Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.

Gold-Catalyzed Spiro-*N,O*-Ketal Synthesis

Supporting Information

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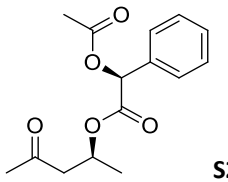
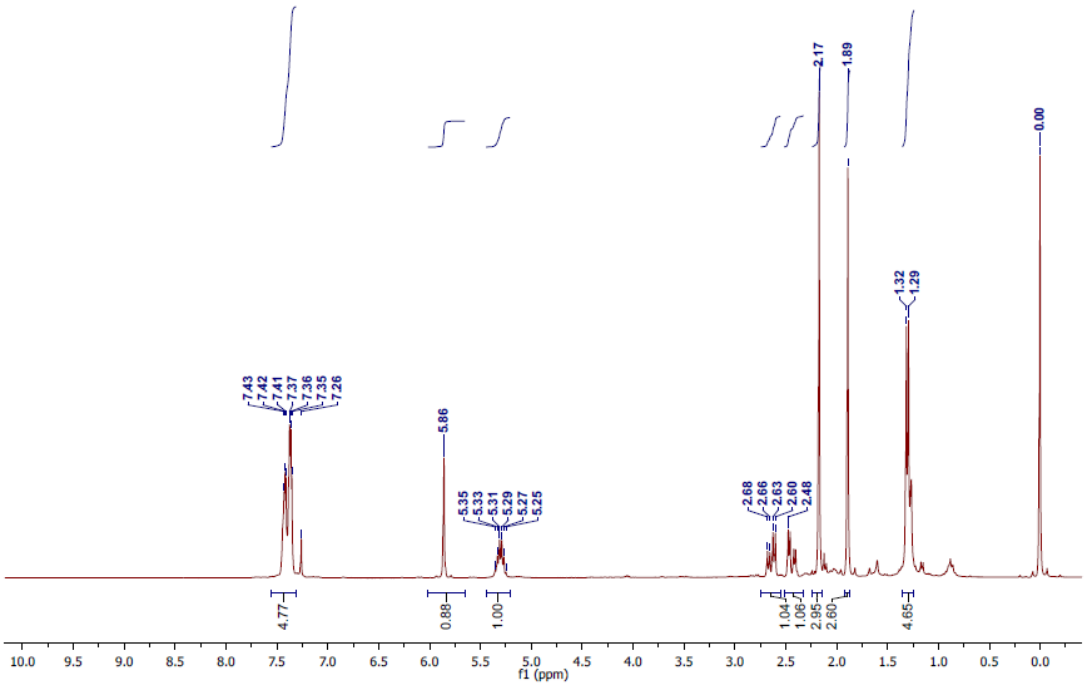


S2

MG29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7.41
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7.36
7.35
7.26
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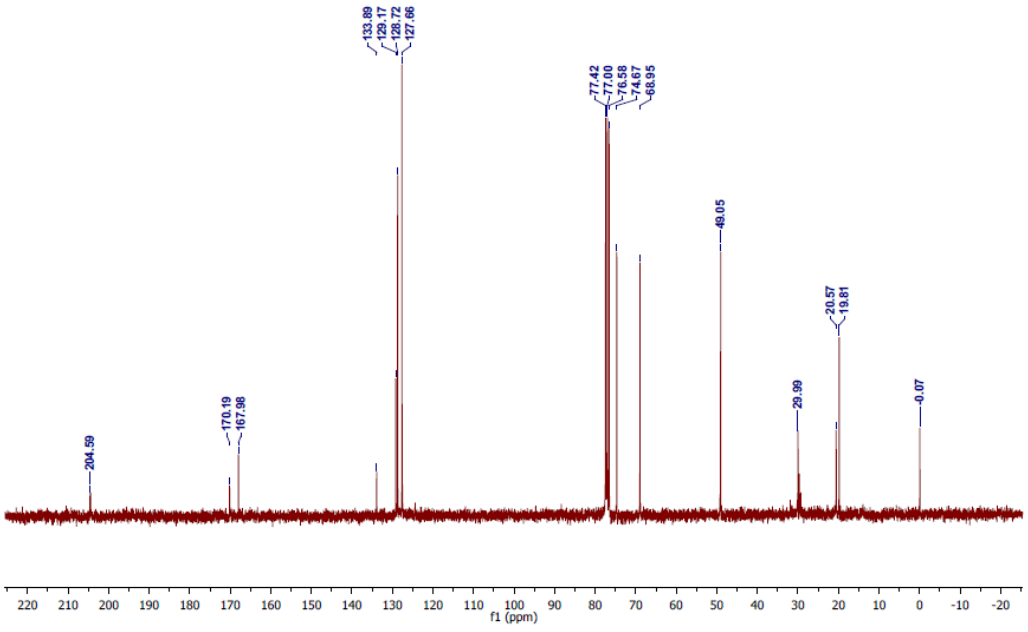
5.35
5.33
5.31
5.29
5.27
5.25
2.68
2.66
2.63
2.60
2.48
2.17
1.89
1.32
1.29
0.00
4.77
0.88
1.00
1.04
1.06
2.95
2.60
4.65
f1 (ppm)

MG29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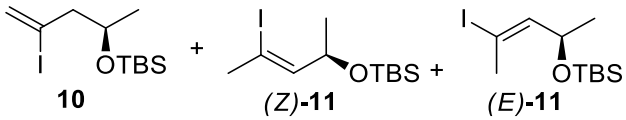
19.81
204.59
170.19
167.98
-0.07
f1 (ppm)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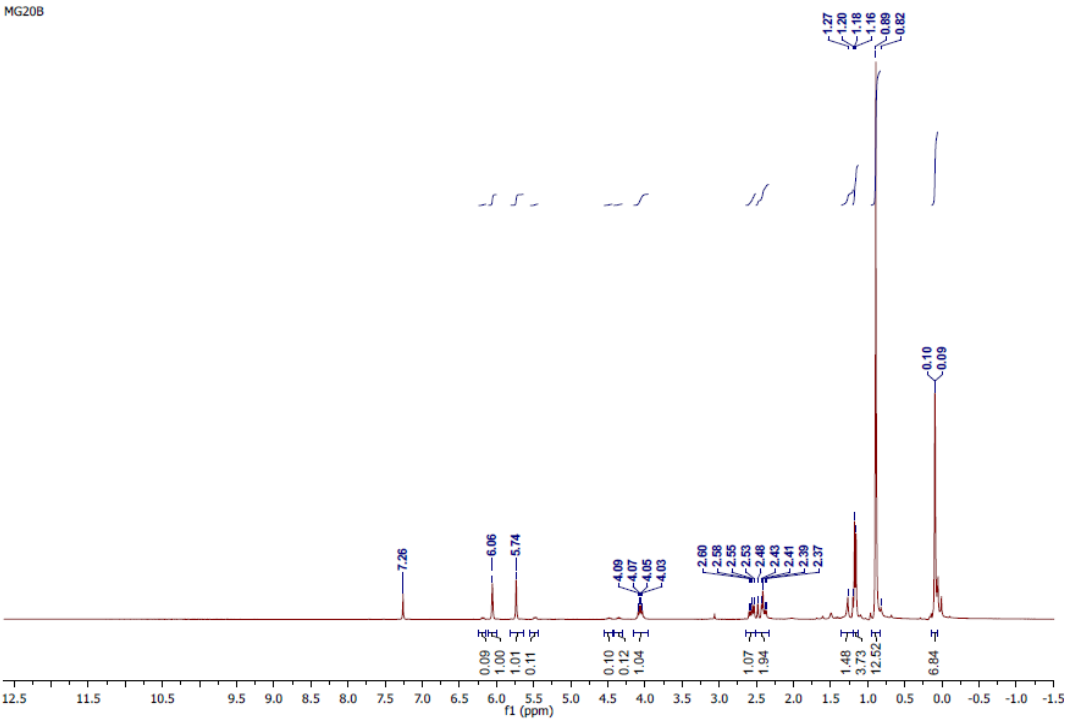
+
OTBS +
OTBS

10 *(Z)*-**11** *(E)*-**11**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1.18
1.16
0.89
0.82
0.10
0.09
7.26
6.06
5.74
4.09
4.07
4.05
4.03
2.60
2.58
2.55
2.53
2.48
2.43
2.41
2.39
2.37
0.09
1.00
1.01
0.11
0.10
0.12
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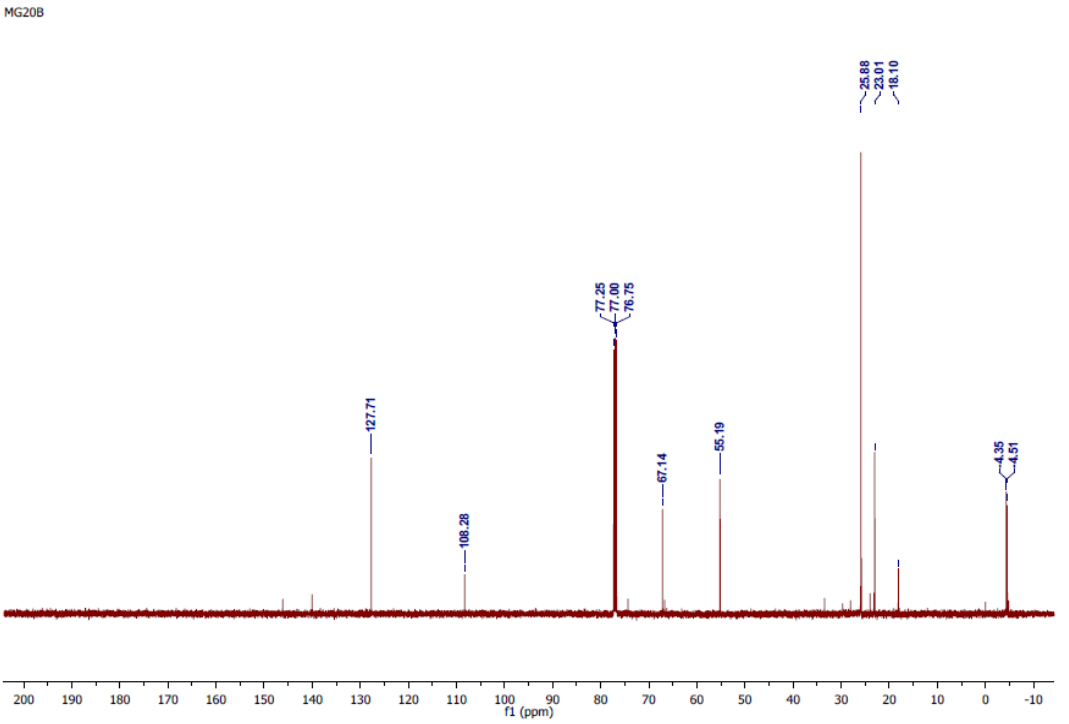
1.07
1.94
1.48
3.73
12.52
6.84
f1 (ppm)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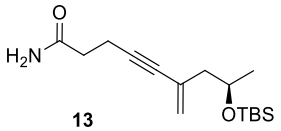
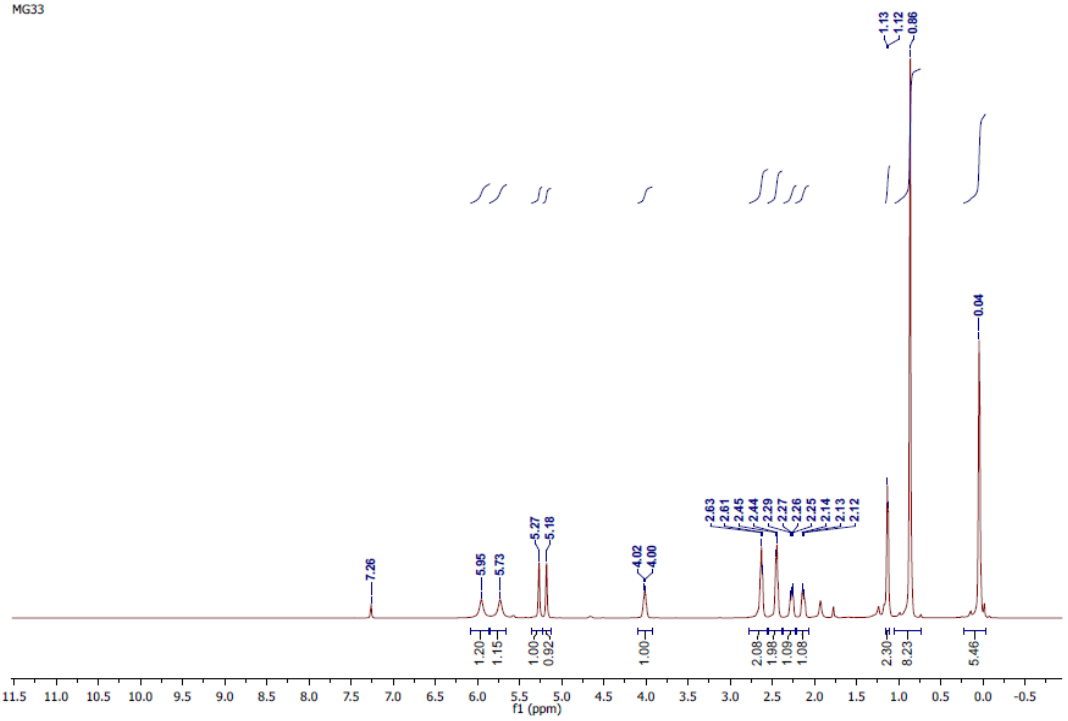
f1 (ppm)


O
H2N
OTBS

13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5.18
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4.00
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2.61
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2.26
2.25
2.14
2.13
2.12
1.13
1.12
0.86
0.04
1.20
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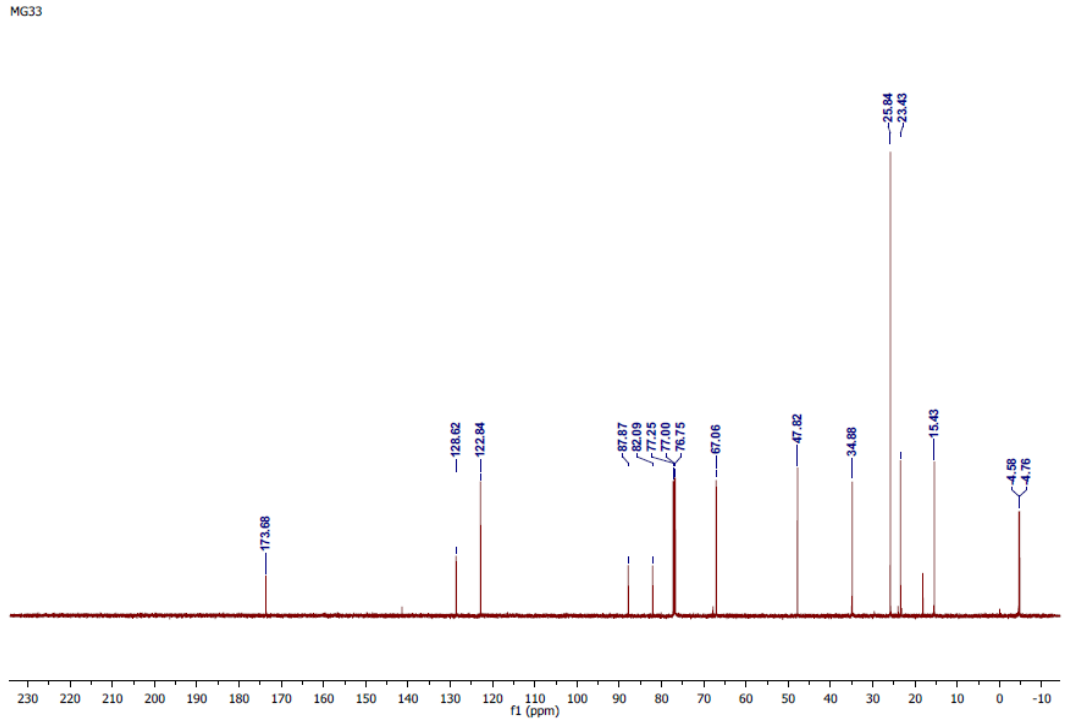
1.09
1.08
2.30
8.23
5.46
f1 (ppm)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25.84
23.43
15.43
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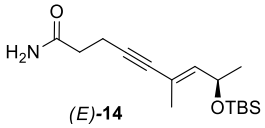
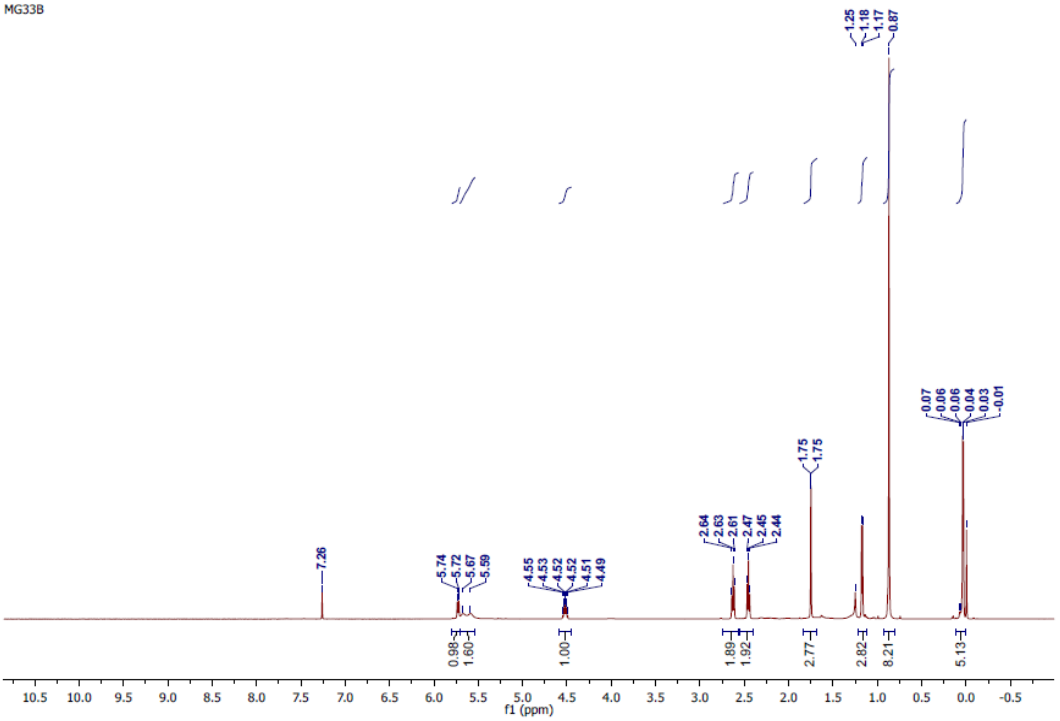
4.76
f1 (ppm)


O
H2N
OTBS

(E)-**14**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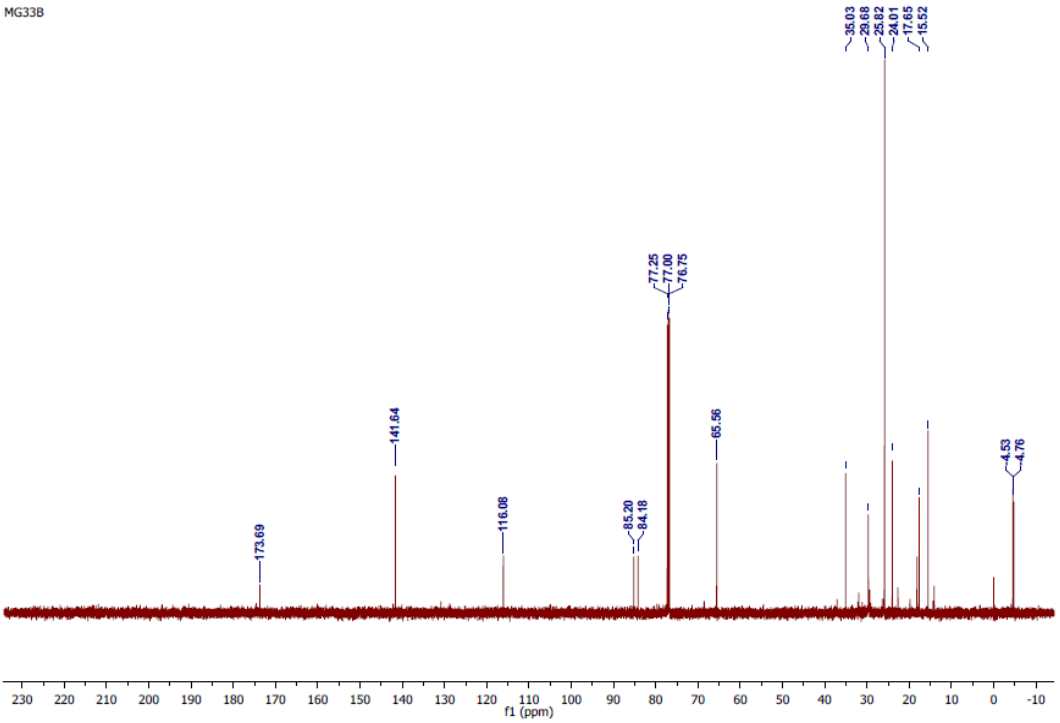
0.07
0.06
0.06
0.04
0.03
-0.01
1.75
1.75
2.64
2.63
2.61
2.47
2.45
2.44
7.26
5.74
5.72
5.67
5.59
4.55
4.53
4.52
4.52
4.51
4.49
0.98
1.60
1.00
1.89
1.92
2.77
2.82
8.21
5.13
f1 (ppm)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4.76
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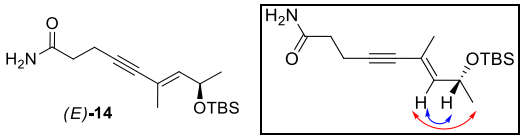
85.20
84.18
173.69
f1 (ppm)



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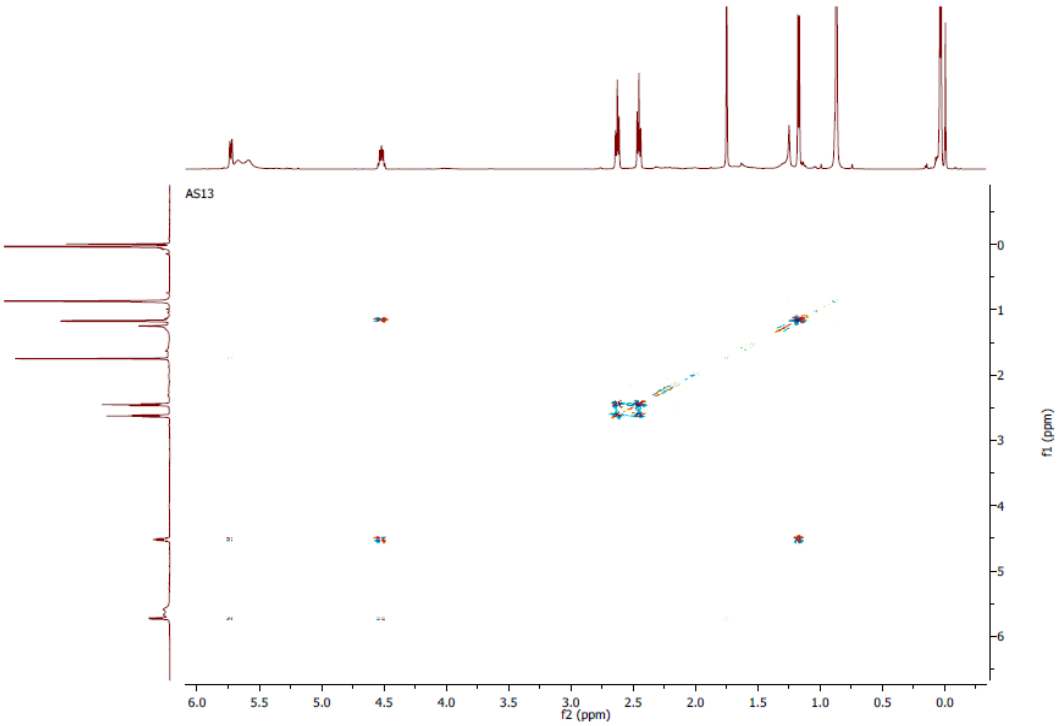

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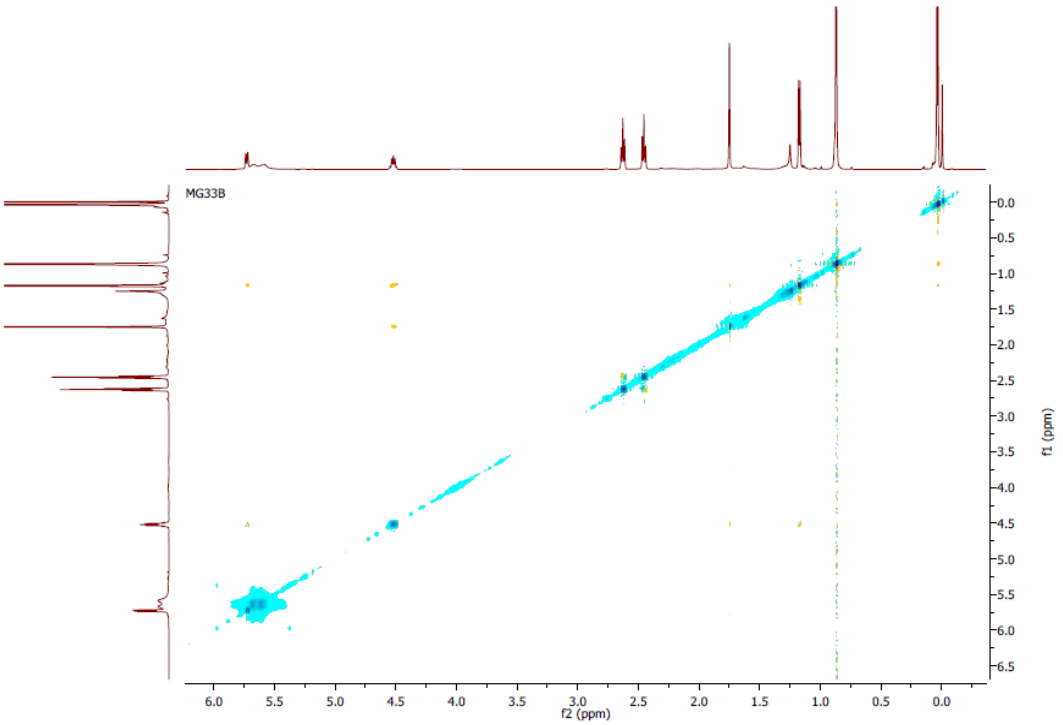
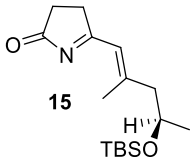
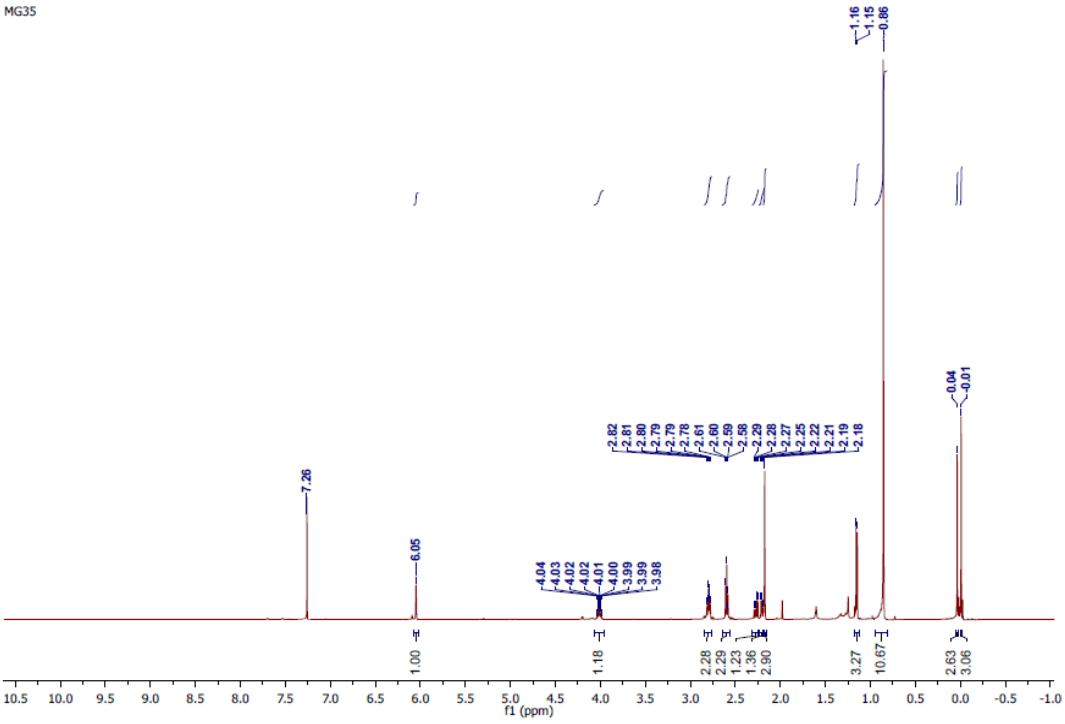



O
N
H
TBSO

15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4.03
4.02
4.02
4.01
4.00
3.99
3.99
3.98
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2.81
2.80
2.79
2.79
2.78
2.61
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2.29
2.28
2.27
2.25
2.22
2.21
2.19
2.18
1.16
1.15
0.86
0.04
0.01
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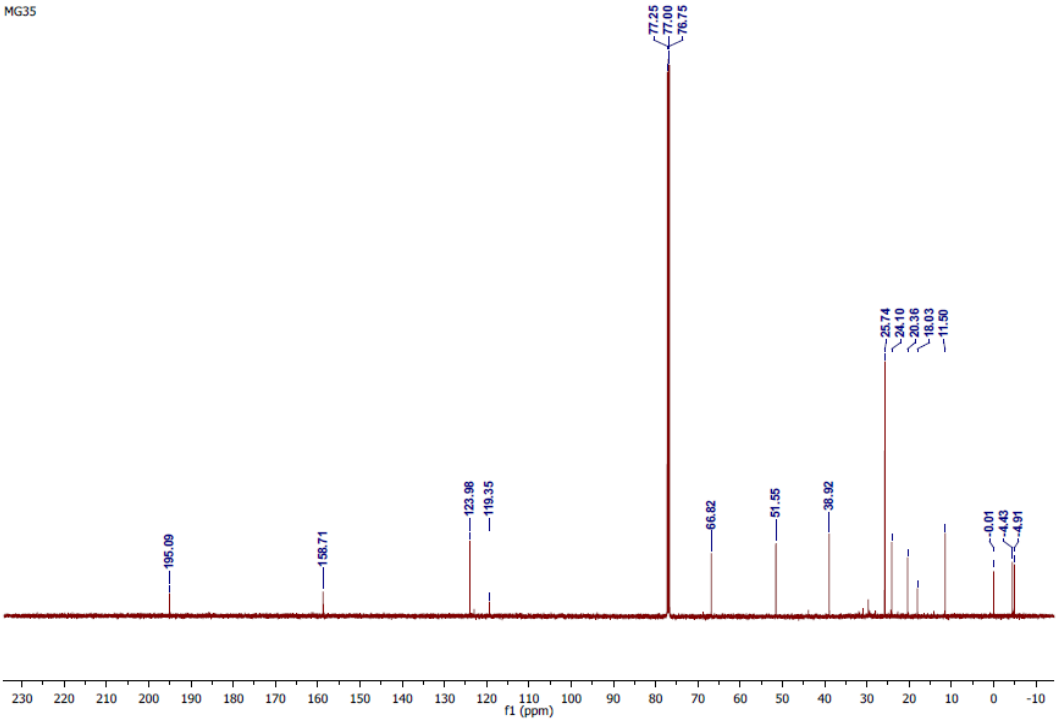
3.06
f1 (ppm)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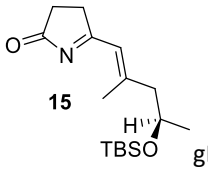
-4.91
f1 (ppm)



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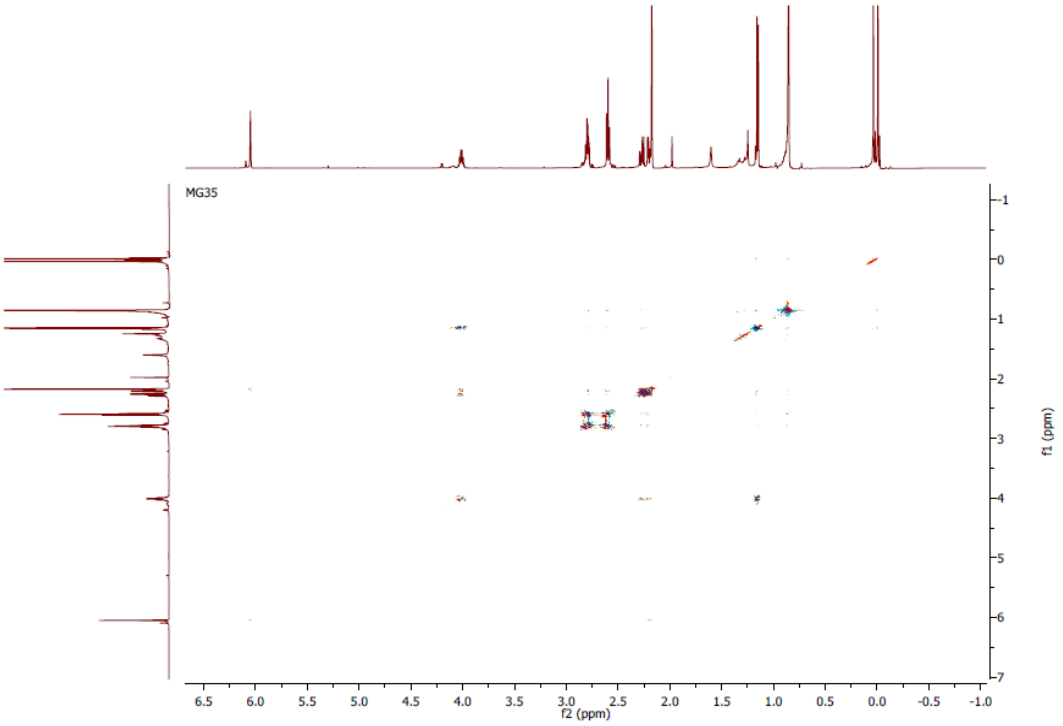

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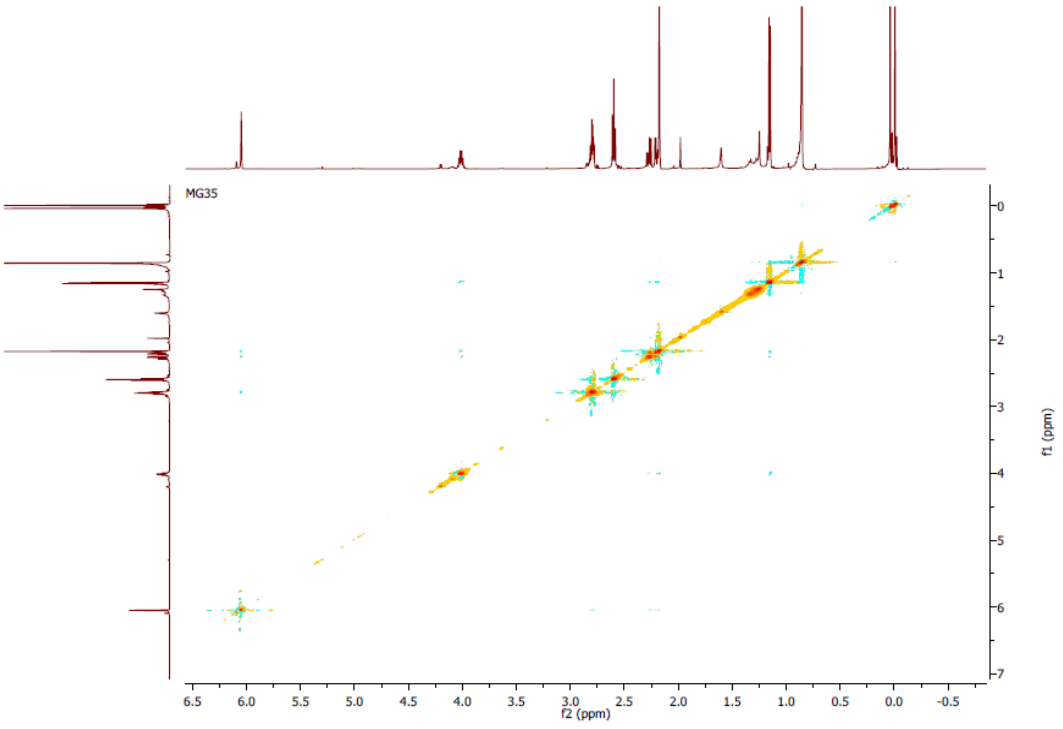
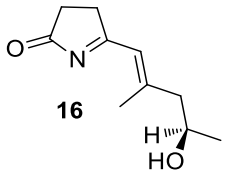
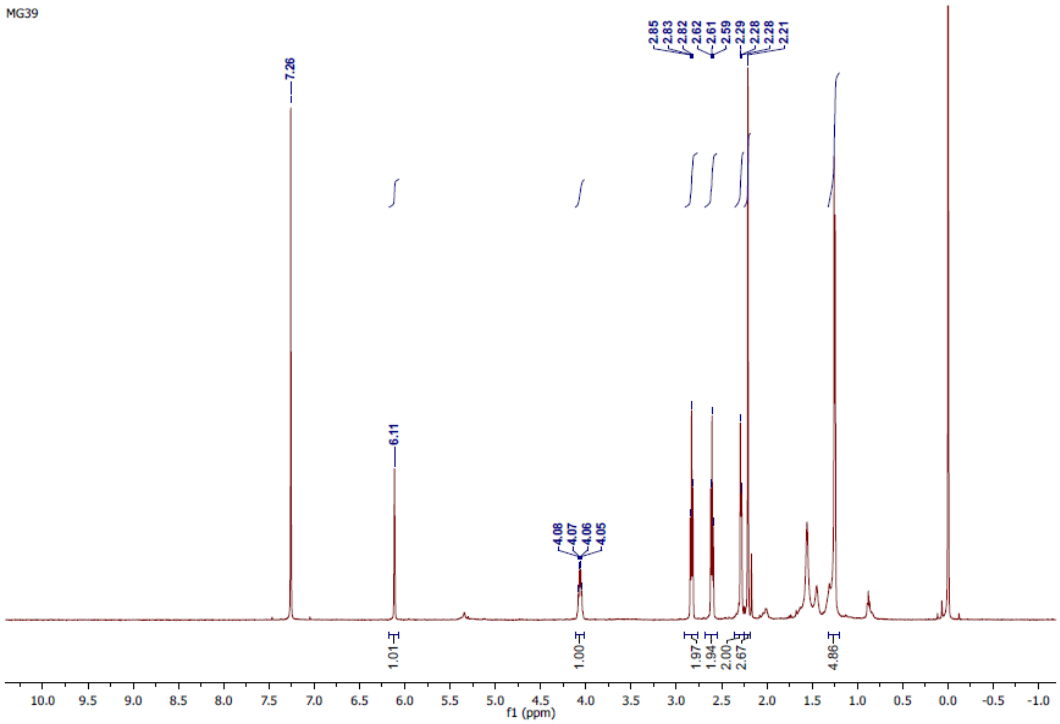



O
N
H
HO

16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4.08
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4.06
4.05
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2.82
2.62
2.61
2.59
2.29
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2.21
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1.00
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2.00
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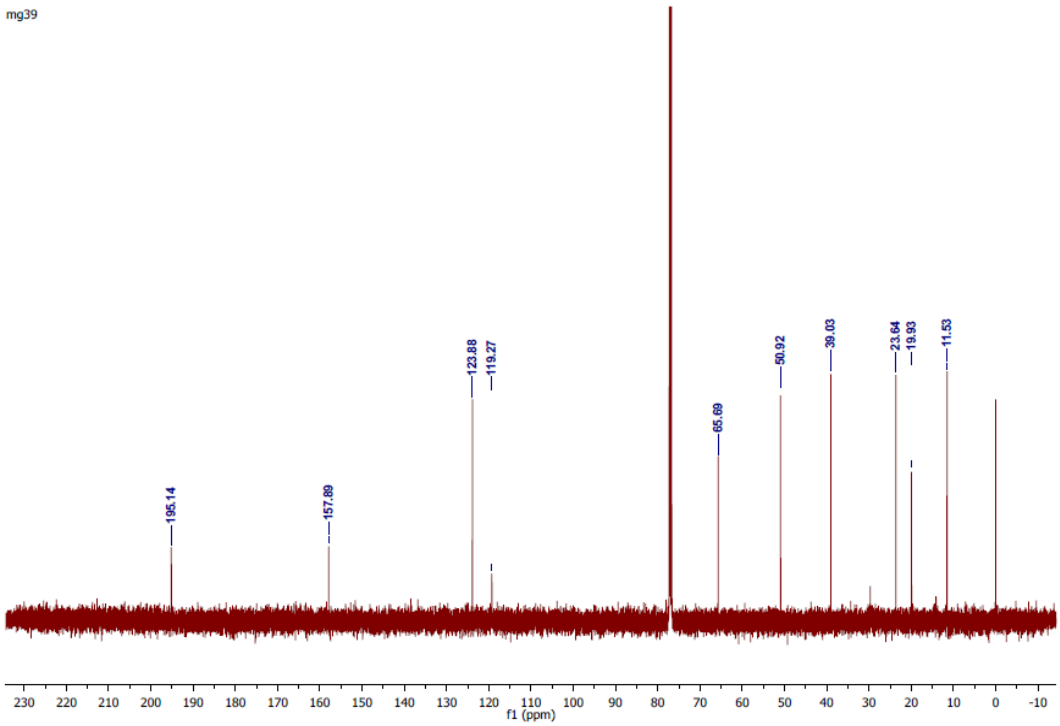
f1 (ppm)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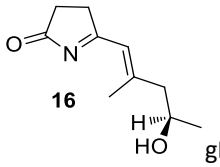
39.03
23.64
19.93
11.53
f1 (ppm)



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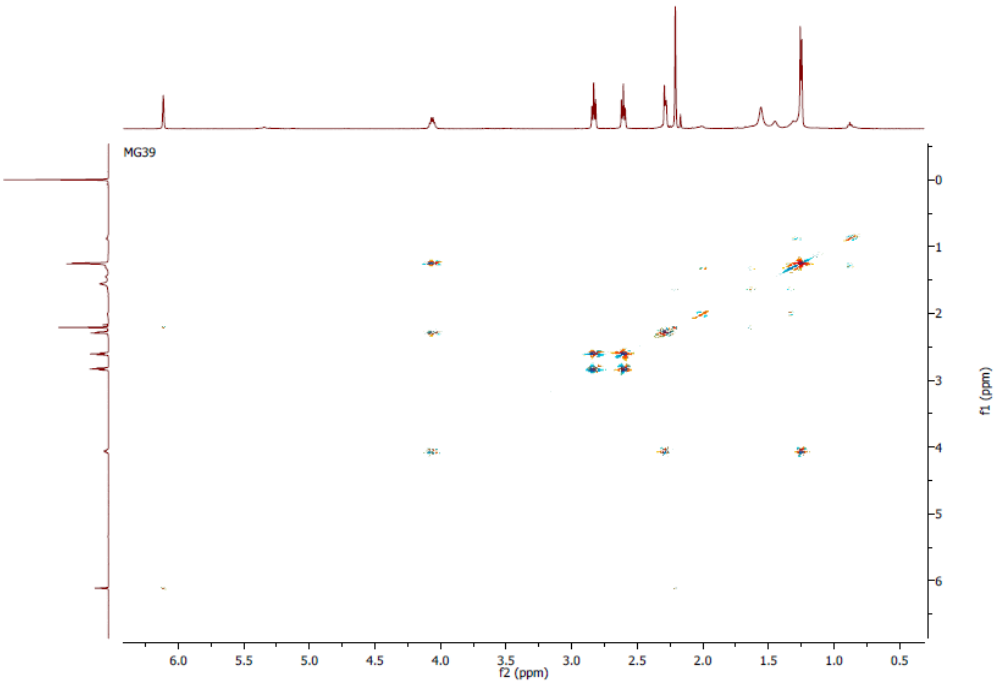

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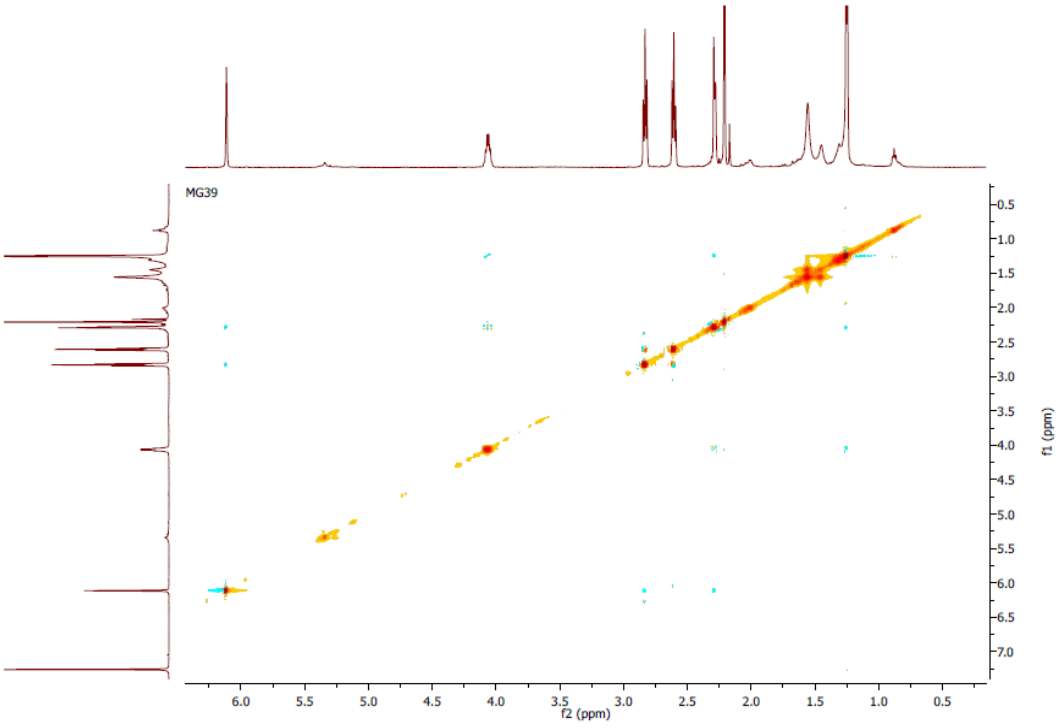

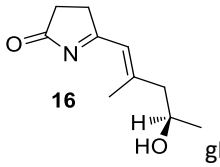

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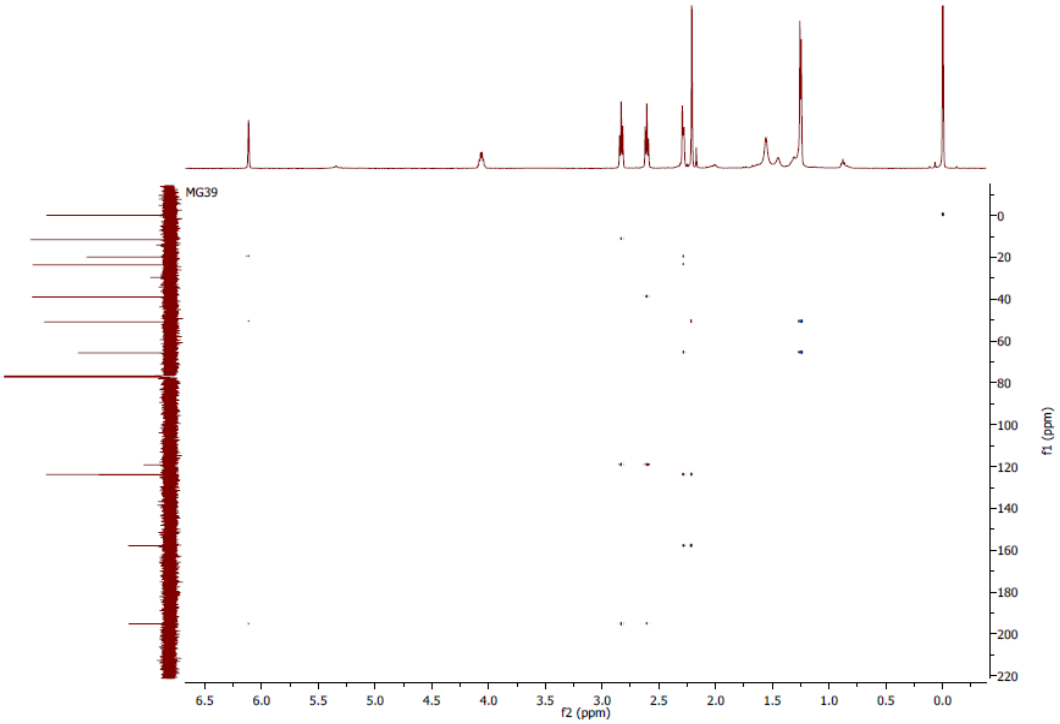

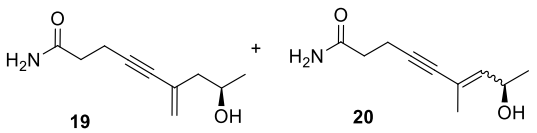
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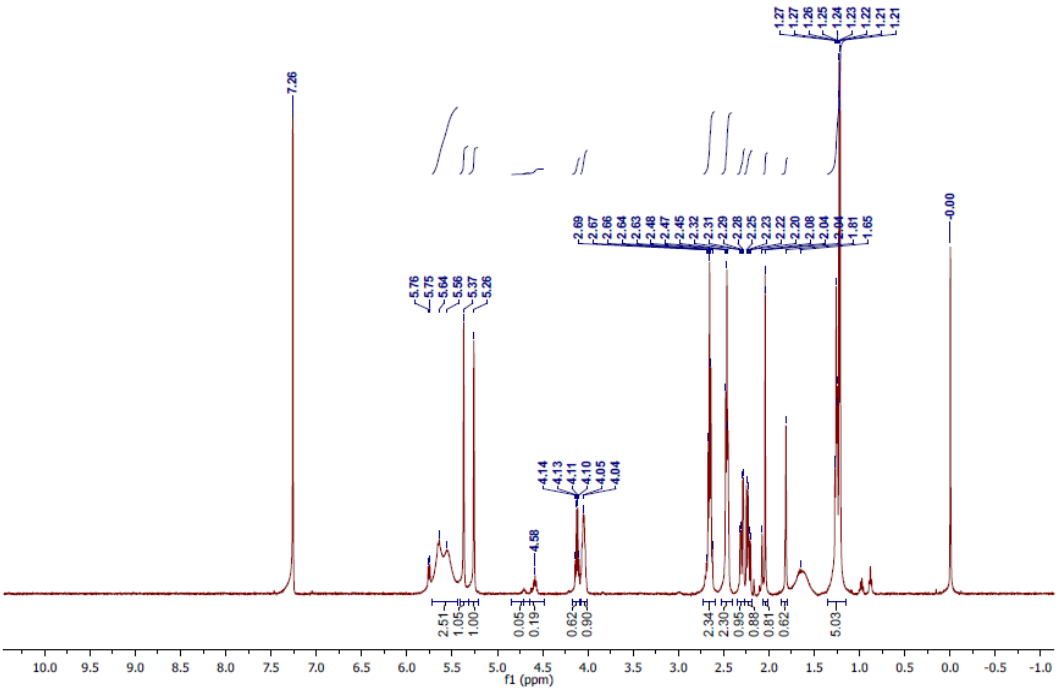
H2N
OH
19
+
O
H2N
OH
20

MG64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4.11
4.10
4.05
4.04
2.69
2.67
2.66
2.64
2.63
2.48
2.47
2.45
2.32
2.31
2.29
2.28
2.25
2.23
2.22
2.20
2.08
2.04
1.81
1.65
1.27
1.27
1.26
1.25
1.24
1.23
1.22
1.21
1.21
0.00
2.51
1.05
1.00
0.05
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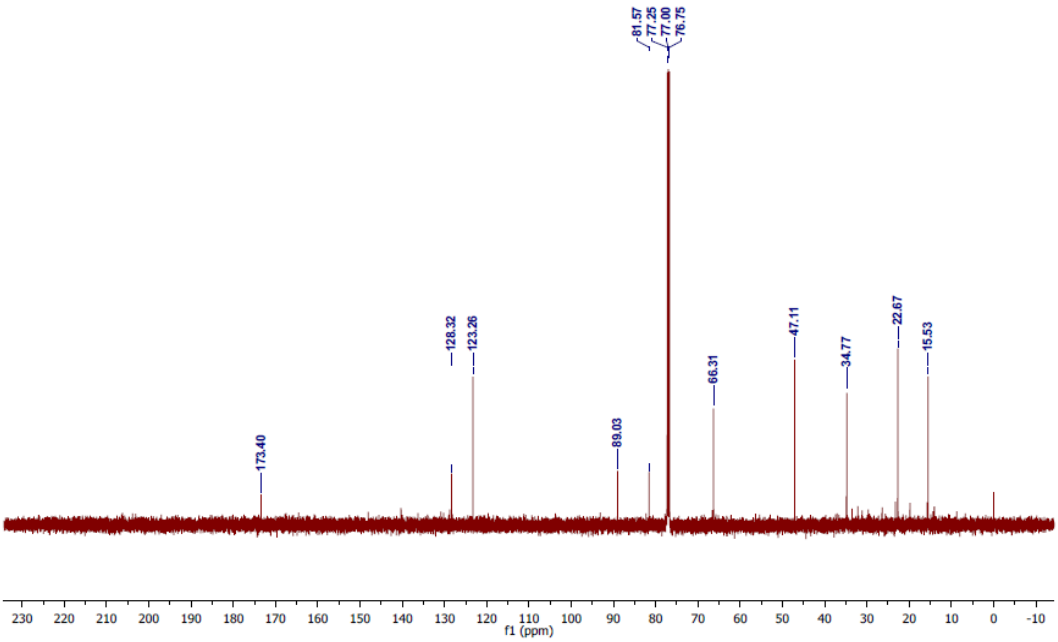
f1 (ppm)

MG64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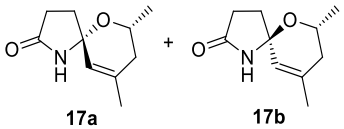
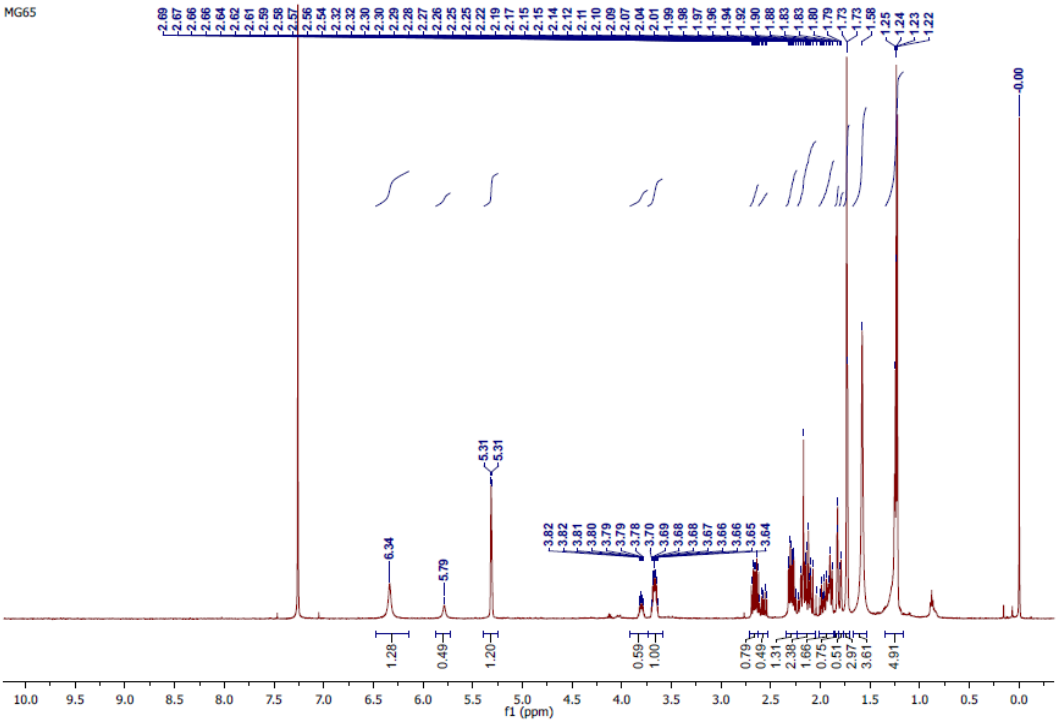
173.40
f1 (ppm)



17a + **17b**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1.20
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1.31
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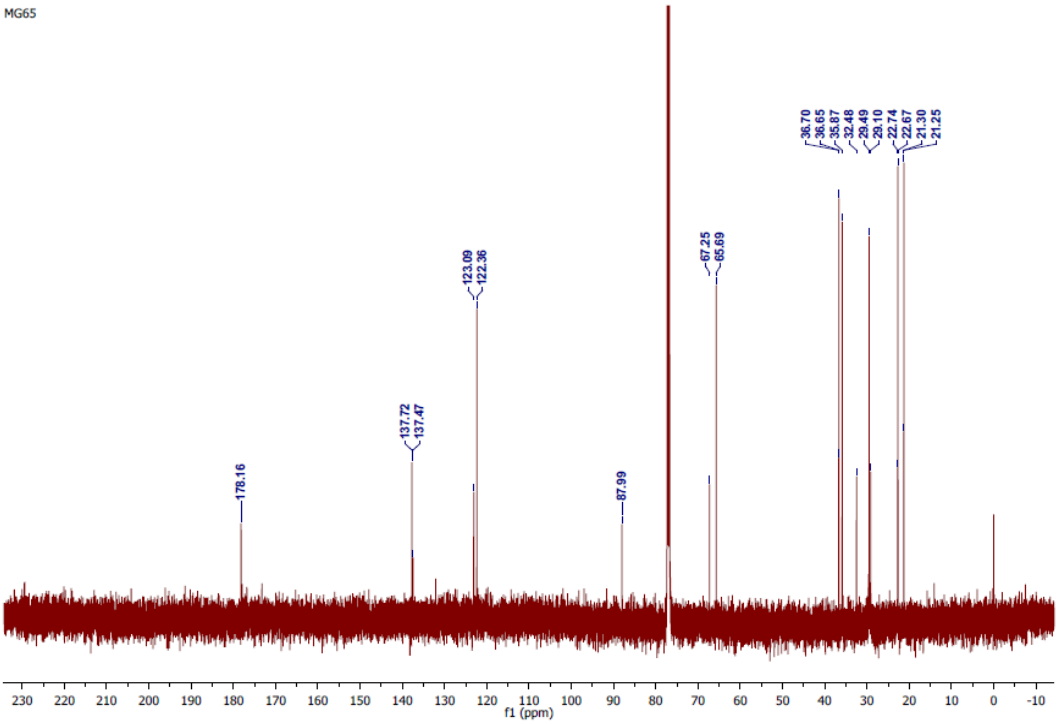
1.66
0.75
0.51
2.97
3.61
4.91
f1 (ppm)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67.25
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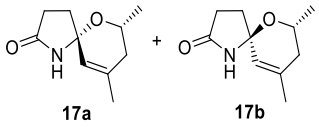
22.74
22.67
21.30
21.25
f1 (ppm)



17a 17b

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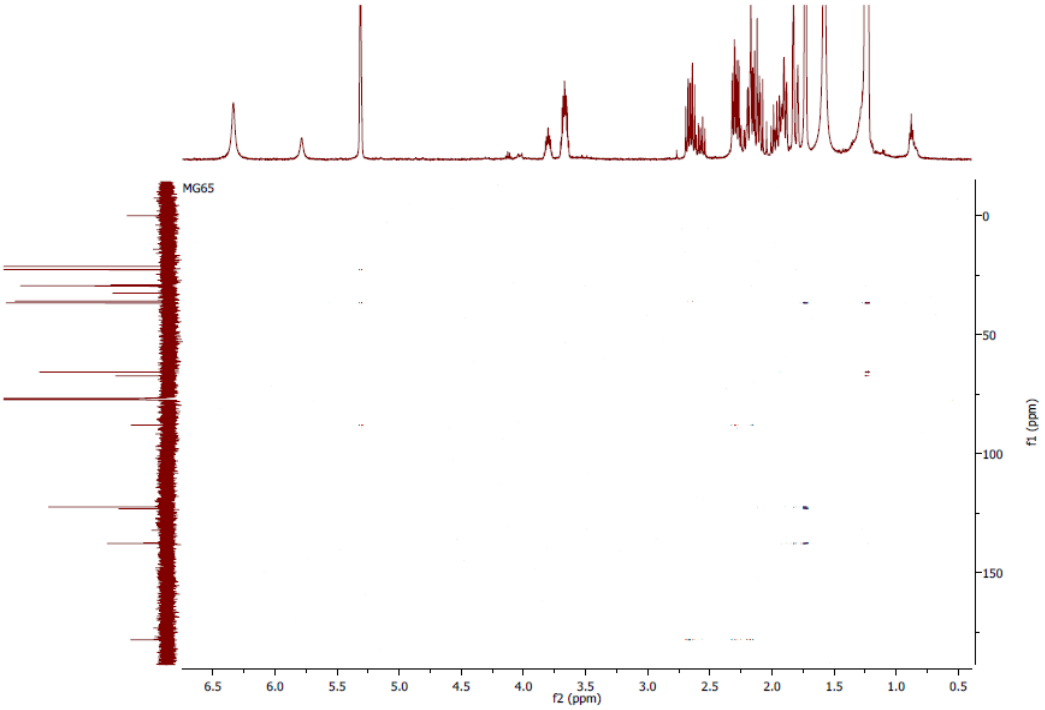

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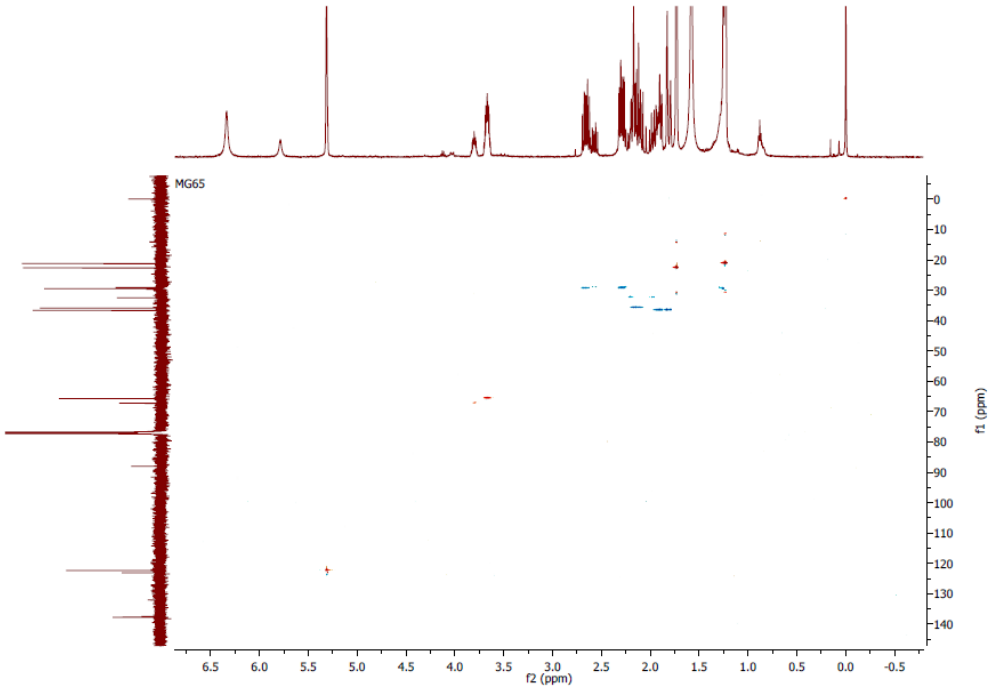

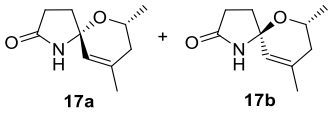

17a **17b**

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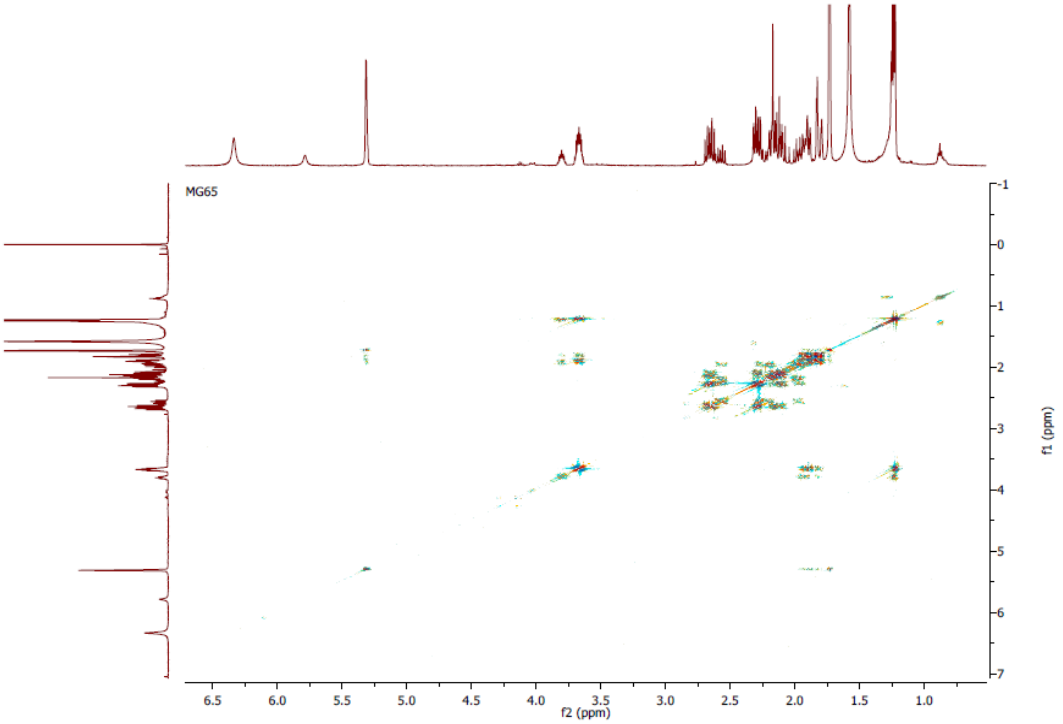

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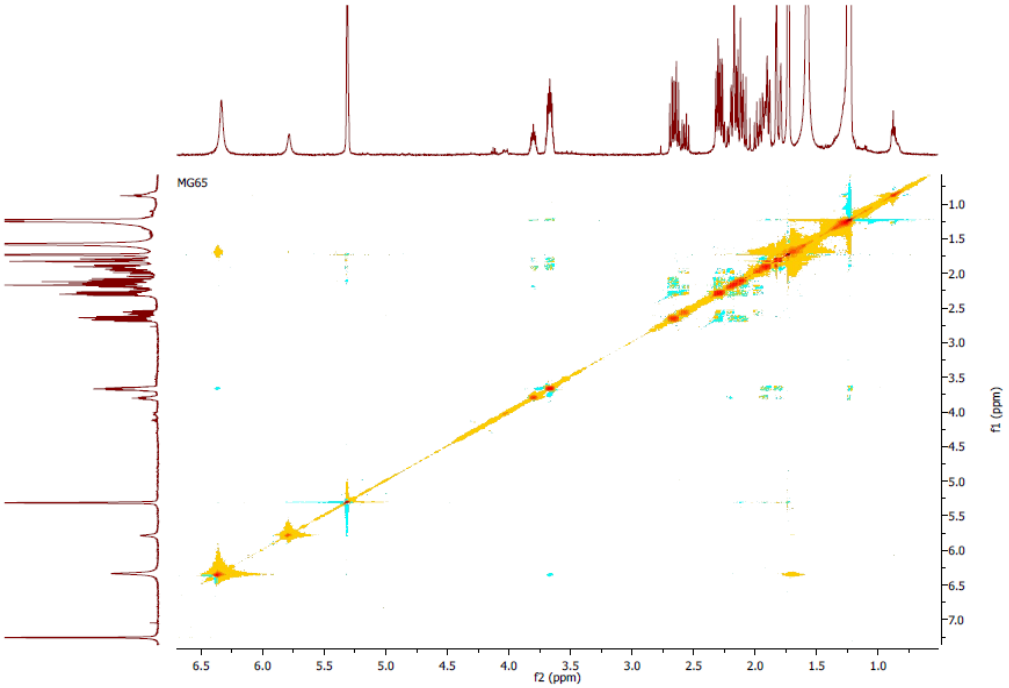
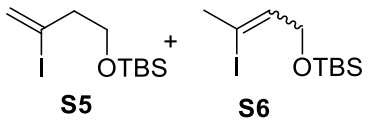
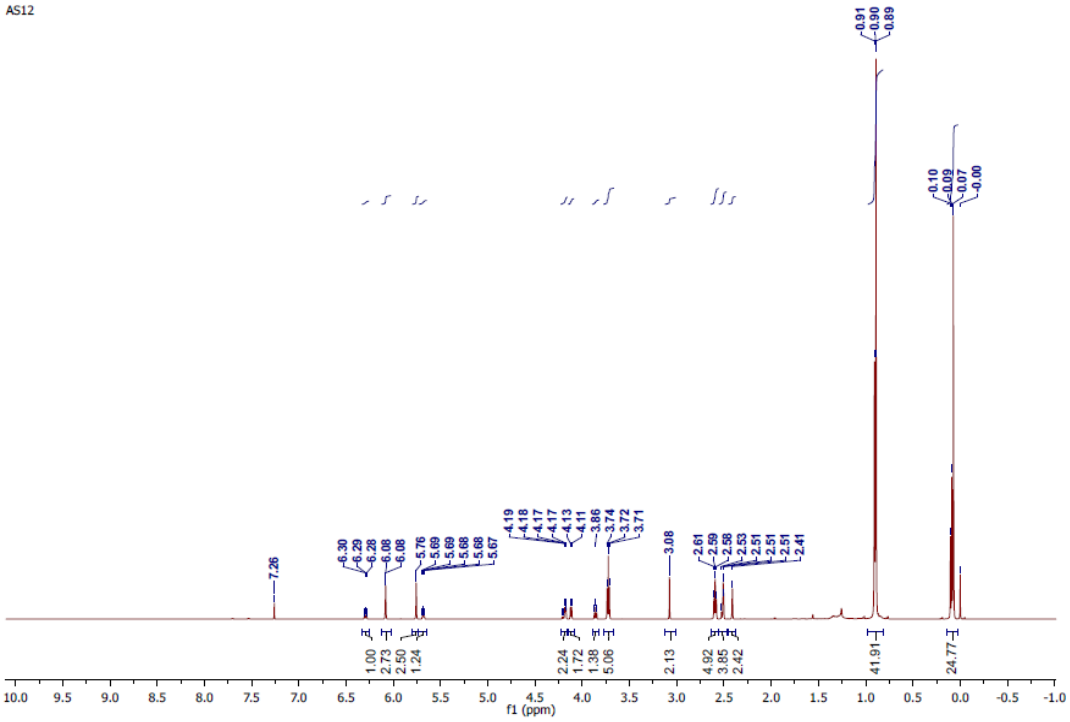
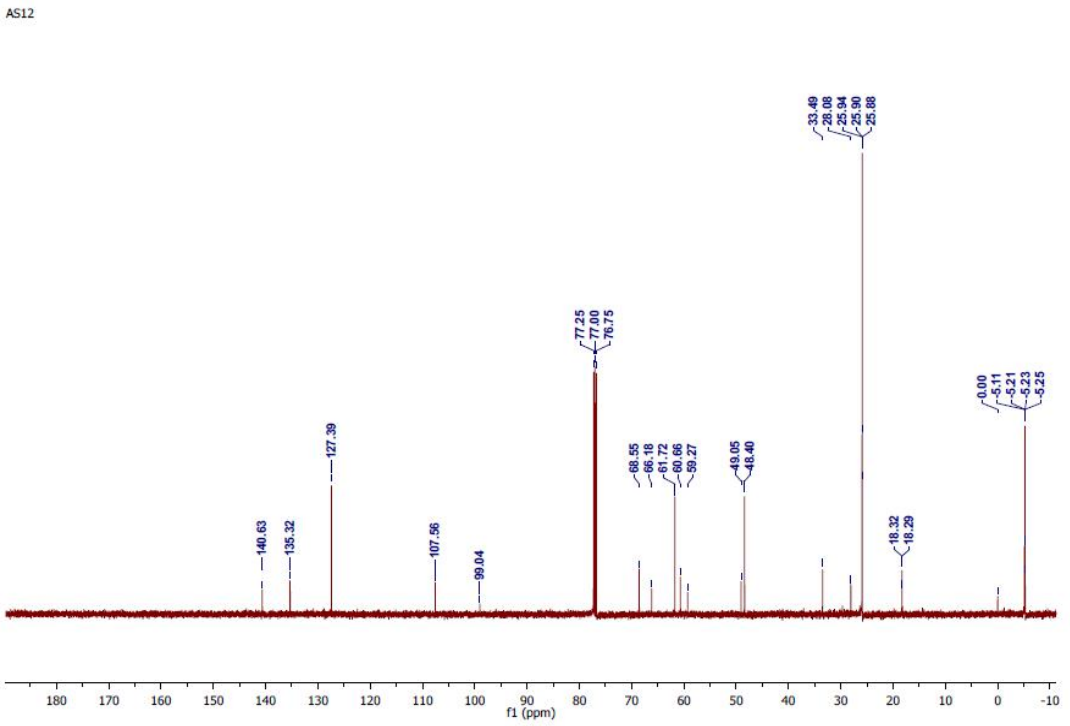
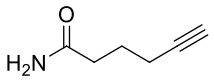




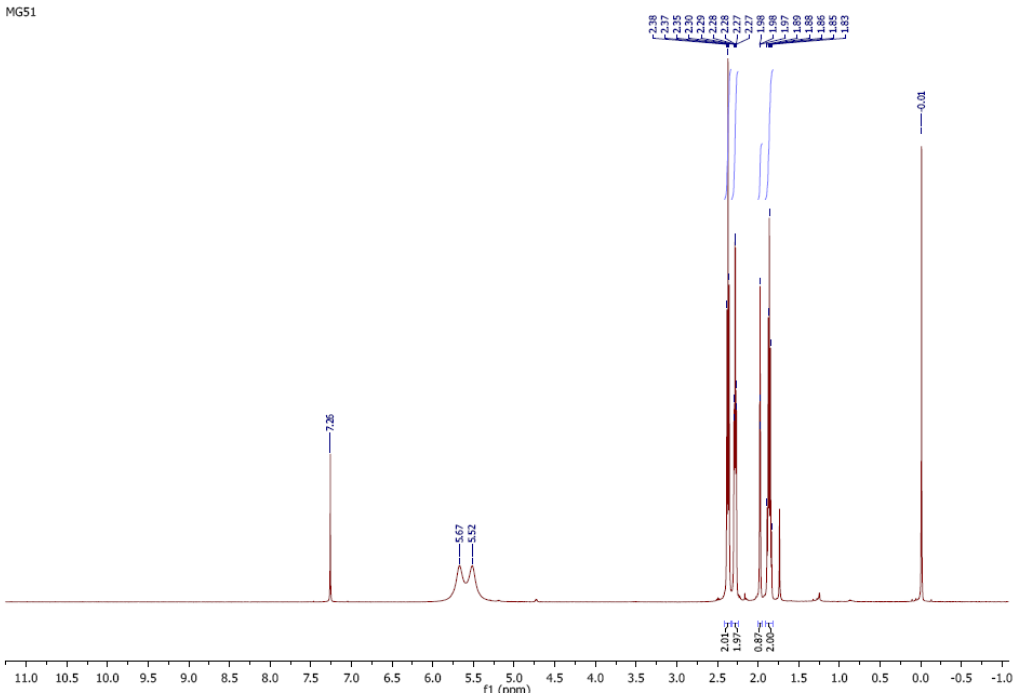
S5 **S6**

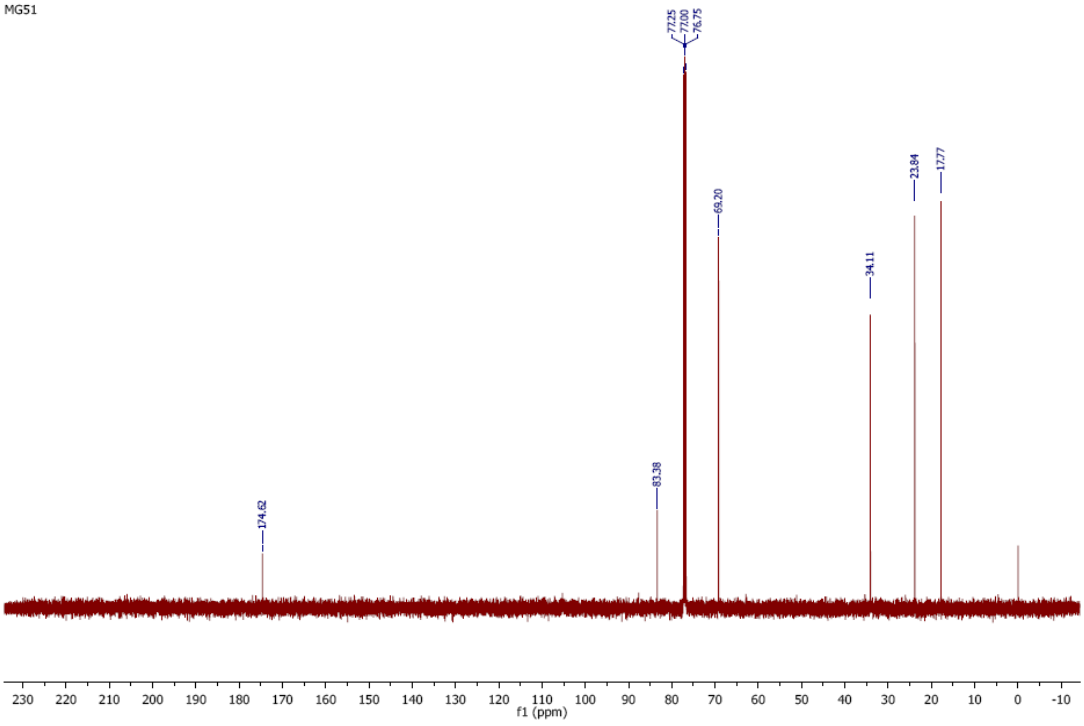


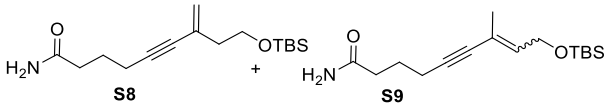




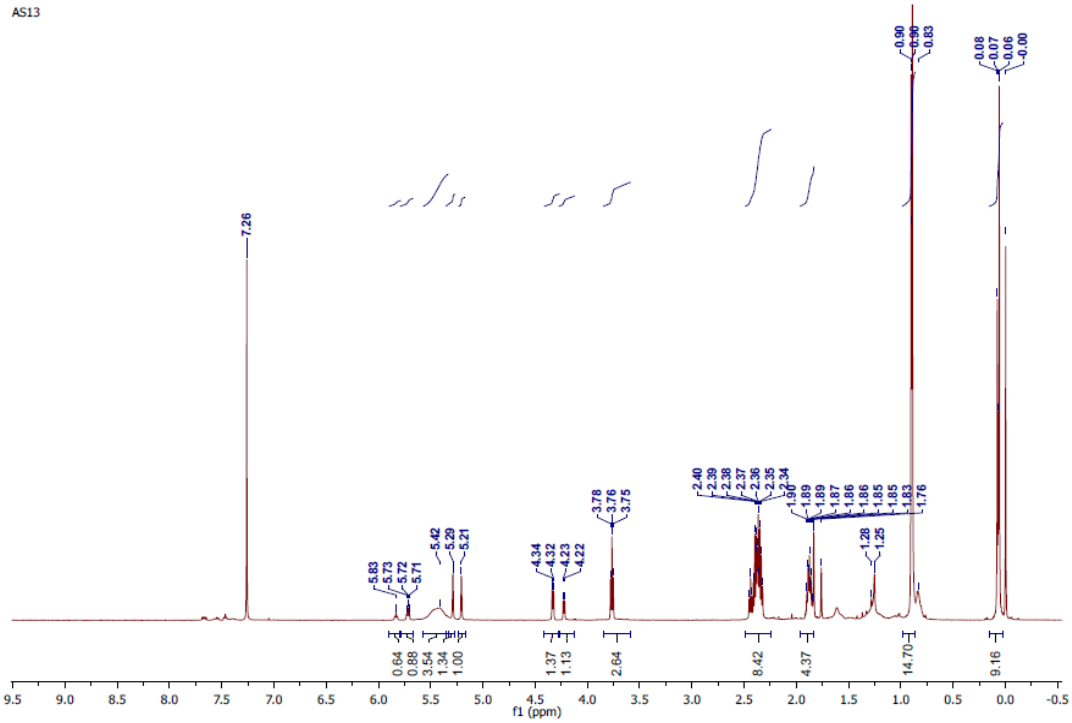
S7

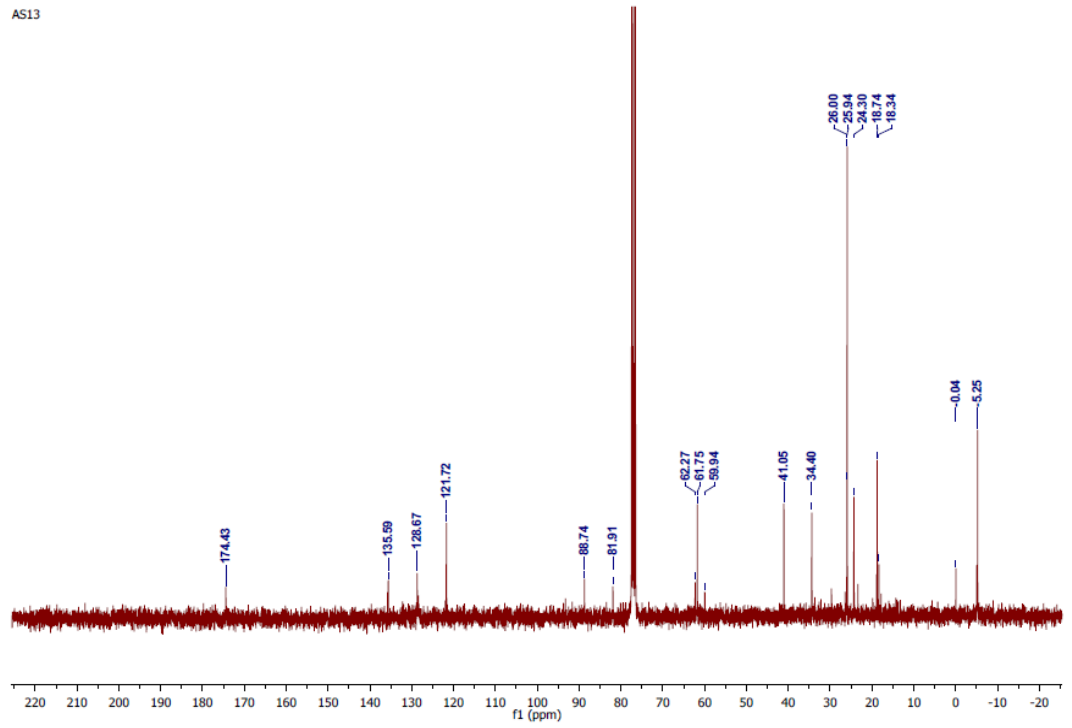

MG51
7.26
5.67
5.52
0.01
2.01
1.97
0.87
2.00
f1 (ppm)

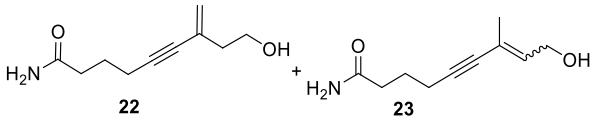

MG51
77.25
77.00
76.75
83.38
69.20
34.11
23.84
17.77
174.62
f1 (ppm)


O
H2N
OTBS
+
O
H2N
OTBS

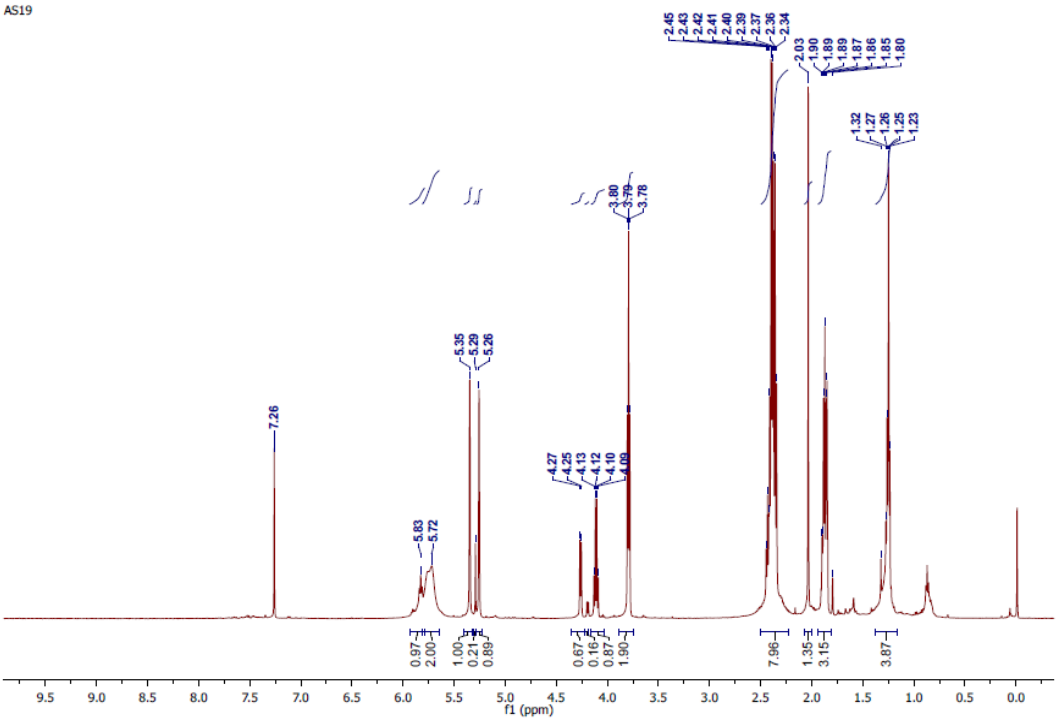
S8 + S9

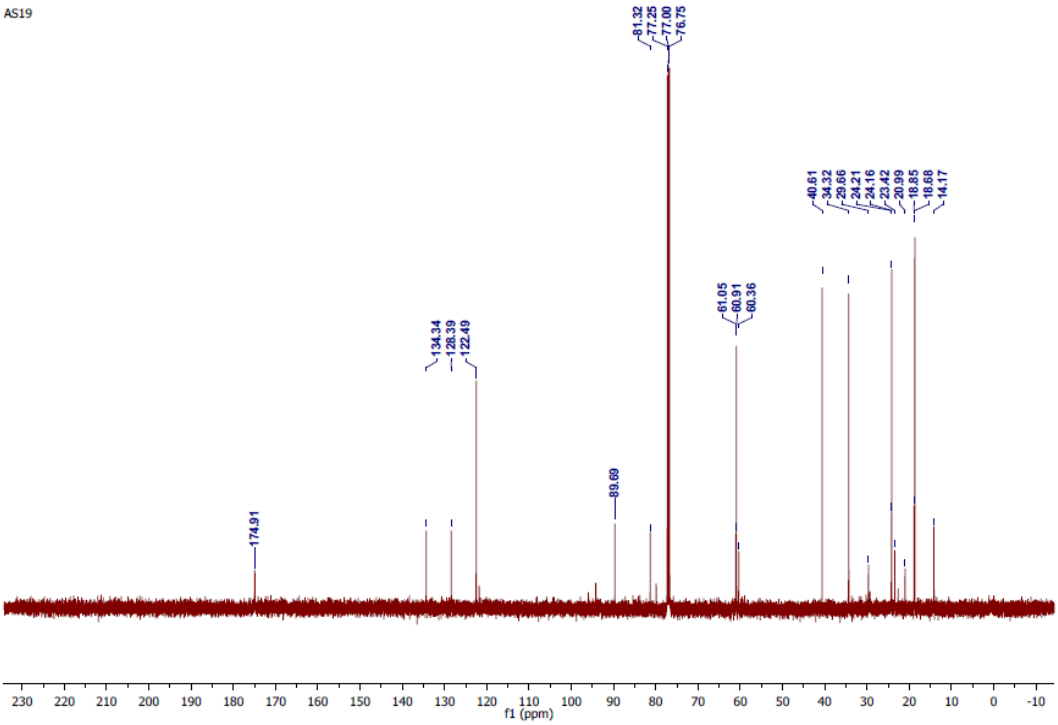

AS13
7.26
5.83
5.73
5.72
5.71
5.42
5.29
5.21
4.34
4.32
4.23
4.22
3.78
3.76
3.75
2.40
2.39
2.38
2.37
2.36
2.35
2.34
1.90
1.89
1.89
1.87
1.86
1.86
1.85
1.85
1.83
1.76
1.28
1.25
0.90
0.90
0.83
0.08
0.07
0.06
-0.00
0.64
0.88
3.54
1.34
1.00
1.37
1.13
2.64
8.42
4.37
14.70
9.16
f1 (ppm)

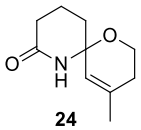

AS13
174.43
135.59
128.67
121.72
88.74
81.91
62.27
61.75
59.94
41.05
34.40
26.00
25.94
24.30
18.74
18.34
-0.04
-5.25
f1 (ppm)


O
H2N
OH
+
O
H2N
OH

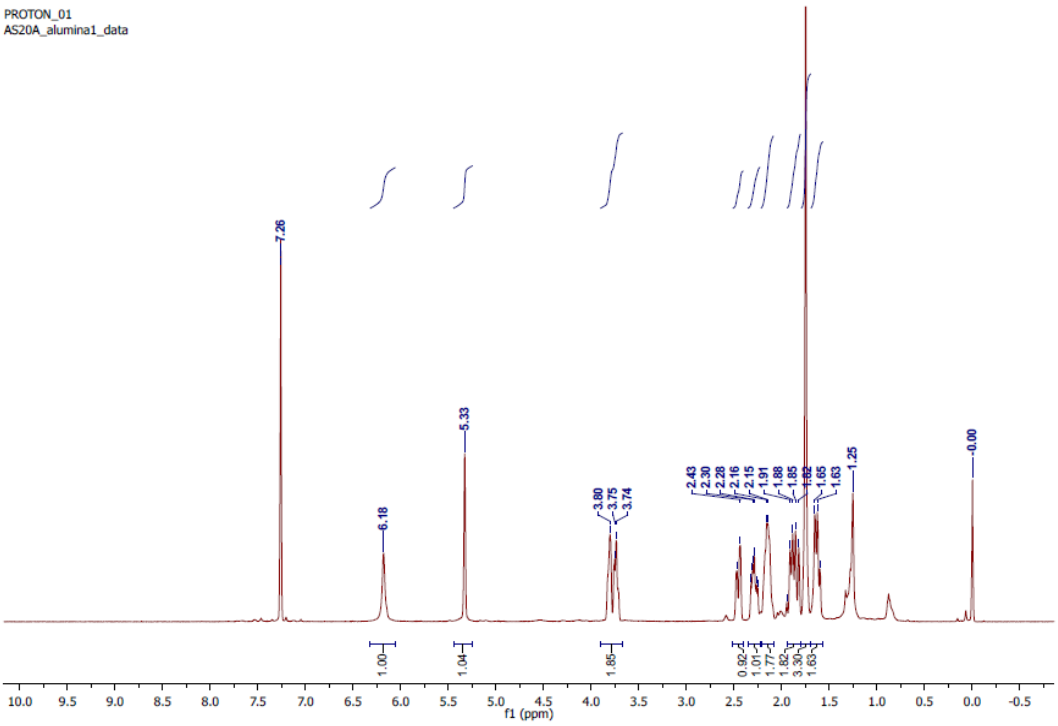
22 **23**

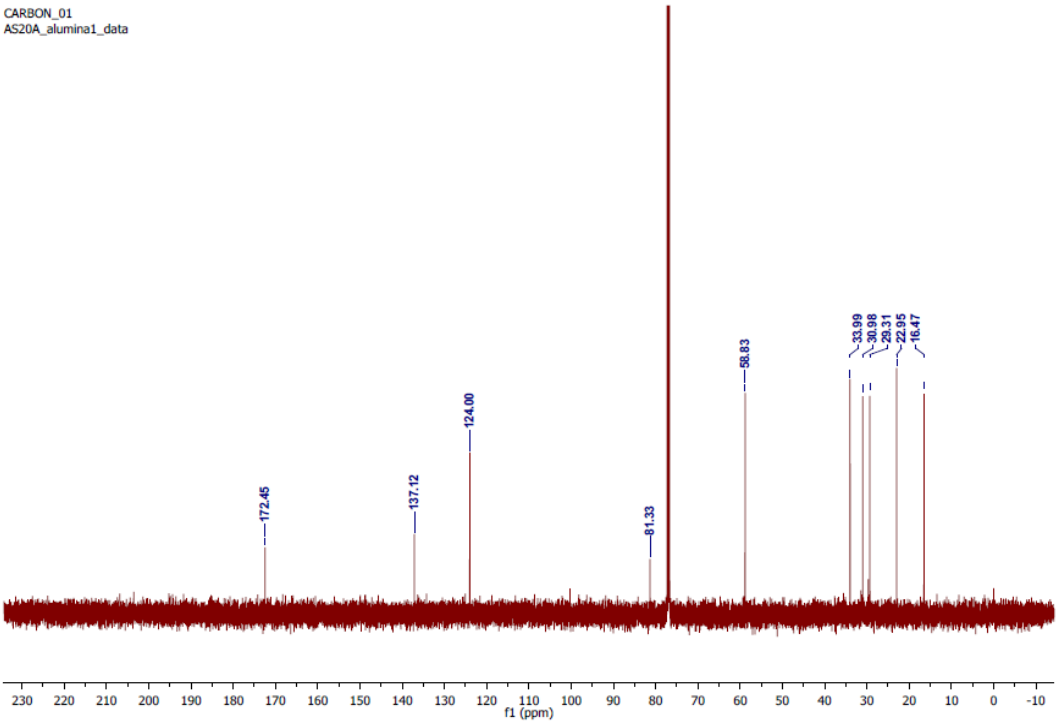

AS19
7.26
5.83
5.72
5.35
5.29
5.26
4.27
4.25
4.13
4.12
4.10
4.09
3.80
3.79
3.78
2.45
2.43
2.42
2.41
2.40
2.39
2.37
2.36
2.34
2.03
1.90
1.89
1.89
1.87
1.86
1.85
1.80
1.32
1.27
1.26
1.25
1.23
0.97
2.00
1.00
0.21
0.89
0.67
0.16
0.87
1.90
7.96
1.35
3.15
3.87
f1 (ppm)

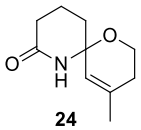

AS19
81.32
77.25
77.00
76.75
174.91
134.34
128.39
122.49
89.69
61.05
60.91
60.36
40.61
34.32
29.66
24.21
24.16
23.42
20.99
18.85
18.68
14.17
f1 (ppm)



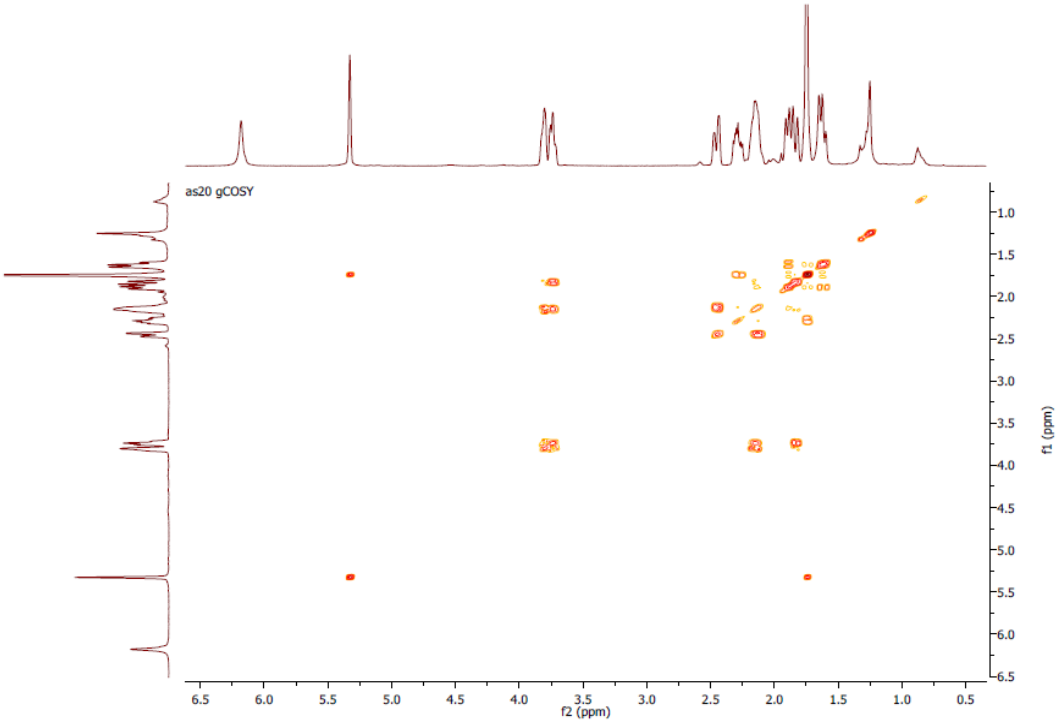
24

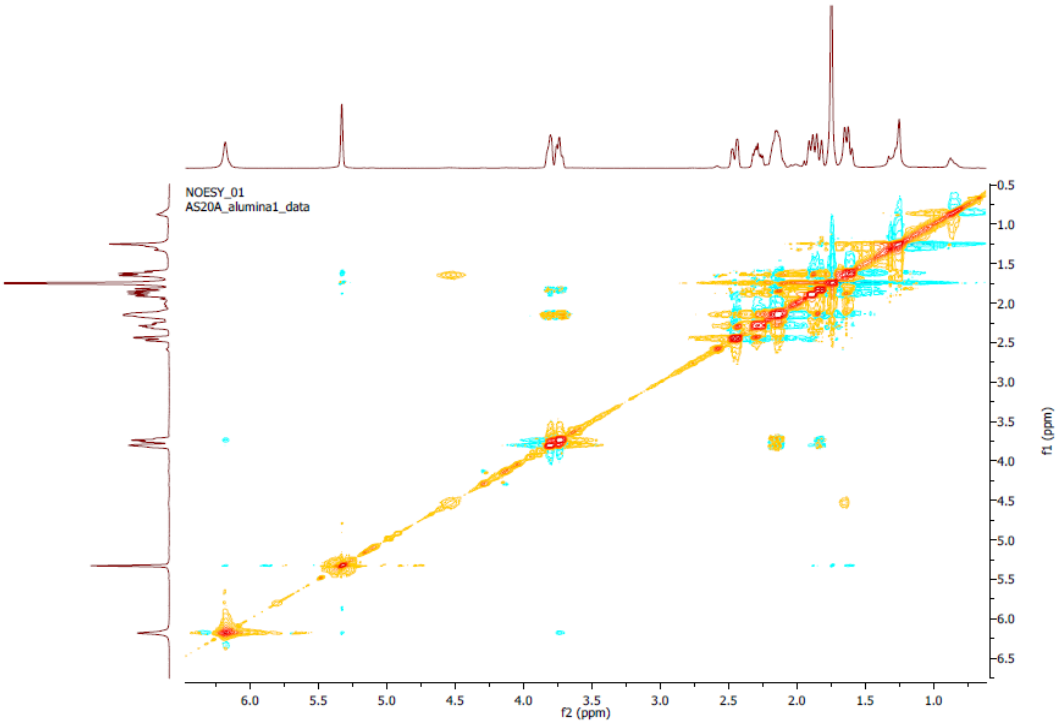

PROTON_01
AS20A_alumina1_data
7.26
6.18
5.33
3.80
3.75
3.74
2.43
2.30
2.28
2.16
2.15
1.91
1.88
1.85
1.82
1.65
1.63
1.25
0.00
1.00
1.04
1.85
0.92
1.01
1.77
1.82
3.30
1.63
f1 (ppm)

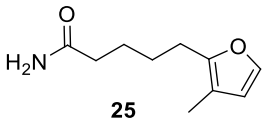

CARBON_01
AS20A_alumina1_data
172.45
137.12
124.00
81.33
58.83
33.99
30.98
29.31
22.95
16.47
f1 (ppm)



24

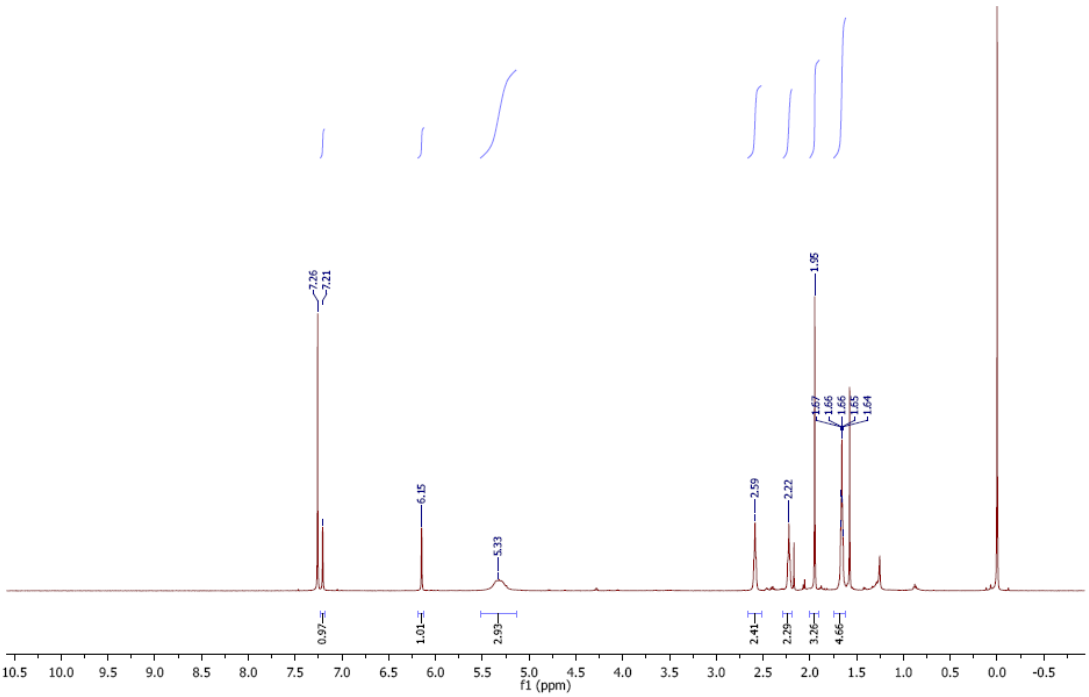

as20 gCOSY
f2 (ppm)
f1 (ppm)


NOESY_01
AS20A_alumina1_data
f2 (ppm)
f1 (ppm)

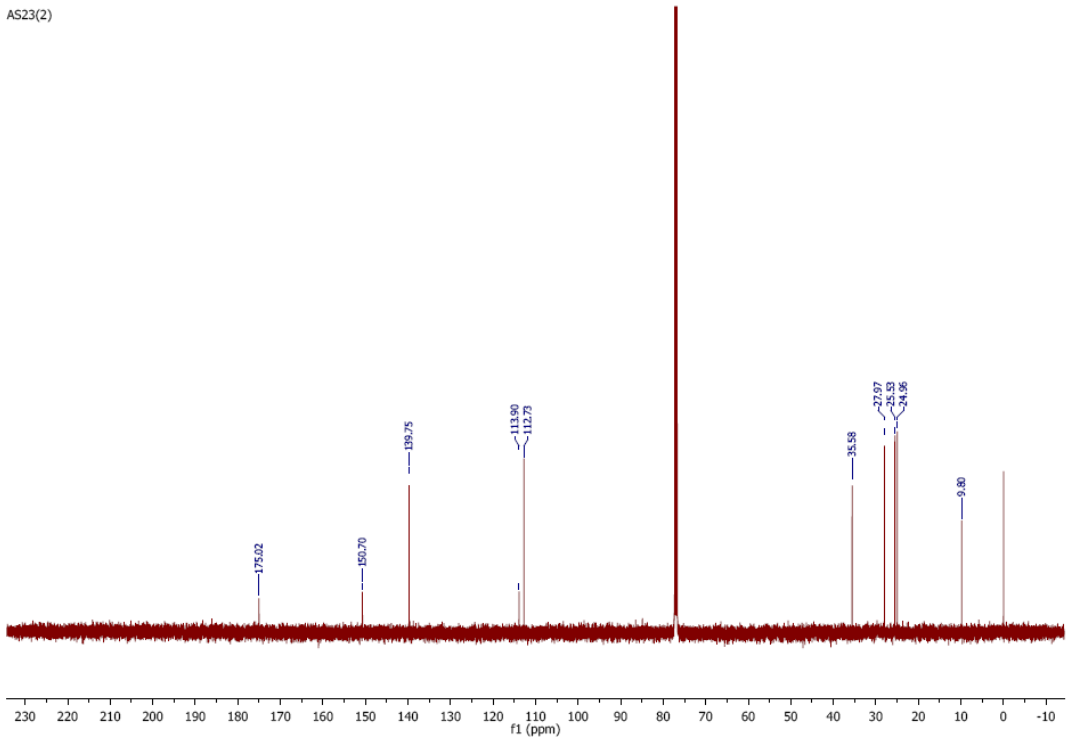


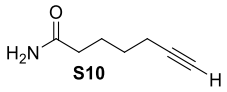
25

AS23(2)

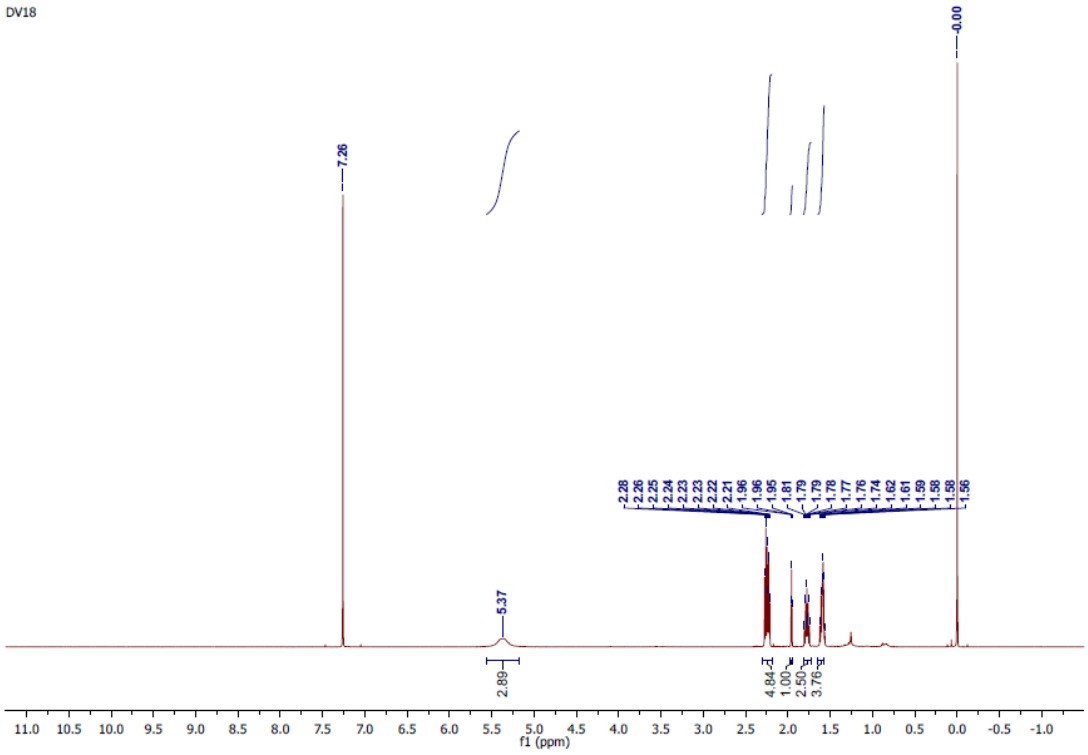


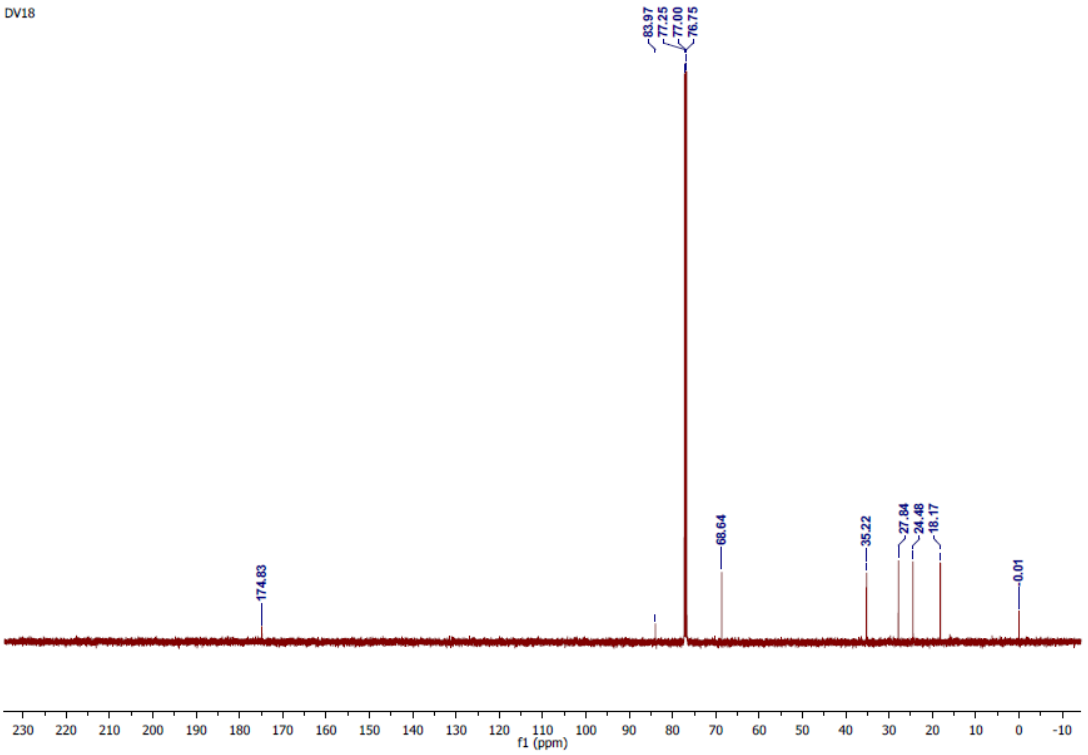
AS23(2)

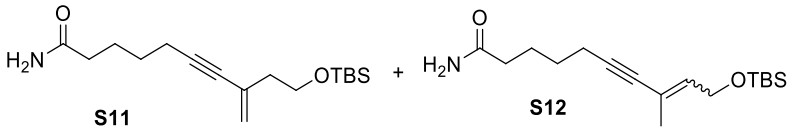



O
H2N
H

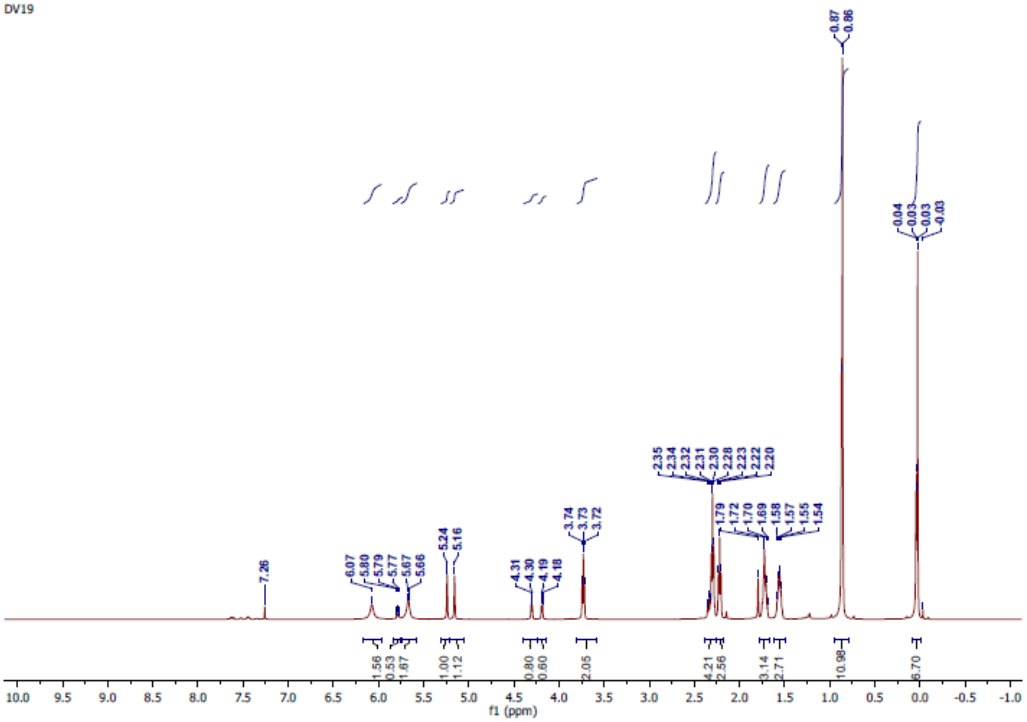
S10

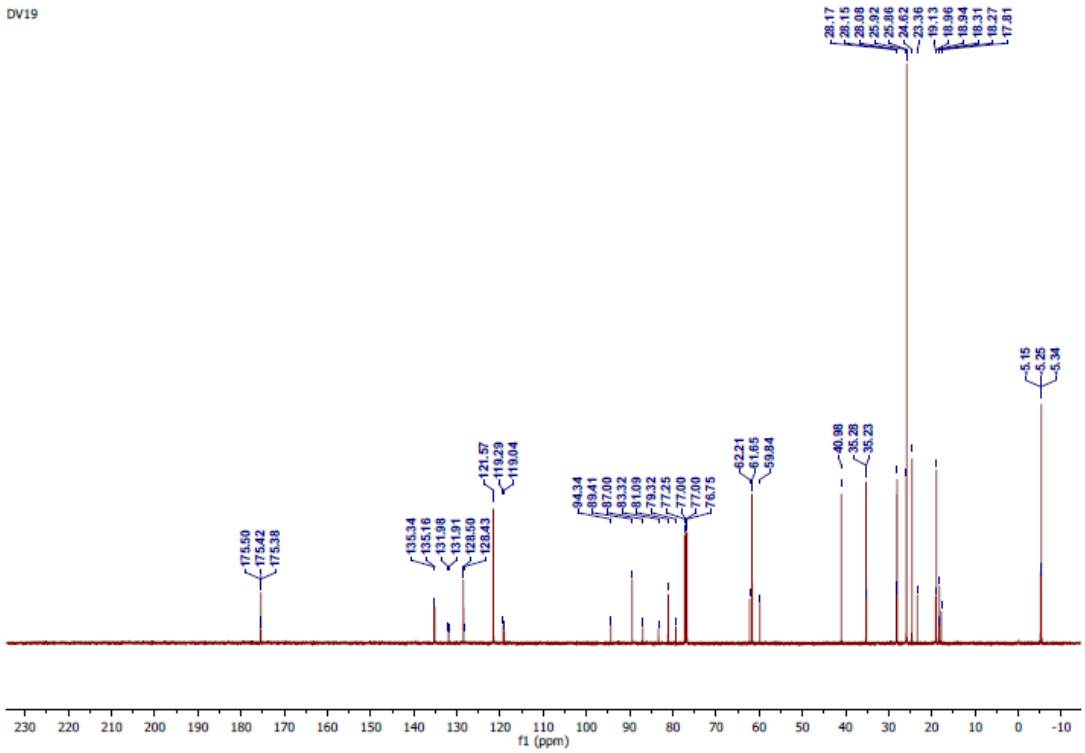

DV18
7.26
5.37
0.00
2.28
2.26
2.25
2.24
2.23
2.23
2.22
2.21
1.96
1.96
1.95
1.81
1.79
1.79
1.78
1.77
1.76
1.74
1.62
1.61
1.59
1.58
1.58
1.56
2.89
4.84
1.00
2.50
3.76
f1 (ppm)

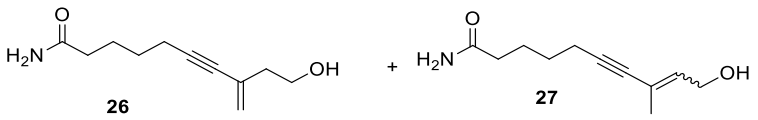

DV18
83.97
77.25
77.00
76.75
174.83
68.64
35.22
27.84
24.48
18.17
0.01
f1 (ppm)



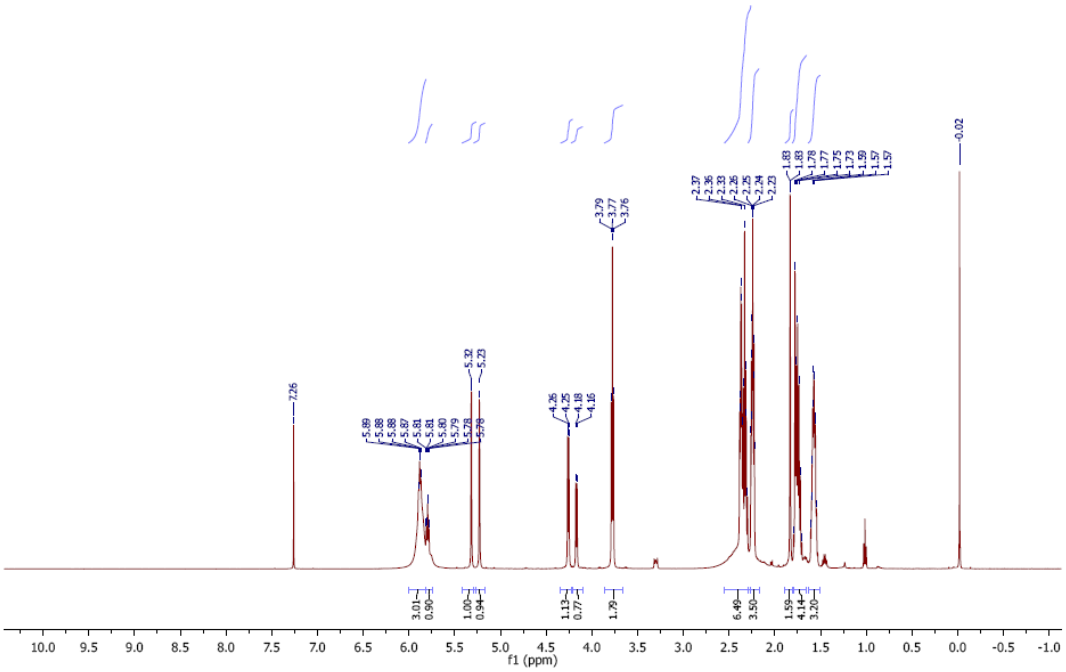
S11 **S12**



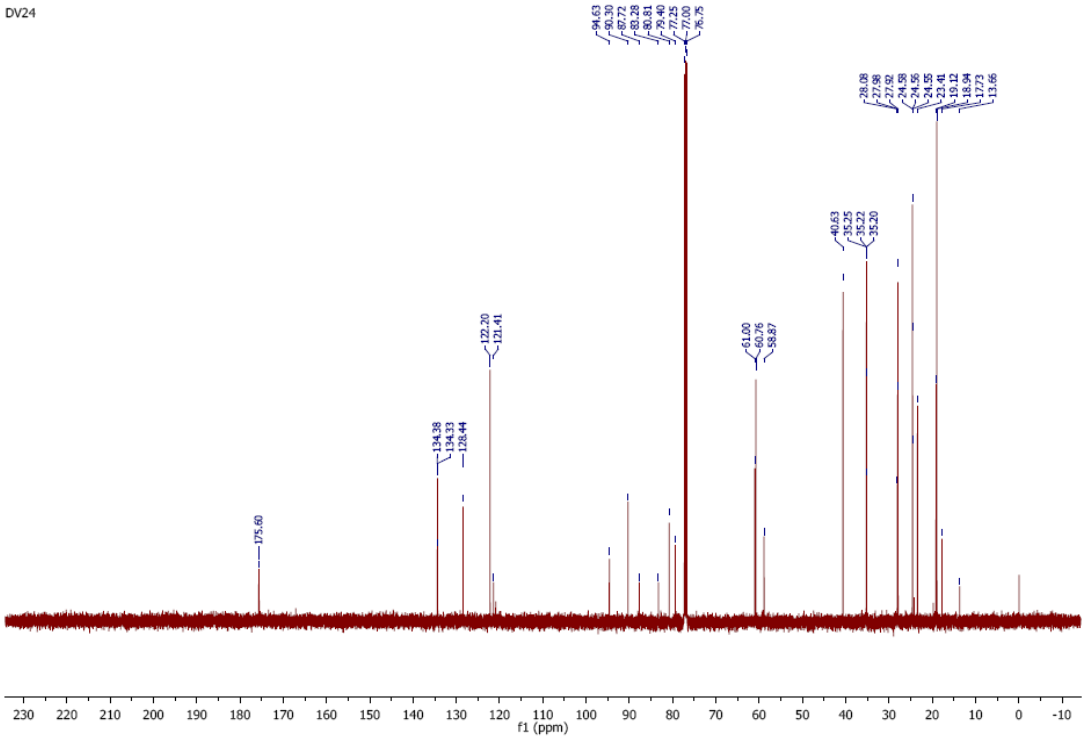


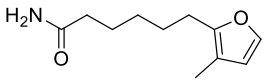

O
H2N
OH
26
+
O
H2N
OH
27

DV24


7.26
5.89
5.88
5.88
5.87
5.81
5.81
5.80
5.79
5.78
5.78
5.32
5.23
4.26
4.25
4.18
4.16
3.79
3.77
3.76
2.37
2.36
2.33
2.28
2.25
2.24
2.20
1.83
1.83
1.78
1.77
1.75
1.73
1.59
1.57
1.57
0.02
3.01
0.90
1.00
0.94
1.13
0.77
1.79
6.49
3.50
1.59
4.14
3.20
f1 (ppm)

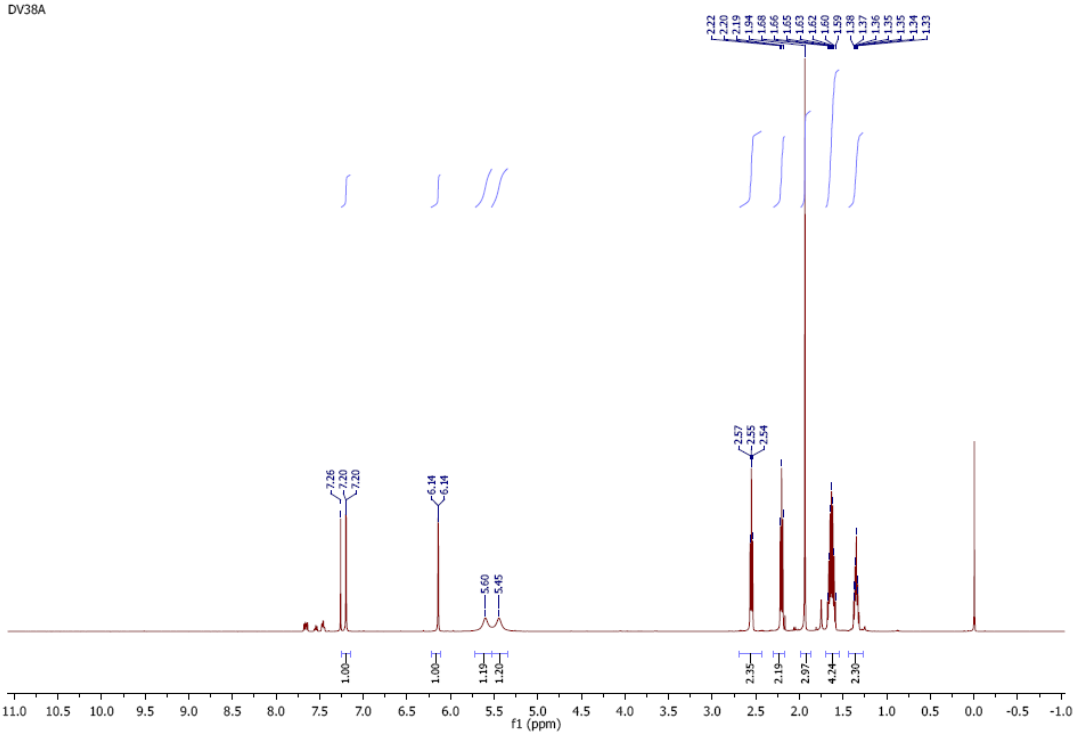
DV24


94.63
90.30
87.72
83.28
80.81
79.40
77.35
77.00
76.75
28.08
27.98
27.92
24.58
24.56
24.55
23.41
19.13
18.04
17.73
13.66
40.63
35.25
35.22
35.20
122.20
121.41
61.00
60.76
58.87
134.38
134.33
128.44
175.60
f1 (ppm)

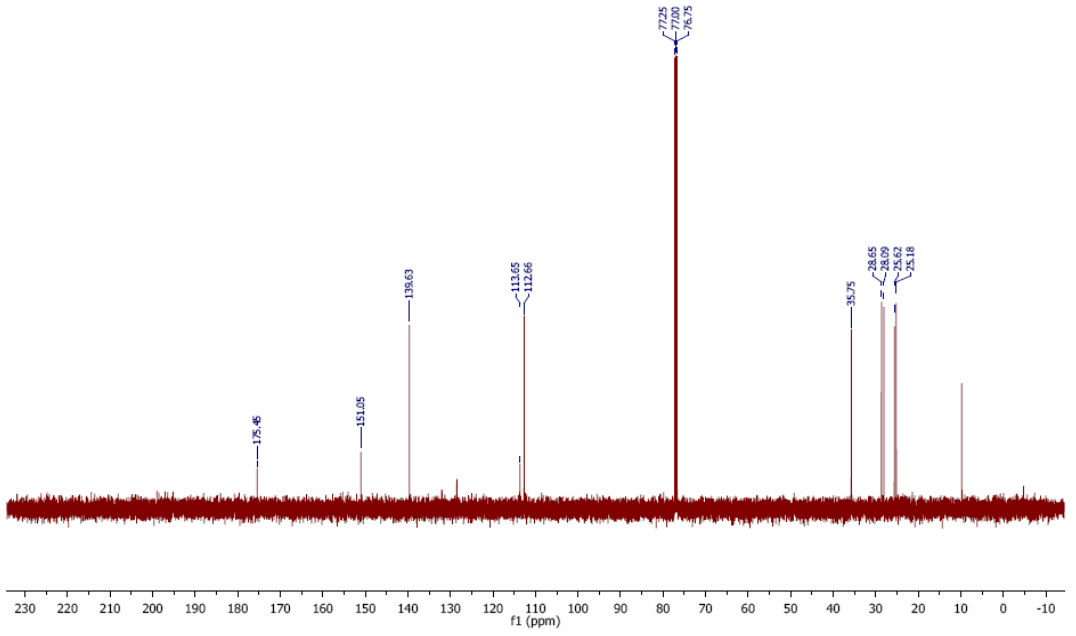


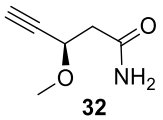
29

DV38A

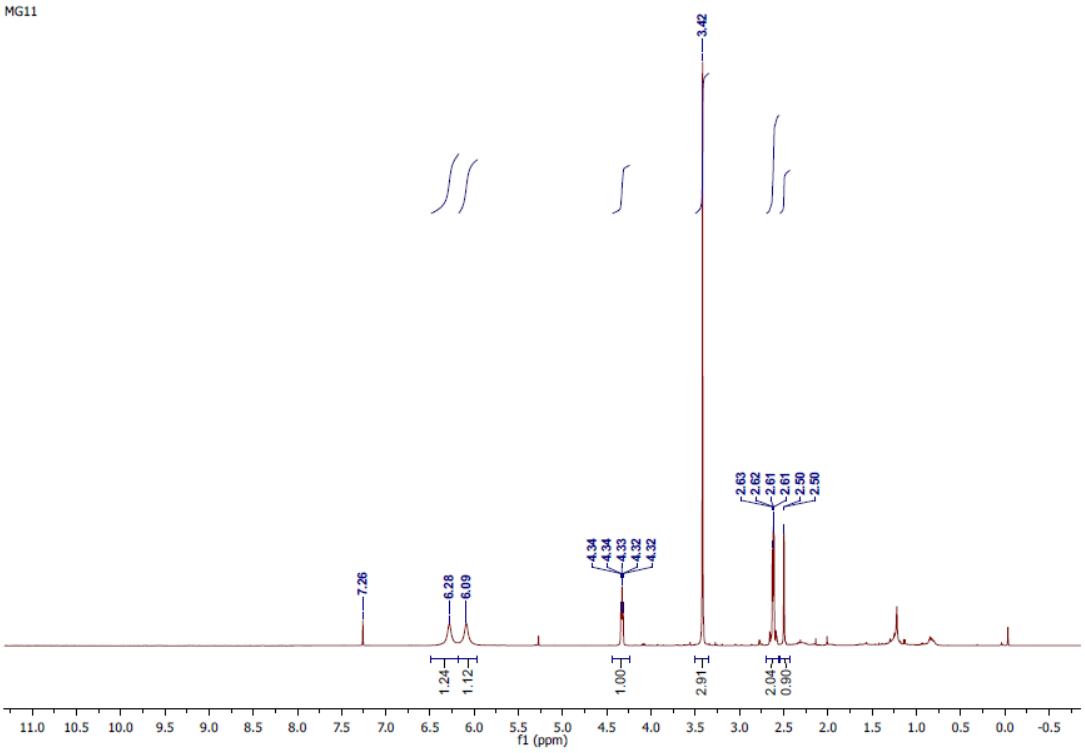


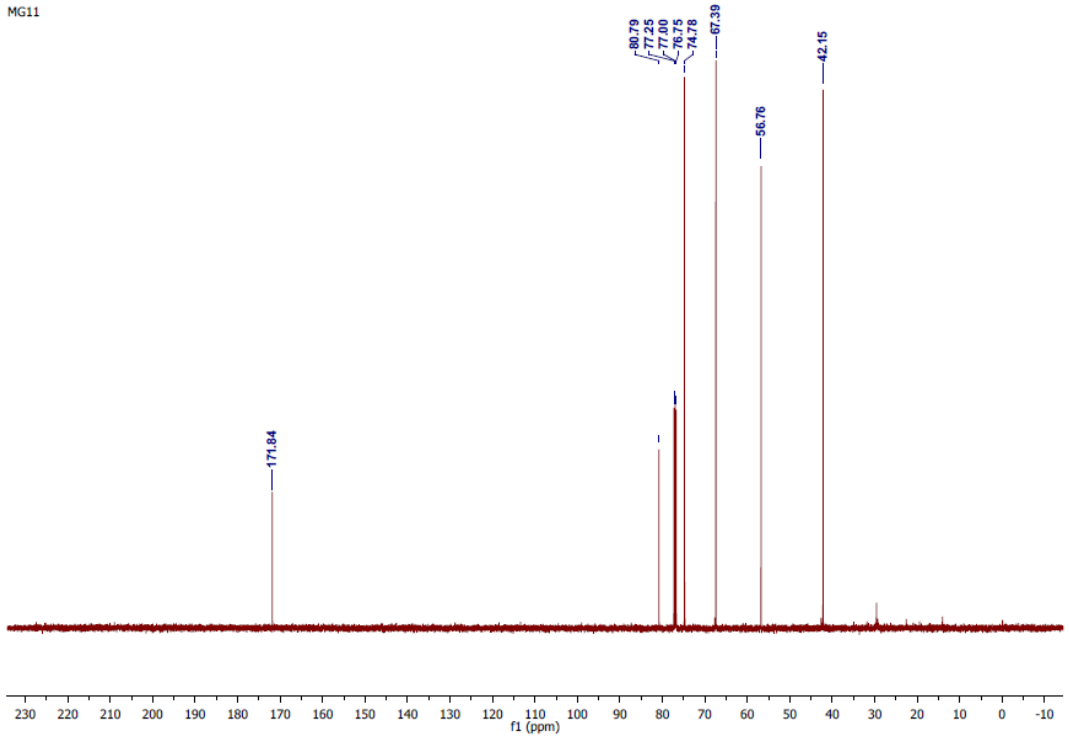
DV38A

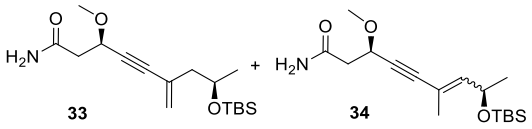



O
O
NH2

32

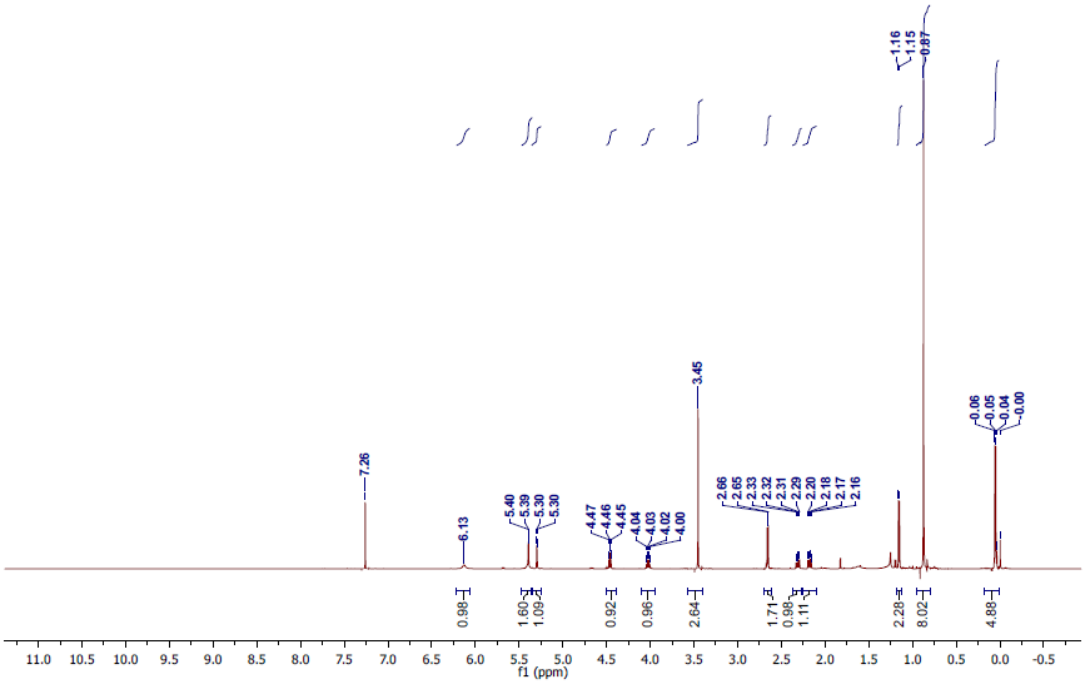

MG11
3.42
2.63
2.62
2.61
2.61
2.50
2.50
4.34
4.34
4.33
4.32
4.32
7.26
6.28
6.09
1.24
1.12
1.00
2.91
2.04
0.90
f1 (ppm)


MG11
80.79
77.25
77.00
76.75
74.78
67.39
56.76
42.15
171.84
f1 (ppm)

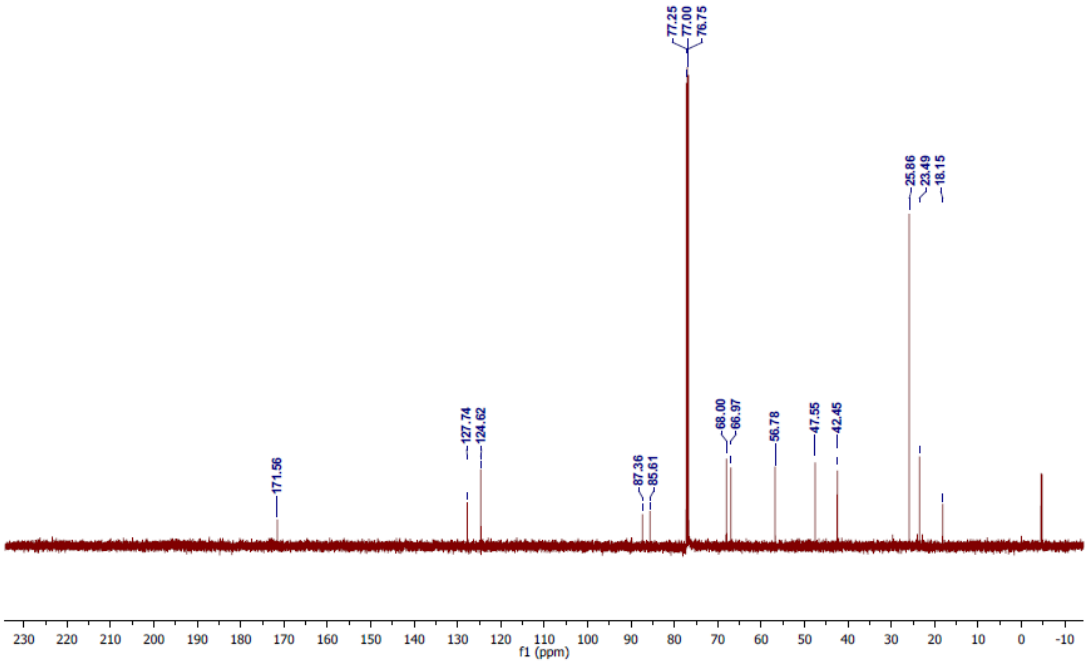


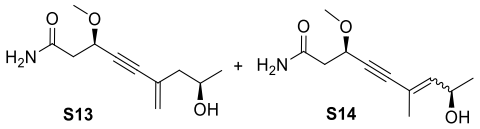
33 34

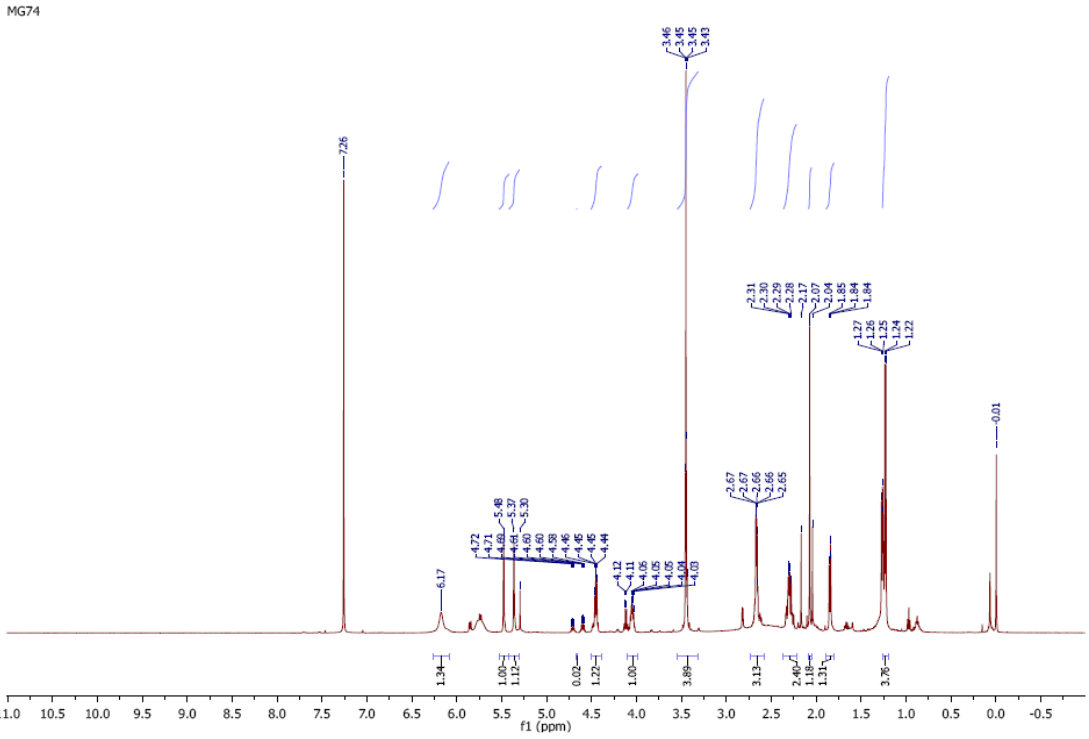
MG21

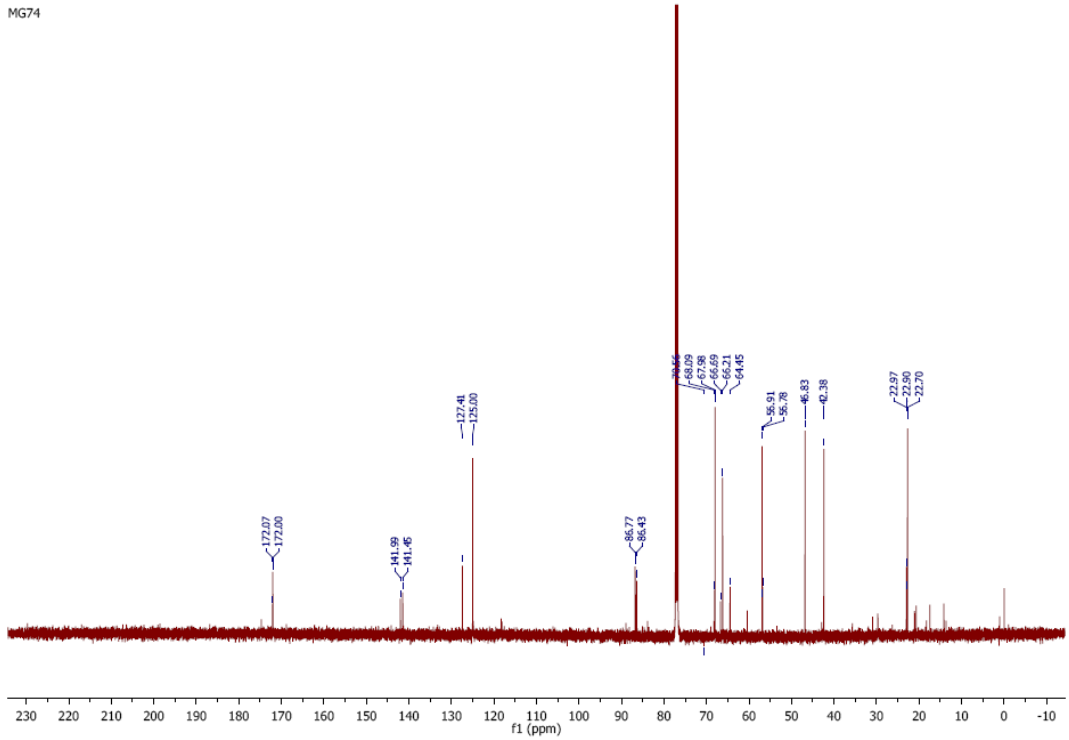


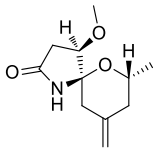
MG21



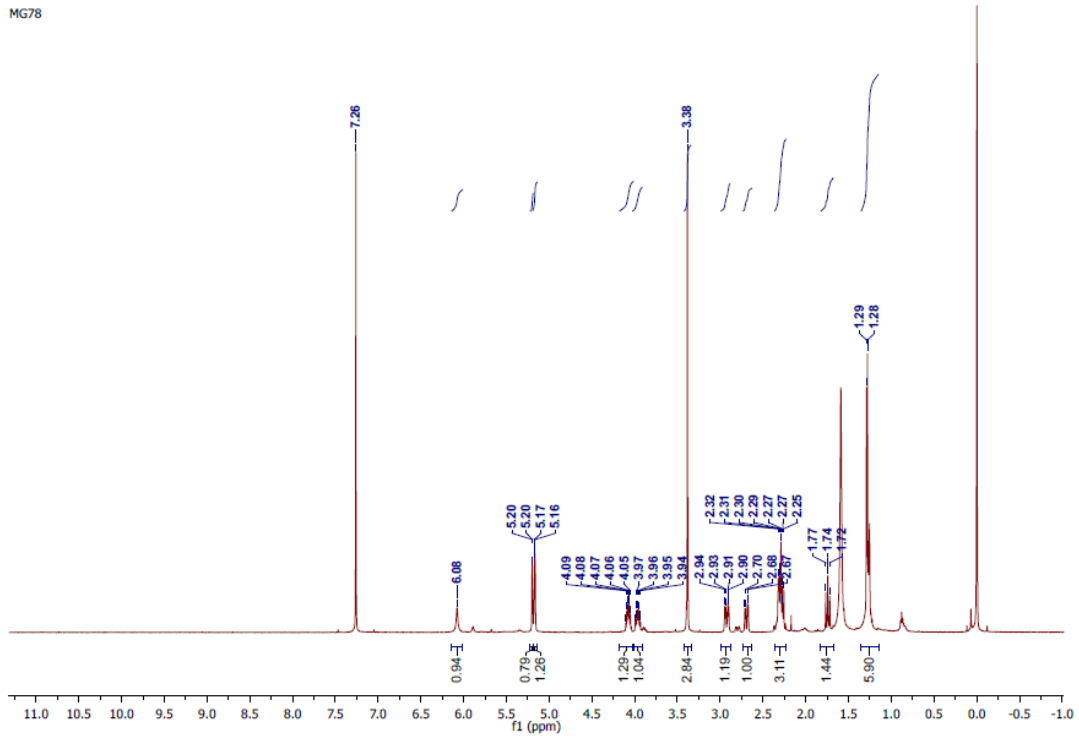

S13
S14

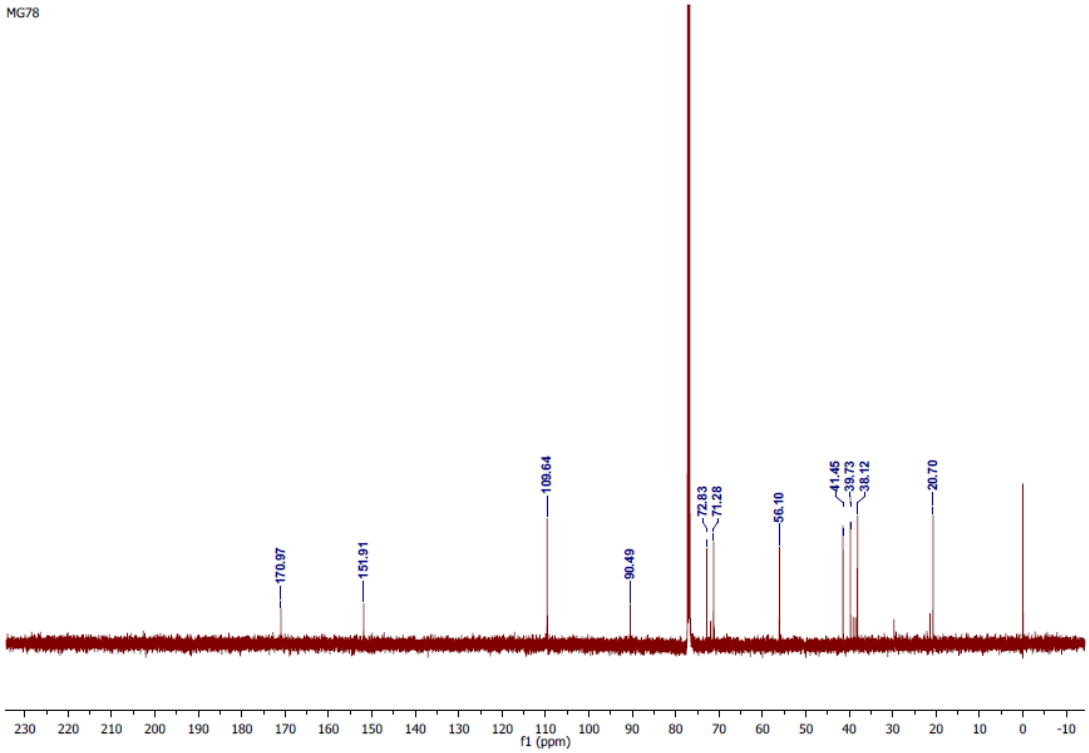

MG74
f1 (ppm)

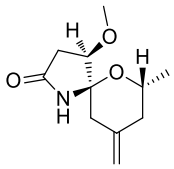

MG74
f1 (ppm)



35a

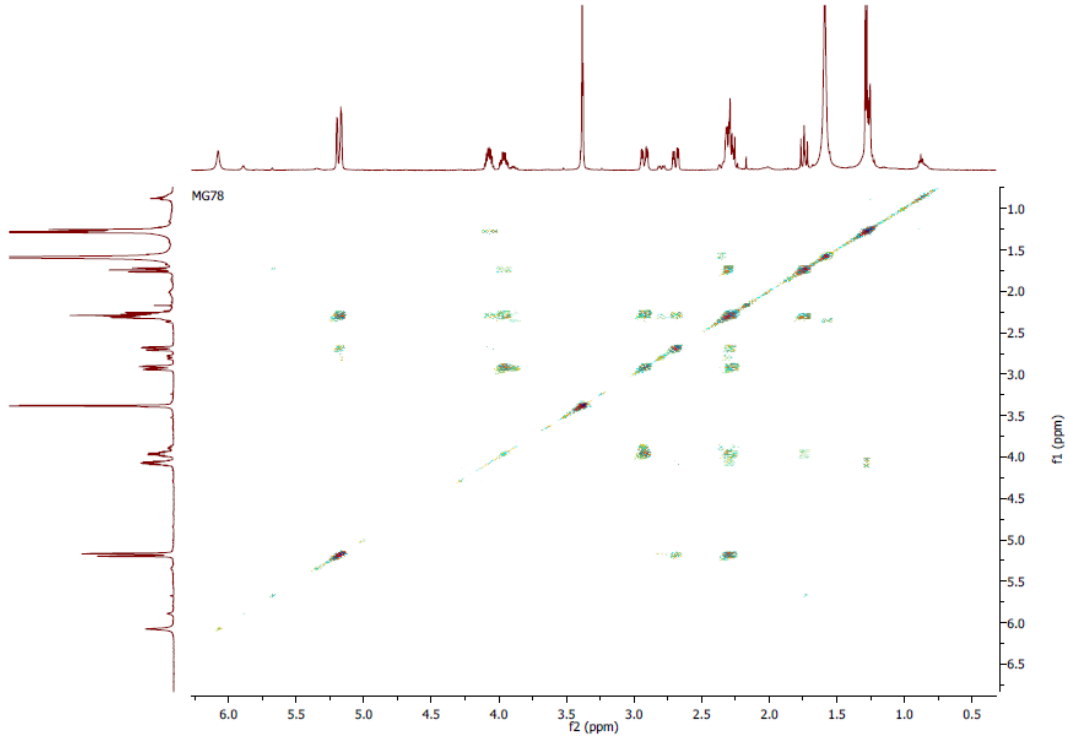

MG78
7.26
3.38
6.08
5.20
5.20
5.17
5.16
4.09
4.08
4.07
4.06
4.05
3.97
3.96
3.95
3.94
2.94
2.93
2.91
2.90
2.70
2.68
2.67
2.32
2.31
2.30
2.29
2.27
2.27
2.25
1.77
1.74
1.72
1.29
1.28
0.94
0.79
1.26
1.29
1.04
2.84
1.19
1.00
3.11
1.44
5.90
f1 (ppm)


MG78
170.97
151.91
109.64
90.49
72.83
71.28
56.10
41.45
39.73
38.12
20.70
f1 (ppm)



35a

gCOSY



NOESY