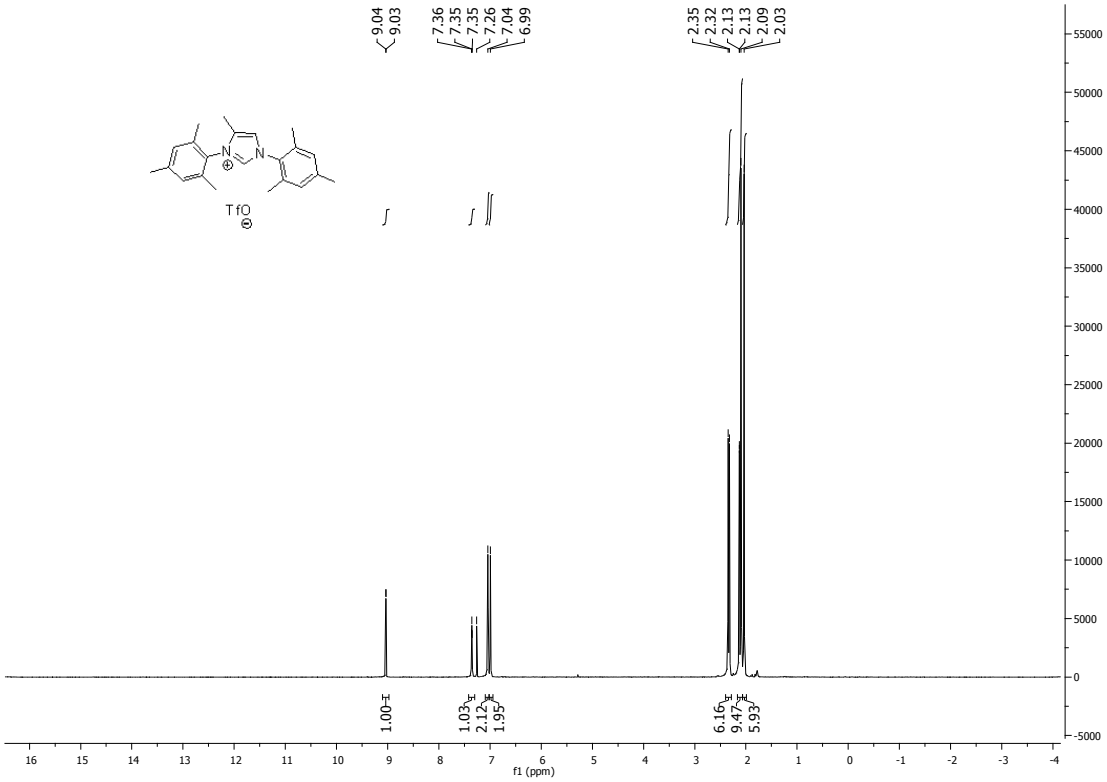
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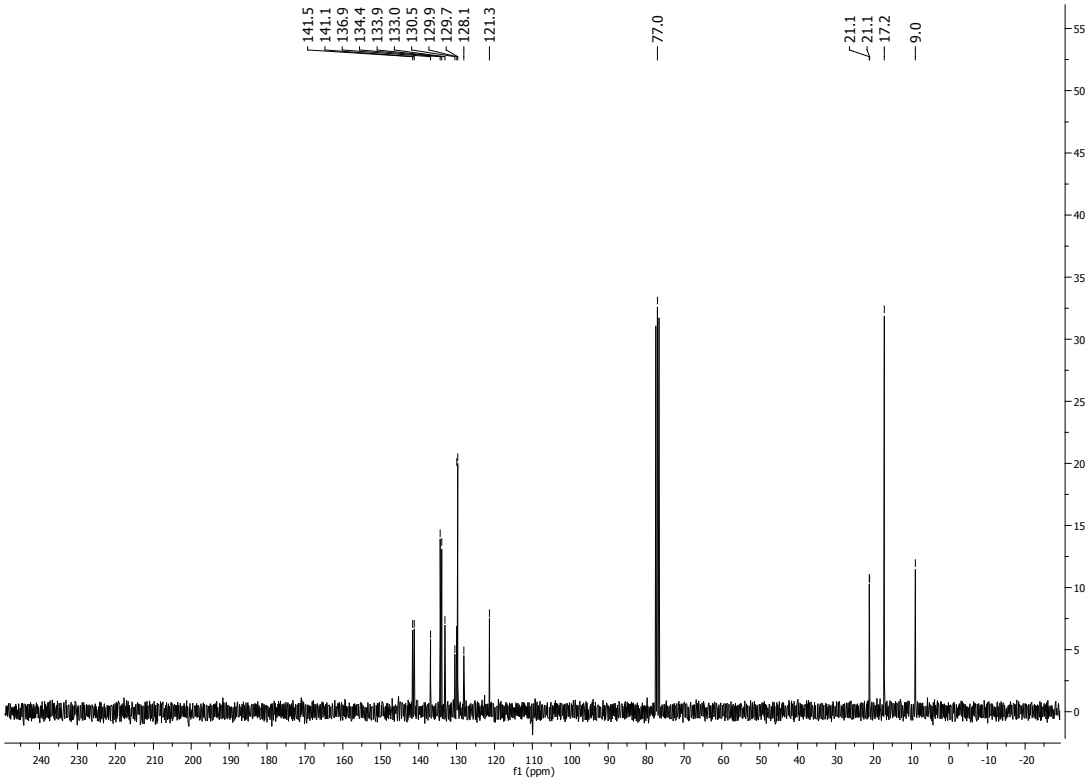
9.03
7.36
7.35
7.35
7.26
7.04
6.99
2.35
2.32
2.13
2.13
2.09
2.03
TfO
1.00
1.03
2.12
1.95
6.16
9.47
5.93
f1 (ppm)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141.1
136.9
134.4
133.9
133.0
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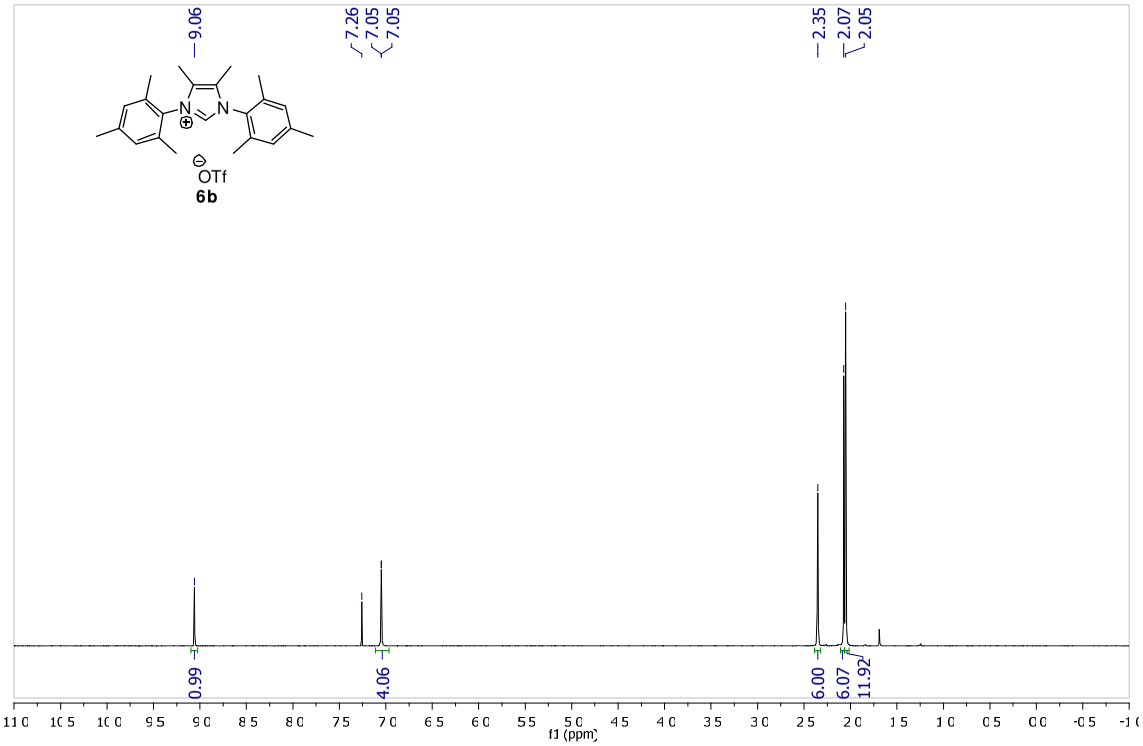
129.7
128.1
121.3
77.0
21.1
21.1
17.2
9.0
f1 (ppm)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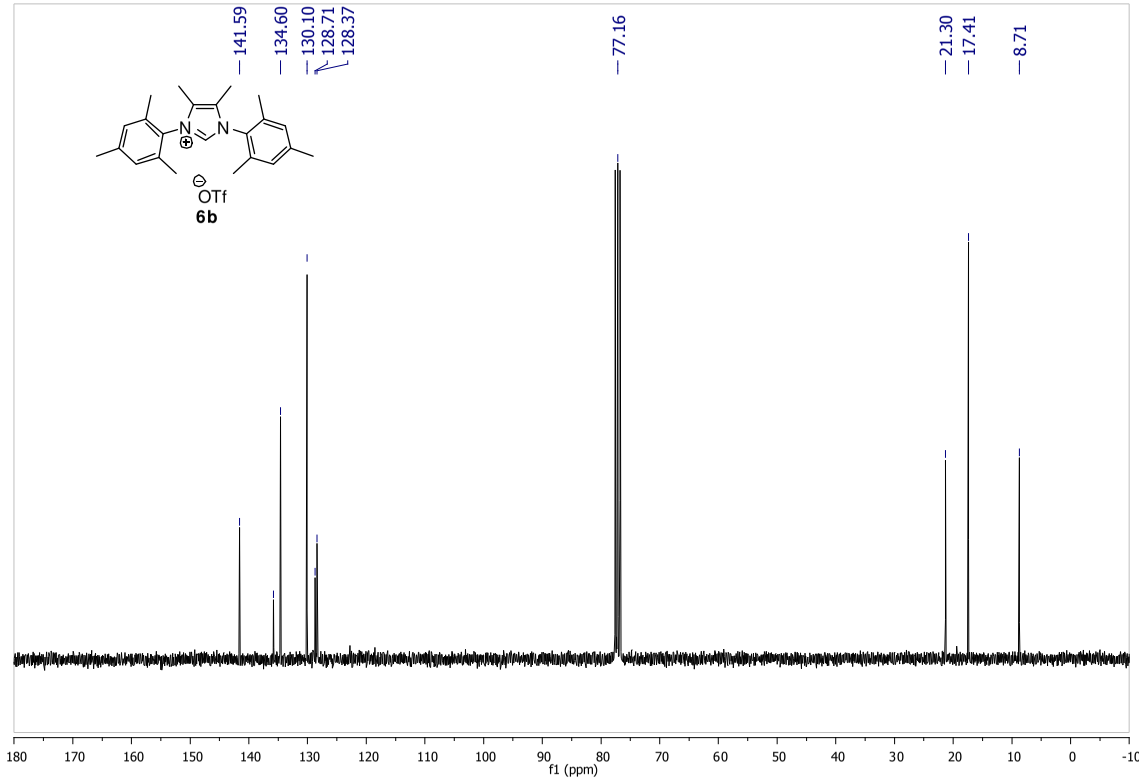
7.26
7.05
7.05
2.35
2.07
2.05
OTf
6b
0.99
4.06
6.00
6.07
11.92
f1 (ppm)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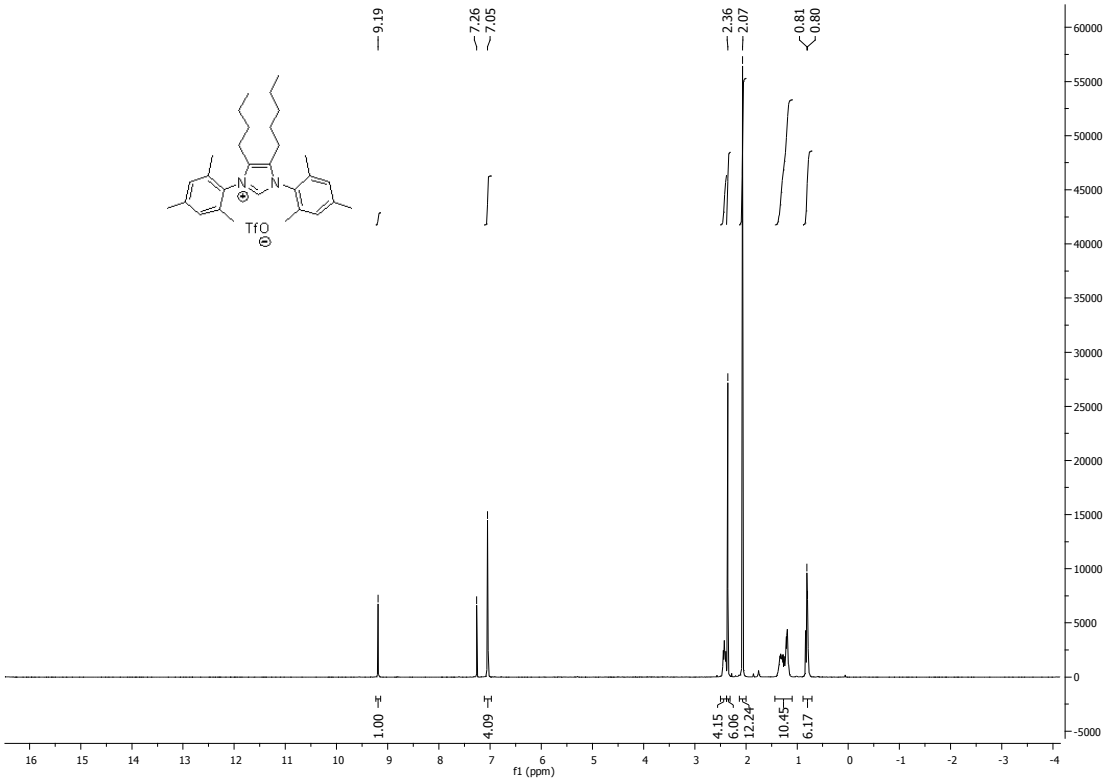
128.71
128.37
77.16
21.30
17.41
8.71
OTf
6b
f1 (ppm)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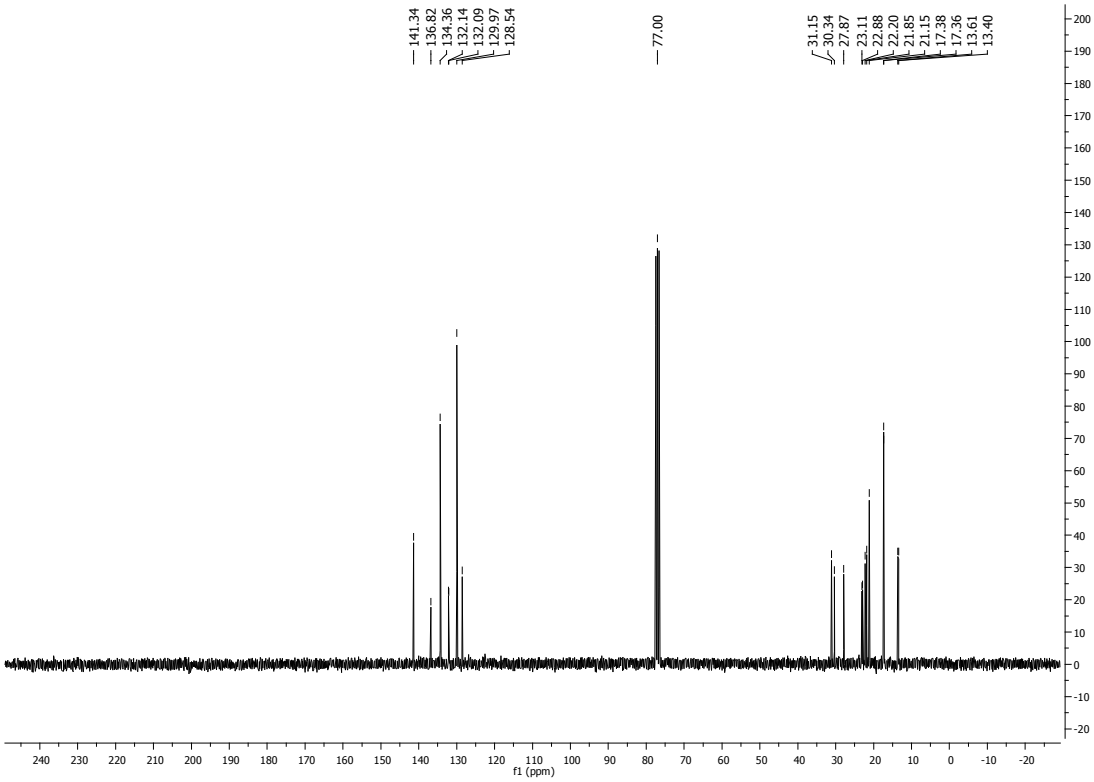
7.26
7.05
2.36
2.07
0.81
0.80
TfO
1.00
4.09
4.15
6.06
12.24
10.45
6.17
f1 (ppm)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134.36
132.14
132.09
129.97
128.54
77.00
31.15
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27.87
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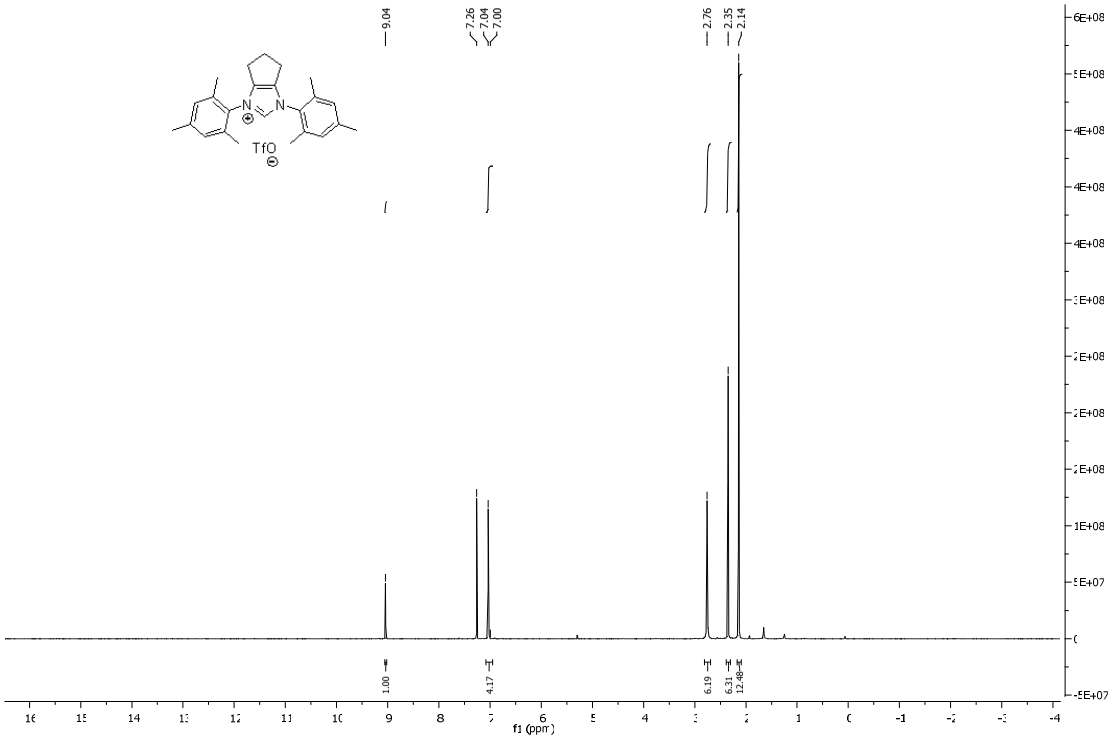
22.88
22.20
21.85
21.15
17.38
17.36
13.61
13.40
f1 (ppm)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7.26
7.04
7.00
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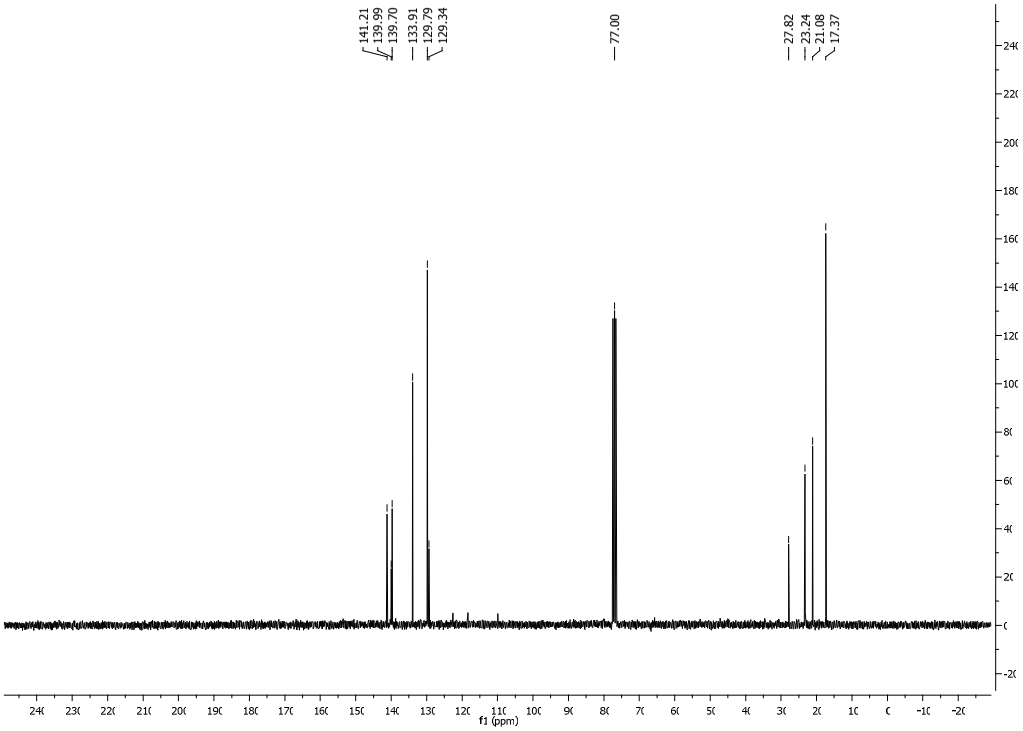
2.35
2.14
TfO
1.00
4.17
6.19
6.31
12.48
f1 (ppm)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129.34
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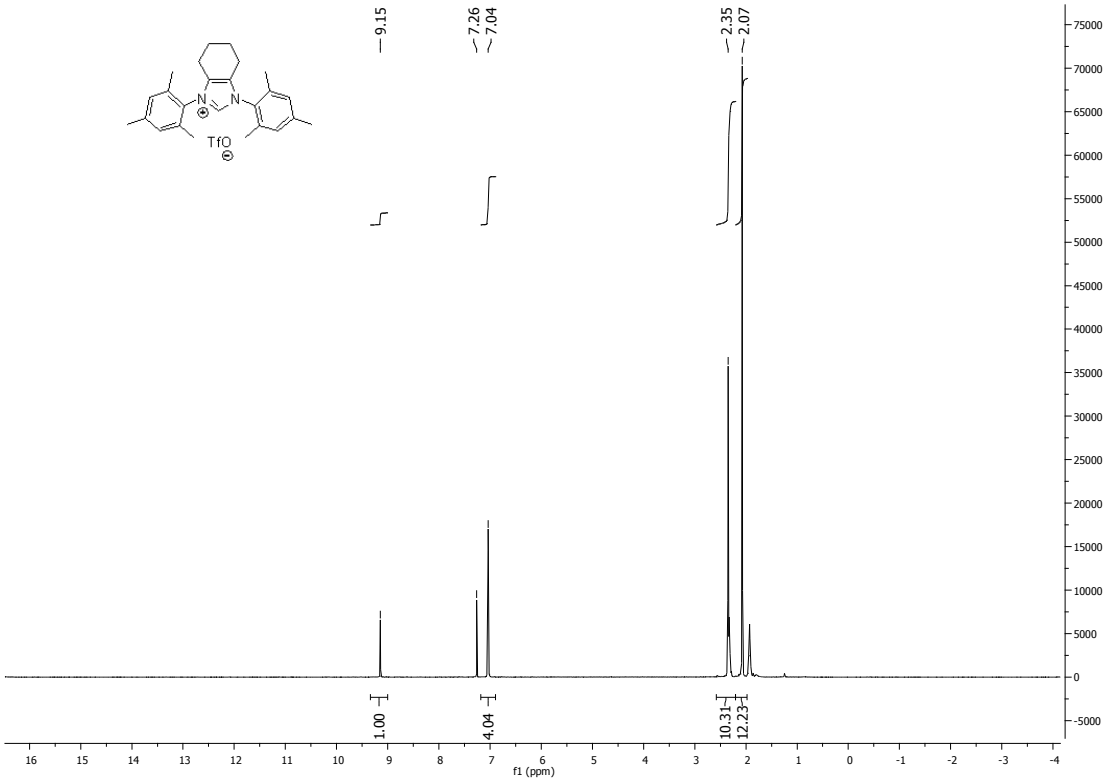
27.82
23.24
21.08
17.37
f1 (ppm)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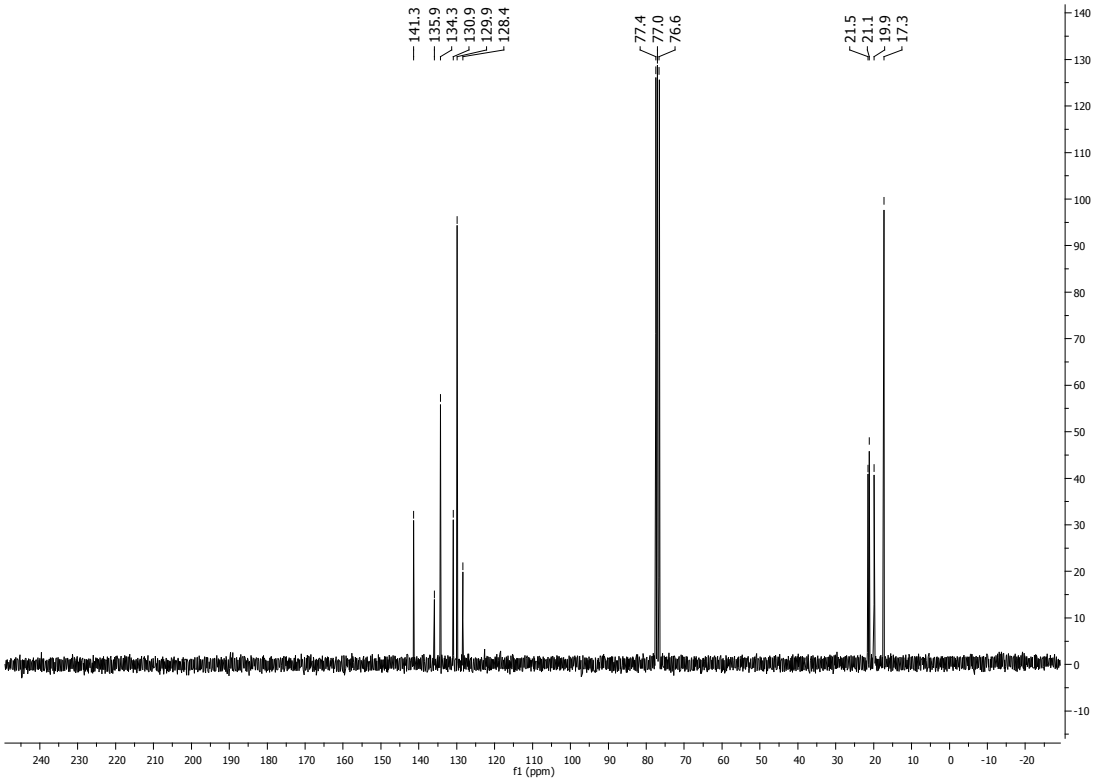
7.26
7.04
2.35
2.07
TfO
1.00
4.04
10.31
12.23
f1 (ppm)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128.4
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76.6
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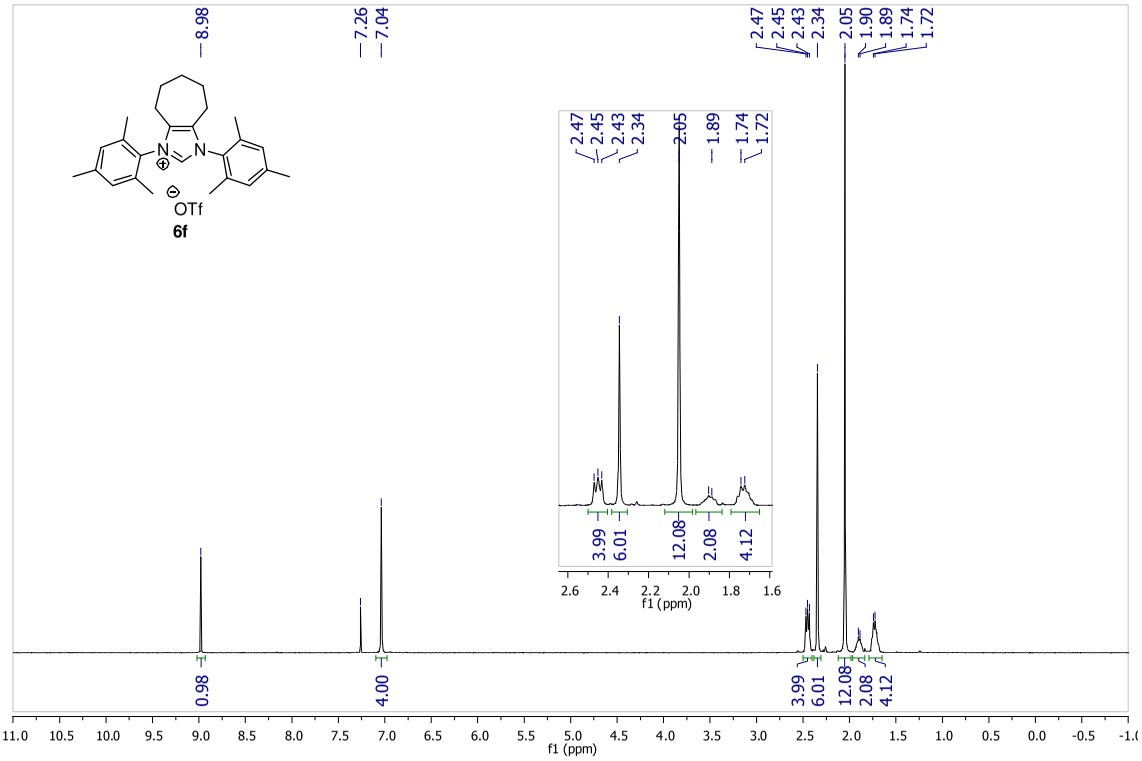
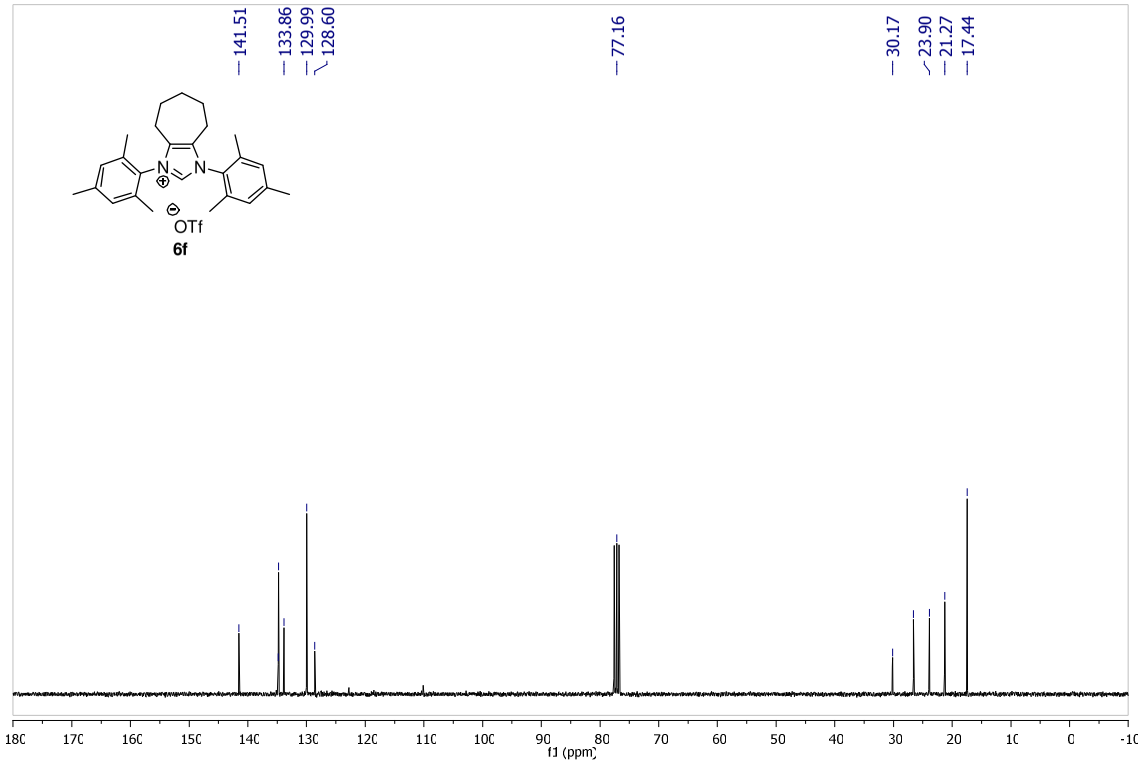
21.1
19.9
17.3
f1 (ppm)


8.98
7.26
7.04
2.47
2.45
2.43
2.34
2.05
1.90
1.89
1.74
1.72
OTf
6f
3.99
6.01
12.08
2.08
4.12
f1 (ppm)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129.99
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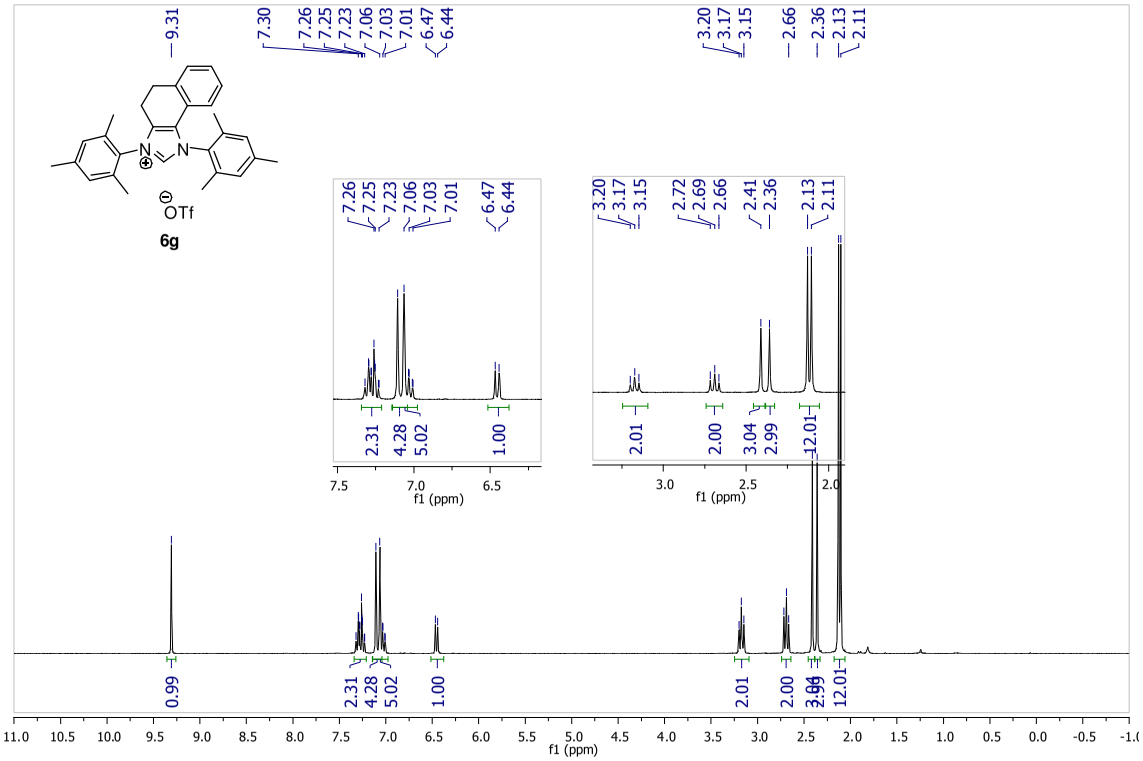
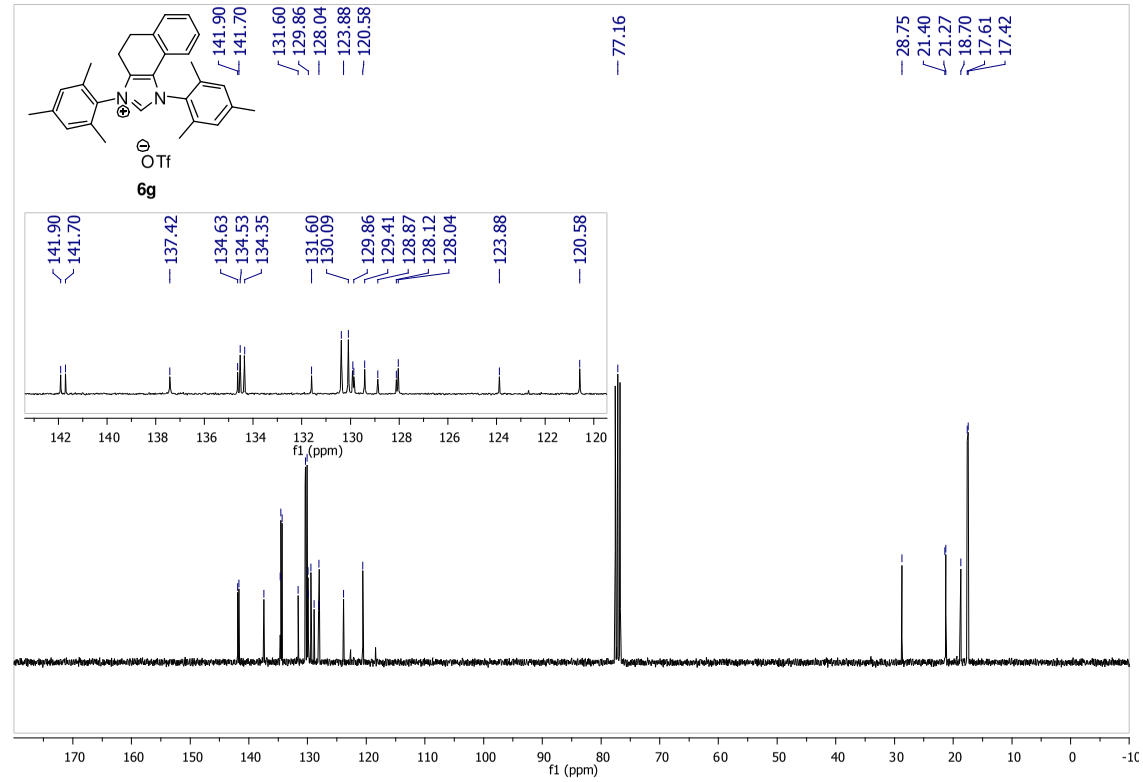
77.16
30.17
23.90
21.27
17.44
OTf
6f
f1 (ppm)


6g
OTf
9.31
7.30
7.26
7.25
7.23
7.06
7.03
7.01
6.47
6.44
3.20
3.17
3.15
2.66
2.36
2.13
2.11
2.72
2.69
2.41
0.99
2.31
4.28
5.02
1.00
2.01
2.00
3.04
2.99
12.01
f1 (ppm)


6g
OTf
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141.70
131.60
129.86
128.04
123.88
120.58
77.16
28.75
21.40
21.27
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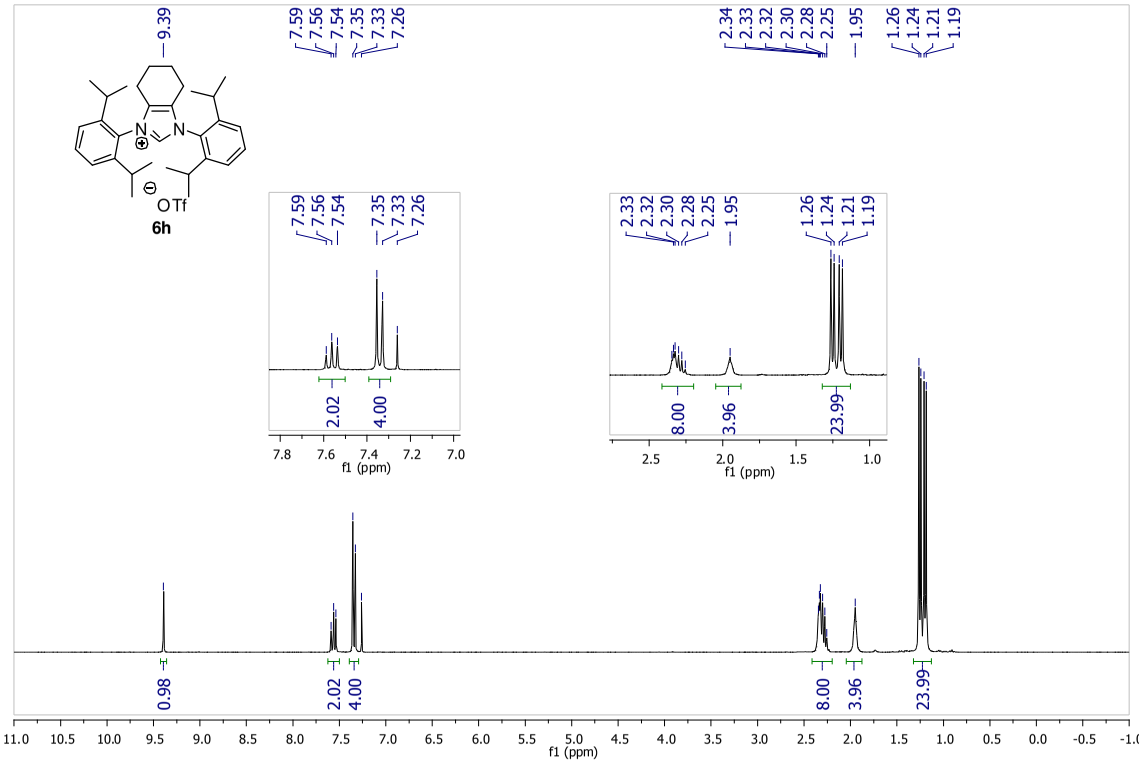
137.42
134.63
134.53
134.35
130.09
129.41
128.87
128.12
f1 (ppm)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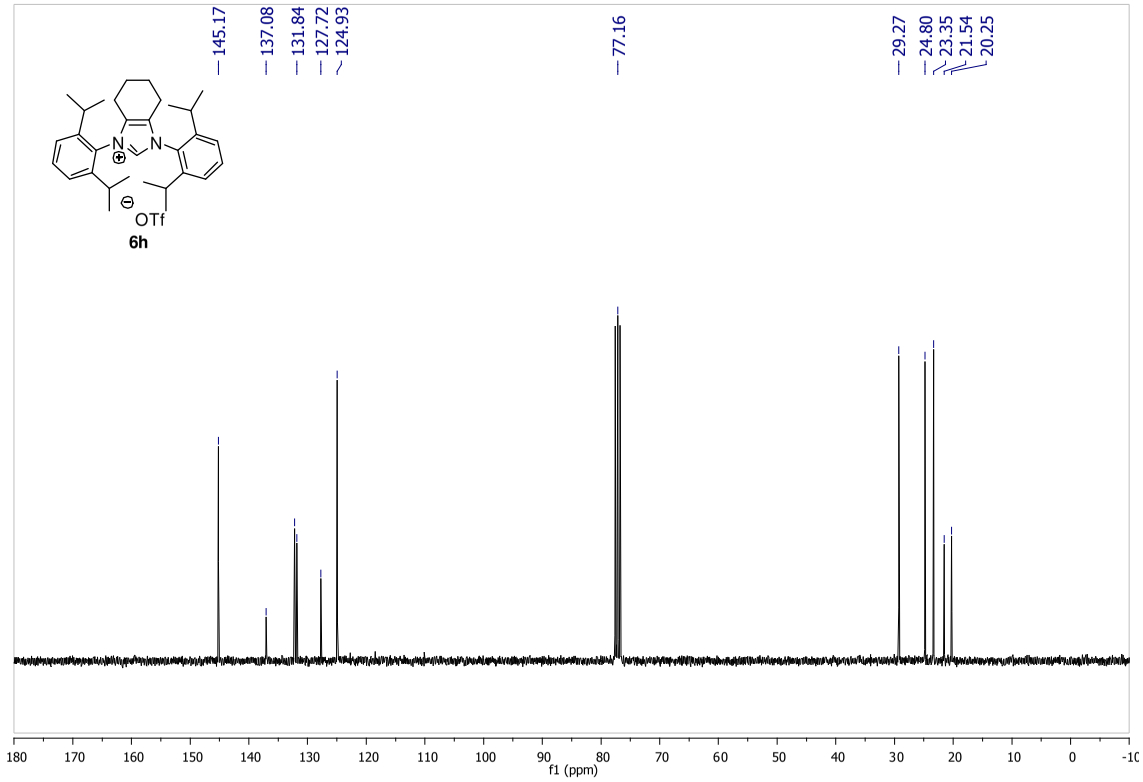
7.54
7.35
7.33
7.26
2.34
2.33
2.32
2.30
2.28
2.25
1.95
1.26
1.24
1.21
1.19
OTf
6h
2.02
4.00
8.00
3.96
23.99
f1 (ppm)


145.17
137.08
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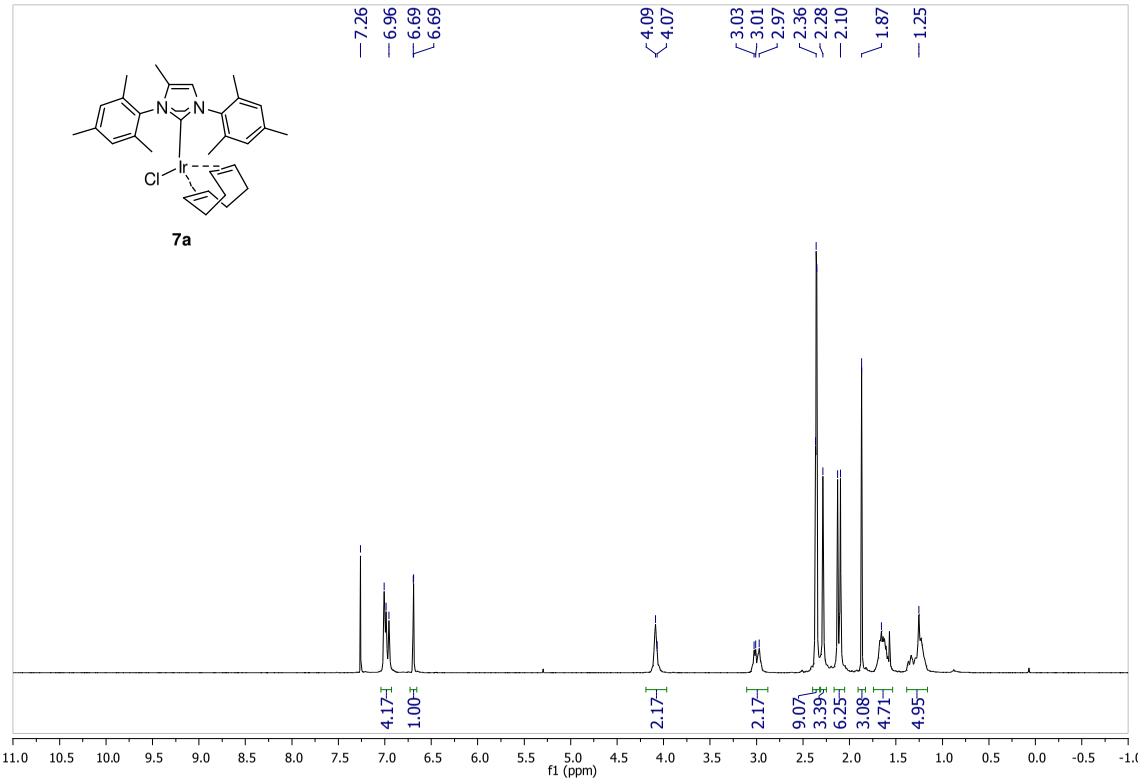
127.72
124.93
77.16
29.27
24.80
23.35
21.54
20.25
OTf
6h
f1 (ppm)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6.96
6.69
6.69
4.09
4.07
3.03
3.01
2.97
2.36
2.28
2.10
1.87
1.25
7a
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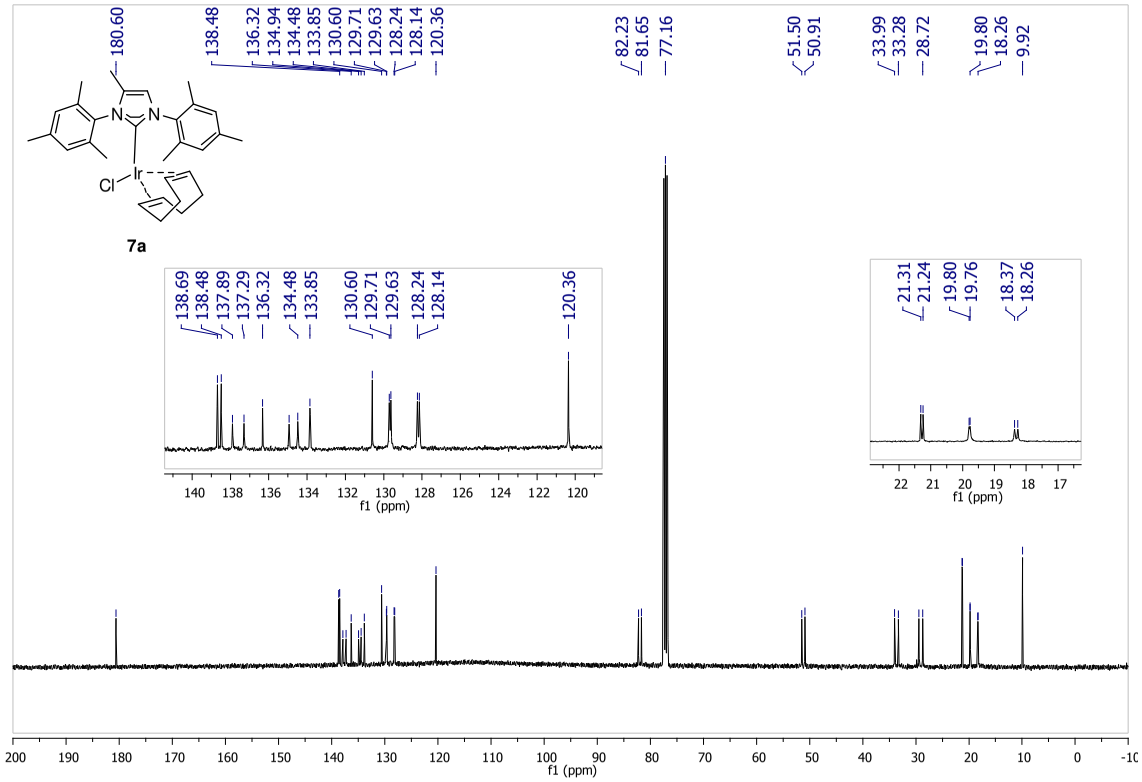
2.17
2.17
9.07
3.39
6.25
3.08
4.71
4.95
f1 (ppm)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133.85
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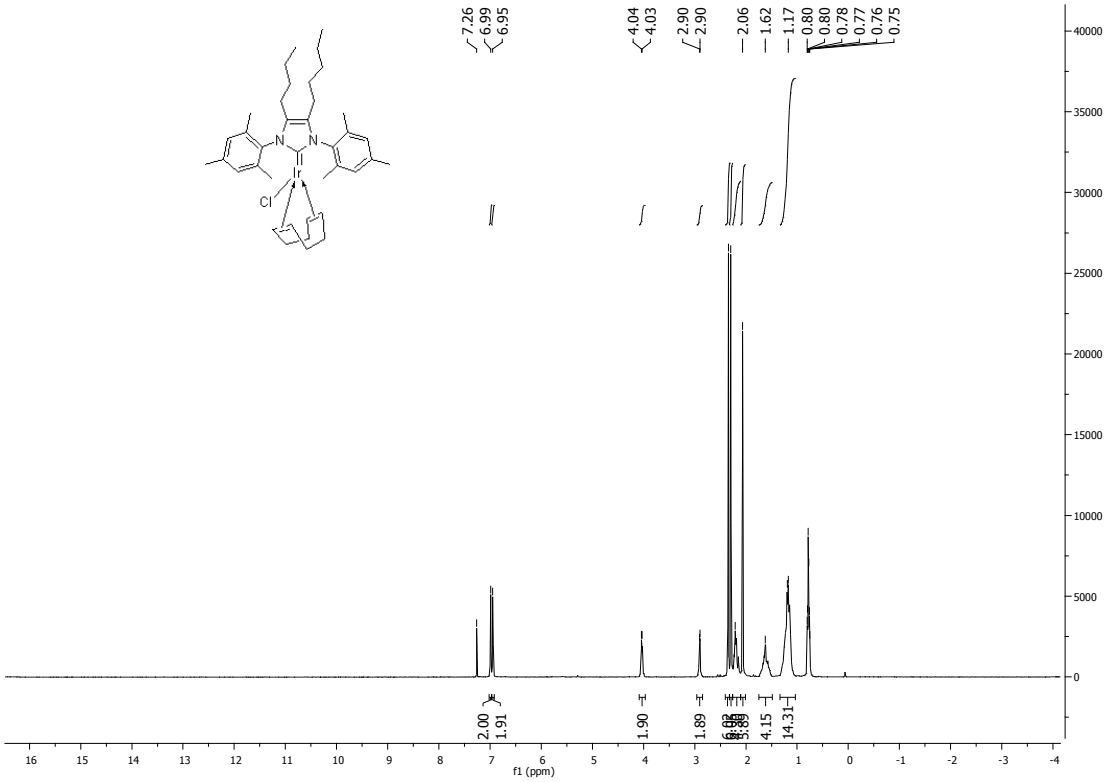
129.71
129.63
128.24
128.14
120.36
82.23
81.65
77.16
51.50
50.91
33.99
33.28
28.72
19.80
18.26
9.92
7a
138.69
138.48
137.89
137.29
136.32
134.48
133.85
130.60
129.71
129.63
128.24
128.14
120.36
f1 (ppm)
21.31
21.24
19.80
19.76
18.37
18.26
f1 (ppm)
f1 (ppm)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6.99
6.95
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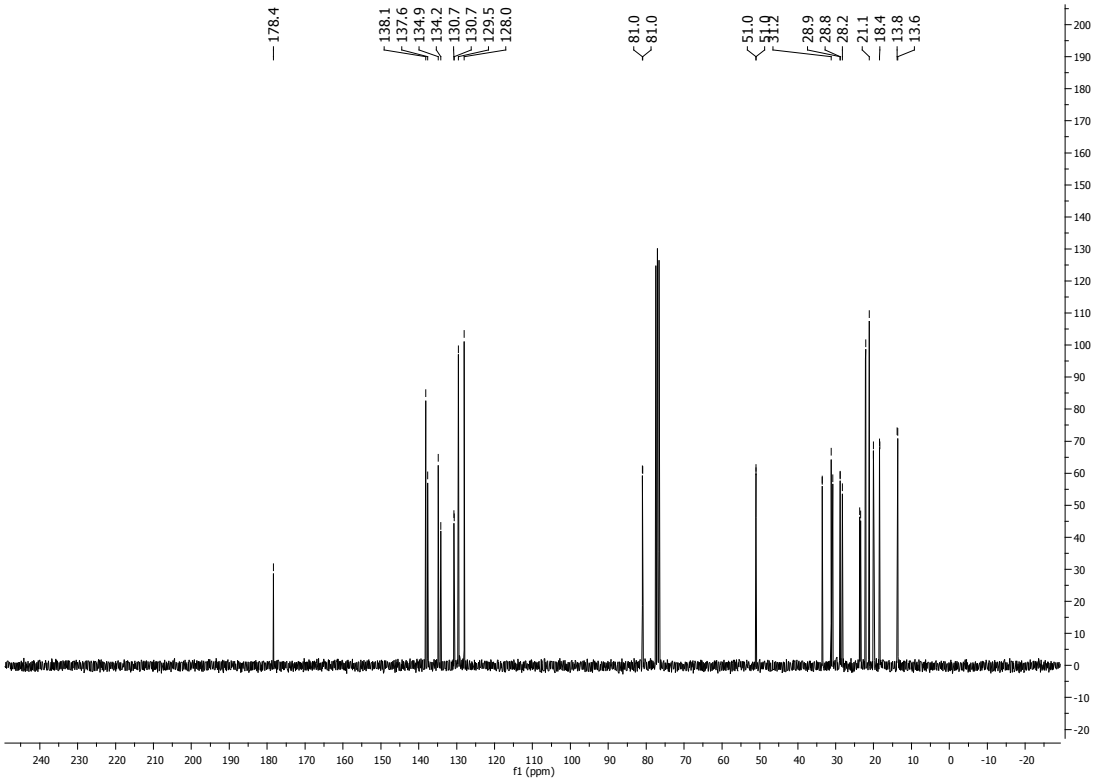
4.03
2.90
2.90
2.06
1.62
1.17
0.80
0.80
0.78
0.77
0.76
0.75
2.00
1.91
1.90
1.89
4.15
14.31
f1 (ppm)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138.1
137.6
134.9
134.2
130.7
130.7
129.5
128.0
81.0
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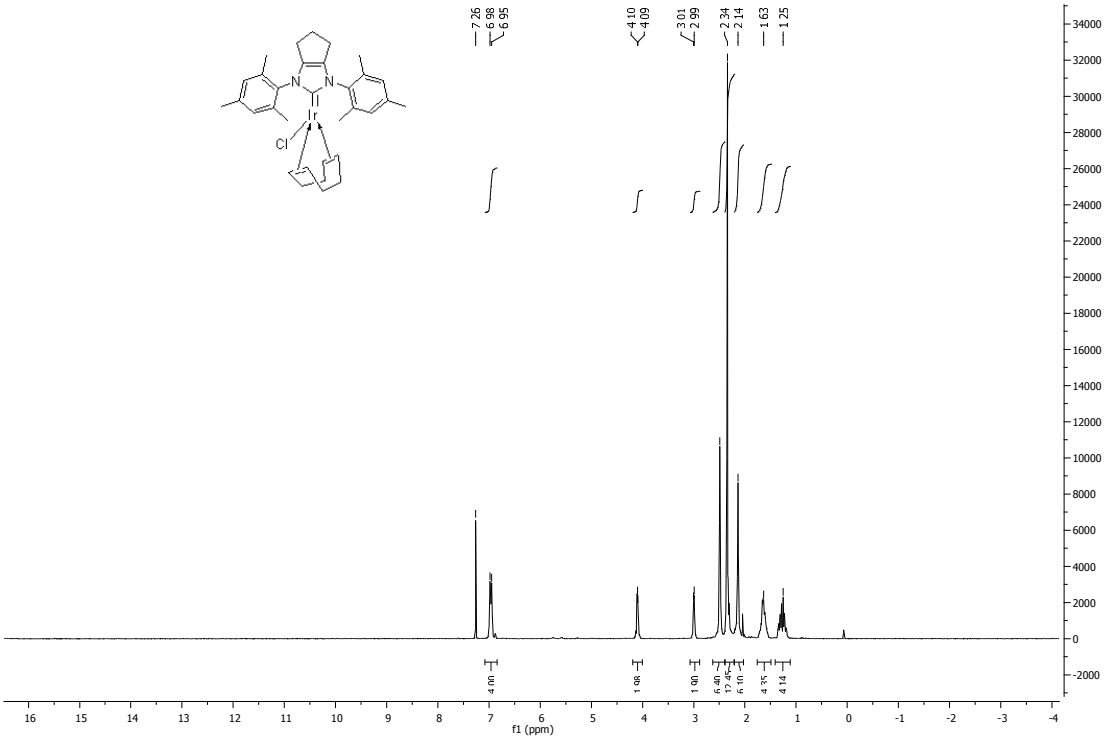
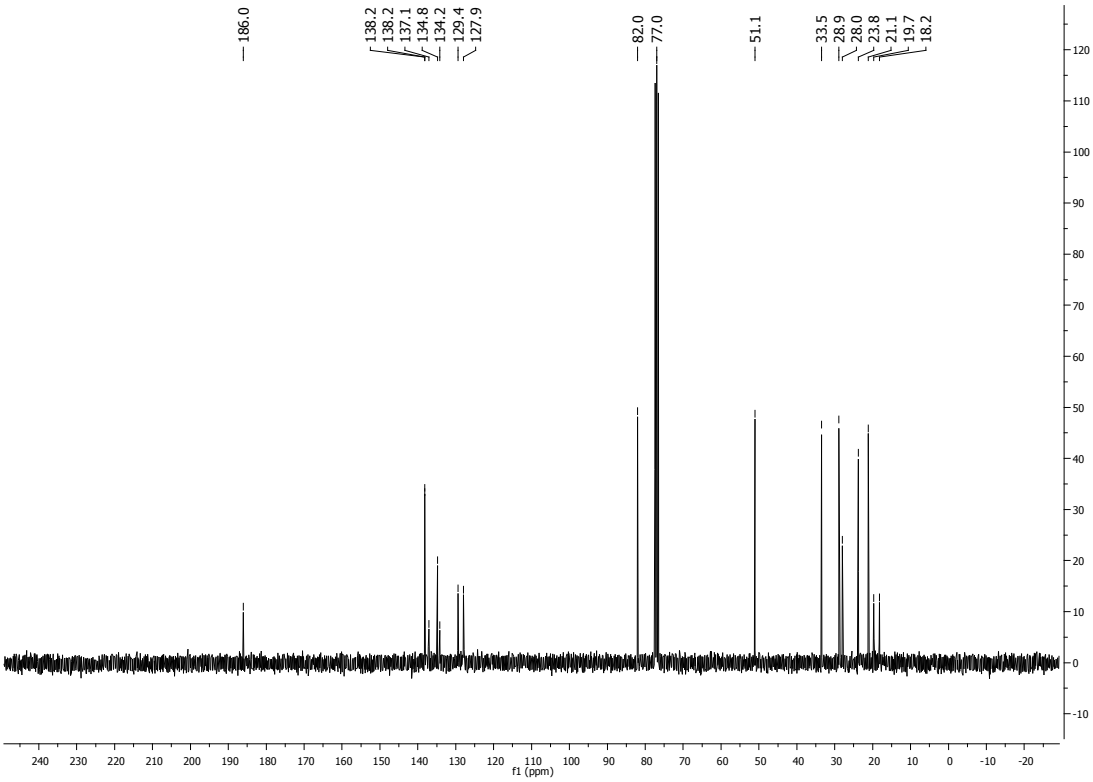
31.2
28.9
28.8
28.2
21.1
18.4
13.8
13.6
f1 (ppm)


7.26
6.98
6.95
4.10
4.09
3.01
2.99
2.34
2.14
1.63
1.25
f1 (ppm)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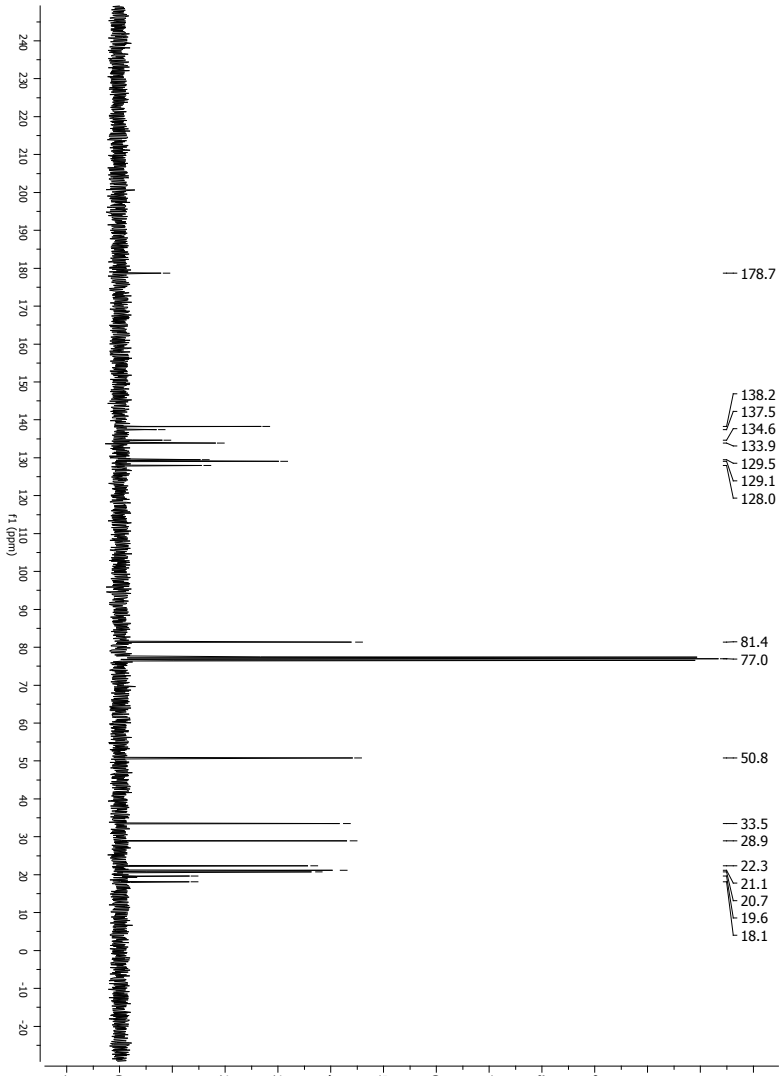
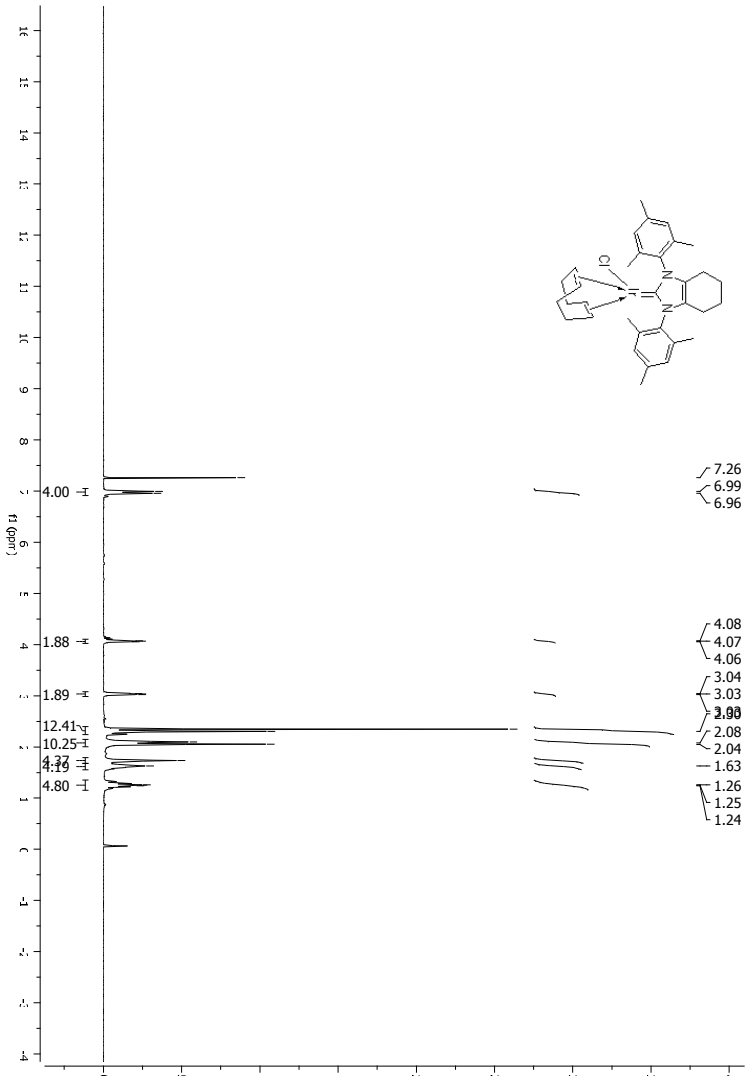
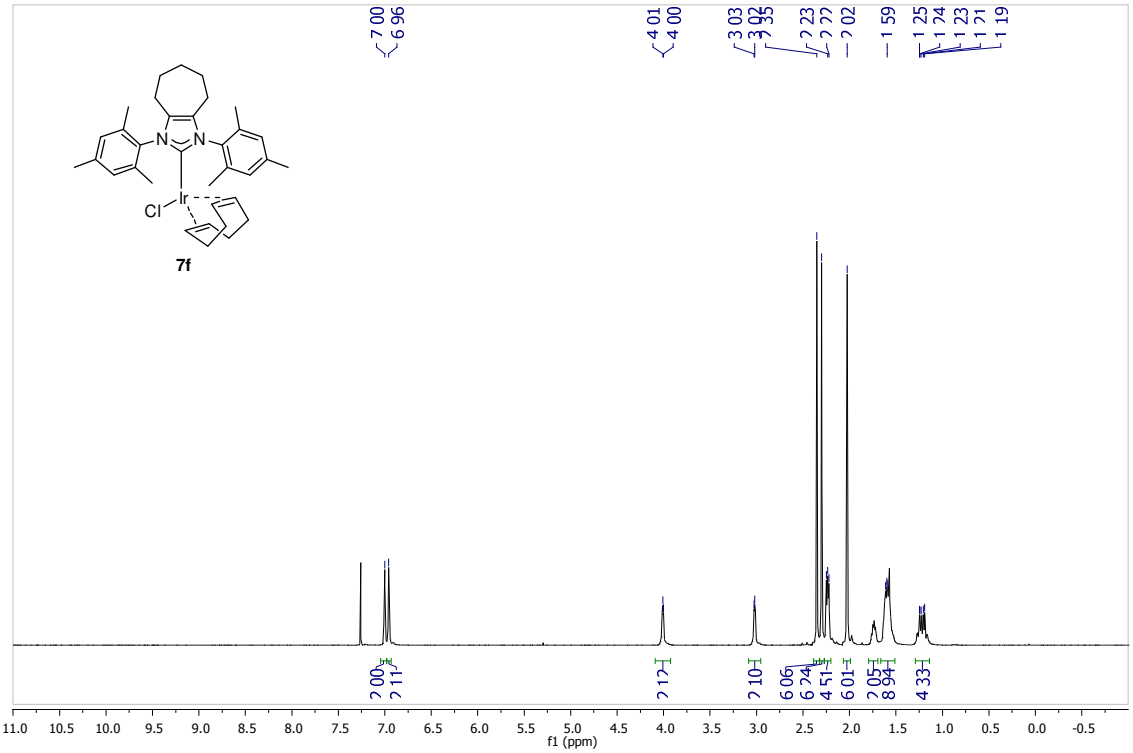
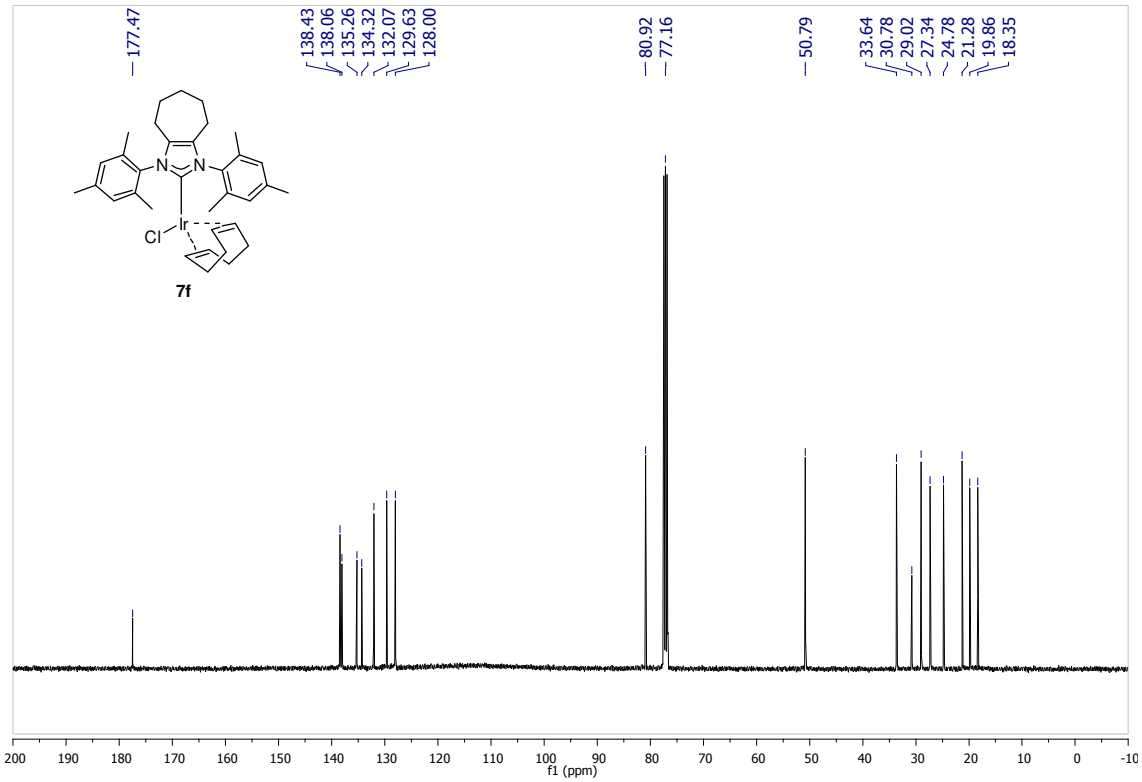
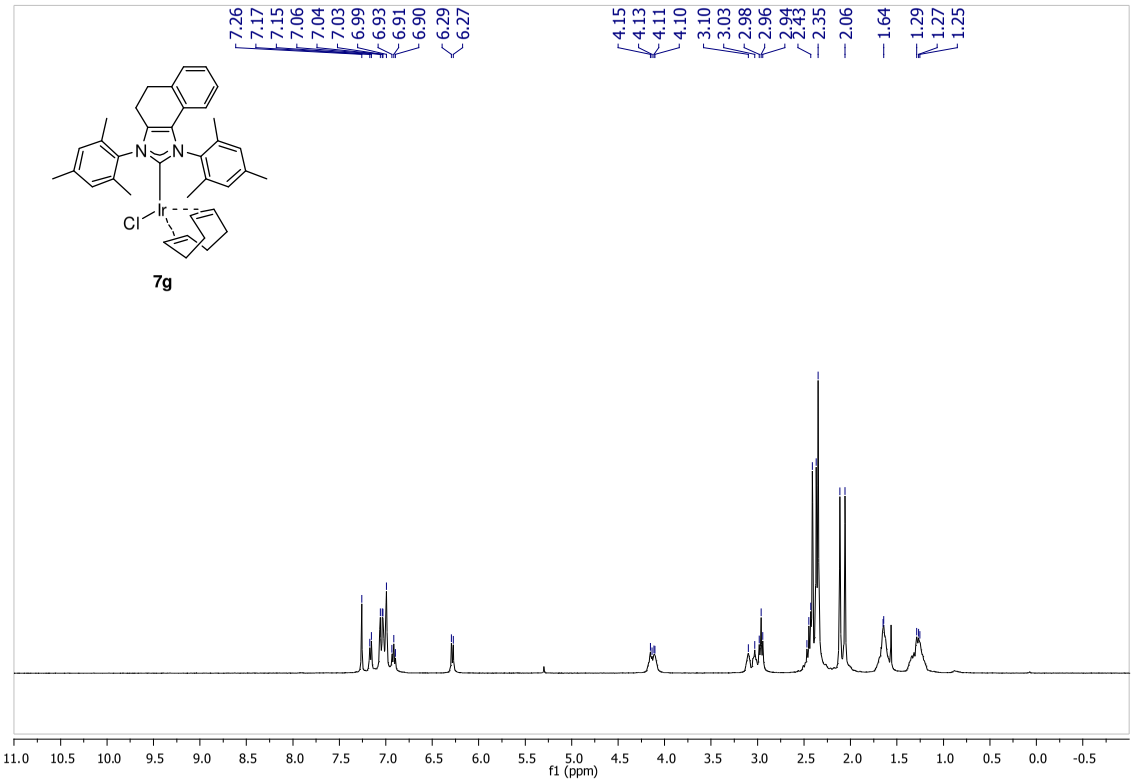
138.2
137.1
134.8
134.2
129.4
127.9
82.0
77.0
51.1
33.5
28.9
28.0
23.8
21.1
19.7
18.2
f1 (ppm)

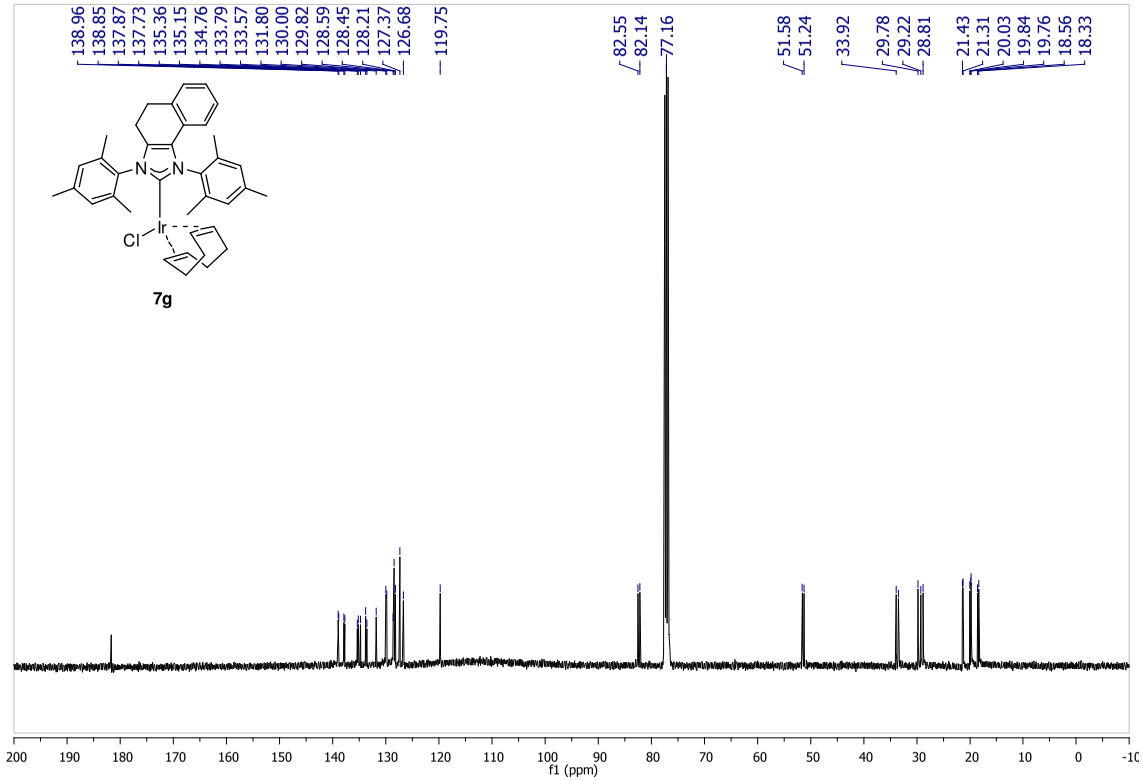

178.7
138.2
137.5
134.6
133.9
129.5
129.1
128.0
81.4
77.0
50.8
33.5
28.9
22.3
21.1
20.7
19.6
18.1
f1 (ppm)


Cl
7.26
6.99
6.96
4.00
4.08
4.07
4.06
1.88
3.04
3.03
1.89
2.08
12.41
2.04
10.25
1.63
4.80
1.26
1.25
1.24
f1 (ppm)


7f
f1 (ppm)


7f
f1 (ppm)


7.26
7.17
7.15
7.06
7.04
7.03
6.99
6.93
6.91
6.90
6.29
6.27
4.15
4.13
4.11
4.10
3.10
3.03
2.98
2.96
2.94
2.43
2.35
2.06
1.64
1.29
1.27
1.25
N
N
Ir
Cl
7g
11.0 10.5 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 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)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133.79
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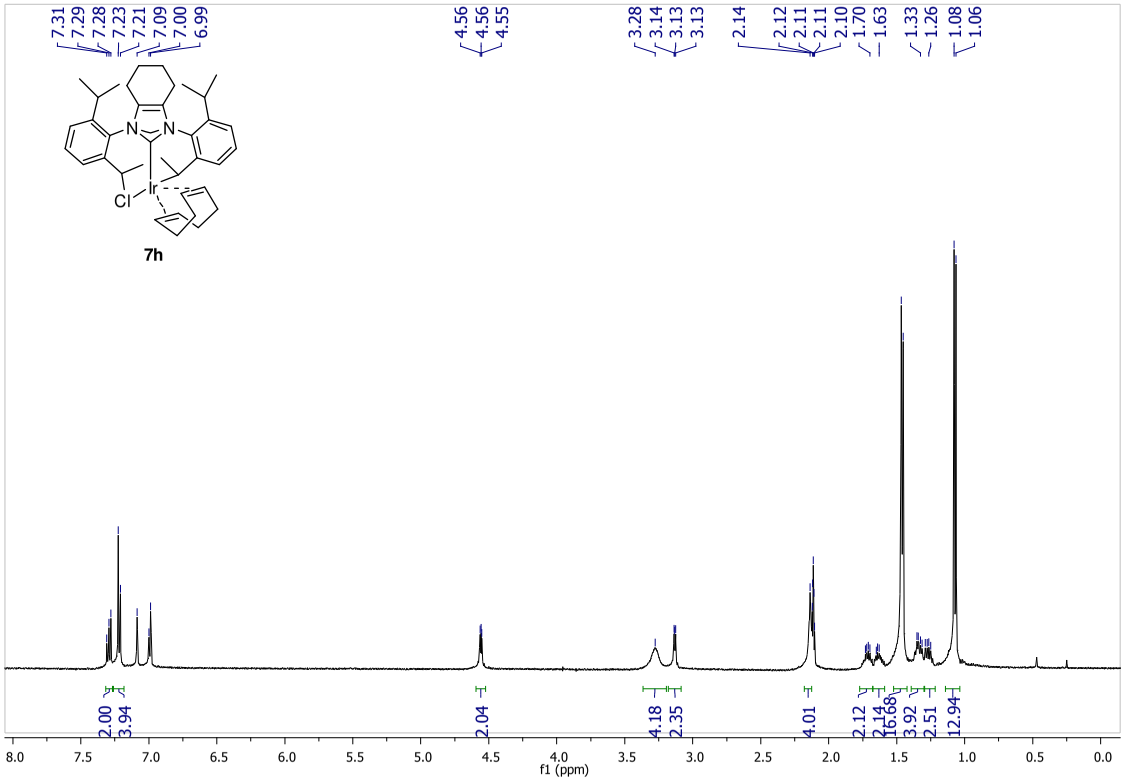
130.00
129.82
128.59
128.45
128.21
127.37
126.68
119.75
82.55
82.14
77.16
51.58
51.24
33.92
29.78
29.22
28.81
21.43
21.31
20.03
19.84
19.76
18.56
18.33
N
N
Ir
Cl
7g
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


7.31
7.29
7.28
7.23
7.21
7.09
7.00
6.99
4.56
4.56
4.55
3.28
3.14
3.13
3.13
2.14
2.12
2.11
2.11
2.10
1.70
1.63
1.33
1.26
1.08
1.06
N
N
Ir
Cl
7h
2.00
3.94
2.04
4.18
2.35
4.01
2.12
2.14
16.68
3.92
2.51
12.94
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
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3.5
3.0
2.5
2.0
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1.0
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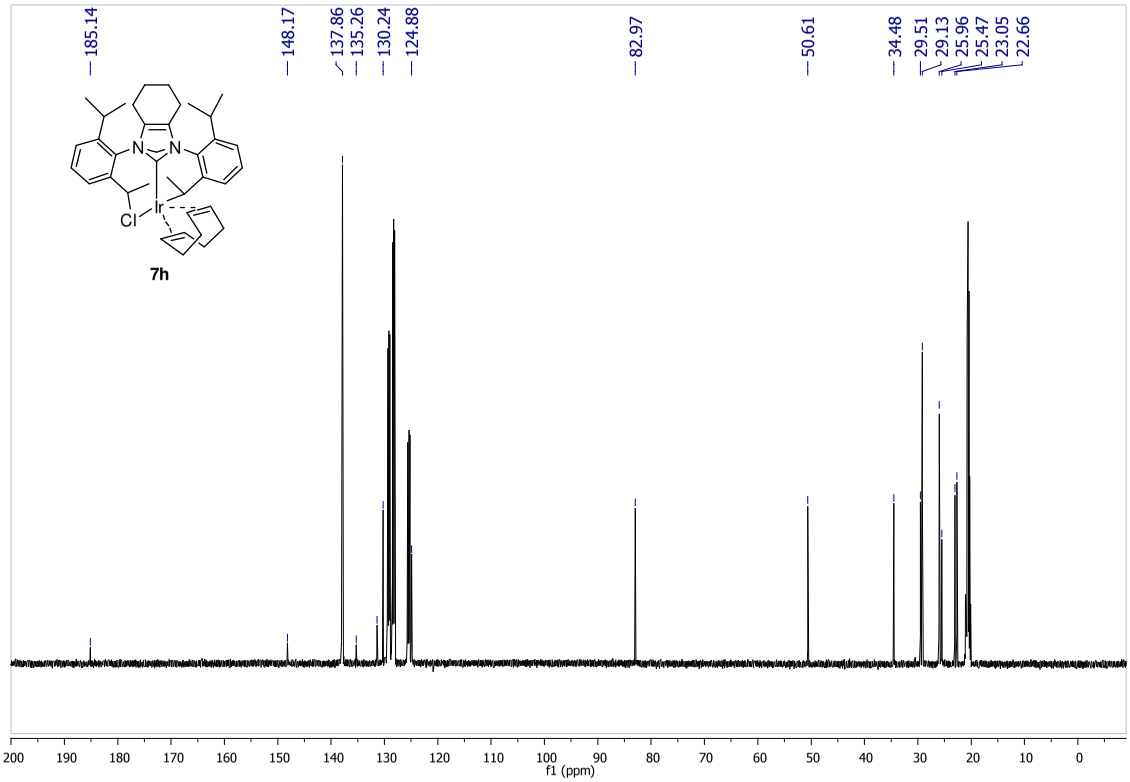
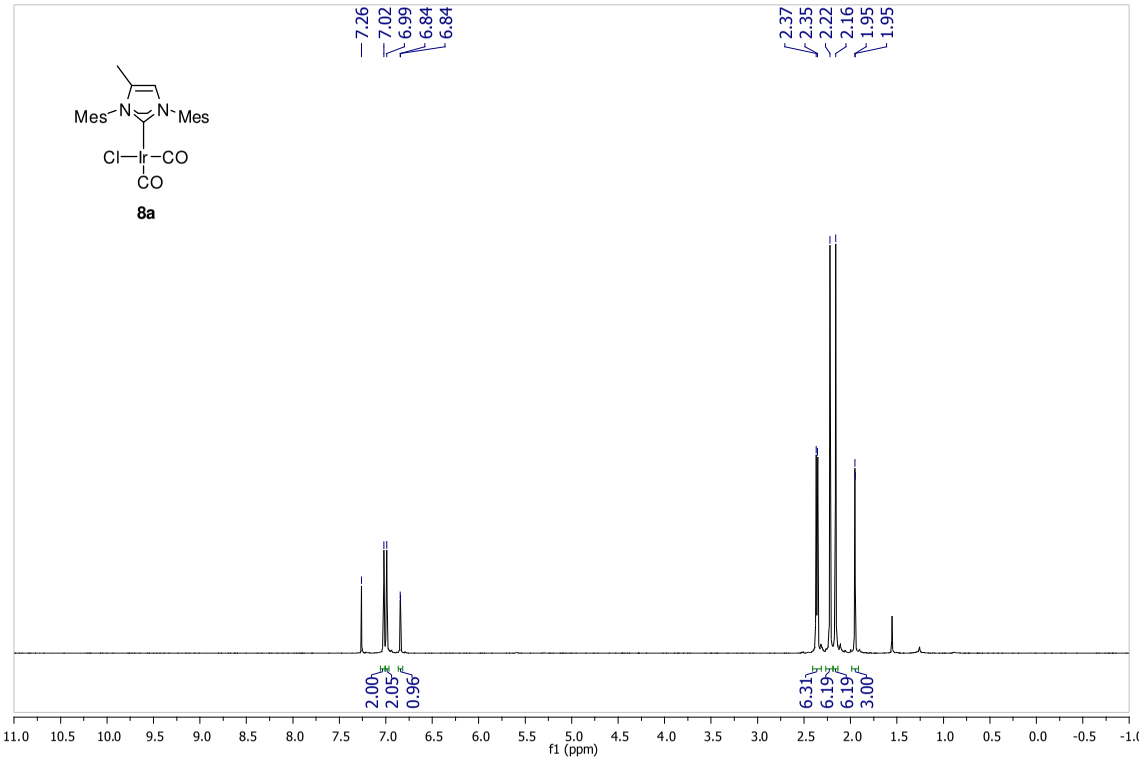
0.0
f1 (ppm)


185.14
148.17
137.86
135.26
130.24
124.88
82.97
50.61
34.48
29.51
29.13
25.96
25.47
23.05
22.66
N
N
Ir
Cl
7h
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)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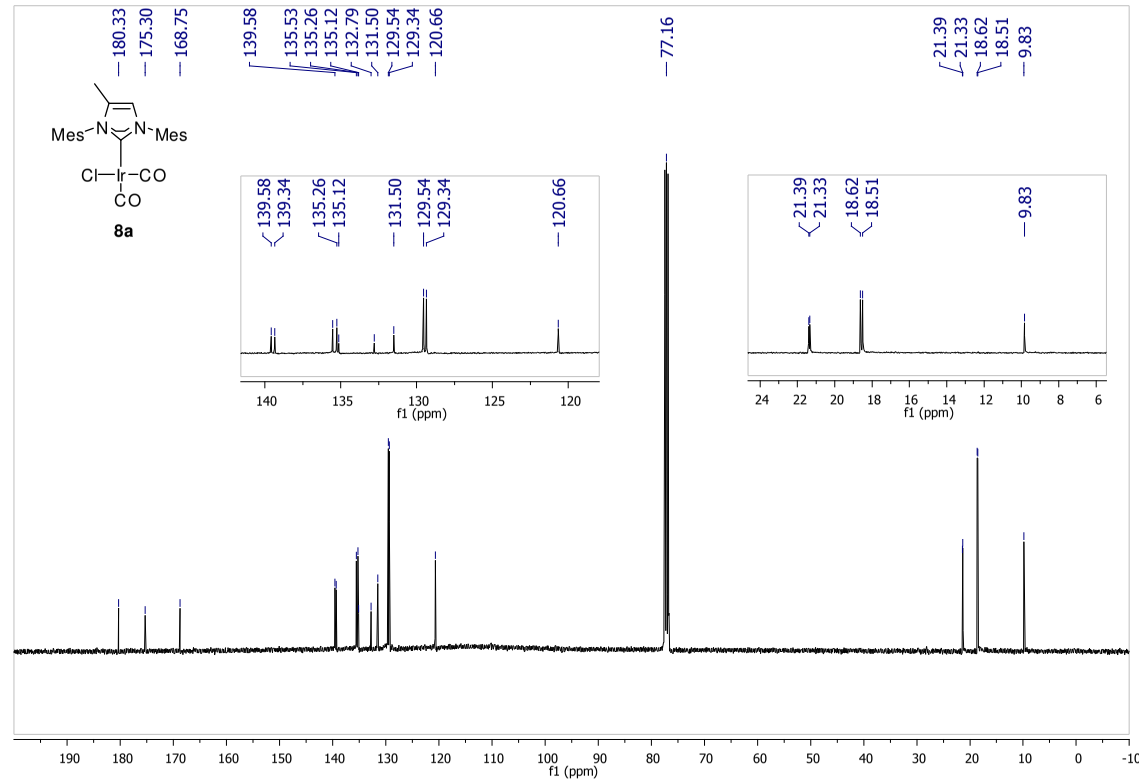
7.02
6.99
6.84
6.84
2.37
2.35
2.22
2.16
1.95
1.95
Mes
N
N
Mes
Cl
Ir
CO
CO
8a
2.00
2.05
0.96
6.31
6.19
6.19
3.00
f1 (ppm)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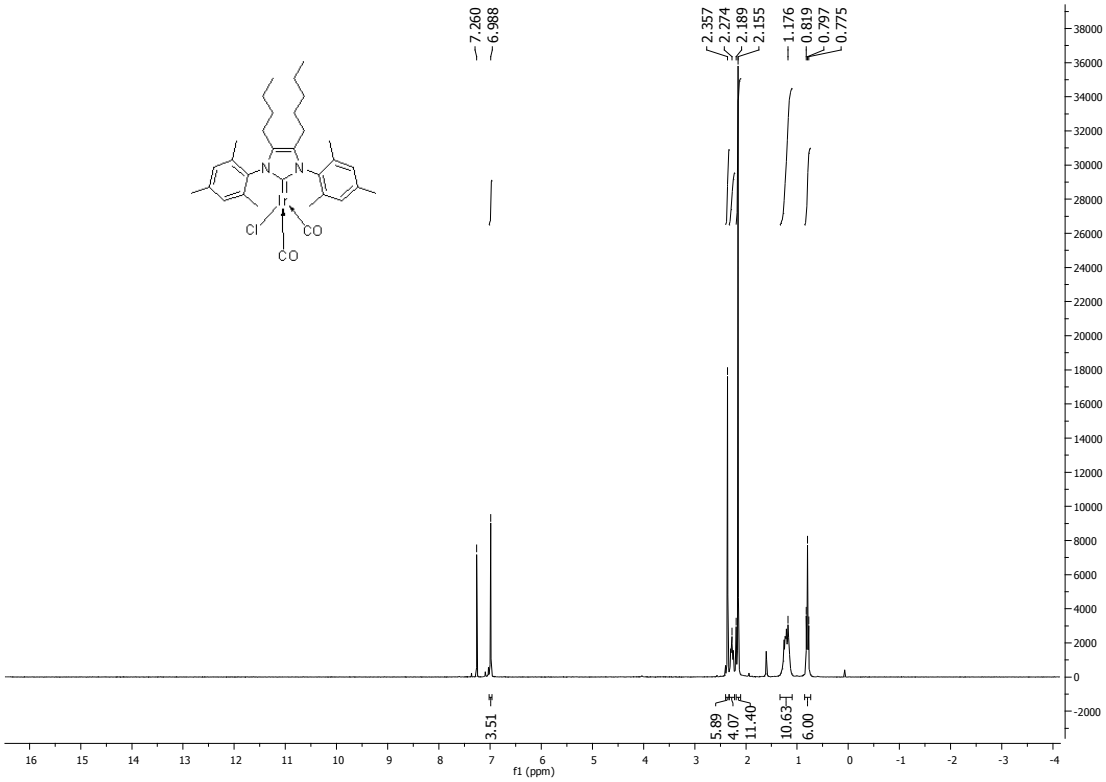
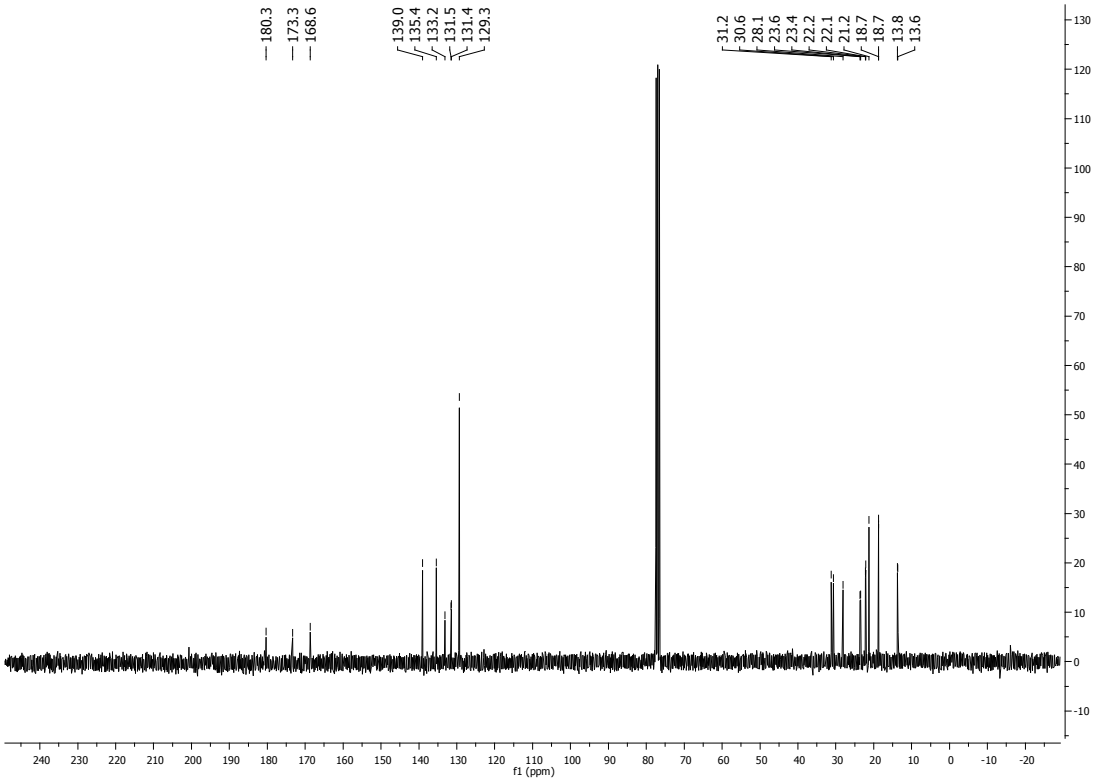
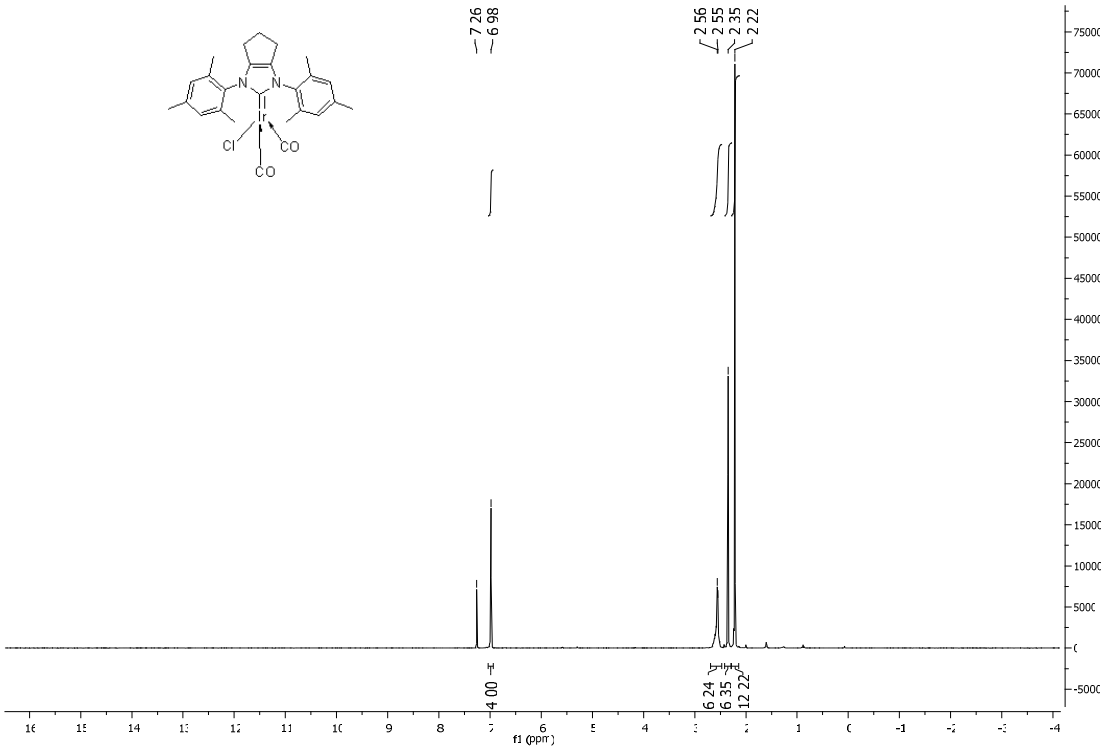
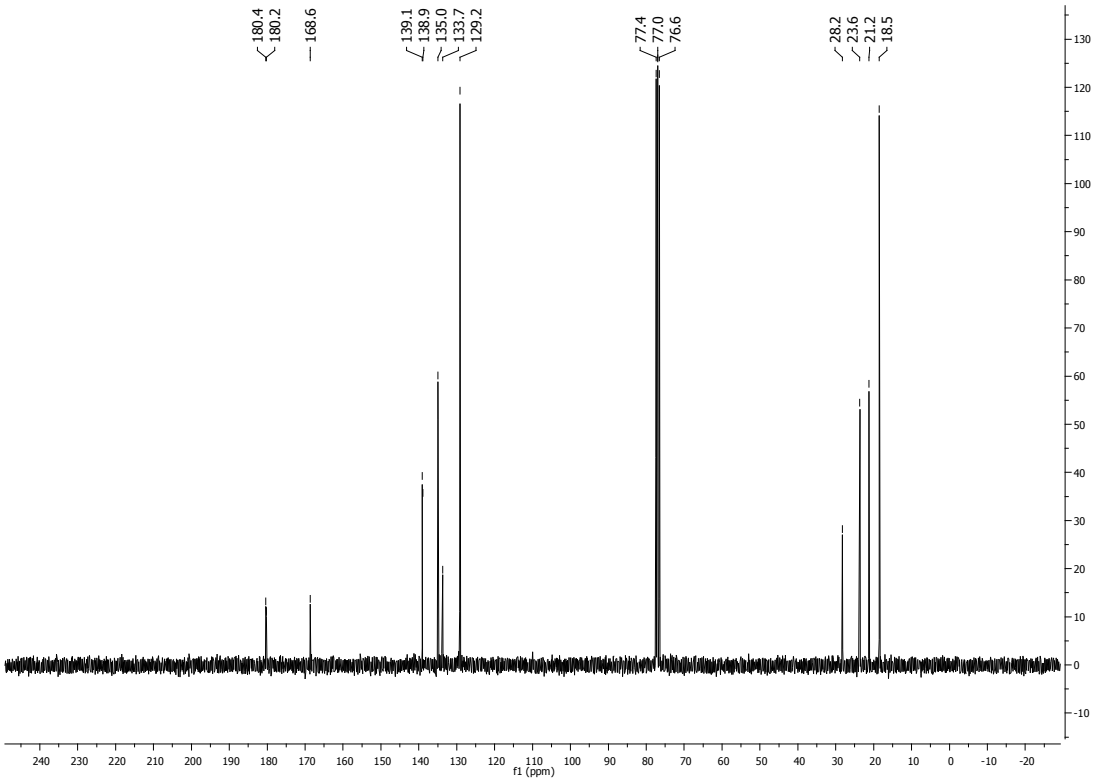
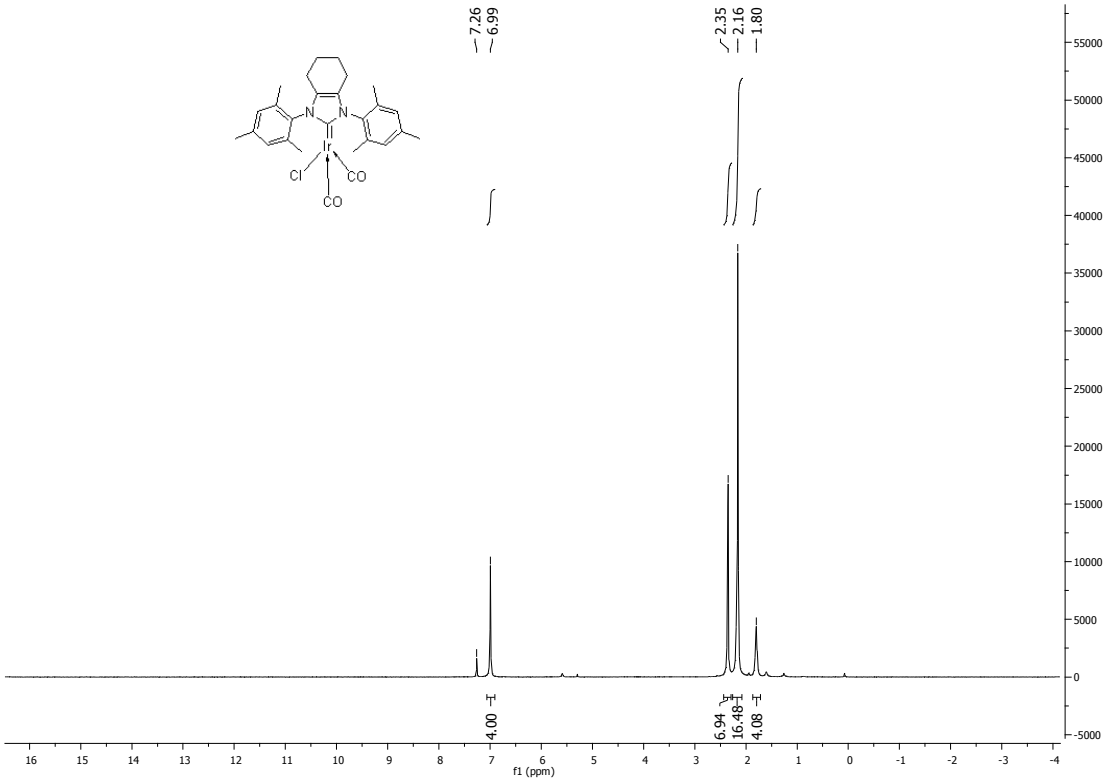
135.53
135.26
135.12
132.79
131.50
129.54
129.34
120.66
77.16
21.39
21.33
18.62
18.51
9.83
Mes
N
N
Mes
Cl
Ir
CO
CO
8a
f1 (ppm)

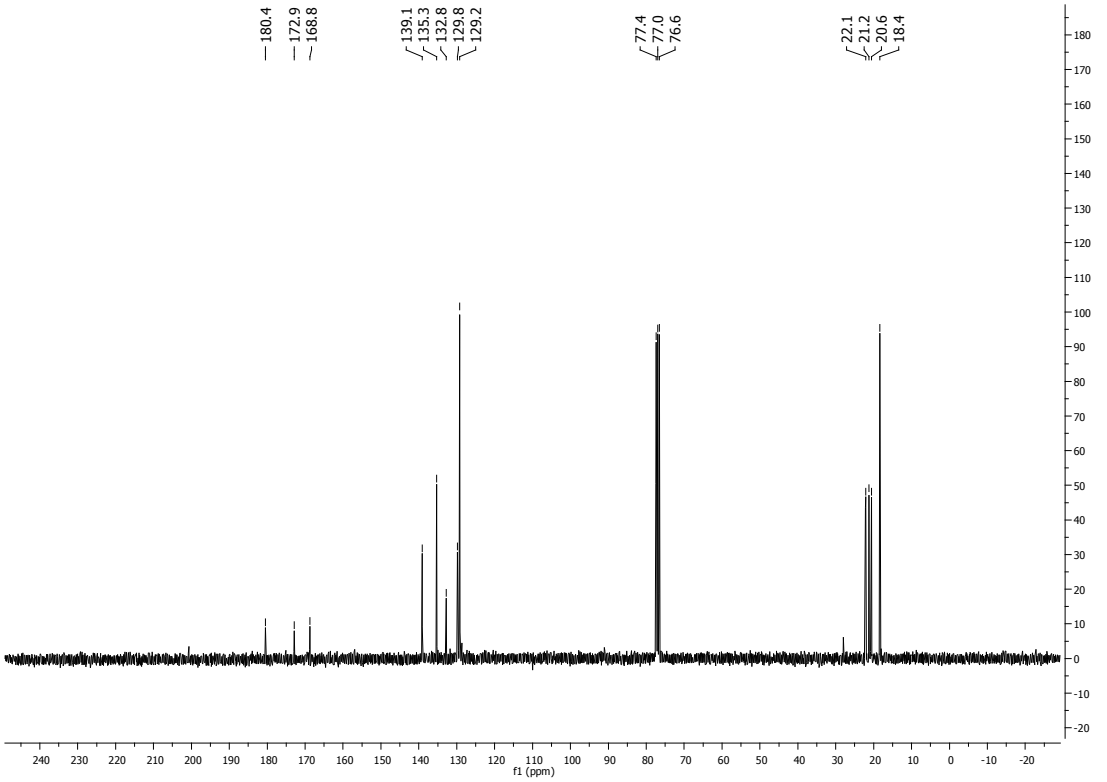

7.260
6.988
2.357
2.274
2.189
2.155
1.176
0.819
0.797
0.775
3.51
5.89
4.07
11.40
10.63
6.00
f1 (ppm)

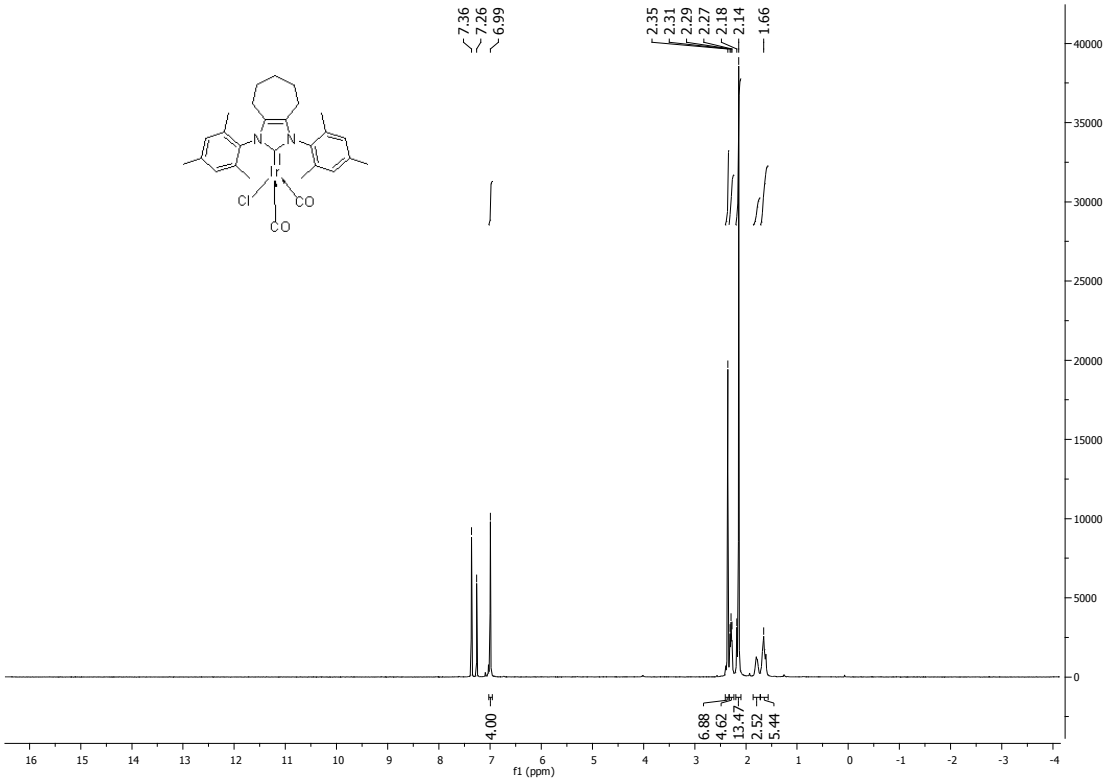

180.3
173.3
168.6
139.0
135.4
133.2
131.5
131.4
129.3
31.2
30.6
28.1
23.6
23.4
22.2
22.1
21.2
18.7
18.7
13.8
13.6
f1 (ppm)

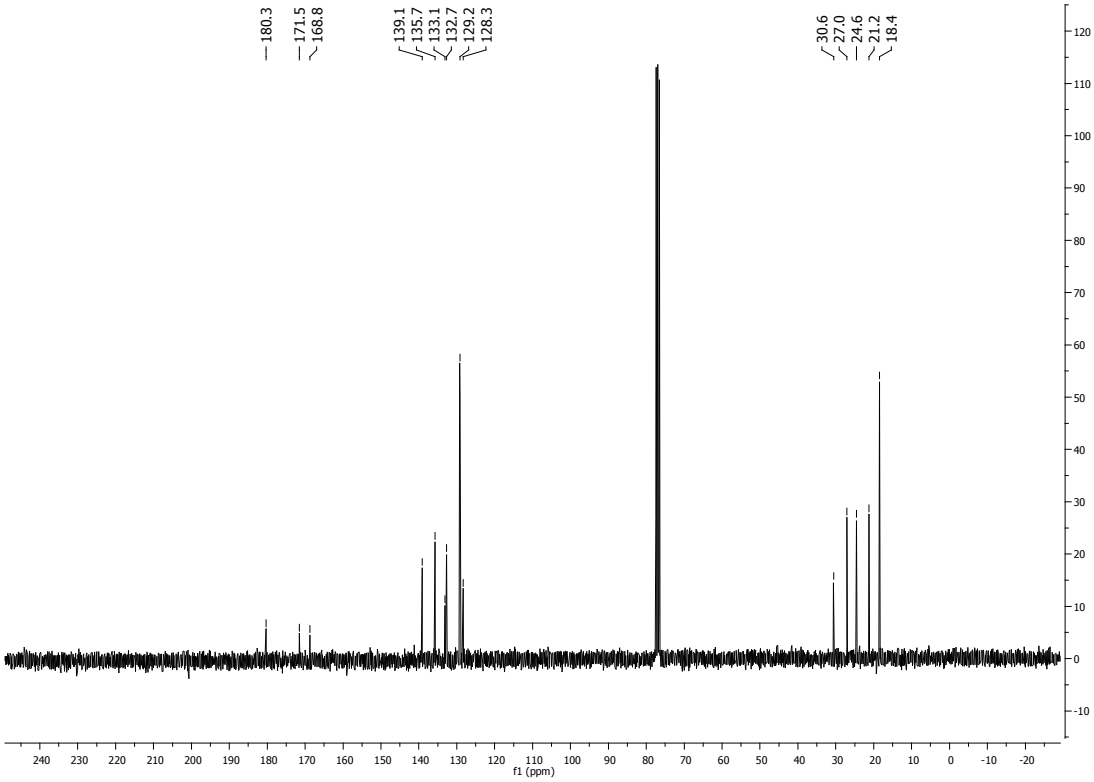

7.26
6.98
2.56
2.55
2.35
2.22
4.00
6.24
6.35
12.22
f1 (ppm)

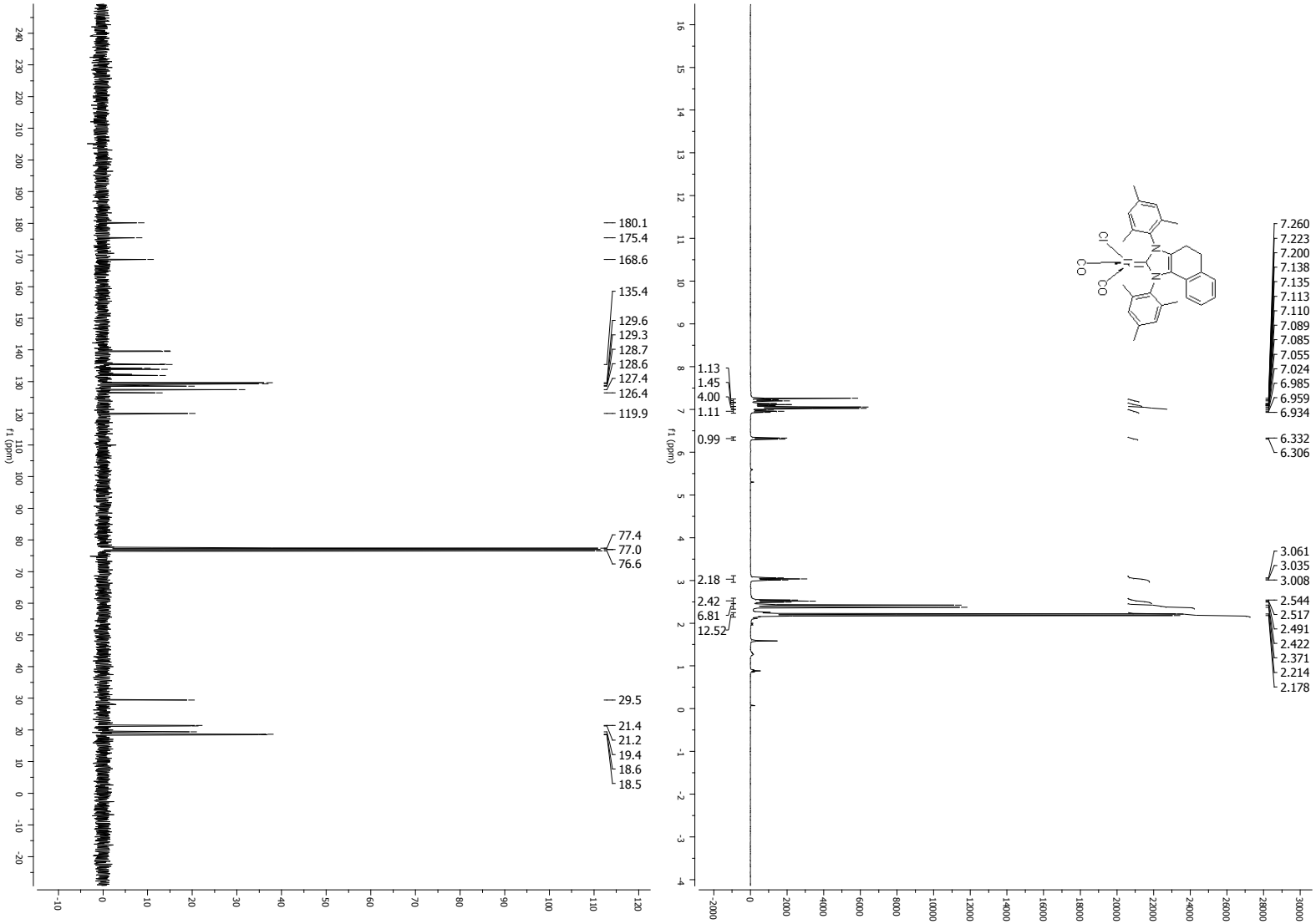

180.4
180.2
168.6
139.1
138.9
135.0
133.7
129.2
77.4
77.0
76.6
28.2
23.6
21.2
18.5
f1 (ppm)

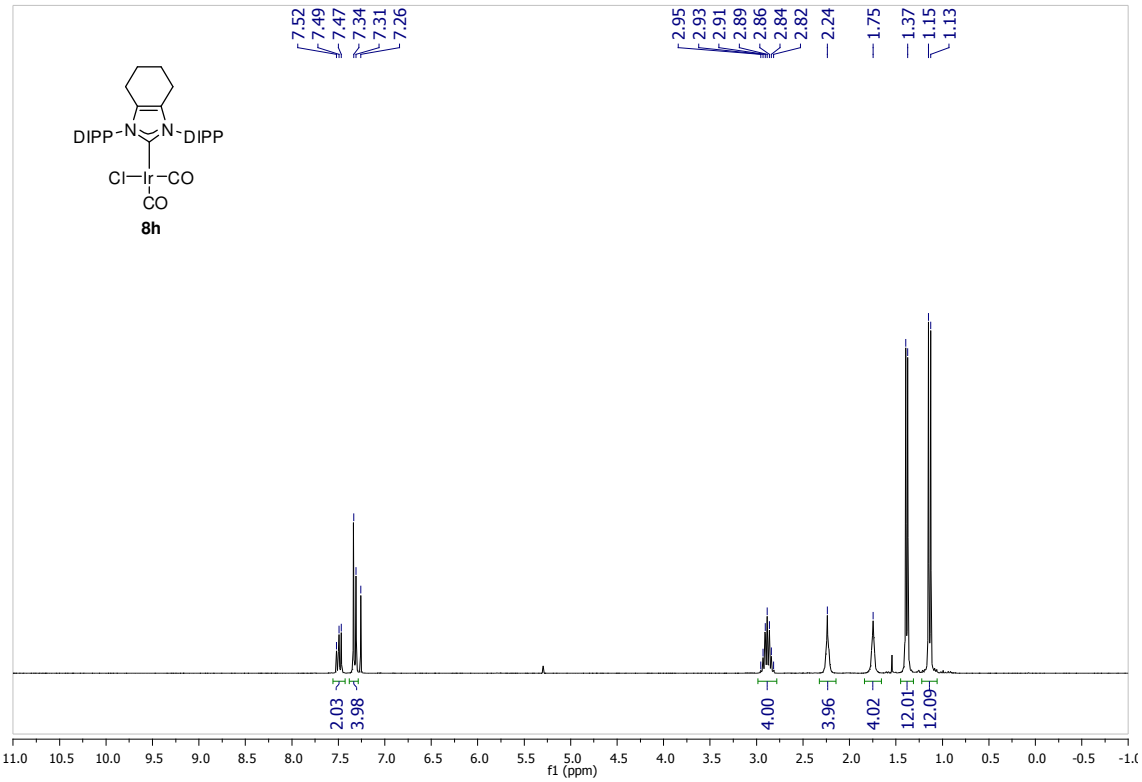

7.26
6.99
2.35
2.16
1.80
4.00
6.94
16.48
4.08
f1 (ppm)

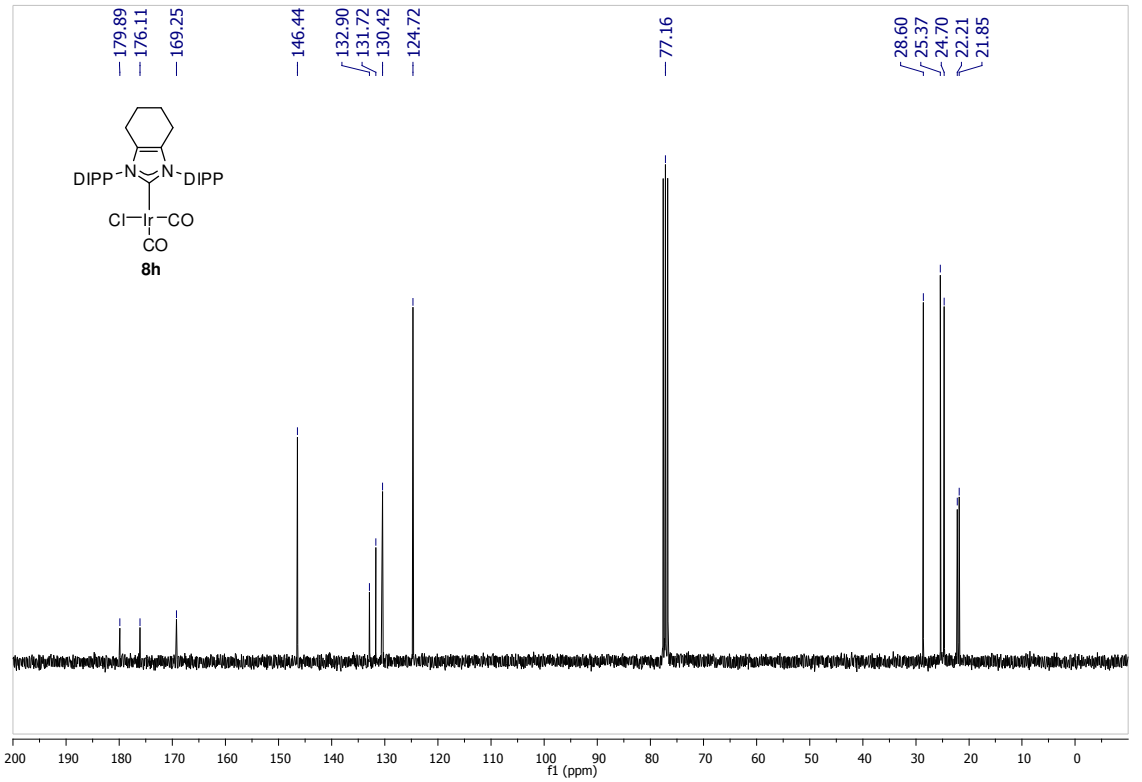

180.4
172.9
168.8
139.1
135.3
132.8
129.8
129.2
77.4
77.0
76.6
22.1
21.2
20.6
18.4
f1 (ppm)


7.36
7.26
6.99
2.35
2.31
2.29
2.27
2.18
2.14
1.66
4.00
6.88
4.62
13.47
2.52
5.44
f1 (ppm)


180.3
171.5
168.8
139.1
135.7
133.1
132.7
129.2
128.3
30.6
27.0
24.6
21.2
18.4
f1 (ppm)


180.1
175.4
168.6
135.4
129.6
129.3
128.7
128.6
127.4
126.4
119.9
77.4
77.0
76.6
29.5
21.4
21.2
19.4
18.6
18.5
f1 (ppm)
1.13
1.45
4.00
1.11
0.99
2.18
2.42
6.81
12.52
7.260
7.223
7.200
7.138
7.135
7.113
7.110
7.089
7.085
7.055
7.024
6.985
6.959
6.934
6.332
6.306
3.061
3.035
3.008
2.544
2.517
2.491
2.422
2.371
2.214
2.178
Cl
CO
CO


7.52
7.49
7.47
7.34
7.31
7.26
2.95
2.93
2.91
2.89
2.86
2.84
2.82
2.24
1.75
1.37
1.15
1.13
DIPP
N
N
DIPP
Cl
Ir
CO
CO
8h
2.03
3.98
4.00
3.96
4.02
12.01
12.09
f1 (ppm)


179.89
176.11
169.25
146.44
132.90
131.72
130.42
124.72
77.16
28.60
25.37
24.70
22.21
21.85
DIPP
N
N
DIPP
Cl
Ir
CO
CO
8h
f1 (ppm)