MS 4A-PROMOTED AQUEOUS PHOSPHO-ALDOL-BROOK REARRANGEMENT REACTION OF ISATINS

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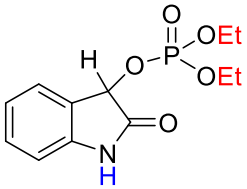
1. **Compounds Data**

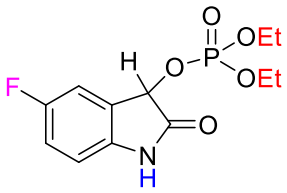
1. *diethyl (2-oxoindolin-3-yl) phosphate*, **3aa**[1,2]



3aa

Yield: 100%. Pale yellow oil. ^{1}H NMR ($CDCl_3$, δ): 9.00 (s, 1H), 7.51 (d, J = 8.7 Hz, 1H), 7.28−7.25 (m, 1H), 7.04 (td, J = 17.1, 9.0 Hz, 1H), 6.88 (d, J = 9.0 Hz, 1H), 5.58 (d, J = 13.9 Hz, 1H), 4.31−4.17 (m, 4H), 1.39−1.32 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 174.0, 141.8, 130.6, 126.1, 124.6, 122.9, 110.6, 72.8, 72.7, 64.5 (dd, $J_{C,P}$ = 6.2, 30.5 Hz), 16.0. IR (neat, cm^{-1}): 3261, 2988, 2933, 2912, 1735, 1654, 1624, 1473, 1444, 1395, 1370, 1327, 1255, 1182, 1104, 1035, 976, 909, 871, 817, 754.

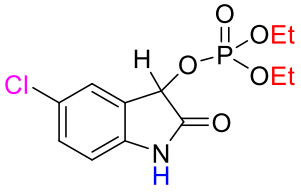
2. *diethyl (5-fluoro-2-oxoindolin-3-yl) phosphate*, **3ab**[1]



3ab

Yield: 100%. Orange oil. ^{1}H NMR ($CDCl_3$, δ): 8.79 (s, 1H), 7.28−7.27 (m, 1H), 6.98 (t, J = 8.7 Hz, 1H), 6.82−6.80 (m, 1H), 5.56 (d, J = 13.6 Hz, 1H), 4.27−4.18 (m, 4H), 1.40−1.35 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 173.8 (d, $J_{C,F}$ = 6.5 Hz), 160.0, 158.1, 137.5, 126.0 (dd, $J_{C,F}$ = 2.5, 8.3 Hz), 117.2 (d, $J_{C,F}$ = 23.4 Hz), 114.1 (d, $J_{C,F}$ = 25.1 Hz), 111.3 (d, $J_{C,F}$ = 7.8 Hz), 72.6, 64.8 (dd, $J_{C,P}$ = 6.2, 27.5 Hz), 16.0. IR (neat, cm^{-1}): 3225, 2987, 2933, 1732, 1633, 1614, 1487, 1395, 1257, 1195, 1166, 1140, 1109, 1038, 986, 909, 861, 819.

3. *5-chloro-2-oxoindolin-3-yl diethyl phosphate*, **3ac**[1]

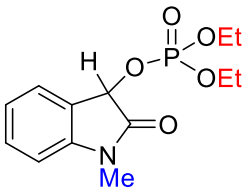


3ac

Yield: 32%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 8.31 (s, 1H), 7.51 (s, 1H), 7.27−7.25 (m, 1H), 6.79 (d, J = 8.3 Hz, 1H), 5.54 (d, J = 13.9 Hz, 1H), 4.29−4.19 (m, 4H), 1.40−1.35 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 173.2, 139.9, 130.6, 128.4, 126.6,

126.1, 111.4, 72.2, 64.8 (dd, $J_{C,P}$ = 6.1, 26.1 Hz), 16.0. IR (neat, cm^{-1}): 3449, 2984, 2926, 2850, 1735, 1622, 1477, 1458, 1444, 1394, 1257, 1182, 1123, 1039, 978, 819.

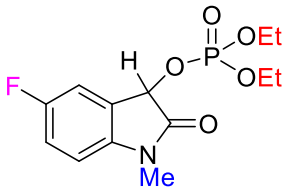
4. *diethyl (1-methyl-2-oxoindolin-3-yl) phosphate*, **3ad**



3ad

Yield: 81%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.57 (d, *J* = 7.3 Hz, 1H), 7.36 (td, *J* = 15.4, 7.8 Hz, 1H), 7.1 (td, *J* = 15.4, 7.3 Hz, 1H), 6.82 (d, *J* = 7.8 Hz, 1H), 5.60 (d, *J* = 11.8 Hz, 1H), 4.34−4.15 (m, 4H), 3.19 (s, 3H), 1.41−1.32 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 171.9, 144.2, 130.6, 126.0, 124.2, 123.1, 108.5, 72.3, 64.6 (dd, $J_{C,P}$ = 6.0, 42.3 Hz), 26.3, 16.0 (dd, $J_{C,P}$ = 3.5, 7.1 Hz). IR (neat, cm^{-1}): 3490, 3060, 2985, 2934, 2912, 1735, 1617, 1495, 1473, 1376, 1355, 1329, 1262, 1213, 1165, 1130, 1093, 1024, 905, 881, 801, 754, 697, 637, 605.

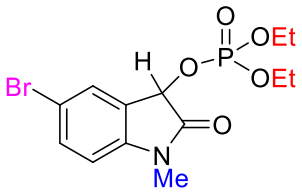
5. *diethyl (5-fluoro-1-methyl-2-oxoindolin-3-yl) phosphate*, **3ae**



3ae

Yield: 91%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.35 (d, *J* = 7.3 Hz, 1H), 7.07 (td, *J* = 17.4, 8.7 Hz, 1H), 6.76−6.75 (m, 1H), 6.82 (d, *J* = 7.8 Hz, 1H), 5.57 (d, *J* = 12.1 Hz, 1H), 4.32−4.17 (m, 4H), 3.19 (s, 3H), 1.42−1.34 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 171.6, 160.3, 158.3, 140.1. 125.6, 117.0 (d, $J_{C,F}$ = 23.6 Hz), 114.3 (d, $J_{C,F}$ = 25.4 Hz), 109.1, 72.0, 64.8 (dd, $J_{C,P}$ = 15.7, 41.1 Hz), 26.4, 16.0. IR (neat, cm^{-1}): 3479, 3066, 2986, 2934, 2913, 1732, 1625, 1614, 1495, 1471, 1456, 1368, 1329, 1274, 1230, 1145, 1103, 1024, 954, 820, 769, 692.

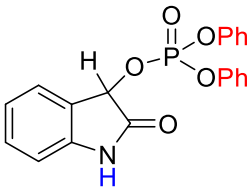
6. *5-bromo-1-methyl-2-oxoindolin-3-yl diethyl phosphate*, **3af**



3af

Yield: 82%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.69 (s, 1H), 7.49 (d, J = 8.1 Hz, 1H), 6.70 (d, J = 8.1 Hz, 1H), 5.57 (d, J = 12.3 Hz, 1H), 4.32−4.18 (m, 4H), 3.18 (s, 3H), 1.41−1.35 (m, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 171.3, 143.2, 133.4, 129.2, 126.0, 115.7, 109.9, 71.7, 64.8 (dd, $J_{C,P}$ = 6.1, 36.5 Hz), 26.4. IR (neat, cm^{-1}): 3464, 2984, 2932, 1735, 1611, 1490, 1363, 1326, 1267, 1212, 1103, 1025, 984, 904, 874, 810, 657.

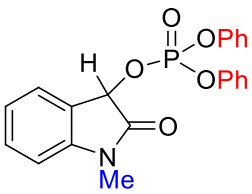
7. *2-oxoindolin-3-yl diphenyl phosphate*, **3ag**



3ag

Yield: 34%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 8.29 (s, 1H), 7.36−7.20 (m, 12H), 6.95 (td, J = 15.0, 7.5 Hz, 1H), 6.79 (d, J = 7.8 Hz, 1H), 5.78 (d, J = 12.8 Hz, 1H). ^{13}C NMR (125 MHz, $CDCl_3$): 172.8 (d, $J_{C,P}$ = 6.4 Hz), 150.4 (dd, $J_{C,P}$ = 11.8, 26.6 Hz), 141.5, 130.8, 129.8 (d, $J_{C,P}$ = 4.2 Hz), 126.3, 125.6 (d, $J_{C,P}$ = 5.0 Hz), 123.7 (d, $J_{C,P}$ = 3.8 Hz), 123.0, 120.4 (dd, $J_{C,P}$ = 1.5, 11.0 Hz), 110.4, 73.8 (d, $J_{C,P}$ = 5.9 Hz). IR (neat, cm^{-1}): 3252, 1716, 1682, 1622, 1590, 1488, 1471, 1196, 1163, 1070, 1025, 952, 753, 689.

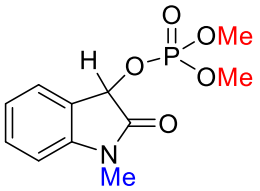
8. *1-methyl-2-oxoindolin-3-yl diphenyl phosphate*, **3ah**[3,4]



3ah

Yield: 32%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.35−7.20 (m, 12H), 6.99 (td, J = 15.0, 7.5 Hz, 1H), 6.80 (d, J = 7.5 Hz, 1H), 5.79 (d, J = 11.7 Hz, 1H), 3.19 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): 171.1 (d, $J_{C,P}$ = 7.2 Hz), 150.5 (dd, $J_{C,P}$ = 14.5, 29.5 Hz), 144.3, 130.9, 129.7, 126.1, 125.6, 123.1, 120.5 (dd, $J_{C,P}$ = 5.9, 15.4 Hz), 115.3, 108.5, 73.5 (d, $J_{C,P}$ = 6.1 Hz), 26.4. IR (neat, cm^{-1}): 3060, 2967, 1729, 1617, 1586, 1487, 1472, 1378, 1278, 1262, 1190, 1165, 1092, 1037, 1023, 1009, 973, 957, 905, 766, 690, 609.

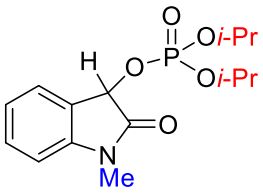
9. *dimethyl (1-methyl-2-oxoindolin-3-yl) phosphate*, **3ai**



3ai

Yield: 73%. Yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.55 (d, J = 7.2 Hz, 1H), 7.37 (td, J = 15.4, 7.7 Hz, 1H), 7.11 (td, J = 15.4, 7.2 Hz, 1H), 6.83 (d, J = 7.7 Hz, 1H), 5.59 (d, J = 11.7 Hz, 1H), 3.93 (d, J = 11.3 Hz, 3H), 3.82 (d, J = 11.3 Hz, 3H), 3.20 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): 171.8 (d, $J_{C,P}$ = 6.9 Hz), 144.2, 130.7, 125.9, 124.0 (d, $J_{C,P}$ = 3.3 Hz), 123.2, 108.6, 72.4 (d, $J_{C,P}$ = 5.5 Hz), 55.0 (d, $J_{C,P}$ = 49.1 Hz), 54.6 (d, $J_{C,P}$ = 36.9 Hz), 26.3. IR (neat, cm^{-1}): 3484, 2959, 2856, 1735, 1617, 1495, 1472, 1377, 1356, 1331, 1272, 1188, 1094, 1028, 914, 852, 809, 756, 697.

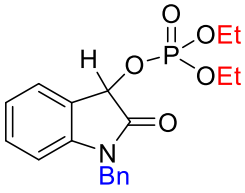
10. *diisopropyl (1-methyl-2-oxoindolin-3-yl) phosphate*, **3a*J***



3aj

Yield: 89%. Pale yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.60 (d, J = 7.4 Hz, 1H), 7.37−7.34 (m, 1H), 7.11−7.07 (m, 1H), 6.81 (d, J = 7.8 Hz, 1H), 5.60 (d, J = 11.9 Hz, 1H), 4.87−4.80 (m, 1H), 4.74−4.67 (m, 1H), 3.19 (s, 3H), 1.42−1.38 (dd, J = 15.7, 6.1 Hz, 6H), 1.34−1.32 (dd, J = 6.1, 1.6 Hz, 6H). ^{13}C NMR (125 MHz, $CDCl_3$): 172.0 (d, $J_{C,P}$ = 7.4 Hz), 144.1, 130.5, 126.1, 124.3, 123.0, 108.4, 73.5 (d, $J_{C,P}$ = 6.3 Hz), 73.2 (d, $J_{C,P}$ = 6.3 Hz), 72.2 (d, $J_{C,P}$ = 5.6 Hz), 26.2, 23.7 (m). IR (neat, cm^{-1}): 3480, 2981, 2936, 1738, 1615, 1495, 1471, 1376, 1354, 1329, 1261, 1143, 1130, 1092, 1006, 909, 797, 753, 697.

11. *1-benzyl-2-oxoindolin-3-yl diethyl phosphate*, **3ak**[4]

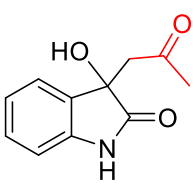


3ak

Yield: 17%. Pale yellow oil. ^{1}H NMR ($CDCl_3$, δ): 7.57 (d, J = 7.3 Hz, 1H), 7.34−7.22 (m, 7H), 7.07−7.04 (m, 1H), 6.71 (d, J = 7.9 Hz, 1H), 5.70 (d, J = 11.9 Hz, 1H), 4.92 (d, J = 15.6 Hz, 1H), 4.83 (d, J = 15.6 Hz, 1H), 4.36−4.17 (m, 4H), 1.43−1.33 (m, 6H). ^{13}C NMR

(125 MHz, $CDCl_3$): 172.0 (d, $J_{C,P}$ = 7.2 Hz), 143.3, 135.1, 130.5, 128.8, 127.8, 127.3, 126.0, 124.2, 123.2, 109.5, 72.3 (d, $J_{C,P}$ = 5.6 Hz), 64.7 (d, $J_{C,P}$ = 6.1 Hz), 64.4 (d, $J_{C,P}$ = 5.8 Hz), 44.0, 16.1 (d, $J_{C,P}$ = 4.5 Hz), 16.0 (d, $J_{C,P}$ = 4.5 Hz). IR (neat, cm^{-1}): 3450, 3061, 3030, 2984, 2926, 2853, 1735, 1616, 1489, 1467, 1457, 1368, 1264, 1173, 1103, 1021, 753, 697.

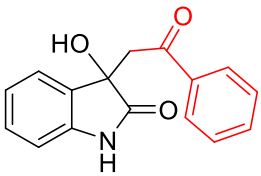
12. *3-hydroxy-3-(2-oxopropyl)indolin-2-one*, **3am**[5]



3am

Yield: 92%. White solid. ^1H NMR ($CDCl_3$, δ): 7.45 (s, 1H), 7.28 (d, *J* = 7.5 Hz, 1H), 7.21−7.18 (m, 1H), 7.00−6.96 (m, 1H), 6.80 (d, *J* = 7.8 Hz, 1H), 4.28 (s, 1H), 3.11 (d, *J* = 17.0 Hz, 1H), 2.90 (d, *J* = 17.0 Hz, 1H), 2.12 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): 206.6, 176.5, 139.3, 131.0, 129.0, 123.3, 122.1, 109.2, 73.3, 47.5, 30.4. IR (neat, cm^{-1}): 3365, 3317, 2897, 1717, 1621, 1484, 1470, 1362, 1333, 1181, 1113, 1088, 1060, 1014, 779, 760, 621, 591, 554, 496, 477.

13. *3-hydroxy-3-(2-oxo-2-phenylethyl)indolin-2-one*, **3an**[6]



3an

Yield: 90%. White solid. ^1H NMR ($CDCl_3$, δ): 7.88 (d, *J* = 7.7 Hz, 2H), 7.58−7.55 (m, 1H), 7.45−7.41 (m, 3H), 7.34−7.31 (m, 1H), 7.05−7.02 (m, 1H), 6.86 (d, *J* = 7.7 Hz, 1H), 4.44 (s, 1H), 3.81 (d, *J* = 17.3 Hz, 1H), 3.49 (d, *J* = 17.3 Hz, 1H), 3.24 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): 198.5, 176.1, 143.6, 136.4, 133.8, 130.0, 128.7, 128.1, 124.0, 123.1, 108.5, 74.5, 44.3, 26.3. IR (neat, cm^{-1}): 3384, 3317, 2933, 1686, 1616, 1497, 1469, 1384, 1353, 1228, 1114, 1093, 1069, 1031, 1023, 996, 767, 685, 606, 554.

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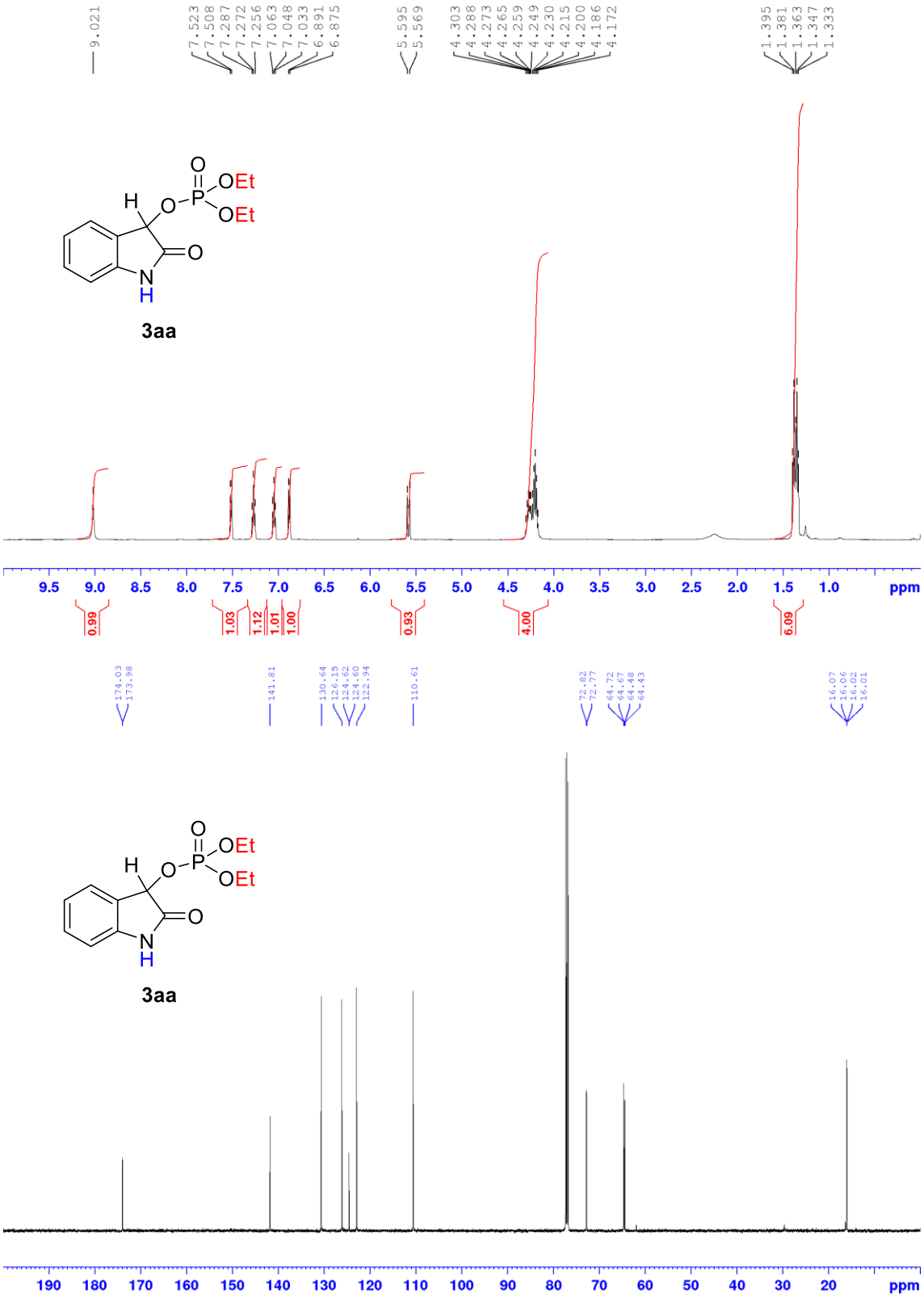
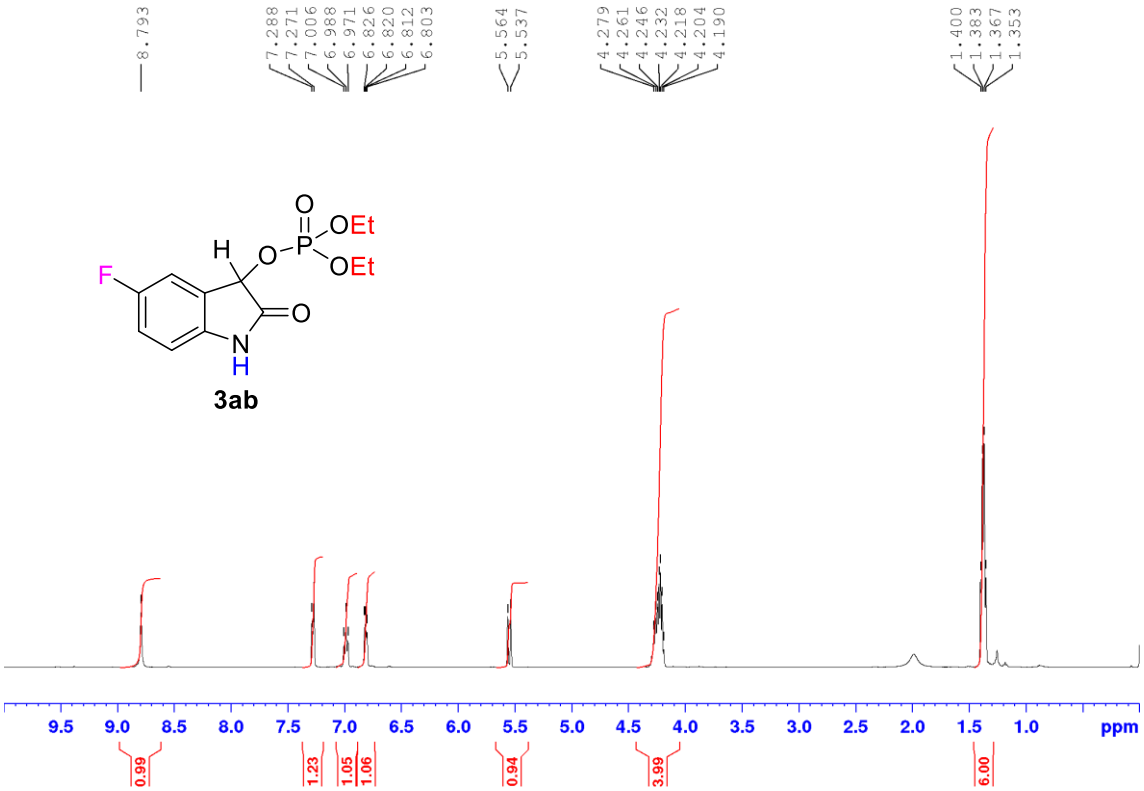
3. ^{1}H NMR and ^{13}C NMR Spectra

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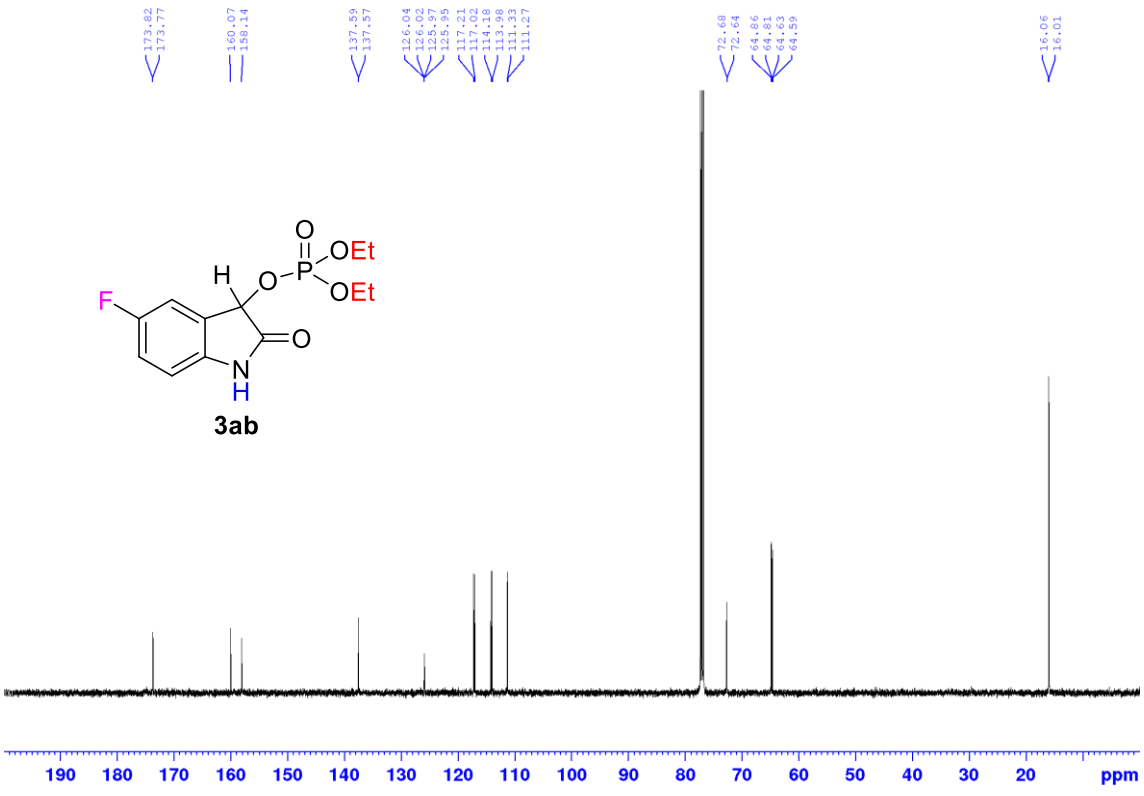
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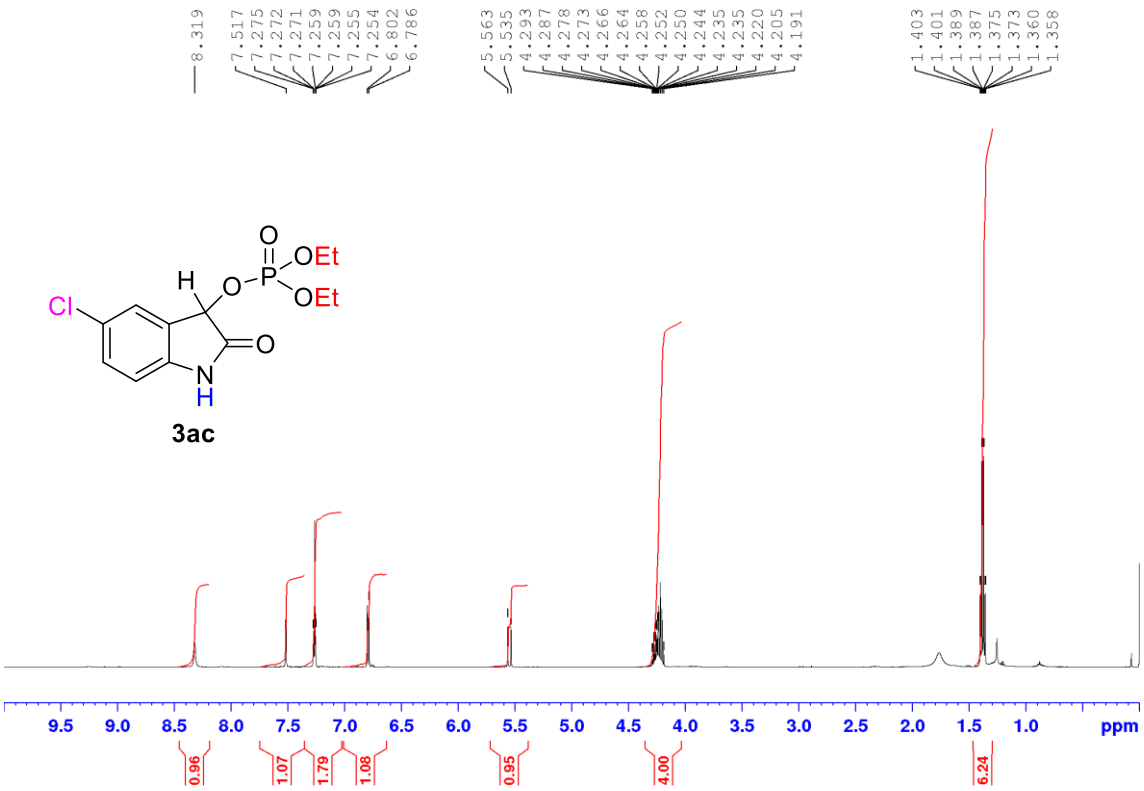
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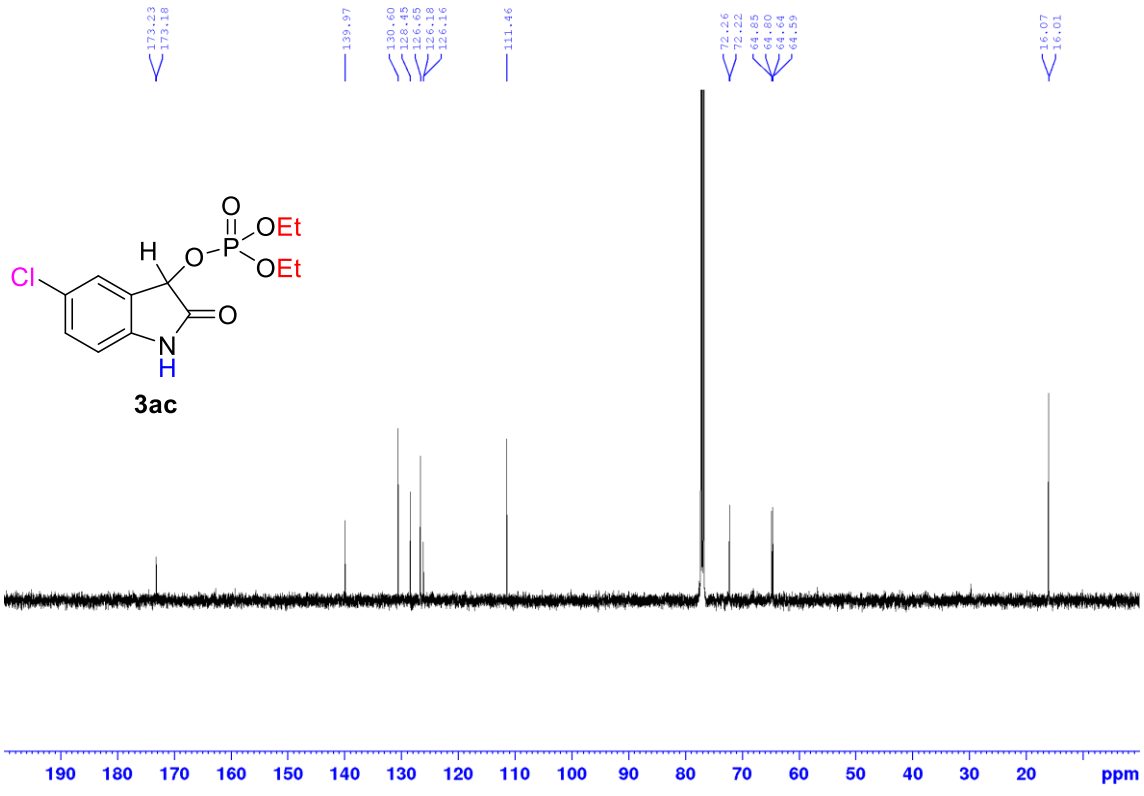
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OEt
O
N
H
O
3ac
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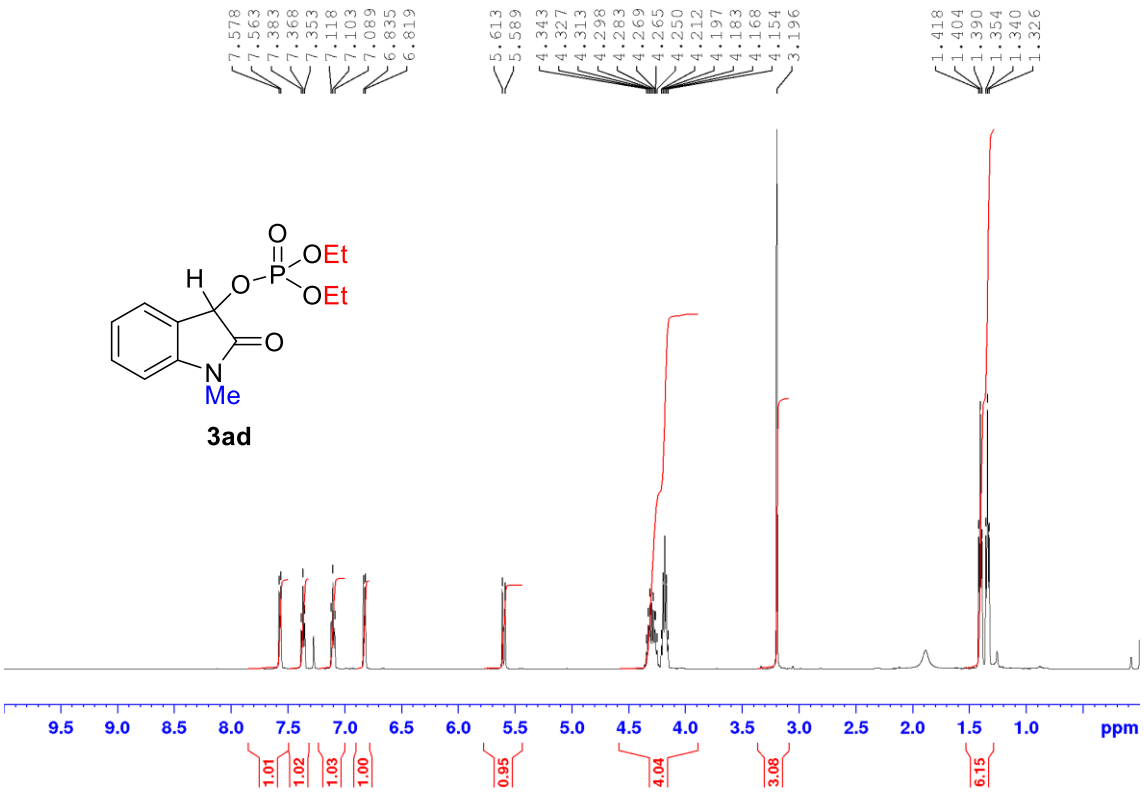
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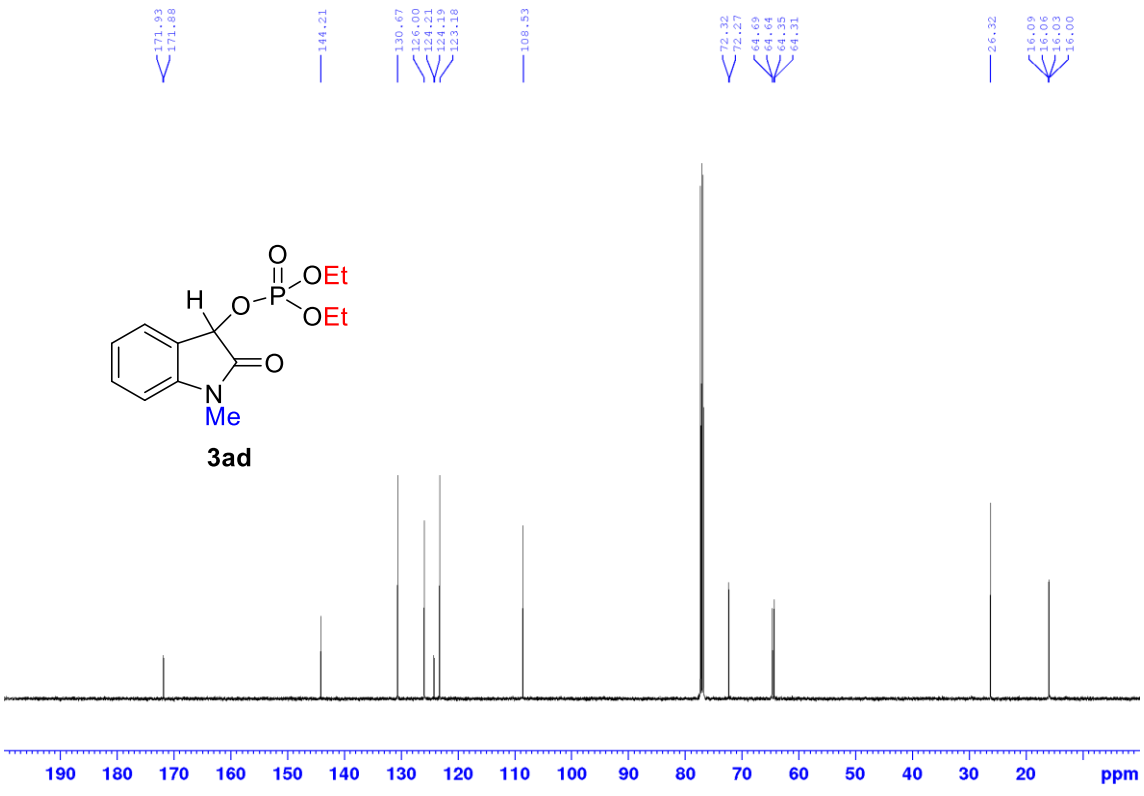
7.103
7.089
6.835
6.819
5.613
5.589
4.343
4.327
4.313
4.298
4.283
4.269
4.265
4.250
4.212
4.197
4.183
4.168
4.154
3.196
1.418
1.404
1.390
1.354
1.340
1.326
O
OEt
H
O
P
OEt
O
N
Me
3ad
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.01
1.02
1.03
1.00
0.95
4.04
3.08
6.15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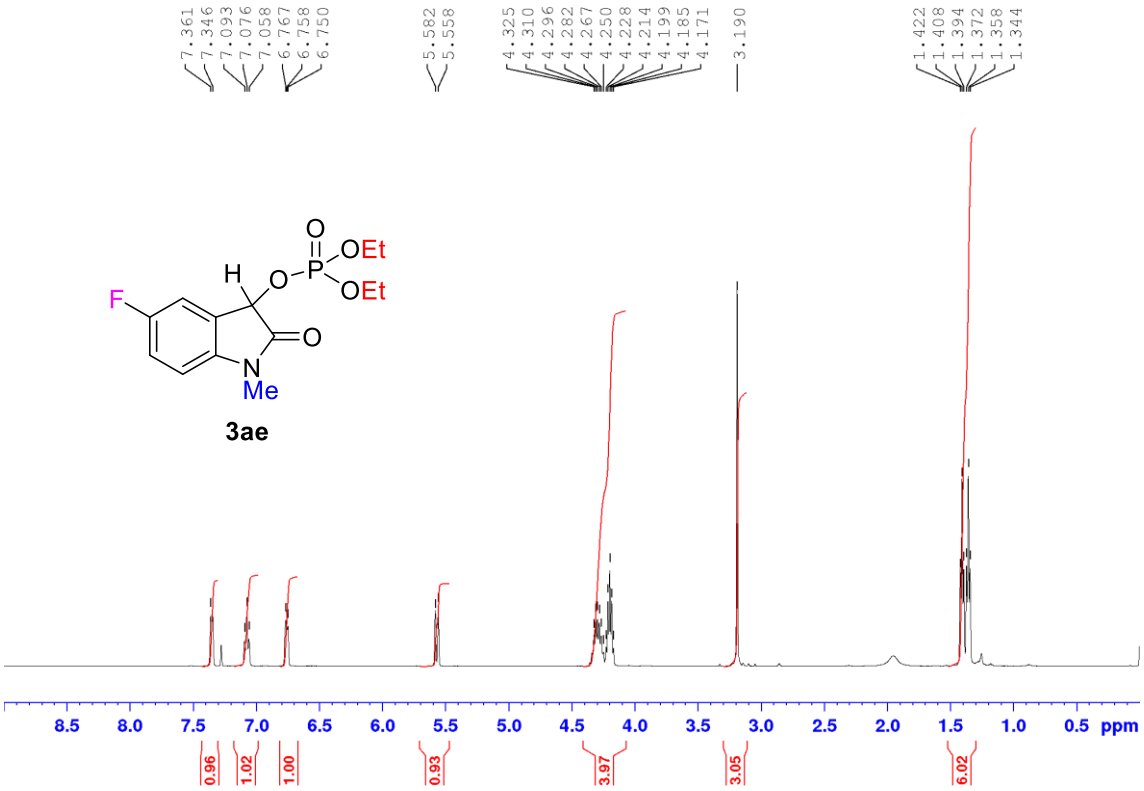
126.00
124.21
124.19
123.18
108.53
72.32
72.27
64.69
64.64
64.35
64.31
26.32
16.09
16.06
16.03
16.00
O
OEt
H
O
P
OEt
O
N
Me
3ad
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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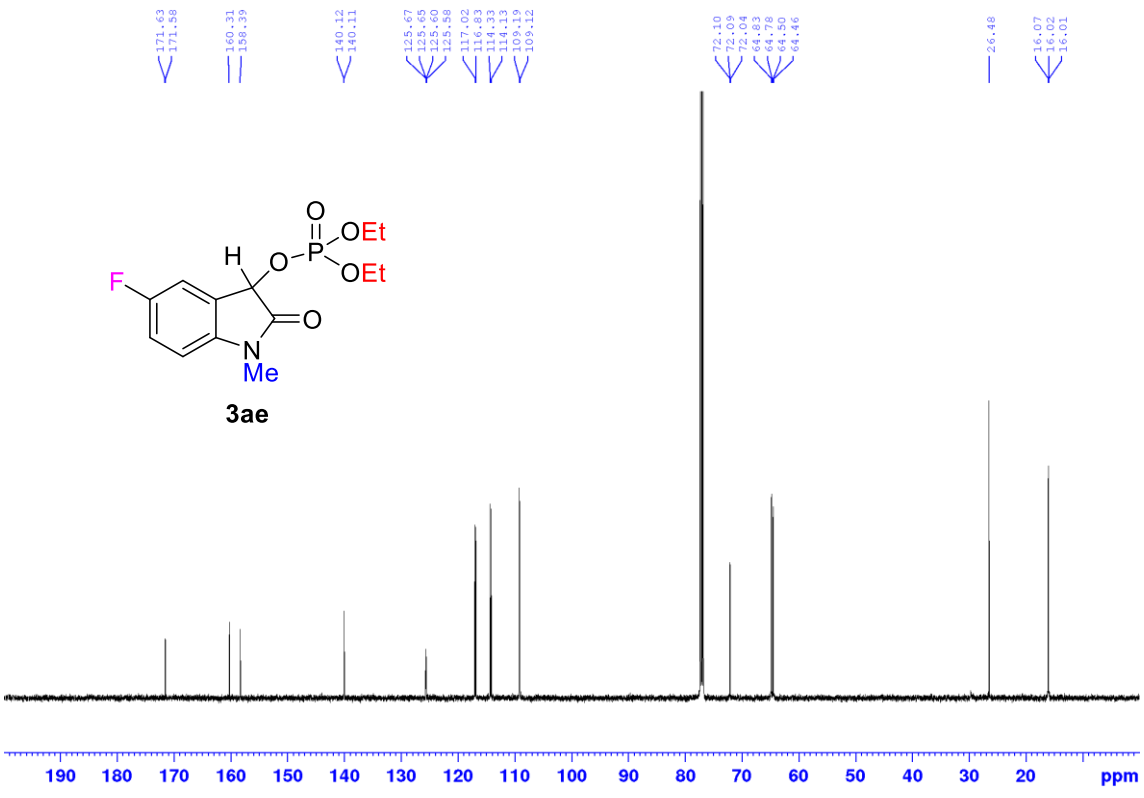
7.346
7.093
7.076
7.058
6.767
6.758
6.750
5.582
5.558
4.325
4.310
4.296
4.282
4.267
4.250
4.228
4.214
4.199
4.185
4.171
3.190
1.422
1.408
1.394
1.372
1.358
1.344
O
OEt
H
O
P
OEt
F
O
N
Me
3ae
8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
0.96
1.02
1.00
0.93
3.97
3.05
6.02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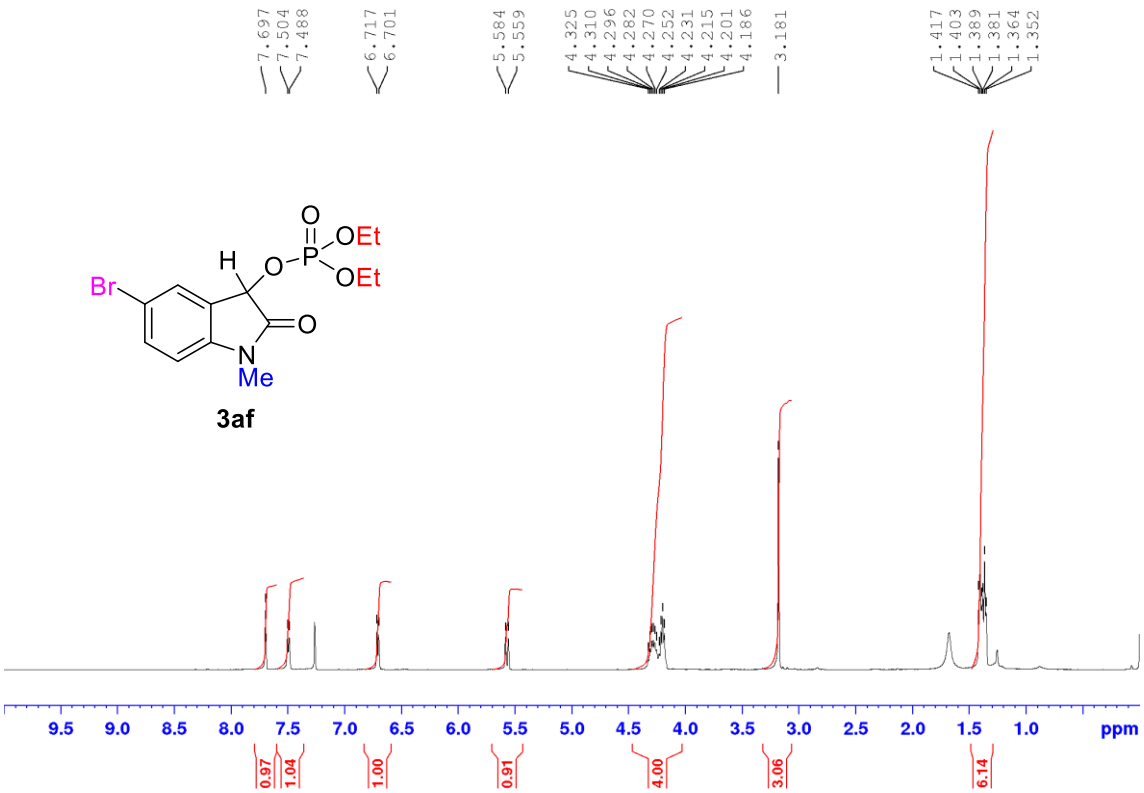
171.58
160.31
158.39
140.12
140.11
125.67
125.65
125.60
125.58
117.02
116.83
114.33
114.13
109.19
109.12
72.10
72.09
72.04
64.83
64.78
64.50
64.46
26.48
16.07
16.02
16.01
O
OEt
H
O
P
OEt
F
O
N
Me
3ae
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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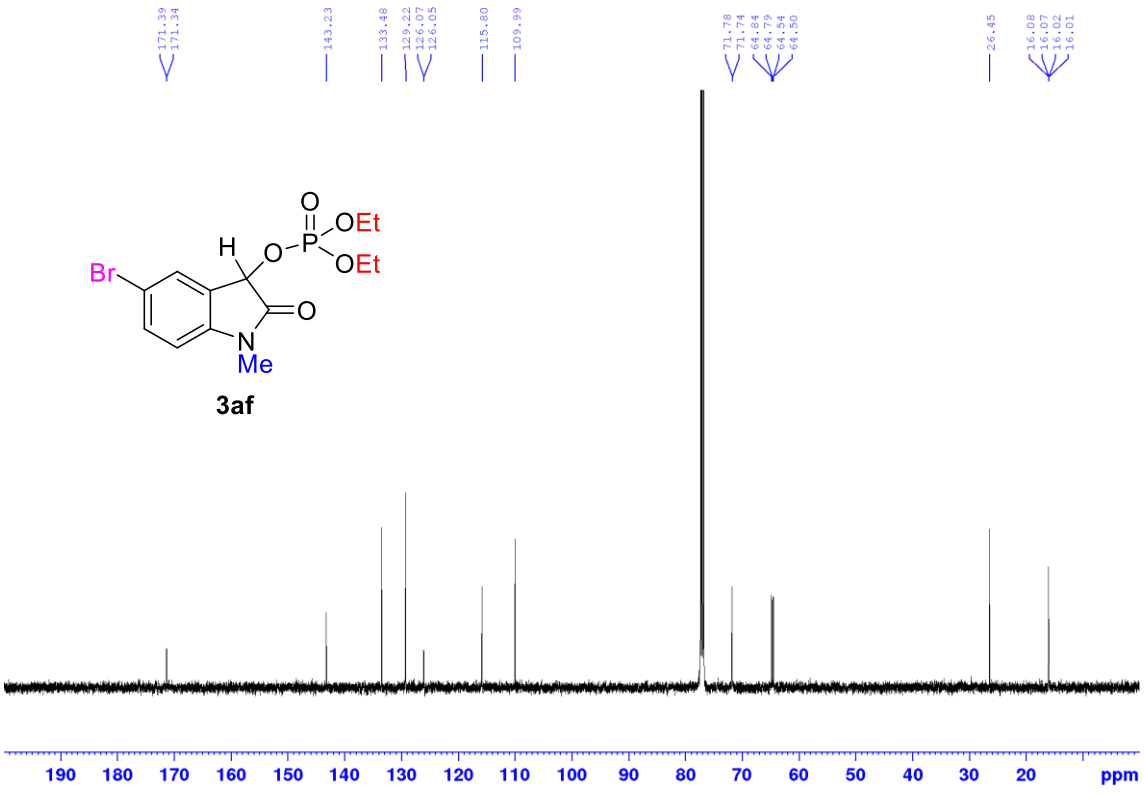
6.717
6.701
5.584
5.559
4.325
4.310
4.296
4.282
4.270
4.252
4.231
4.215
4.201
4.186
3.181
1.417
1.403
1.389
1.381
1.364
1.352
Br
H
O
P
OEt
OEt
O
N
Me
3af
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
ppm
0.97
1.04
1.00
0.91
4.00
3.06
6.14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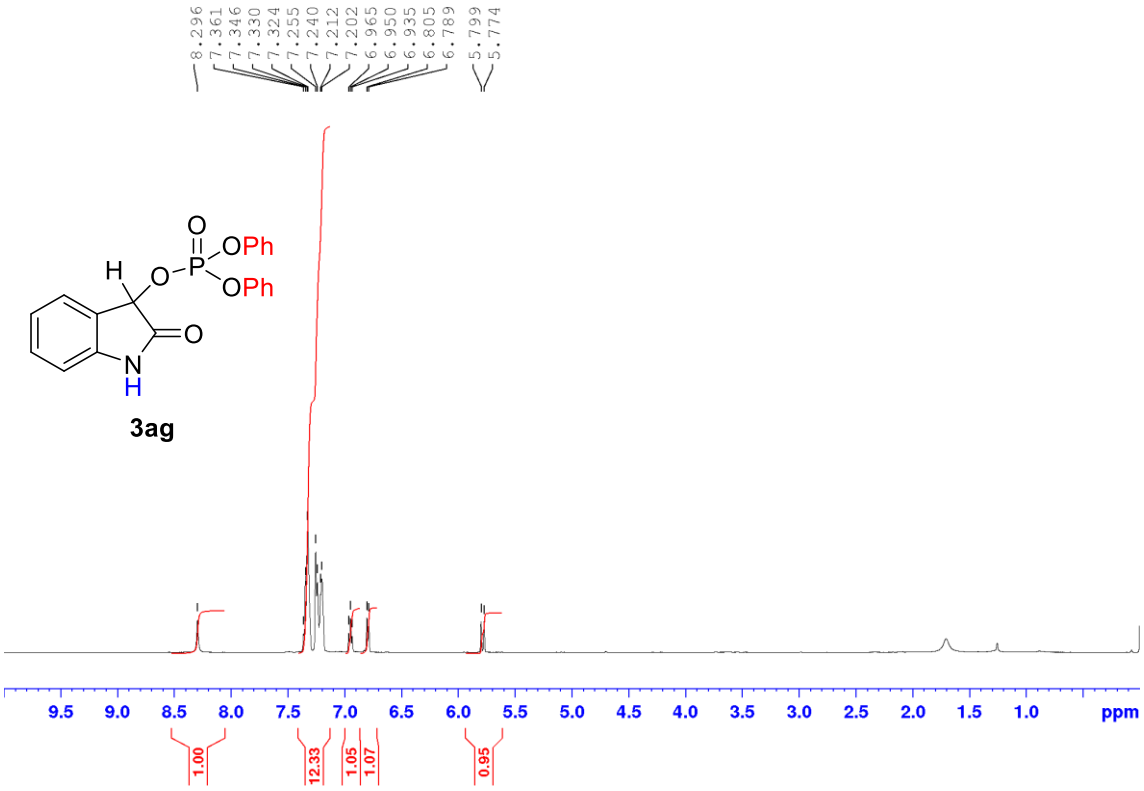
171.34
143.23
133.48
129.22
126.07
126.05
115.80
109.99
71.78
71.74
64.84
64.79
64.54
64.50
26.45
16.08
16.07
16.02
16.01
Br
H
O
P
OEt
OEt
O
N
Me
3af
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
ppm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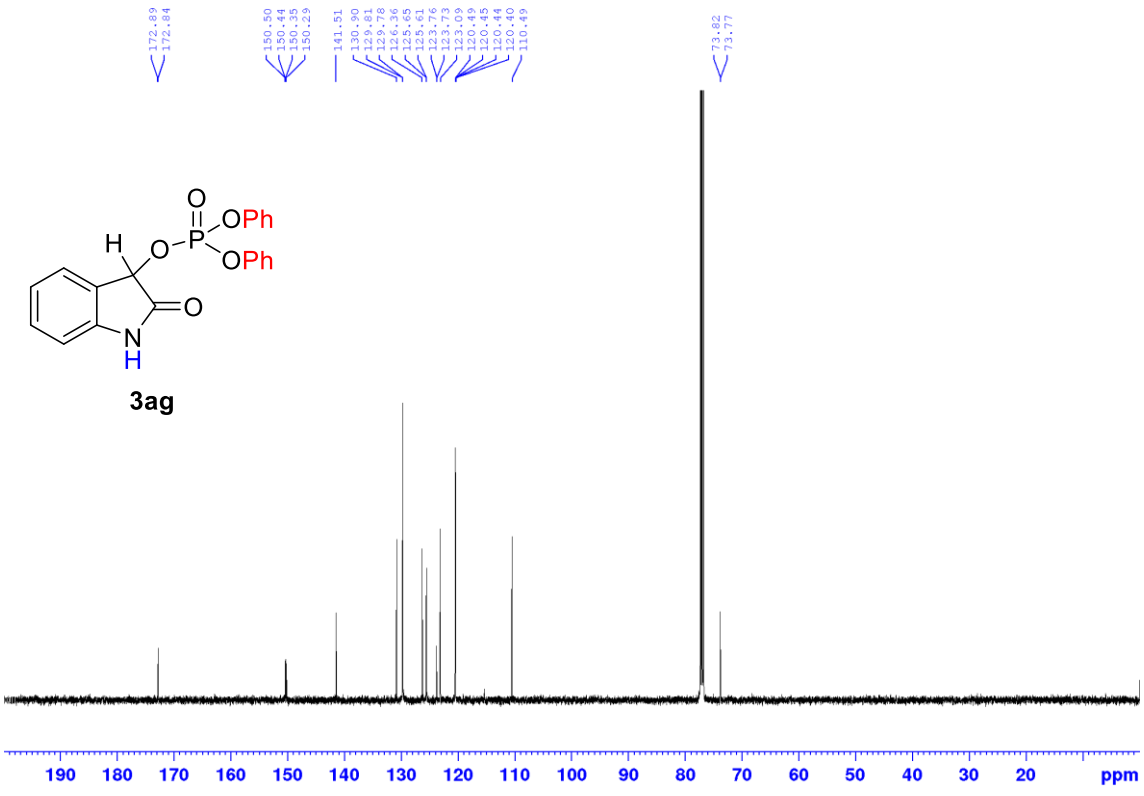
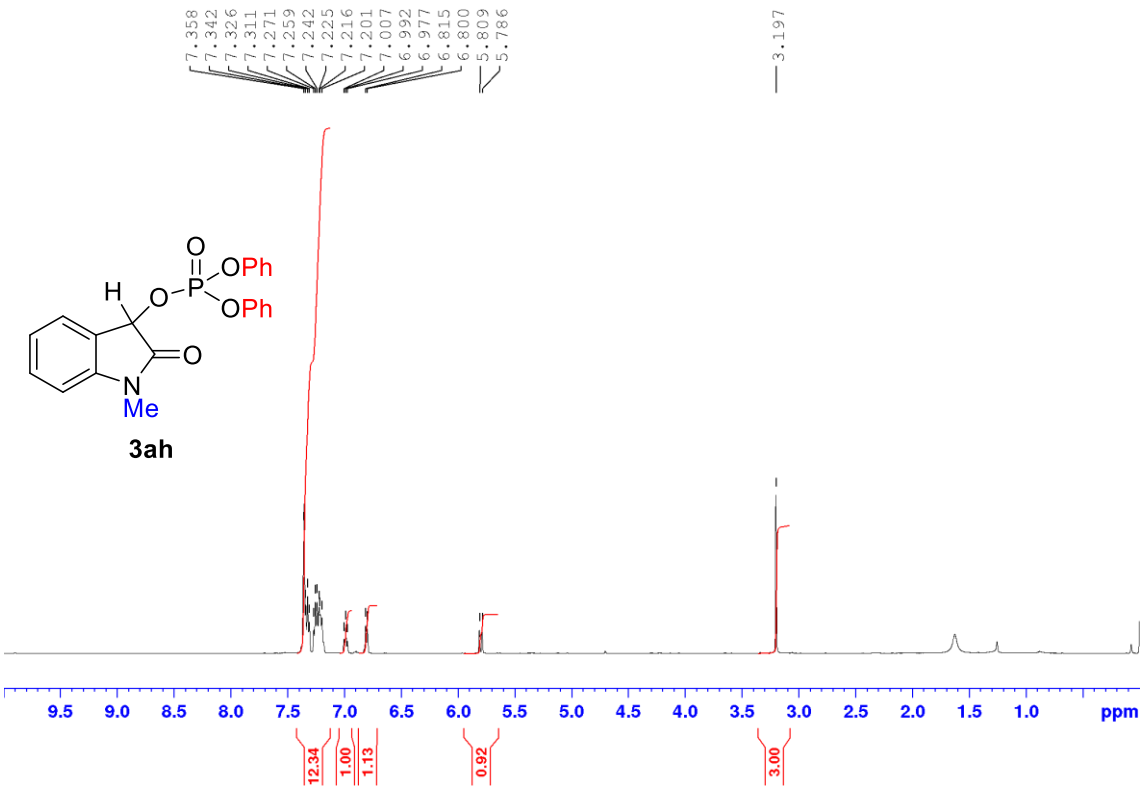
7.346
7.330
7.324
7.255
7.240
7.212
7.202
6.965
6.950
6.935
6.805
6.789
5.799
5.774
O
OPh
H
O
P
OPh
O
N
H
3ag
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
ppm
1.00
12.33
1.05
1.07
0.95


172.89
172.84
150.50
150.44
150.35
150.29
141.51
130.90
129.81
129.78
126.46
125.65
123.61
123.76
123.73
123.09
120.49
120.45
120.44
120.40
110.49
73.82
73.77
O
OPh
H
O
P
OPh
O
N
H
3ag
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
ppm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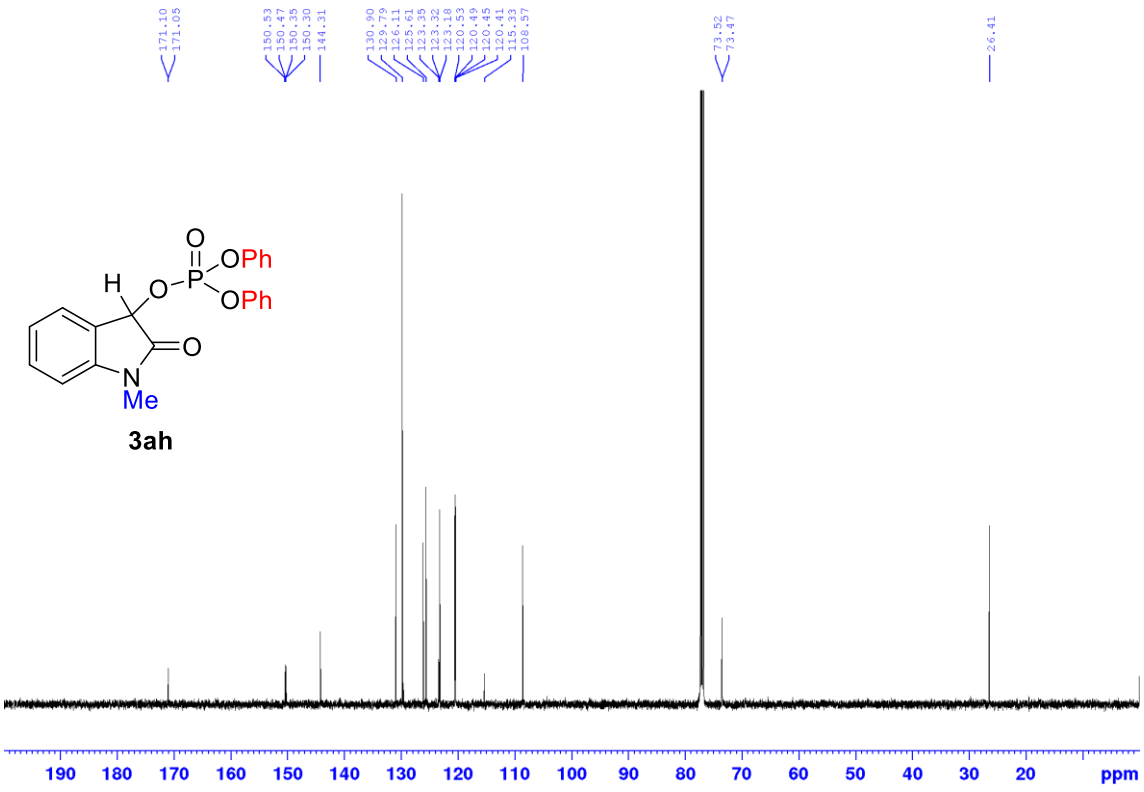
7.326
7.311
7.271
7.259
7.242
7.225
7.216
7.201
7.007
6.992
6.977
6.815
6.800
5.809
5.786
3.197
O
OPh
H
O
P
OPh
O
N
Me
3ah
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
12.34
1.00
1.13
0.92
3.00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150.53
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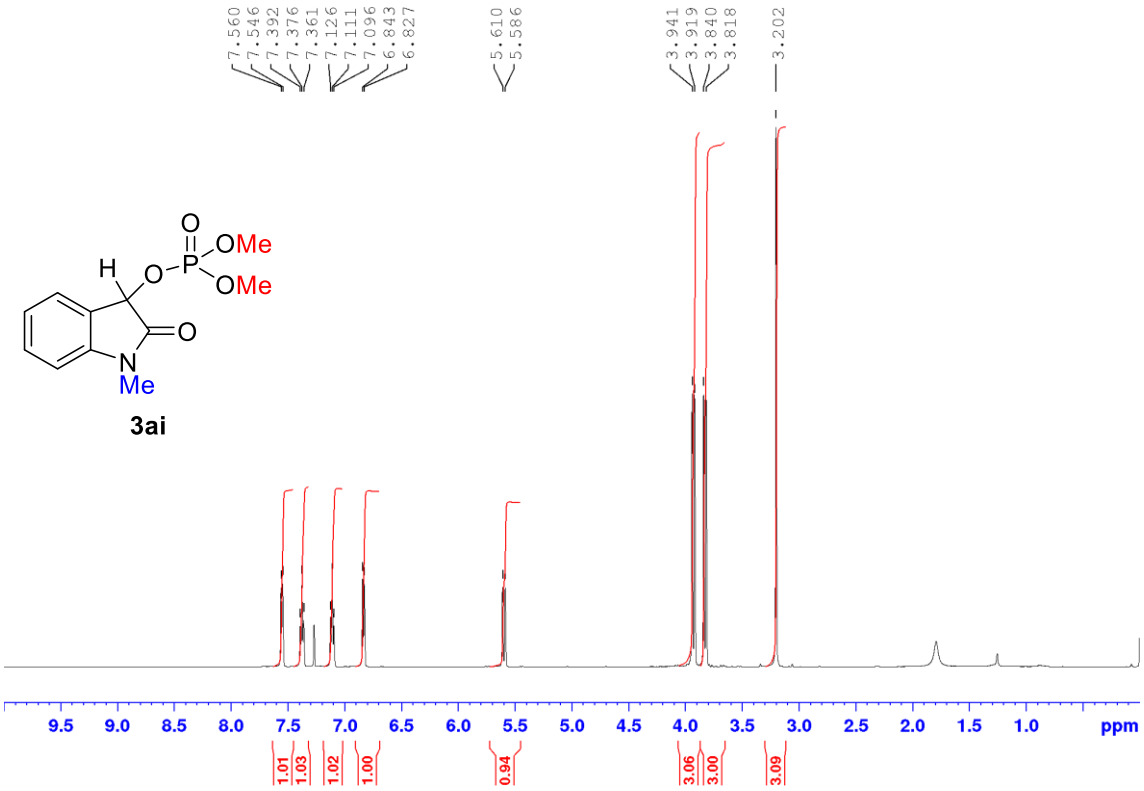
150.35
150.30
144.31
130.90
129.79
126.11
125.61
123.55
123.32
123.18
120.53
120.49
120.45
120.41
115.33
108.57
73.52
73.47
26.41
O
OPh
H
O
P
OPh
O
N
Me
3ah
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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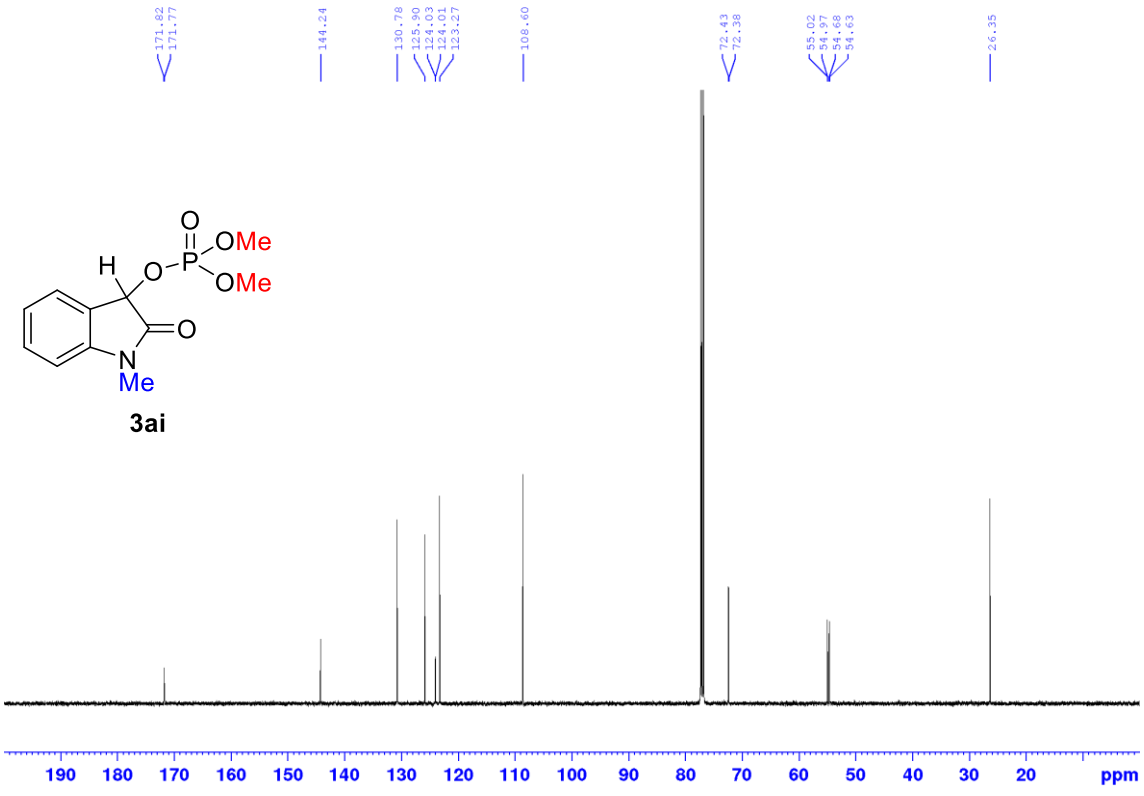
7.546
7.392
7.376
7.361
7.126
7.111
7.096
6.843
6.827
5.610
5.586
3.941
3.919
3.840
3.818
3.202
O
H
O
P
OMe
OMe
O
N
Me
3ai
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.01
1.03
1.02
1.00
0.94
3.06
3.00
3.09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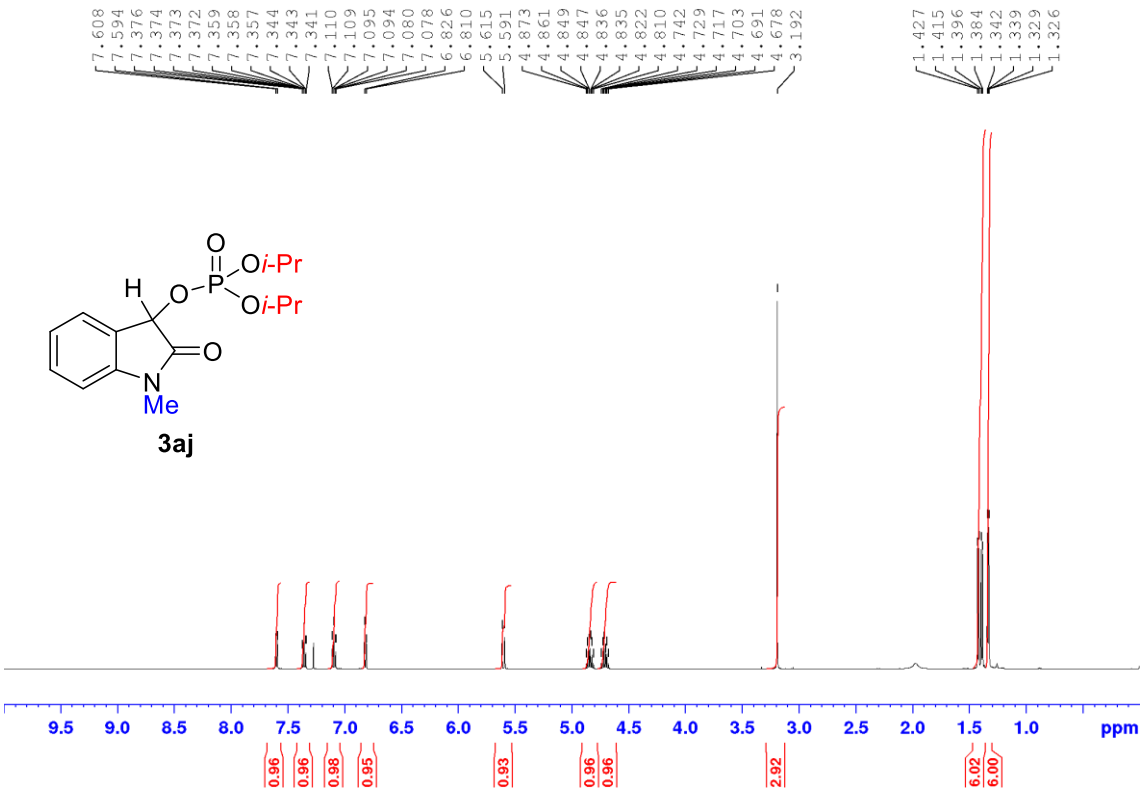
171.77
144.24
130.78
125.90
124.03
124.01
123.27
108.60
72.43
72.38
55.02
54.97
54.68
54.63
26.35
O
H
O
P
OMe
OMe
O
N
Me
3ai
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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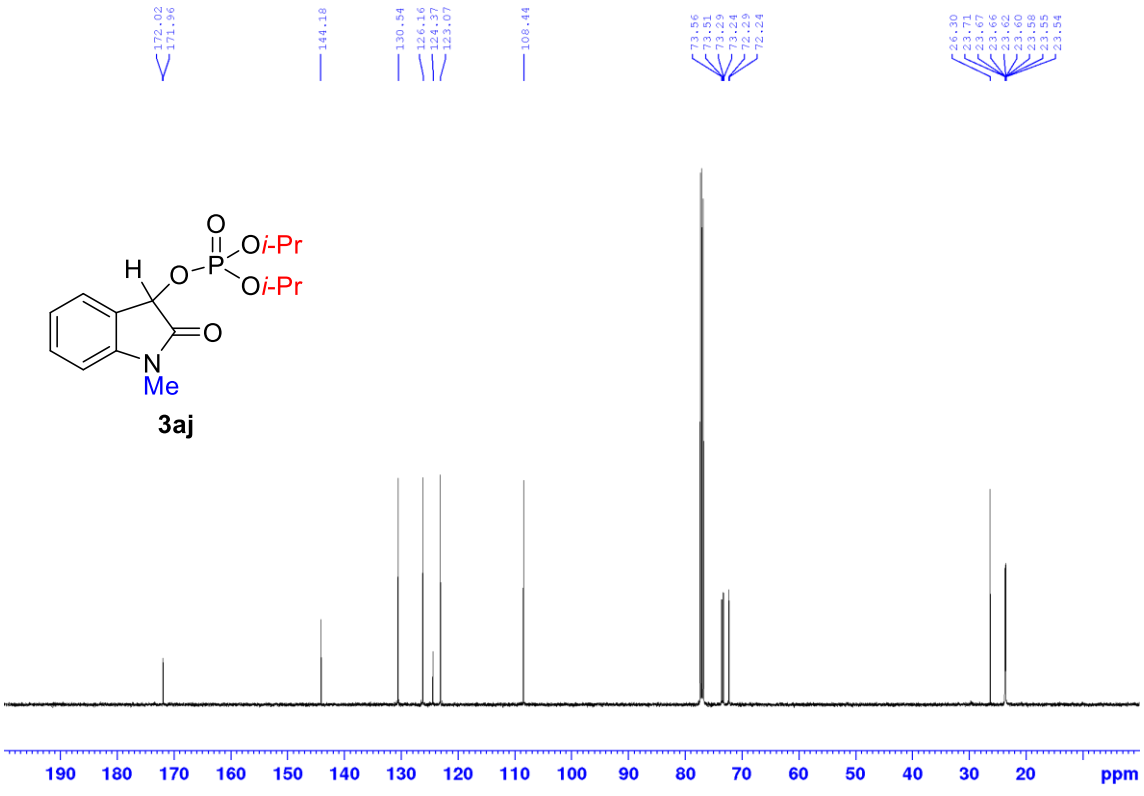
7.373
7.372
7.359
7.358
7.357
7.344
7.343
7.341
7.110
7.109
7.095
7.094
7.080
7.078
6.826
6.810
5.615
5.591
4.873
4.861
4.849
4.847
4.836
4.835
4.822
4.810
4.742
4.729
4.717
4.703
4.691
4.678
3.192
1.427
1.415
1.396
1.384
1.342
1.339
1.329
1.326
O
O
i-Pr
H
O
P
O
i-Pr
O
N
Me
3aj
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
0.96
0.96
0.98
0.95
0.93
0.96
0.96
2.92
6.02
6.00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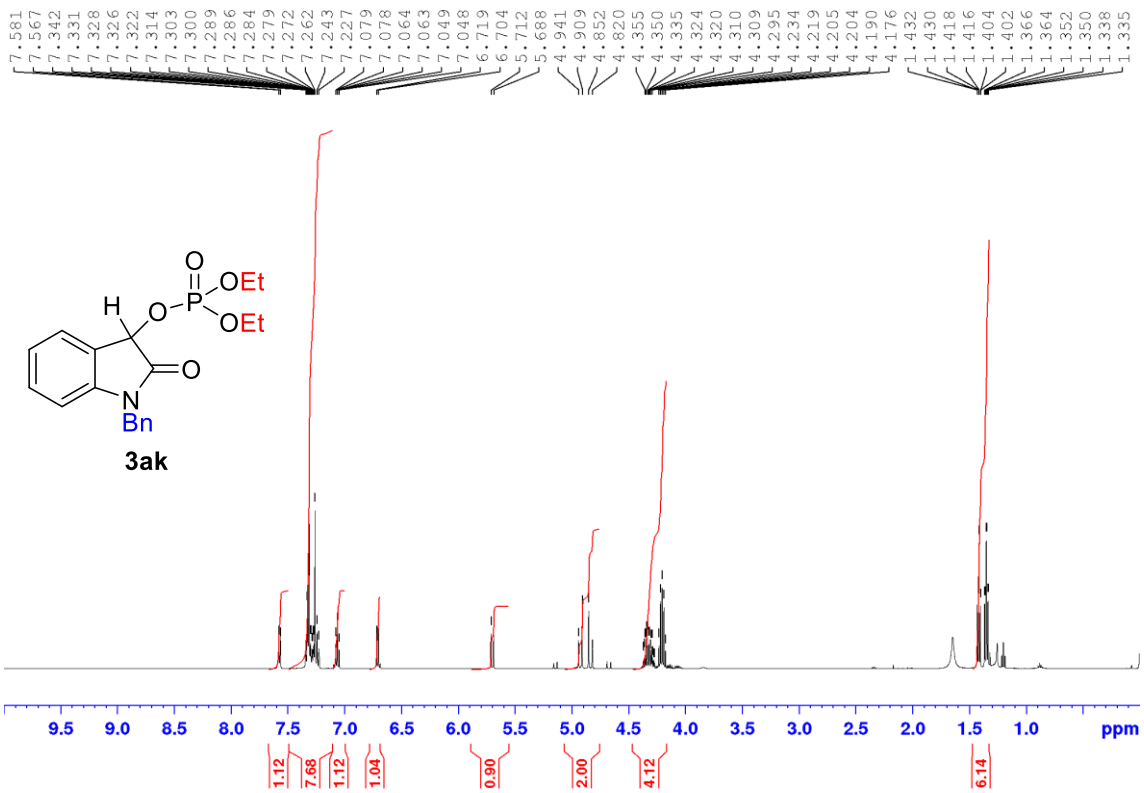
171.96
144.18
130.54
126.16
124.37
123.07
108.44
73.56
73.51
73.29
73.24
72.29
72.24
26.30
23.71
23.67
23.66
23.62
23.60
23.58
23.55
23.54
O
O
i-Pr
H
O
P
O
i-Pr
O
N
Me
3aj
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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7.286
7.284
7.279
7.272
7.262
7.243
7.227
7.079
7.078
7.064
7.063
7.049
7.048
6.719
6.704
5.712
5.688
4.941
4.909
4.852
4.820
4.355
4.350
4.335
4.324
4.320
4.310
4.309
4.295
4.234
4.219
4.205
4.204
4.190
4.176
1.432
1.430
1.418
1.416
1.404
1.402
1.366
1.364
1.352
1.350
1.338
1.335
O
OEt
H
O
P
OEt
O
N
Bn
3ak
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
ppm
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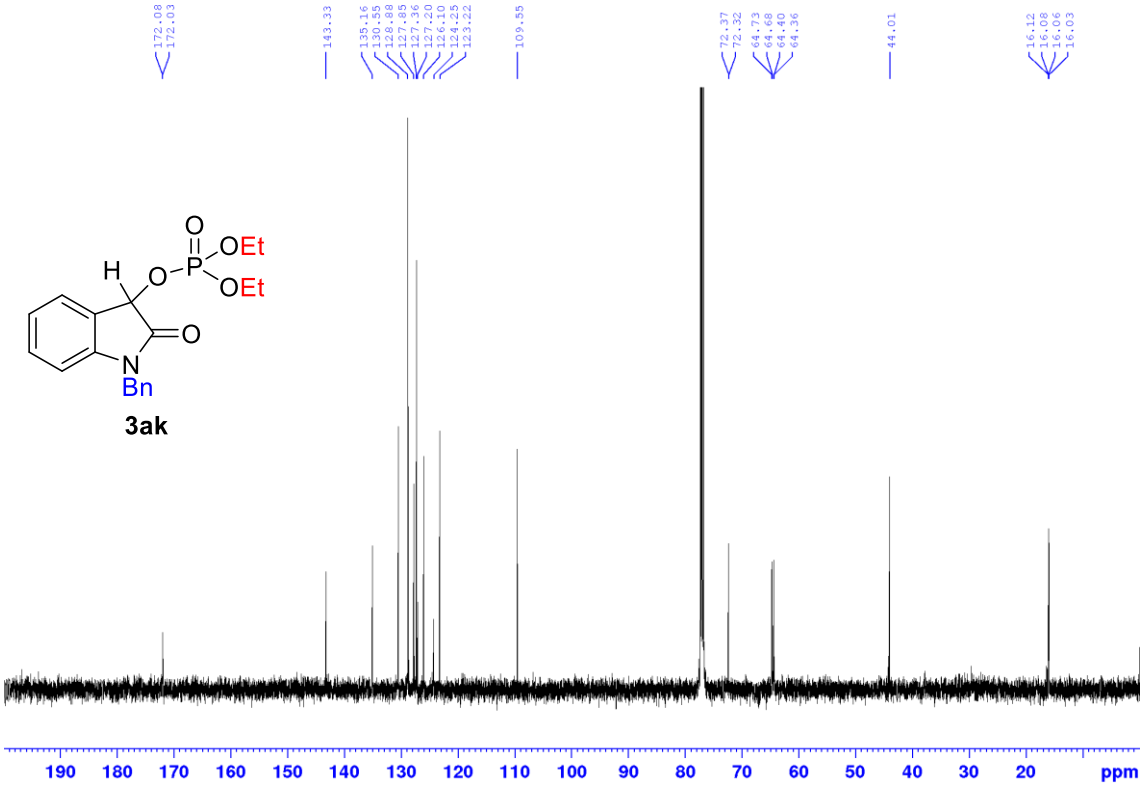
1.12
1.04
0.90
2.00
4.12
6.14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172.03
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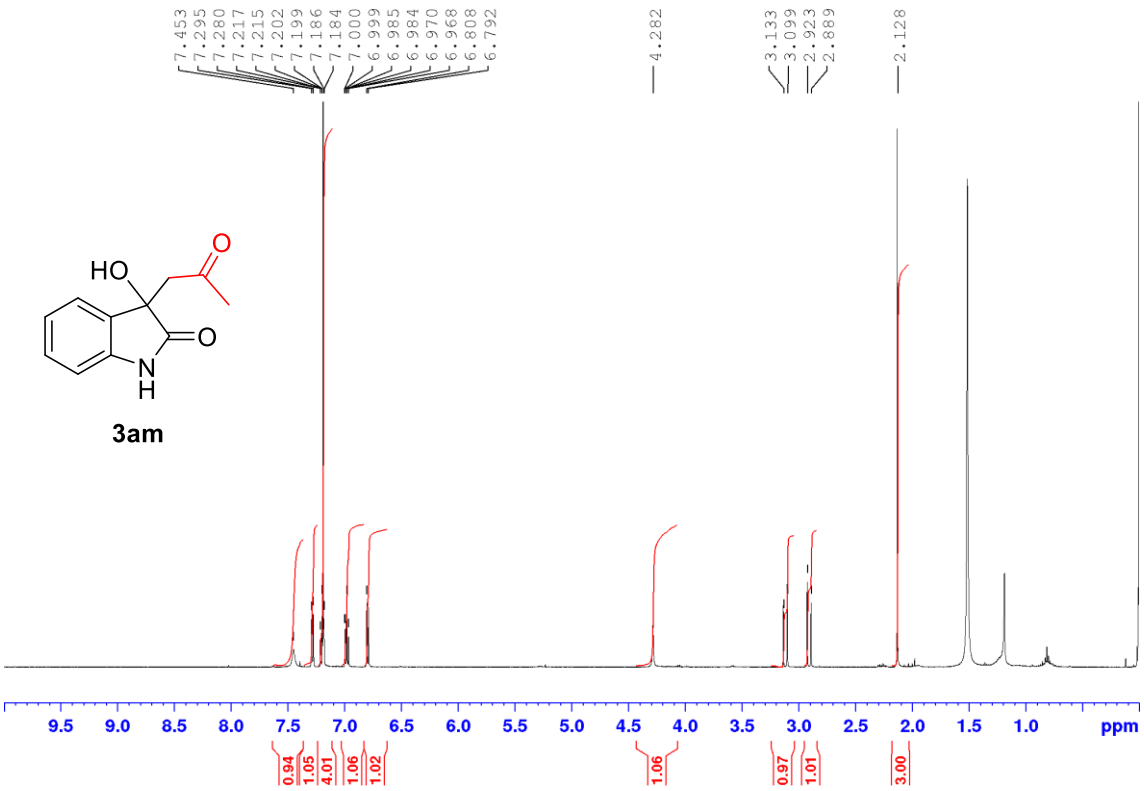
135.16
130.55
128.88
127.85
127.36
127.20
126.10
124.25
123.22
109.55
72.37
72.32
64.73
64.68
64.40
64.36
44.01
16.12
16.08
16.06
16.03
O
OEt
H
O
P
OEt
O
N
Bn
3ak
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
ppm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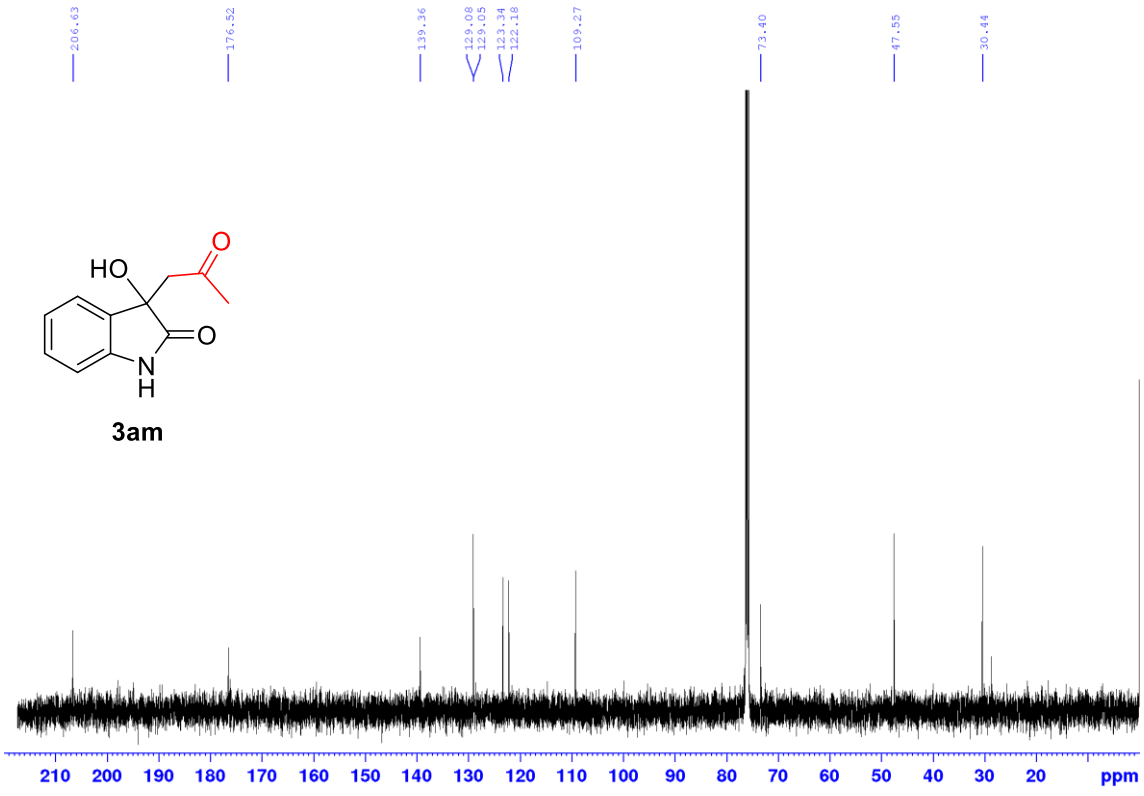
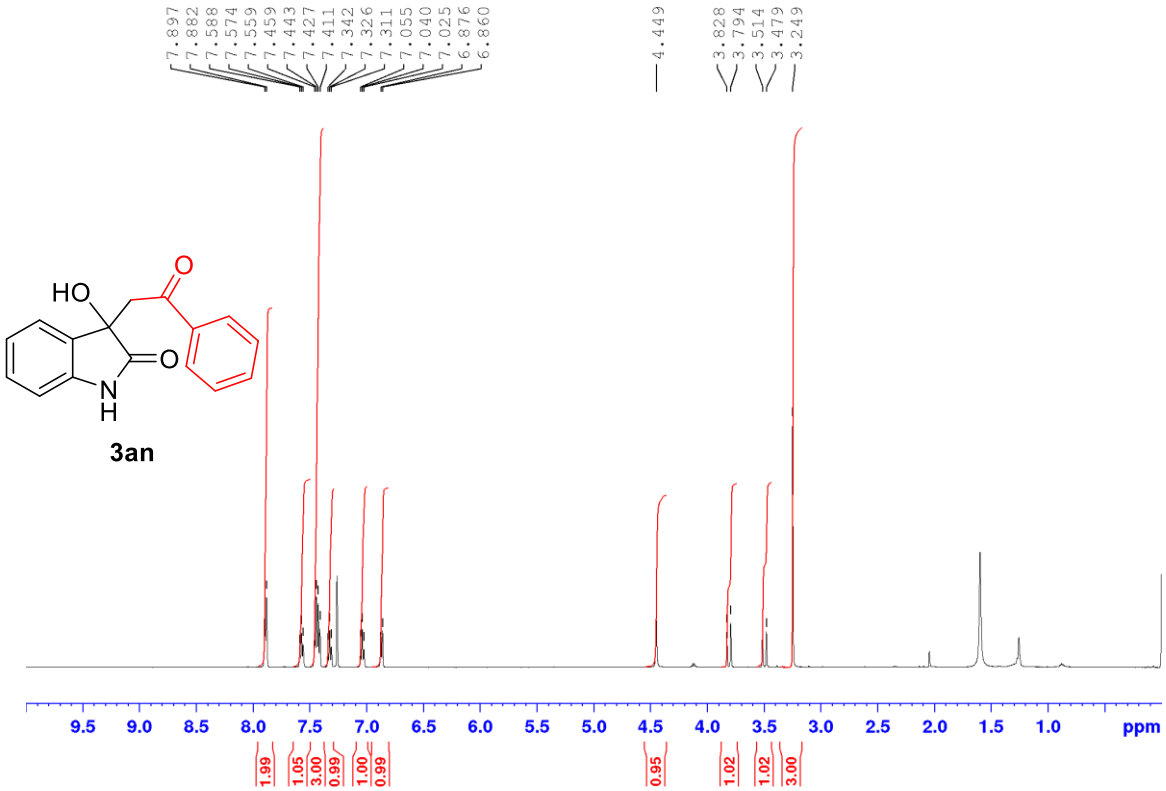
7.217
7.215
7.202
7.199
7.186
7.184
7.000
6.999
6.985
6.984
6.970
6.968
6.808
6.792
4.282
3.133
3.099
2.923
2.889
2.128
HO
O
O
N
H
3am
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
0.94
1.05
4.01
1.06
1.02
1.06
0.97
1.01
3.00


206.63
176.52
139.36
129.08
129.05
123.34
122.18
109.27
73.40
47.55
30.44
HO
O
O
N
H
3am
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm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7.559
7.459
7.443
7.427
7.411
7.342
7.326
7.311
7.055
7.040
7.025
6.876
6.860
4.449
3.828
3.794
3.514
3.479
3.249
HO
O
O
N
H
3an
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 ppm
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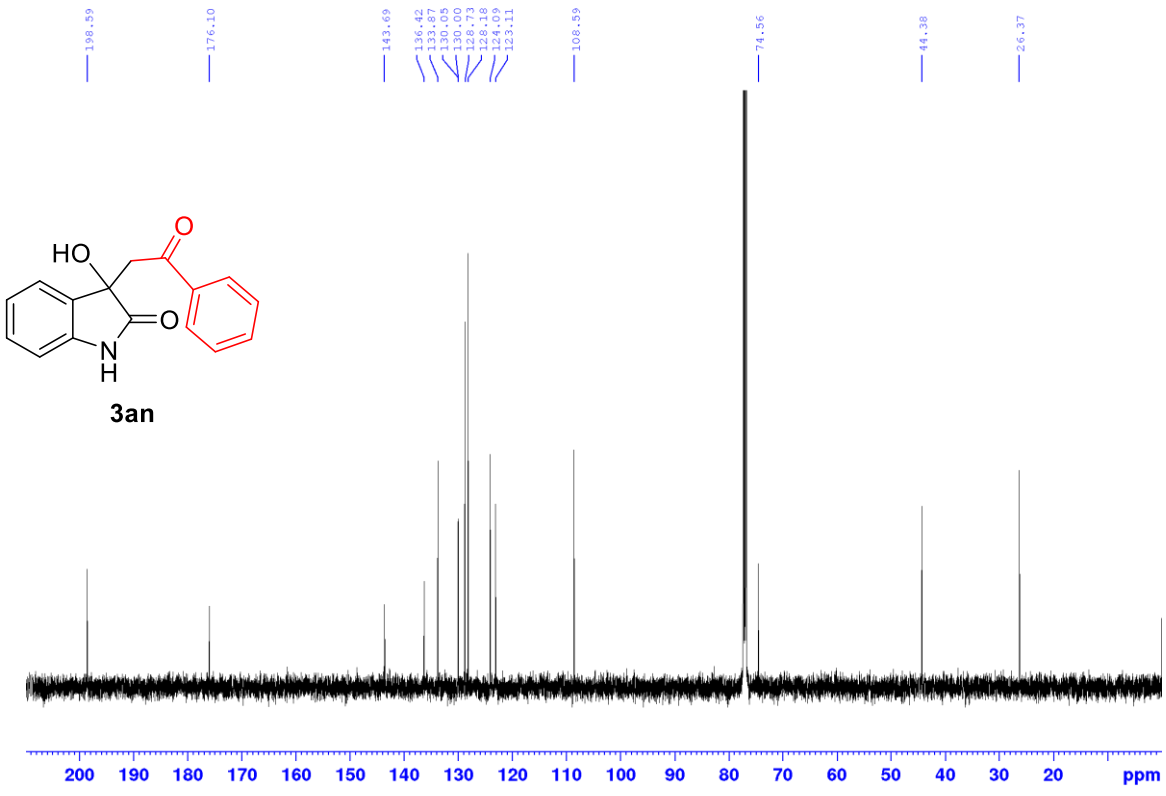
1.05
3.00
0.99
1.00
0.99
0.95
1.02
1.02
3.00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136.42
133.87
130.05
130.00
128.73
128.18
124.09
123.11
108.59
74.56
44.38
26.37
HO
O
O
N
H
3an
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm