Supporting Information for

# Assembly of Indolenines, 3-Amino Oxindoles, and Aldehydes into Indolenine-substituted Spiro[pyrrolidin-2,3'-oxindoles] via 1,3-Dipolar Cycloaddition with Divergent Diastereoselectivities

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bmwang@dlut.edu.cn

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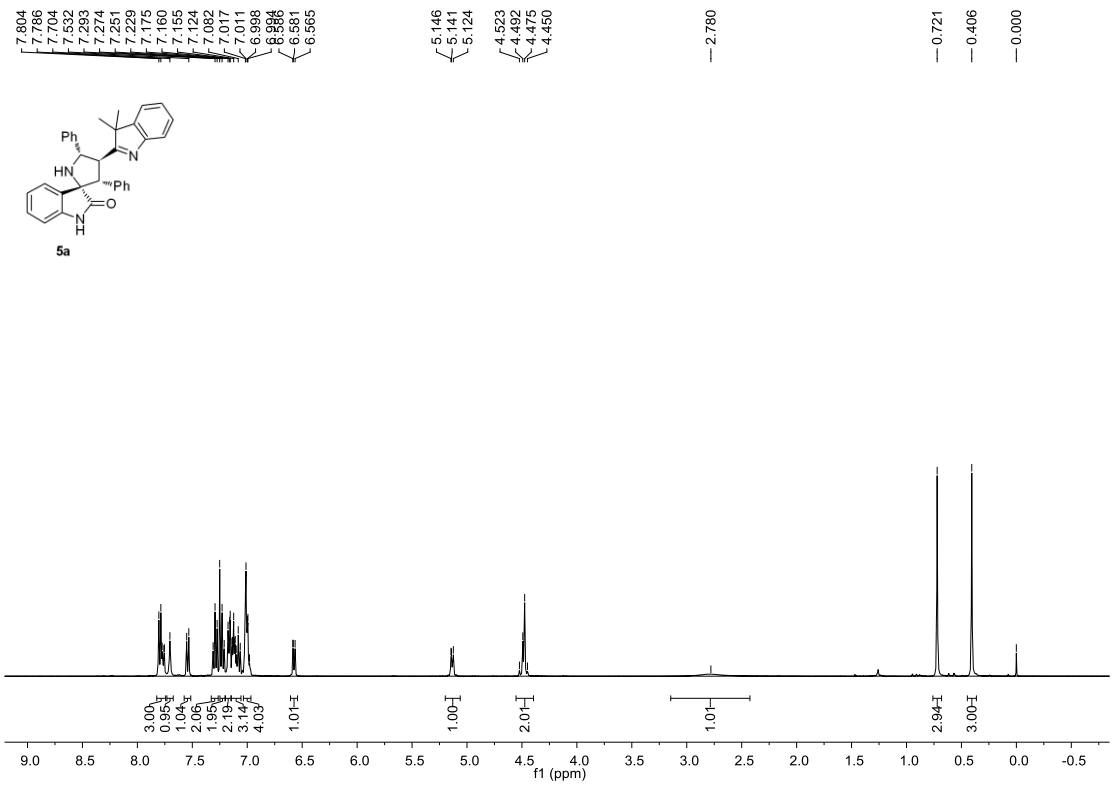
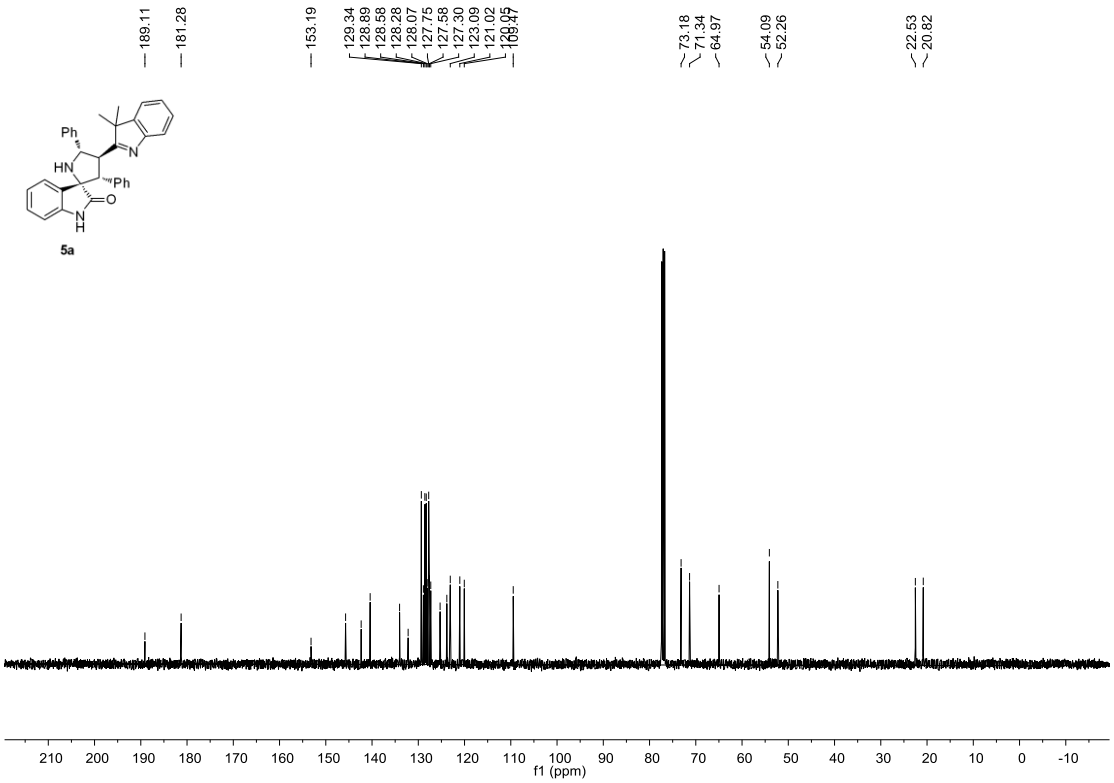
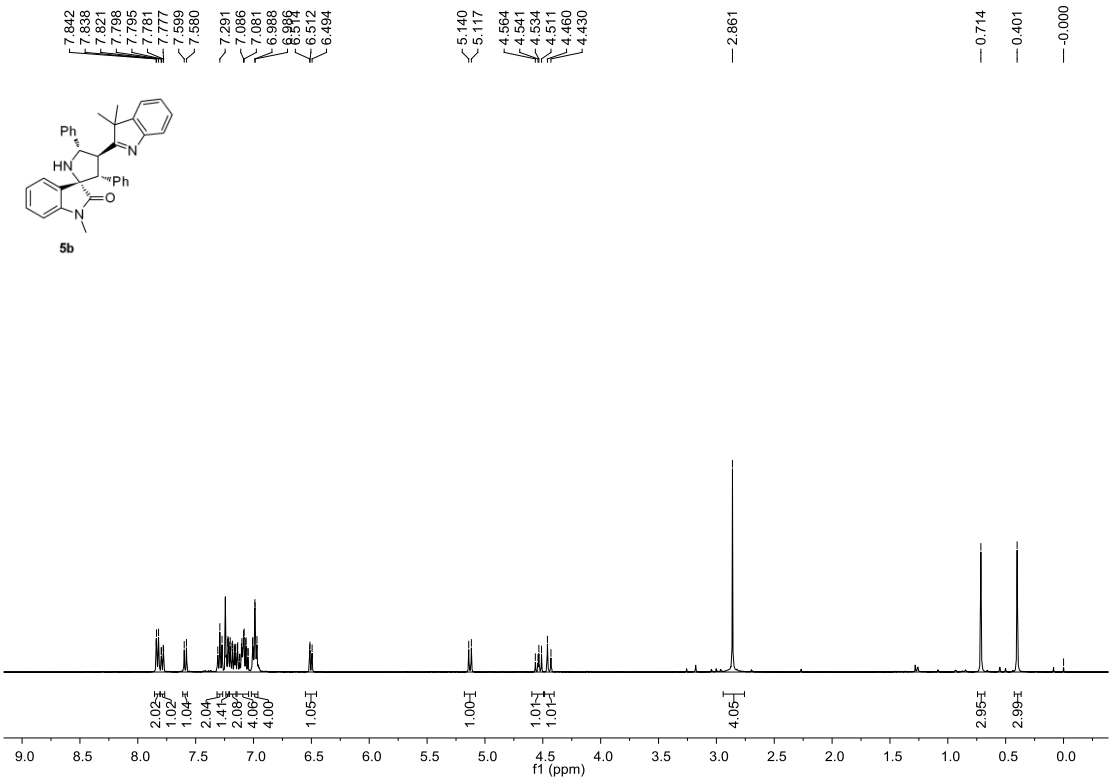
# 1. Copies of $^{1}$H NMR and $^{13}$C NMR spectra

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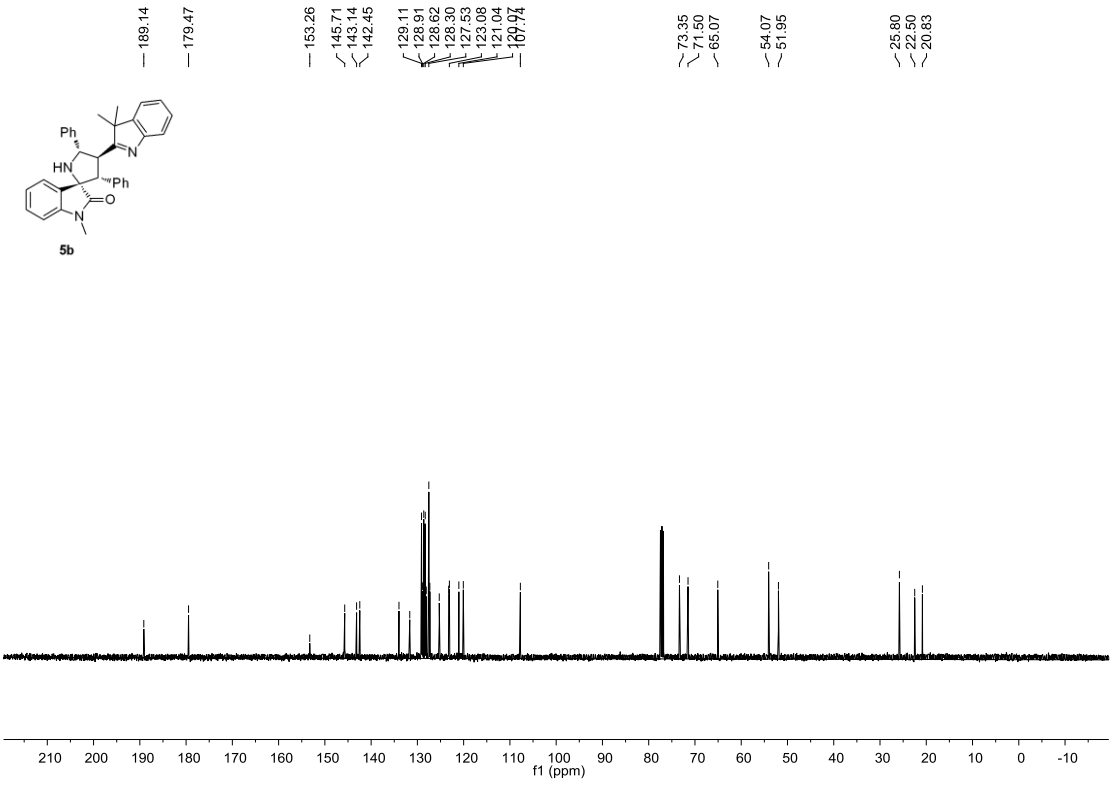
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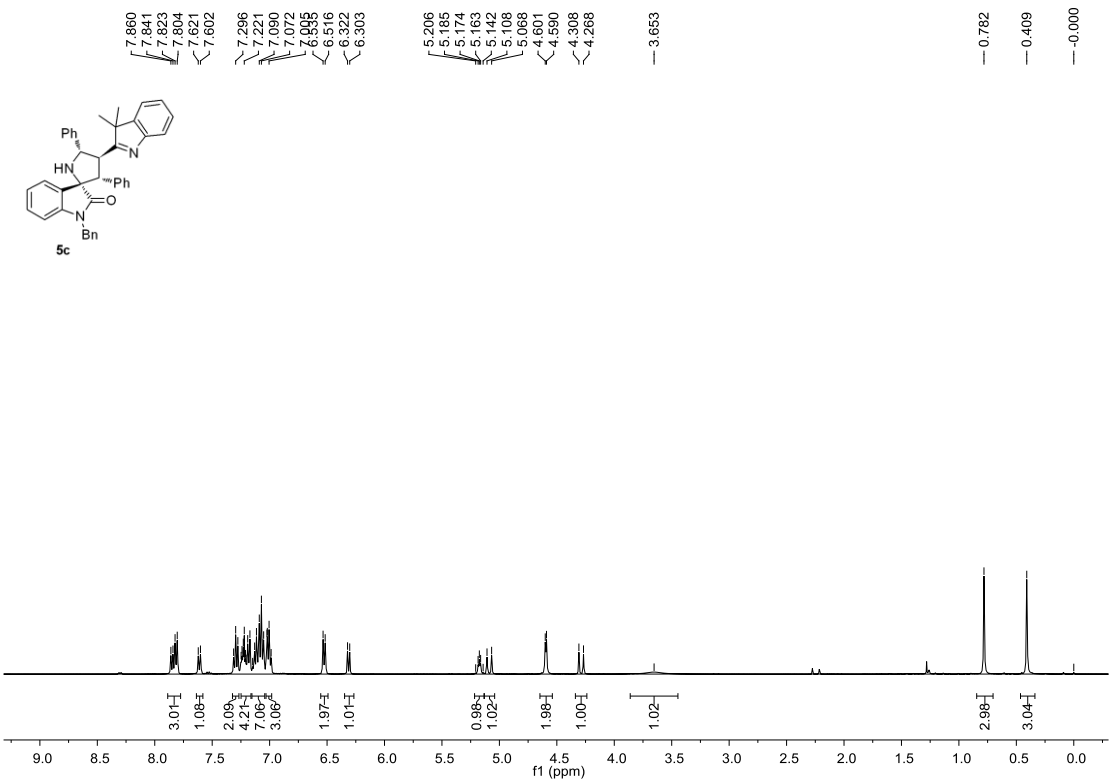
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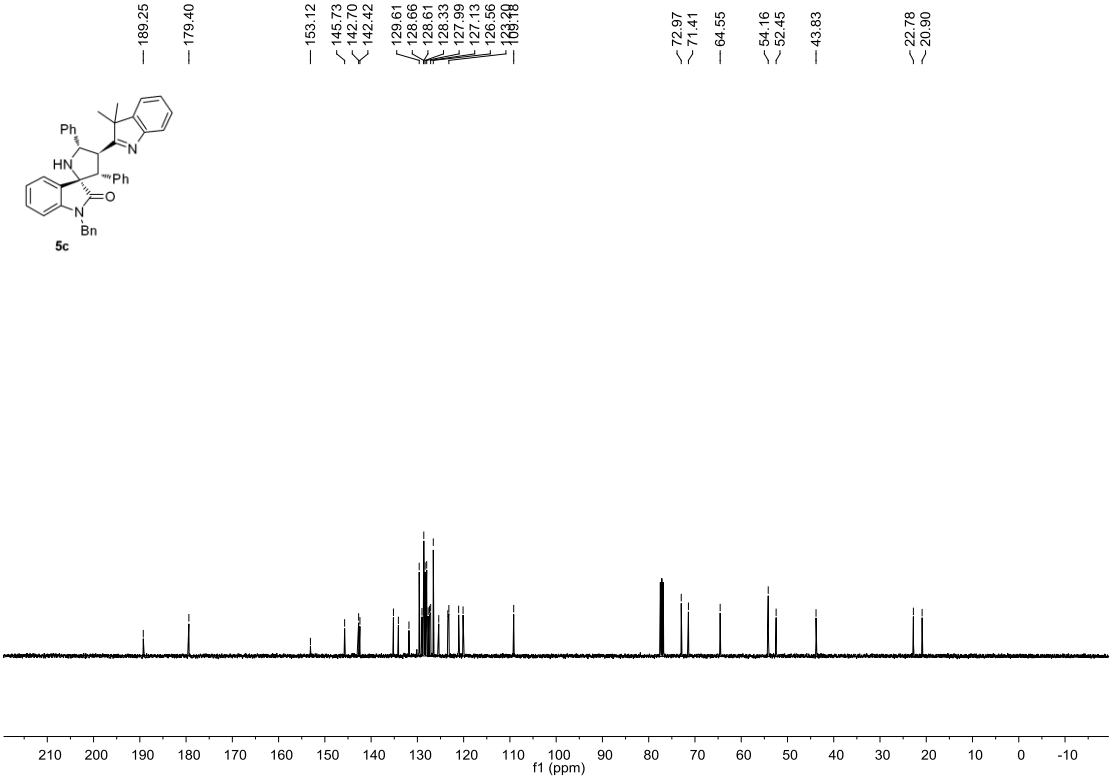
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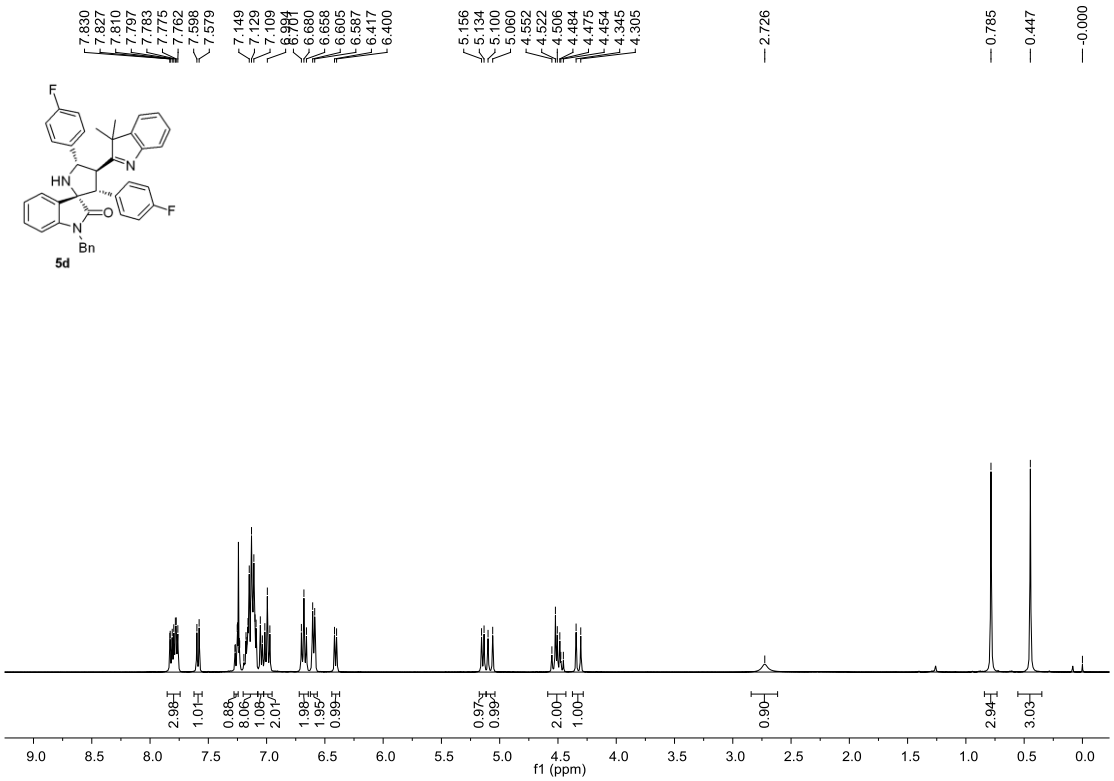
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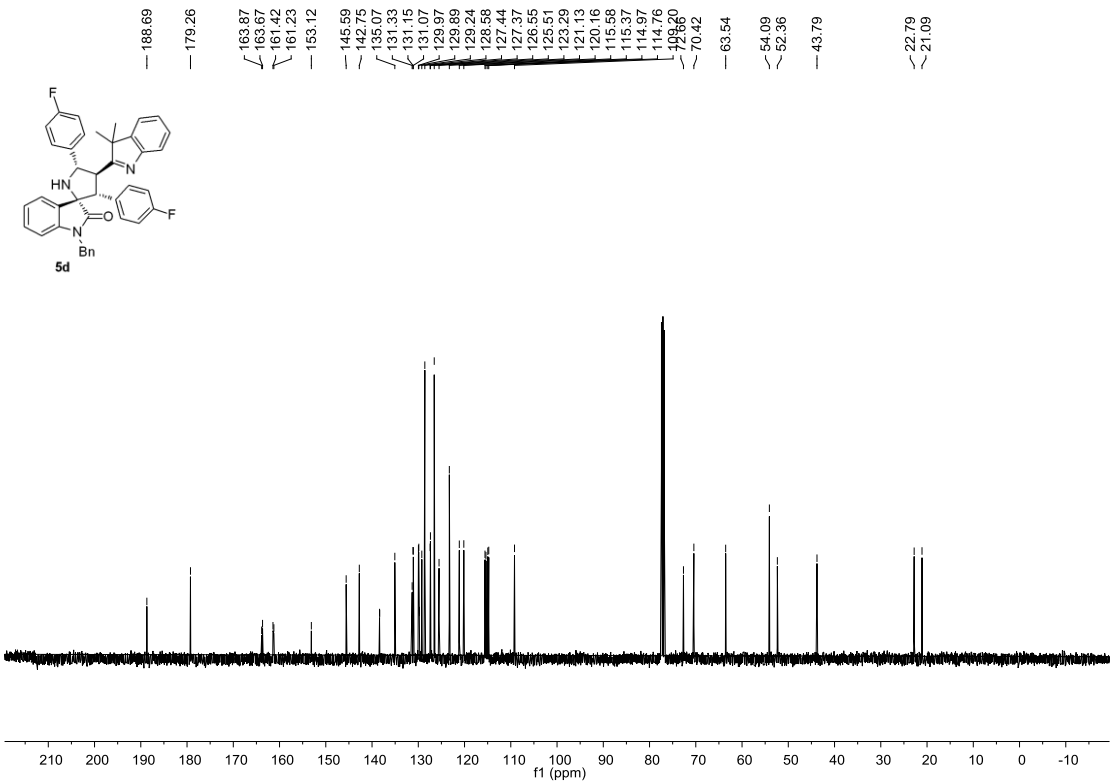
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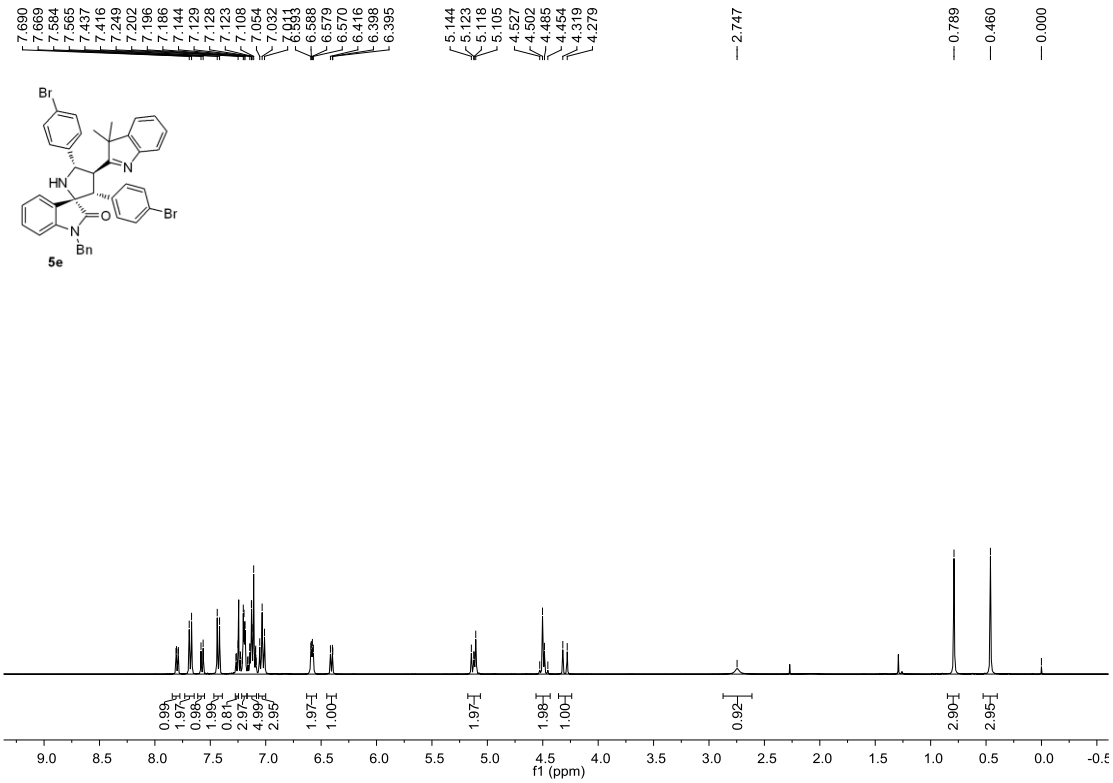
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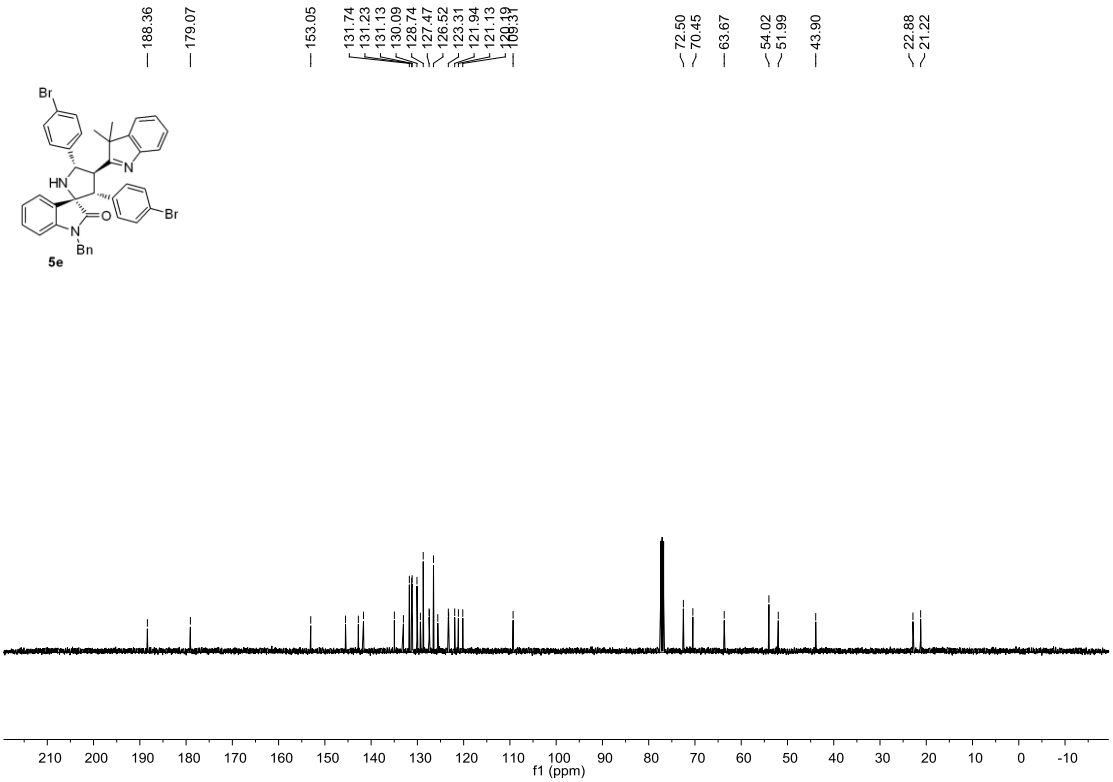
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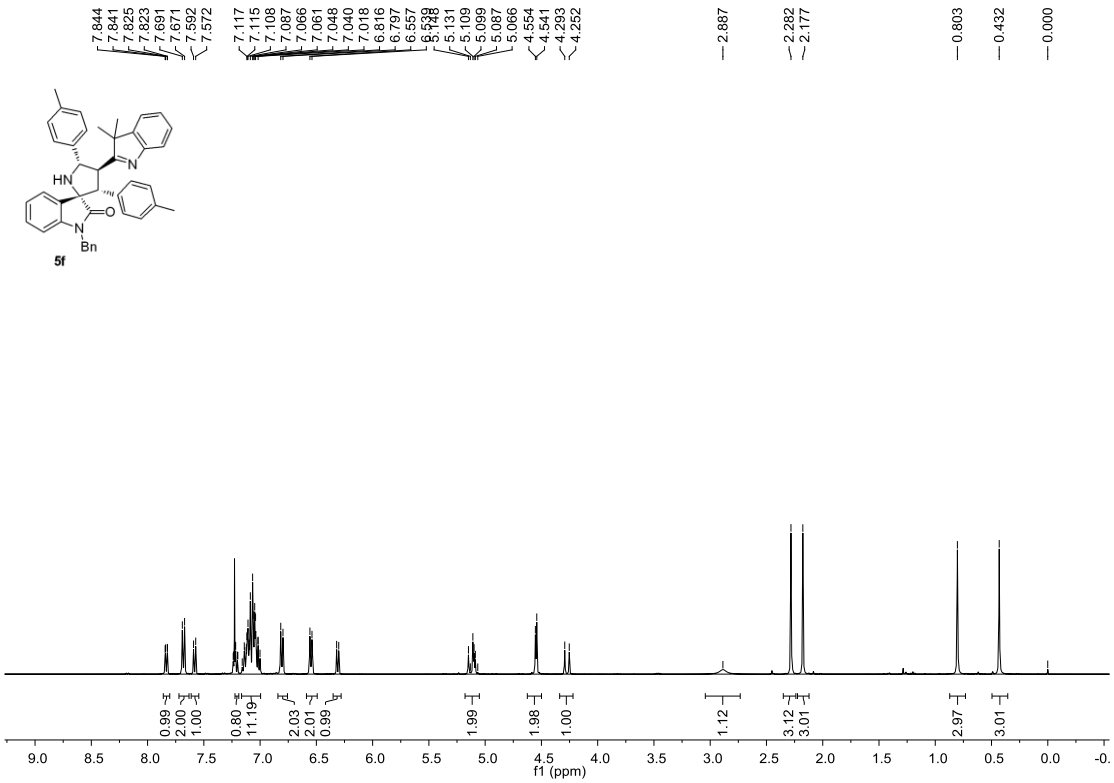
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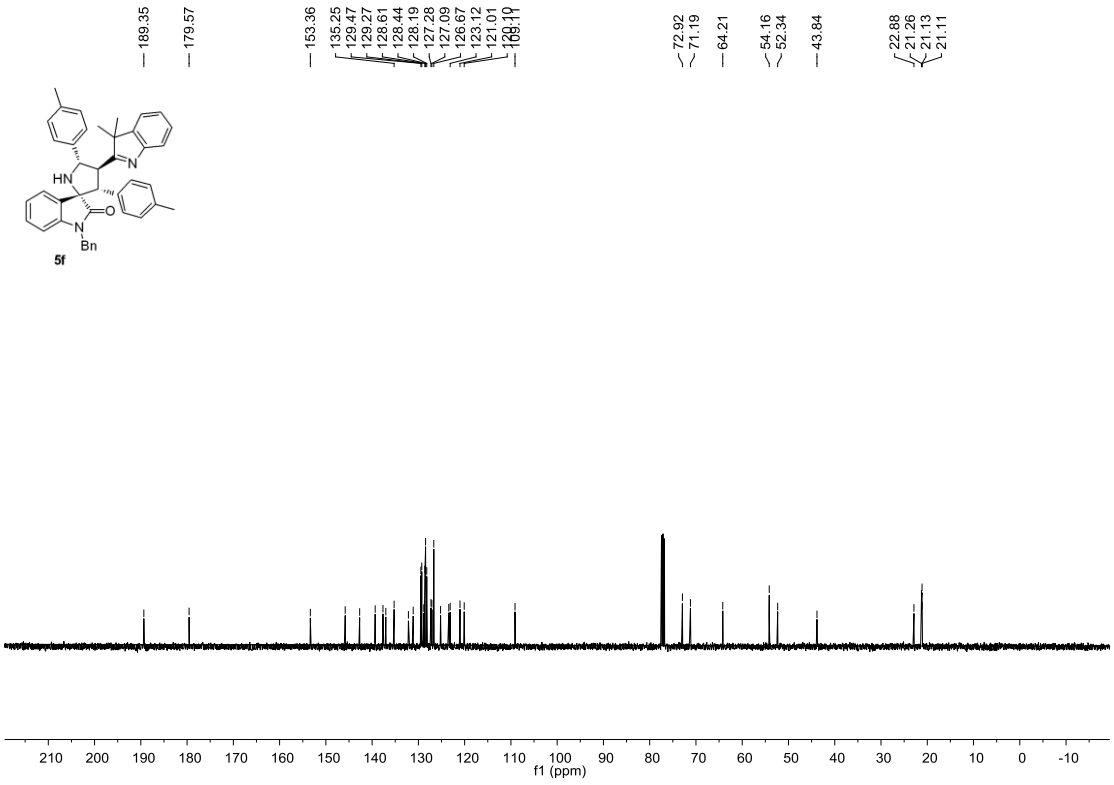
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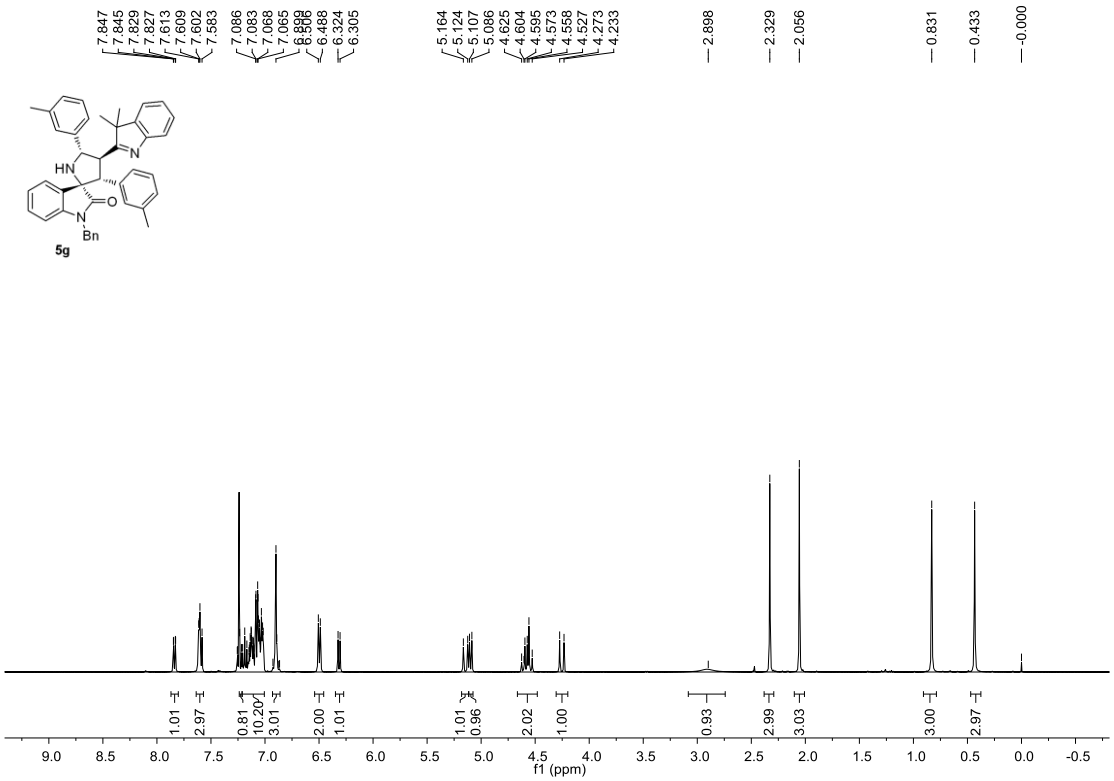
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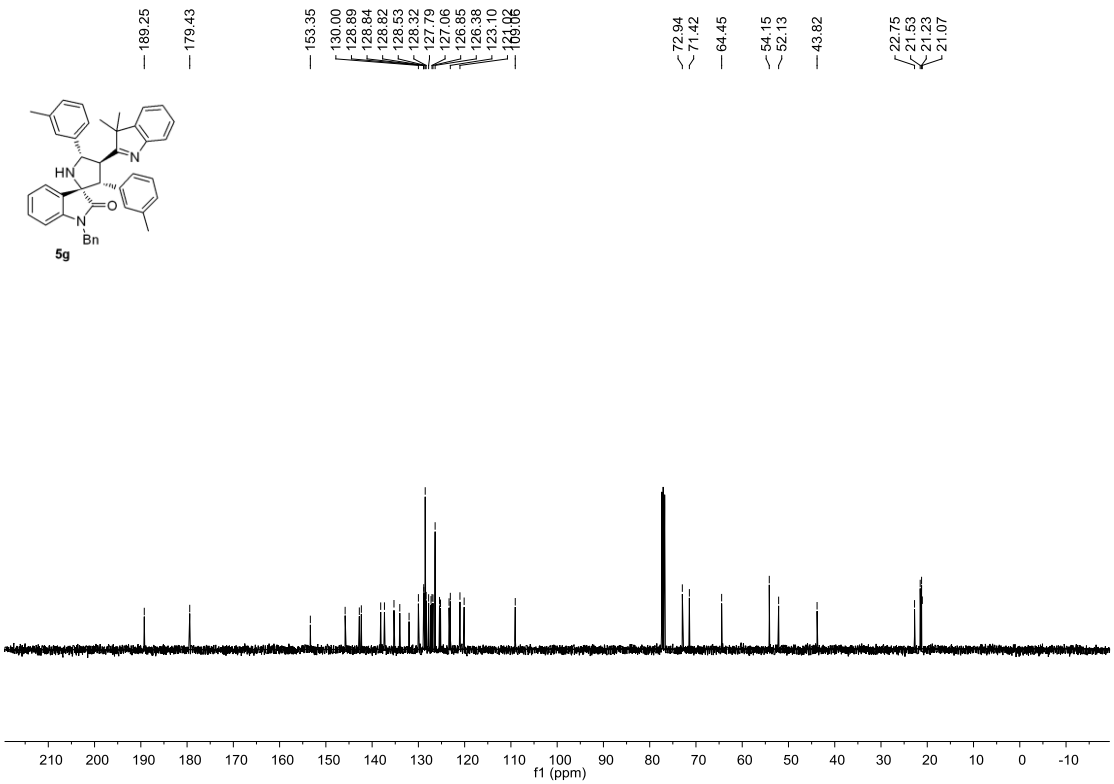
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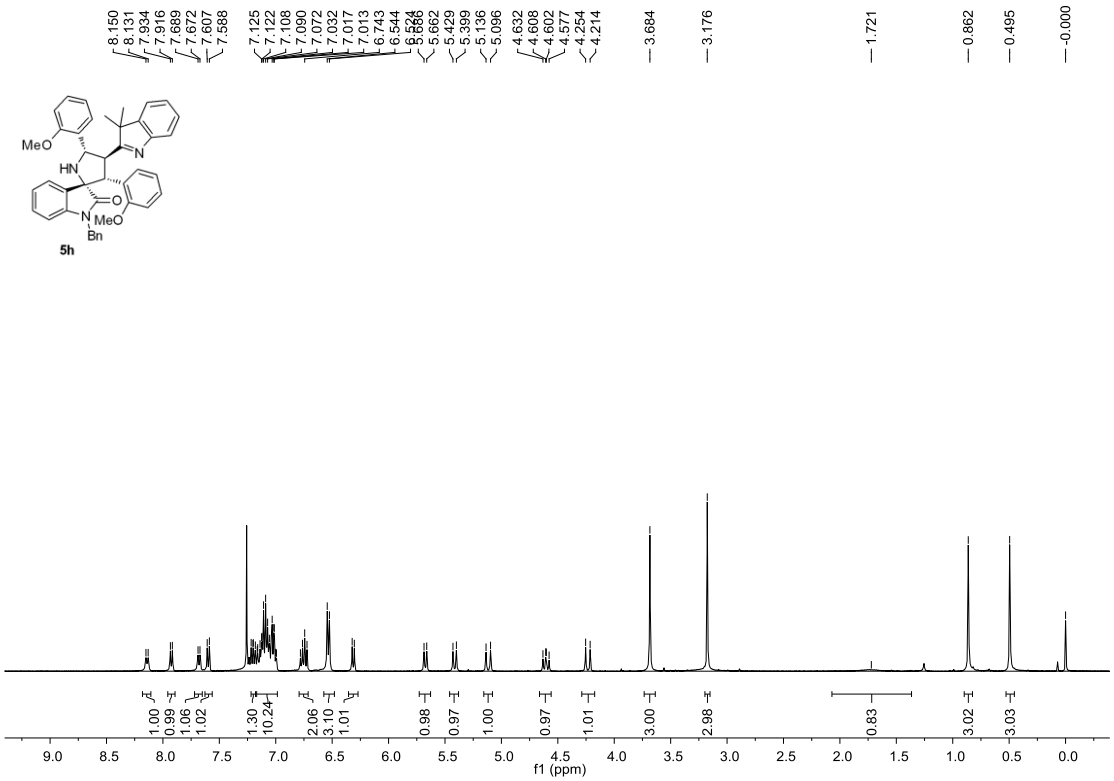
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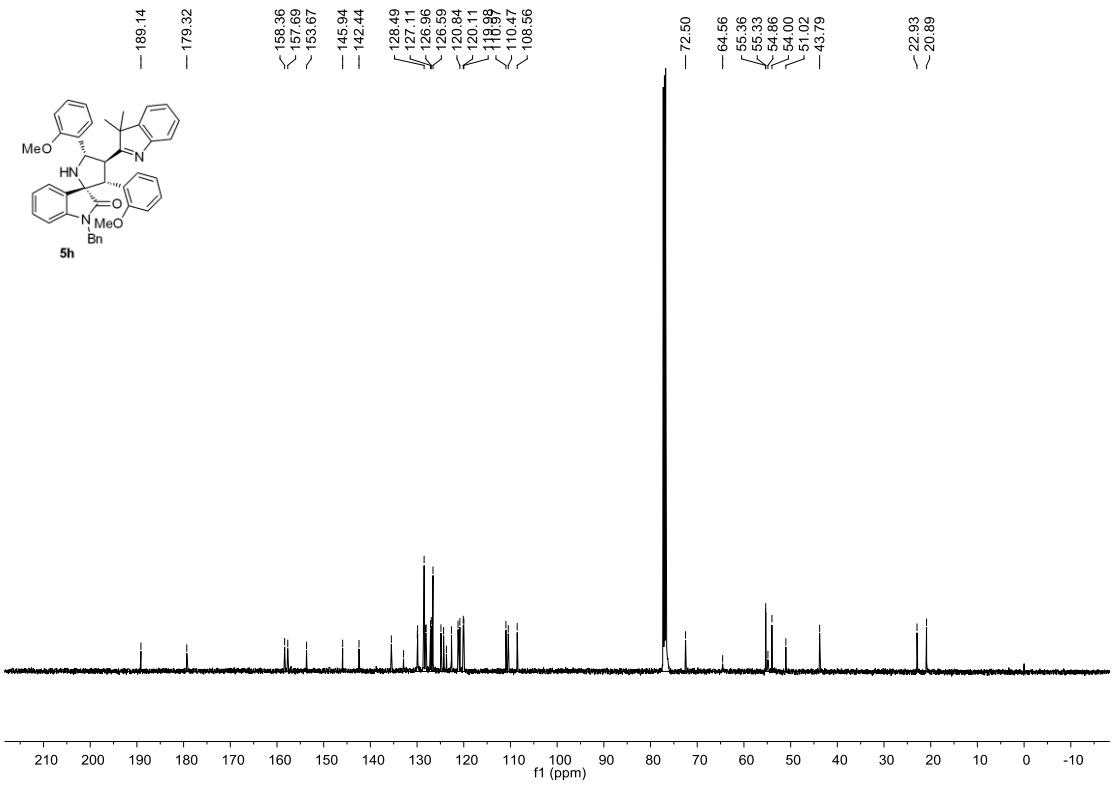
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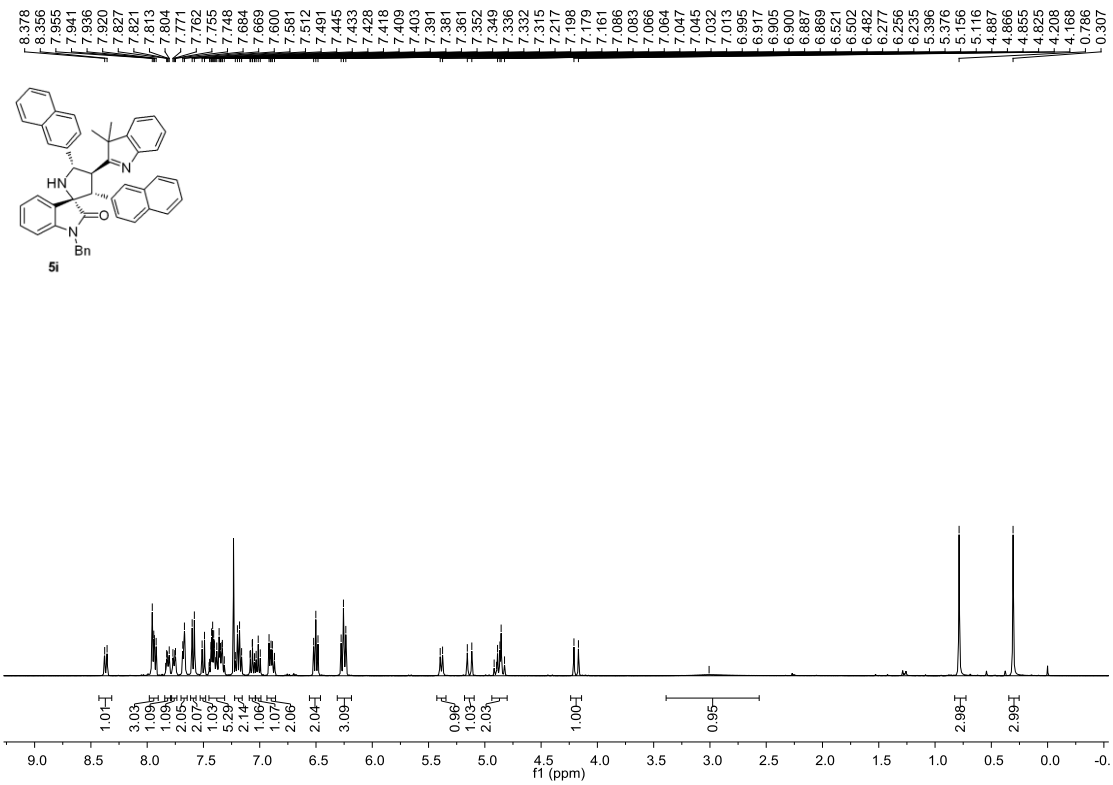
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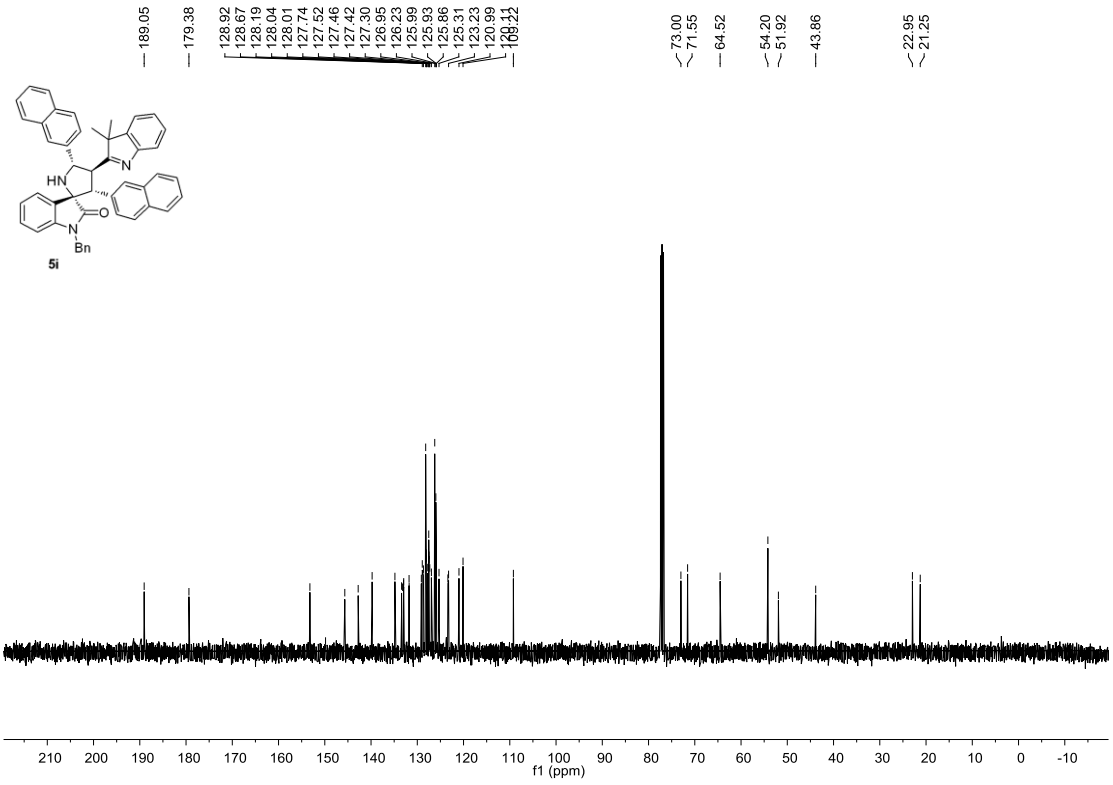
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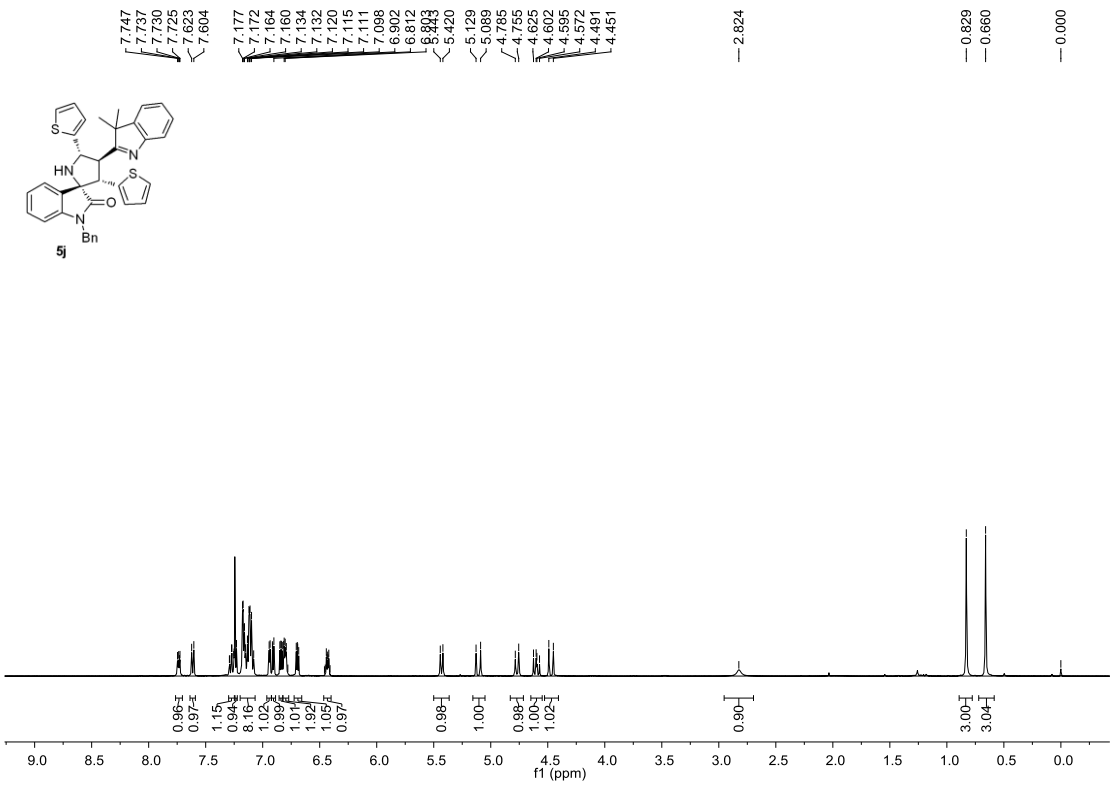
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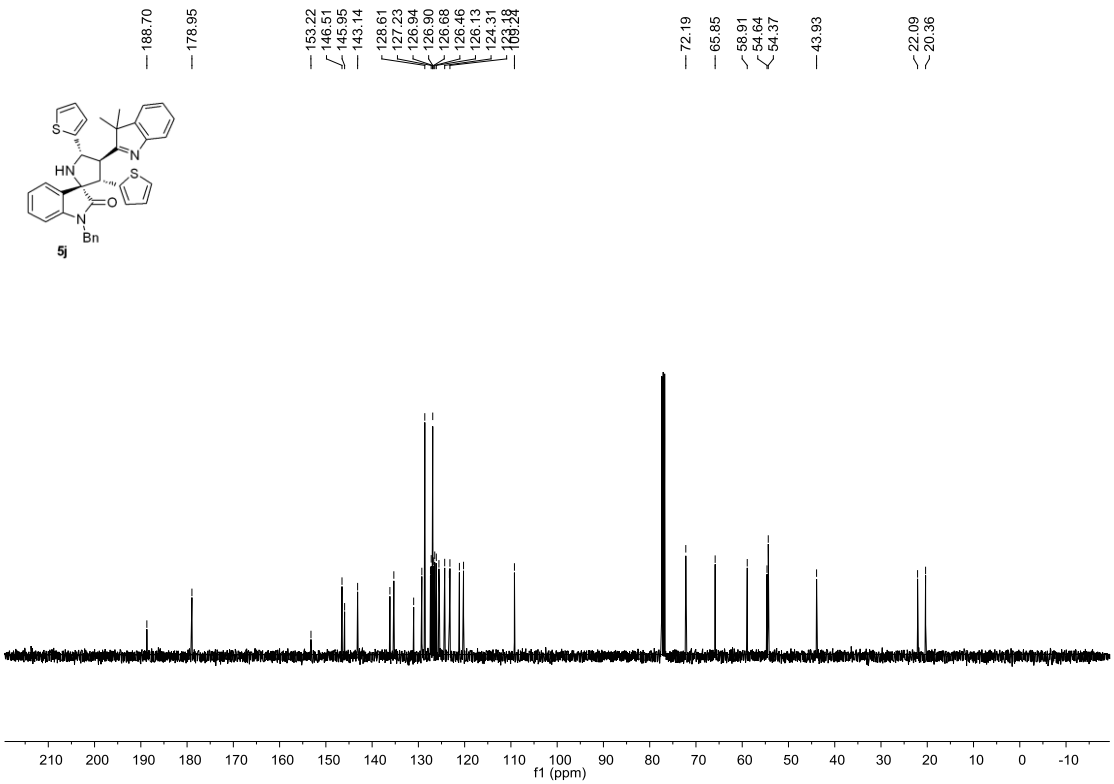
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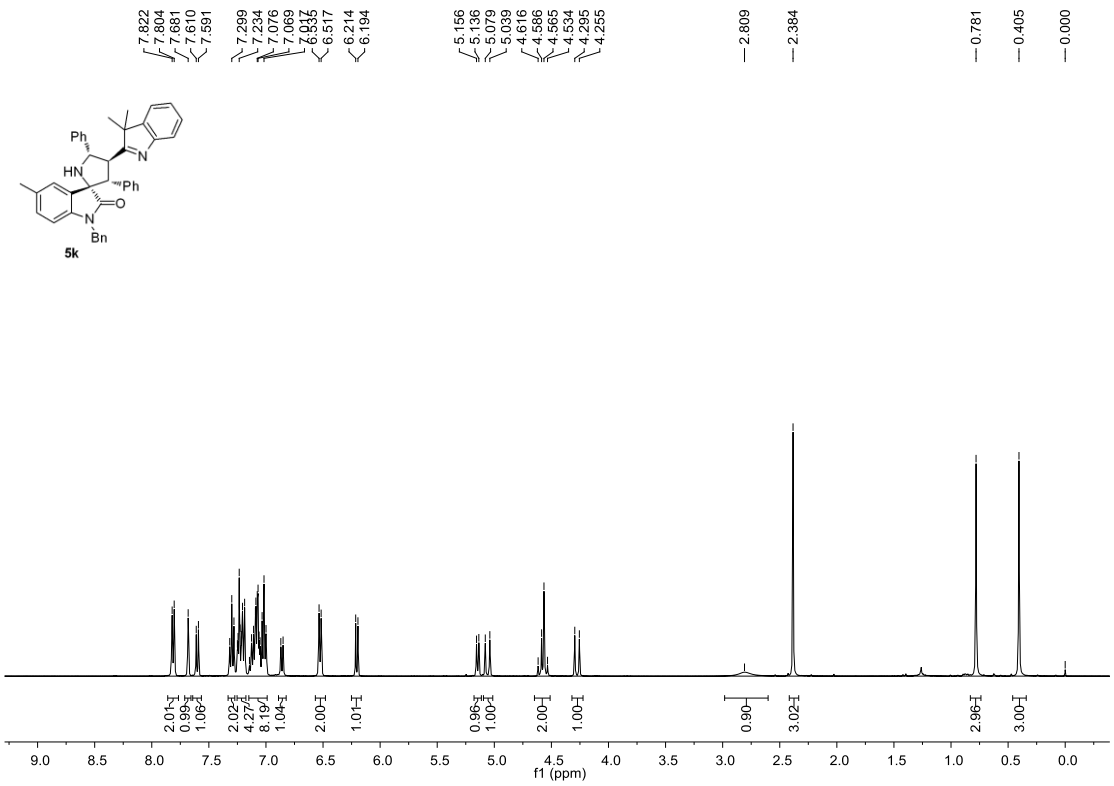
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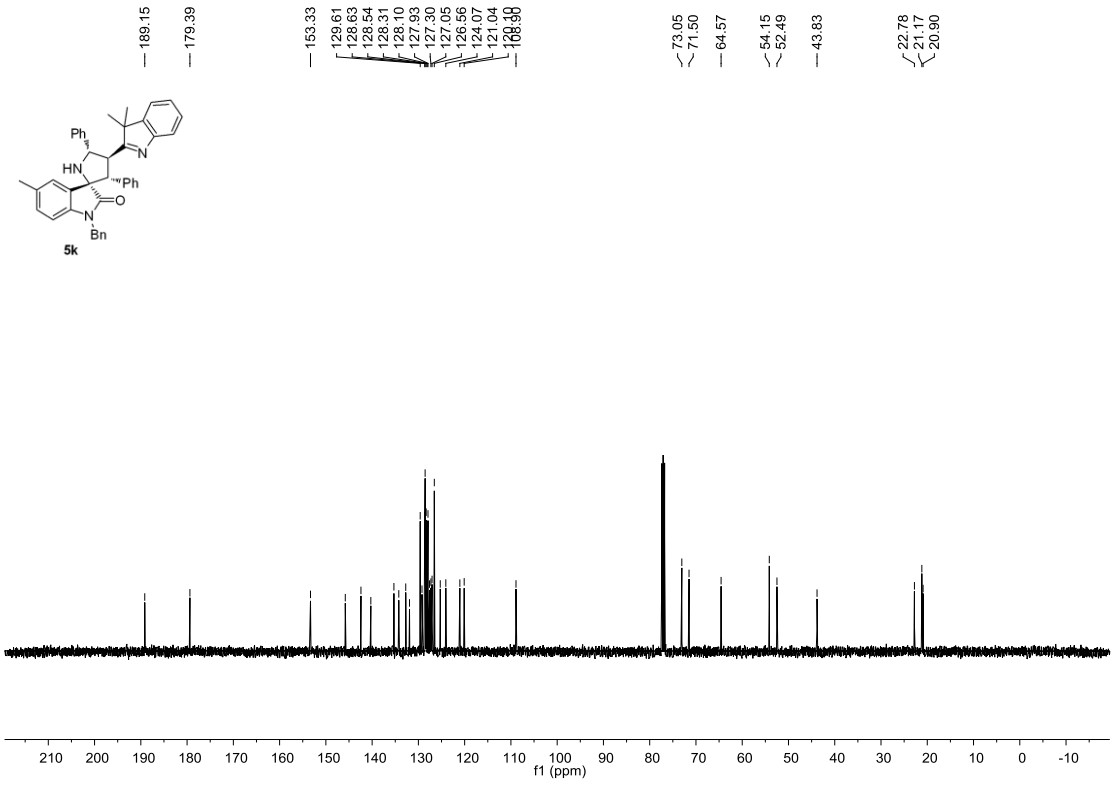
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Ph
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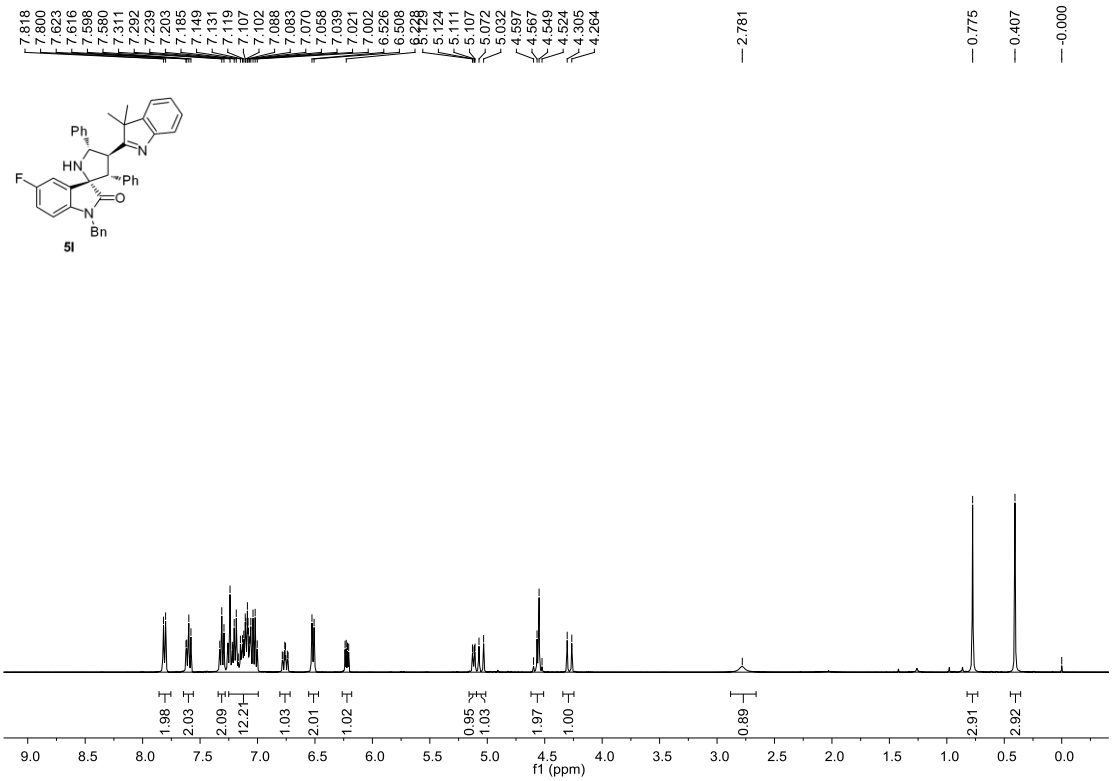
5k
f1 (ppm)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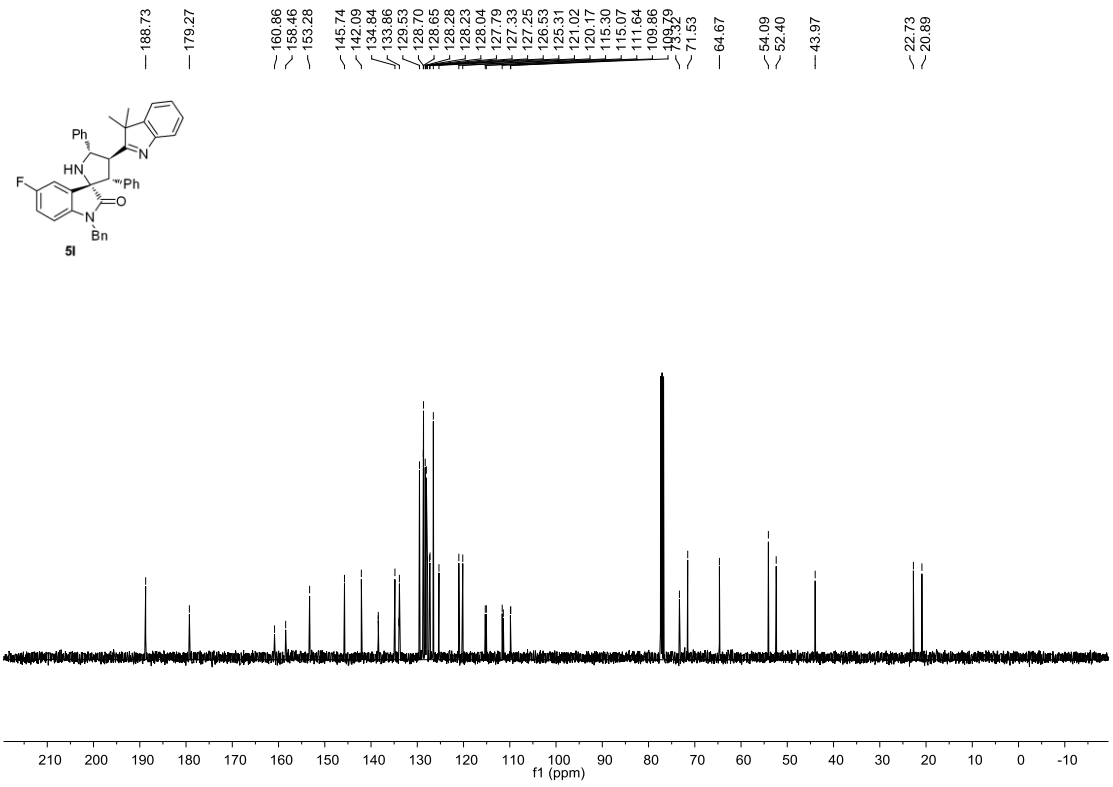
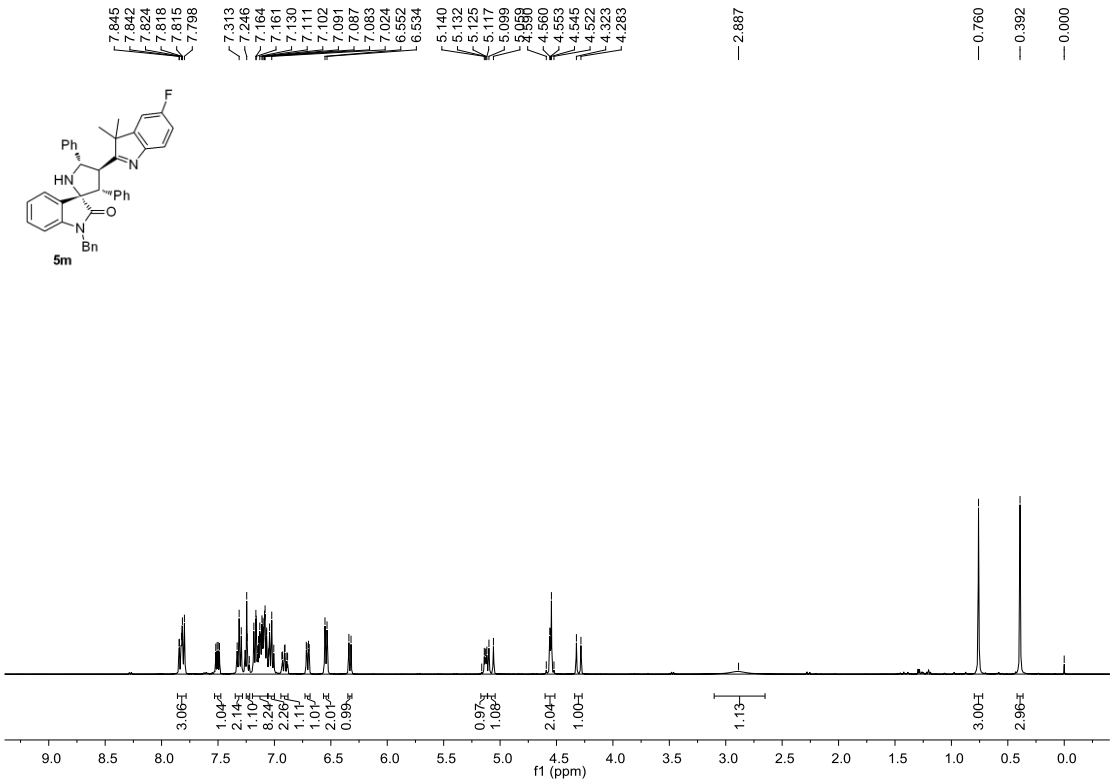
7.800
7.623
7.616
7.598
7.580
7.311
7.292
7.239
7.203
7.185
7.149
7.131
7.119
7.107
7.102
7.088
7.083
7.070
7.058
7.039
7.021
7.002
6.526
6.508
5.124
5.111
5.107
5.072
5.032
4.597
4.567
4.549
4.524
4.305
4.264
2.781
0.775
0.407
-0.000
Ph
HN
F
Ph
O
N
Bn
5l
1.98
2.03
2.09
12.21
1.03
2.01
1.02
0.95
1.03
1.97
1.00
0.89
2.91
2.92
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
f1 (ppm)


188.73
179.27
160.86
158.46
153.28
145.74
142.09
134.84
133.86
129.53
128.70
128.65
128.28
128.23
128.04
127.79
127.33
127.25
126.53
125.31
121.02
120.17
115.30
115.07
111.64
109.86
109.79
73.32
71.53
64.67
54.09
52.40
43.97
22.73
20.89
Ph
HN
F
Ph
O
N
Bn
5l
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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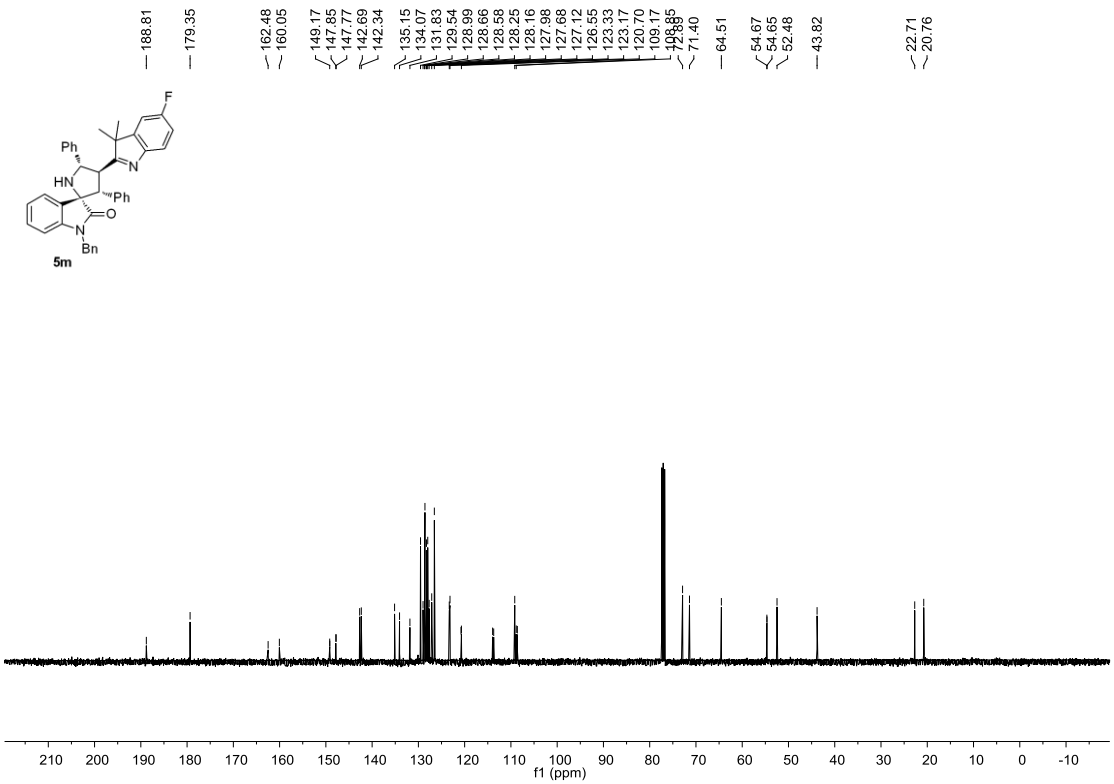
7.824
7.818
7.815
7.798
7.313
7.246
7.164
7.161
7.130
7.111
7.102
7.091
7.087
7.083
7.024
6.552
6.534
5.140
5.132
5.125
5.117
5.099
4.560
4.553
4.545
4.522
4.323
4.283
2.887
0.760
0.392
0.000
F
Ph
HN
Ph
O
N
Bn
5m
3.06
1.04
2.14
1.10
8.24
2.26
1.11
1.01
2.01
0.99
0.97
1.08
2.04
1.00
1.13
3.00
2.96
9.0
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
f1 (ppm)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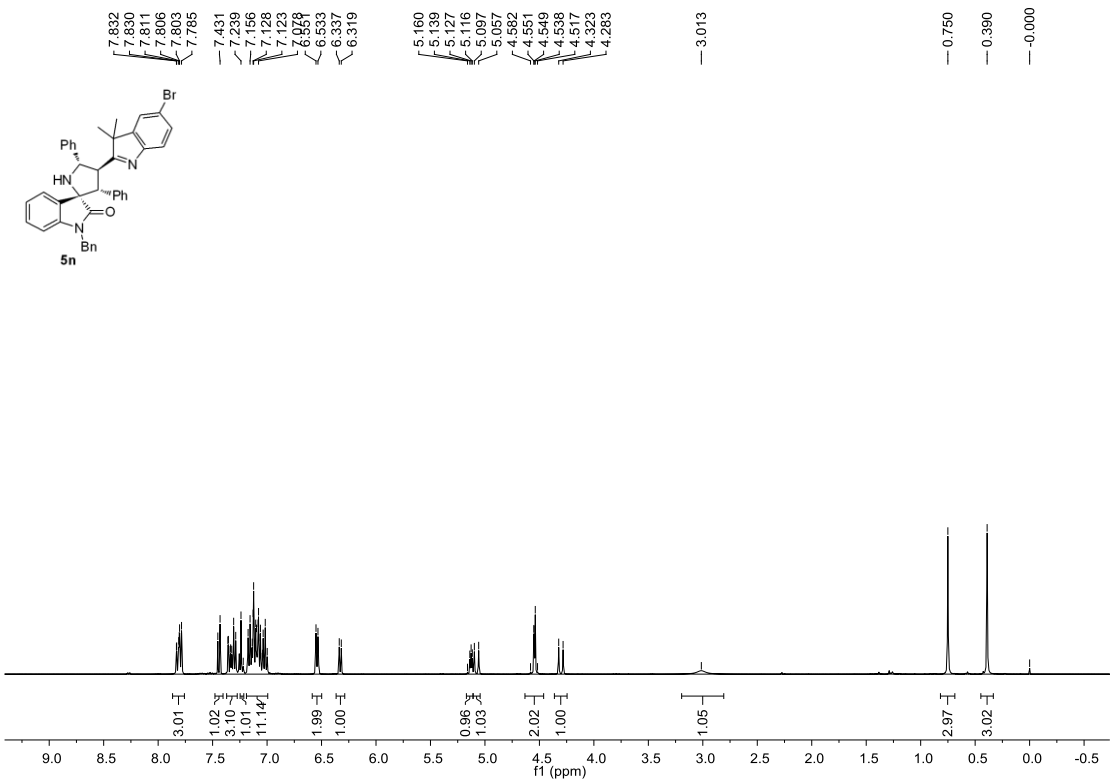
179.35
162.48
160.05
149.17
147.85
147.77
142.69
142.34
135.15
134.07
131.83
129.54
128.99
128.66
128.58
128.25
128.16
127.98
127.68
127.12
126.55
123.33
123.17
120.70
109.17
108.85
72.89
71.40
64.51
54.67
54.65
52.48
43.82
22.71
20.76
F
Ph
HN
Ph
O
N
Bn
5m
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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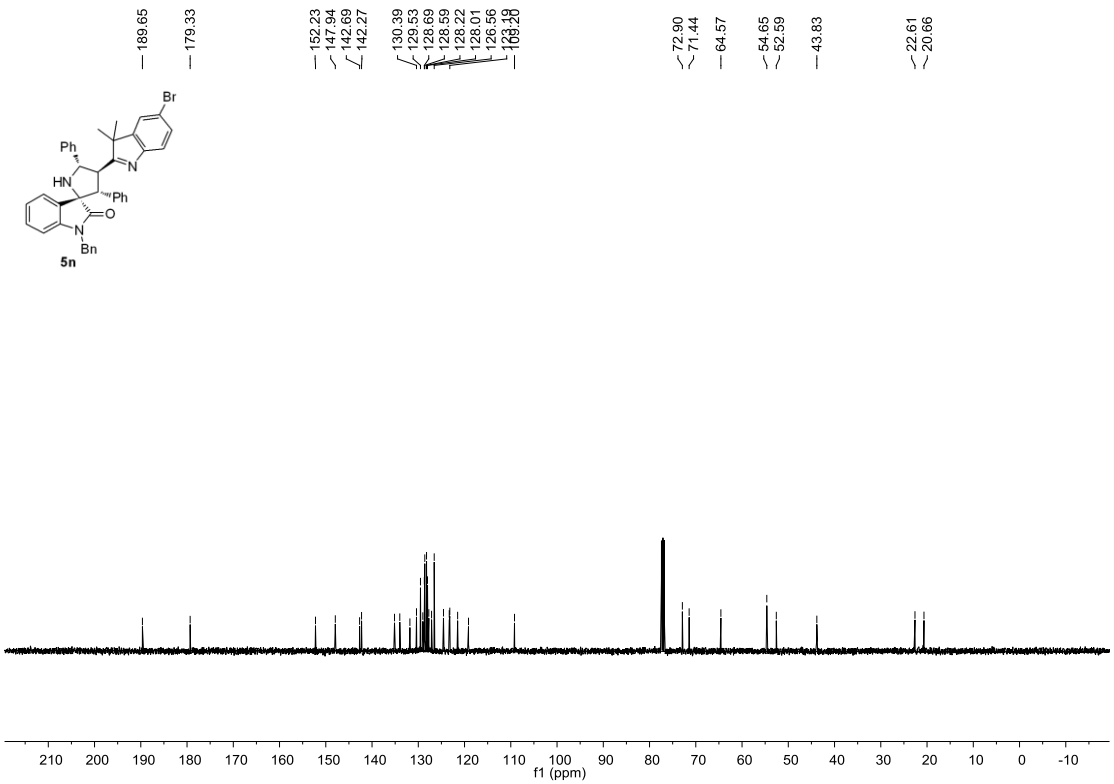
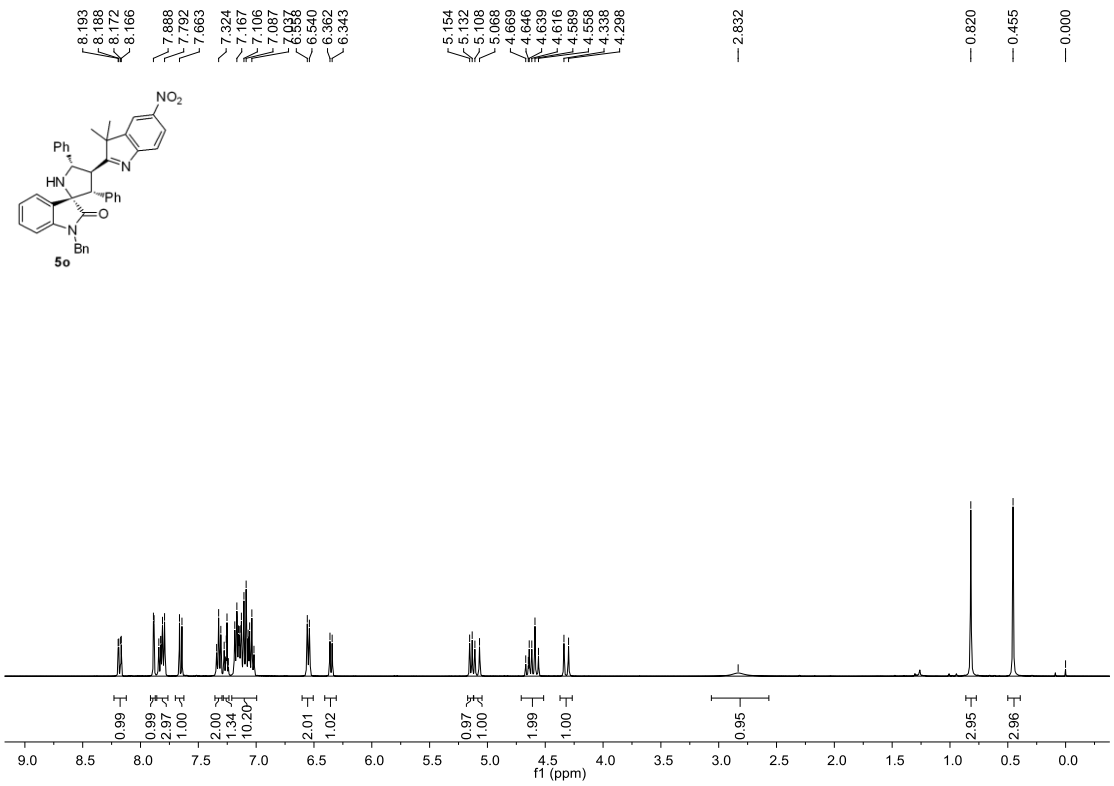
7.830
7.811
7.806
7.803
7.785
7.431
7.239
7.156
7.128
7.123
6.533
6.337
6.319
5.160
5.139
5.127
5.116
5.097
5.057
4.582
4.551
4.549
4.538
4.517
4.323
4.283
3.013
0.750
0.390
-0.000
Br
Ph
HN
Ph
O
N
Bn
5n
3.01
1.02
3.10
1.01
11.14
1.99
1.00
0.96
1.03
2.02
1.00
1.05
2.97
3.02
f1 (ppm)


189.65
179.33
152.23
147.94
142.69
142.27
130.39
129.53
128.69
128.59
128.22
128.01
126.56
72.90
71.44
64.57
54.65
52.59
43.83
22.61
20.66
Br
Ph
HN
Ph
O
N
Bn
5n
f1 (ppm)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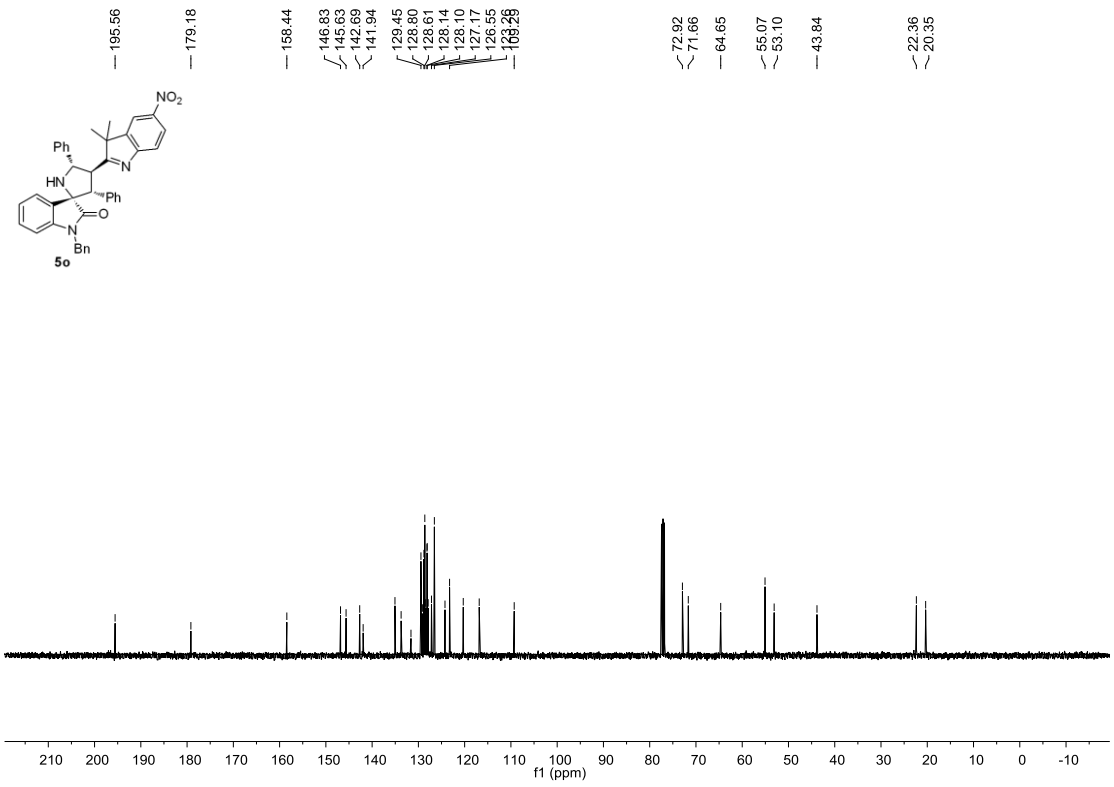
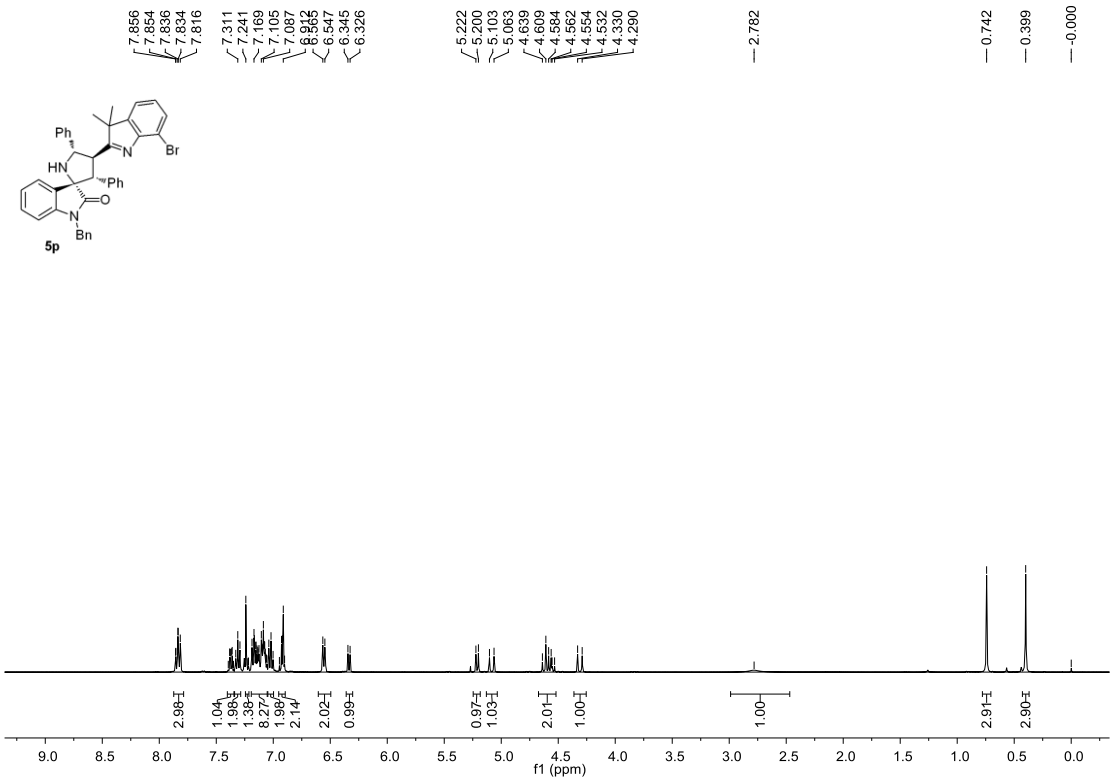
8.188
8.172
8.166
7.888
7.792
7.663
7.324
7.167
7.106
7.087
6.858
6.540
6.362
6.343
5.154
5.132
5.108
5.068
4.669
4.646
4.639
4.616
4.589
4.558
4.338
4.298
2.832
0.820
0.455
0.000
NO2
Ph
HN
Ph
O
N
Bn
5o
0.99
0.99
2.97
1.00
2.00
1.34
10.20
2.01
1.02
0.97
1.00
1.99
1.00
0.95
2.95
2.96
f1 (ppm)


195.56
179.18
158.44
146.83
145.63
142.69
141.94
129.45
128.80
128.61
128.14
128.10
127.17
126.55
72.92
71.66
64.65
55.07
53.10
43.84
22.36
20.35
NO2
Ph
HN
Ph
O
N
Bn
5o
f1 (ppm)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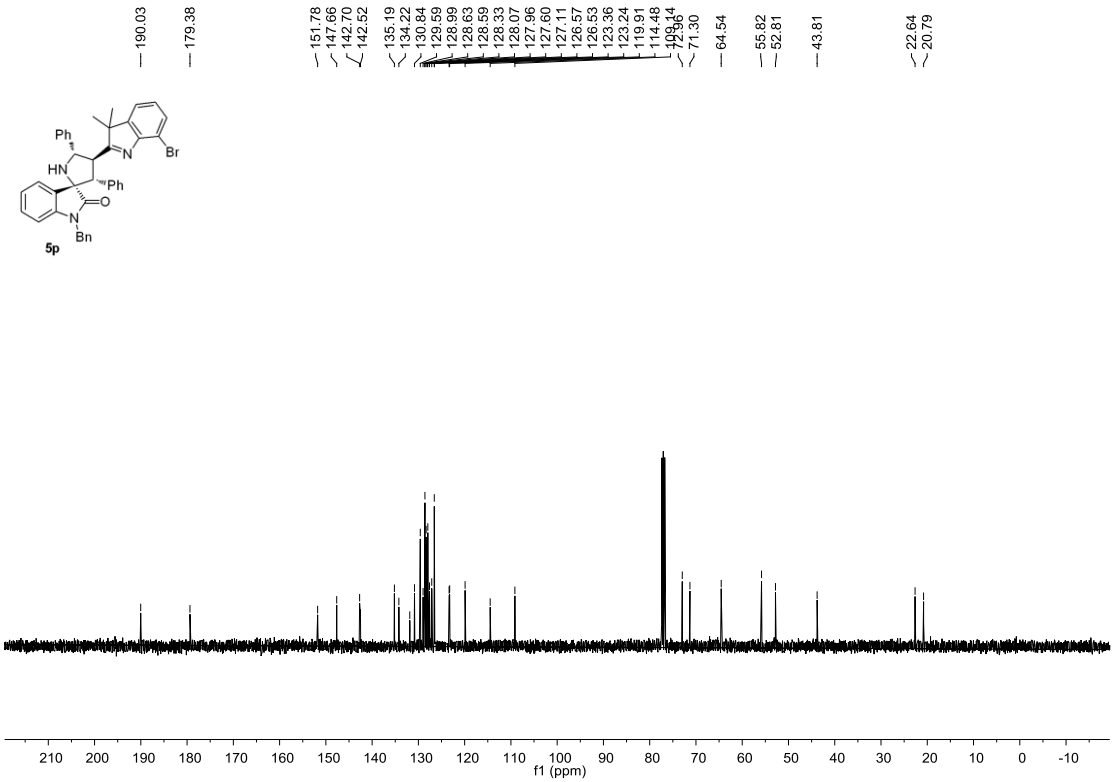
7.854
7.836
7.834
7.816
7.311
7.241
7.169
7.105
7.087
6.912
6.565
6.547
6.345
6.326
5.222
5.200
5.103
5.063
4.639
4.609
4.584
4.562
4.554
4.532
4.330
4.290
2.782
0.742
0.399
-0.000
Ph
HN
Br
Ph
O
N
Bn
5p
2.98
1.04
1.98
1.38
8.27
1.98
2.14
2.02
0.99
0.97
1.03
2.01
1.00
1.00
2.91
2.90
9.0
8.5
8.0
7.5
7.0
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
f1 (ppm)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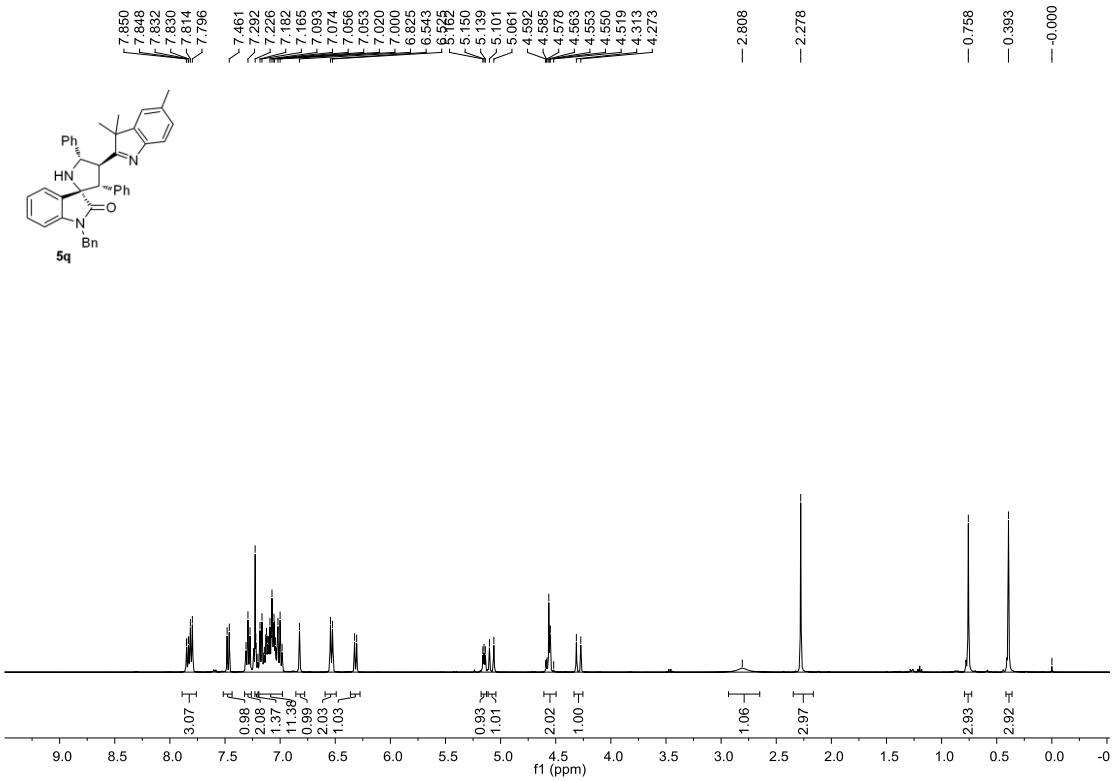
179.38
151.78
147.66
142.70
142.52
135.19
134.22
130.84
129.59
128.99
128.63
128.59
128.33
128.07
127.96
127.60
127.11
126.57
126.53
123.36
123.24
119.91
114.48
109.14
72.96
71.30
64.54
55.82
52.81
43.81
22.64
20.79
Ph
HN
Br
Ph
O
N
Bn
5p
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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7.832
7.830
7.814
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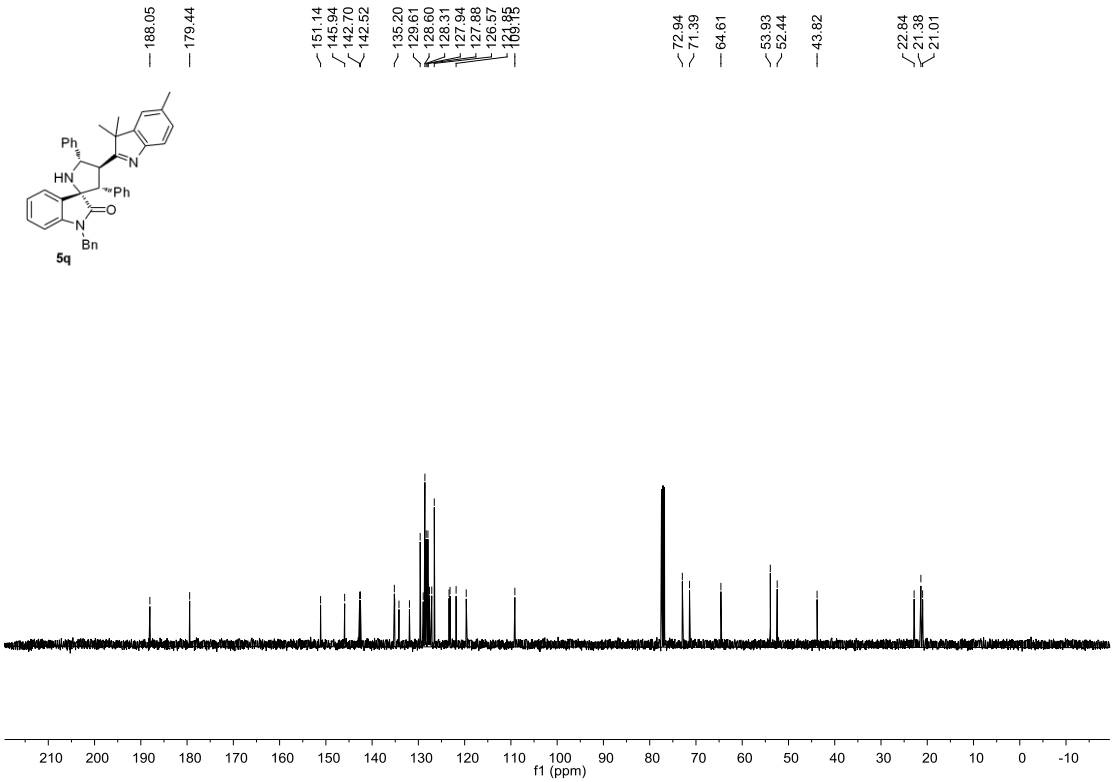
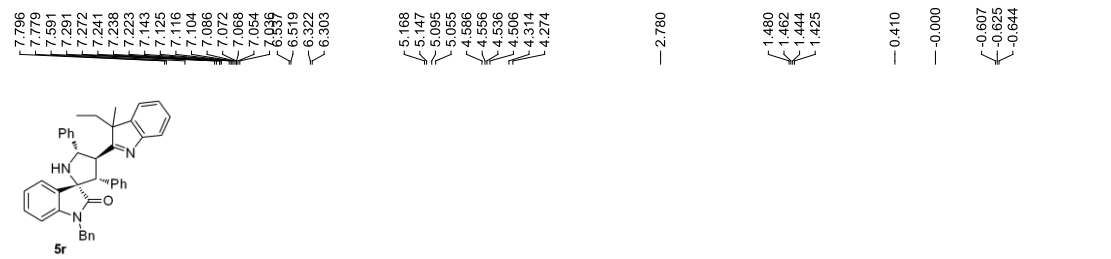
7.461
7.292
7.226
7.182
7.165
7.093
7.074
7.056
7.053
7.020
7.000
6.825
6.543
5.150
5.139
5.101
5.061
4.592
4.585
4.578
4.563
4.553
4.550
4.519
4.313
4.273
2.808
2.278
0.758
0.393
-0.000
Ph
HN
Ph
O
N
Bn
5q
3.07
0.98
2.08
1.37
11.38
0.99
2.03
1.03
0.93
1.01
2.02
1.00
1.06
2.97
2.93
2.92
f1 (ppm)


188.05
179.44
151.14
145.94
142.70
142.52
135.20
129.61
128.60
128.31
127.94
127.88
126.57
72.94
71.39
64.61
53.93
52.44
43.82
22.84
21.38
21.01
Ph
HN
Ph
O
N
Bn
5q
f1 (ppm)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7.291
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7.241
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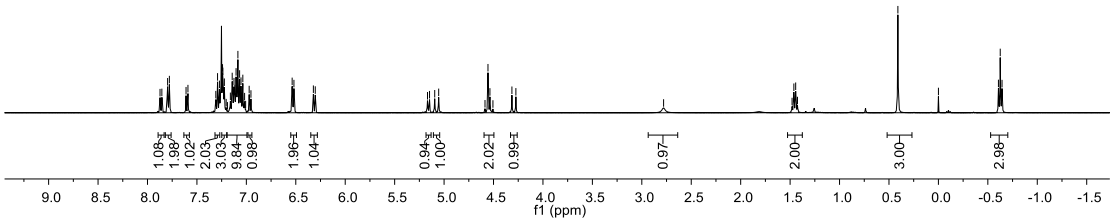
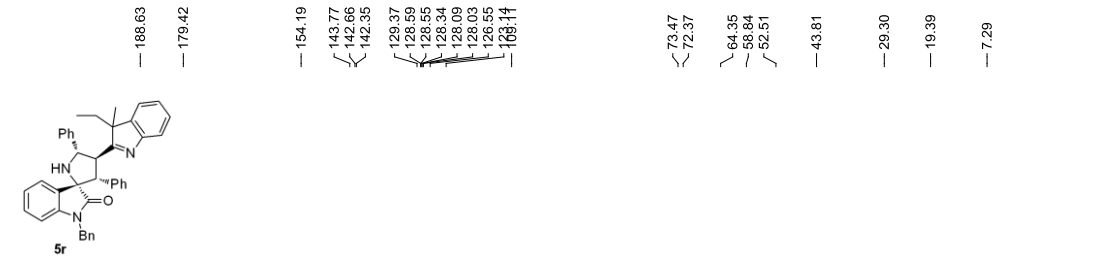
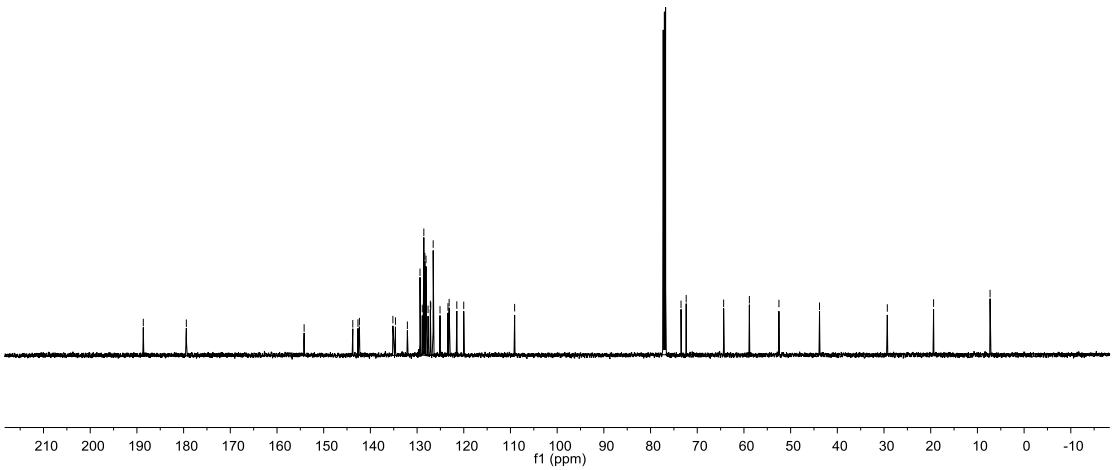
7.223
7.143
7.125
7.116
7.104
7.086
7.072
7.068
7.054
6.519
6.322
6.303
5.168
5.147
5.095
5.055
4.586
4.556
4.536
4.506
4.314
4.274
2.780
1.480
1.462
1.444
1.425
0.410
-0.000
-0.607
-0.625
-0.644

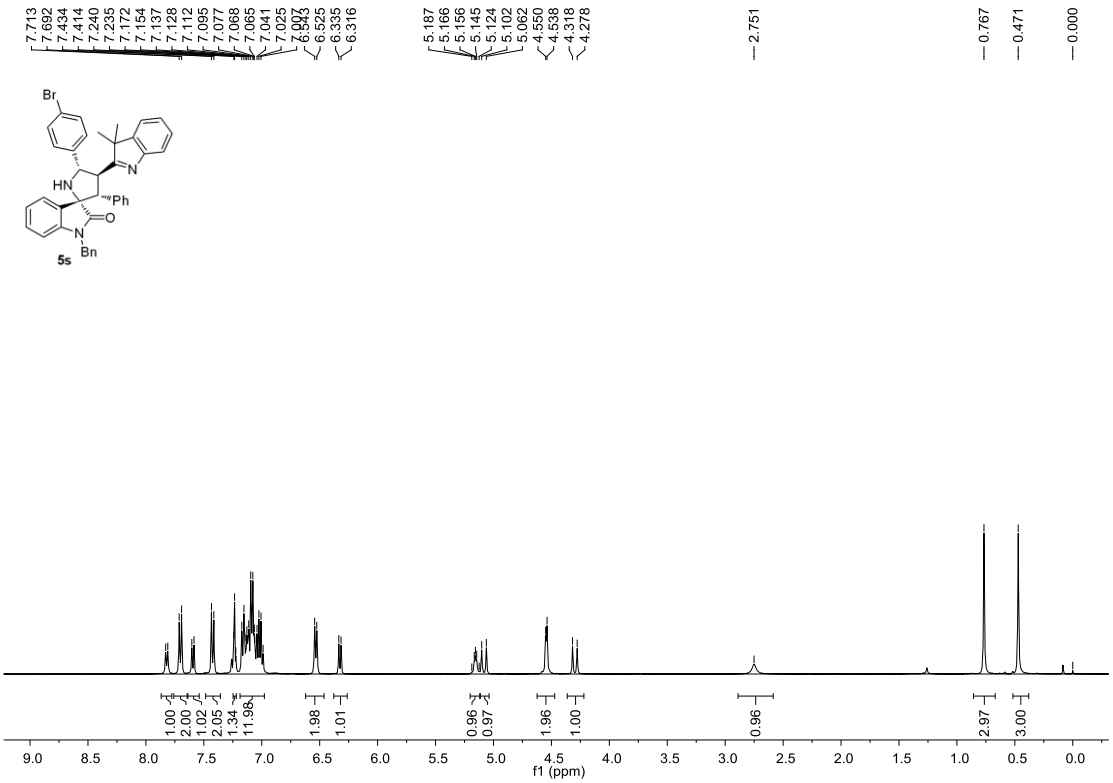

Ph
HN
Ph
O
N
Bn
5r


1.08
1.98
1.02
2.03
3.03
9.84
0.98
1.96
1.04
0.94
1.00
2.02
0.99
0.97
2.00
3.00
2.98
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 -1.0 -1.5
f1 (ppm)


188.63
179.42
154.19
143.77
142.66
142.35
129.37
128.59
128.55
128.34
128.09
128.03
126.55
73.47
72.37
64.35
58.84
52.51
43.81
29.30
19.39
7.29


Ph
HN
Ph
O
N
Bn
5r


210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)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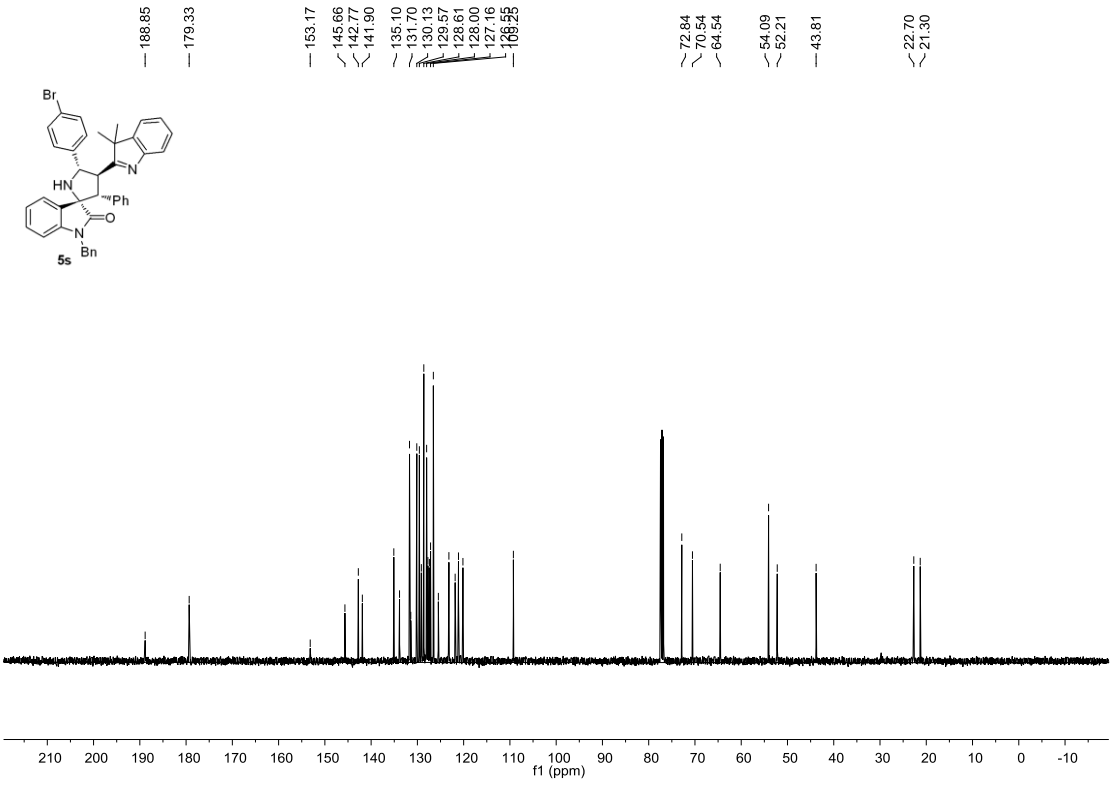
7.414
7.240
7.235
7.172
7.154
7.137
7.128
7.112
7.095
7.077
7.068
7.065
7.041
7.025
6.525
6.335
6.316
5.187
5.166
5.156
5.145
5.124
5.102
5.062
4.550
4.538
4.318
4.278
2.751
0.767
0.471
0.000
Br
HN
Ph
O
N
Bn
5s
1.00
2.00
1.02
2.05
1.34
11.98
1.98
1.01
0.96
0.97
1.96
1.00
0.96
2.97
3.00
9.0
8.5
8.0
7.5
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
f1 (ppm)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142.77
141.90
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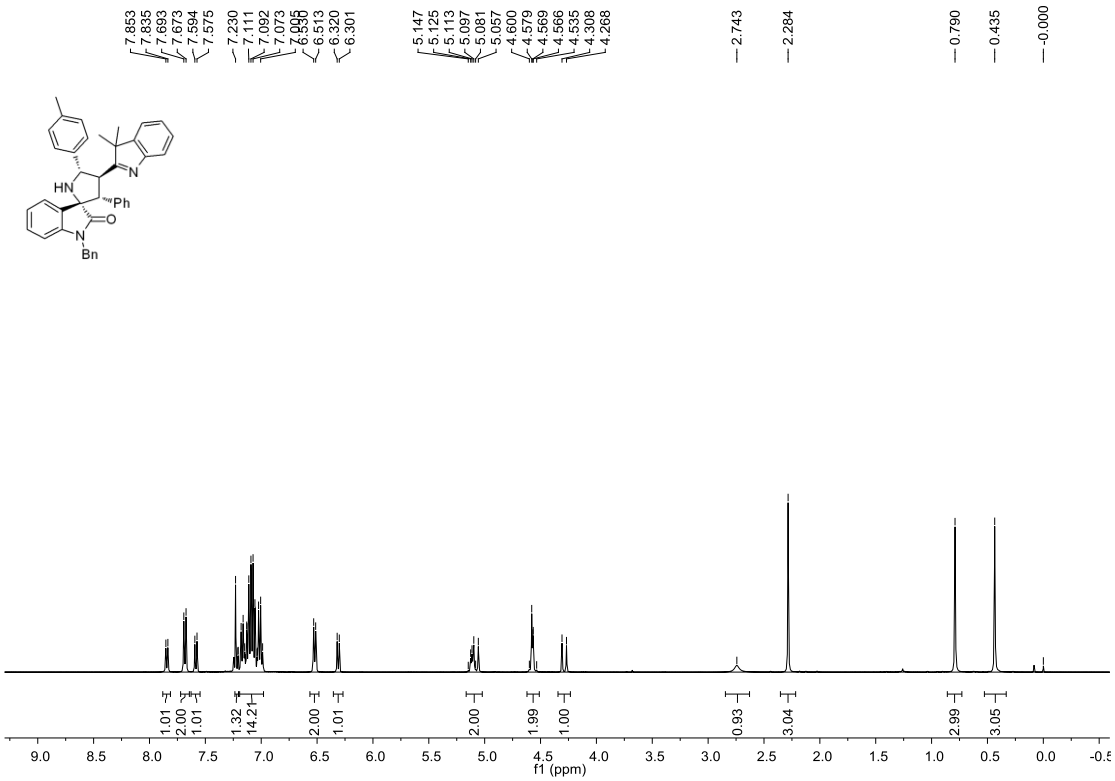
131.70
130.13
129.57
128.61
128.00
127.16
72.84
70.54
64.54
54.09
52.21
43.81
22.70
21.30
Br
HN
Ph
O
N
Bn
5s
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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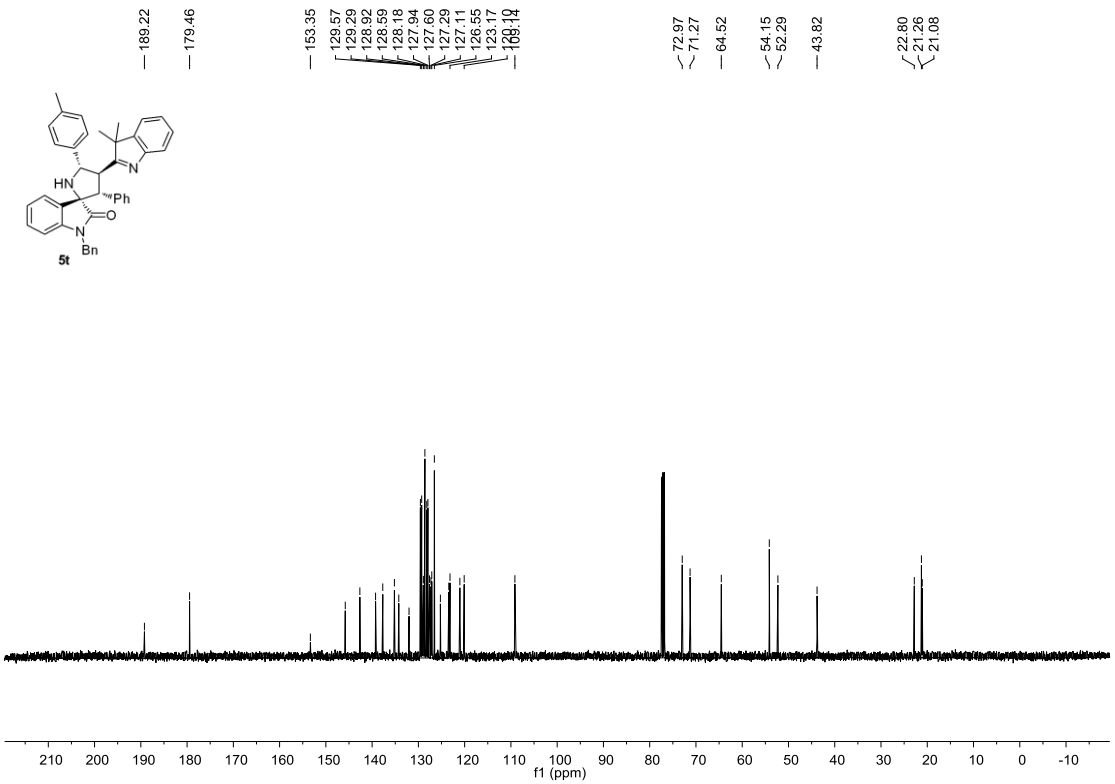
7.575
7.230
7.111
7.092
7.073
6.513
6.320
6.301
5.147
5.125
5.113
5.097
5.081
5.057
4.600
4.579
4.569
4.566
4.535
4.308
4.268
2.743
2.284
0.790
0.435
-0.000
HN
Ph
N
O
N
Bn
1.01
2.00
1.01
1.32
14.21
2.00
1.01
2.00
1.99
1.00
0.93
3.04
2.99
3.05
f1 (ppm)


189.22
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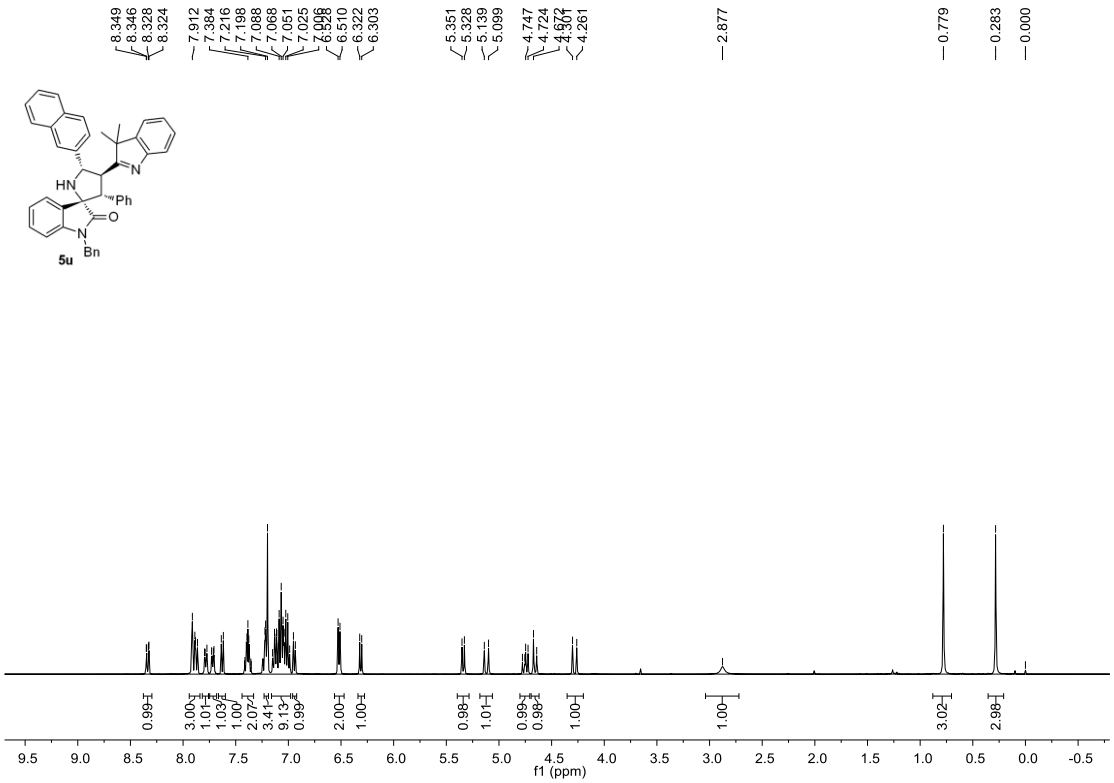
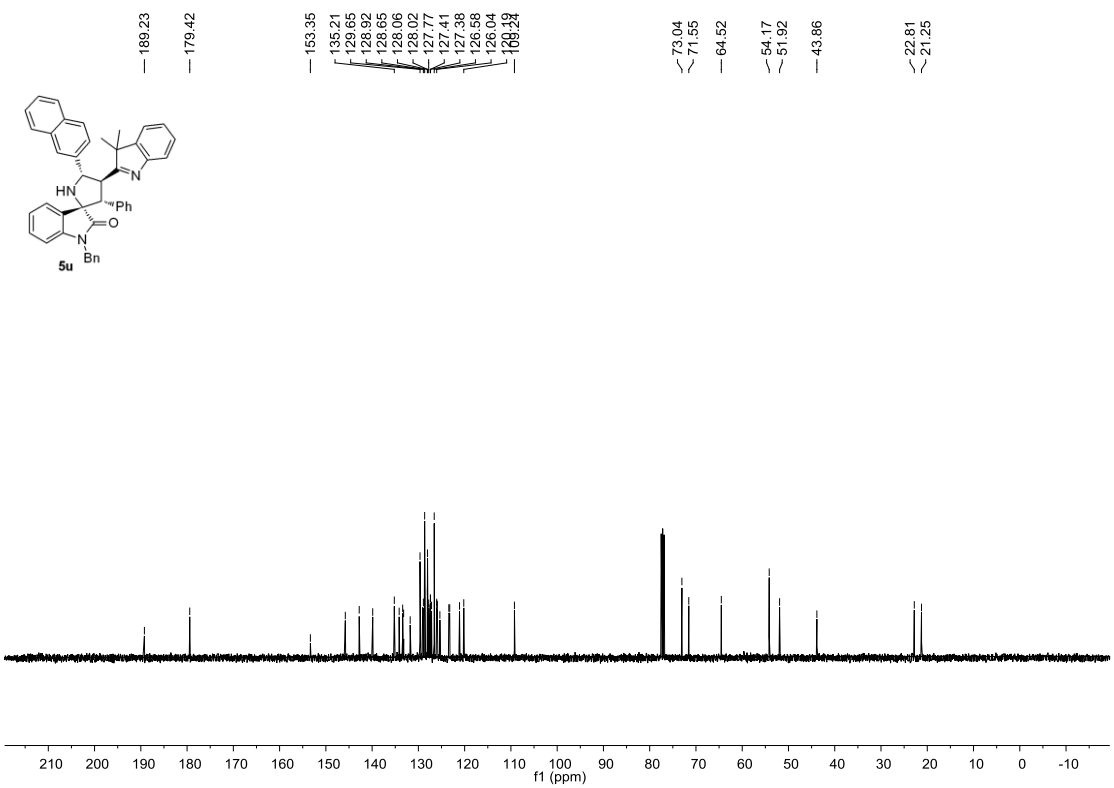
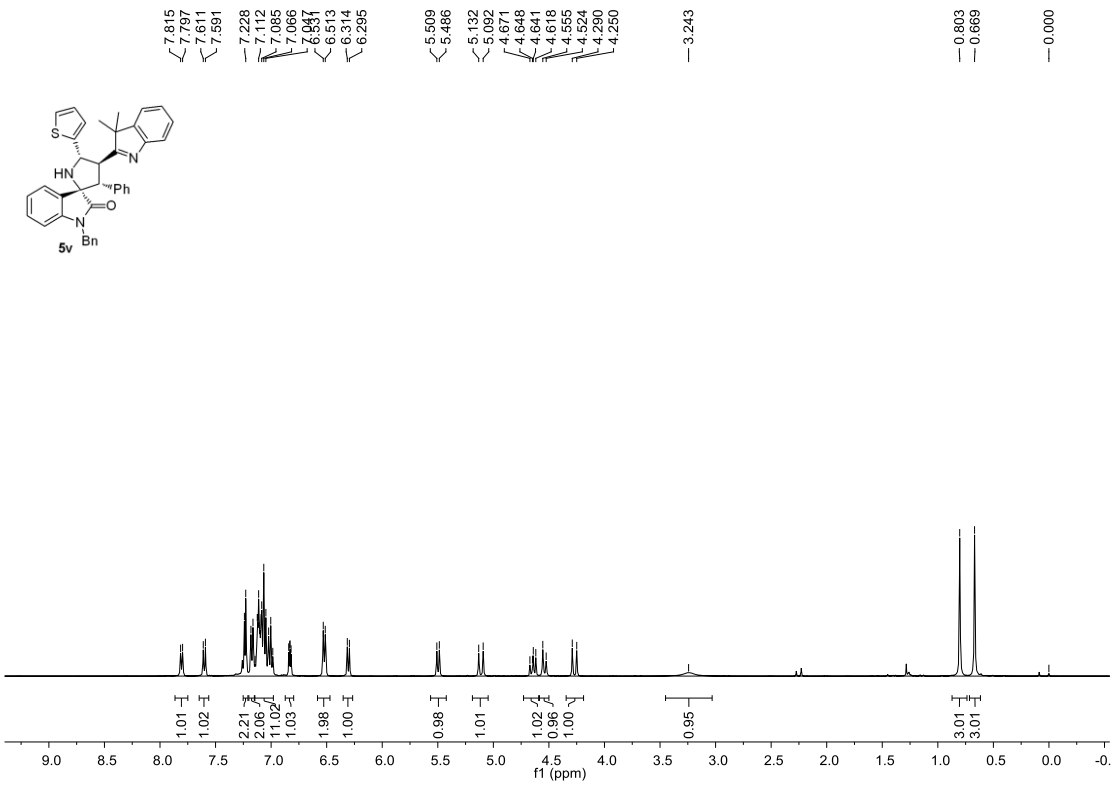
153.35
129.57
129.29
128.92
128.59
128.18
127.94
127.60
127.29
127.11
126.55
123.17
72.97
71.27
64.52
54.15
52.29
43.82
22.80
21.26
21.08
HN
Ph
N
O
N
Bn
5t
f1 (ppm)


8.349
8.346
8.328
8.324
7.912
7.384
7.216
7.198
7.088
7.068
7.051
7.025
6.528
6.510
6.322
6.303
5.351
5.328
5.139
5.099
4.747
4.724
4.672
4.301
4.261
2.877
0.779
0.283
0.000
HN
Ph
O
N
Bn
5u
0.99
3.00
1.01
1.03
1.00
2.07
3.41
9.13
0.99
2.00
1.00
0.98
1.01
0.99
0.98
1.00
1.00
3.02
2.98
f1 (ppm)


189.23
179.42
153.35
135.21
129.65
128.92
128.65
128.06
128.02
127.77
127.41
127.38
126.58
126.04
73.04
71.55
64.52
54.17
51.92
43.86
22.81
21.25
HN
Ph
O
N
Bn
5u
f1 (ppm)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6.295
5.509
5.486
5.132
5.092
4.671
4.648
4.641
4.618
4.555
4.524
4.290
4.250
3.243
0.803
0.669
0.000
1.01
1.02
2.21
2.06
11.02
1.03
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0.98
1.01
1.02
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1.00
0.95
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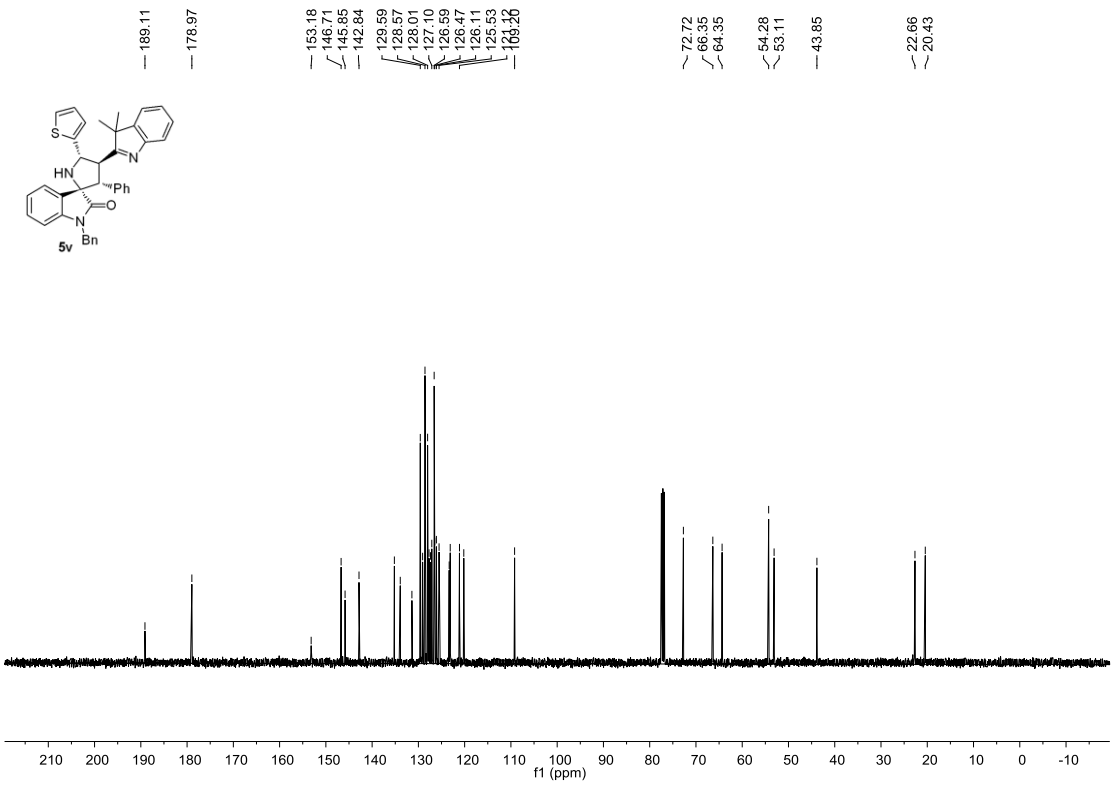
3.01
f1 (ppm)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128.57
128.01
127.10
126.59
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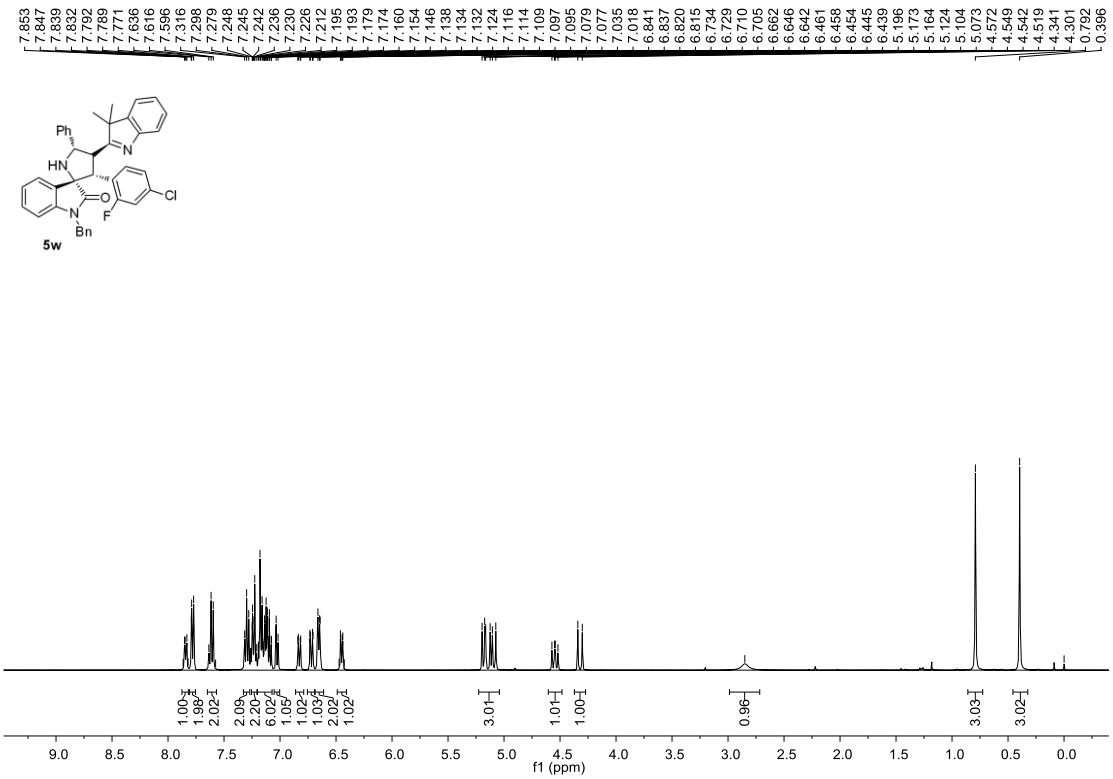
64.35
54.28
53.11
43.85
22.66
20.43
f1 (ppm)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7.230
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7.195
7.193
7.179
7.174
7.160
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7.146
7.138
7.134
7.132
7.124
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7.114
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7.095
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7.077
7.035
7.018
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6.837
6.820
6.815
6.734
6.729
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6.705
6.662
6.646
6.642
6.461
6.458
6.454
6.445
6.439
5.196
5.173
5.164
5.124
5.104
5.073
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4.549
4.542
4.519
4.341
4.301
0.792
0.396
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N
O
N
Bn
F
Cl
5w
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1.98
2.02
2.09
2.20
6.02
1.05
1.02
1.03
2.02
1.02
3.01
1.01
1.00
0.96
3.03
3.02
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
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2.5
2.0
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1.0
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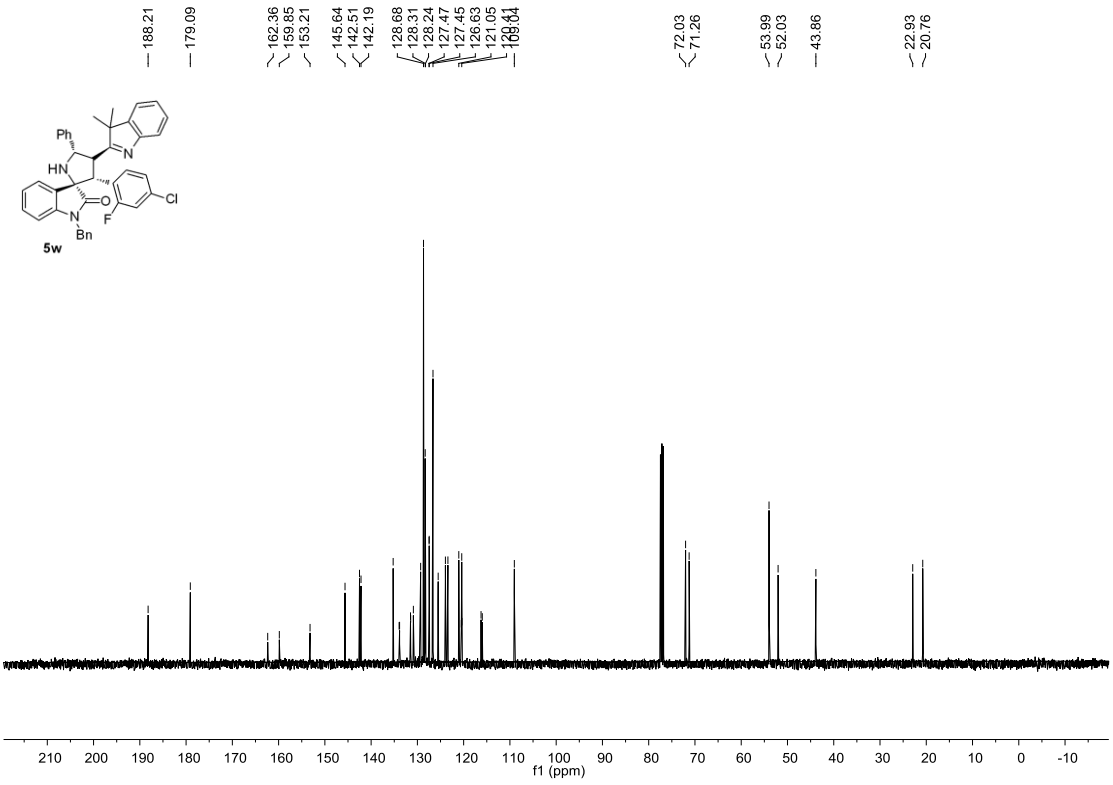
0.0
f1 (ppm)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142.19
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126.63
121.05
72.03
71.26
53.99
52.03
43.86
22.93
20.76
Ph
HN
N
O
N
Bn
F
Cl
5w
210
200
190
180
170
160
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140
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120
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100
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80
70
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40
30
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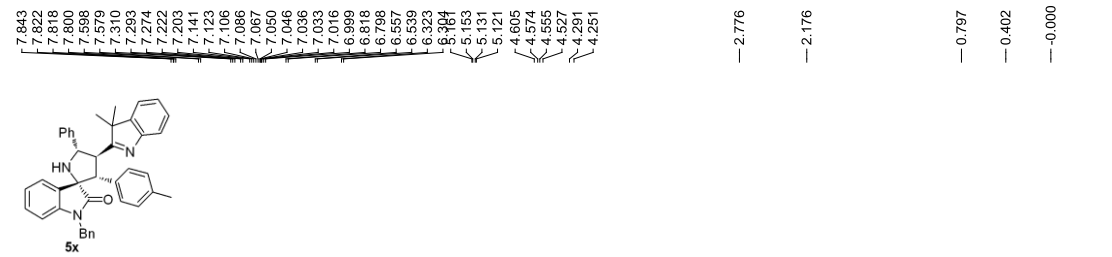
-10
f1 (ppm)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7.106
7.086
7.067
7.050
7.046
7.036
7.033
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6.818
6.798
6.557
6.539
6.323
6.304
5.161
5.153
5.131
5.121
4.605
4.574
4.555
4.527
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2.176
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0.402
-0.000


Ph
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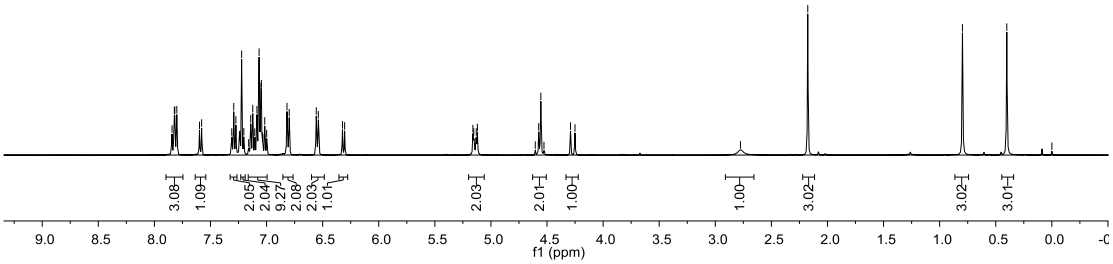
O
N
Bn
5x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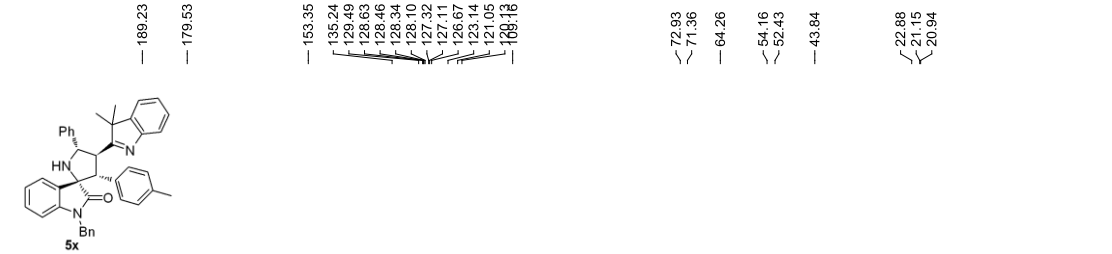
2.05
2.04
9.27
2.08
2.03
1.01
2.03
2.01
1.00
1.00
3.02
3.02
3.01
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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128.46
128.34
128.10
127.32
127.11
126.67
123.14
121.05
72.93
71.36
64.26
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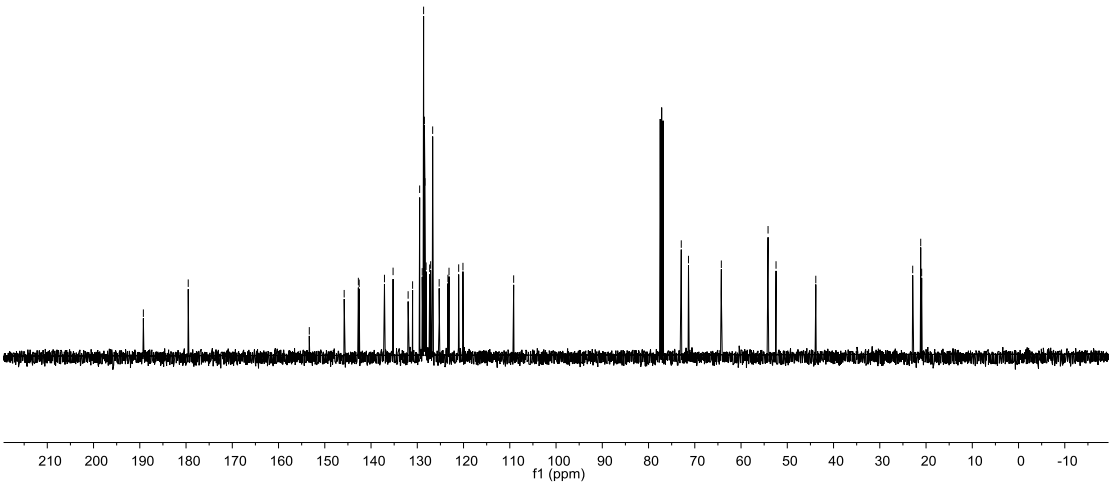
52.43
43.84
22.88
21.15
20.94


Ph
HN
N
O
N
Bn
5x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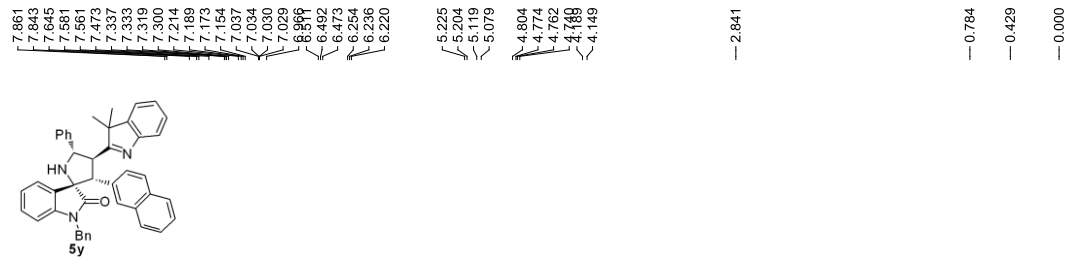
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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7.214
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7.173
7.154
7.037
7.034
7.030
7.029
6.492
6.473
6.254
6.236
6.220
5.225
5.204
5.119
5.079
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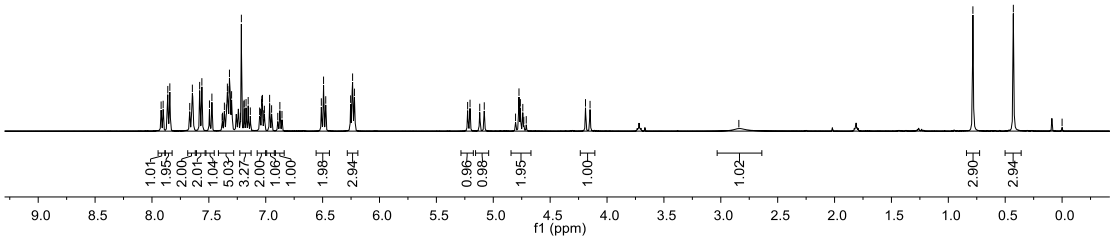
4.149
2.841
0.784
0.429
0.000


Ph
HN
O
N
Bn
5y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1.95
2.00
2.01
1.04
5.03
3.27
2.00
1.06
1.00
1.98
2.94
0.96
0.98
1.95
1.00
1.02
2.90
2.94
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
f1 (ppm)


194.03
189.01
179.38
153.22
145.72
142.74
142.48
128.68
128.37
128.19
128.17
128.00
127.50
127.46
73.00
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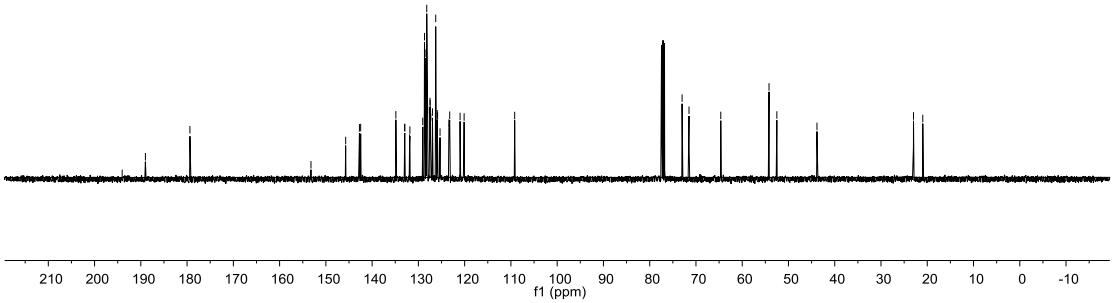
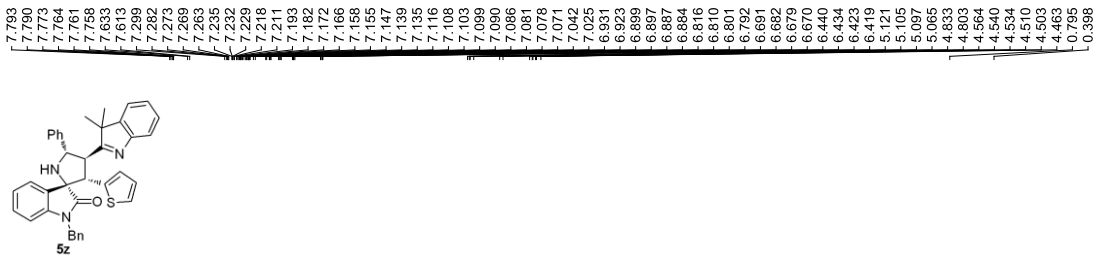
54.21
52.52
43.84
22.98
20.97


Ph
HN
O
N
Bn
5y


210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)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7.235
7.232
7.229
7.218
7.211
7.193
7.182
7.172
7.166
7.158
7.155
7.147
7.139
7.135
7.116
7.108
7.103
7.099
7.090
7.086
7.081
7.078
7.071
7.042
7.025
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6.923
6.899
6.897
6.887
6.884
6.816
6.810
6.801
6.792
6.691
6.682
6.679
6.670
6.440
6.434
6.423
6.419
5.121
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5.097
5.065
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4.803
4.564
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4.463
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Ph
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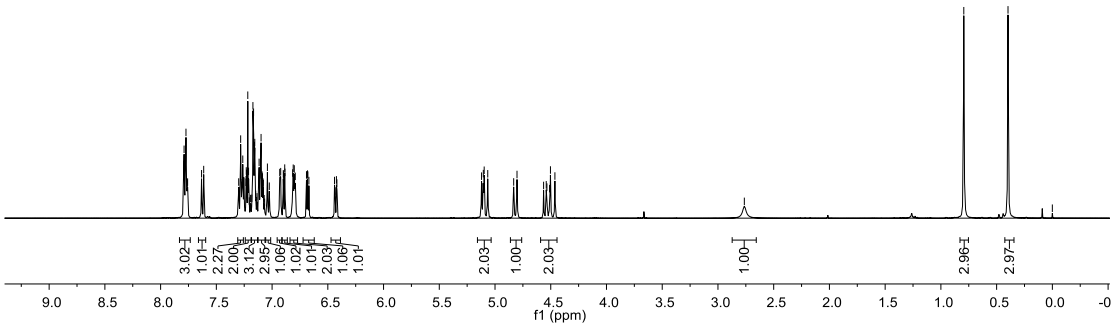
O
S
N
Bn
5z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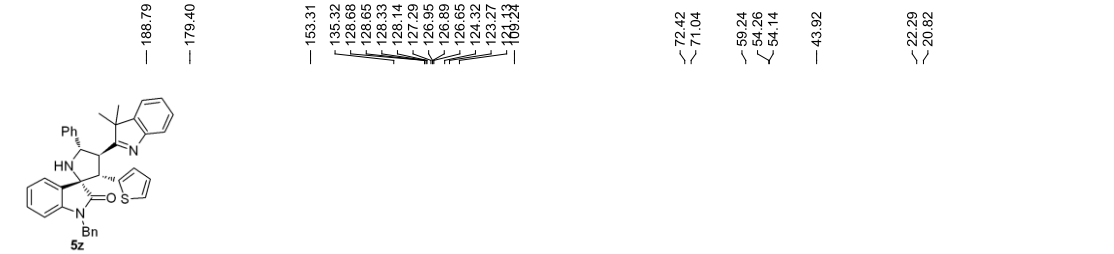
1.06
1.02
1.01
2.03
1.06
1.01
2.03
1.00
2.03
1.00
2.96
2.97
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0
f1 (ppm)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126.95
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123.27
72.42
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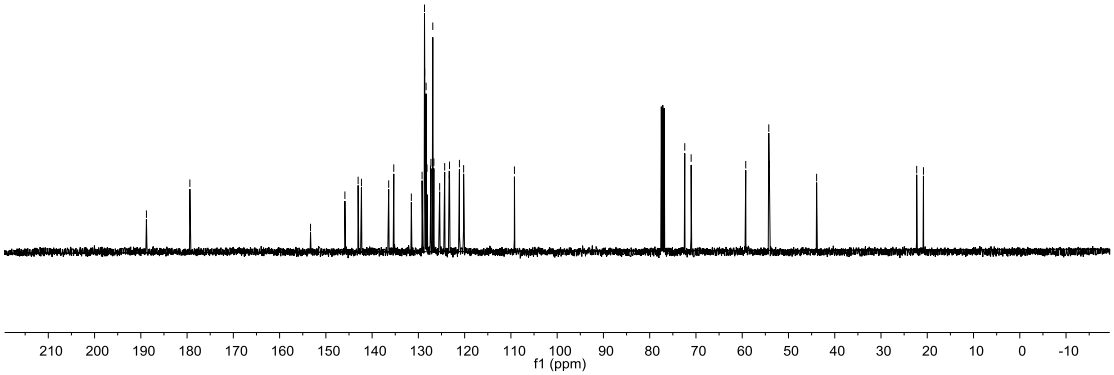
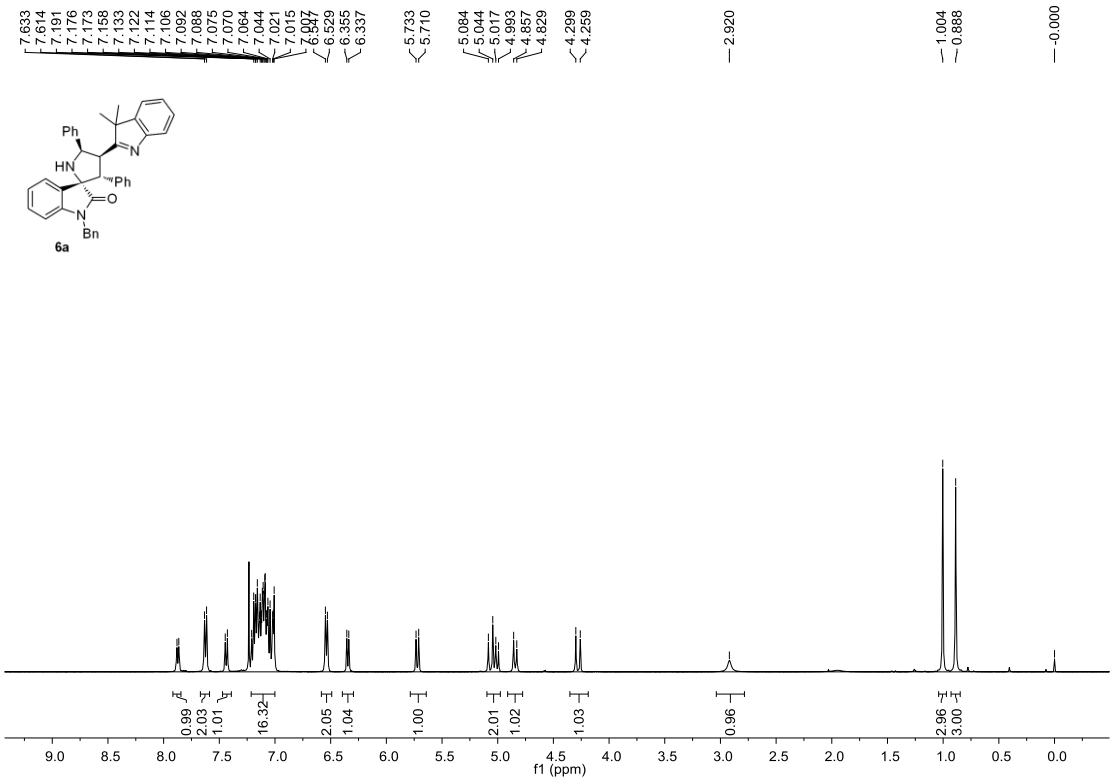
54.14
43.92
22.29
20.82


Ph
HN
N
O
S
N
Bn
5z


210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)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7.106
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7.088
7.075
7.070
7.064
7.044
7.021
7.015
6.547
6.529
6.355
6.337
5.733
5.710
5.084
5.044
5.017
4.993
4.857
4.829
4.299
4.259
2.920
1.004
0.888
-0.000
Ph
HN
Ph
O
N
Bn
6a
0.99
2.03
1.01
16.32
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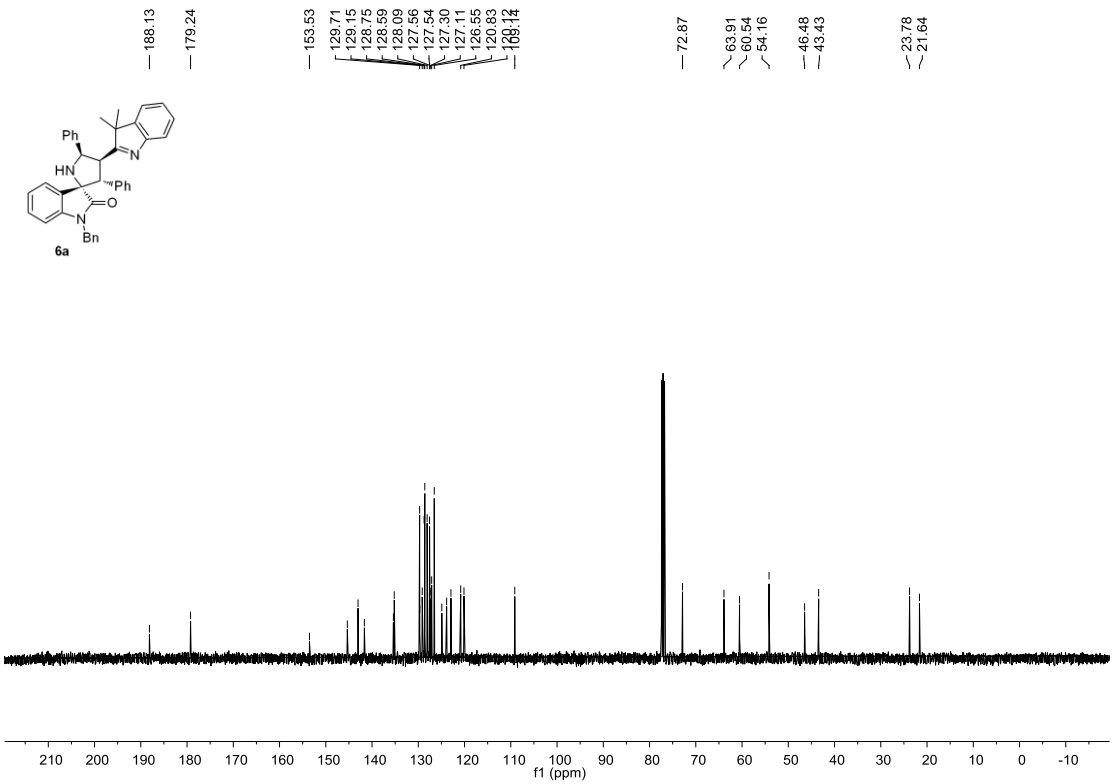
1.04
1.00
2.01
1.02
1.03
0.96
2.96
3.00
f1 (ppm)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128.09
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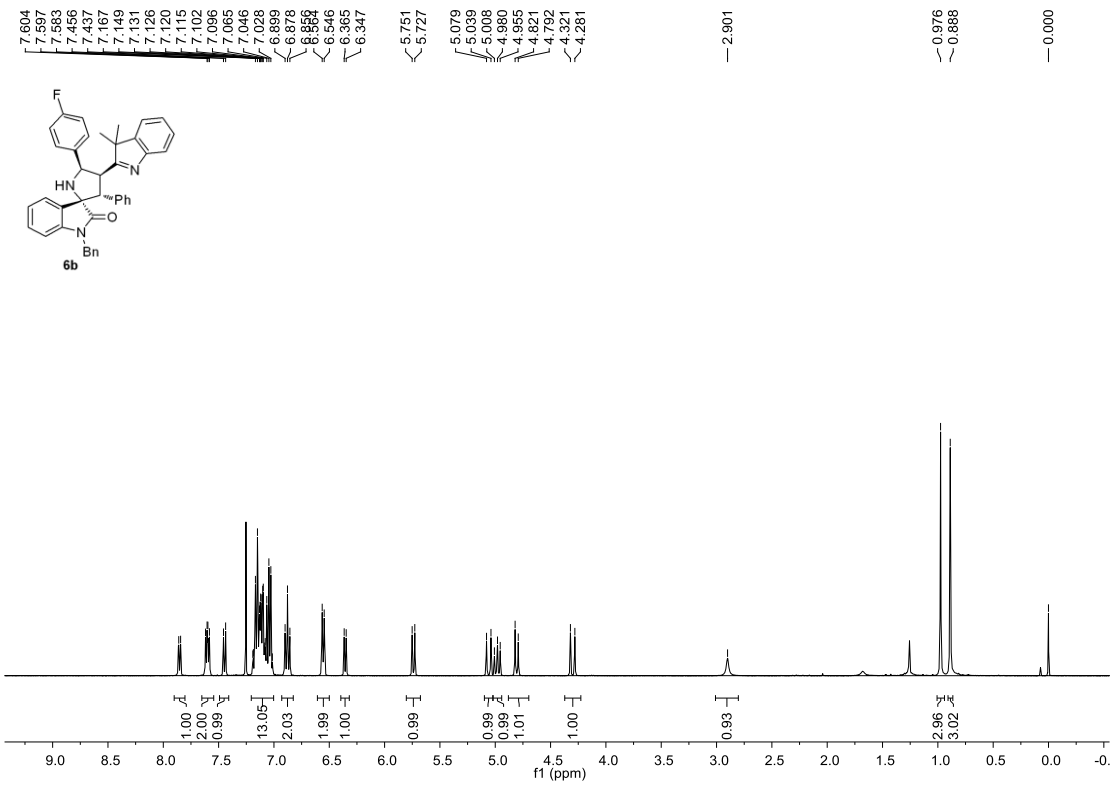
127.54
127.30
127.11
126.55
120.83
72.87
63.91
60.54
54.16
46.48
43.43
23.78
21.64
Ph
HN
Ph
O
N
Bn
6a
f1 (ppm)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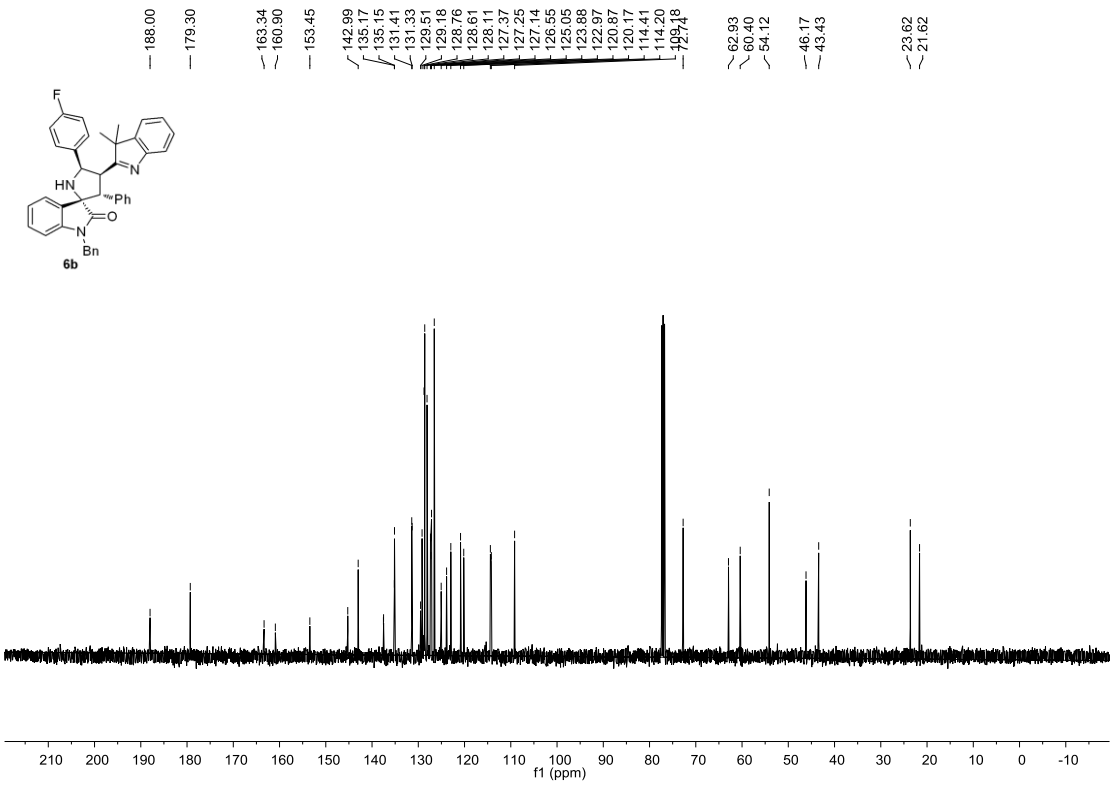
6.347
5.751
5.727
5.079
5.039
5.008
4.980
4.955
4.821
4.792
4.321
4.281
2.901
0.976
0.888
0.000
F
HN
Ph
O
N
Bn
6b
1.00
2.00
0.99
13.05
2.03
1.99
1.00
0.99
0.99
0.99
1.01
1.00
0.93
2.96
3.02
f1 (ppm)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128.11
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127.25
127.14
126.55
125.05
123.88
122.97
120.87
120.17
114.41
114.20
62.93
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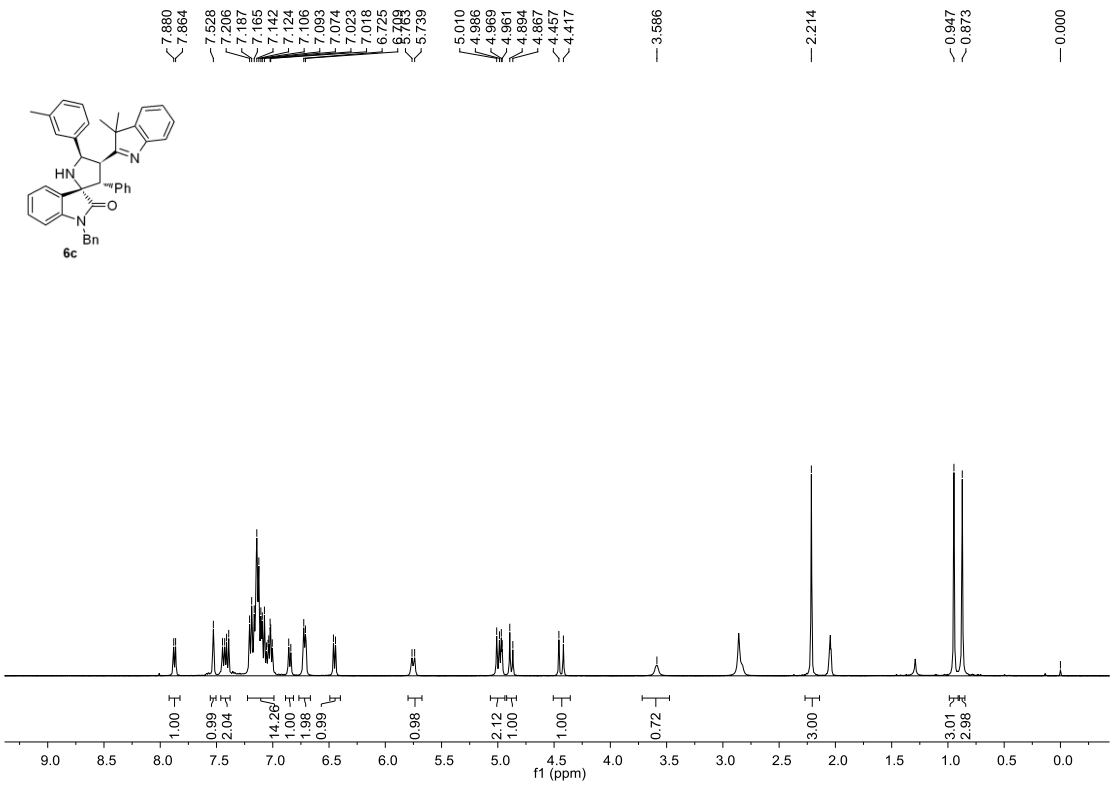
43.43
23.62
21.62
F
HN
Ph
O
N
Bn
6b
f1 (ppm)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5.739
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Bn
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1.00
1.98
0.99
0.98
2.12
1.00
1.00
0.72
3.00
3.01
2.98
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8.5
8.0
7.5
7.0
6.5
6.0
5.5
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2.5
2.0
1.5
1.0
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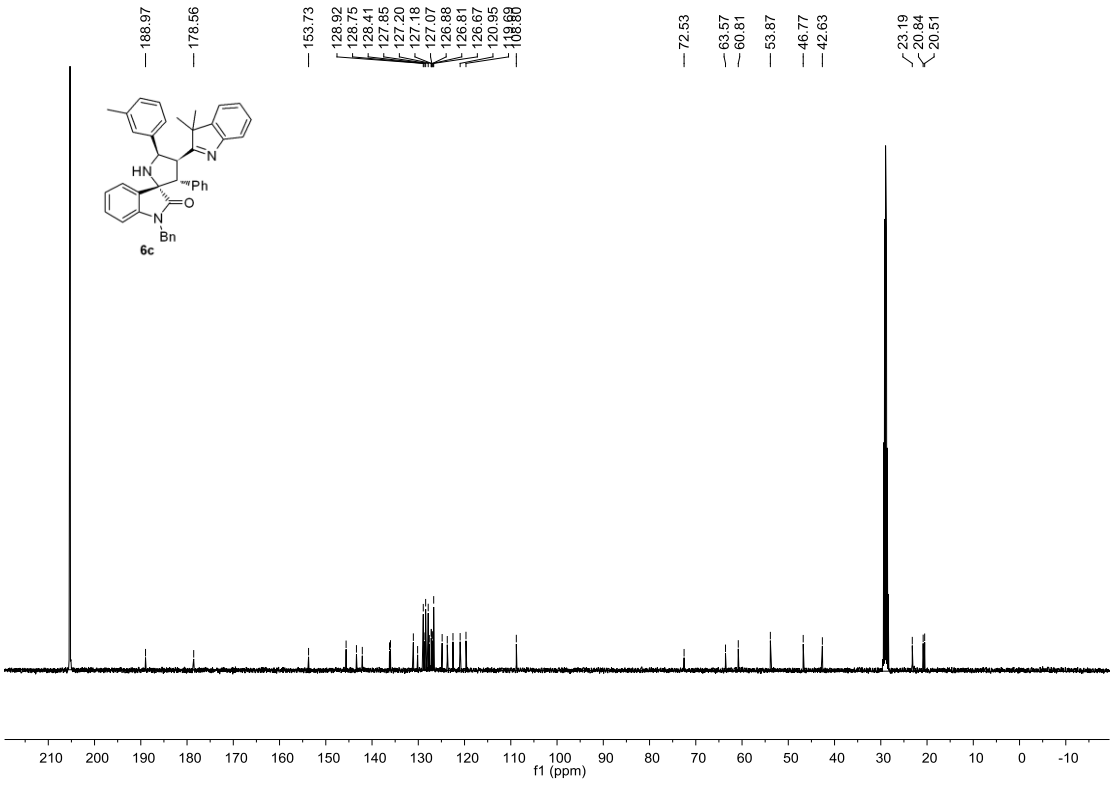
0.0
f1 (ppm)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126.67
120.95
72.53
63.57
60.81
53.87
46.77
42.63
23.19
20.84
20.51
HN
Ph
N
O
N
Bn
6c
210
200
190
180
170
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140
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100
90
80
70
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50
40
30
20
10
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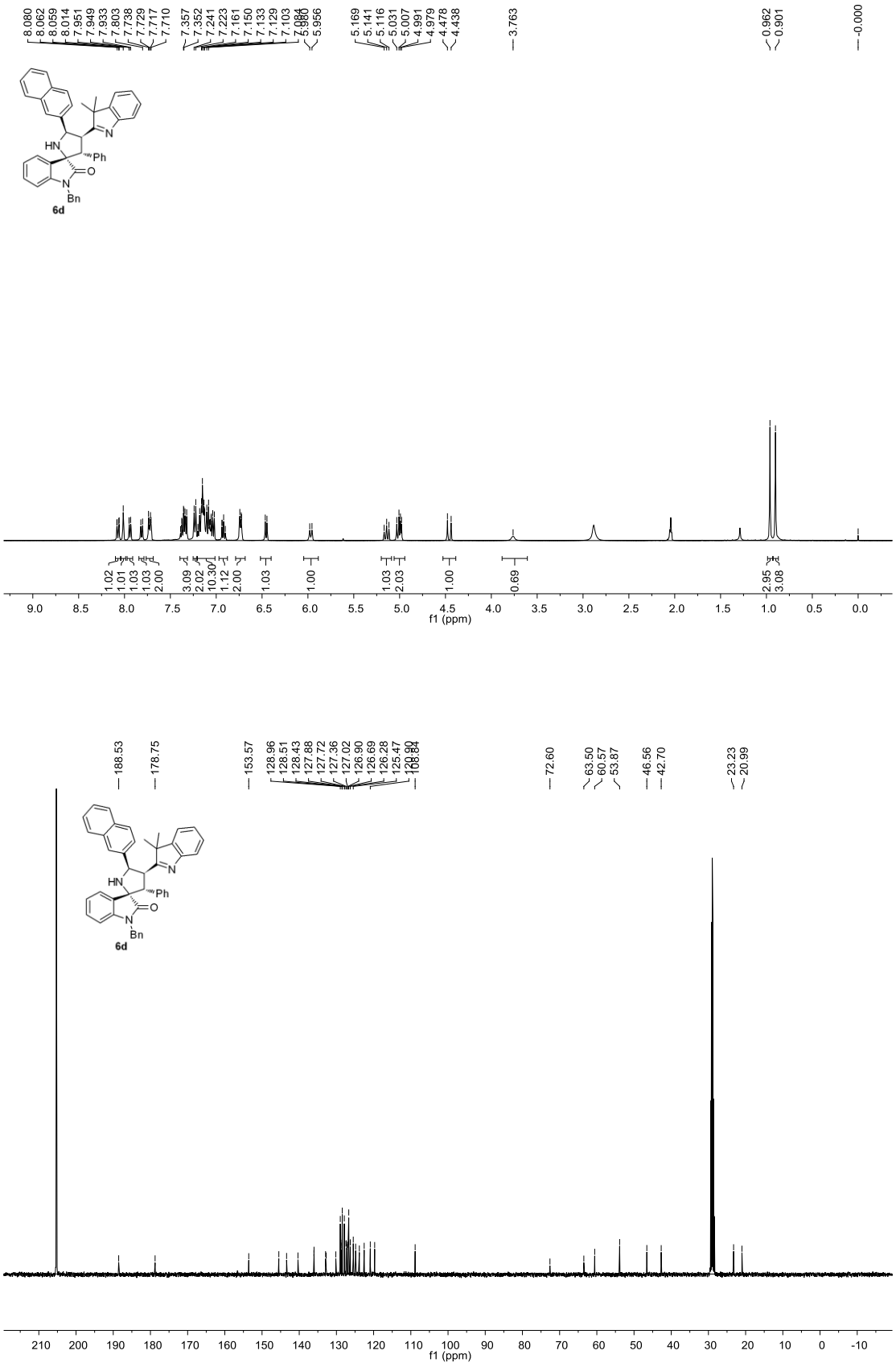
-10
f1 (ppm)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7.357
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7.241
7.223
7.161
7.150
7.133
7.129
7.103
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5.169
5.141
5.116
5.031
5.007
4.991
4.979
4.478
4.438
3.763
0.962
0.901
-0.000
HN
Ph
O
N
Bn
6d
1.02
1.01
1.03
1.03
2.00
3.09
2.02
10.30
1.12
2.00
1.03
1.00
1.03
2.03
1.00
0.69
2.95
3.08
f1 (ppm)
188.53
178.75
153.57
128.96
128.51
128.43
127.88
127.72
127.36
127.02
126.90
126.69
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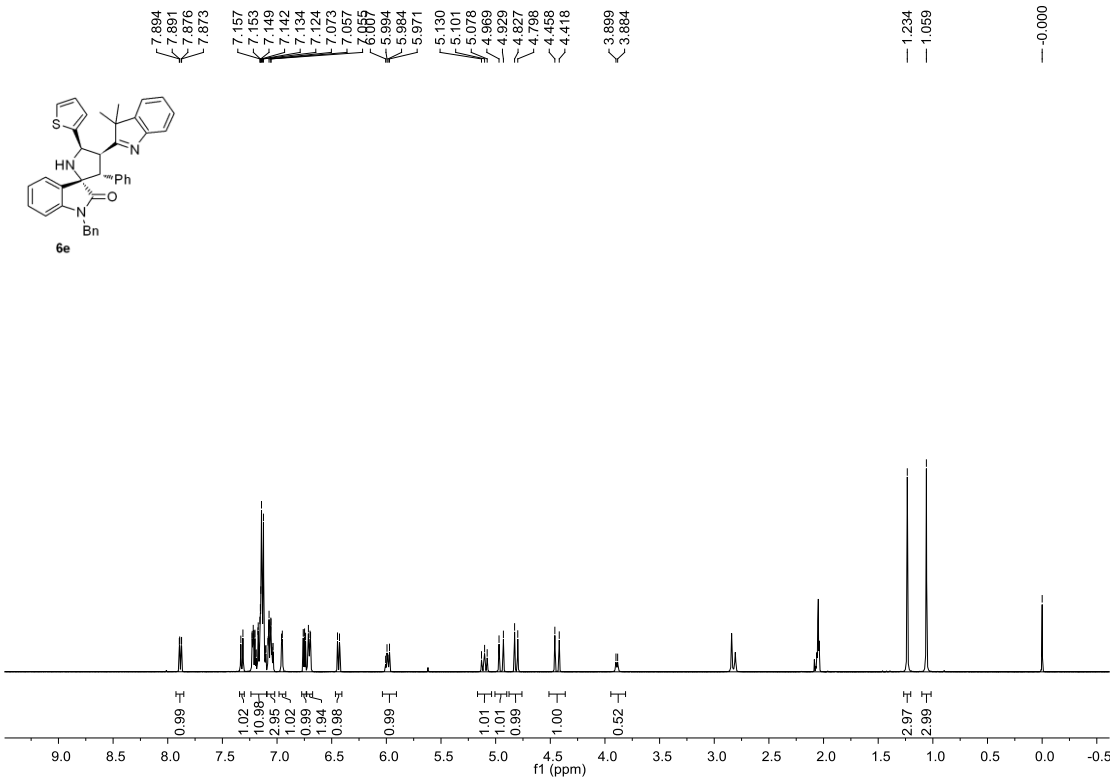
60.57
53.87
46.56
42.70
23.23
20.99
f1 (ppm)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7.134
7.124
7.073
7.057
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5.994
5.984
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5.130
5.101
5.078
4.969
4.929
4.827
4.798
4.458
4.418
3.899
3.884
1.234
1.059
-0.000
S
HN
Ph
O
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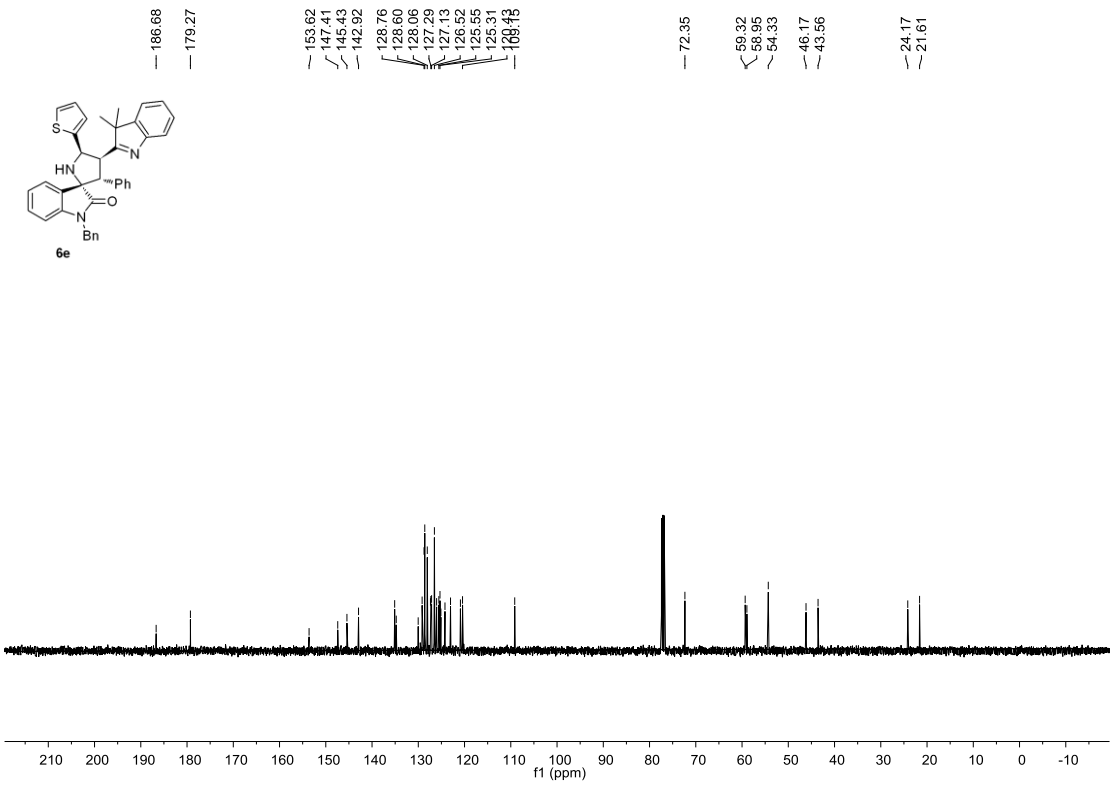
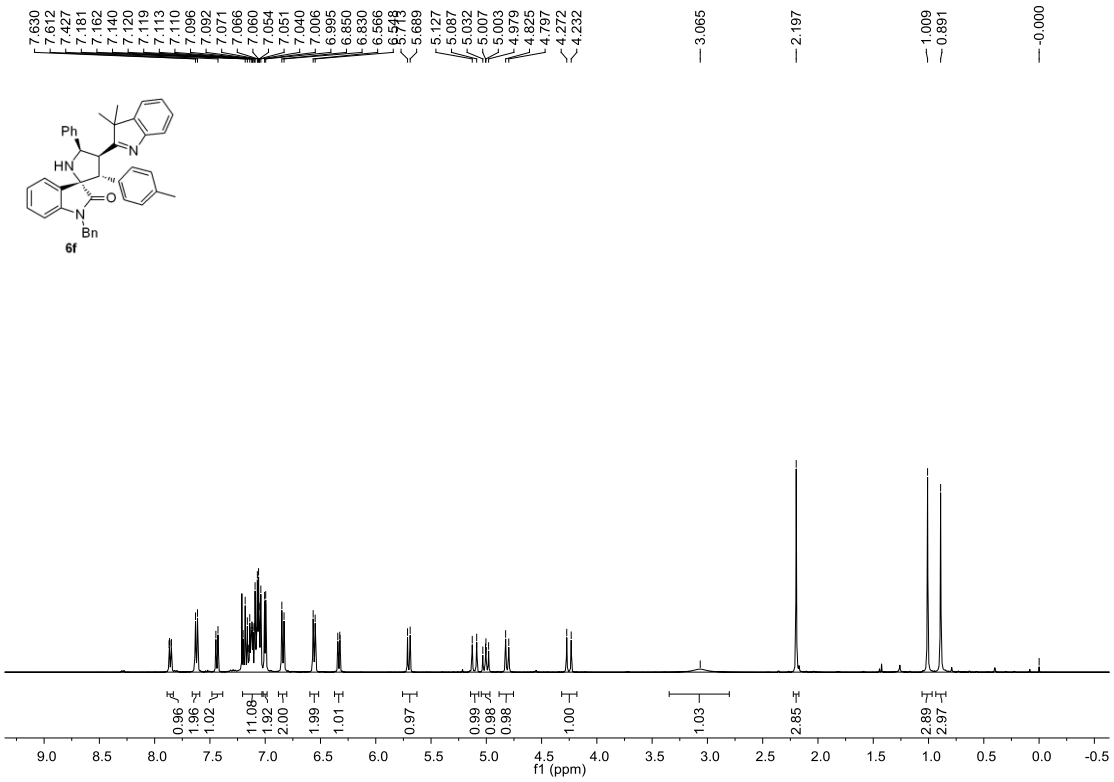
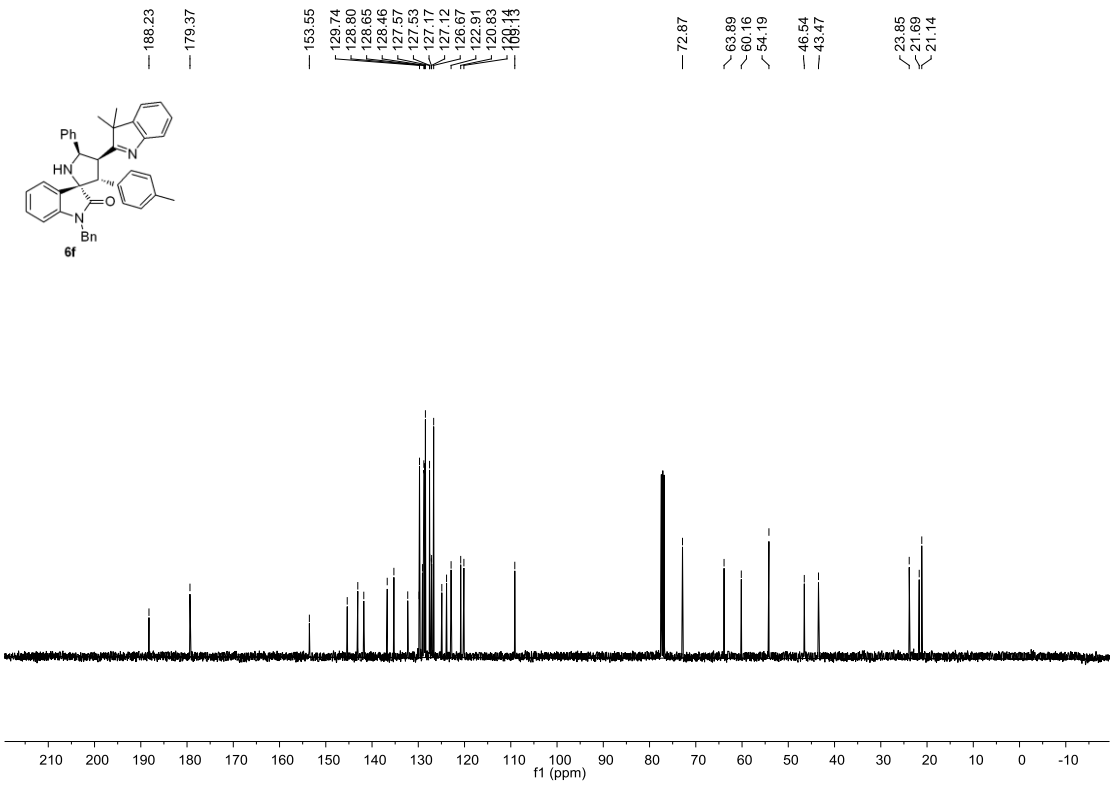
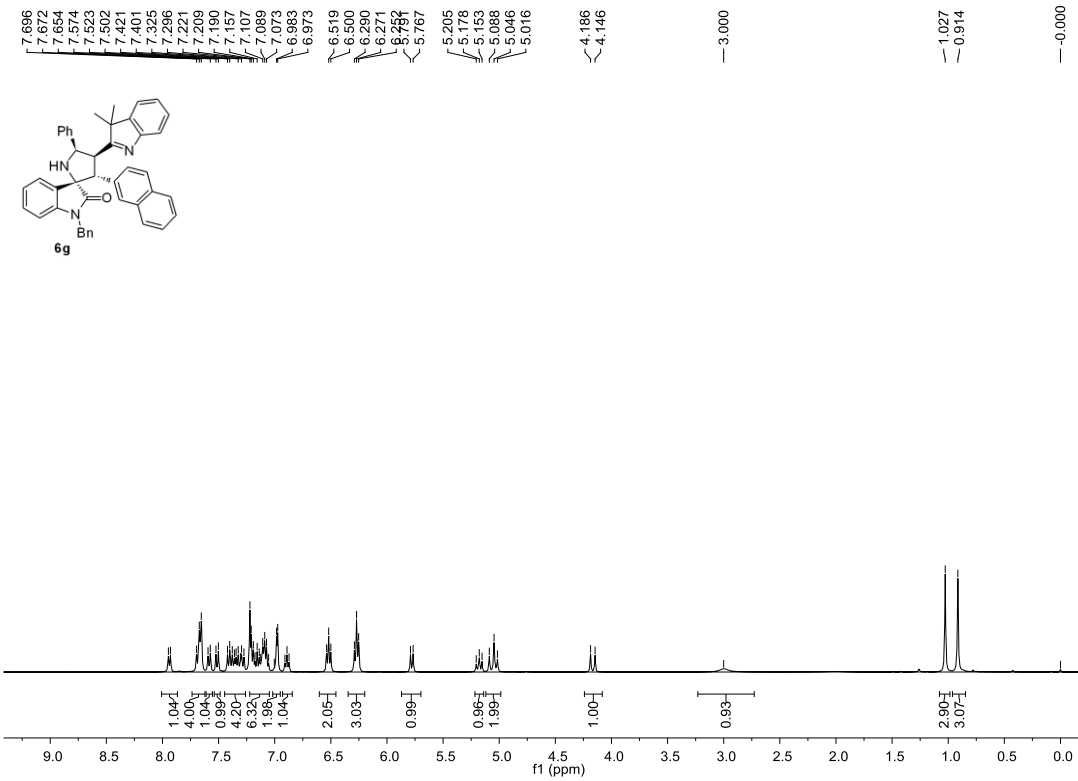
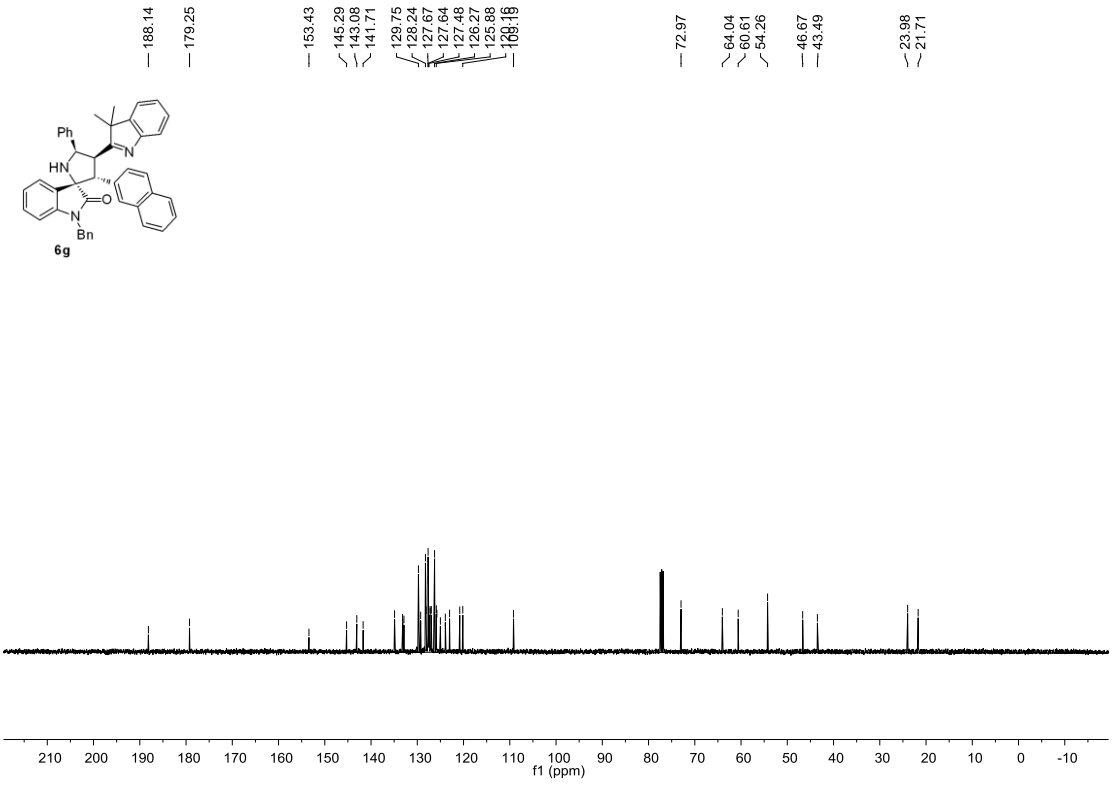
Bn
6e
0.99
1.02
10.98
2.95
1.02
0.99
1.94
0.98
0.99
1.01
1.01
0.99
1.00
0.52
2.97
2.99
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)

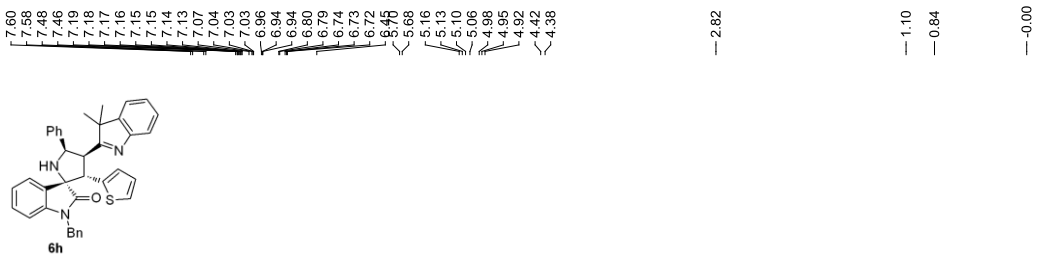

186.68
179.27
153.62
147.41
145.43
142.92
128.76
128.60
128.06
127.29
127.13
126.52
125.55
125.31
72.35
59.32
58.95
54.33
46.17
43.56
24.17
21.61
S
HN
Ph
O
N
Bn
6e
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


7.630
7.612
7.427
7.181
7.162
7.140
7.120
7.119
7.113
7.110
7.096
7.092
7.071
7.066
7.060
7.054
7.051
7.040
7.006
6.995
6.850
6.830
6.566
6.548
5.713
5.689
5.127
5.087
5.032
5.007
5.003
4.979
4.825
4.797
4.272
4.232
3.065
2.197
1.009
0.891
-0.000
Ph
HN
N
O
N
Bn
6f
0.96
1.96
1.02
11.08
1.92
2.00
1.99
1.01
0.97
0.99
0.98
0.98
1.00
1.03
2.85
2.89
2.97
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)


188.23
179.37
153.55
129.74
128.80
128.65
128.46
127.57
127.53
127.17
127.12
126.67
122.91
120.83
72.87
63.89
60.16
54.19
46.54
43.47
23.85
21.69
21.14
Ph
HN
N
O
N
Bn
6f
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

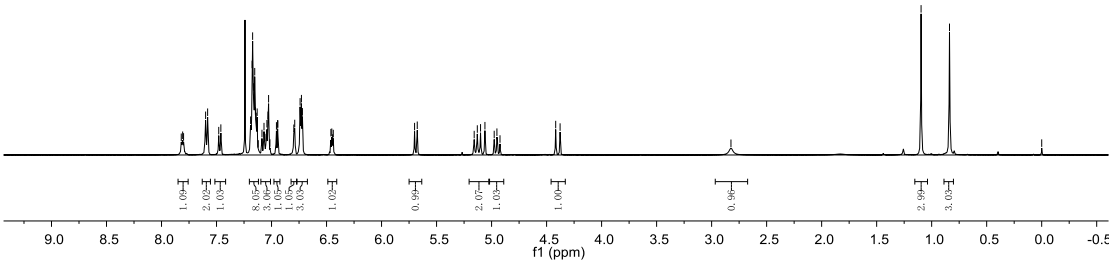

7.696
7.672
7.654
7.574
7.523
7.502
7.421
7.401
7.325
7.296
7.221
7.209
7.190
7.157
7.107
7.089
7.073
6.983
6.973
6.519
6.500
6.290
6.271
5.767
5.205
5.178
5.153
5.088
5.046
5.016
4.186
4.146
3.000
1.027
0.914
-0.000
Ph
HN
N
O
N
Bn
6g
1.04
4.00
1.04
0.99
4.20
6.32
1.96
1.04
2.05
3.03
0.99
0.96
1.99
1.00
0.93
2.90
3.07
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
f1 (ppm)

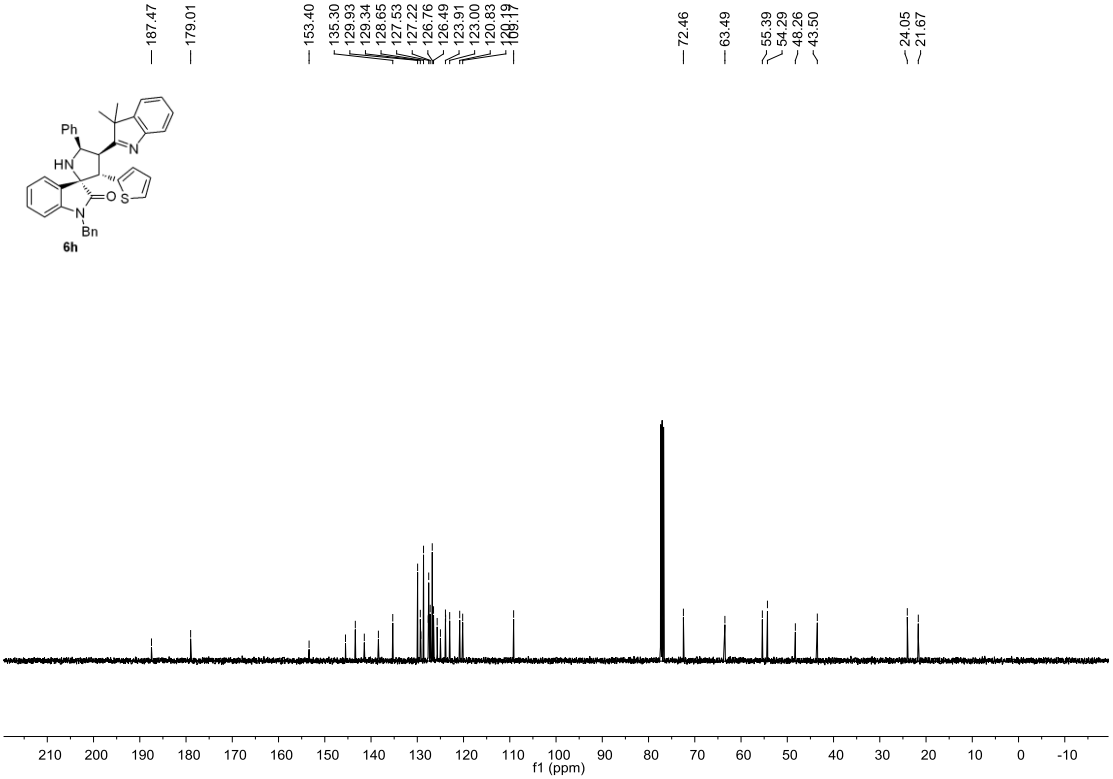

188.14
179.25
153.43
145.29
143.08
141.71
129.75
128.24
127.67
127.64
127.48
126.27
125.88
72.97
64.04
60.61
54.26
46.67
43.49
23.98
21.71
Ph
HN
N
O
N
Bn
6g
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


7.60
7.58
7.48
7.46
7.19
7.18
7.17
7.16
7.15
7.14
7.13
7.07
7.04
7.03
7.03
6.96
6.94
6.94
6.80
6.79
6.74
6.73
6.72
5.68
5.16
5.13
5.10
5.06
4.98
4.95
4.92
4.42
4.38
2.82
1.10
0.84
-0.00


Ph
HN
N
O
S
N
Bn

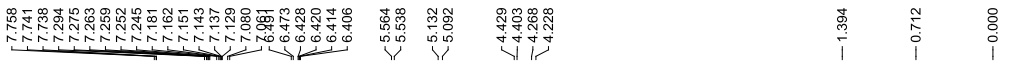
6h

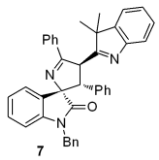

1.00
2.03
1.03
8.05
1.05
3.00
1.02
0.99
2.07
1.03
1.00
0.96
2.99
3.03
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


187.47
179.01
153.40
135.30
129.93
129.34
128.65
127.53
127.22
126.76
126.49
123.91
123.00
120.83
72.46
63.49
55.39
54.29
48.26
43.50
24.05
21.67
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

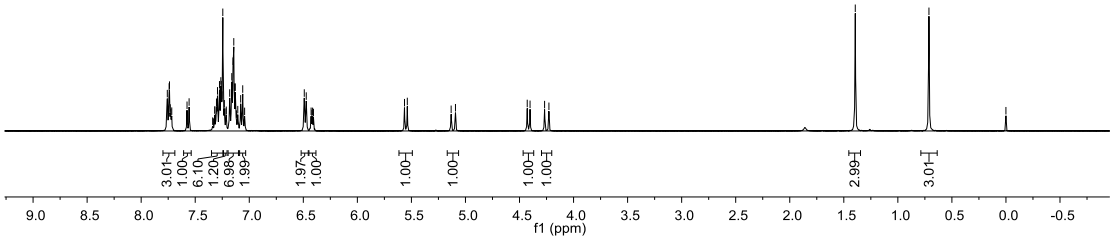

Ph
HN
N
O
S
N
Bn

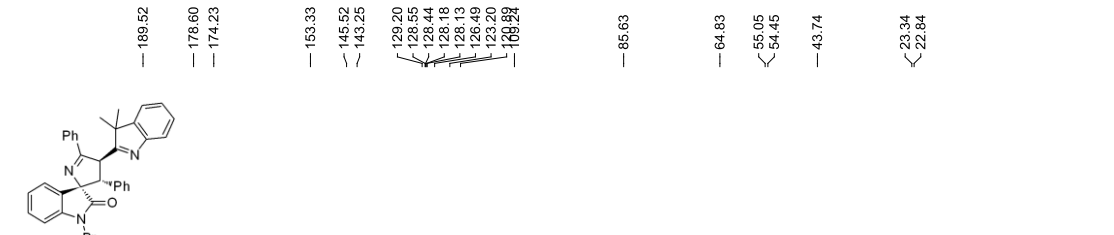
6h


7.758
7.741
7.738
7.294
7.275
7.263
7.259
7.252
7.245
7.181
7.162
7.151
7.143
7.137
7.129
7.080
6.473
6.428
6.420
6.414
6.406
5.564
5.538
5.132
5.092
4.429
4.403
4.268
4.228
1.394
0.712
0.000


Ph
N
N
Ph
O
N
Bn

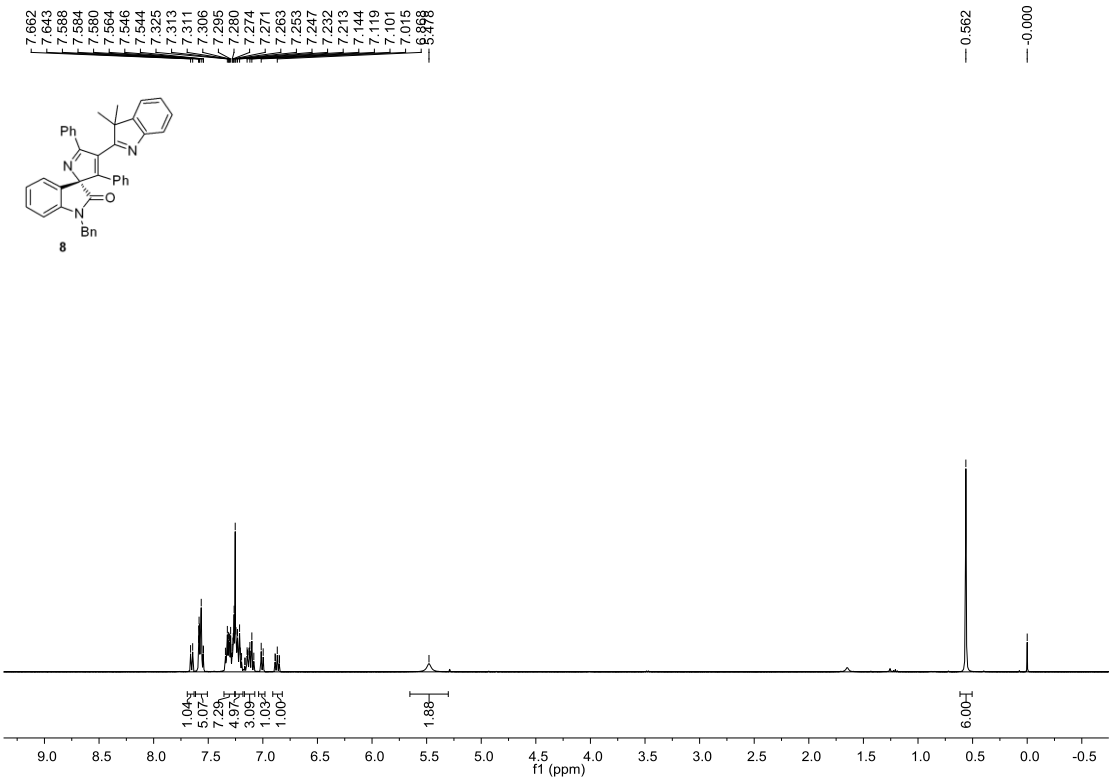
7

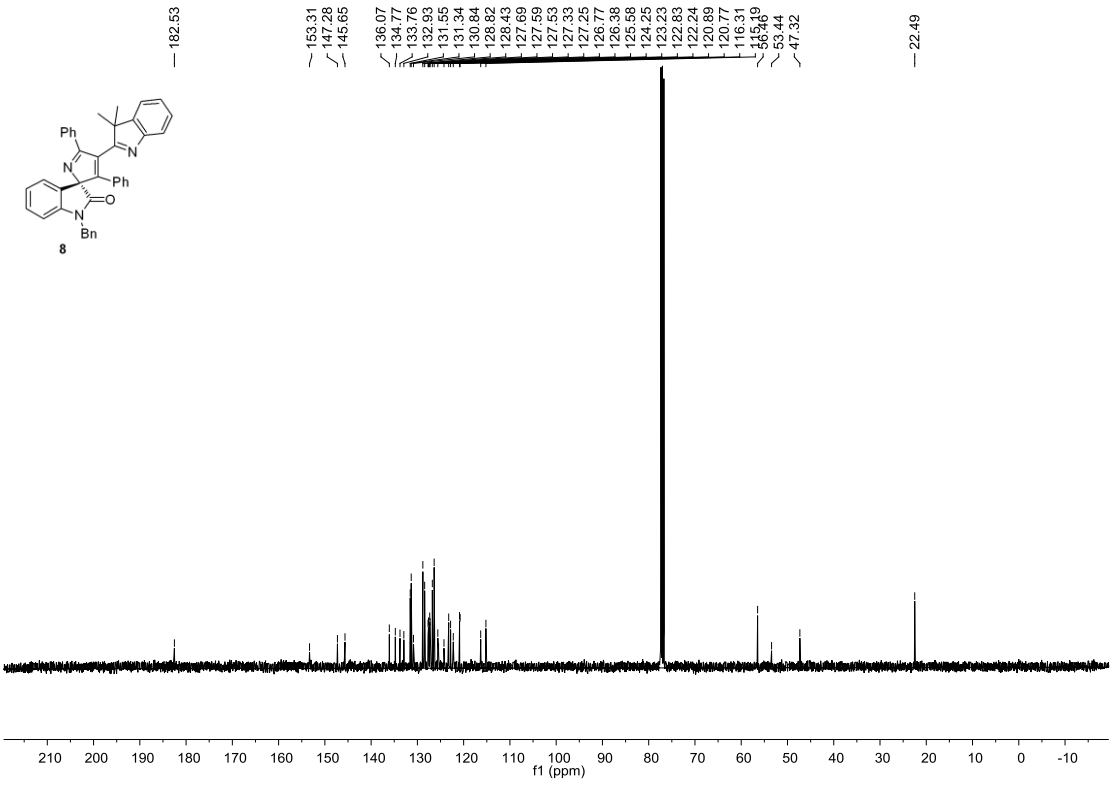

3.01
1.00
6.10
1.20
6.98
1.99
1.97
1.00
1.00
1.00
1.00
1.00
2.99
3.01
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)

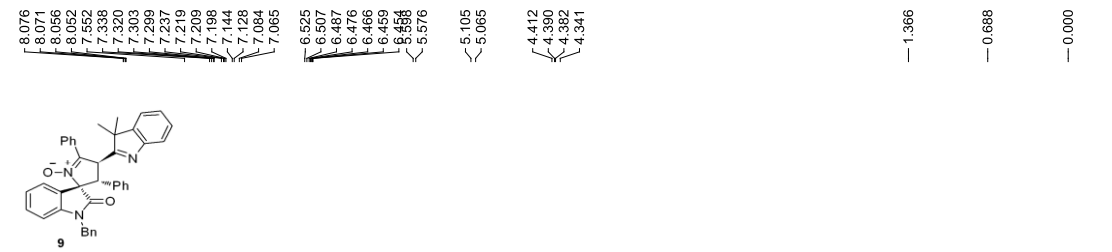

189.52
178.60
174.23
153.33
145.52
143.25
129.20
128.55
128.44
128.18
128.13
126.49
123.20
85.63
64.83
55.05
54.45
43.74
23.34
22.84
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)


Ph
N
N
Ph
O
N
Bn

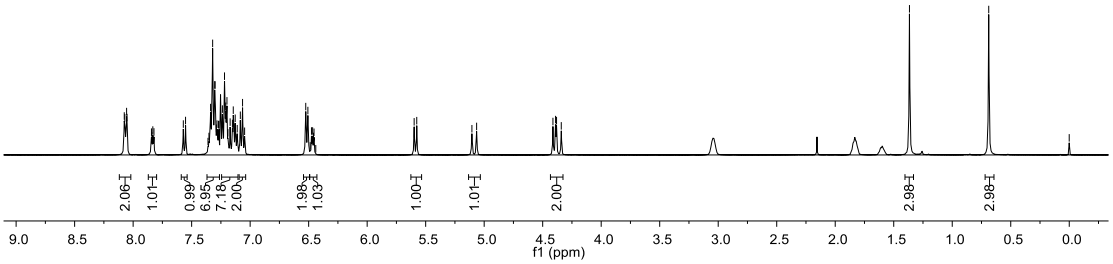
7

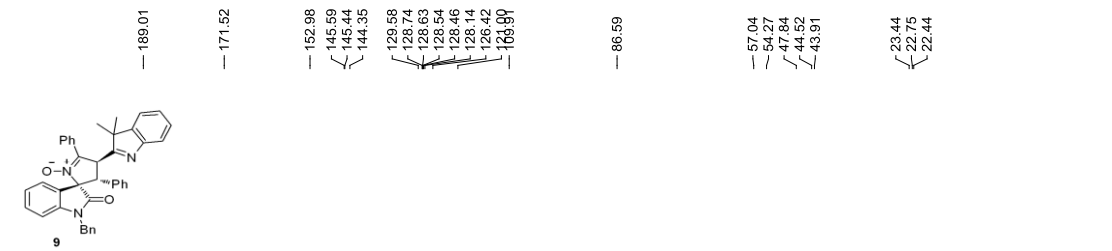

7.662
7.643
7.588
7.584
7.580
7.564
7.546
7.544
7.325
7.313
7.311
7.306
7.295
7.280
7.274
7.271
7.263
7.253
7.247
7.232
7.213
7.144
7.119
7.101
7.015
6.868
5.478
0.562
-0.000
Ph
N
Ph
O
N
Bn
8
1.04
5.07
7.29
4.97
3.09
1.03
1.00
1.88
6.00
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)


182.53
153.31
147.28
145.65
136.07
134.77
133.76
132.93
131.55
131.34
130.84
128.82
128.43
127.69
127.59
127.53
127.33
127.25
126.77
126.38
125.58
124.25
123.23
122.83
122.24
120.89
120.77
116.31
115.19
56.46
53.44
47.32
22.49
Ph
N
Ph
O
N
Bn
8
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

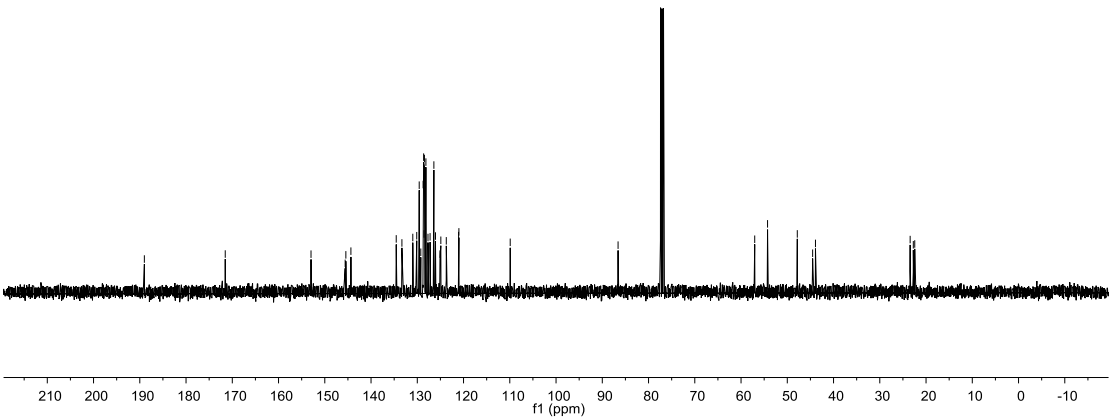

8.076
8.071
8.056
8.052
7.552
7.338
7.320
7.303
7.299
7.237
7.219
7.209
7.198
7.144
7.128
7.084
7.065
6.525
6.507
6.487
6.476
6.466
6.459
5.576
5.105
5.065
4.412
4.390
4.382
4.341
1.366
0.688
0.000


Ph
Ph
O
N
Bn
9


2.06
1.01
0.99
6.95
7.18
2.00
1.98
1.03
1.00
1.01
2.00
2.98
2.98
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
f1 (ppm)


189.01
171.52
152.98
145.59
145.44
144.35
129.58
128.74
128.63
128.54
128.46
128.14
126.42
121.00
120.91
86.59
57.04
54.27
47.84
44.52
43.91
23.44
22.75
22.44

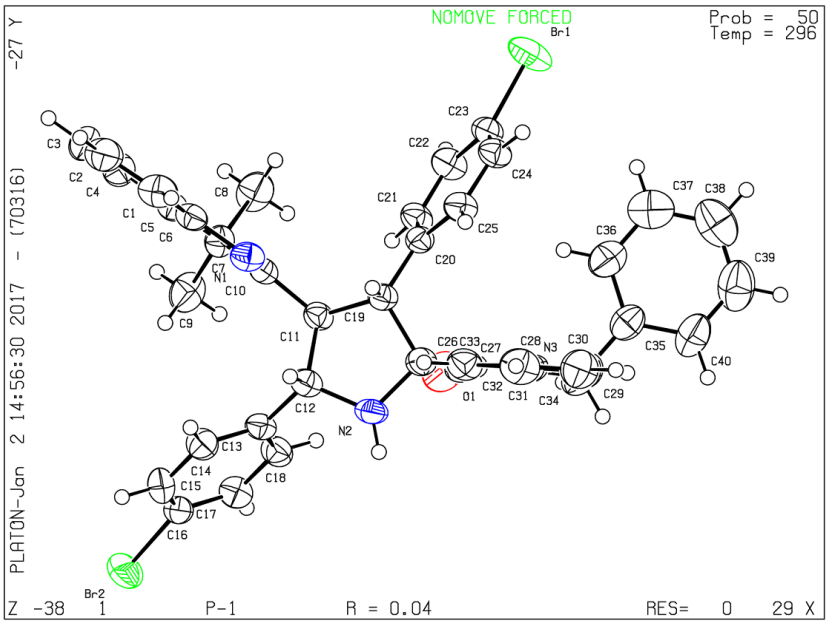

Ph
Ph
O
N
Bn
9


210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

## 2. Crystal data of 5e and 6a

**For 5e:**

Empirical formula C40 H34 Br2 N3 O
Formula weight 732.52
Temperature (K) 296(2)
Crystal system triclinic
Space group P-1
a (Å ) 11.2235(2)
b (Å ) 12.7822(3)
c (Å ) 13.1058(3)
α(°) 62.5490(10)
β(°) 83.9160(10)
γ(°) 87.4370(10)
Volume (Å $^3$) 1659.06(6)
Z 2
Dcalcd (g cm$^3$) = 1.466
μ(mm$^{-1}$) =2.480
F (000) = 746
Theta range for data collection 1.76 to 25.00
Index ranges -13<=h<=13, -13<=k<=15, -15<=l<=15
Reflections collected 22697
Independent reflections 5857 [R(int) = 0.0352]
Data/restraints/parameters 5857/0/415
GOF (on F$^2$) 0.930
Final R indexes [I>=2σ (I)] R1 = 0.0391, wR2 = 0.1211
Final R indexes [all data] R1 = 0.0568, wR2 = 0.1311
Largest diff. peak and hole (e Å $^{-3}$) 0.764/-0.635



**For 6a:**

Empirical formula C14.67 H14.33 N O
Formula weight 220.60
Temperature (K) 296(2)
Crystal system triclinic
Space group P-1
a (Å ) 9.9514(2)
b (Å ) 12.1514(3)
c (Å ) 16.6468(3)
α(°) 109.6120(10)
β(°) 93.8450(10)
γ(°) 106.0740(10)
Volume (Å $^3$) 1793.39(7)
Z 6
Dcalcd (g cm$^3$) = 1.226
μ(mm$^{-1}$) = 0.077
F (000) = 704
Theta range for data collection 1.85 to 24.99
Index ranges -11<=h<=11, -14<=k<=14, -19<=l<=19
Reflections collected 18484
Independent reflections 6299 [R(int) = 0.0199]
Data/restraints/parameters 6299/1/451
GOF (on F$^2$) 1.082
Final R indexes [I>=2σ (I)] R1 = 0.0504, wR2 = 0.1354
Final R indexes [all data] R1 = 0.0590, wR2 = 0.1425
Largest diff. peak and hole (e Å $^{-3}$) 0.584/-0.609