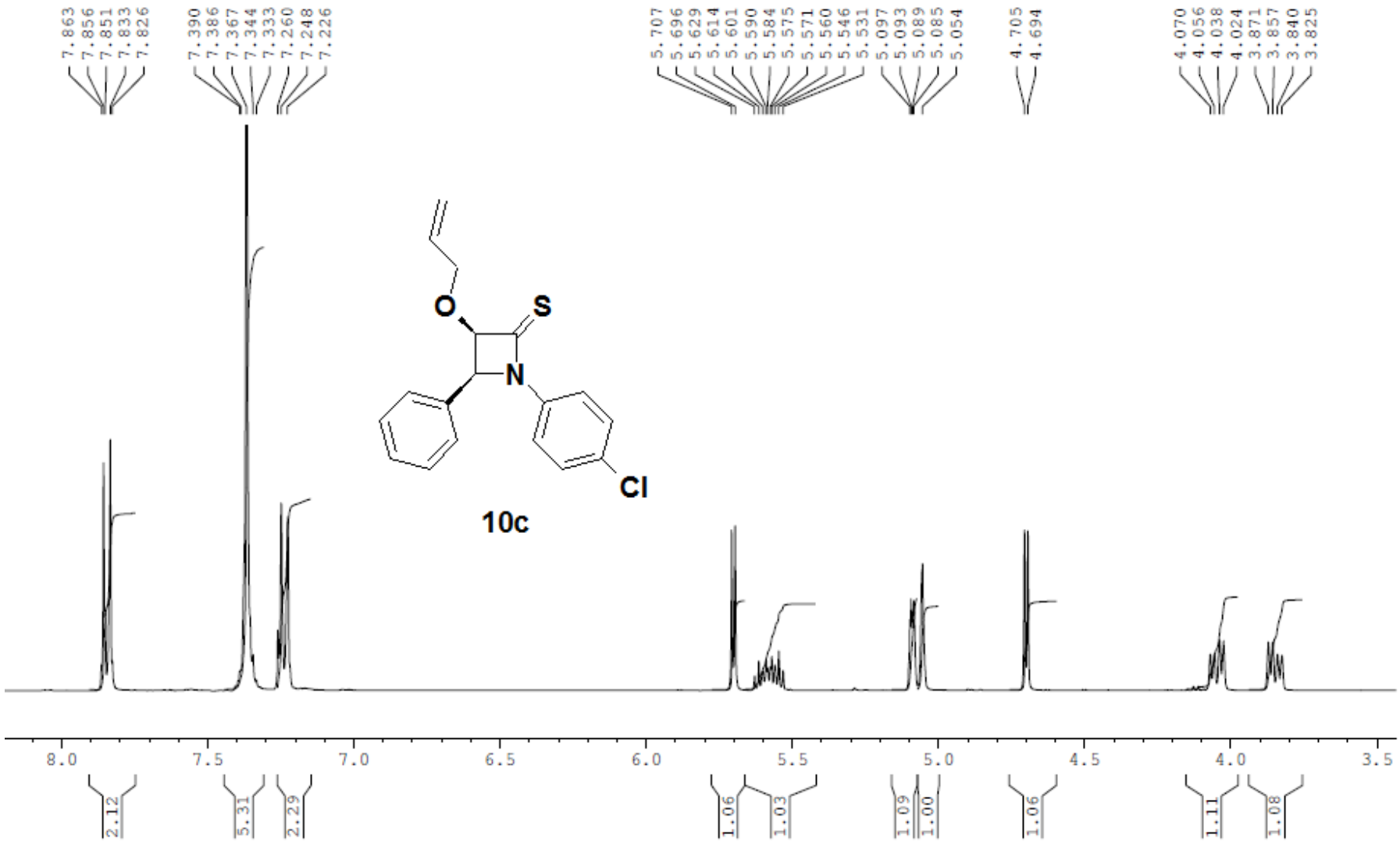

1H spectra Osama SA2 in CDCL3
7.843
7.838
7.832
7.826
7.821
7.812
7.374
7.365
7.358
7.349
7.344
7.340
7.336
7.261
6.805
6.799
6.787
6.782
5.681
5.670
5.604
5.577
5.562
5.535
5.083
5.079
5.075
5.067
5.065
5.061
5.041
5.037
5.034
4.696
4.684
4.056
4.042
4.028
4.024
4.021
4.014
4.011
4.007
3.848
3.845
3.837
3.834
3.831
3.816
3.802
3.734
O
S
N
O
10b
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
ppm
2.88
5.58
0.71
2.32
1.10
1.04
1.12
1.00
1.07
1.24
2.31
3.40

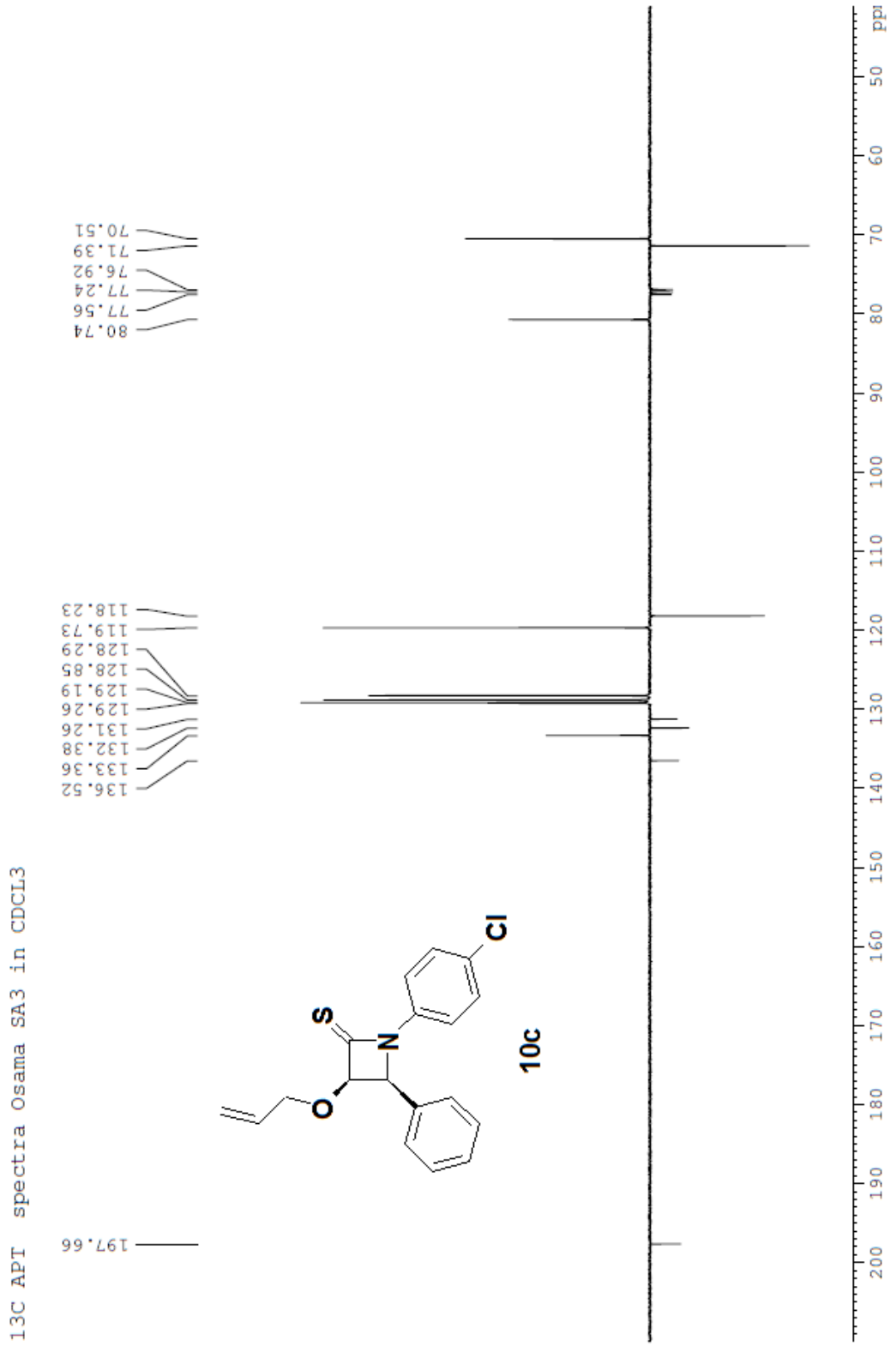
13C APT spectra Osama SA2 in CDCL3

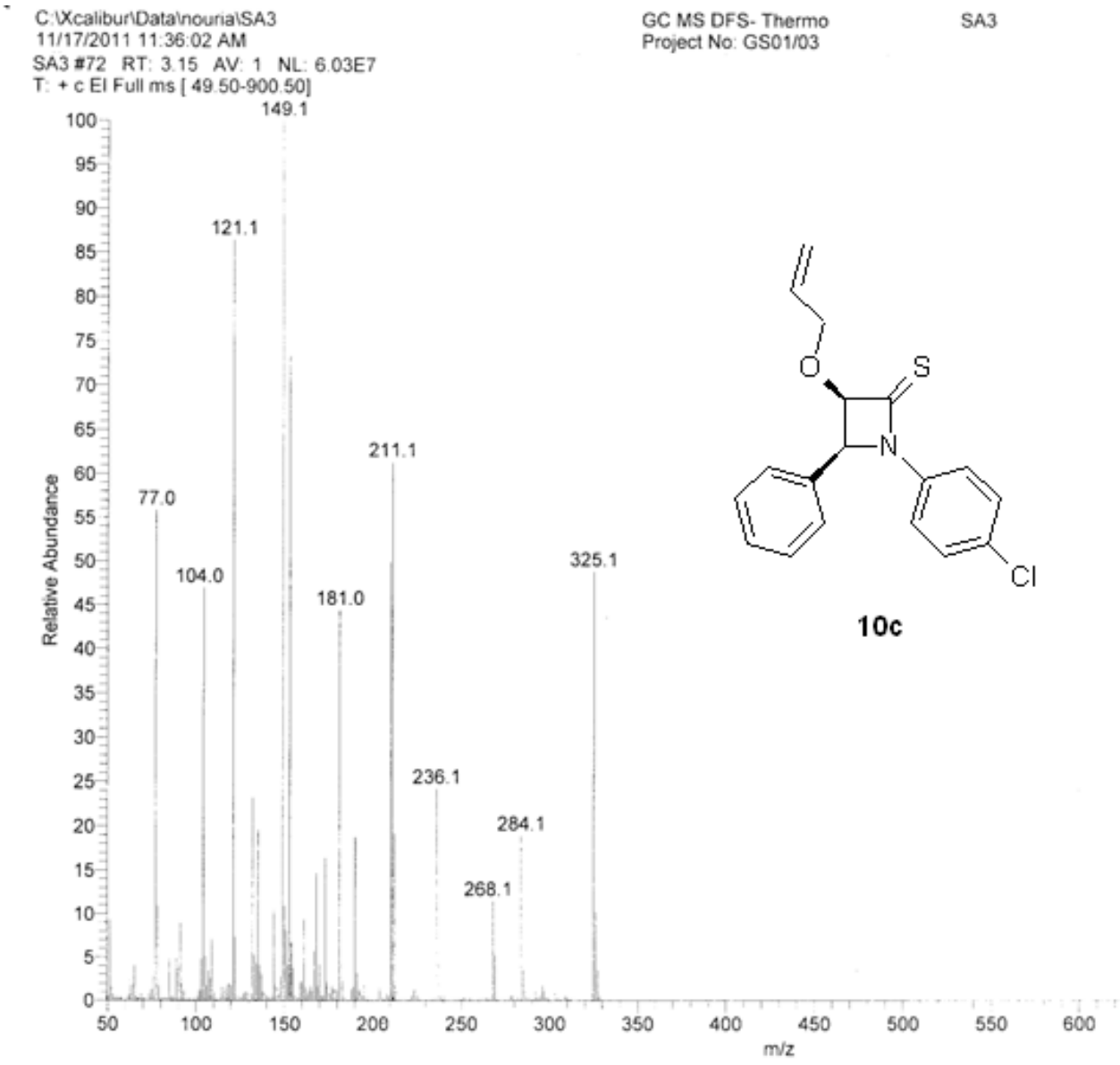



C:\Xcalibur\Data\nouria\SA2
5/27/2012 12:46:00 PM
SA2 #97 RT: 4.26 AV: 1 NL: 1.03E6
T: + c EI Full ms [49.50-900.50]
GC MS DFS- Thermo
Project No: GS01/03
SA2
Relative Abundance
m/z
210.1
77.0
121.1
153.1
104.1
236.1
181.0
135.0
268.1
91.1
325.1
65.0
167.1
190.1
284.1
O
S
N
O
10b

1H spectra Osama SA3 in CDCL3




13C APT spectra Osama SA3 in CDCL3
197.66
136.52
133.36
132.38
131.26
129.26
129.19
128.85
128.29
119.73
118.23
80.74
77.56
77.24
76.92
71.39
70.51
S
N
O
Cl
10c
ppm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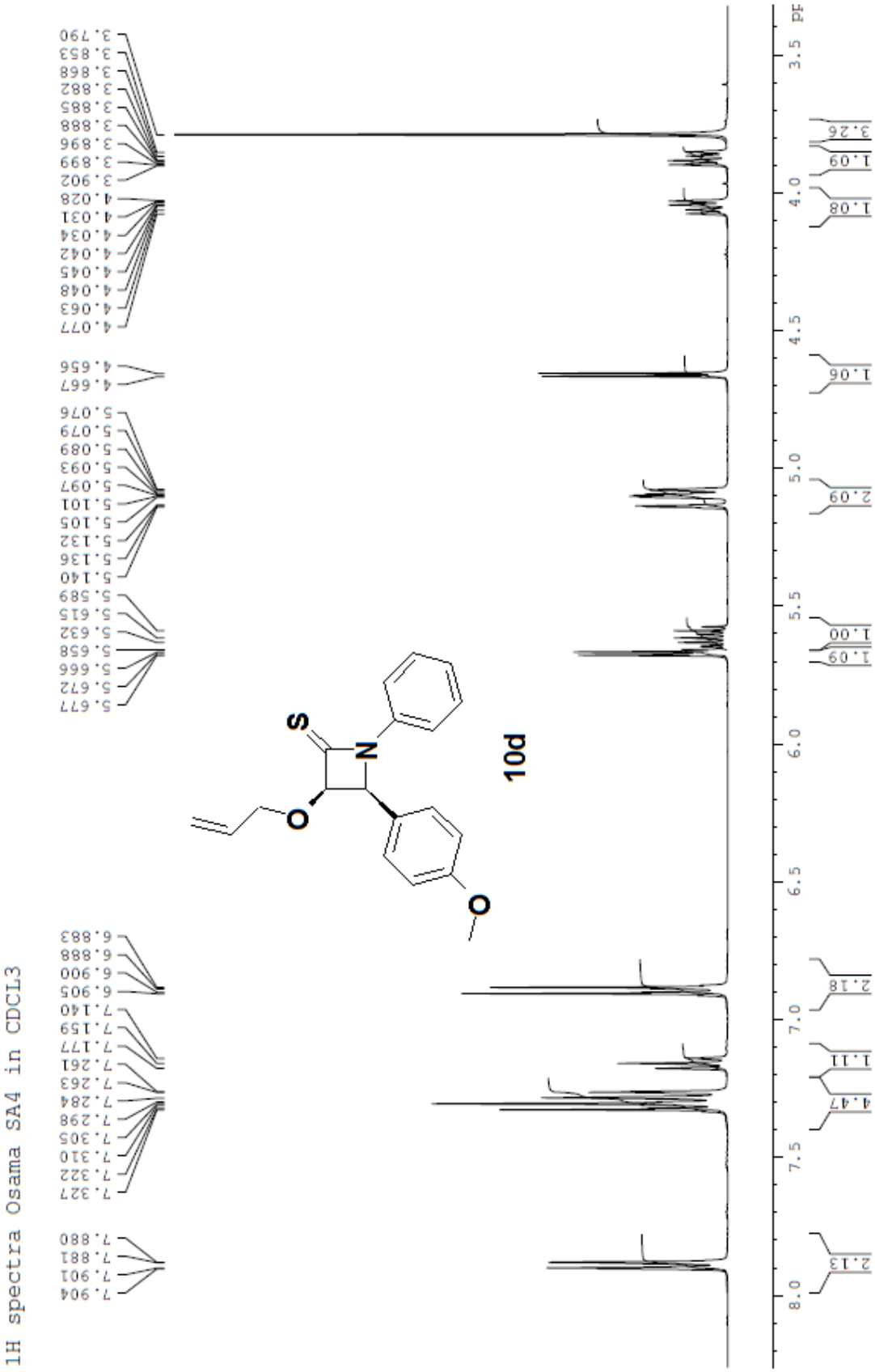
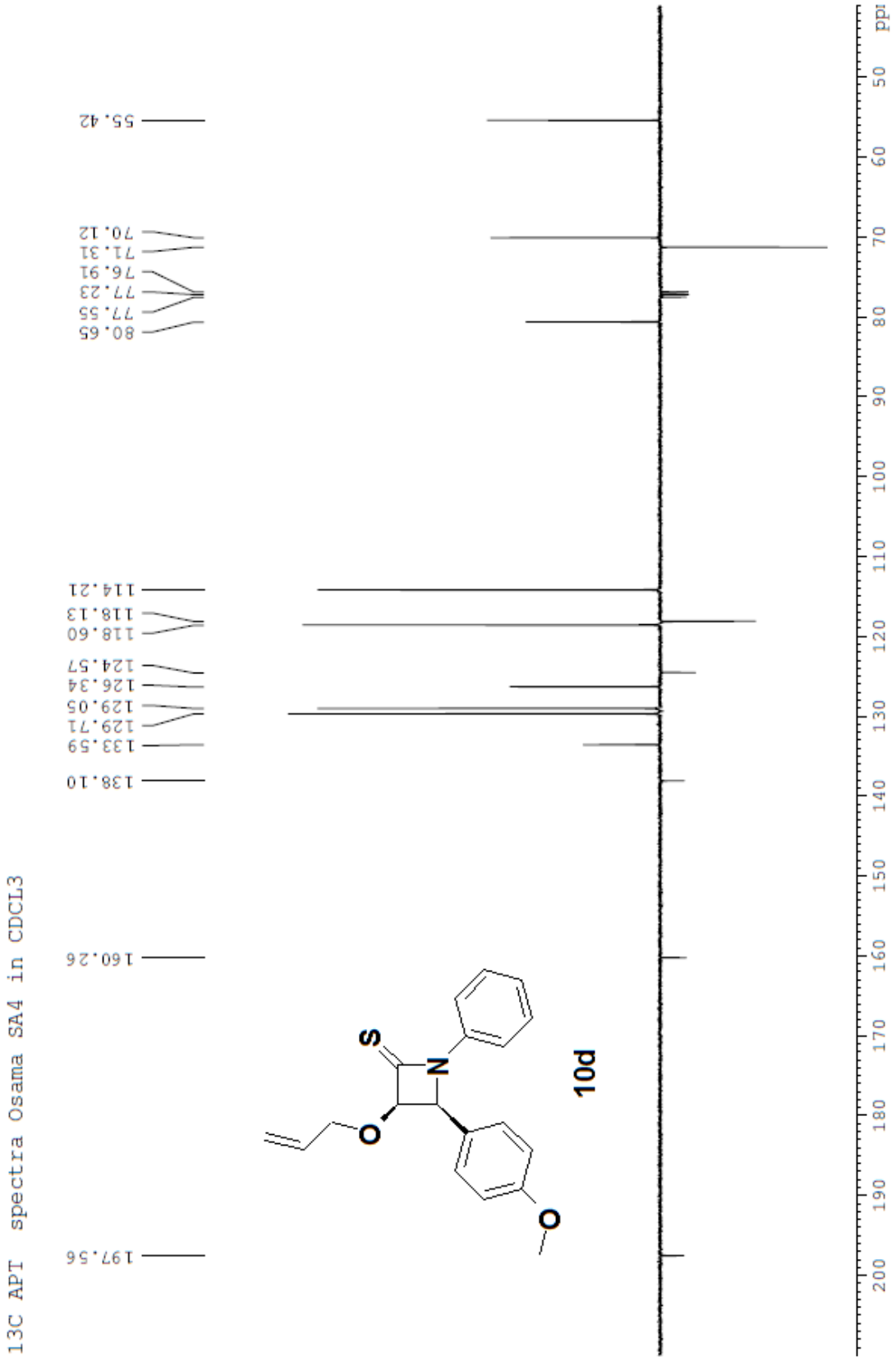
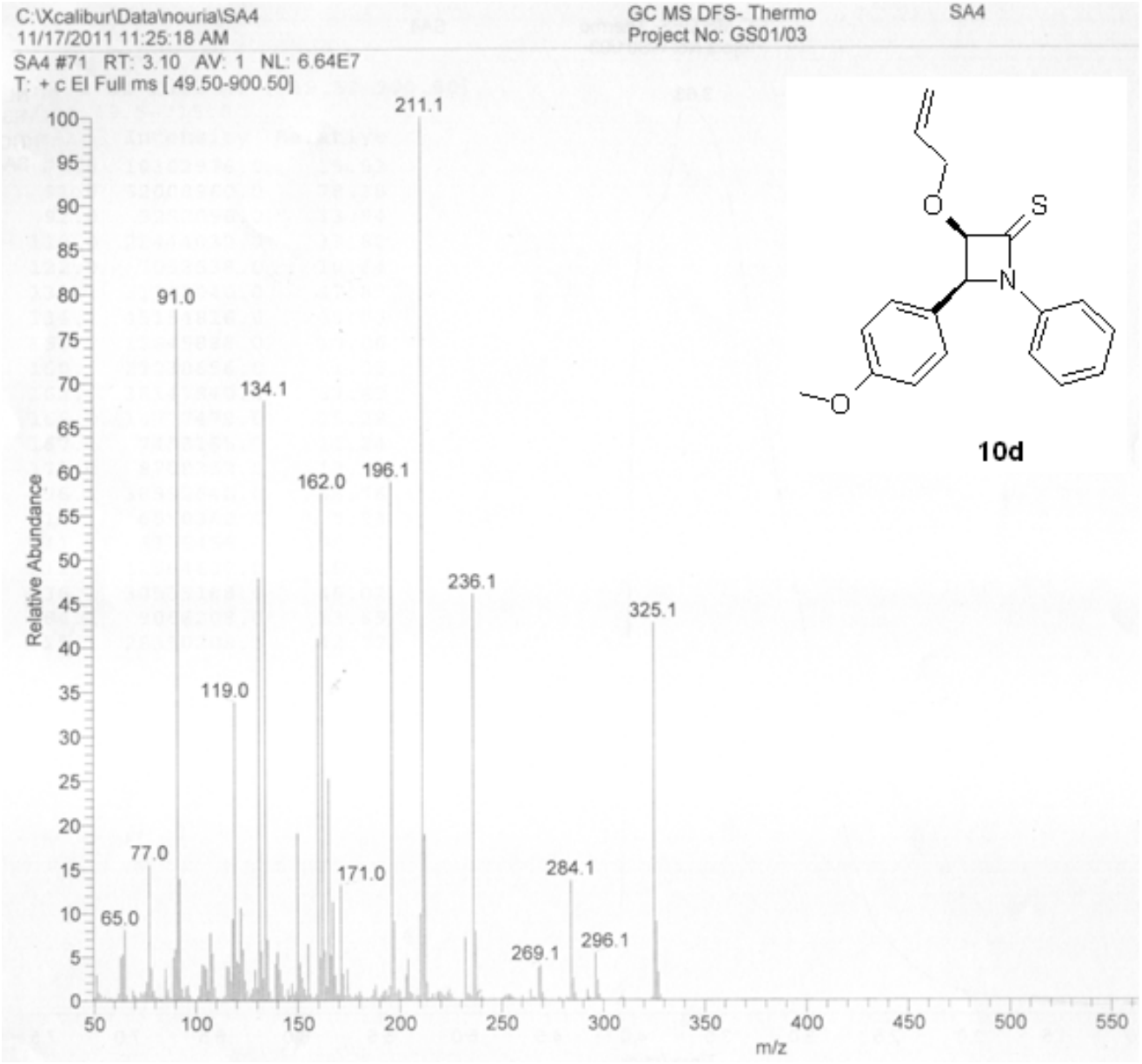
11/17/2011 11:36:02 AM
SA3 #72 RT: 3.15 AV: 1 NL: 6.03E7
T: + c EI Full ms [49.50-900.50]
GC MS DFS- Thermo
Project No: GS01/03
SA3
Relative Abundance
m/z
149.1
121.1
211.1
77.0
104.0
181.0
325.1
236.1
284.1
268.1
O
S
N
Cl
10c


1H spectra Osama SA4 in CDCl3
10d
S
N
O
O
7.904
7.901
7.881
7.880
7.327
7.322
7.310
7.305
7.298
7.284
7.263
7.261
7.177
7.159
7.140
6.905
6.900
6.888
6.883
5.677
5.672
5.666
5.658
5.632
5.615
5.589
5.140
5.136
5.132
5.105
5.101
5.097
5.093
5.089
5.079
5.076
4.667
4.656
4.077
4.063
4.048
4.045
4.042
4.034
4.031
4.028
3.902
3.899
3.896
3.888
3.885
3.882
3.868
3.853
3.790
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
2.13
4.47
1.11
2.18
1.00
1.09
2.09
1.06
1.08
1.09
3.26


13C APT spectra Osama SA4 in CDCL3
197.56
160.26
138.10
133.59
129.71
129.05
126.34
124.57
118.60
118.13
114.21
80.65
77.55
77.23
76.91
71.31
70.12
55.42
10d
S
N
O
O
ppm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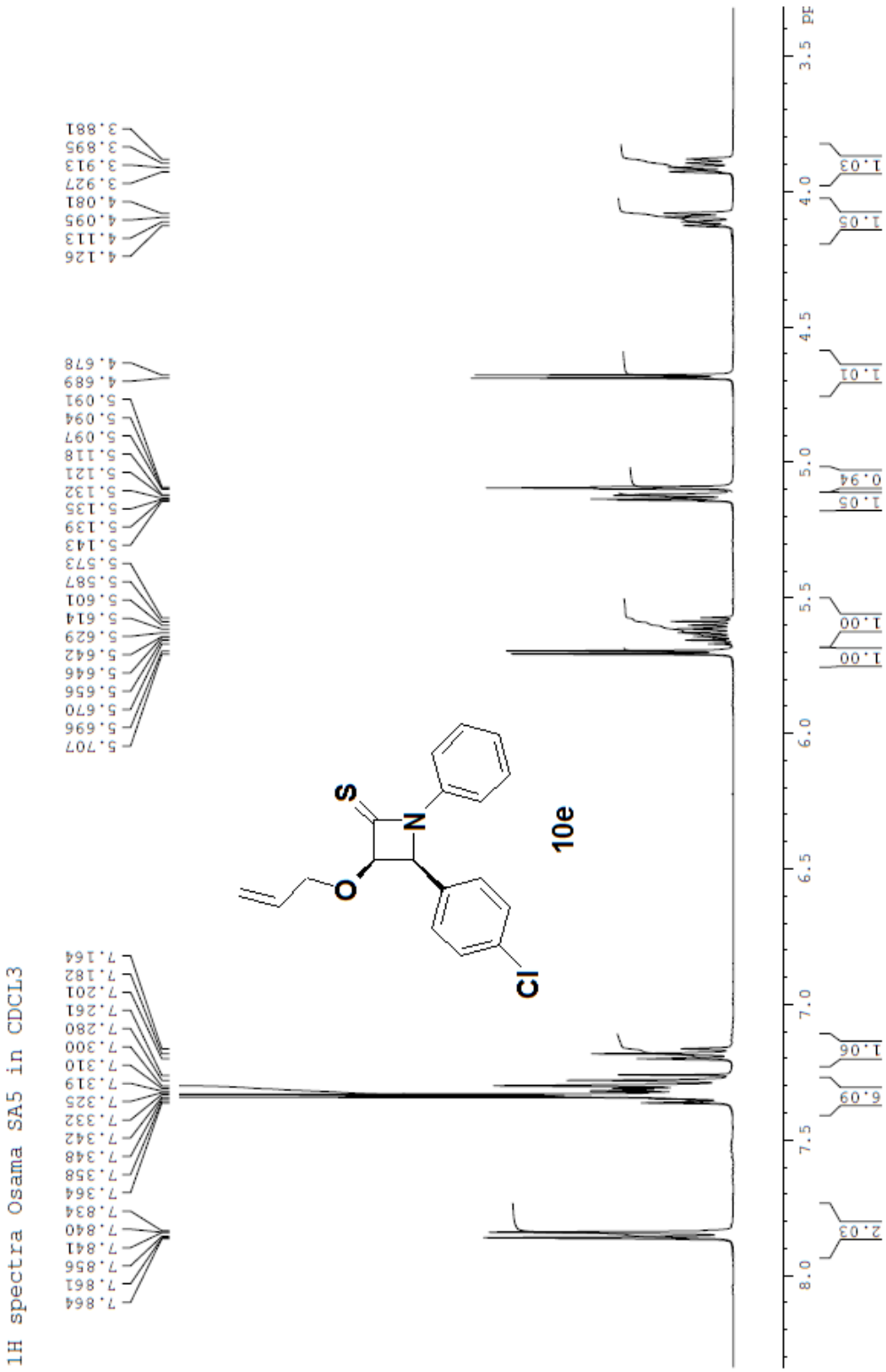
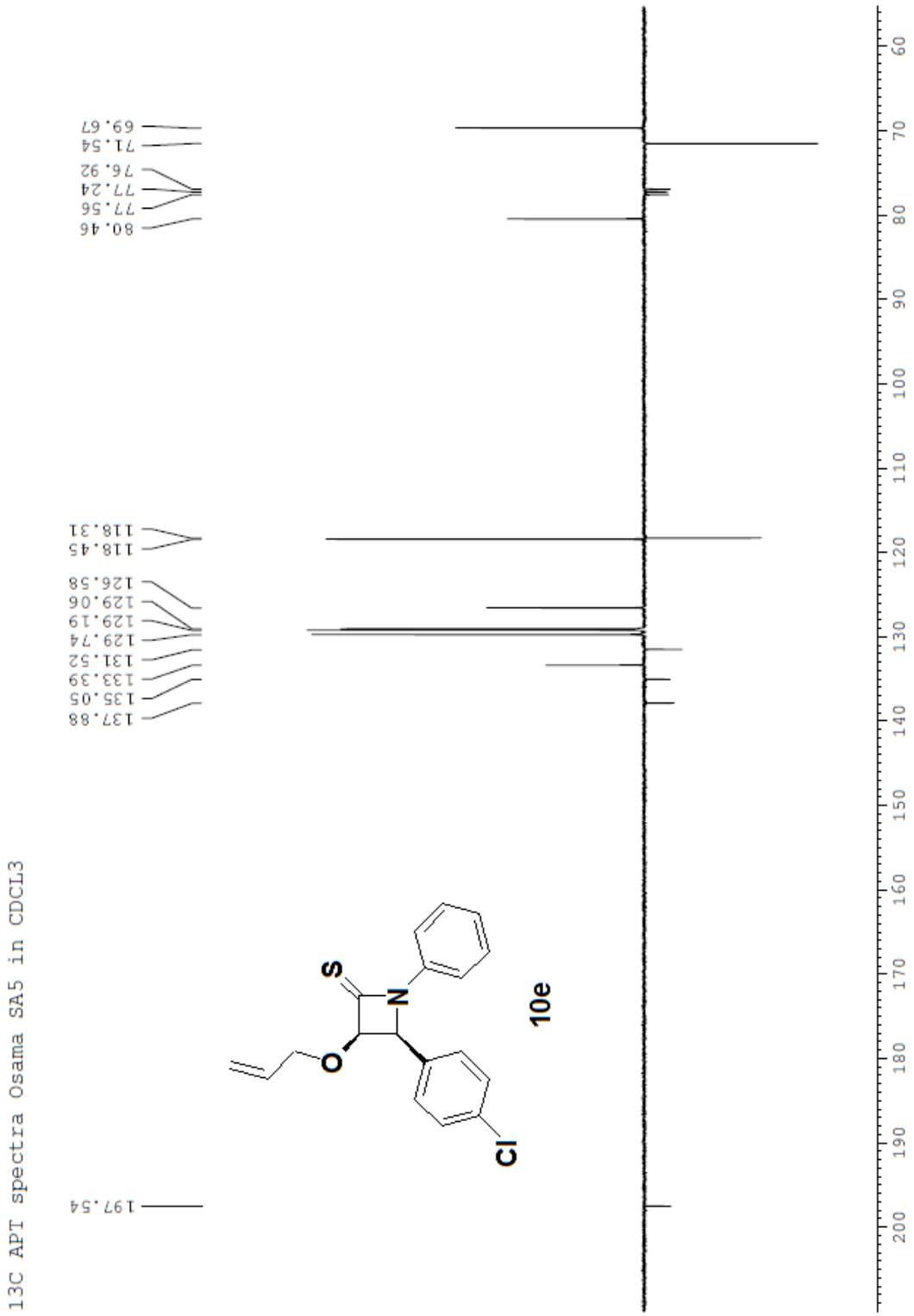
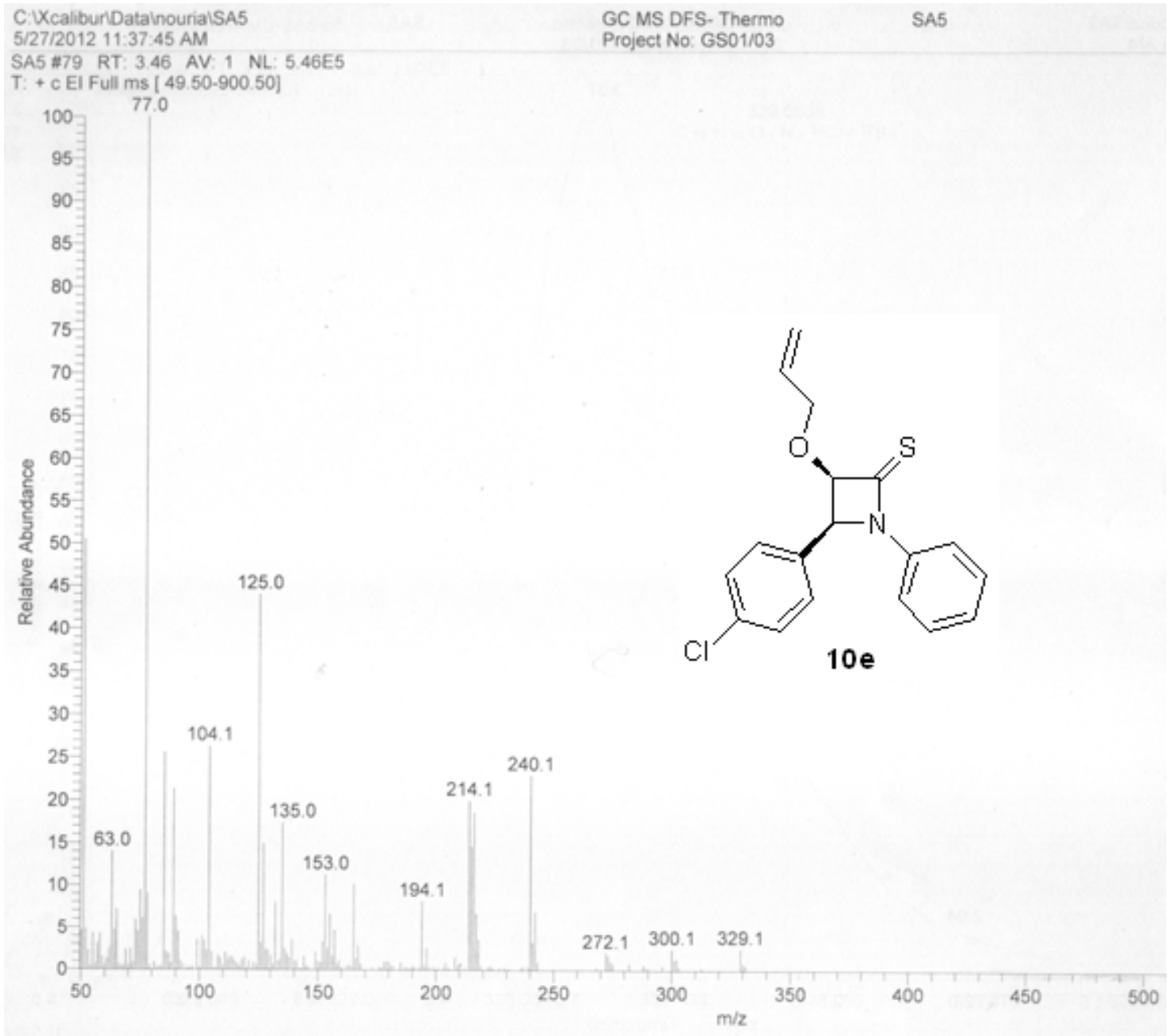
11/17/2011 11:25:18 AM
GC MS DFS- Thermo
Project No: GS01/03
SA4
SA4 #71 RT: 3.10 AV: 1 NL: 6.64E7
T: + c EI Full ms [49.50-900.50]
Relative Abundance
m/z
211.1
91.0
134.1
162.0
196.1
236.1
325.1
119.0
77.0
171.0
284.1
65.0
269.1
296.1
O
S
N
O
10d


1H spectra Osama SA5 in CDCL3
7.864
7.861
7.856
7.841
7.840
7.834
7.364
7.358
7.348
7.342
7.332
7.325
7.319
7.310
7.300
7.280
7.261
7.201
7.182
7.164
5.707
5.696
5.670
5.656
5.646
5.642
5.629
5.614
5.601
5.587
5.573
5.143
5.139
5.135
5.132
5.121
5.118
5.097
5.094
5.091
4.689
4.678
4.126
4.113
4.095
4.081
3.927
3.913
3.895
3.881
S
N
O
Cl
10e
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
2.03
6.09
1.06
1.00
1.00
1.05
0.94
1.01
1.05
1.03


13C APT spectra Osama SA5 in CDCL3
197.54
137.88
135.05
133.39
131.52
129.74
129.19
129.06
126.58
118.45
118.31
80.46
77.56
77.24
76.92
71.54
69.67
S
N
O
Cl
10e
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200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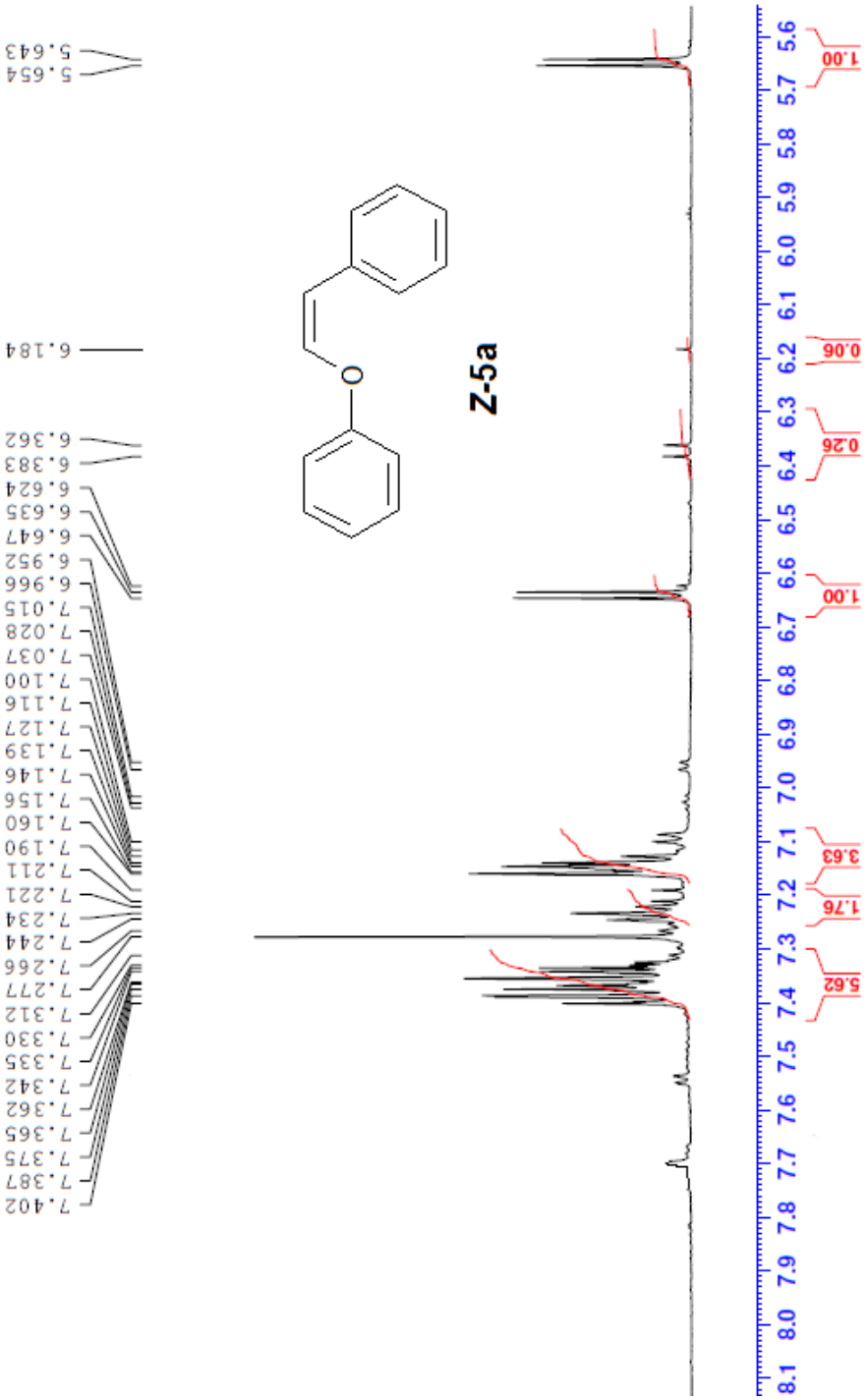
5/27/2012 11:37:45 AM
GC MS DFS- Thermo
Project No: GS01/03
SA5
SA5 #79 RT: 3.46 AV: 1 NL: 5.46E5
T: + c EI Full ms [49.50-900.50]
Relative Abundance
m/z
77.0
125.0
104.1
240.1
214.1
135.0
63.0
153.0
194.1
272.1
300.1
329.1
O
S
N
Cl
10e

Table 2. H-3/C-3 and H-4/C-4 of azetidinone rings of 8a-e, 9a and 10a-e.

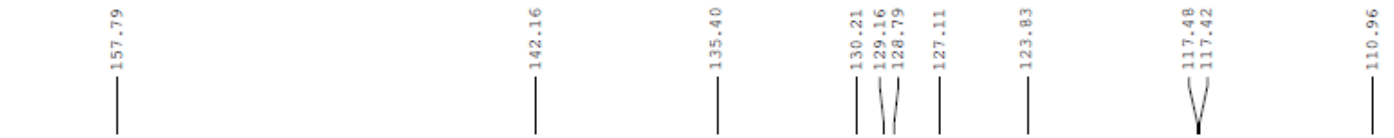
8a	75%	4.99 (d, J 4.8)/82.5	5.22 (d, J 4.8)/61.0
8b	84%	4.97 (d, J 4.8)/82.7	5.17 (d, J 4.8)/62.1
8c	69%	4.92 (d, J 4.8)/82.8	5.19 (d, J 4.8)/62.1
8d	82%	4.94 (d, J 4.8)/82.4	5.16 (d, J 4.8)/61.5
8e	70%	4.98 (d, J 4.8)/82.5	5.19 (d, J 4.8)/61.3
9a	4%	4.55 (d, J 2.4)	4.95 (d, J 2.4)
10a	70%	4.72 (d, J 4.4)/80.4	5.75(d, J 4.4)/70.2
10b	75%	4.71 (d, J 4.4)/80.3	5.70(d, J 4.4)/70.3
10c	65%	4.72 (d, J 4.4)/80.6	5.73(d, J 4.4)/70.3
10d	72%	4.68 (d, J 4.4)/80.5	5.70(d, J 4.4)/69.9
10e	68%	4.70 (d, J 4.4)/80.3	5.73(d, J 4.4)/69.5

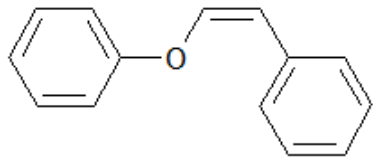
Assignment of H3, H4 proton signals is based on their cross correlations with their respective carbon signals in the 2D-HSQC NMR spectra.

Spectra of some selected product after preparative TLC separation

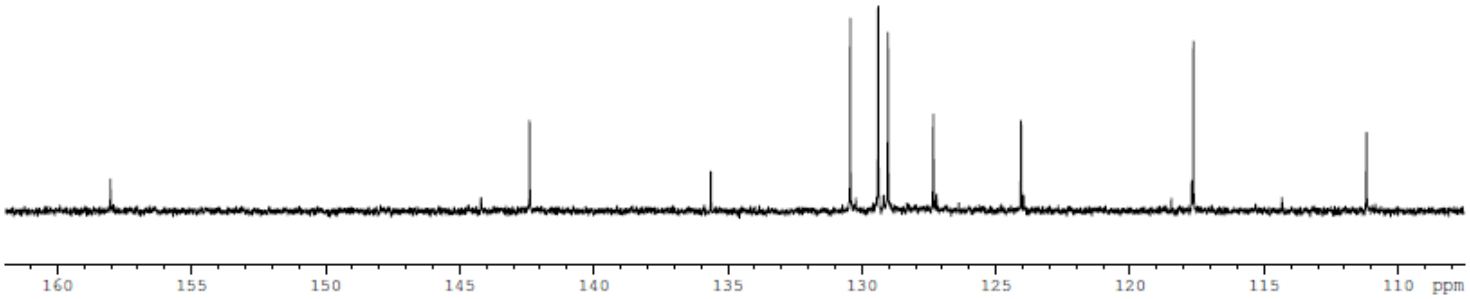


13C Spectra Dr.YEHIA C3 in CDCL3

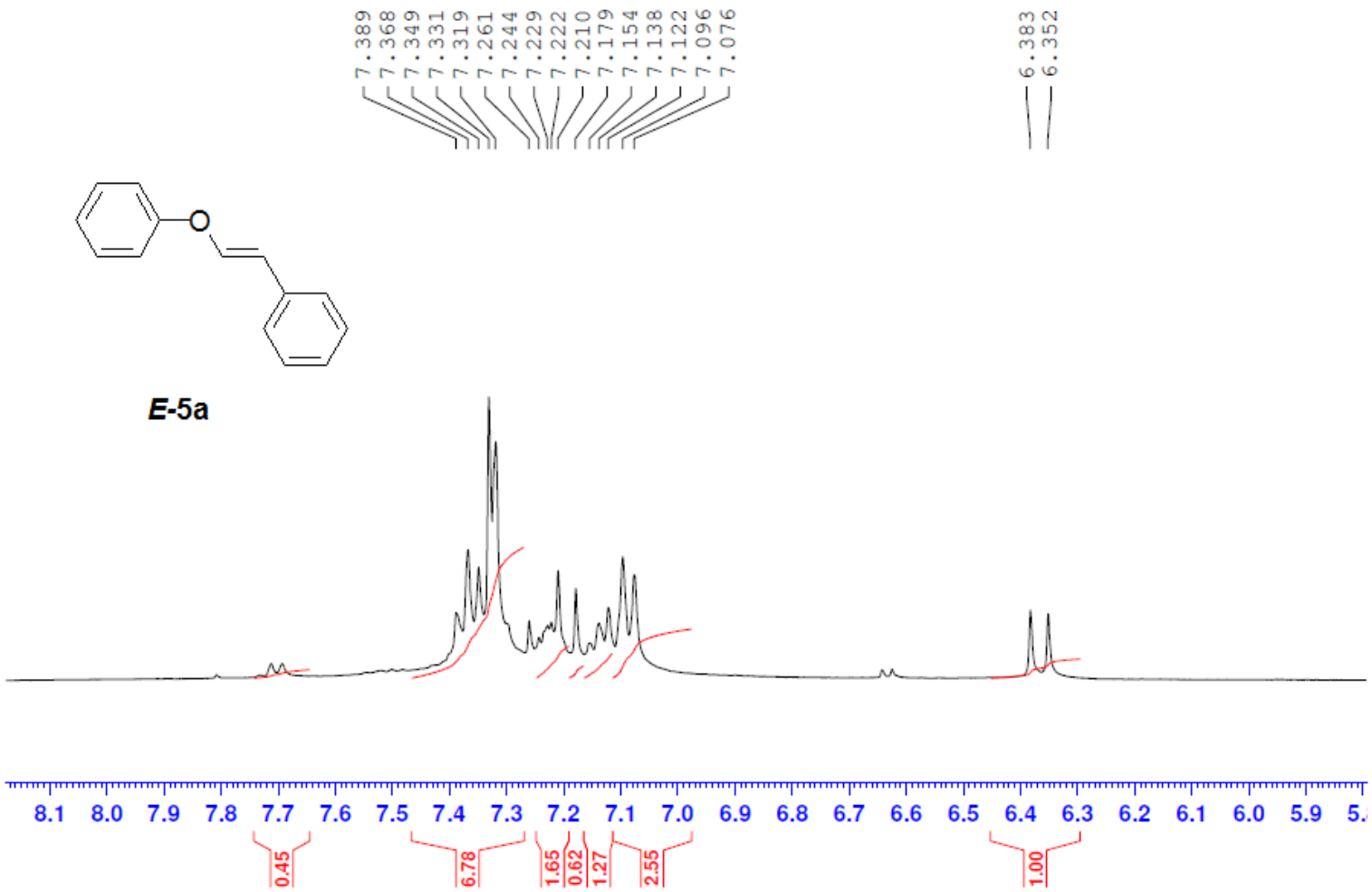




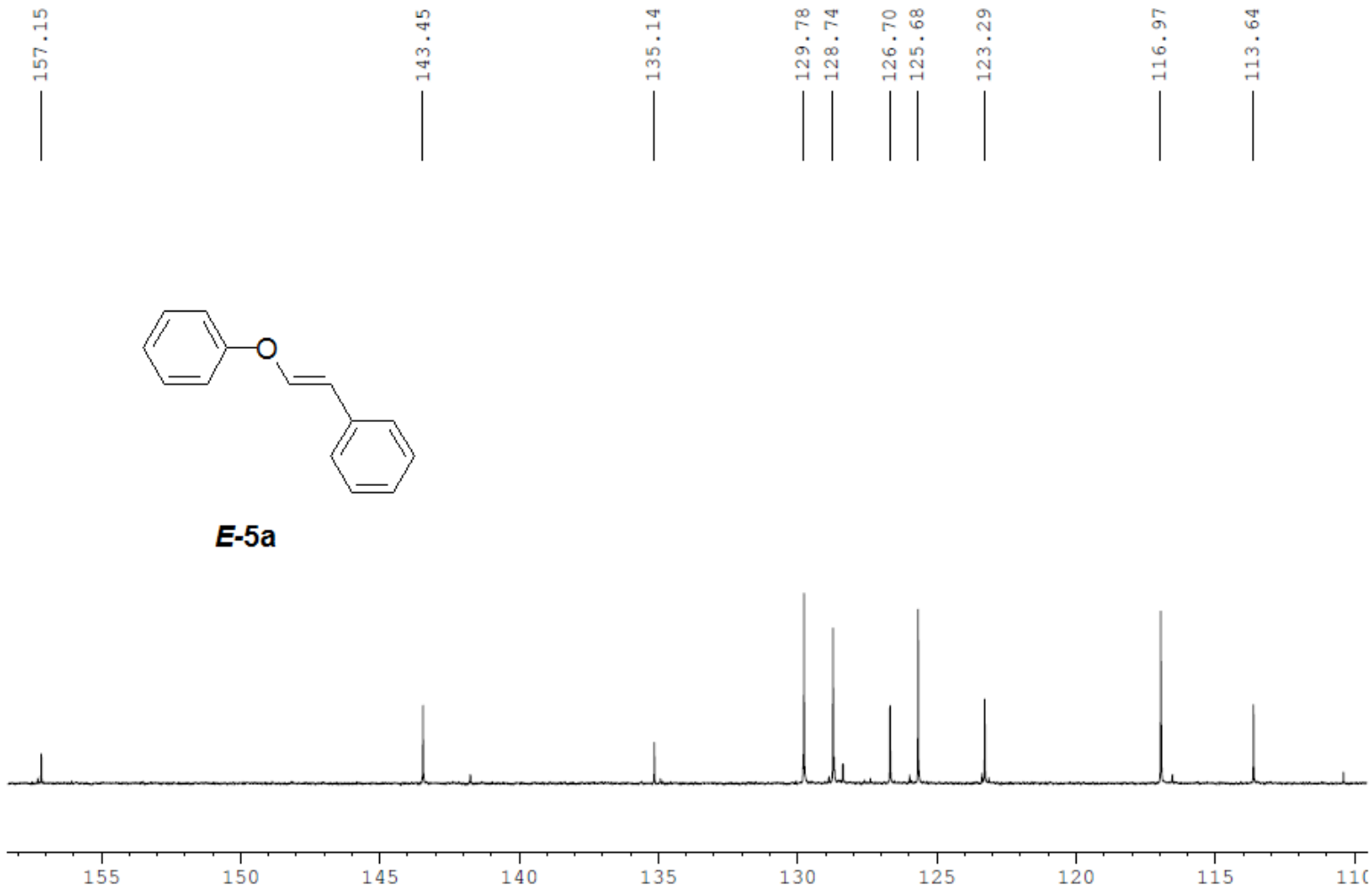
Z-5a



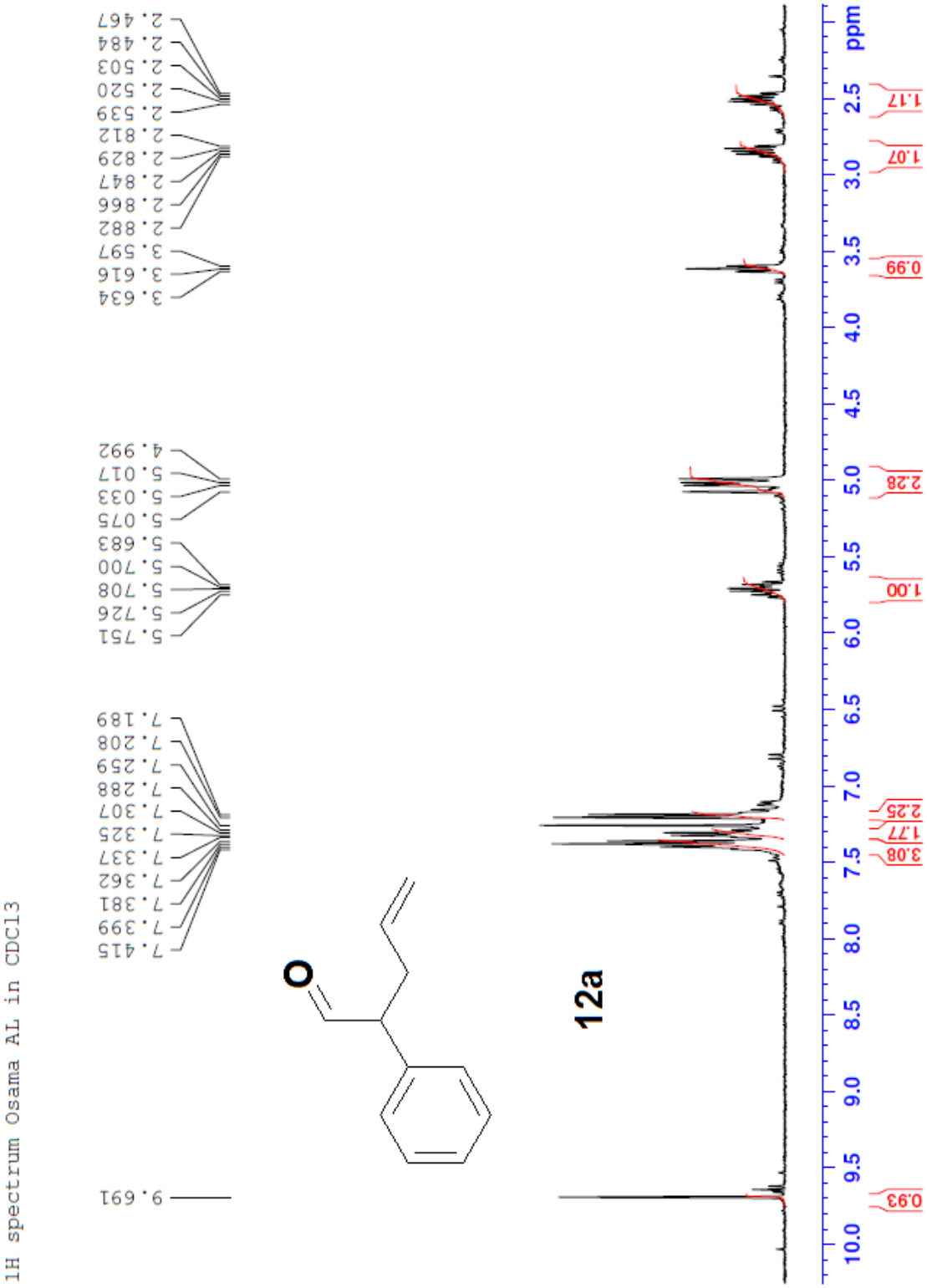
1H spectra Dr.Yehia C1 in CDCL3



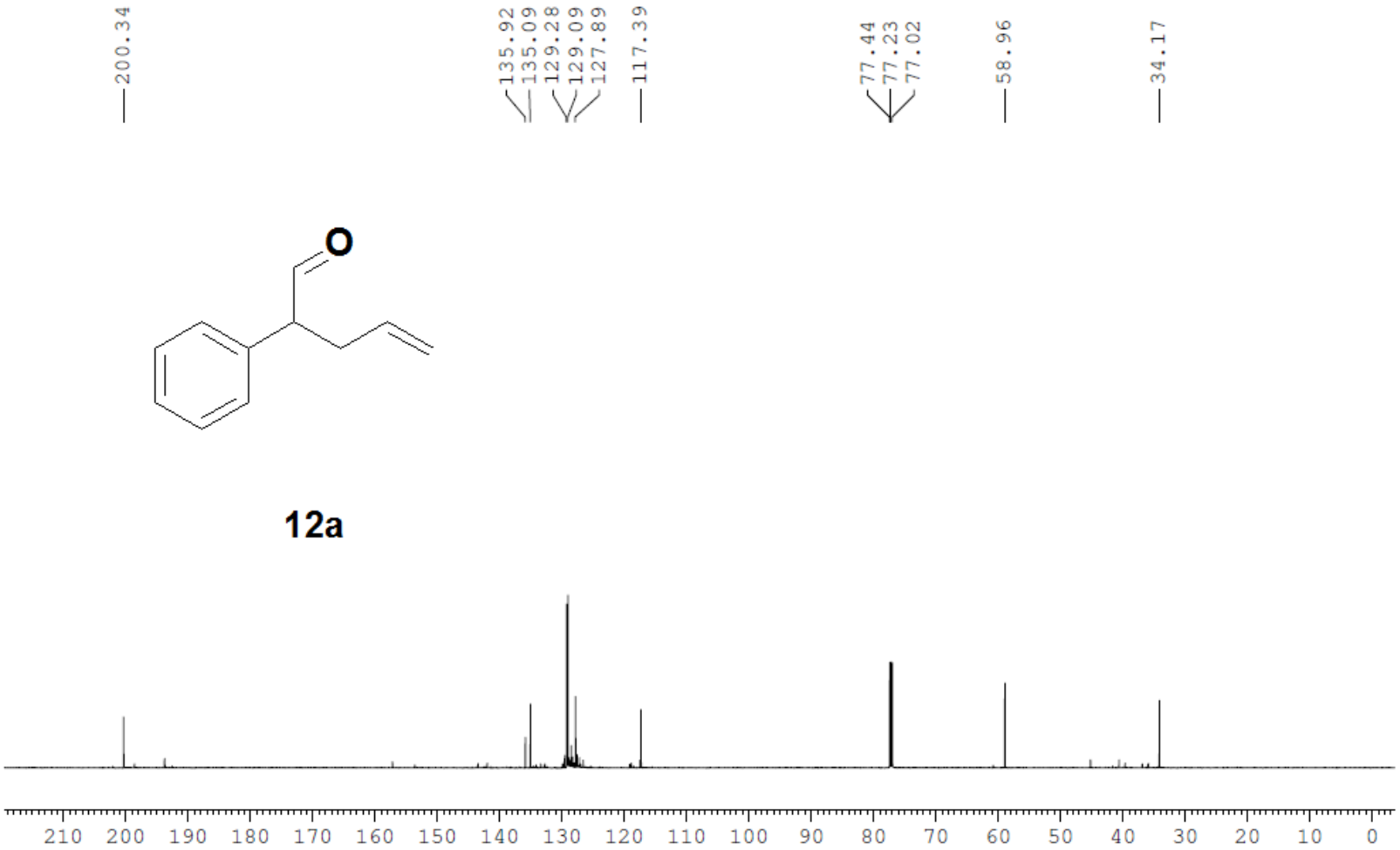
13C decoupled spectra Dr.Yehia C1 in CDCL3



***E*-5a**


1H spectrum Osama AL in CDCl3
9.691
7.415
7.399
7.381
7.362
7.337
7.325
7.307
7.288
7.259
7.208
7.189
5.751
5.726
5.708
5.700
5.683
5.075
5.033
5.017
4.992
3.634
3.616
3.597
2.882
2.866
2.847
2.829
2.812
2.539
2.520
2.503
2.484
2.467
O
12a
ppm
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
0.93
3.08
1.77
2.25
1.00
2.28
0.99
1.07
1.17

13C decoupled Spectra Osama AL in CDCl3



12a