Electronic Supplementary Material (ESI) for RSC Advances.
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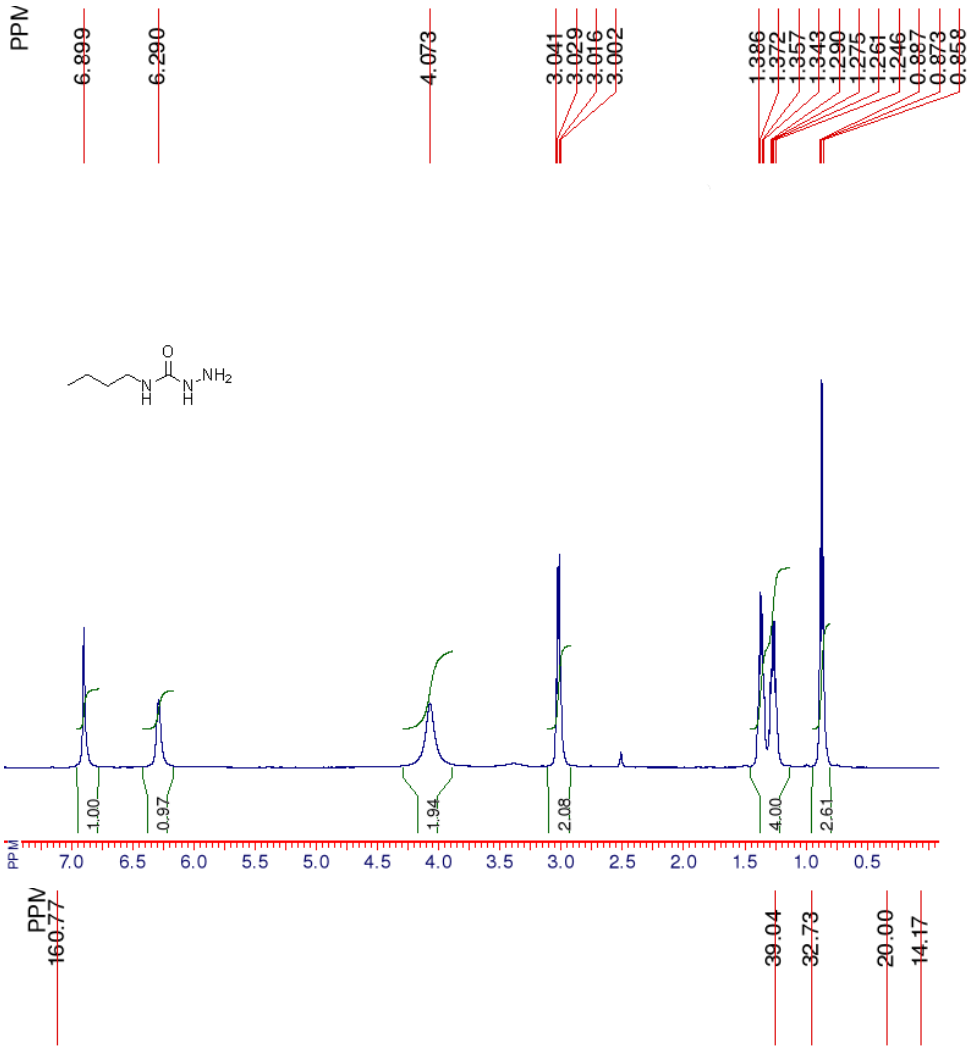
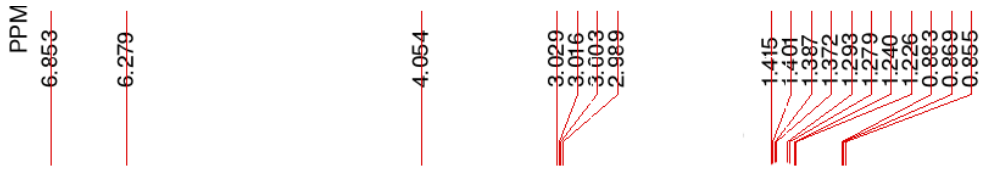
NMR spectra of the synthesized compounds

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1.293
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1.226
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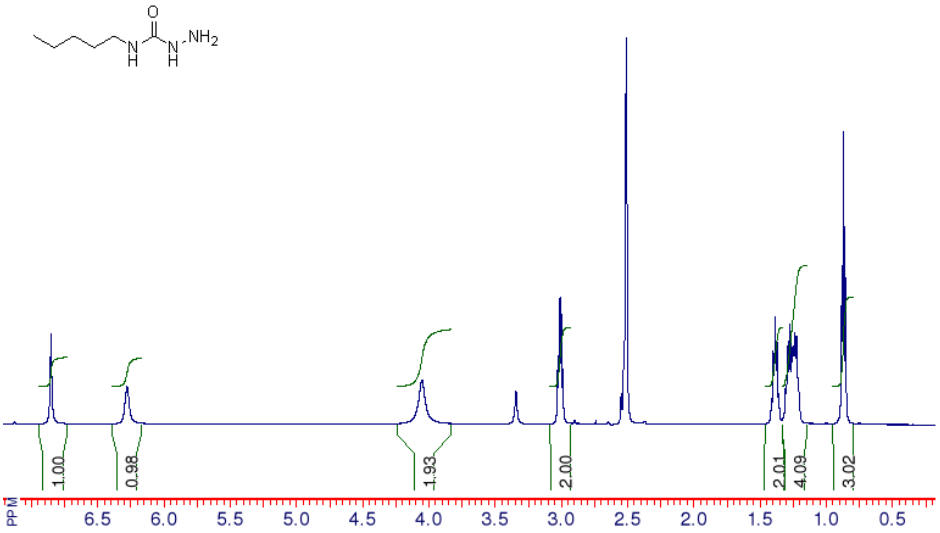
0.869
0.855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4.5
4.0
3.5
3.0
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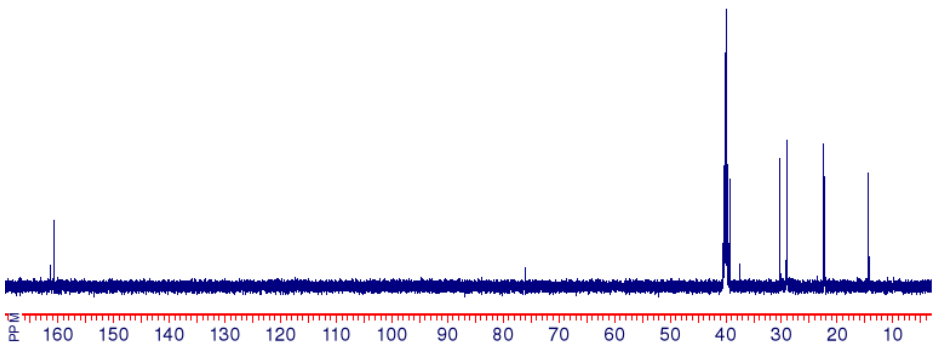
29.09
22.40
14.42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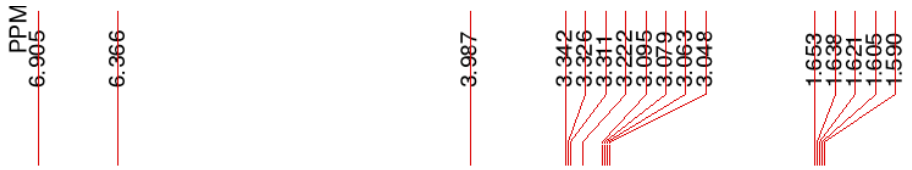
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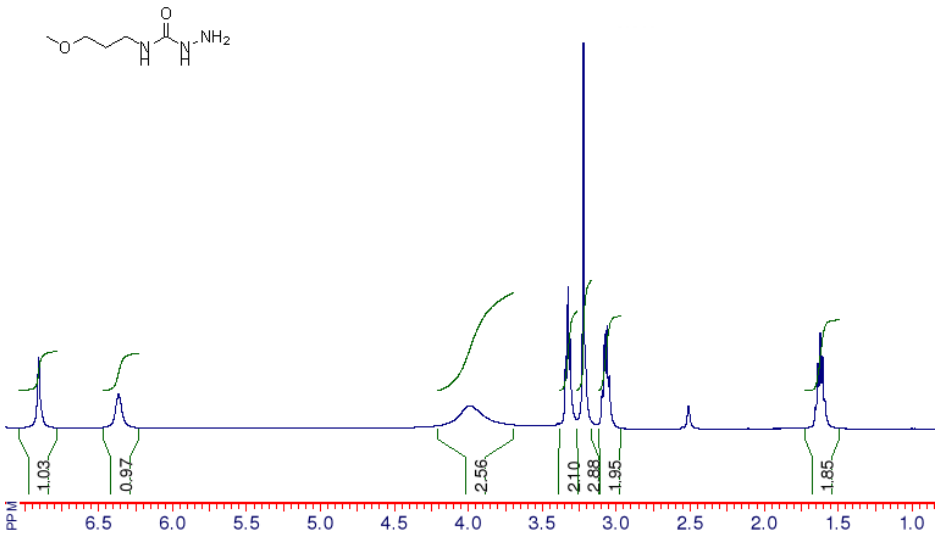
1.621
1.605
1.590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2.56
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2.88
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5.0
4.5
4.0
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2.5
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1.0

PPM
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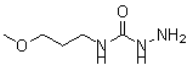
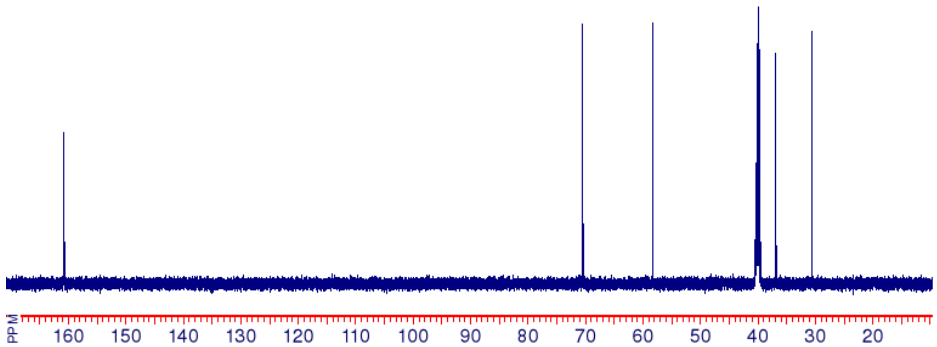
36.88
30.56


O
NH2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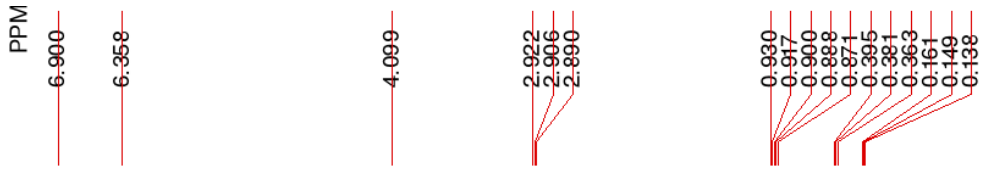
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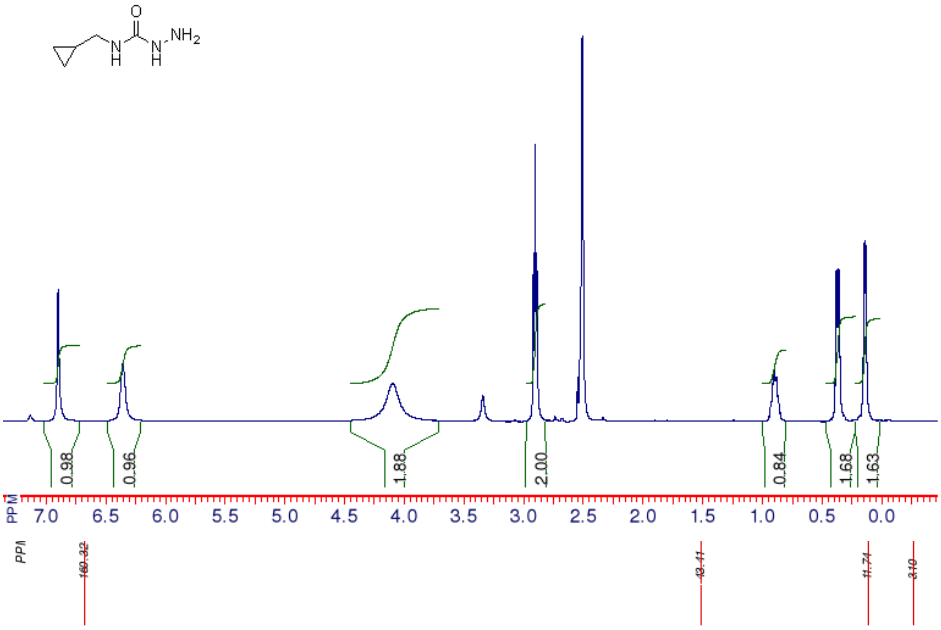
0.363
0.161
0.149
0.138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H
N
H
NH2
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6.5
6.0
5.5
5.0
4.5
4.0
3.5
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1.5
1.0
0.5
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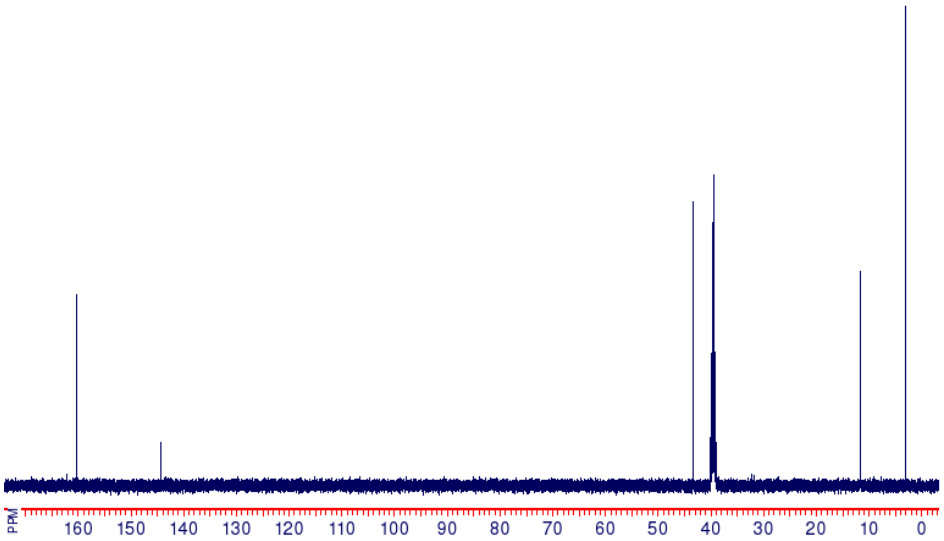
11.74
3.10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50
40
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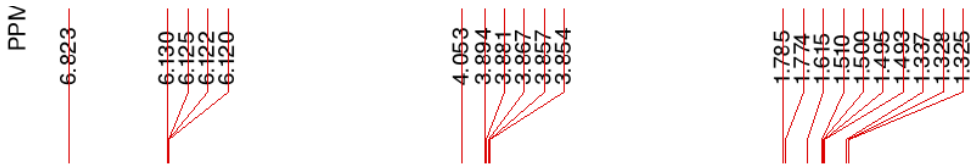
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6.120
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3.881
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1.510
1.500
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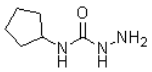
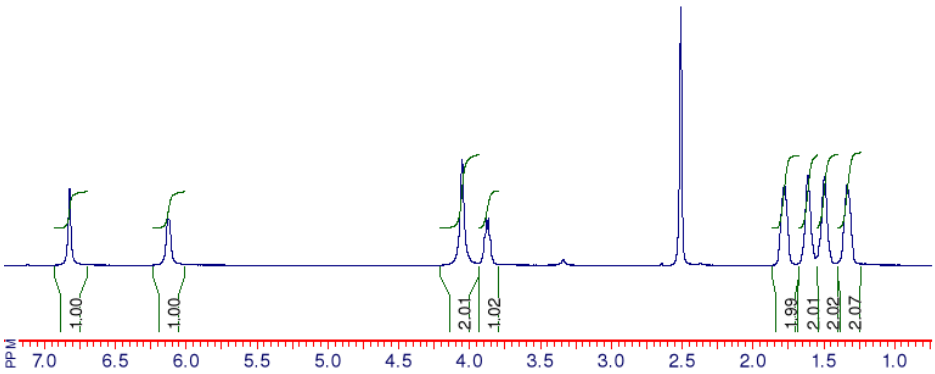
1.493
1.337
1.328
1.325

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1.00
2.01
1.02
1.99
2.01
2.02
2.07
PPM
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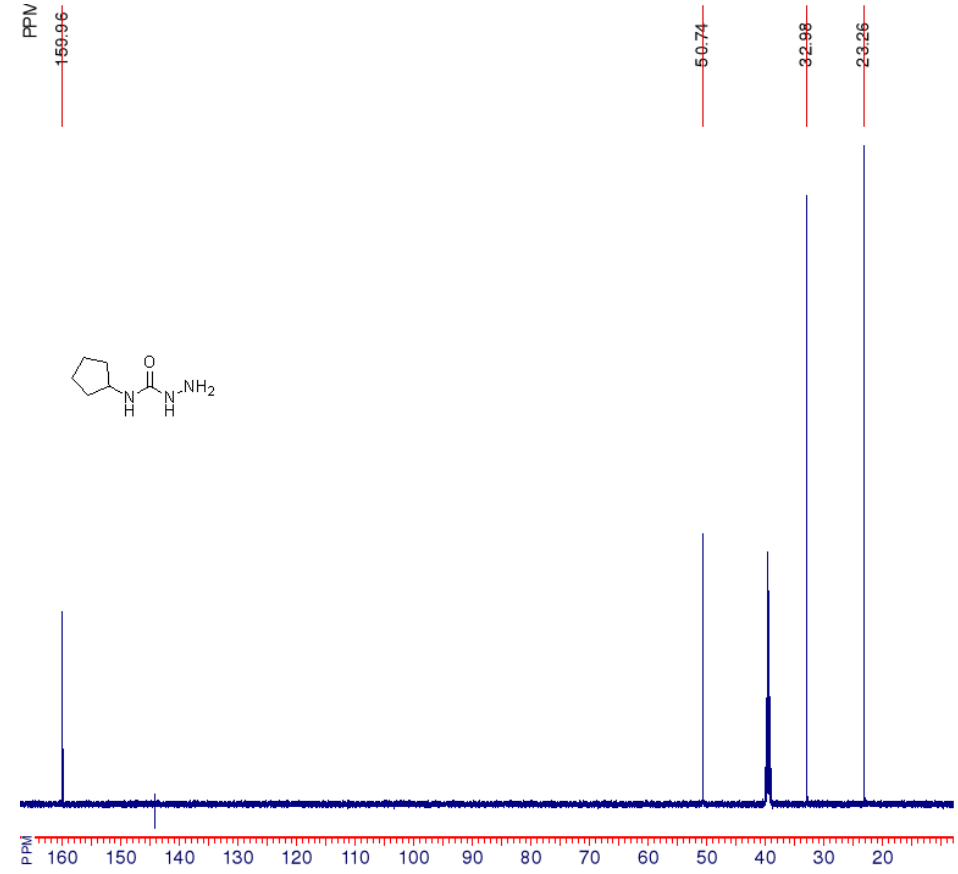
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0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50.74
32.98
23.26
PPM
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20

PPM
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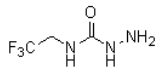
3.796
3.778
3.772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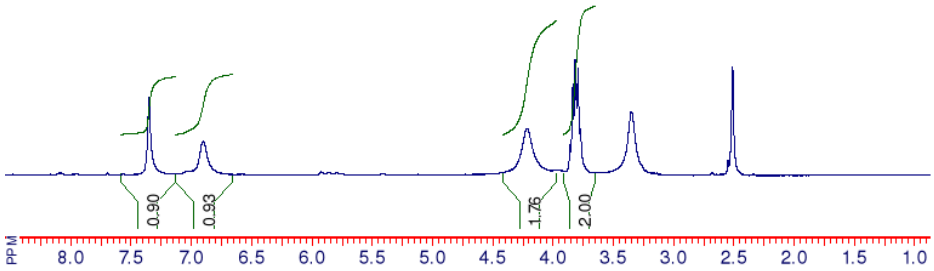
N
H
N
H
NH2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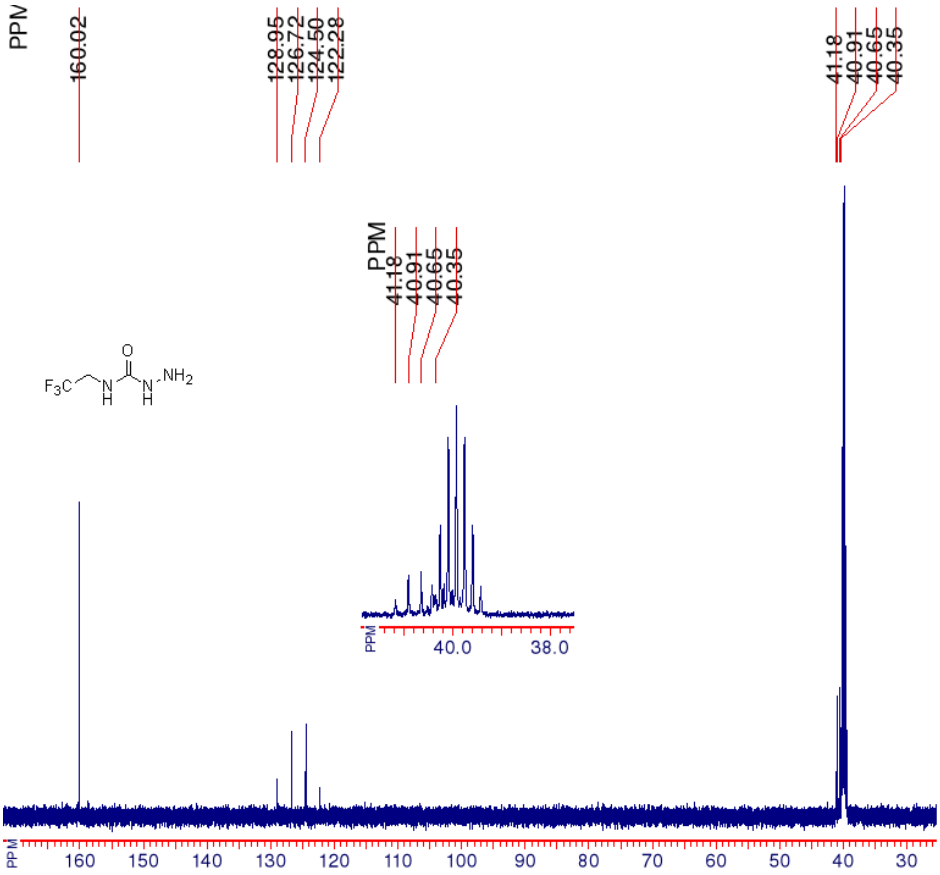
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40.35
PPM
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40.91
40.65
40.35
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38.0
F3C
O
N
H
N
H
NH2
PPM
160
150
140
130
120
110
100
90
80
70
60
50
40
30

PPM
7.341
7.339
7.328
7.326
6.997
6.969
6.961
6.957
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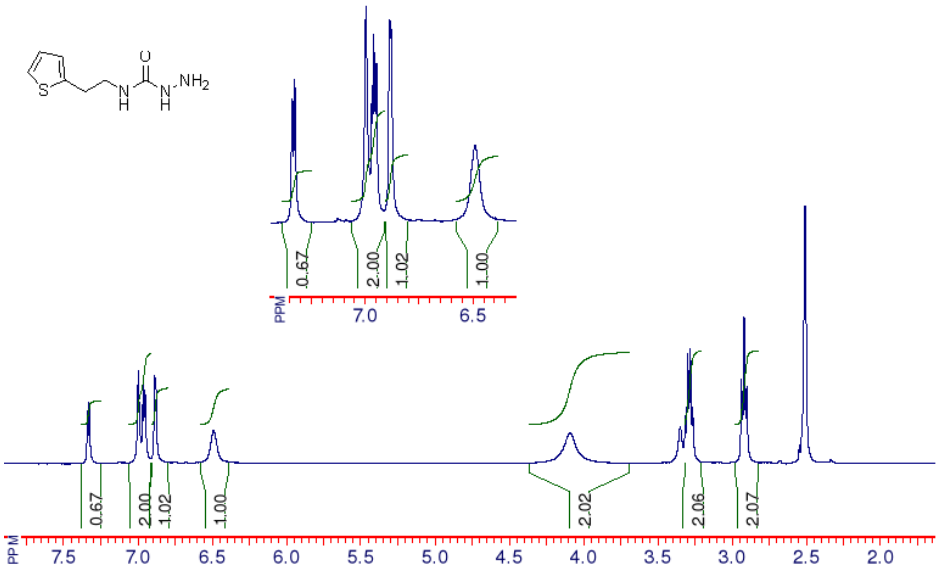
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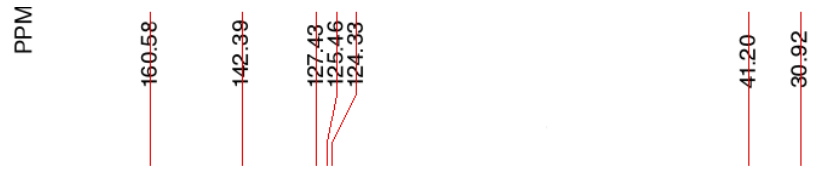
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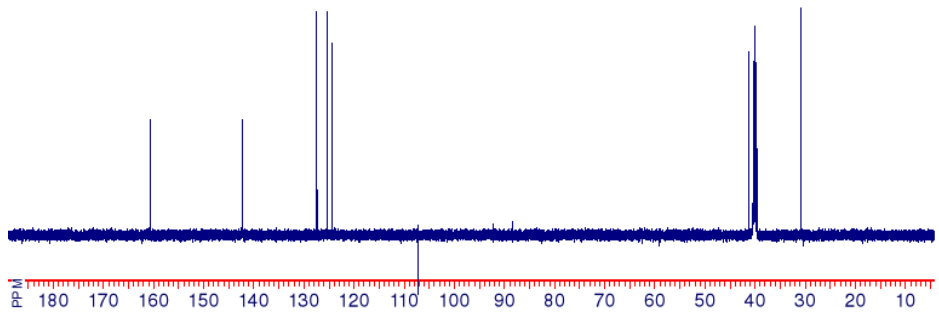
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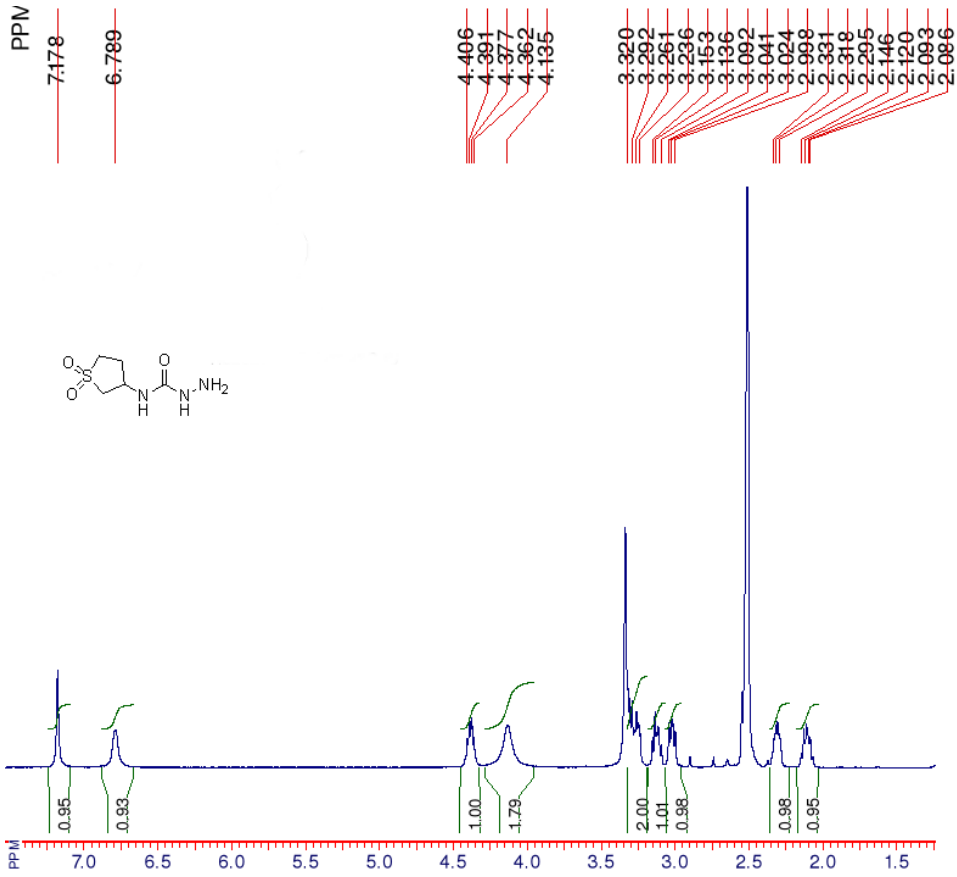
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3.136
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3.041
3.024
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2.318
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2.146
2.120
2.093
2.086
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0.93
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1.01
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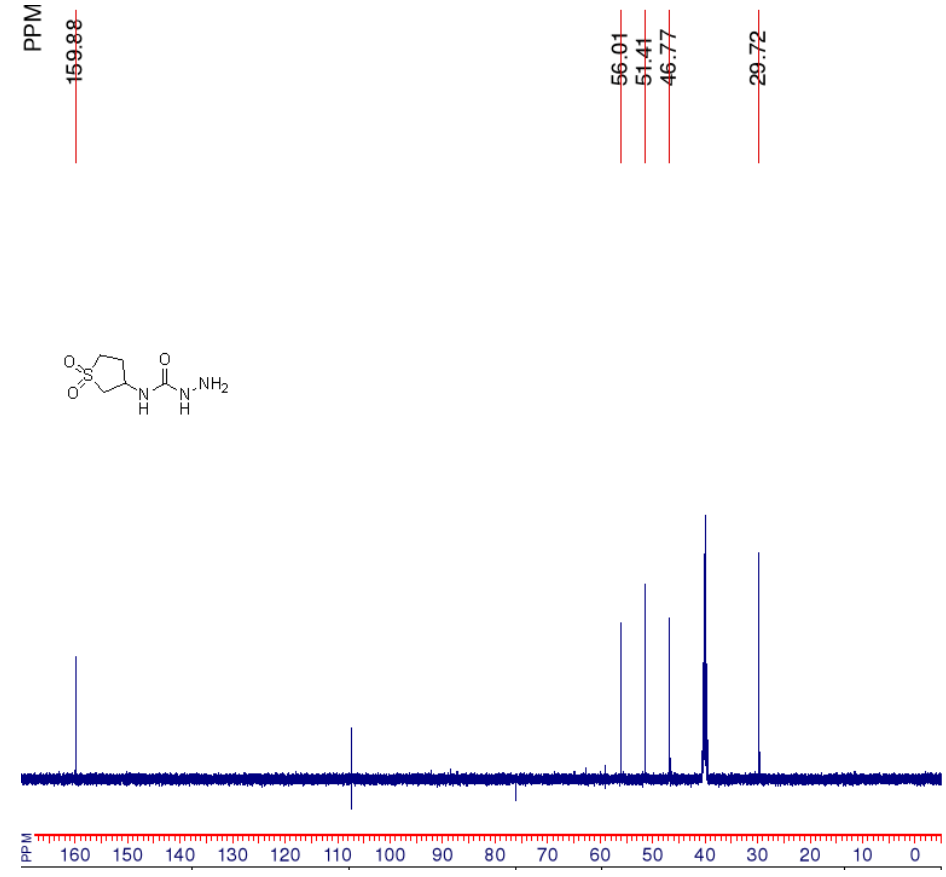
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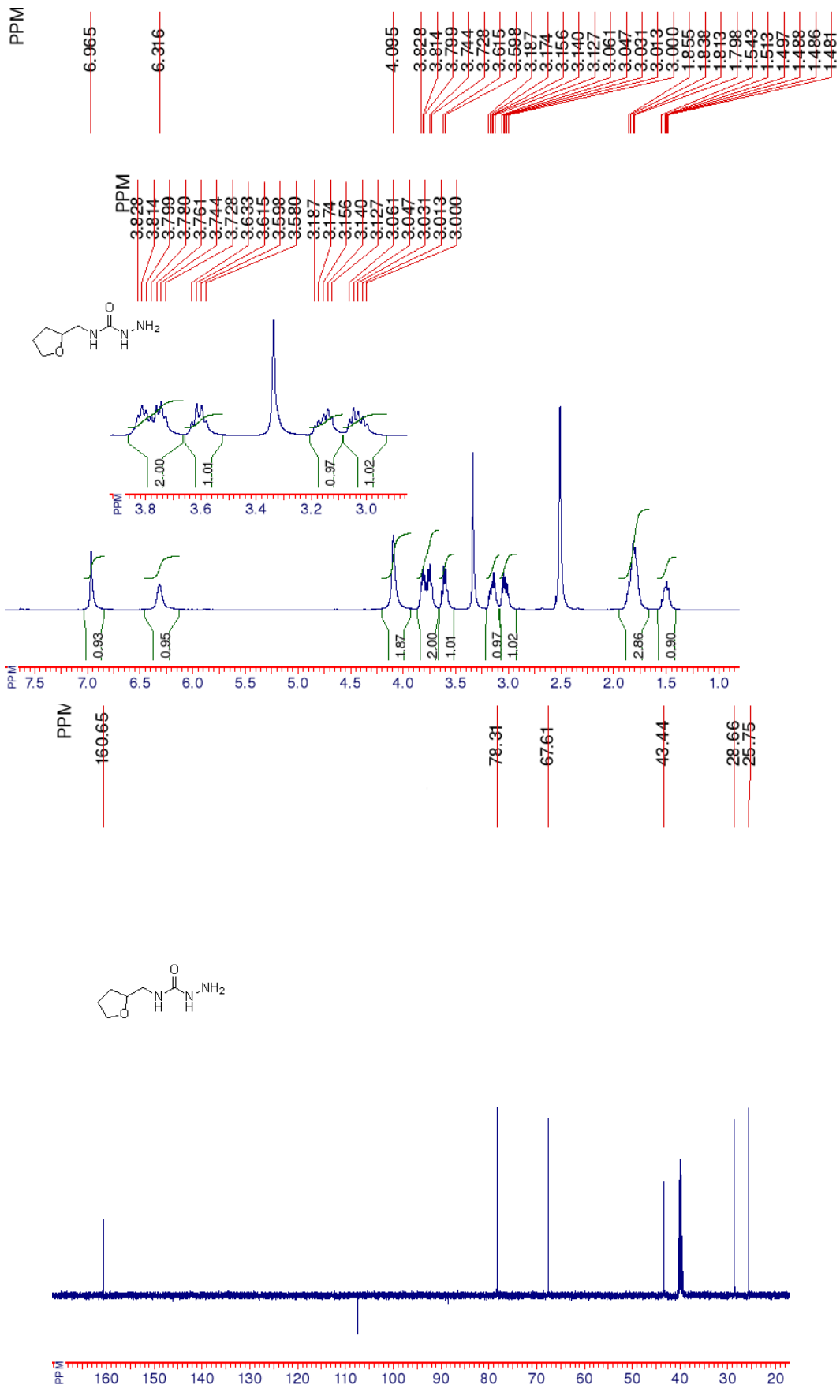
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3.156
3.140
3.127
3.061
3.047
3.031
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3.000
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1.481
PPM
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3.814
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3.744
3.728
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3.615
3.598
3.580
3.187
3.174
3.156
3.140
3.127
3.061
3.047
3.031
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0.97
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0.90
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6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
PPM
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43.44
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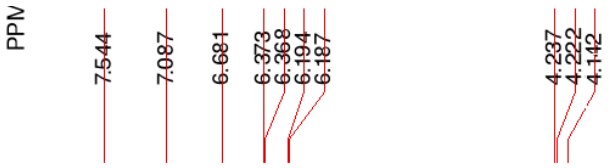
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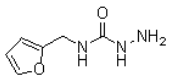

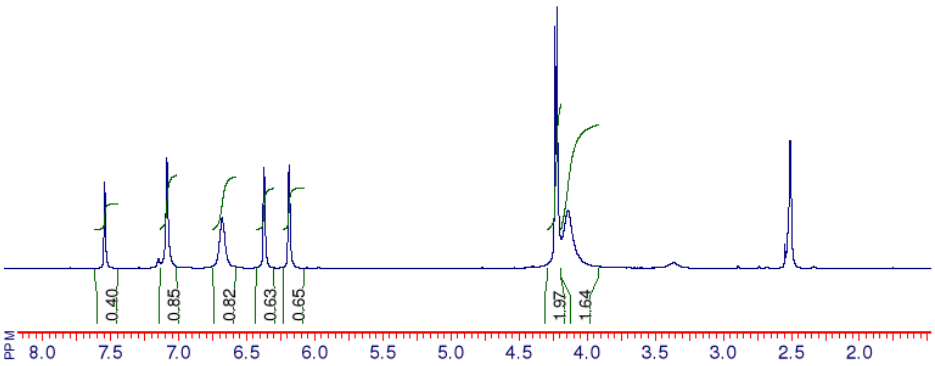
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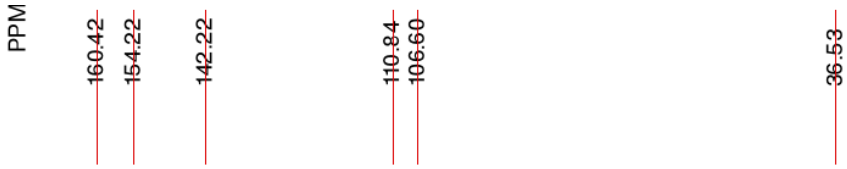
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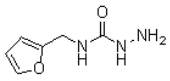

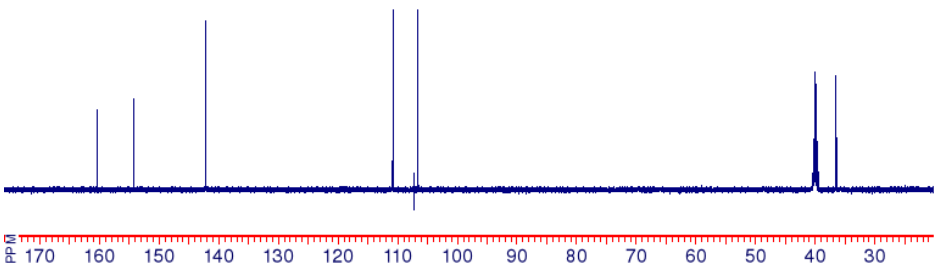
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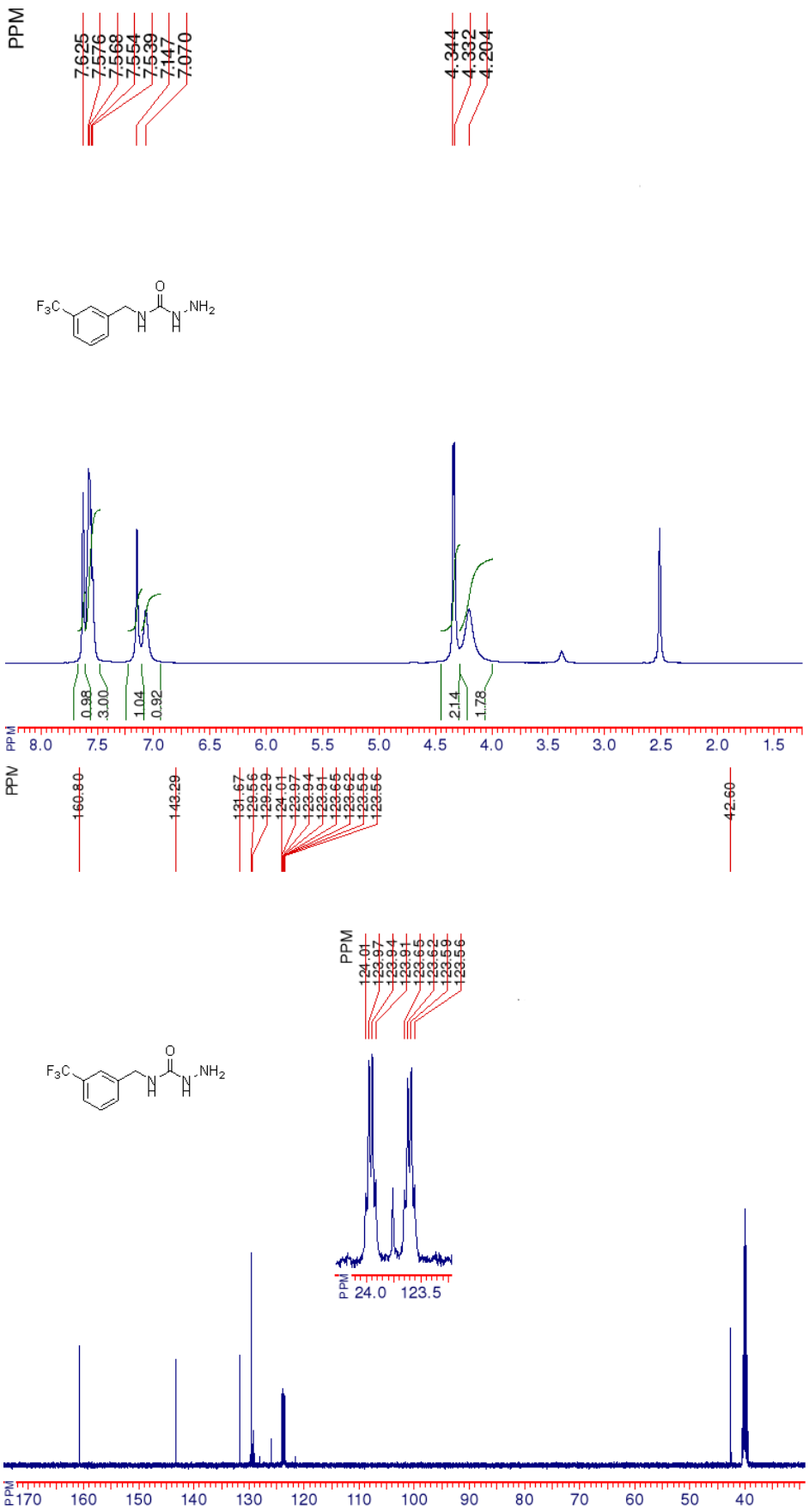
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7.070
4.344
4.332
4.204
F3C
O
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3.00
1.04
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2.14
1.78
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
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131.67
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124.01
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123.91
123.65
123.62
123.59
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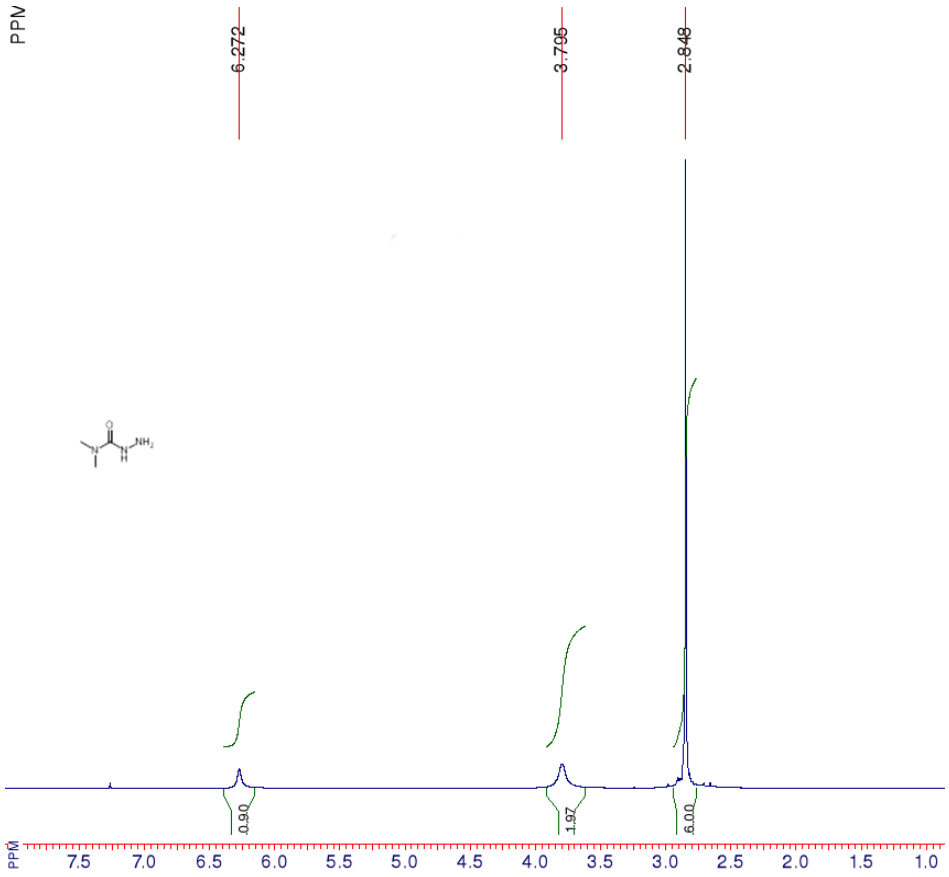
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6.00
PPM
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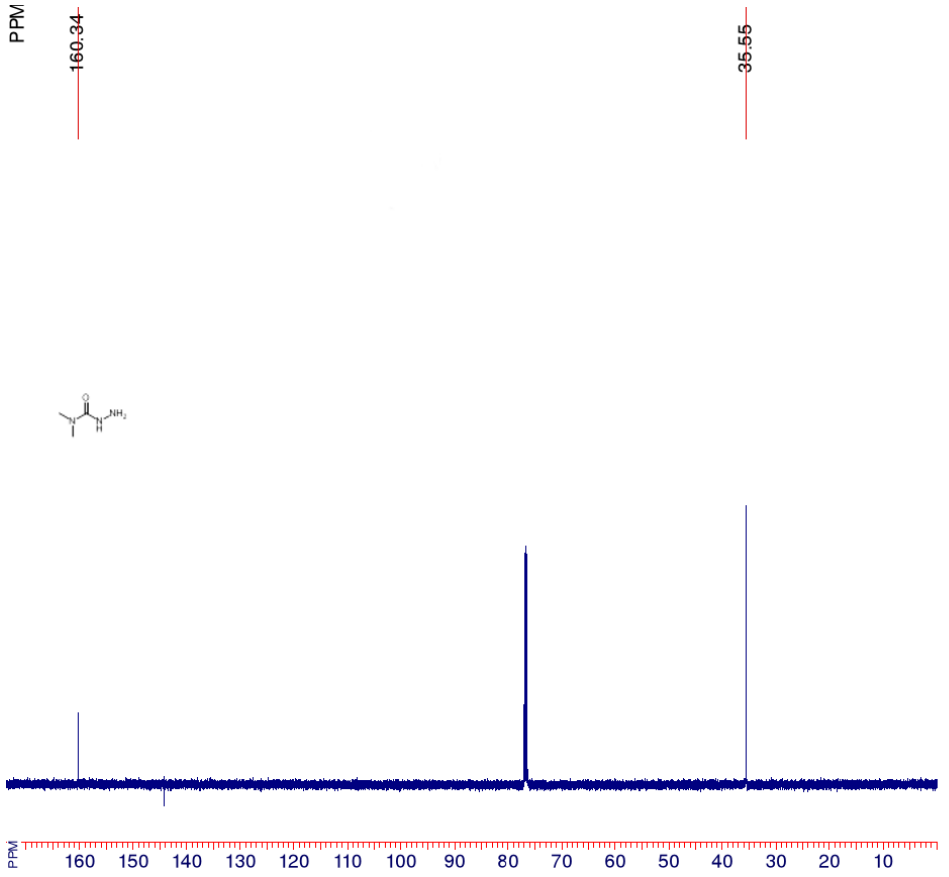
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PPM
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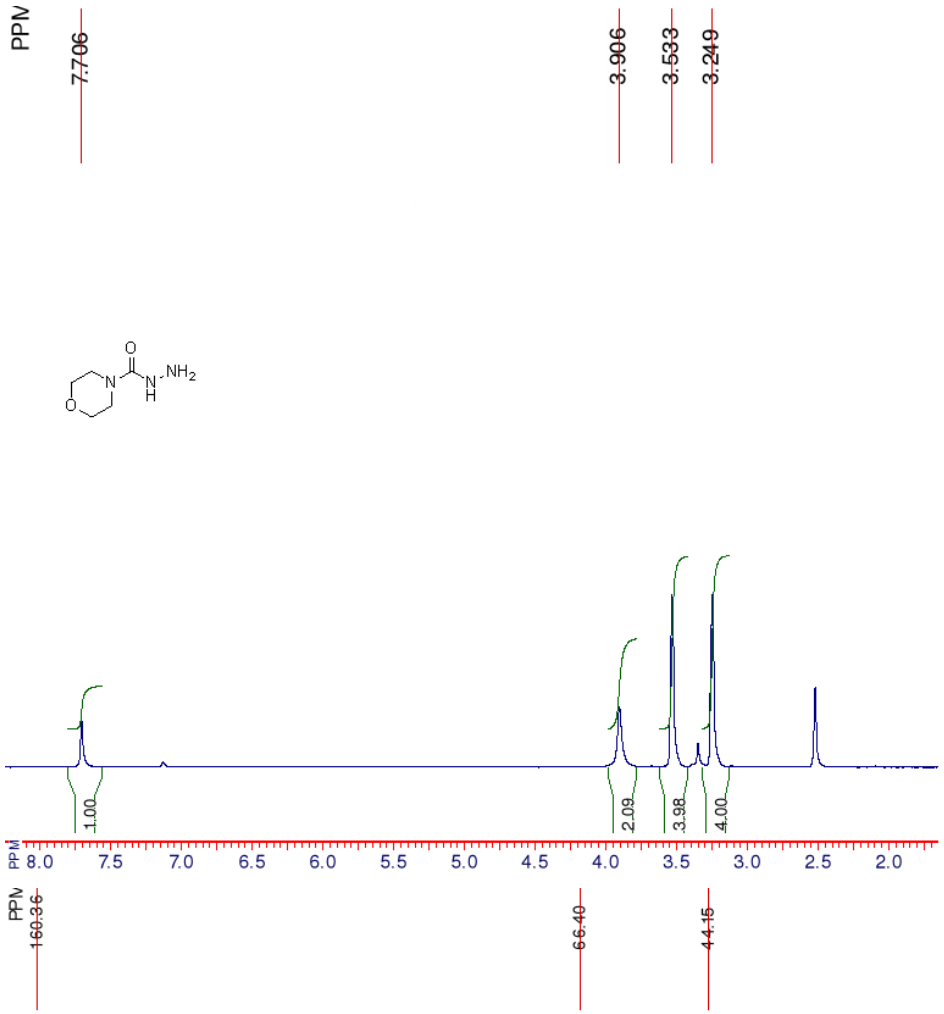
20
10


PPM
7.706
3.906
3.533
3.249
1.00
2.09
3.98
4.00
PPM 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
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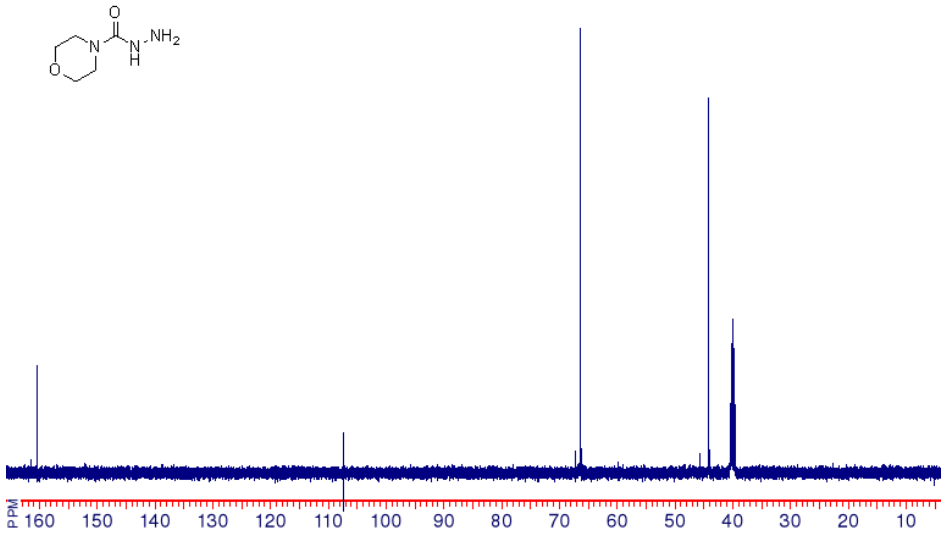
66.40
44.15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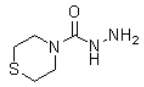
3.575
3.565
3.555
2.512
2.509
2.498
2.488
2.479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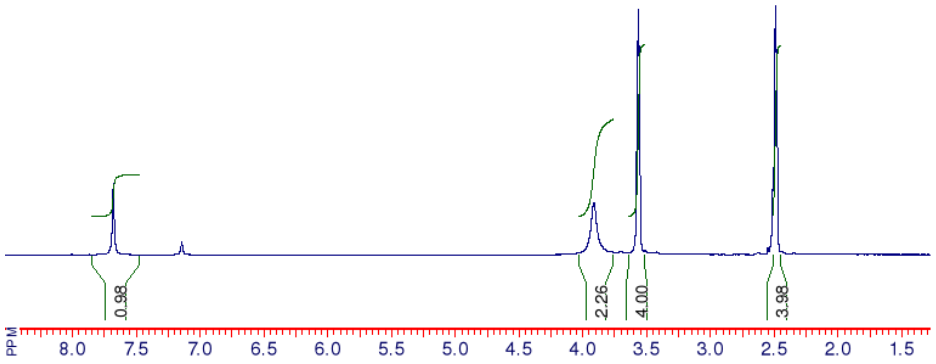
N
NH2
H
S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2.26
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PPM
8.0
7.5
7.0
6.5
6.0
5.5
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4.0
3.5
3.0
2.5
2.0
1.5

PPM
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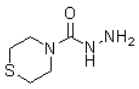
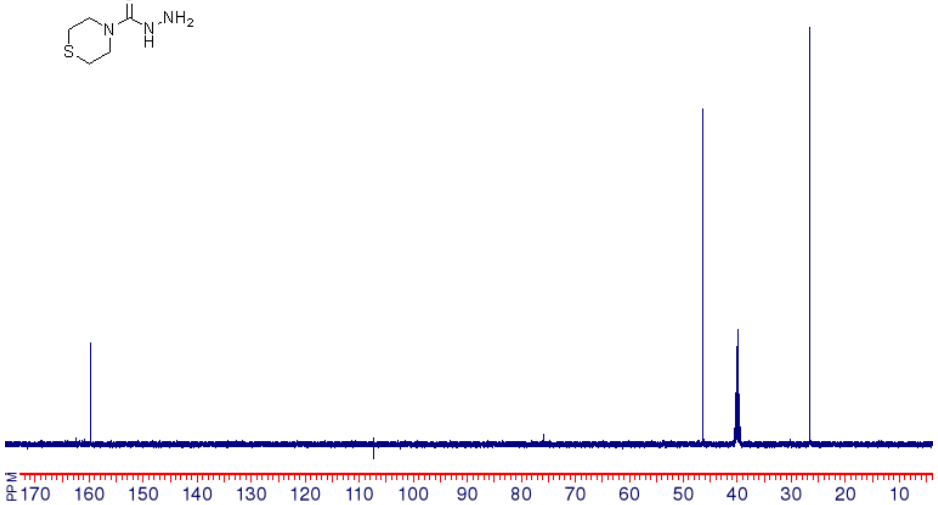
46.37
26.63


O
N
NH2
H
S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160
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40
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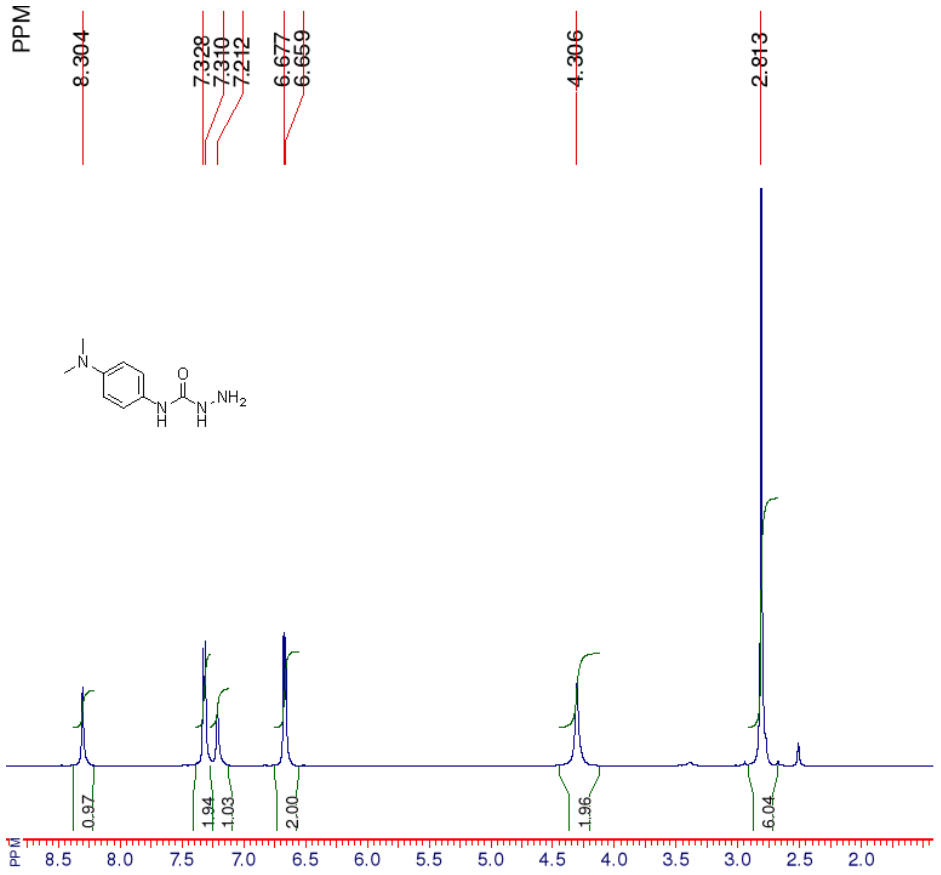
20
10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7.212
6.677
6.659
4.306
2.813
0.97
1.94
1.03
2.00
1.96
6.04
PPM
8.5
8.0
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7.0
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6.0
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4.0
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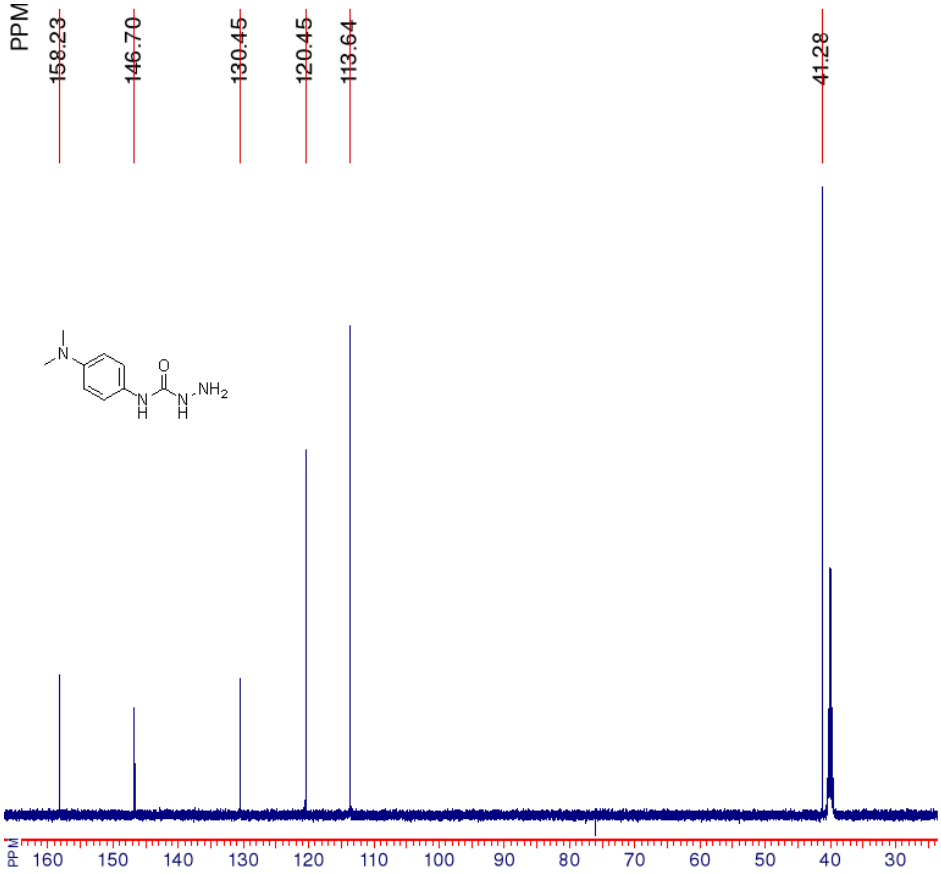
3.0
2.5
2.0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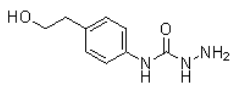
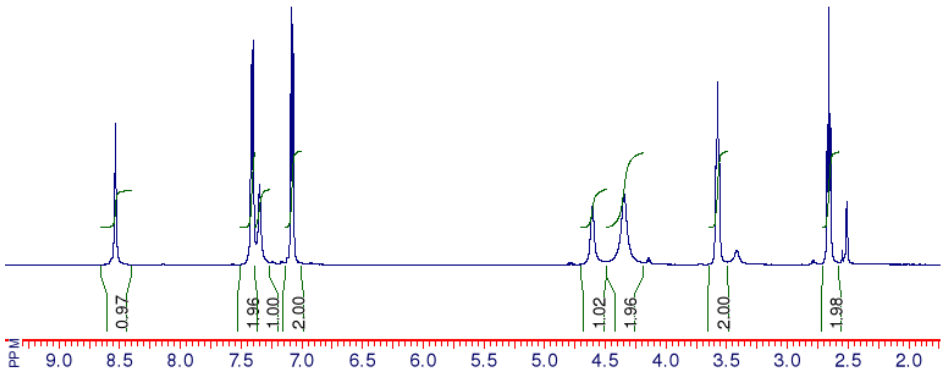
146.70
130.45
120.45
113.64
41.28
PPM
160
150
140
130
120
110
100
90
80
70
60
50
40
30

PPM
8.536
7.418
7.402
7.349
7.089
7.072
4.609
4.346
3.590
3.577
3.563
2.674
2.659
2.645


HO
O
N
H
N
H
NH2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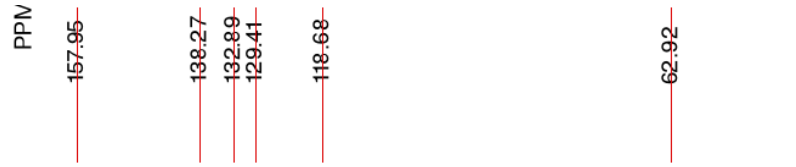
1.96
1.00
2.00
1.02
1.96
2.00
1.98
PPM
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0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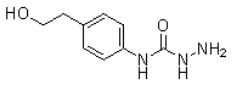
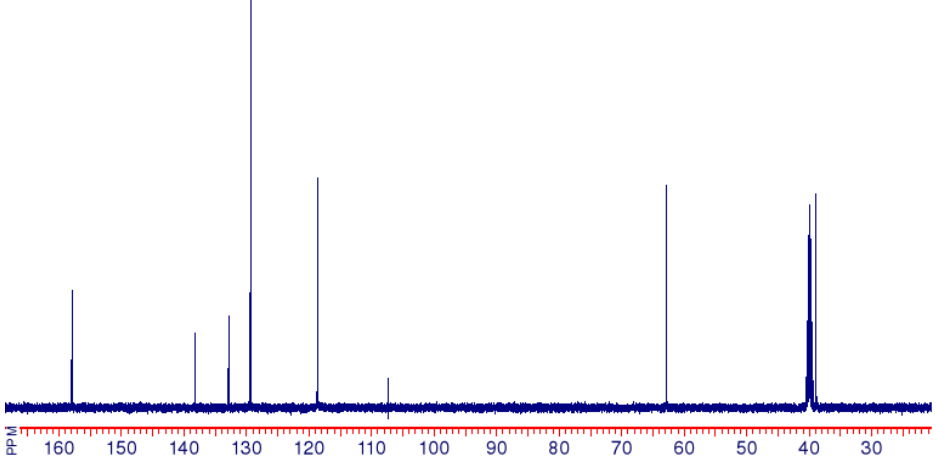
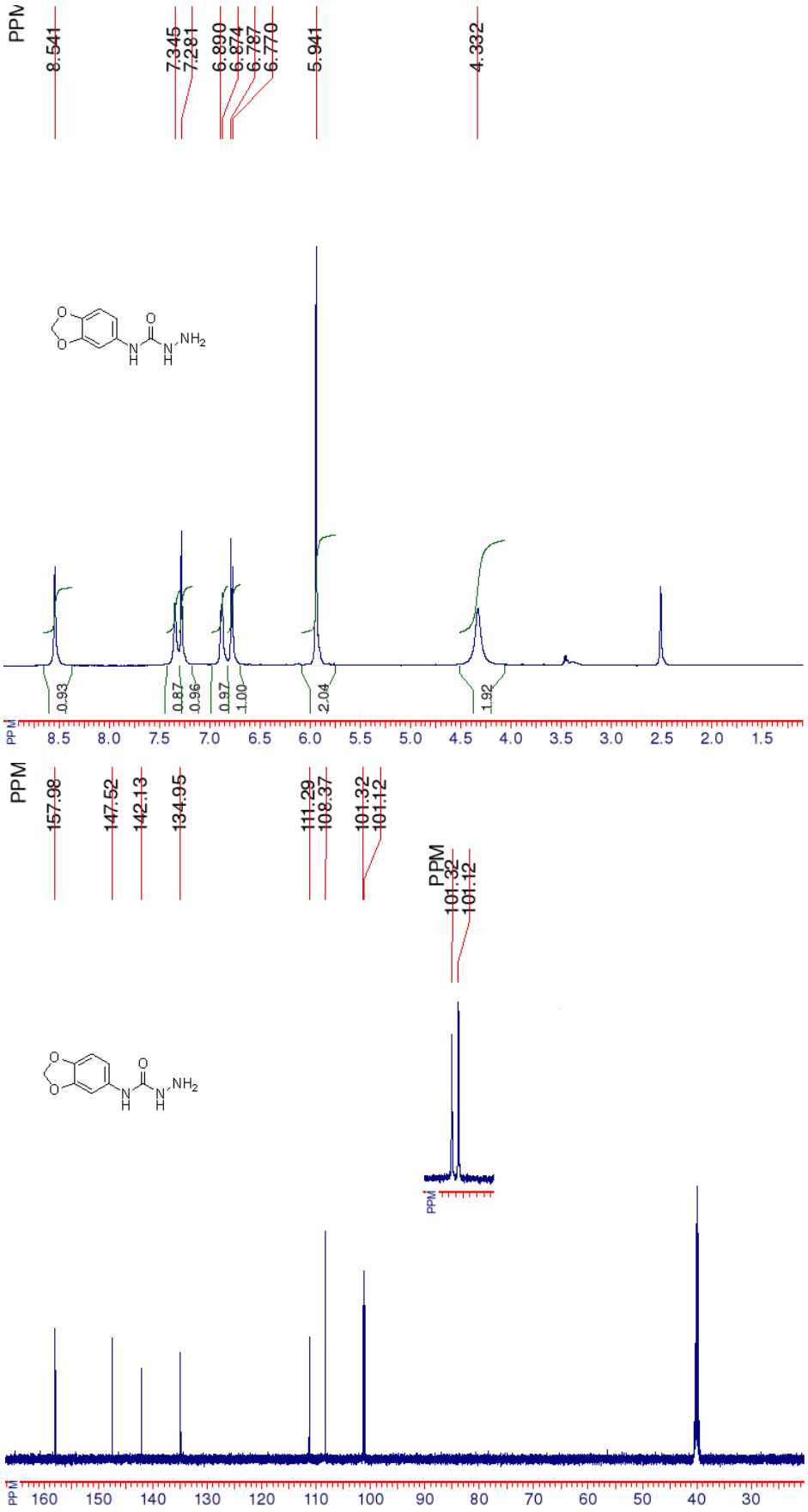
132.89
129.41
118.68
62.92
38.91


HO
O
N
H
N
H
NH2


PPM
160
150
140
130
120
110
100
90
80
70
60
50
40
30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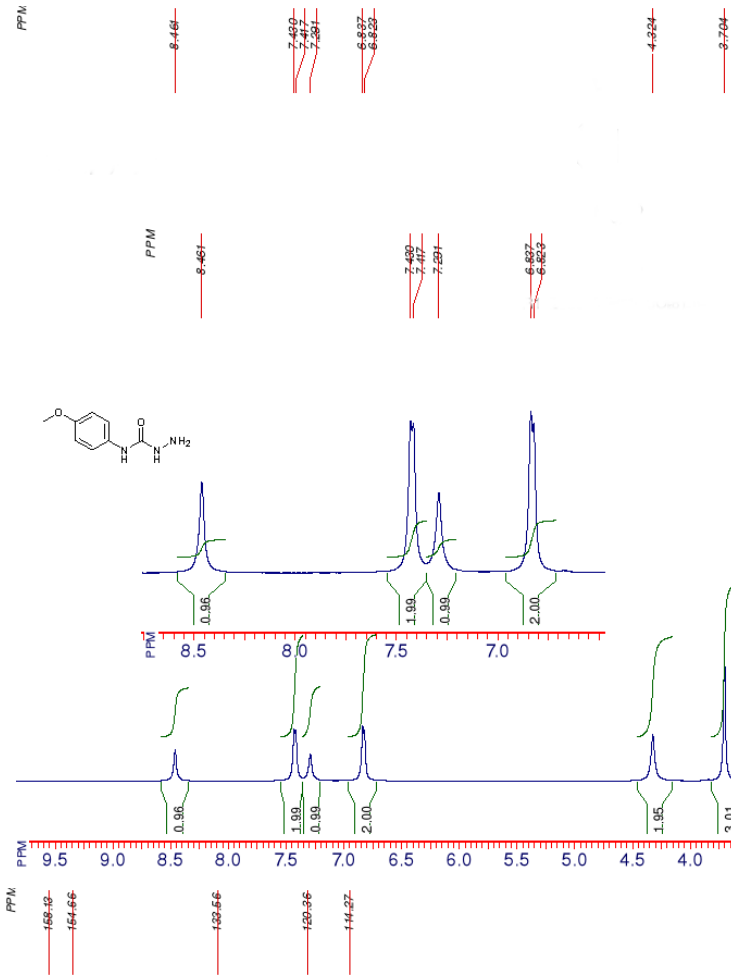
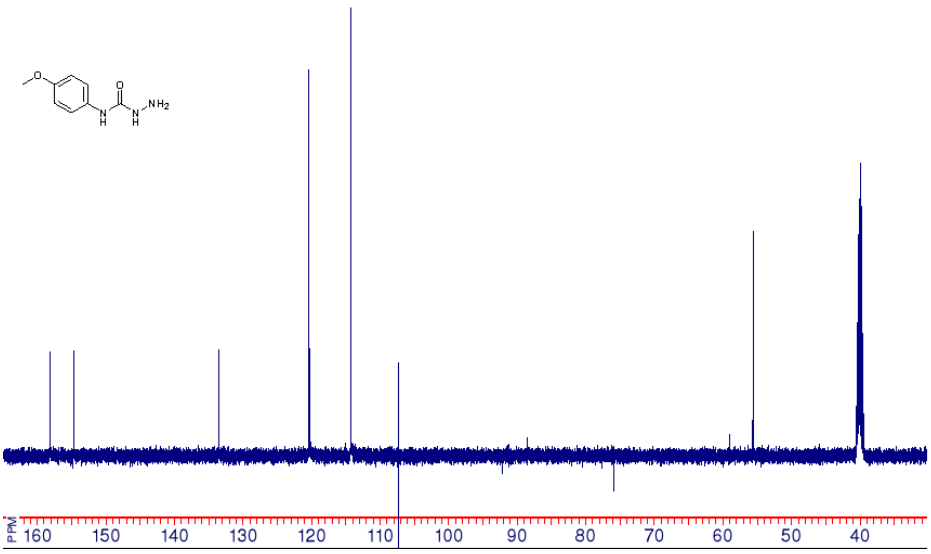
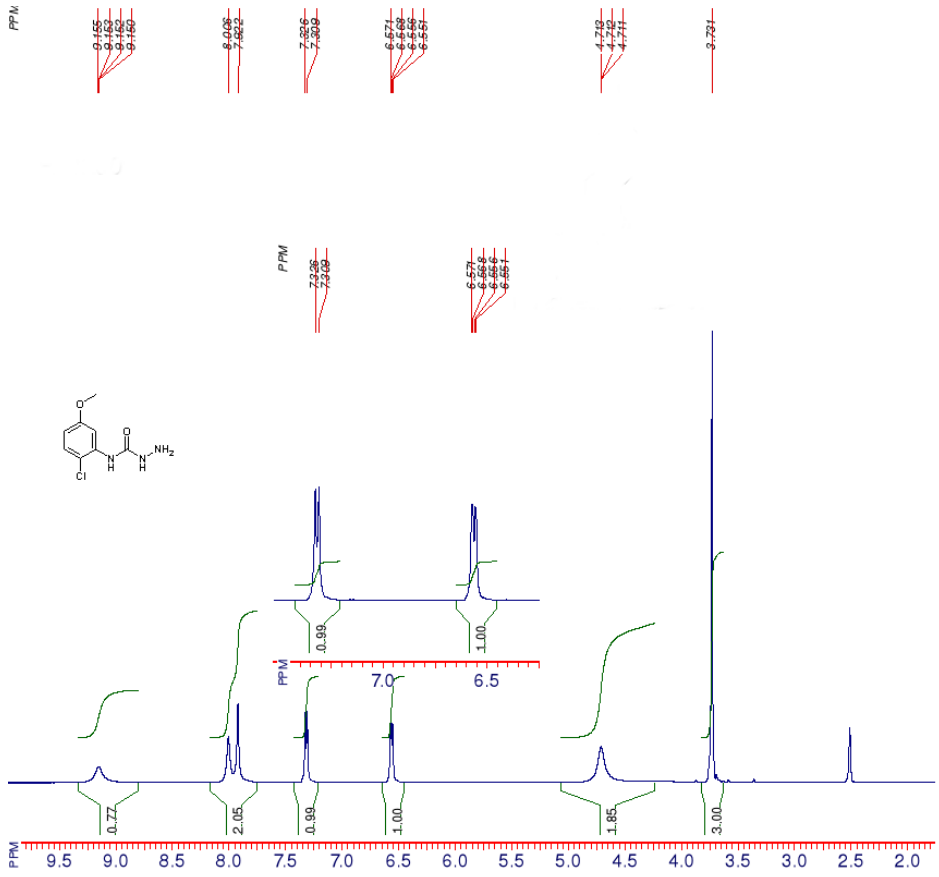
8.541
7.345
7.281
6.890
6.874
6.787
6.770
5.941
4.332
0.93
0.87
0.96
0.97
1.00
2.04
1.92
PPM
157.98
147.52
142.13
134.95
111.29
108.37
101.32
101.12
PPM
101.32
101.12


PPM
8.461
7.430
7.417
7.391
6.837
6.823
4.324
3.704
0.96
1.99
0.99
2.00
1.95
3.01
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

PPM
159.19
154.66
130.56
120.36
114.27
55.62


PPM
160 150 140 130 120 110 100 90 80 70 60 50 40


PPM
9.155
9.153
9.152
9.150
8.006
7.922
7.326
7.309
6.571
6.568
6.556
6.551
4.713
4.712
4.711
3.731
0.99
1.00
7.0
6.5
0.77
2.05
0.99
1.00
1.85
3.00
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
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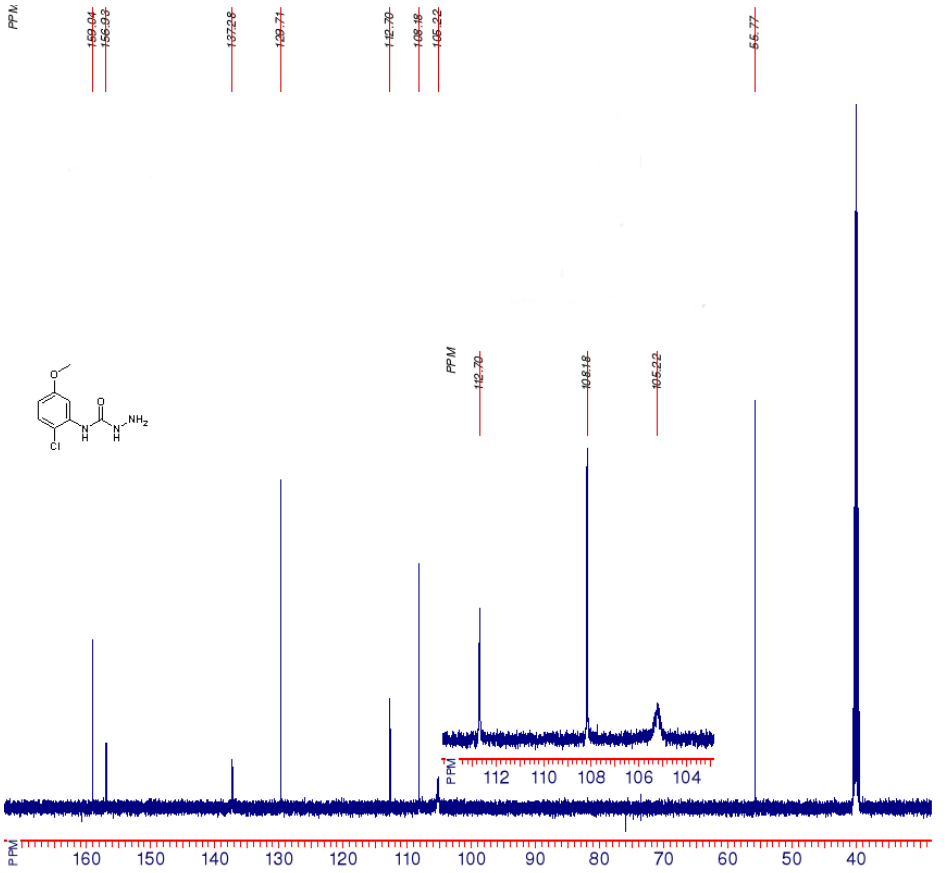
2.5
2.0


PPM
159.04
156.93
137.28
129.71
112.70
108.18
105.22
55.77
112
110
108
106
104
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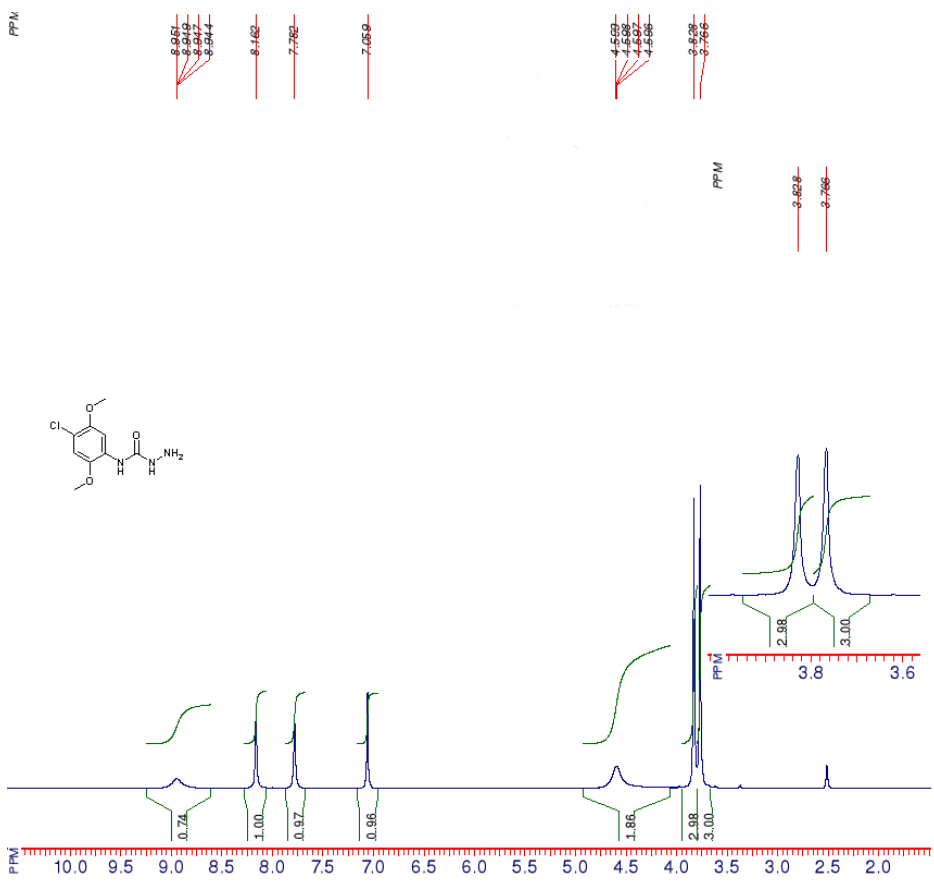
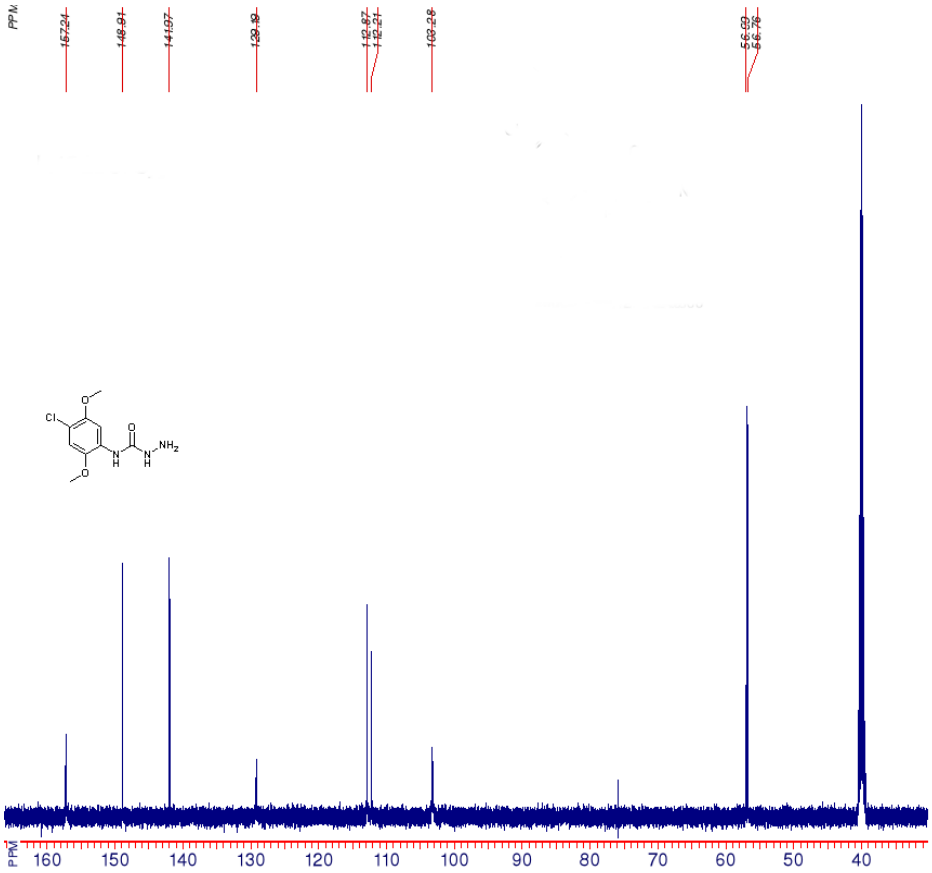
150
140
130
120
110
100
90
80
70
60
50
40


PPM
8.961
8.949
8.947
8.944
8.162
7.782
7.059
4.599
4.598
4.597
4.596
3.828
3.766
0.74
1.00
0.97
0.96
1.86
2.98
3.00
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
3.8 3.6


PPM
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112.21
103.28
56.93
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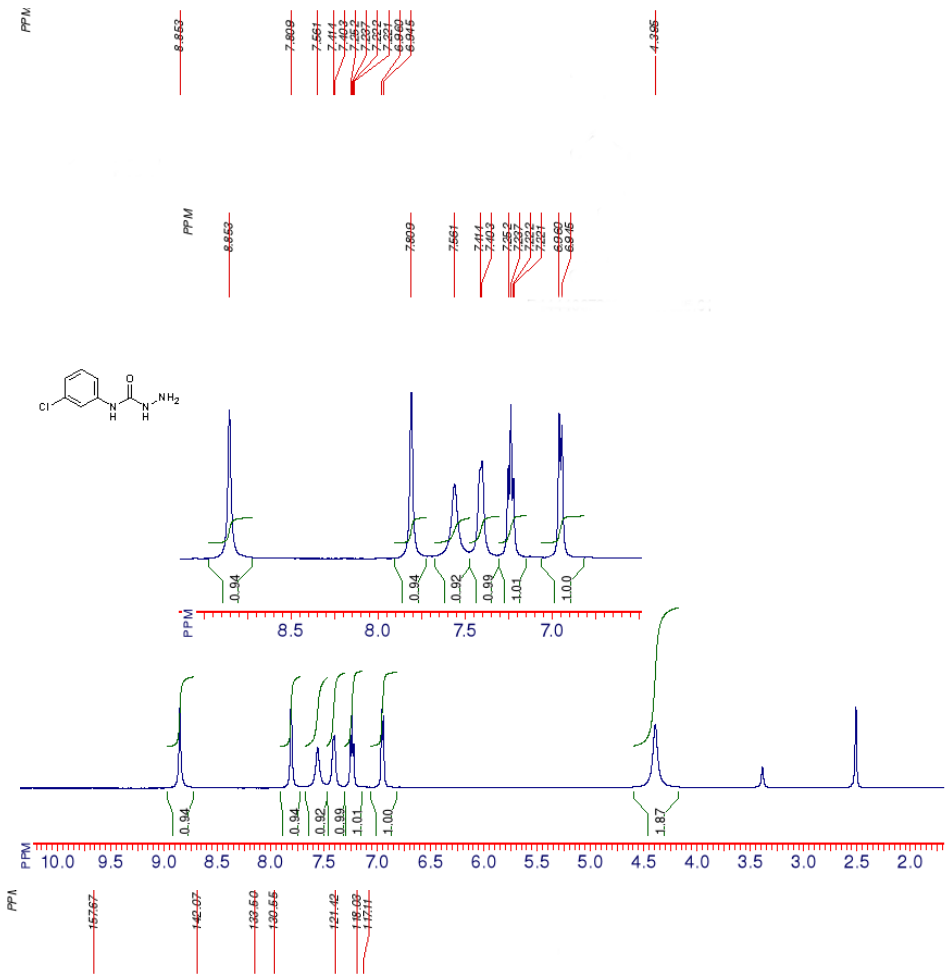
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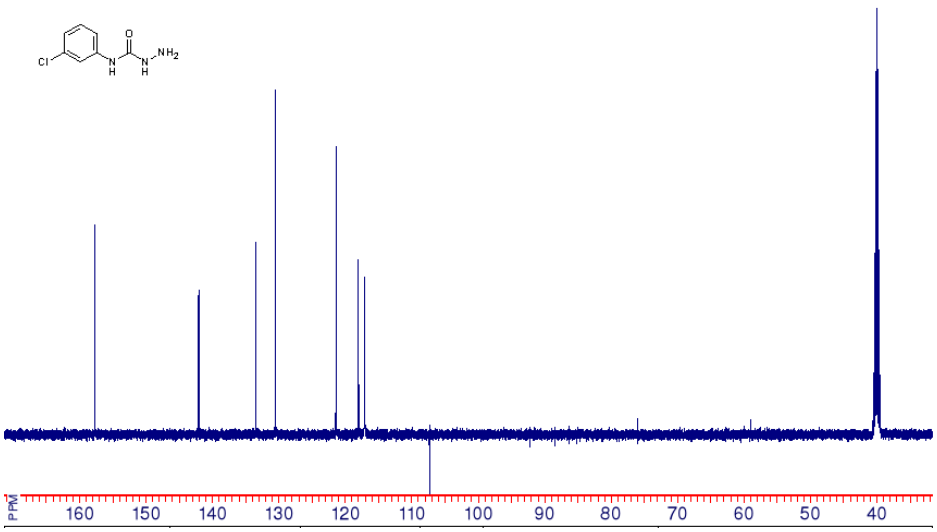
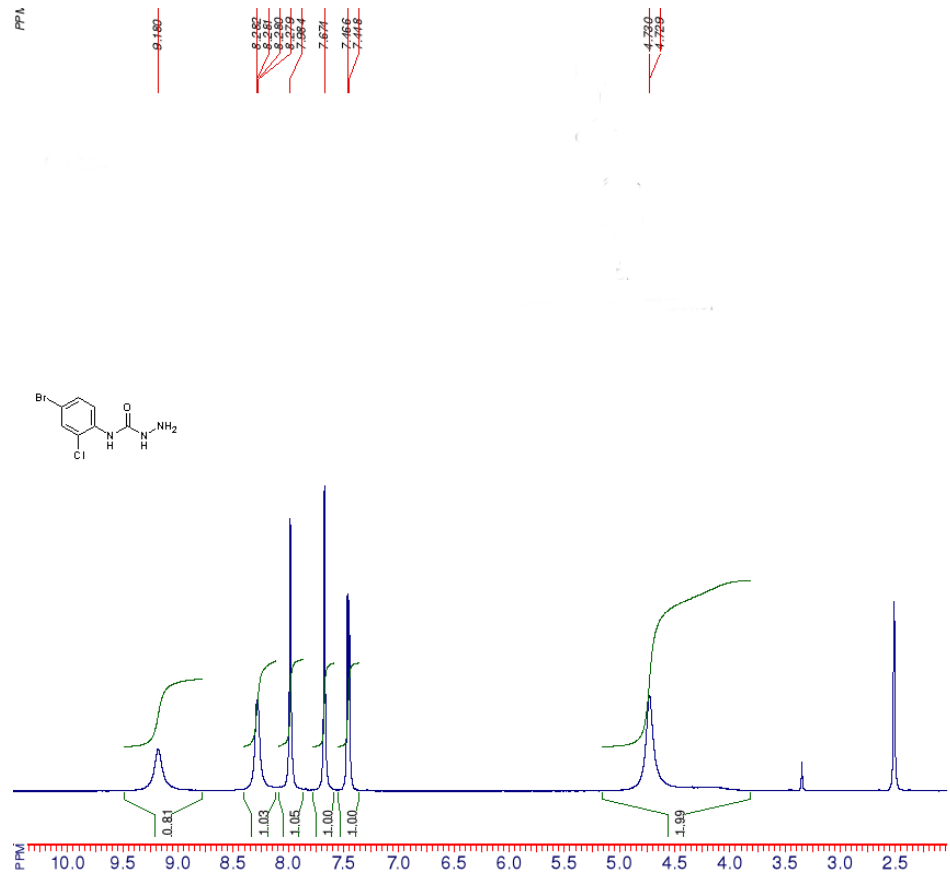
7.561
7.414
7.403
7.252
7.237
7.222
7.221
6.060
6.046
4.385
Cl
NH2
0.94
0.94
0.92
0.99
1.01
1.00
1.87
8.5
8.0
7.5
7.0
10.0
9.5
9.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0

PPM
157.67
142.07
133.60
130.56
121.42
118.08
117.11


Cl
NH2
PPM
160
150
140
130
120
110
100
90
80
70
60
50
40


PPM
9.180
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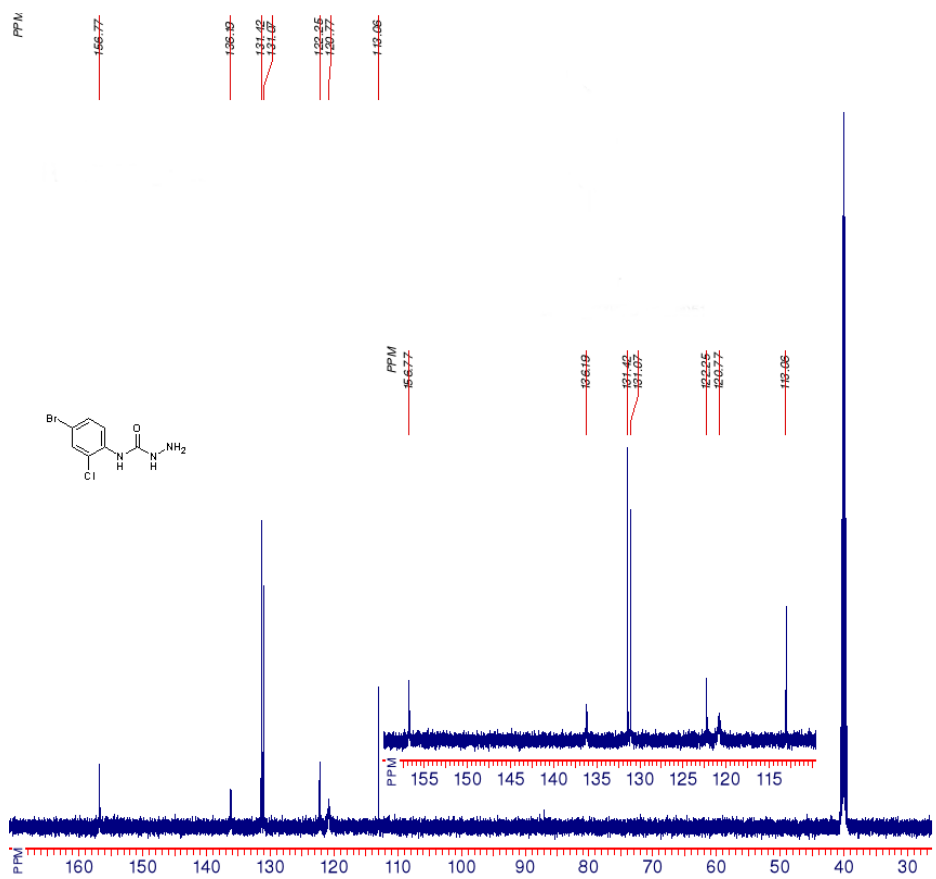
8.281
8.280
8.279
7.984
7.674
7.466
7.448
4.730
4.729
Br
Cl
O
N
H
NH2
0.81
1.03
1.05
1.00
1.00
1.99
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5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131.42
131.07
122.25
120.77
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Br
Cl
O
N
H
NH2
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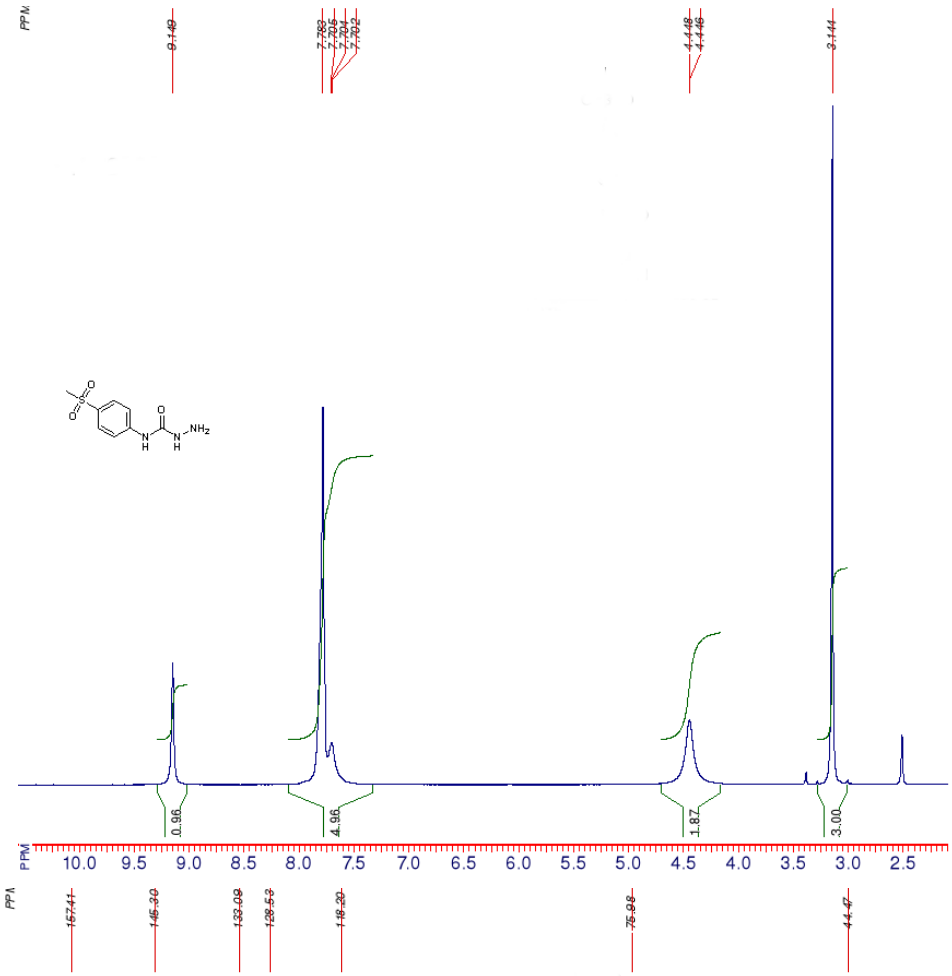
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7.701
7.692
4.148
4.146
3.144
0.98
4.96
1.87
3.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5
PPM
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145.30
133.09
128.52
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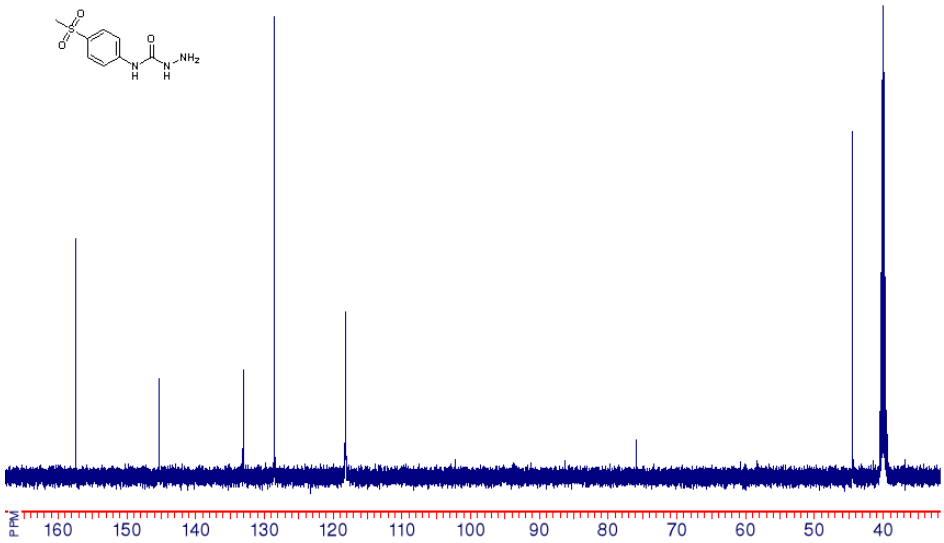
76.98
44.67


PPM
160 150 140 130 120 110 100 90 80 70 60 50 40

PPM
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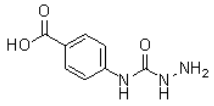
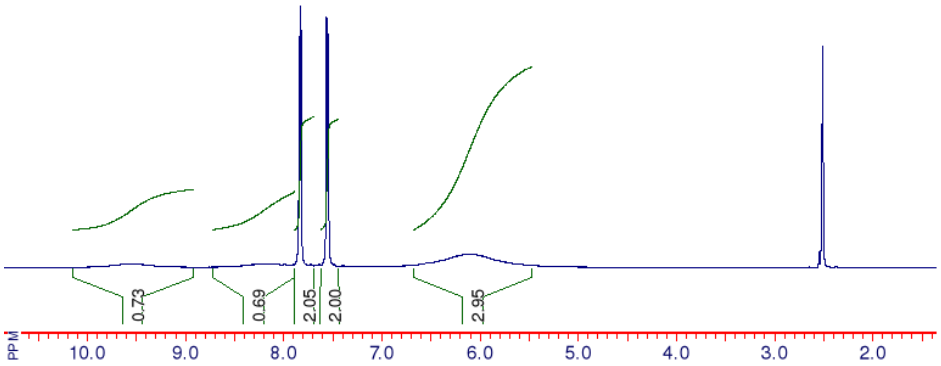
7.825
7.563
7.547


HO
O
N
H
O
N
H
NH2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0.69
2.05
2.00
2.95
PPM
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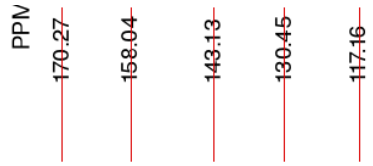
8.0
7.0
6.0
5.0
4.0
3.0
2.0


PPM
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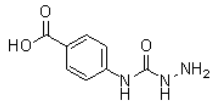
117.16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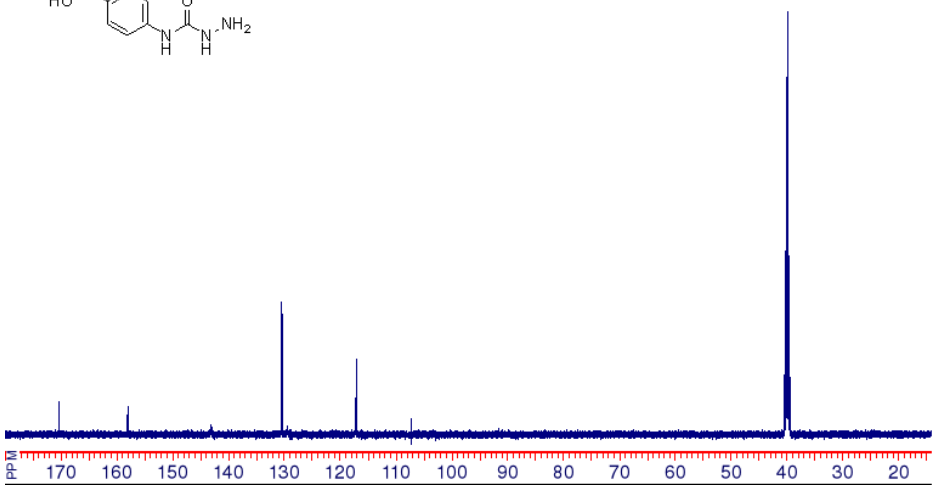
N
H
NH2


PPM
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120
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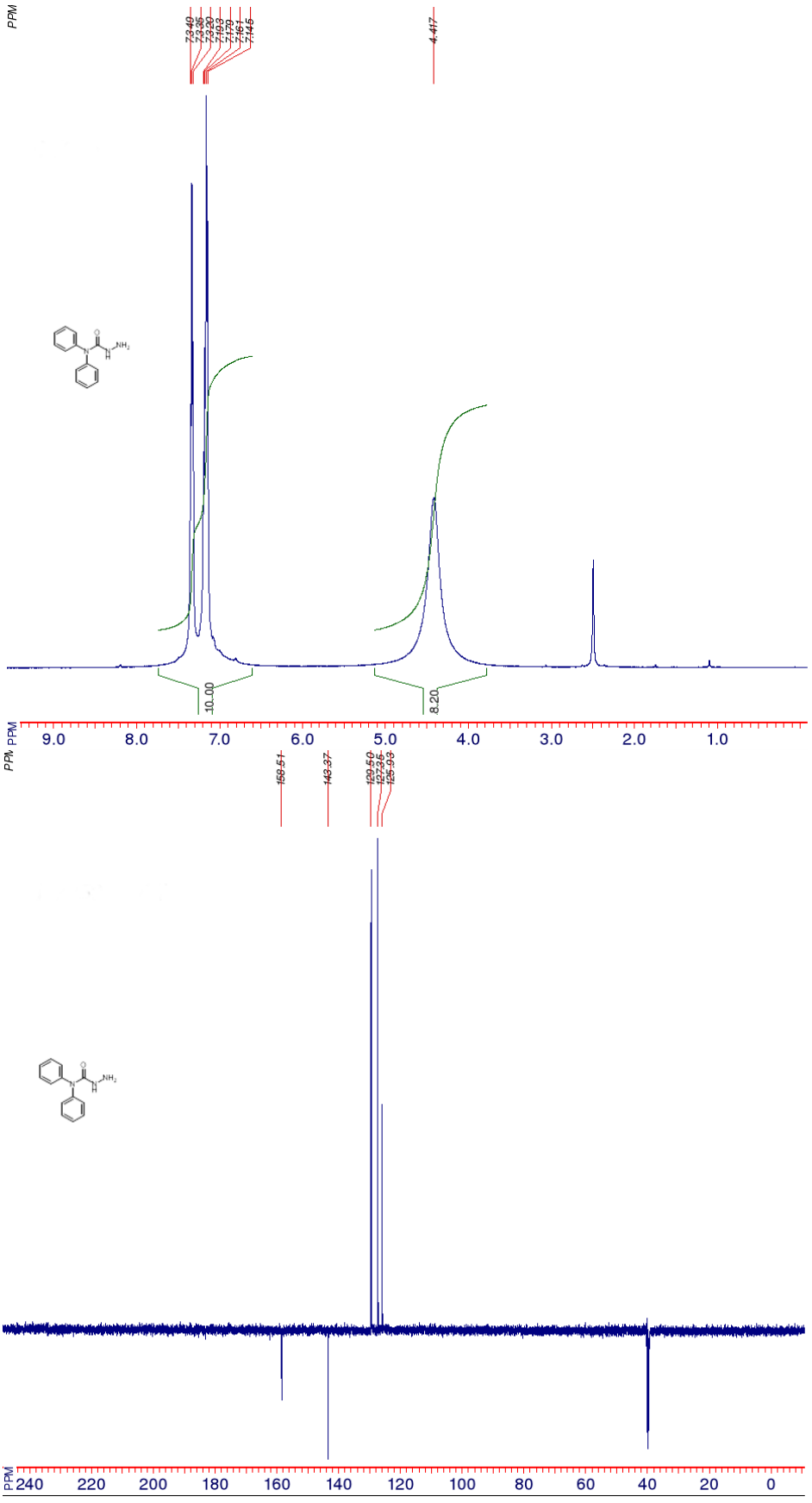
20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7.161
7.146
4.417
10.00
8.20
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
159.51
143.37
129.50
127.36
125.93
240
220
200
180
160
140
120
100
80
60
40
20
0