Supporting information for

Exciplex Electroluminescence Induced by Cross-linked Hole-Transporting Materials for White Light Polymer Light-Emitting Diodes

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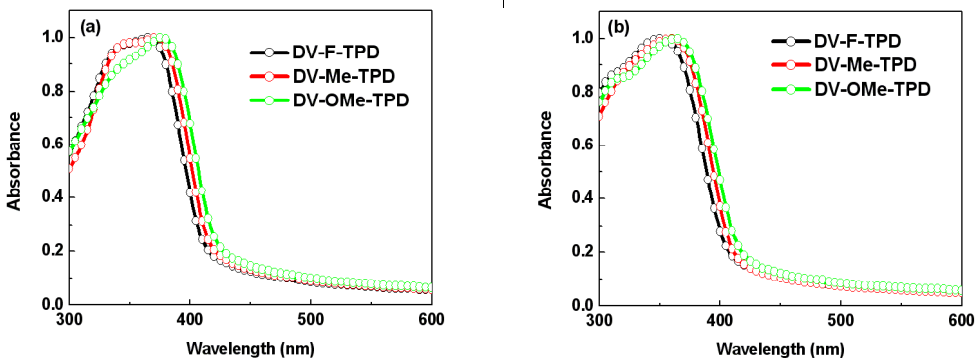


Figure S1. UV-Vis absorption spectra of the uncross-linked HTMs (a), and cross-linked HTMs (b).

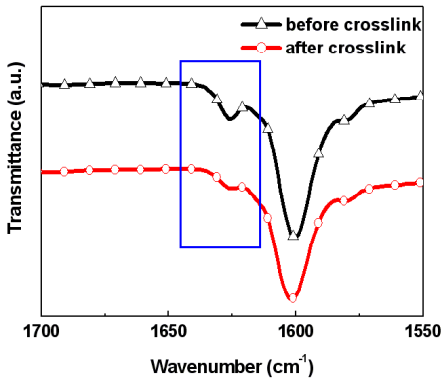


Figure S2. Infrared spectra of the **DV-Me-TPD** film before cross-linking (triangle) and after cross-linking (cured 180 ^{o}C for 30 min) (circle).

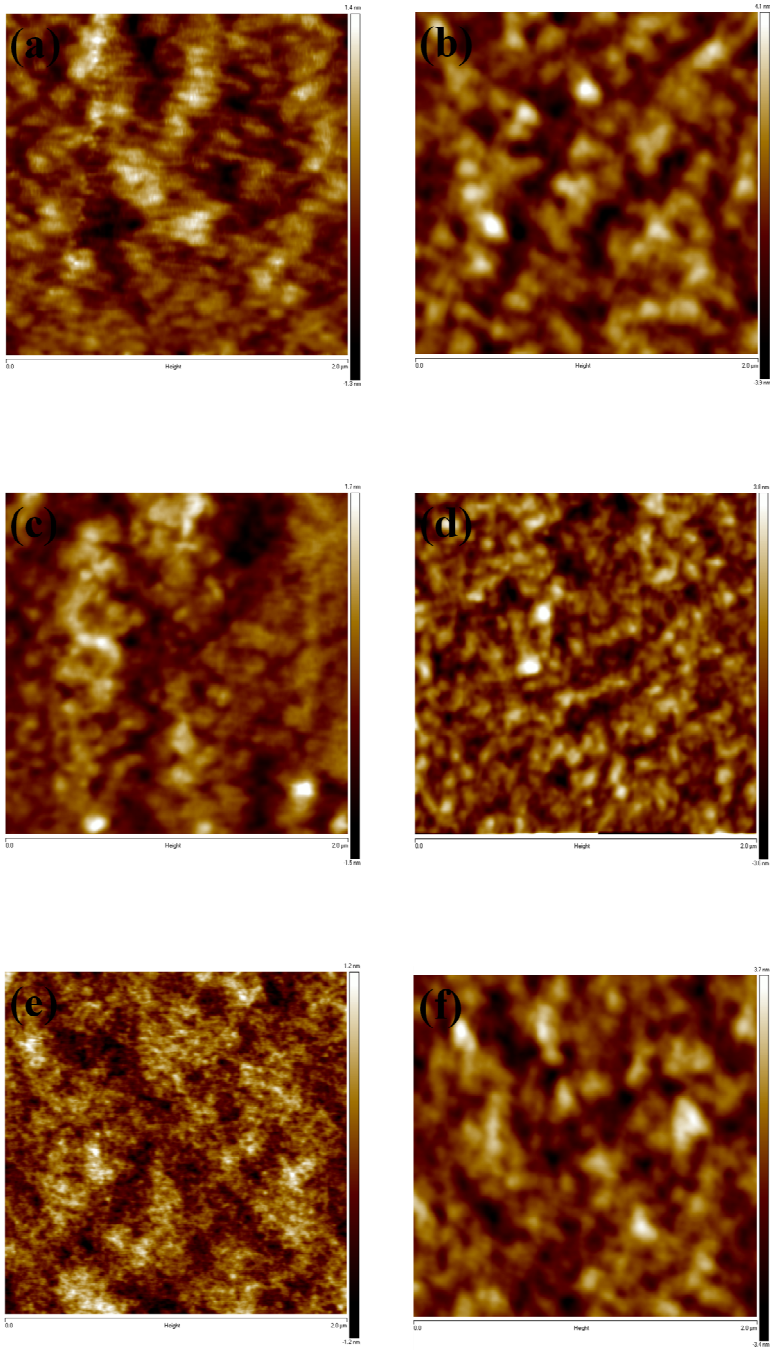
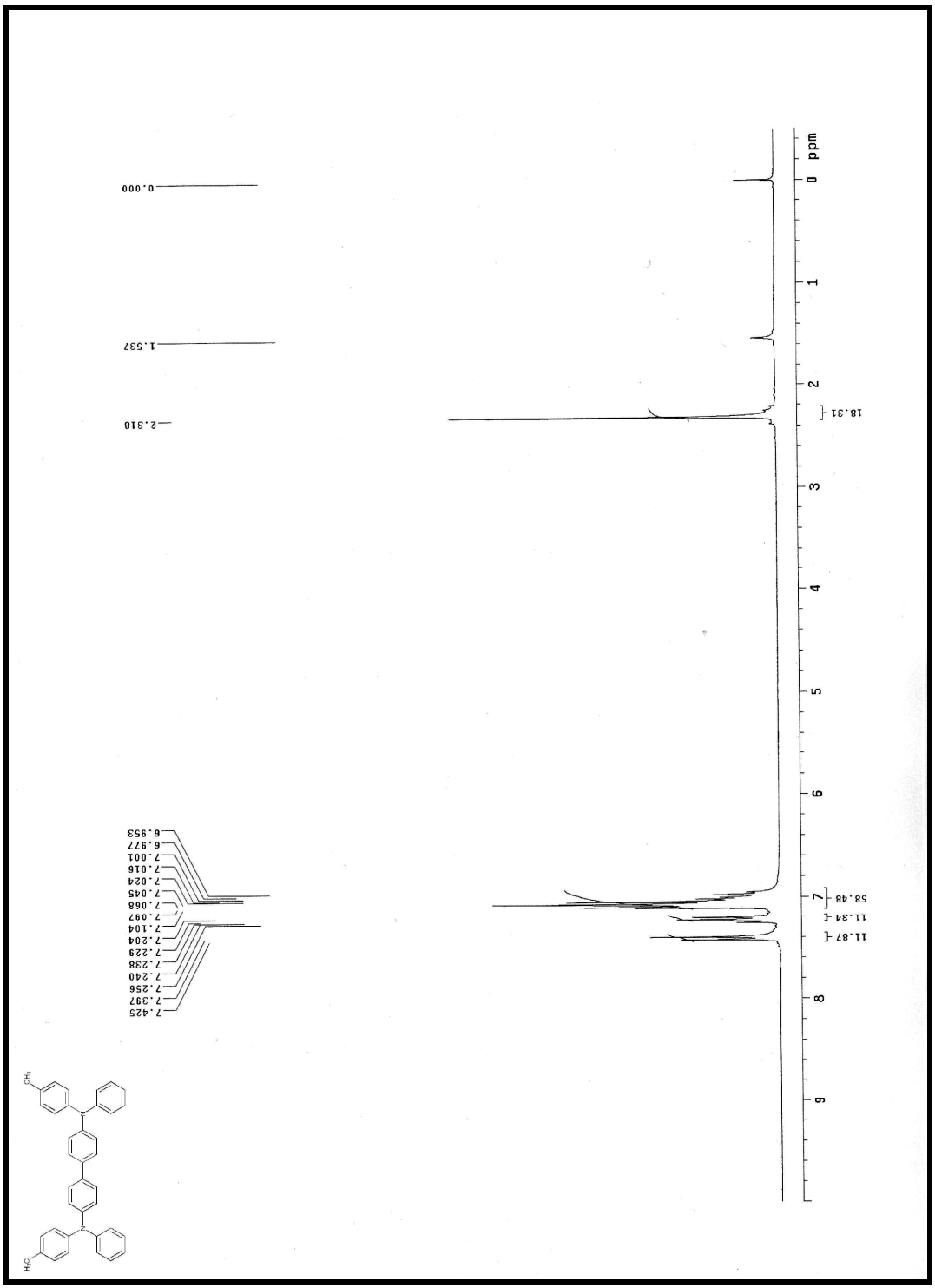
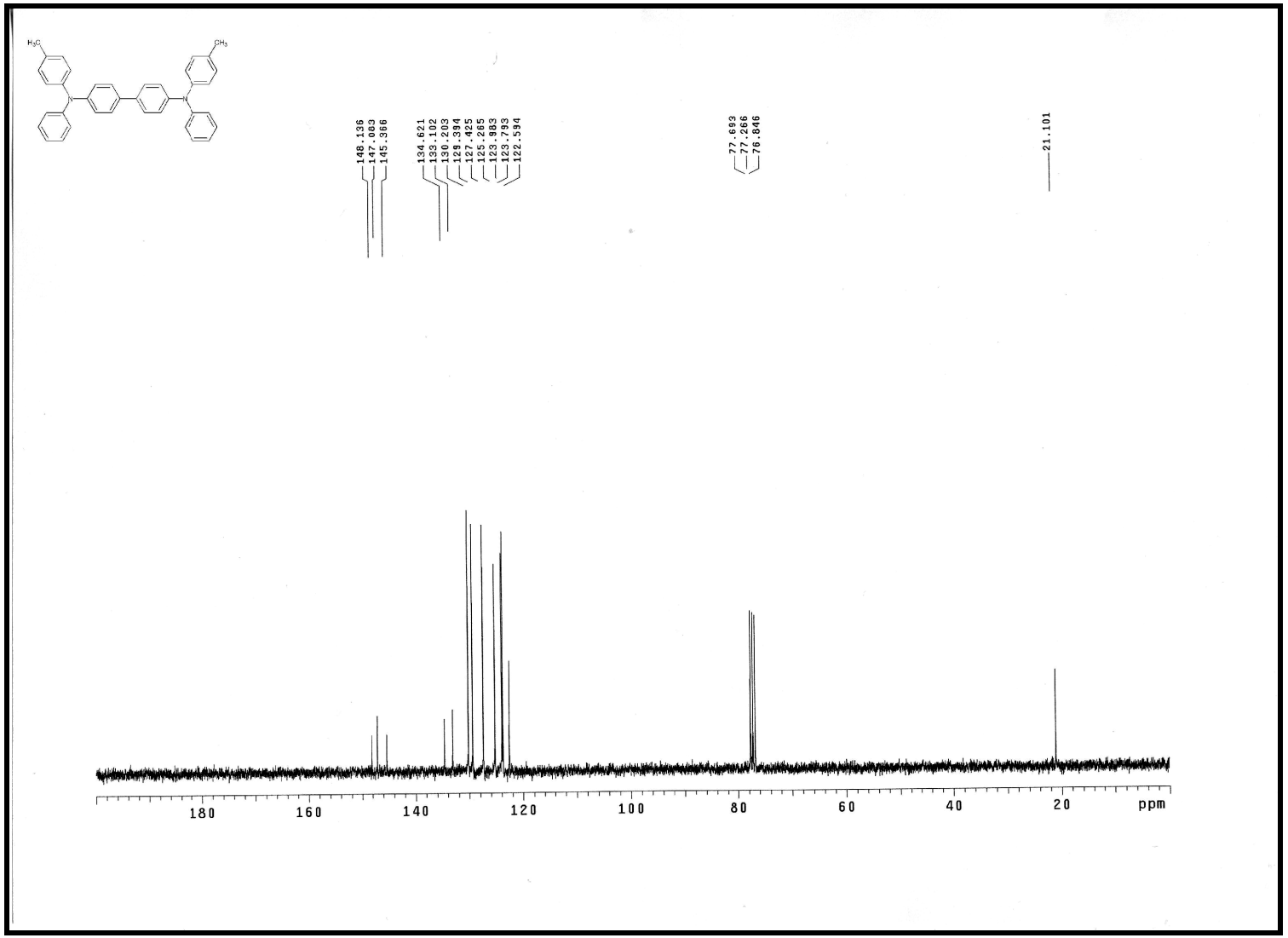


Figure S3. Atomic force microscopy images of the spin-coated HTMs on PEDOT:PSS before and after thermal curing at 180 °C for 30 min: (a) **DV-Me-TPD**, rms roughness = 0.367 nm, (b) cross-linked **DV-Me-TPD**, rms roughness = 1.15 nm, (c) **DV-F-TPD** rms roughness = 0.446 nm, (d) cross-linked **DV-F-TPD**, rms roughness = 1.00 nm, (e) **DV-OMe-TPD,** rms roughness = 0.337 nm, (f) cross-linked **DV-OMe-TPD**, rms roughness = 0.971 nm.

^{1}H and ^{13}C NMR spectra of new compounds in this research

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133.102
130.203
129.394
127.425
125.265
123.983
123.793
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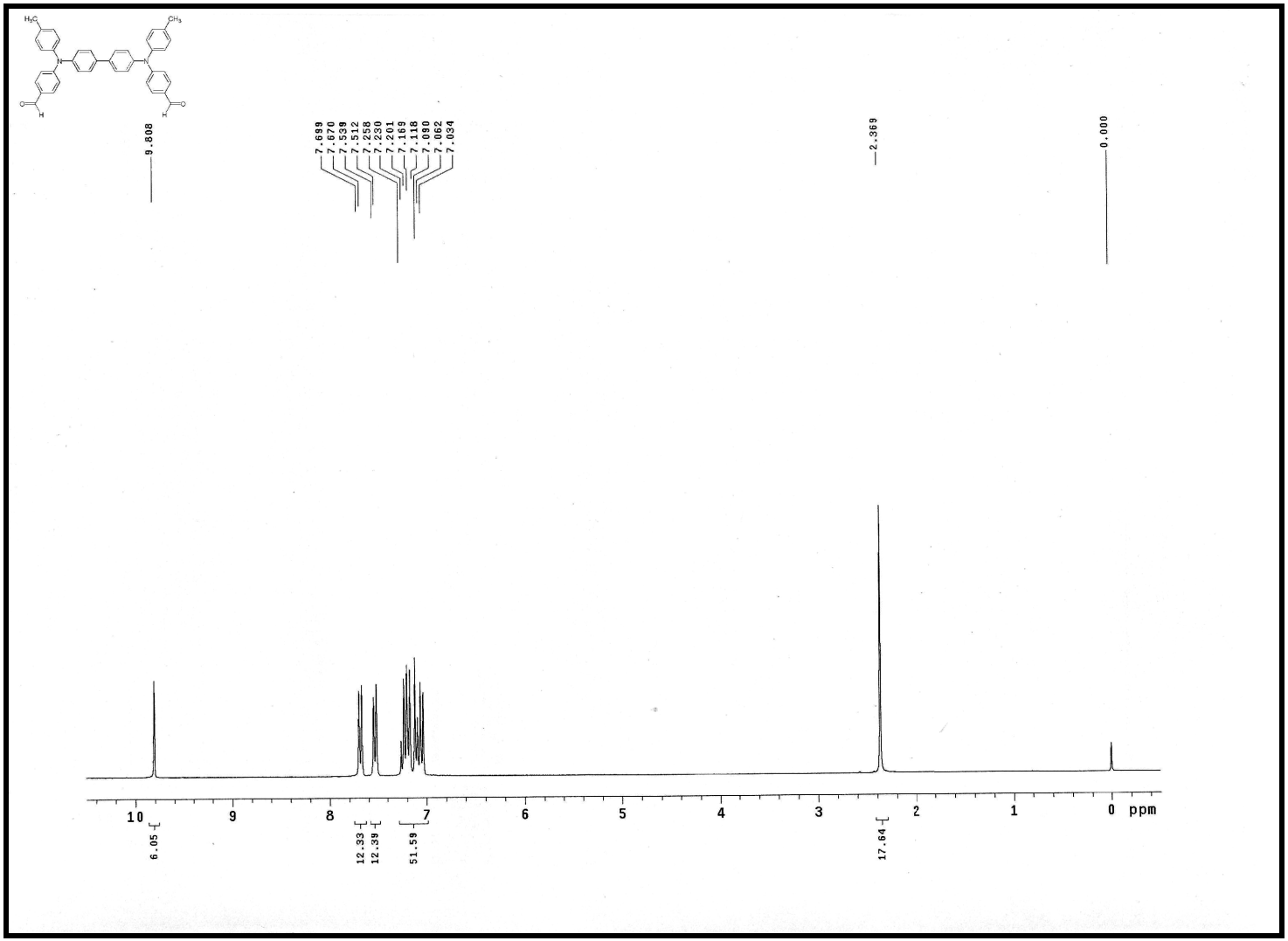
77.693
77.266
76.846
21.101
180
160
140
120
100
80
60
40
20
ppm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7.670
7.539
7.512
7.258
7.230
7.201
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7.118
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7.062
7.034
2.369
0.000
10
9
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6
5
4
3
2
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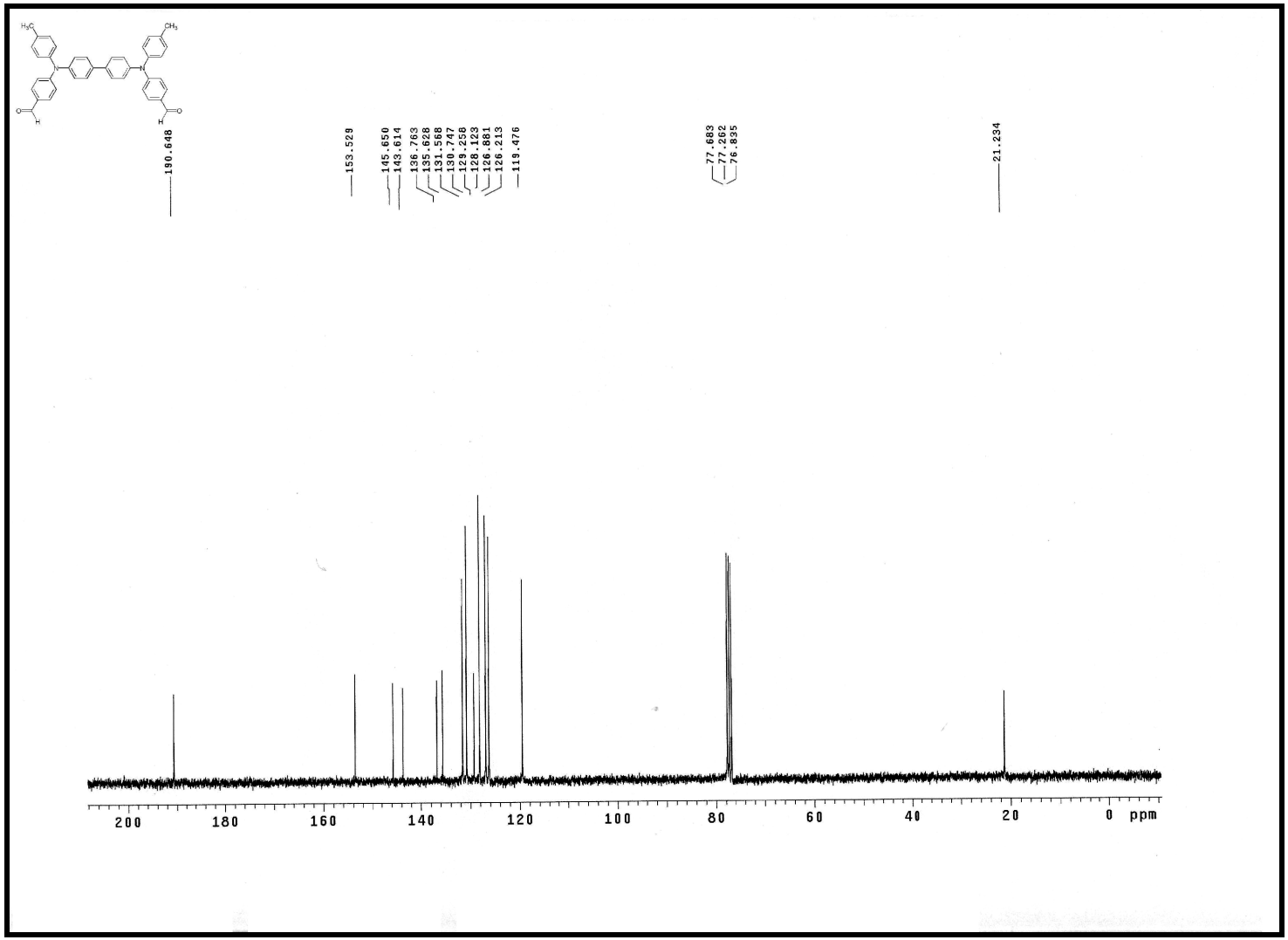
0 ppm
6.05
12.33
12.39
51.59
17.64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145.650
143.614
136.763
135.628
131.568
130.747
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128.123
126.881
126.213
119.476
77.683
77.262
76.835
21.234
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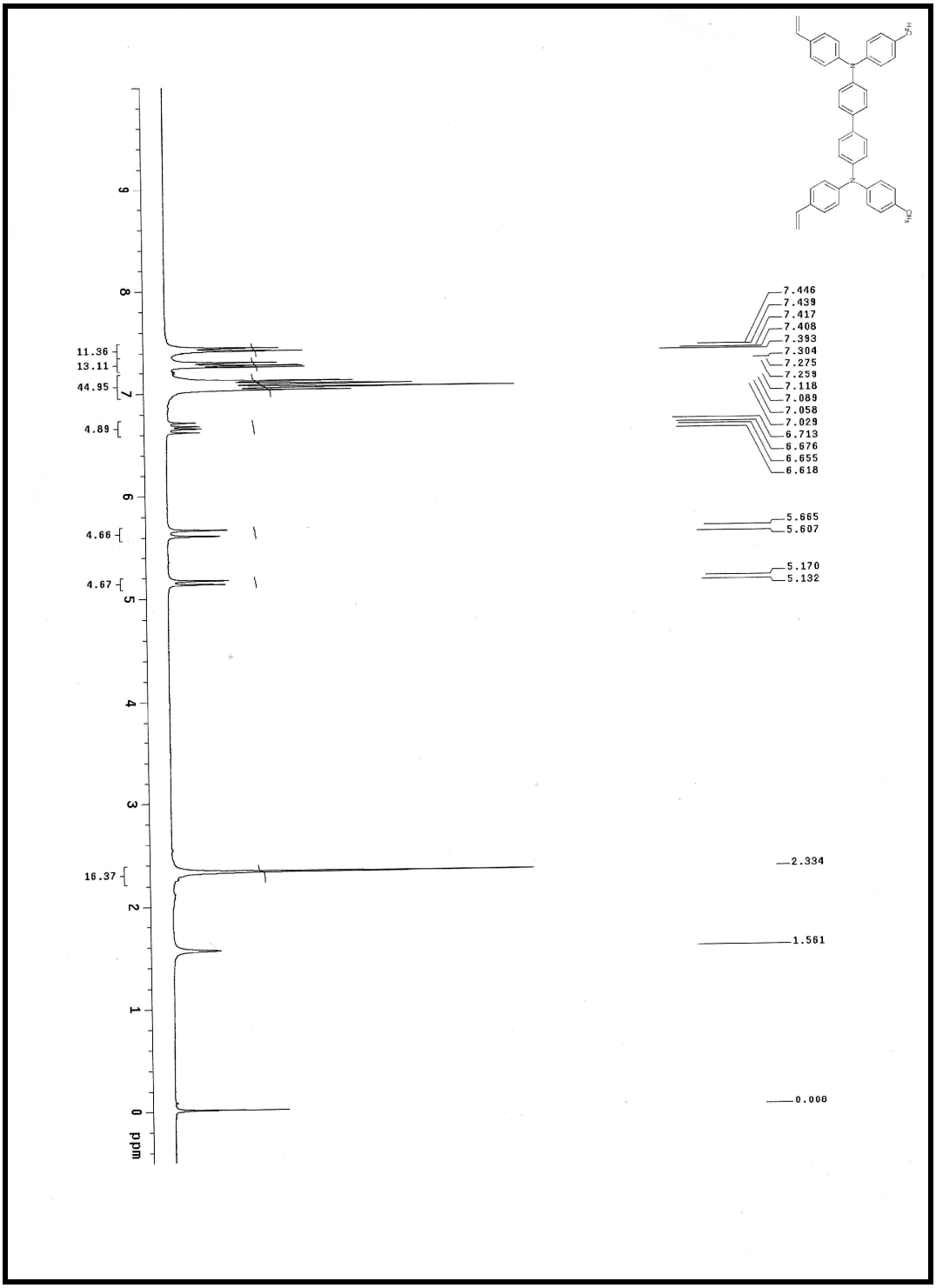
180
160
140
120
100
80
60
40
20
0 ppm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6.713
6.676
6.655
6.618
5.665
5.607
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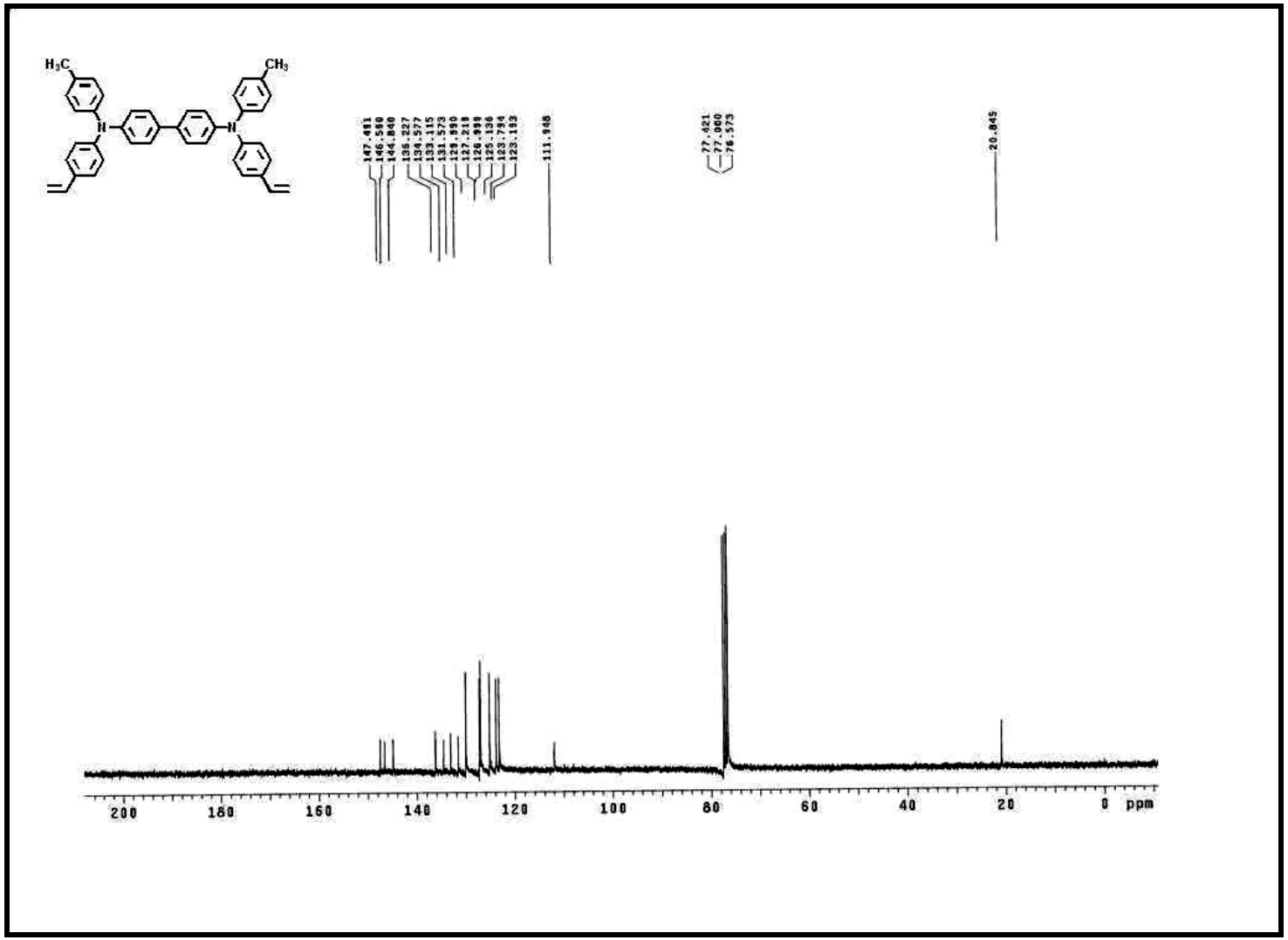
4.67
16.37
ppm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126.998
125.136
123.794
123.193
111.948
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77.000
76.573
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180
160
140
120
100
80
60
40
20
0
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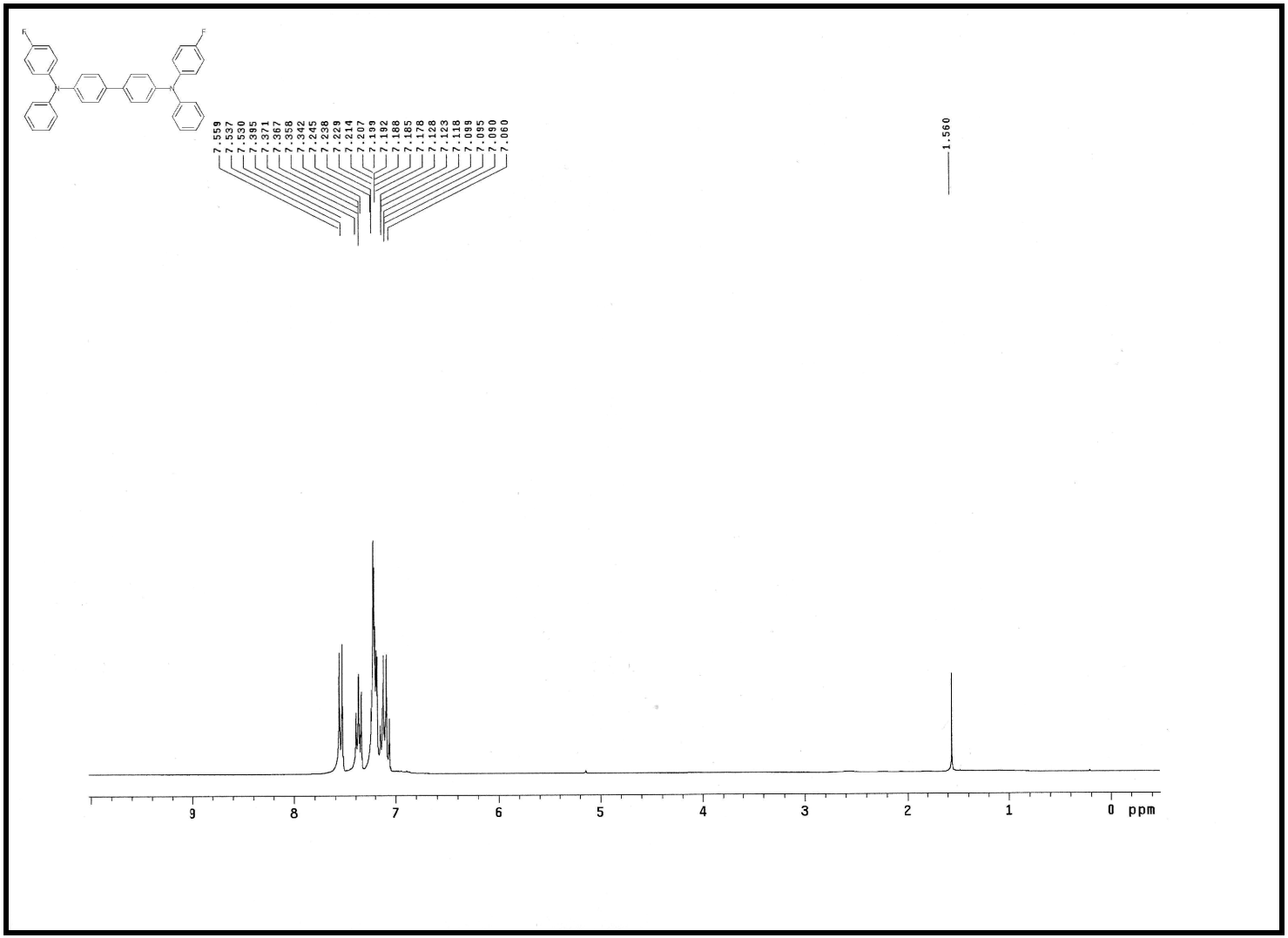
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N
N
F
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7.530
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7.371
7.367
7.358
7.342
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7.238
7.229
7.214
7.207
7.199
7.192
7.188
7.185
7.178
7.128
7.123
7.118
7.099
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7.090
7.060
1.560
9
8
7
6
5
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3
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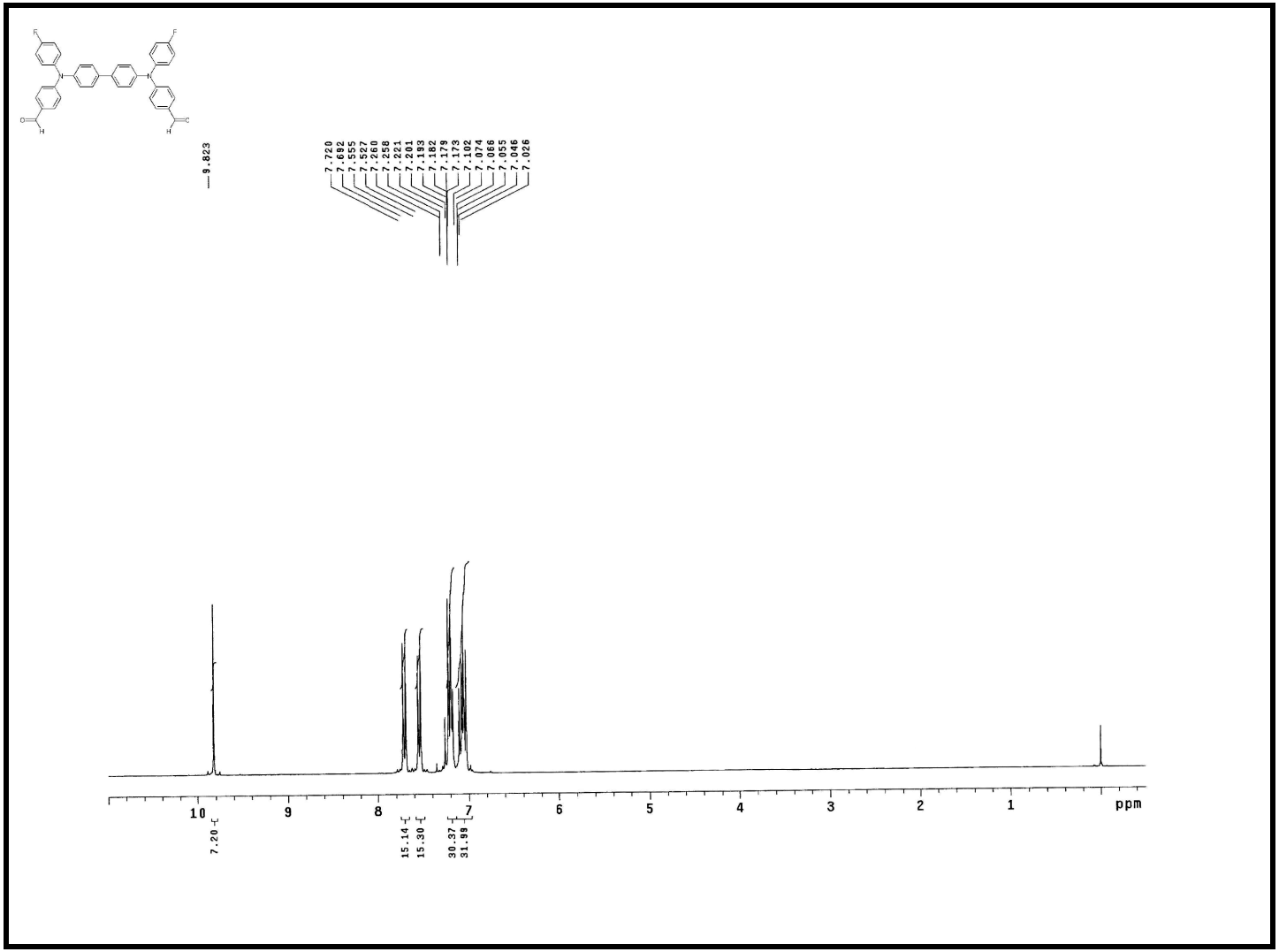
1
0 ppm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7.221
7.201
7.193
7.182
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7.173
7.102
7.074
7.066
7.055
7.046
7.026
10
9
8
7
6
5
4
3
2
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ppm
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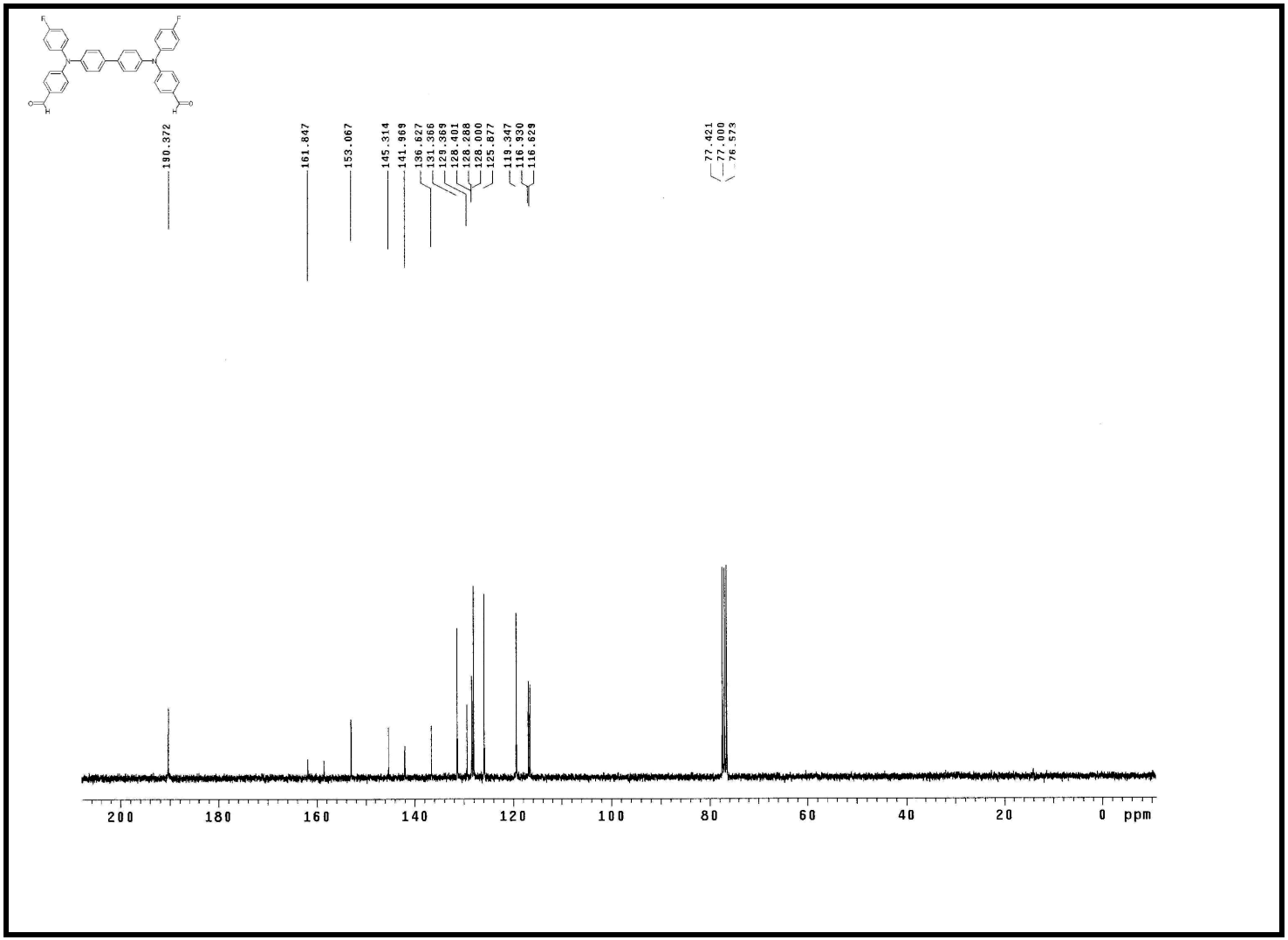
30.97
31.99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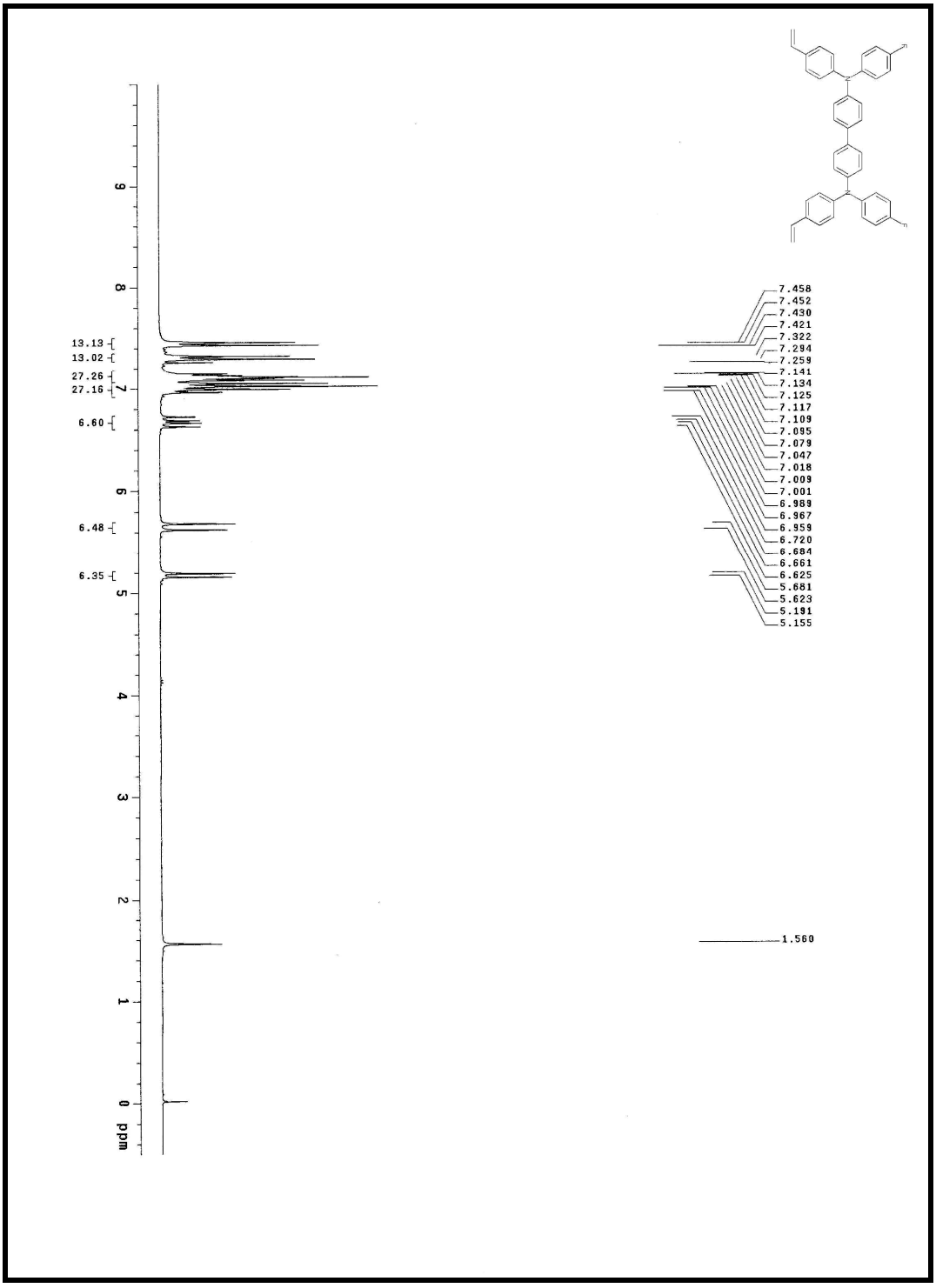
136.627
131.366
129.369
128.401
128.288
128.000
125.877
119.347
116.930
116.629
77.421
77.000
76.573
200
180
160
140
120
100
80
60
40
20
0
ppm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27.16
6.60
6.48
6.35
9
8
7
6
5
4
3
2
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0
ppm
7.458
7.452
7.430
7.421
7.322
7.294
7.259
7.141
7.134
7.125
7.117
7.109
7.095
7.079
7.047
7.018
7.009
7.001
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6.720
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6.625
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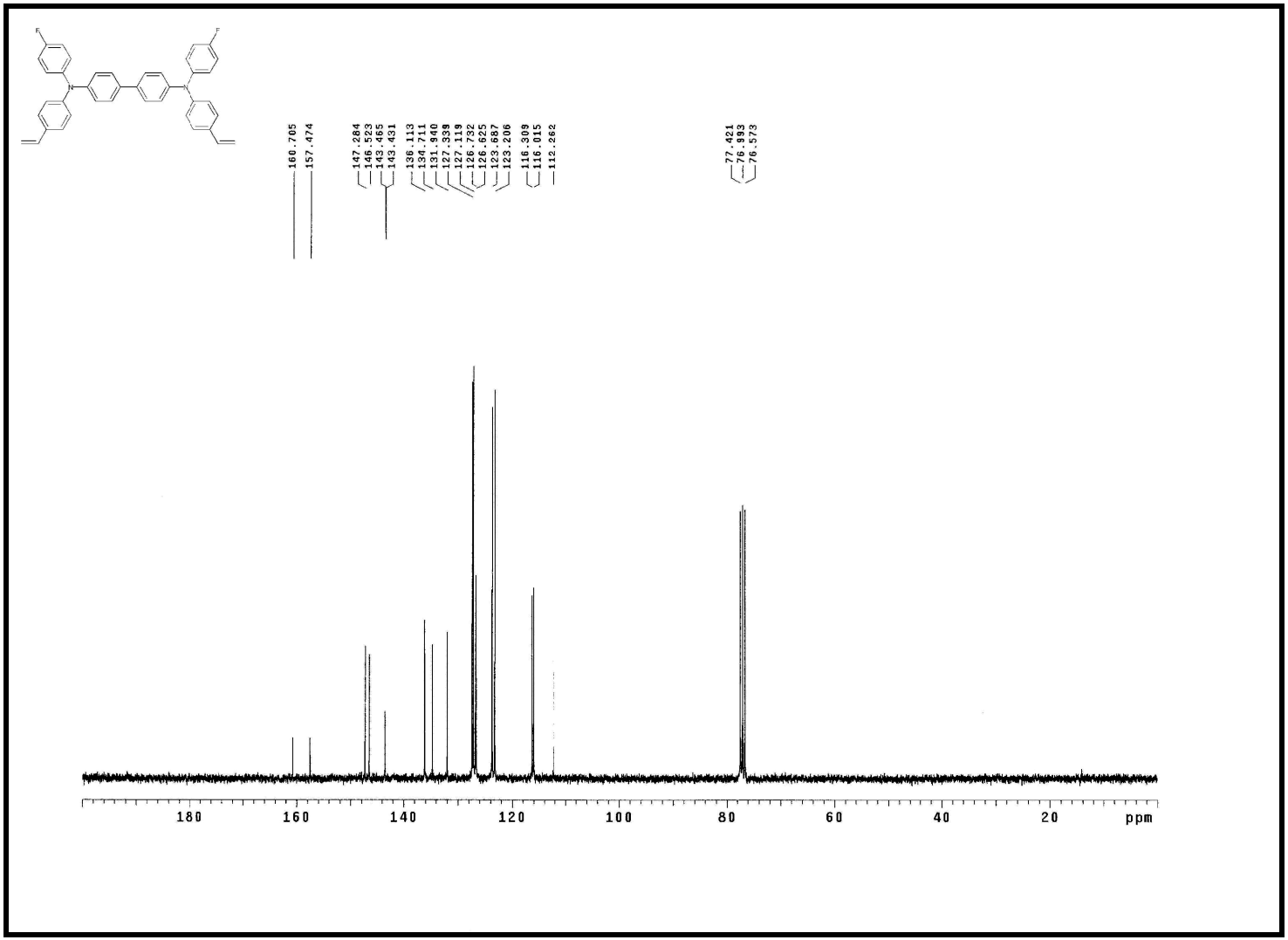
5.191
5.155
1.560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123.687
123.206
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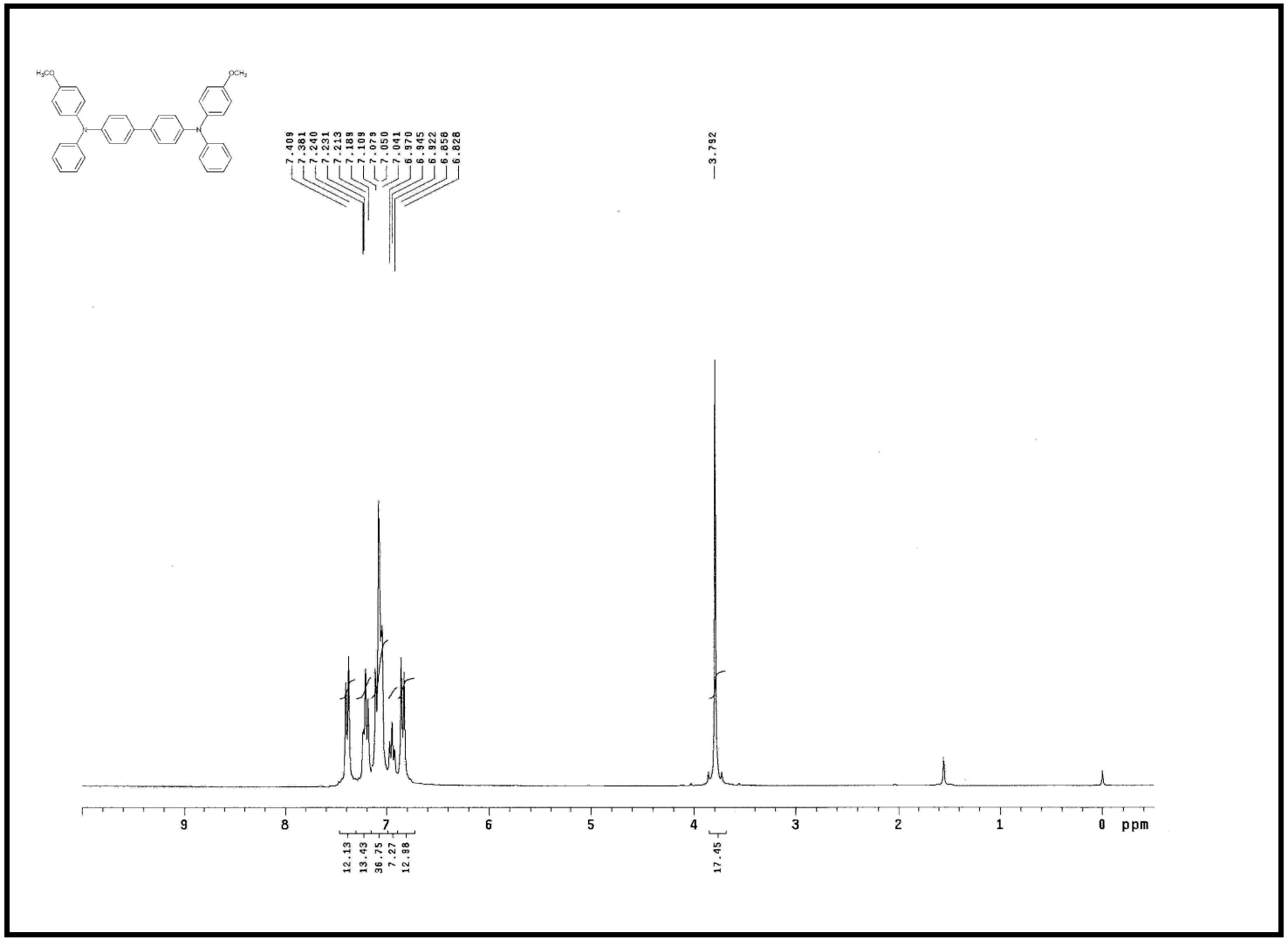
160
140
120
100
80
60
40
20
ppm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7.079
7.050
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6.922
6.858
6.828
3.792
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7
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5
4
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13.43
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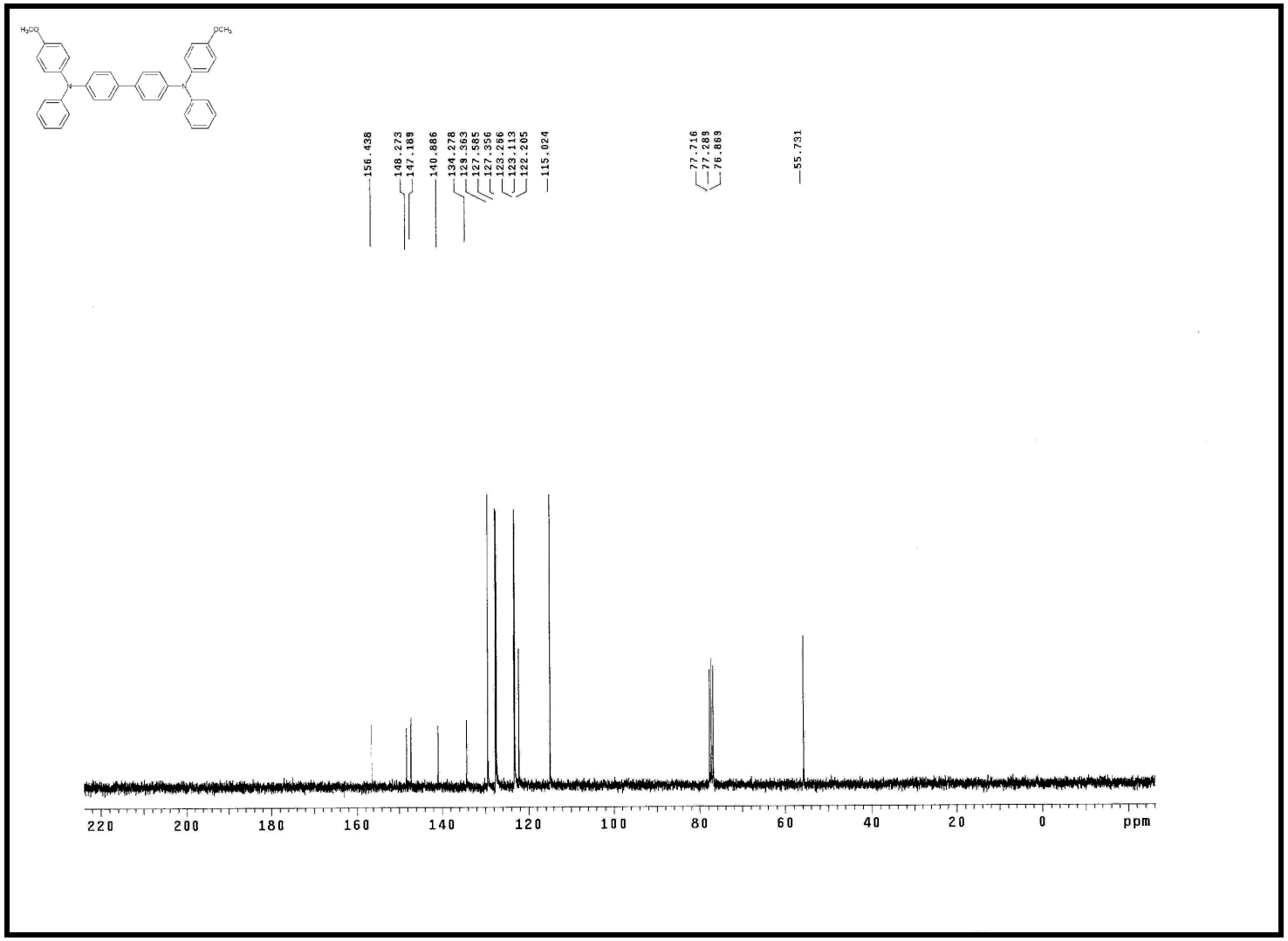
17.45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129.363
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123.113
122.205
115.024
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200
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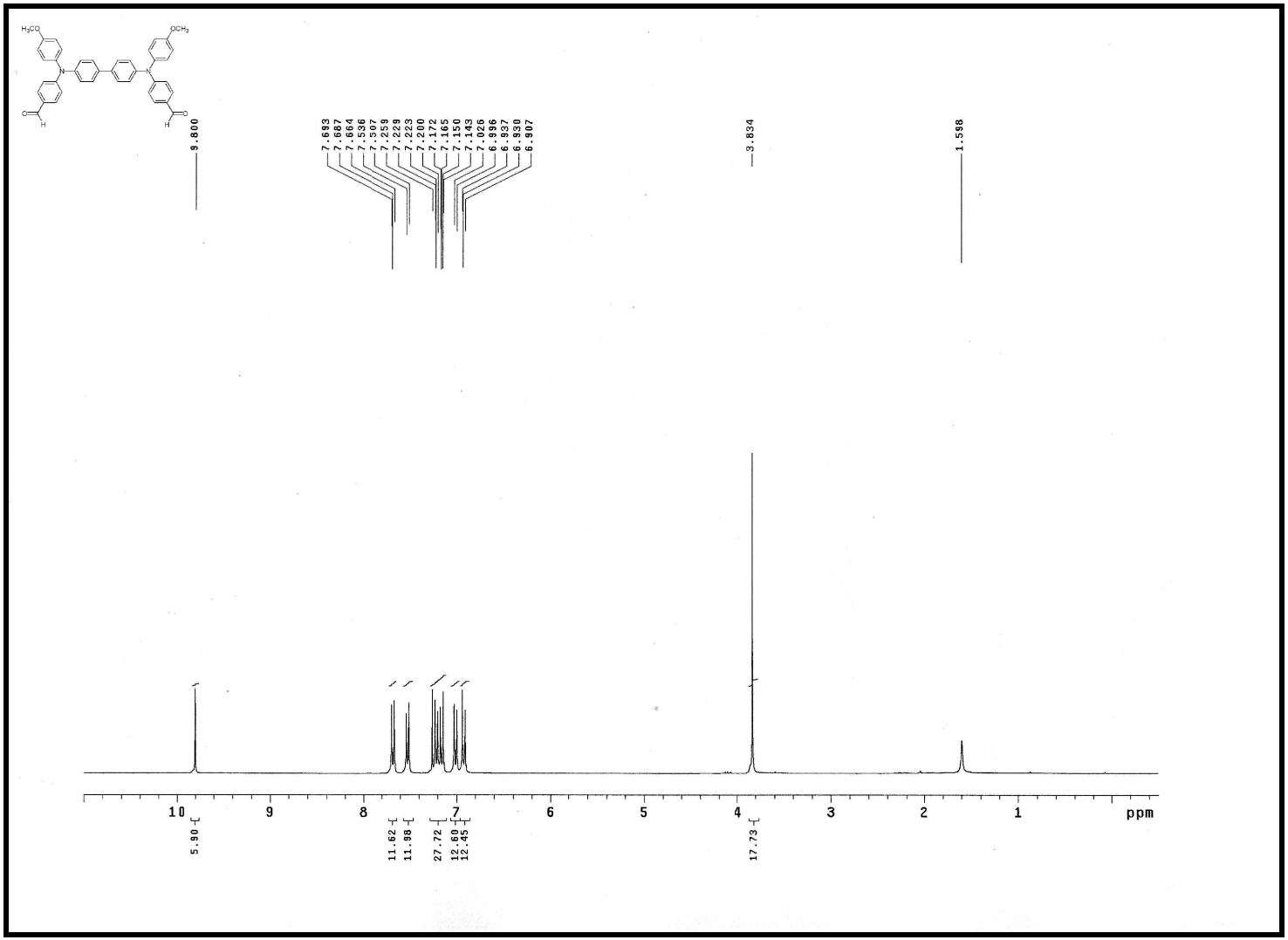
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7.687
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7.259
7.229
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7.150
7.143
7.026
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6.937
6.930
6.907
3.834
1.598
10
9
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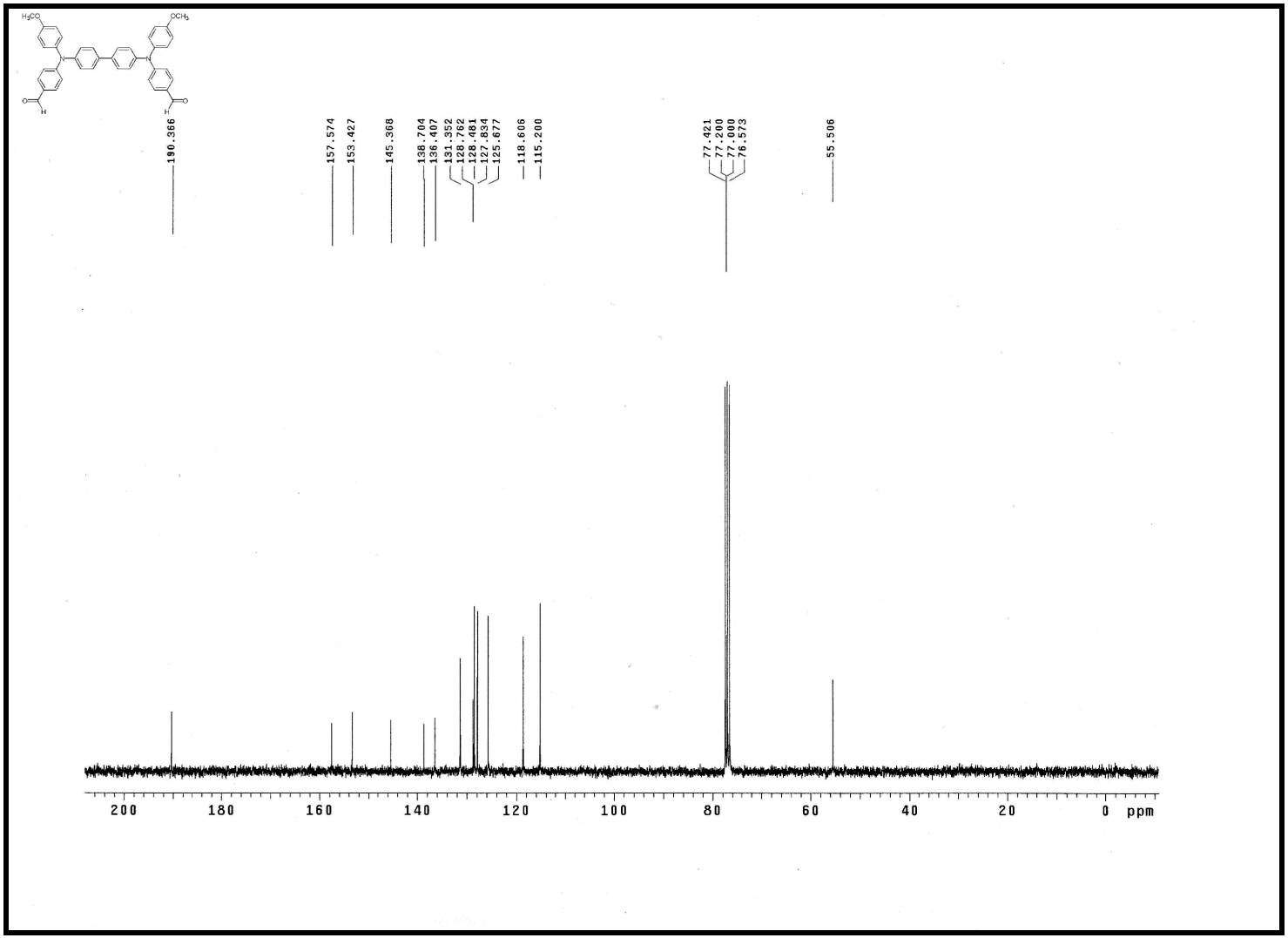
12.45
17.73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OCH3
O
H
N
N
O
H
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153.427
145.368
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131.352
128.762
128.481
127.834
125.677
118.606
115.200
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55.506
200
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120
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60
40
20
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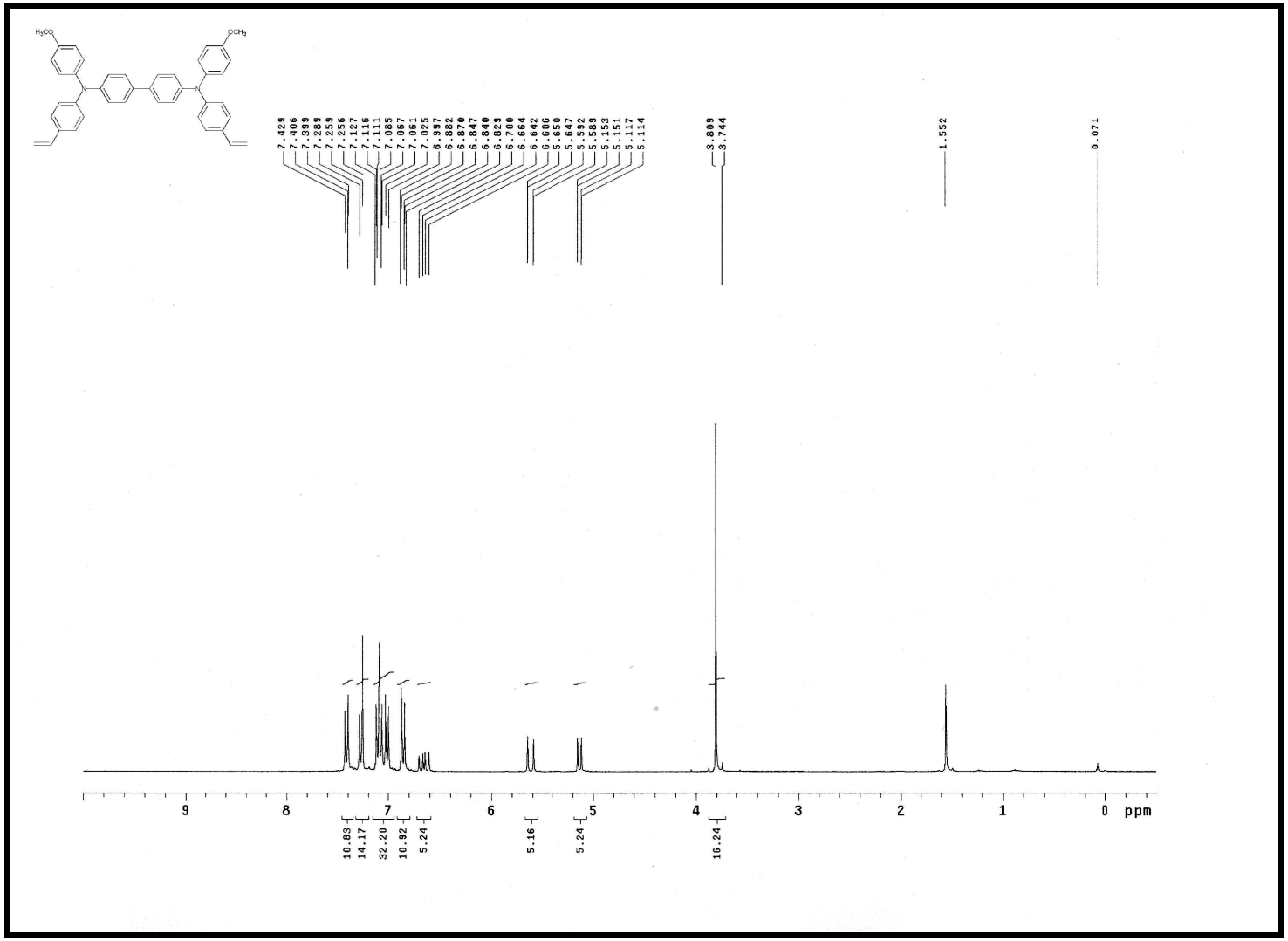
ppm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7.061
7.025
6.997
6.882
6.870
6.847
6.840
6.829
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6.664
6.642
6.606
5.650
5.647
5.592
5.589
5.153
5.151
5.117
5.114
3.808
3.744
1.552
0.071
9
8
7
6
5
4
3
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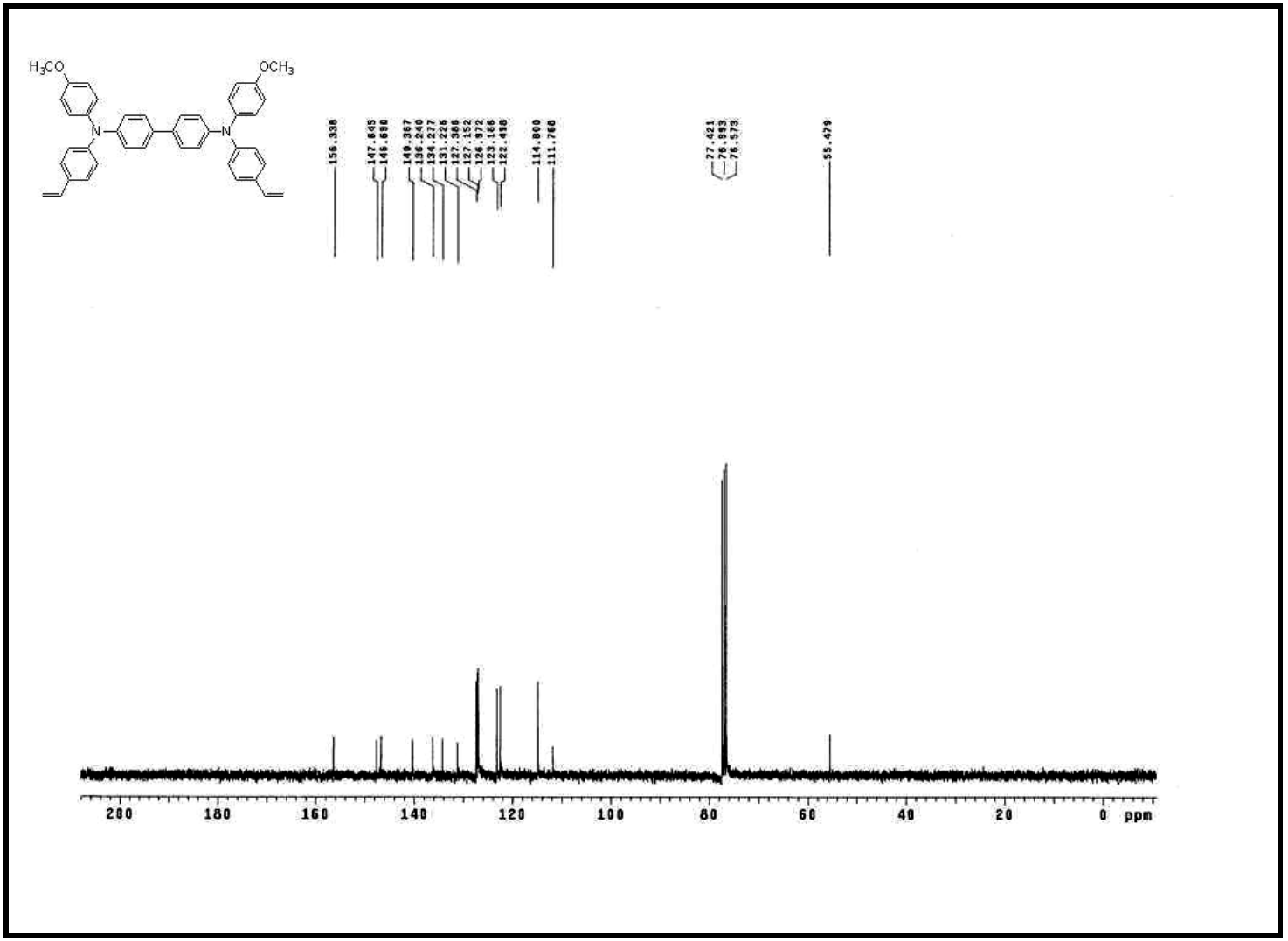
32.20
10.92
5.24
5.16
5.24
16.24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131.226
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127.152
124.972
123.166
122.486
114.809
111.766
77.421
76.993
76.573
55.479
200
180
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140
120
100
80
60
40
20
0 ppm