

I₂ Catalyzed Tandem Protocol for Synthesis of Quinoxalines *via* sp³, sp² and sp C-H Functionalization

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^a*Department of Dyestuff Technology, Institute of Chemical Technology, Mumbai 400019, India*

^b*National Taiwan University, Taipei 10617, Taiwan*

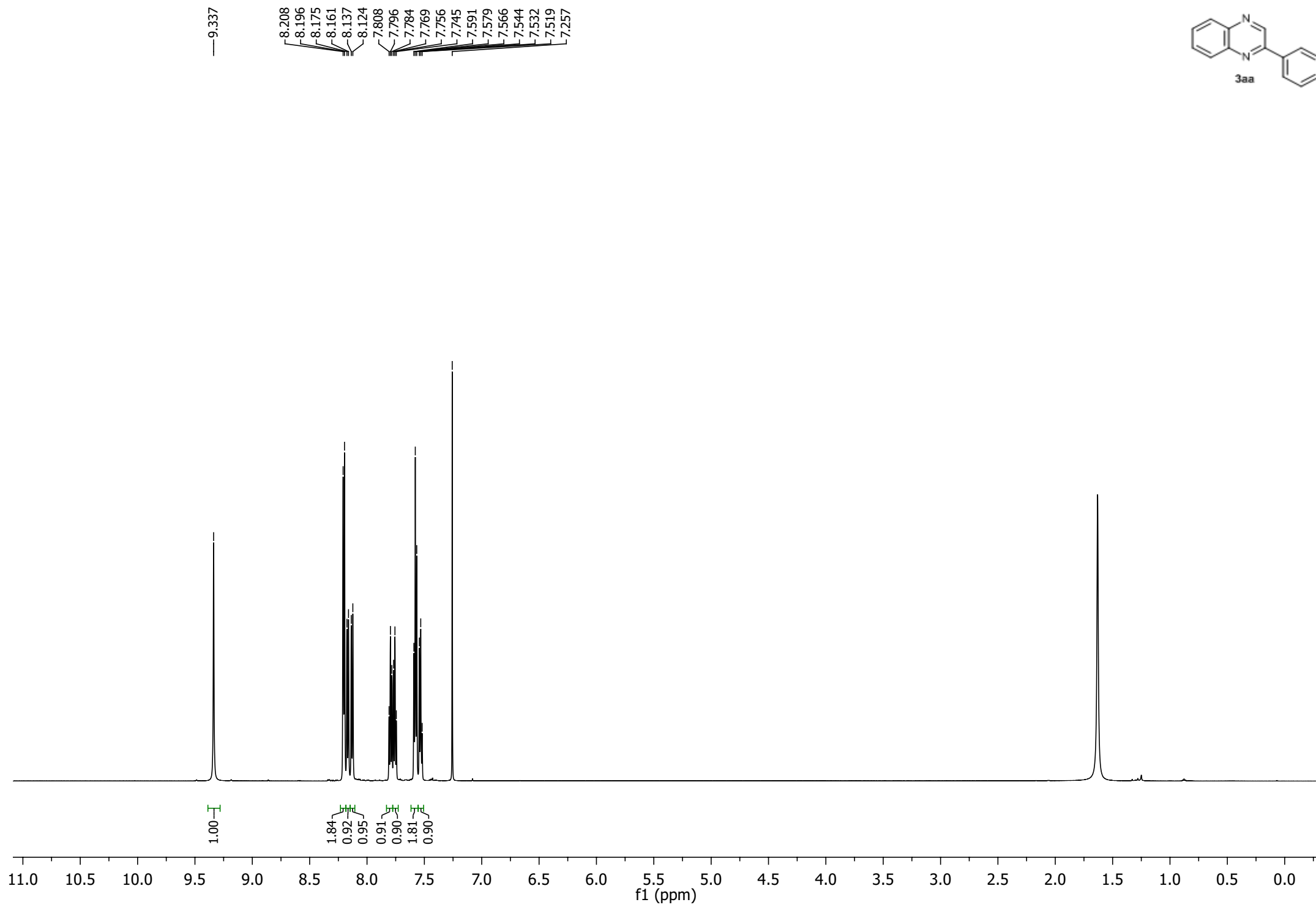
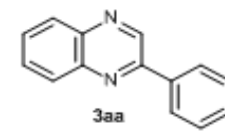
^c*National Centre for Nanosciences and Nanotechnology, University of Mumbai, Mumbai 400098, India*

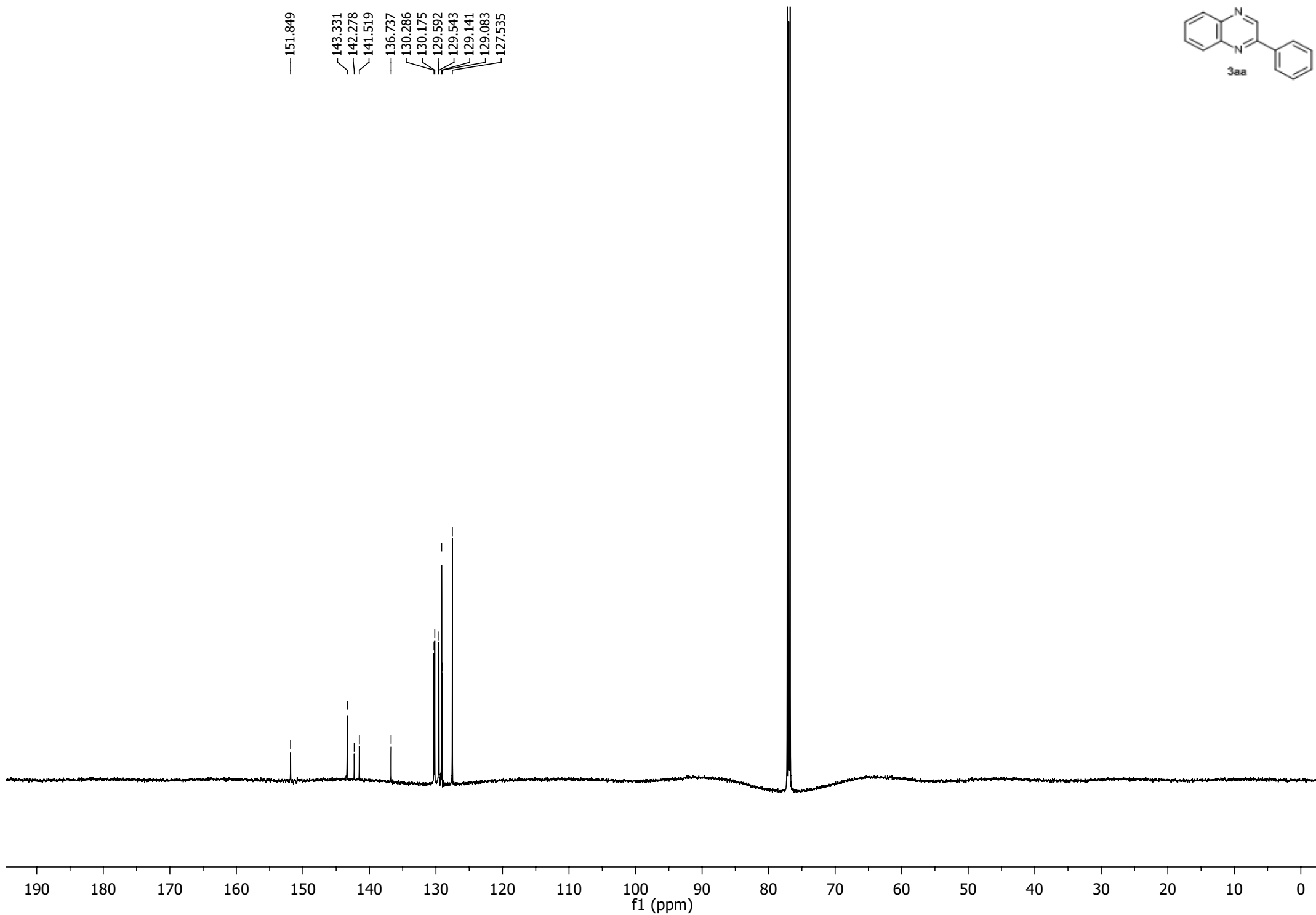
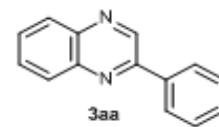
Tel.: +91-22- 3361 1111/ 2706; Fax: +91-22- 3361 1020; E-mail: achaskar25@gmail.com

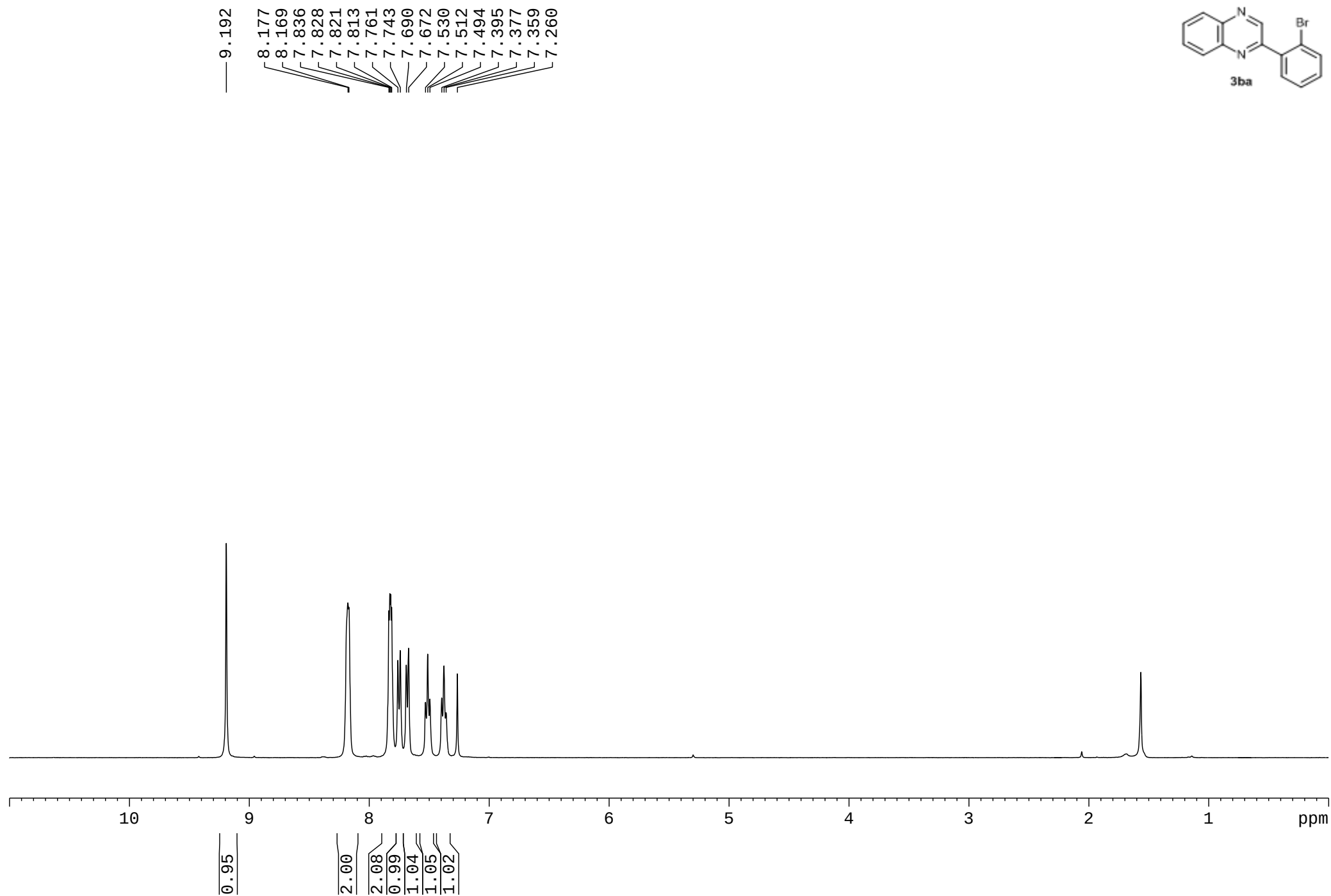
Supporting information

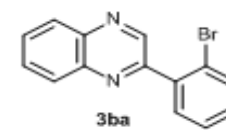
Content

1. Copies of ¹ H and ¹³ C NMR spectra of the products.....	2-51
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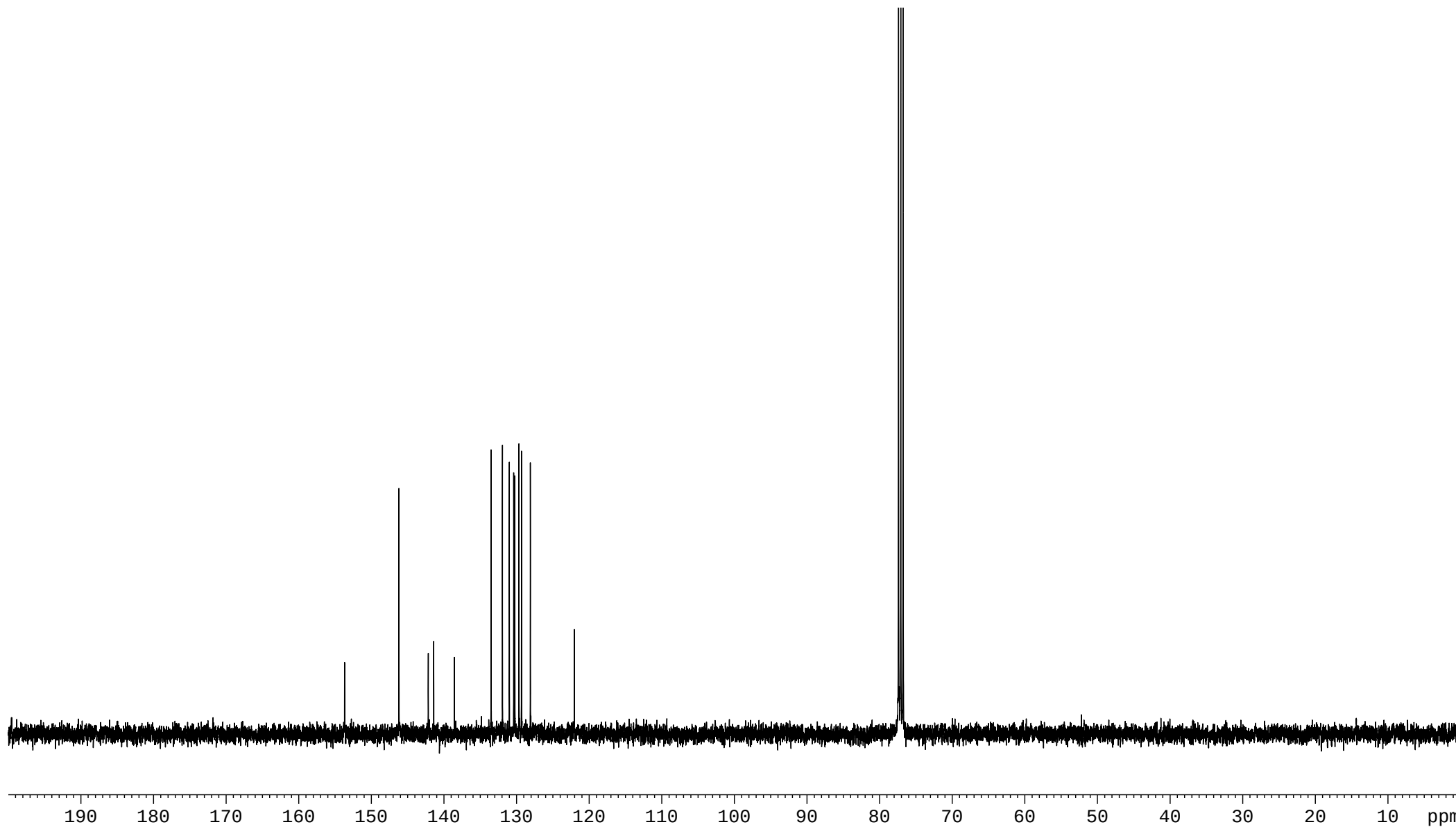


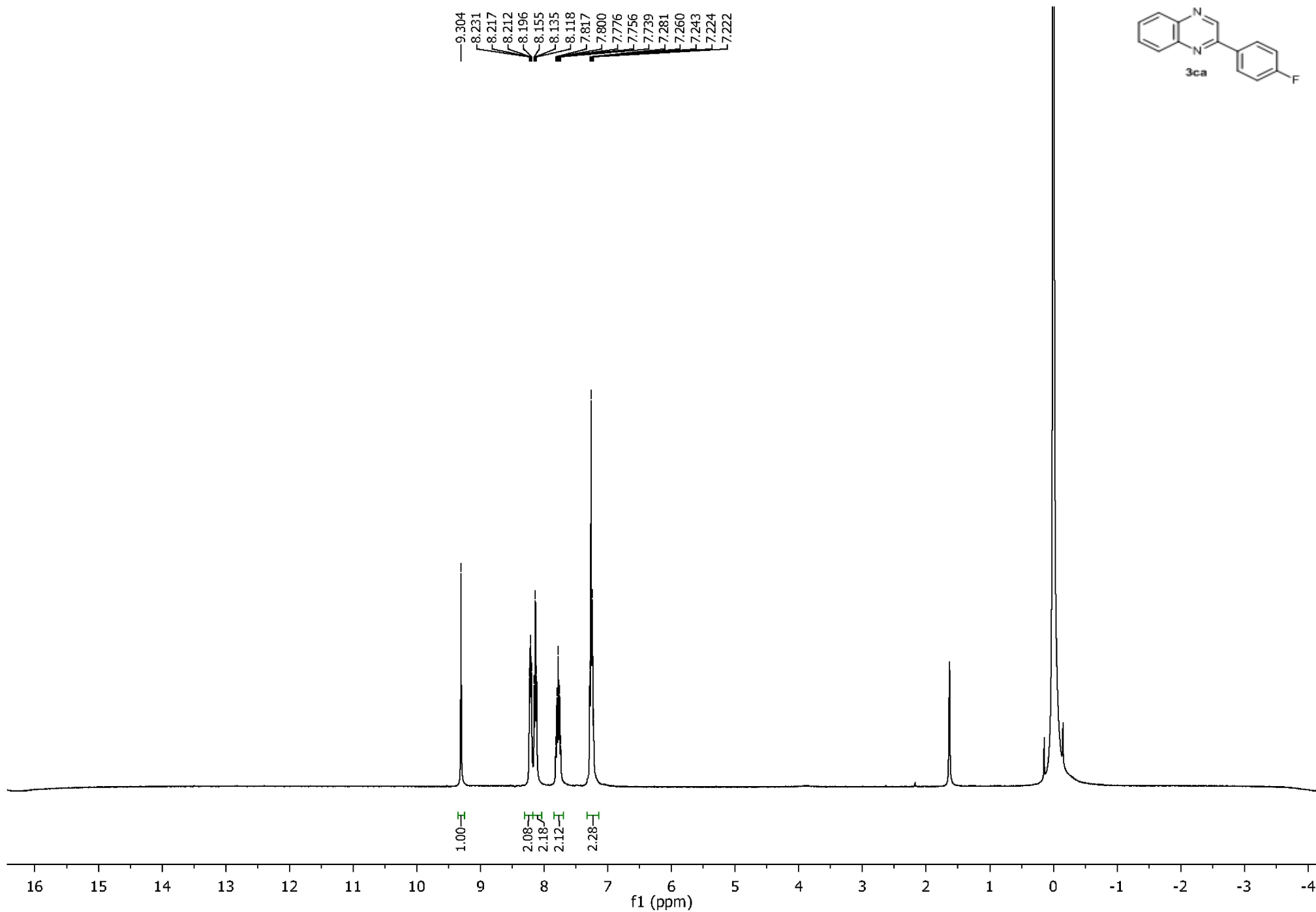
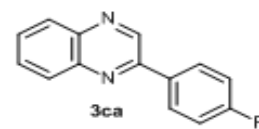


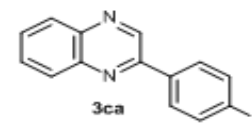




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146.207
142.159
141.411
138.568
133.510
131.949
130.995
130.391
130.240
129.675
129.324
128.099
122.054







— 165.545
— 163.052

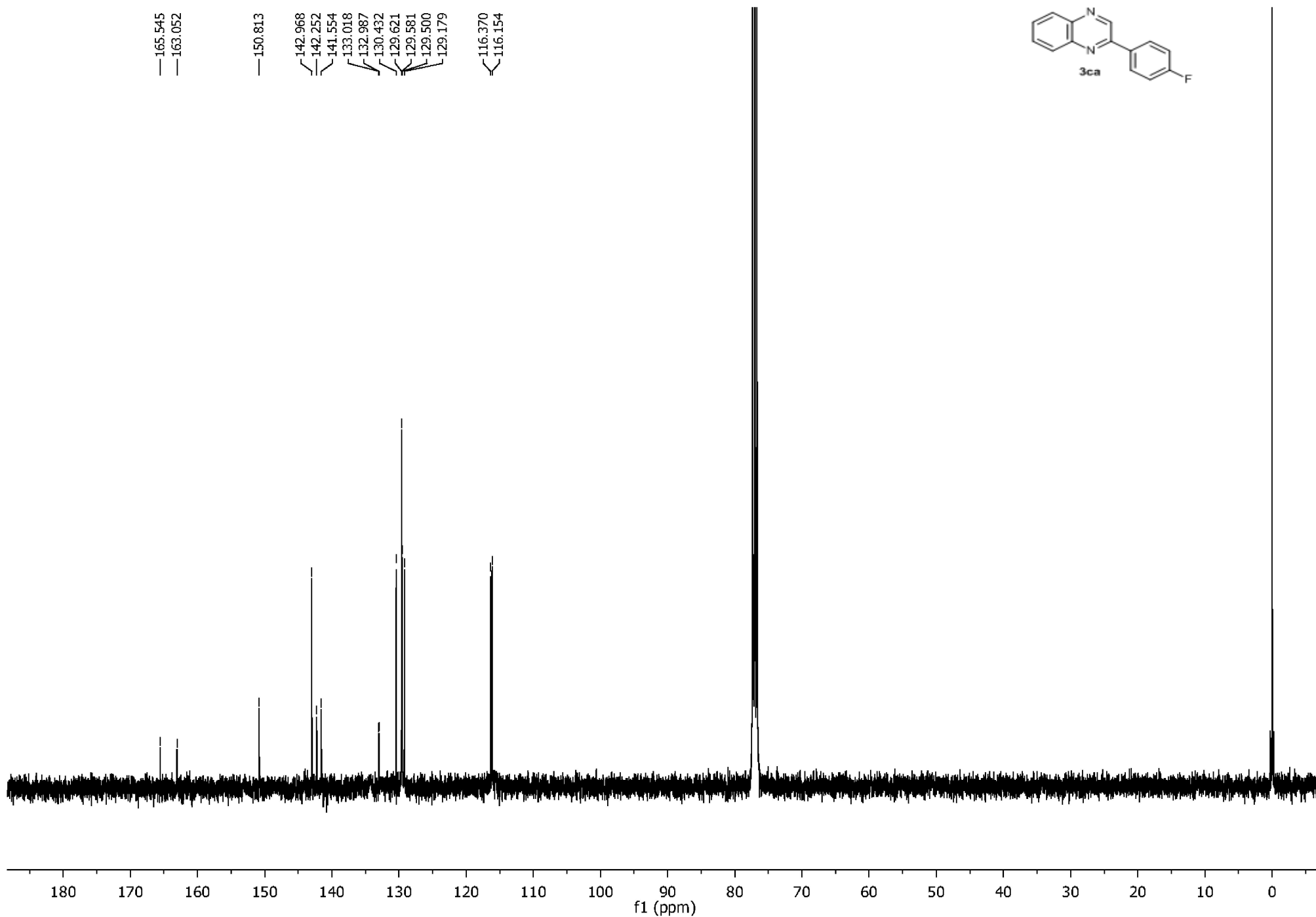
— 150.813

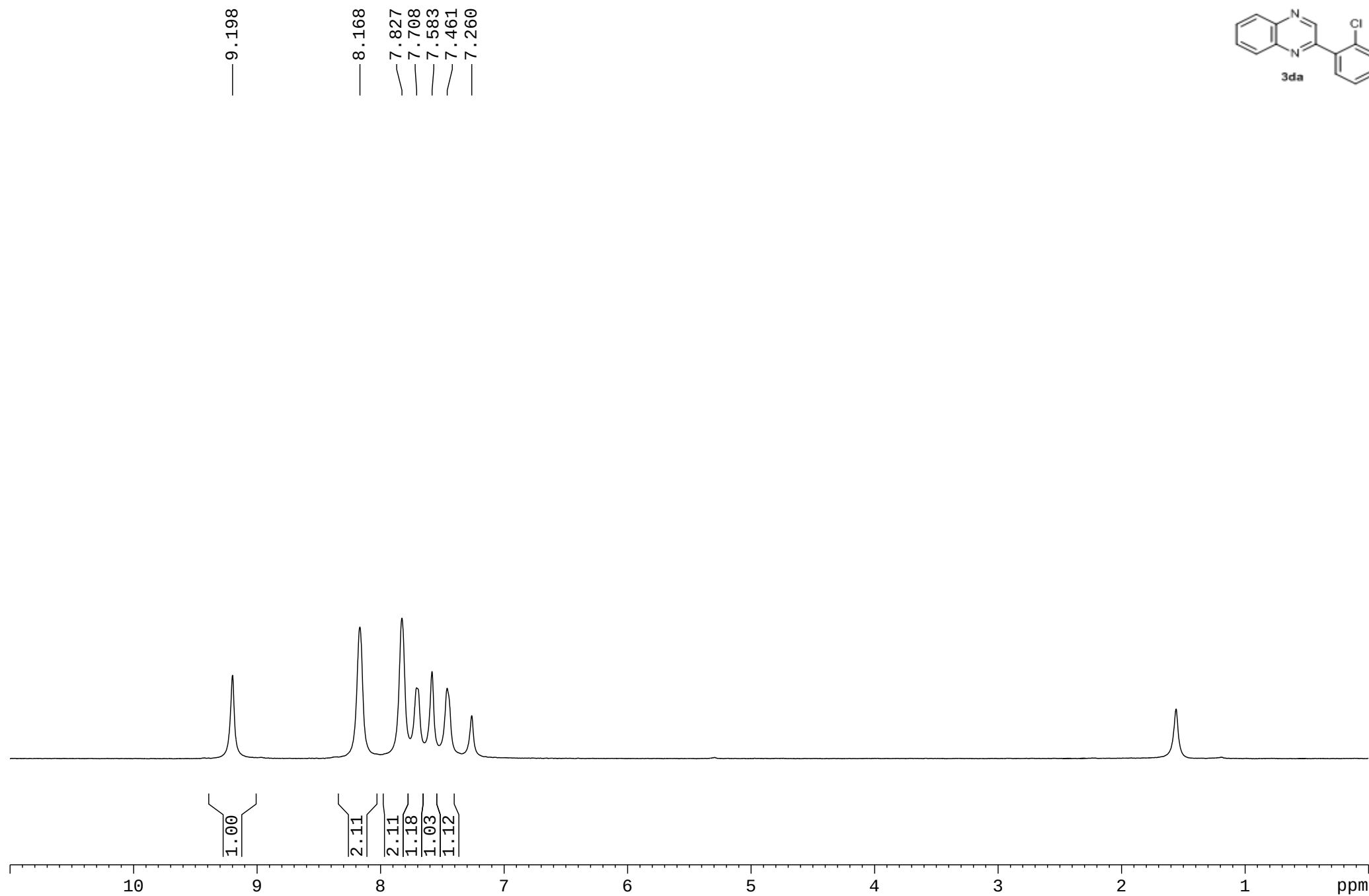
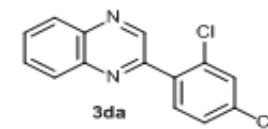
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— 142.252
— 141.554

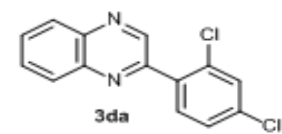
— 133.018
— 132.987
— 130.432

— 129.621
— 129.581
— 129.500
— 129.179

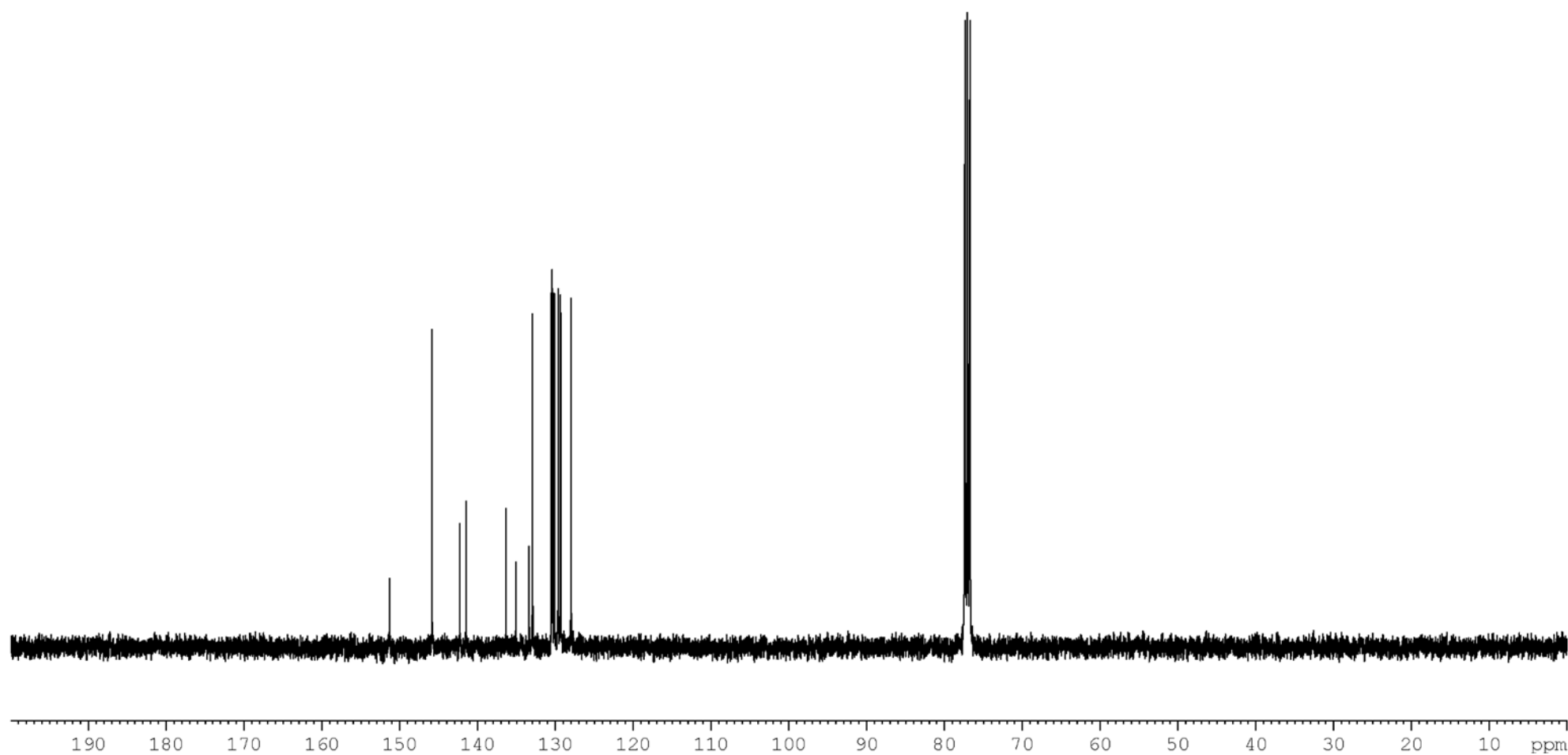
— 116.370
— 116.154

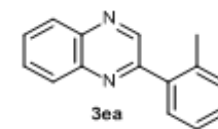
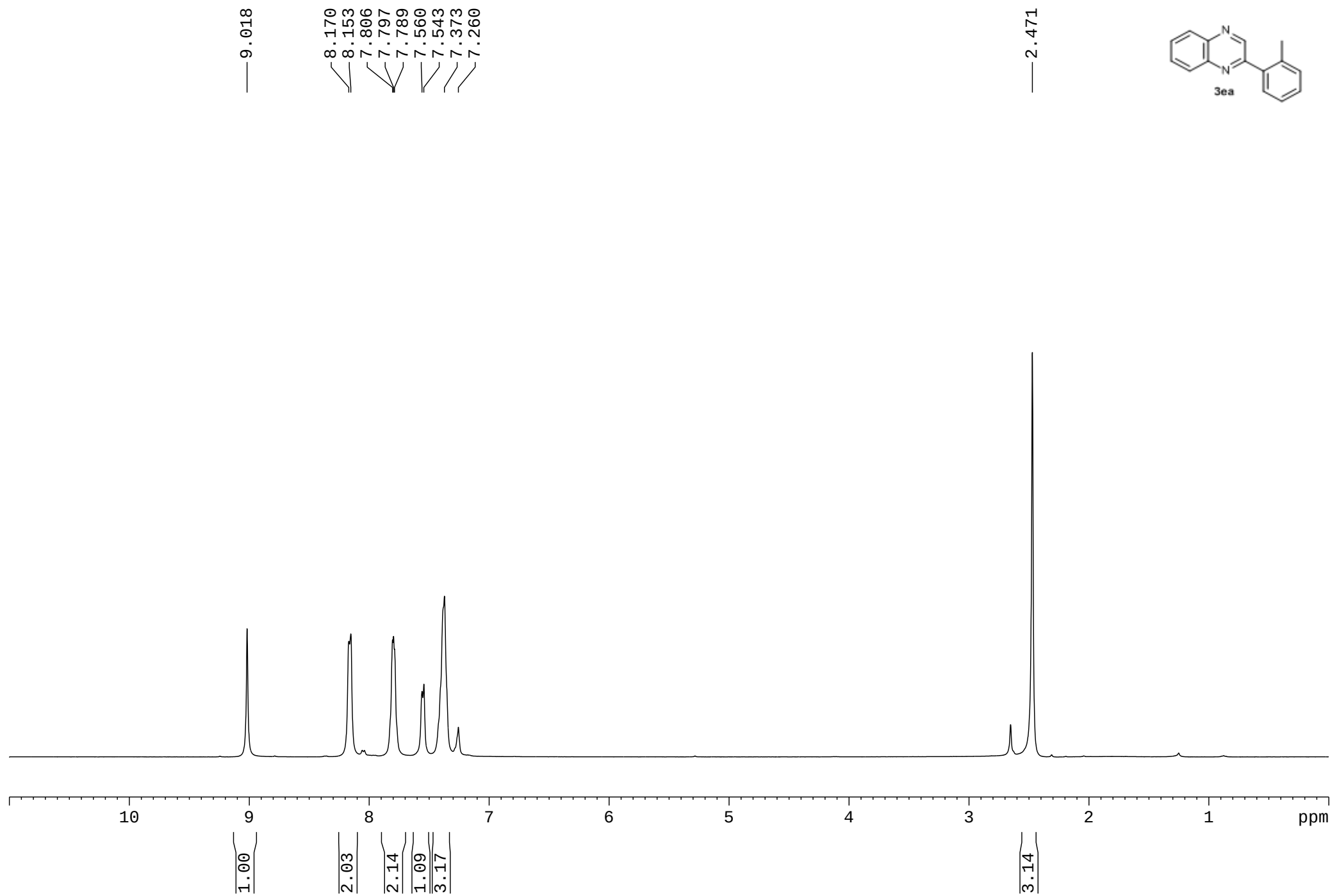


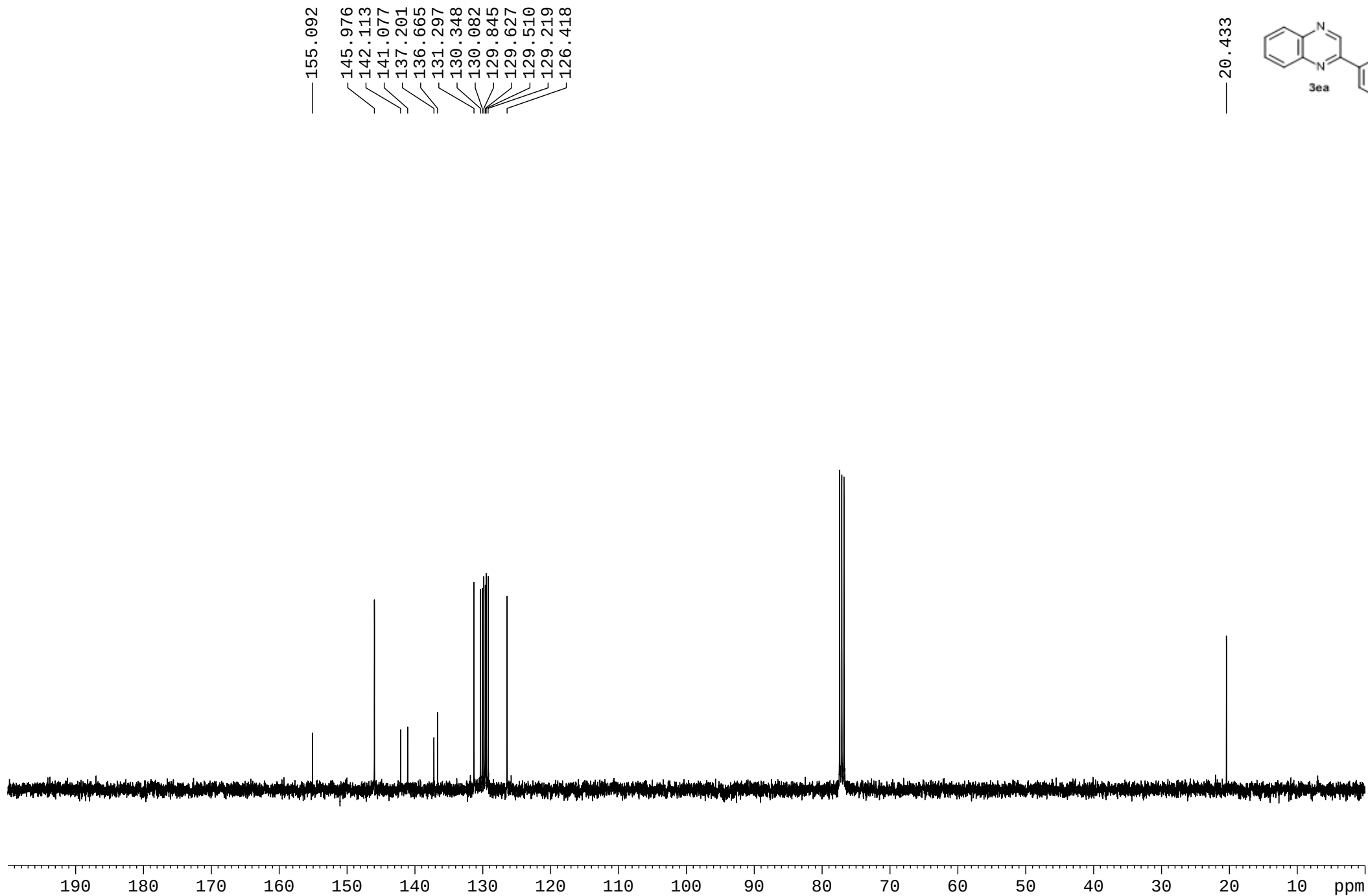


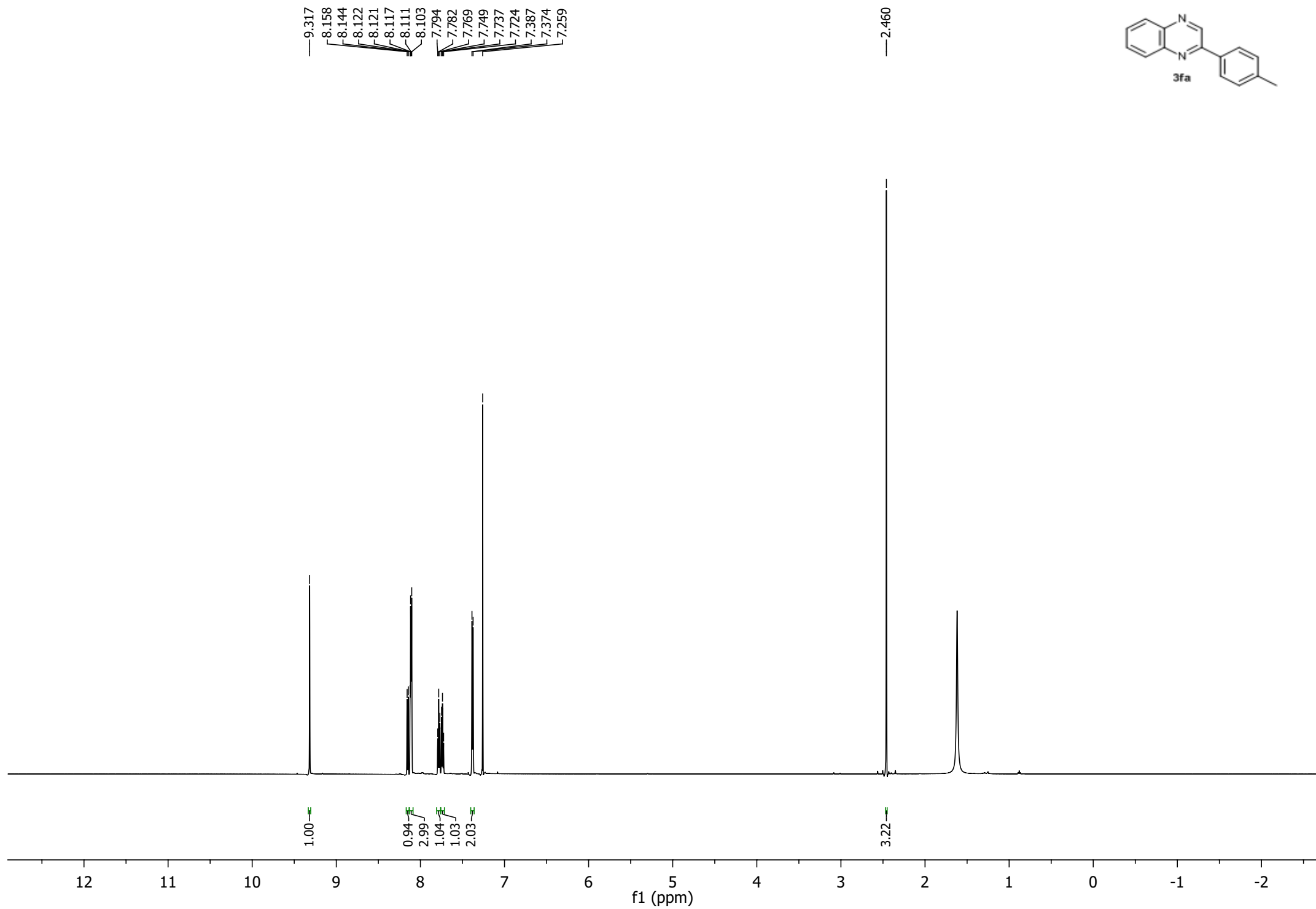


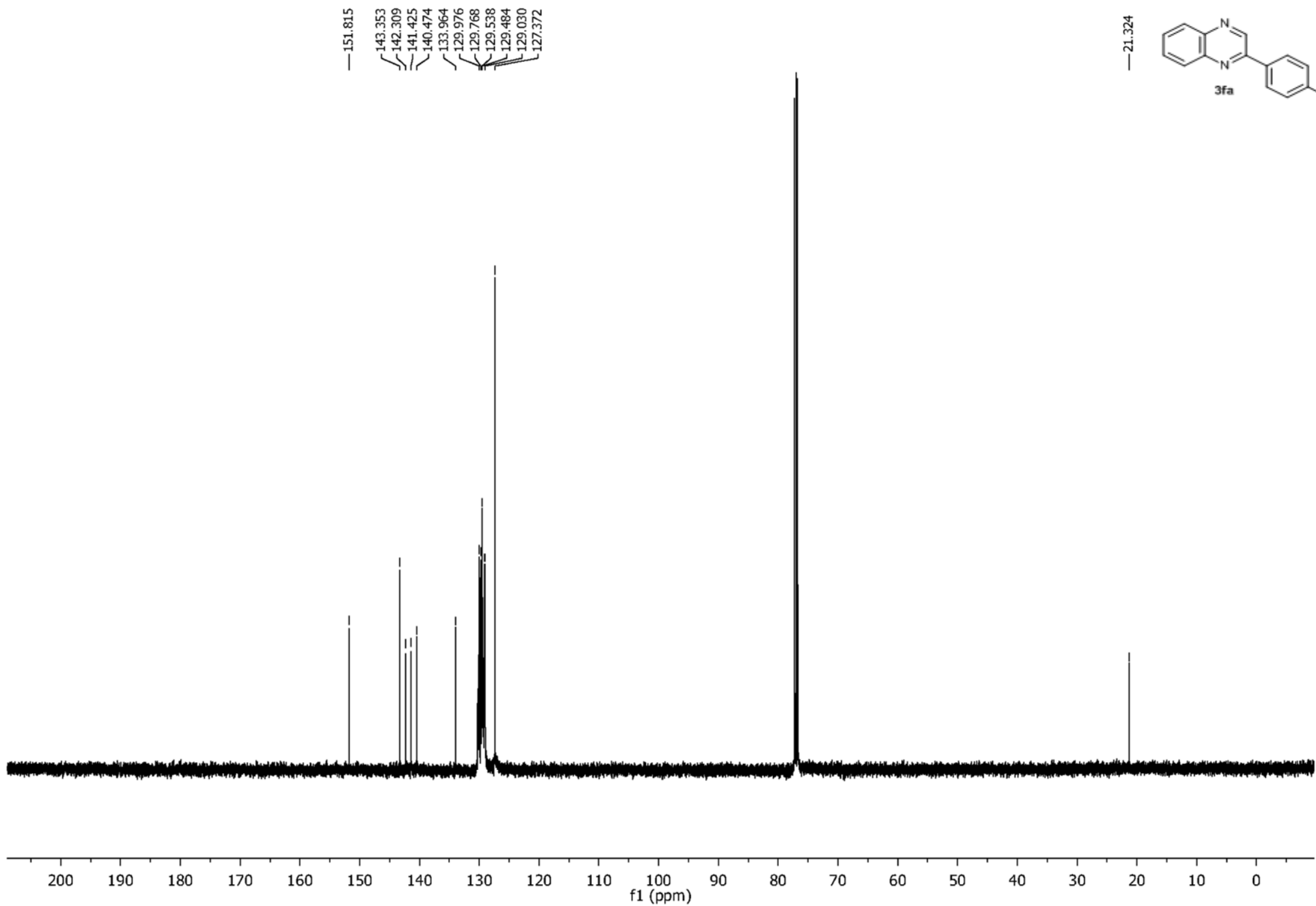
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129.346
127.999

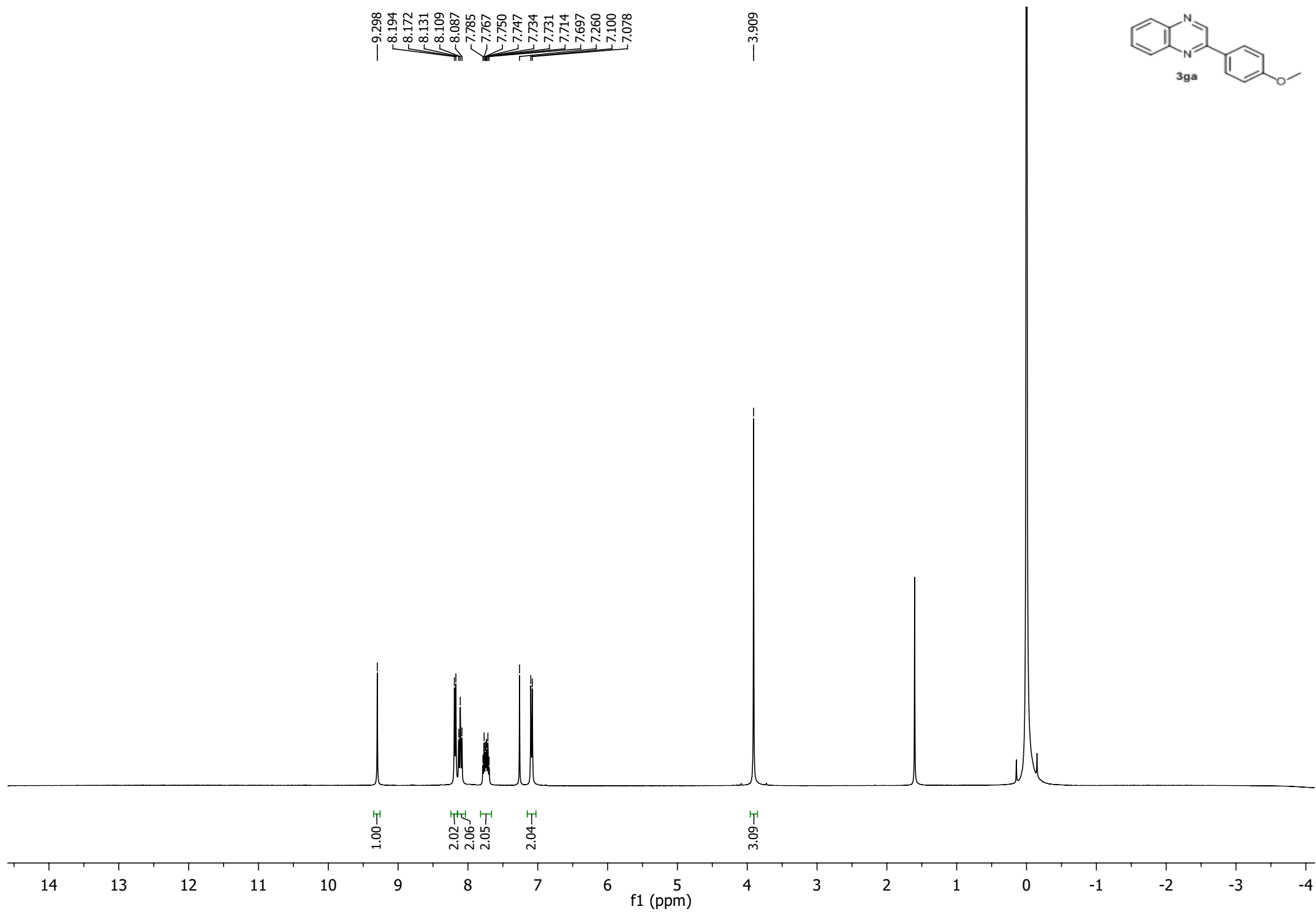


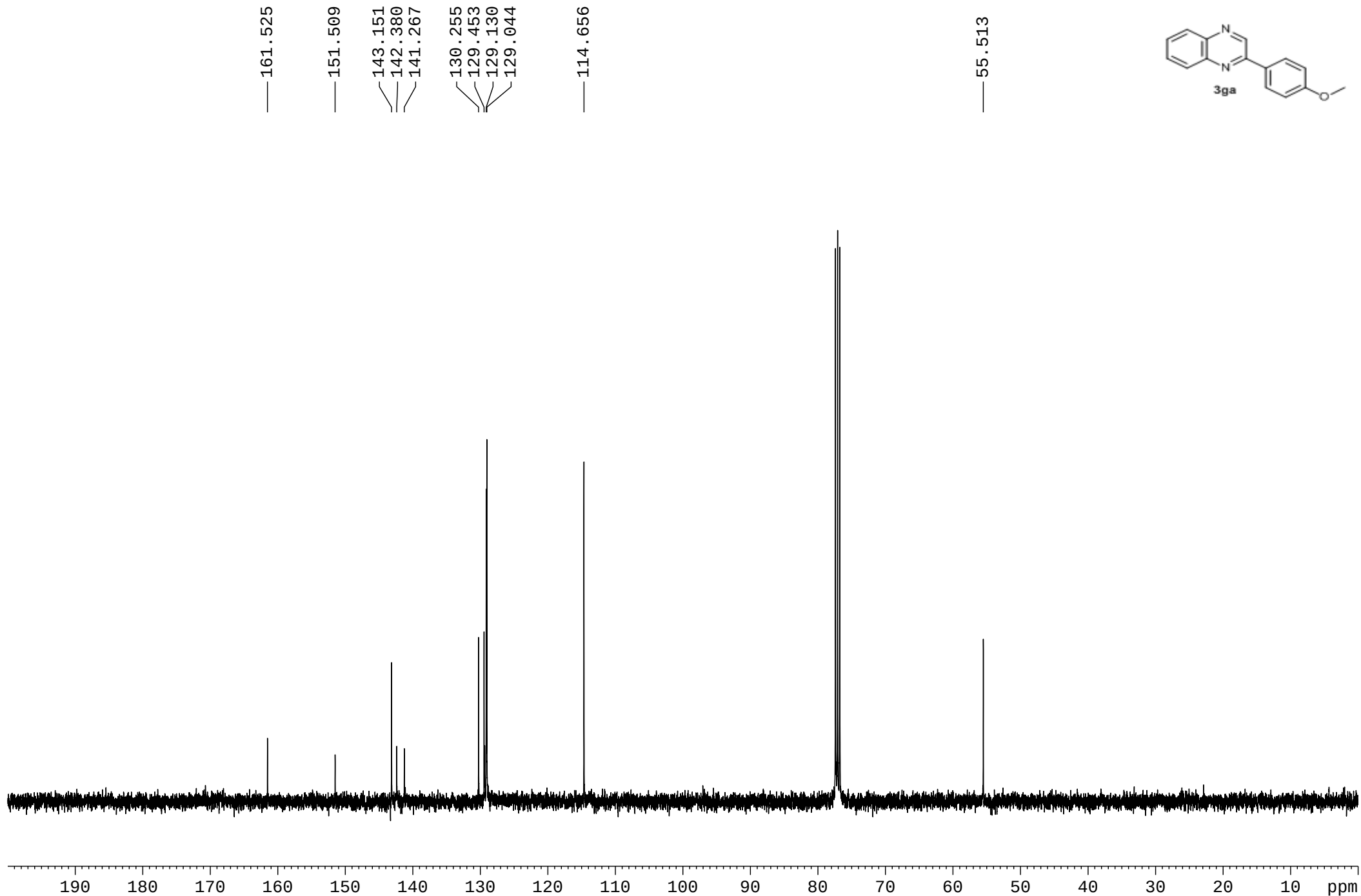


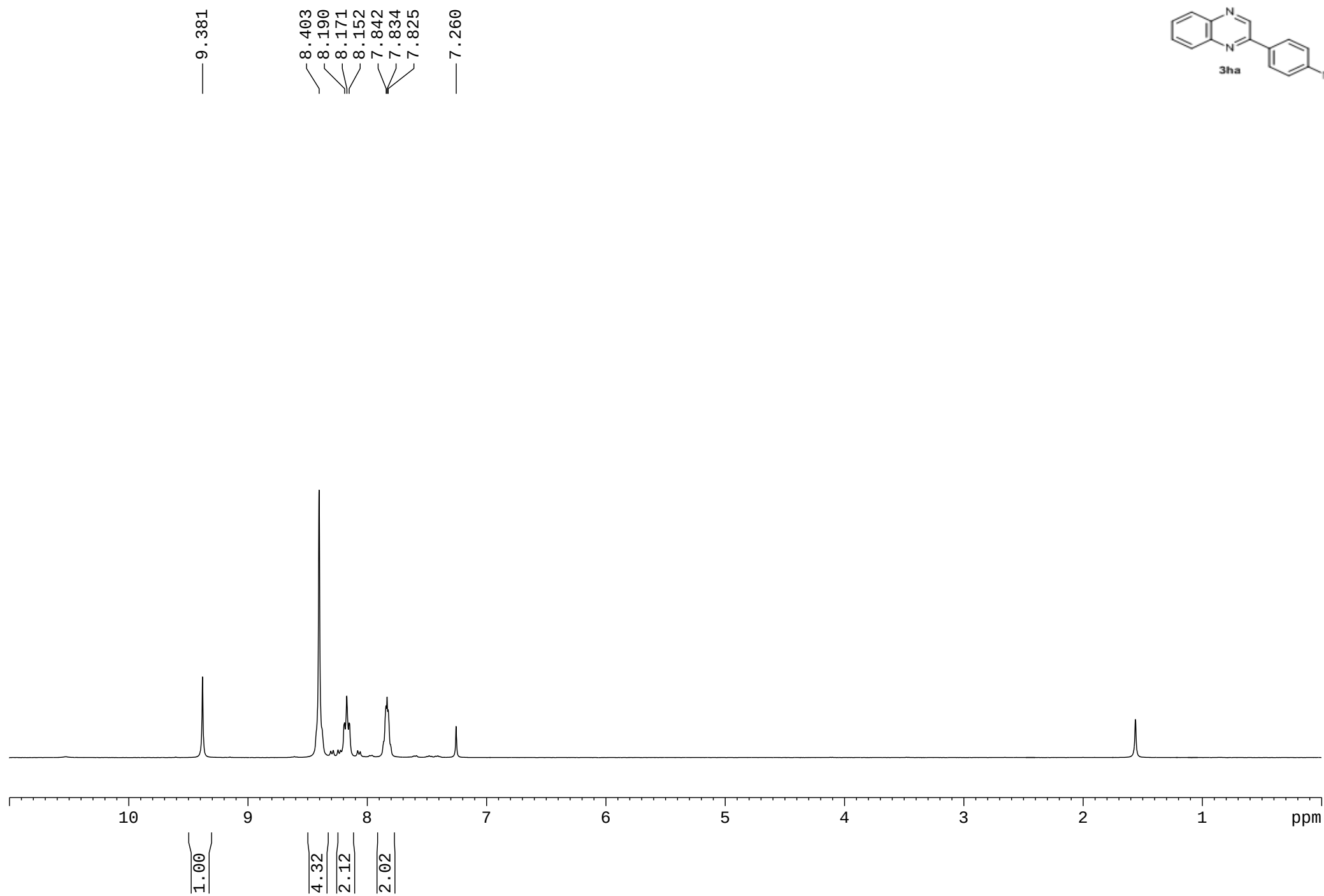


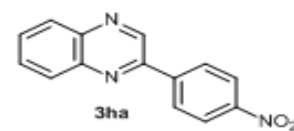




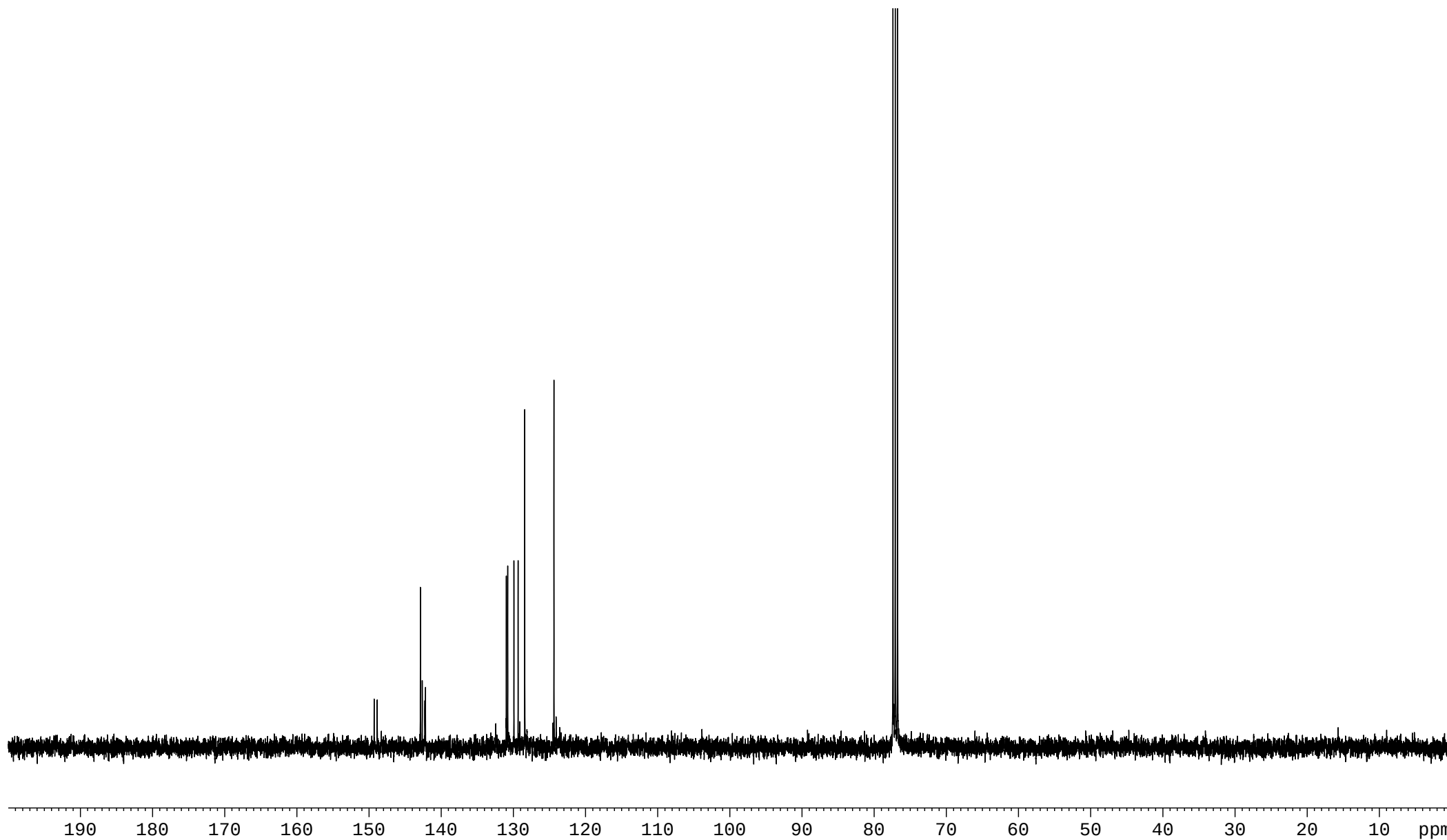


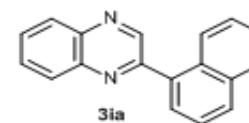






149.297
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142.881
142.623
142.267
142.174
130.974
130.780
129.921
129.346
128.421
124.380





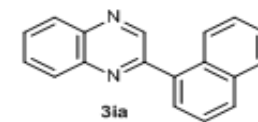
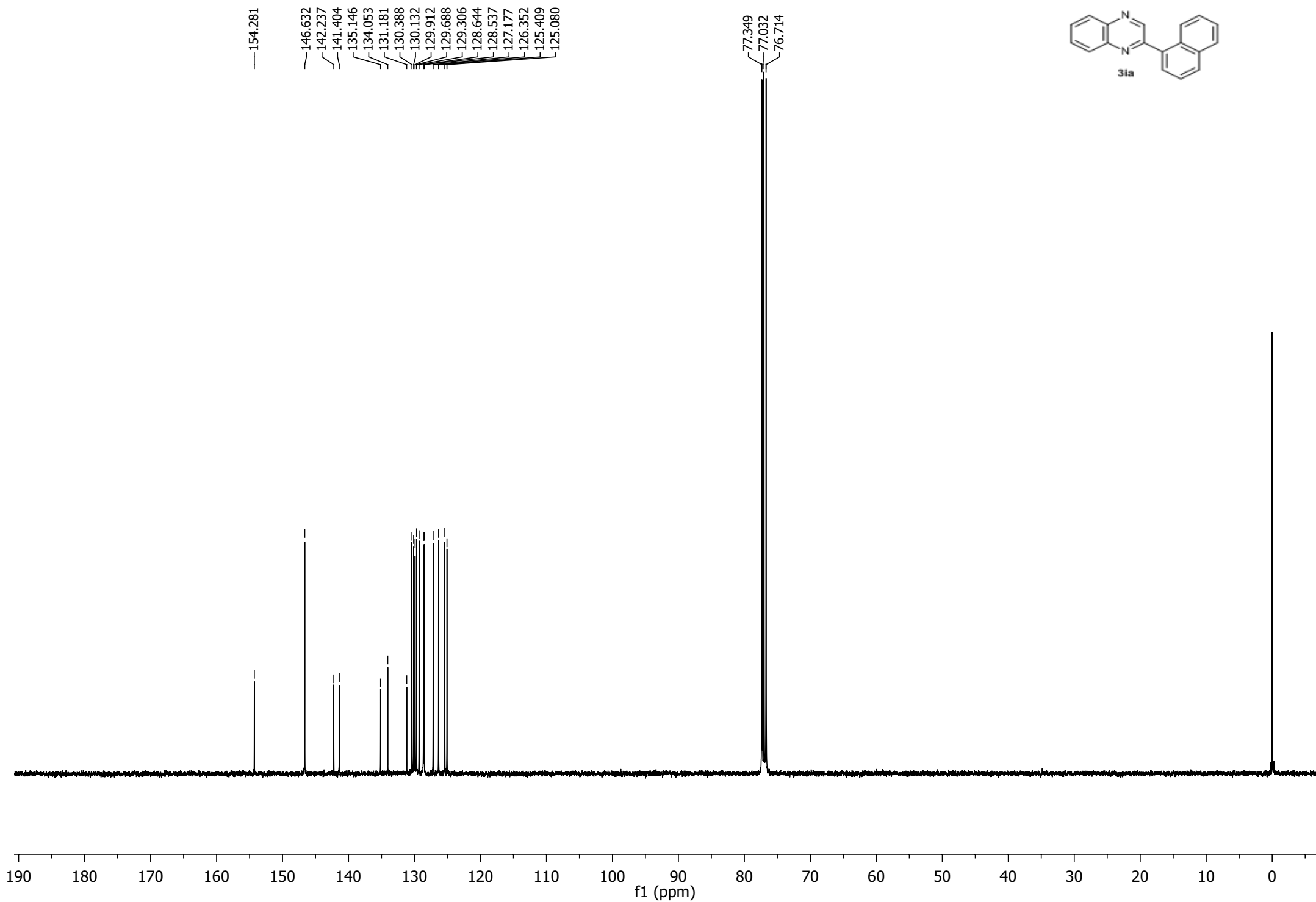
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8.235
8.219
8.205
8.199
8.185
8.165
8.023
8.003
7.974
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7.862
7.845
7.835
7.825
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7.621
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7.560
7.544
7.528
7.511
7.260

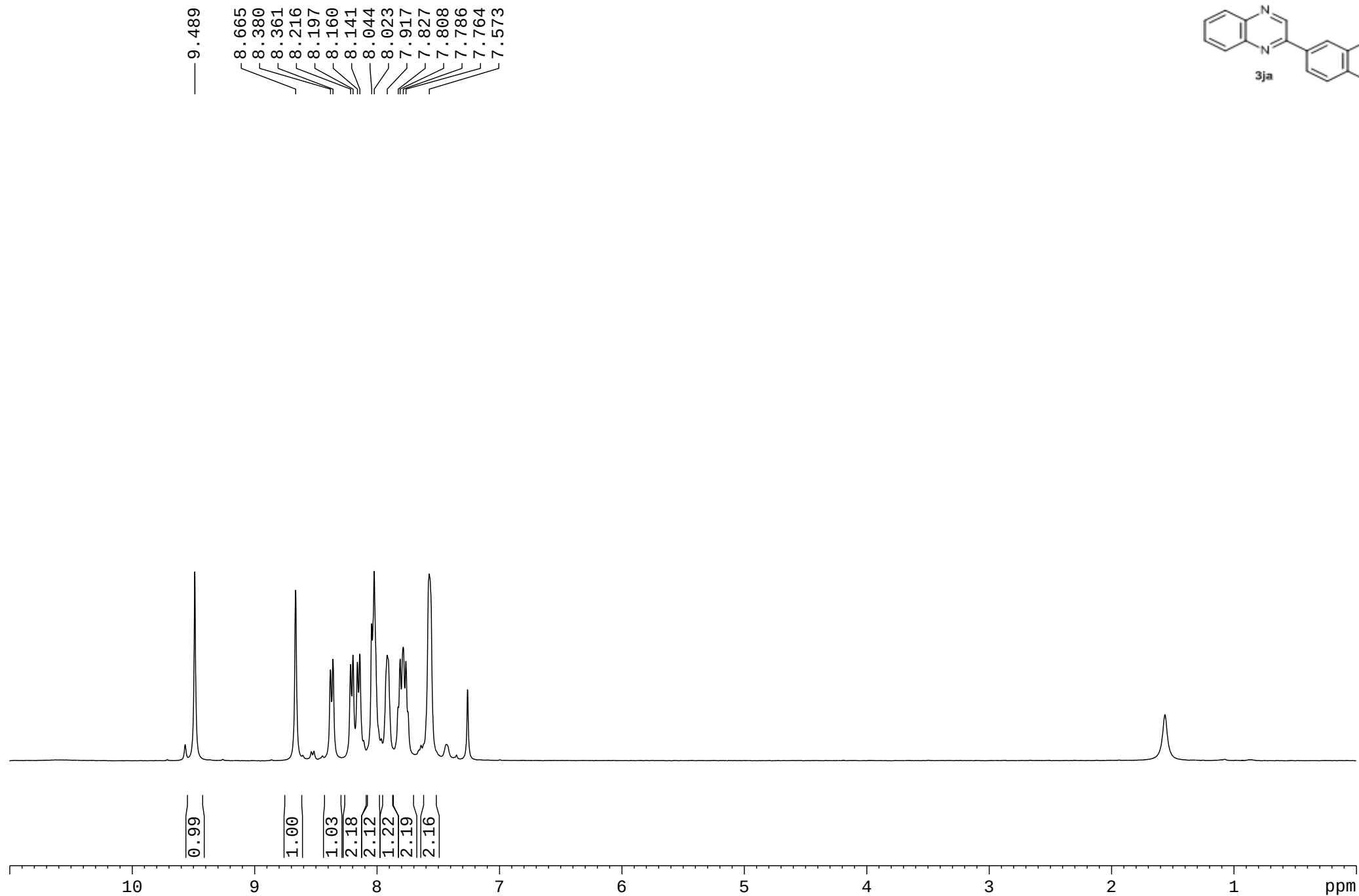
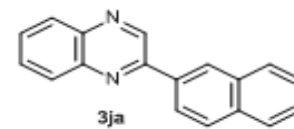
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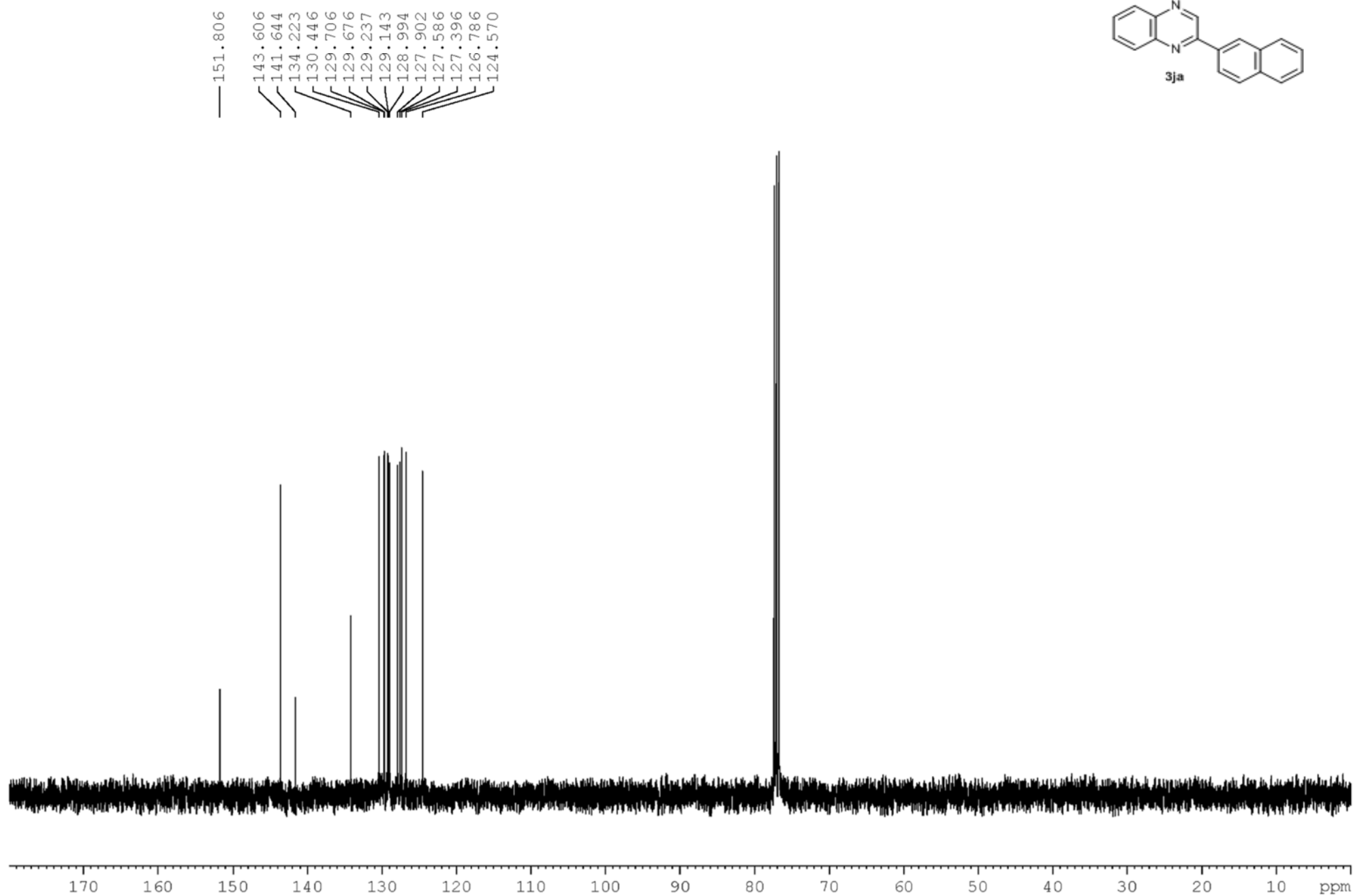
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1.09
1.14
2.17
1.15
1.12
2.22

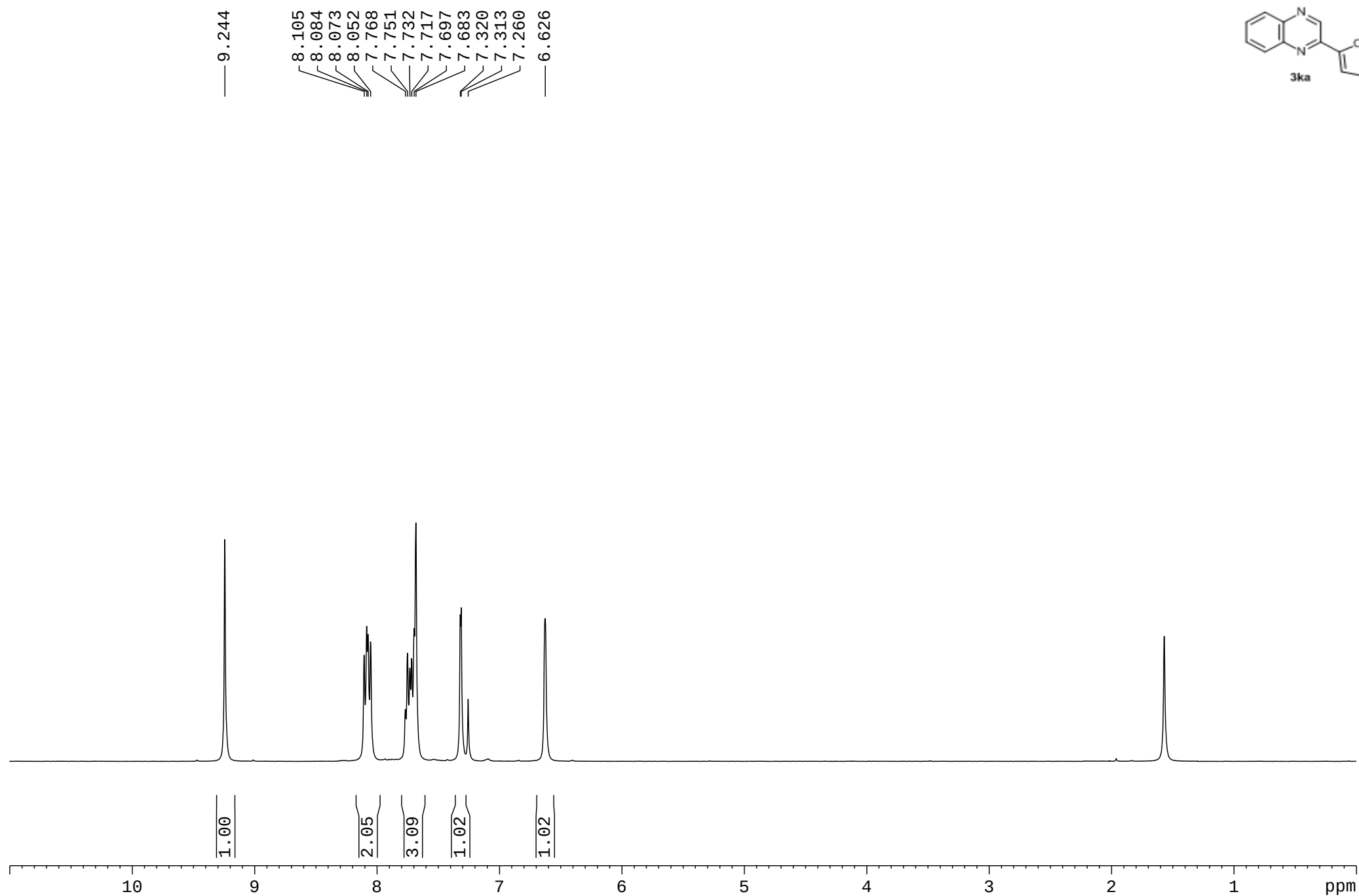
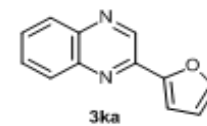
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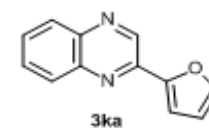
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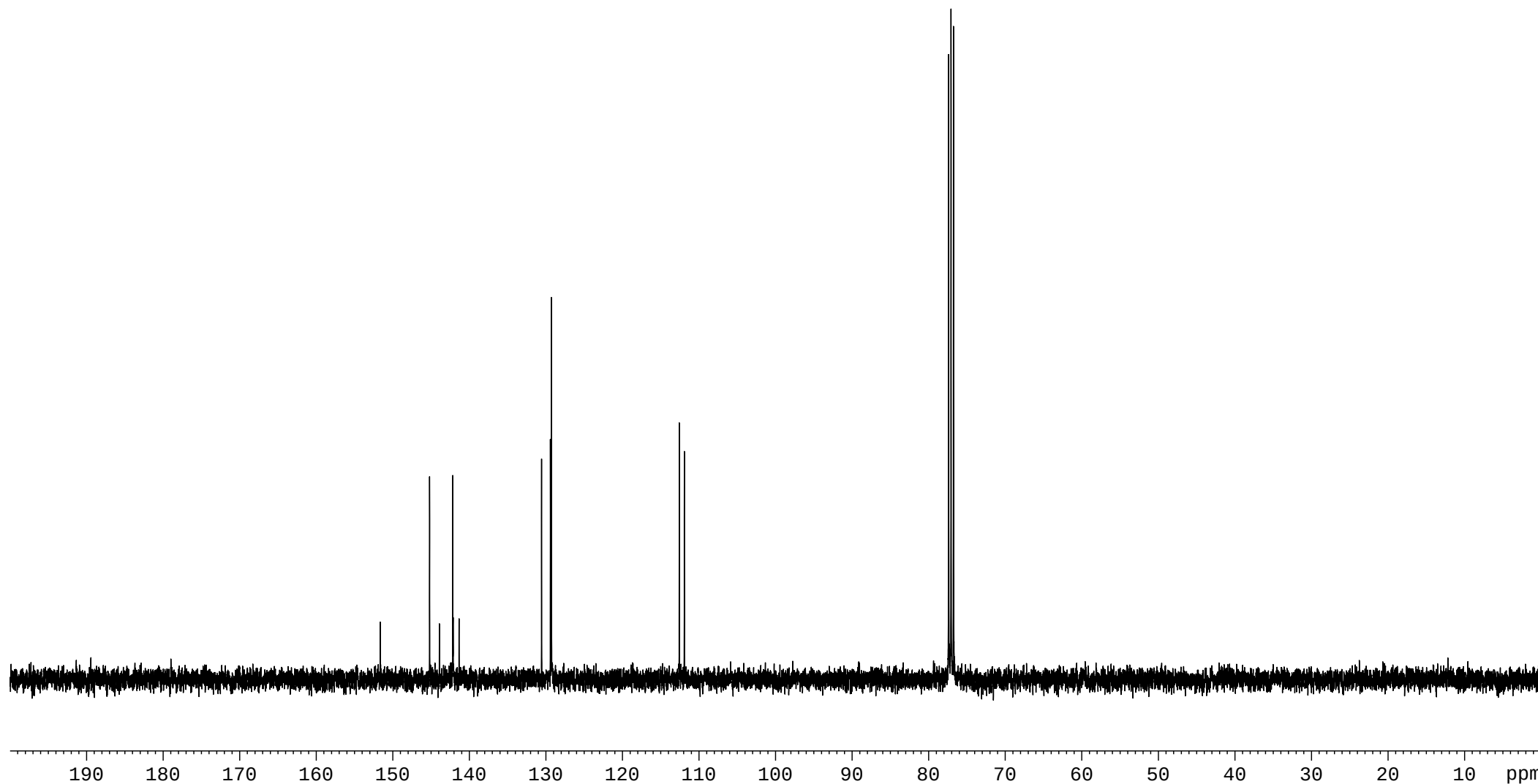


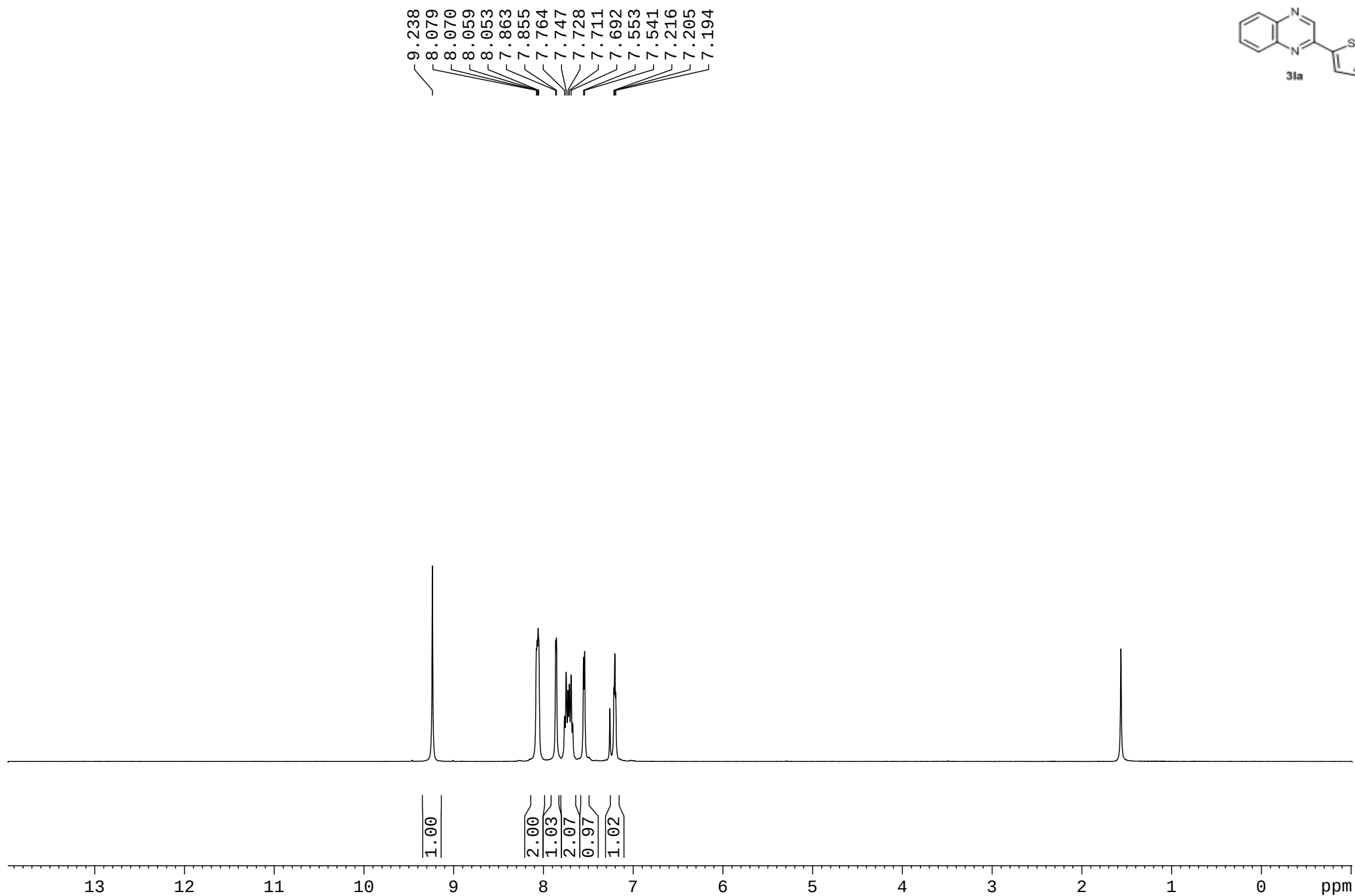
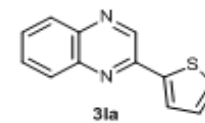


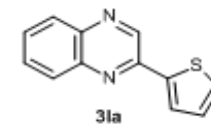




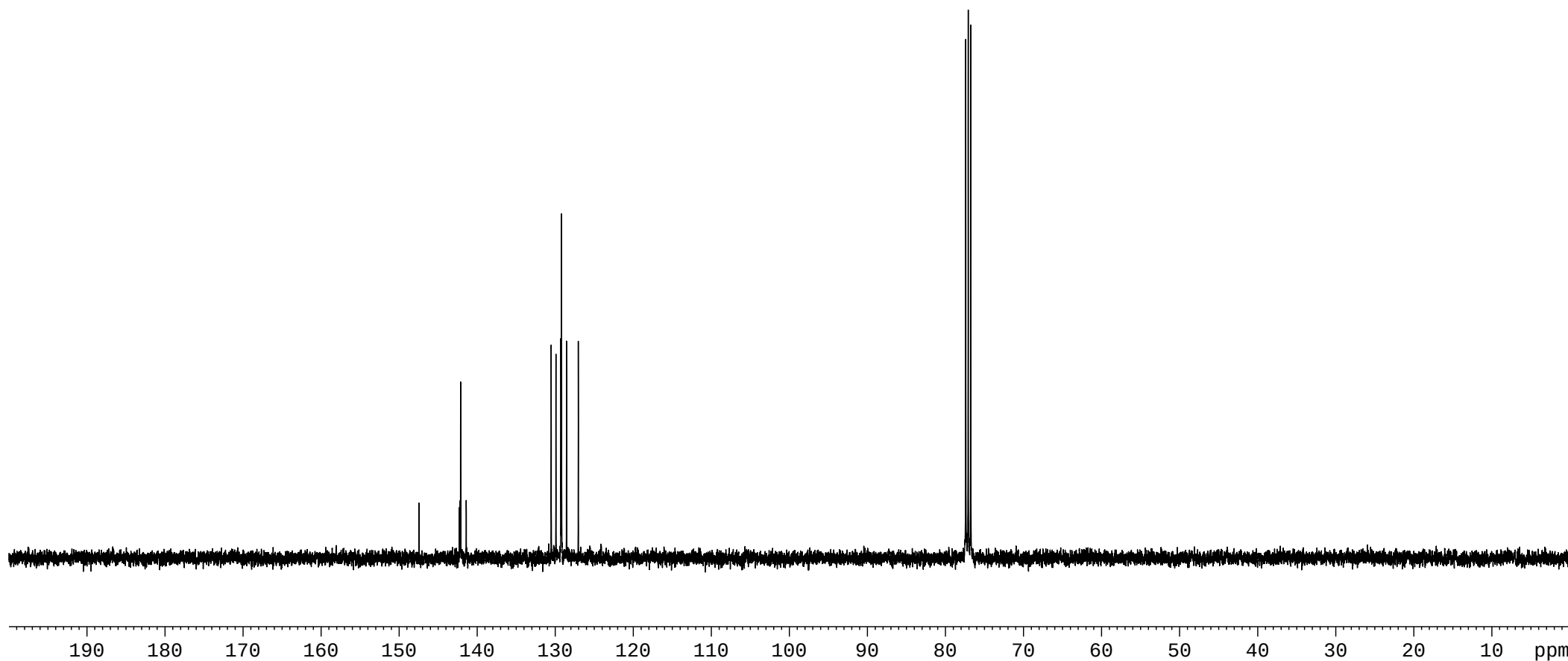
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129.283
112.581
111.912

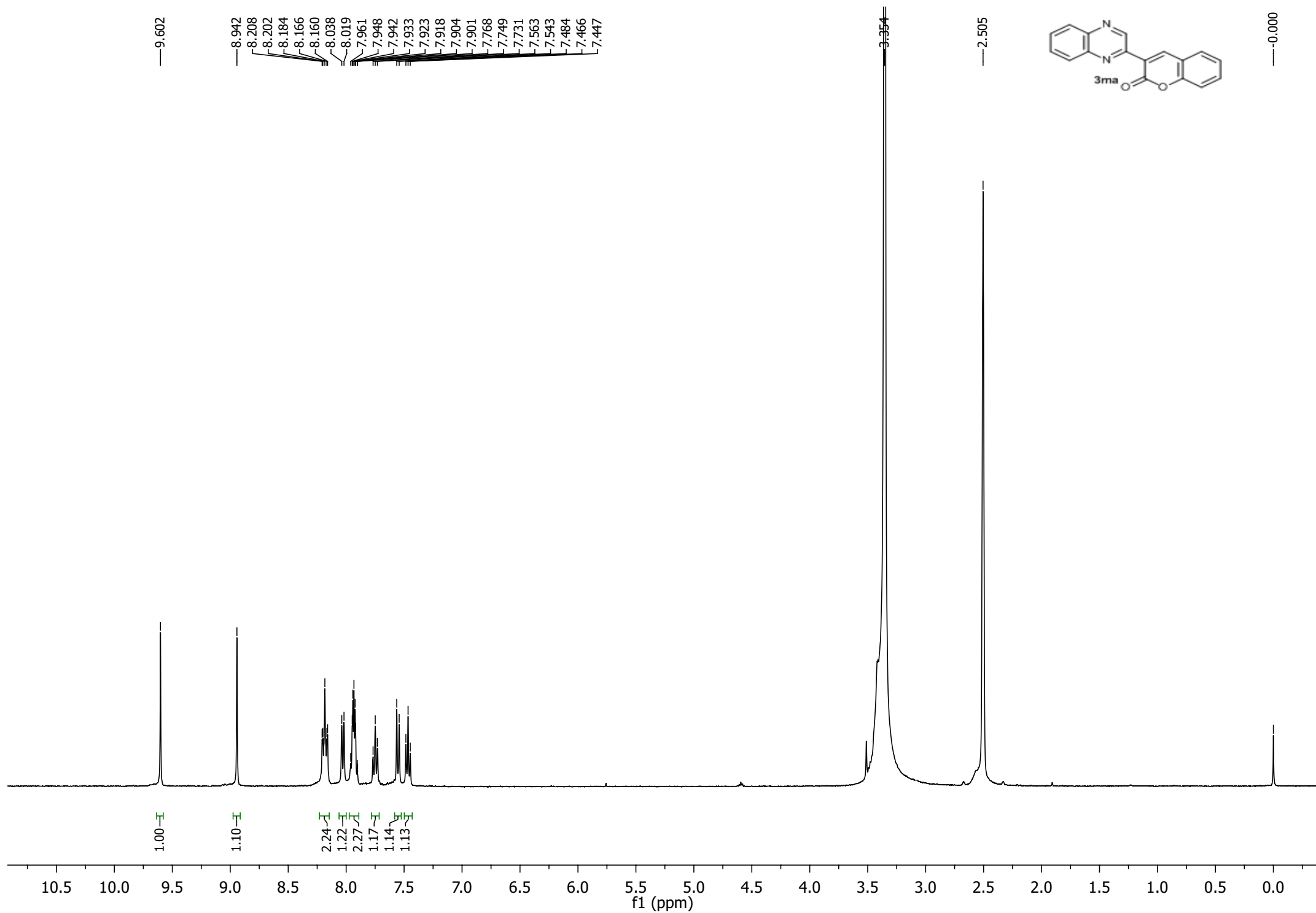


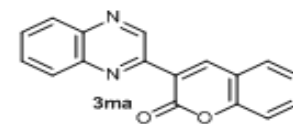




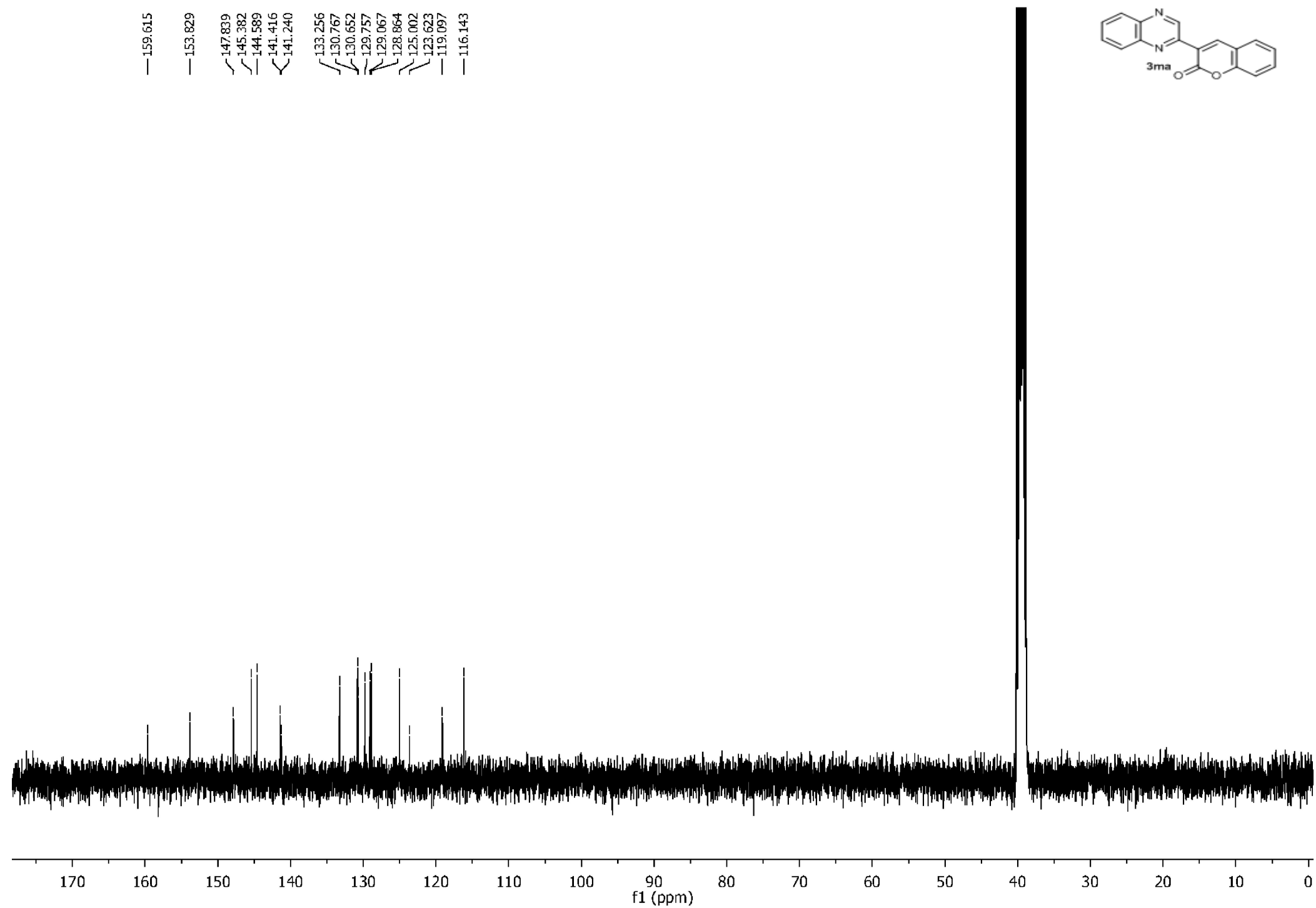
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142.125
141.403
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129.911
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129.193
128.555
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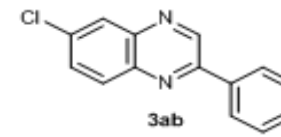






— 159.615
— 153.829
/ 147.839
/ 145.382
— 144.589
/ 141.416
/ 141.240
/ 133.256
/ 130.767
/ 130.652
/ 129.757
/ 129.067
/ 128.864
/ 125.002
/ 123.623
— 119.097
— 116.143





9.329
8.196
8.179
8.118
8.113
8.103
8.080
7.742
7.737
7.720
7.714
7.595
7.579
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7.554
7.537
7.527
7.519
7.260

1.00

2.03

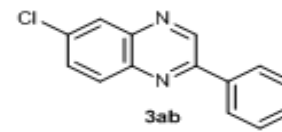
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1.07

1.04

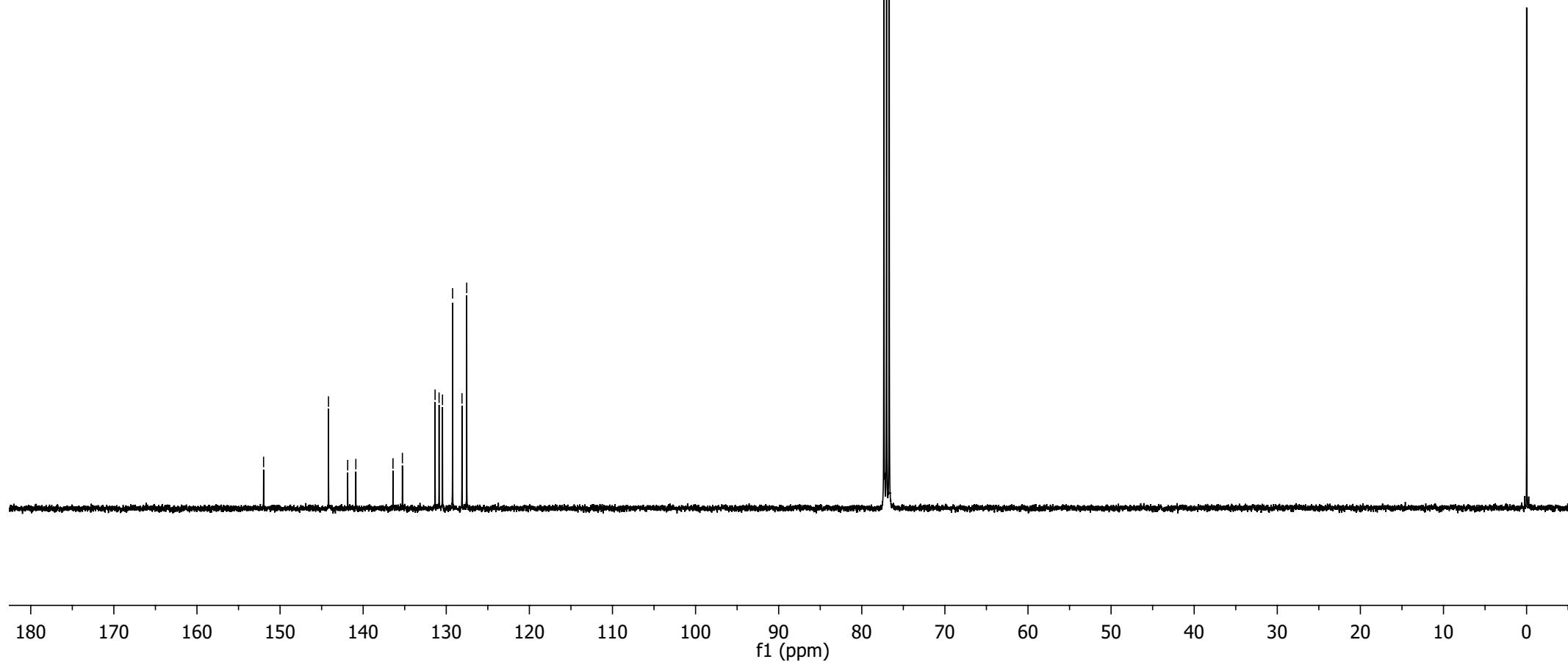
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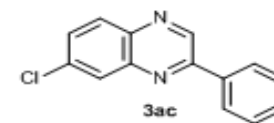
f1 (ppm)



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 144.171
 141.862
 140.880
 136.412
 135.278
 131.345
 130.864
 130.453
 129.239
 128.108
 127.540

77.336
 77.018
 76.701





9.308
8.200
8.197
8.180
8.177
8.151
8.145
8.058
8.036
7.694
7.689
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7.527
7.524
7.520

1.00

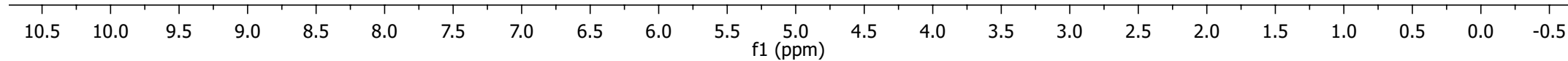
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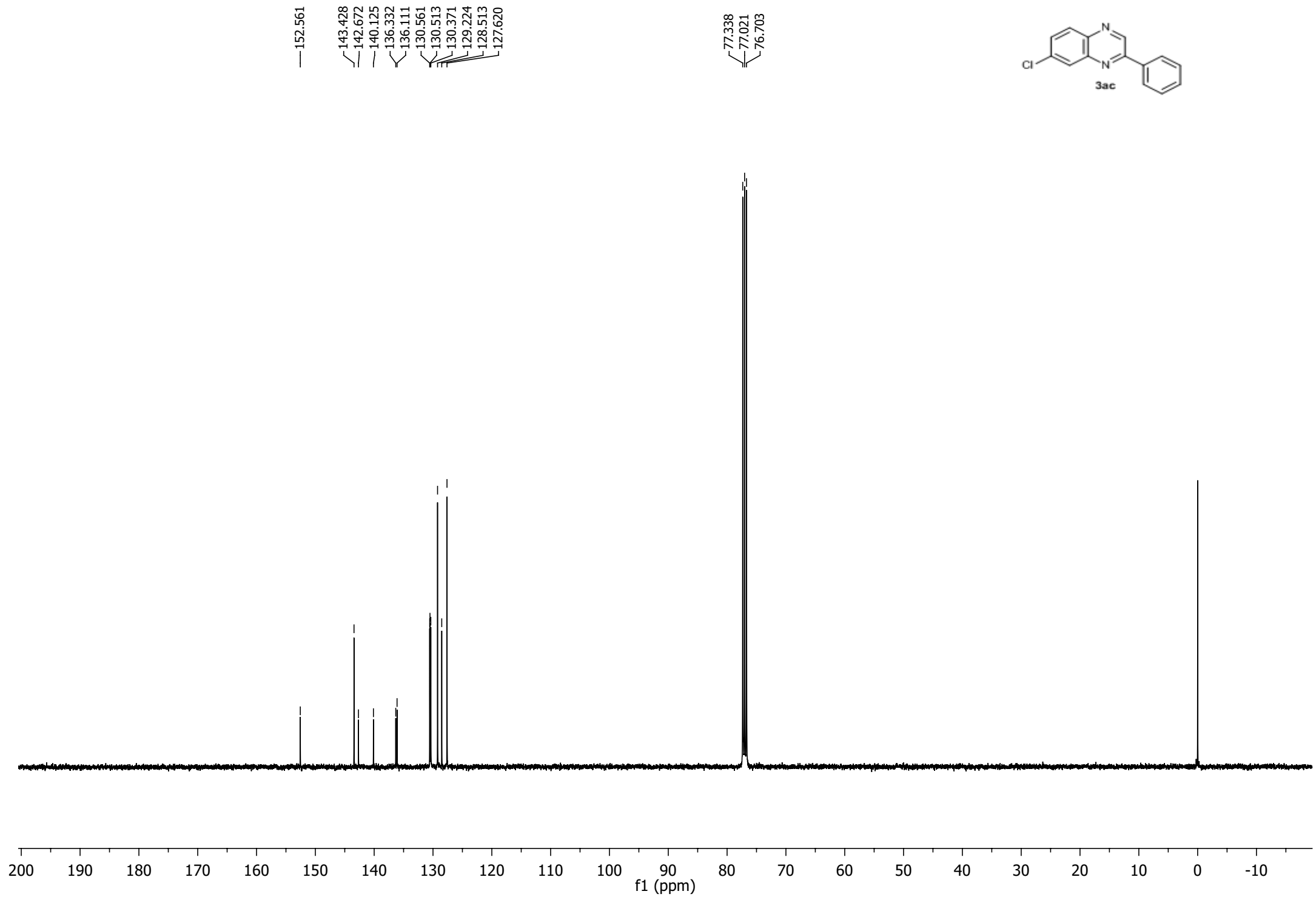
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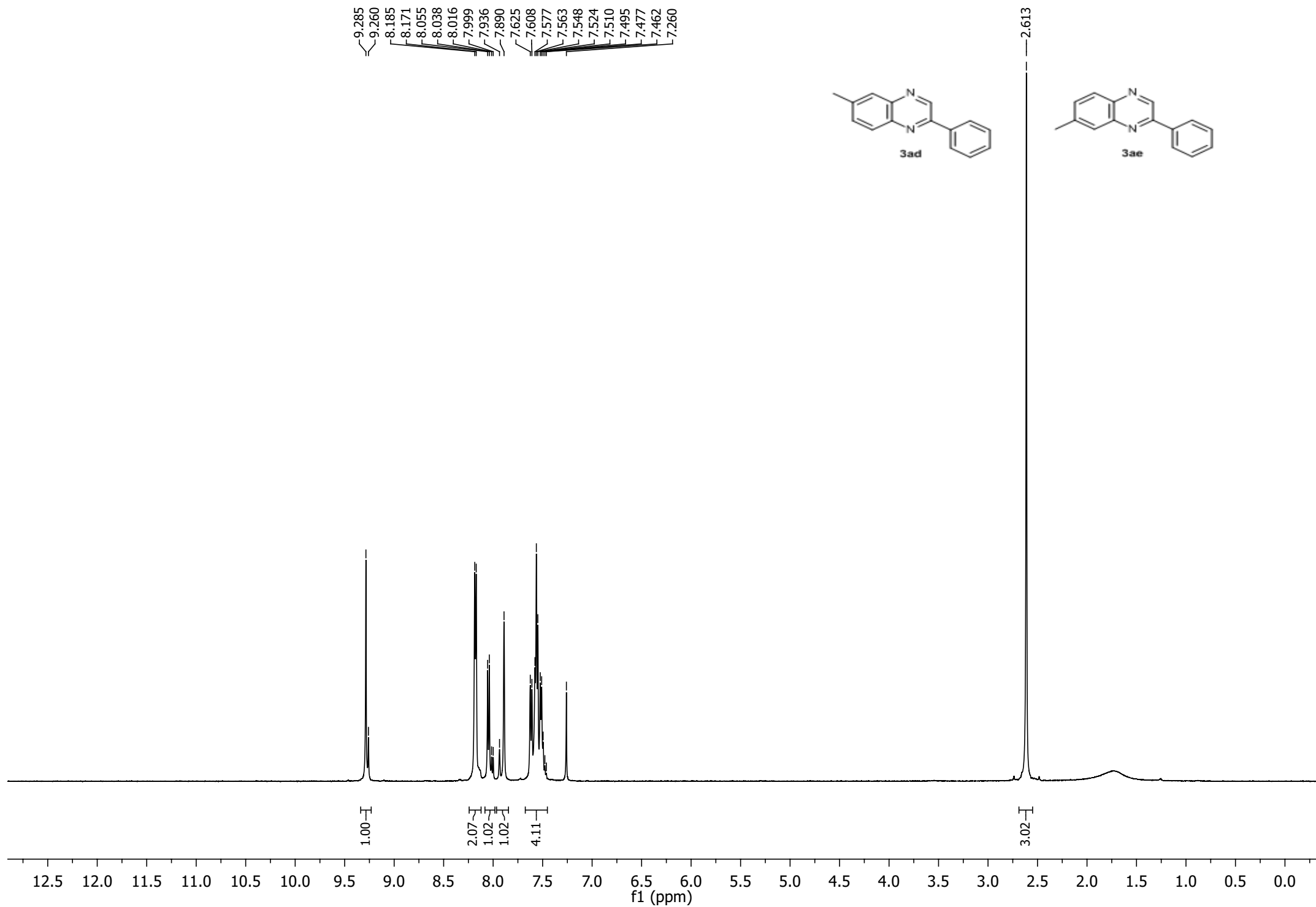
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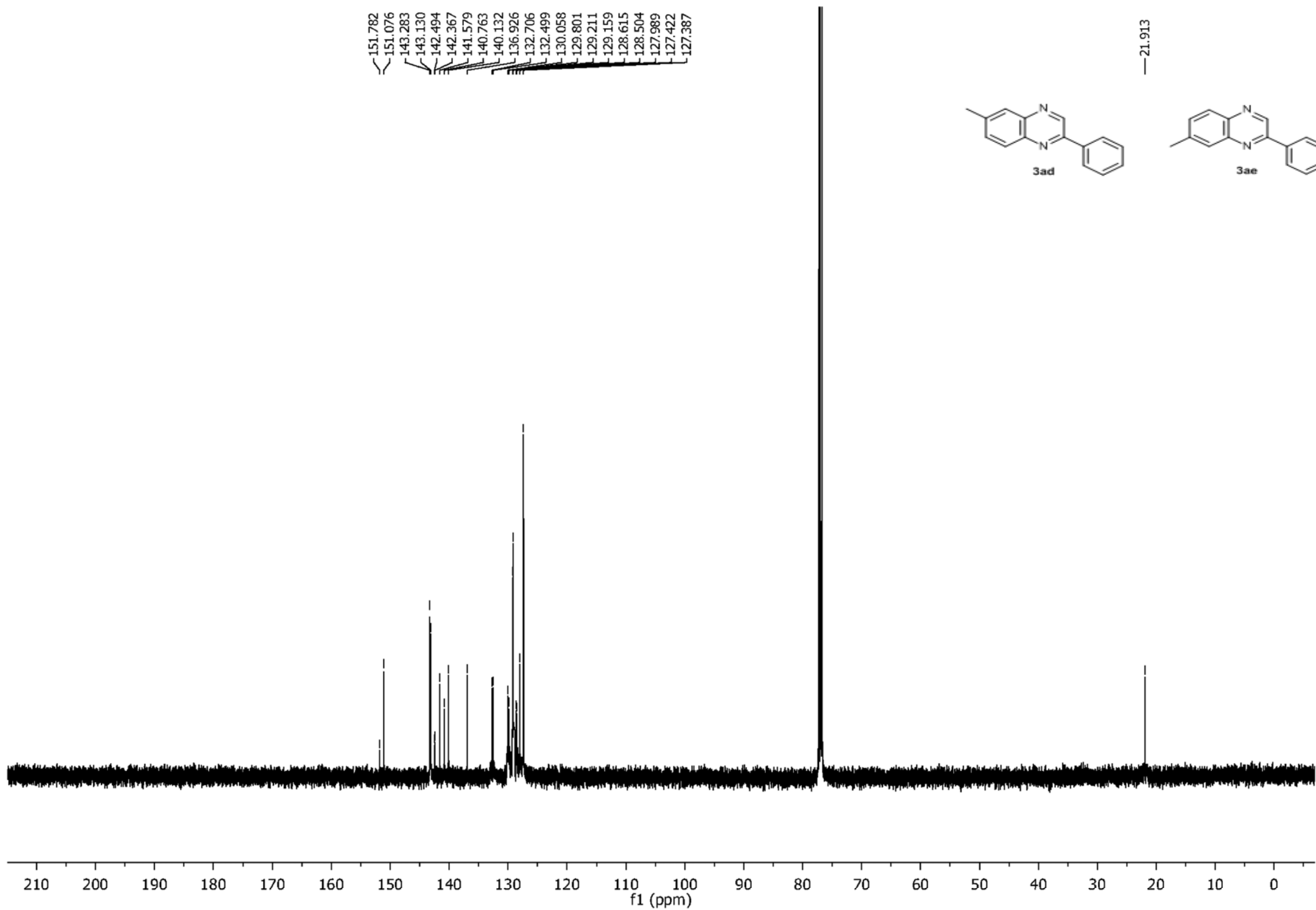
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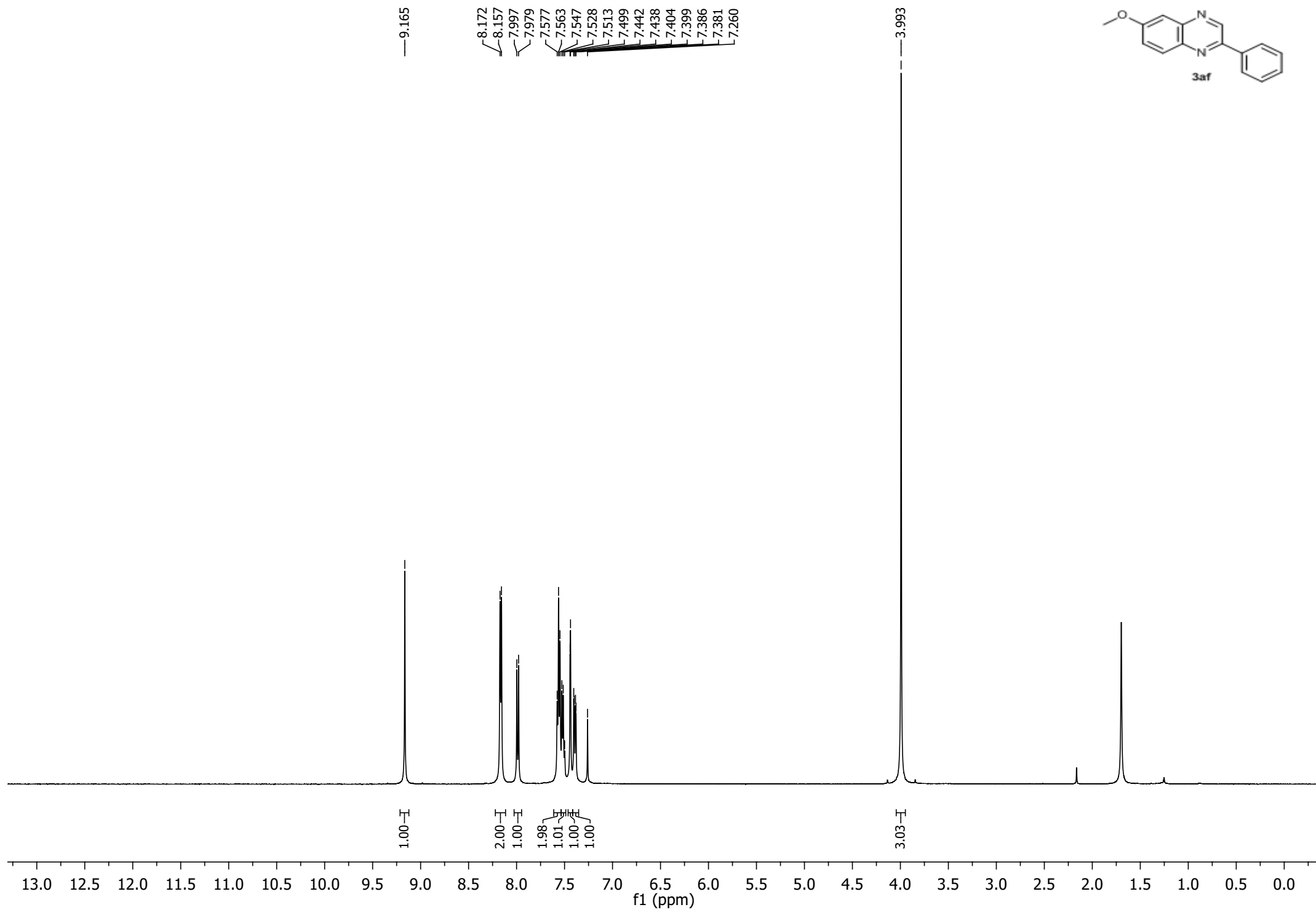
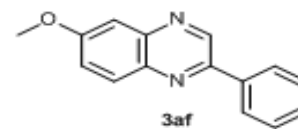
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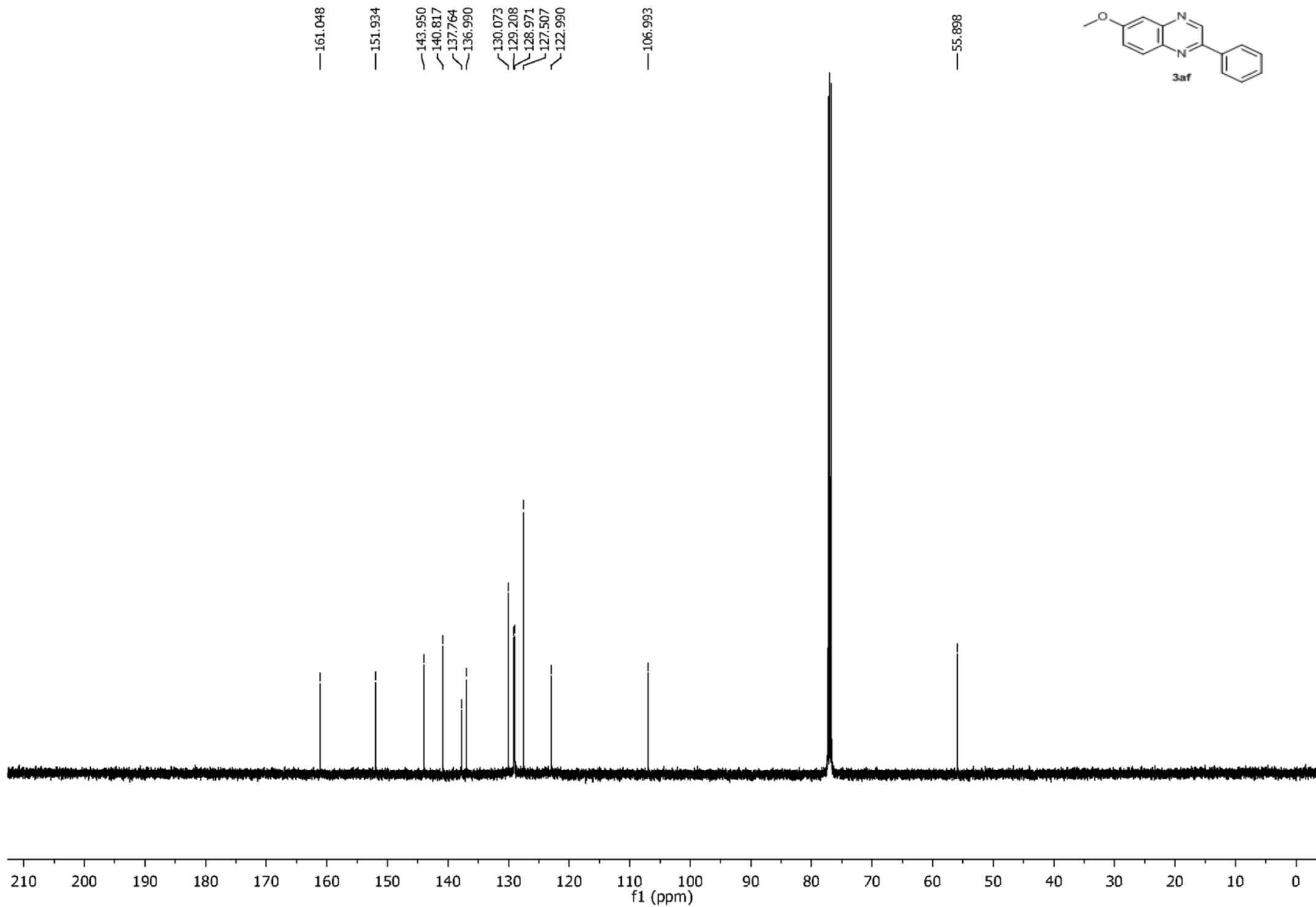


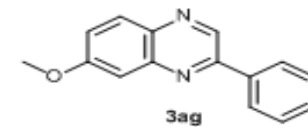
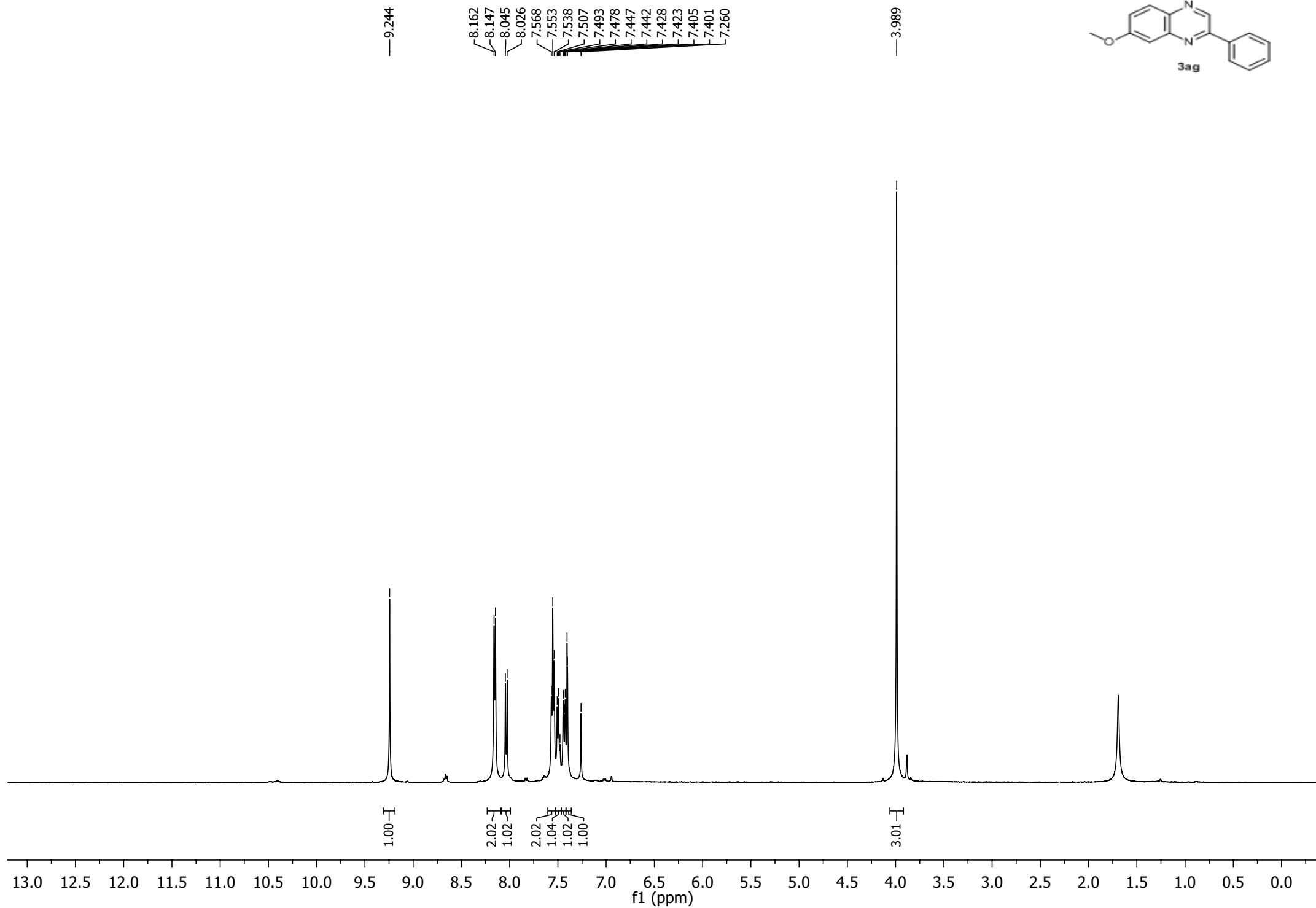


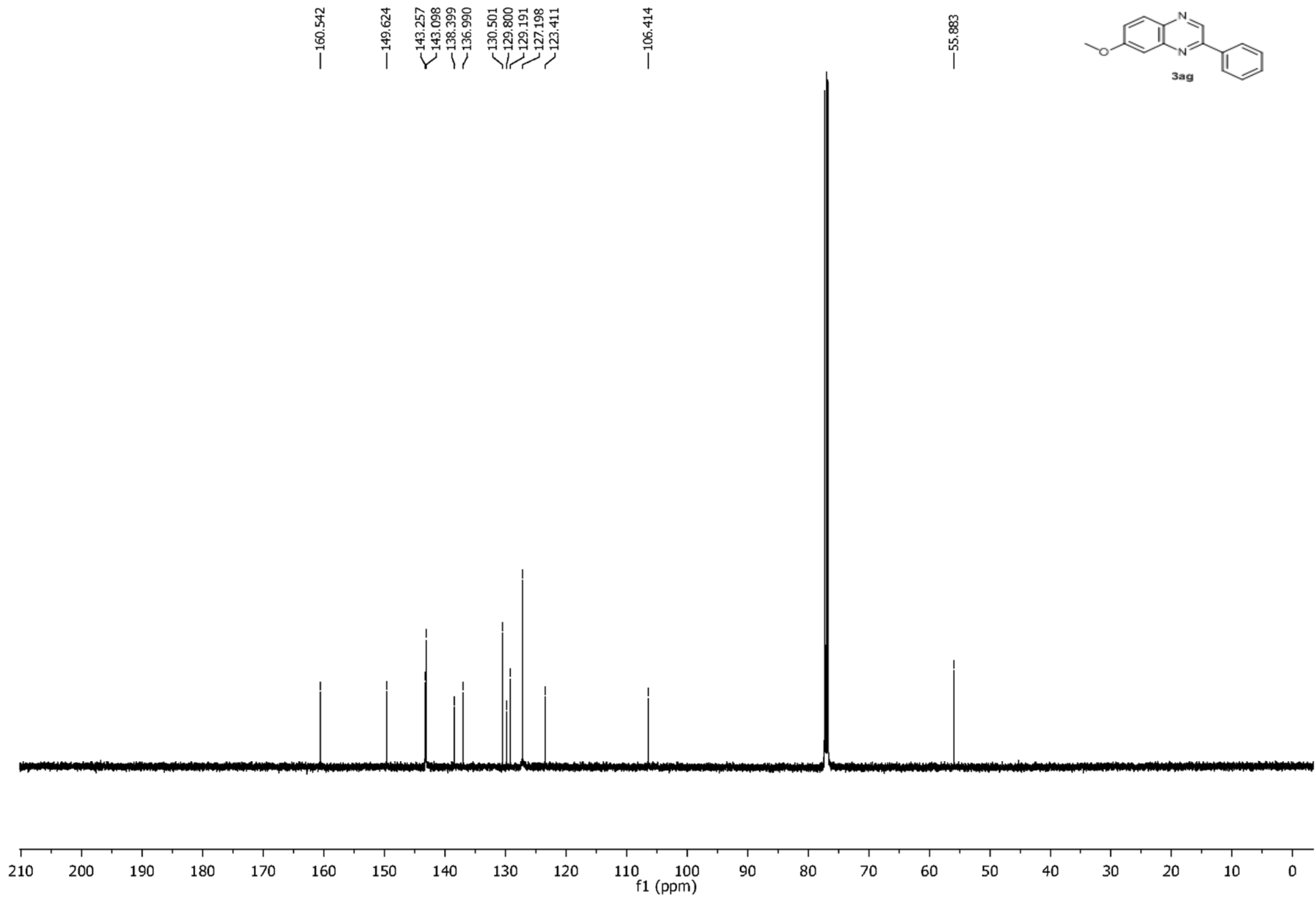


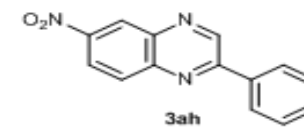












9.492
9.027
9.022
8.564
8.559
8.546
8.541
8.292
8.273
8.257
8.253
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7.601
7.260

1.00-H

0.97-H

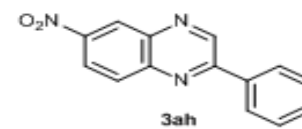
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3.01-H

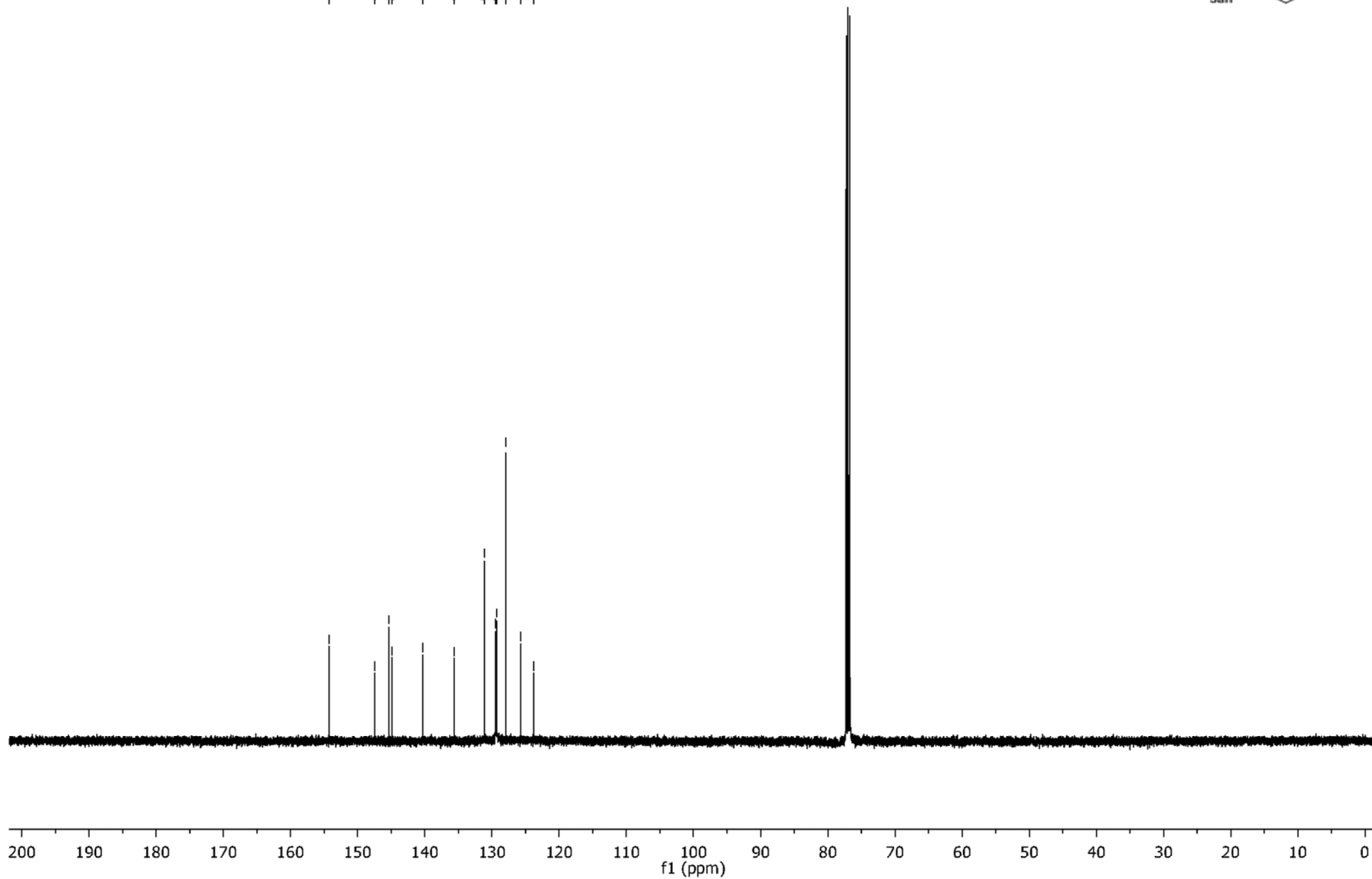
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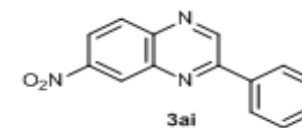
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f1 (ppm)

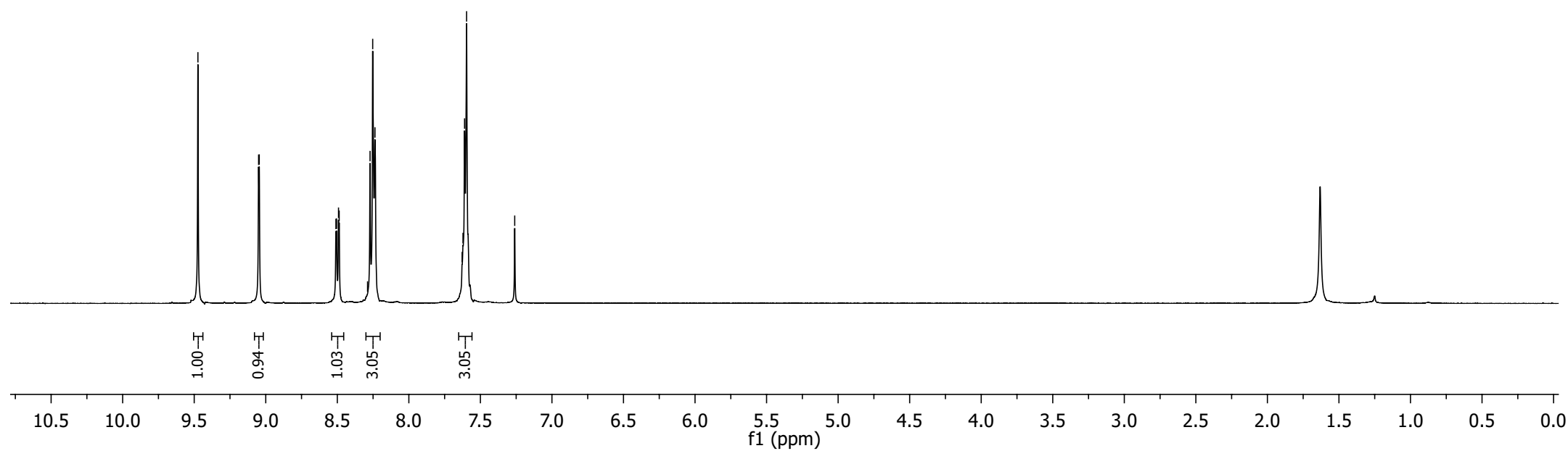


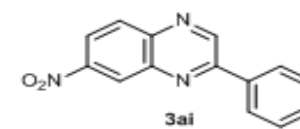
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 — 147.427
 — 145.400
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 — 140.313
 — 135.599
 — 131.145
 — 129.509
 — 129.274
 — 127.916
 — 125.722
 — 123.817



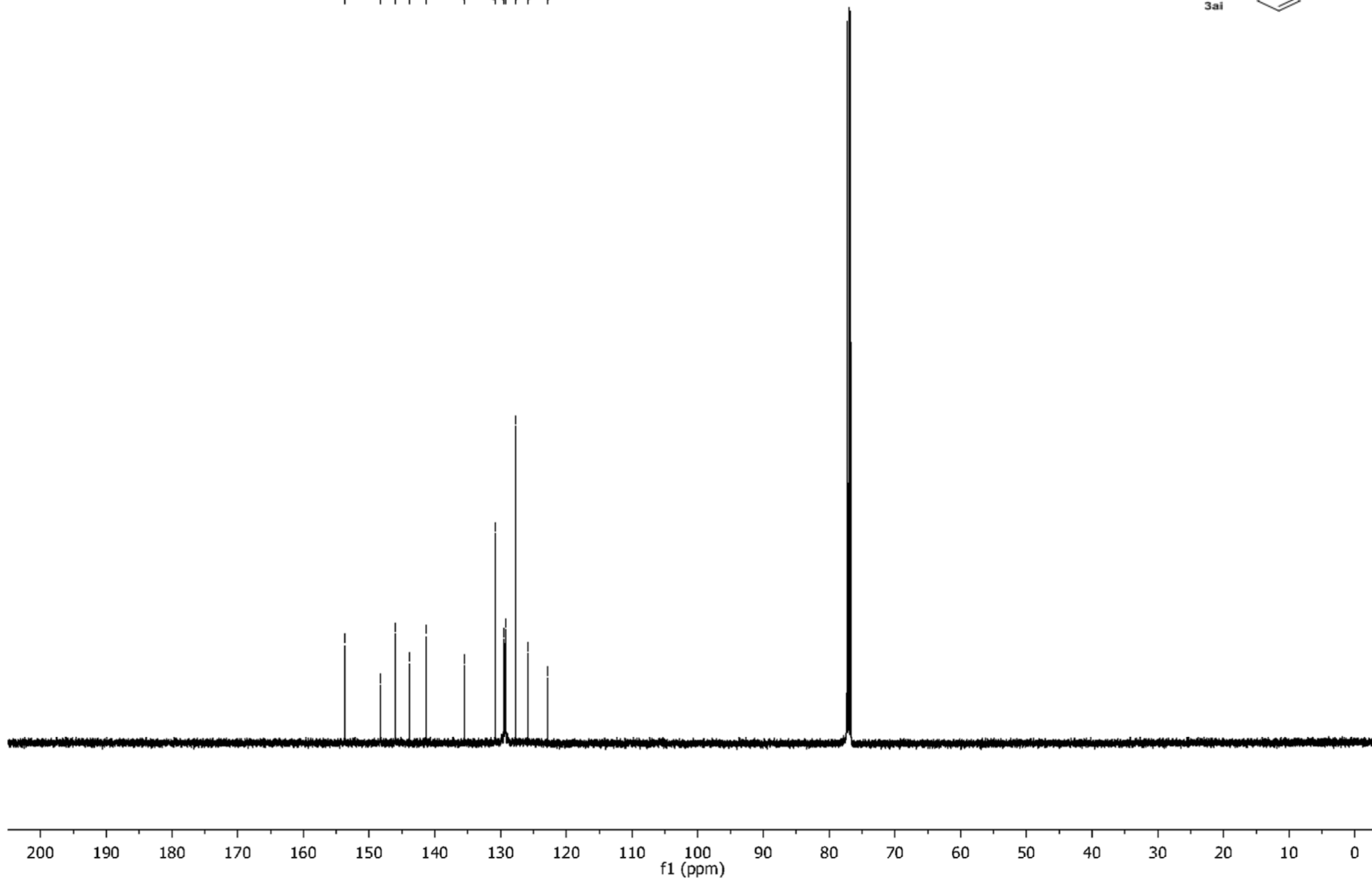


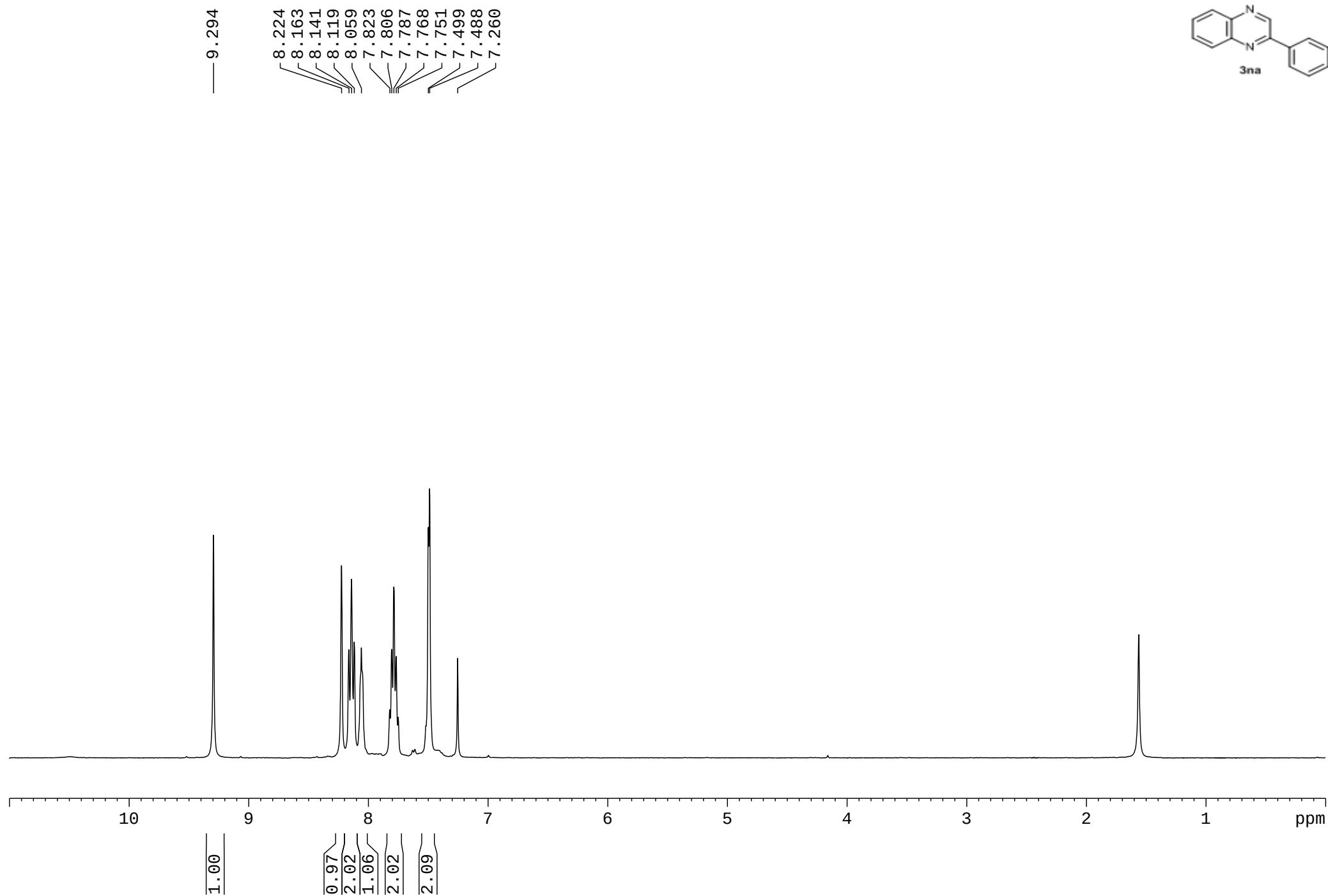
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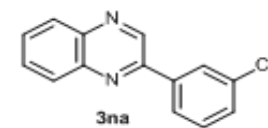




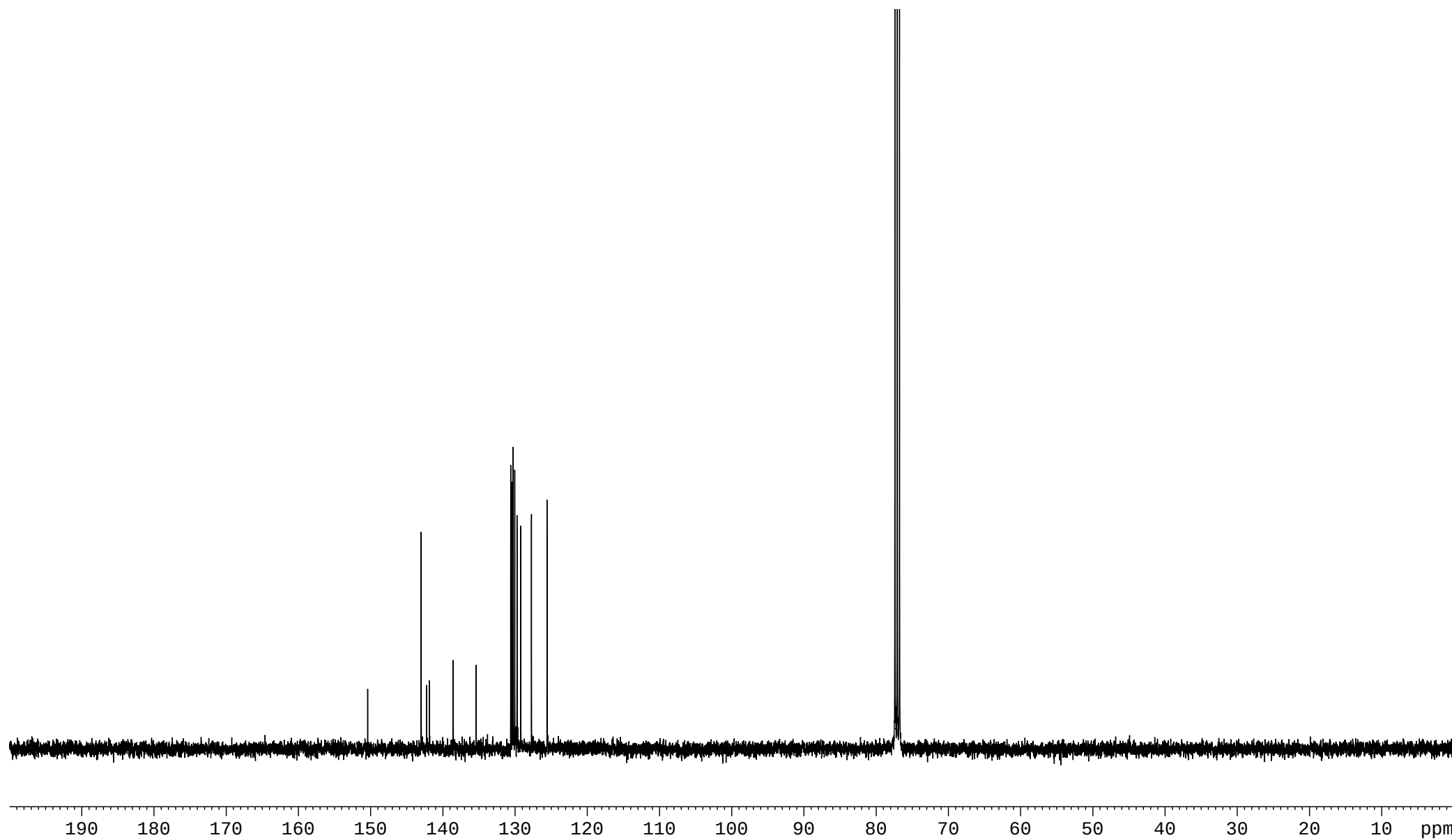
— 153.693
— 148.258
— 146.050
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— 125.813
— 122.835

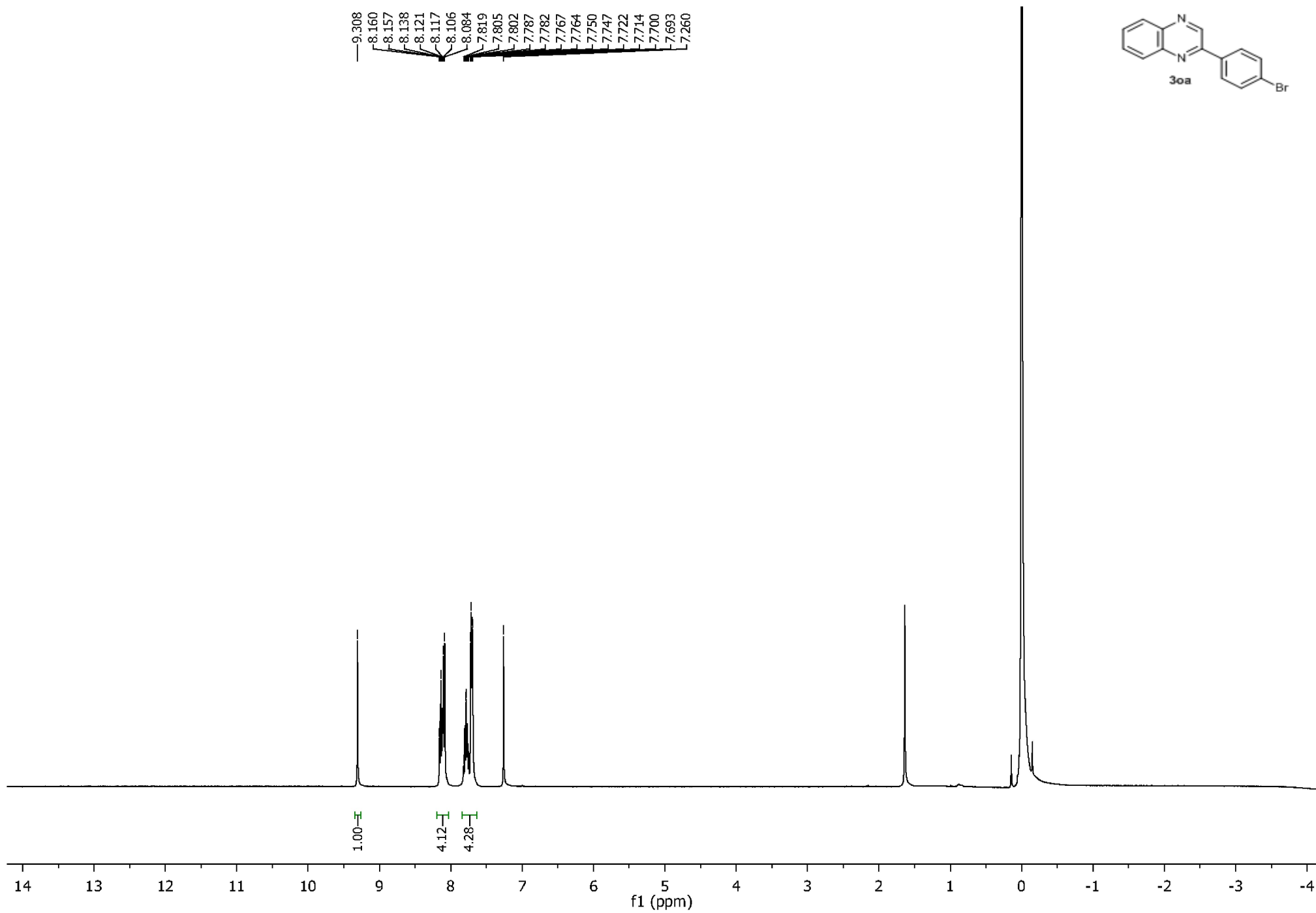




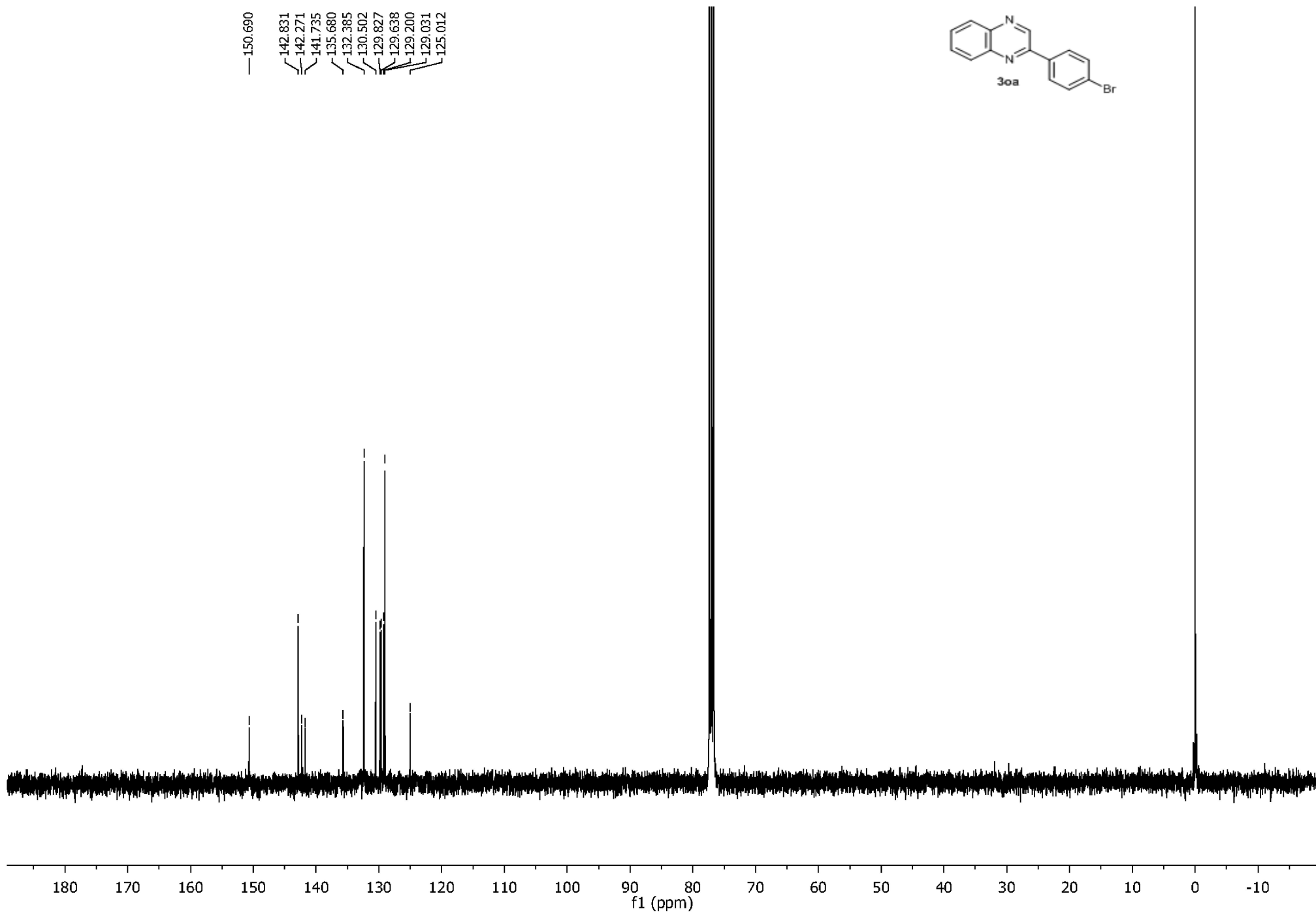
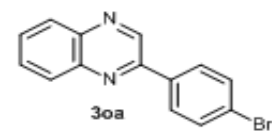


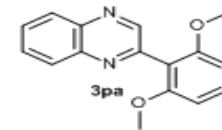
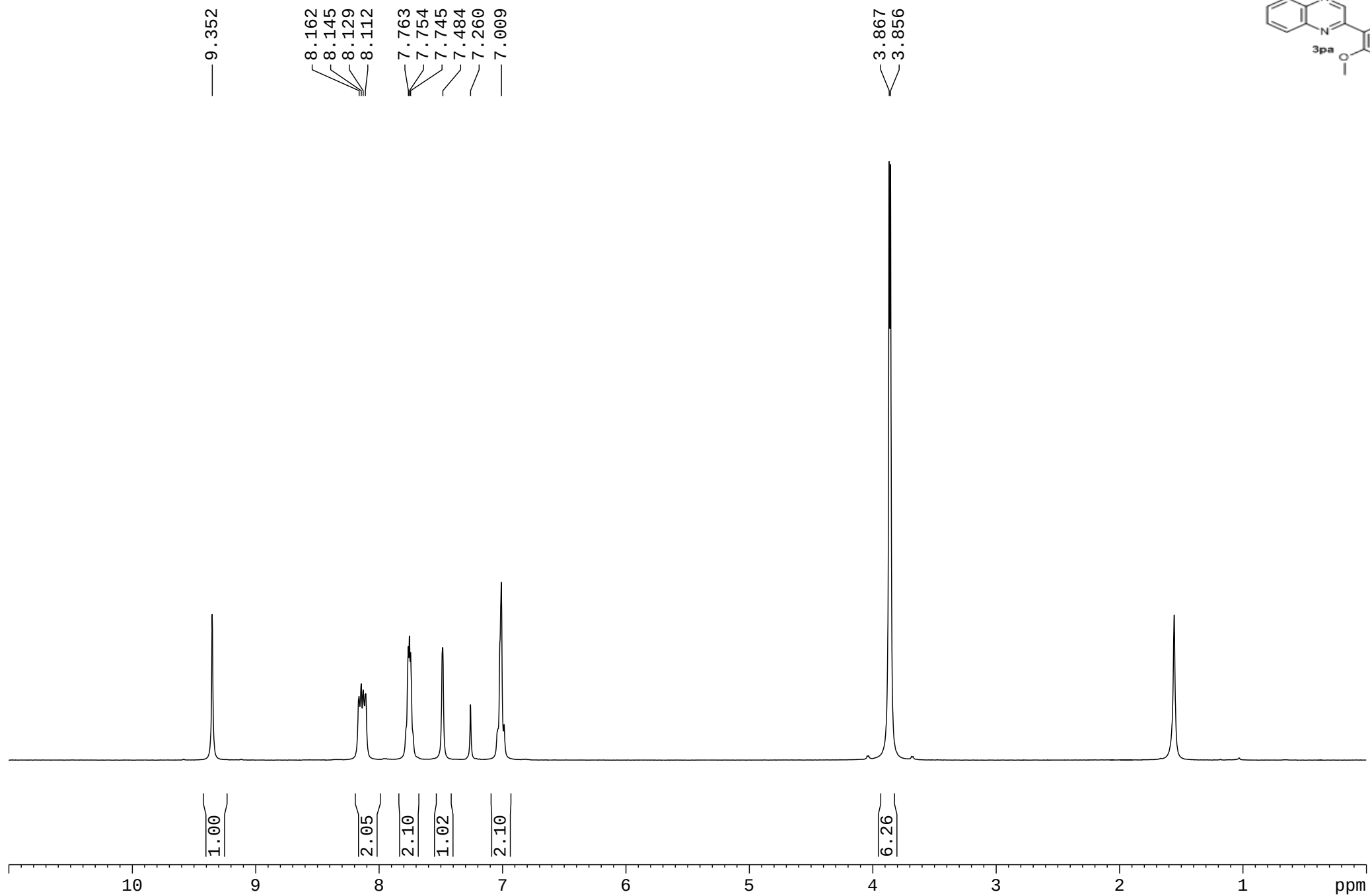
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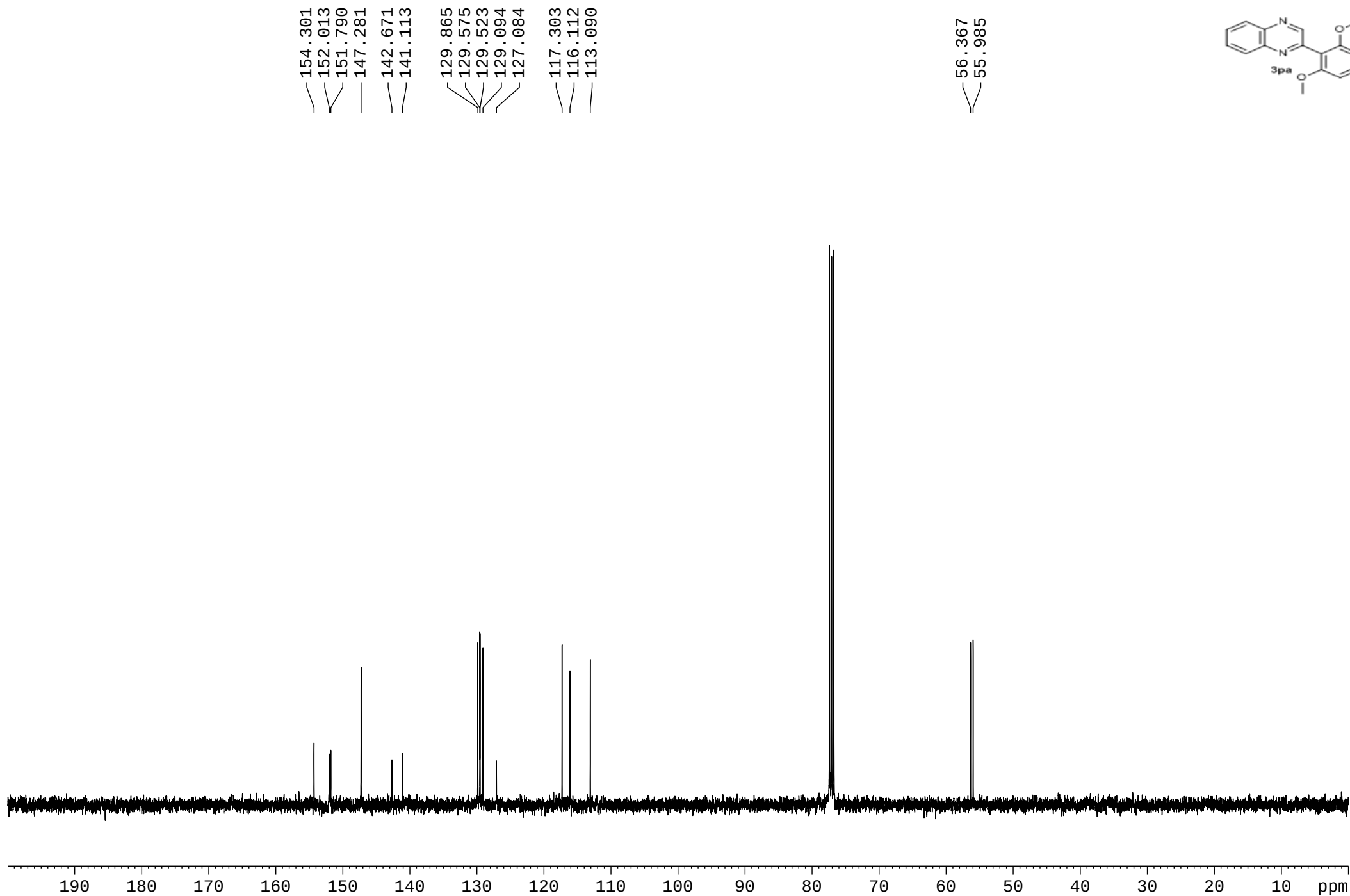


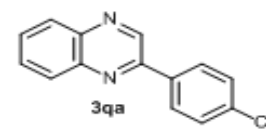


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125.012





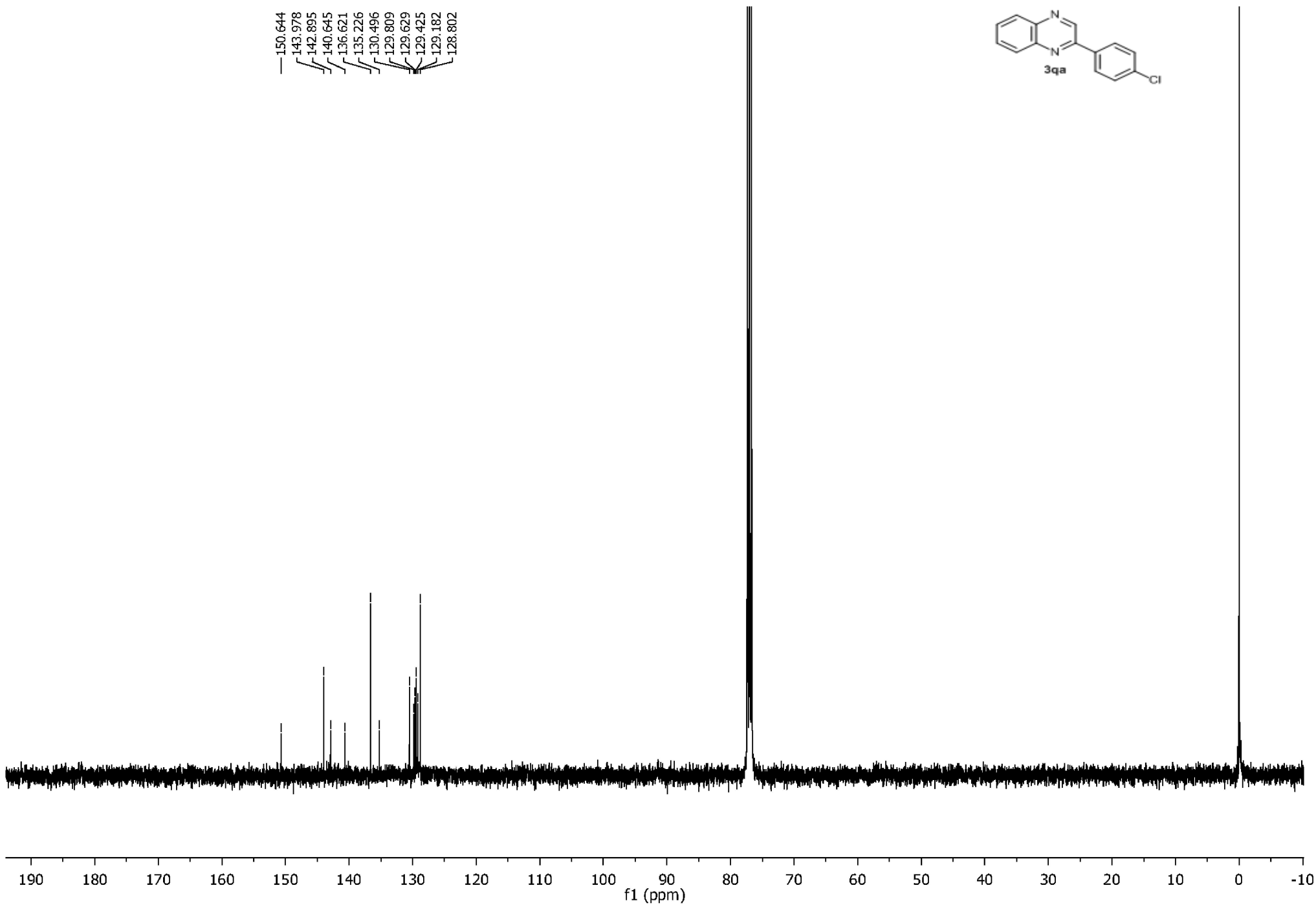


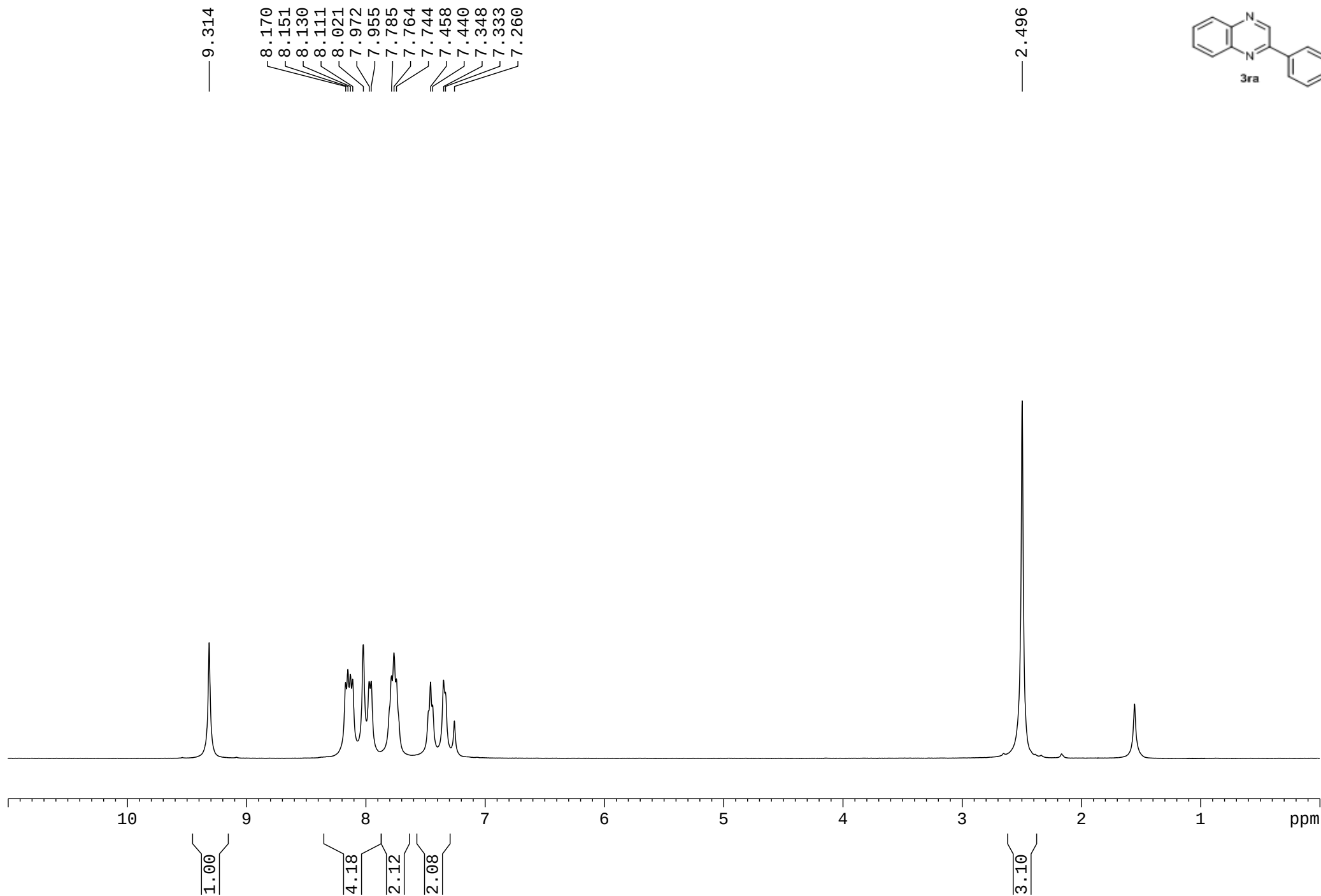


9.313
8.174
8.156
8.142
8.123
7.819
7.803
7.784
7.765
7.749
7.592
7.572
7.554
7.534
7.260

1.00
4.13
2.11
2.27

11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
f1 (ppm)





152.140
143.612
142.364
141.625
139.035
136.812
131.077
130.330
129.655
129.541
129.191
129.119
128.279
124.765

21.655

