Supplementary Material (ESI) for Journal of Materials Chemistry


# Solution Processable Donor-Acceptor Oligothiophenes for Bulk-Heterojunction Solar Cells

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## Contents

## 1. Results of Physical Characterization

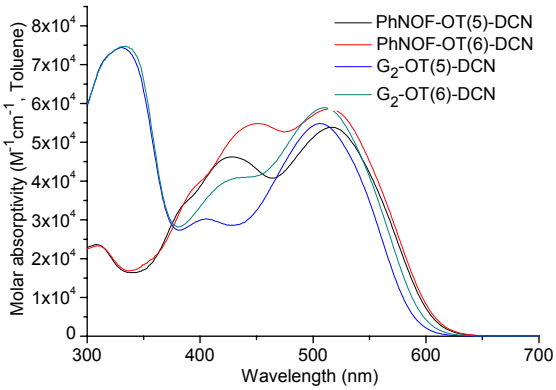



**Fig. S1** Absorption spectra of **PhNOF-OT(n)-DCN** and **$G_2$-OT(n)-DCN** in toluene.

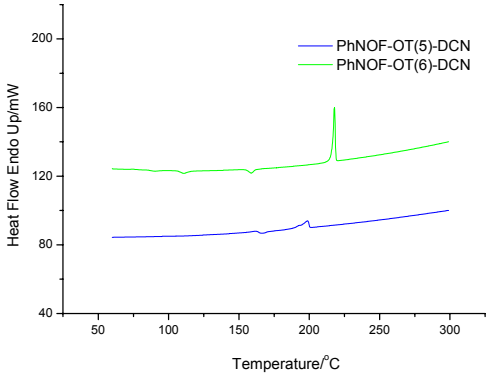



**Fig. S2** DSC traces of **PhNOF-OT(n)-DCN**.

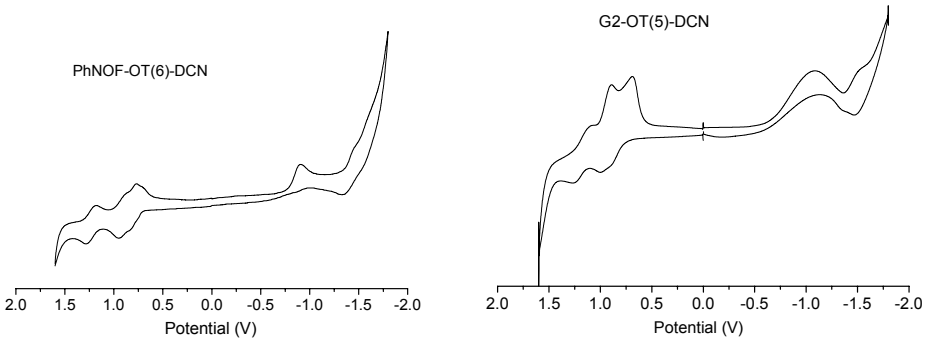
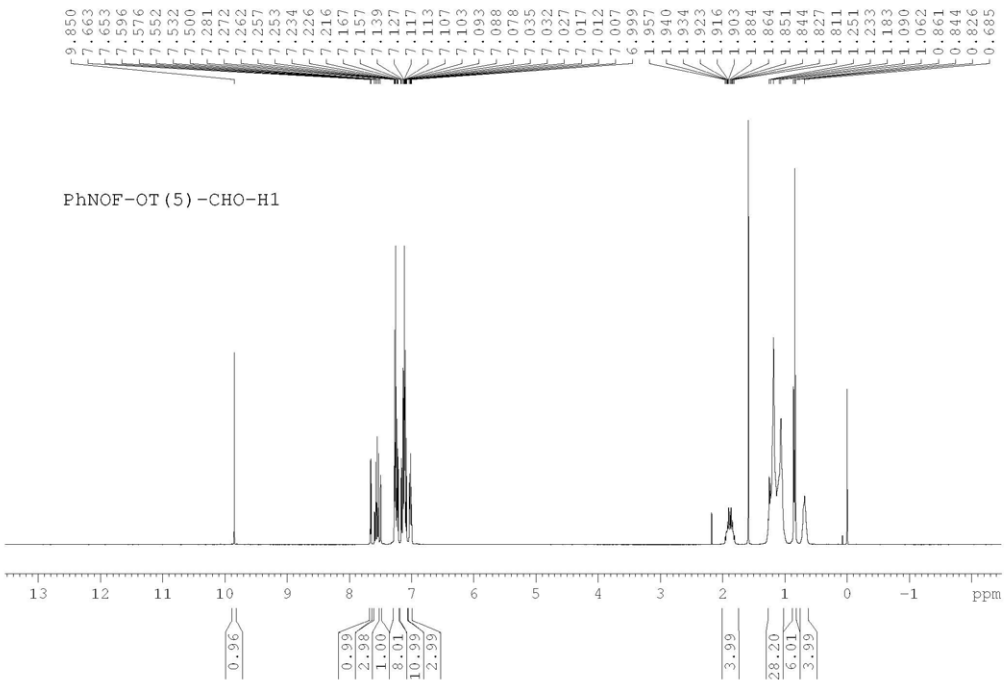
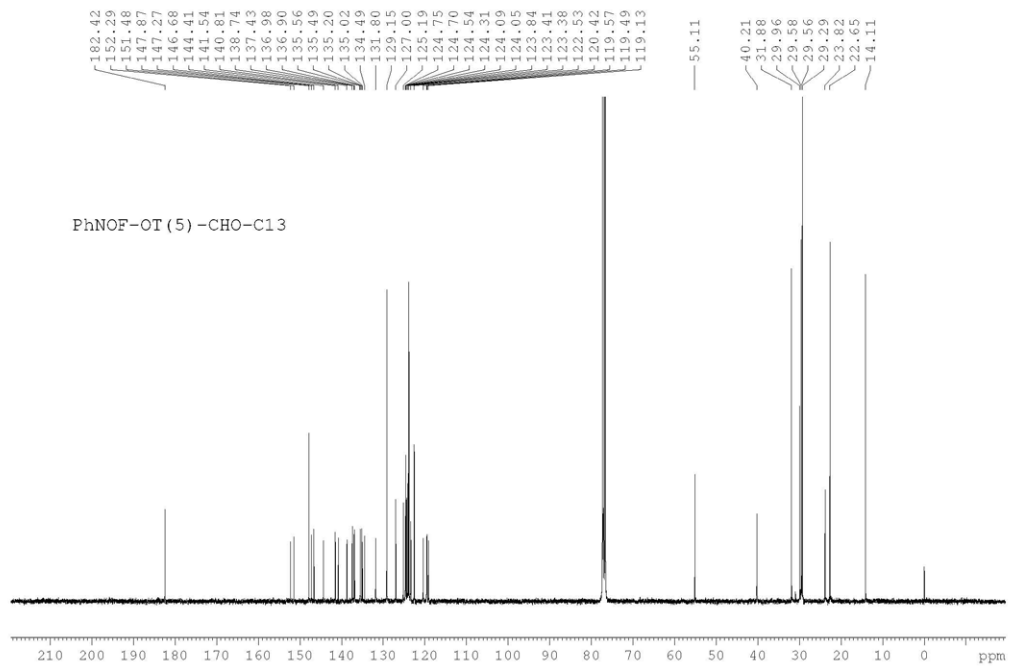
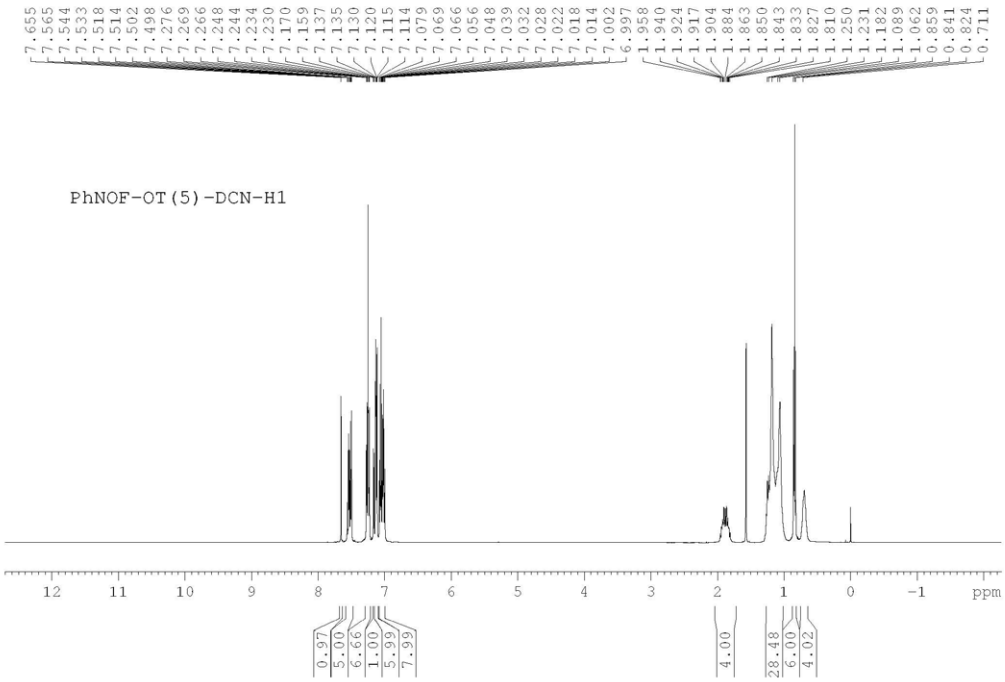



**Fig. S3** CV traces of **PhNOF-OT(6)-DCN** and **$G_2$-OT(5)-DCN**.

2. The $^{1}H$ NMR and $^{13}C$ NMR spectra of new oligothiophenes

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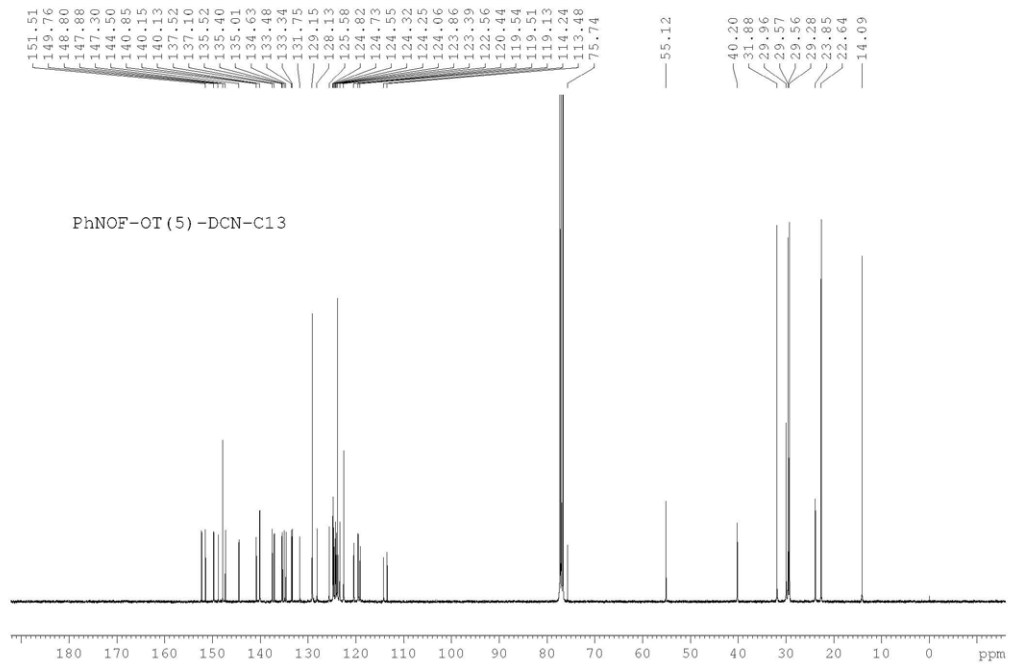
PhNOF-OT(5)-DCN-C13
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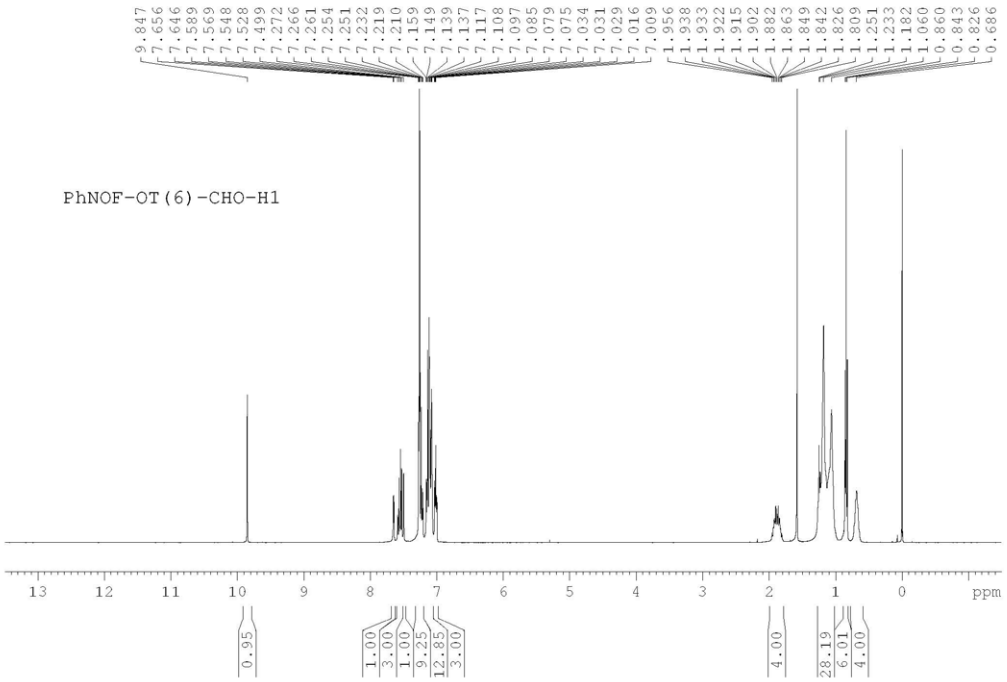
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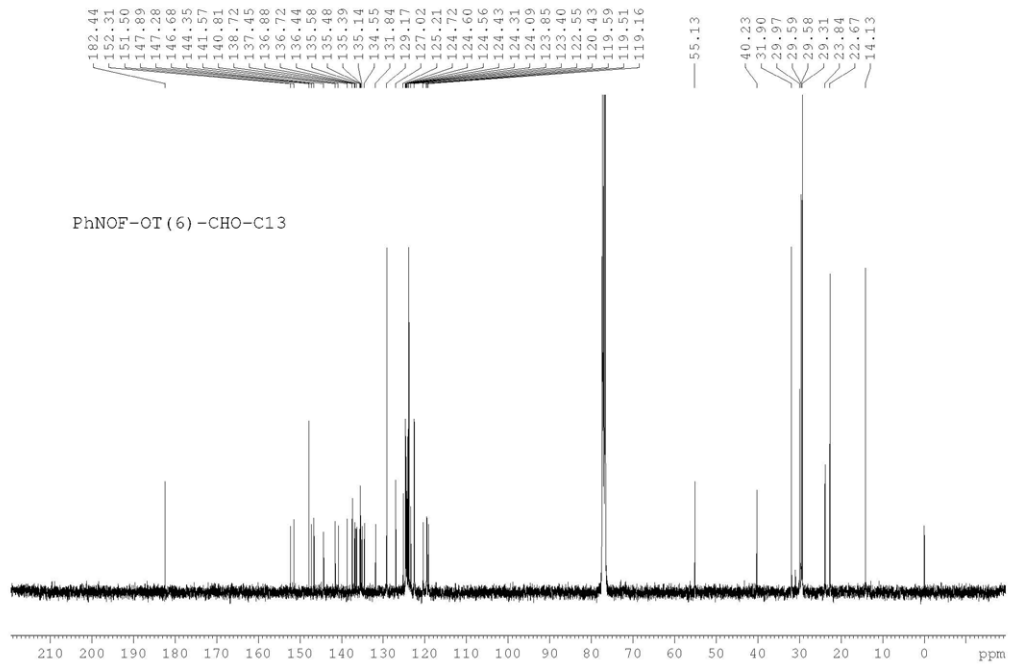
9.847
7.656
7.646
7.589
7.569
7.548
7.528
7.499
7.272
7.266
7.261
7.254
7.251
7.232
7.219
7.210
7.159
7.149
7.139
7.137
7.117
7.108
7.097
7.085
7.079
7.075
7.034
7.031
7.029
7.016
7.009
1.956
1.938
1.933
1.922
1.915
1.902
1.882
1.863
1.849
1.842
1.826
1.809
1.251
1.233
1.182
1.060
0.860
0.843
0.826
0.686
13 12 11 10 9 8 7 6 5 4 3 2 1 0 ppm
0.95
1.00
3.00
1.00
9.25
12.85
3.00
4.00
28.19
6.01
4.00


PhNOF-OT(6)-CHO-C13
182.44
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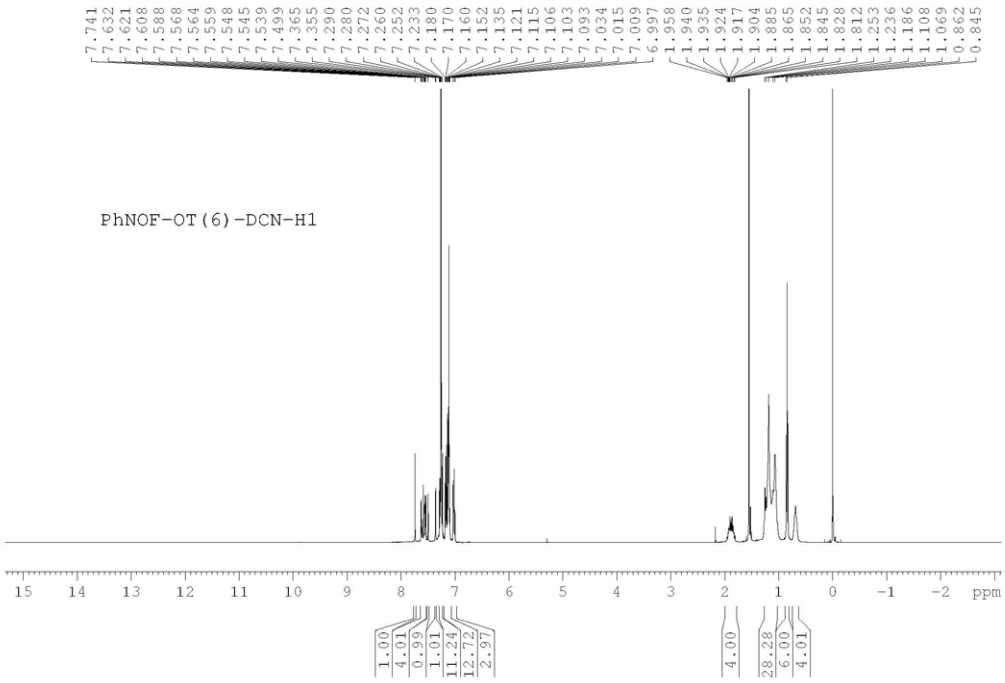
151.50
147.89
147.28
146.68
144.35
141.57
140.81
138.72
137.45
136.88
136.72
136.44
135.58
135.48
135.39
135.14
134.55
131.84
129.17
127.02
125.21
124.72
124.60
124.56
124.43
124.31
124.09
123.85
123.40
122.55
120.43
119.59
119.51
119.16
55.13
40.23
31.90
29.97
29.59
29.58
29.31
23.84
22.67
14.13
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm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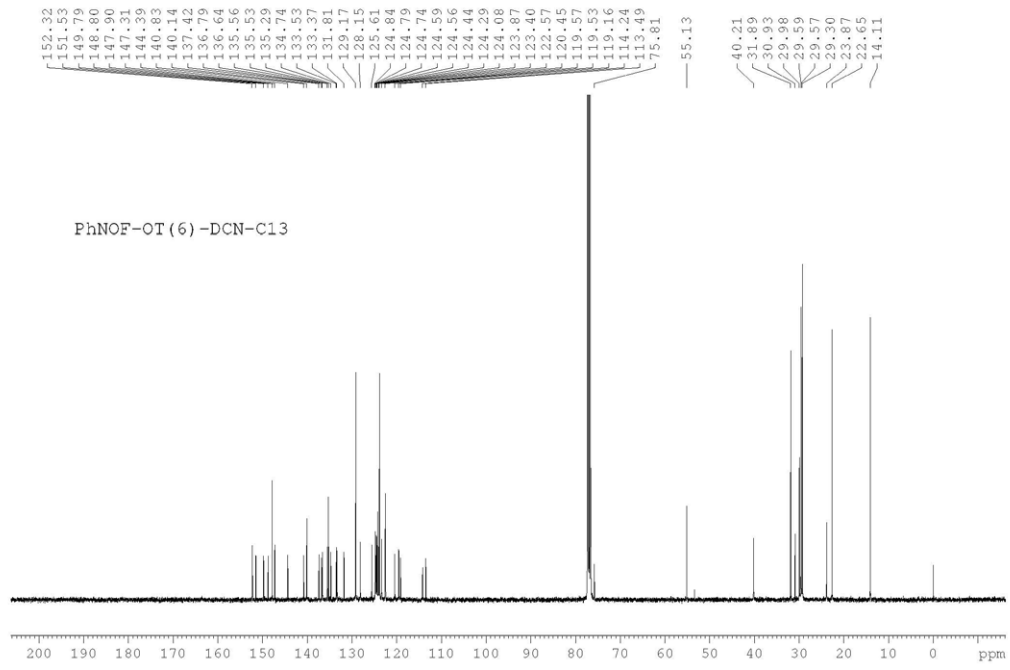
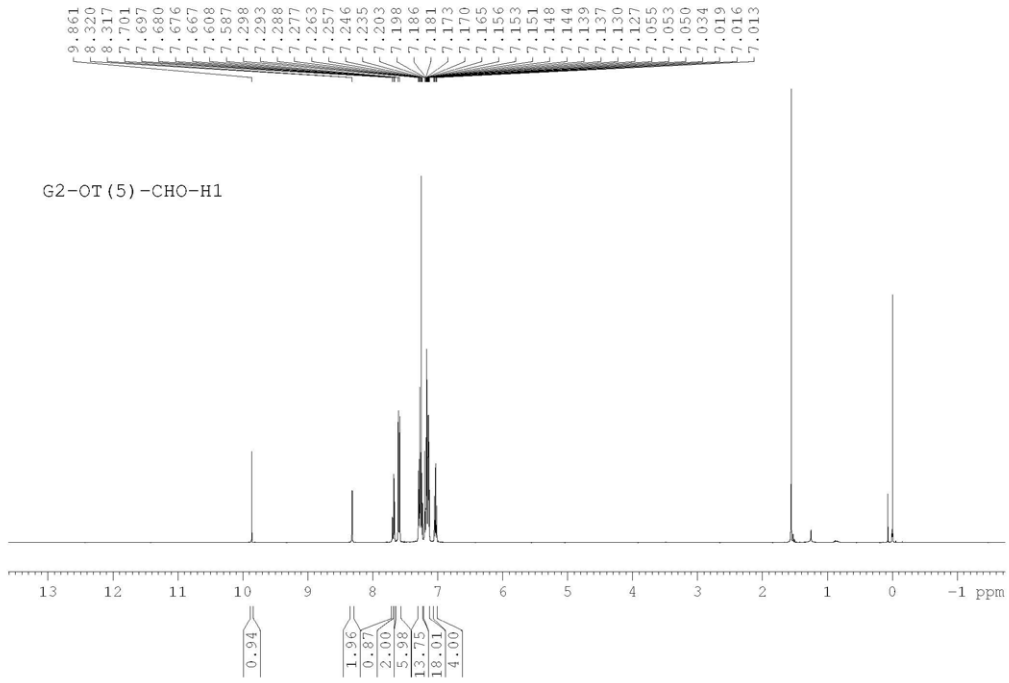
ppm


PhNOF-OT(6)-DCN-C13
ppm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7.701
7.697
7.680
7.676
7.667
7.608
7.587
7.298
7.293
7.288
7.277
7.263
7.257
7.246
7.235
7.203
7.198
7.186
7.181
7.173
7.170
7.165
7.156
7.153
7.151
7.148
7.144
7.139
7.137
7.130
7.127
7.055
7.053
7.050
7.034
7.019
7.016
7.013
G2-OT(5)-CHO-H1
13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 ppm
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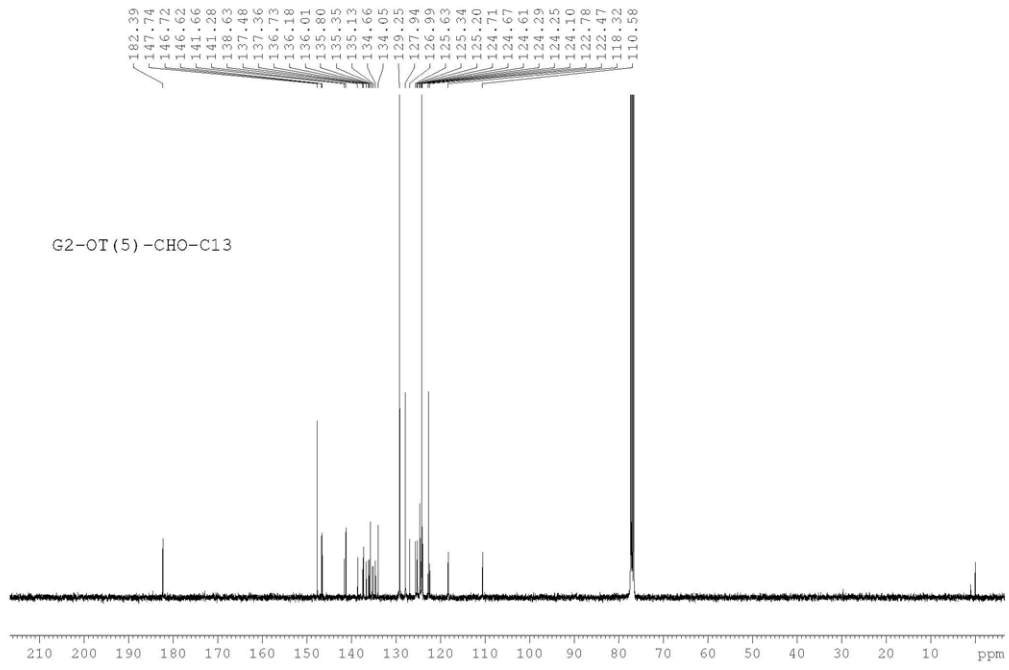
1.96
0.87
2.00
5.98
13.75
18.01
4.00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146.72
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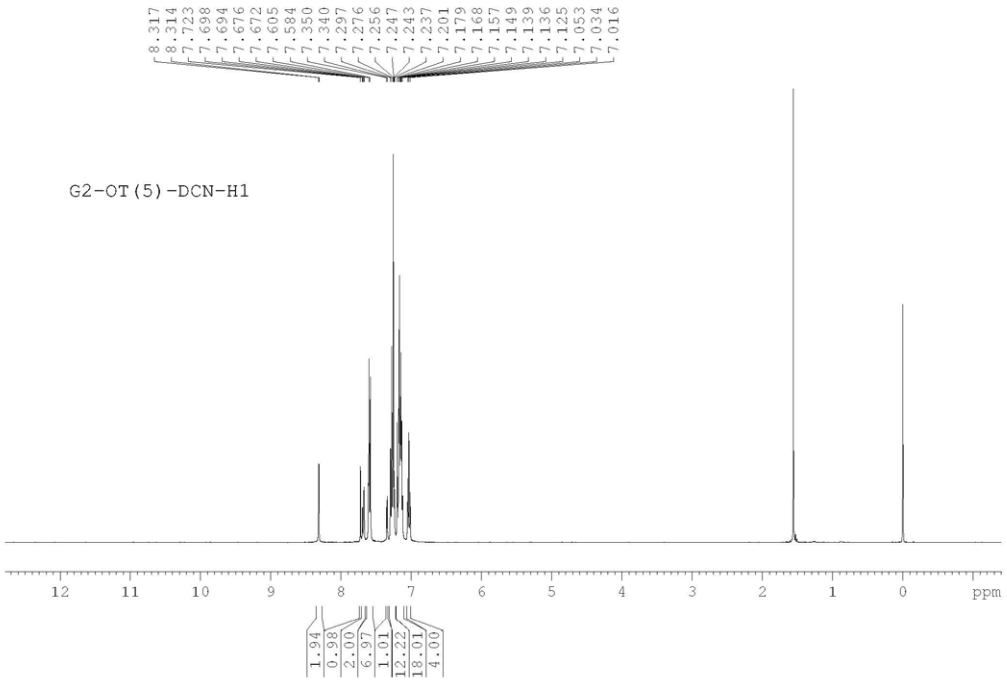
141.66
141.28
138.63
137.48
137.36
136.73
136.18
136.01
135.80
135.35
135.13
134.66
134.05
129.25
127.94
126.99
125.63
125.34
125.20
124.71
124.67
124.61
124.29
124.25
124.10
122.78
122.47
118.32
110.58
G2-OT(5)-CHO-C13
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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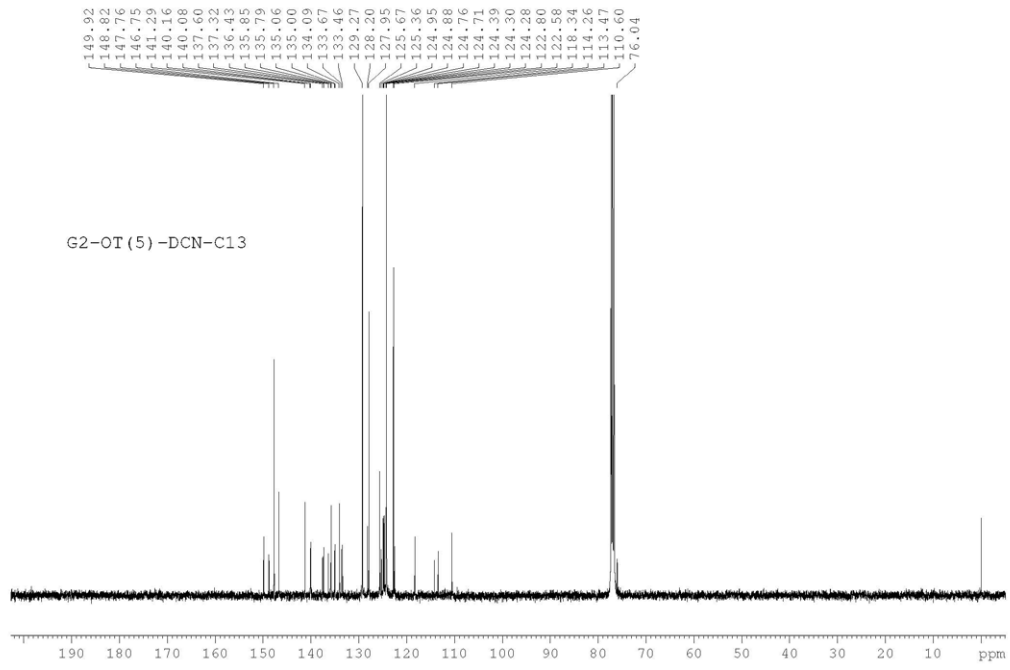
7.698
7.694
7.676
7.672
7.605
7.584
7.350
7.340
7.297
7.276
7.256
7.247
7.243
7.237
7.201
7.179
7.168
7.157
7.149
7.139
7.136
7.125
7.053
7.034
7.016
G2-OT(5)-DCN-H1
12
11
10
9
8
7
6
5
4
3
2
1
0
ppm
1.94
0.98
2.00
6.97
1.01
12.22
18.01
4.00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140.08
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135.85
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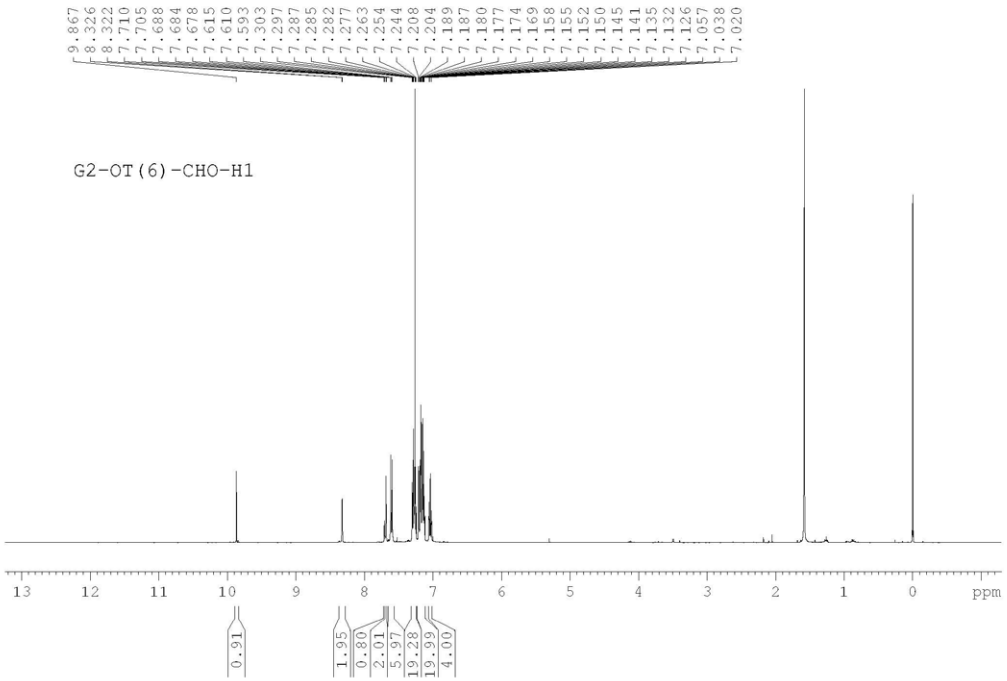
135.06
135.00
134.09
133.67
133.46
129.27
128.20
127.95
125.67
125.36
124.95
124.88
124.76
124.71
124.39
124.30
124.28
122.80
122.58
118.34
114.26
113.47
110.60
76.04
G2-OT(5)-DCN-C13
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm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7.705
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7.684
7.678
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7.287
7.285
7.282
7.277
7.263
7.254
7.244
7.208
7.204
7.189
7.187
7.180
7.177
7.174
7.169
7.158
7.155
7.152
7.150
7.145
7.141
7.135
7.132
7.126
7.057
7.038
7.020
G2-OT(6)-CHO-H1
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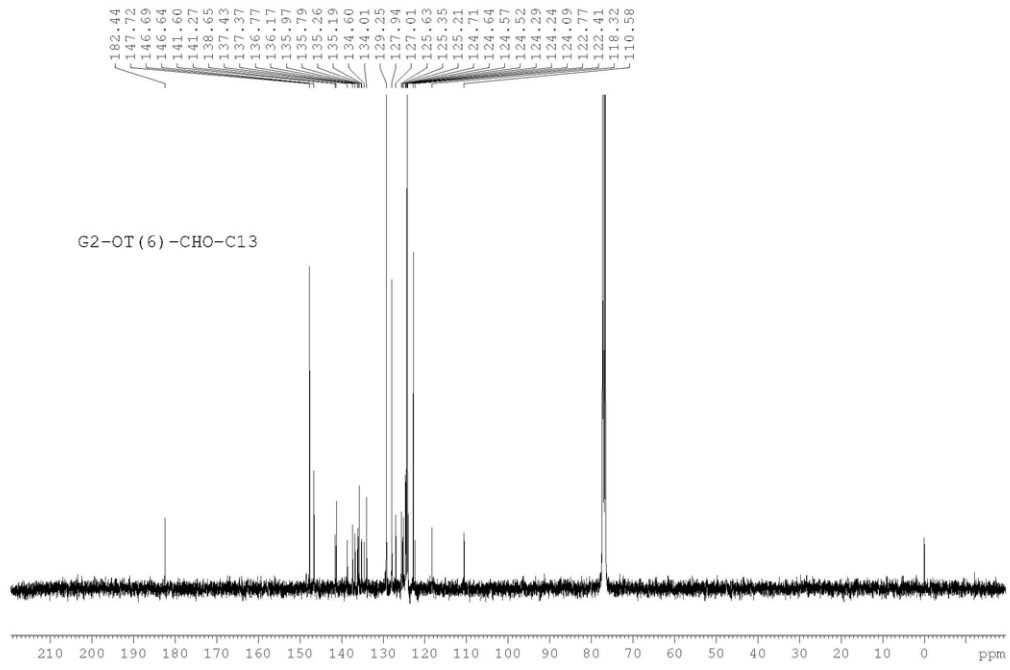
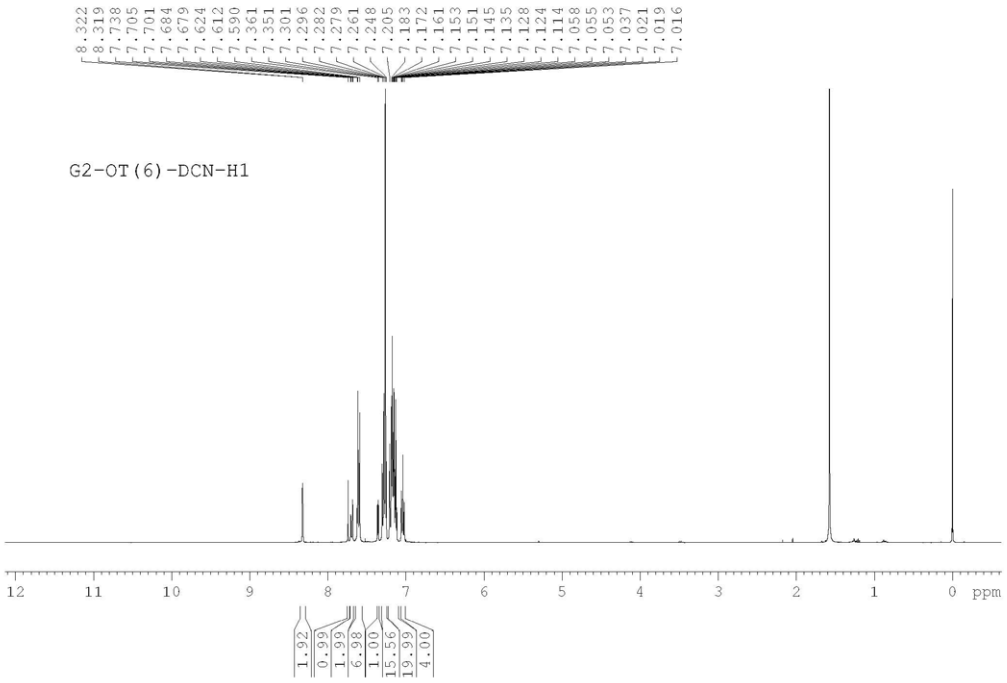
0.91
1.95
0.80
2.01
5.97
19.28
19.99
4.00


182.44
147.72
146.69
146.64
141.60
141.27
138.65
137.43
137.37
136.77
136.17
135.97
135.79
135.26
135.19
134.60
134.01
129.25
127.94
127.01
125.63
125.35
125.21
124.71
124.64
124.57
124.52
124.29
124.24
124.09
122.77
122.41
118.32
110.58
G2-OT(6)-CHO-C13
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm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7.684
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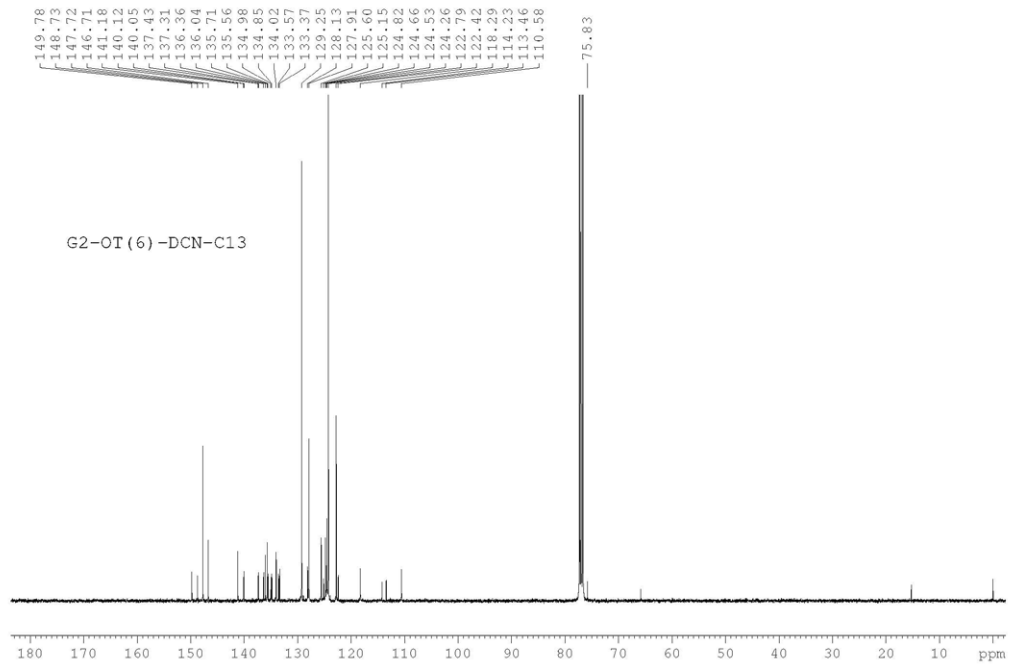
7.351
7.301
7.296
7.282
7.279
7.261
7.248
7.205
7.183
7.172
7.161
7.153
7.151
7.145
7.135
7.128
7.124
7.114
7.058
7.055
7.053
7.037
7.021
7.019
7.016
G2-OT(6)-DCN-H1
12
11
10
9
8
7
6
5
4
3
2
1
0
ppm
1.92
0.99
1.99
6.98
1.00
15.56
19.99
4.00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148.73
147.72
146.71
141.18
140.12
140.05
137.43
137.31
136.36
136.04
135.71
135.56
134.98
134.85
134.02
133.57
133.37
129.25
128.13
127.91
125.60
125.15
124.82
124.66
124.53
124.26
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118.29
114.23
113.46
110.58
75.83
G2-OT(6)-DCN-C13
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
ppm