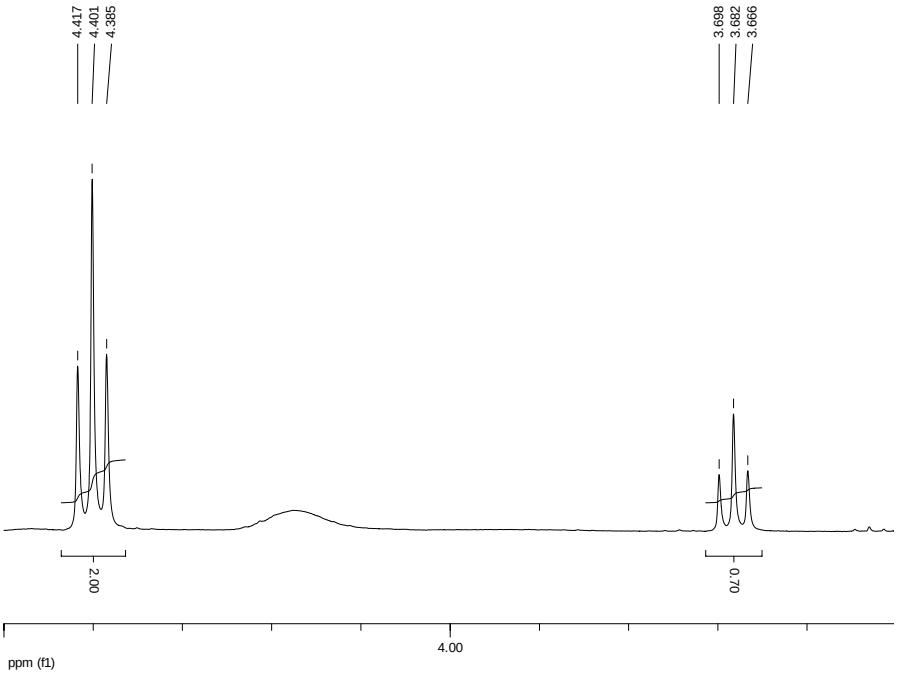
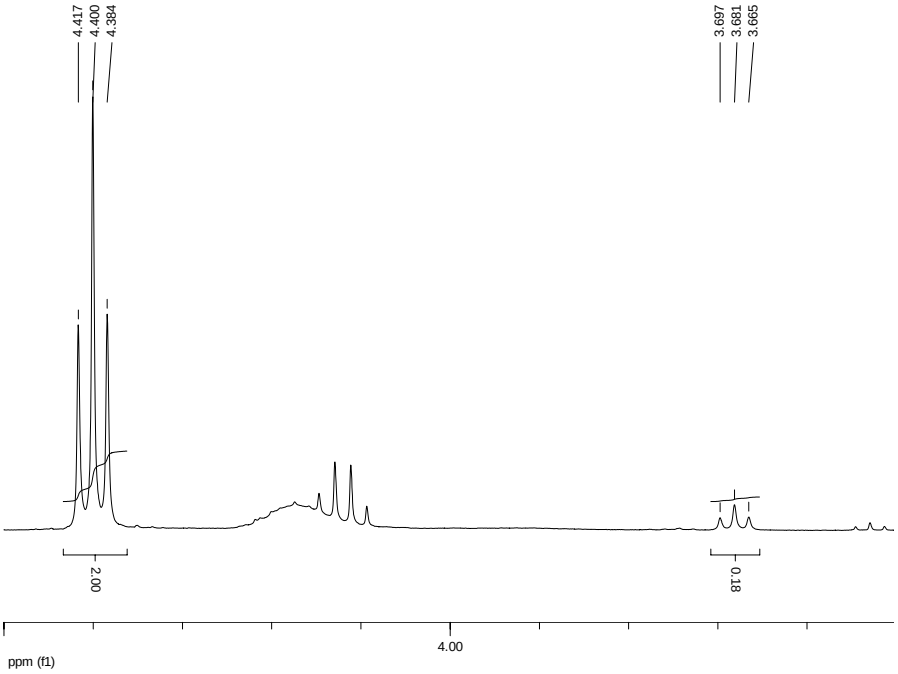
NMR Spectra of Equivalents Study (Table 1, 4.5 to 3.5 ppm shown))

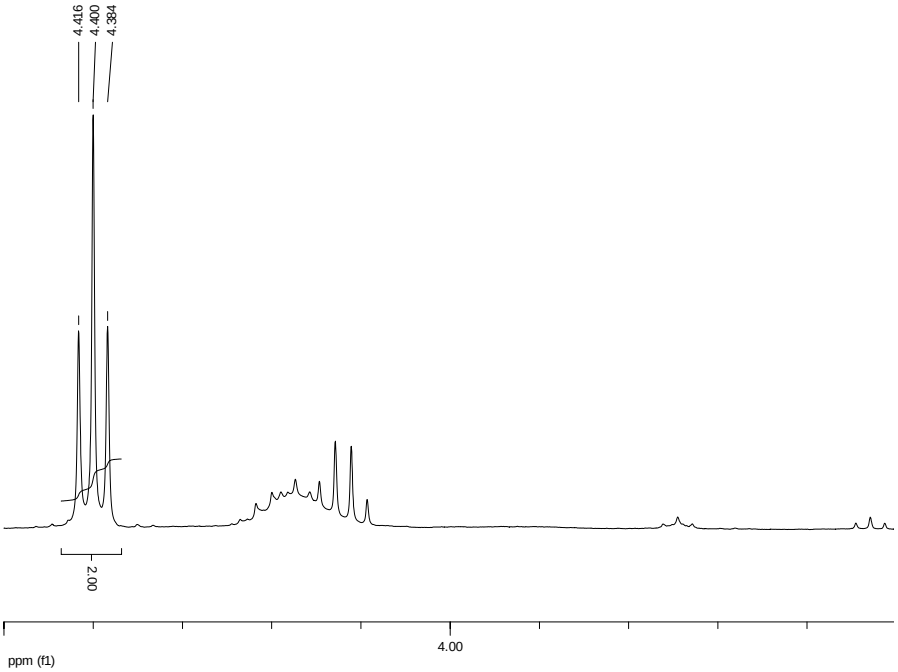
1.5 equiv OTPP, 1.5 equiv HO-DEAD



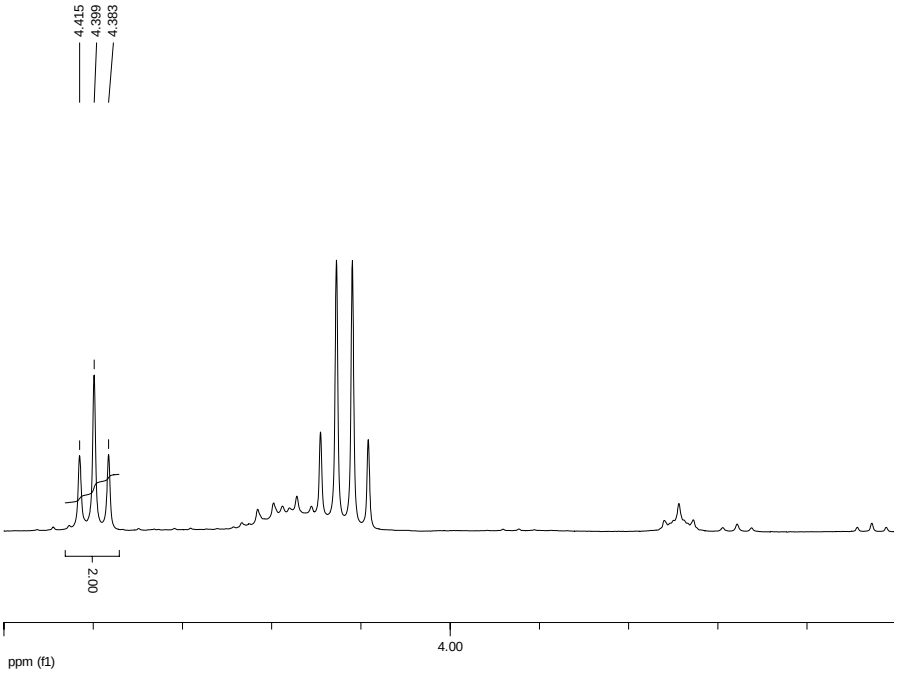
2 equiv OTPP, 2 equiv HO-DEAD



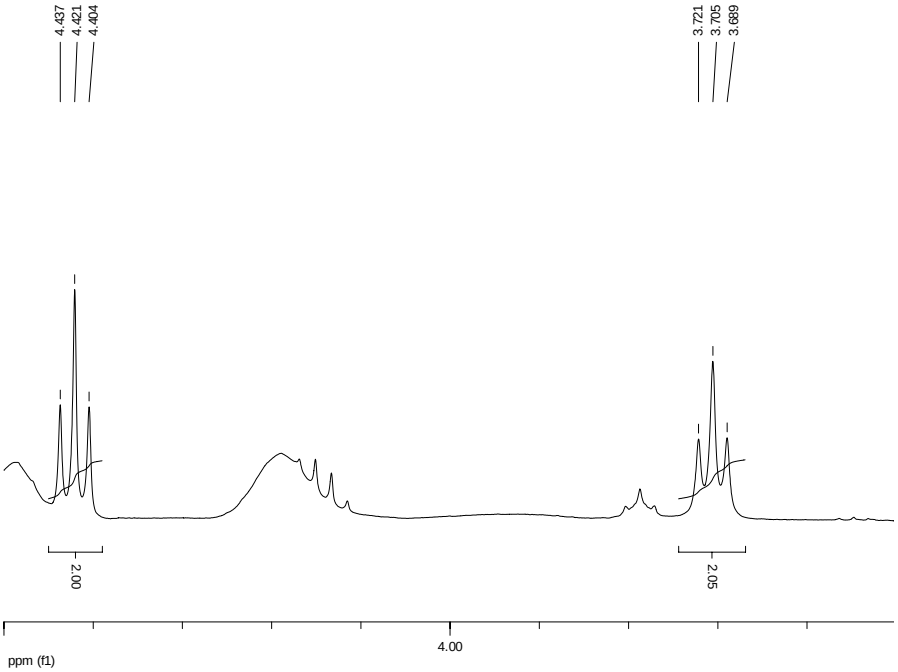
3 equiv OTPP, 3 equiv HO-DEAD



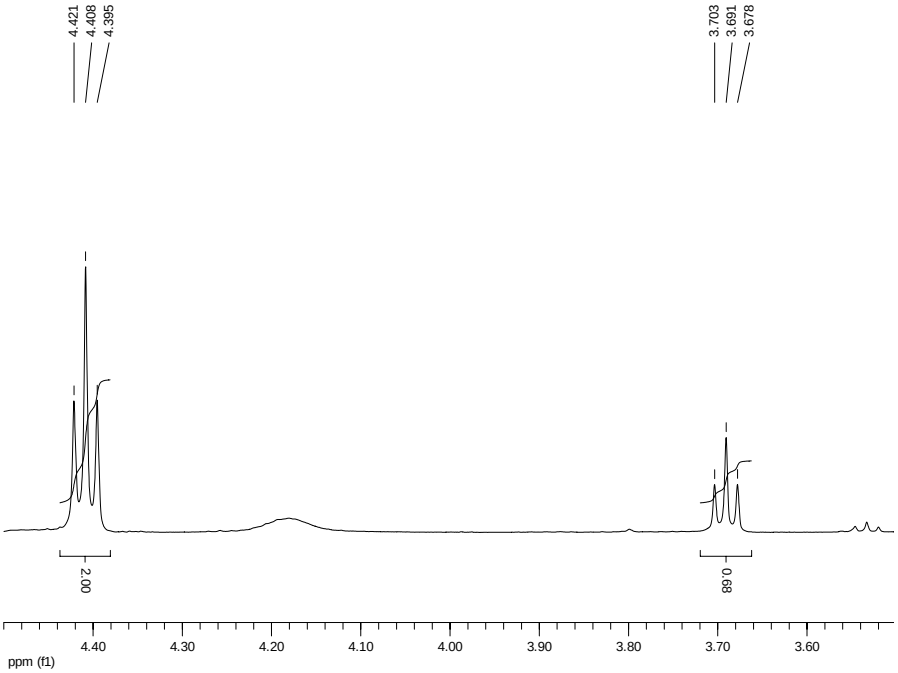
5 equiv OTPP, 3 equiv HO-DEAD



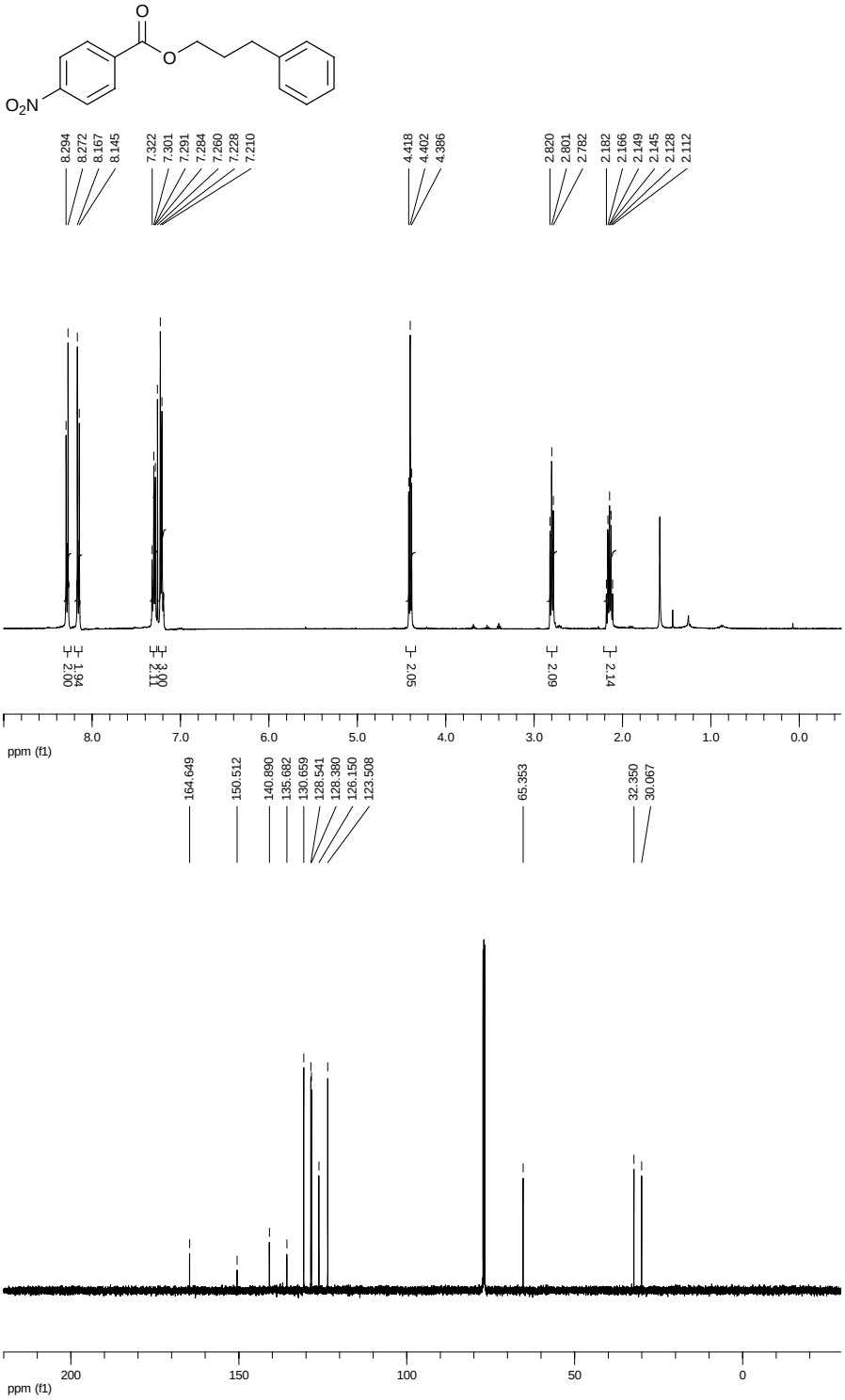
2 equiv *JJ*-PPh_2, 2 equiv HO-DEAD

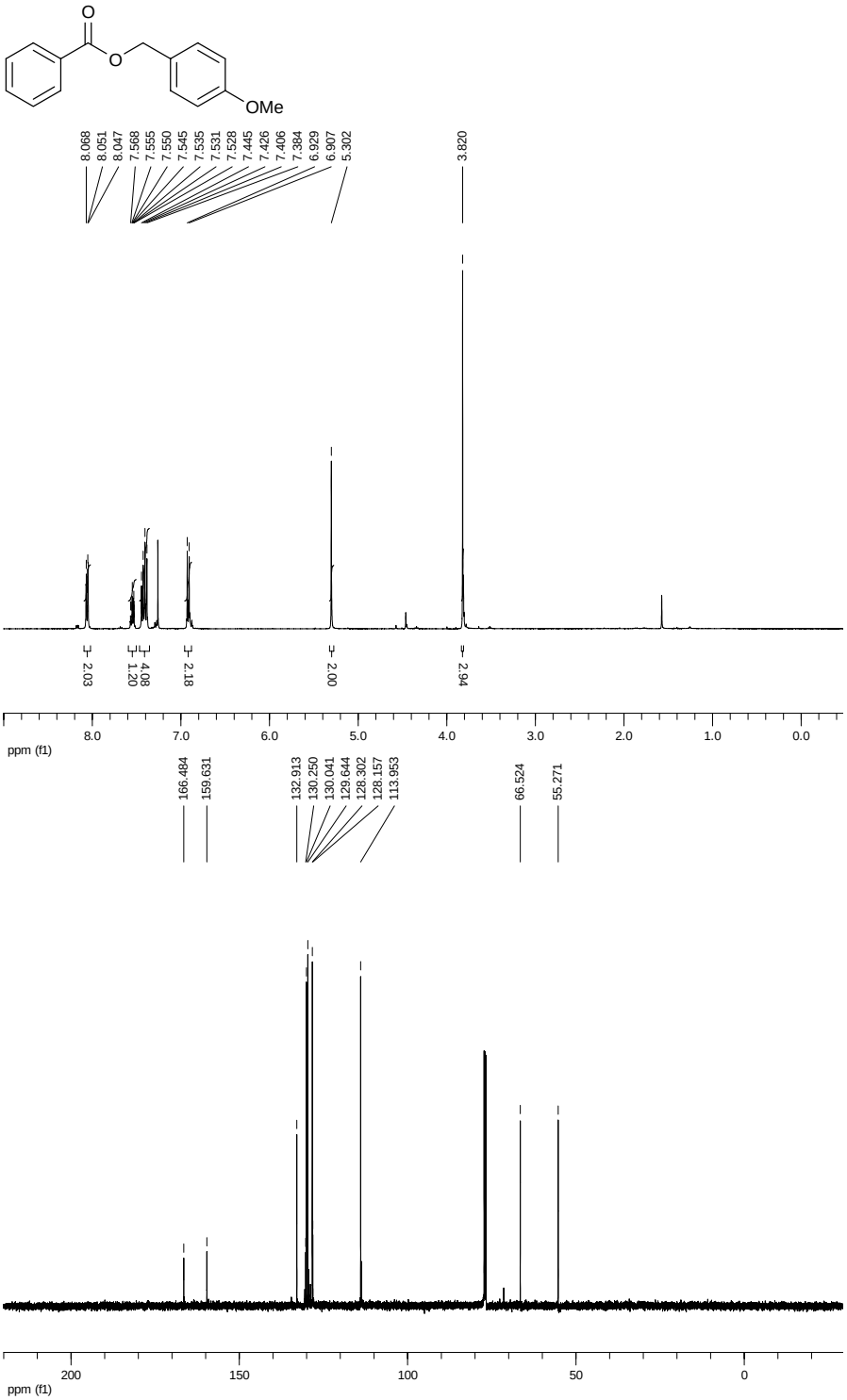


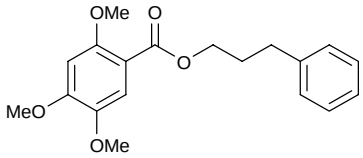
2 equiv LPS-PPh_3, 2 equiv HO-DEAD

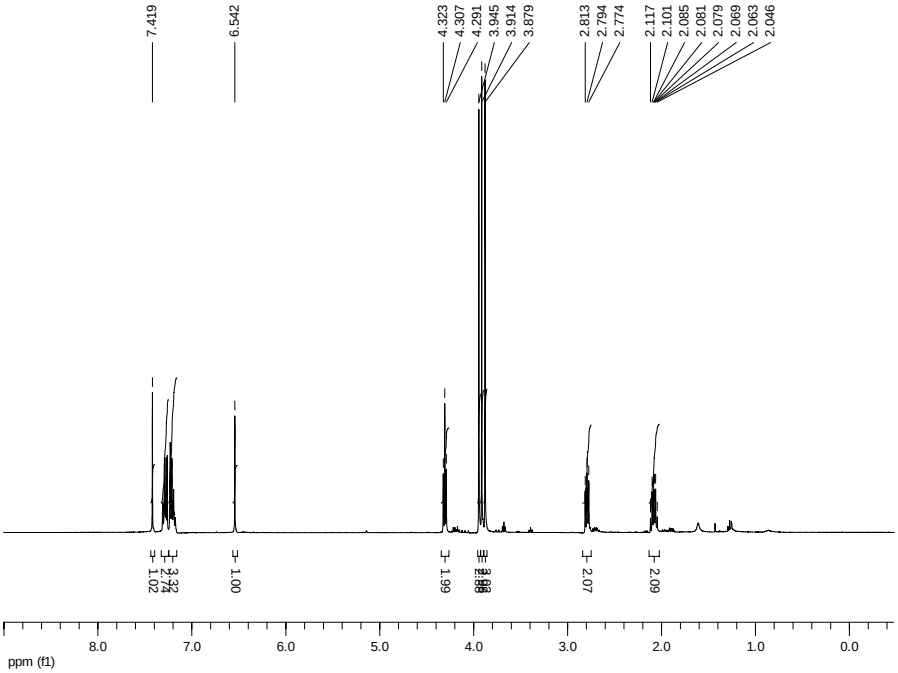


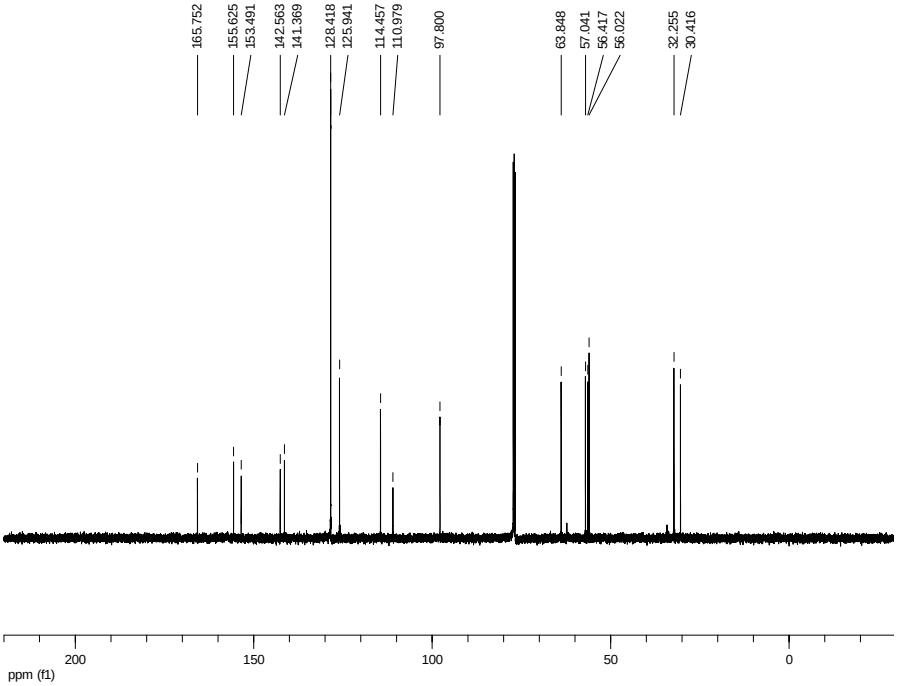
NMR Spectra of Isolated Mitsunobu Products

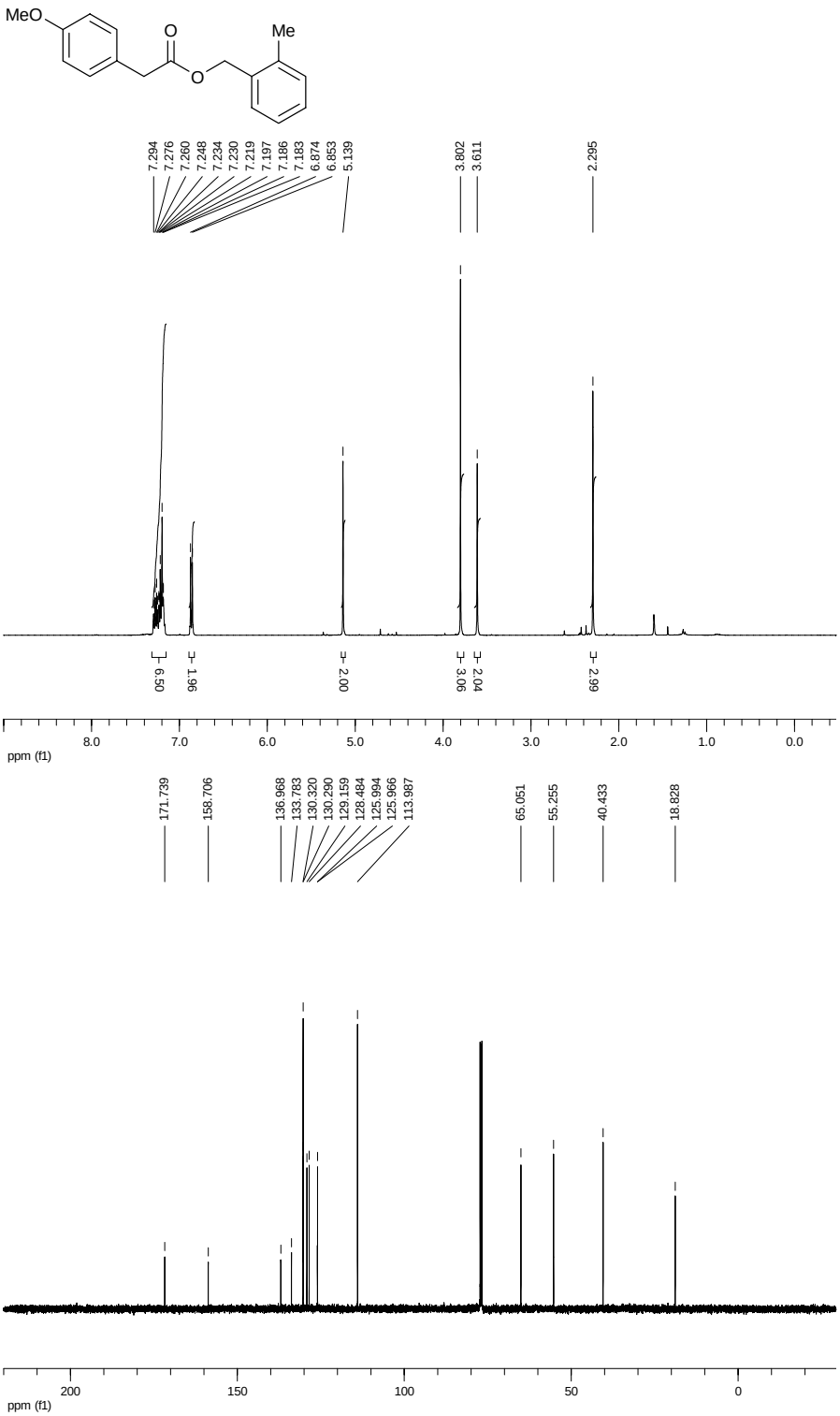


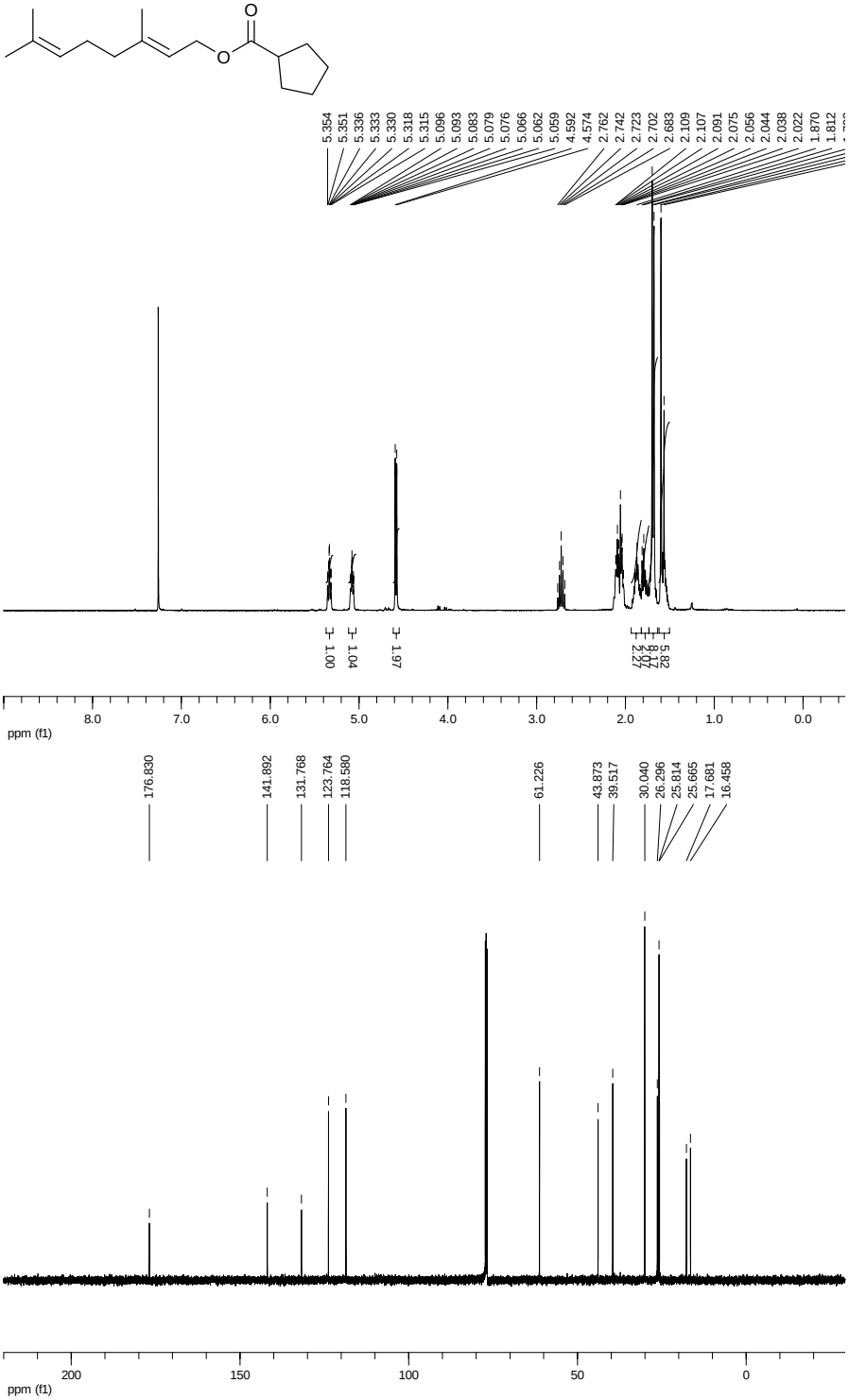

O
O
OMe
8.068
8.051
8.047
7.568
7.555
7.550
7.545
7.535
7.531
7.528
7.445
7.426
7.406
7.384
6.929
6.907
5.302
3.820
2.03
1.20
4.08
2.18
2.00
2.94
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)
166.484
159.631
132.913
130.250
130.041
129.644
128.302
128.157
113.953
66.524
55.271
200
150
100
50
0
ppm (f1)

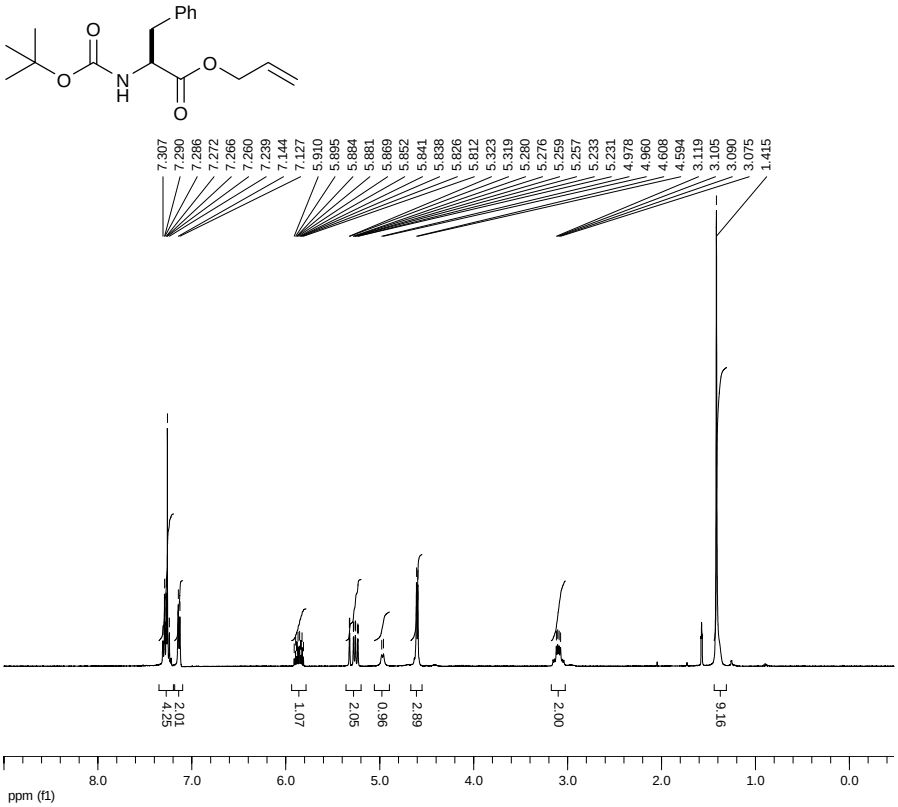

OMe
O
O
MeO
OMe

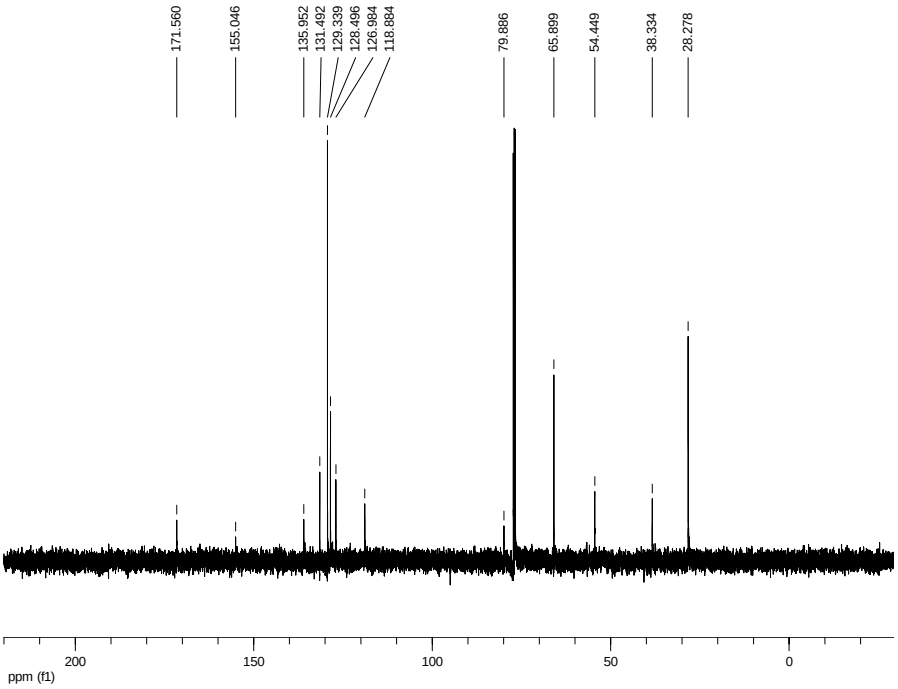

7.419
6.542
4.323
4.307
4.291
3.945
3.914
3.879
2.813
2.794
2.774
2.117
2.101
2.085
2.081
2.079
2.069
2.063
2.046
1.02
1.00
1.99
2.07
2.09
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)

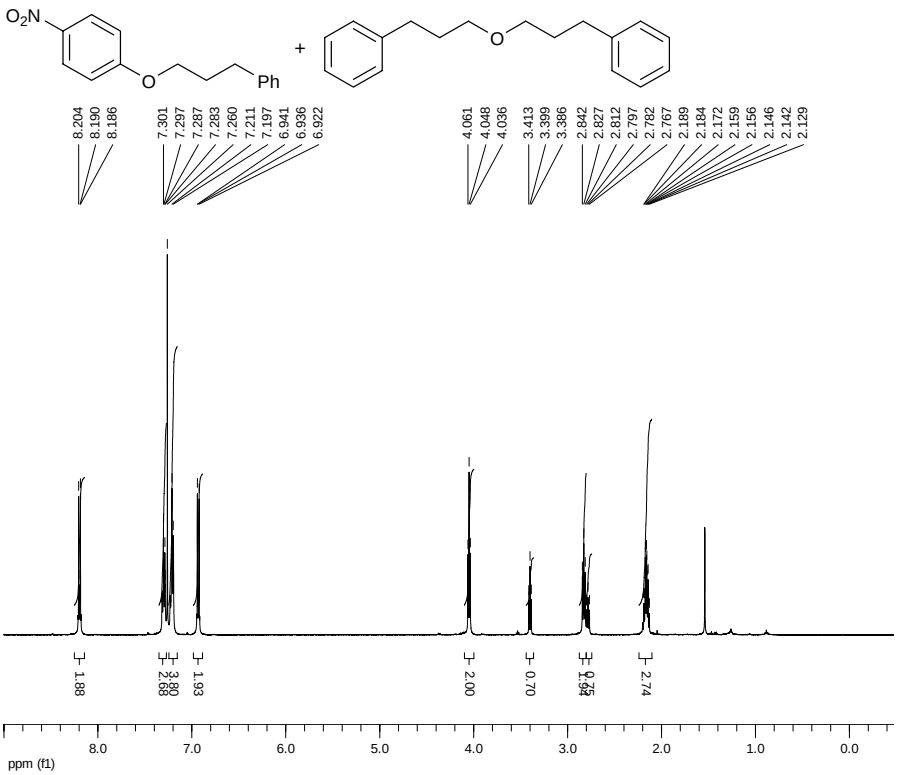

165.752
155.625
153.491
142.563
141.369
128.418
125.941
114.457
110.979
97.800
63.848
57.041
56.417
56.022
32.255
30.416
200
150
100
50
0
ppm (f1)

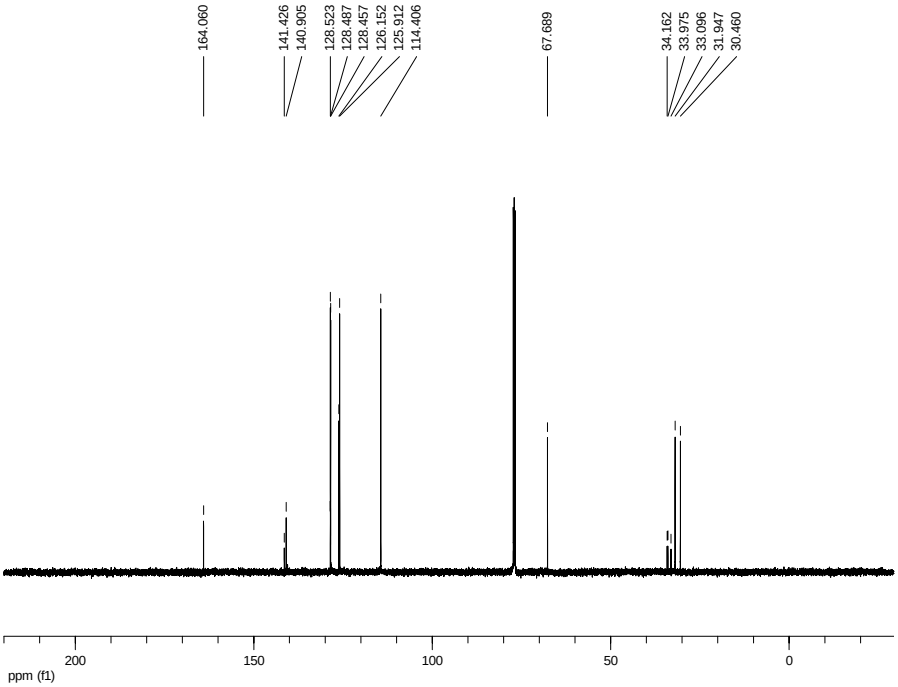

MeO
O
O
Me
7.294
7.276
7.260
7.248
7.234
7.230
7.219
7.197
7.186
7.183
6.874
6.853
5.139
3.802
3.611
2.295
6.50
1.96
2.00
3.06
2.04
2.99
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)
171.739
158.706
136.968
133.783
130.320
130.290
129.159
128.484
125.994
125.966
113.987
65.051
55.255
40.433
18.828
200
150
100
50
0
ppm (f1)

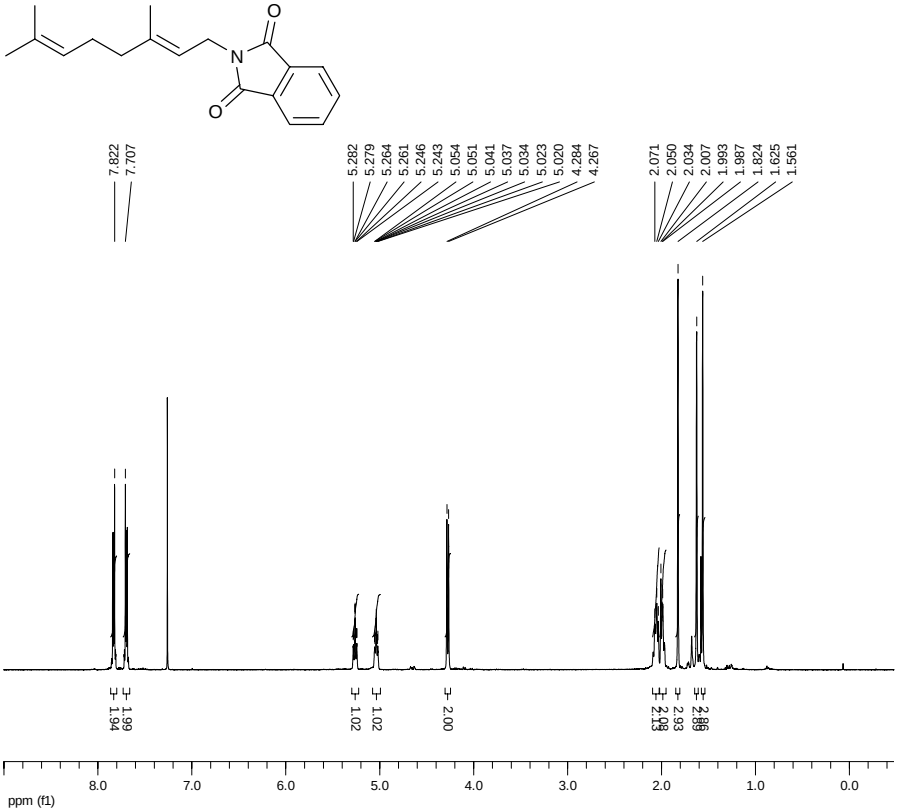

O
O
5.354
5.351
5.336
5.333
5.330
5.318
5.315
5.096
5.093
5.083
5.079
5.076
5.066
5.062
5.059
4.592
4.574
2.762
2.742
2.723
2.702
2.683
2.109
2.107
2.091
2.075
2.056
2.044
2.038
2.022
1.870
1.812
1.00
1.04
1.97
2.27
5.82
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)
176.830
141.892
131.768
123.764
118.580
61.226
43.873
39.517
30.040
26.296
25.814
25.665
17.681
16.458
200
150
100
50
0
ppm (f1)

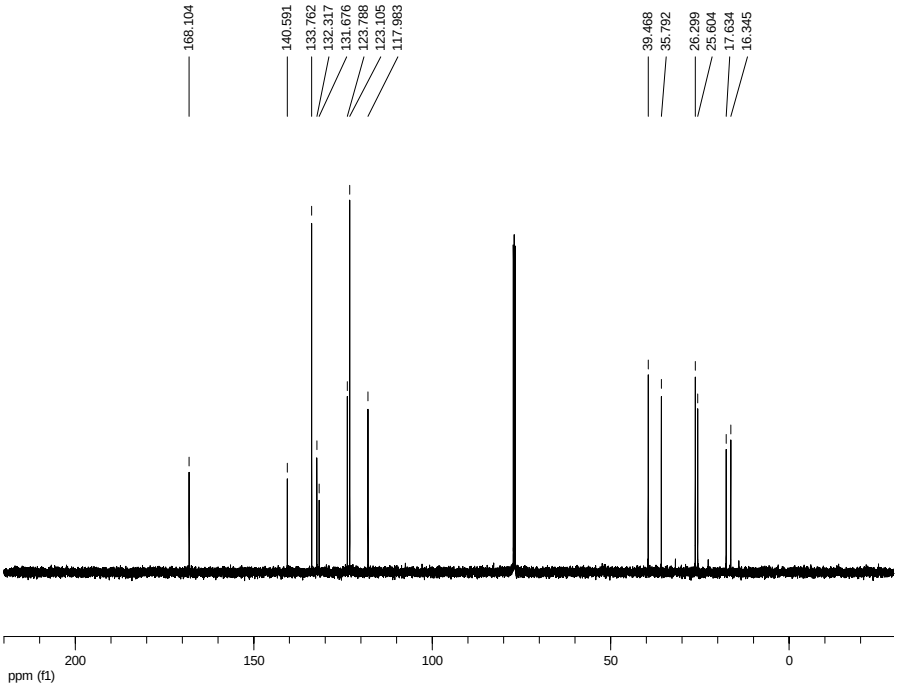

Ph
O
O
N
H
O
O
7.307
7.290
7.286
7.272
7.266
7.260
7.239
7.144
7.127
5.910
5.895
5.884
5.881
5.869
5.852
5.841
5.838
5.826
5.812
5.323
5.319
5.280
5.276
5.259
5.257
5.233
5.231
4.978
4.960
4.608
4.594
3.119
3.105
3.090
3.075
1.415
4.25
2.01
1.07
2.05
0.96
2.89
2.00
9.16
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)


171.560
155.046
135.952
131.492
129.339
128.496
126.984
118.884
79.886
65.899
54.449
38.334
28.278
200
150
100
50
0
ppm (f1)


O2N
O
Ph
+
O
8.204
8.190
8.186
7.301
7.297
7.287
7.283
7.280
7.211
7.197
6.941
6.936
6.922
4.061
4.048
4.036
3.413
3.399
3.386
2.842
2.827
2.812
2.797
2.782
2.767
2.189
2.184
2.172
2.159
2.156
2.146
2.142
2.129
1.88
3.80
2.88
1.93
2.00
0.70
0.75
1.95
2.74
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)


164.060
141.426
140.905
128.523
128.487
128.457
126.152
125.912
114.406
67.689
34.162
33.975
33.096
31.947
30.460
200
150
100
50
0
ppm (f1)


7.822
7.707
5.282
5.279
5.264
5.261
5.246
5.243
5.054
5.051
5.041
5.037
5.034
5.023
5.020
4.284
4.267
2.071
2.050
2.034
2.007
1.993
1.987
1.824
1.625
1.561
1.94
1.99
1.02
1.02
2.00
2.93
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ppm (f1)


168.104
140.591
133.762
132.317
131.676
123.788
123.105
117.983
39.468
35.792
26.299
25.604
17.634
16.345
200
150
100
50
0
ppm (f1)