ORGANIC CHEMISTRY
FRONTIERS

Supporting Information

Copper(I)-catalyzed enantioselective hydroboration of cyclopropenes: facile synthesis of optically active cyclopropylboronates

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CYCLOPROPENE SUBSTRATES

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TRANSFORMATION

HPLC of HYDROBORATION PRODUCTS

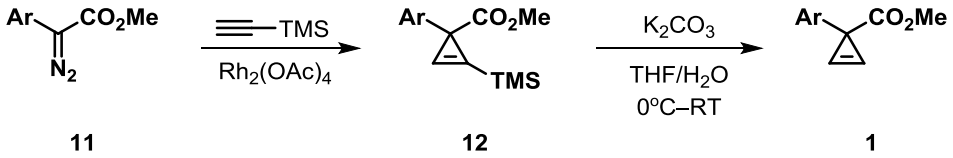
1. General Information

All solvents were dried before use following the standard procedures. Unless otherwise indicated, all starting materials purchased from commercial suppliers were used without further purification. The ^{1}H and ^{13}C NMR spectra were recorded on Bruker AV-400 MHz in the indicated solvents. Chemical shifts are reported in δ (ppm) referenced to an internal TMS standard for ^{1}H NMR and $CDCl_3$ (δ = 77.10 ppm) for ^{13}C NMR. Coupling constants (*J*) are quoted in Hz. Optical rotations were measured on a JASCO P-1030 polarimeter. IR spectra were recorded on Nicolet iN 10 MX. ESI mass spectra were recorded on Agilent1200/G6100A. HRMS of boron-containing compounds is based on ^{10}B.

2. Substrate Preparation

Cyclopropene **1o** was prepared according to the literature procedure.[1]

General procedures for the preparation of other cyclopropenes substrates[2−3]



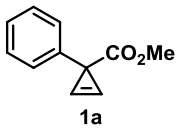
11 **12** **1**

Starting material, methyl diazoarylacetate **11** was prepared according to the literature procedure[3].

A solution of methyl diazoarylacetate (**11**, 7 mmol, 1.0 equiv) in trimethylsilylacetylene (10 mL) was added via syringe pump over 16 h to a stirred mixture of $Rh_2(OAc)_4$ (1 mol%) in trimethylsilylacetylene (5 mL). After the addition was complete, the reaction mixture was stirred at room temperature for additional 12 h. Then the trimethylsilylacetylene was removed under reduced pressure to give the crude product **12**.

Crude material **12** was dissolved in THF (15 mL) and stirred at 0 °C. 10% aqueous K_2CO_3 (10 mL) was added dropwise, and the reaction mixture was stirred at room temperature for 5 h, when the reaction completed. Ethyl acetate (20 mL) and water (20 mL) were added to the mixture, aqueous phase was separated, and the water layer was extracted with ethyl acetate (50 mL × 3), the combined organic phase was washed by brine (100 mL), dried ($MgSO_4$), filtered, and evaporated. The residue was purified by silica gel column chromatography (eluent: *n*-hexane / EtOAc = 15:1) to give pure cyclopropene products **1**.

Methyl 1-phenylcycloprop-2-enecarboxylate (1a)[3]

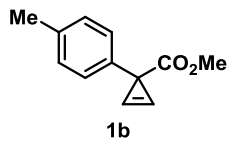


1a

Light yellow oil, 640 mg, 52% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) :*δ* (ppm) 7.33−7.24 (m, 5H), 7.22 (s, 2H), 3.70 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) *δ* (ppm) 175.52, 141.44, 128.16, 128.13, 126.59, 107.68 (2C), 52.25, 30.58 ESI-MS: $[M+Na]^{\oplus}$ 197.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_{10}O_2Na^{\oplus}$ 197.0573, found 197.0565; IR (KBr) *v* (cm^{-1}) 3155, 3113, 3058, 3025, 2951, 1724, 1662, 1601, 1495, 1435, 1228, 1113, 1021, 1009, 998, 892, 791, 762, 738, 699.

[1] D. H. T. Phan, K. G. M. Kou and V. M. Dong, *J. Am. Chem. Soc.*, 2010, **132**, 16354.
[2] H. M. L. Davies, T. Hansen and M. R. Churchill, *J. Am. Chem. Soc.*, 2000, **122**, 3063.
[3] M. Rubina, M. Rubin and V. Gevorgyan, *J. Am. Chem. Soc.*, 2003, **125**, 7198.

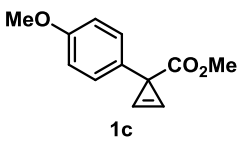
Methyl 1-*p*-tolylcycloprop-2-enecarboxylate (1b)



1b

Light yellow oil, 315 mg, 24% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.20(s, 2H), 7.17−7.10 (m, 4H), 3.69 (s, 3H), 2.32 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.71, 138.50, 136.22, 128.86, 128.03, 107.84 (2C), 52.24, 30.28, 21.05; ESI-MS: $[M+Na]^{\oplus}$ 211.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{12}H_{12}O_2Na^{\oplus}$ 211.0730, found 211.0734; IR (KBr) ν (cm^{-1}) 3128, 3088, 3053, 3001, 2948, 2925, 2840, 1710, 1651, 1515, 1434, 1292, 1219, 1033, 1019, 1003, 899, 863, 812, 741, 638, 547.

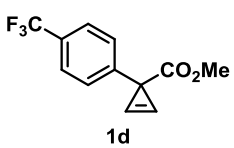
Methyl 1-(4-methoxyphenyl)cycloprop-2-enecarboxylate (1c)



1c

Yellow oil, 250 mg, 18% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.21 (s, 2H), 7.18 (d, J = 8.8 Hz, 2H), 6.84 (d, J = 8.8 Hz, 2H), 3.78 (s, 3H), 3.69 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.81, 158.25, 133.66, 129.23, 113.57, 107.92 (2C), 55.23, 52.25, 29.92; ESI-MS: $[M+Na]^{\oplus}$ 227.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{12}H_{12}O_3Na^{\oplus}$ 227.0679, found 227.0677; IR (KBr) ν (cm^{-1}) 3151, 3109, 3005, 2958, 2840, 1713, 1663, 1611, 1516, 1442, 1436, 1250, 1223, 1119, 926, 829, 806, 771, 626, 550.

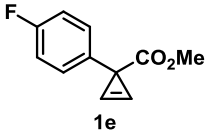
Methyl 1-(4-(trifluoromethyl)phenyl)cycloprop-2-enecarboxylate (1d)



1d

Yellow oil, 863 mg, 51% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.56 (d, J = 8.0 Hz, 2H), 7.39 (d, J = 8.0 Hz, 2H), 7.21(s, 2H), 3.71 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 174.79, 145.41, 129.02, 128.90, 125.15 (q, J_{CF} = 3.8 Hz), 122.95, 107.24 (2C), 52.47, 30.42; ESI-MS: $[M+H]^{\oplus}$ 243.0; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{12}H_9F_3O_2Na^{\oplus}$ 265.0447, found 265.0447; IR (KBr) ν (cm^{-1}) 3120, 2955, 1727, 1666, 1618, 1436, 1409, 1327, 1292, 1225, 1165, 1120, 1069, 1014, 872, 833, 796, 767, 606.

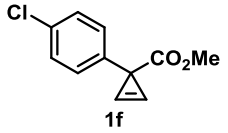
Methyl 1-(4-fluorophenyl)cycloprop-2-enecarboxylate (1e)



1e

Yellow oil, 445 mg, 34% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.26−7.20 (m, 2H), 7.20 (s, 2H), 7.00−6.95 (m, 2H), 3.69 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.32, 161.55 (d, J_{CF} = 243.7 Hz), 137.23 (d, J_{CF} = 3.8 Hz), 129.80 (d, J_{CF} = 8.3 Hz, 2C), 114.92 (d, J_{CF} = 20.5 Hz, 2C), 107.67 (2C), 52.30, 29.89; ESI-MS: $[M+ Na]^{\oplus}$ 215.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_9FO_2Na^{\oplus}$ 215.0479, found 215.0488; IR (KBr) ν (cm^{-1}) 3433, 3158, 3117, 2999, 2953, 2844, 1724, 1660, 1604, 1510, 1435, 1293, 1224, 1030, 1006, 870, 832, 625, 544.

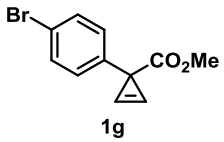
Methyl 1-(4-chlorophenyl)cycloprop-2-enecarboxylate (1f)



1f

Light yellow oil, 728 mg, 50% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.27 (d, J = 8.0 Hz, 2H), 7.22-7.19 (m, 4H), 3.70 (s, 3H) ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.05, 139.96, 132.37, 129.61, 128.22, 107.42 (2C), 52.32, 29.98; ESI-MS: $[M+H]^{\oplus}$ 209.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_9ClO_2Na^{\oplus}$ 231.0183, found 231.0186; IR (KBr) ν (cm^{-1}) 3432, 3153, 3114, 2959, 2849, 1725, 1686, 1657, 1488, 1436, 1280, 1236, 1086, 1005, 996, 875, 789, 748, 614, 548, 464.

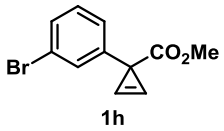
Methyl 1-(4-bromophenyl)cycloprop-2-enecarboxylate (1g)



1g

Light yellow oil, 243 mg, 35% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.42 (d, J = 8.4 Hz, 2H), 7.19 (s, 2H), 7.15 (d, J = 8.4 Hz, 2H), 3.70 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 174.98, 140.49, 131.16, 129.99, 120.50, 107.36 (2C), 52.33, 30.05; ESI-MS: $[M+Na]^{\oplus}$ 274.9; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_9B_rO_2Na^{\oplus}$ 274.9678, found 274.9687; IR (KBr) ν (cm^{-1}) 3152, 3114, 3043, 3025, 2956, 1725, 1656, 1483, 1436, 1412, 1280, 1237, 1069, 1030, 1005, 897, 876, 788, 746, 718, 612.

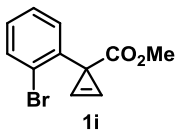
Methyl 1-(3-bromophenyl)cycloprop-2-enecarboxylate (1h)



1h

Light yellow oil, 413 mg, 24% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.40 (s, 1H), 7.35 (d, J = 8.0 Hz, 1H), 7.23−7.14 (m, 4H), 3.70 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 174.80, 143.80, 131.33, 129.68, 129.65, 126.95, 122.16, 107.32 (2C), 52.36, 30.17; ESI-MS: $[M+H]^{\oplus}$ 253.0; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_9BrO_2Na^{\oplus}$ 274.9678, found 274.9671; IR (KBr) ν (cm^{-1}) 3157, 3116, 2997, 2950, 2848, 1940, 1724, 1661, 1593, 1564, 1476, 1434, 1223, 1033, 1011, 738, 711, 604.

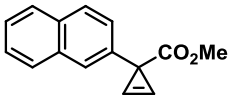
Methyl 1-(2-bromophenyl)cycloprop-2-enecarboxylate (1i)



1i

Light yellow oil, 552 mg, 32% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.54−7.51 (m, 1H), 7.33 (s, 2H), 7.29−7.09 (m, 3H), 3.67 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.07, 141.71, 132.60, 130.23, 128.65, 127.63, 125.18, 108.78 (2C), 52.55, 32.31; ESI-MS: $[M+Na]^{\oplus}$ 275.0; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_9BrO_2Na^{\oplus}$ 274.9678, found 274.9683; IR (KBr) ν (cm^{-1}) 3430, 3139, 3097, 3065, 2950, 2838, 1731, 1651, 1589, 1466, 1432, 1285, 1225, 1051, 1023, 877, 745, 650, 562.

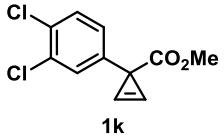
Methyl 1-(naphthalen-2-yl)cycloprop-2-enecarboxylate (1j)



1j

Light yellow oil, 564 mg, 36% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.81−7.60 (m, 3H), 7.66 (s, 1H), 7.45−7.41 (m, 3H), 7.29 (s, 2H), 3.72 (s, 3H) ; ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 175.60, 139.08, 133.31, 132.28, 127.72, 127.65, 127.59, 126.73, 126.61, 125.99, 125.67, 107.89 (2C), 52.33, 30.77; ESI-MS: $[M+H]^{\oplus}$ 225.1; HRMS (FTMS-ESI): $[M+H]^{\oplus}$ calcd for $C_{15}H_{13}O_2$ 225.0910, found 225.0905; IR (KBr) ν (cm^{-1}) 3155, 3114, 3055, 3019, 1950, 1724, 1661, 1631, 1434, 1243, 1214, 1186, 1035, 1013, 818, 749, 635, 613.

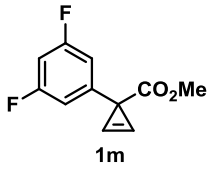
Methyl 1-(3,4-dichlorophenyl)cycloprop-2-enecarboxylate (1k)



1k

Light yellow oil, 300 mg, 20% yield for two steps. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.37−7.35 (m, 2H), 7.18 (s, 2H), 7.14−7.12 (m, 1H), 3.70 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 174.57, 141.88, 130.43, 130.09, 127.84, 107.19 (2C), 52.52, 29.82; ESI-MS: $[M+Na]^{\oplus}$ 265.0; HRMS (FTMS-ESI): $[M+ Na]^{\oplus}$ calcd for $C_{11}H_8Cl_2O_2$ $Na^{\oplus}$ 264.9794, found 264.9788; IR (KBr) ν (cm^{-1}) 3429, 3160, 3119, 2951, 2848, 1726, 1663, 1471, 1435, 1292, 1252, 1223, 1135, 1031, 887, 813, 741, 616, 598, 440.

Methyl 1-(3,5-difluorophenyl)cycloprop-2-enecarboxylate (1m)

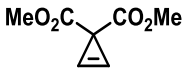


1m

Yellow oil, 350 mg, 23% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 7.15 (s, 2H), 6.81 (d, J = 7.2 Hz, 2H), 6.60 (t, J = 9.2 Hz, 1H), 3.71 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 174.30, 164.14, 145.63, 111.36, 106.82 (2C), 102.44, 52.49, 30.19; ESI-MS: $[M+H]^{\oplus}$ 211.2; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_{11}H_8F_2O_2Na^{\oplus}$ 233.0385, found 233.0377; IR (KBr) ν (cm^{-1}) 3716, 3219, 3084, 2957, 2484, 1724, 1625, 1594, 1469, 1430, 1253, 1150, 1120, 988, 883, 854, 745, 867, 629, 531, 515, 493.

Ethyl 1-methylcycloprop-2-enecarboxylate (1n). Preparation of this cyclopropene used the same procedure with literature.[1]

Dimethyl cycloprop-2-ene-1,1-dicarboxylate (1p).[2]

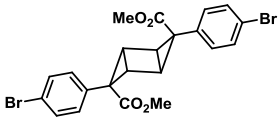


1p

Light yellow oil, 568 mg, 52% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ (ppm) 6.91 (s, 2H), 3.74 (s, 6H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 171.33, 102.41 (2C), 52.45, 29.83; ESI-MS: $[M+Na]^{\oplus}$ 179.1; HRMS (FTMS-ESI): $[M+Na]^{\oplus}$ calcd for $C_7H_8O_4Na^{\oplus}$ 179.0315, found 179.0312; IR (KBr) ν (cm^{-1}) 3617, 3167, 3122, 3004, 2956, 2847, 1728, 1671, 1436, 1293, 1192, 1143, 1069, 987, 950, 883, 817, 766, 720, 635, 519.

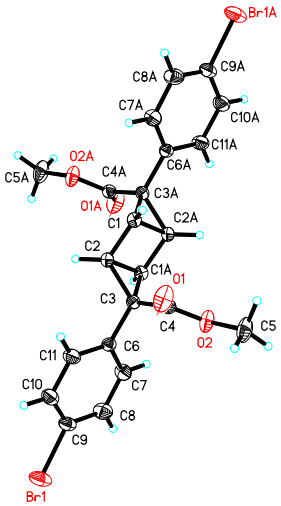
3. X-RAY CRYSTAL STRUCTURE OF 6

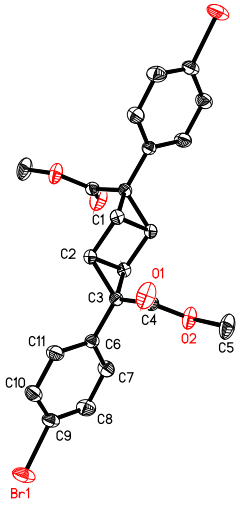
Preparation of the crystal: To a one-neck round-bottomed flask was added 30 mg of product **3g**, dissolved with 0.5 mL dichloromethane, added 5.0 mL *n*-hexane. Then the flask was sealed with rubber plug for two weeks to gives the crystal **6**. CCDC 1004894 (**6**) contains the supplementary crystallographic data. These data can be obtained free of charge from The Cambridge Crystallographic Data Centre via www.ccdc.cam.ac.uk/data_request/cif.



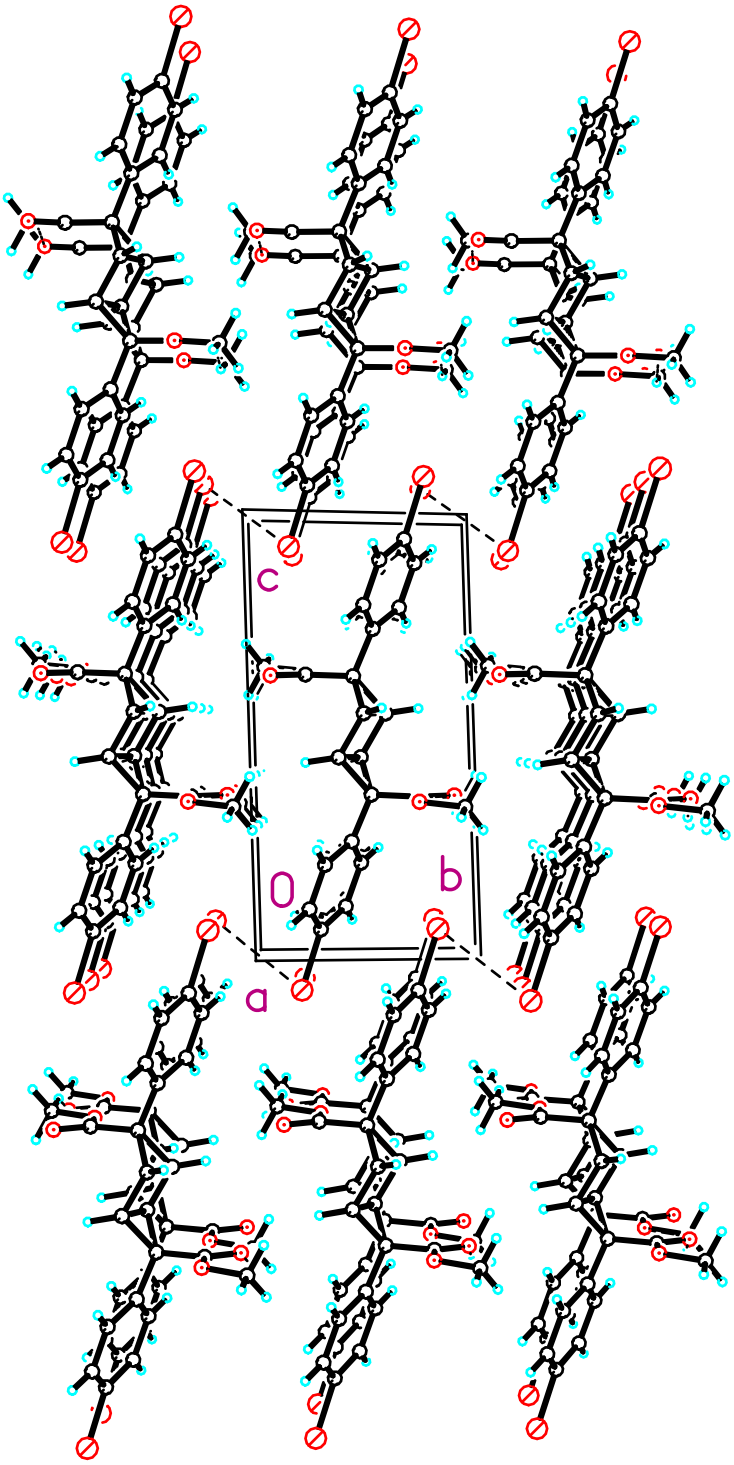
6

Colorless crystal, 5 mg. ^{1}H NMR (300 MHz, $CDCl_3$) δ (ppm) 7.50−7.28 (m, 6H), 7.21−7.15 (m, 2H), 3.72 (s, 6H), 2.36 (s, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ (ppm) 169.85, 132.20, 131.33, 130.18, 127.85, 122.59, 54.15, 52.55, 30.09.



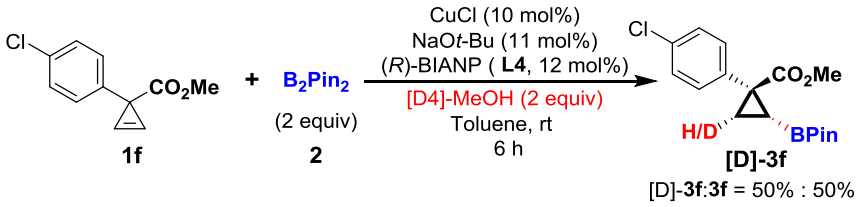


[1] Z. Yu, Y. Pan, Z. Wang, J. Wang and Q. Lin, *Angew. Chem. Int. Ed.*, 2012, **51**, 10600.
[2] M. Rubina, M. Rubin and V. Gevorgyan, *J. Am. Chem. Soc.*, 2003, **125**, 7198.

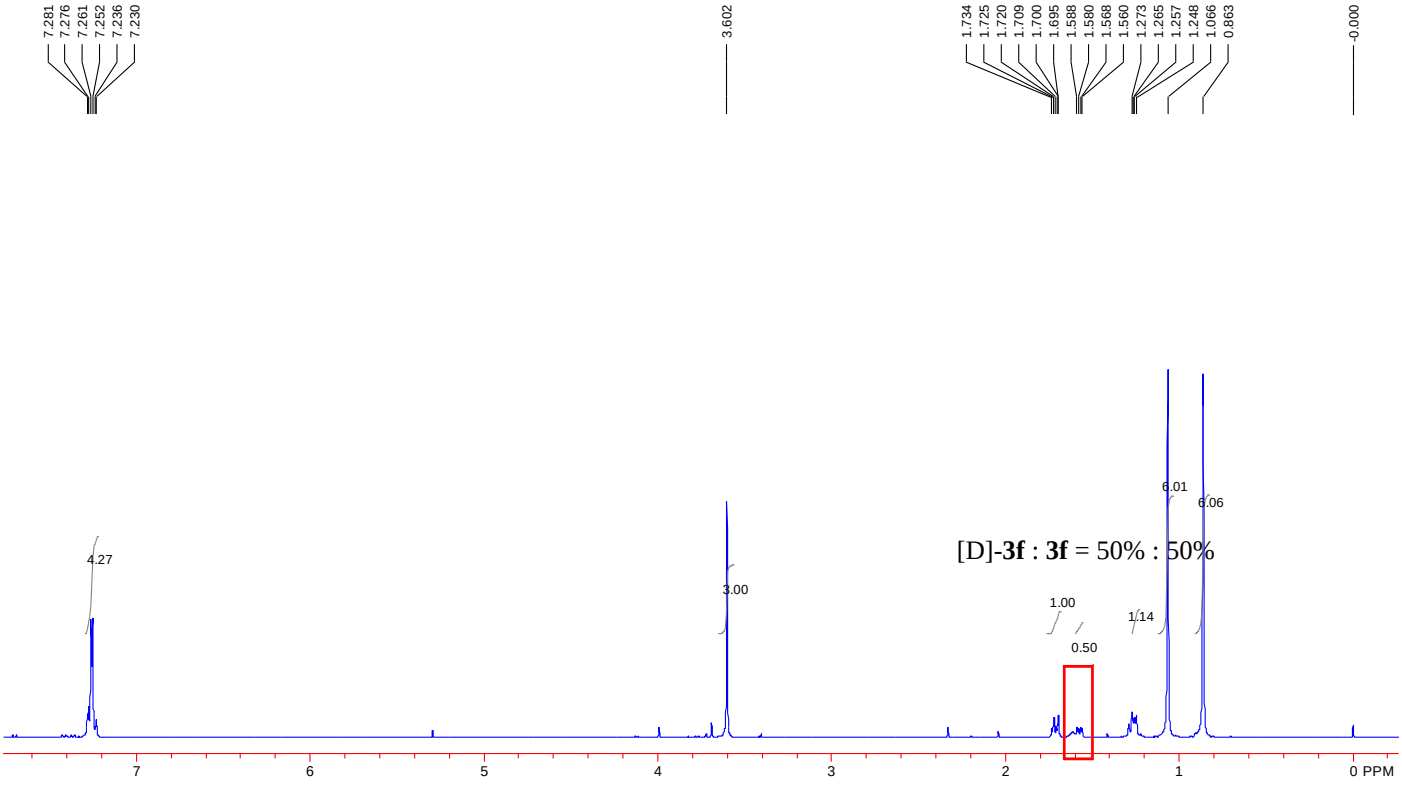

c
0
b
a

4. DEUTERATED EXPERIMENT

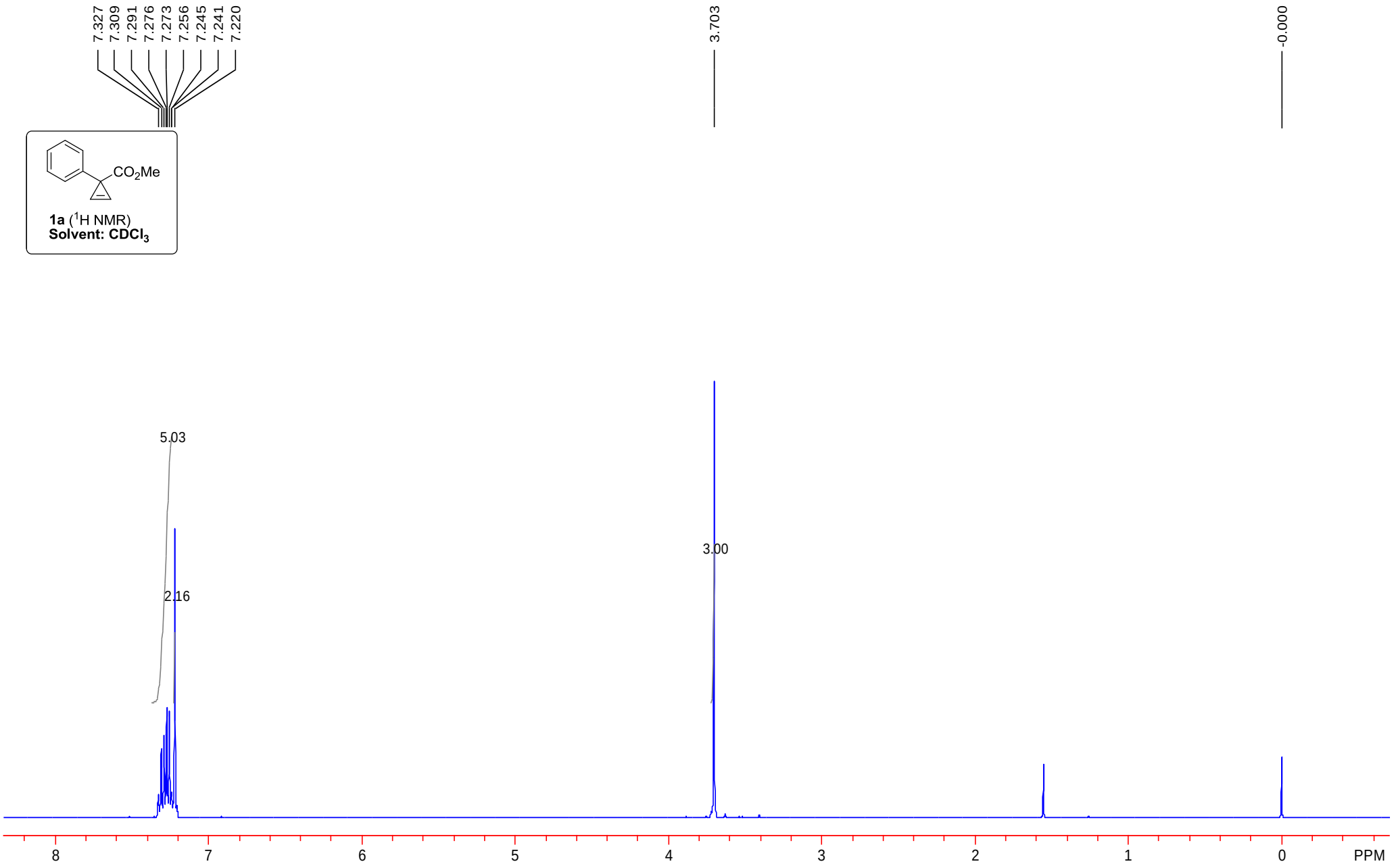
To probe the '*hydrogen*' source of this hydroboration reaction, [D4]-methanol experiment was investigated.

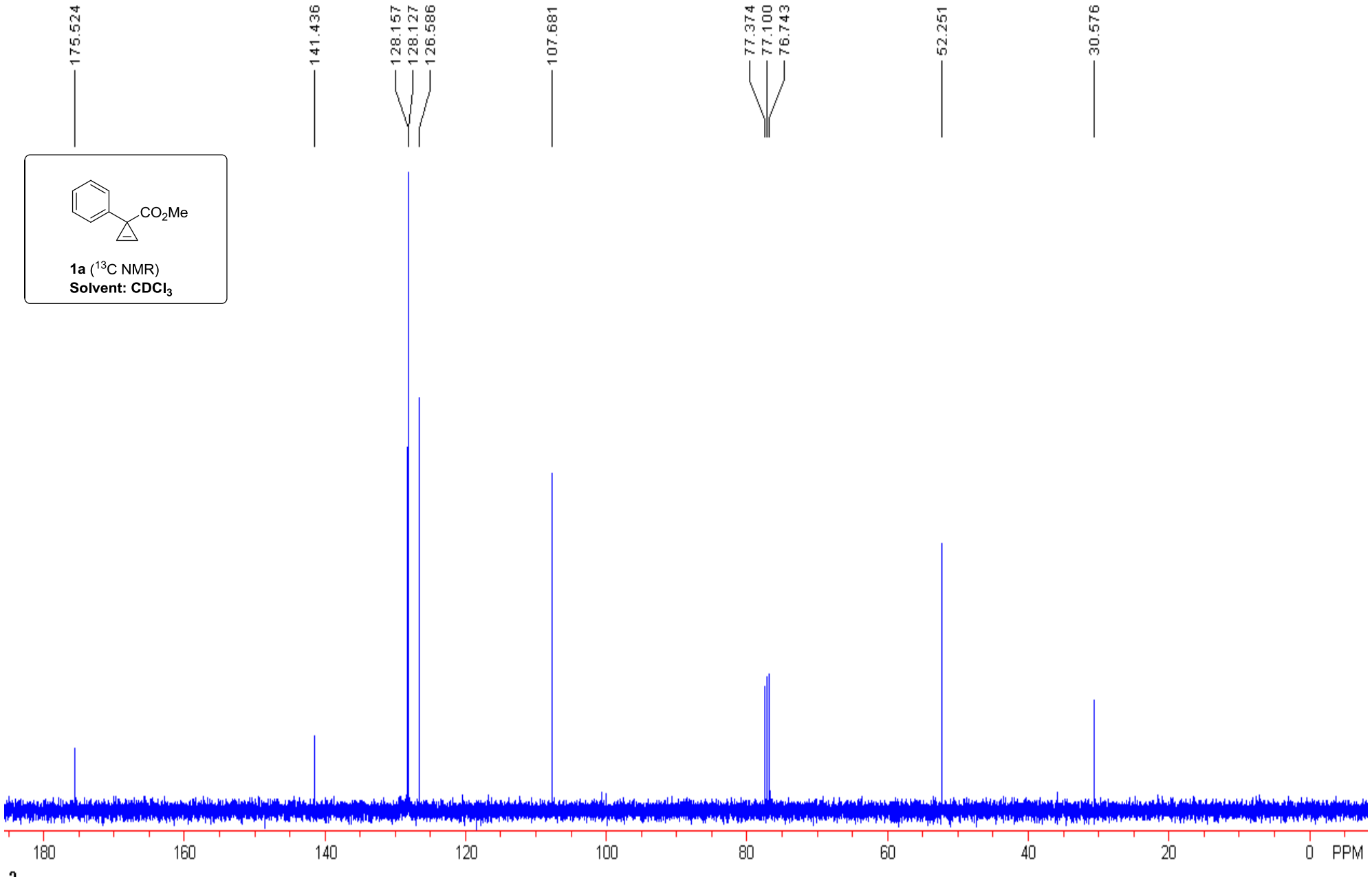


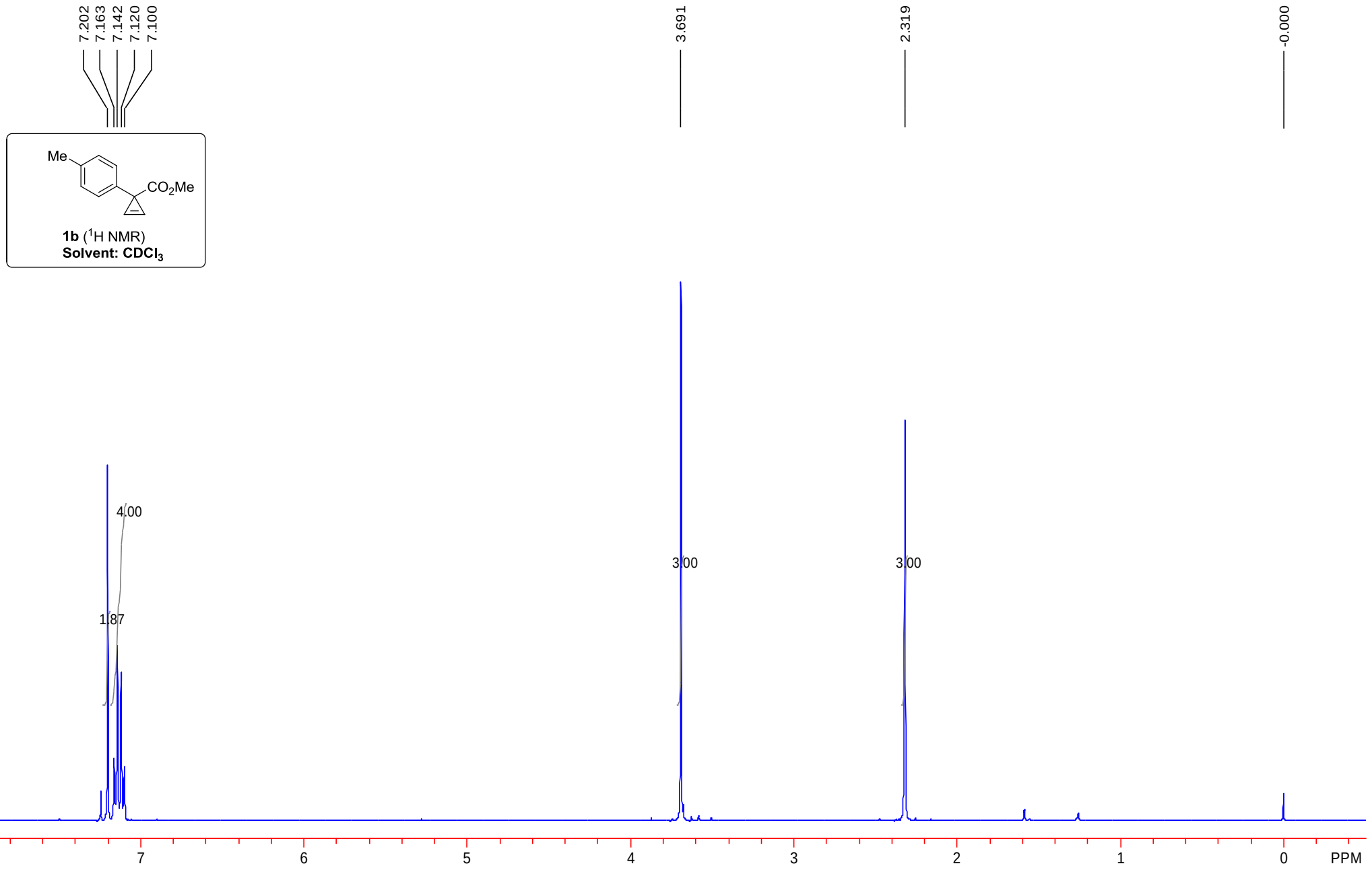
Procedure: A dried Schlenk flask was charged with CuCl (1.5 mg, 0.015mmol, 10 mol%), (*R*)-(+)-BINAP (14 mg, 0.0225mmol, 15 mol%), B_2Pin_2 (**2**, 76.2 mg, 0.3 mmol, 2.0 equiv), NaO*t*Bu (1.6 mg, 0.0165mmol, 11 mol%) and anhydrous toluene (1.0 mL) under nitrogen atmosphere. After the mixture was stirred at room temperature for 40 min, a solution of cyclopropene **1f** (0.15 mmol) in anhydrous toluene (0.5 mL) was added, followed by anhydrous [D4]-MeOH (12.2 μL, 0.30 mmol, 2.0 equiv).The resulting mixture was stirred at room temperature for 6h, then filtered through Celite®, and concentrated in vacuo. The residue was purified by silica gel (300−400 mesh) column chromatography to afford the desired product **3f**. Deuterated product **3f** (50%) was observed, which was proved that the proton partially came from methanol.

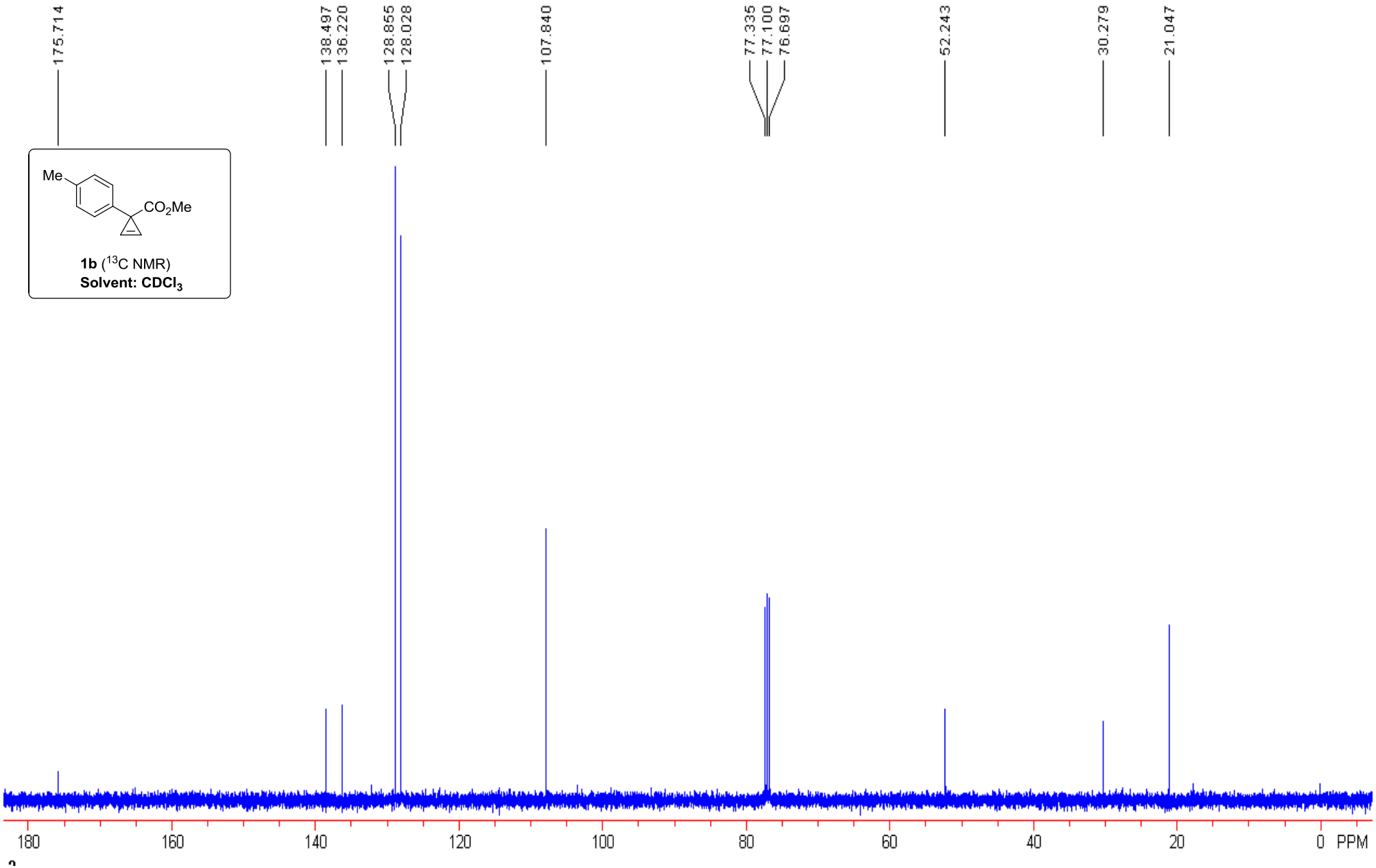


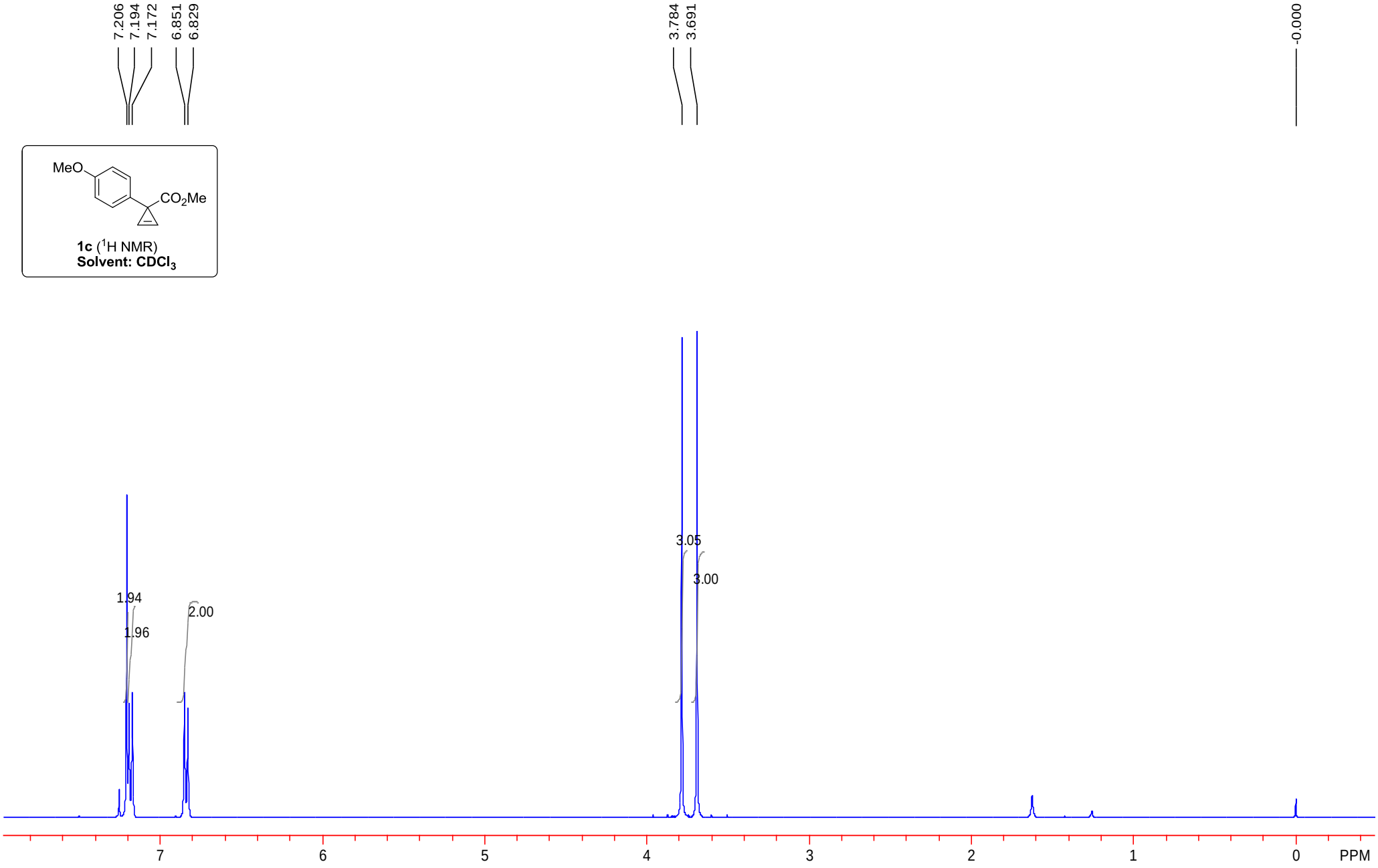
5. ^{1}H NMR, ^{13}C NMR, NOSEY & HPLC

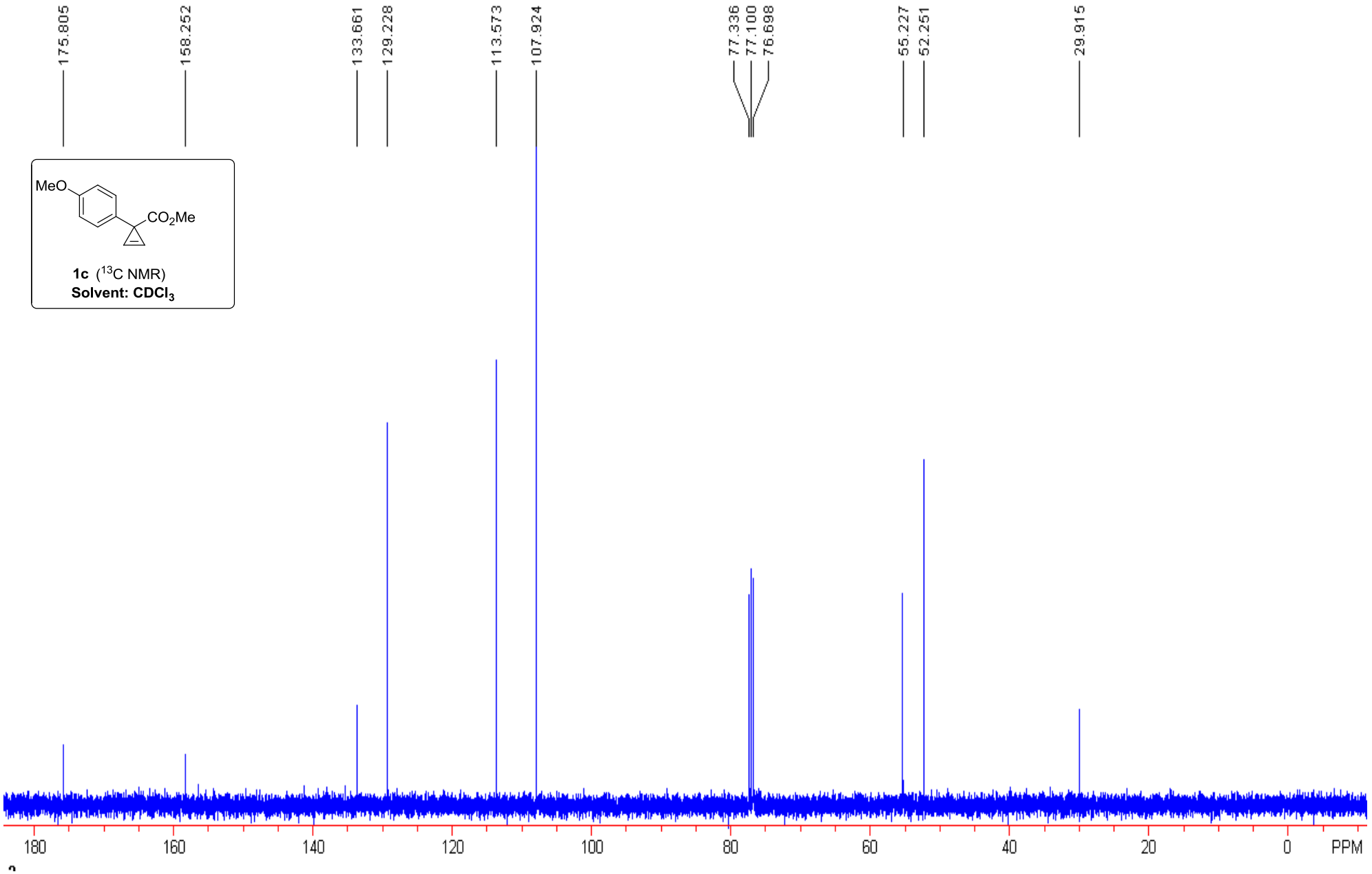

7.327
7.309
7.291
7.276
7.273
7.256
7.245
7.241
7.220
3.703
-0.000
CO2Me
1a (1H NMR)
Solvent: CDCl3
5.03
3.00
2.16
8
7
6
5
4
3
2
1
0
PPM

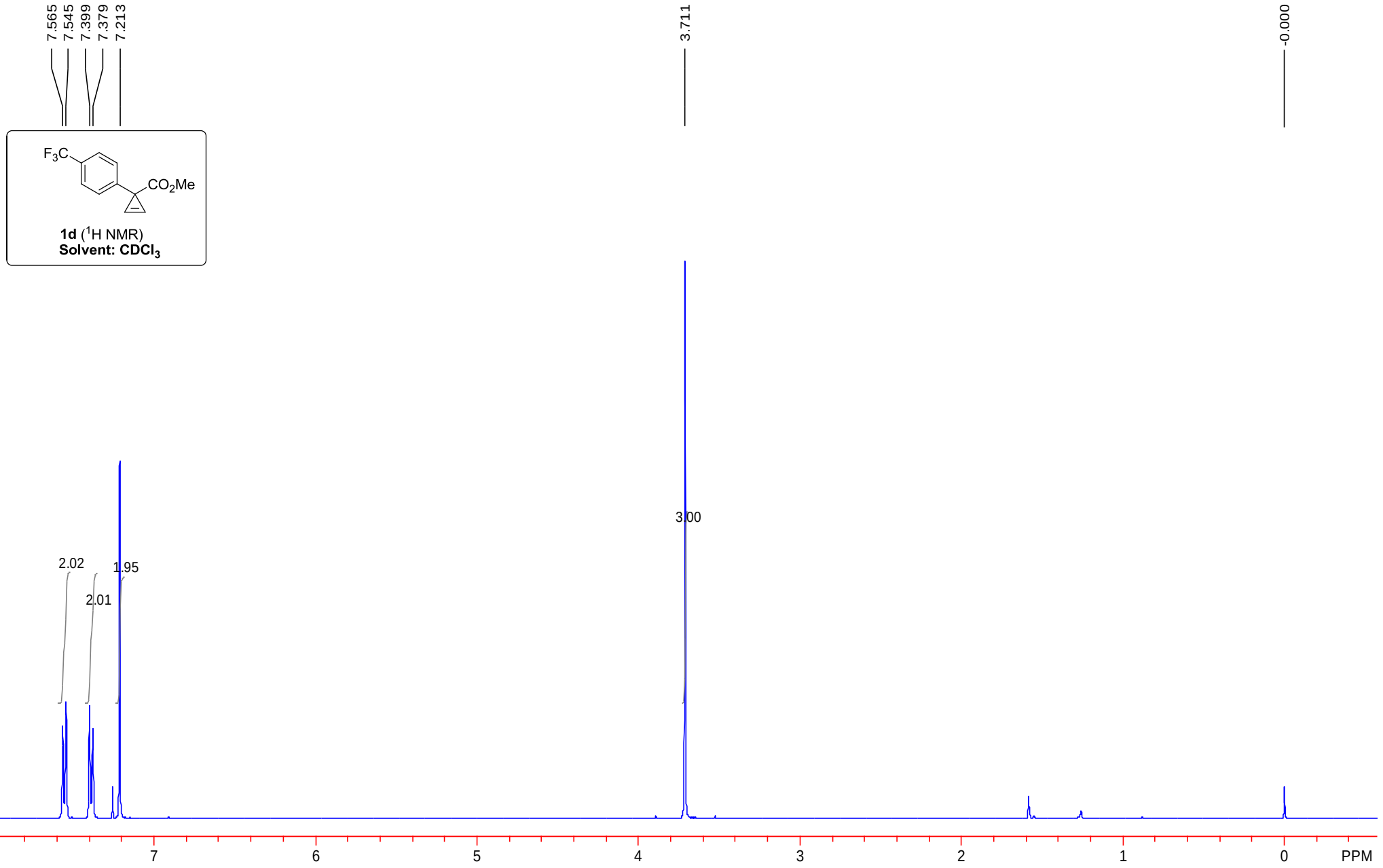

175.524
141.436
128.157
128.127
126.586
107.681
77.374
77.100
76.743
52.251
30.576
CO2Me
1a (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM

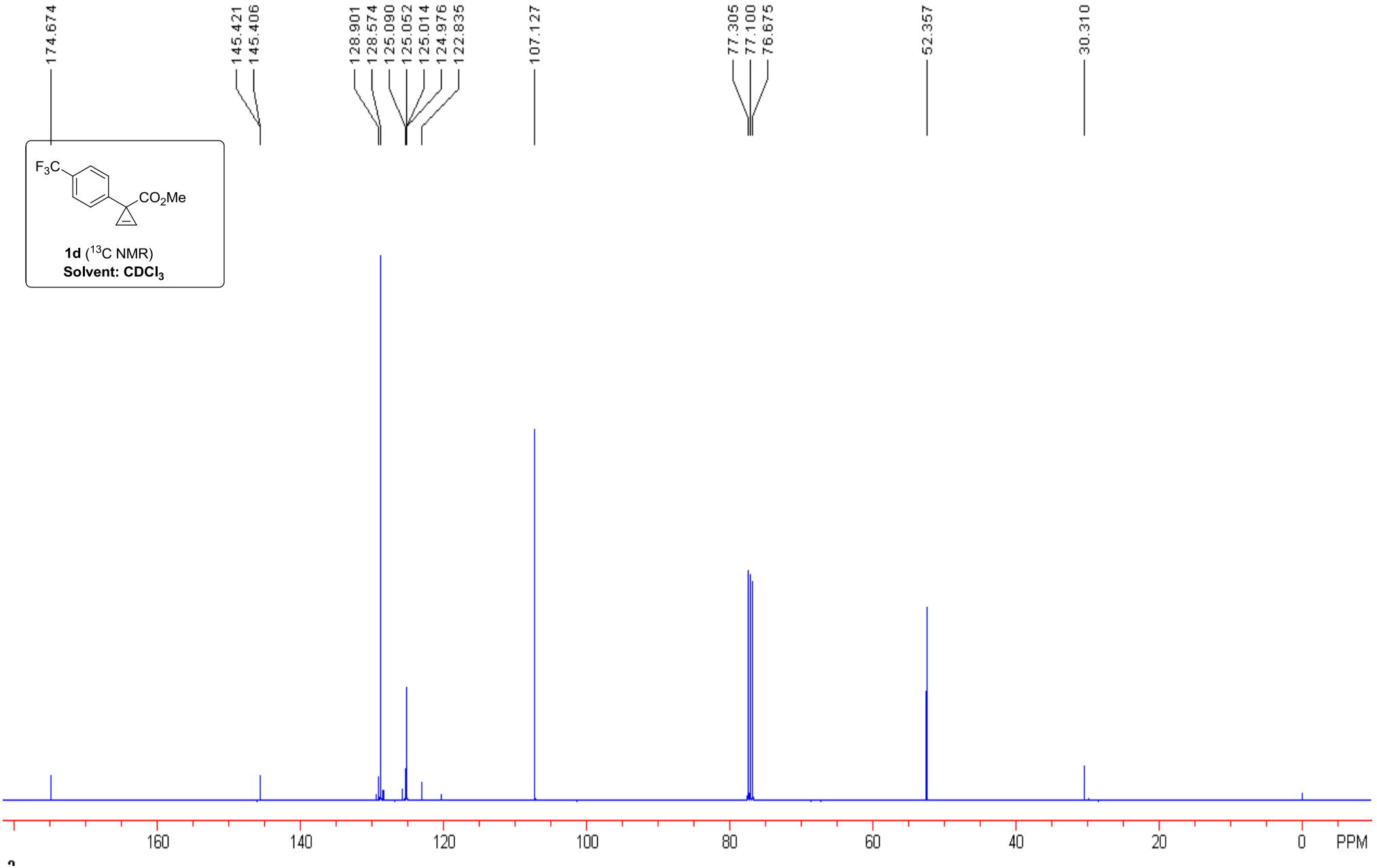

7.202
7.163
7.142
7.120
7.100
3.691
2.319
-0.000
Me
CO2Me
1b (1H NMR)
Solvent: CDCl3
4.00
1.87
3.00
3.00
7
6
5
4
3
2
1
0
PPM

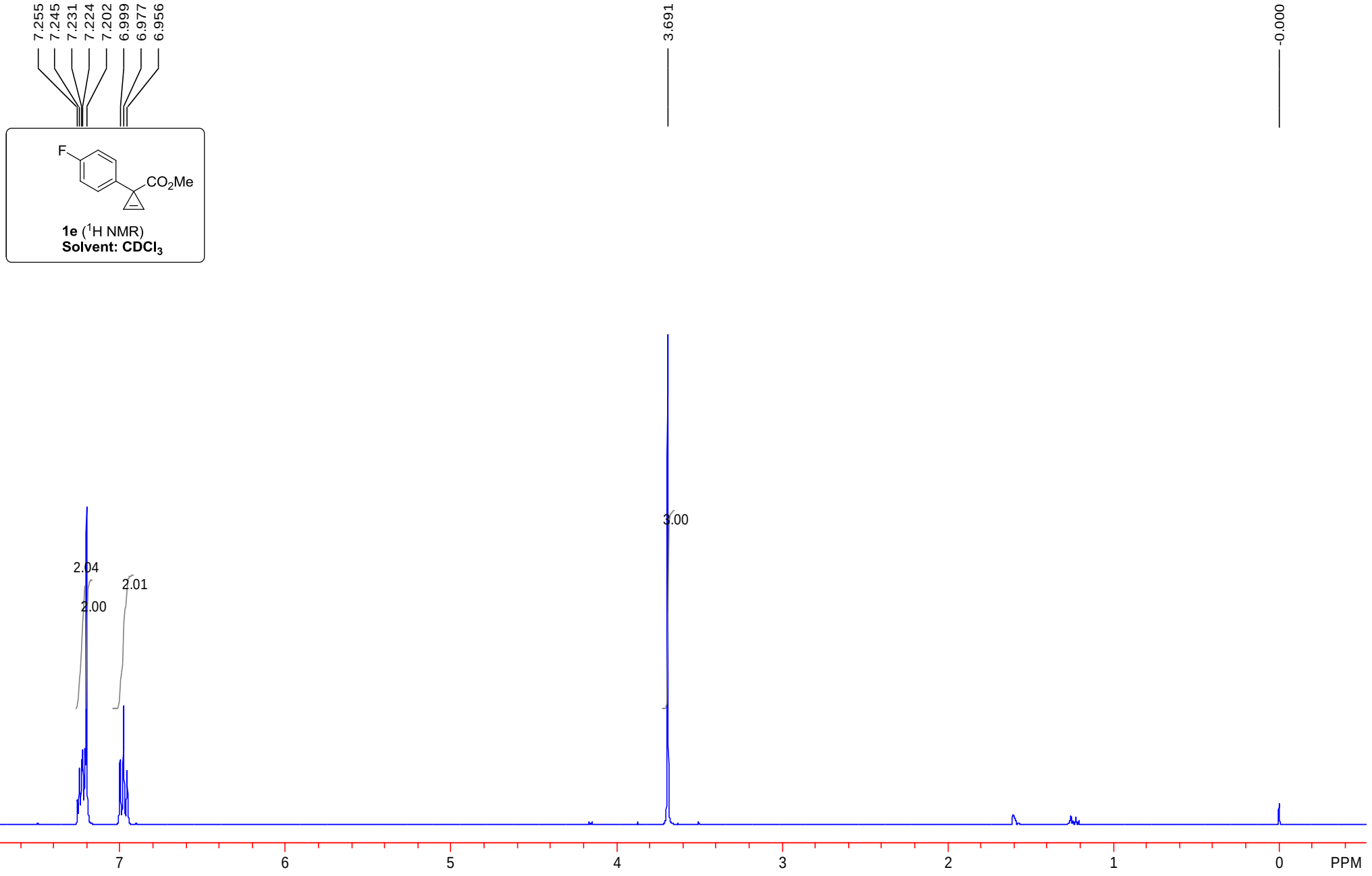

175.714
138.497
136.220
128.855
128.028
107.840
77.335
77.100
76.697
52.243
30.279
21.047
Me
CO2Me
1b (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0 PPM

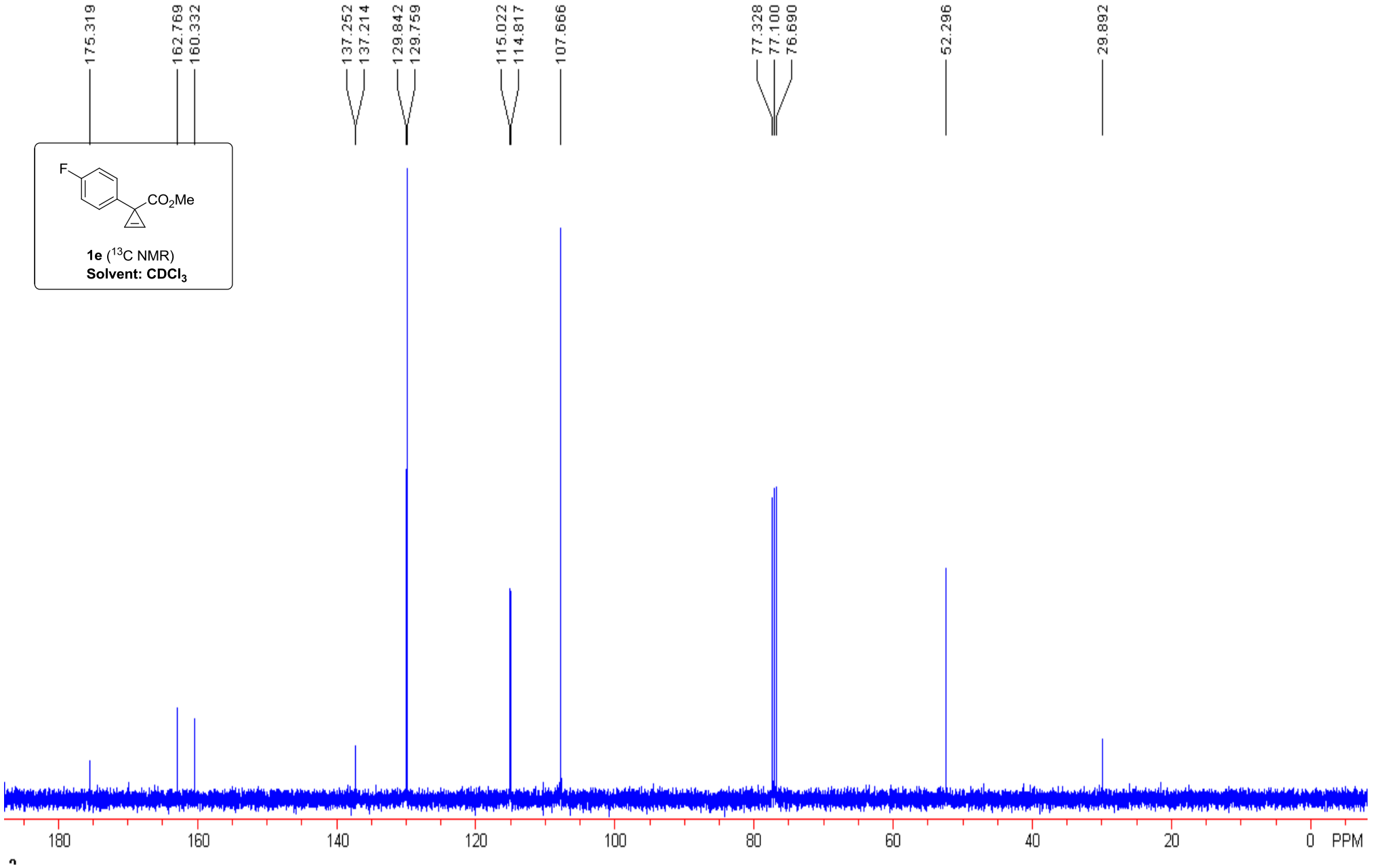

7.206
7.194
7.172
6.851
6.829
3.784
3.691
-0.000
MeO
CO2Me
1c (1H NMR)
Solvent: CDCl3
1.94
1.96
2.00
3.05
3.00
7
6
5
4
3
2
1
0
PPM


175.805
158.252
133.661
129.228
113.573
107.924
77.336
77.100
76.698
55.227
52.251
29.915
MeO
CO2Me
1c (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM


7.565
7.545
7.399
7.379
7.213
3.711
-0.000
F3C
CO2Me
1d (1H NMR)
Solvent: CDCl3
2.02
2.01
1.95
3.00
8
7
6
5
4
3
2
1
0
PPM


174.674
145.421
145.406
128.901
128.574
125.090
125.052
125.014
124.976
122.835
107.127
77.305
77.100
76.675
52.357
30.310
F3C
CO2Me
1d (13C NMR)
Solvent: CDCl3
160
140
120
100
80
60
40
20
0
PPM


7.255
7.245
7.231
7.224
7.202
6.999
6.977
6.956
3.691
-0.000
F
CO2Me
1e (1H NMR)
Solvent: CDCl3
2.04
2.01
2.00
3.00
7
6
5
4
3
2
1
0
PPM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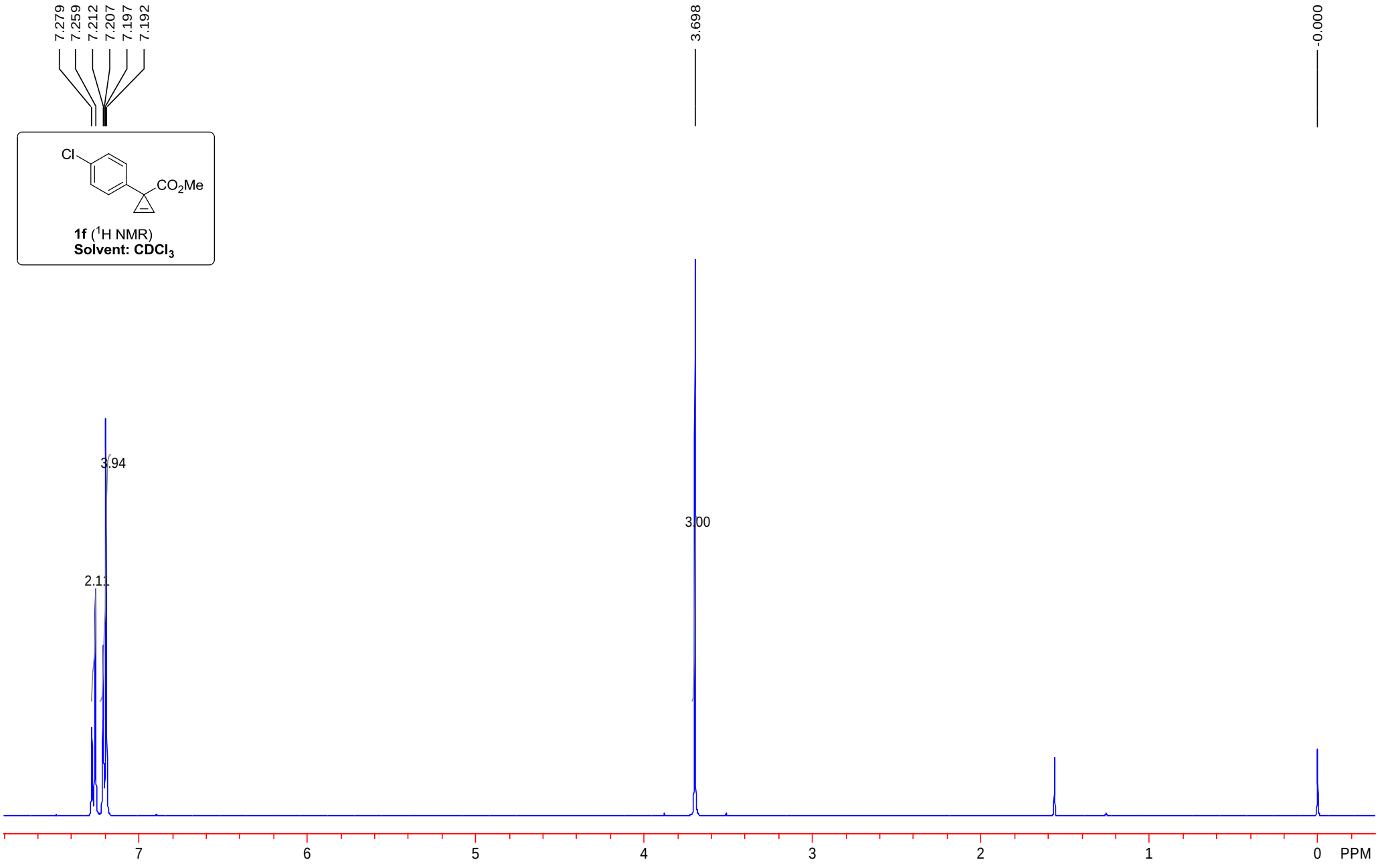
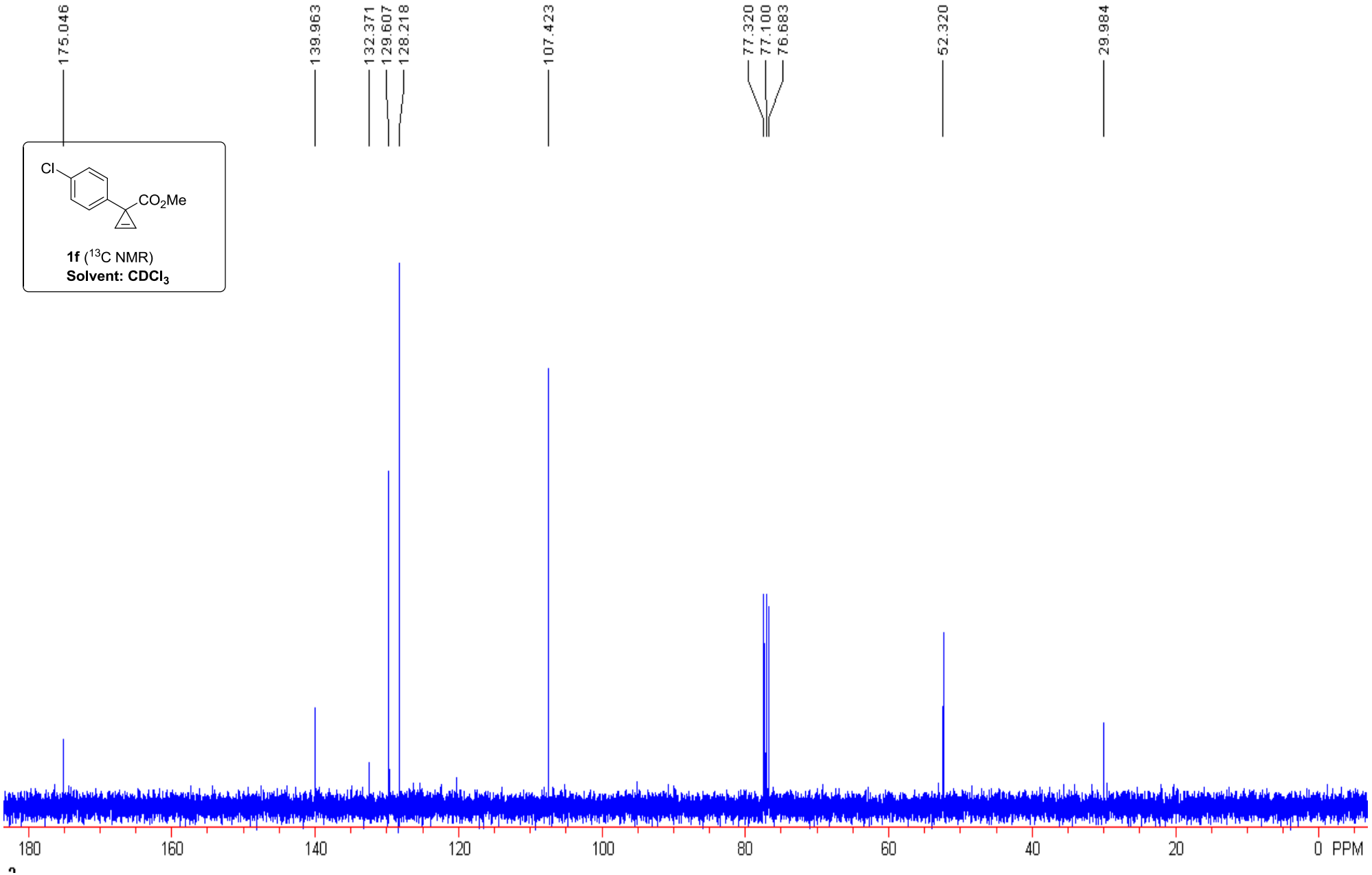
162.769
160.332
137.252
137.214
129.842
129.759
115.022
114.817
107.666
77.328
77.100
76.690
52.296
29.892
F
CO2Me
1e (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM


7.279
7.259
7.212
7.207
7.197
7.192
3.698
-0.000
Cl
CO2Me
1f (1H NMR)
Solvent: CDCl3
3.94
2.11
3.00
7
6
5
4
3
2
1
0
PPM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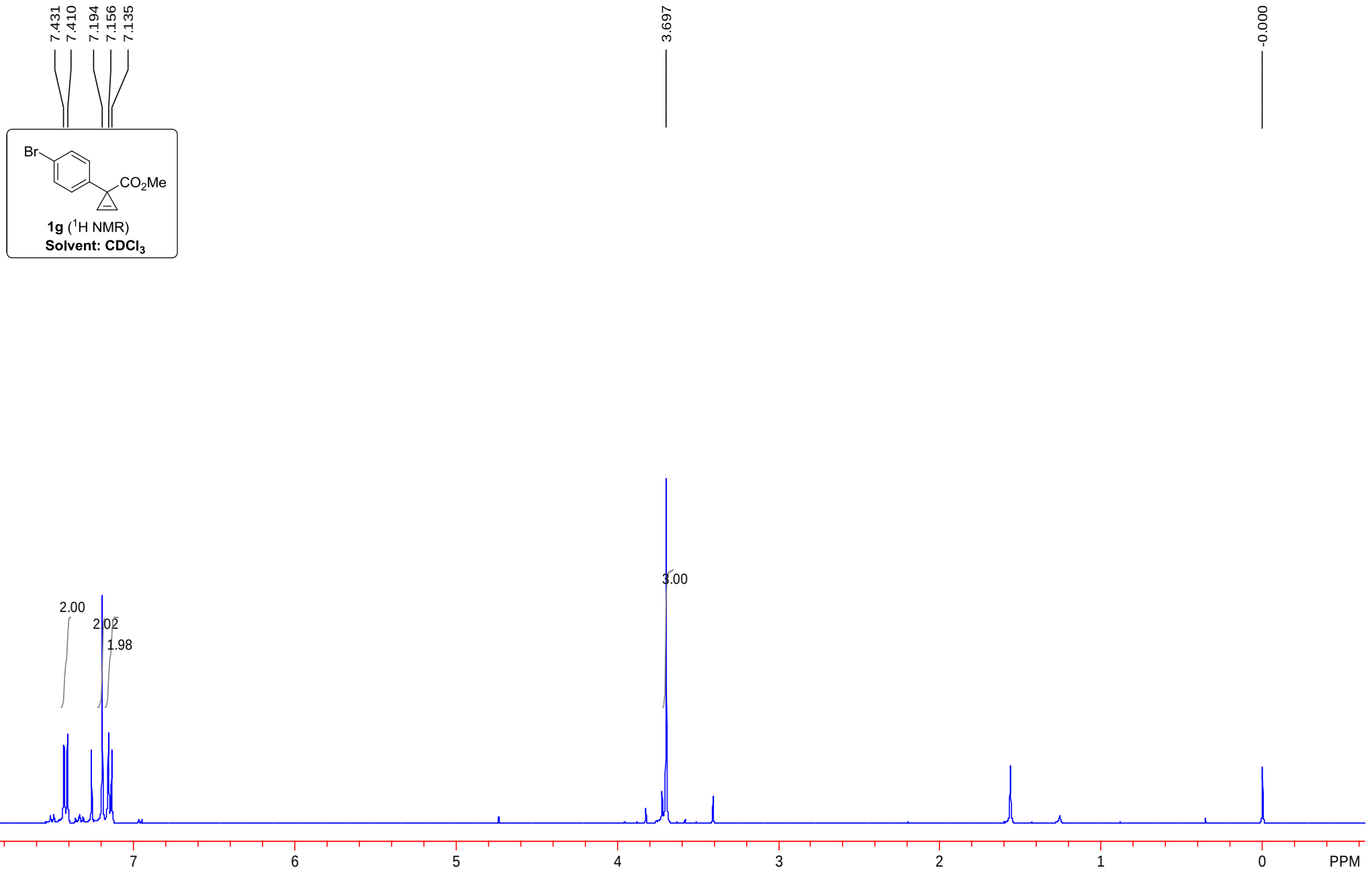
139.963
132.371
129.607
128.218
107.423
77.320
77.100
76.683
52.320
29.984
Cl
CO2Me
1f (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0 PPM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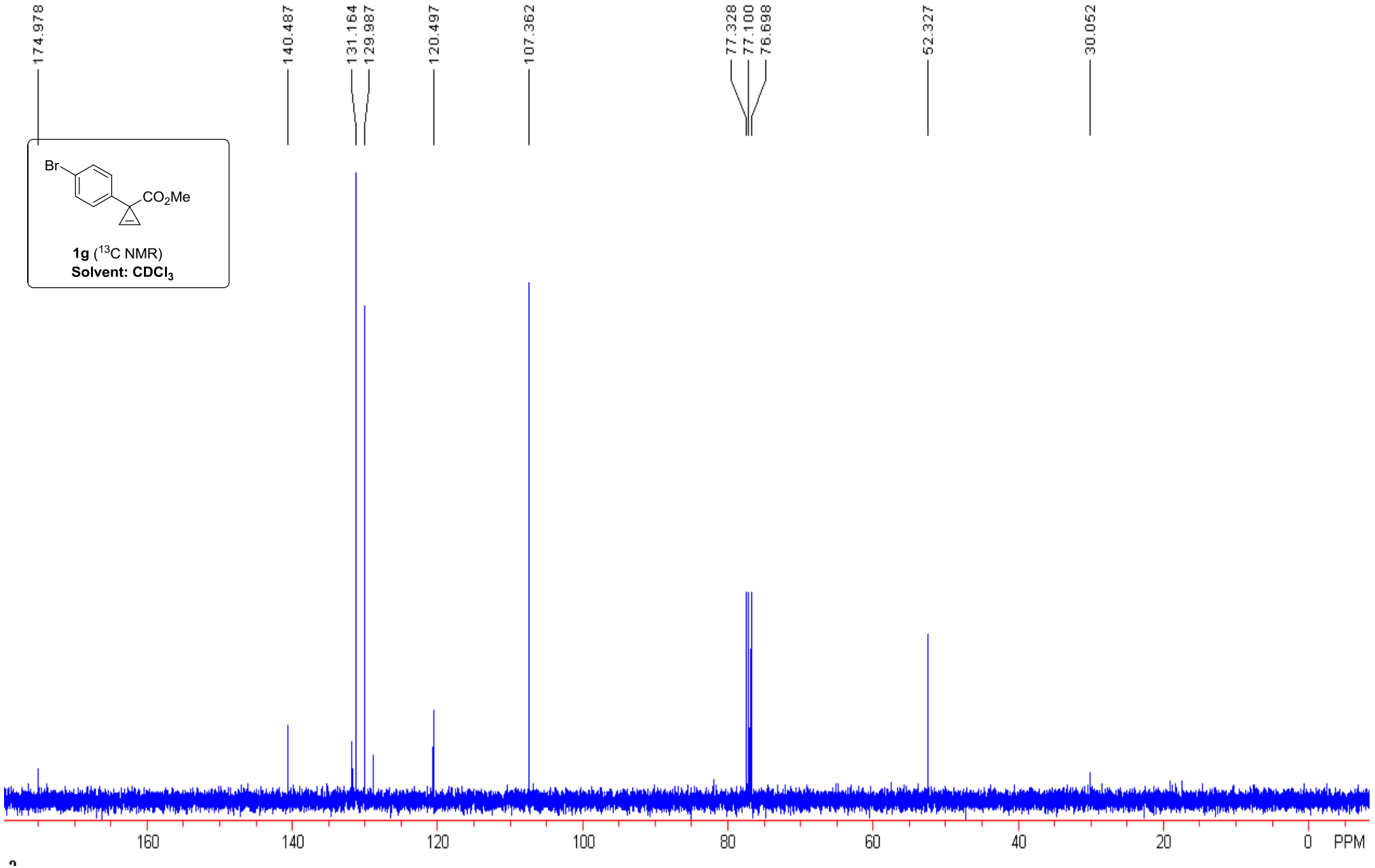
7.410
7.194
7.156
7.135
3.697
-0.000
Br
CO2Me
1g (1H NMR)
Solvent: CDCl3
2.00
2.02
1.98
3.00
7
6
5
4
3
2
1
0
PPM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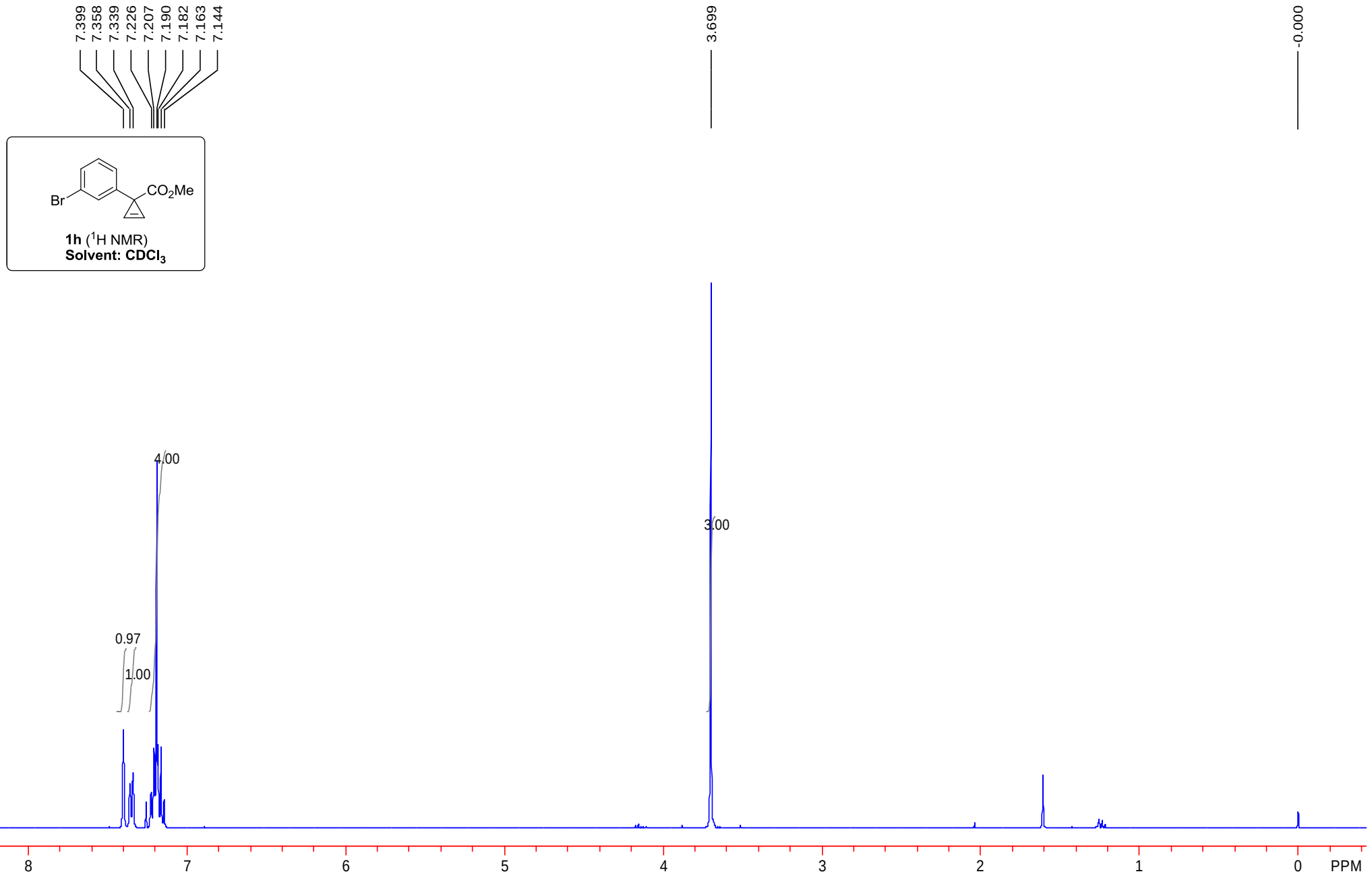
140.487
131.164
129.987
120.497
107.362
77.328
77.100
76.698
52.327
30.052
Br
CO2Me
1g (13C NMR)
Solvent: CDCl3
160
140
120
100
80
60
40
20
0
PPM


7.399
7.358
7.339
7.226
7.207
7.190
7.182
7.163
7.144
3.699
-0.000
Br
CO2Me
1h (1H NMR)
Solvent: CDCl3
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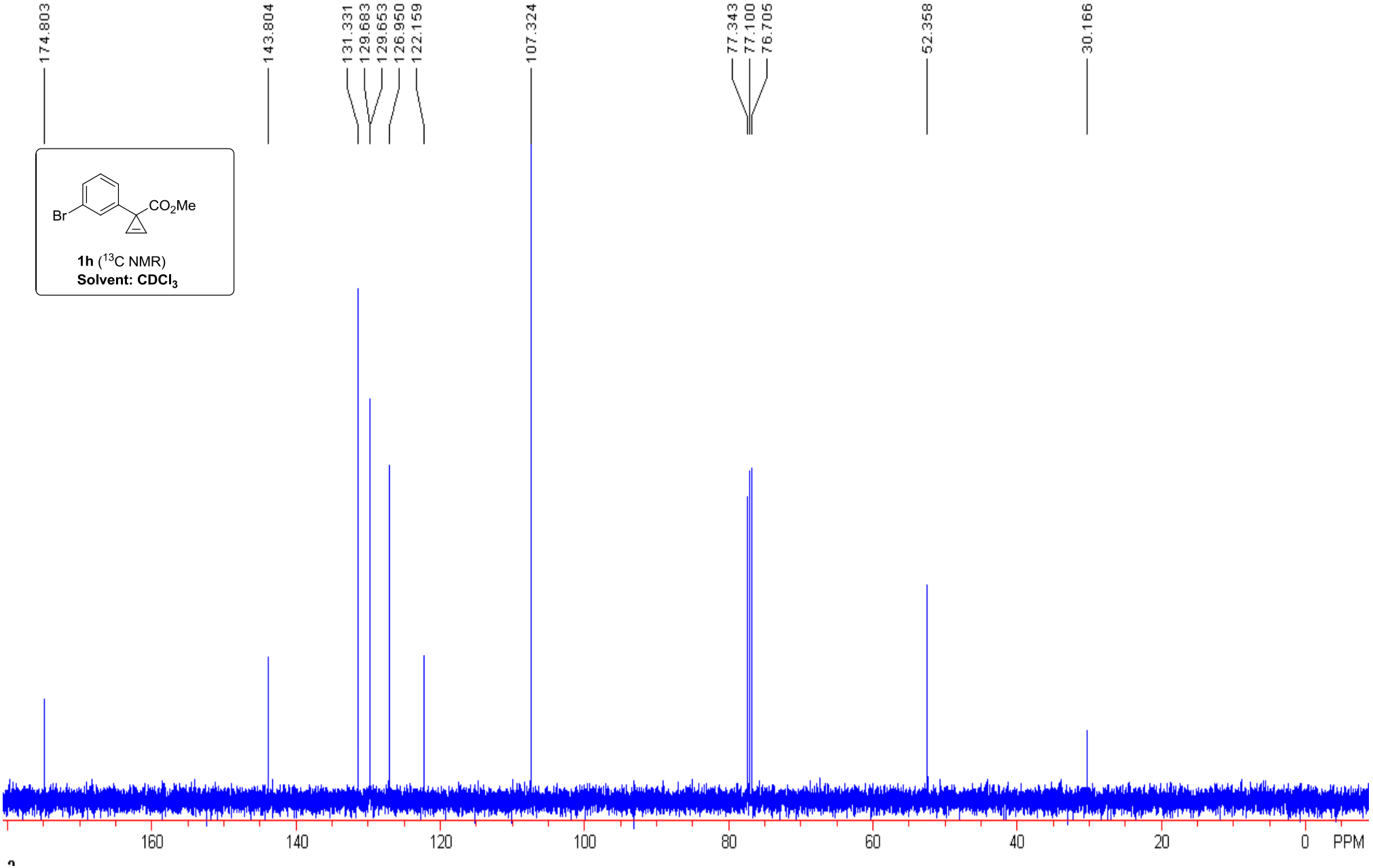
3.00
0.97
1.00
8
7
6
5
4
3
2
1
0
PPM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143.804
131.331
129.683
129.653
126.950
122.159
107.324
77.343
77.100
76.705
52.358
30.166
Br
CO2Me
1h (13C NMR)
Solvent: CDCl3
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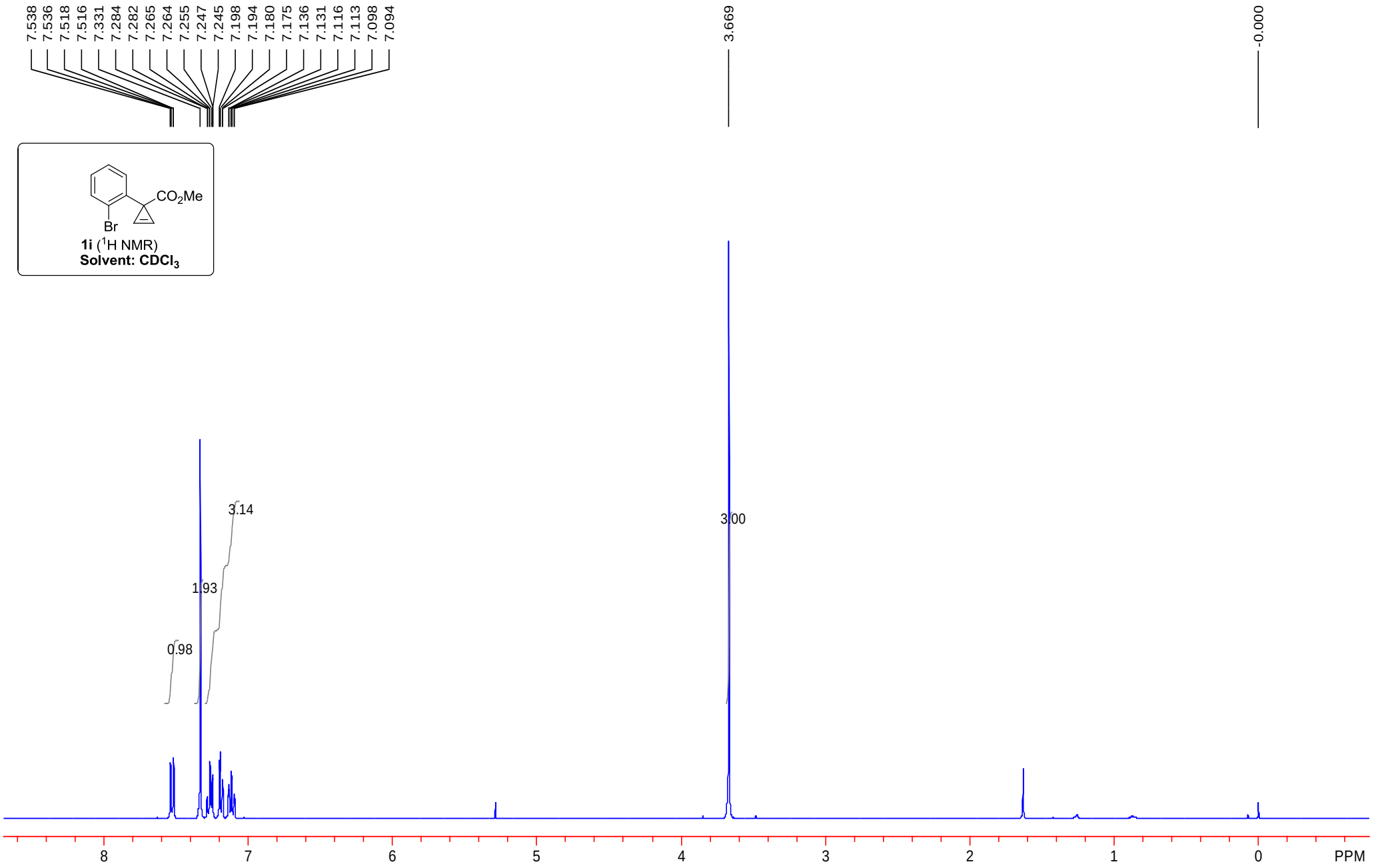
140
120
100
80
60
40
20
0
PPM


7.538
7.536
7.518
7.516
7.331
7.284
7.282
7.265
7.264
7.255
7.247
7.245
7.198
7.194
7.180
7.175
7.136
7.131
7.116
7.113
7.098
7.094
3.669
-0.000
CO2Me
Br
1i (1H NMR)
Solvent: CDCl3
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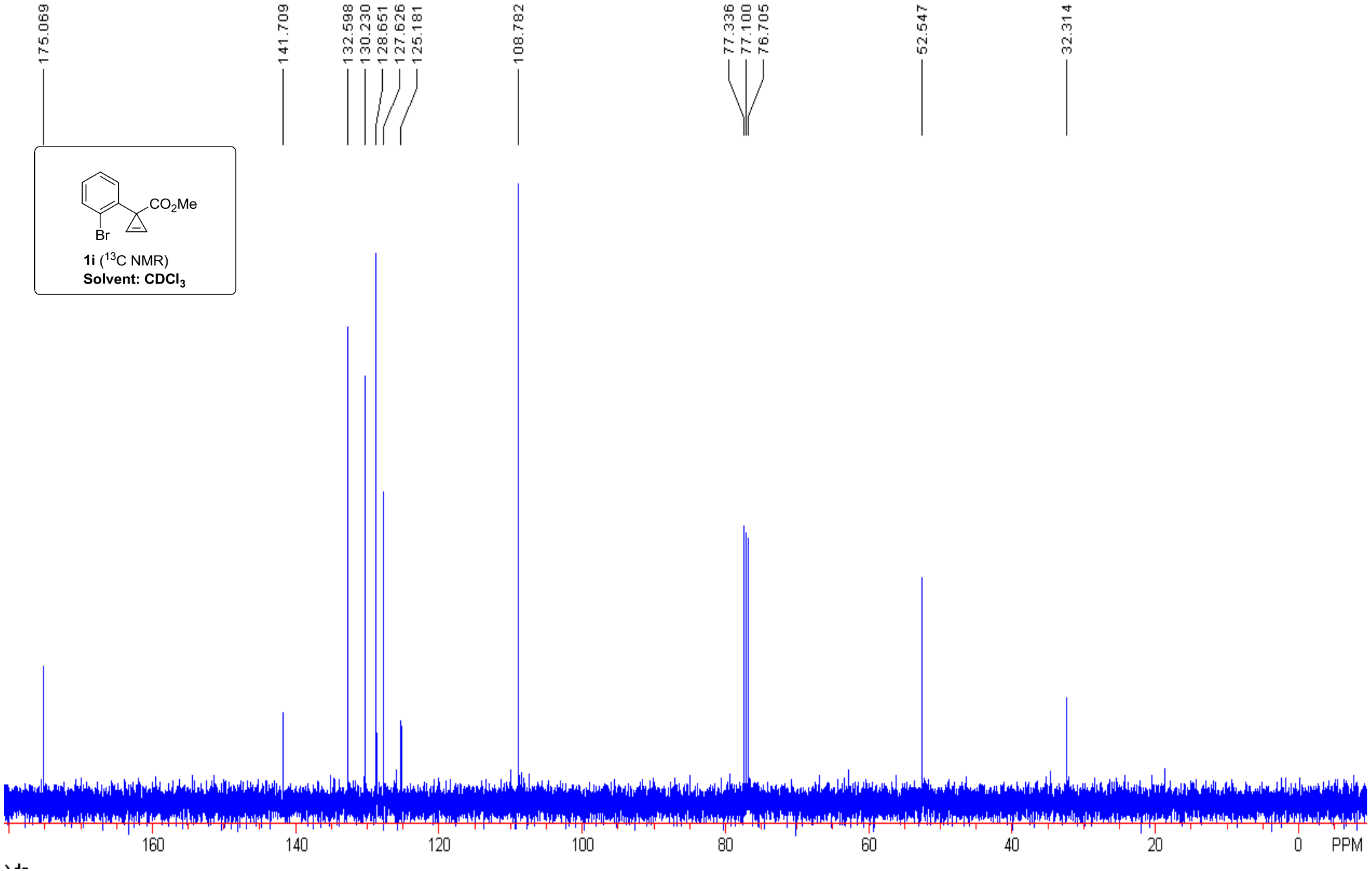
1.93
0.98
3.00
8
7
6
5
4
3
2
1
0
PPM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141.709
132.598
130.230
128.651
127.626
125.181
108.782
77.336
77.100
76.705
52.547
32.314
CO2Me
Br
1i (13C NMR)
Solvent: CDCl3
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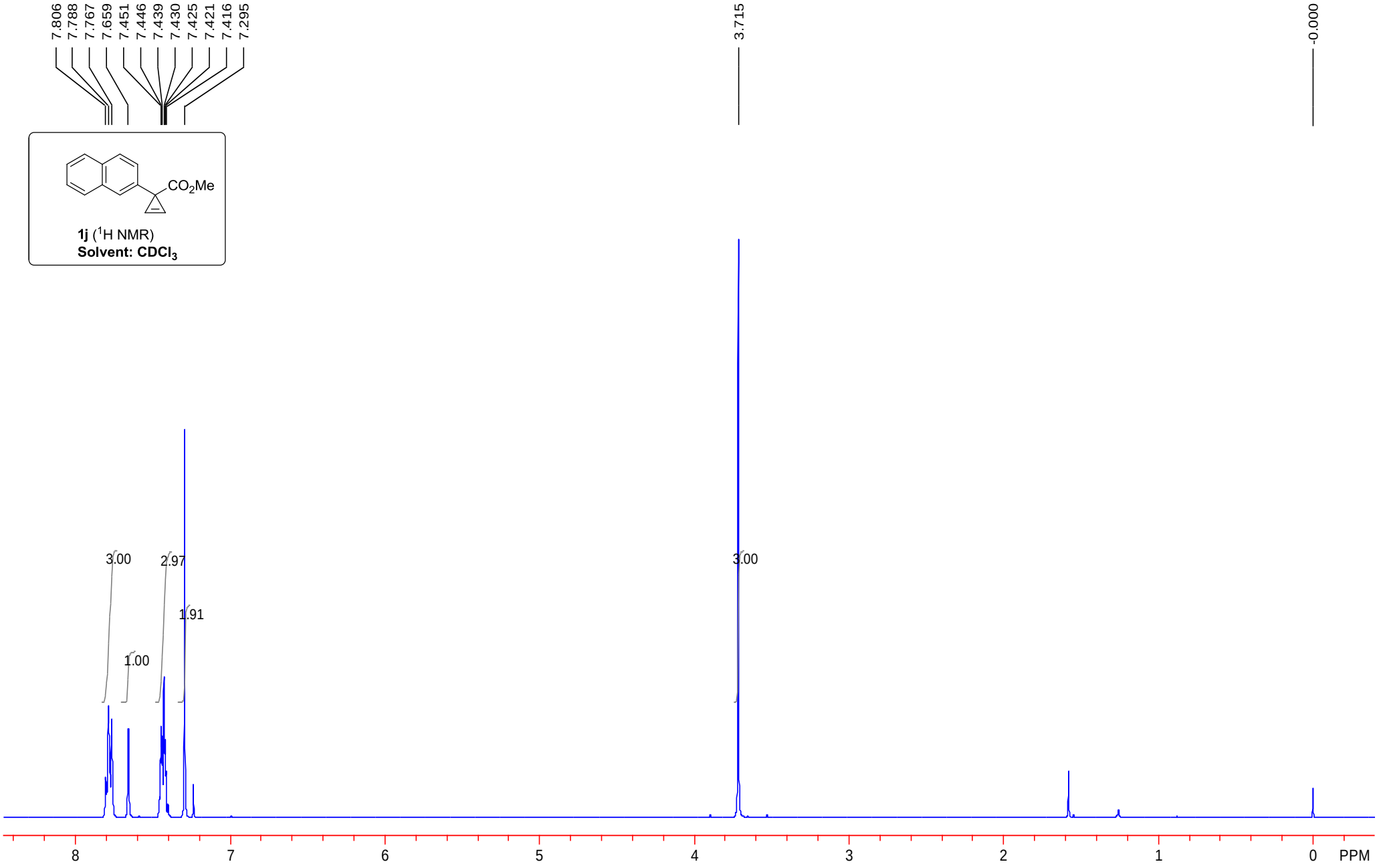
140
120
100
80
60
40
20
0
PPM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7.788
7.767
7.659
7.451
7.446
7.439
7.430
7.425
7.421
7.416
7.295
3.715
-0.000
CO2Me
1j (1H NMR)
Solvent: CDCl3
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1.91
1.00
3.00
8
7
6
5
4
3
2
1
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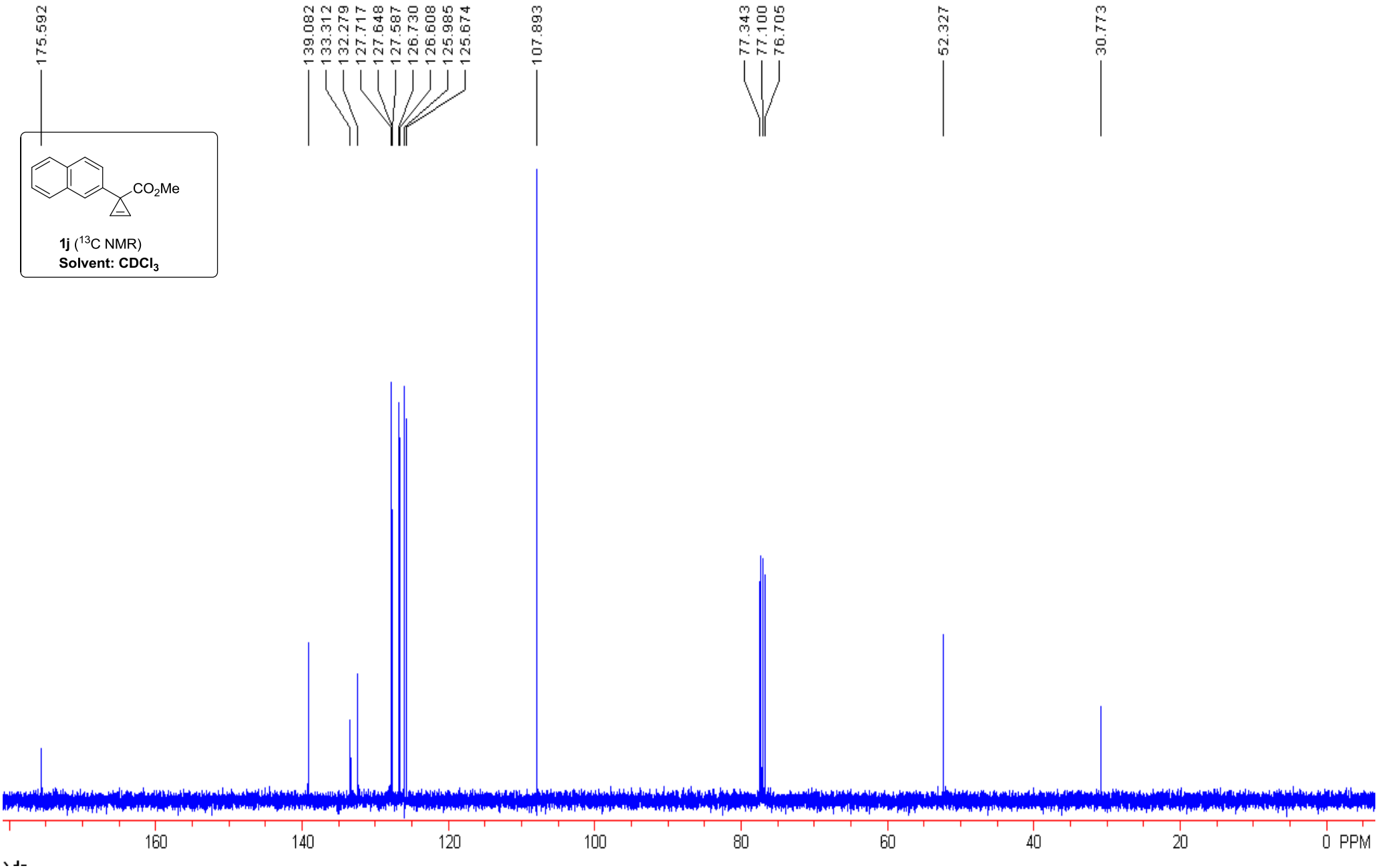
PPM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133.312
132.279
127.717
127.648
127.587
126.730
126.608
125.985
125.674
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77.343
77.100
76.705
52.327
30.773
CO2Me
1j (13C NMR)
Solvent: CDCl3
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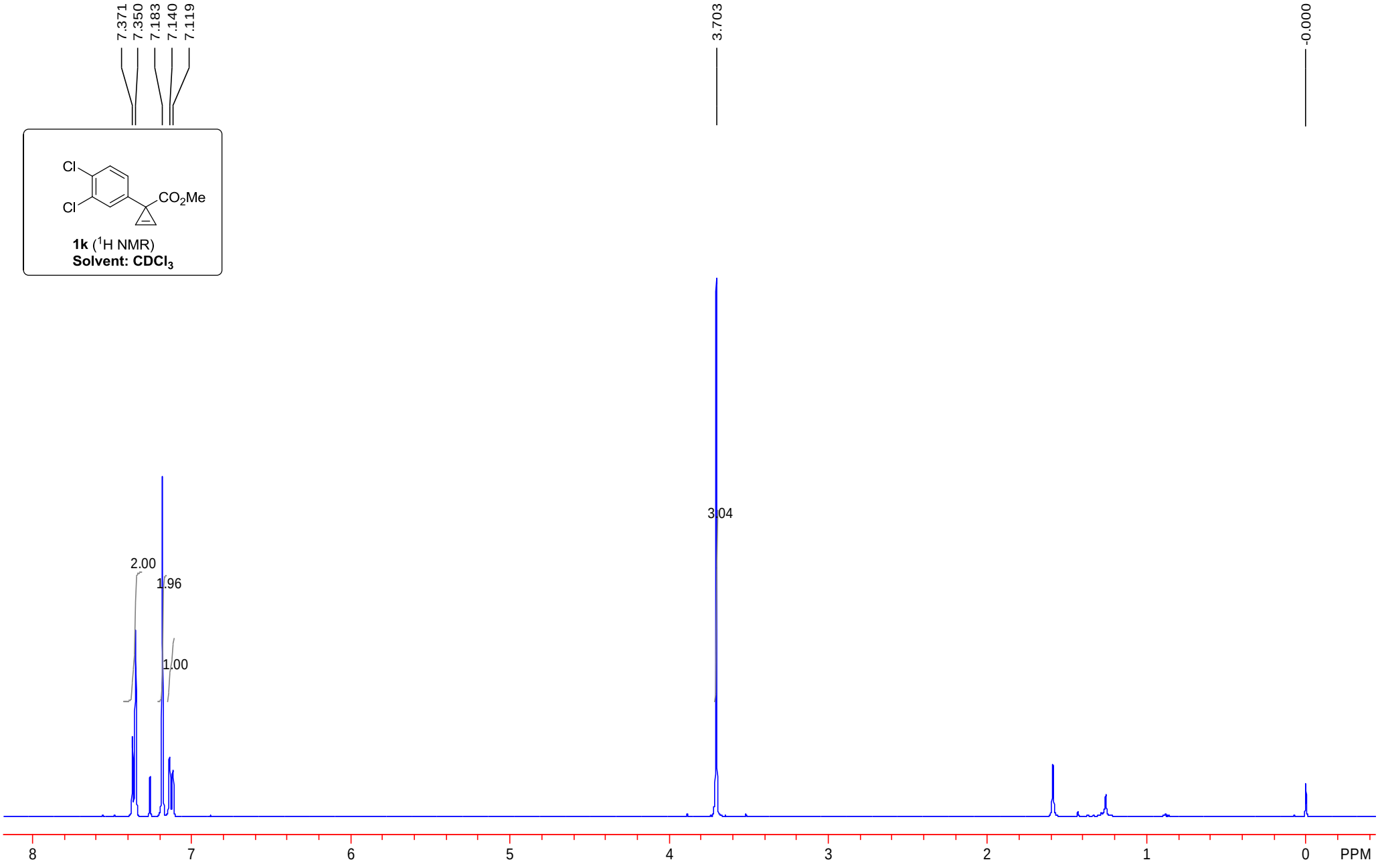
140
120
100
80
60
40
20
0 PPM


7.371
7.350
7.183
7.140
7.119
3.703
-0.000
Cl
Cl
CO2Me
1k (1H NMR)
Solvent: CDCl3
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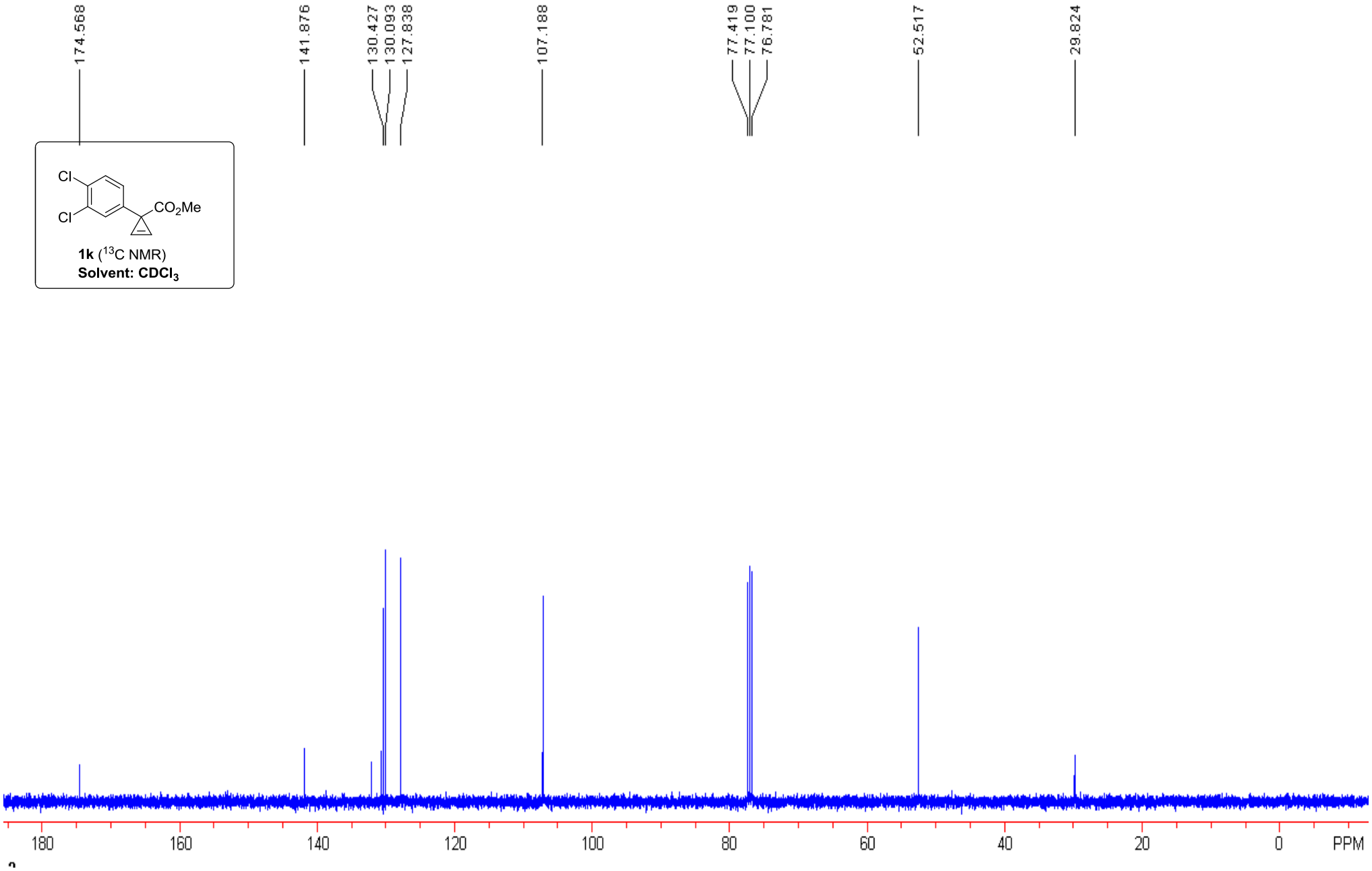
1.96
1.00
3.04
8
7
6
5
4
3
2
1
0
PPM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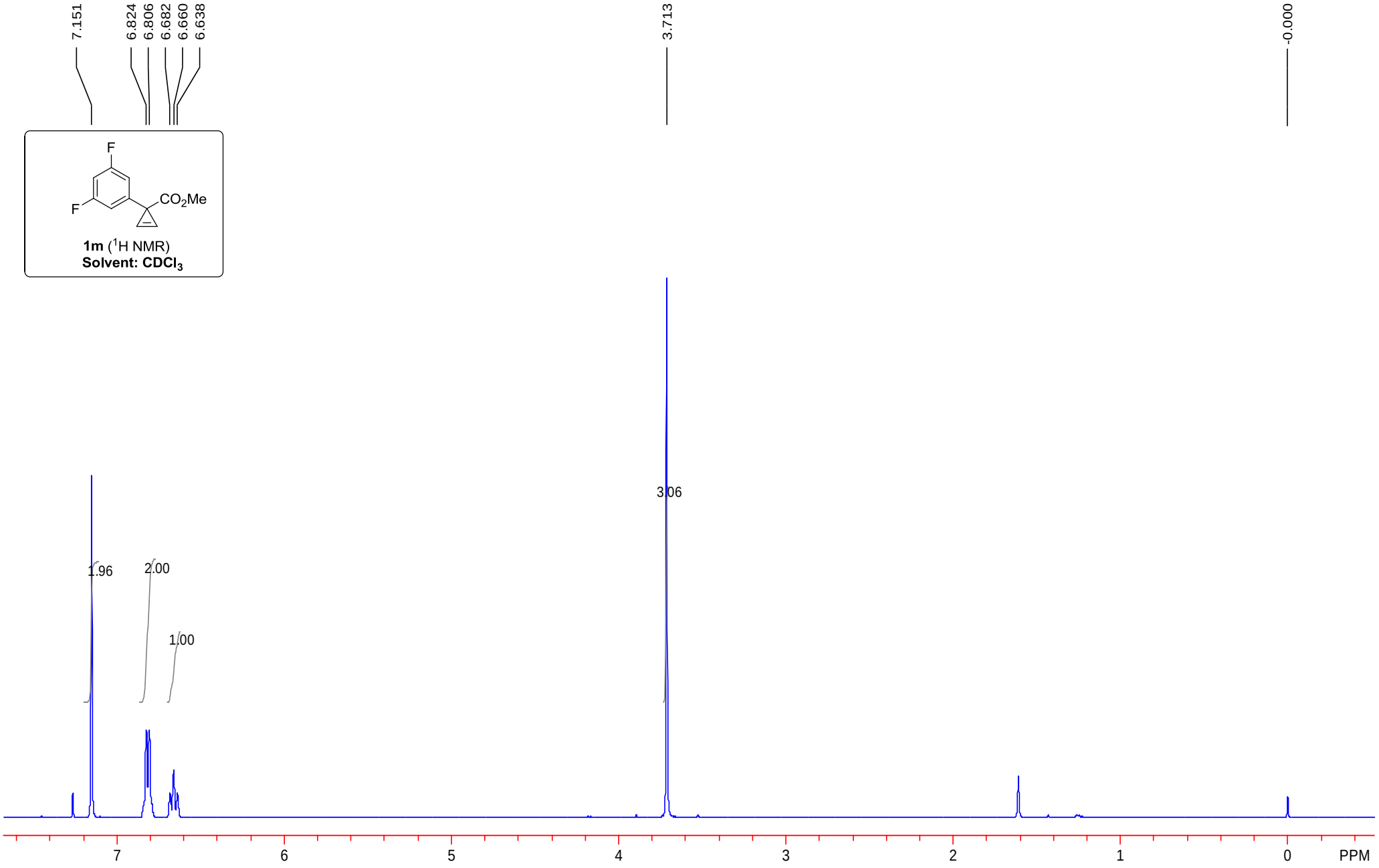
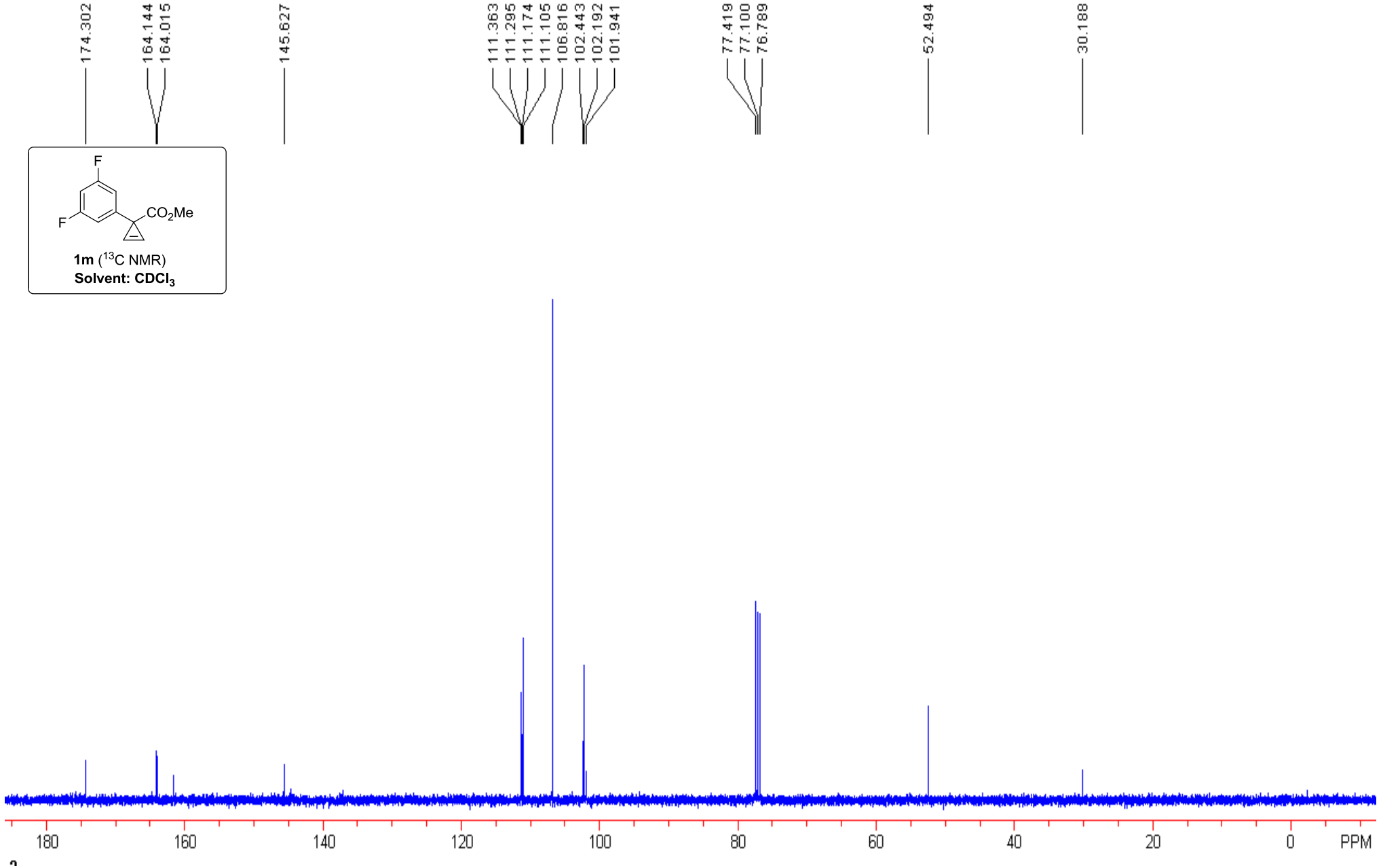
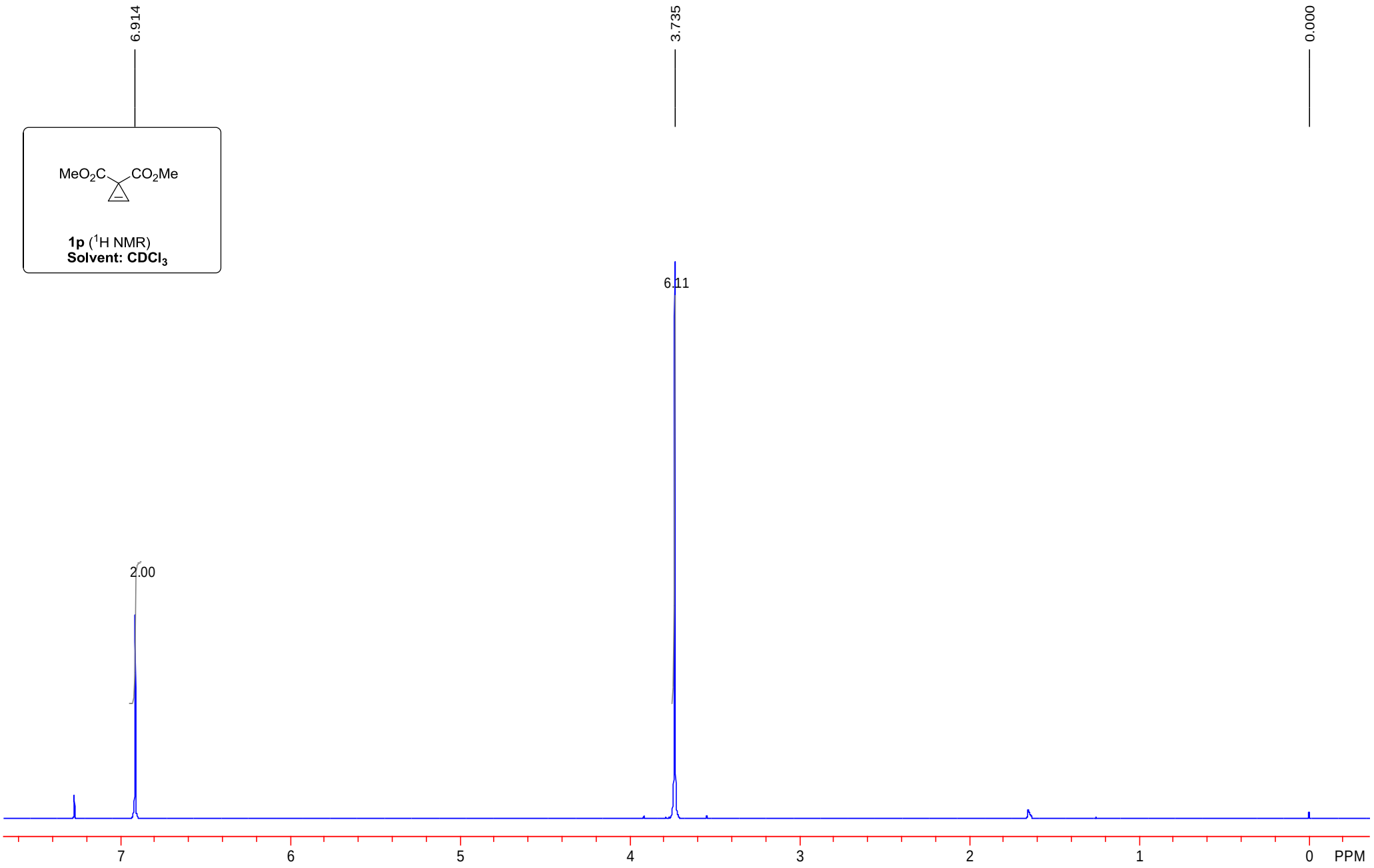
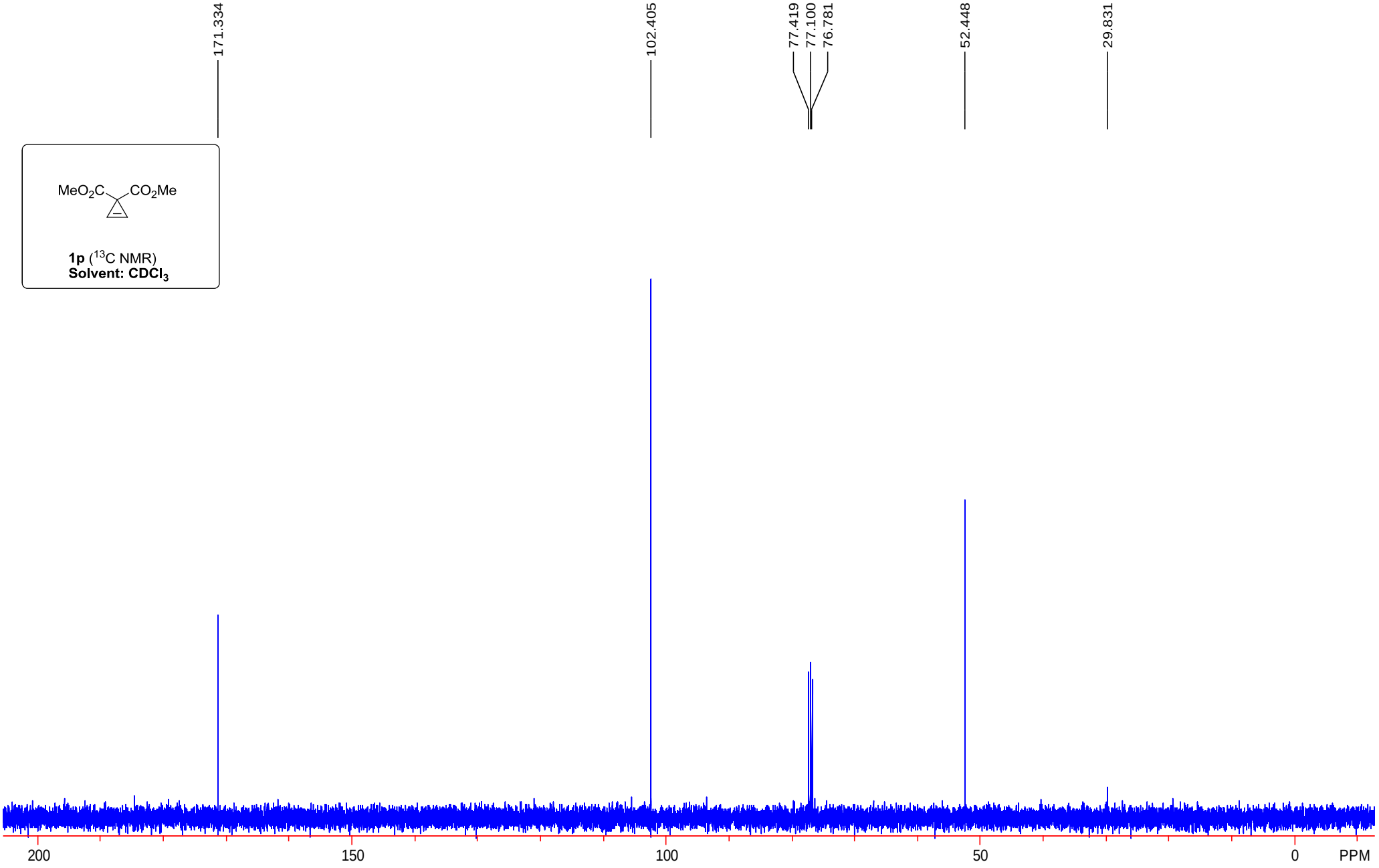
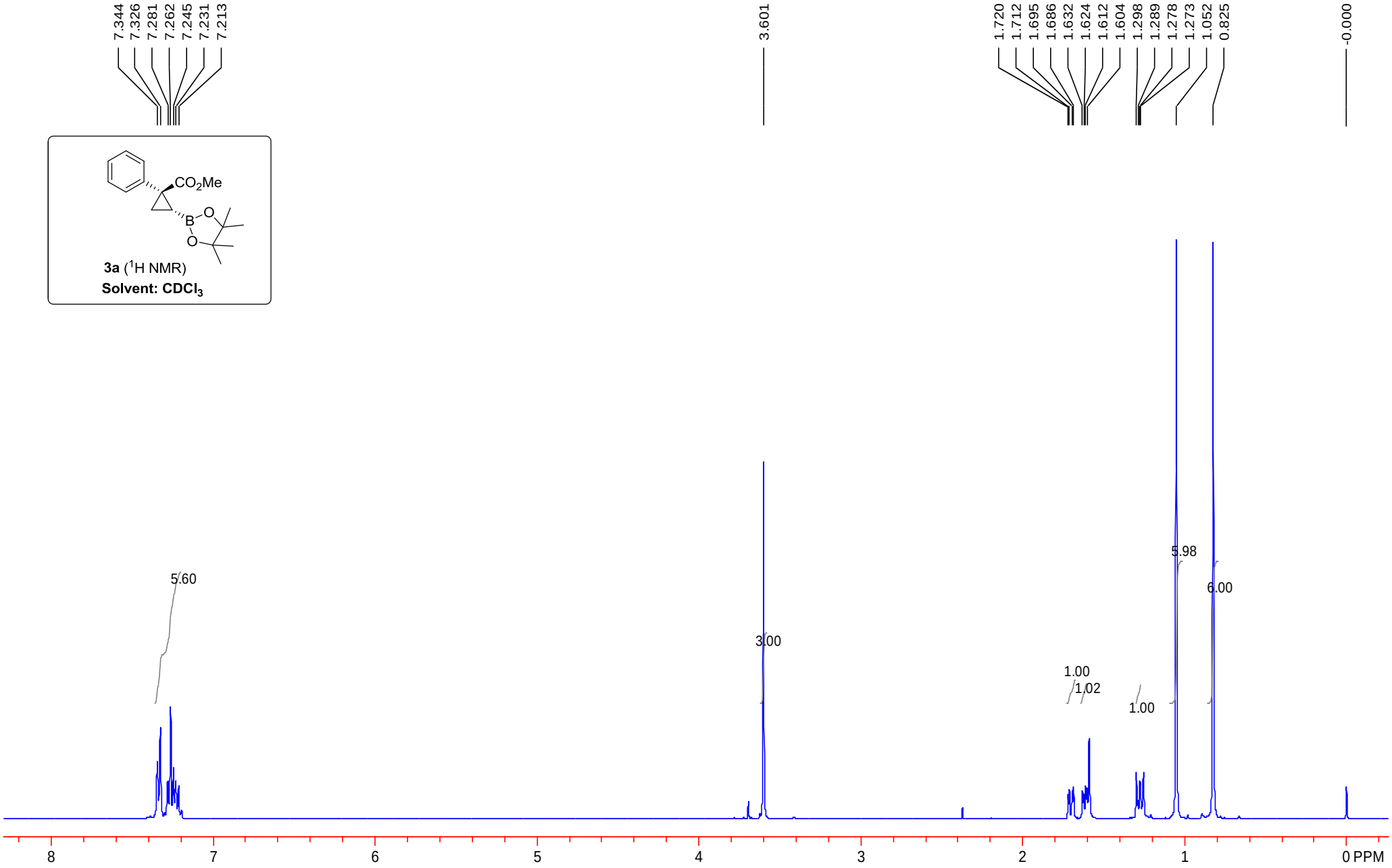
141.876
130.427
130.093
127.838
107.188
77.419
77.100
76.781
52.517
29.824
Cl
Cl
CO2Me
1k (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM

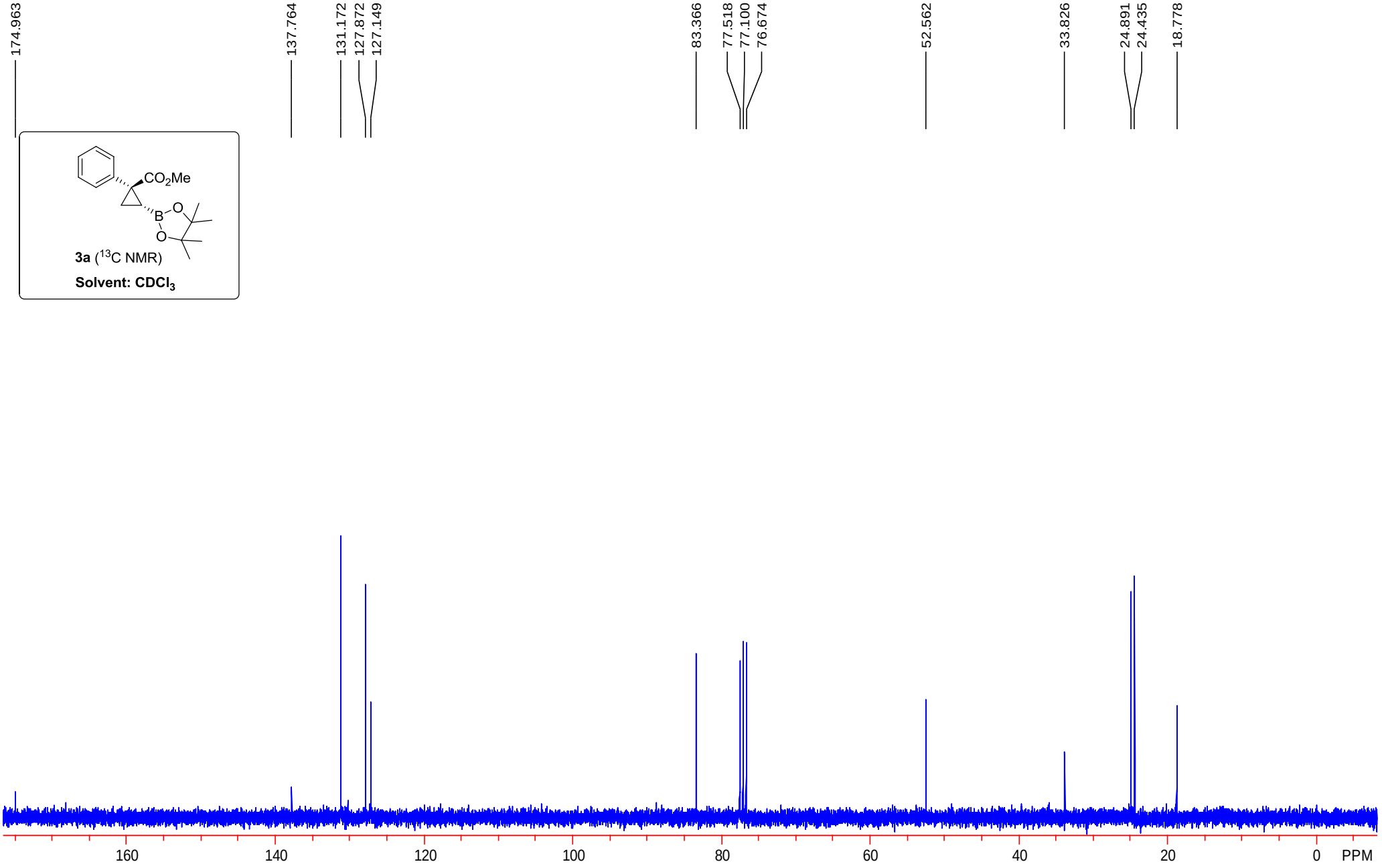

7.151
6.824
6.806
6.682
6.660
6.638
3.713
-0.000
F
F
CO2Me
1m (1H NMR)
Solvent: CDCl3
3.06
1.96
2.00
1.00
7
6
5
4
3
2
1
0
PPM

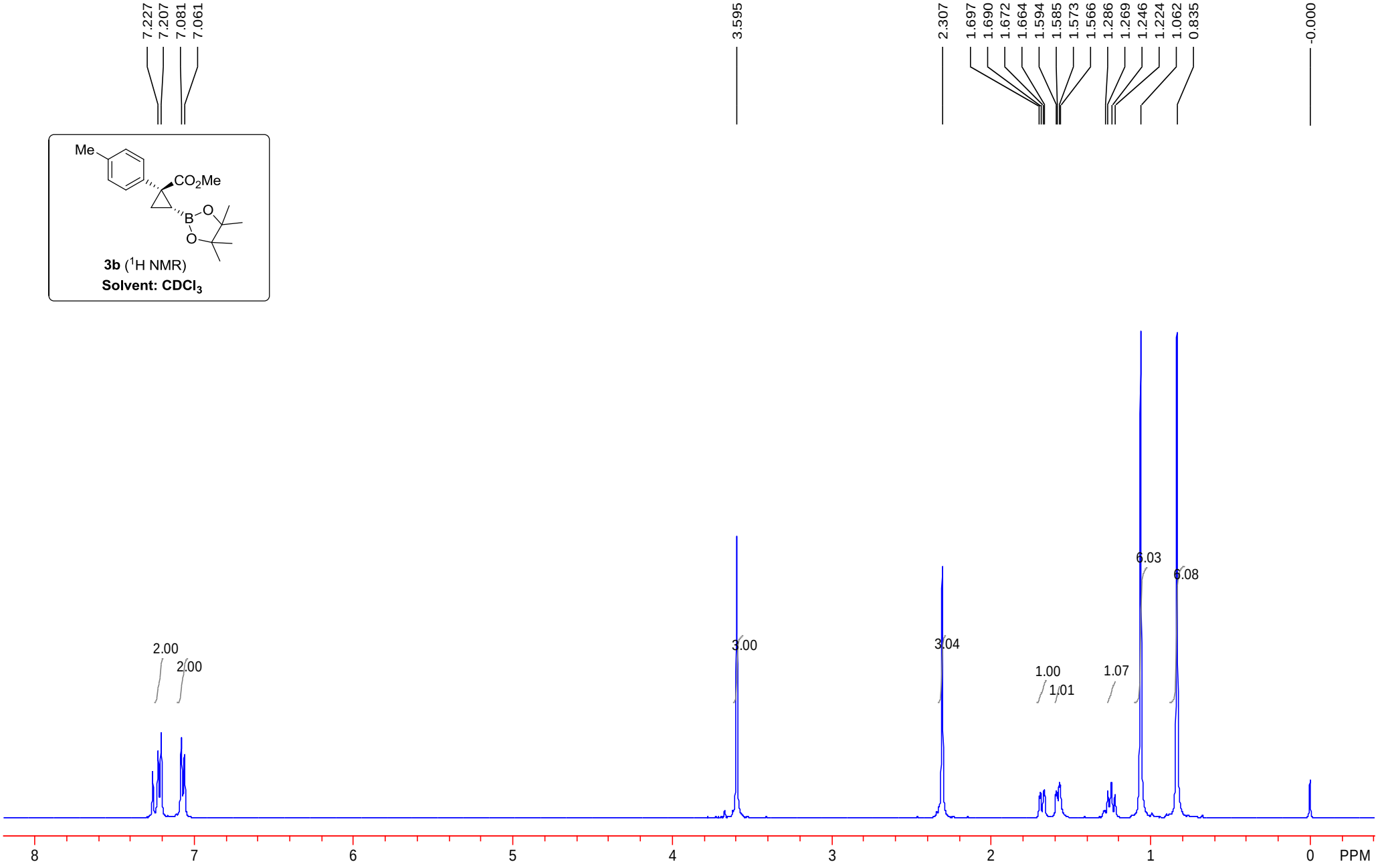

174.302
164.144
164.015
145.627
111.363
111.295
111.174
111.105
106.816
102.443
102.192
101.941
77.419
77.100
76.789
52.494
30.188
F
F
CO2Me
1m (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM

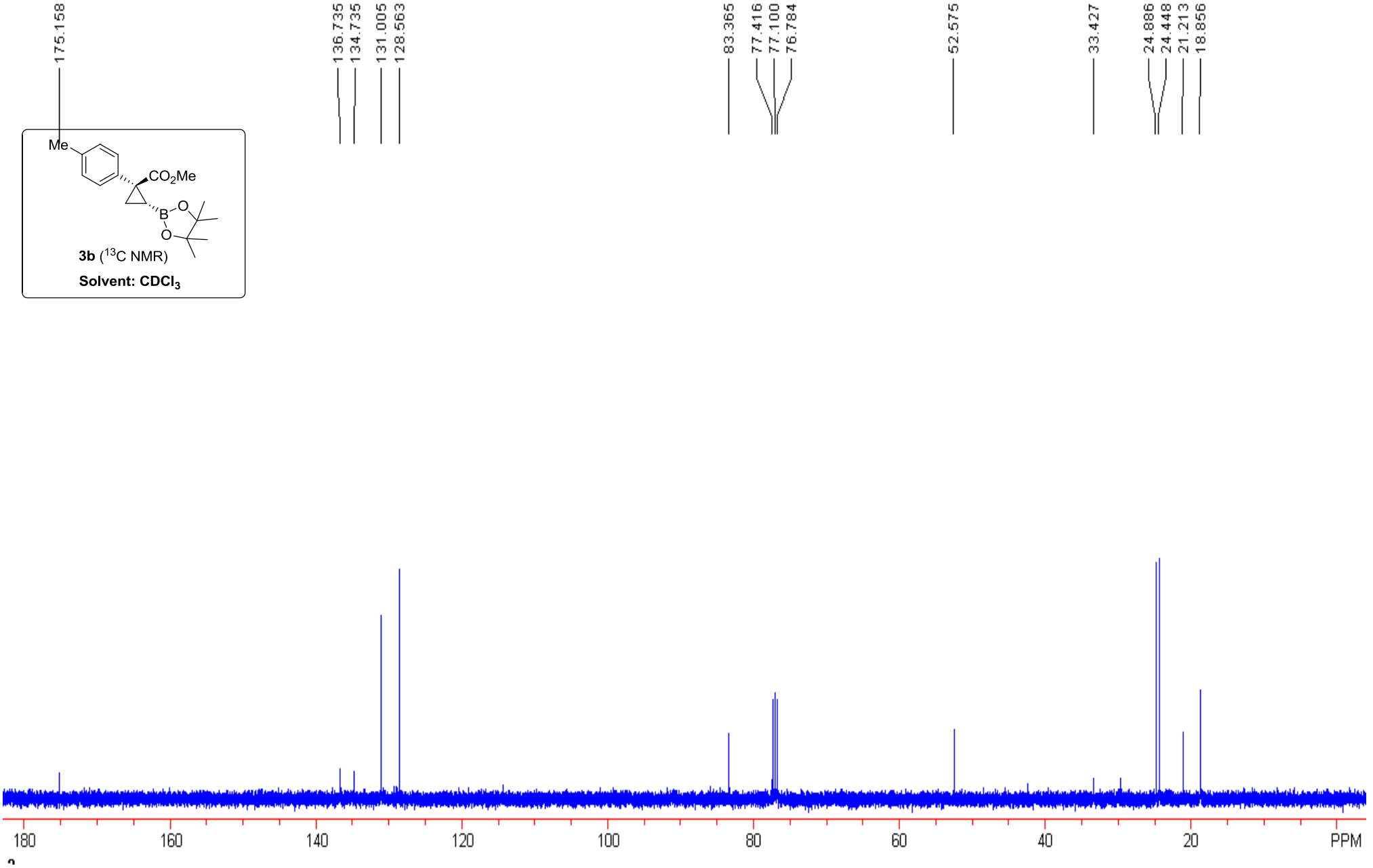

6.914
3.735
0.000
MeO2C
CO2Me
1p (1H NMR)
Solvent: CDCl3
6.11
2.00
7
6
5
4
3
2
1
0
PPM


171.334
102.405
77.419
77.100
76.781
52.448
29.831
MeO2C
CO2Me
1p (13C NMR)
Solvent: CDCl3
200
150
100
50
0
PPM


7.344
7.326
7.281
7.262
7.245
7.231
7.213
3.601
1.720
1.712
1.695
1.686
1.632
1.624
1.612
1.604
1.298
1.289
1.278
1.273
1.052
0.825
-0.000
CO2Me
B
O
O
3a (1H NMR)
Solvent: CDCl3
5.60
3.00
1.00
1.02
1.00
5.98
6.00
8
7
6
5
4
3
2
1
0 PPM


174.963
137.764
131.172
127.872
127.149
83.366
77.518
77.100
76.674
52.562
33.826
24.891
24.435
18.778
CO2Me
B
O
O
3a (13C NMR)
Solvent: CDCl3
160
140
120
100
80
60
40
20
0
PPM


7.227
7.207
7.081
7.061
3.595
2.307
1.697
1.690
1.672
1.664
1.594
1.585
1.573
1.566
1.286
1.269
1.246
1.224
1.062
0.835
-0.000
Me
CO2Me
B
O
O
3b (1H NMR)
Solvent: CDCl3
2.00
2.00
3.00
3.04
1.00
1.01
1.07
6.03
6.08
8
7
6
5
4
3
2
1
0
PPM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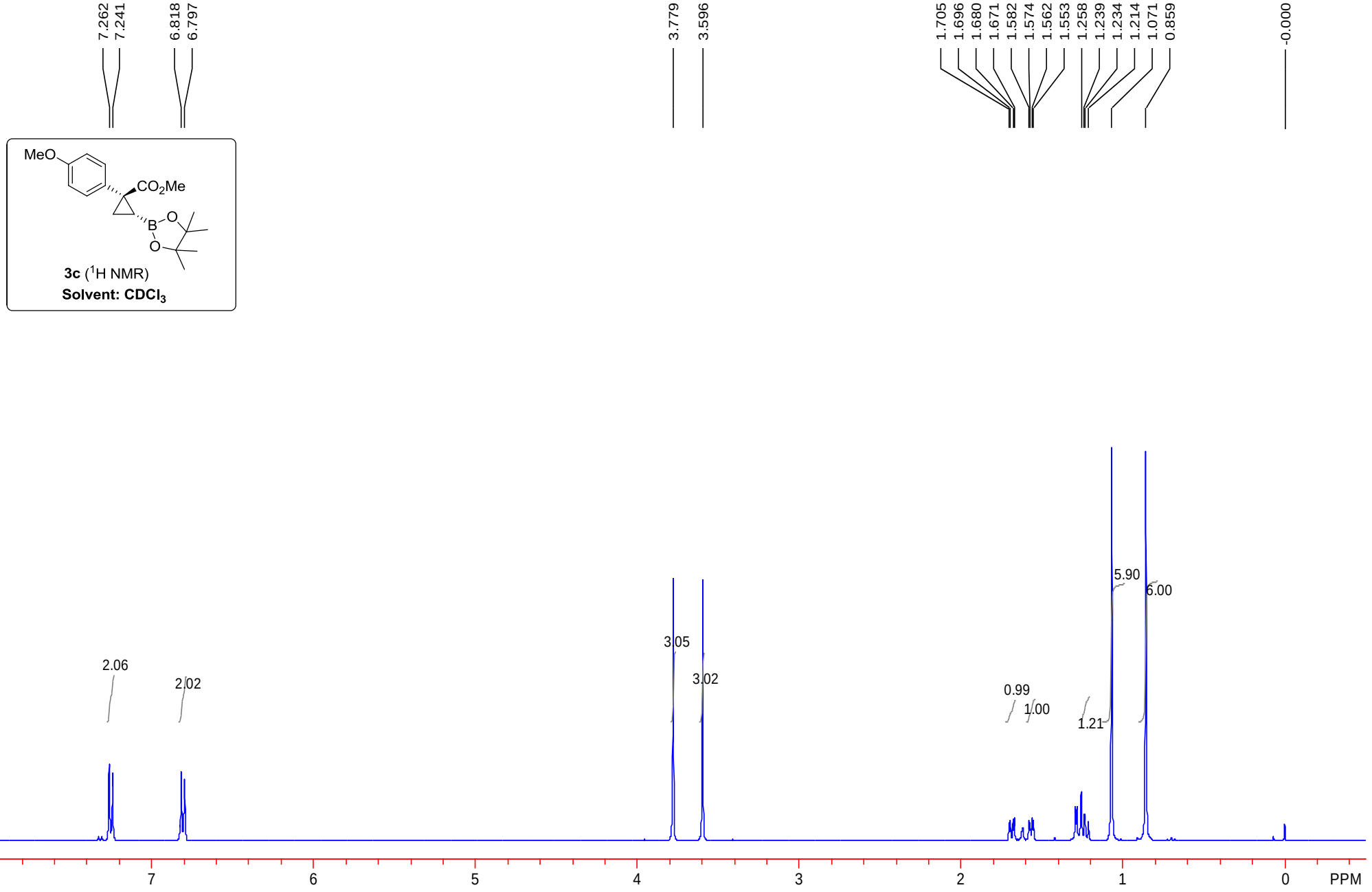
134.735
131.005
128.563
83.365
77.416
77.100
76.784
52.575
33.427
24.886
24.448
21.213
18.856
Me
CO2Me
B
O
O
3b (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
PPM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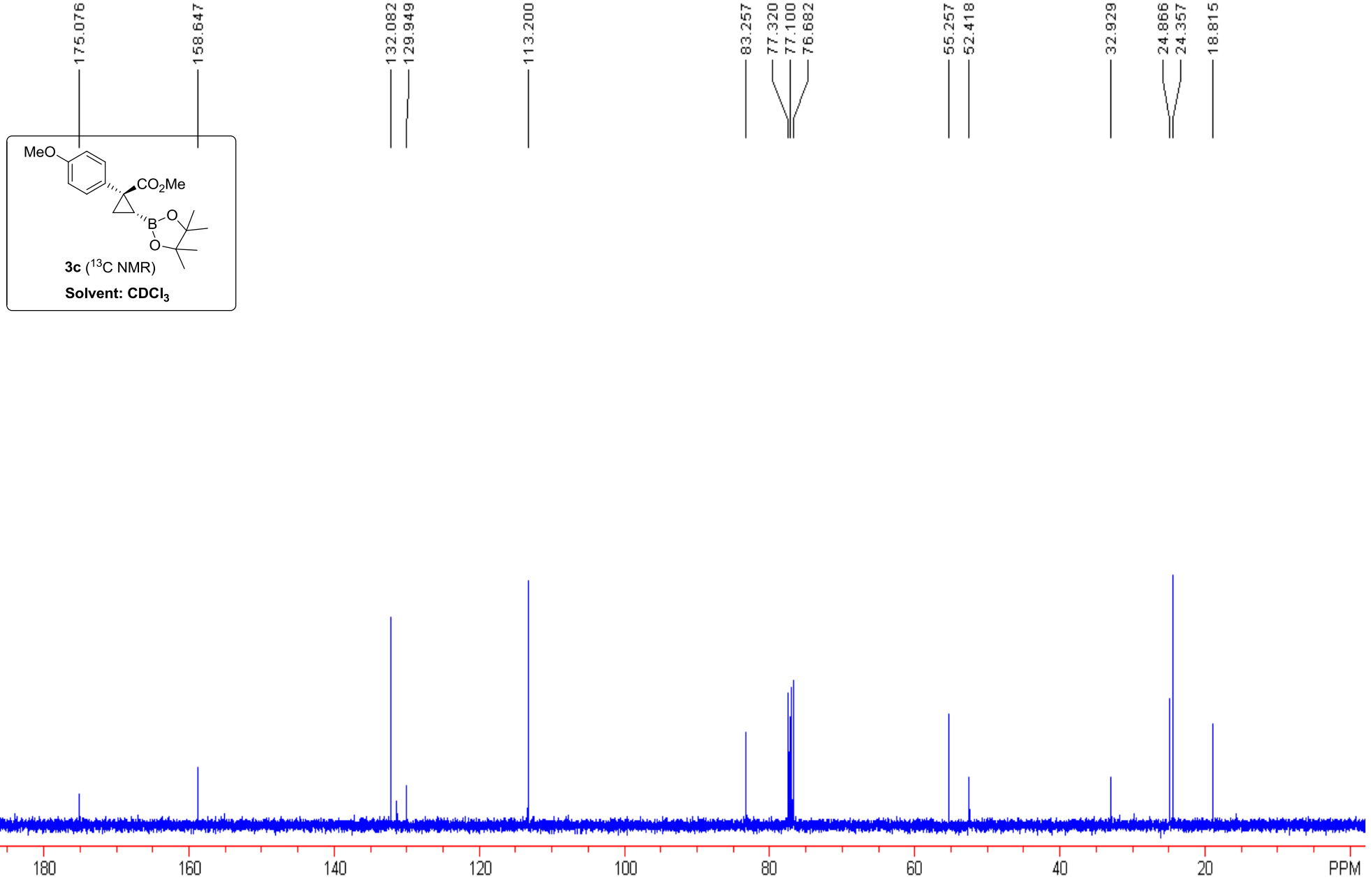
7.241
6.818
6.797
3.779
3.596
1.705
1.696
1.680
1.671
1.582
1.574
1.562
1.553
1.258
1.239
1.234
1.214
1.071
0.859
-0.000
MeO
CO2Me
B
O
O
3c (1H NMR)
Solvent: CDCl3
2.06
2.02
3.05
3.02
0.99
1.00
1.21
5.90
6.00
8
7
6
5
4
3
2
1
0
PPM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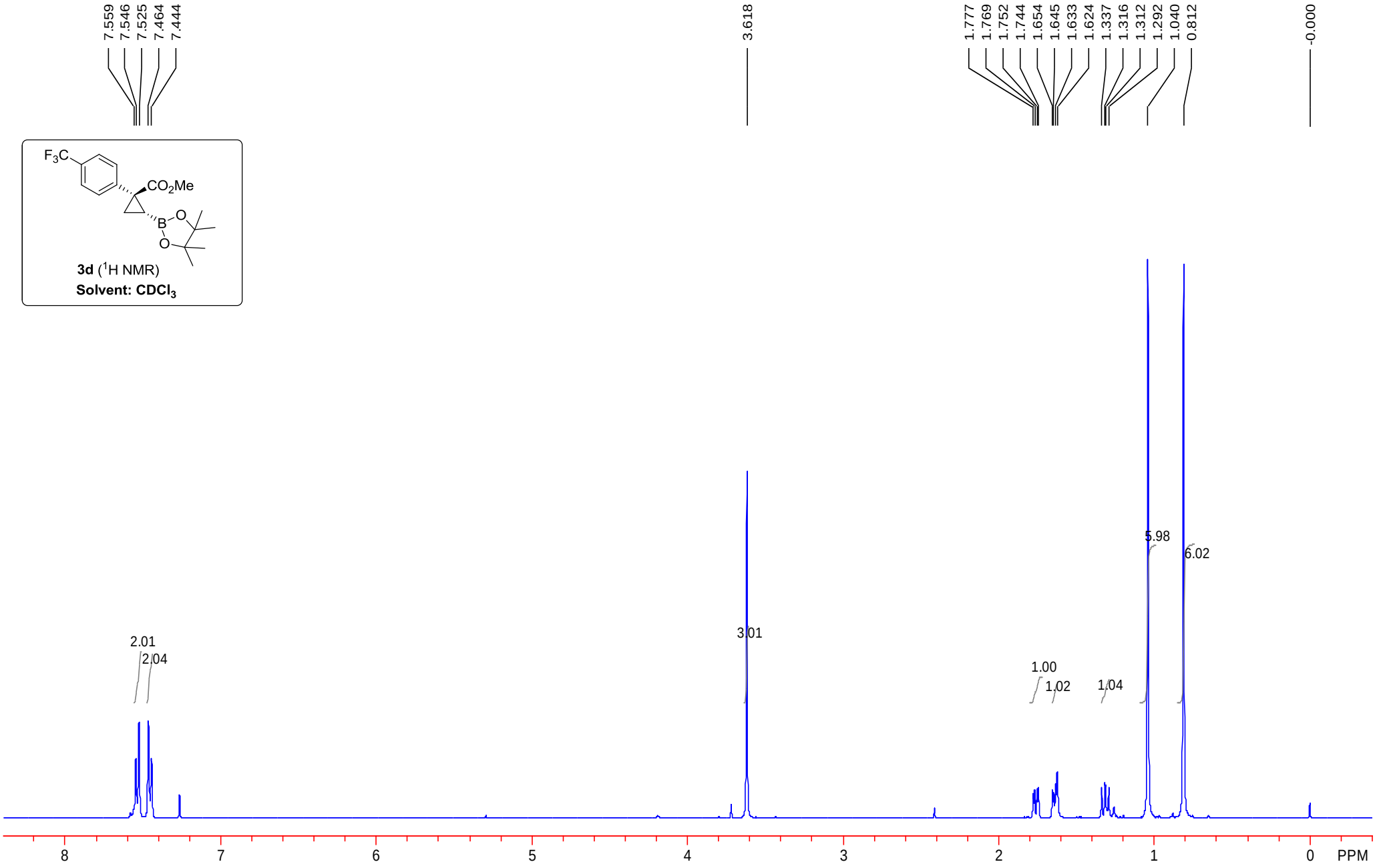
158.647
132.082
129.949
113.200
83.257
77.320
77.100
76.682
55.257
52.418
32.929
24.866
24.357
18.815
MeO
CO2Me
B
O
O
3c (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
PPM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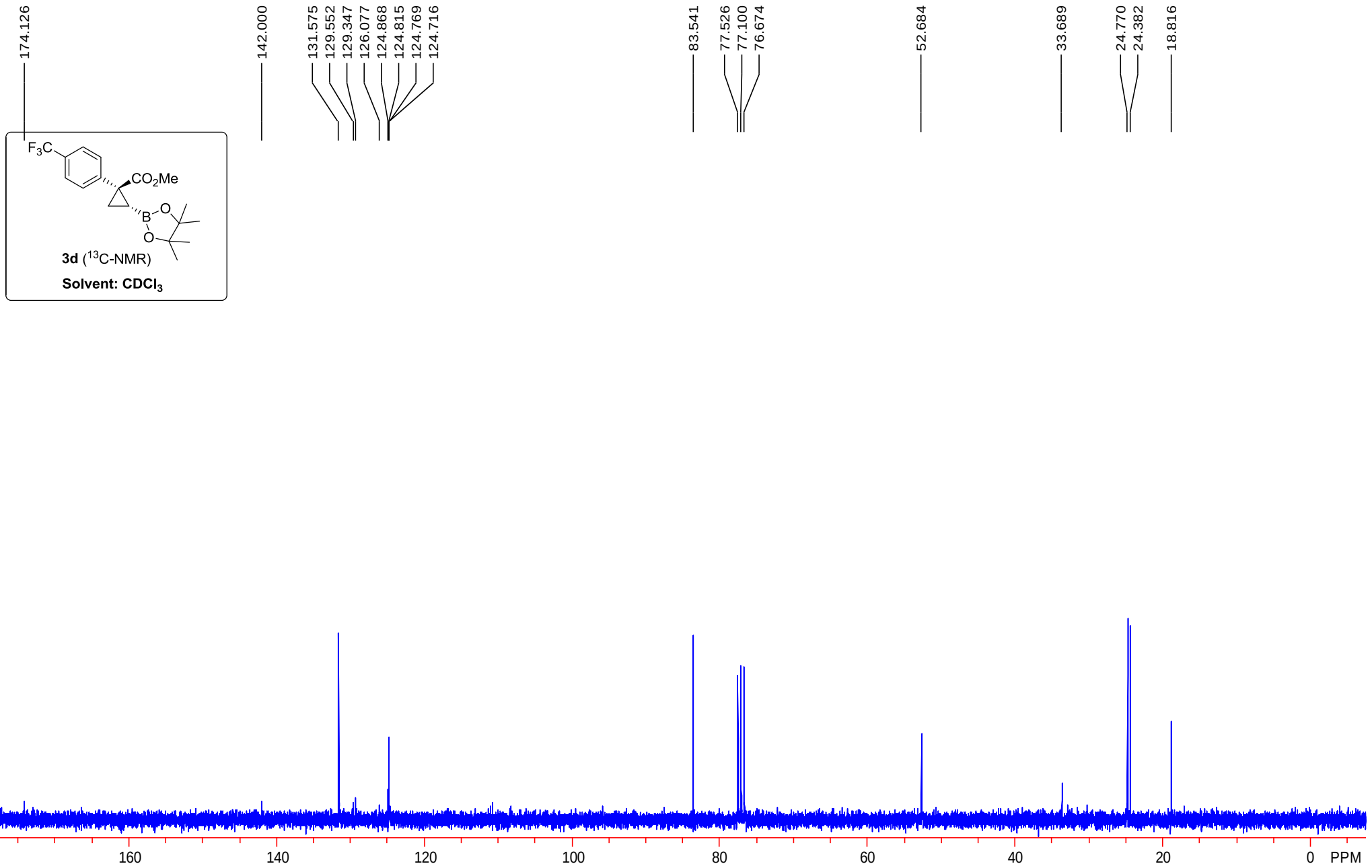
7.546
7.525
7.464
7.444
3.618
1.777
1.769
1.752
1.744
1.654
1.645
1.633
1.624
1.337
1.316
1.312
1.292
1.040
0.812
-0.000
F3C
CO2Me
B
O
O
3d (1H NMR)
Solvent: CDCl3
2.01
2.04
3.01
1.00
1.02
1.04
5.98
6.02
8
7
6
5
4
3
2
1
0
PPM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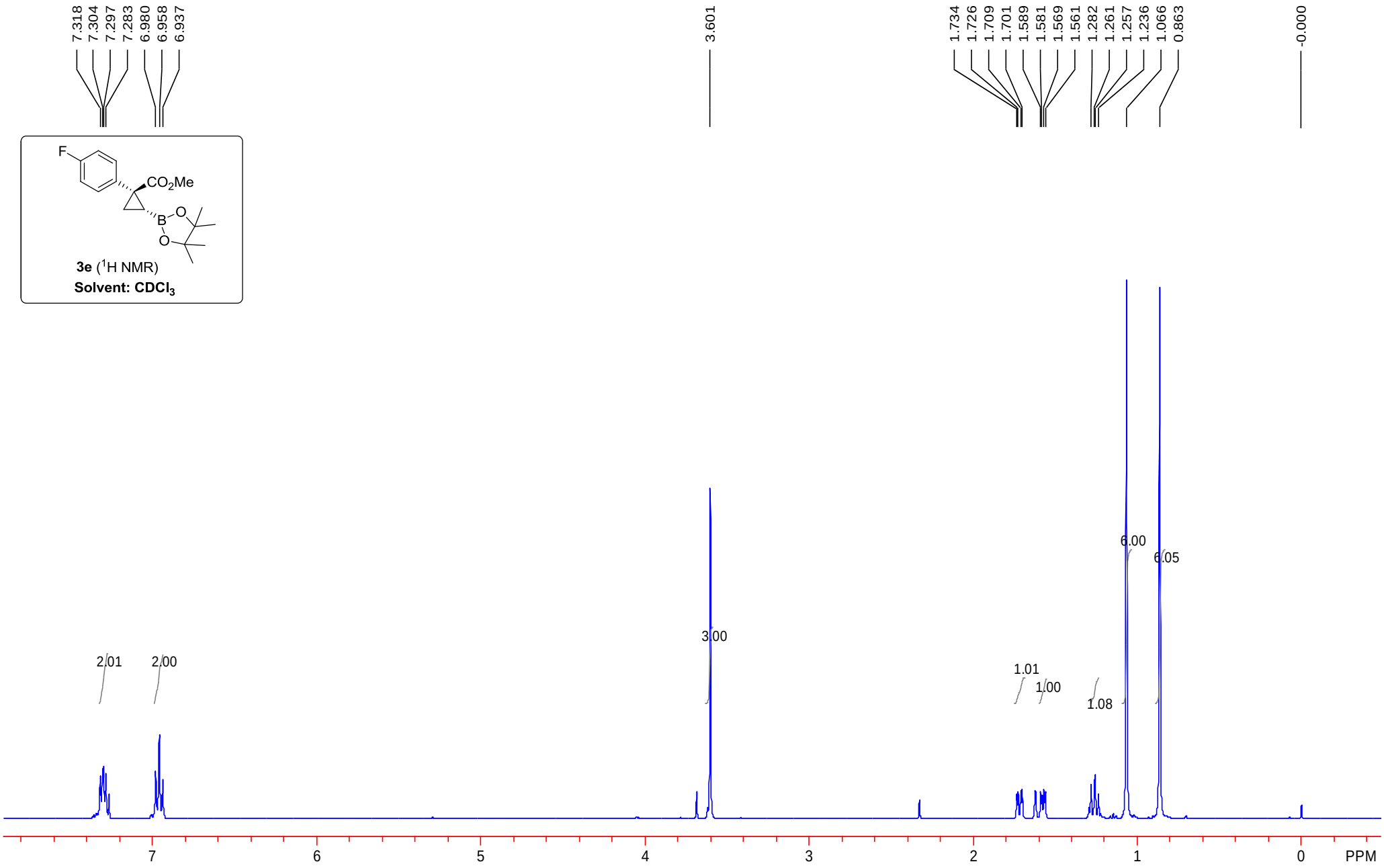
142.000
131.575
129.552
129.347
126.077
124.868
124.815
124.769
124.716
83.541
77.526
77.100
76.674
52.684
33.689
24.770
24.382
18.816
F3C
CO2Me
B
O
O
3d (13C-NMR)
Solvent: CDCl3
160
140
120
100
80
60
40
20
0
PPM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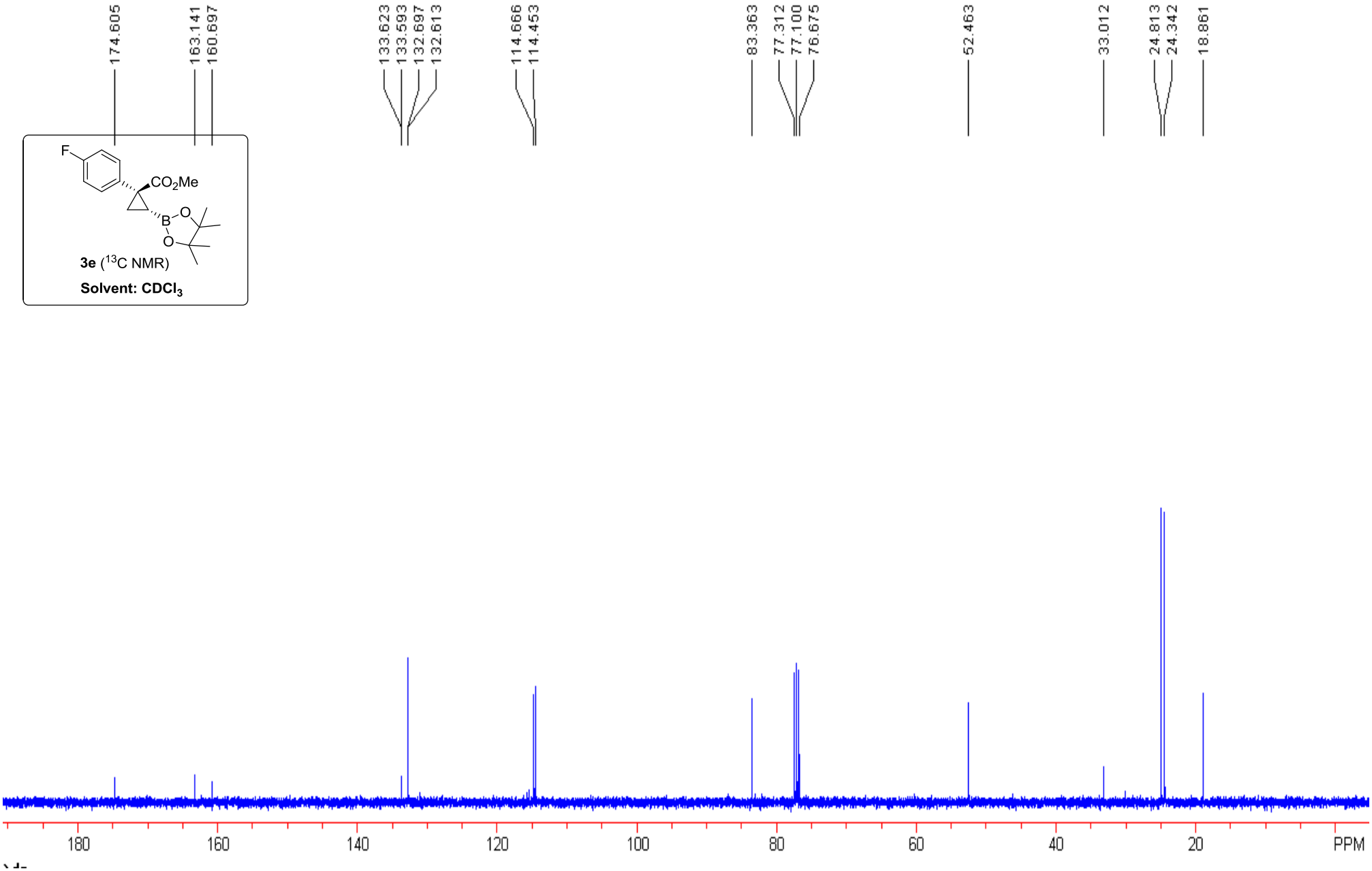
7.297
7.283
6.980
6.958
6.937
3.601
1.734
1.726
1.709
1.701
1.589
1.581
1.569
1.561
1.282
1.261
1.257
1.236
1.066
0.863
-0.000
F
CO2Me
B
O
O
3e (1H NMR)
Solvent: CDCl3
2.01
2.00
3.00
1.01
1.00
1.08
6.00
6.05
7
6
5
4
3
2
1
0
PPM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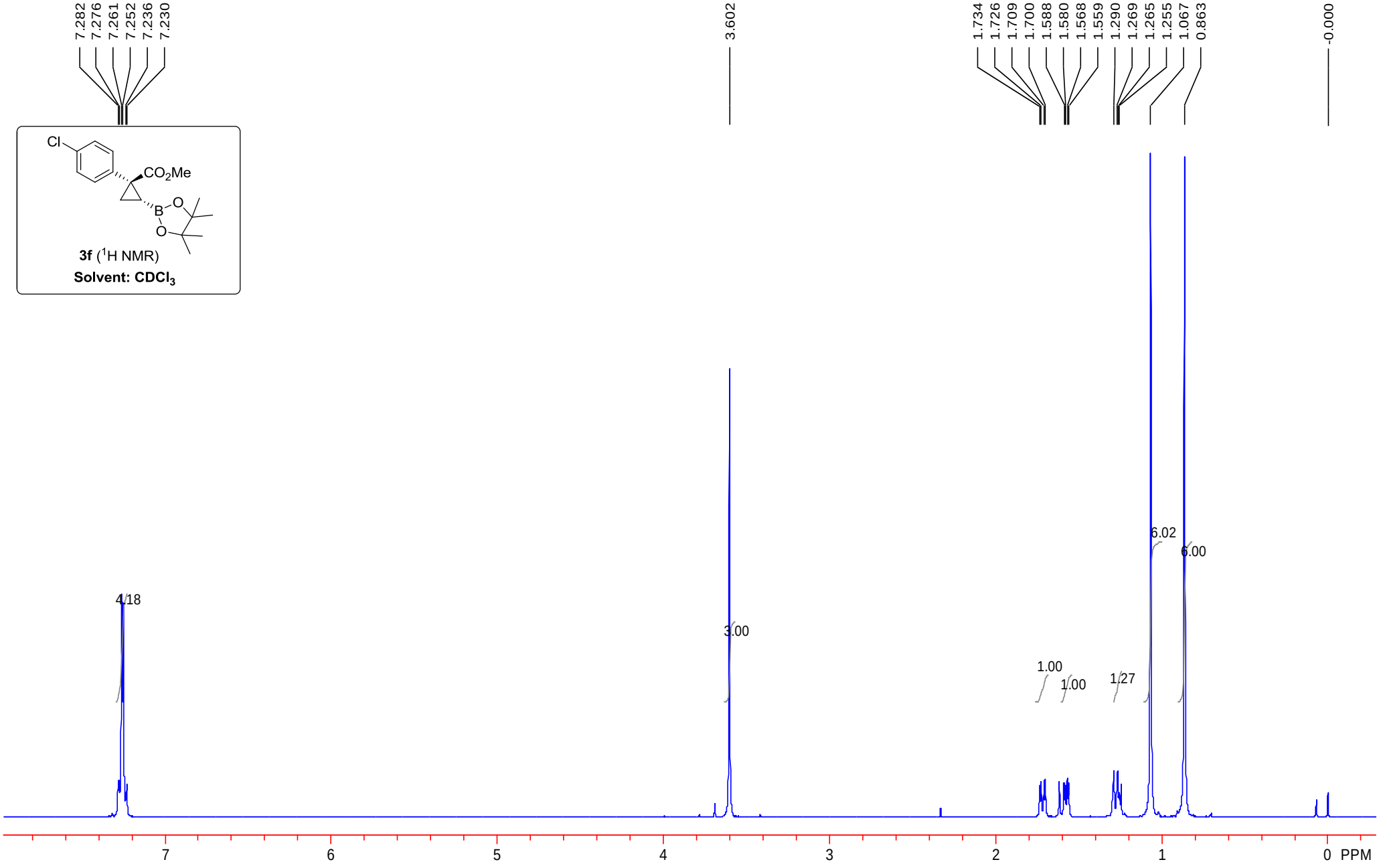
163.141
160.697
133.623
133.593
132.697
132.613
114.666
114.453
83.363
77.312
77.100
76.675
52.463
33.012
24.813
24.342
18.861
F
CO2Me
B
O
O
3e (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
PPM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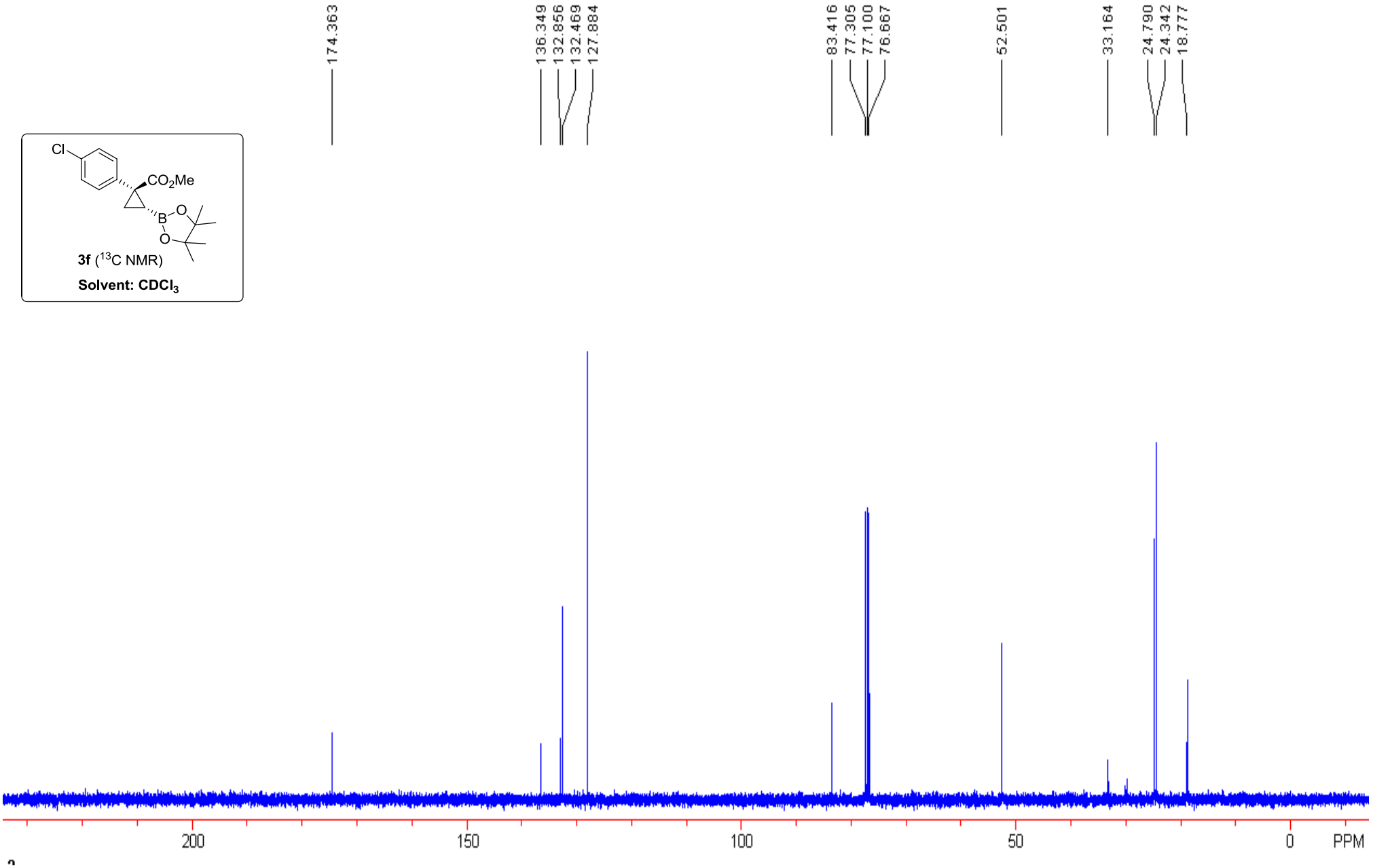
7.276
7.261
7.252
7.236
7.230
3.602
1.734
1.726
1.709
1.700
1.588
1.580
1.568
1.559
1.290
1.269
1.265
1.255
1.067
0.863
-0.000
Cl
CO2Me
B
O
O
3f (1H NMR)
Solvent: CDCl3
4.18
3.00
1.00
1.00
1.27
6.02
6.00
7
6
5
4
3
2
1
0 PPM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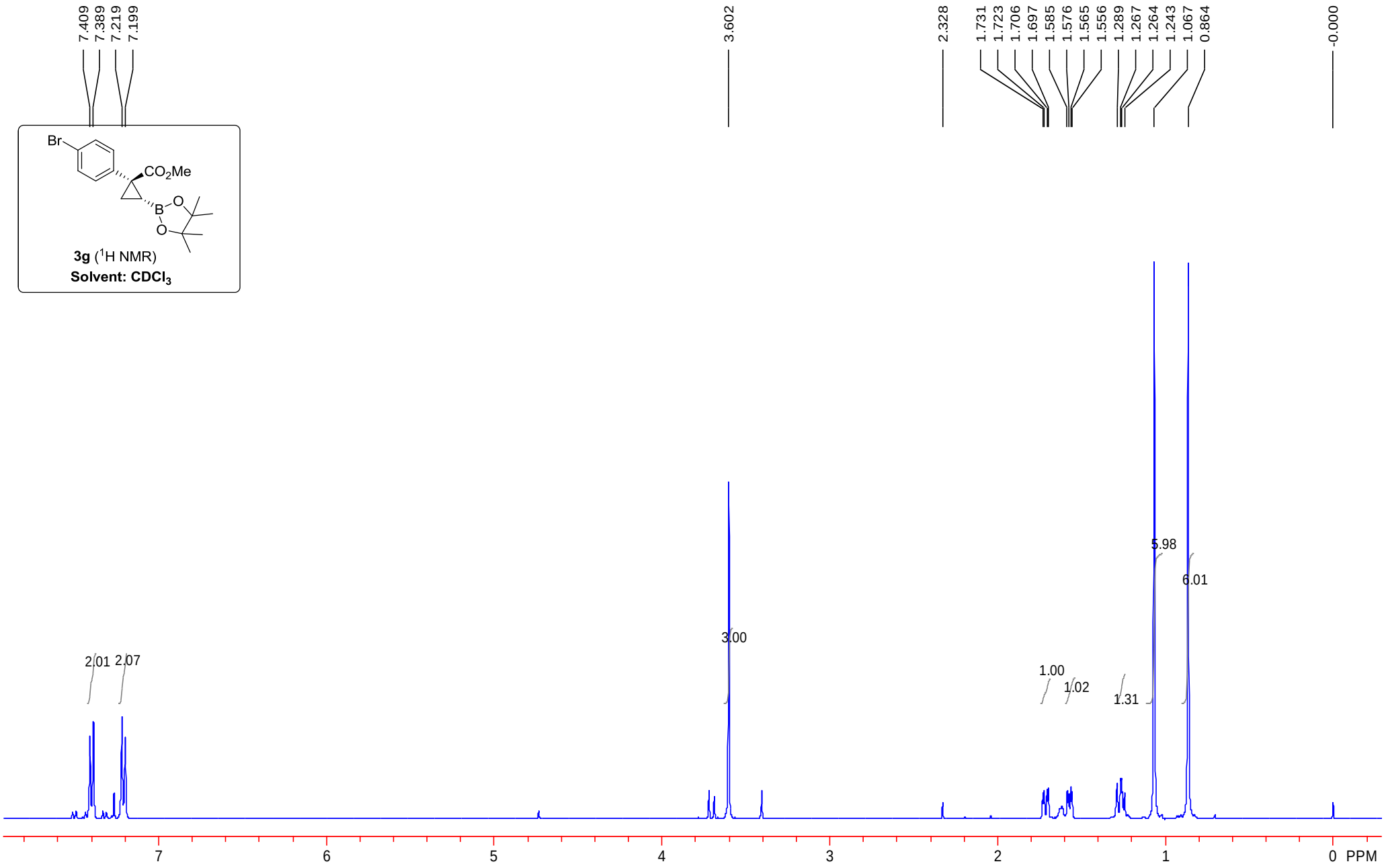
132.856
132.469
127.884
83.416
77.305
77.100
76.667
52.501
33.164
24.790
24.342
18.777
Cl
CO2Me
B
O
O
3f (13C NMR)
Solvent: CDCl3
200
150
100
50
0
PPM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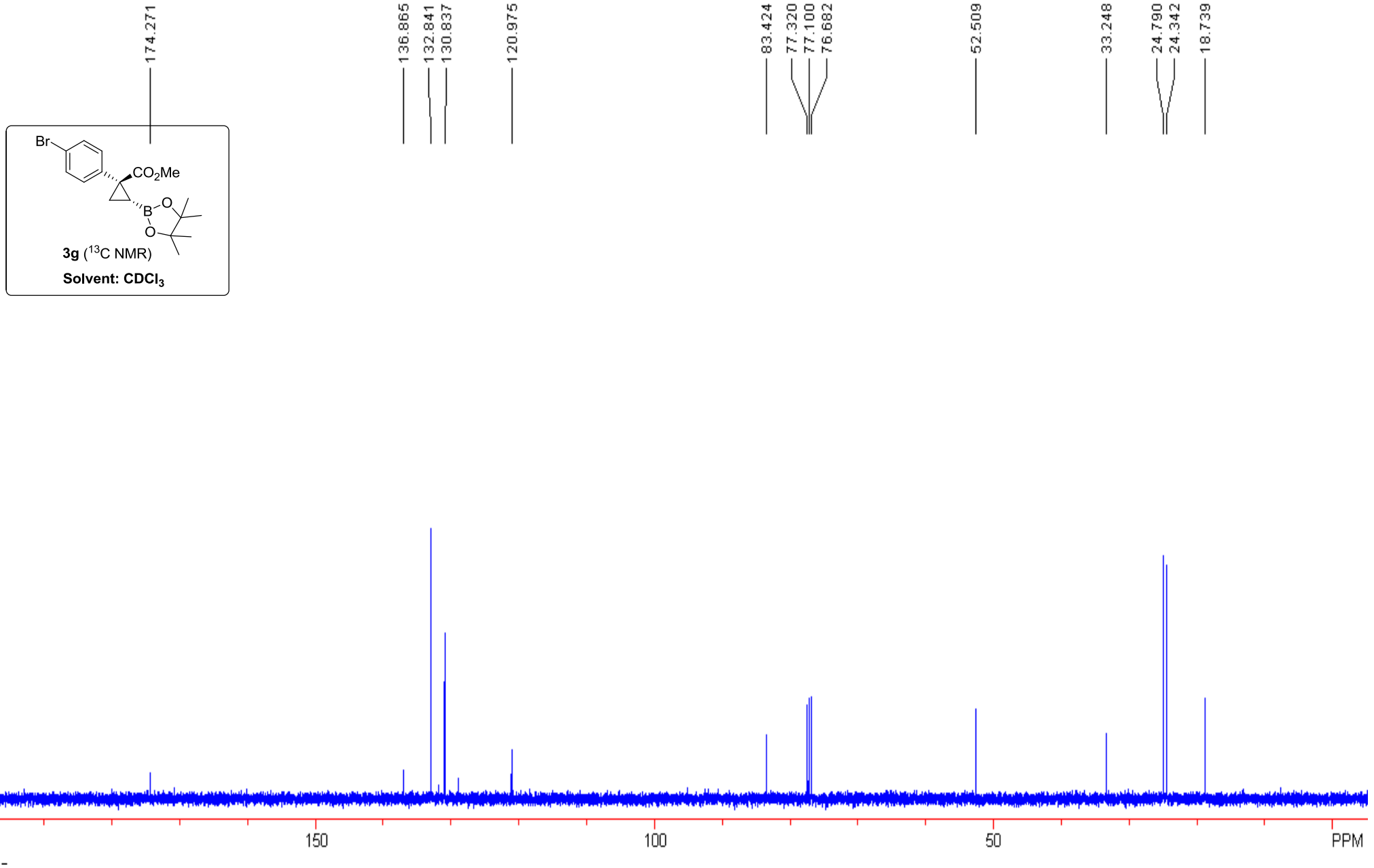
7.389
7.219
7.199
3.602
2.328
1.731
1.723
1.706
1.697
1.585
1.576
1.565
1.556
1.289
1.267
1.264
1.243
1.067
0.864
-0.000
Br
CO2Me
B
O
O
3g (1H NMR)
Solvent: CDCl3
2.01
2.07
3.00
1.00
1.02
1.31
5.98
6.01
7
6
5
4
3
2
1
0 PPM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136.865
132.841
130.837
120.975
83.424
77.320
77.100
76.682
52.509
33.248
24.790
24.342
18.739
Br
CO2Me
B
O
O
3g (13C NMR)
Solvent: CDCl3
150
100
50
PPM

```
20135681qtb-br

 Sample Name:
   20135681qtb-br
 Data Collected on:
   Agilent-NMR-vnmrs400
 Archive directory:
   /home/sioc/date
 Sample directory:
   20135681qtb-br_20140903_01
 FidFile: NOESY_01

Pulse Sequence: NOESY
Solvent: cdcl3
Data collected on: Sep  3 2014

 Temp. 25.0 C / 298.1 K
Operator: sioc

 Relax. delay 1.000 sec
 Acq. time 0.150 sec
 Width     3858.0 Hz
 2D Width 3858.0 Hz
 8 repetitions
 2 x 200 increments
OBSERVE    H1, 399.6538482 MHz
DATA PROCESSING
 Gauss apodization 0.069 sec
F1 DATA PROCESSING
 Gauss apodization 0.048 sec
FT size 2048 x 2048
Total time 1 hr, 41 min
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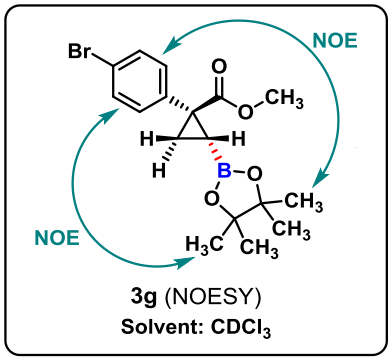
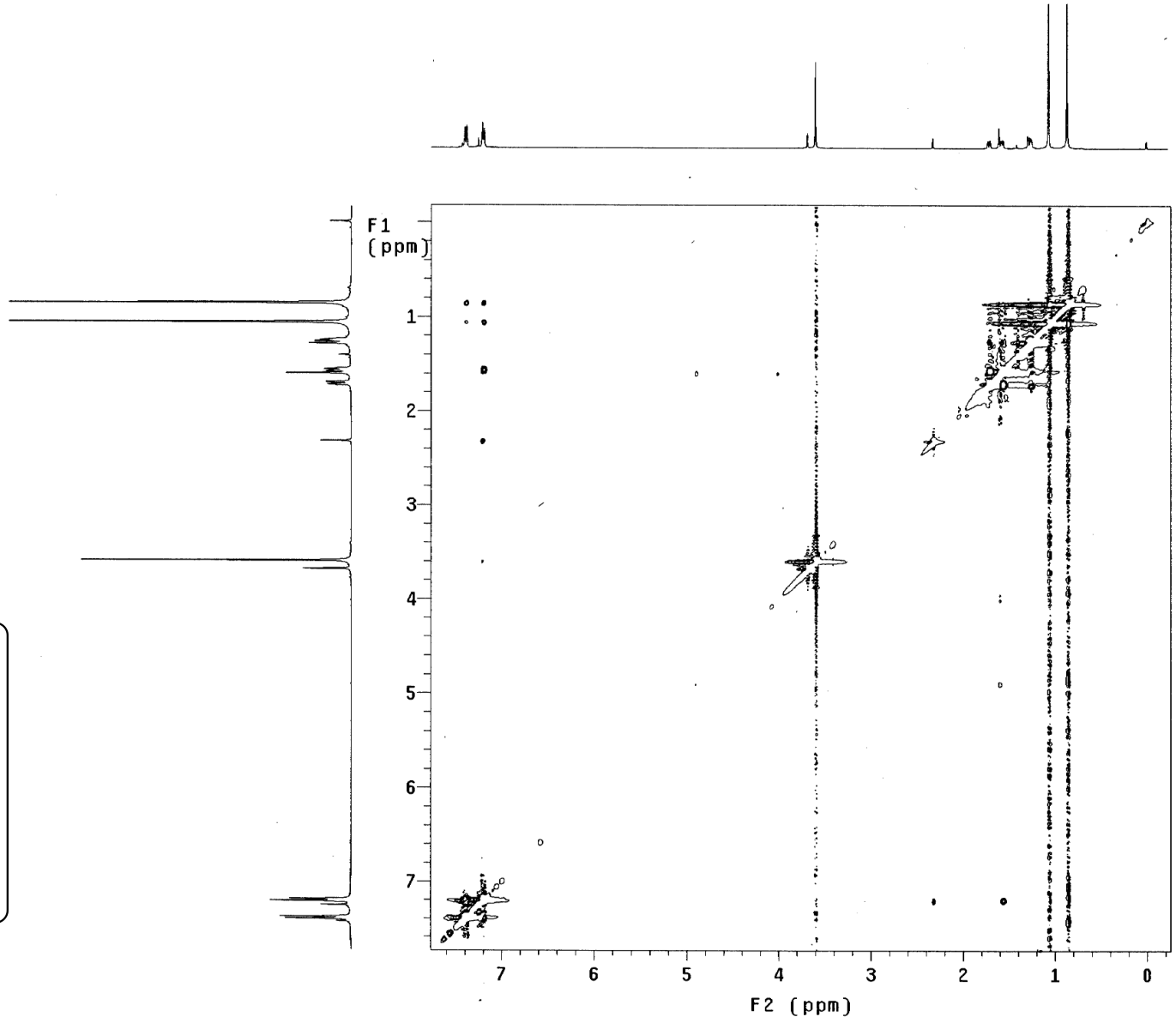
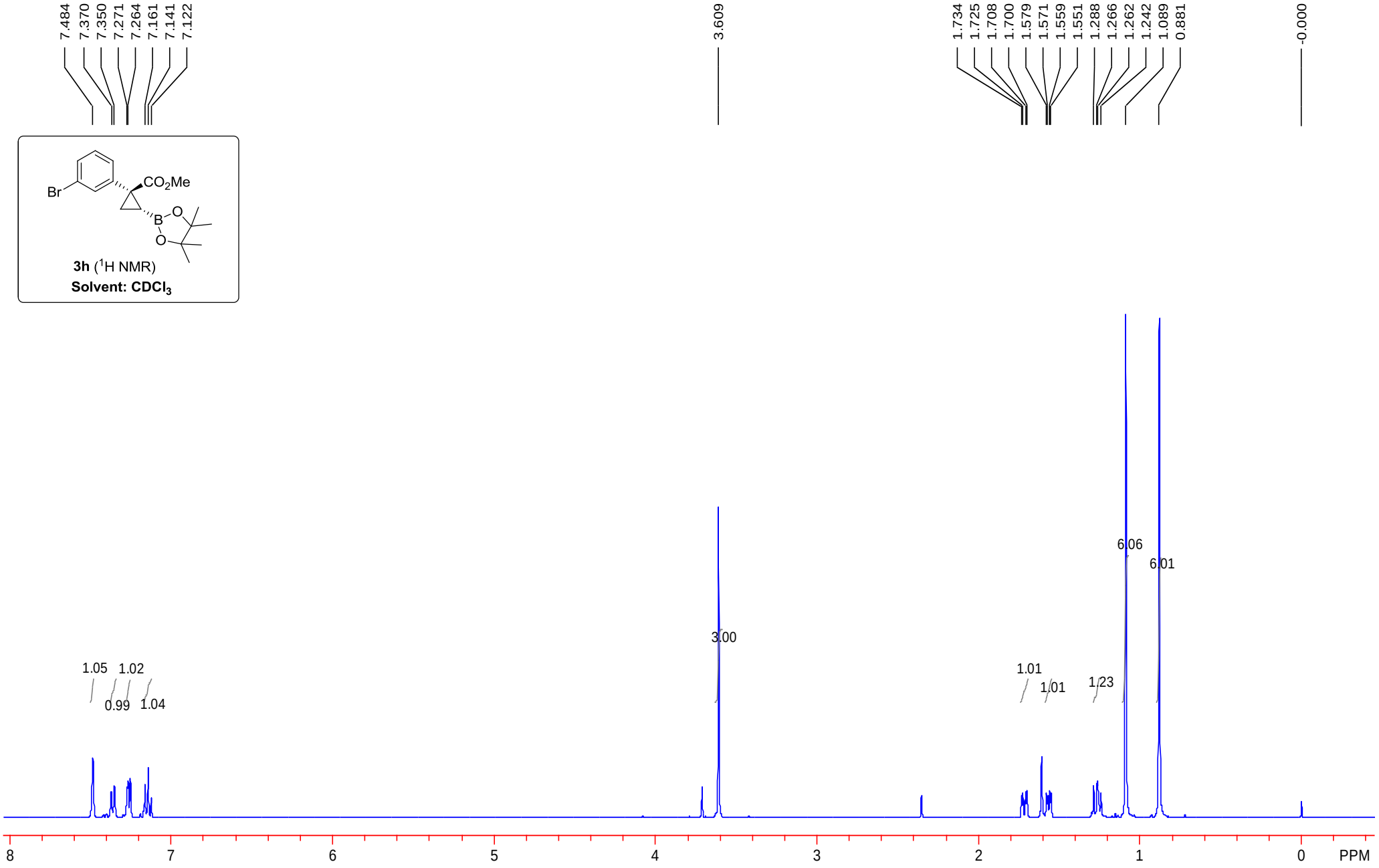


3g (NOESY)
Solvent: $CDCl_3$

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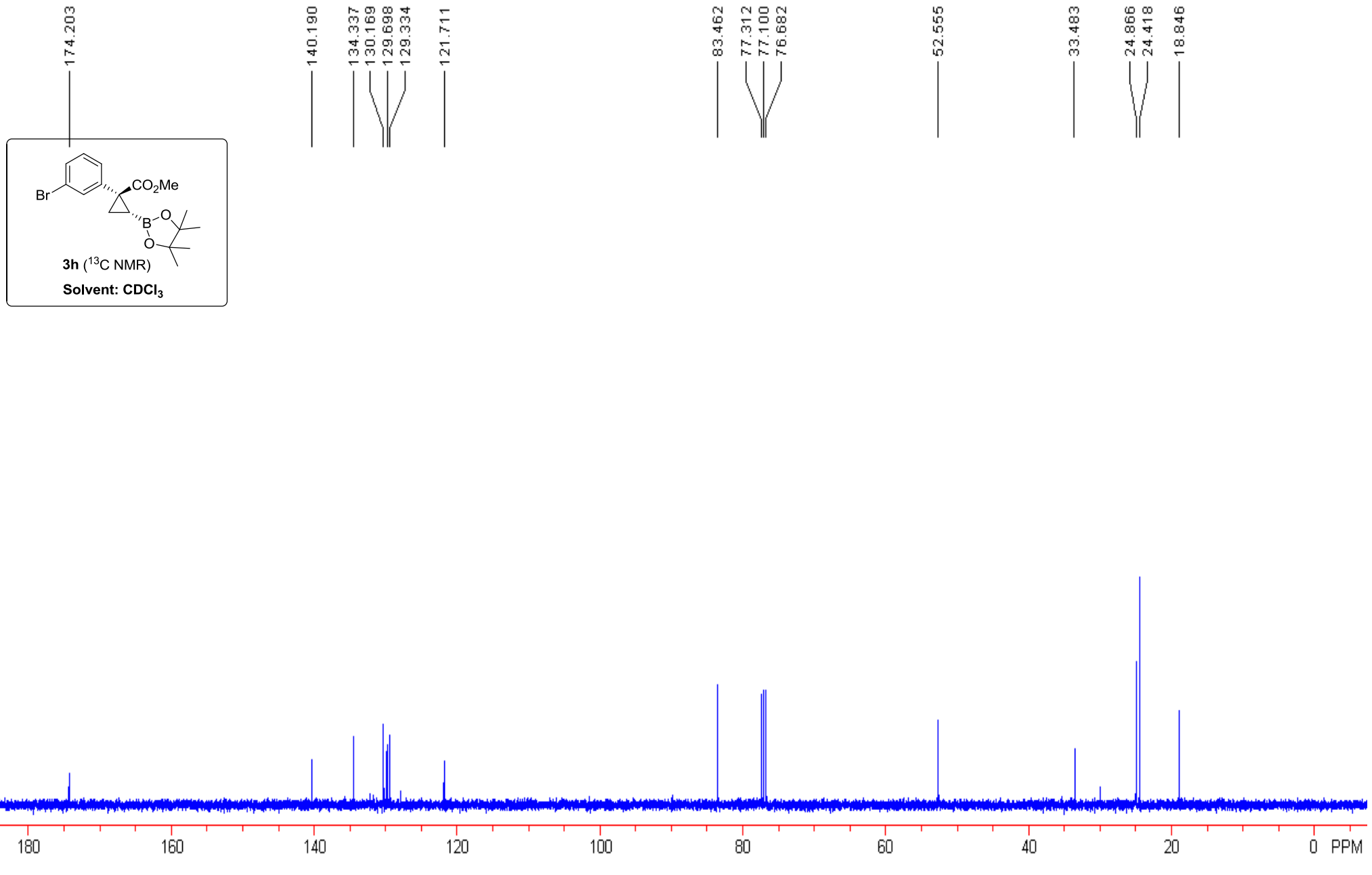
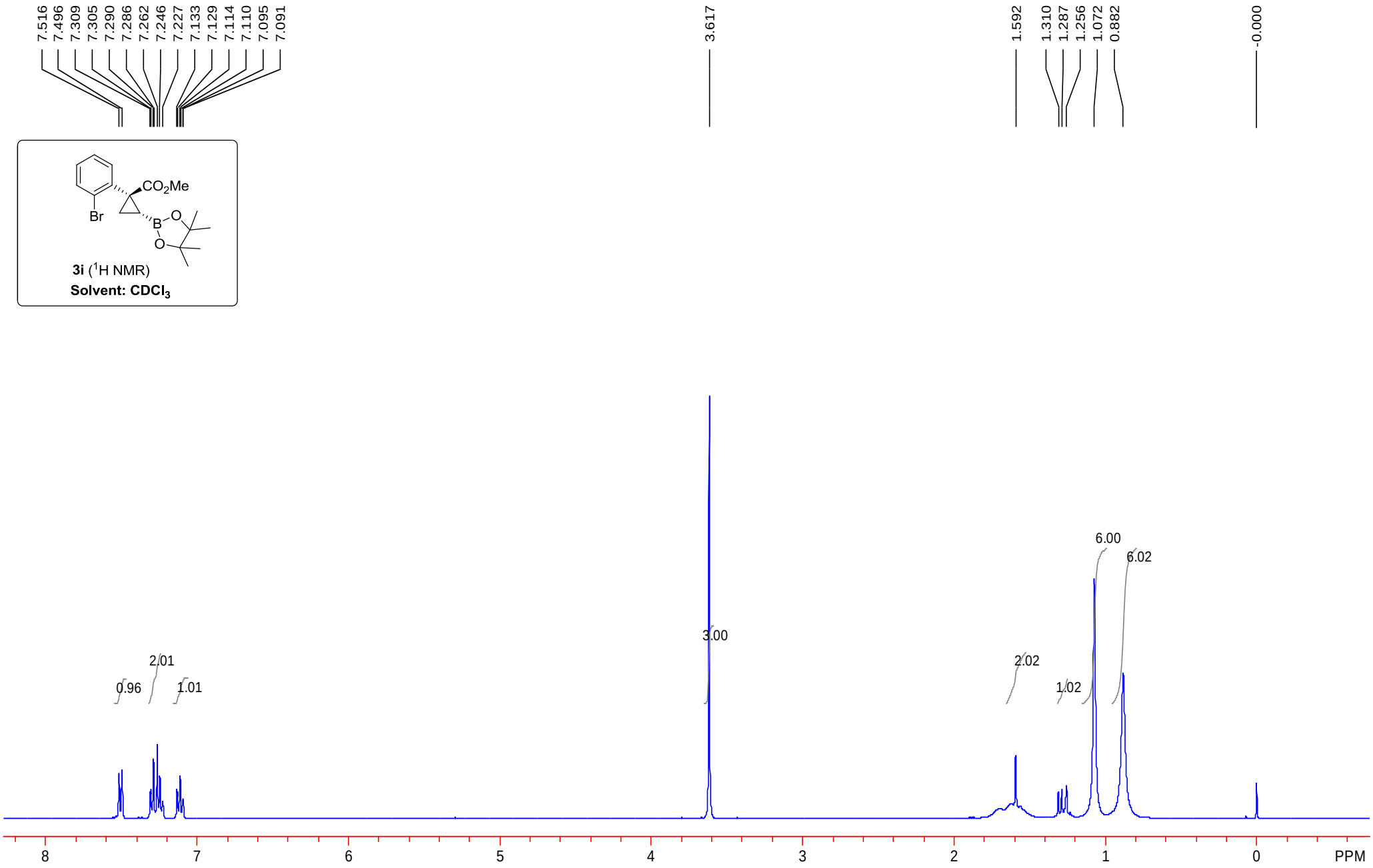
7.370
7.350
7.271
7.264
7.161
7.141
7.122
3.609
1.734
1.725
1.708
1.700
1.579
1.571
1.559
1.551
1.288
1.266
1.262
1.242
1.089
0.881
-0.000
Br
CO2Me
B
O
O
3h (1H NMR)
Solvent: CDCl3
1.05
1.02
0.99
1.04
3.00
1.01
1.01
1.23
6.06
6.01
8
7
6
5
4
3
2
1
0
PPM


174.203
140.190
134.337
130.169
129.698
129.334
121.711
83.462
77.312
77.100
76.682
52.555
33.483
24.866
24.418
18.846
Br
CO2Me
B
O
O
3h (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM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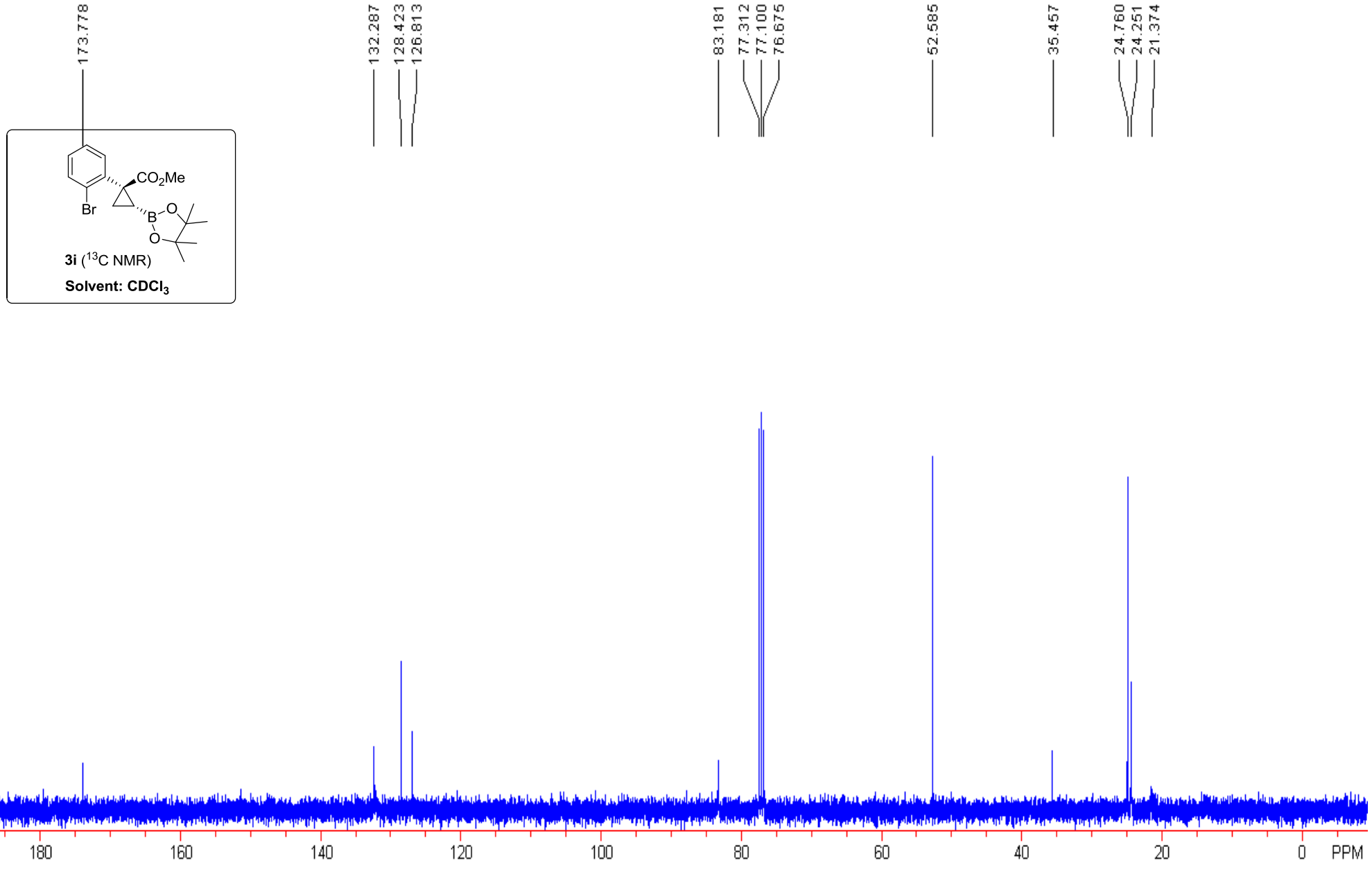
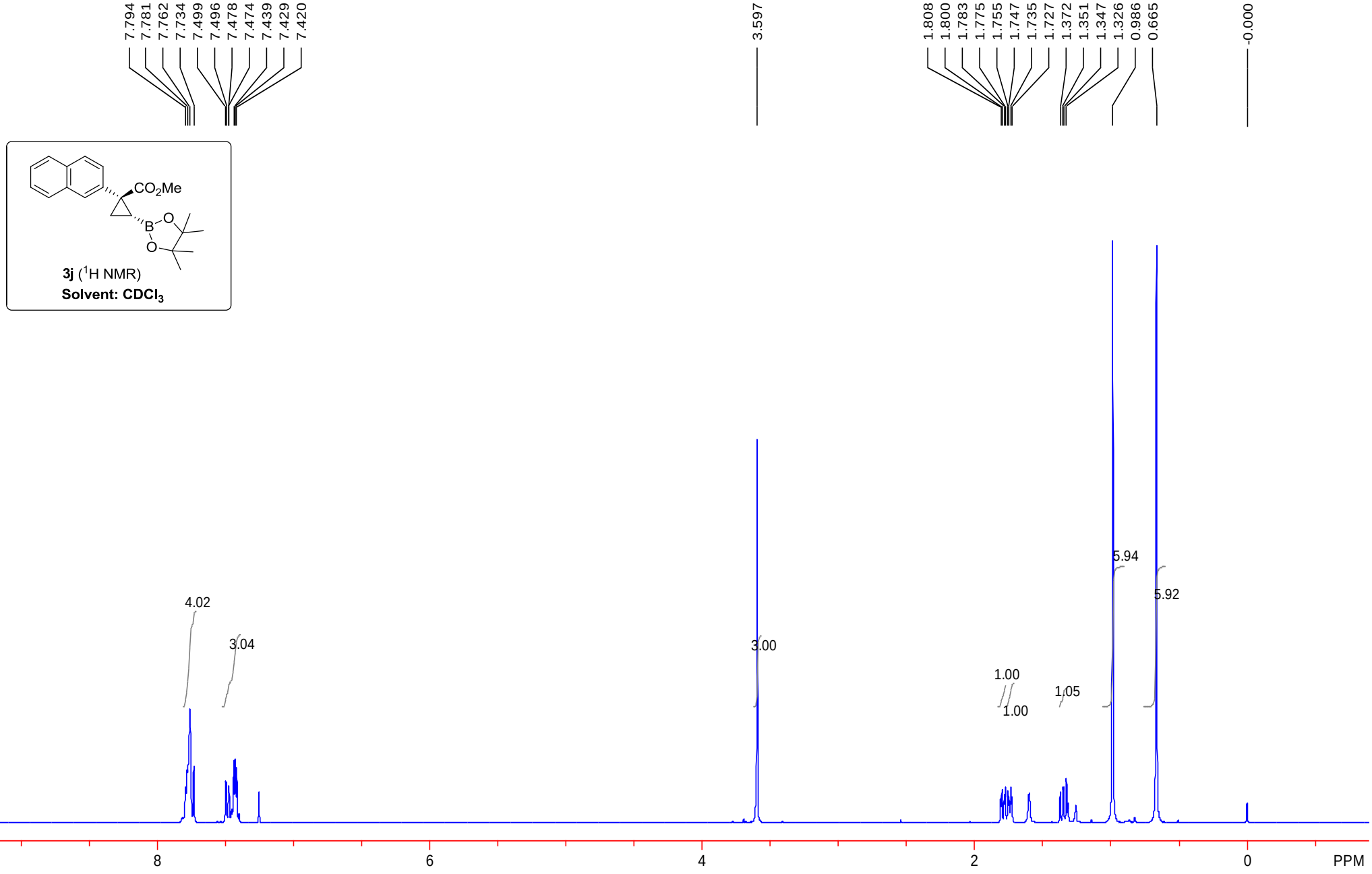
7.496
7.309
7.305
7.290
7.286
7.262
7.246
7.227
7.133
7.129
7.114
7.110
7.095
7.091
3.617
1.592
1.310
1.287
1.256
1.072
0.882
-0.000
CO2Me
Br
B
O
O
3i (1H NMR)
Solvent: CDCl3
0.96
2.01
1.01
3.00
2.02
1.02
6.00
6.02
8
7
6
5
4
3
2
1
0
PPM


173.778
132.287
128.423
126.813
83.181
77.312
77.100
76.675
52.585
35.457
24.760
24.251
21.374
CO2Me
Br
B
O
O
3i (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM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7.762
7.734
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7.496
7.478
7.474
7.439
7.429
7.420
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1.808
1.800
1.783
1.775
1.755
1.747
1.735
1.727
1.372
1.351
1.347
1.326
0.986
0.665
-0.000
CO2Me
B
O
O
3j (1H NMR)
Solvent: CDCl3
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3.00
1.00
1.00
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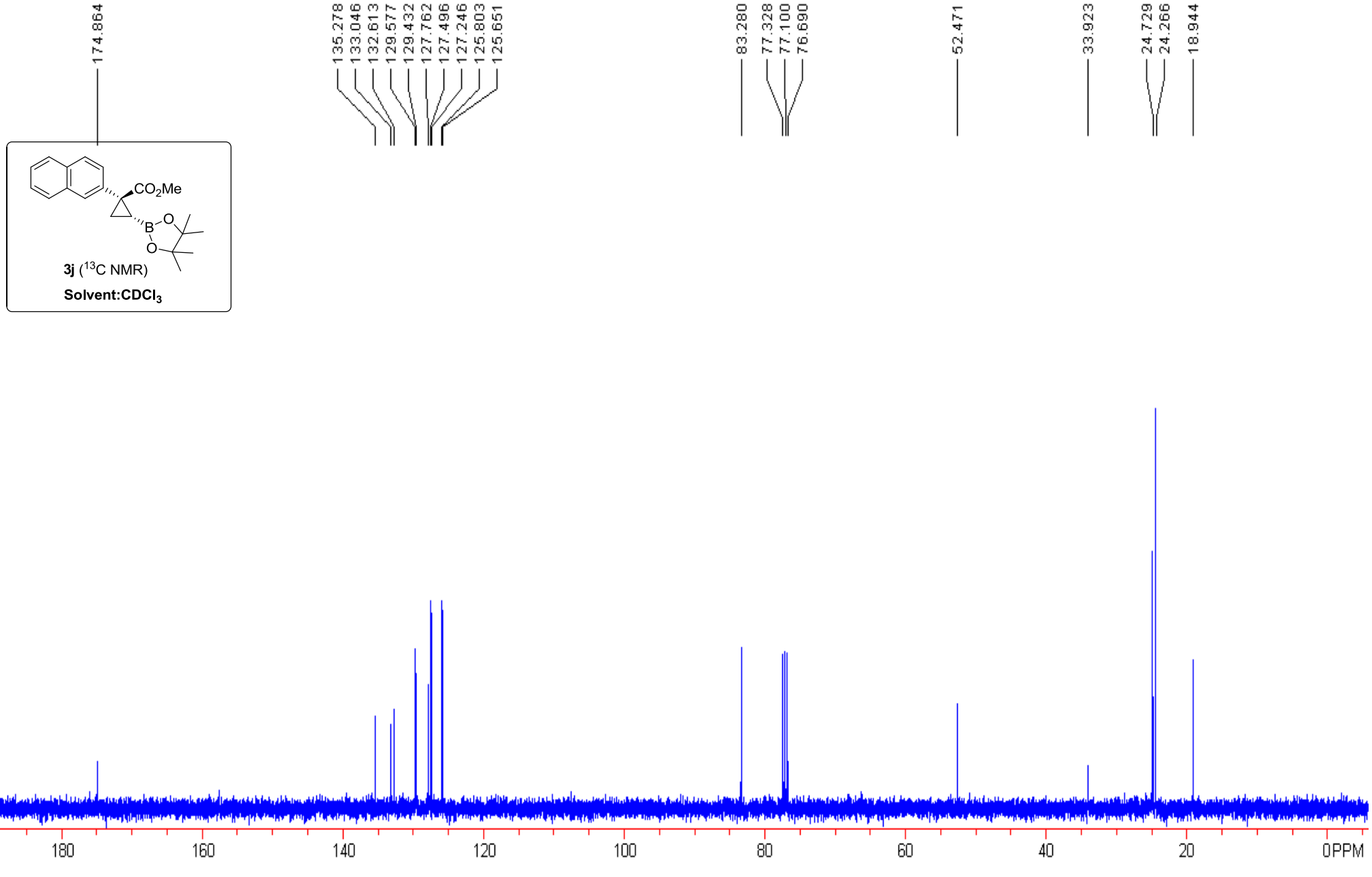
8
6
4
2
0
PPM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129.432
127.762
127.496
127.246
125.803
125.651
83.280
77.328
77.100
76.690
52.471
33.923
24.729
24.266
18.944
CO2Me
B
O
O
3j (13C NMR)
Solvent:CDCl3
180
160
140
120
100
80
60
40
20
0PPM

```
20135681qtb-cf3

 Sample Name:
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 Data Collected on:
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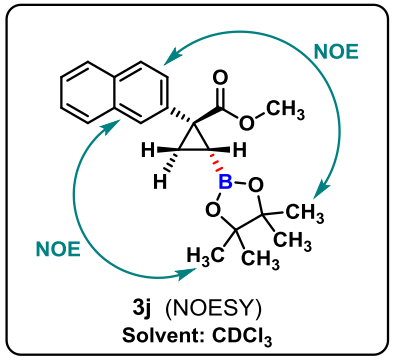
 Archive directory:
   /home/sioc/date
 Sample directory:
   20135681qtb-cf3_20140904_01
 FidFile: NOESY_01

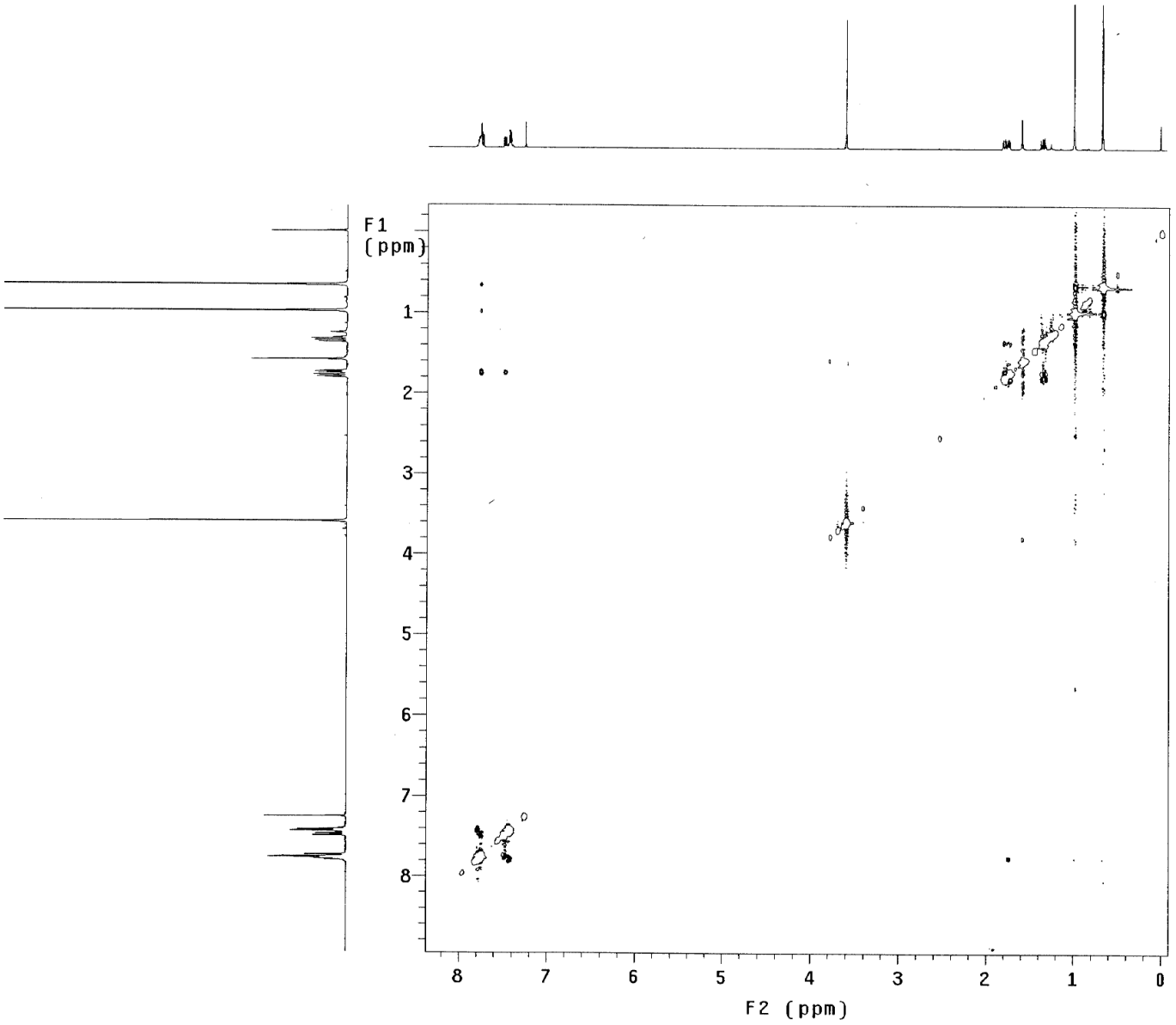
Pulse Sequence: NOESY
Solvent: cdcl3
Data collected on: Sep  4 2014

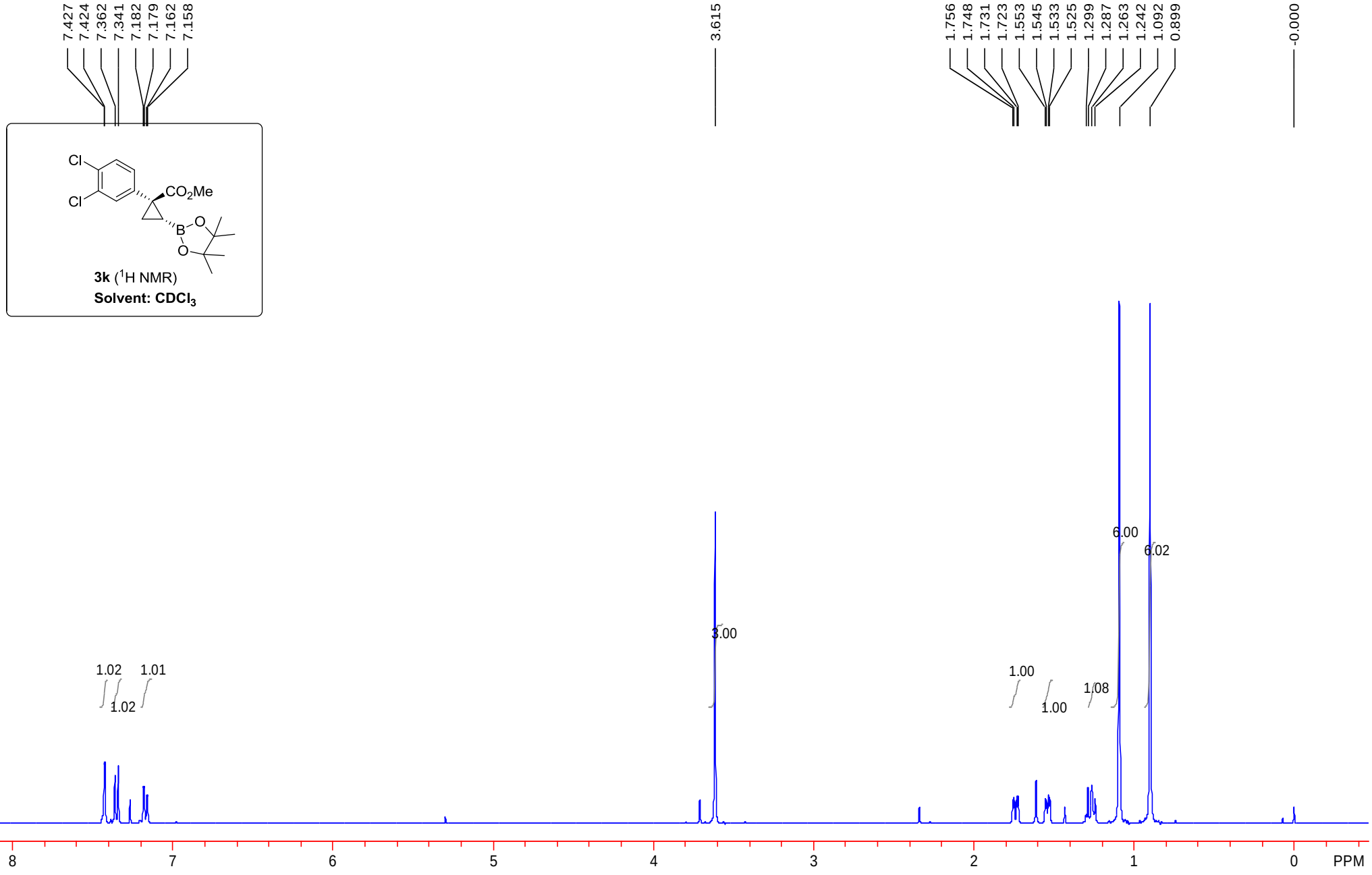
 Temp. 25.0 C / 298.1 K
Operator: sioc

 Relax. delay 1.000 sec
 Acq. time 0.150 sec
 Width     4921.3 Hz
 2D Width 4921.3 Hz
 8 repetitions
 2 x 256 increments
OBSERVE    H1, 399.6538482 MHz
DATA PROCESSING
 Gauss apodization 0.069 sec
F1 DATA PROCESSING
 Gauss apodization 0.037 sec
FT size 2048 x 2048
Total time 2 hr, 9 min
```



3j (NOESY)
Solvent: $CDCl_3$

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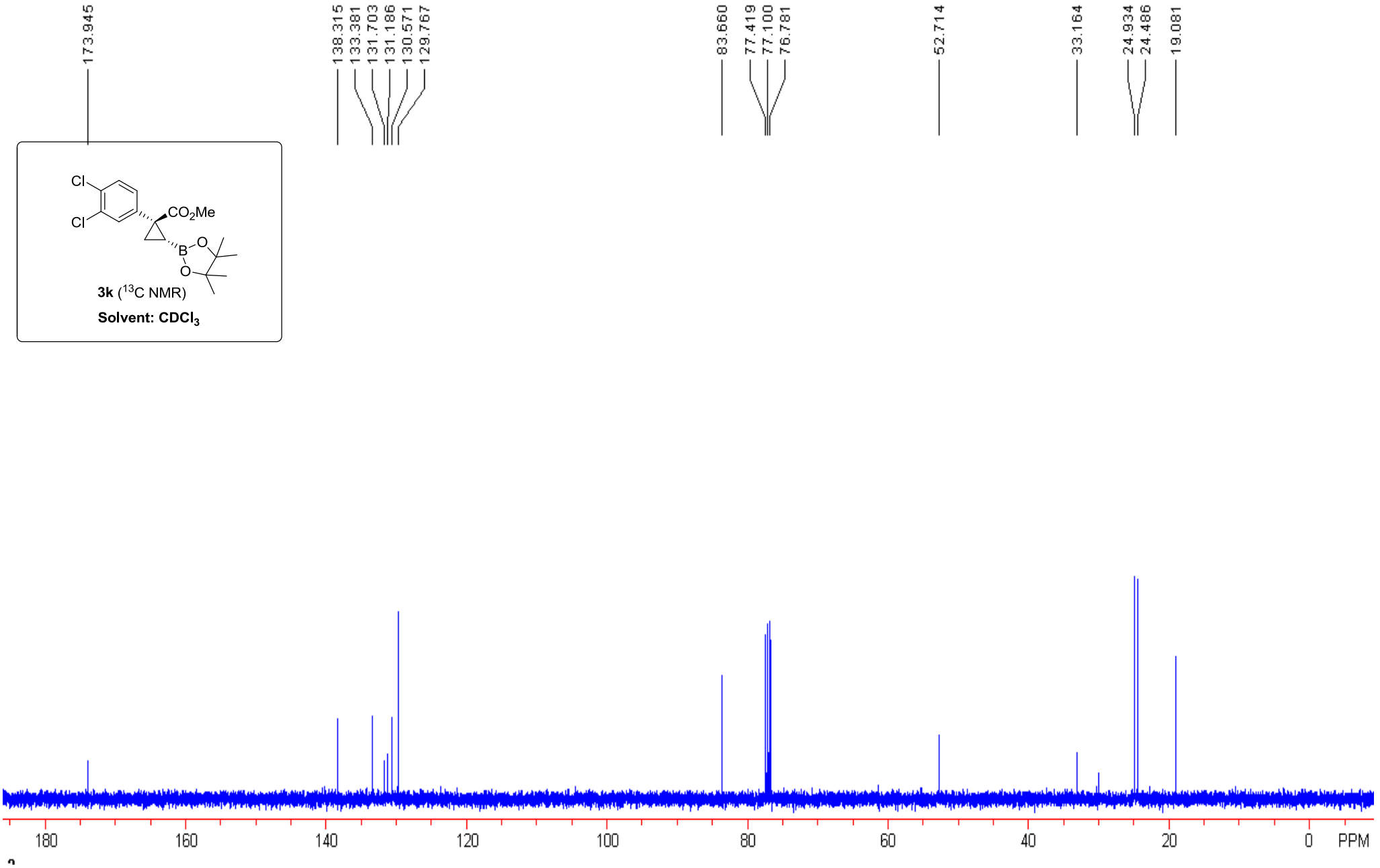
7.424
7.362
7.341
7.182
7.179
7.162
7.158
3.615
1.756
1.748
1.731
1.723
1.553
1.545
1.533
1.525
1.299
1.287
1.263
1.242
1.092
0.899
-0.000
Cl
Cl
CO2Me
B
O
O
3k (1H NMR)
Solvent: CDCl3
1.02
1.01
1.02
3.00
1.00
1.00
1.08
6.00
6.02
8
7
6
5
4
3
2
1
0
PPM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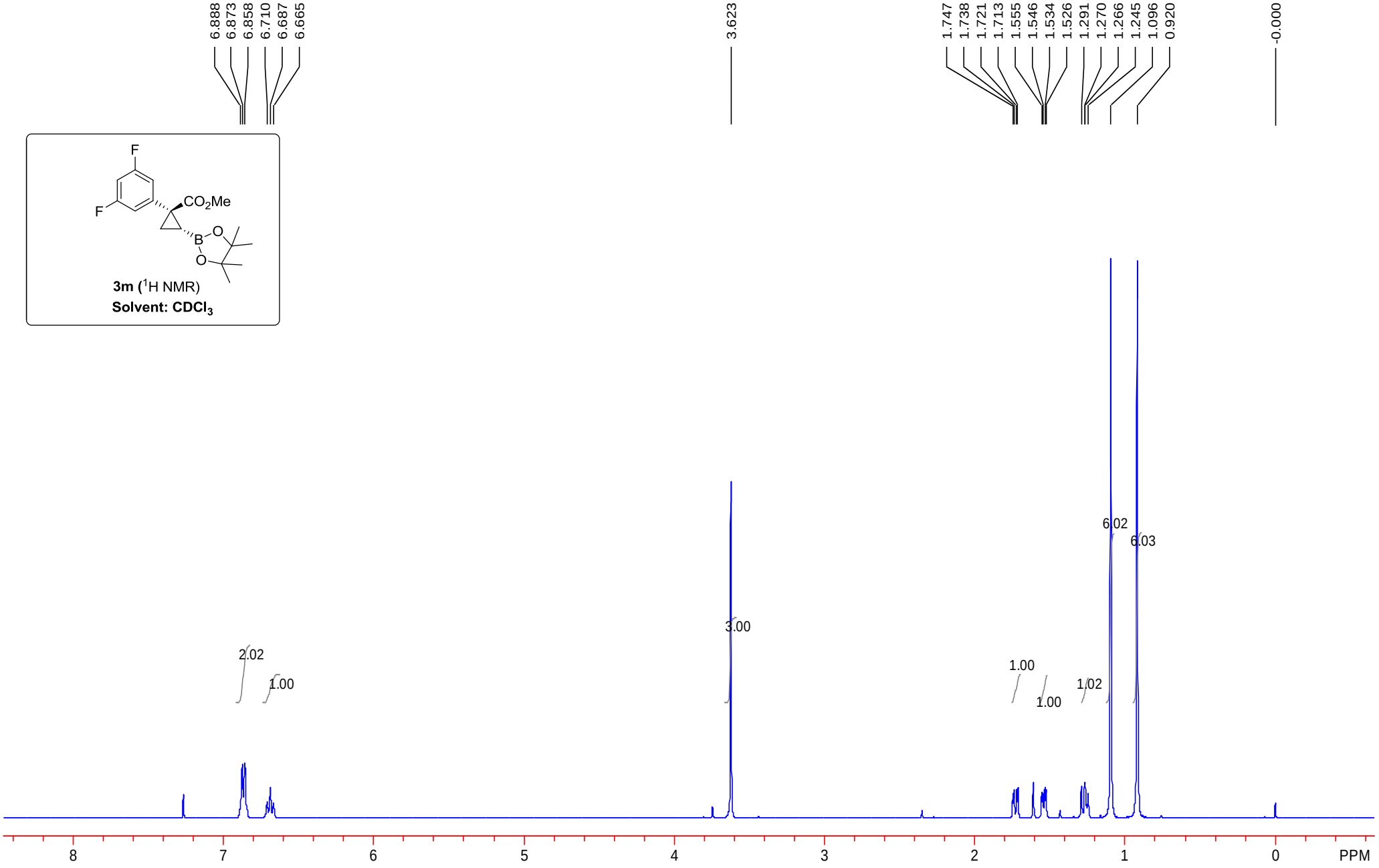
138.315
133.381
131.703
131.186
130.571
129.767
83.660
77.419
77.100
76.781
52.714
33.164
24.934
24.486
19.081
Cl
Cl
CO2Me
B
O
O
3k (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
0
PPM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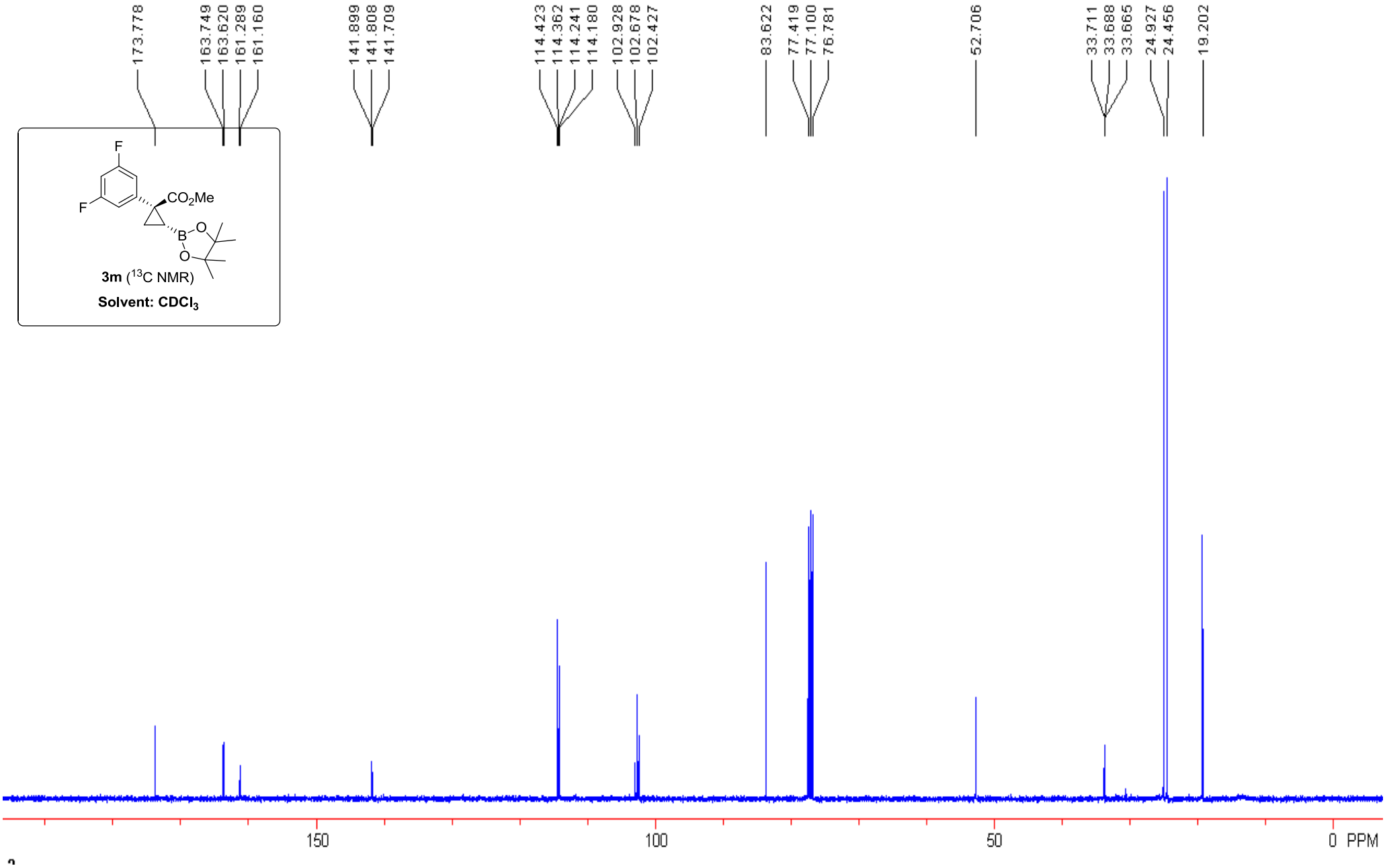
6.873
6.858
6.710
6.687
6.665
3.623
1.747
1.738
1.721
1.713
1.555
1.546
1.534
1.526
1.291
1.270
1.266
1.245
1.096
0.920
-0.000
F
F
CO2Me
B
O
O
3m (1H NMR)
Solvent: CDCl3
2.02
1.00
3.00
1.00
1.00
1.02
6.02
6.03
8
7
6
5
4
3
2
1
0
PPM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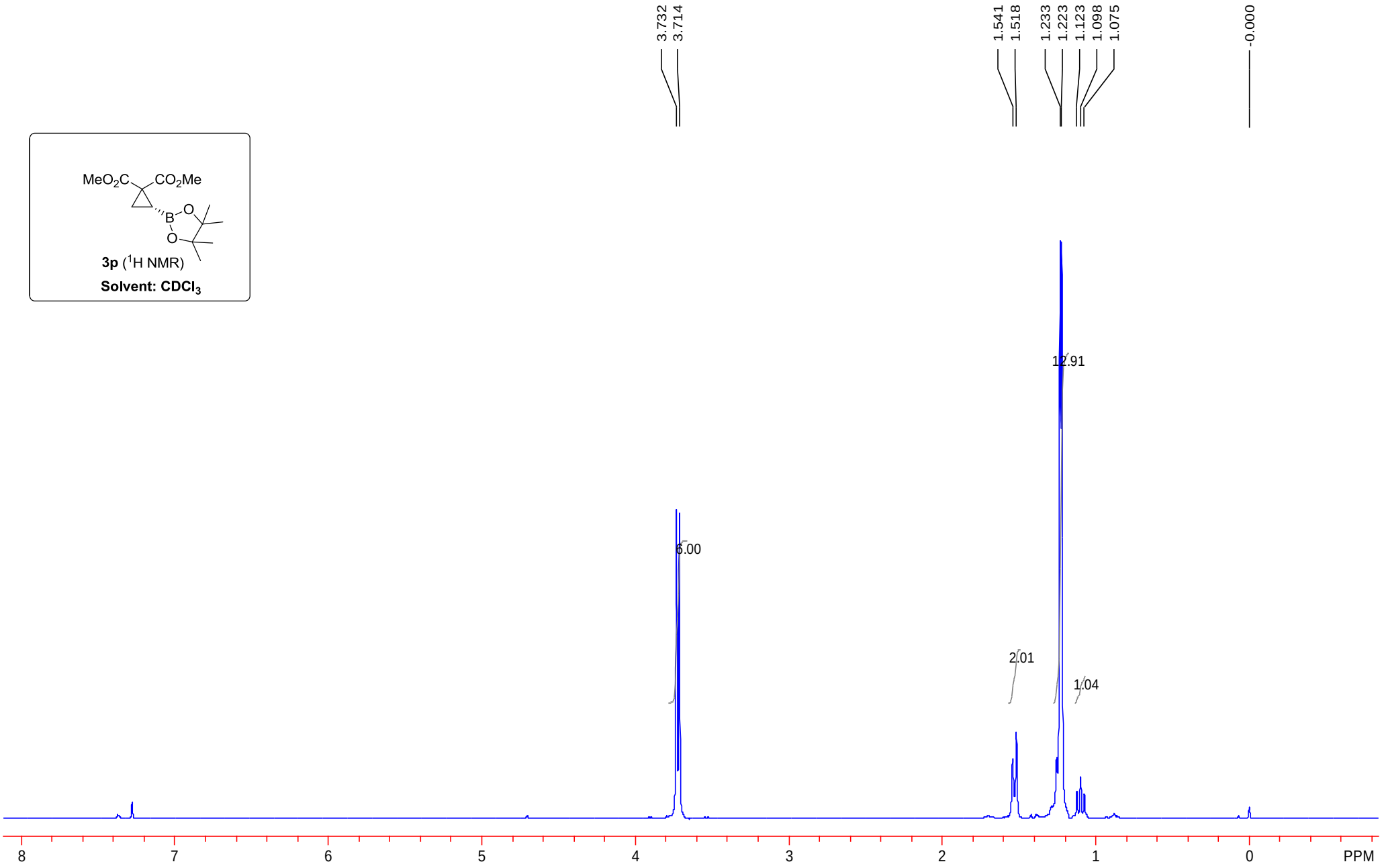
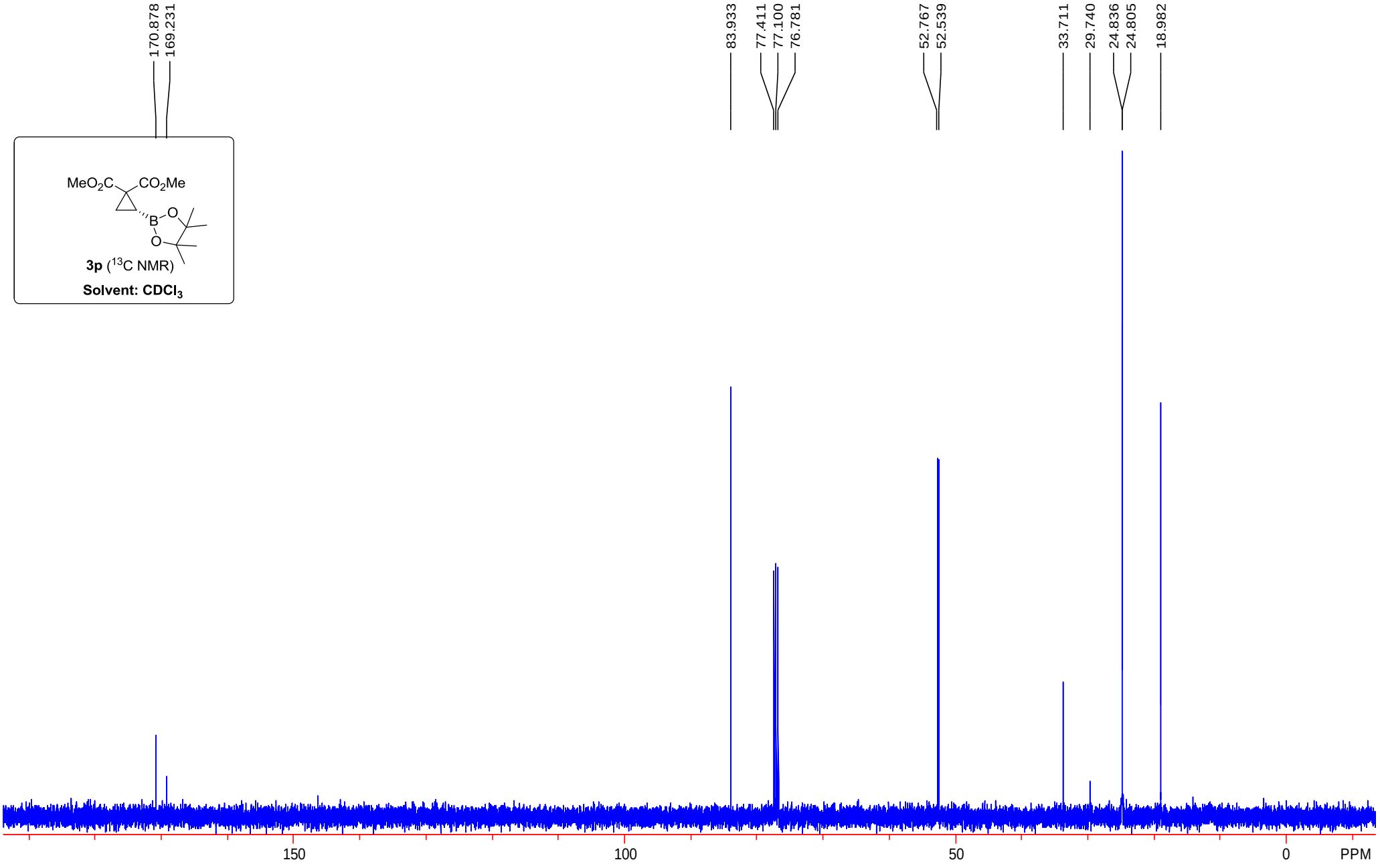
163.749
163.620
161.289
161.160
141.899
141.808
141.709
114.423
114.362
114.241
114.180
102.928
102.678
102.427
83.622
77.419
77.100
76.781
52.706
33.711
33.688
33.665
24.927
24.456
19.202
F
F
CO2Me
B
O
O
3m (13C NMR)
Solvent: CDCl3
150
100
50
0 PPM


3.732
3.714
1.541
1.518
1.233
1.223
1.123
1.098
1.075
-0.000
MeO2C
CO2Me
B
O
O
3p (1H NMR)
Solvent: CDCl3
12.91
6.00
2.01
1.04
8
7
6
5
4
3
2
1
0
PPM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77.411
77.100
76.781
52.767
52.539
33.711
29.740
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24.805
18.982
MeO2C
CO2Me
B
O
O
3p (13C NMR)
Solvent: CDCl3
150
100
50
0
PPM

```
2012442tb06-55

 Sample Name:
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 Data Collected on:
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 Archive directory:
   /home/sioc/date
 Sample directory:
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 FidFile: NOESY_01

Pulse Sequence: NOESY
Solvent: cdcl3
Data collected on: May 16 2014

 Temp. 25.0 C / 298.1 K
Operator: sioc

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 Acq. time 0.150 sec
 Width    5458.5 Hz
 2D Width 5458.5 Hz
 8 repetitions
 2 x 200 increments
OBSERVE   H1, 399.6556605 MHz
DATA PROCESSING
 Gauss apodization 0.069 sec
F1 DATA PROCESSING
 Gauss apodization 0.034 sec
FT size 2048 x 2048
Total time 1 hr, 40 min
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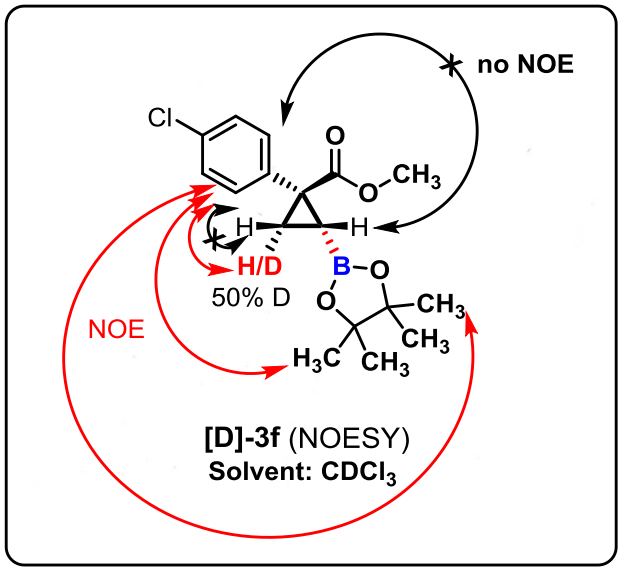

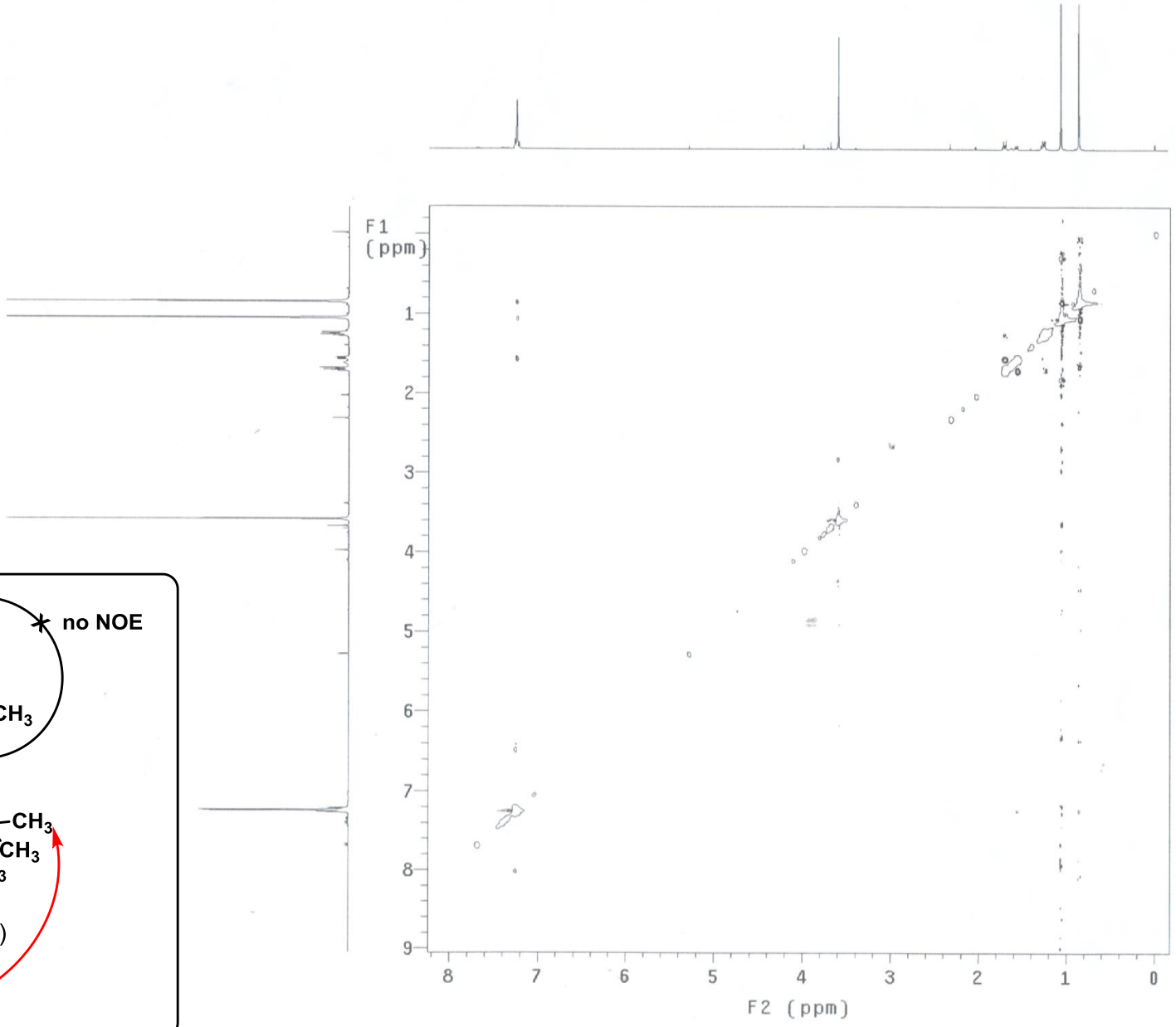

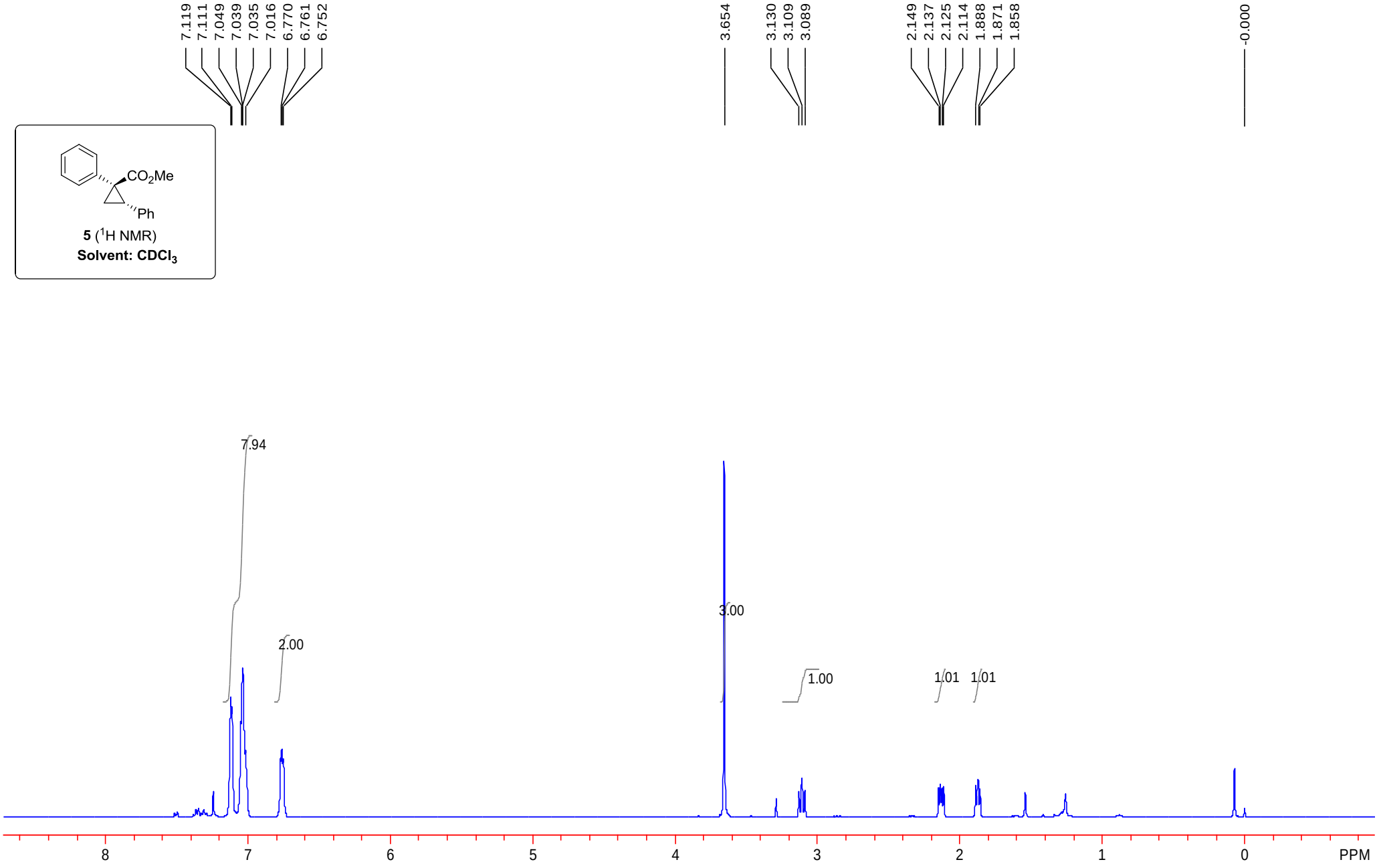
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Ph
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Solvent: CDCl3
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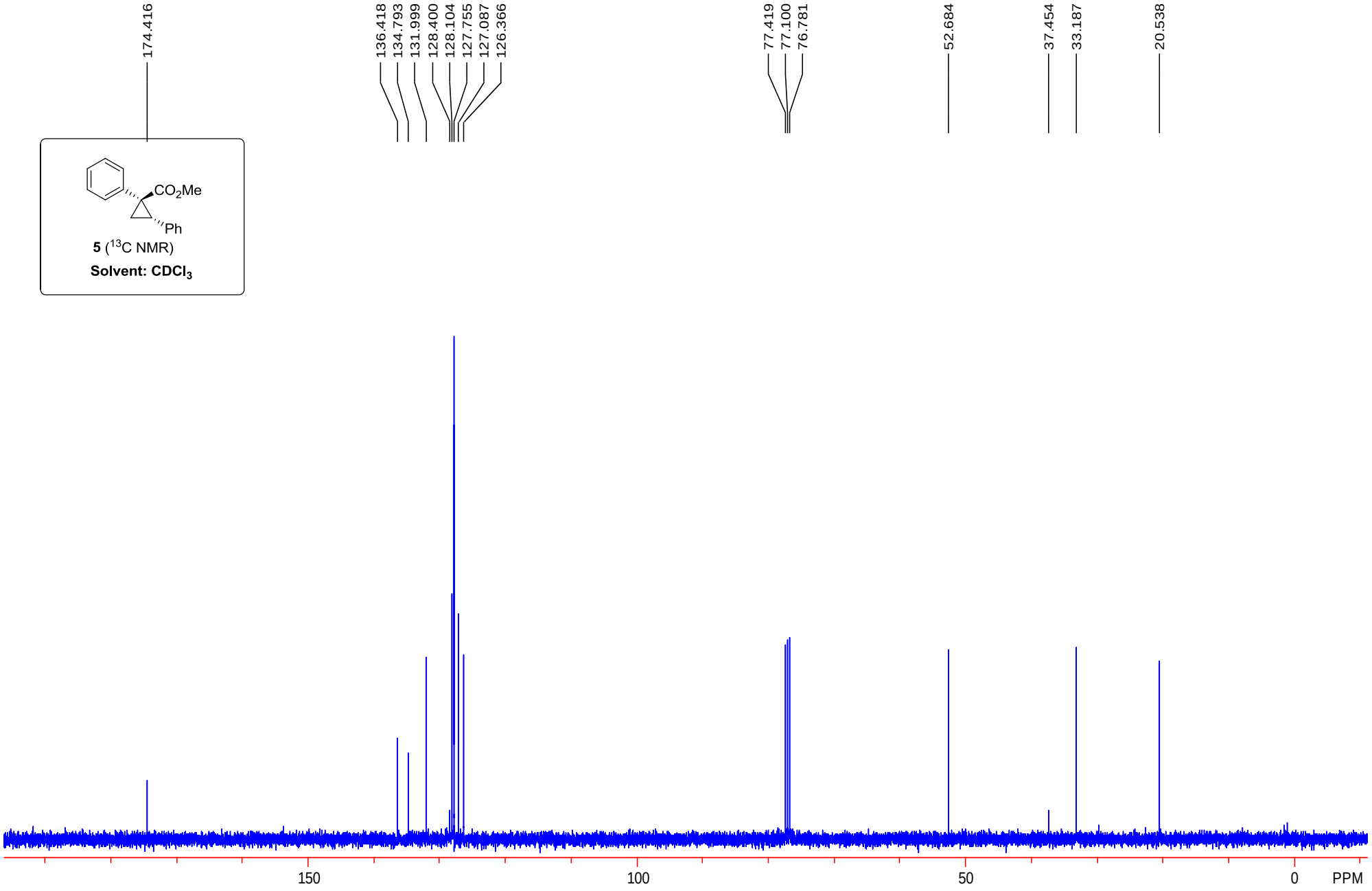
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Ph
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Solvent: CDCl3
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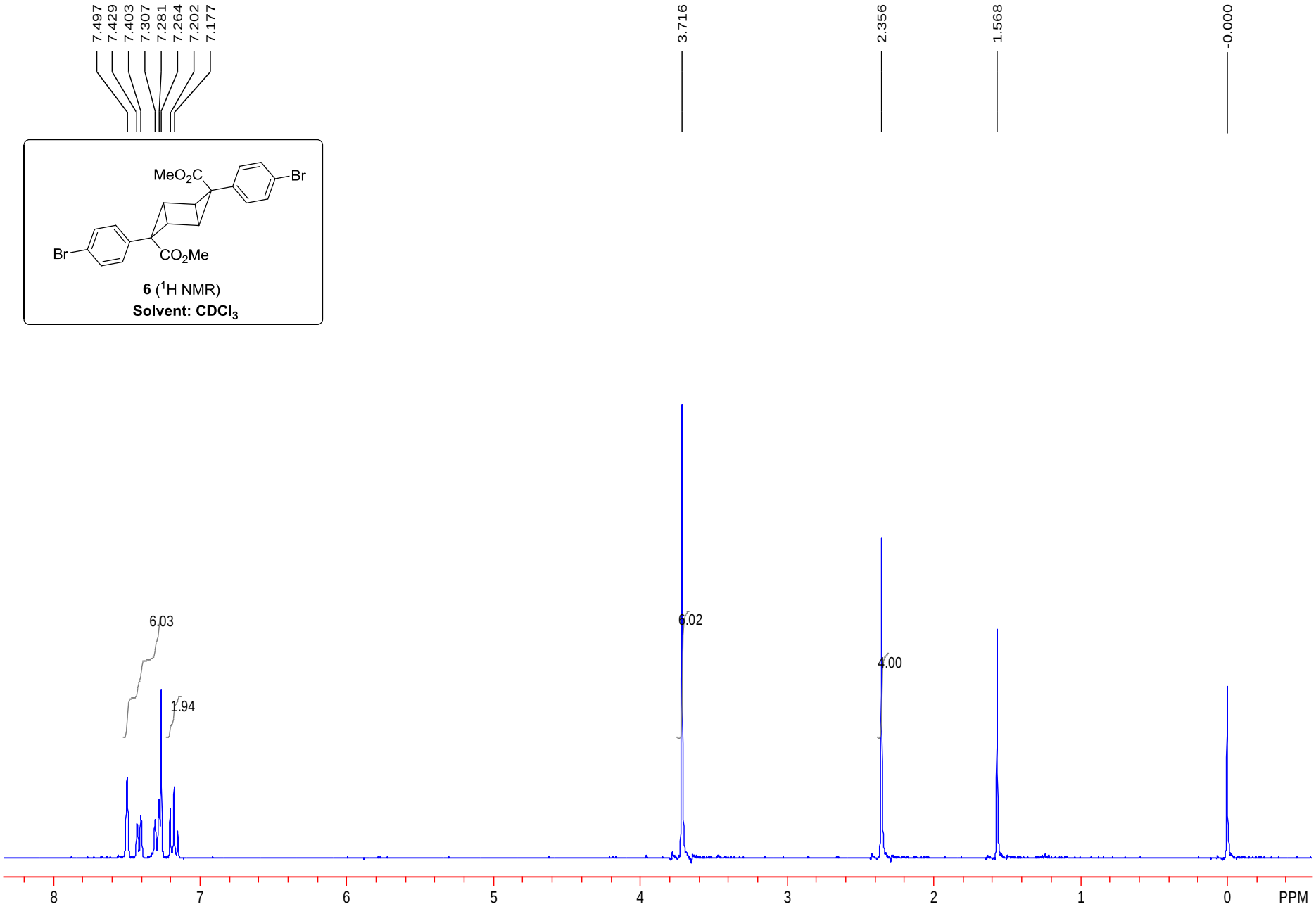
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MeO2C
Br
Br
CO2Me
6 (1H NMR)
Solvent: CDCl3
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6
5
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3
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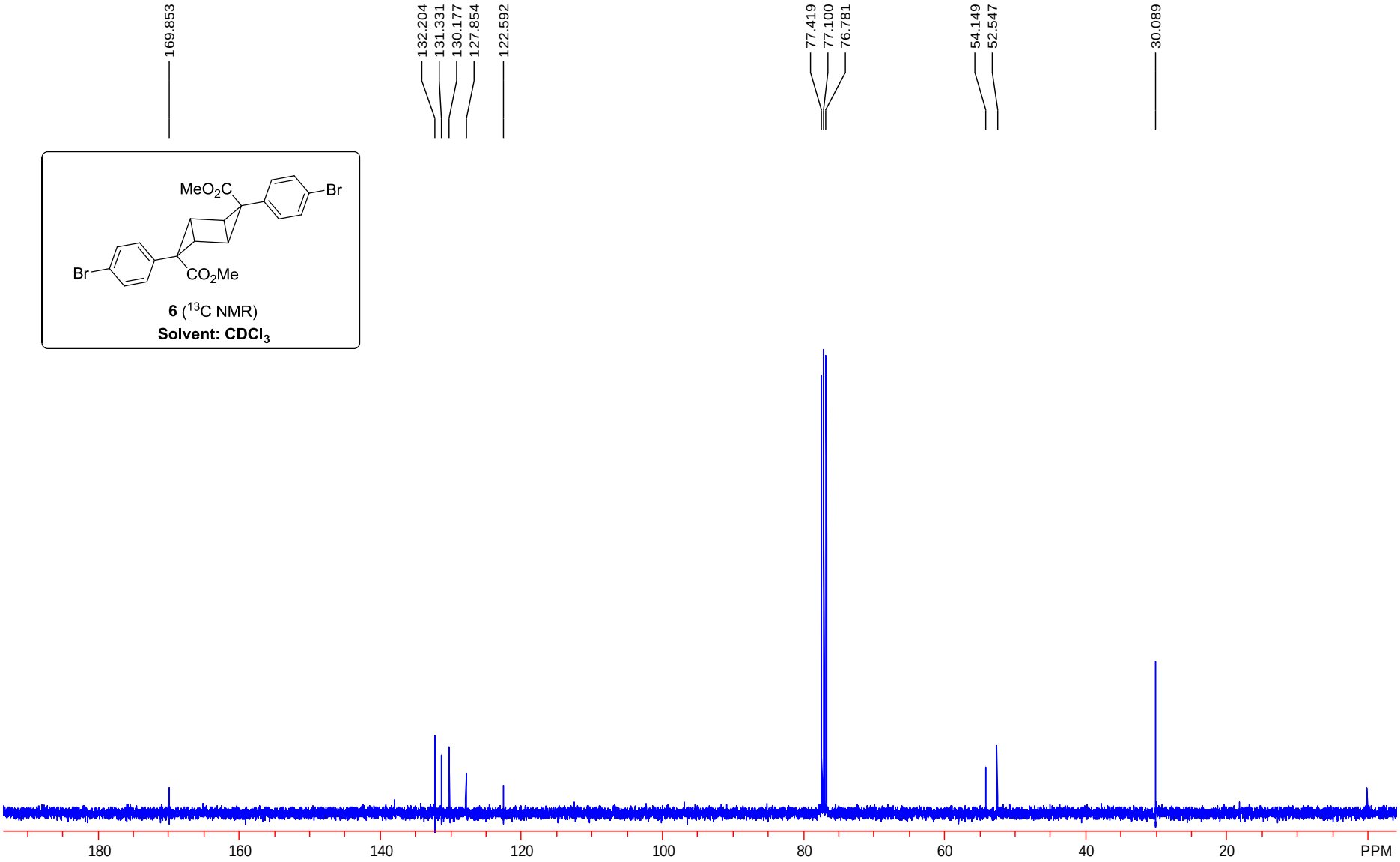
PPM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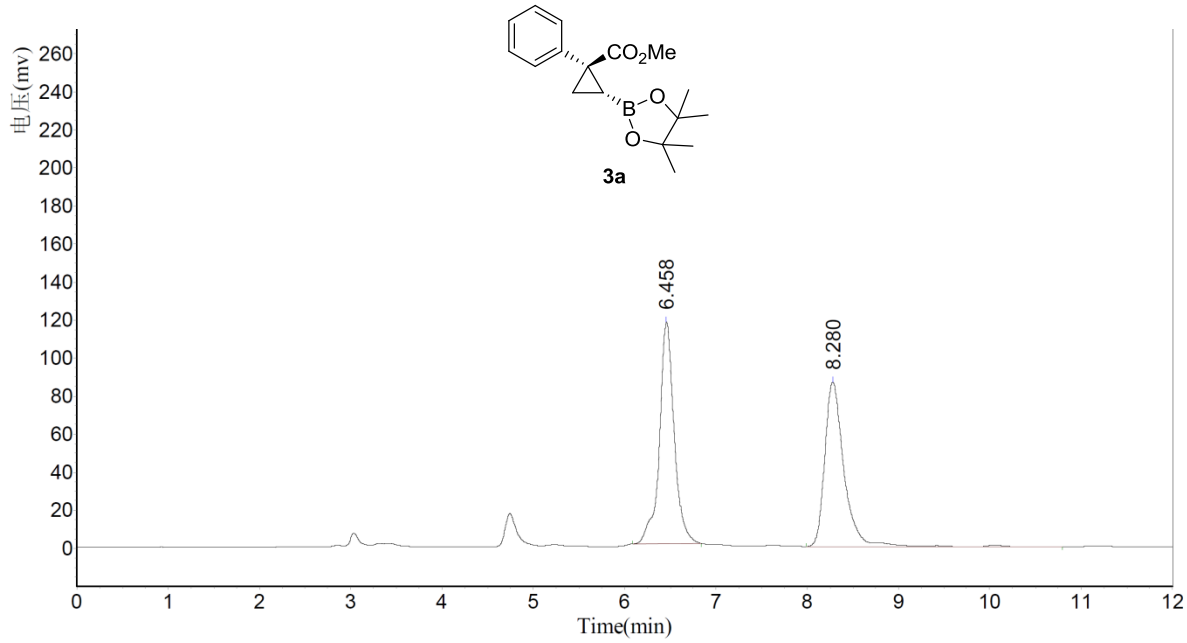
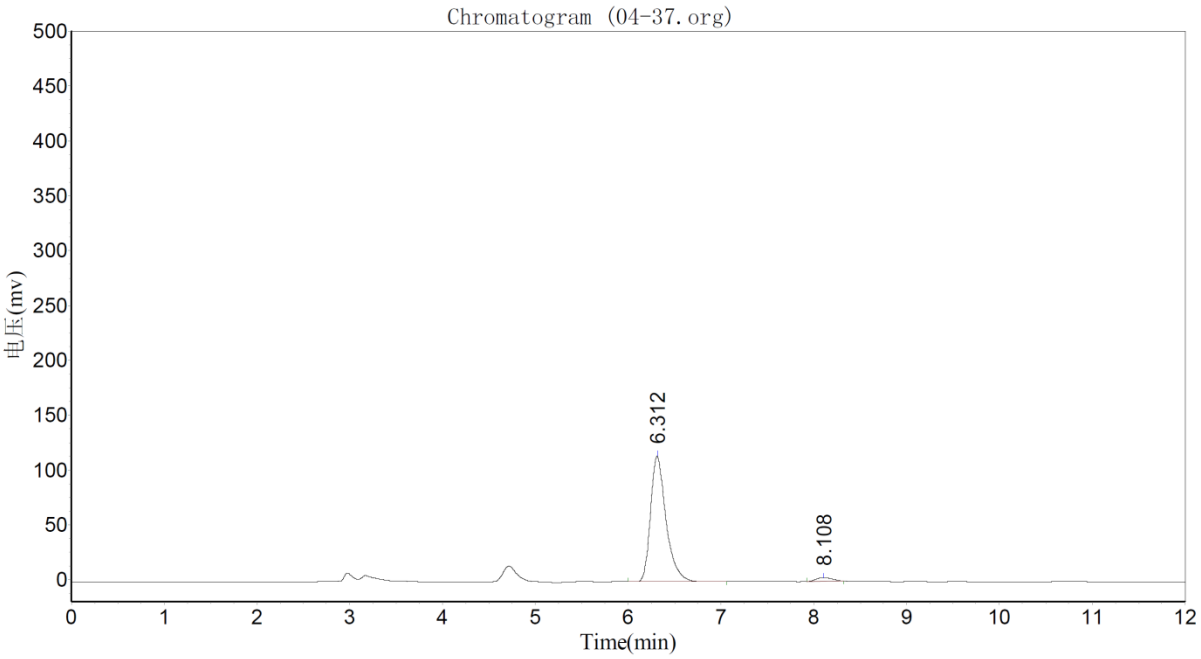
Br
Br
CO2Me
6 (13C NMR)
Solvent: CDCl3
180
160
140
120
100
80
60
40
20
PPM

(1*R*,2*R*)-Methyl 1-phenyl-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropanecarboxylate (3a)



Results

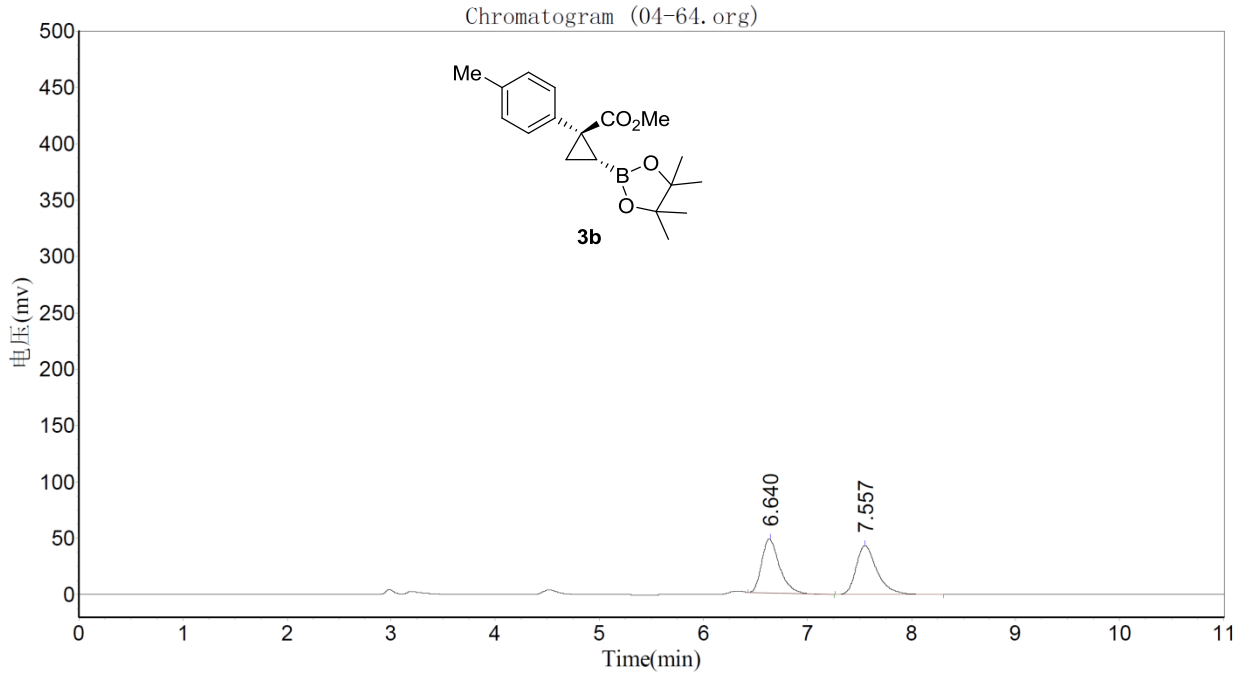
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		6.458	116572.070	1309002.125	50.6992
2		8.280	86462.656	1272896.875	49.3008
Total			203034.727	2581899.000	100.0000



Results

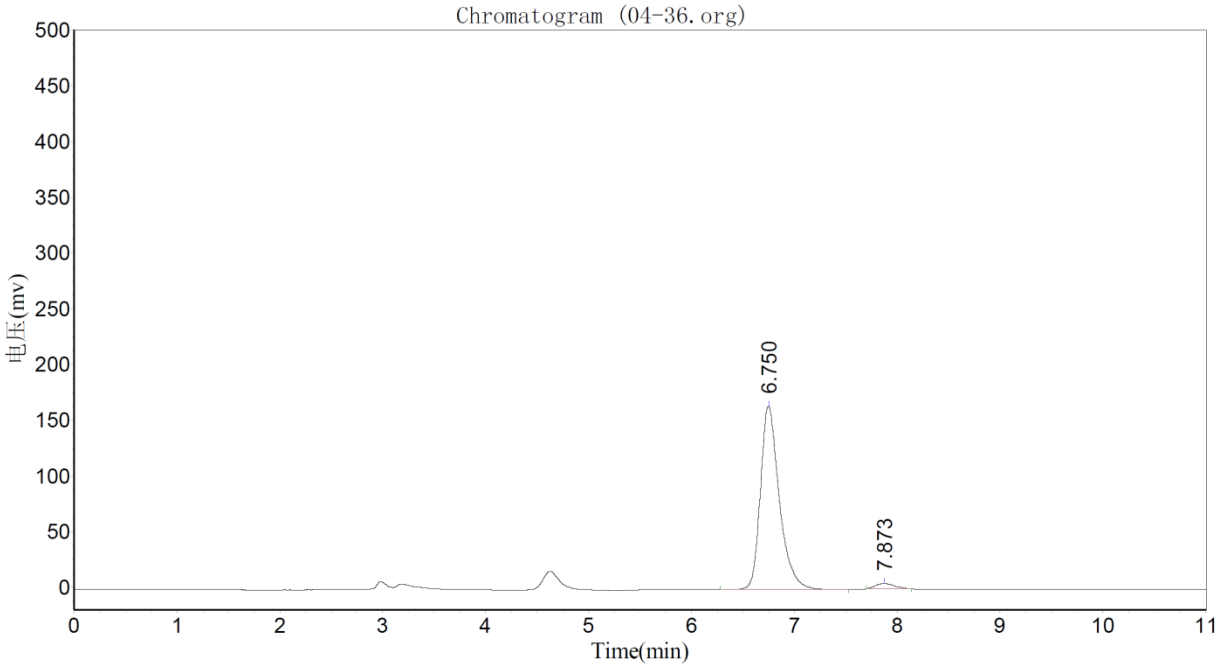
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		6.312	114378.969	1330611.125	97.2773
2		8.108	3001.004	37242.652	2.7227
Total			117379.973	1367853.777	100.0000

(1*R*,2*R*)-Methyl 2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-1-p-tolylcyclopropanecarboxylate (3b)



Results

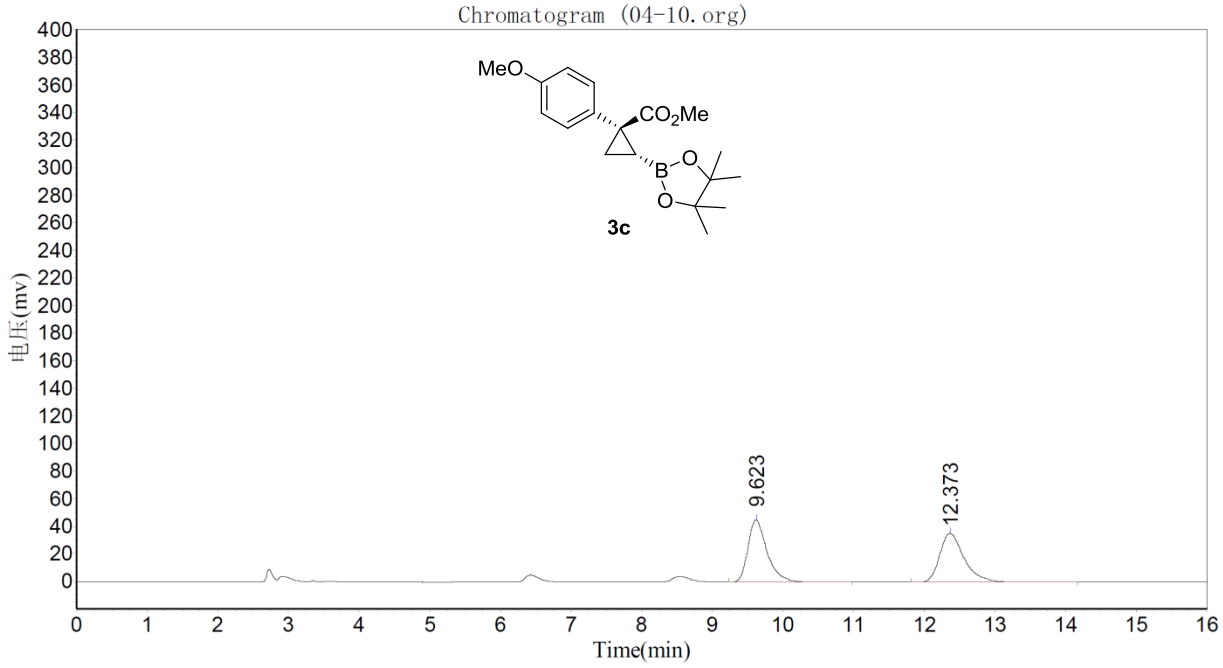
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		6.640	49345.270	615000.000	50.3441
2		7.557	43474.520	606592.313	49.6559
Total			92819.789	1221592.313	100.0000



Results

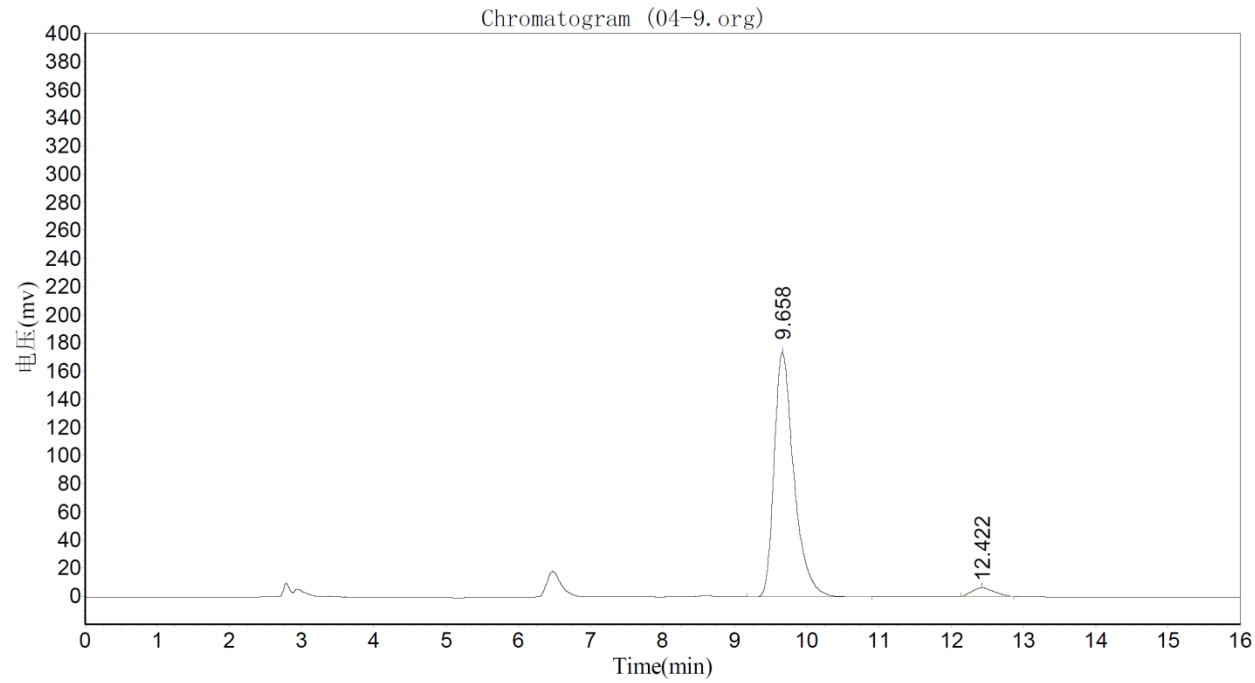
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		6.750	164177.375	2098171.500	97.1788
2		7.873	4890.031	60911.500	2.8212
Total			169067.406	2159083.000	100.0000

(1*R*,2*R*)-Methyl 1-(4-methoxyphenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3c)



Results

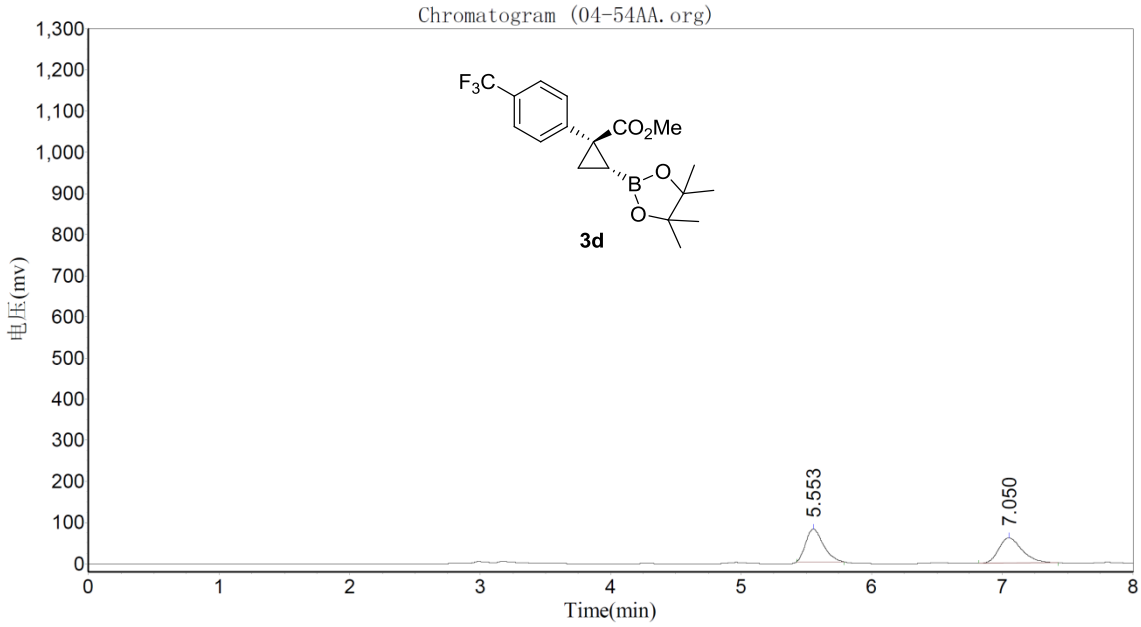
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		9.623	44988.973	844058.375	49.9452
2		12.373	35401.379	845910.875	50.0548
Total			80390.352	1689969.250	100.0000



Results

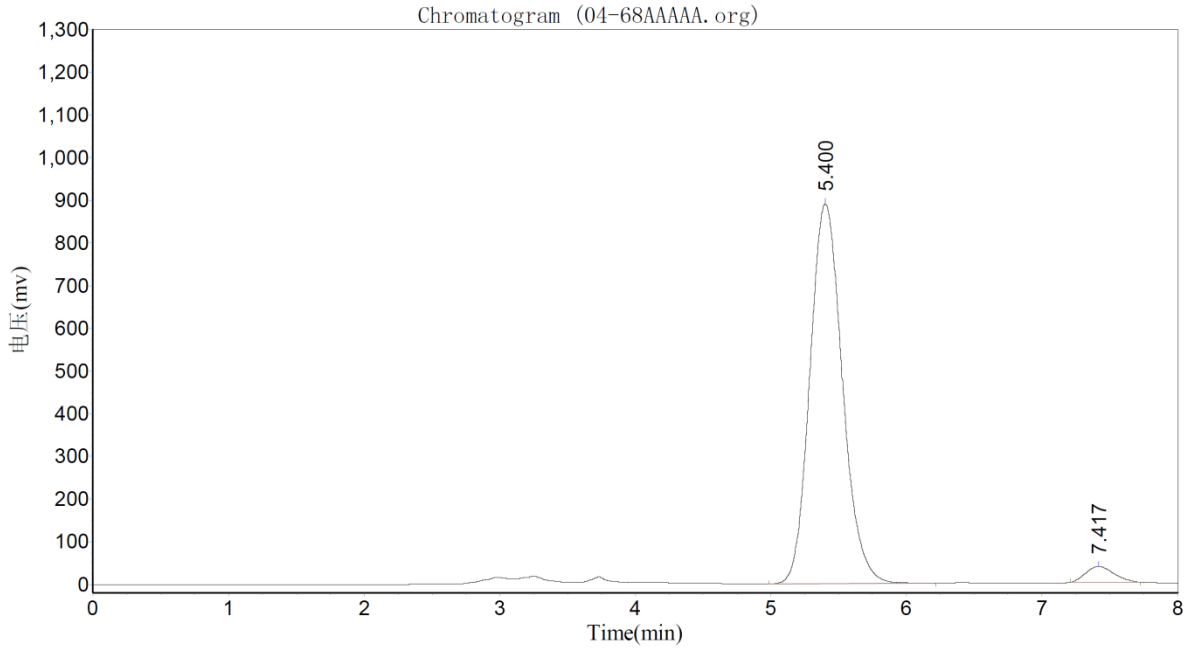
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		9.658	173736.938	3306299.250	96.4440
2		12.422	5879.554	121906.297	3.5560
Total			179616.492	3428205.547	100.0000

(1*R*,2*R*)-Methyl 2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)-1-(4-(trifluoromethyl)phenyl)cyclopropanecarboxylate (3d)



Results

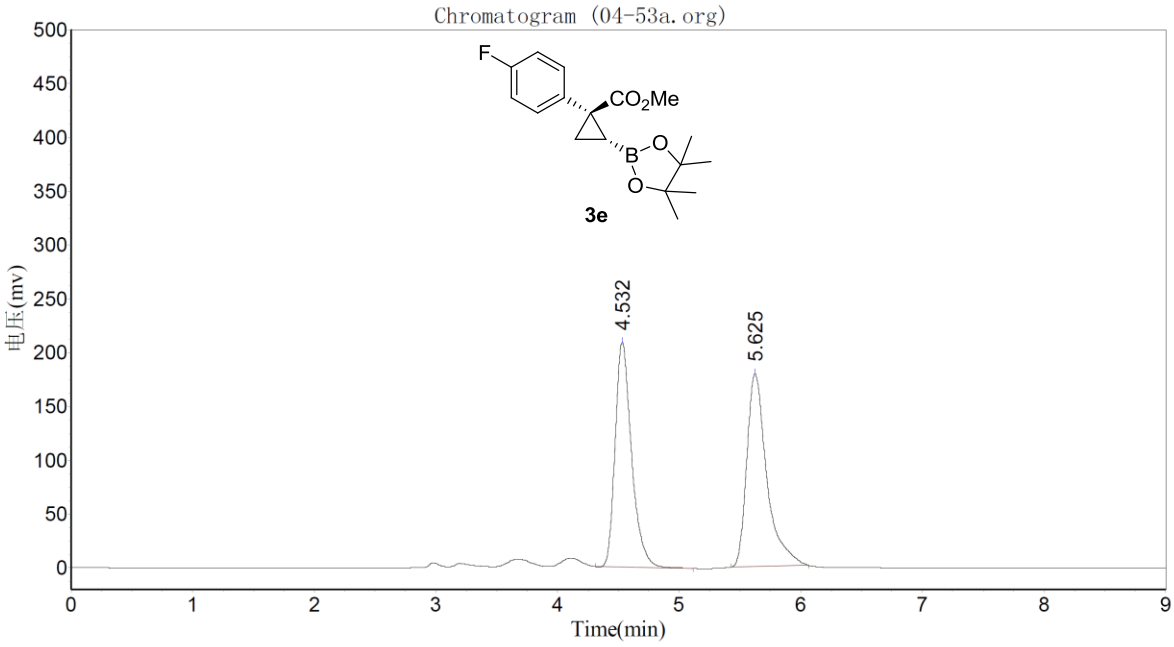
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.553	79736.586	739423.063	49.2303
2		7.050	61355.023	762544.938	50.7697
Total			141091.609	1501968.000	100.0000



Results

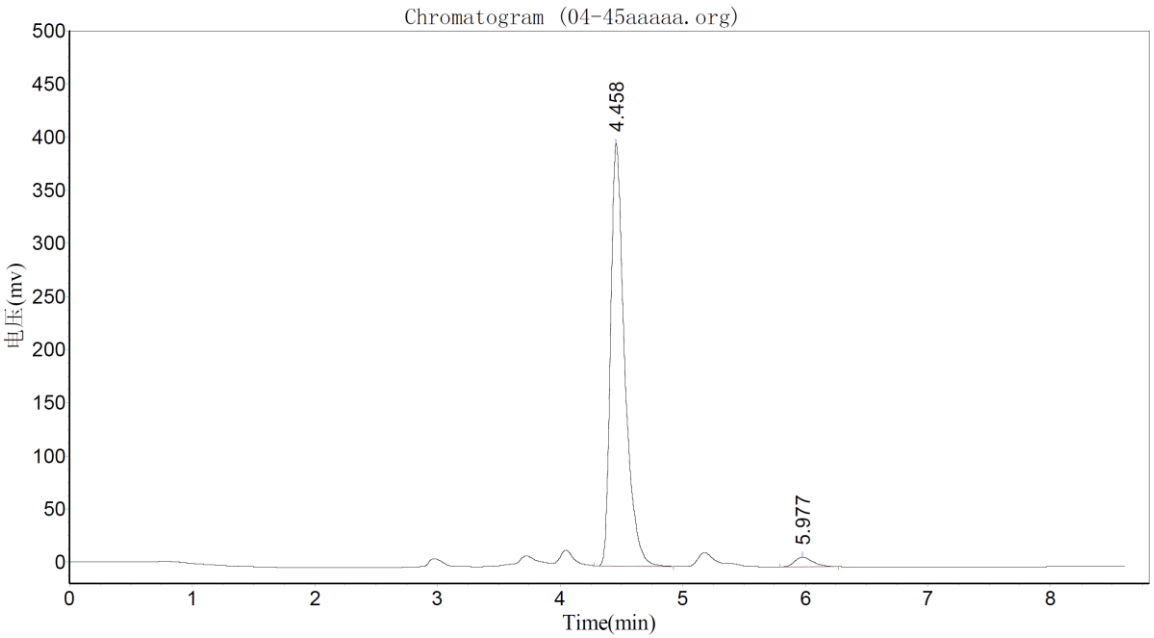
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.400	889776.500	14841171.000	96.5931
2		7.417	36571.199	523453.000	3.4069
Total			926347.699	15364624.000	100.0000

(1*R*,2*R*)-Methyl 1-(4-fluorophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3e)



Results

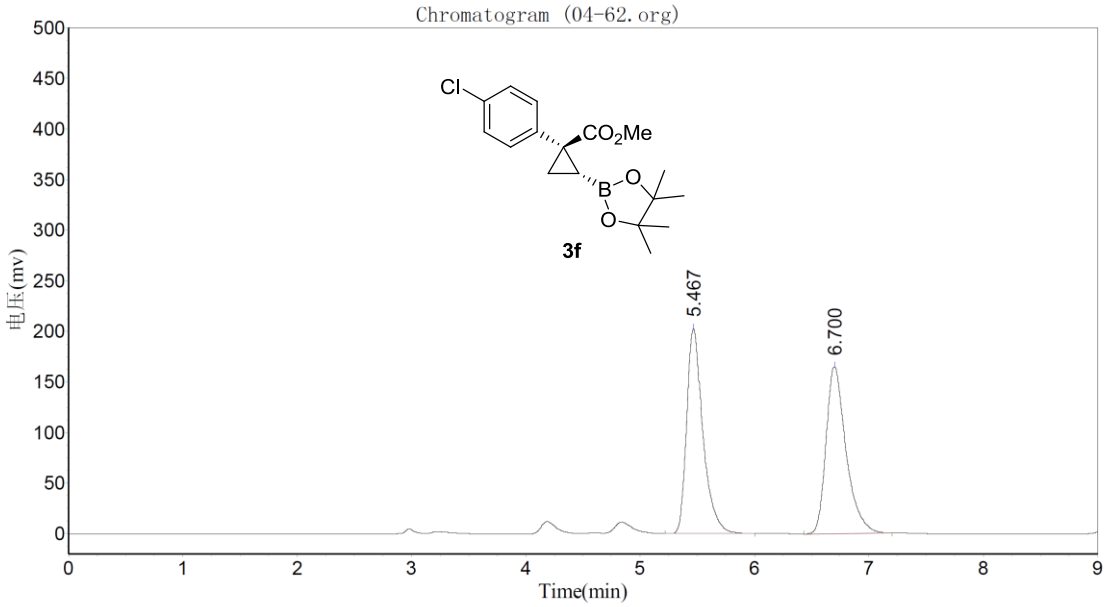
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		4.532	208747.313	1967327.375	48.9368
2		5.625	179538.953	2052813.125	51.0632
Total			388286.266	4020140.500	100.0000



Results

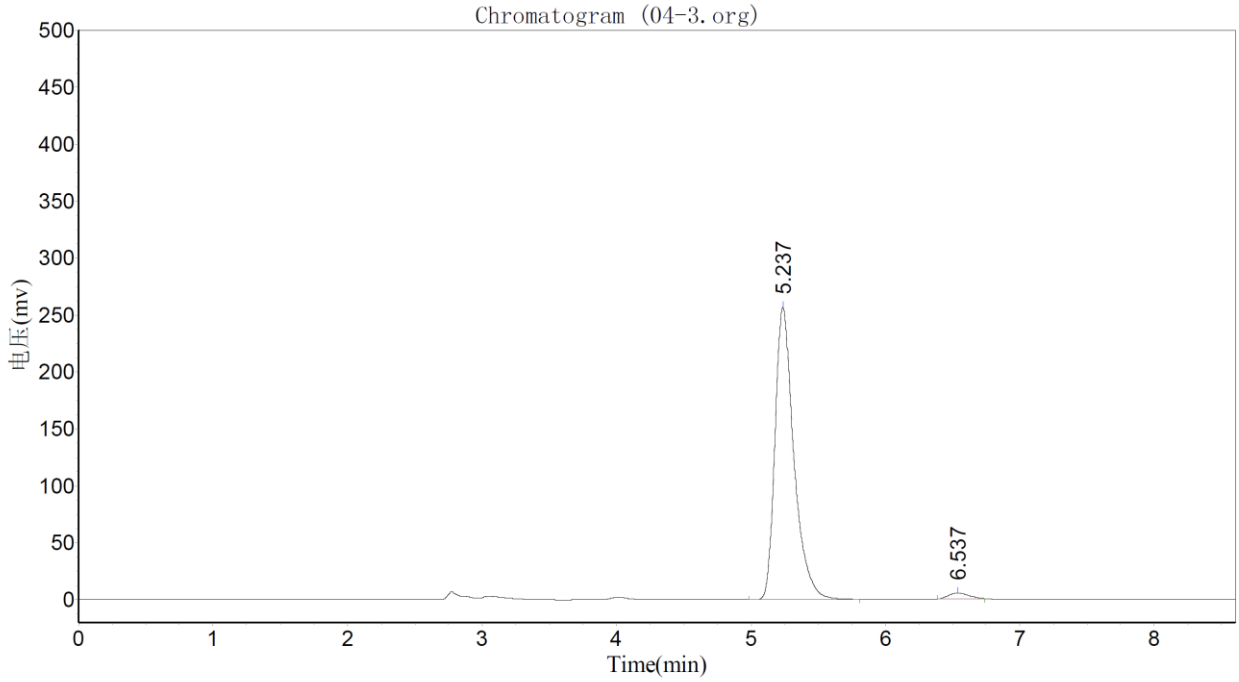
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		4.458	397386.375	3157529.000	97.0913
2		5.977	9145.035	94593.945	2.9087
Total			406531.410	3252122.945	100.0000

(1*R*,2*R*)-Methyl 1-(4-chlorophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3f)



Results

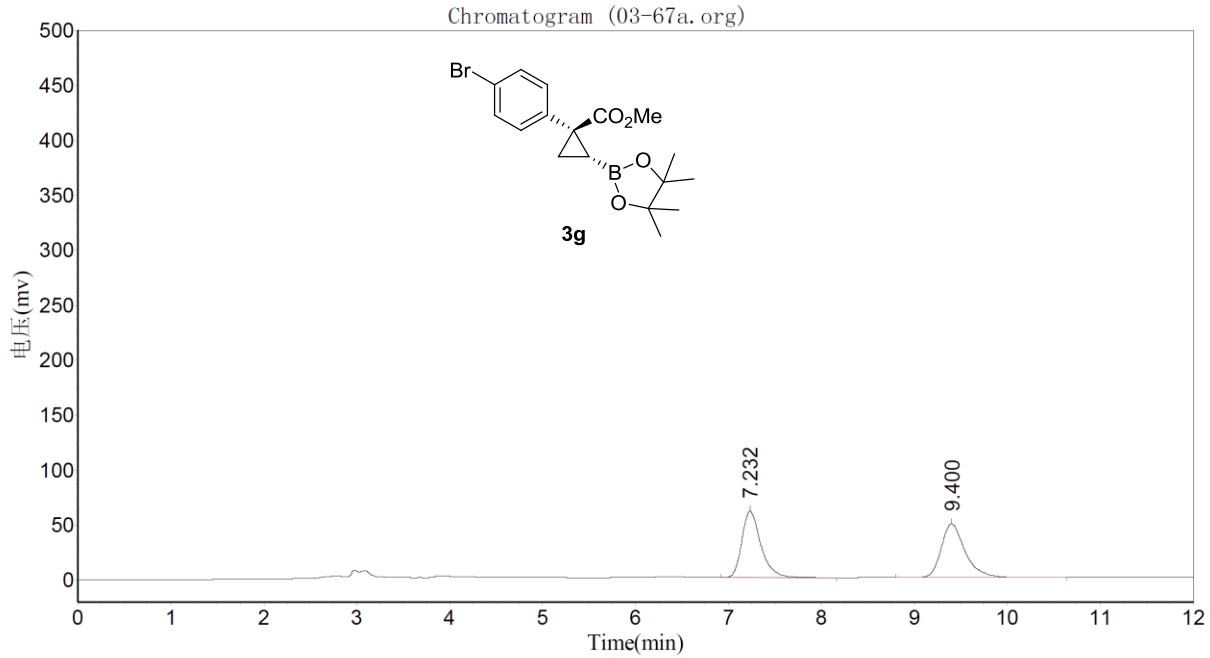
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.467	202831.969	2006685.750	49.9623
2		6.700	165151.688	2009715.125	50.0377
Total			367983.656	4016400.875	100.0000



Results

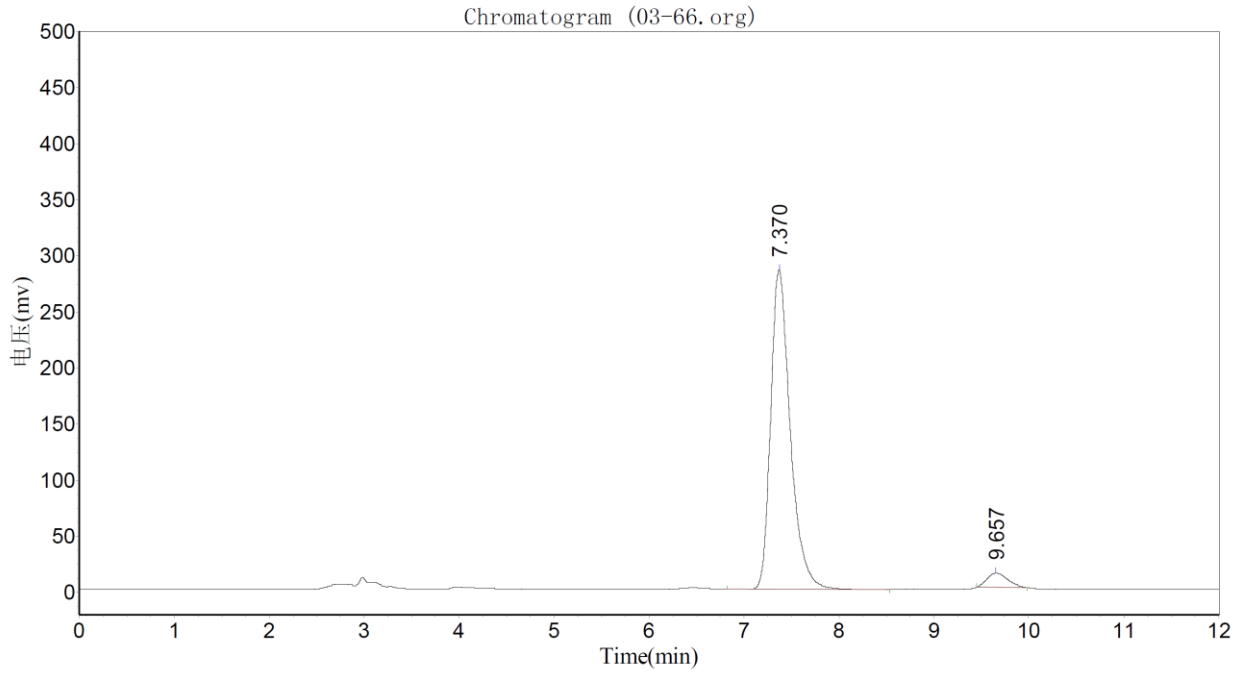
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.237	256793.281	2501006.500	97.8061
2		6.537	5470.327	56100.047	2.1939
Total			262263.608	2557106.547	100.0000

(1*R*,2*R*)-Methyl 1-(4-bromophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3g)



Results

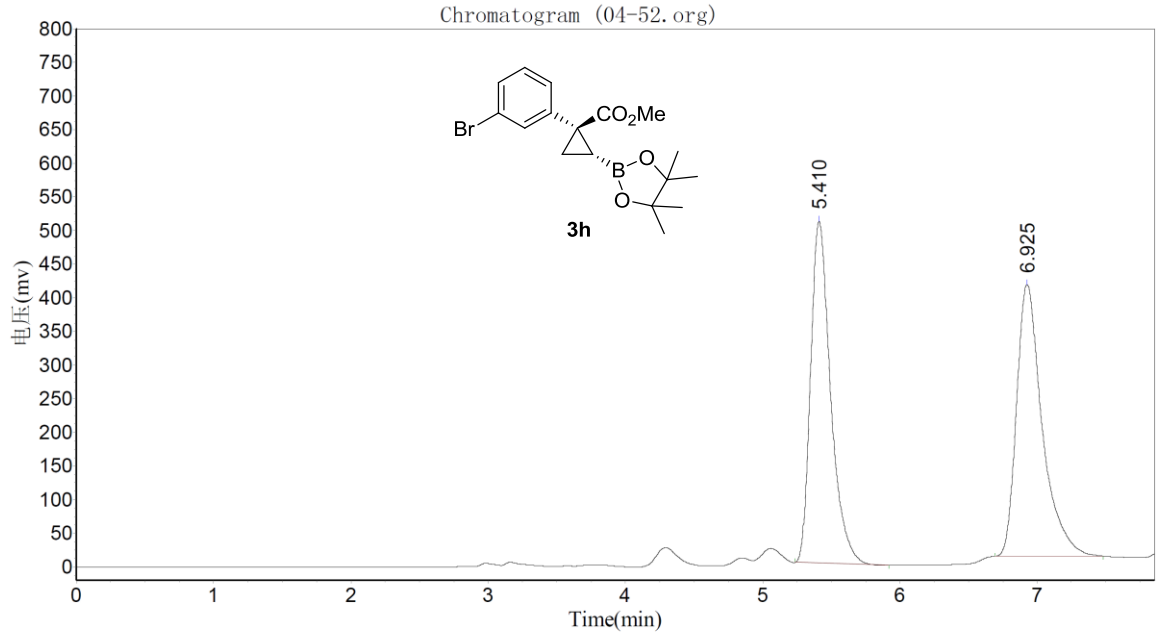
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		7.232	60576.539	866571.813	49.7521
2		9.400	48777.621	875208.688	50.2479
Total			109354.160	1741780.500	100.0000



Results

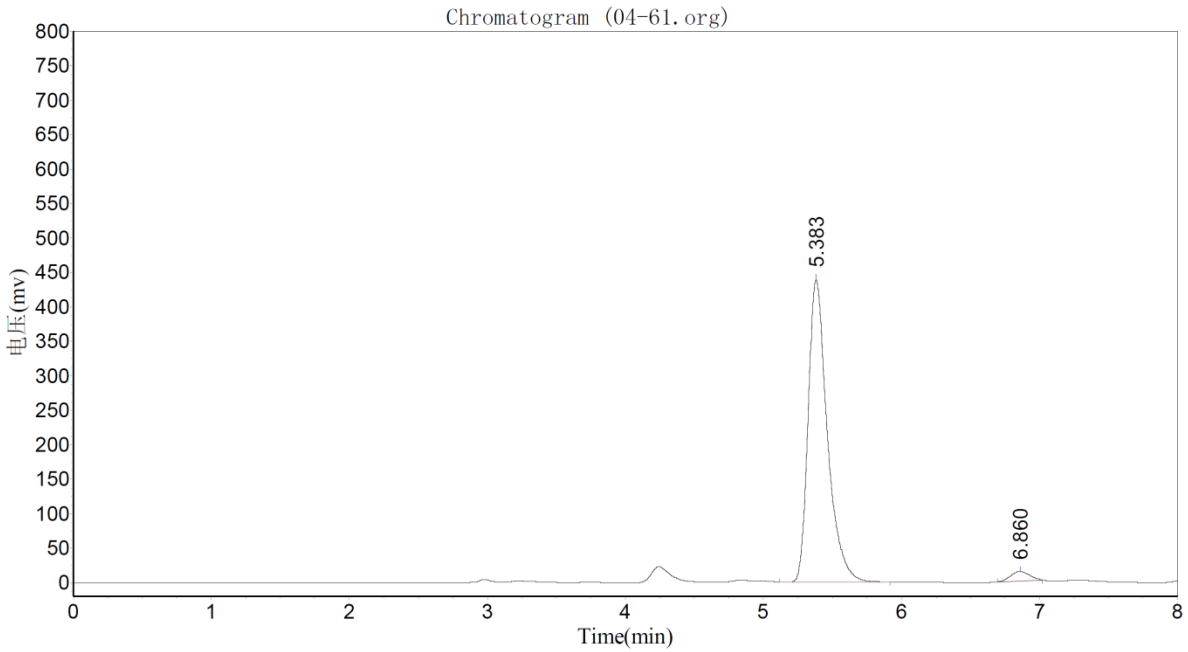
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		7.370	284587.781	4060744.500	95.5031
2		9.657	12635.659	191205.594	4.4969
Total			297223.440	4251950.094	100.0000

(1*R*,2*R*)-Methyl 1-(3-bromophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3h)



Results

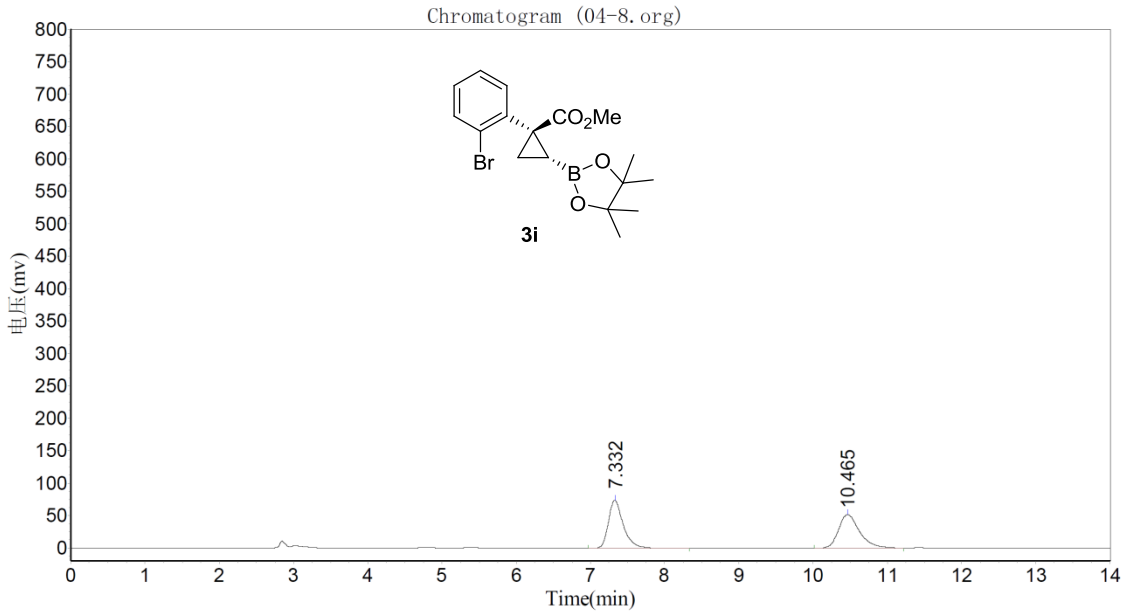
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.410	507967.063	5130262.000	49.4841
2		6.925	404073.844	5237237.000	50.5159
Total			912040.906	10367499.000	100.0000



Results

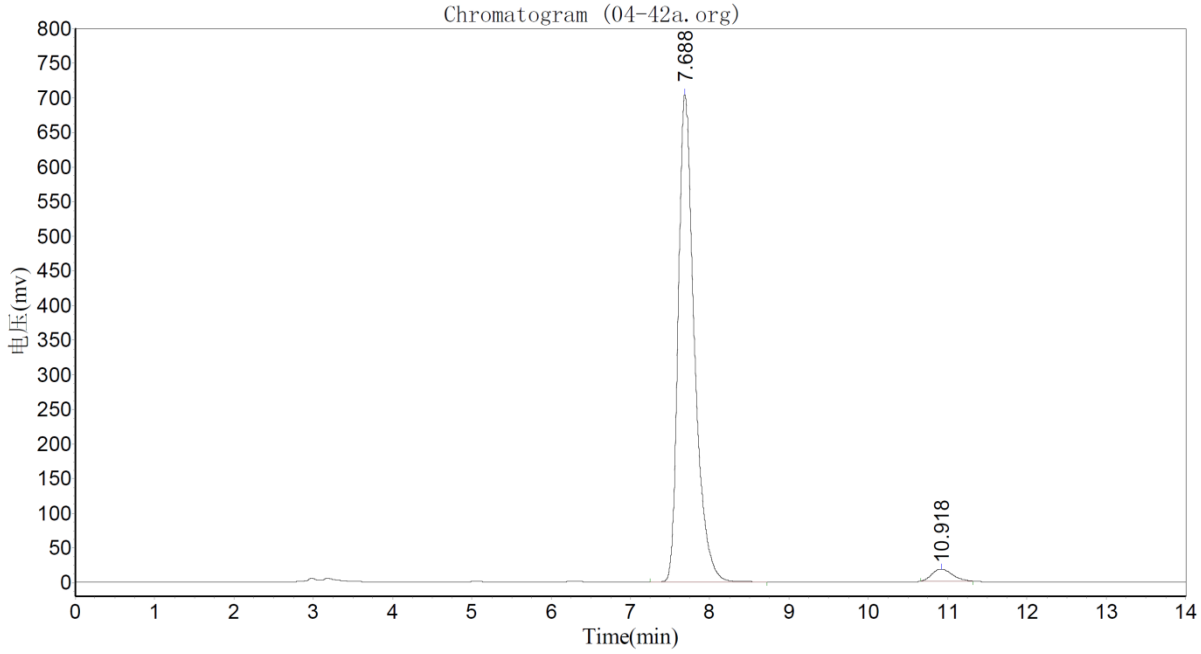
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.383	439026.688	4229278.500	97.0151
2		6.860	13452.745	130121.805	2.9849
Total			452479.433	4359400.305	100.0000

(1*R*,2*R*)-Methyl 1-(2-bromophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3i)



Results

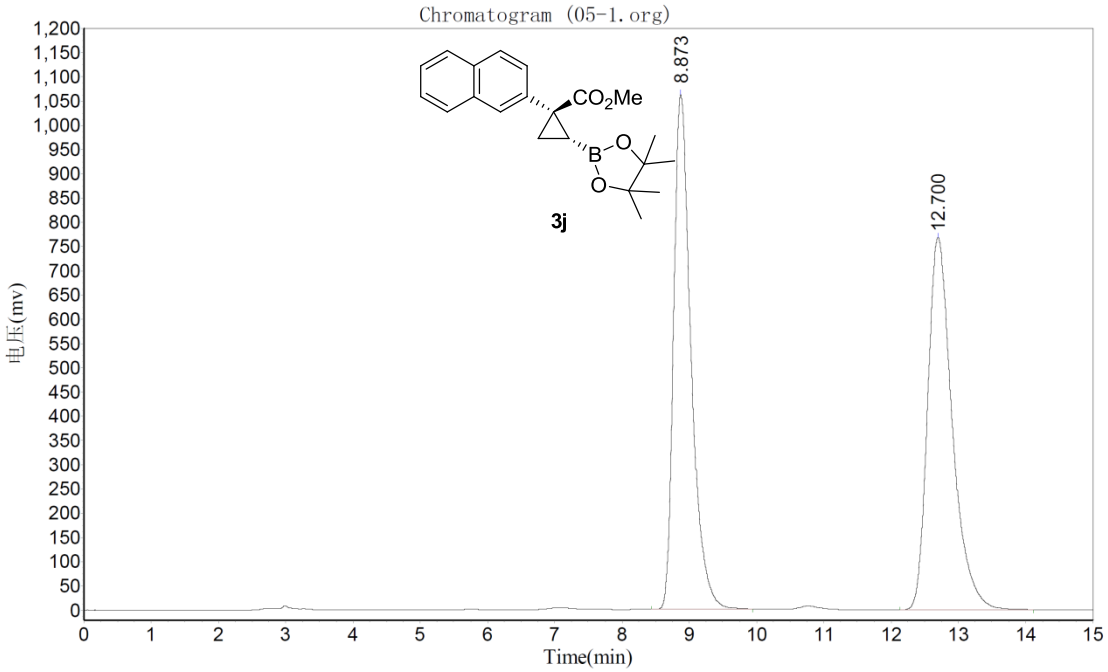
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		7.332	73764.633	1015637.125	49.9145
2		10.465	51737.223	1019116.188	50.0855
Total			125501.855	2034753.313	100.0000



Results

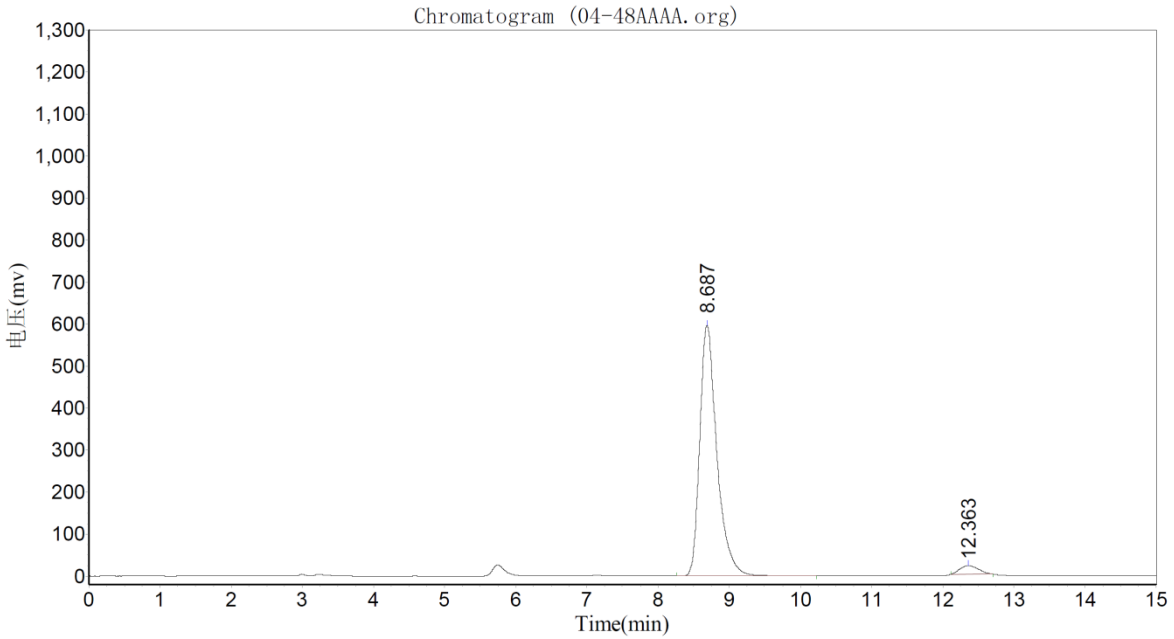
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		7.688	704335.750	9943681.000	96.9136
2		10.918	17944.900	316671.375	3.0864
Total			722280.650	10260352.375	100.0000

(1*R*,2*R*)-Methyl 1-(naphthalen-2-yl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3j)



Results

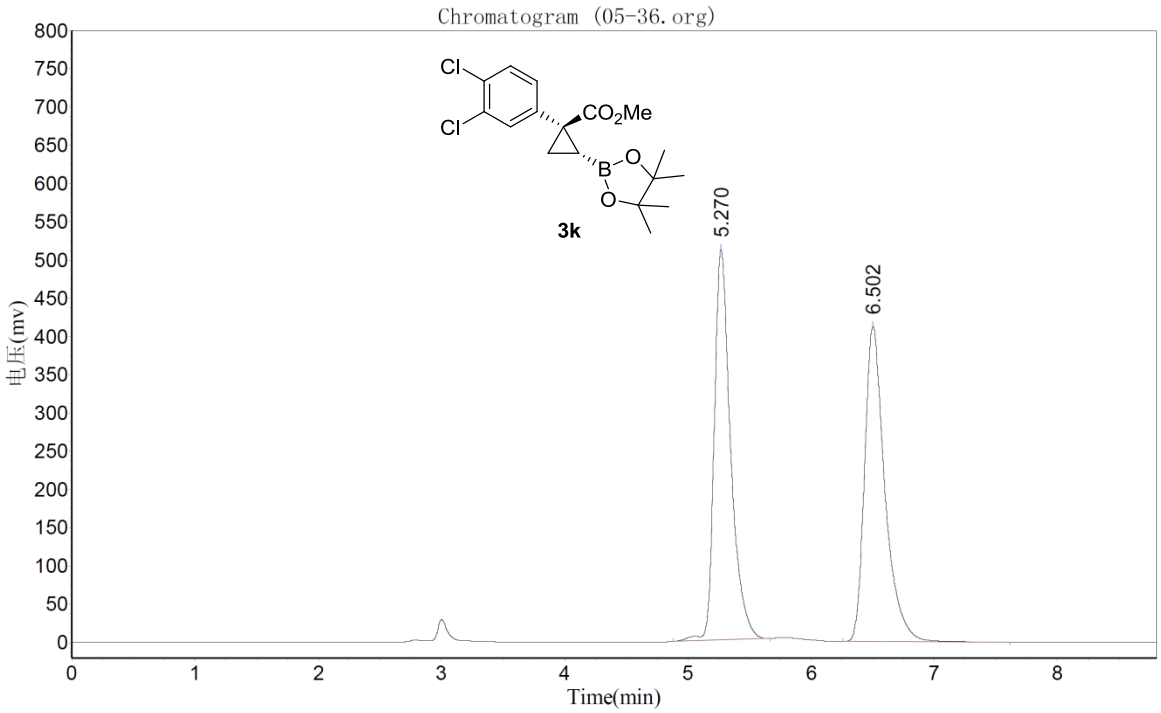
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		8.873	1061924.750	19054004.000	49.3895
2		12.700	767961.688	19525076.000	50.6105
Total			1829886.438	38579080.000	100.0000



Results

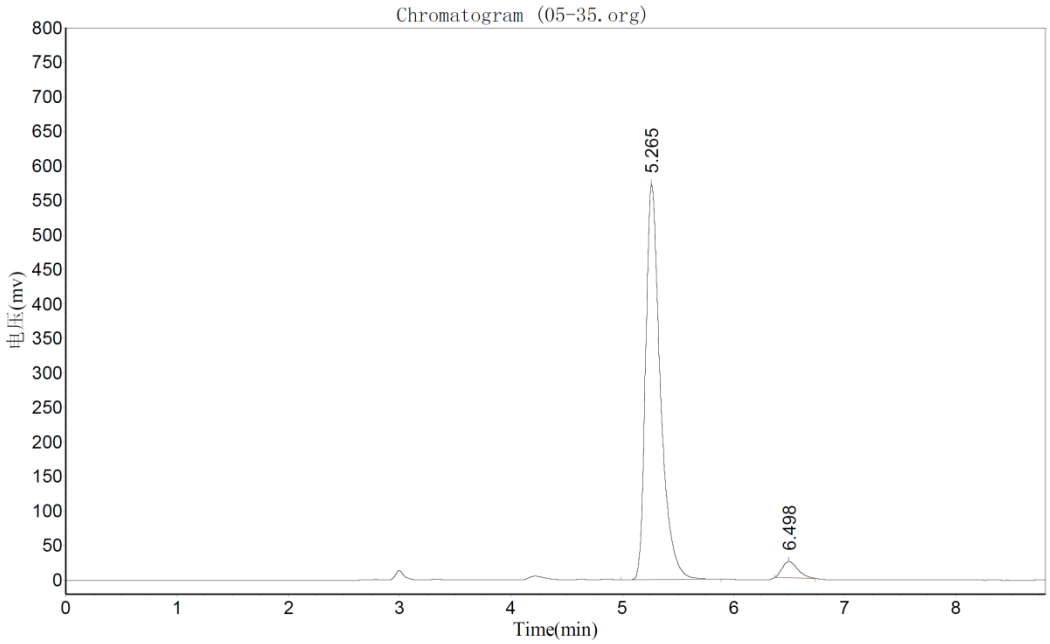
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		8.687	596291.938	9960564.000	96.4901
2		12.363	20132.539	362323.688	3.5099
Total			616424.477	10322887.688	100.0000

(1*R*,2*R*)-Methyl 1-(3,4-dichlorophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3k)



Results

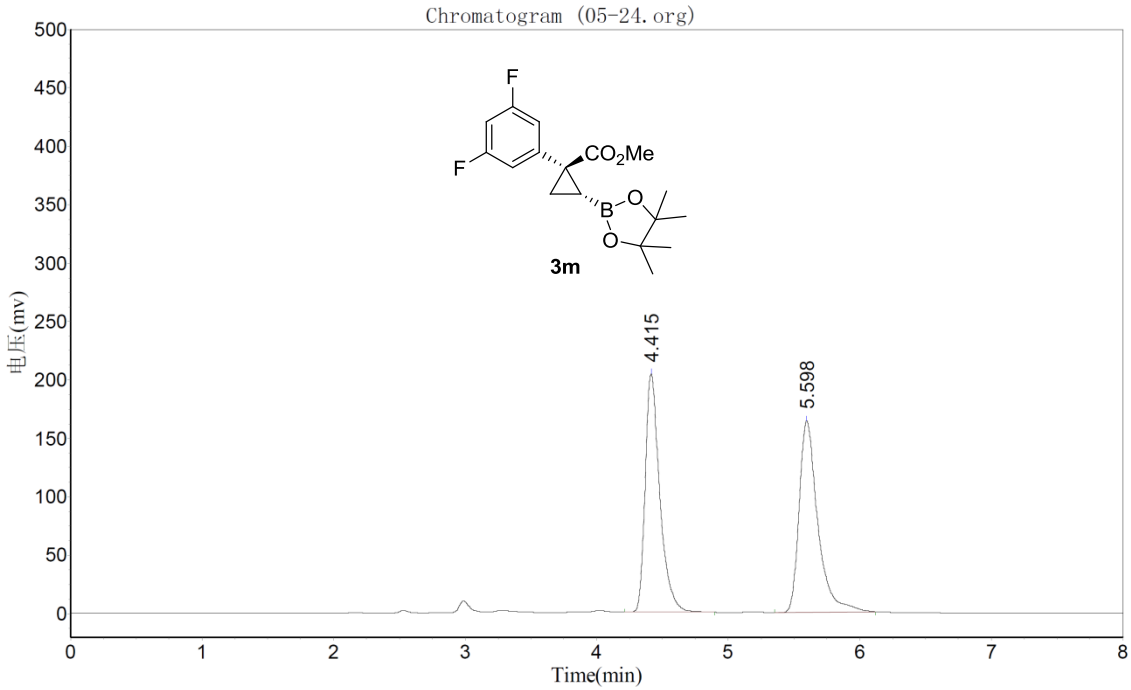
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.270	510356.500	4717506.000	49.9098
2		6.502	412098.219	4734558.500	50.0902
Total			922454.719	9452064.500	100.0000



Results

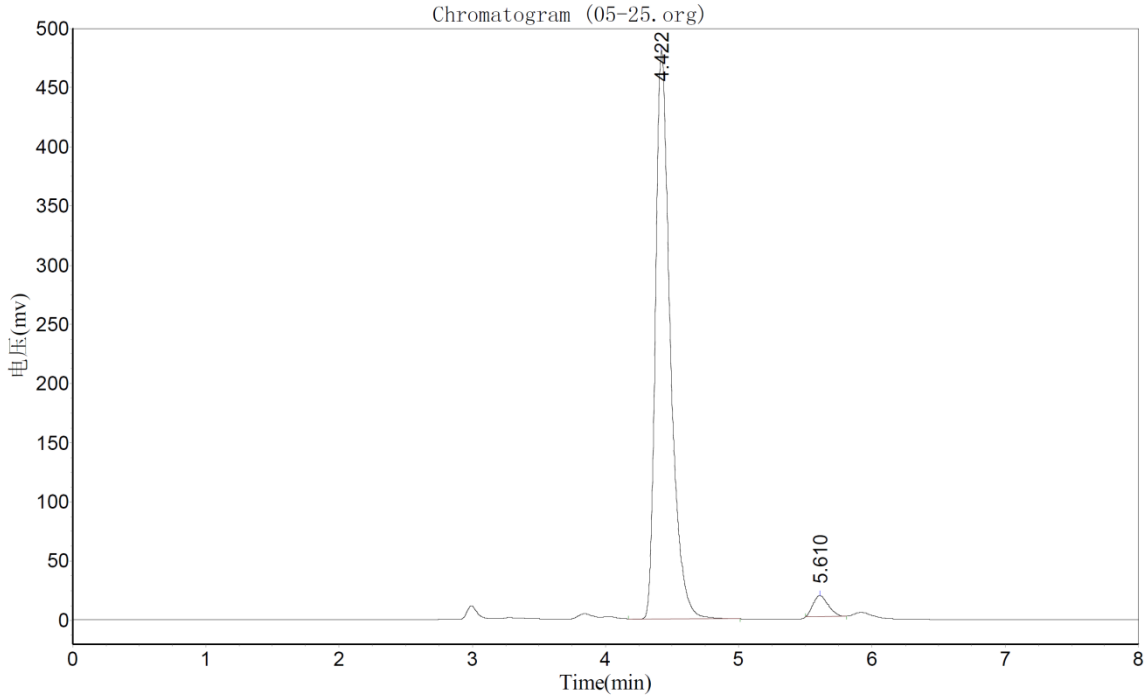
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		5.265	572598.313	5268845.500	95.8538
2		6.498	23473.000	227908.391	4.1462
Total			596071.313	5496753.891	100.0000

(1*R*,2*R*)-Methyl 1-(3,5-difluorophenyl)-2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-carboxylate (3m)



Results

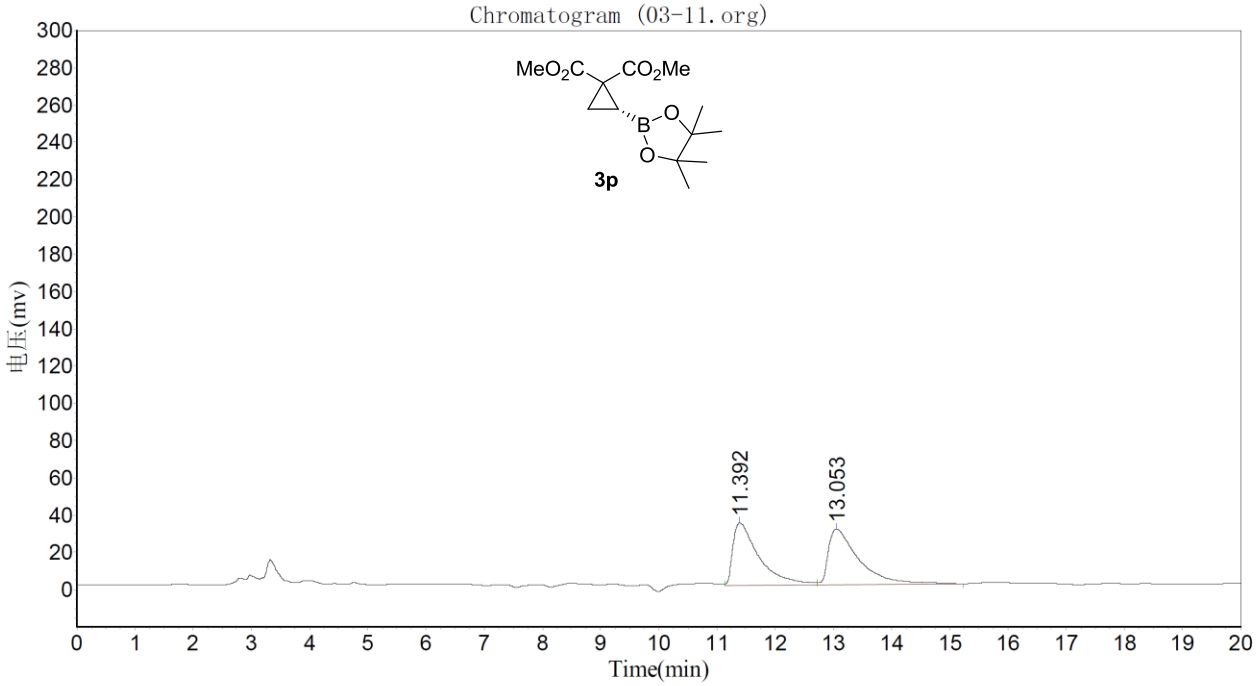
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		4.415	204051.234	1570528.625	49.2951
2		5.598	164095.063	1615441.625	50.7049
Total			368146.297	3185970.250	100.0000



Results

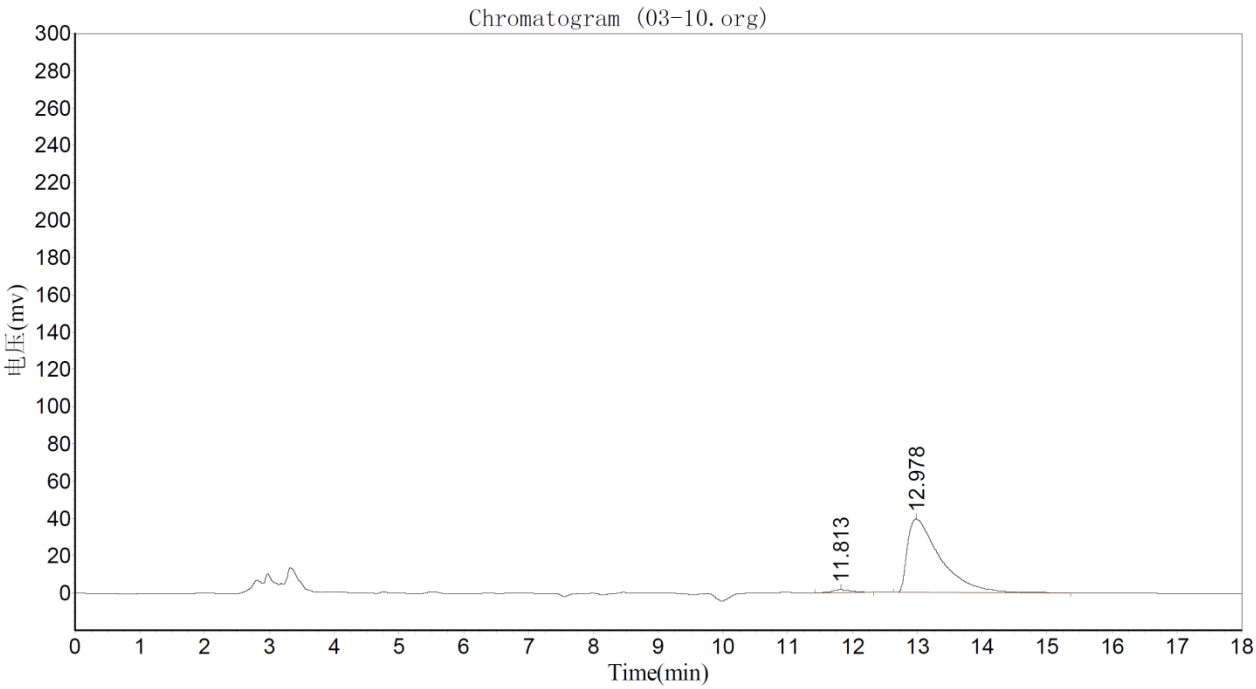
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		4.422	480571.531	3714432.250	96.3744
2		5.610	17728.537	139735.297	3.6256
Total			498300.068	3854167.547	100.0000

(*R*)-Dimethyl 2-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)cyclopropane-1,1-dicarboxylate (3p)



Results

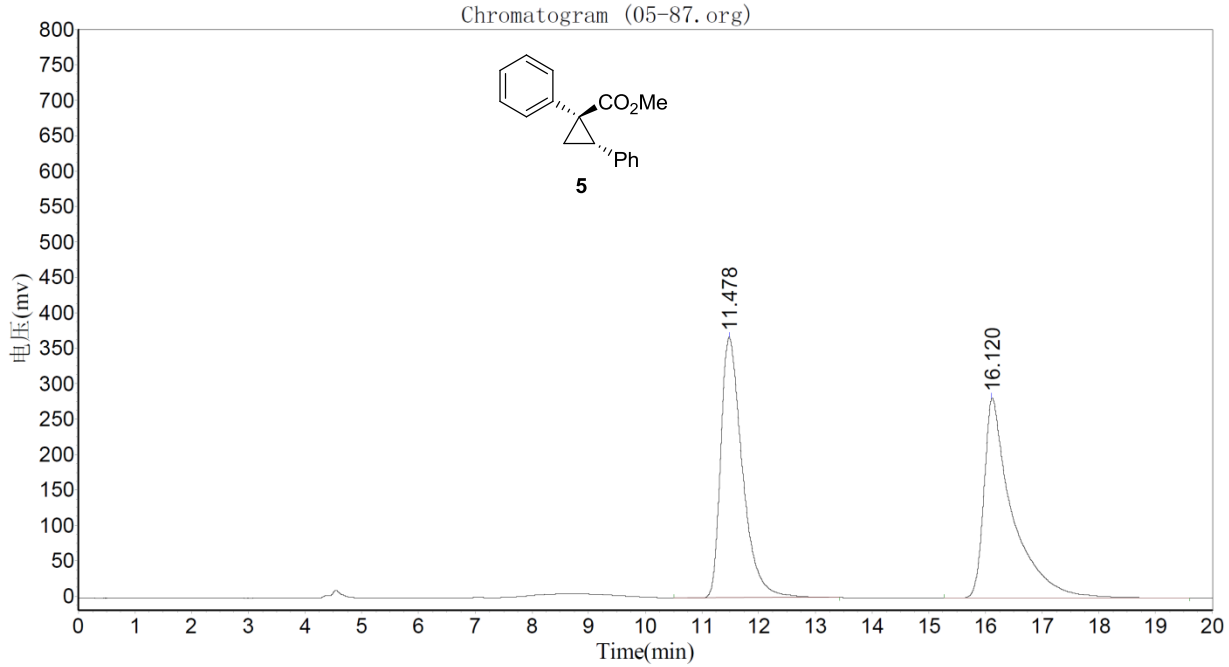
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		11.392	33715.301	1063152.250	49.0988
2		13.053	30026.555	1102178.125	50.9011
Total			63741.855	2165330.375	100.0000



Results

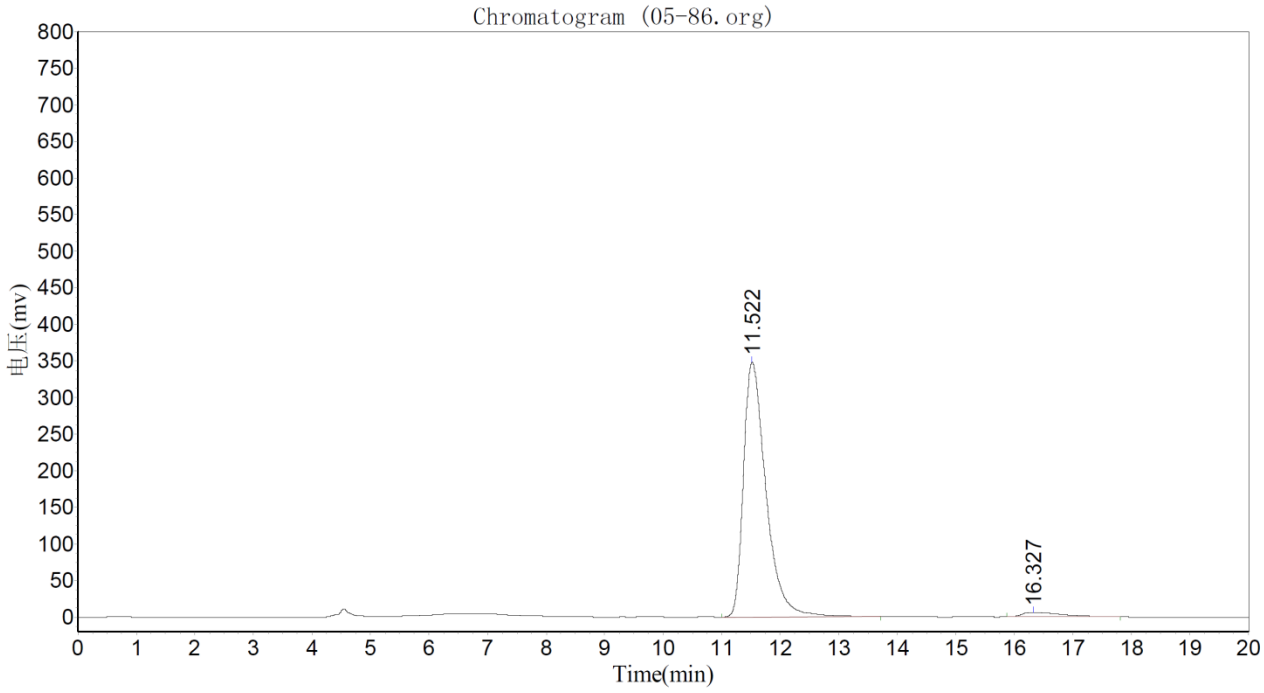
Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		11.813	1526.219	35190.750	2.4737
2		12.978	39417.293	1387382.375	97.5263
Total			40943.512	1422573.125	100.0000

(1*R*,2*S*)-Methyl 1,2-diphenylcyclopropanecarboxylate (5)



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		11.478	367557.656	9726735.000	49.8654
2		16.120	281591.313	9779263.000	50.1346
Total			649148.969	19505998.000	100.0000



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc.
1		11.522	348305.125	9299768.000	97.0302
2		16.327	6018.578	284638.719	2.9698
Total			354323.703	9584406.719	100.0000