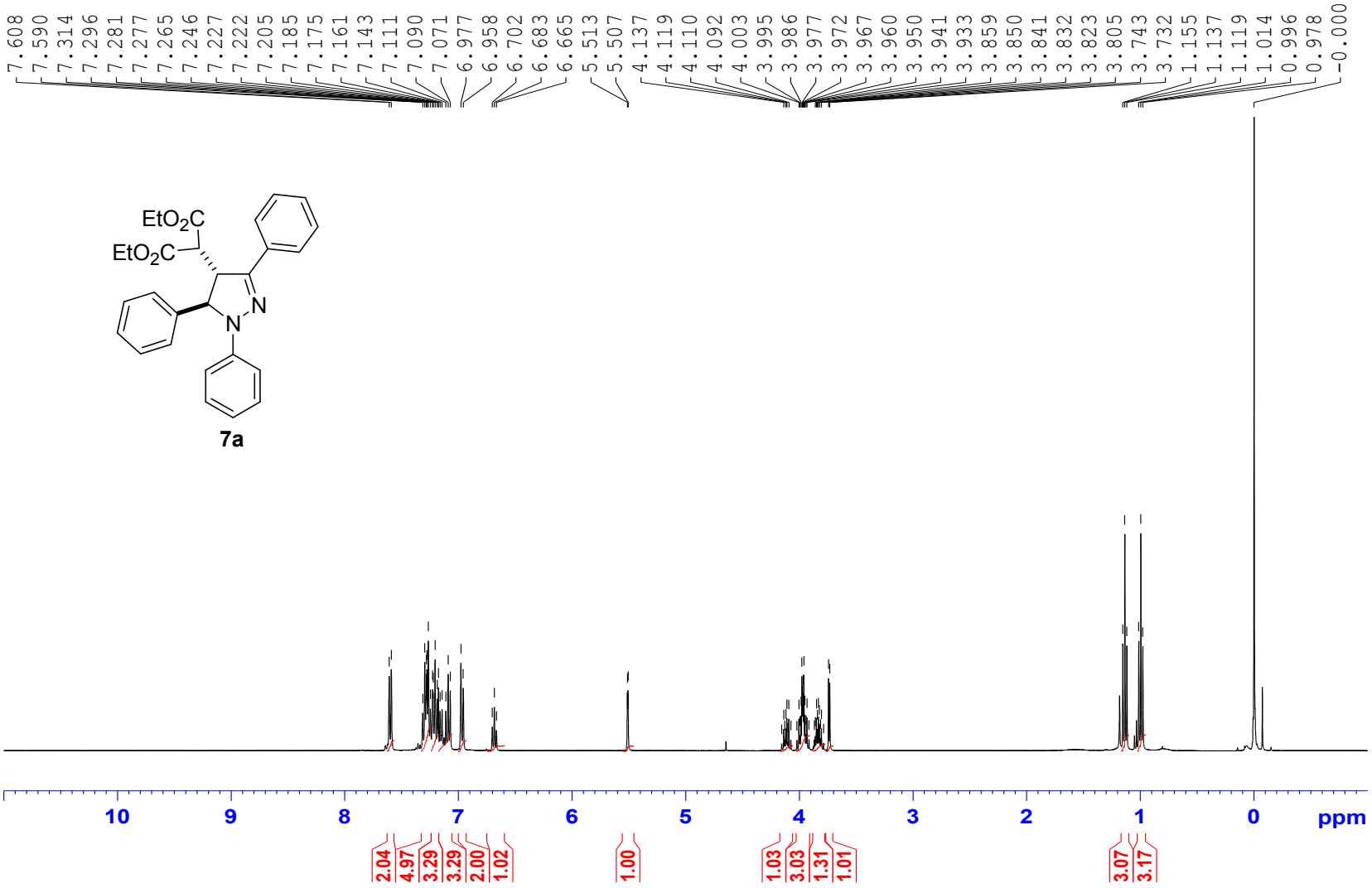
Electronic Supplementary Information

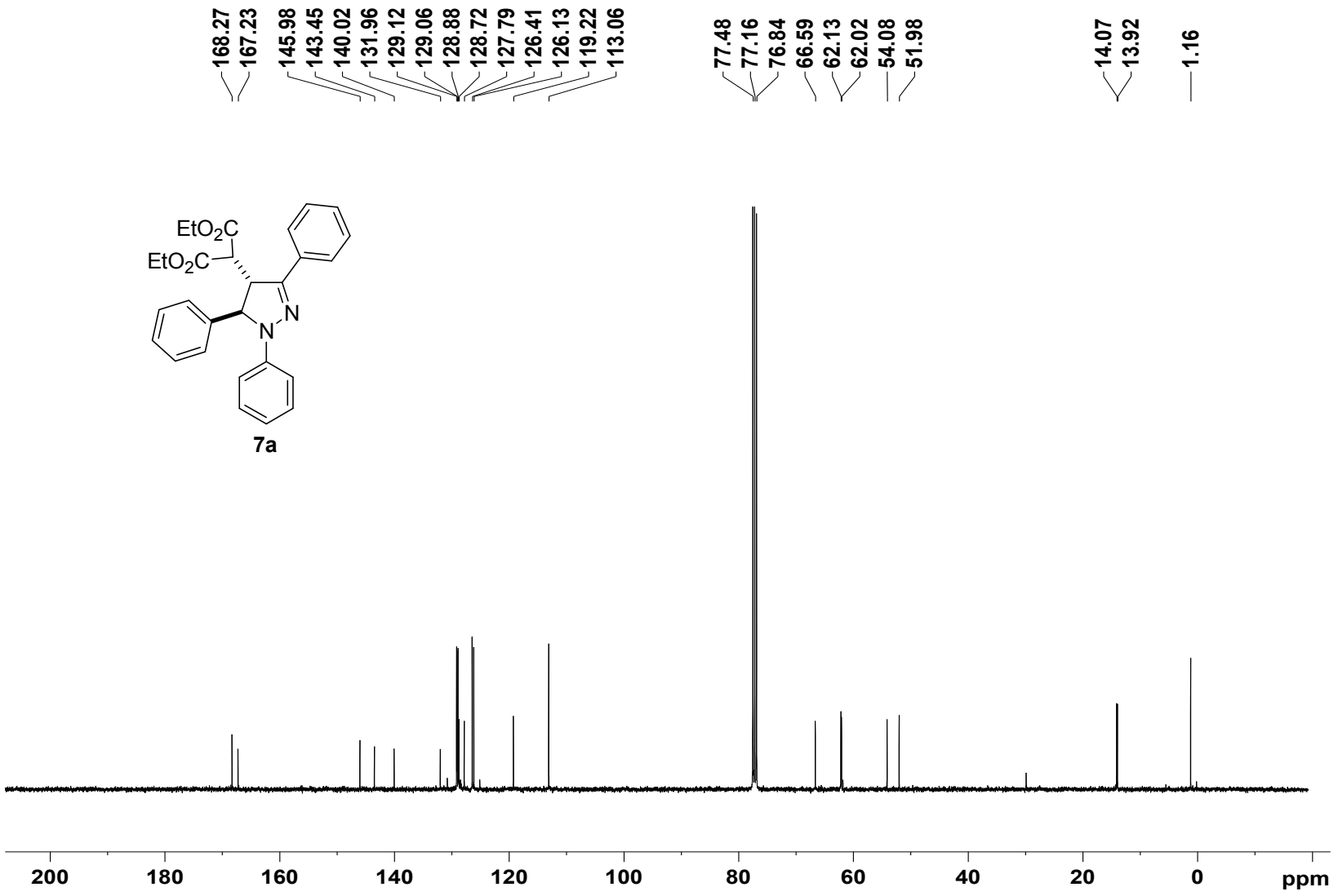
Nucleophilic Ring-Opening Reactions of *trans*-2-Aroyl-3-Aryl-Cyclopropane-1,1-Dicarboxylates with Hydrazines

Gopal Sathishkannan, V. John Tamilarasan and Kannupal Srinivasan*

School of Chemistry, Bharathidasan University, Tiruchirappalli-620 024, Tamil Nadu, India

COPIES OF ^{1}H NMR AND ^{13}C NMR SPECTRA

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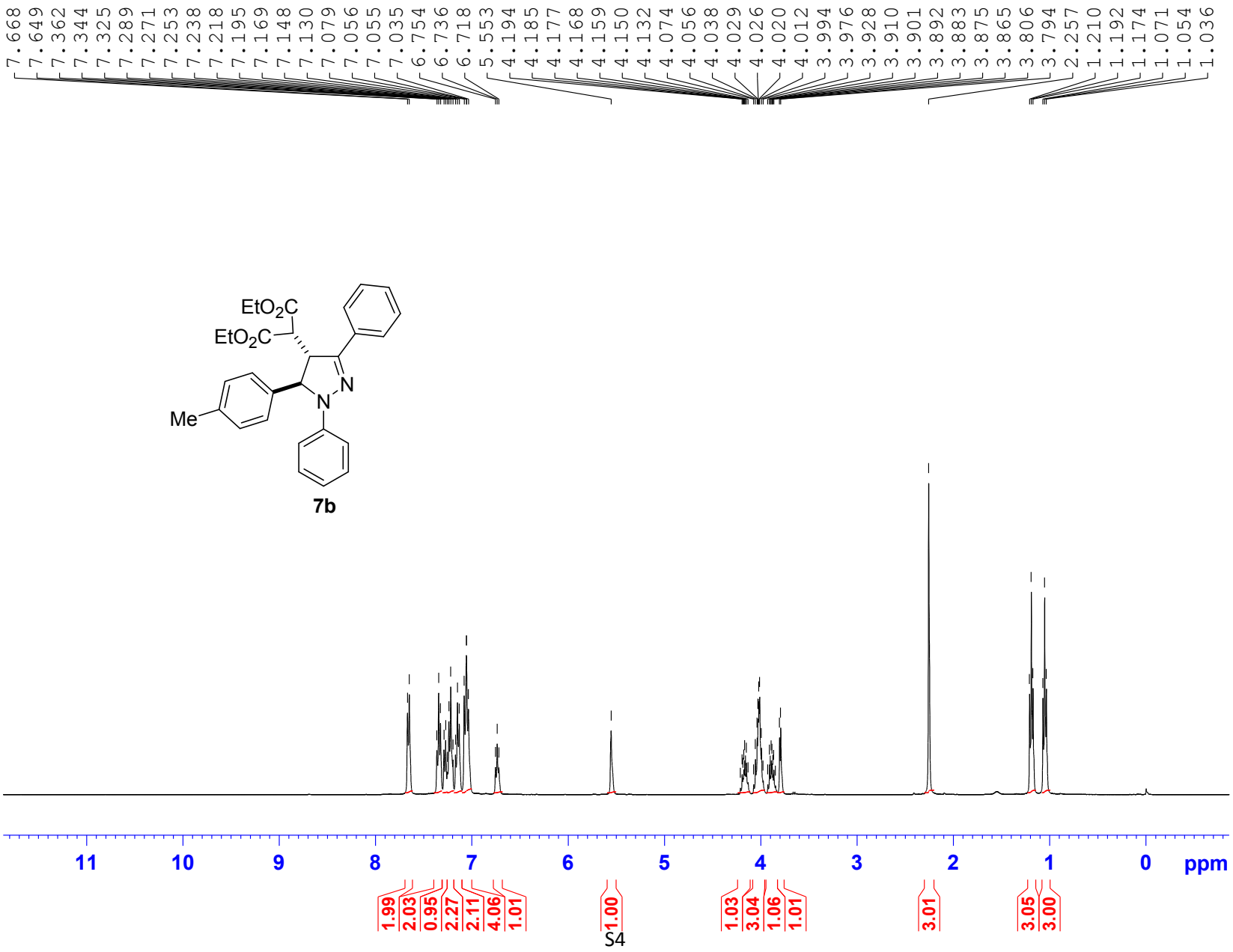
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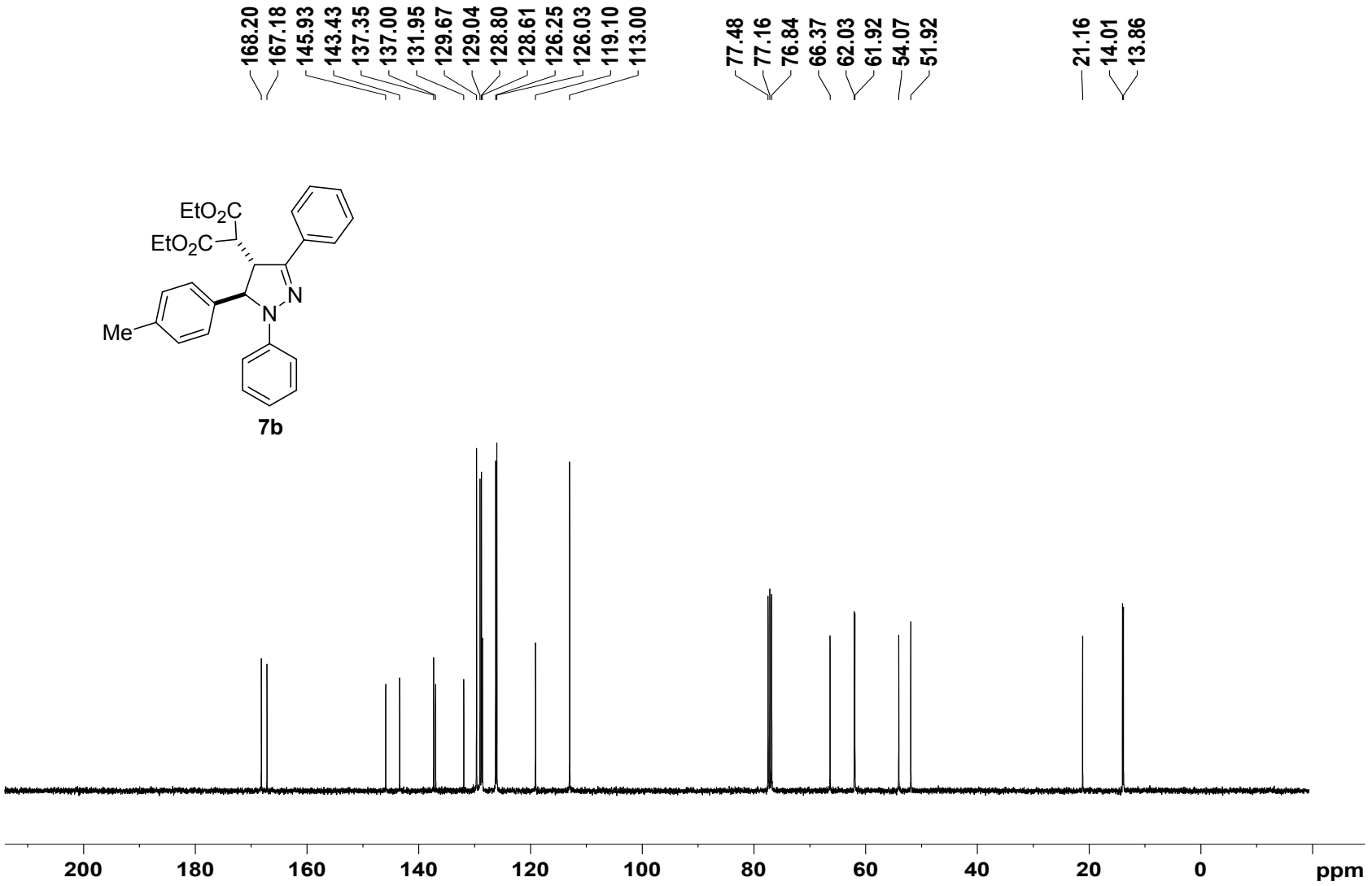
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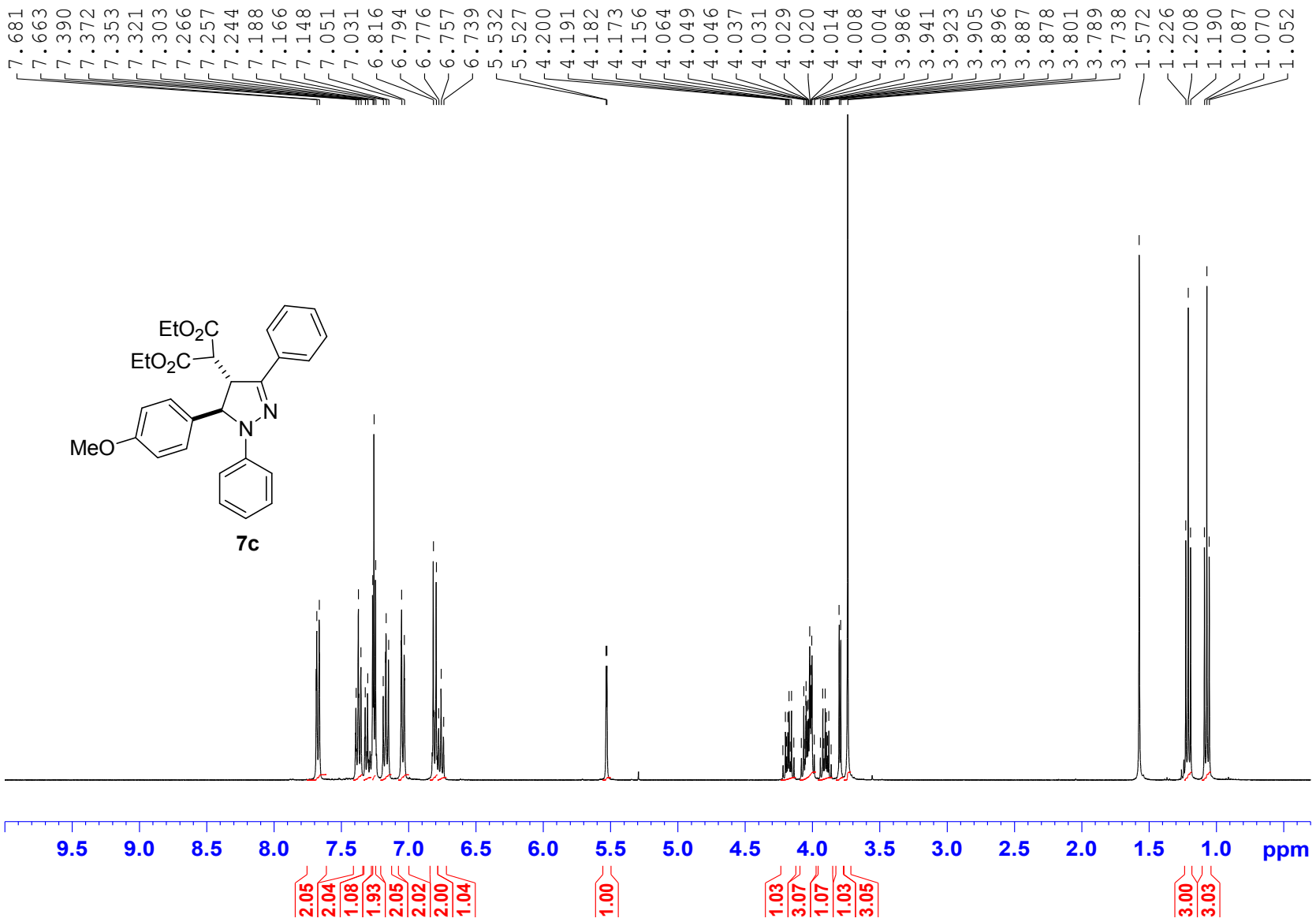
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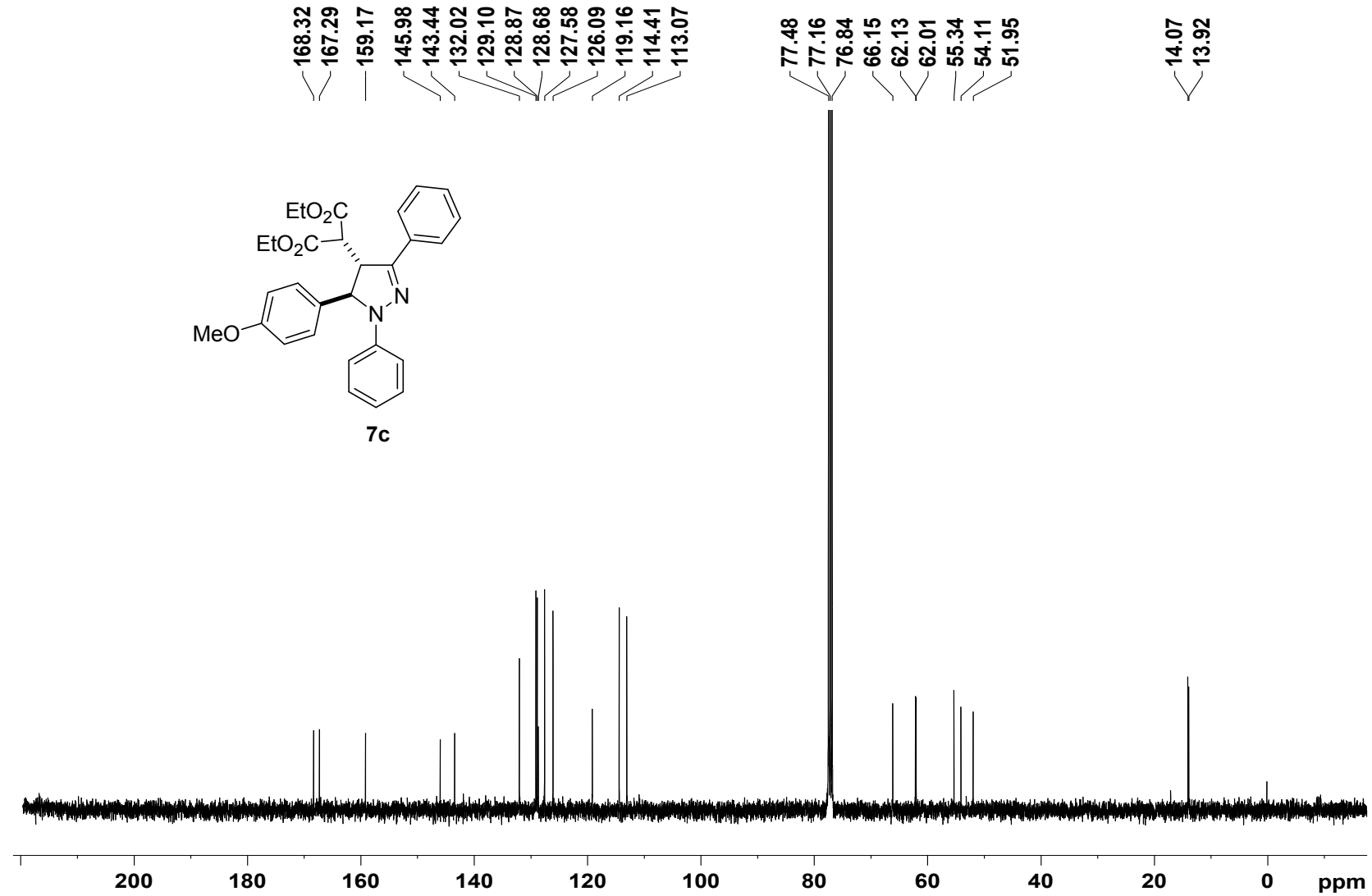
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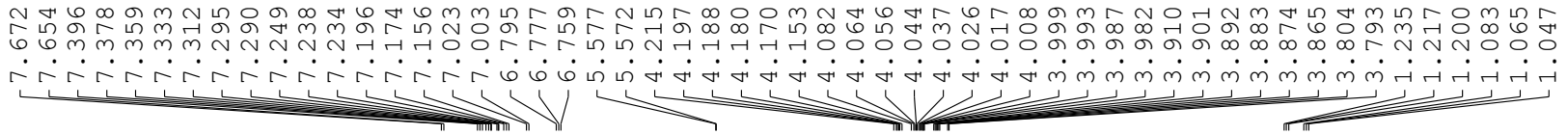
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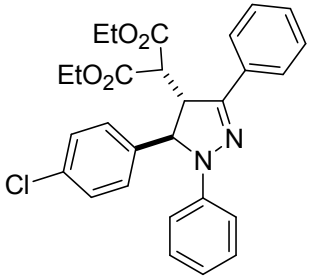
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Cl

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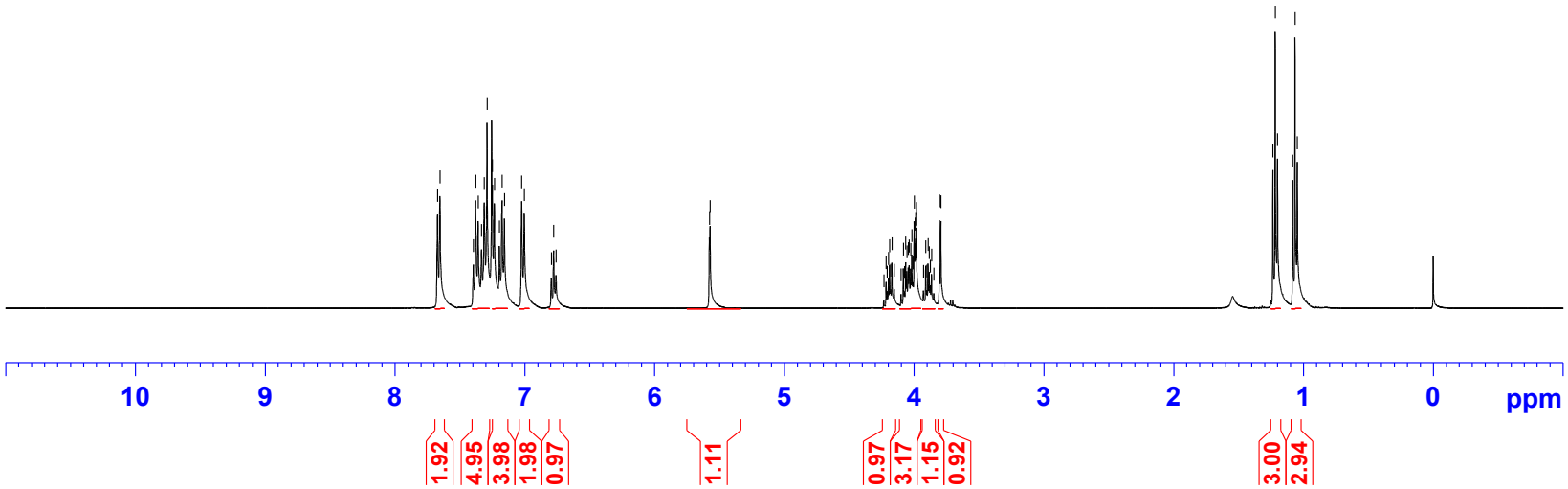
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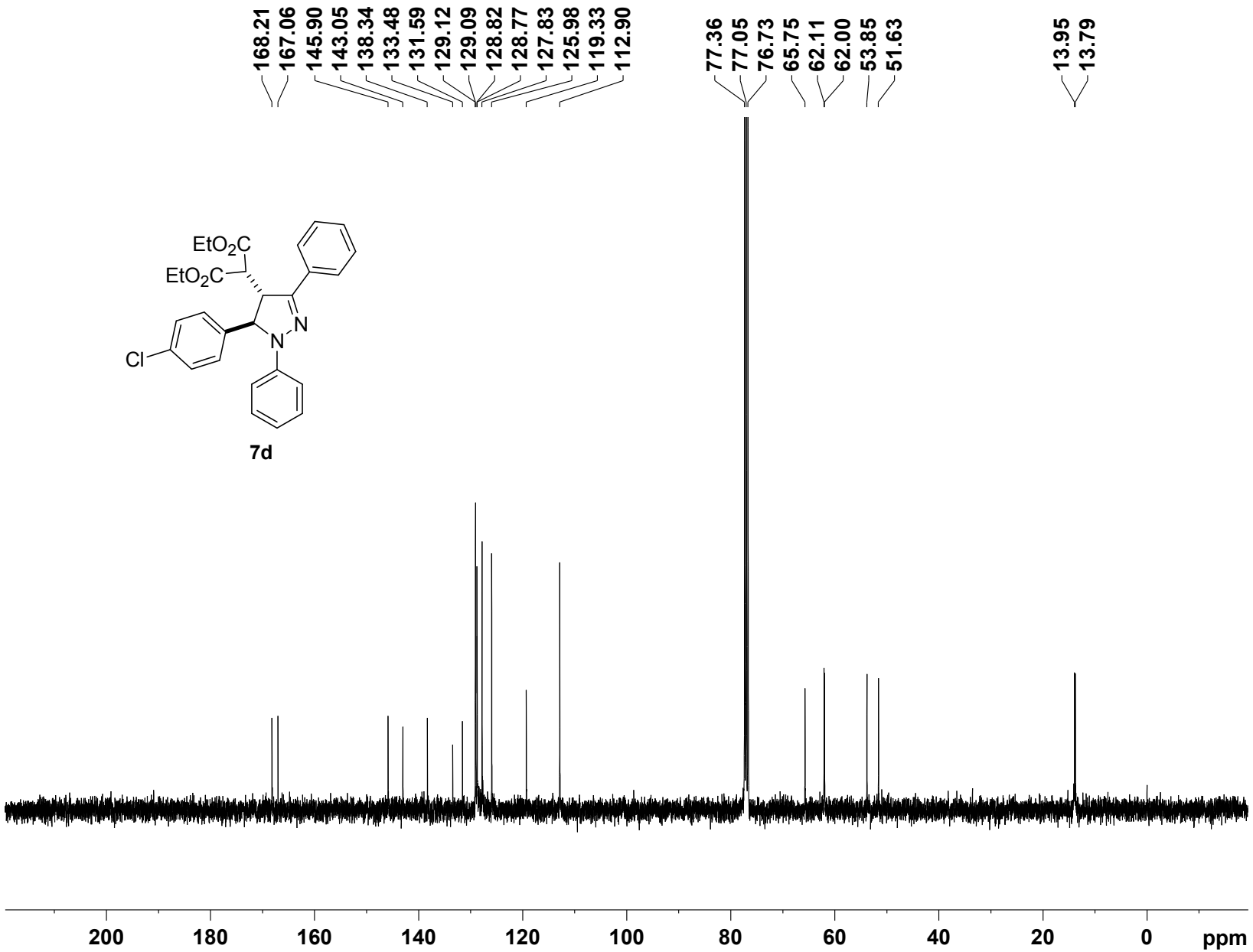
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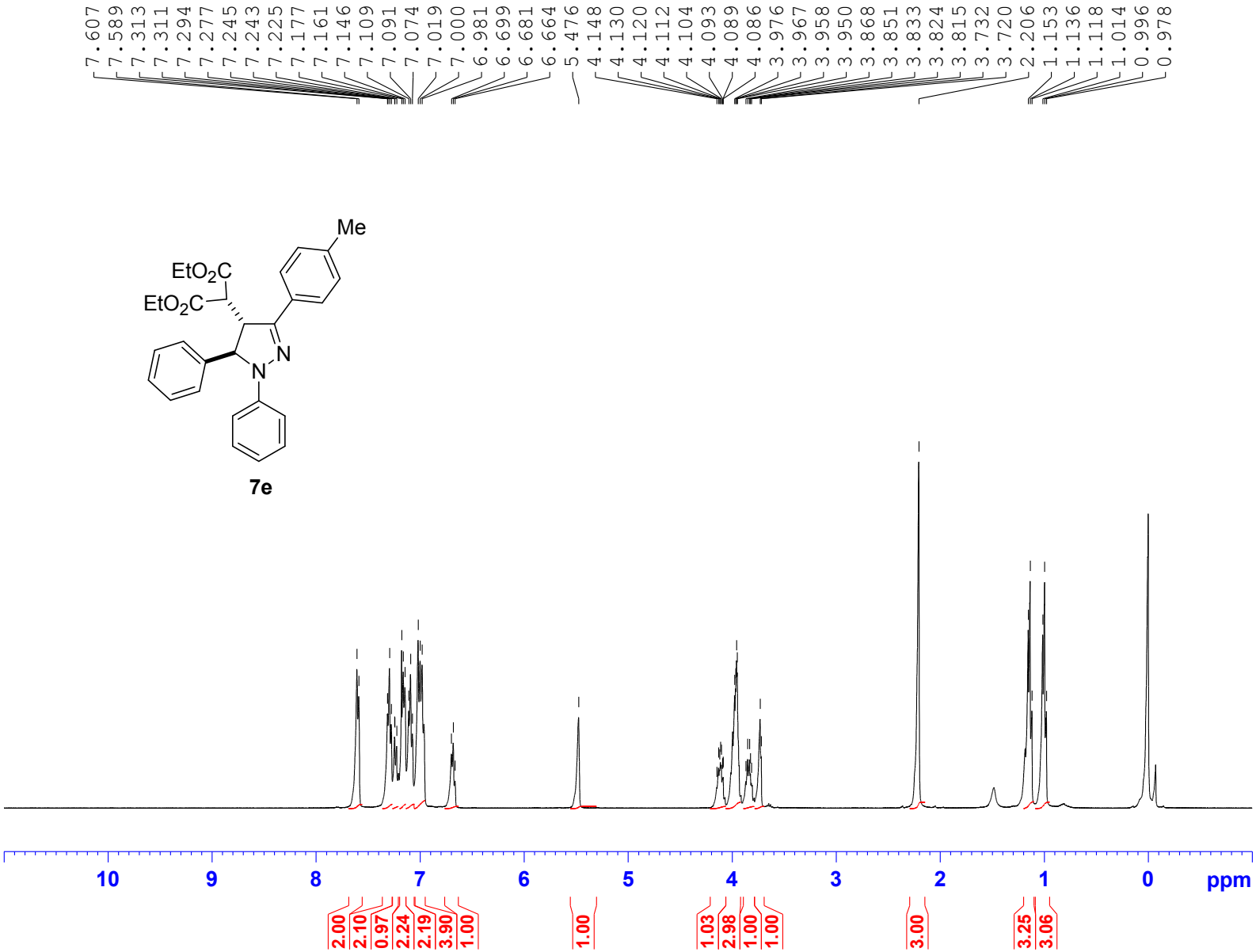
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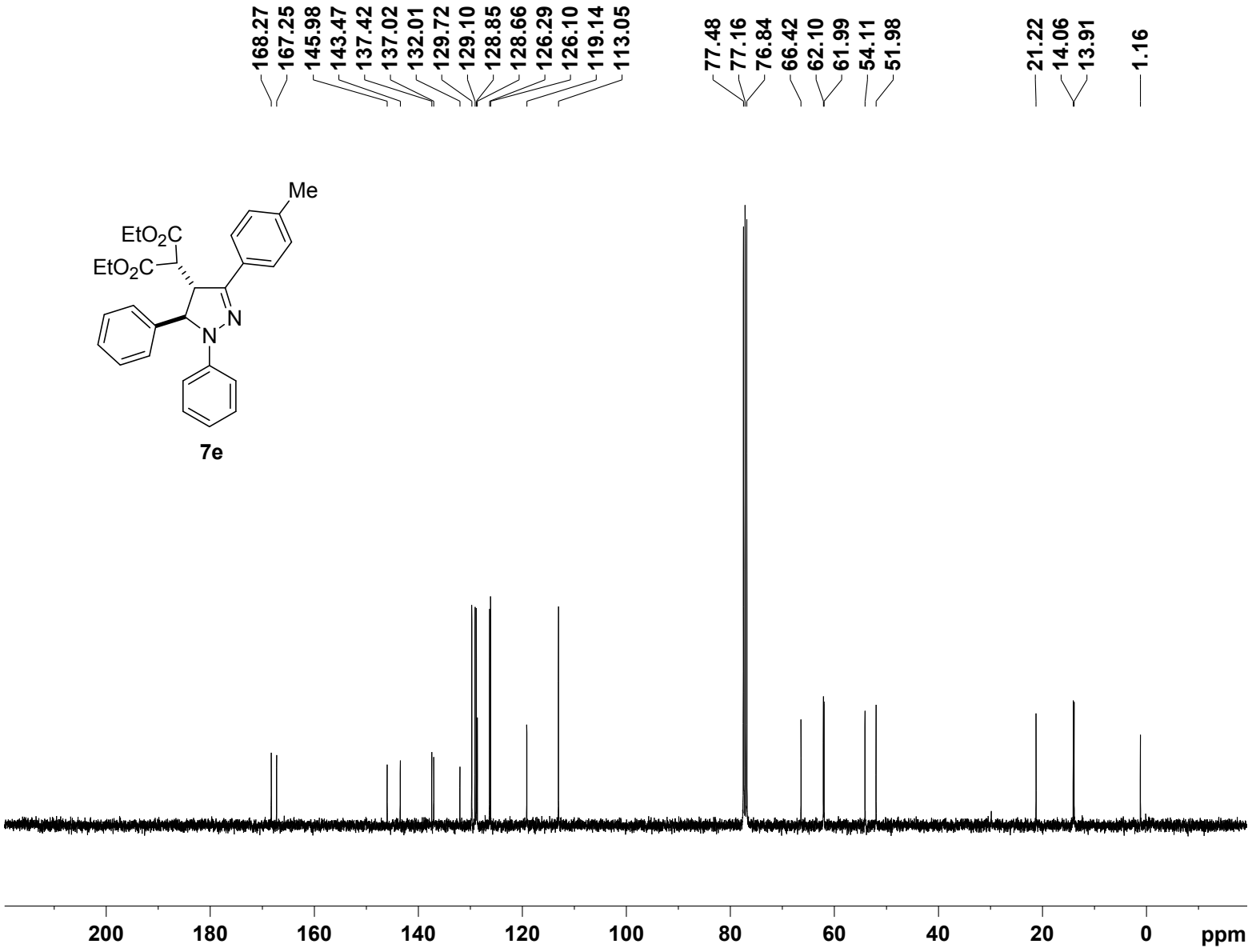
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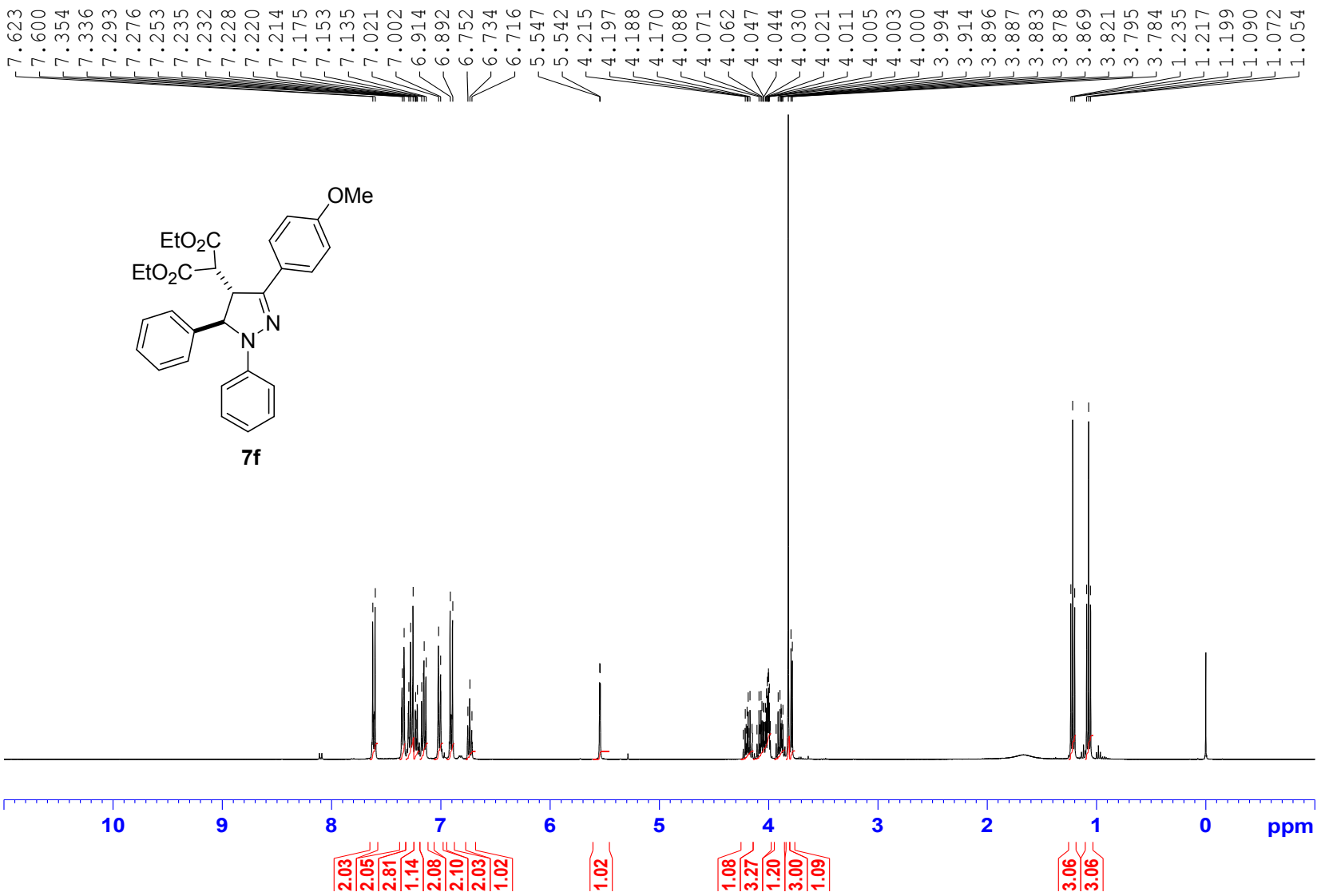
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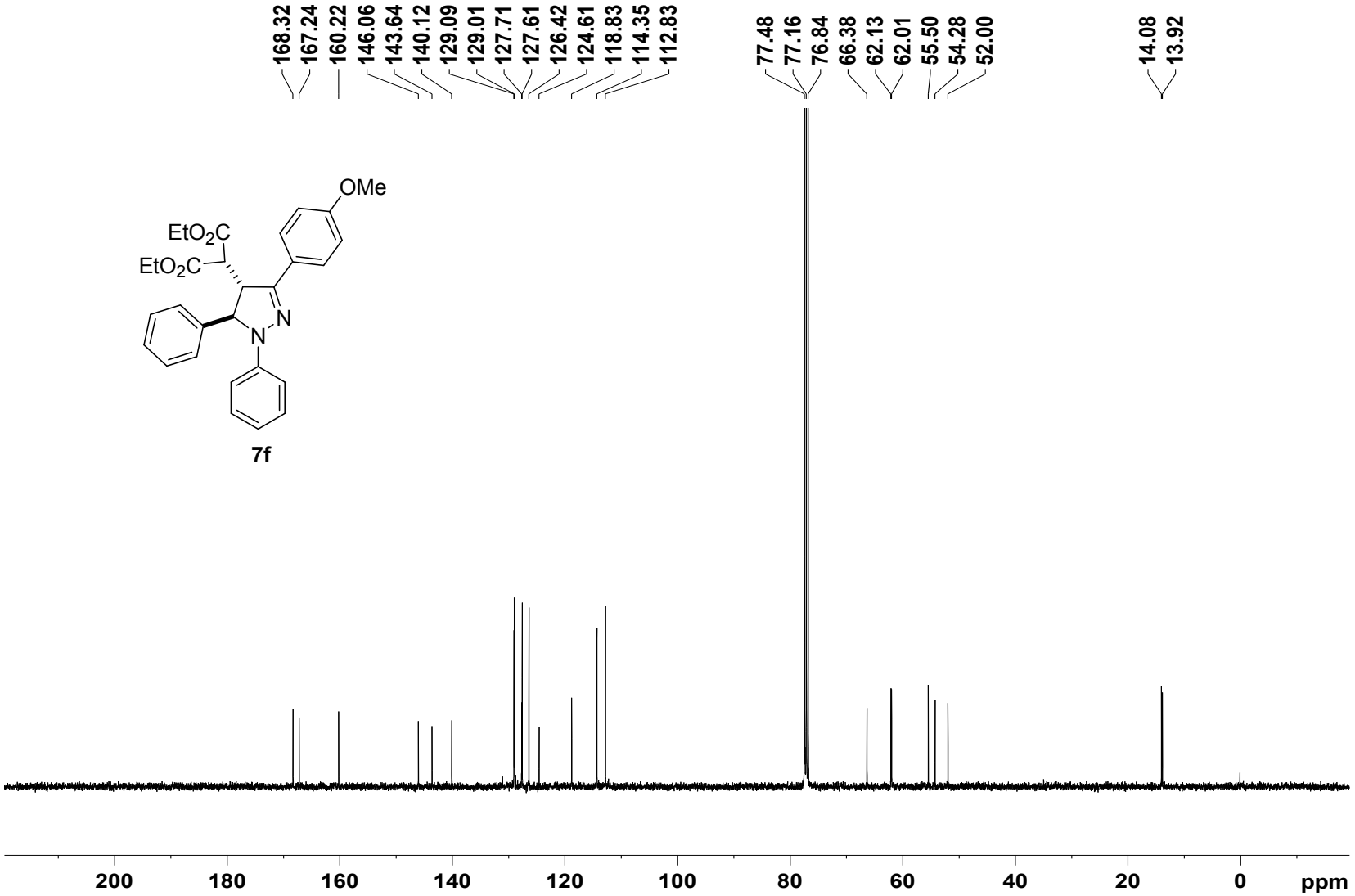
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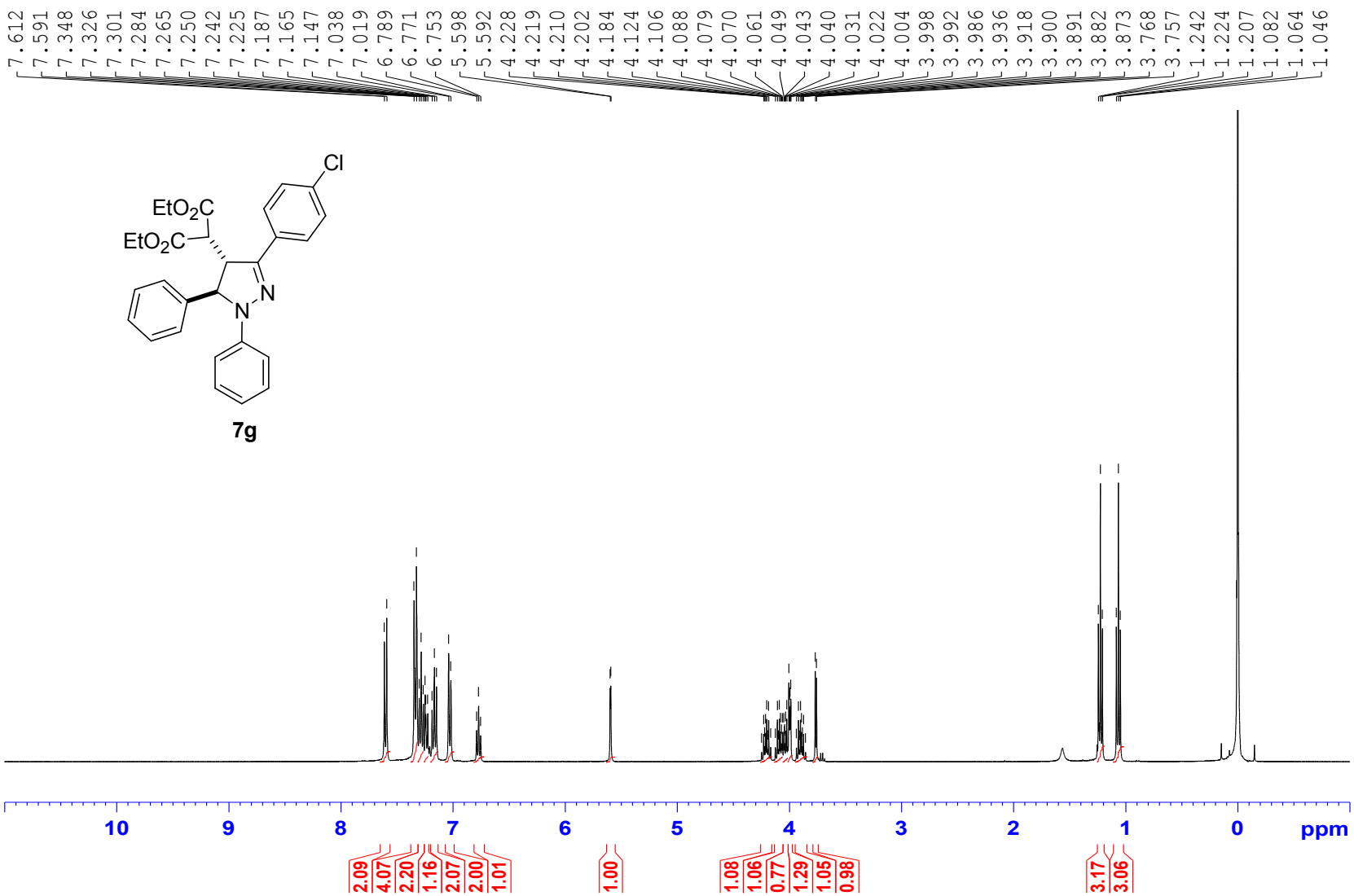
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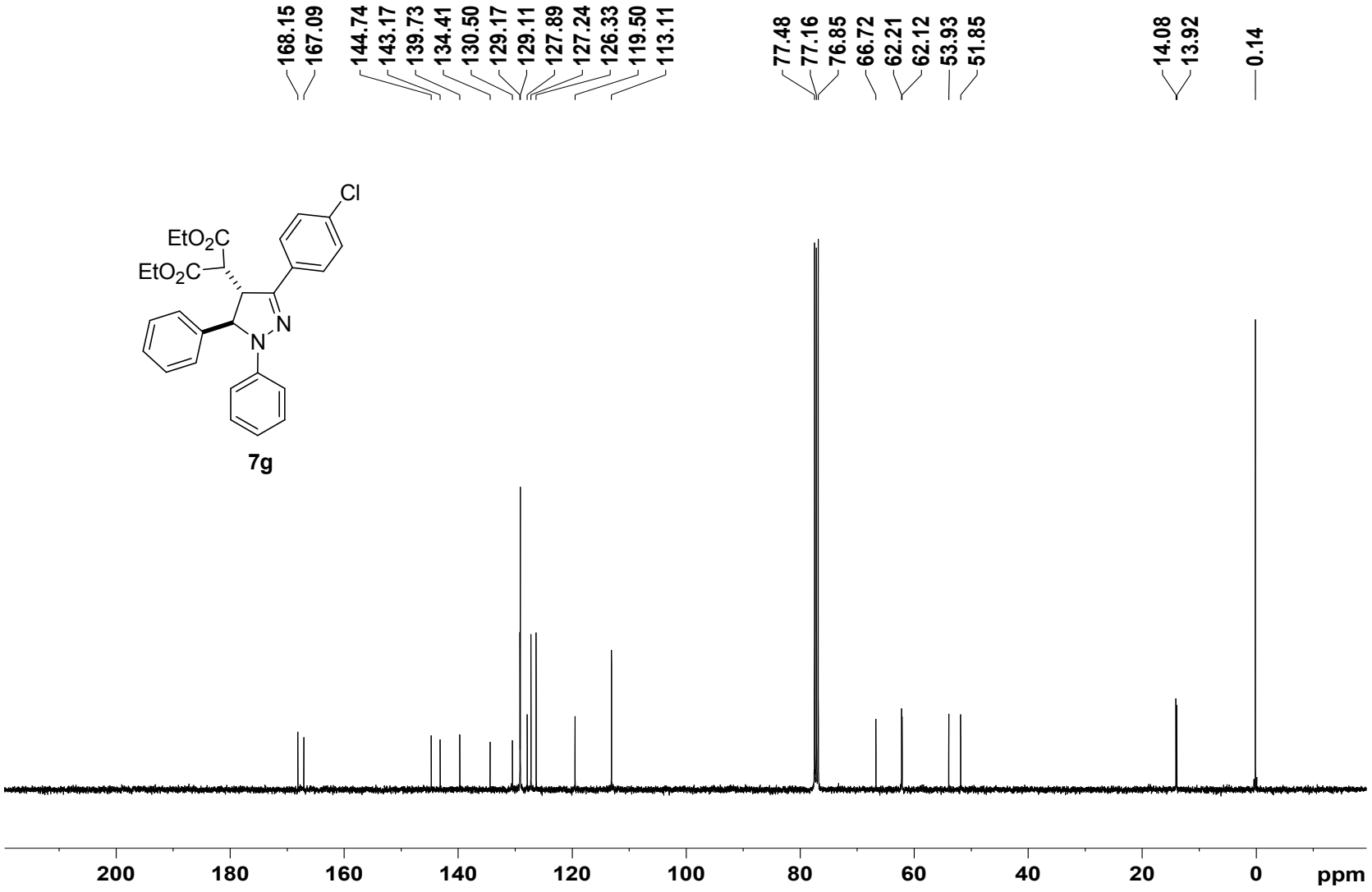
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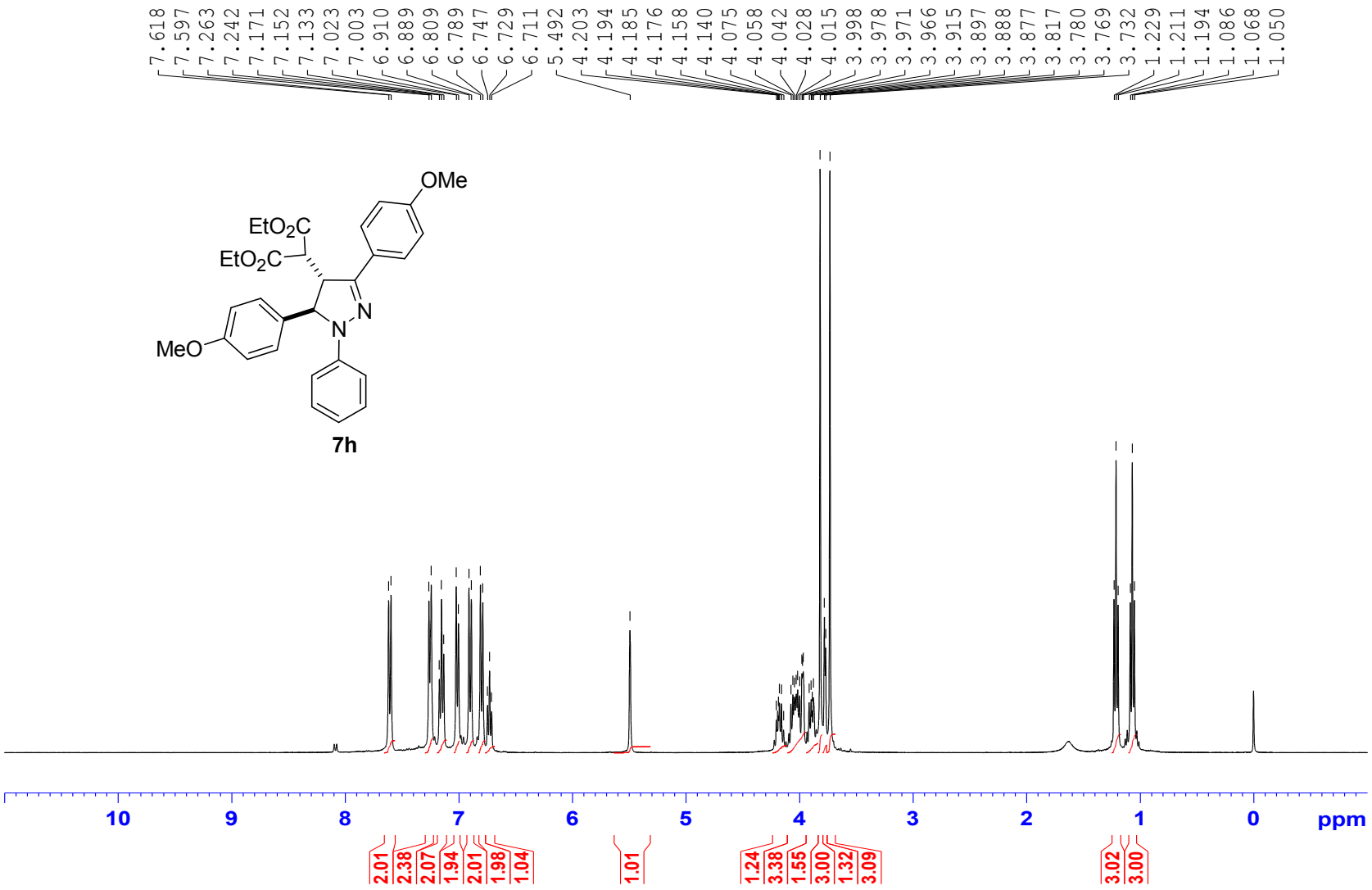
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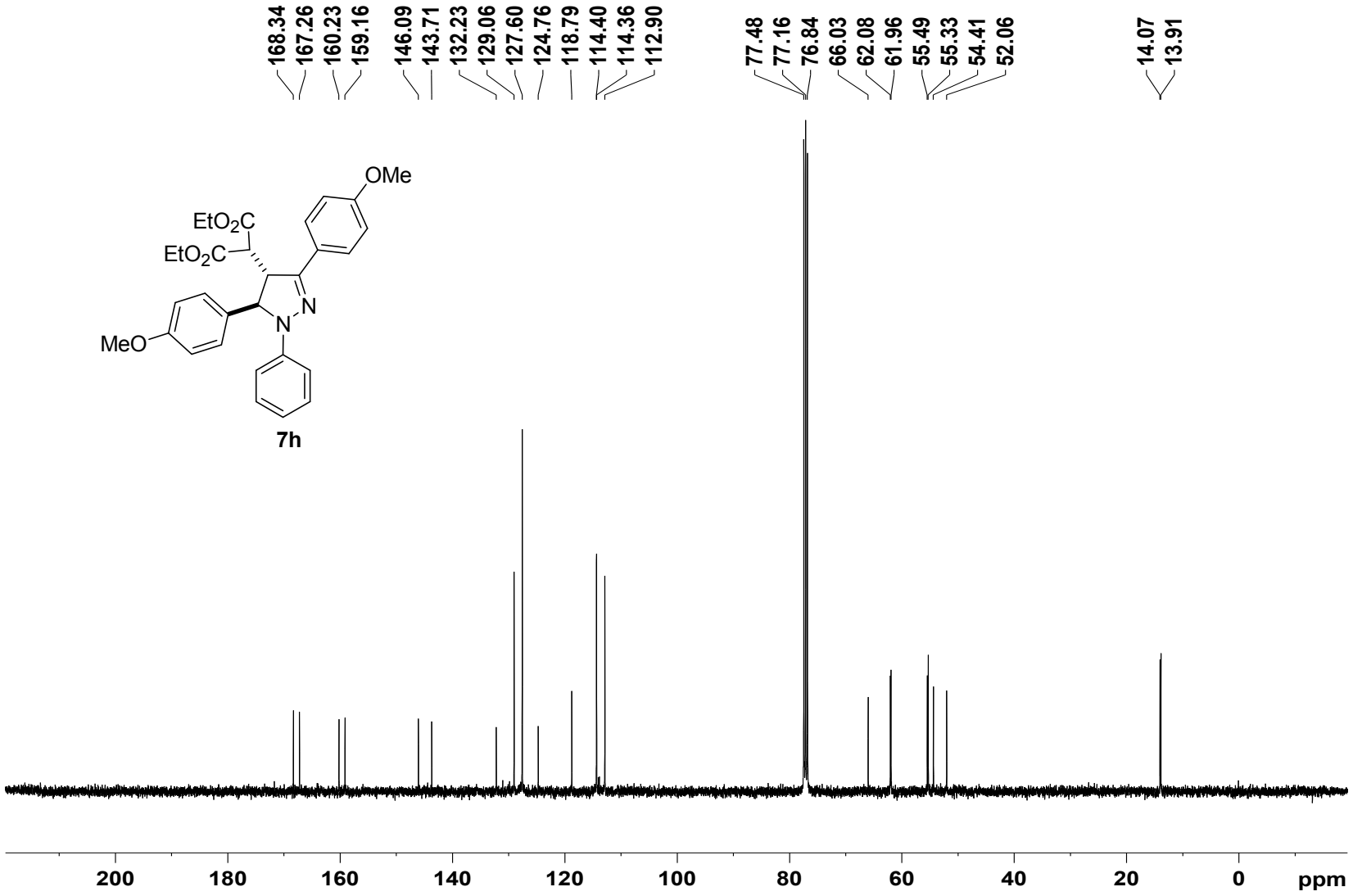
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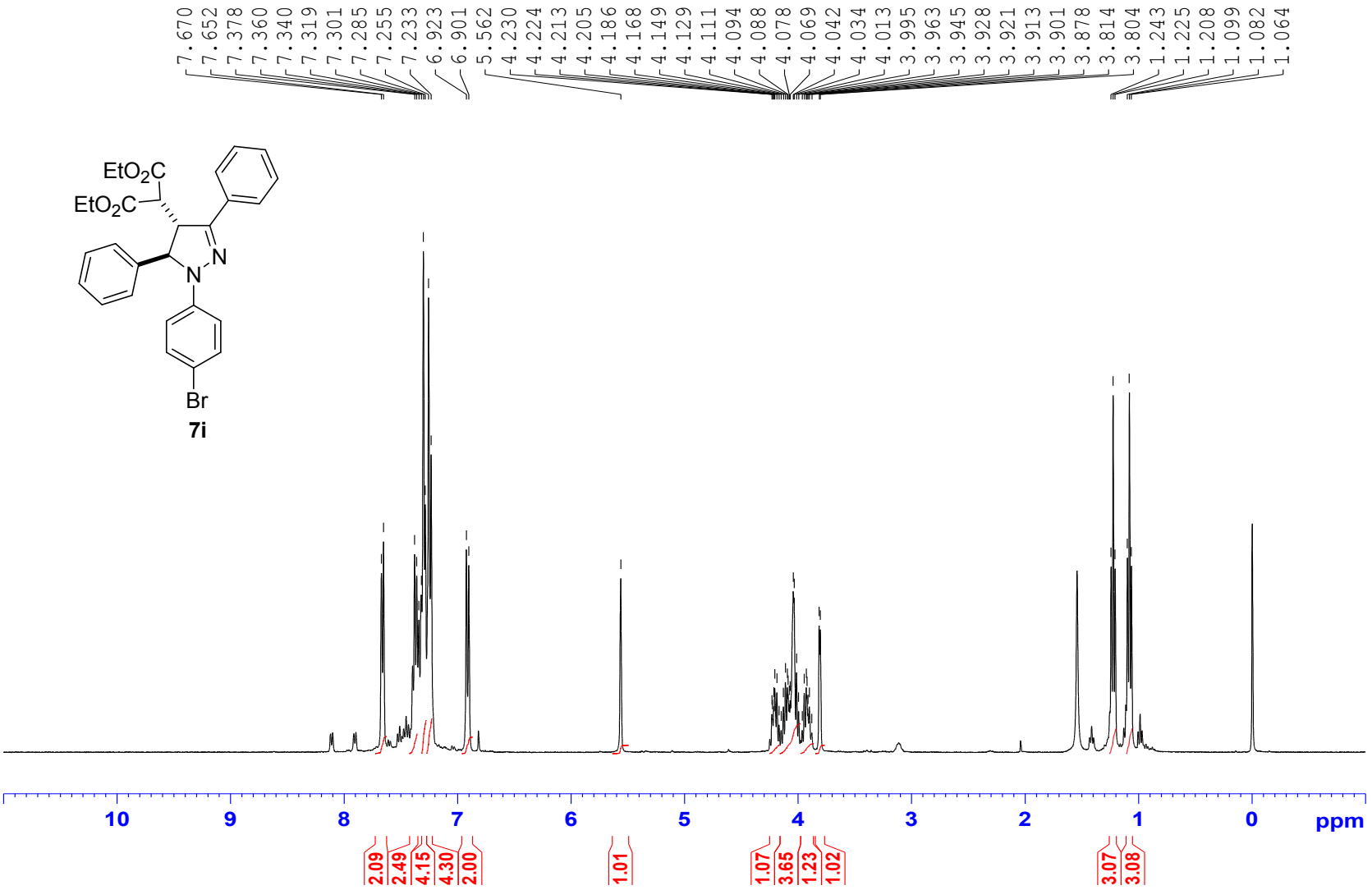
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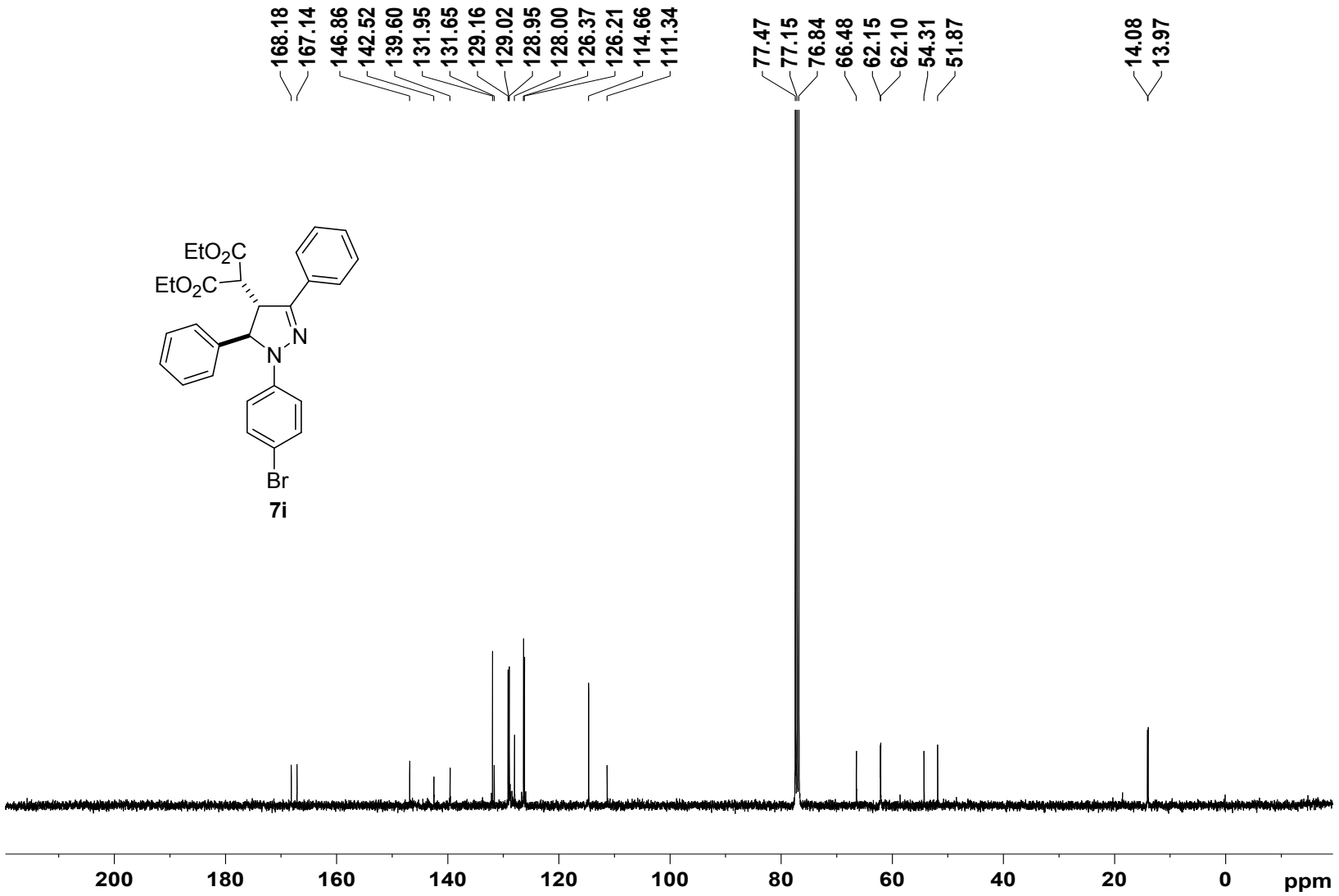
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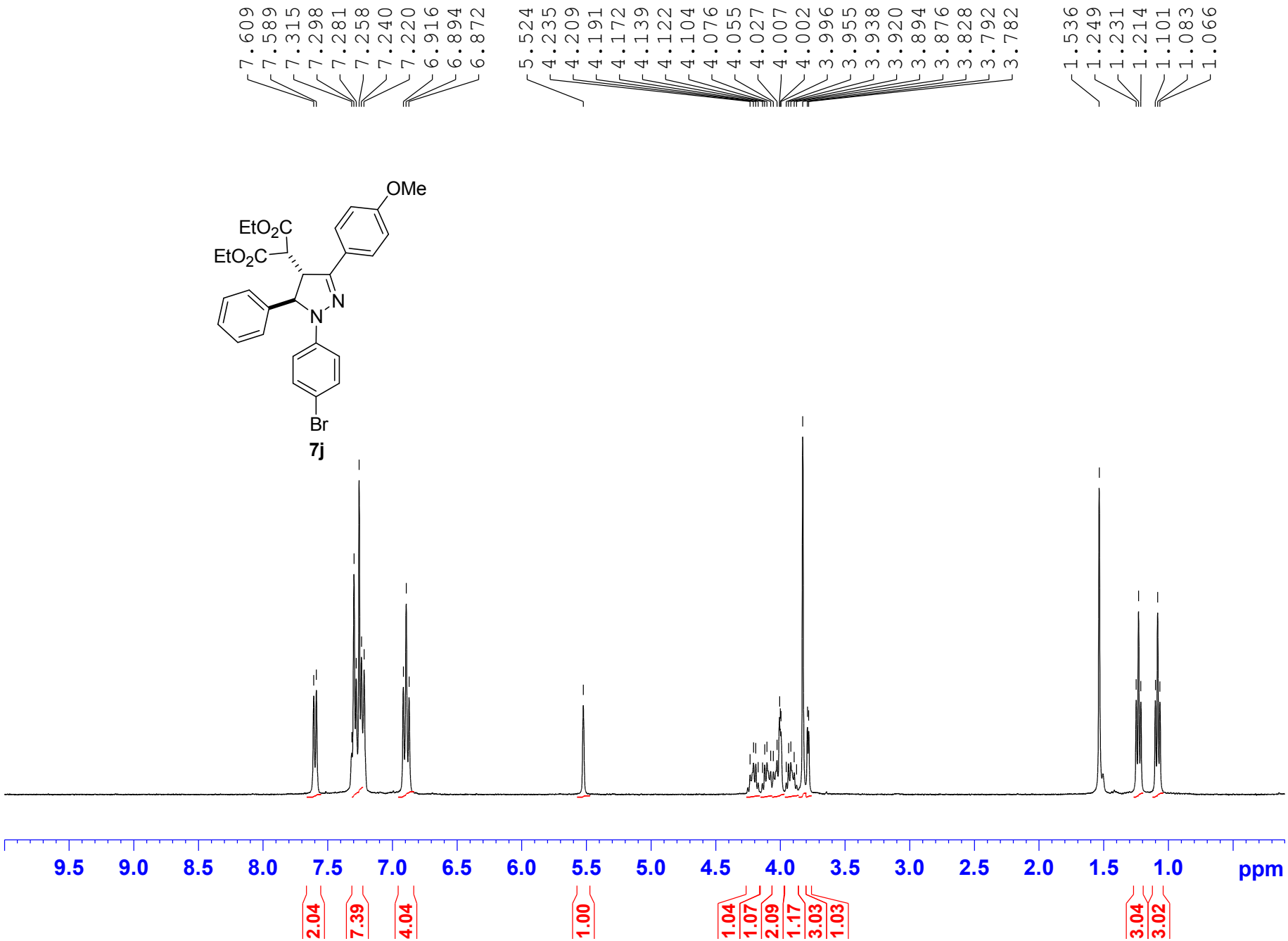
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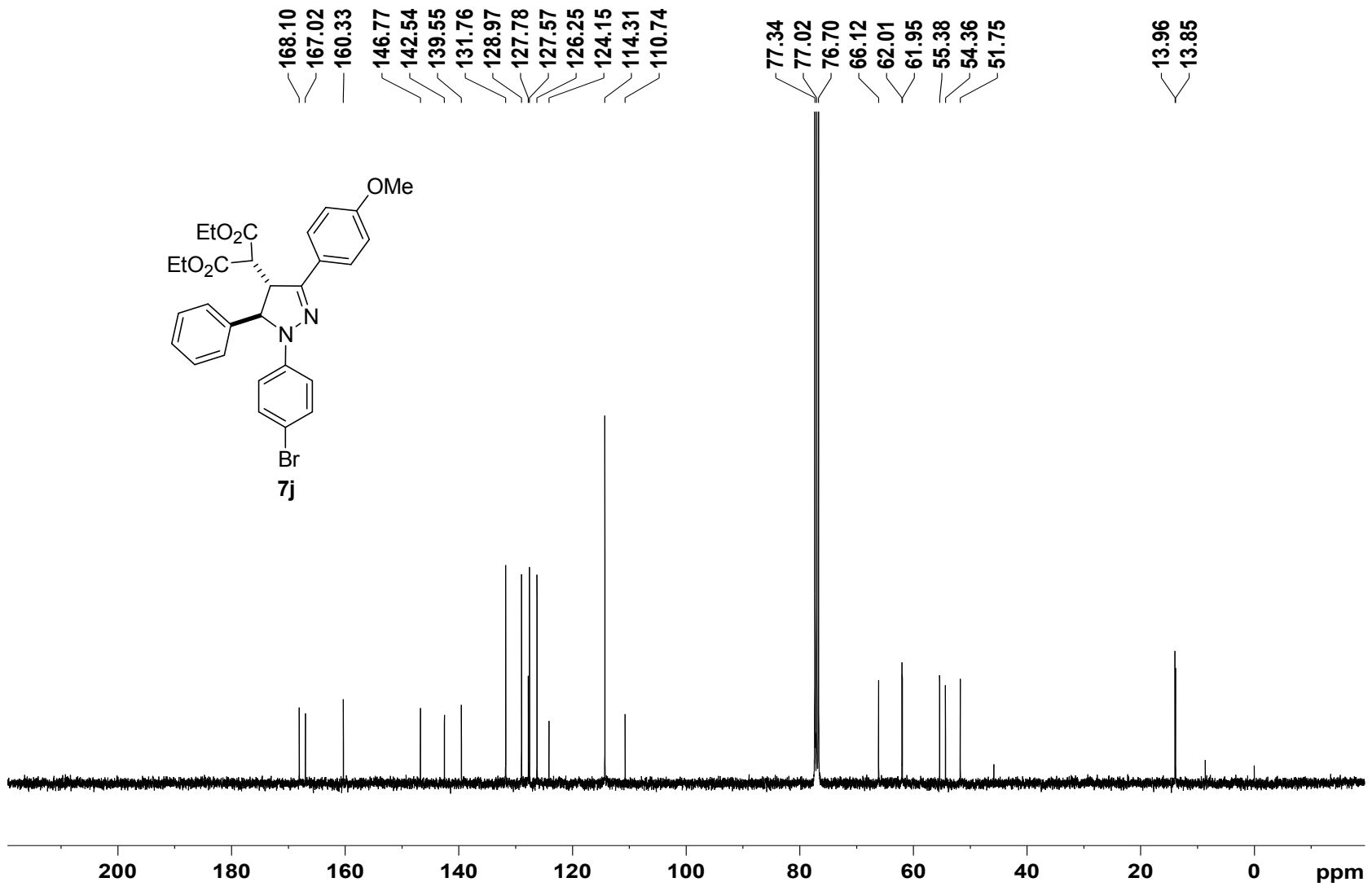
3.04
3.02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160.33
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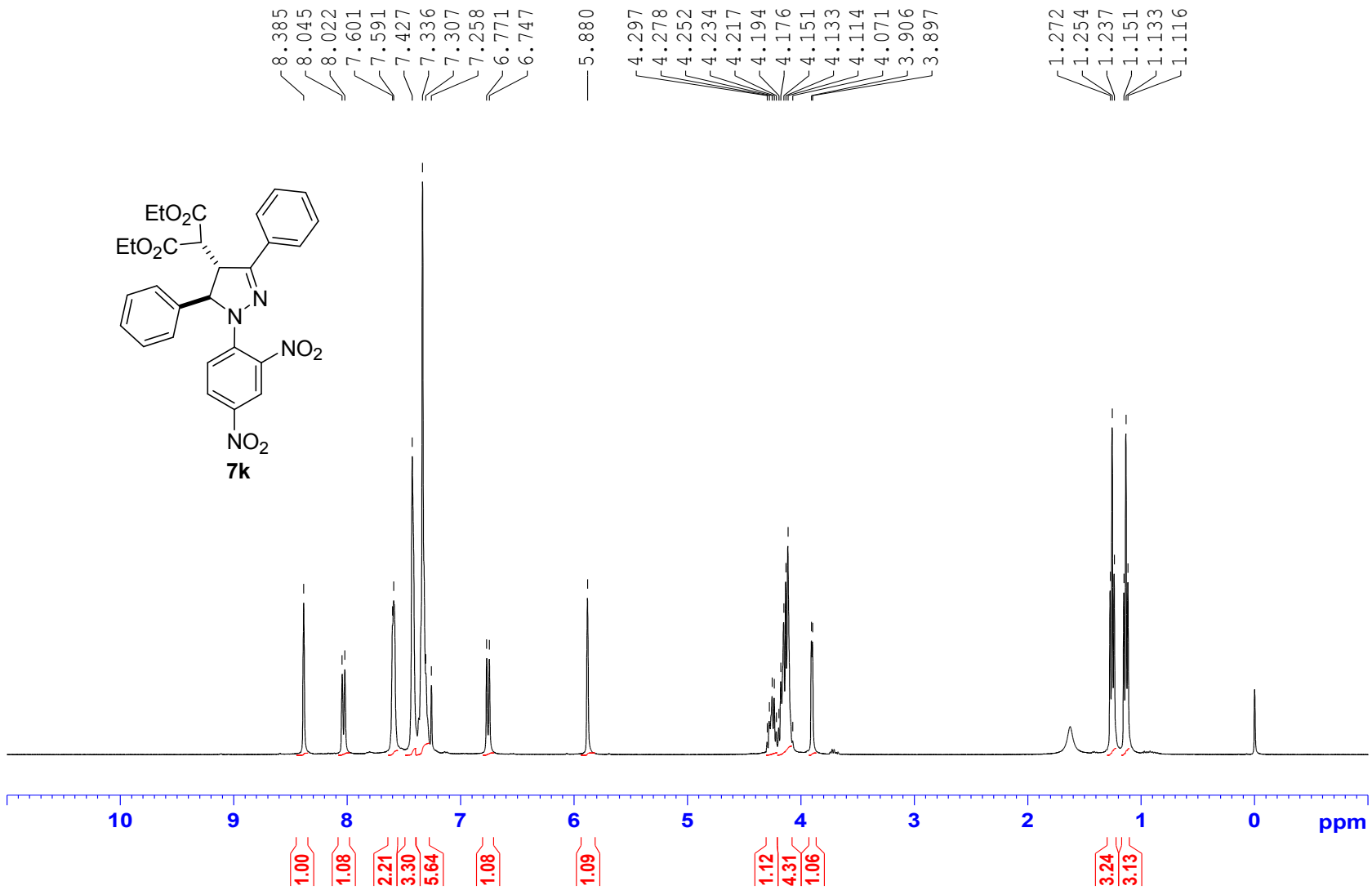
139.55
131.76
128.97
127.78
127.57
126.25
124.15
114.31
110.74
77.34
77.02
76.70
66.12
62.01
61.95
55.38
54.36
51.75
13.96
13.85
OMe
EtO2C
EtO2C
N
N
Br
7j
200
180
160
140
120
100
80
60
40
20
0
ppm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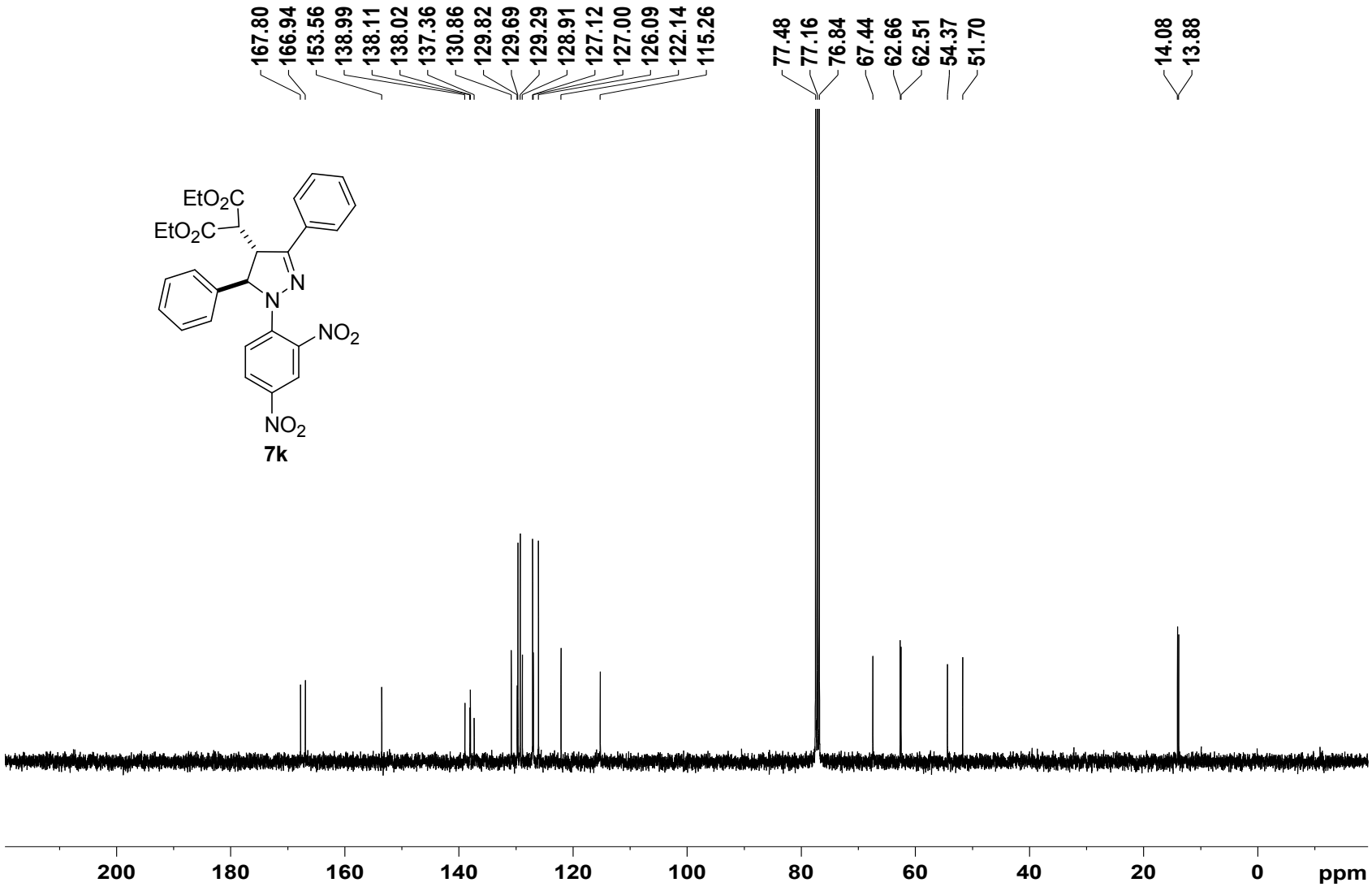
8.045
8.022
7.601
7.591
7.427
7.336
7.307
7.258
6.771
6.747
5.880
4.297
4.278
4.252
4.234
4.217
4.194
4.176
4.151
4.133
4.114
4.071
3.906
3.897
1.272
1.254
1.237
1.151
1.133
1.116
EtO2C
EtO2C
N
N
NO2
NO2
7k
10
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.08
2.21
3.30
5.64
1.08
1.09
1.12
4.31
1.06
3.24
3.13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166.94
153.56
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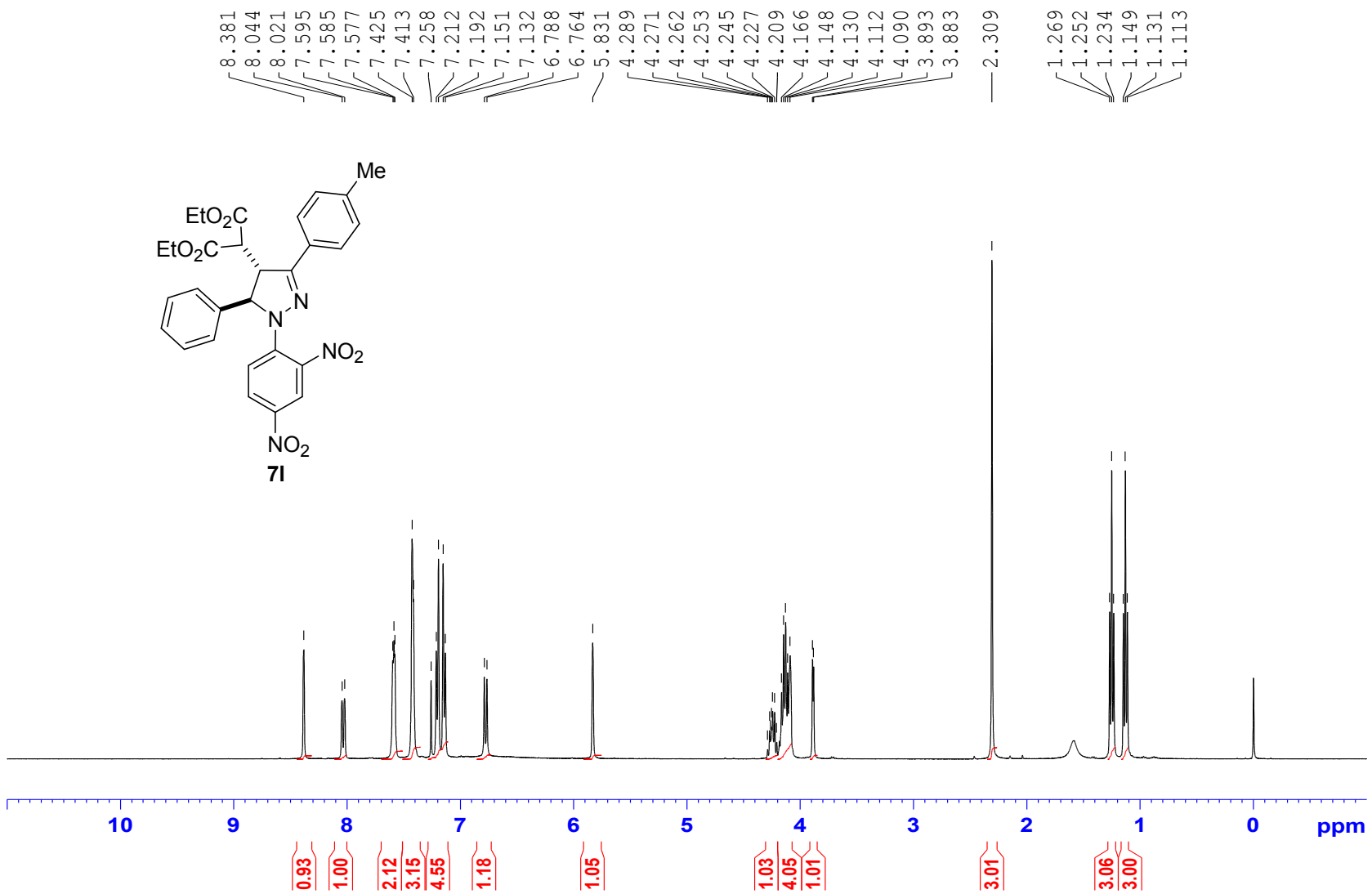
138.11
138.02
137.36
130.86
129.82
129.69
129.29
128.91
127.12
127.00
126.09
122.14
115.26
77.48
77.16
76.84
67.44
62.66
62.51
54.37
51.70
14.08
13.88
EtO2C
EtO2C
N
N
NO2
NO2
7k
200
180
160
140
120
100
80
60
40
20
0
ppm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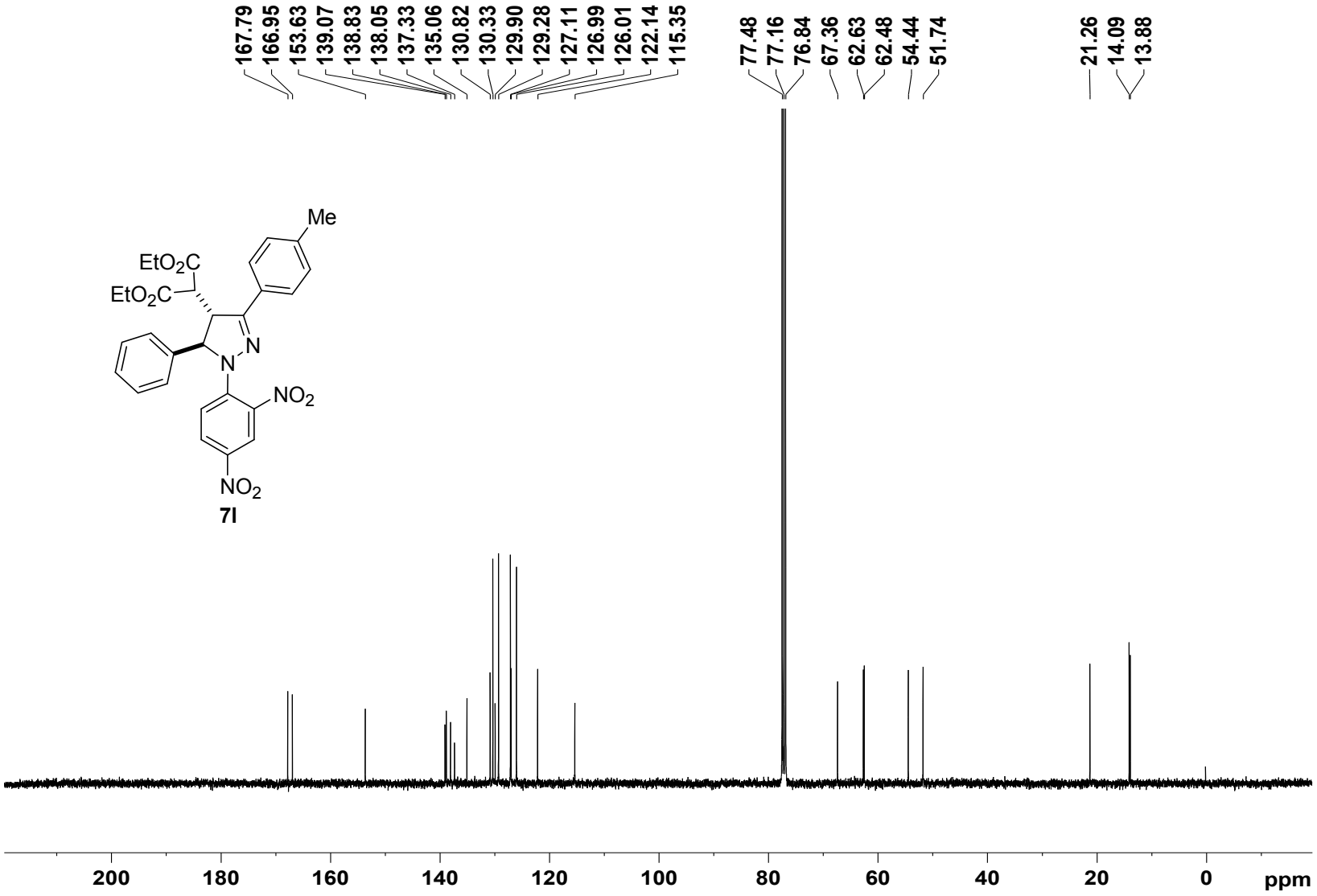
8.044
8.021
7.595
7.585
7.577
7.425
7.413
7.258
7.212
7.192
7.151
7.132
6.788
6.764
5.831
4.289
4.271
4.262
4.253
4.245
4.227
4.209
4.166
4.148
4.130
4.112
4.090
3.893
3.883
2.309
1.269
1.252
1.234
1.149
1.131
1.113
Me
EtO2C
EtO2C
N
N
NO2
NO2
7l
10
9
8
7
6
5
4
3
2
1
0
ppm
0.93
1.00
2.12
3.15
4.55
1.18
1.05
1.03
4.05
1.01
3.01
3.06
3.00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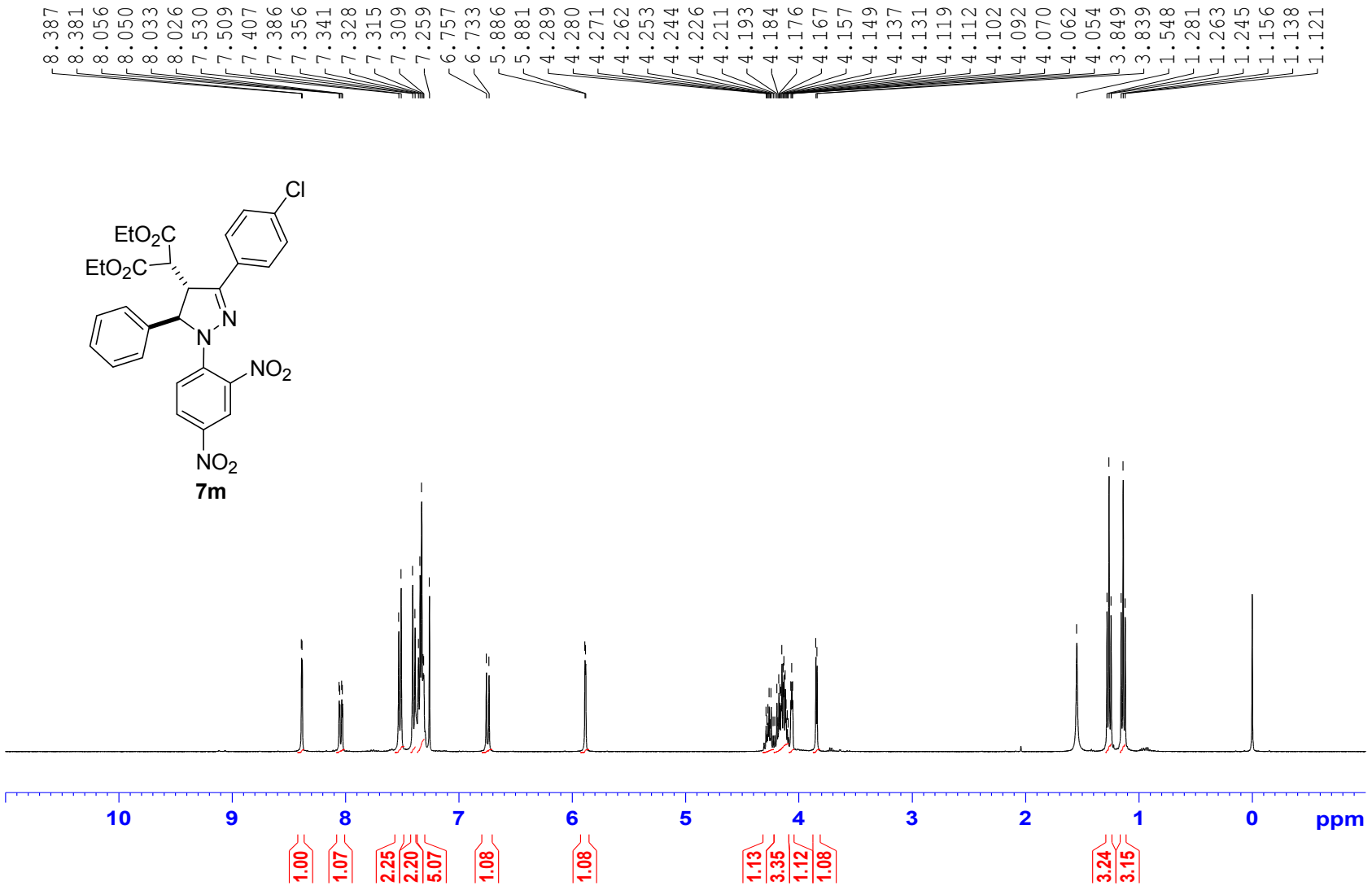
166.95
153.63
139.07
138.83
138.05
137.33
135.06
130.82
130.33
129.90
129.28
127.11
126.99
126.01
122.14
115.35
77.48
77.16
76.84
67.36
62.63
62.48
54.44
51.74
21.26
14.09
13.88
Me
EtO2C
EtO2C
N
N
NO2
NO2
7l
200
180
160
140
120
100
80
60
40
20
0
ppm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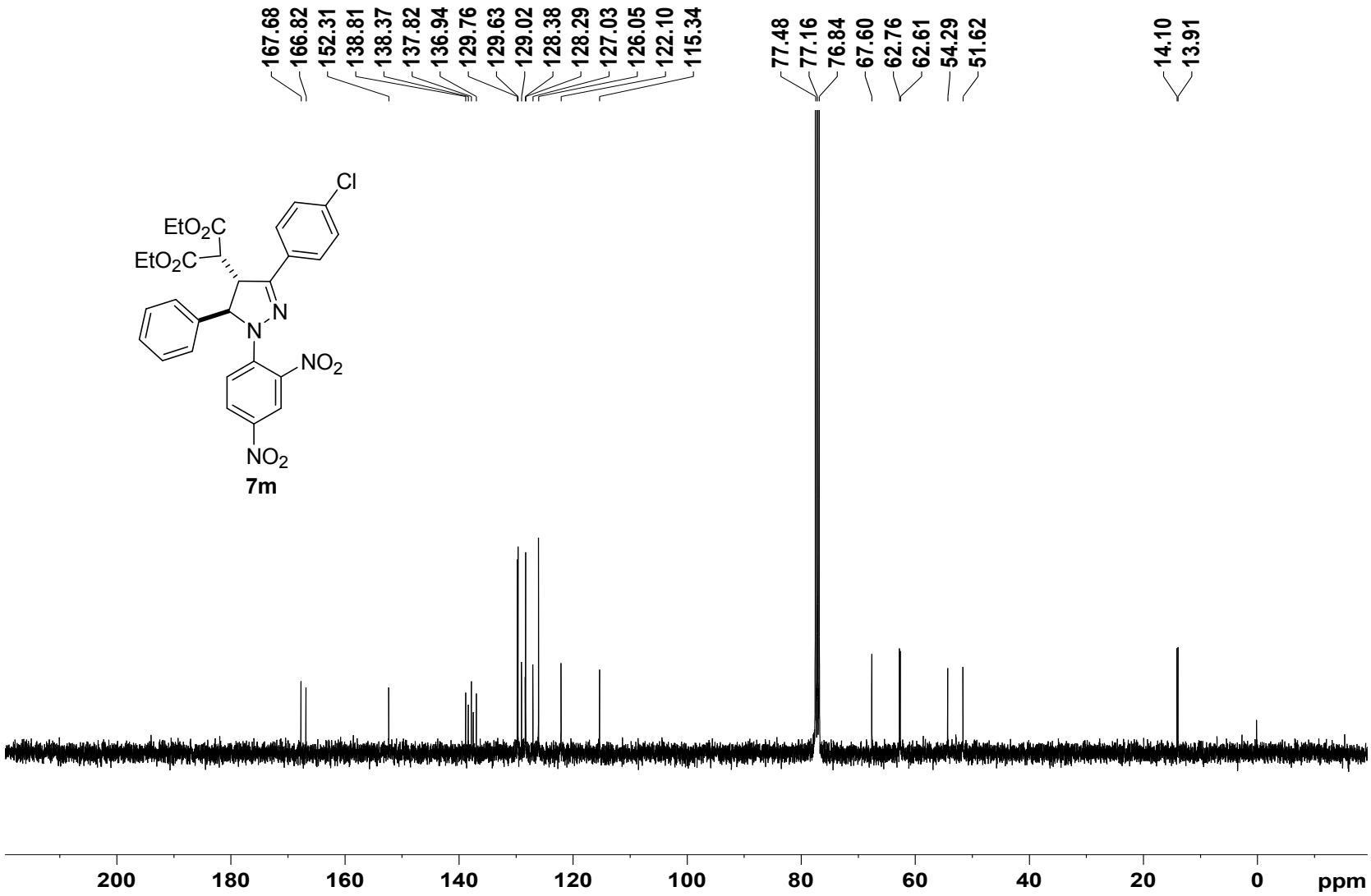
8.381
8.056
8.050
8.033
8.026
7.530
7.509
7.407
7.386
7.356
7.341
7.328
7.315
7.309
7.259
6.757
6.733
5.886
5.881
4.289
4.280
4.271
4.262
4.253
4.244
4.226
4.211
4.193
4.184
4.176
4.167
4.157
4.149
4.137
4.131
4.119
4.112
4.102
4.092
4.070
4.062
4.054
3.849
3.839
1.548
1.281
1.263
1.245
1.156
1.138
1.121
Cl
EtO2C
EtO2C
N
N
NO2
NO2
7m
10
9
8
7
6
5
4
3
2
1
0
ppm
1.00
1.07
2.25
2.20
5.07
1.08
1.08
1.13
3.35
1.12
1.08
3.24
3.15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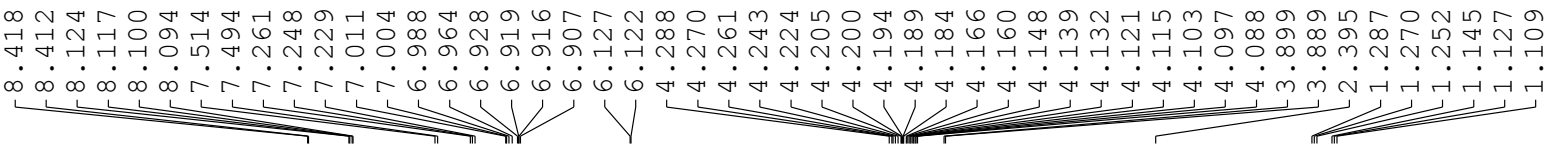
166.82
152.31
138.81
138.37
137.82
136.94
129.76
129.63
129.02
128.38
128.29
127.03
126.05
122.10
115.34
77.48
77.16
76.84
67.60
62.76
62.61
54.29
51.62
14.10
13.91
Cl
EtO2C
EtO2C
N
N
NO2
NO2
7m
200
180
160
140
120
100
80
60
40
20
0
ppm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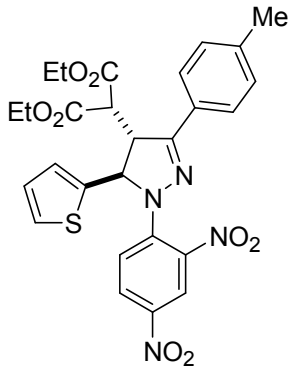
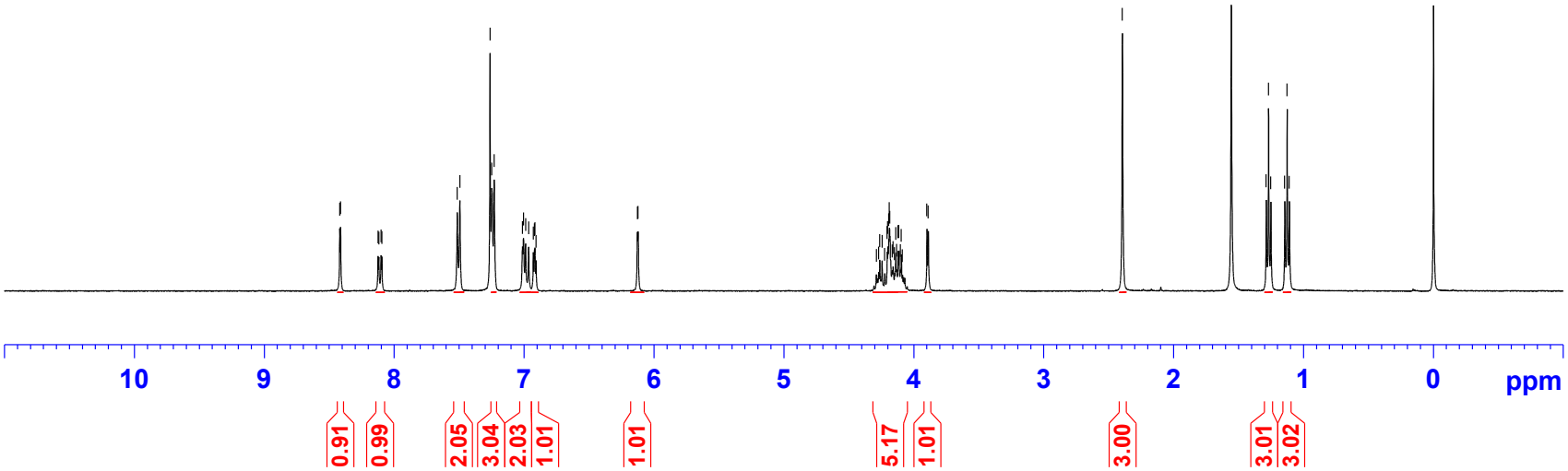
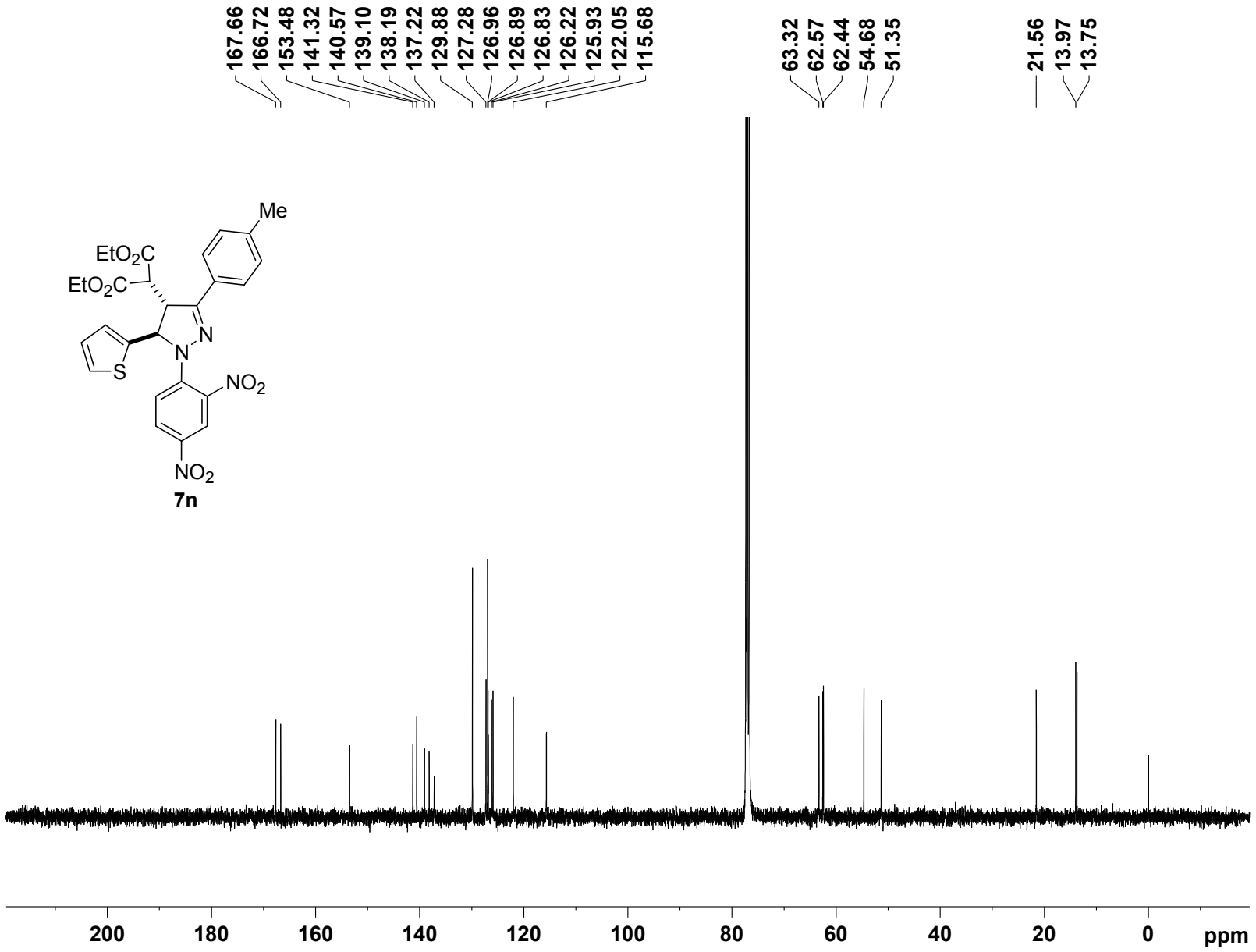
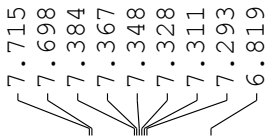
8.412
8.124
8.117
8.100
8.094
7.514
7.494
7.261
7.248
7.229
7.011
7.004
6.988
6.964
6.928
6.919
6.916
6.907
6.127
6.122
4.288
4.270
4.261
4.243
4.224
4.205
4.200
4.194
4.189
4.184
4.166
4.160
4.148
4.139
4.132
4.121
4.115
4.103
4.097
4.088
3.899
3.889
2.395
1.287
1.270
1.252
1.145
1.127
1.109

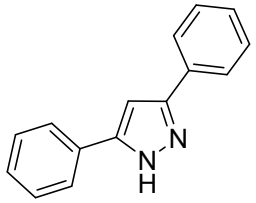

Me
EtO2C
EtO2C
N
N
S
NO2
NO2

7n

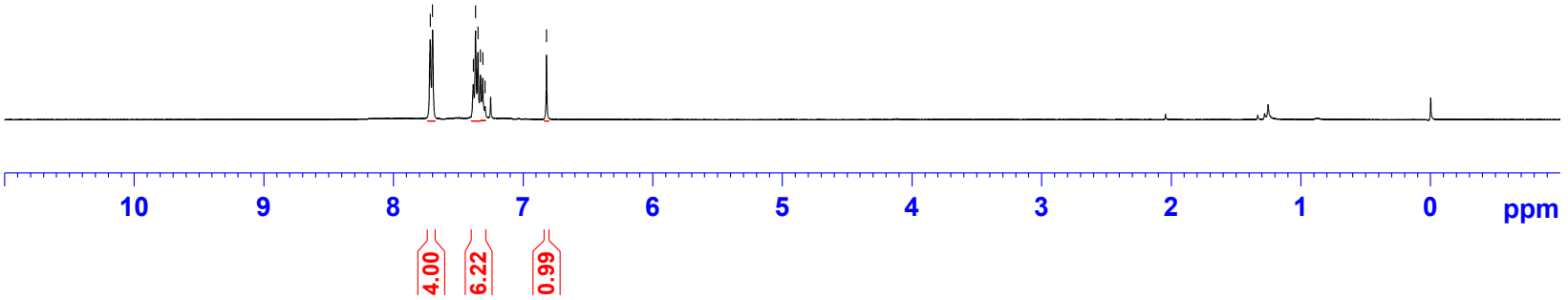

10
9
8
7
6
5
4
3
2
1
0
ppm
0.91
0.99
2.05
3.04
2.03
1.01
1.01
5.17
1.01
3.00
3.01
3.02

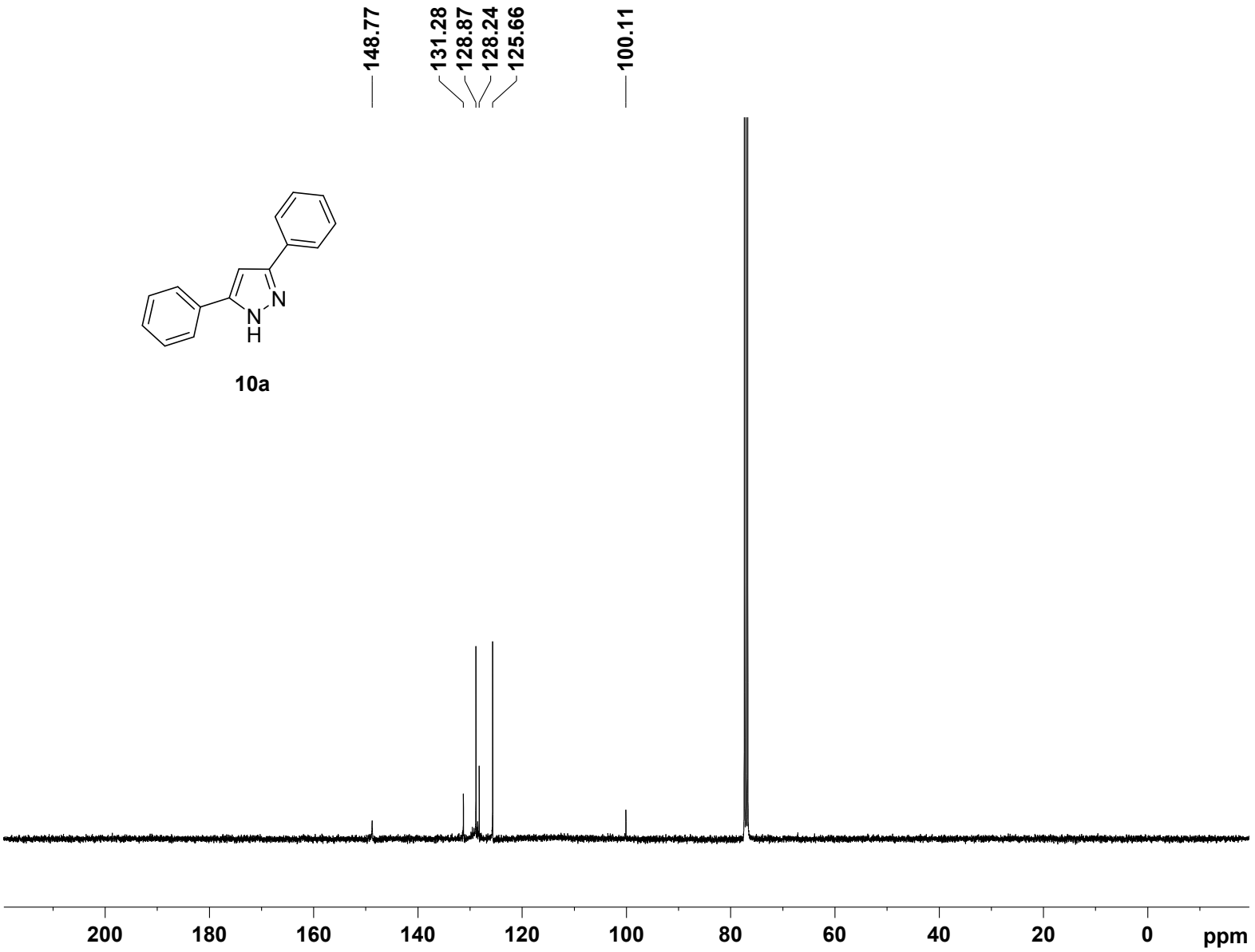

167.66
166.72
153.48
141.32
140.57
139.10
138.19
137.22
129.88
127.28
126.96
126.89
126.83
126.22
125.93
122.05
115.68
63.32
62.57
62.44
54.68
51.35
21.56
13.97
13.75
Me
EtO2C
EtO2C
N
N
S
NO2
NO2
7n
200
180
160
140
120
100
80
60
40
20
0
ppm

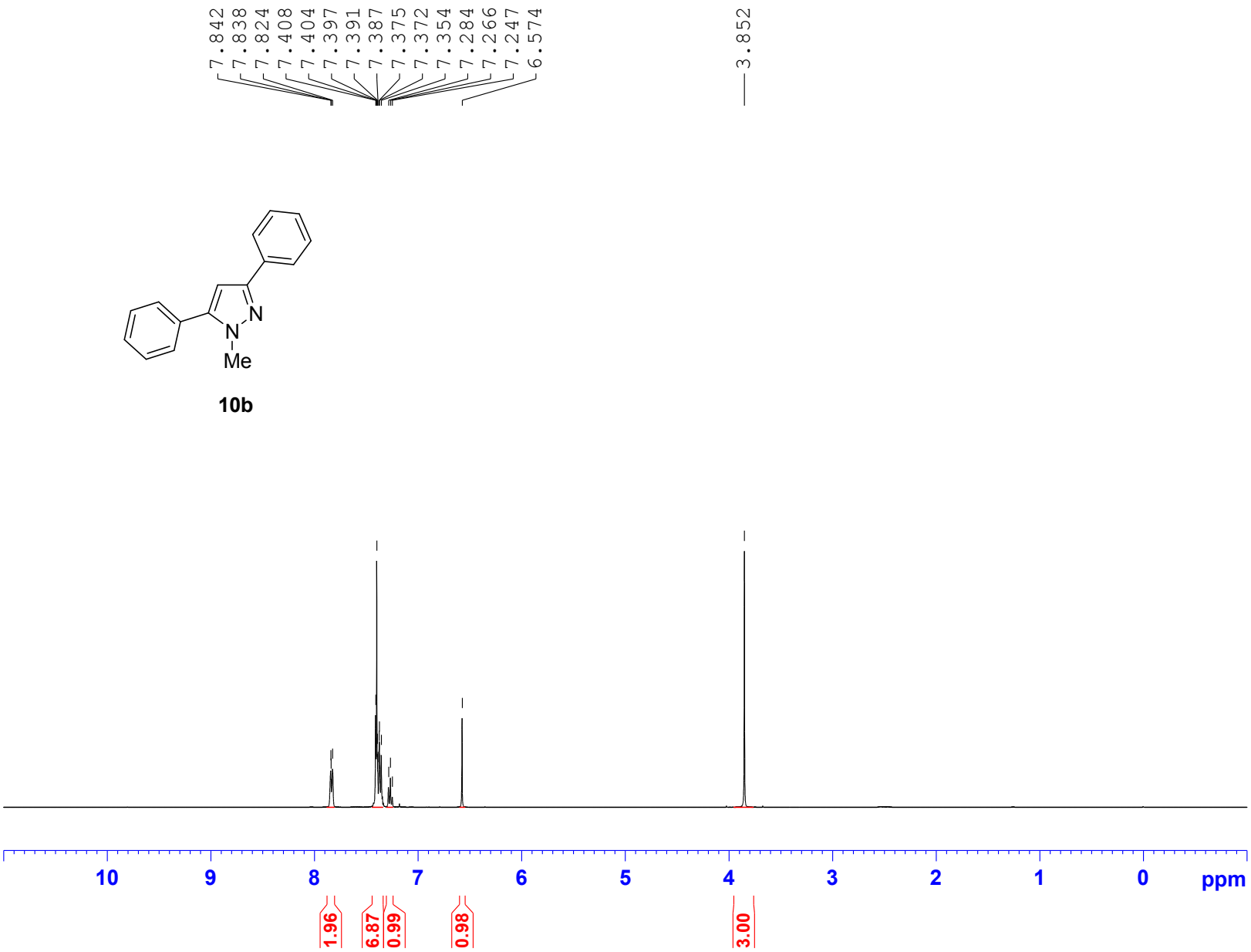

7.715
7.698
7.384
7.367
7.348
7.328
7.311
7.293
6.819


N
N
H

10a


10
9
8
7
6
5
4
3
2
1
0
ppm
4.00
6.22
0.99


148.77
131.28
128.87
128.24
125.66
100.11
N
N
H
10a
200
180
160
140
120
100
80
60
40
20
0
ppm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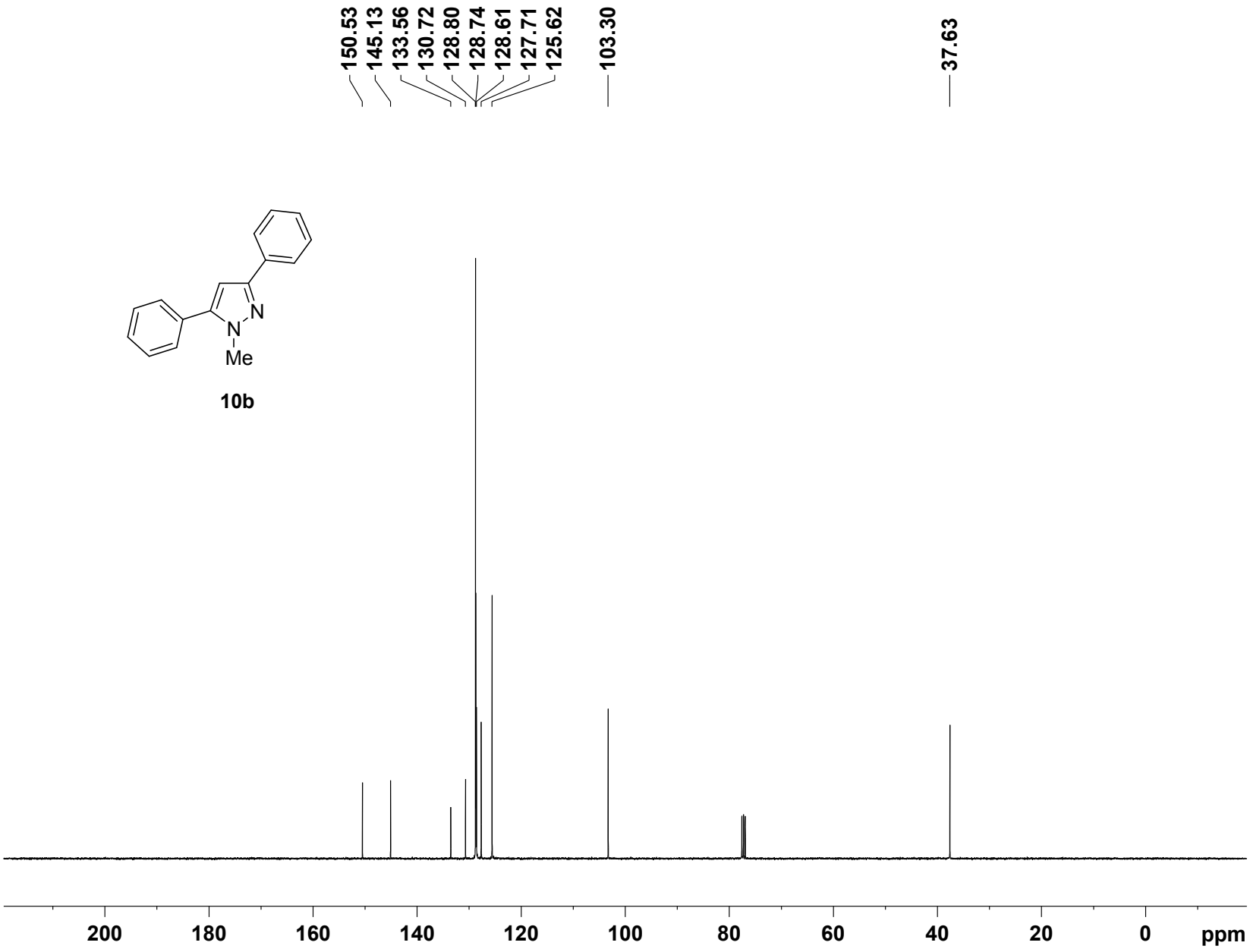
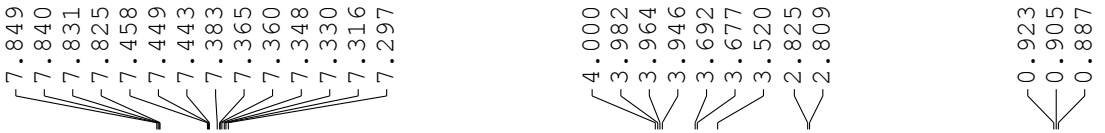
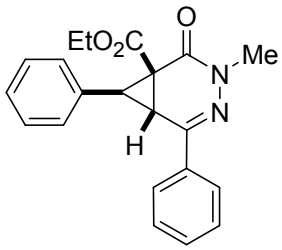
7.838
7.824
7.408
7.404
7.397
7.391
7.387
7.375
7.372
7.354
7.284
7.266
7.247
6.574
3.852
N
N
Me
10
9
8
7
6
5
4
3
2
1
0
ppm
1.96
6.87
0.99
0.98
3.00

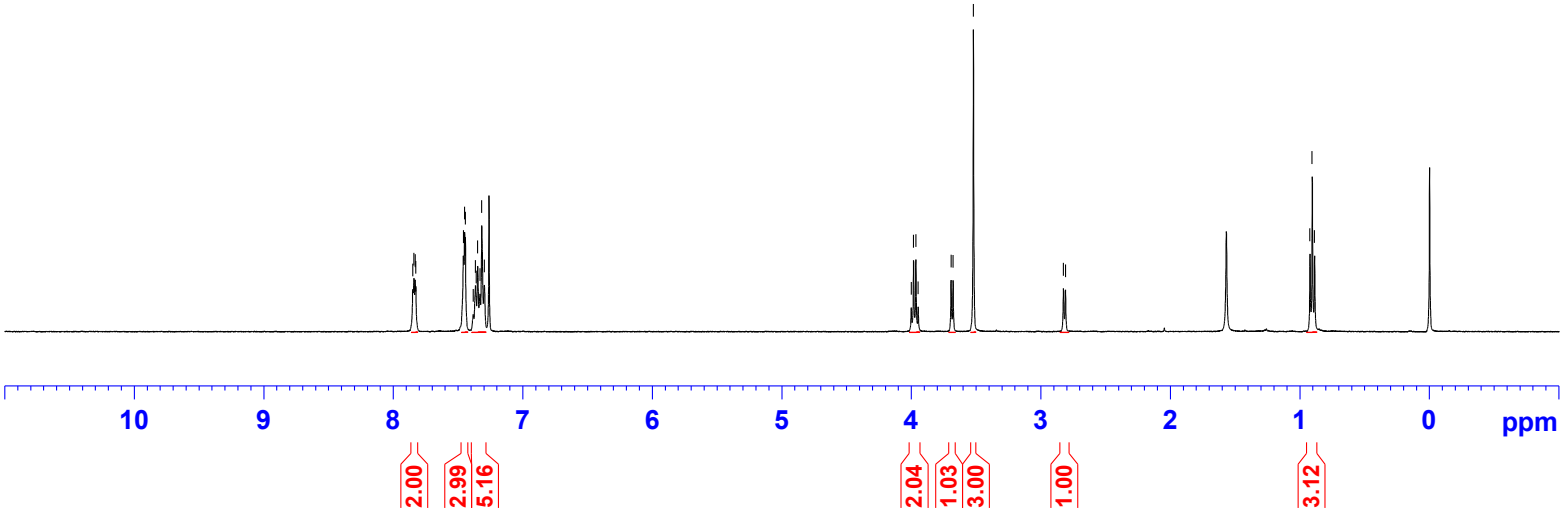
10b

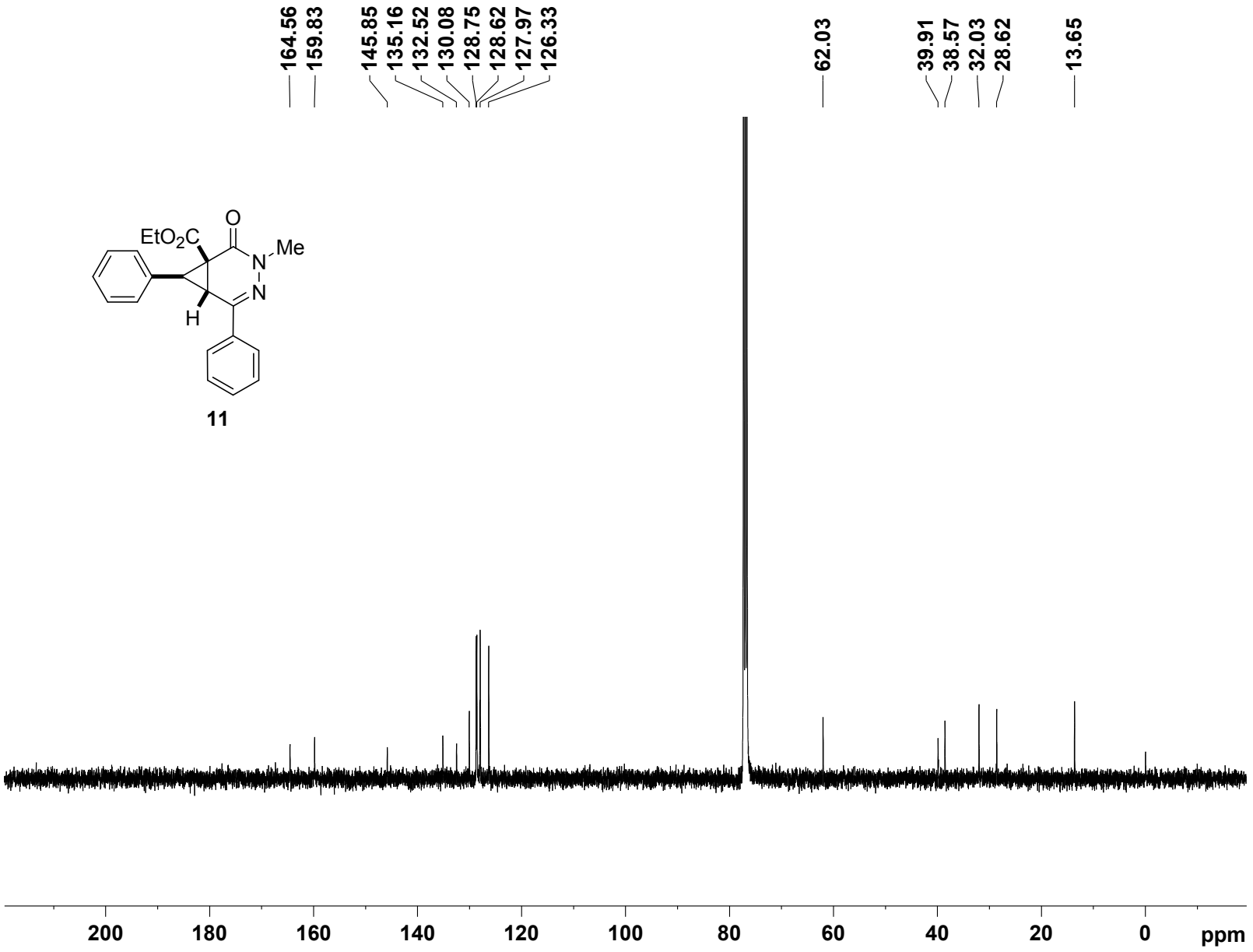

150.53
145.13
133.56
130.72
128.80
128.74
128.61
127.71
125.62
103.30
37.63
N
N
Me
10b
200
180
160
140
120
100
80
60
40
20
0
ppm

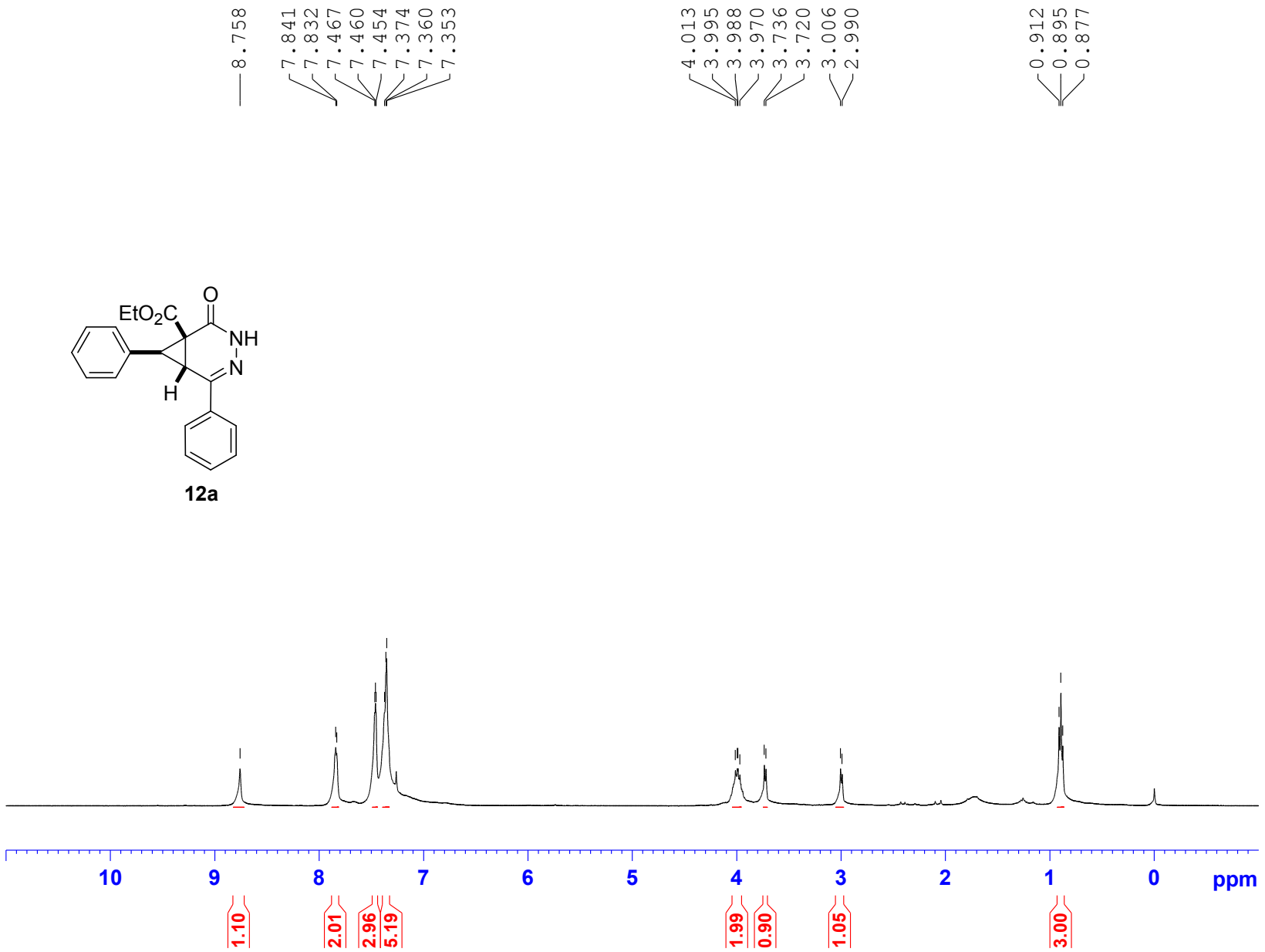

7.849
7.840
7.831
7.825
7.458
7.449
7.443
7.383
7.365
7.360
7.348
7.330
7.316
7.297
4.000
3.982
3.964
3.946
3.692
3.677
3.520
2.825
2.809
0.923
0.905
0.887


EtO2C
O
Me
N
N
H

11


10
9
8
7
6
5
4
3
2
1
0
ppm
2.00
2.99
5.16
2.04
1.03
3.00
1.00
3.12


164.56
159.83
145.85
135.16
132.52
130.08
128.75
128.62
127.97
126.33
62.03
39.91
38.57
32.03
28.62
13.65
EtO2C
O
N
Me
N
H
11
200
180
160
140
120
100
80
60
40
20
0
ppm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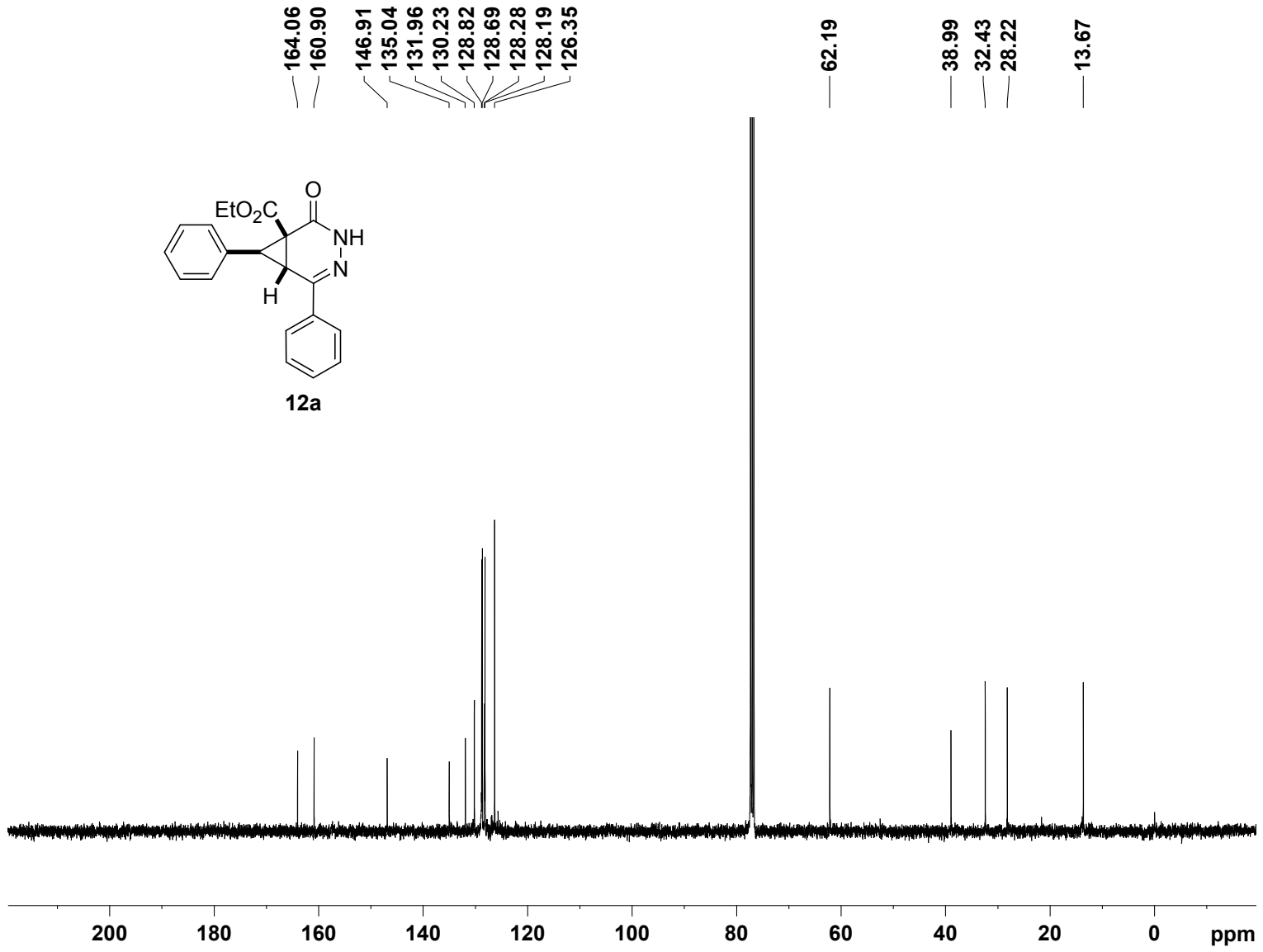
7.832
7.467
7.460
7.454
7.374
7.360
7.353
4.013
3.995
3.988
3.970
3.736
3.720
3.006
2.990
0.912
0.895
0.877
EtO2C
O
NH
N
H
12a
10
9
8
7
6
5
4
3
2
1
0
ppm
1.10
2.01
2.96
5.19
1.99
0.90
1.05
3.00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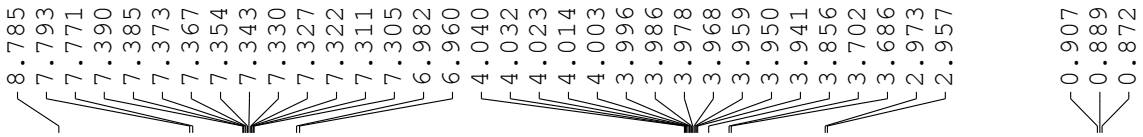
160.90
146.91
135.04
131.96
130.23
128.82
128.69
128.28
128.19
126.35
62.19
38.99
32.43
28.22
13.67
EtO2C
O
NH
N
H
12a
200
180
160
140
120
100
80
60
40
20
0
ppm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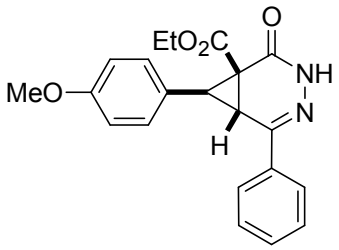
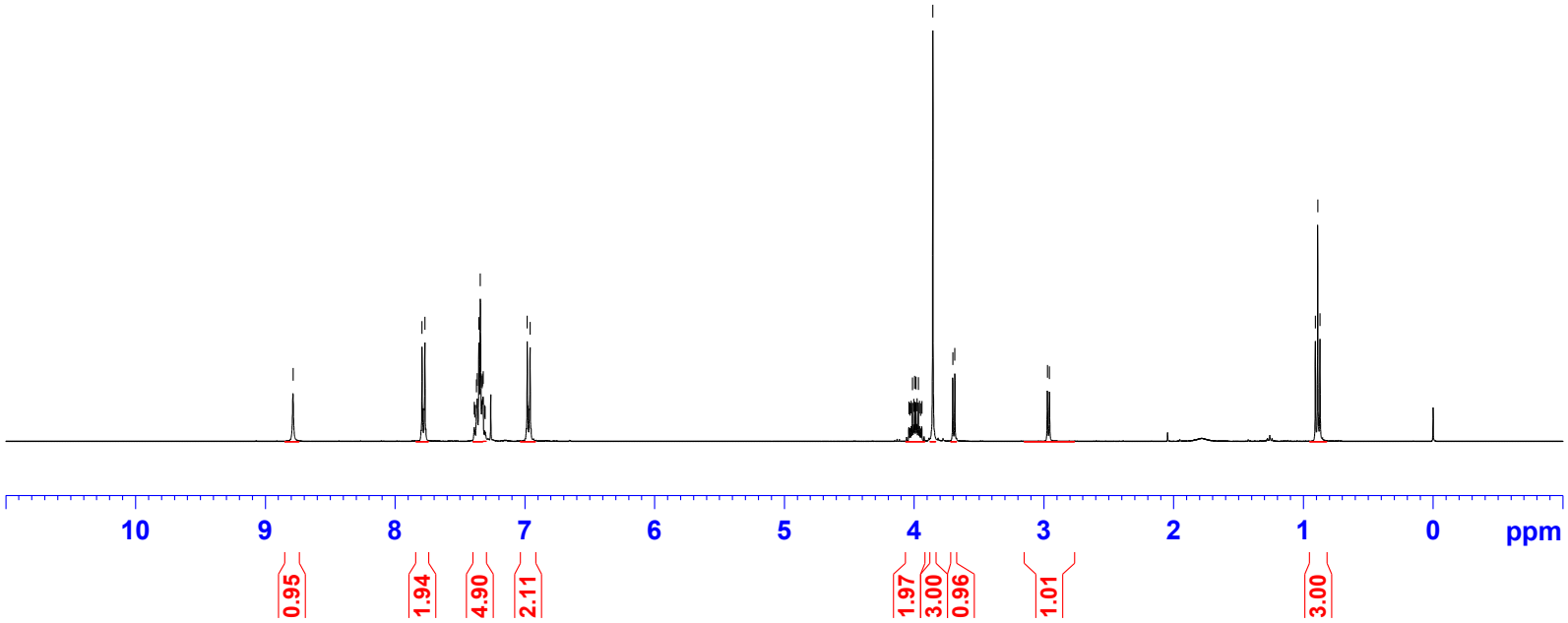
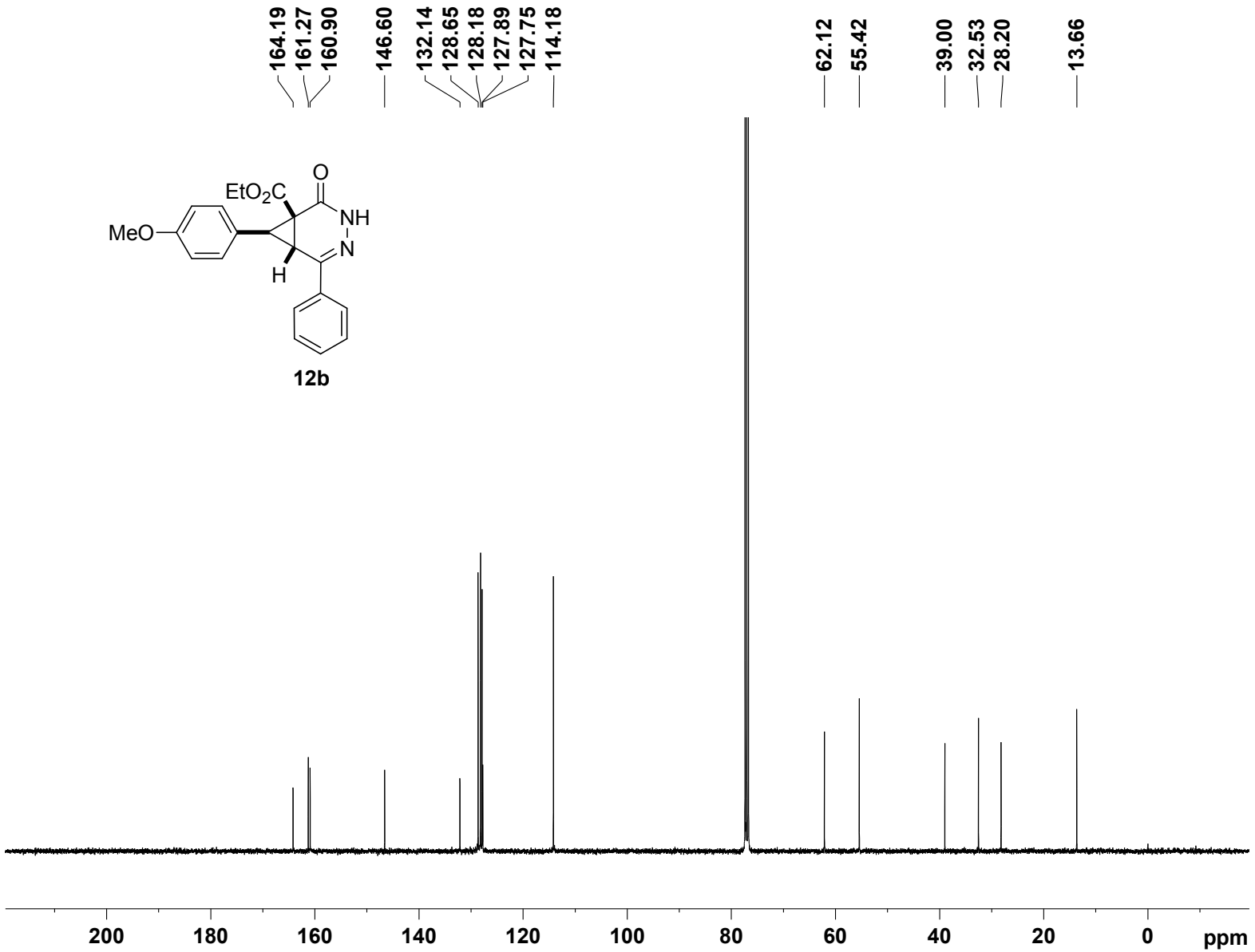
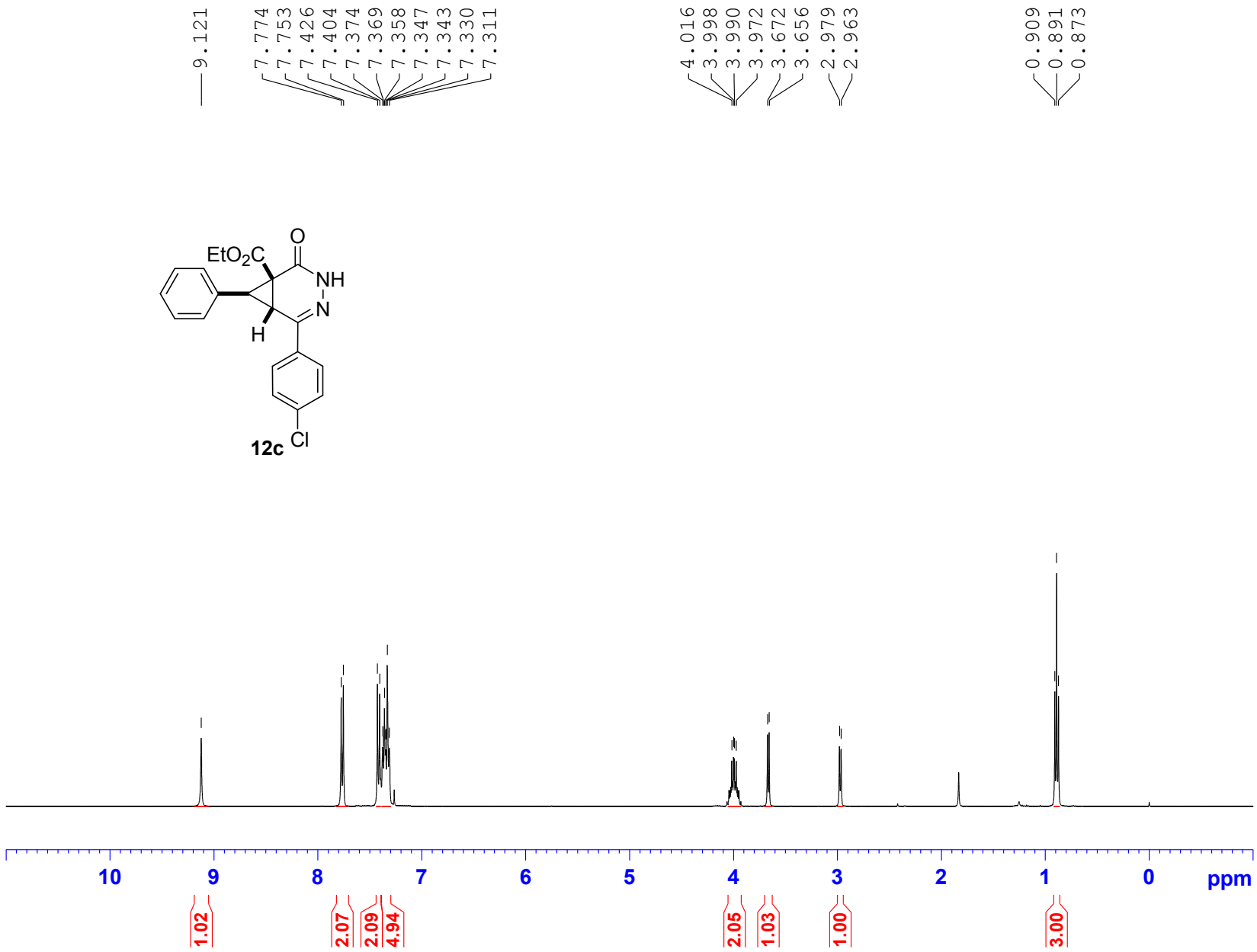
7.771
7.390
7.385
7.373
7.367
7.354
7.343
7.330
7.327
7.322
7.311
7.305
6.982
6.960
4.040
4.032
4.023
4.014
4.003
3.996
3.986
3.978
3.968
3.959
3.950
3.941
3.856
3.702
3.686
2.973
2.957
0.907
0.889
0.872

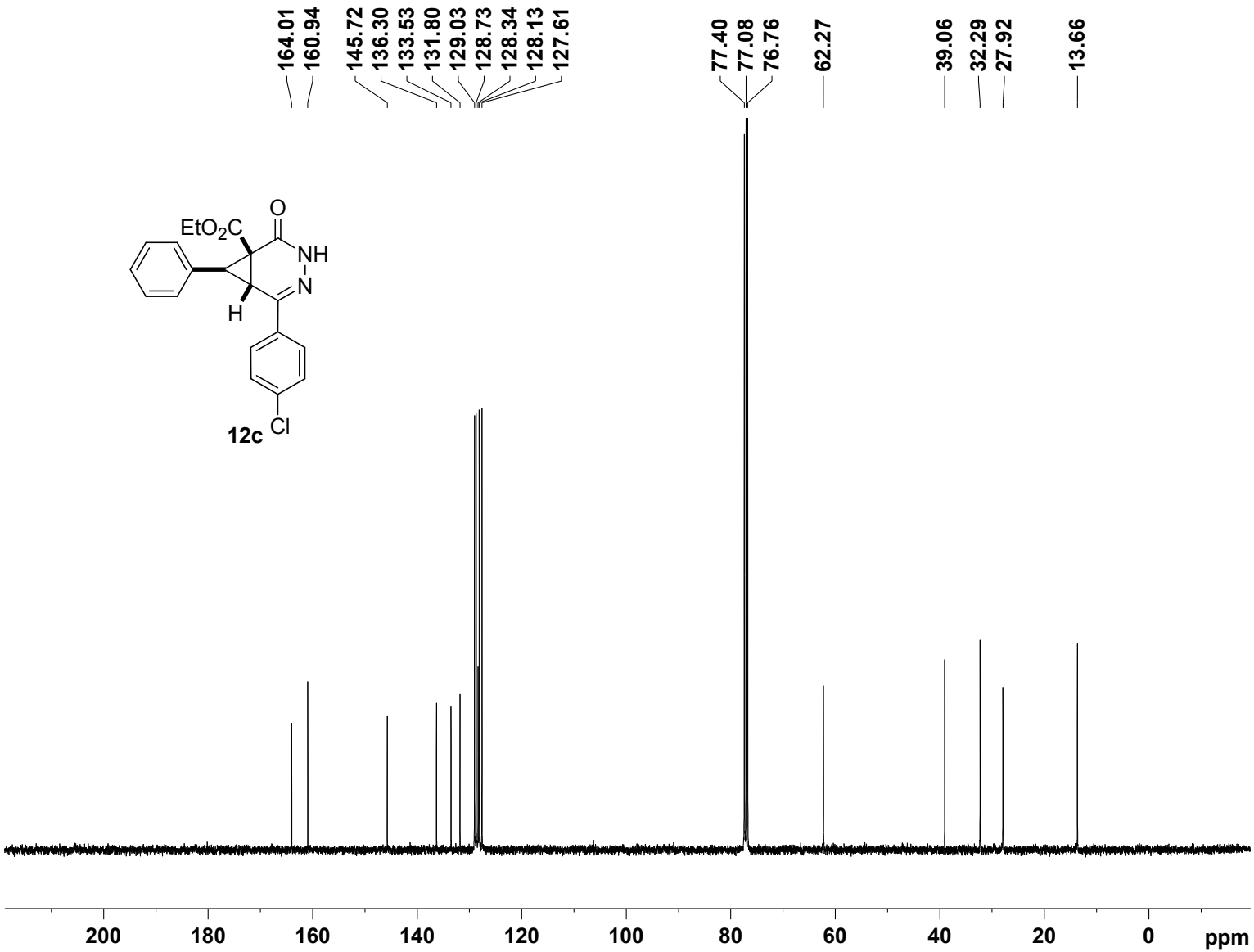

EtO2C
O
NH
N
MeO
H

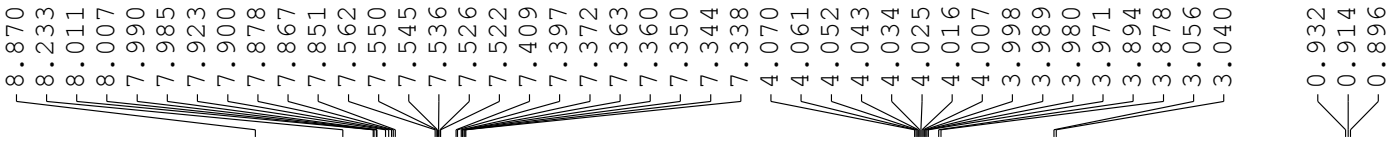
12b


10
9
8
7
6
5
4
3
2
1
0
ppm
0.95
1.94
4.90
2.11
1.97
3.00
0.96
1.01
3.00


164.19
161.27
160.90
146.60
132.14
128.65
128.18
127.89
127.75
114.18
62.12
55.42
39.00
32.53
28.20
13.66
EtO2C
O
NH
N
MeO
H
12b
200
180
160
140
120
100
80
60
40
20
0
ppm


9.121
7.774
7.753
7.426
7.404
7.374
7.369
7.358
7.347
7.343
7.330
7.311
4.016
3.998
3.990
3.972
3.672
3.656
2.979
2.963
0.909
0.891
0.873
EtO2C
O
NH
N
H
Cl
12c
10
9
8
7
6
5
4
3
2
1
0
ppm
1.02
2.07
2.09
4.94
2.05
1.03
1.00
3.00


164.01
160.94
145.72
136.30
133.53
131.80
129.03
128.73
128.34
128.13
127.61
77.40
77.08
76.76
62.27
39.06
32.29
27.92
13.66
EtO2C
O
NH
N
H
Cl
12c
200
180
160
140
120
100
80
60
40
20
0
ppm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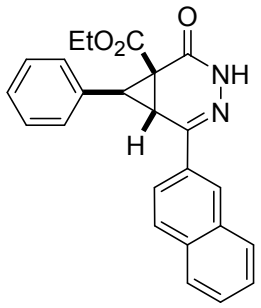
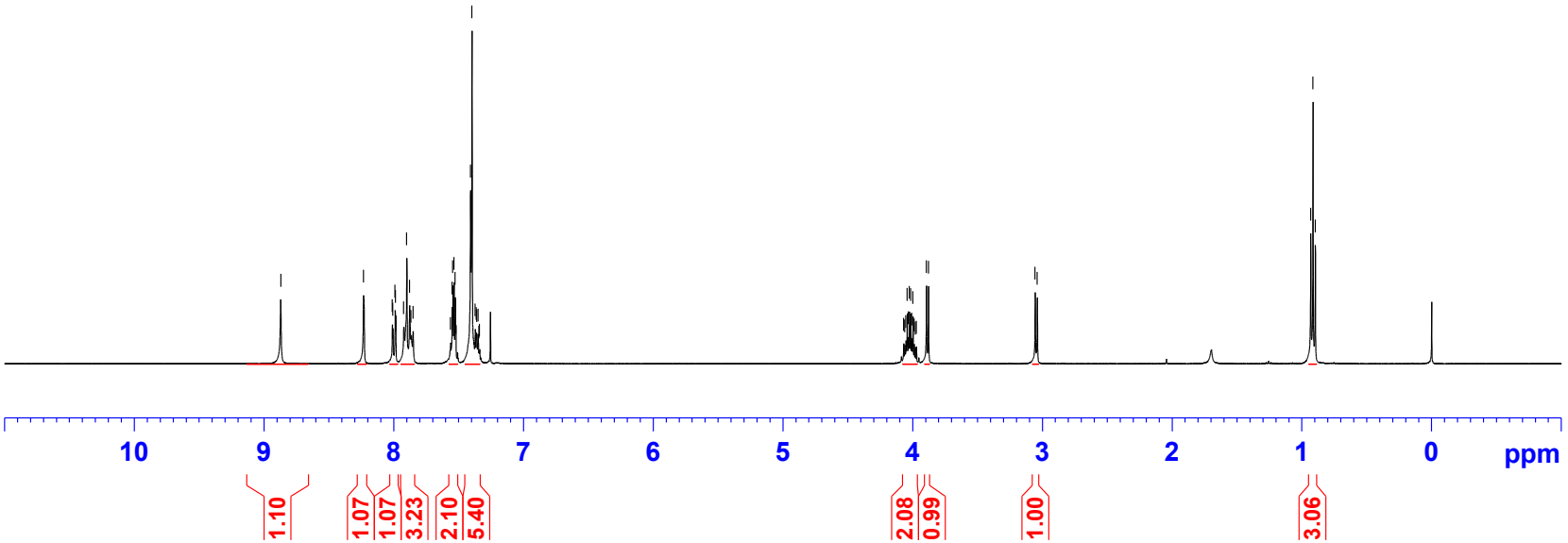
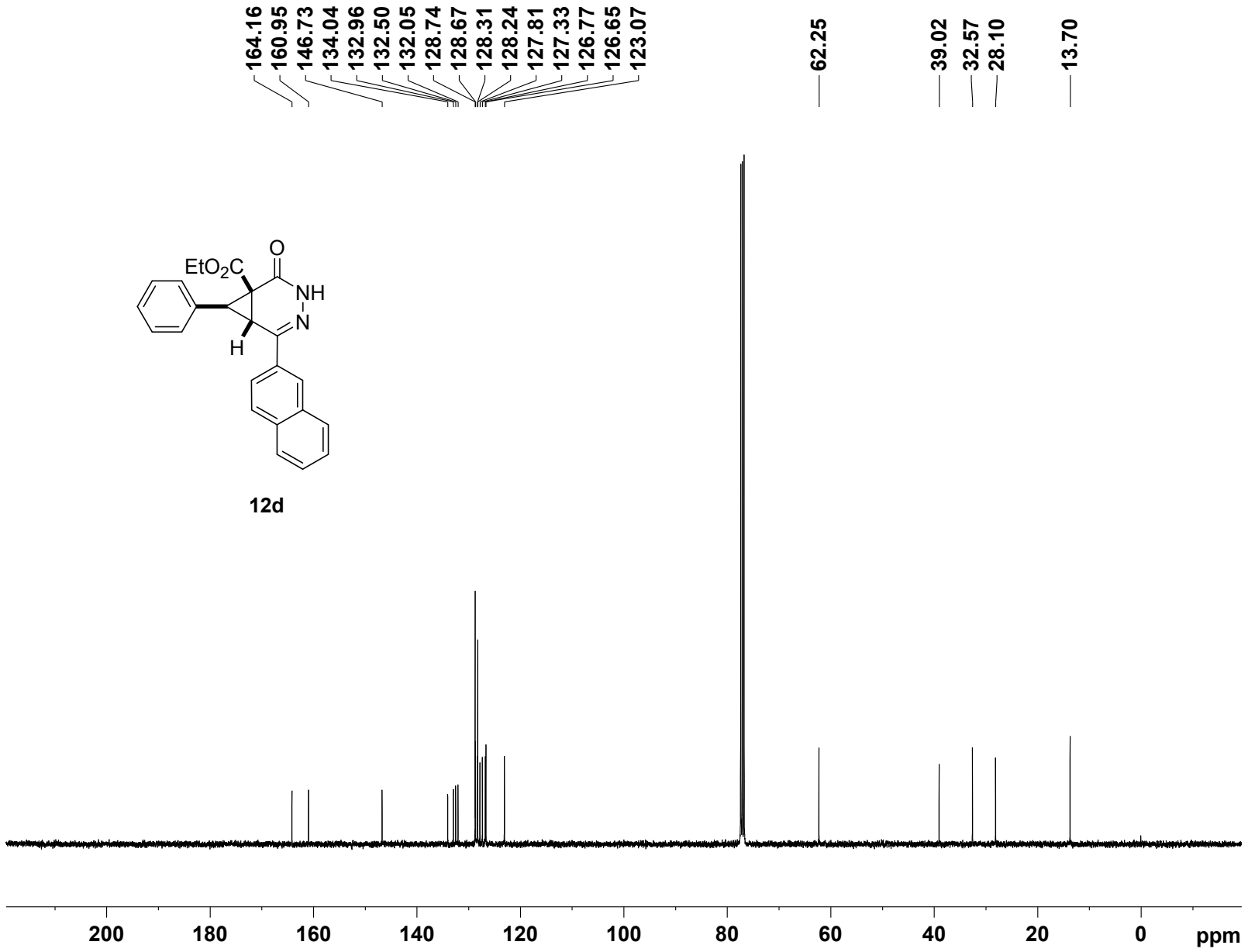
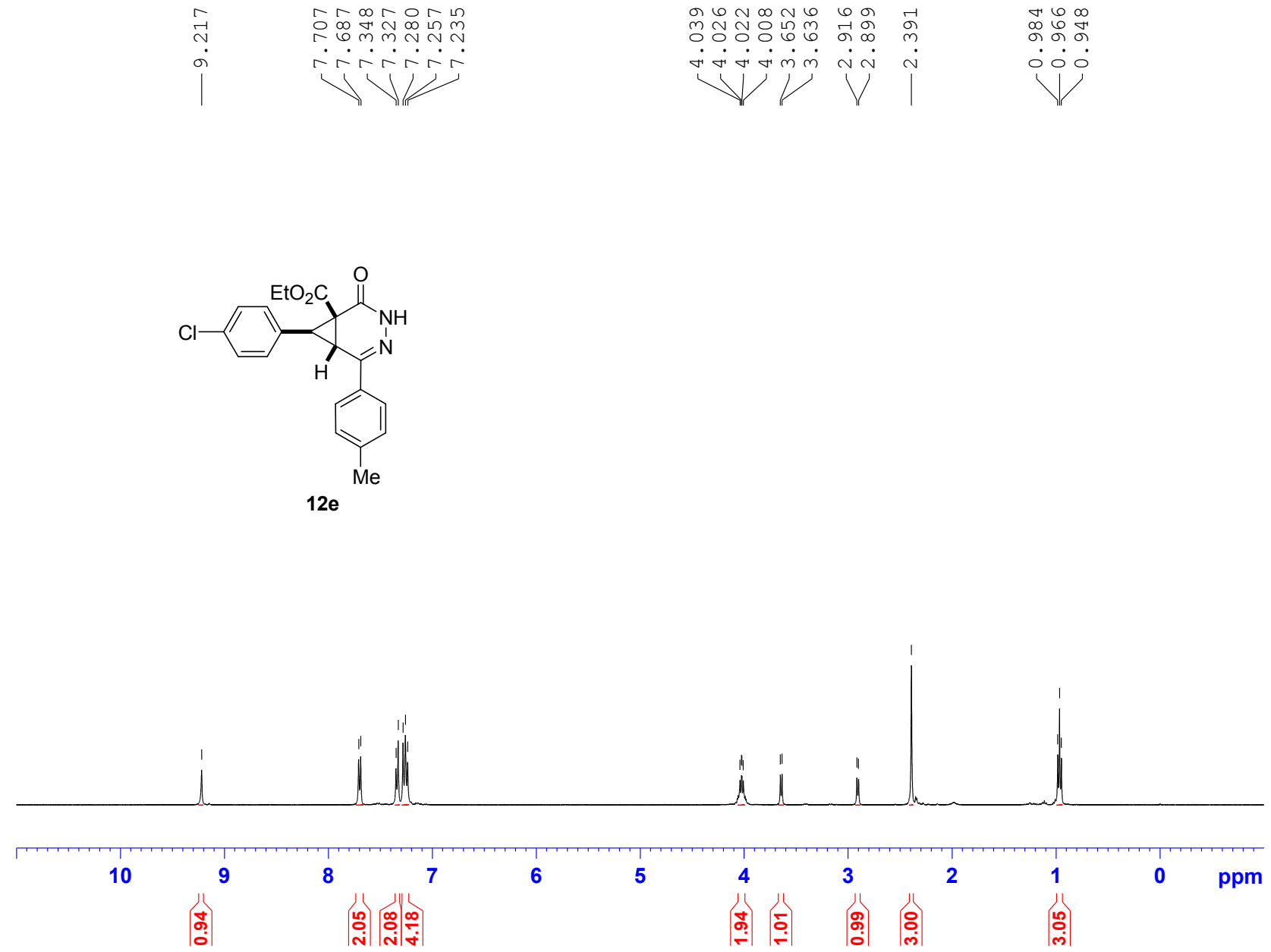
8.233
8.011
8.007
7.990
7.985
7.923
7.900
7.878
7.867
7.851
7.562
7.550
7.545
7.536
7.526
7.522
7.409
7.397
7.372
7.363
7.360
7.350
7.344
7.338
4.070
4.061
4.052
4.043
4.034
4.025
4.016
4.007
3.998
3.989
3.980
3.971
3.894
3.878
3.056
3.040
0.932
0.914
0.896


EtO2C
O
NH
N
H

12d


10
9
8
7
6
5
4
3
2
1
0
ppm
1.10
1.07
1.07
3.23
2.10
5.40
2.08
0.99
1.00
3.06


164.16
160.95
146.73
134.04
132.96
132.50
132.05
128.74
128.67
128.31
128.24
127.81
127.33
126.77
126.65
123.07
62.25
39.02
32.57
28.10
13.70
EtO2C
O
NH
N
H
12d
200
180
160
140
120
100
80
60
40
20
0
ppm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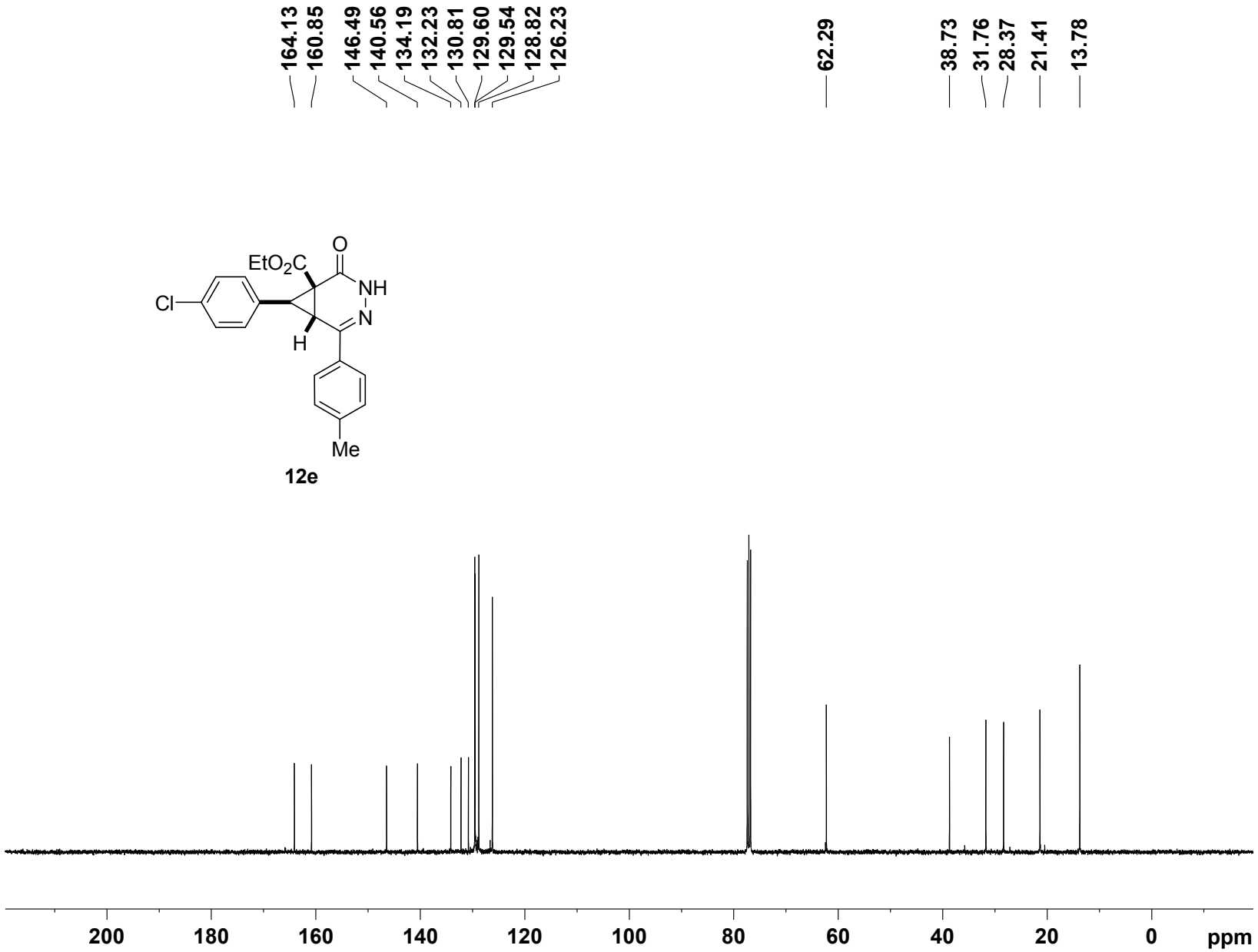
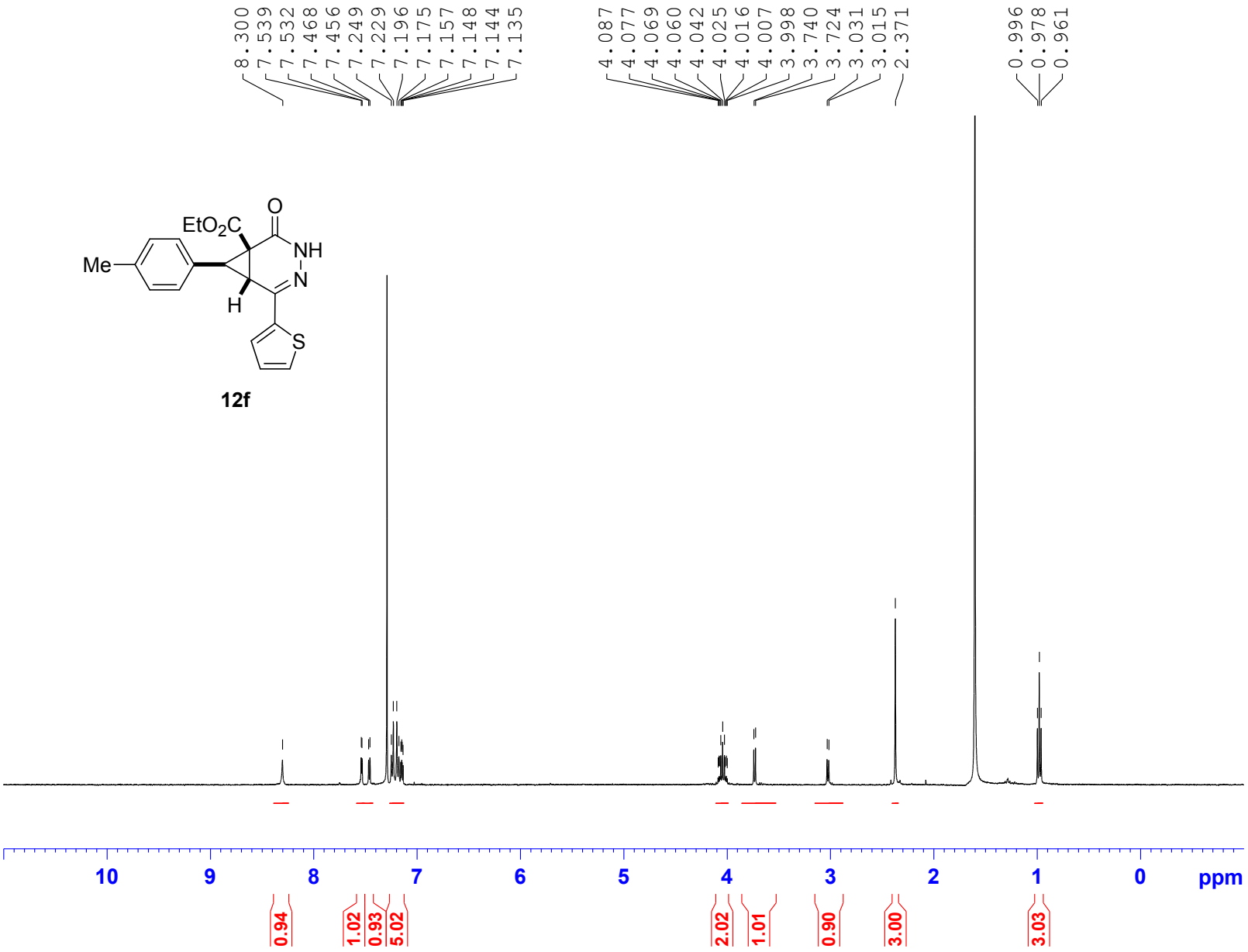
7.687
7.348
7.327
7.280
7.257
7.235
4.039
4.026
4.022
4.008
3.652
3.636
2.916
2.899
2.391
0.984
0.966
0.948
EtO2C
O
NH
N
Cl
H
Me
12e
10
9
8
7
6
5
4
3
2
1
0
ppm
0.94
2.05
2.08
4.18
1.94
1.01
0.99
3.00
3.05


164.13
160.85
146.49
140.56
134.19
132.23
130.81
129.60
129.54
128.82
126.23
62.29
38.73
31.76
28.37
21.41
13.78
EtO2C
O
NH
N
Cl
H
Me
12e
200
180
160
140
120
100
80
60
40
20
0
ppm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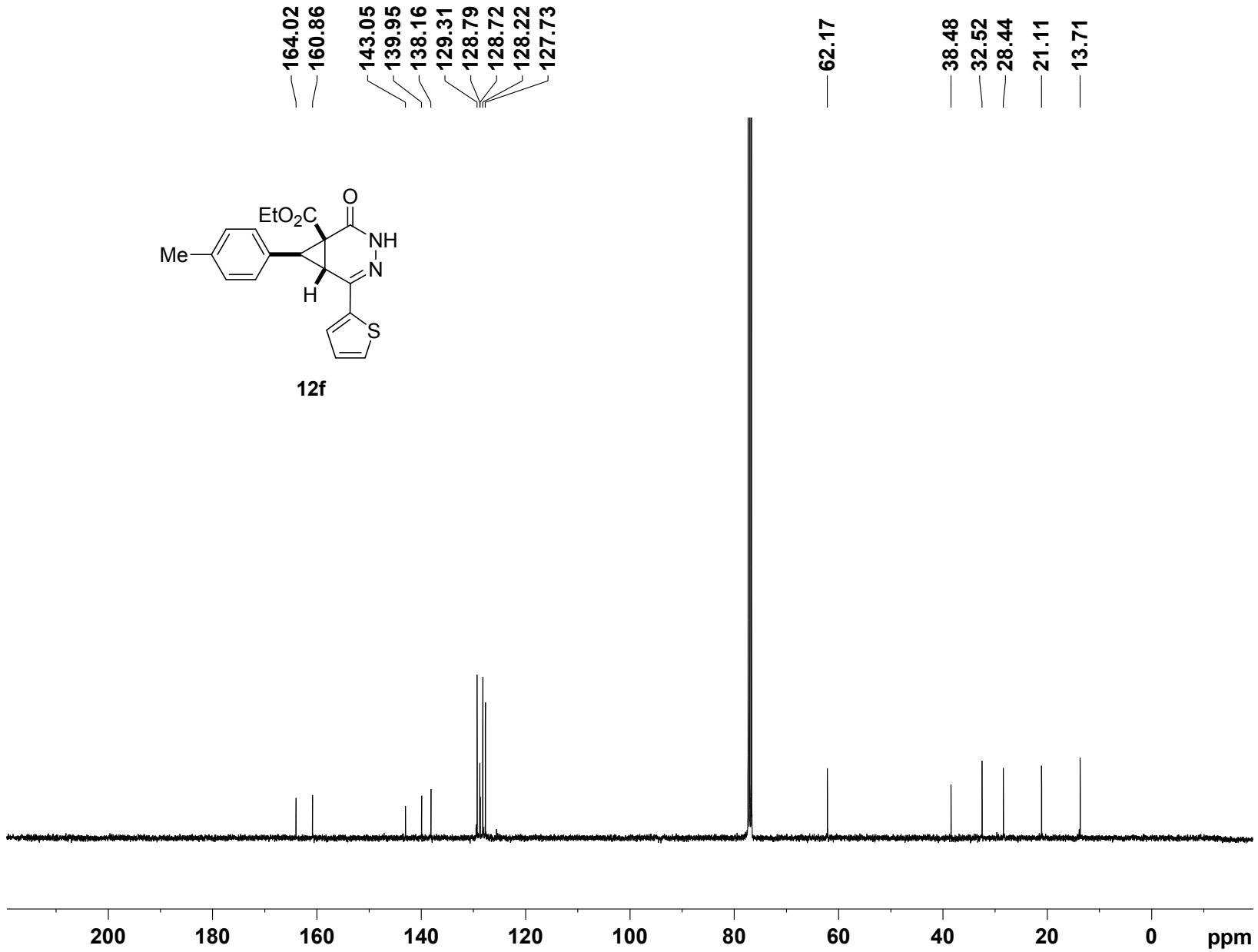
7.539
7.532
7.468
7.456
7.249
7.229
7.196
7.175
7.157
7.148
7.144
7.135
4.087
4.077
4.069
4.060
4.042
4.025
4.016
4.007
3.998
3.740
3.724
3.031
3.015
2.371
0.996
0.978
0.961
EtO2C
O
NH
N
Me
H
S
12f
10
9
8
7
6
5
4
3
2
1
0
ppm
0.94
1.02
0.93
5.02
2.02
1.01
0.90
3.00
3.03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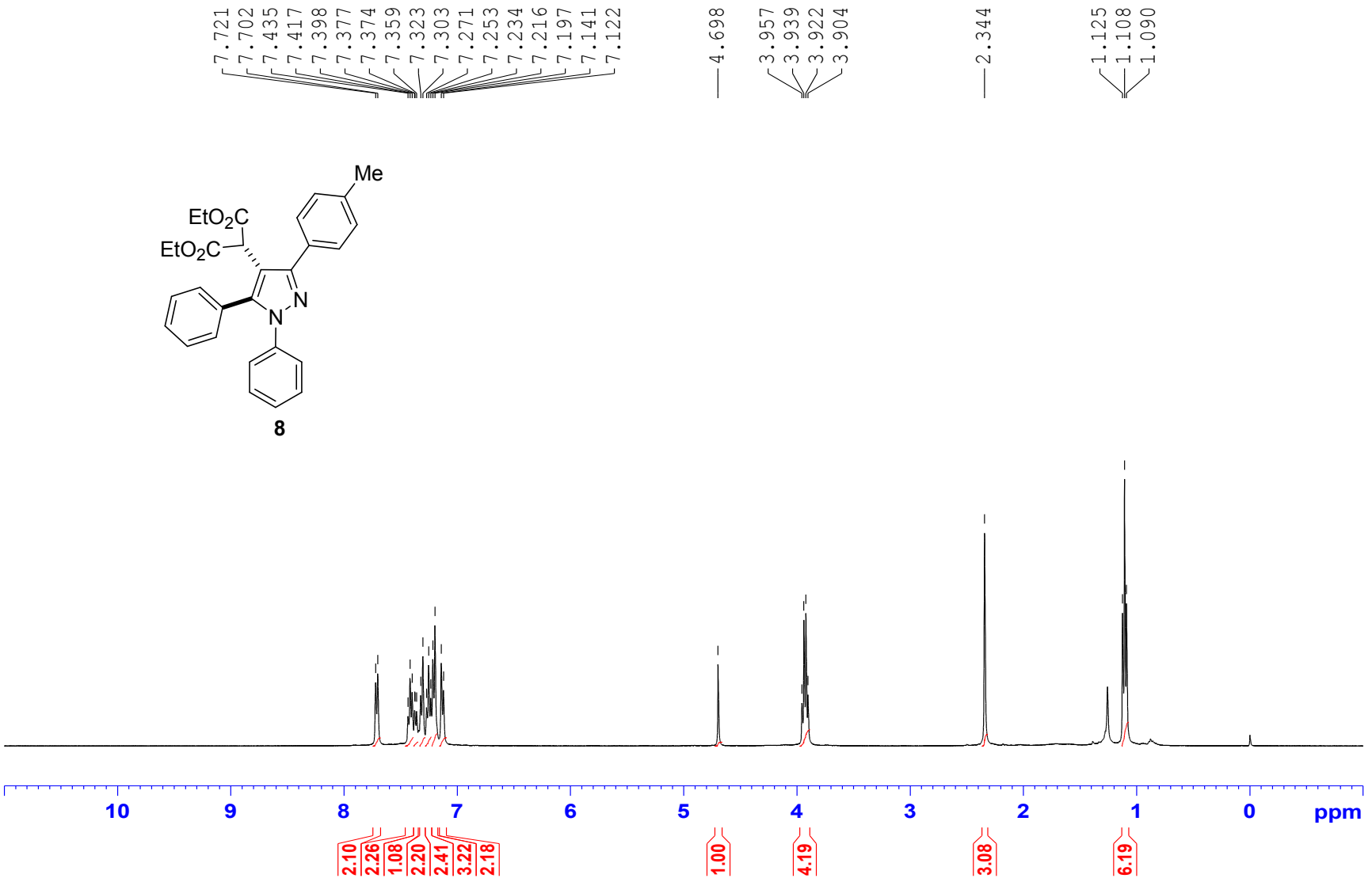
160.86
143.05
139.95
138.16
129.31
128.79
128.72
128.22
127.73
62.17
38.48
32.52
28.44
21.11
13.71
O
EtO2C
NH
Me
N
H
S
12f
200
180
160
140
120
100
80
60
40
20
0
ppm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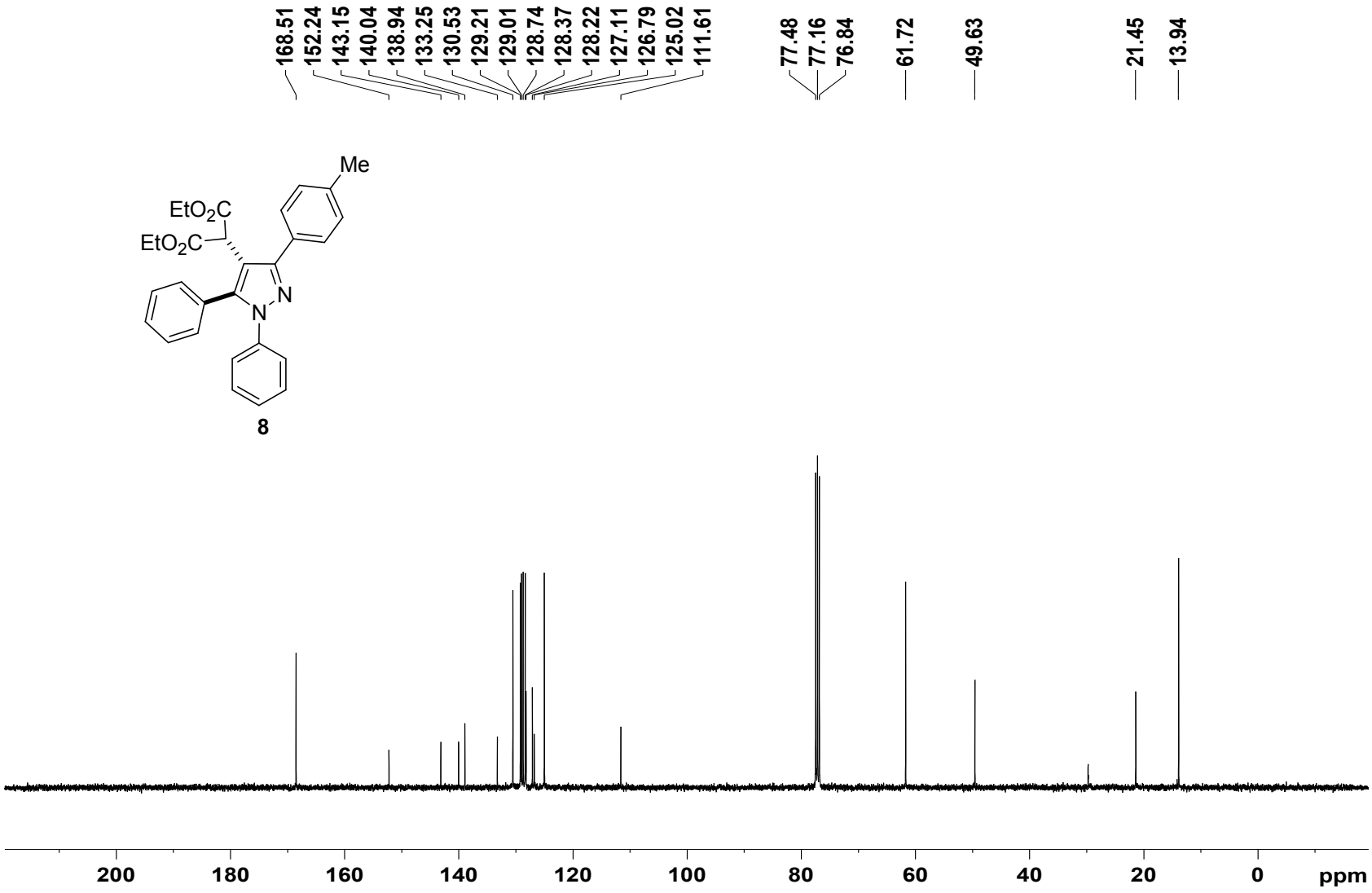
7.702
7.435
7.417
7.398
7.377
7.374
7.359
7.323
7.303
7.271
7.253
7.234
7.216
7.197
7.141
7.122
4.698
3.957
3.939
3.922
3.904
2.344
1.125
1.108
1.090
Me
EtO2C
EtO2C
N
N
8
10
9
8
7
6
5
4
3
2
1
0
ppm
2.10
2.26
1.08
2.20
2.41
3.22
2.18
1.00
4.19
3.08
6.19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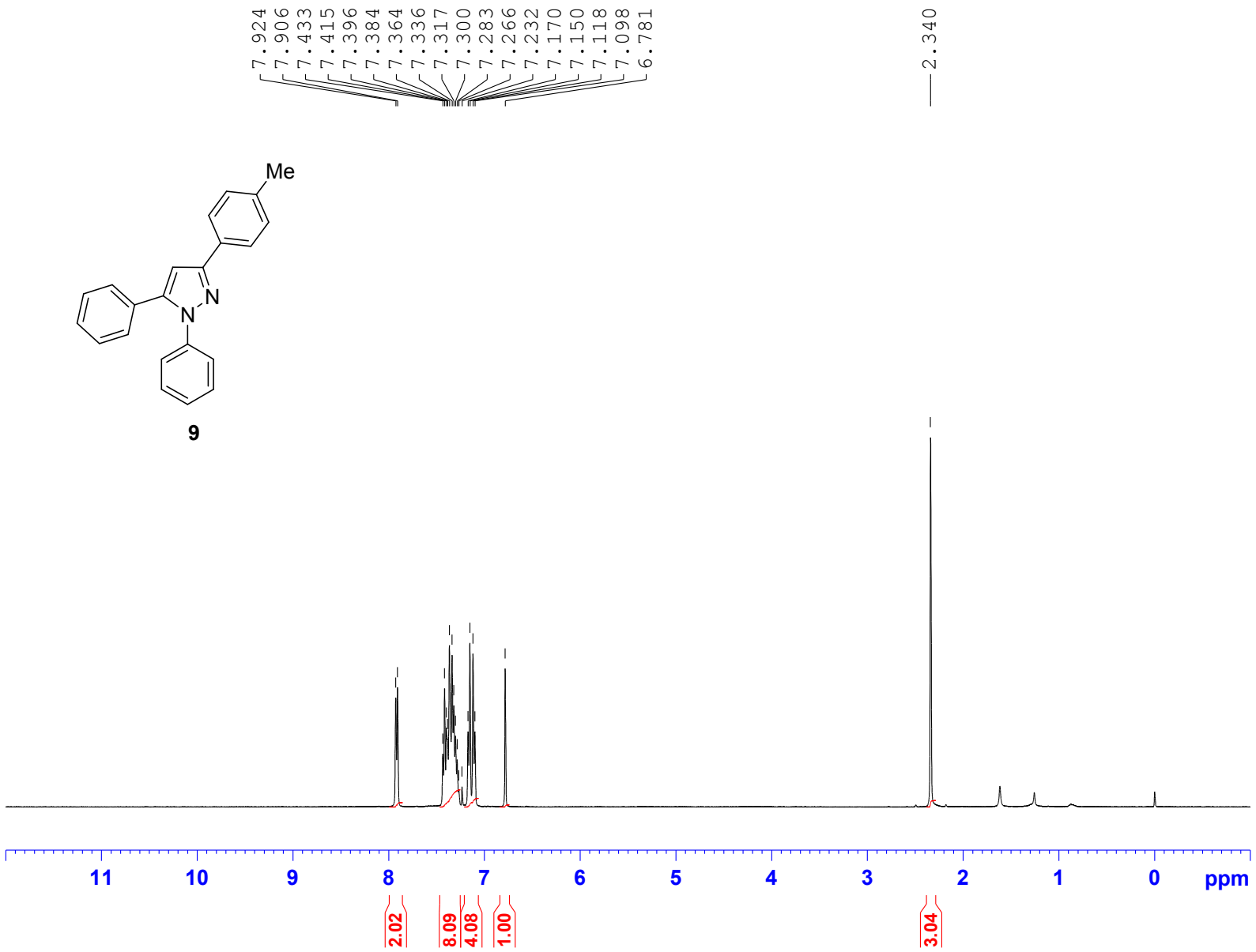
143.15
140.04
138.94
133.25
130.53
129.21
129.01
128.74
128.37
128.22
127.11
126.79
125.02
111.61
77.48
77.16
76.84
61.72
49.63
21.45
13.94
Me
EtO2C
EtO2C
N
N
8
200
180
160
140
120
100
80
60
40
20
0
ppm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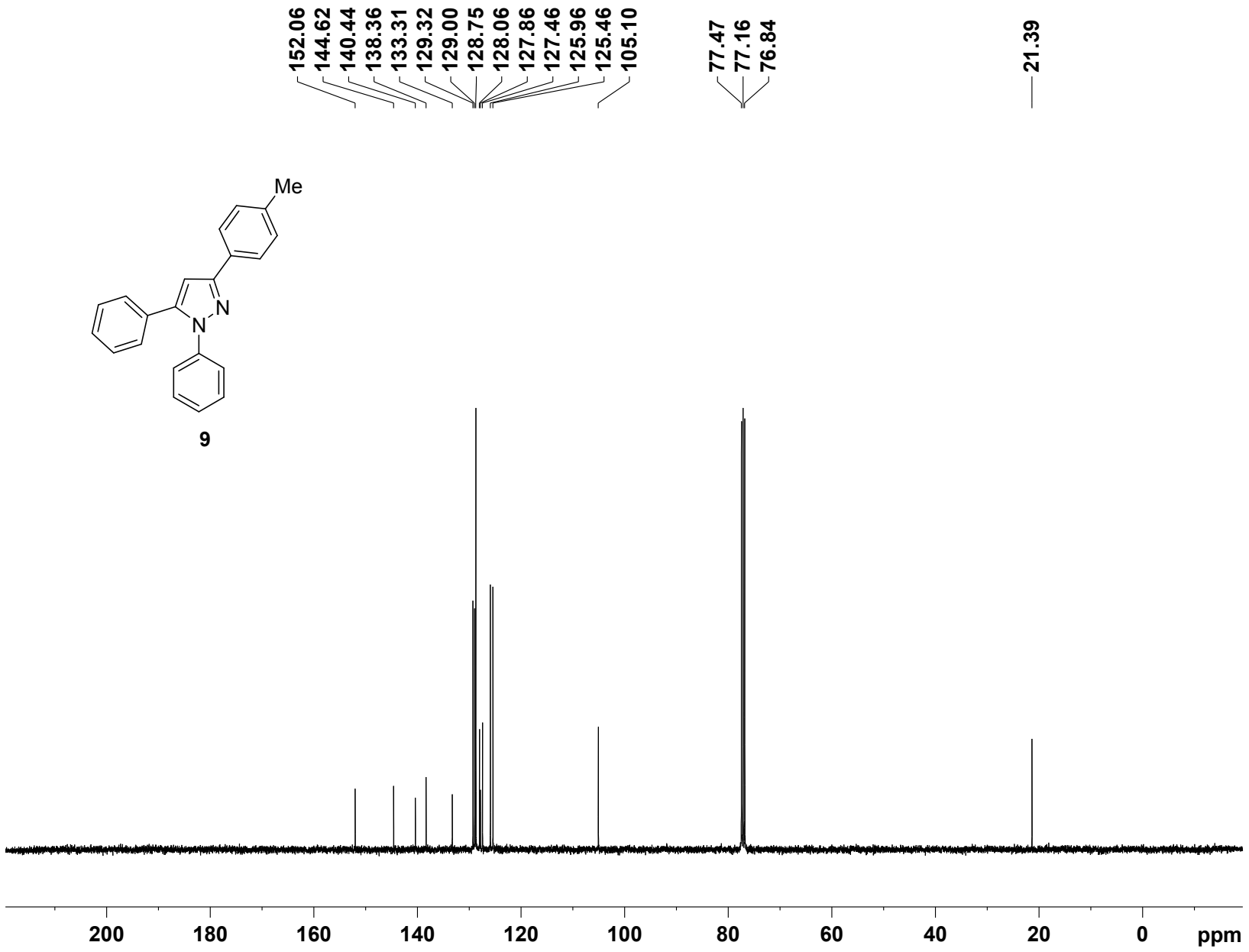
7.433
7.415
7.396
7.384
7.364
7.336
7.317
7.300
7.283
7.266
7.232
7.170
7.150
7.118
7.098
6.781
2.340
Me
N
N
9
11
10
9
8
7
6
5
4
3
2
1
0
ppm
2.02
8.09
4.08
1.00
3.04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144.62
140.44
138.36
133.31
129.32
129.00
128.75
128.06
127.86
127.46
125.96
125.46
105.10
77.47
77.16
76.84
21.39
Me
N
N
9
200
180
160
140
120
100
80
60
40
20
0
ppm