

Metal-free cycloisomerizations of *o*-alkynylbiaryls

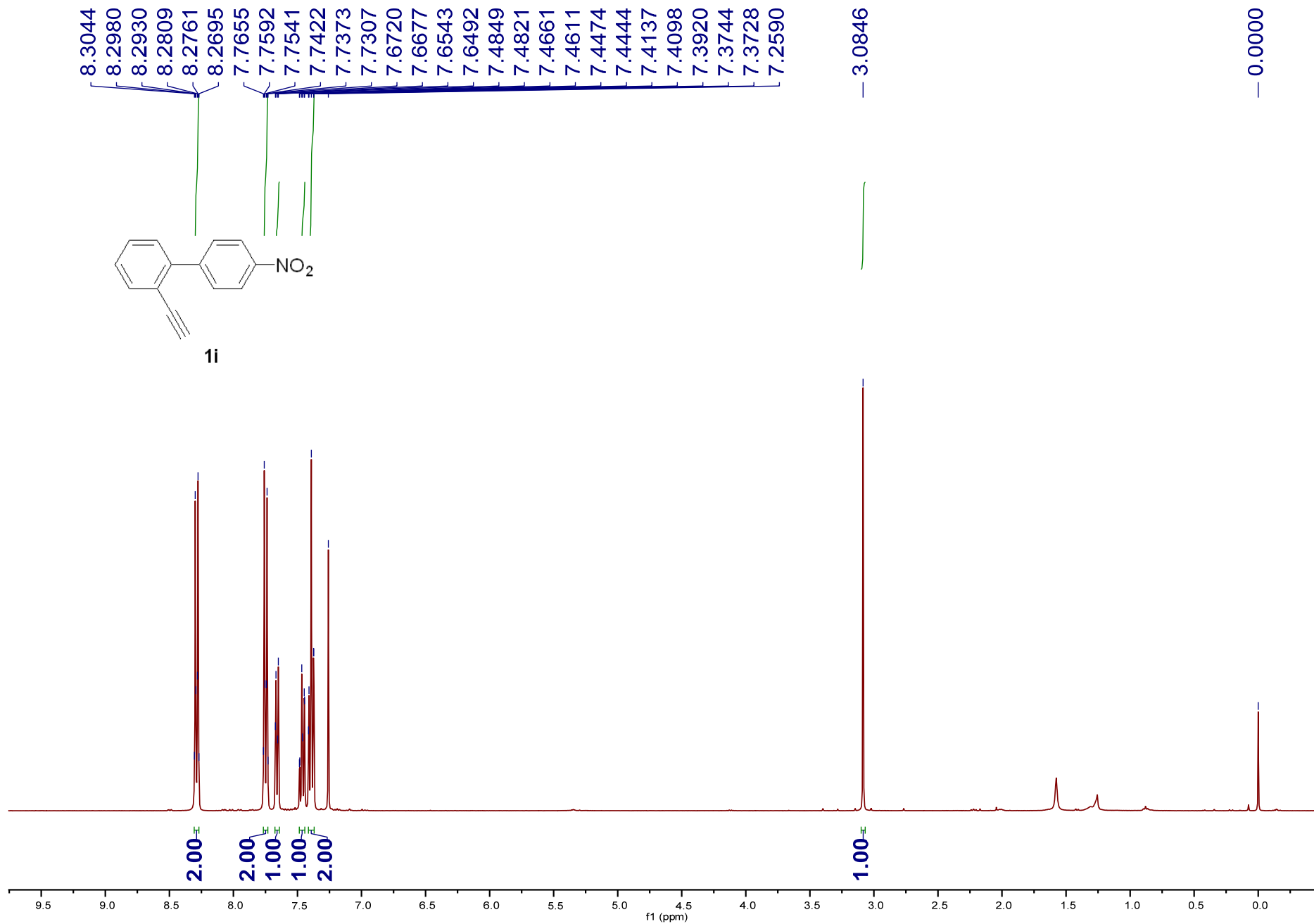
Jingyi Zhang,^a Siqu Li,^a Yan Qiao,^b Cheng Peng,^a Xiao-Na Wang^{*,a} and Junbiao Chang^{*,a}

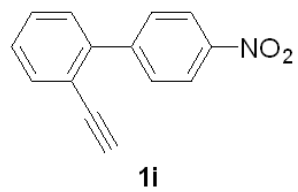
^a Collaborative Innovation Center of New Drug Research and Safety Evaluation, Henan Province, Key Laboratory of Advanced Drug Preparation Technologies, Ministry of Education, School of Pharmaceutical Sciences, and College of Chemistry and Molecular Engineering, Zhengzhou University, Zhengzhou 450001, P. R. China

^b School of Basic Medical Sciences, Zhengzhou University, Zhengzhou 450001, P. R. China

Supporting Information Part 2

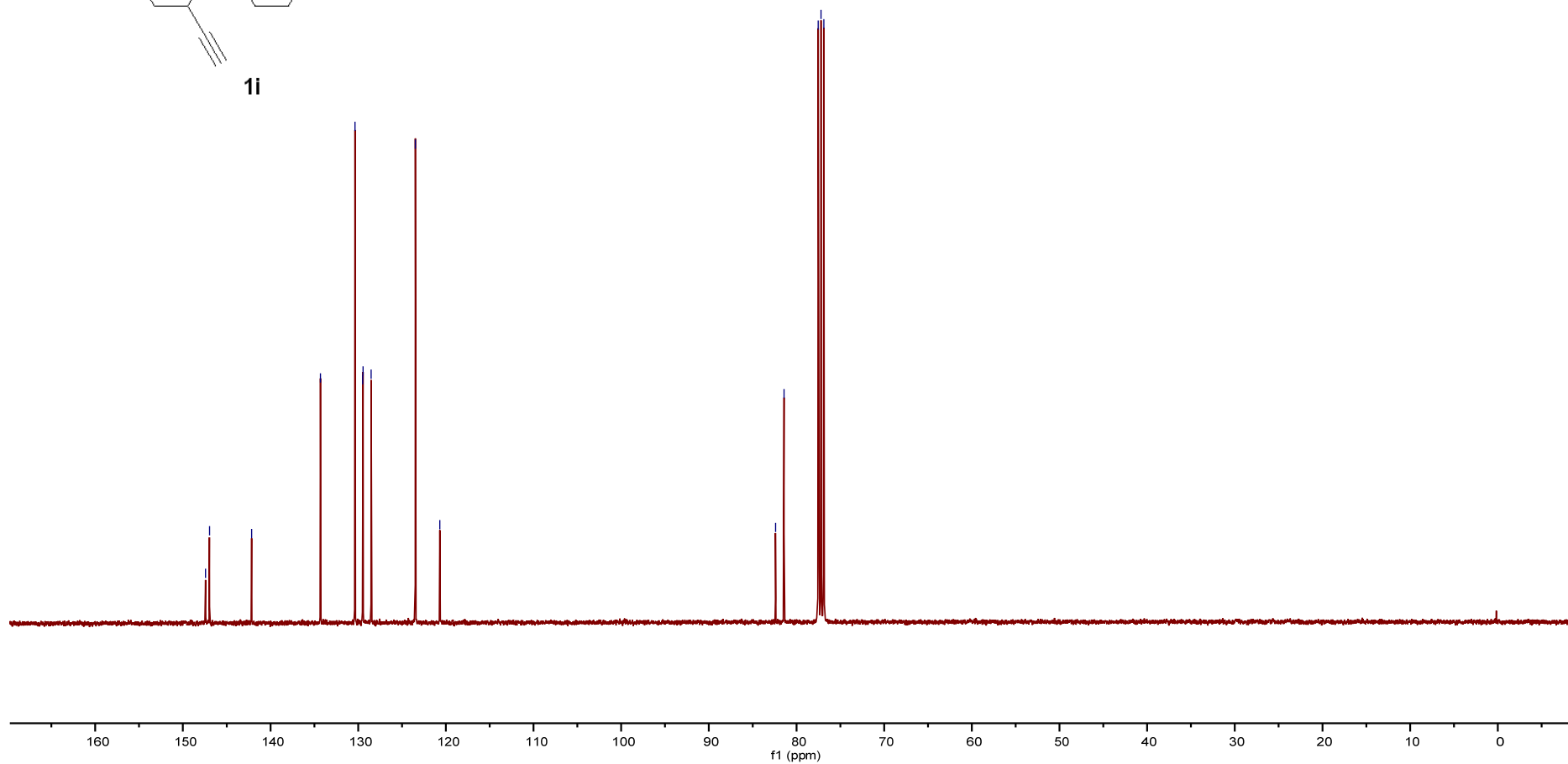
Proton NMR and Selected Carbon NMR Spectra

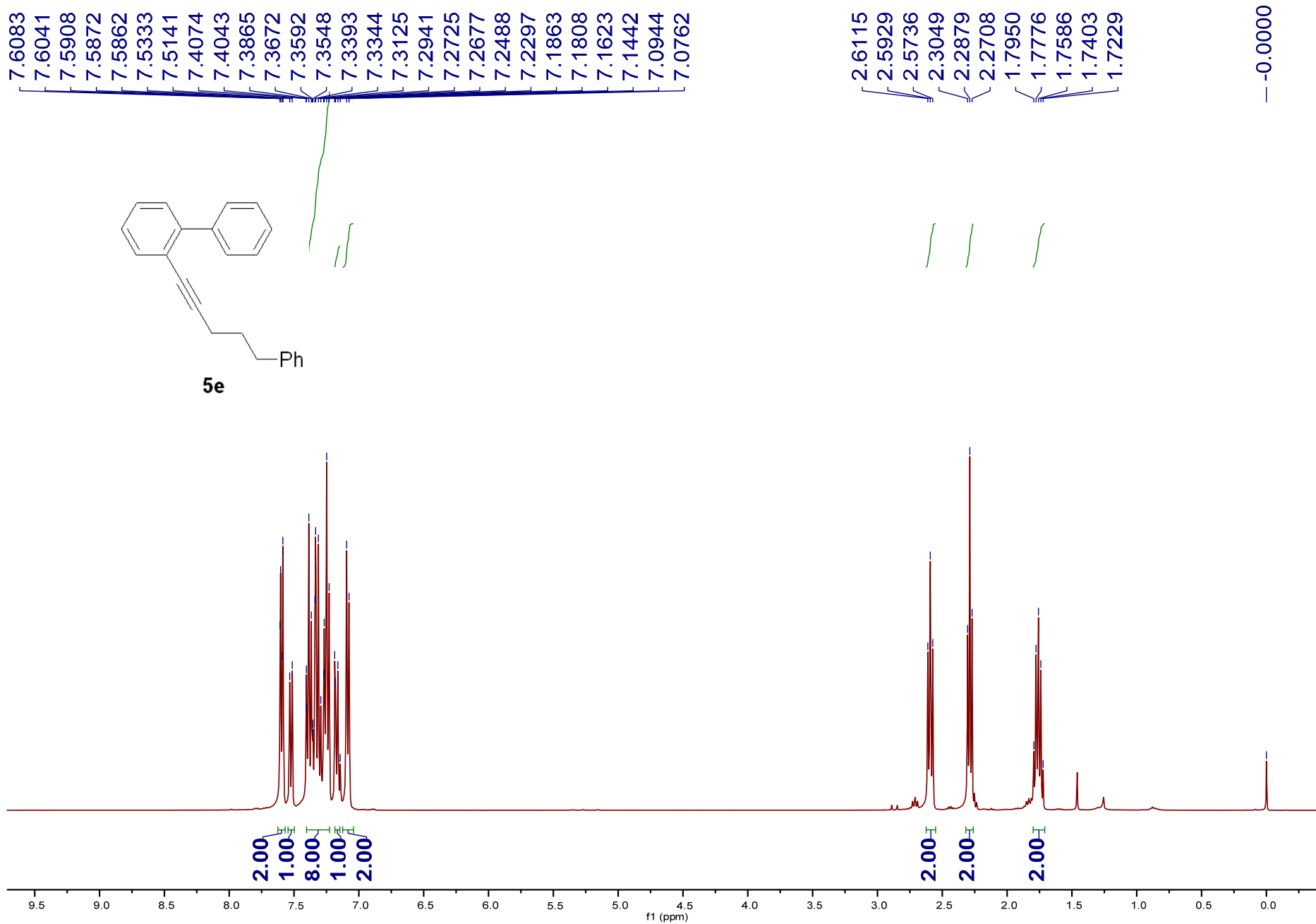


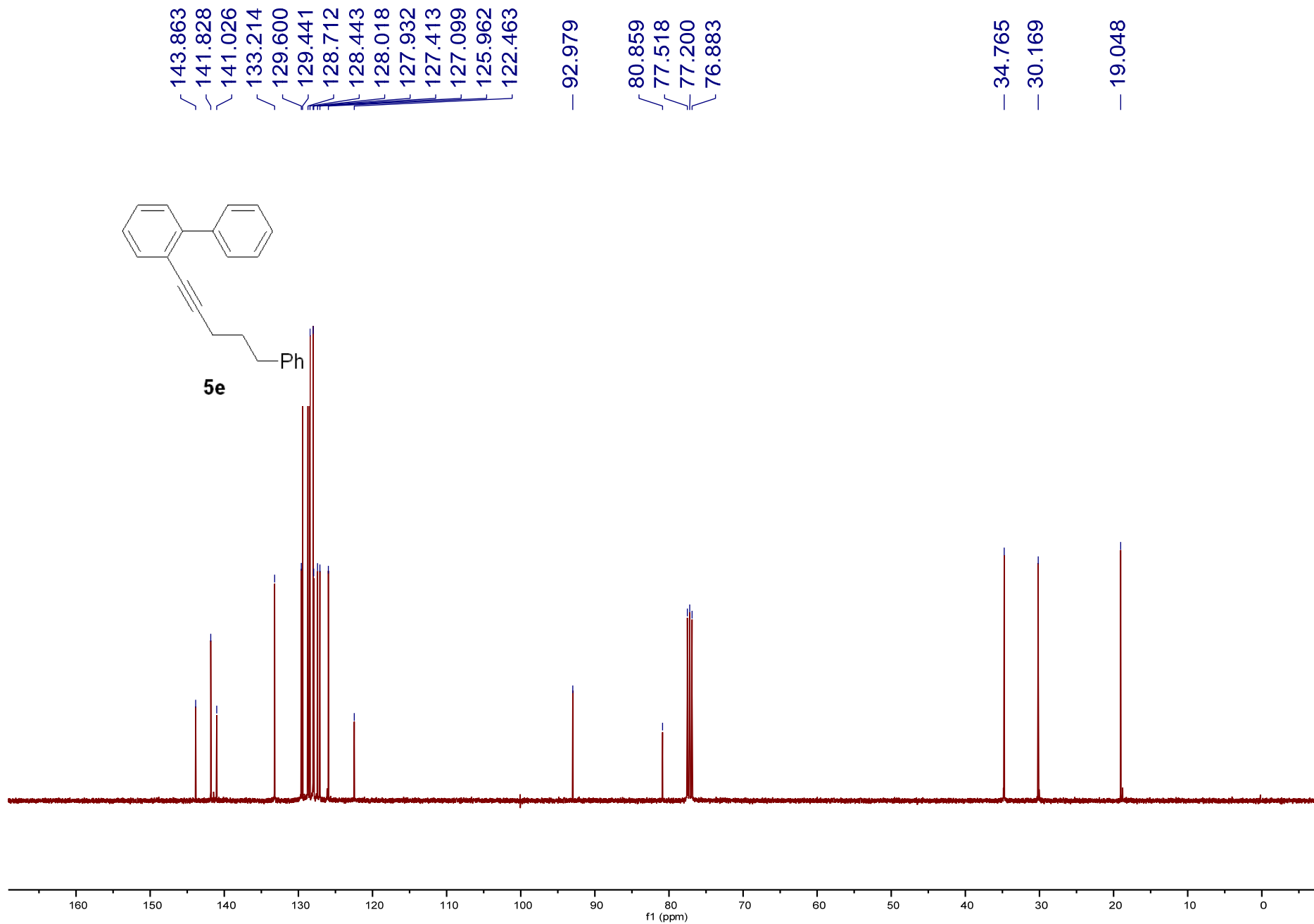
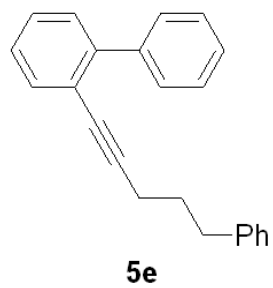


147.418
 146.963
 142.161
 134.303
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 129.490
 129.447
 128.518
 123.477
 120.687

82.393
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 77.518
 77.200
 76.883



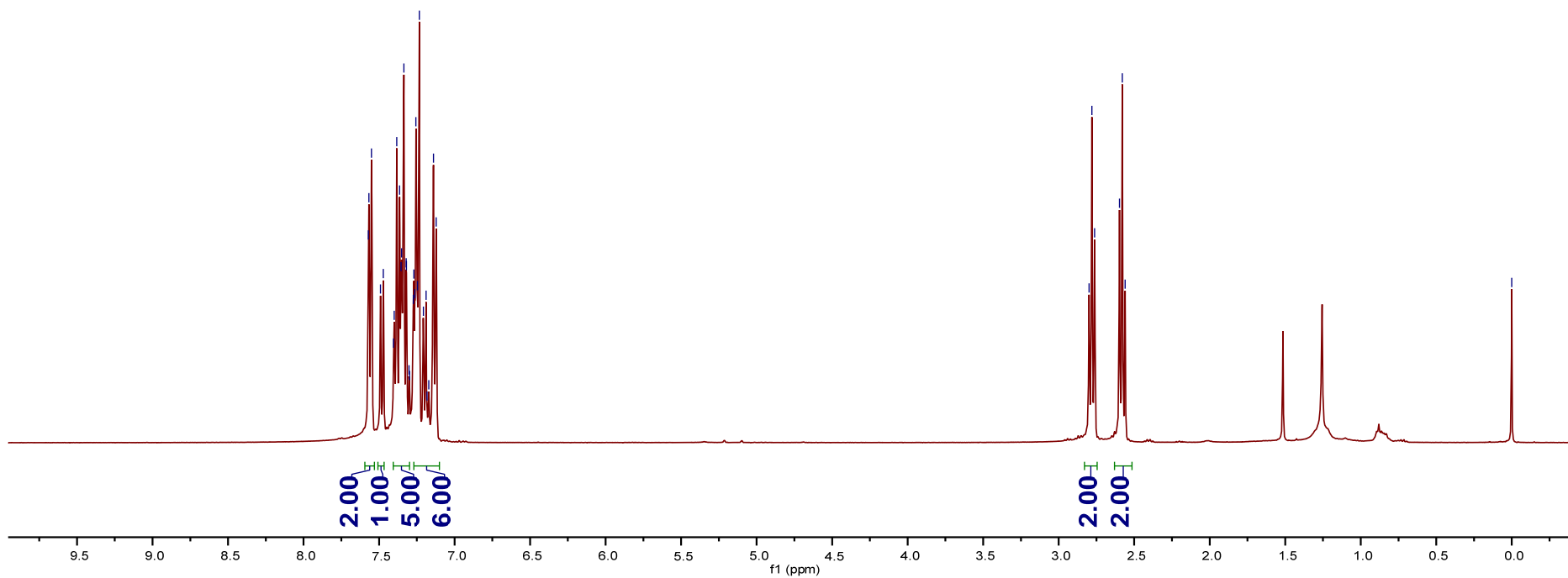
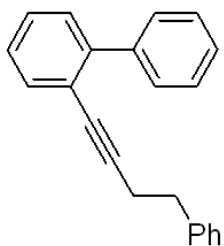


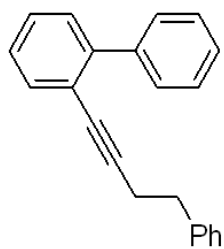


7.5706
7.5673
7.5502
7.4905
7.4717
7.4042
7.3998
7.3830
7.3642
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7.3509
7.3357
7.3208
7.3188
7.3020
7.2986
7.2729
7.2693
7.2631
7.2560
7.2460
7.2333
7.2068
7.1890
7.1825
7.1707
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2.7619
2.5973
2.5788
2.5601

— 0.0000





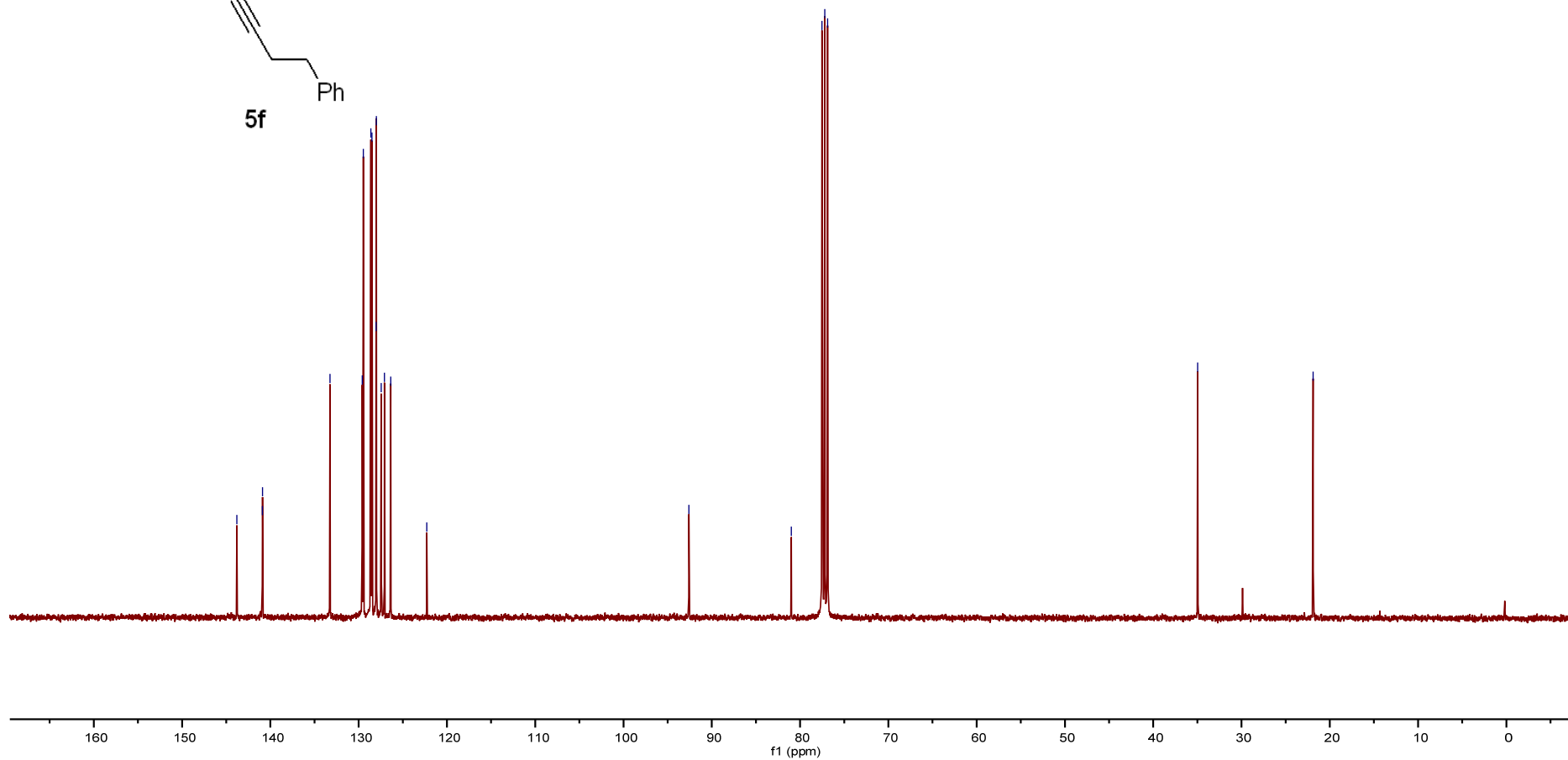
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140.888
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129.472
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122.287

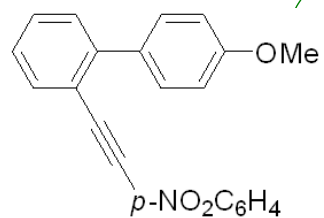
— 92.590

80.990
77.517
77.200
76.882

— 34.960

— 21.888



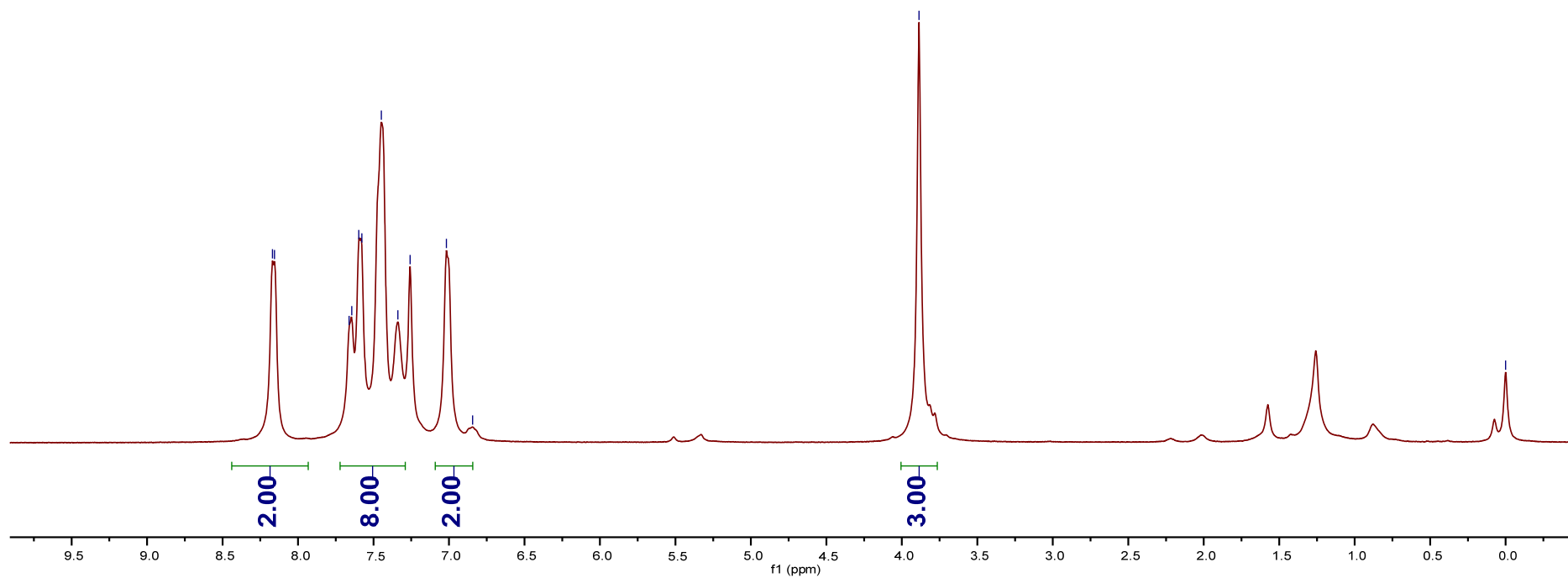


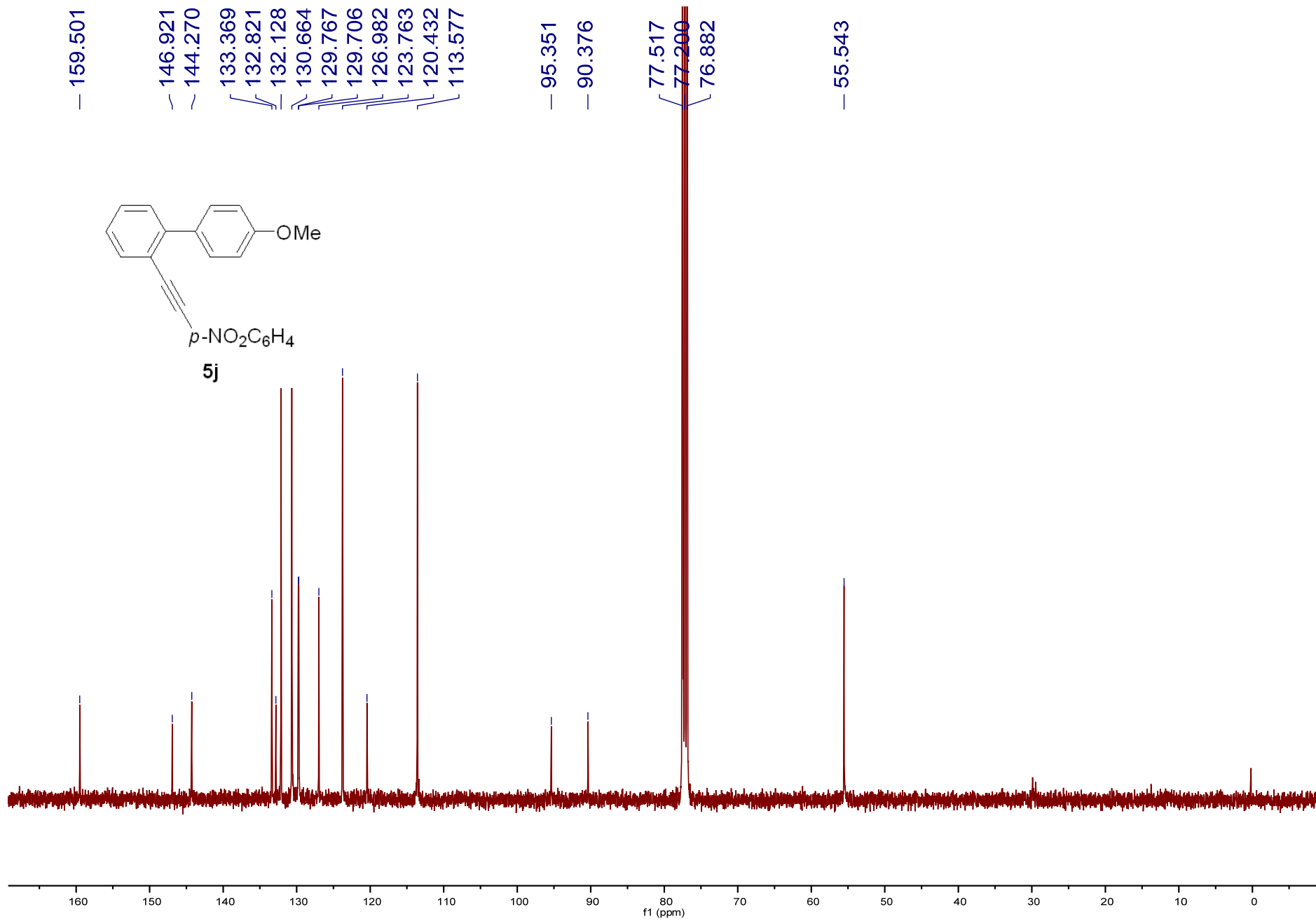
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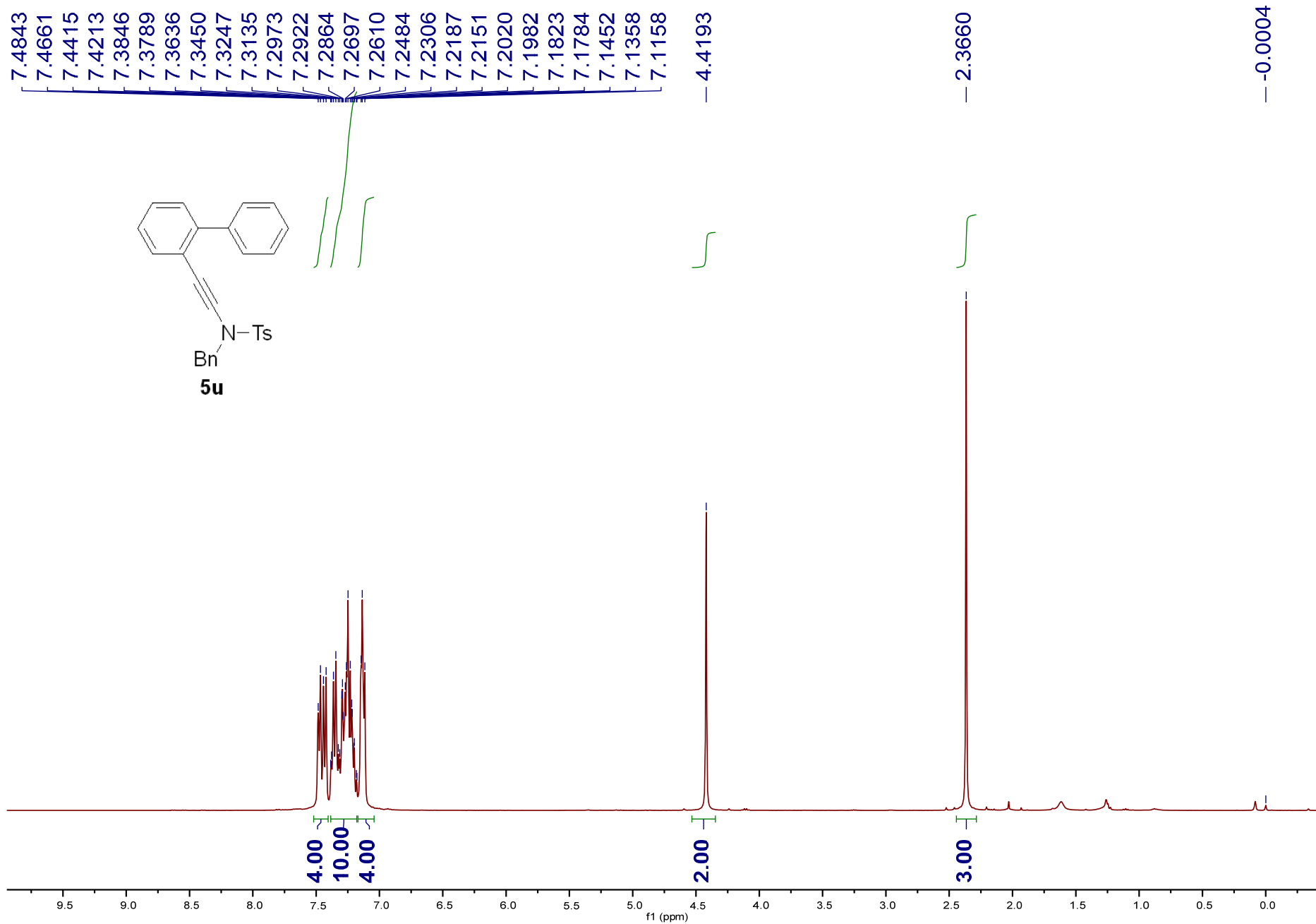
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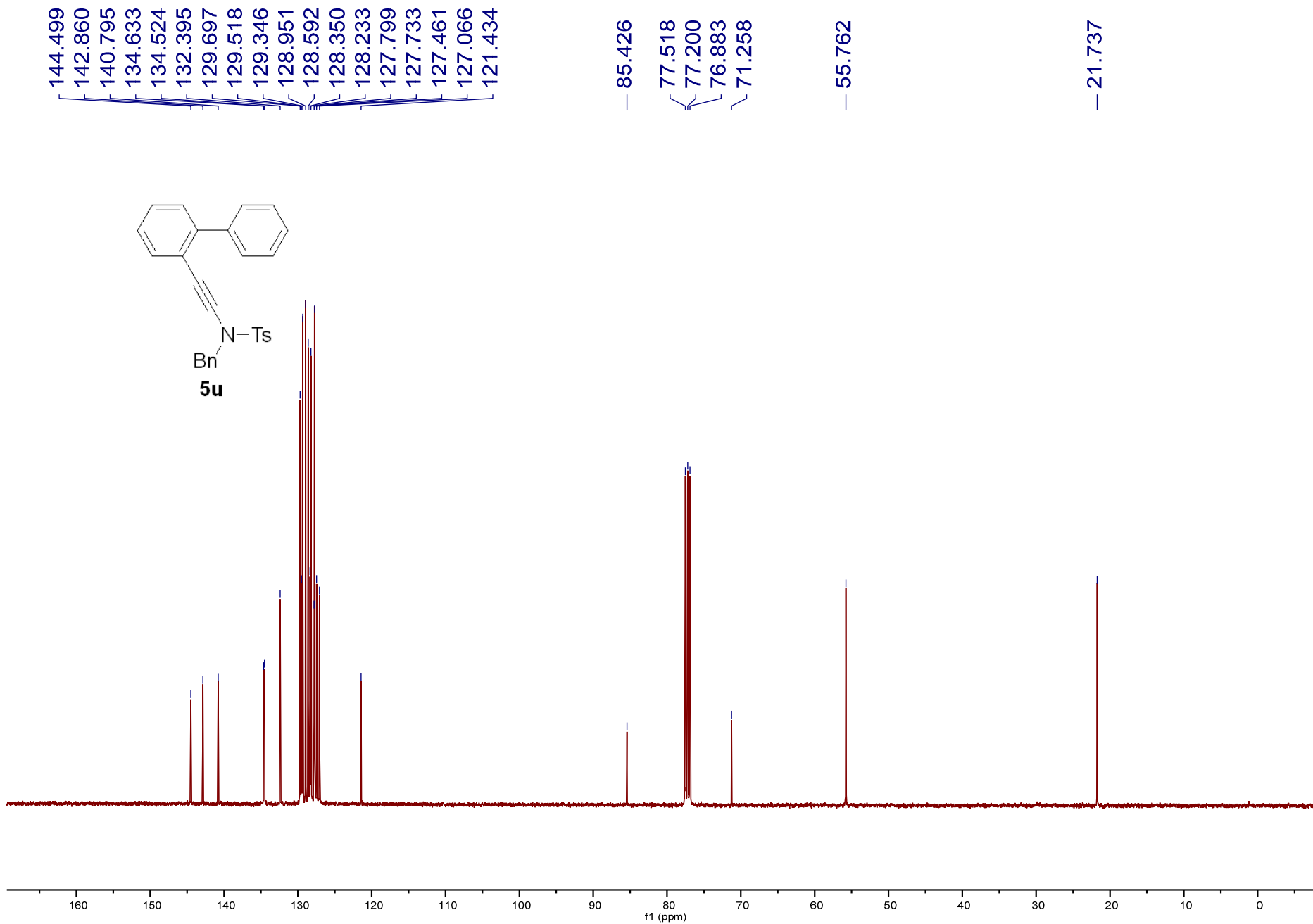
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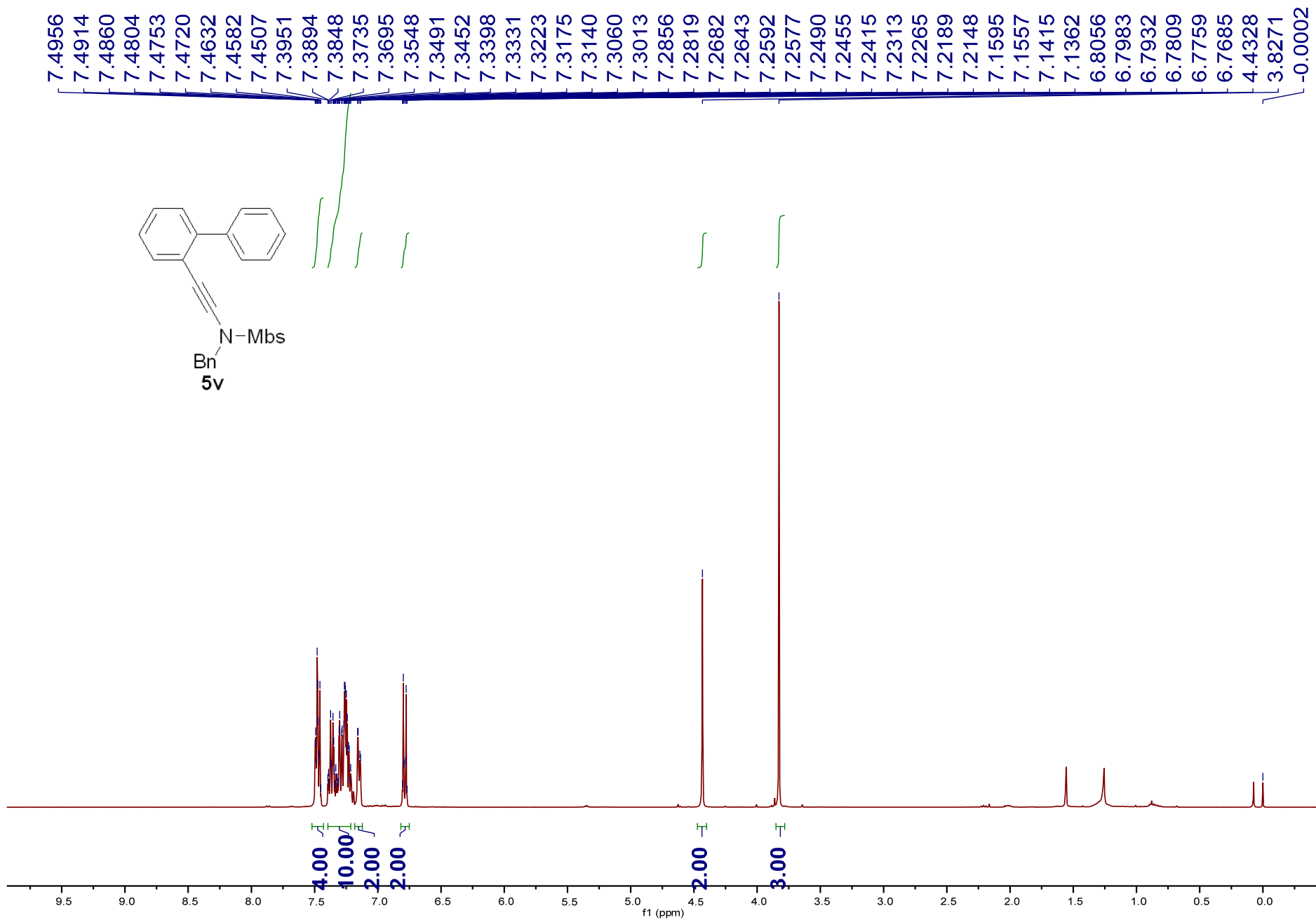
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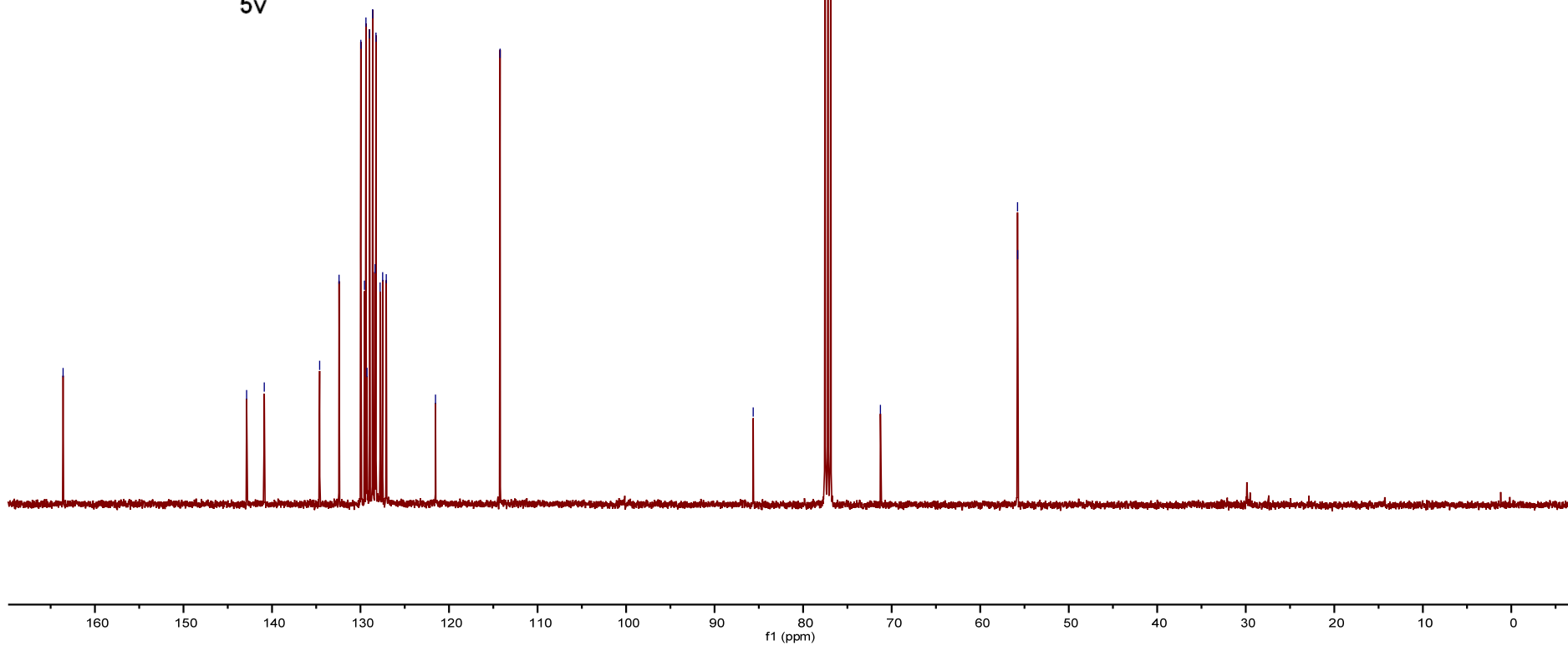
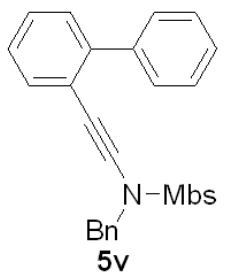






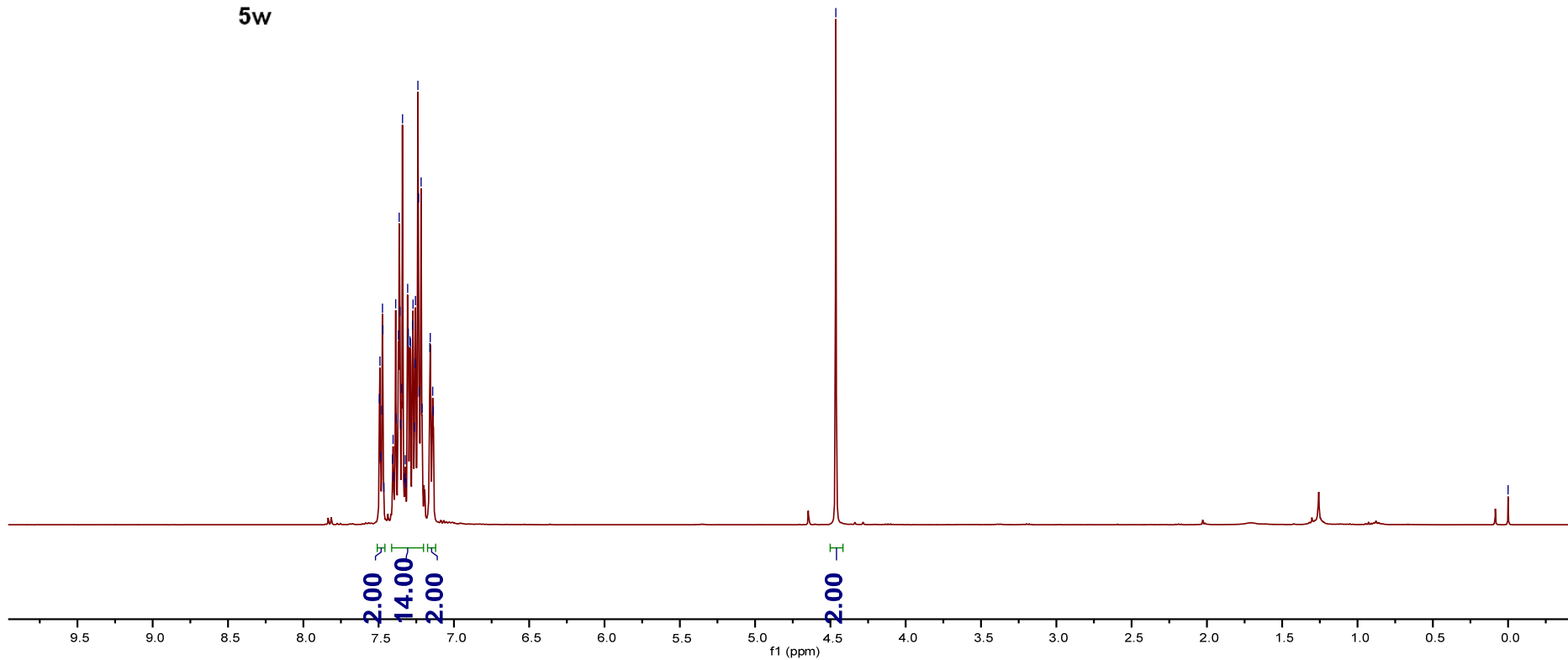
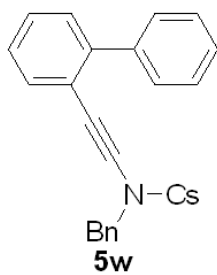
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 128.364
 128.255
 127.788
 127.497
 127.095
 121.522
 114.232

— 85.642
 77.517
 77.200
 76.882
 71.264
 55.781
 55.763

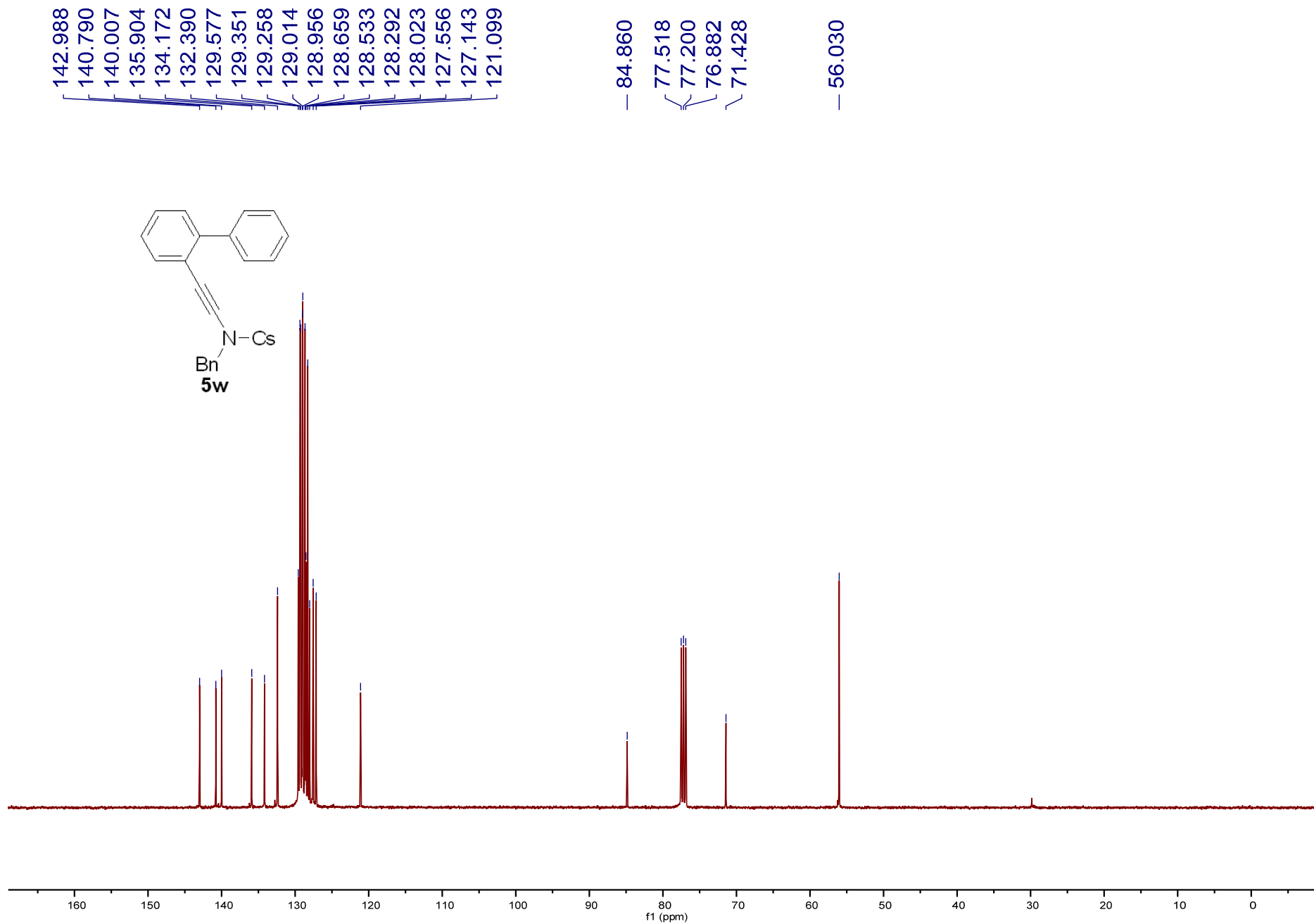


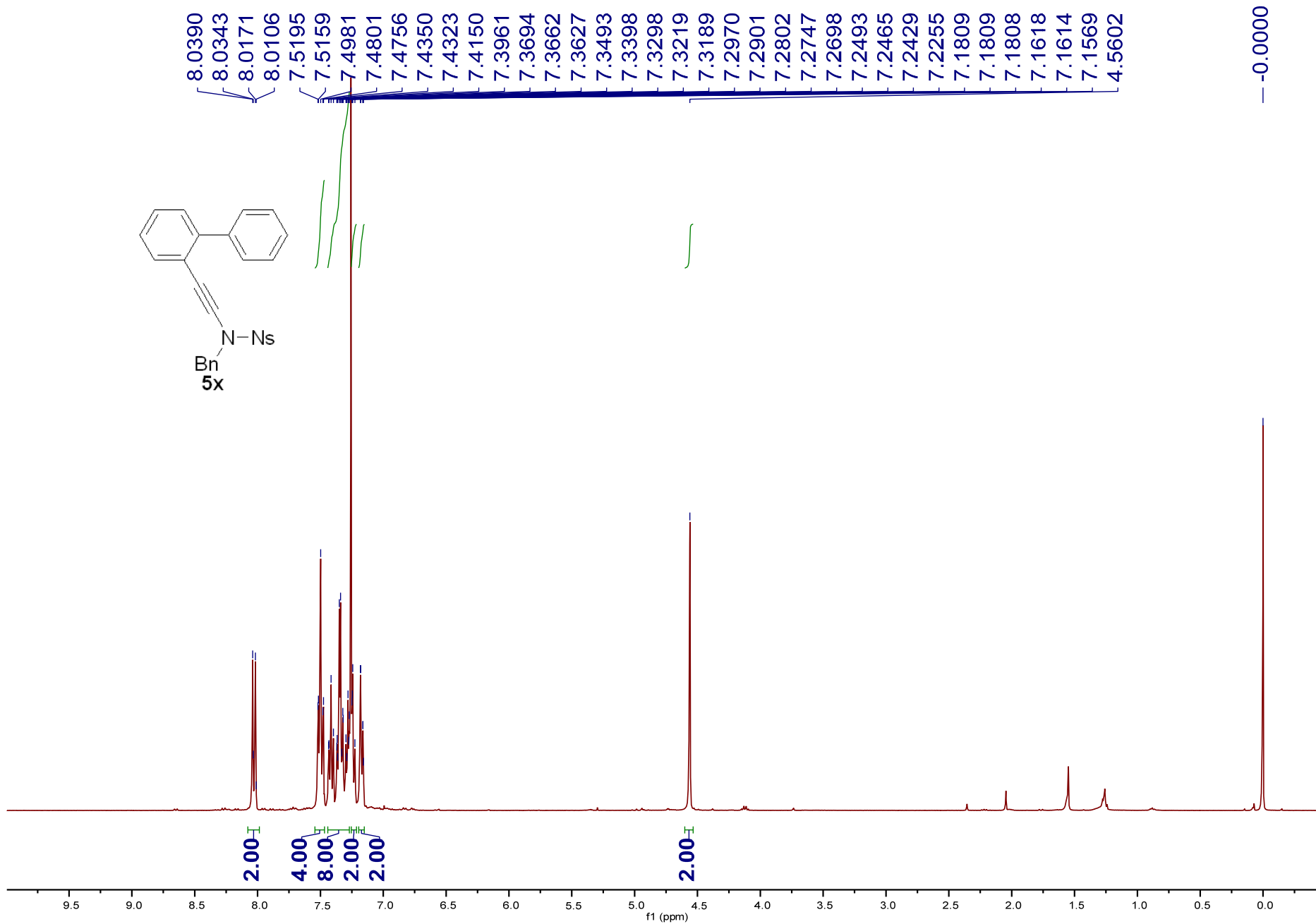
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7.4649
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7.3867
7.3829
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7.3583
7.3547
7.3465
7.3415
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7.2716
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7.2551
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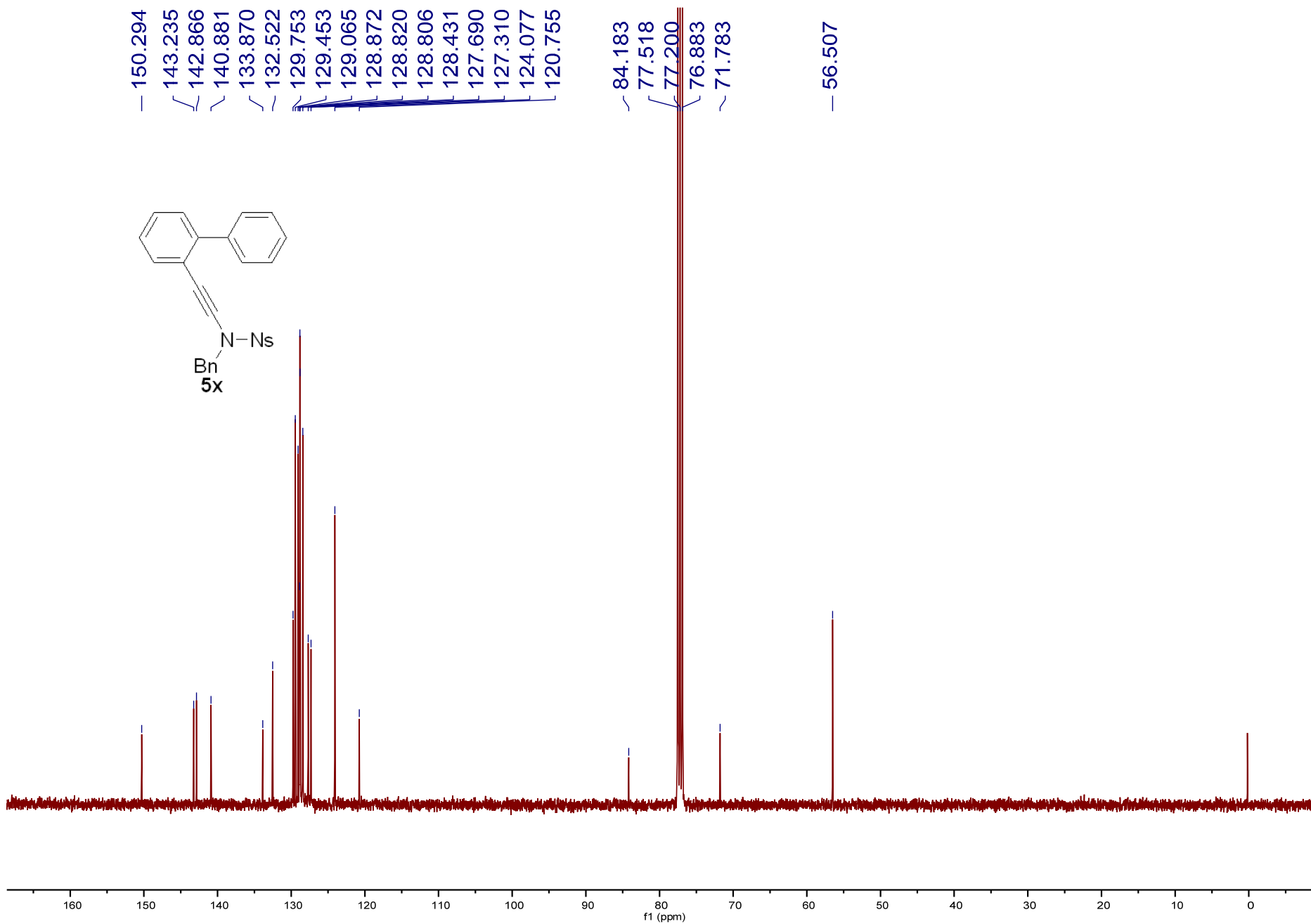
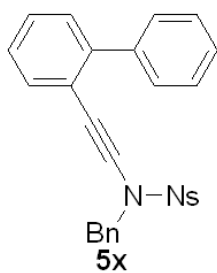
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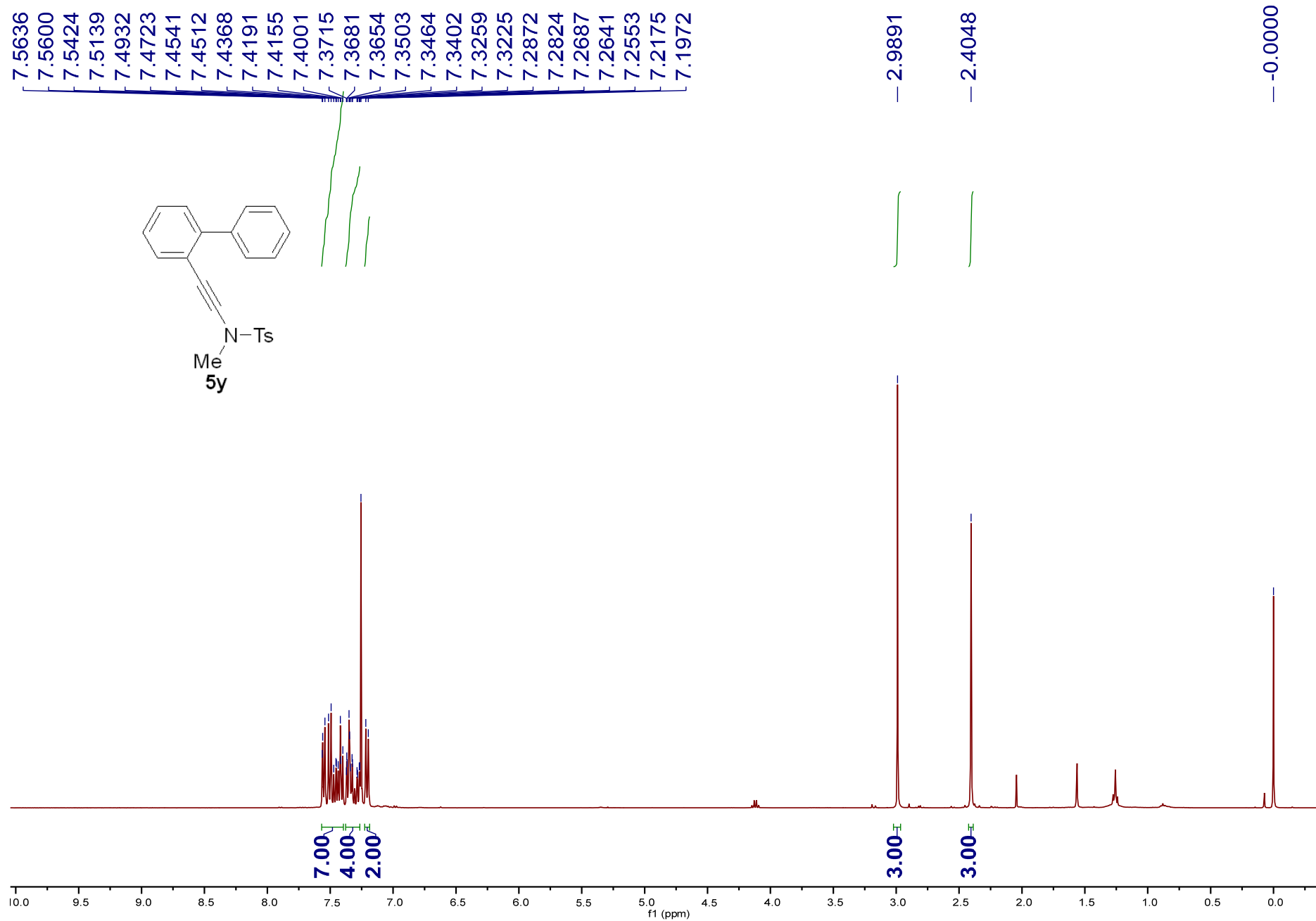


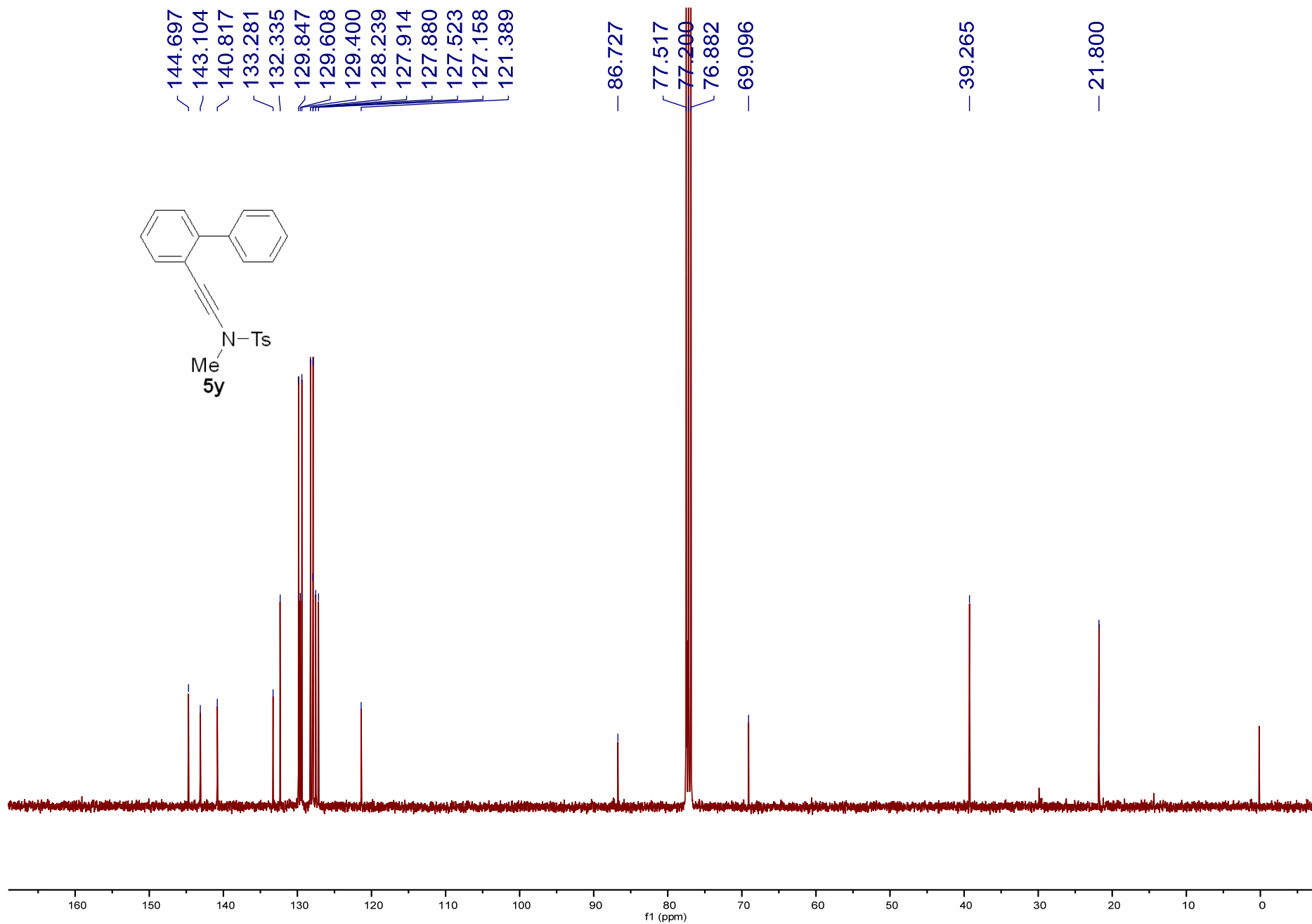
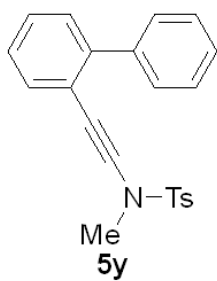
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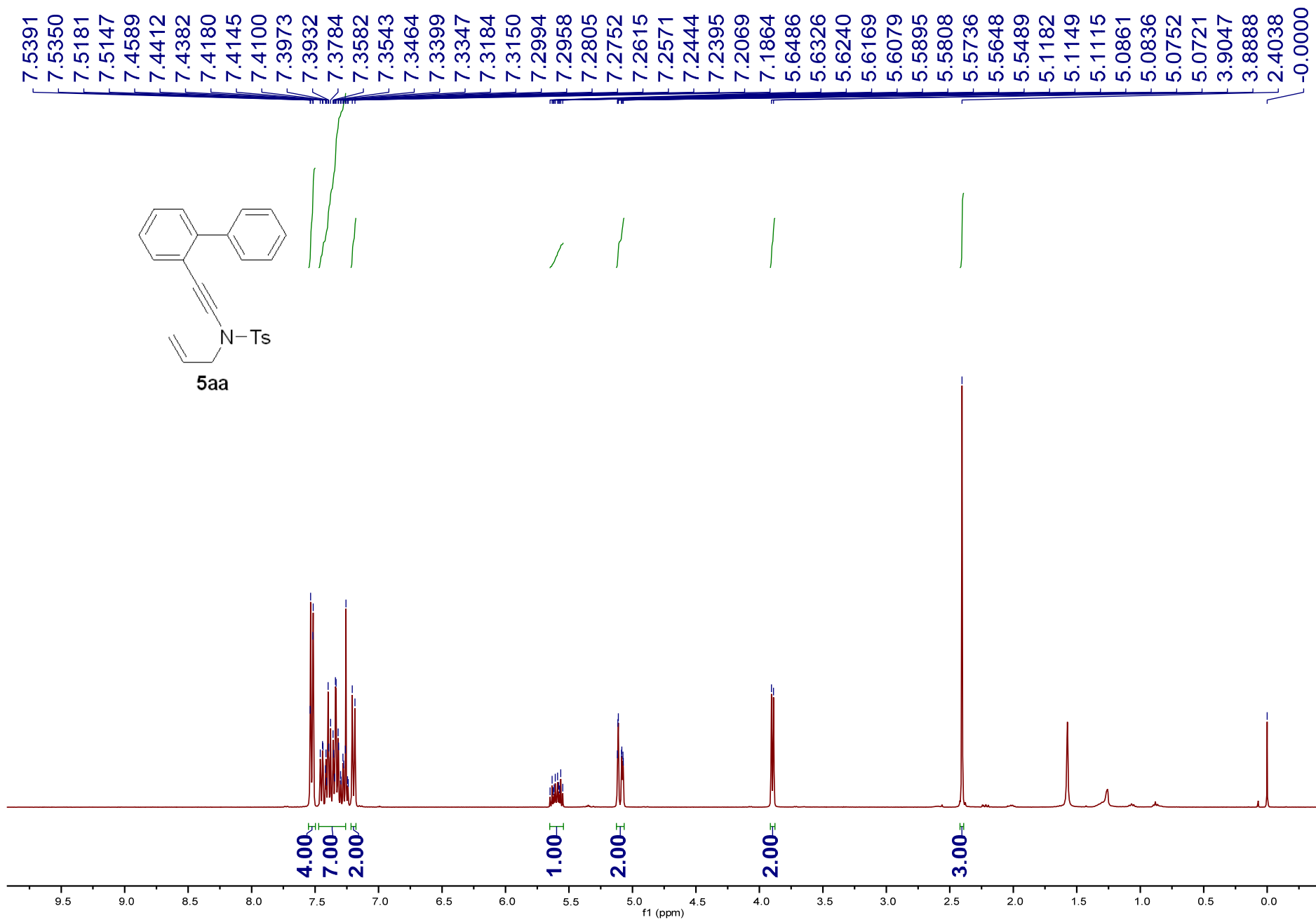


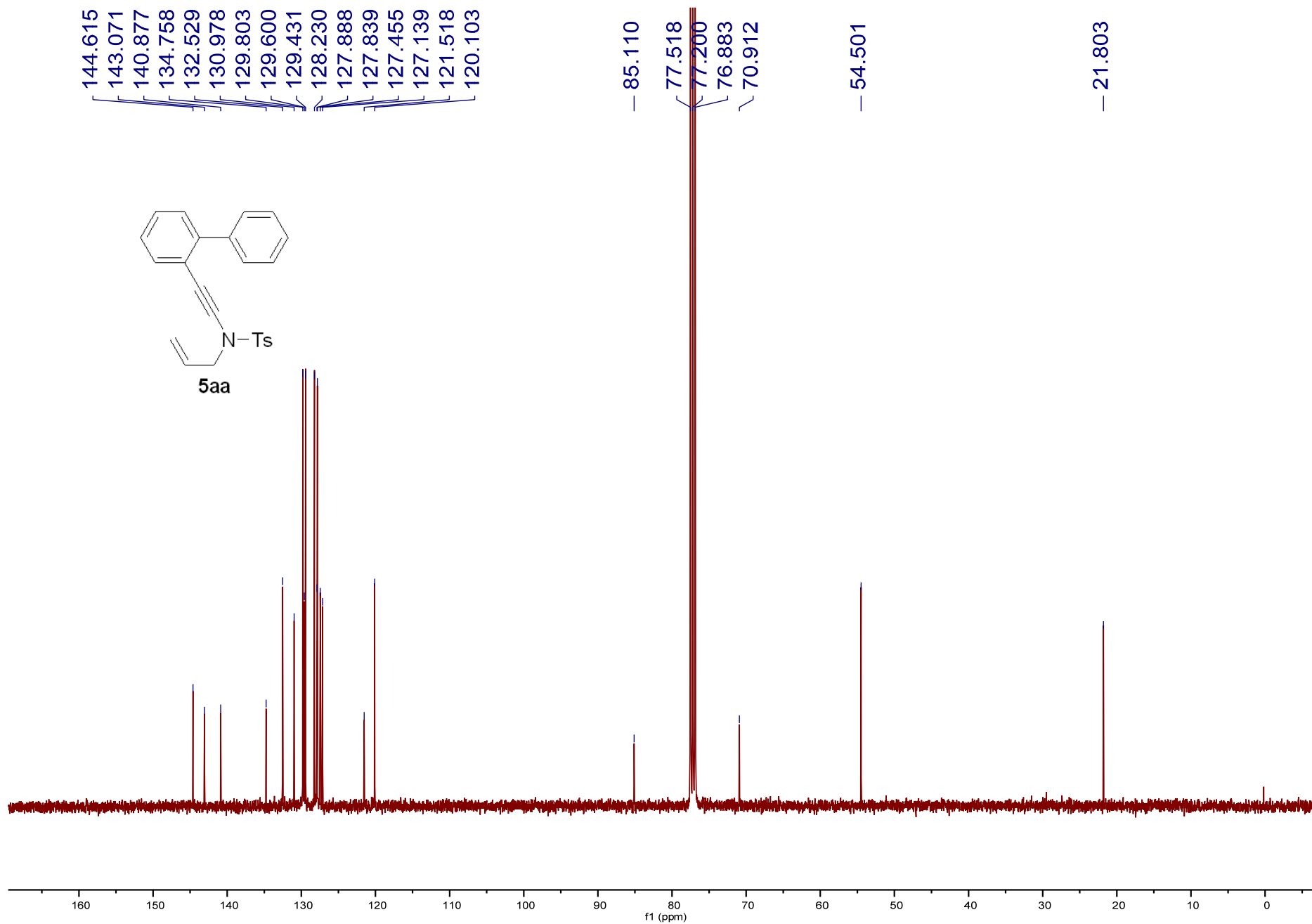
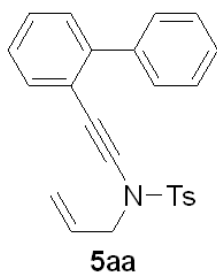


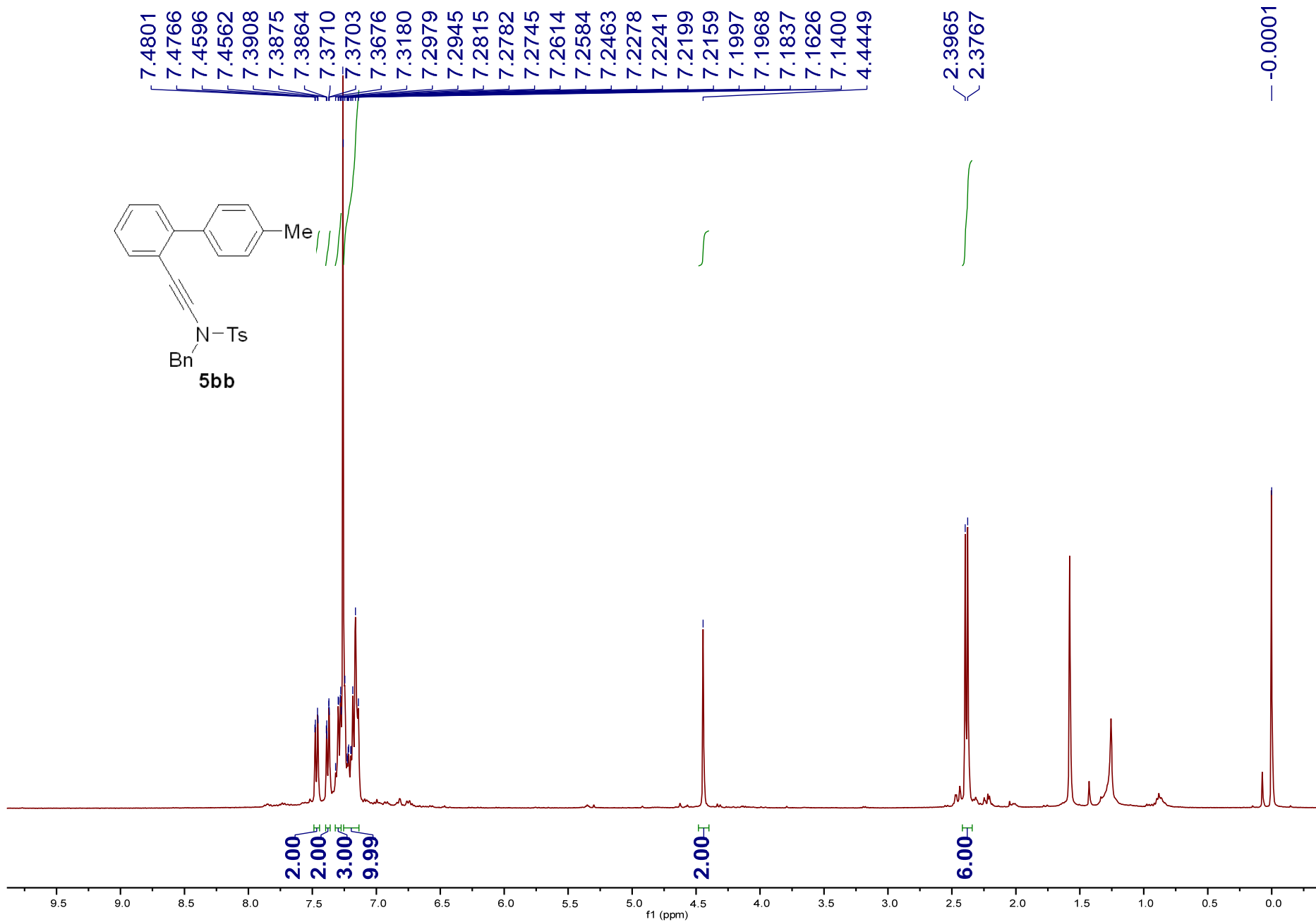


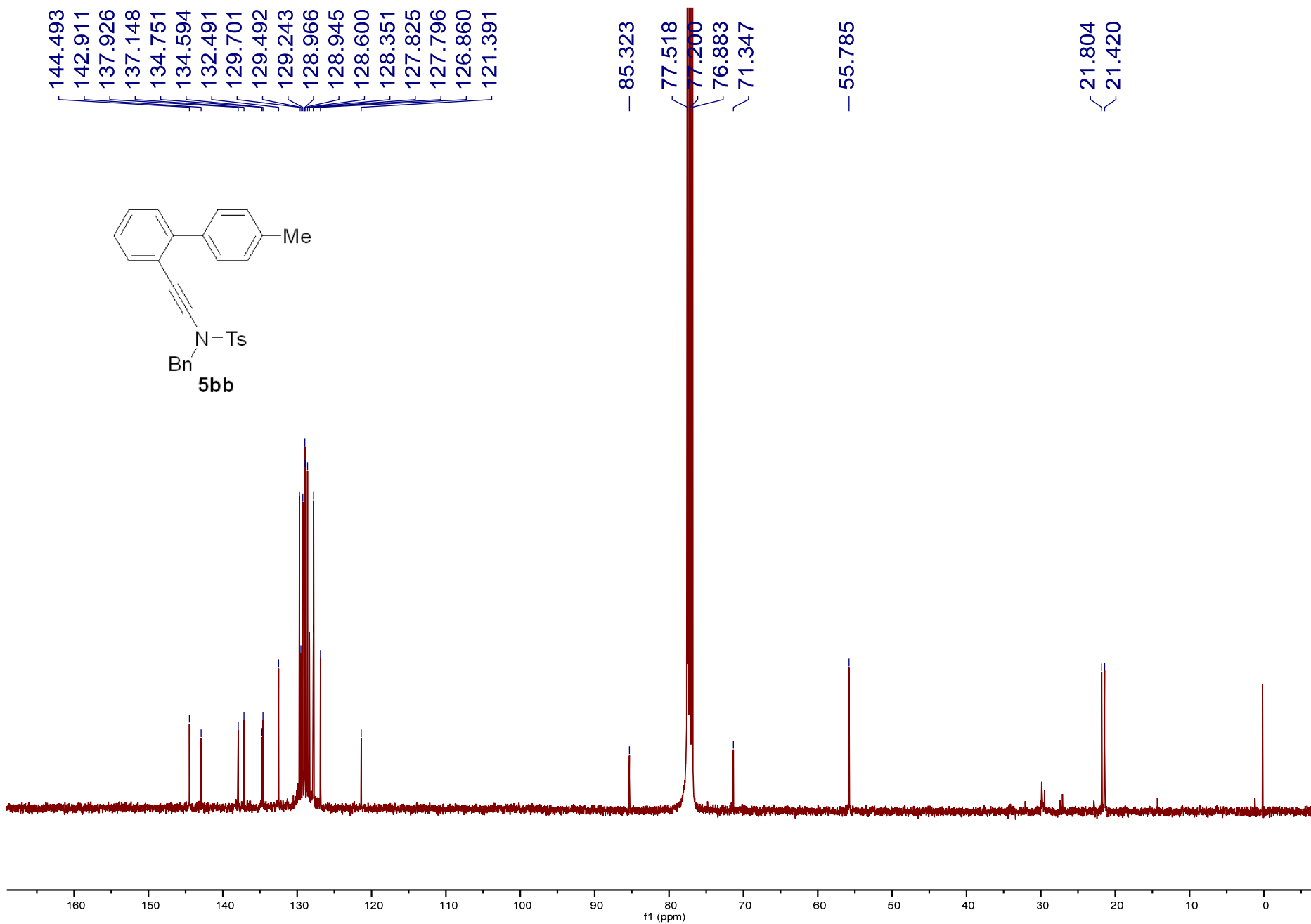


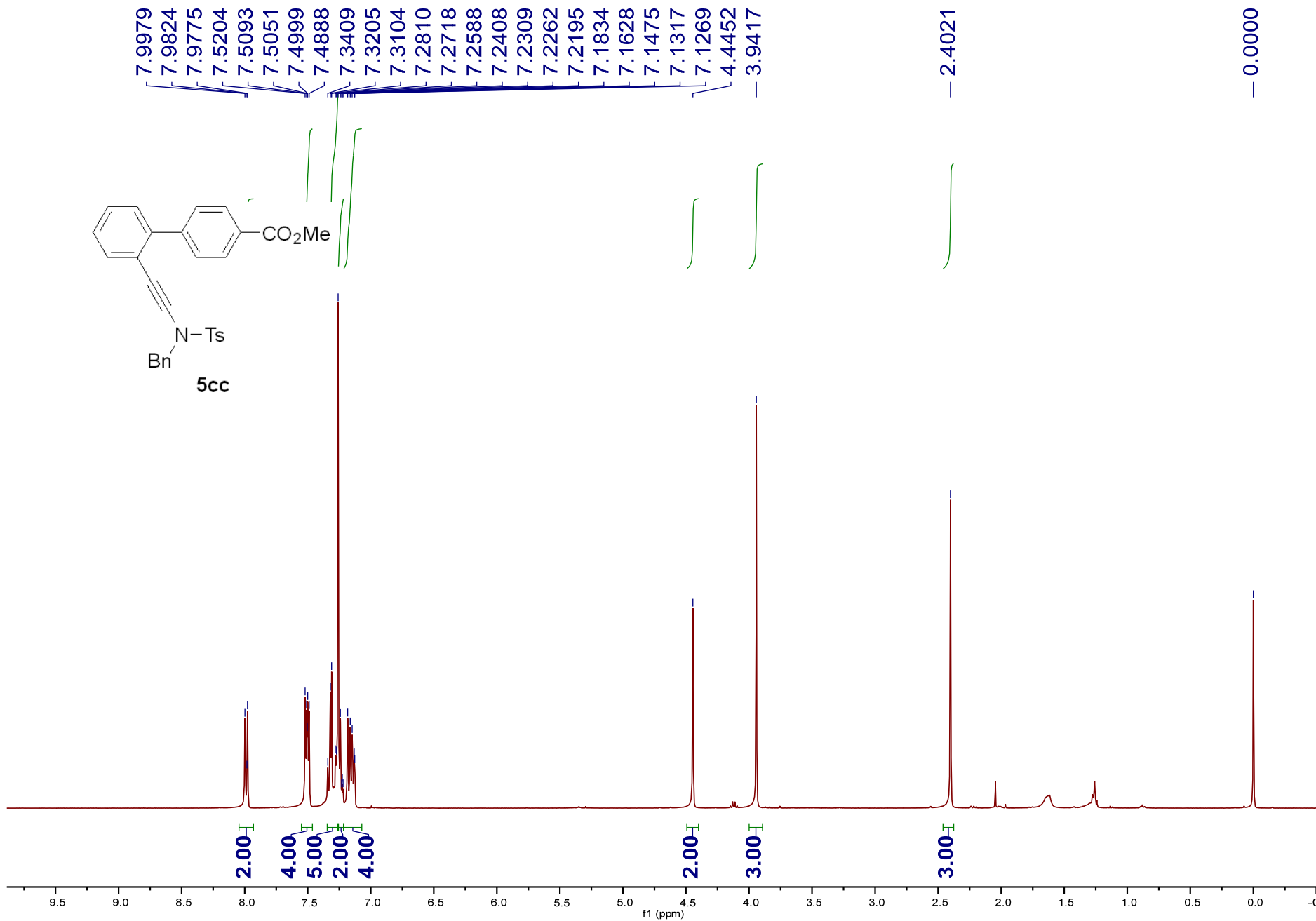


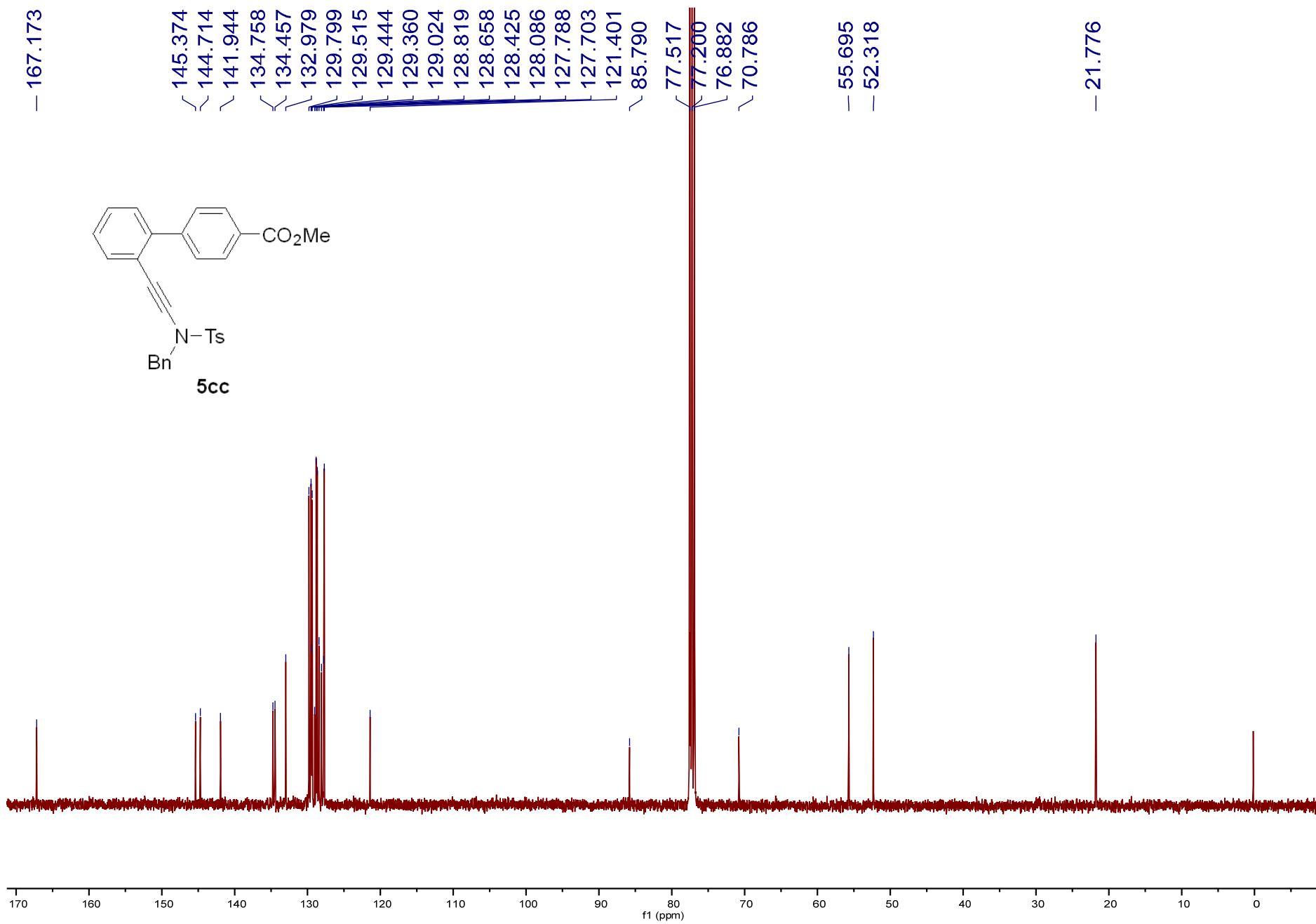


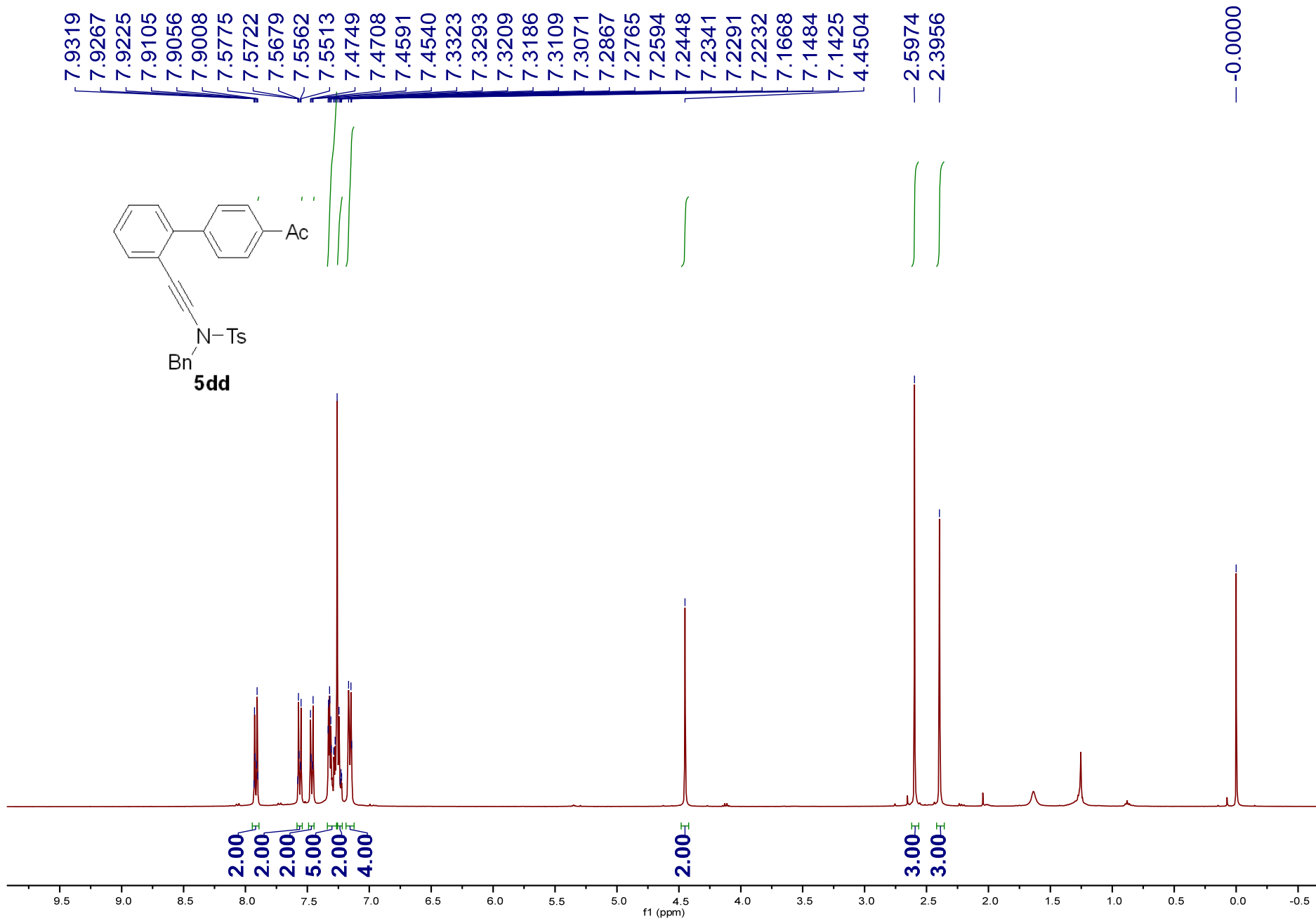


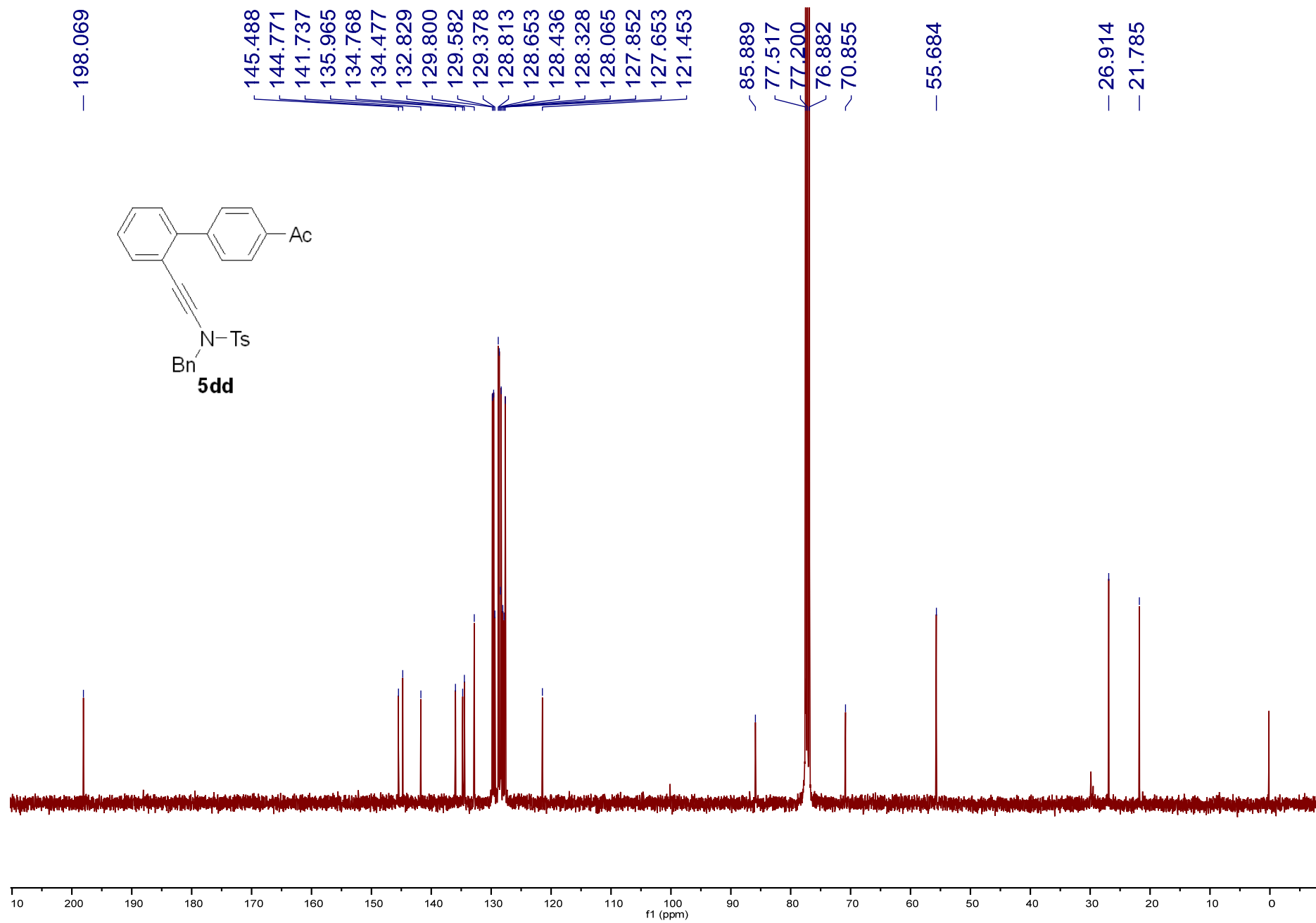


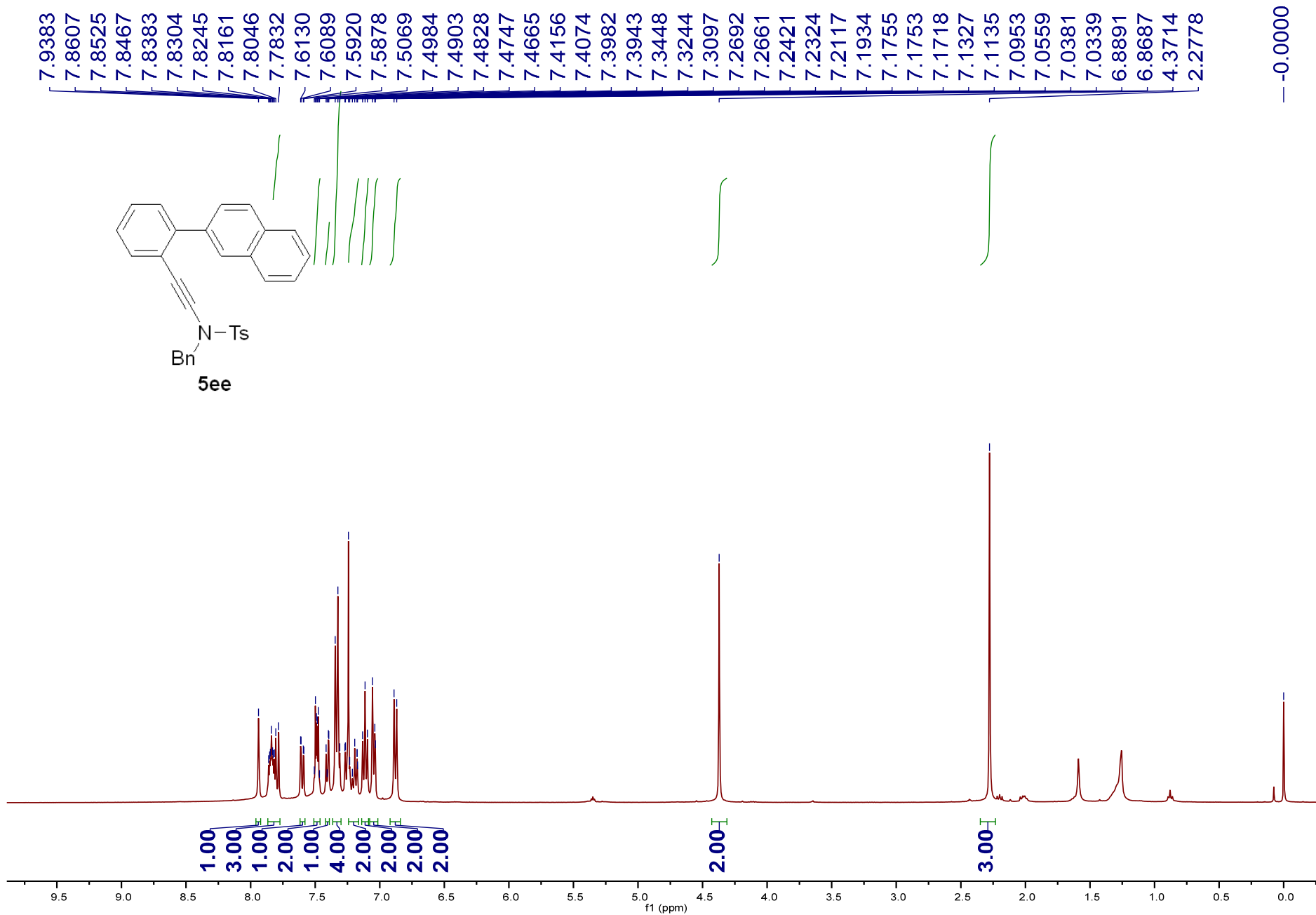












144.417
143.041
138.441
134.607
134.413
133.391
132.756
129.812
129.540
128.832
128.496
128.278
128.085
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127.764
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127.561
127.209
126.244
126.220
121.656

— 85.518

77.518

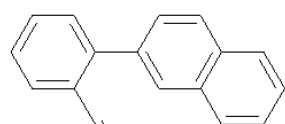
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76.882

71.136

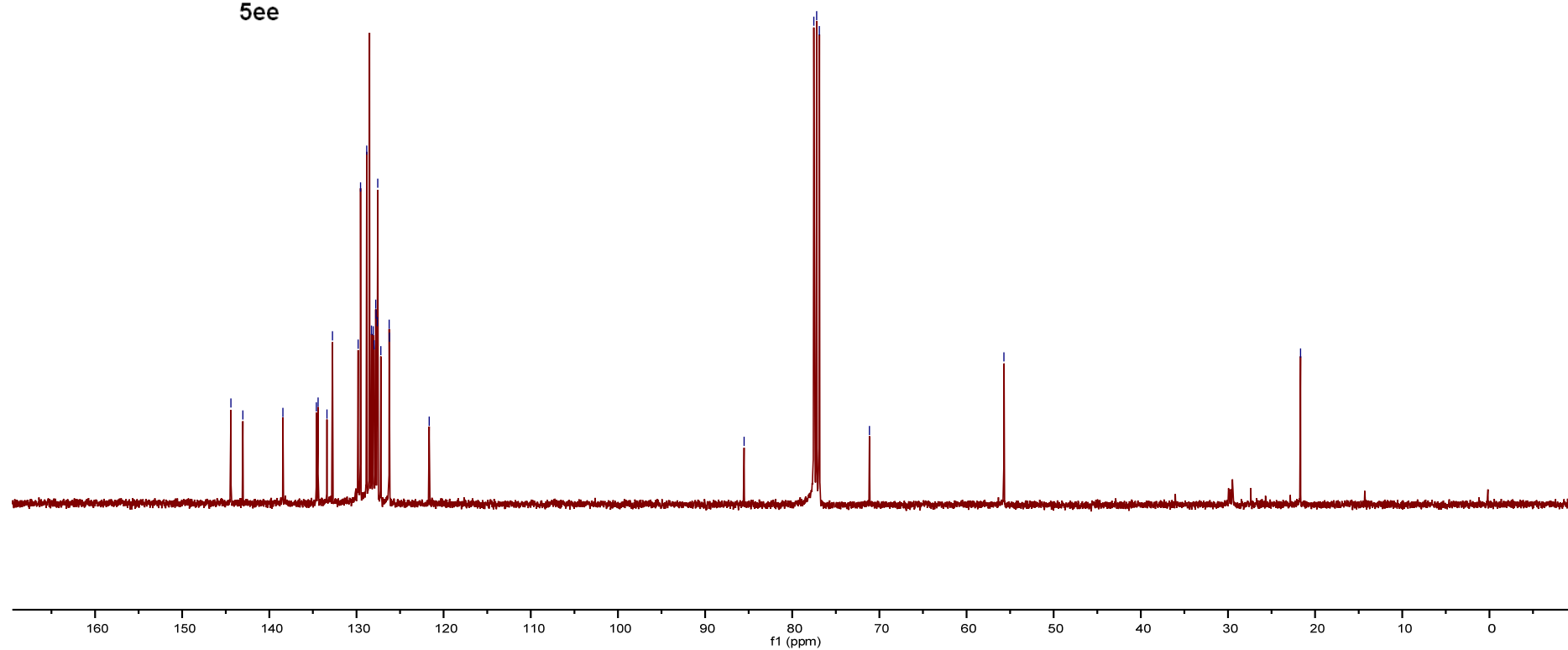
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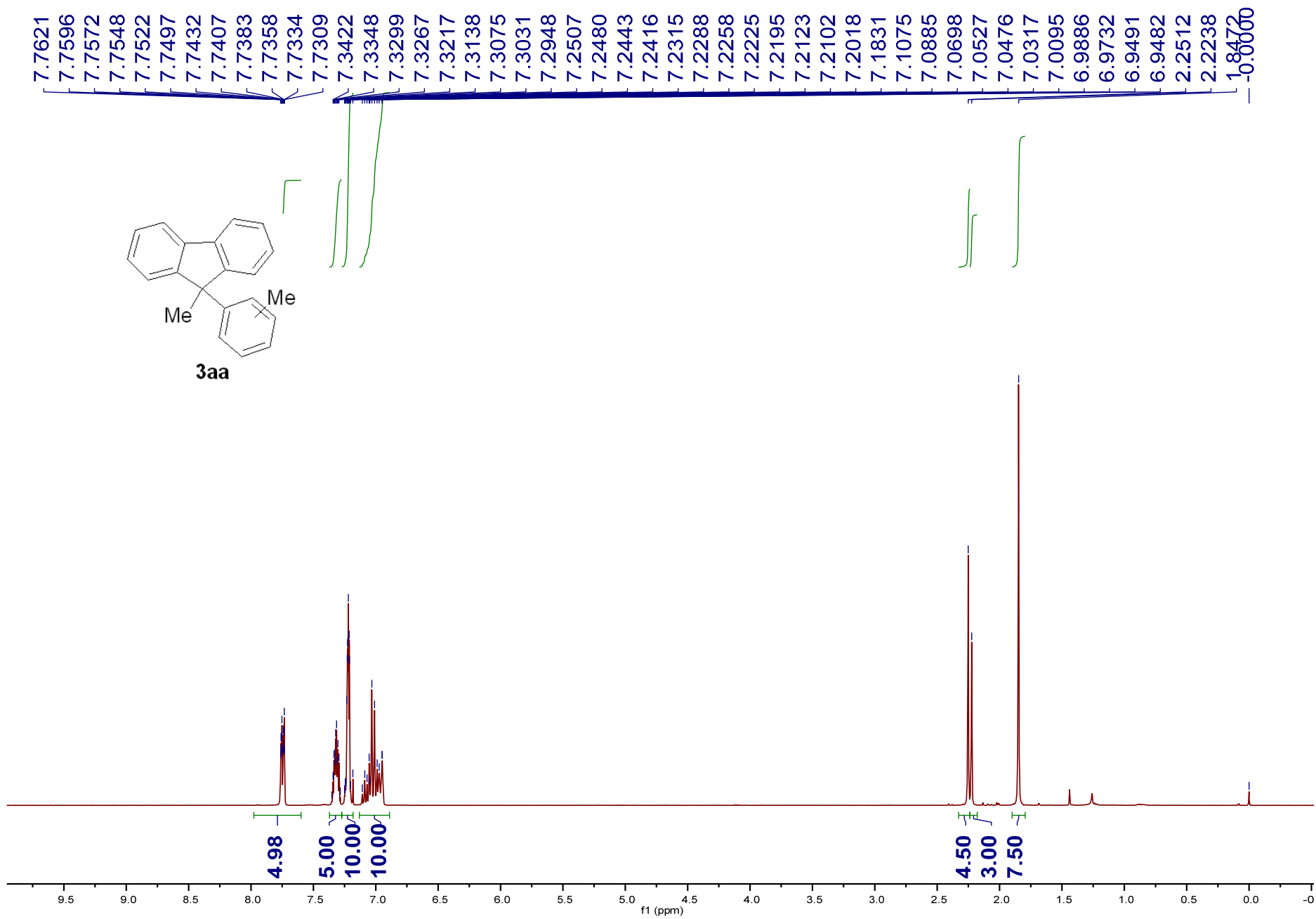
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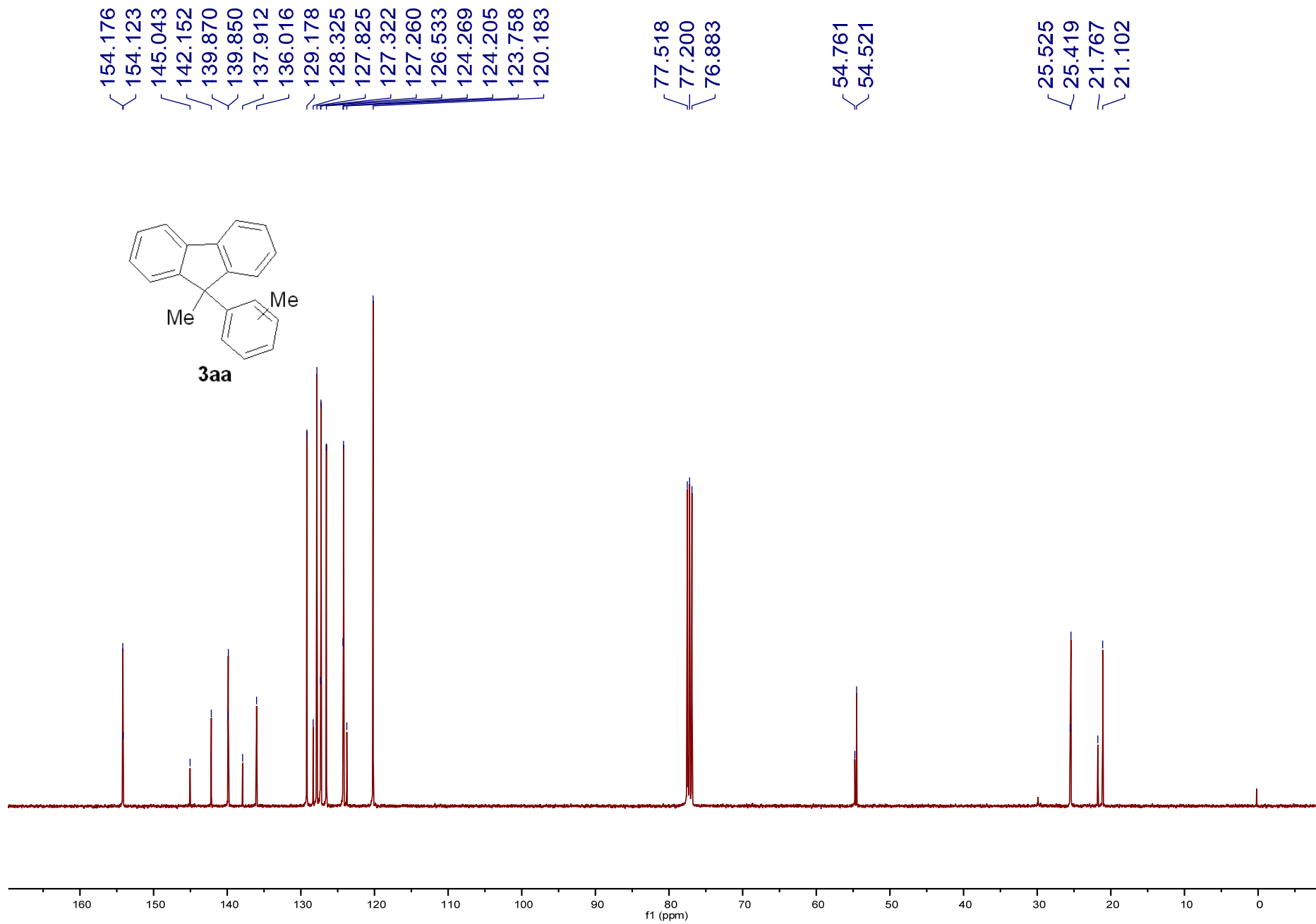


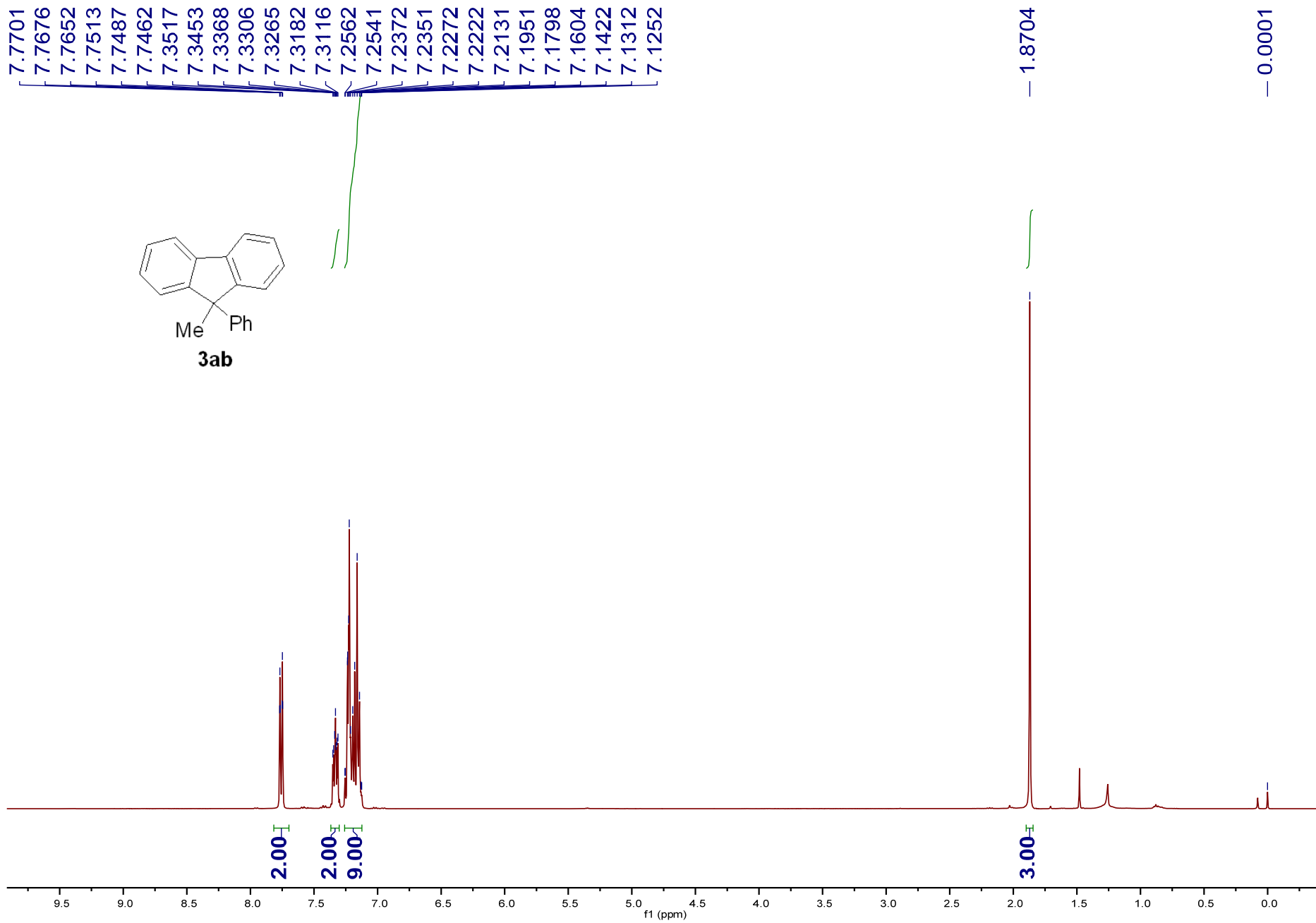
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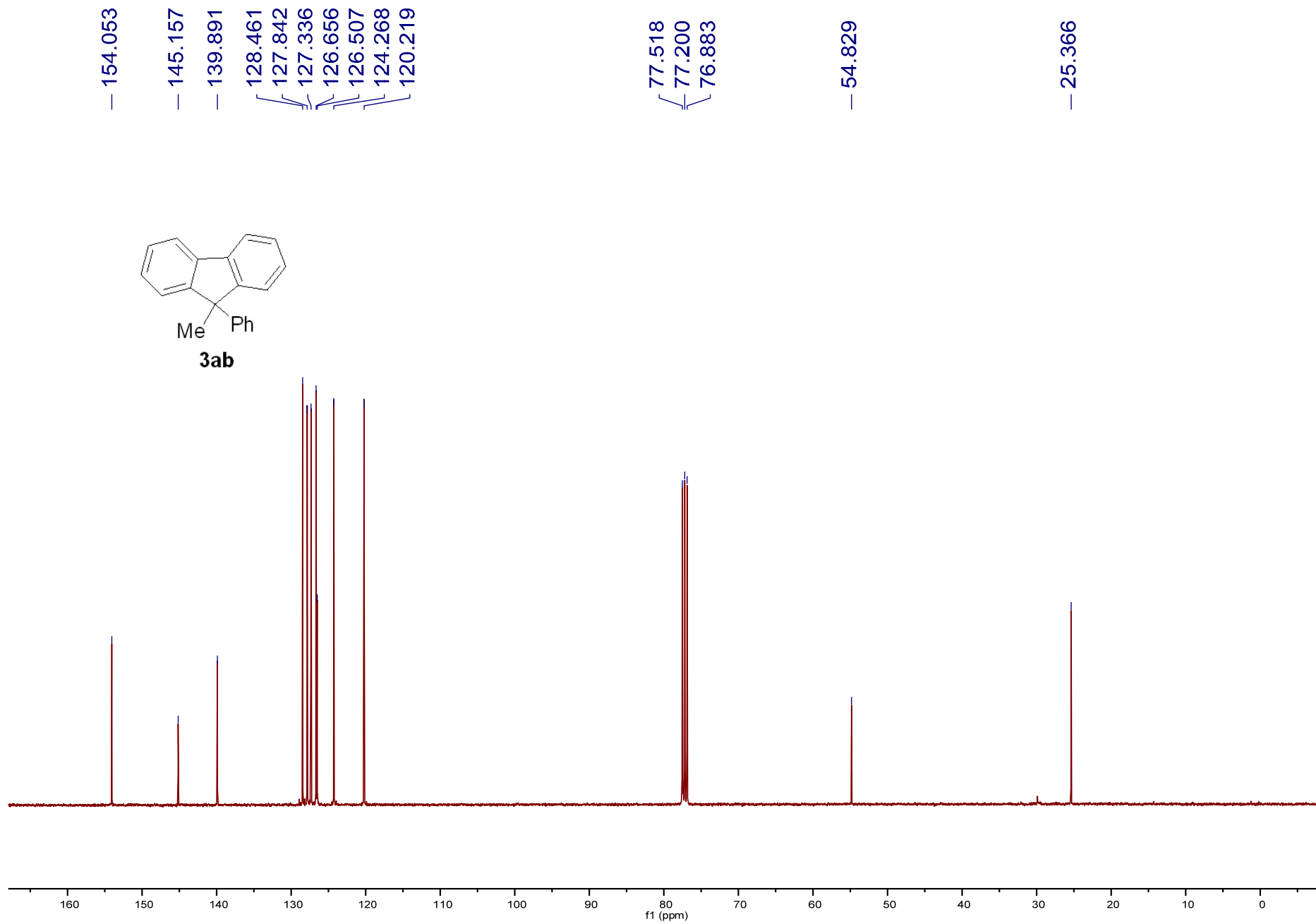
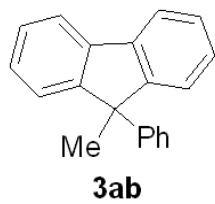
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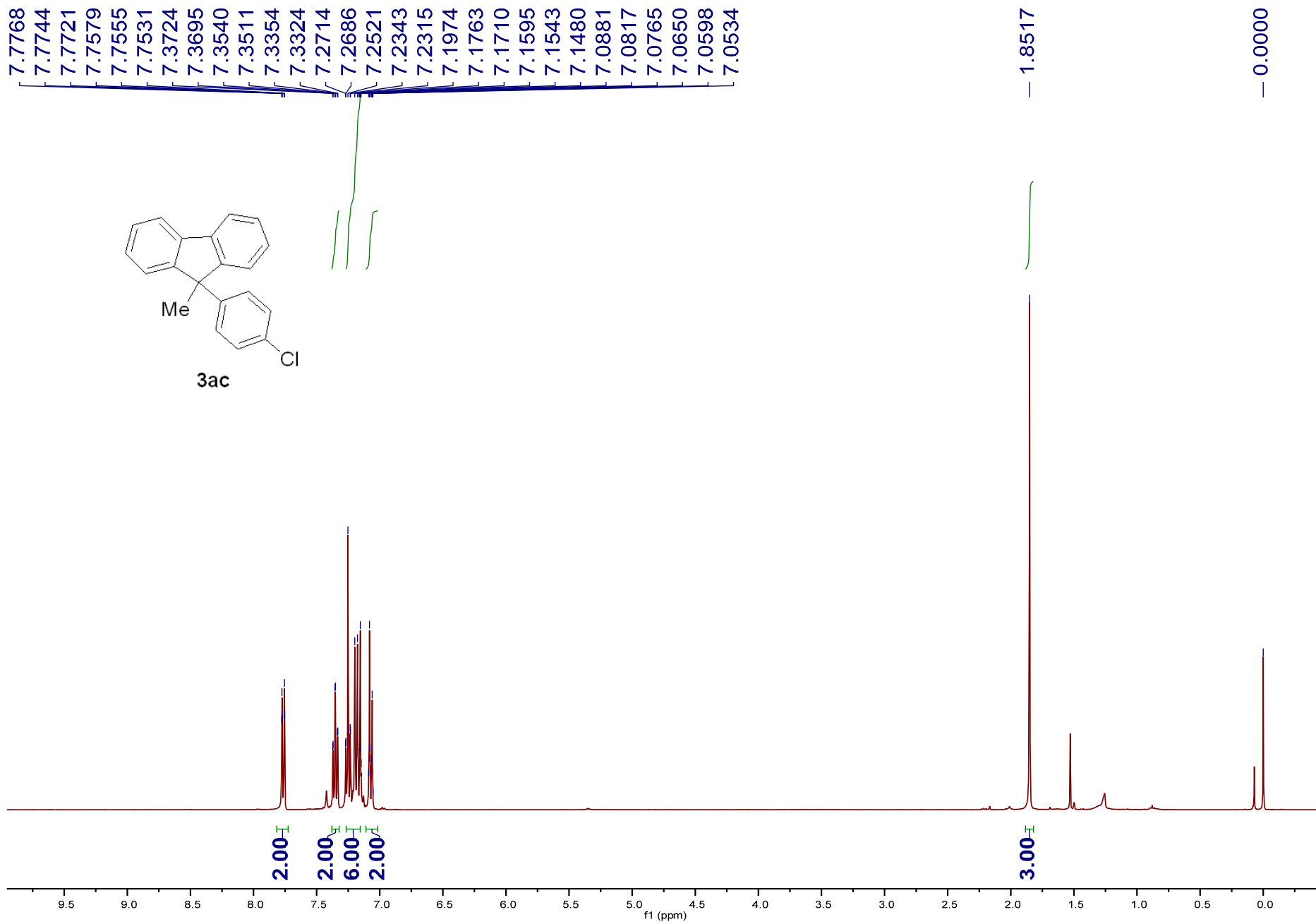


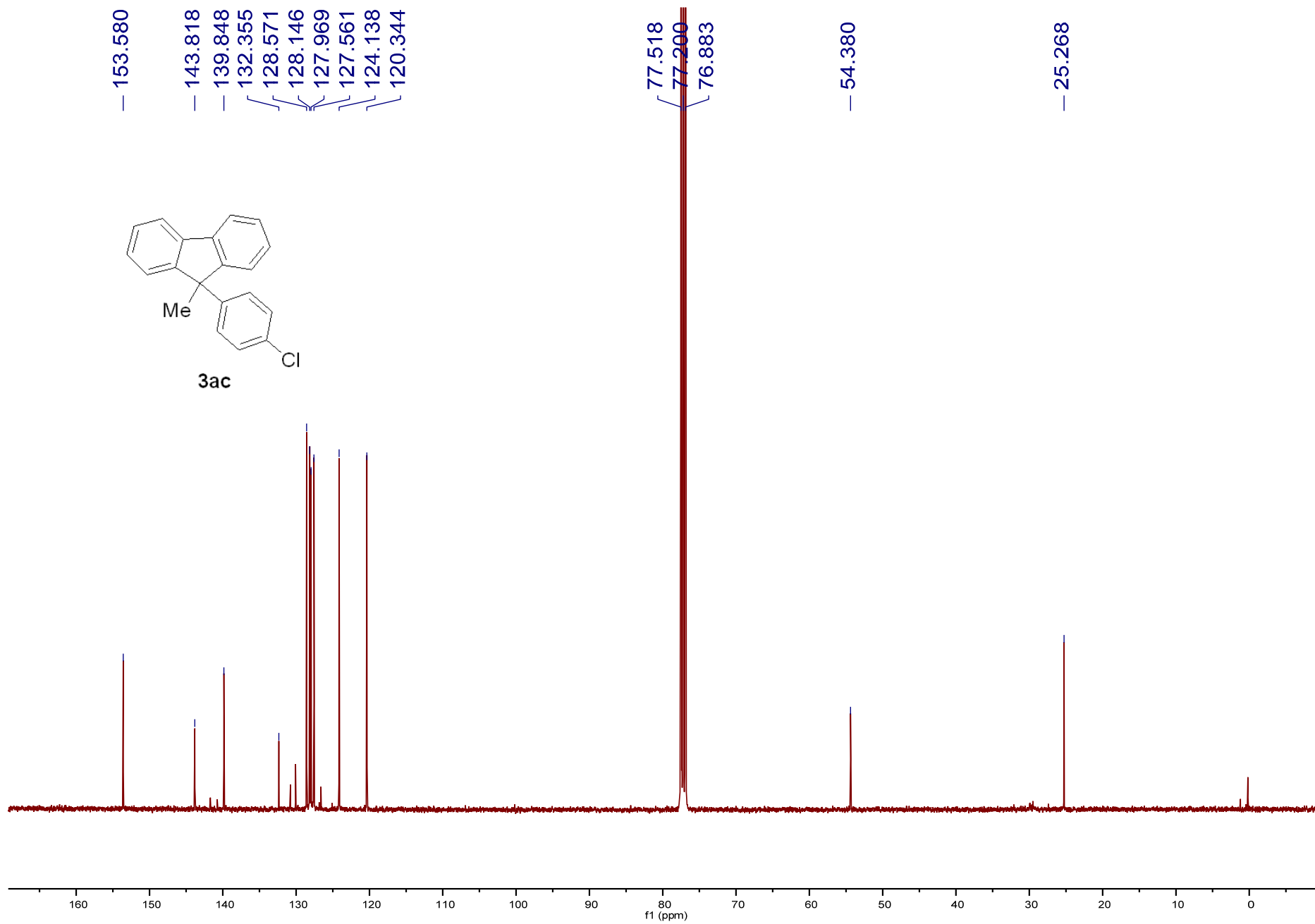
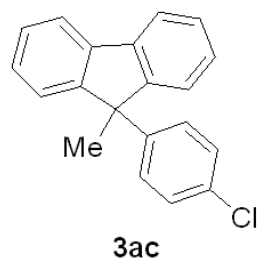


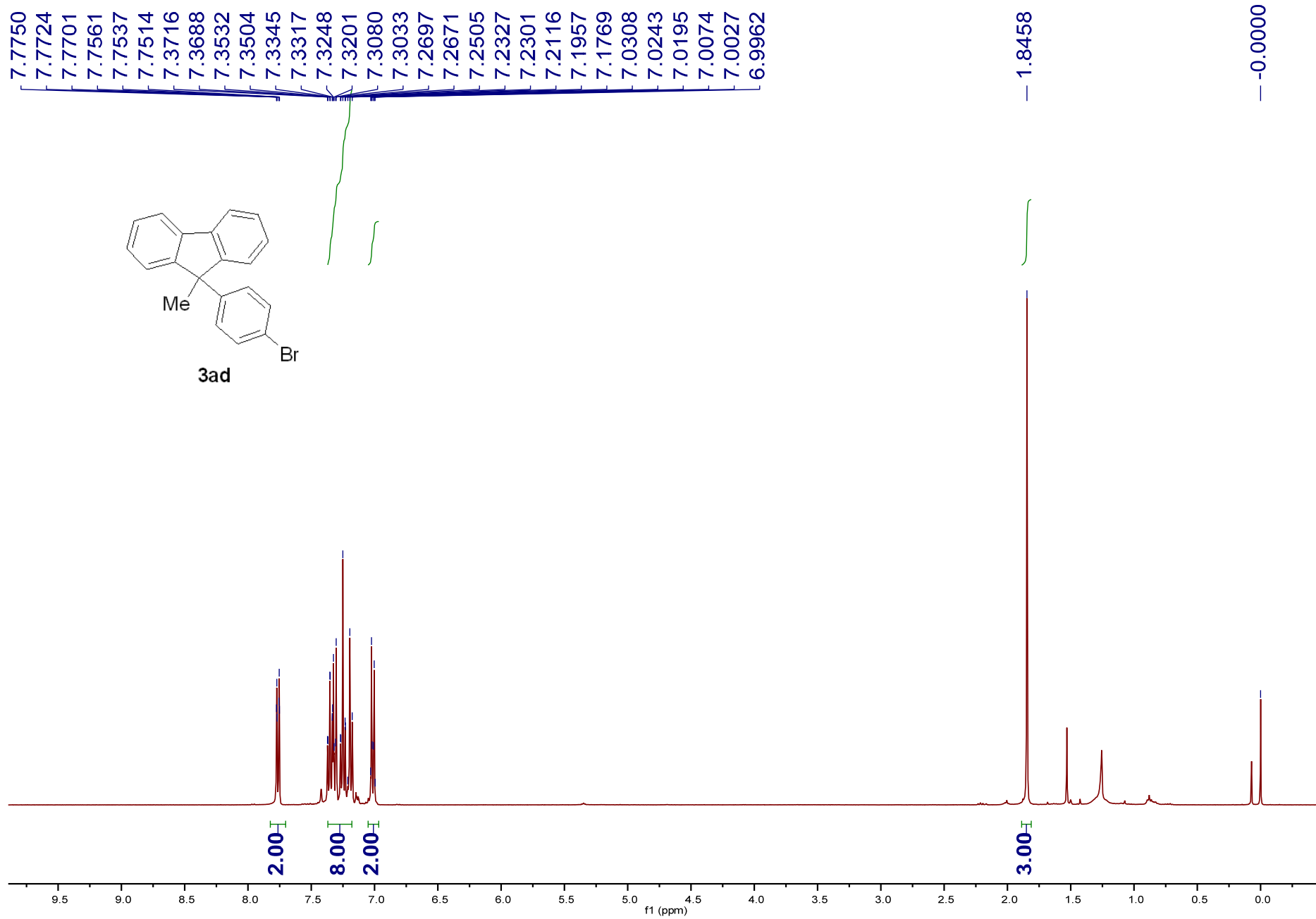


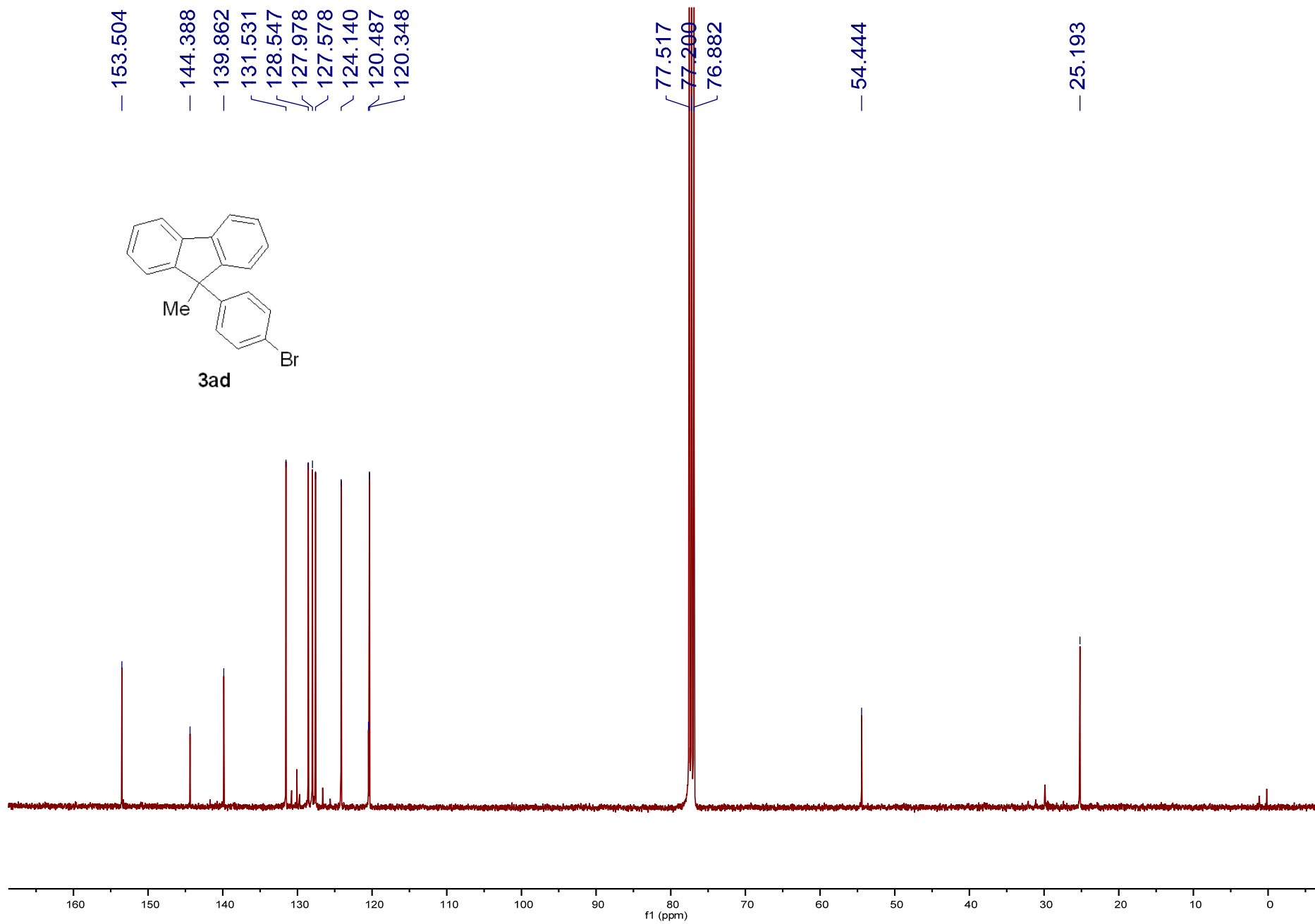
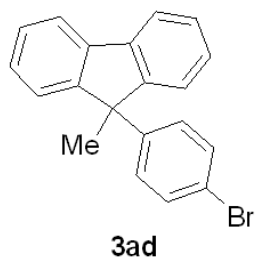


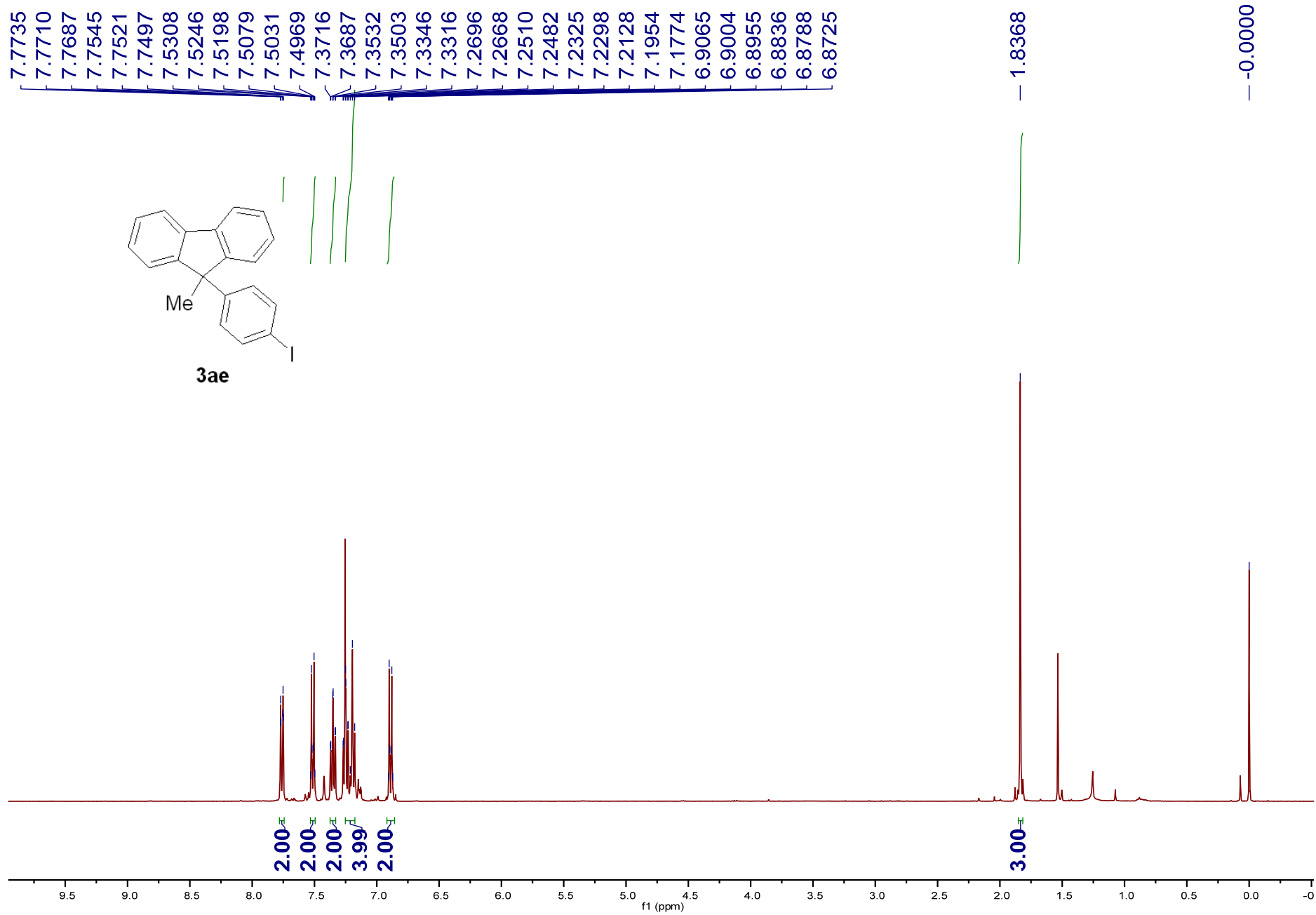


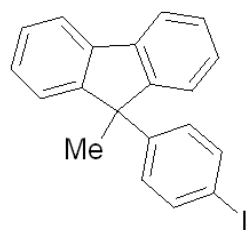




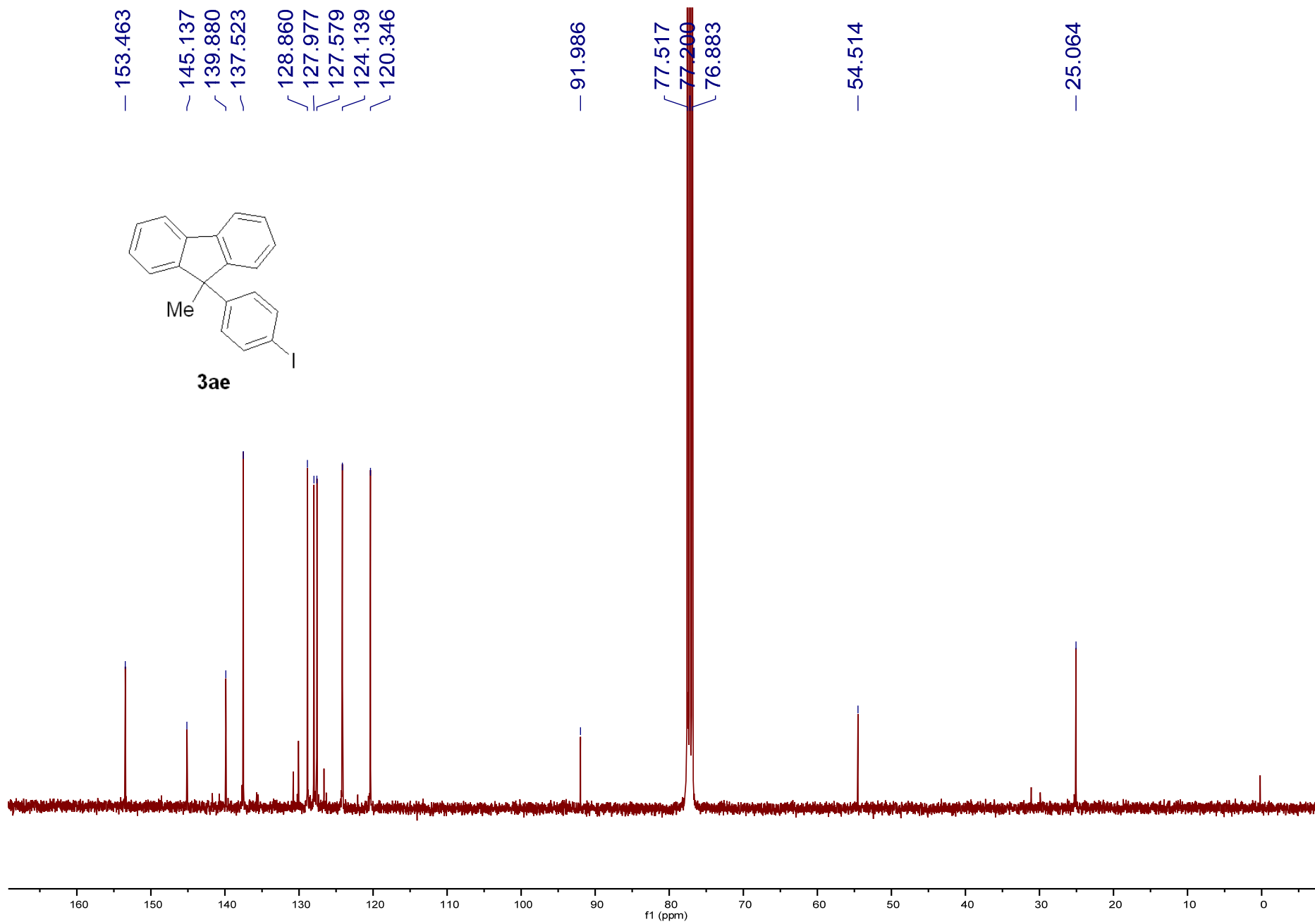


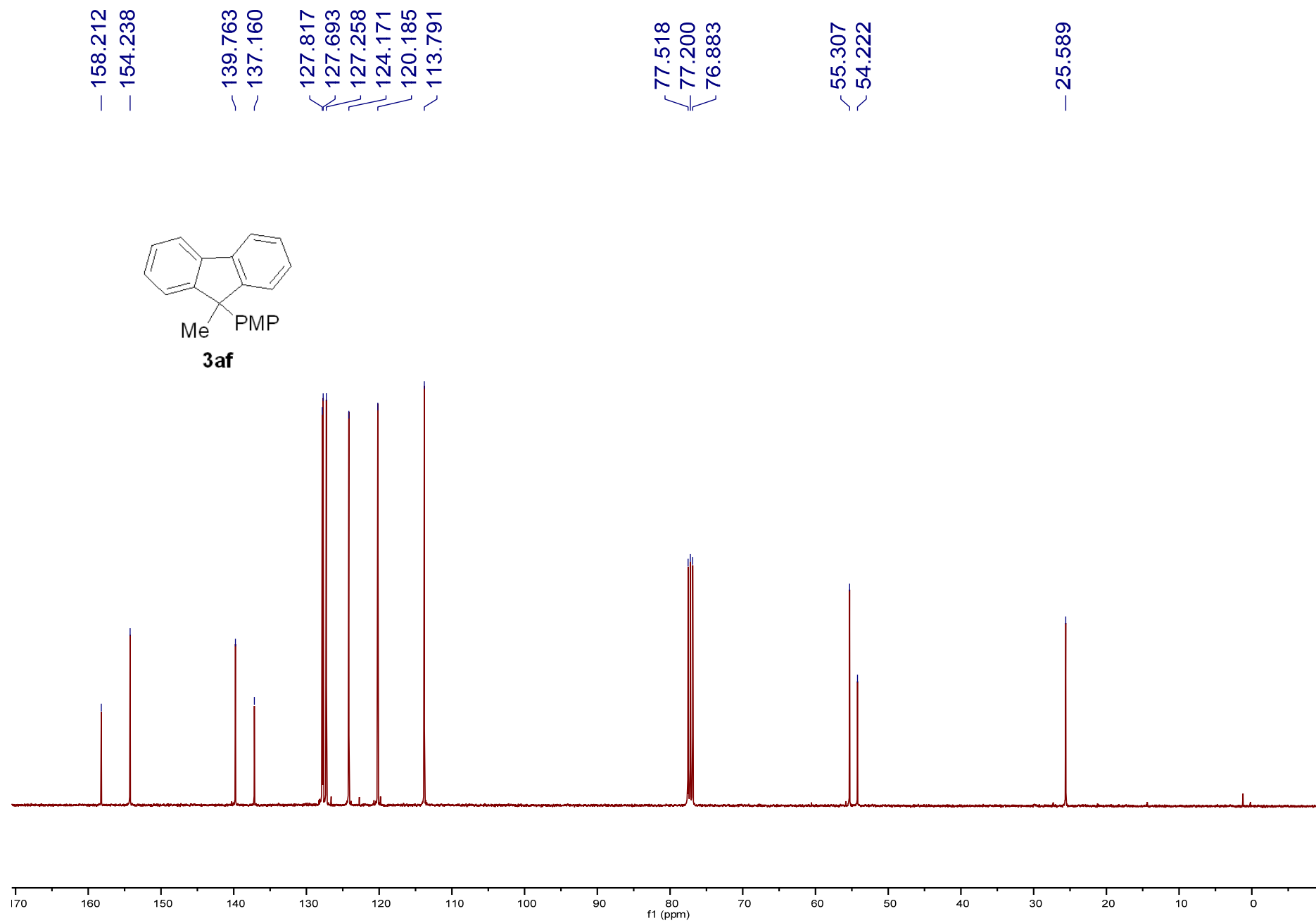


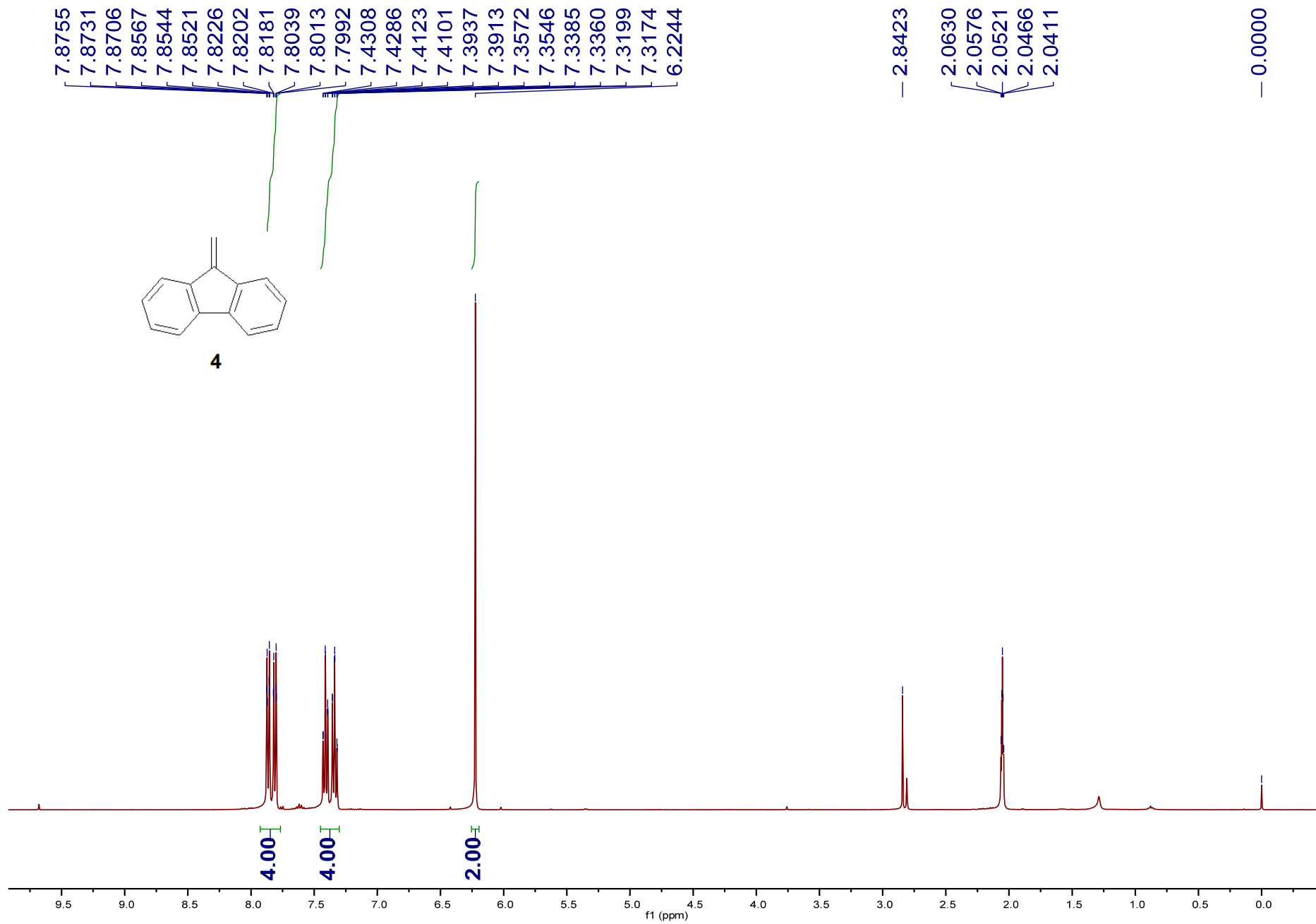


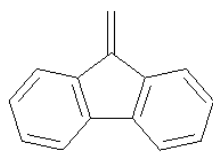


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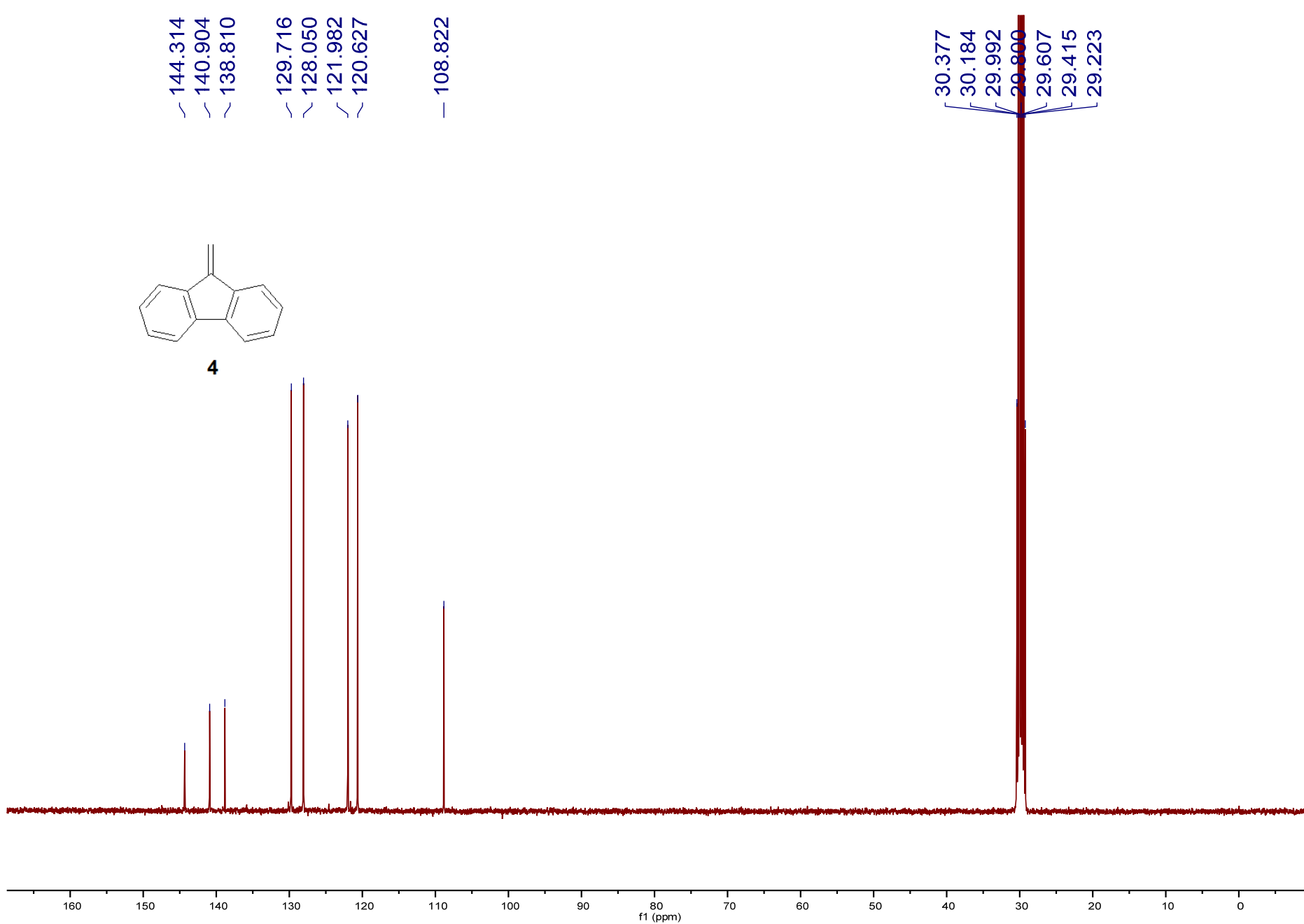
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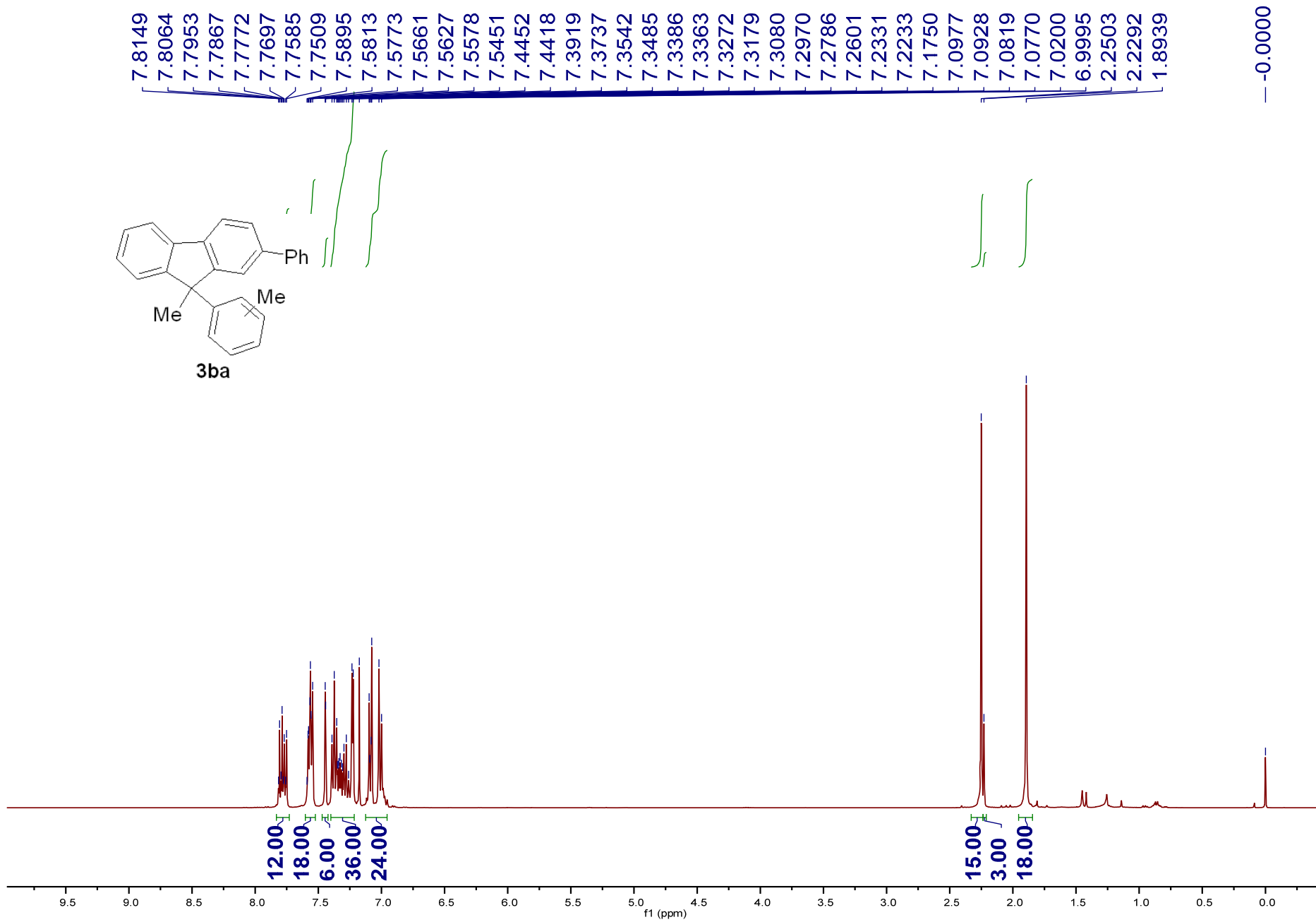
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~ 140.904
~ 138.810

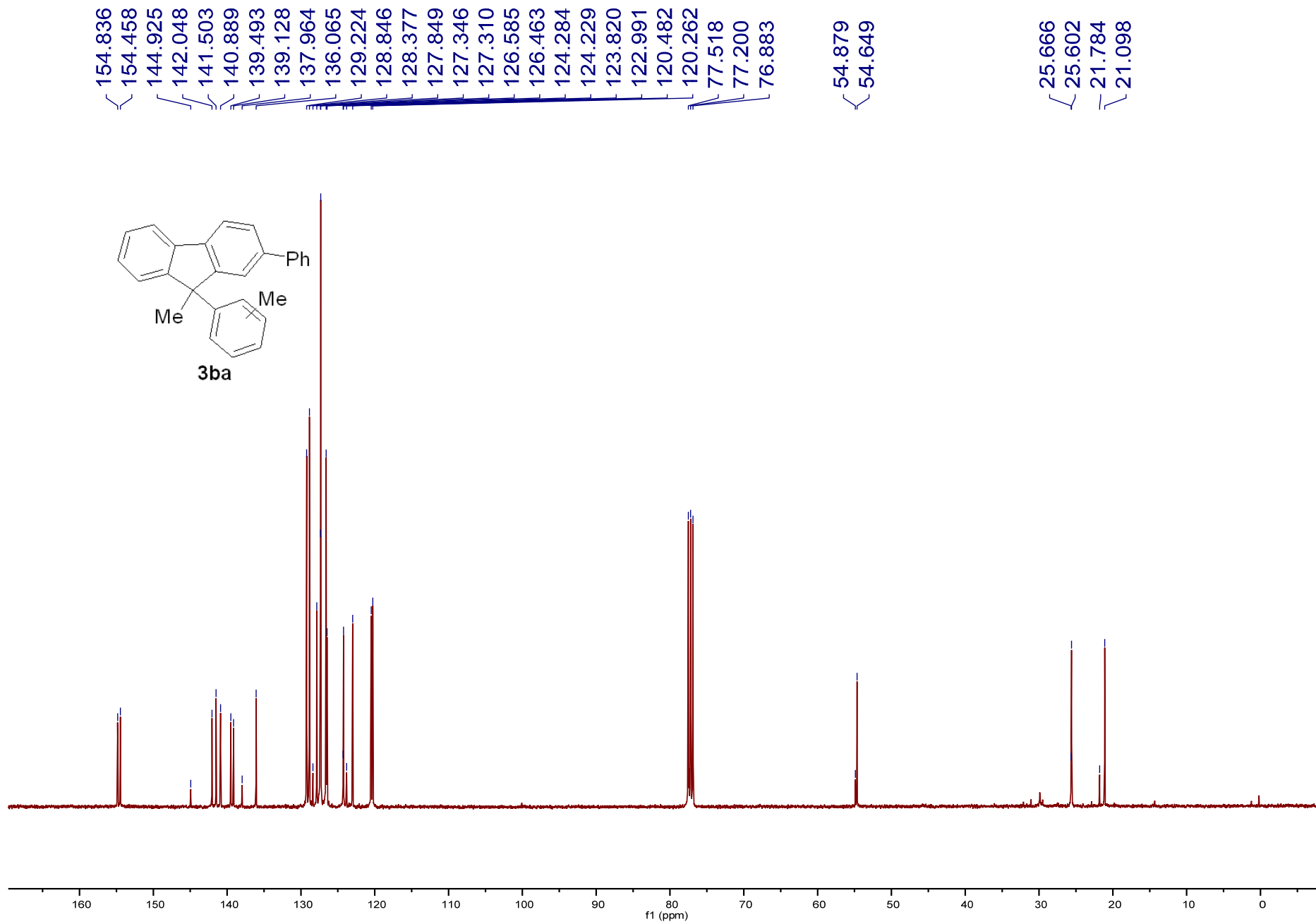
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~ 128.050
~ 121.982
~ 120.627

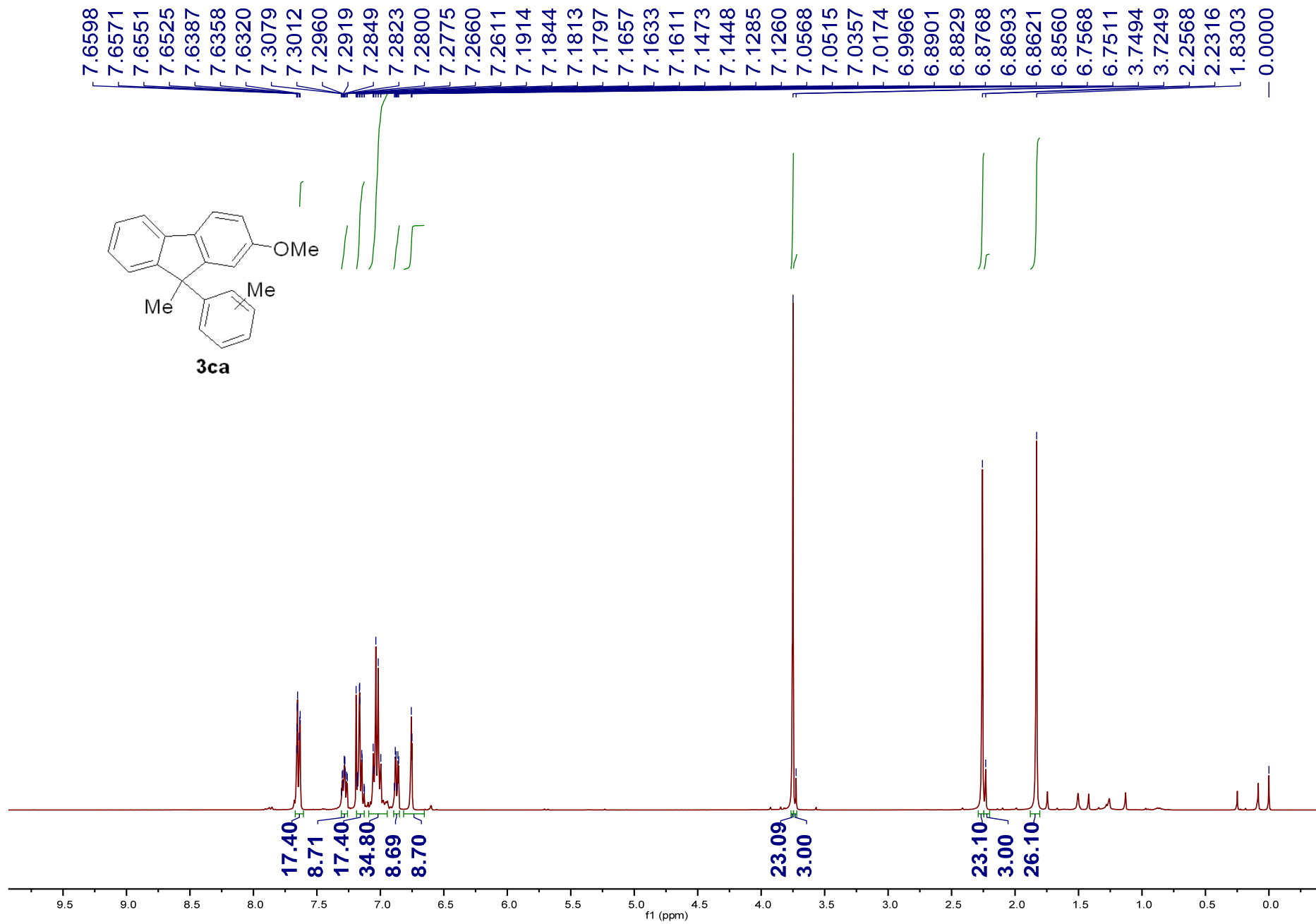
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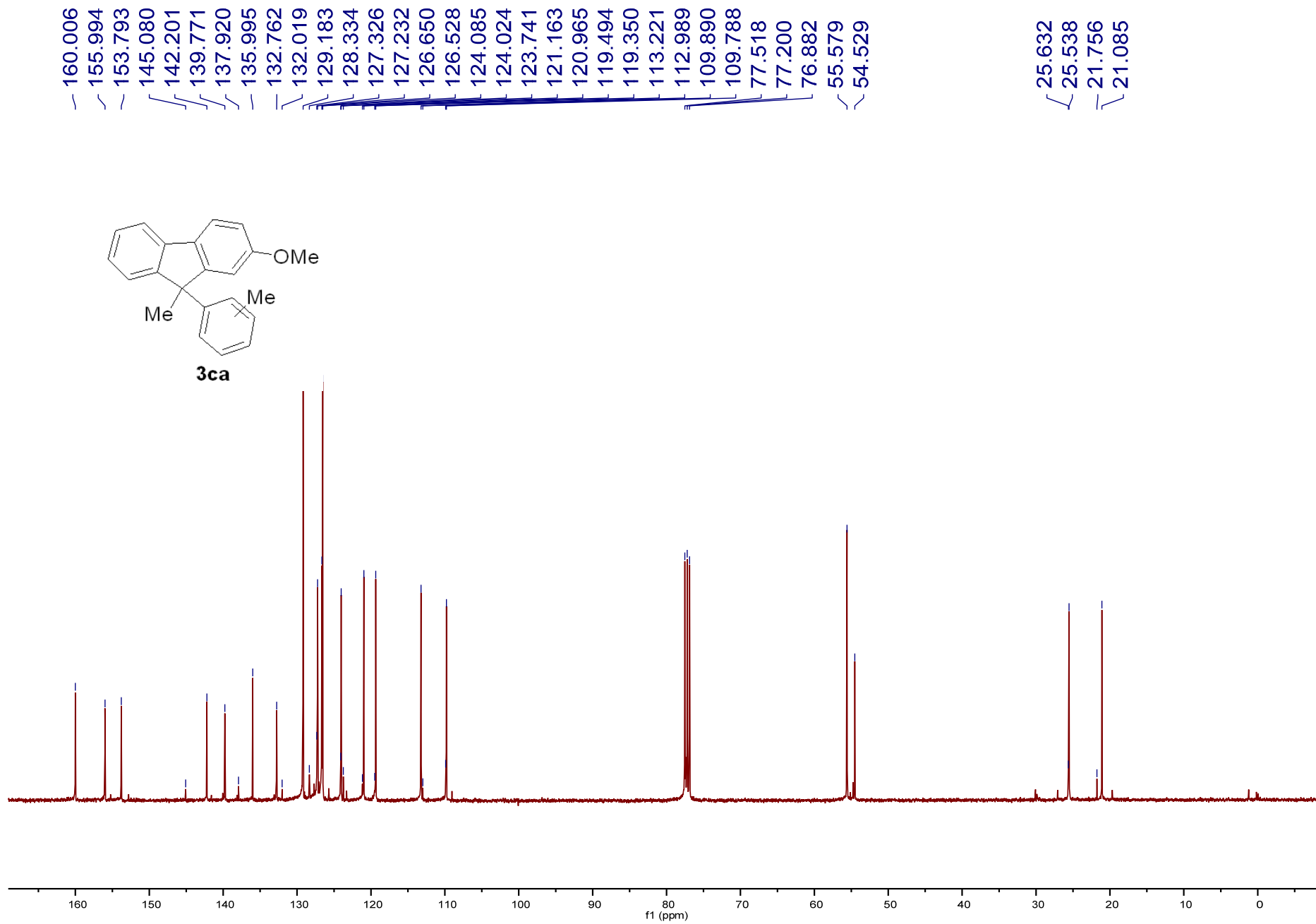
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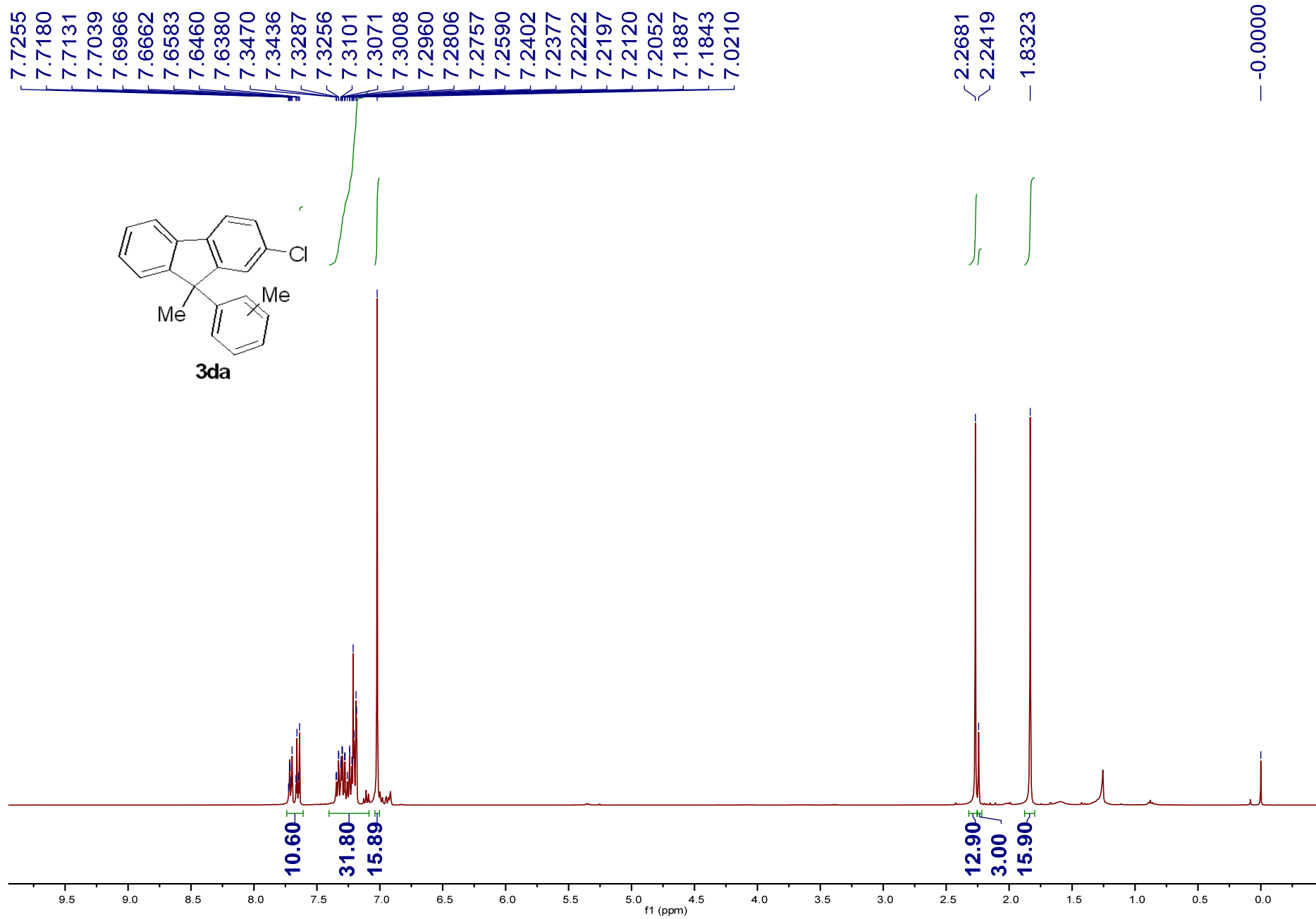


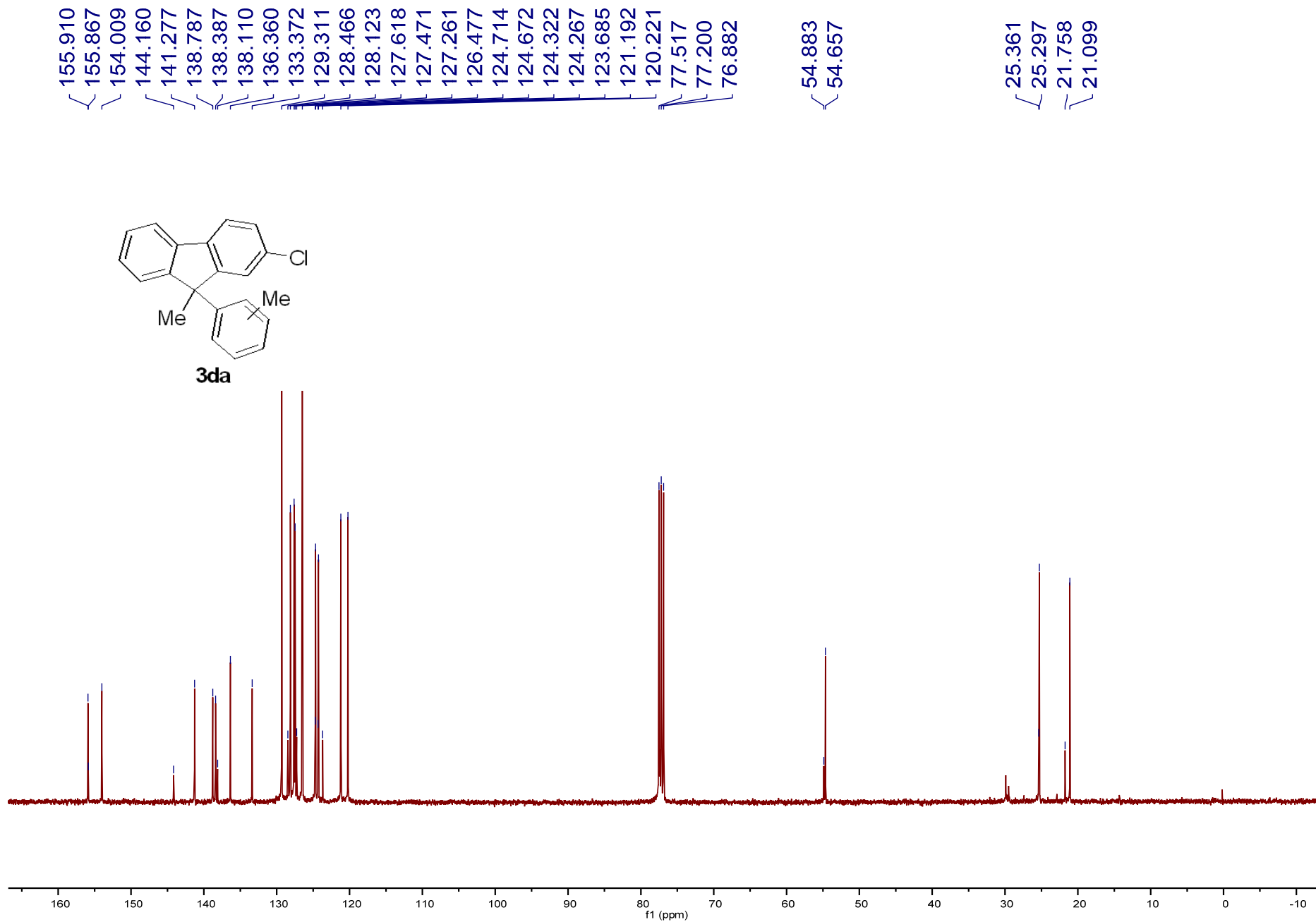


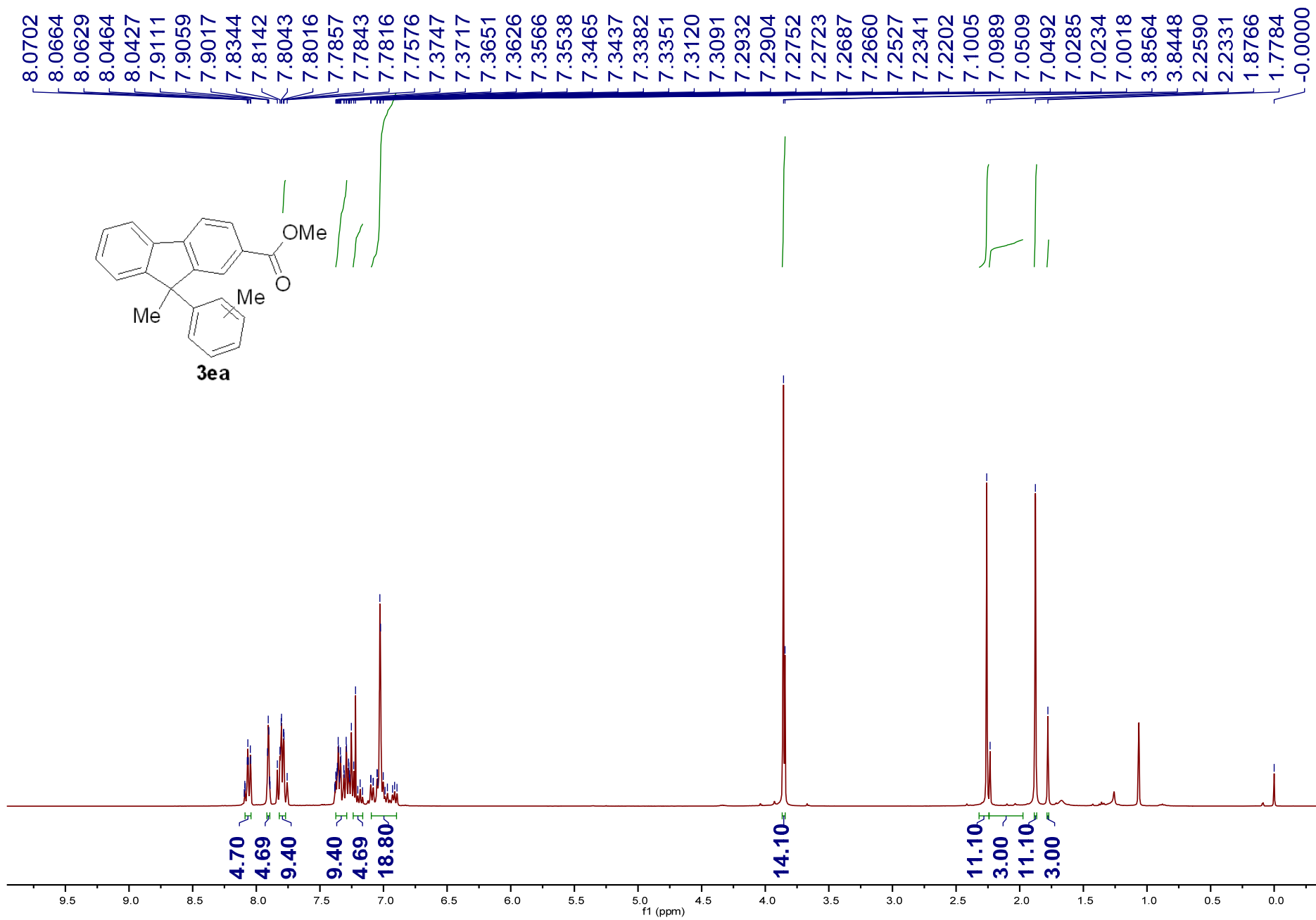


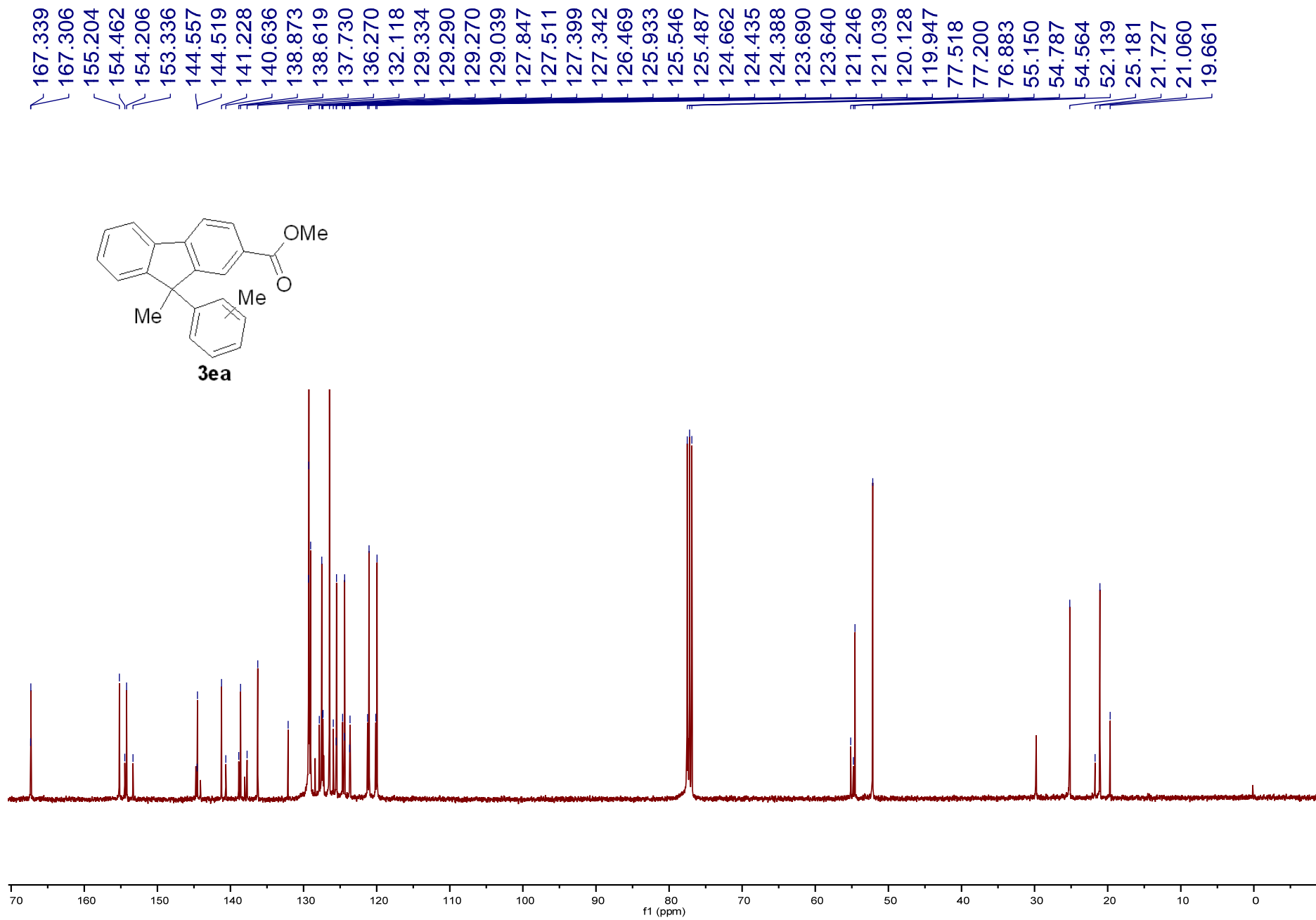


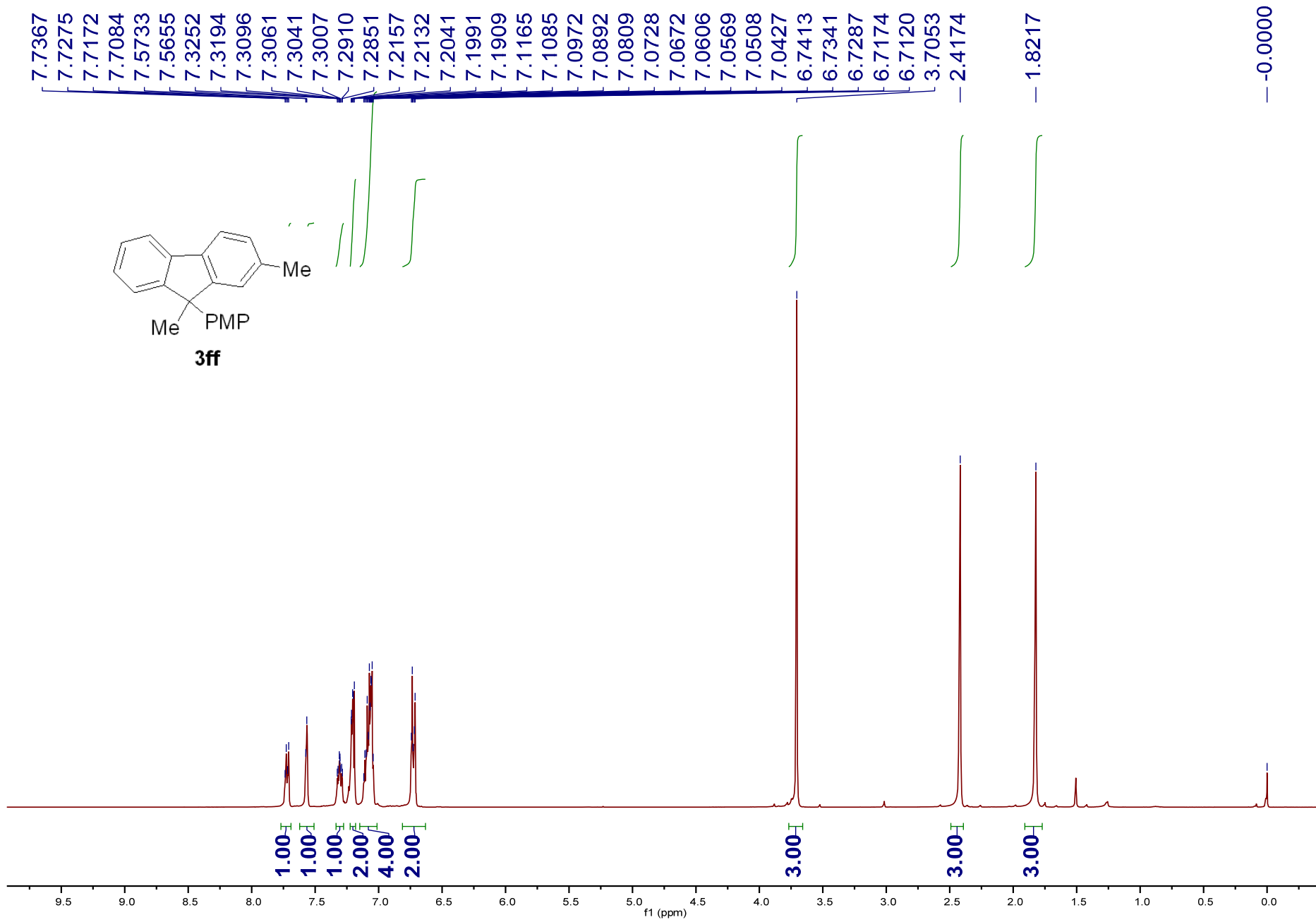


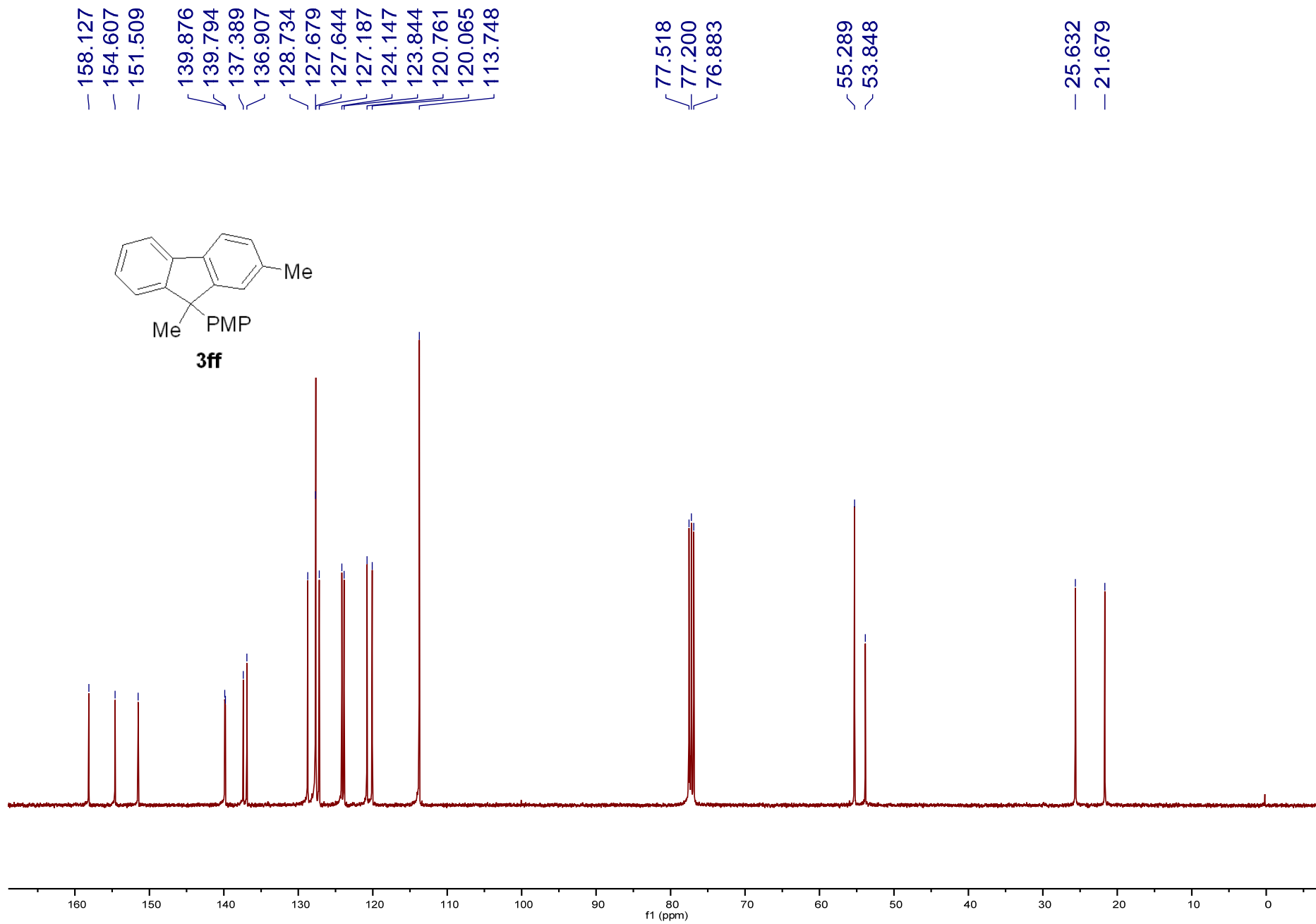


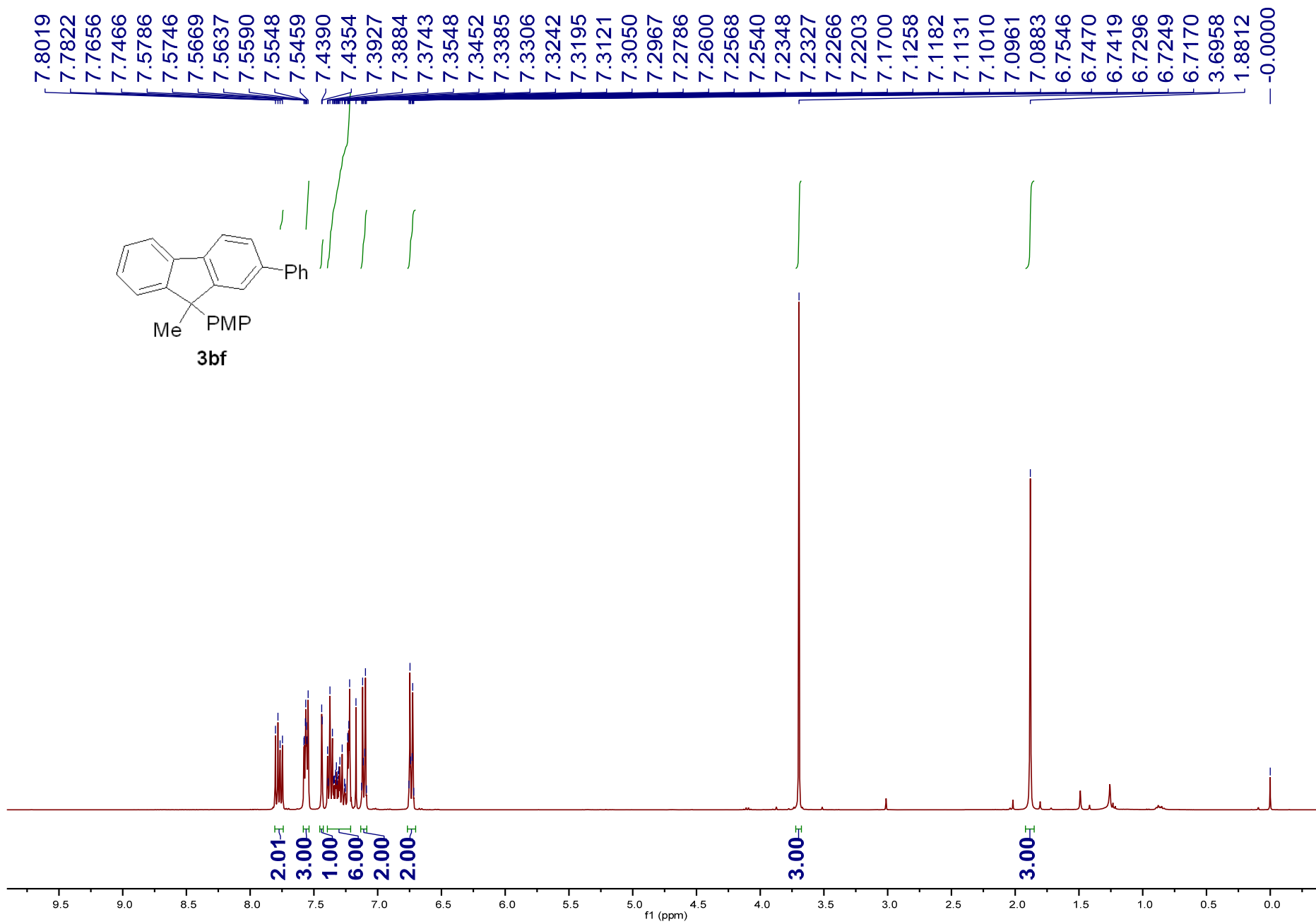


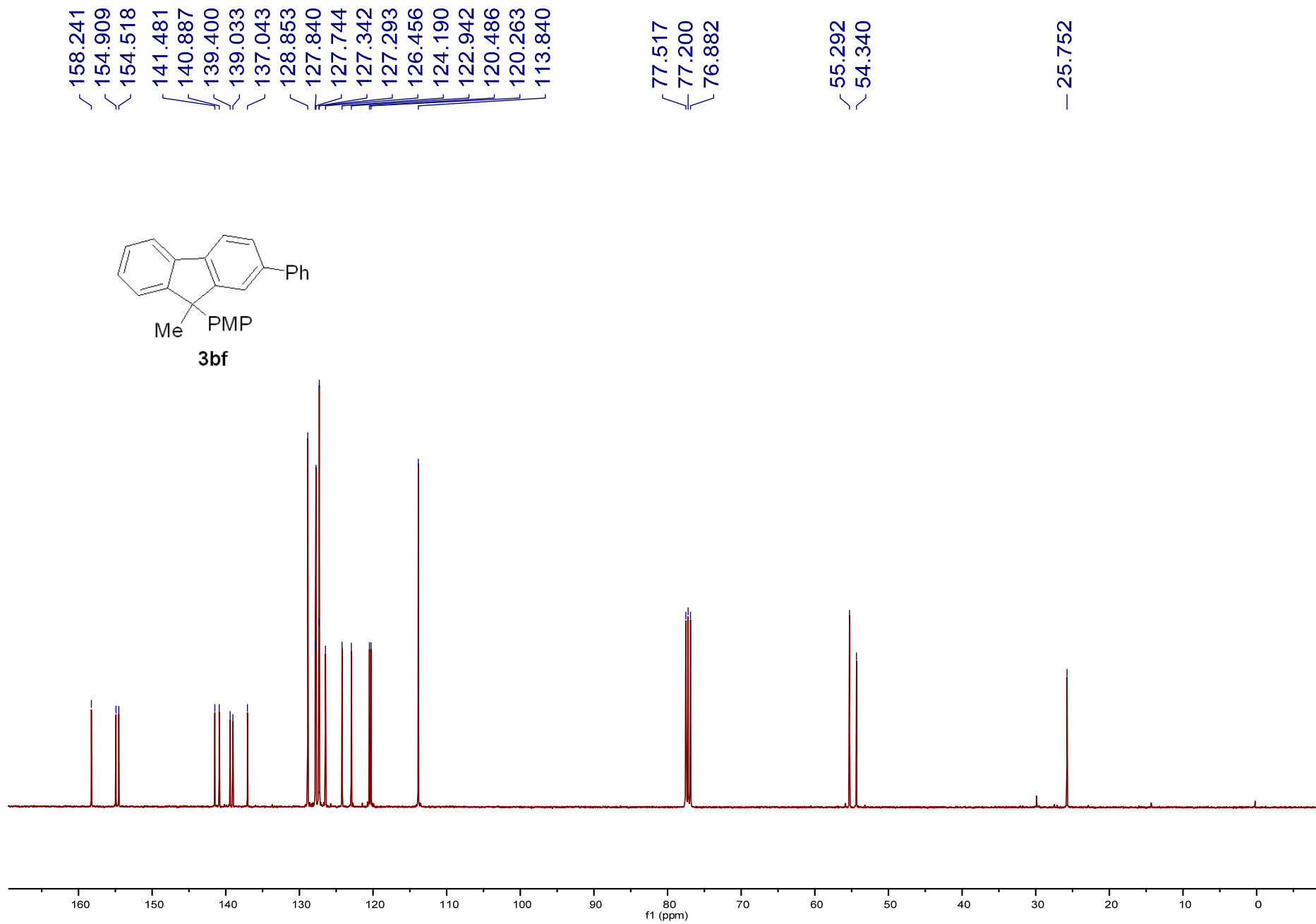


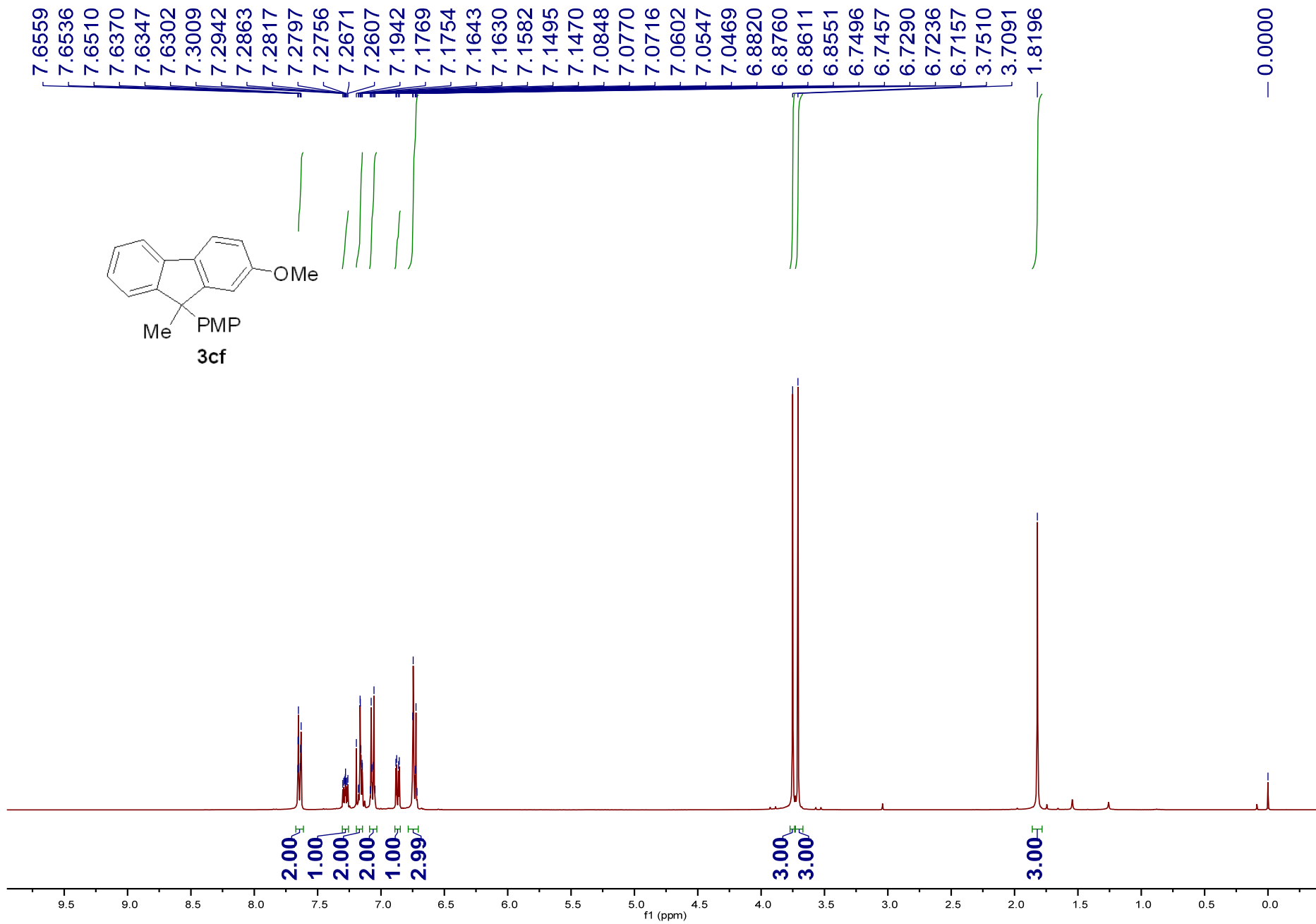


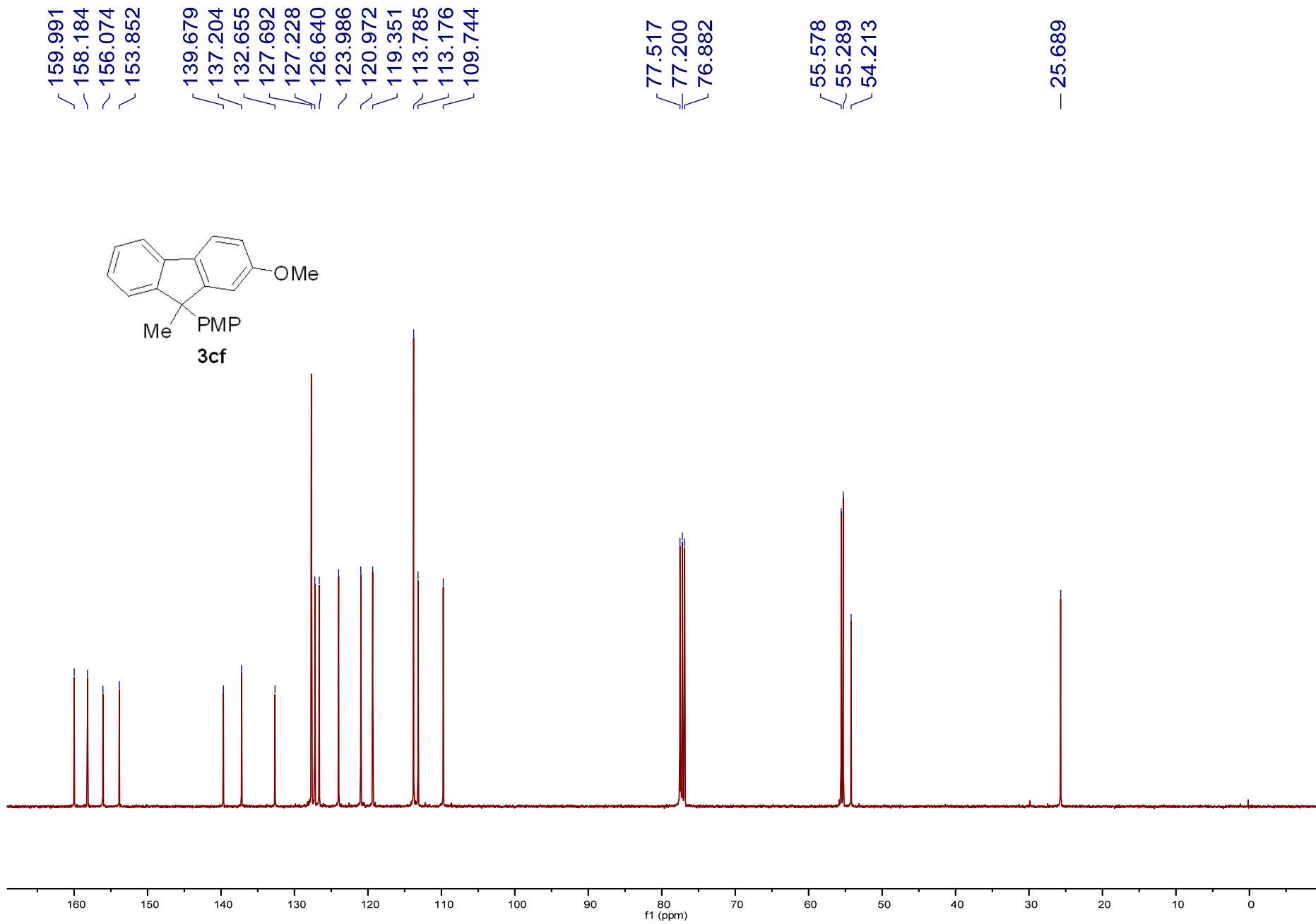


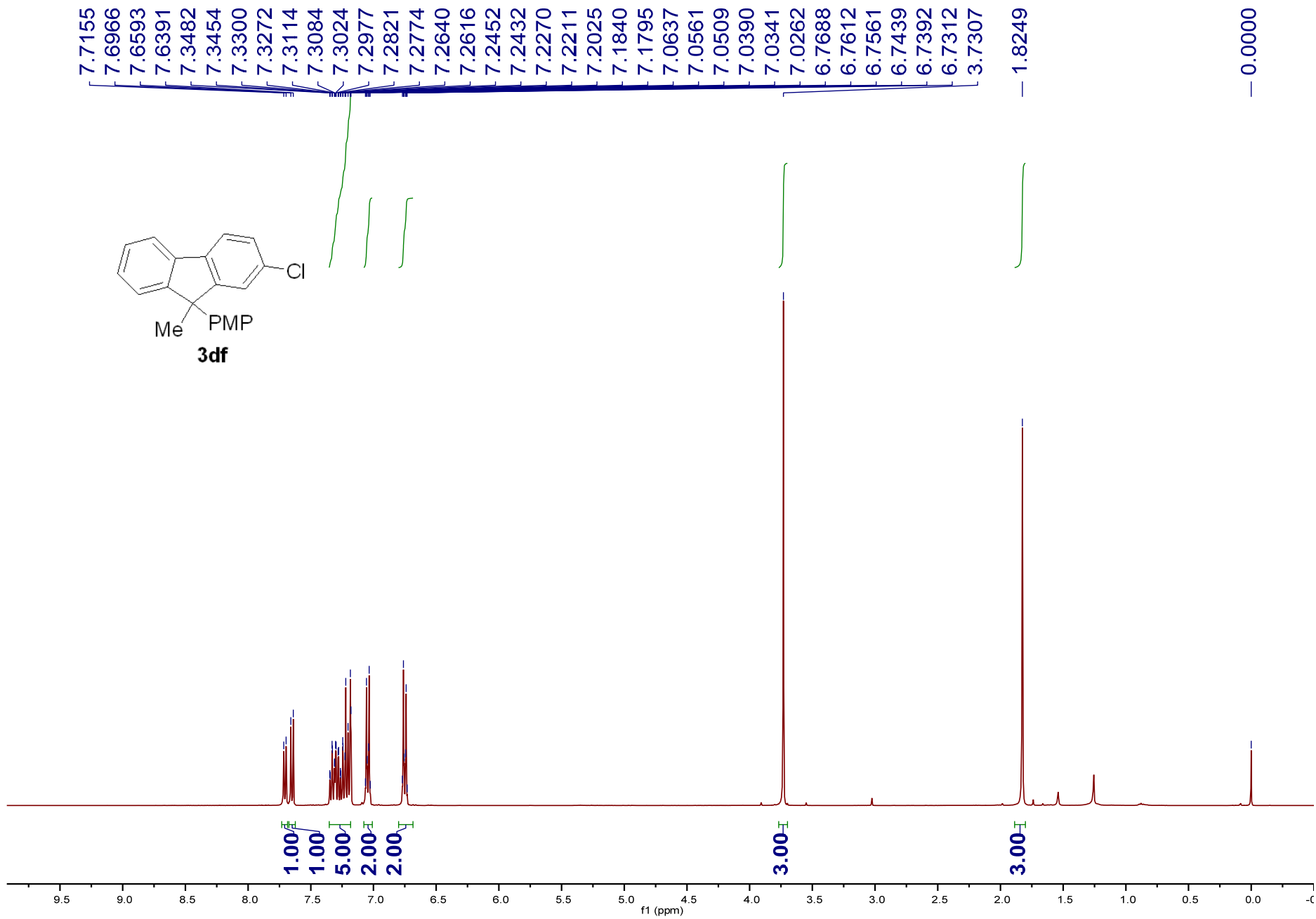


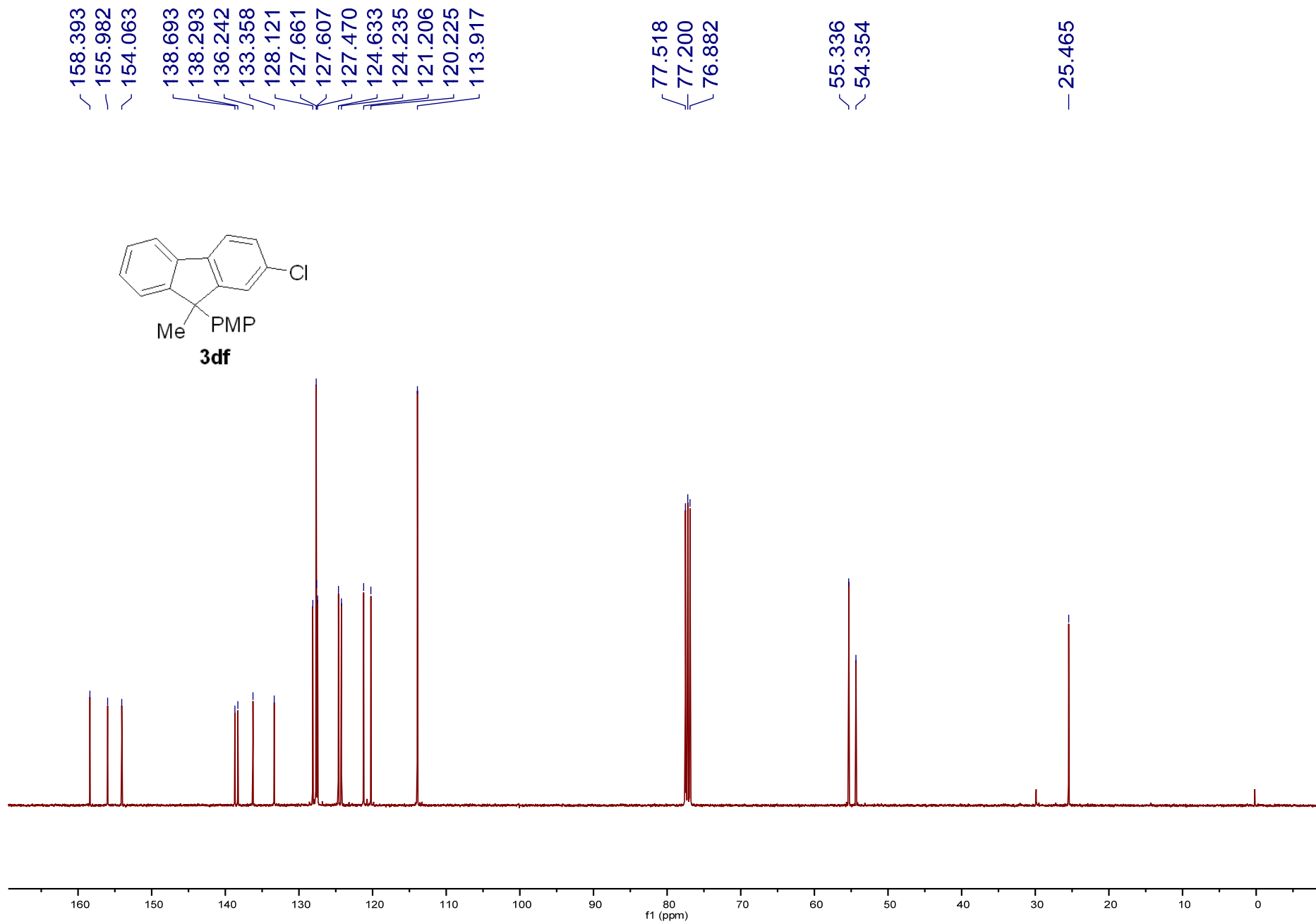


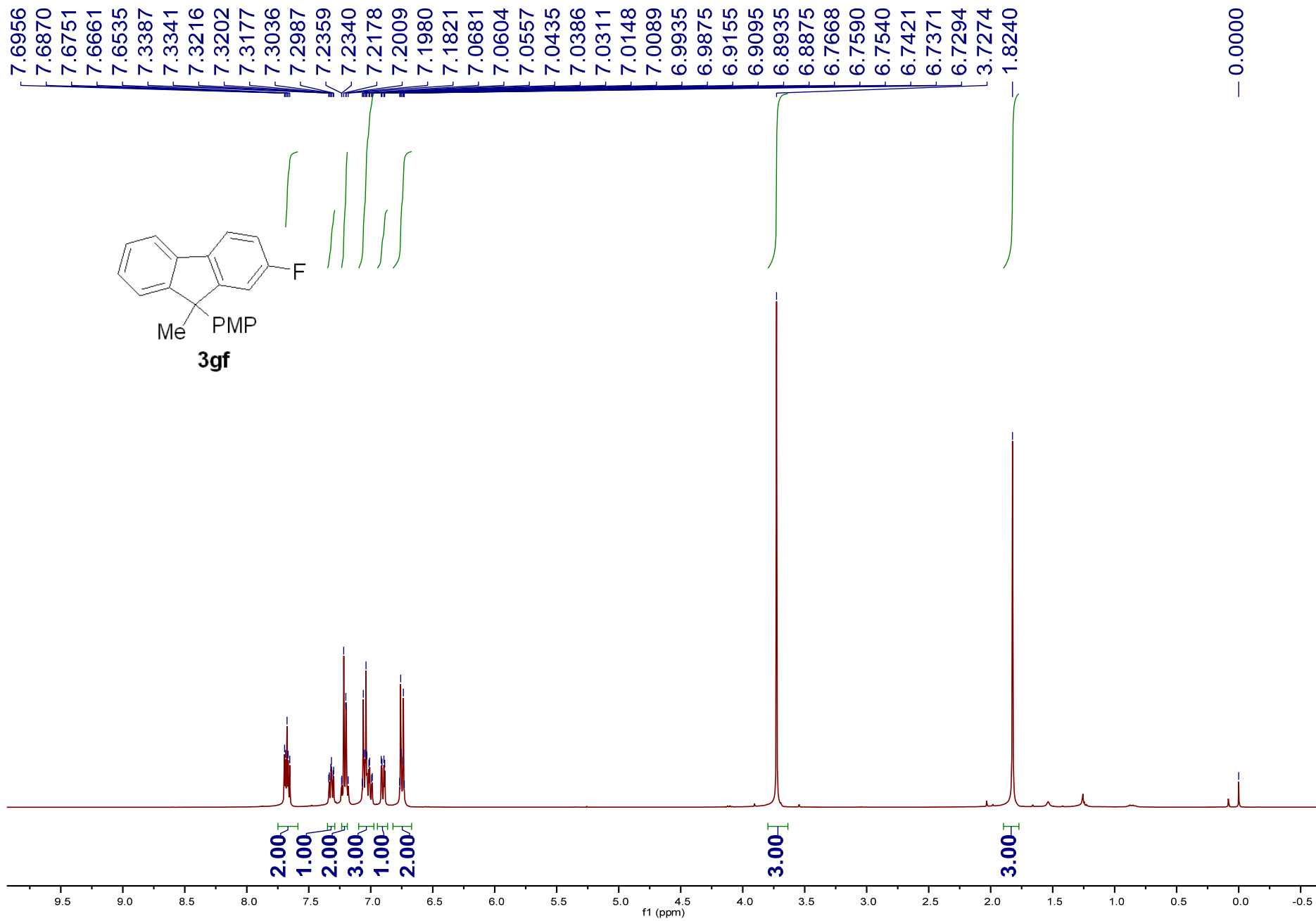


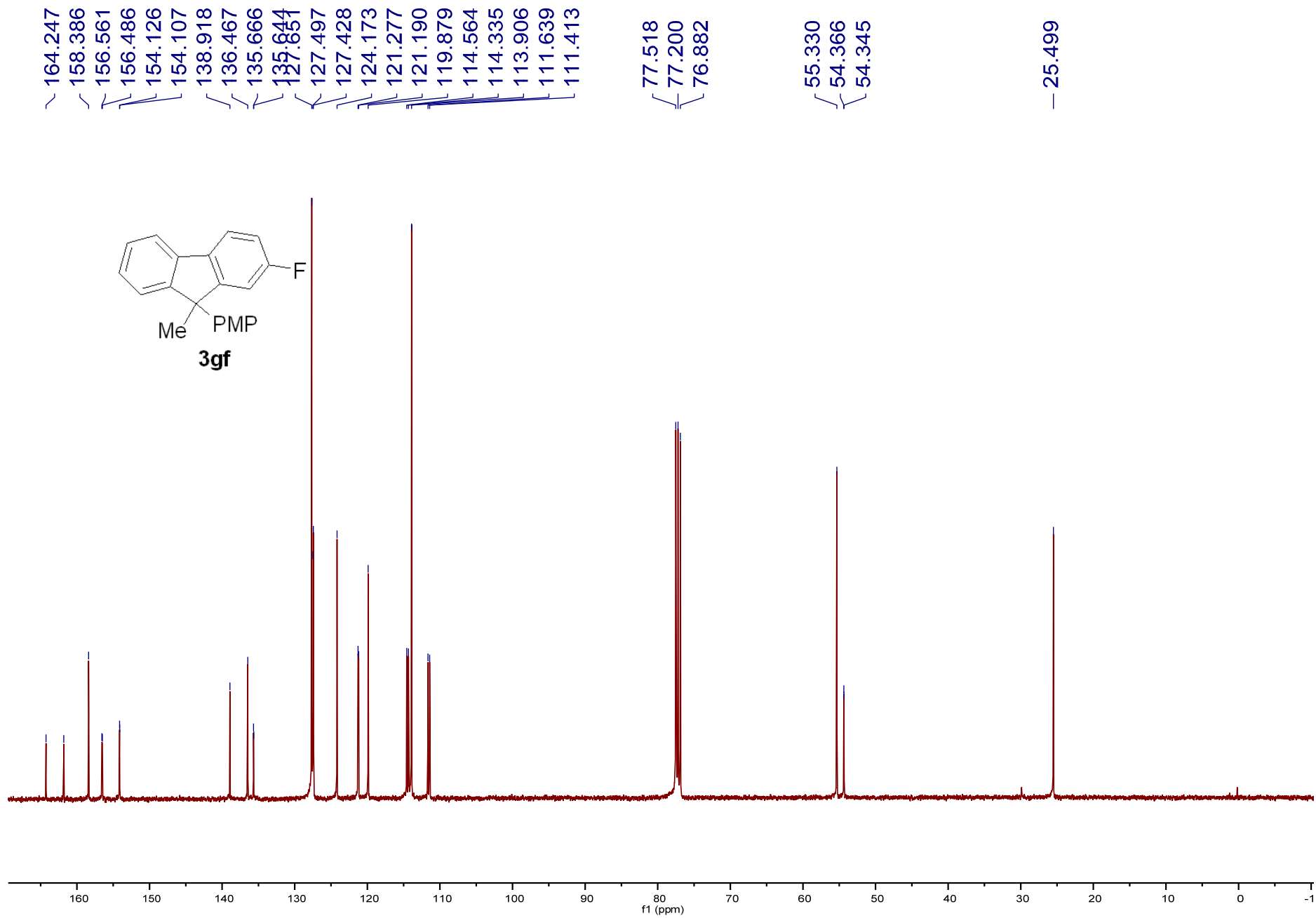


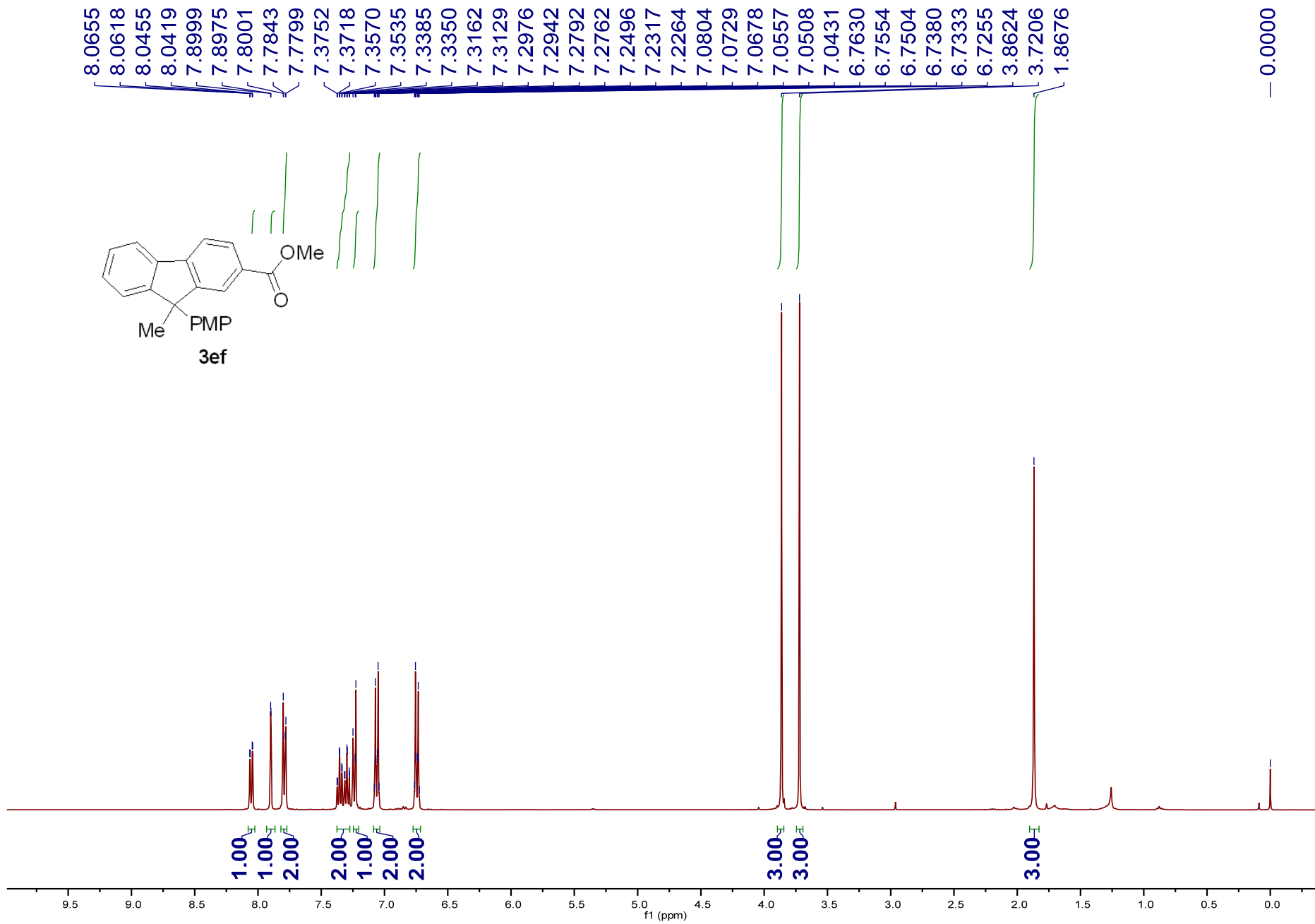










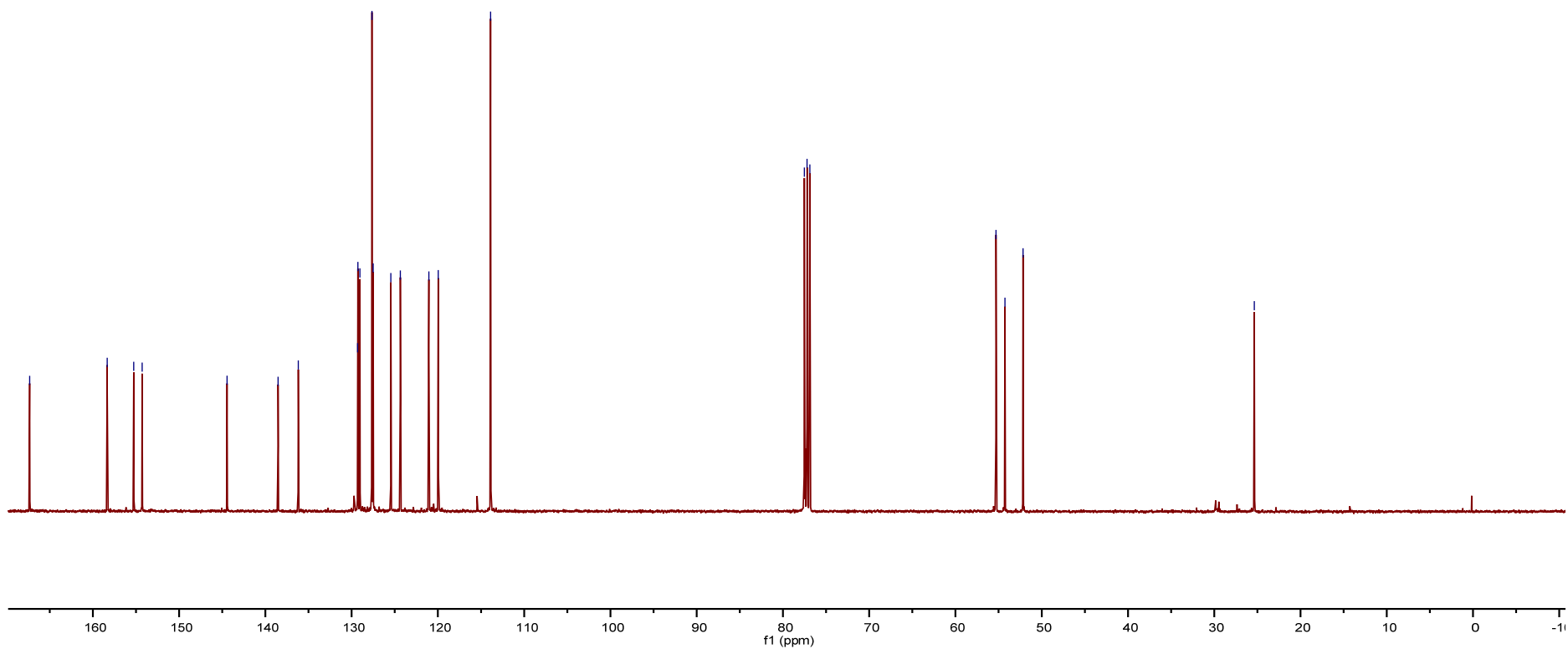
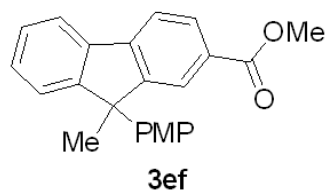


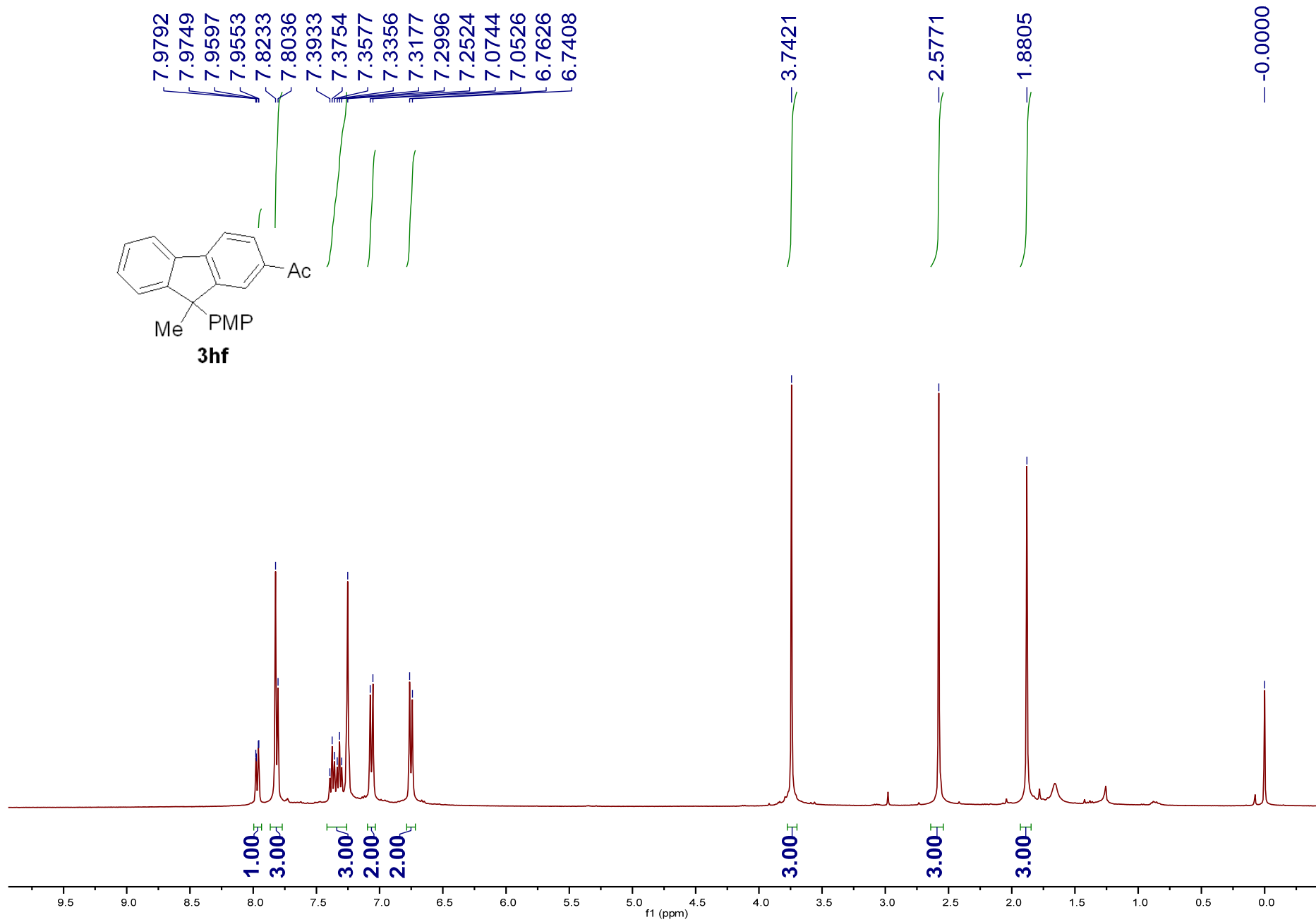
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 / 158.339
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 / 154.279
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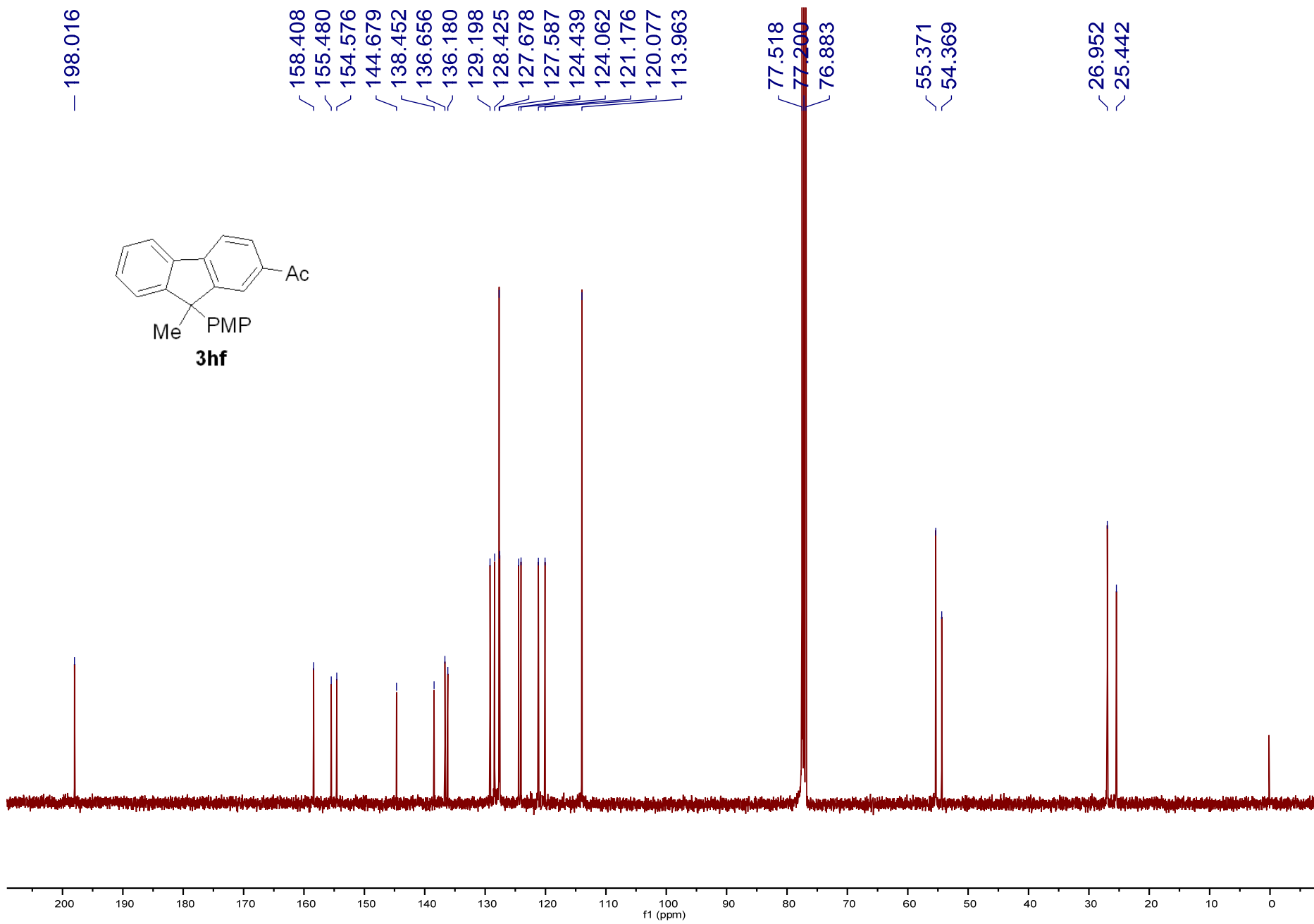
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 / 77.200
 / 76.882

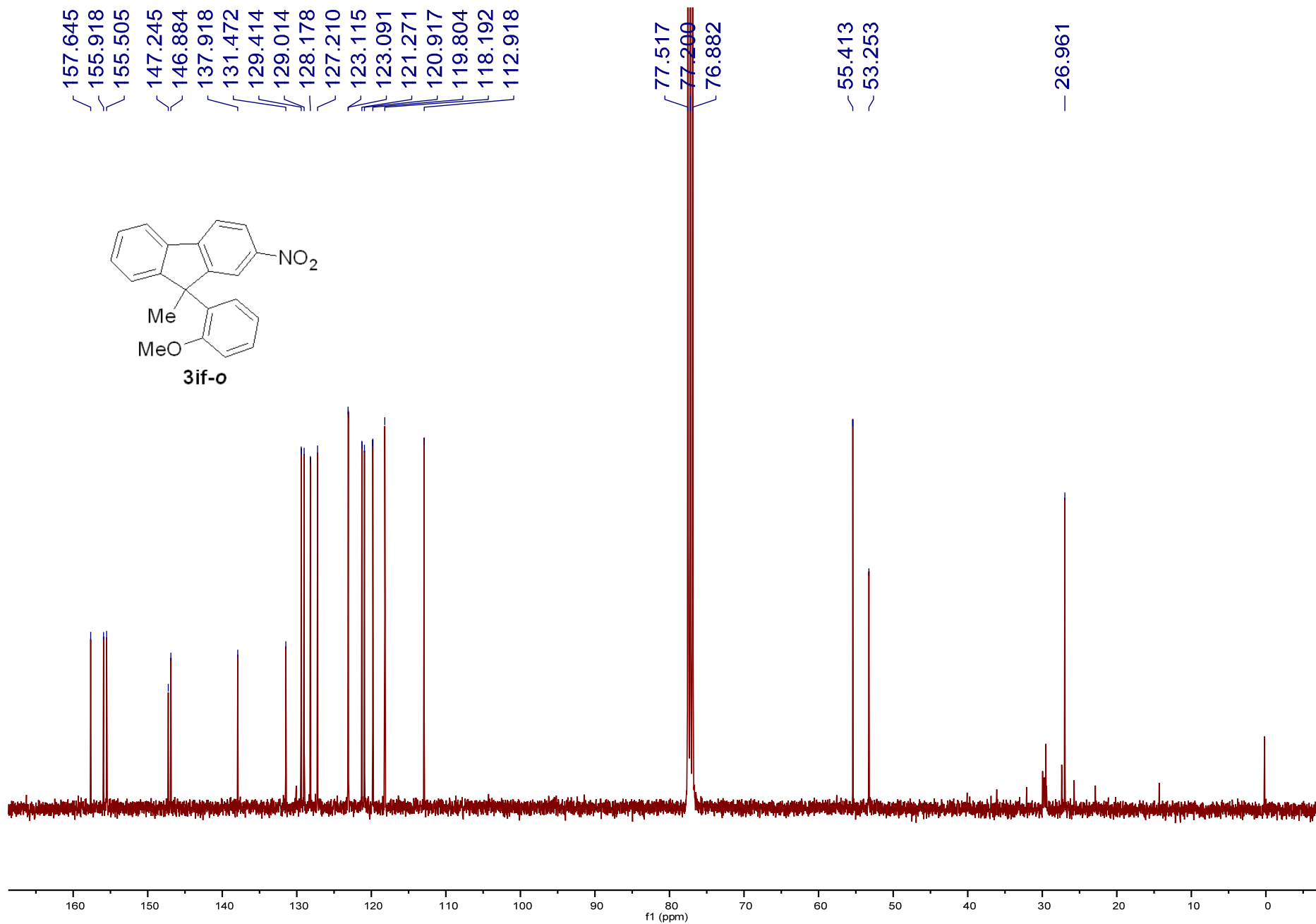
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 / 54.263
 / 52.168

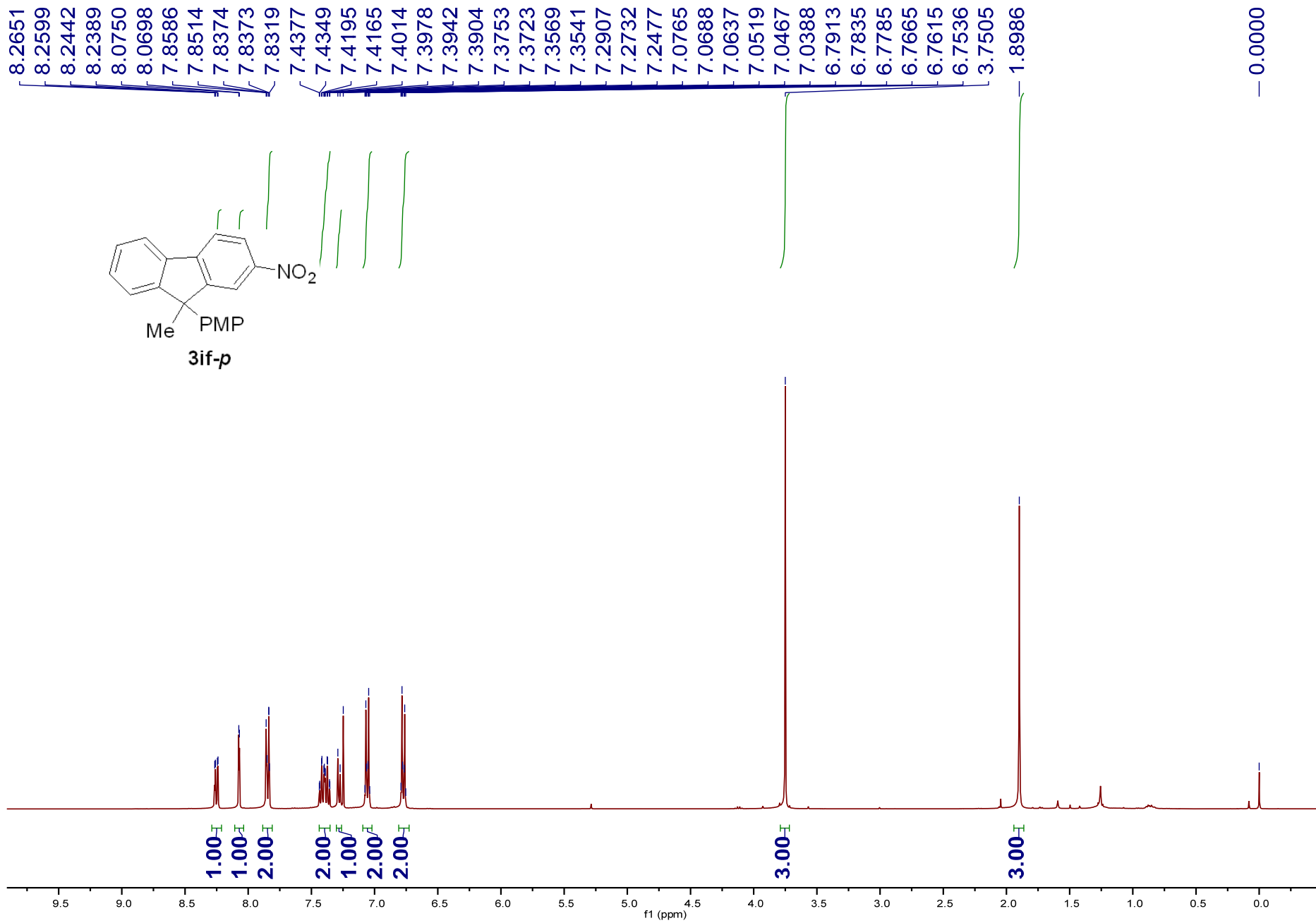
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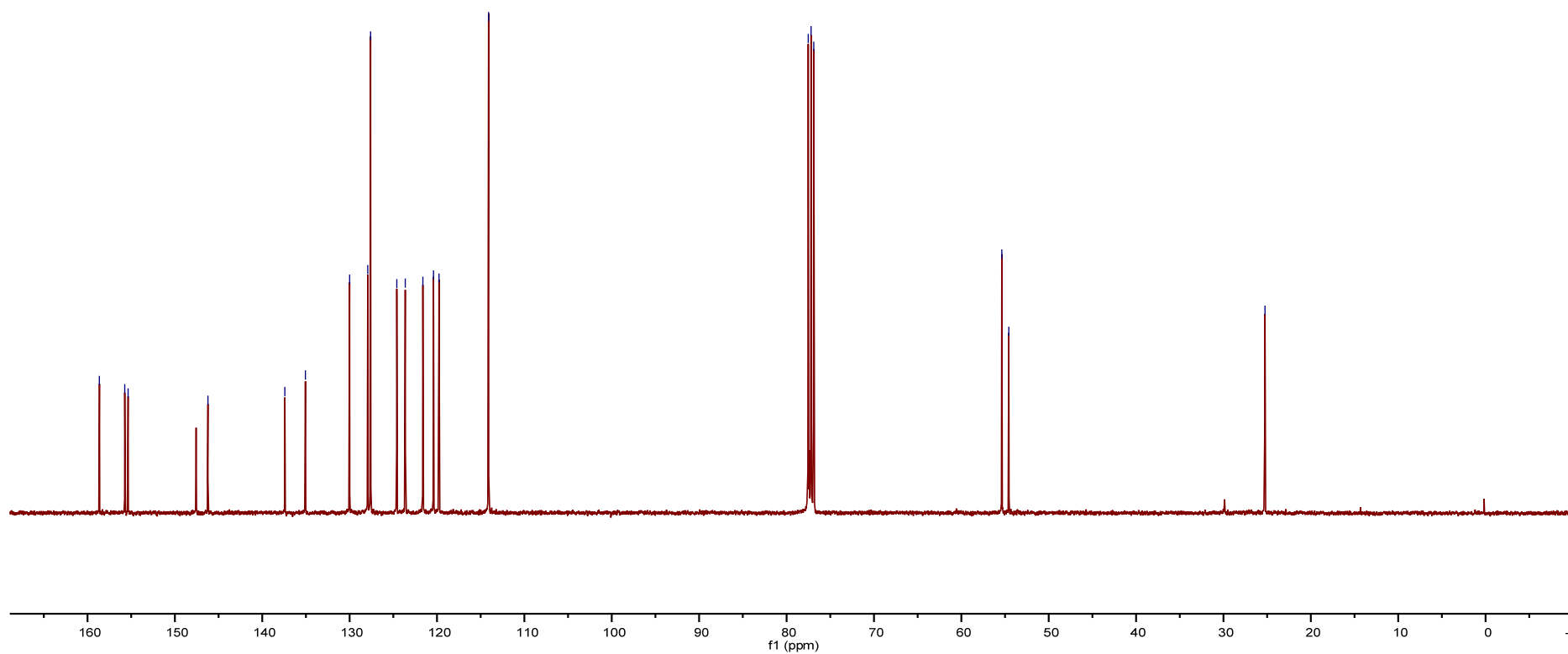
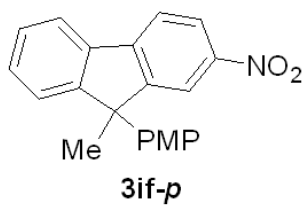


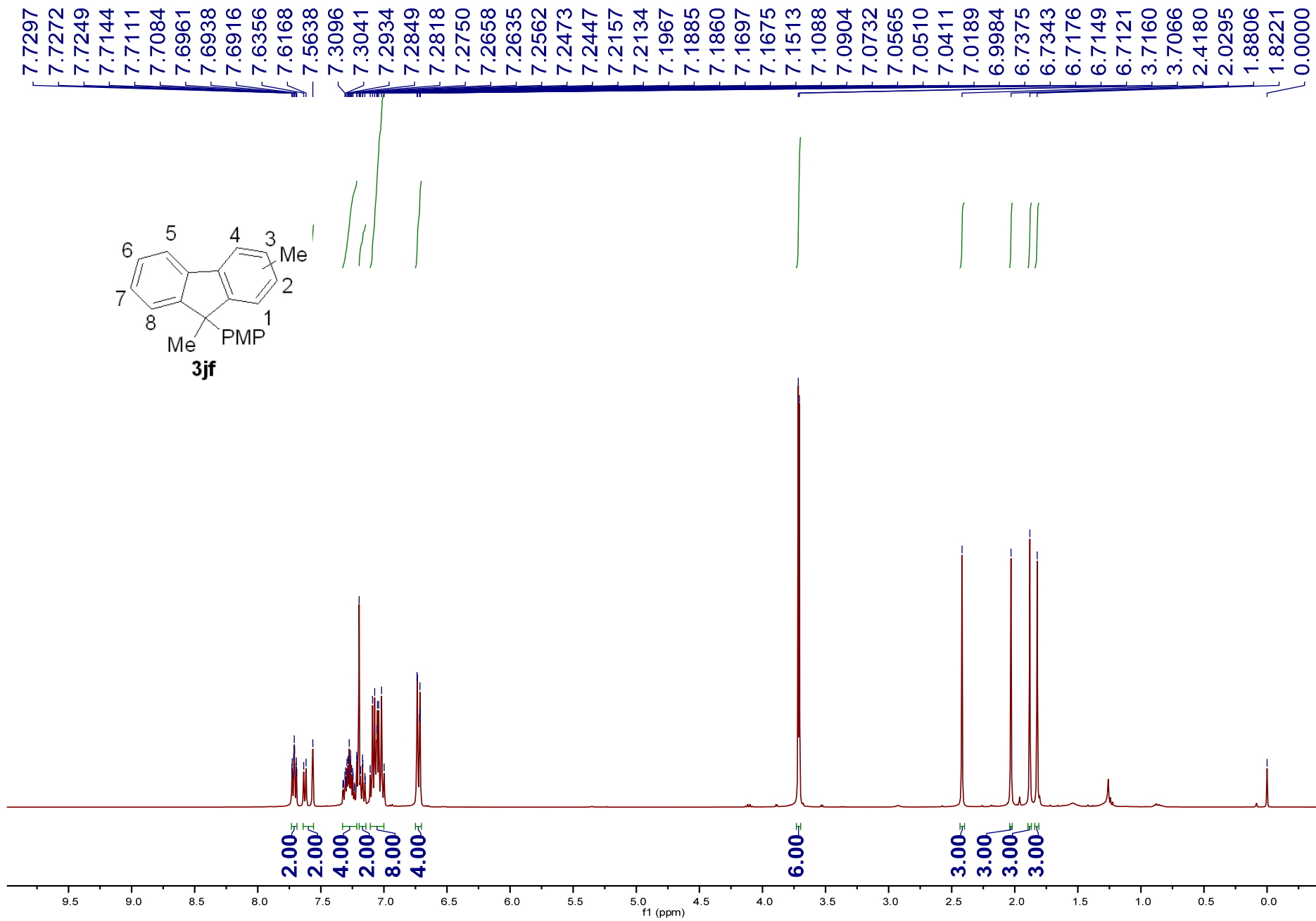
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120.395
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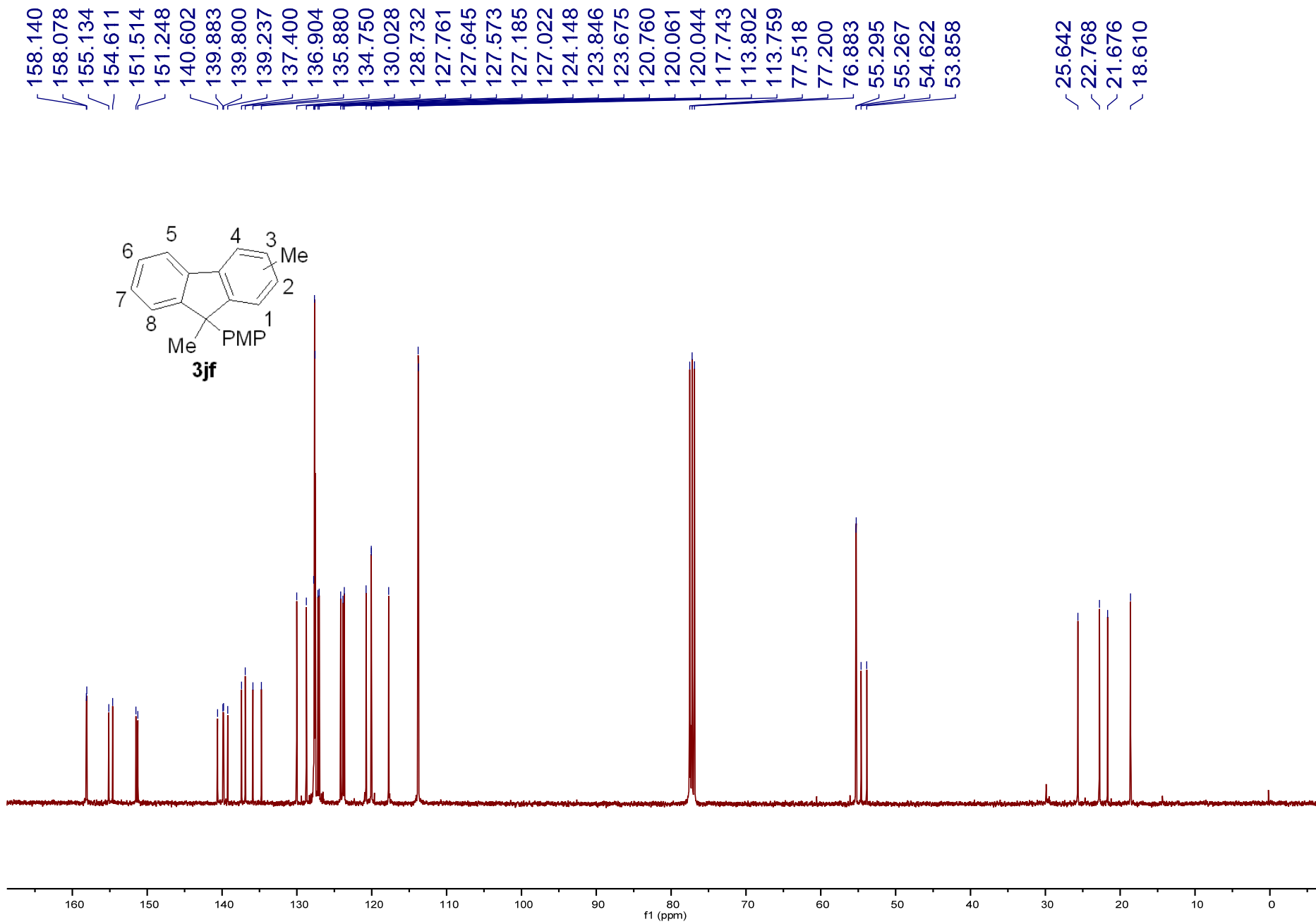
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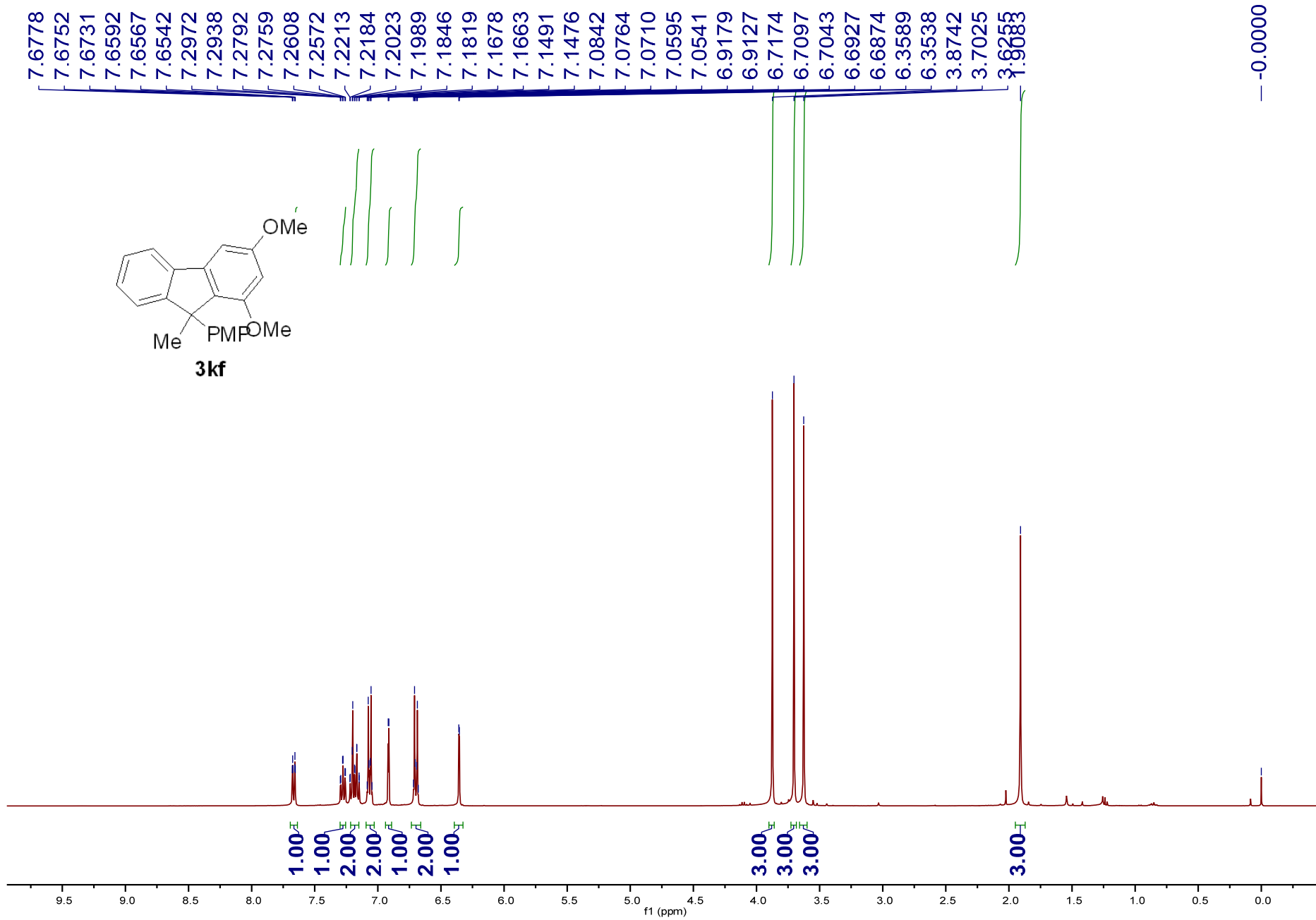
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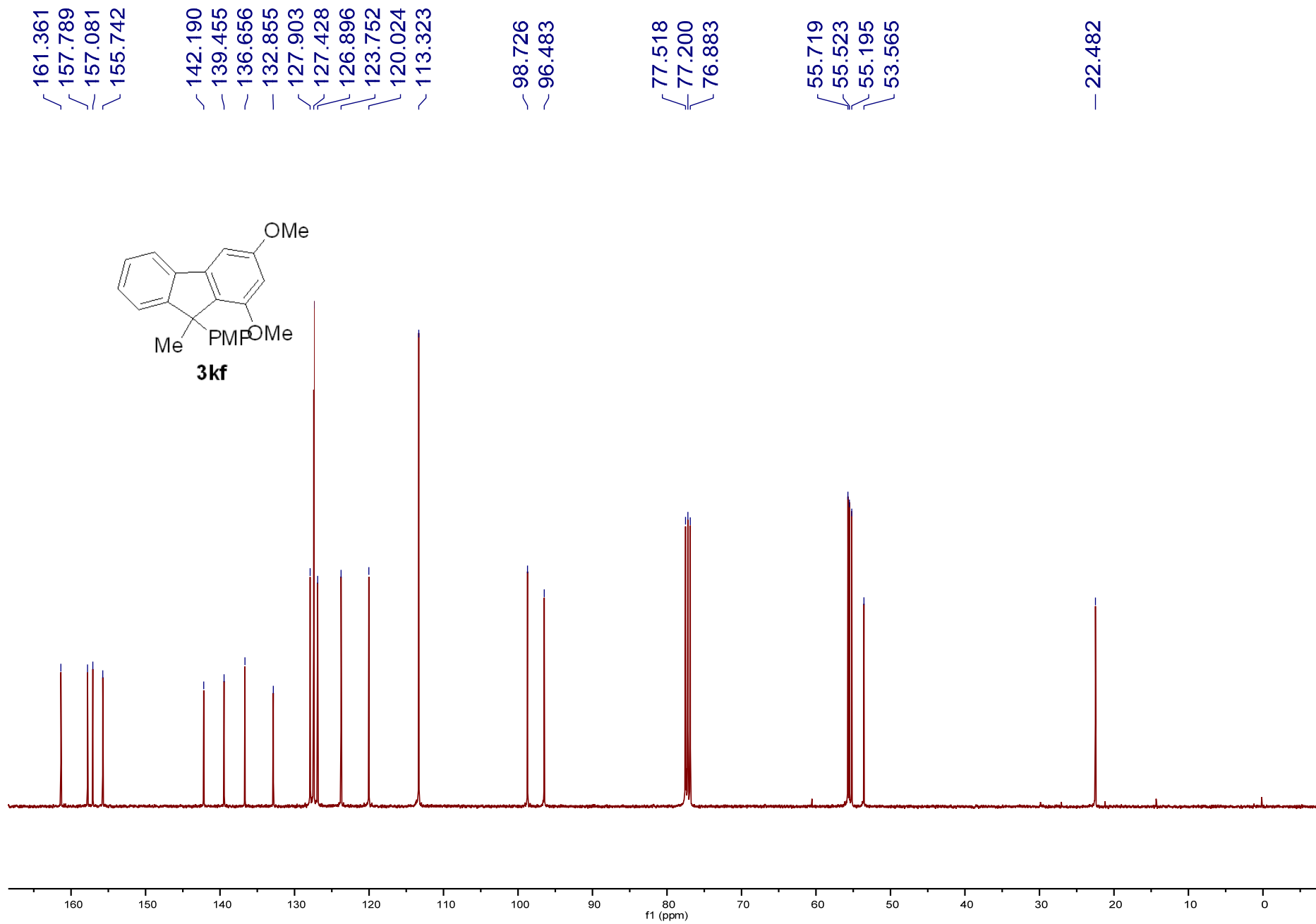


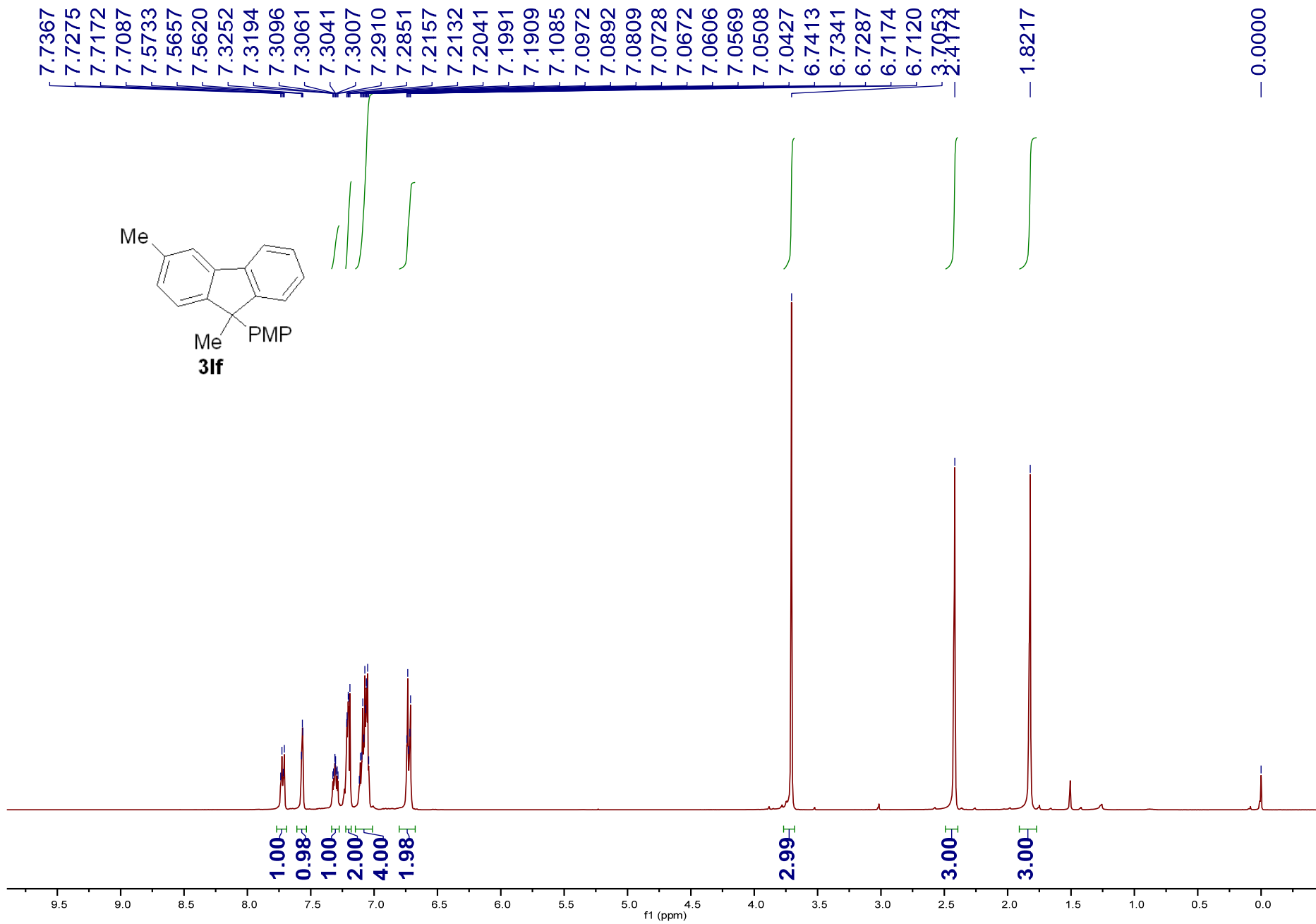


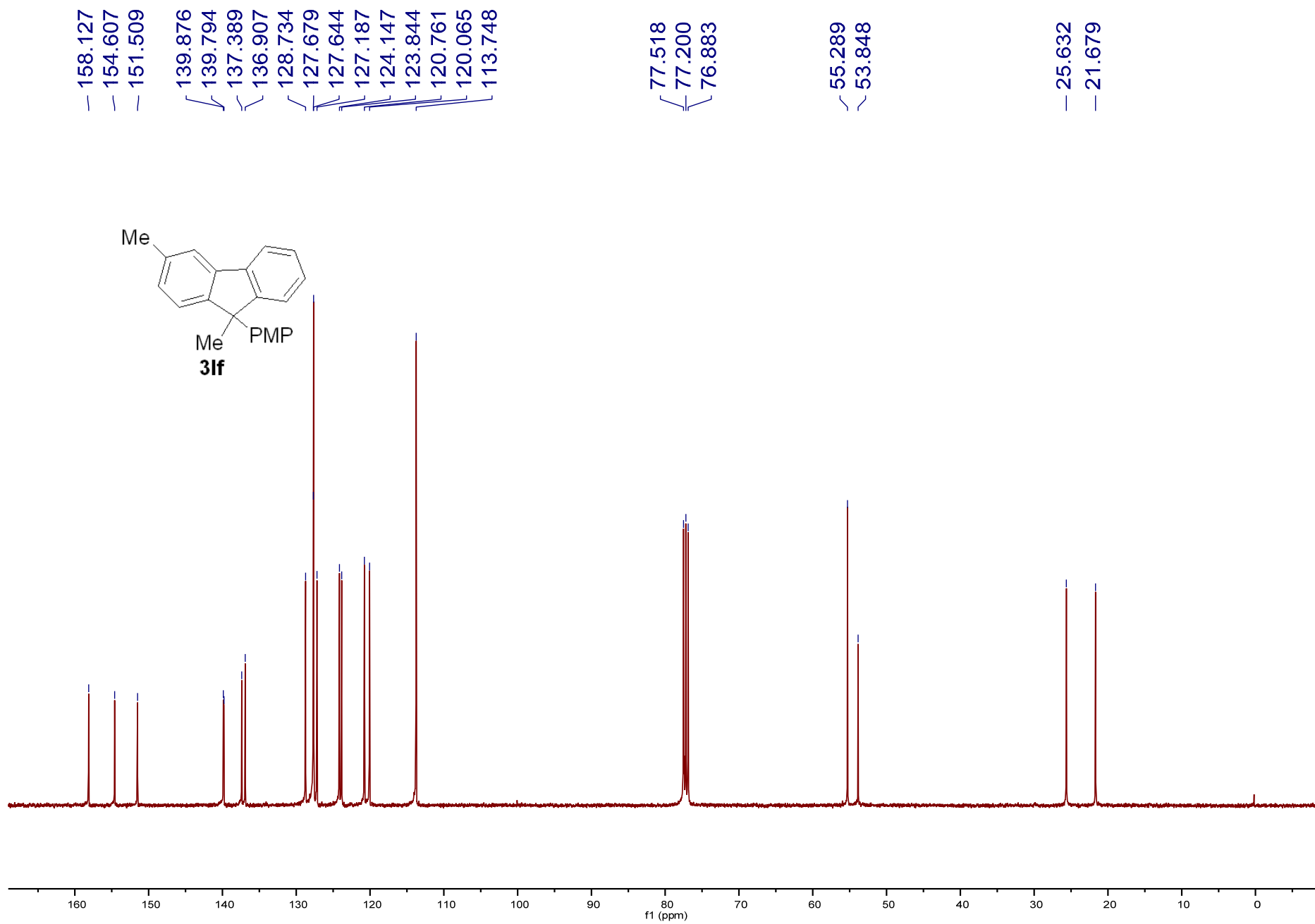


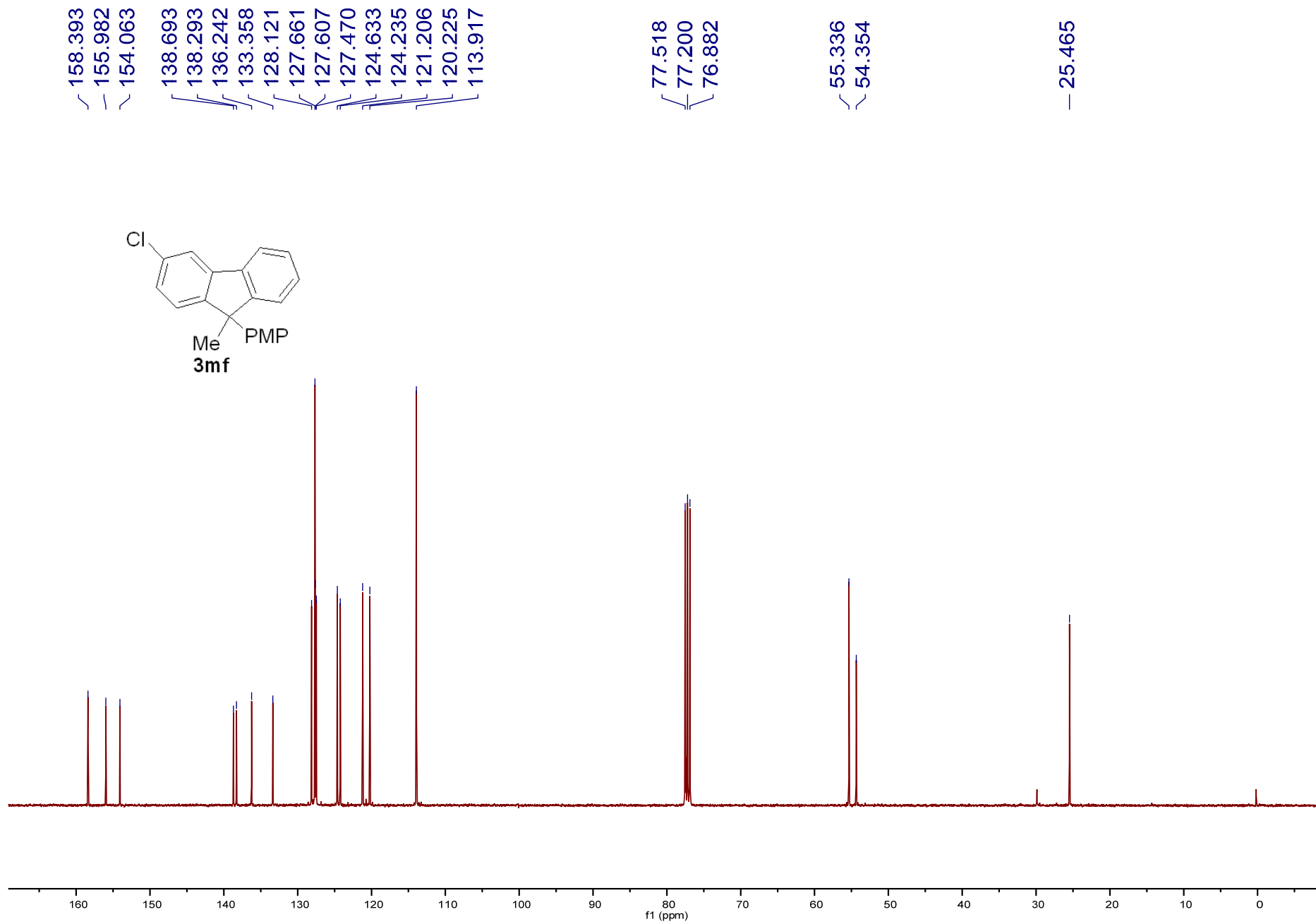


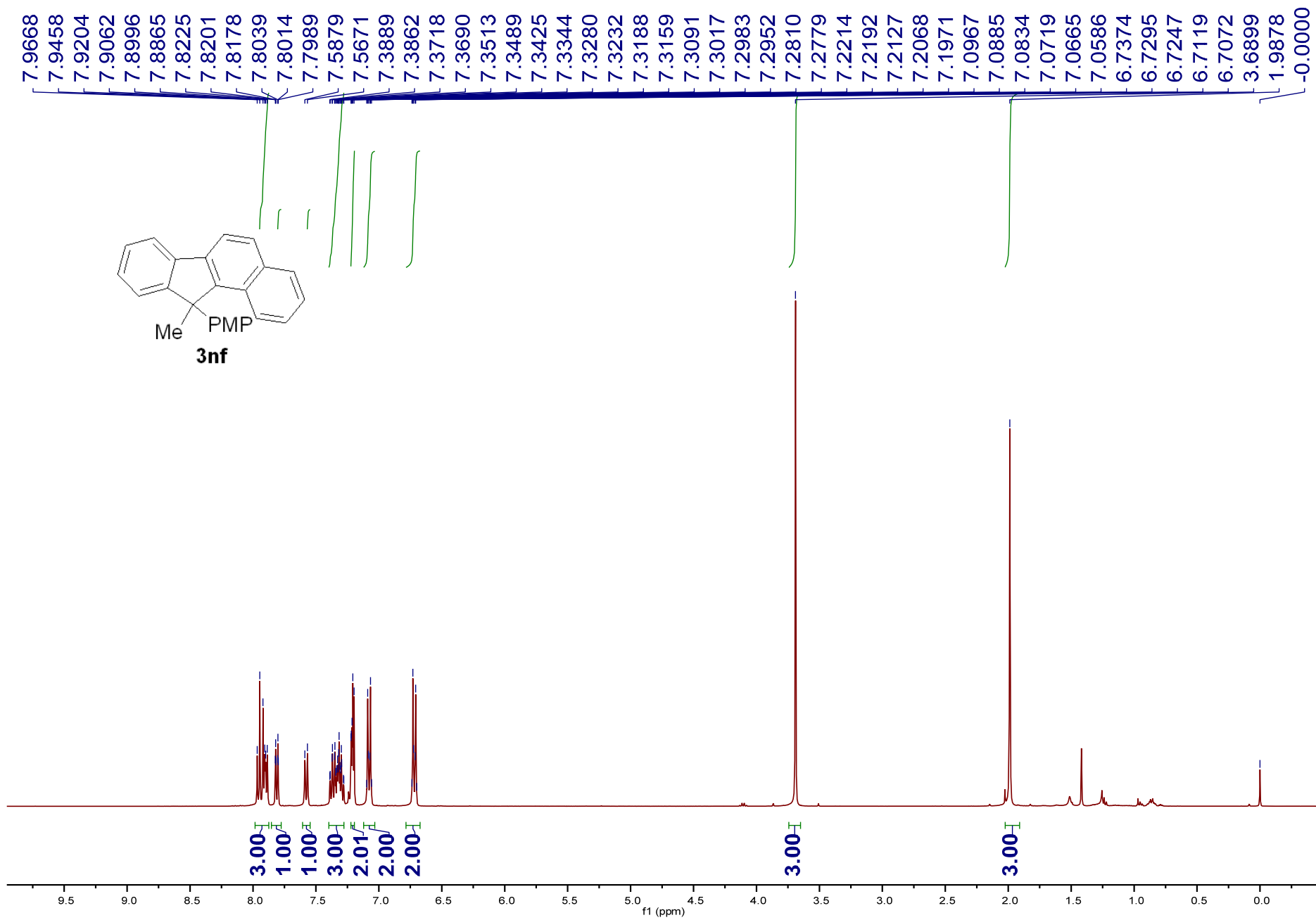
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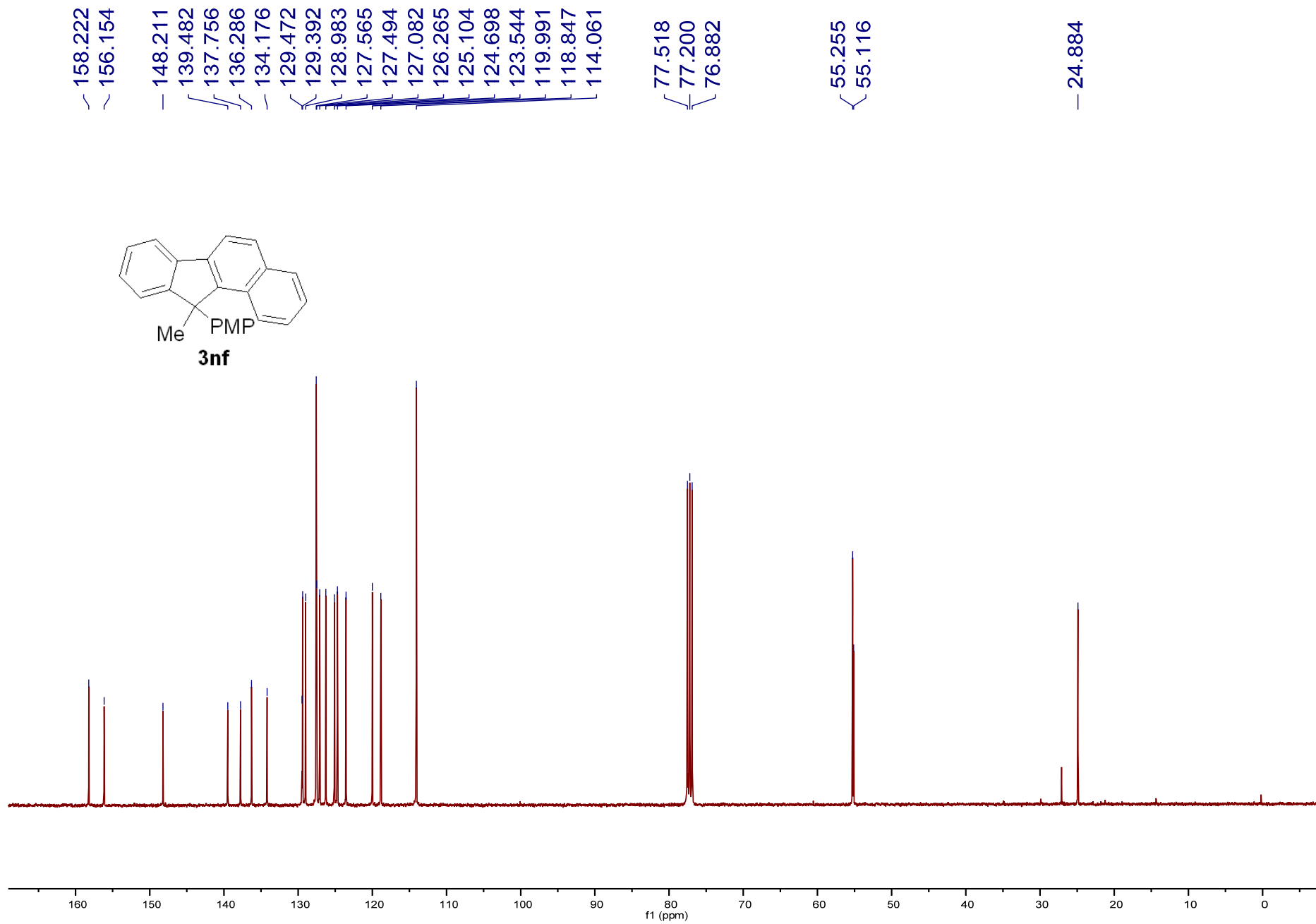


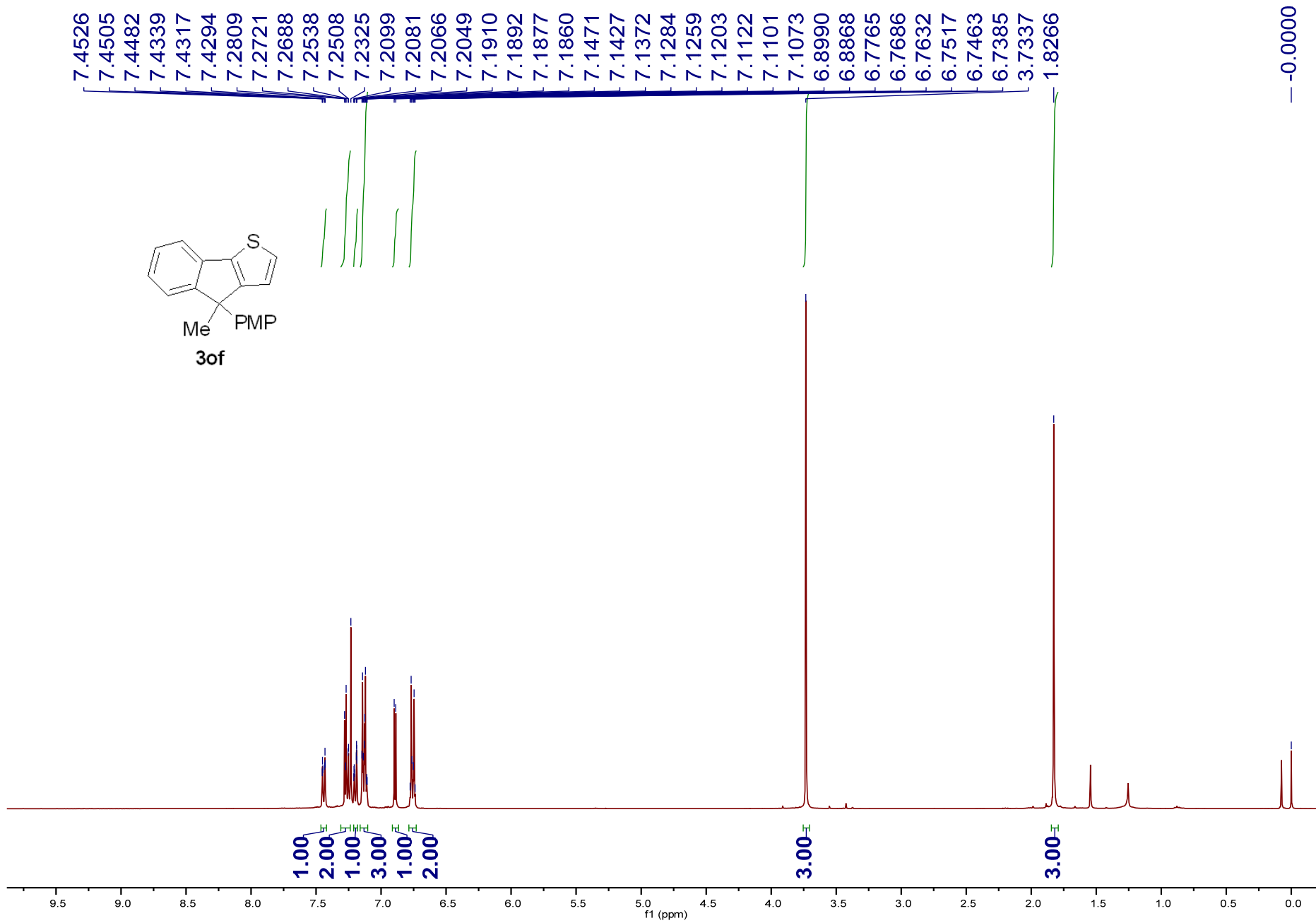












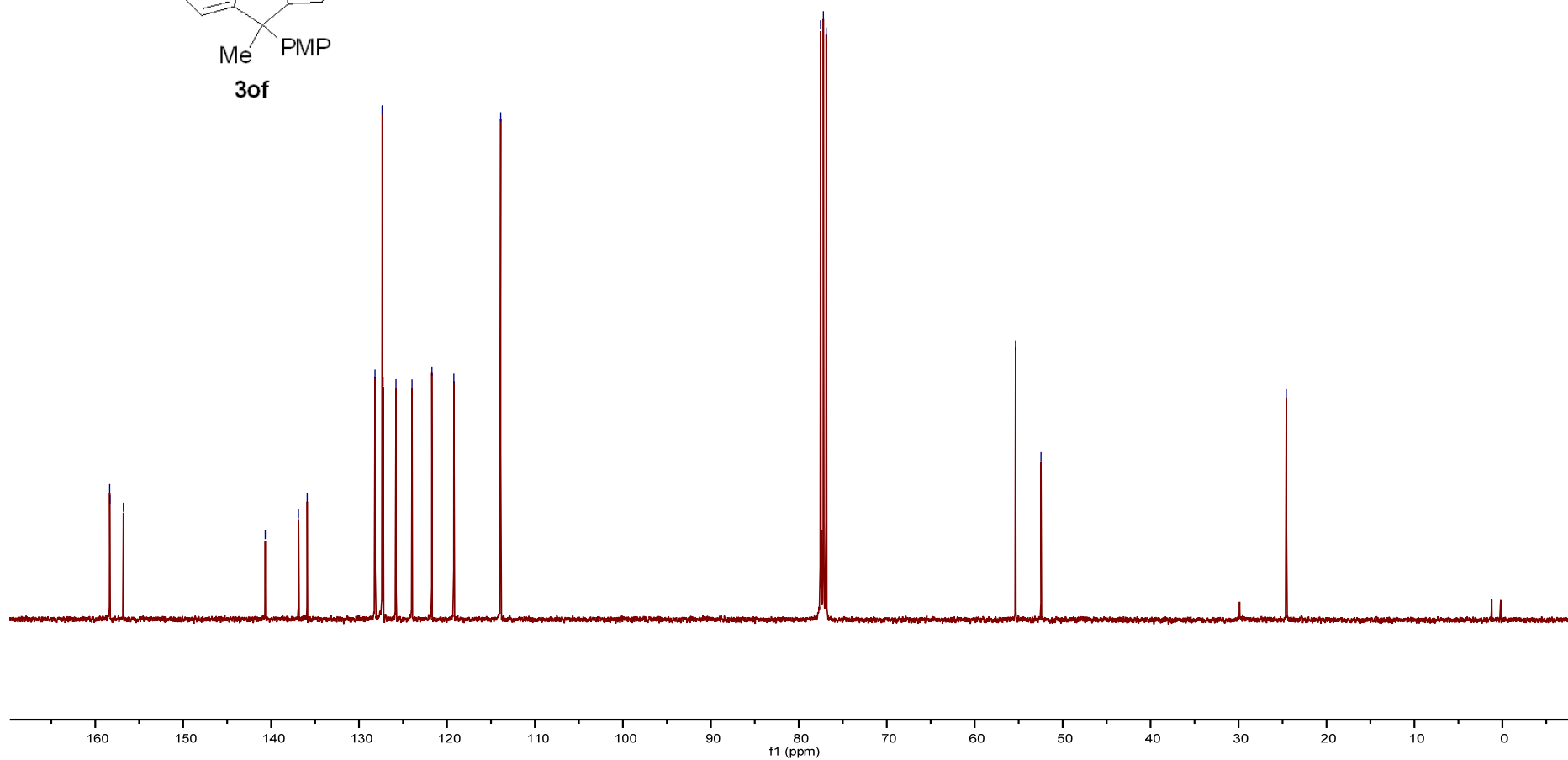
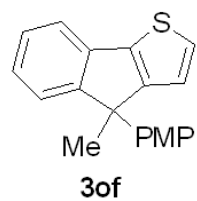
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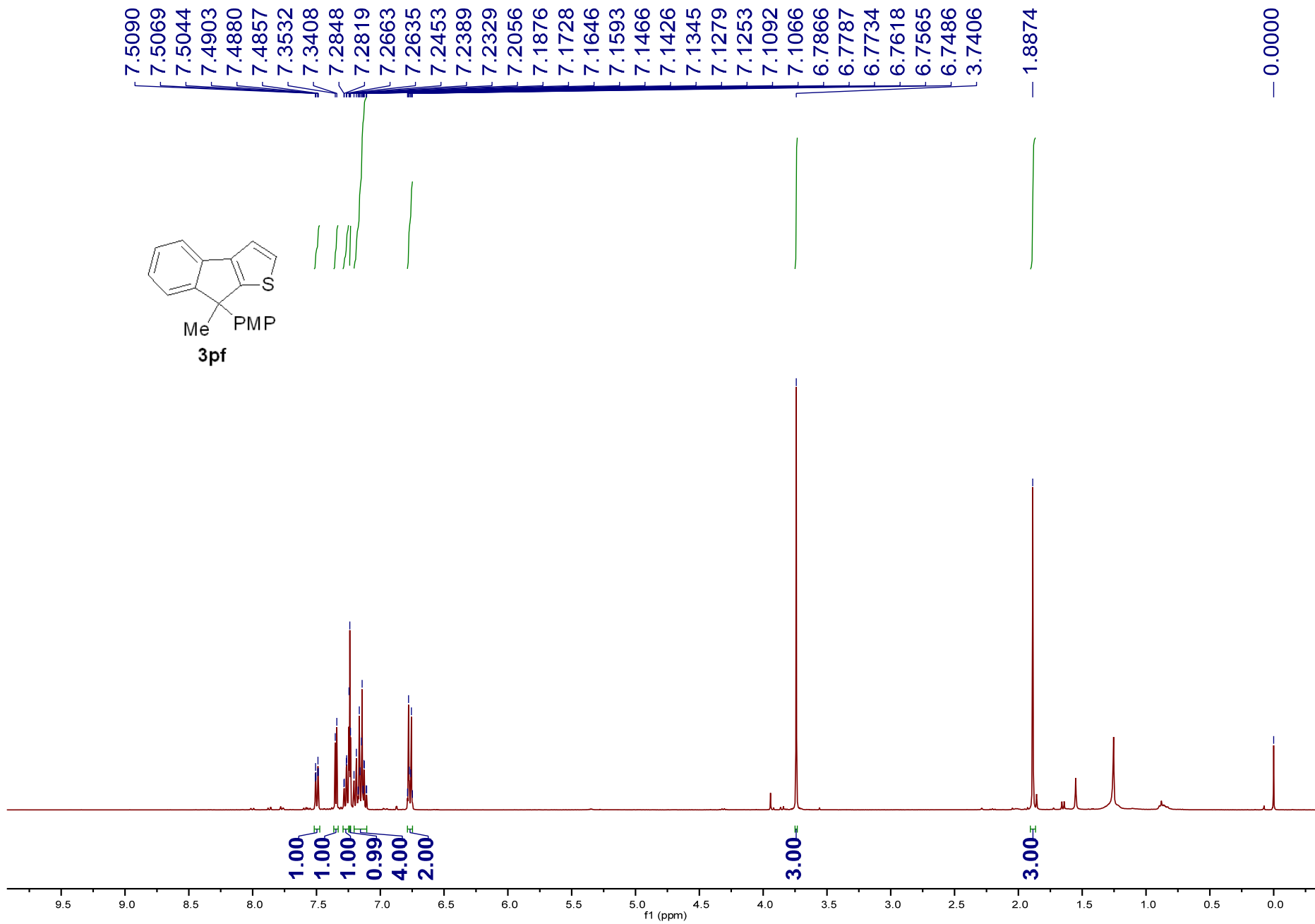
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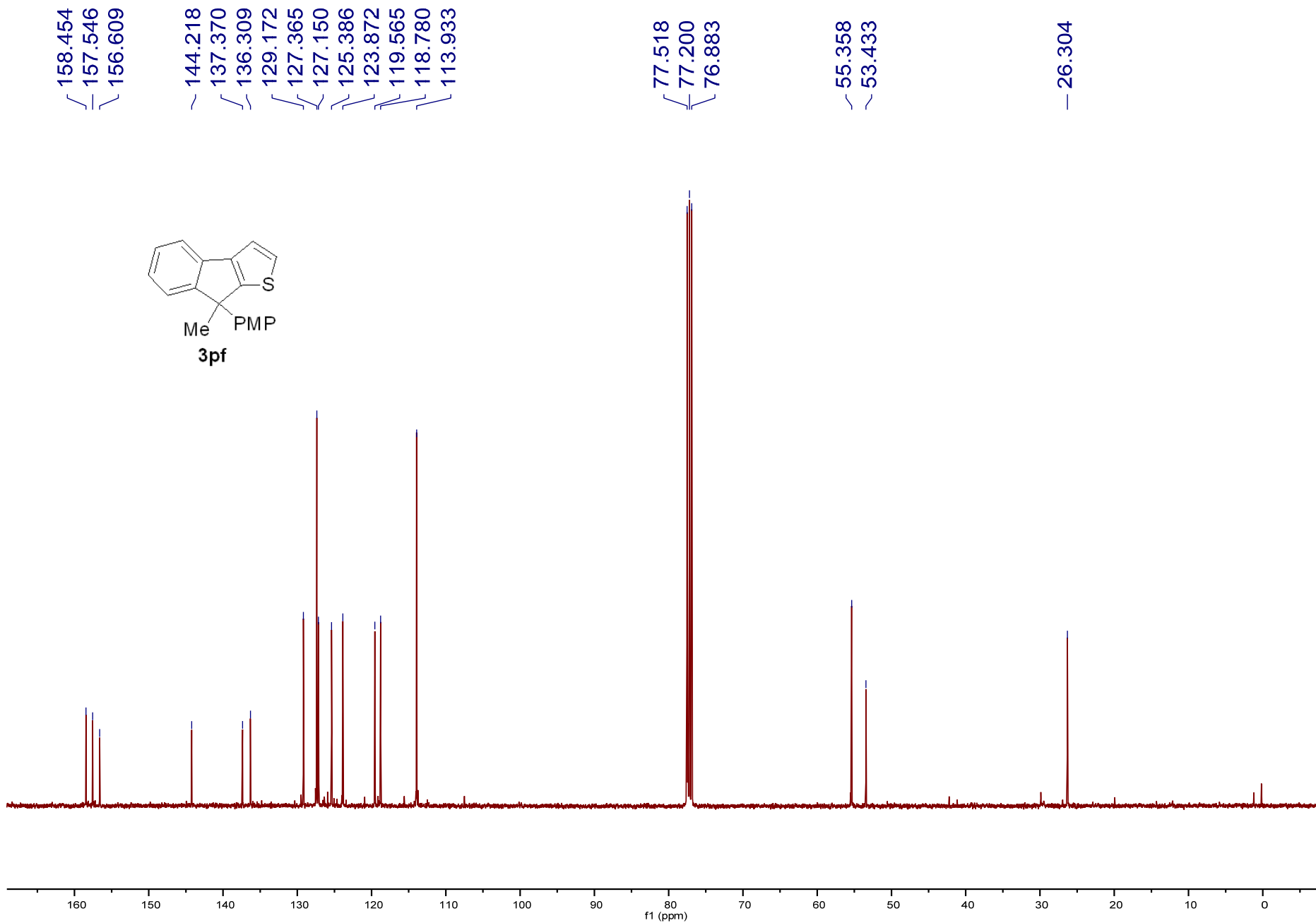
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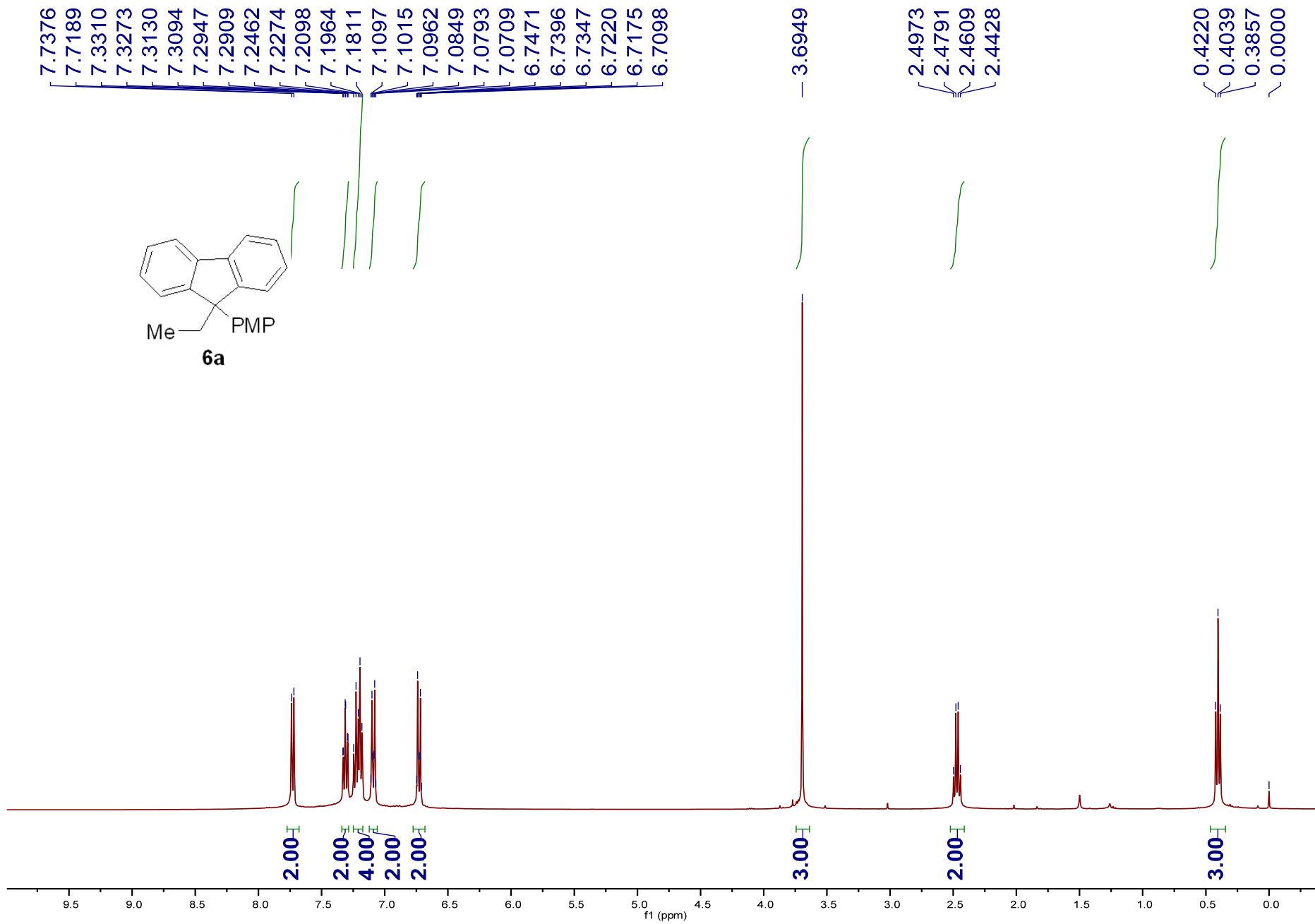
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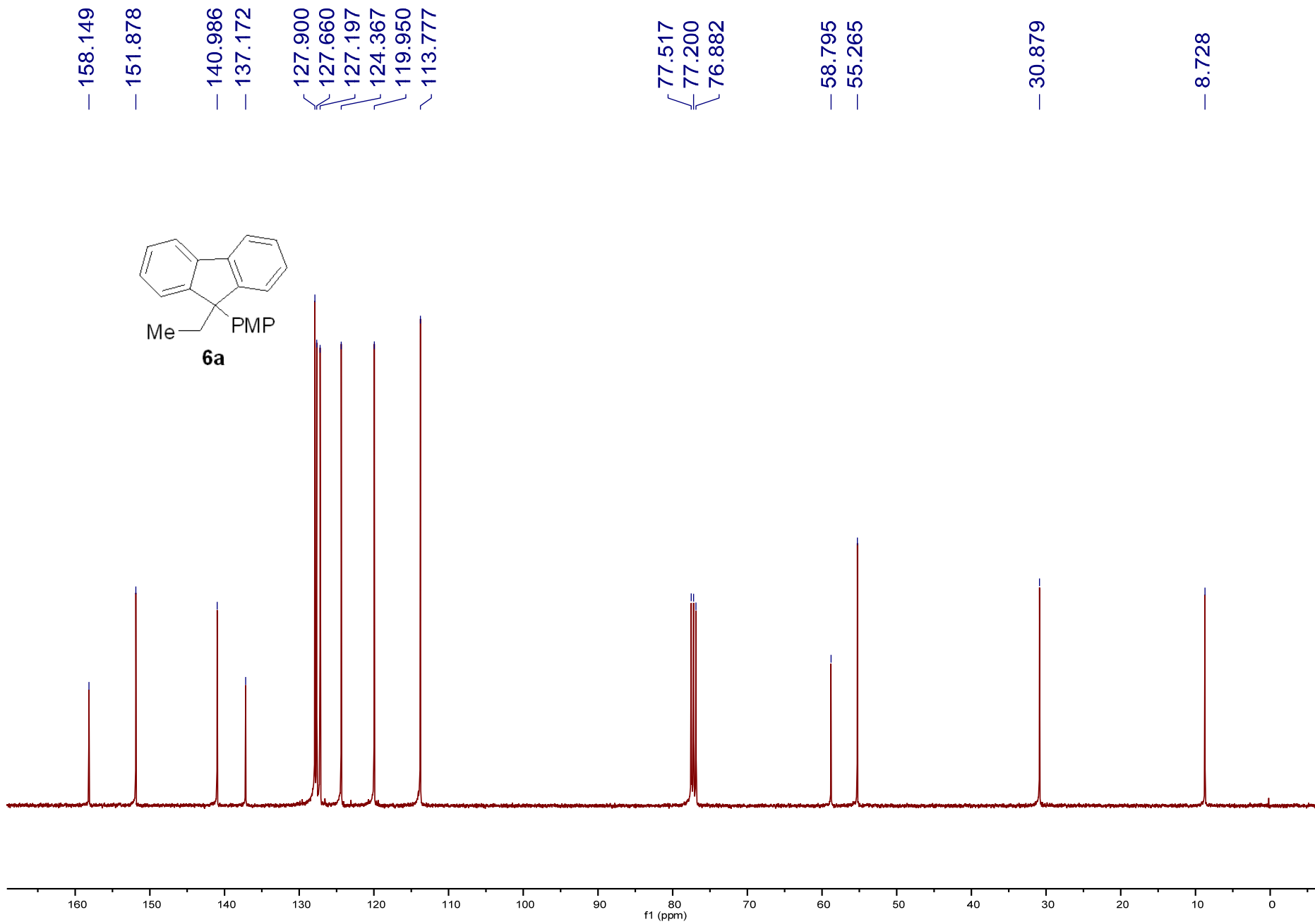
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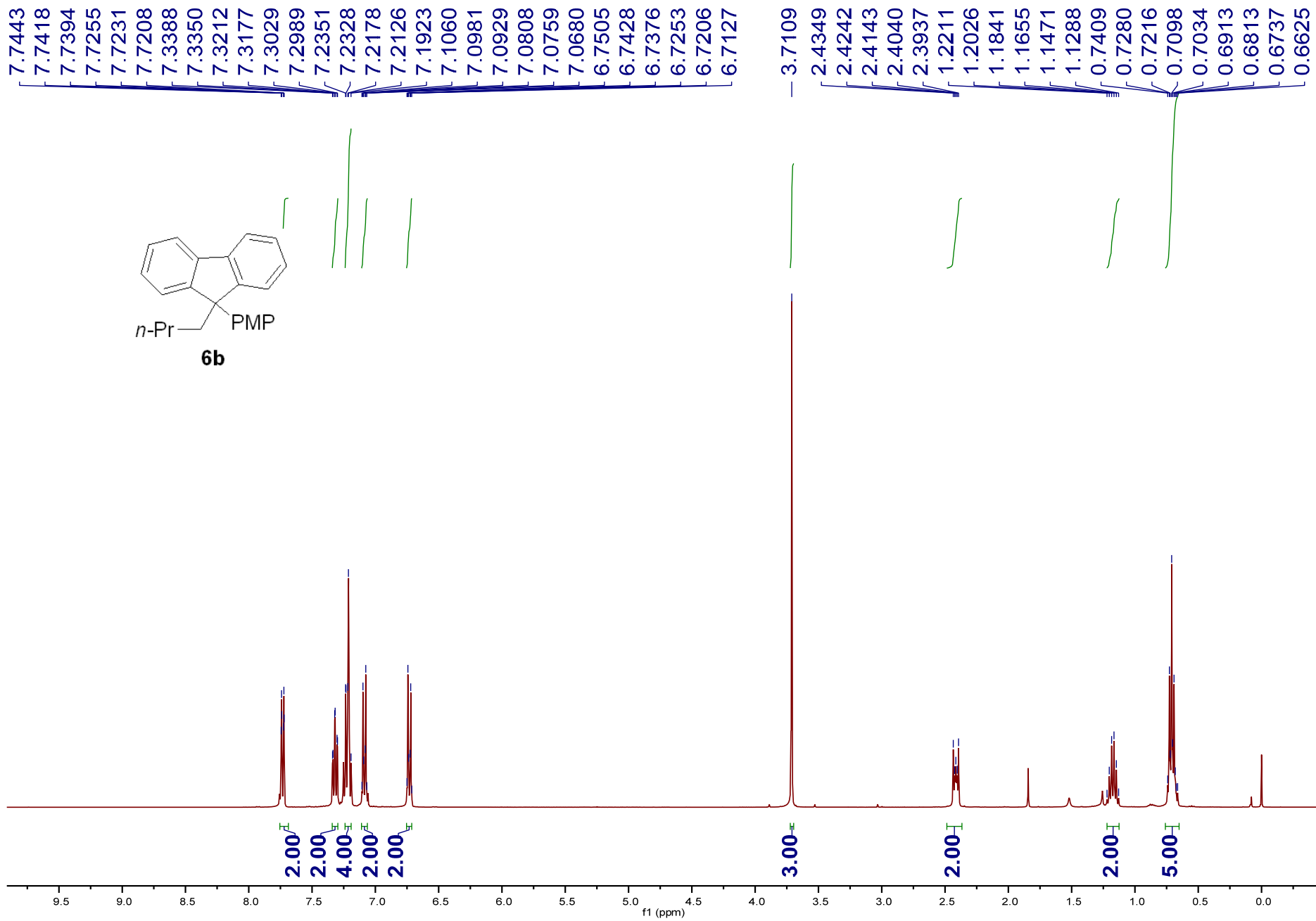


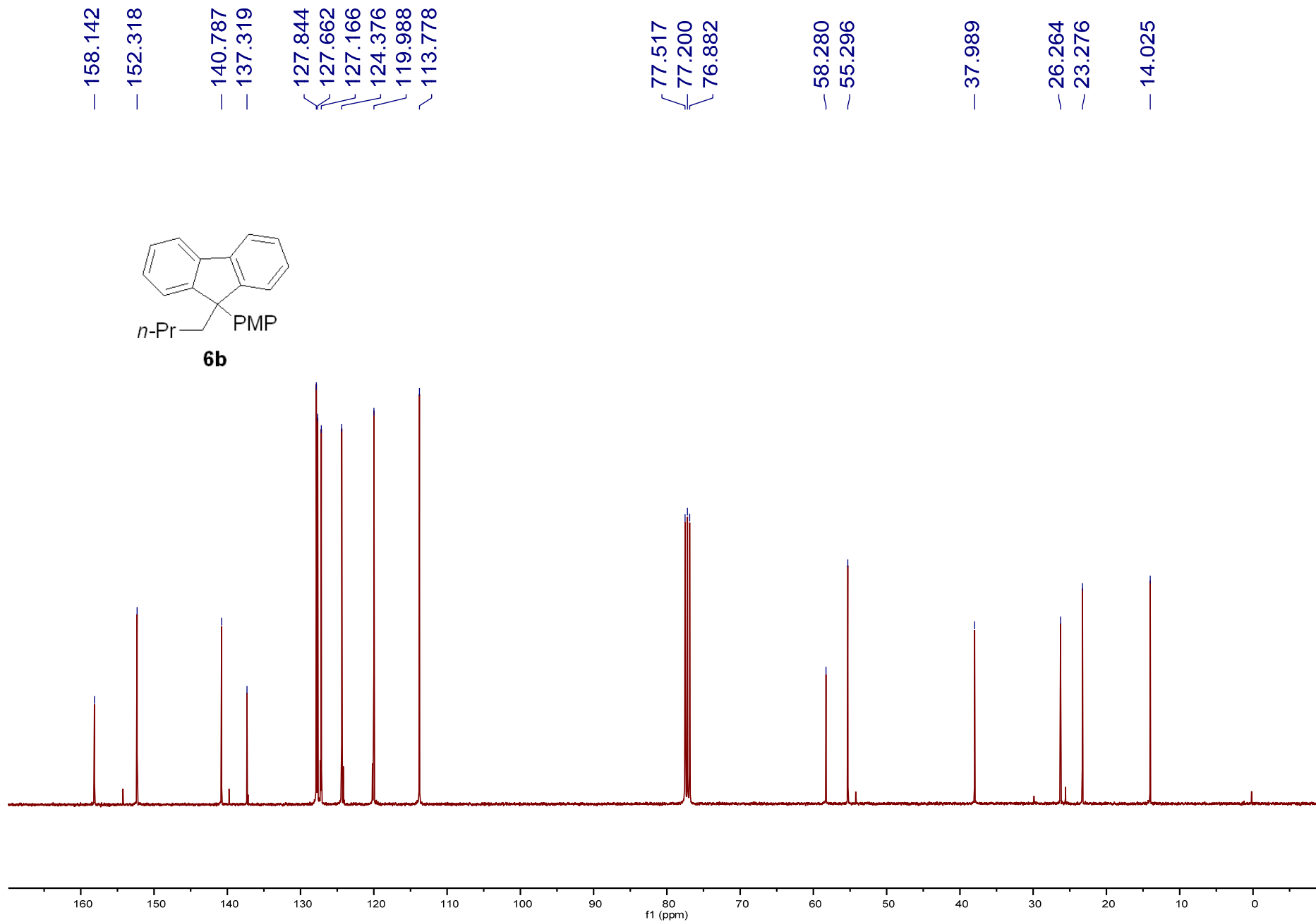
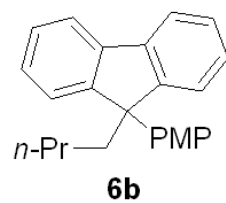


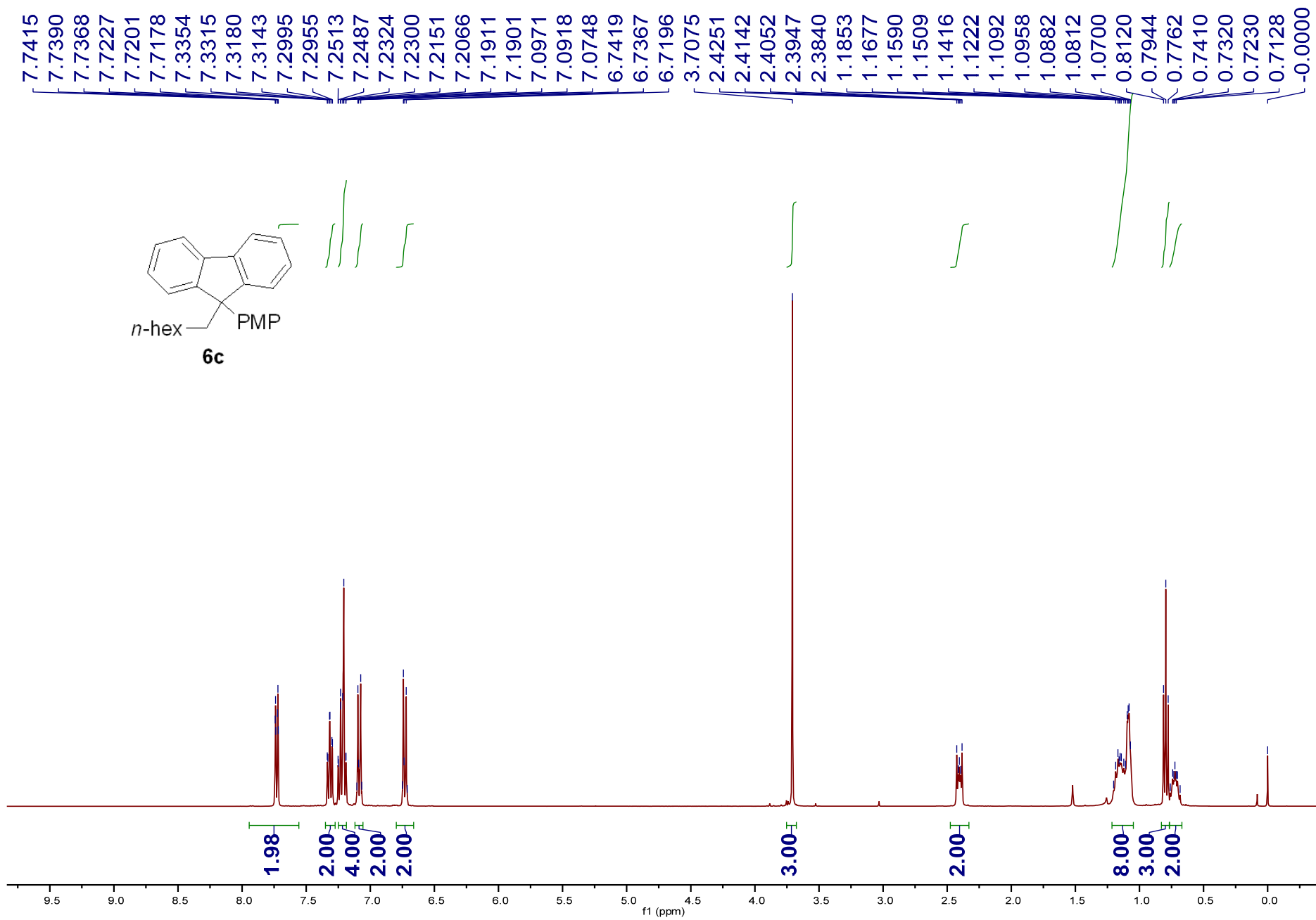


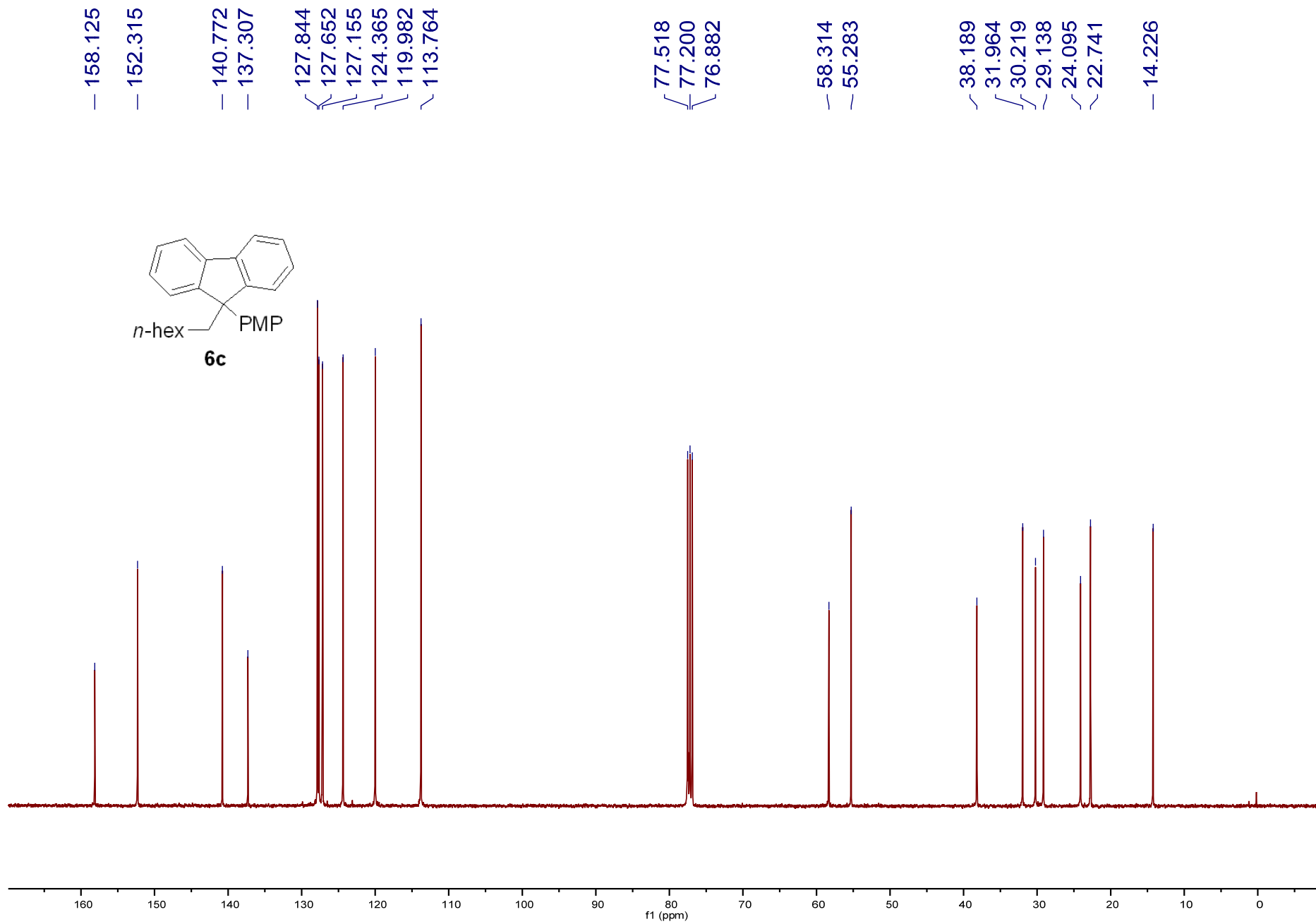


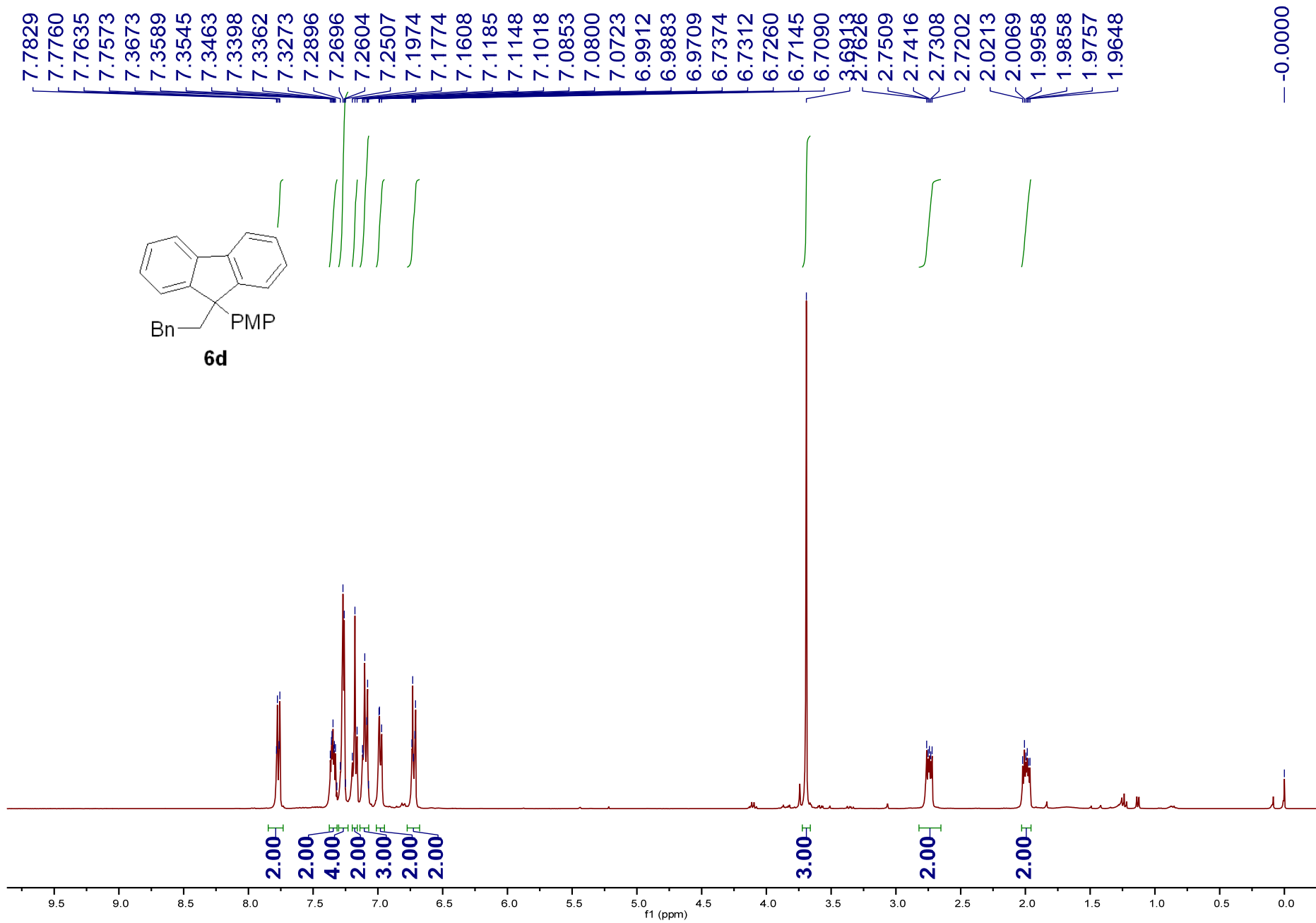


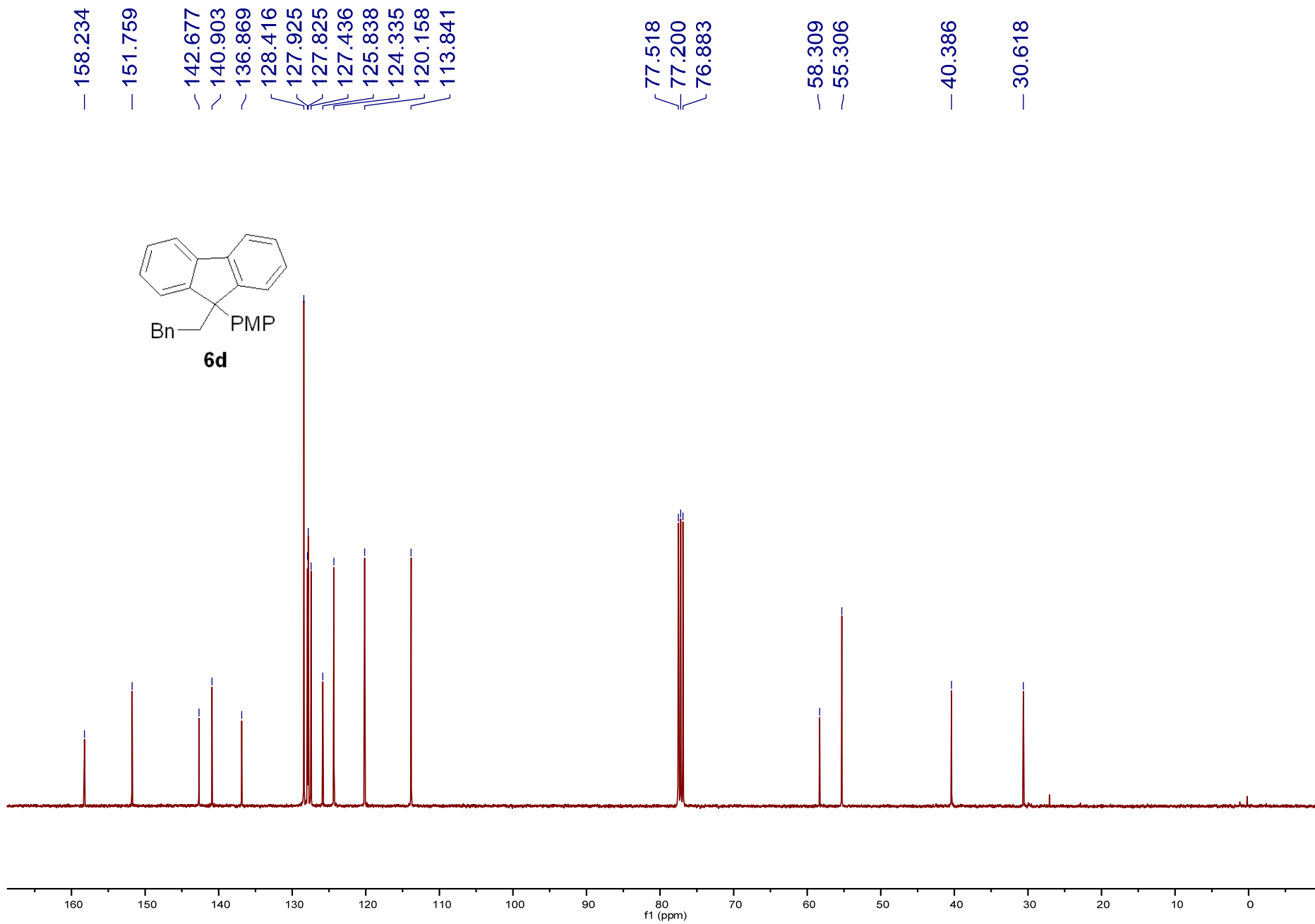


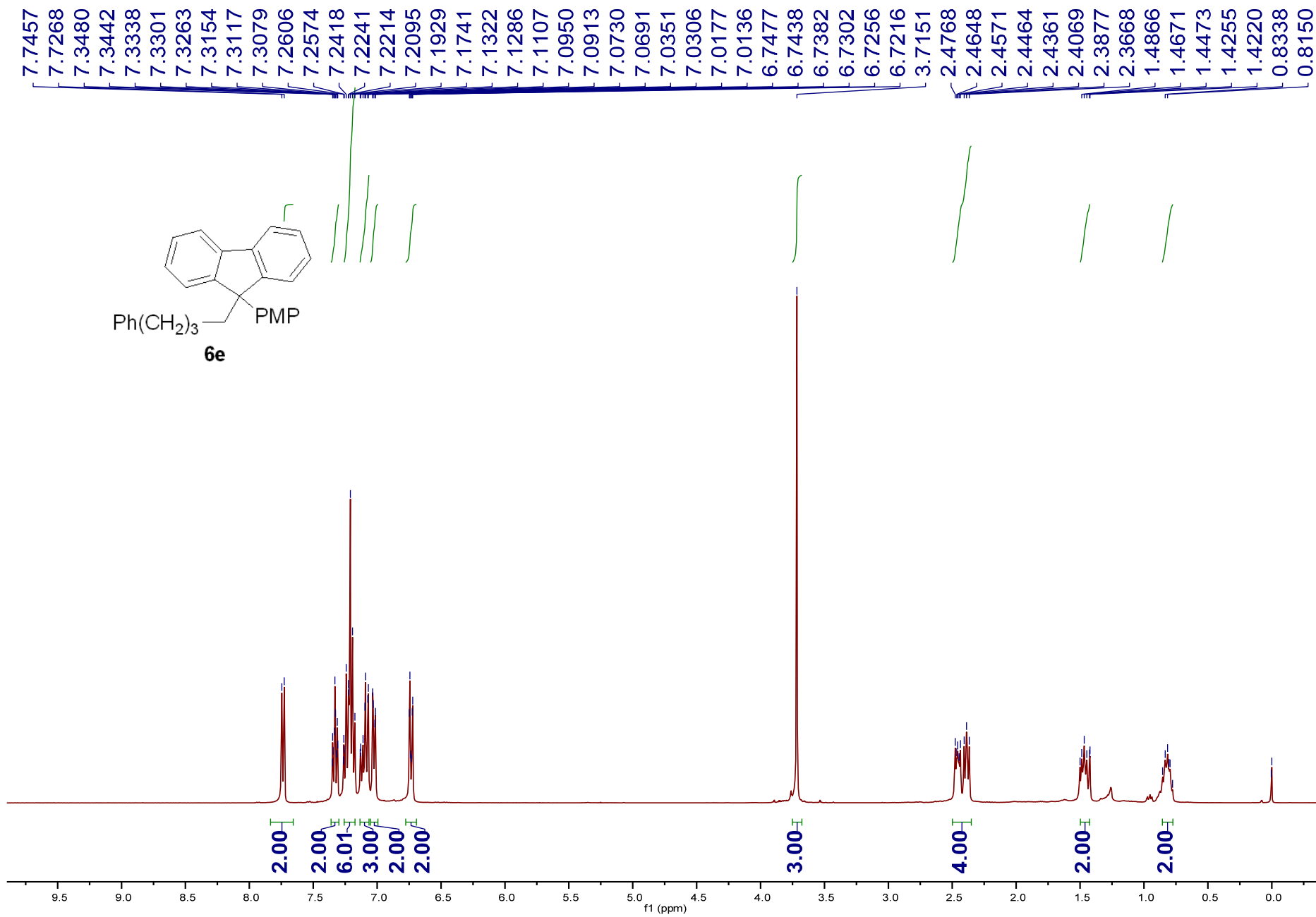


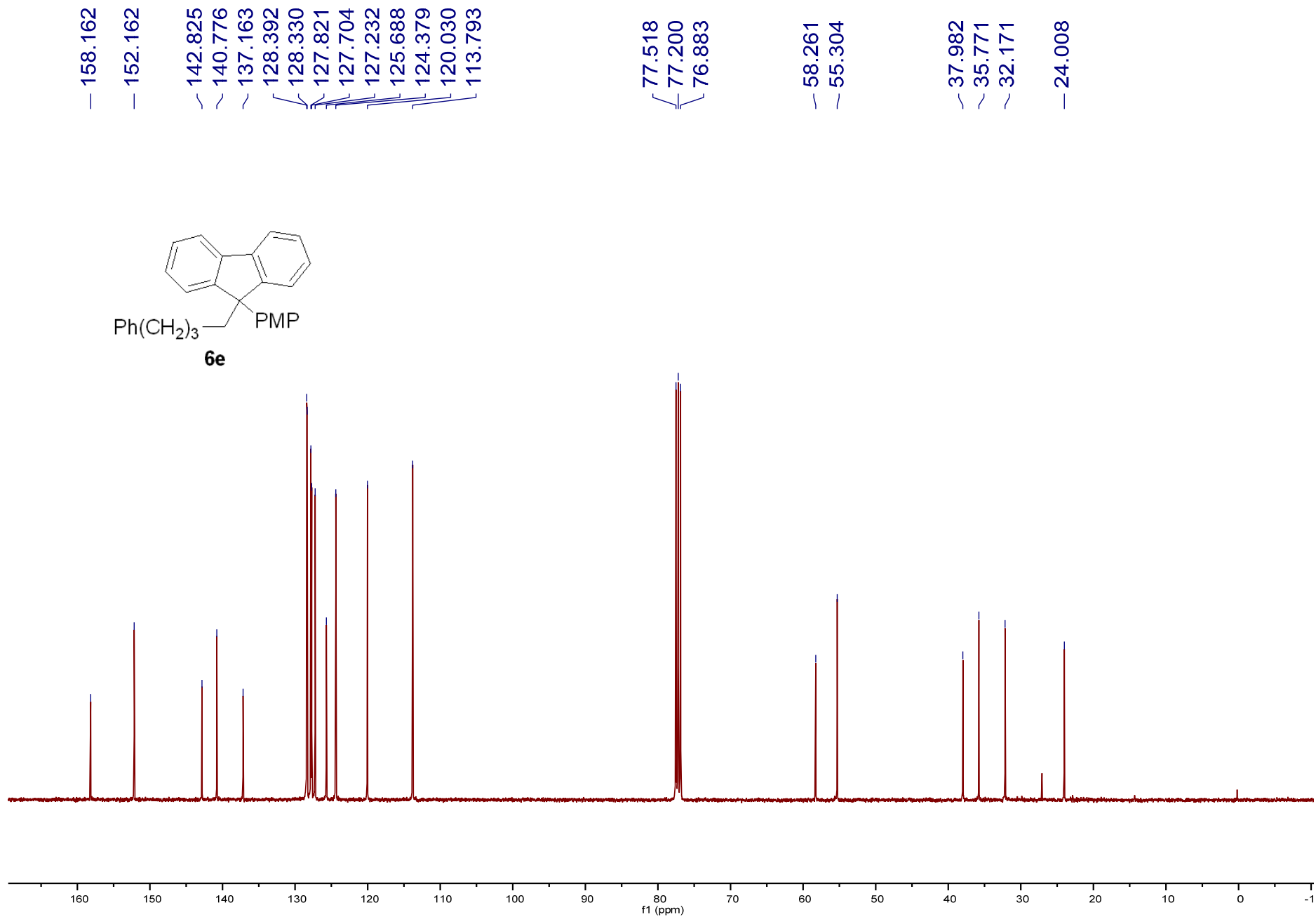
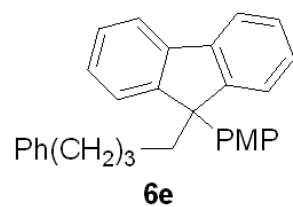


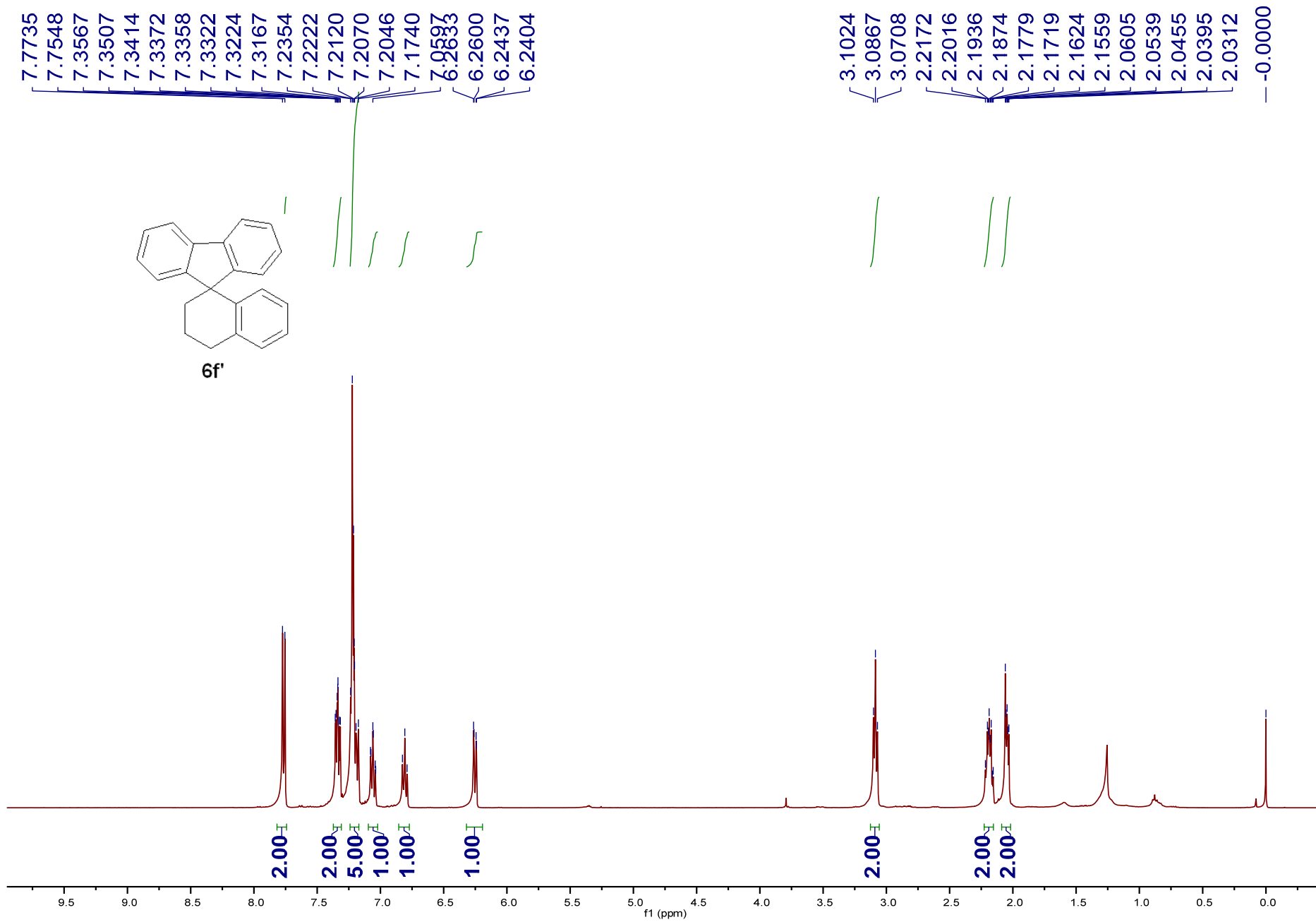


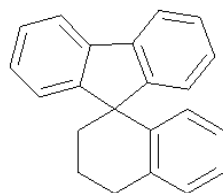




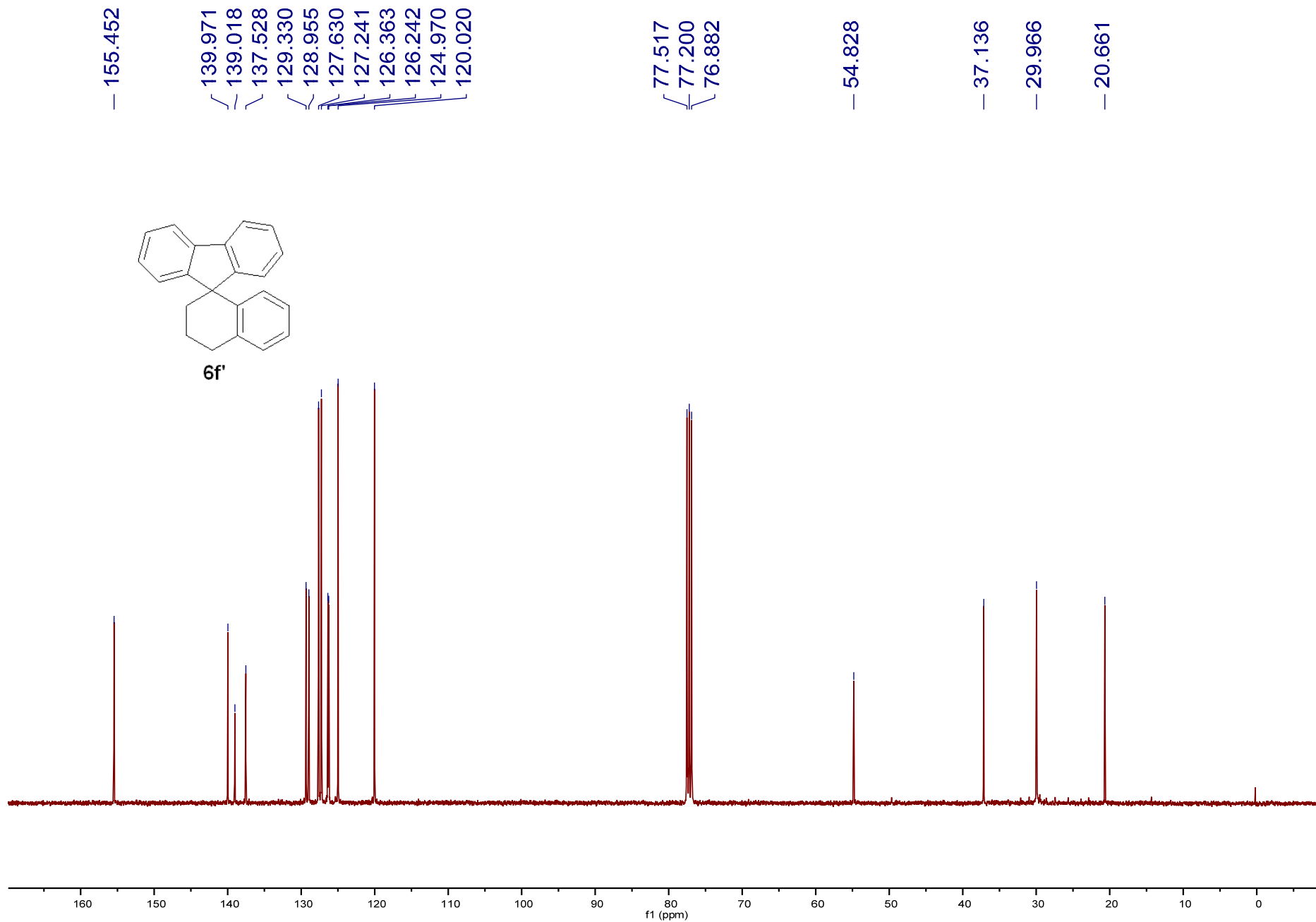


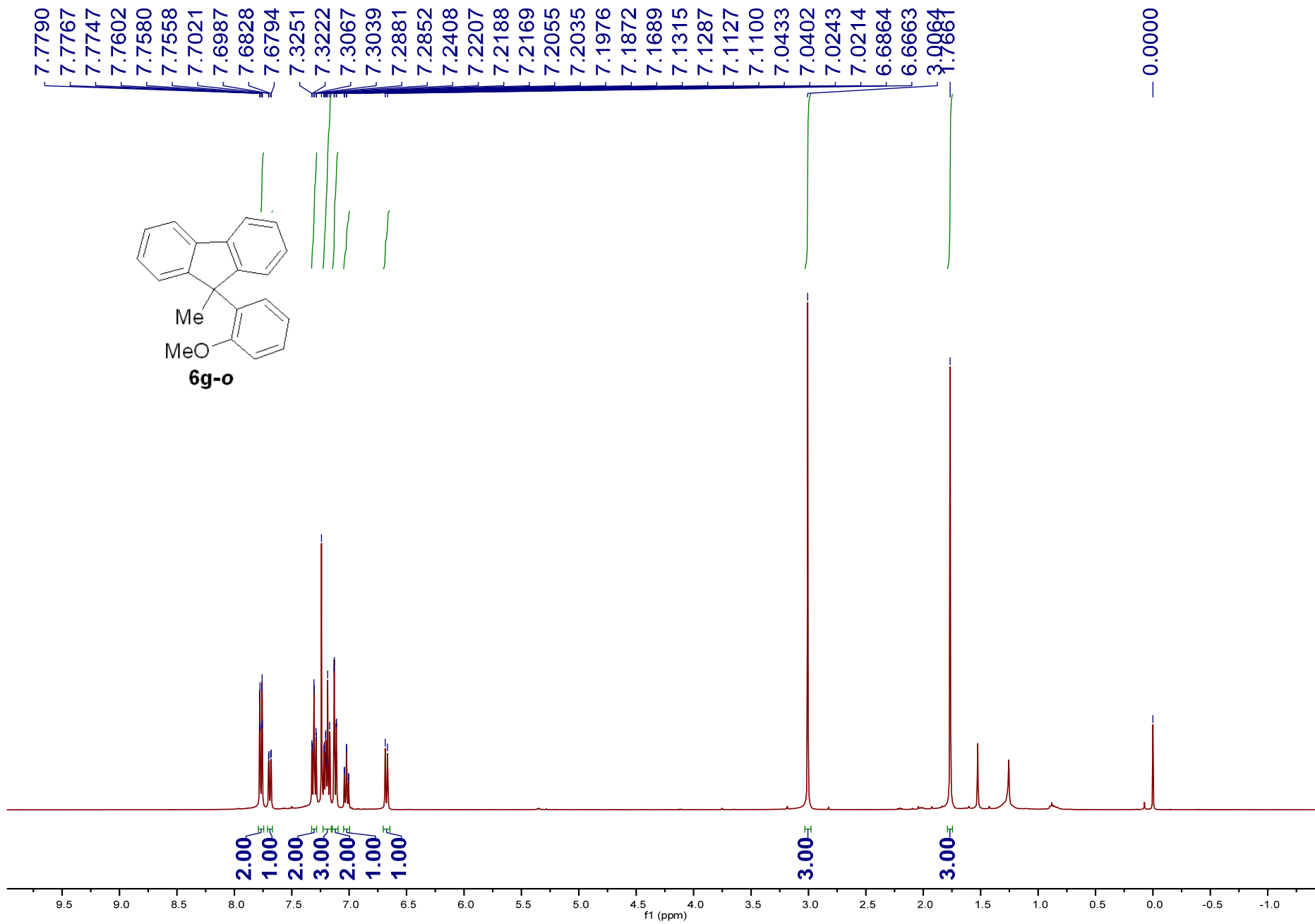


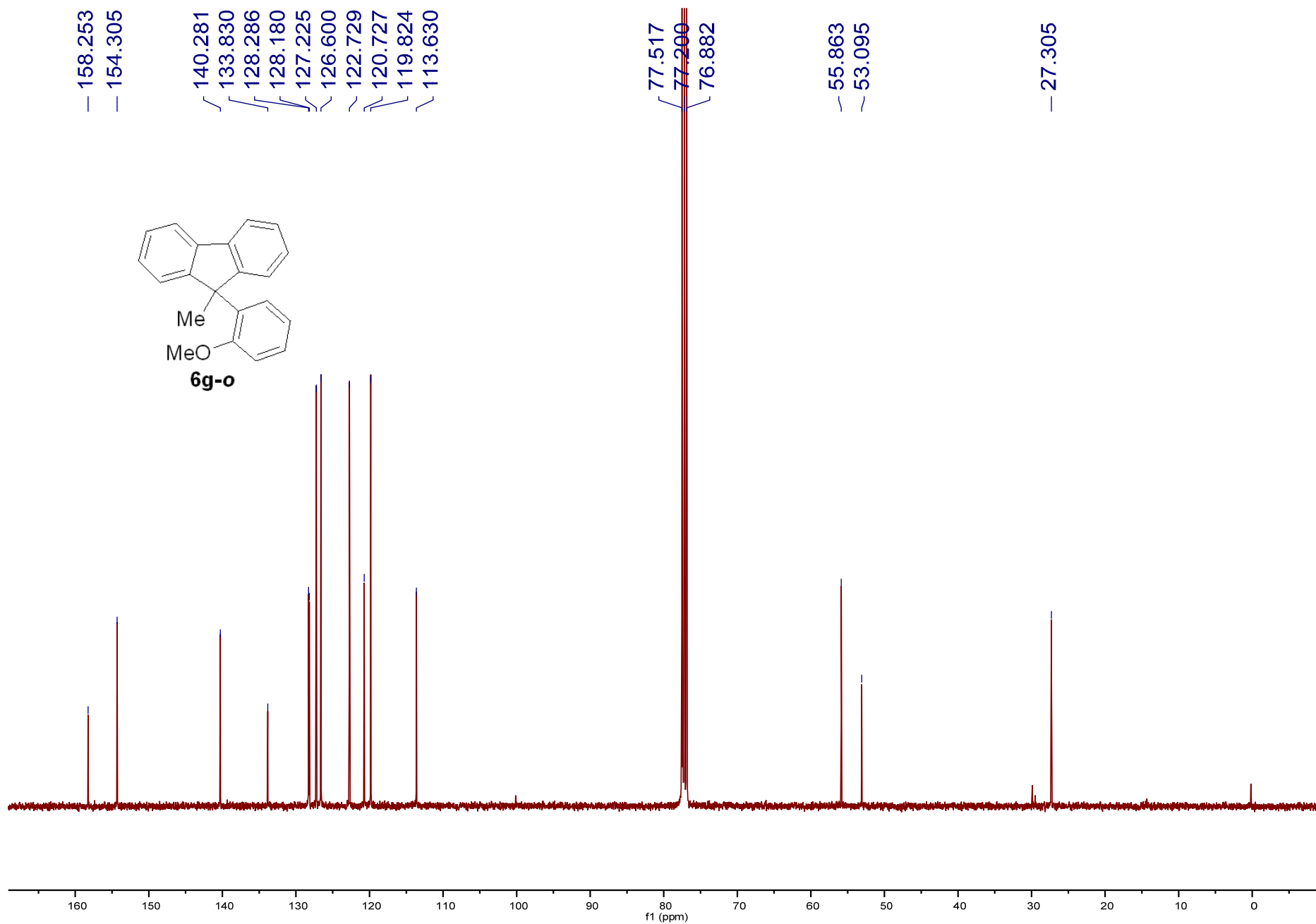
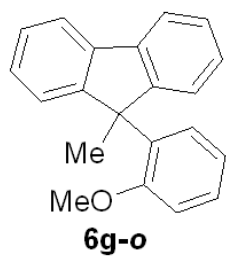


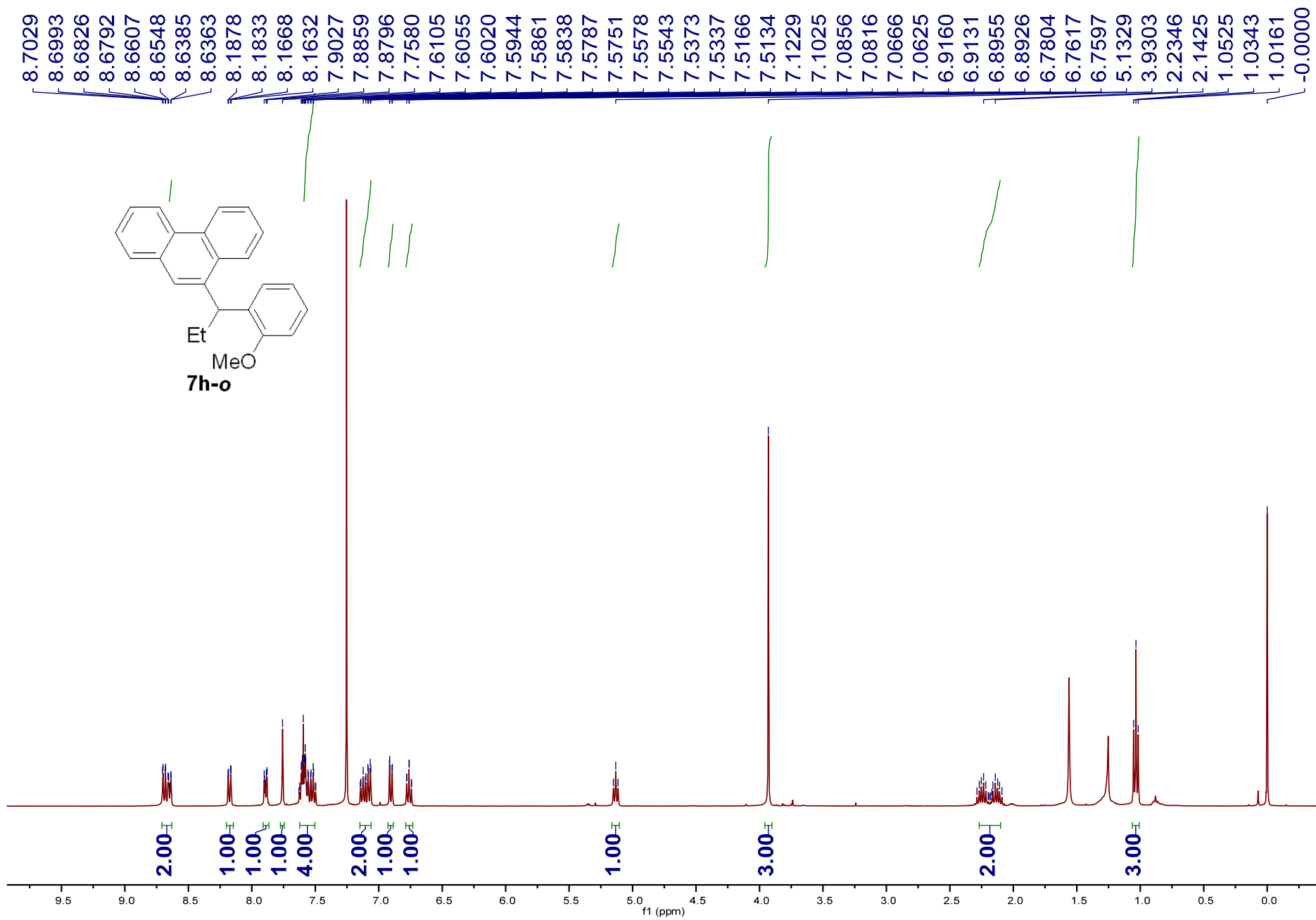


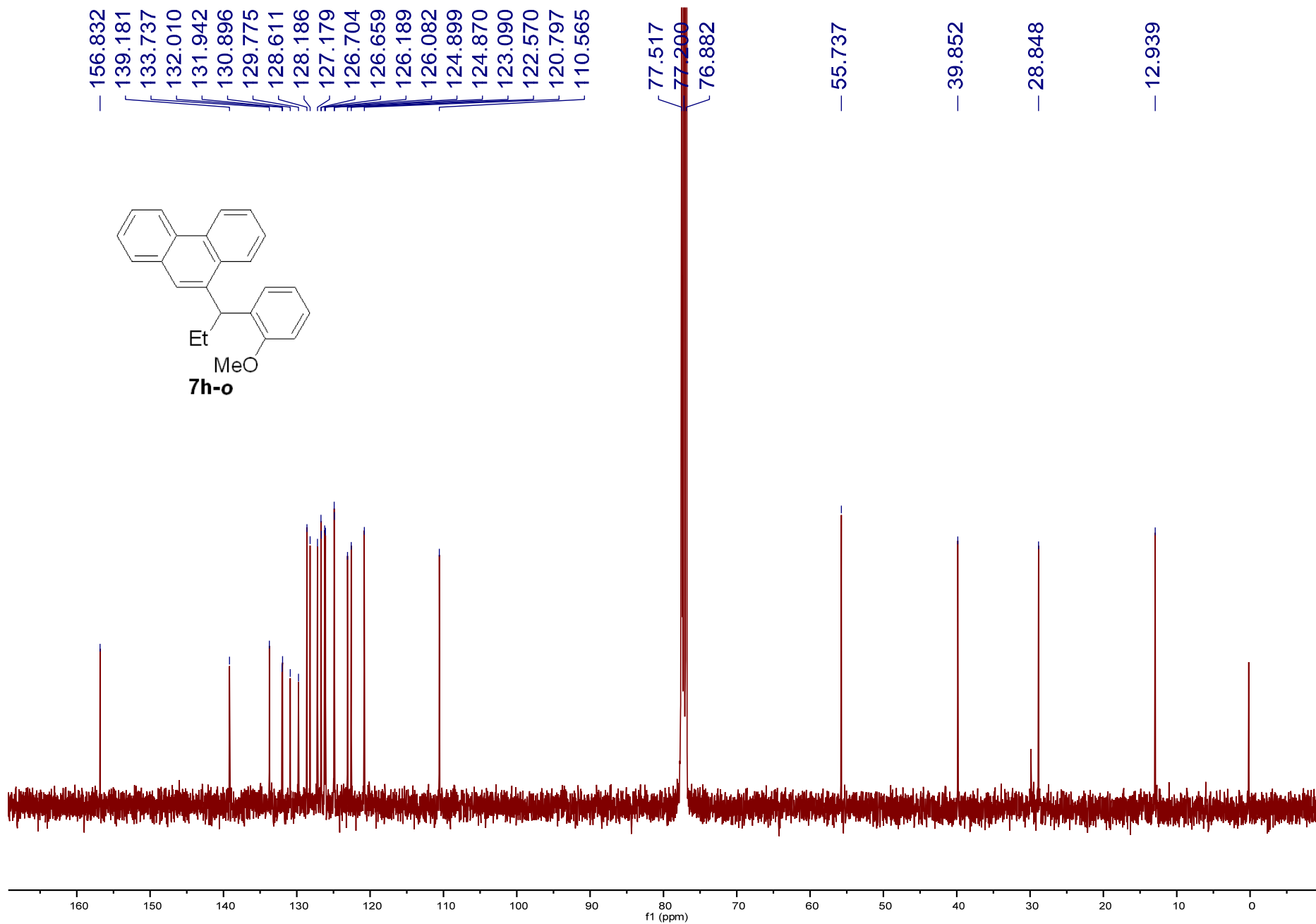
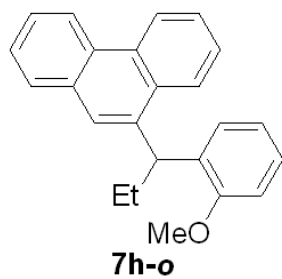
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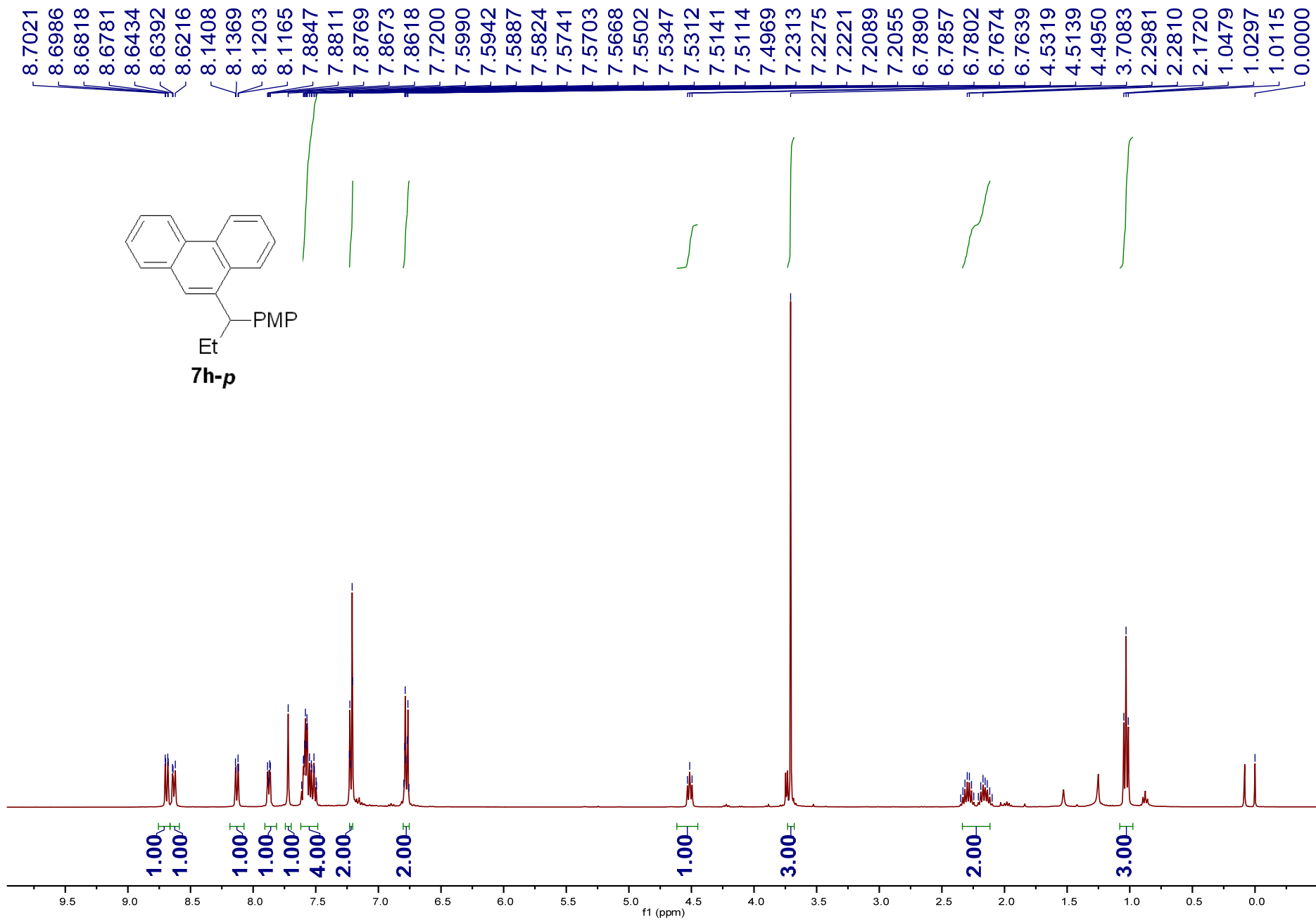


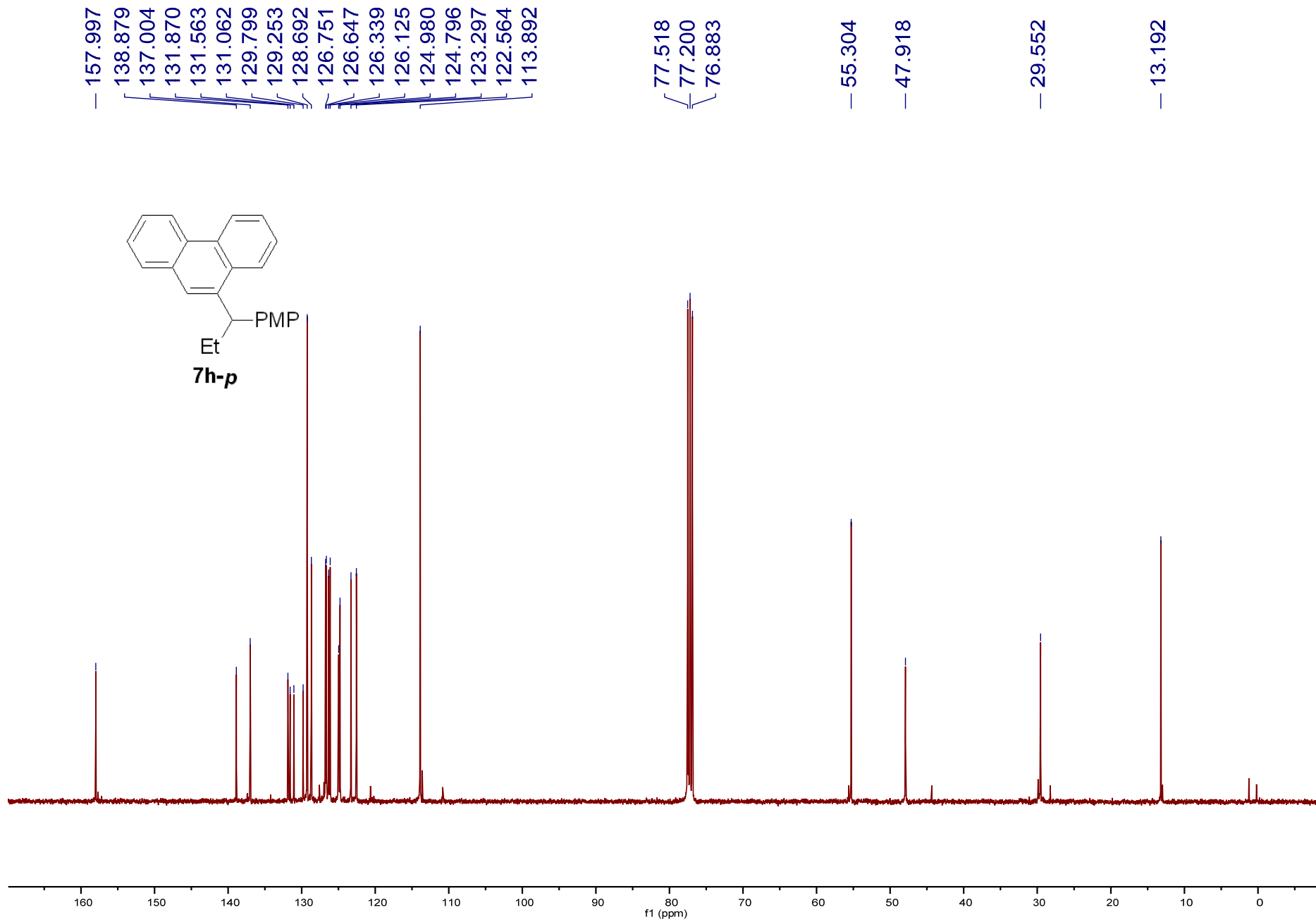


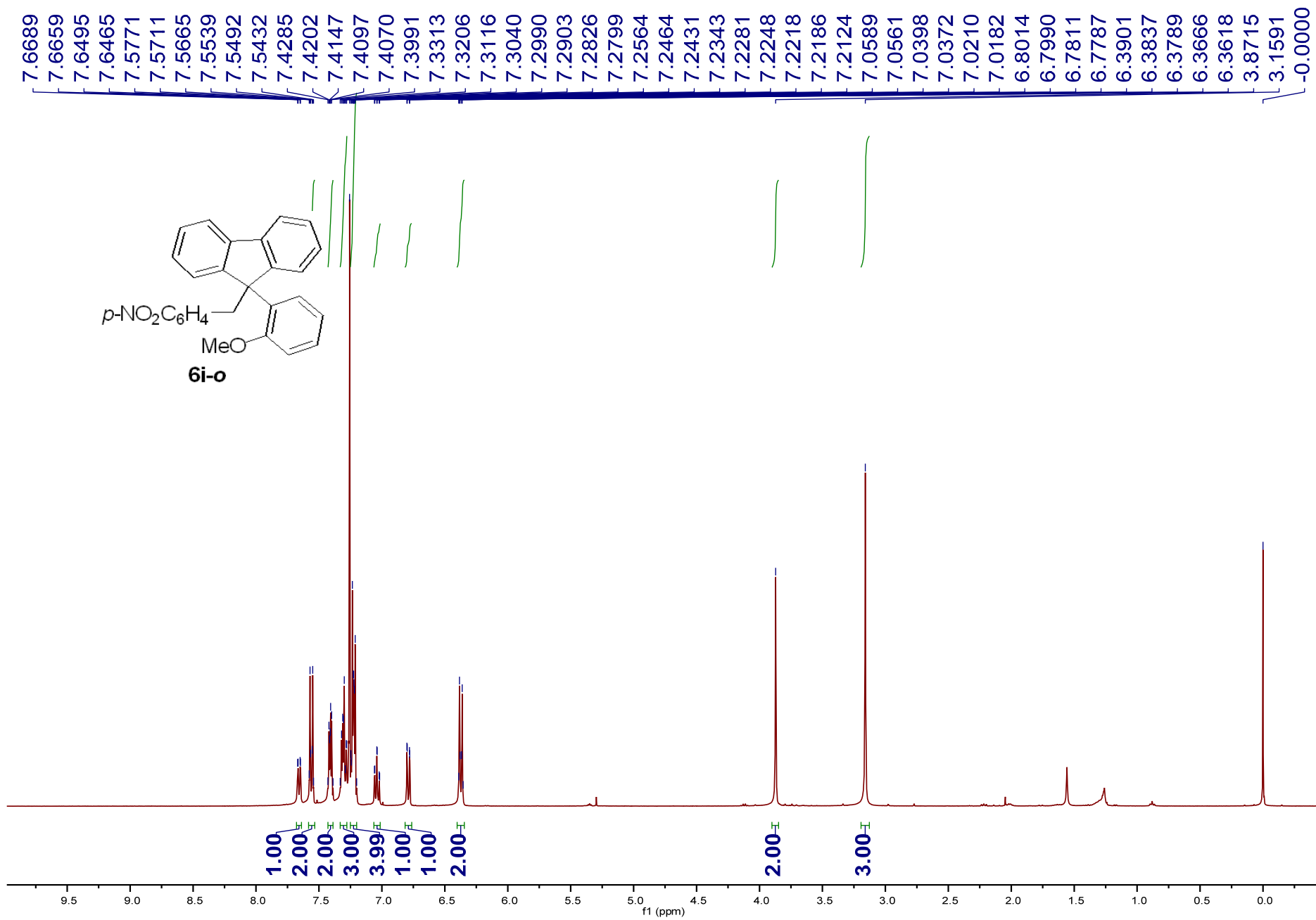


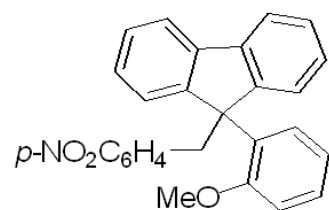




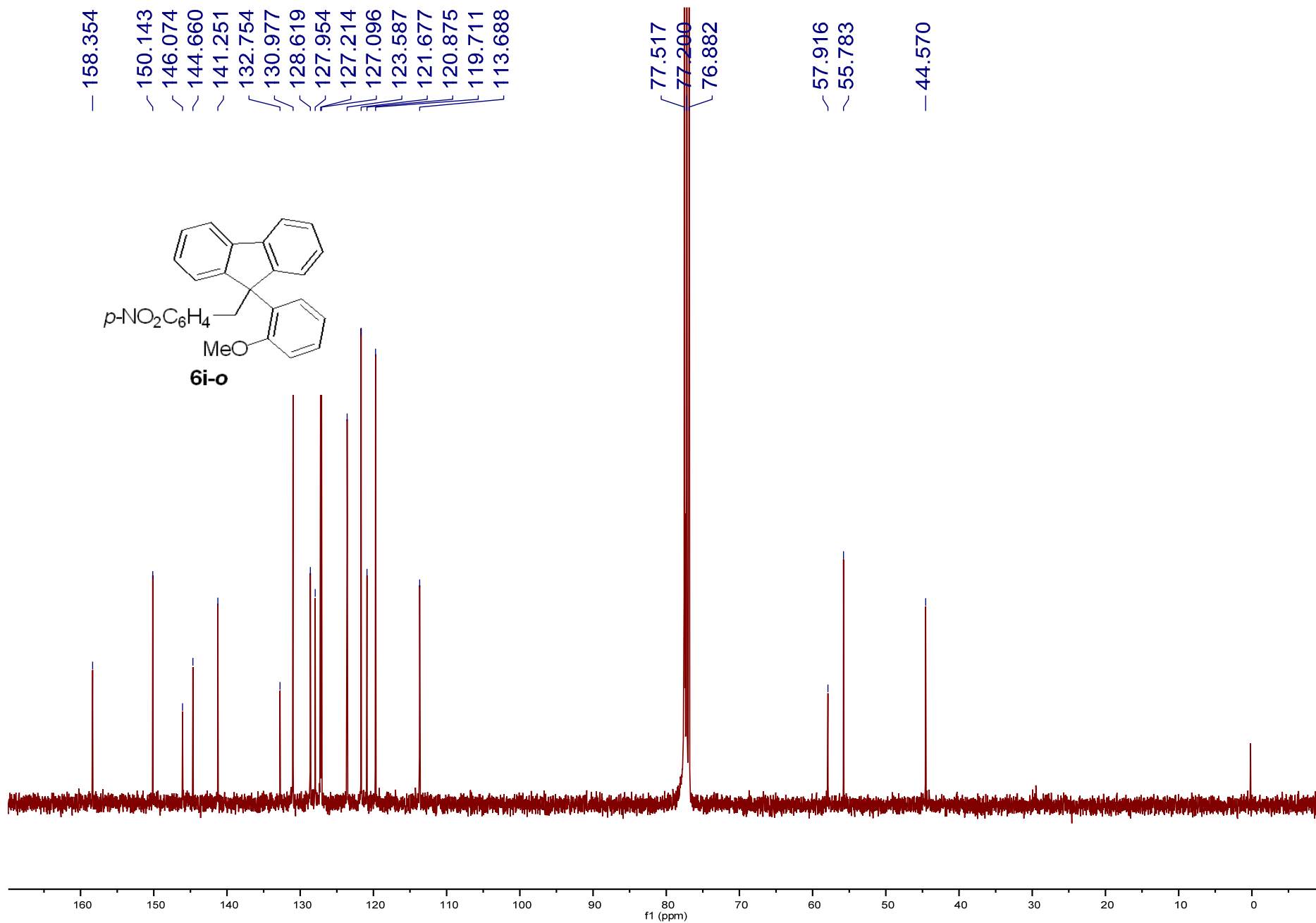


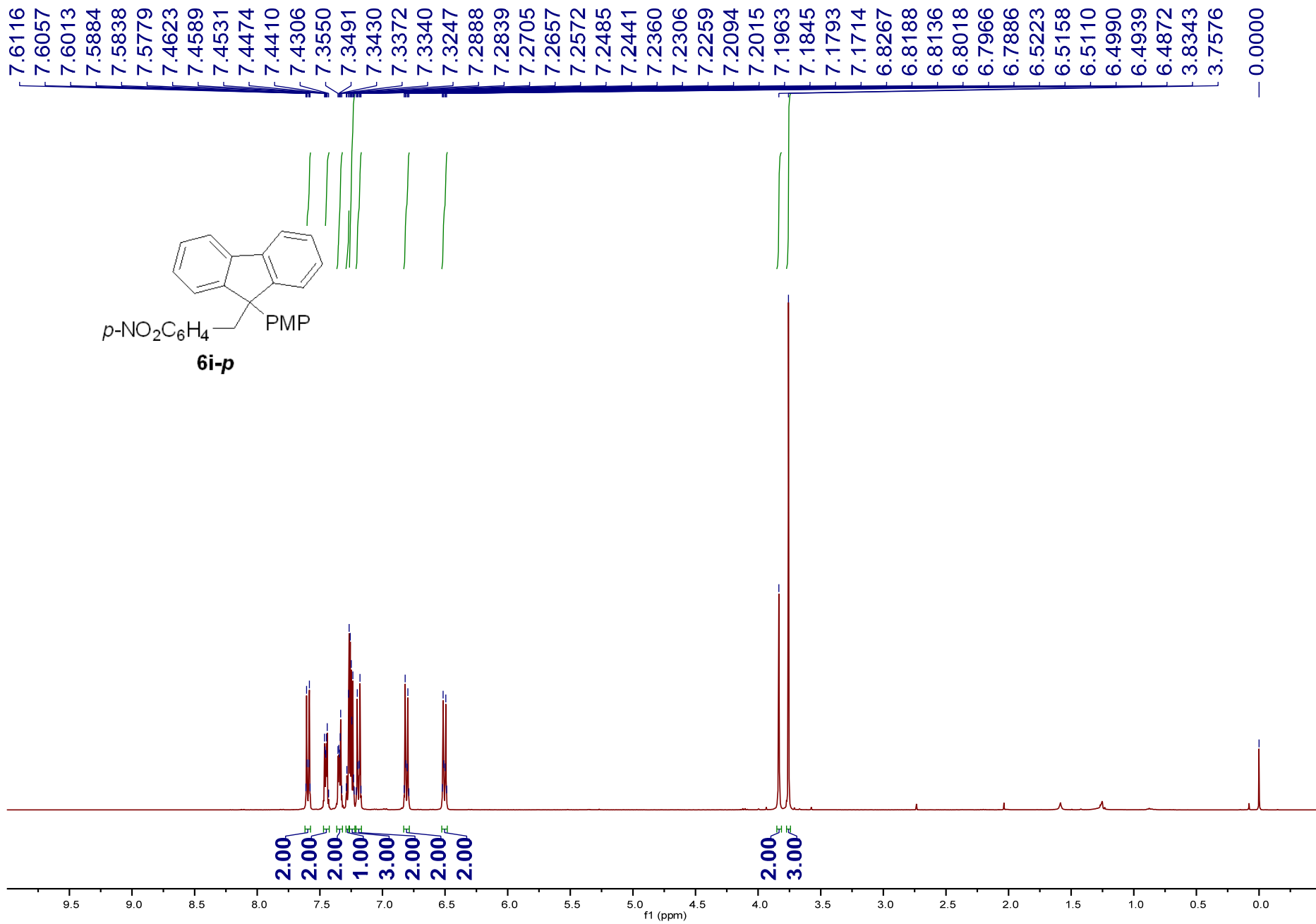


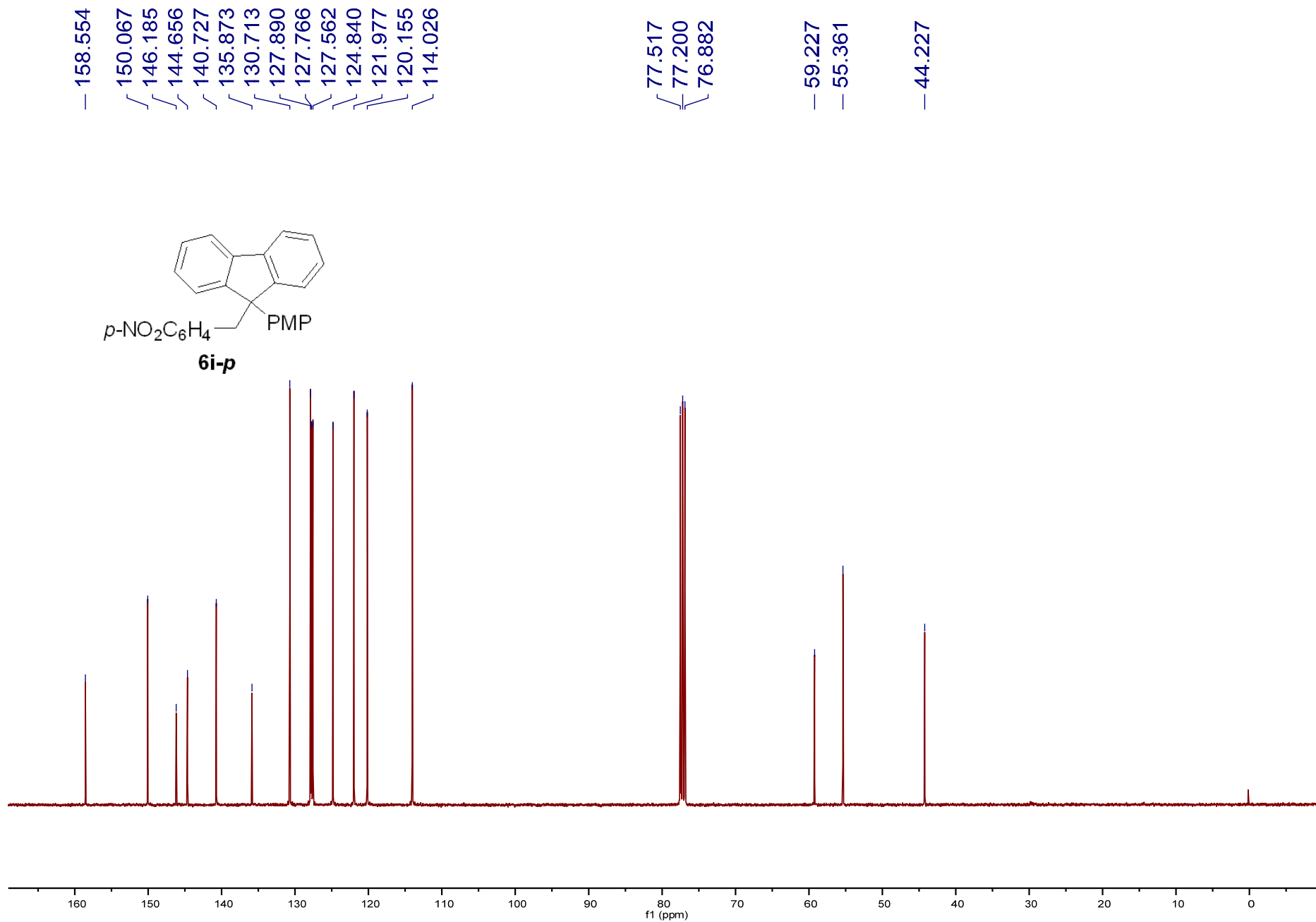
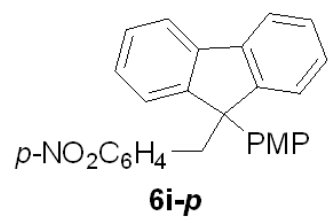


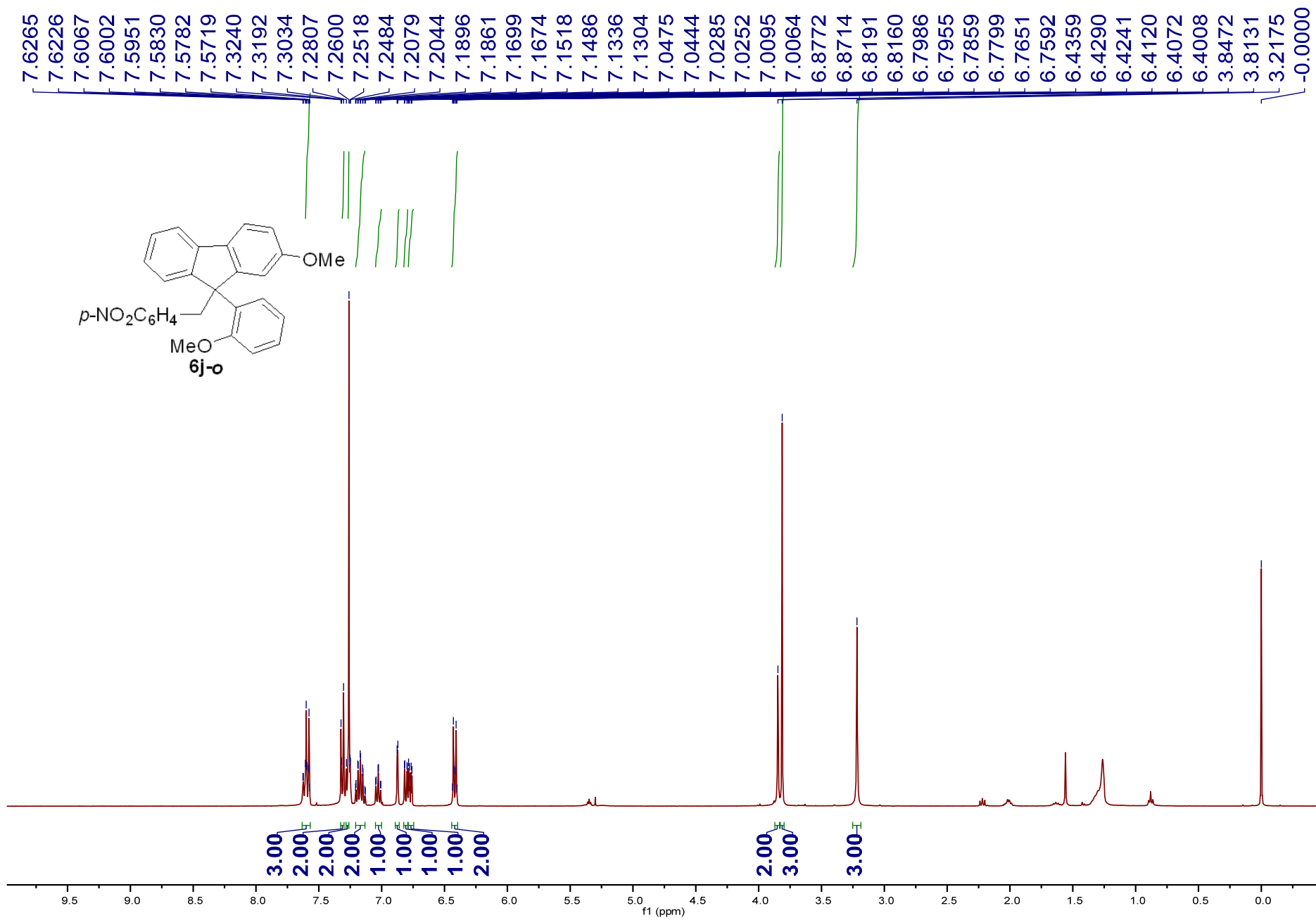


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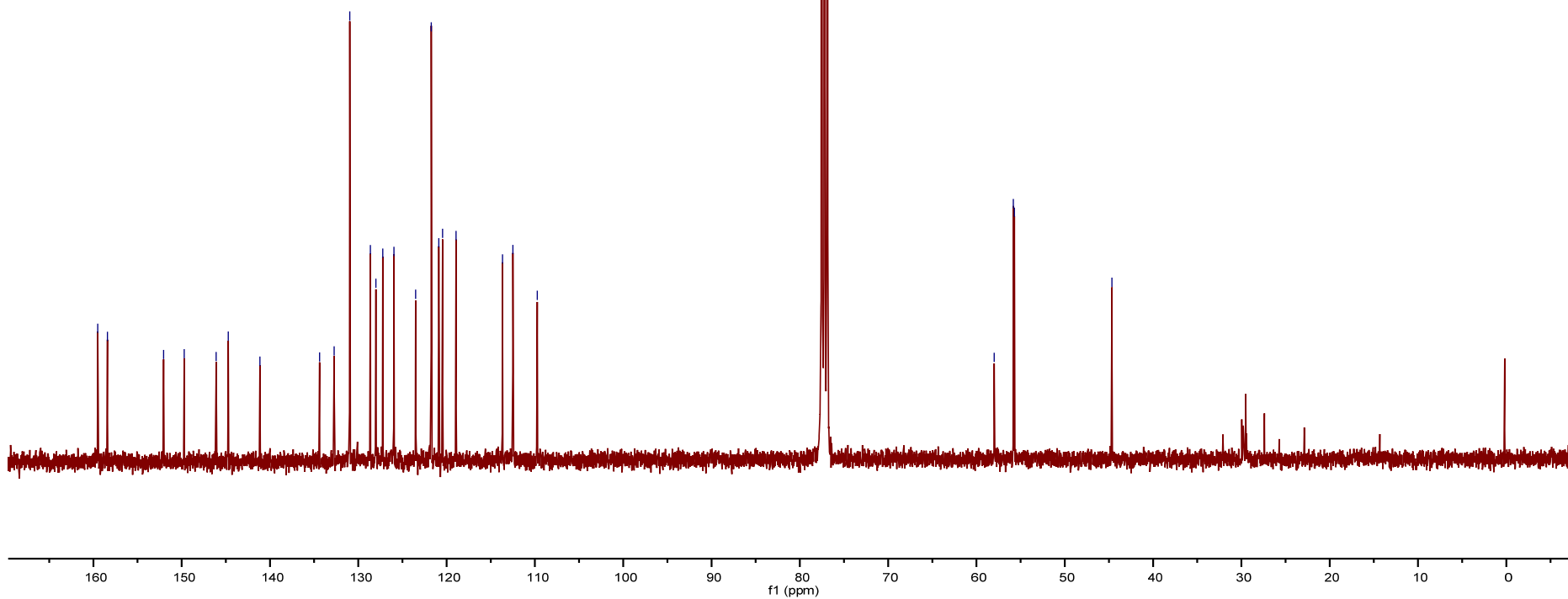
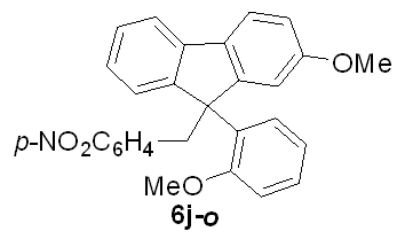


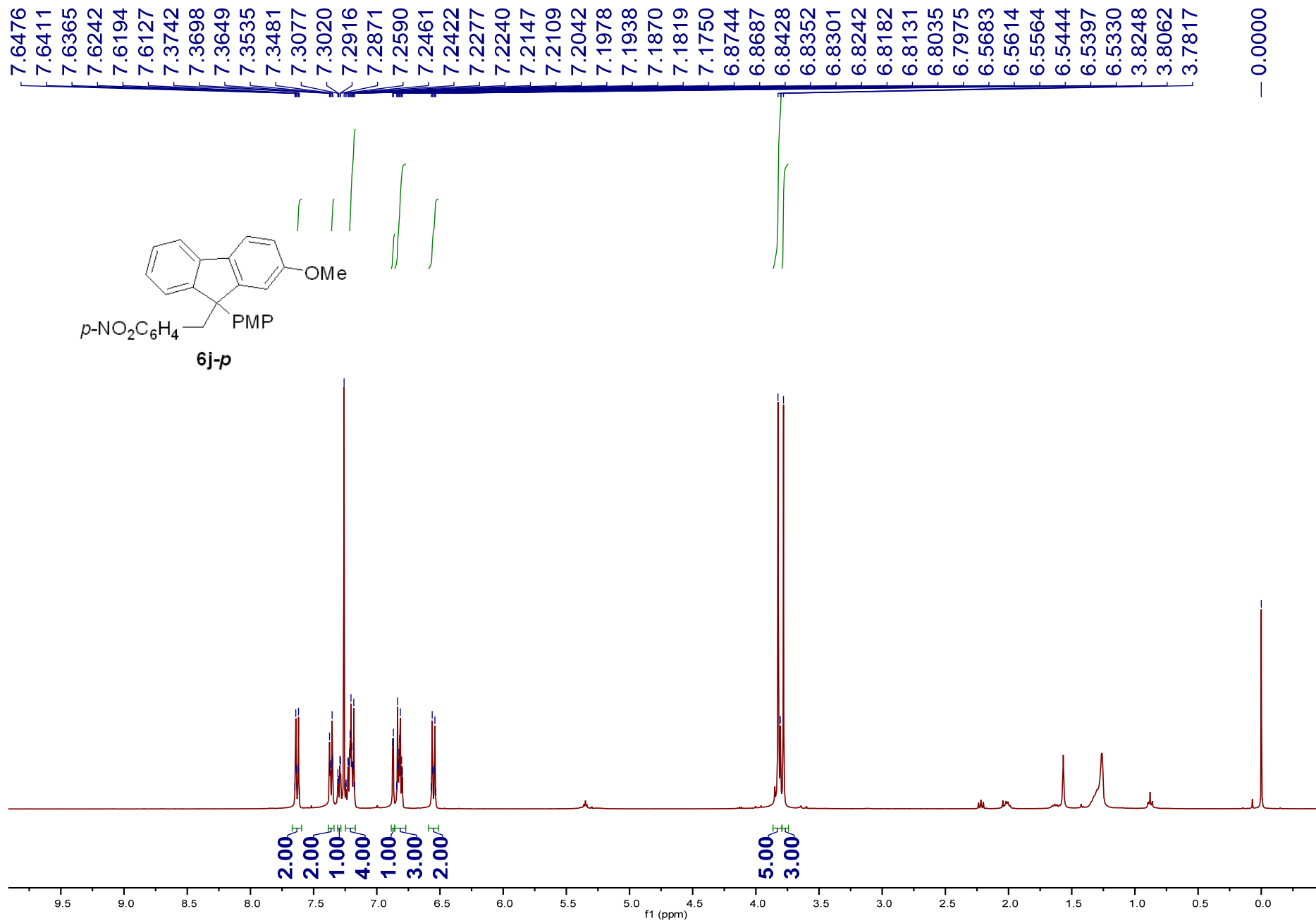
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127.223
125.969
123.511
121.735
120.877
120.452
118.935
113.674
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109.732

77.518
77.200
76.883

57.990
55.822
55.706

— 44.662



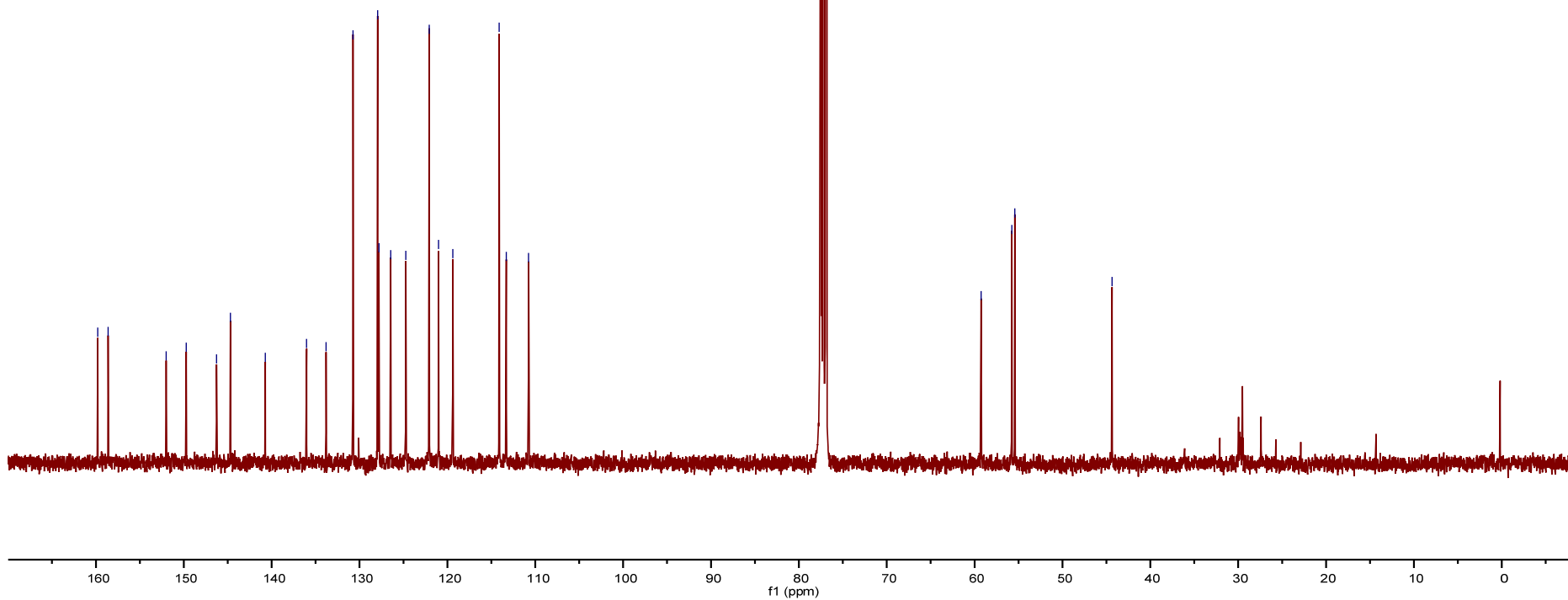
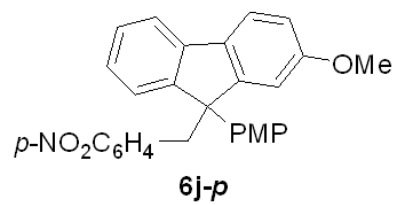


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121.003
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113.295
110.760

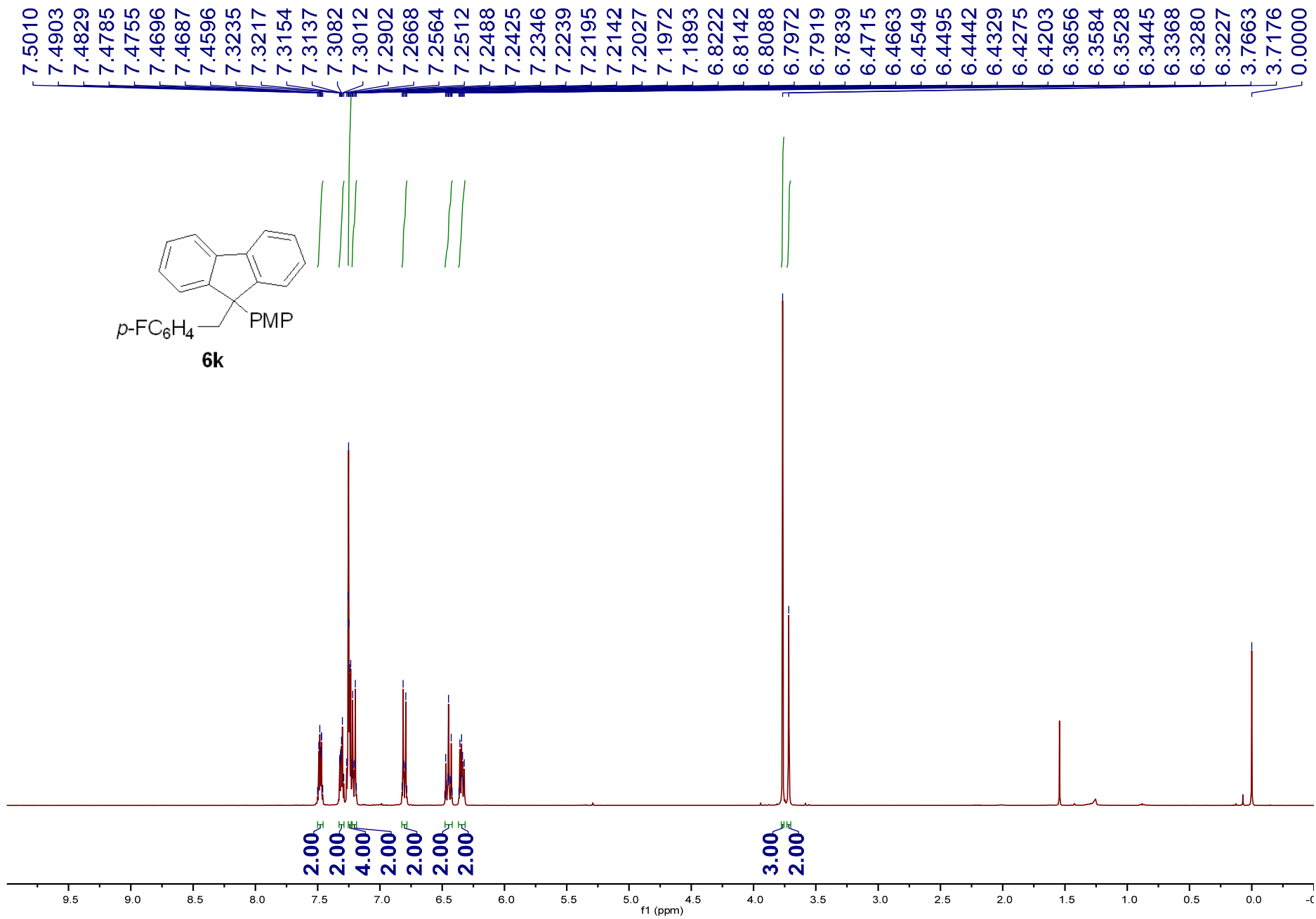
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77.200
76.882

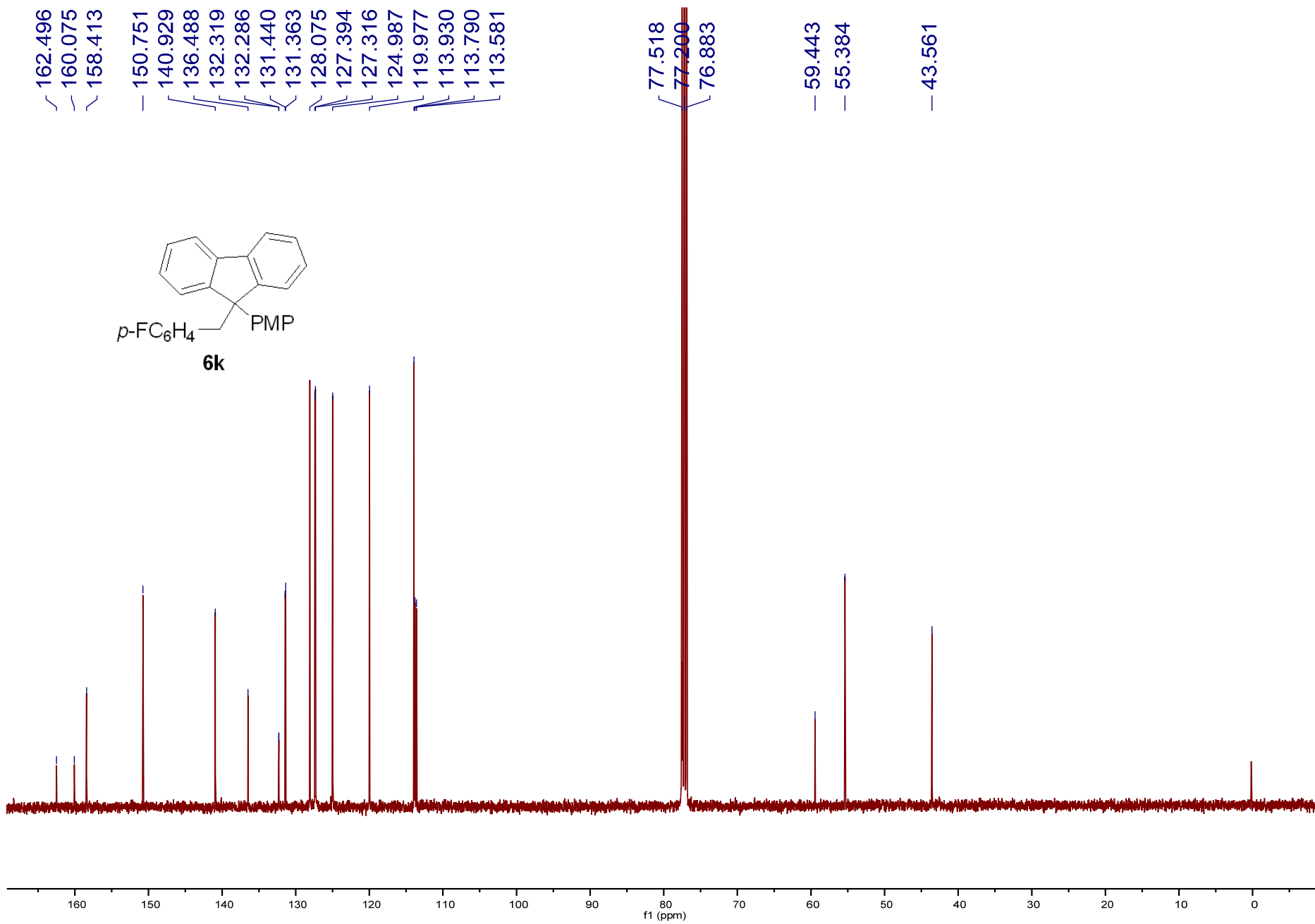
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55.425

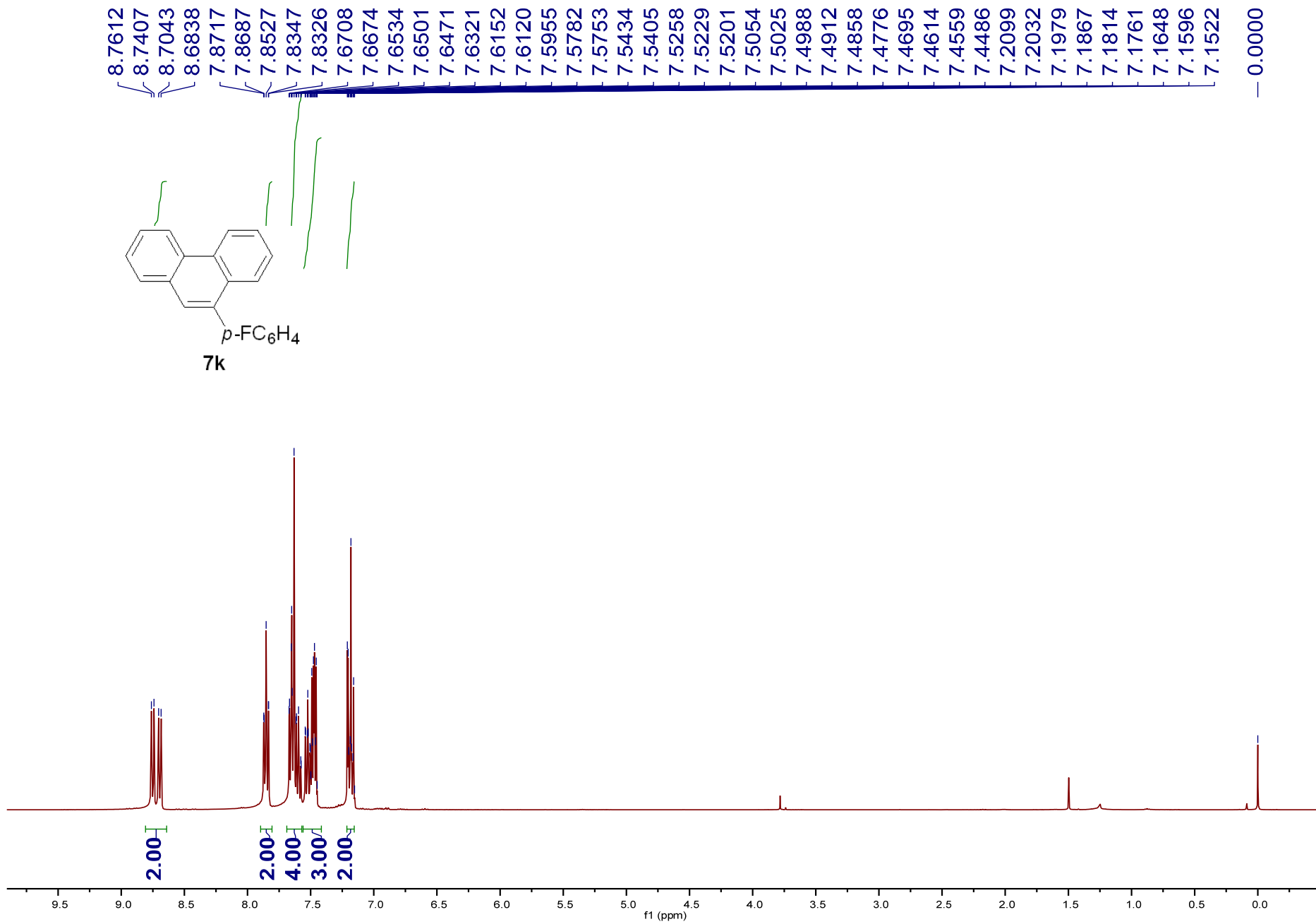
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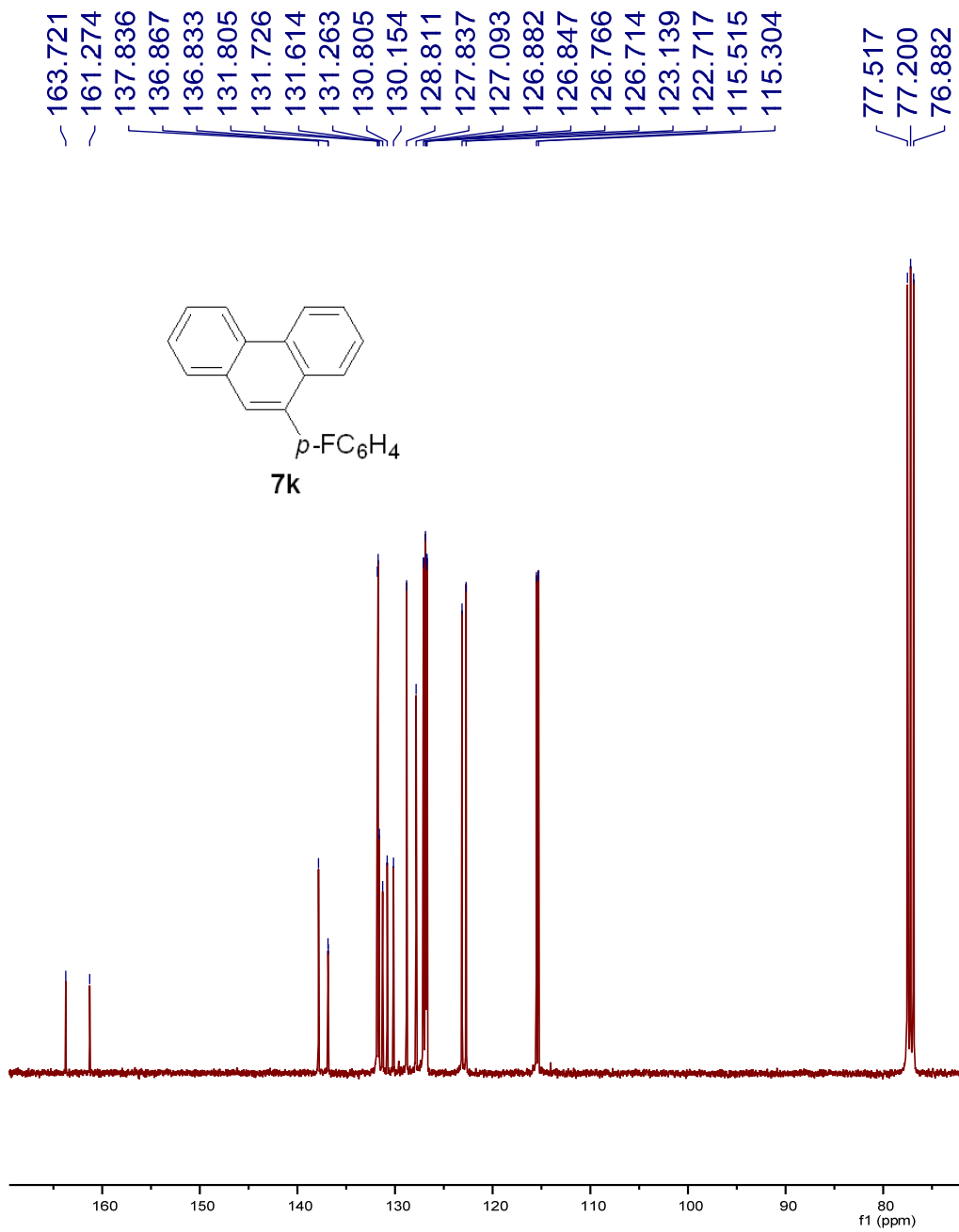


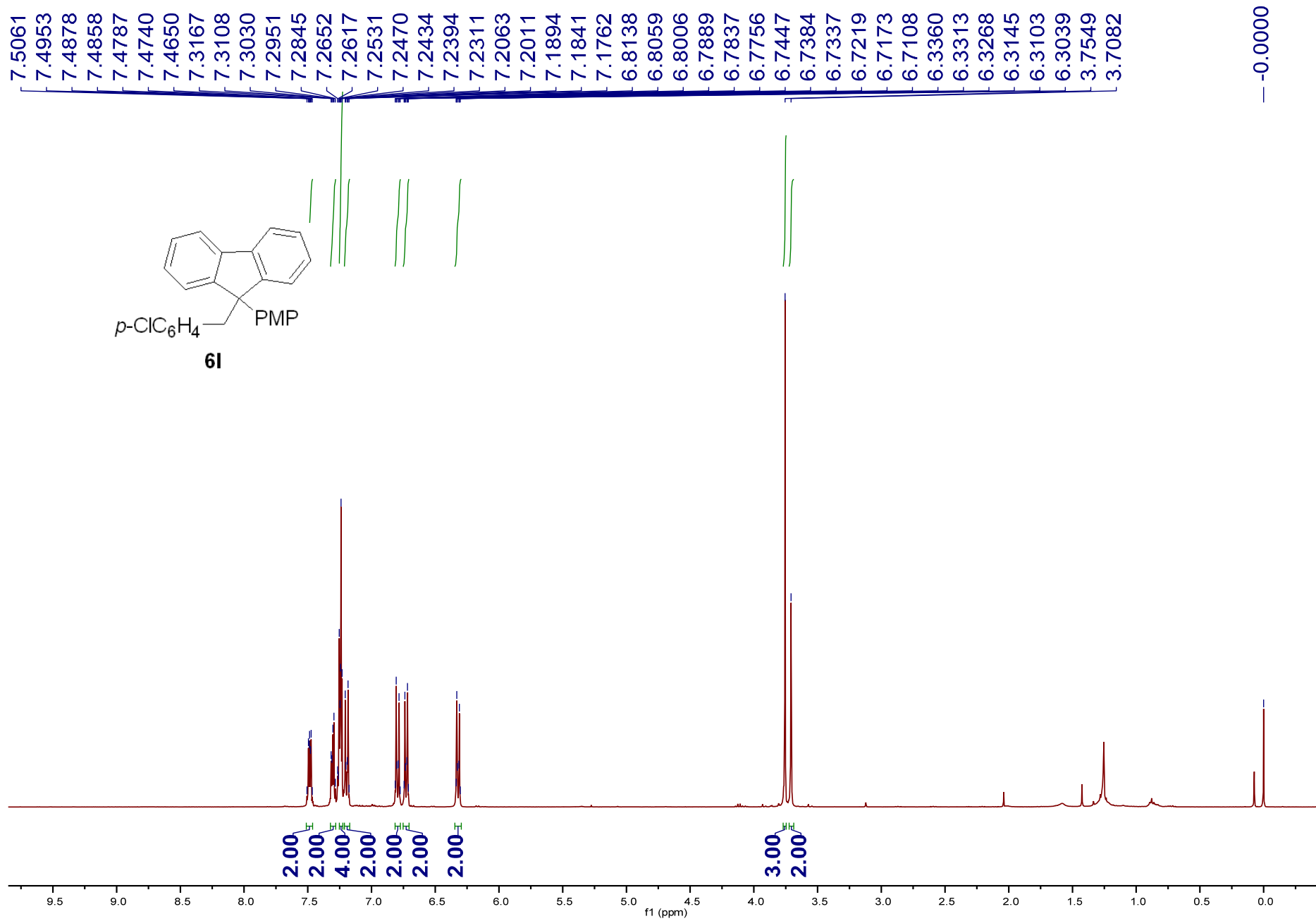
S144



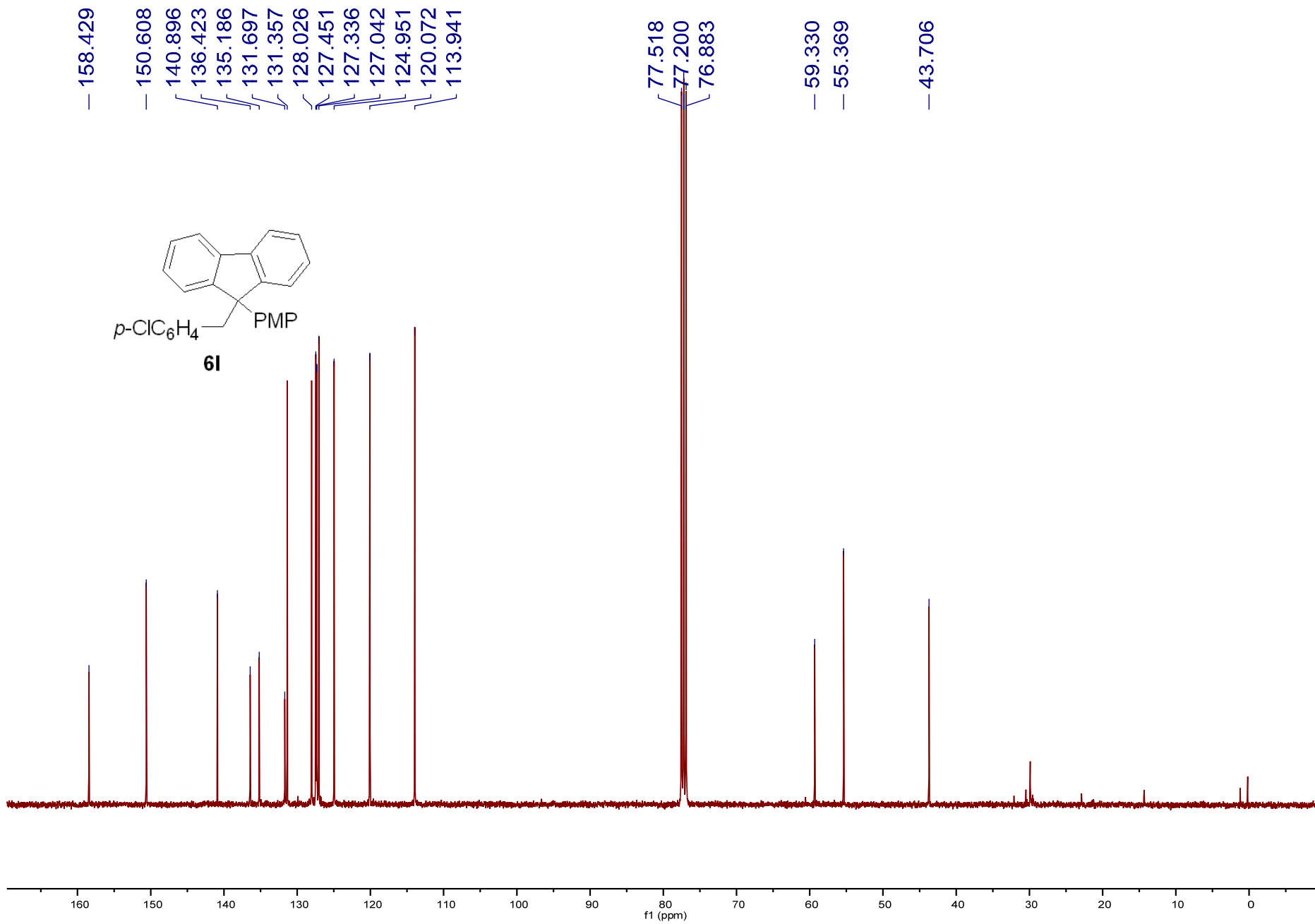


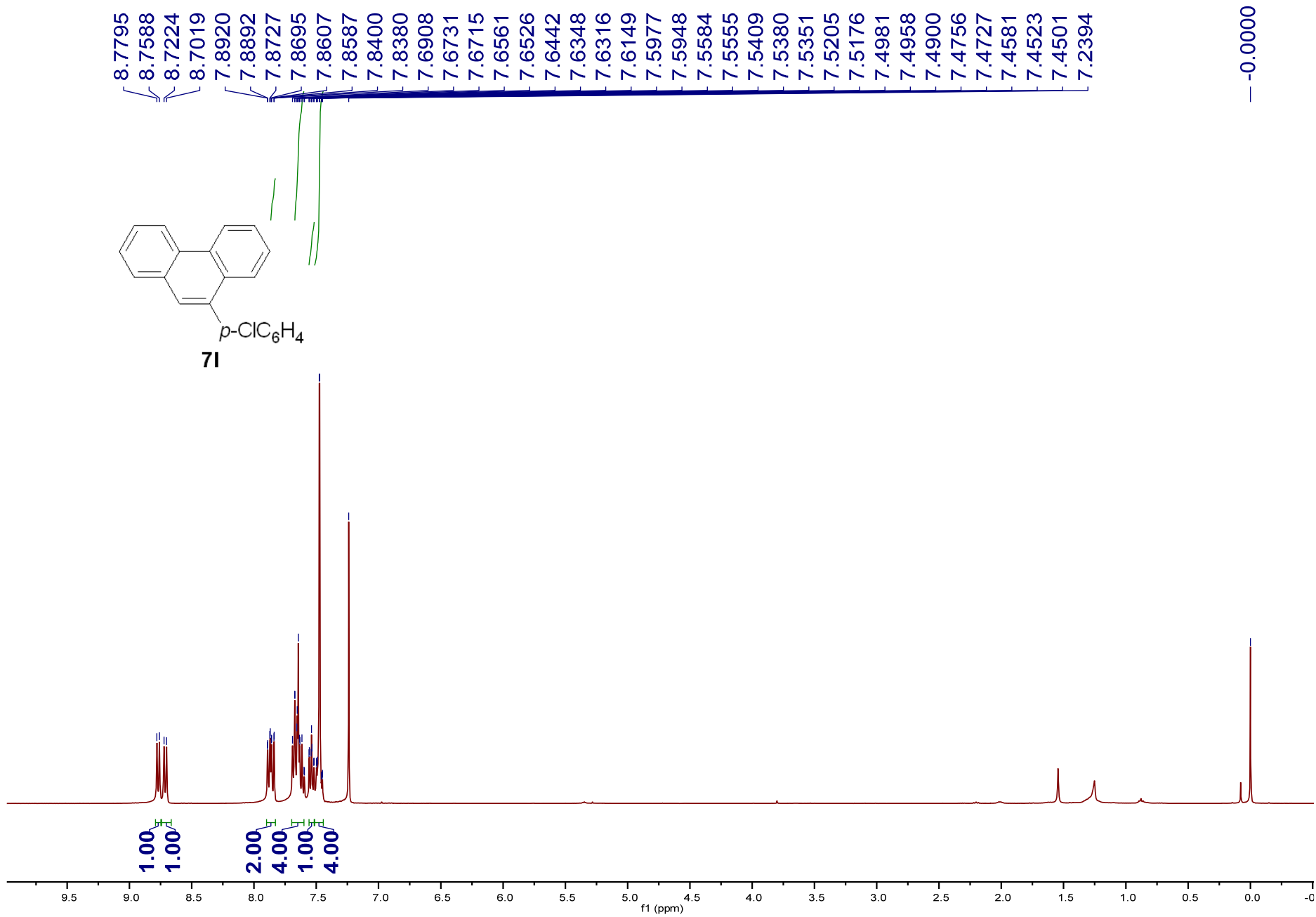


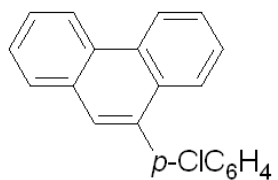




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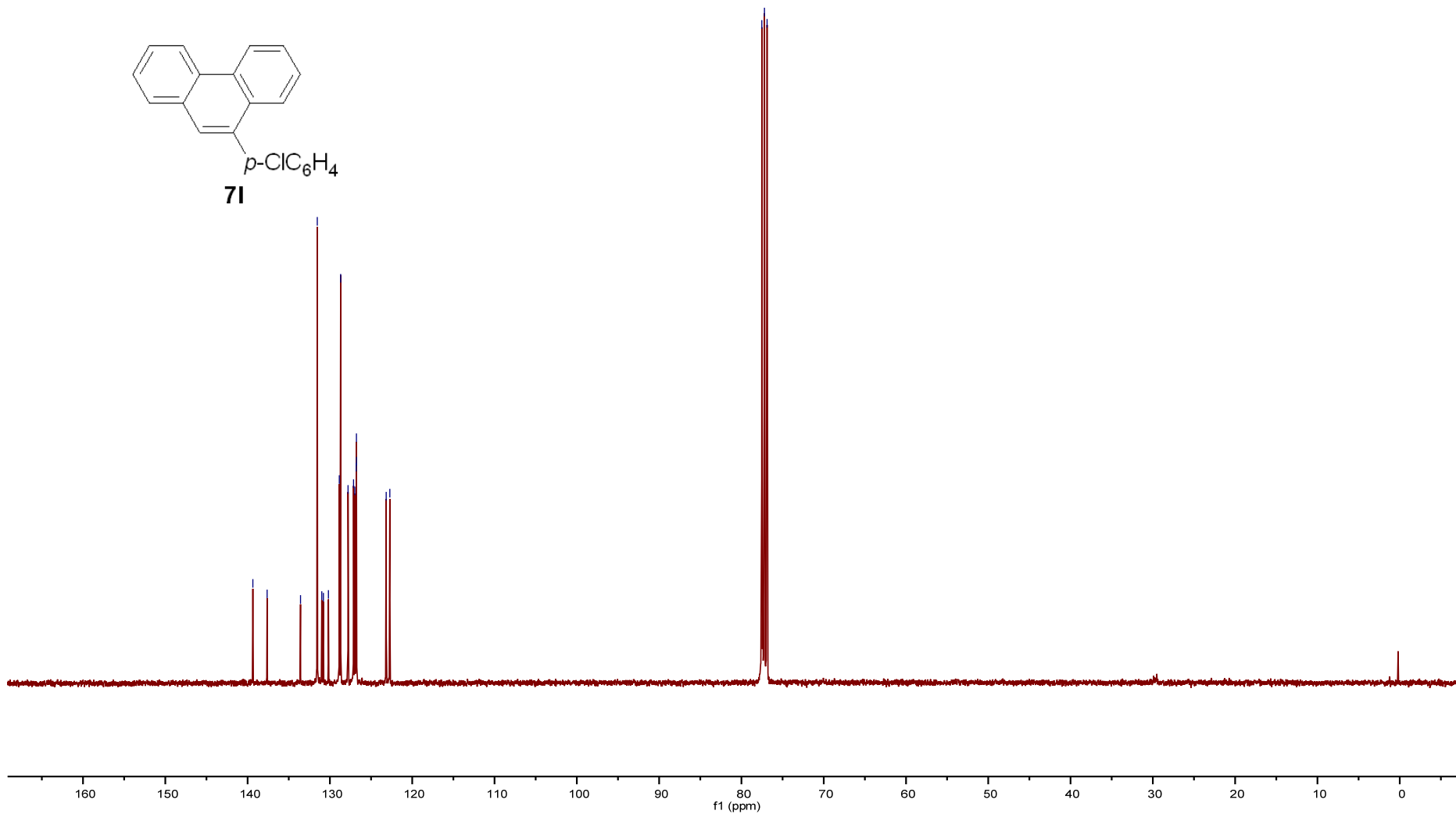




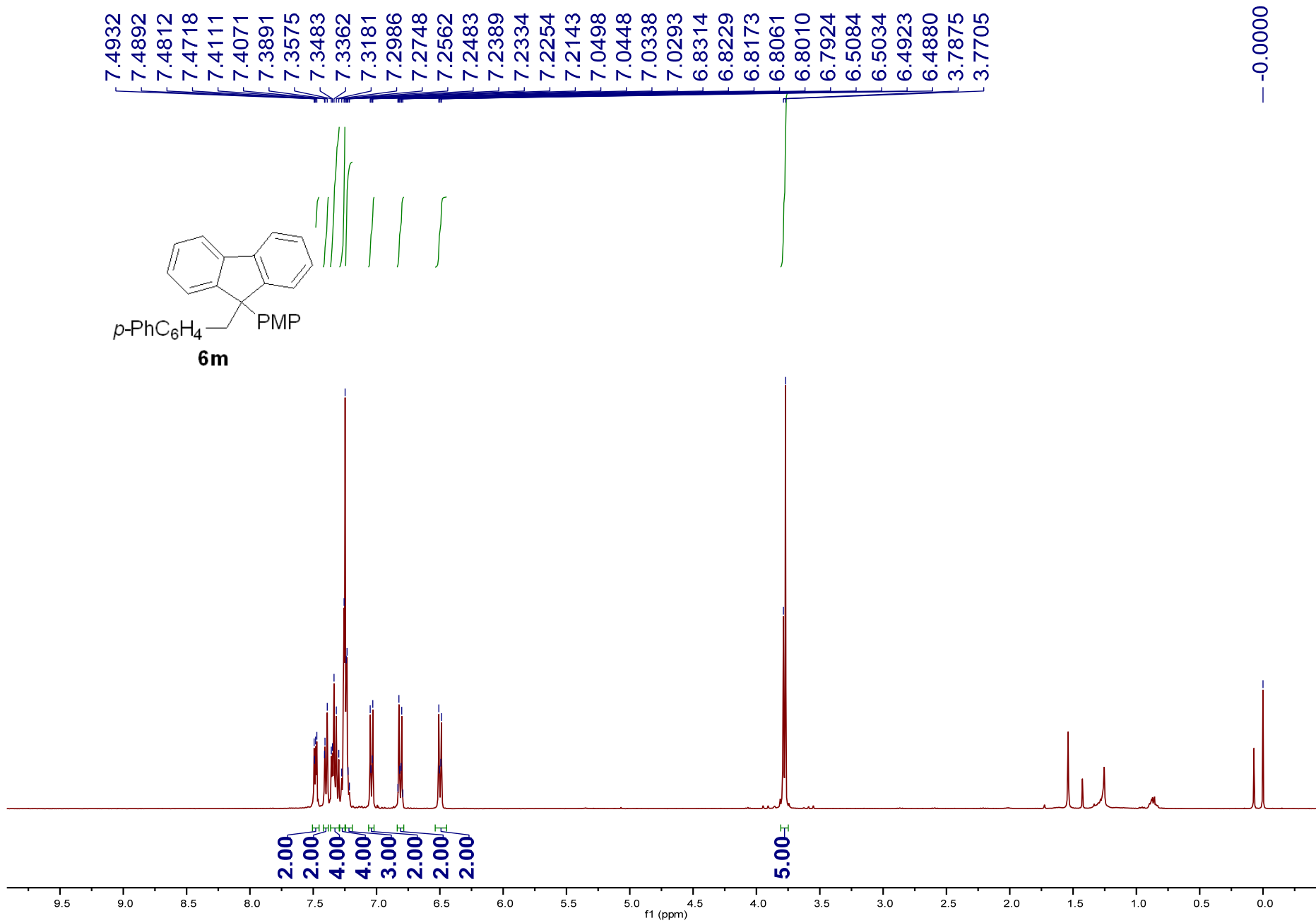
71

139.361
137.634
133.577
131.538
130.990
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122.728

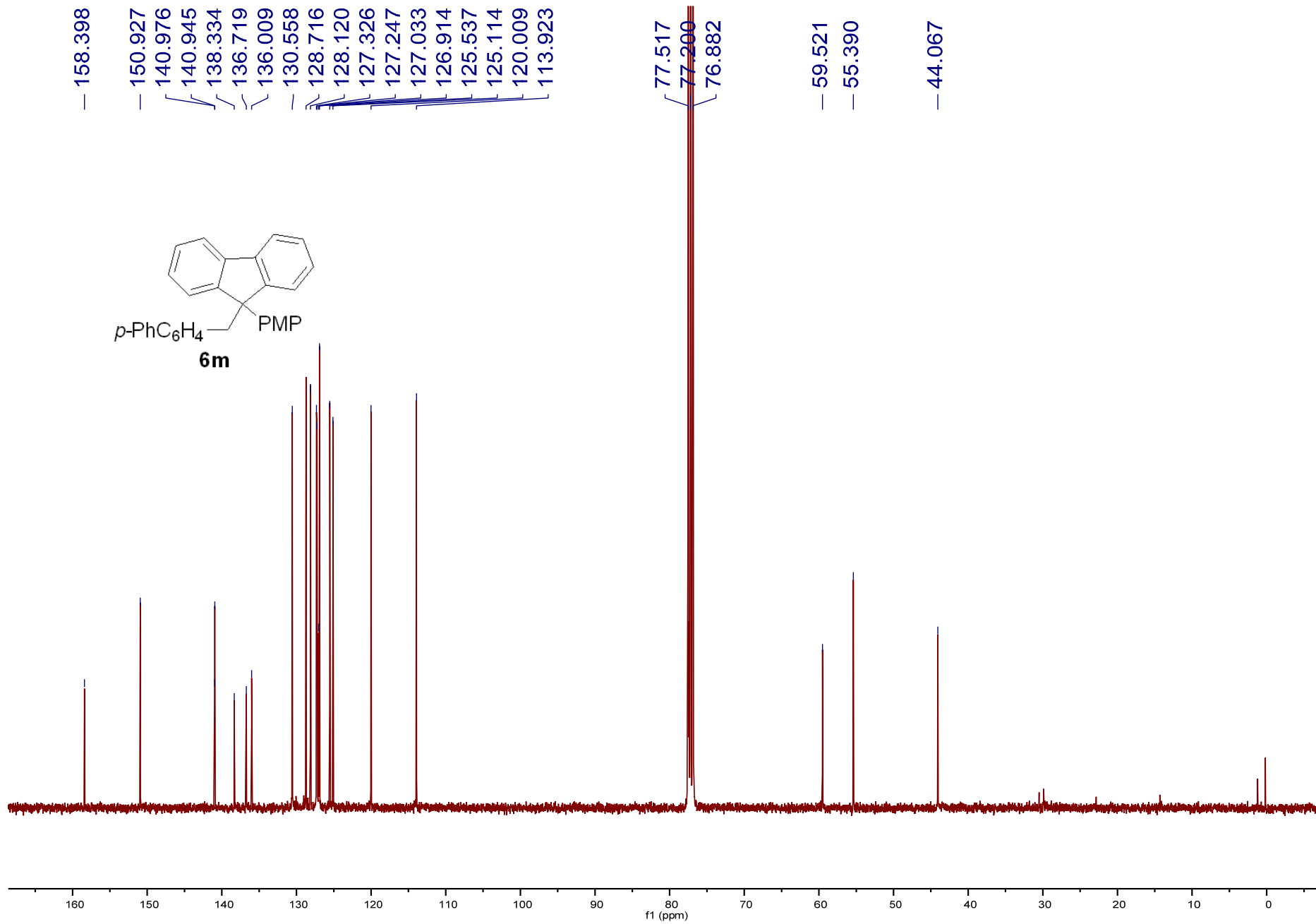
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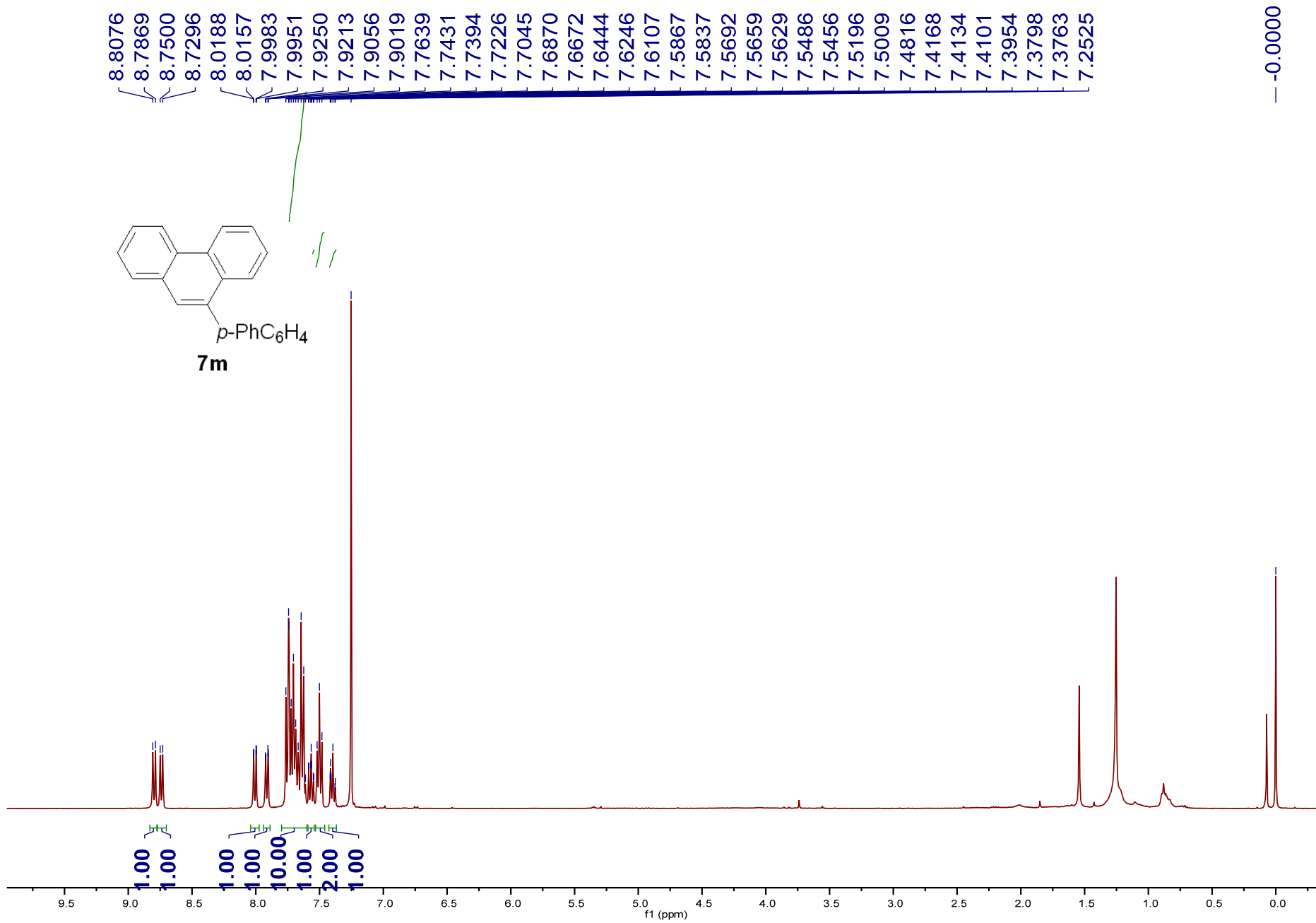


S152



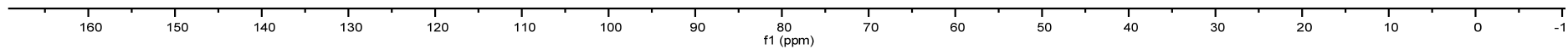
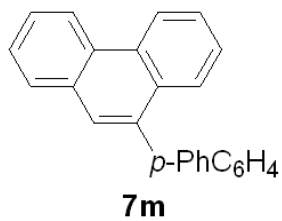
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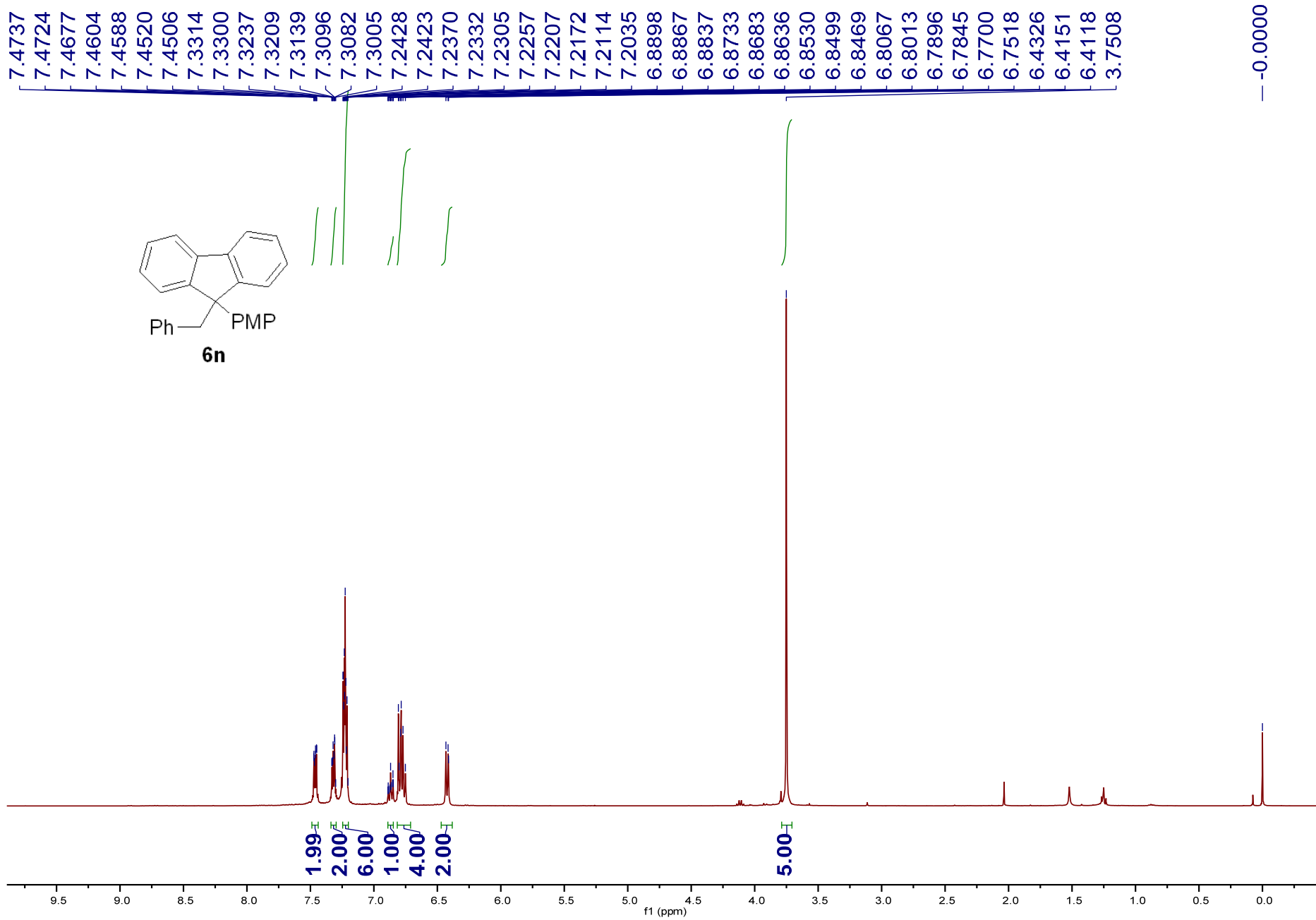


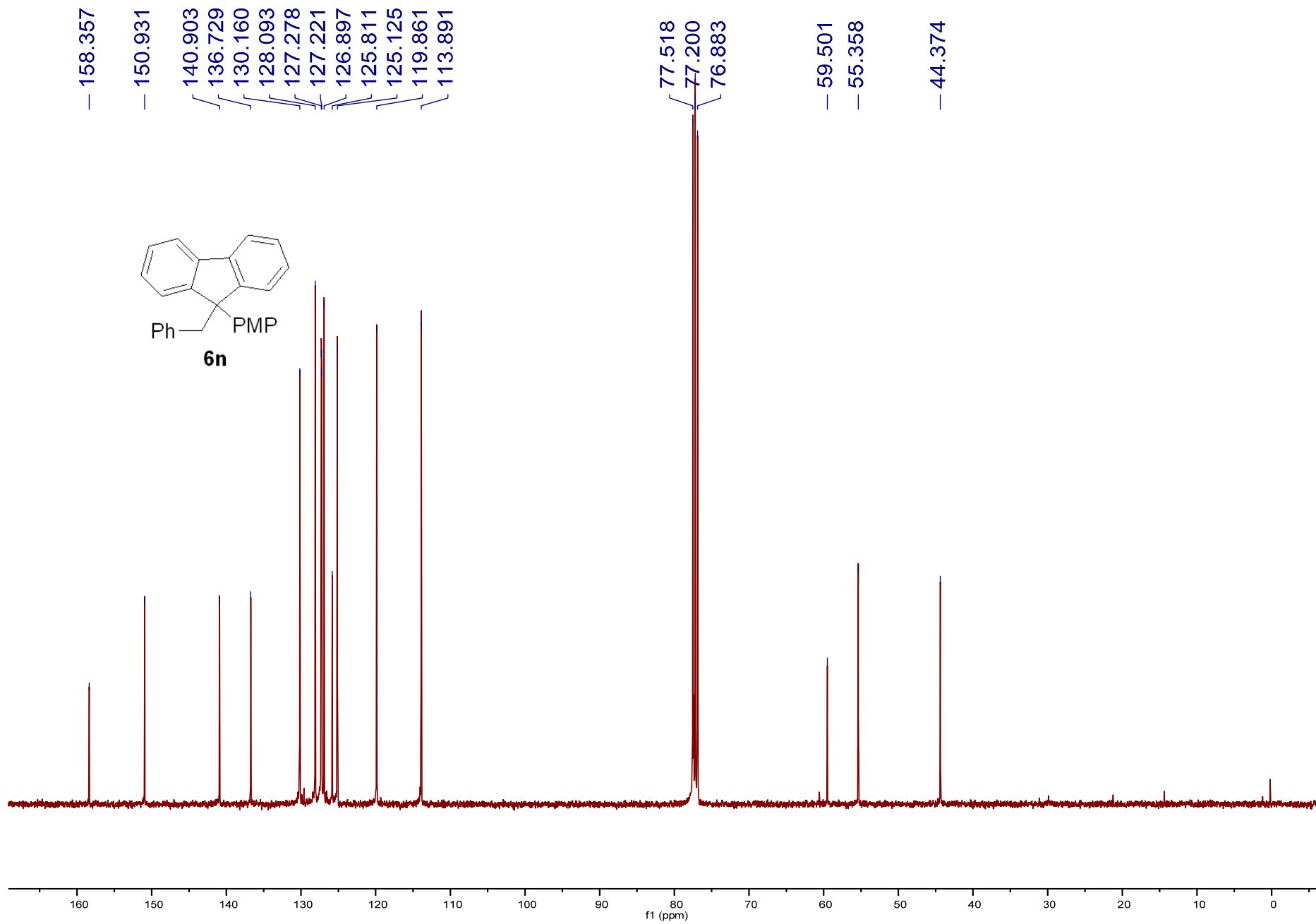


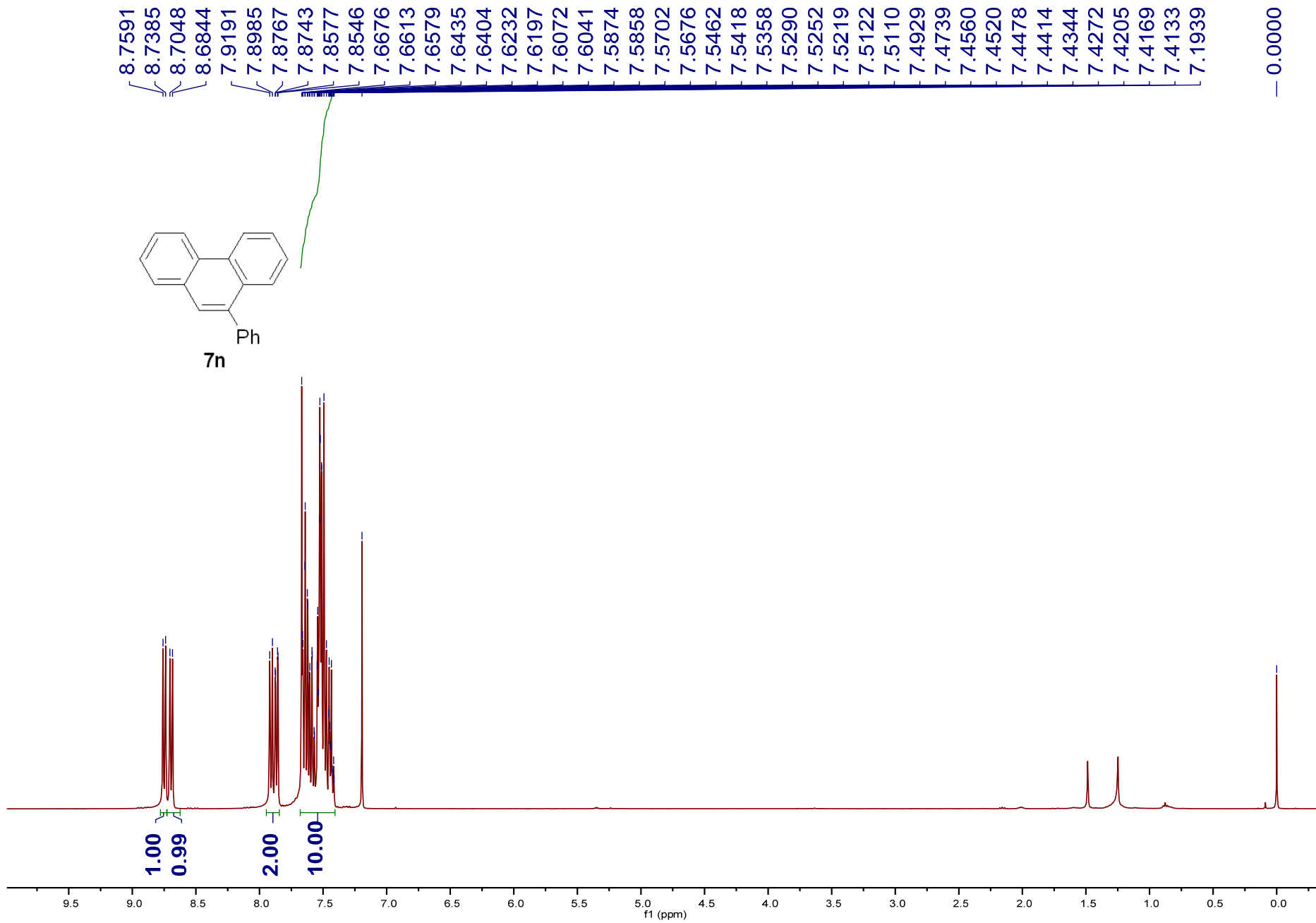
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122.737

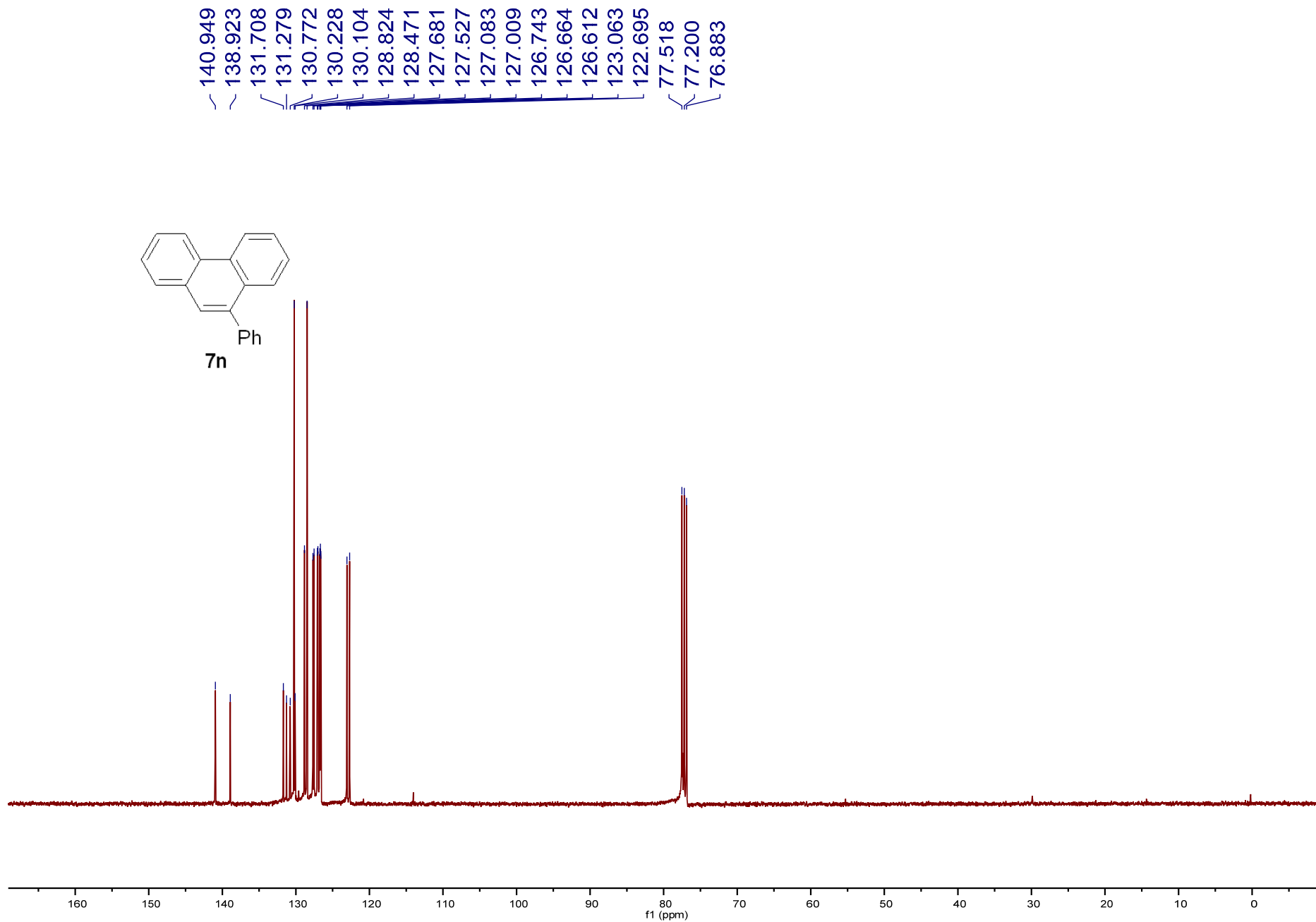
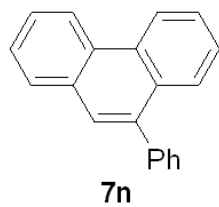
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77.200
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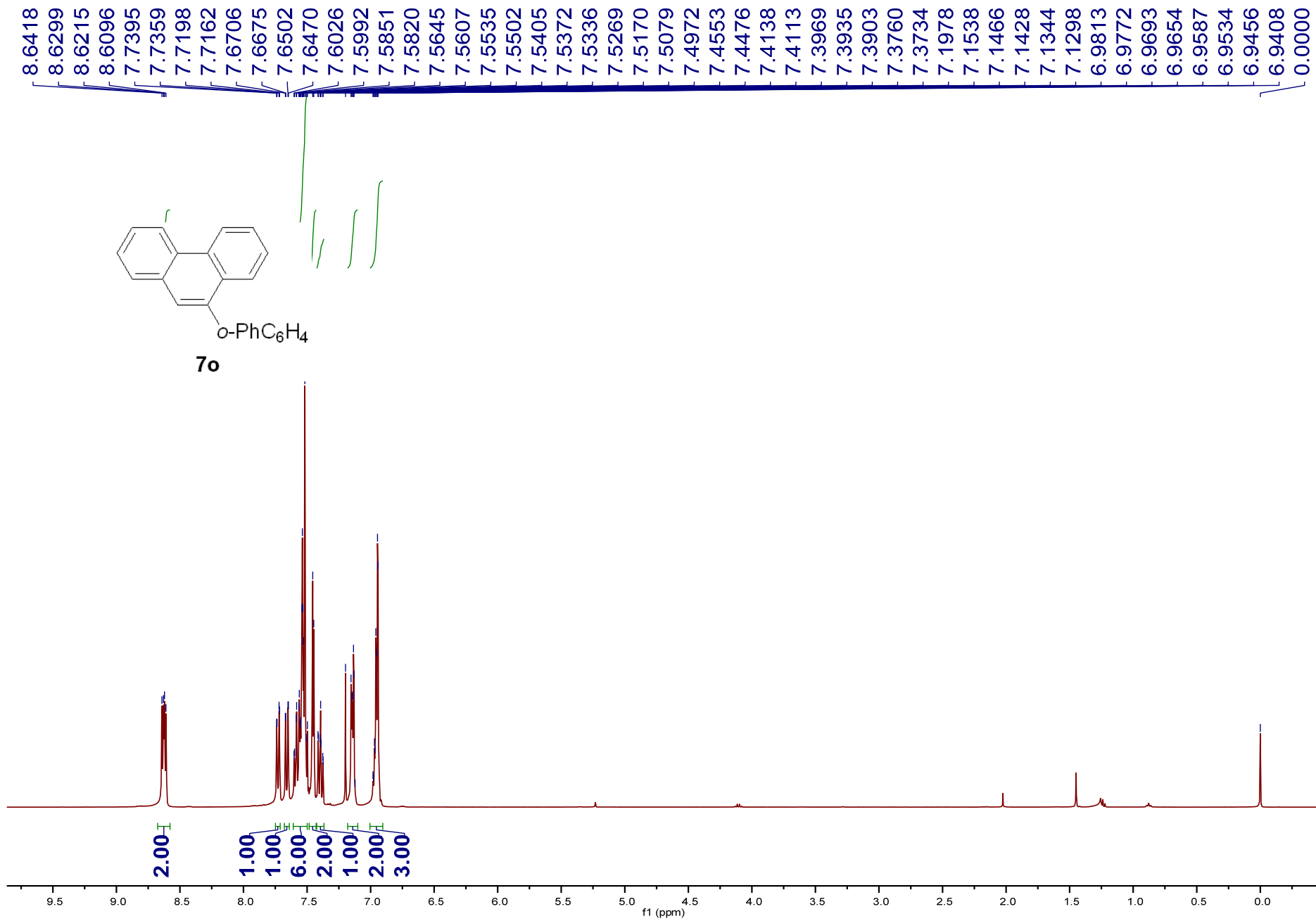






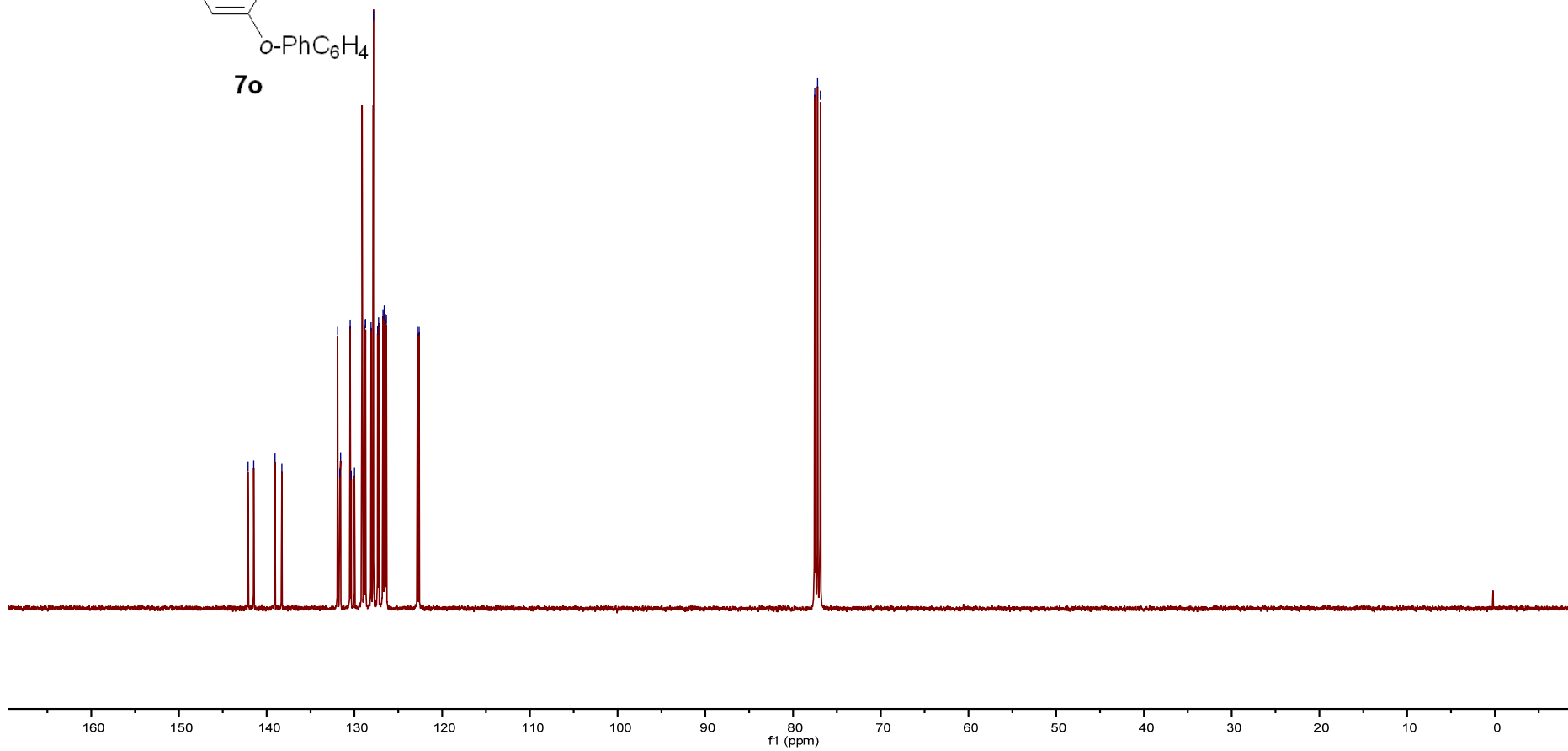
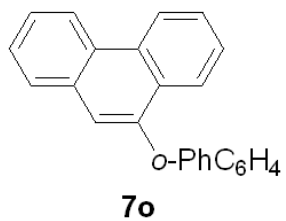


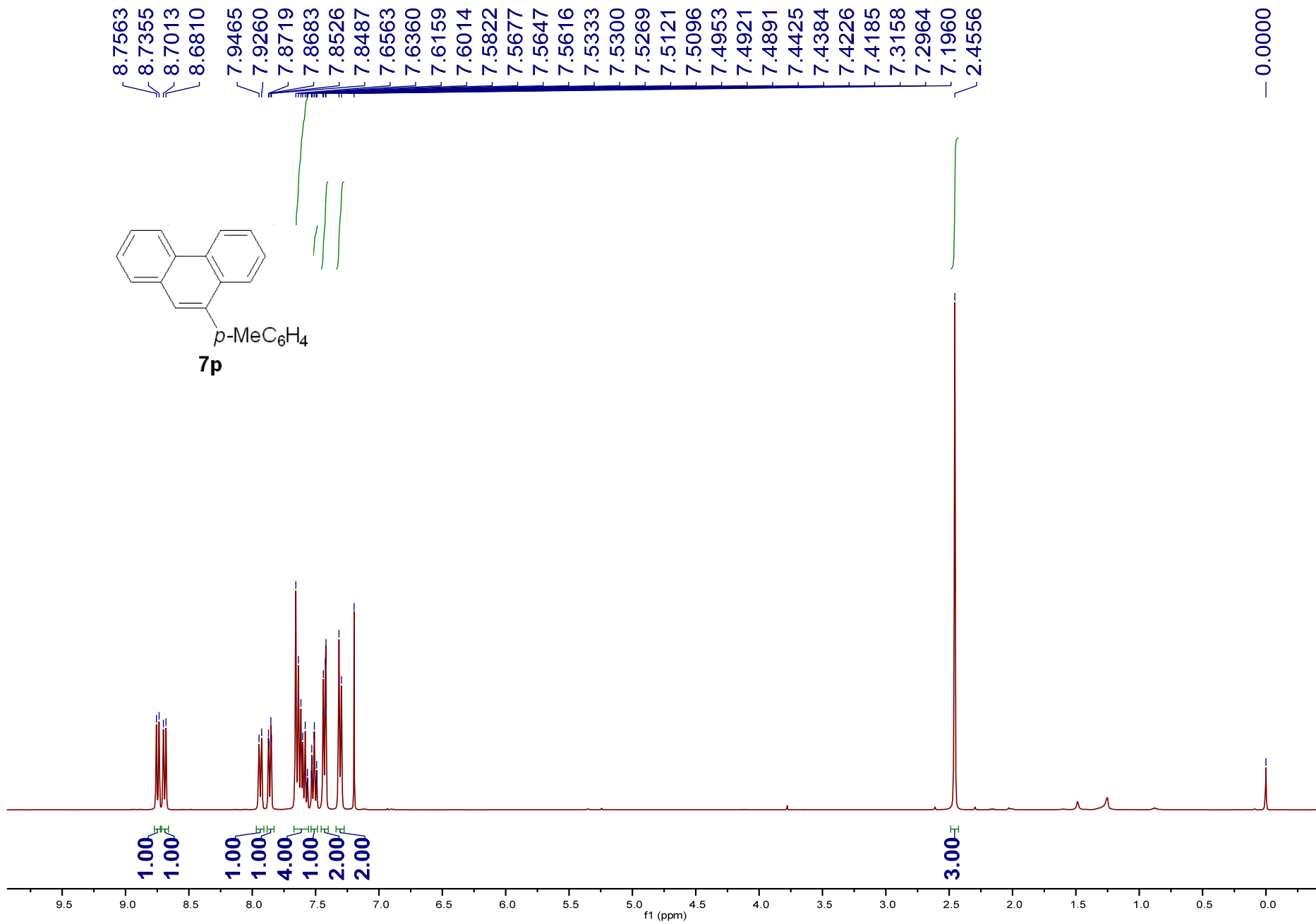


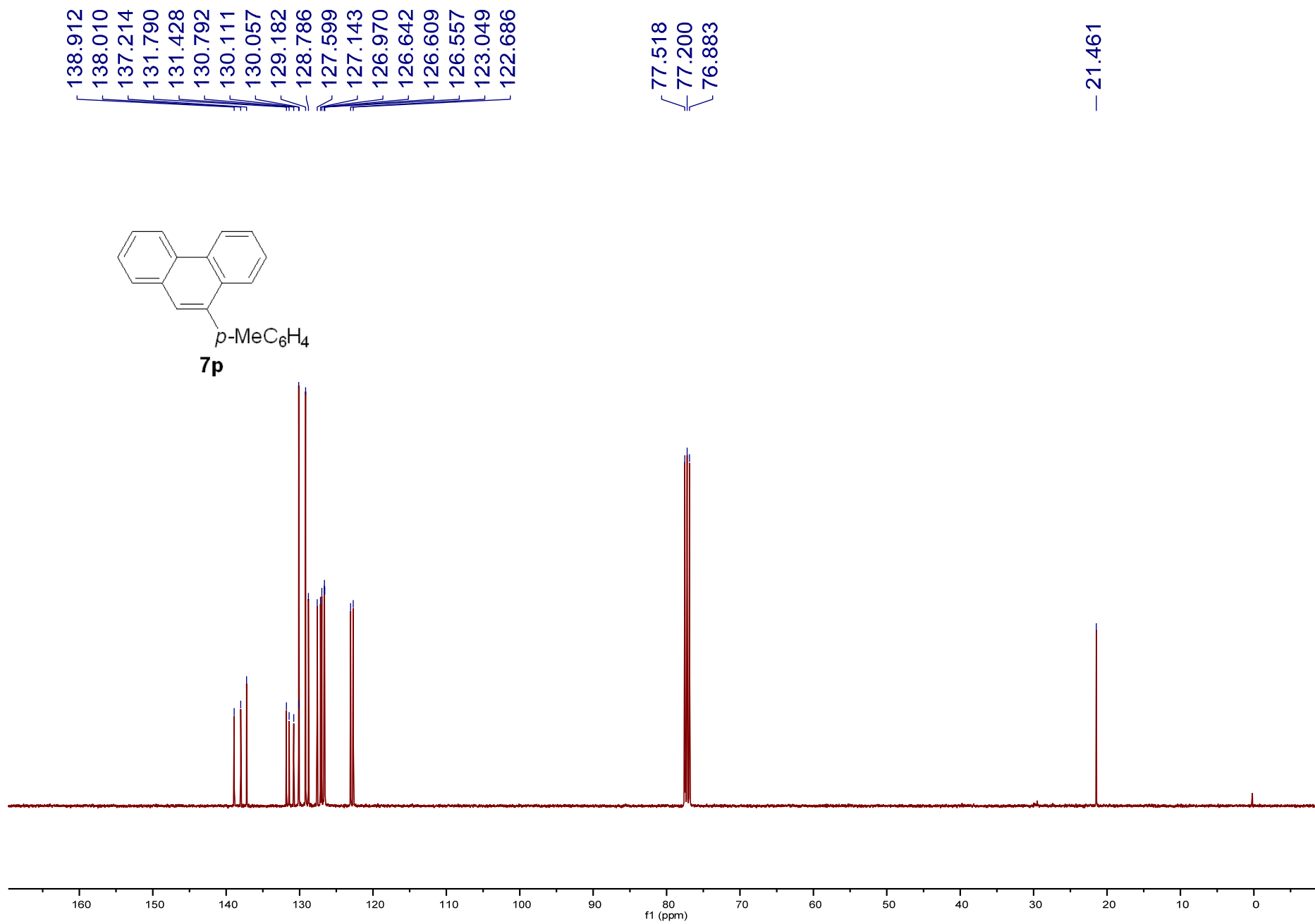


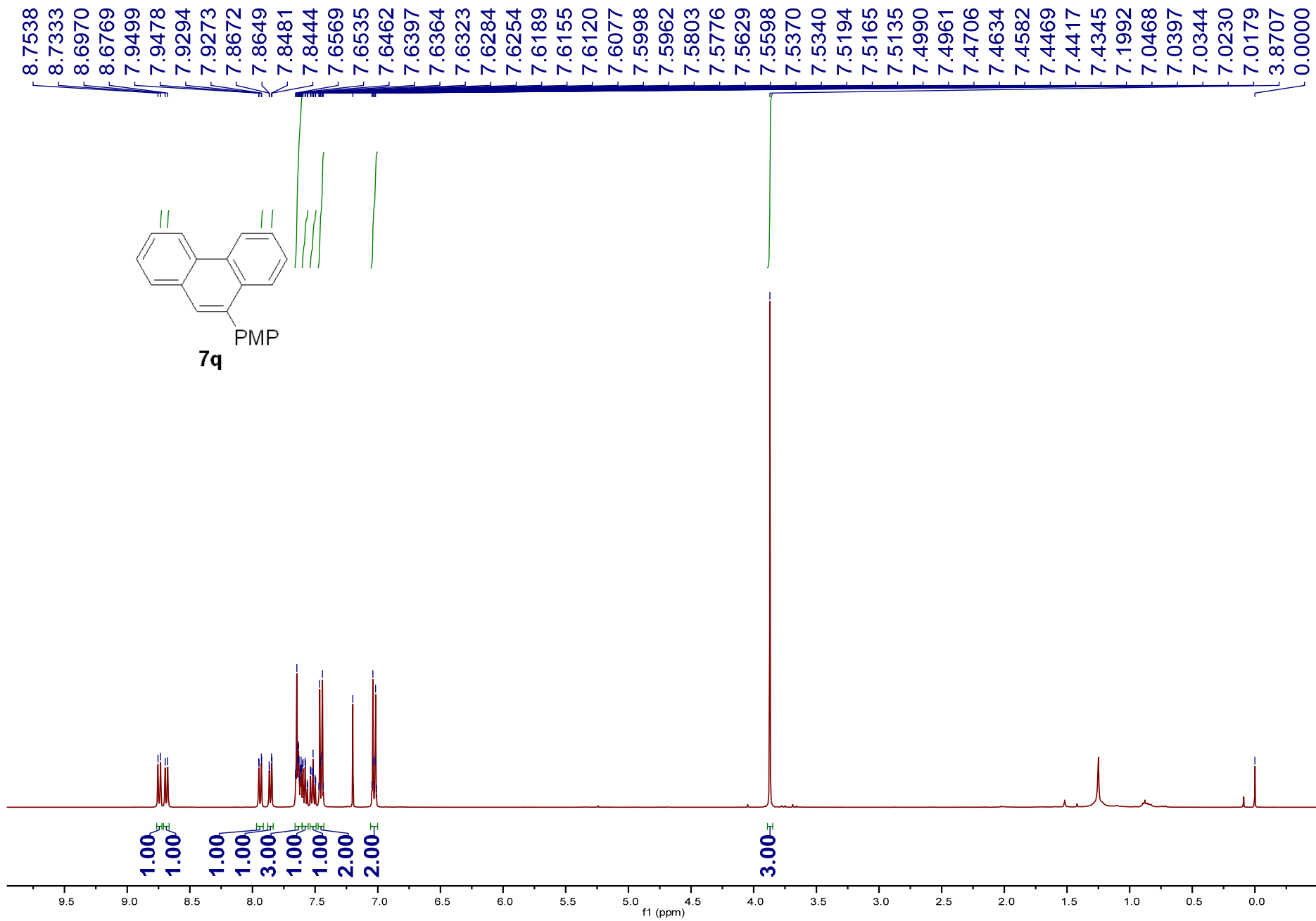
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122.621

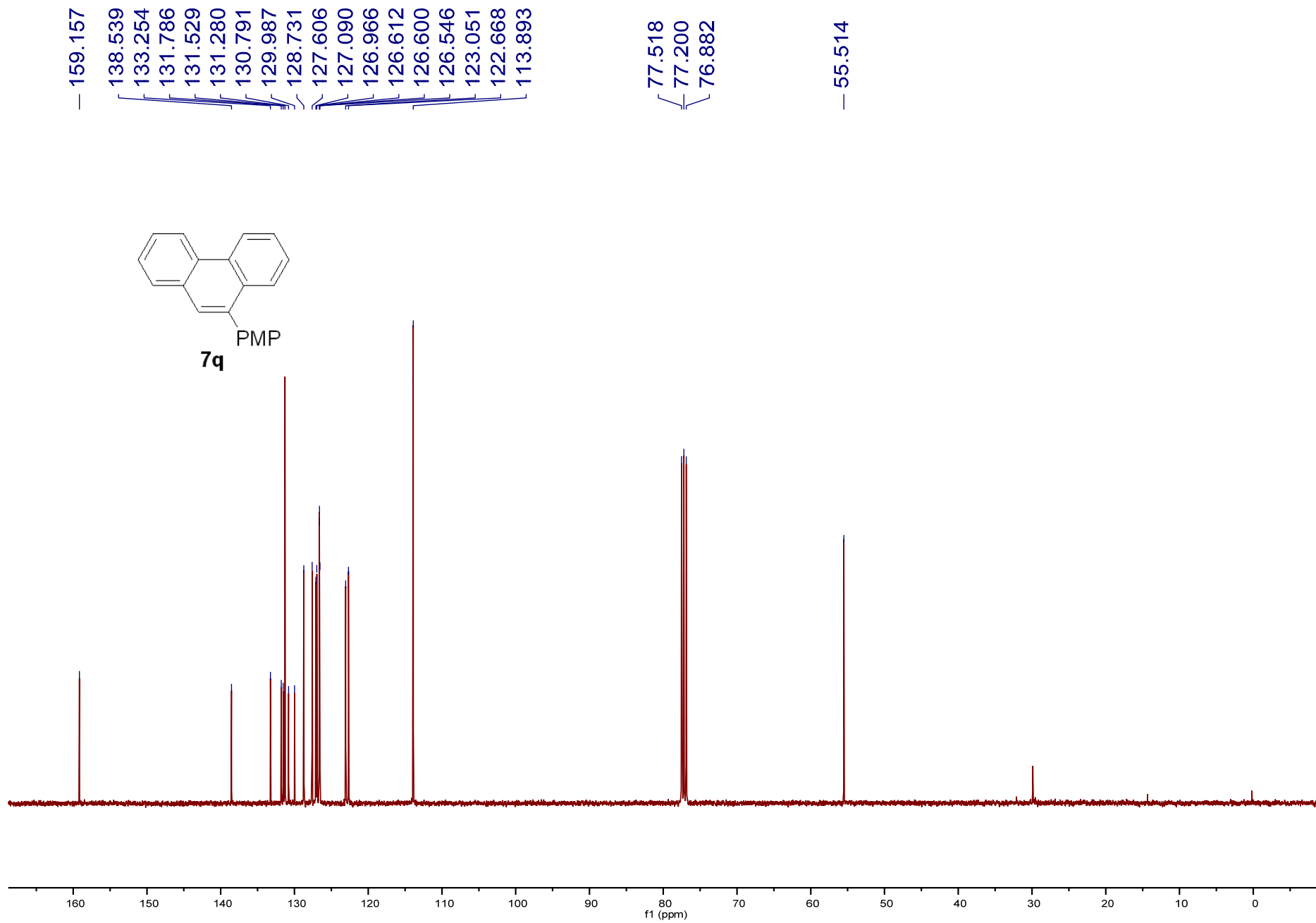
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77.200
76.882

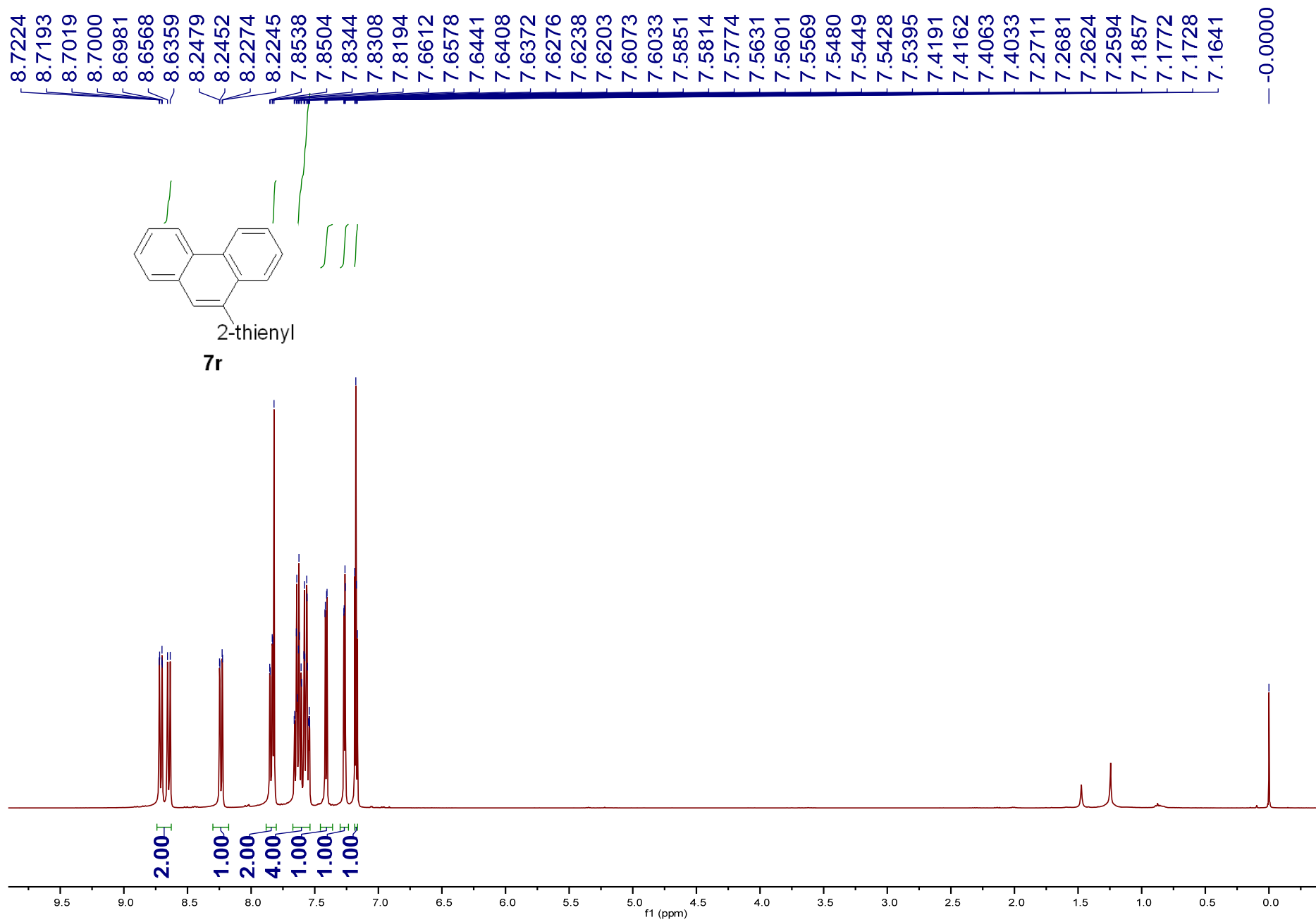


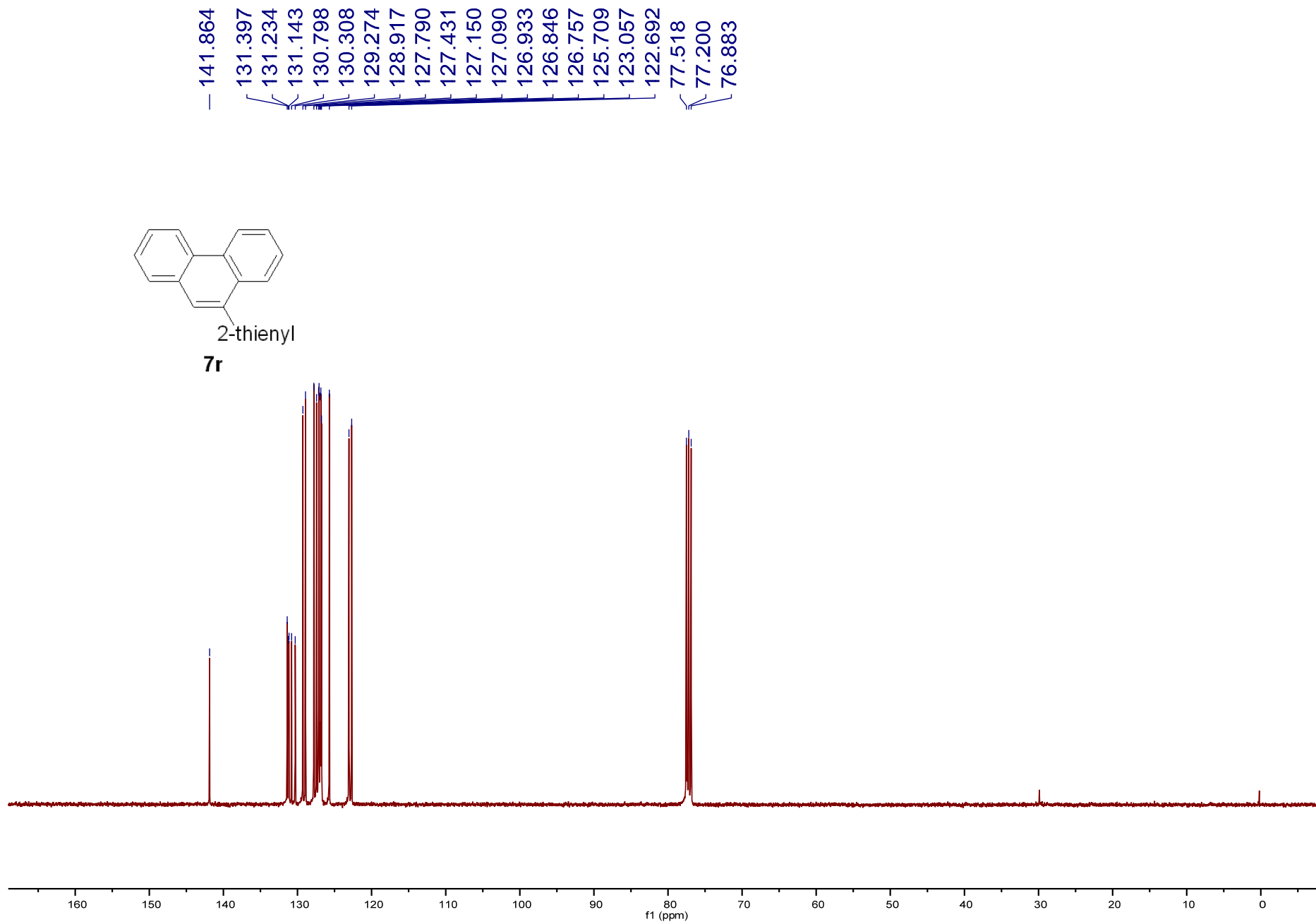
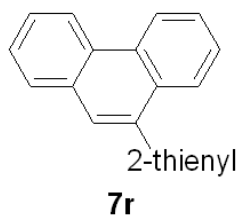


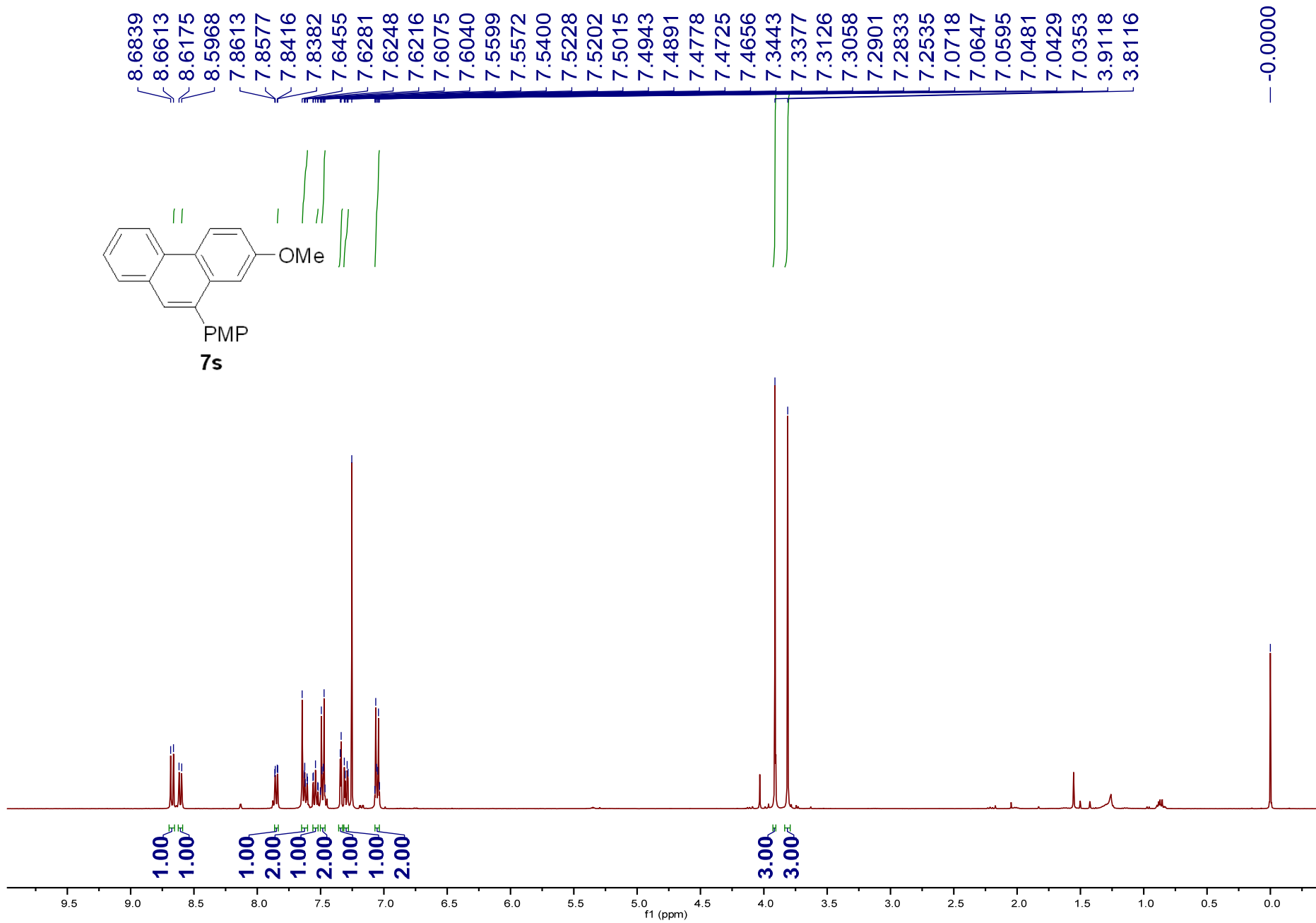


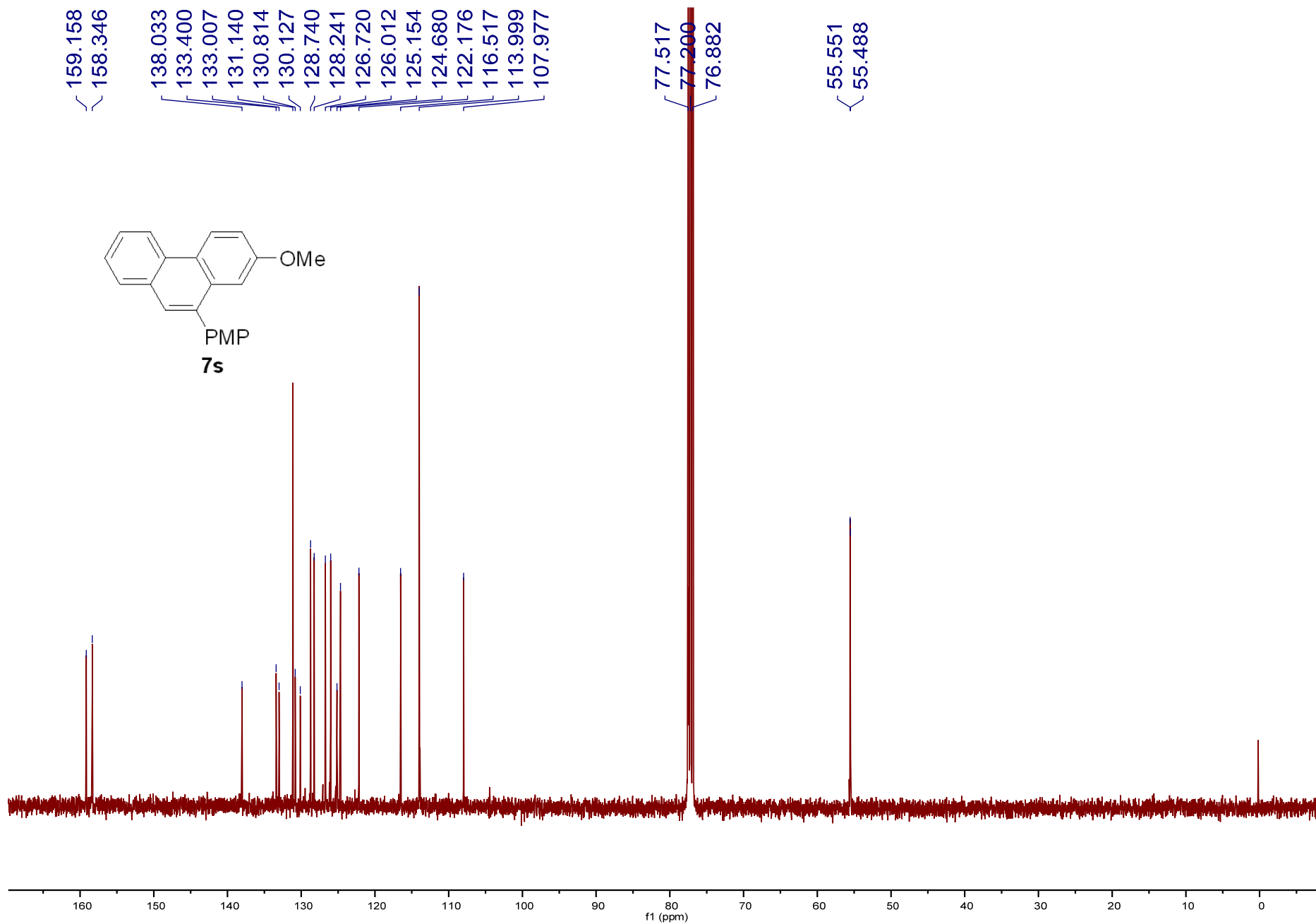
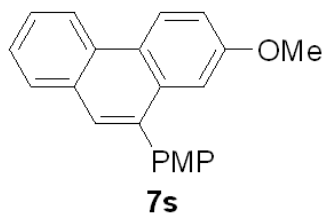


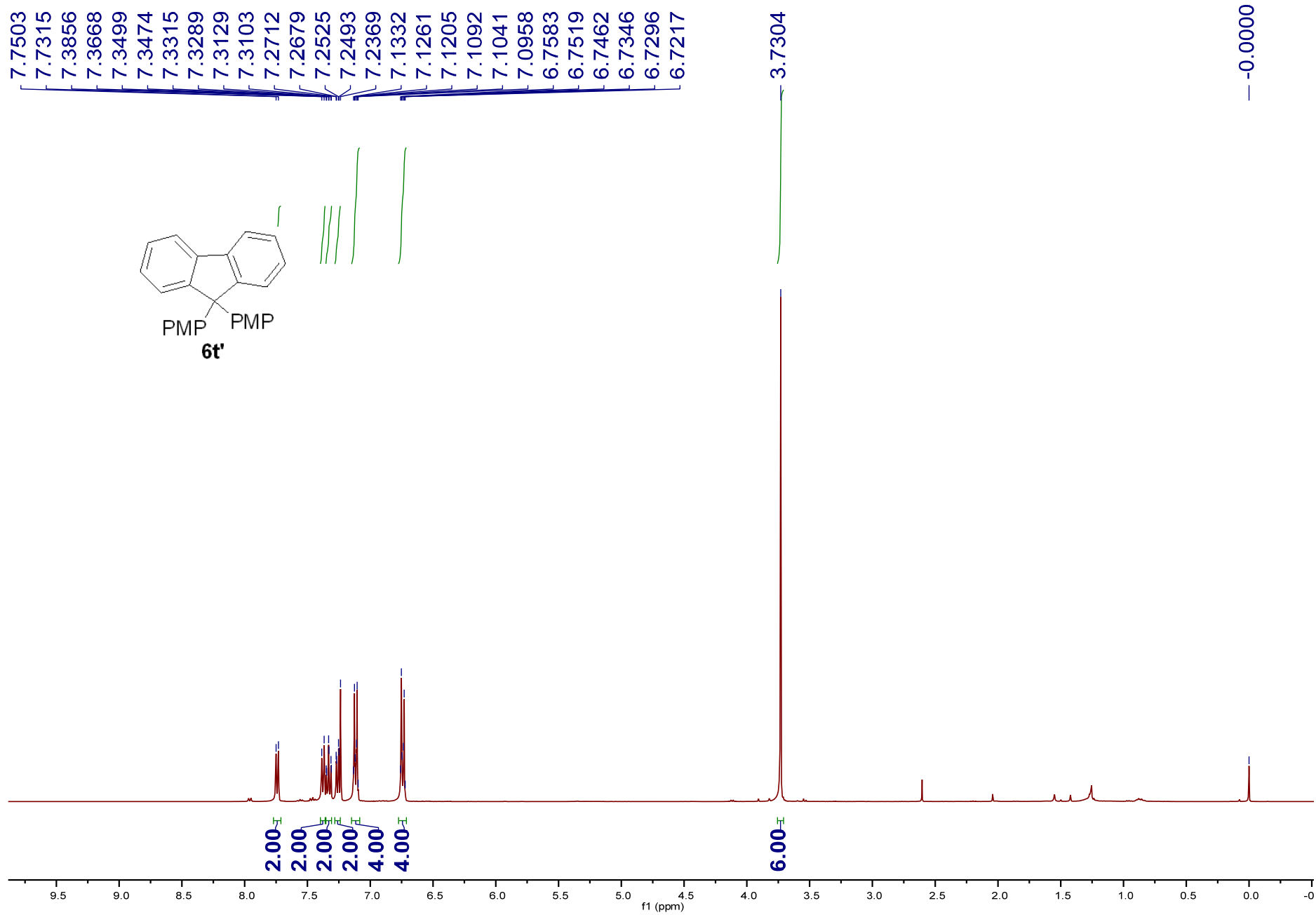


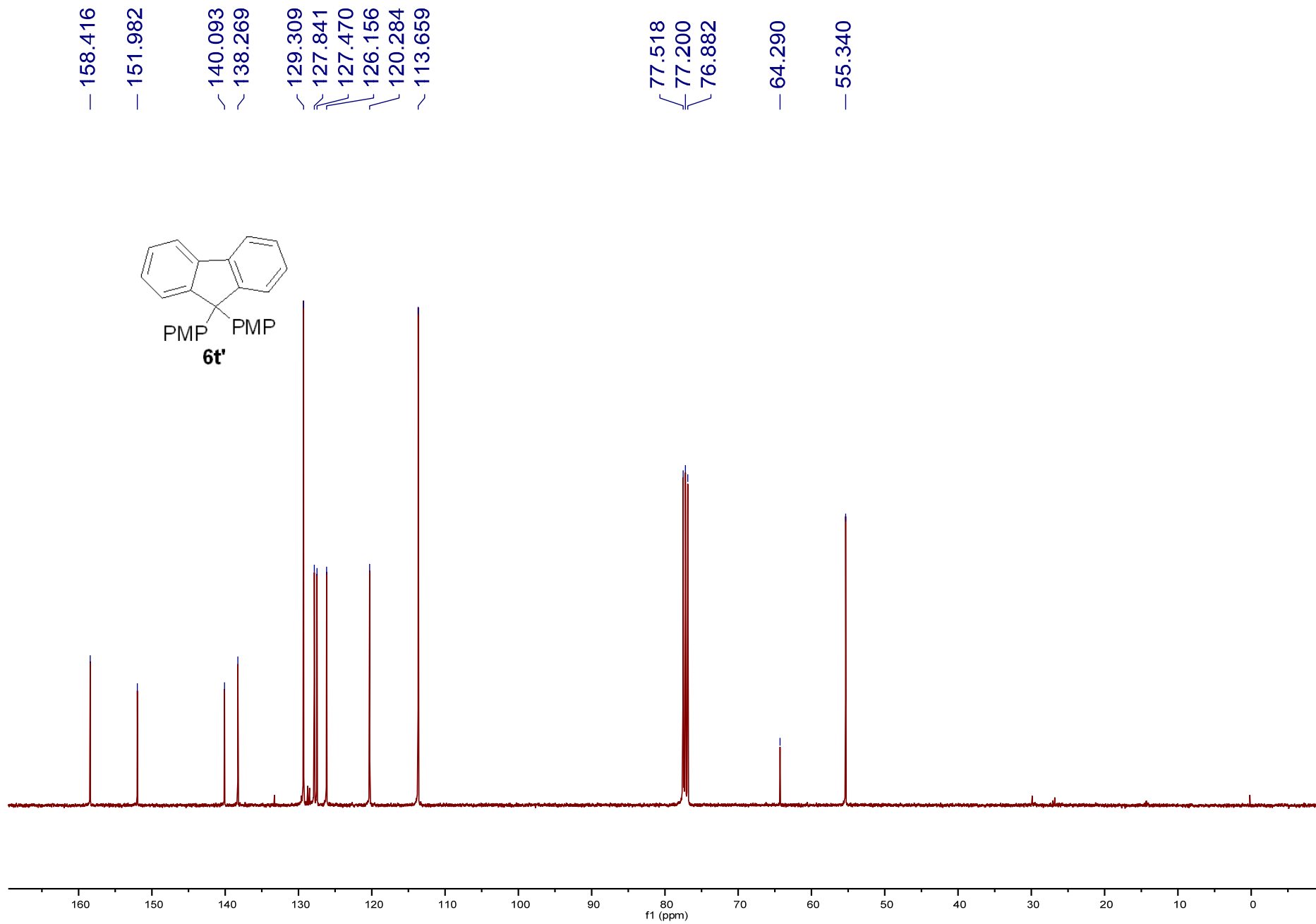


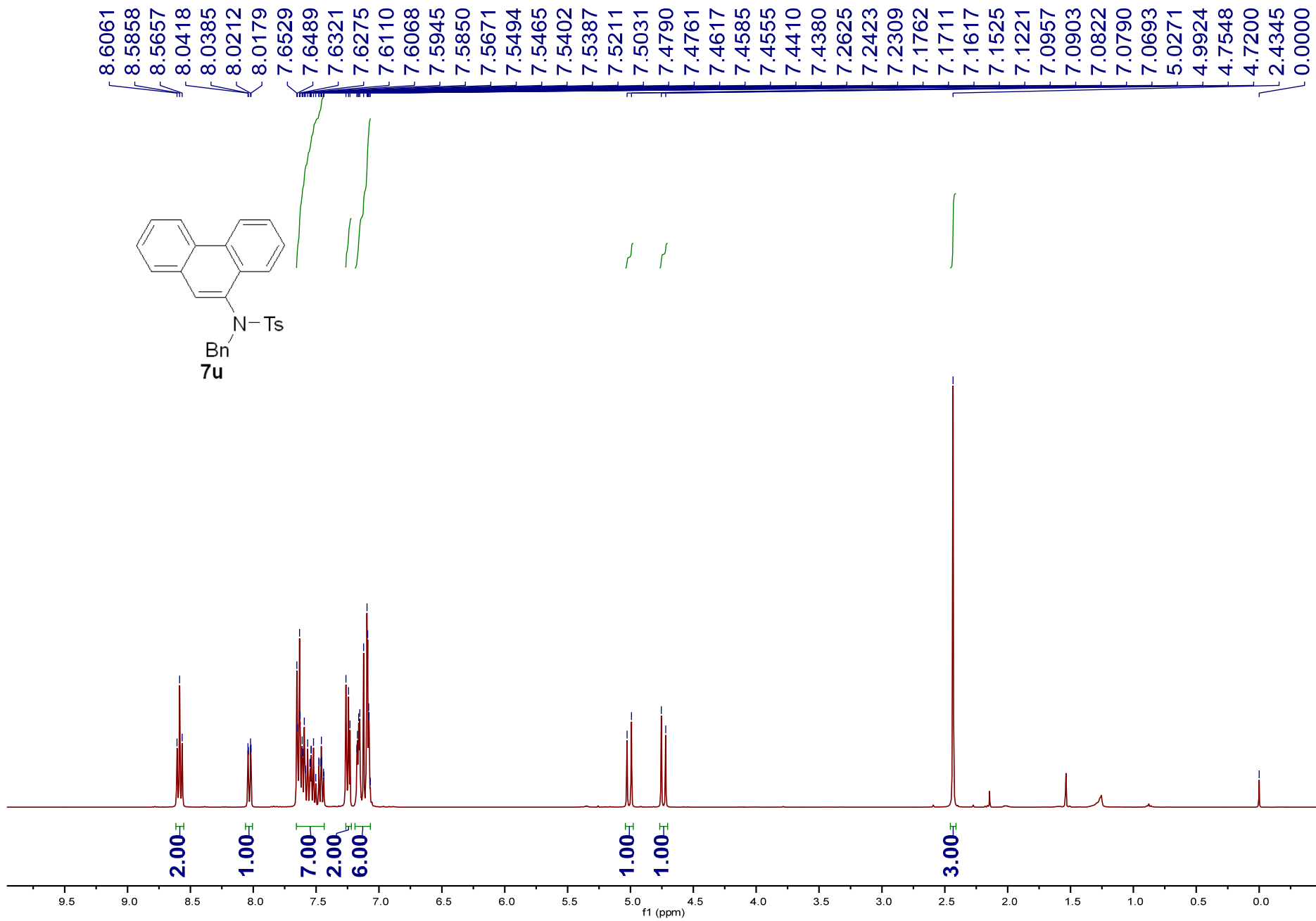


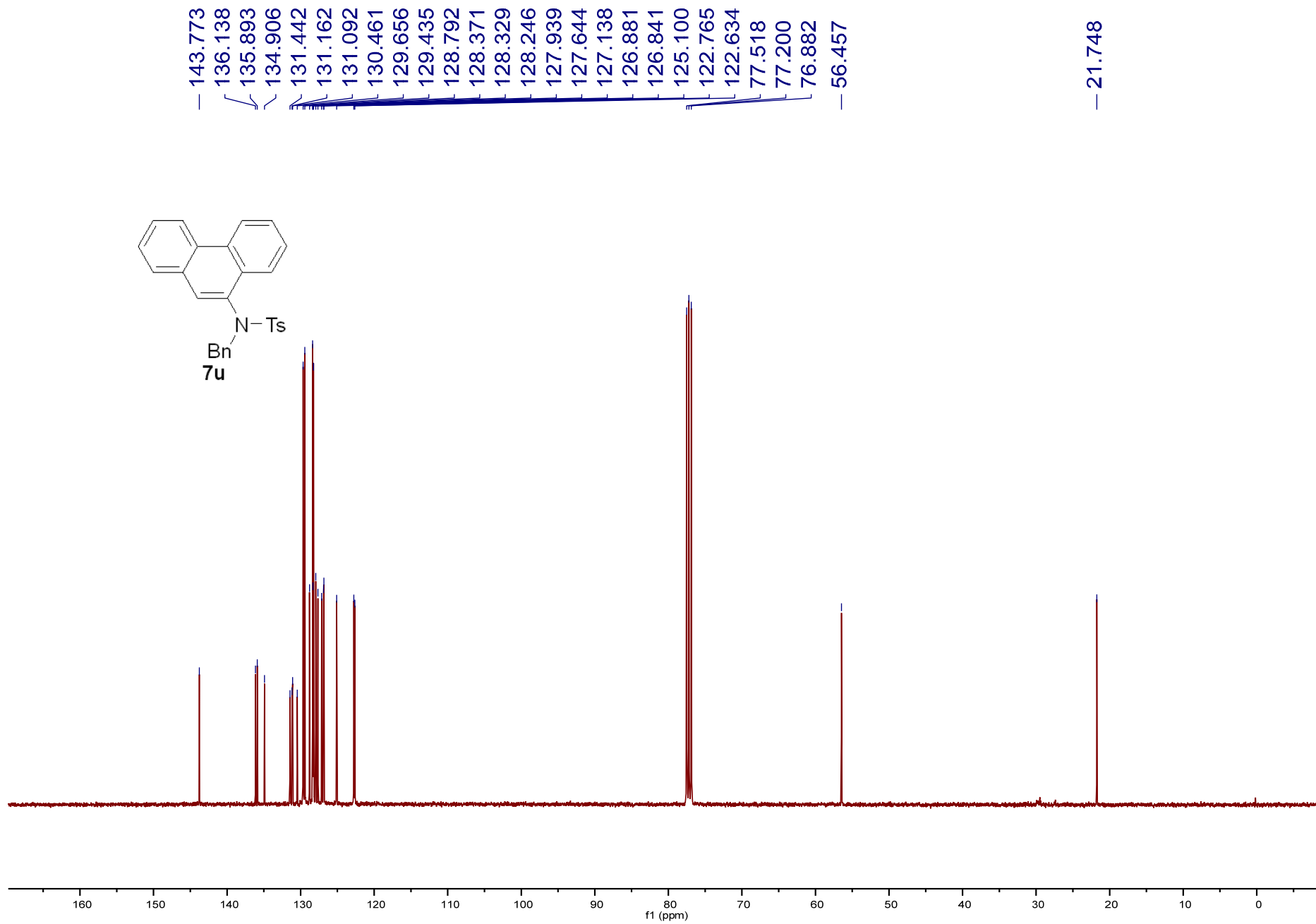
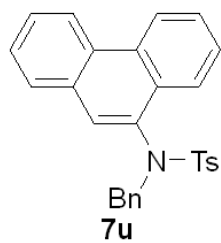


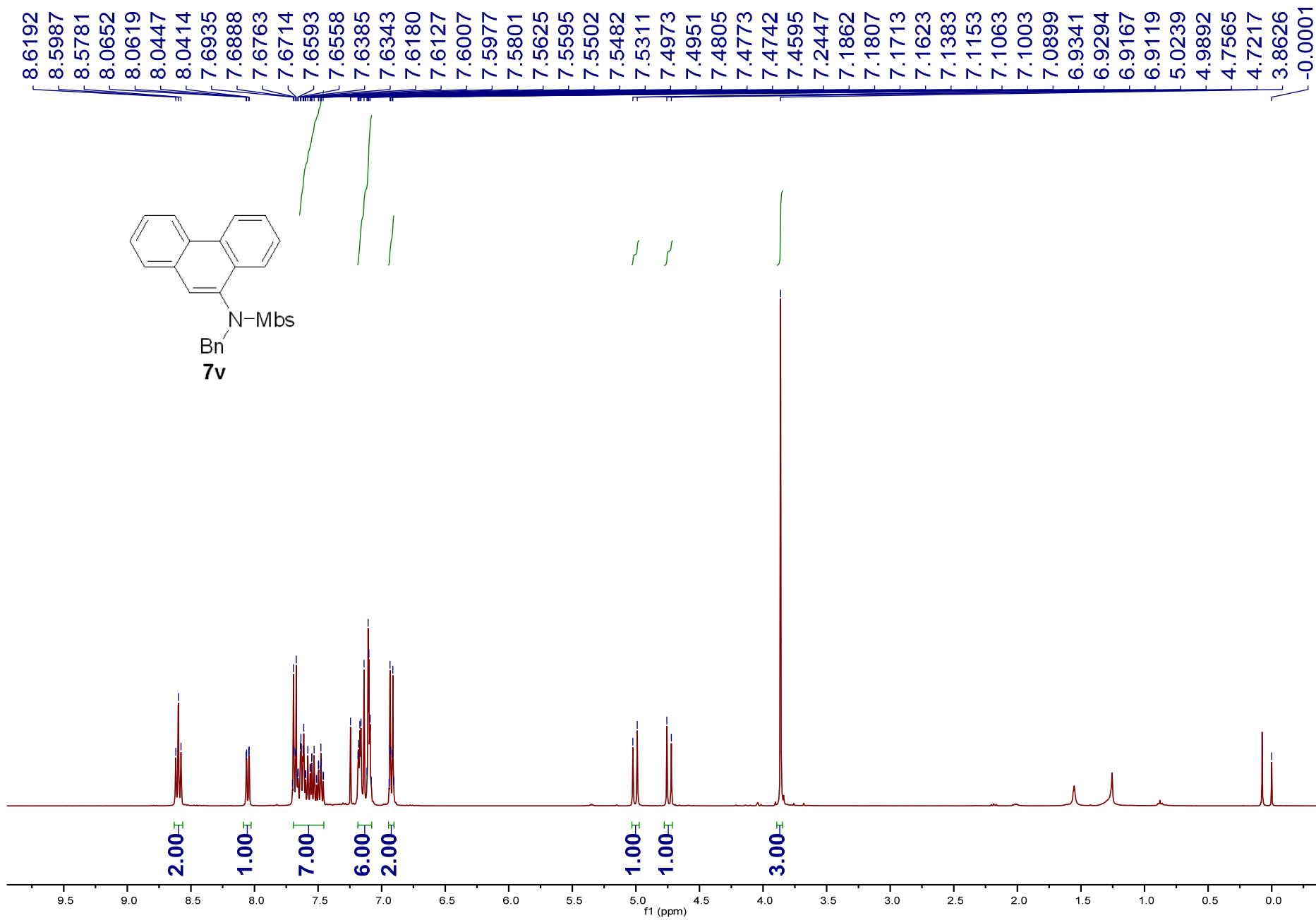


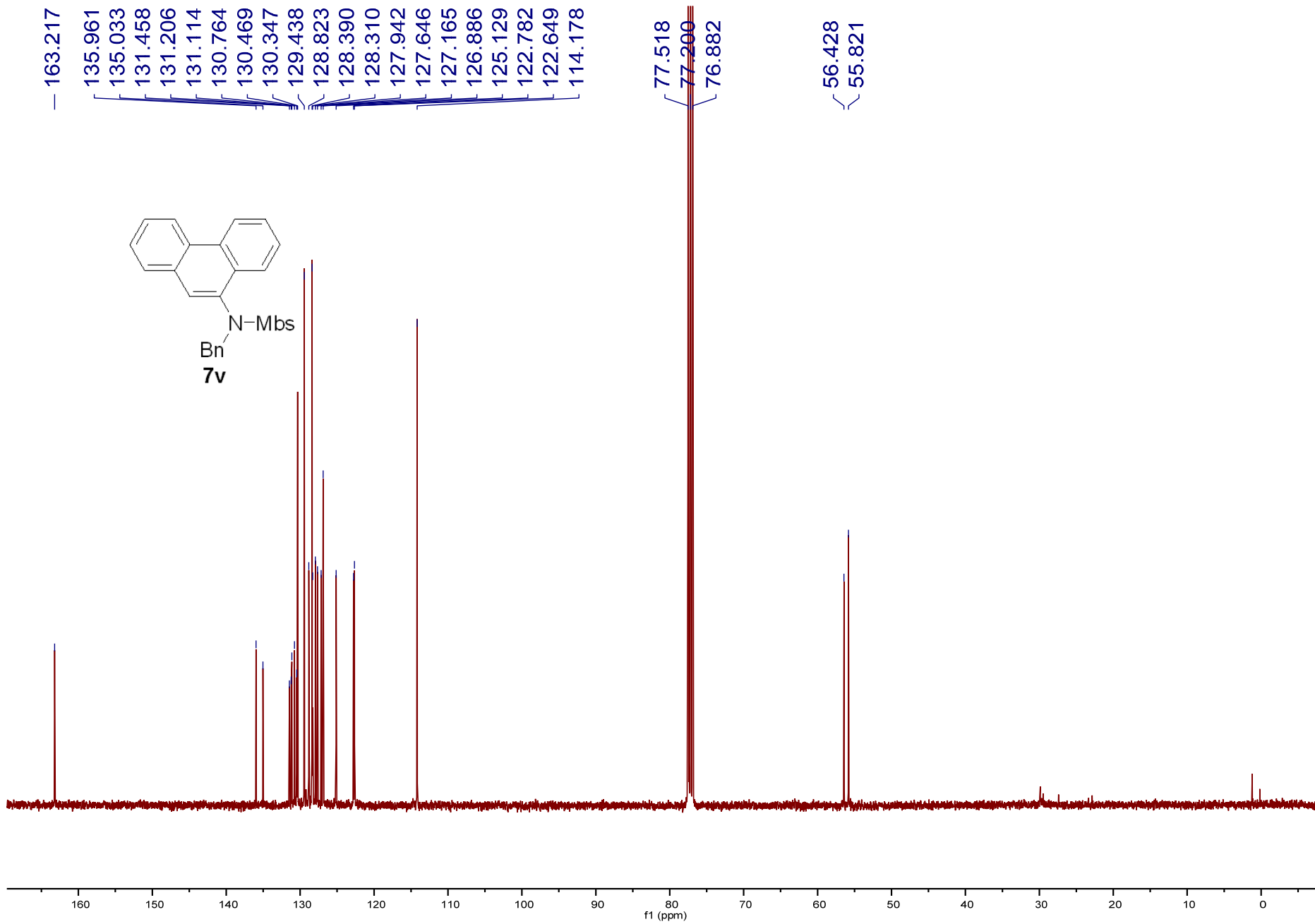


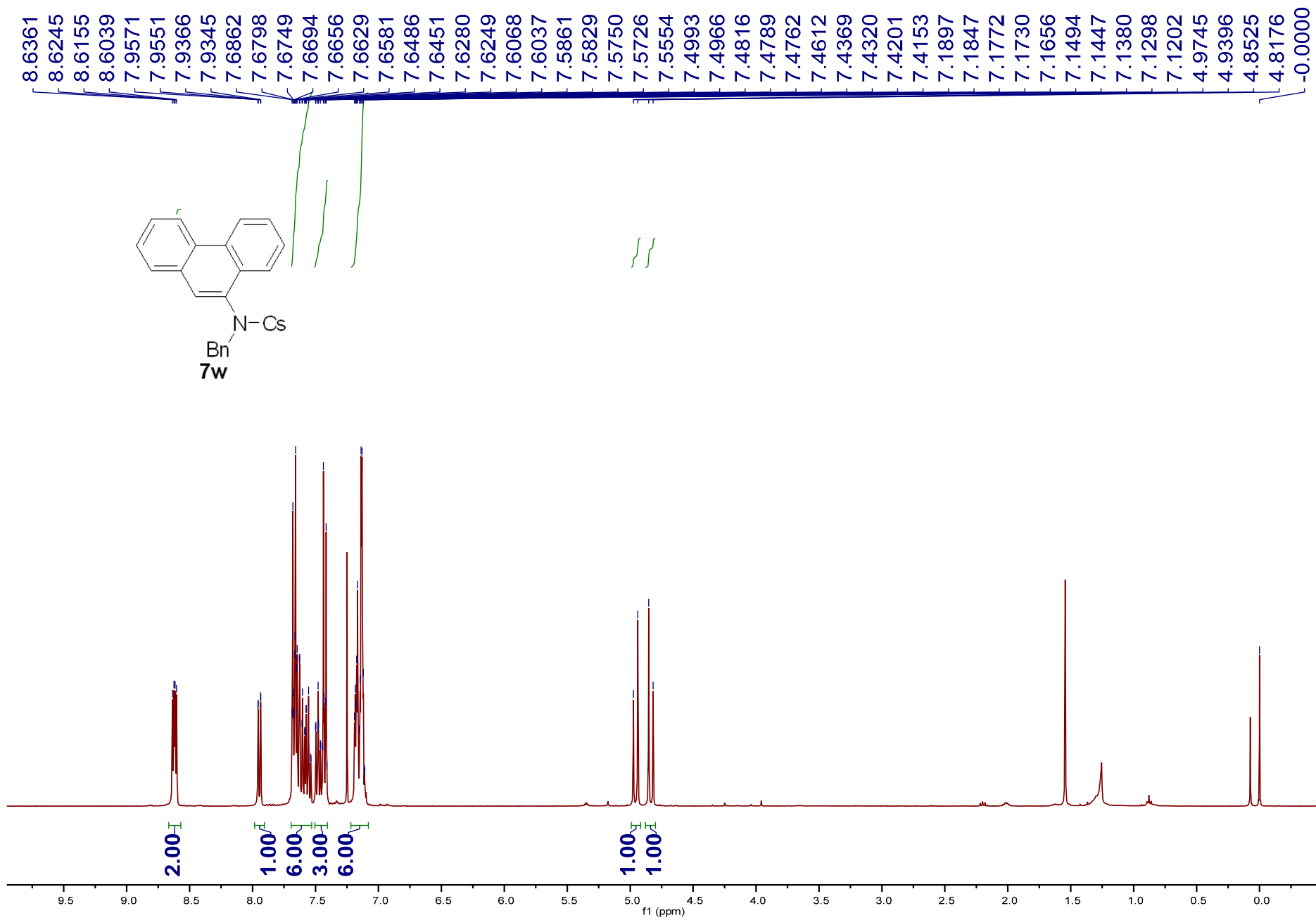








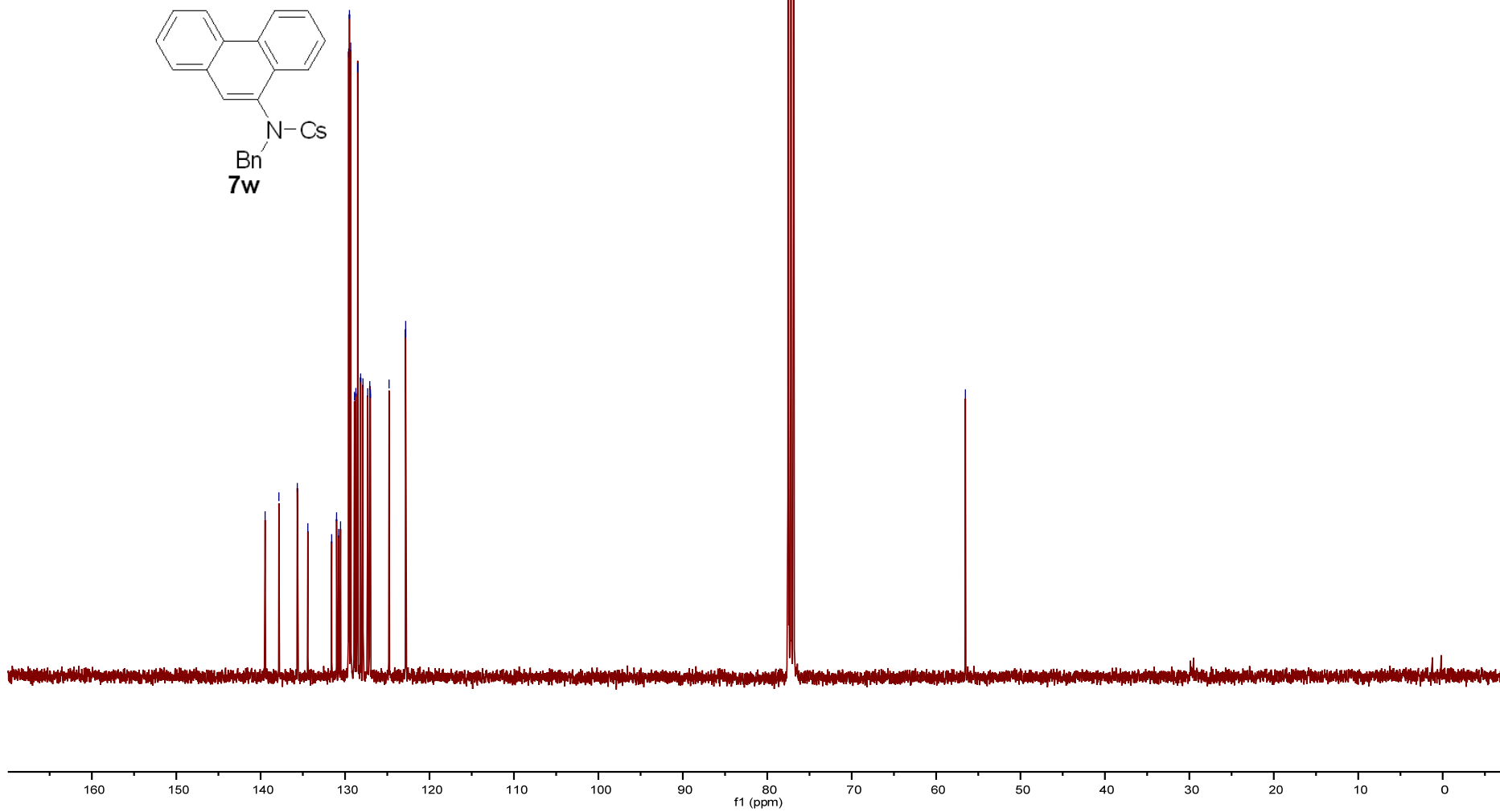
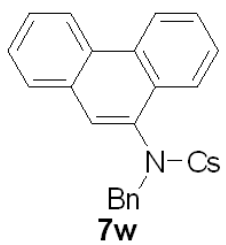


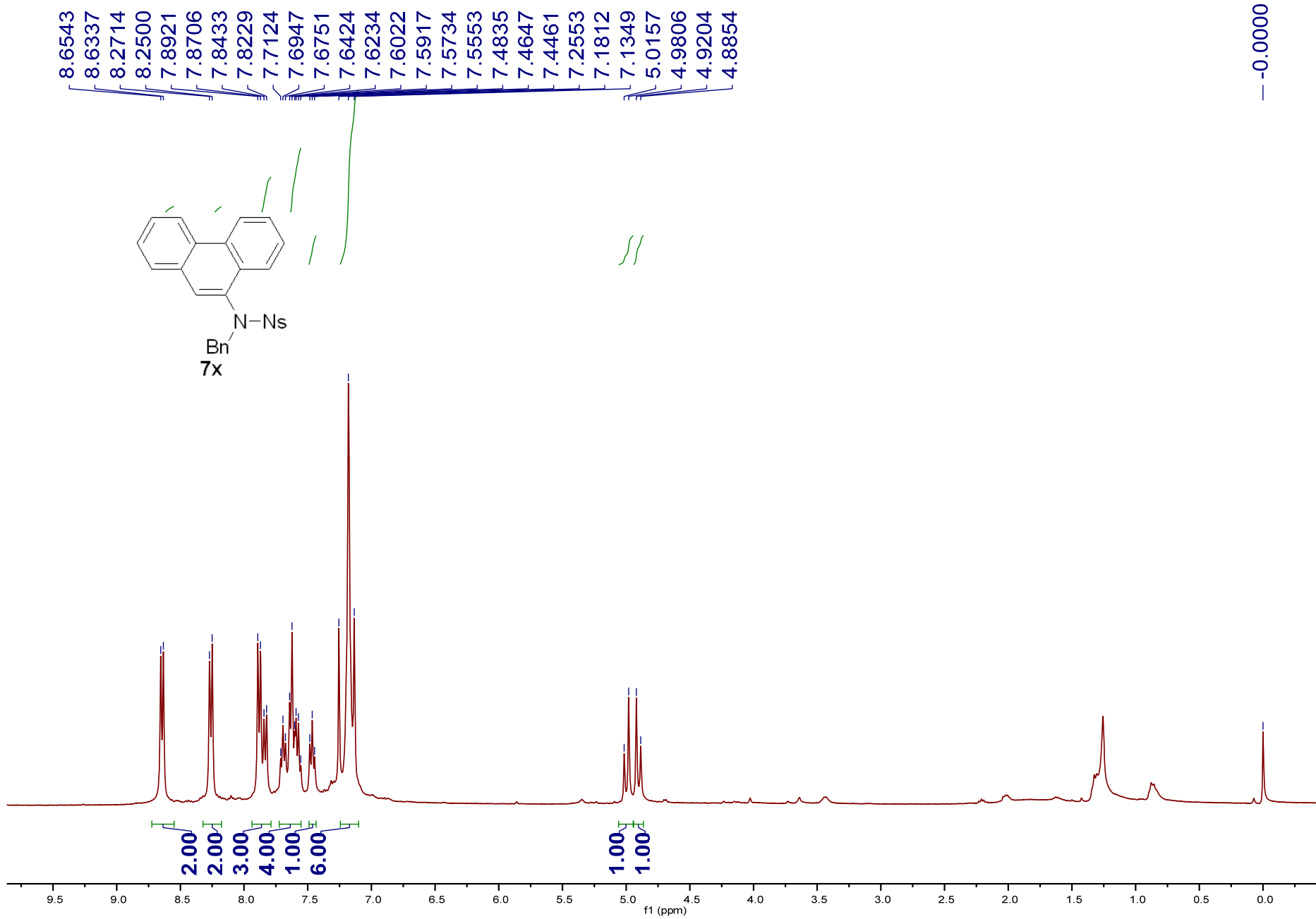


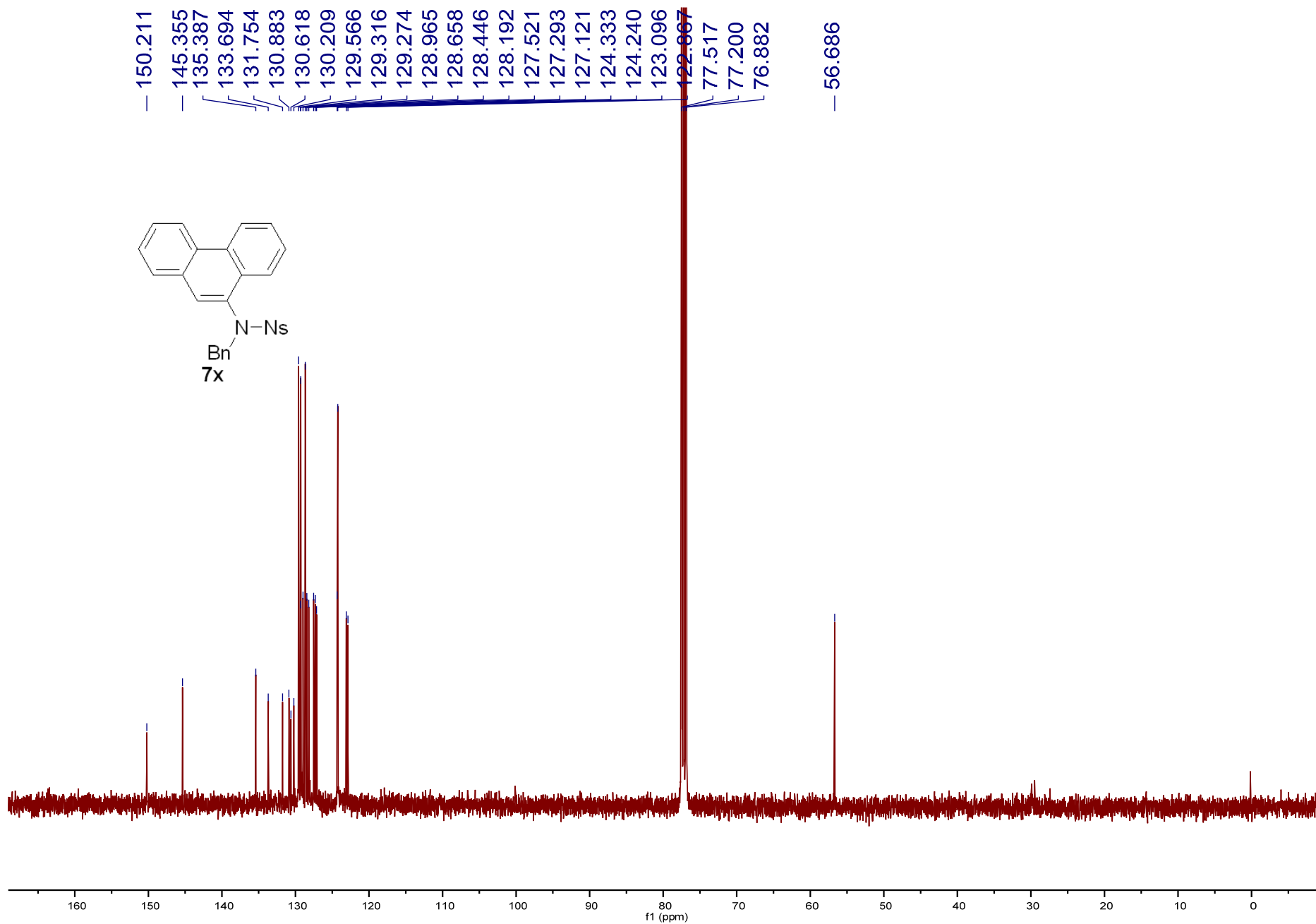
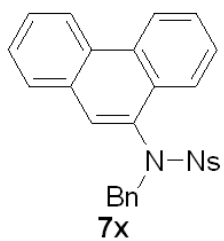
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122.819

77.518
77.200
76.883

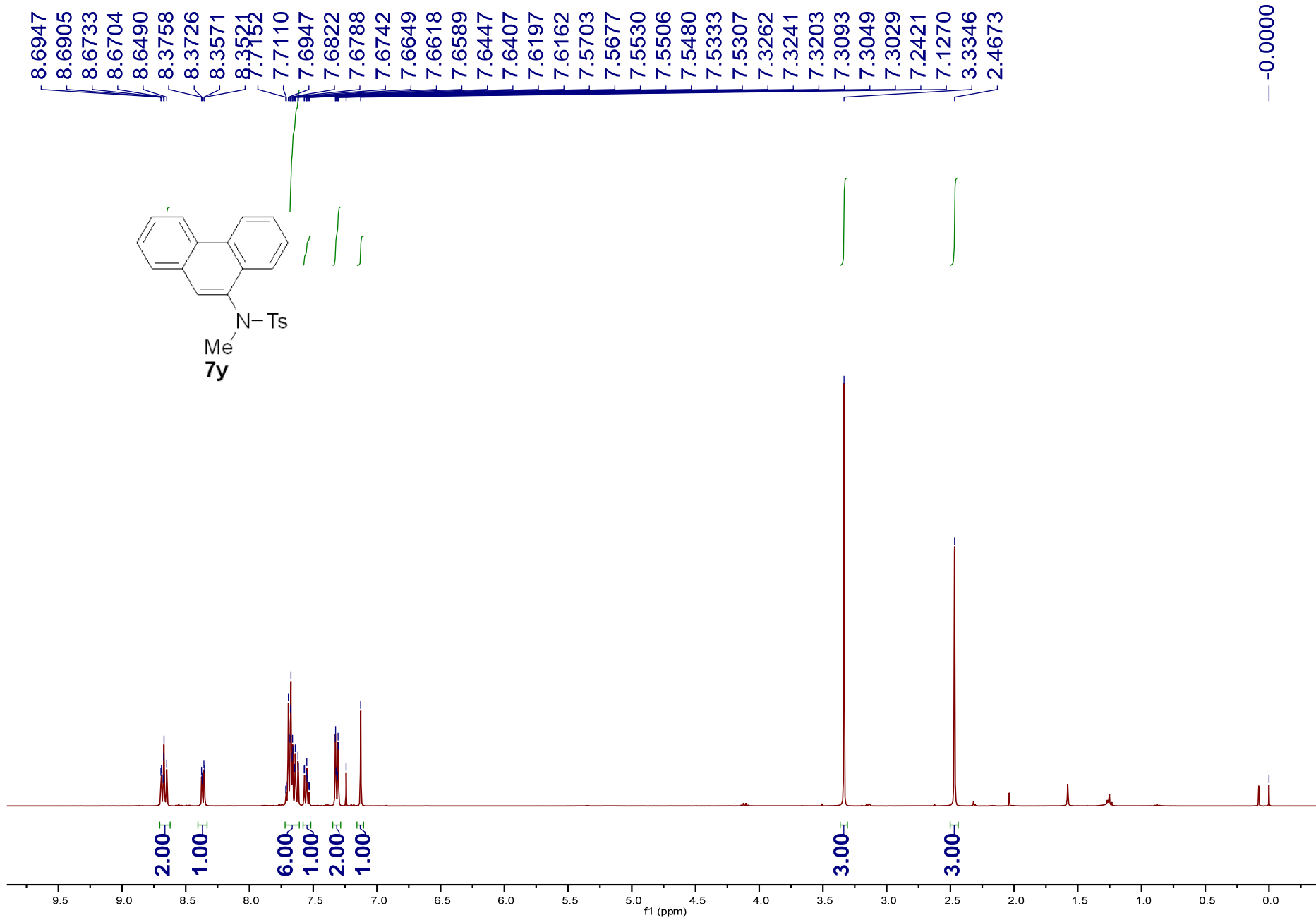
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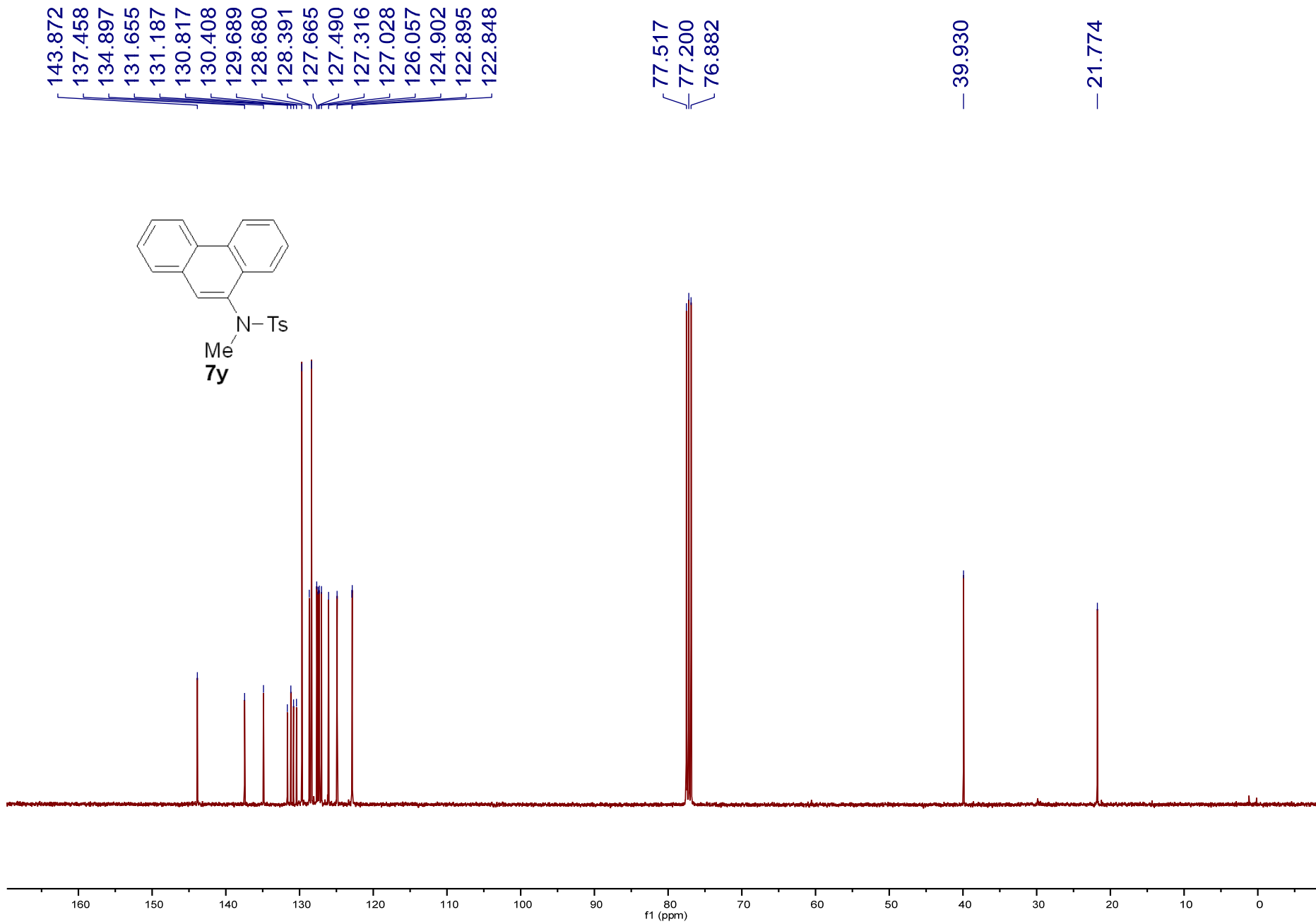


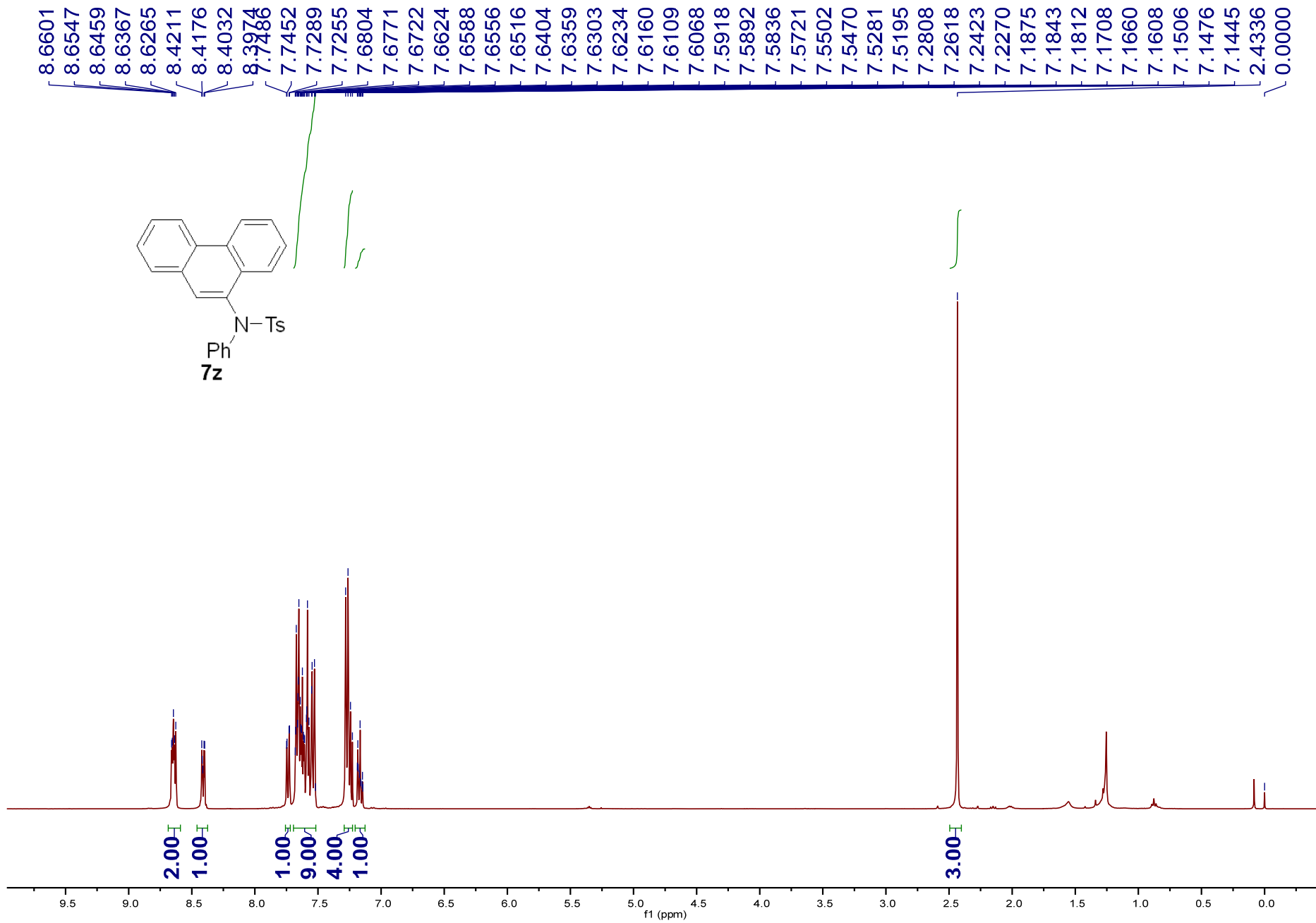


S180



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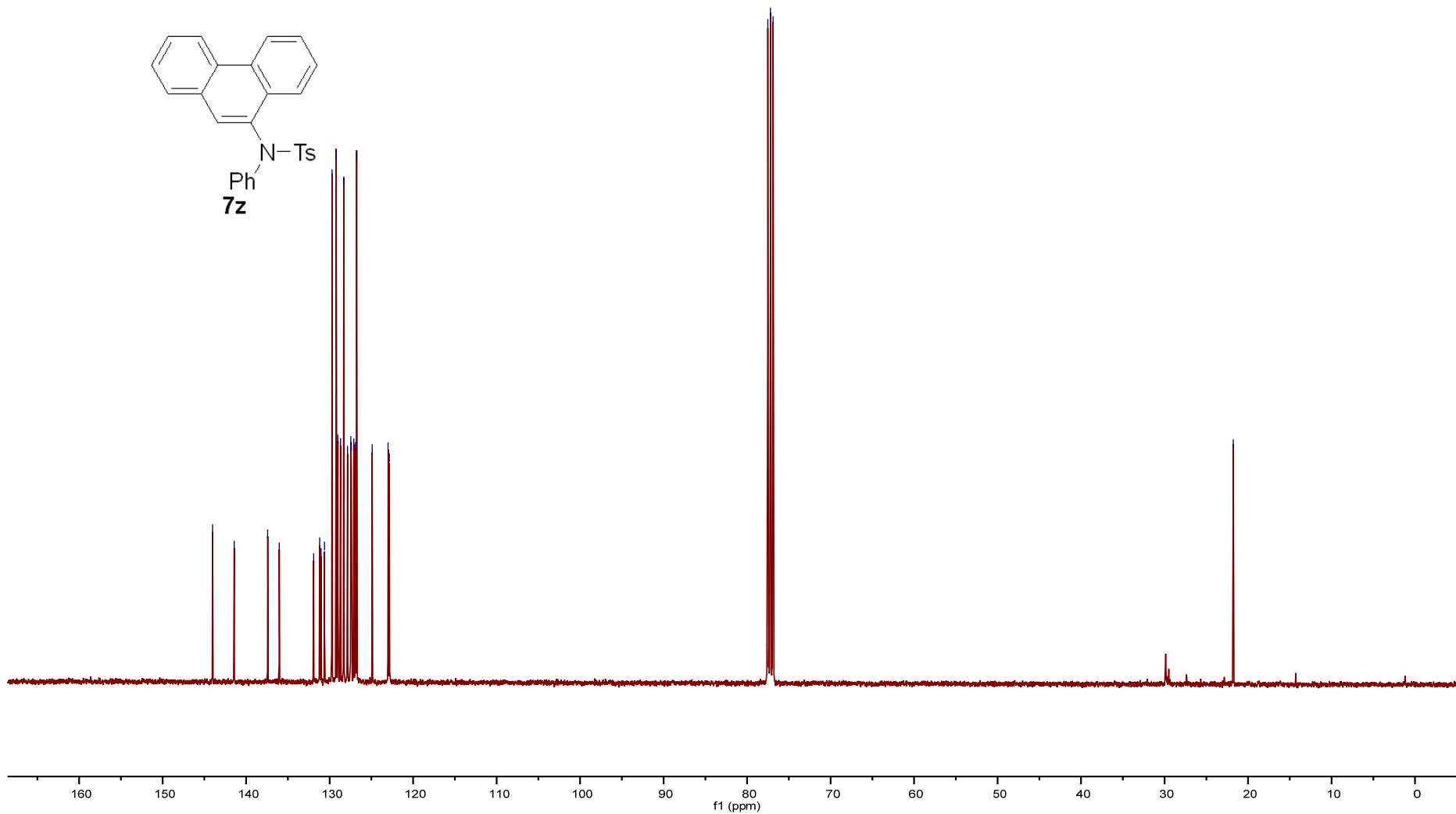
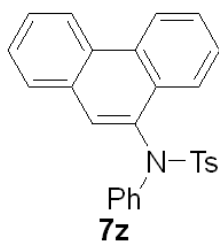


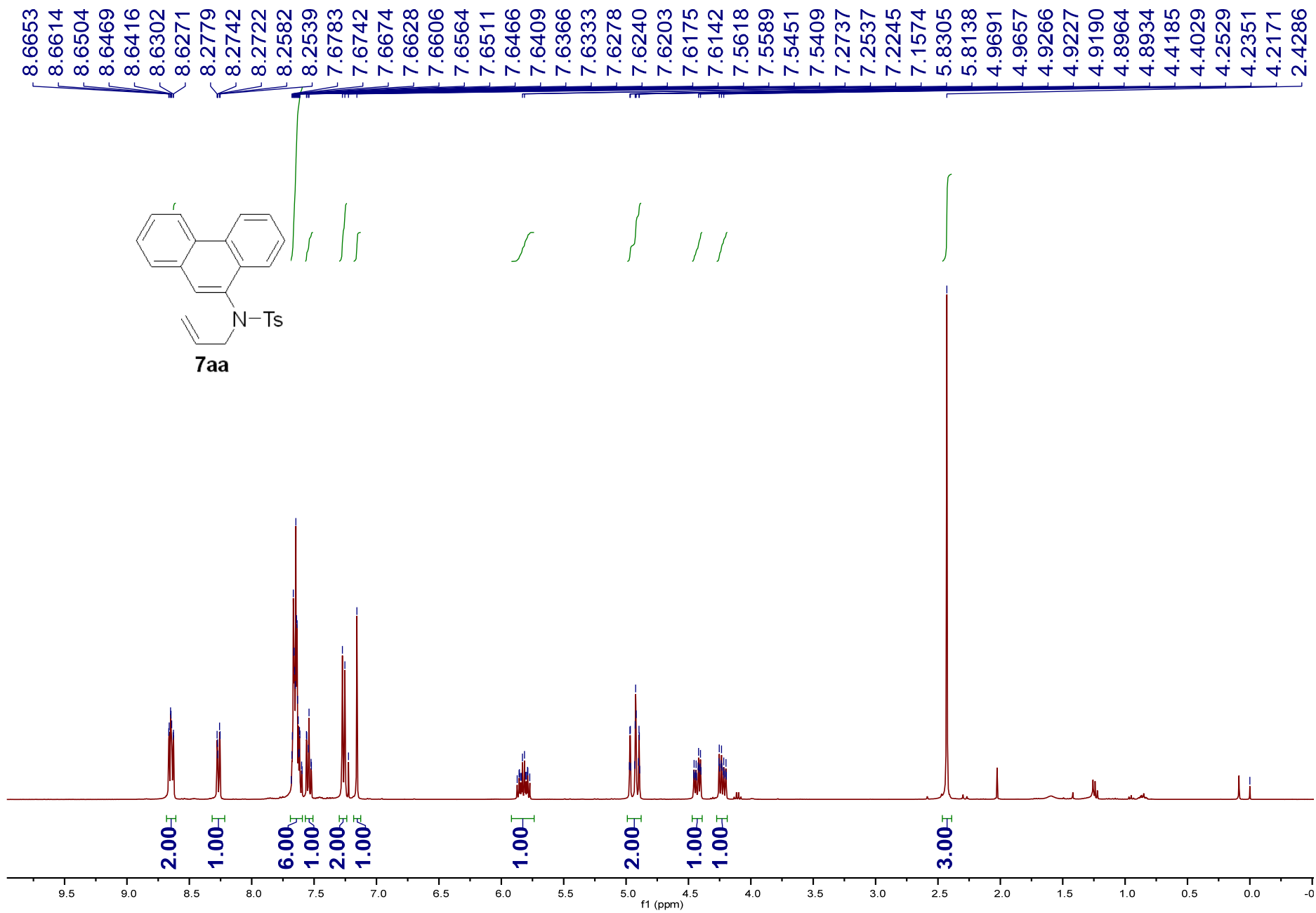


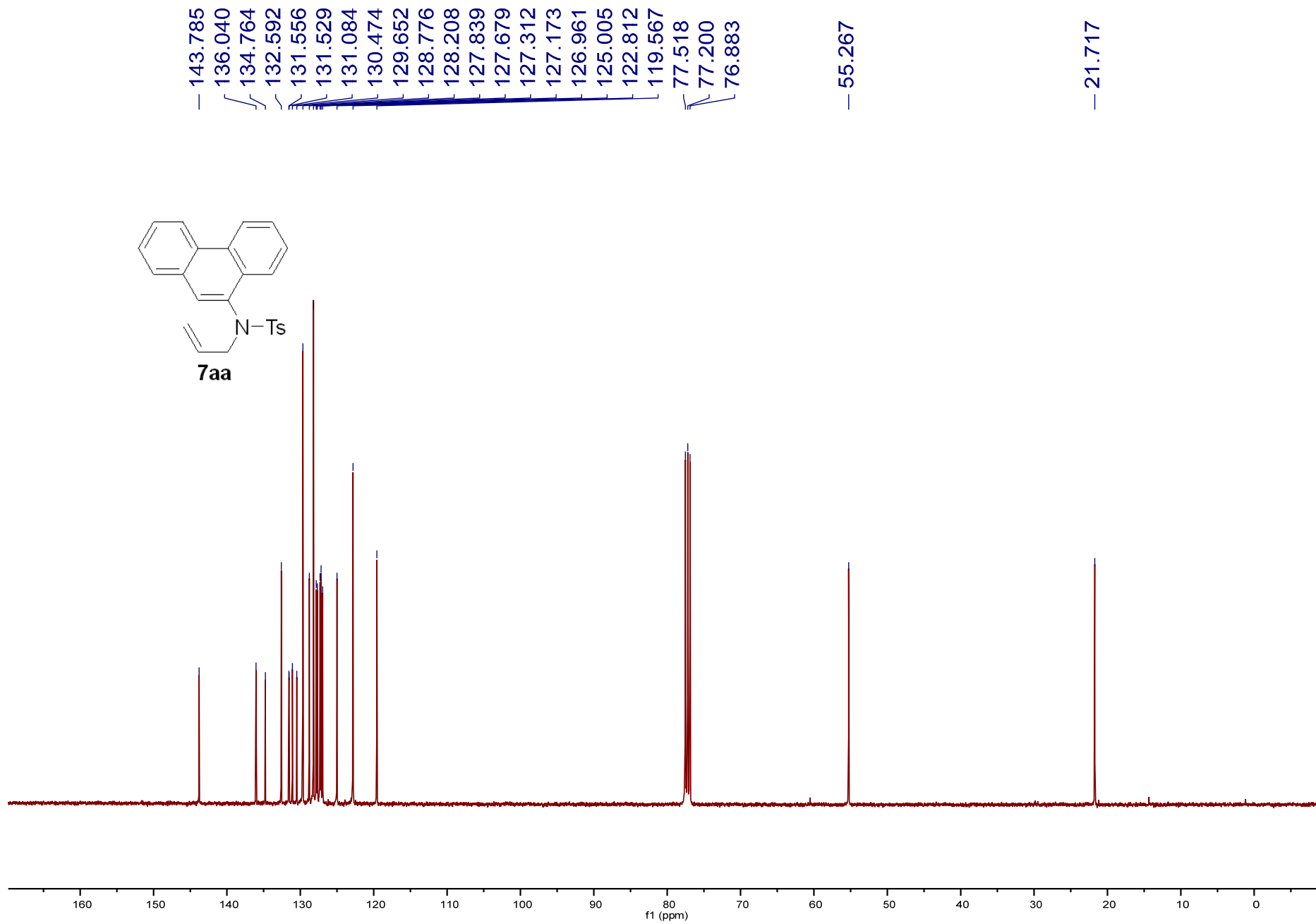
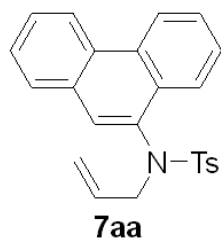
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130.611
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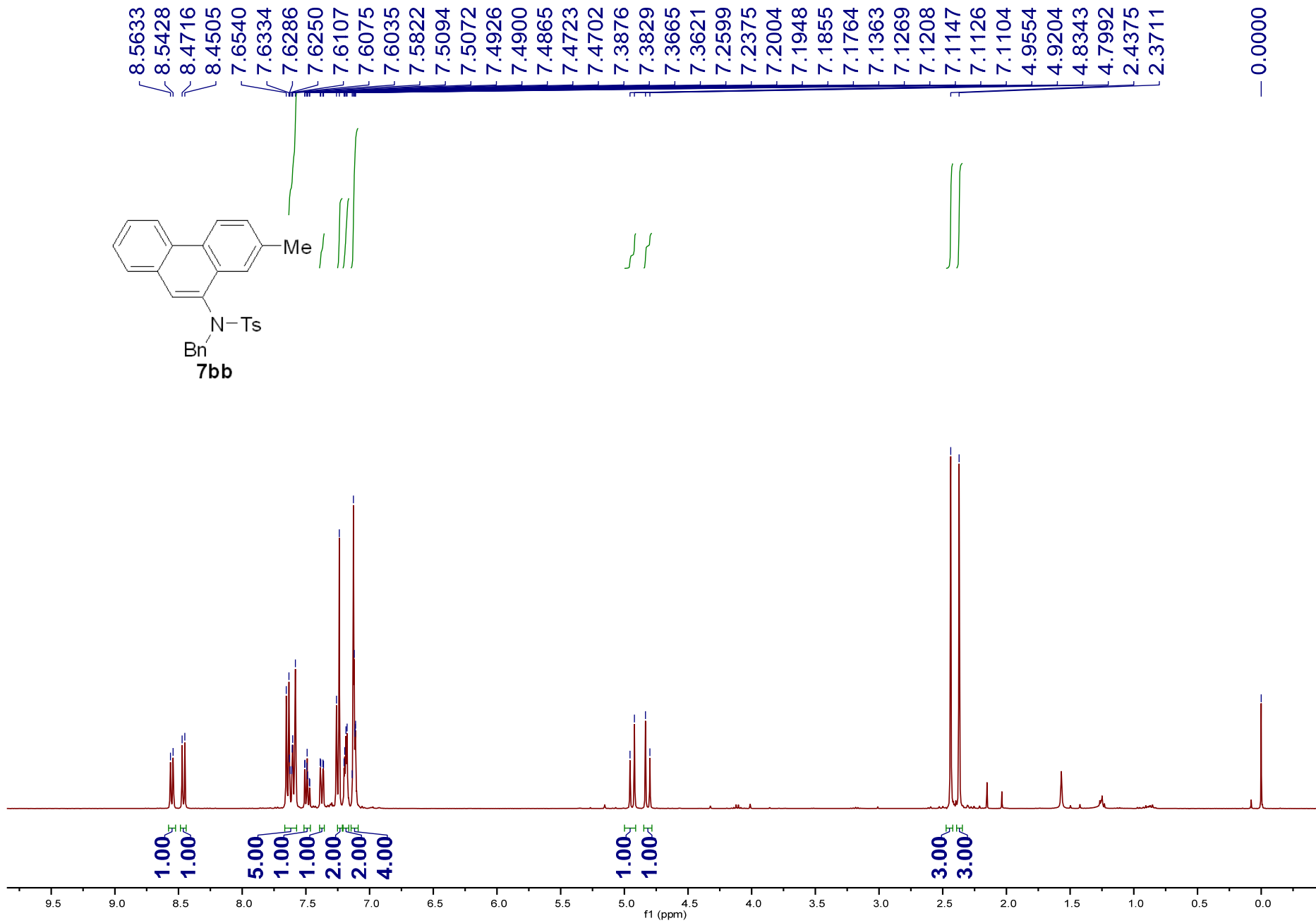
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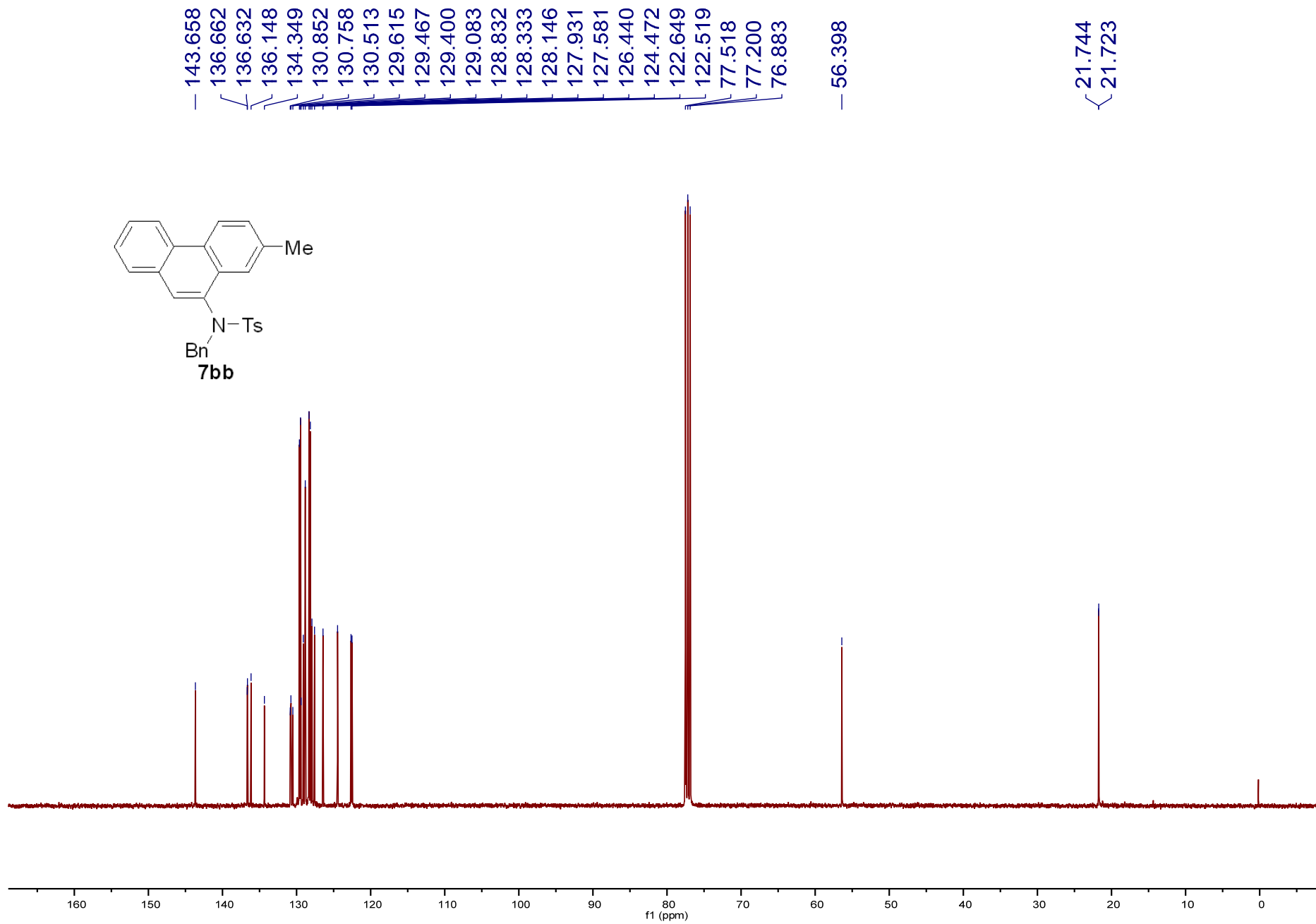
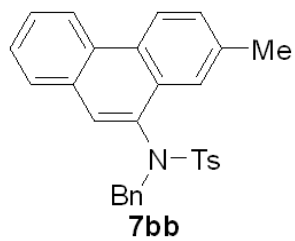
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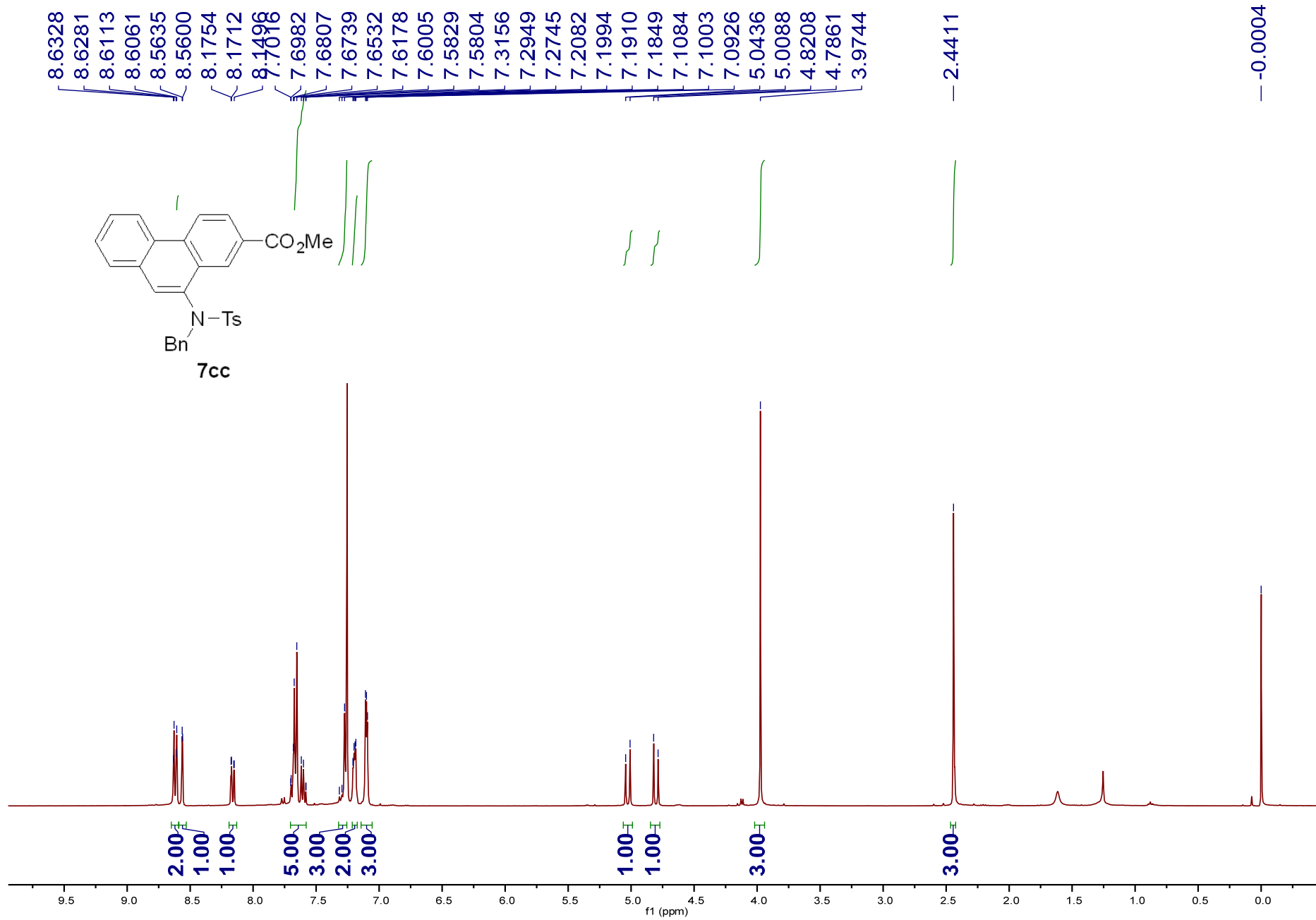


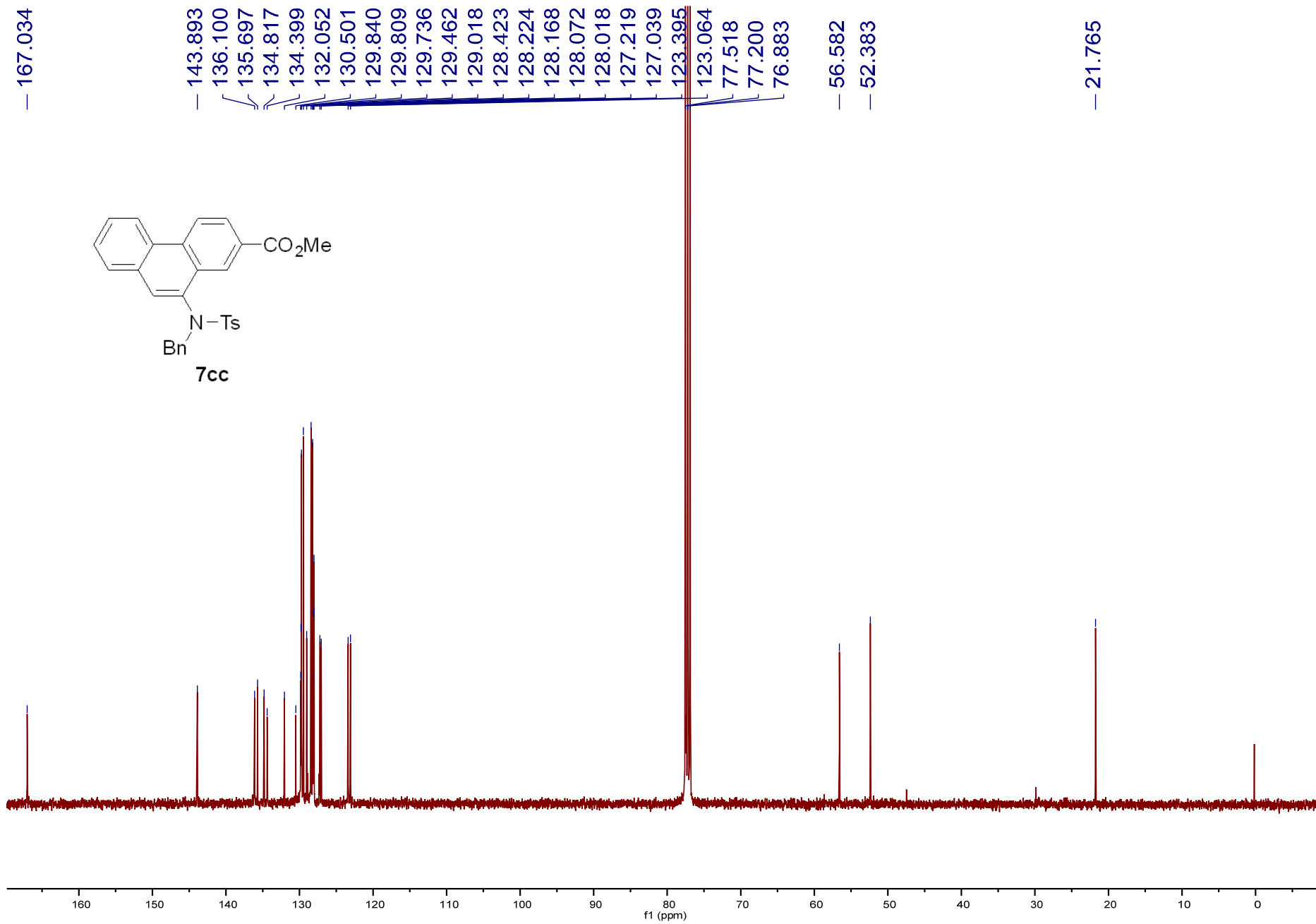


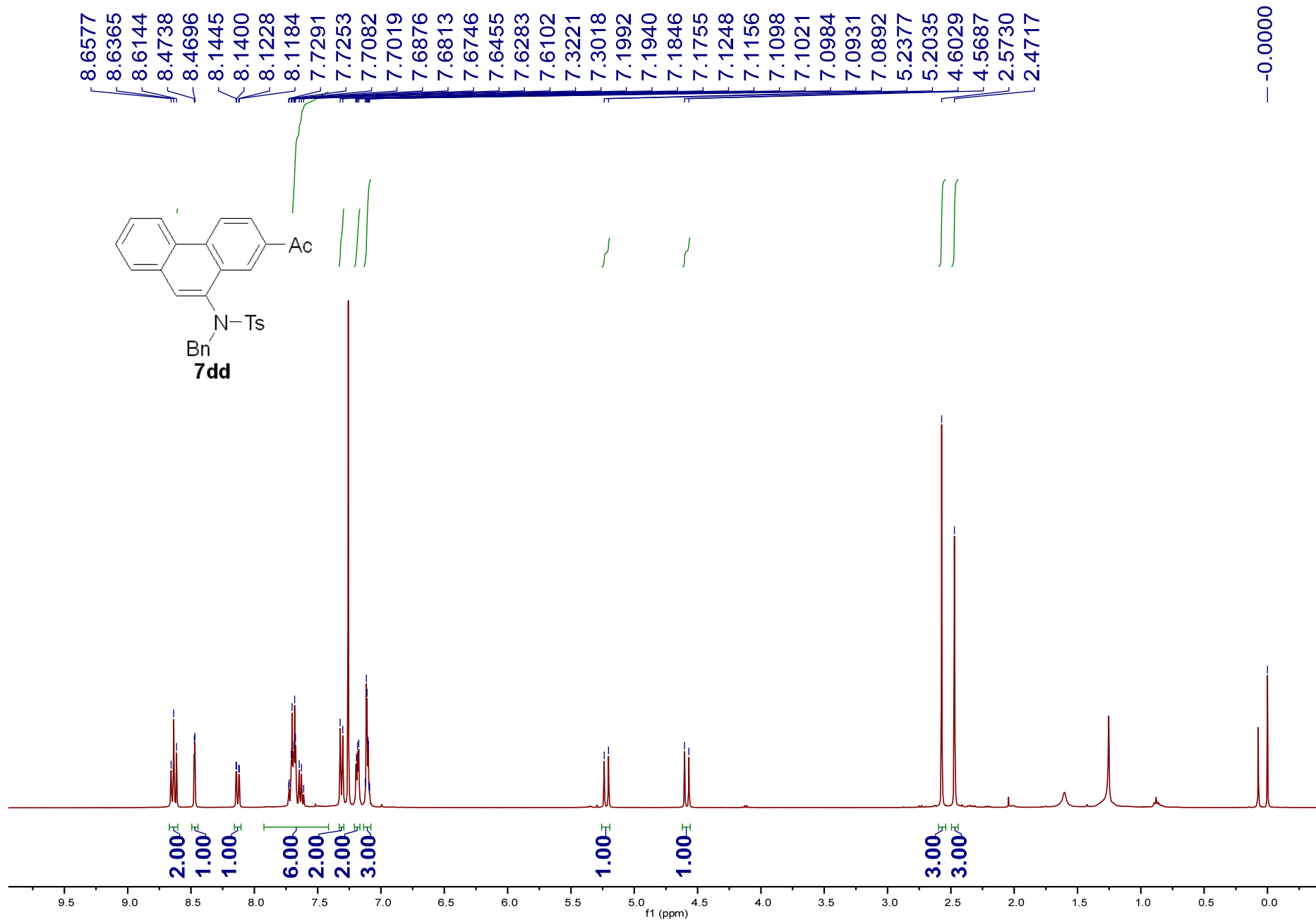


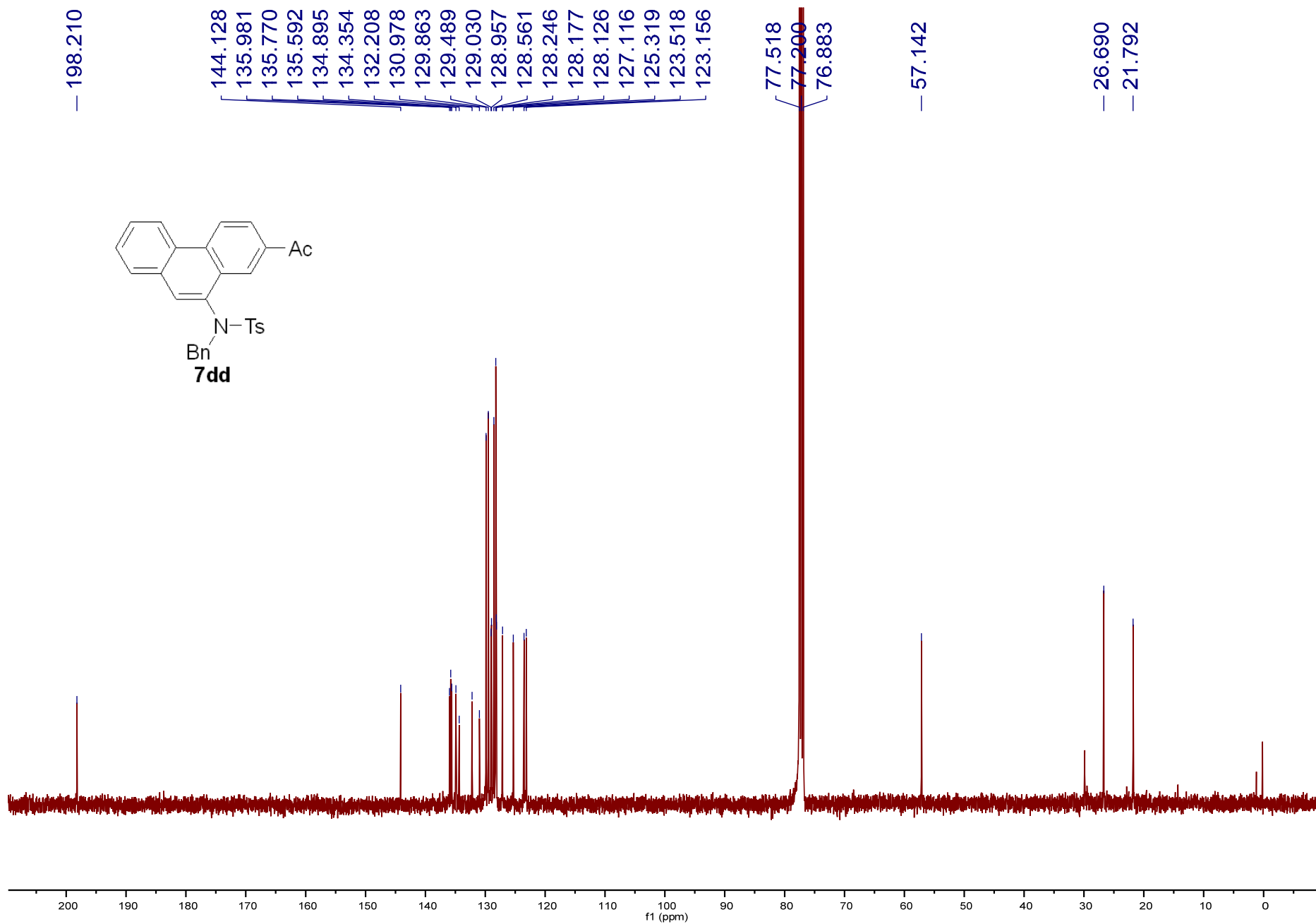
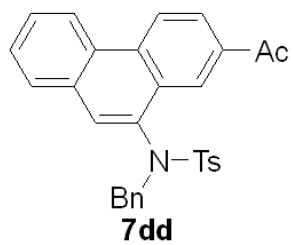


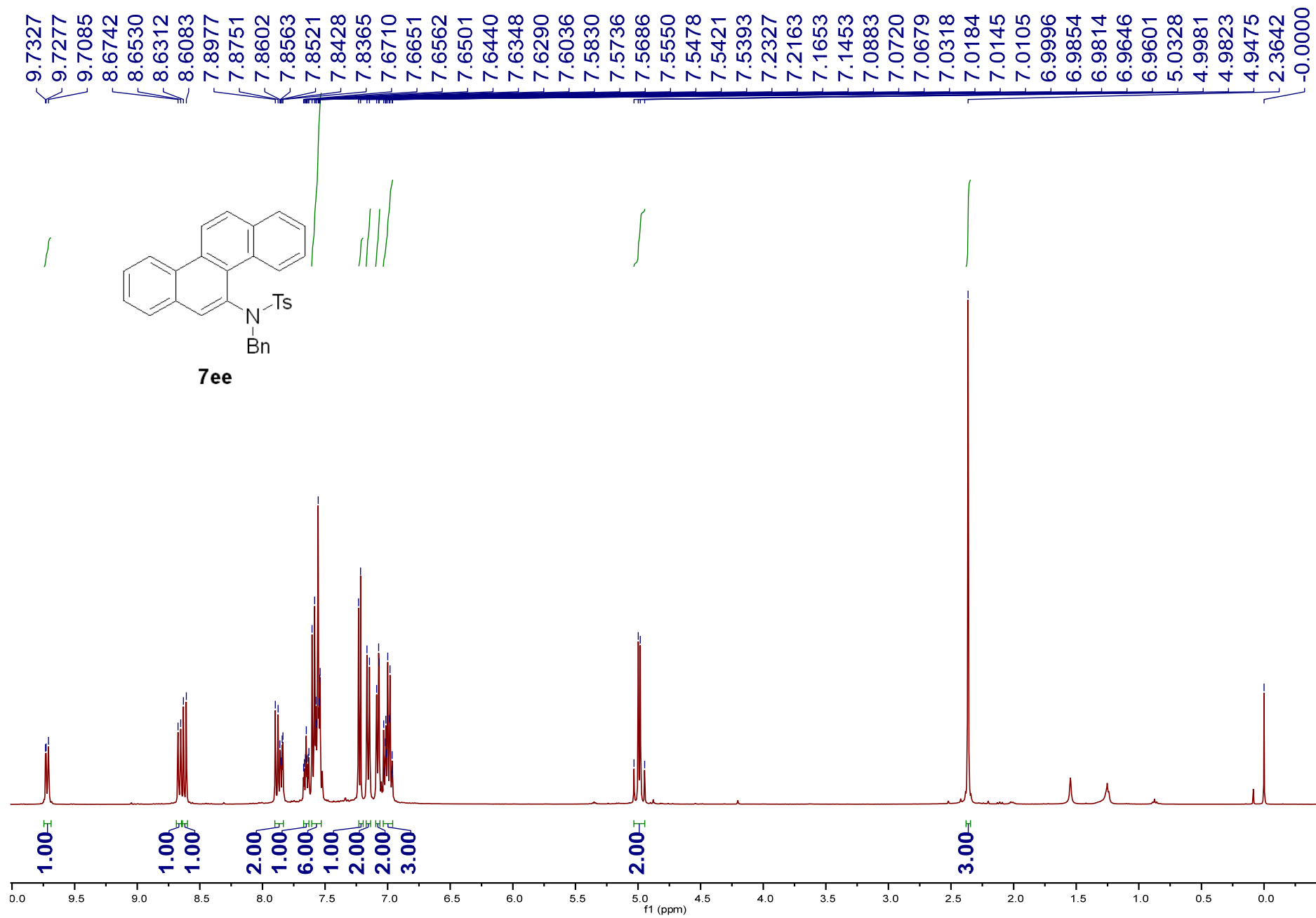


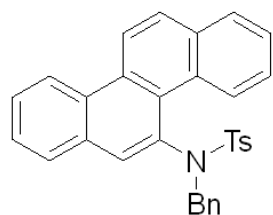












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