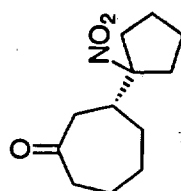


24.121
24.167
24.296
28.555
32.211
34.872
35.319
43.252
43.789
45.735

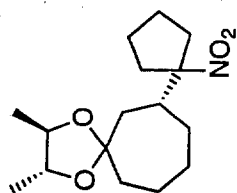
76.589
76.906
77.224

103.969



212.192

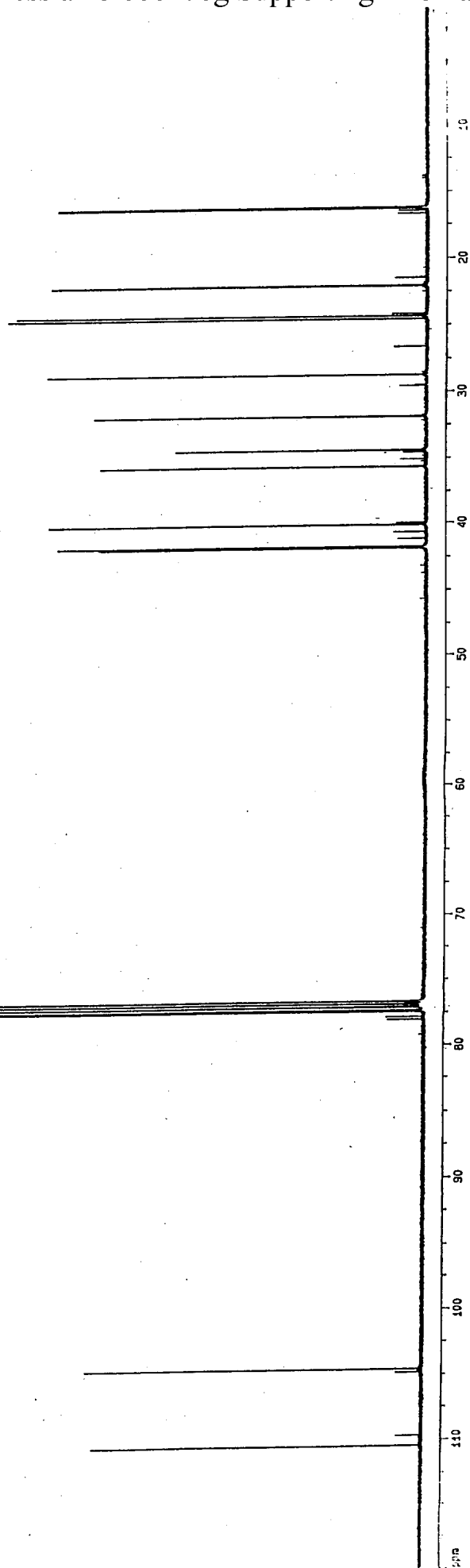
ppm

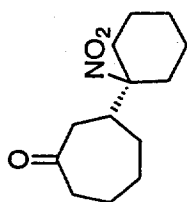
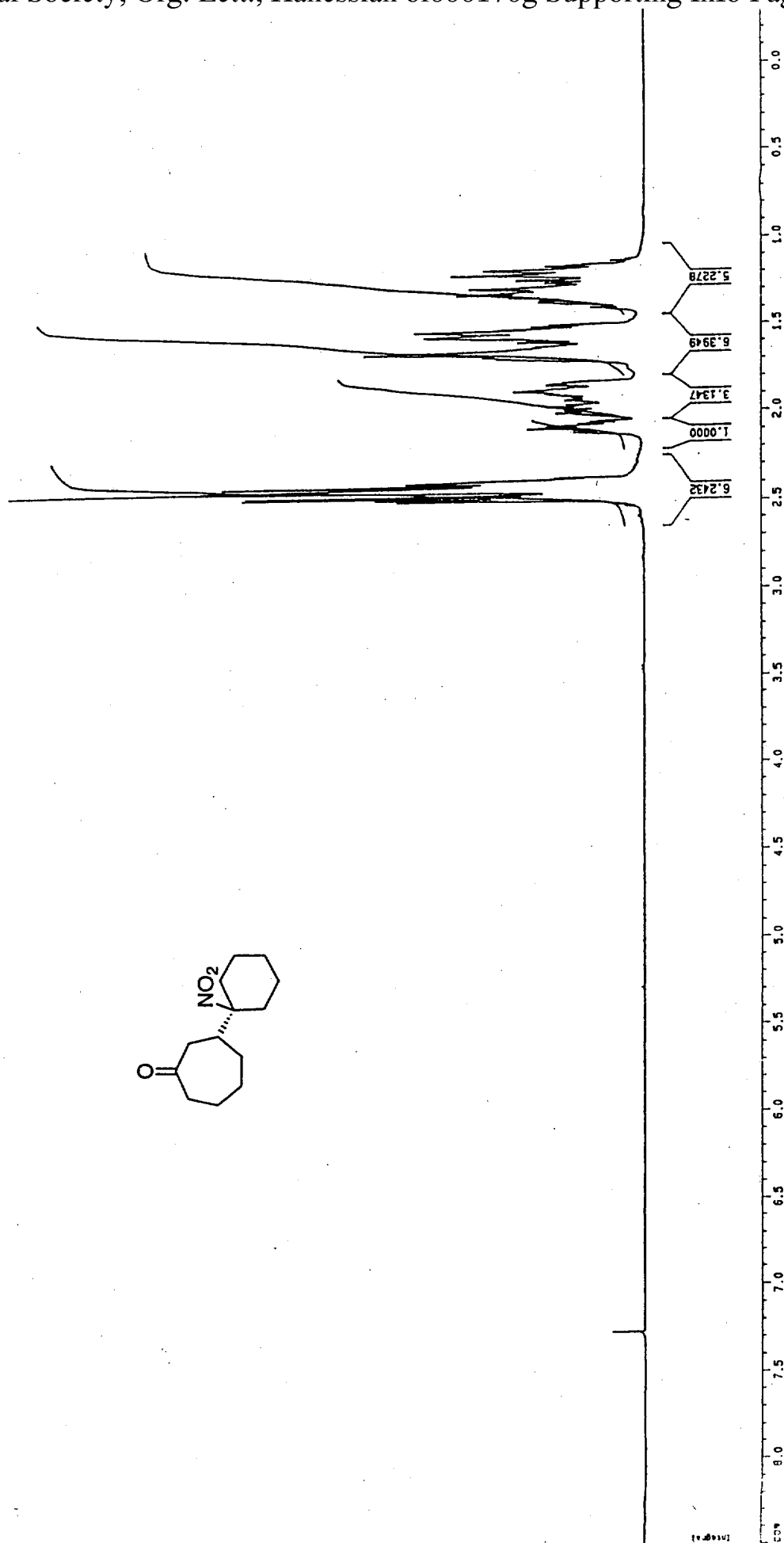


¹³C-NMR, 100 MHz

CDCl₃

87% ee





21.991
22.080
24.352
24.569
28.477
30.562
30.666
31.463

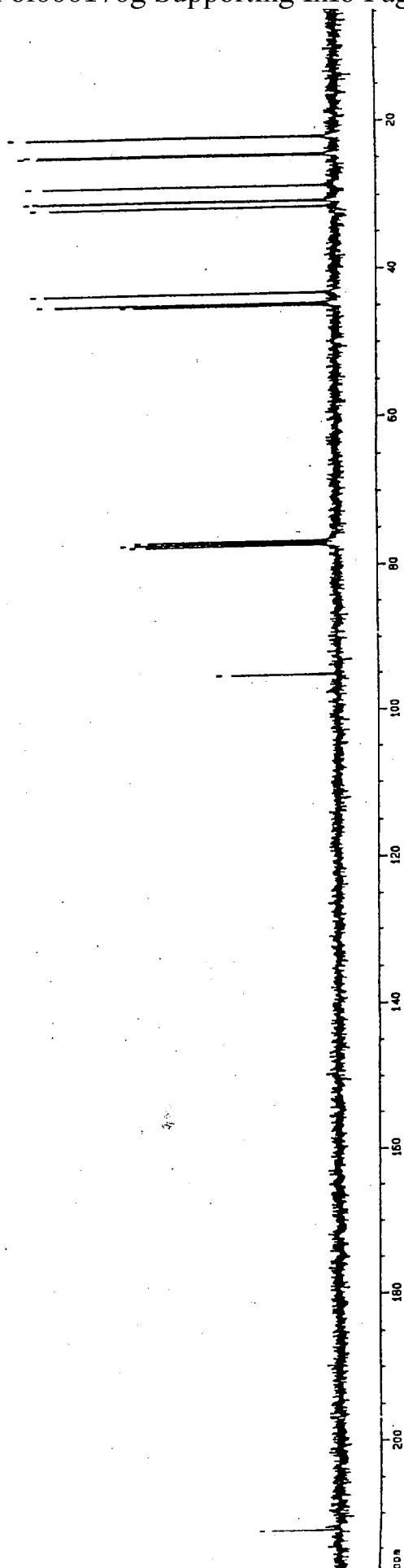
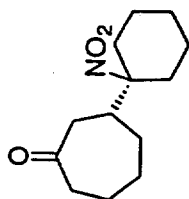
43.082
44.479
44.777

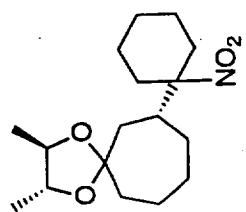
76.621
76.939
77.257

95.000

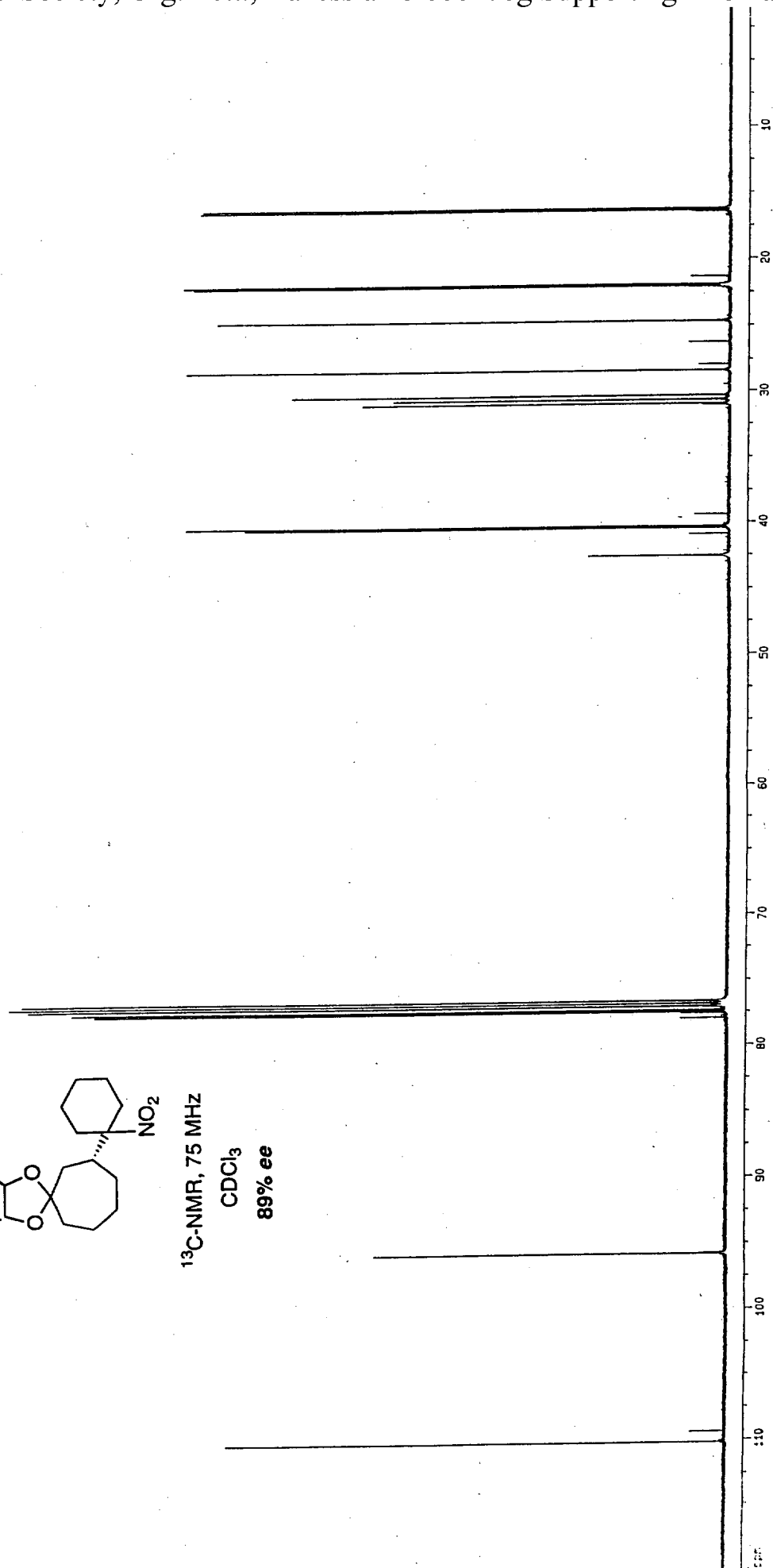
212.104

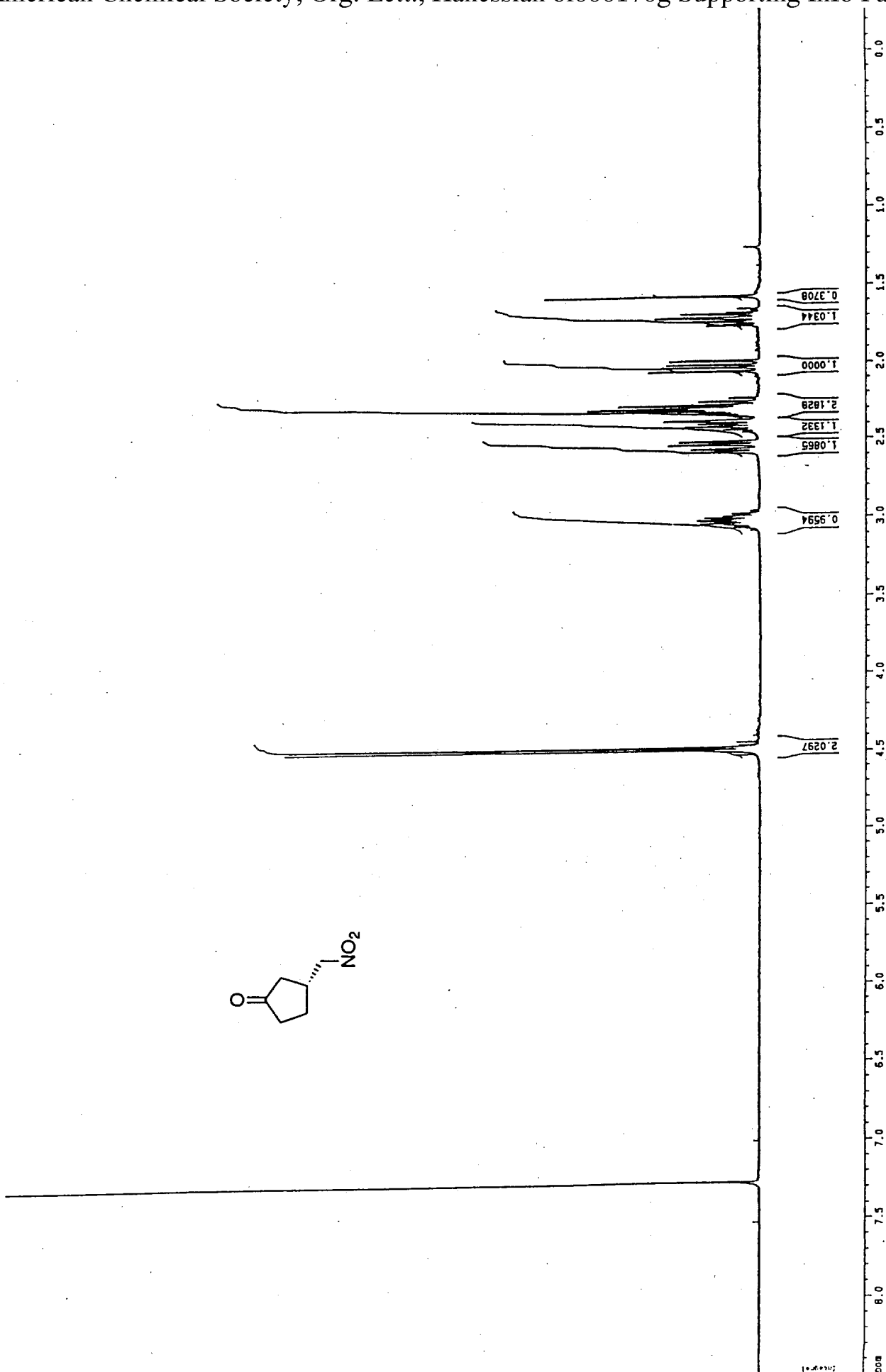
ppm





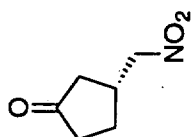
¹³C-NMR, 75 MHz
CDCl₃
89% ee





26.569
35.052
37.639
41.952

76.606
76.923
77.241
78.964



215.381
ppm

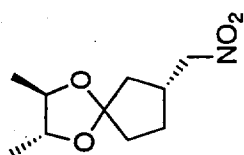
16.830
16.843
16.804
16.740

27.195
26.812

35.147
35.471
36.522
36.845

41.065
41.465

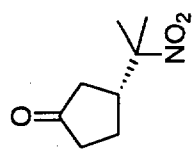
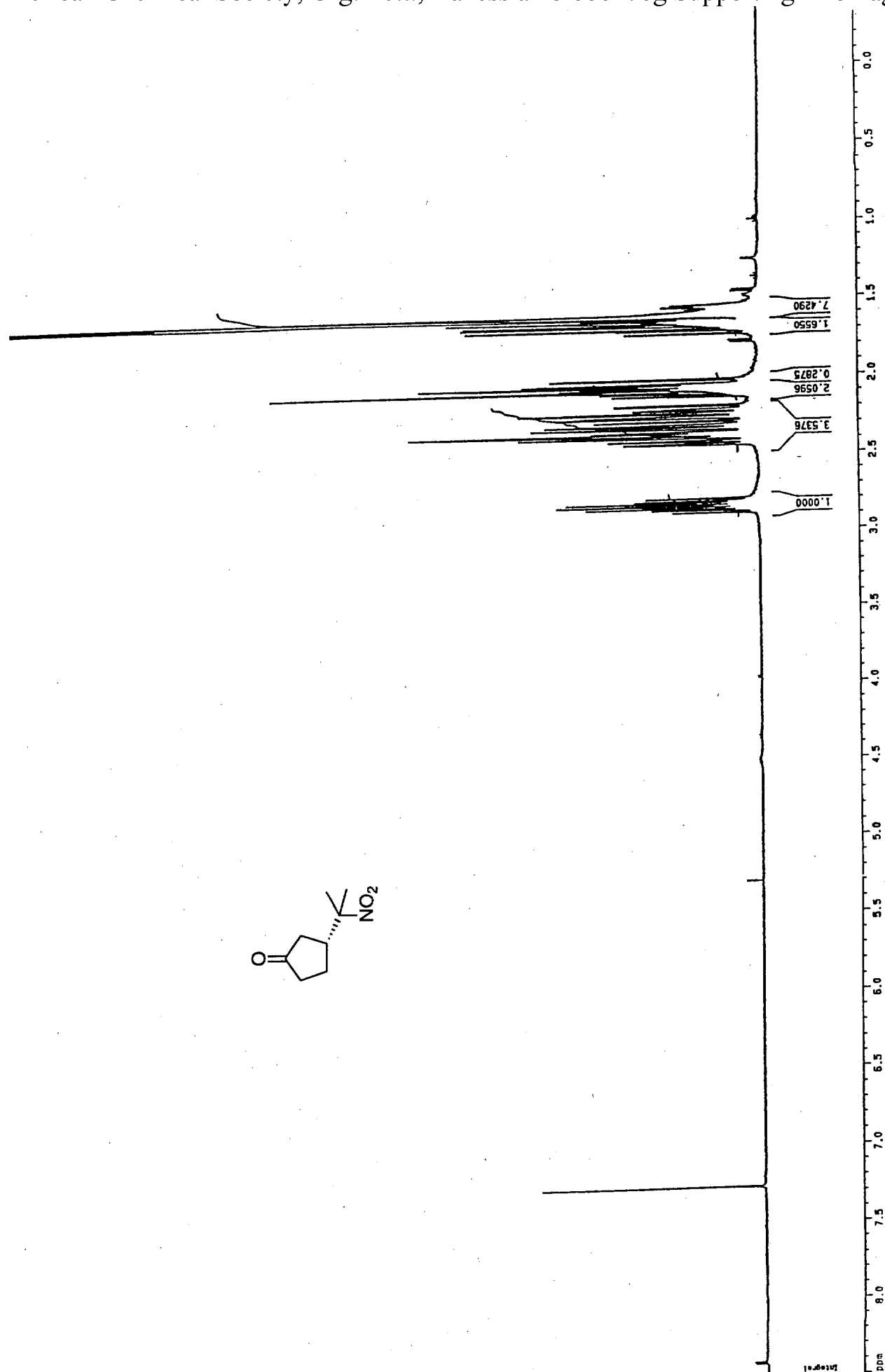
76.584
76.902
77.219
78.363
78.389
79.748



¹³C-NMR, 75MHz
CDCl₃
62% ee

115.788

ppm

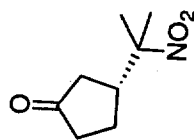


23.263
23.513
24.303

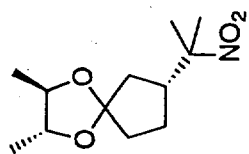
38.459
40.026
45.542

76.585
76.902
77.220

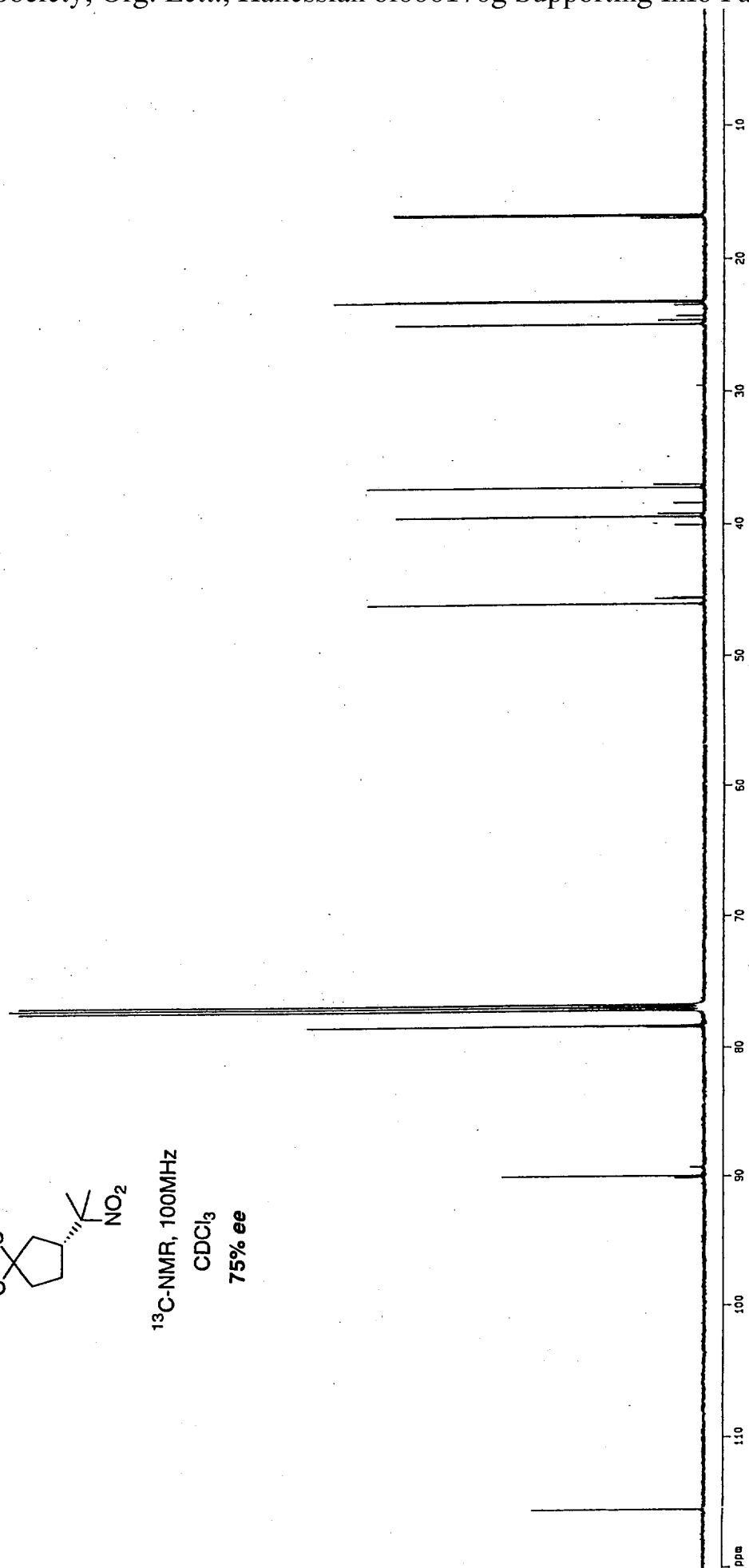
89.309

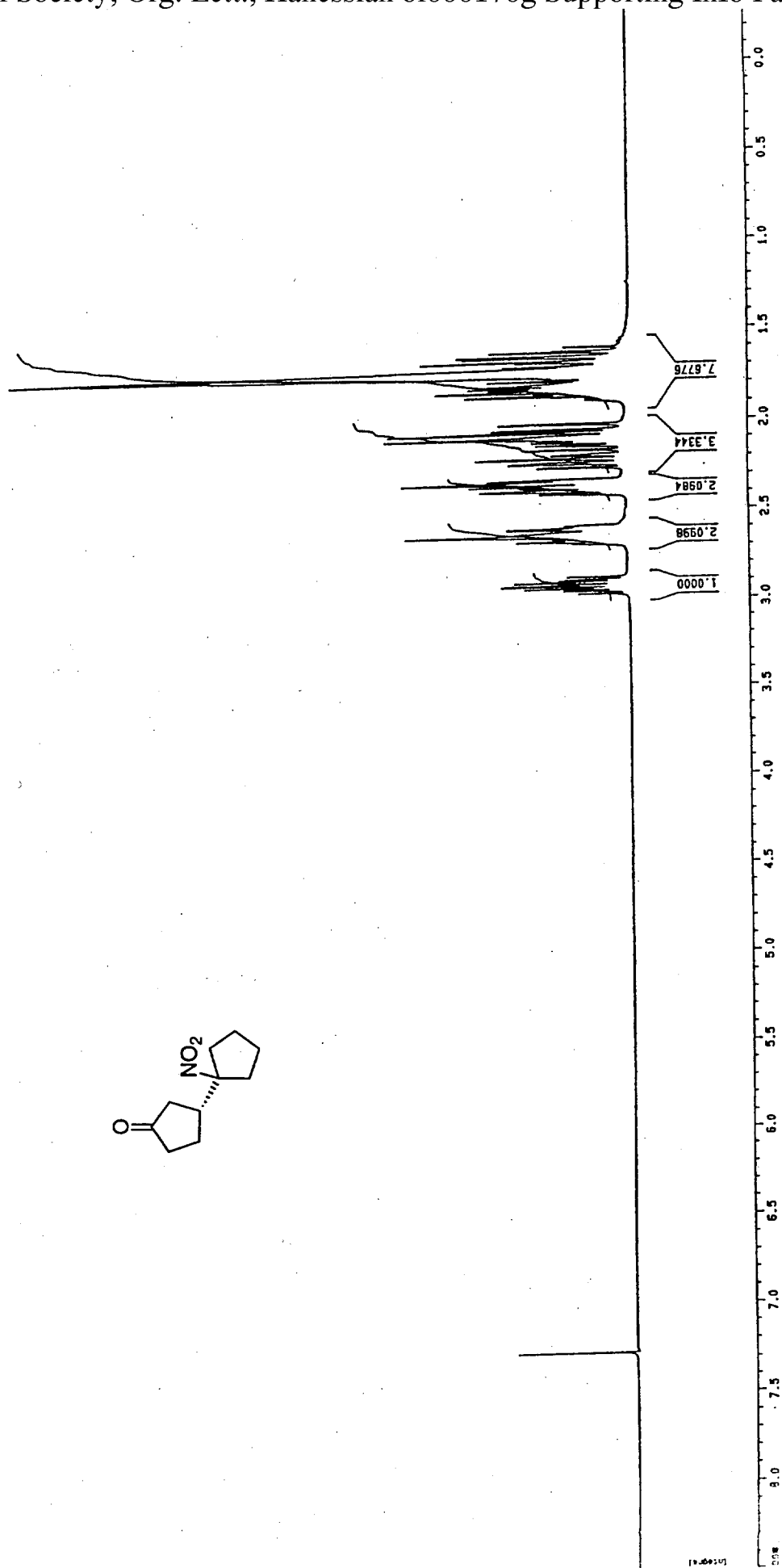


215.460
ppm



$^{13}\text{C-NMR}$, 100MHz
 CDCl_3
 75% ee





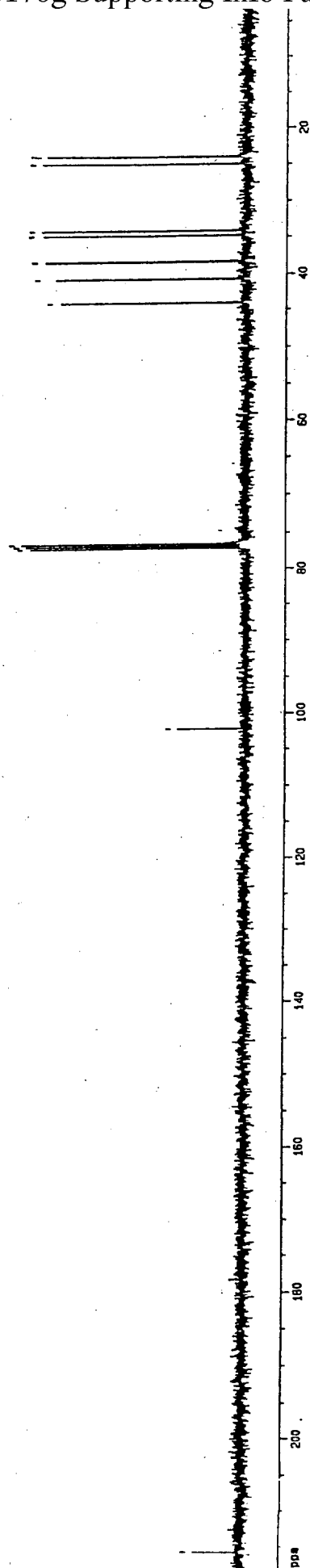
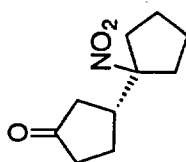
23.910
24.014
25.021

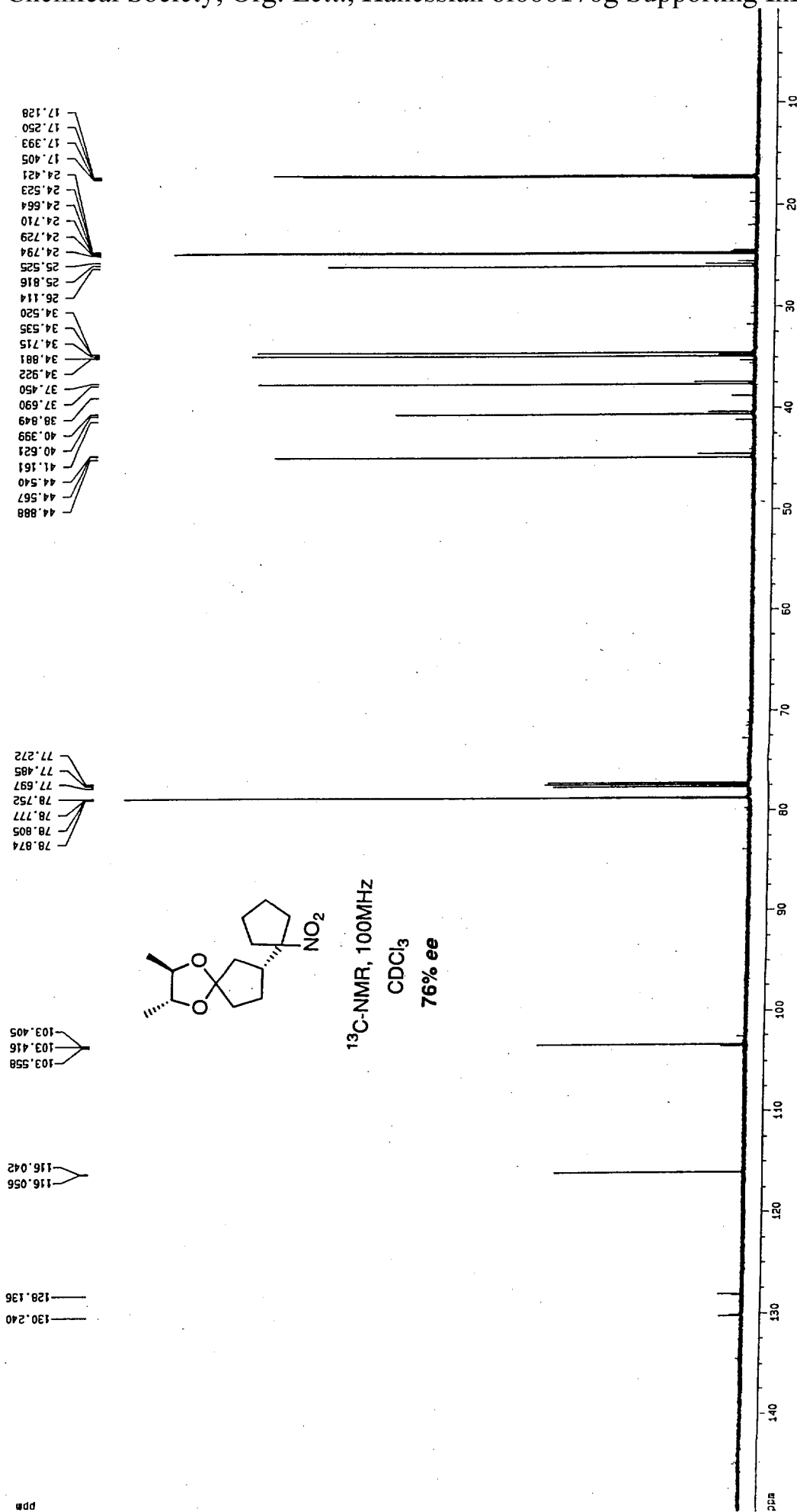
34.142
34.829
38.366
40.666
44.049

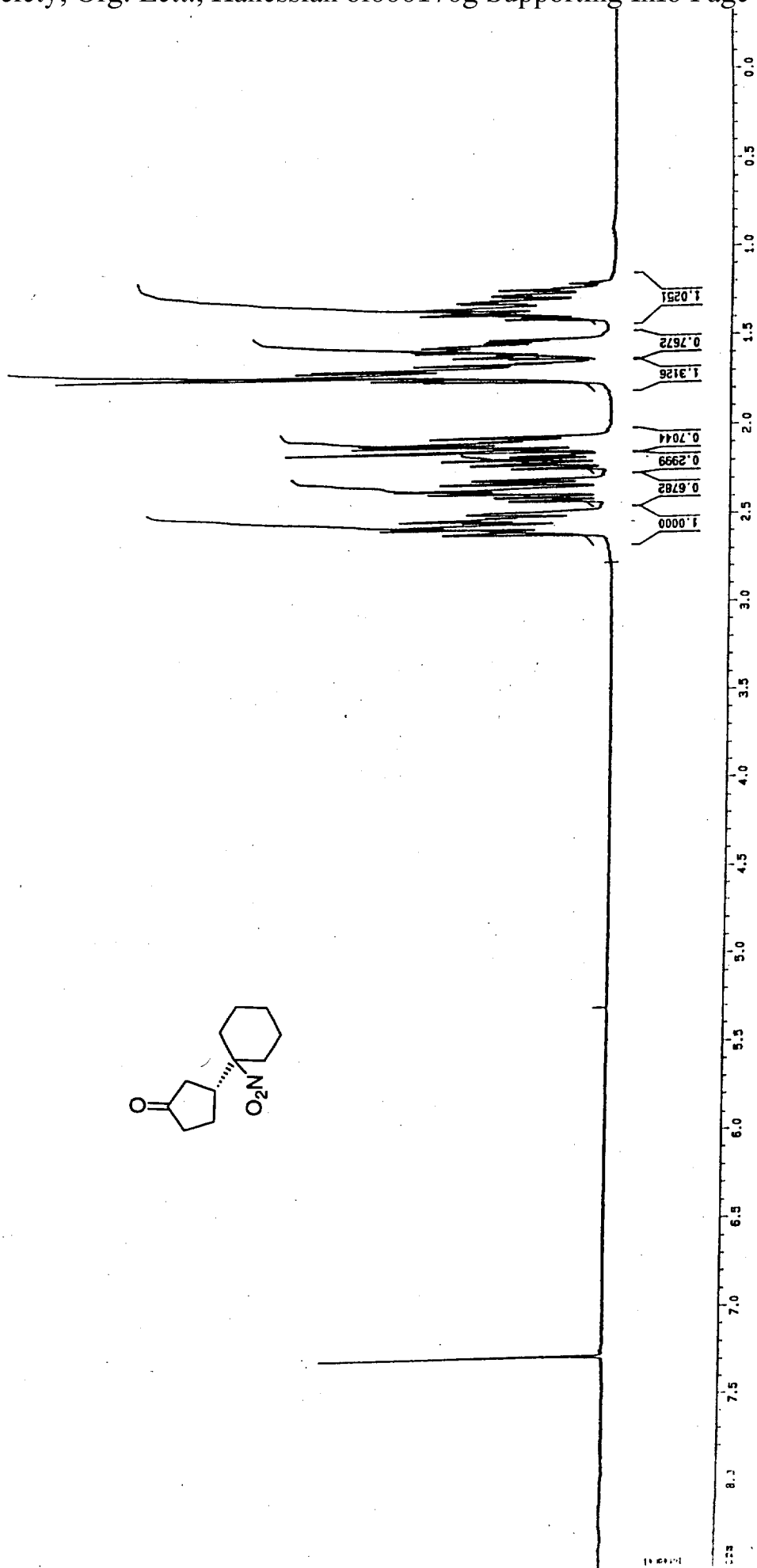
76.605
76.923
77.241

102.118

215.710
ppm



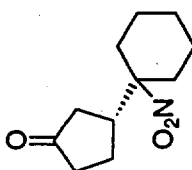




22.108
22.128
23.805
24.601
32.168
32.278
38.562
39.610
46.388

76.734
77.051
77.370

92.870



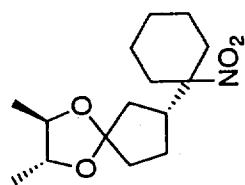
219.525

16.670
16.819
16.957
17.007
22.171
23.955
24.341
24.755
29.630
31.757
31.811
31.900
36.902
37.223
38.737
39.014
46.736
47.159

76.697
77.015
77.333
78.254
78.311
78.357
78.482

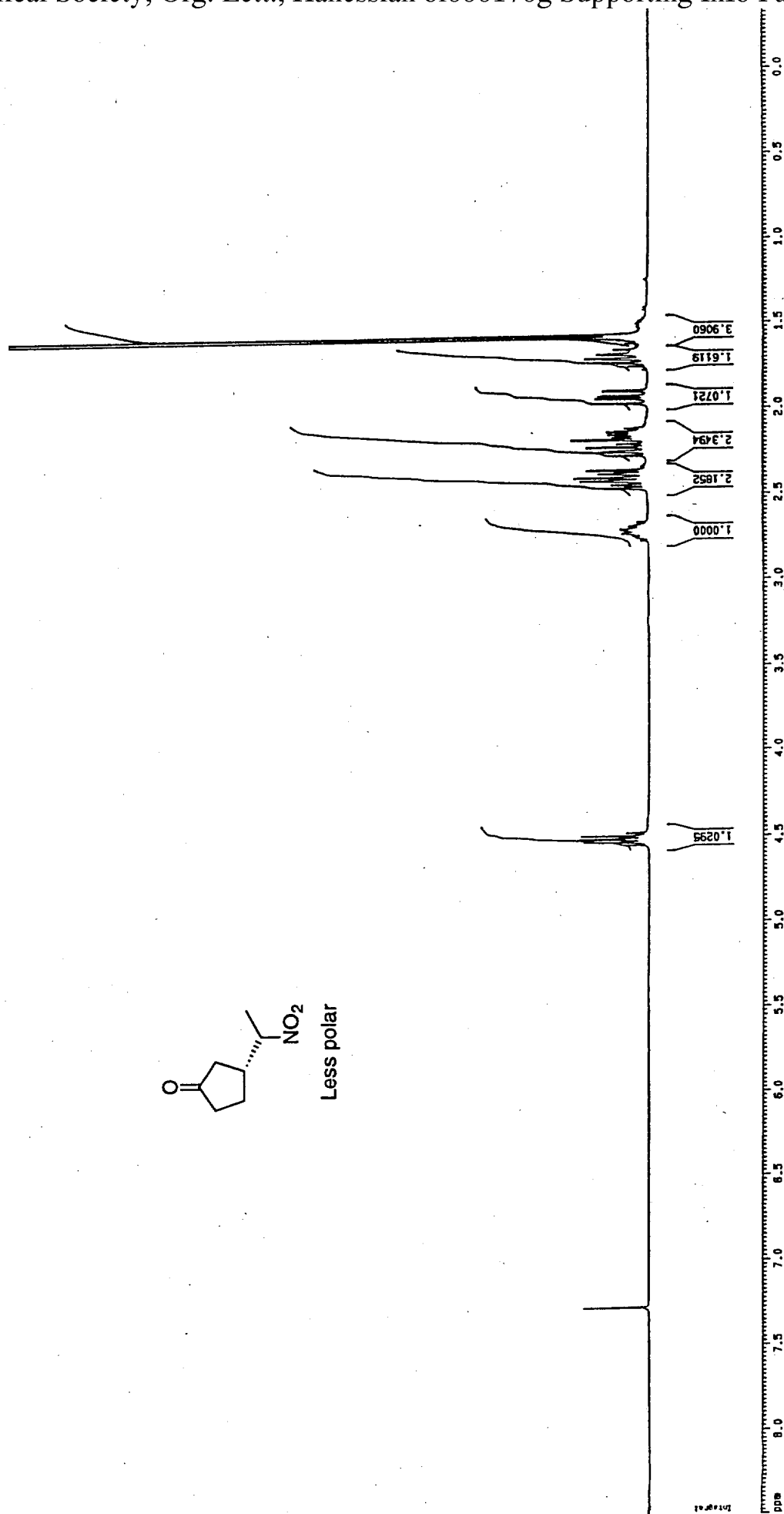
93.438

115.431



¹³C-NMR, 75 MHz
CDCl₃
76% ee

20 40 60 80 100 120 140 160 180 200 ppm



17.881

26.408

37.964

41.133

40.898

76.584

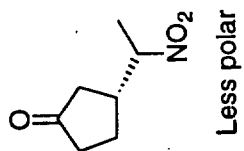
76.902

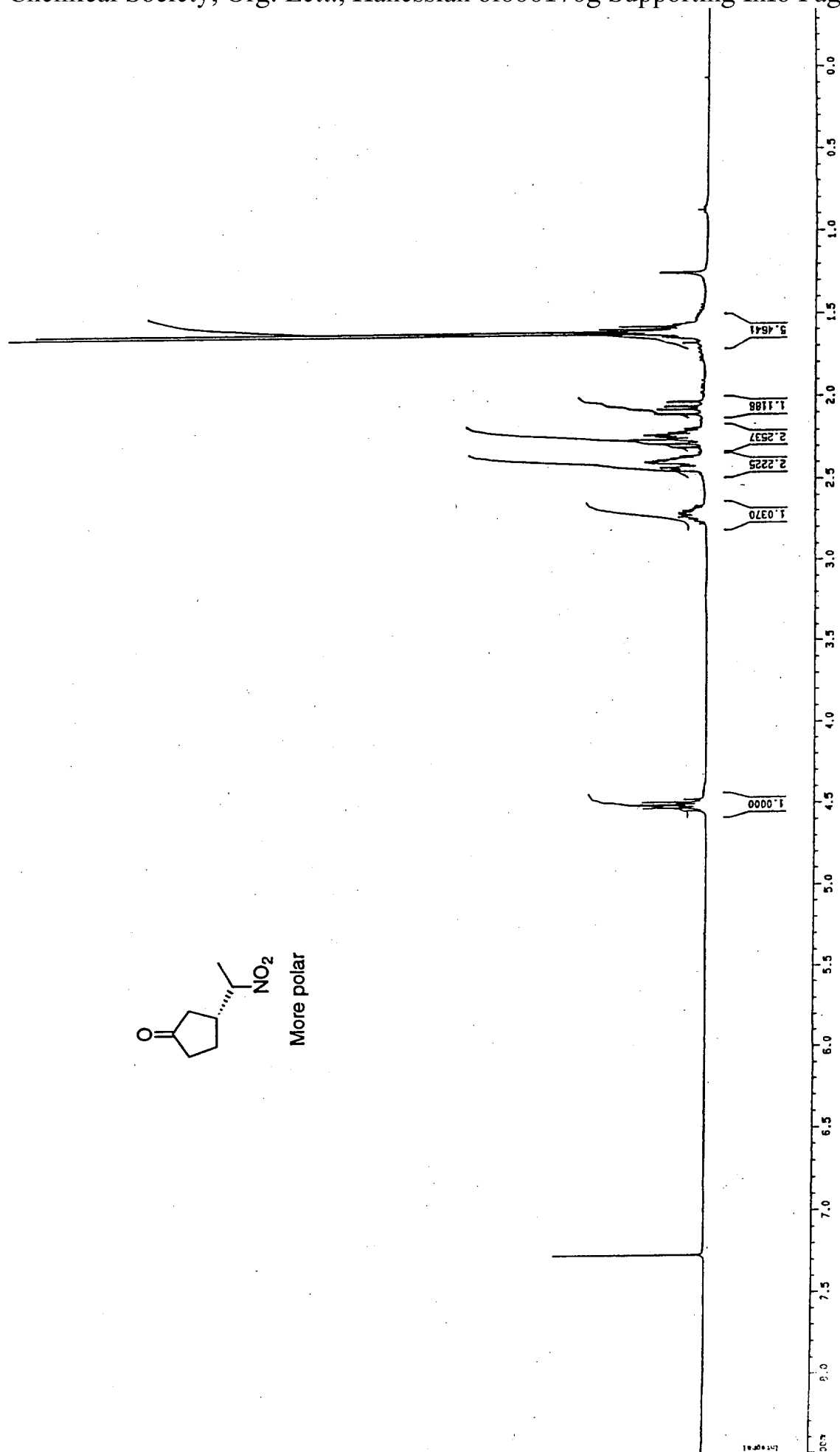
77.219

86.806

215.185

ppm





17.148

25.616

38.198

41.002

41.860

76.578

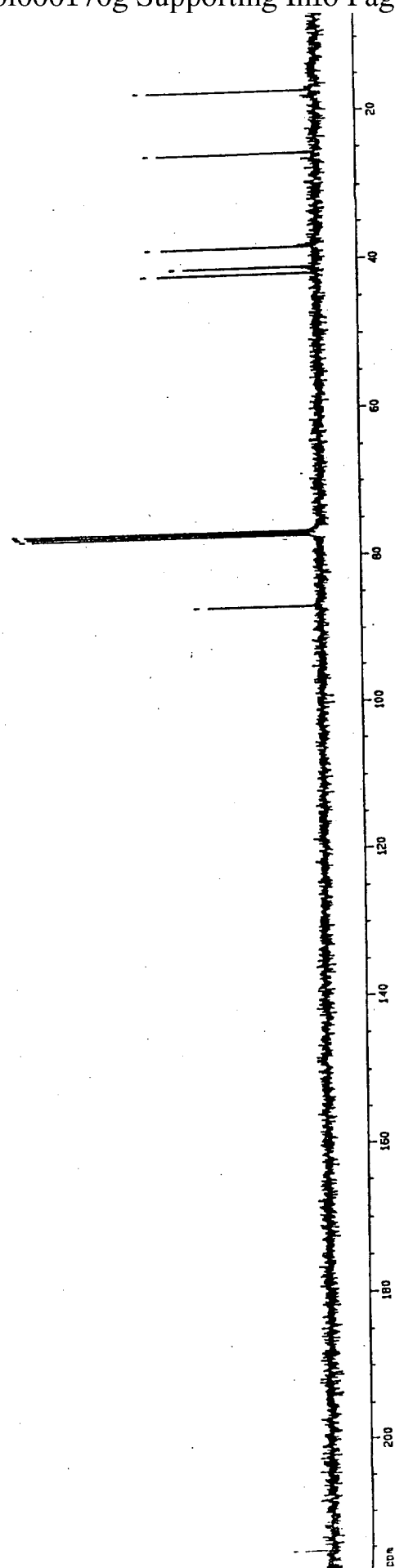
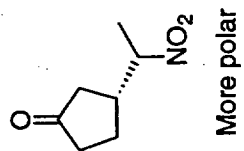
76.895

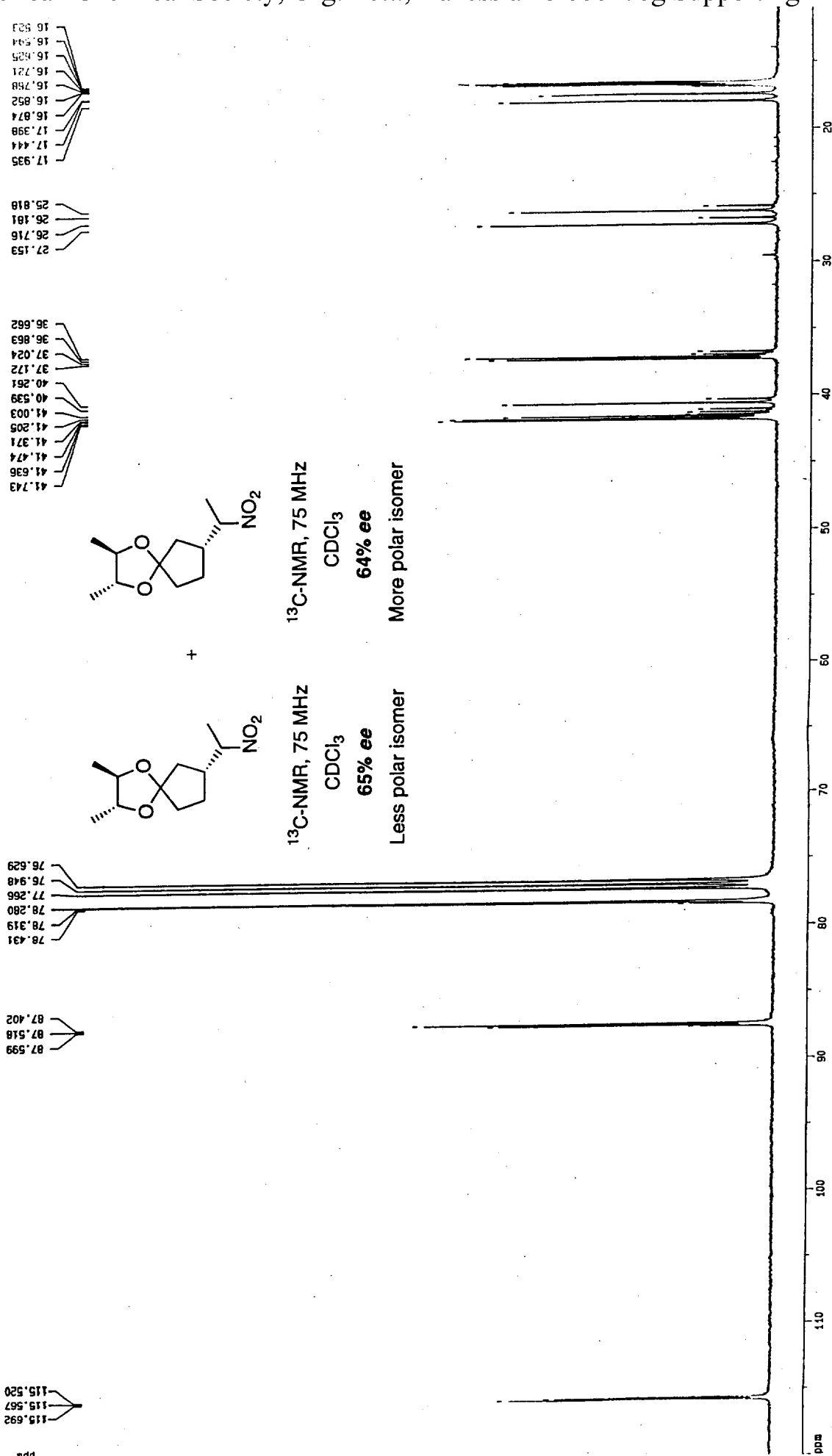
77.213

86.937

115.255

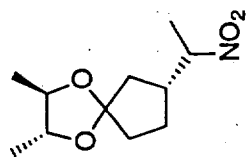
ppm





300. USRE=chimie, NAME=epial, EXPR=63, PROGNO=1
 F1=230.000ppm, F2=0.000ppm, M1=0.00cm, MAX1=10000.00cm, PC=1.00cm

#	ADDRESS	FREQUENCY [Hz]	PPM	INTENSITY
1	31382.4	11645.312	115.7446	3.03
2	38844.5	8798.973	87.4529	7.57
3	41210.0	7896.582	78.4840	4.68
4	41238.3	7885.560	78.3745	5.95
5	41249.5	7881.501	78.3341	6.11
6	41259.9	7877.550	78.2949	5.02
7	41532.4	7773.624	77.2619	3.59
8	41616.2	7741.528	76.9439	3.70
9	41700.1	7709.546	76.6261	3.52
10	50889.1	4204.320	41.7867	5.86
11	50986.6	4167.335	41.4151	4.62
12	51203.7	4084.315	40.5940	6.55
13	51276.2	4056.535	40.3138	5.50
14	52131.4	3730.423	37.0756	6.74
15	52226.5	3694.126	36.7159	5.55
16	54733.7	2737.222	27.2102	5.35
17	54548.3	2693.764	26.7733	5.28
18	57166.3	1309.544	17.9350	7.18
19	57453.3	1700.280	16.5991	5.29
20	57475.5	1691.797	16.8147	5.35
21	57514.0	1677.132	16.5690	7.33
22	57521.4	1674.291	16.5403	7.04

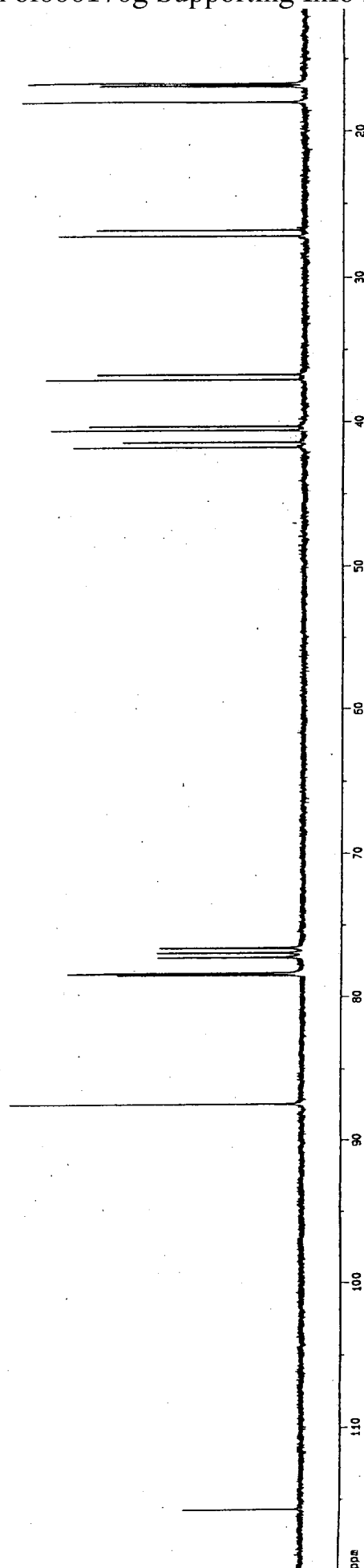


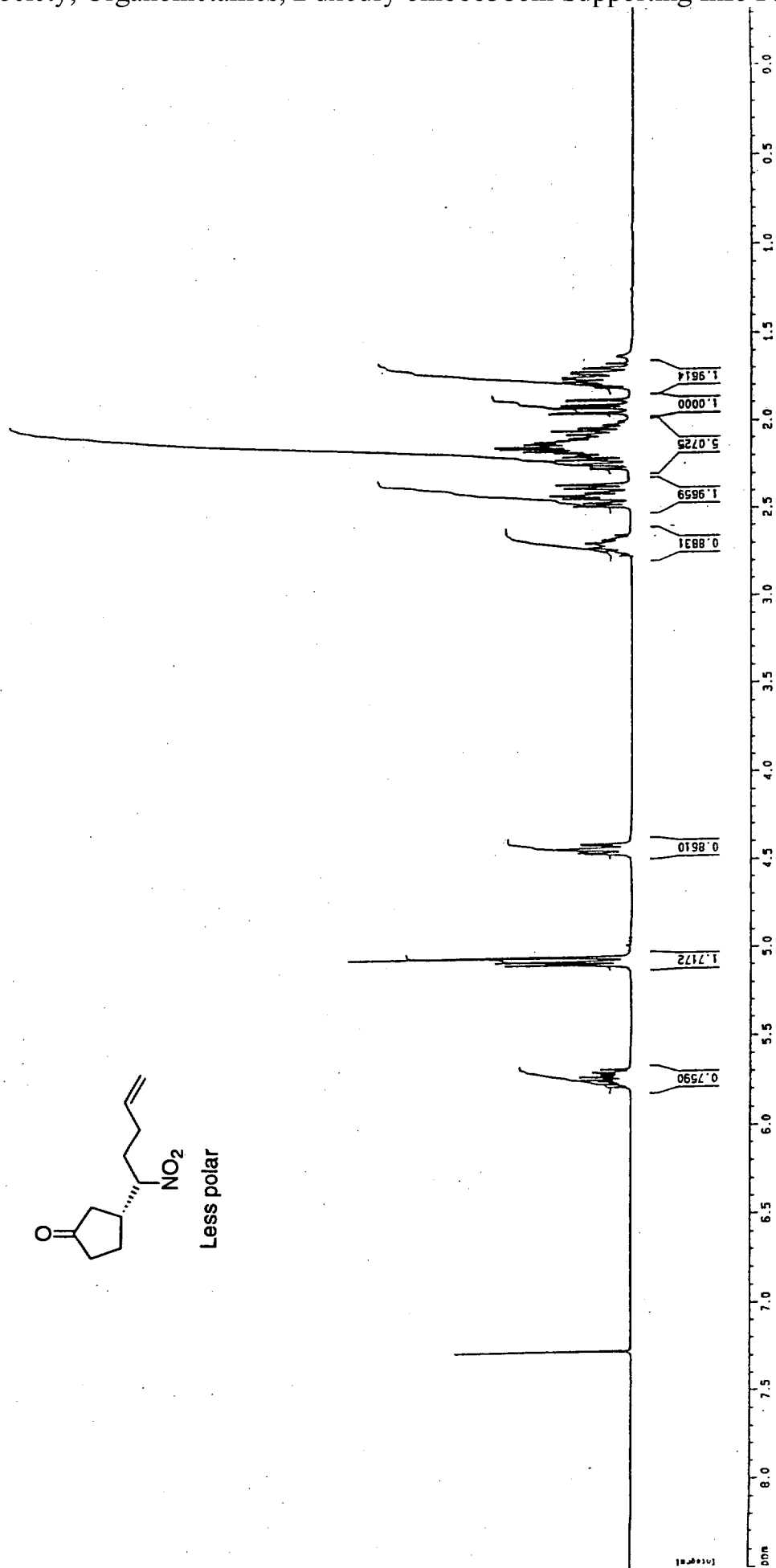
¹³C-NMR, 100 MHz

CDCl₃

12% ee

Less polar isomer





41.296
40.354
37.852
31.489
29.643
26.357

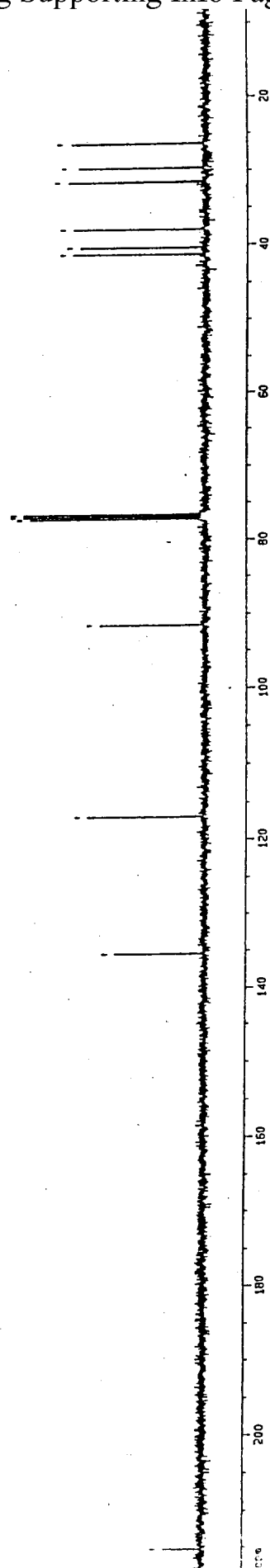
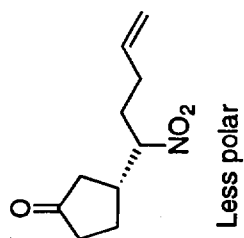
77.228
76.910
76.592

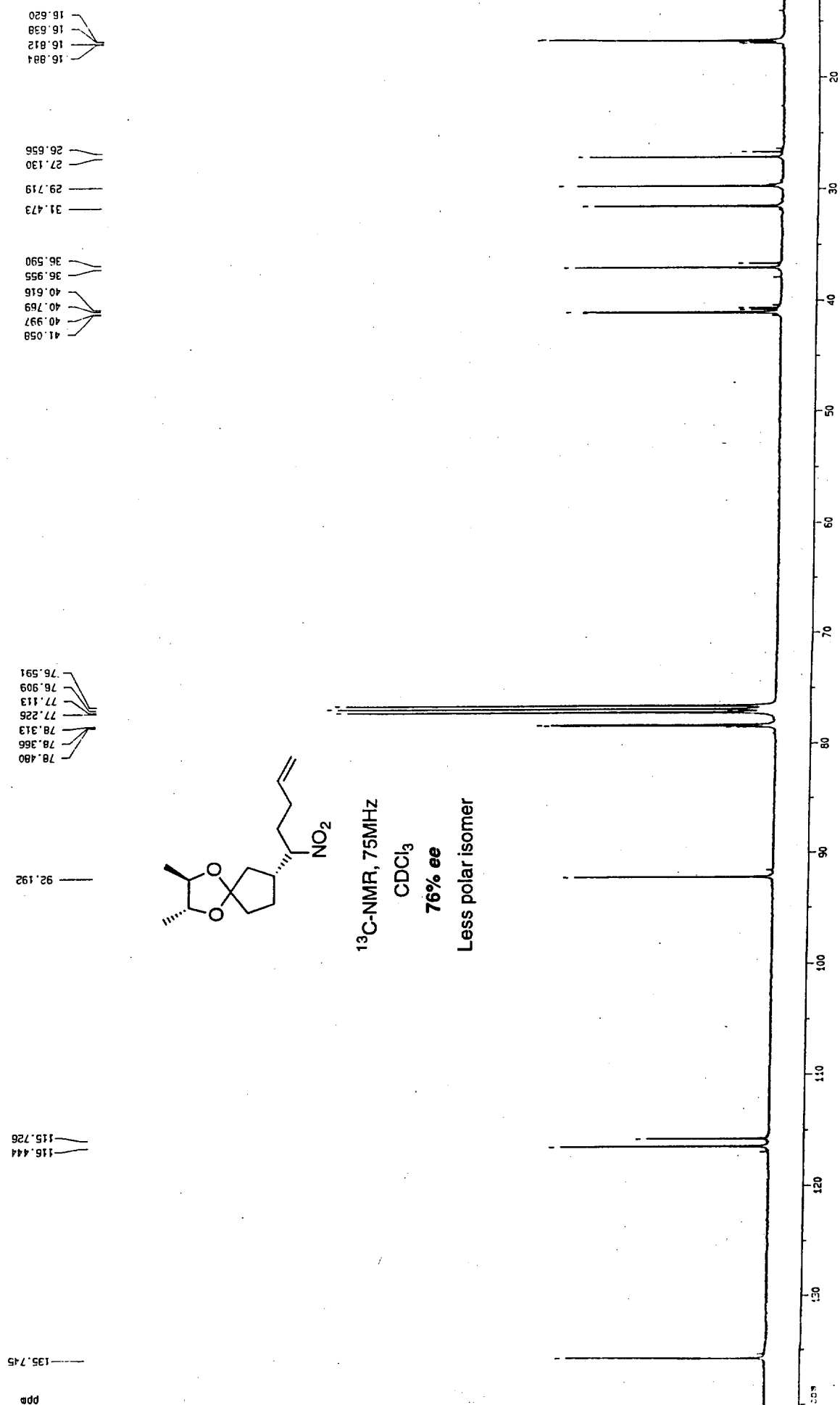
91.594

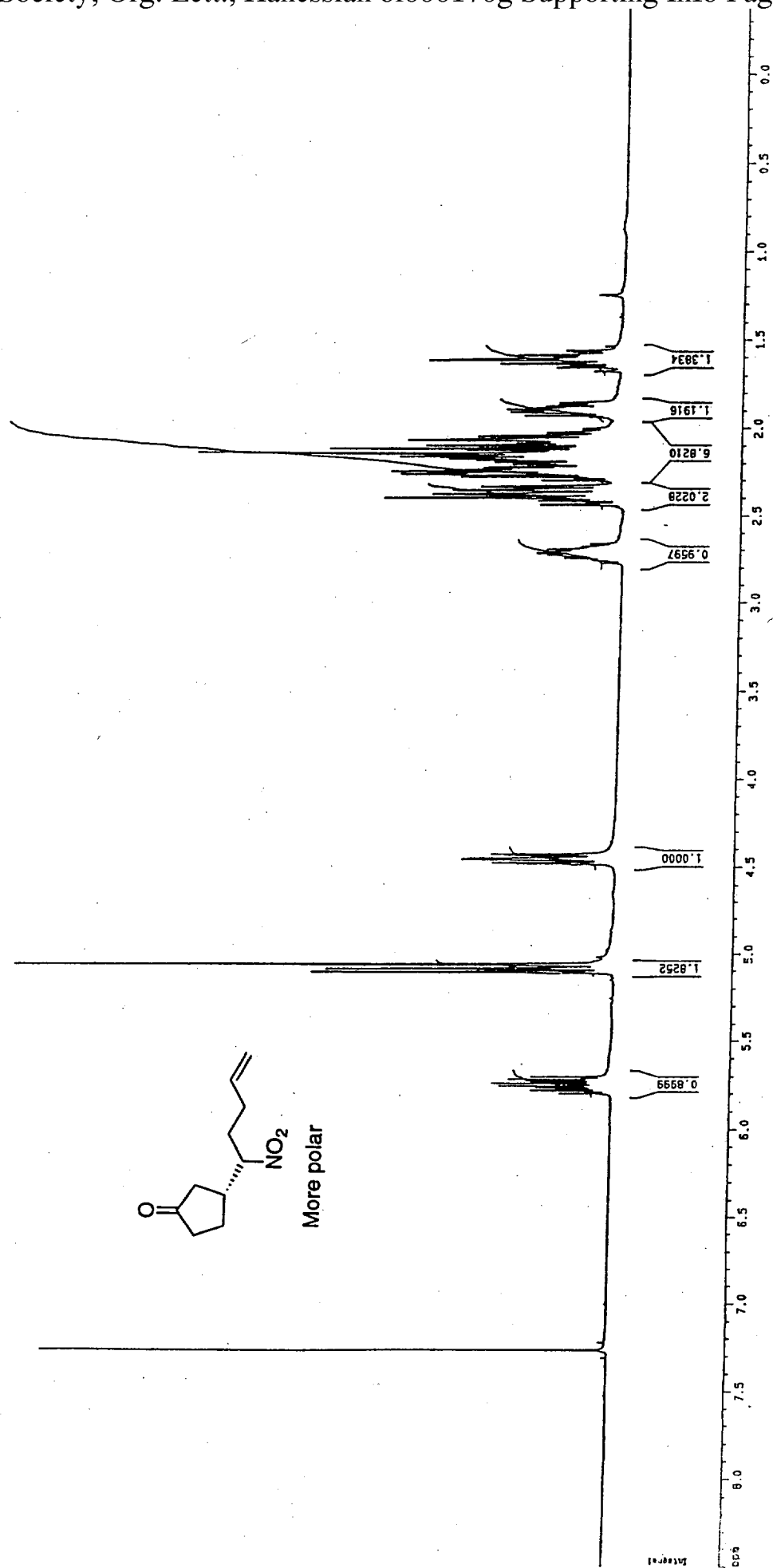
116.920

135.325

215.074
ppm







41.558
40.238
38.211
30.550
29.572
25.962

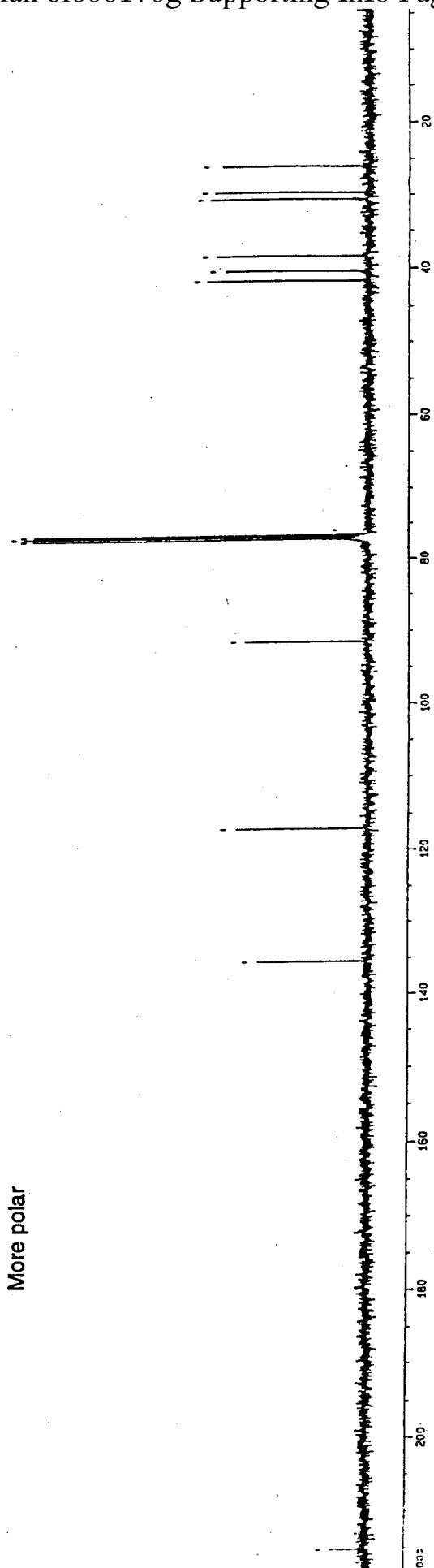
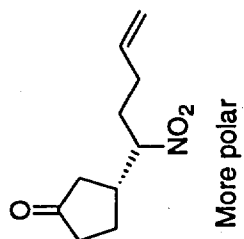
77.219
76.902
76.584

91.473

116.895

135.377

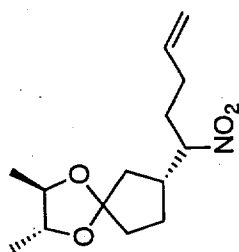
215.017
ppm



16.941
16.780
16.536

30.890
29.700
29.577
28.560
26.207

41.357
40.903
40.461
37.198
36.878



¹³C-NMR, 75 MHz

CDCl₃

63% ee

More polar isomer

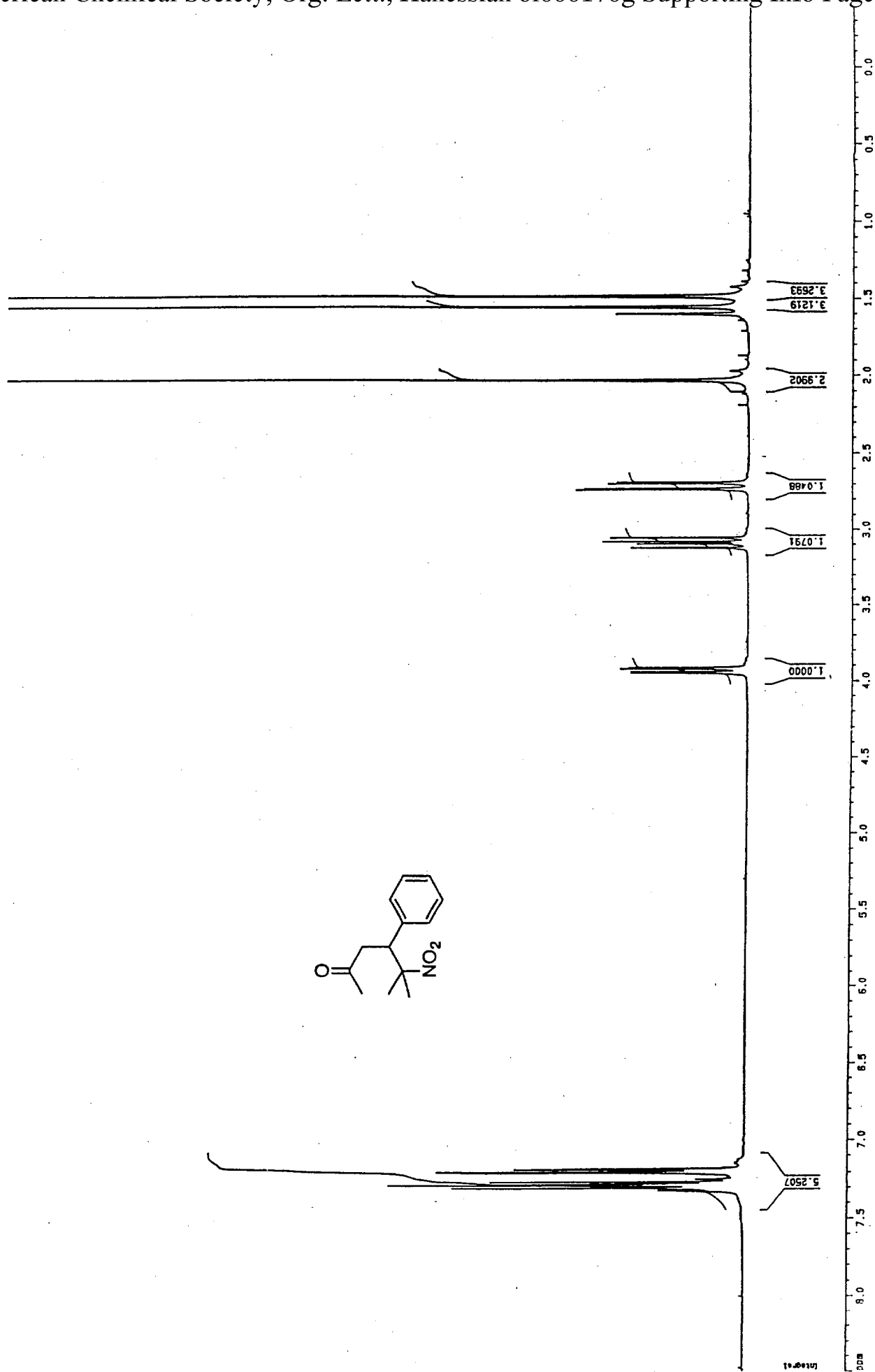
78.346
78.313
77.212
76.894
76.577

92.412
92.287

115.433
115.443

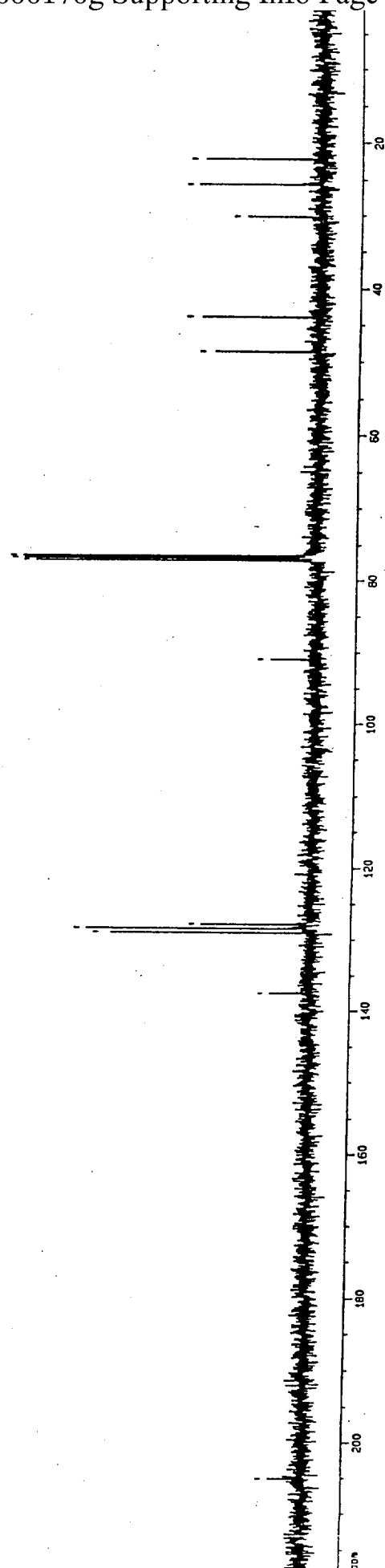
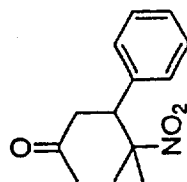
135.786

ppm



22.275
 25.759
 30.217
 43.928
 48.683
 76.584
 76.902
 77.219
 90.921
 127.784
 128.424
 129.068
 137.475
 205.043

ppm



15.835
16.183
16.522
16.680
21.585
21.907
25.314
25.446
26.138

39.760
39.819

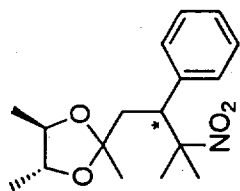
49.398
49.667

76.674
76.992
77.310
77.950
78.005
78.036
78.462

92.149
92.251

107.888
108.004

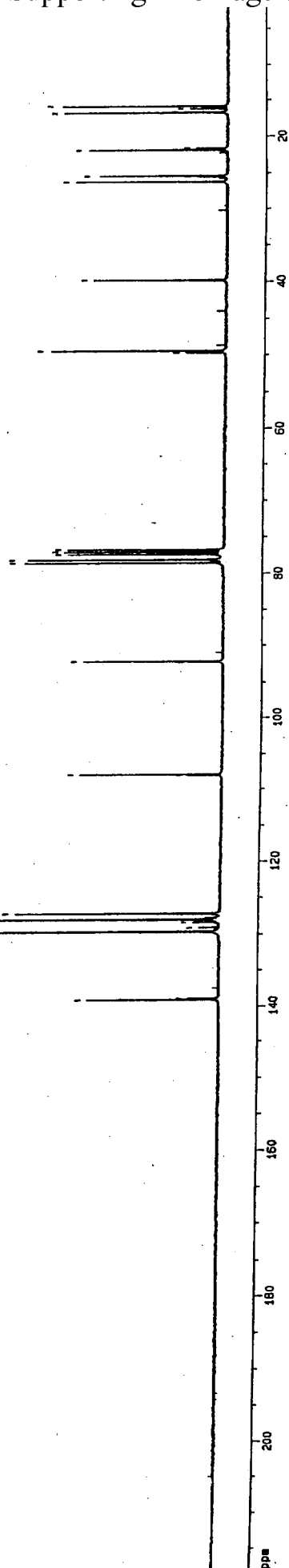
127.184
127.265
127.998
128.052
128.396
129.059
129.602
138.882
139.040



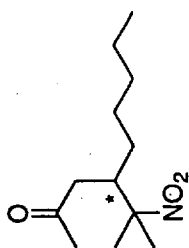
¹³C-NMR, 75 MHz

CDCl₃

61% ee

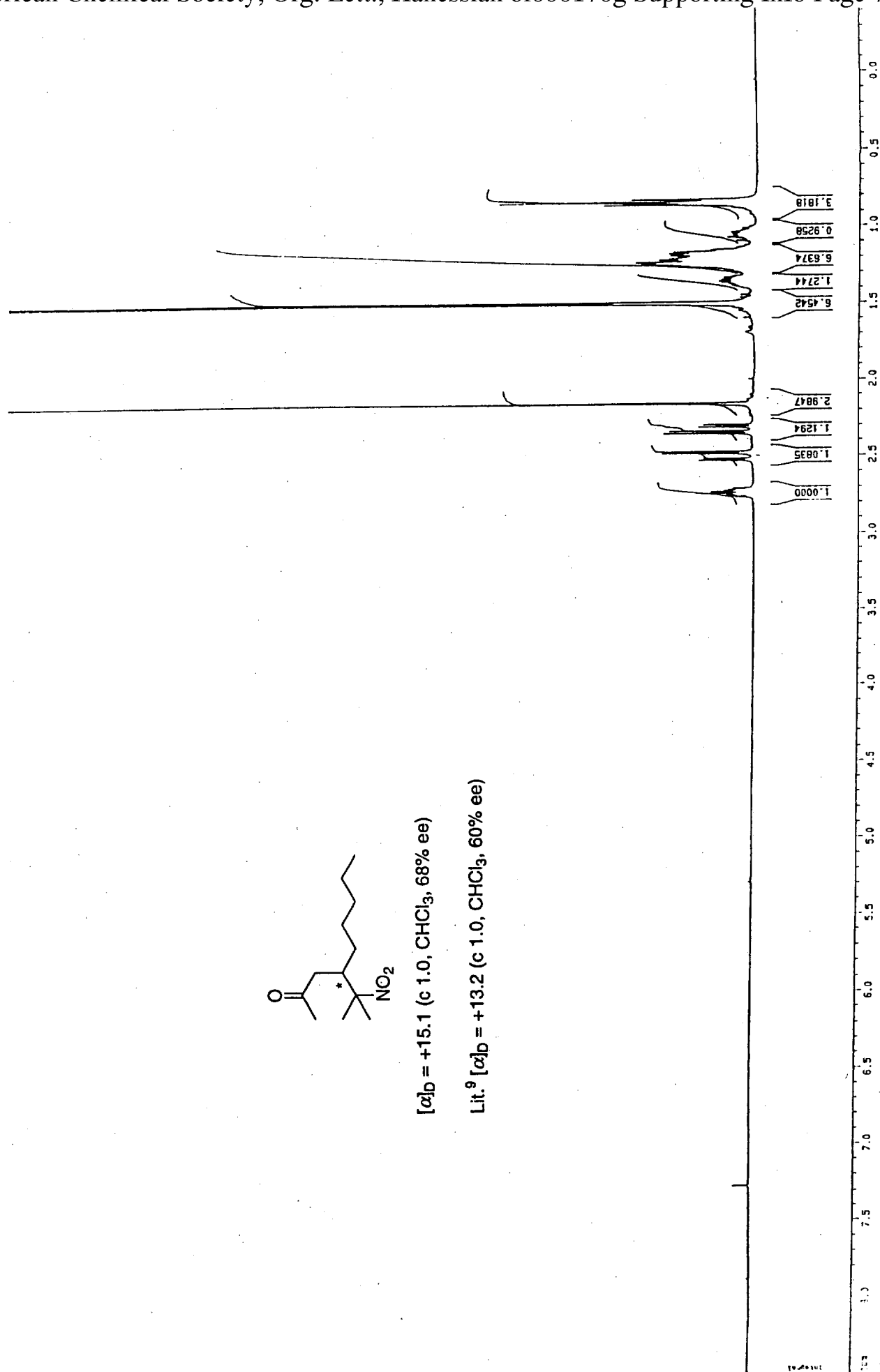


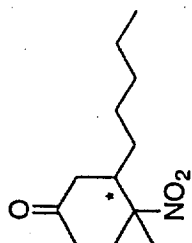
ppm



$[\alpha]_D = +15.1$ (c 1.0, CHCl_3 , 68% ee)

Lit.⁹ $[\alpha]_D = +13.2$ (c 1.0, CHCl_3 , 60% ee)





$[\alpha]_D = +15.1$ (c 1.0, CHCl_3 , 68% ee)

Lit.⁹ $[\alpha]_D = +13.2$ (c 1.0, CHCl_3 , 60% ee)

