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Dioxane-Involving Reaction for the Synthesis of 3-Aryl-1-(2-(vinyloxy)ethoxy)-isoquinolines Catalyzed by AgOTf

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xswang1974@yahoo.com

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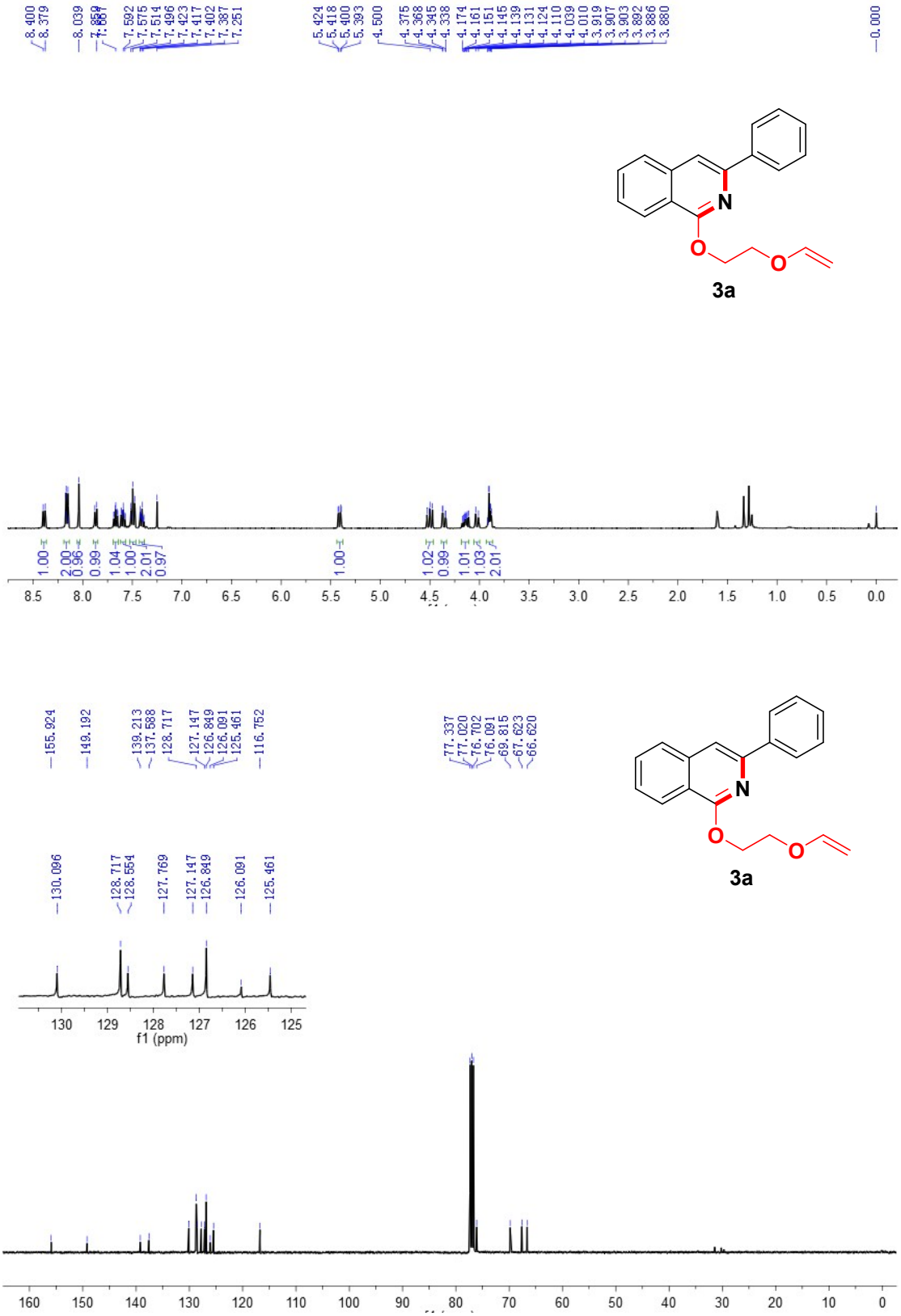
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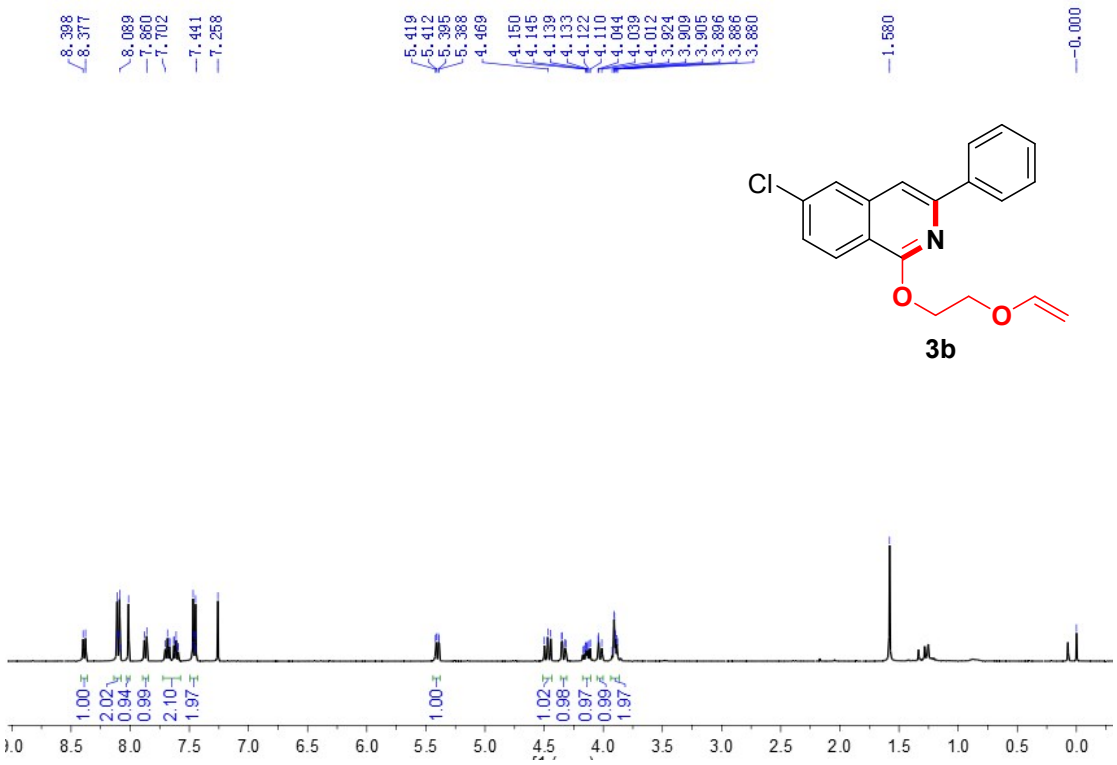
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O
O
3b
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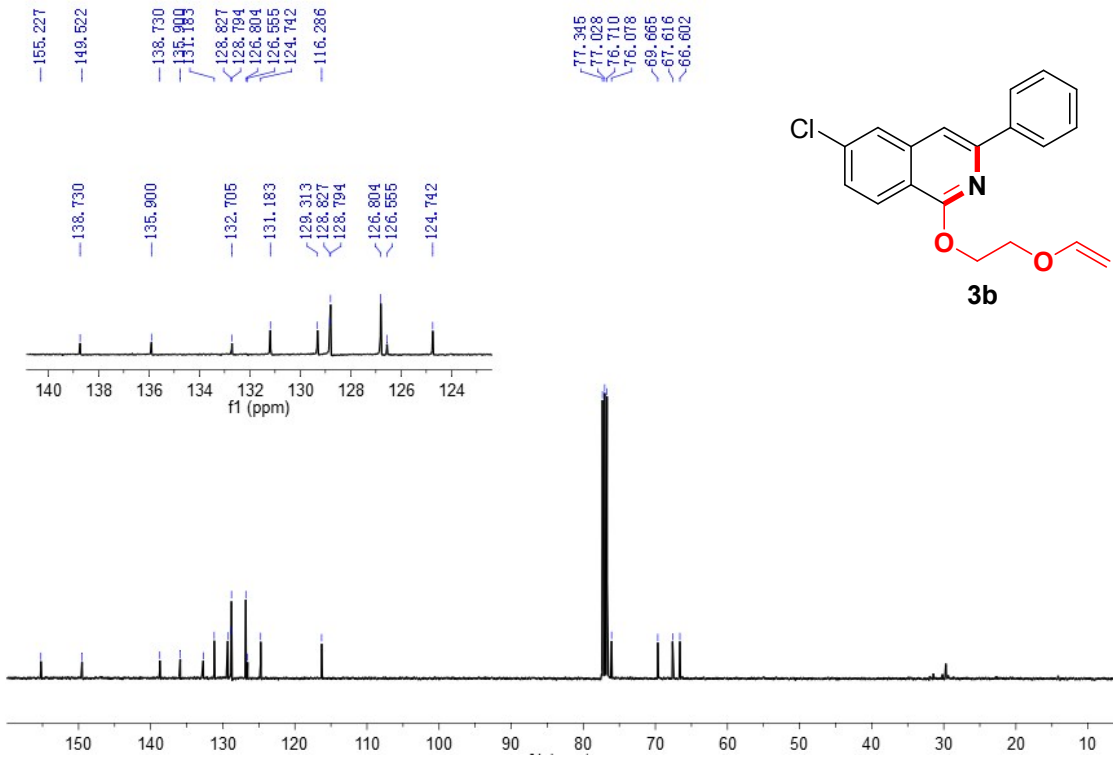
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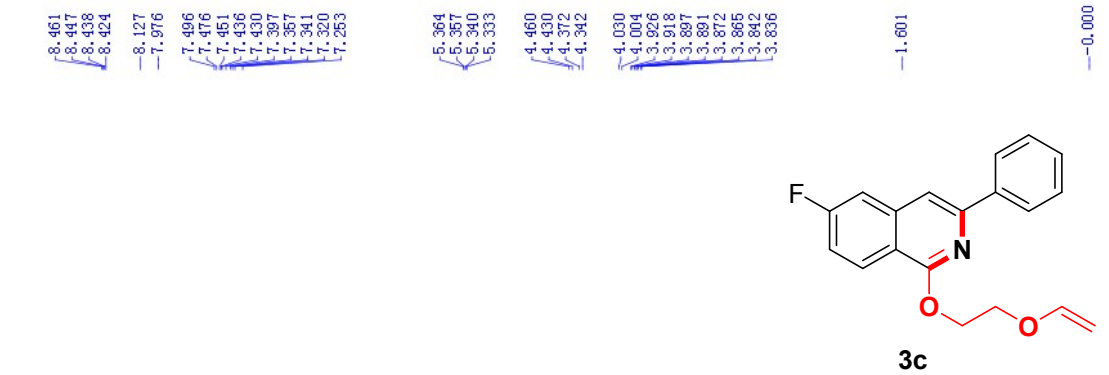
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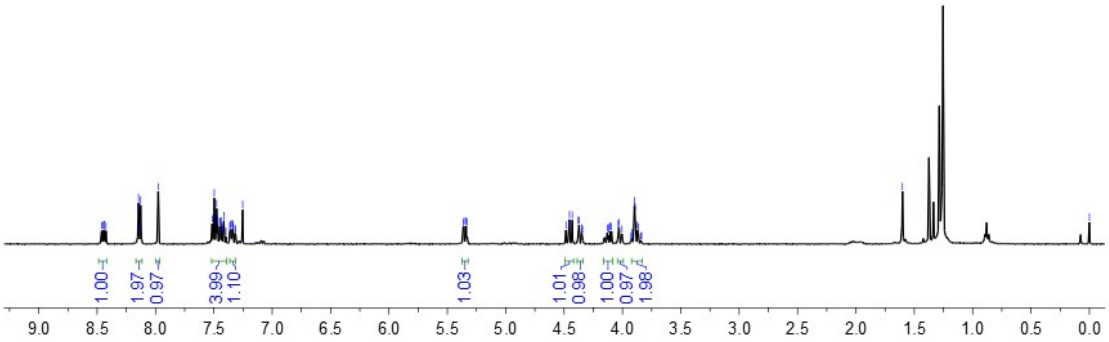

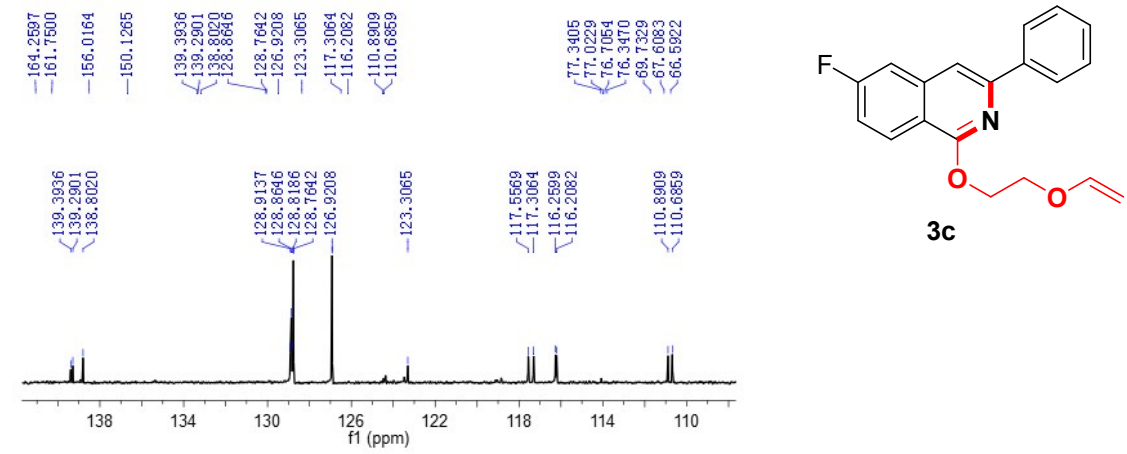
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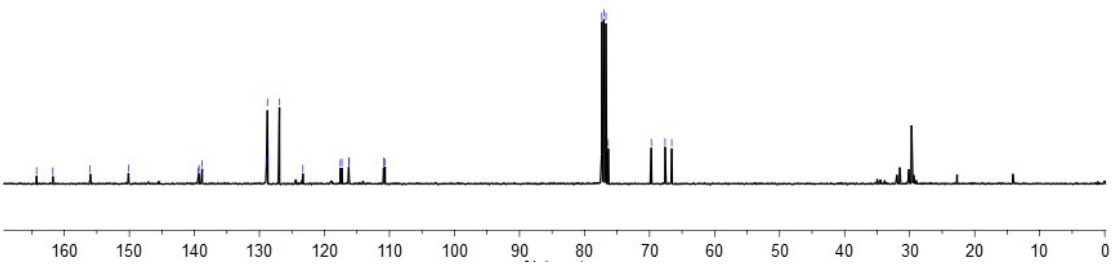
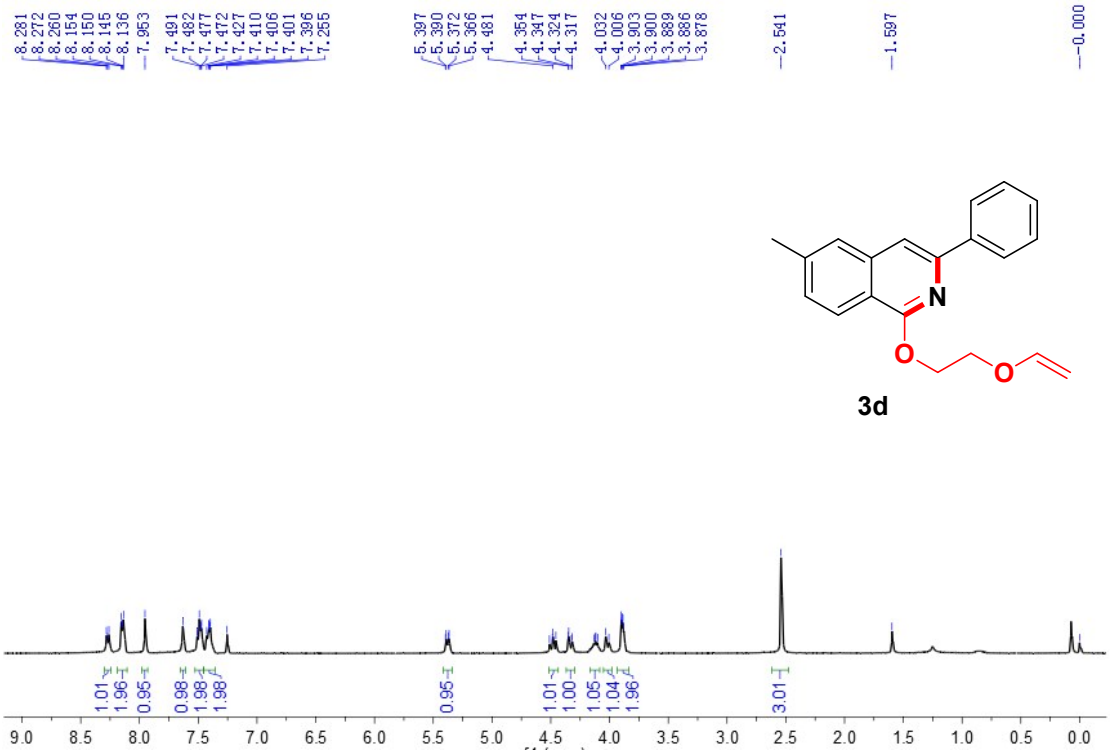
f1 (ppm)

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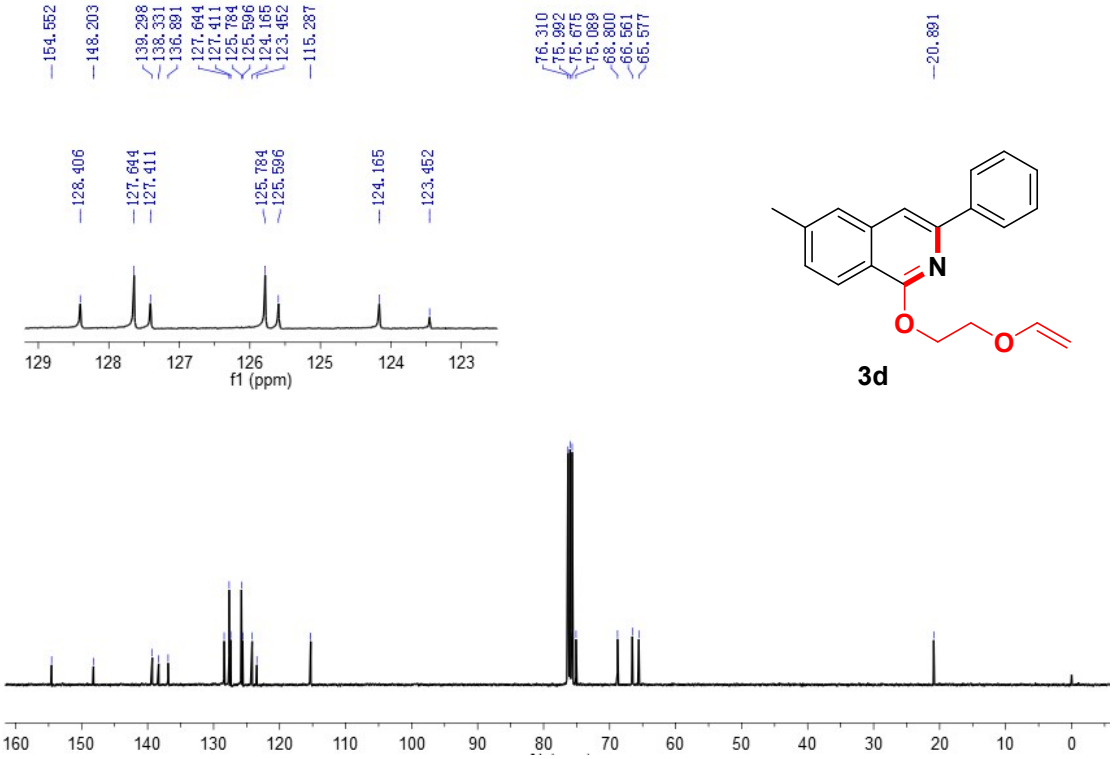
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129
128
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126
125
124
123
f1 (ppm)
N
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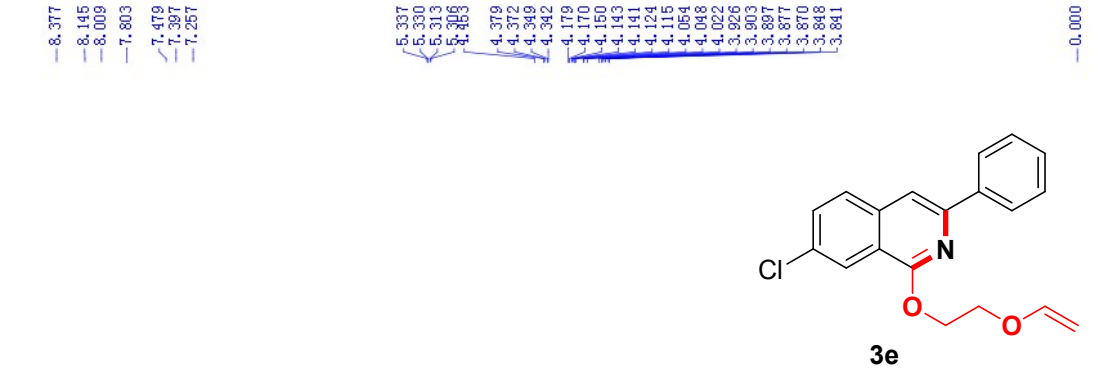
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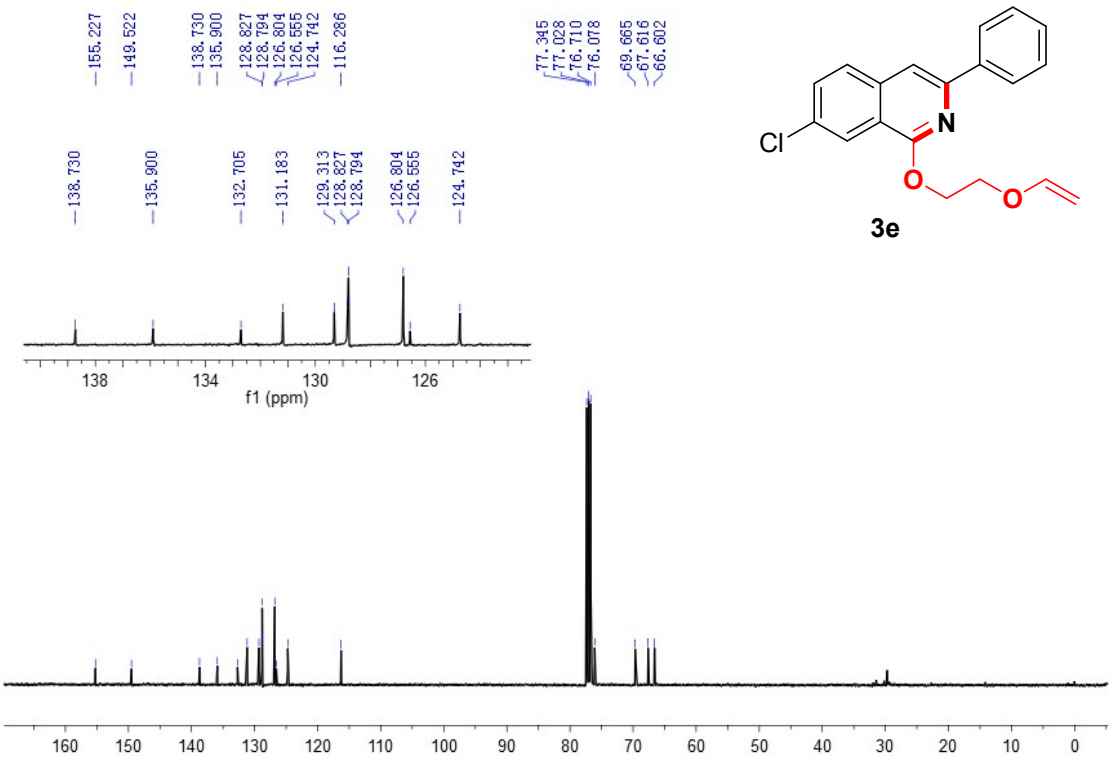
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128.794
126.804
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124.742
Cl
N
O
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138
134
130
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140
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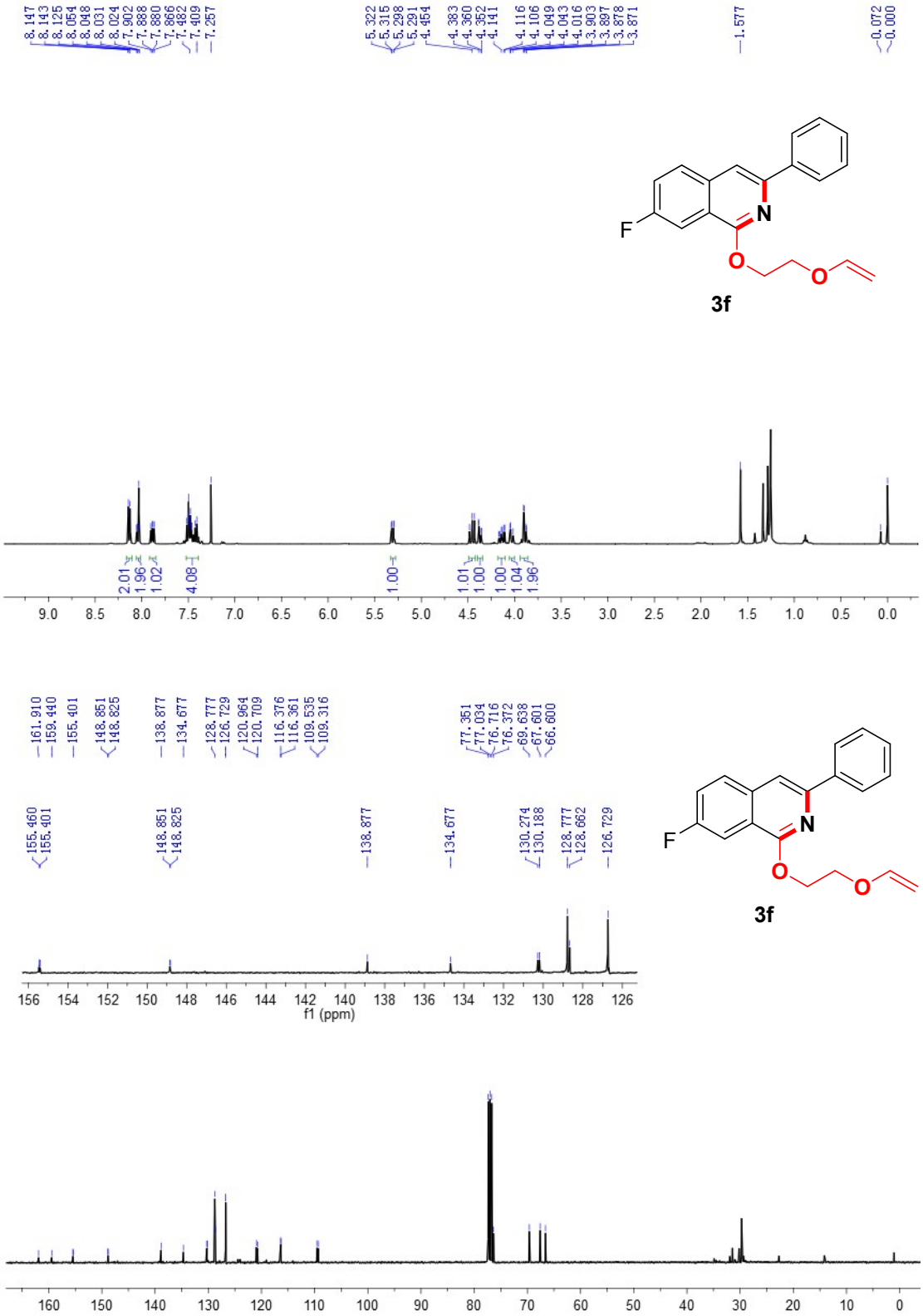
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128.777
128.662
126.729
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O
O
3f
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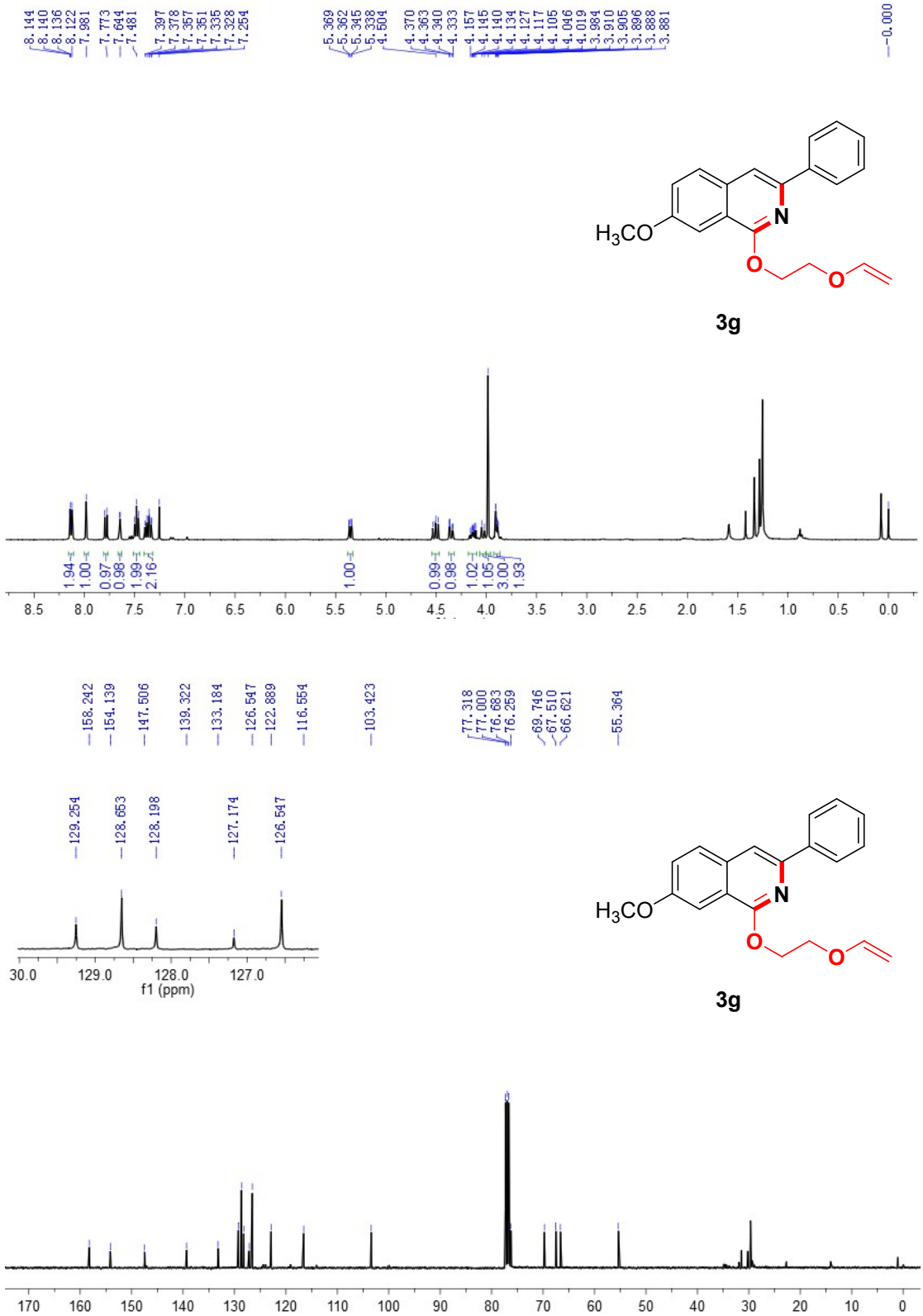
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3g
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128.0
127.0
f1 (ppm)
H3CO
N
O
O
3g
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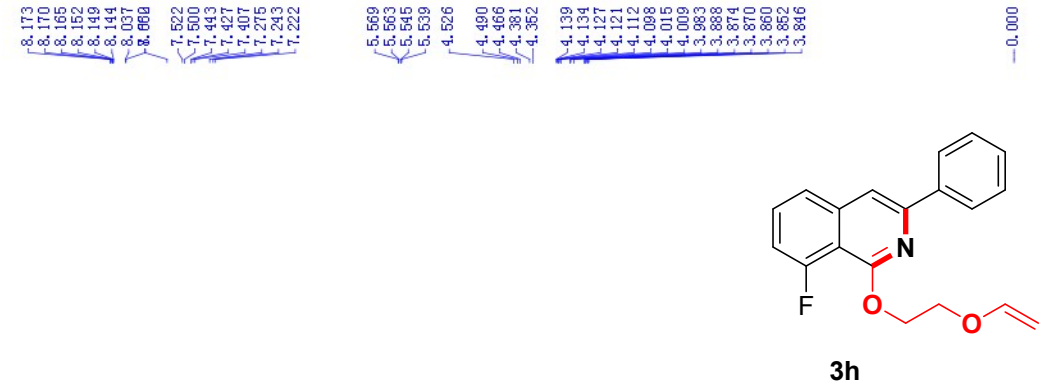
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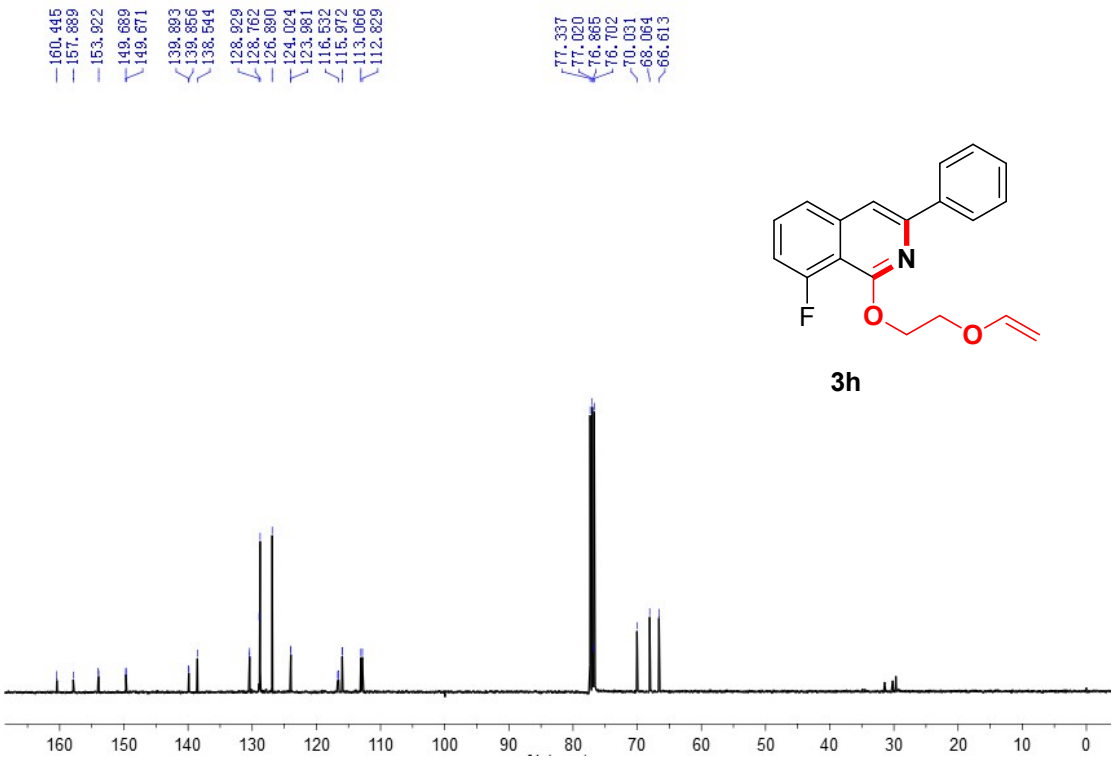
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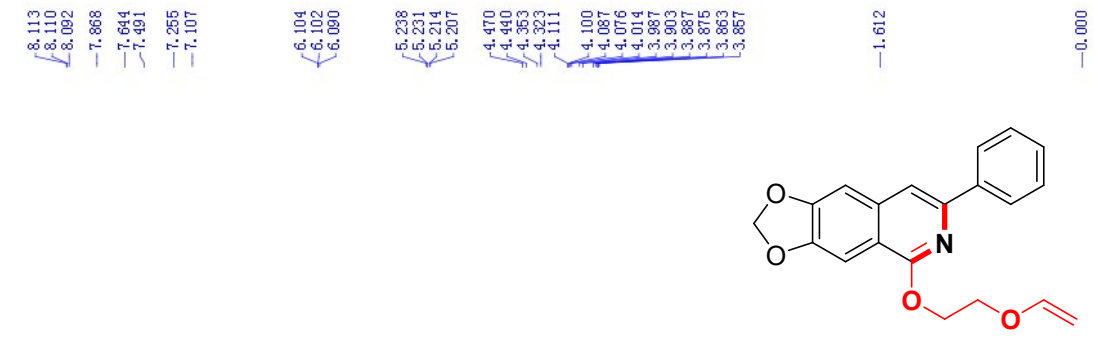
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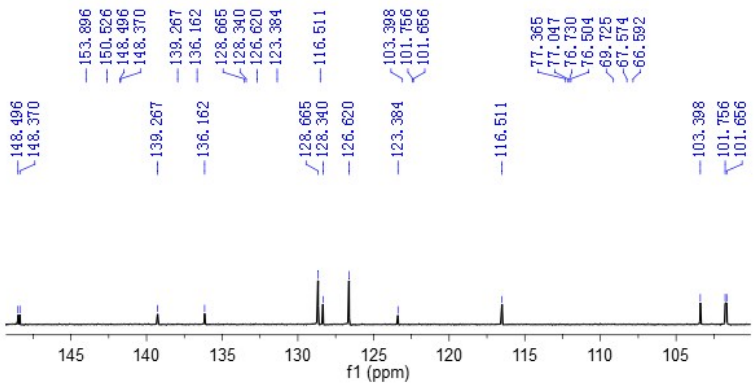
3i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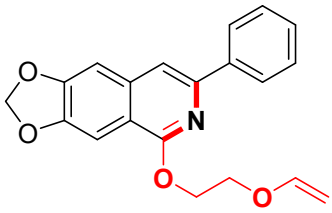
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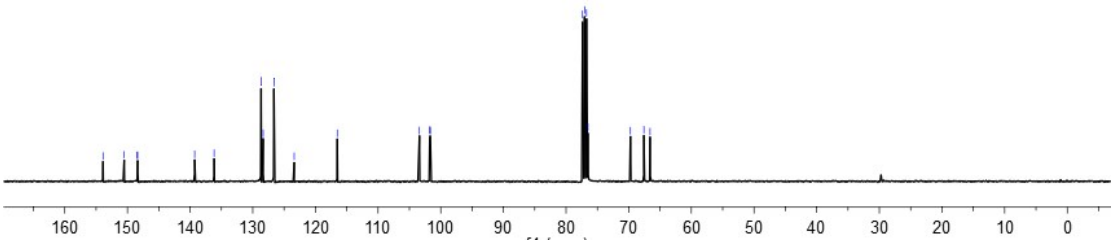
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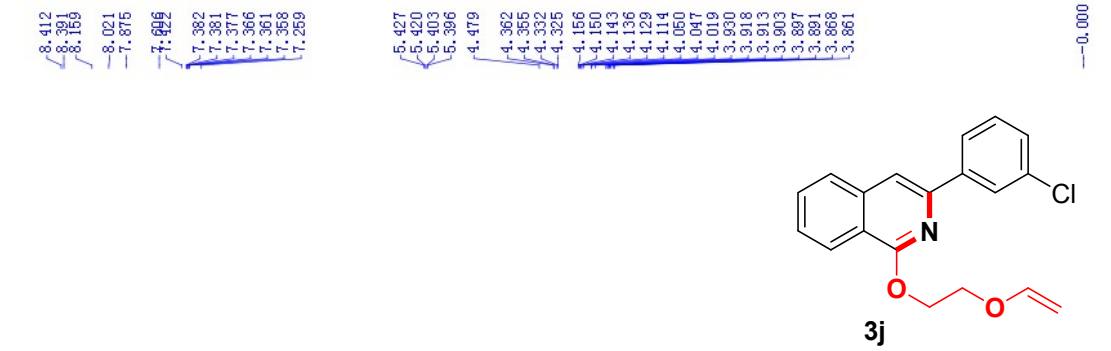
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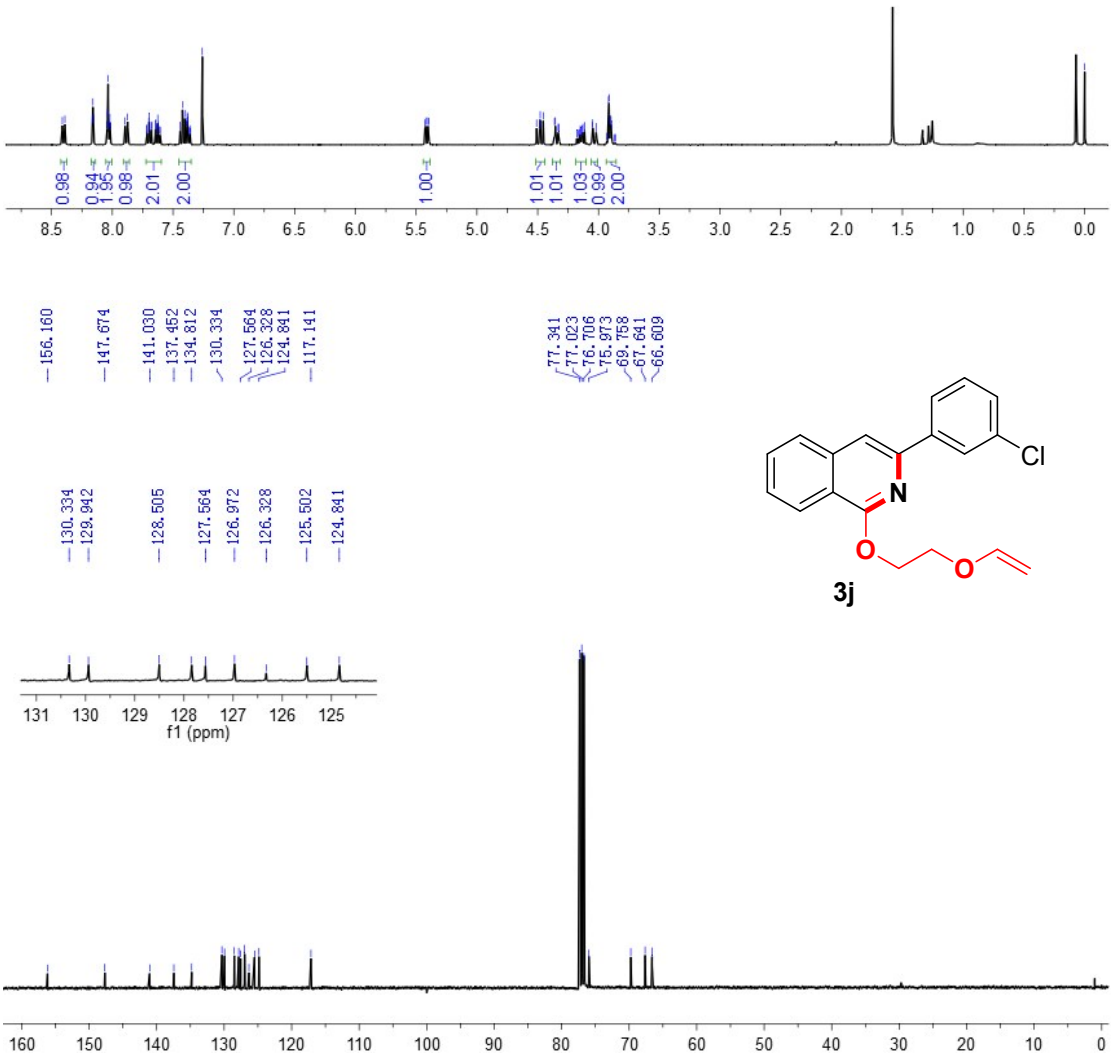
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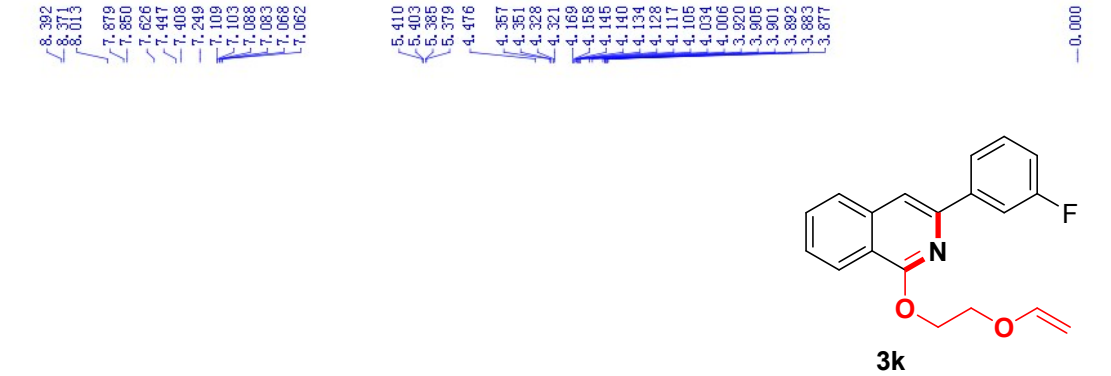
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F
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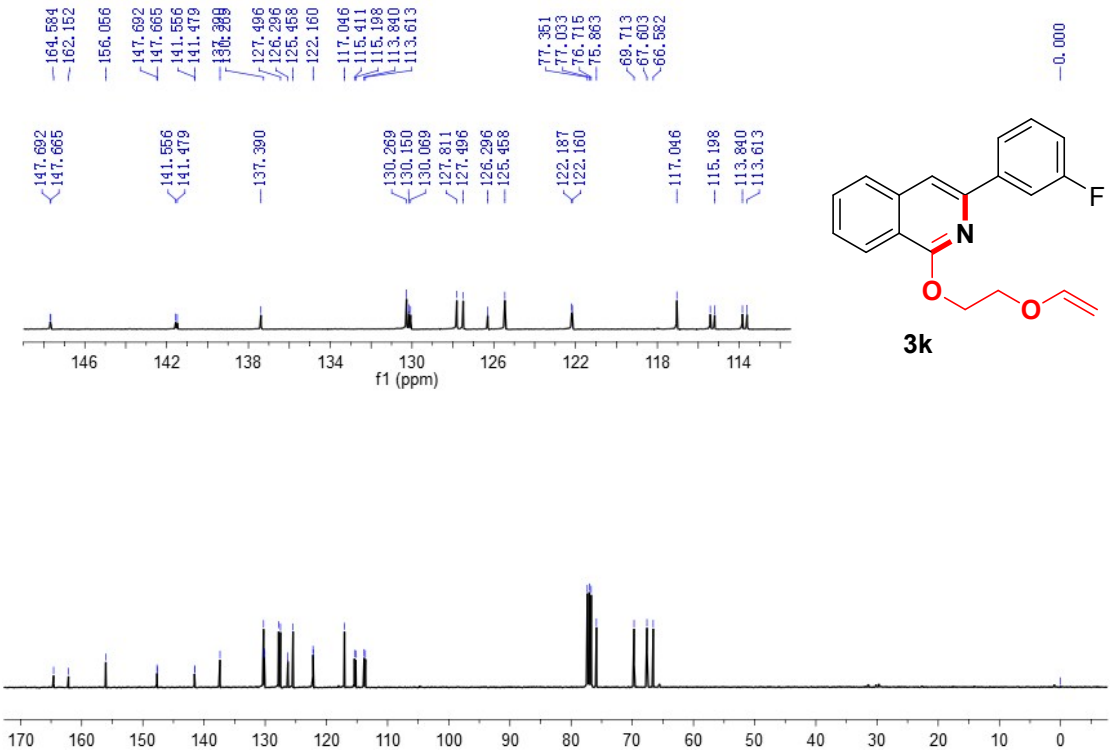
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75.863
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141.479
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113.840
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F
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3k
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138
134
130
126
122
118
114
f1 (ppm)
170
160
150
140
130
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80
70
60
50
40
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20
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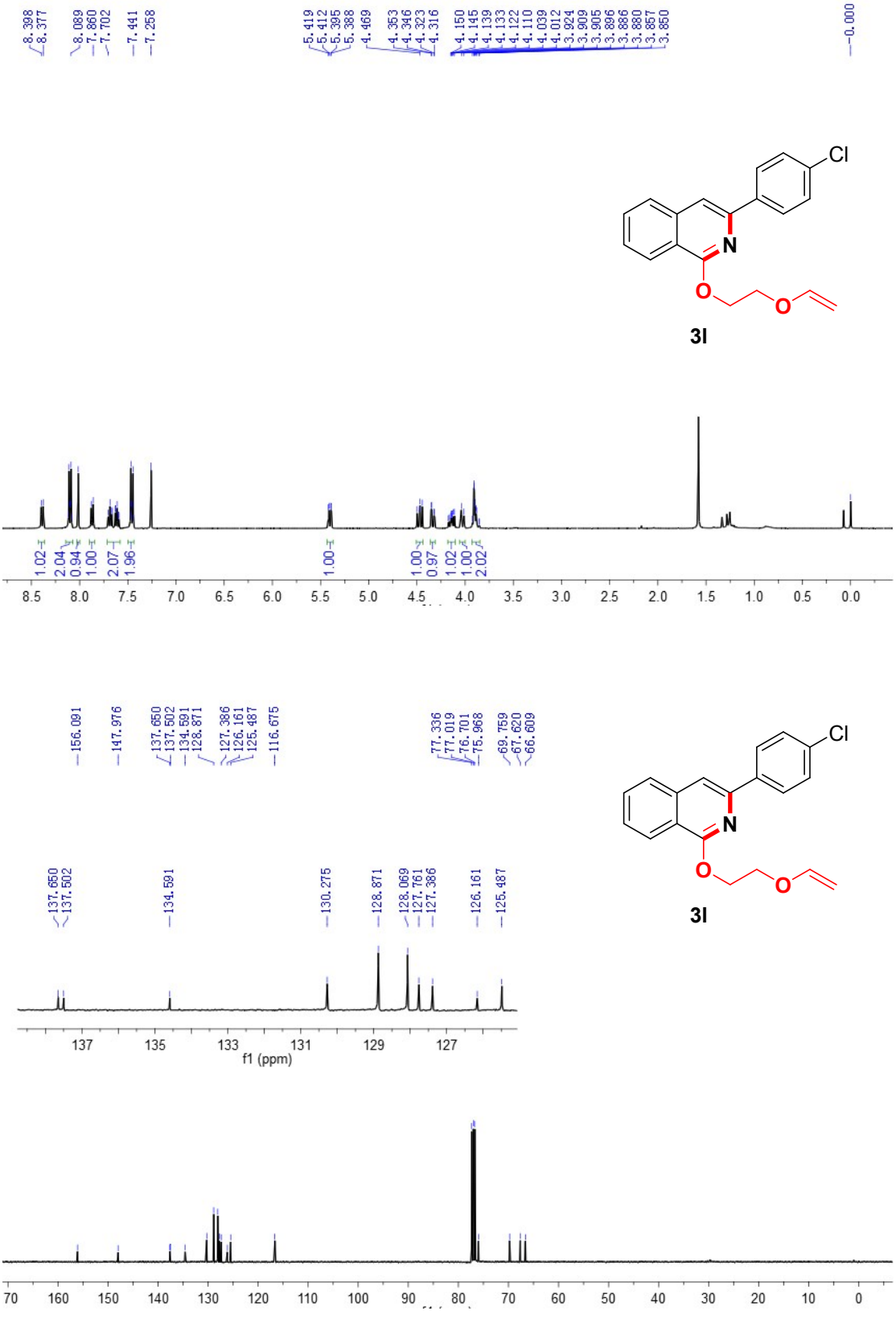
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4.353
4.346
4.323
4.316
4.150
4.145
4.139
4.133
4.122
4.110
4.039
4.012
3.924
3.909
3.905
3.896
3.886
3.880
3.857
3.850
0.000
Cl
N
O
O
3l
1.02
2.04
0.94
1.00
2.07
1.96
1.00
1.00
0.97
1.02
1.00
2.02
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
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137.502
134.591
128.871
127.386
126.161
125.487
116.675
77.336
77.019
76.701
75.968
69.759
67.620
66.609
Cl
N
O
O
3l
137.650
137.502
134.591
130.275
128.871
128.069
127.761
127.386
126.161
125.487
137
135
133
131
129
127
f1 (ppm)
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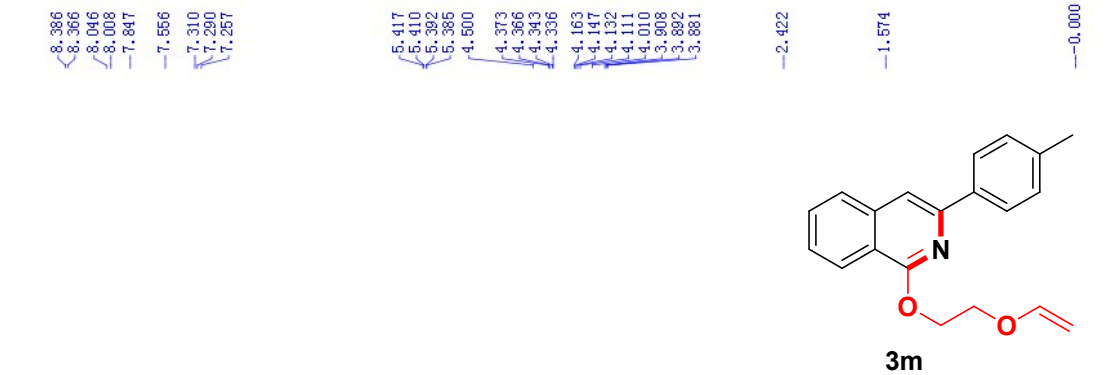
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0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4.500
4.373
4.366
4.343
4.336
4.163
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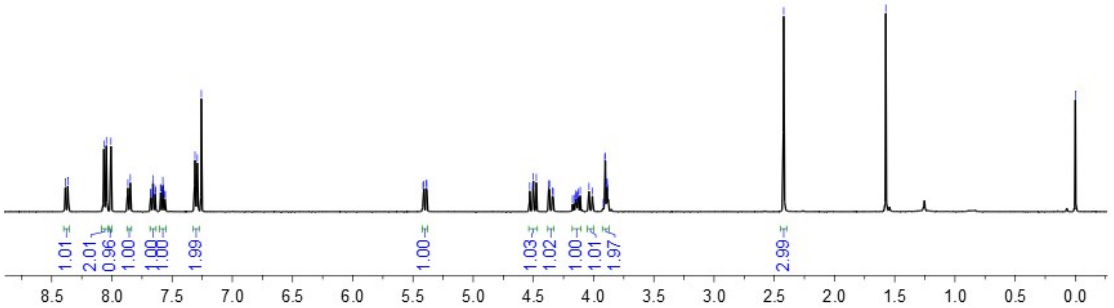
O
O
3m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2.01
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1.00
1.99
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1.02
1.00
1.01
1.97
2.99
8.5
8.0
7.5
7.0
6.5
6.0
5.5
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4.5
4.0
3.5
3.0
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2.0
1.5
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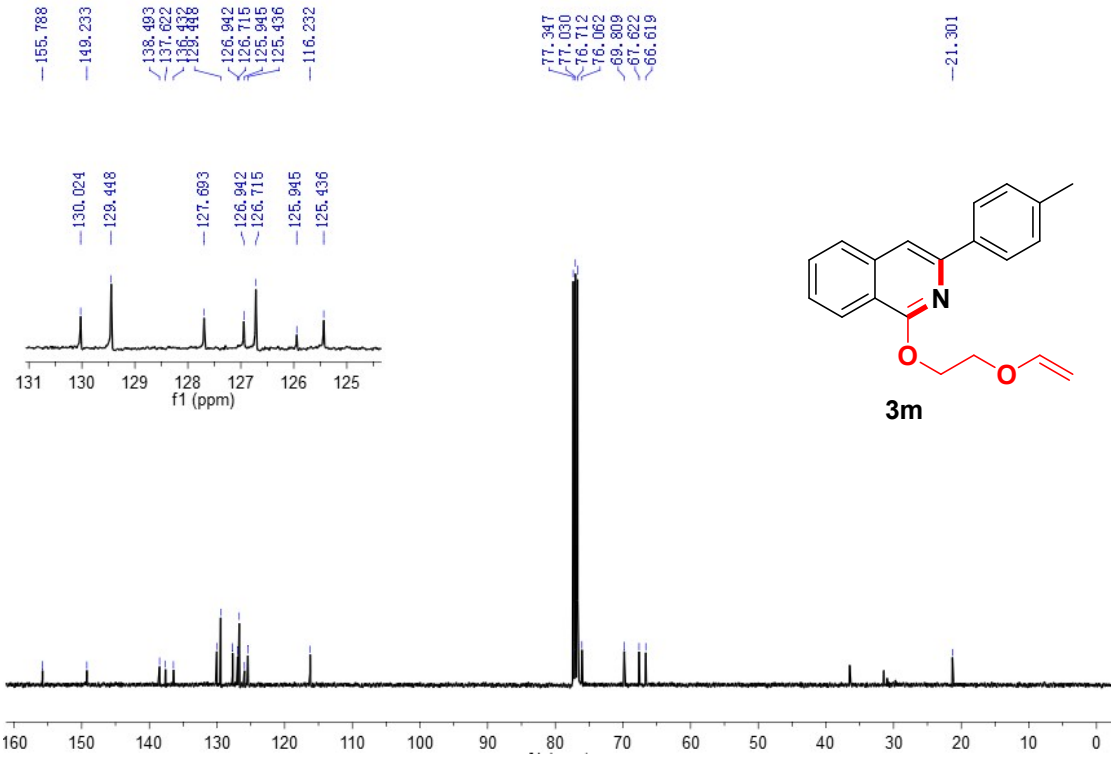
0.0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126.715
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125.436
116.232
77.347
77.030
76.712
76.062
69.809
67.622
66.619
21.301
130.024
129.448
127.693
126.942
126.715
125.945
125.436
131
130
129
128
127
126
125
f1 (ppm)
N
O
O
3m
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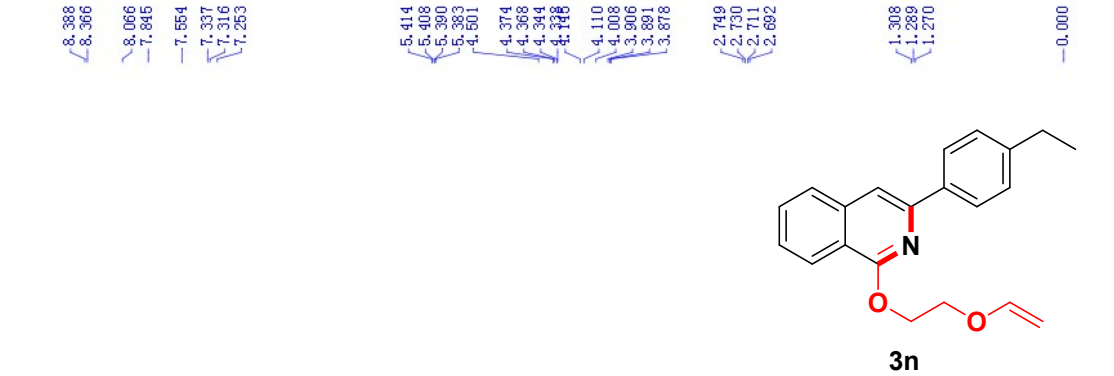
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0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7.253
5.414
5.408
5.390
5.383
4.501
4.374
4.368
4.344
4.110
4.008
3.906
3.891
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2.730
2.711
2.692
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1.270
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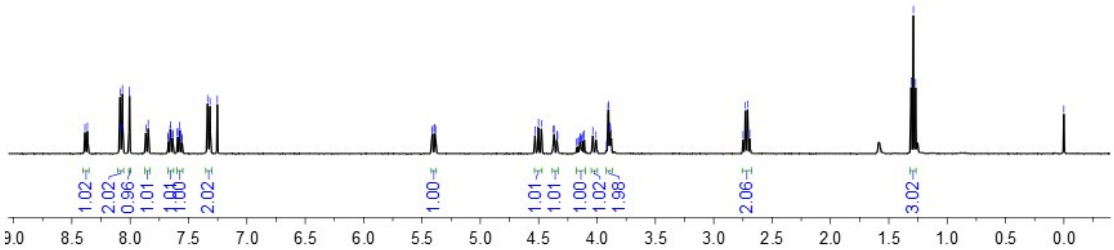
O
O

3n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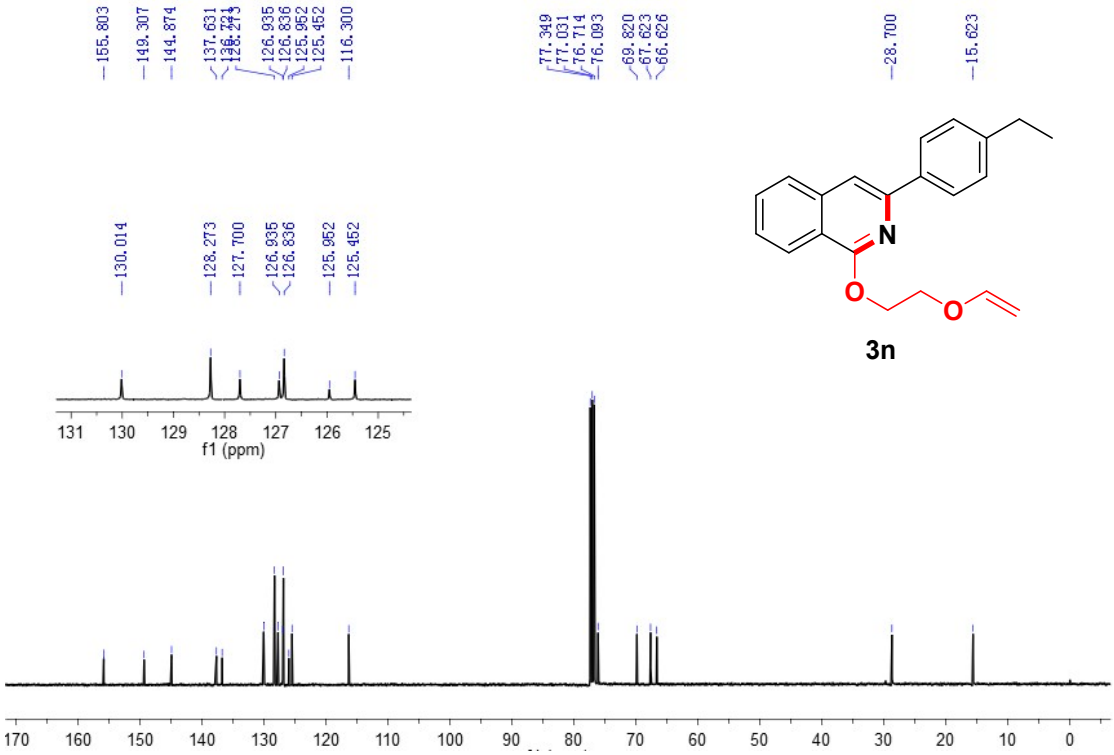
2.02
0.96
1.01
2.02
1.00
1.01
1.01
1.00
1.02
1.98
2.06
3.02
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0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144.874
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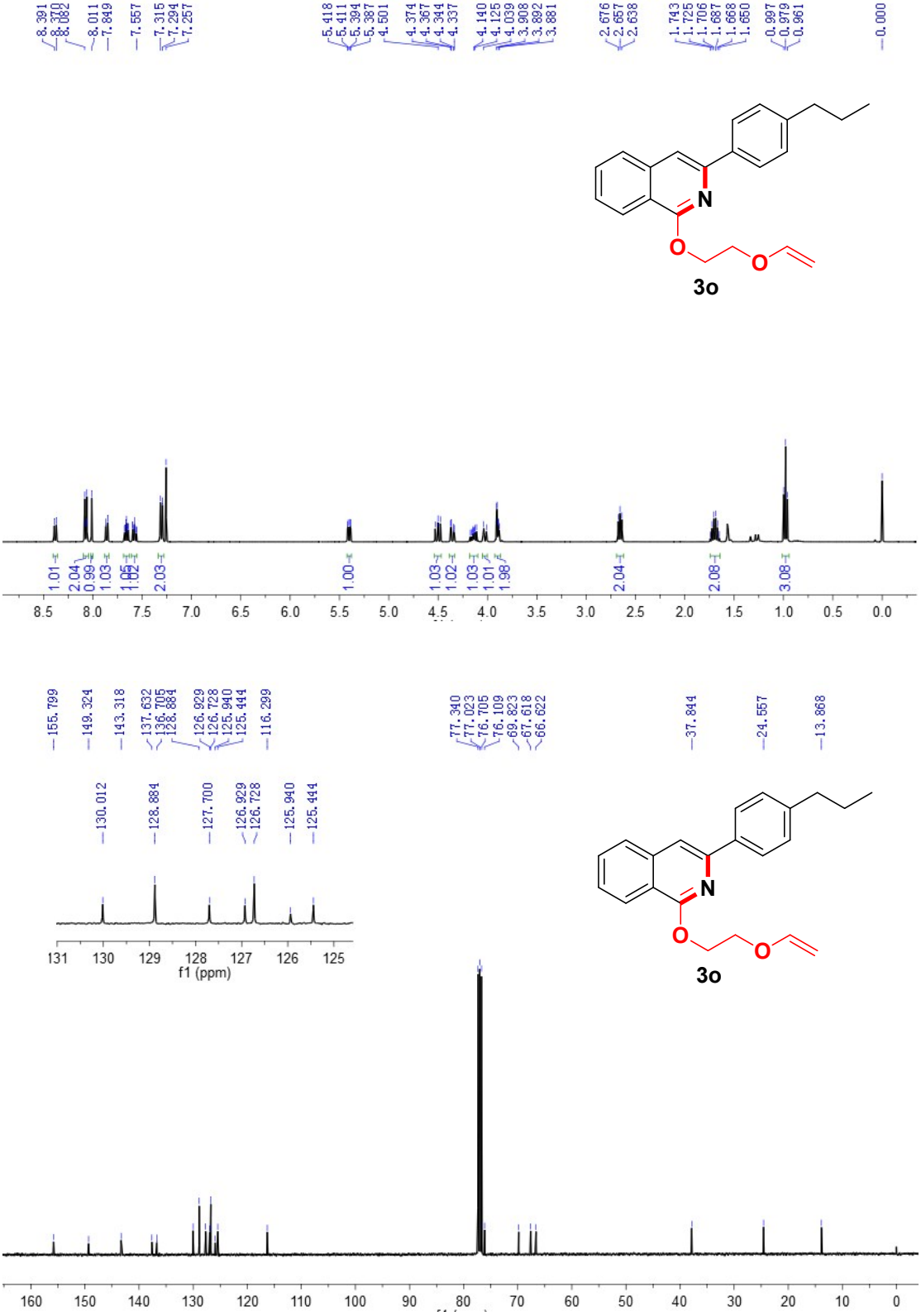
126.836
125.952
125.452
116.300
77.349
77.031
76.714
76.093
69.820
67.623
66.626
28.700
15.623
130.014
128.273
127.700
126.935
126.836
125.952
125.452
131
130
129
128
127
126
125
f1 (ppm)
N
O
O

3n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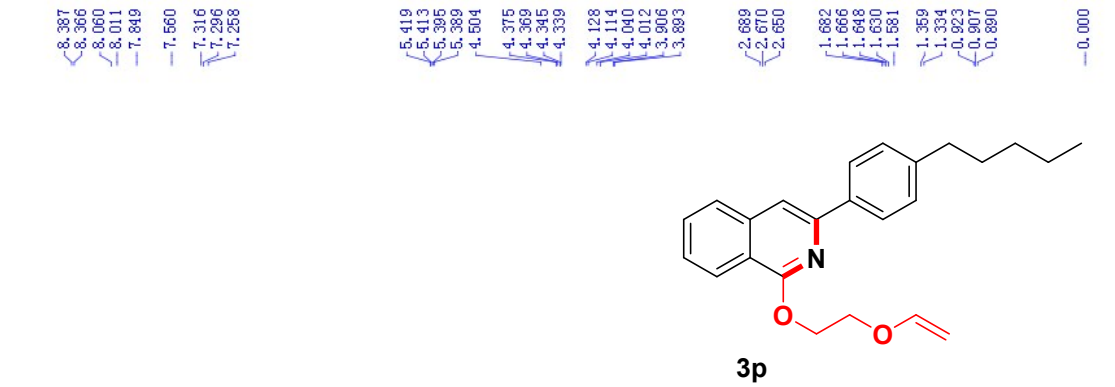
7.294
7.257
5.418
5.411
5.394
5.387
4.501
4.374
4.367
4.344
4.337
4.140
4.125
4.039
3.908
3.892
3.881
2.676
2.657
2.638
1.743
1.725
1.706
1.687
1.668
1.650
0.997
0.979
0.961
0.000
N
O
O
3o
1.01
2.04
0.99
1.03
2.03
1.00
1.03
1.02
1.03
1.01
1.98
2.04
2.08
3.08
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
155.799
149.324
143.318
137.632
136.705
128.884
126.929
126.728
125.940
125.444
116.299
77.340
77.023
76.705
76.109
69.823
67.618
66.622
37.844
24.557
13.868
130.012
128.884
127.700
126.929
126.728
125.940
125.444
131
130
129
128
127
126
125
f1 (ppm)
N
O
O
3o
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0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7.258
5.419
5.413
5.396
5.389
4.504
4.375
4.369
4.345
4.339
4.128
4.114
4.040
4.012
3.906
3.893
2.689
2.670
2.650
1.682
1.666
1.648
1.630
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1.359
1.334
0.923
0.907
0.890
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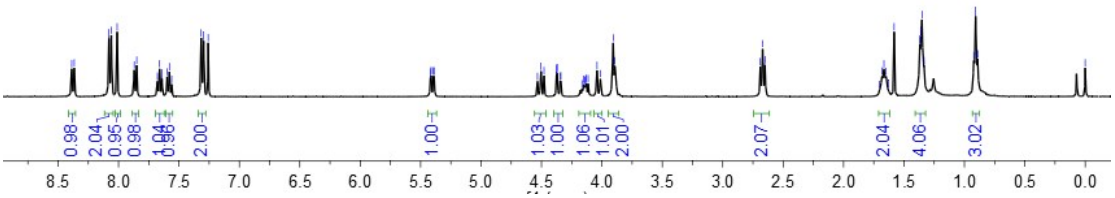
N
O
O
3p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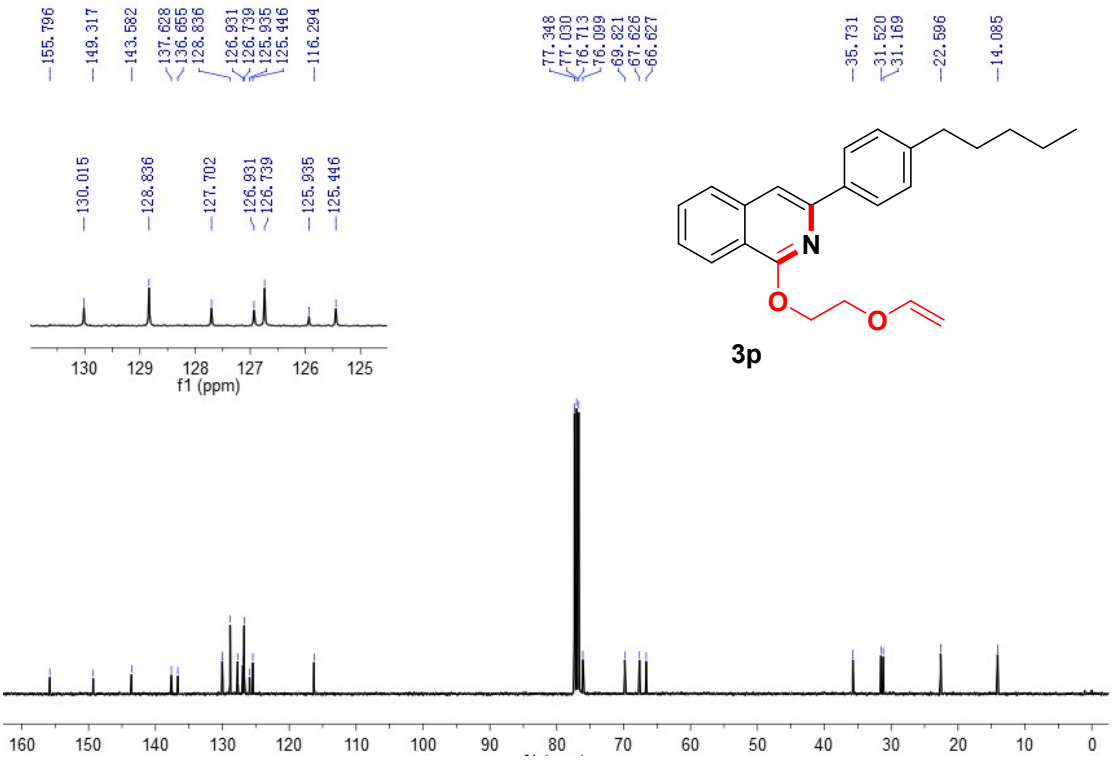
1.03
1.00
1.06
1.01
2.00
2.07
2.04
4.06
3.02
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0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77.348
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76.713
76.099
69.821
67.626
66.627
35.731
31.520
31.169
22.596
14.085
130.015
128.836
127.702
126.931
126.739
125.935
125.446
130
129
128
127
126
125
f1 (ppm)
N
O
O
3p
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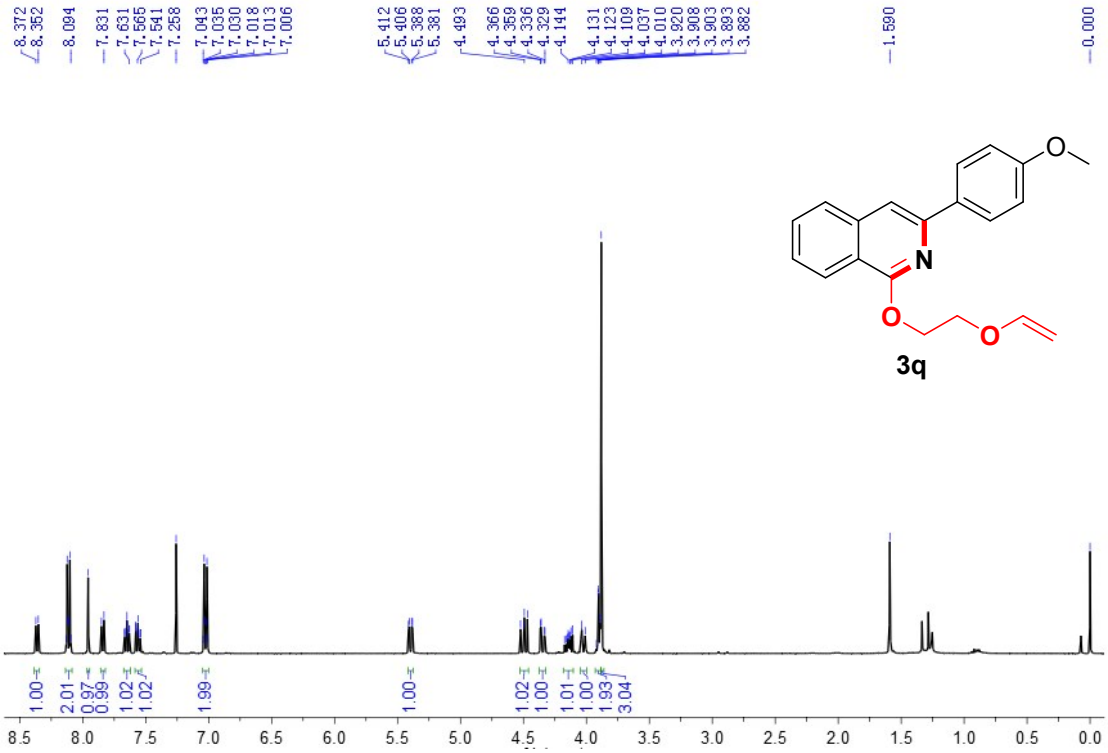
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0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7.043
7.035
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7.018
7.013
7.006
5.412
5.406
5.388
5.381
4.493
4.366
4.359
4.336
4.329
4.144
4.131
4.123
4.109
4.037
4.010
3.920
3.908
3.903
3.893
3.882
1.590
0.000
N
O
O
O
3q
1.00
2.01
0.97
0.99
1.02
1.02
1.99
1.00
1.02
1.00
1.01
1.00
1.93
3.04
8.5
8.0
7.5
7.0
6.5
6.0
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3.0
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2.0
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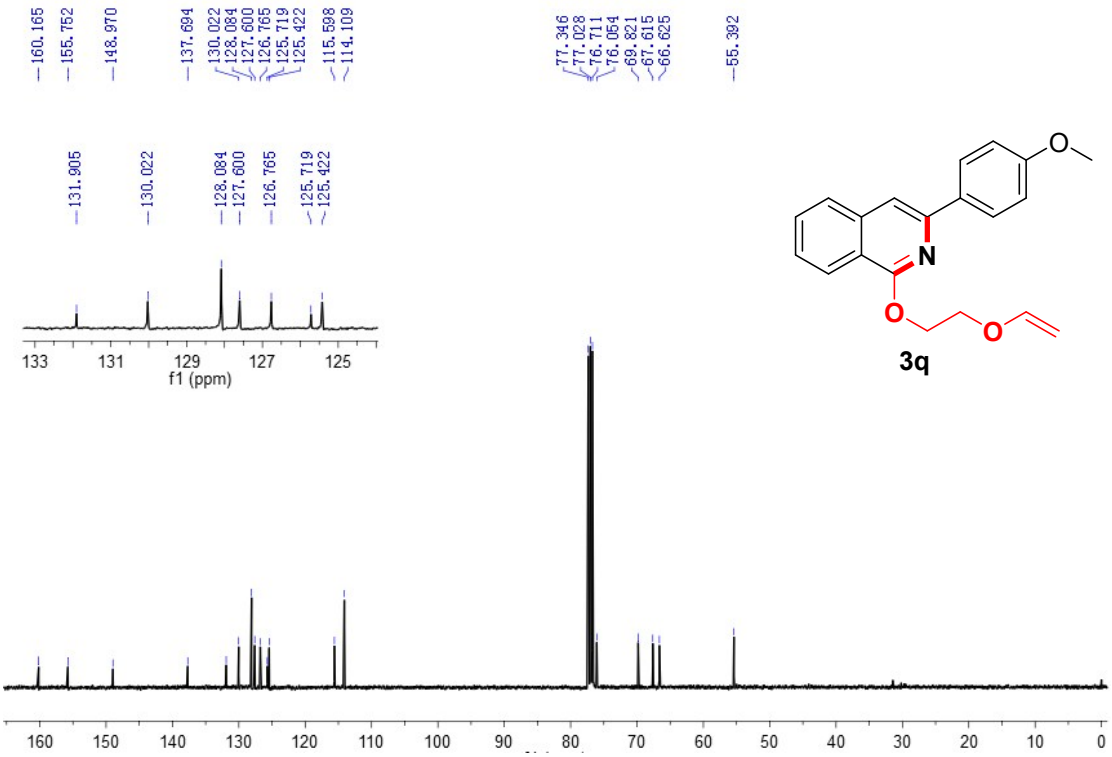
0.5
0.0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125.422
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114.109
77.346
77.028
76.711
76.054
69.821
67.615
66.625
55.392
131.905
130.022
128.084
127.600
126.765
125.719
125.422
133
131
129
127
125
f1 (ppm)
N
O
O
O
3q
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150
140
130
120
110
100
90
80
70
60
50
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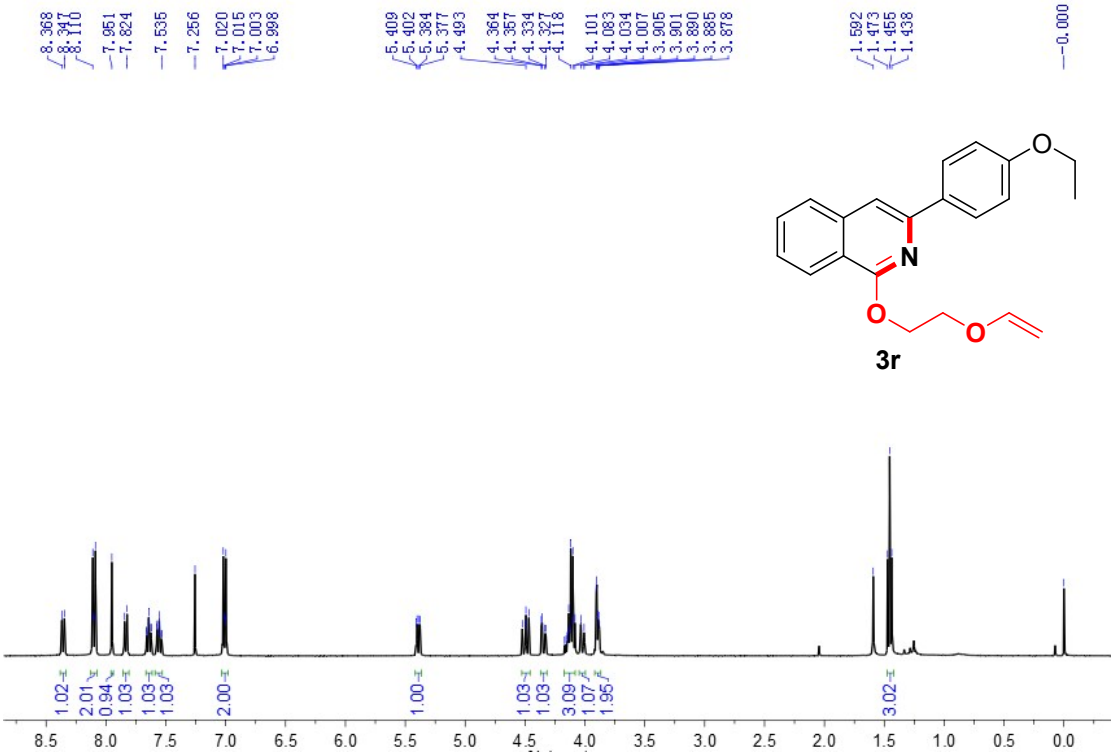
30
20
10
0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4.118
4.101
4.083
4.034
4.007
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3.901
3.890
3.885
3.878
1.592
1.473
1.455
1.438
0.000
N
O
O
O
3r
1.02
2.01
0.94
1.03
1.03
1.03
2.00
1.00
1.03
1.03
3.09
1.07
1.95
3.02
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7.0
6.5
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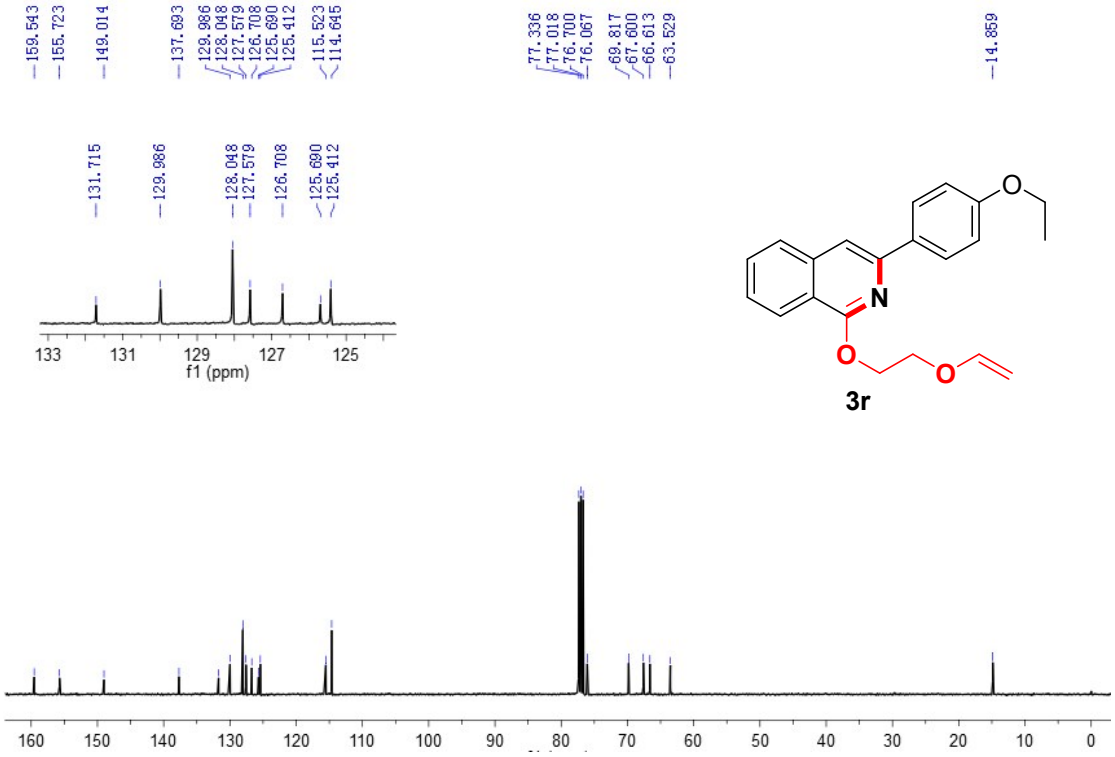
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115.523
114.645
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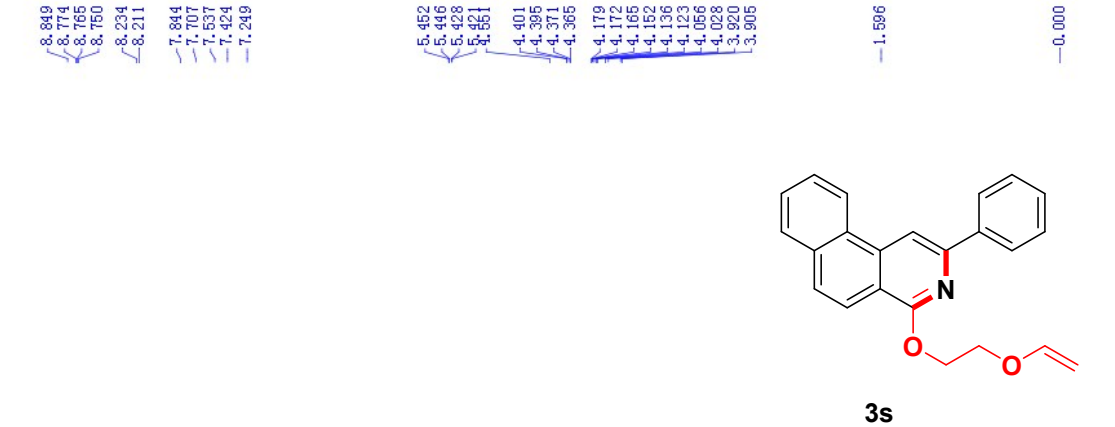
77.018
76.700
76.067
69.817
67.600
66.613
63.529
14.859
131.715
129.986
128.048
127.579
126.708
125.690
125.412
133
131
129
127
125
f1 (ppm)
N
O
O
O
3r
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0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5.446
5.428
5.421
5.561
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4.395
4.371
4.365
4.179
4.172
4.165
4.152
4.136
4.123
4.056
4.028
3.920
3.905
1.596
0.000
1.04
1.02
3.07
1.05
0.97
2.00
2.00
0.99
1.00
1.03
1.01
1.02
1.04
2.03
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
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3.0
2.5
2.0
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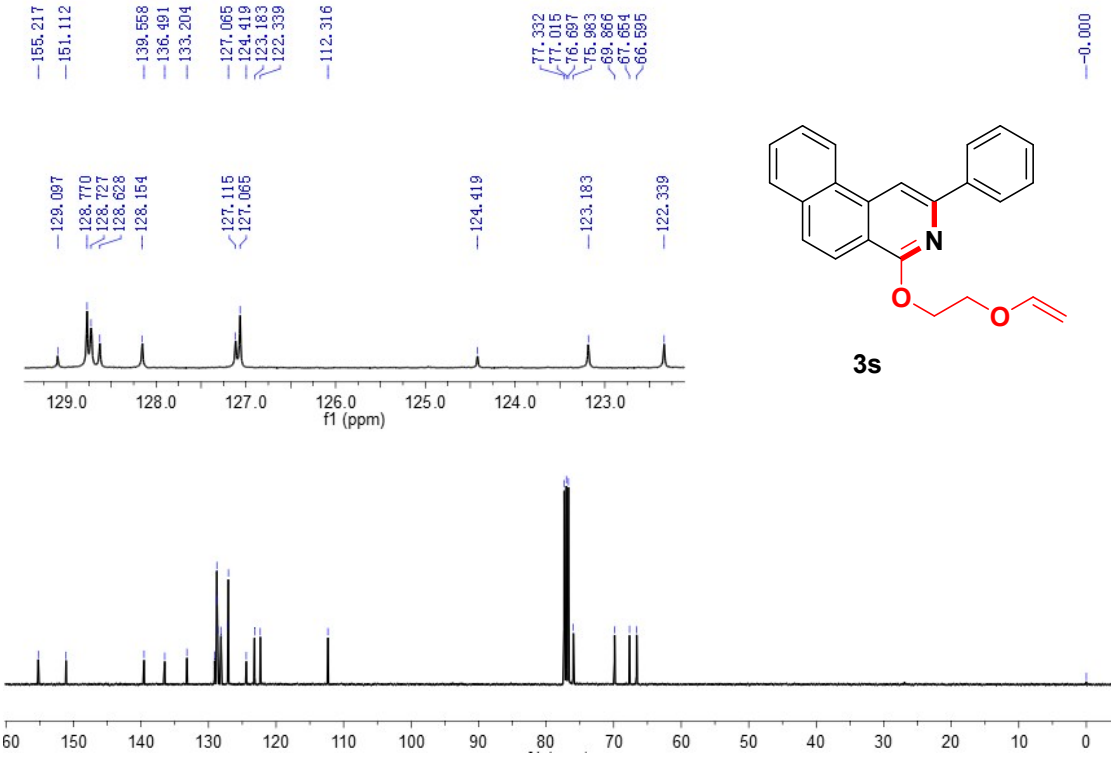
0.5
0.0

N
O
O

3s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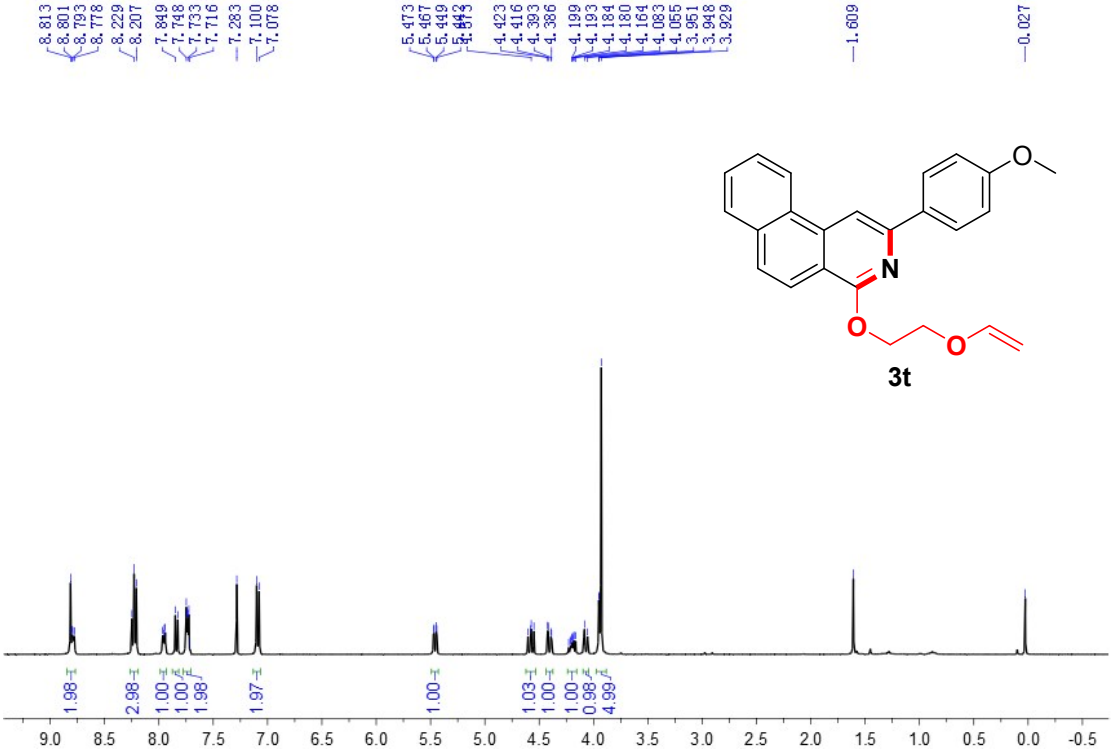
77.015
76.697
75.983
69.866
67.654
66.595
0.000
129.097
128.770
128.727
128.628
128.154
127.115
127.065
124.419
123.183
122.339
129.0
128.0
127.0
126.0
125.0
124.0
123.0
f1 (ppm)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

N
O
O

3s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7.078
5.473
5.467
5.449
4.423
4.416
4.393
4.386
4.199
4.193
4.184
4.180
4.164
4.083
4.055
3.951
3.948
3.929
1.609
0.027
O
N
O
O
3t
1.98
2.98
1.00
1.00
1.98
1.97
1.00
1.03
1.00
1.00
0.98
4.99
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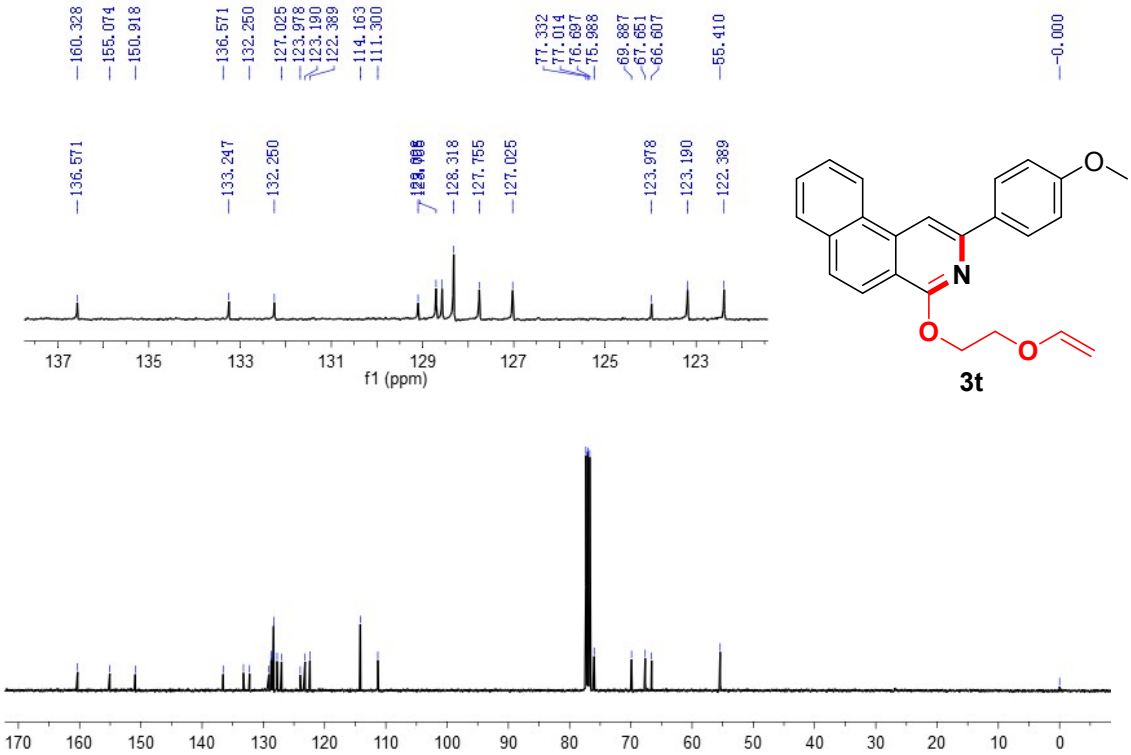
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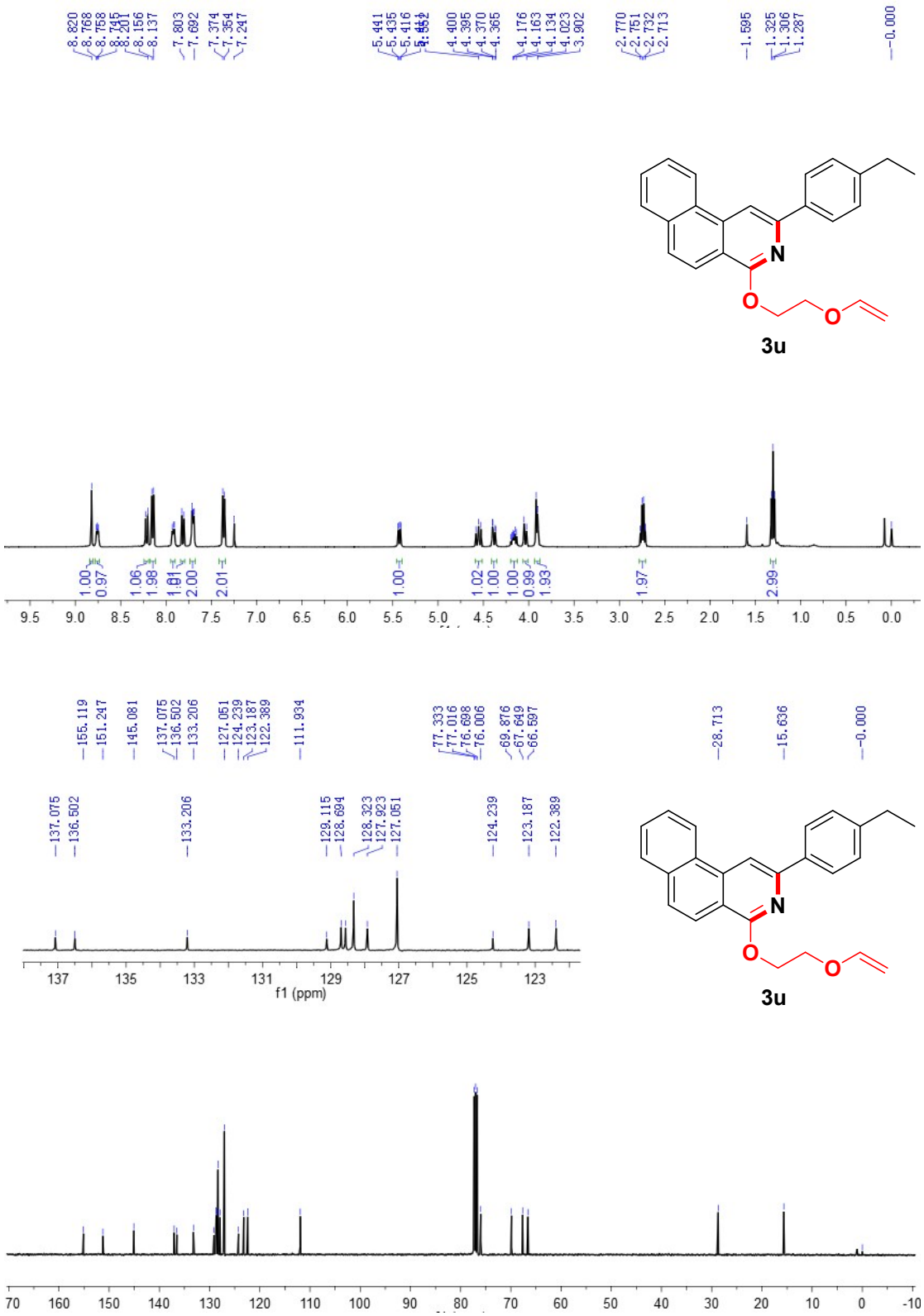
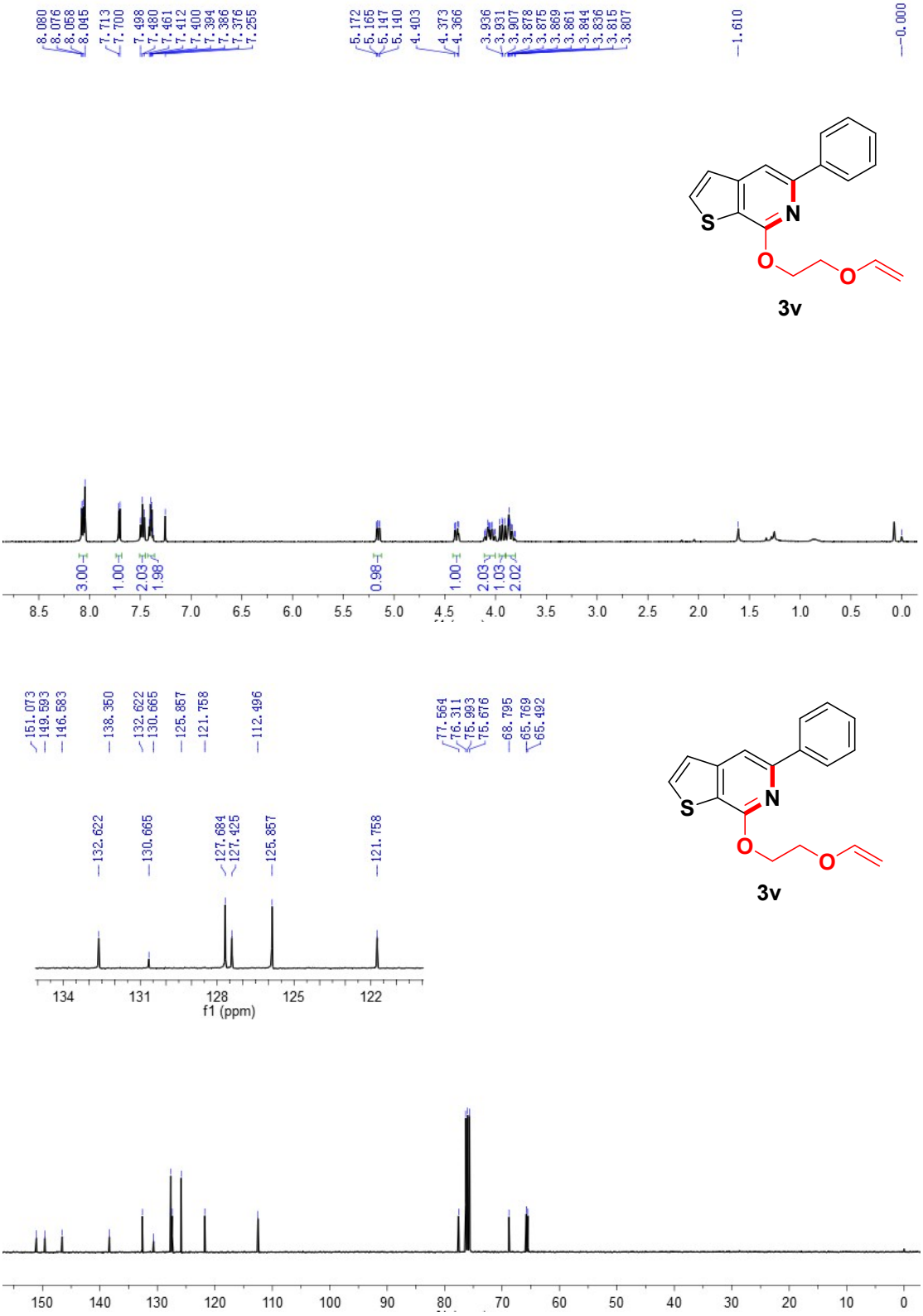
136.571
132.250
127.025
123.978
123.190
122.389
114.163
111.300
77.332
77.014
76.697
76.988
69.887
67.651
66.607
55.410
0.000
136.571
133.247
132.250
128.318
127.755
127.025
123.978
123.190
122.389
137 135 133 131 129 127 125 123
f1 (ppm)
O
N
O
O
3t
170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0


3u
3u
f1 (ppm)


8.080
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7.386
7.376
7.255
5.172
5.165
5.147
5.140
4.403
4.373
4.366
3.936
3.931
3.907
3.878
3.875
3.869
3.861
3.844
3.836
3.815
3.807
1.610
0.000
S
N
O
O
3v
3.00
1.00
2.03
1.98
0.98
1.00
2.03
1.03
2.02
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
151.073
149.593
146.583
138.350
132.622
130.665
125.857
121.758
112.496
77.564
76.311
75.993
75.676
68.795
65.769
65.492
132.622
130.665
127.684
127.425
125.857
121.758
134
131
128
125
122
f1 (ppm)
S
N
O
O
3v
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140
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120
110
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90
80
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60
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10
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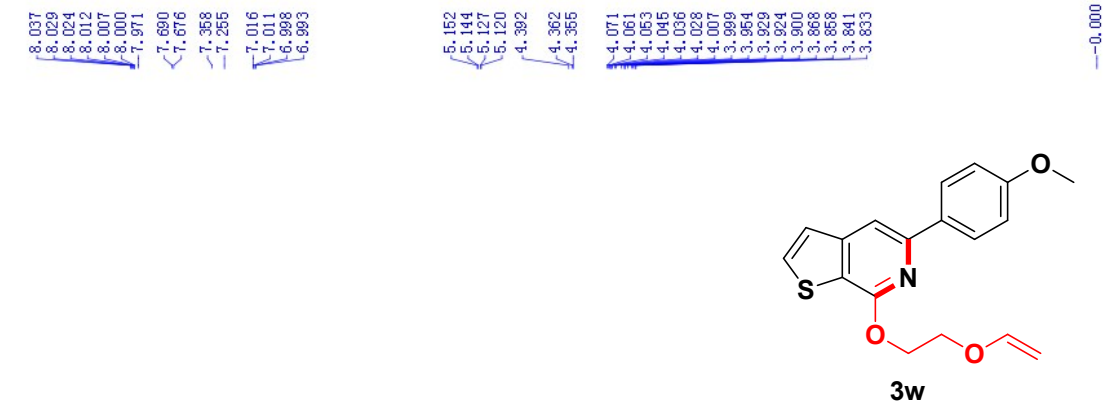
8.037
8.029
8.024
8.012
8.007
8.000
7.971
7.690
7.676
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7.255
7.016
7.011
6.998
6.993
5.152
5.144
5.127
5.120
4.392
4.362
4.355
4.071
4.061
4.053
4.045
4.036
4.028
4.007
3.999
3.954
3.929
3.924
3.900
3.868
3.858
3.841
3.833
0.000
O
N
S
O
O
3w
2.02
0.98
0.96
1.09
2.01
1.00
0.99
2.00
4.96
9.0
8.5
8.0
7.5
7.0
6.5
6.0
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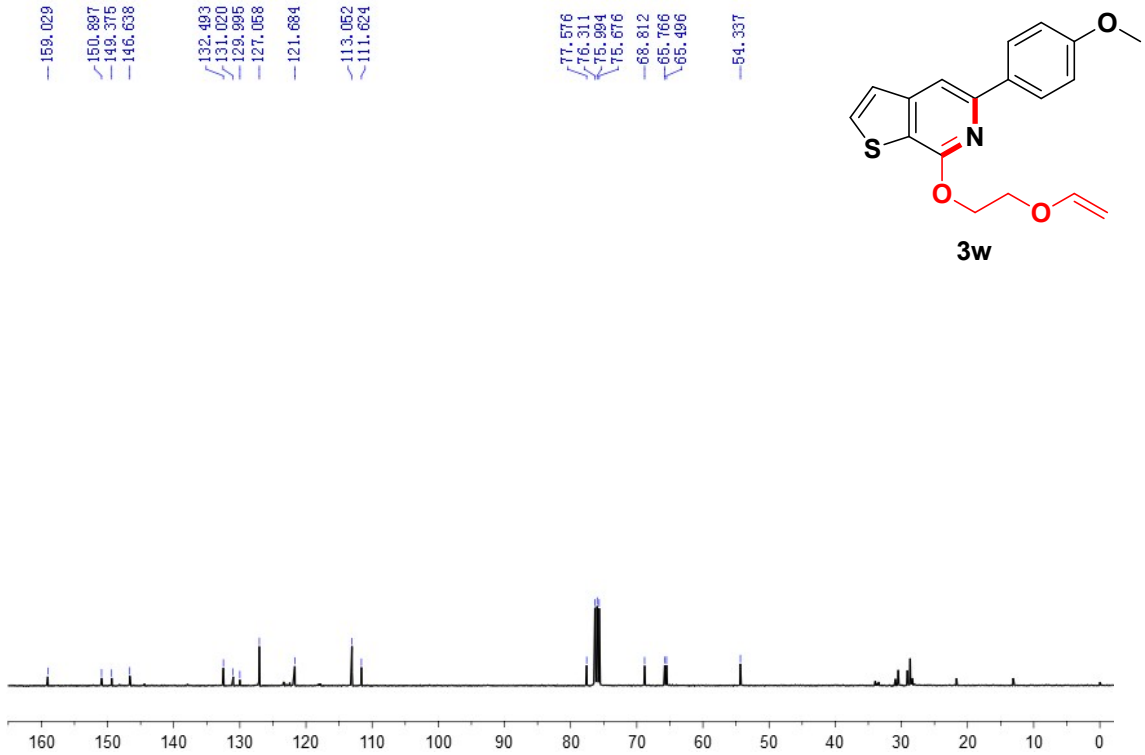
159.029
150.897
149.375
146.638
132.493
131.020
129.995
127.058
121.684
113.052
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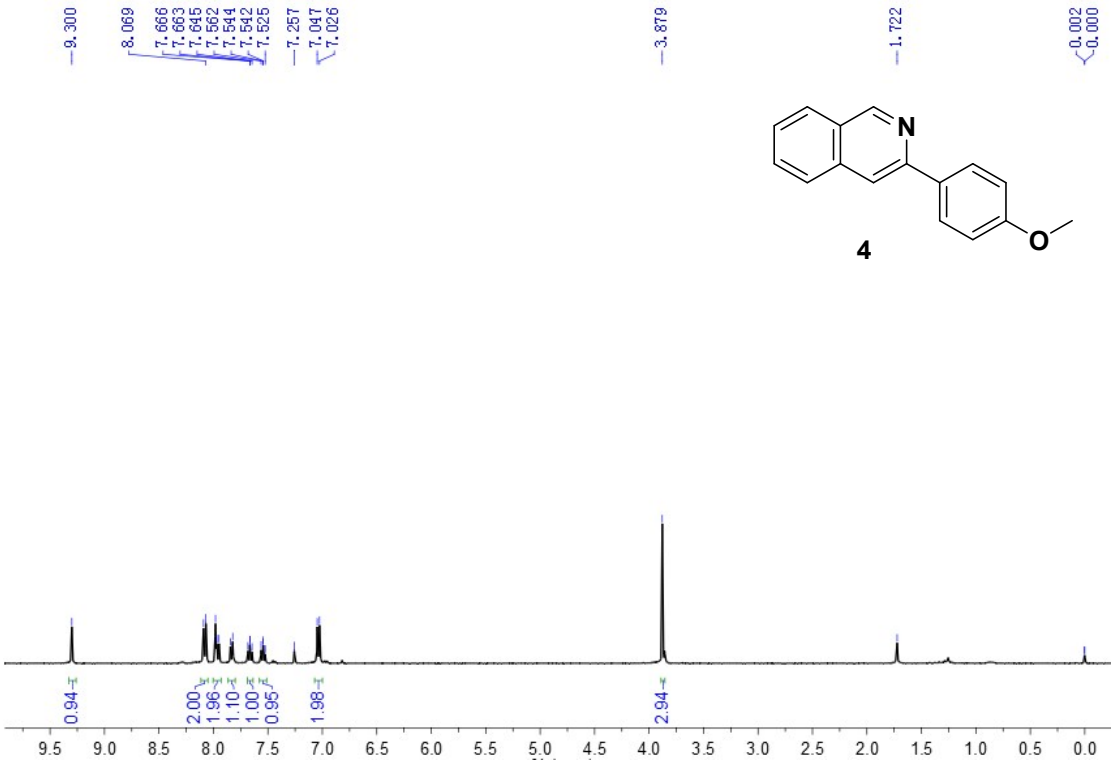
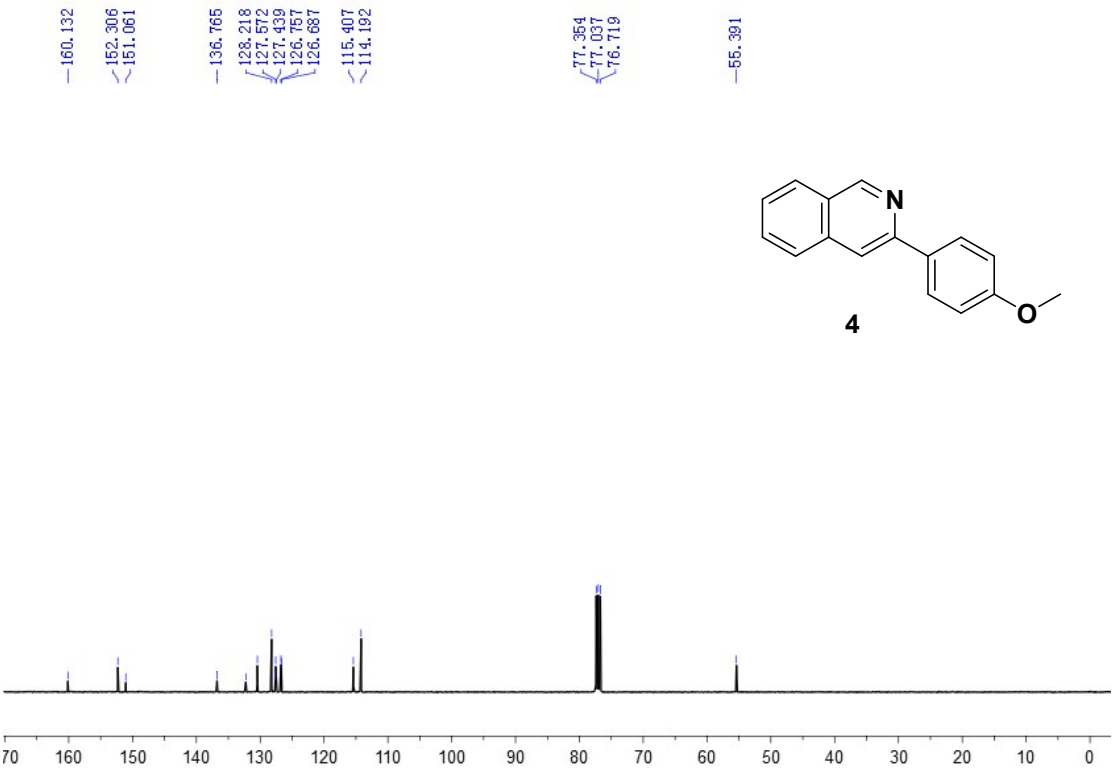
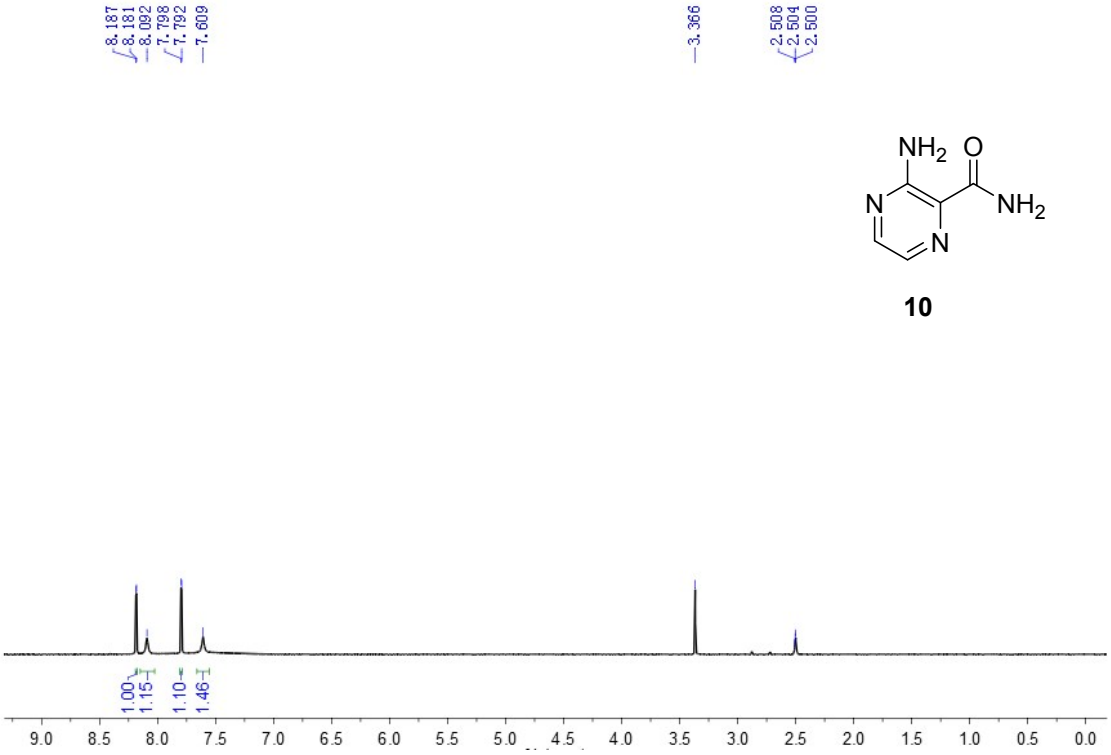
77.576
76.311
75.994
75.676
68.812
65.766
65.496
54.337
O
N
S
O
O
3w
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

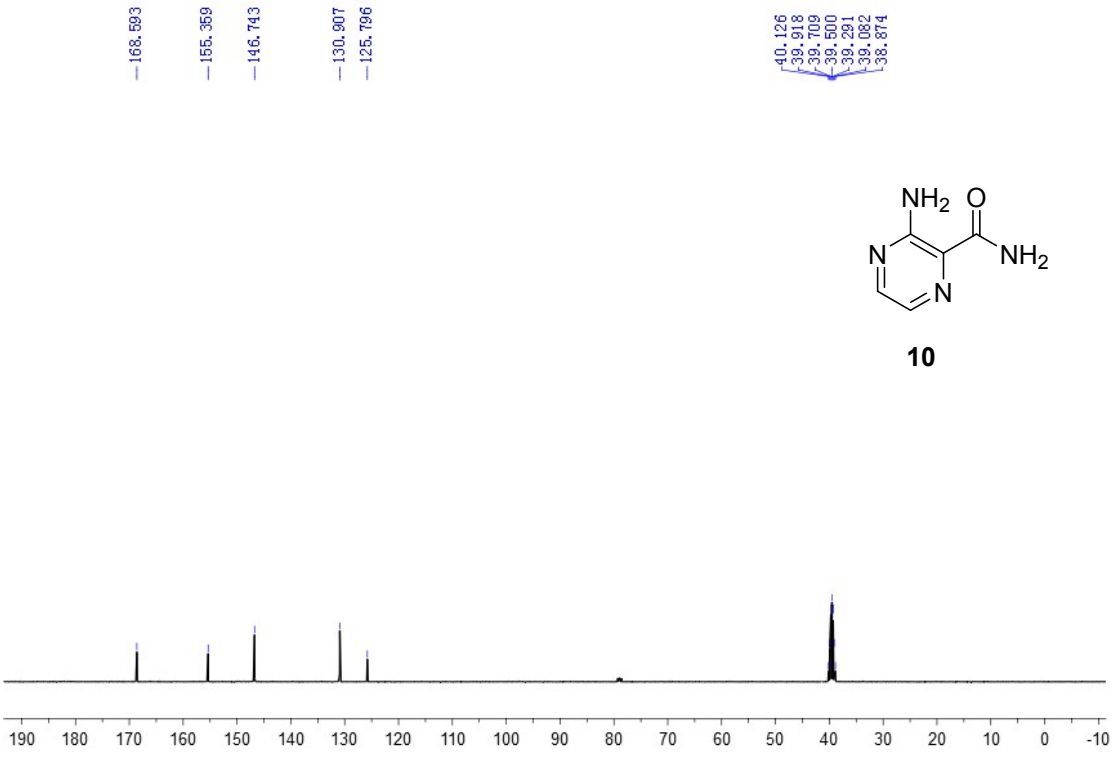

9.300
8.069
7.666
7.663
7.645
7.562
7.544
7.542
7.525
7.257
7.047
7.026
3.879
1.722
0.002
0.000
N
O
4
0.94
2.00
1.96
1.10
1.00
0.95
1.98
2.94
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0


160.132
152.306
151.061
136.765
128.218
127.572
127.439
126.757
126.687
115.407
114.192
77.354
77.037
76.719
55.391
N
O
4
70 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0


8.187
8.181
8.092
7.798
7.792
7.609
3.366
2.508
2.504
2.500
1.00
1.15
1.10
1.46
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

NH2
O
N
NH2
N

10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155.359
146.743
130.907
125.796
40.126
39.918
39.709
39.500
39.291
39.082
38.874
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

NH2
O
N
NH2
N

10