

SUPPORTING INFORMATION FOR

Synthetic Versatility of 2-Substituted-6-methyl 2,3-dihydropyridinones accessed via the Vinylogous Mannich Reaction in the Construction of Chiral Polyfunctional Piperidine-based Compounds and β Amino Acid Derivatives

Yang Yang*, Clayton Hardman

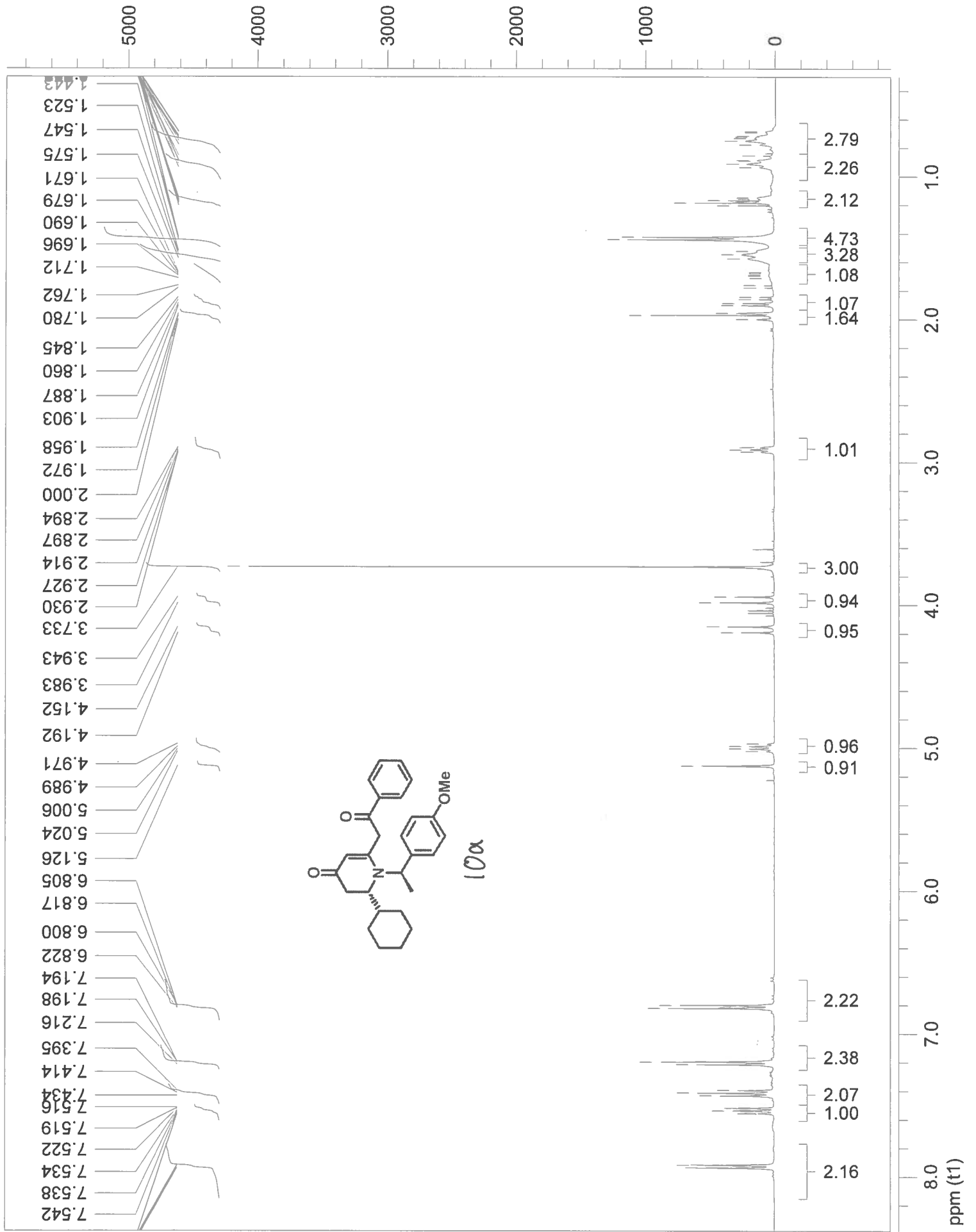
Genomics Institute of the Novartis Research Foundation

10675 John Jay Hopkins Drive, San Diego, California 92121

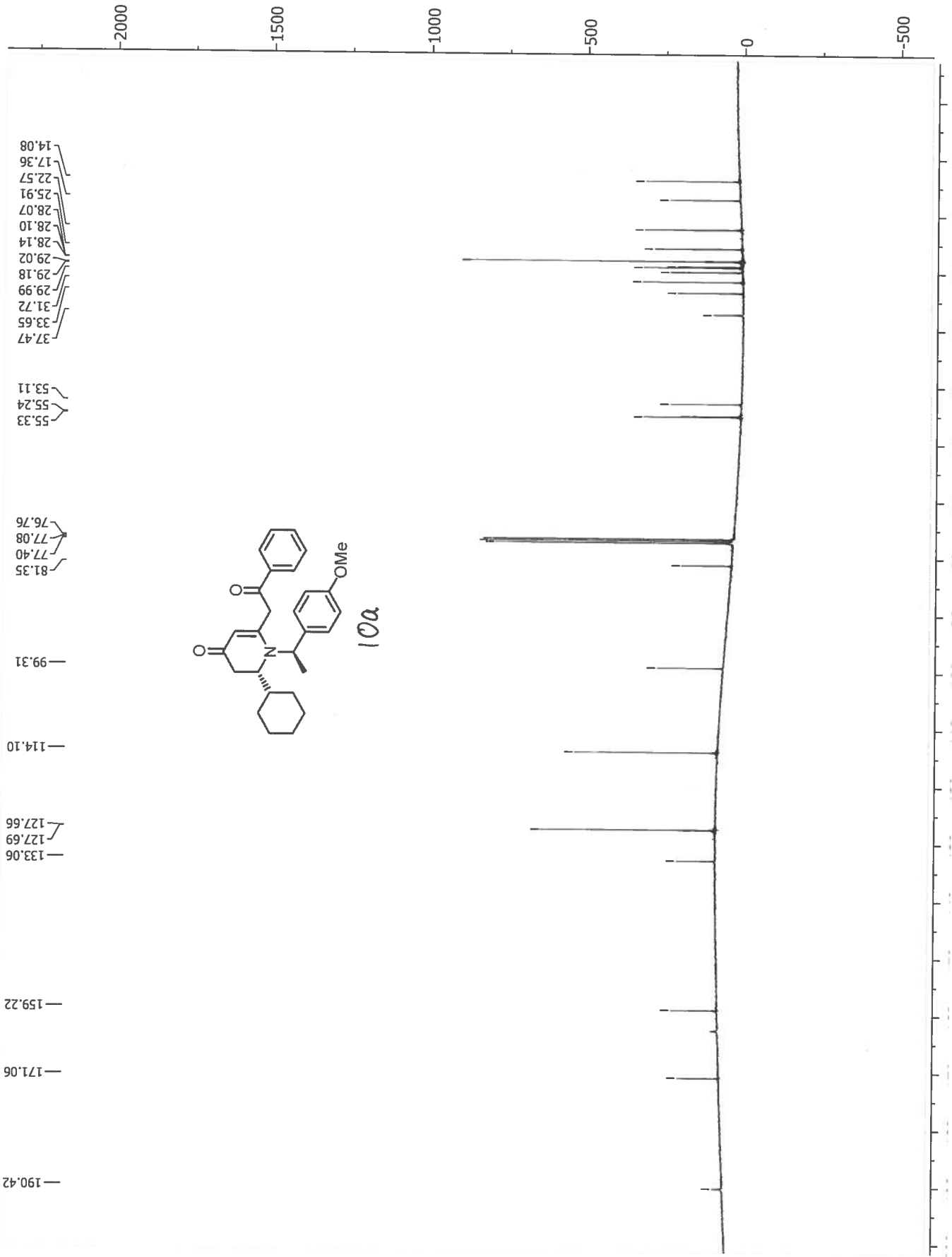
yyang@gnf.org

TABLE OF CONTENTS:

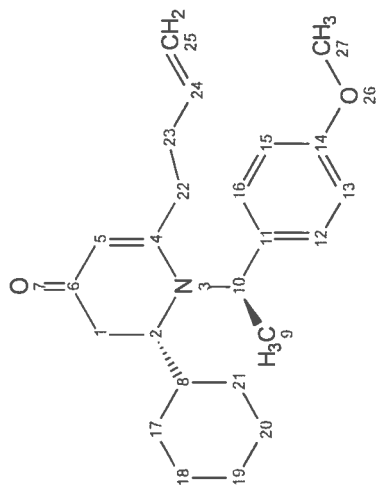
NMR spectra copy of compounds **10a-i; 12; 13; 14b-e; 15a-e; 16a-e; 17; 18; 19; 20; 21; 22a-d; 23a-b; 24a-b; 25a-g; 26a-g; 27; 28.**



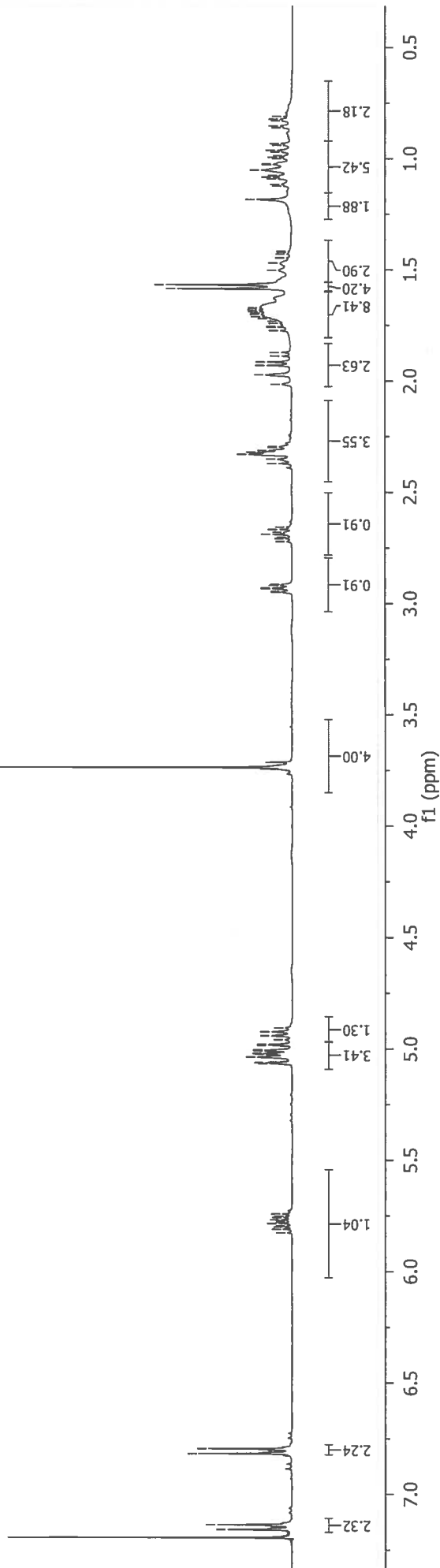
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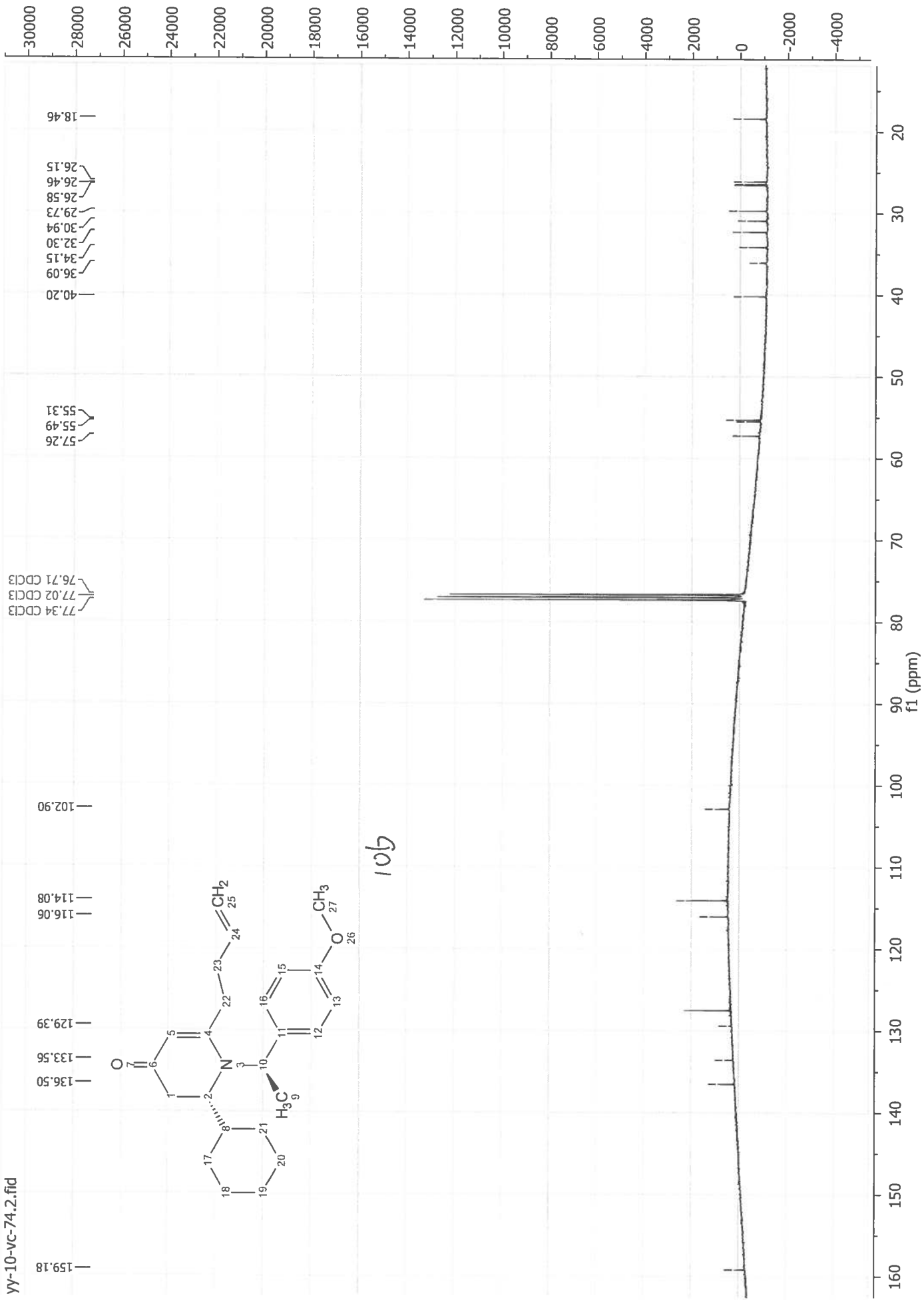
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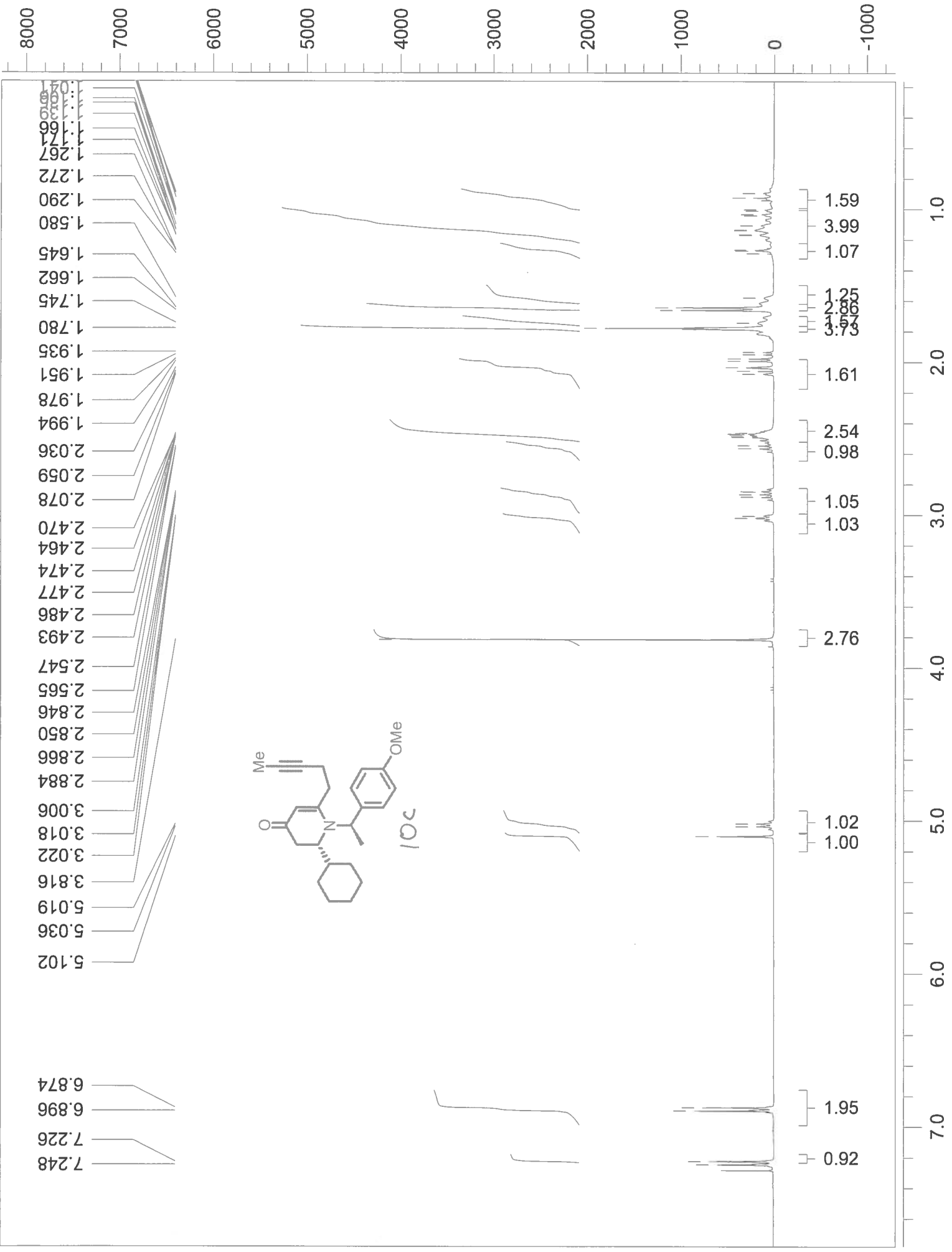


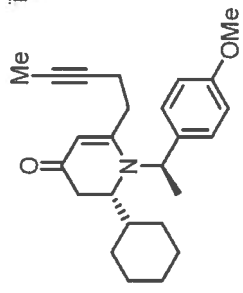
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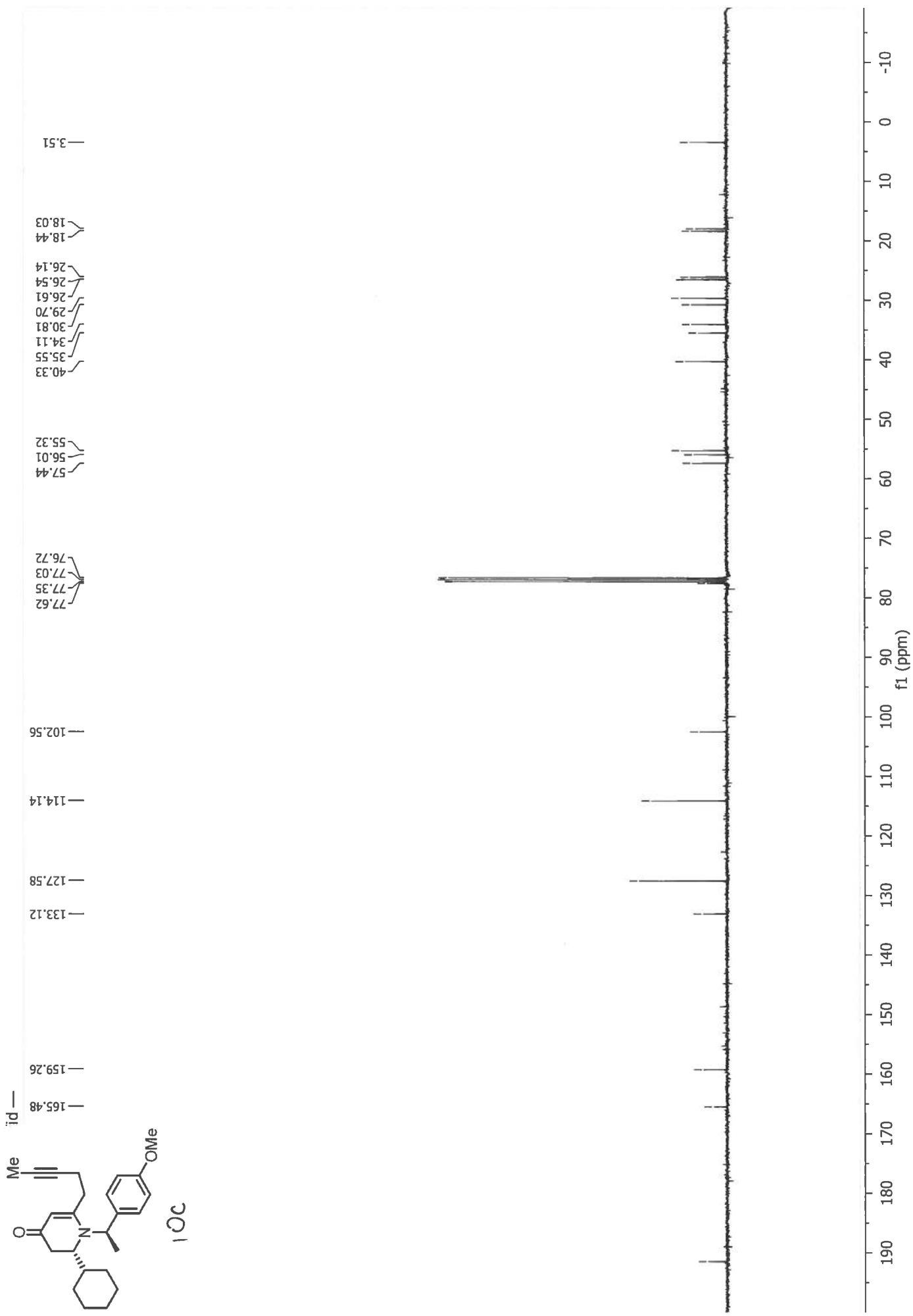
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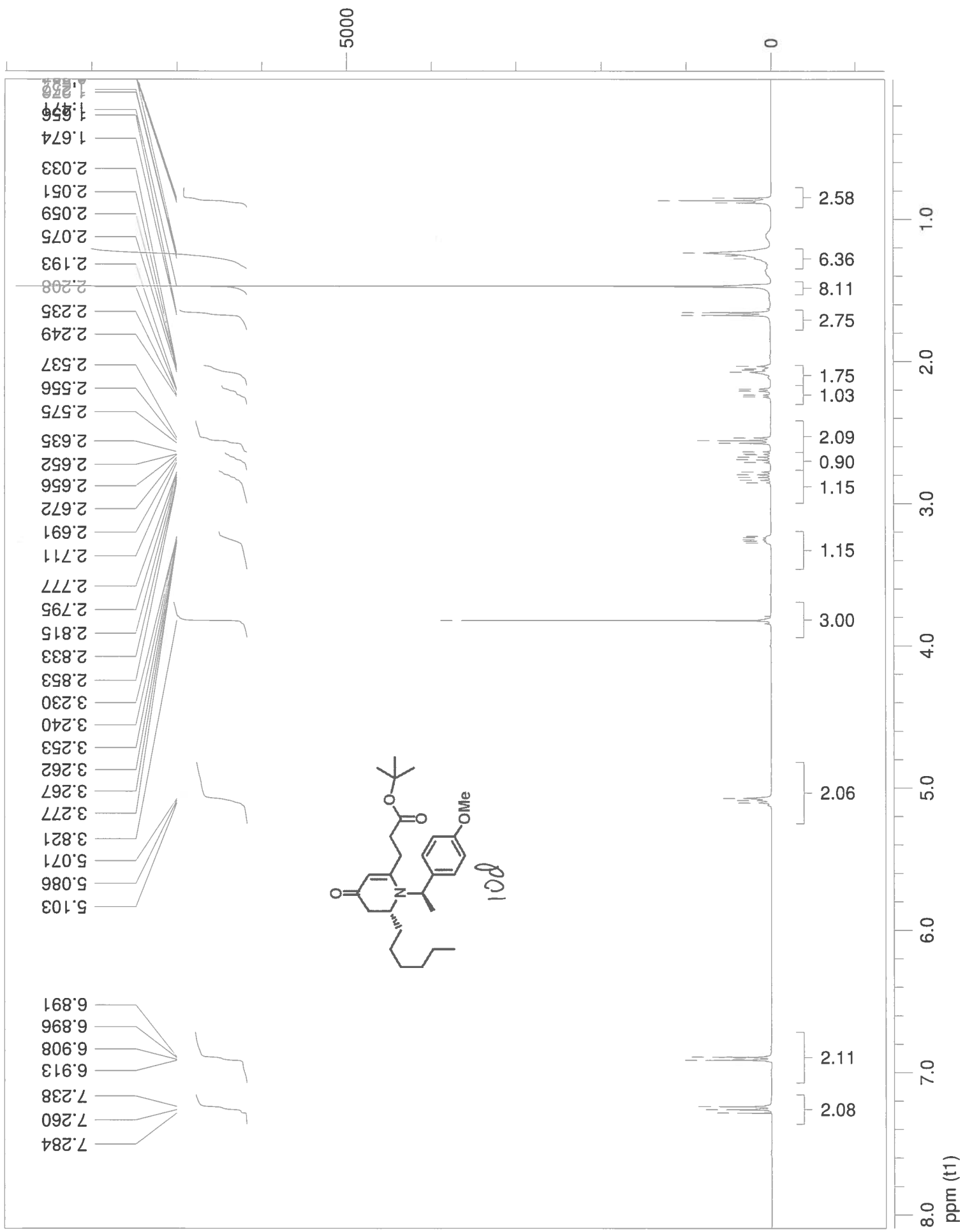


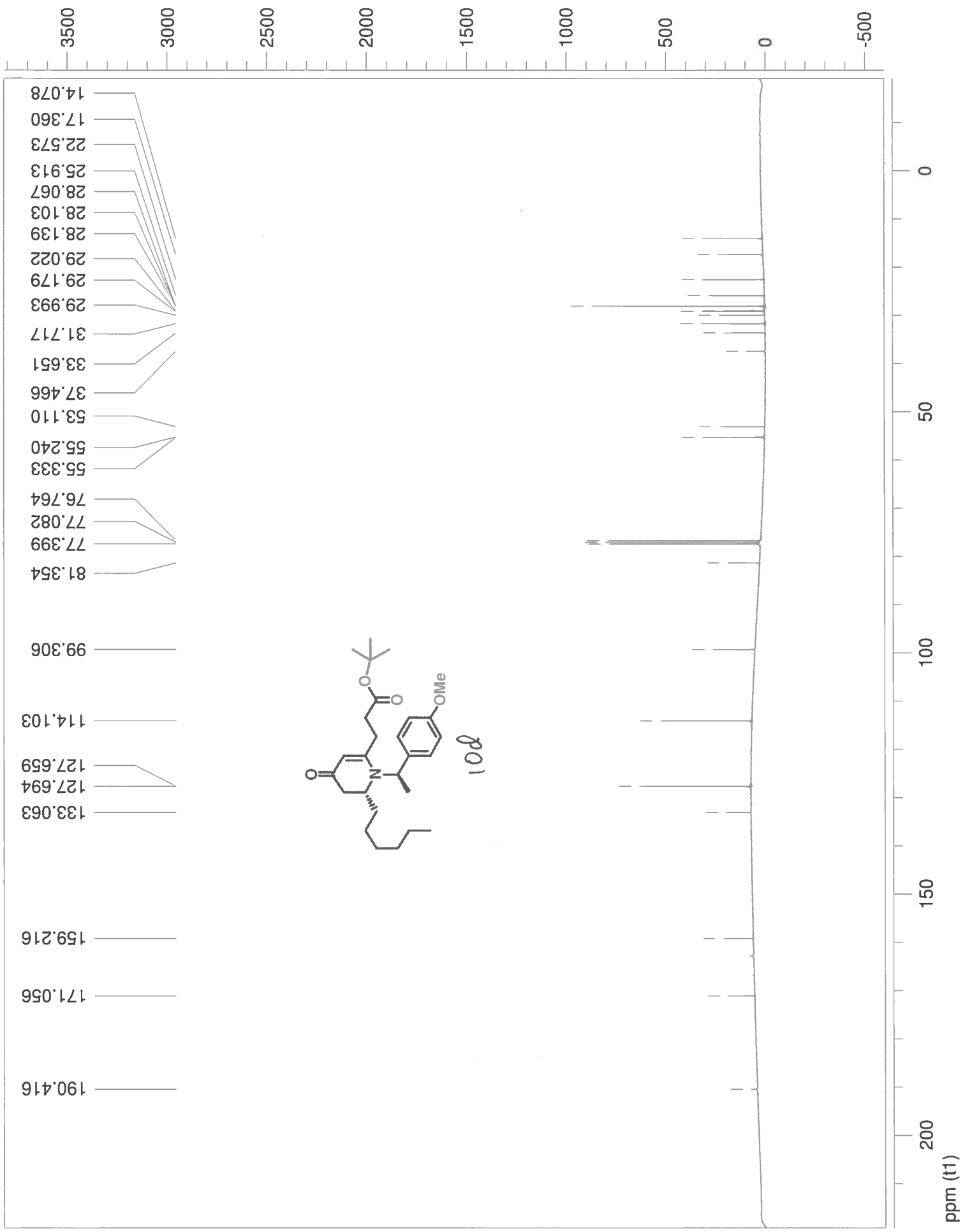


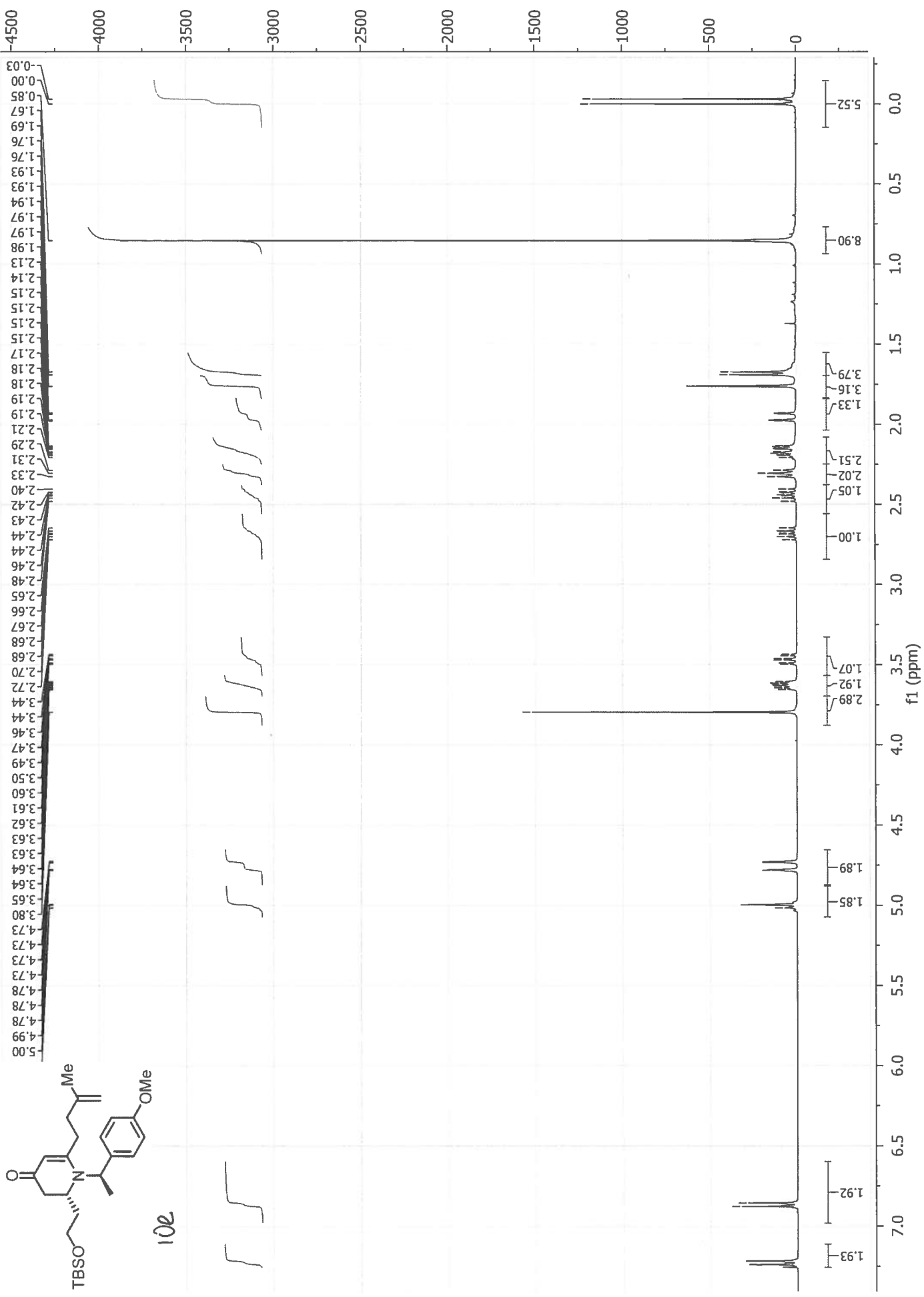


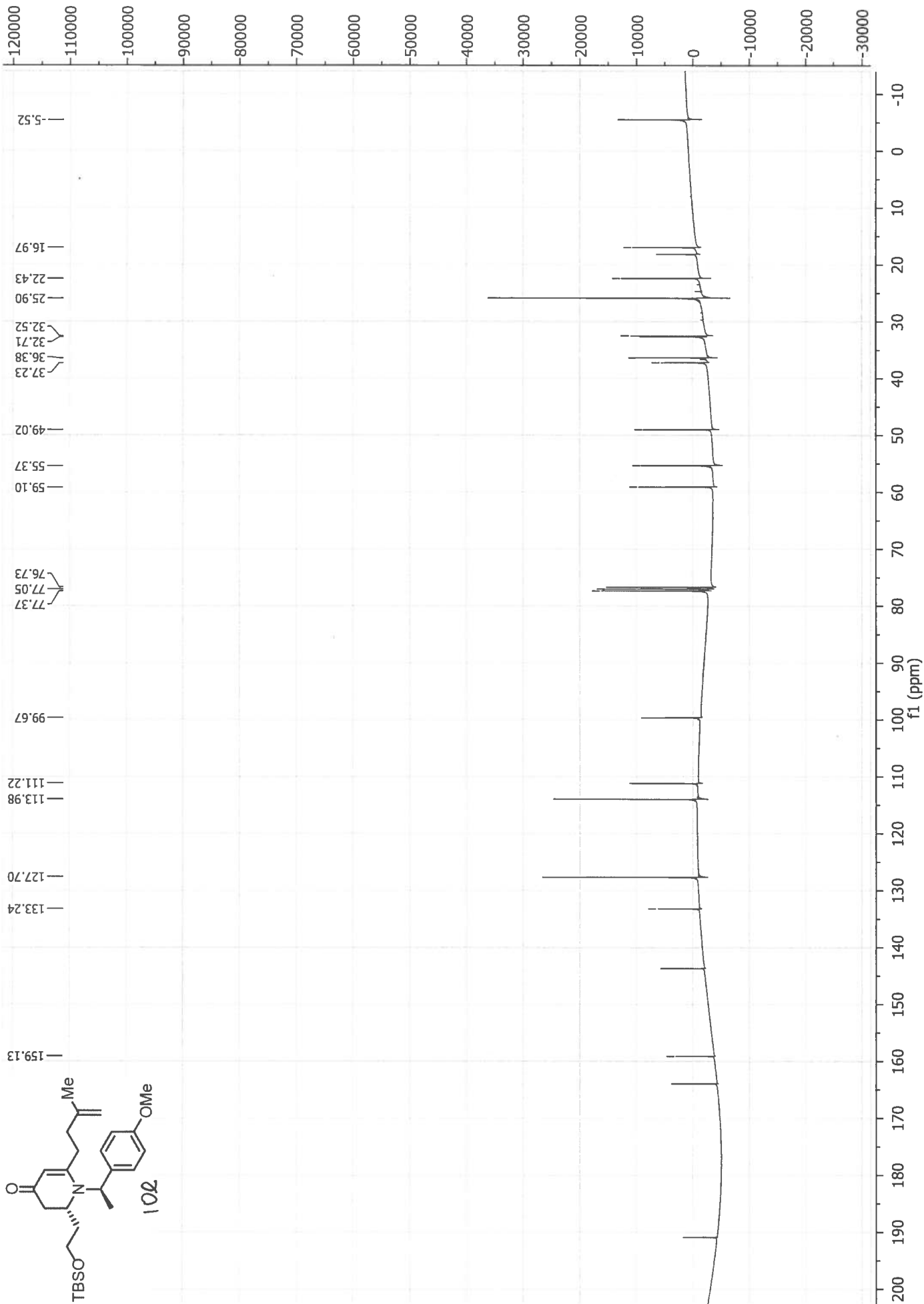
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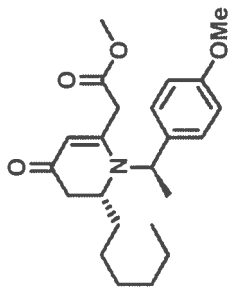










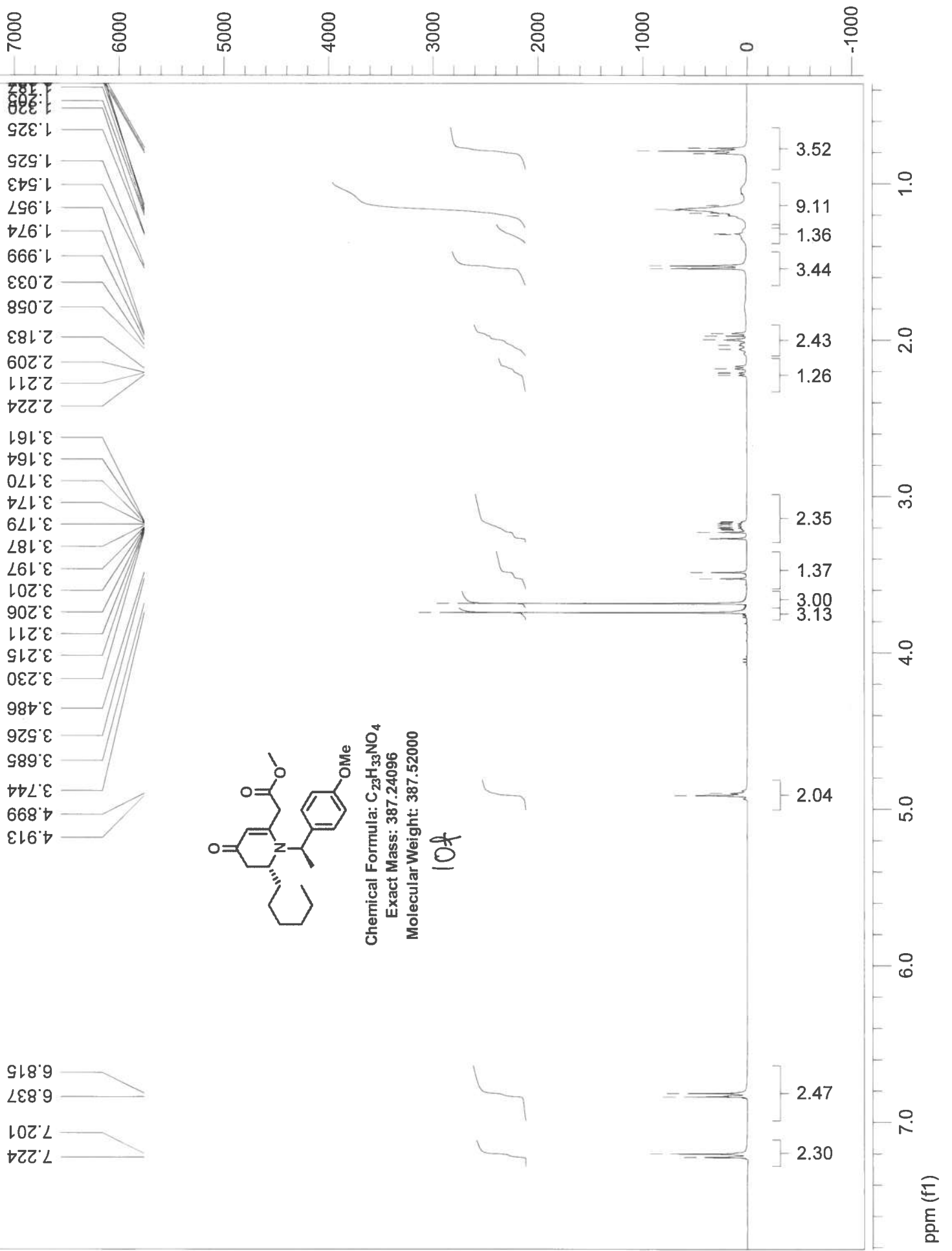


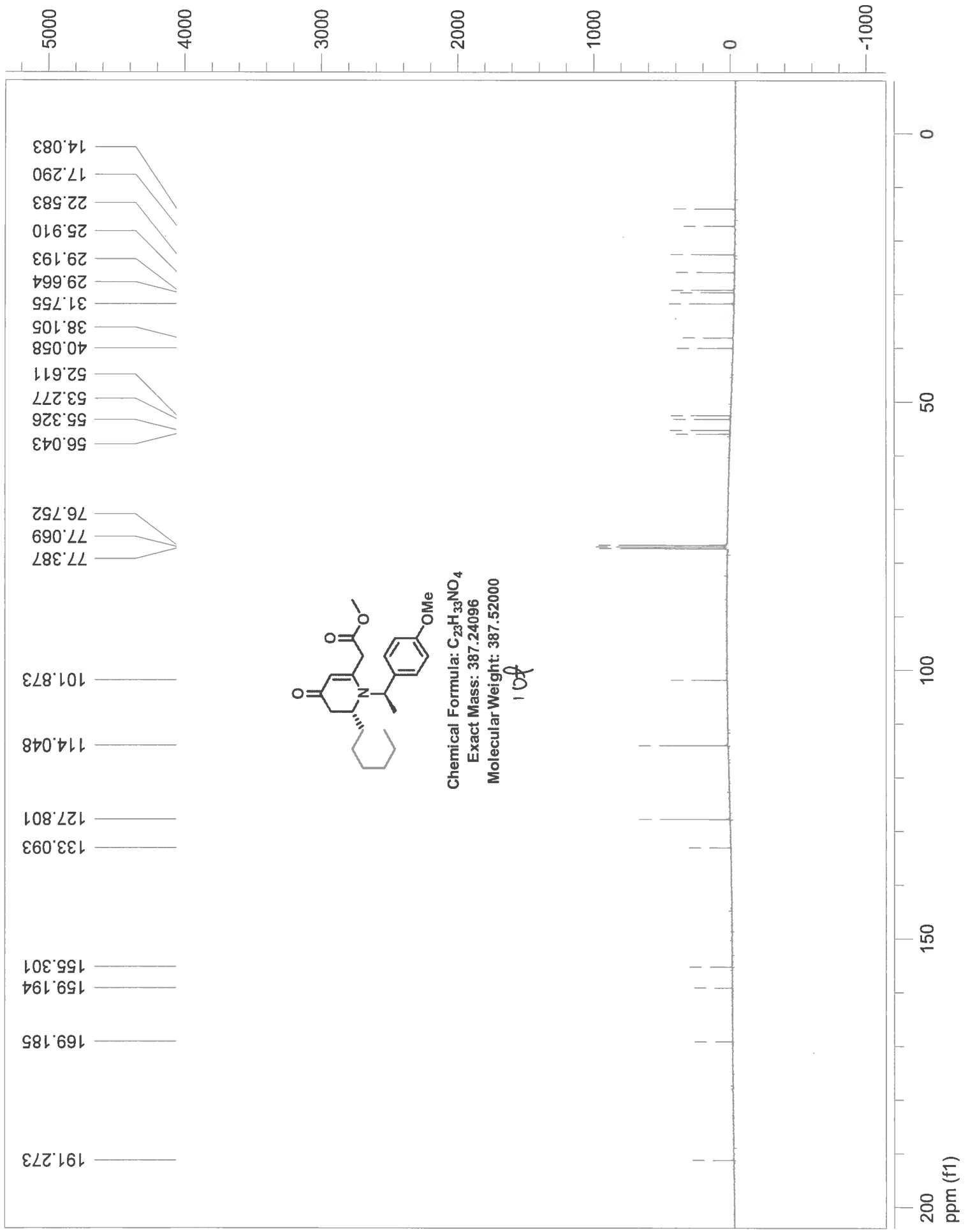
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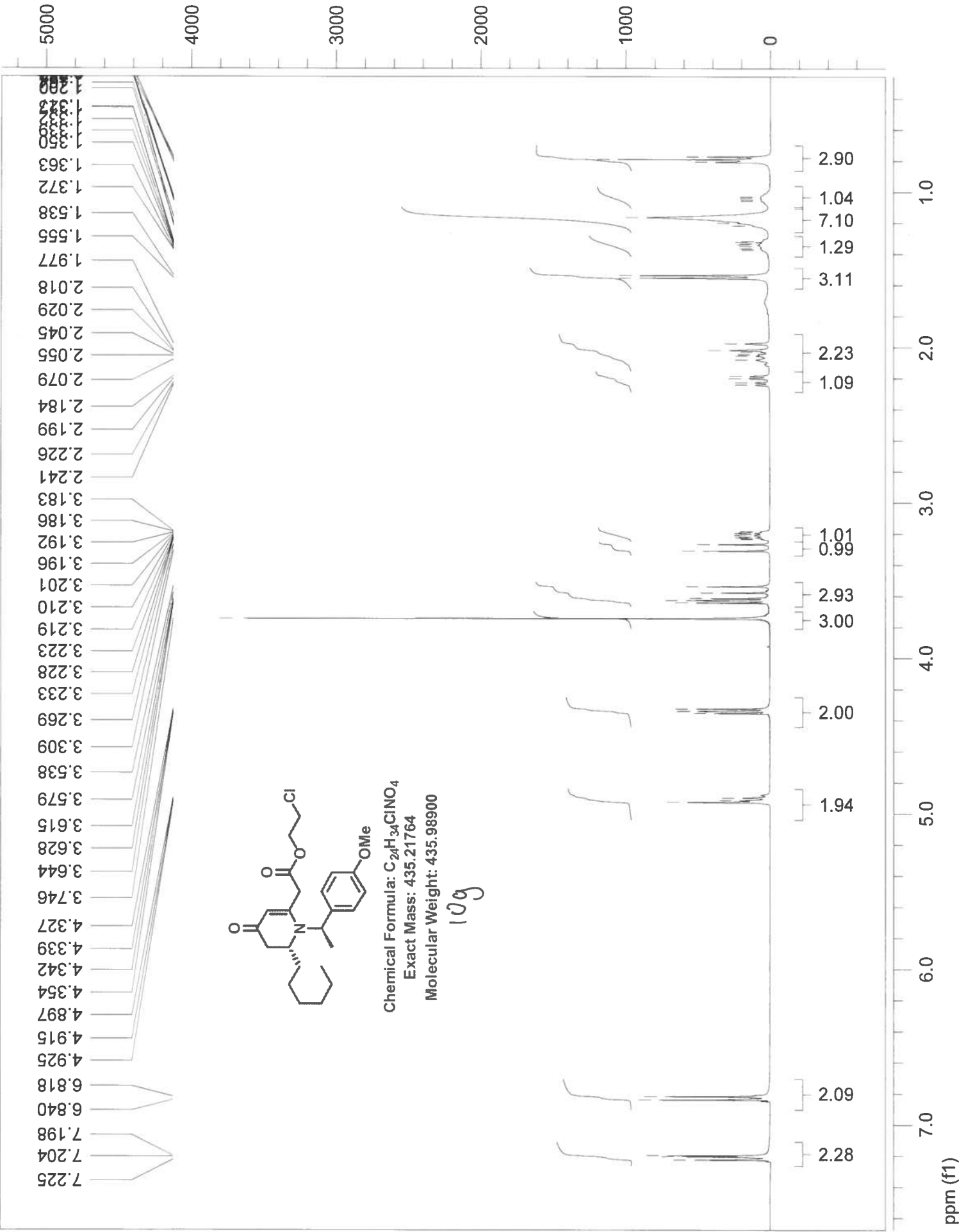
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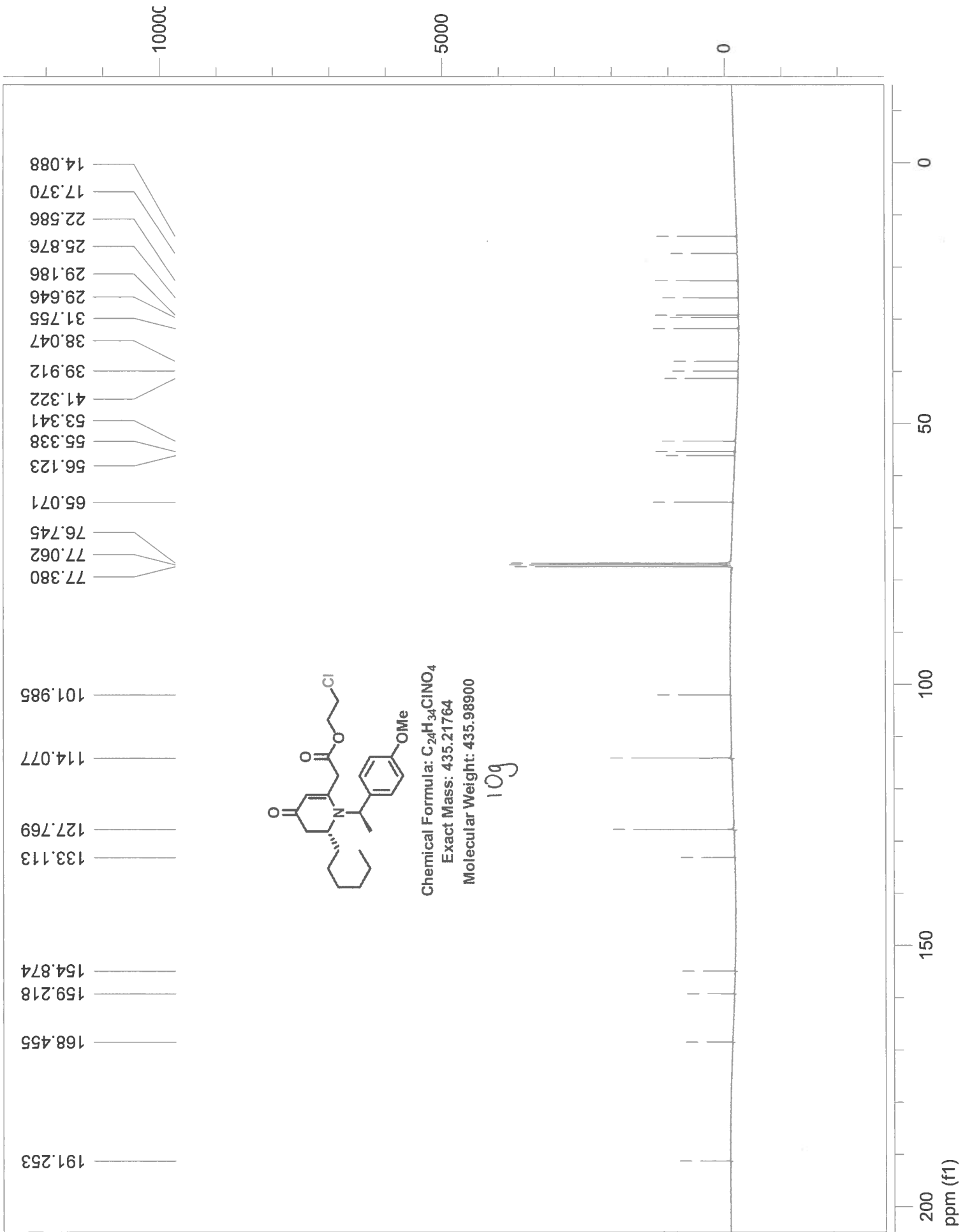
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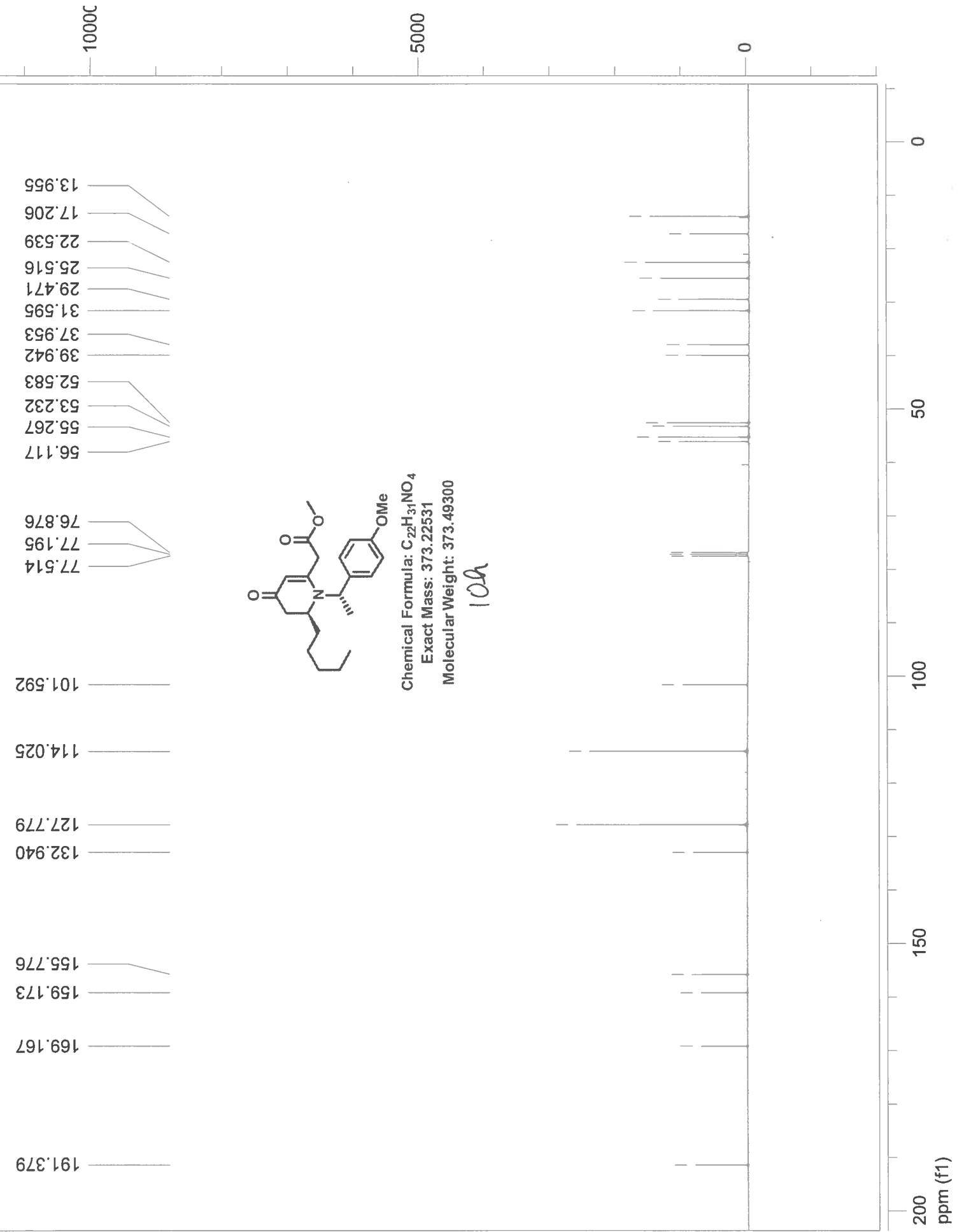


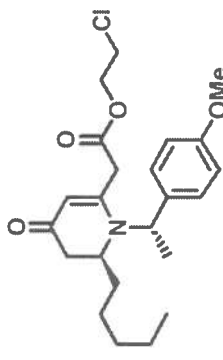






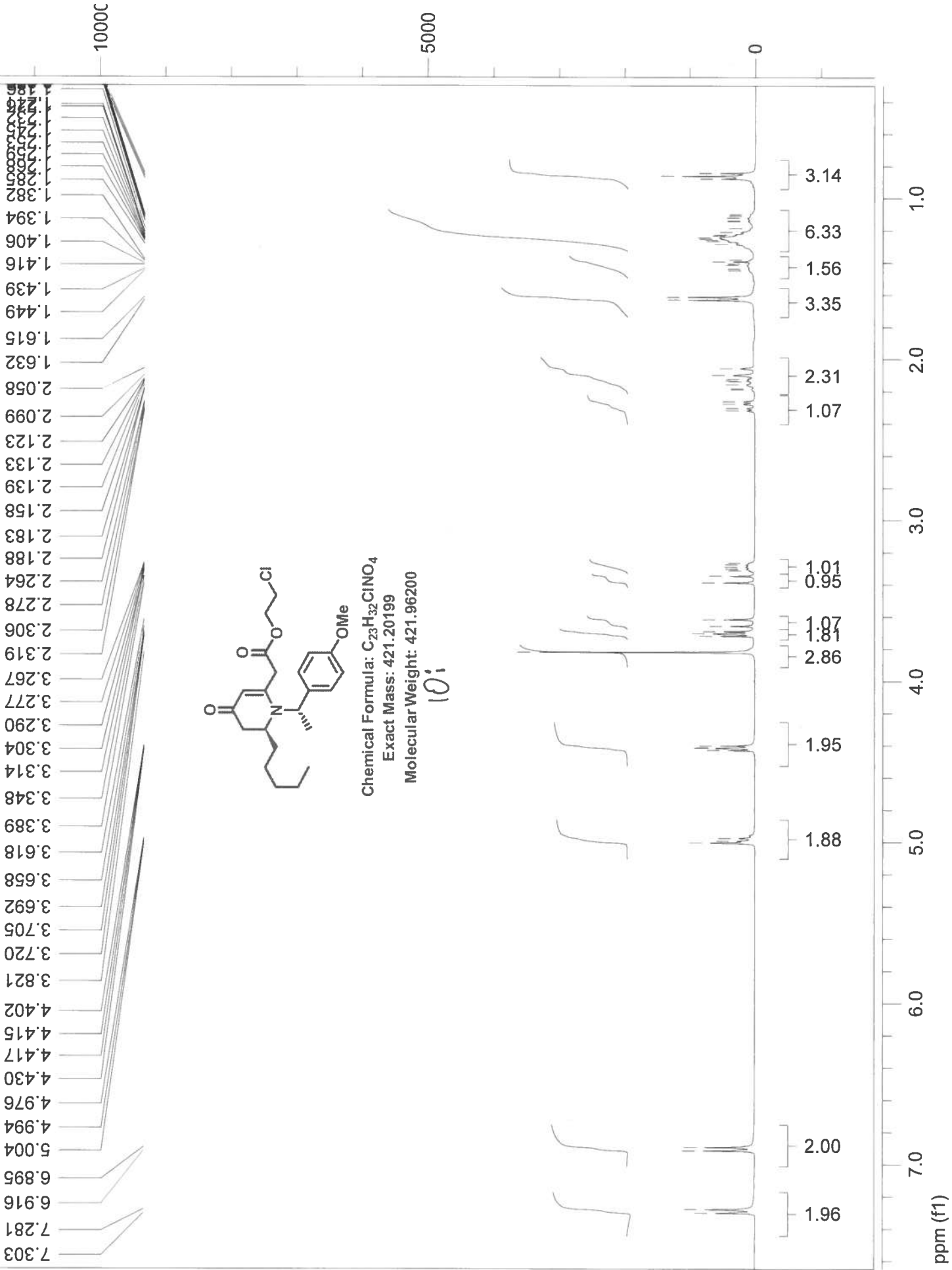


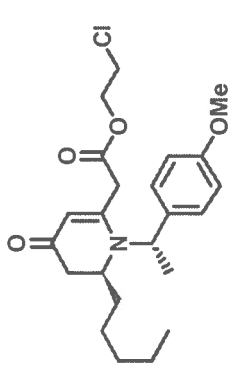
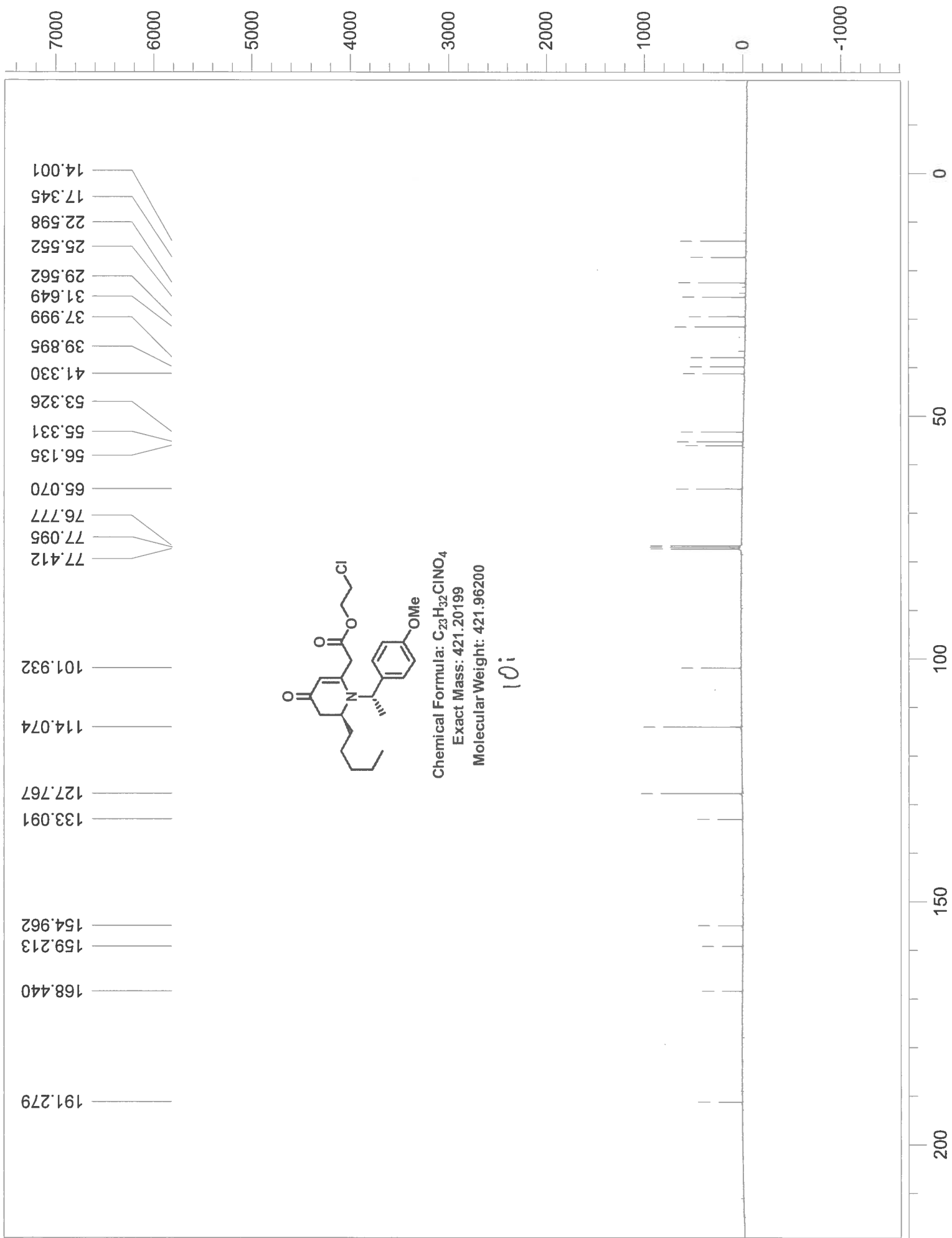




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 Molecular Weight: 421.96200

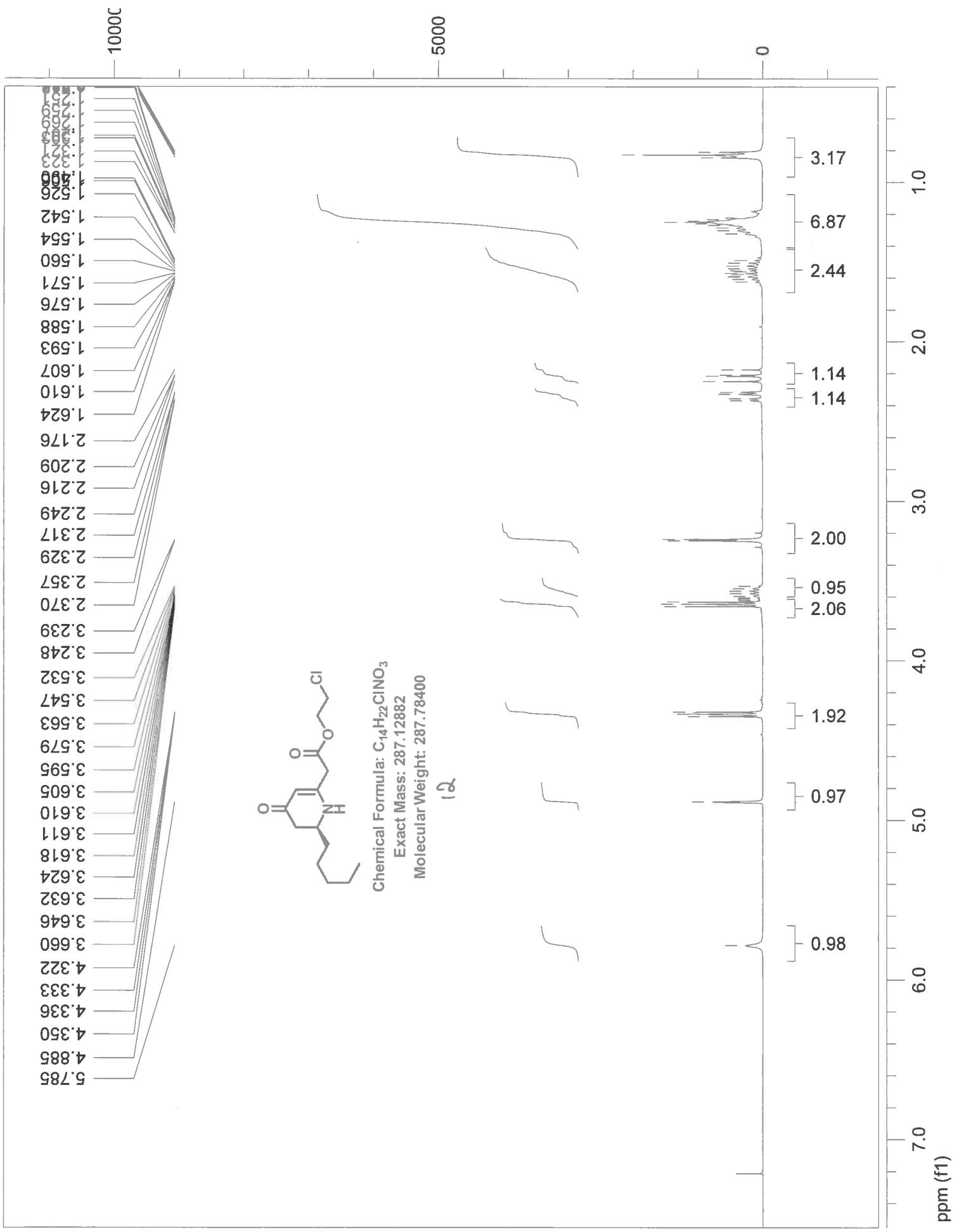
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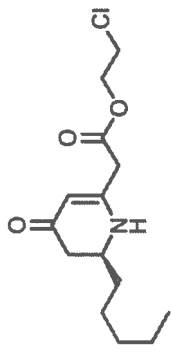




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 Molecular Weight: 421.96200

10i



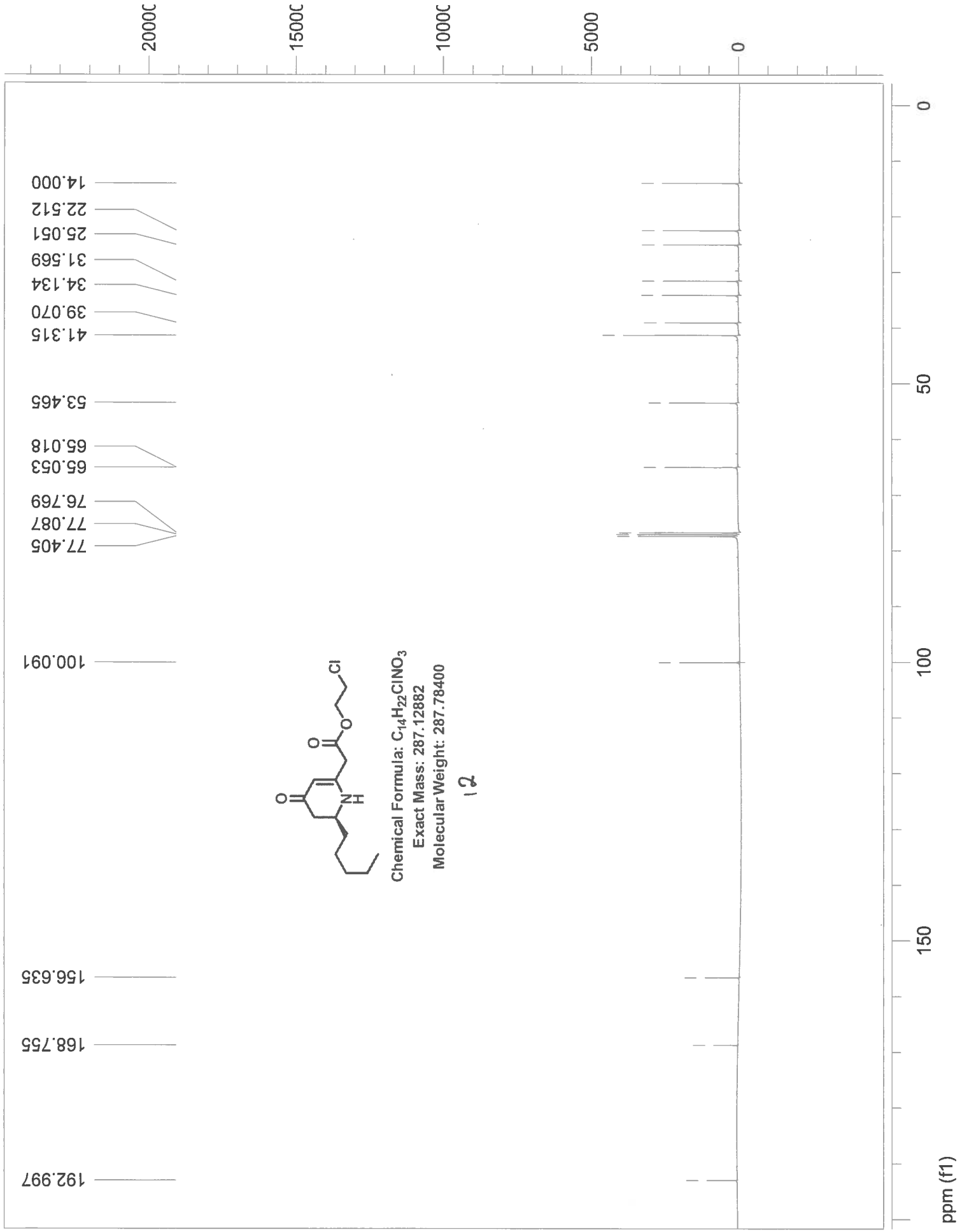


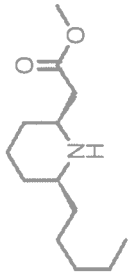
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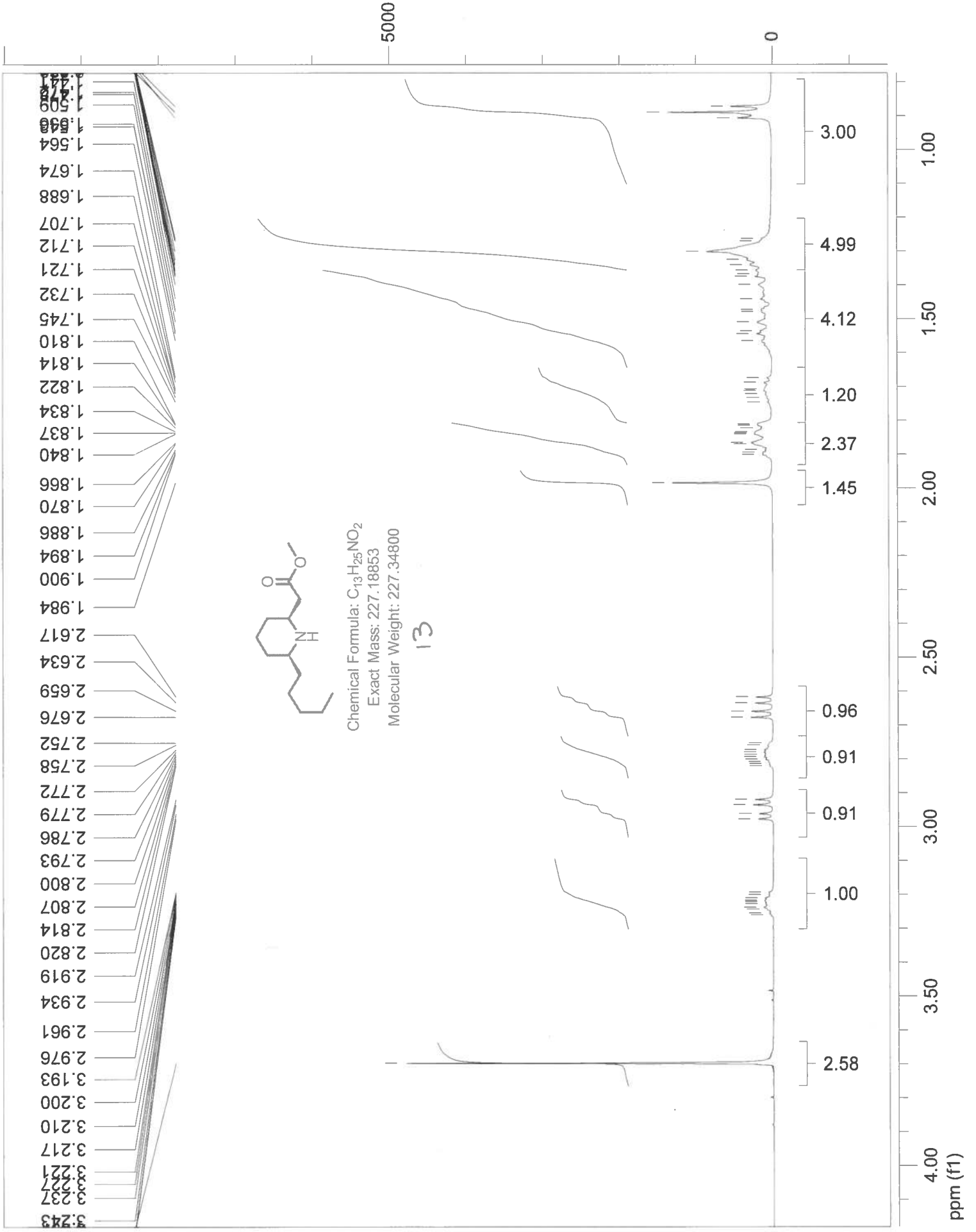
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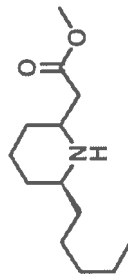




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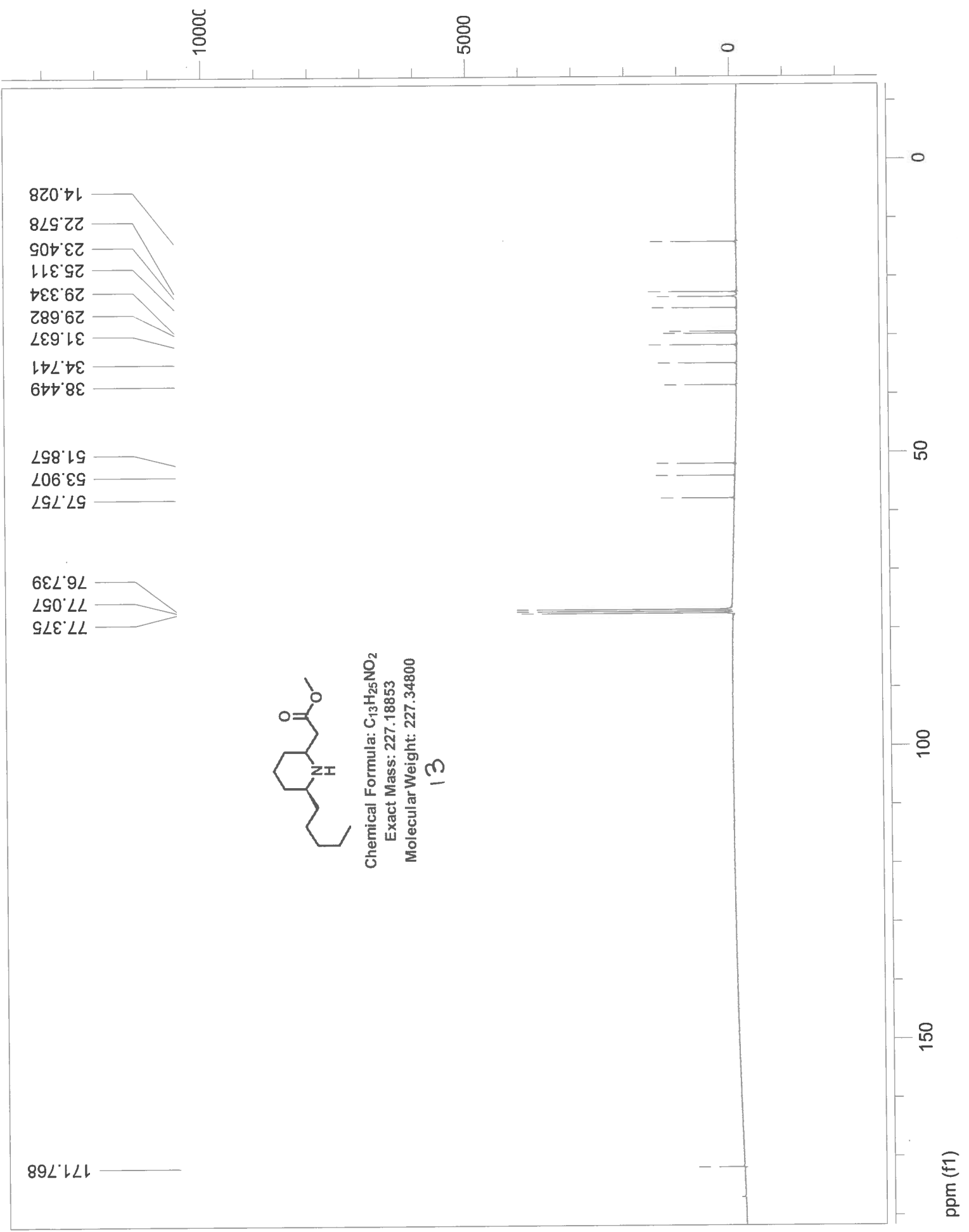
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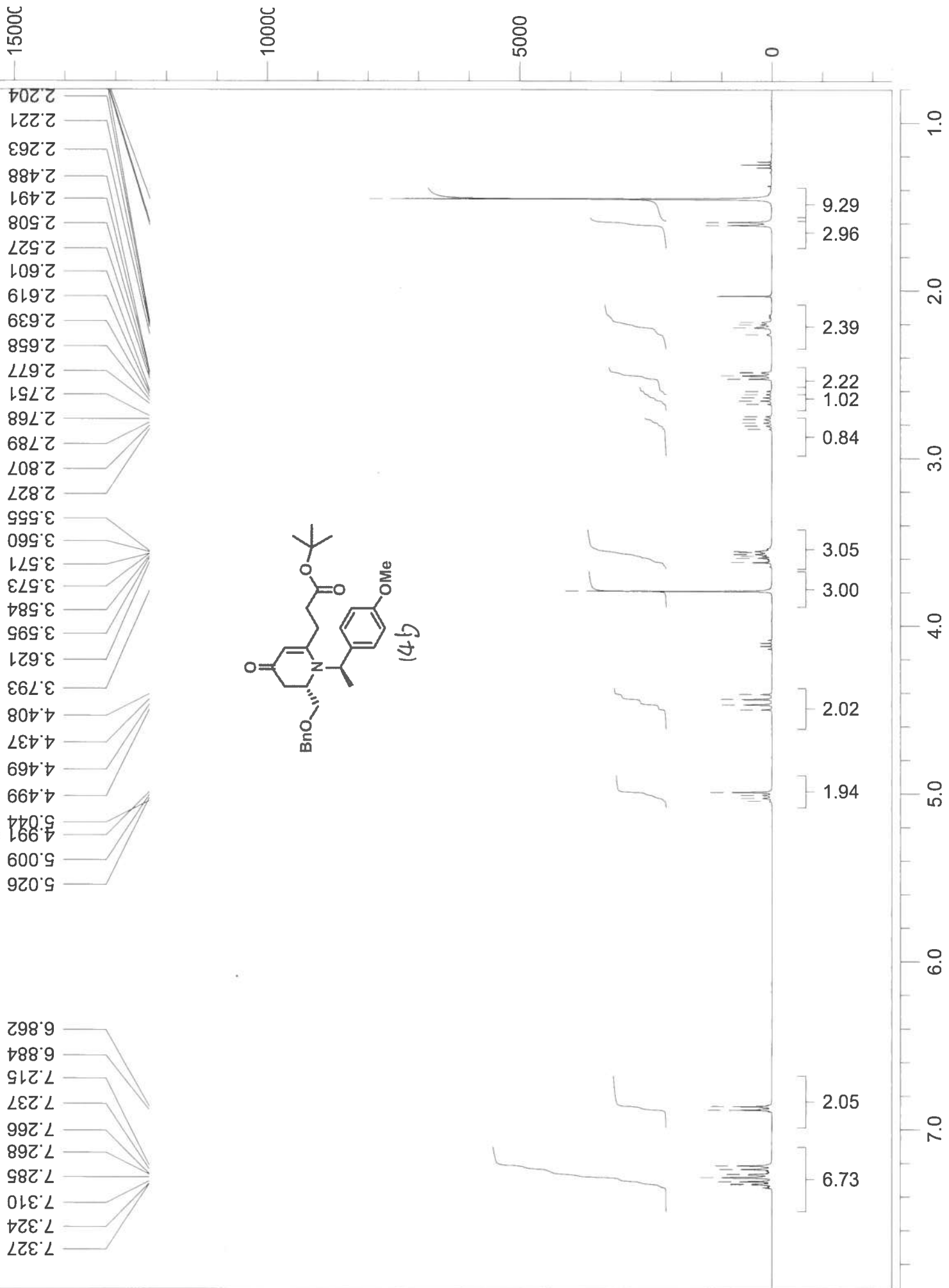
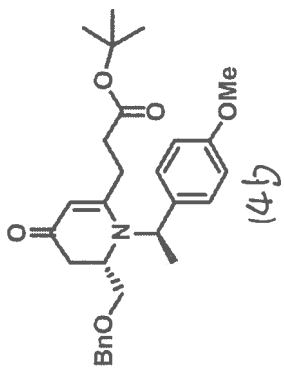


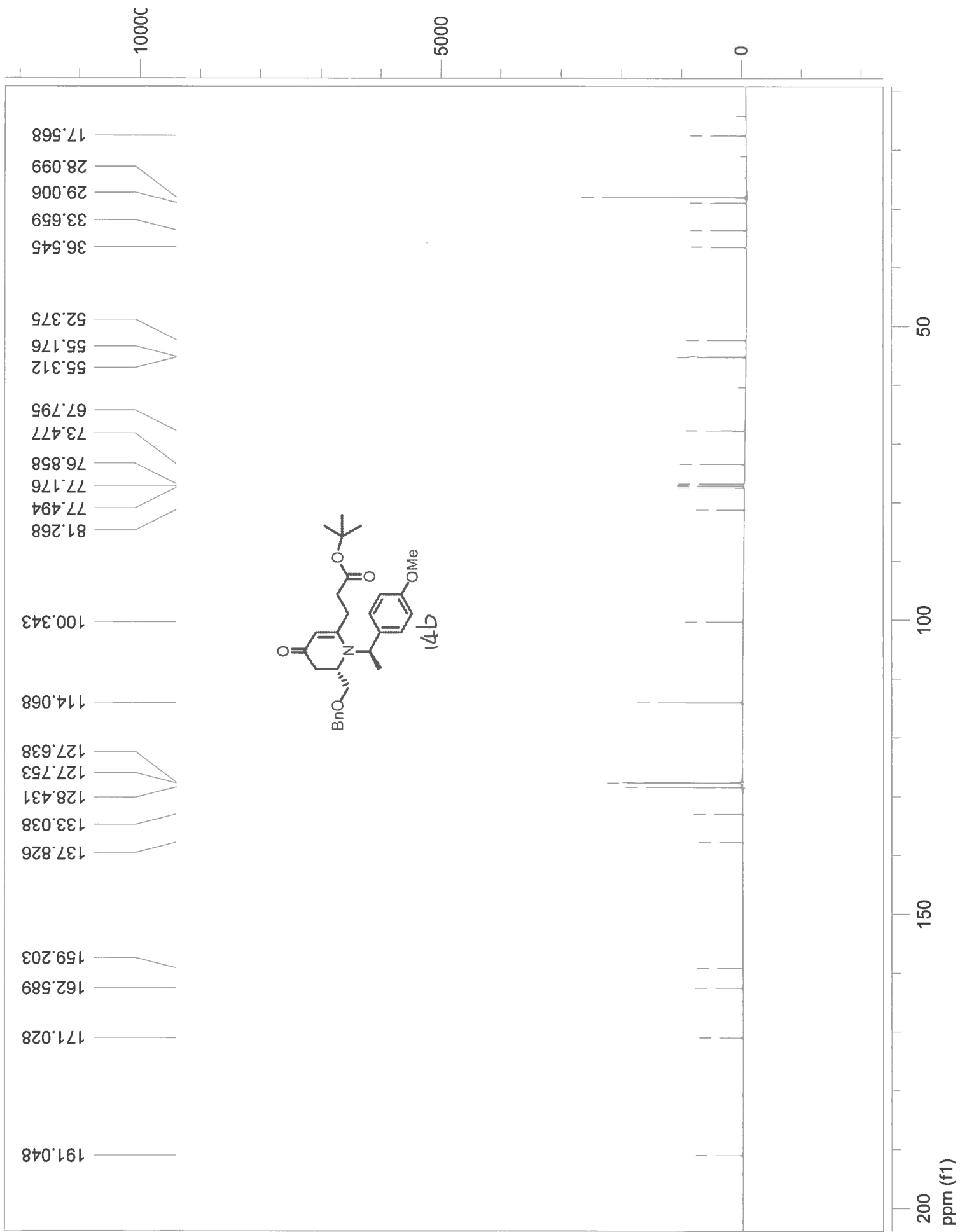
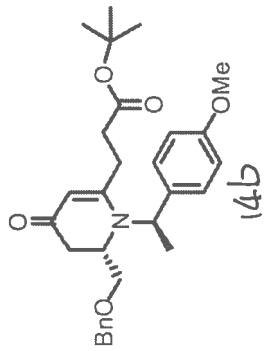


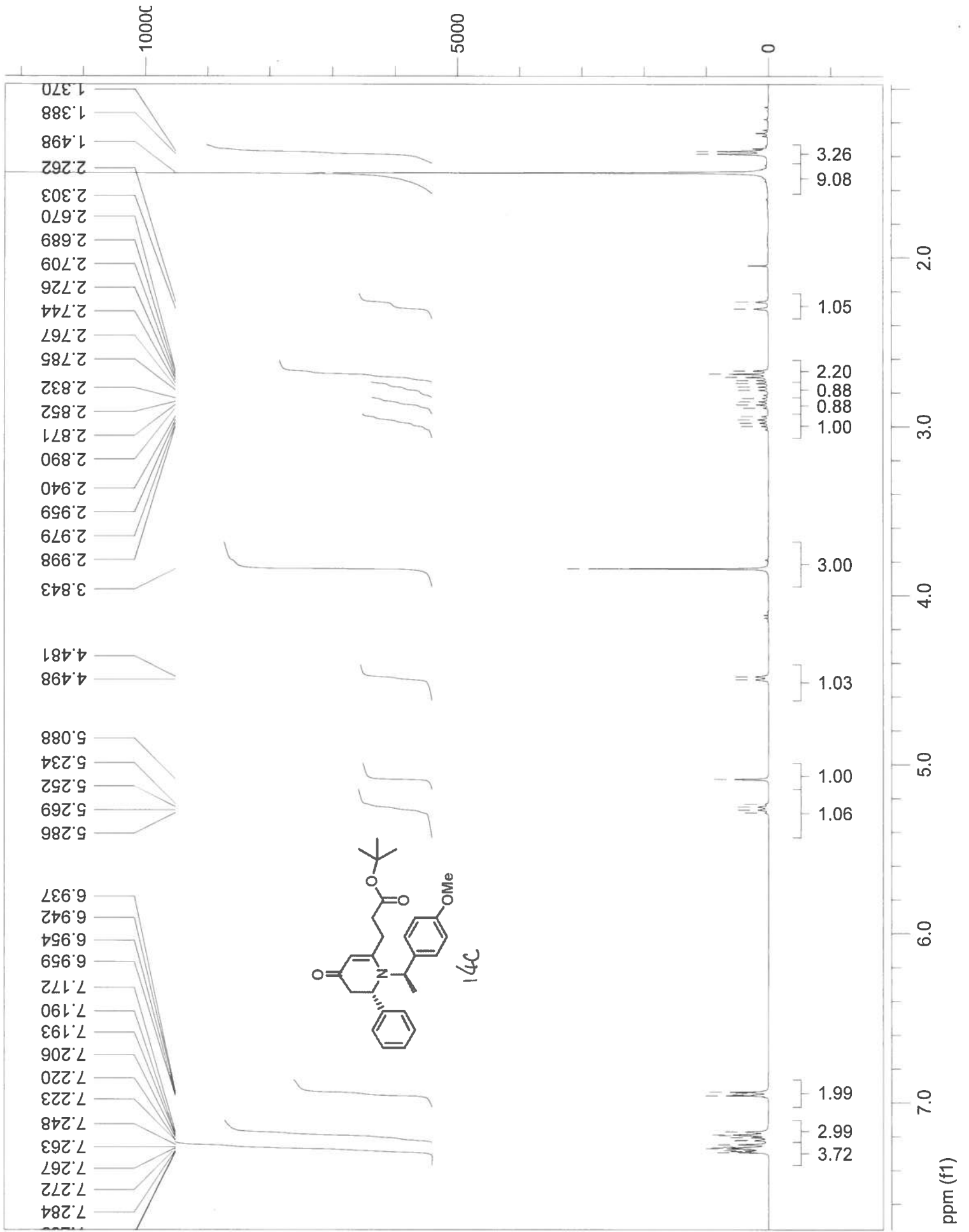
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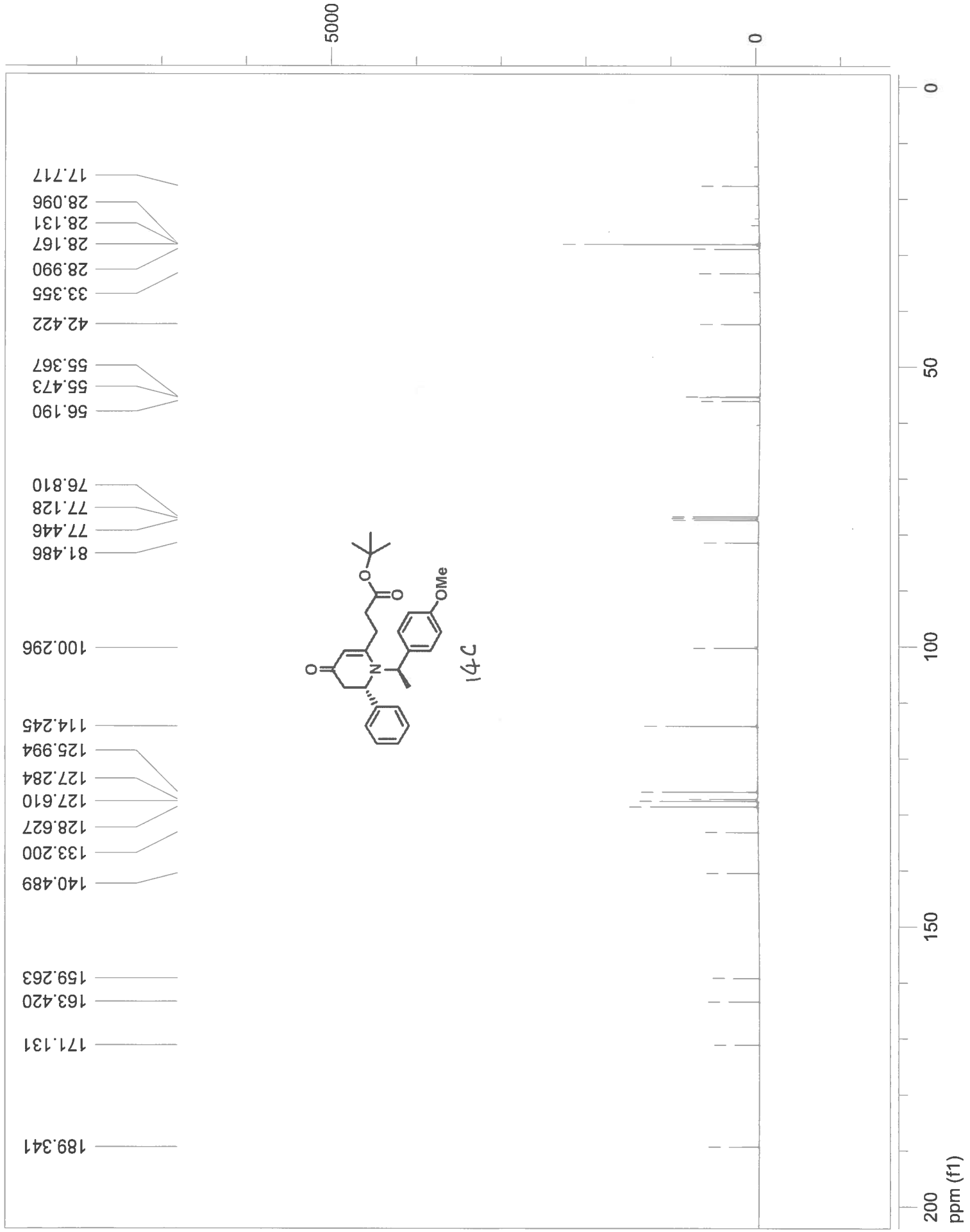
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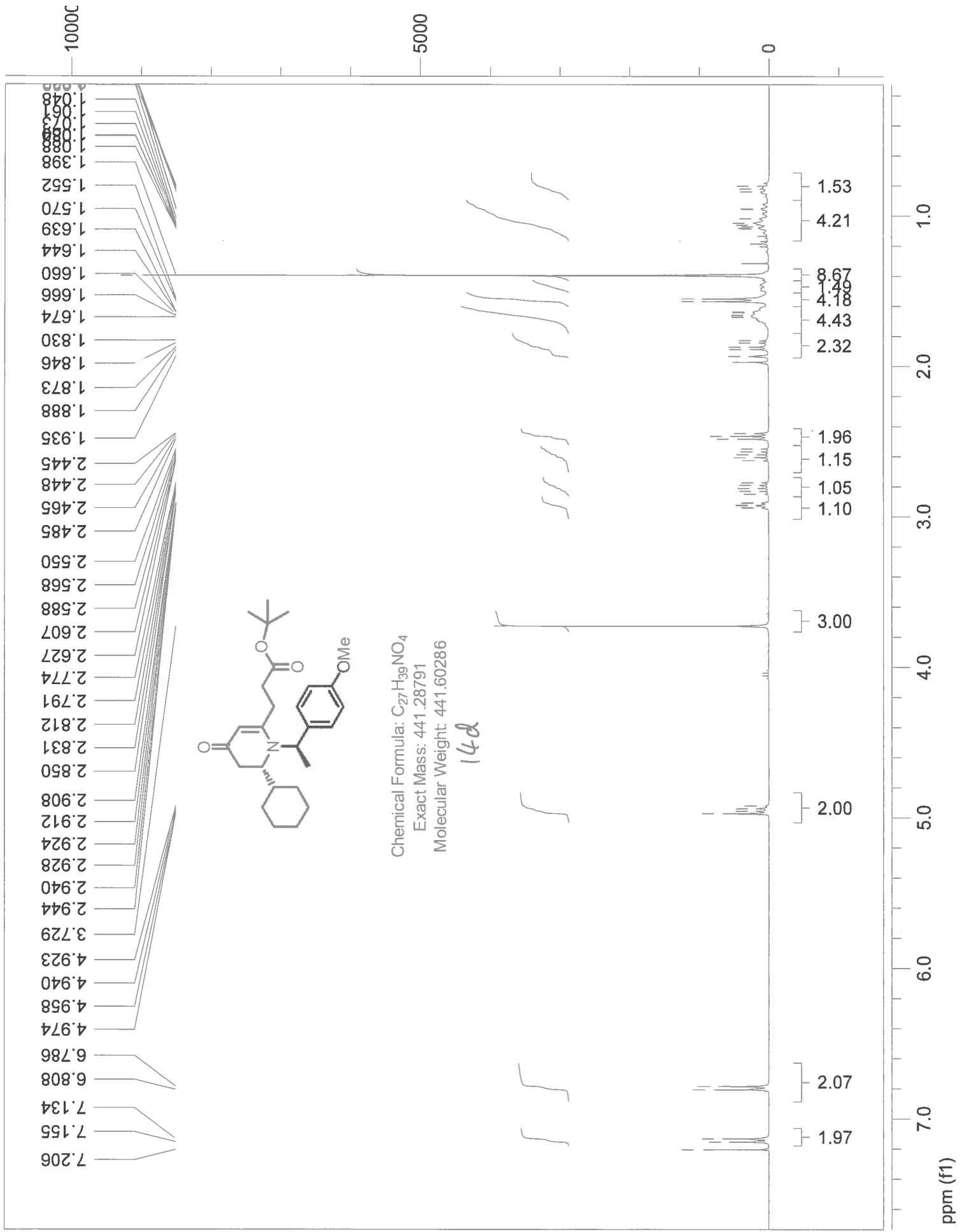


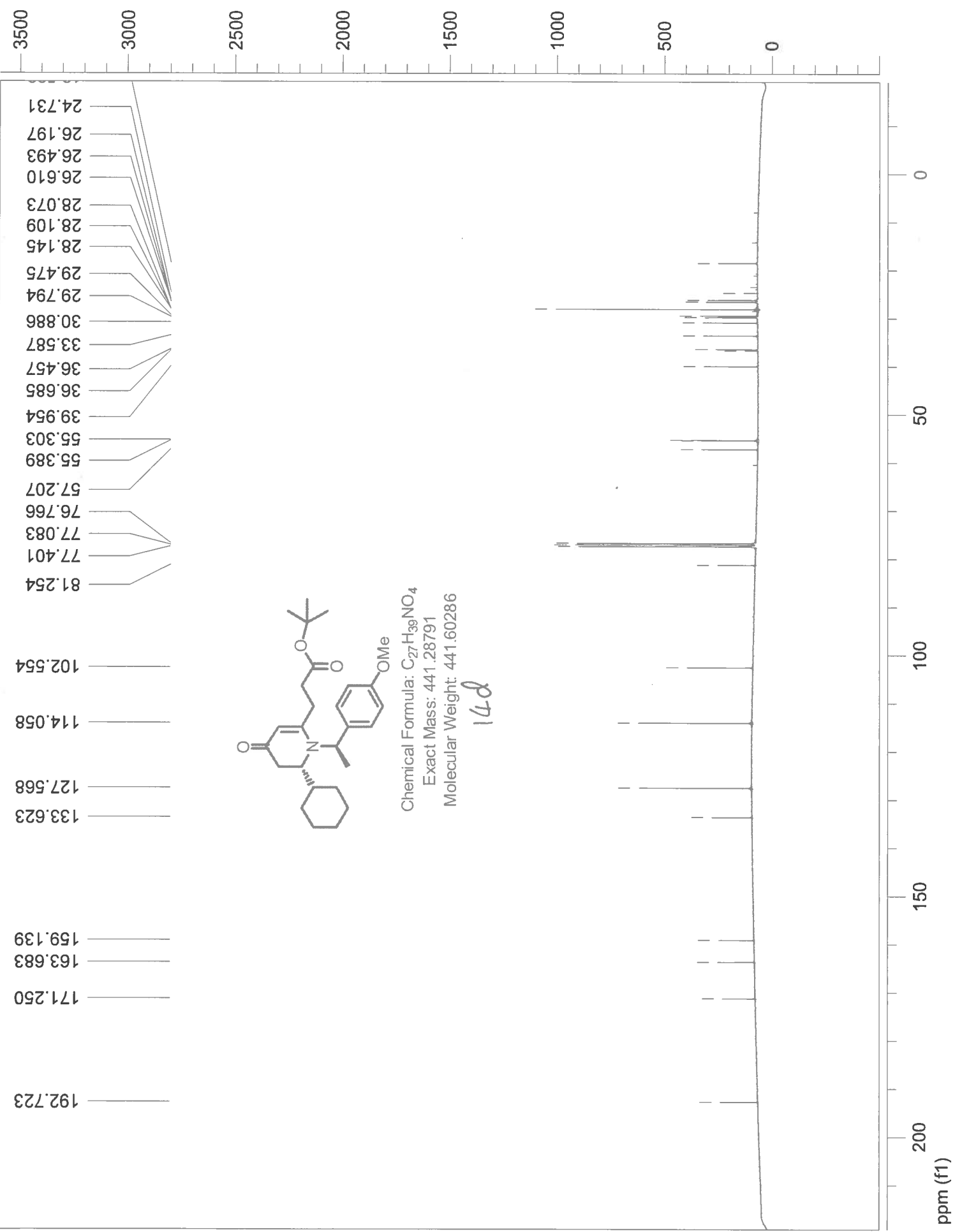


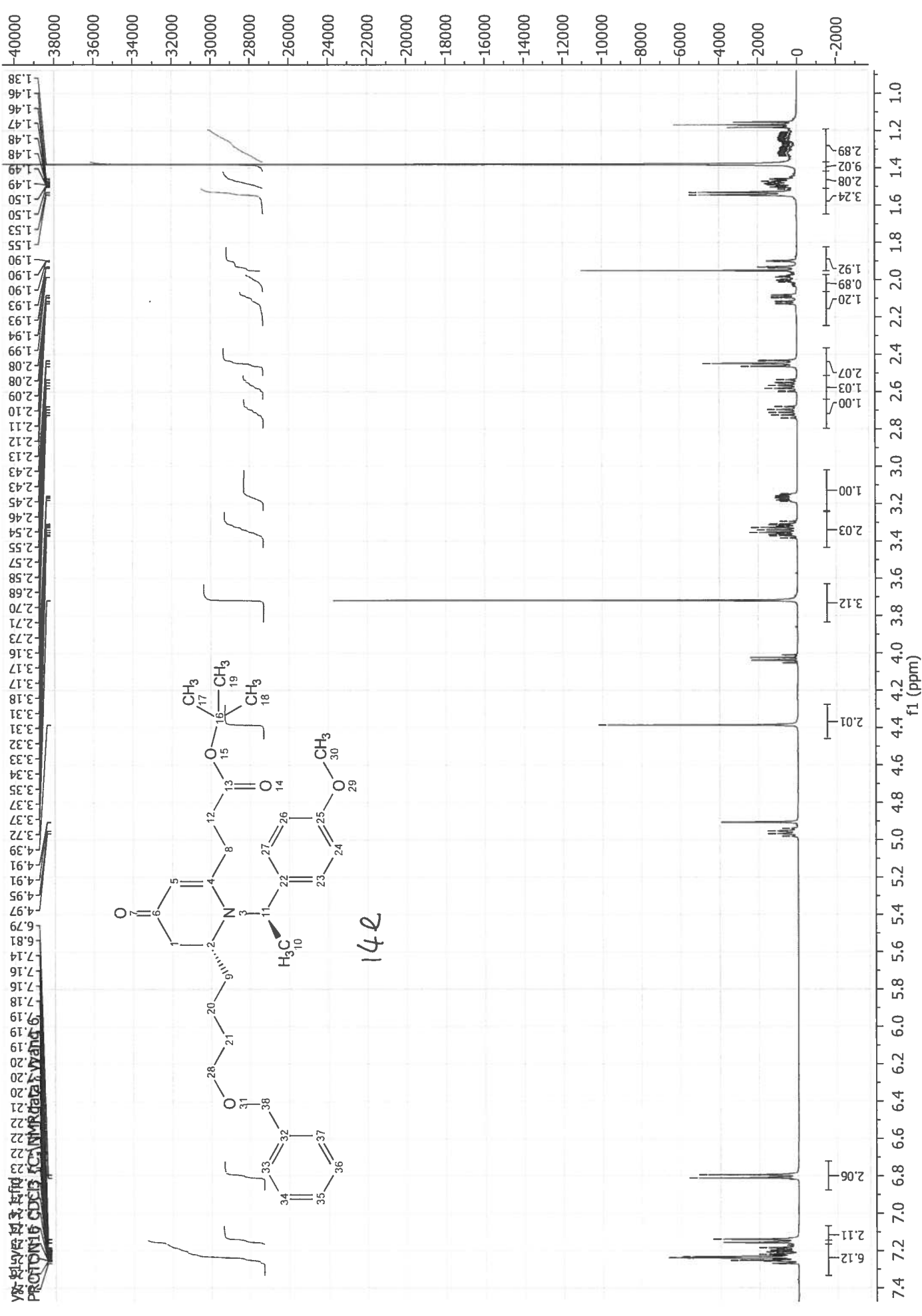


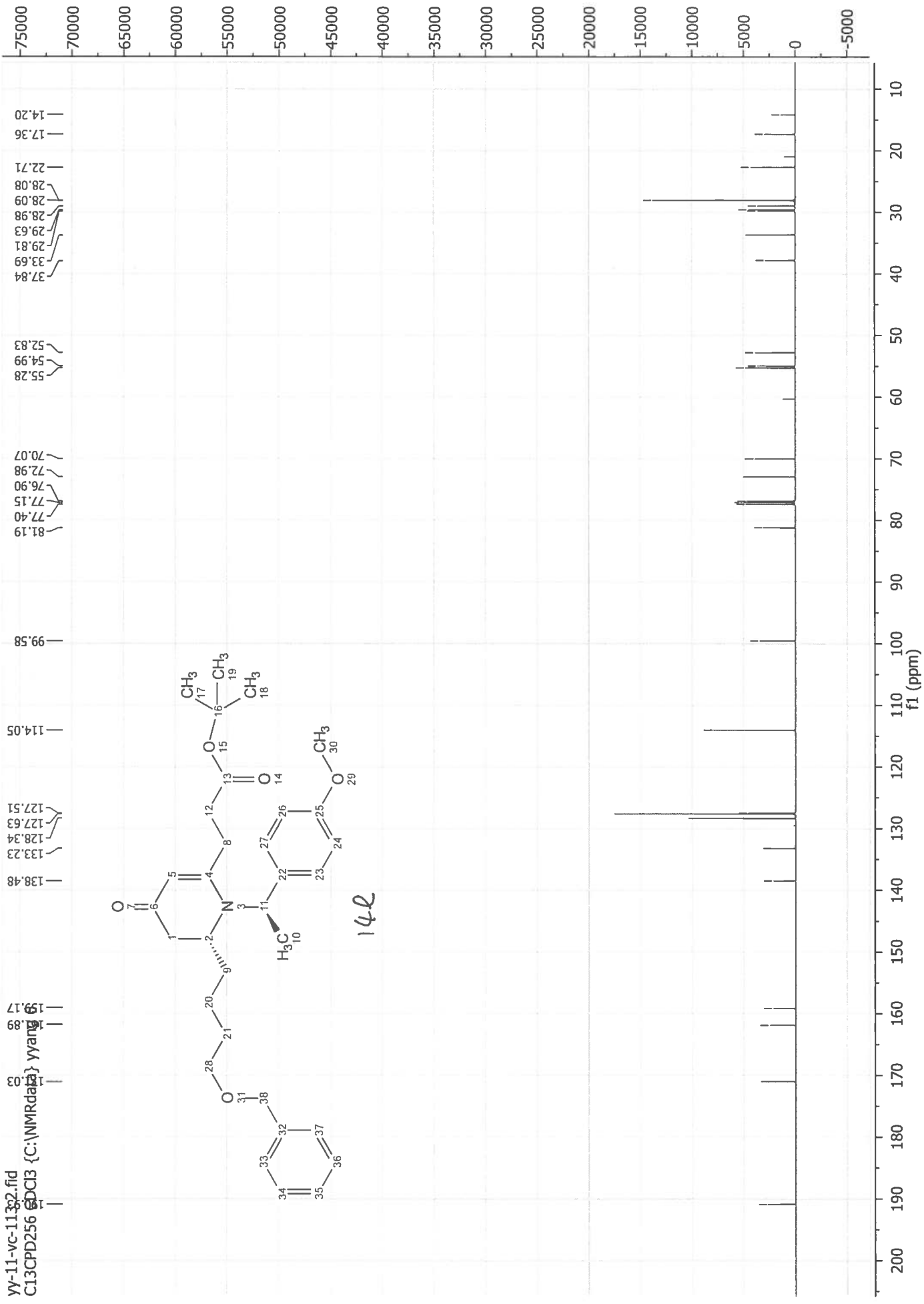




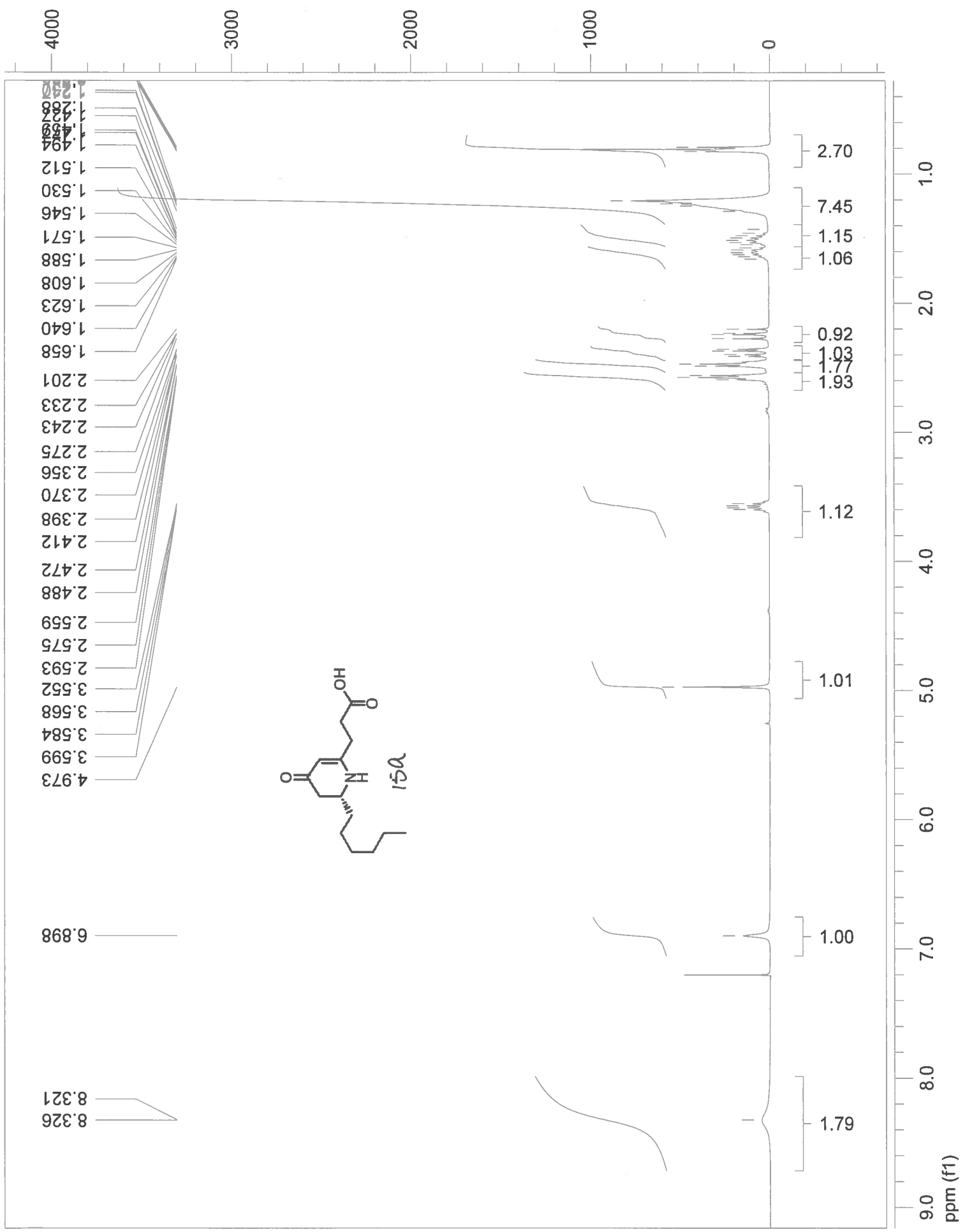


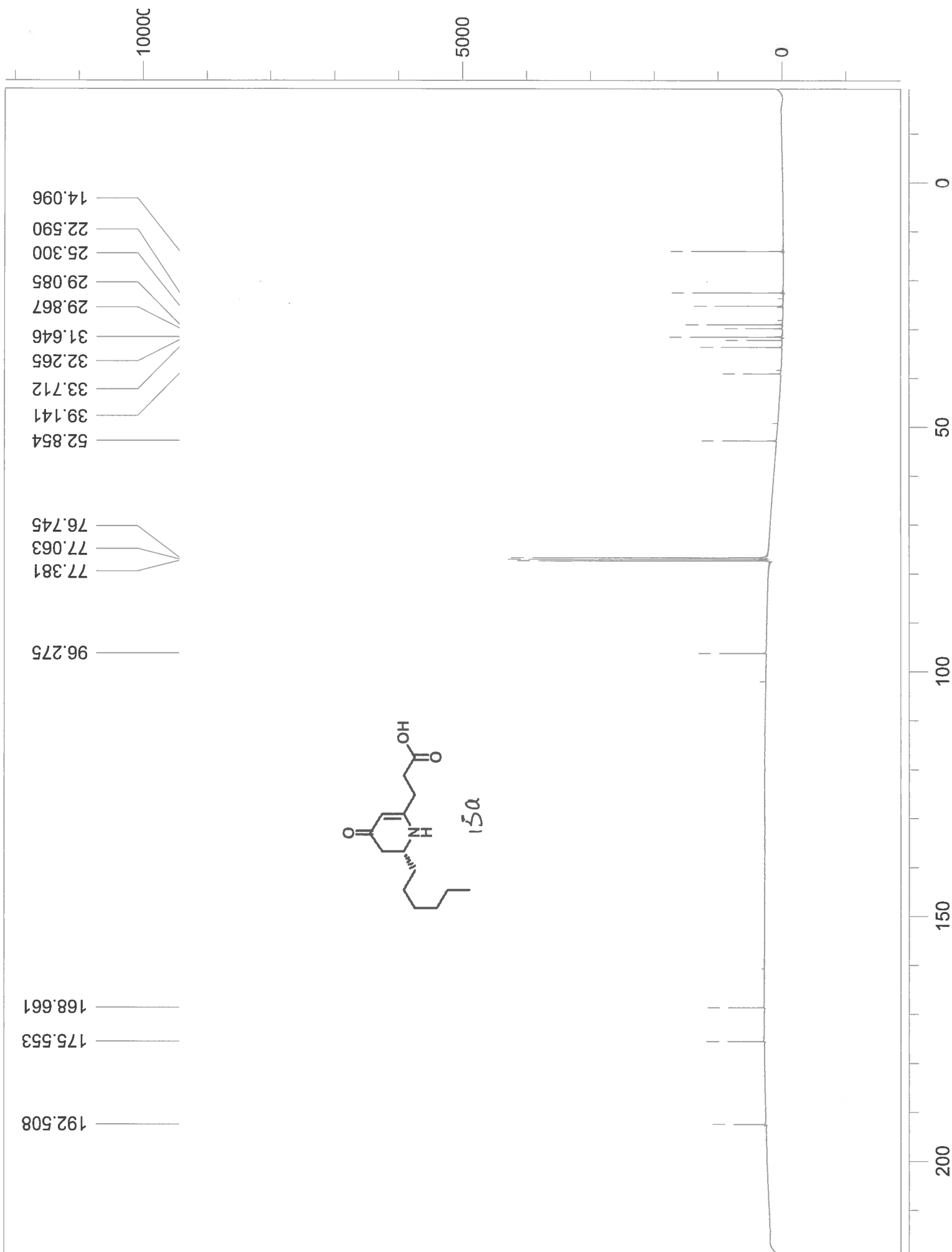


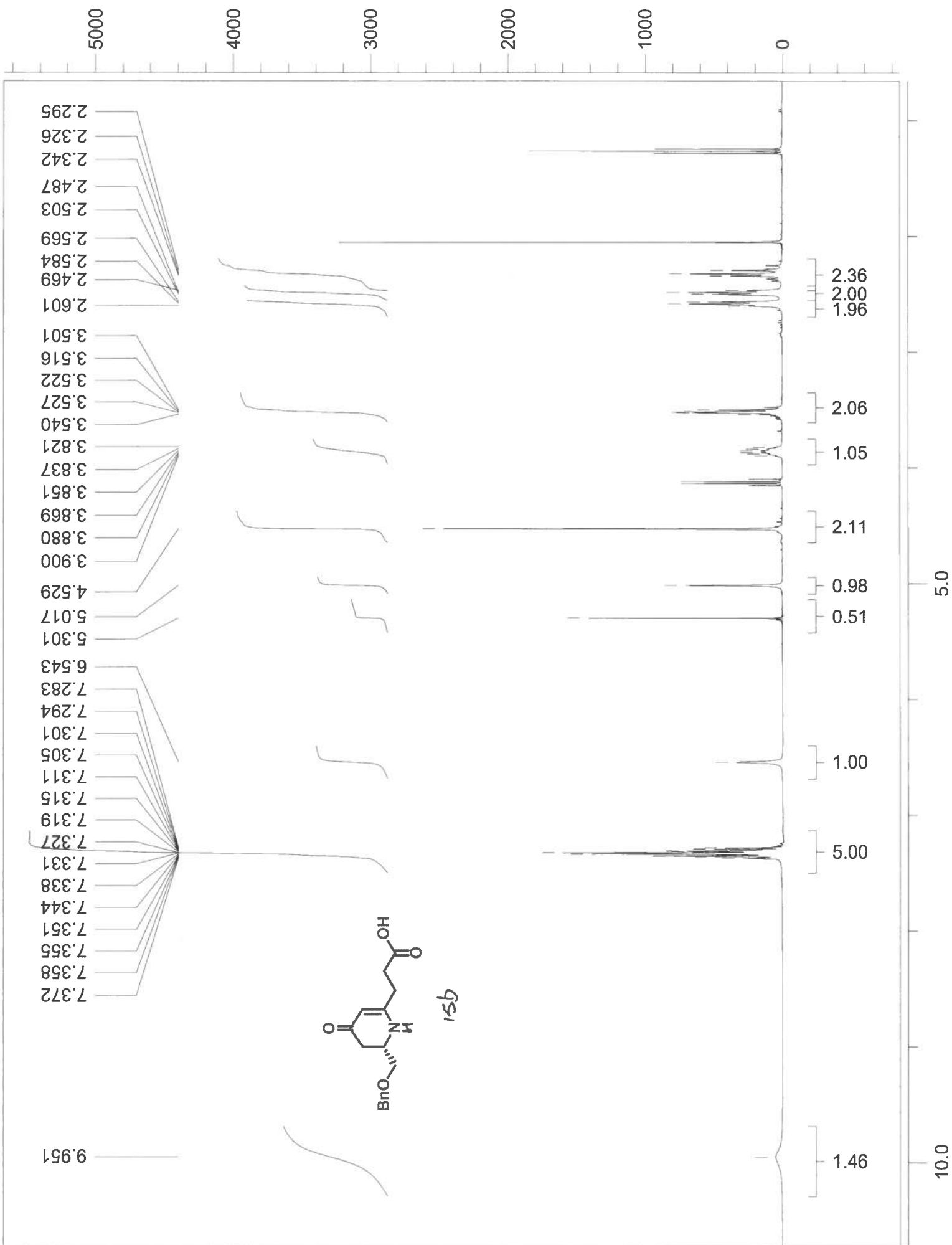


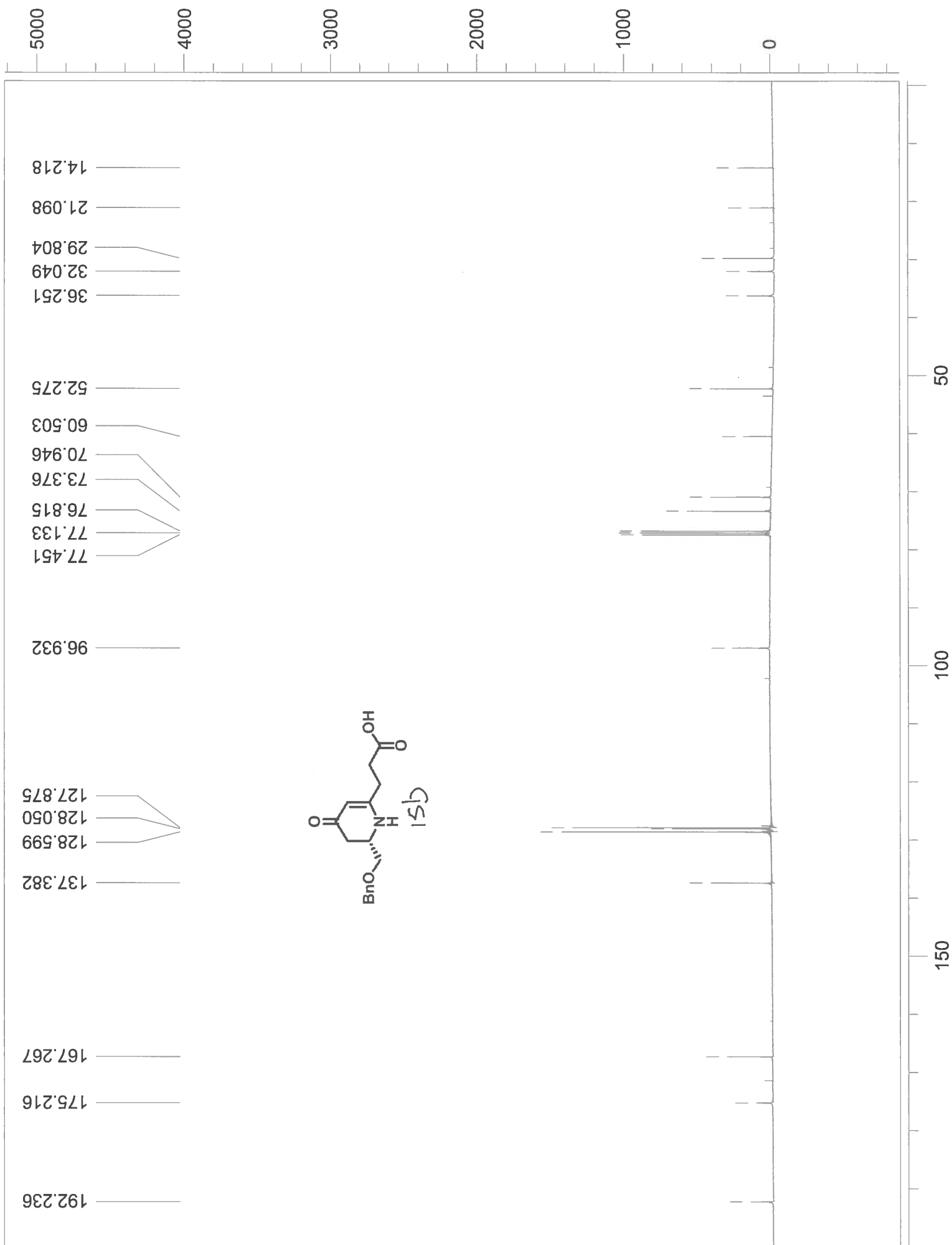


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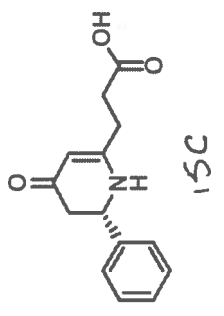




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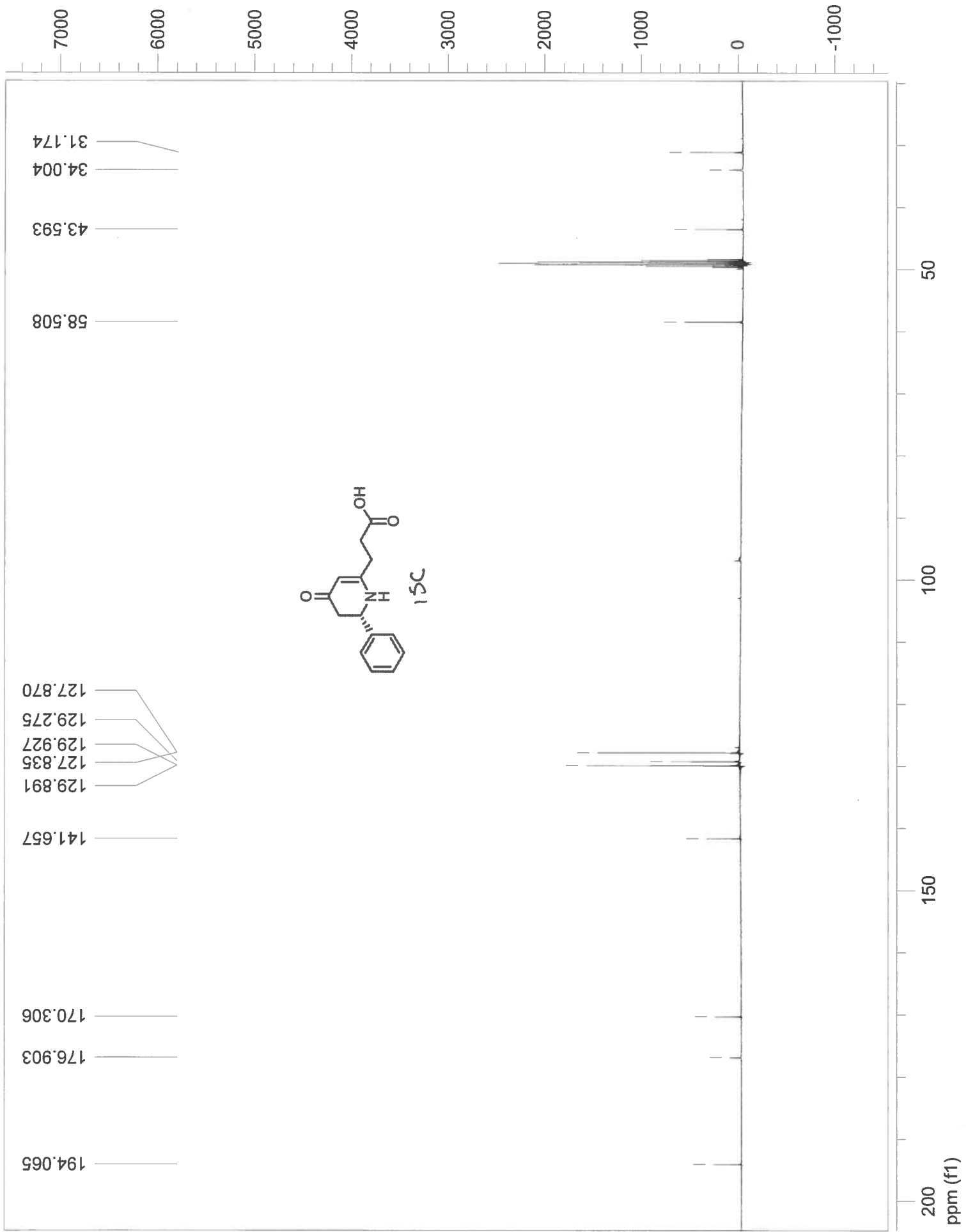
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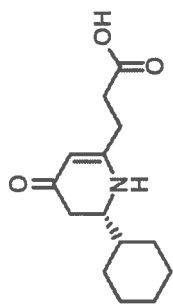
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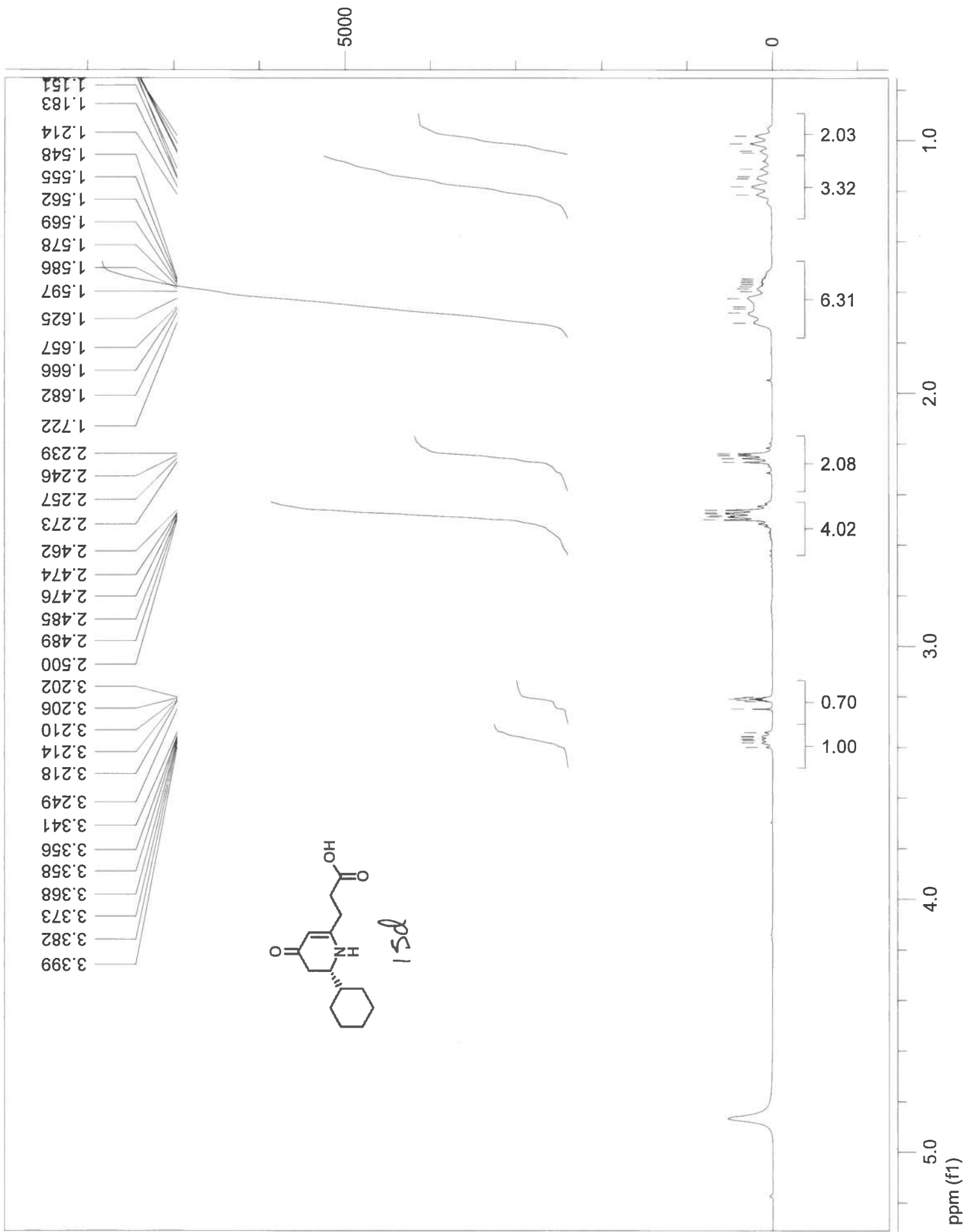
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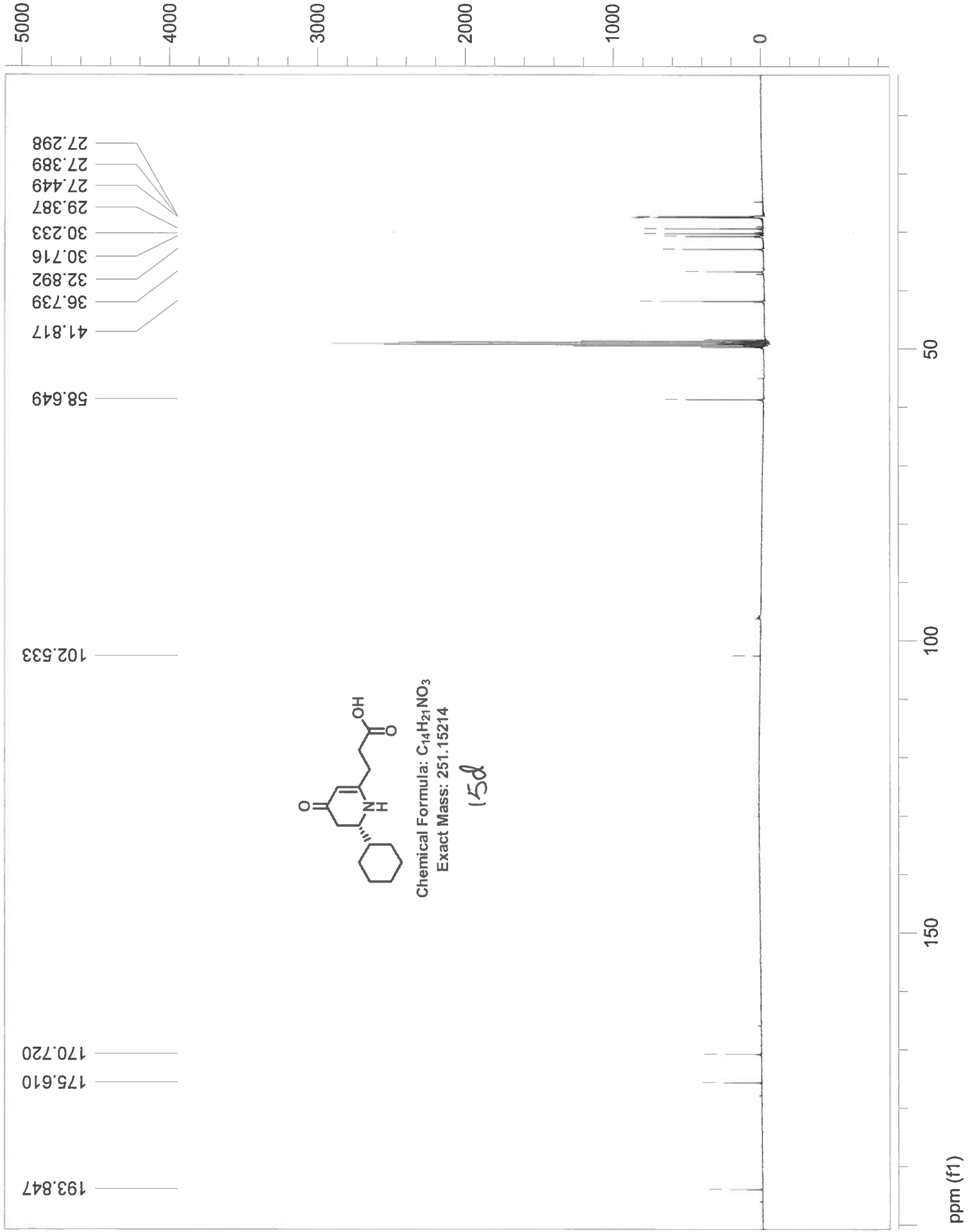
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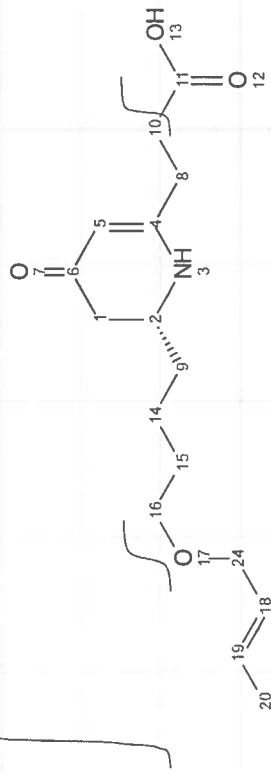
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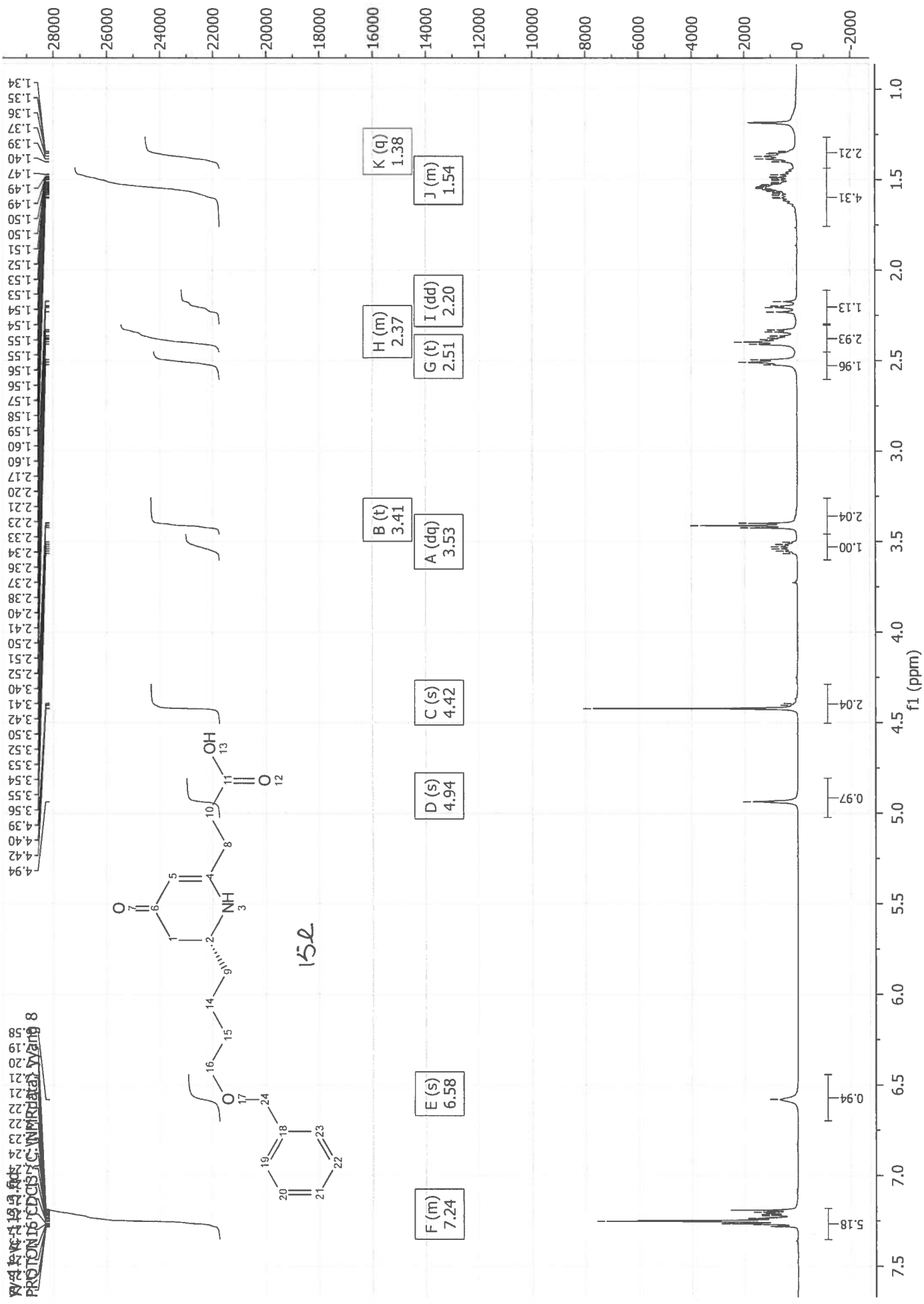


Waktu: 18.13.00
PROTON 1D CDCl₃ C: WIRIDATAY Yang 8

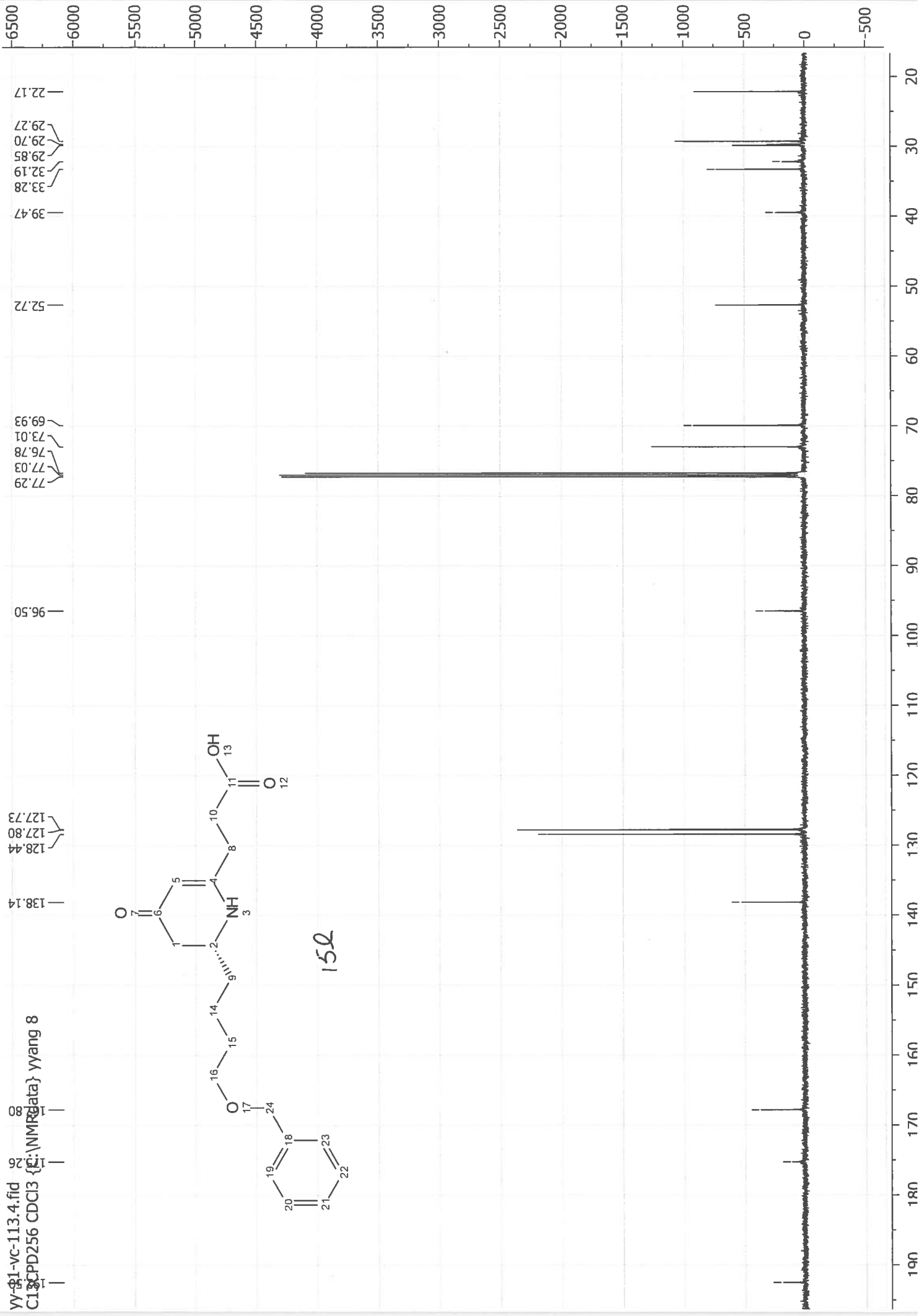
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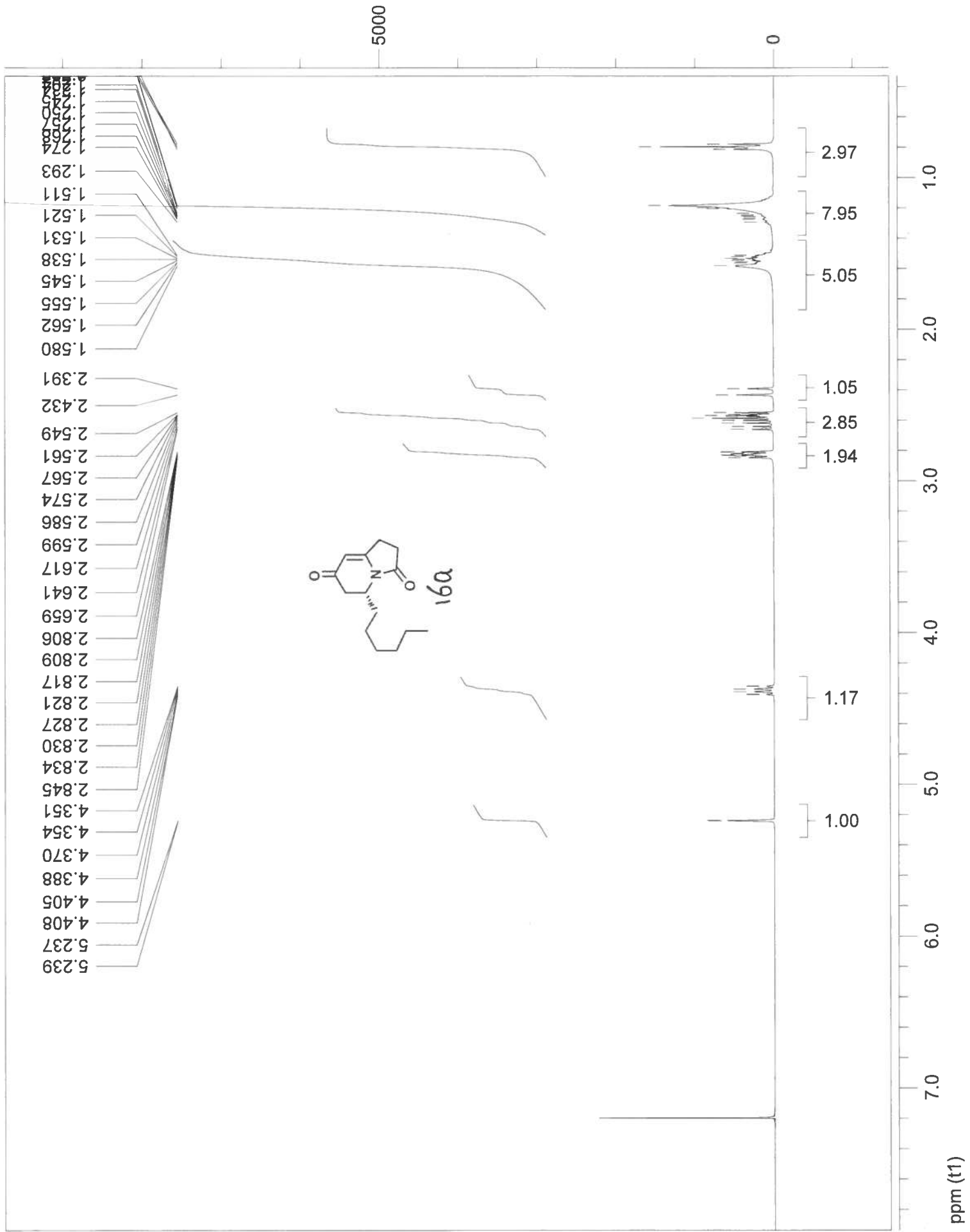
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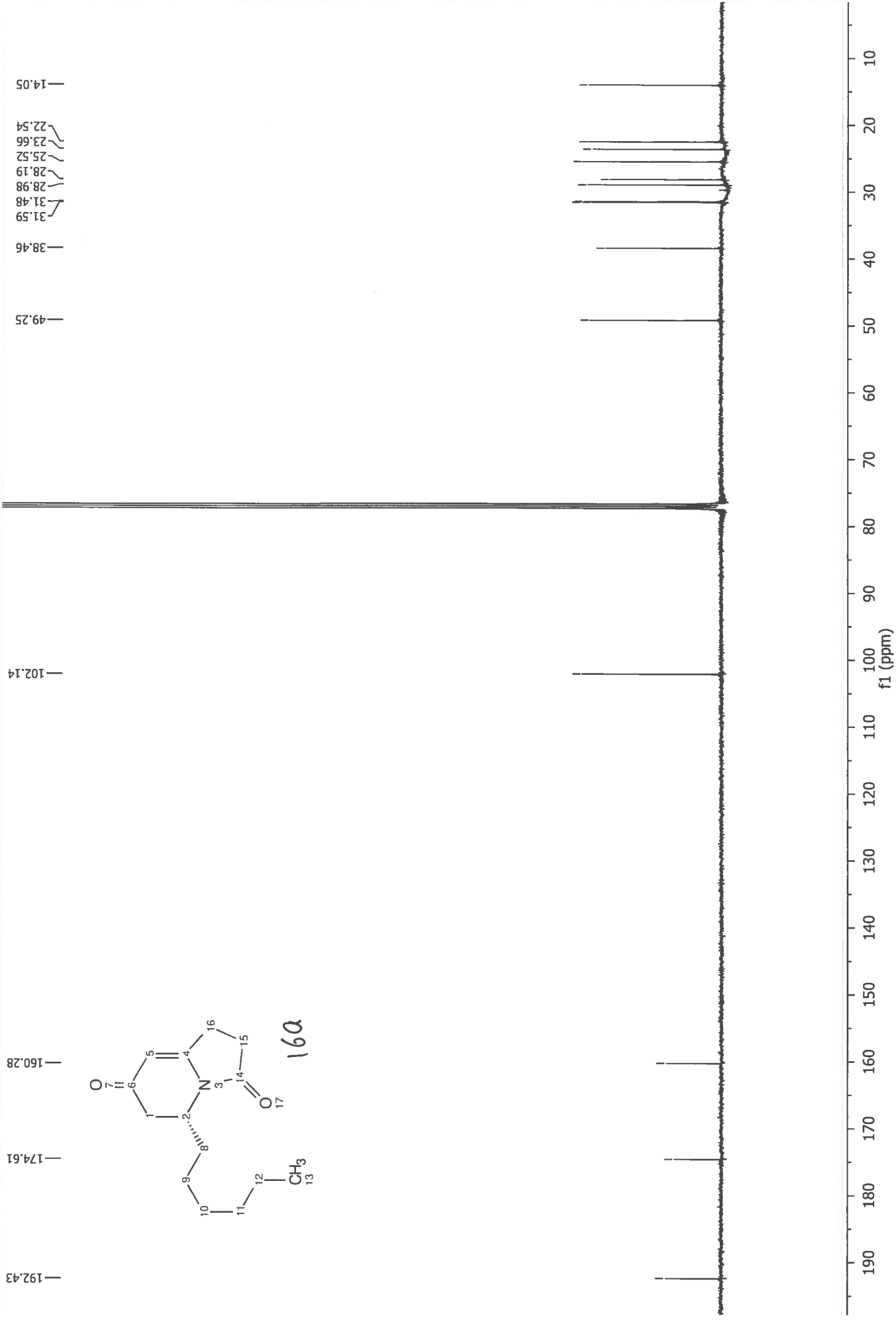
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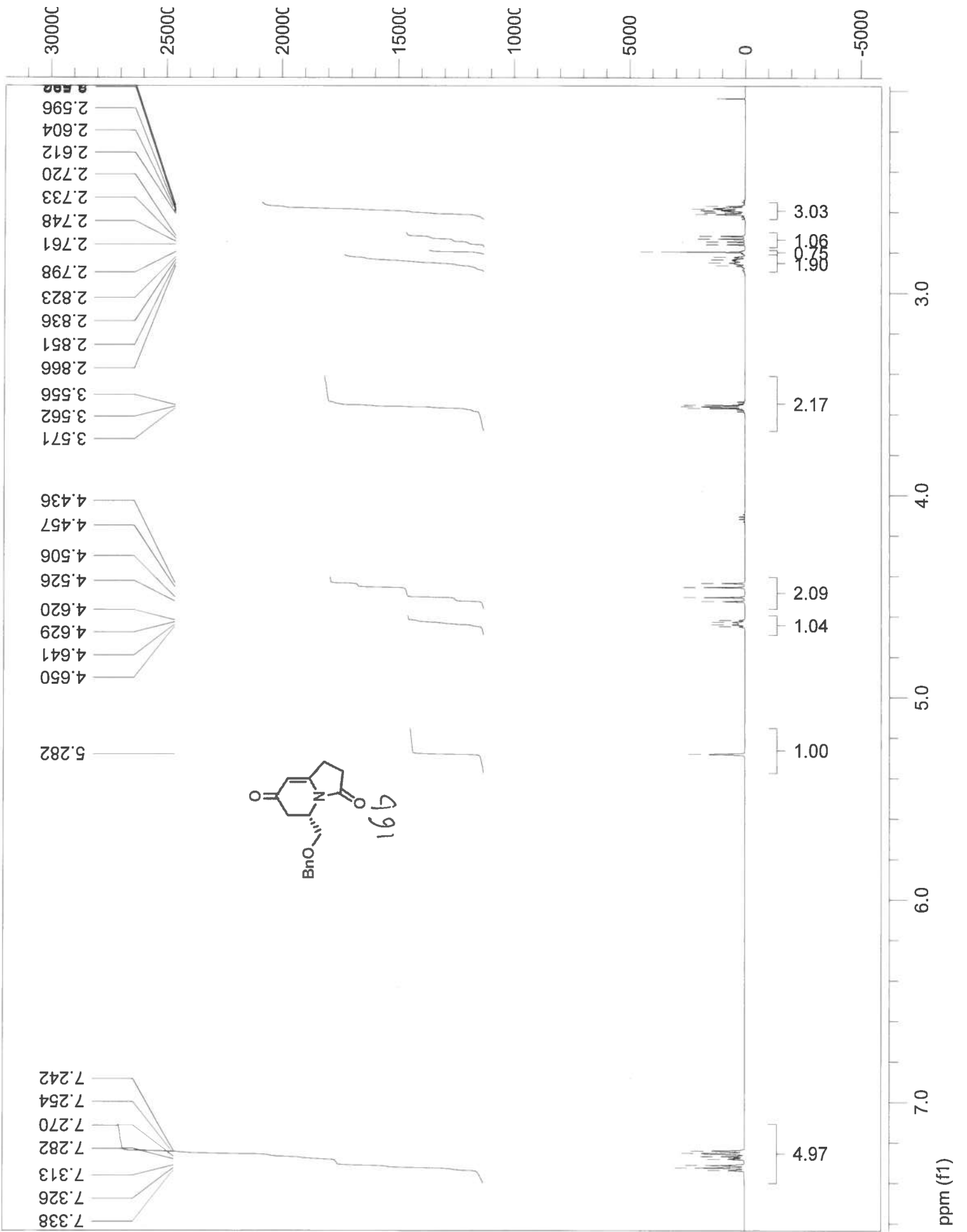


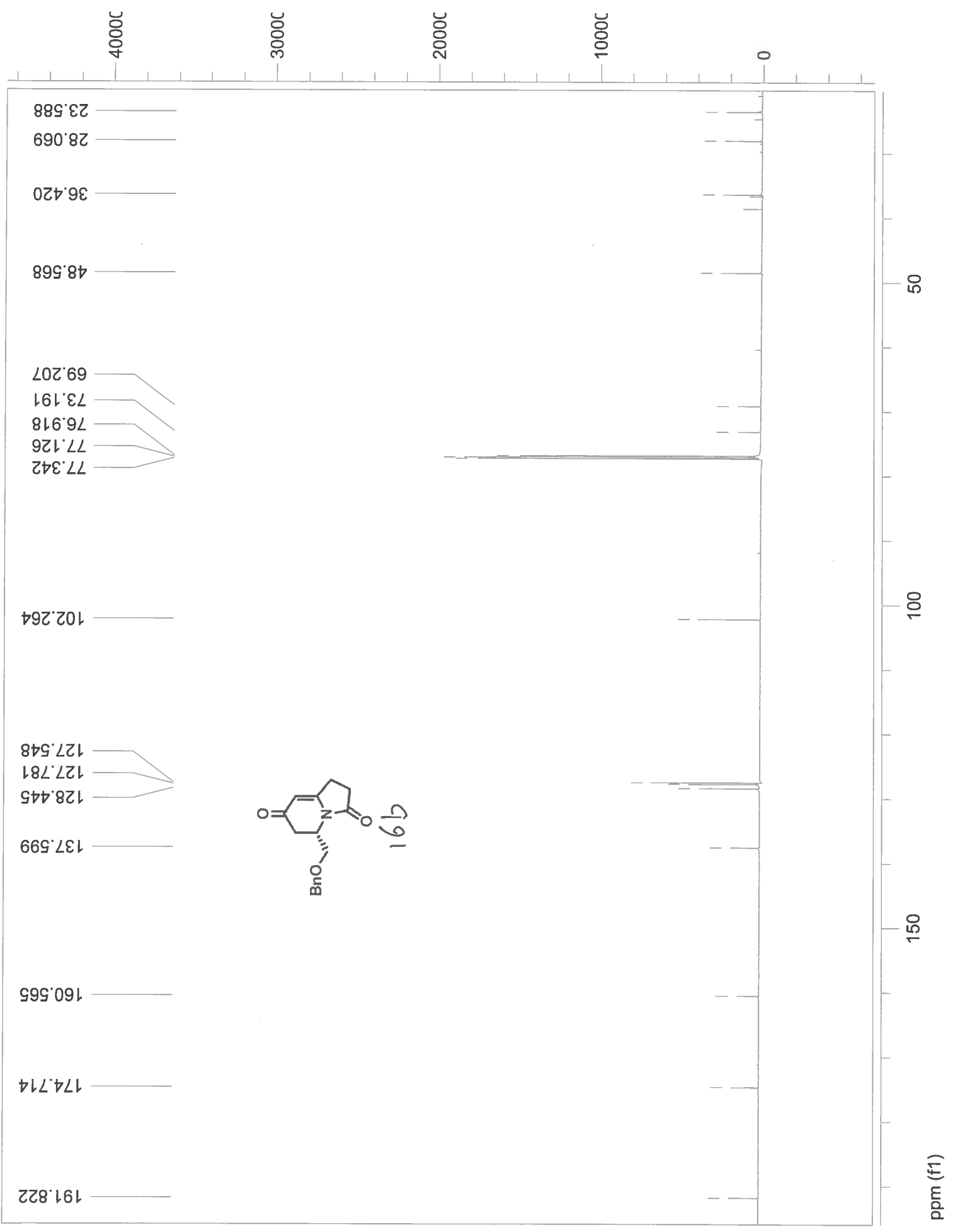
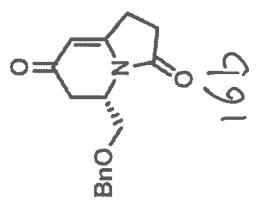
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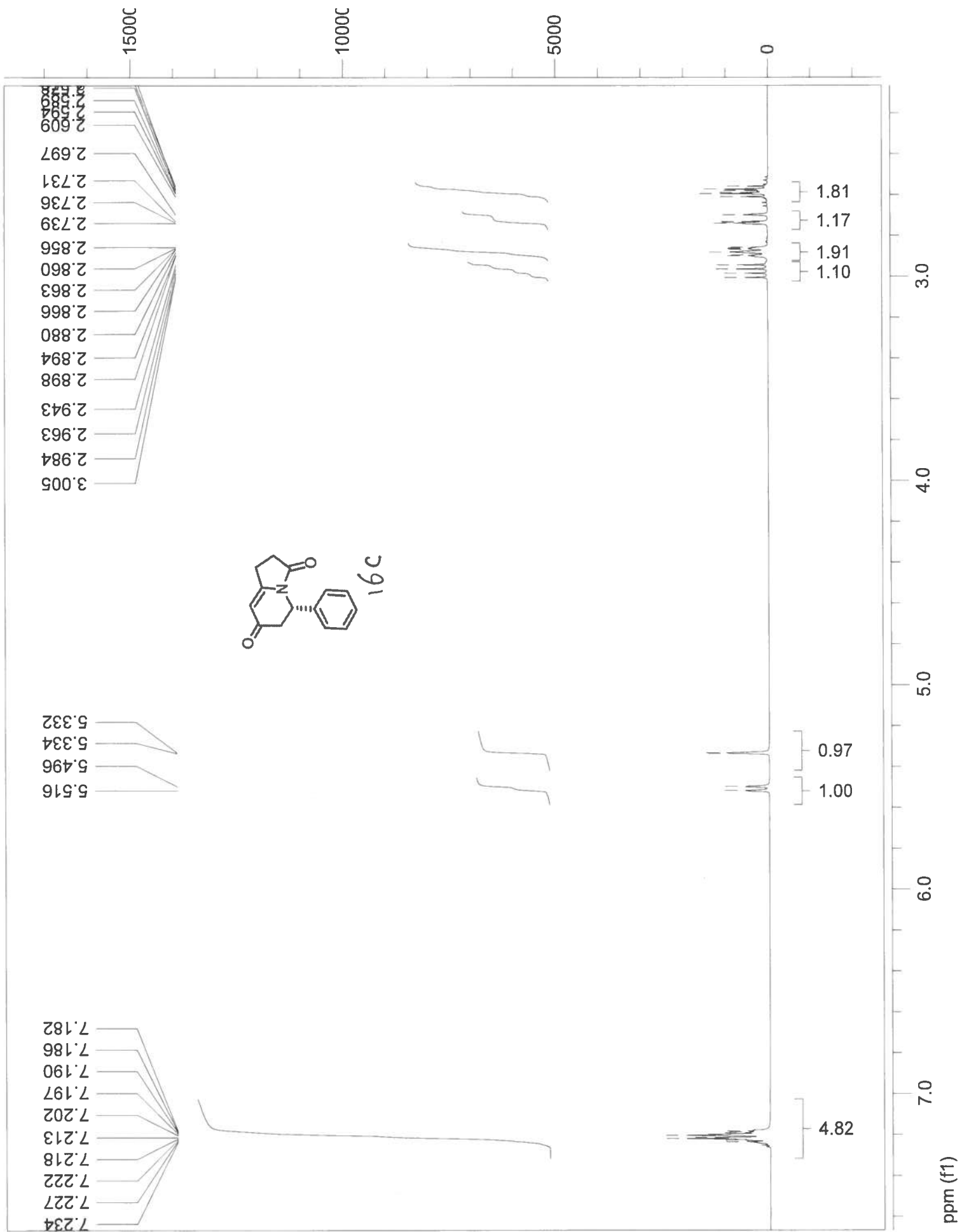


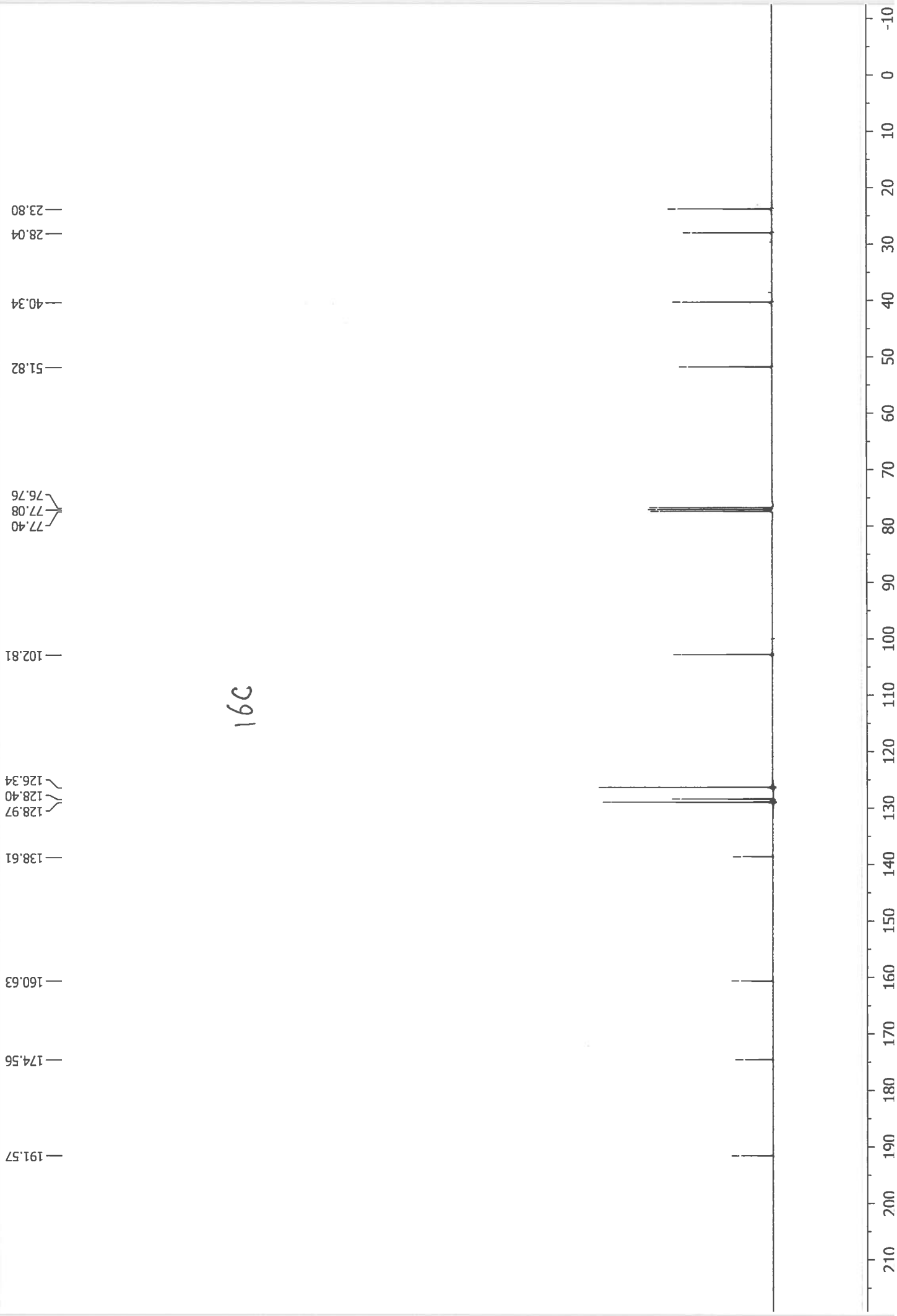
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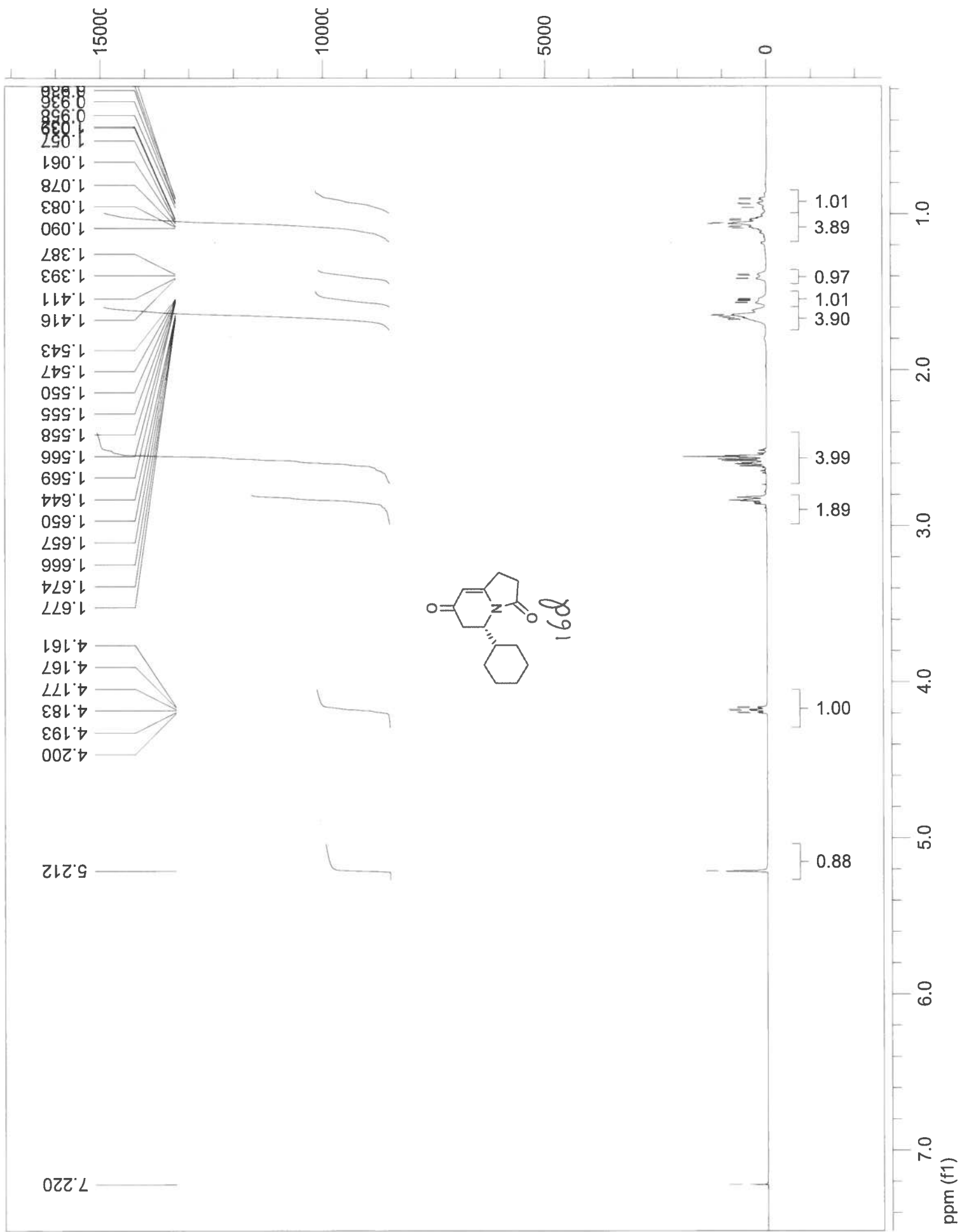


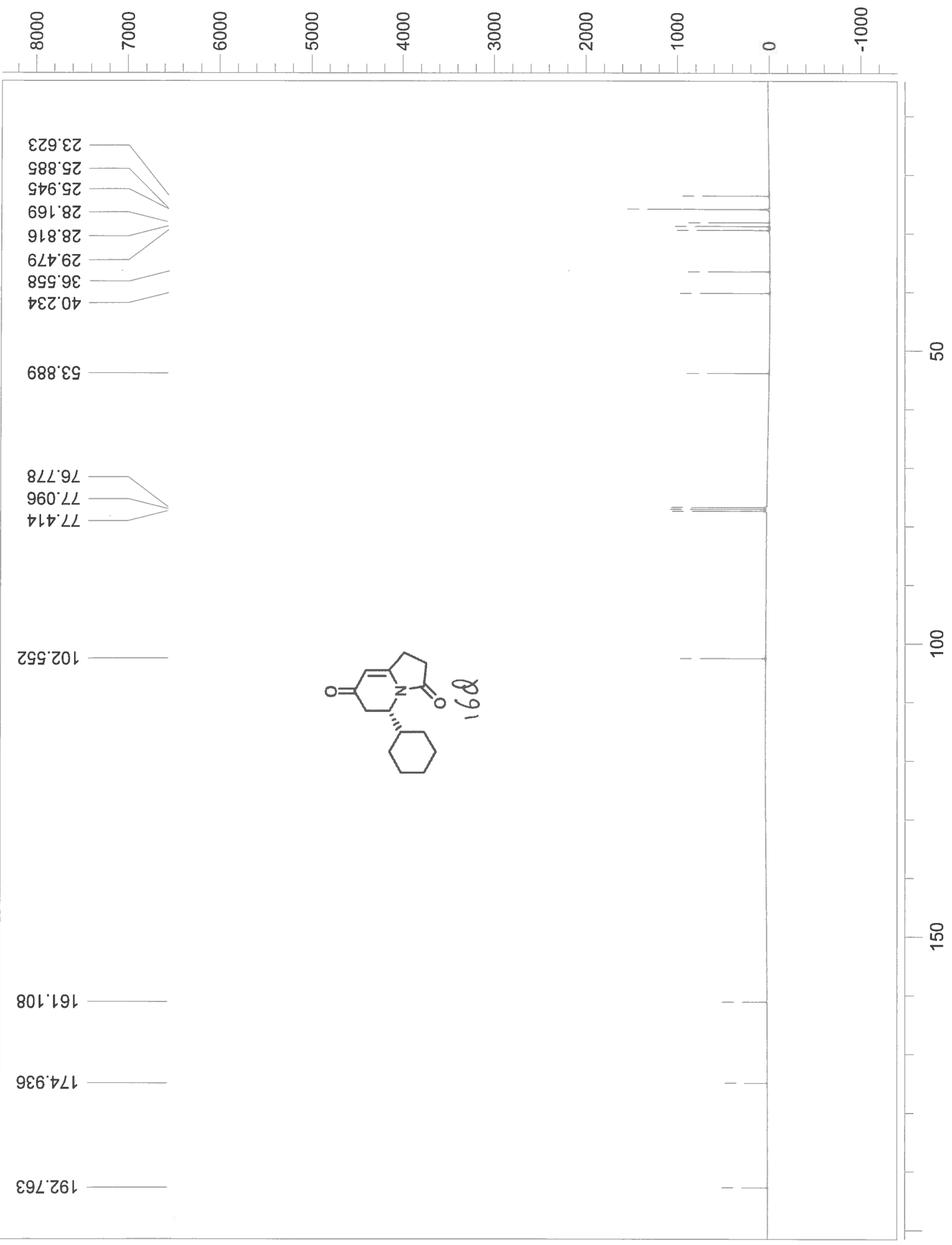


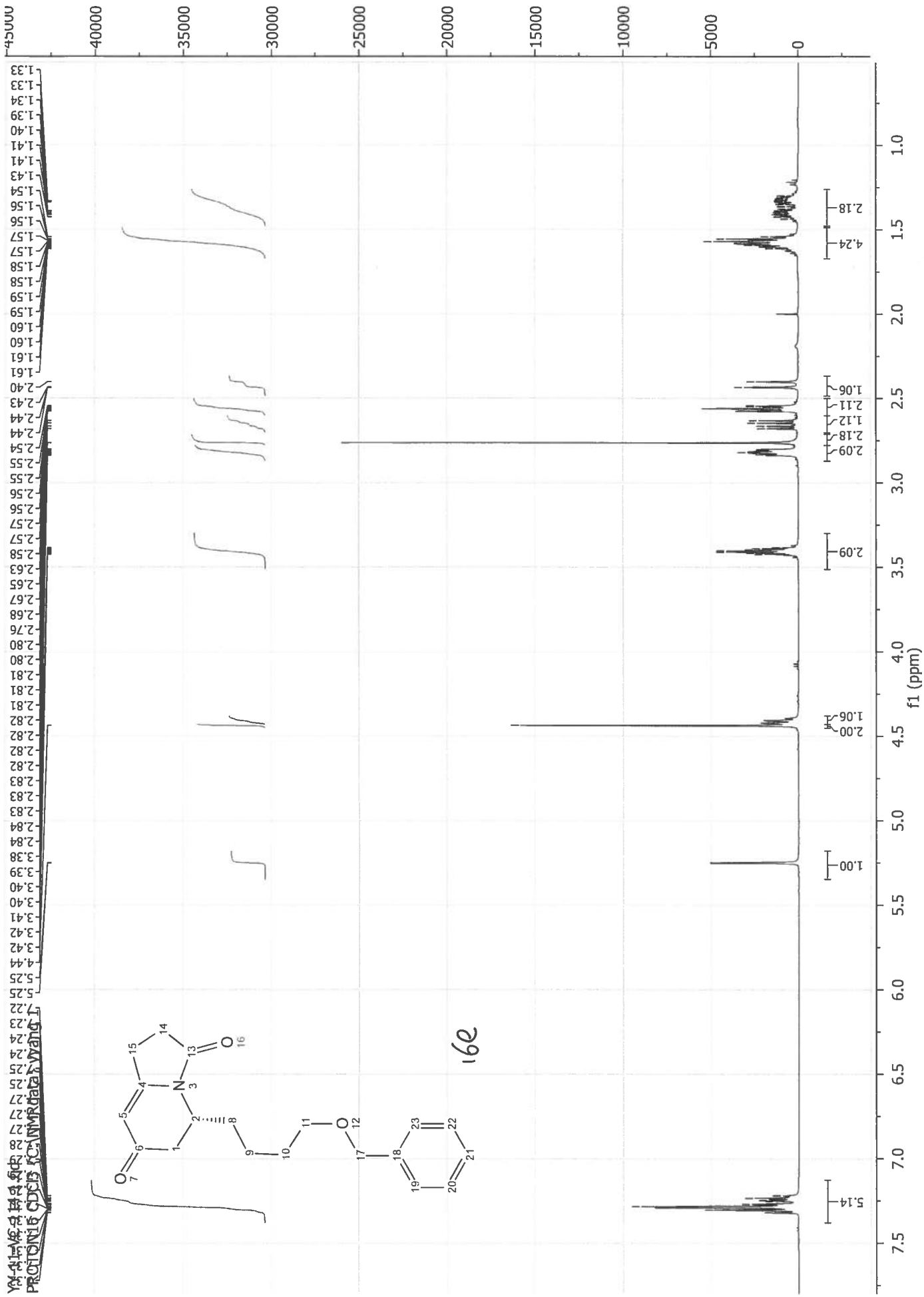




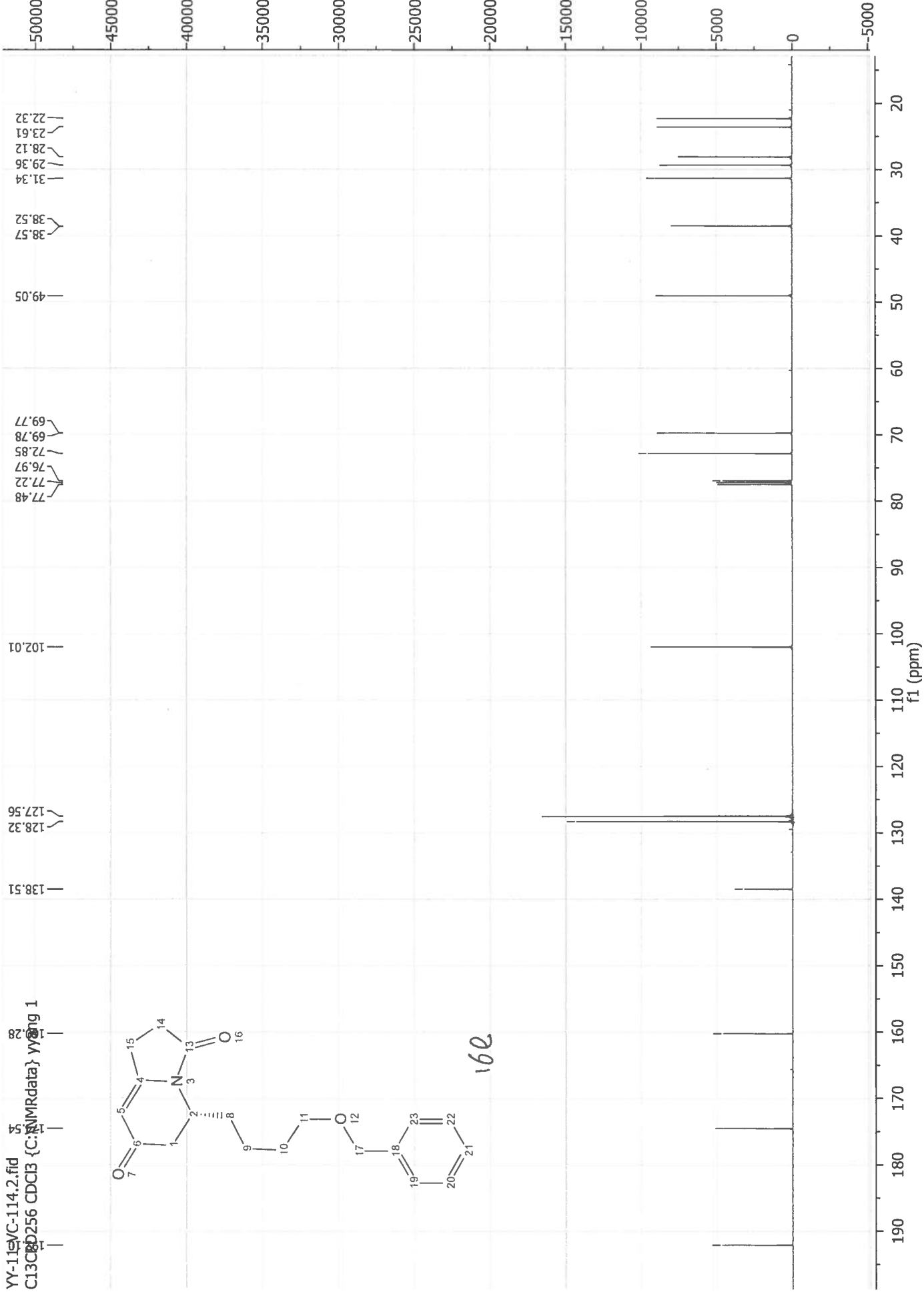


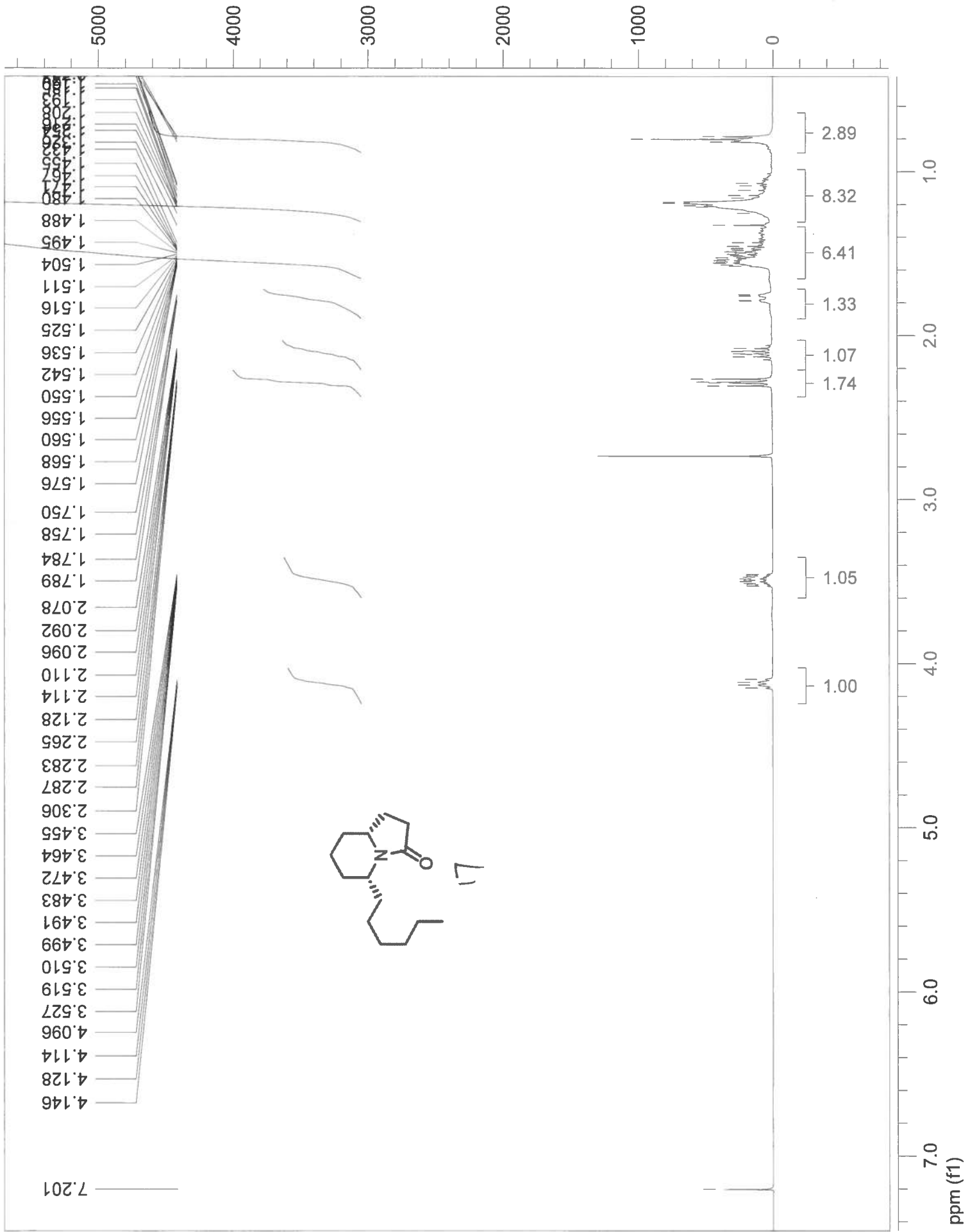


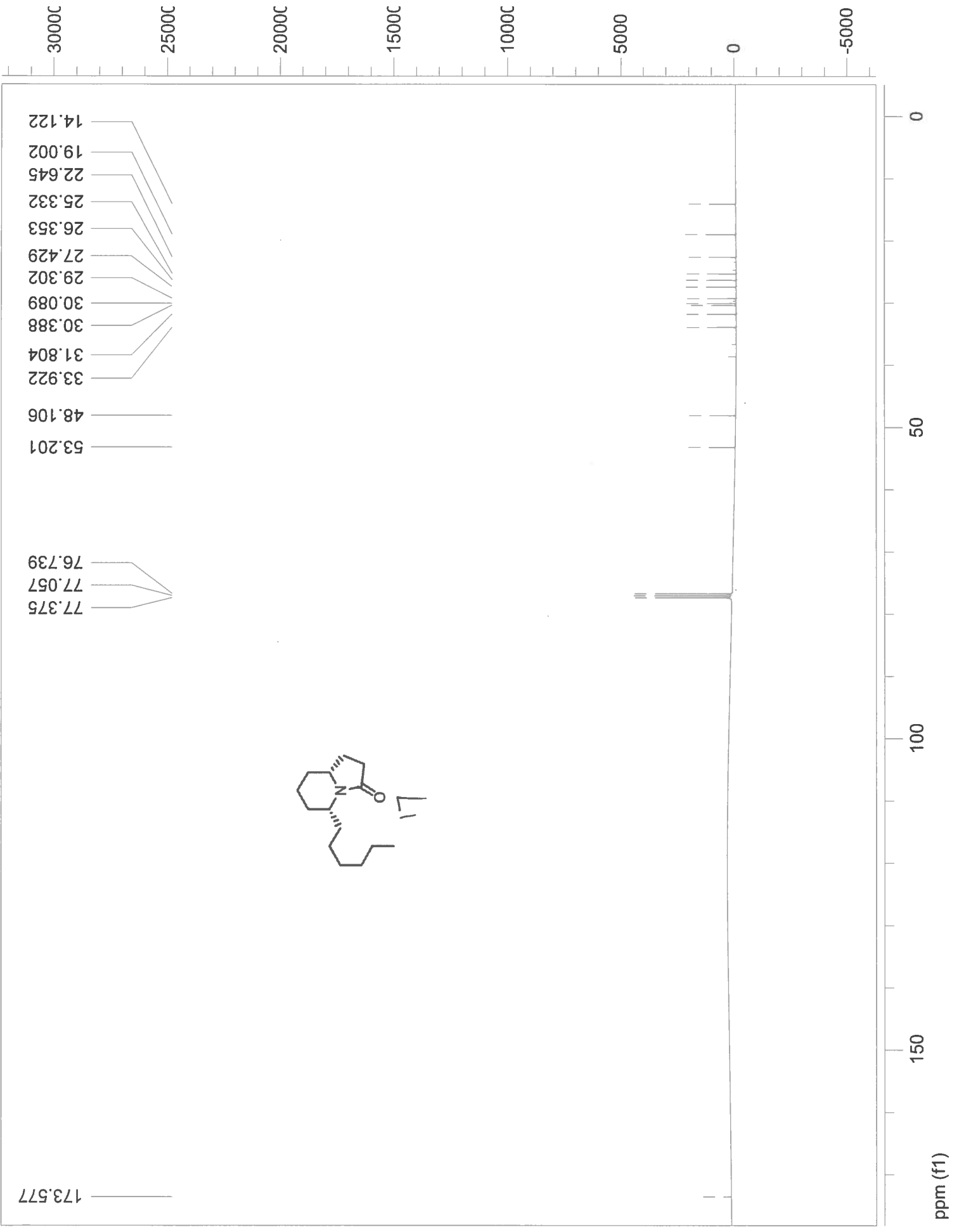


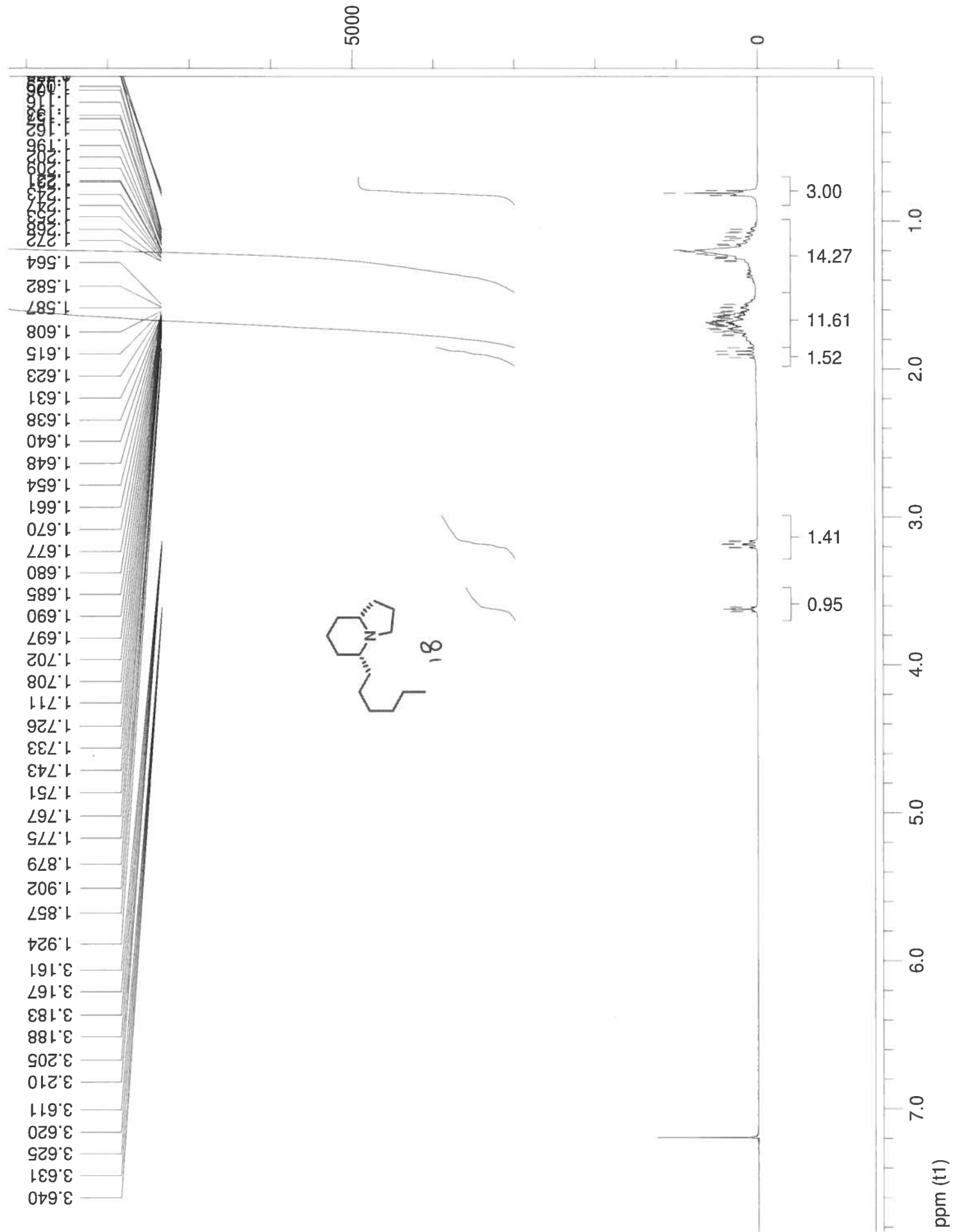


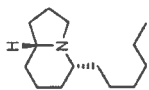
YAN LIANG, ZHANG QIANG
 PROTON 16 CD15 SC-MMRdata\16e





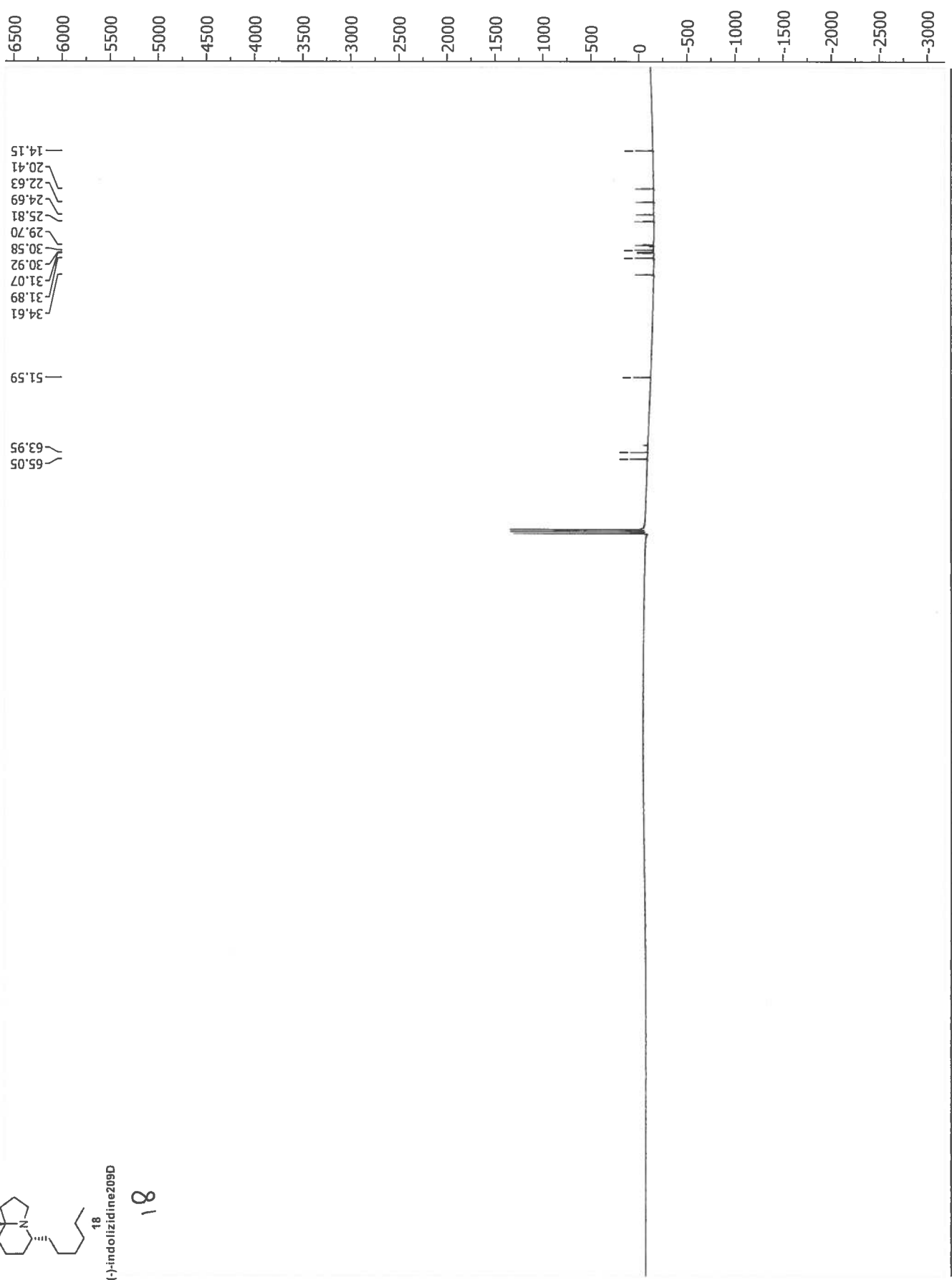


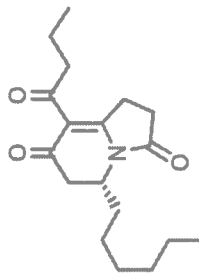




18
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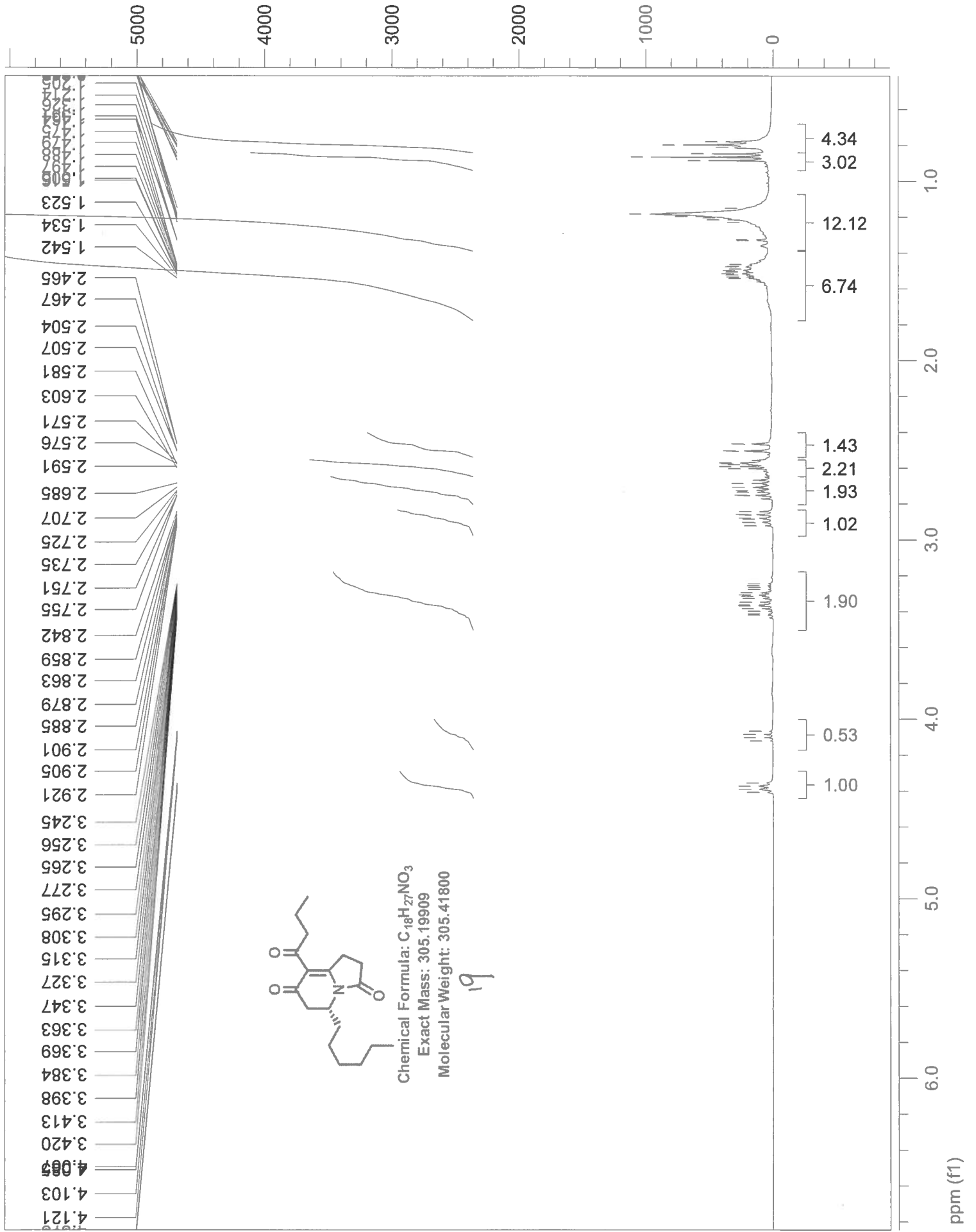
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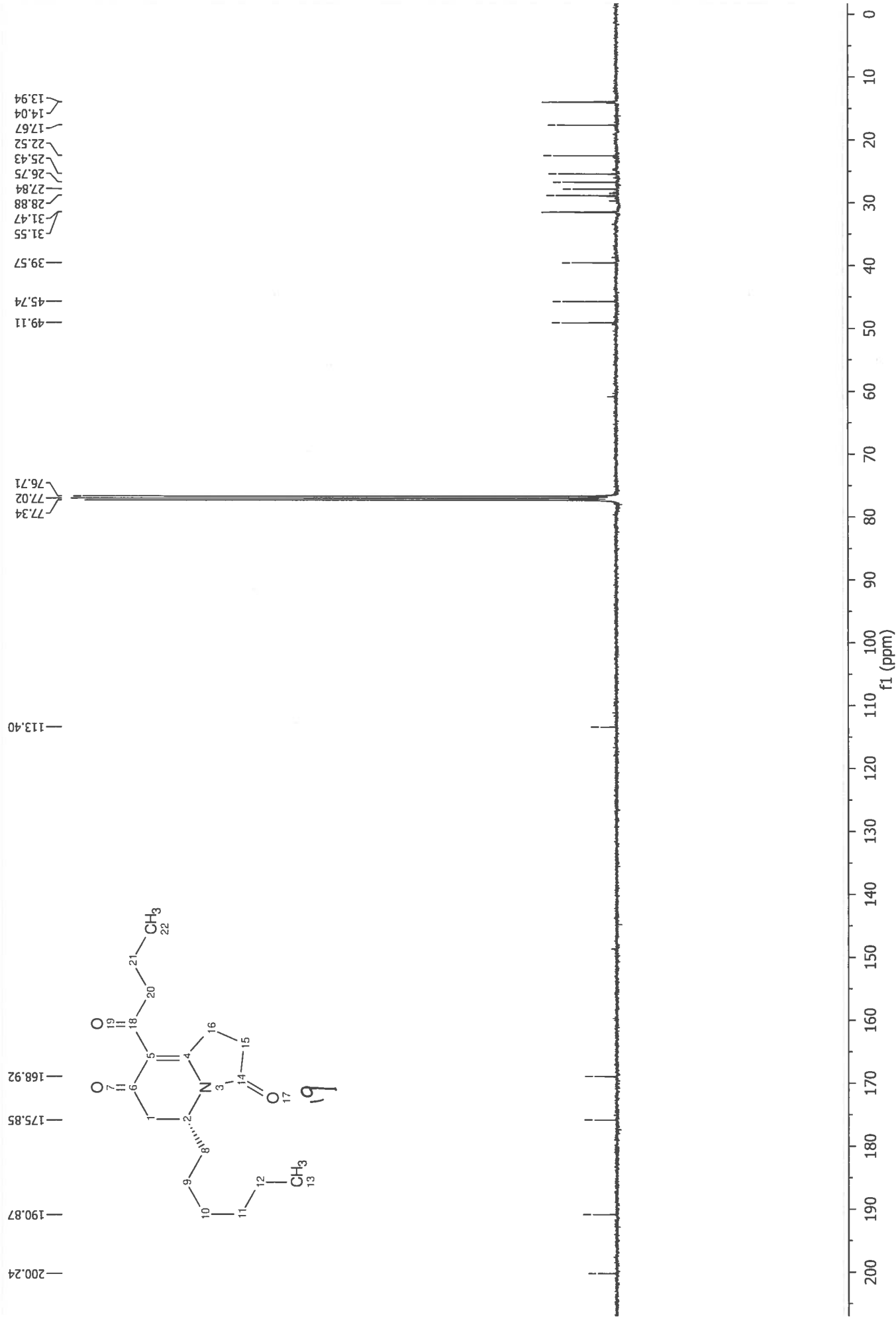


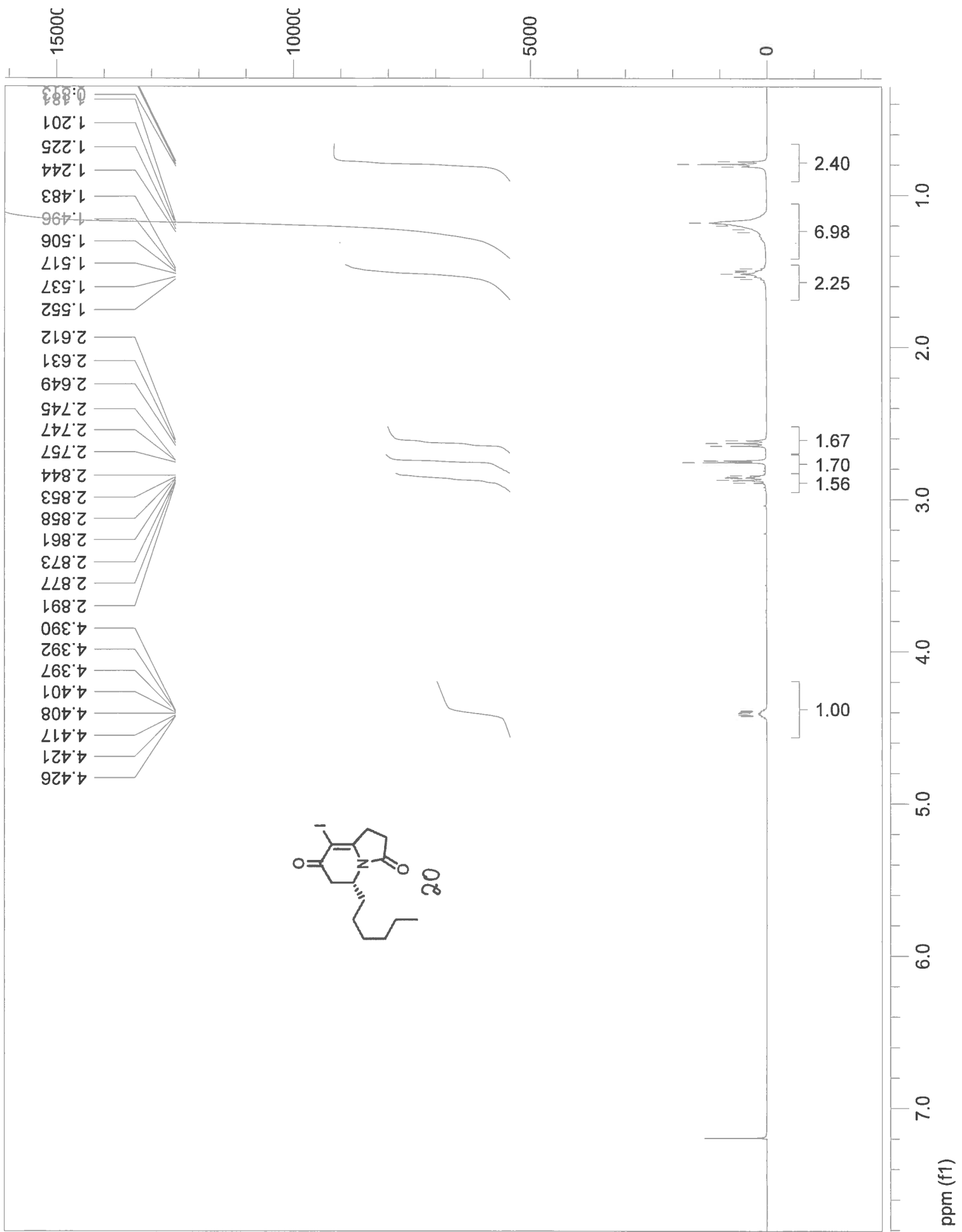
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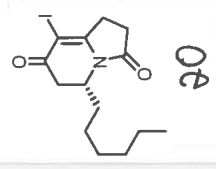
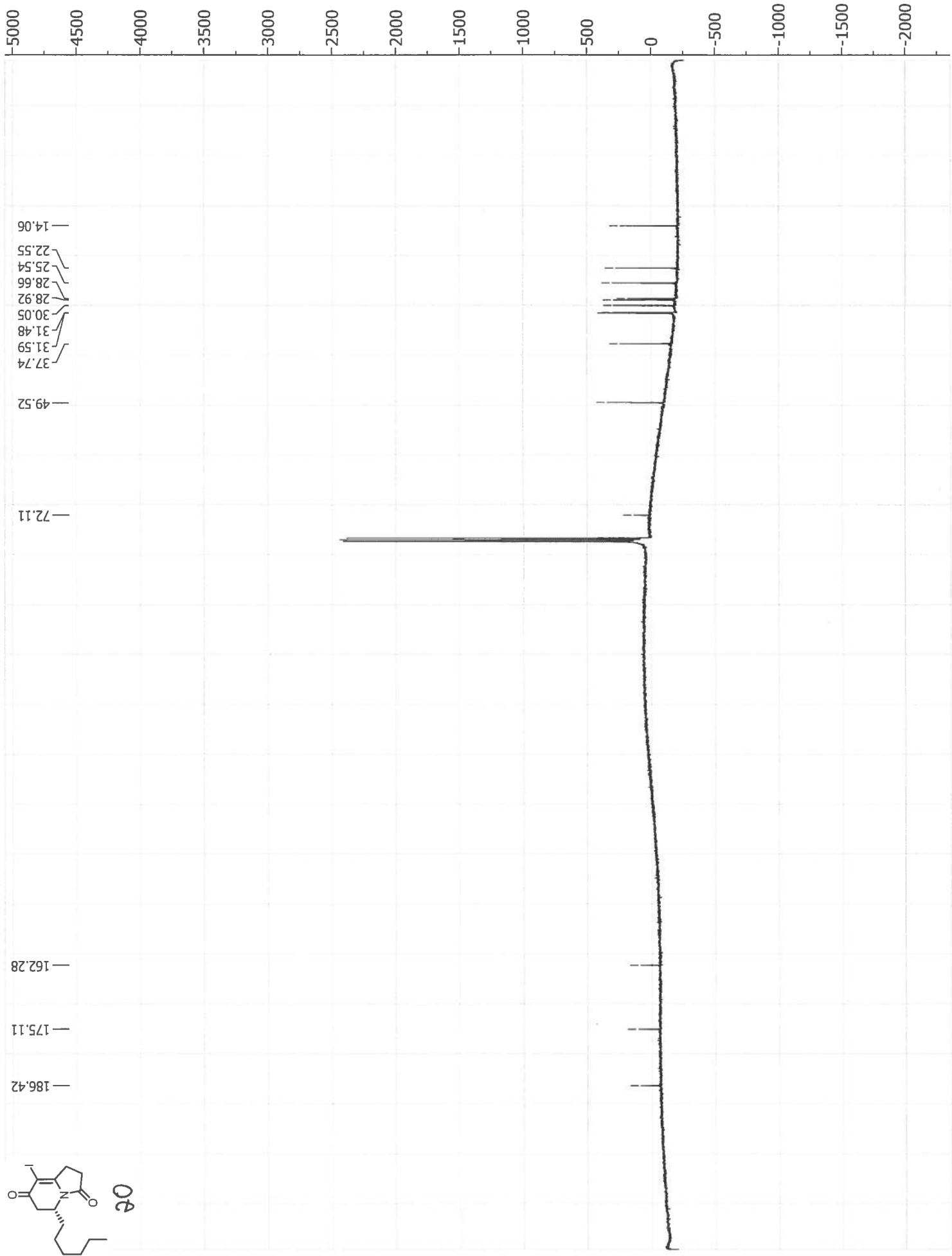
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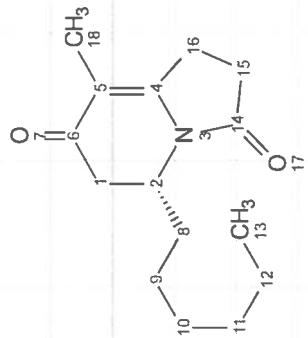
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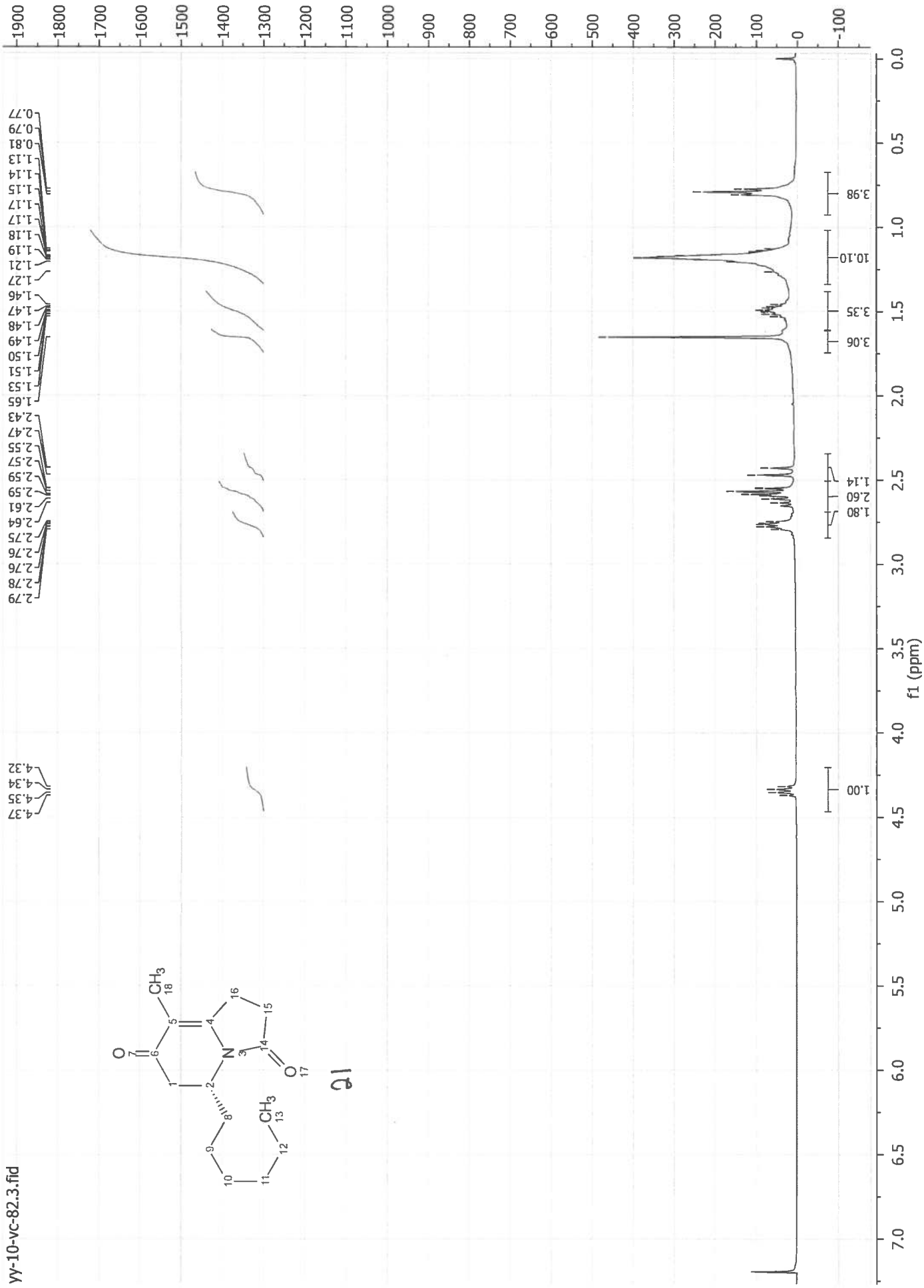


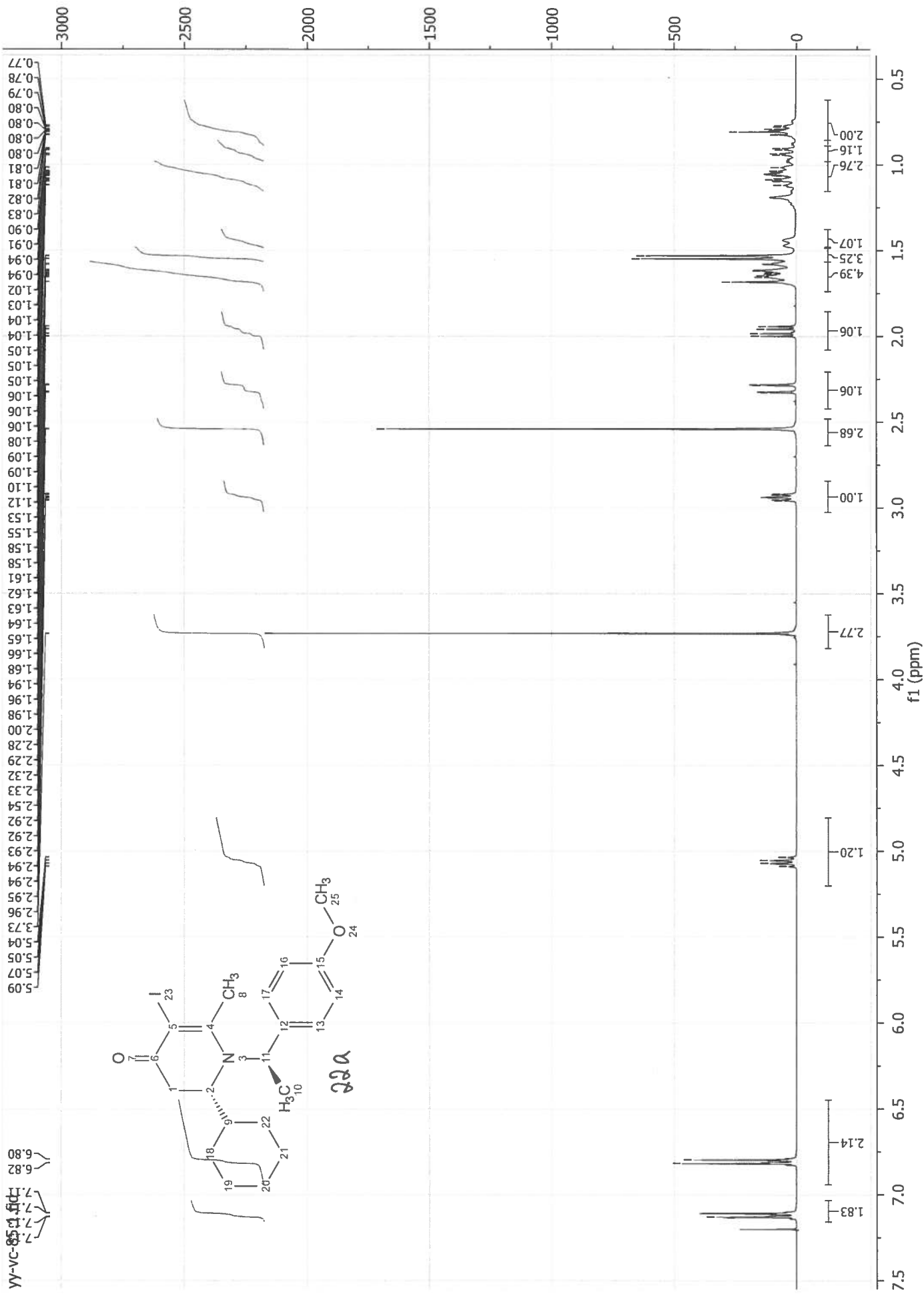


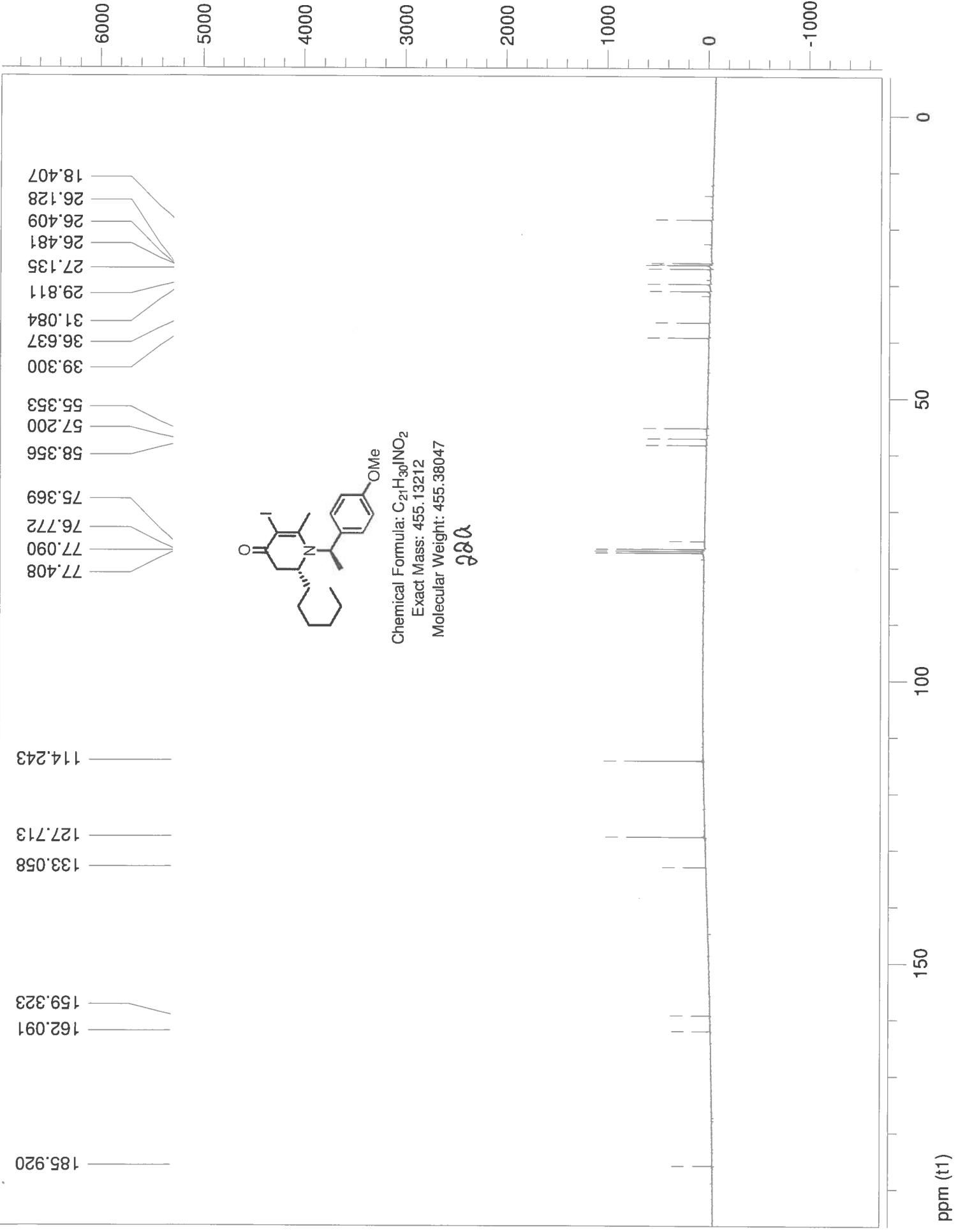
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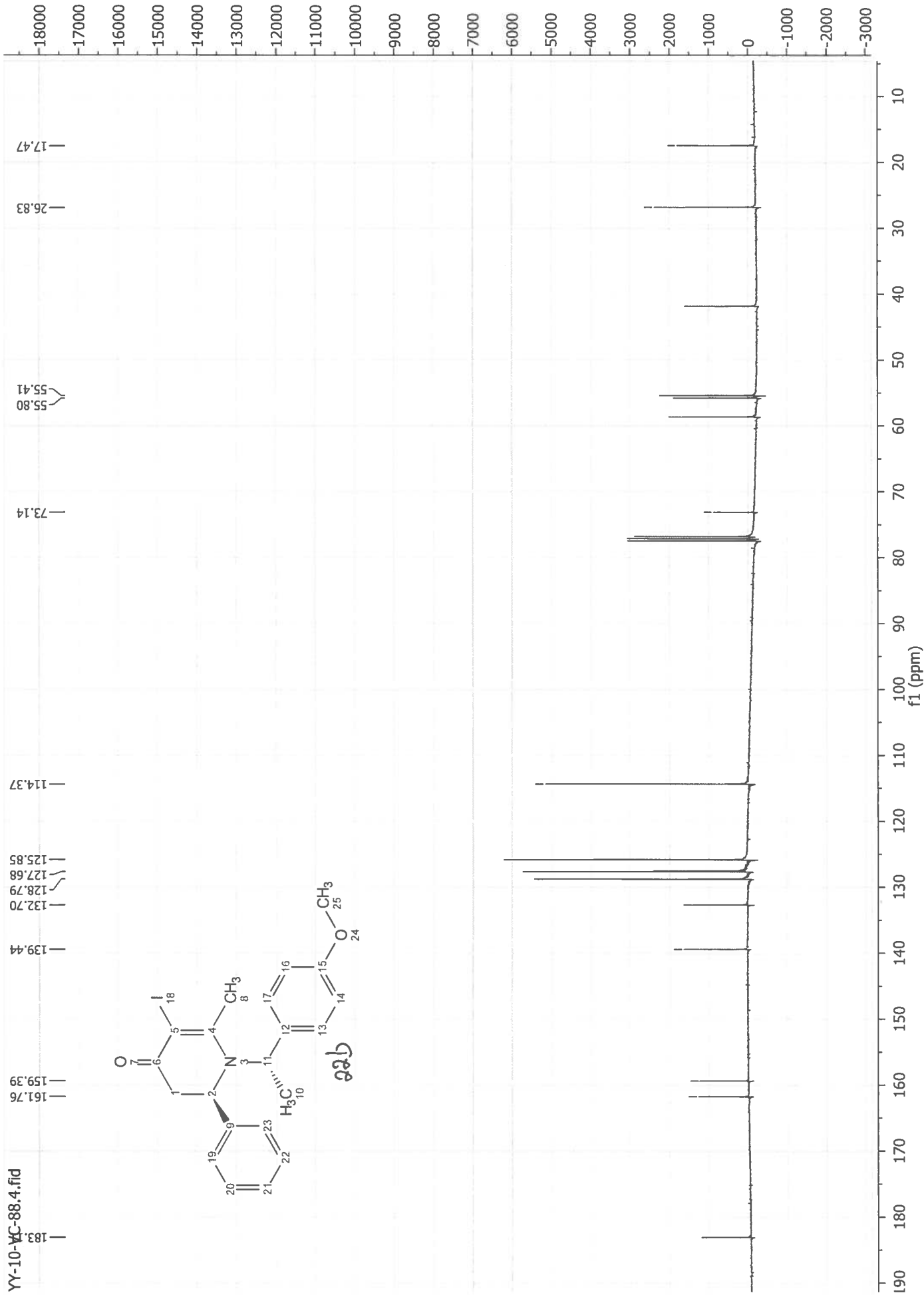


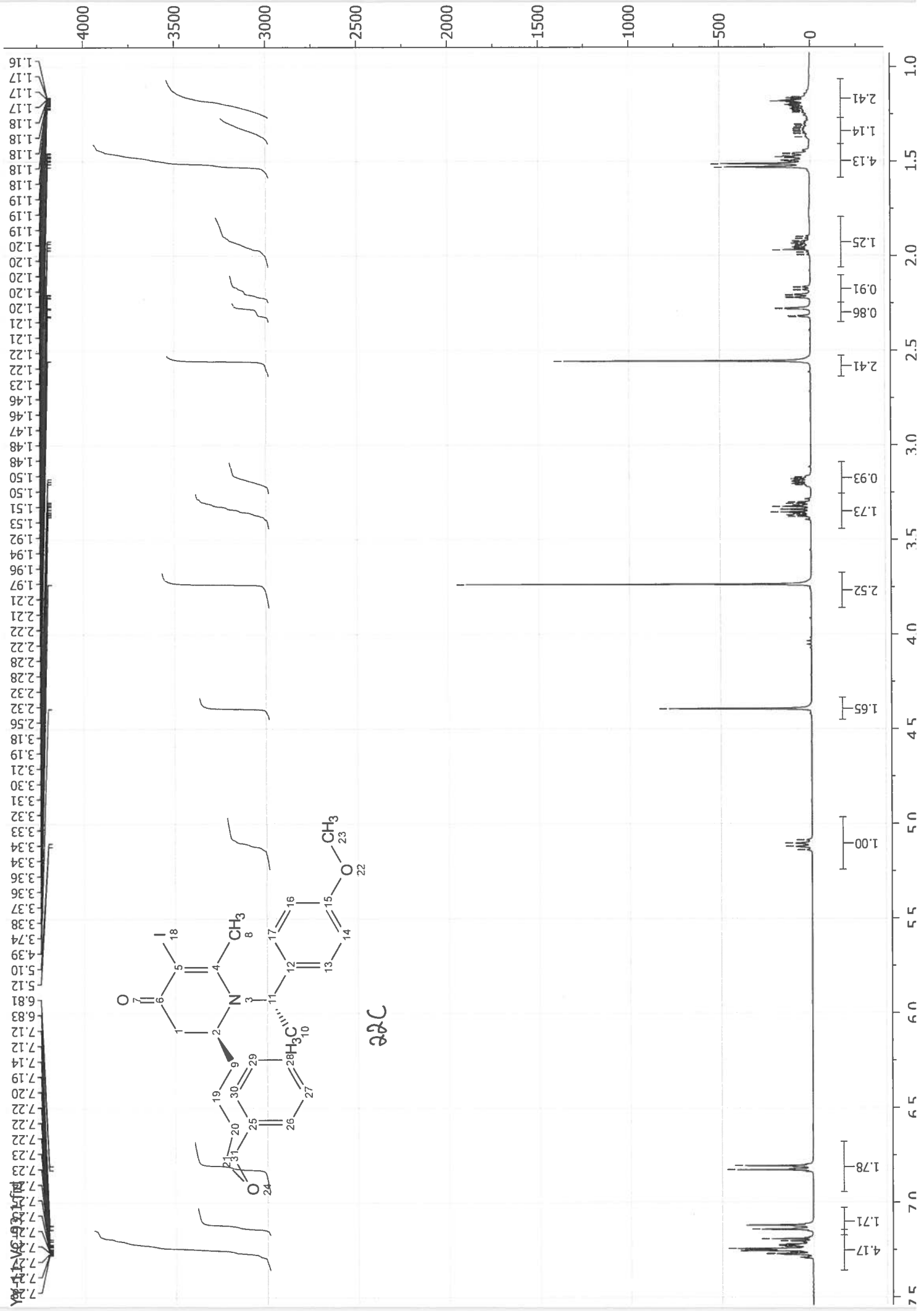
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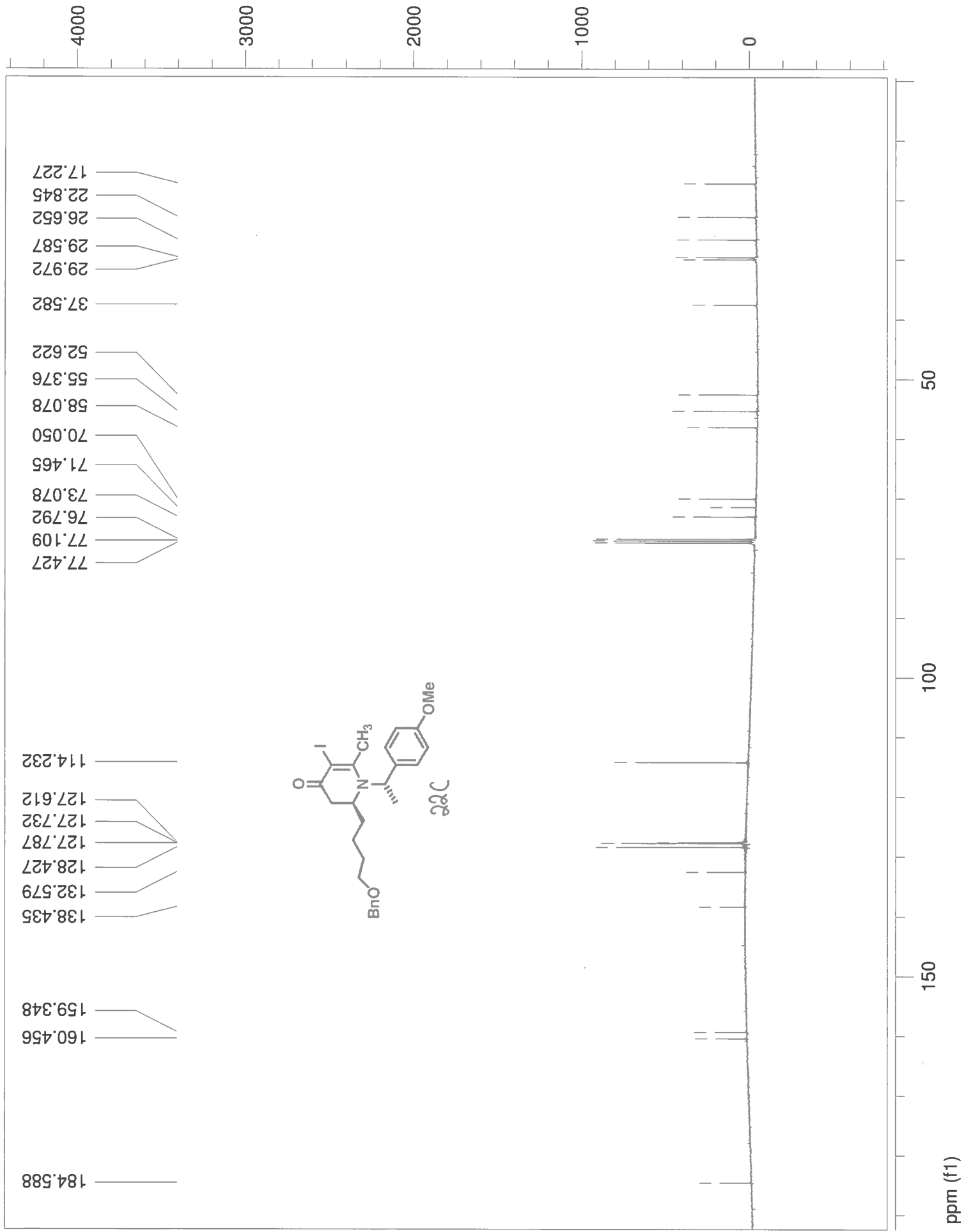


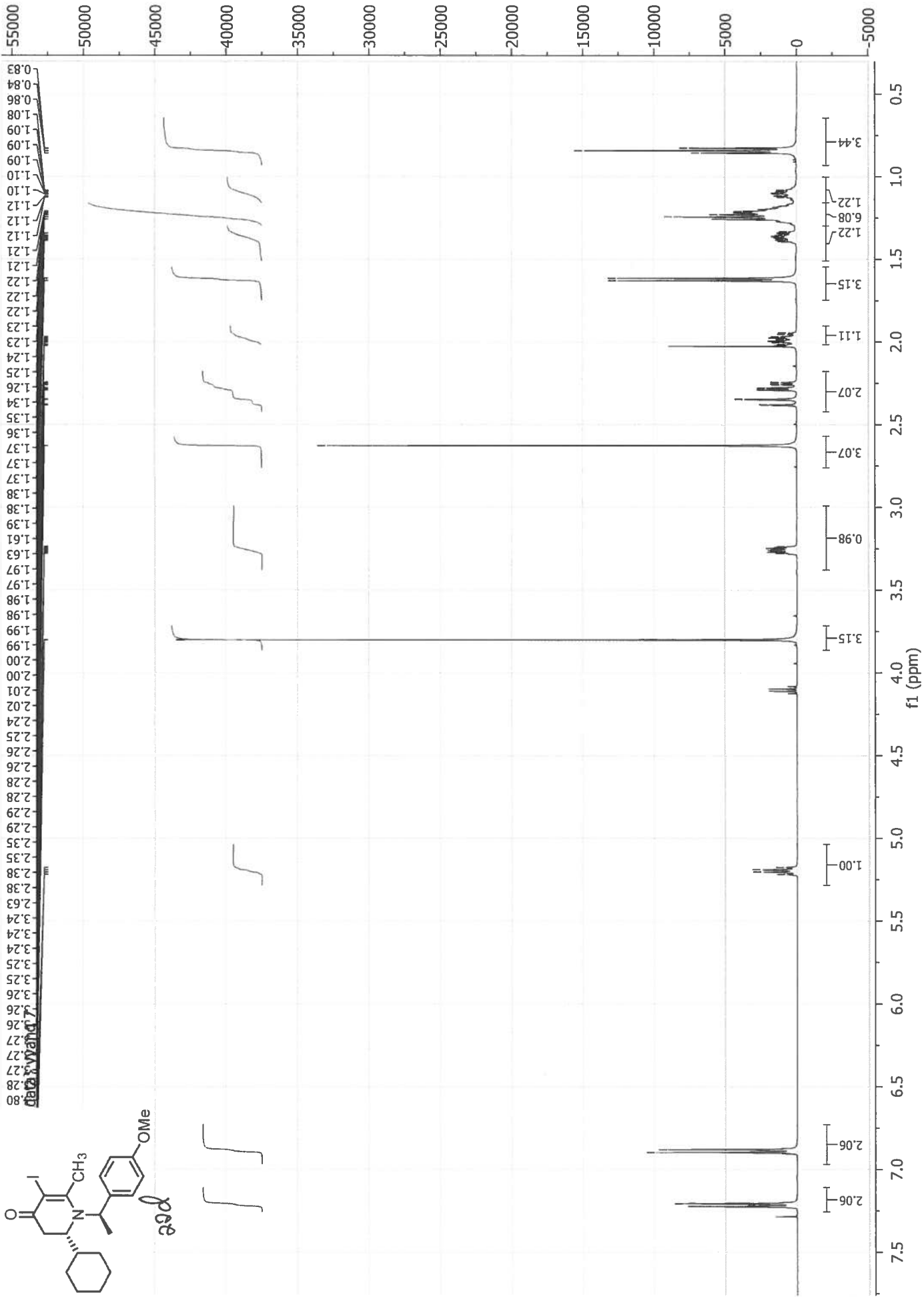






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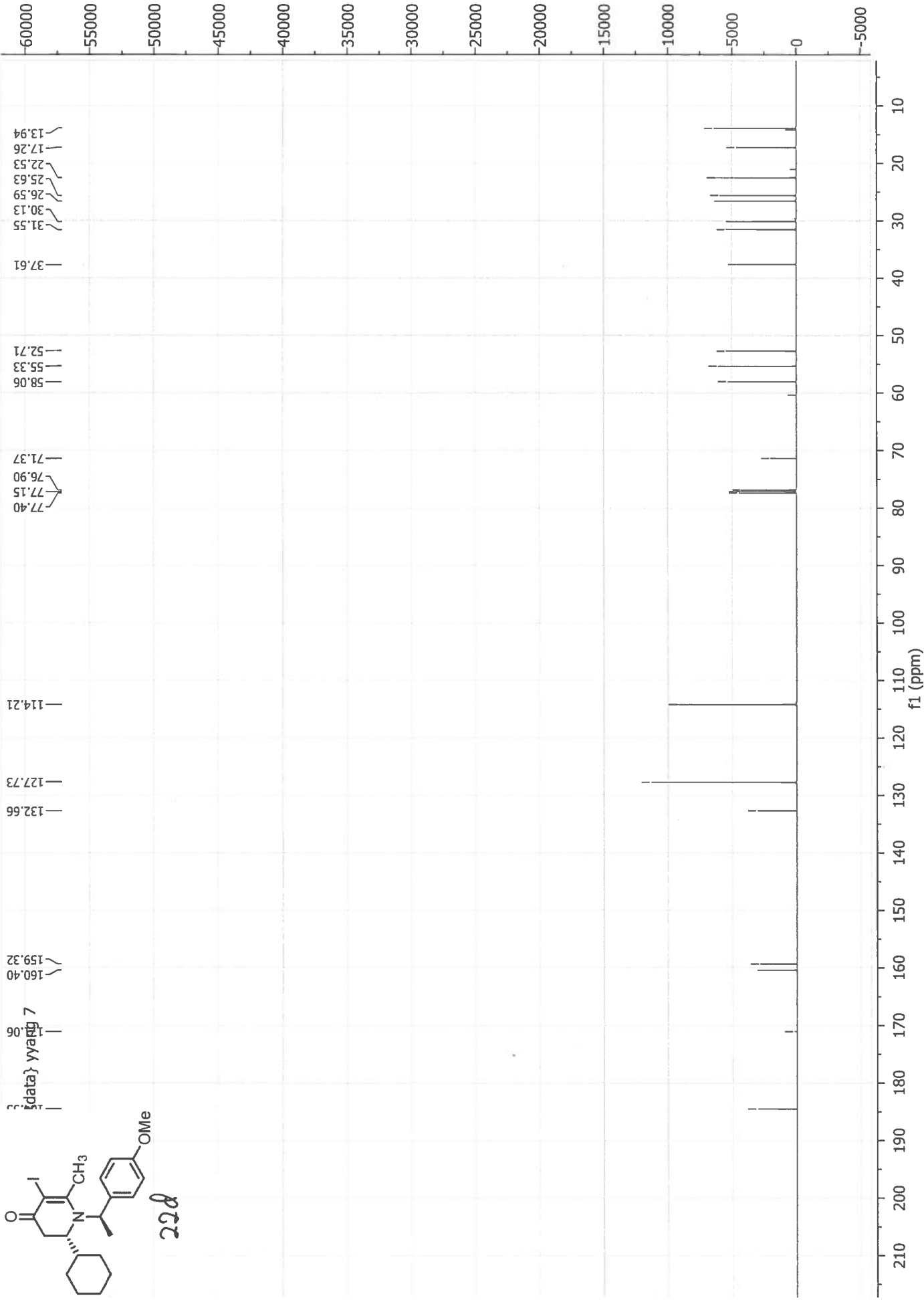


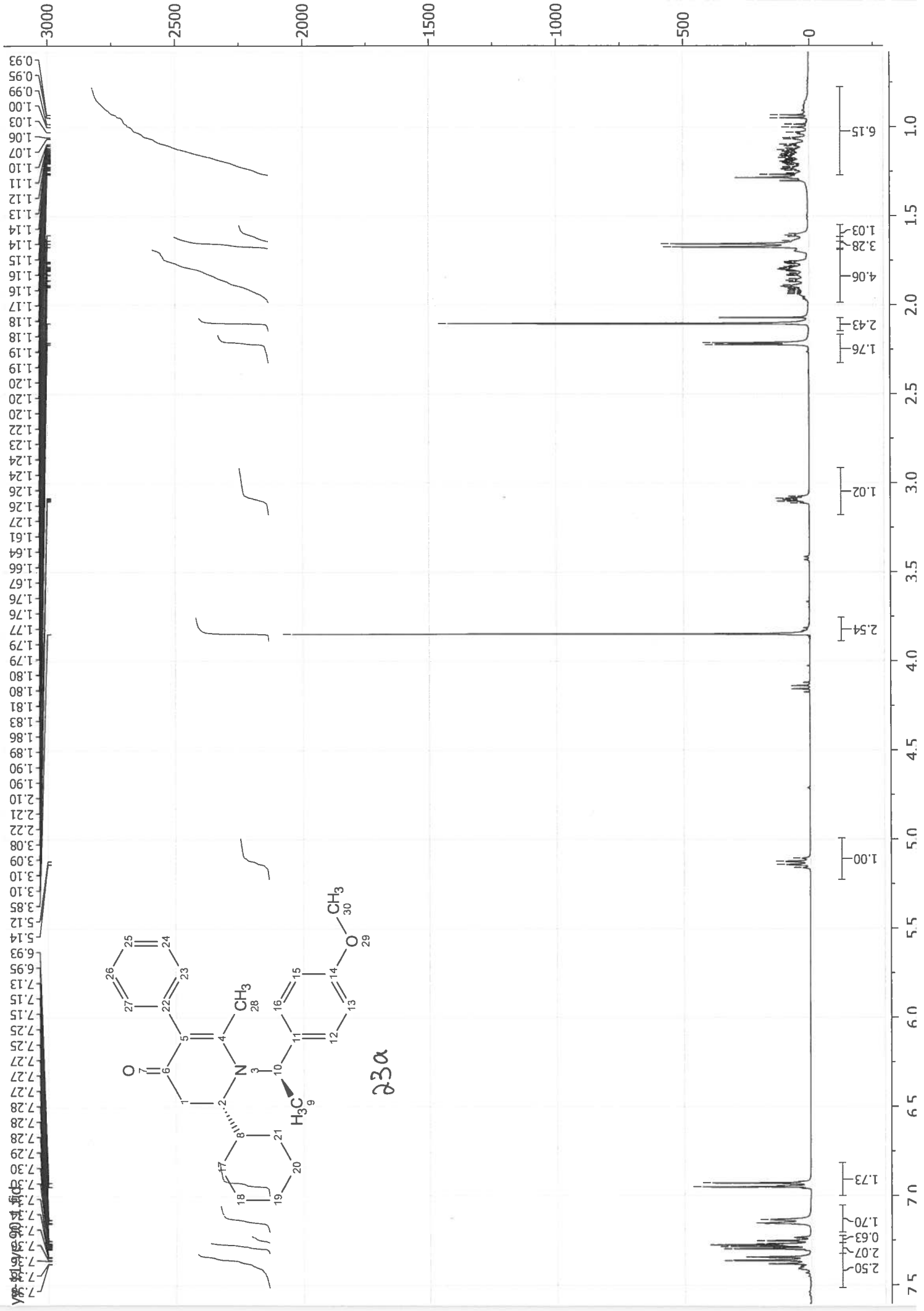


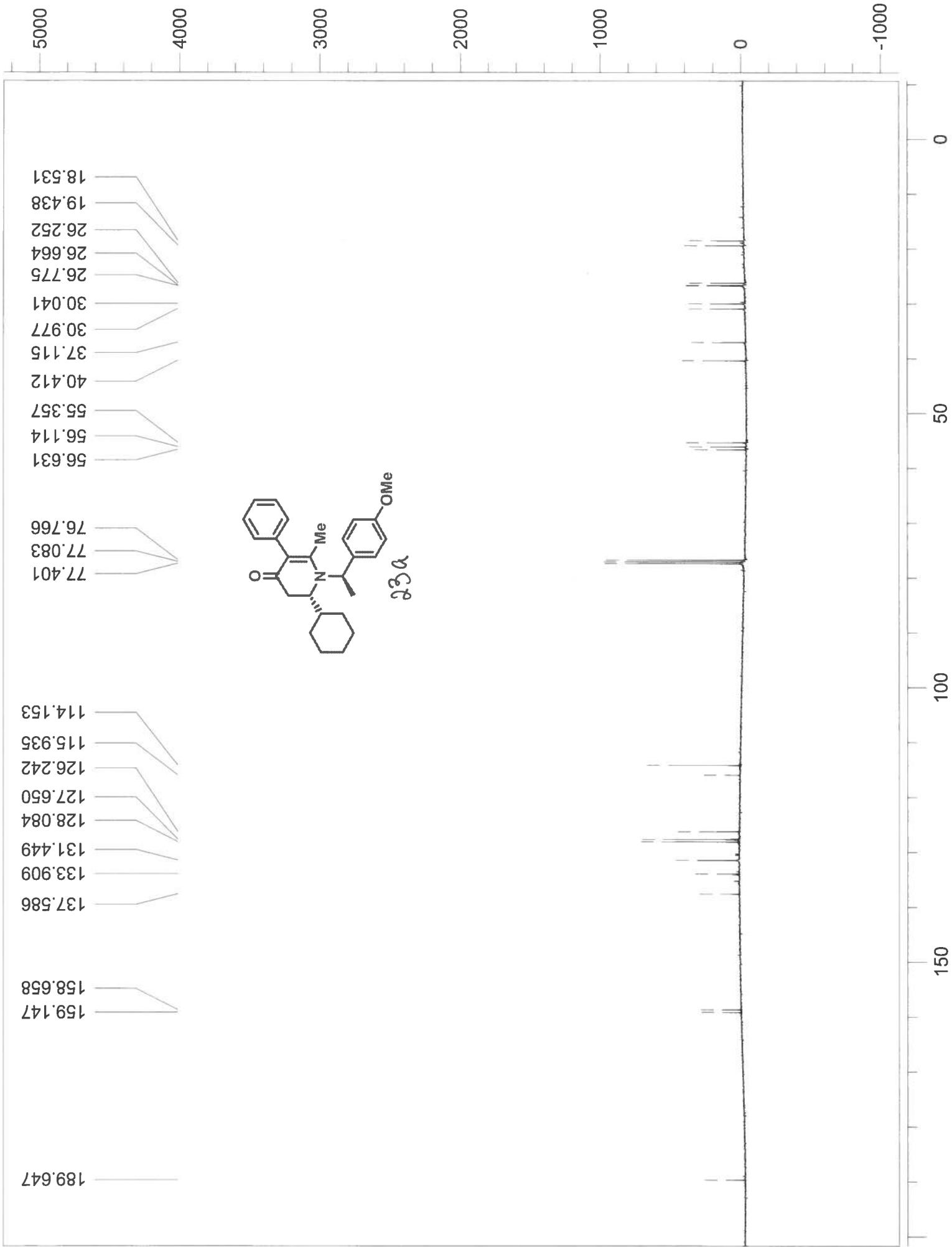
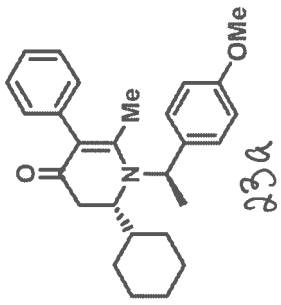
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2.35
2.38
2.38
2.63
3.24
3.24
3.24
3.25
3.25
3.26
3.26
3.26
3.27
3.27
3.28
3.28
3.80

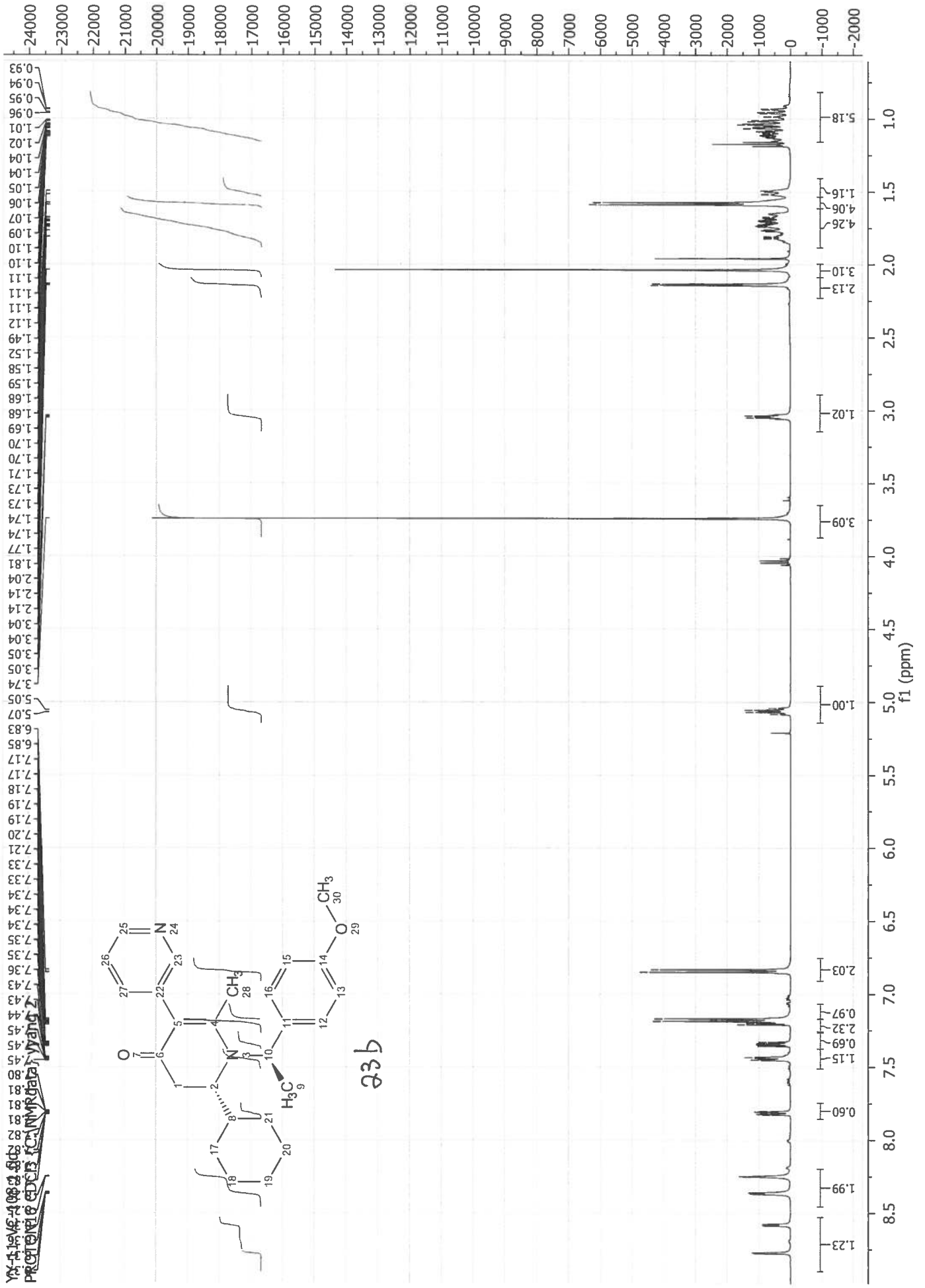
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5

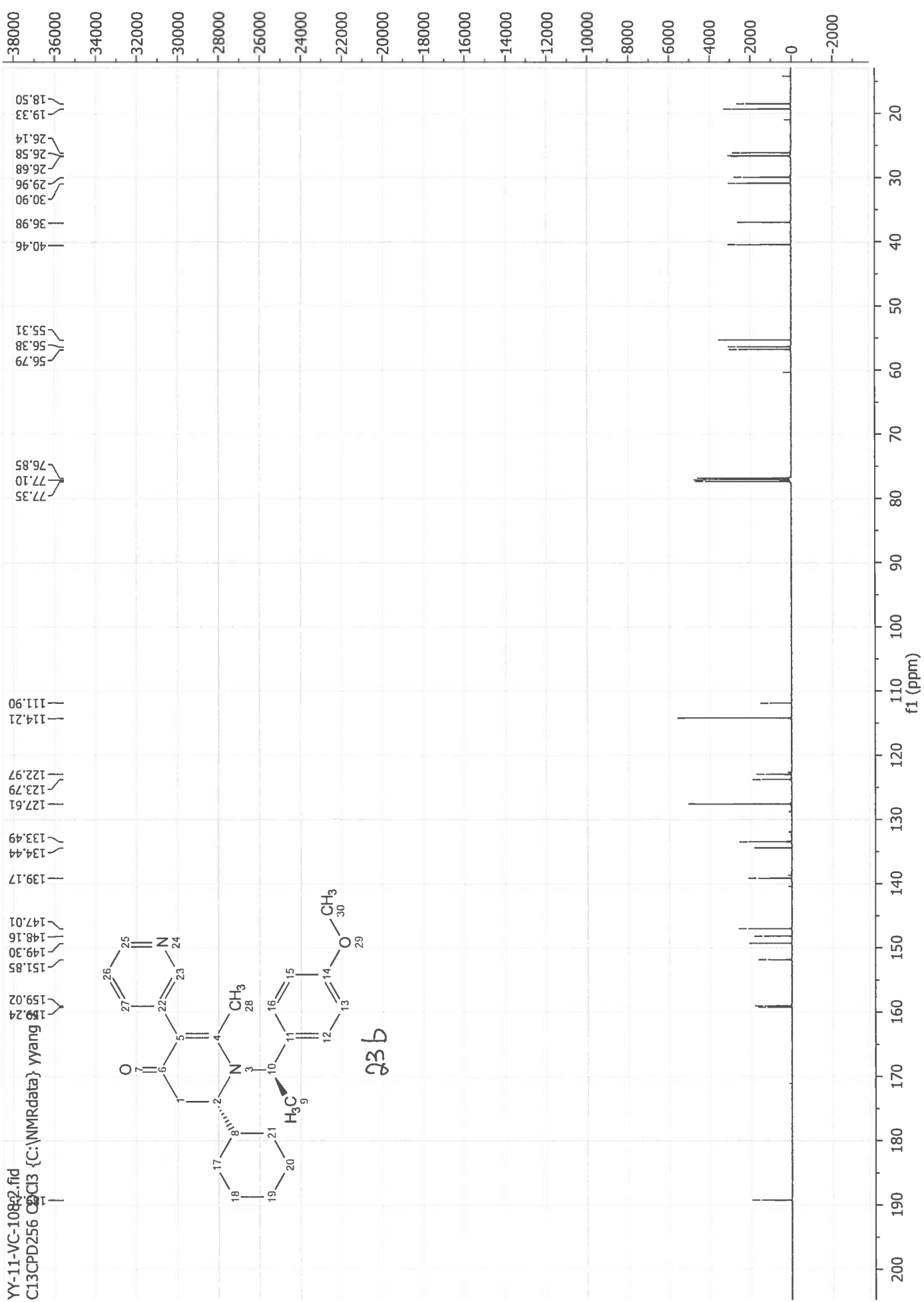
f1 (ppm)

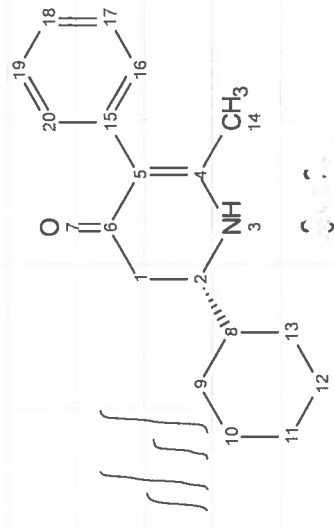




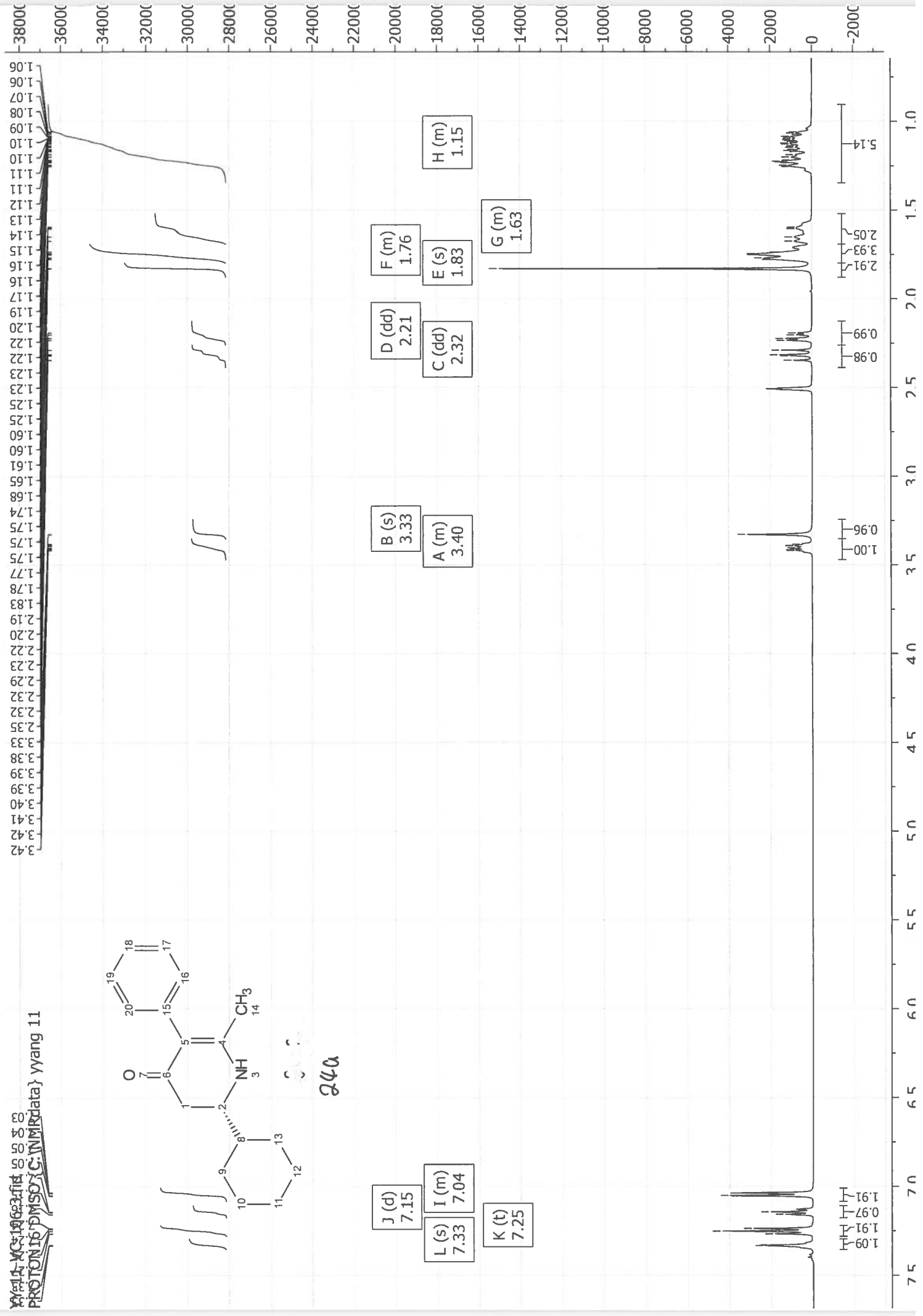




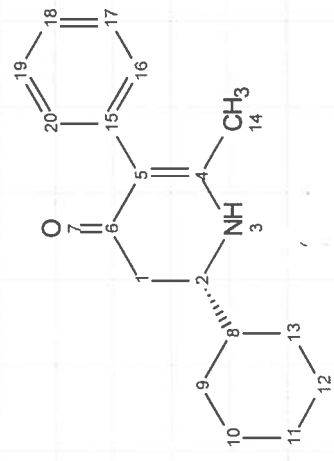




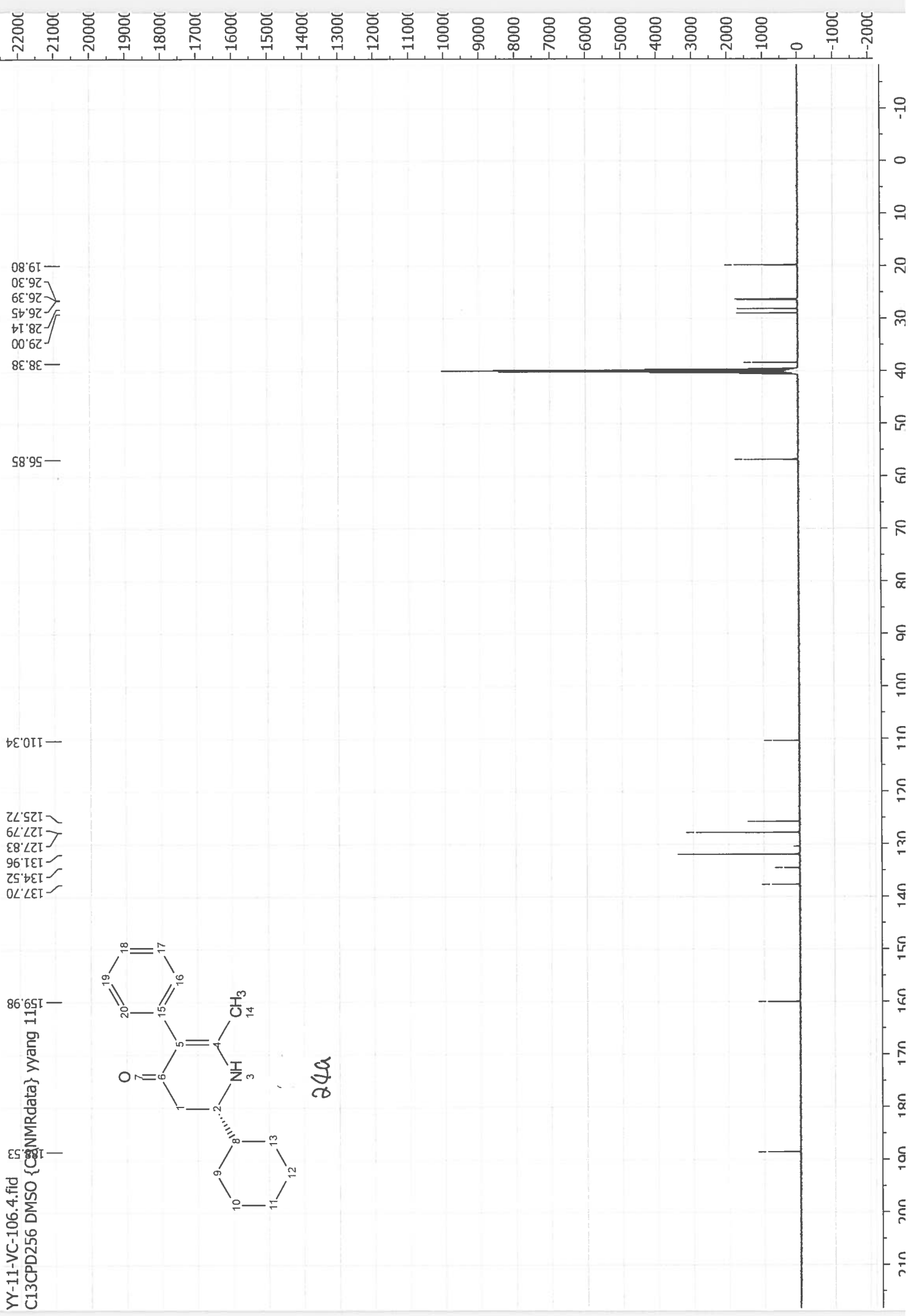
24a



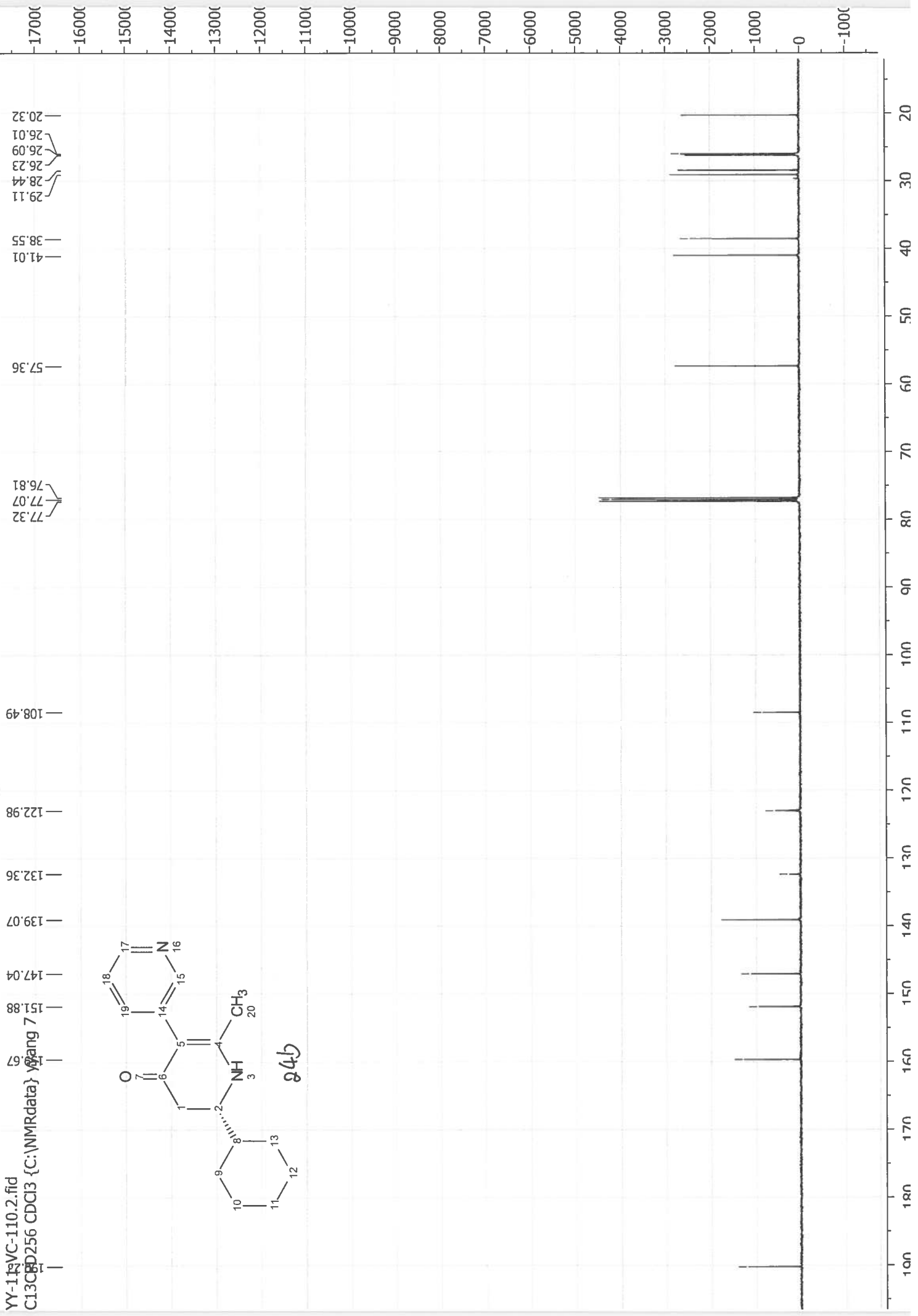
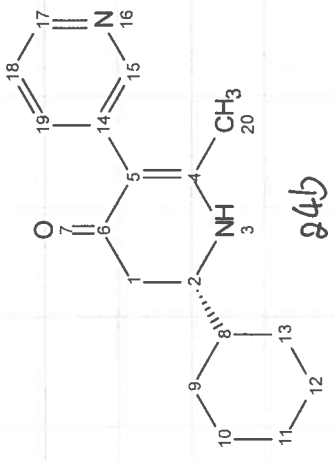
YY-11-VC-106.4.fid
C13CPD256 DMSO {C13NMRdata} yyang 1115



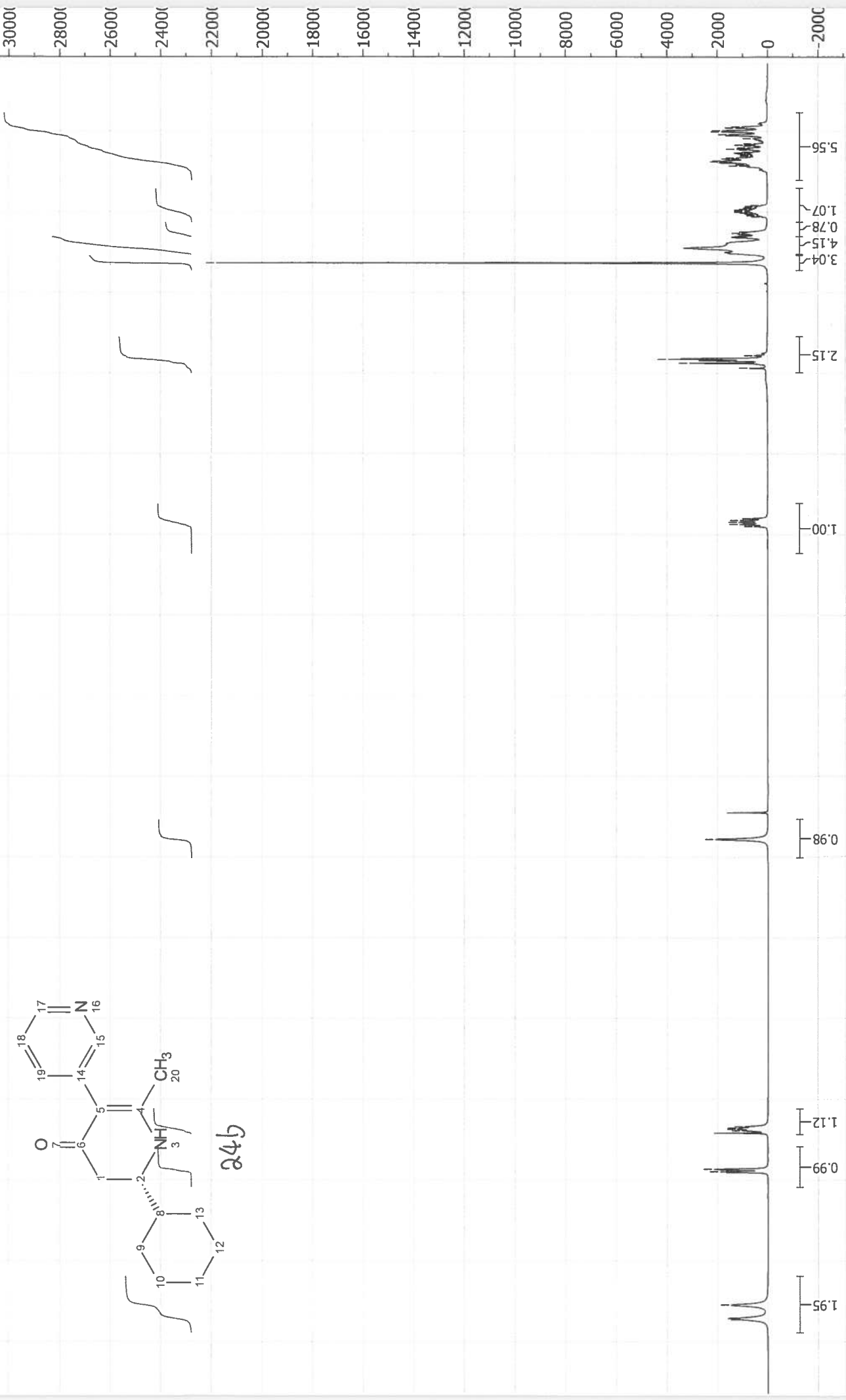
24a



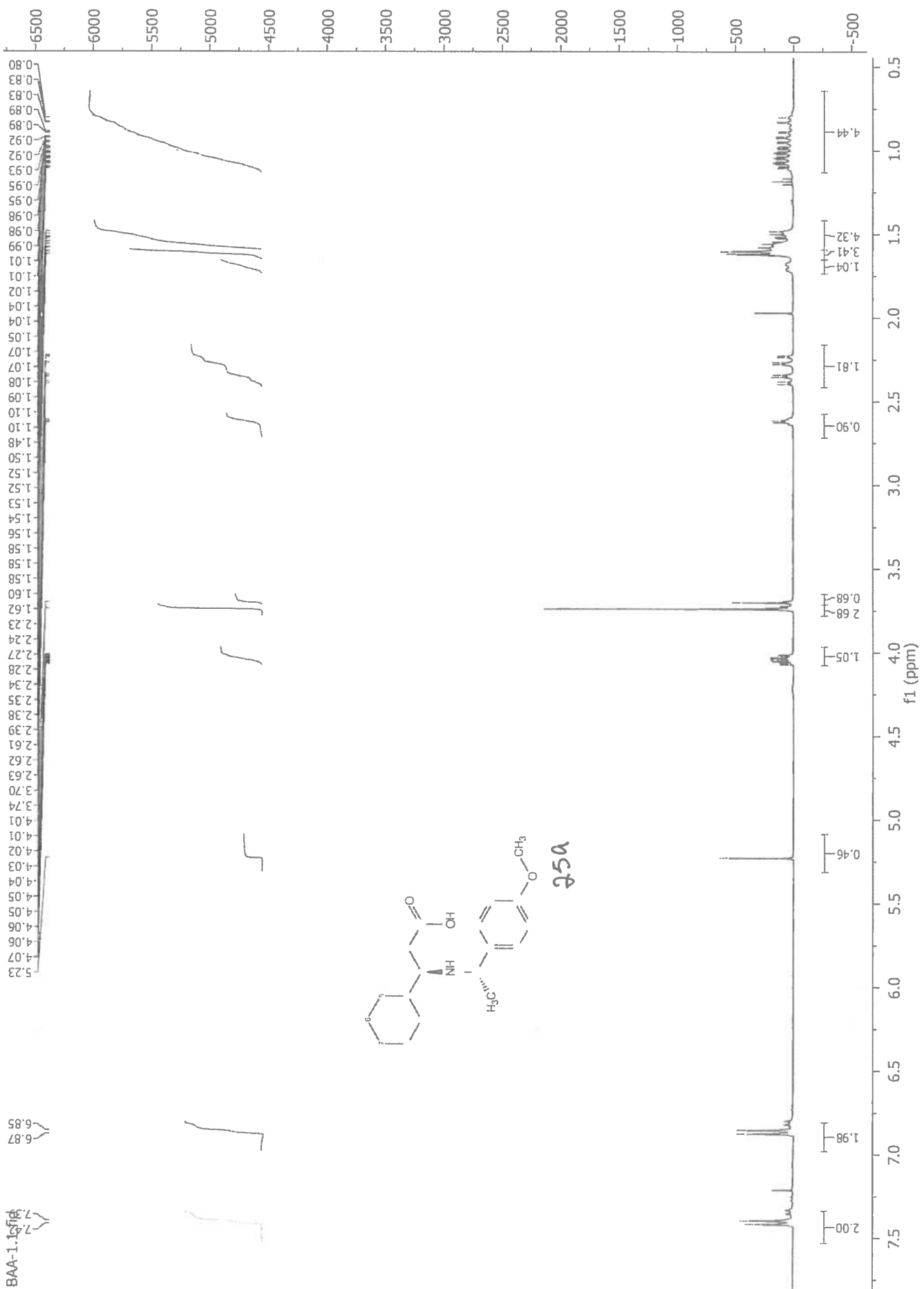
YY-114VC-110.2.fid
C13CPD256 CDCl3 {c:\NMRdata} 7/2/2017

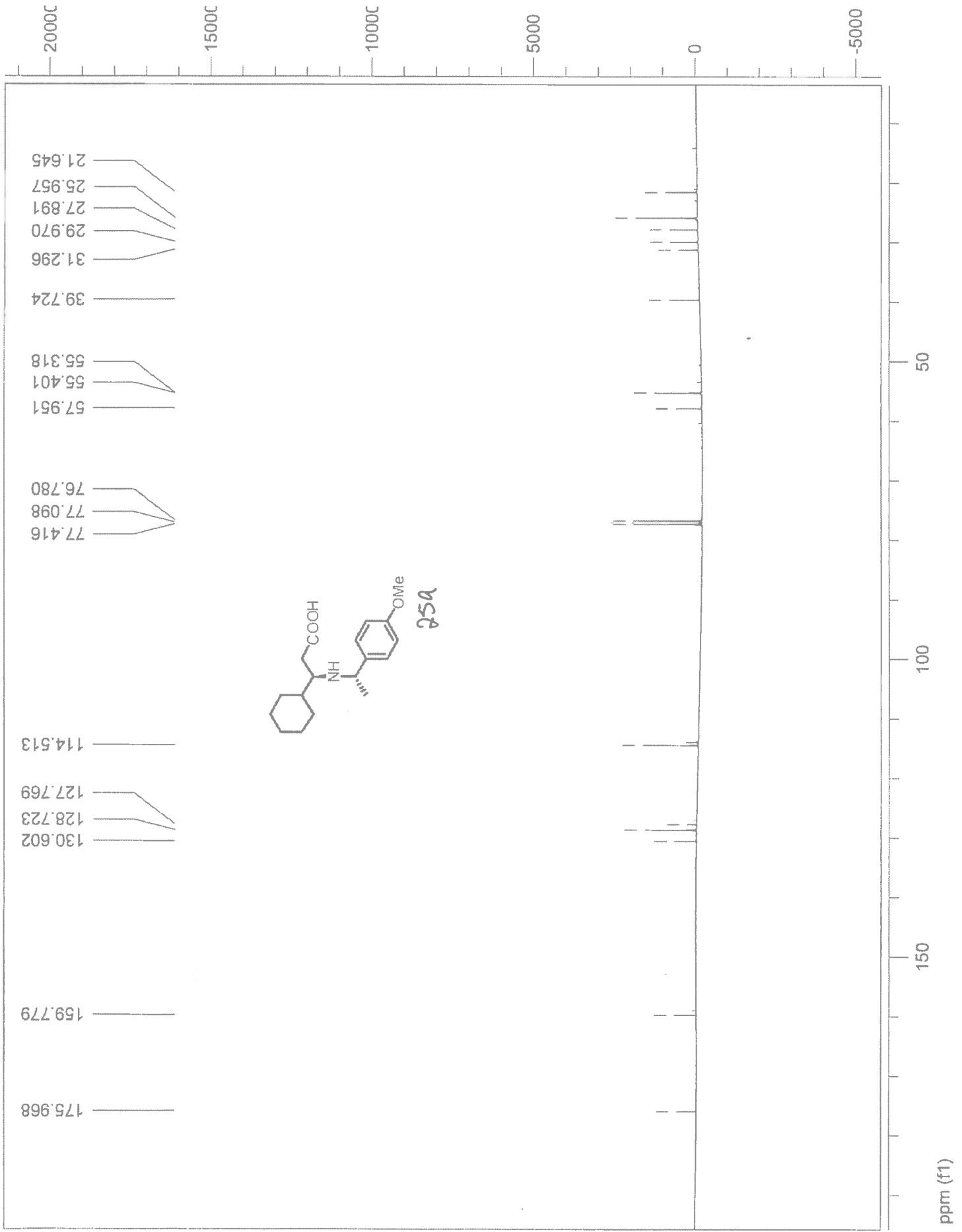


YAG-114AC-14 100% Me₂SO-d₆ 400 MHz, 300 K, INMRADETA Vyvanti 7
PR010116 CDE13 1C, INMRADETA Vyvanti 7

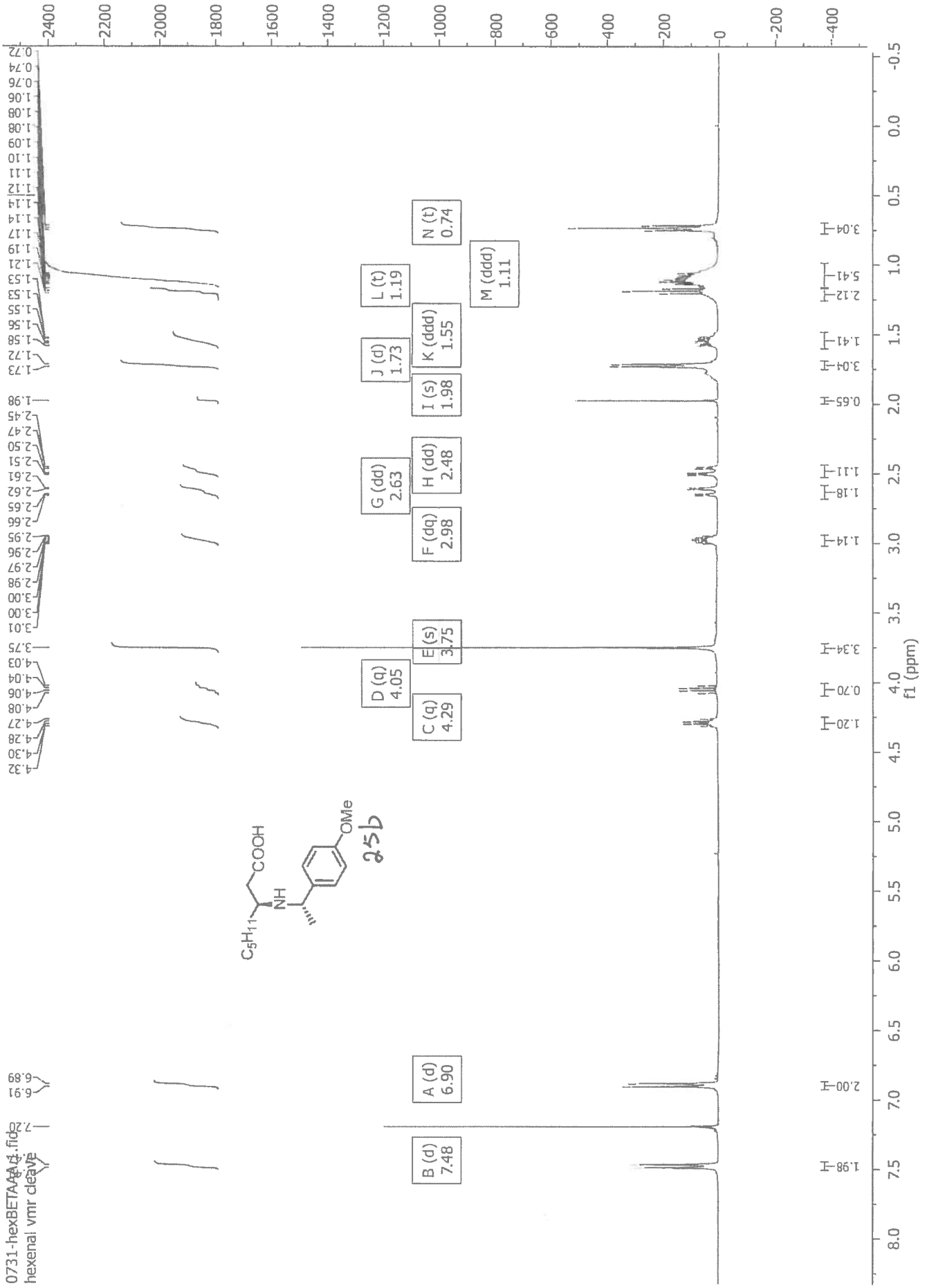
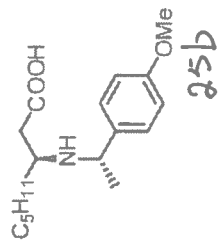


24b

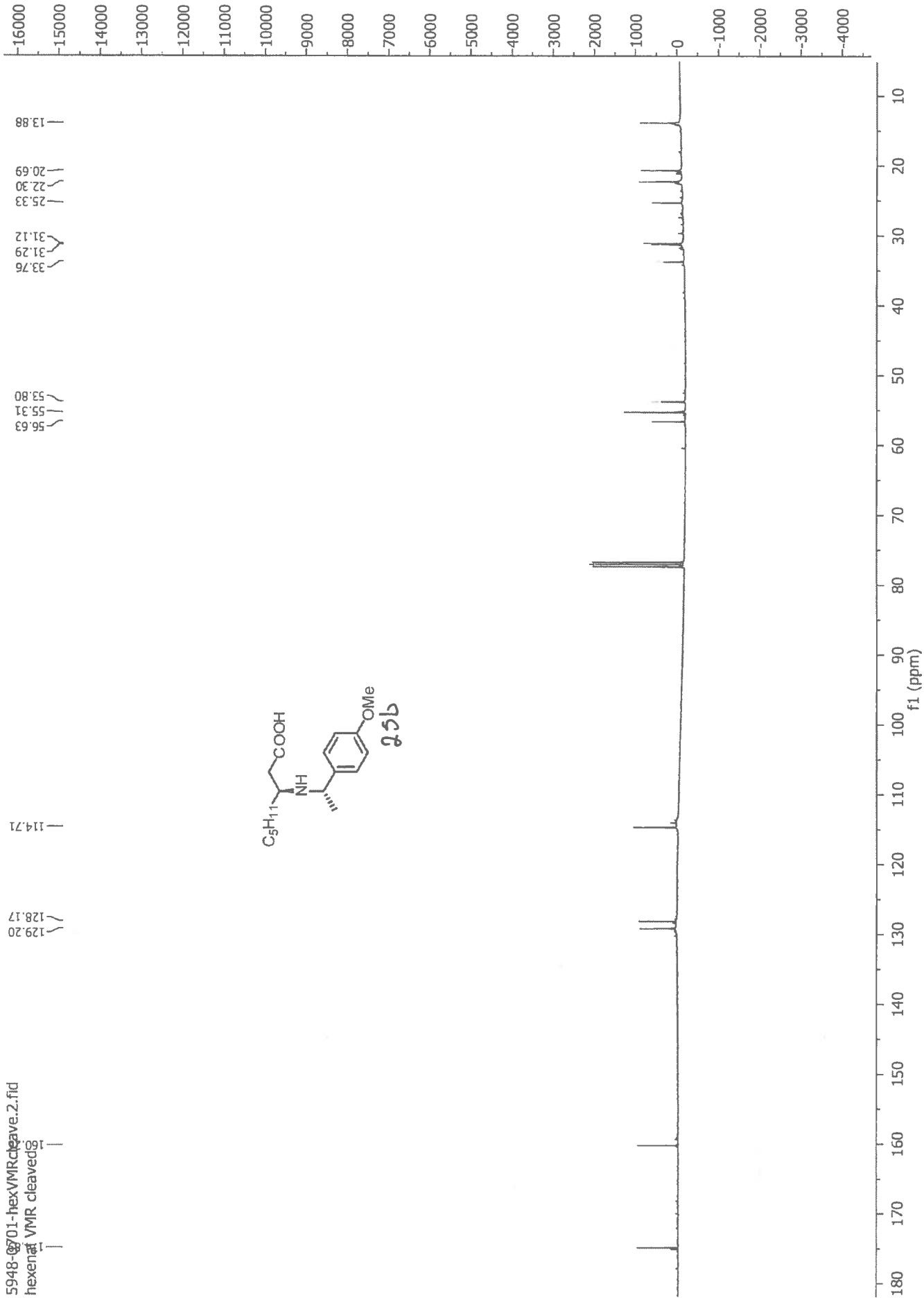


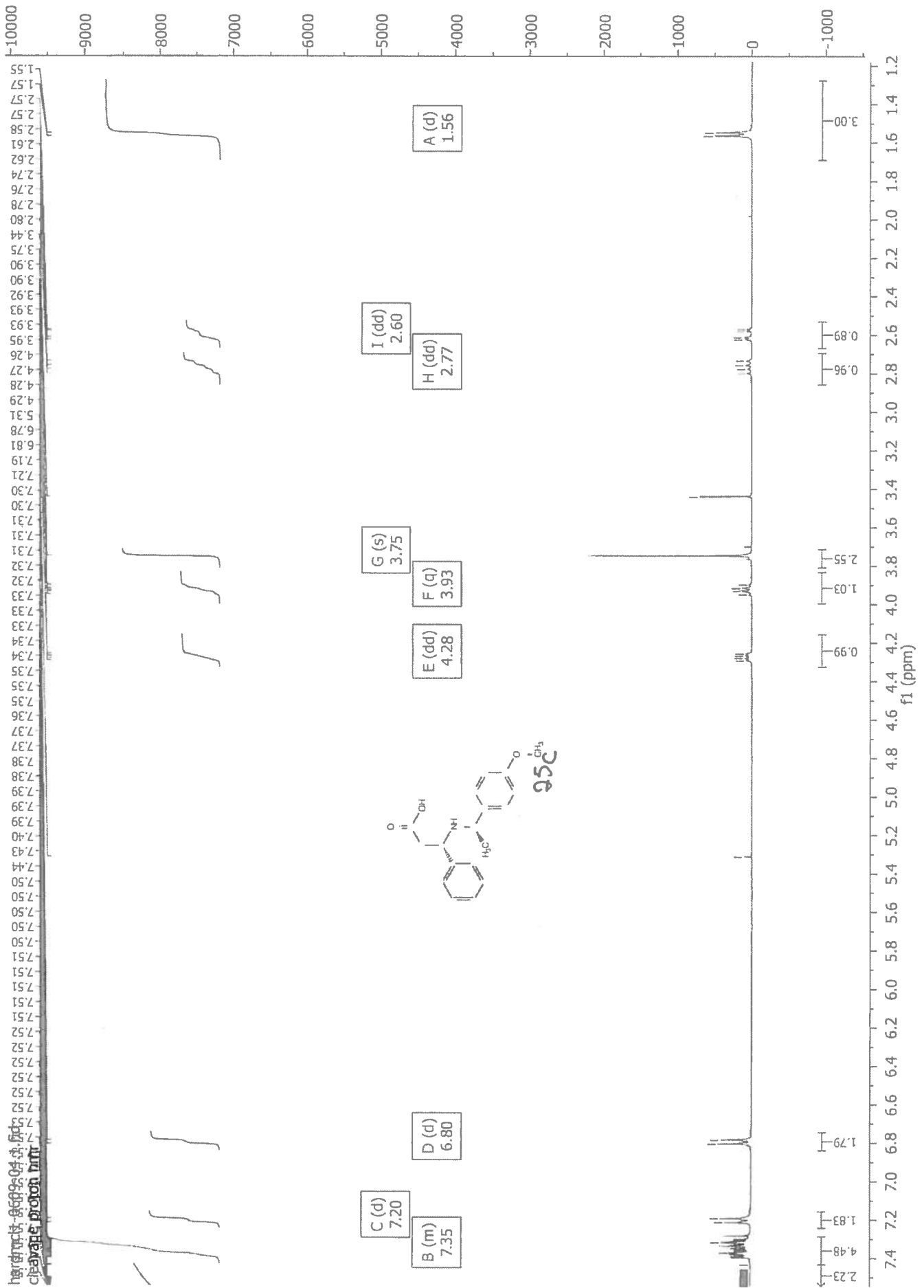


0731-hexBETA 4.fid
hexenal vmr cleave

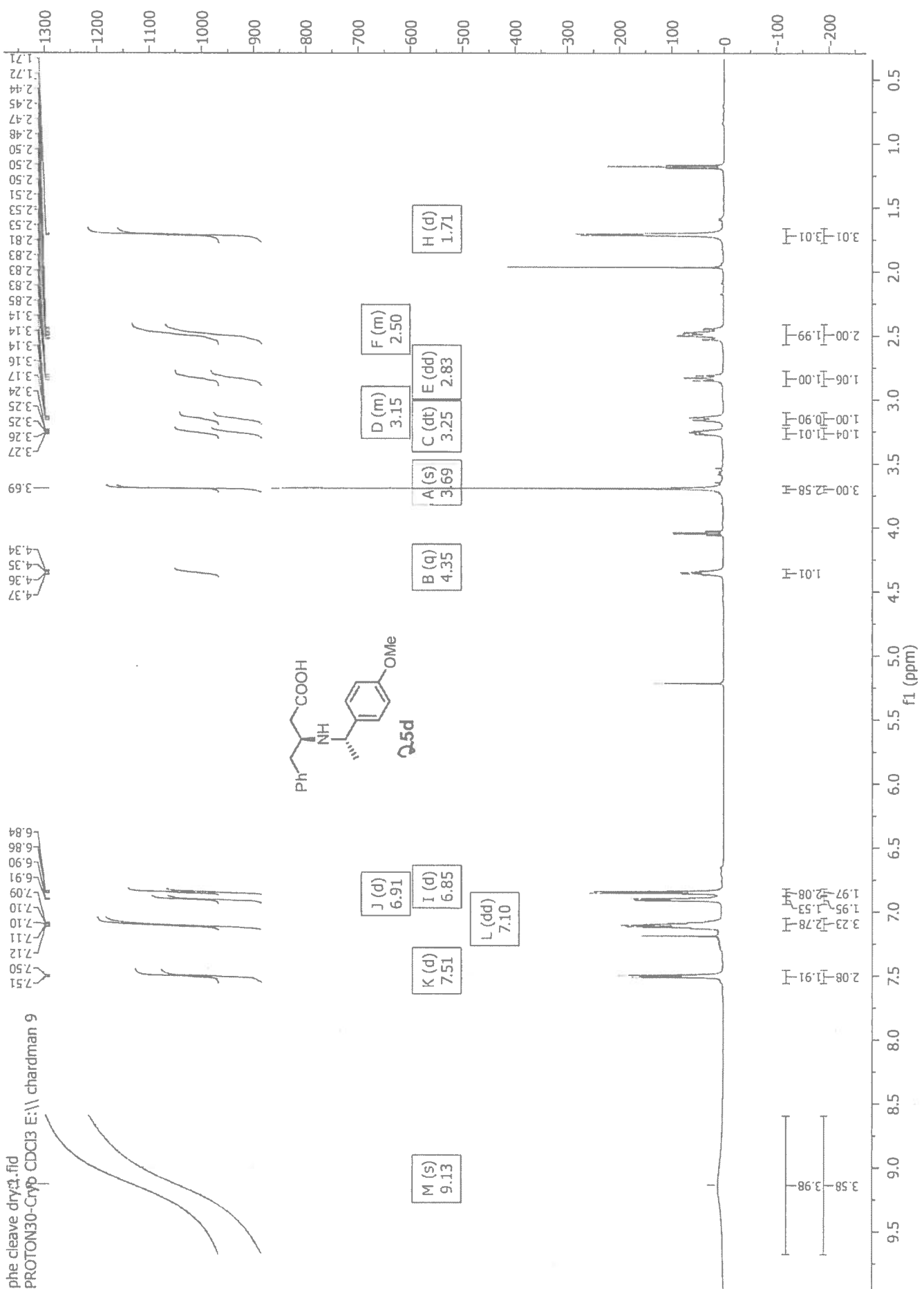


5948-0701-hexVMRcleave.2.fid
hexenol VMR cleaved

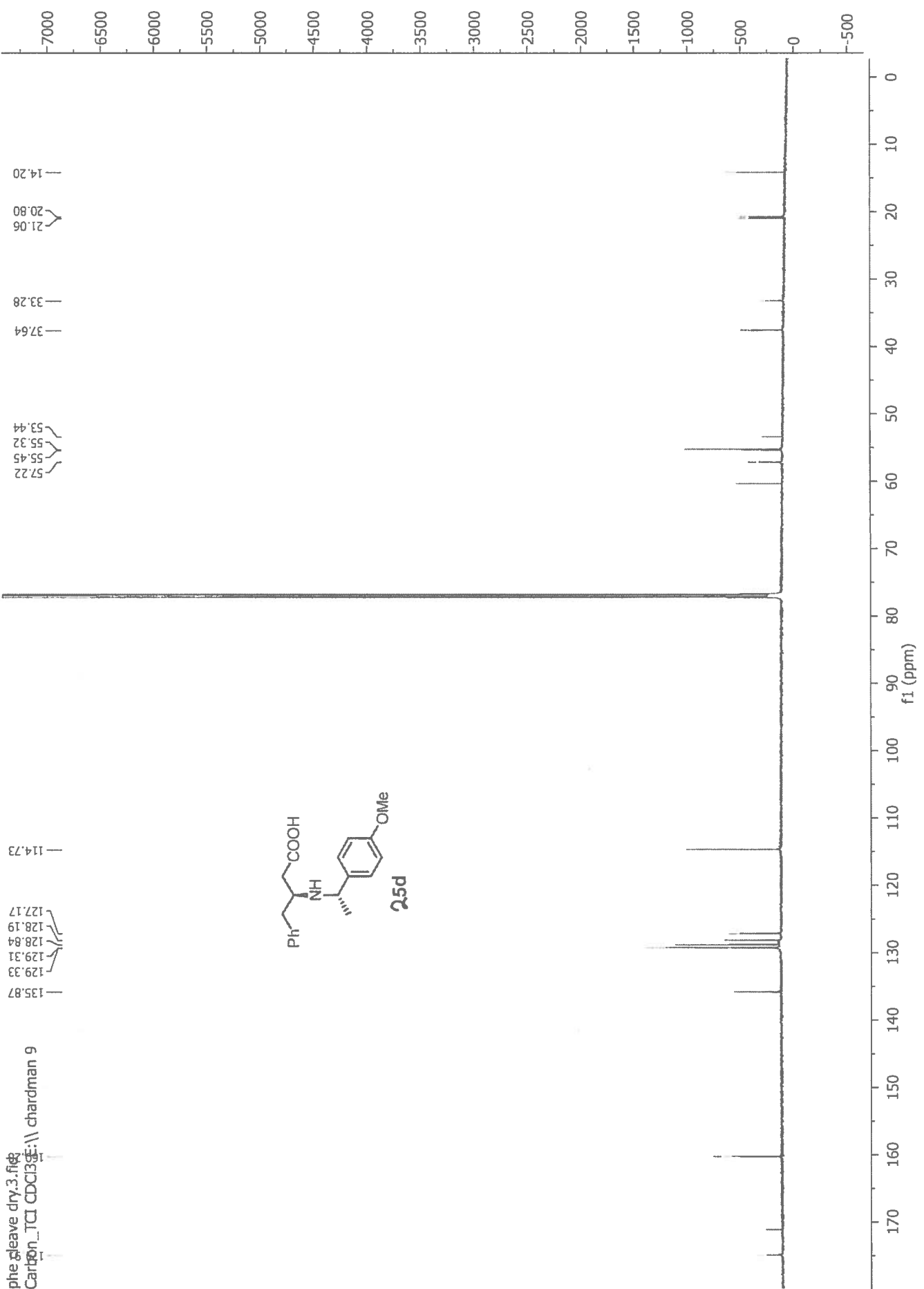




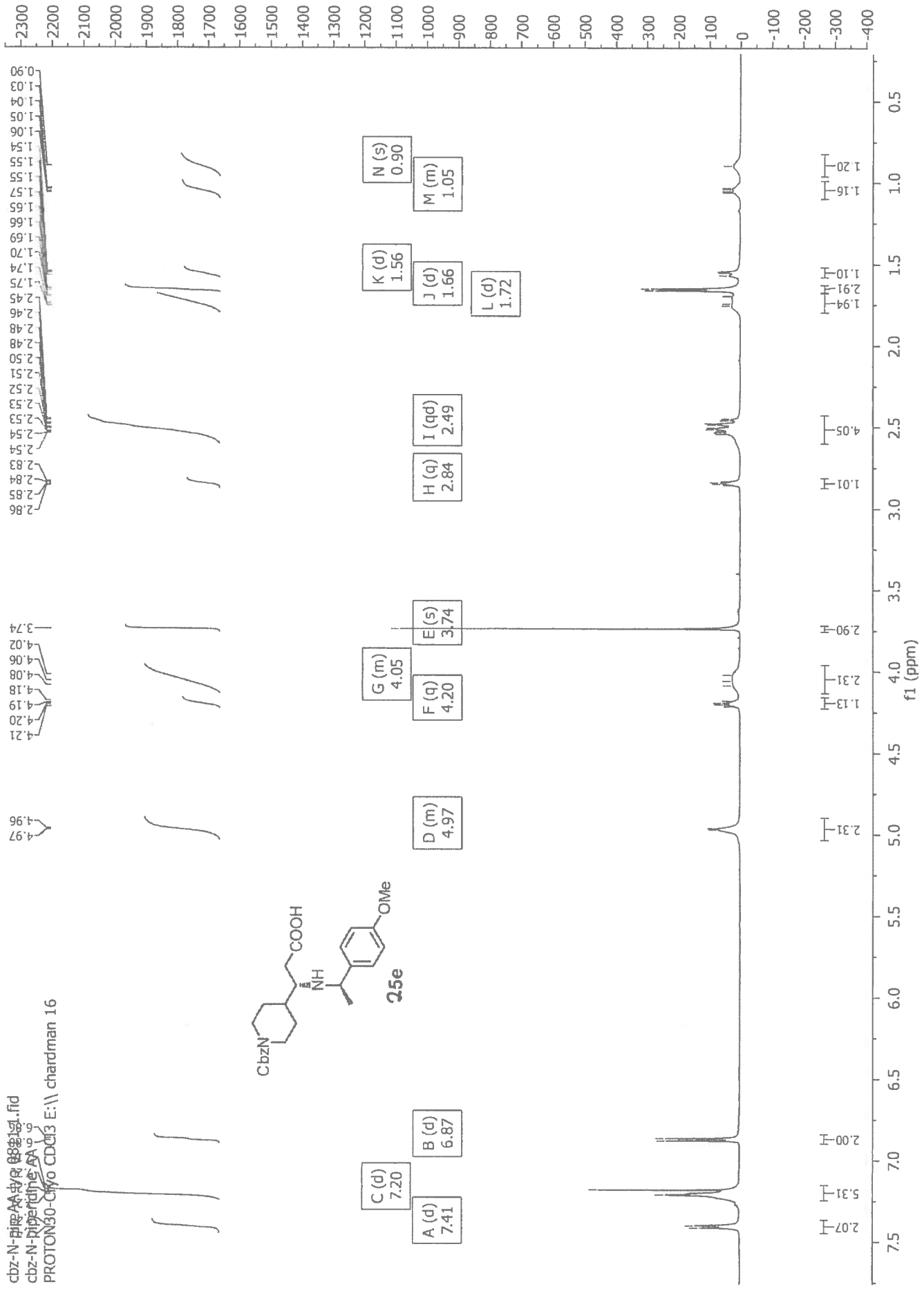
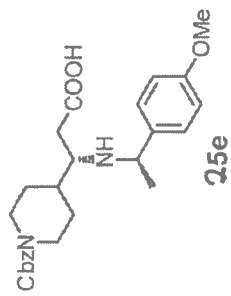
phe cleave dry2.fid
 PROTON30-Cryp CDCl3 E:\ chardman 9



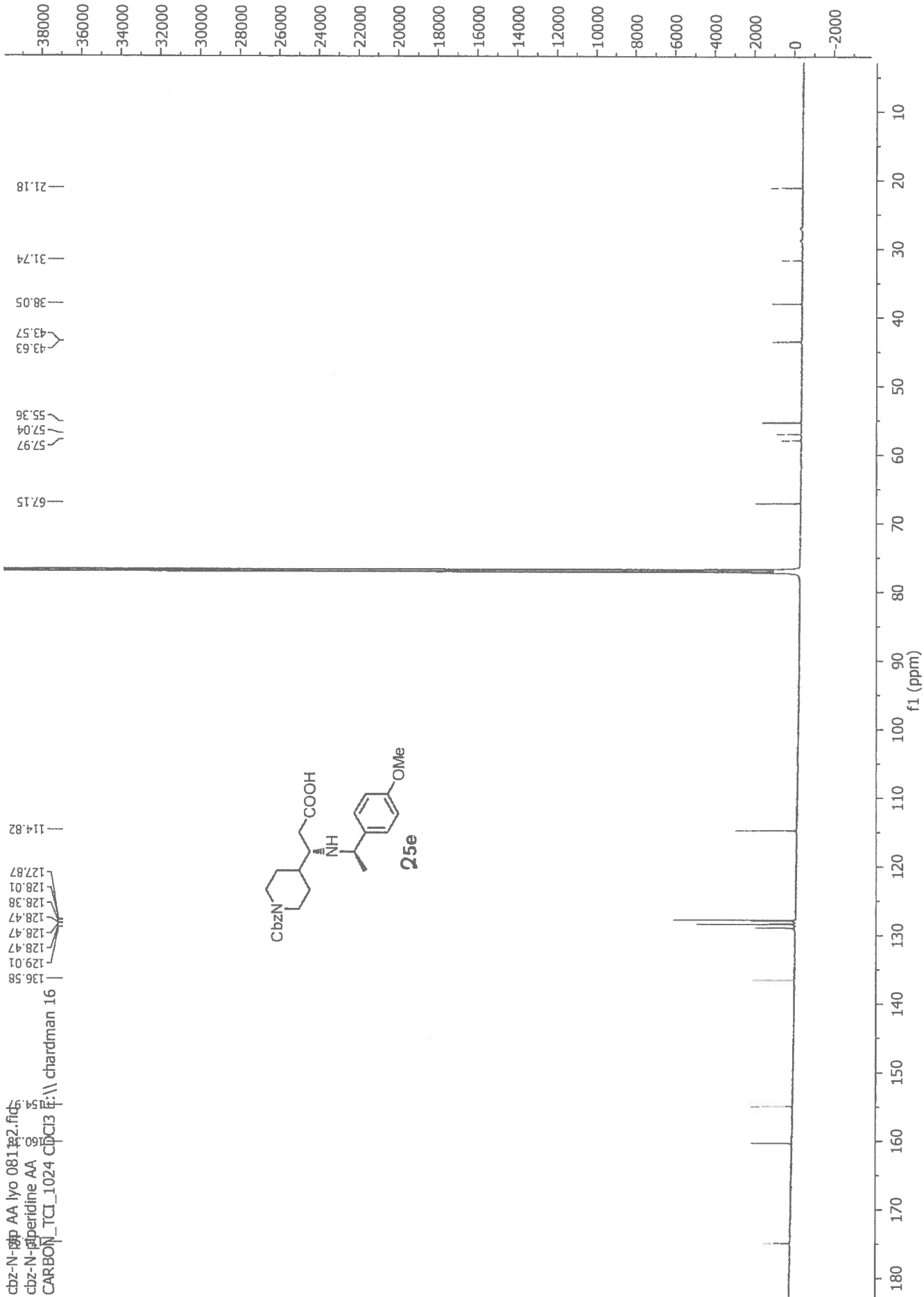
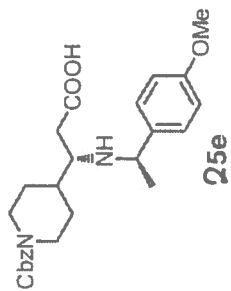
phe_gleave dry.3.fid
Carbon_TCI CDCl3.d1 chardman 9



cbz-N-riptide AA chx (8888).fid
 cbz-N-riptide AA g
 PROTON30-Cryo CDC13 E:\\ chardman 16

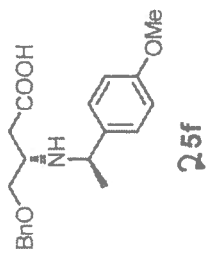


cbz-N-~~pp~~ AA lyo 081 12. f16
cbz-N-~~pp~~iperidine AA
CARBON_TCI_1024 CDCl3 F:\ chardman 16



ethanol-d4
 ester amino acid
 PROTONS
 CDCl3 E: chardman 6

4.37
4.35
4.32
4.30
3.98
3.97
3.96
3.94
3.72
3.42
3.41
3.40
3.39
3.39
3.38
3.37
3.36
3.12
3.11
3.11
3.10
3.10
3.09
2.45
2.43
2.42
2.33
2.32
2.29
1.46
1.44



B (m) 7.20
A (d) 6.81

C (m) 4.35

D (q) 3.96

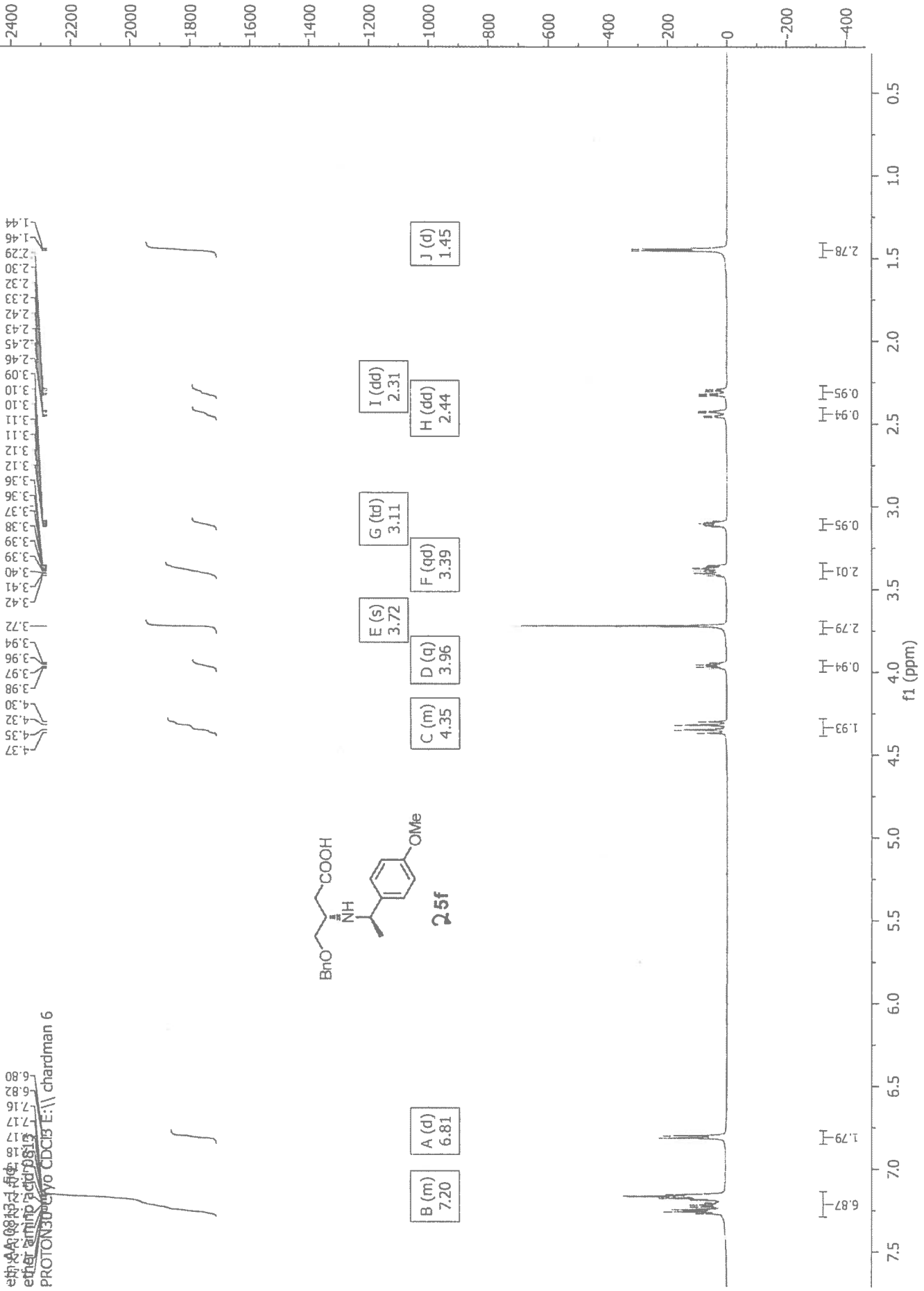
F (qd) 3.39

H (dd) 2.44

J (d) 1.45

G (td) 3.11

I (dd) 2.31

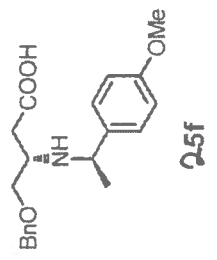
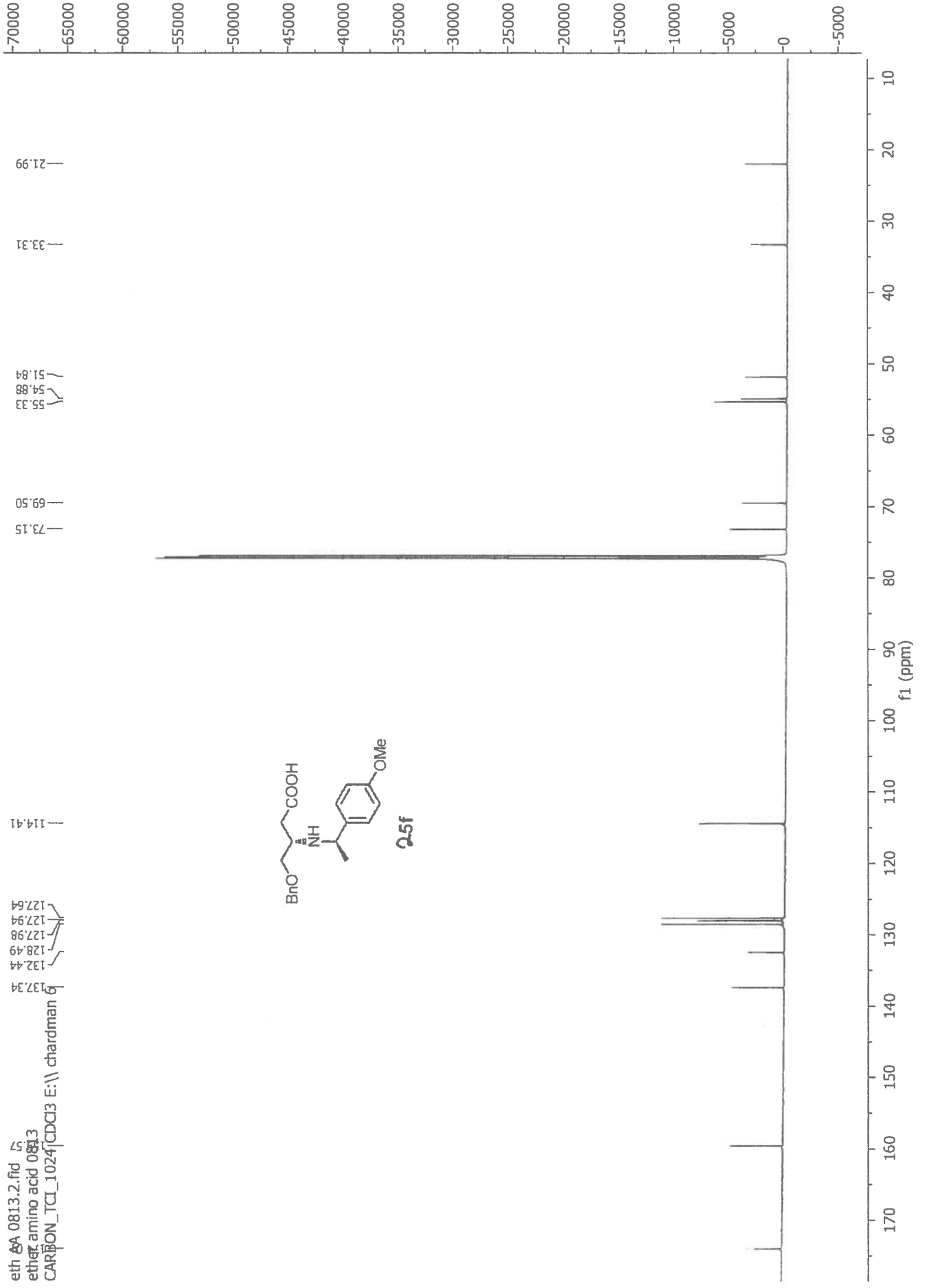


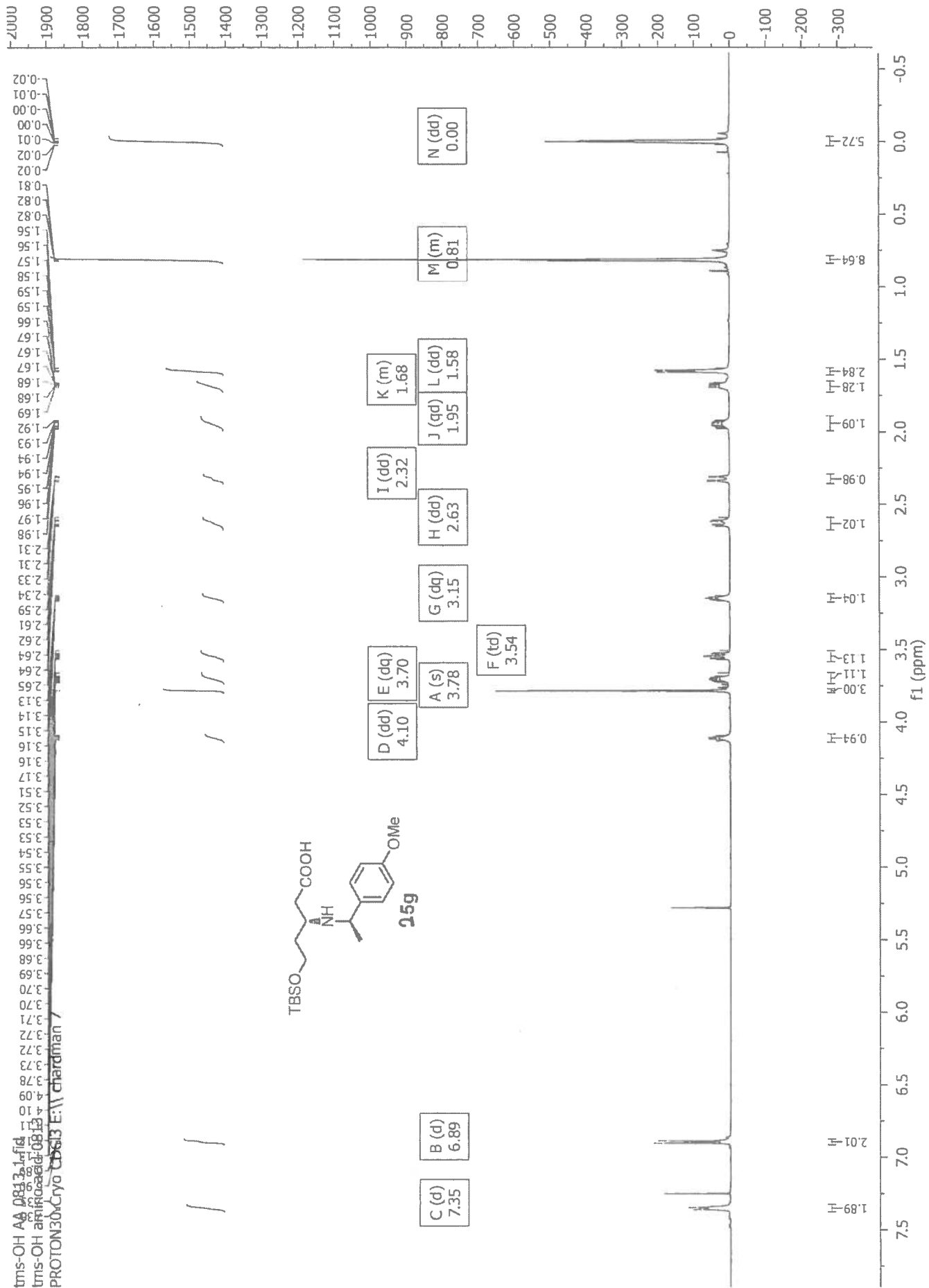
6.87
1.79

1.93
0.94
2.79
2.01
0.95

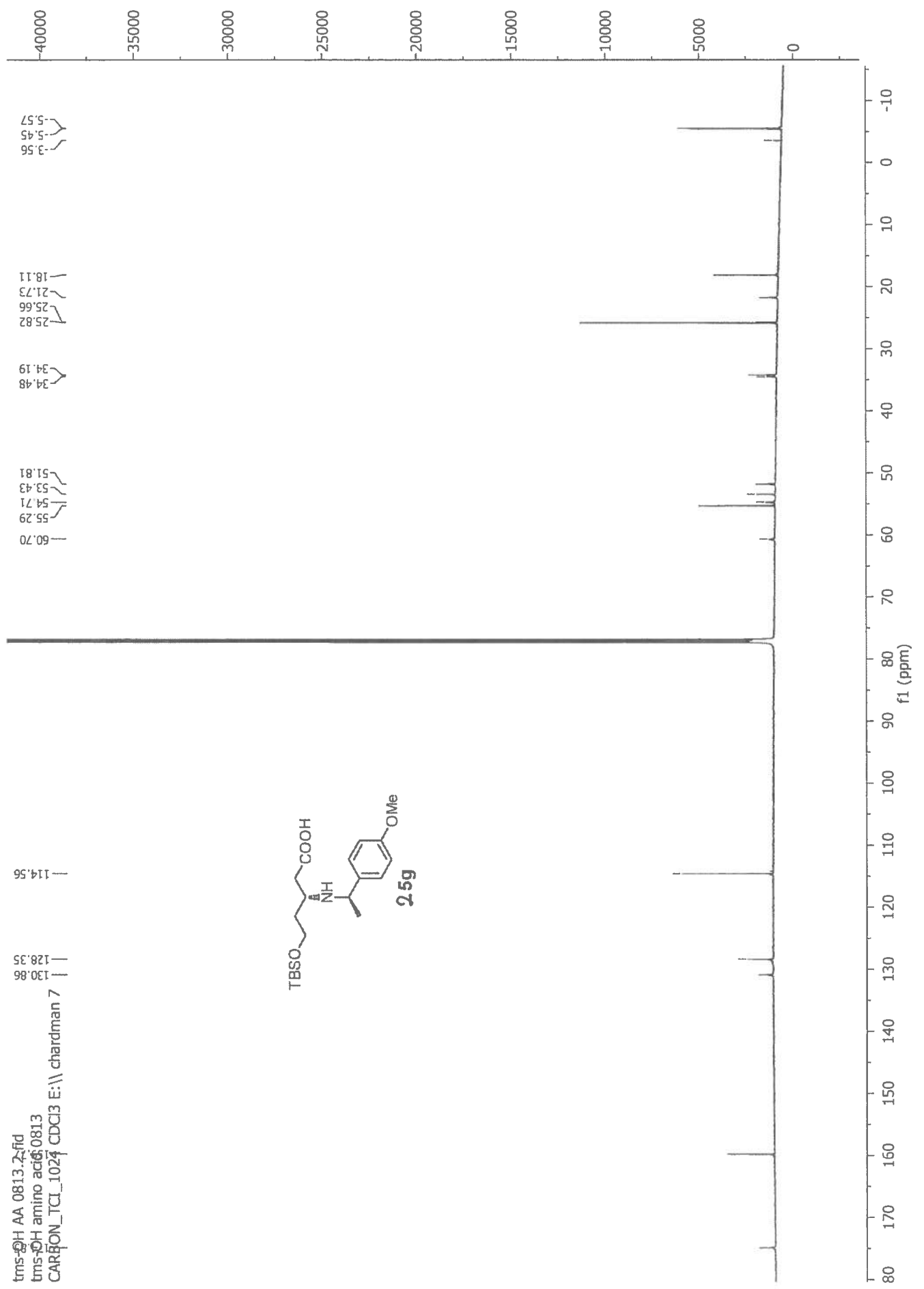
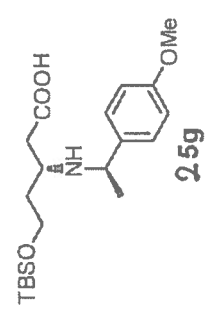
2.78

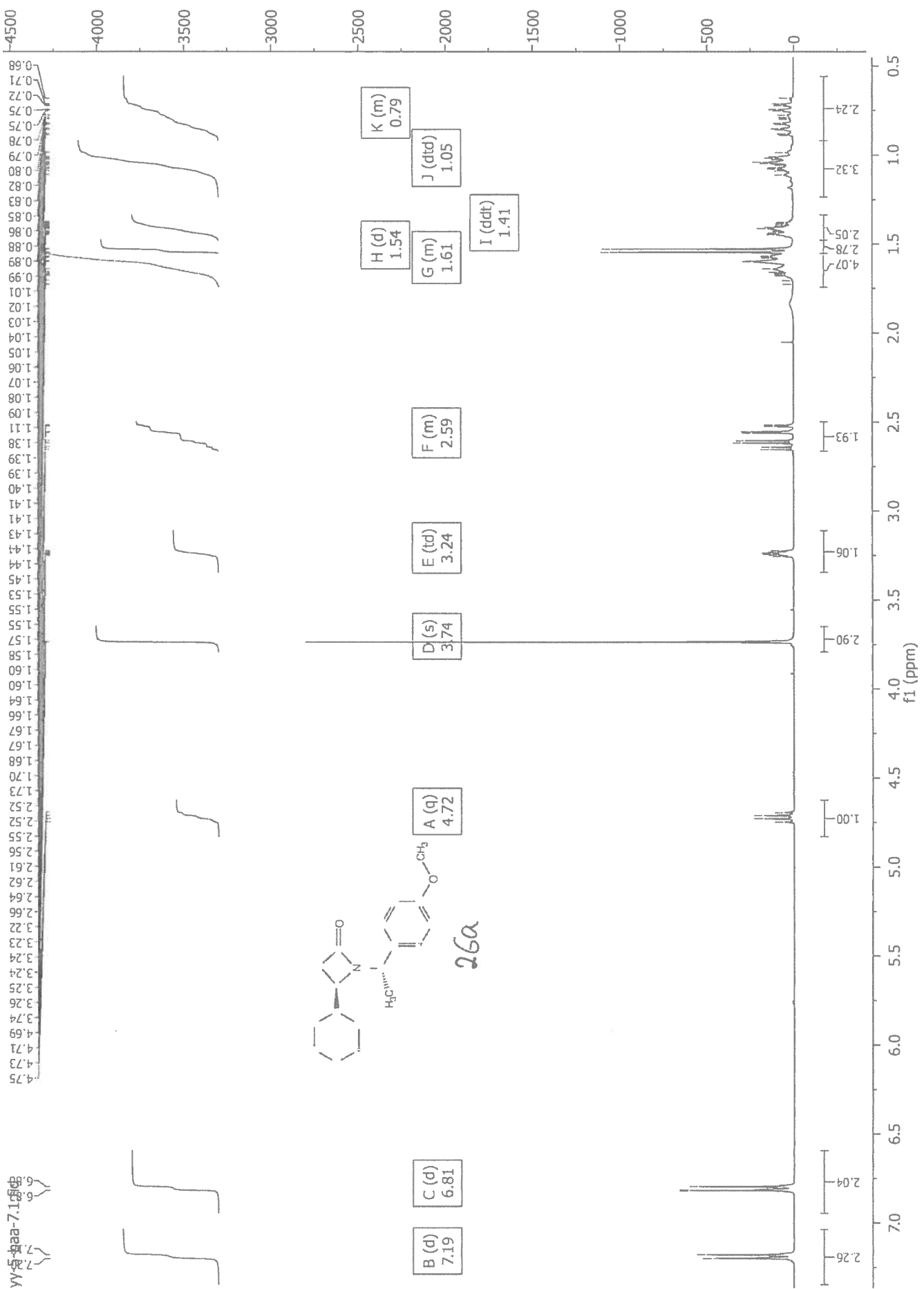
eth SA 0813.2.fid
ether amino acid 0813
CARBON_TCI_1024 CDCl3 E:\ chardman 6





tms-¹³C AA 0813.2.fid
tms-¹³C amino aci 0813
CARBON_TCL_1024 CDCl3 E:\\ chardman 7





yy-5-baa-7.2.tif

167.8
158.9

132.84

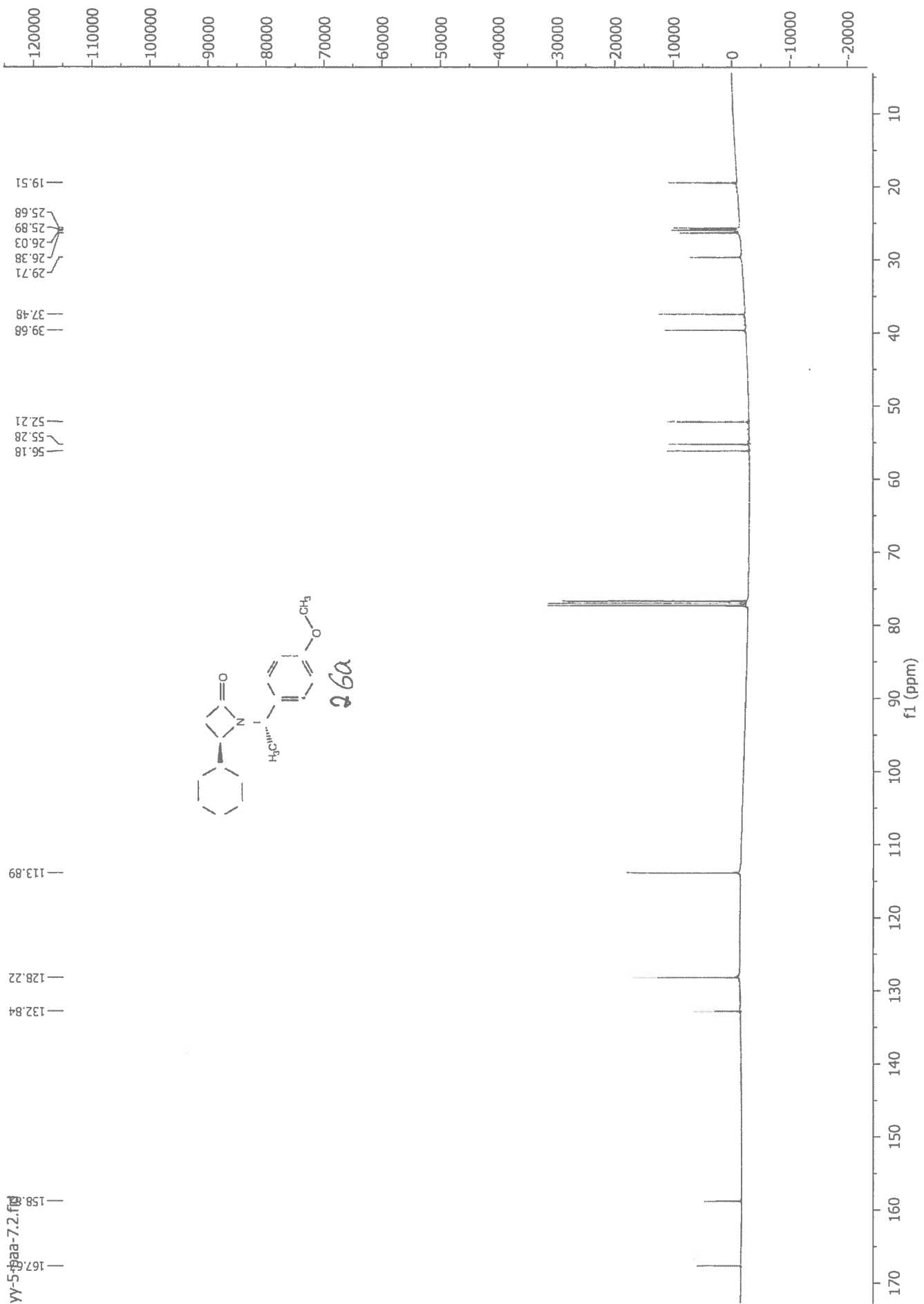
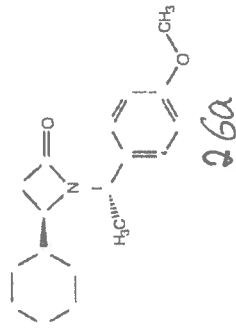
128.22

113.89

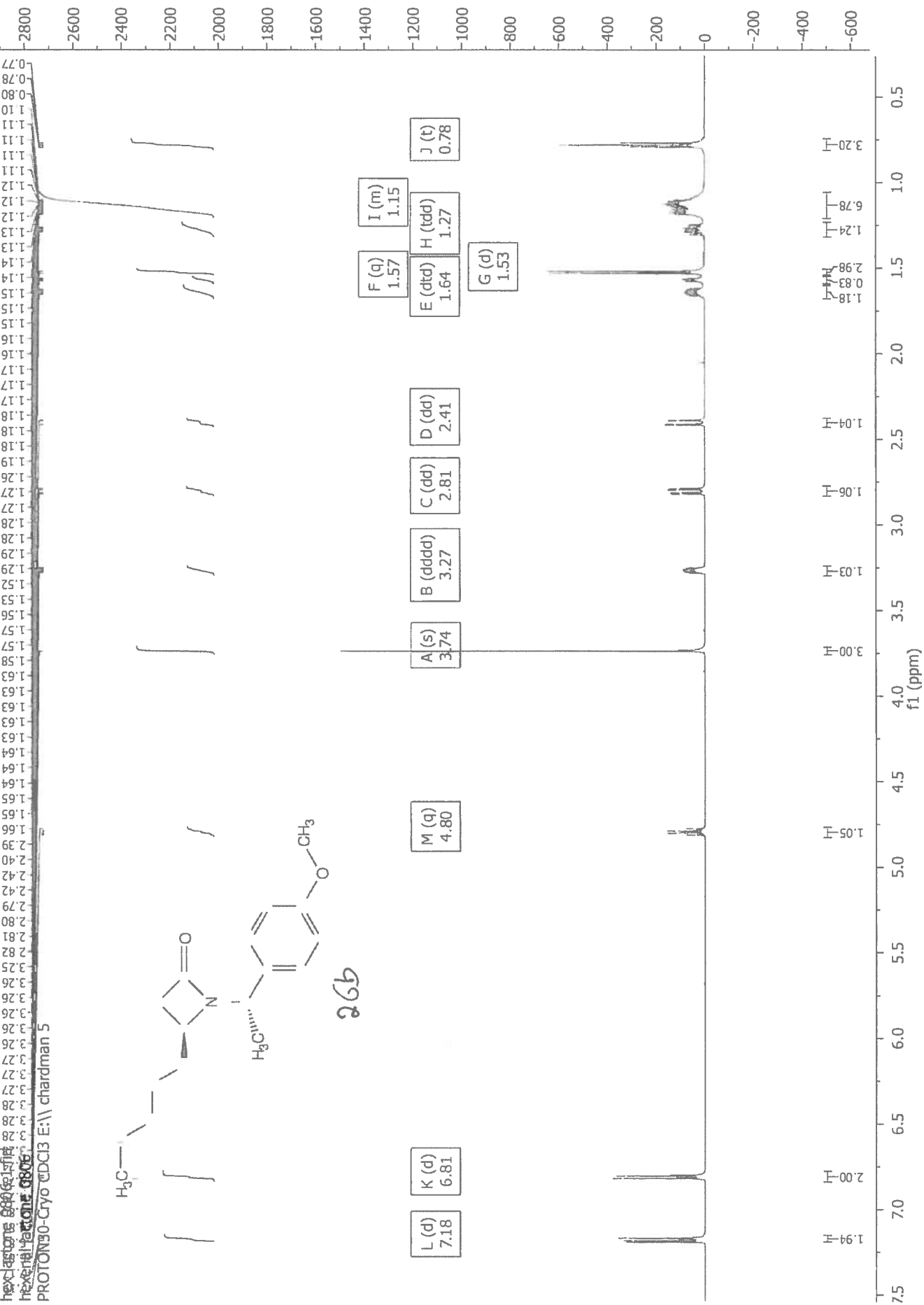
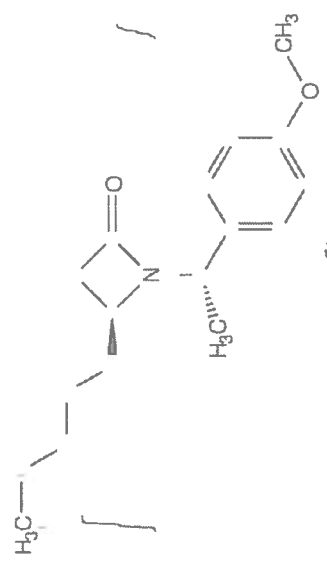
56.18
55.28
52.21

39.68
37.48

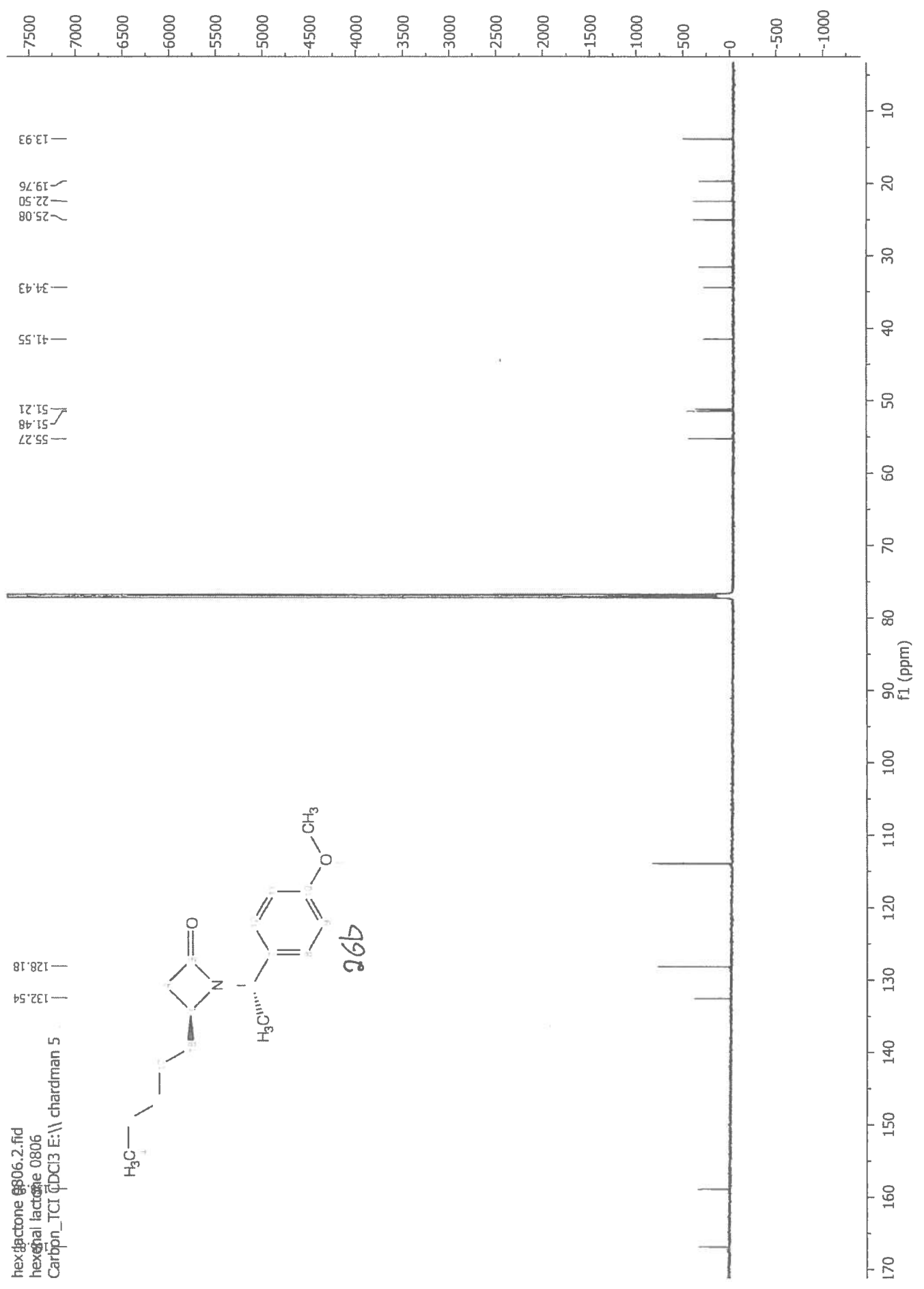
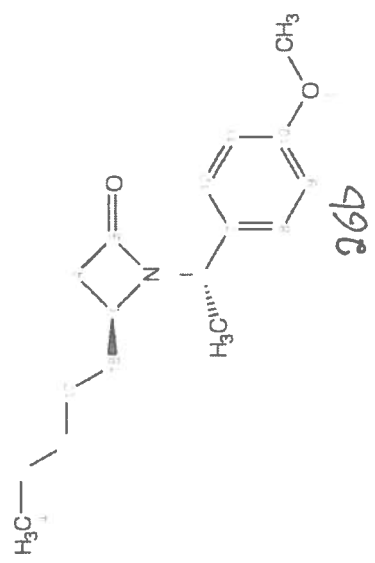
29.71
26.38
26.03
25.89
25.68
19.51

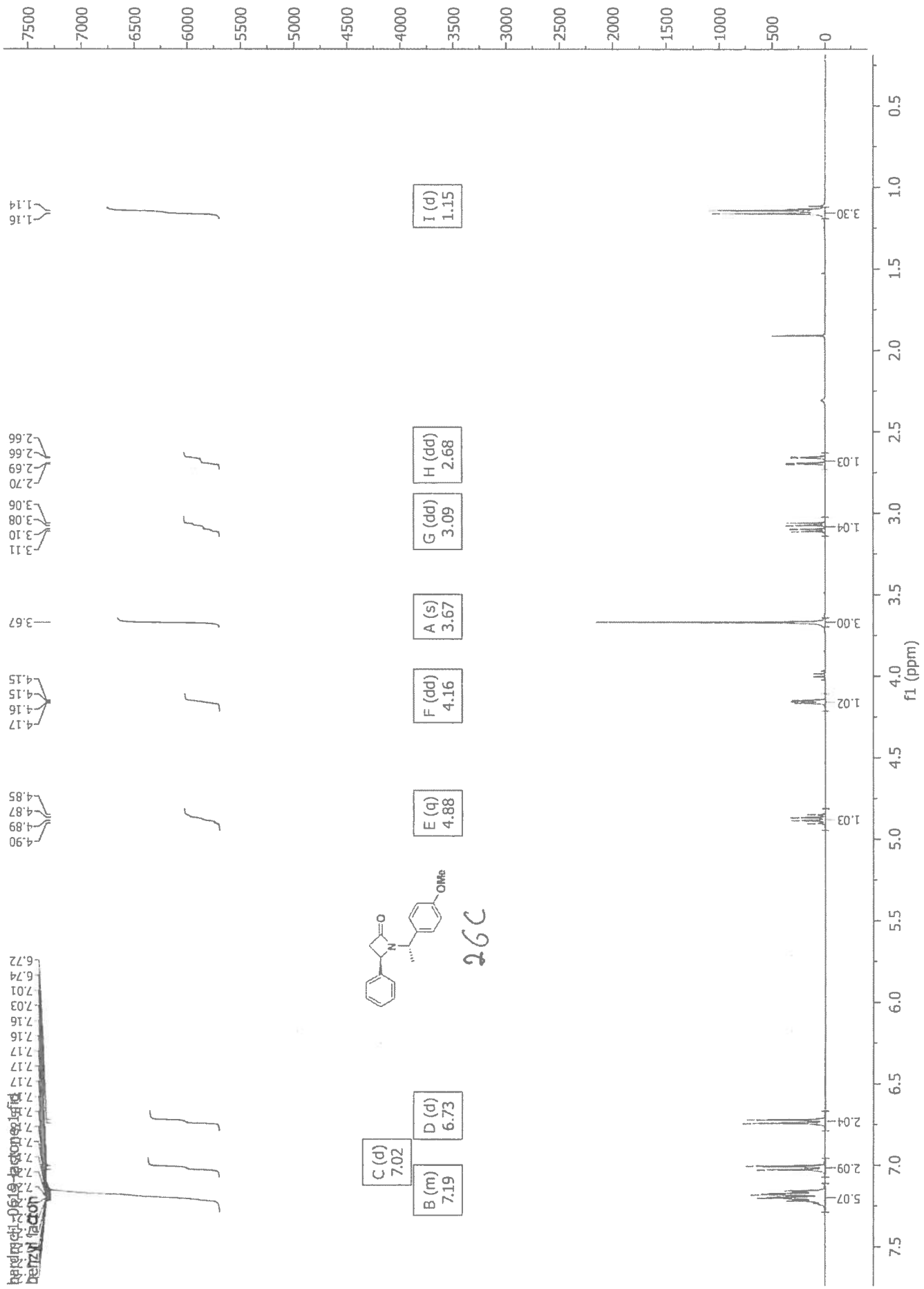


hexclastone 08061511et
 hexentelracone 08061511et
 PROTON30-Cryo CDCl3 E:\ chardman 5

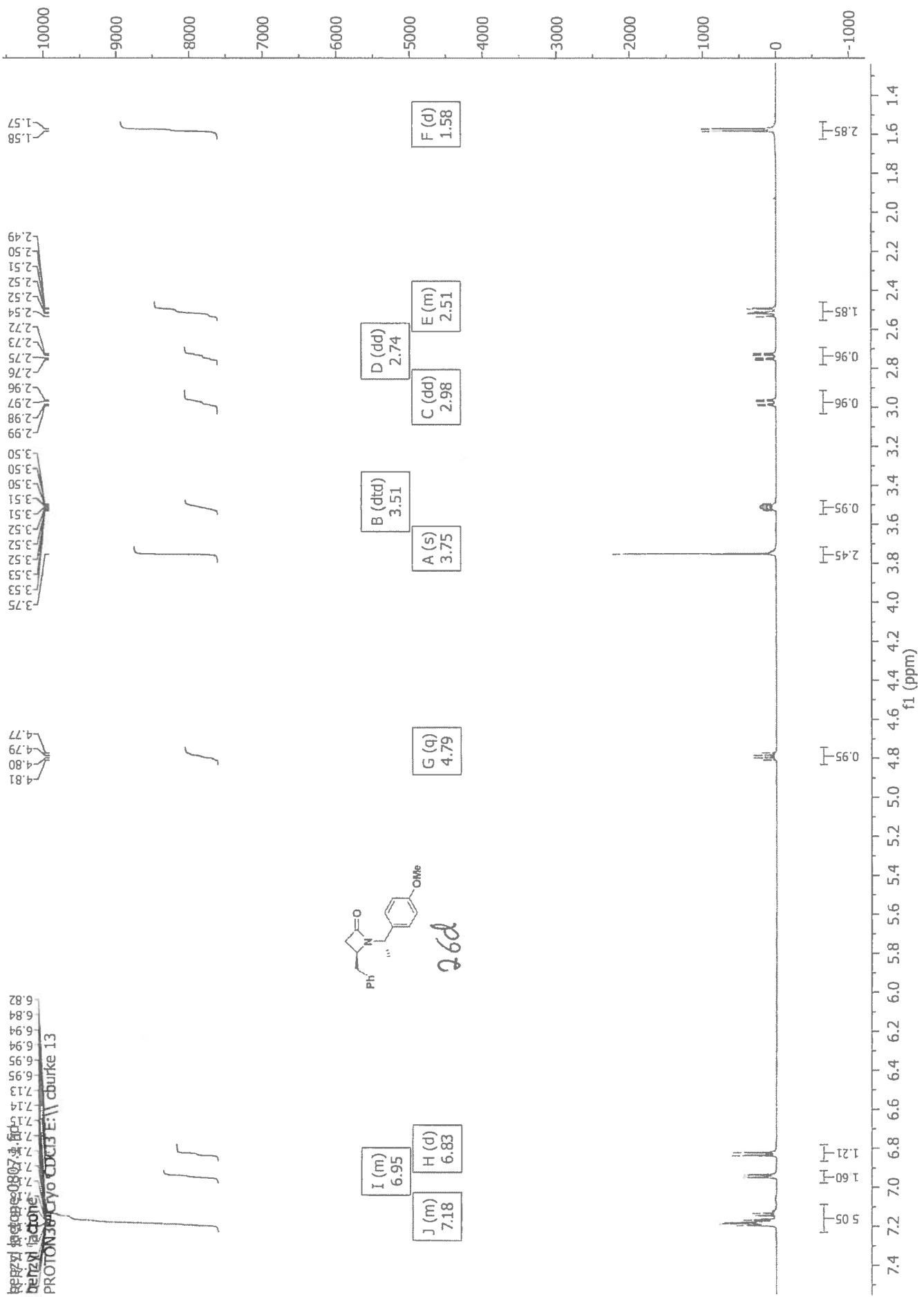


hex:lactone 0806.2.fid
hex:lactone 0806
Carbpn_TCI CDCl3 E:\\ chardman 5





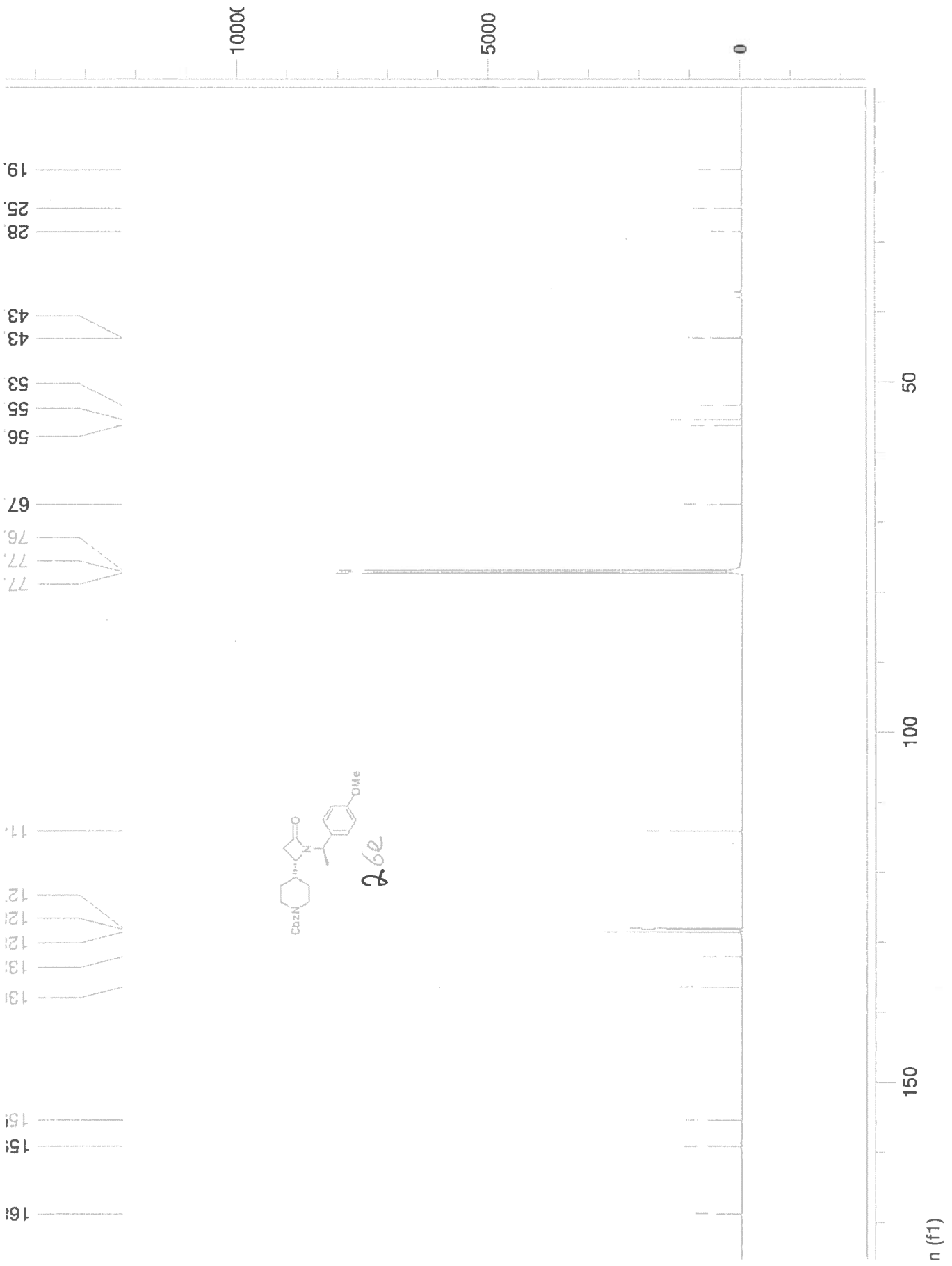
26C

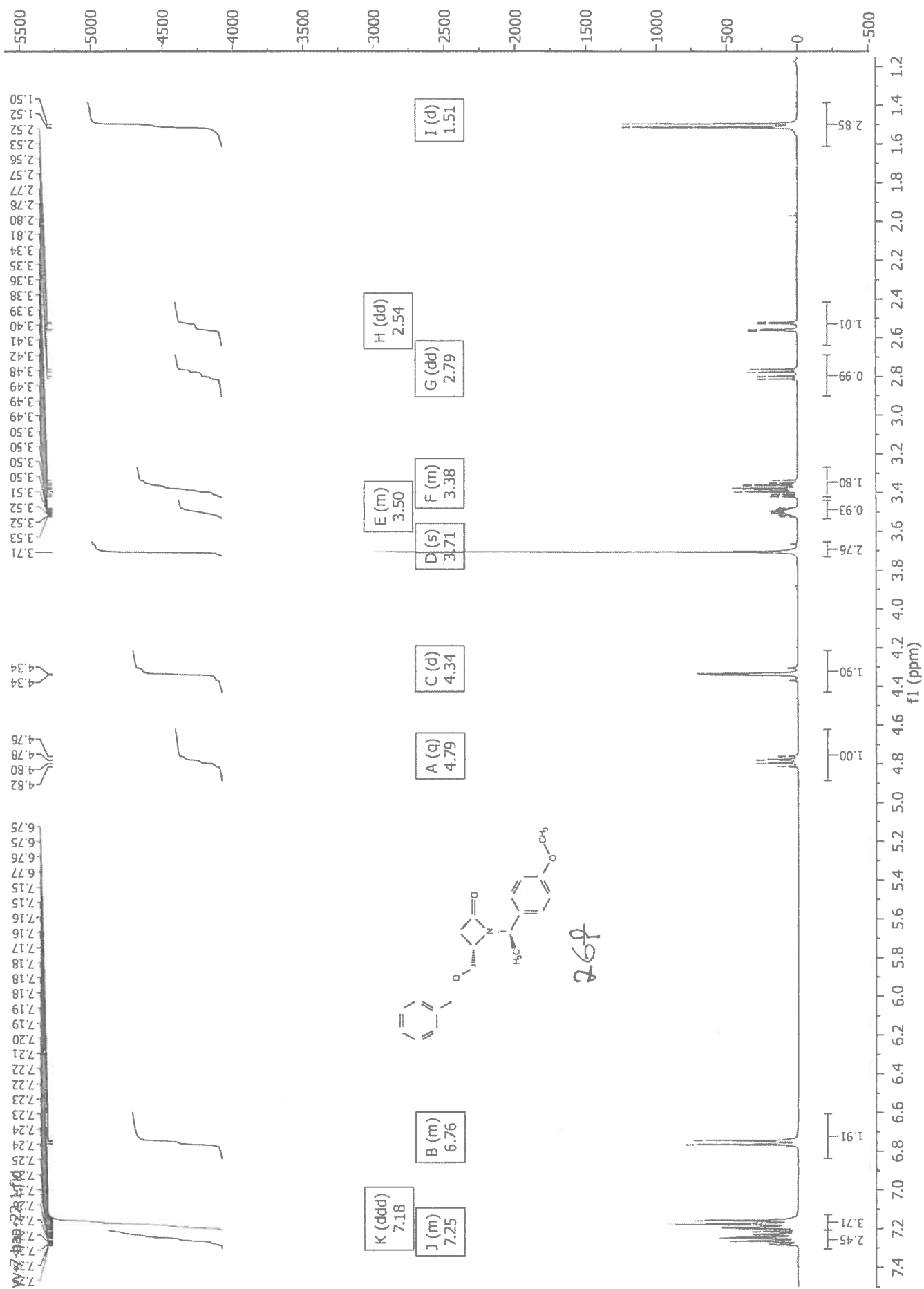


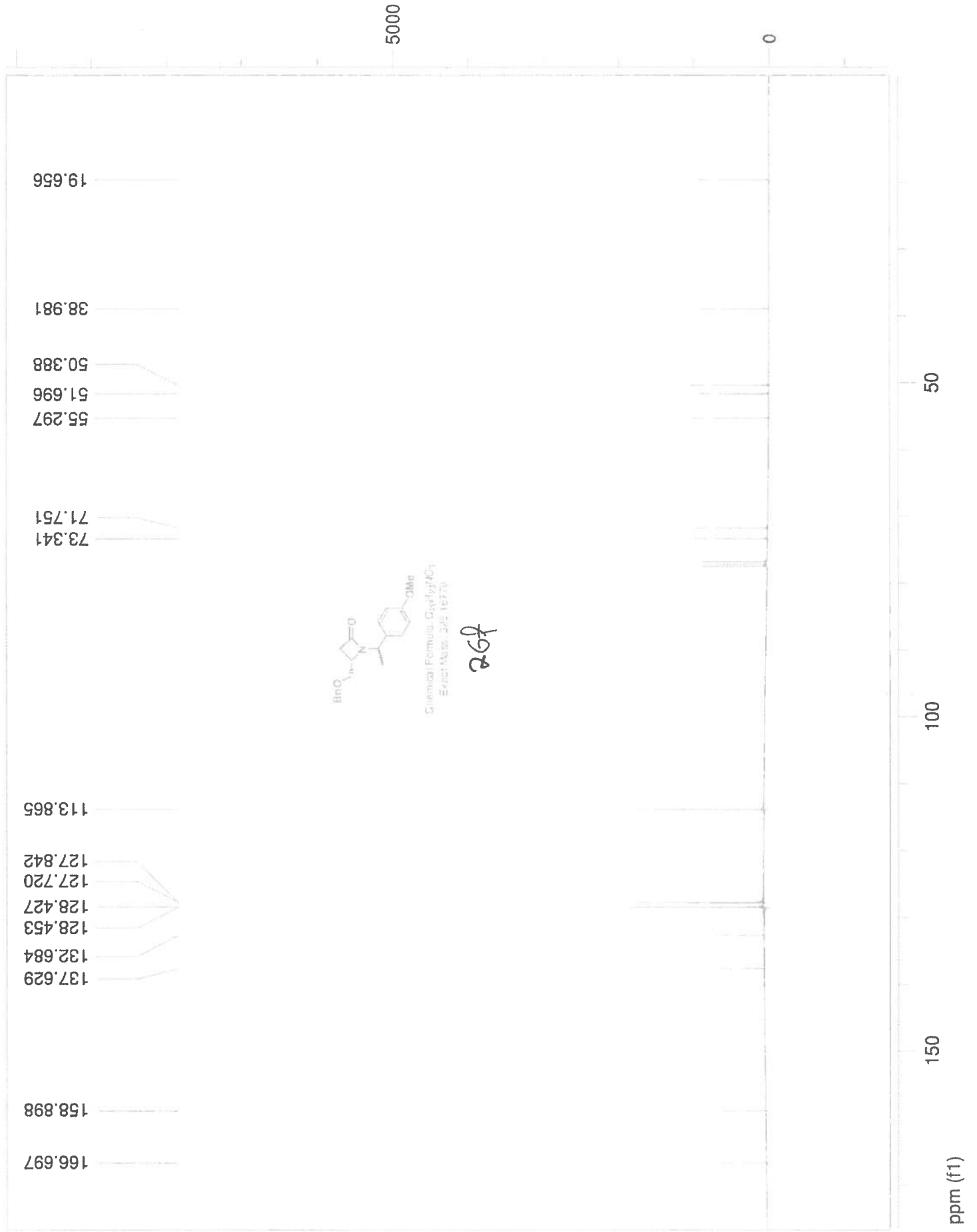
7.18
7.17
7.16
7.15
7.14
7.13
6.95
6.95
6.94
6.94
6.84
6.82
 4.81
4.80
4.79
4.77
 3.75
3.53
3.52
3.52
3.51
3.51
3.50
3.50
2.99
2.98
2.97
2.76
2.75
2.73
2.72
2.54
2.52
2.52
2.51
2.50
2.49
 1.58
1.57

7.18
7.17
7.16
7.15
7.14
7.13
6.95
6.95
6.94
6.94
6.84
6.82
 4.81
4.80
4.79
4.77
 3.75
3.53
3.52
3.52
3.51
3.51
3.50
3.50
2.99
2.98
2.97
2.76
2.75
2.73
2.72
2.54
2.52
2.52
2.51
2.50
2.49
 1.58
1.57

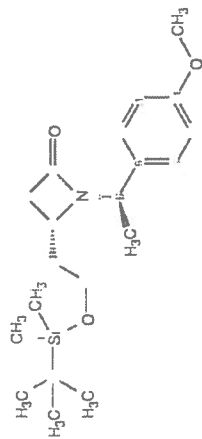
PROTONS: cryo cdcl3 f1: cburke 13
 08202013
 13072013



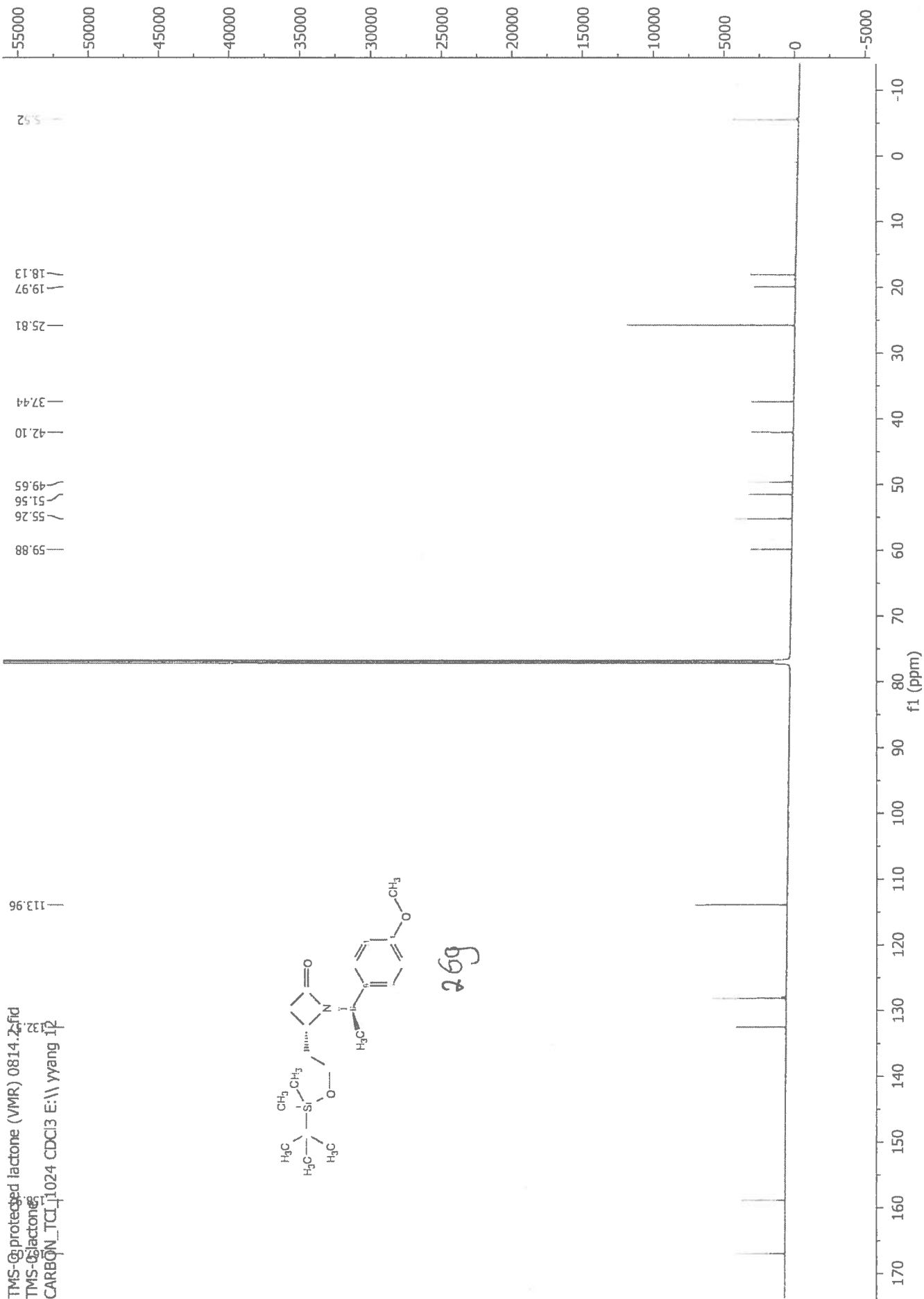




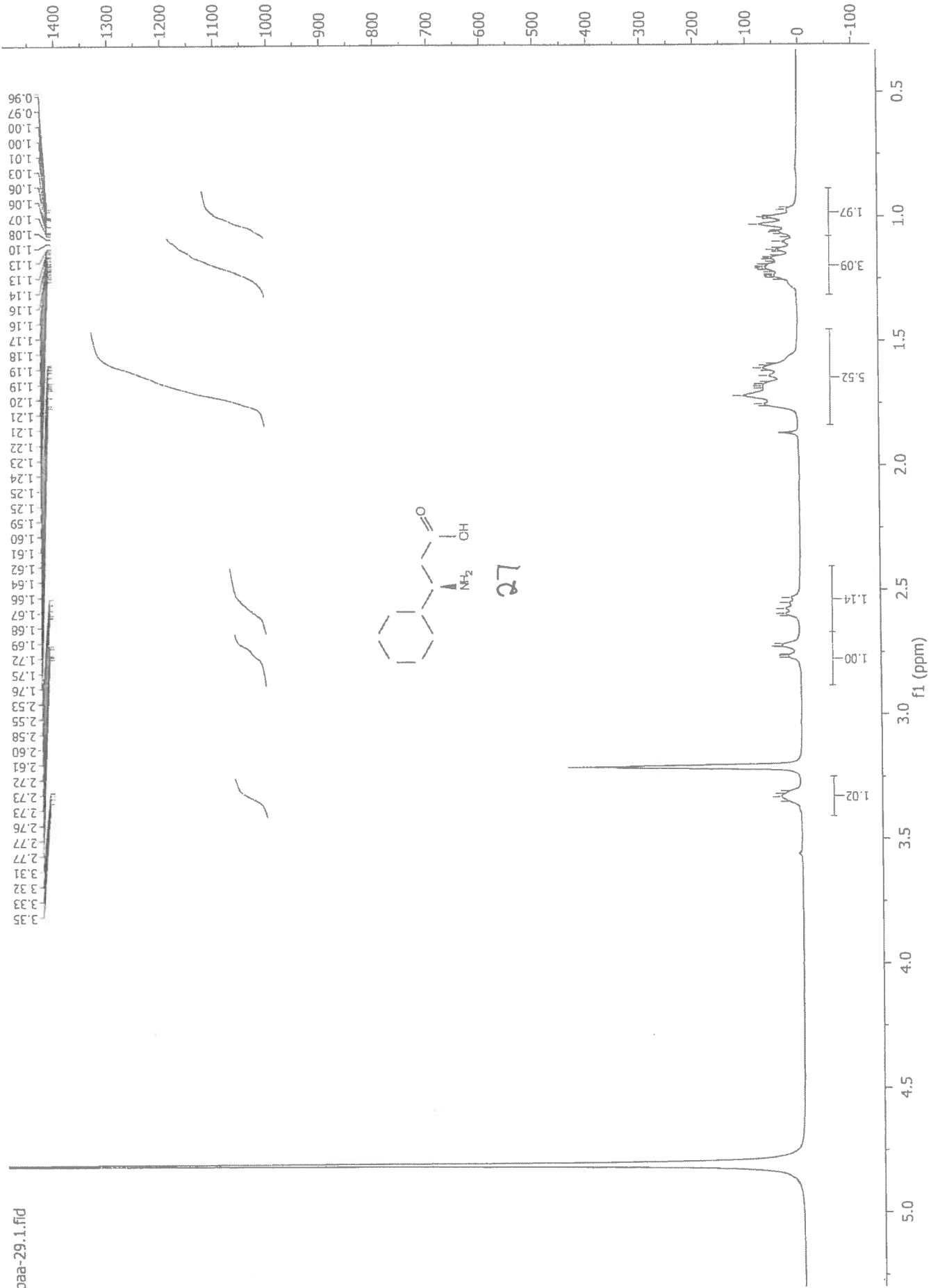
TMS-protected lactone (VMR) 0814_2.fid
TMS-protected lactone
CARBON_TCI_1024 CDCl3 E:\Wyang IP



26g



baa-29.1.fid



1D — baa-29.3.fid —

— 174.36

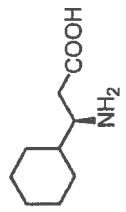
101.42
101.40

— 54.34

— 41.33

— 34.98

29.72
29.18
26.97



27

