

## Supporting Information

### A Diastereoselective Approach to Amino Alcohols and Application for Divergent Synthesis of Dolastatin 10

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E-mail: sicm@fudan.edu.cn (Si C.-M.); bgwei1974@fudan.edu.cn (Wei B.-G.)

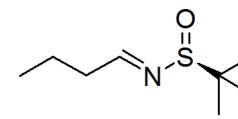
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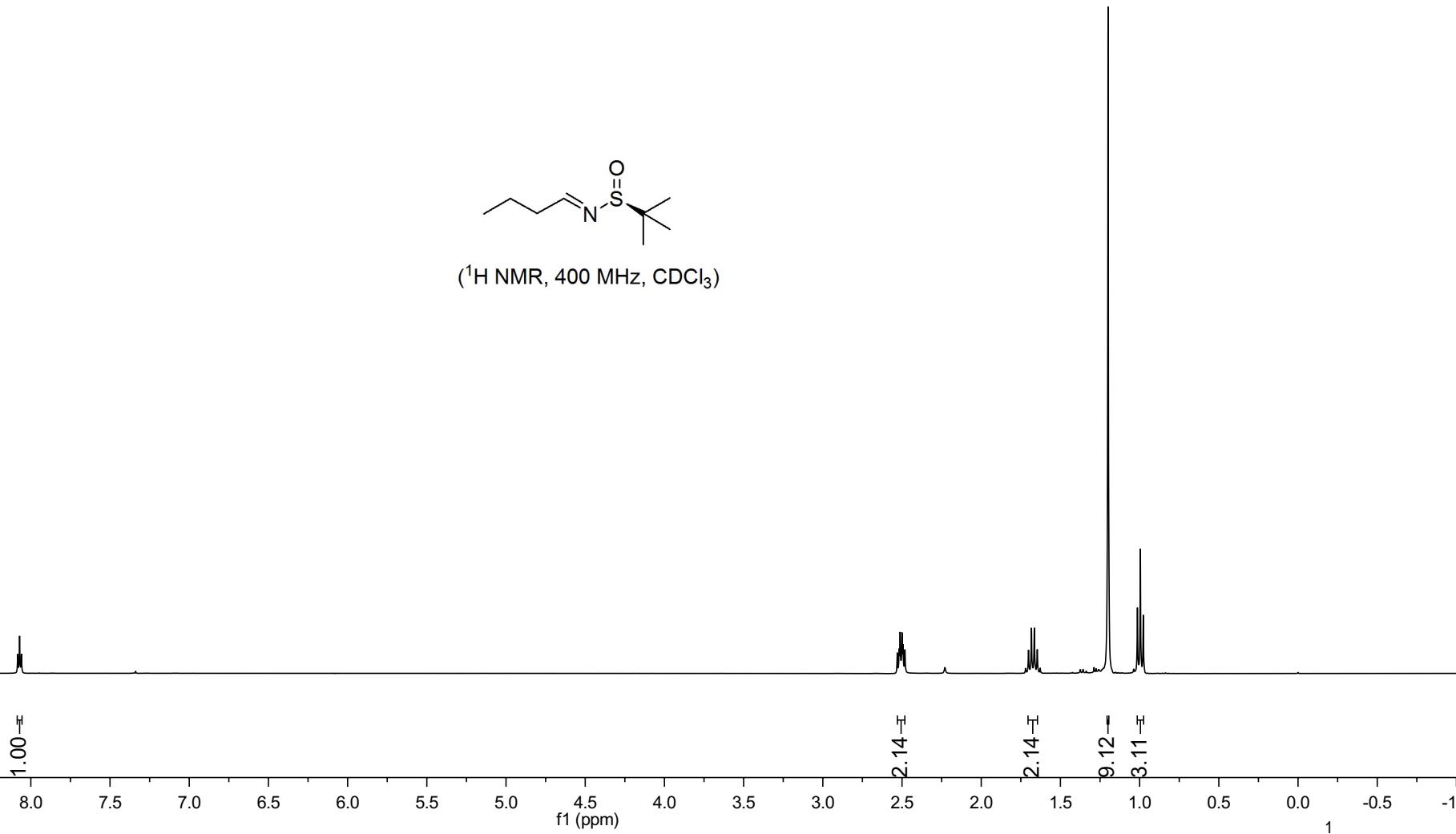
NMR spectra of compound 8a

8.083  
8.071  
8.059

2.530  
2.518  
2.512  
2.500  
2.493  
2.482  
1.702  
1.683  
1.665  
1.646  
1.199  
1.014  
0.995  
0.977



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8a

—169.605

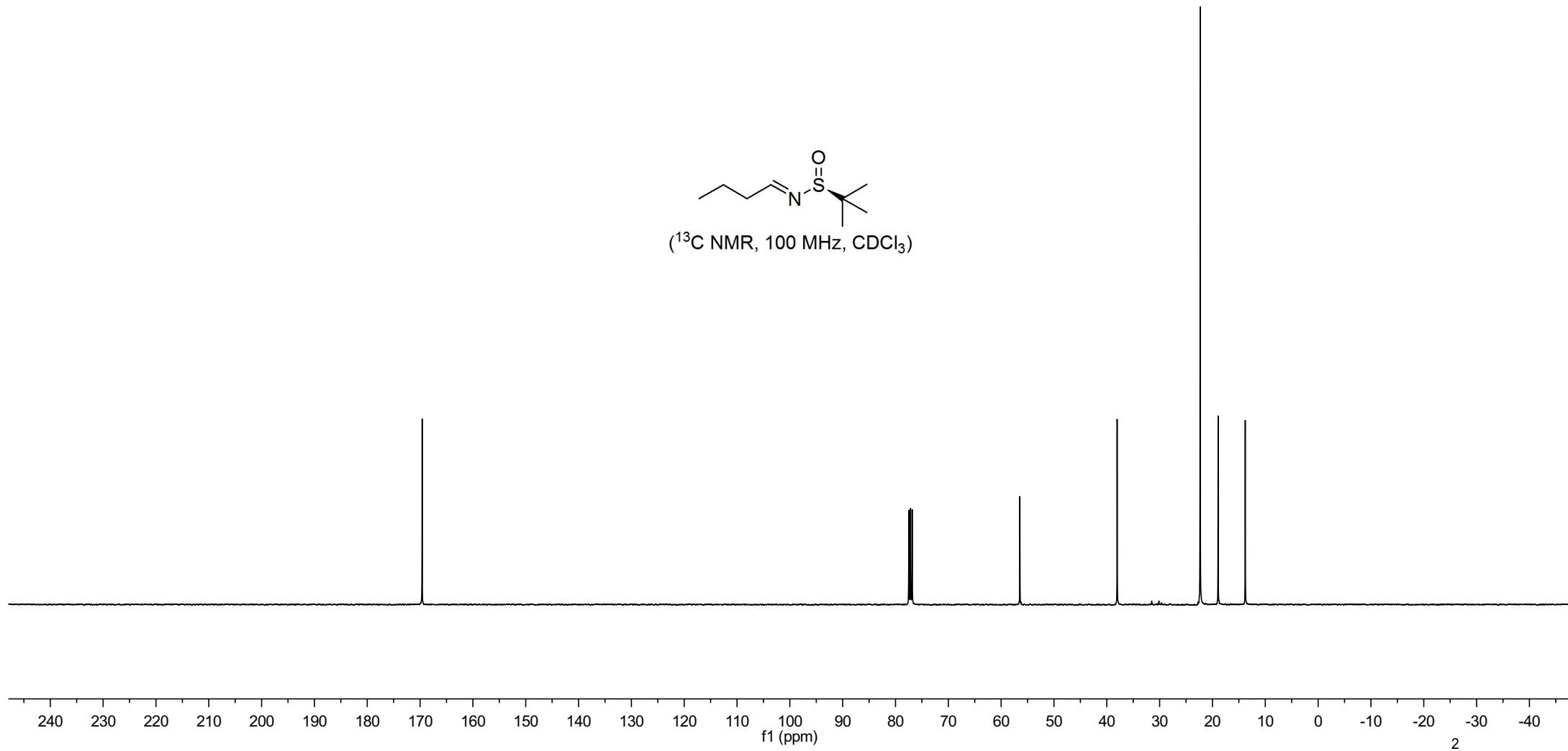
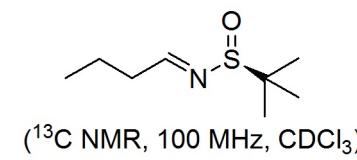
—56.456

—38.039

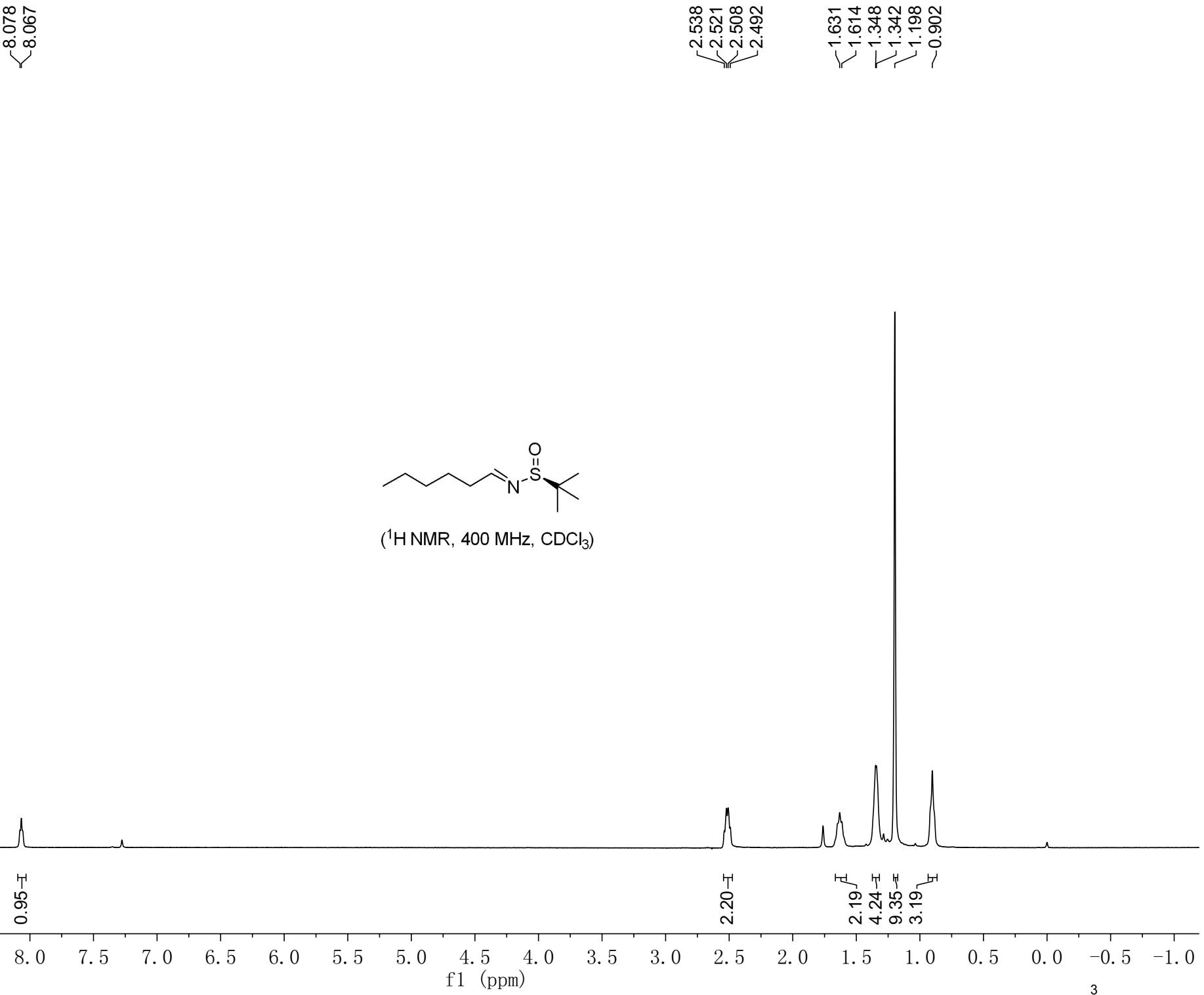
—22.329

~18.931

—13.795



NMR spectra of compound 8b



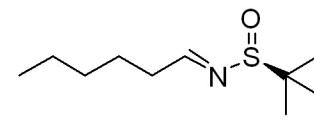
NMR spectra of compound 8b

—169.948

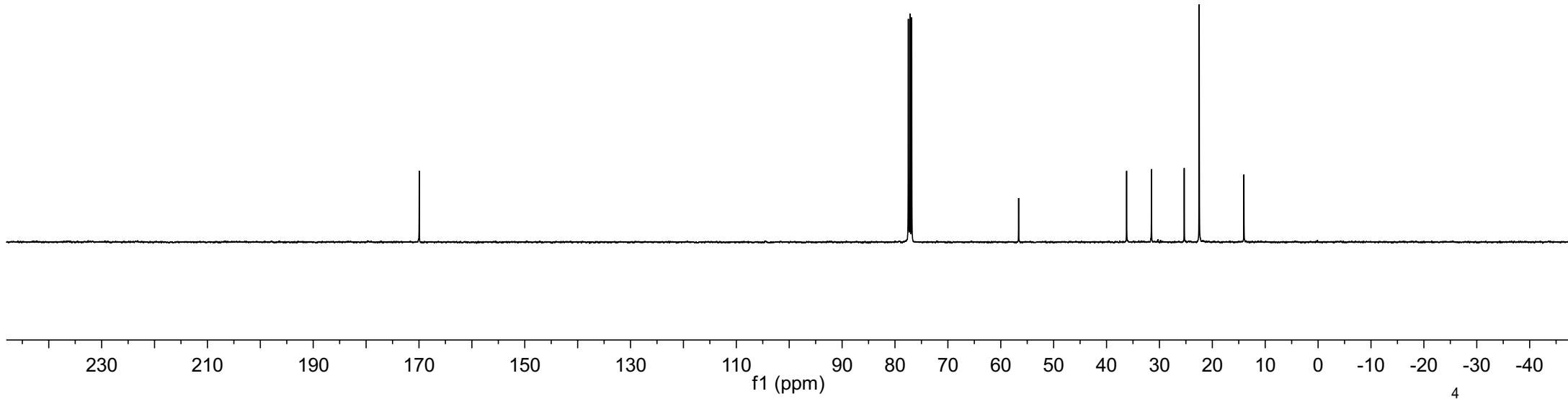
—56.625

—36.209  
—31.507  
—25.311  
—22.476

—14.026



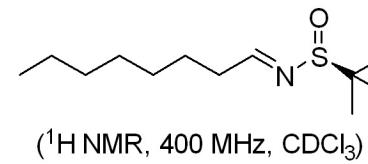
(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 8c

8.079  
8.067  
8.055

2.541  
2.529  
2.523  
2.511  
2.504  
2.492  
1.644  
1.627  
1.608  
1.327  
1.309  
1.282  
1.197  
0.901  
0.884  
0.867



0.91

2.03

2.13  
8.18  
9.11  
3.02

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 -1.0

f1 (ppm)

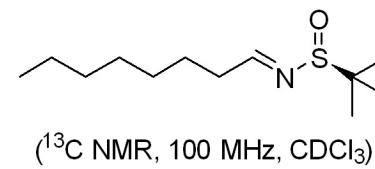
5

NMR spectra of compound 8c

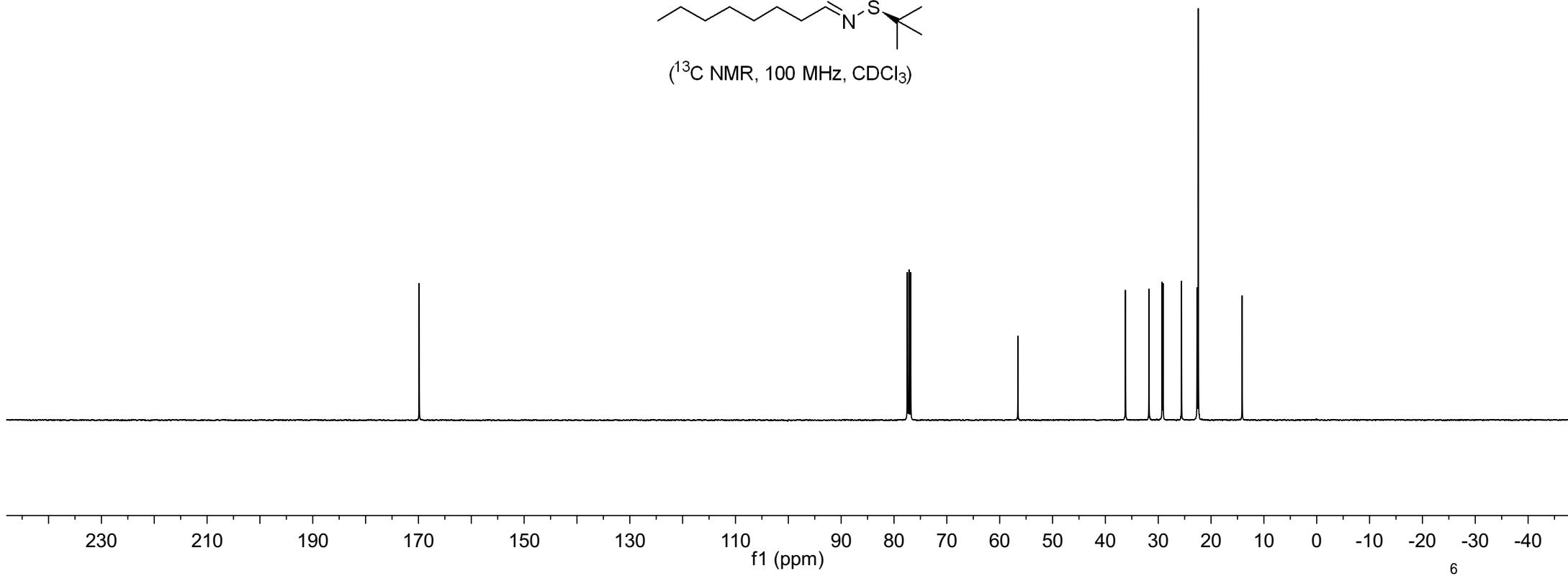
—169.863

—56.547

36.193  
31.747  
29.265  
29.078  
25.585  
22.652  
22.416  
14.113



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

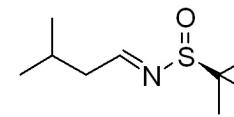


NMR spectra of compound 8d

8.074  
8.062  
8.050

2.432  
2.418  
2.415  
2.402  
2.103  
2.087  
2.070  
2.053  
2.037

1.206  
1.006  
0.990



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

0.93

2.15

1.00

9.13

3.03  
3.02

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

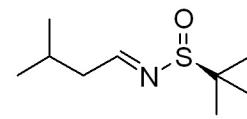
NMR spectra of compound 8d

—169.403

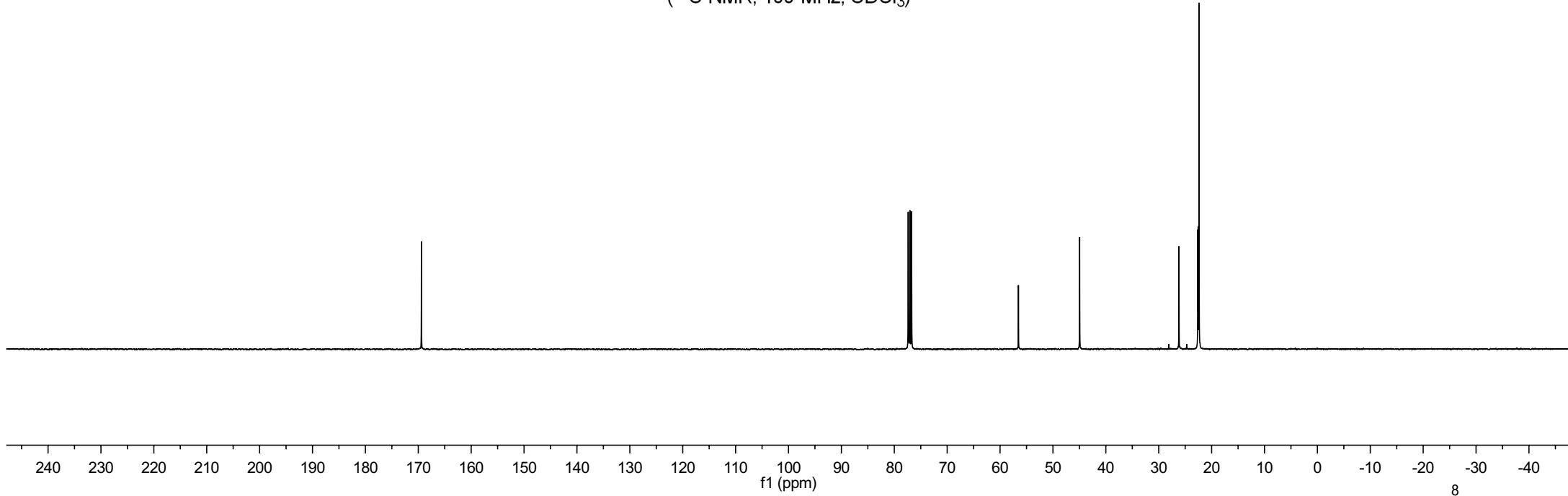
—56.524

—44.956

26.175  
22.623  
22.544  
22.380



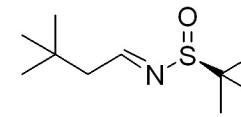
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



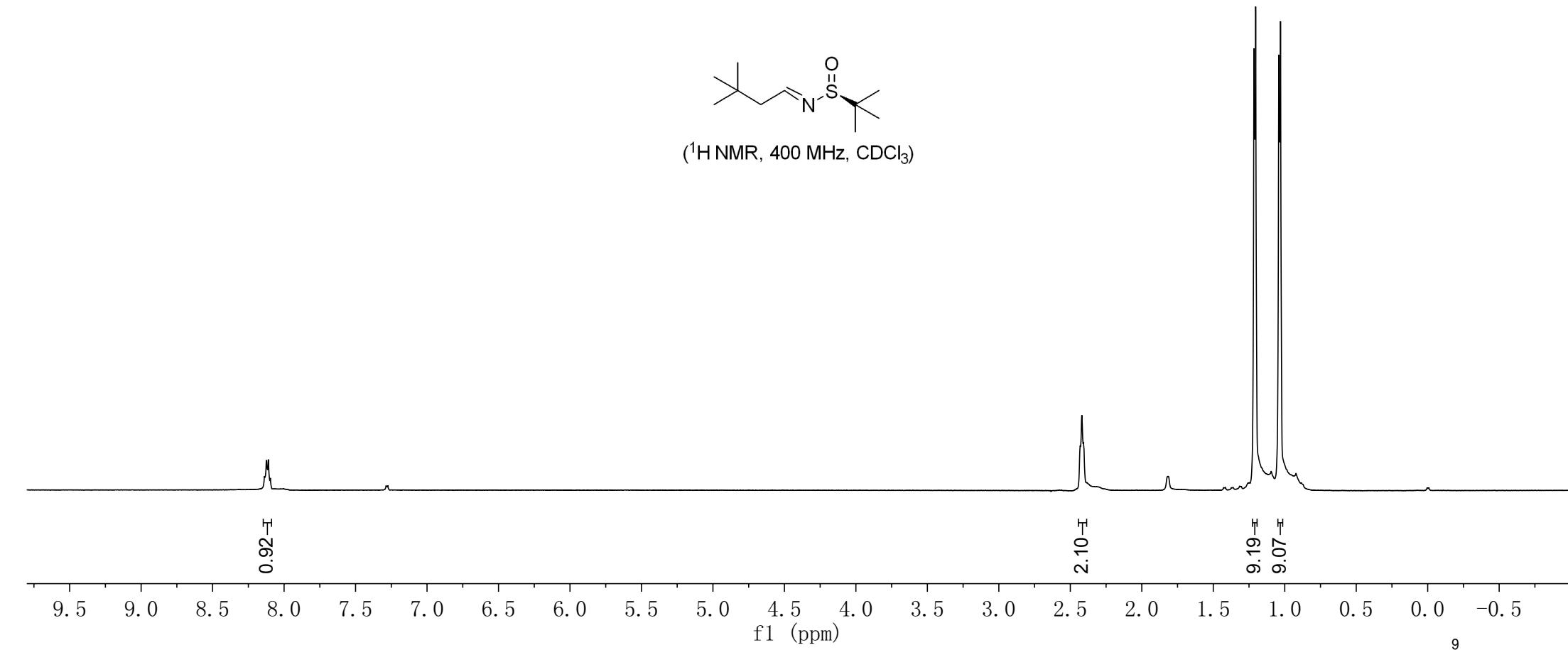
NMR spectra of compound 8e

{  
8.137  
8.124  
8.110  
8.096

{  
2.431  
2.419  
2.408  
  
/  
1.215  
1.203  
1.041  
\\  
1.029



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

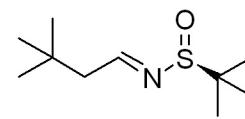


NMR spectra of compound 8e

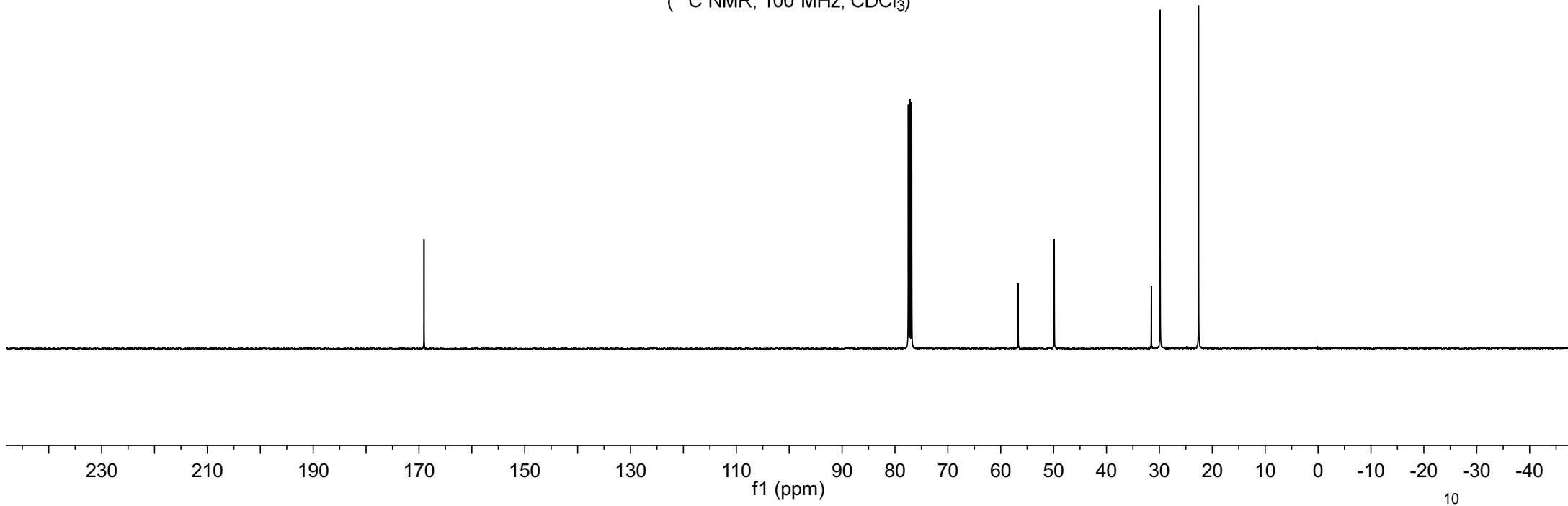
—169.043

—56.709  
—49.862

—31.525  
—29.854  
—22.587



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)

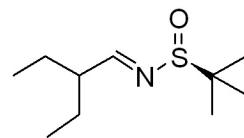


NMR spectra of compound 8f

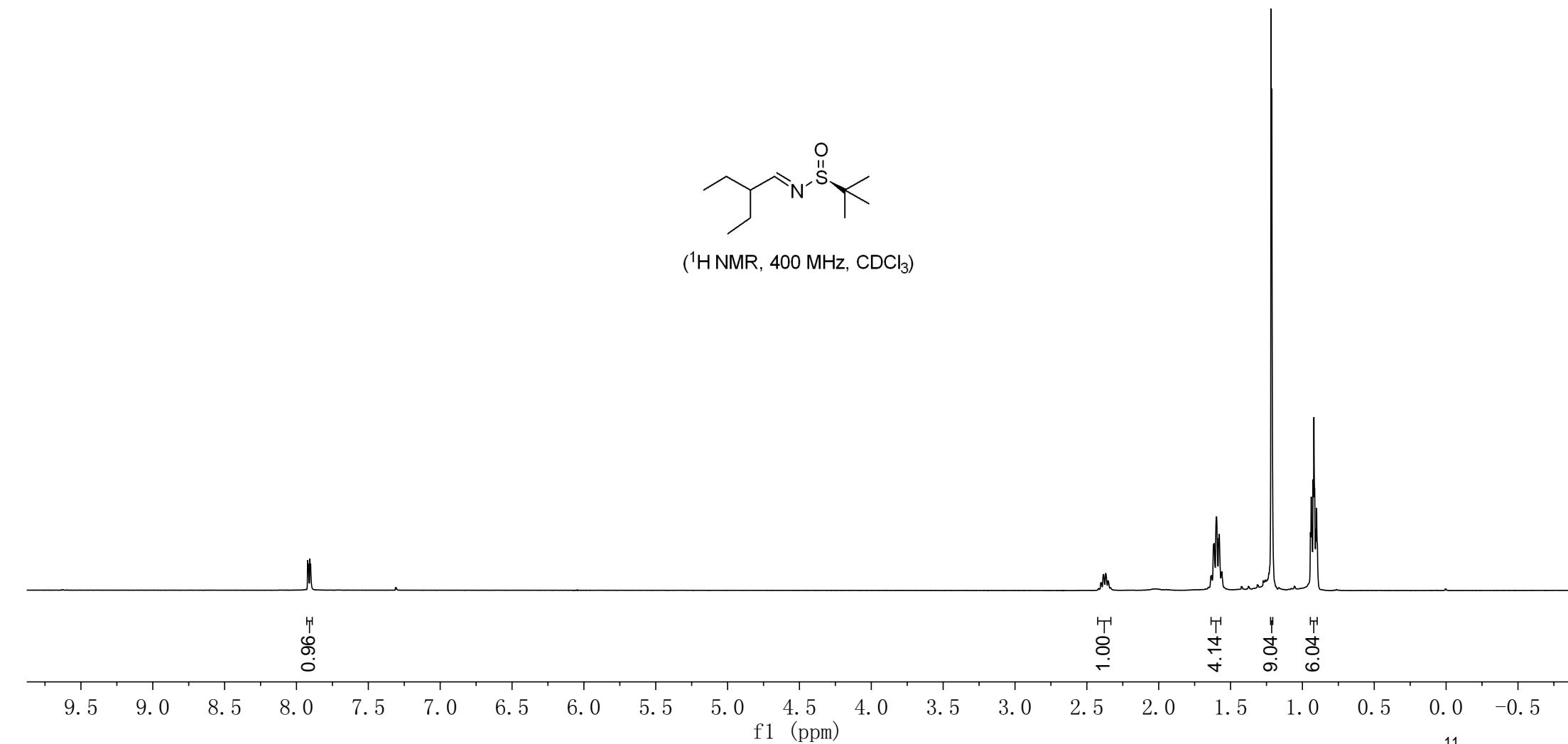
7.922  
7.917  
7.907  
7.902

2.402  
2.385  
2.369  
2.353

1.614  
1.598  
1.583  
1.579  
1.219  
1.213  
0.944  
0.939  
0.926  
0.920  
0.915  
0.907  
0.901



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8f

—173.314

—56.544

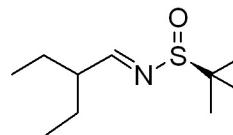
—48.844

—24.634

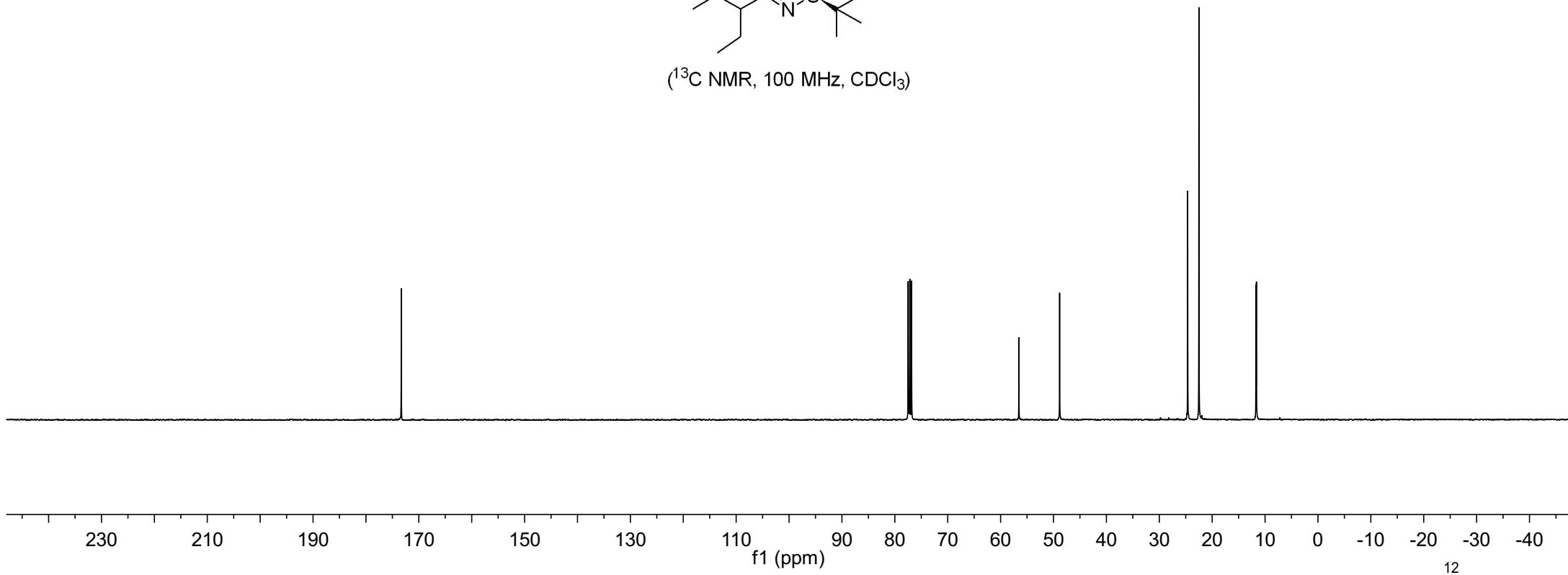
—22.506

—11.721

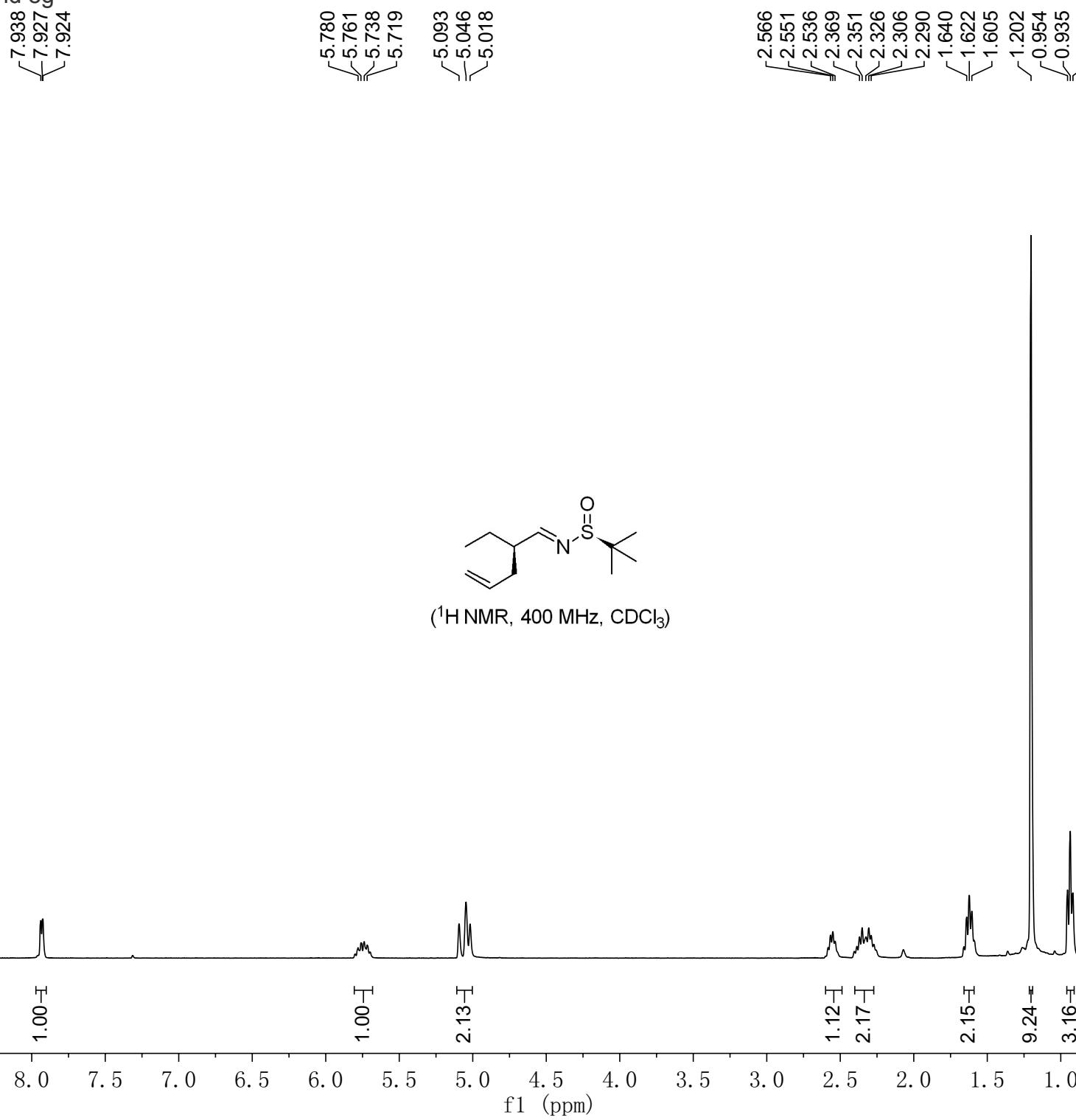
—11.633



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



## NMR spectra of compound 8g



NMR spectra of compound 8g

—172.404

—135.387

—117.011

—56.466

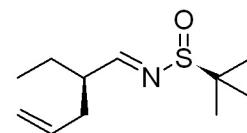
—46.731

—35.763

—24.470

—22.405

—11.421



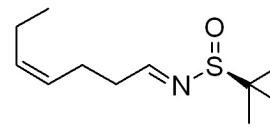
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

230 210 190 170 150 130 110 90 70 60 50 40 30 20 10 0 -10 -20 -30 -40

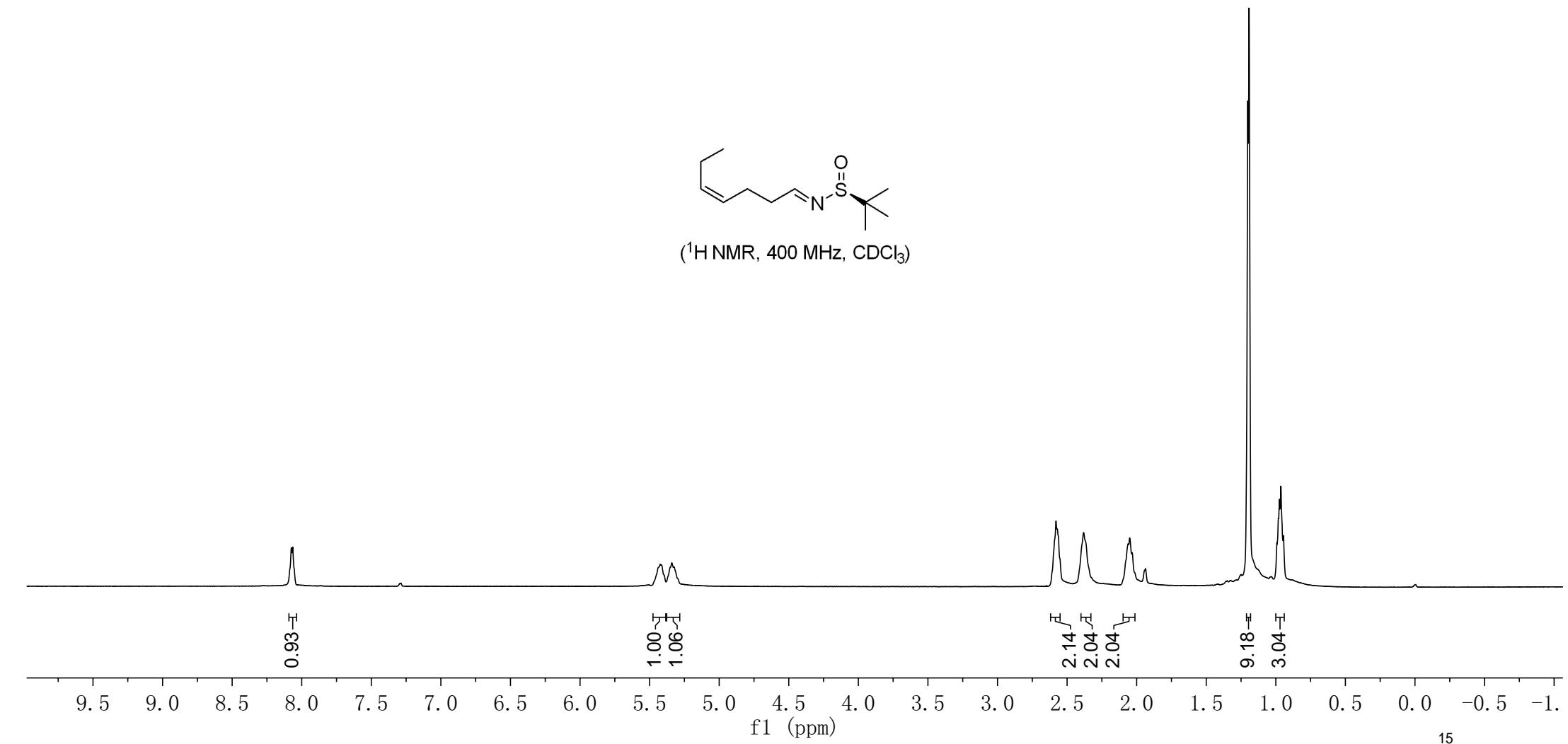
f1 (ppm)

NMR spectra of compound 8h

8.075  
8.065  
5.423  
5.341  
2.580  
2.381  
2.061  
2.050  
2.033  
1.202  
1.192  
0.981  
0.974  
0.964

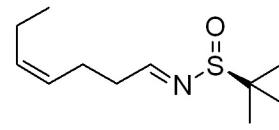


(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

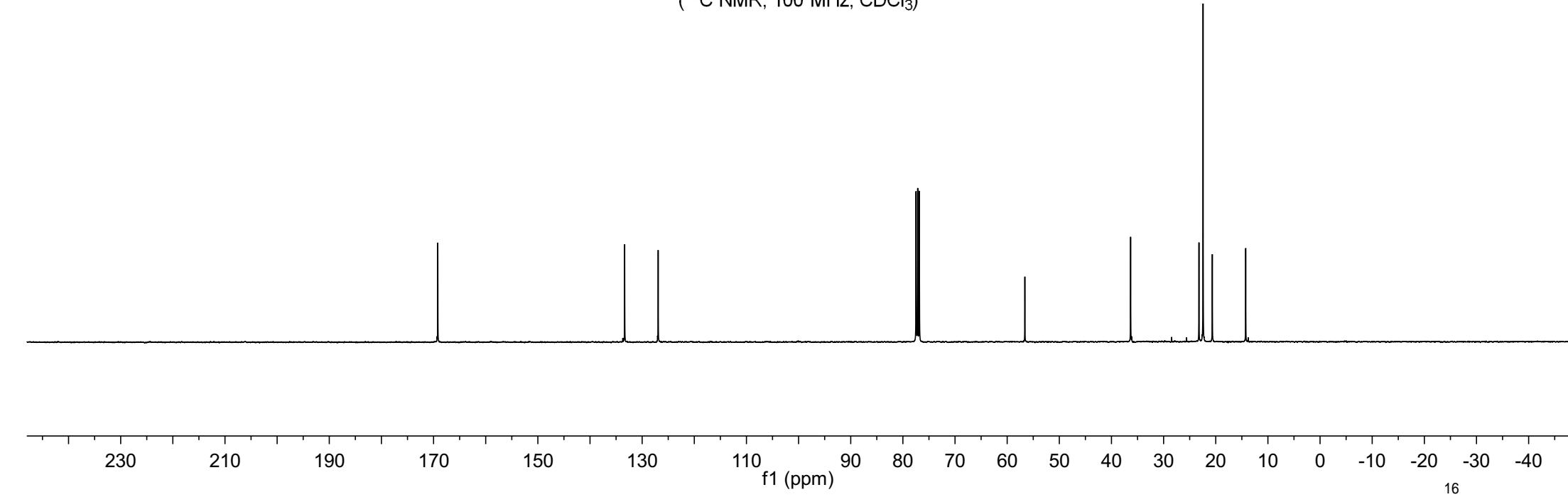


NMR spectra of compound 8h

—169.187  
—133.352  
—126.925  
—56.607  
—36.326  
—23.224  
—22.432  
—20.660  
—14.256



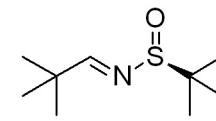
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



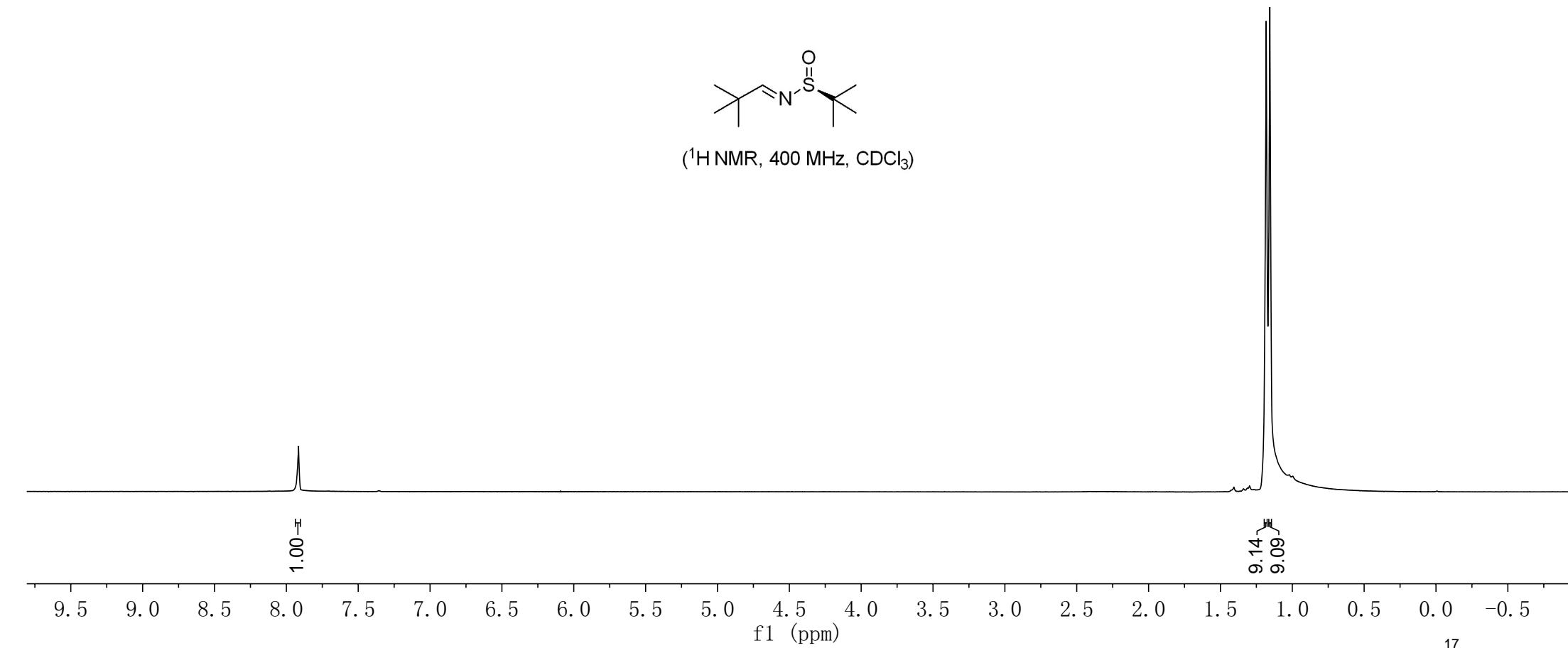
NMR spectra of compound 8i

-7.915

1.182  
1.156



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8i

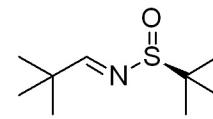
—175.585

—56.424

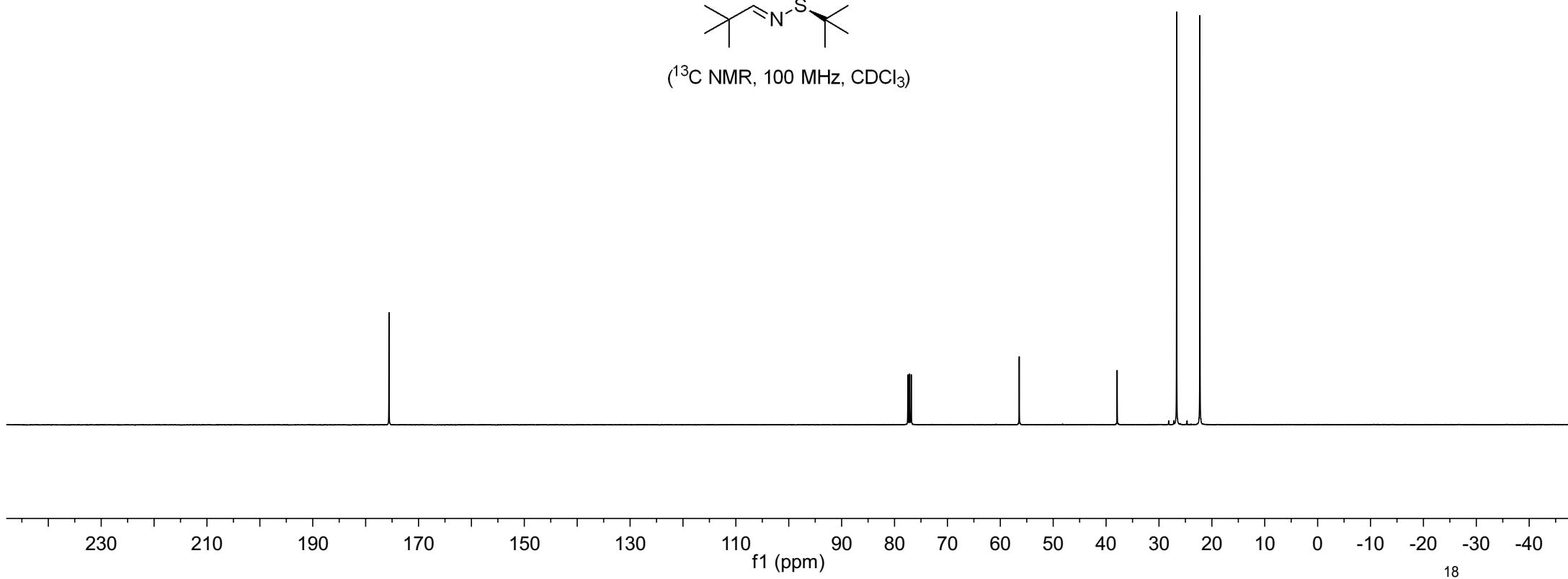
—37.908

—26.664

—22.264



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

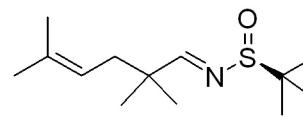


NMR spectra of compound 8j

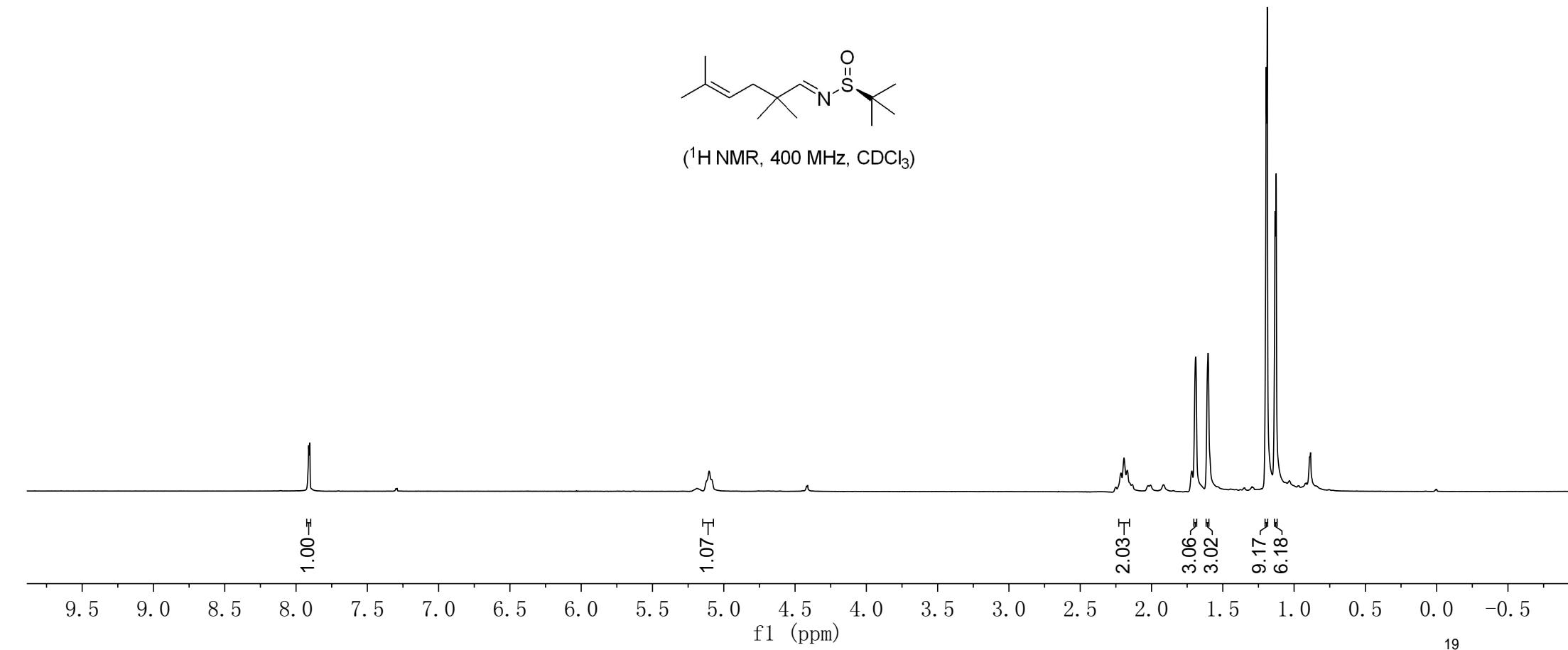
7.912  
7.904

—5.102

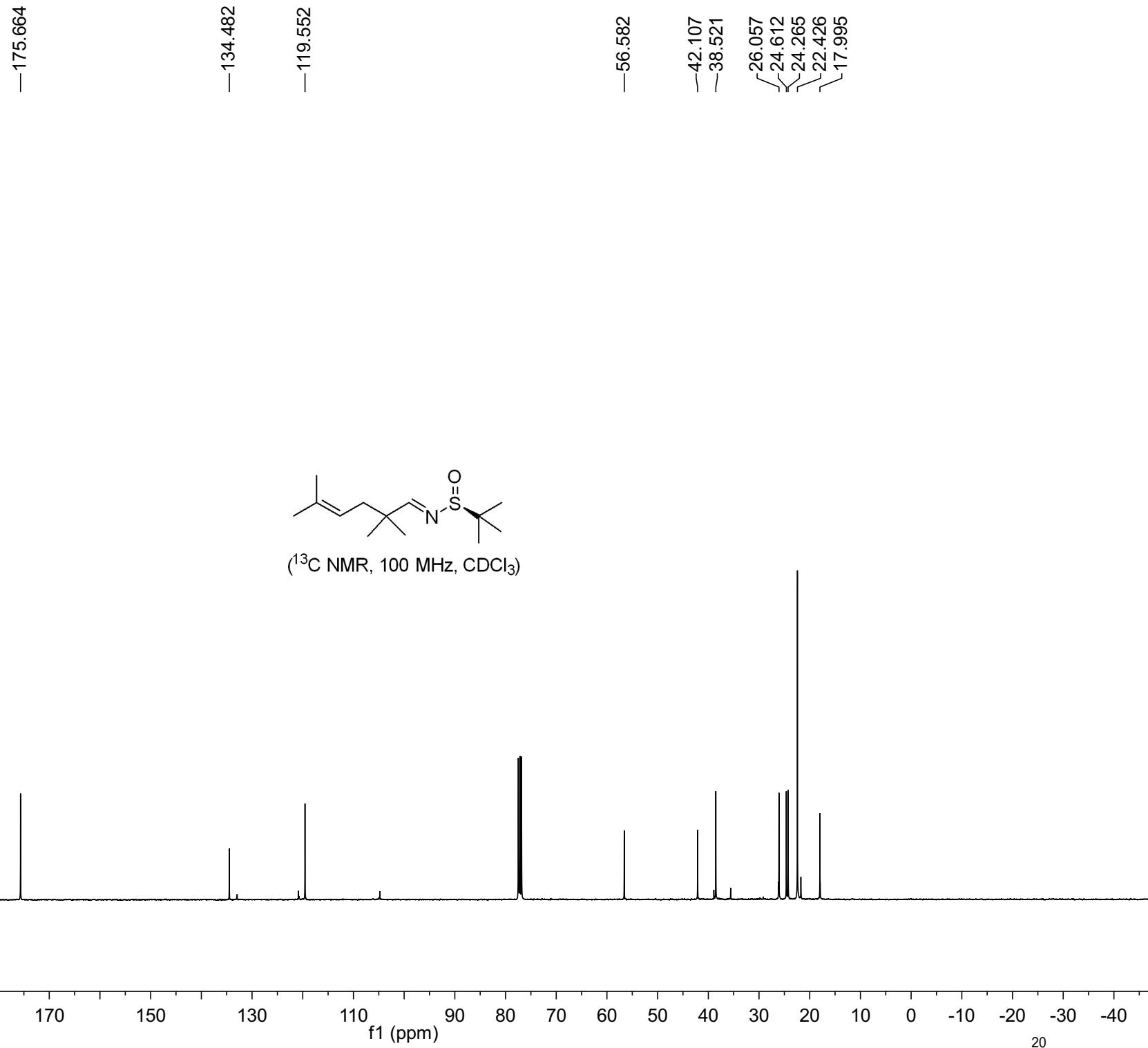
2.214  
2.193  
2.170  
~1.690  
~1.603  
1.196  
1.188  
1.133  
1.126



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



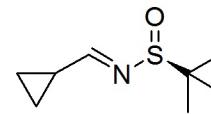
NMR spectra of compound 8j



NMR spectra of compound 8k

<7.449  
7.468

2.011  
2.000  
1.991  
1.989  
1.980  
1.969  
1.966  
1.969  
1.189  
1.105  
1.096  
1.085  
1.076  
0.972  
0.967  
0.960  
0.957

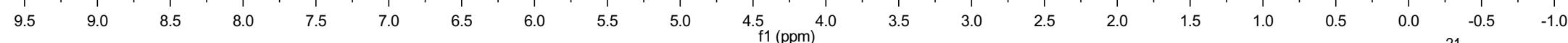


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

1.00  $\text{\AA}$

1.16  $\text{\AA}$

9.23  $\text{\AA}$   
2.12  $\text{\AA}$   
2.00  $\text{\AA}$



NMR spectra of compound 8k

—171.787

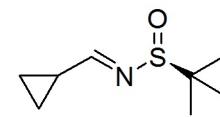
—56.701

—22.339

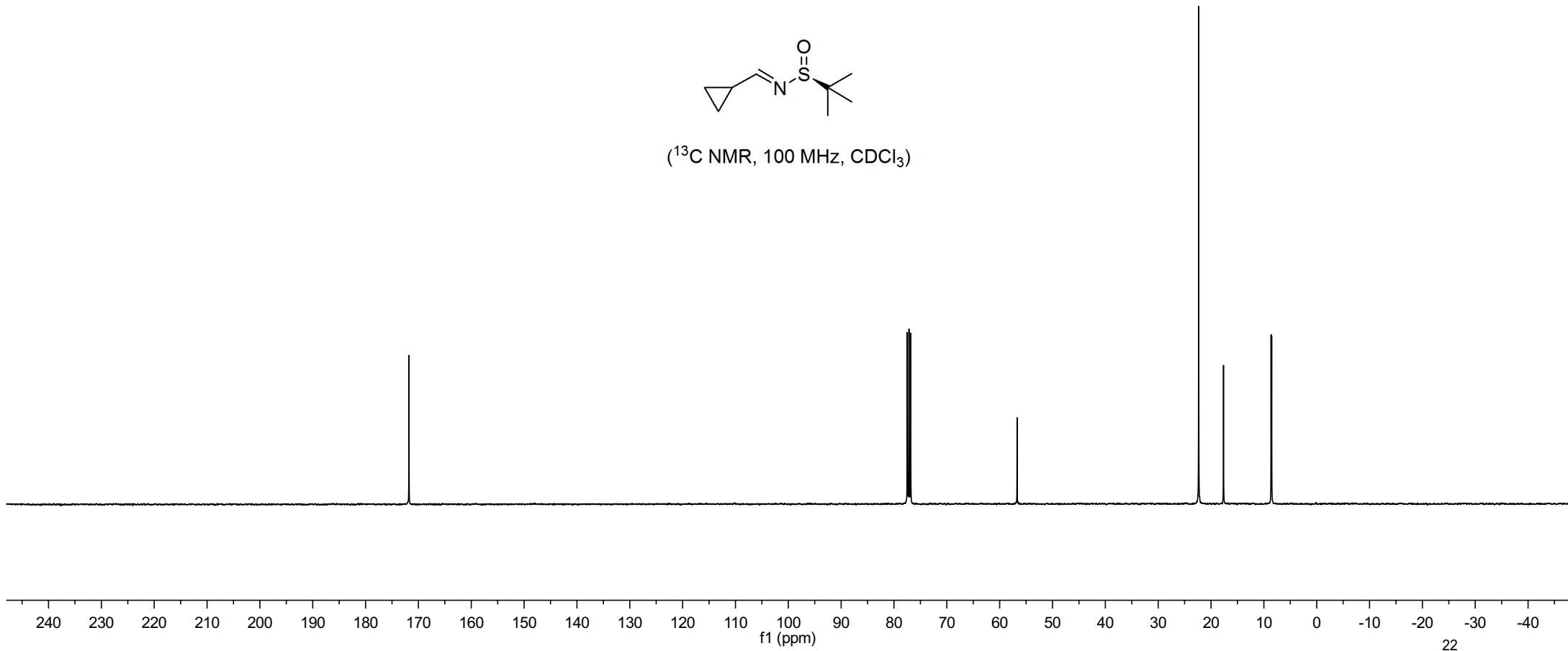
—17.641

—8.635

—8.524



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

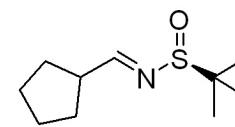


NMR spectra of compound 8l

8.002  
7.996  
7.988  
7.983

2.962  
2.948

1.904  
1.883  
1.870  
1.706  
1.686  
1.193  
1.188



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

1.00

1.05

2.11  
6.17

9.16

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

f1 (ppm)

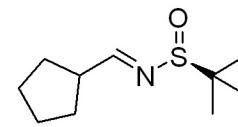
NMR spectra of compound 8l

—172.567

—56.543

—45.695

29.996  
29.909  
25.607  
25.591  
22.375



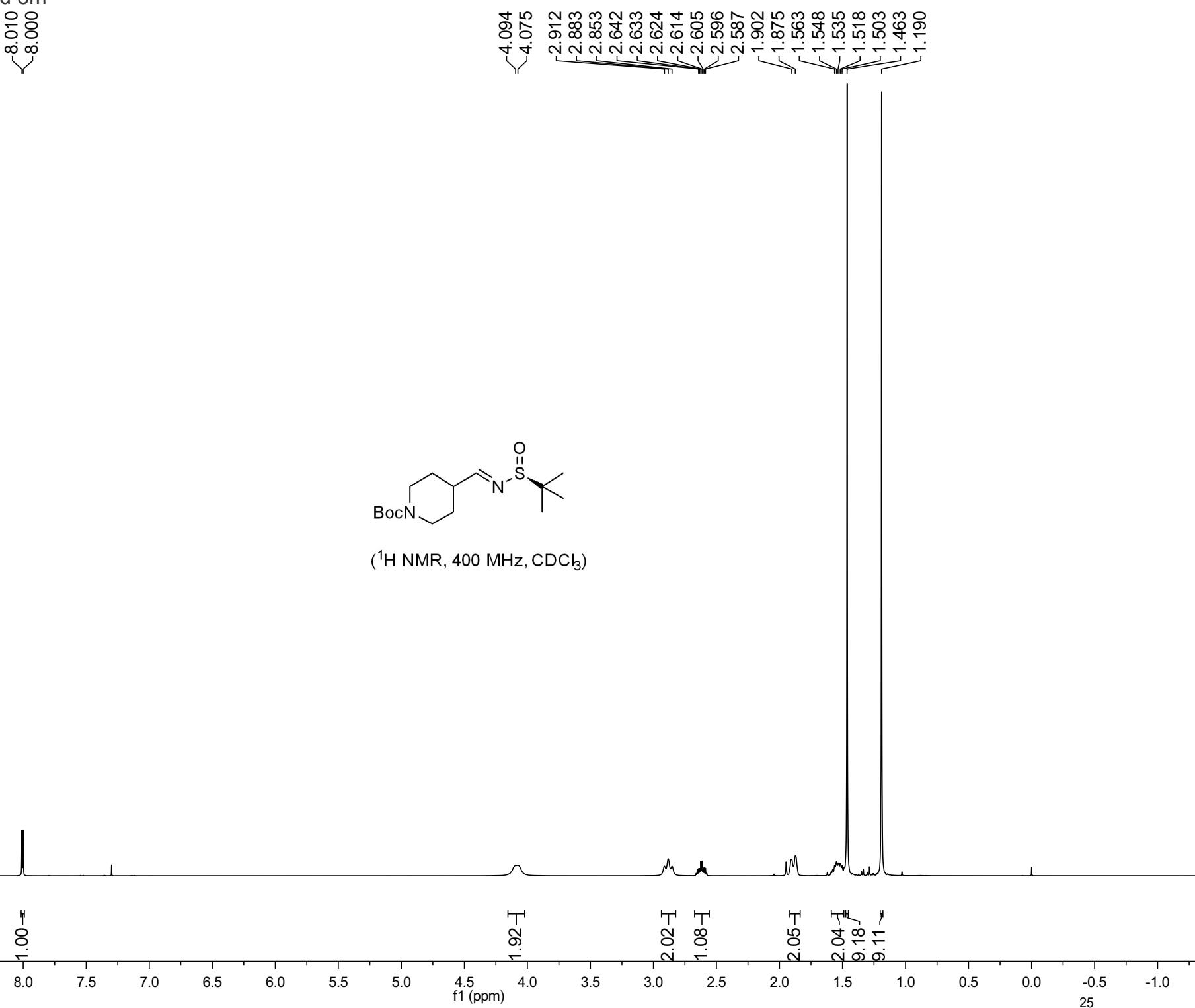
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

230 210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40

f1 (ppm)

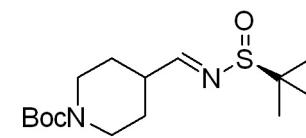
24

NMR spectra of compound 8m

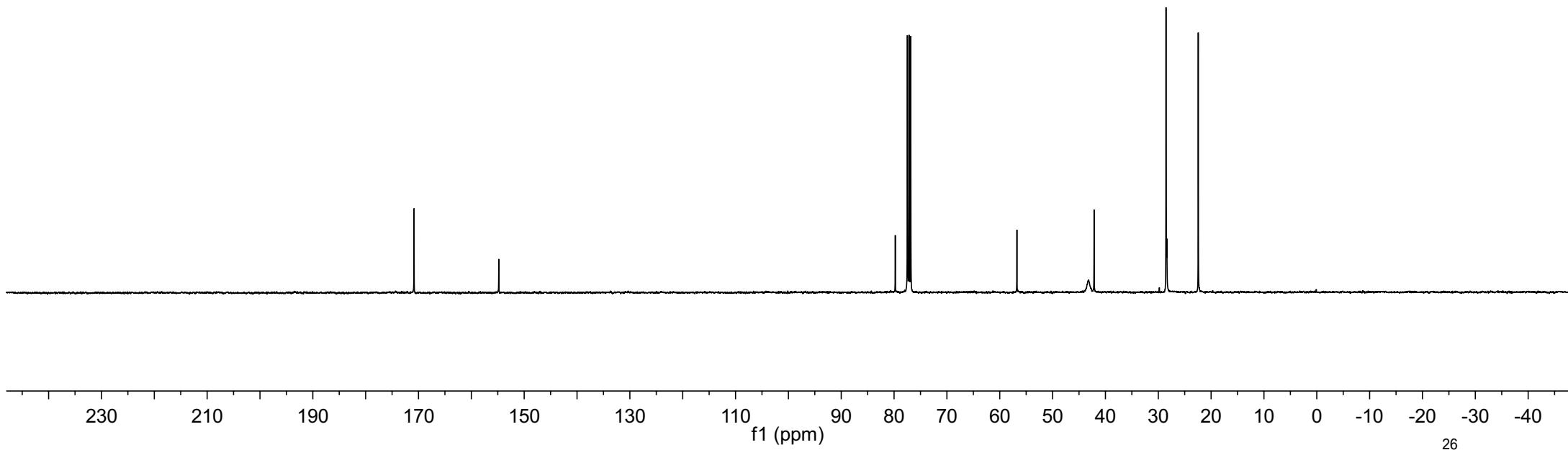


NMR spectra of compound 8m

—170.842  
—154.809  
—79.771  
—56.749  
—42.150  
—28.538  
—28.377  
—22.432



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



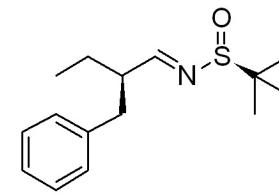
## NMR spectra of compound 8n

7.924  
7.922  
7.913

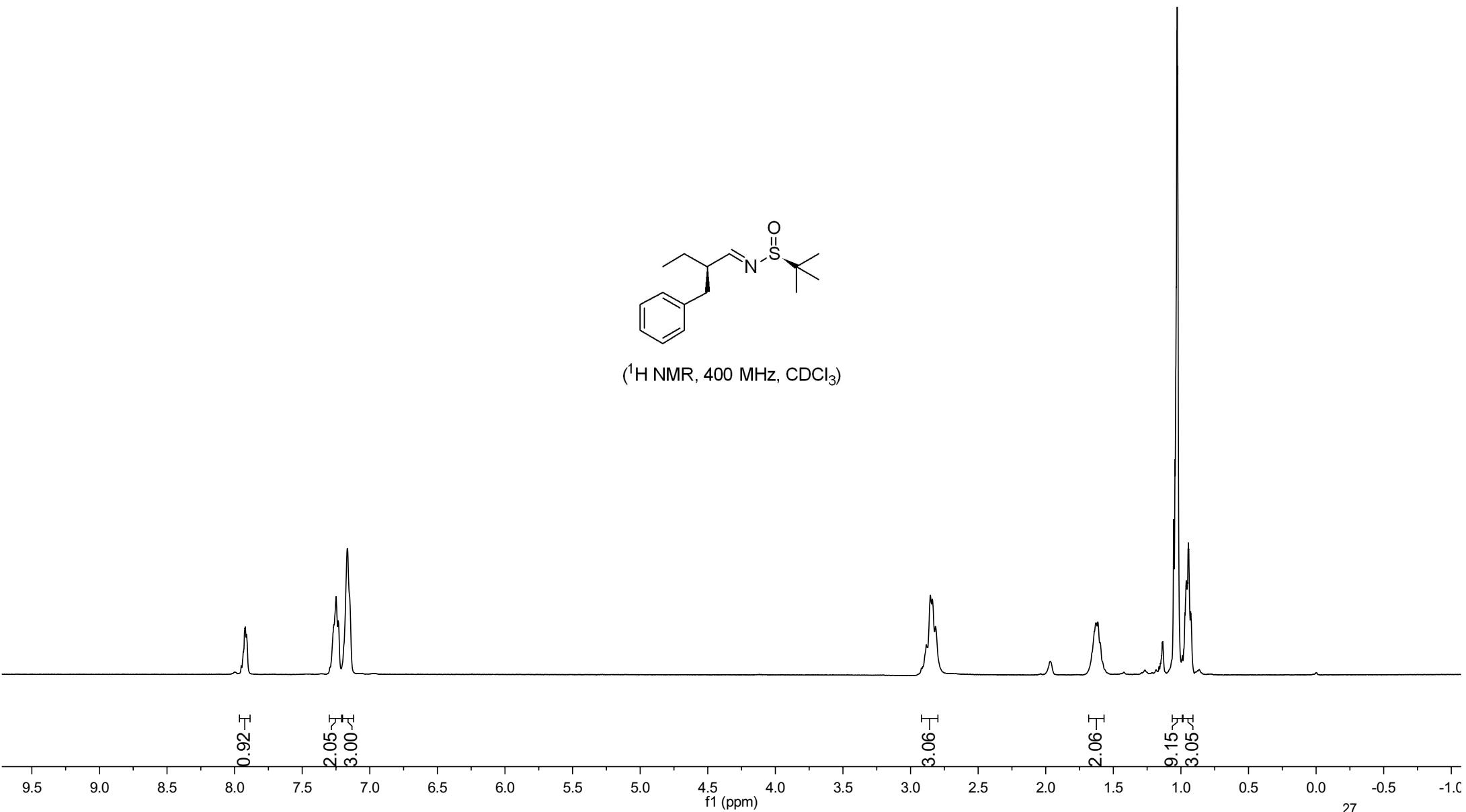
7.266  
7.250  
7.233  
7.166

2.883  
2.853  
2.839  
2.816

1.628  
1.615  
1.599  
1.044  
1.034  
1.030  
1.027  
1.025  
0.928

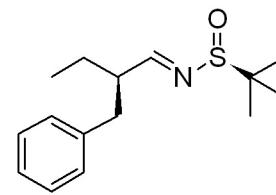


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

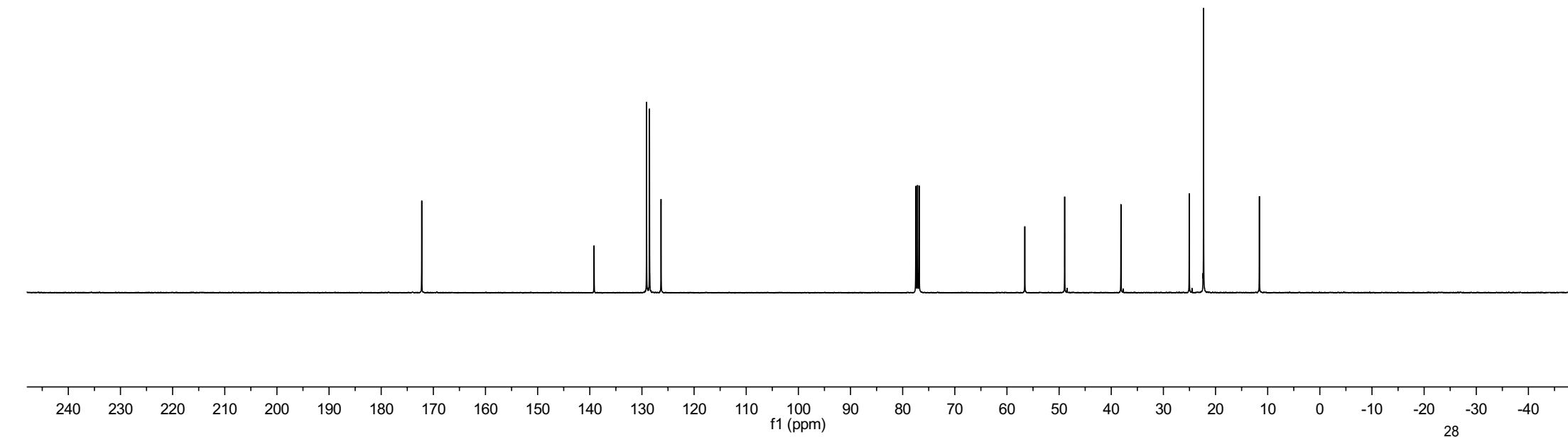


NMR spectra of compound 8n

—172.223  
—139.169  
—129.110  
—128.547  
—126.335  
—56.574  
—48.934  
—38.144  
—25.042  
—22.297  
—11.594



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



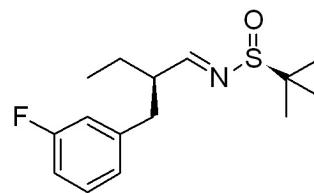
NMR spectra of compound 8o

7.915  
7.901  
7.223  
7.207  
7.189  
6.950  
6.932  
6.890  
6.867  
6.848

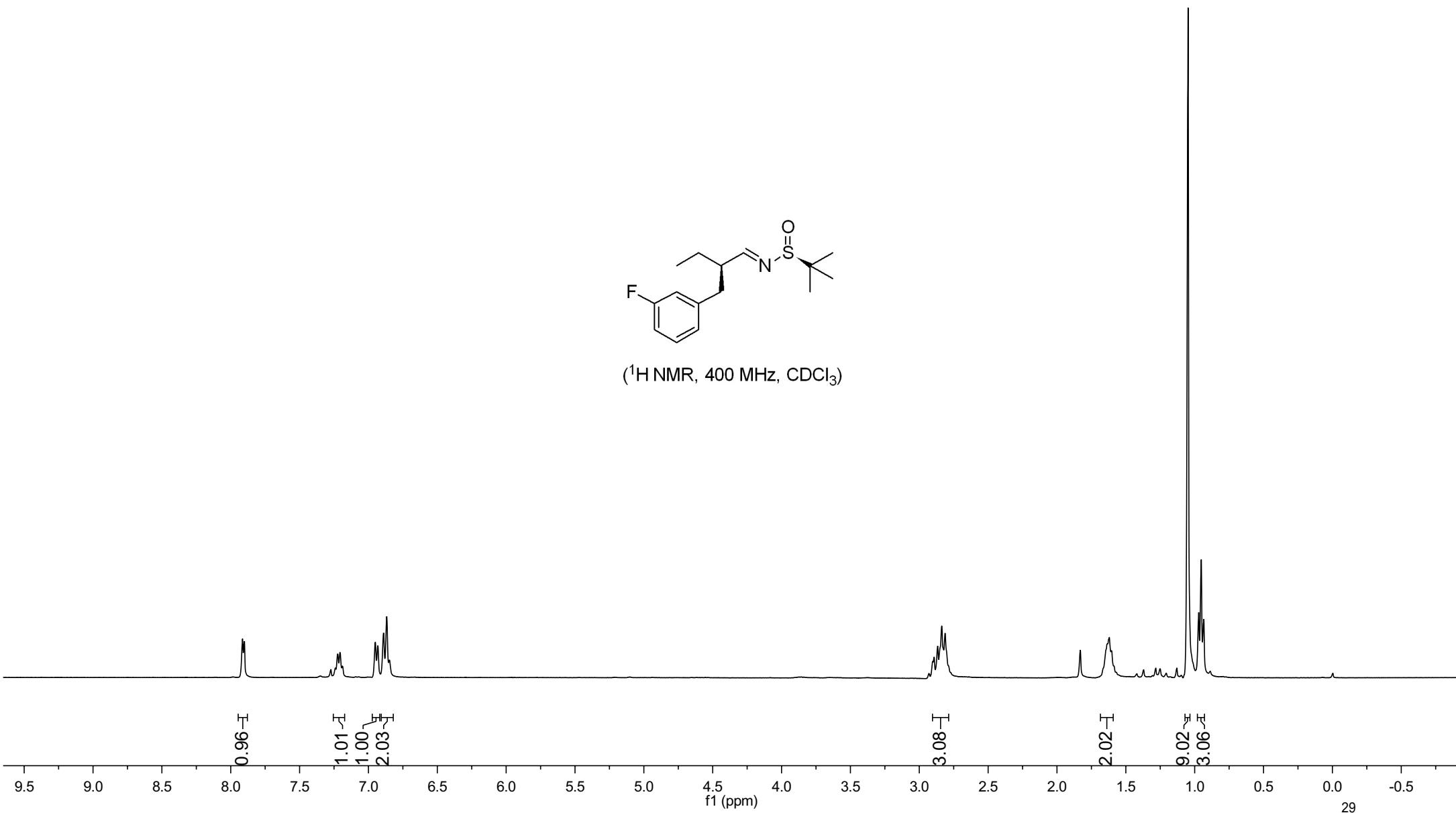
2.866  
2.837  
2.812

1.620  
1.606

1.048  
0.971  
0.952  
0.934

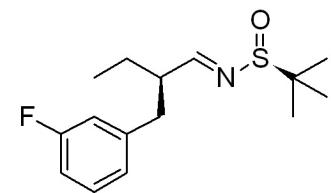


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

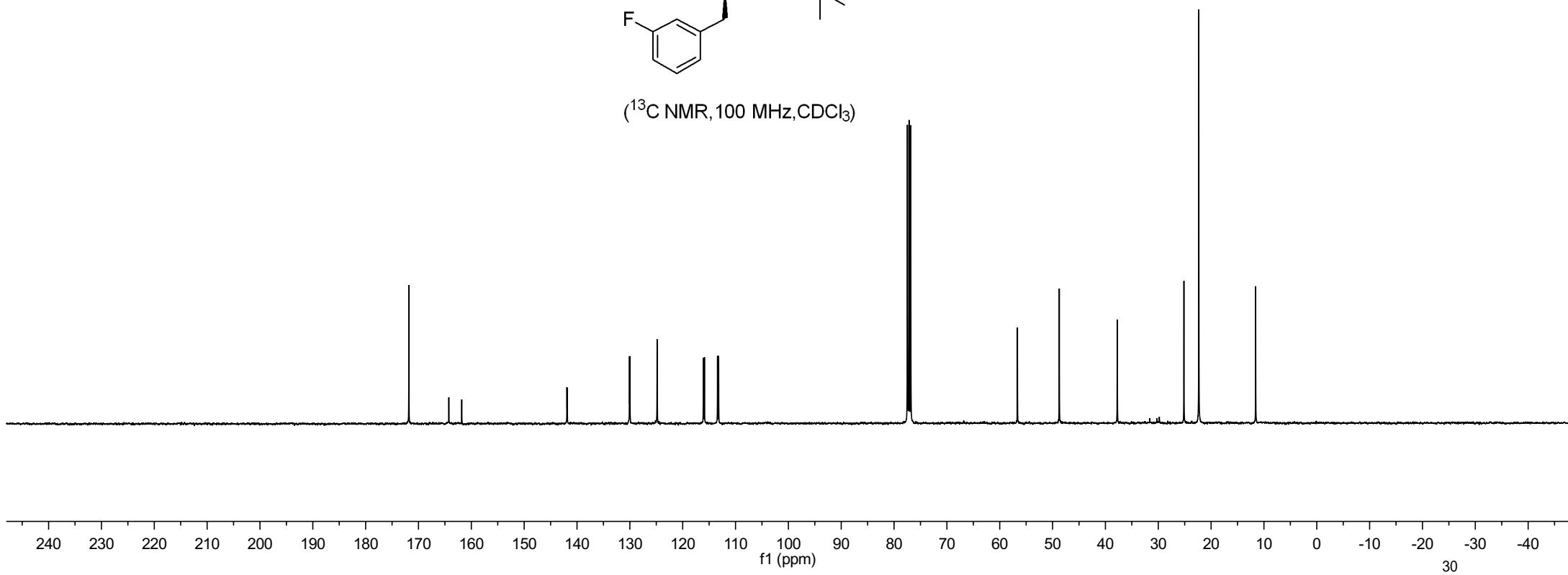


NMR spectra of compound 8o

~171.817  
~164.255  
~161.812  
  
141.908  
141.836  
130.069  
129.986  
124.842  
124.820  
116.089  
115.880  
113.407  
113.198  
  
—56.650  
—48.732  
—37.754  
—25.143  
—22.324  
—11.569

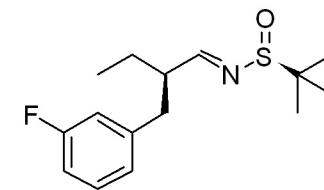


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

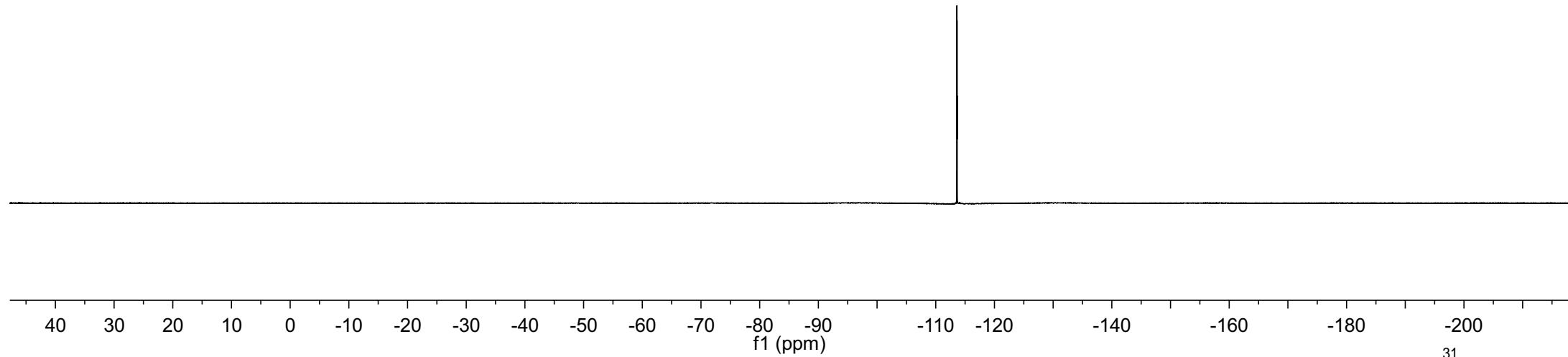


NMR spectra of compound 8o

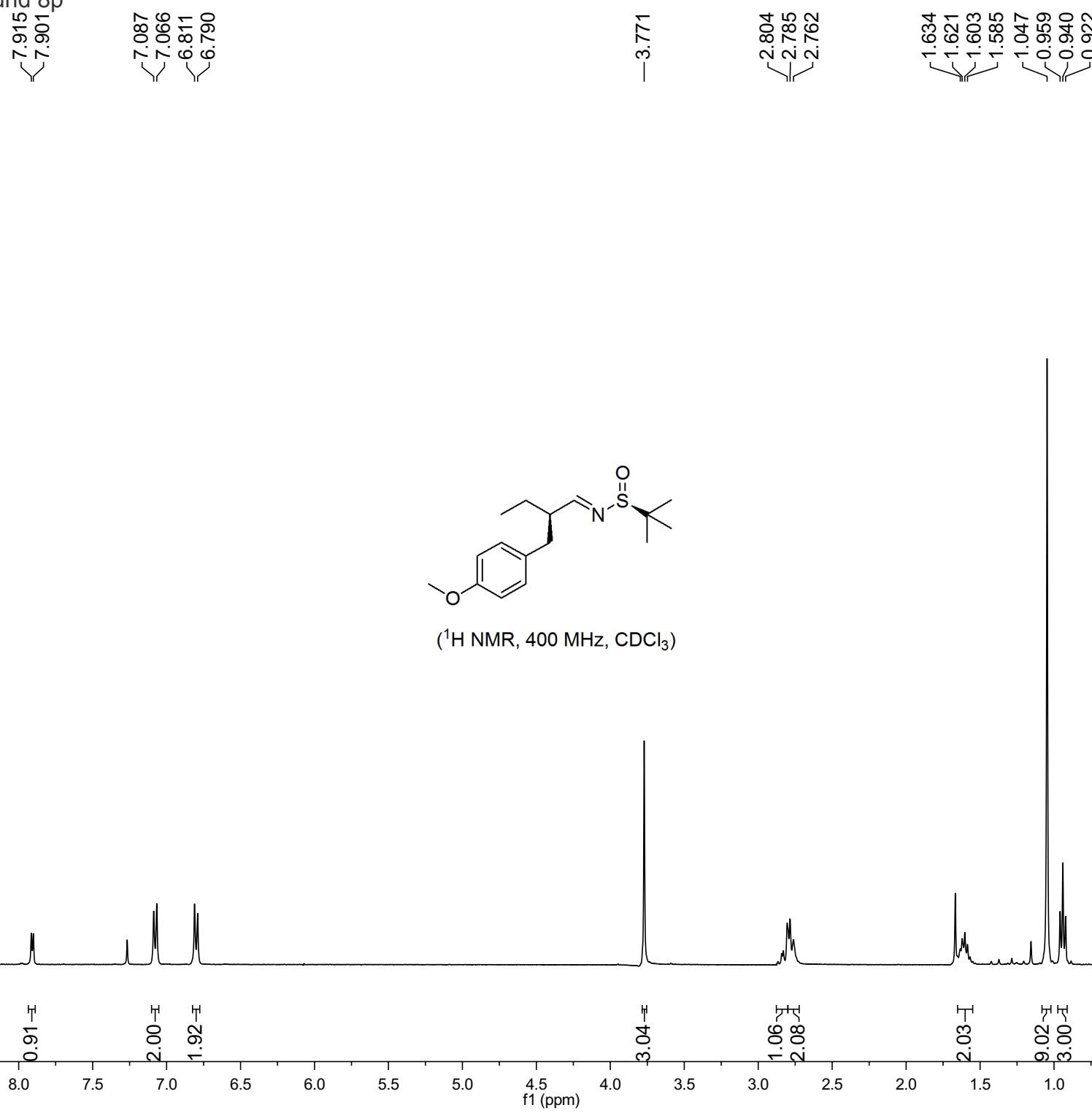
— -113.606



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ )

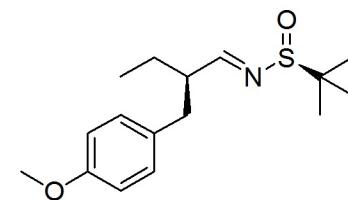


NMR spectra of compound 8p

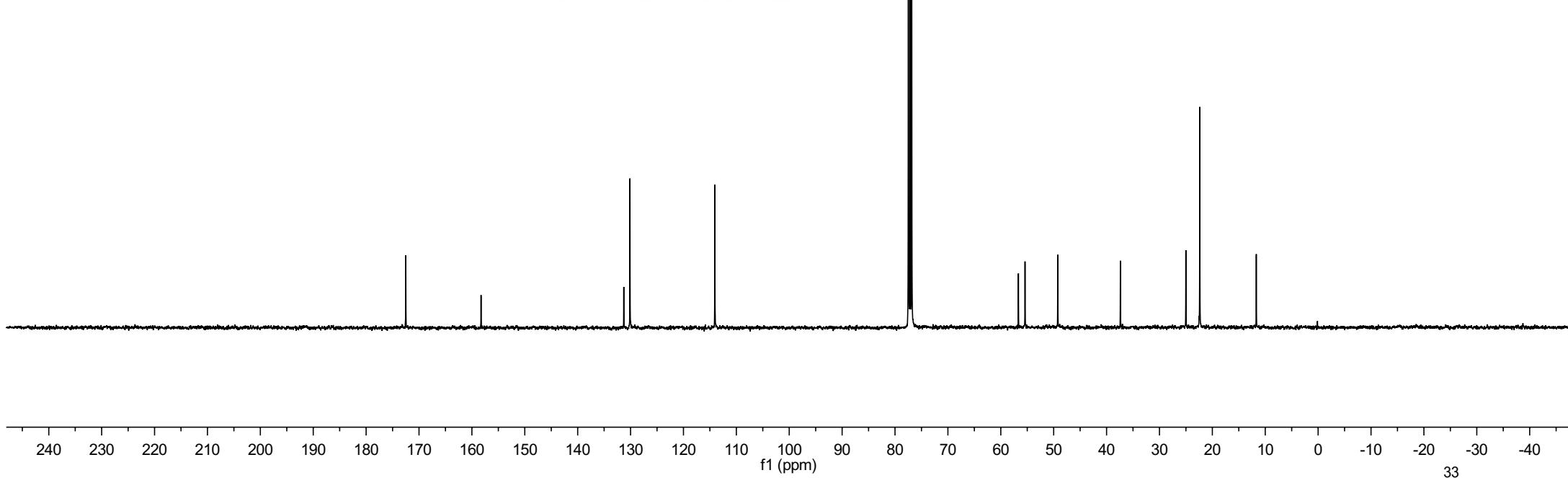


NMR spectra of compound 8p

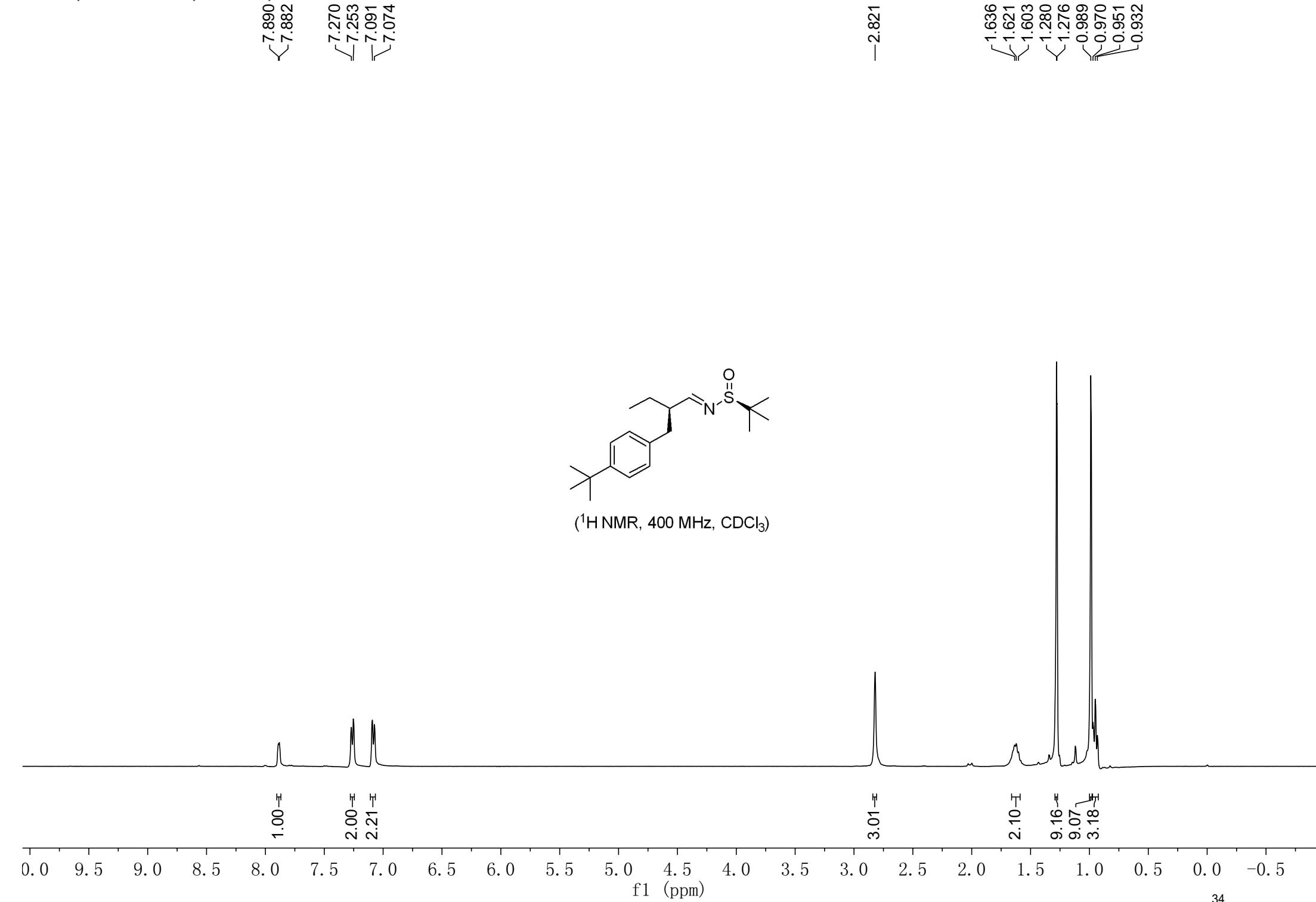
—172.499  
—158.270  
—131.284  
—130.118  
—114.068  
—56.667  
—55.417  
—49.229  
—37.386  
—25.008  
—22.380  
—11.689



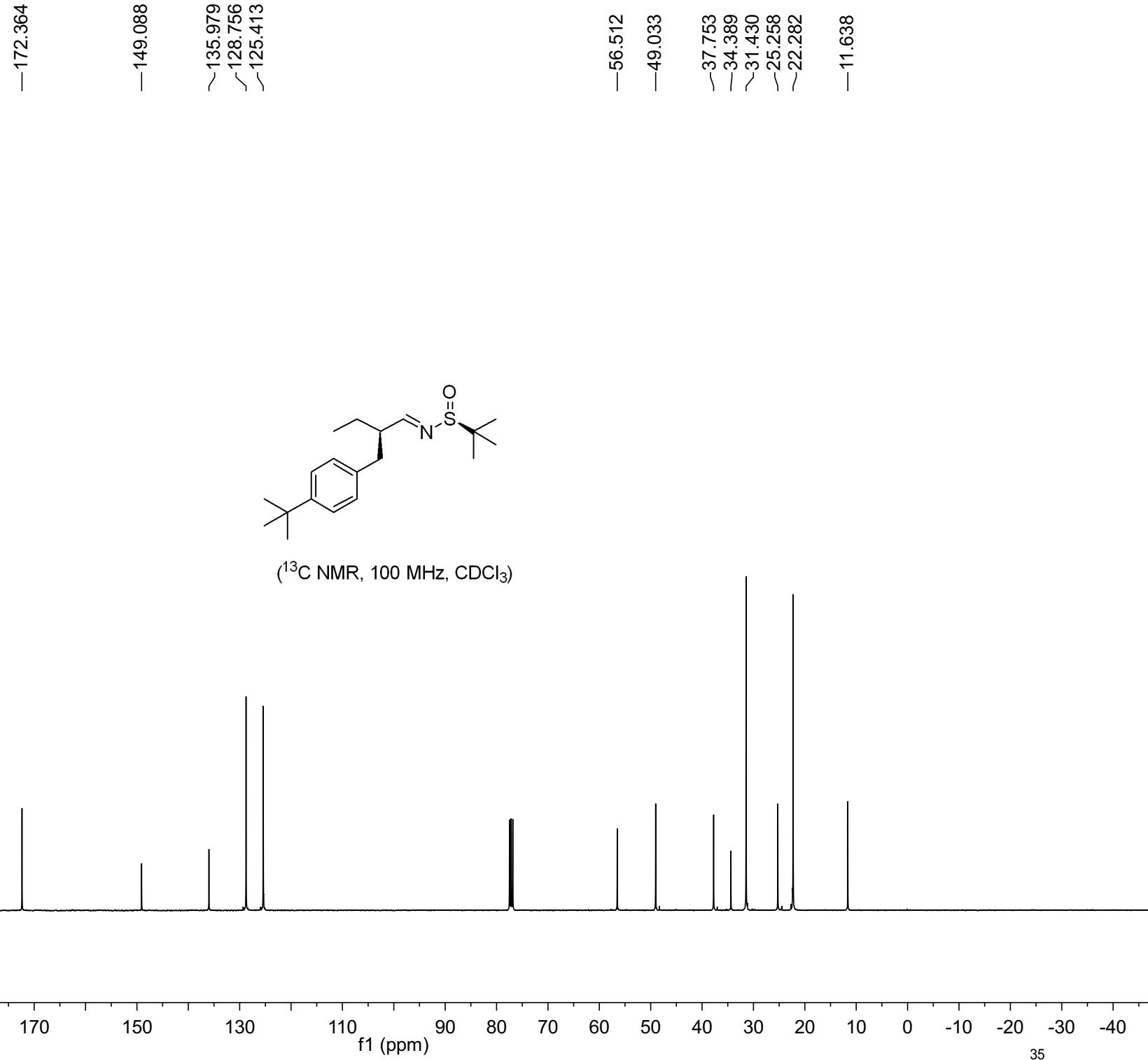
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8q



NMR spectra of compound 8q



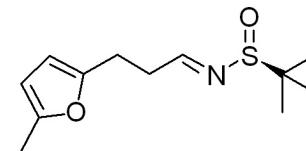
NMR spectra of compound 8r

8.123  
8.114  
8.104

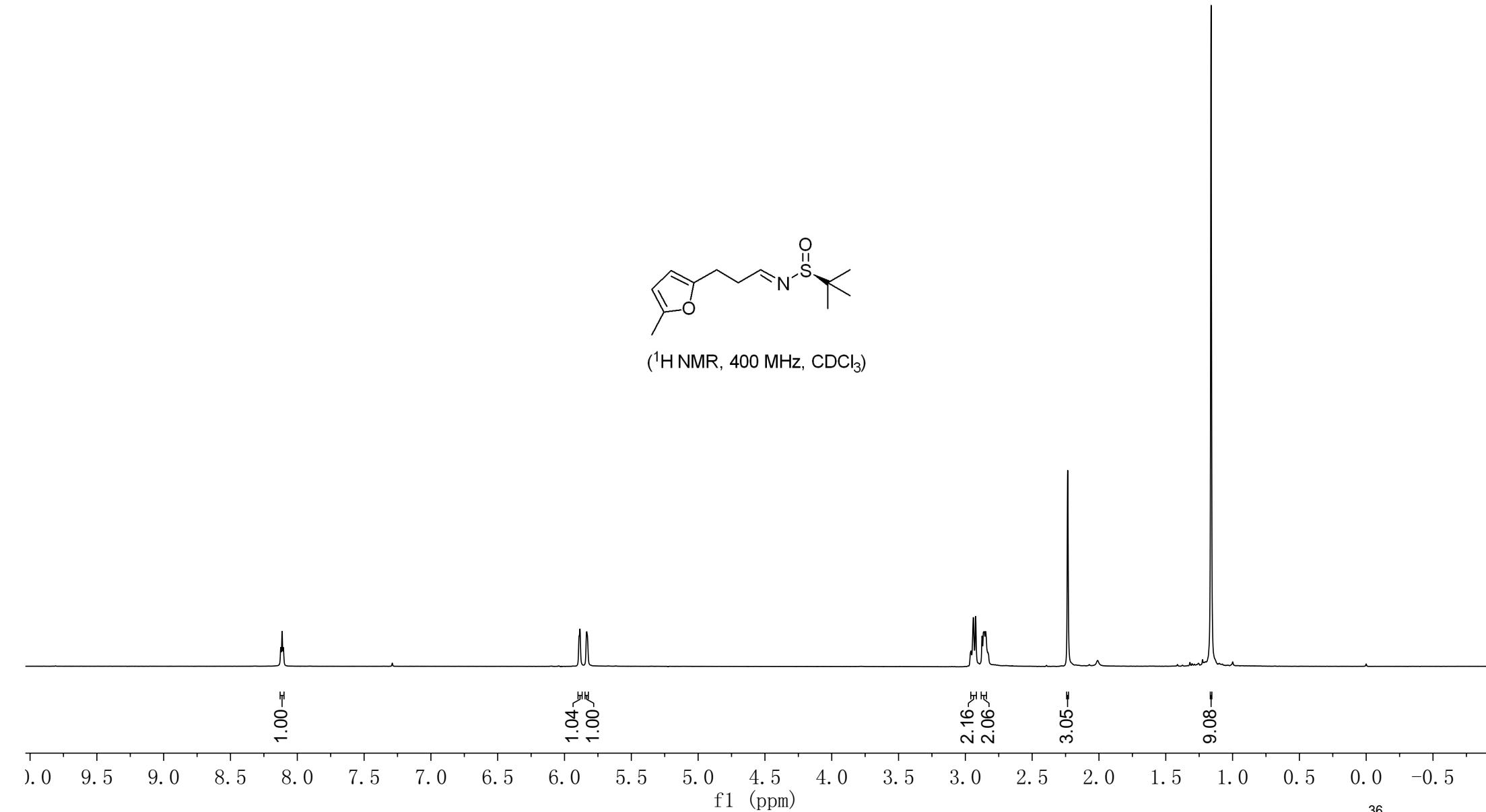
5.885  
5.834

2.940  
2.923  
2.875  
2.864  
2.859  
2.847

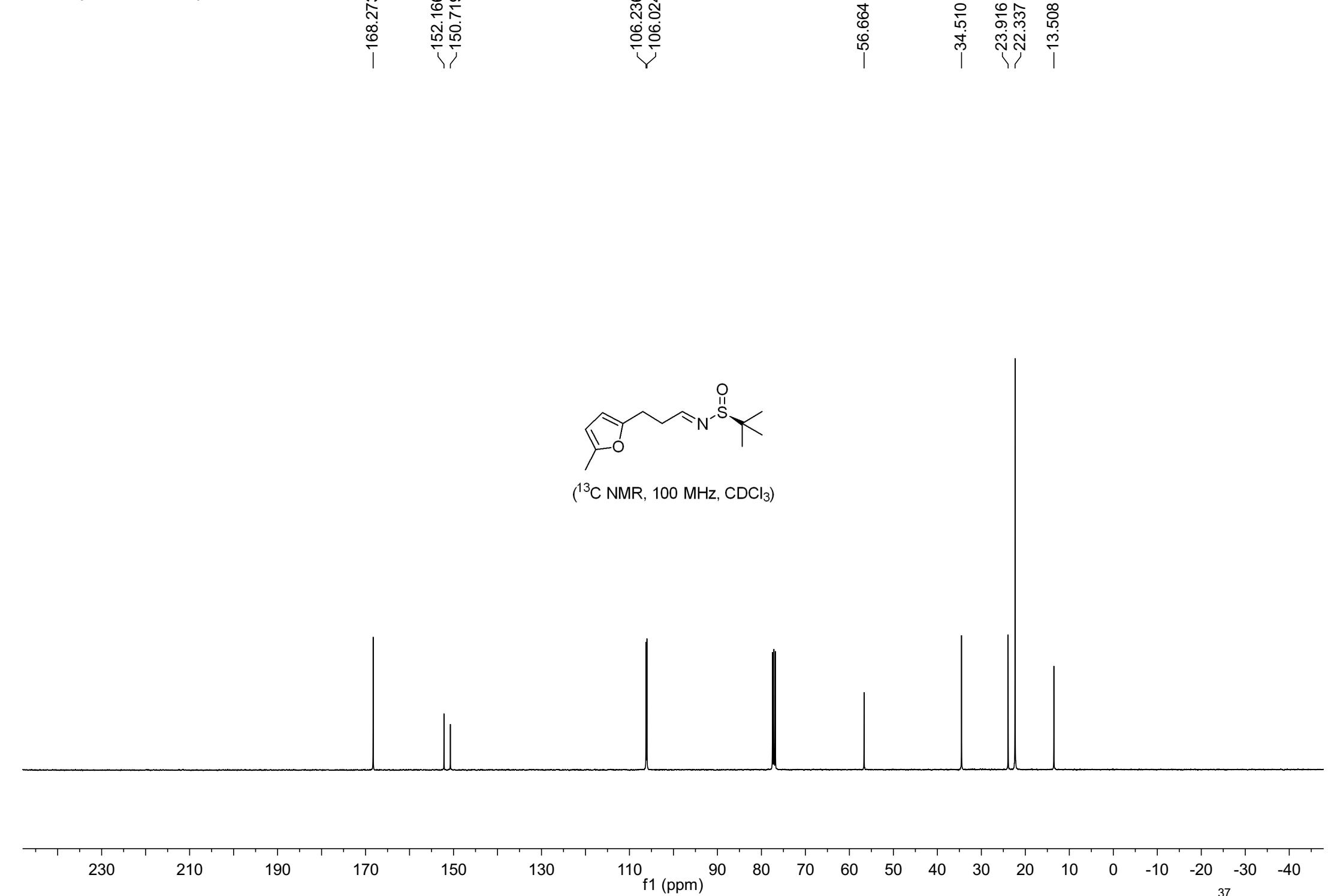
2.234  
-1.161



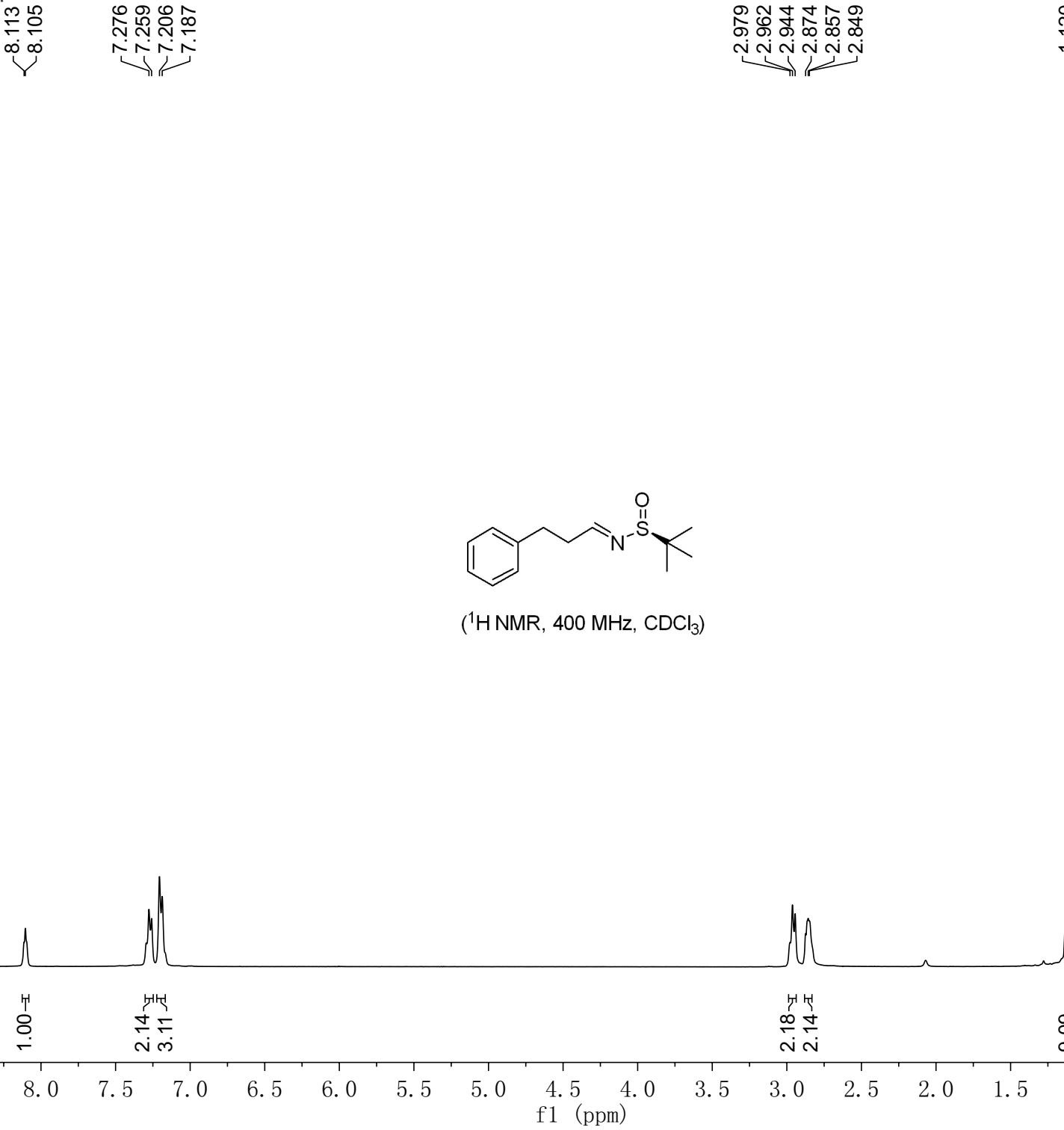
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8r

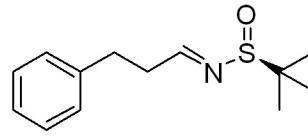


NMR spectra of compound 8s

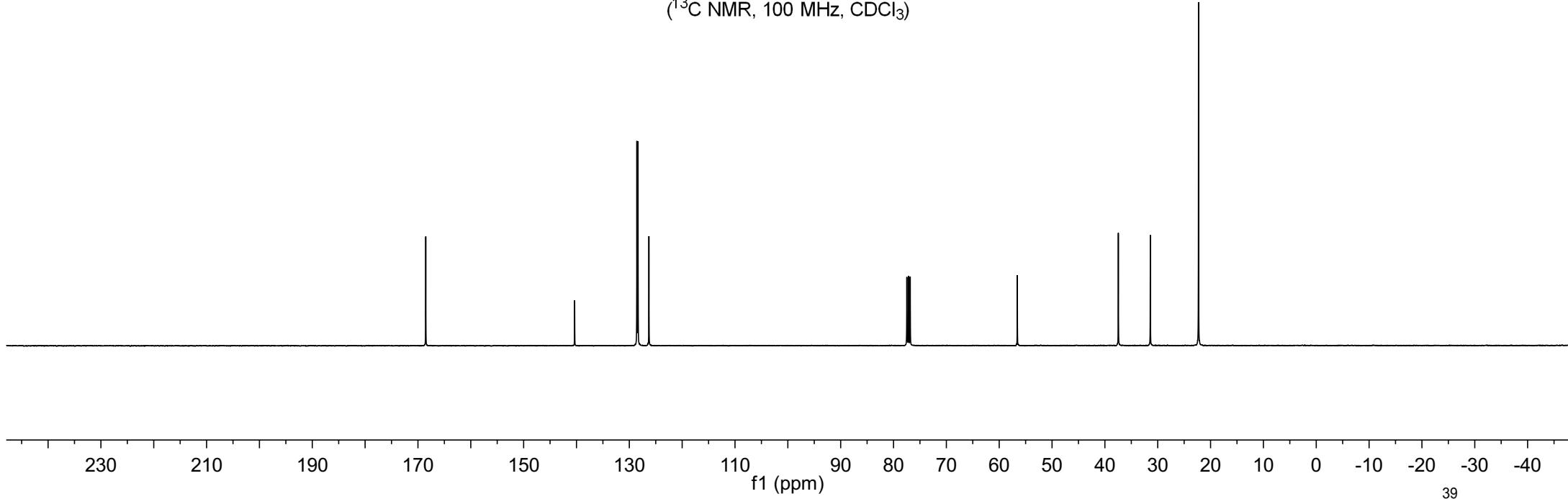


NMR spectra of compound 8s

—168.522  
—140.345  
—128.570  
—128.354  
—126.289  
—56.572  
—37.452  
—31.397  
—22.280



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

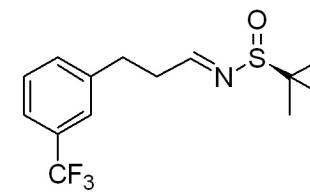


NMR spectra of compound 8t

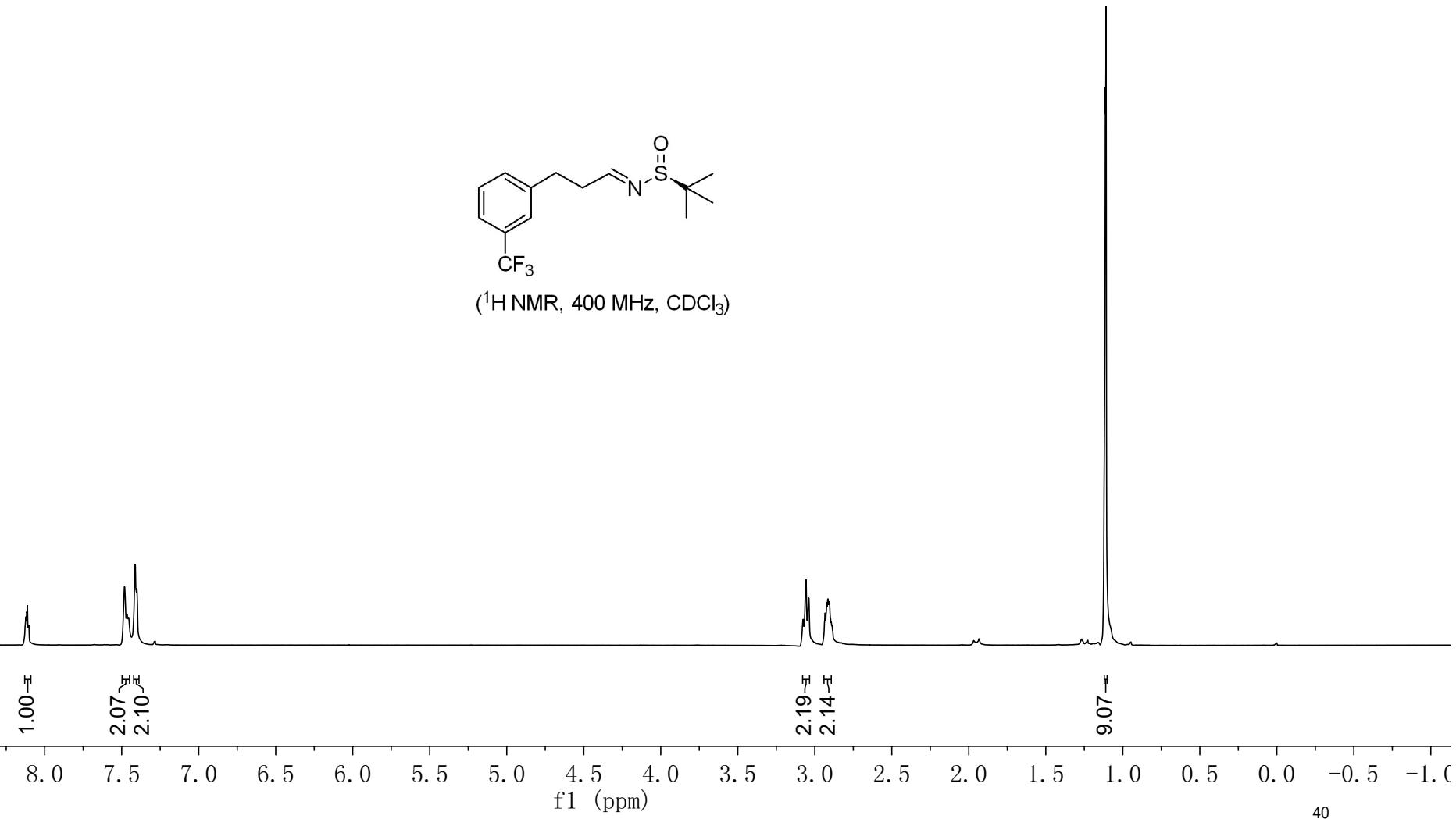
8.122  
8.117  
8.107  
8.103  
7.481  
7.466  
7.455  
7.412  
7.407  
7.402

3.076  
3.057  
3.039  
2.933  
2.922  
2.915  
2.906  
2.893

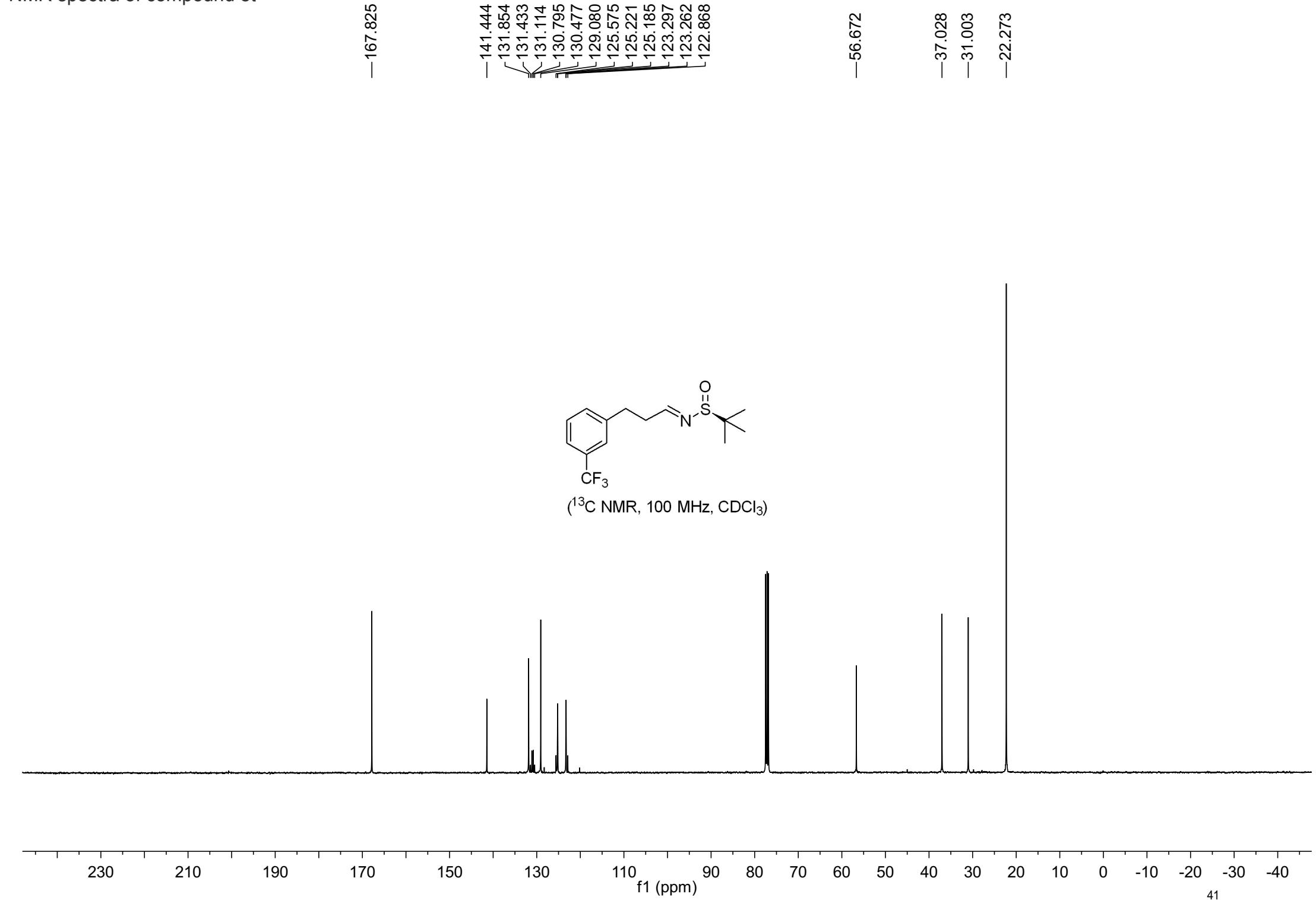
1.113  
1.109



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

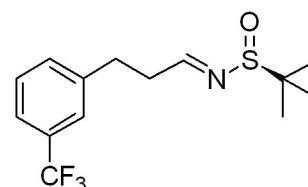


NMR spectra of compound 8t

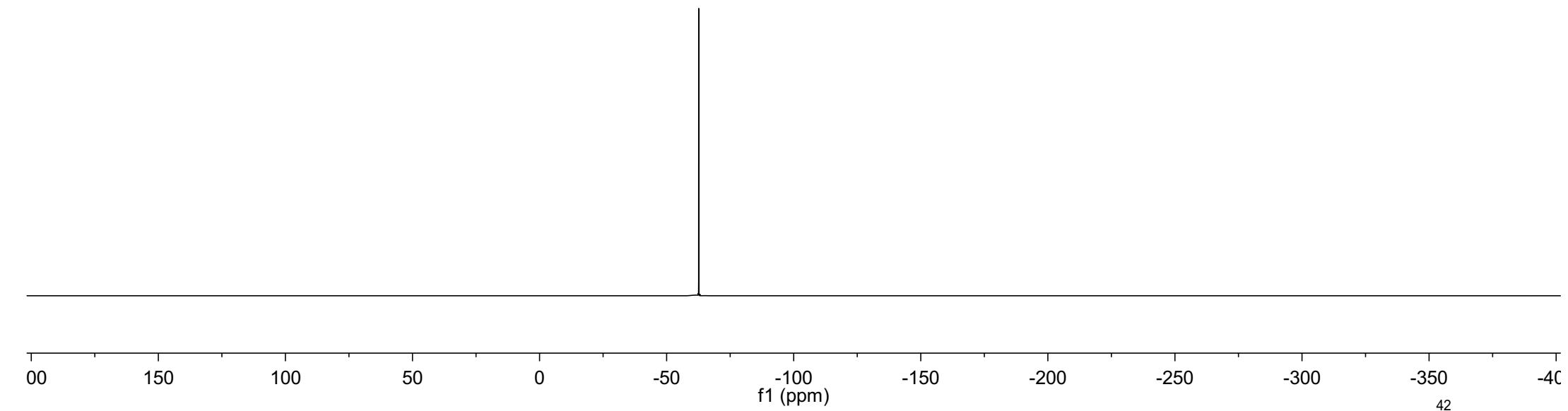


NMR spectra of compound 8

-62.615



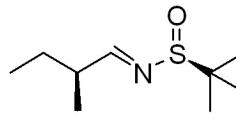
( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 8u

<7.904  
<7.892

2.497  
2.481  
2.465  
2.448  
1.625  
1.607  
1.589  
1.571  
1.463  
1.446  
1.428  
1.411  
1.393  
1.127  
1.077  
1.060  
0.900  
0.881  
0.862



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

0.95- $\pi$

1.07- $\pi$   
1.08- $\pi$   
1.11- $\pi$   
9.26- $\pi$   
3.15- $\pi$   
3.16- $\pi$

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)

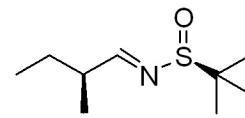
NMR spectra of compound 8u

—173.345

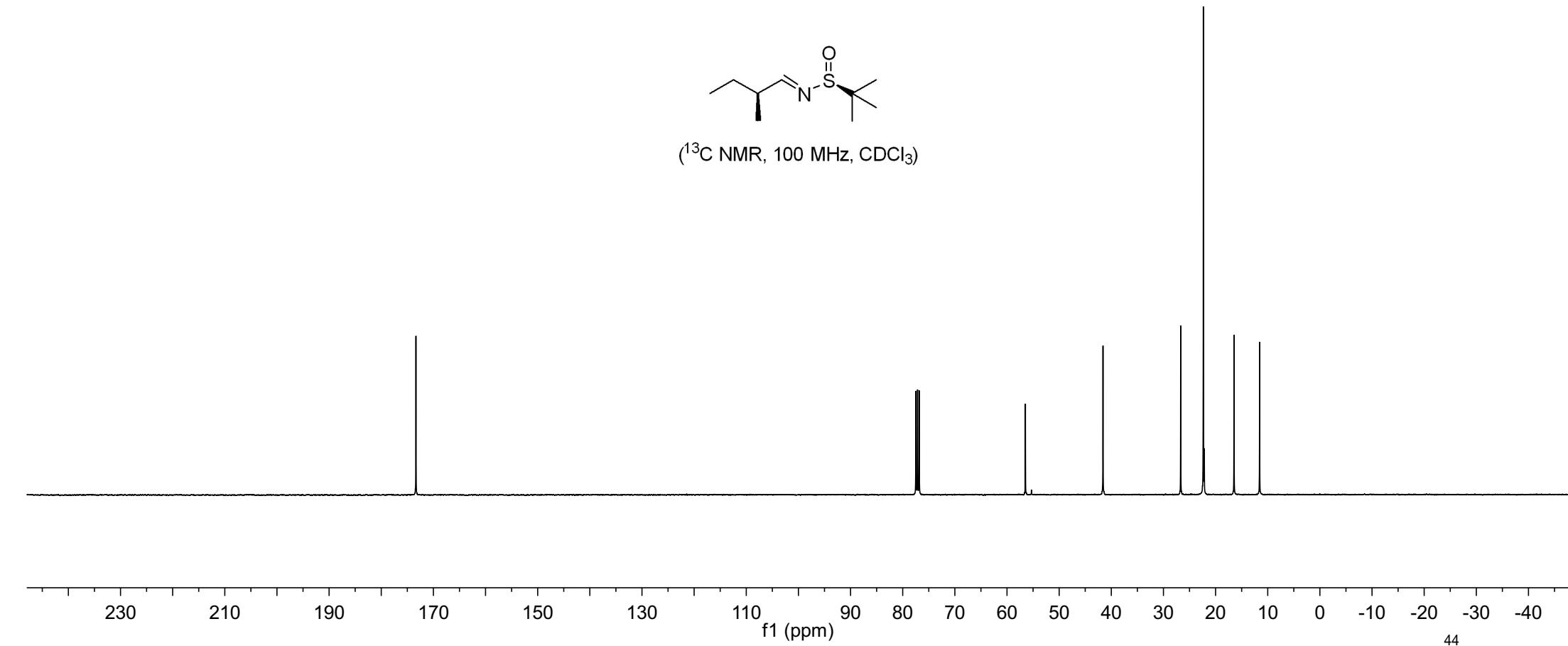
—56.474

—41.591

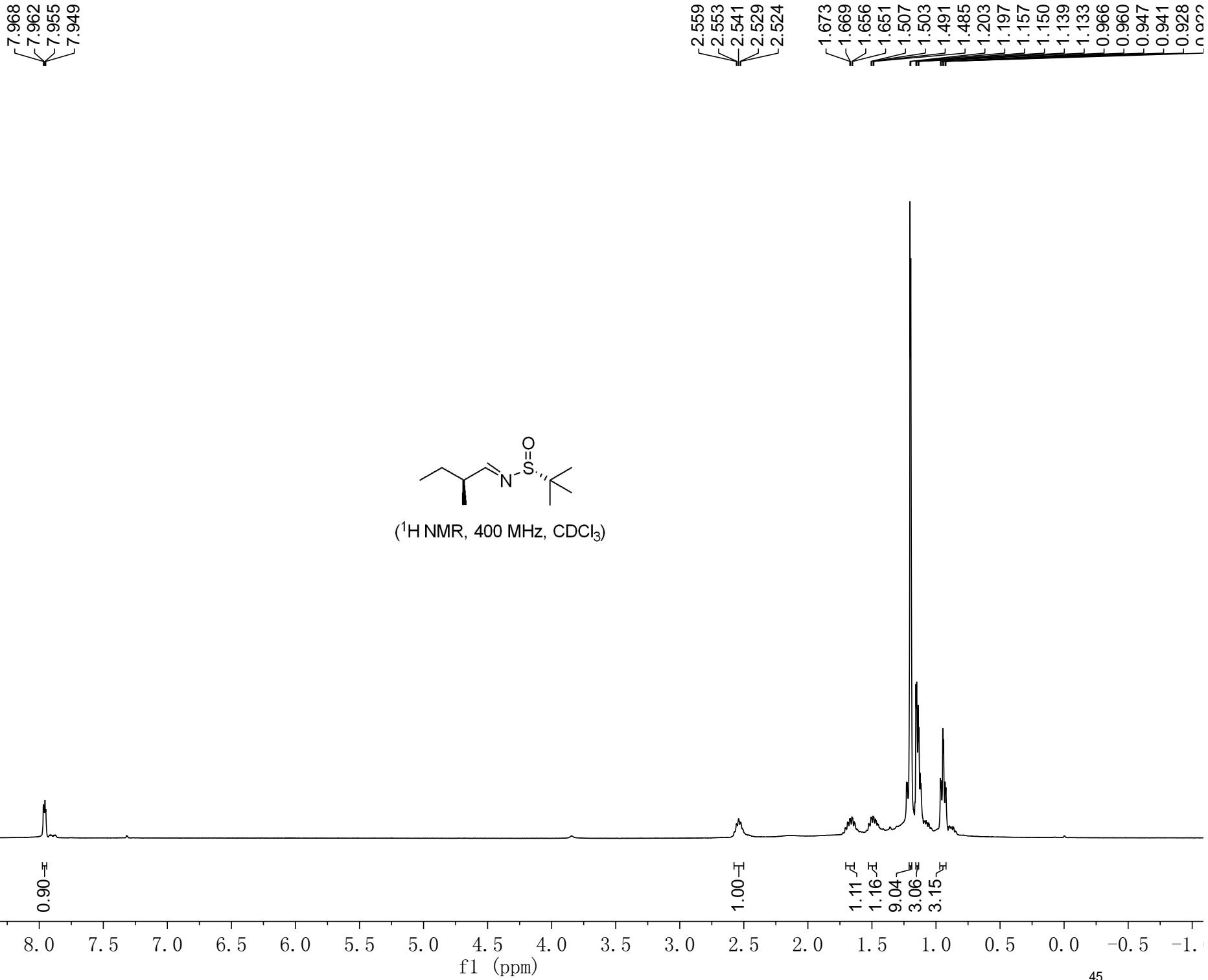
~26.692  
~22.347  
~16.465  
~11.560



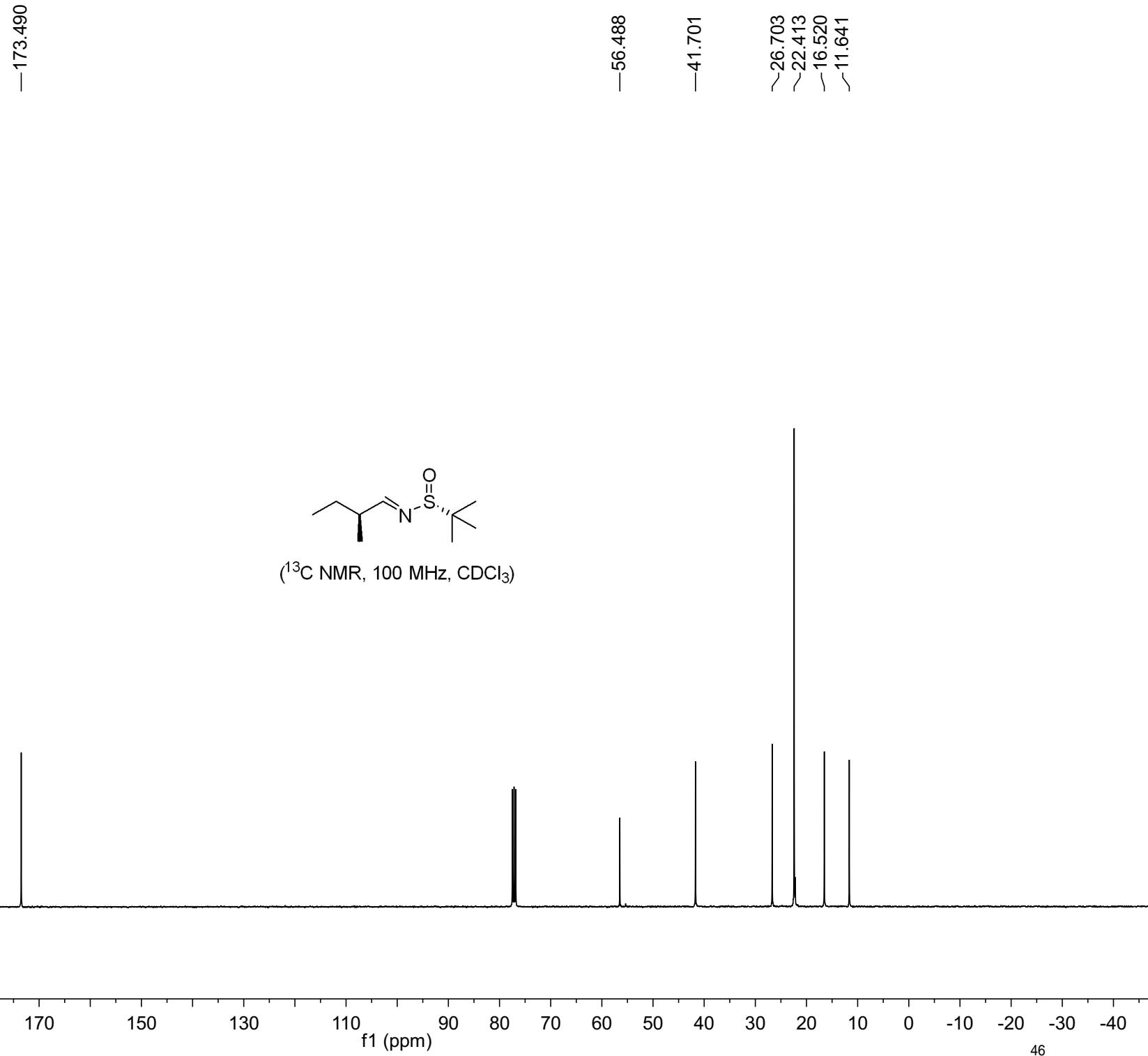
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



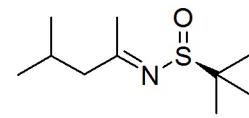
NMR spectra of compound 8v



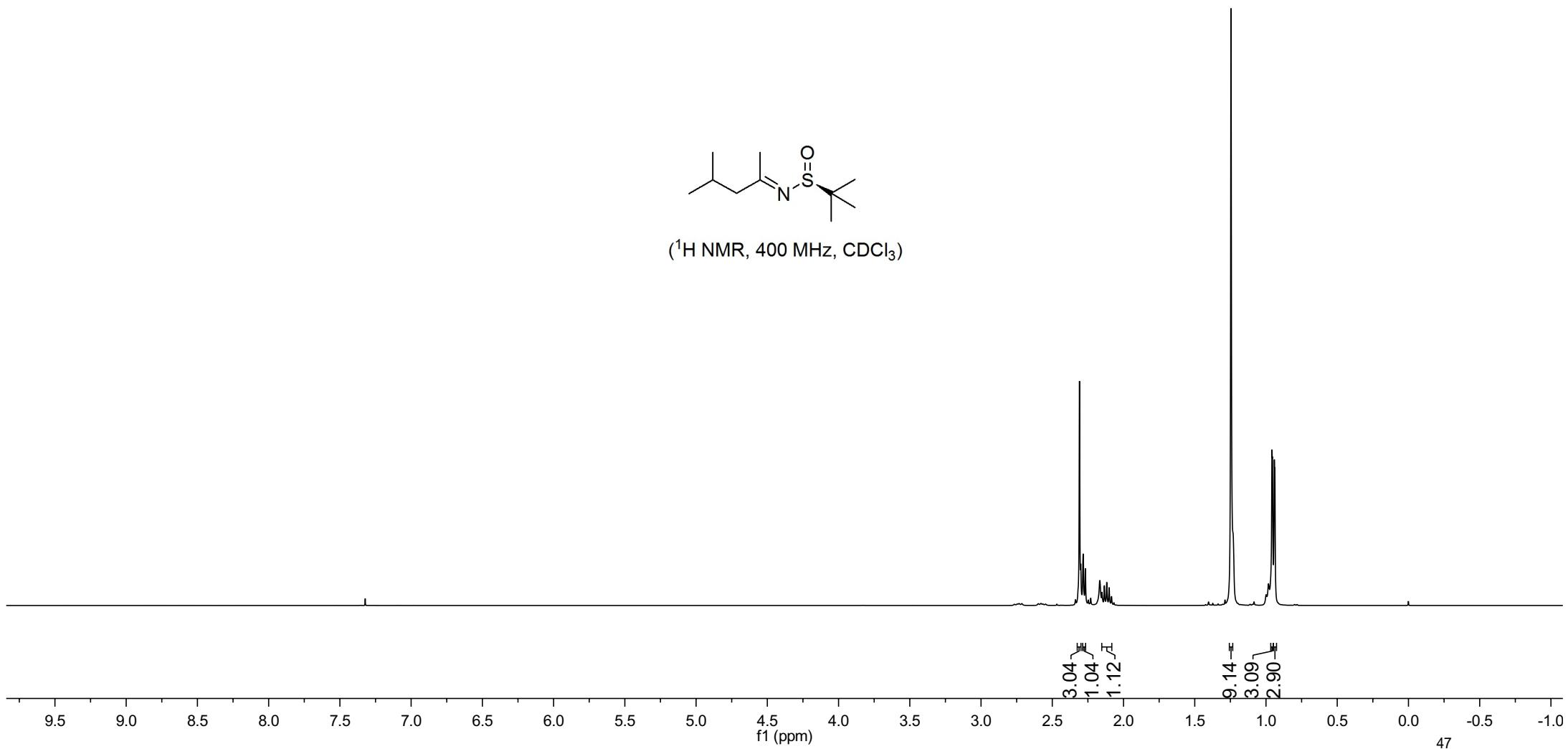
NMR spectra of compound 8v



NMR spectra of compound 8w



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

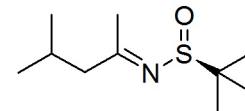


NMR spectra of compound 8w

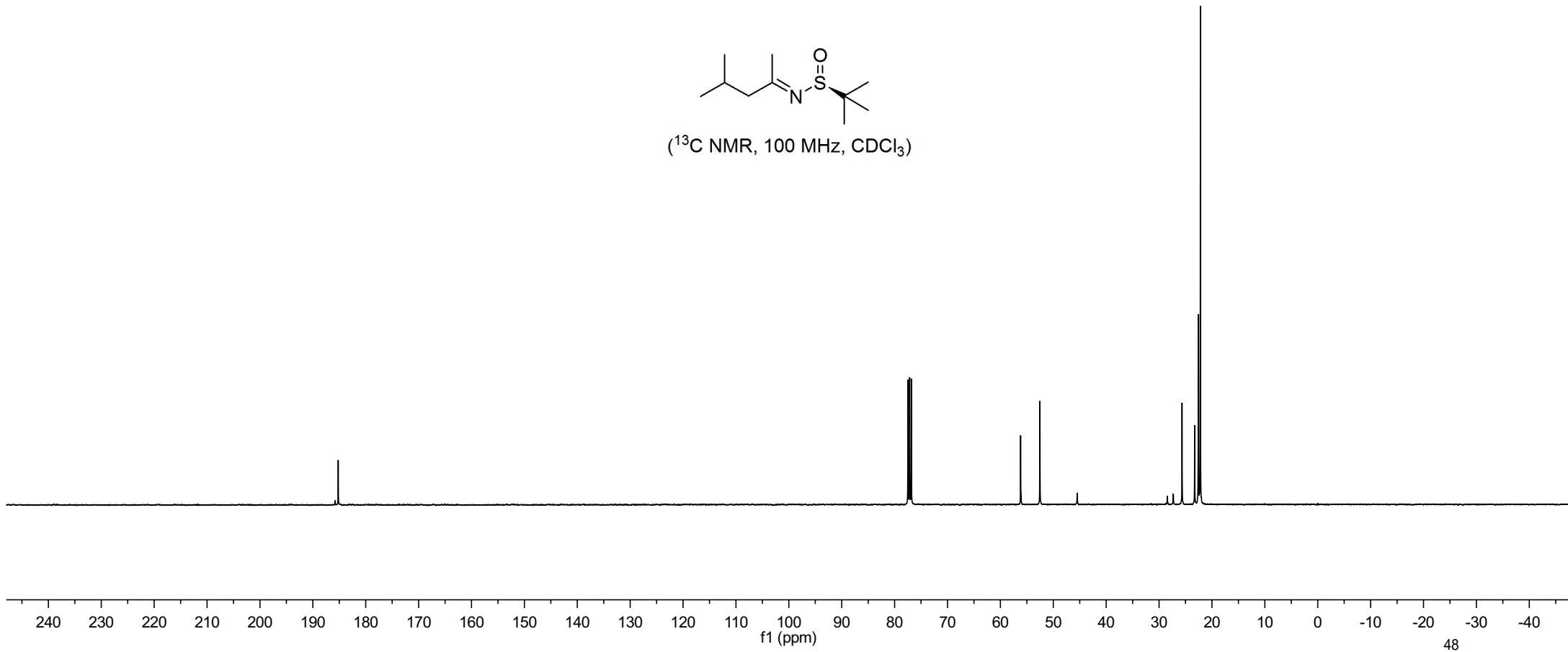
—185.200

—56.177  
—52.532

25.655  
23.268  
22.569  
22.536  
22.189



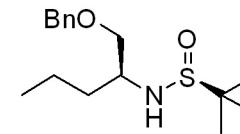
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



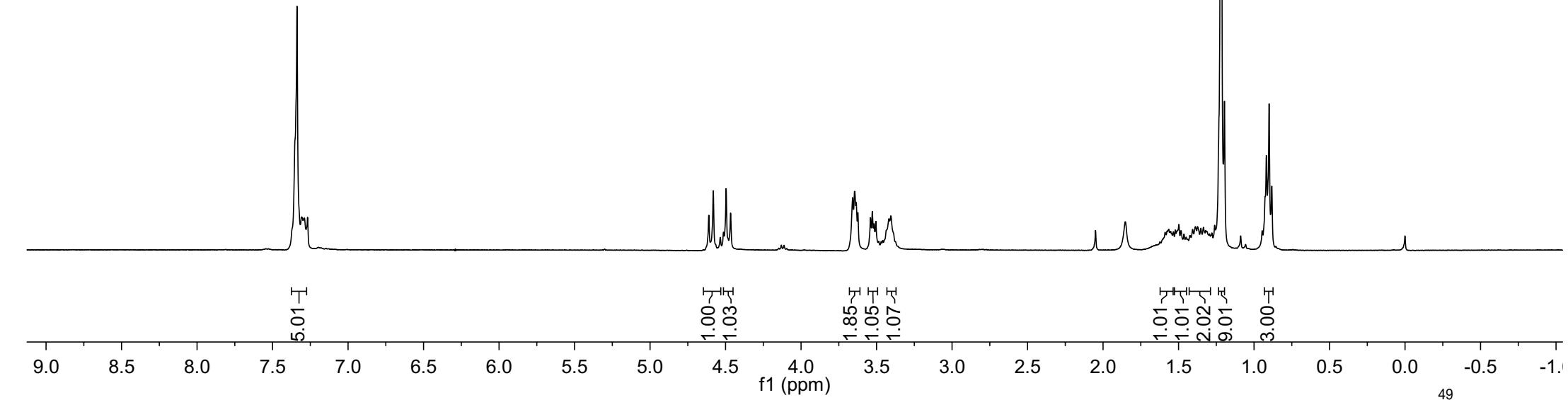
NMR spectra of compound 10a

-7.338

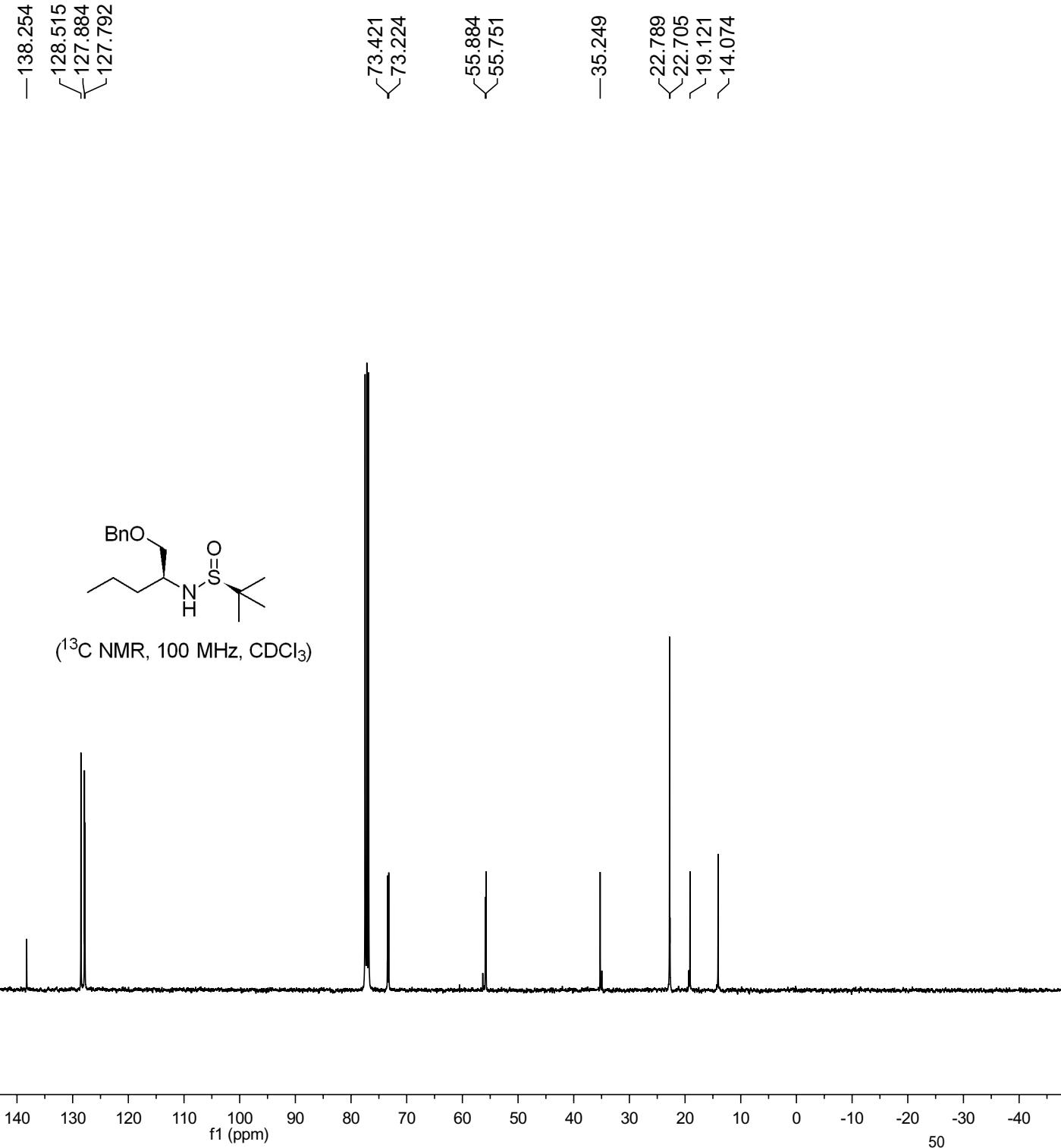
4.611  
4.581  
4.496  
4.466  
3.658  
3.646  
3.635  
3.540  
3.528  
3.517  
3.505  
3.418  
3.405  
1.576  
1.565  
1.521  
1.498  
1.407  
1.389  
1.375  
1.352  
1.335  
1.319  
1.217  
0.900  
0.882



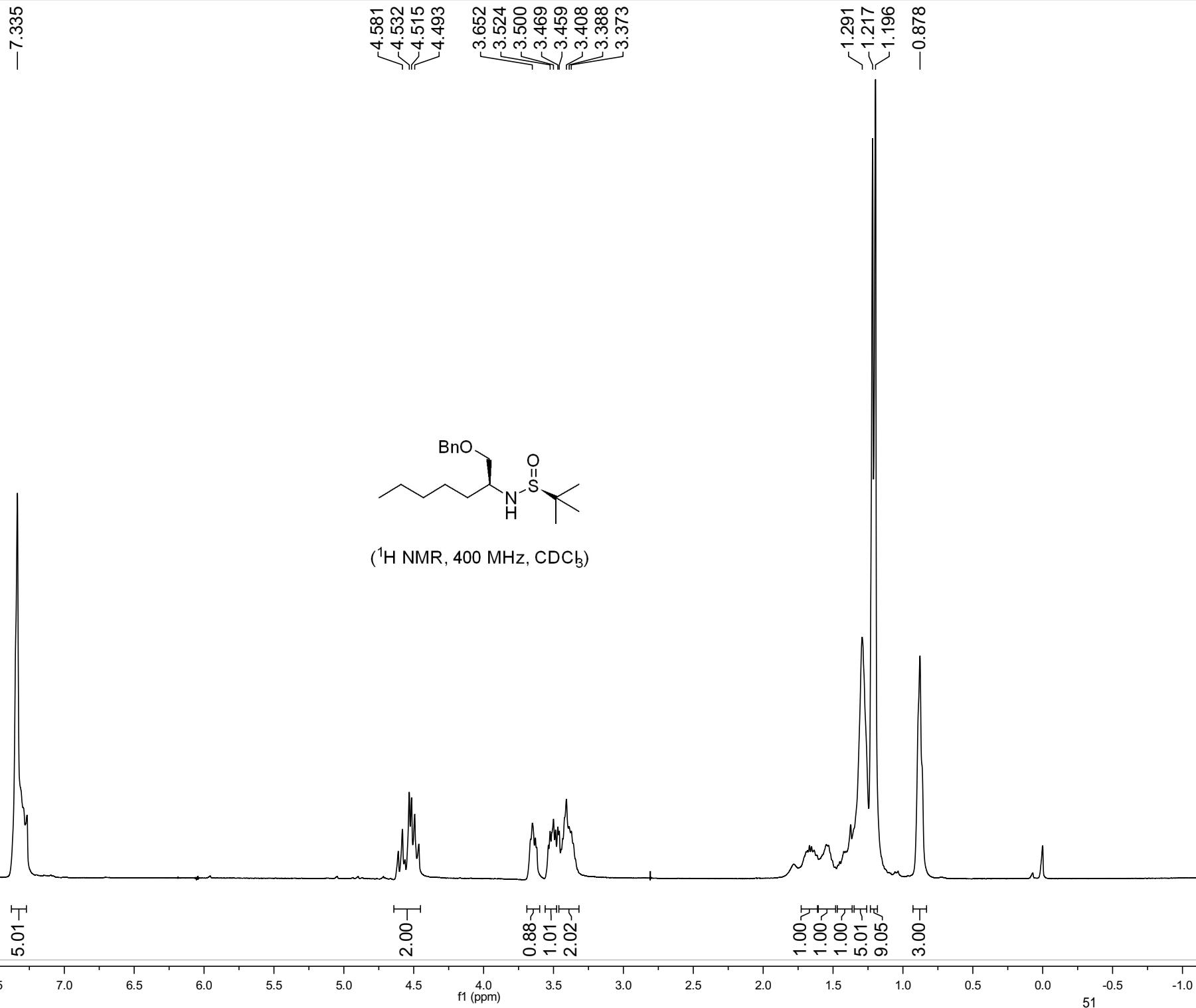
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



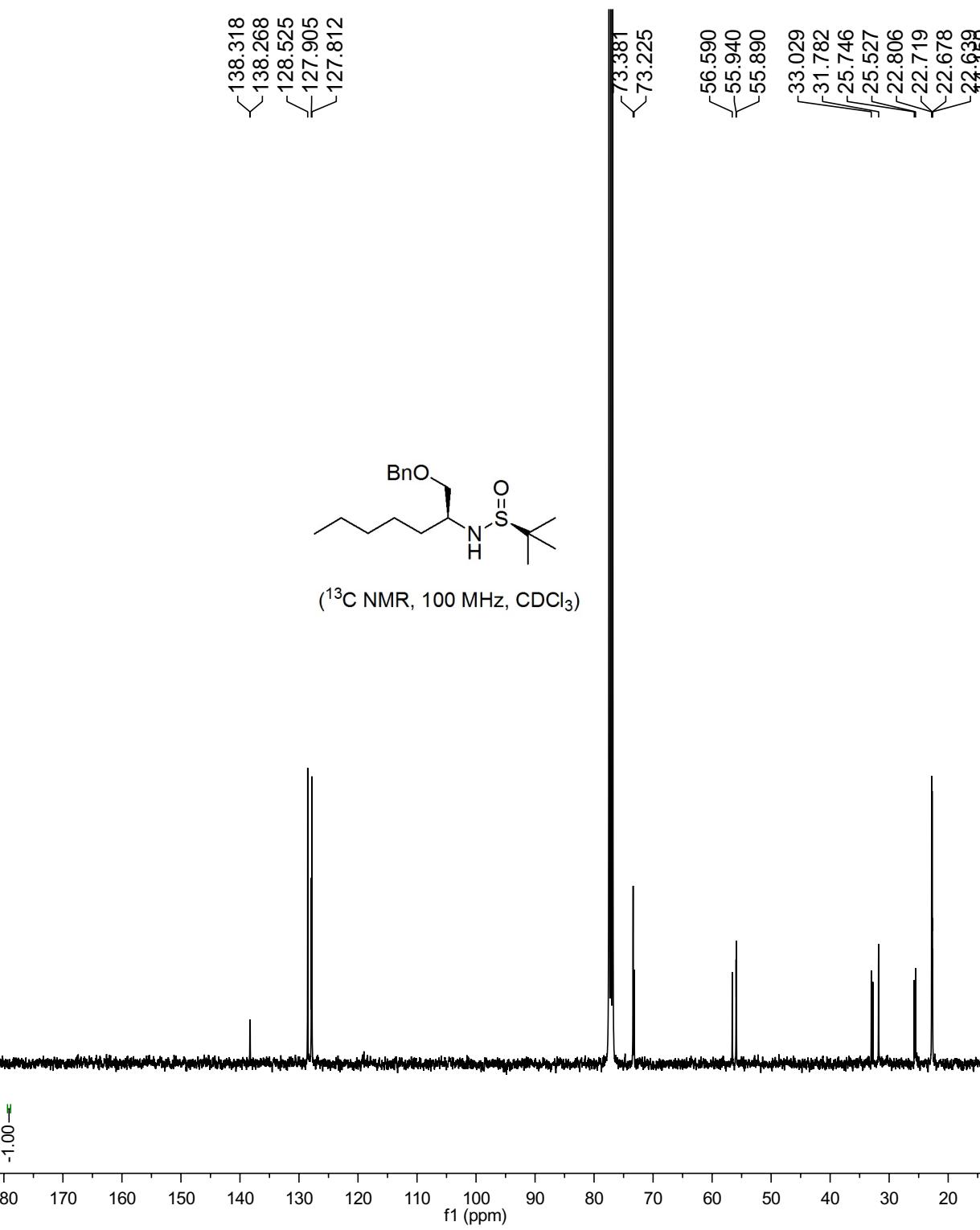
NMR spectra of compound 10a



NMR spectra of compound 10b



NMR spectra of compound 10b



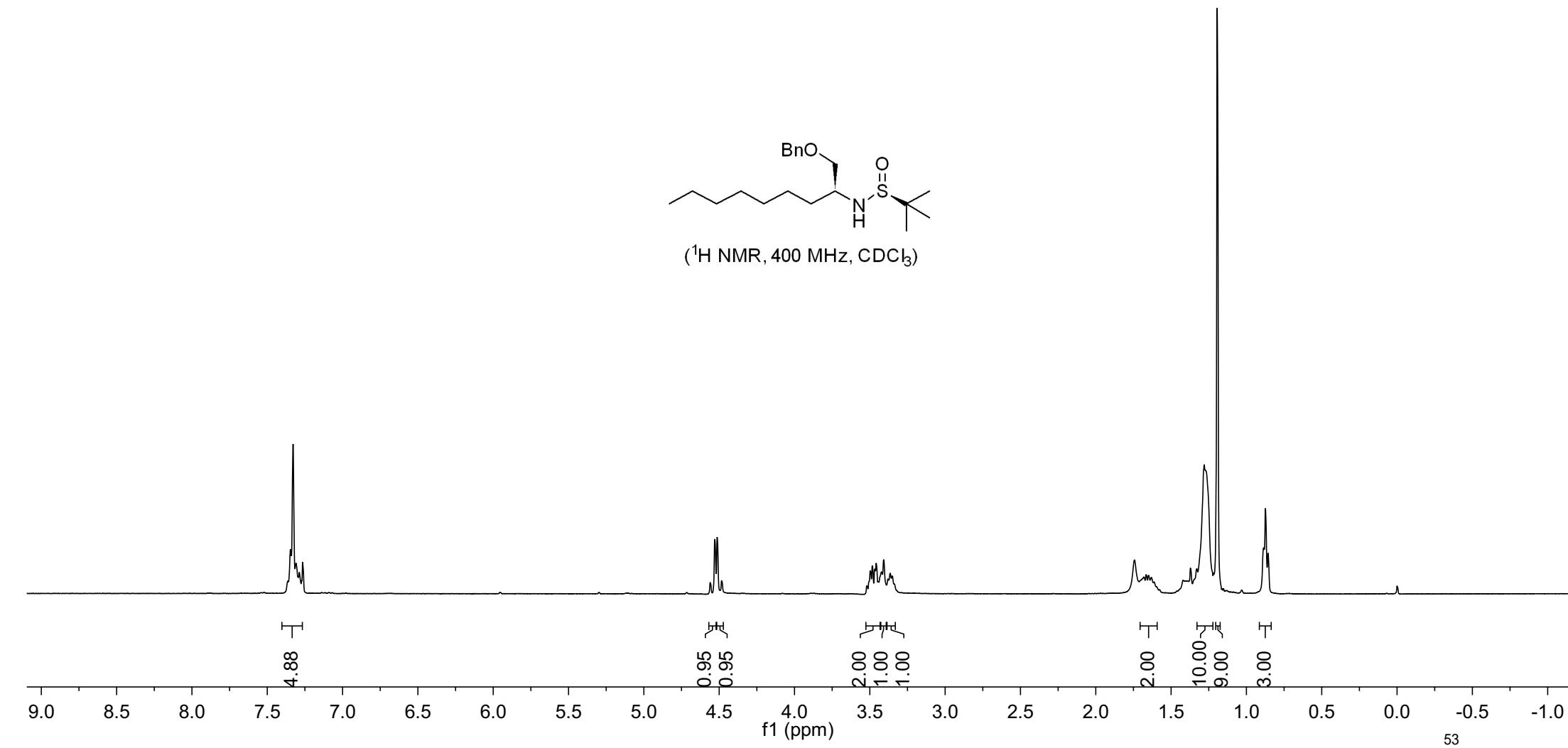
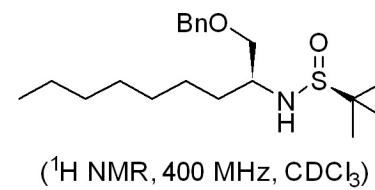
NMR spectra of compound 10c

7.346  
7.329  
7.309

4.559  
4.529  
4.513  
4.483

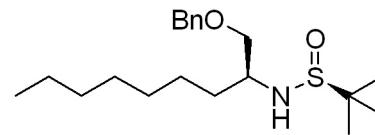
3.497  
3.484  
3.466  
3.458  
3.423  
3.408  
3.365  
3.351

1.681  
1.666  
1.650  
1.631  
1.613  
1.280  
~1.194  
0.886  
0.874  
0.856

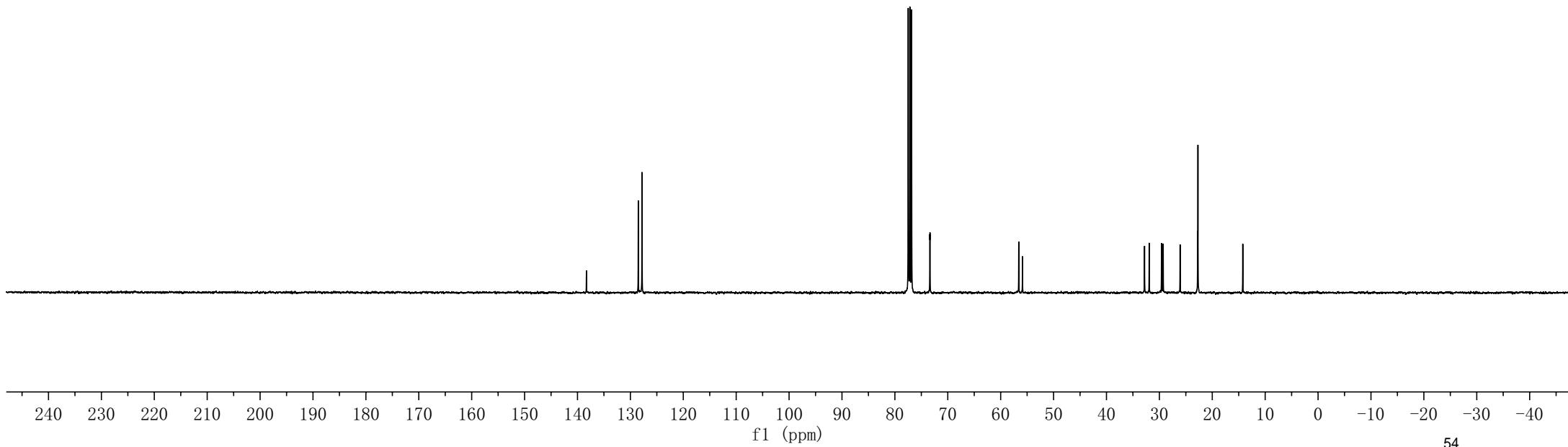


NMR spectra of compound 10c

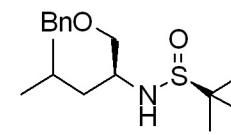
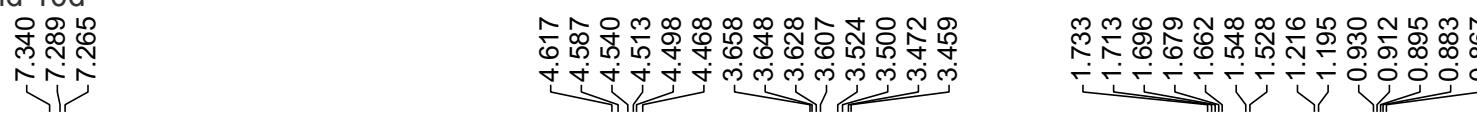
—138.312  
—128.507  
—127.802  
—73.387  
—73.360  
—56.581  
—55.878  
—32.806  
—31.928  
—29.596  
—29.277  
—26.082  
—22.769  
—22.711  
—14.232



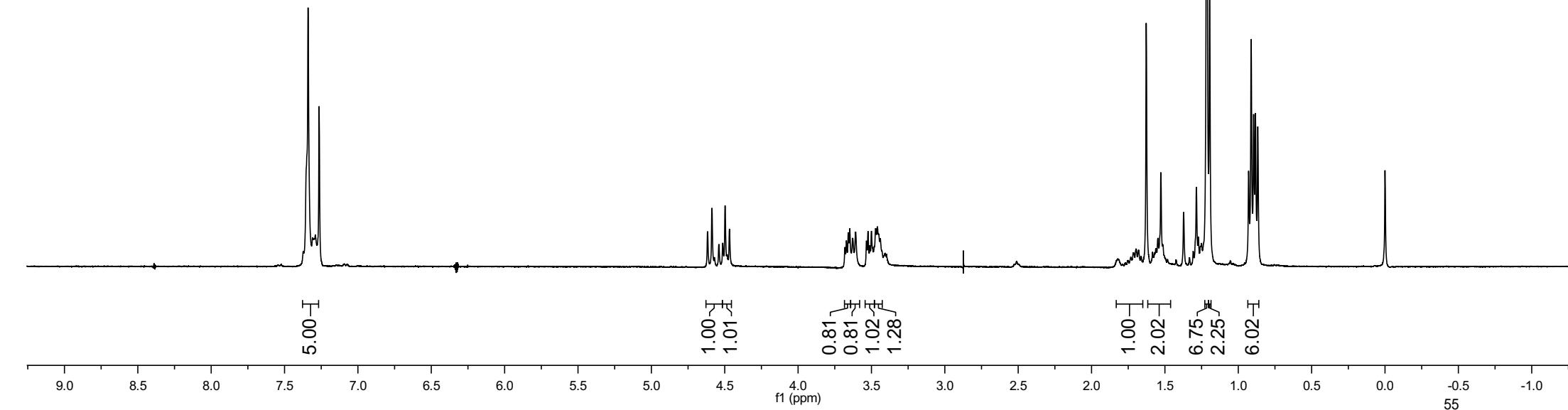
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



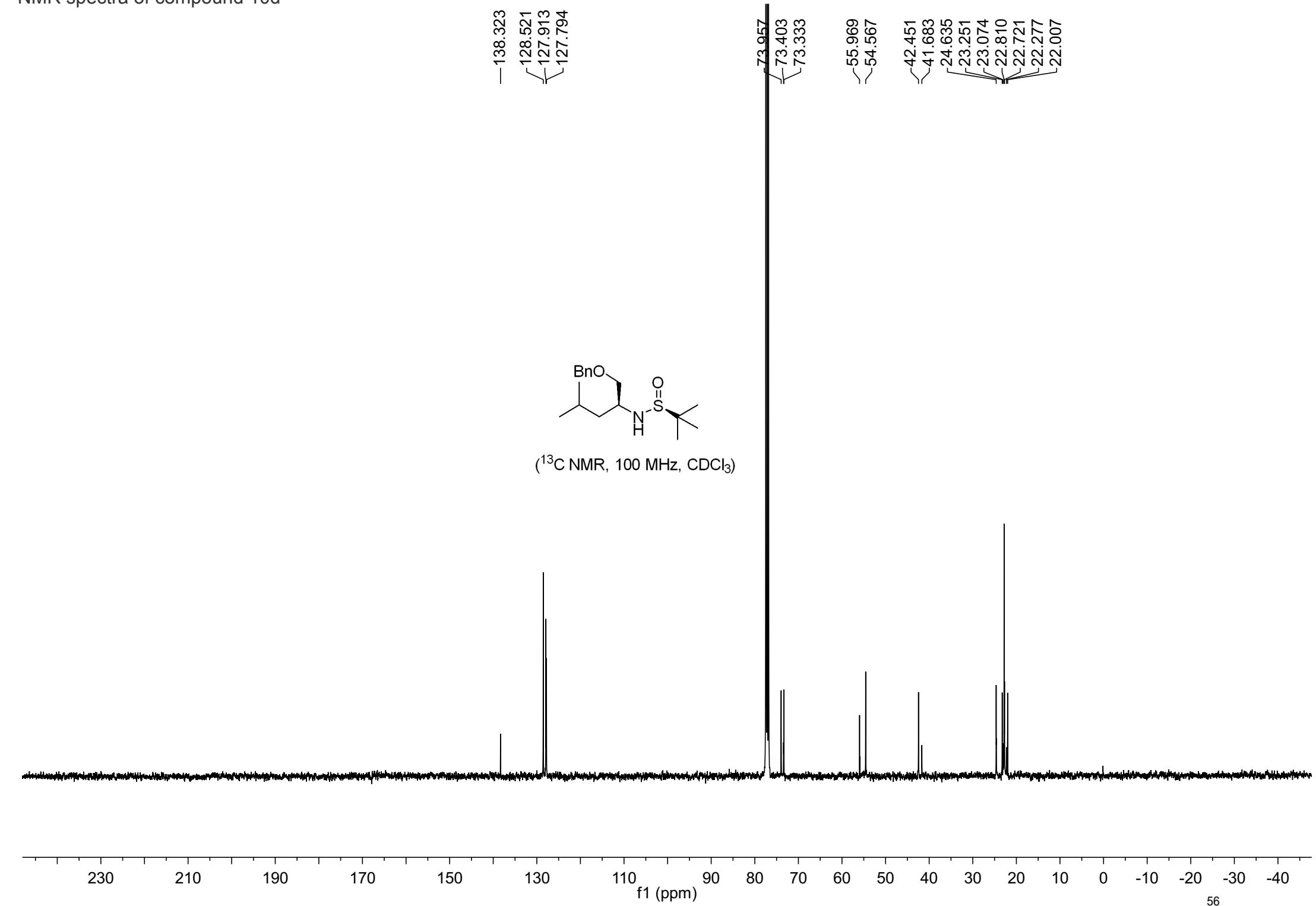
NMR spectra of compound 10d



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 10d

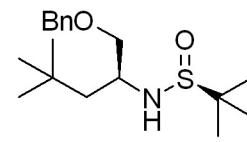


NMR spectra of compound 10e

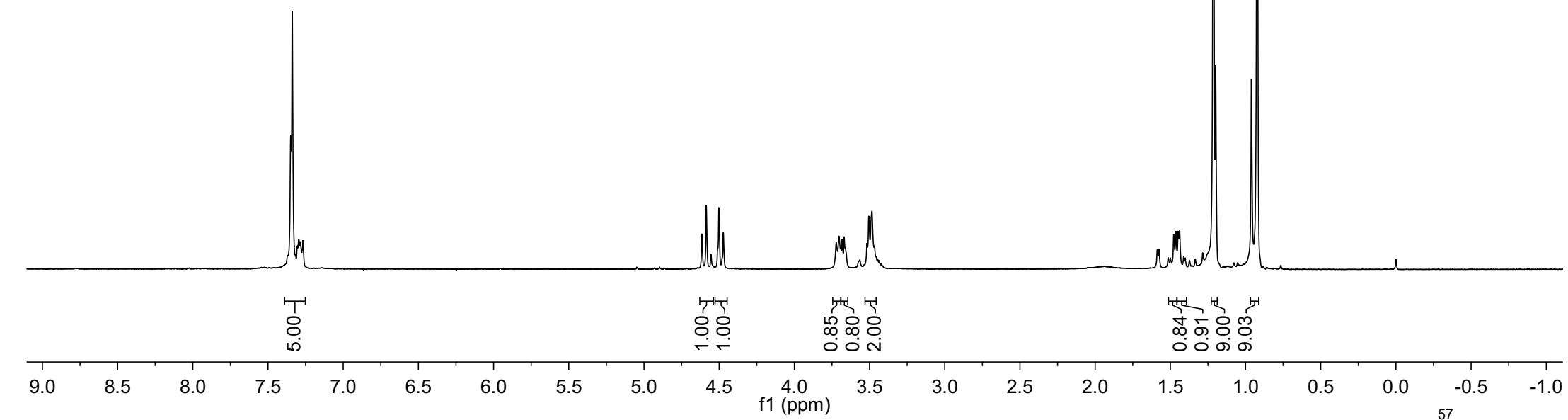
7.349  
7.339  
7.306  
7.295  
7.285  
7.268

4.615  
4.586  
4.502  
4.472  
3.722  
3.703  
3.682  
3.669  
3.565  
3.517  
3.505  
3.484  
3.468  
3.446  
3.436

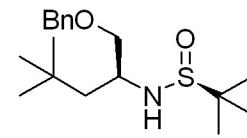
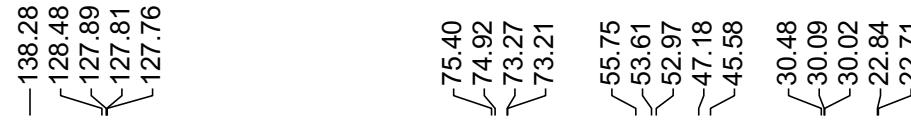
1.587  
1.576  
1.478  
1.463  
1.448  
1.438  
1.411  
1.214  
1.199  
0.961  
0.923



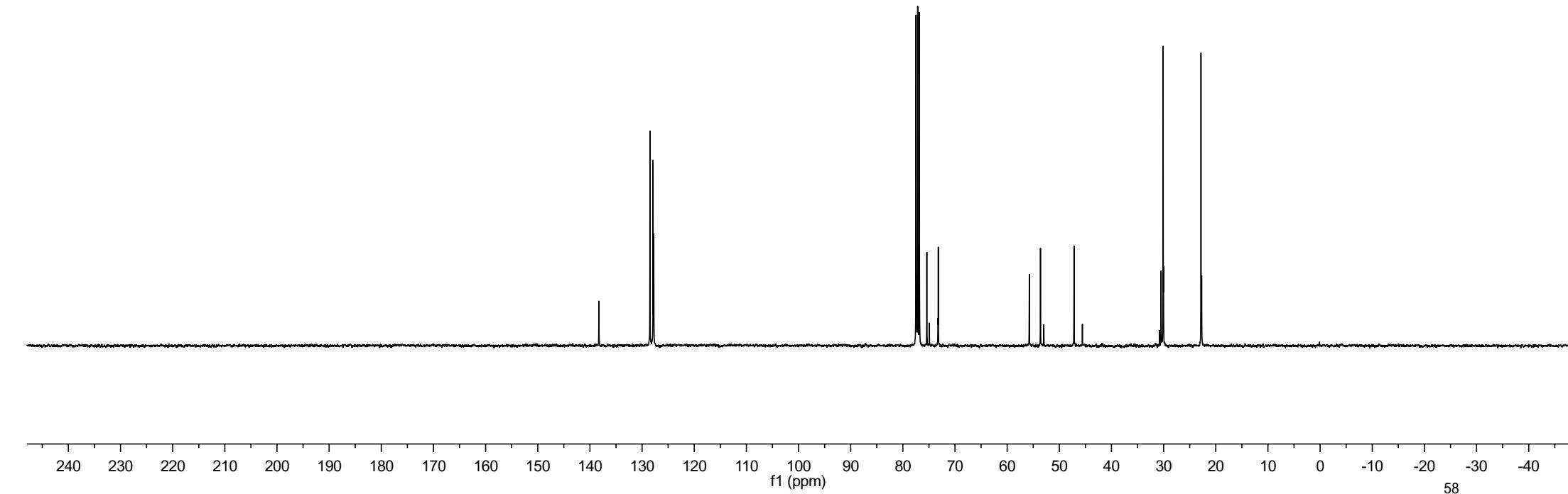
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



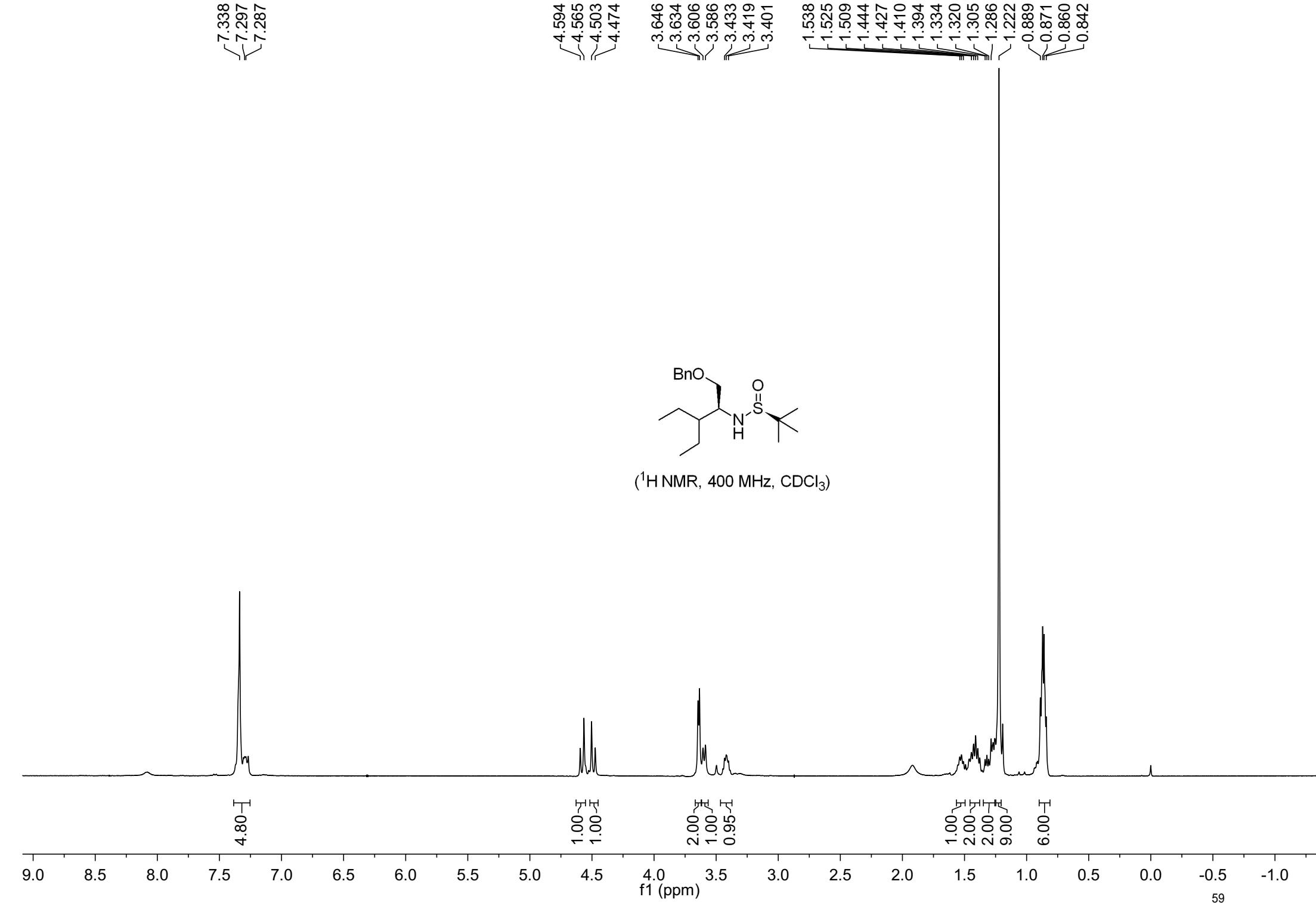
NMR spectra of compound 10e



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10f



NMR spectra of compound 10f

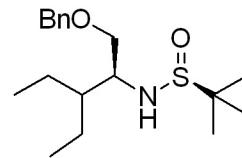
—138.315  
—128.505  
—127.901  
—127.773

—73.199  
—71.176

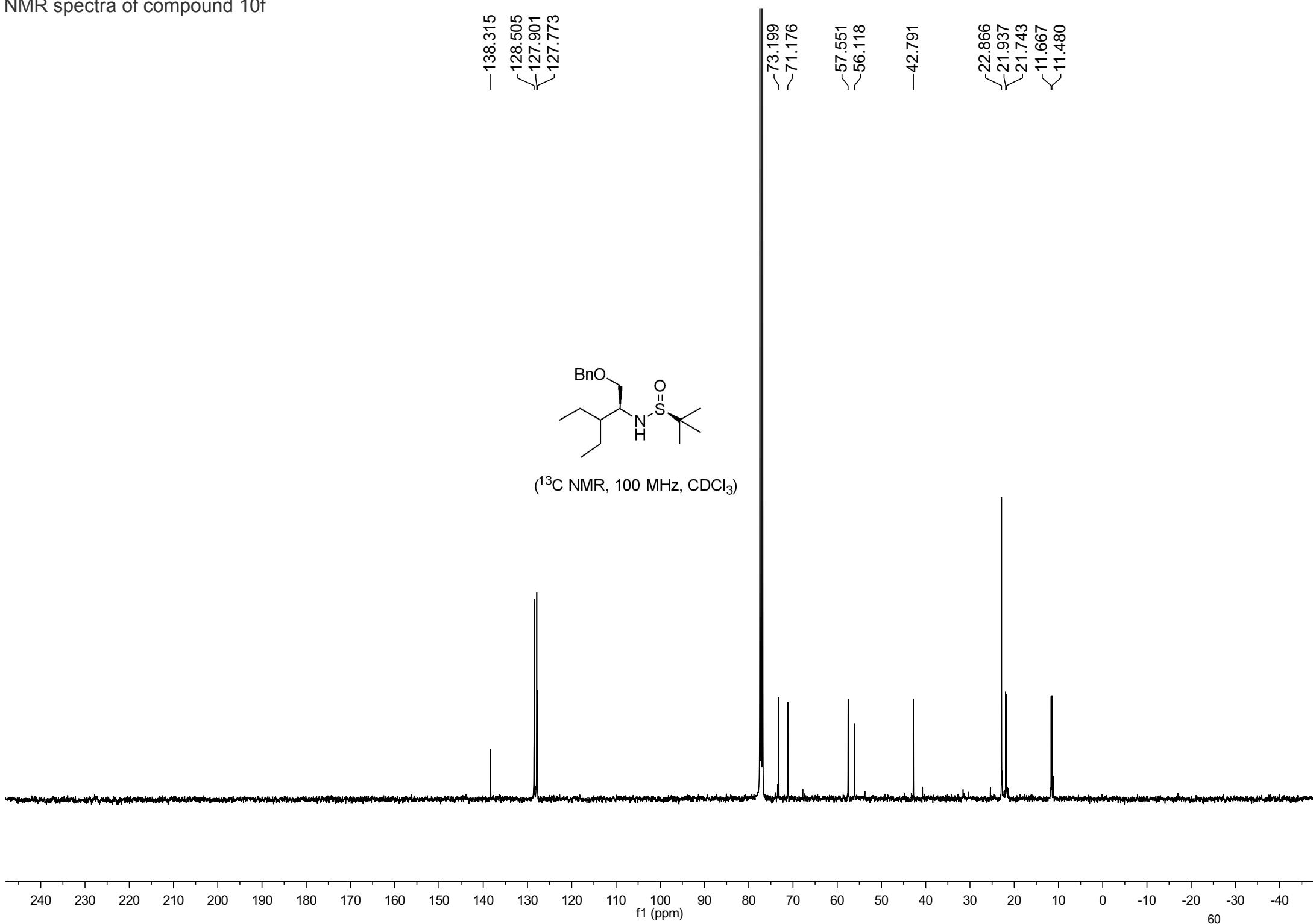
—57.551  
—56.118

—42.791

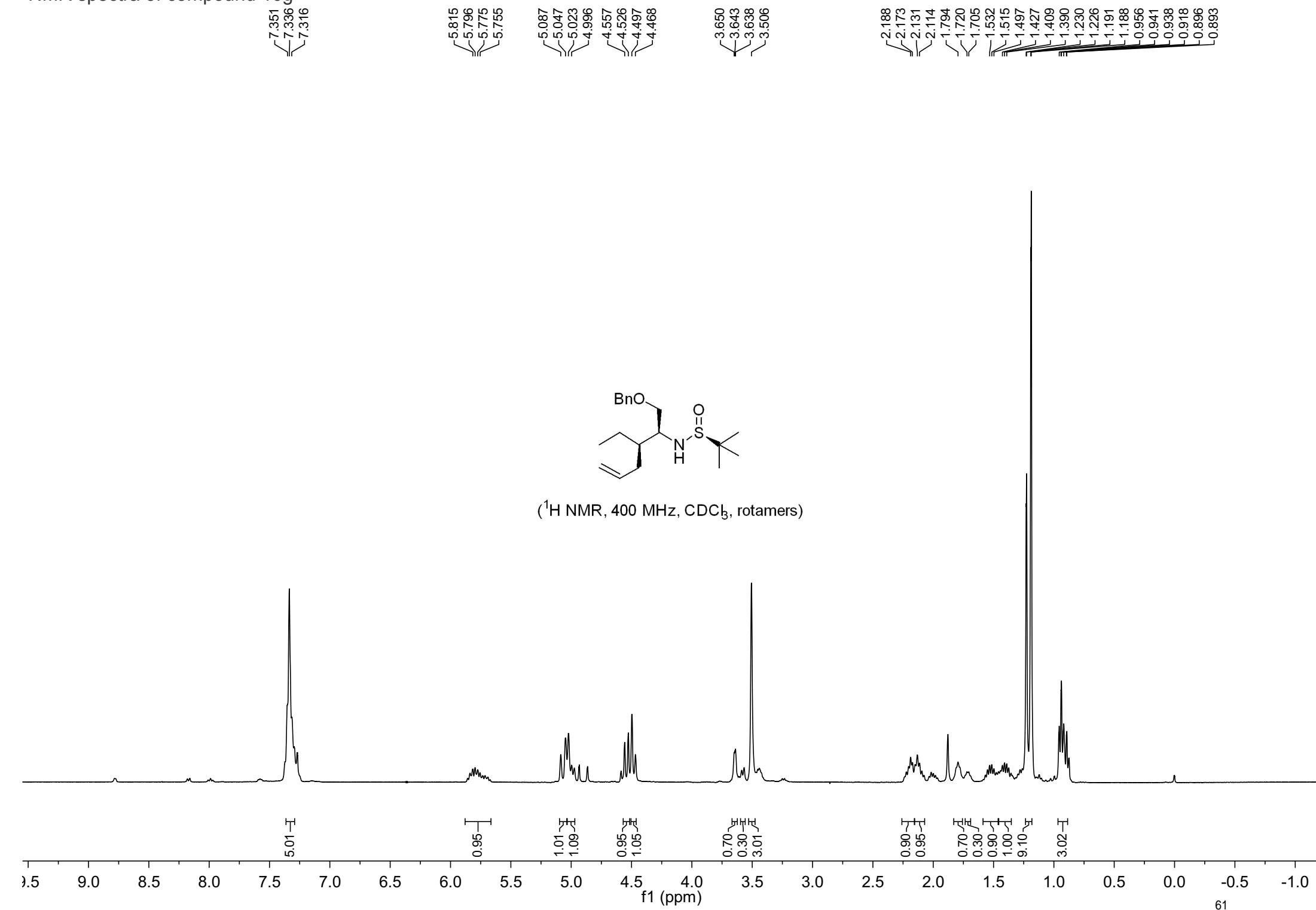
—22.866  
—21.937  
—21.743  
—11.667  
—11.480



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10g



NMR spectra of compound 10g

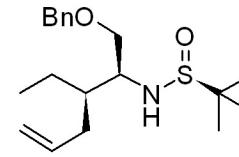
138.201  
137.238  
137.147  
128.491  
127.900  
127.762  
116.774  
116.501

73.258  
73.175  
71.893  
71.000  
57.884  
57.462  
56.102  
56.025

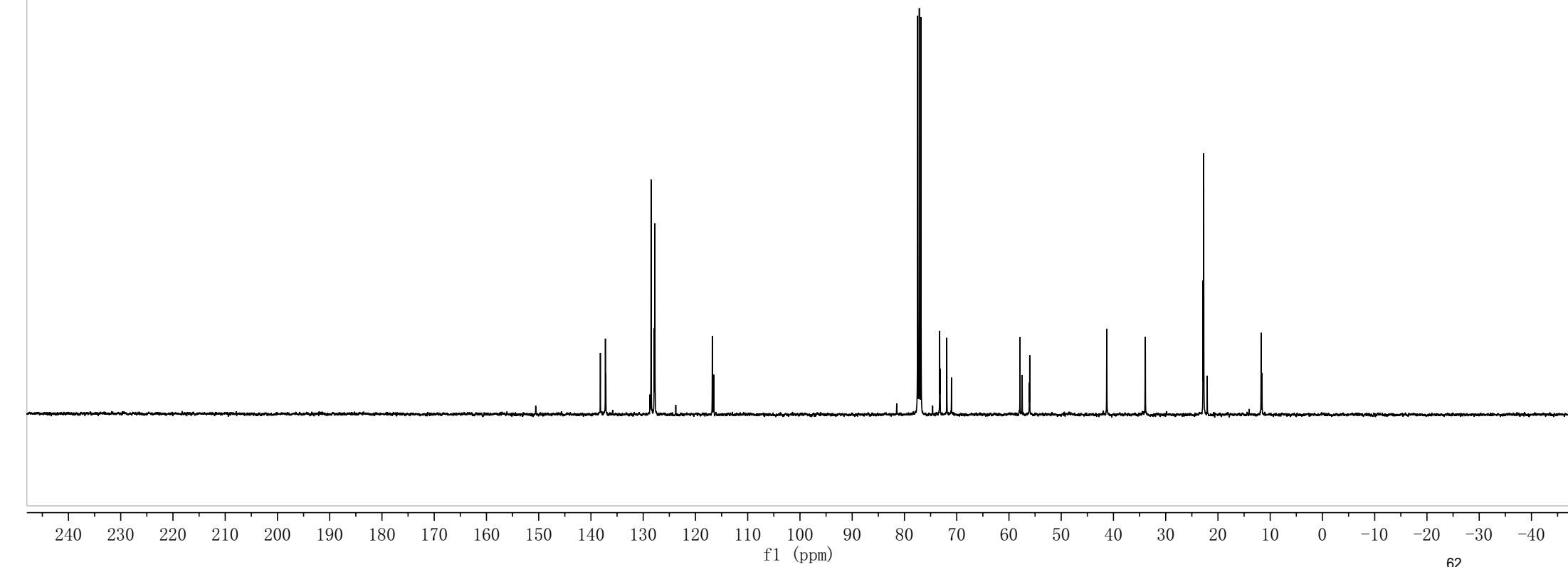
41.307  
41.262  
33.944  
33.894

22.857  
22.726  
22.054

11.742  
11.570



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 10h

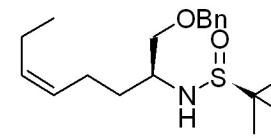
7.350  
 { 7.336  
 { 7.310  
 { 7.291  
 { 7.266

5.391  
 { 5.367  
 { 5.349  
 { 5.317  
 { 5.298  
 { 5.275

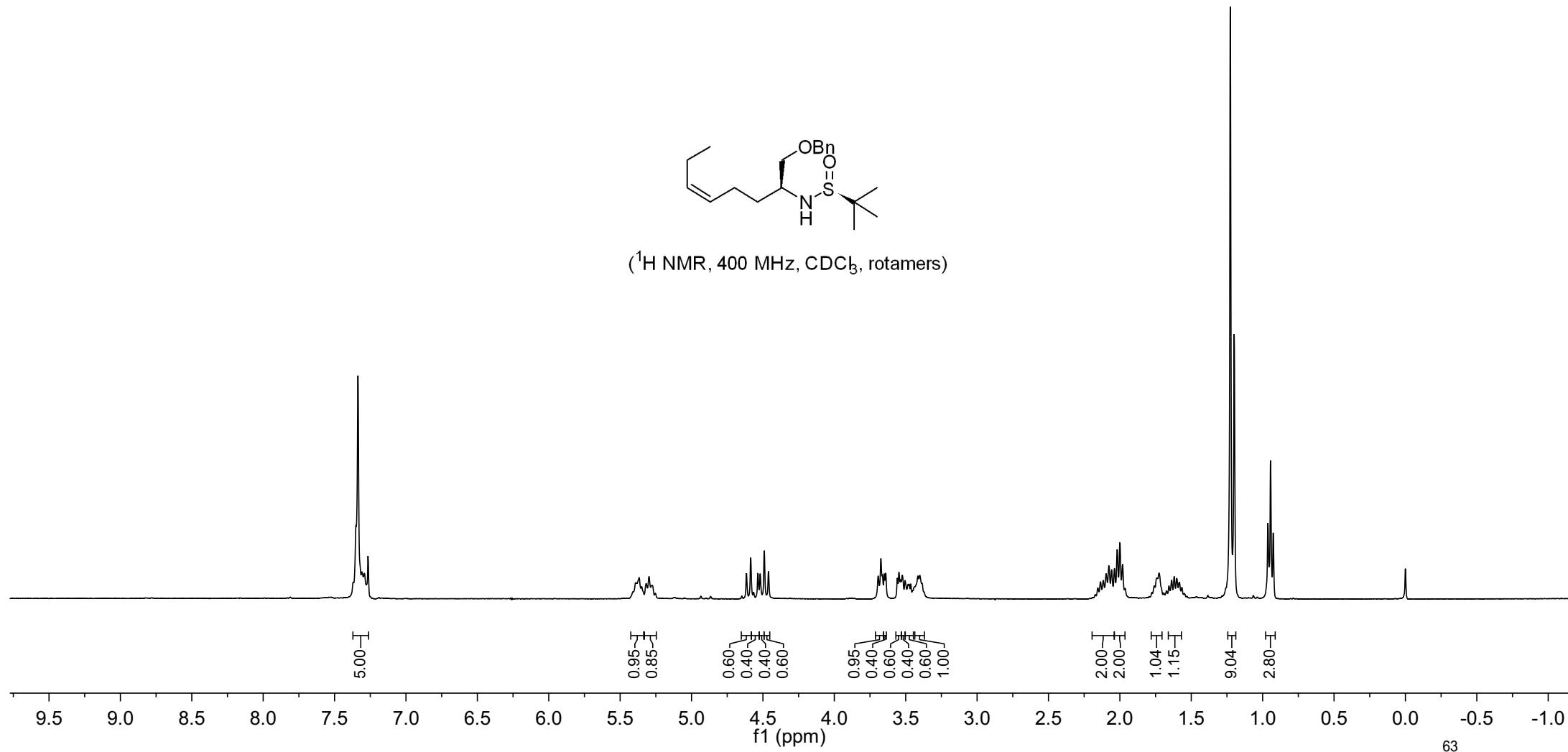
4.615  
 { 4.586  
 { 4.535  
 { 4.491  
 { 4.461

3.674  
 { 3.664  
 { 3.650  
 { 3.640  
 { 3.547  
 { 3.525  
 { 3.415  
 { 3.401

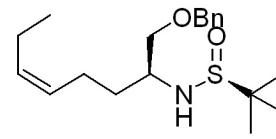
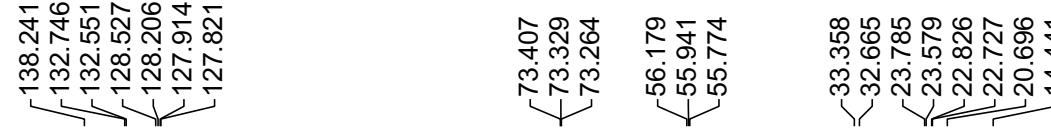
2.096  
 { 2.076  
 { 2.058  
 { 2.019  
 { 2.000  
 - 1.725  
 { 1.619  
 { 1.602  
 { 1.199  
 { 0.963  
 { 0.945  
 { 0.926



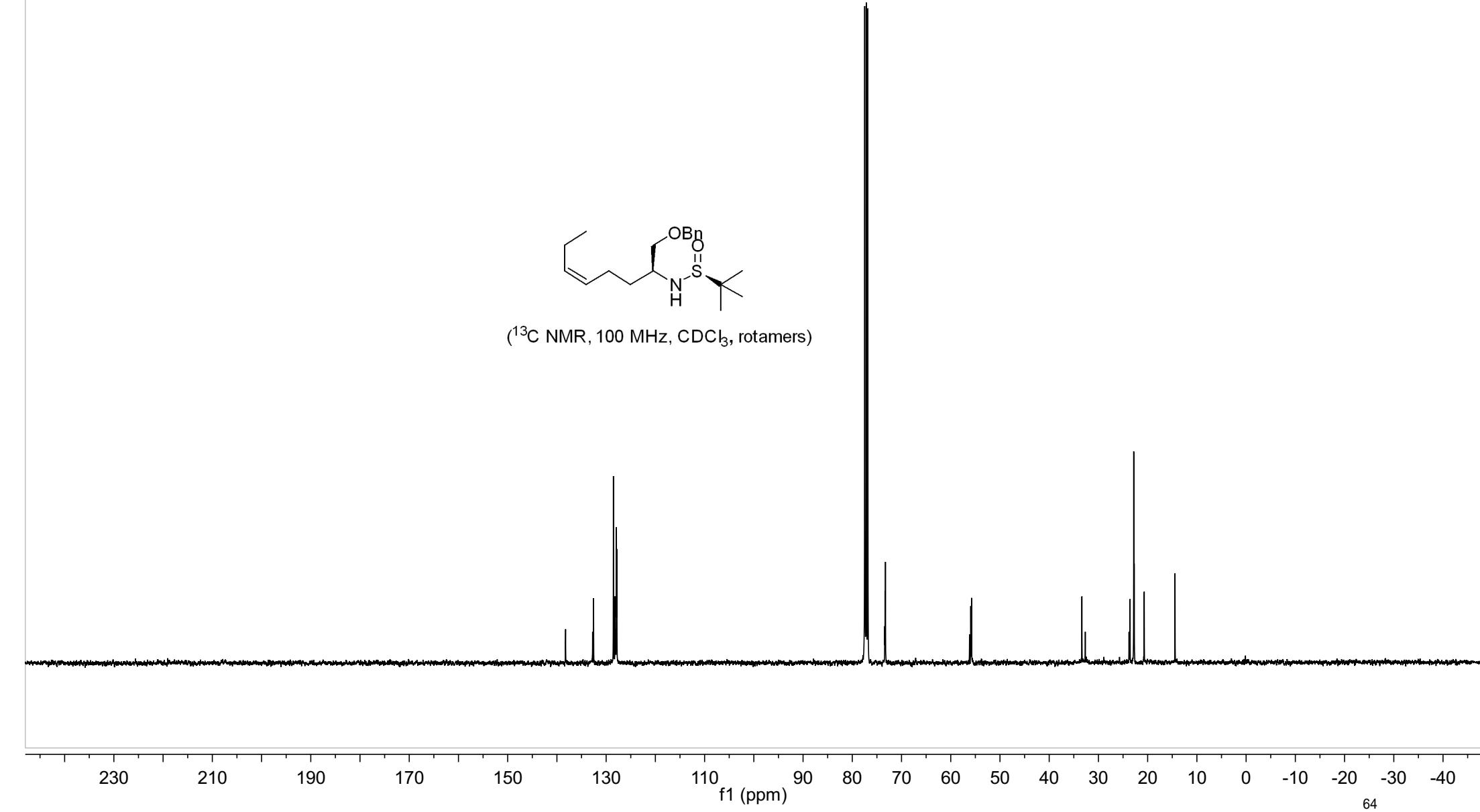
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 10h



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>, rotamers)



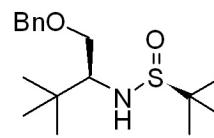
NMR spectra of compound 10i

7.345  
7.336  
7.288

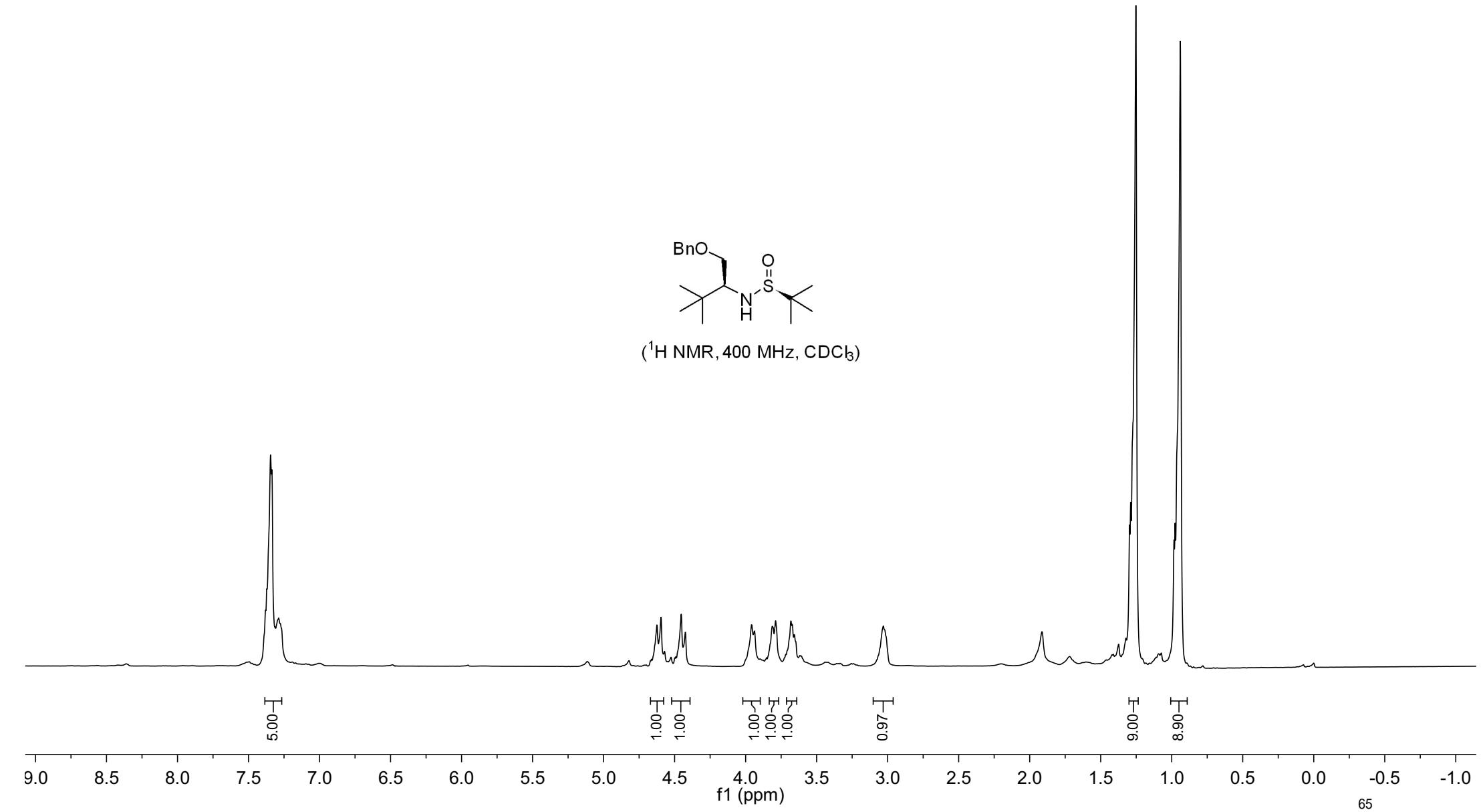
4.624  
4.596  
4.454  
4.424  
3.958  
3.938  
3.812  
3.789  
3.681  
3.672

-3.031

-1.252  
-0.939



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

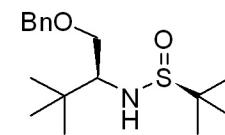


NMR spectra of compound 10i

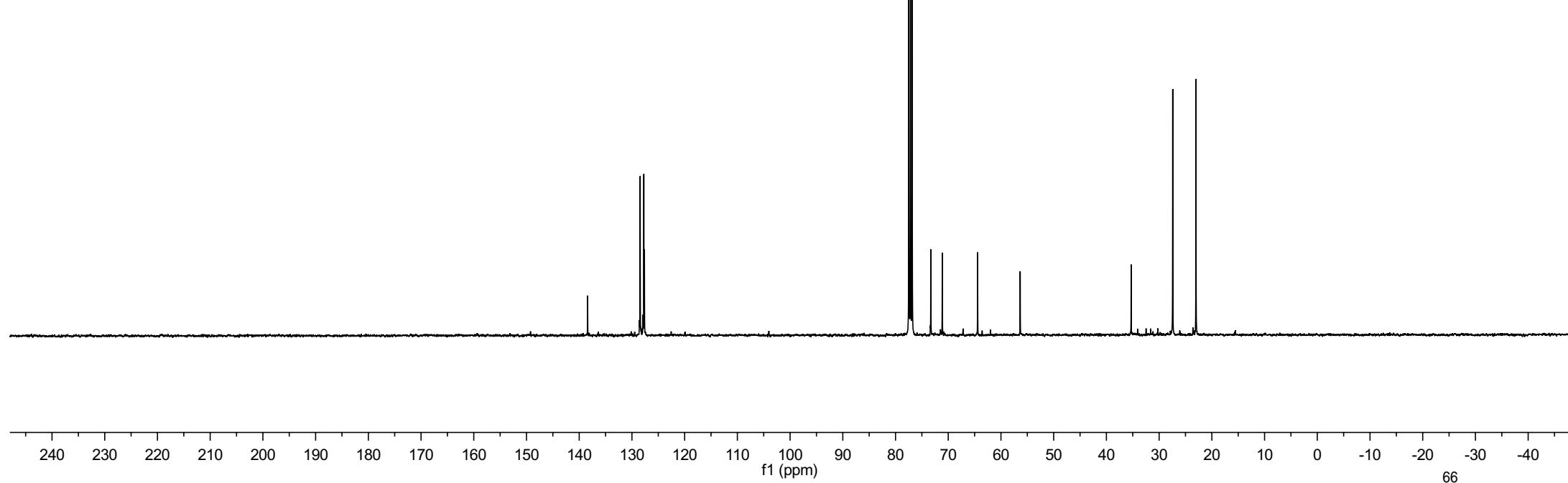
—138.398  
—128.436  
—127.743  
—127.627

—73.302  
—71.131  
—64.427  
—56.354

—35.300  
—27.421  
—23.010



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



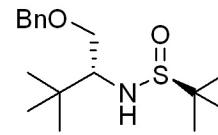
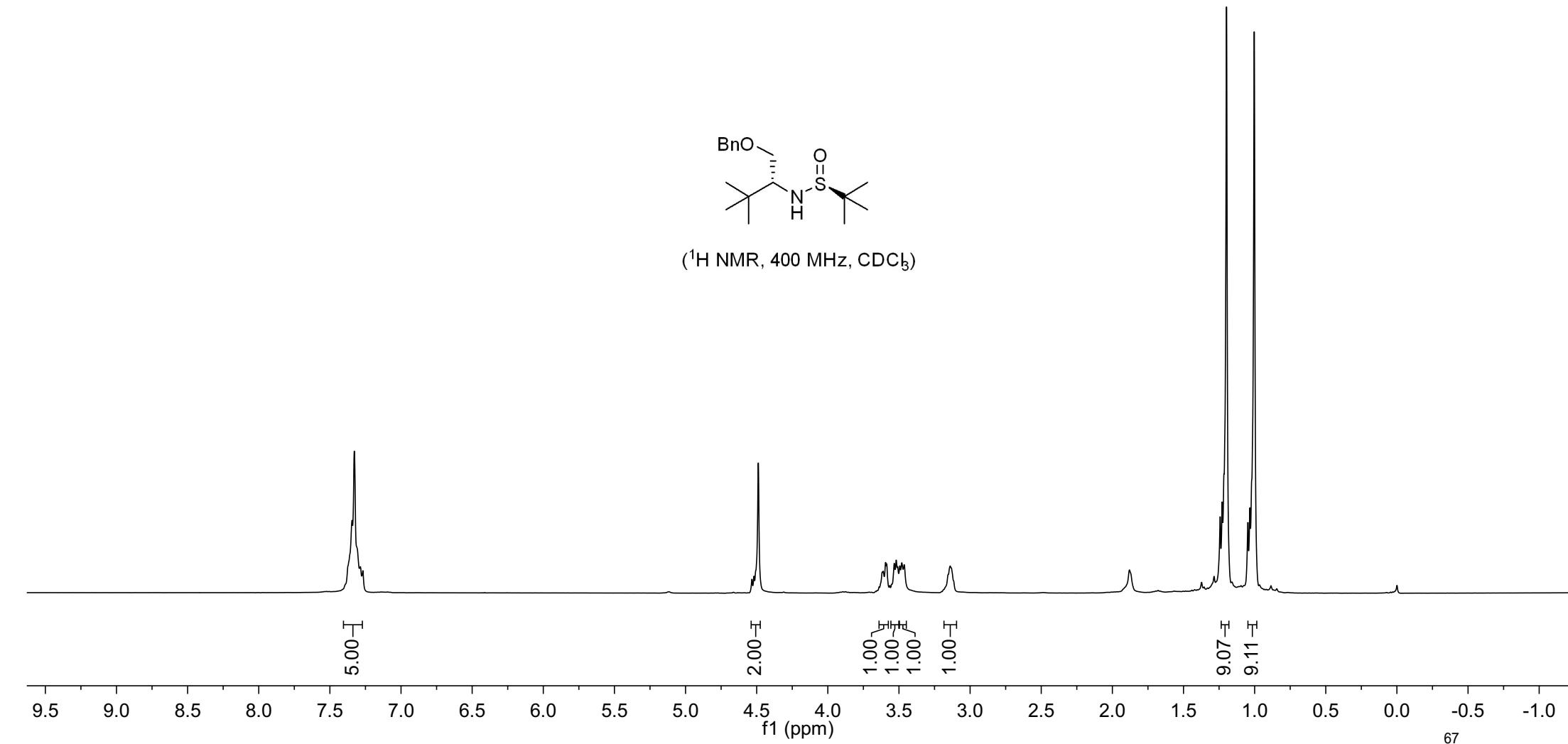
## NMR spectra of compound (1R)-10i

7.344  
7.328  
7.286  
7.268

-4.489

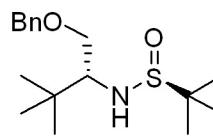
3.594  
3.586  
3.533  
3.519  
3.480  
3.463  
3.140

1.228  
1.216  
1.198  
1.033  
1.003

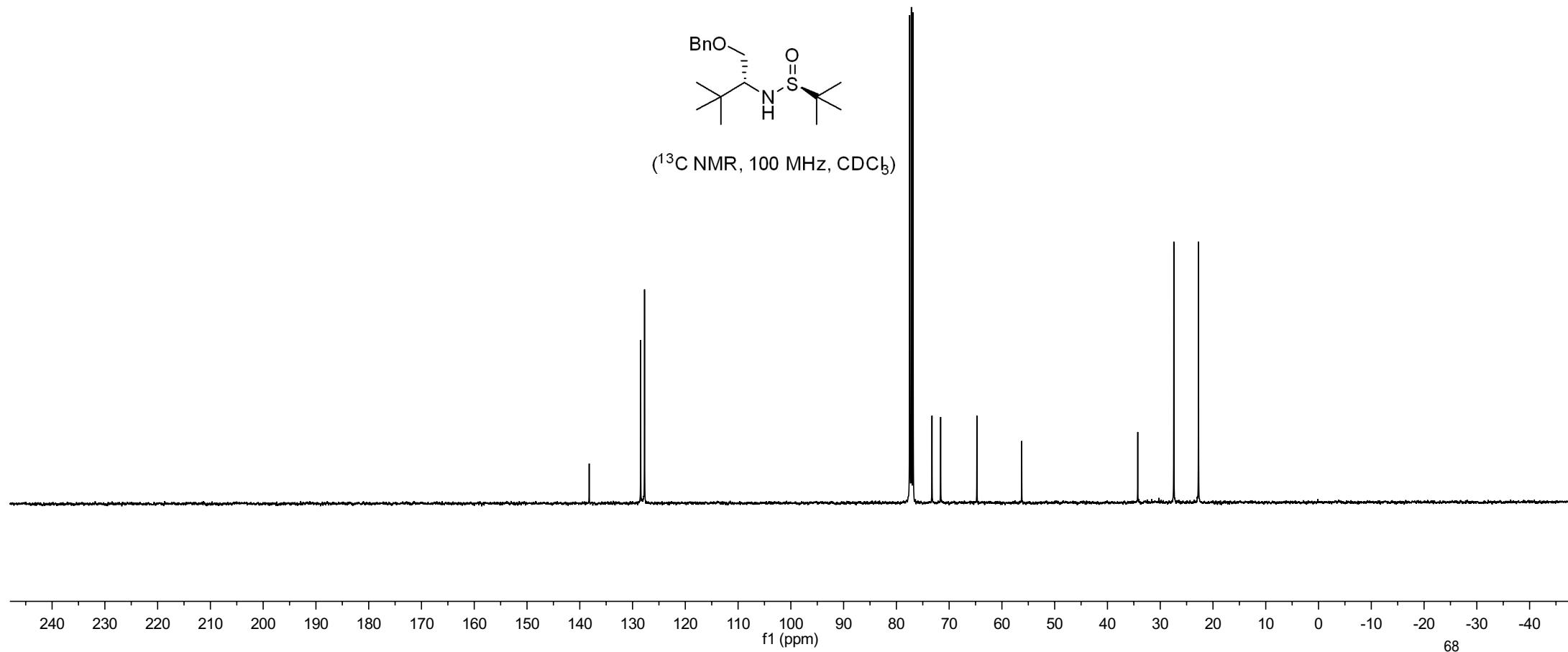
(1H NMR, 400 MHz, CDCl<sub>3</sub>)

NMR spectra of compound (1R)-10i

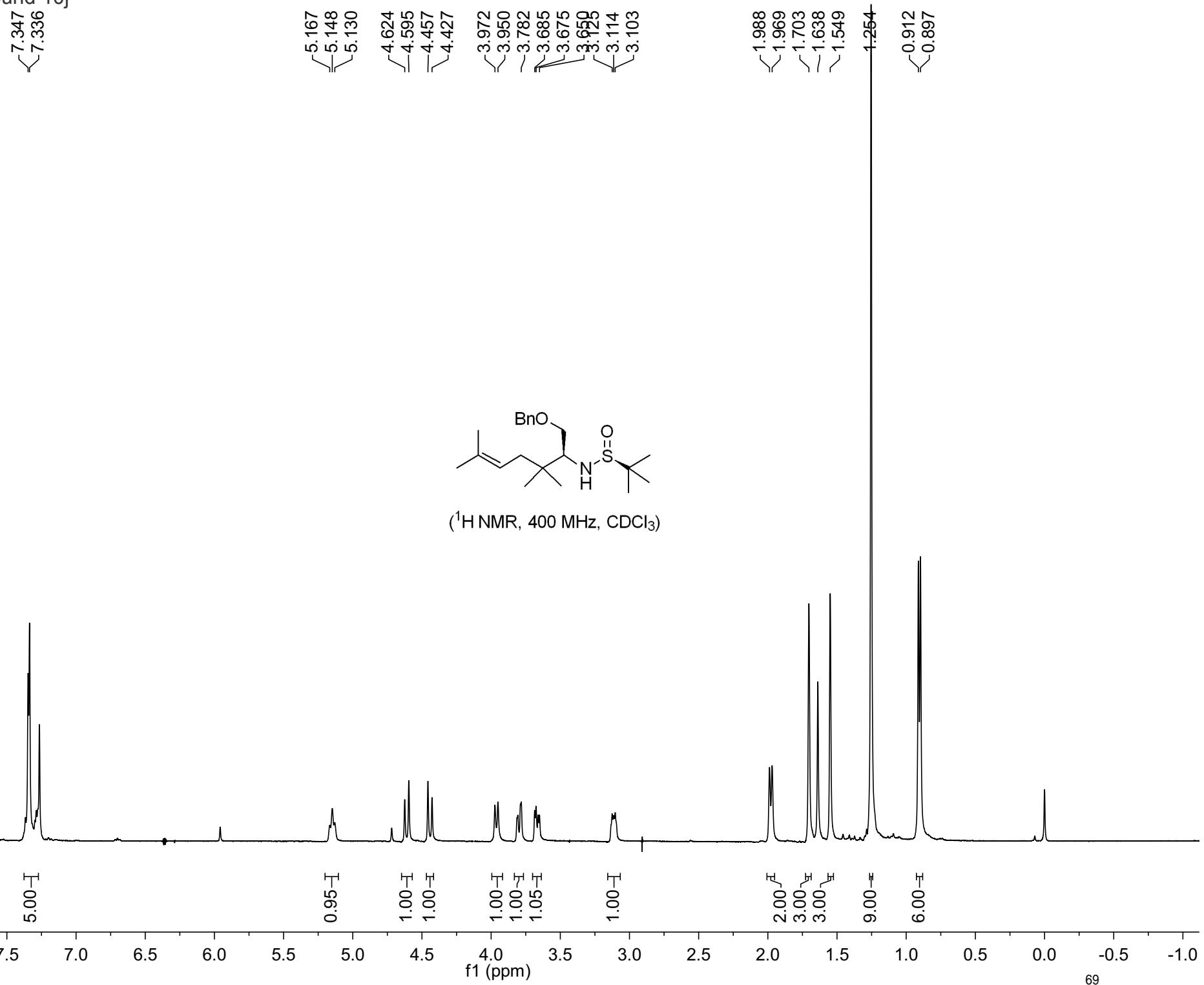
—138.215  
—128.461  
—127.730  
—73.251  
—71.612  
—64.742  
—56.248  
—34.259  
—27.422  
—22.749



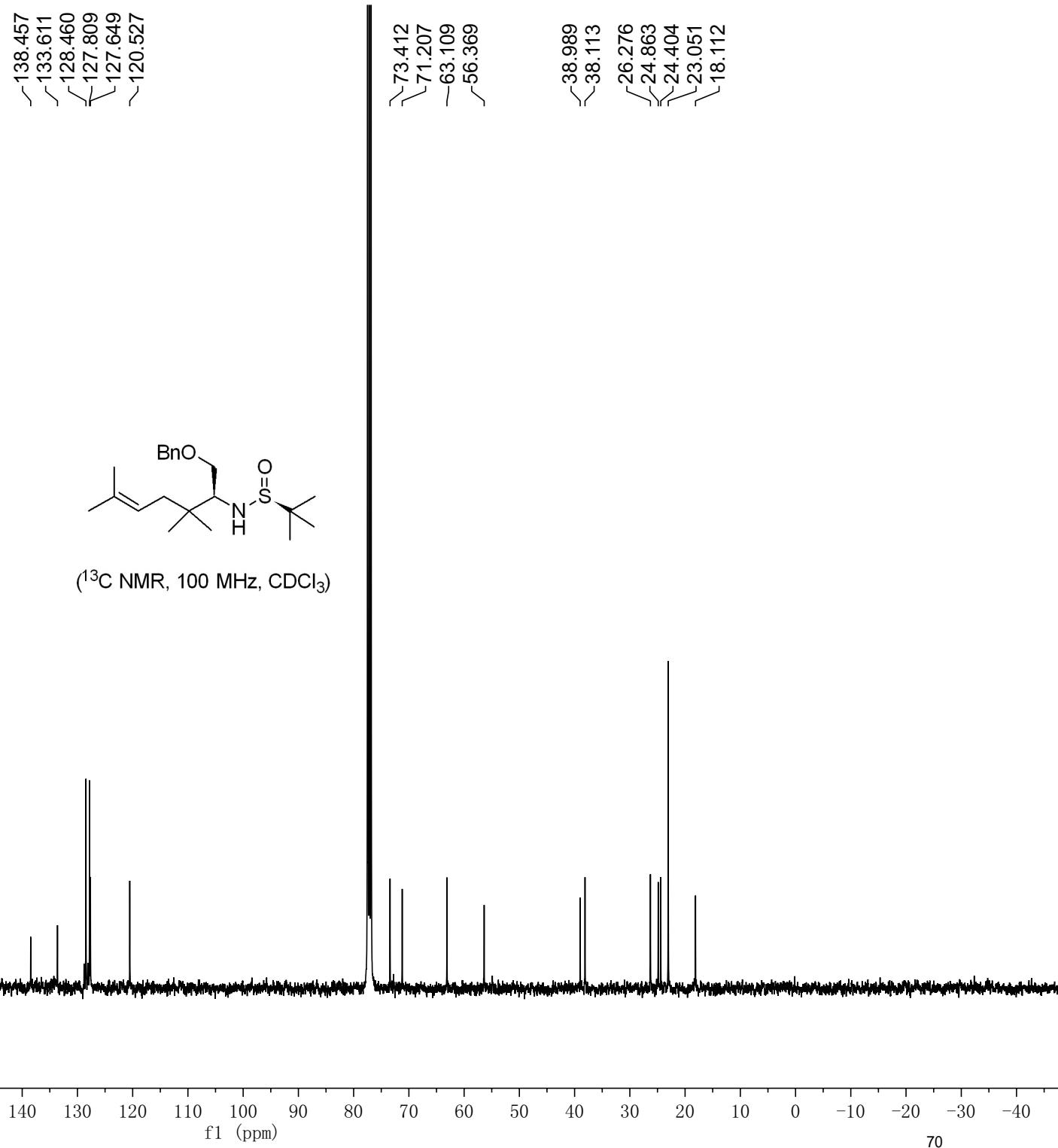
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10j



NMR spectra of compound 10j



## NMR spectra of compound (1R)-10j

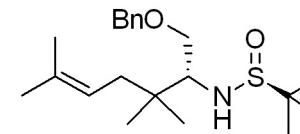
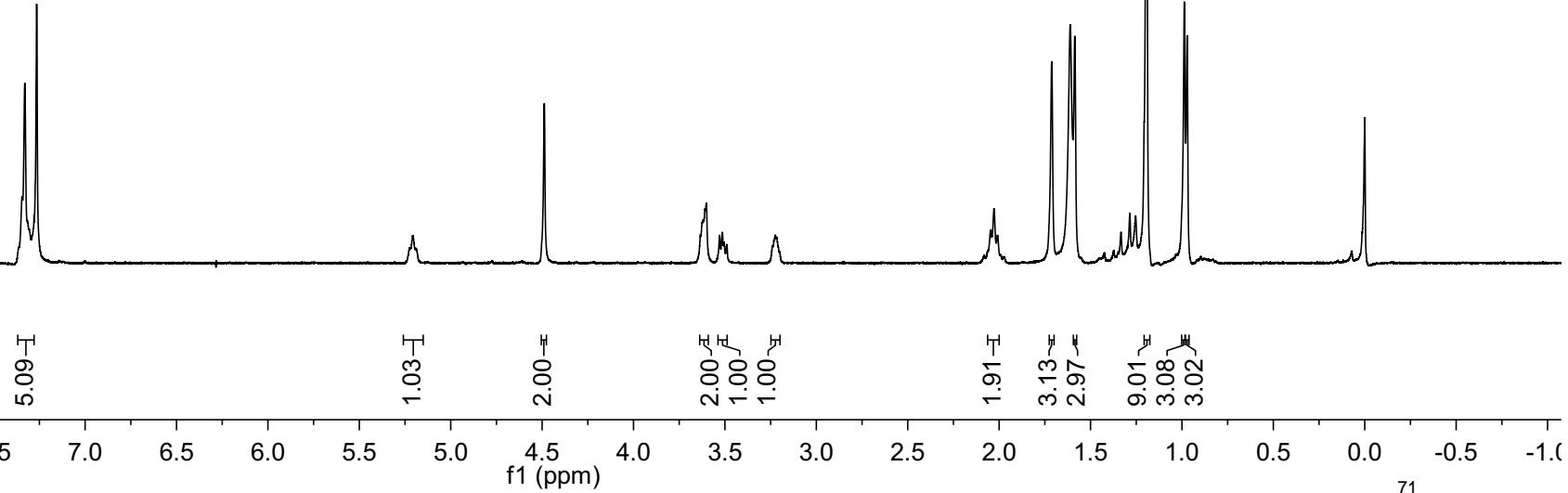
7.330  
7.279  
7.265

-5.206

-4.488

3.602  
3.529  
3.514  
3.490  
3.225

2.047  
2.028  
2.009  
1.712  
1.586  
1.193  
0.987  
0.971

(1H NMR, 400 MHz, CDCl<sub>3</sub>)

NMR spectra of compound (1R)-10j

—134.107  
—128.482  
—127.805  
—127.735  
—120.417

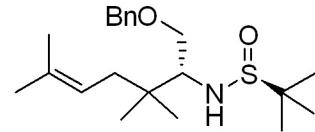
—73.272  
—71.646

—63.821

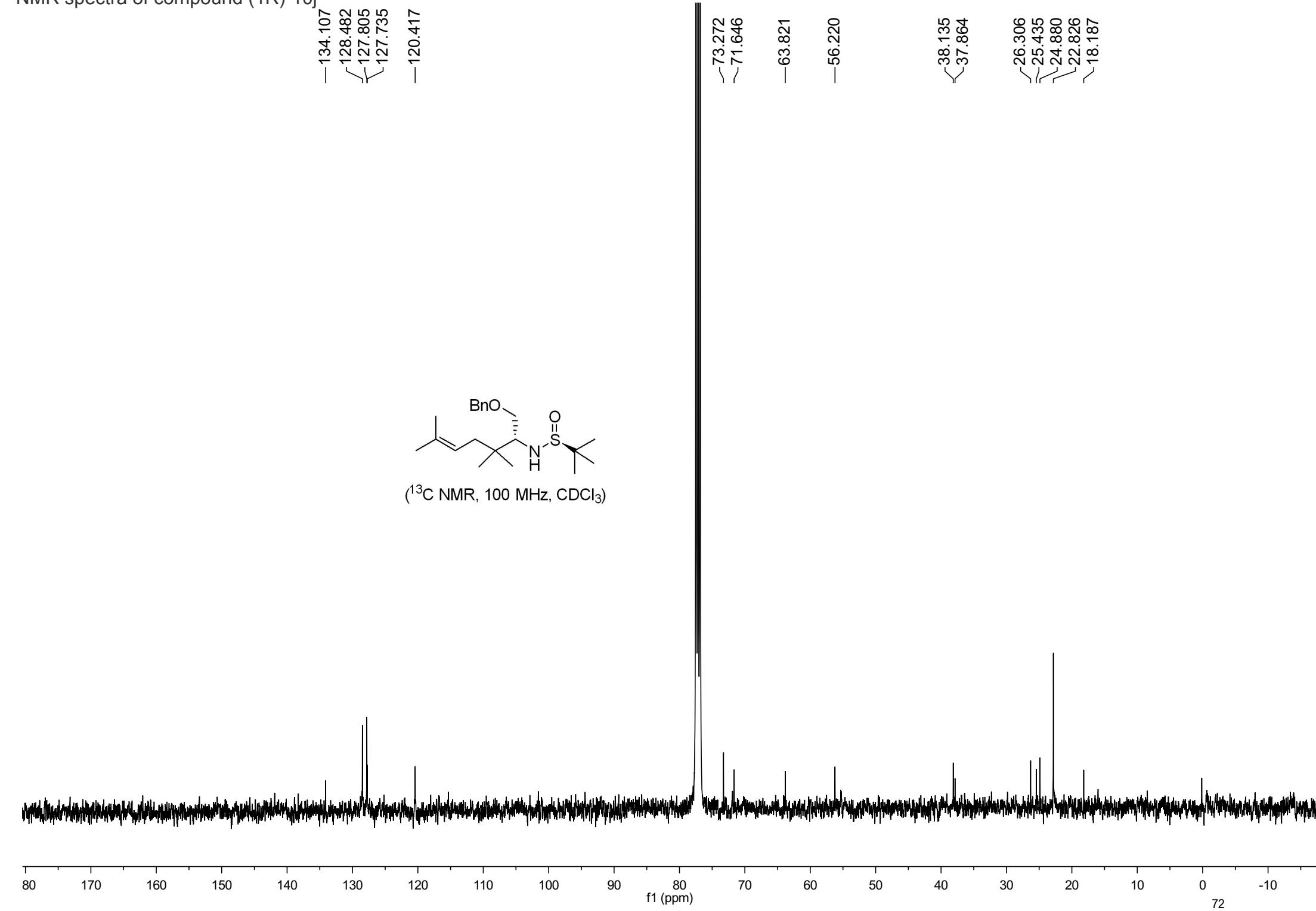
—56.220

—38.135  
—37.864

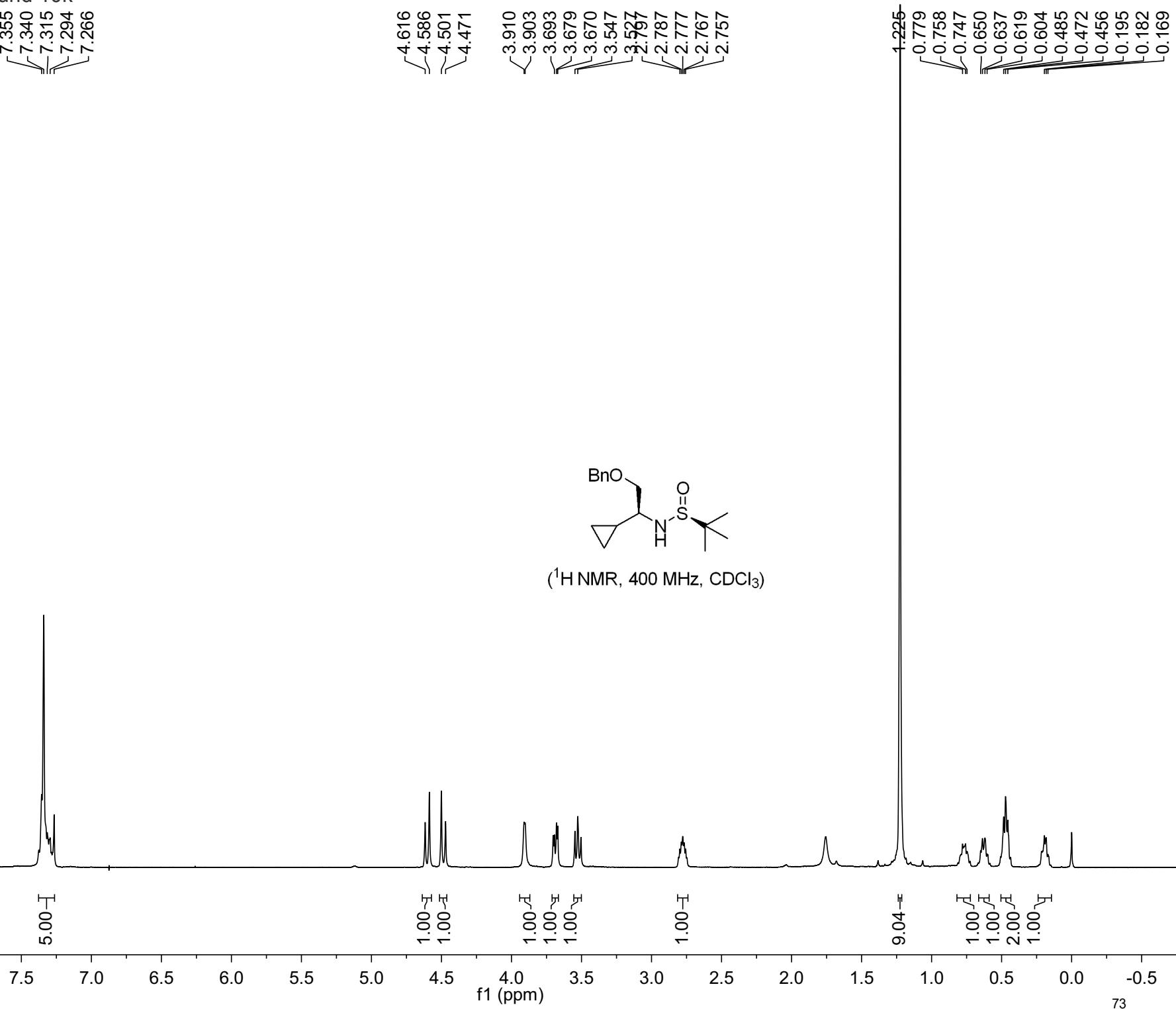
—26.306  
—25.435  
—24.880  
—22.826  
—18.187



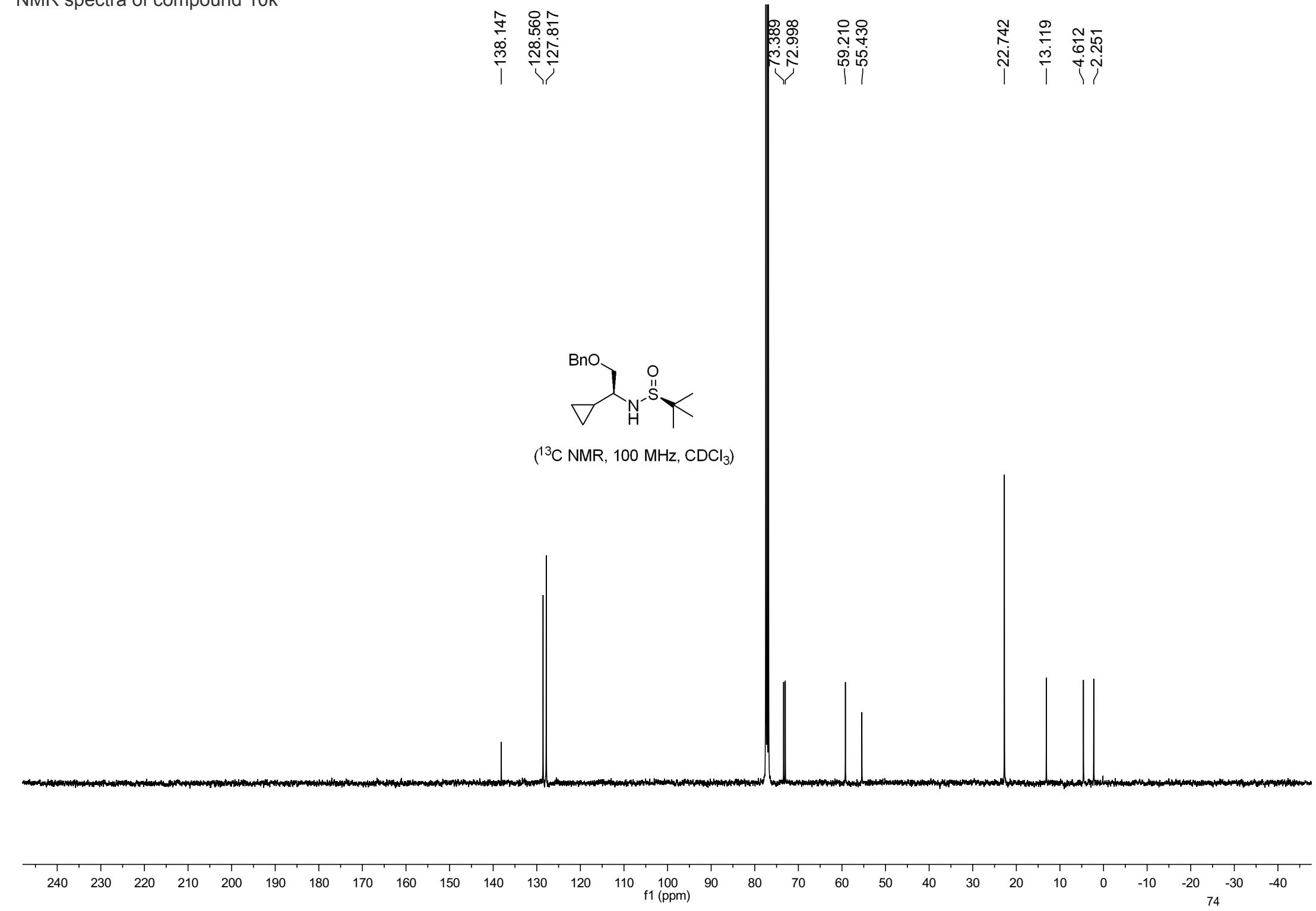
(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 10k



NMR spectra of compound 10k



NMR spectra of compound (1R)-10k

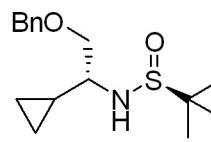
7.339  
7.312  
7.265

4.594  
4.564  
4.550  
4.521

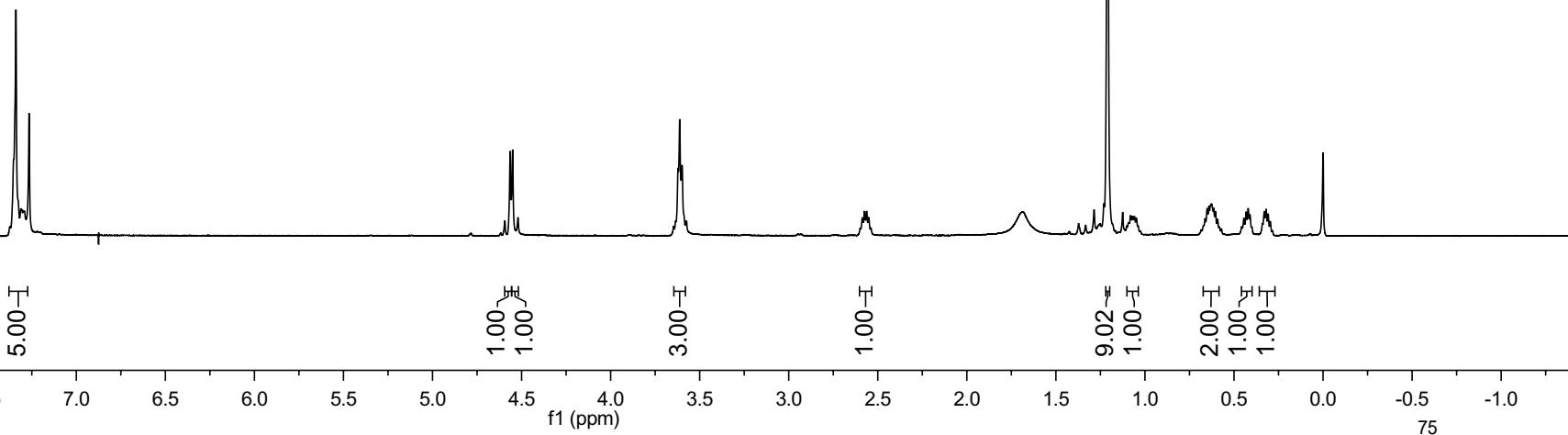
3.621  
3.612  
3.599

2.587  
2.575  
2.563  
2.551

1.209  
1.081  
1.069  
1.059  
1.049  
0.651  
0.641  
0.627  
0.614  
0.604  
0.444  
0.410  
0.431  
0.420  
0.330  
0.320  
0.308

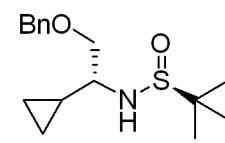


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

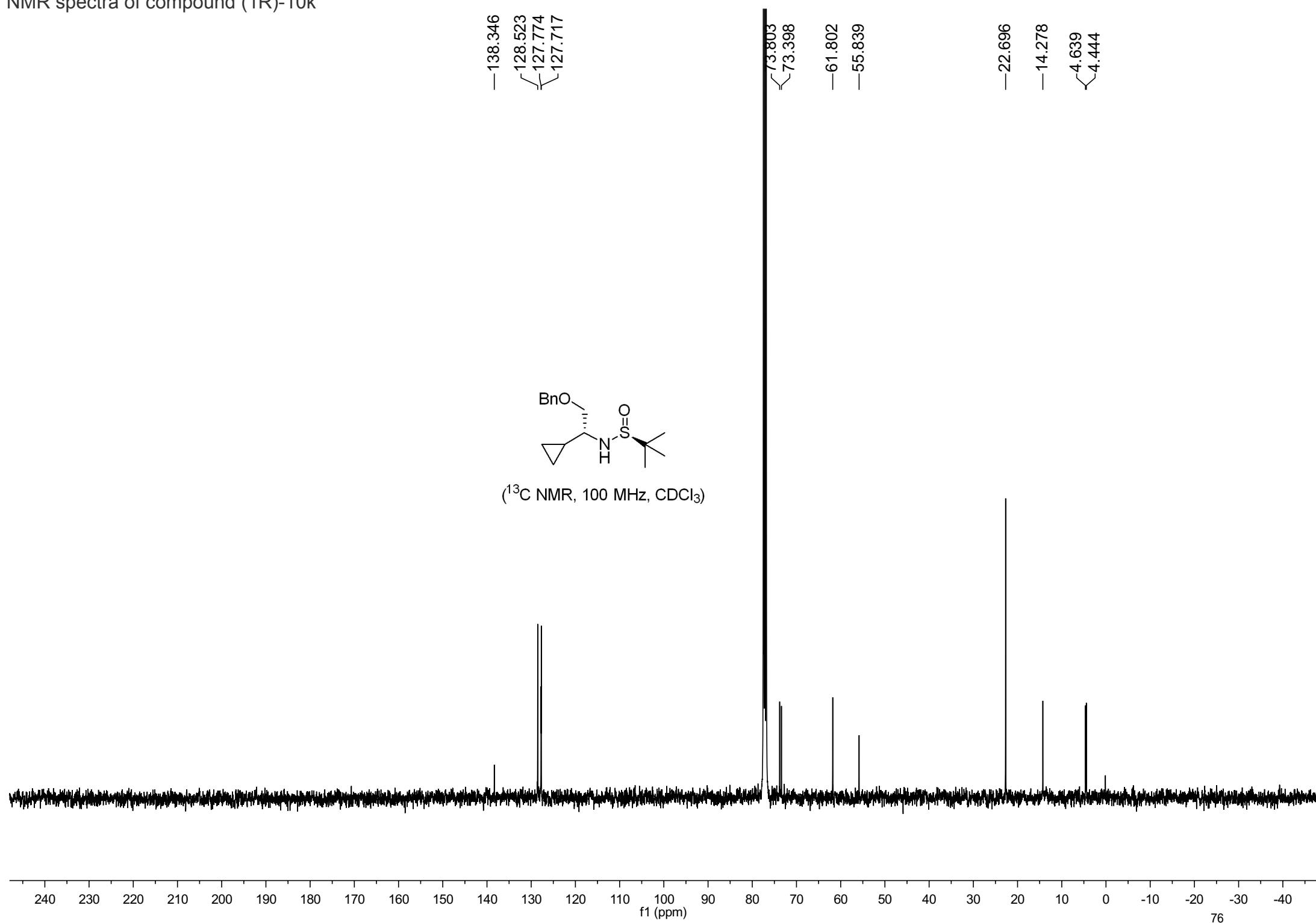


NMR spectra of compound (1R)-10k

—138.346  
—128.523  
—127.774  
—127.717  
—73.803  
—73.398  
—61.802  
—55.839  
—22.696  
—14.278  
—4.639  
—4.444



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 10l

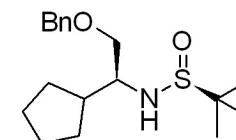
7.340  
7.298  
7.287  
7.265

4.633  
4.603  
4.477  
4.448

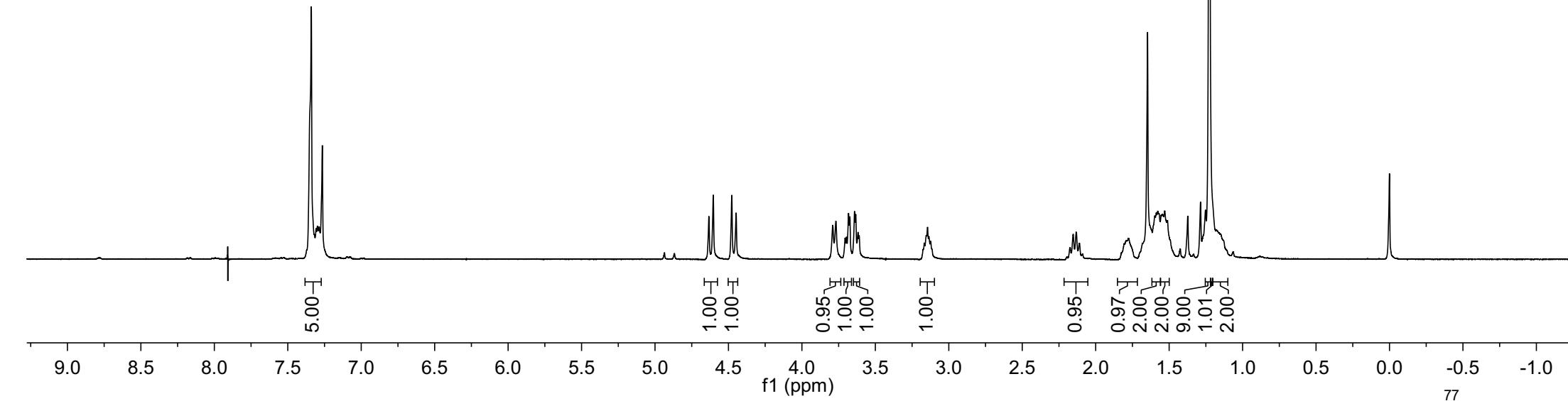
3.790  
3.769  
3.683  
3.674  
3.642  
3.634  
3.625

2.153  
2.132  
2.112  
1.777  
1.578  
1.530

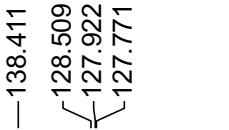
1.225



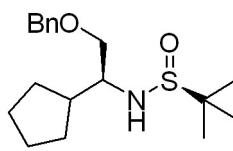
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10l

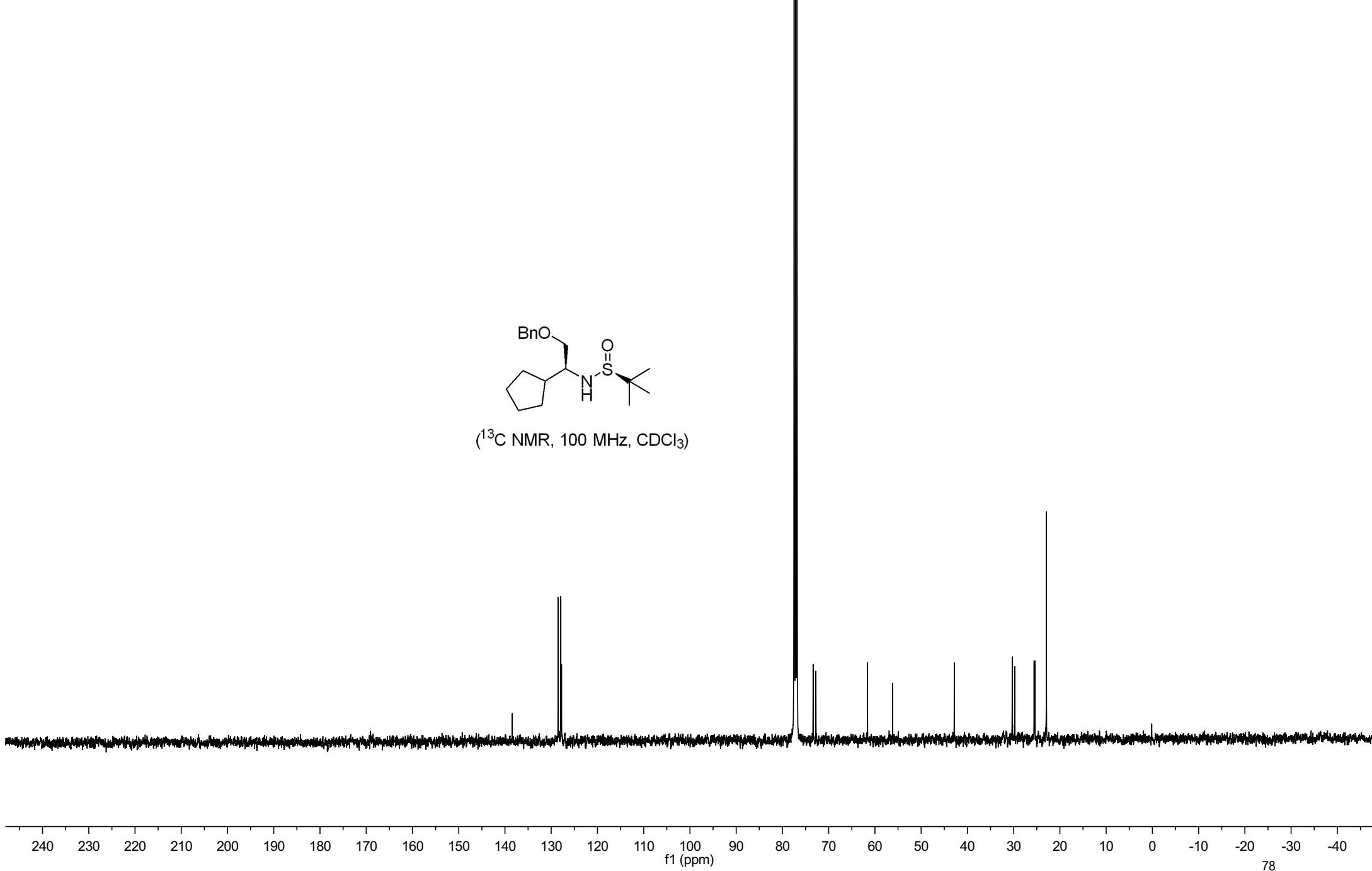


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

—138.411  
—128.509  
—127.922  
—127.771  
—73.369  
—72.759  
—61.608  
—56.179  
—42.842  
—30.310  
—29.748  
—25.580  
—25.412  
—22.919



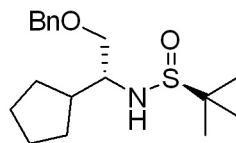
NMR spectra of compound (1R)-10I

>7.340  
>7.295

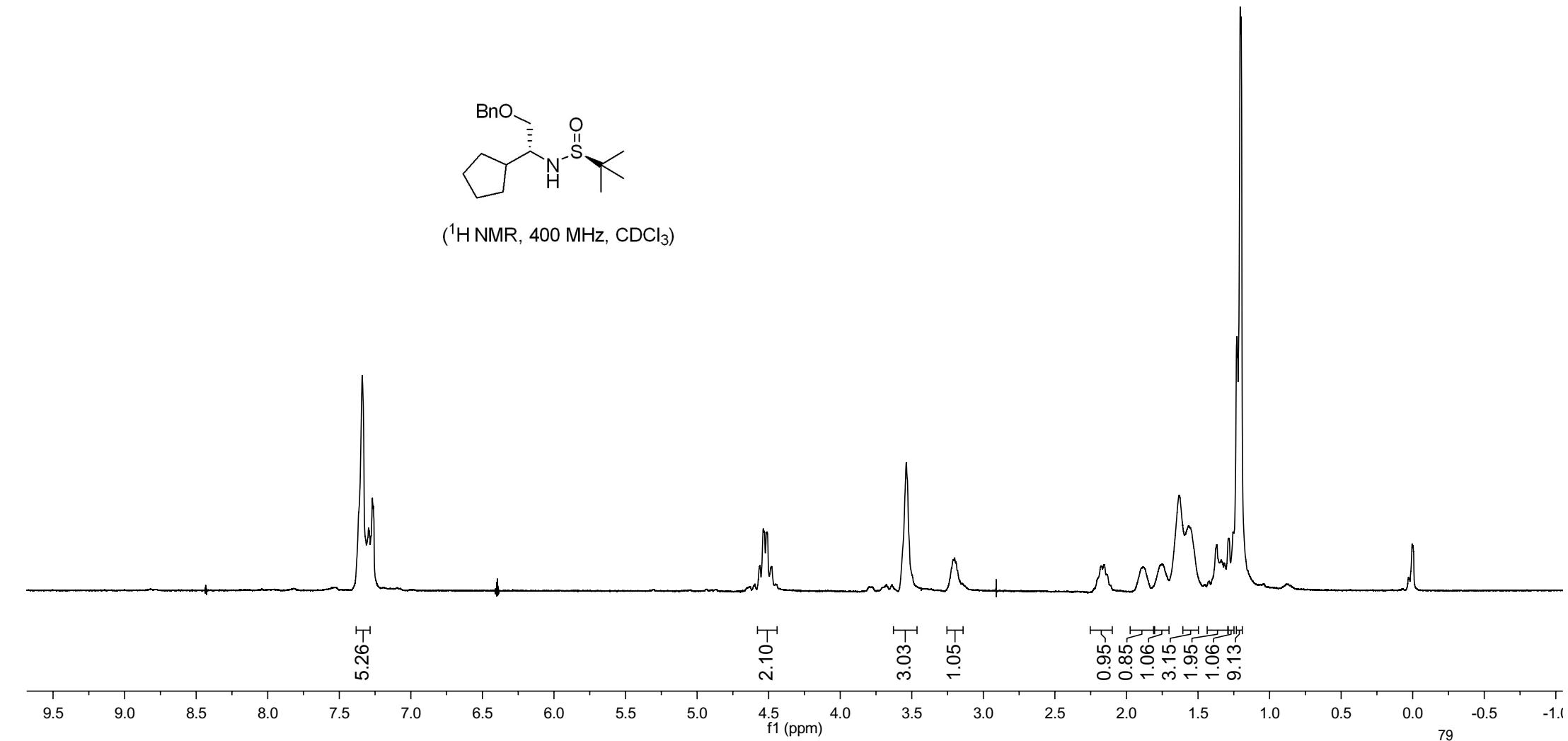
{4.561  
4.538  
4.510  
4.480

{3.677  
3.637  
3.538  
-3.200

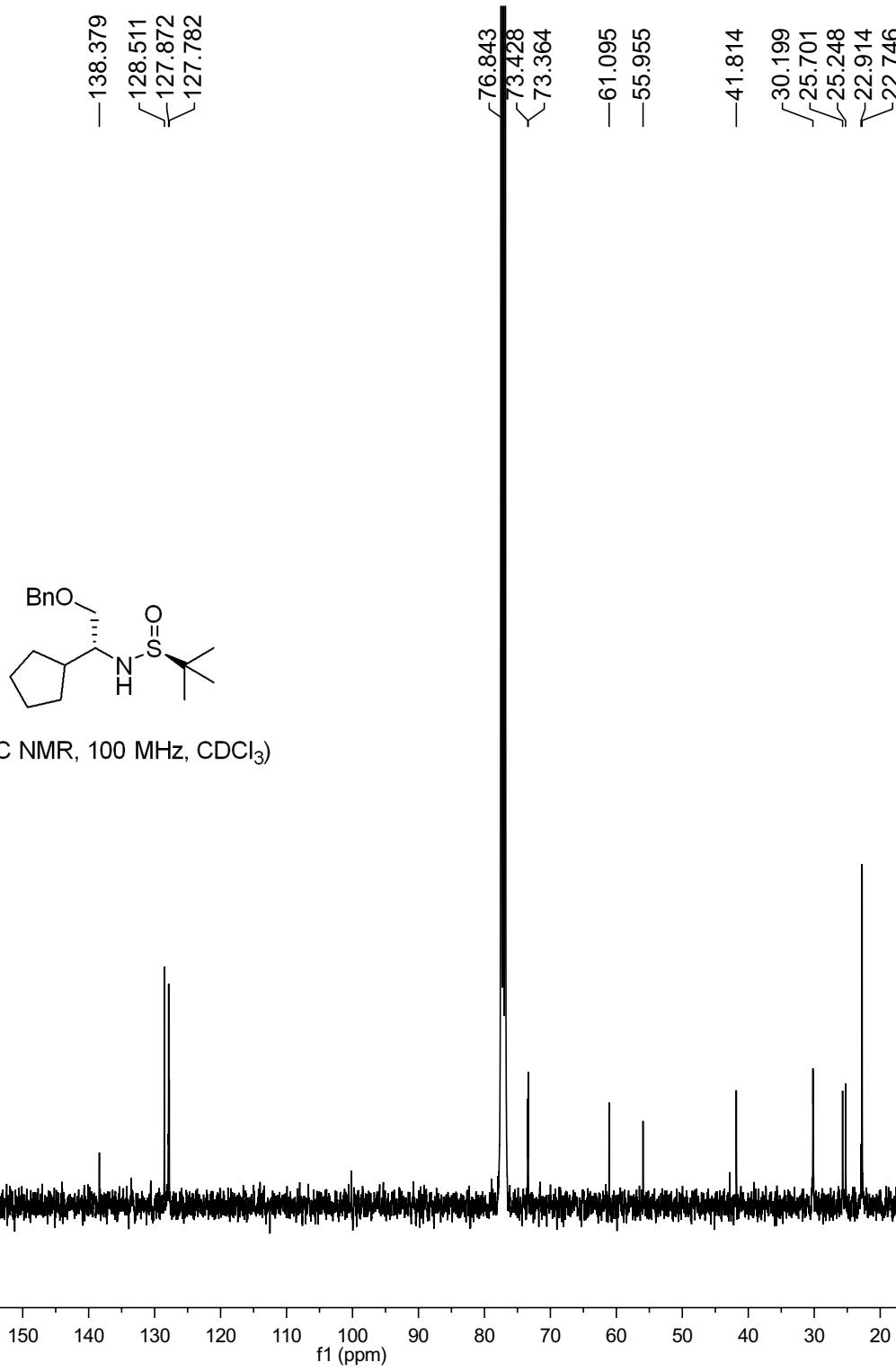
{2.176  
2.156  
-1.886  
-1.749  
-1.567  
{1.228  
1.205  
1.199



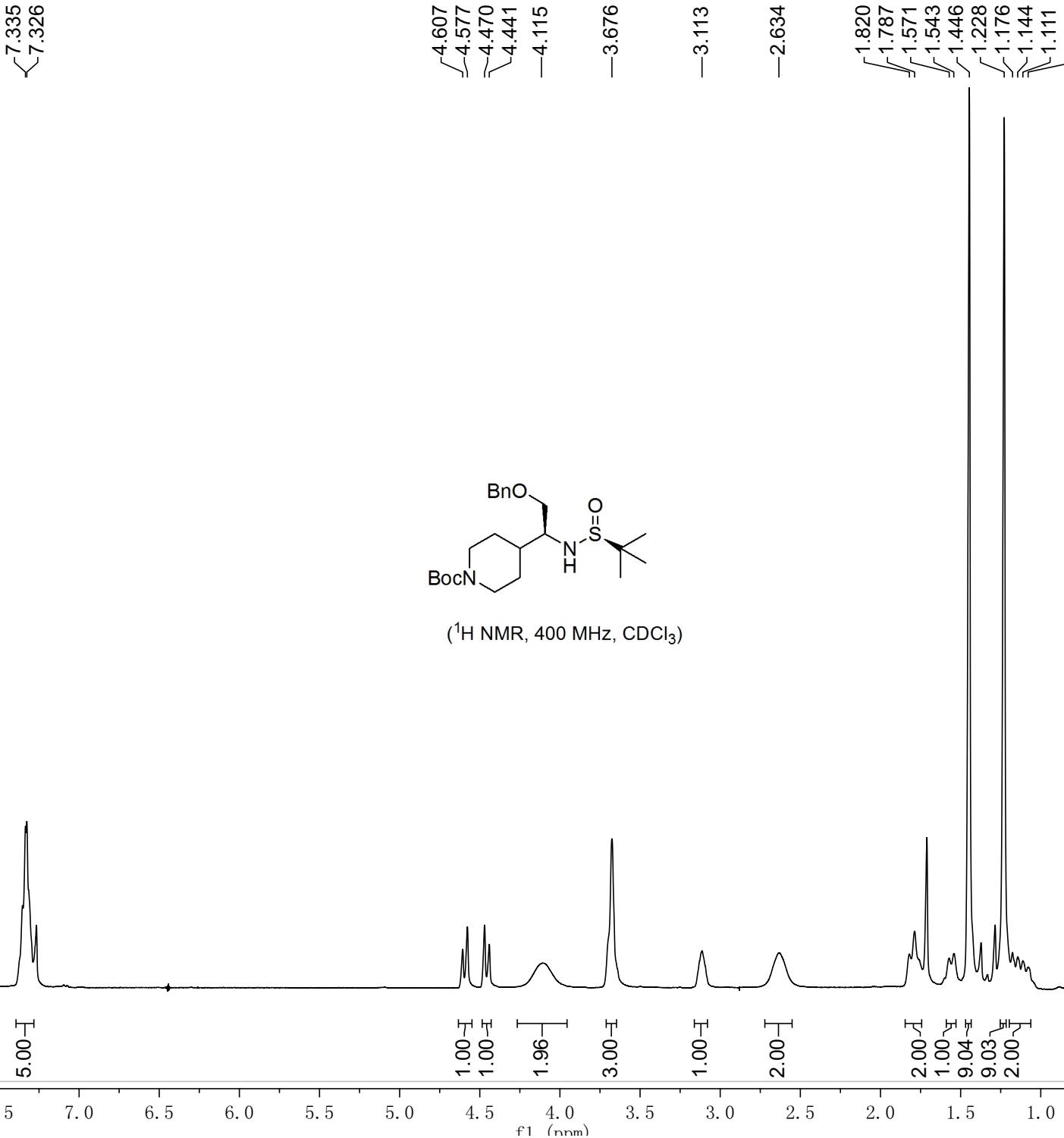
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



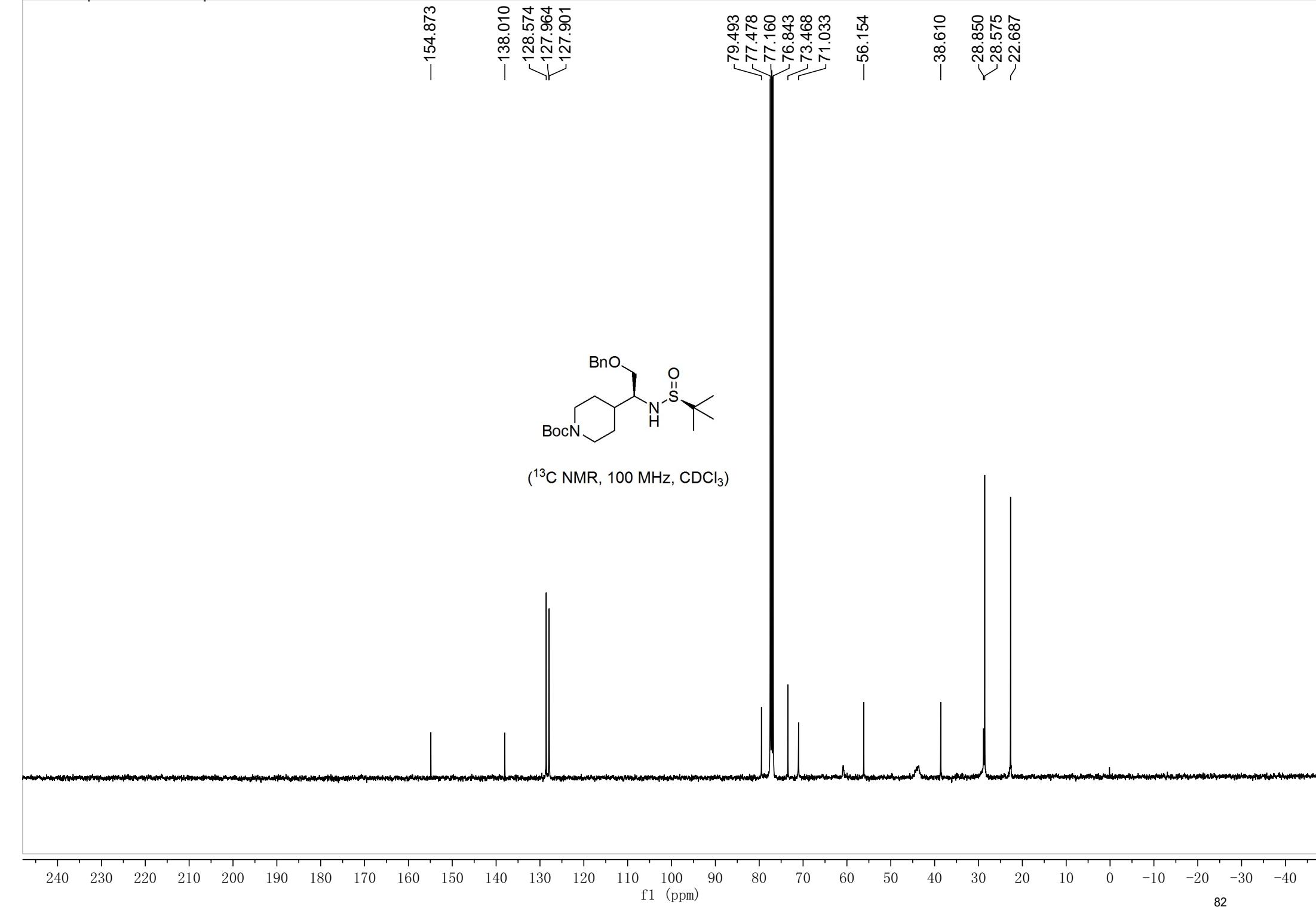
NMR spectra of compound (1R)-10l



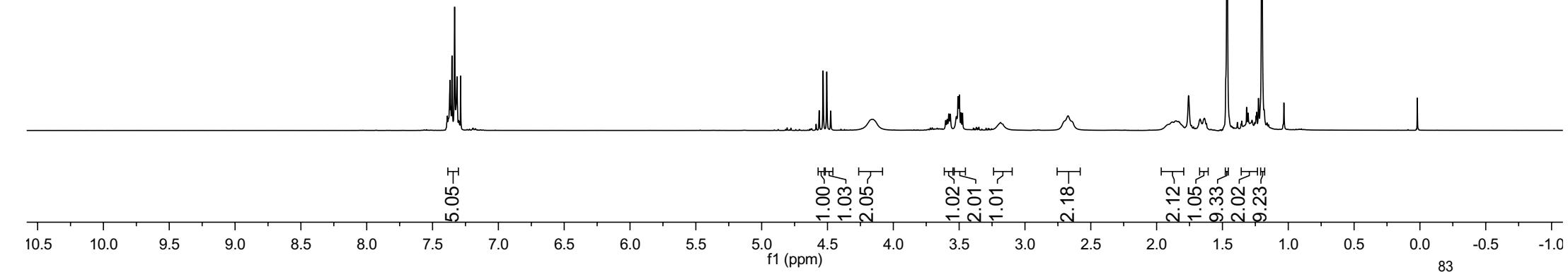
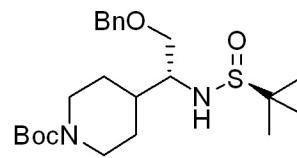
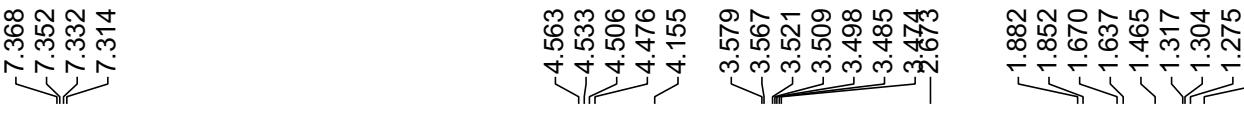
## NMR spectra of compound 10m



NMR spectra of compound 10m

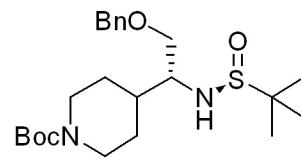


NMR spectra of compound (1R)-10m



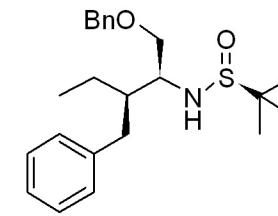
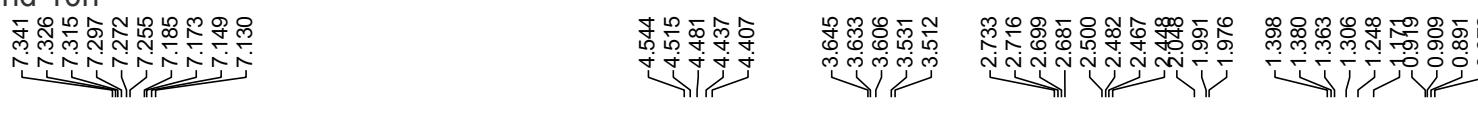
NMR spectra of compound (1R)-10m

—154.87  
—138.01  
—128.57  
—127.96  
—127.90  
—79.49  
—73.47  
—71.03  
—56.15  
—38.61  
—28.85  
—28.58  
—22.69

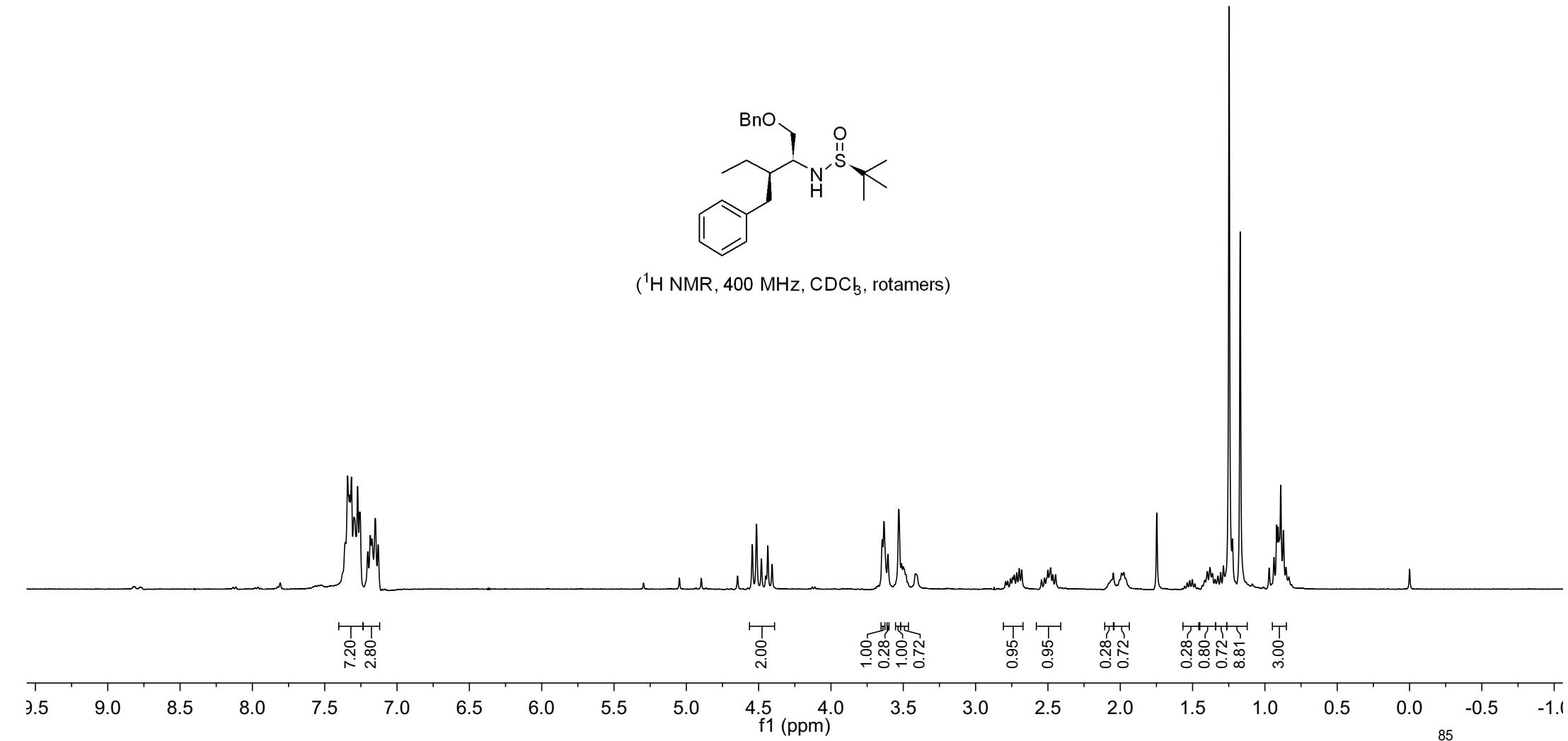


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

NMR spectra of compound 10n

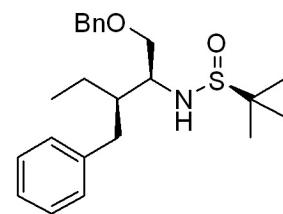


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)

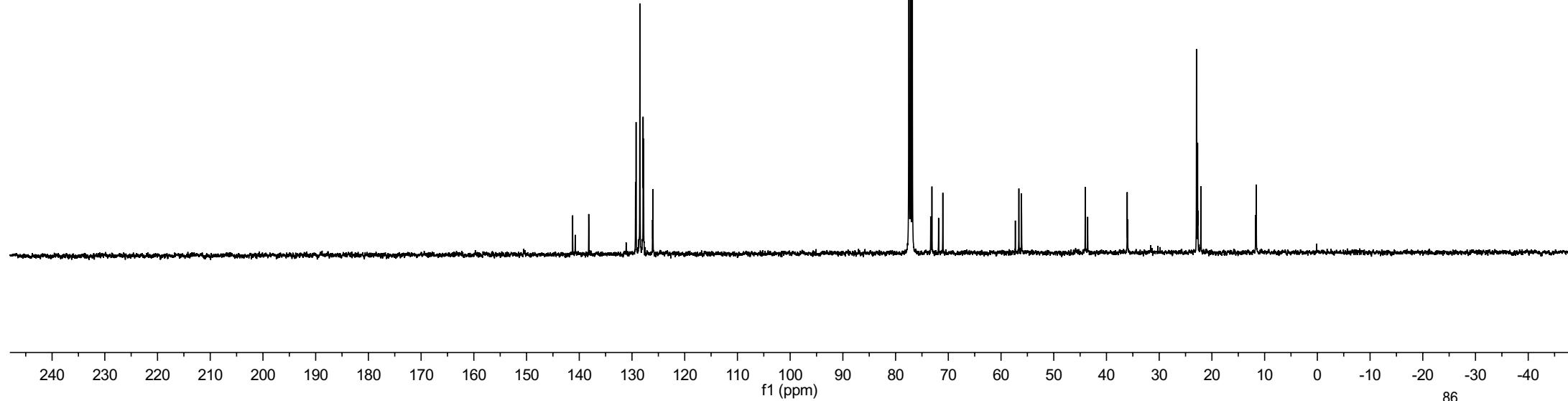


NMR spectra of compound 10n

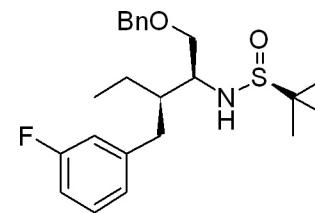
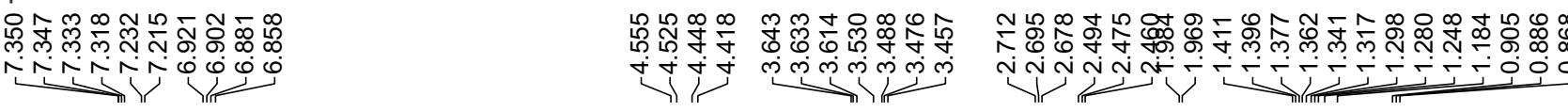
141.254  
138.206  
129.333  
129.225  
128.504  
127.893  
127.840  
127.784  
126.021



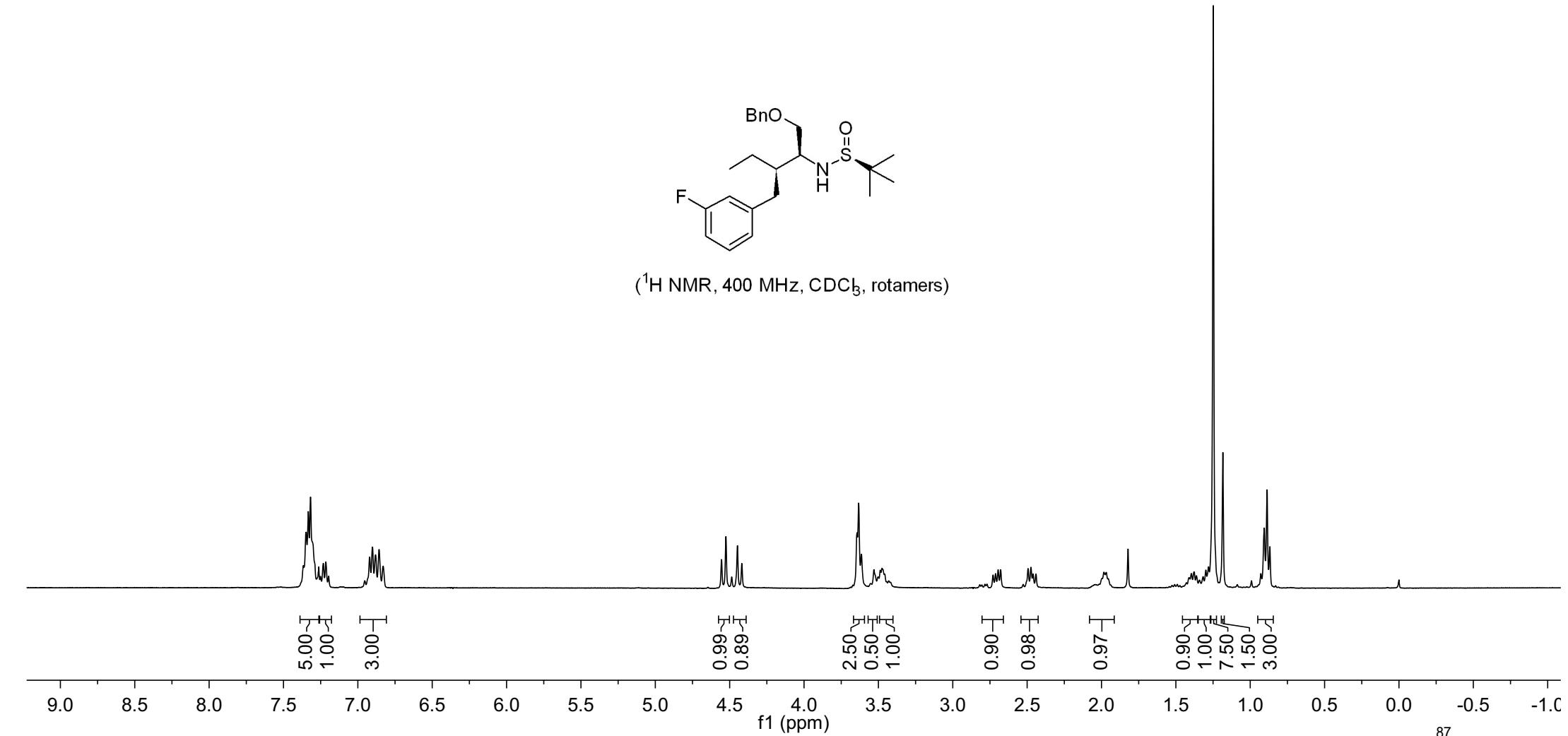
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 100

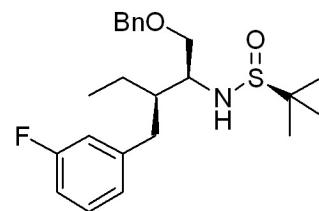


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)

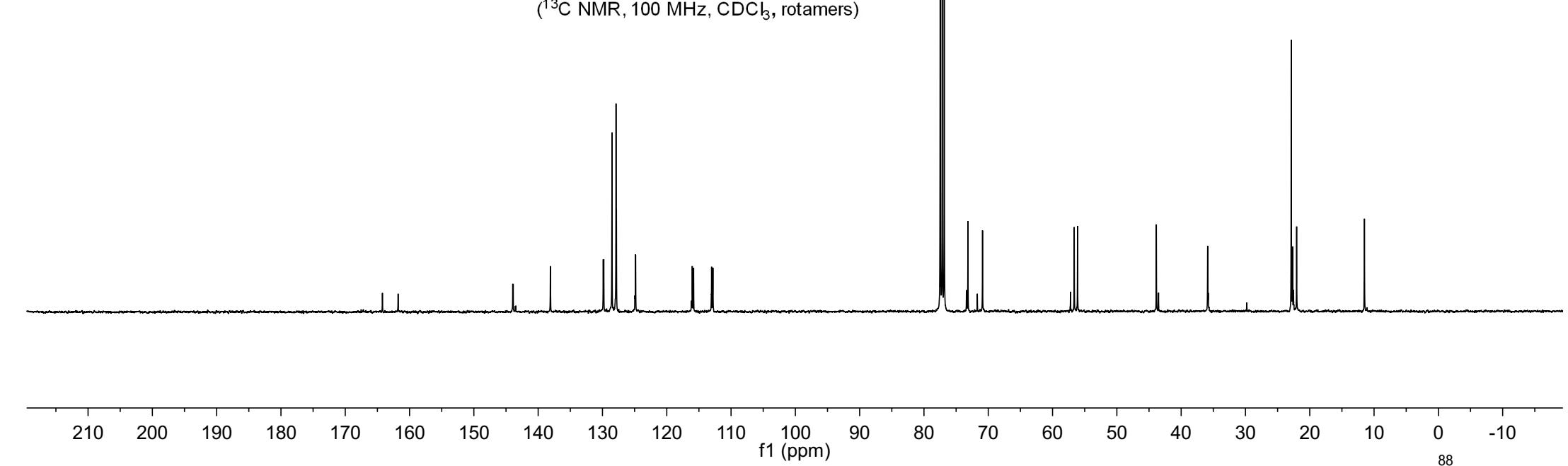


NMR spectra of compound 10o

164.220  
~161.781  
  
143.950  
143.880  
~138.101  
  
128.514  
127.889  
127.823  
124.861  
124.830  
115.823  
113.026  
112.817  
  
73.393  
73.162  
71.701  
70.890  
  
57.209  
56.627  
56.113  
  
43.858  
43.517  
35.879  
35.782  
  
22.884  
22.675  
22.040  
  
-11.491

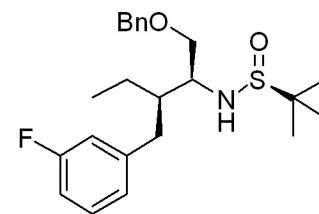


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)

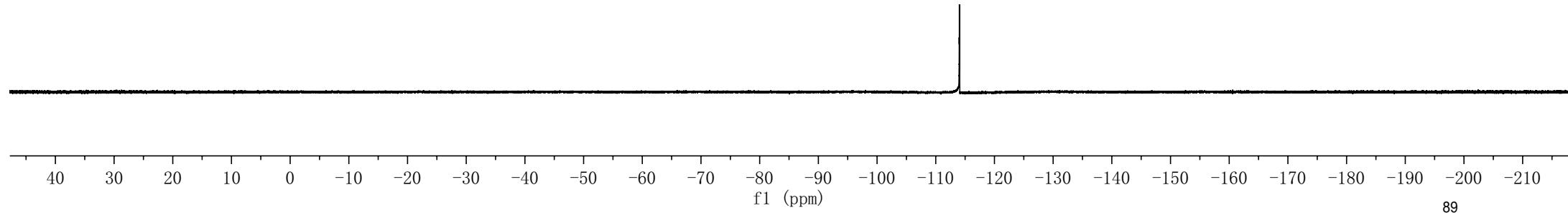


NMR spectra of compound 10o

— -114.030



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 10p

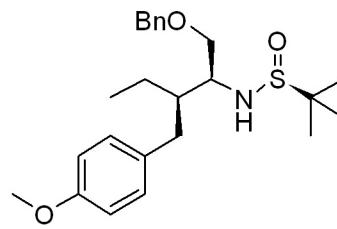
7.336  
7.328  
7.321  
7.312  
7.258  
7.058  
7.036  
6.822  
6.801

4.544  
4.514  
4.481  
4.441

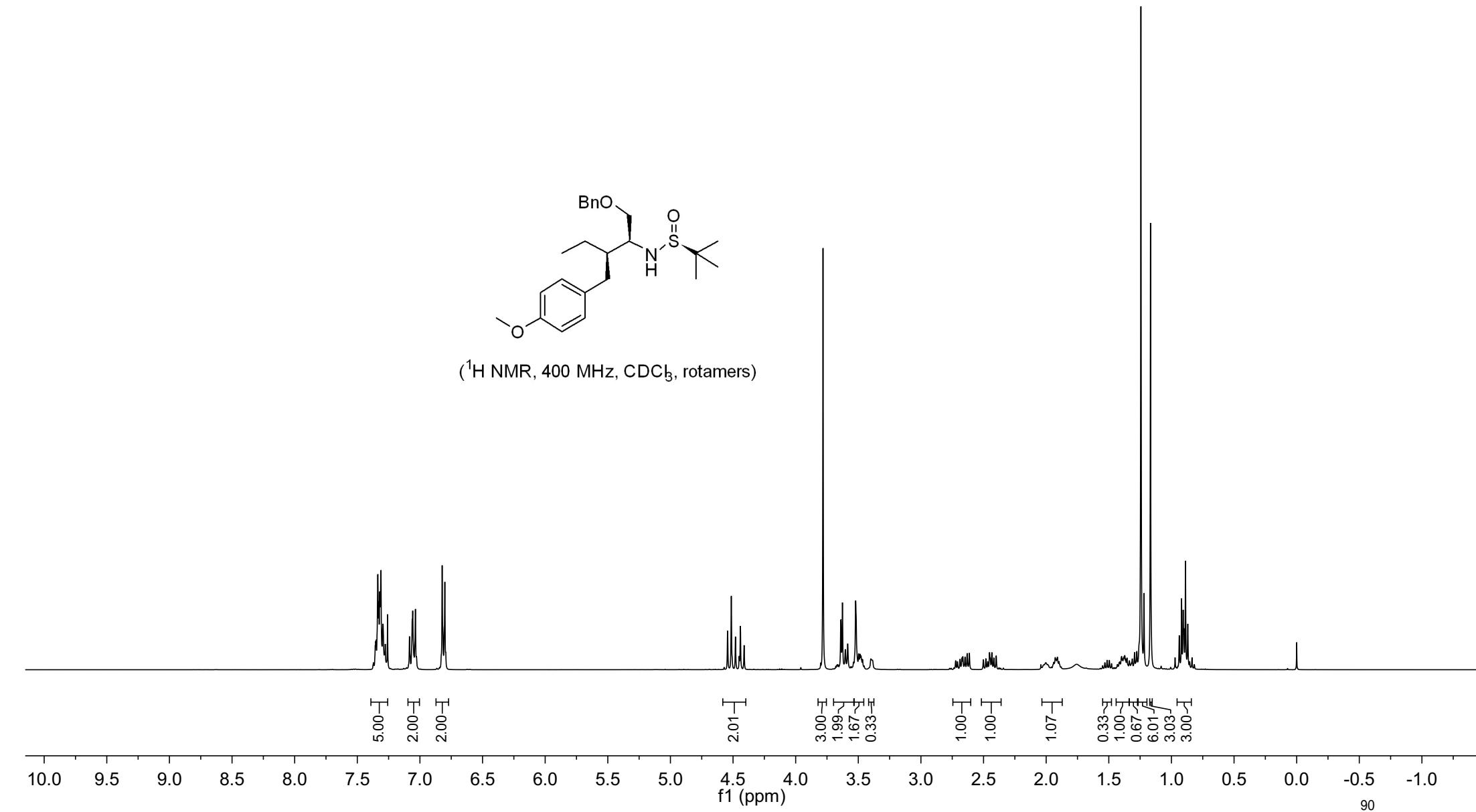
3.782  
3.639  
3.626  
3.521  
3.399

2.665  
2.648  
2.631  
2.613  
2.452  
2.434  
2.399

1.928  
1.922  
1.919  
1.539  
1.514  
1.496  
1.478  
1.397  
1.378  
1.372  
1.312  
1.294  
1.244  
1.167  
1.071  
0.937  
0.919  
0.906  
0.901  
0.888  
0.869



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)

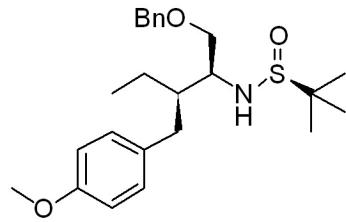


NMR spectra of compound 10p

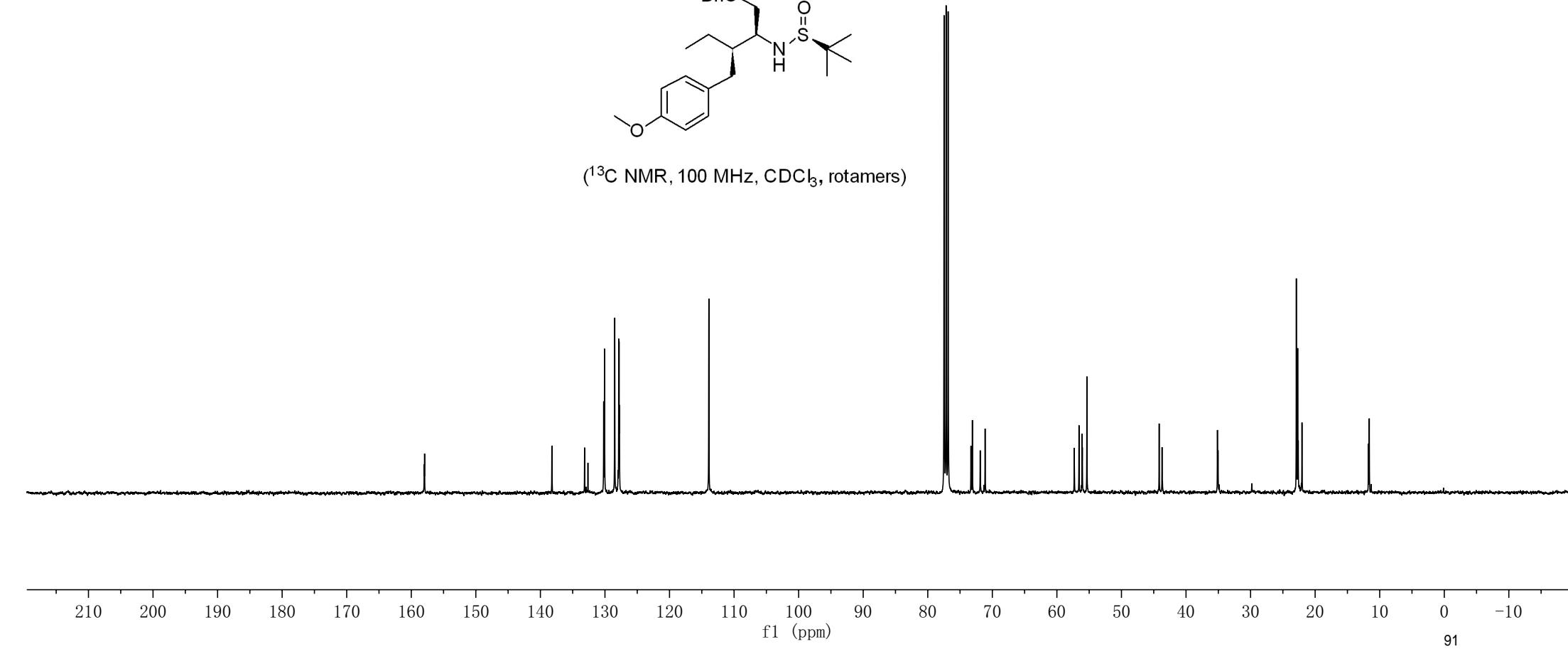
157.996  
157.935  
138.223  
133.157  
132.635  
130.198  
130.068  
128.482  
127.867  
127.811  
127.755  
113.904

73.312  
73.092  
71.878  
71.115  
57.307  
56.577  
56.104  
56.057  
55.351  
44.157  
43.711  
35.133  
35.040

22.914  
22.701  
22.617  
22.037  
11.752  
11.616



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>, rotamers)



## NMR spectra of compound 10q

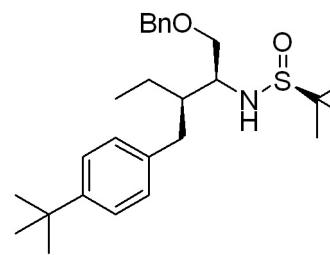
7.338  
 7.320  
 7.294  
 7.274  
 7.073  
 7.057

4.529  
 4.501  
 4.429  
 4.400

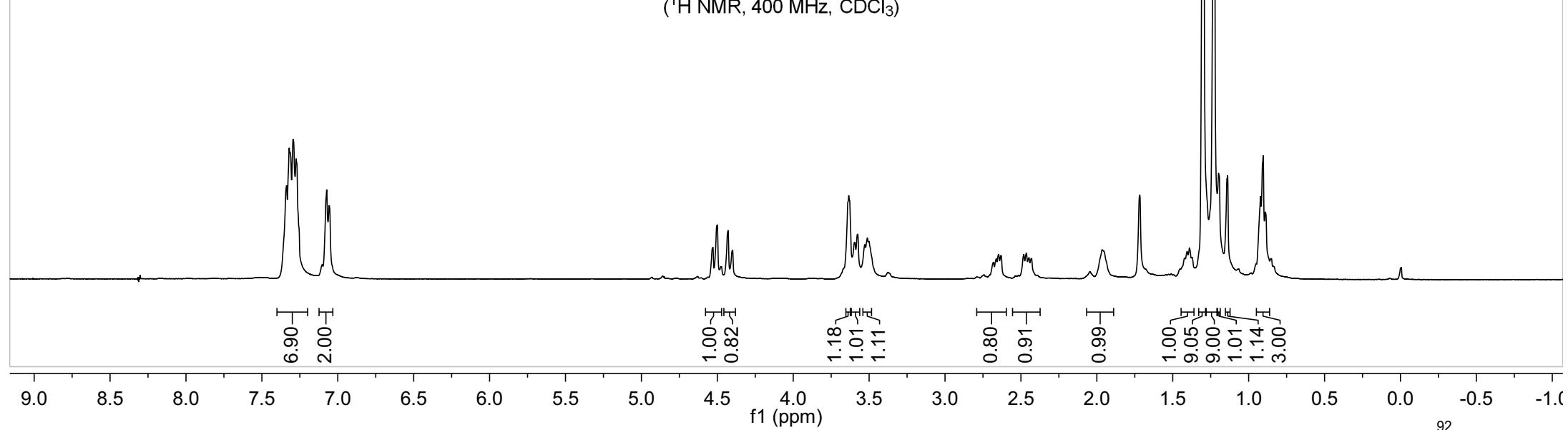
3.634  
 3.597  
 3.576  
 3.529  
 3.512

2.663  
 2.647  
 2.631  
 2.481  
 2.464  
 2.447  
 2.034

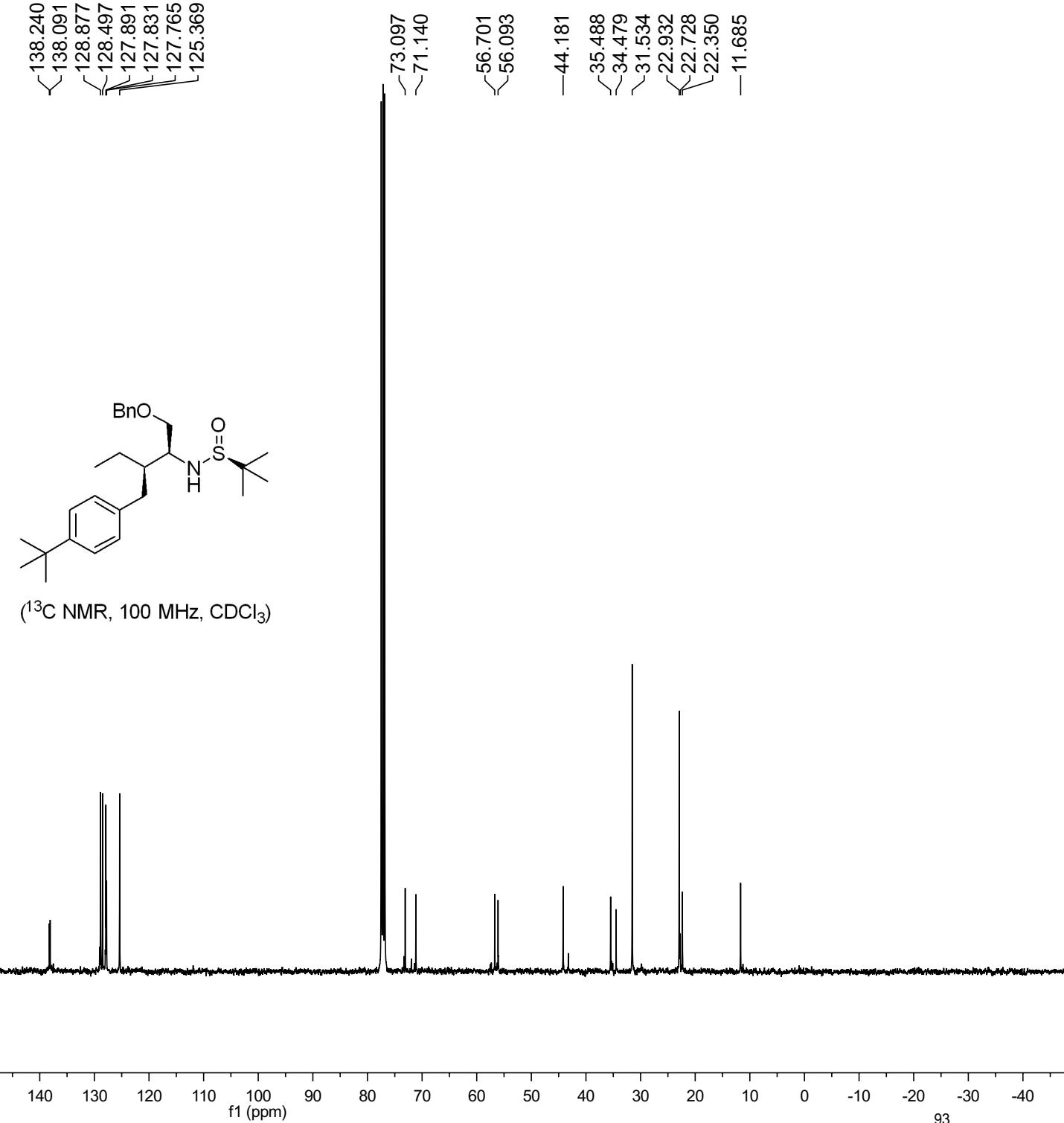
1.405  
 1.390  
 1.297  
 1.226  
 1.198  
 1.138  
 0.922  
 0.904  
 0.890



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10q



NMR spectra of compound 10r

7.334  
7.310  
7.290  
7.263

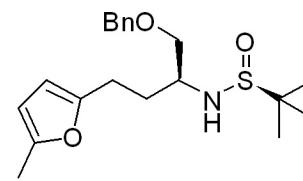
5.903  
5.833

4.580  
4.529  
4.505  
4.493

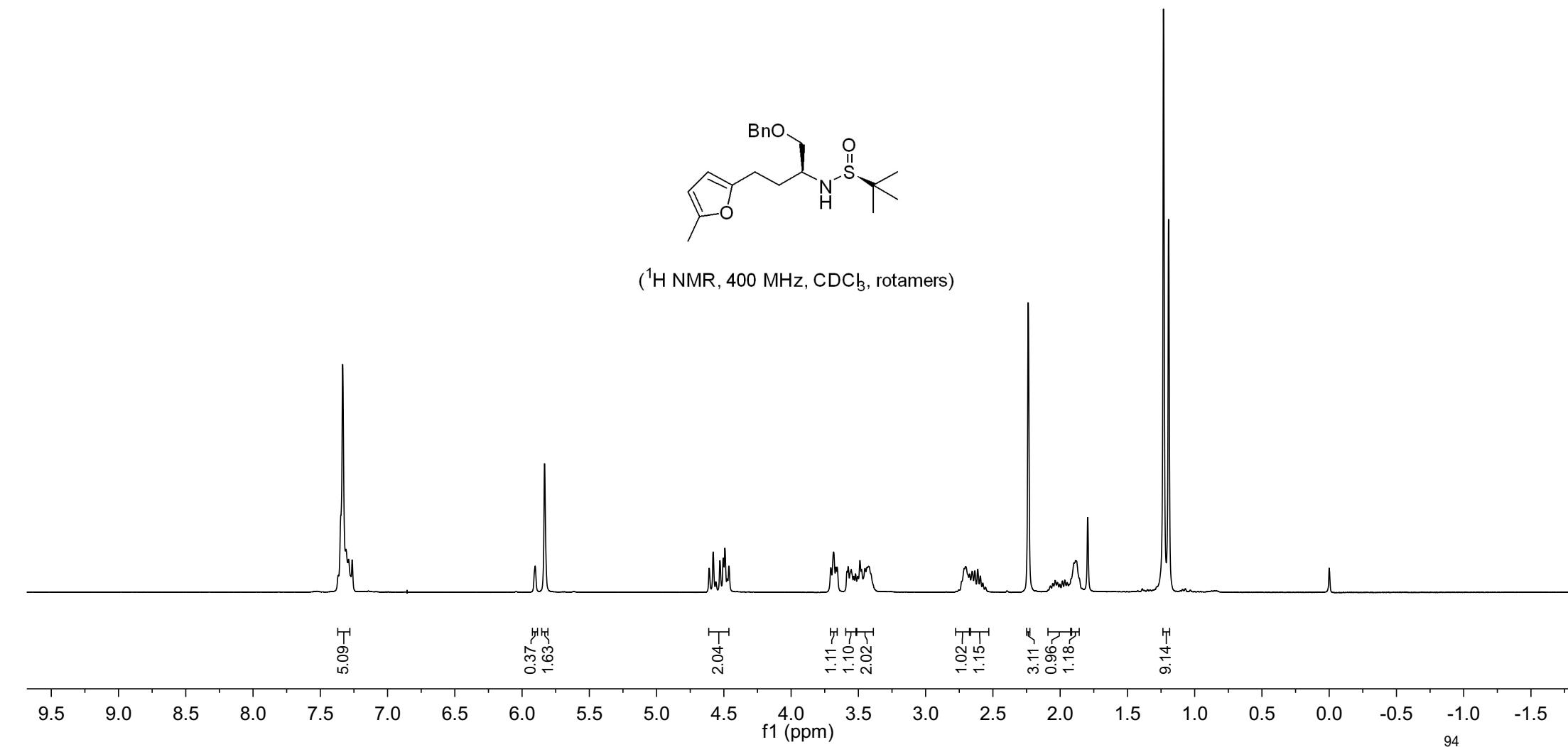
3.705  
3.684  
3.668  
3.657  
3.576  
3.488  
3.477  
3.451  
3.423

2.703  
2.654  
2.635  
2.613  
2.237  
2.037  
2.020  
1.965  
1.948  
1.884

1.232  
1.194

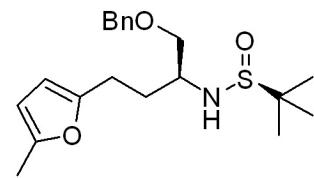


(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>, rotamers)

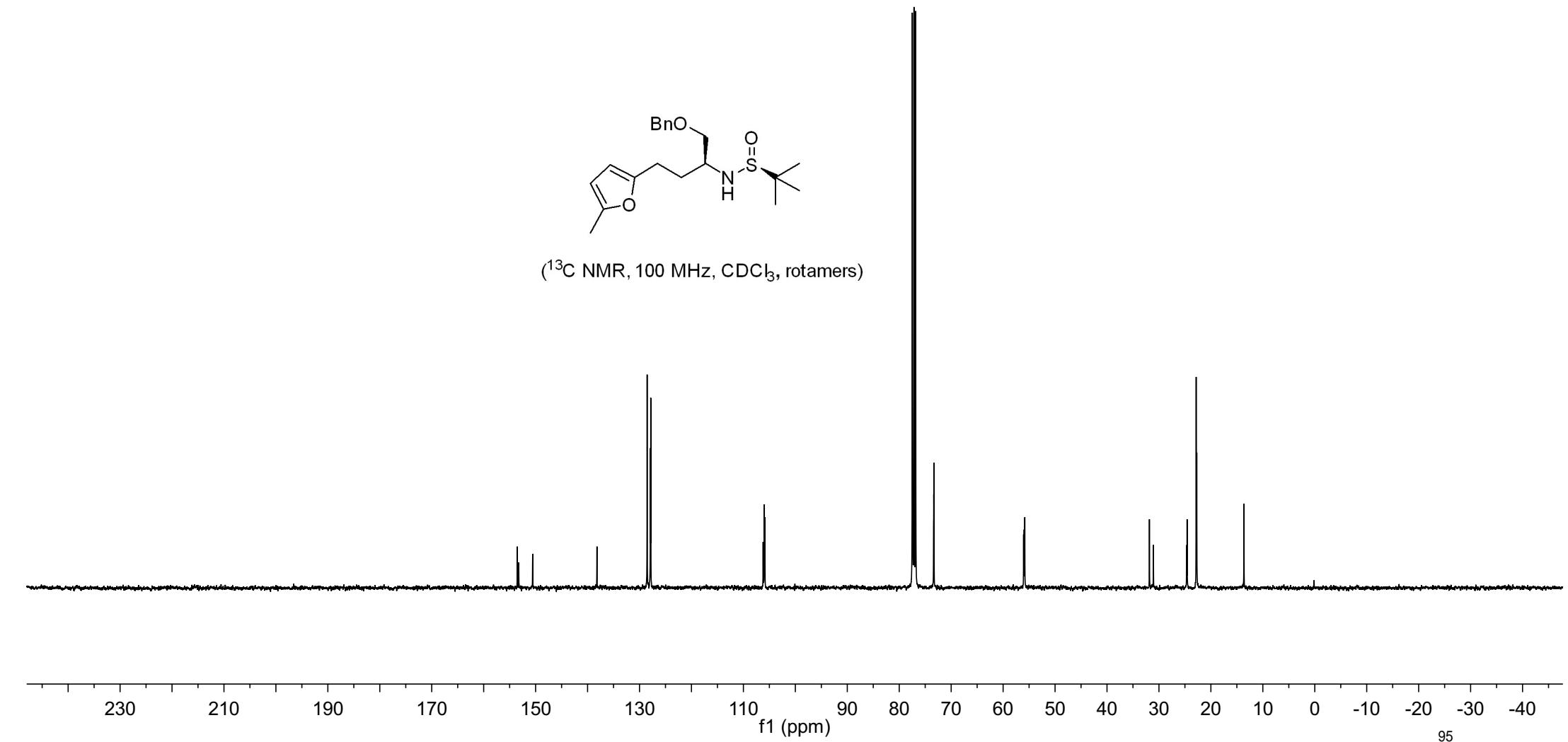


NMR spectra of compound 10r

153.519  
153.247  
150.564  
—138.190  
128.529  
127.913  
127.831  
106.199  
105.970  
105.856  
73.349  
73.312  
56.057  
55.947  
55.828  
—31.835  
24.580  
22.832  
22.721  
—13.636



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 10s

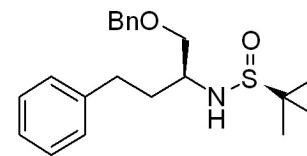
7.347  
7.330  
7.276  
7.183  
7.162  
7.144

4.609  
4.579  
4.483  
4.453

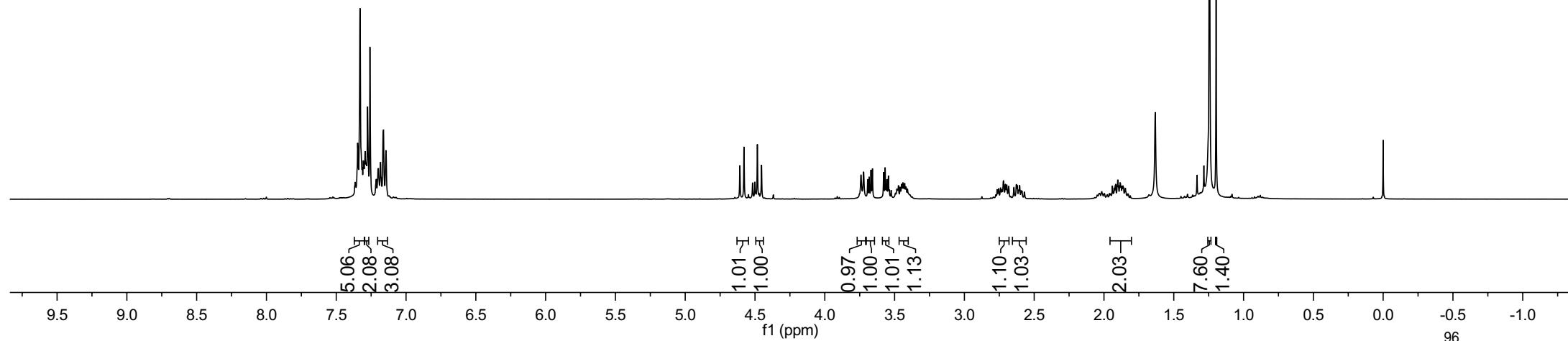
3.741  
3.722  
3.669  
3.659  
3.579  
3.568  
3.544

2.720  
2.706  
2.697  
2.628  
2.621

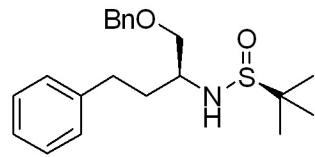
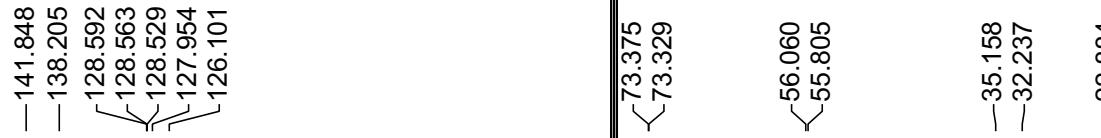
1.919  
1.916  
1.901  
1.896  
1.884  
1.197



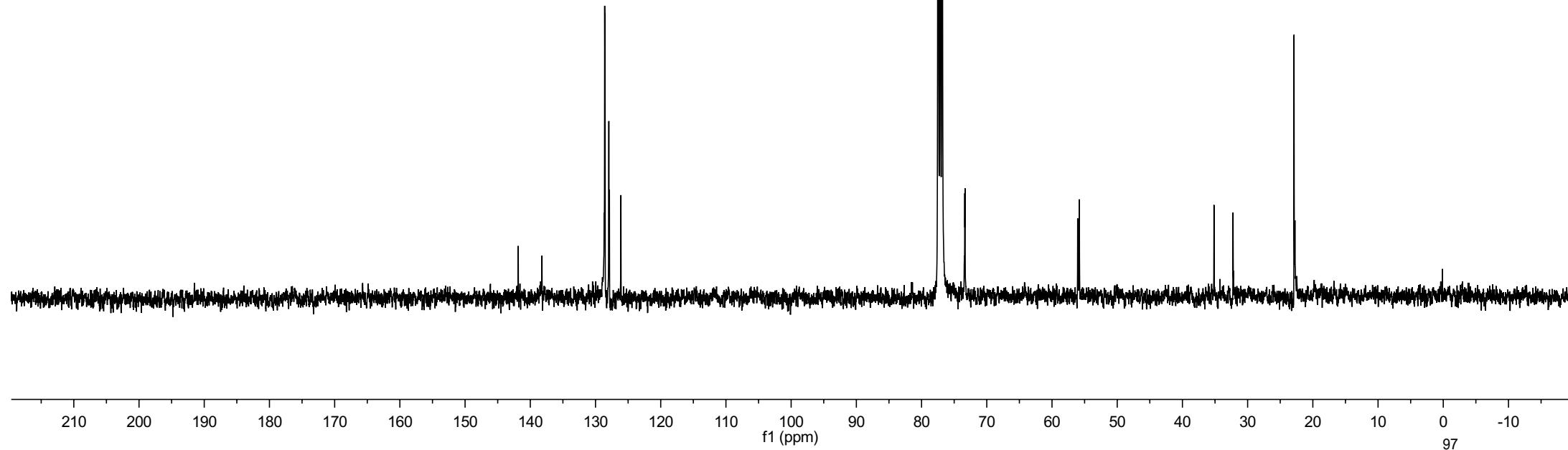
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 10s



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 10t

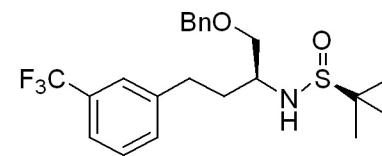
7.440  
7.403  
7.351  
7.336  
7.262

4.616  
4.587  
4.525  
4.511  
4.489  
4.460

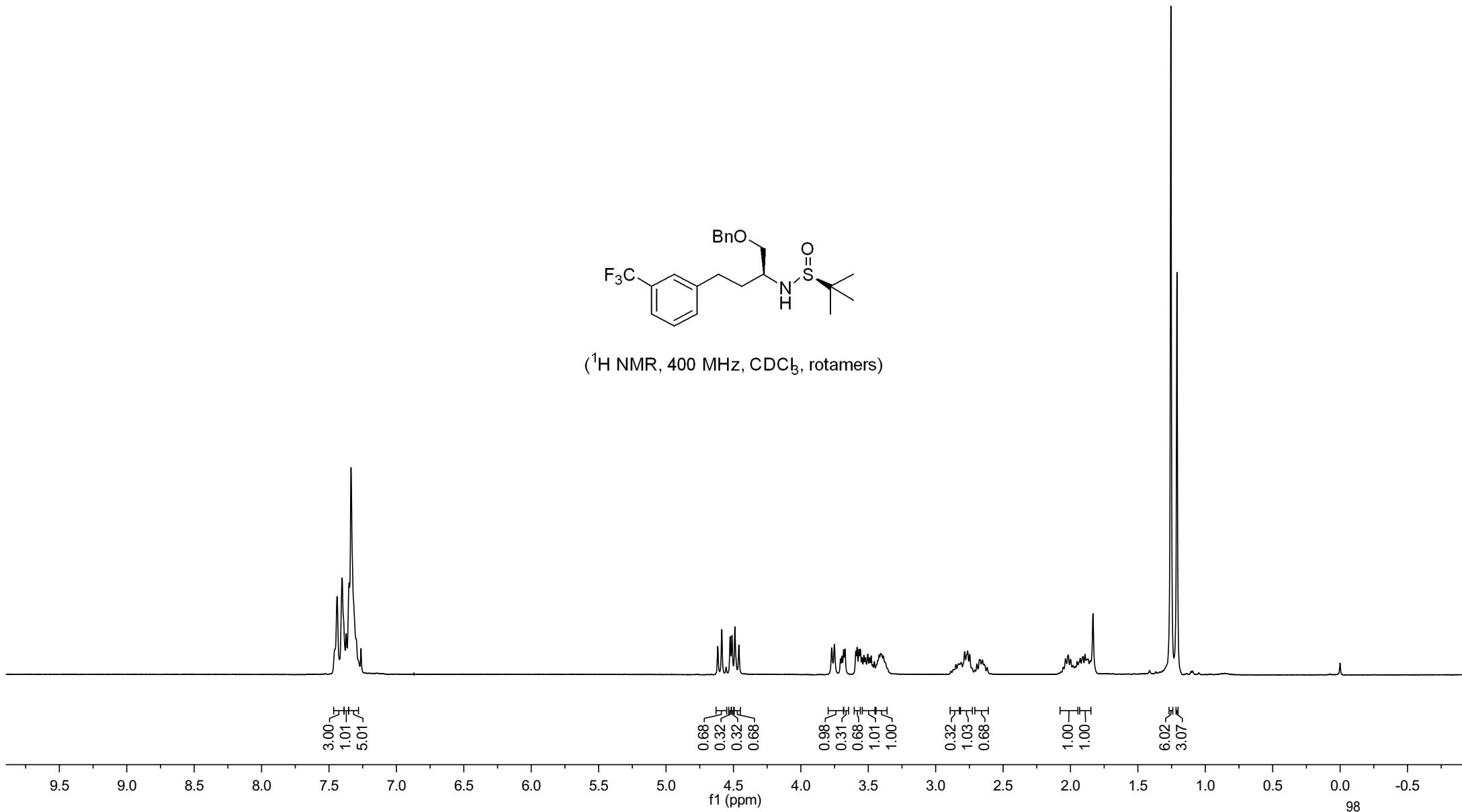
3.771  
3.751  
3.683  
3.672  
3.583  
3.569  
3.559  
3.504  
3.408  
2.785  
2.763  
2.747  
2.670  
2.652

2.037  
2.017  
1.999  
1.908  
1.892

1.255  
1.210



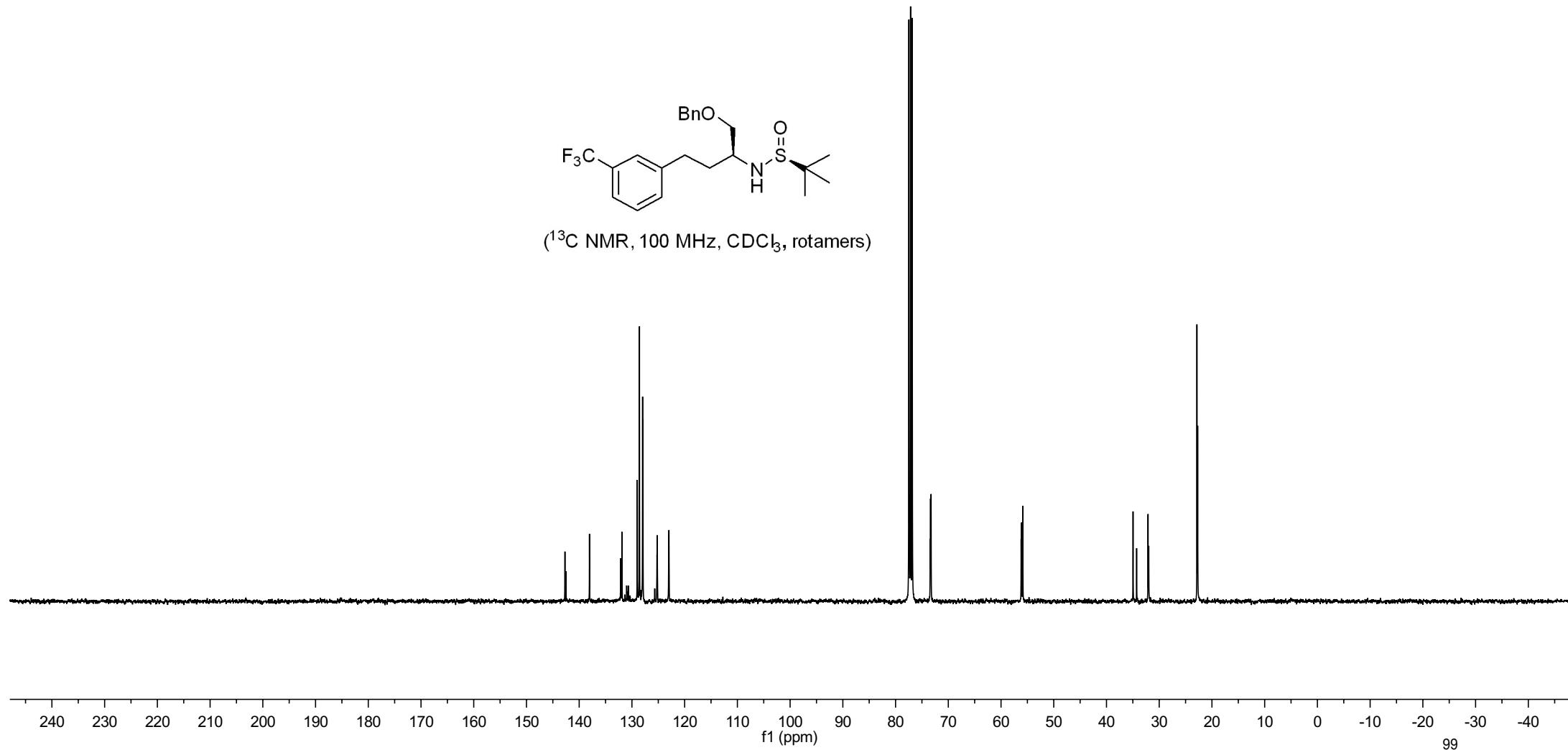
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 10t



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)

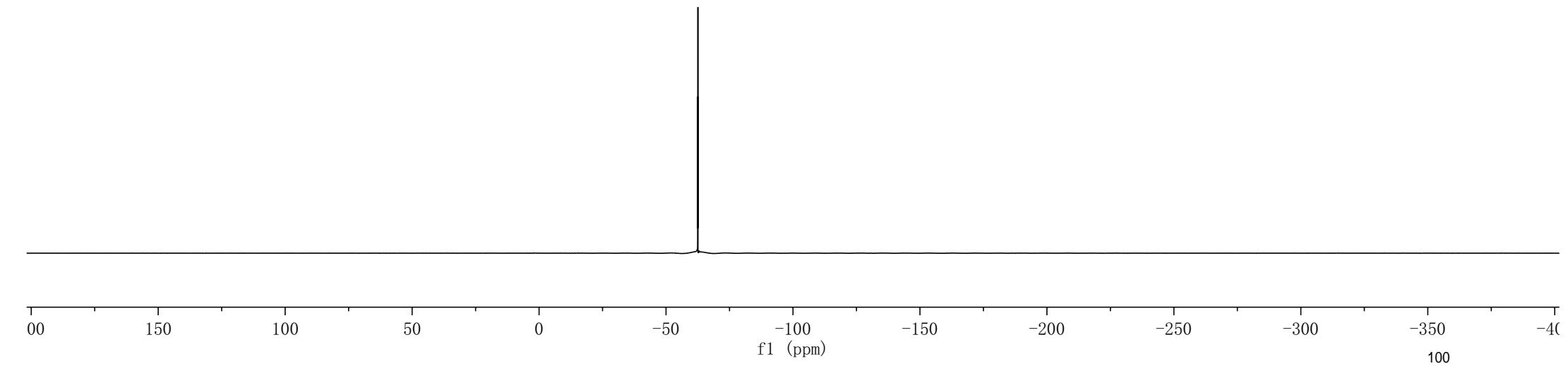


NMR spectra of compound 10t

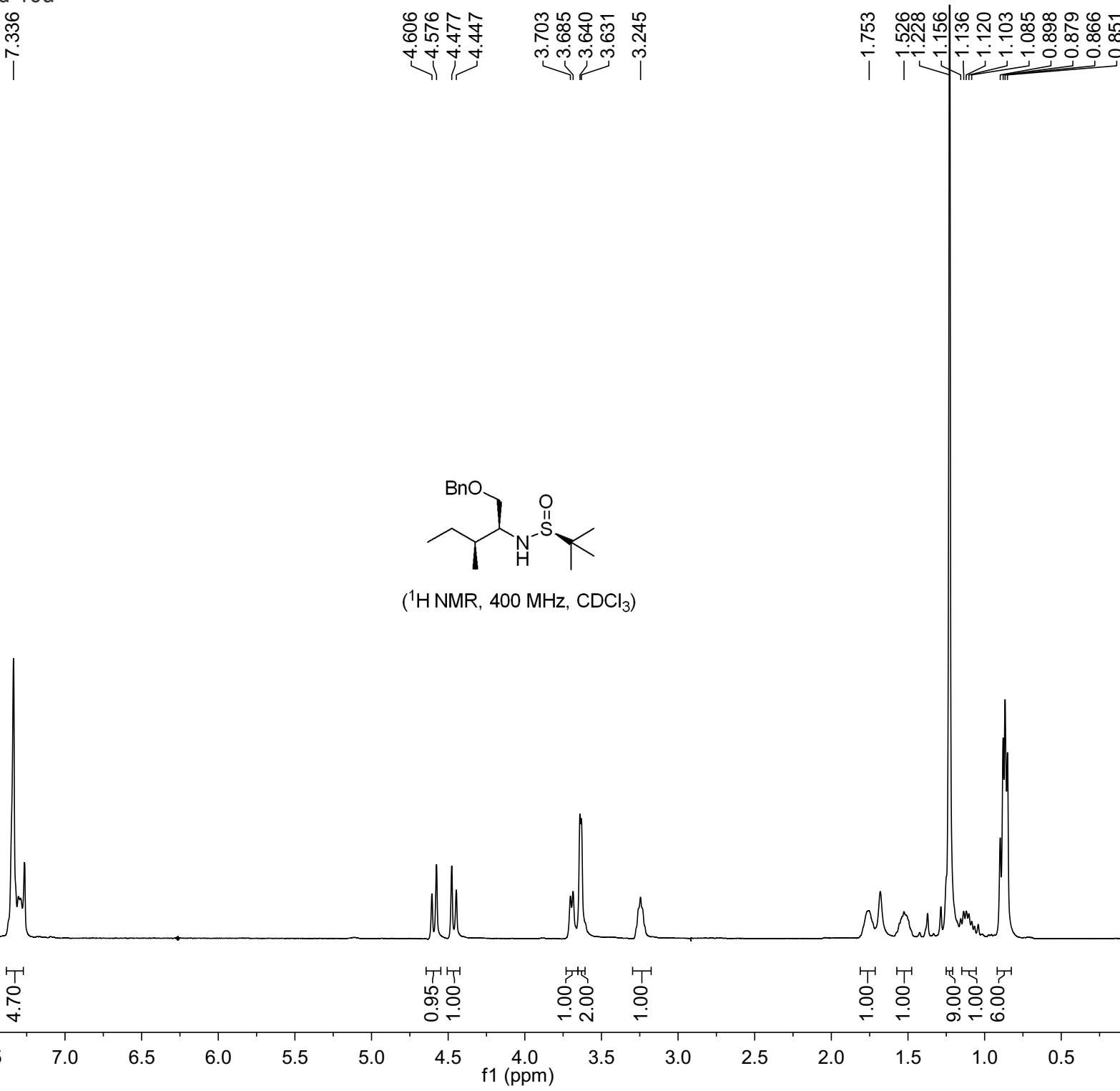
-62.550



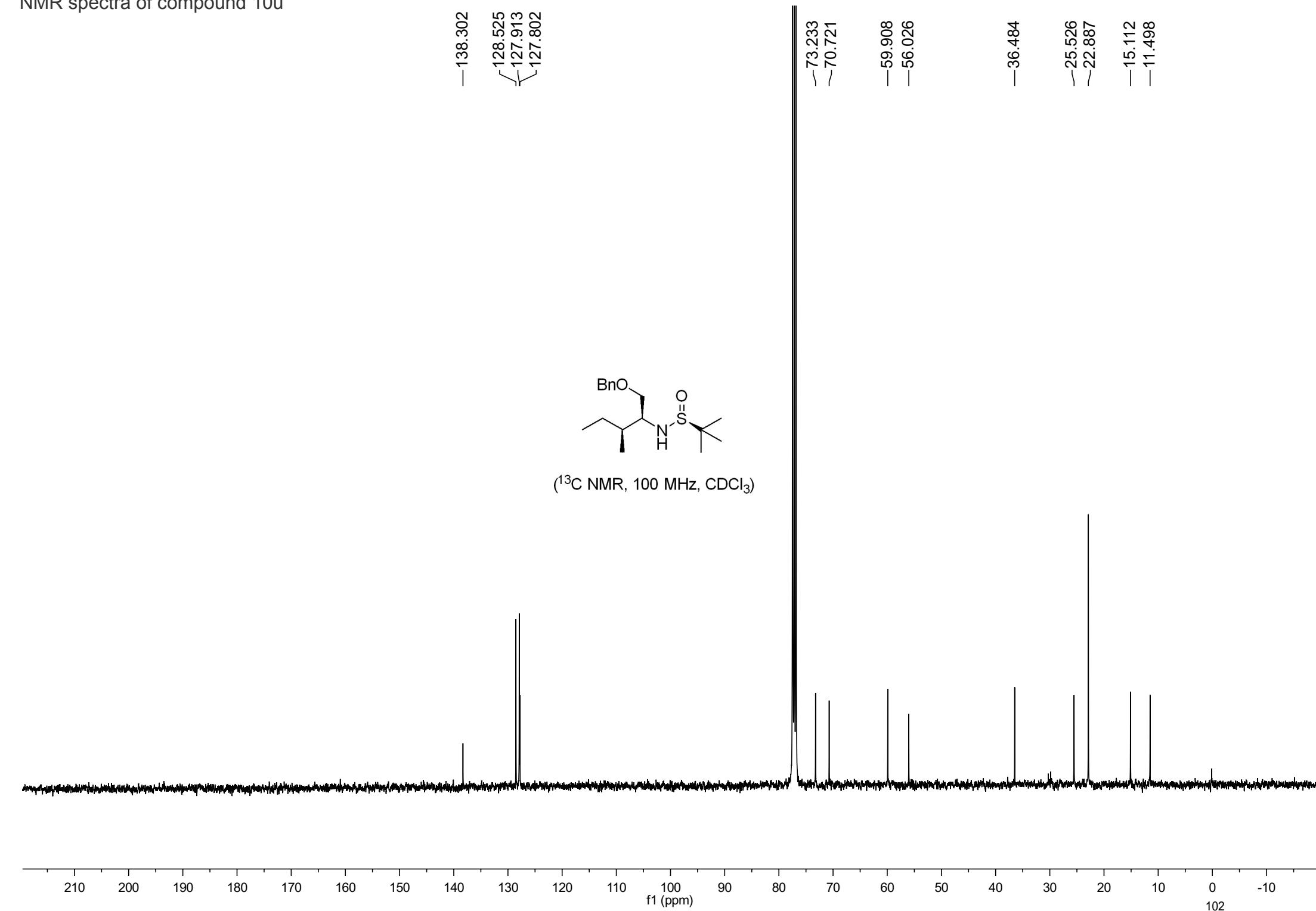
(<sup>19</sup>F NMR, 376 MHz, CDCl<sub>3</sub>, rotamers)



NMR spectra of compound 10u



NMR spectra of compound 10u



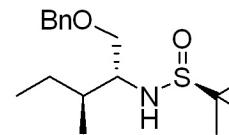
NMR spectra of compound (2R)-10u

7.350  
7.334  
7.312  
7.266

4.556  
4.526  
4.499  
4.469

3.500  
3.484  
3.470  
3.414  
3.401  
3.388  
3.305  
3.290

1.780  
1.546  
1.530  
1.512  
1.276  
1.258  
1.241  
1.193  
0.947  
0.929  
0.913  
0.896



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

5.00

2.00

2.00

1.00

1.00

1.00

9.00

6.00

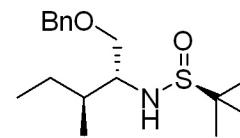
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 -0.5 -1.0

f1 (ppm)

103

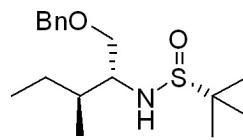
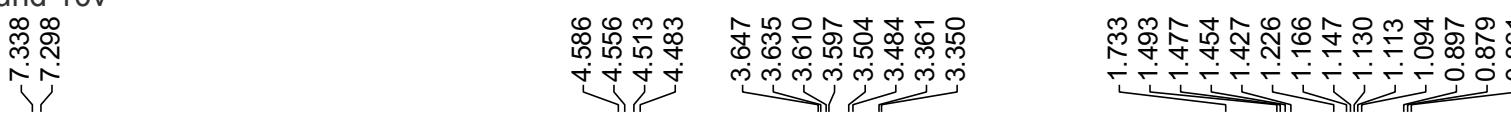
NMR spectra of compound (2R)-10u

—138.269  
—128.501  
—127.747  
—73.299  
—72.034  
—59.421  
—56.039  
—36.437  
—26.185  
—22.717  
—14.610  
—11.833

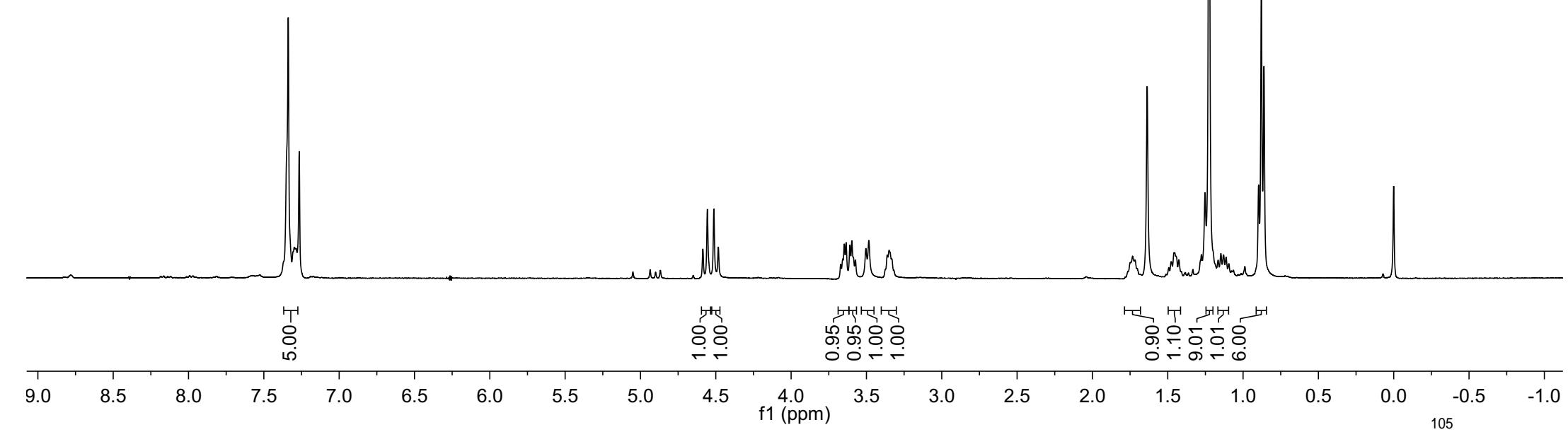


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

NMR spectra of compound 10v

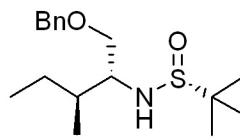


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

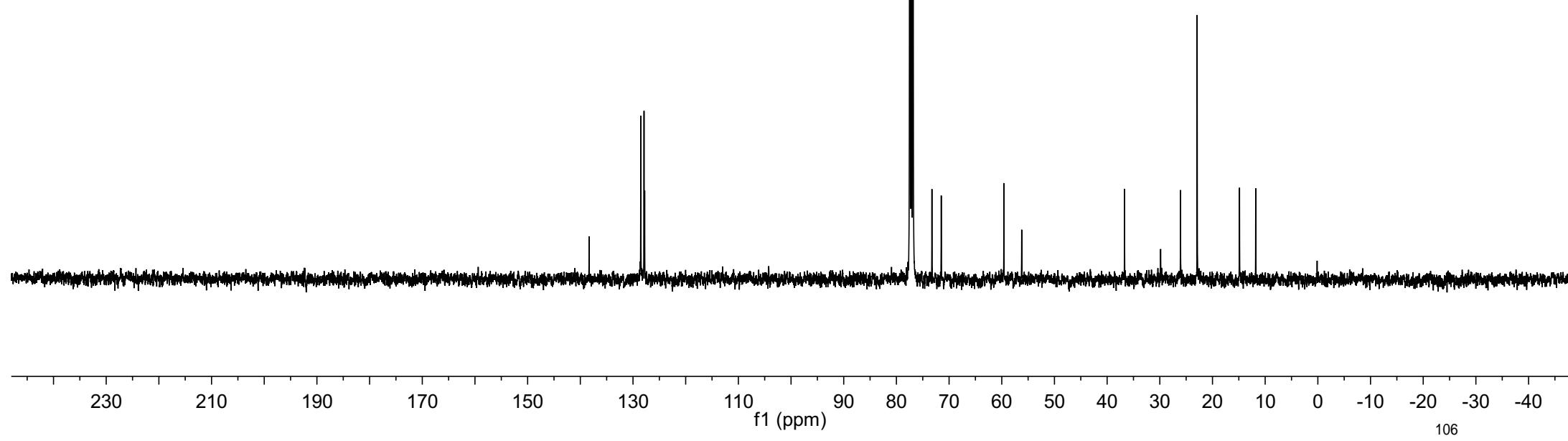


NMR spectra of compound 10v

—138.332  
—128.525  
—127.904  
—127.787  
—  
—73.259  
—71.488  
—  
—59.590  
—  
—36.697  
—  
—26.075  
—22.910  
—14.872  
—11.794



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



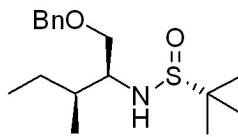
NMR spectra of compound (2S)-10v

7.350  
7.333  
7.312

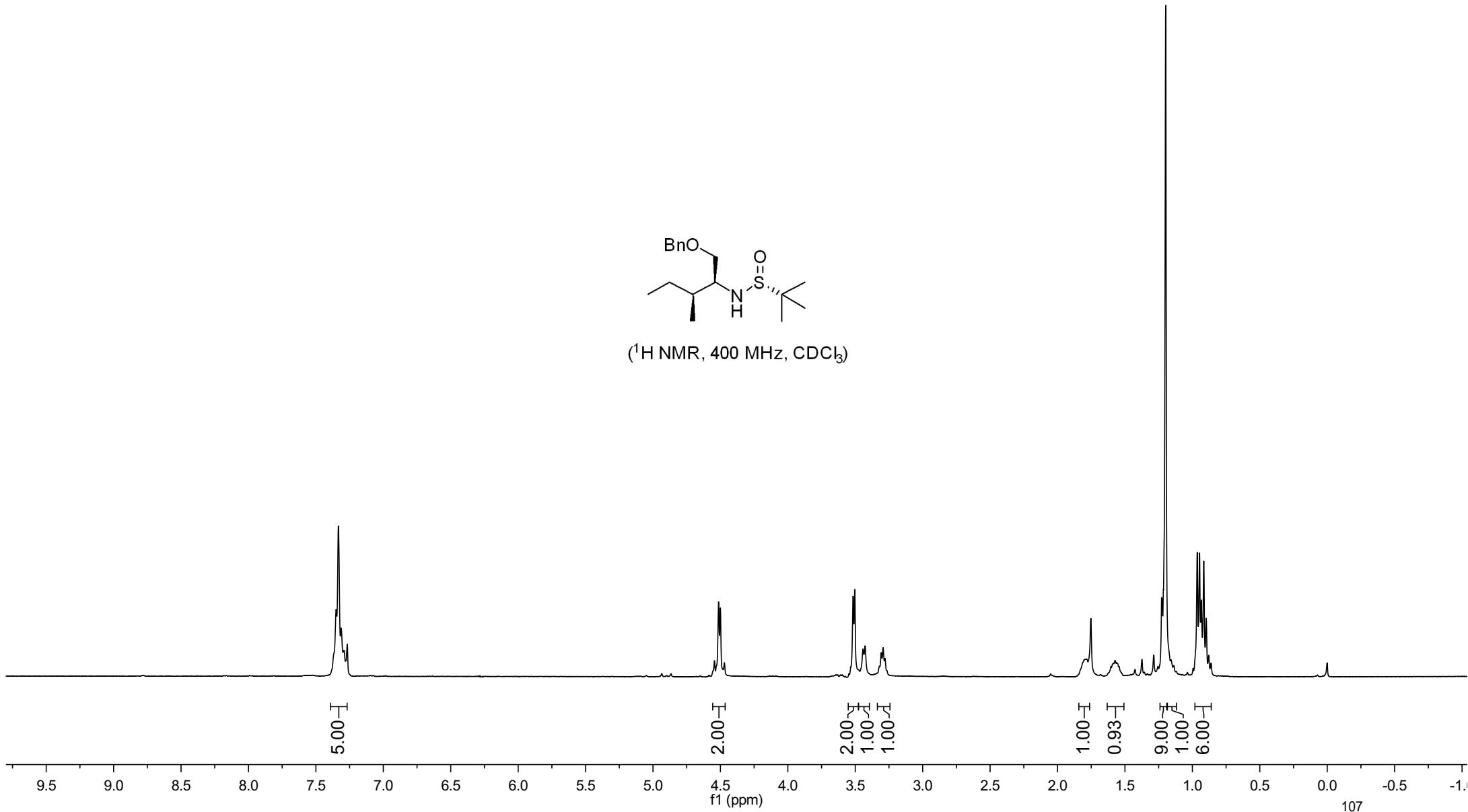
4.544  
4.513  
4.500  
4.470

3.516  
3.504  
3.443  
3.427  
3.307  
3.293

1.783  
1.586  
1.574  
1.561  
1.198  
1.158  
1.137  
0.964  
0.947  
0.933  
0.915  
0.897

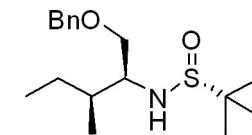


(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

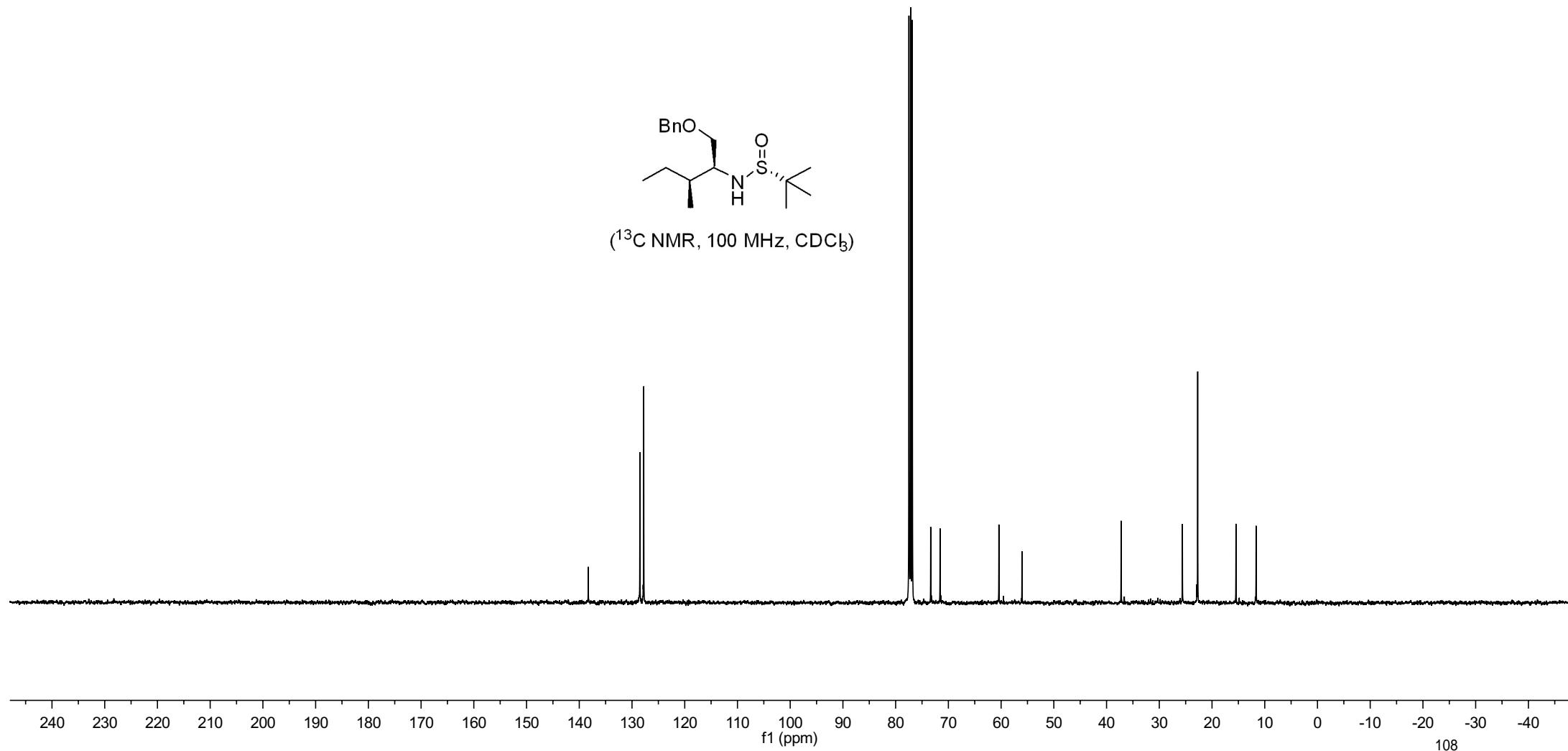


NMR spectra of compound (2S)-10v

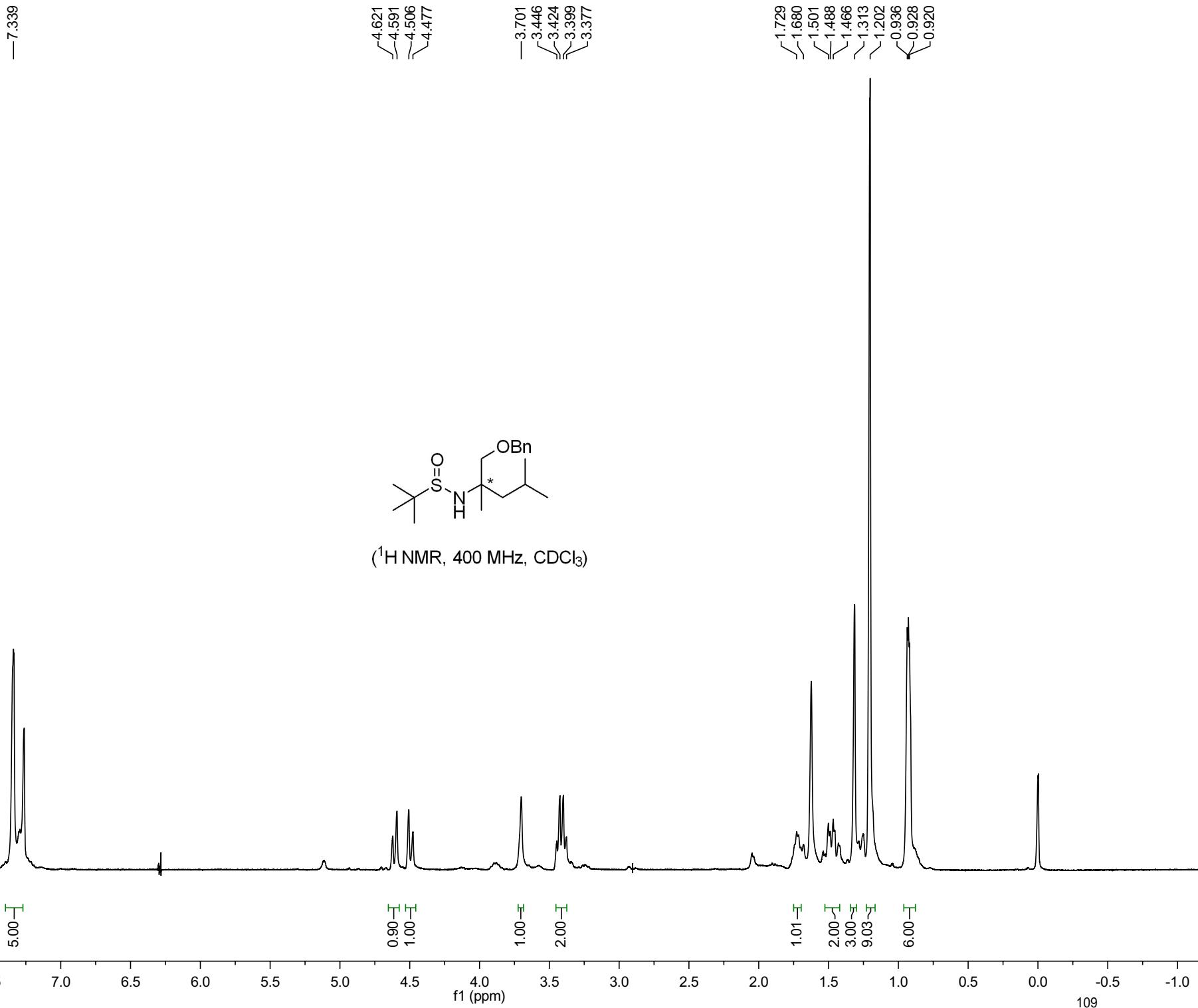
—138.293  
—128.502  
—127.776  
—73.350  
—71.573  
—60.416  
—56.039  
—37.238  
—25.620  
—22.720  
—15.457  
—11.639



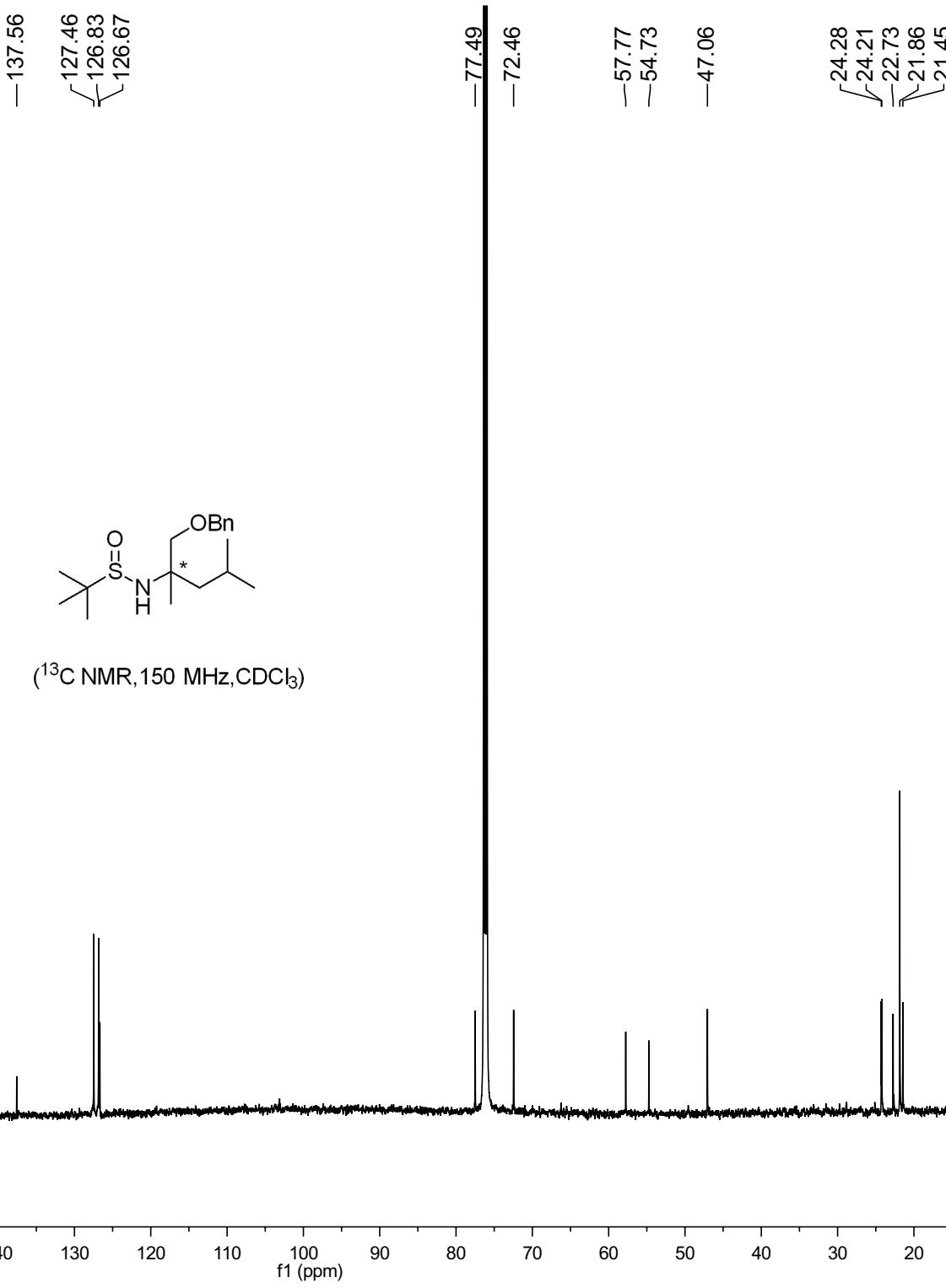
(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 10w



NMR spectra of compound 10w



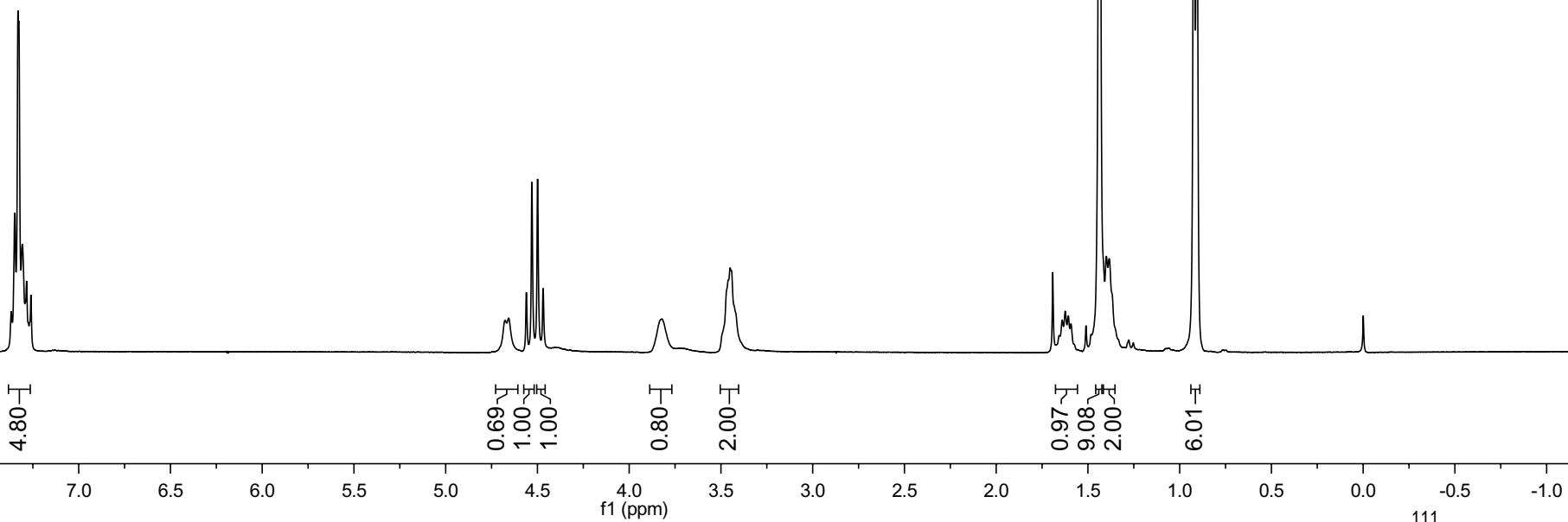
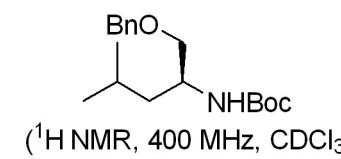
NMR spectra of compound 11

7.348  
7.331  
7.326  
7.307  
7.284  
7.261

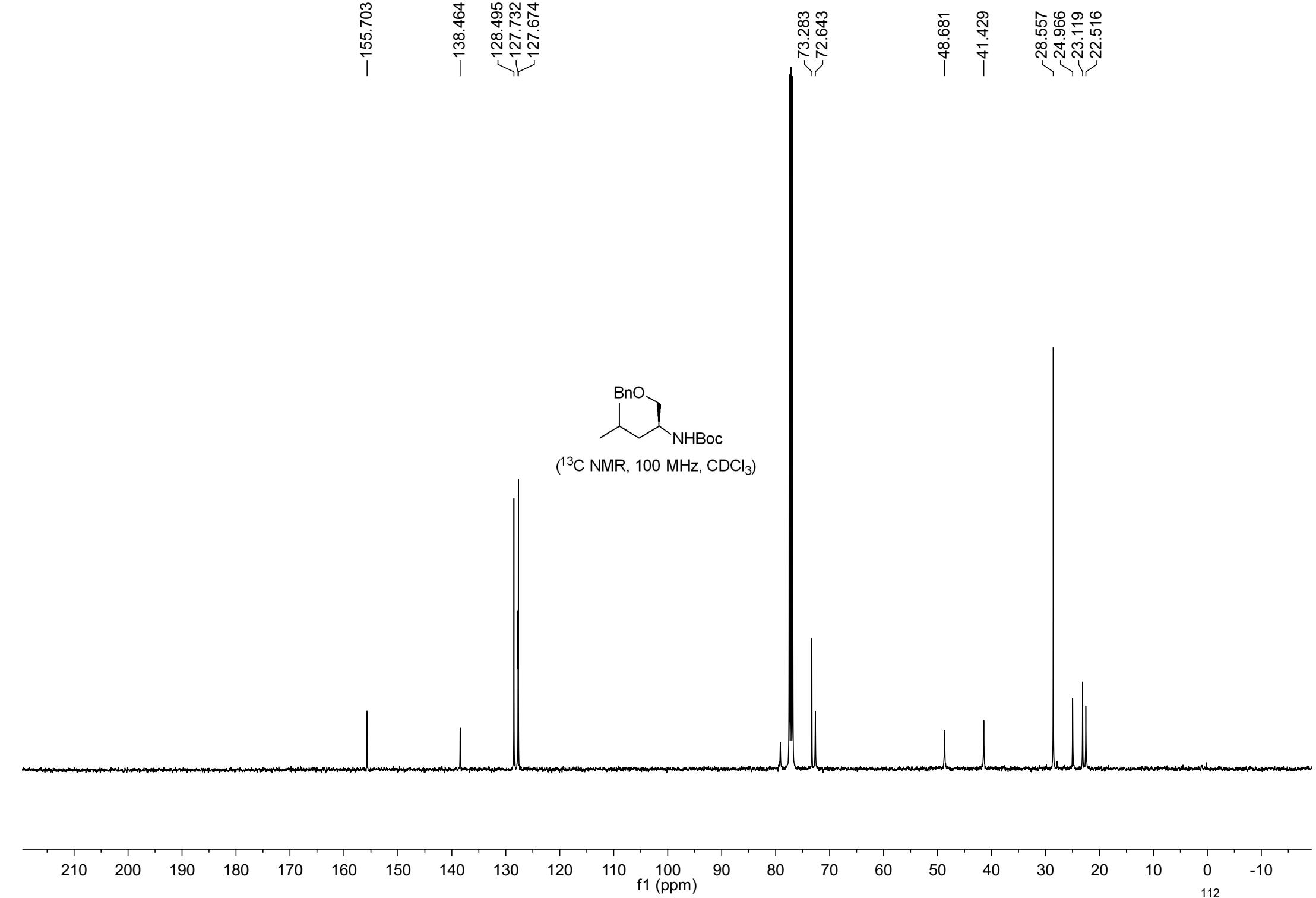
4.676  
4.657  
4.561  
4.530  
4.499  
4.469

-3.822  
-3.450

1.640  
1.623  
1.607  
1.593  
1.437  
1.400  
1.384  
0.926  
0.920  
0.910  
0.903



NMR spectra of compound 11

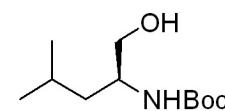


NMR spectra of compound 12

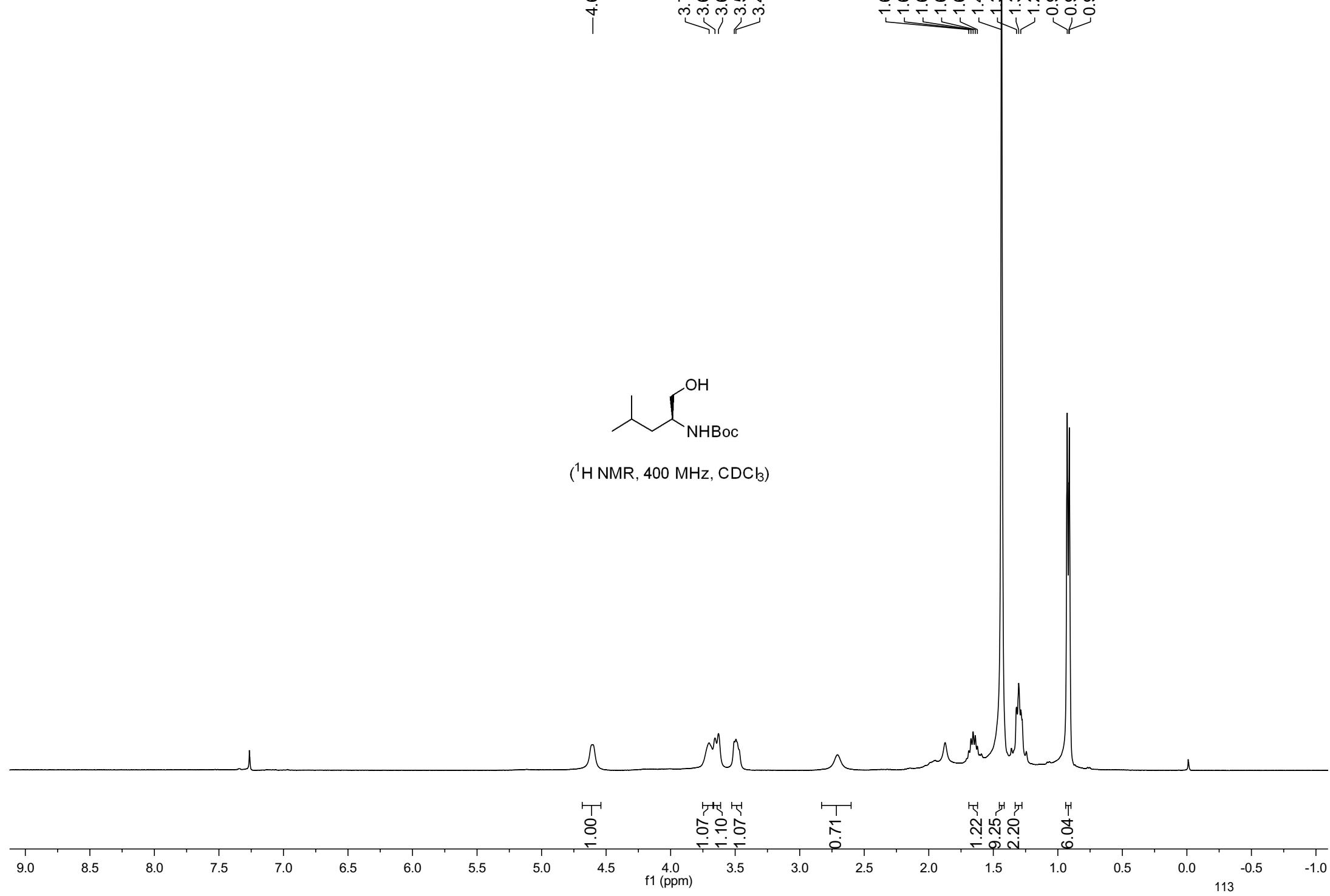
-4.603

3.702  
3.656  
3.630  
3.507  
3.494

1.690  
1.673  
1.656  
1.640  
1.624  
1.437  
1.320  
1.303  
1.287  
0.927  
0.915  
0.911



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



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NMR spectra of compound 12

—156.713

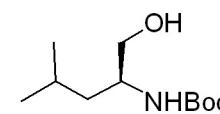
—79.752

—66.682

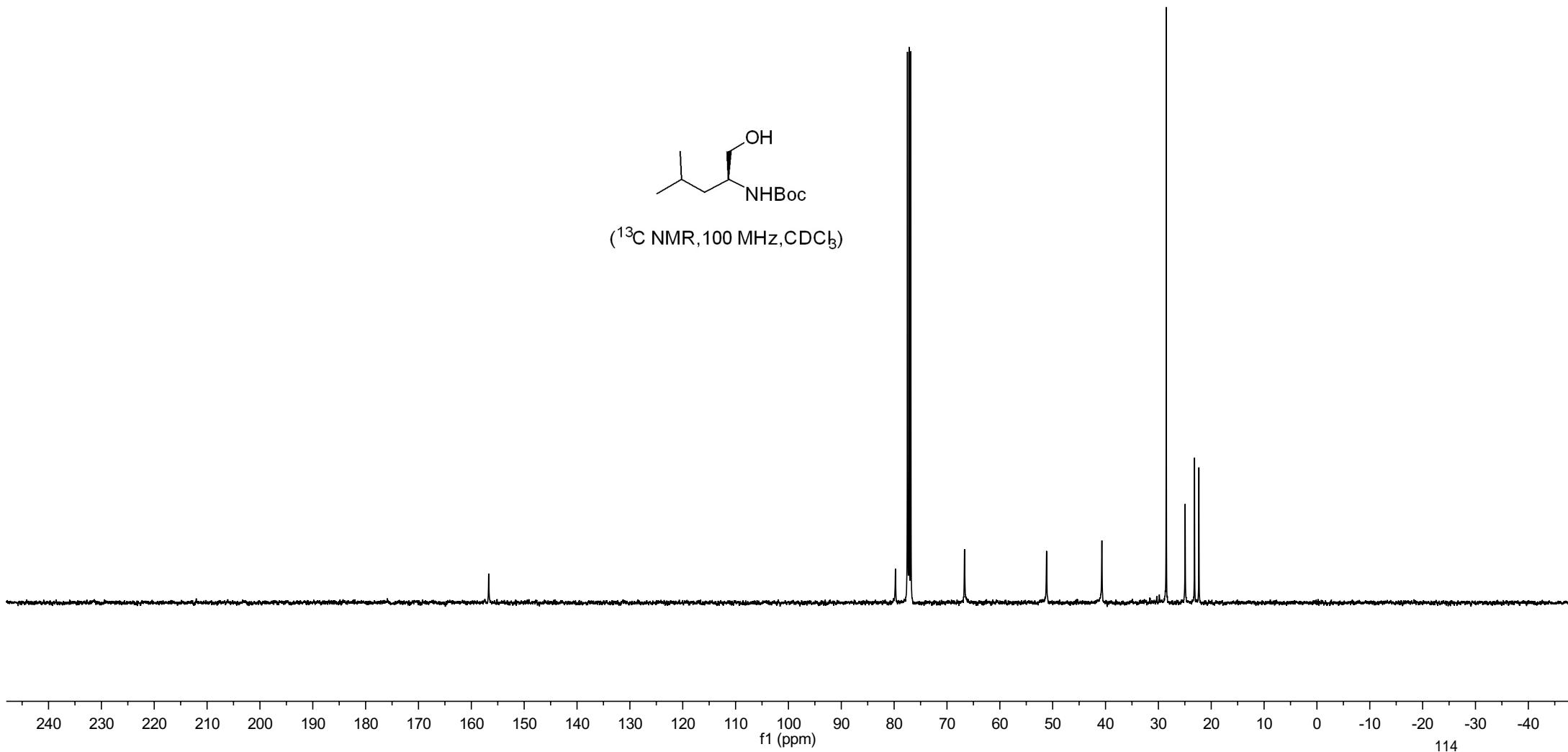
—51.153

—40.690

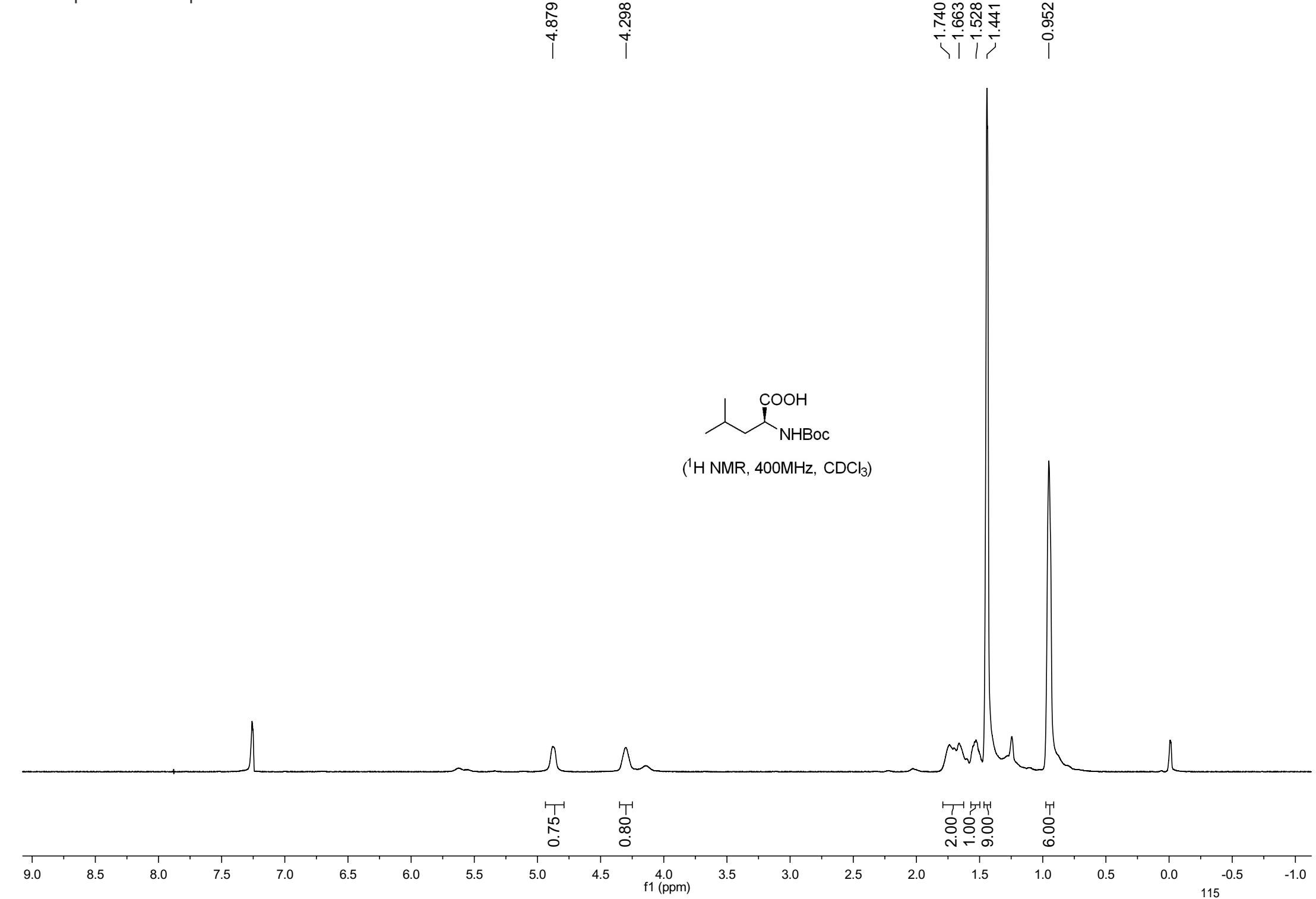
✓28.507  
✓24.943  
✓23.161  
✓22.332



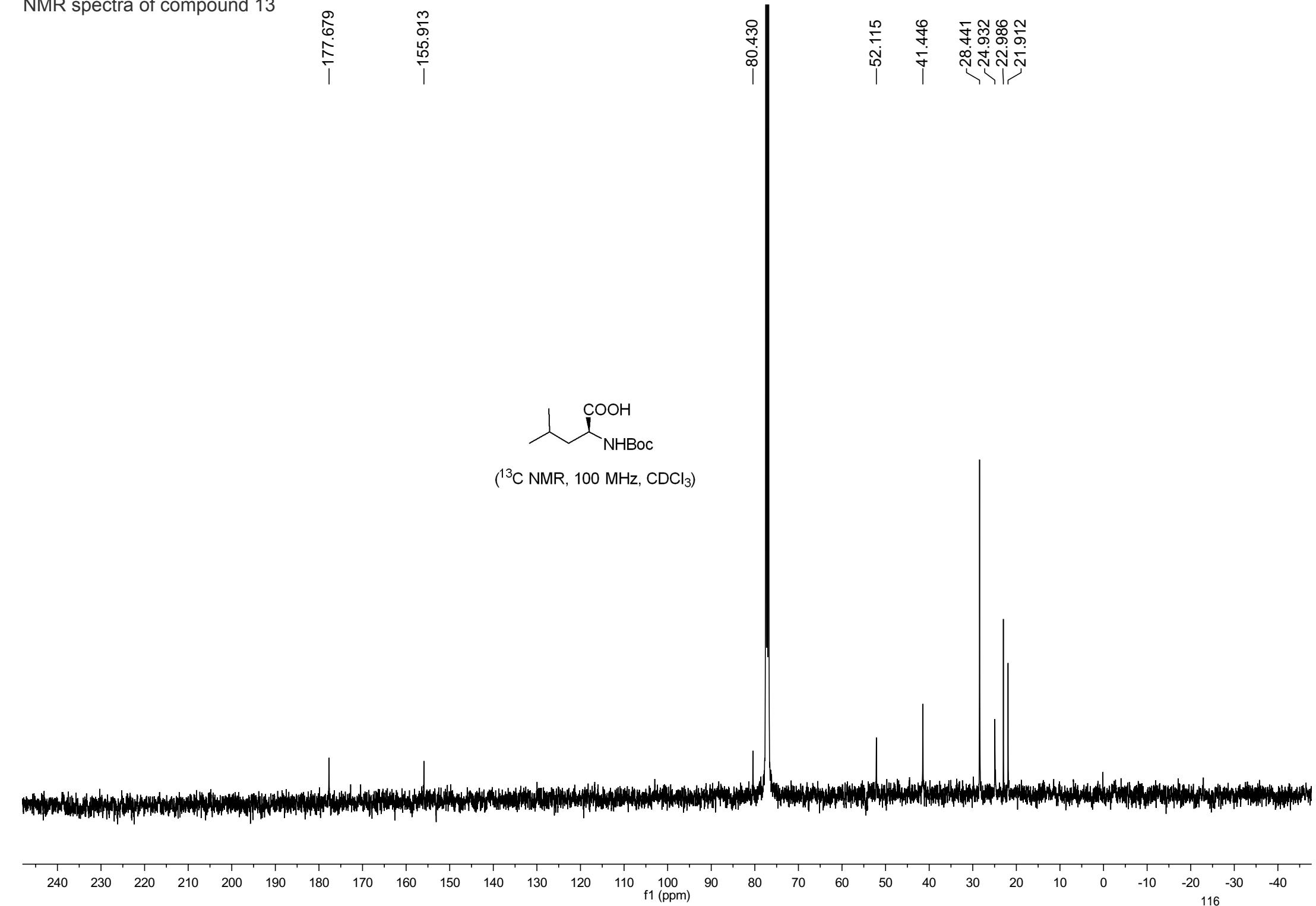
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



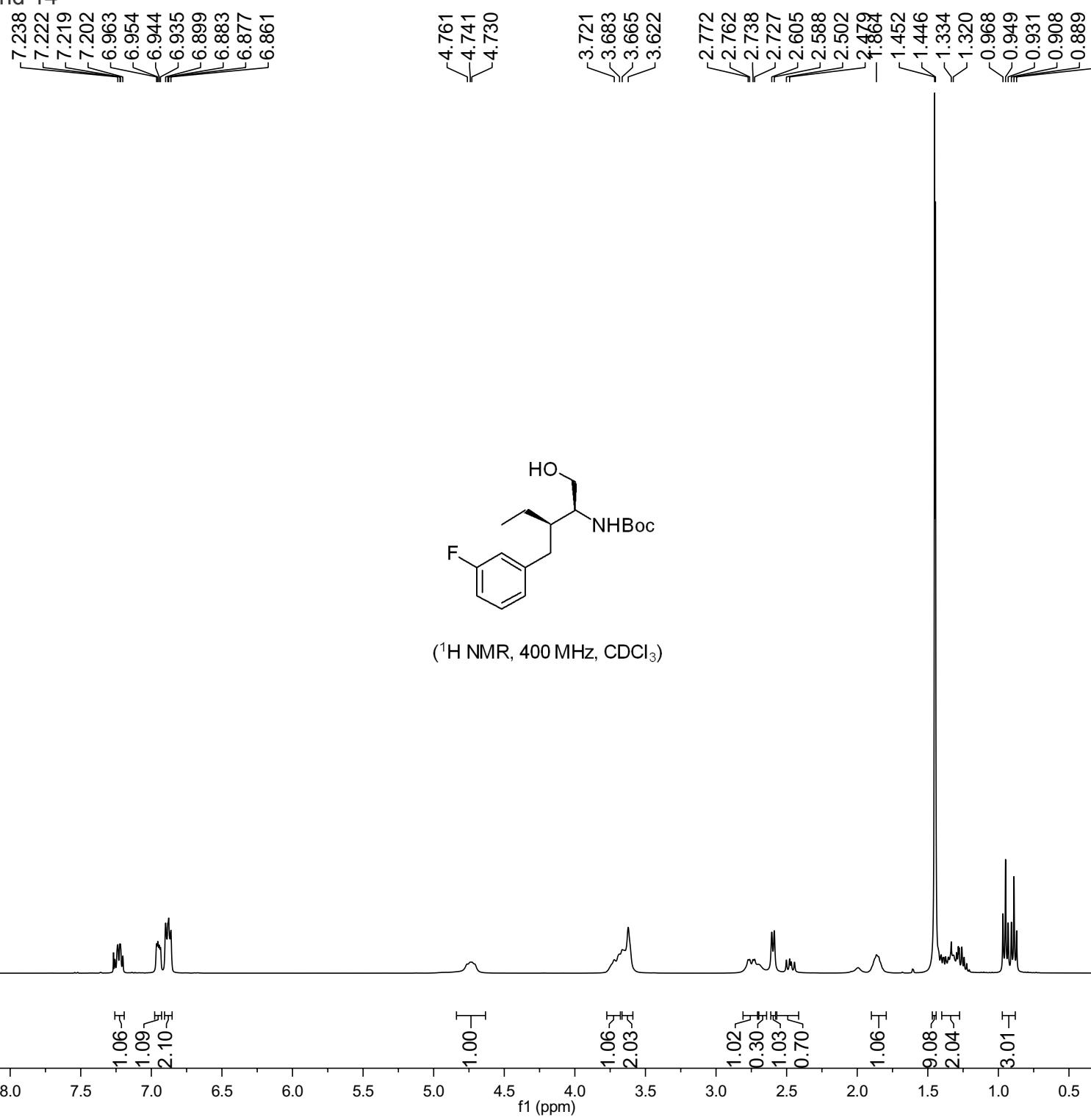
NMR spectra of compound 13



NMR spectra of compound 13



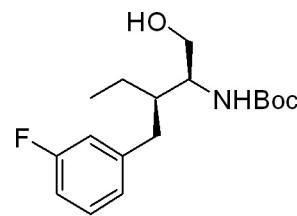
NMR spectra of compound 14



NMR spectra of compound 14

—164.252  
—161.813  
—156.813  
—143.557  
—129.960  
—129.878  
—124.868  
—124.787  
—116.026  
—115.819  
—113.131  
—112.922

—79.911  
—64.476  
—54.454  
—54.325  
—43.191  
—42.528  
—36.500  
—35.922  
—28.497  
—22.569  
—11.826  
—10.803



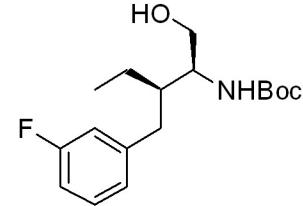
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

230 210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40

f1 (ppm)

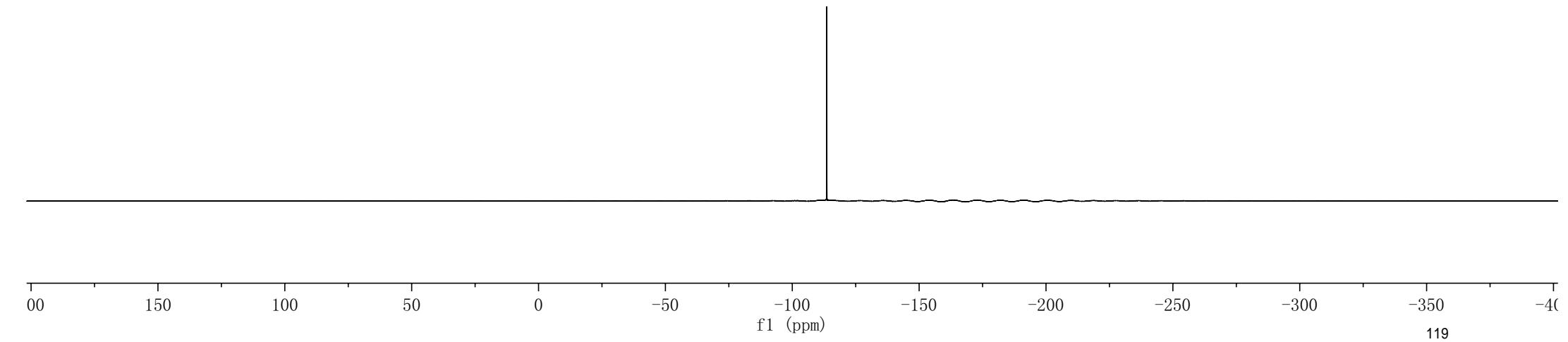
118

NMR spectra of compound 14



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ )

—113.616

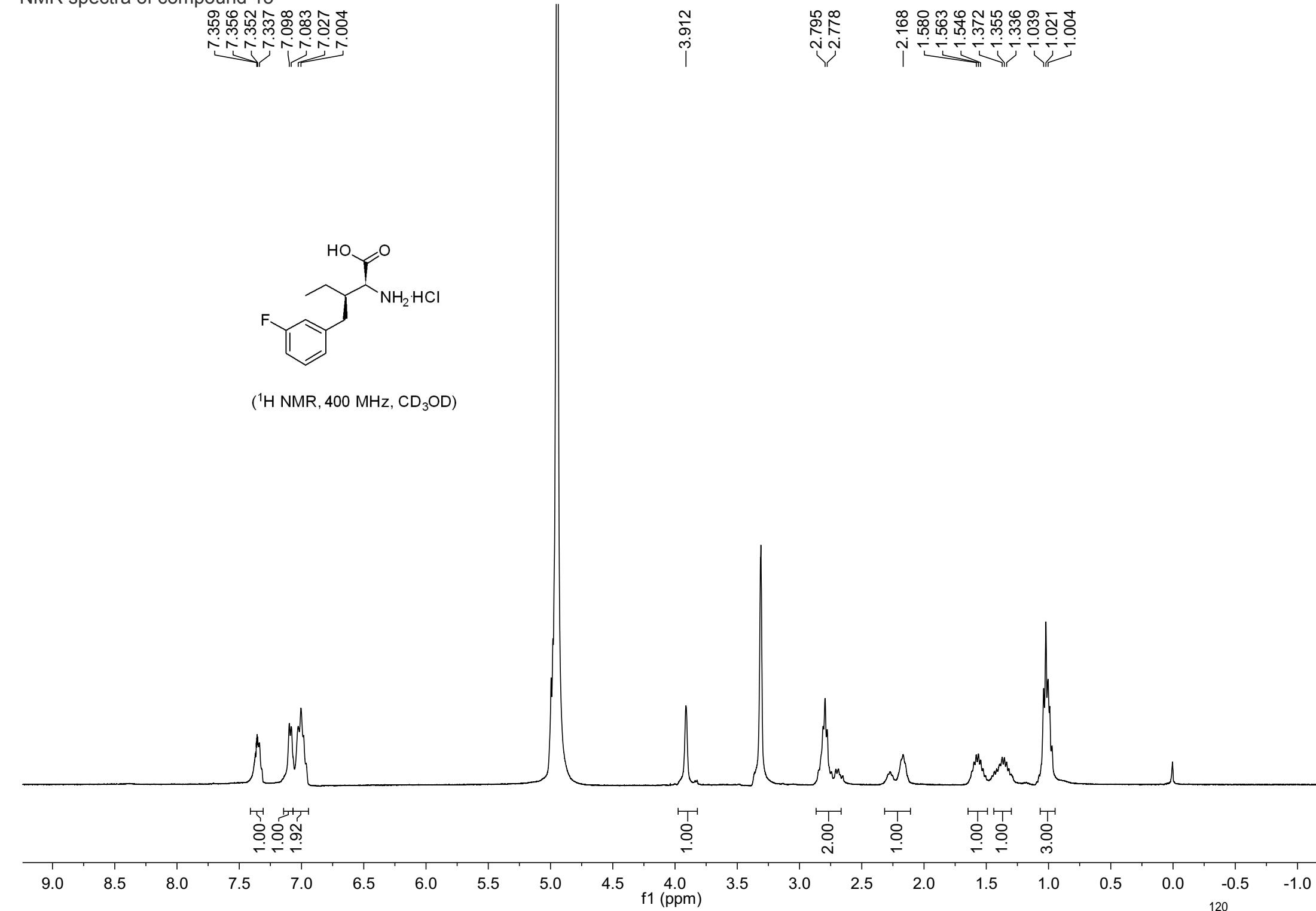


NMR spectra of compound 15

7.359  
7.352  
7.337  
7.098  
7.083  
7.027  
7.004



( $^1\text{H}$  NMR, 400 MHz,  $\text{CD}_3\text{OD}$ )



NMR spectra of compound 15

-171.026  
-165.232  
-163.610

143.313  
143.266

131.460  
131.405  
~126.178

117.003  
116.860

114.498  
114.357

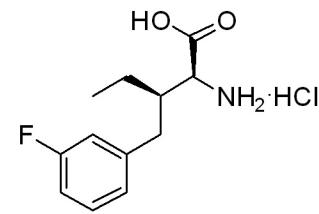
-55.313

44.814  
44.495

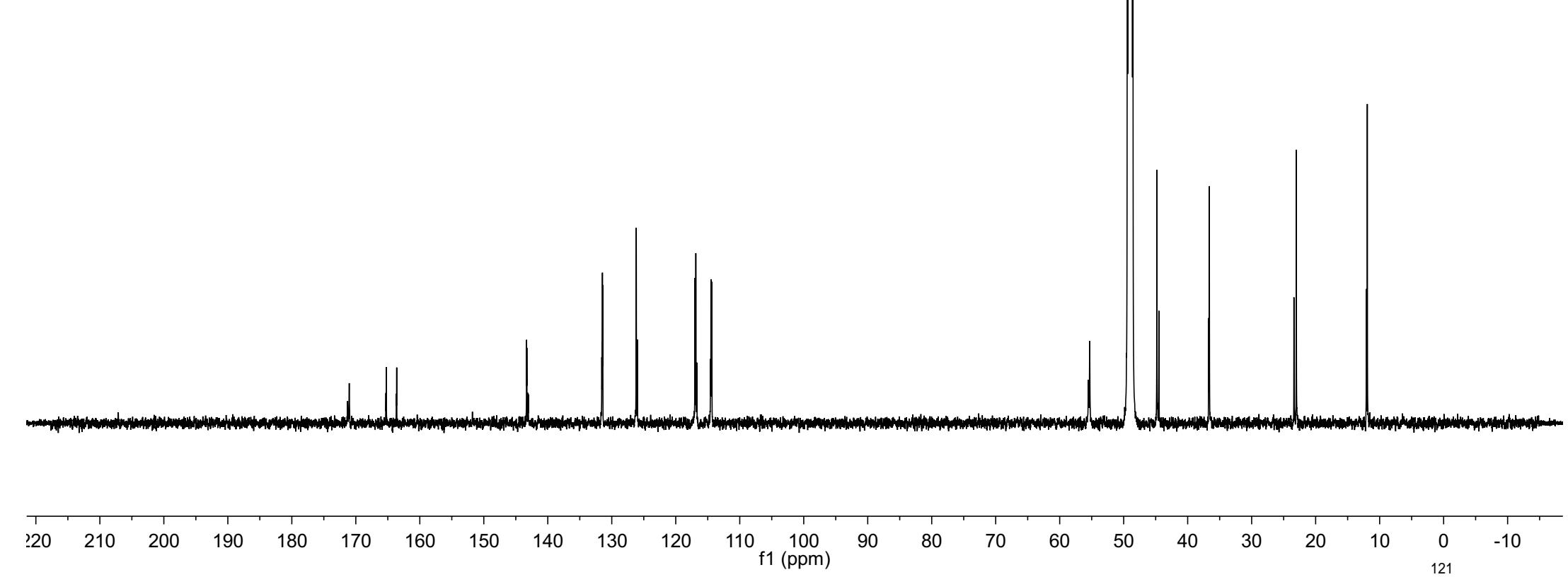
36.722  
36.621

23.394  
23.030

12.085  
11.929



( $^{13}\text{C}$  NMR, 150 MHz,  $\text{CD}_3\text{OD}$ )

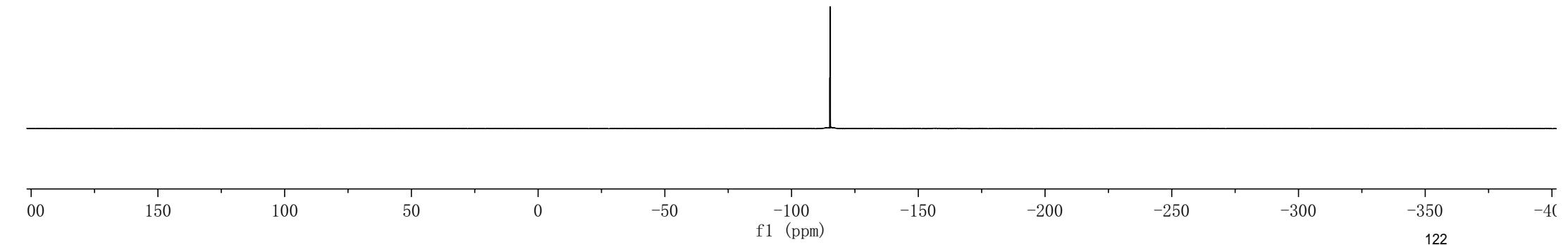


NMR spectra of compound 15



(<sup>19</sup>F NMR, 376 MHz, CD<sub>3</sub>OD)

— -115.299



NMR spectra of compound 16a

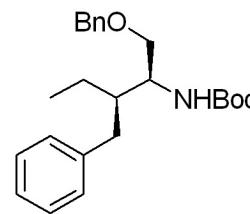
7.317  
7.300  
7.274  
7.259  
7.177  
7.160

~4.750  
4.489  
4.423  
4.382

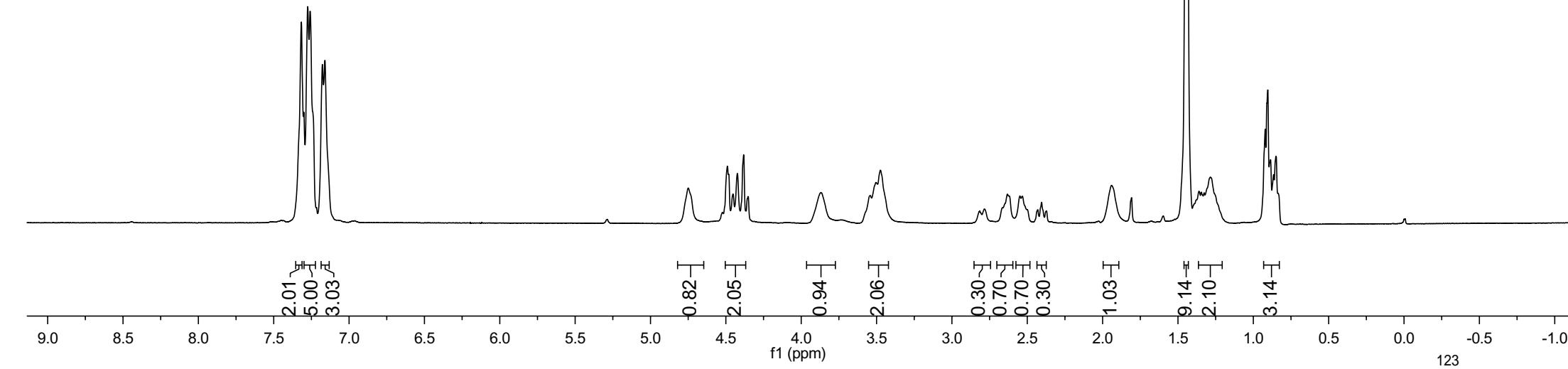
~3.869  
3.503  
3.474

2.816  
2.784  
2.631  
2.549  
2.533  
2.430  
2.405  
2.373  
~1.940

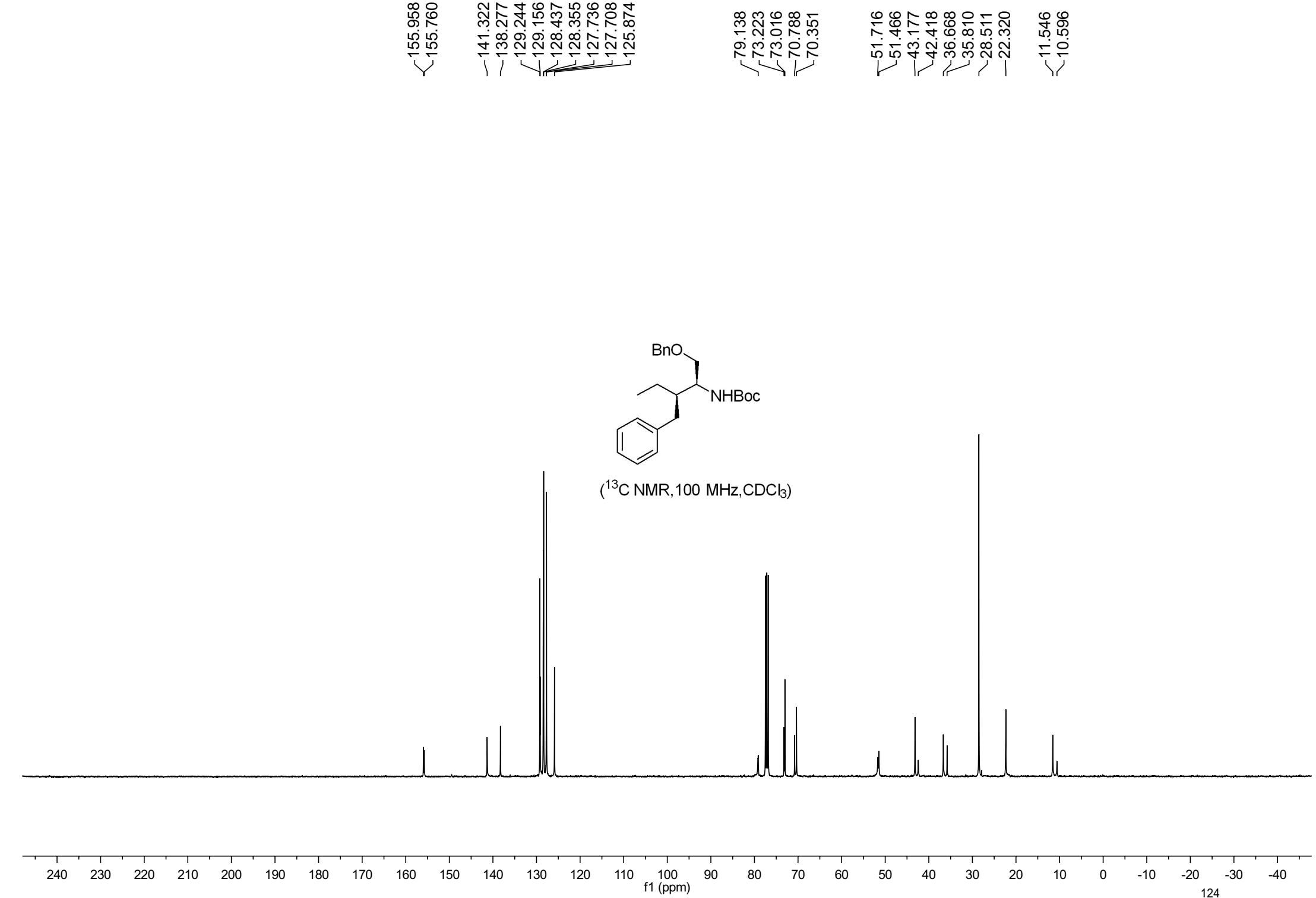
1.441  
1.327  
1.285  
0.921  
0.904  
0.886  
0.866  
0.849



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 16a



## NMR spectra of compound 16b

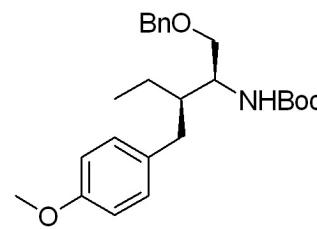
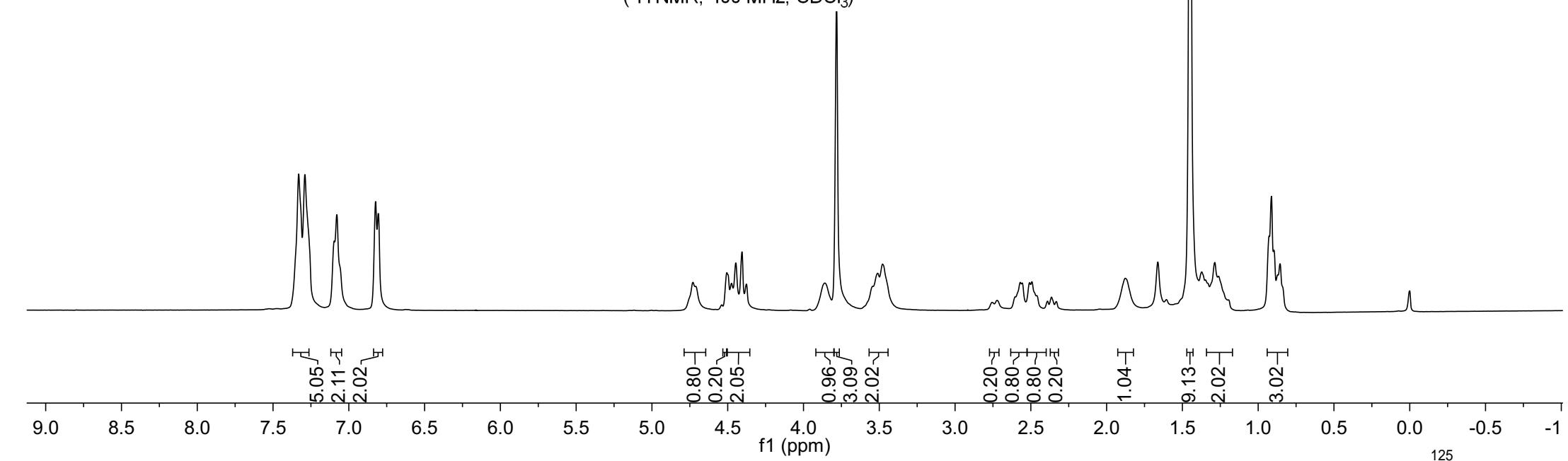
~7.331  
 ~7.290  
 -7.079  
 ~6.823  
 ~6.805

4.730  
 4.506  
 4.475  
 4.447  
 4.406  
 4.377

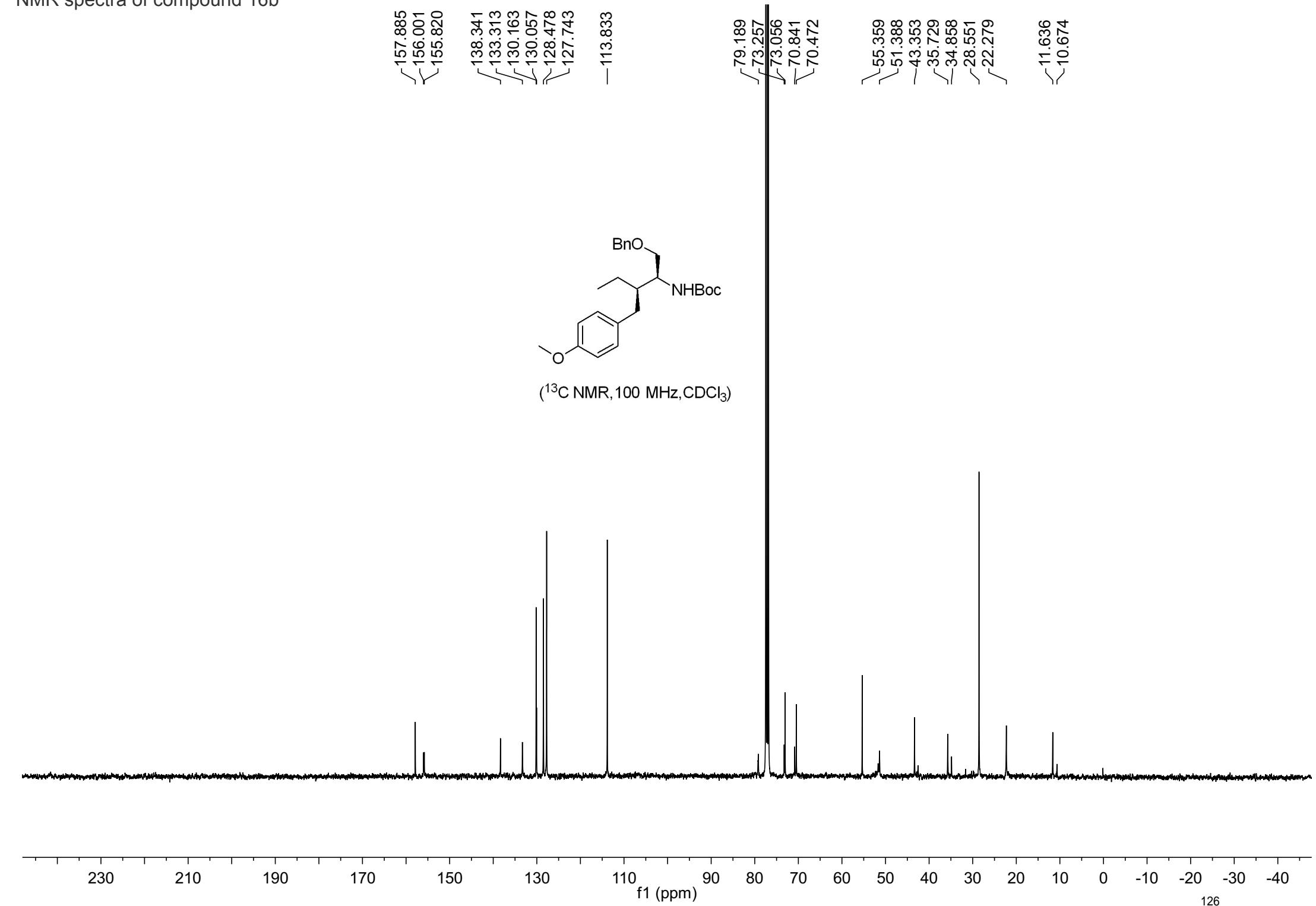
~3.859  
 ~3.782  
 ~3.510  
 ~3.478

2.570  
 2.557  
 2.508  
 2.493

-1.876  
 -1.448  
 -1.286  
 0.928  
 0.912  
 0.897

(1H NMR, 400 MHz, CDCl<sub>3</sub>)

NMR spectra of compound 16b



NMR spectra of compound 16c

7.338  
7.326  
7.292  
7.209  
6.943  
6.892  
6.870  
6.850

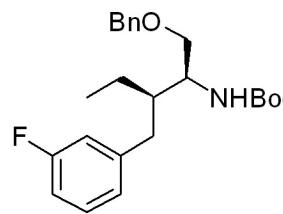
4.747  
4.729  
4.513  
4.499  
4.452  
4.414

-3.847  
3.481  
3.472

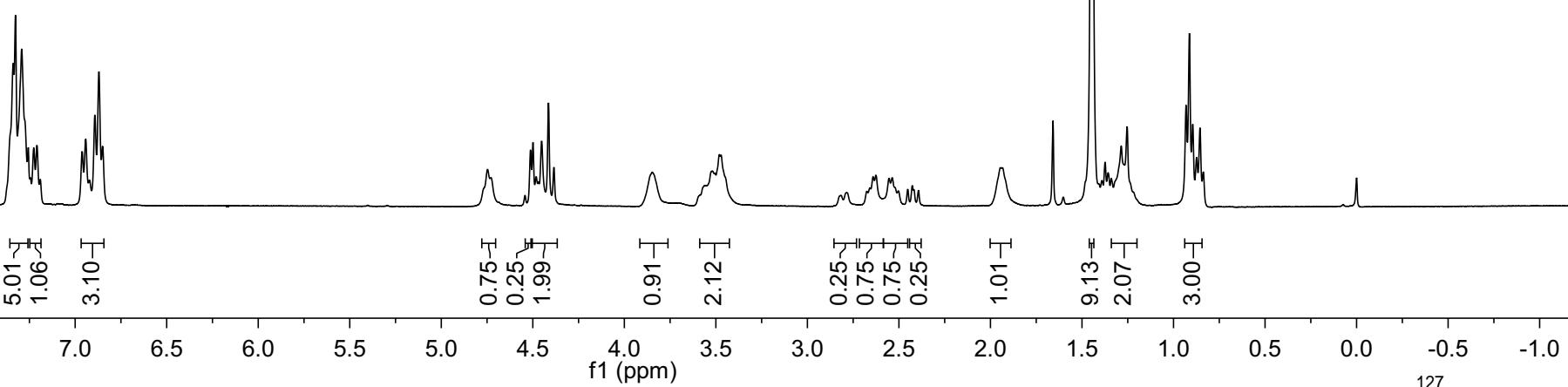
2.641  
2.625  
2.555  
2.537

-1.945

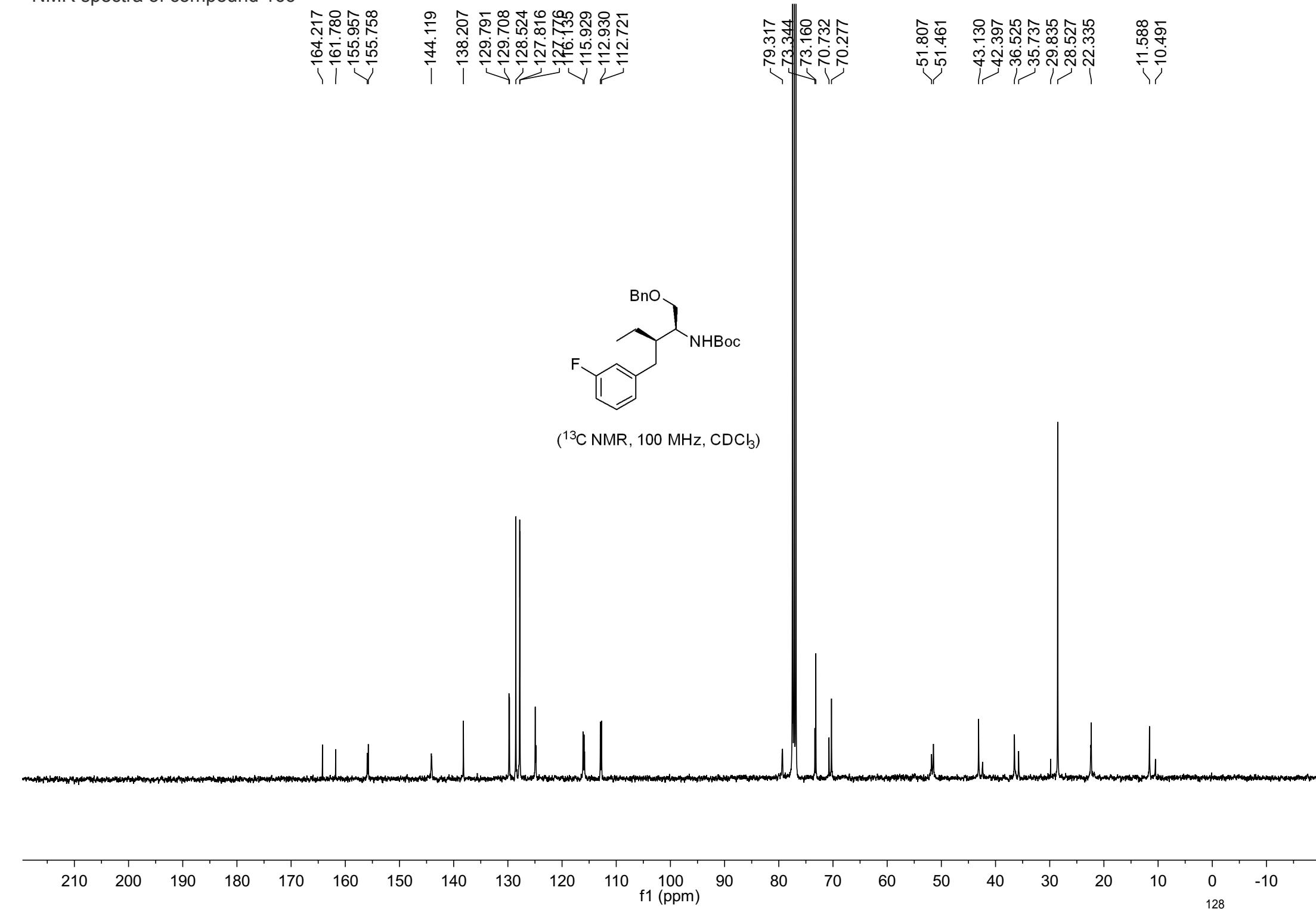
1.446  
1.286  
1.254  
0.931  
0.913  
0.895  
0.874  
0.855  
0.837



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

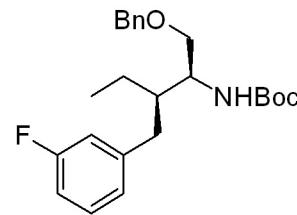


NMR spectra of compound 16c

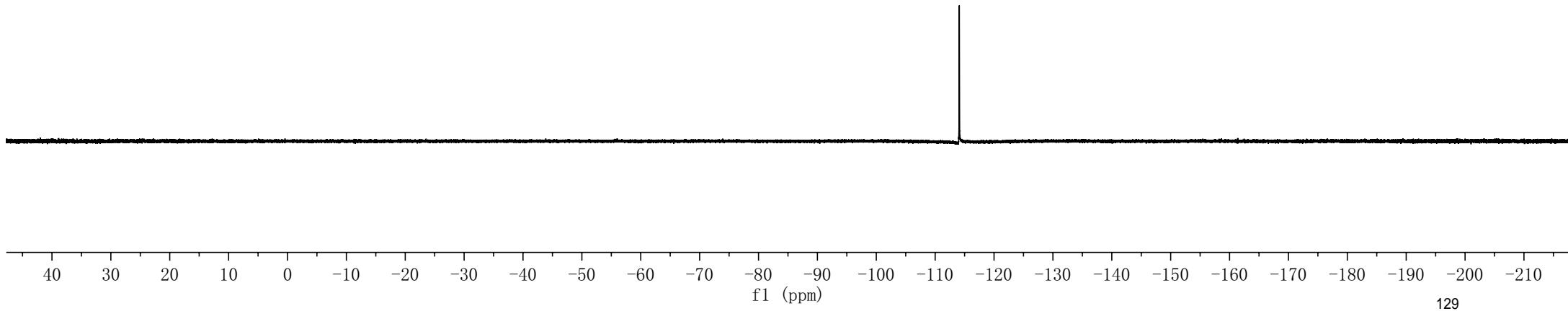


NMR spectra of compound 16c

— -114.094



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ )

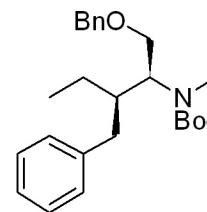


129

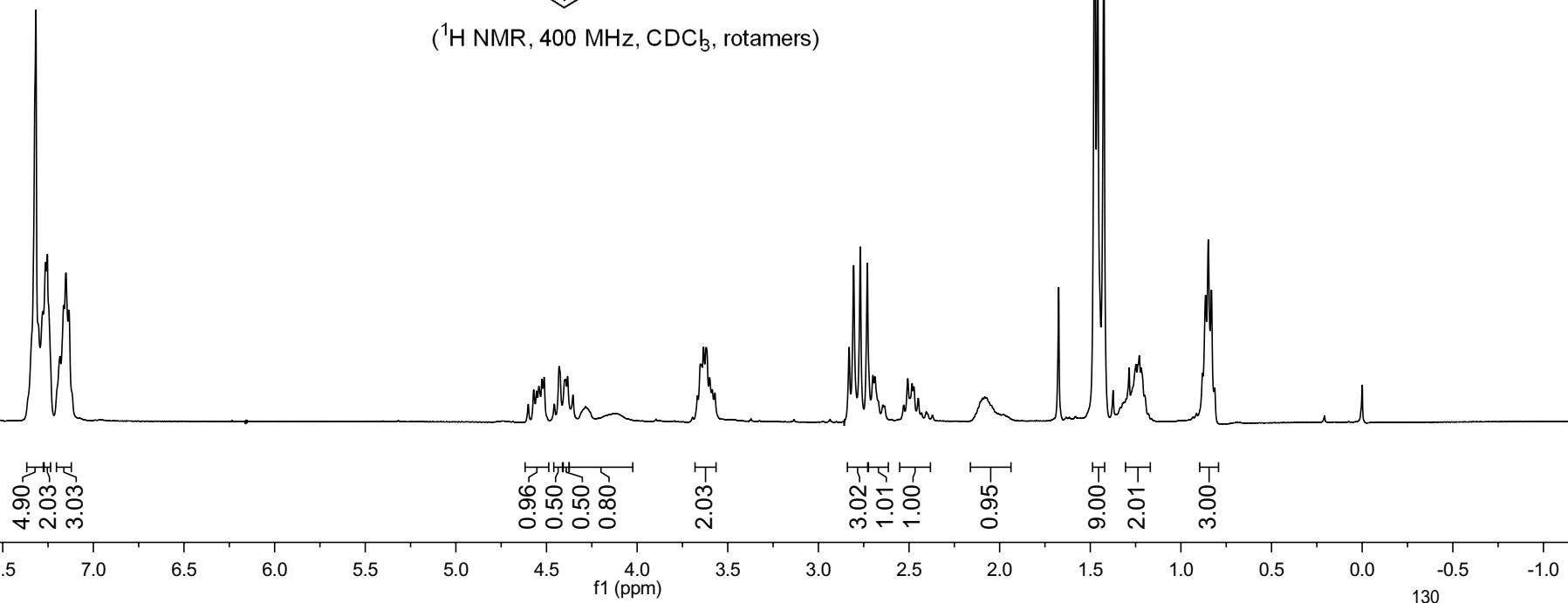
NMR spectra of compound 17a

7.317  
7.164  
7.151  
7.135

4.571  
4.542  
4.525  
4.513  
4.430  
4.394  
4.384  
3.652  
3.644  
3.633  
3.619  
3.600  
2.805  
2.769  
2.730  
2.507  
2.483  
2.473  
-2.082  
1.477  
1.459  
1.425  
1.248  
1.230  
1.219  
0.864  
0.849  
0.832



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>, rotamers)

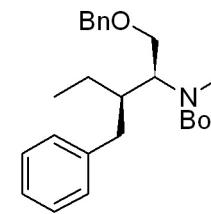


NMR spectra of compound 17a

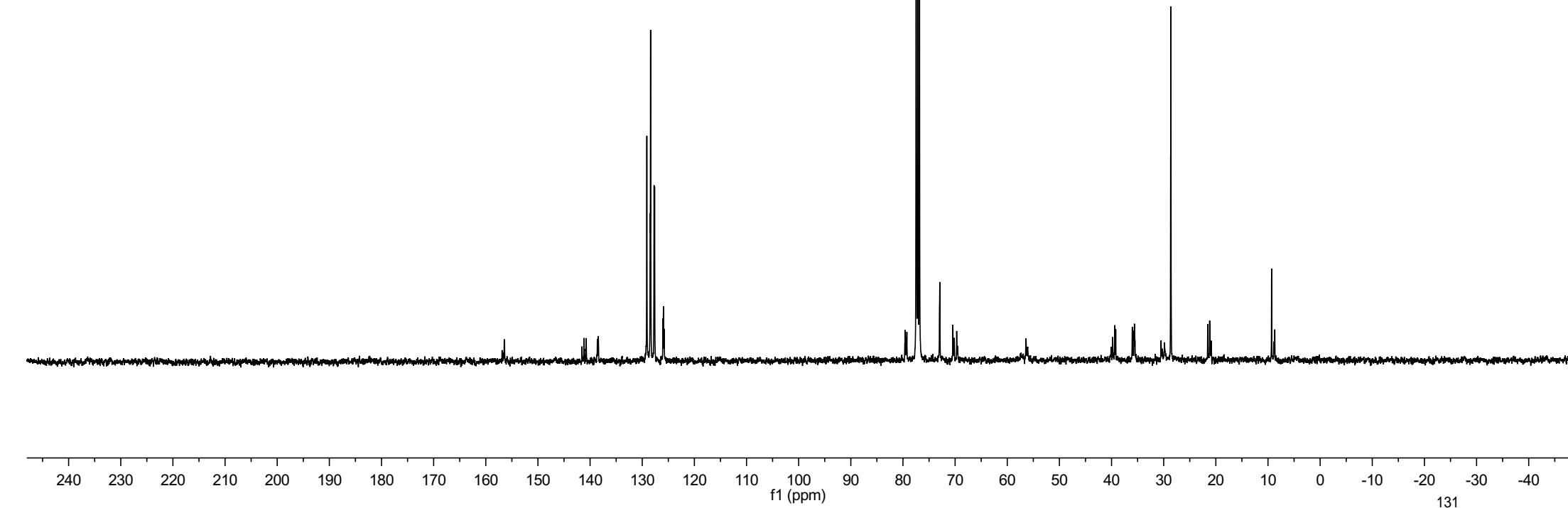
156.879  
156.458  
141.152  
140.742  
138.572  
138.414  
128.415  
128.483  
128.402  
127.727  
127.628  
126.036  
125.935  
125.787

79.585  
79.360  
79.251  
72.929  
70.433  
70.167  
69.695  
69.522  
56.416  
56.106

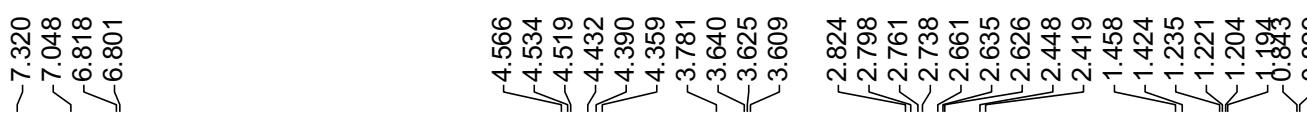
39.359  
39.202  
36.025  
35.700  
35.614  
28.666  
28.610  
21.556  
9.305  
8.696



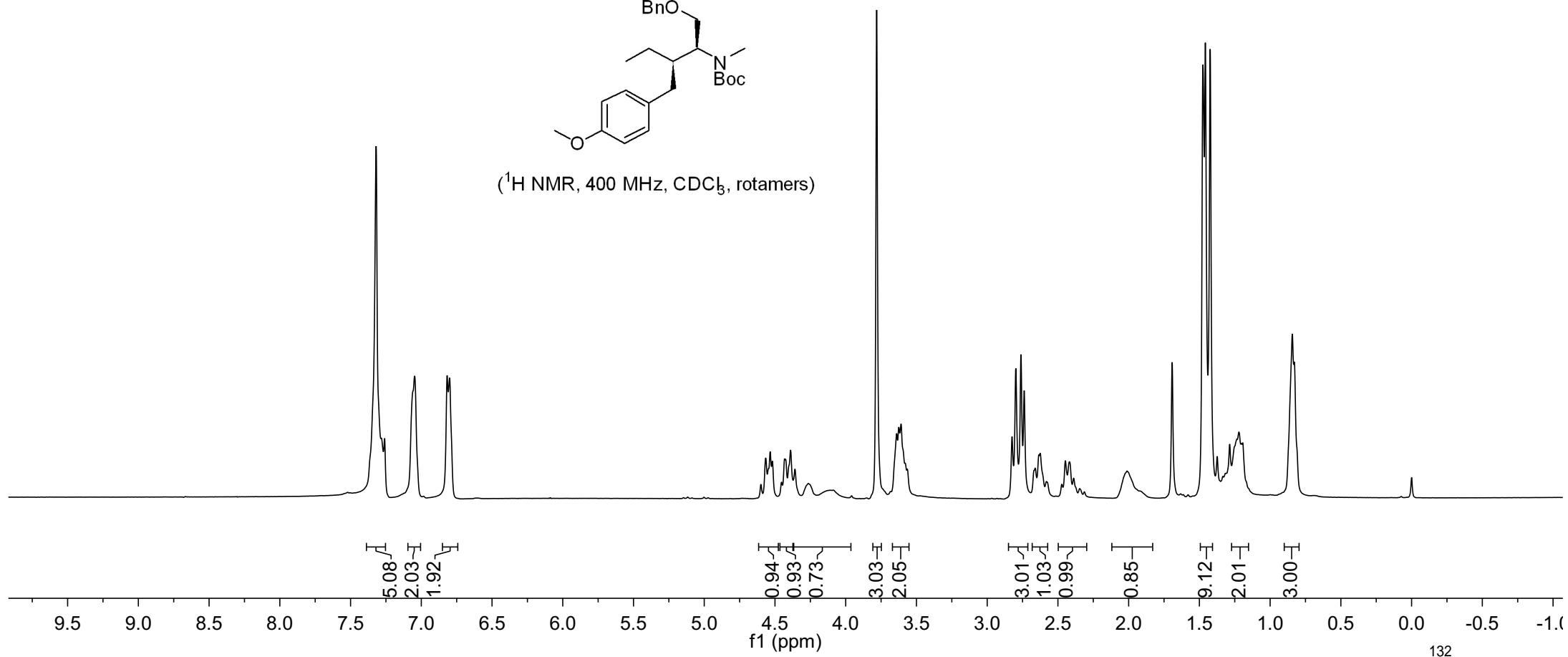
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



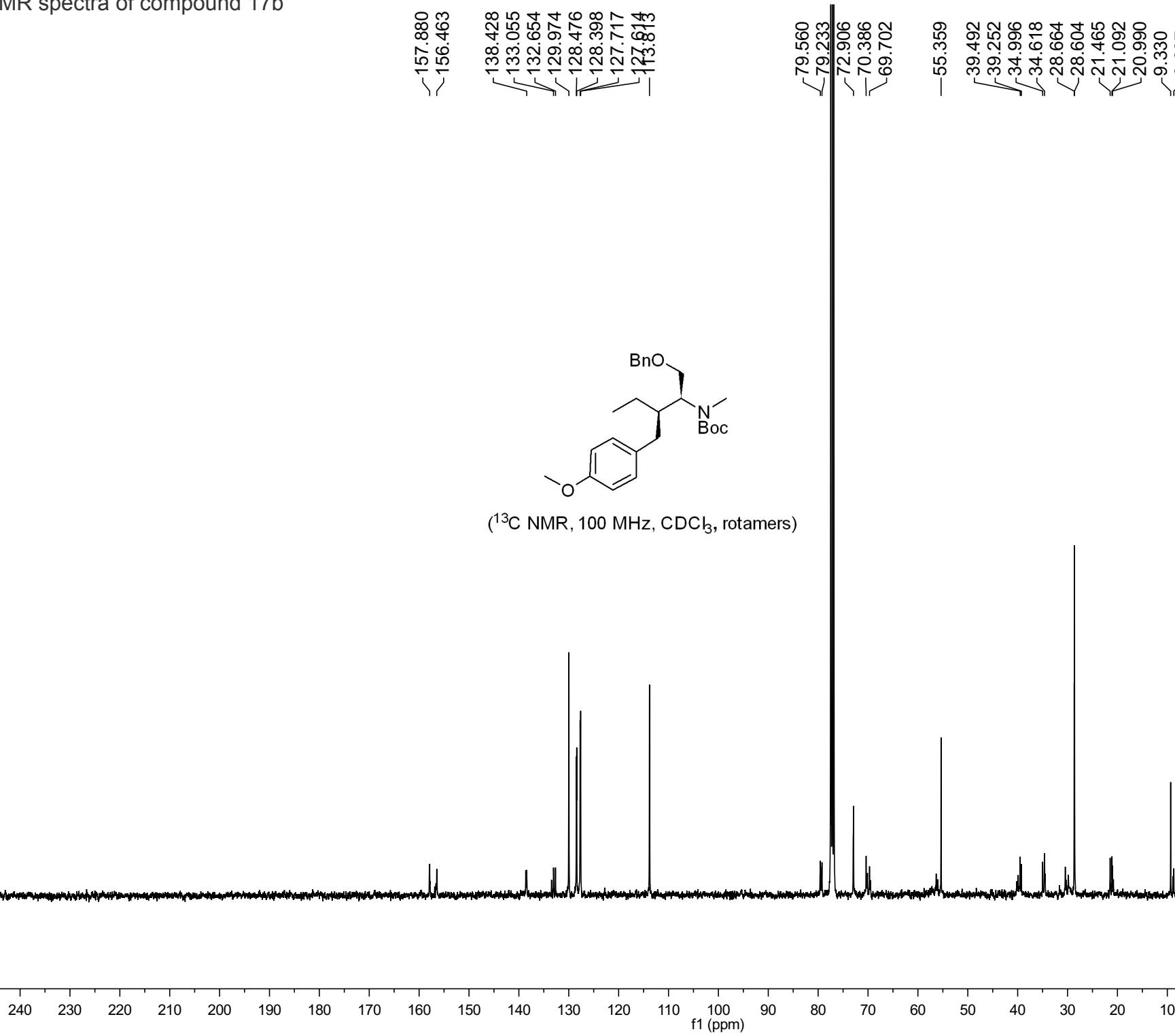
NMR spectra of compound 17b



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>, rotamers)



NMR spectra of compound 17b



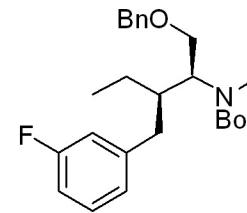
NMR spectra of compound 17c

7.317  
7.259  
6.925  
6.908  
6.866

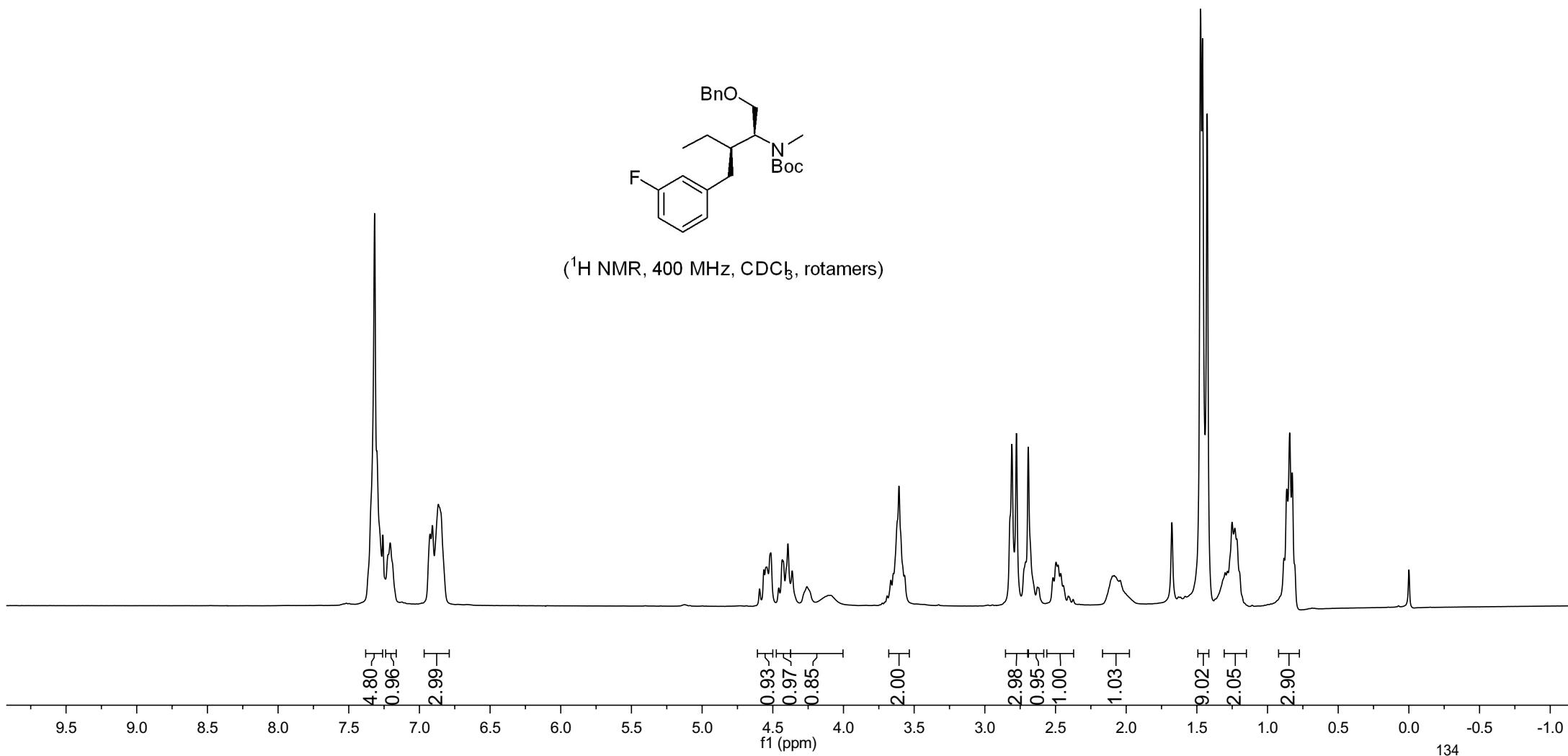
4.563  
4.543  
4.514  
4.433  
4.426  
4.393  
4.363  
4.105

3.607  
2.809  
2.776  
2.693  
2.517  
2.496  
2.482  
2.463  
2.445  
2.096  
2.085  
2.043

1.474  
1.460  
1.427  
1.251  
0.854  
0.843  
0.825



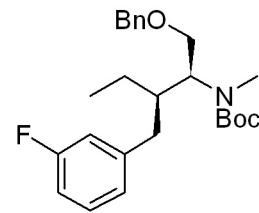
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>, rotamers)



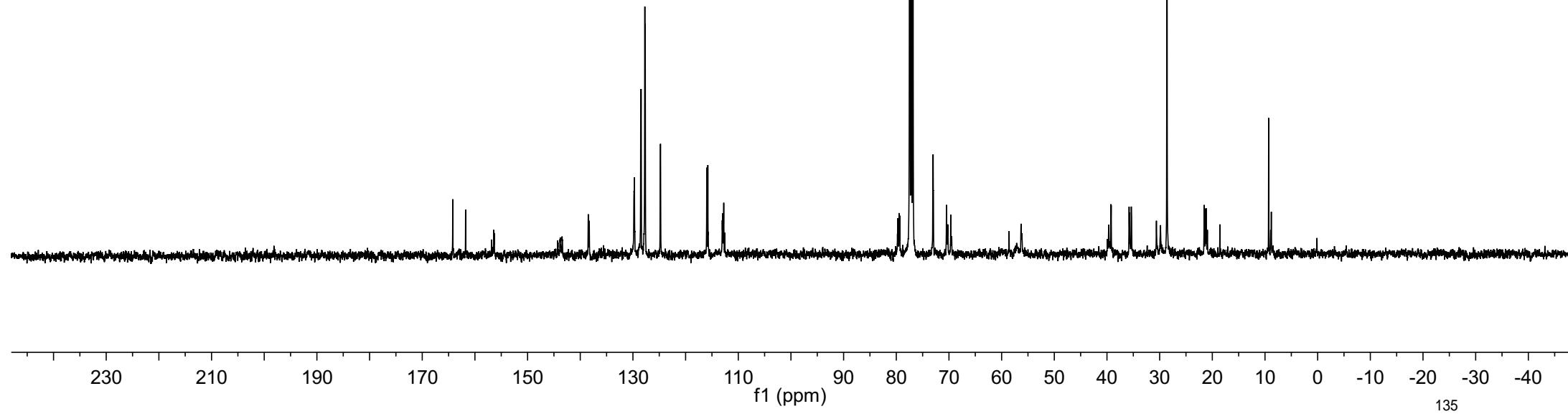
NMR spectra of compound 17c

164.211  
161.773  
156.436  
156.321  
143.795  
143.446  
138.482  
138.291  
128.443  
127.737  
125.984  
115.776  
112.956  
112.757

79.685  
79.480  
79.347  
73.008  
70.473  
70.219  
69.665  
58.579  
56.318  
39.268  
39.200  
35.797  
35.706  
35.379  
28.596  
21.545  
21.353  
9.303  
8.803

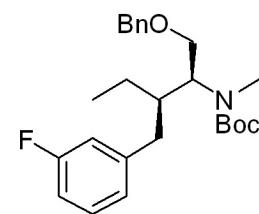


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)

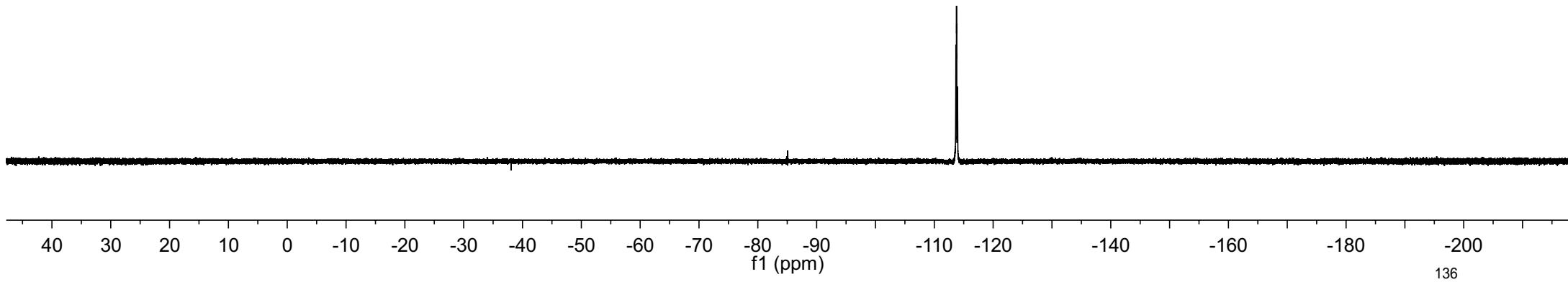


NMR spectra of compound 17c

-113.773



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 18a

7.326  
7.311  
7.299  
7.278  
7.260  
7.179  
7.158  
7.137

5.384  
5.362  
5.241  
5.218

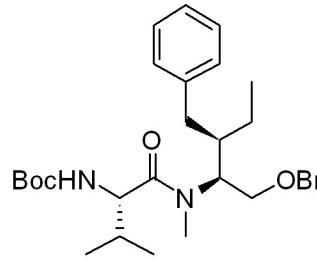
4.780  
4.563  
4.533  
4.462  
4.433  
4.375

3.600  
3.581  
3.566  
3.558

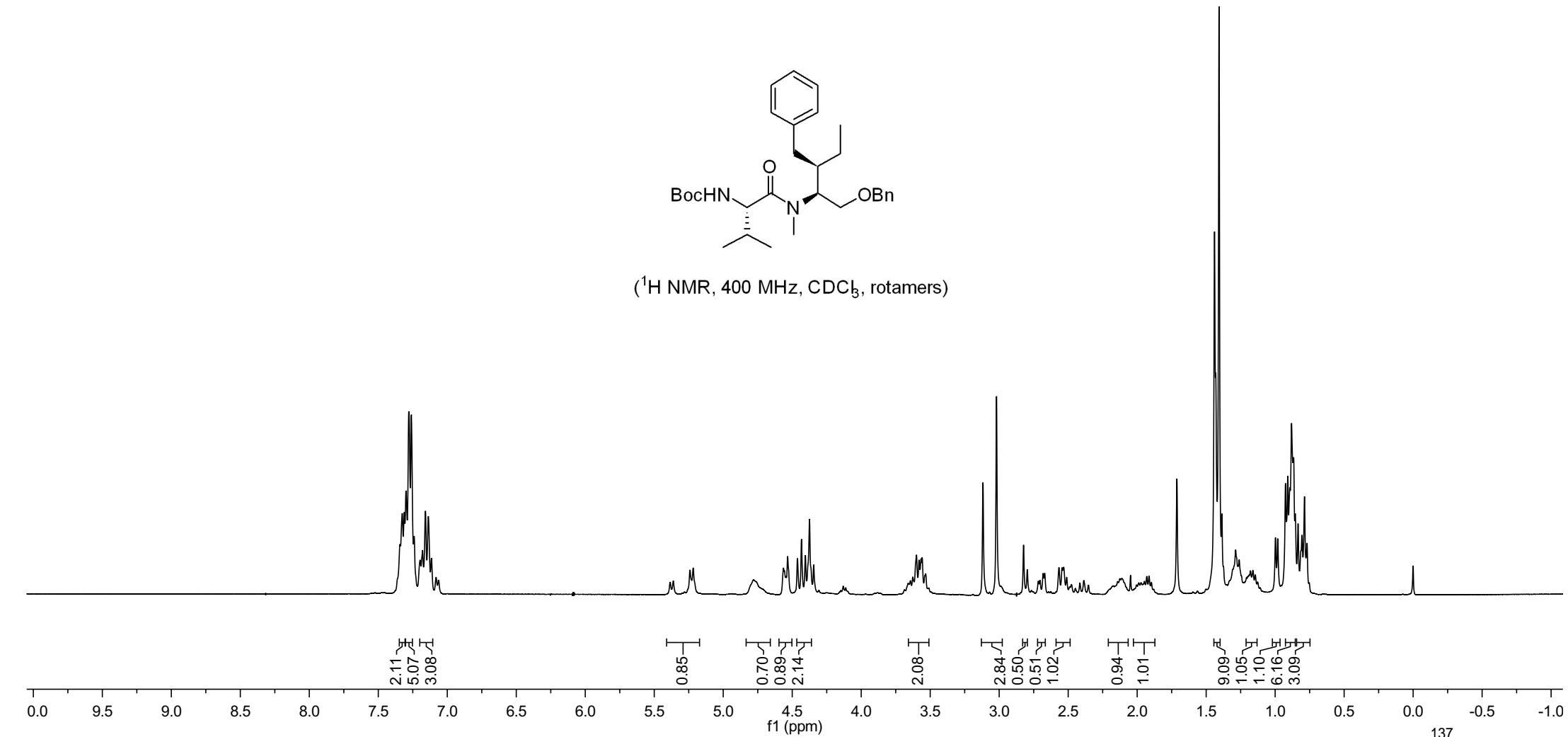
3.118  
3.019  
2.823  
2.796  
2.670  
2.567  
2.544  
2.533  
2.124

1.439  
1.431  
1.407  
1.179  
1.161  
1.144

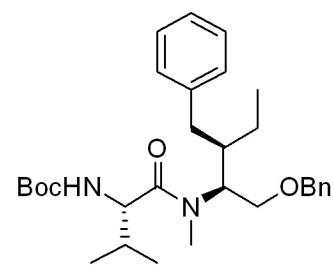
0.925  
0.908  
0.893  
0.881  
0.866  
0.806  
0.787  
0.769



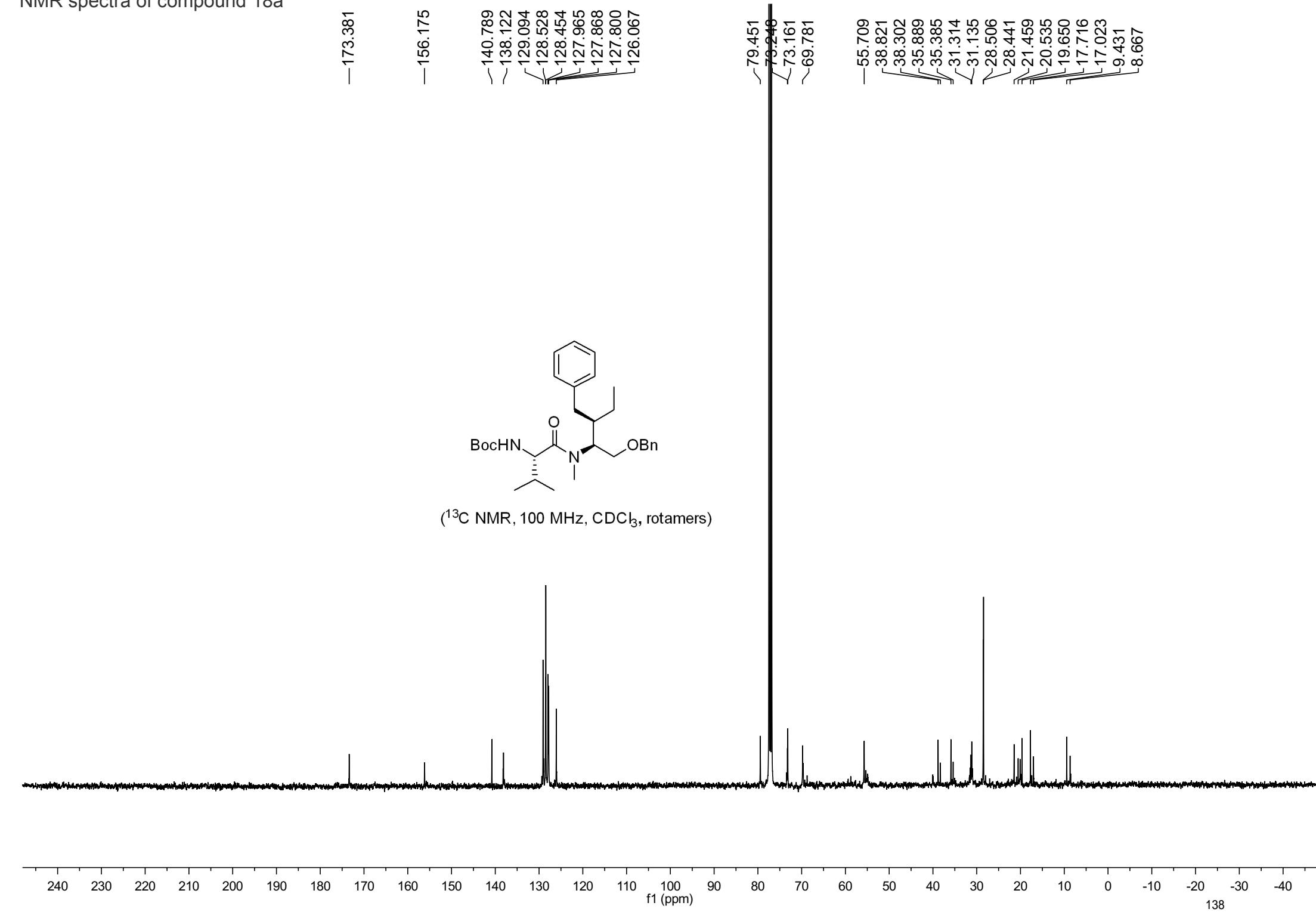
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 18a

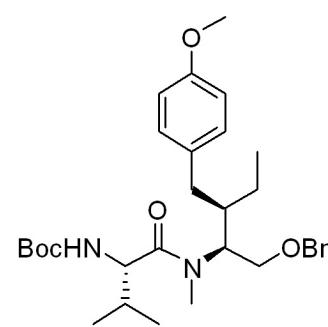


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)

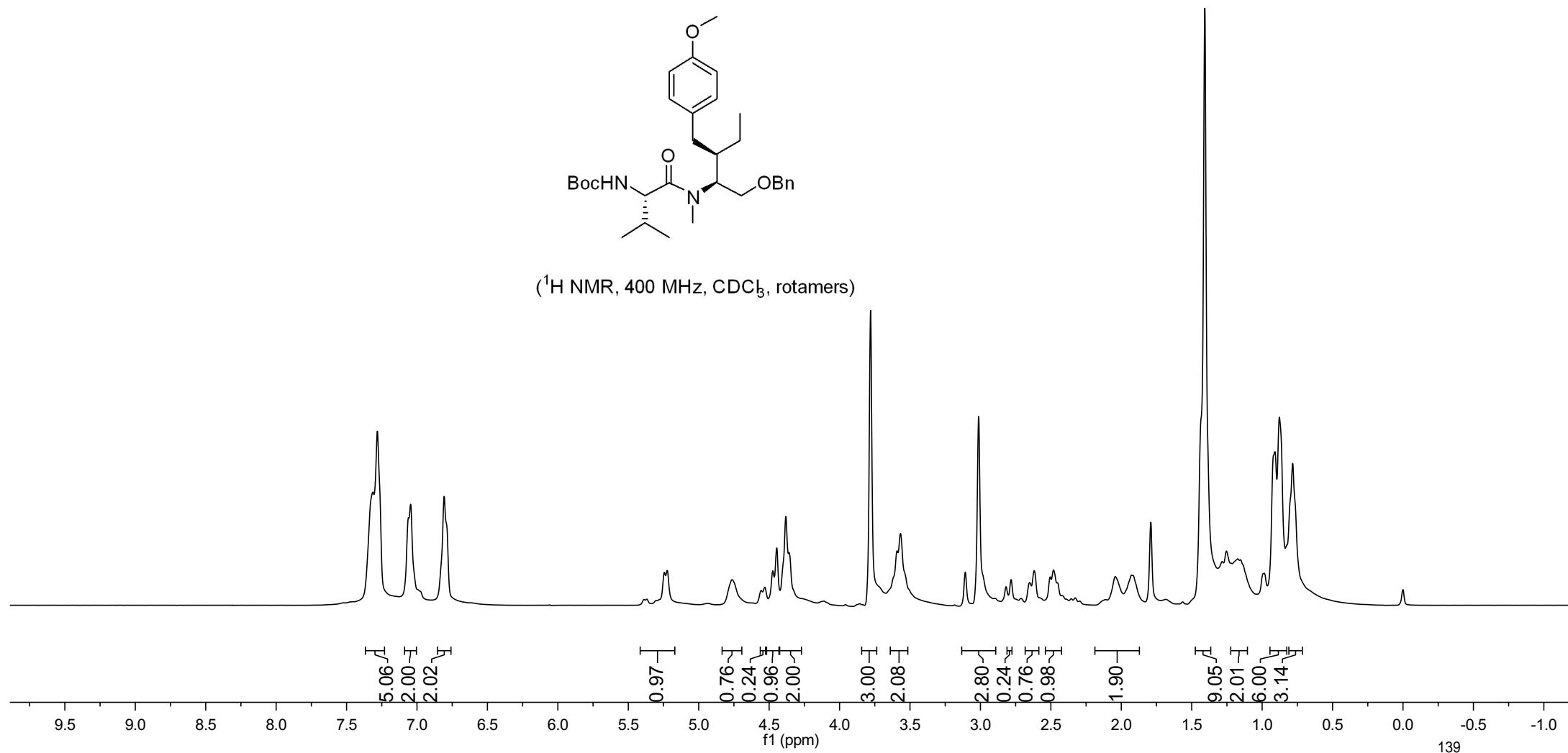


NMR spectra of compound 18b

<7.313  
 <7.281  
 <7.061  
 <7.045  
 ~6.807  
 <5.244  
 <5.224  
 <4.763  
 <4.531  
 <4.474  
 <4.446  
 <4.381  
 <4.359  
 ~3.780  
 <3.592  
 <3.567  
 <3.013  
 <2.782  
 <2.651  
 <2.618  
 <2.505  
 <2.481  
 ~2.043  
 ~1.927  
 -1.407  
 <0.909  
 <0.878  
 <0.783



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



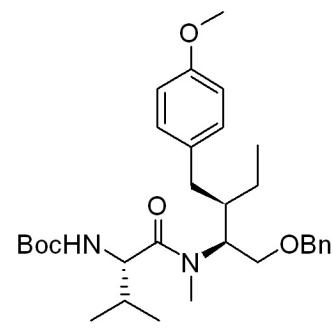
NMR spectra of compound 18b

—173.358  
—157.948  
—156.162  
—138.124  
—132.653  
—129.954  
—128.508  
—128.438  
—127.944  
—127.850  
—127.785  
—113.836

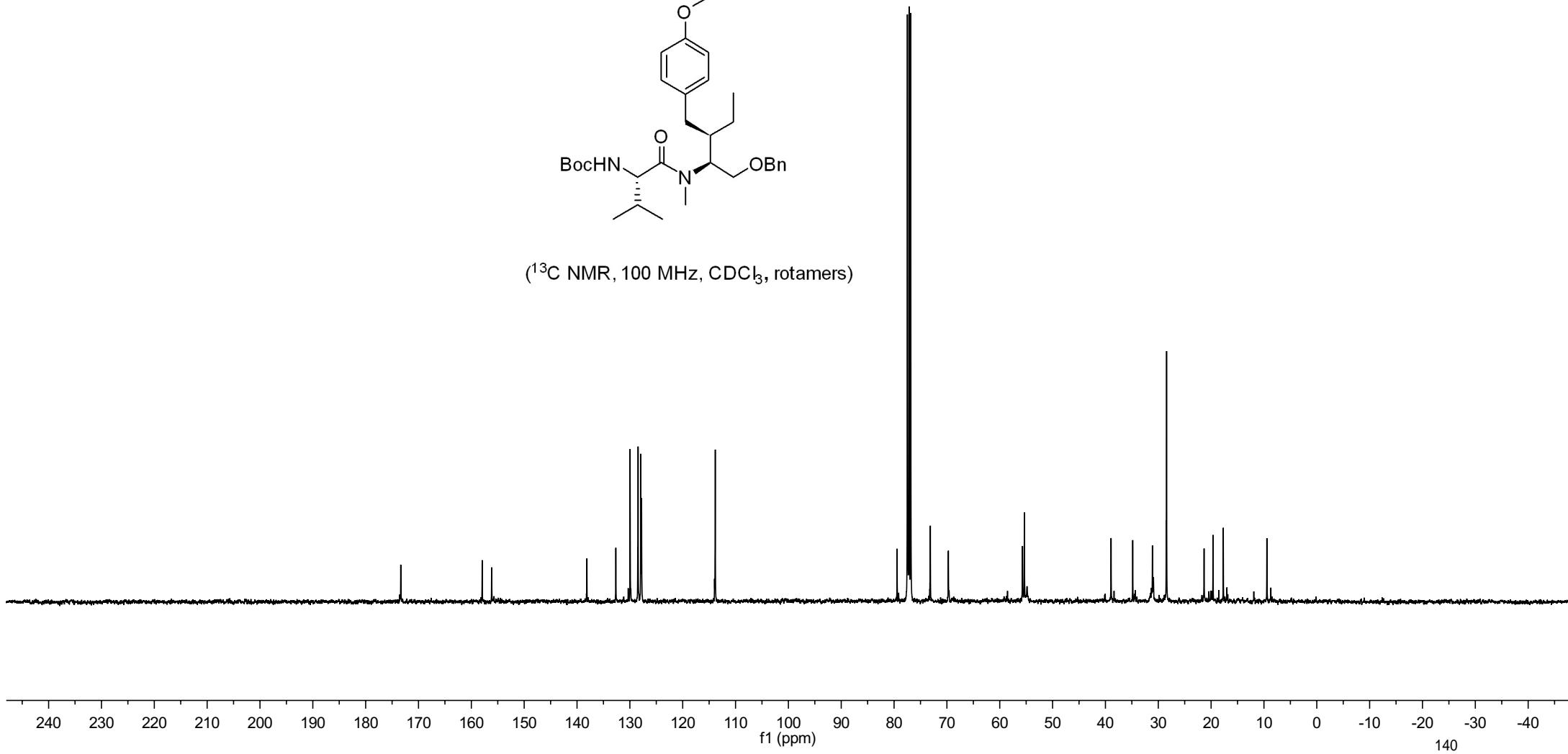
—79.430  
—73.134  
—69.725

—55.690  
—55.342

—38.930  
—34.833  
—31.110  
—28.489  
—28.425  
—21.330  
—19.638  
—17.696  
—9.451



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



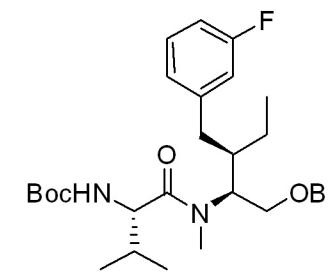
NMR spectra of compound 18c

7.327	7.309	7.278	7.214	6.870	6.850
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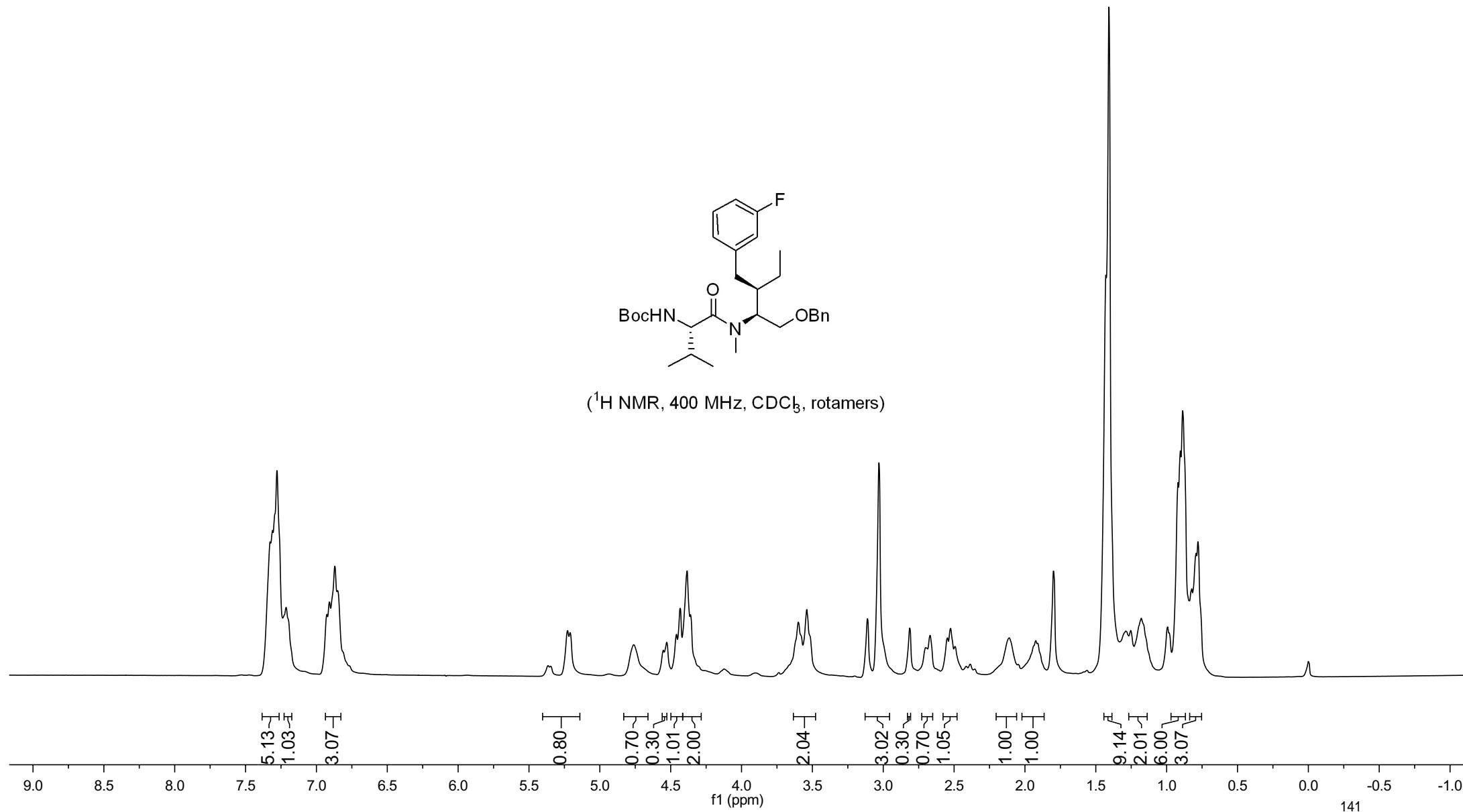
5.365	5.347	5.227	5.210	4.761	4.552	4.528	4.459	4.433	4.384	4.360
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3.600	3.540	3.112	3.030	2.669	2.547	2.525	2.494	2.111	1.924	1.911
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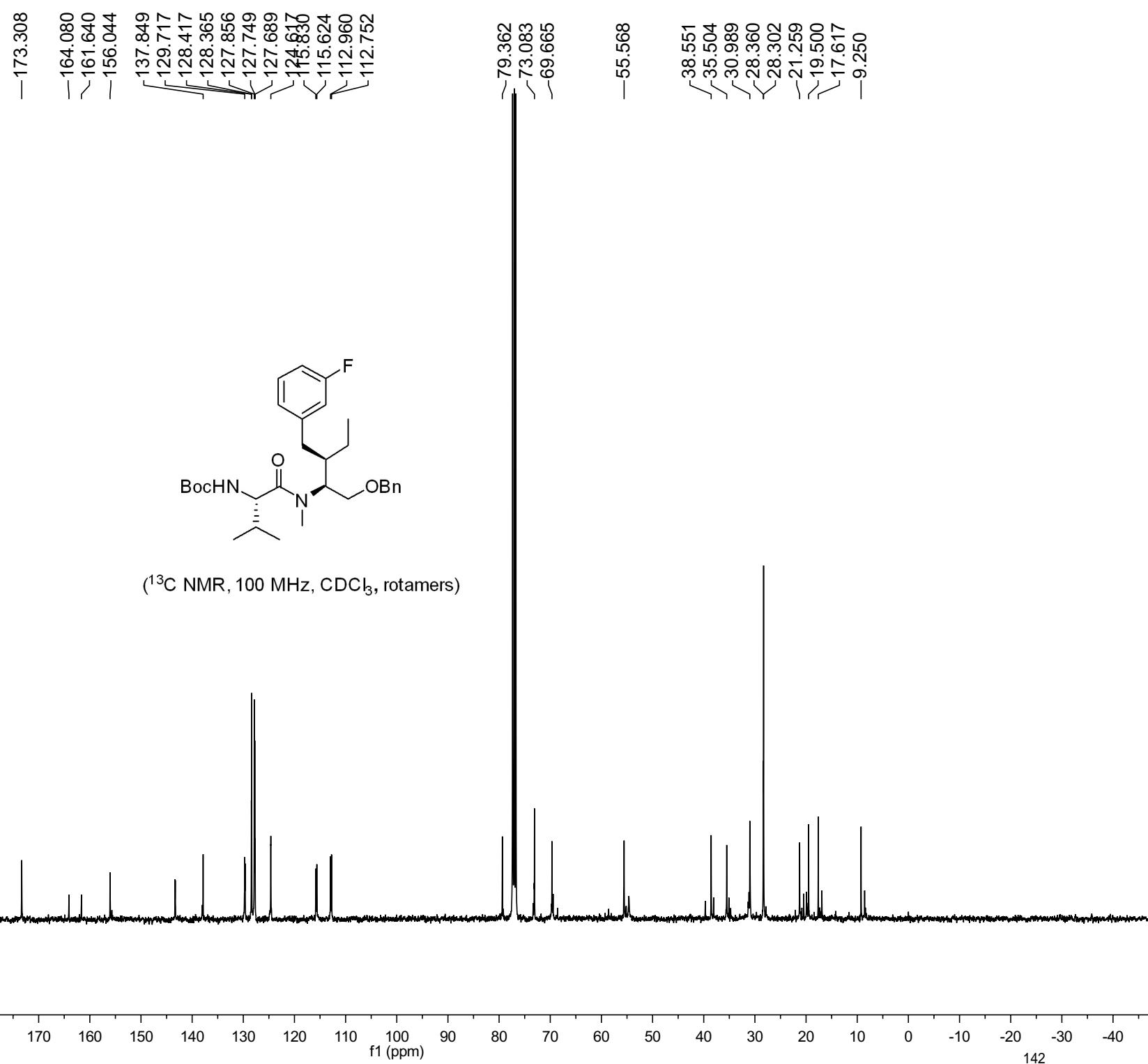
1.407	1.179	0.993	0.920	0.903	0.887	0.823	0.792	0.779
-------	-------	-------	-------	-------	-------	-------	-------	-------



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)

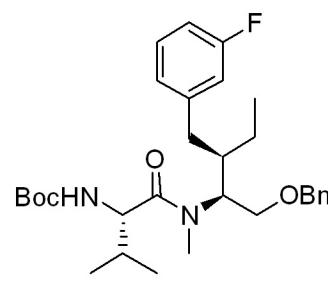


NMR spectra of compound 18c

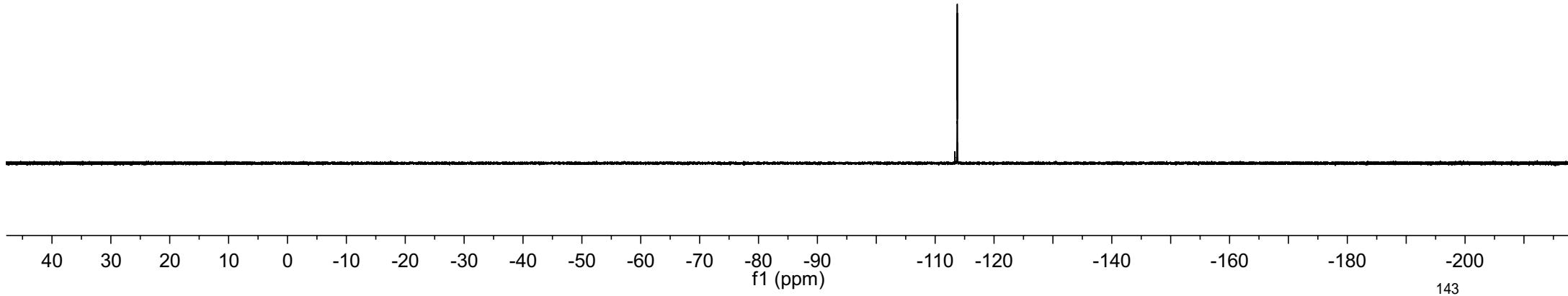


NMR spectra of compound 18c

— -113.752



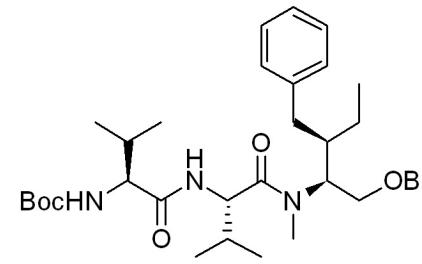
(<sup>19</sup>F NMR, 376 MHz, CDCl<sub>3</sub>, rotamers)



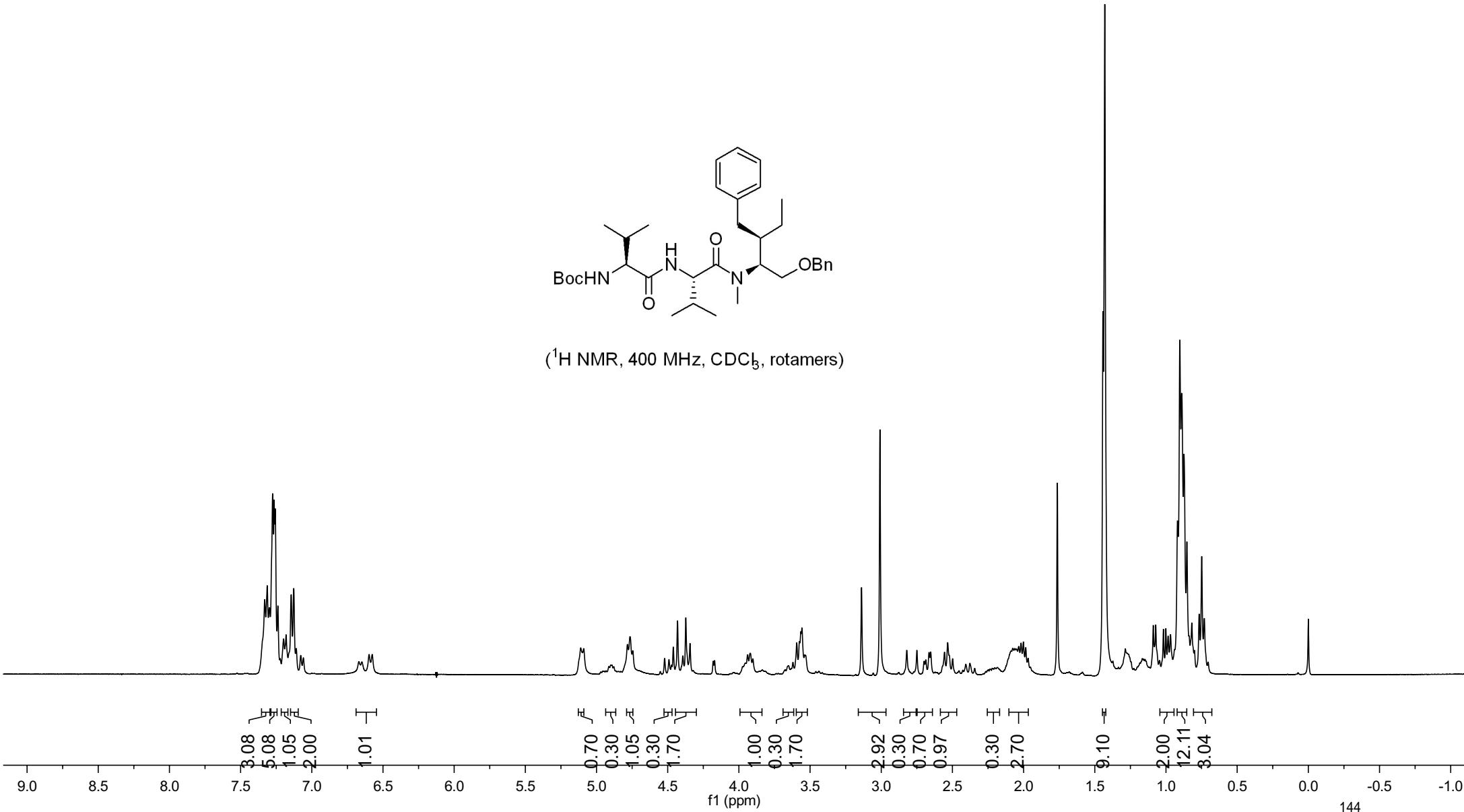
NMR spectra of compound 19a

7.313  
7.275  
7.264  
7.257  
7.198  
7.180  
7.145  
7.127  
7.077  
7.059  
6.670  
6.647  
6.598  
6.575

5.111  
5.090  
4.783  
4.765  
4.431  
4.373  
4.343  
3.938  
3.919  
3.565  
3.557  
3.139  
3.009  
2.821  
2.750  
2.653  
2.556  
2.533  
2.077  
2.062  
2.034  
2.043  
1.430  
1.166  
1.148  
1.089  
1.072  
1.018  
1.001  
0.985  
0.968  
0.919  
0.903  
0.889  
0.874  
0.767  
0.749  
0.731



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



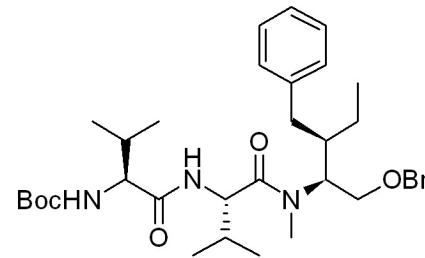
NMR spectra of compound 19a

172.443  
171.547  
—155.824

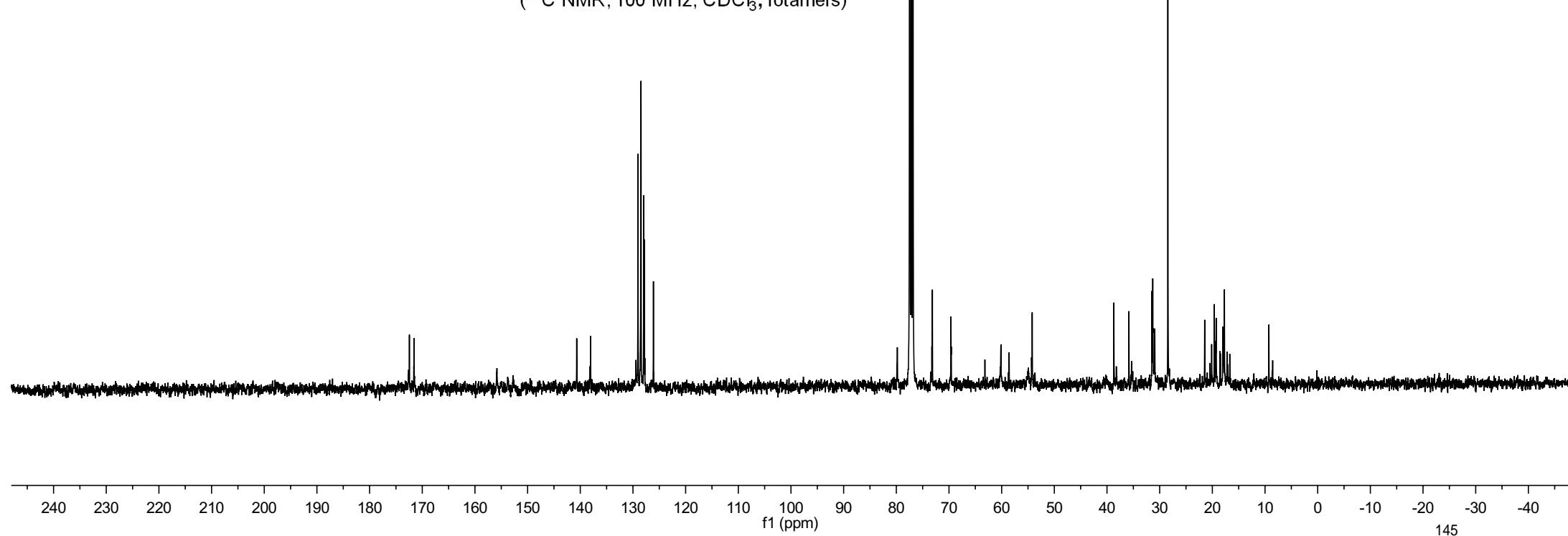
—140.676  
—138.044  
129.049  
128.536  
128.470  
127.955  
127.838  
126.110

79.806  
72.250  
73.152  
69.631  
63.177  
60.142  
58.577  
54.200

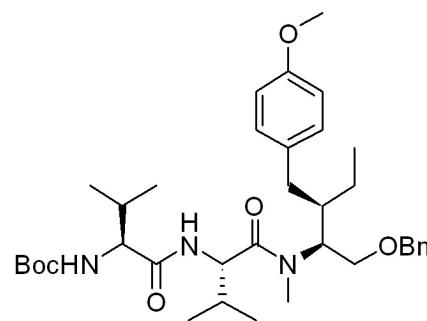
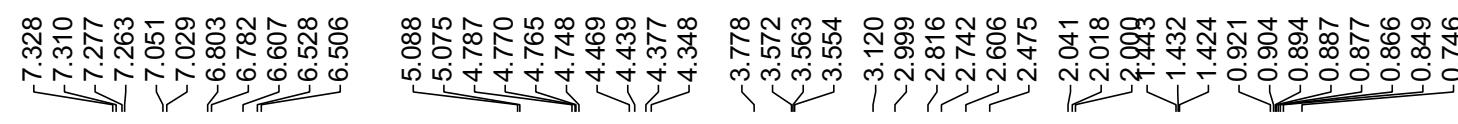
38.695  
35.838  
31.471  
31.310  
—28.445  
21.455  
19.626  
19.279  
17.798  
9.267



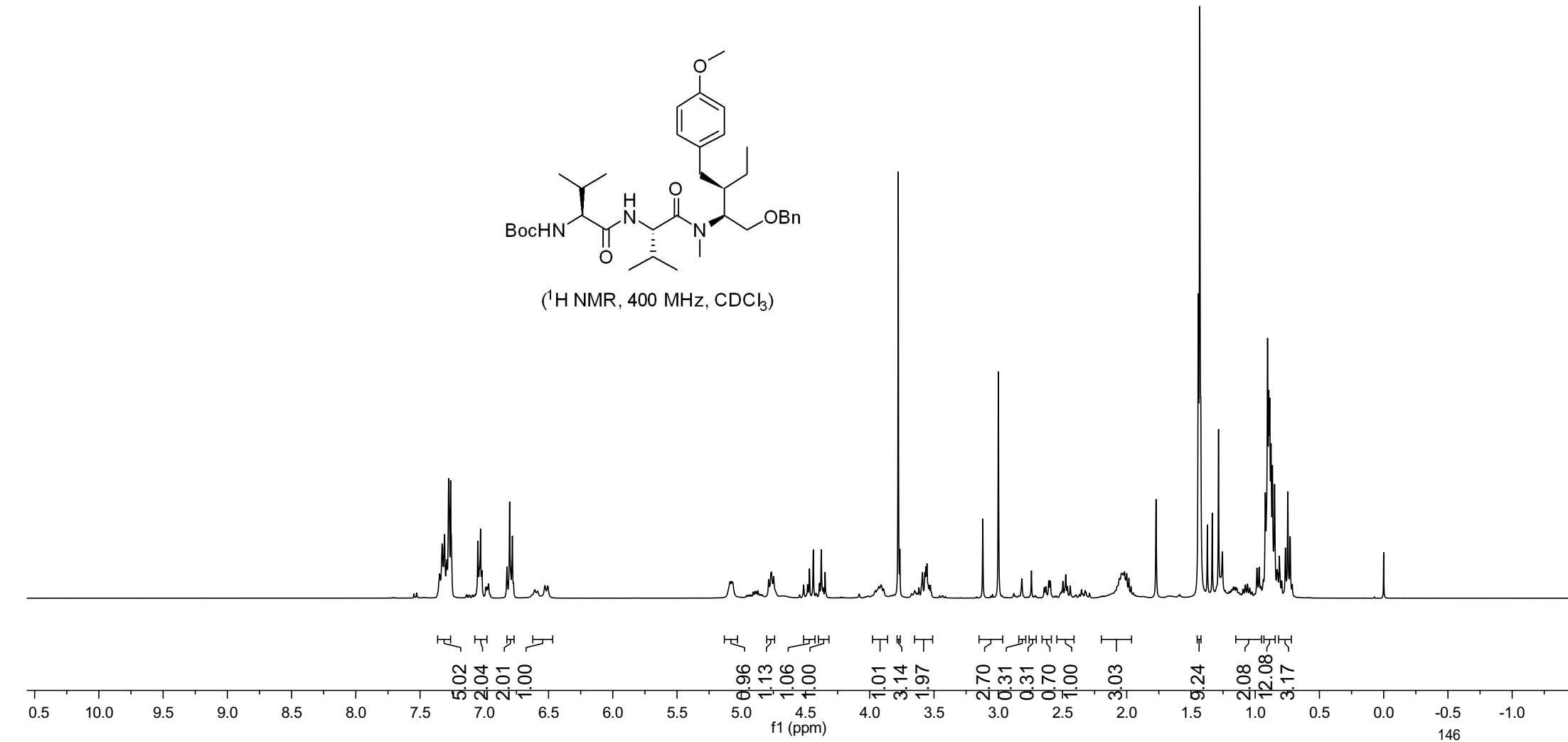
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 19b



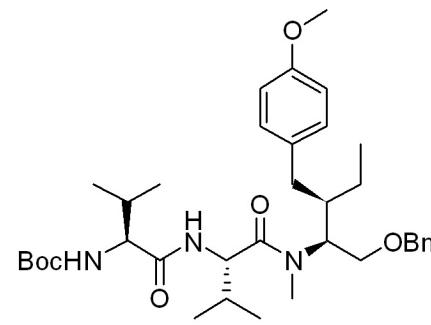
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



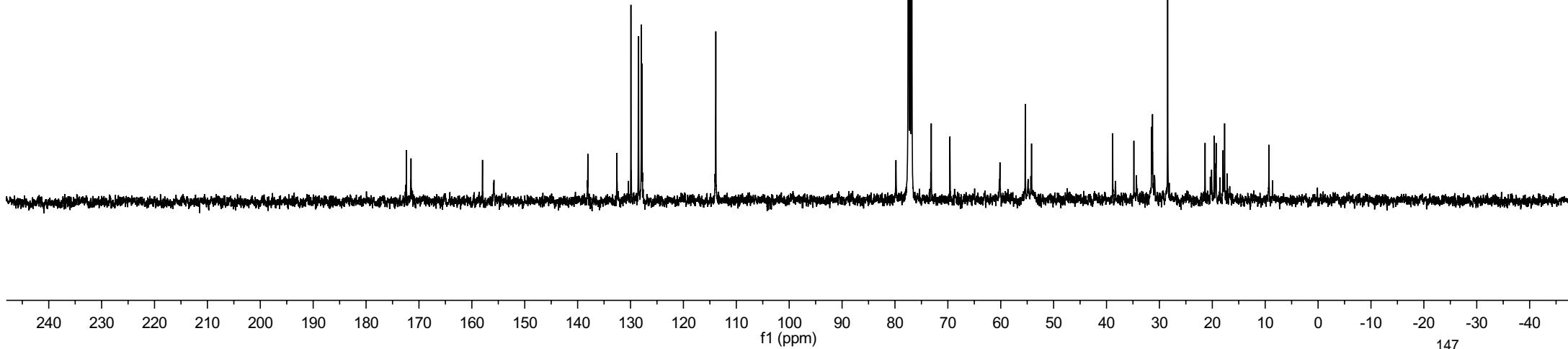
NMR spectra of compound 19b

172.381  
171.503  
157.986  
155.819  
138.073  
132.579  
129.924  
128.533  
128.469  
127.944  
127.826  
113.869

79.812  
73.139  
69.610  
60.151  
55.362  
54.176  
38.837  
34.831  
31.480  
31.312  
28.444  
21.366  
20.137  
19.642  
19.282  
17.998  
17.676

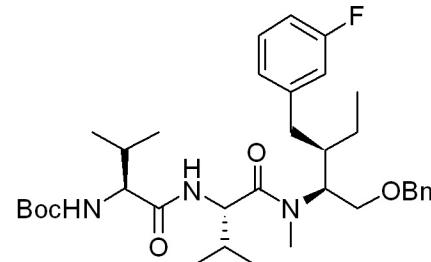


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)

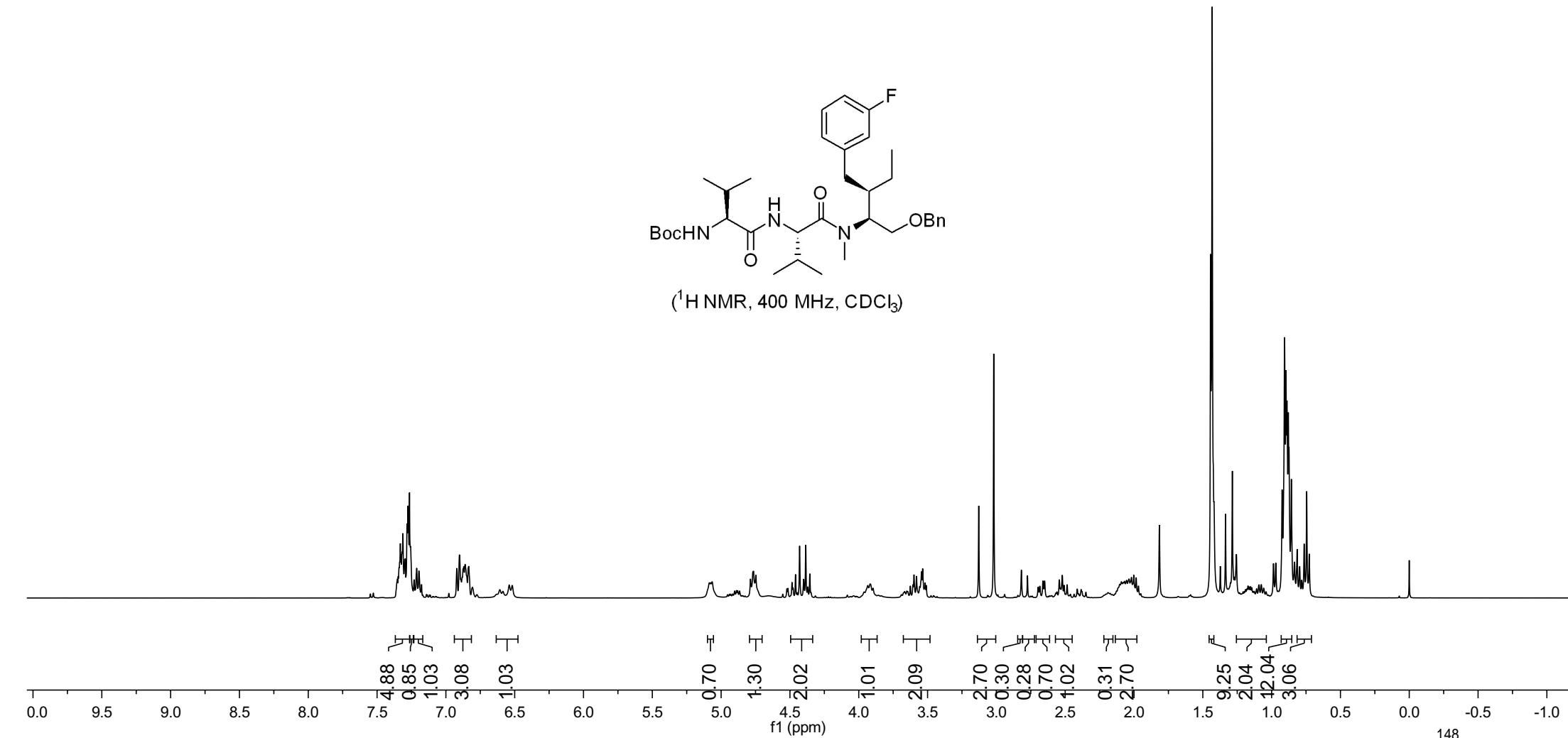


NMR spectra of compound 19c

7.331	7.327	7.317	7.313	7.299	7.295	7.282	7.276	7.264	7.256	7.250	7.196	6.901	6.870	6.860	6.834	6.608	6.540	6.518
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

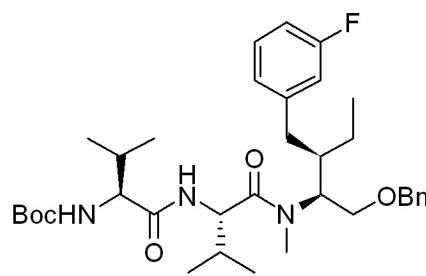


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

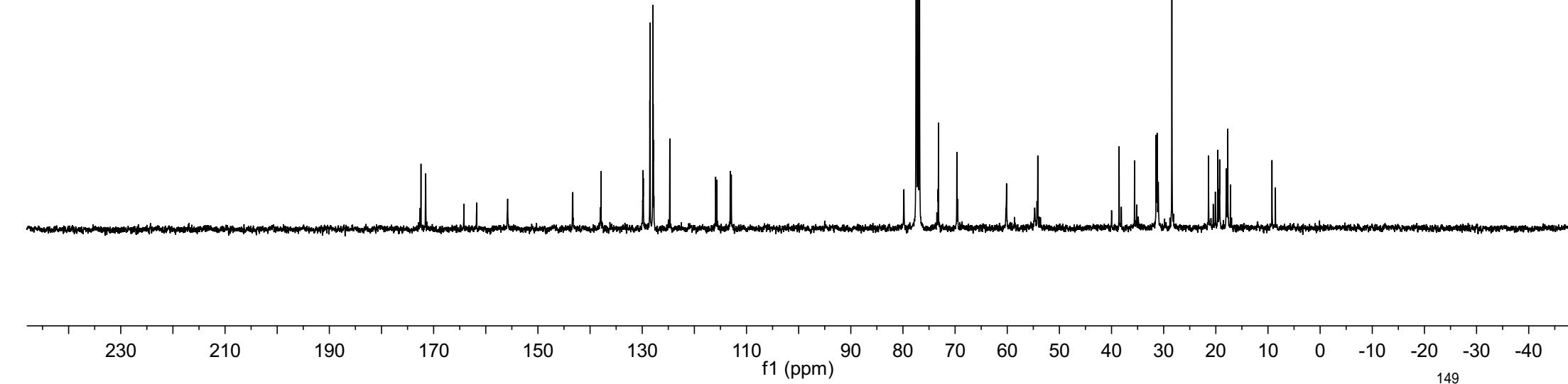


NMR spectra of compound 19c

172.586  
172.426  
171.516  
164.197  
161.758  
155.810  
129.863  
128.544  
128.498  
127.966  
127.898  
127.830  
124.703  
115.705  
113.120  
112.912  
~79.816  
~73.192  
~69.666  
-60.137  
-54.146  
-38.544  
-35.587  
-31.466  
-31.260  
-28.430  
-21.401  
-20.496  
-20.099  
-19.612  
-19.270  
-17.993  
-17.700  
-17.190  
-9.230  
-8.576



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



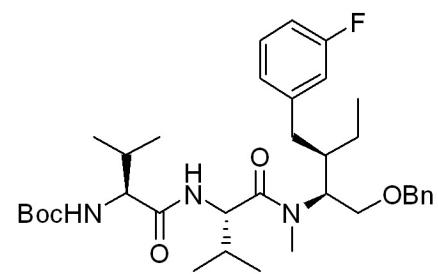
230 210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -20 -30 -40

f1 (ppm)

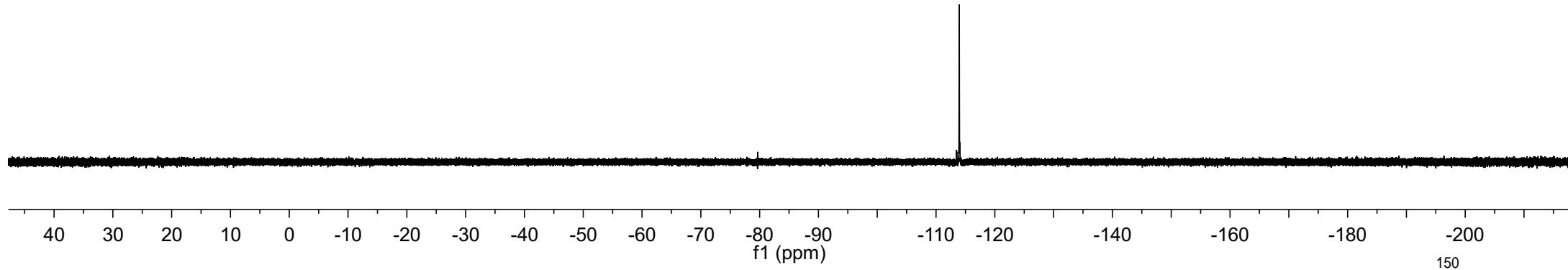
149

NMR spectra of compound 19c

-113.945



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ , rotamers)

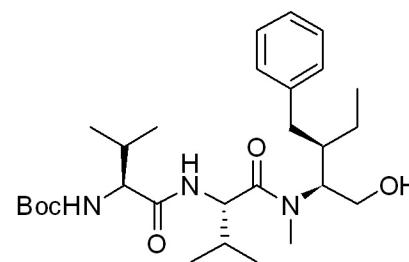


NMR spectra of compound 20a

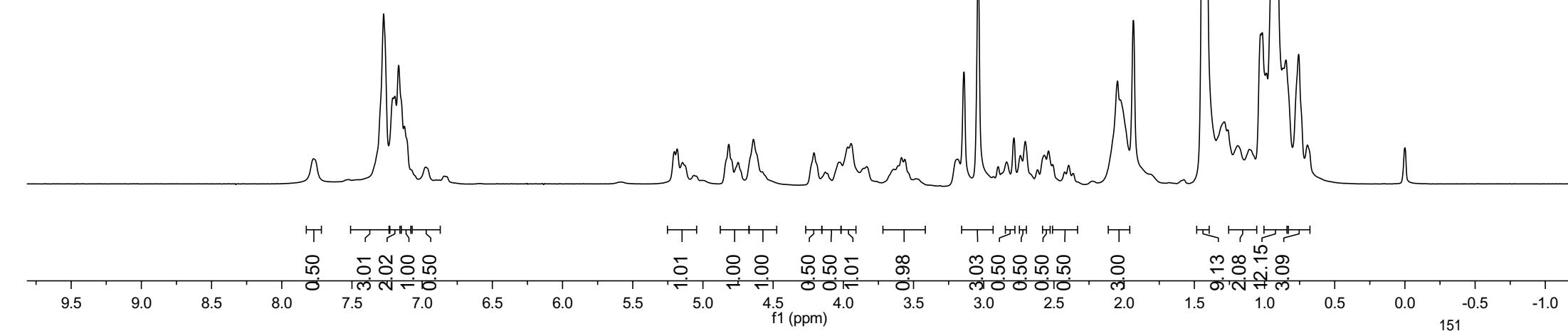
7.274  
7.208  
7.195  
7.167  
7.127

5.204  
5.184  
5.145  
4.816  
4.640  
4.209  
3.968  
3.945  
3.641  
3.586  
3.562  
3.141  
3.039  
2.785  
2.704  
2.569  
2.538  
-2.047

1.418  
1.192  
1.108  
1.028  
1.016  
0.927  
0.847  
0.757



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



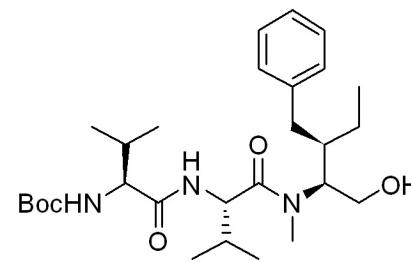
NMR spectra of compound 20a

173.968  
173.647  
172.226  
171.827

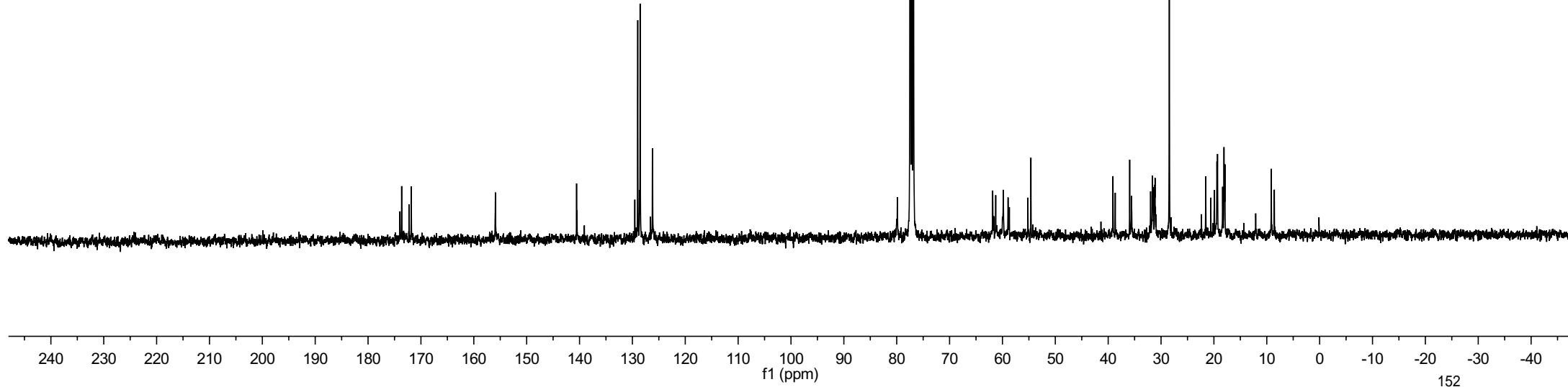
140.559  
140.475  
129.540  
128.985  
128.660  
128.545  
126.215

-79.878  
61.845  
61.274  
59.839  
58.940  
58.696  
55.189  
54.614

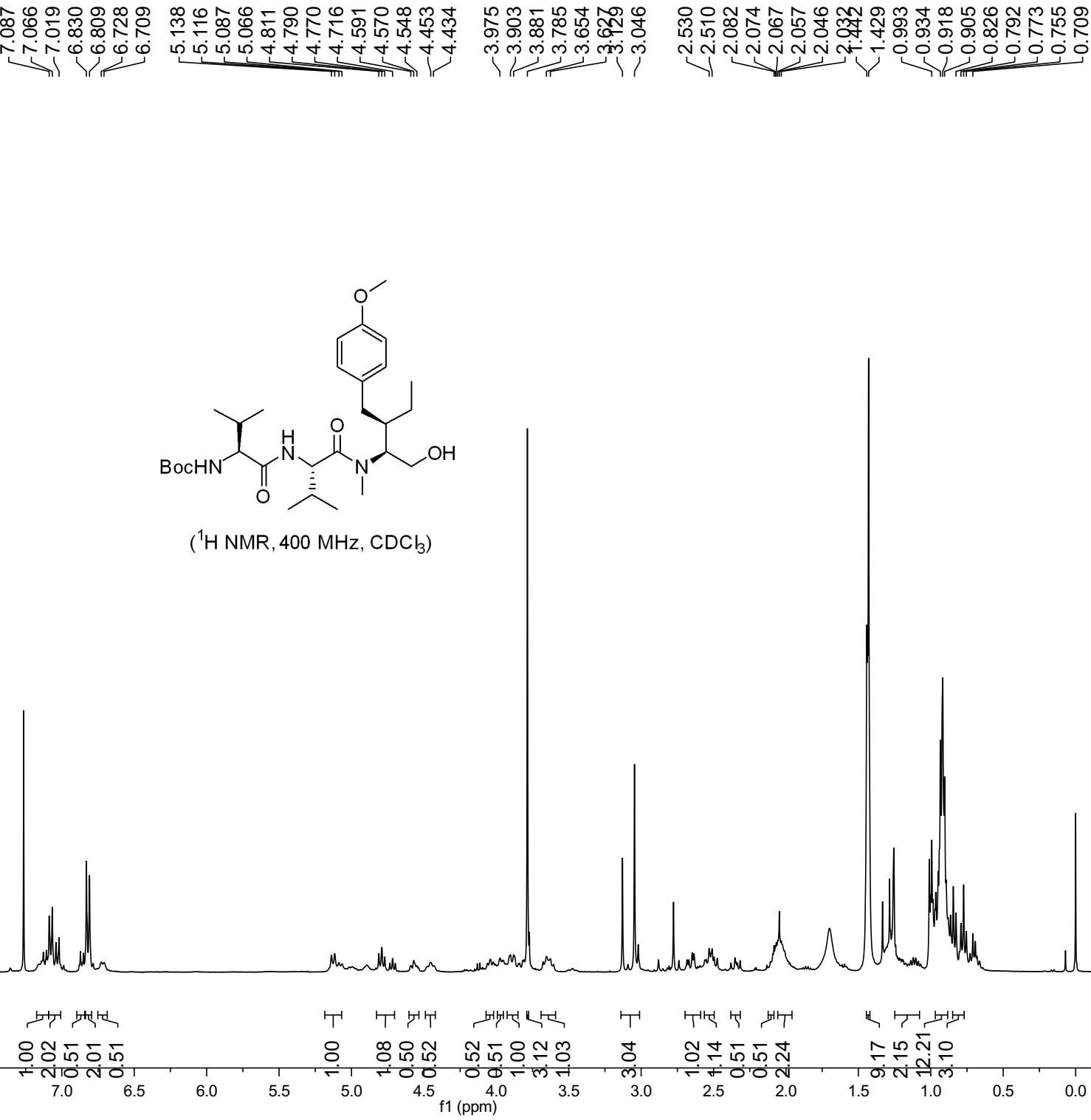
39.095  
35.930  
31.627  
28.434  
19.430  
19.318  
18.090  
17.935  
8.572



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ , rotamers)



NMR spectra of compound 20b

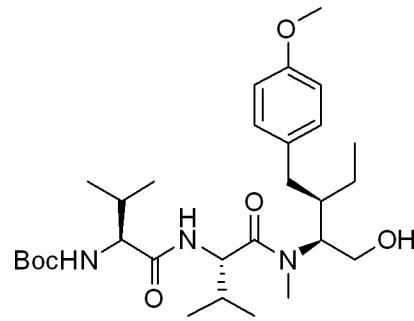


NMR spectra of compound 20b

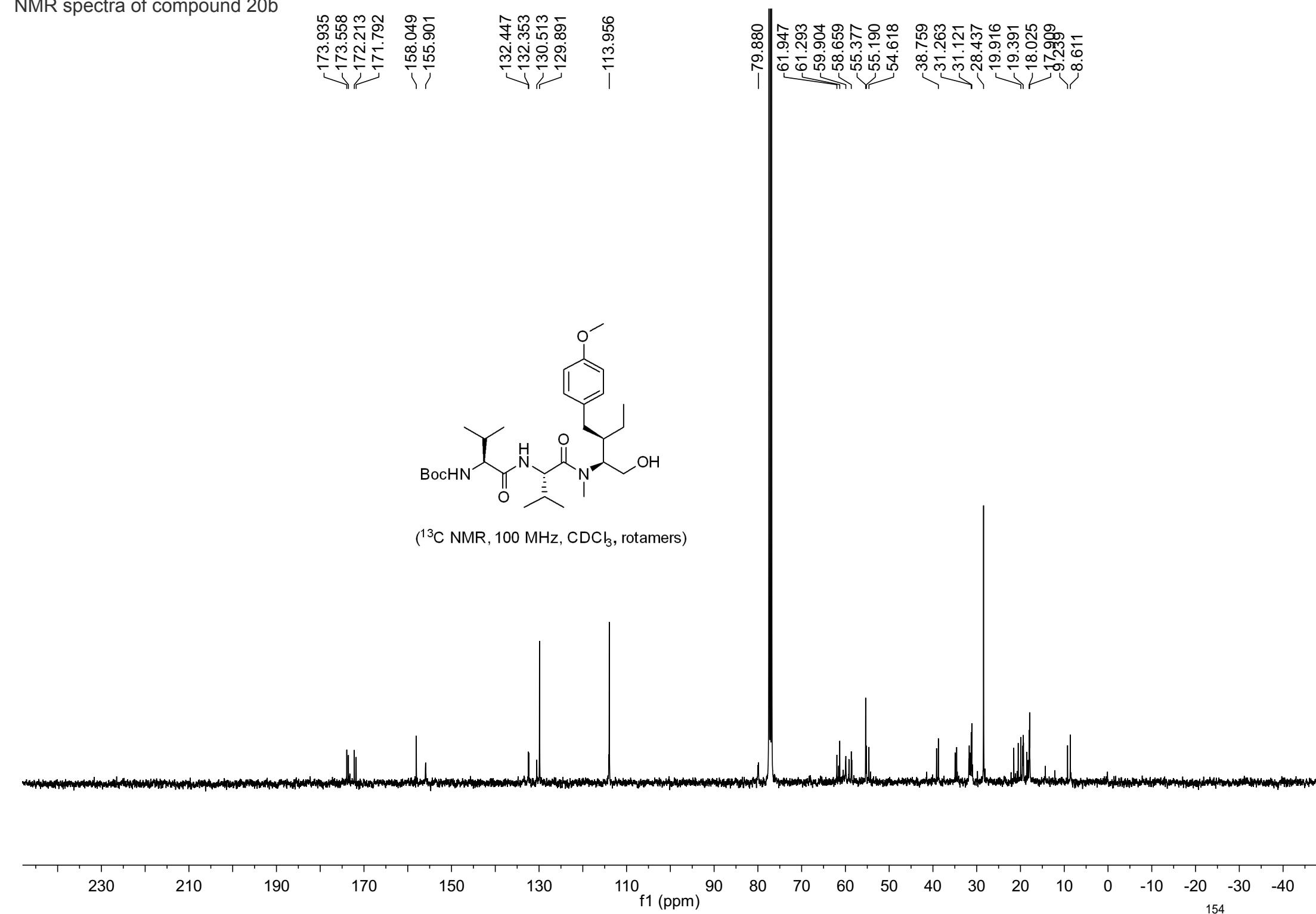
173.935  
173.558  
172.213  
171.792  
158.049  
155.901

132.447  
132.353  
130.513  
129.891

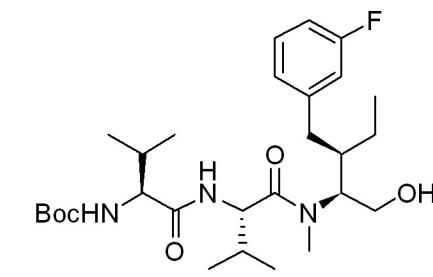
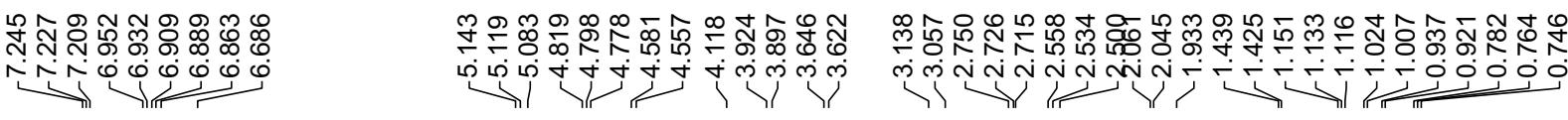
113.956



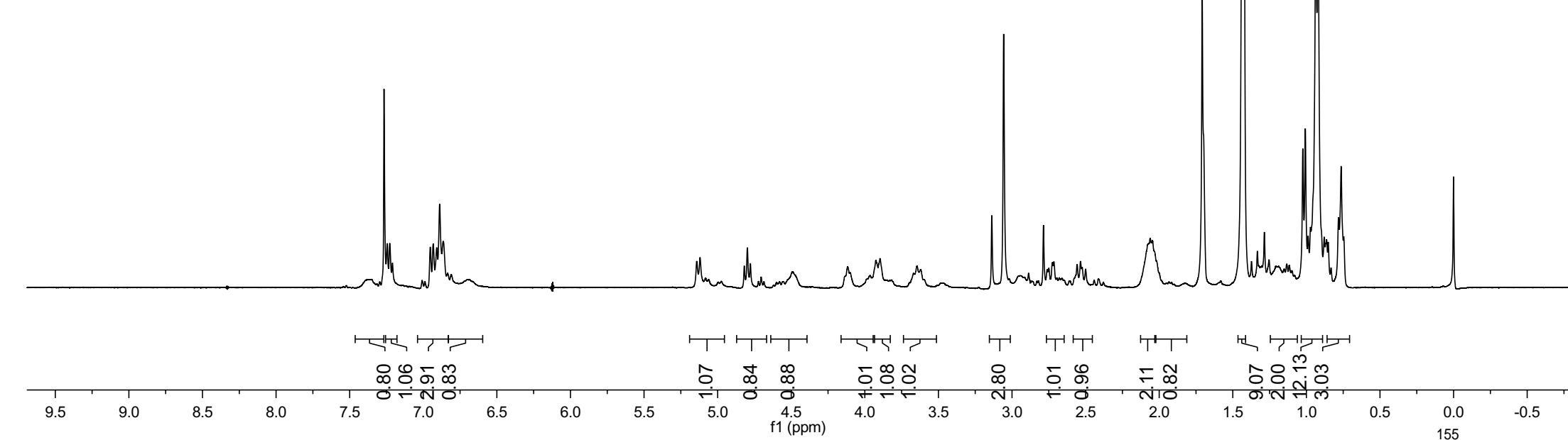
(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>, rotamers)



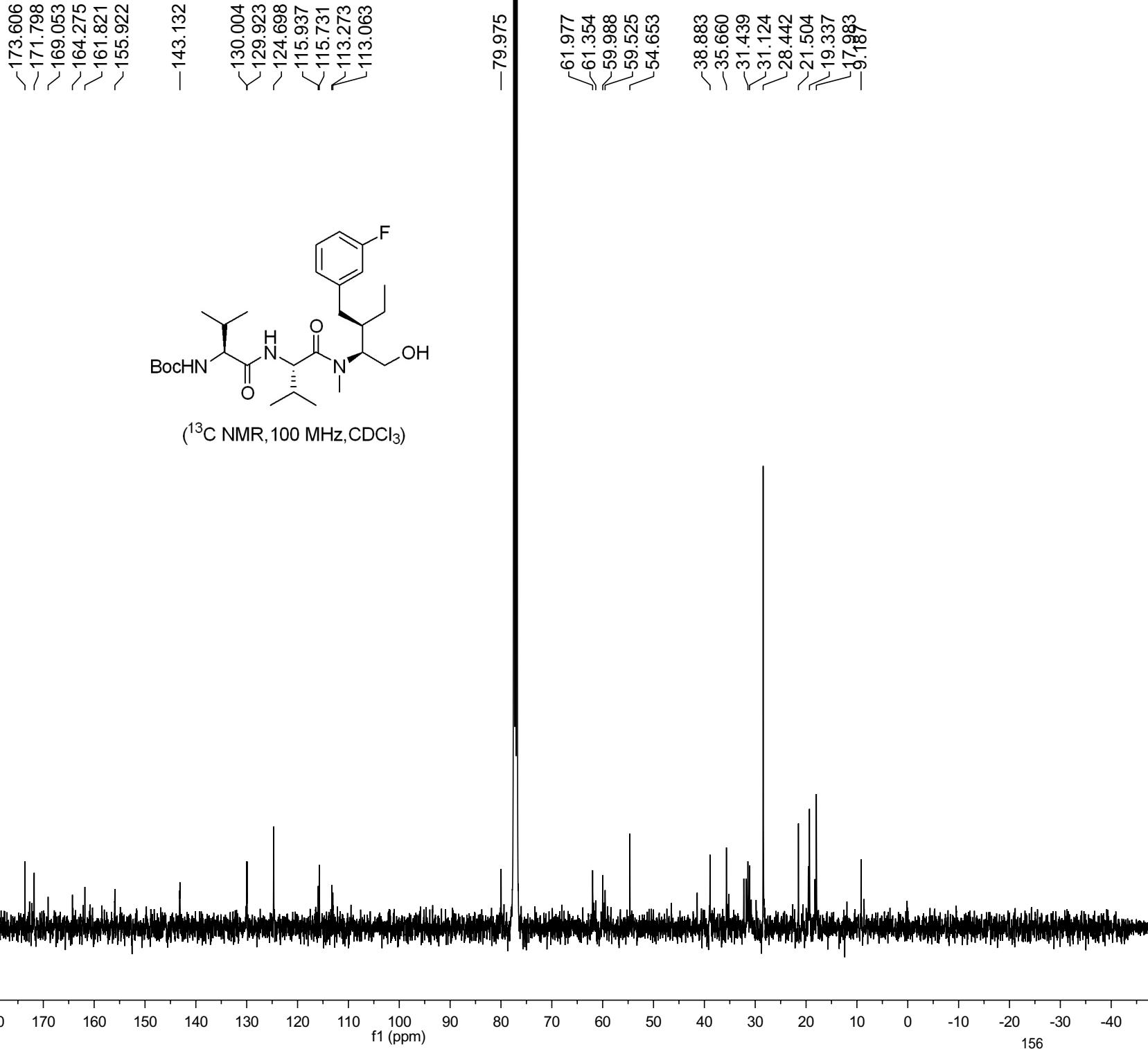
NMR spectra of compound 20c



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)

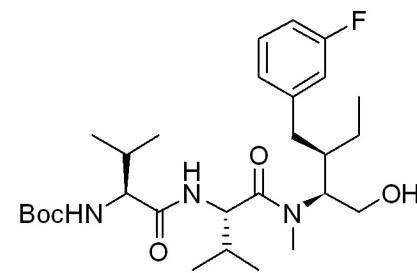


NMR spectra of compound 20c

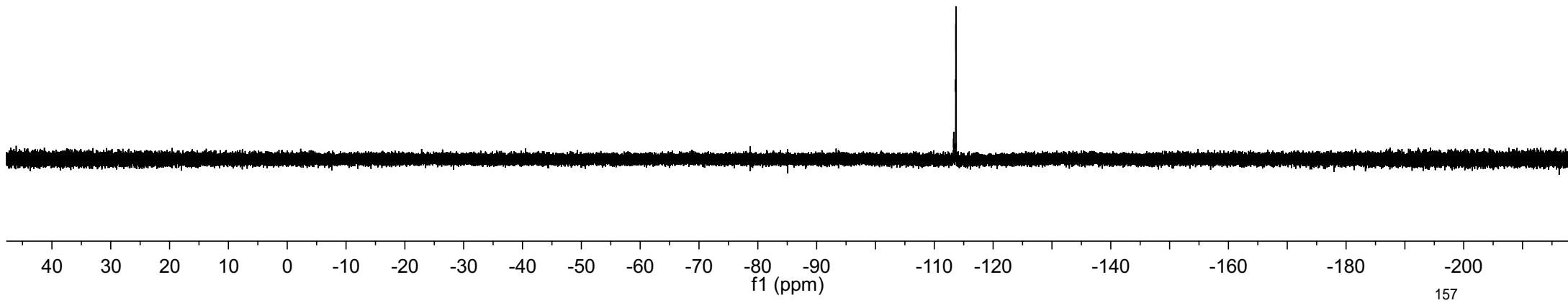


NMR spectra of compound 20c

— -113.675



(<sup>19</sup>F NMR, 376 MHz, CDCl<sub>3</sub>, rotamers)



40 30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200

*f*<sub>1</sub> (ppm)

157

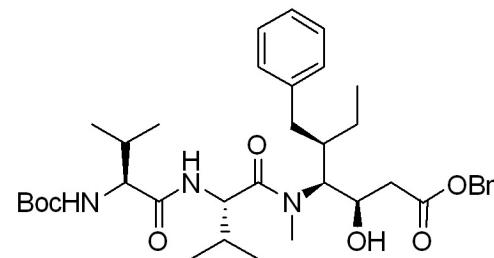
NMR spectra of compound 21a

7.364  
7.351  
7.344  
7.264  
7.254  
7.236  
7.184  
7.166  
6.757  
6.737

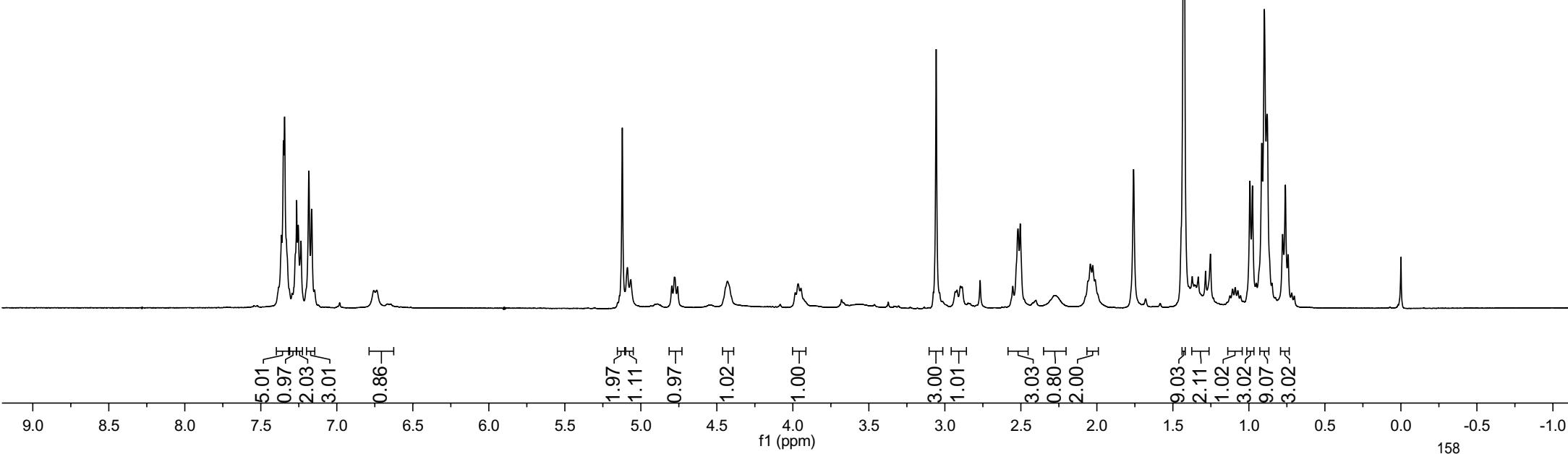
5.122  
5.088  
5.067  
4.796  
4.779  
4.758  
4.430

3.057  
2.920  
2.898  
2.887  
2.519  
2.504  
2.280  
2.043  
2.027  
2.011

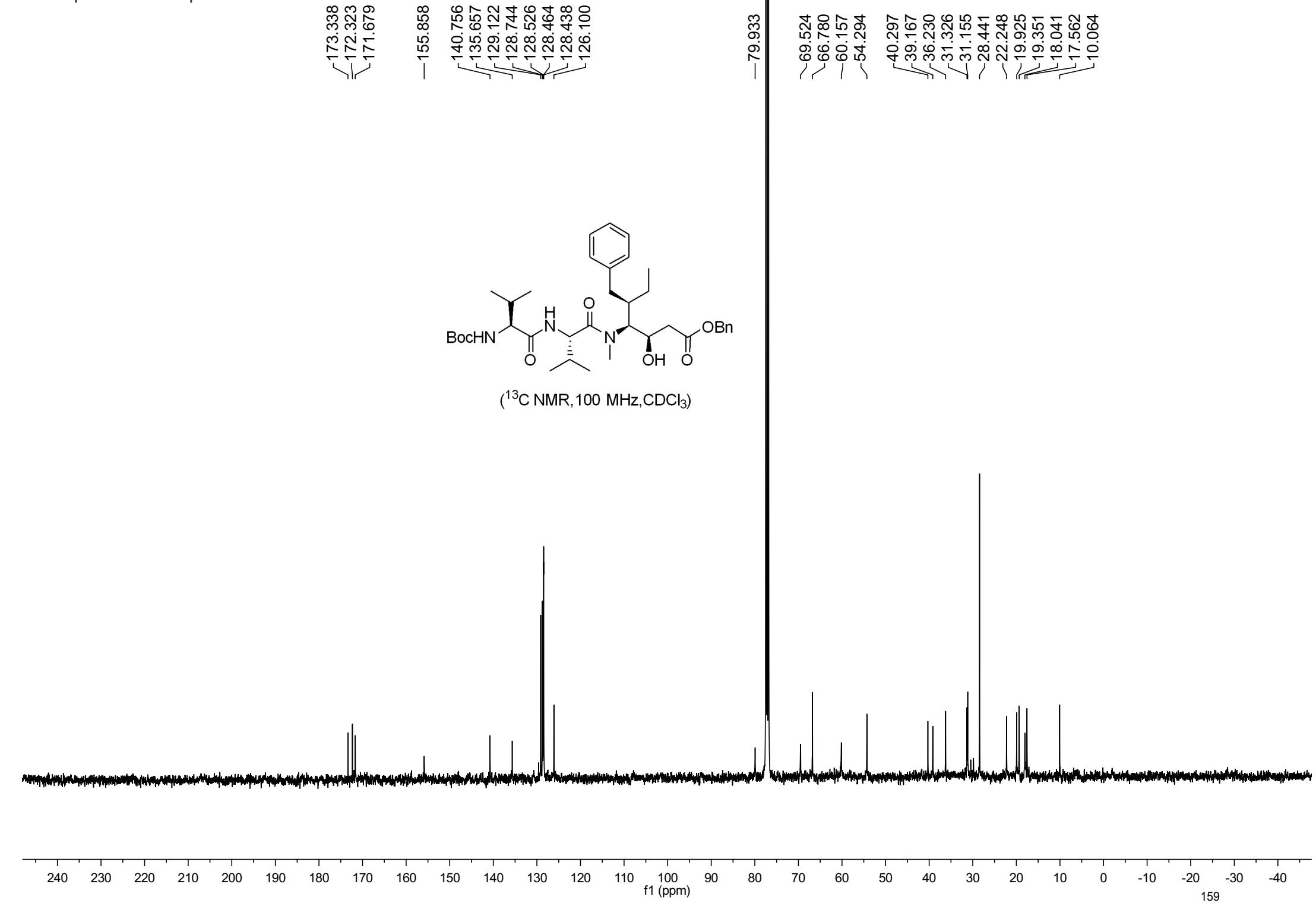
1.427  
1.125  
1.107  
1.090  
1.073  
0.993  
0.976  
0.915  
0.898  
0.880  
0.778  
0.760  
0.742



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 21a



NMR spectra of compound 21b

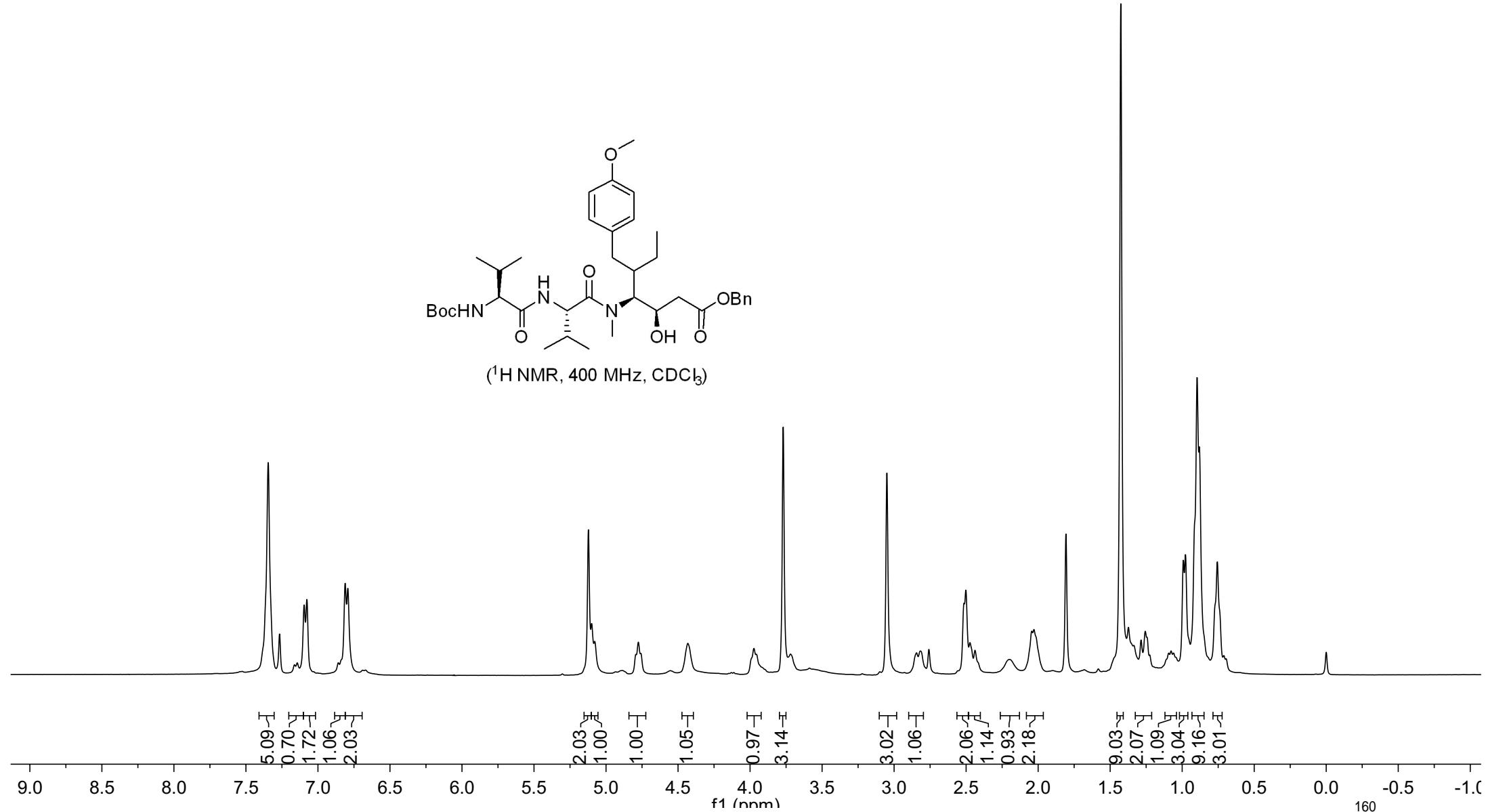
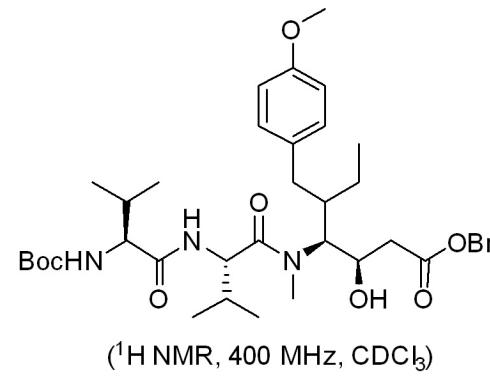
-7.345  
-7.096  
-7.077  
-6.811  
-6.793

<5.122  
<5.100  
<4.793  
<4.776  
<4.758

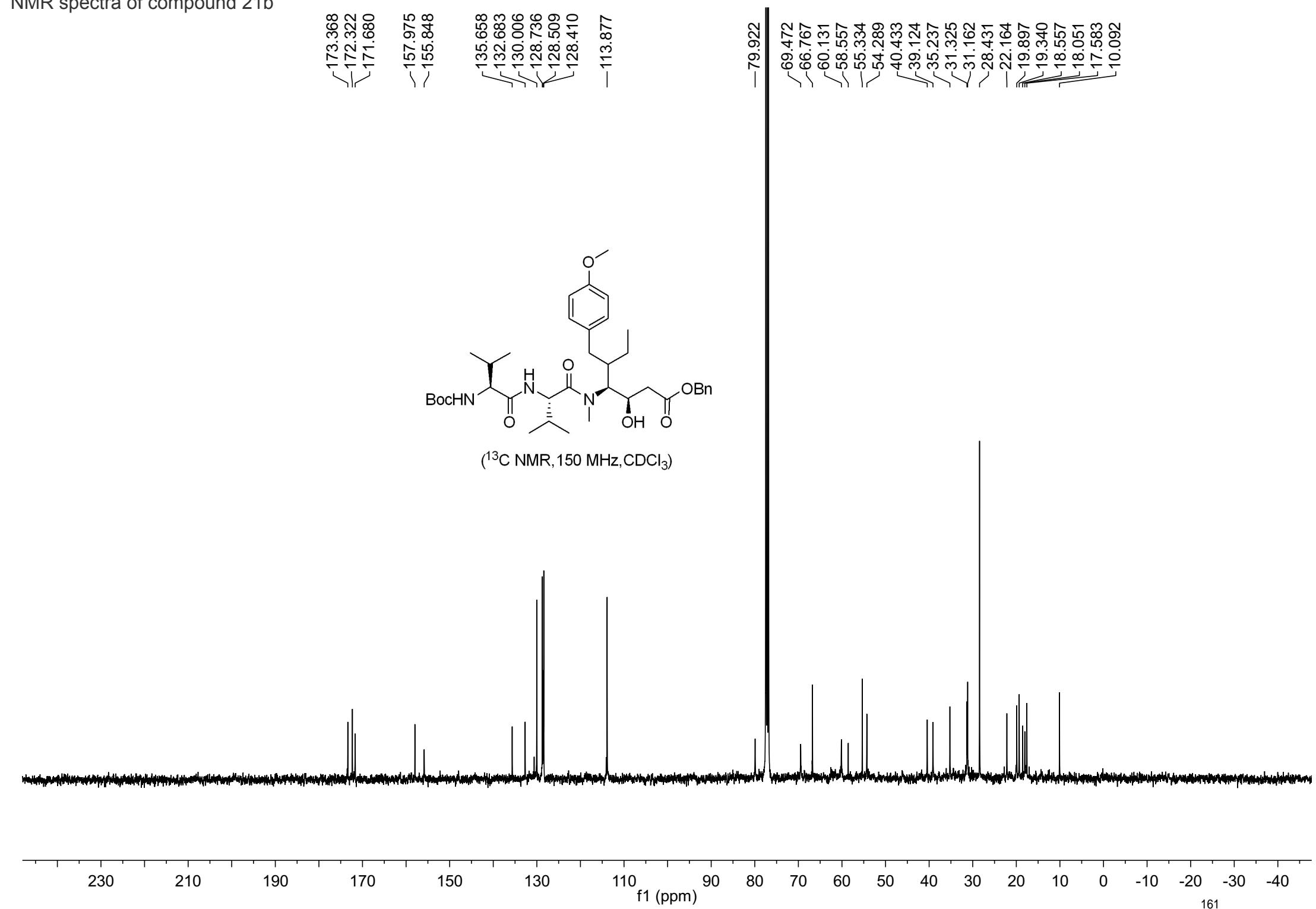
-4.432

3.973  
3.956  
3.770  
3.719

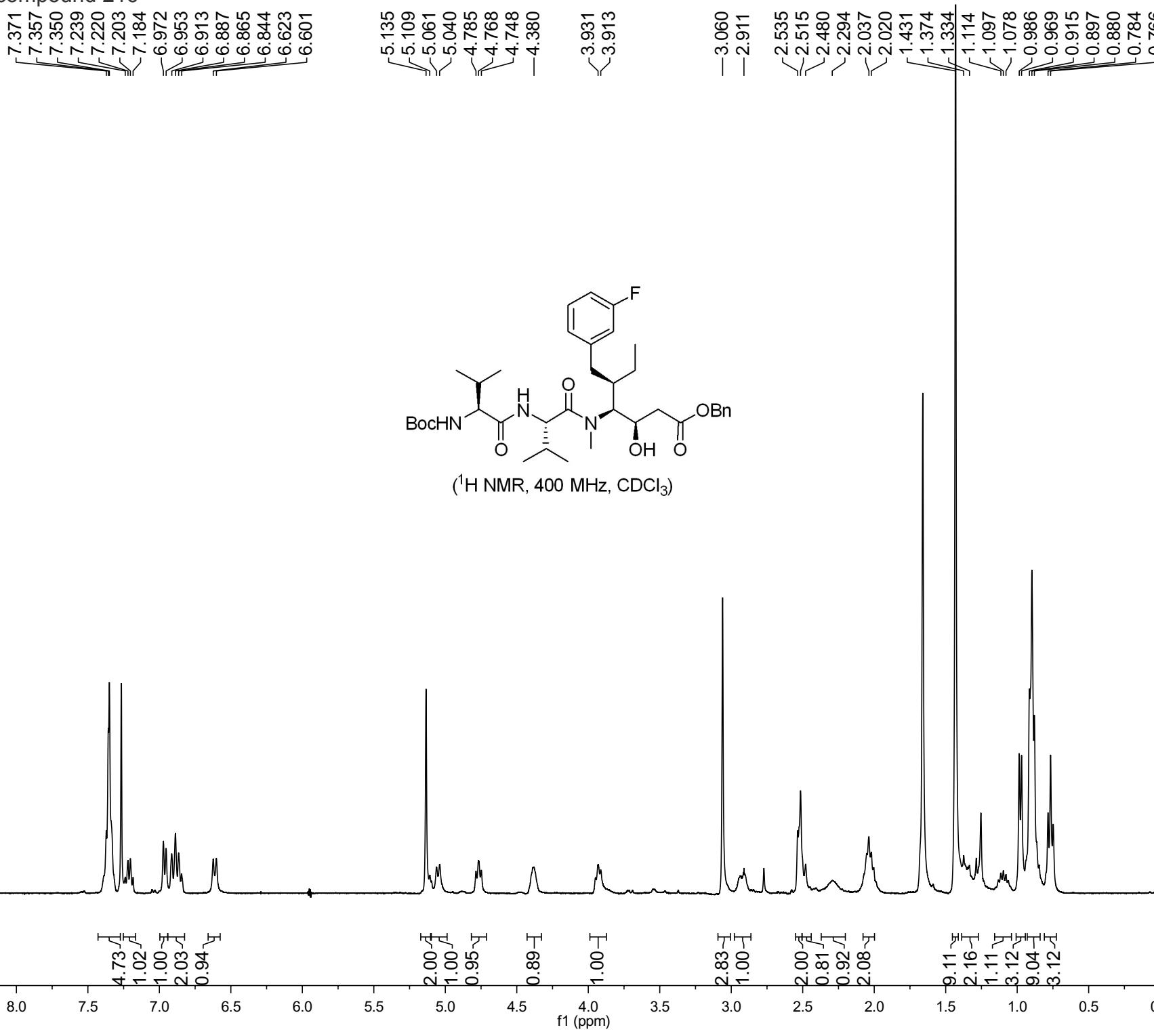
3.050  
2.844  
2.818  
2.758  
2.515  
2.502  
2.473  
2.438  
2.197  
2.044  
2.029  
1.426  
1.285  
1.256  
1.094  
1.077  
1.060  
0.992  
0.977  
0.896  
0.881  
0.756



NMR spectra of compound 21b



NMR spectra of compound 21c

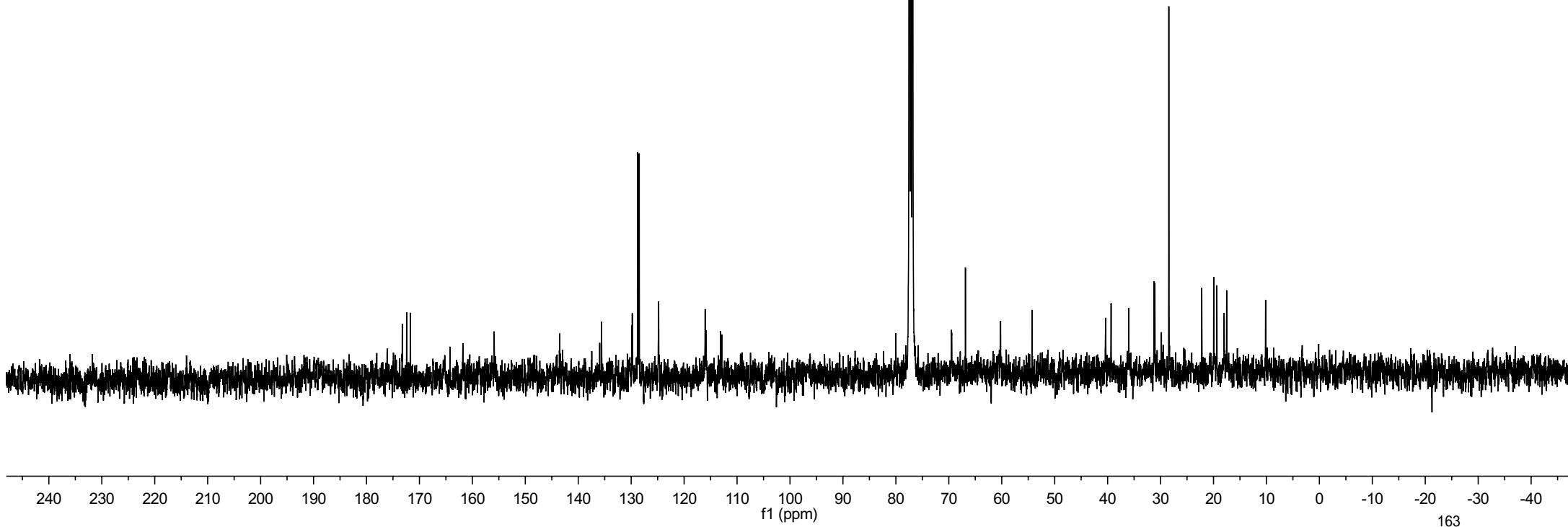
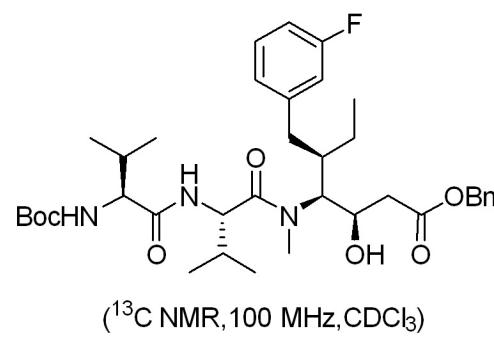


NMR spectra of compound 21c

173.238  
172.410  
171.702  
164.230  
161.793  
155.881

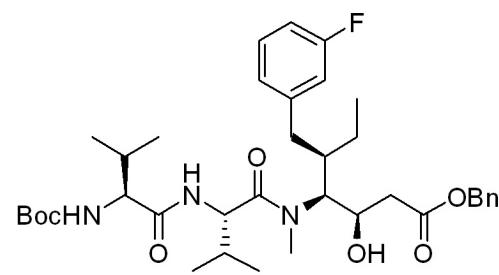
135.589  
129.877  
129.794  
128.778  
128.591  
128.480  
124.828  
115.822  
113.102  
112.894

-80.008

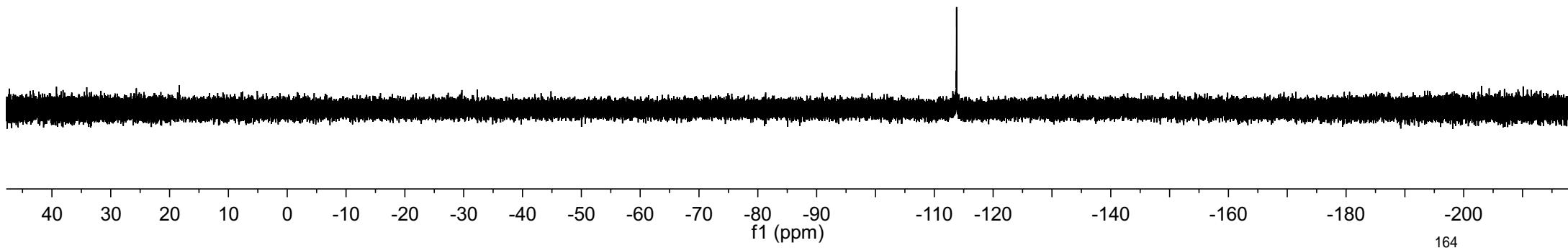


NMR spectra of compound 21c

— -113.781



( $^{19}\text{F}$  NMR, 376 MHz,  $\text{CDCl}_3$ )

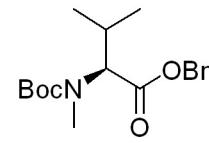
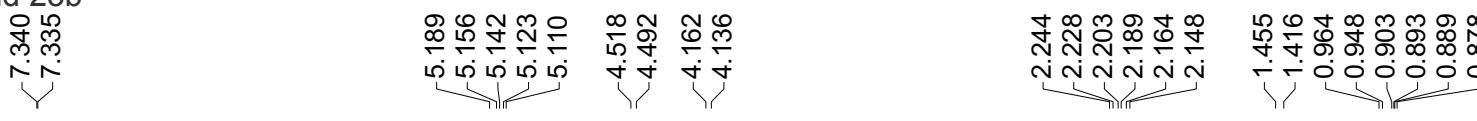


40 30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200

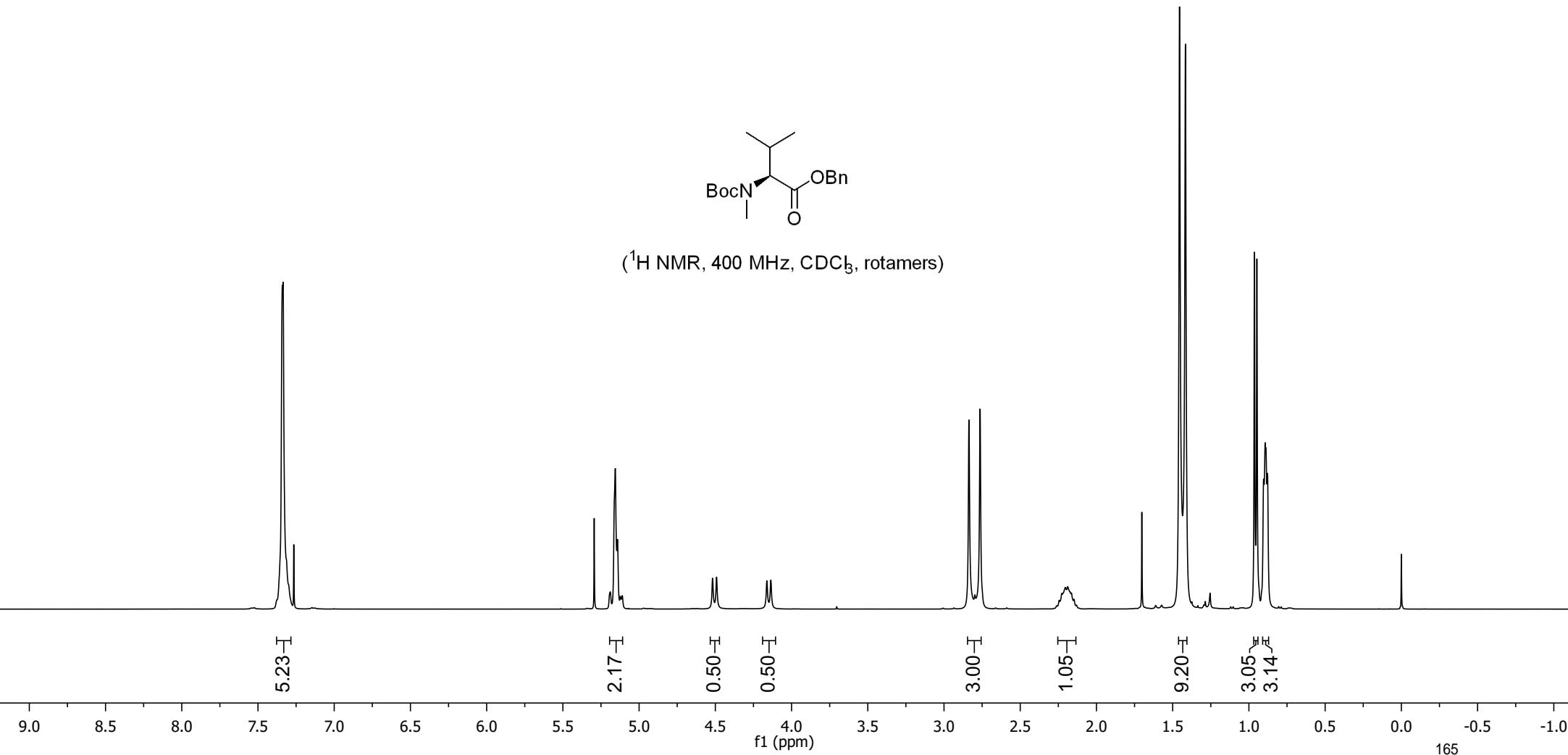
f1 (ppm)

164

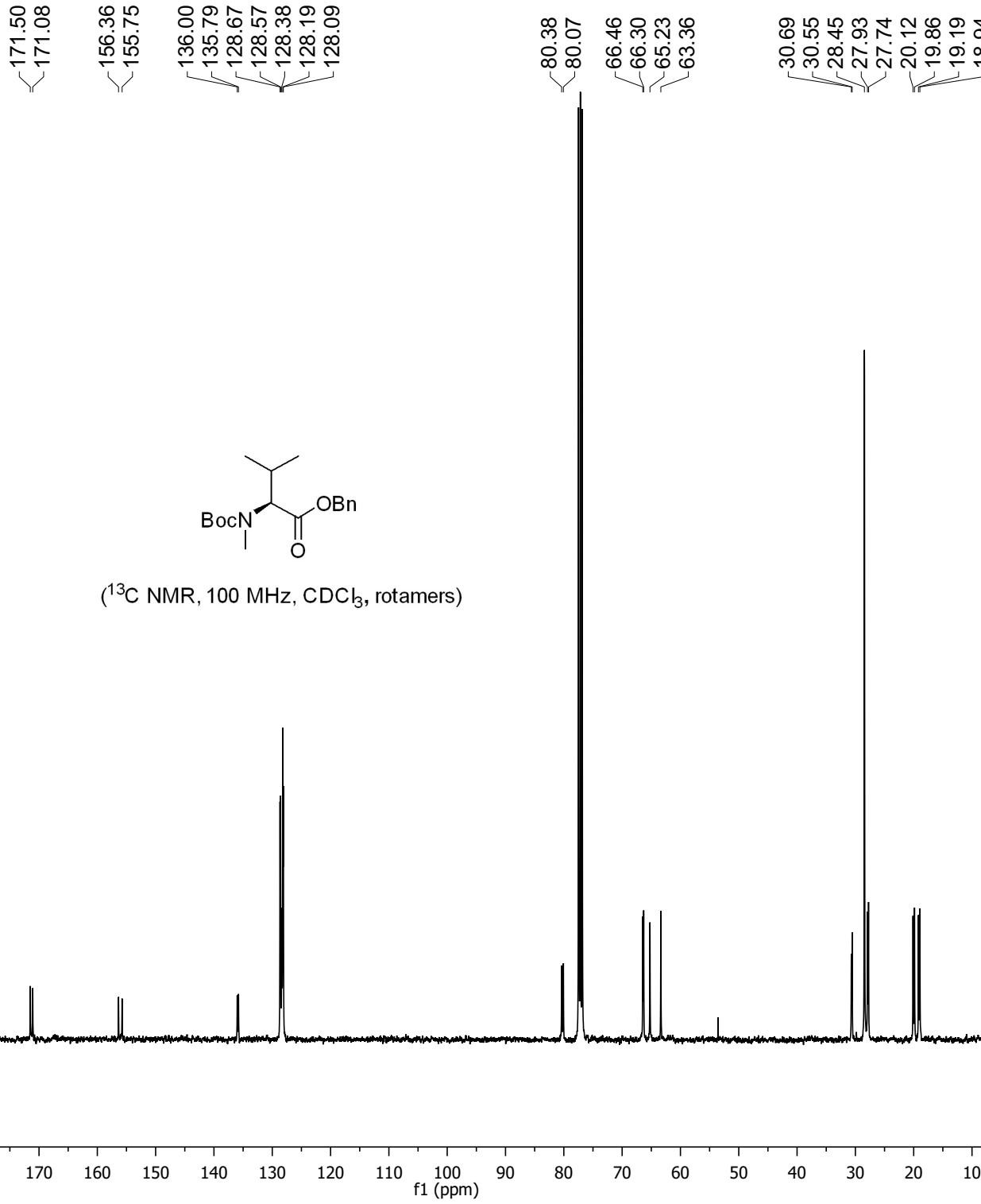
NMR spectra of compound 23b



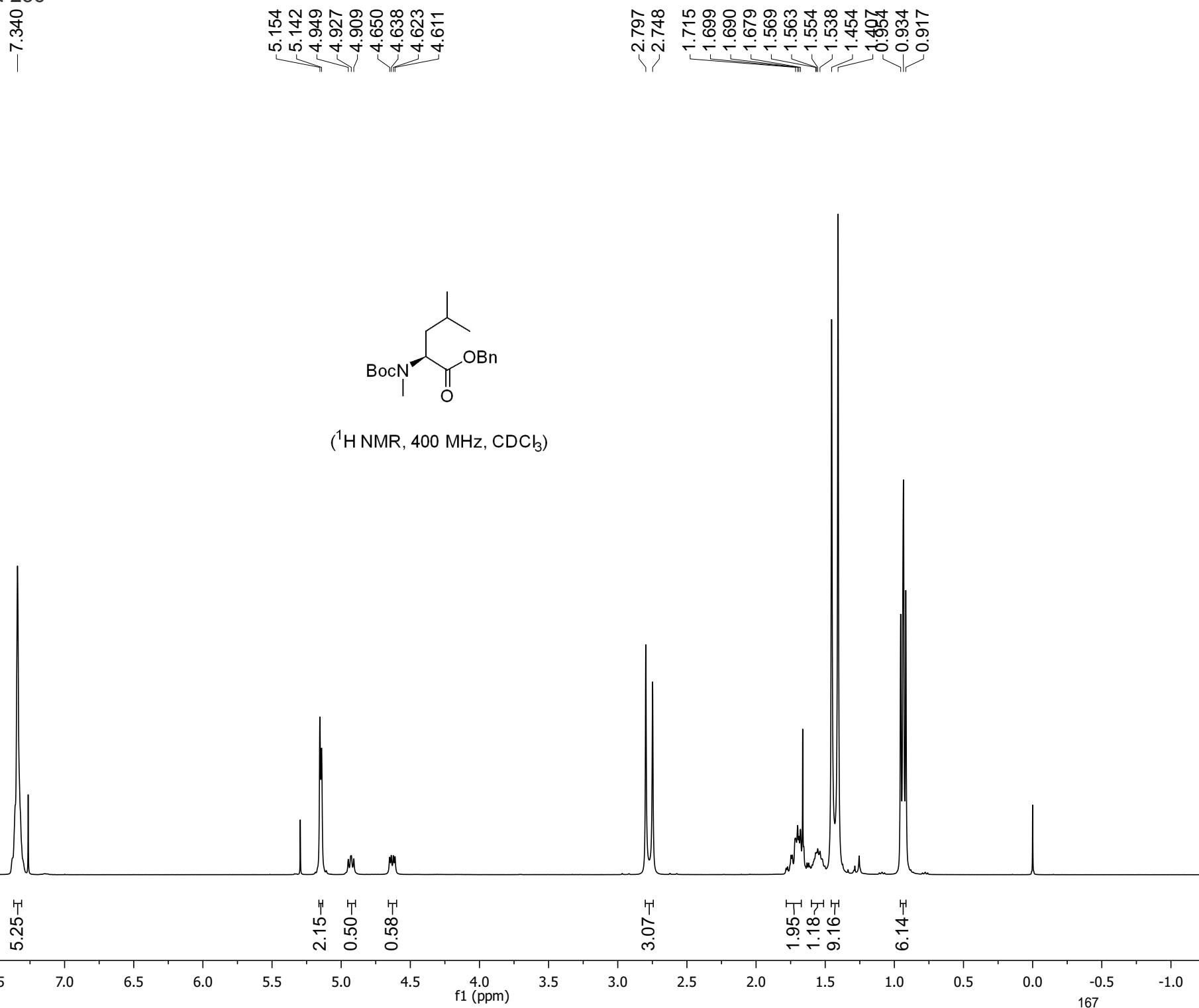
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ , rotamers)



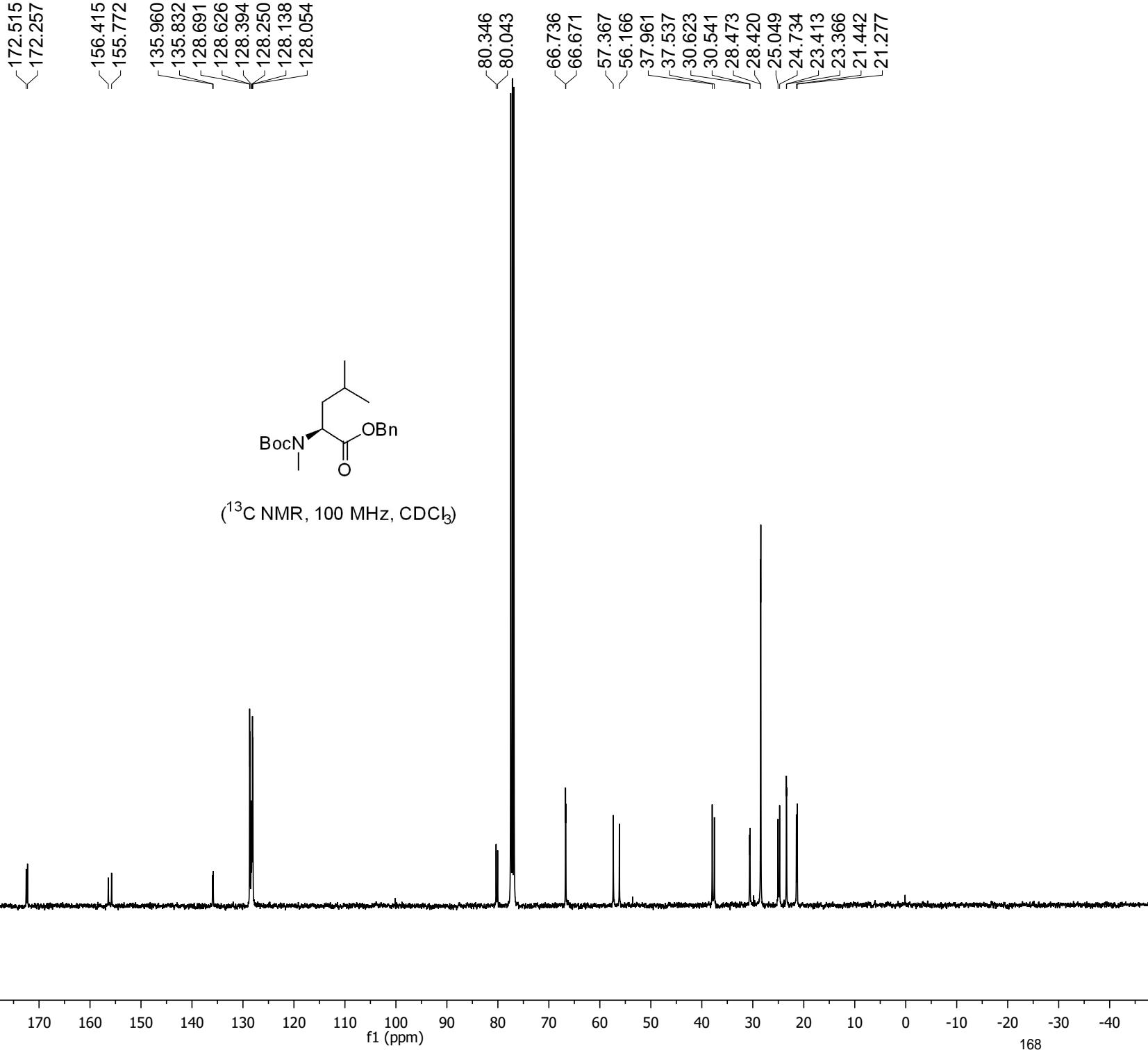
NMR spectra of compound 23b



NMR spectra of compound 23c



NMR spectra of compound 23c

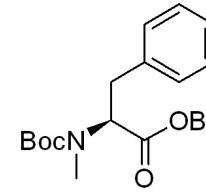


NMR spectra of compound 23d

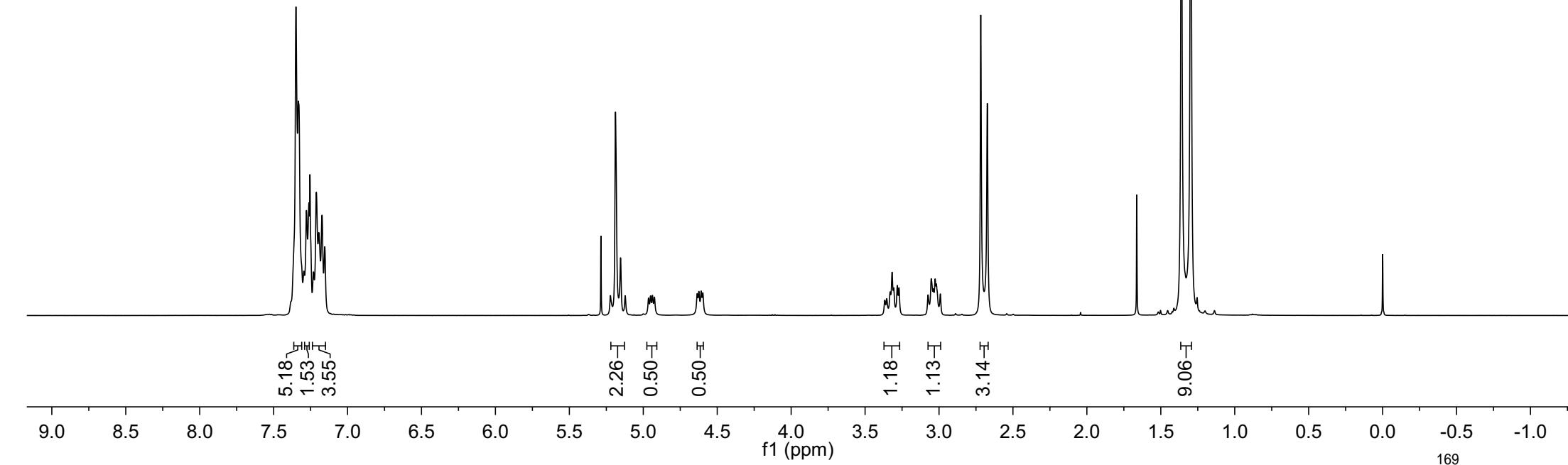
7.349  
7.333  
7.296  
7.278  
7.261  
7.254  
7.230  
7.211  
7.194  
7.173  
7.154

5.222  
5.188  
5.154  
5.122  
4.964  
4.951  
4.938  
4.925  
4.635  
4.624  
4.608  
4.597  
3.367  
3.354  
3.330  
3.317  
3.307  
3.282  
3.271  
3.074  
3.053  
3.039  
3.026  
3.018  
2.991  
2.718  
2.673

1.361  
1.297



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



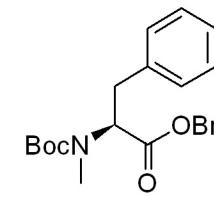
NMR spectra of compound 23d

171.39  
171.10  
155.90  
155.10  
137.68  
137.48  
135.82  
135.59  
129.11  
129.06  
128.73  
128.66  
128.49  
128.29  
128.18  
126.78  
126.62

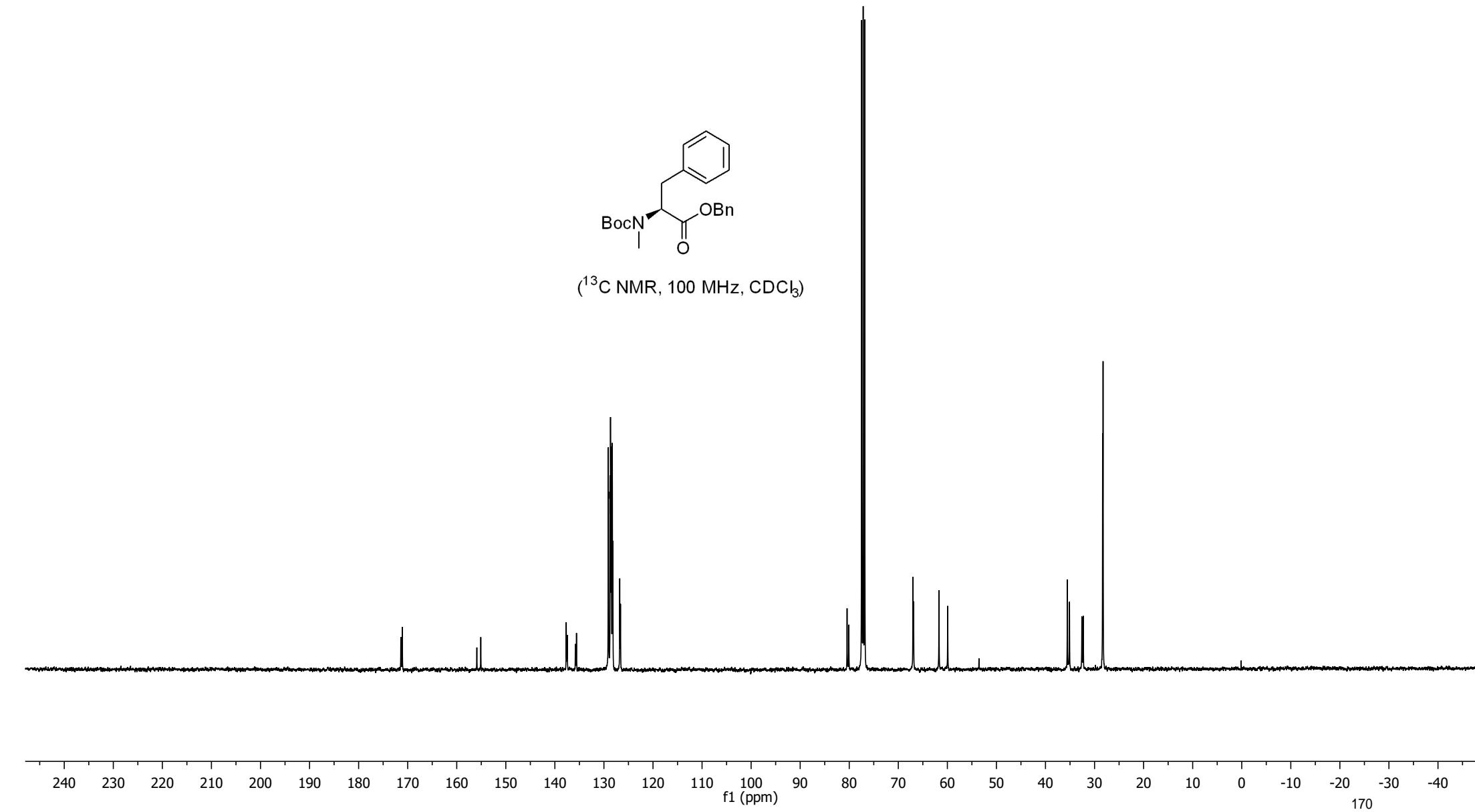
80.44  
80.09

67.02  
66.88  
61.71  
59.93

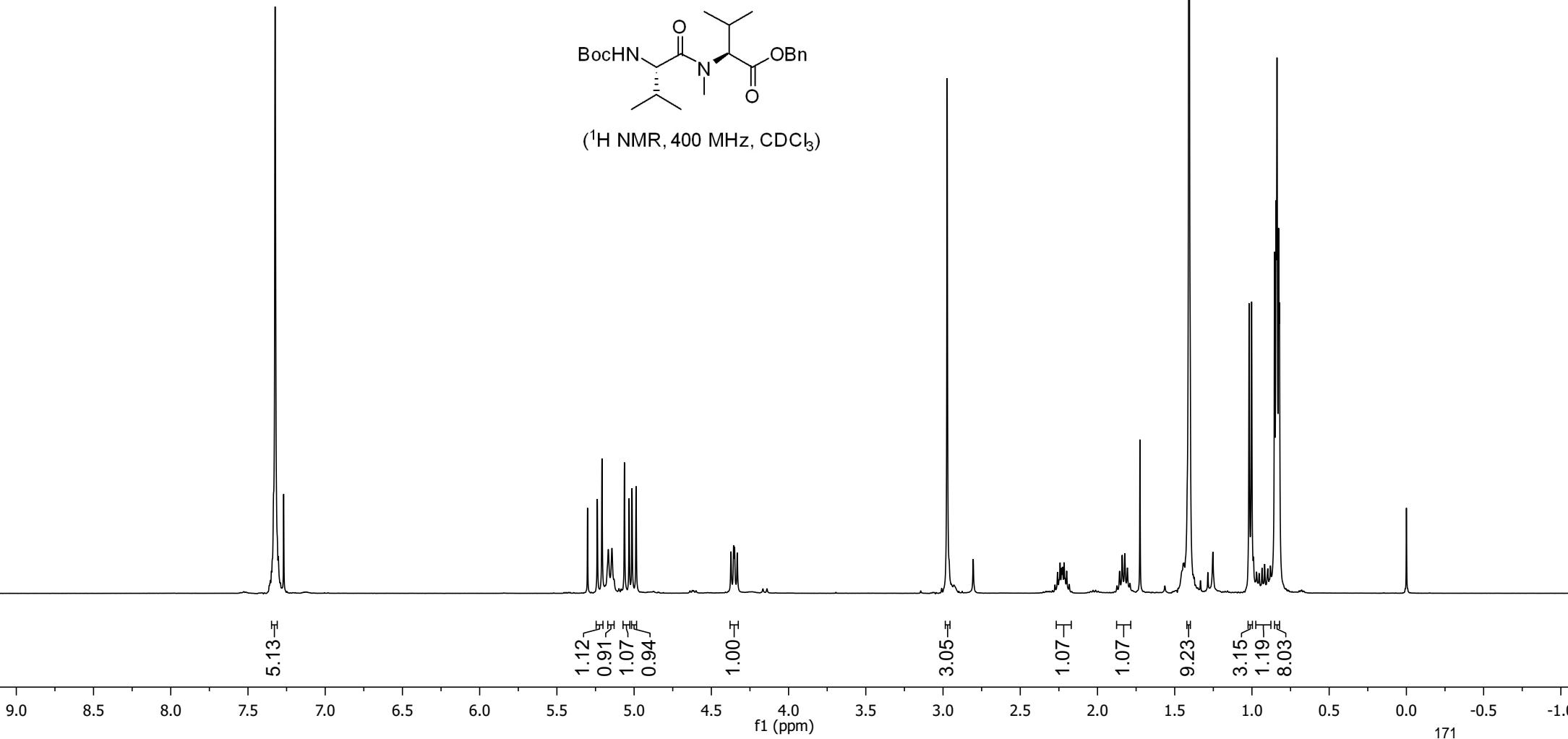
35.55  
35.11  
32.58  
32.30  
28.35  
28.26



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 24b



NMR spectra of compound 24b

—173.626  
—170.753

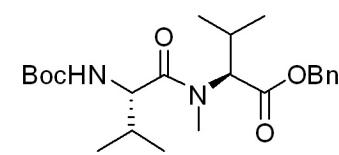
—156.107

135.560  
128.719  
128.644  
128.552

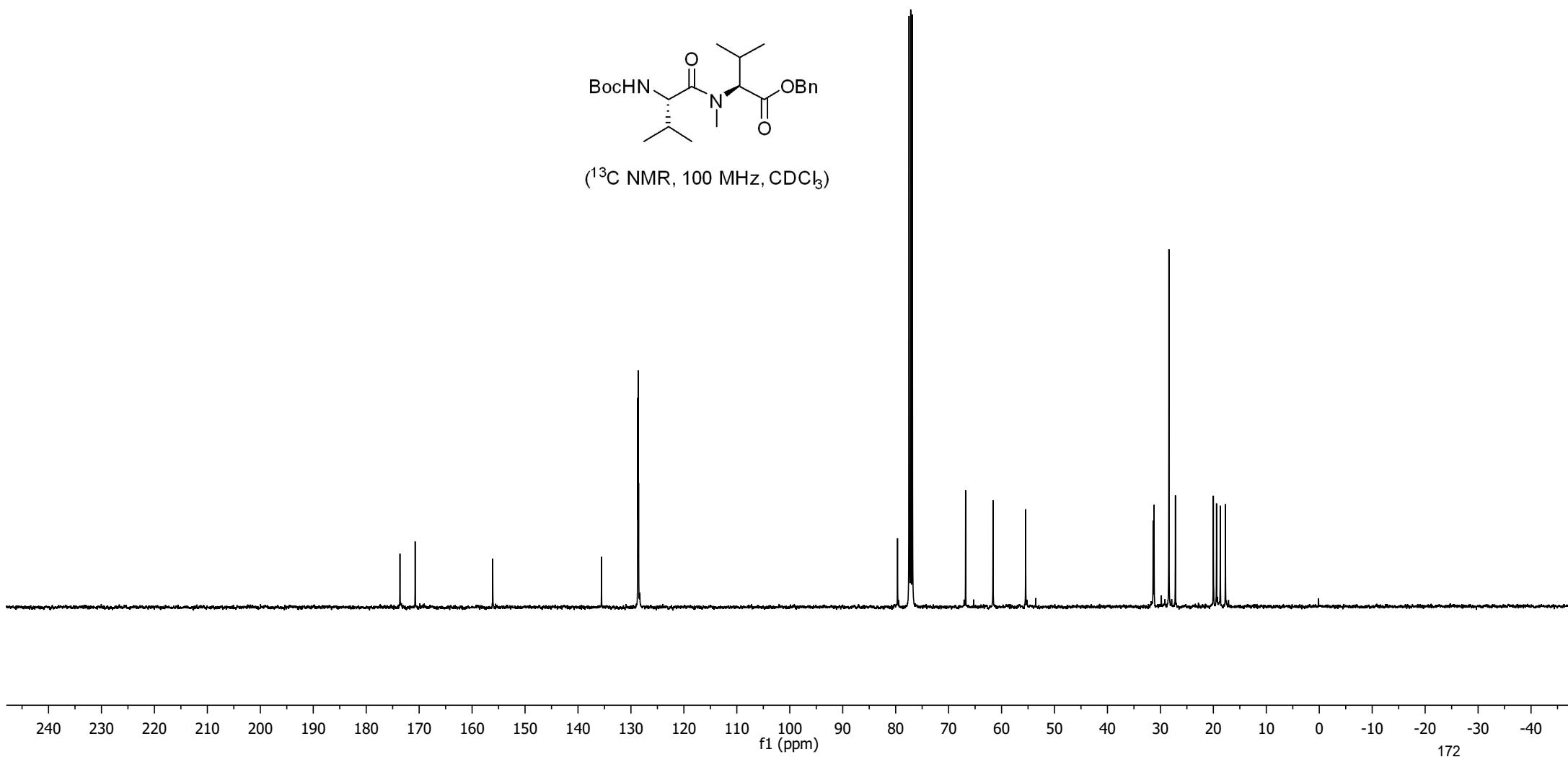
—79.649

—66.795  
—61.618  
—55.456

31.380  
31.198  
28.395  
27.170  
20.000  
19.405  
18.685  
17.723



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

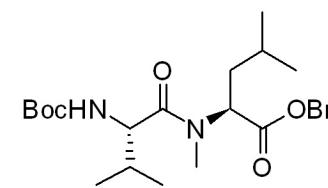


NMR spectra of compound 24c

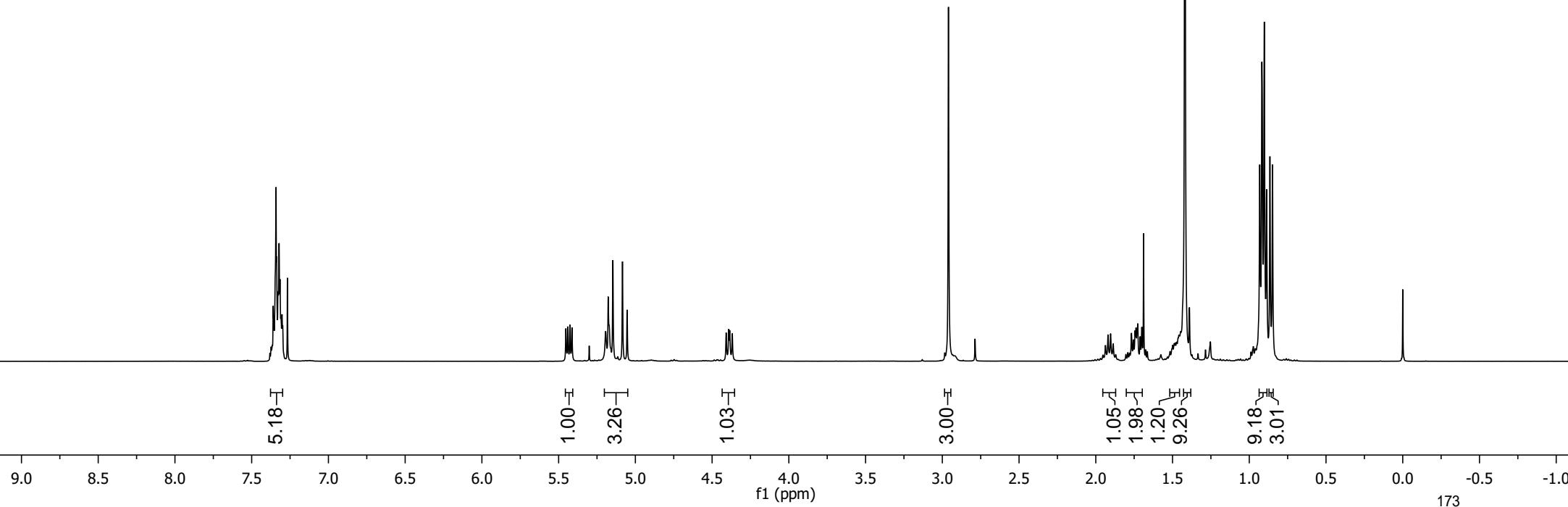
7.381  
7.373  
7.360  
7.342  
7.337  
7.329  
7.322  
7.315  
7.309  
7.302  
7.298

5.453  
5.440  
5.426  
5.413  
5.194  
5.177  
5.147  
5.084  
5.054  
4.408  
4.392  
4.385  
4.369

-2.960  
1.920  
1.903  
1.768  
1.744  
1.738  
1.731  
1.727  
1.700  
1.689  
1.419  
1.399  
0.932  
0.918  
0.902  
0.887  
0.865  
0.849

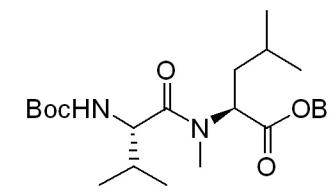


( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

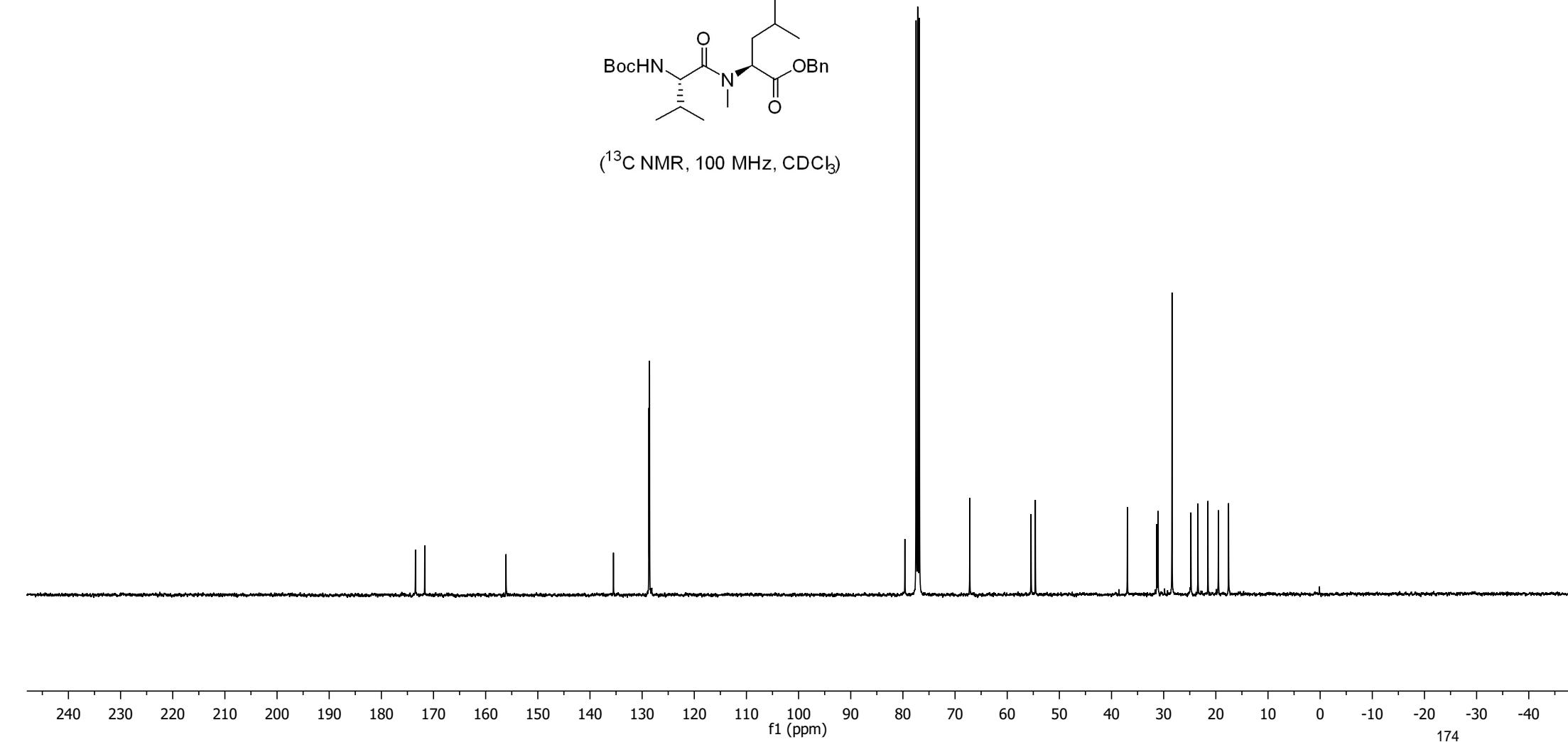


NMR spectra of compound 24c

— 173.464  
— 171.682  
— 156.102  
— 135.496  
— 128.700  
— 128.583  
— 79.621  
— 67.178  
— 55.425  
— 54.606  
— 36.959  
— 31.310  
— 31.085  
— 28.399  
— 24.773  
— 23.431  
— 21.513  
— 19.509  
— 17.560



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



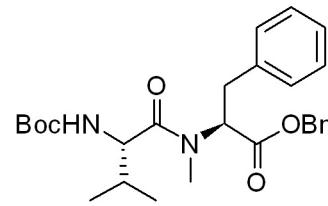
NMR spectra of compound 24d

7.349  
7.332  
7.321  
7.302  
7.296  
7.283  
7.250  
7.233  
7.199  
7.188  
7.169

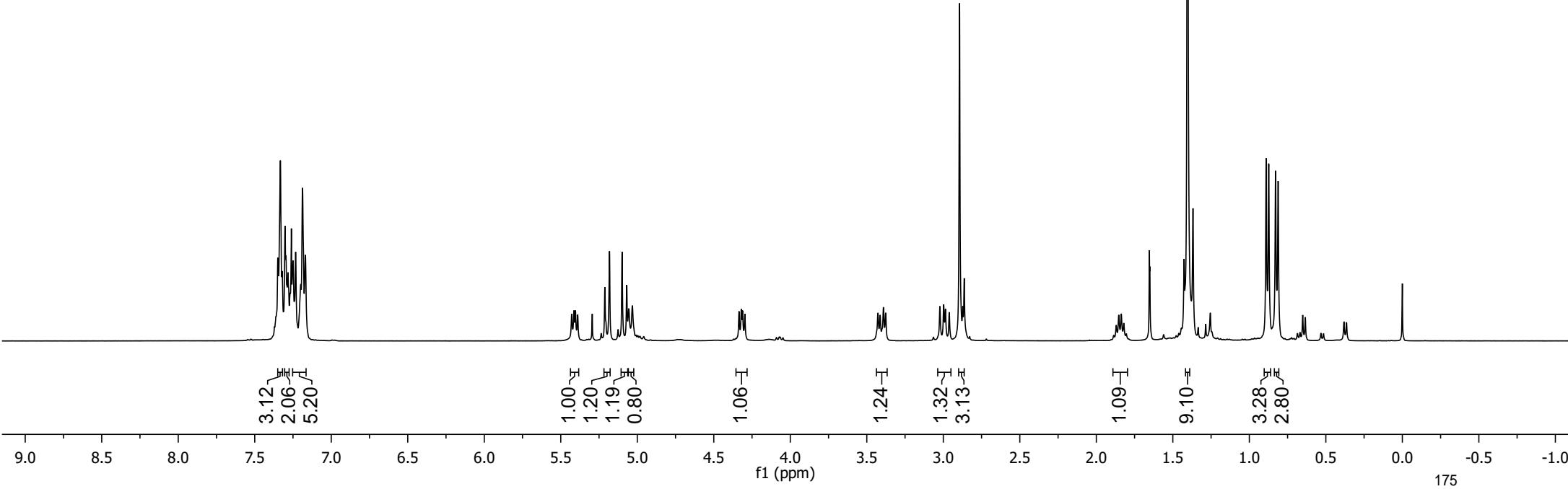
5.428  
5.414  
5.404  
5.389  
5.212  
5.181  
5.099  
5.069  
5.055  
5.032  
4.335  
4.320  
4.312  
4.297

3.427  
3.413  
3.391  
3.377

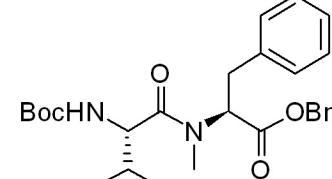
3.022  
2.997  
2.986  
2.894  
2.873  
2.863  
2.860  
1.853  
1.837  
1.820  
1.426  
1.404  
1.368  
0.890  
0.873  
0.828  
0.812



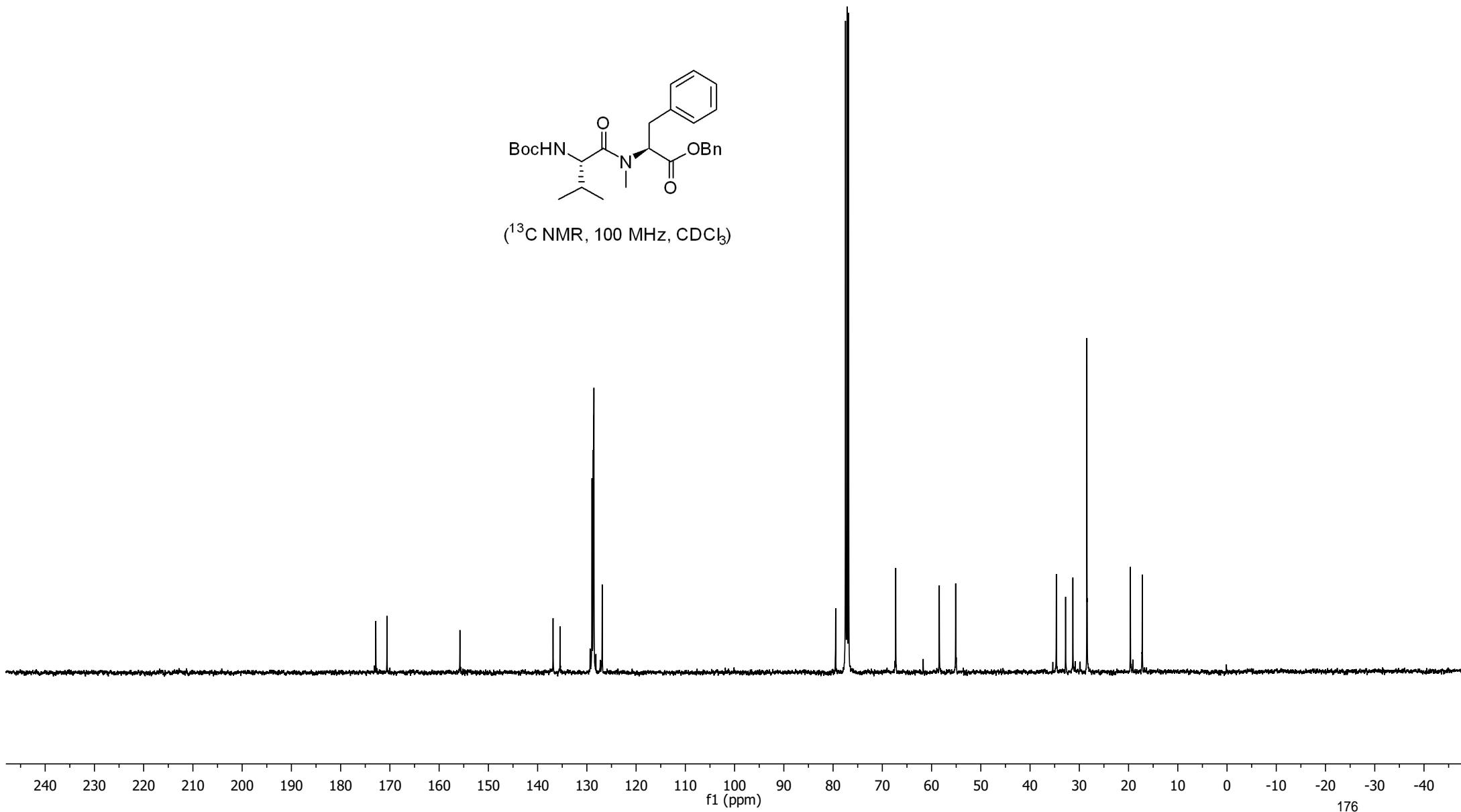
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



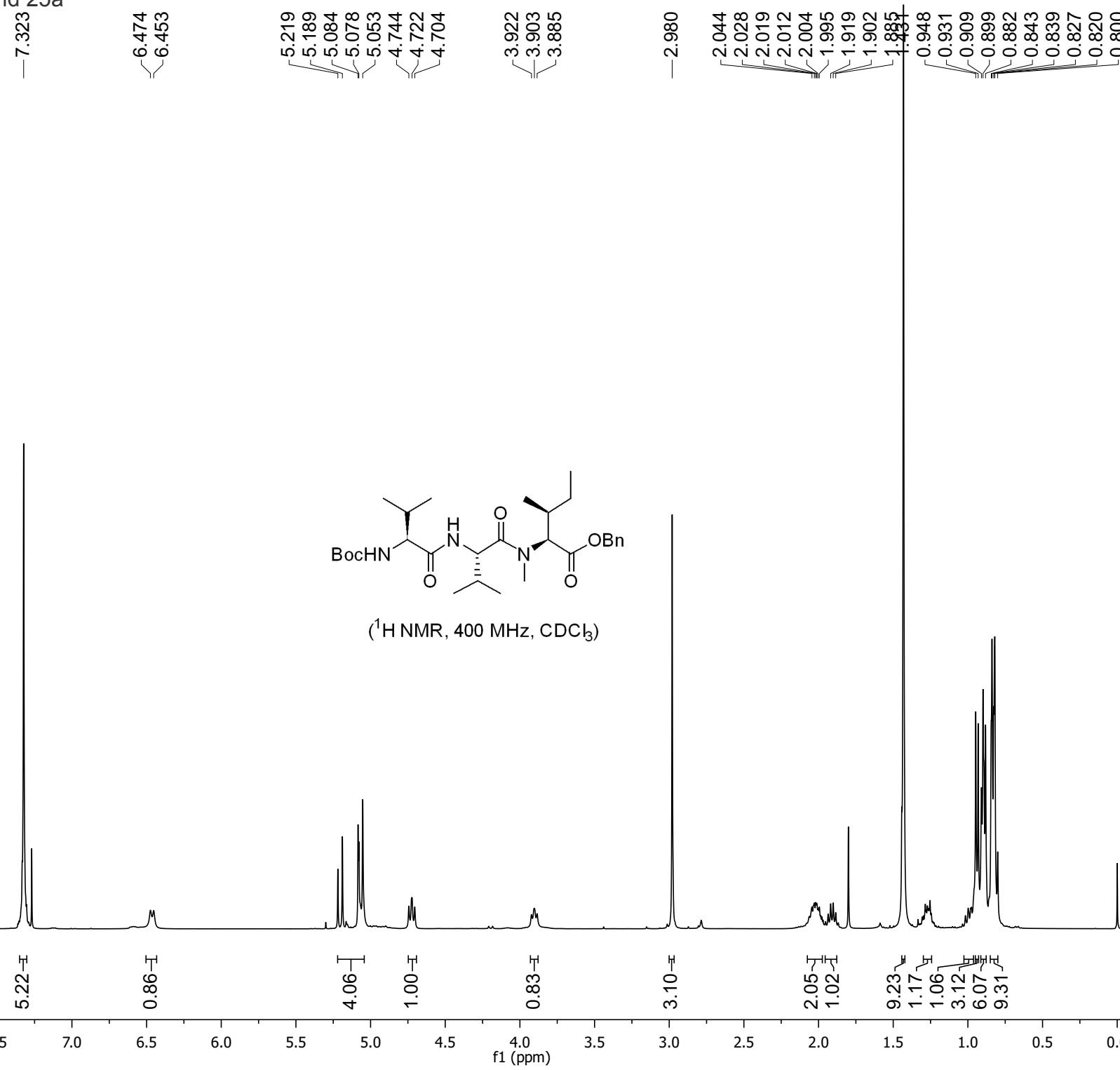
NMR spectra of compound 24d



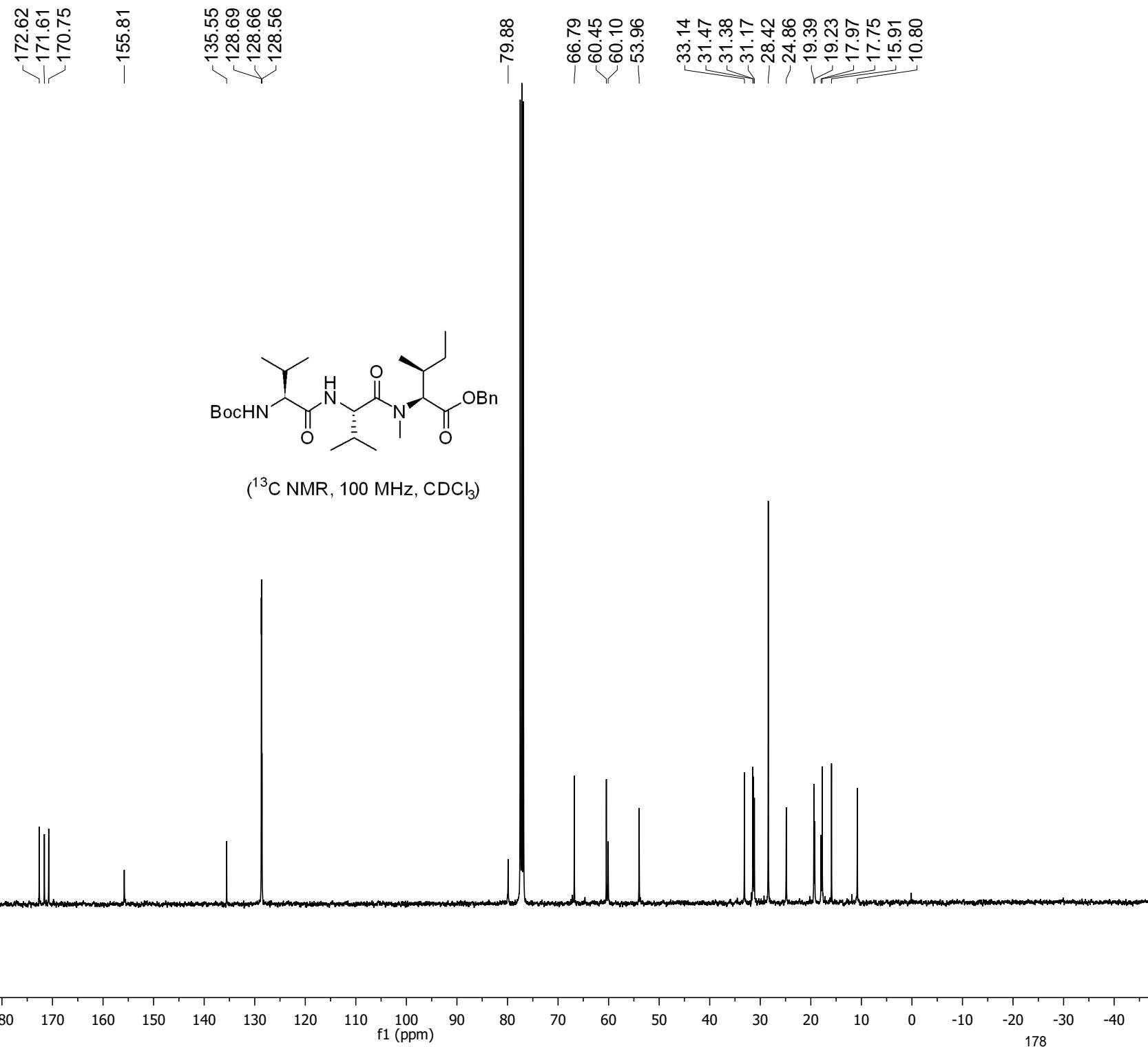
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



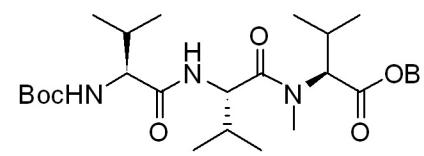
NMR spectra of compound 25a



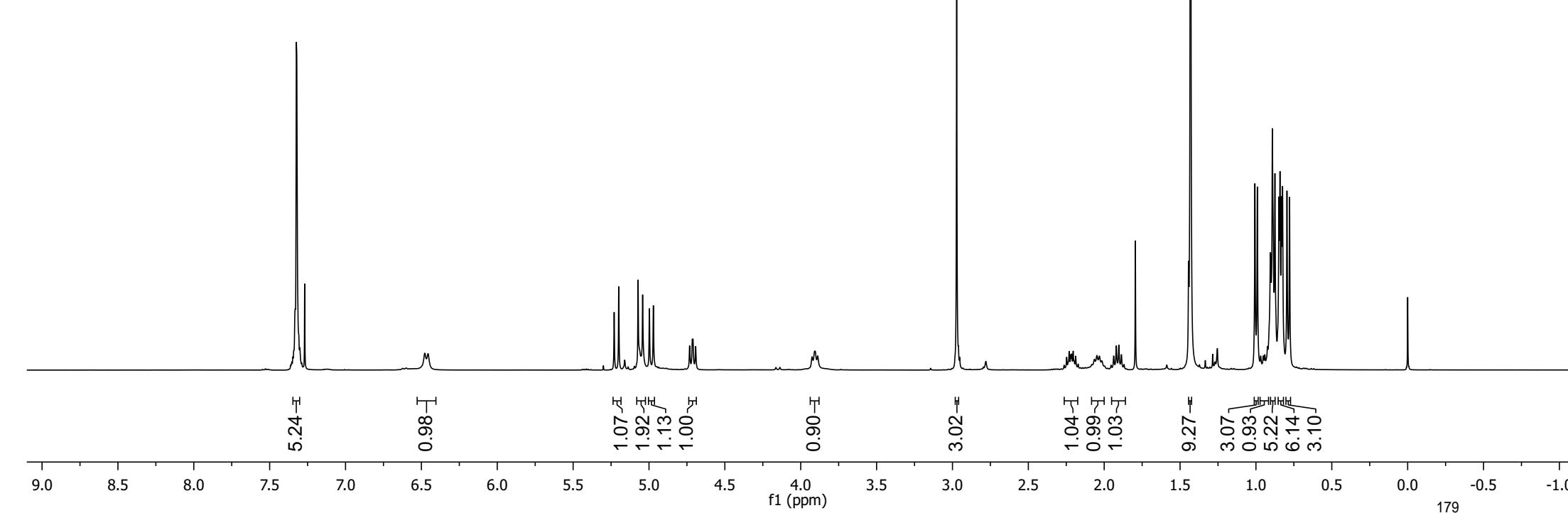
NMR spectra of compound 25a



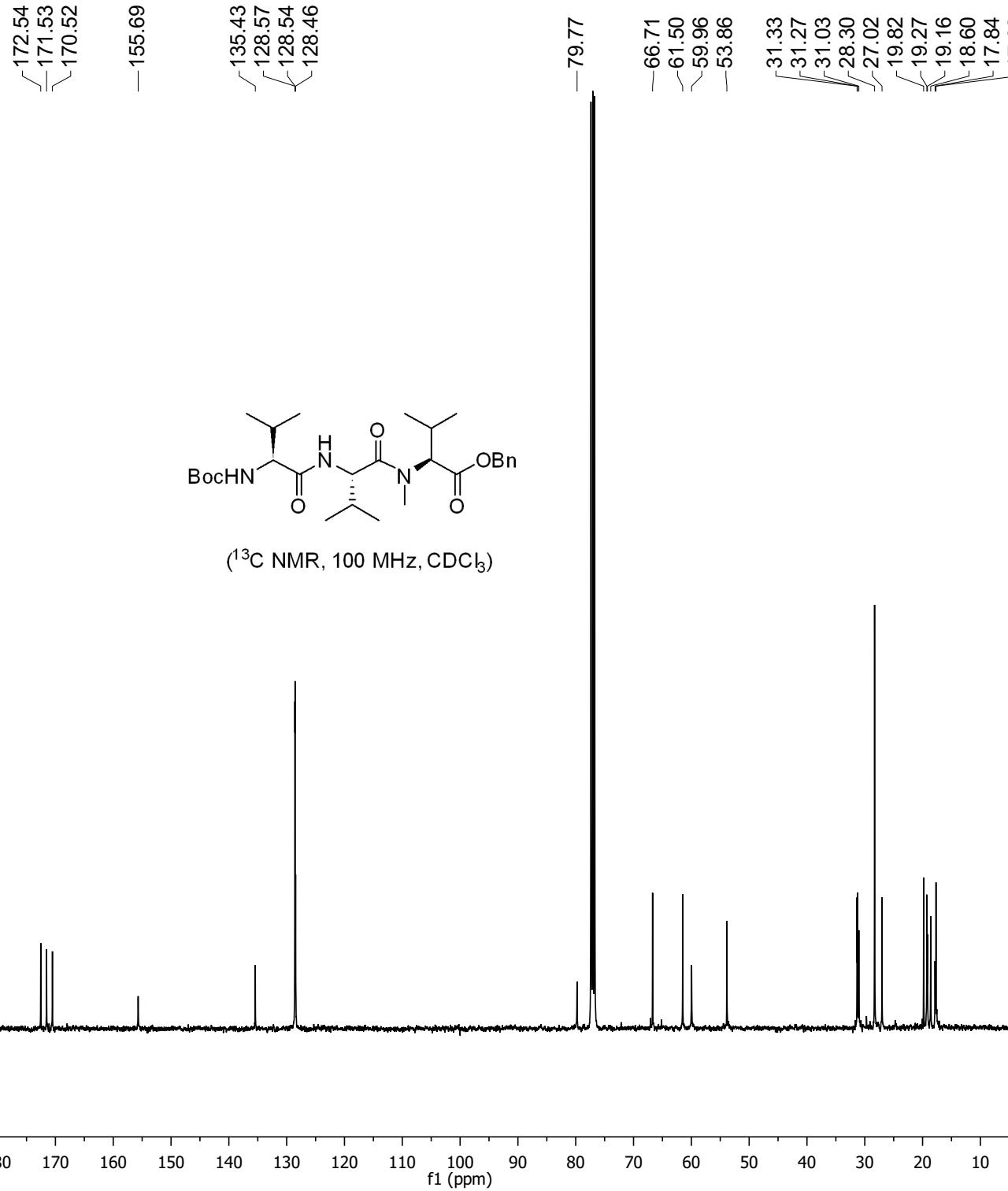
NMR spectra of compound 25b



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 25b

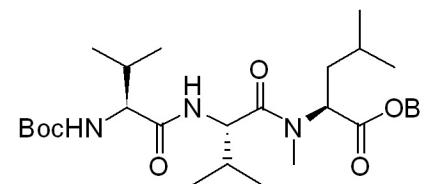


NMR spectra of compound 25c

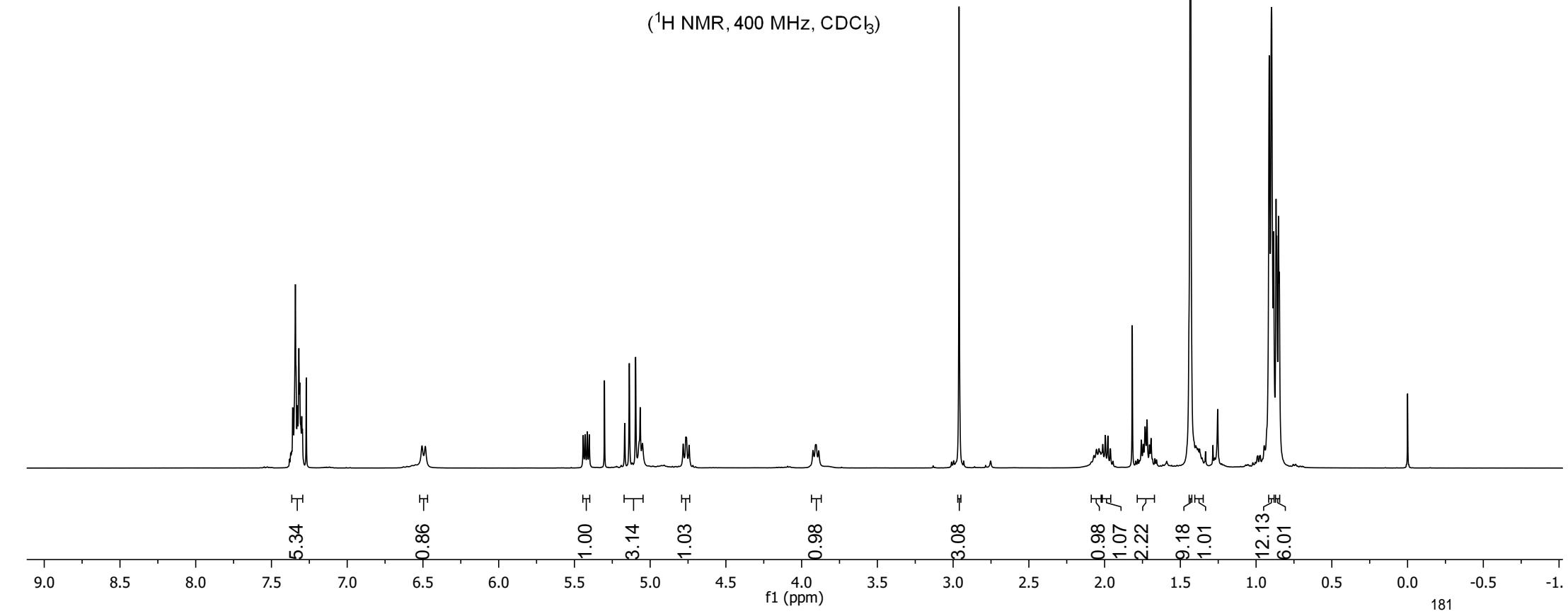
7.373  
7.366  
7.360  
7.342  
7.330  
7.319  
7.307  
7.300  
7.296  
7.296  
6.506  
6.484

5.442  
5.429  
5.415  
5.402  
5.168  
5.138  
5.096  
5.066  
5.051  
4.782  
4.764  
4.761  
4.743  
3.925  
3.904  
3.887

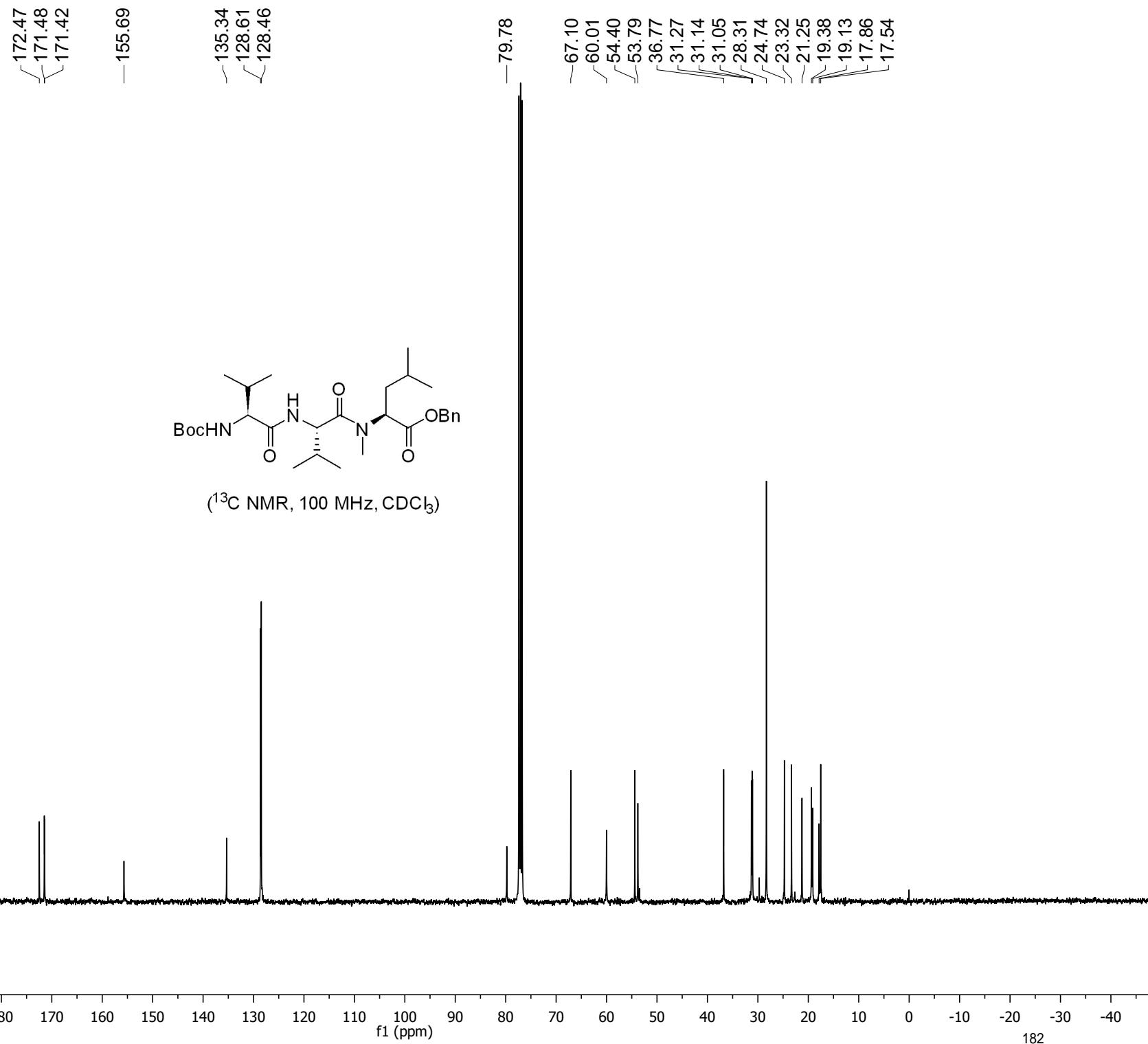
-2.961  
2.012  
1.995  
1.978  
1.962  
1.757  
1.745  
1.733  
1.720  
1.704  
1.434  
1.398  
0.913  
0.898  
0.884  
0.868  
0.864  
0.852  
0.847



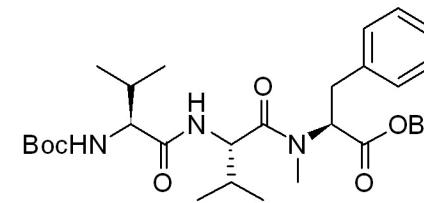
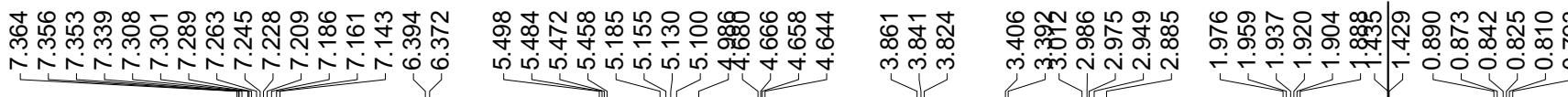
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



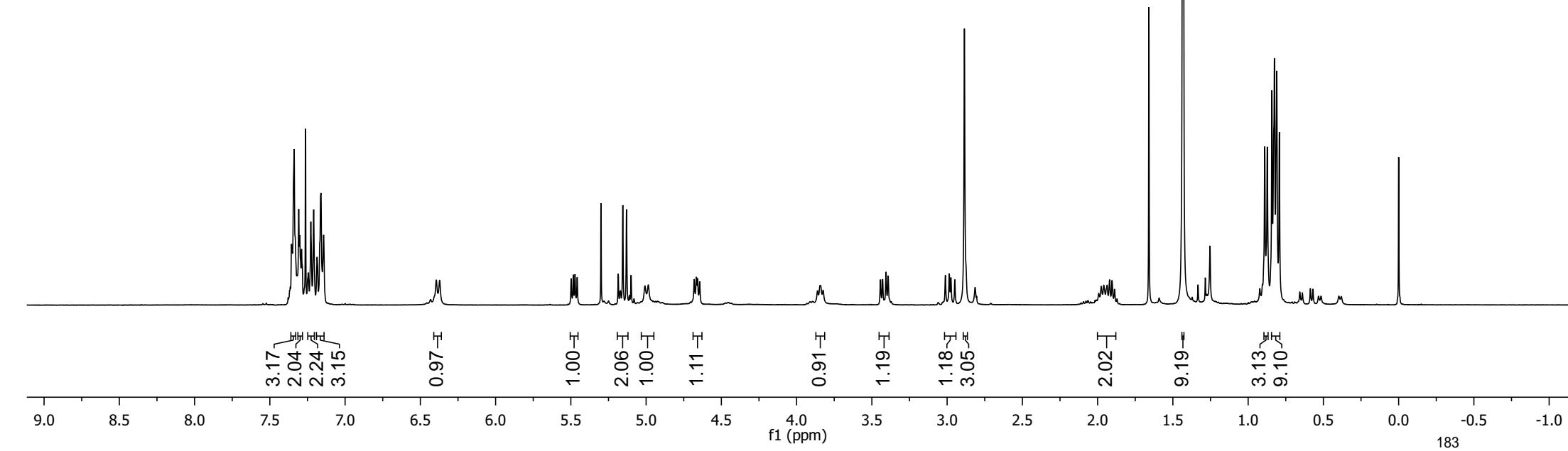
NMR spectra of compound 25c



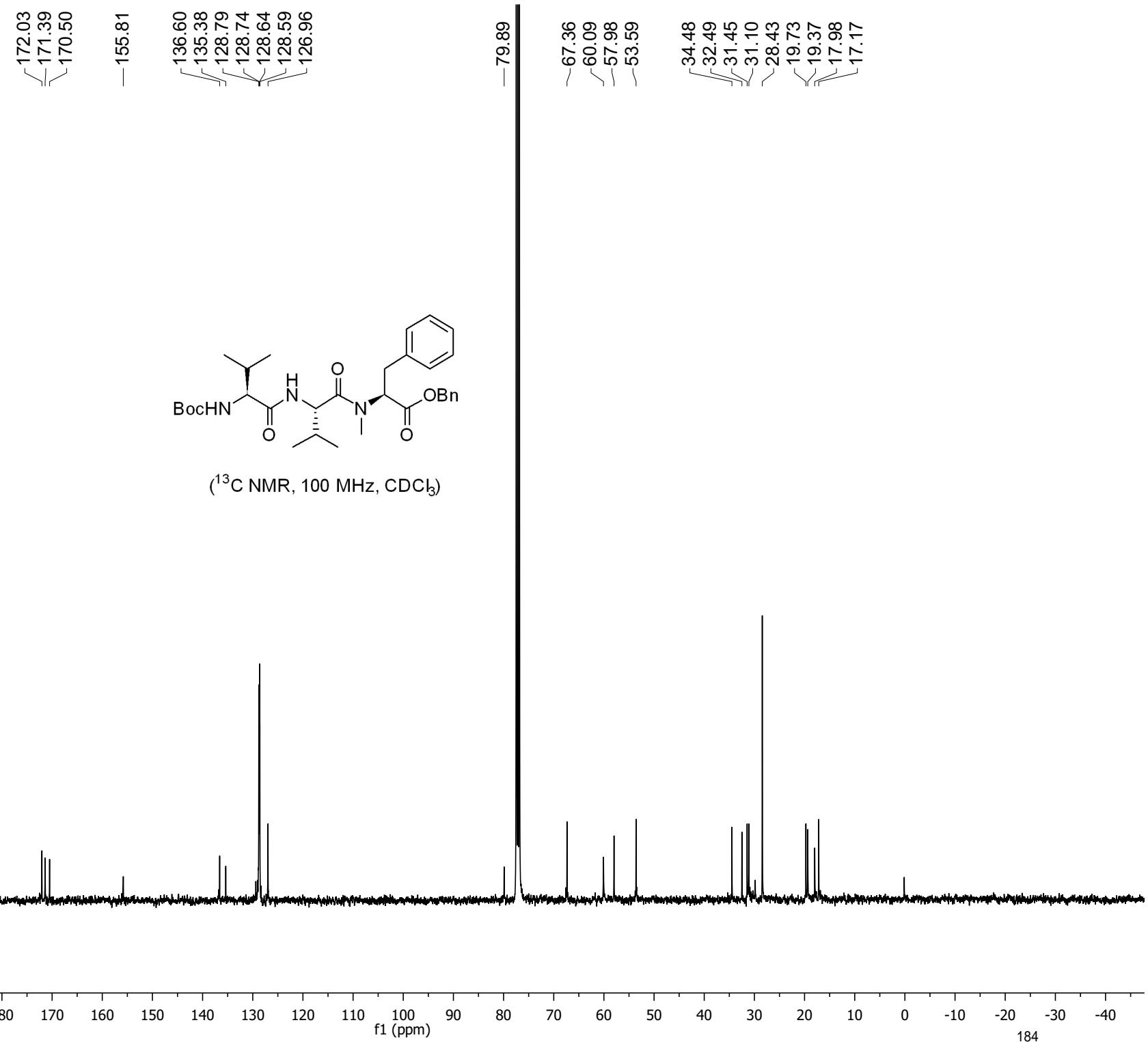
## NMR spectra of compound 25d



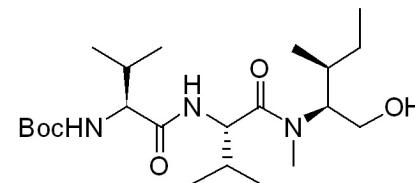
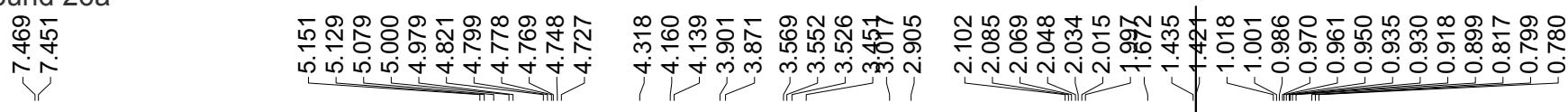
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



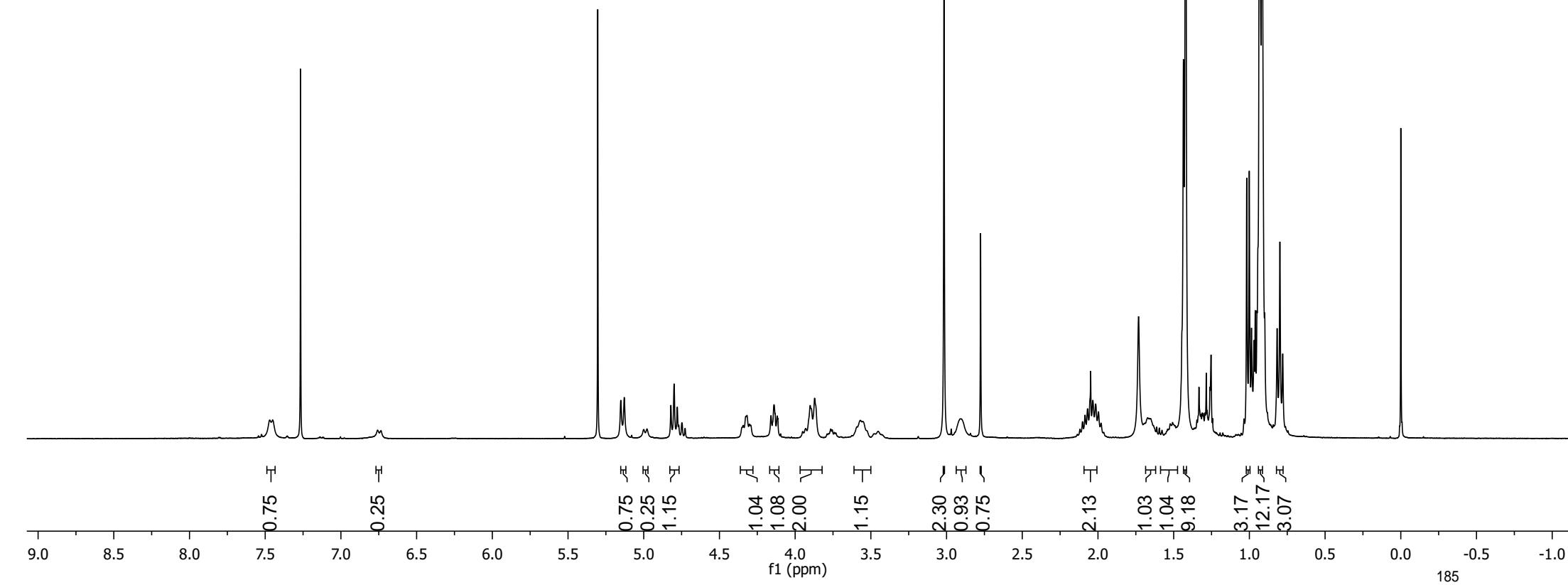
NMR spectra of compound 25d



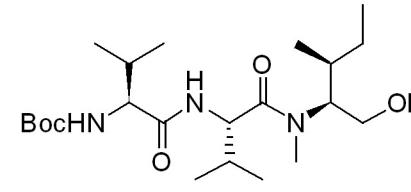
NMR spectra of compound 26a



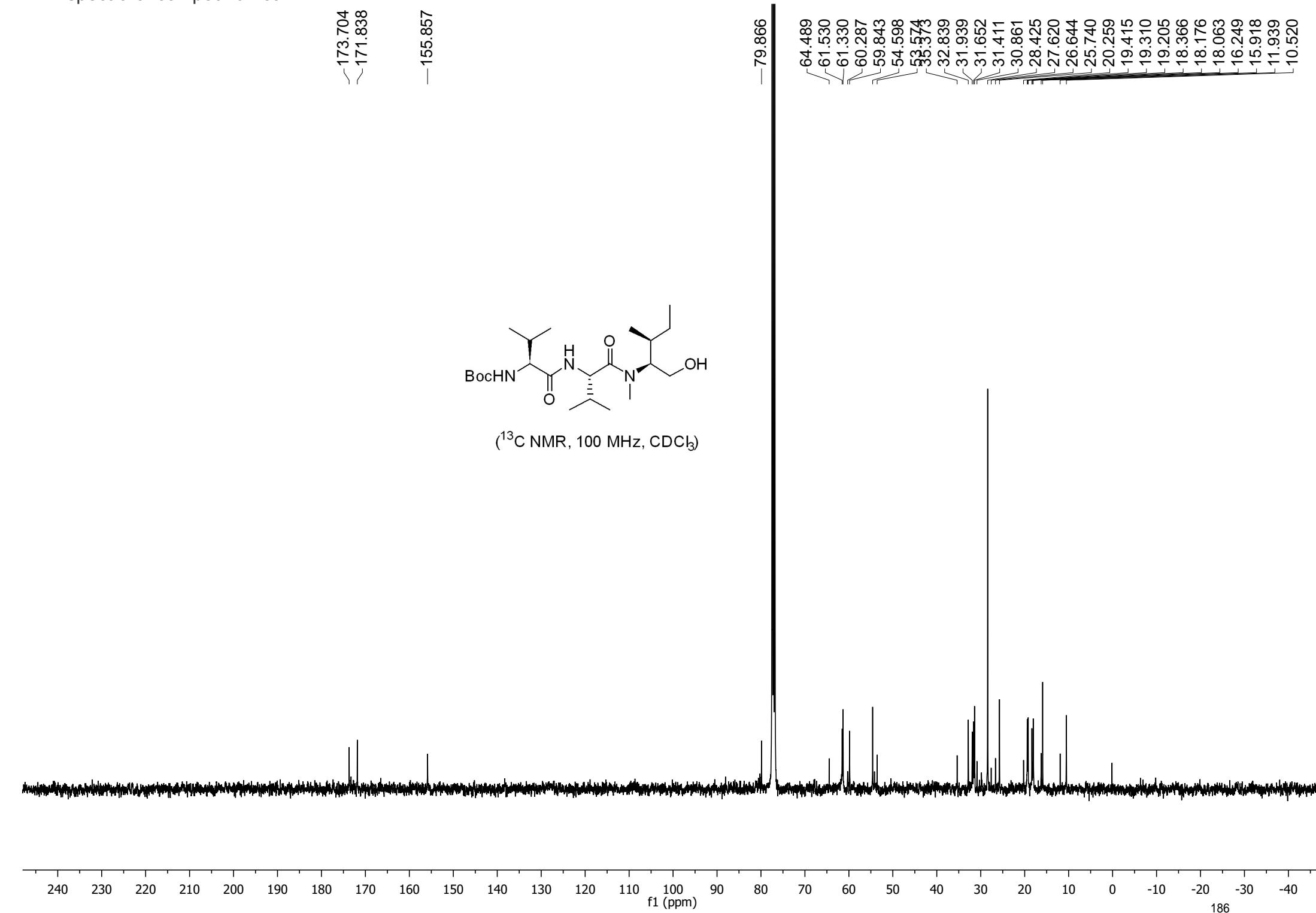
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 26a



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 26b

7.708  
7.686  
7.068  
7.047

5.211  
5.188  
5.068  
5.047

4.345  
4.328  
4.320  
4.303

4.295  
4.244  
4.223

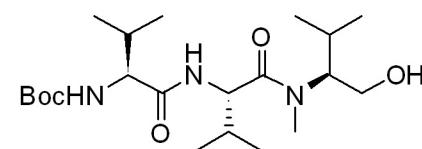
4.202  
3.892  
3.863

3.719  
3.708  
3.568

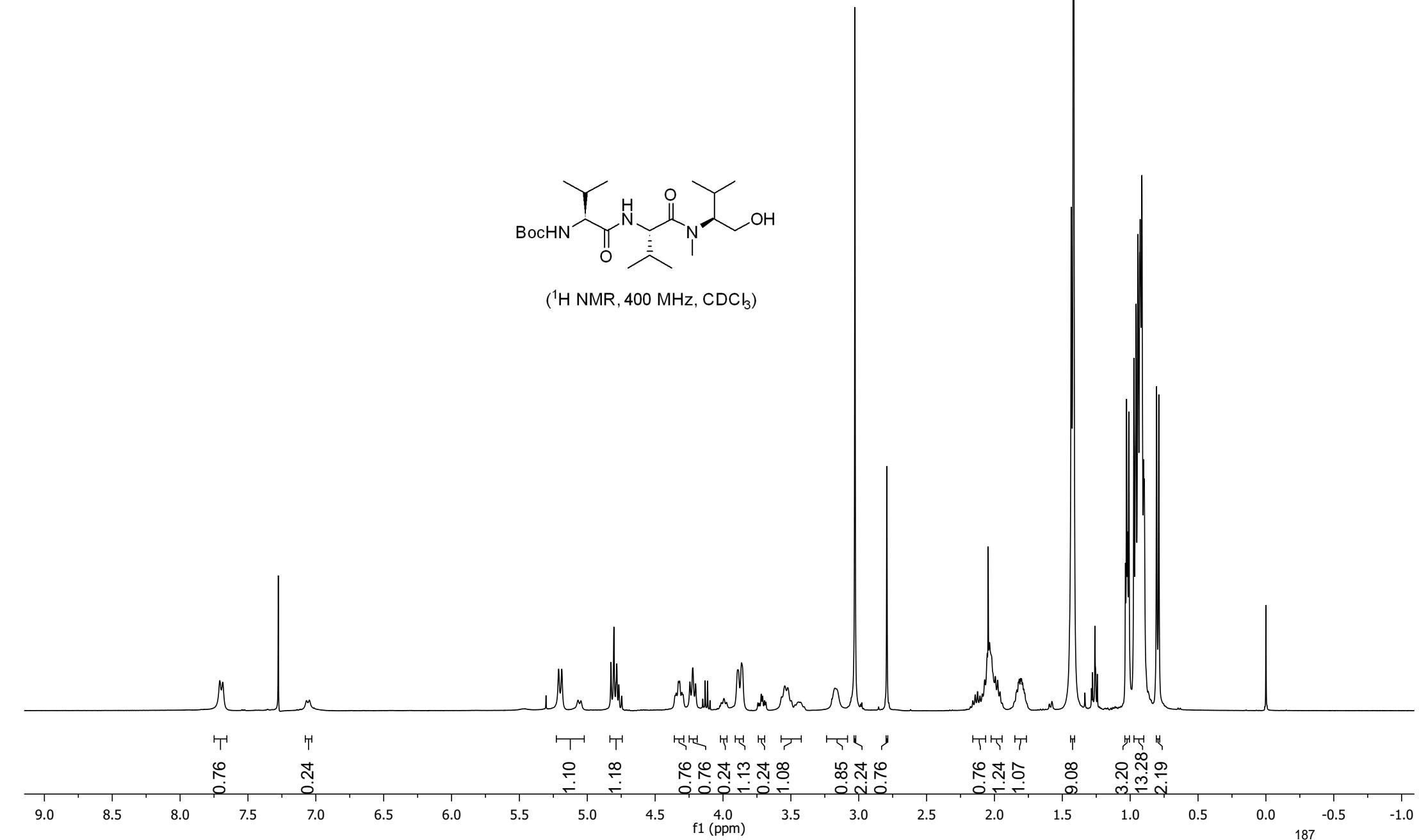
3.545  
3.523

3.176  
3.028

2.793



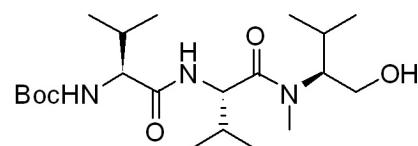
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



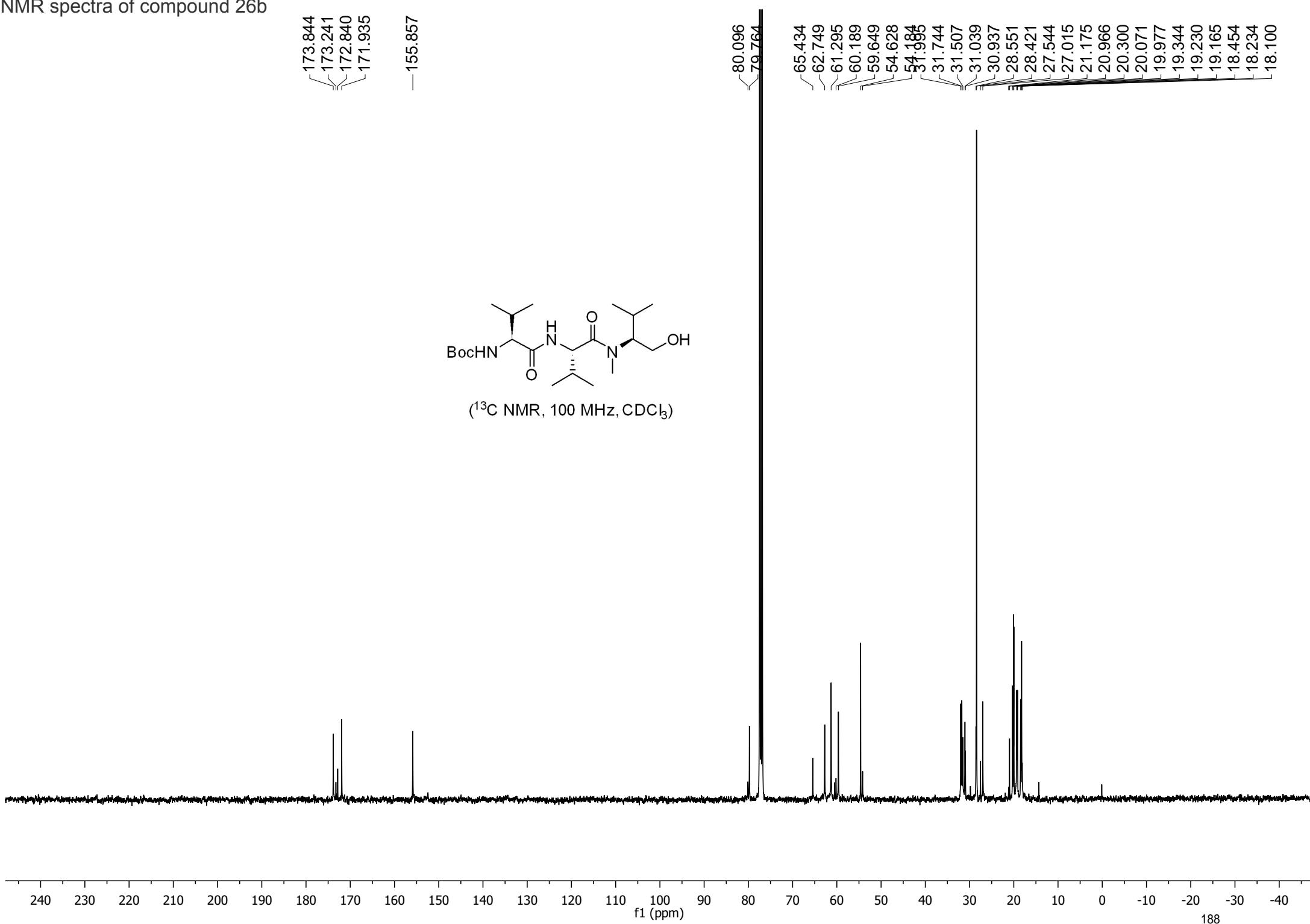
NMR spectra of compound 26b

173.844  
173.241  
172.840  
171.935

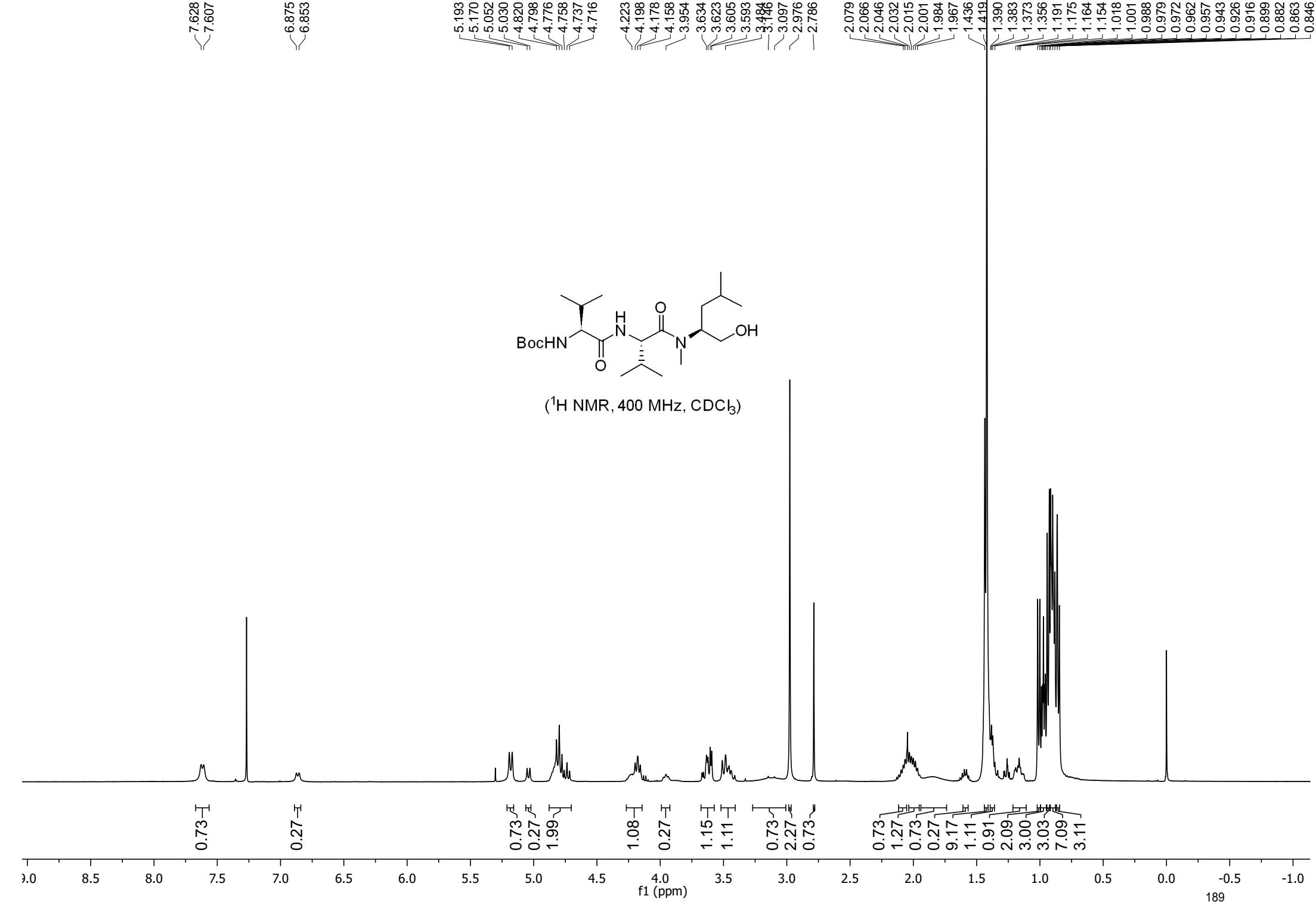
-155.857



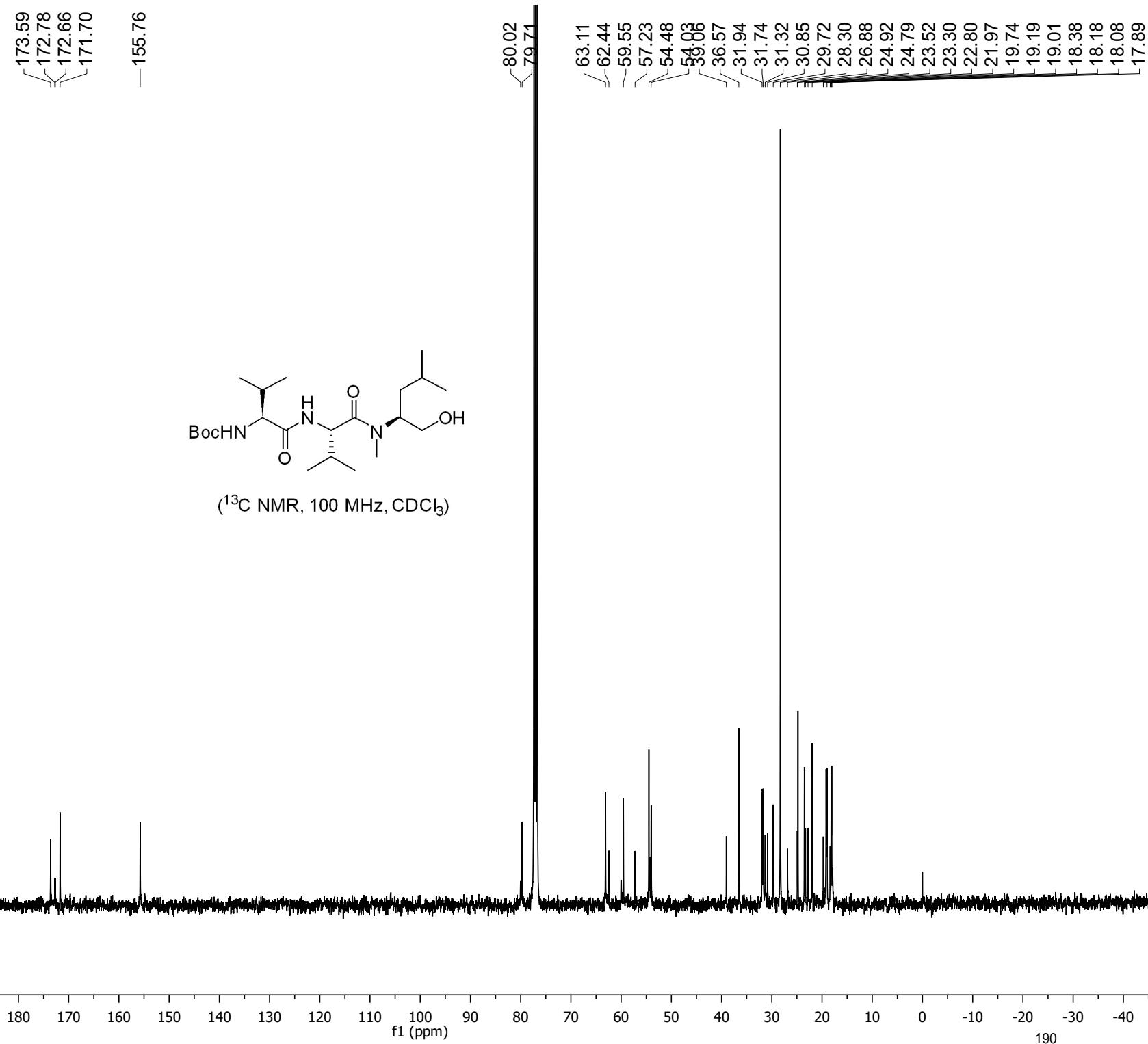
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 26c

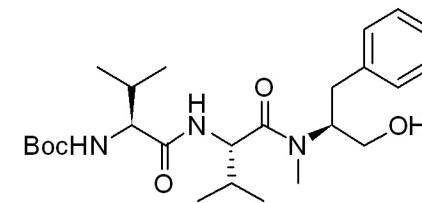


NMR spectra of compound 26c

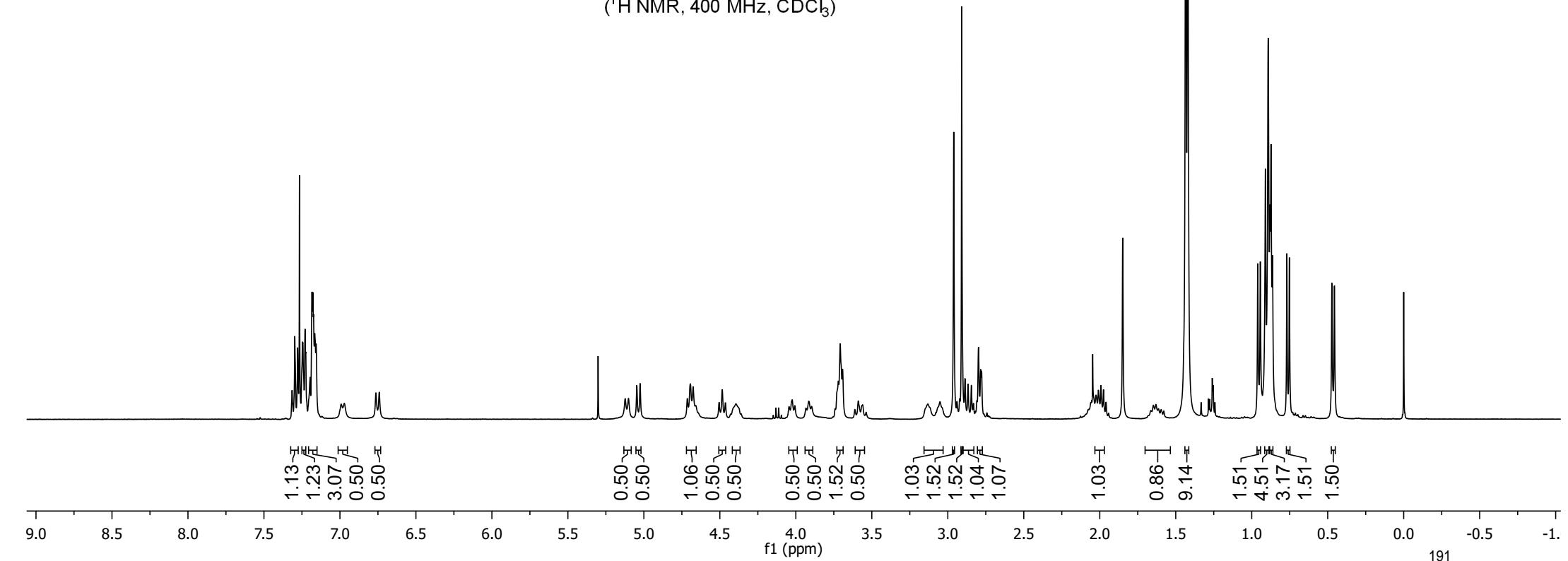


## NMR spectra of compound 26d

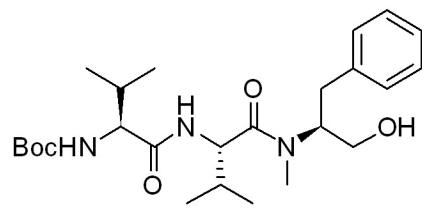
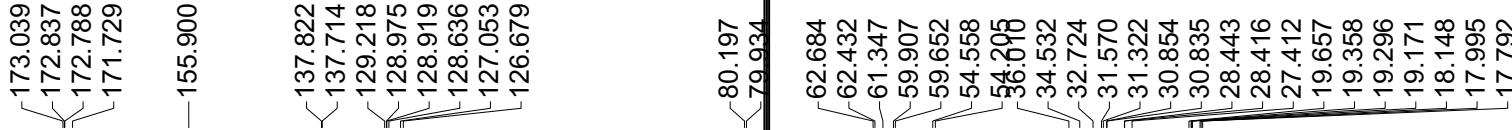
7.315	
7.297	
7.278	
7.246	
7.229	
7.225	
7.196	
7.184	
7.178	
7.174	
7.166	
7.157	
6.992	
6.971	
6.763	
6.741	
5.123	
5.101	
5.046	
5.025	
4.714	
4.694	
4.676	
4.659	
4.505	
4.484	
4.464	
4.394	
4.024	
3.914	
3.720	
3.708	
3.692	
3.589	
3.561	
3.131	
3.052	
2.961	
2.940	
2.922	
2.909	
2.887	
2.867	
2.845	
2.798	
2.783	
2.778	
2.009	
1.992	
1.975	
1.959	
1.647	
1.630	
1.435	
1.421	
0.960	
0.944	
0.910	
0.873	
0.863	
0.892	
0.880	
0.769	
0.752	
0.473	
0.456	



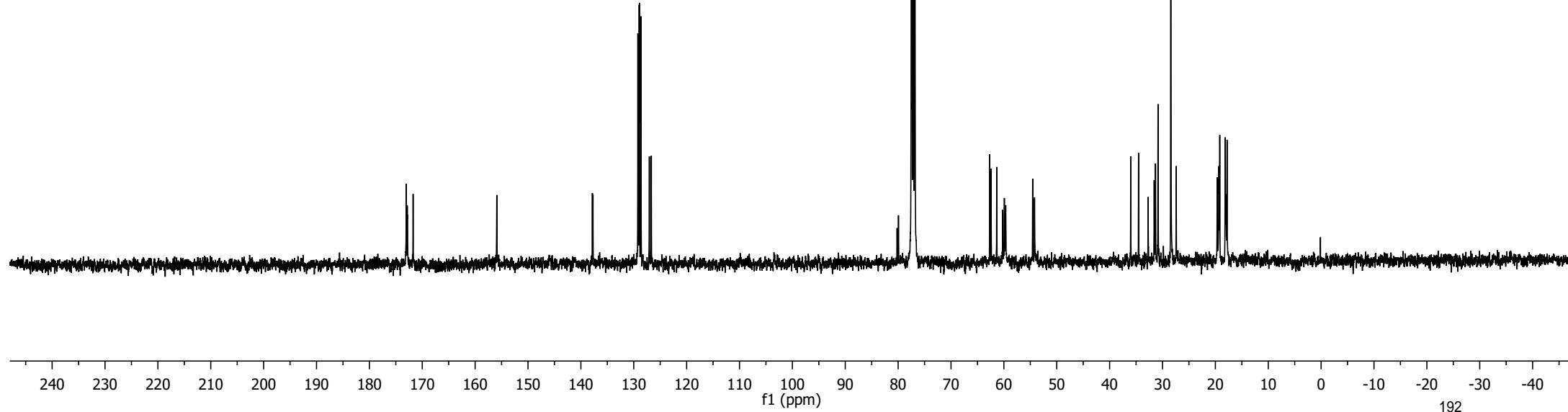
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



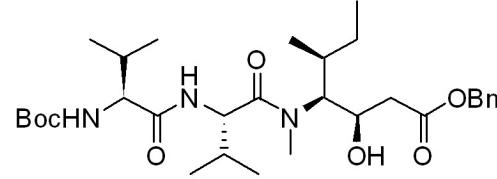
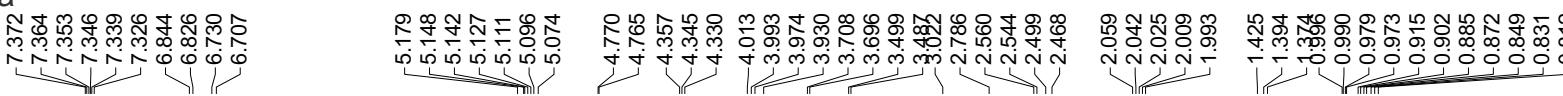
NMR spectra of compound 26d



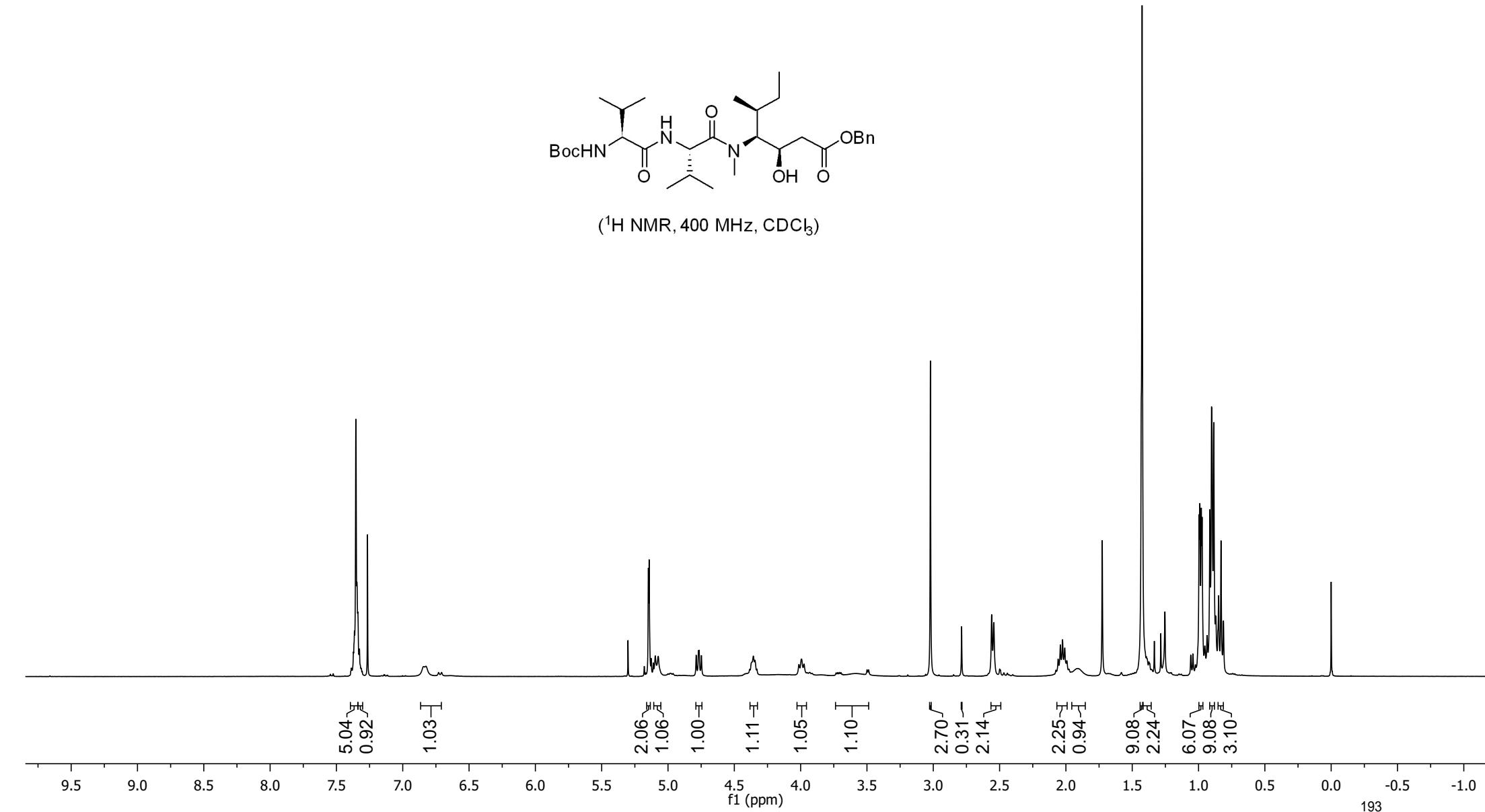
( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



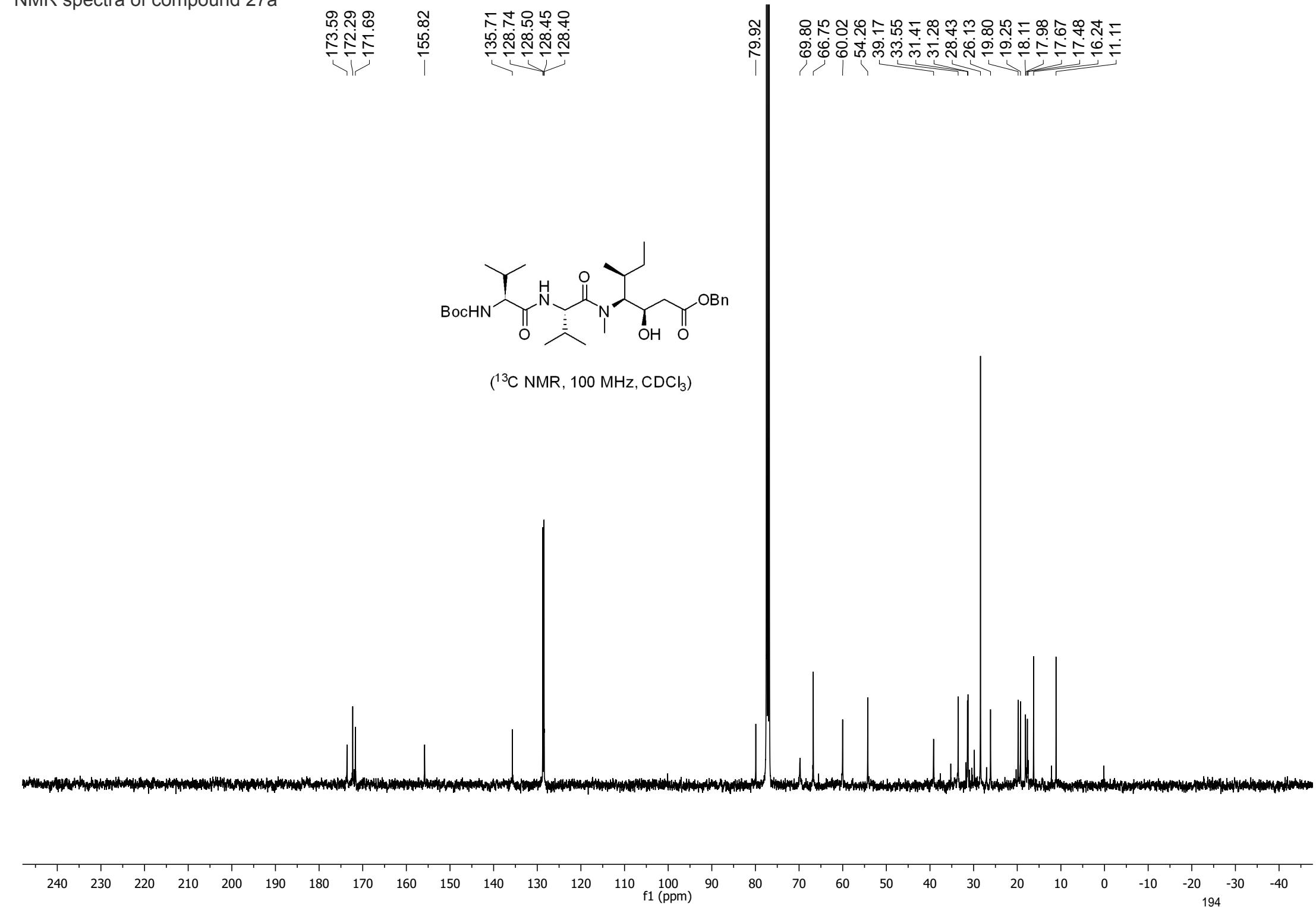
NMR spectra of compound 27a



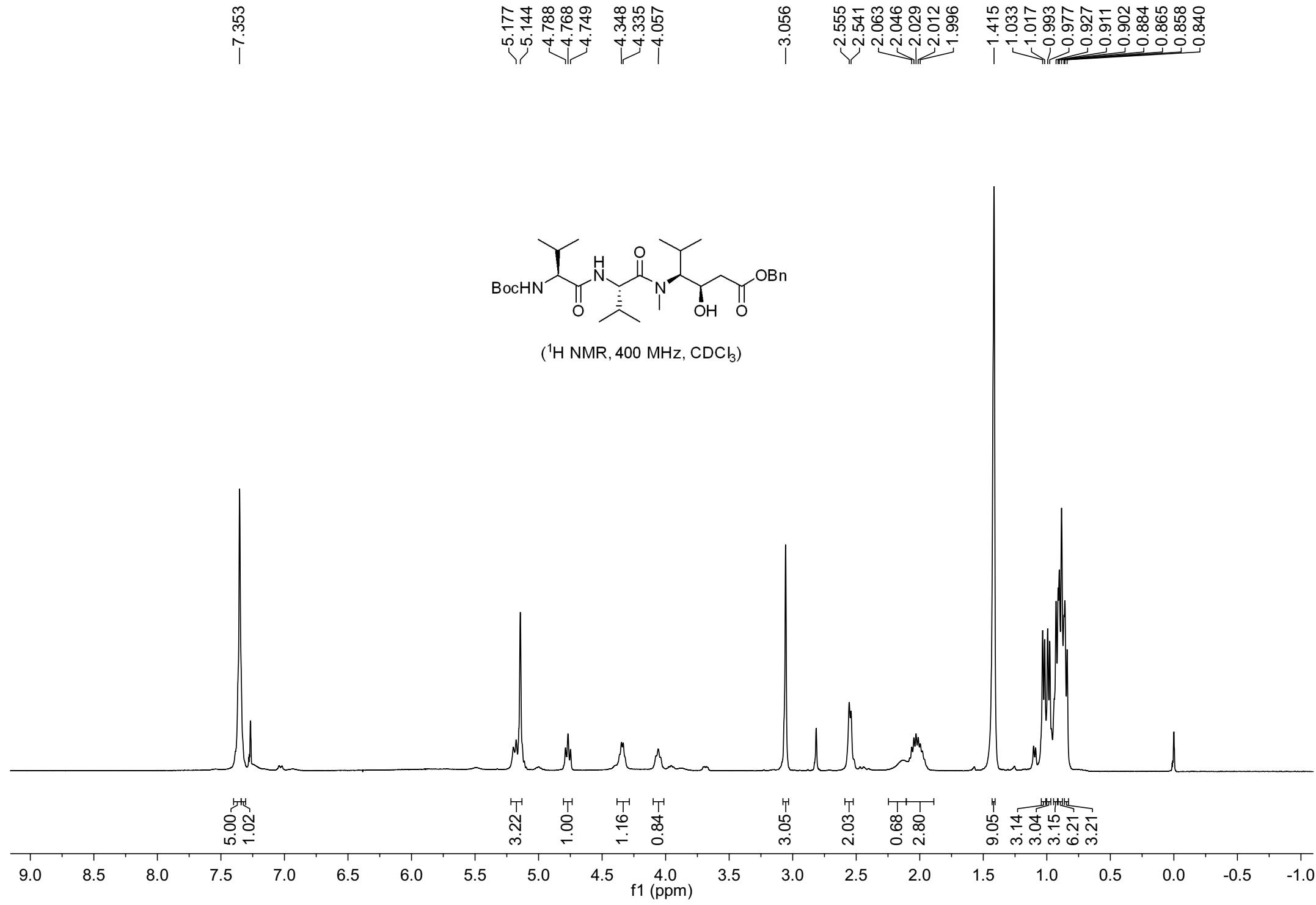
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



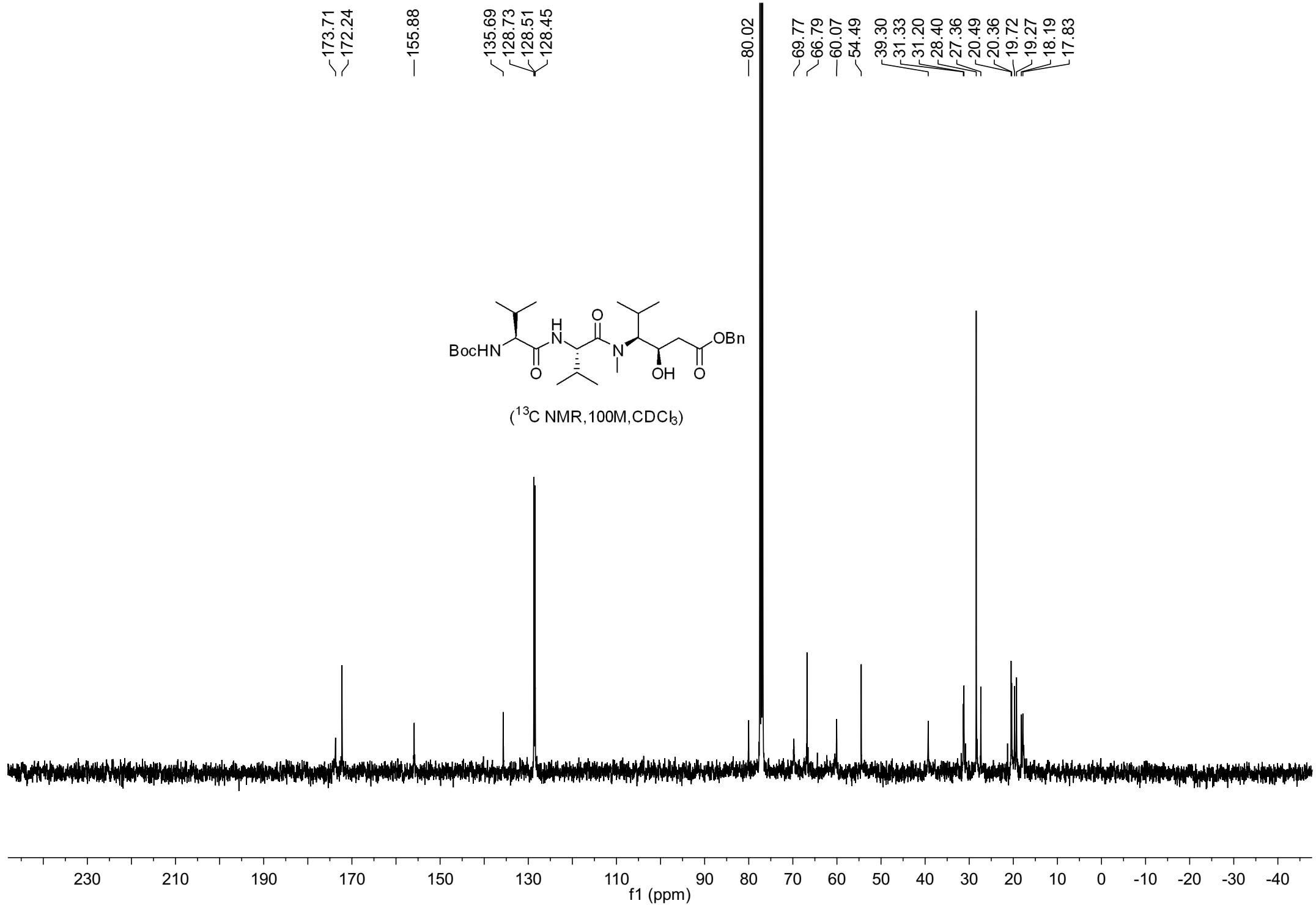
NMR spectra of compound 27a



## NMR spectra of compound 27b

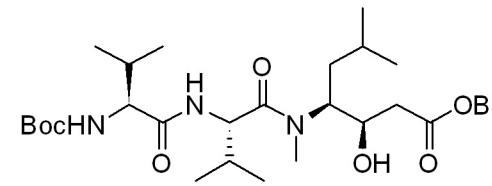


NMR spectra of compound 27b

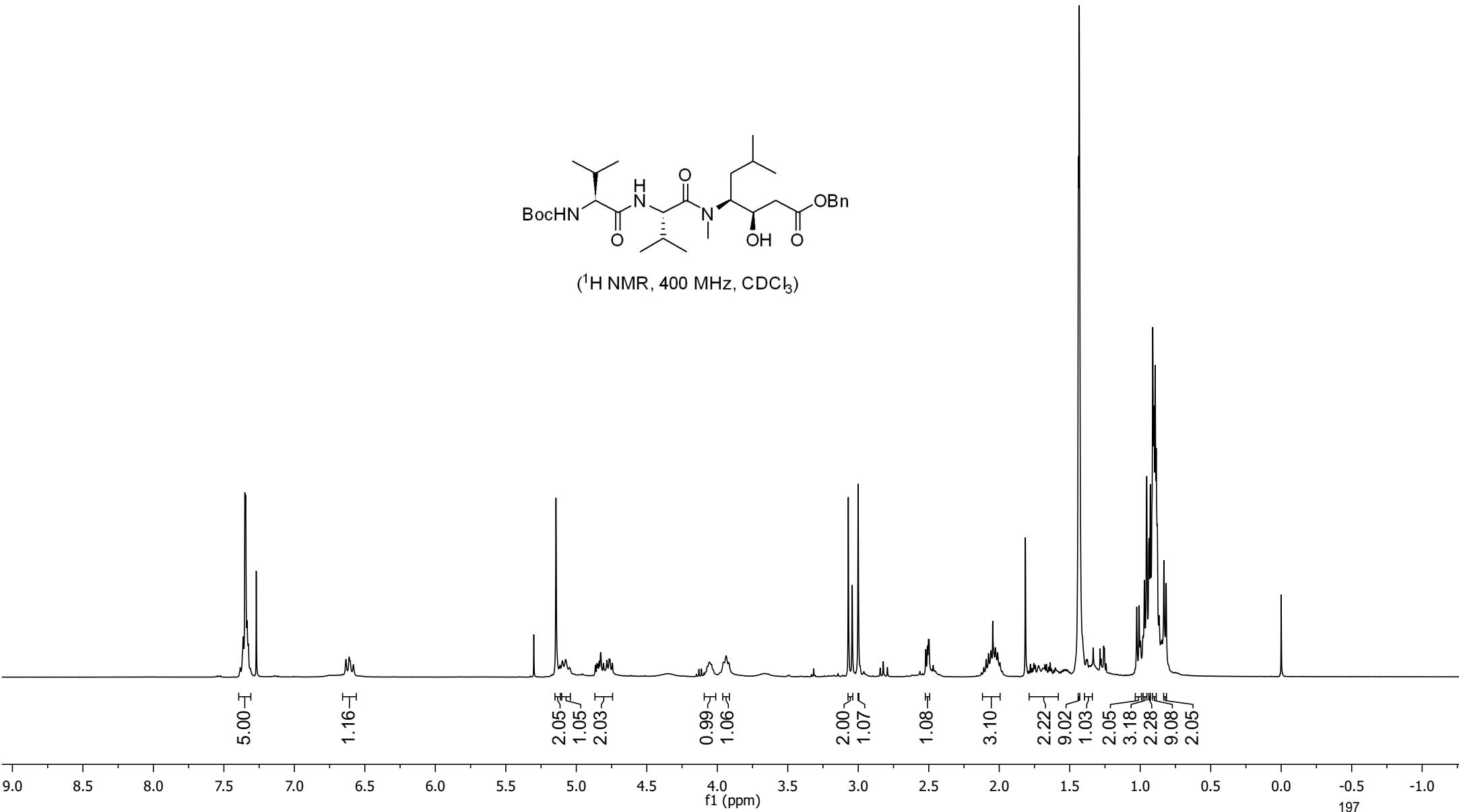


NMR spectra of compound 27c

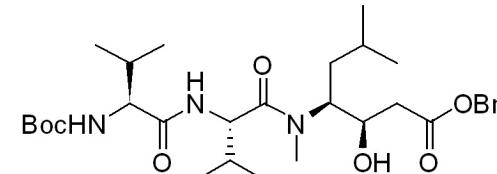
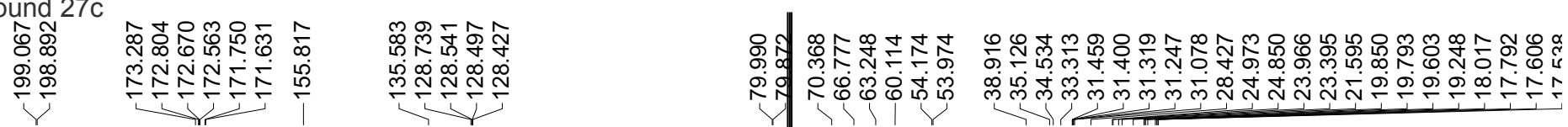
7.362	5.115	4.827	4.865	4.838	4.847	4.854	5.076	5.099	5.144	5.611	6.634	7.327	7.336	7.346	7.351
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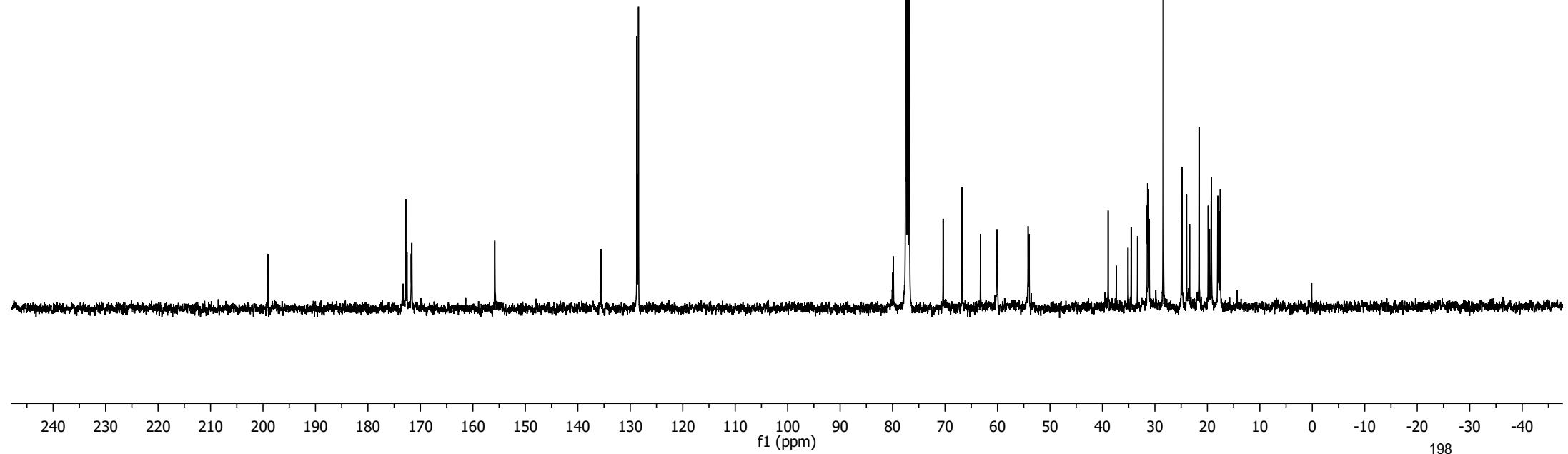
( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 27c

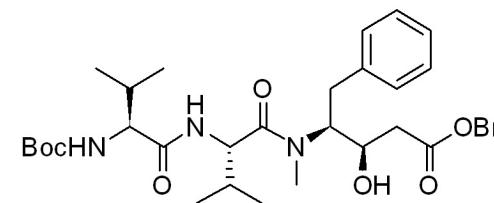


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

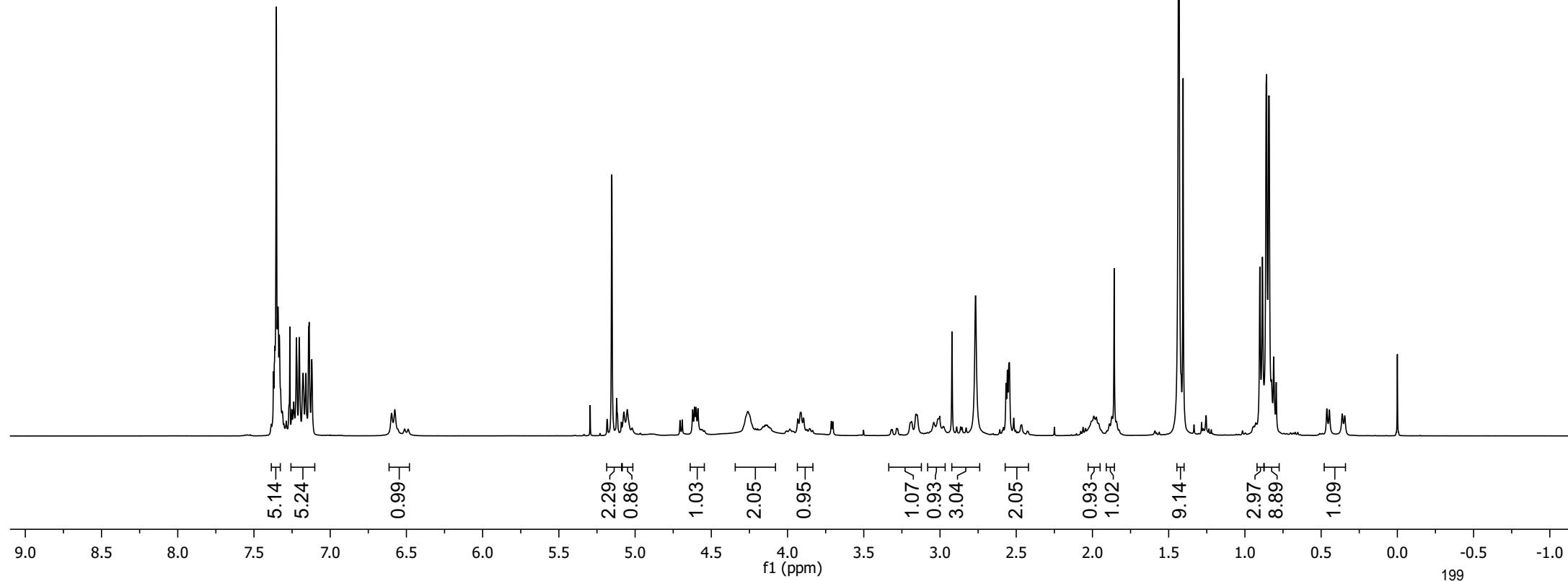


## NMR spectra of compound 27d

7.372	
7.363	
7.353	
7.342	
7.252	7.178
7.239	7.159
7.222	7.141
7.203	7.138
7.121	7.121
6.597	6.576
6.576	6.512
6.512	5.183
5.183	5.153
5.153	5.121
5.121	5.090
5.090	5.074
5.074	5.051
5.051	5.019
5.019	4.622
4.622	4.610
4.610	4.600
4.600	4.588
4.588	4.142
4.142	4.133
4.133	3.932
3.932	3.915
3.915	3.895
3.895	3.284
3.284	3.279
3.279	3.187
3.187	3.158
3.158	3.150
3.150	3.041
3.041	3.002
3.002	2.921
2.921	2.767
2.767	2.583
2.583	2.567
2.567	2.558
2.558	2.548
2.548	2.516
2.516	2.464
2.464	2.062
2.062	2.044
2.044	1.991
1.991	1.975
1.975	1.434
1.434	1.405
1.405	0.902
0.902	0.885
0.885	0.858
0.858	0.811
0.811	0.795
0.795	0.462
0.462	0.446
0.446	0.361
0.361	0.345

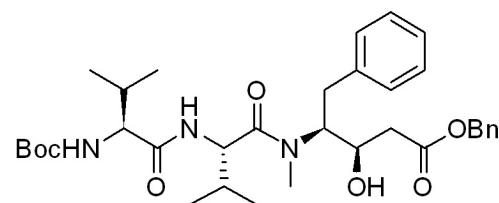


(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

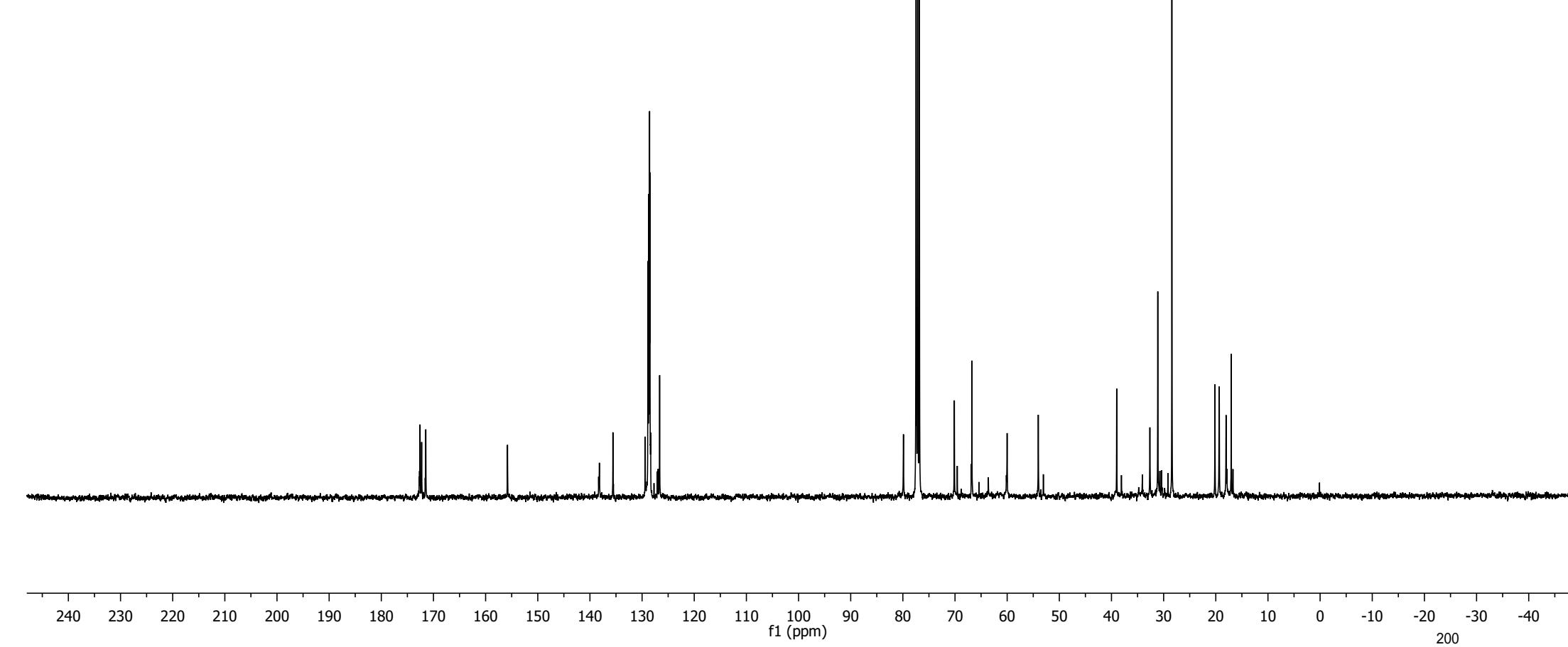


NMR spectra of compound 27d

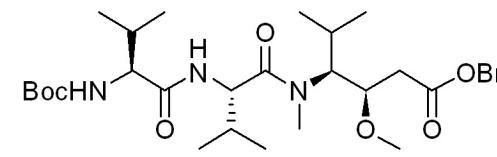
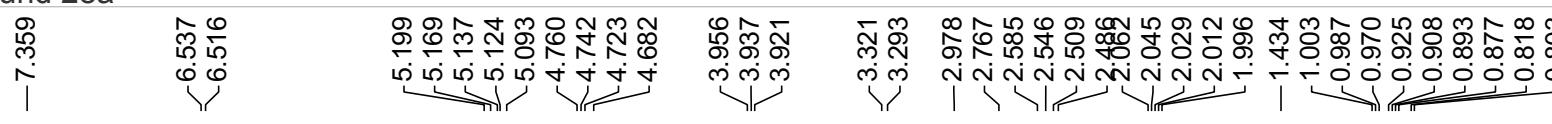
172.736	
172.670	
172.567	
172.262	
171.579	
171.468	
155.806	
138.337	
138.186	
135.591	
135.494	
129.418	
128.898	
128.849	
128.744	
128.677	
128.564	
128.489	
128.415	
128.357	
127.715	
127.090	
126.921	
126.635	
79.885	



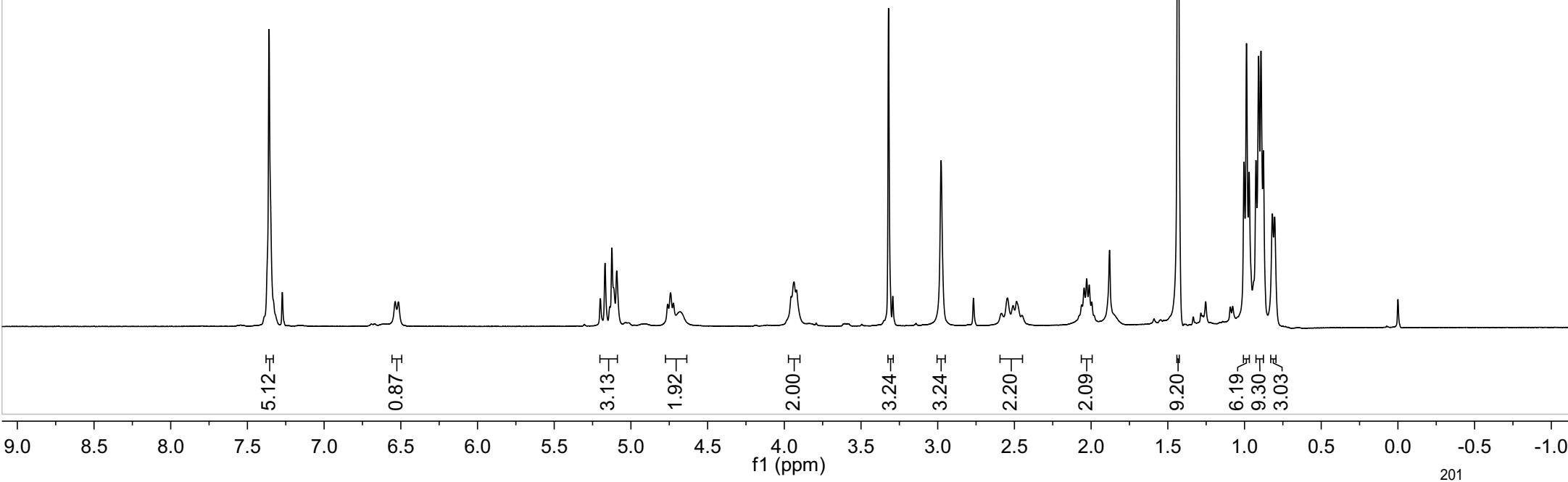
(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 28a



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



## NMR spectra of compound 28a

172.407  
 170.910  
 170.859

-155.062

-135.068  
 127.944  
 127.770  
 127.698

79.056  
 77.808  
 77.260

66.108  
 66.007  
 63.802  
 59.290

57.762  
 57.626  
 57.258

53.496  
 36.599  
 36.075

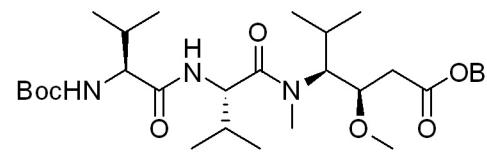
31.043  
 30.882  
 30.613

30.549  
 27.678  
 26.322

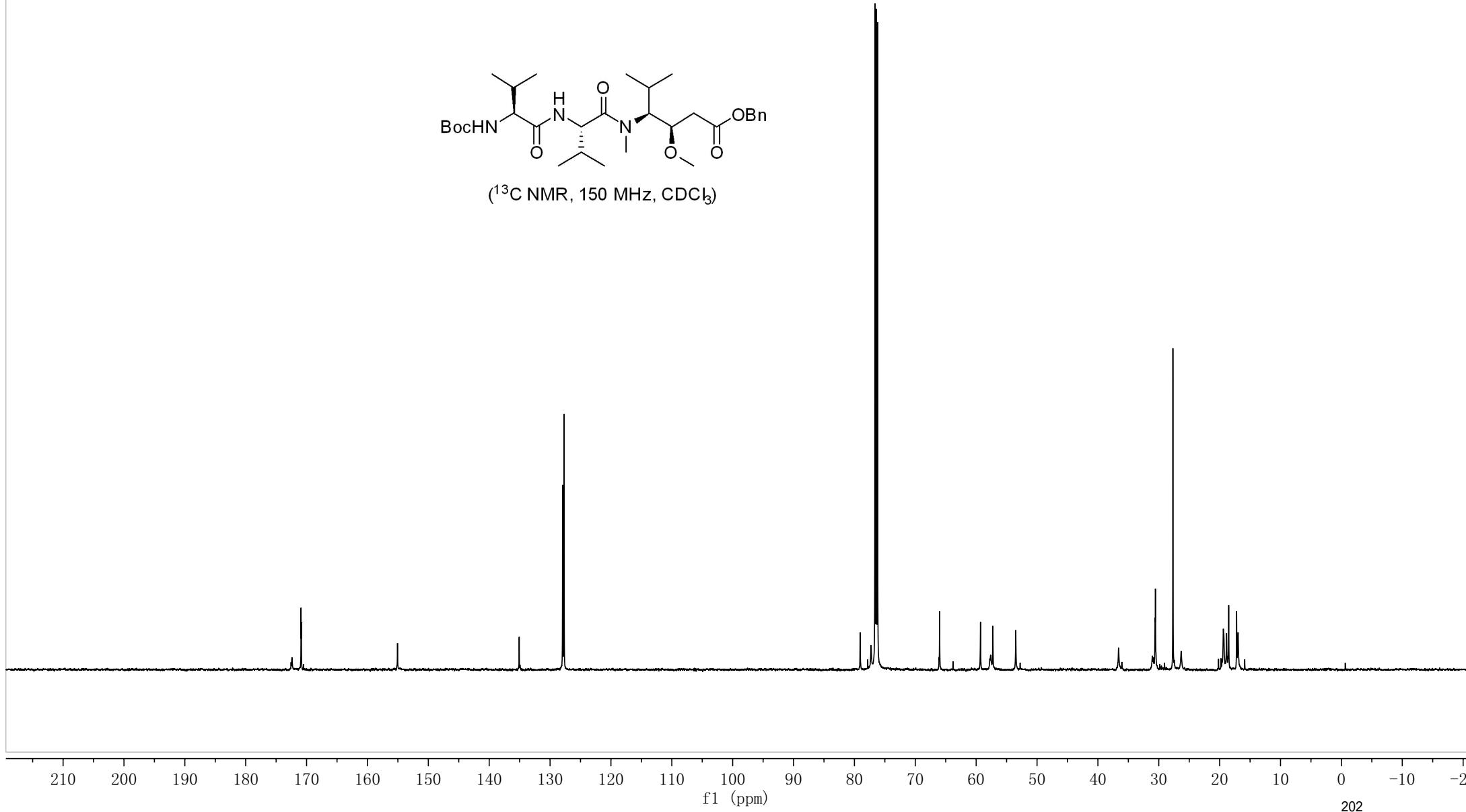
20.183  
 19.776  
 19.386

19.329  
 18.866  
 18.512

17.216  
 16.971  
 15.880



(<sup>13</sup>C NMR, 150 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 28c

7.354  
7.265  
7.255  
7.170  
7.151

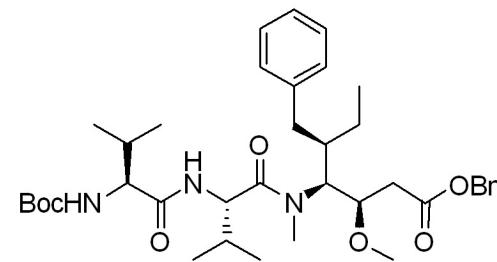
6.502  
6.480

5.137  
5.102  
5.071  
4.969  
4.783  
4.765  
4.745

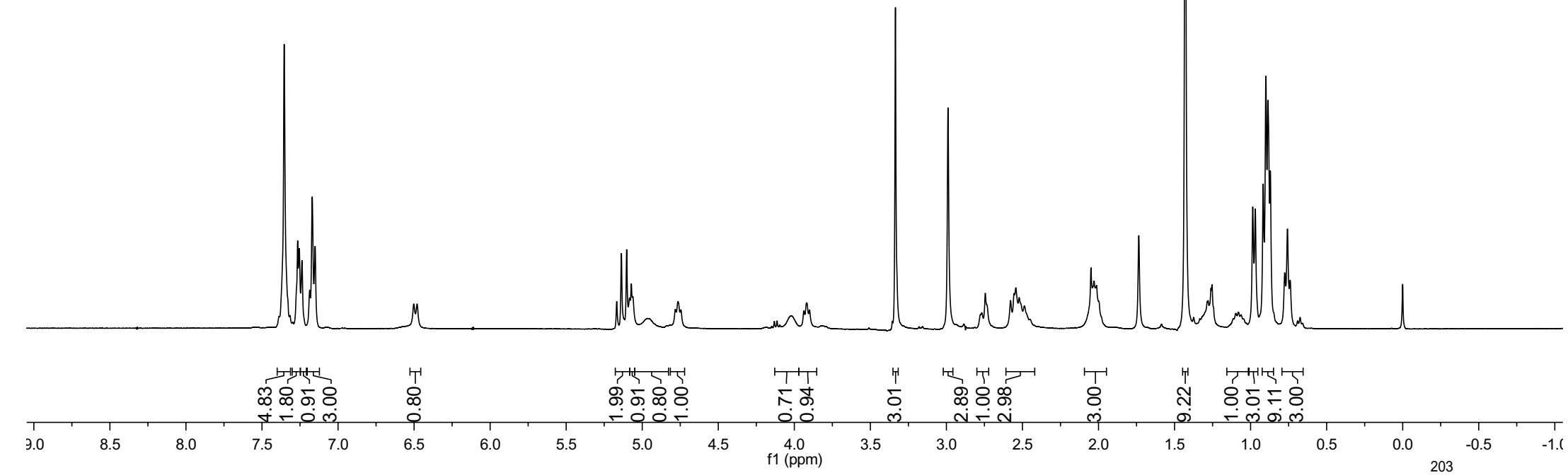
4.022  
3.937  
3.918  
3.900

3.335  
2.989  
2.744  
2.579  
2.555  
2.544  
2.522  
2.487  
2.049  
2.029  
2.013

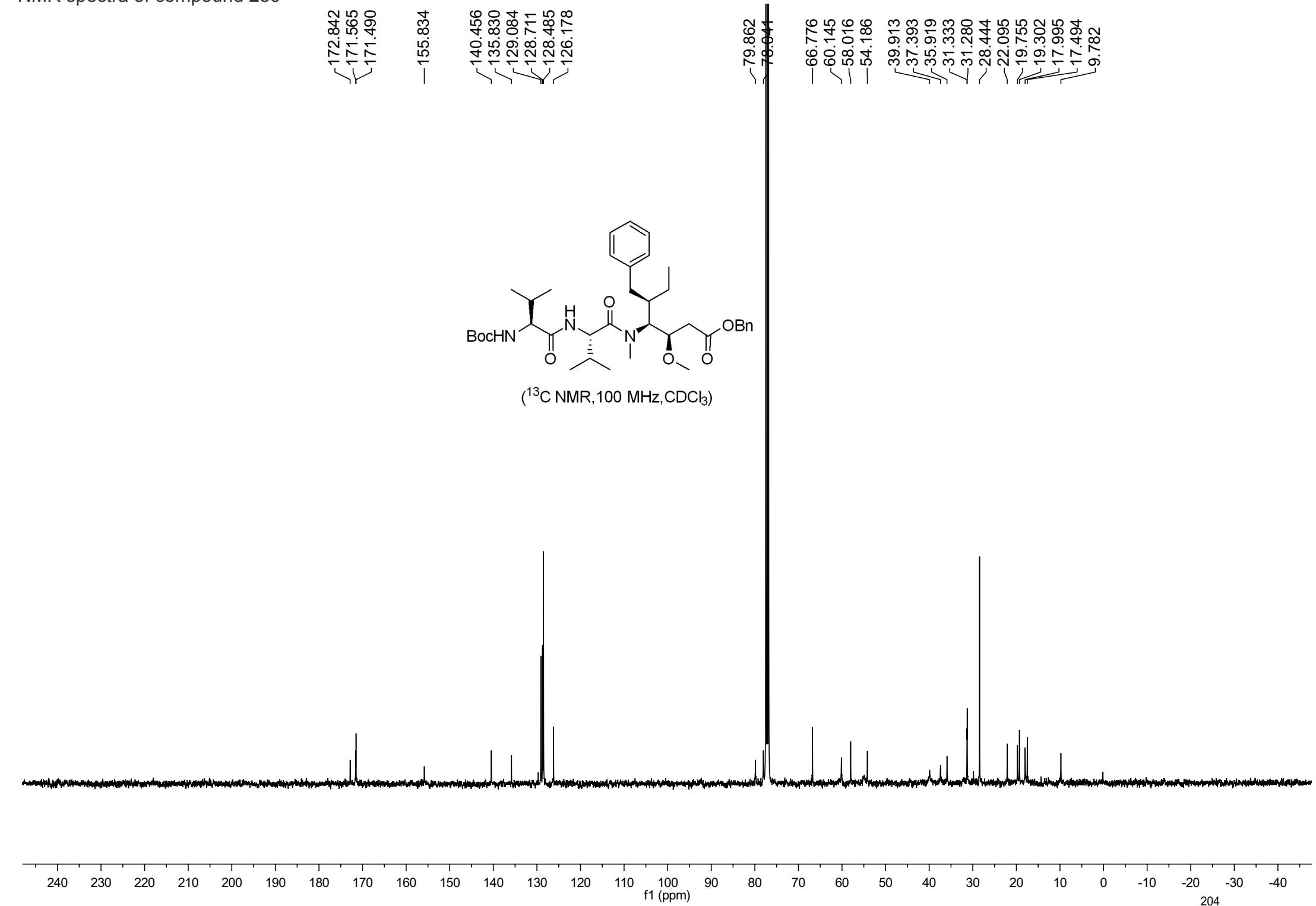
1.429  
1.097  
0.986  
0.969  
0.917  
0.900  
0.886  
0.870  
0.775  
0.758



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )



NMR spectra of compound 28c



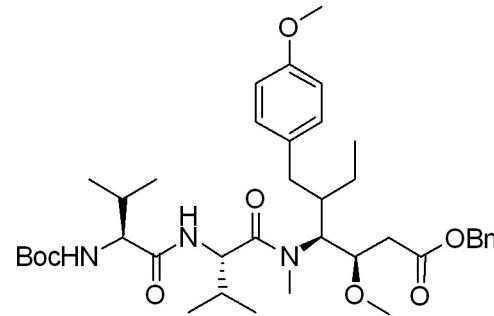
NMR spectra of compound 28d

-7.355  
7.083  
7.062  
6.813  
6.792  
6.486  
6.465

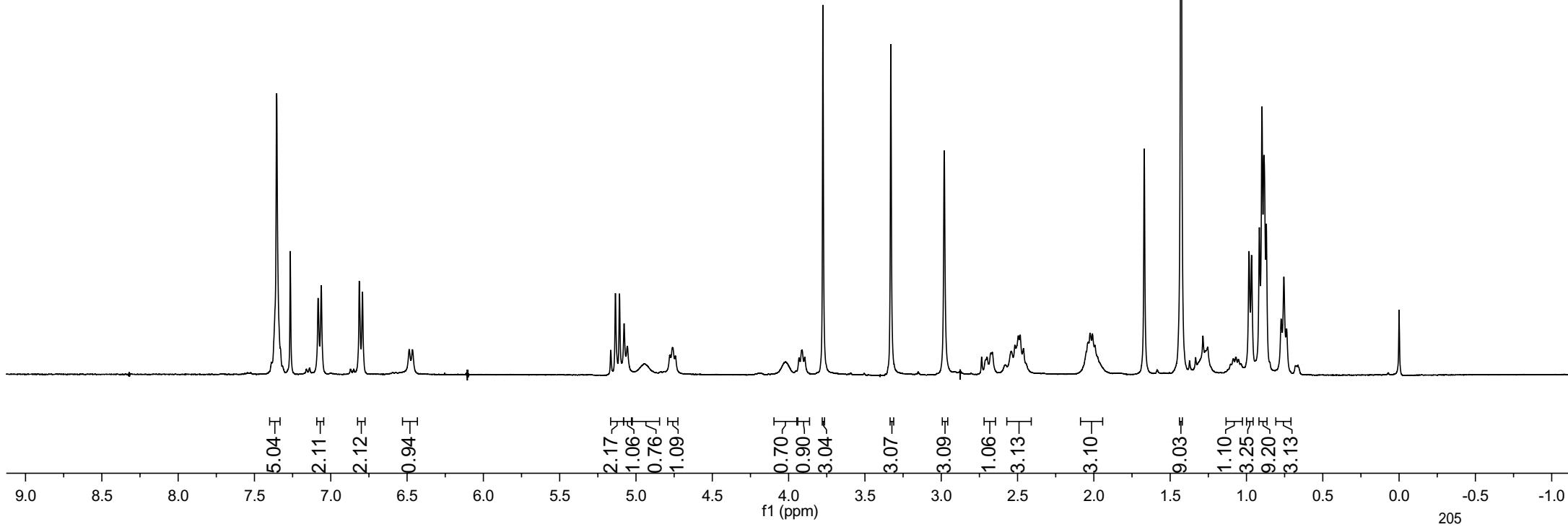
5.166  
5.135  
5.108  
5.078  
5.057  
4.946  
4.778  
4.760  
4.742  
4.019  
3.931  
3.913  
3.895  
3.775

-3.330  
2.665  
2.542  
2.518  
2.494  
2.484  
2.461  
2.025  
2.009

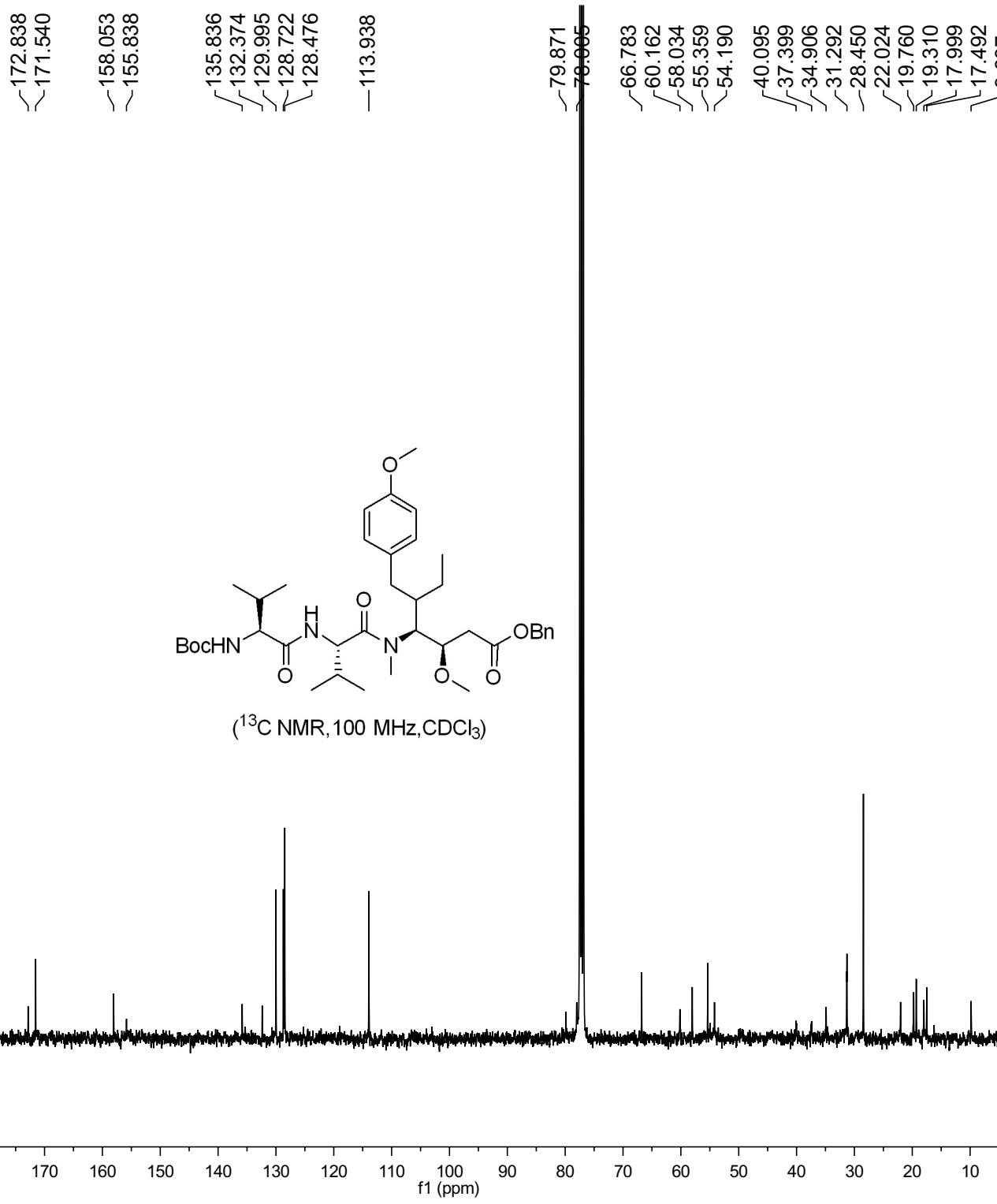
1.429  
1.086  
1.069  
1.053  
0.983  
0.967  
0.916  
0.898  
0.886  
0.870  
0.773  
0.755  
0.737



( $^1\text{H}$  NMR, 400 MHz,  $\text{CDCl}_3$ )

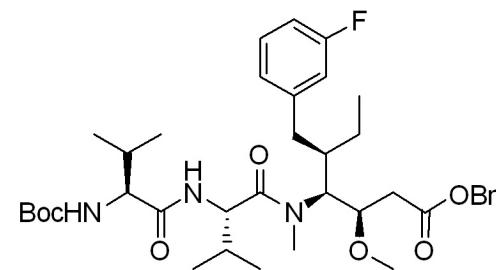


NMR spectra of compound 28d

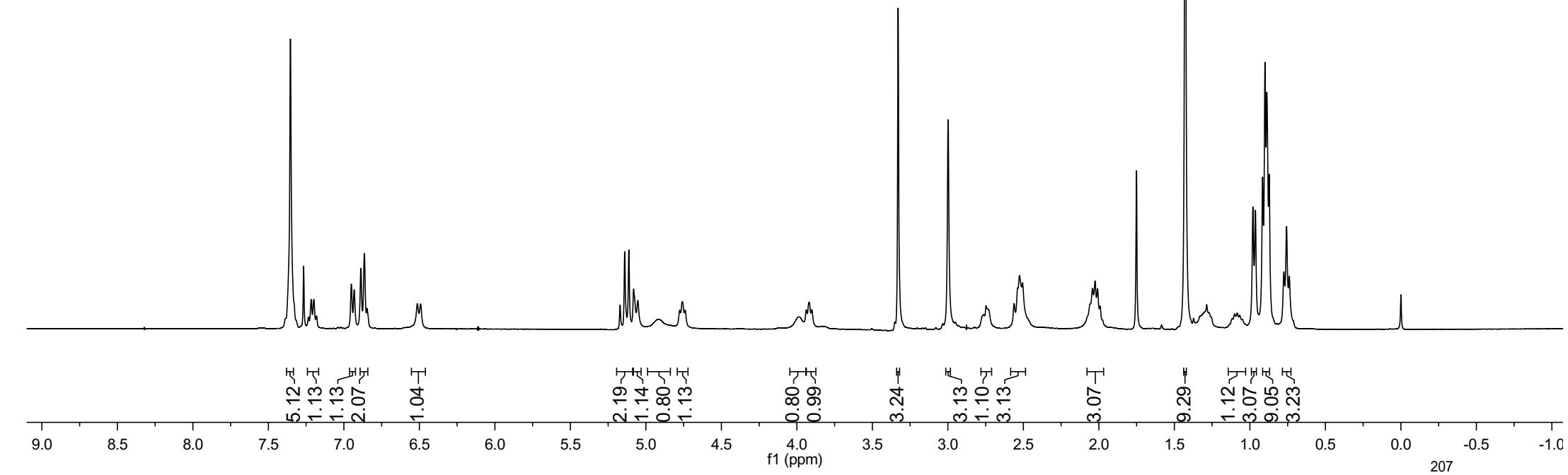


NMR spectra of compound 28e

7.354	7.234	7.217	7.199	7.181	7.151	5.140	5.113	5.081	5.053	4.914	4.776	4.759	4.740	3.984	3.938	3.919	3.901	3.329	2.998	2.764	2.747	2.562	2.526	2.505	2.042	2.025	2.008	1.428



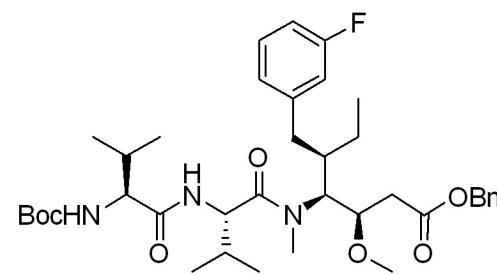
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



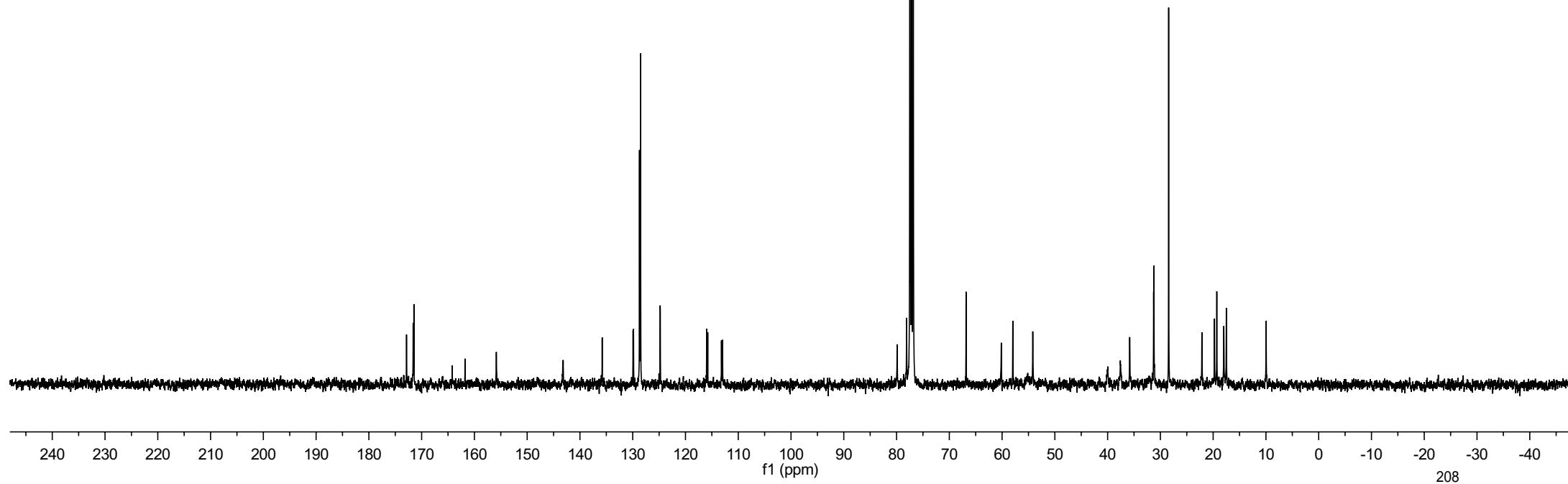
NMR spectra of compound 28e

172.863  
171.601  
171.465  
164.221  
161.783  
155.842  
143.177  
135.783  
129.928  
129.844  
128.718  
128.503  
124.795  
115.985  
115.778  
113.181  
112.972

79.887  
79.007

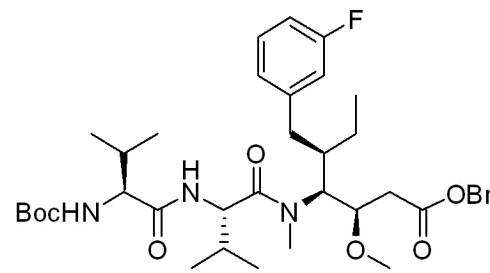


( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

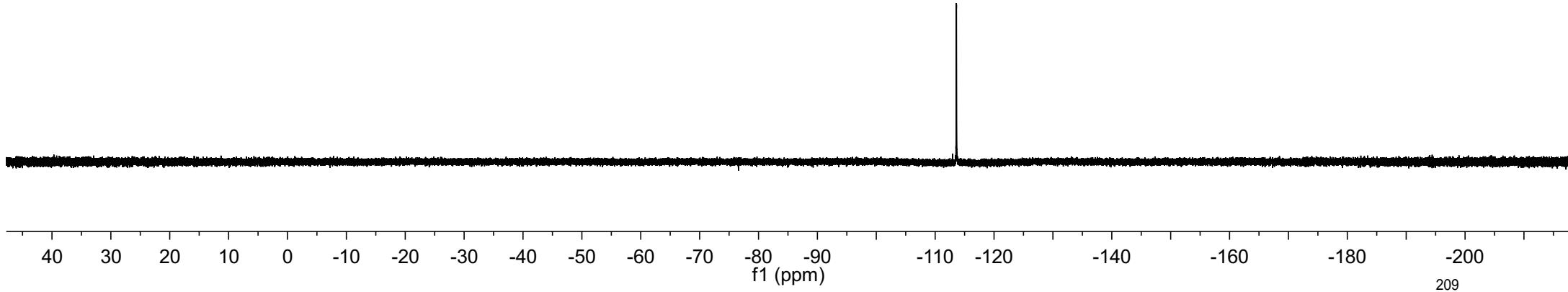


NMR spectra of compound 28e

— -113.604

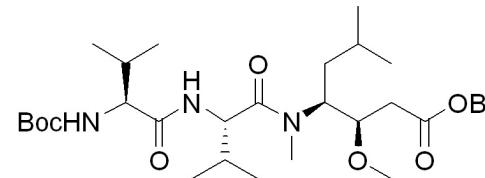


(<sup>19</sup>F NMR, 376 MHz, CDCl<sub>3</sub>)

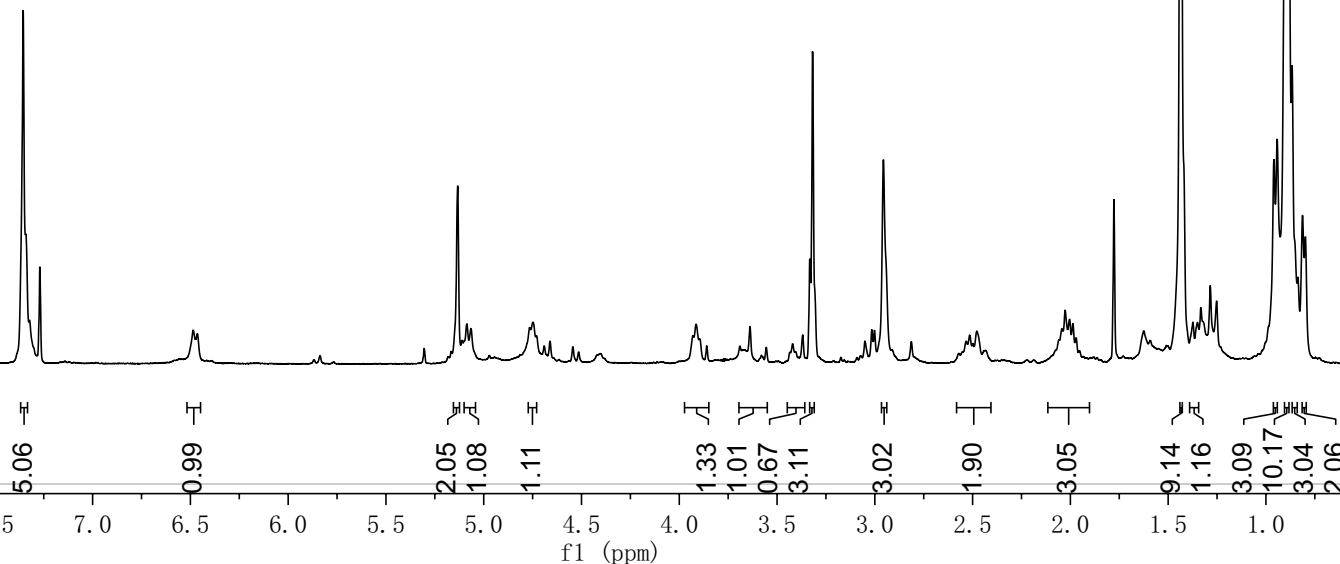


## NMR spectra of compound 28f

7.355      7.323      6.486      6.464      5.133      5.111      5.086      5.065      4.765      4.748      3.930      3.915      3.639      3.369      3.333      3.318      3.050      3.016      3.002      2.956      2.533      2.515      2.478      2.027      2.004      1.987      1.435      1.373      1.332      0.943      0.903      0.884      0.866      0.837      0.813      0.798



(<sup>1</sup> HNMR, 400 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 28f

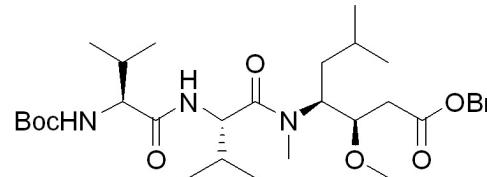
172.451  
 171.592  
 171.563  
 171.479  
 —155.813

—135.799  
 128.686  
 128.549  
 128.483  
 128.453  
 128.028  
 127.914

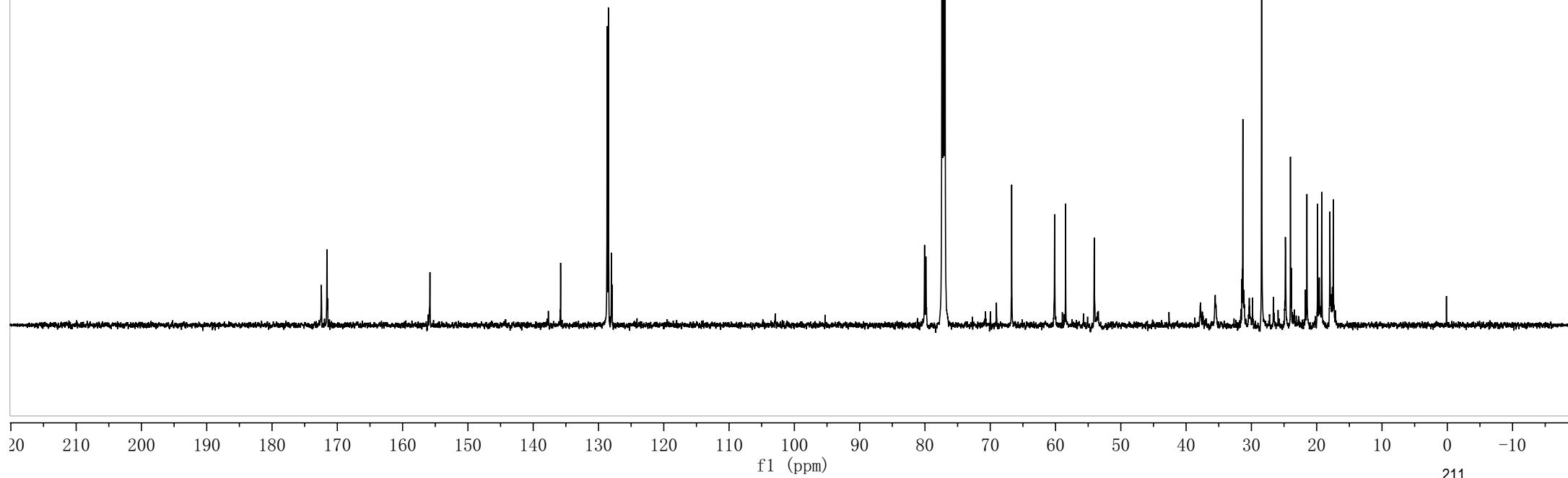
<80.062  
 <79.857

~66.718  
 60.140  
 —58.463  
 —54.071

31.304  
 28.440  
 24.796  
 24.022  
 23.885  
 21.724  
 21.499  
 19.863  
 19.608  
 19.230  
 17.984  
 17.817  
 17.597  
 17.462

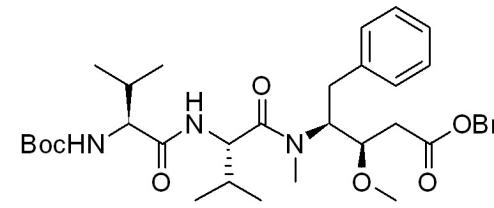


( $^{13}\text{C}$ NMR, 150 MHz,  $\text{CDCl}_3$ )

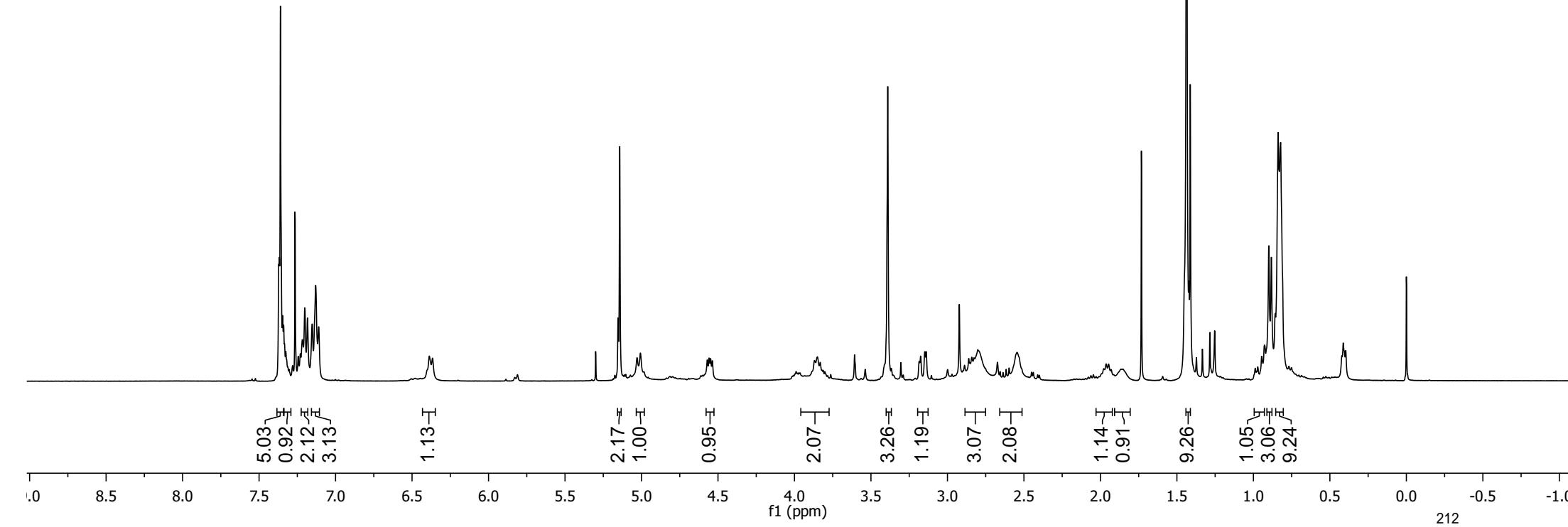


NMR spectra of compound 28g

7.371	7.367	7.347	7.339	7.334	7.244	7.230	7.217	7.201	7.184	7.153	7.130	7.110	6.387	6.366	5.153	5.142	5.029	5.007	3.989	3.869	3.850	3.832	3.812	3.801	3.390	3.367	3.185	3.175	3.148	3.139	2.922	2.888	2.861	2.854	2.841	2.826	2.802	2.673	2.656	2.616	2.597	2.545	2.450	1.979	1.963	1.946	1.930	1.853	1.437	1.421	1.413	0.988	0.971	0.946	0.928	0.899	0.883	0.857	0.838	0.822	0.768	0.751	0.421	0.412	0.396
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------



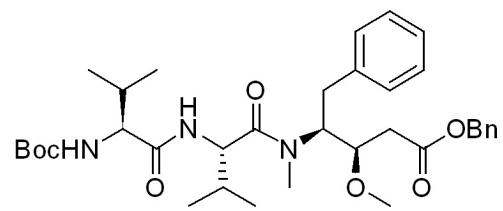
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



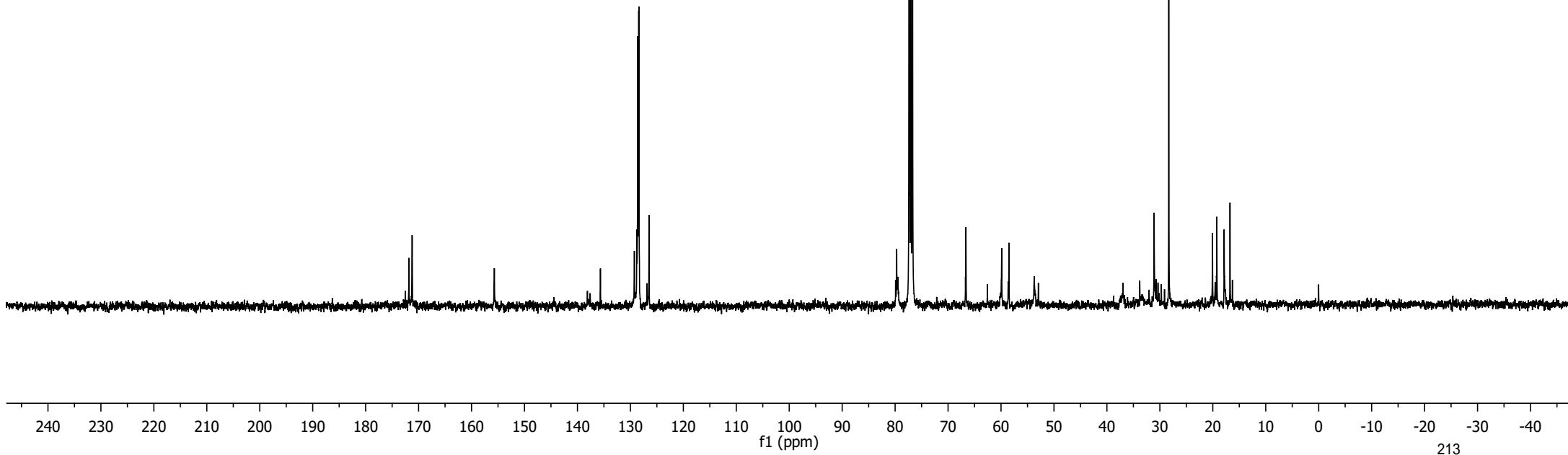
NMR spectra of compound 28g

172.524  
171.828  
171.216  
155.692  
138.115  
137.595  
135.658  
129.249  
128.791  
128.598  
128.539  
128.428  
128.382  
126.845  
126.480  
125.618

79.908  
79.709  
79.537  
79.478  
66.714  
66.629  
59.951  
59.880  
58.512  
53.719  
53.774  
33.799  
32.039  
31.083  
30.670  
30.351  
29.719  
29.126  
28.320  
20.067  
19.542  
19.320  
19.242  
17.858  
17.785  
16.752  
16.306



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 29a

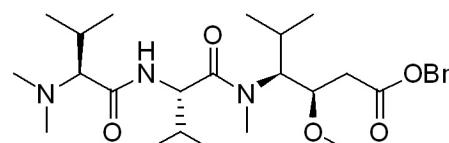
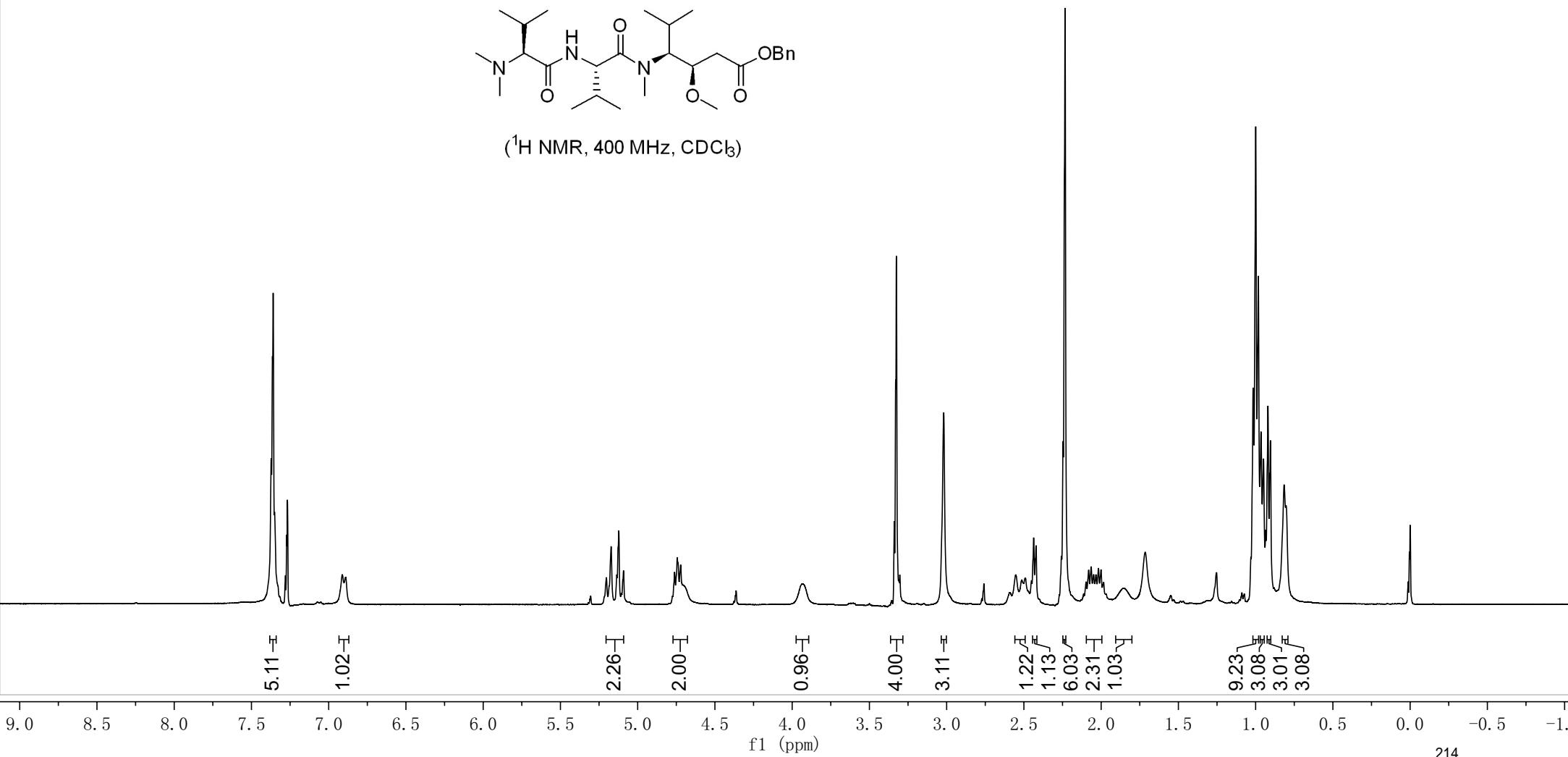
7.372  
 7.364  
 7.359  
 7.350  
 6.911  
 6.890

5.202  
 5.172  
 5.135  
 5.122  
 5.092  
 4.761  
 4.744  
 4.722

-3.930

3.339  
 3.330  
 3.326  
 3.303  
 3.019

2.437  
 2.421  
 2.257  
 2.246  
 2.234  
 2.081  
 2.065  
 2.018  
 2.001  
 0.999  
 0.983  
 0.965  
 0.949  
 0.934  
 0.920  
 0.904  
 0.815

(¹H NMR, 400 MHz, CDCl<sub>3</sub>)

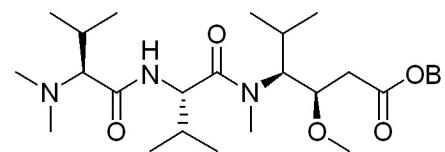
NMR spectra of compound 29a

173.624  
171.984  
171.728

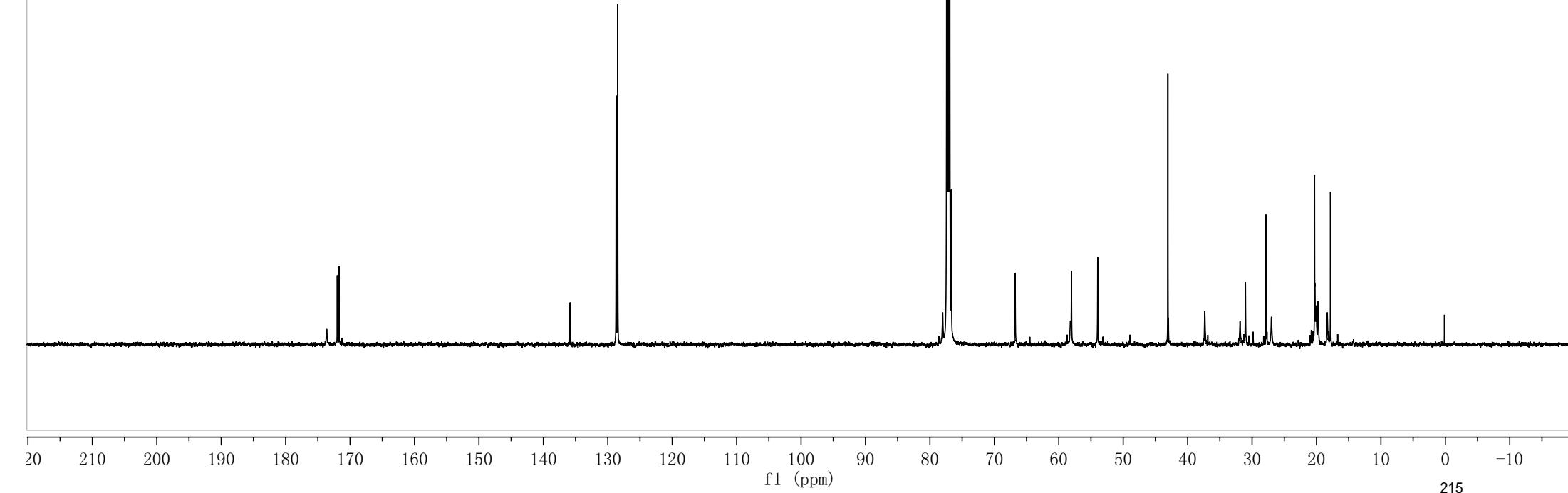
-135.861  
128.712  
128.542  
128.462

78.019  
76.664

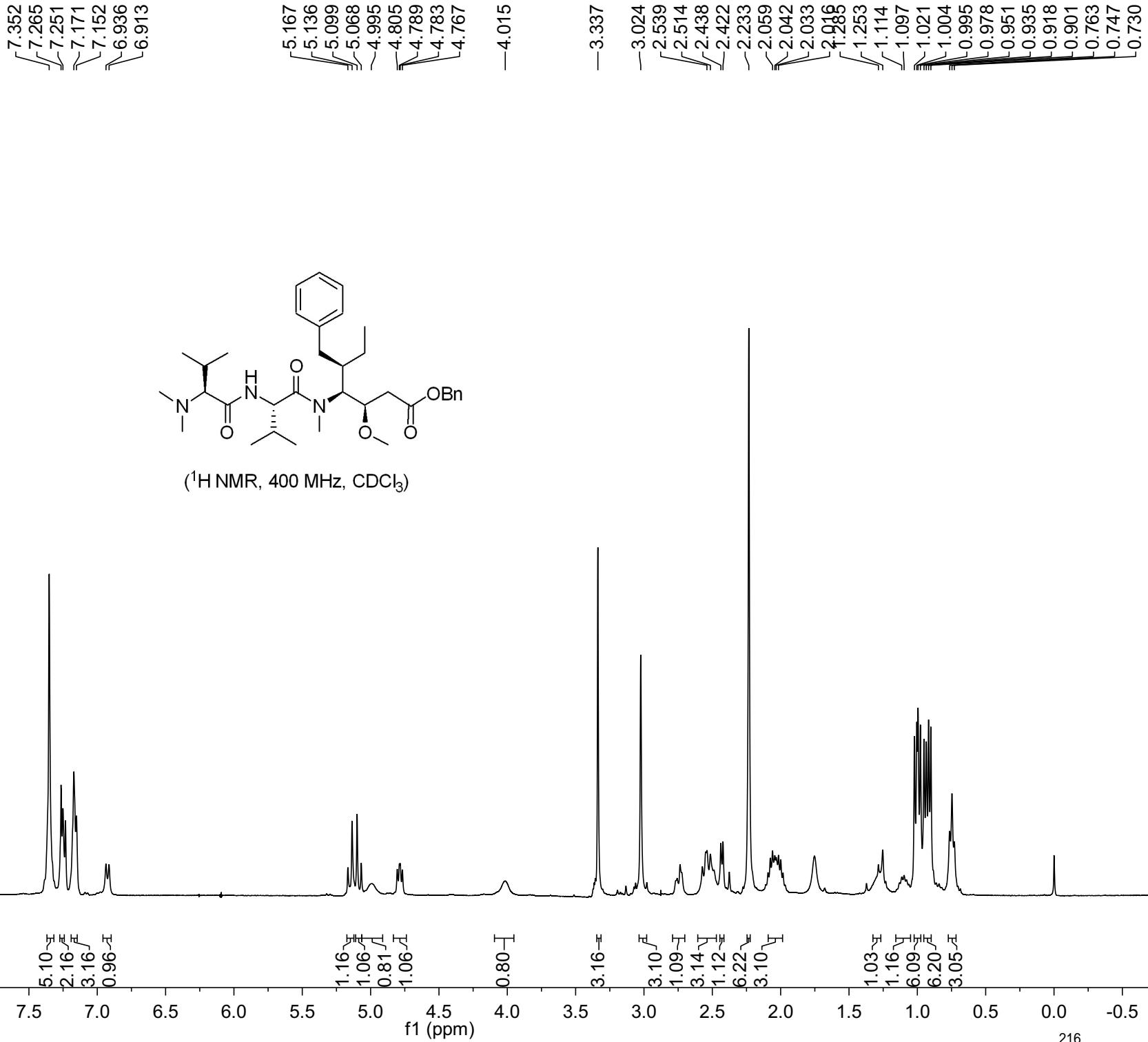
-66.766  
58.200  
58.033  
53.960  
43.065  
42.979  
37.342  
31.869  
31.032  
27.814  
26.996  
20.303  
20.236  
20.052  
19.750  
18.328  
17.830



(<sup>13</sup>C NMR, 150 MHz, CDCl<sub>3</sub>)

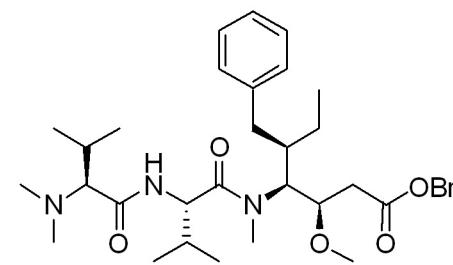


NMR spectra of compound 29c

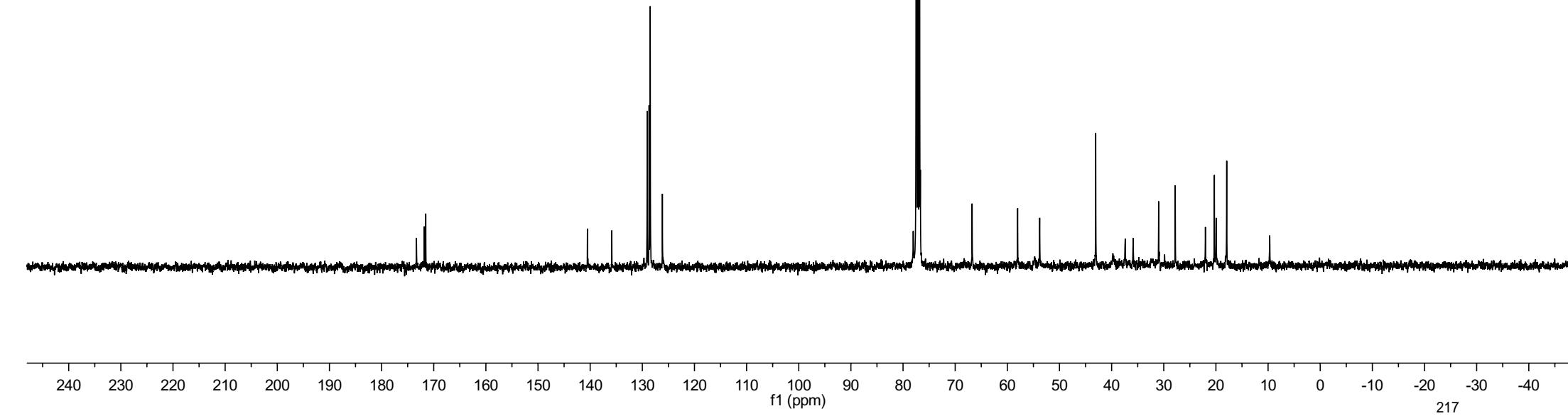


NMR spectra of compound 29c

173.312  
171.805  
171.525  
140.527  
135.850  
129.069  
128.706  
128.478  
126.147  
70.073  
66.754  
58.029  
53.798  
43.053  
37.401  
35.867  
30.988  
27.796  
22.018  
20.297  
19.957  
17.933  
9.685



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )



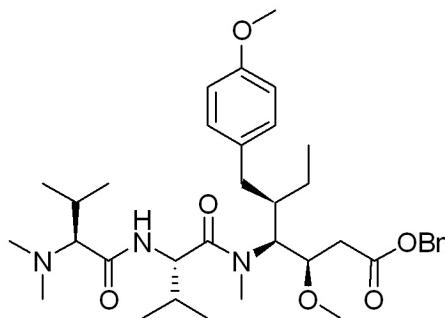
## NMR spectra of compound 29d

7.354  
 7.266  
 7.087  
 7.066  
 6.943  
 6.921  
 6.811  
 6.790

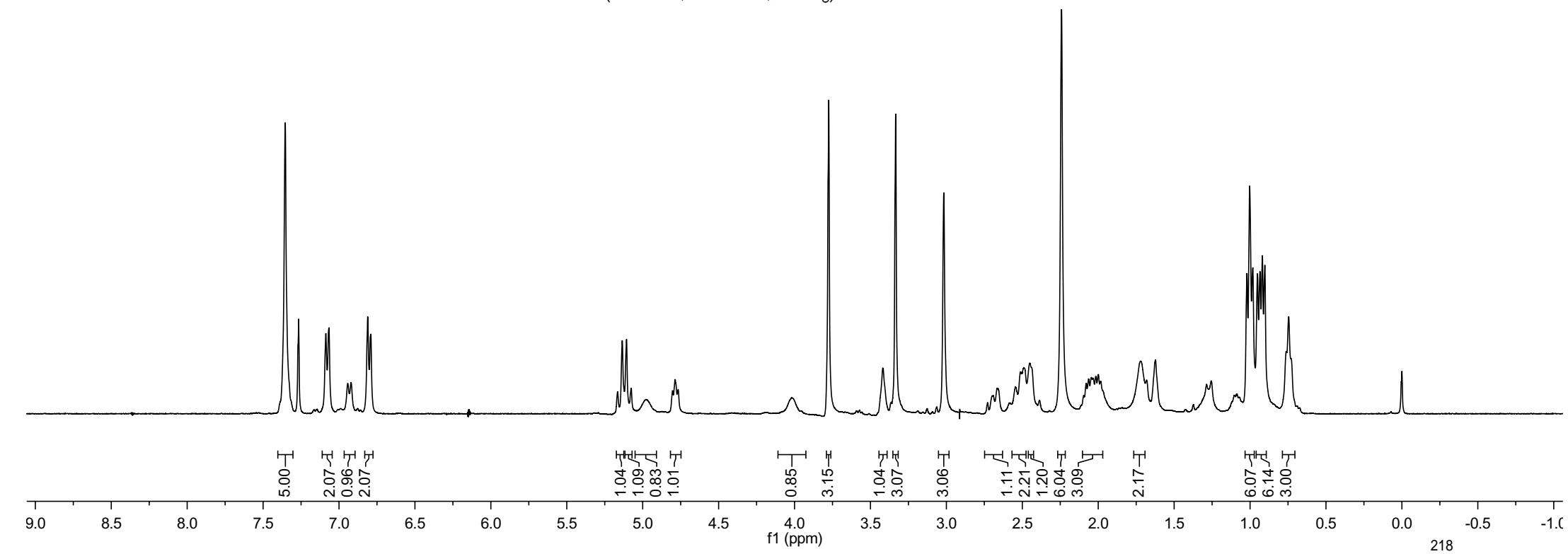
5.135  
 5.107  
 4.977  
 4.803  
 4.787  
 4.766

-4.015  
 -3.775  
 -3.334  
 -3.017  
 -2.665  
 -2.490  
 -2.242  
 2.063  
 2.046  
 2.016  
 1.799  
 -1.623

1.286  
 1.256  
 1.020  
 1.003  
 0.982  
 0.951  
 0.935  
 0.919  
 0.903  
 0.746



(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

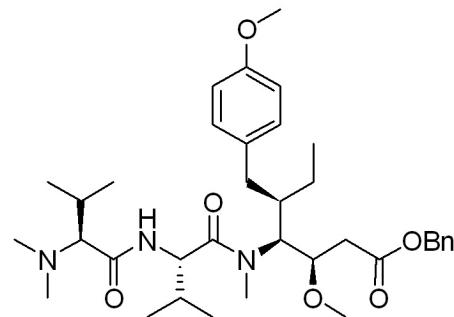


NMR spectra of compound 29d

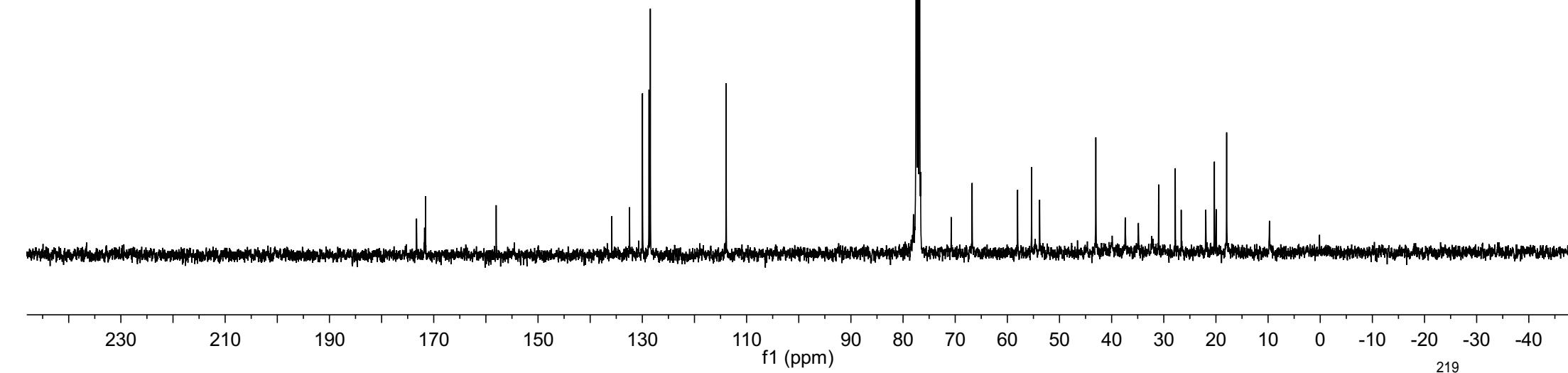
—173.299  
—171.572  
—158.023

135.852  
132.449  
129.973  
128.714  
128.464

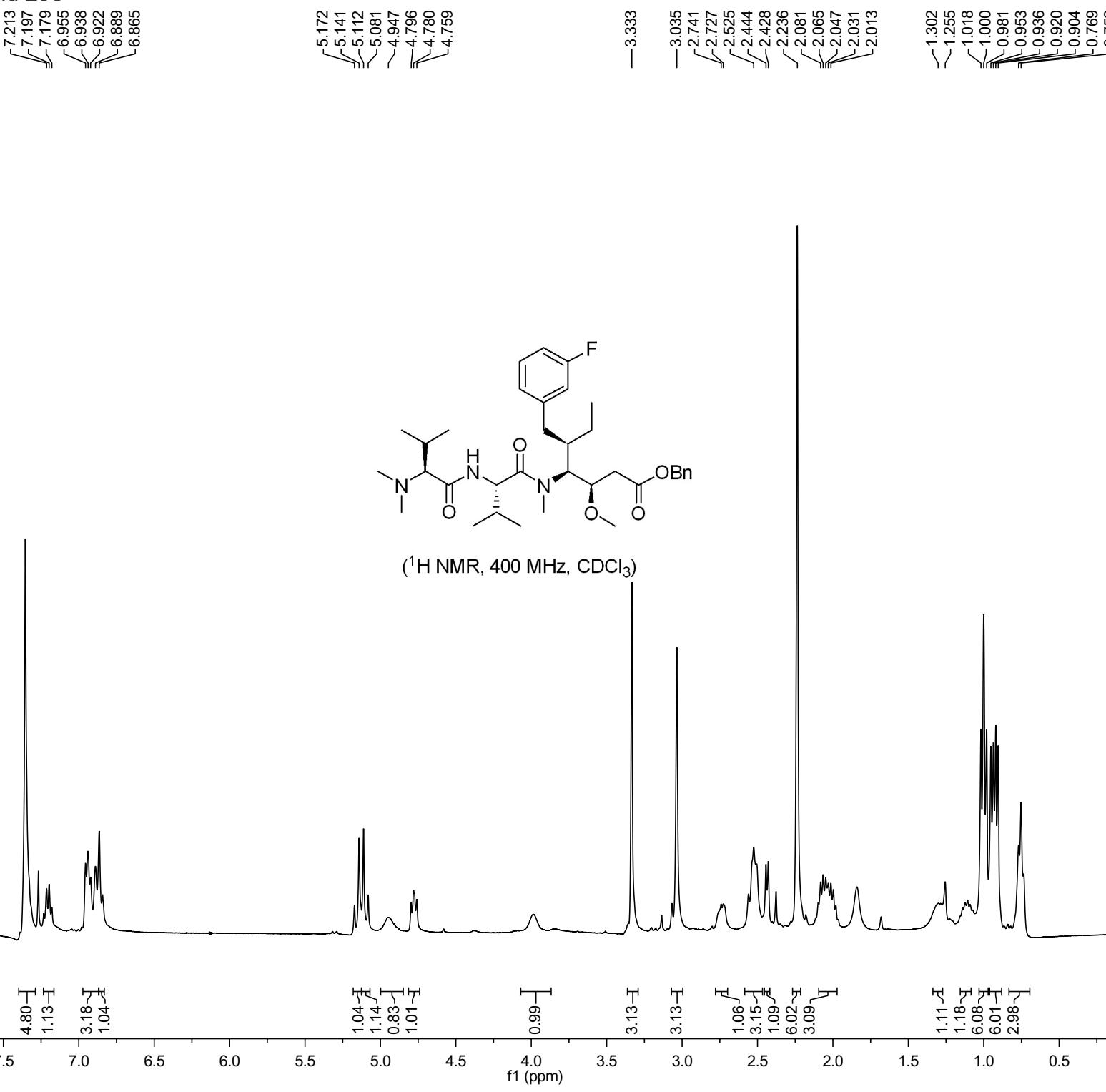
—113.928



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



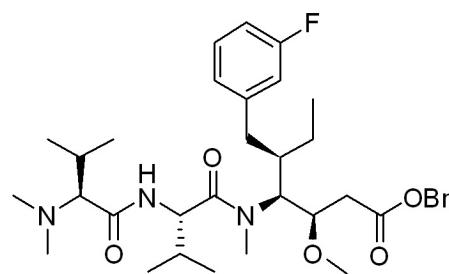
## NMR spectra of compound 29e



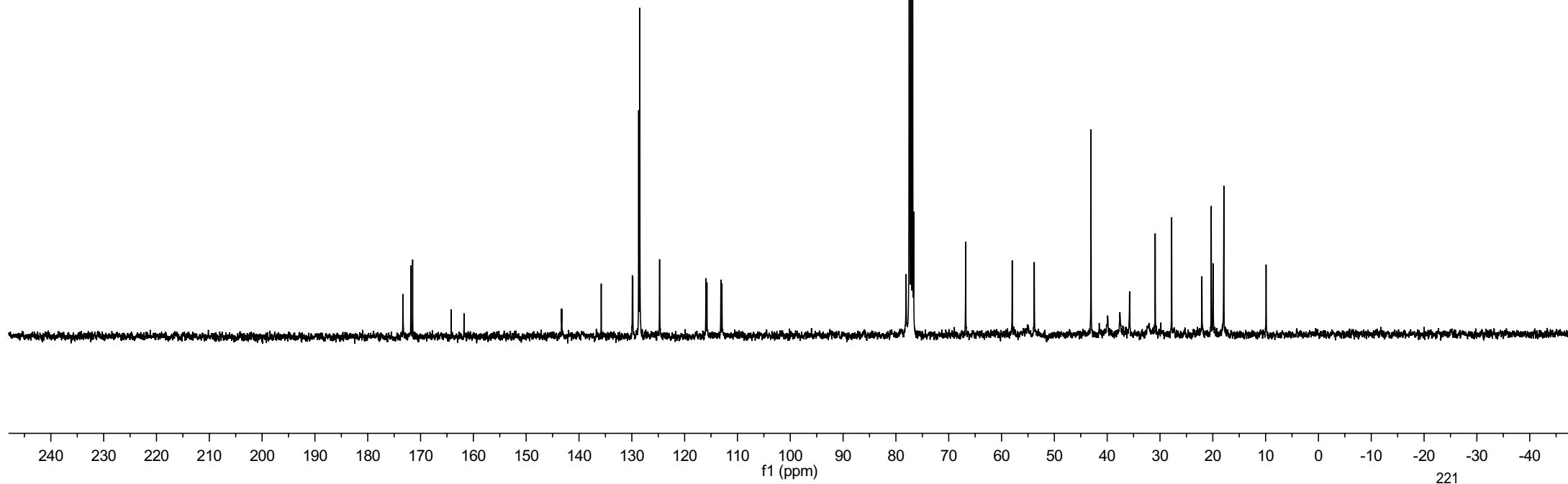
NMR spectra of compound 29e

173.331  
171.842  
171.503  
164.210  
161.771  
143.317  
143.246  
129.904  
129.821  
128.706  
128.487  
124.754  
125.783  
115.776  
113.142  
112.933

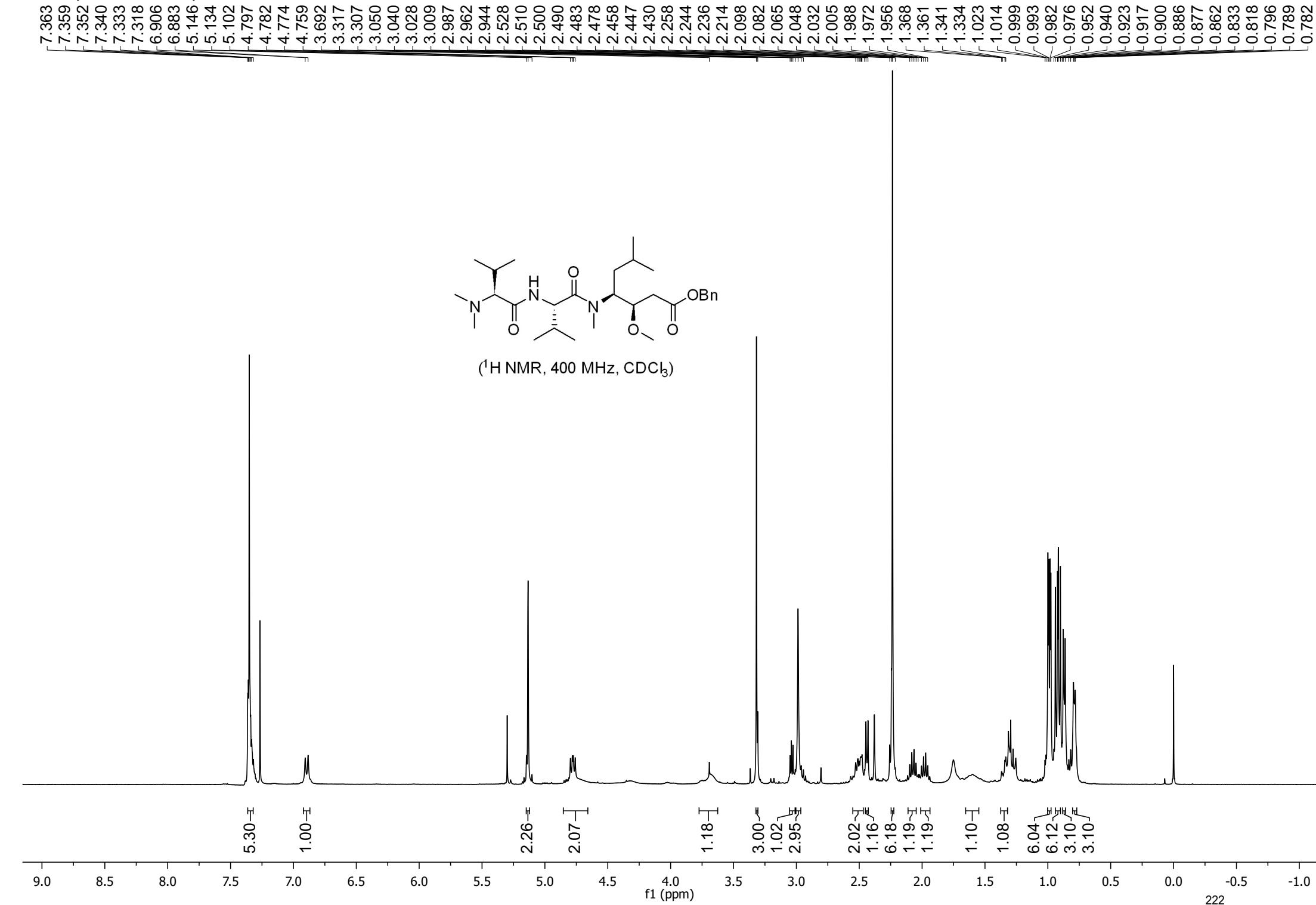
78.081  
76.643  
66.797  
57.983  
53.806  
43.060  
35.758  
30.908  
27.787  
22.066  
20.293  
19.956  
17.913  
9.913



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)



## NMR spectra of compound 29f



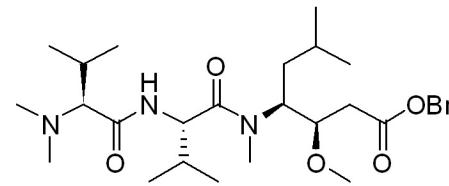
NMR spectra of compound 29f

172.746  
171.723  
171.535

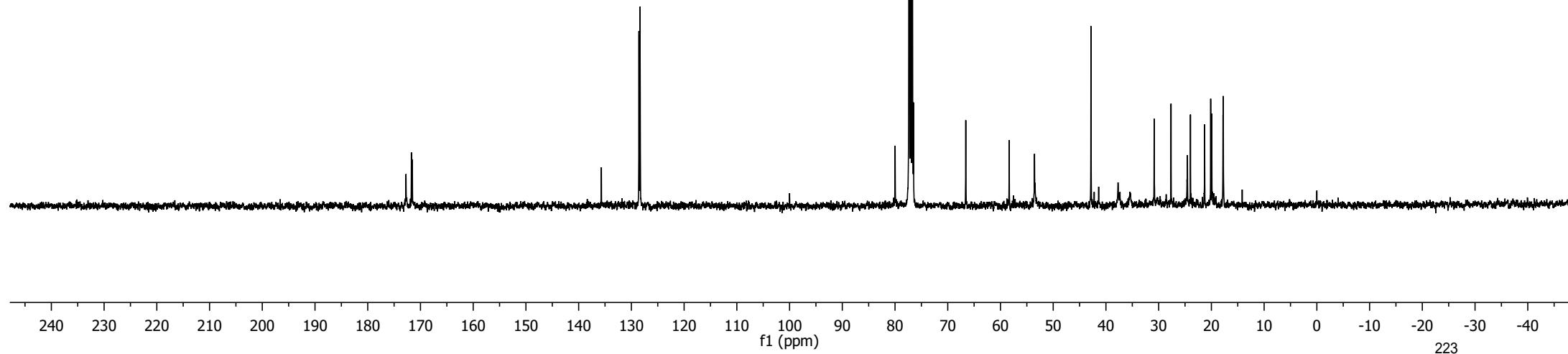
135.692  
128.566  
128.354

79.983  
76.502

66.583  
58.349  
53.549  
53.437  
42.839  
37.708  
30.854  
27.658  
24.622  
24.550  
23.976  
21.286  
20.135  
19.931  
17.796  
17.746



( $^{13}\text{C}$  NMR, 100 MHz,  $\text{CDCl}_3$ )

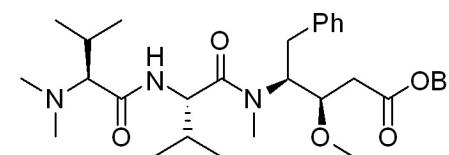
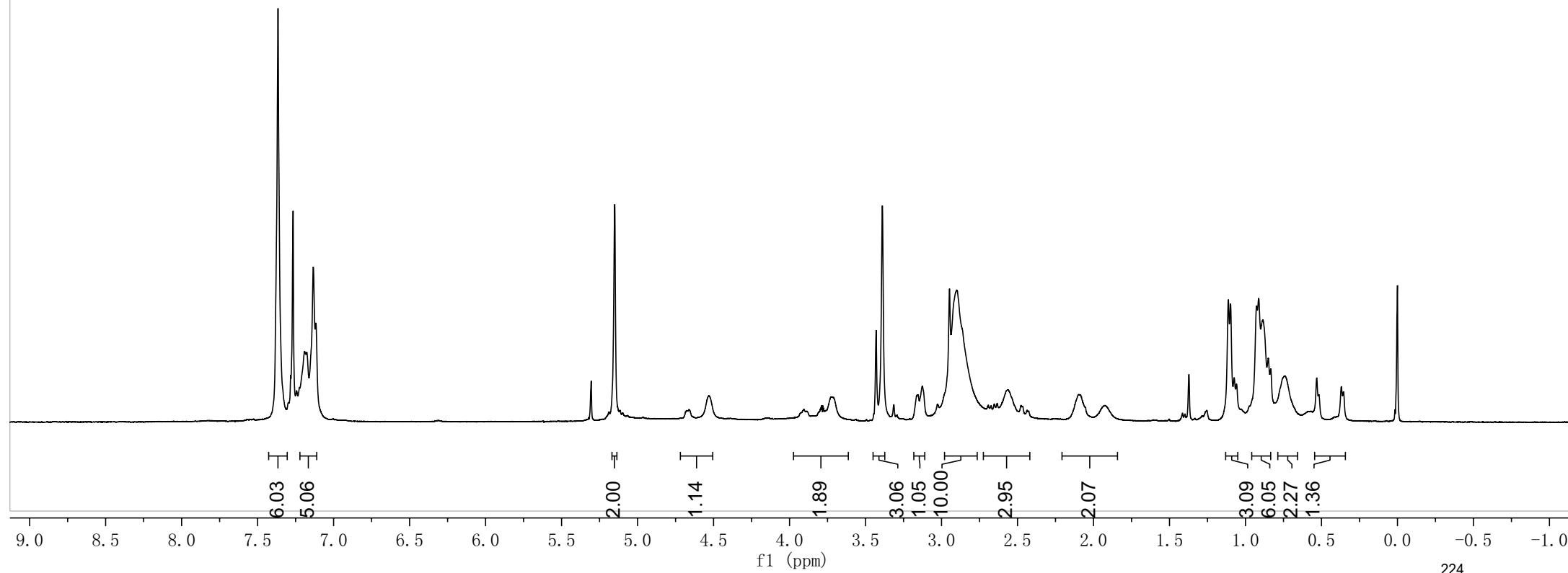


## NMR spectra of compound 29g

7.366  
7.244  
7.191  
7.178  
7.134  
7.117

-5.150  
-4.662  
-4.531  
3.791  
3.788  
3.784  
3.782  
3.781  
3.724  
3.430  
3.389  
3.155  
3.127  
2.947  
2.900  
2.653  
2.634  
2.561  
2.096  
-1.929

1.113  
1.098  
1.074  
1.059  
0.928  
0.913  
0.884  
0.850  
0.833  
0.739  
0.531  
0.369  
0.355

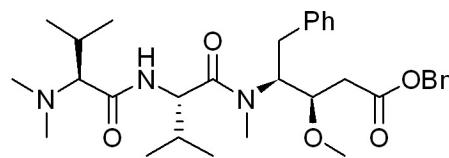
(1<sup>H</sup> NMR, 400 MHz, CDCl<sub>3</sub>)

NMR spectra of compound 29g

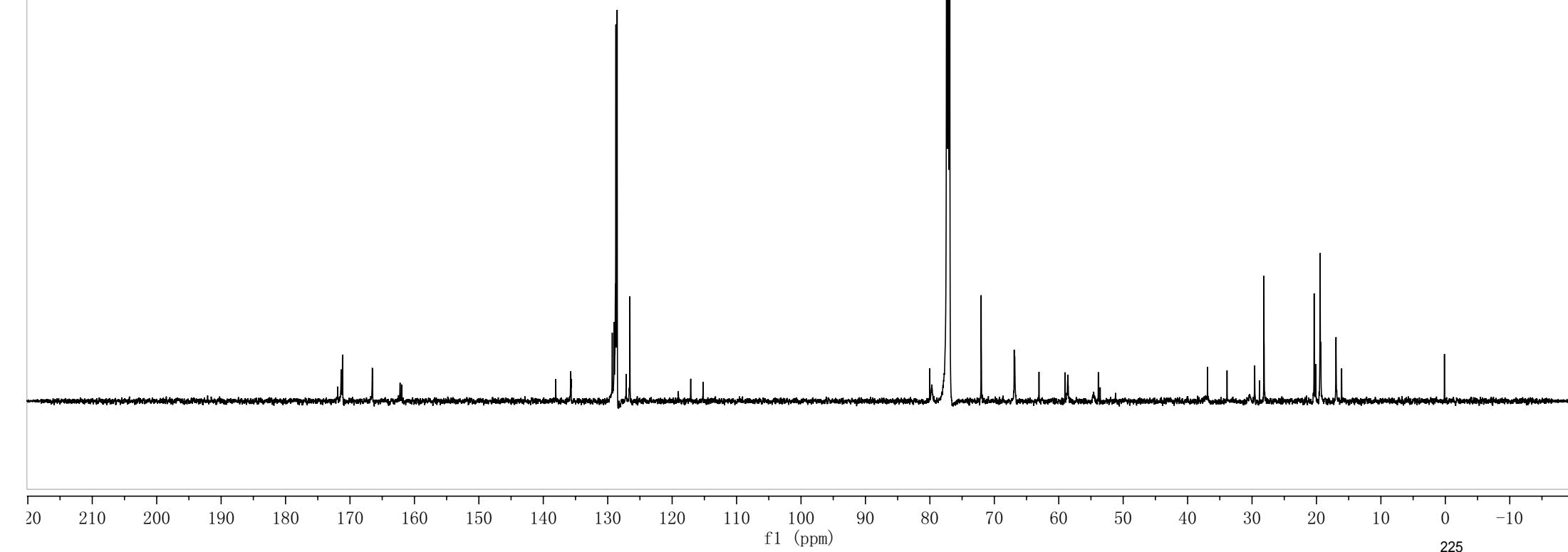
171.91  
171.37  
171.16  
166.53  
166.49  
162.23  
161.97  
135.74  
135.67  
129.29  
129.01  
128.80  
128.73  
128.58  
128.54  
127.14  
126.56  
115.20

80.02  
79.71  
72.04  
66.92  
66.83  
63.06  
59.04  
58.59  
53.86  
53.57

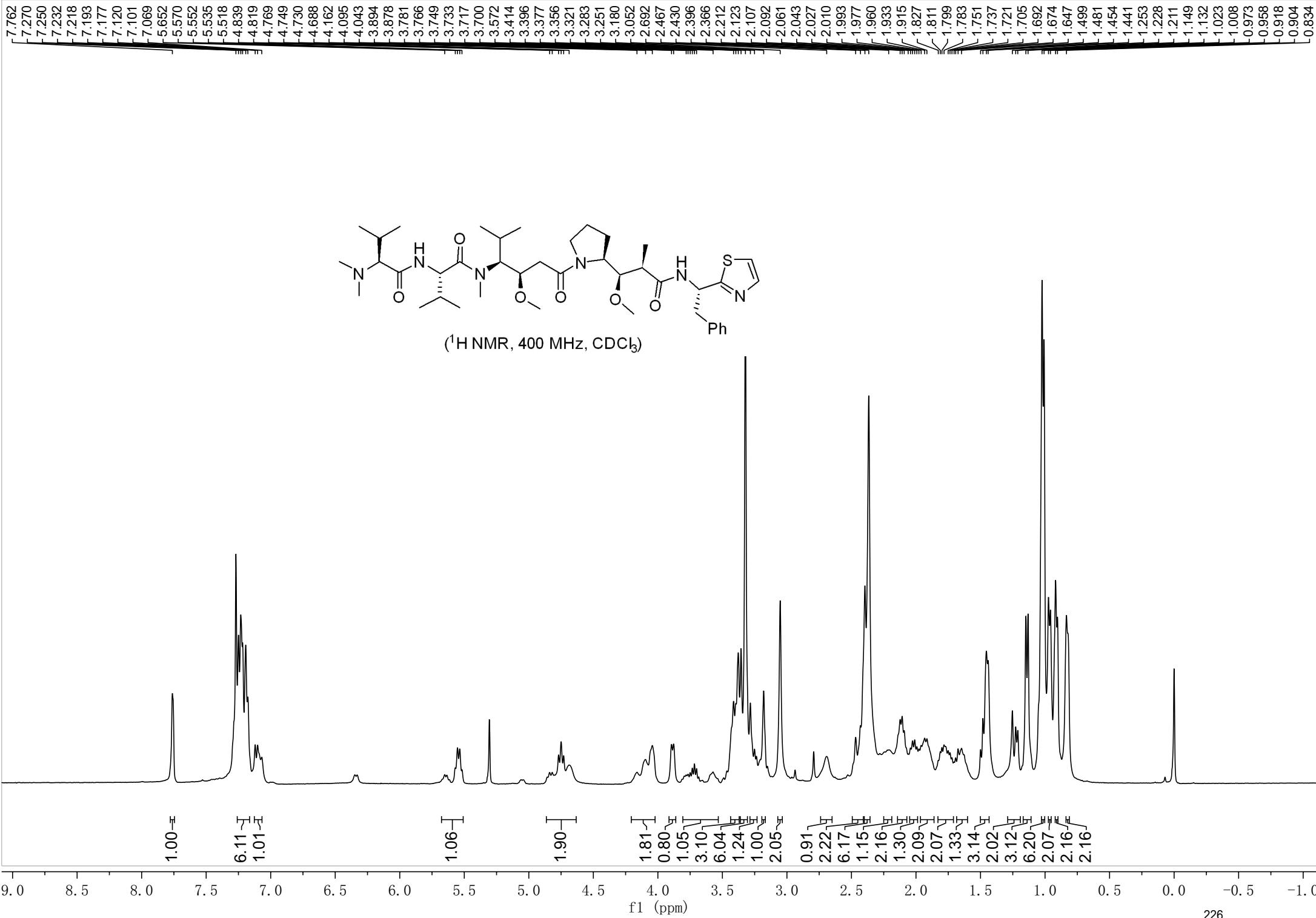
36.91  
33.88  
29.59  
28.85  
28.15  
20.36  
20.12  
19.43  
19.36  
19.31  
16.97  
16.09



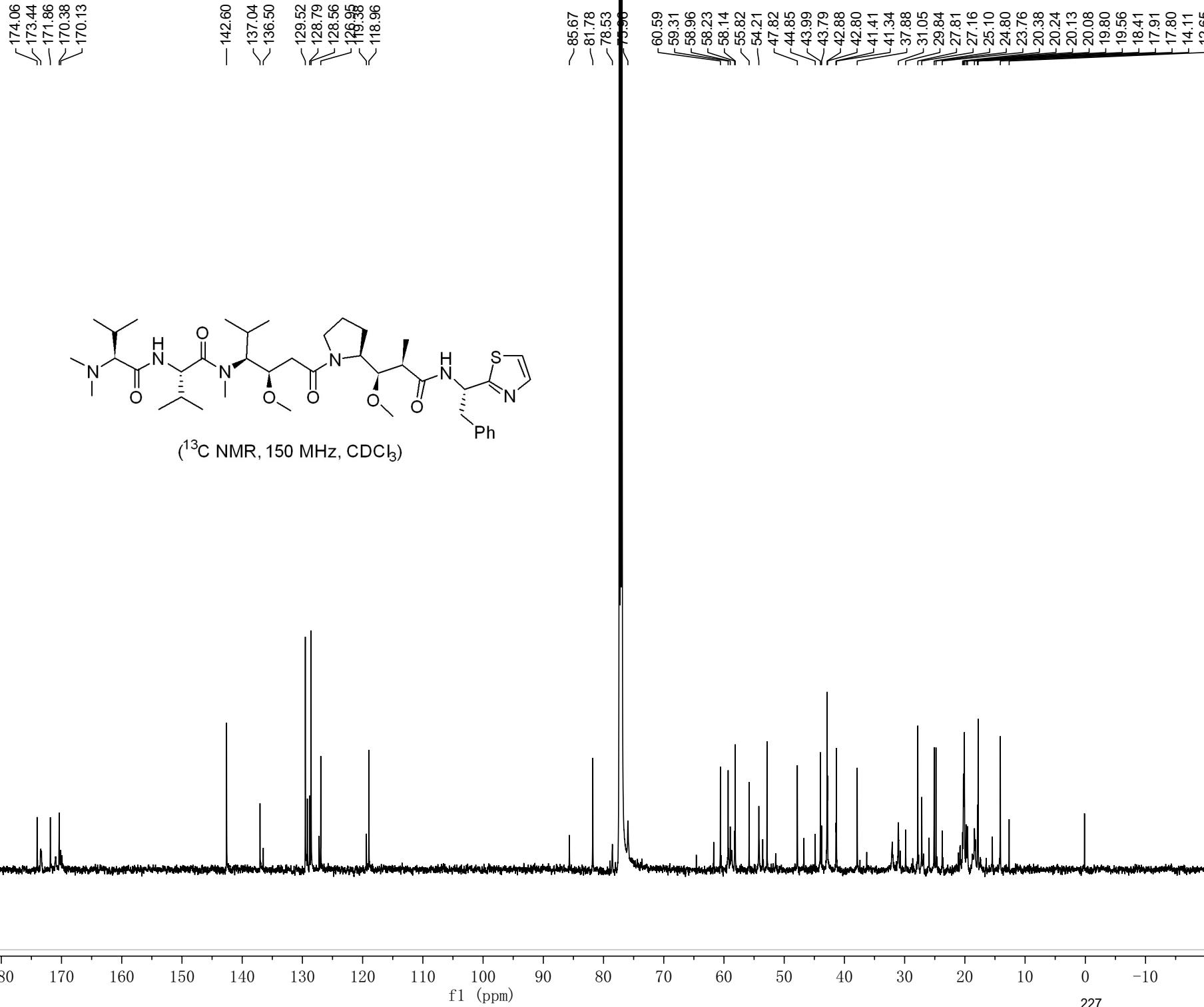
(<sup>13</sup>CNMR, 150 MHz, CDCl<sub>3</sub>)



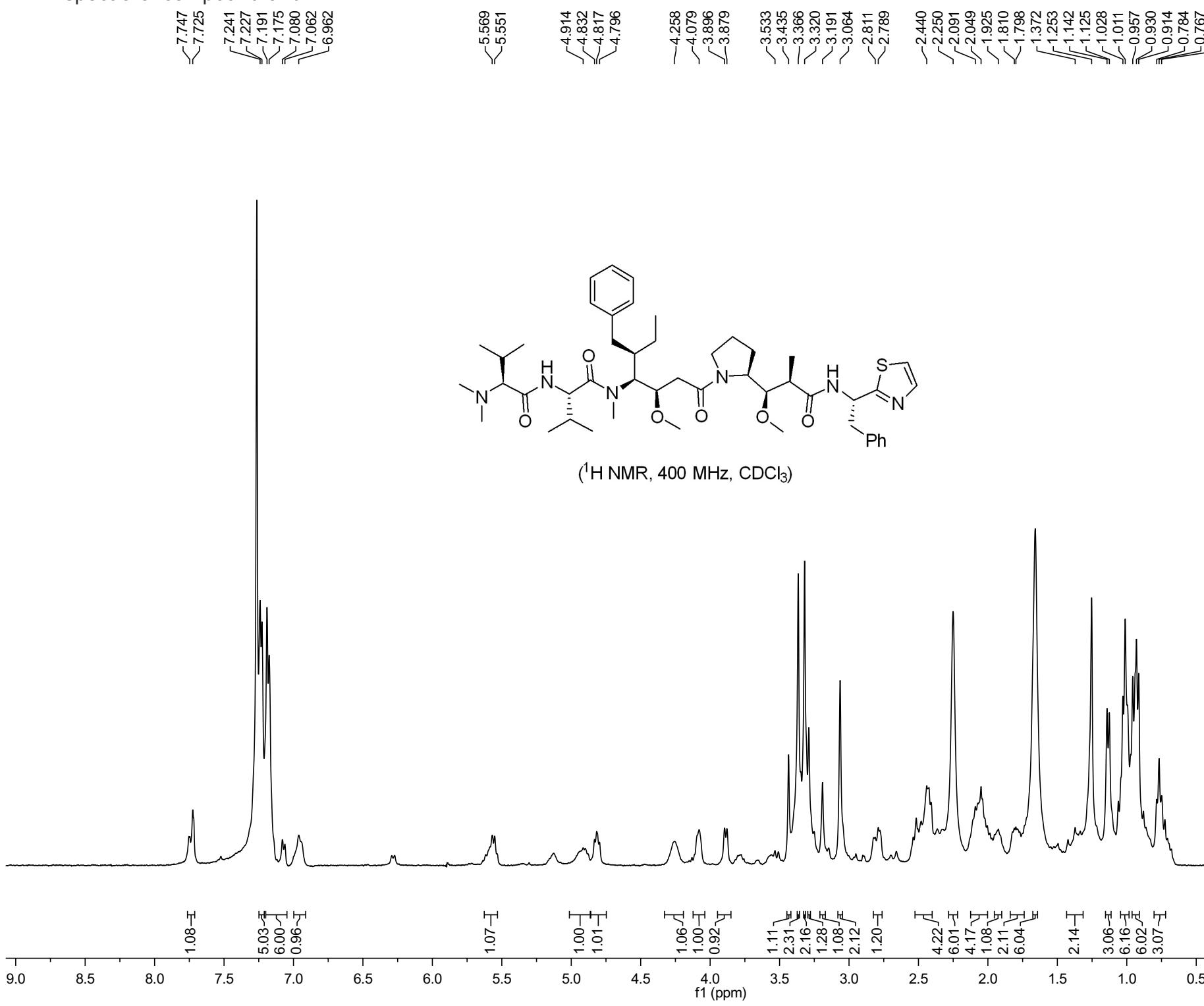
## NMR spectra of compound 31a



## NMR spectra of compound 31a



NMR spectra of compound 31b



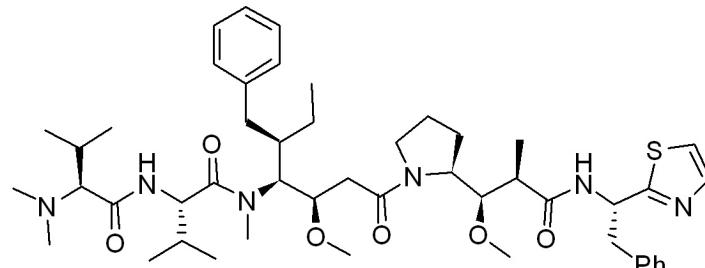
NMR spectra of compound 31b

173.860  
 173.251  
 171.743  
 170.130

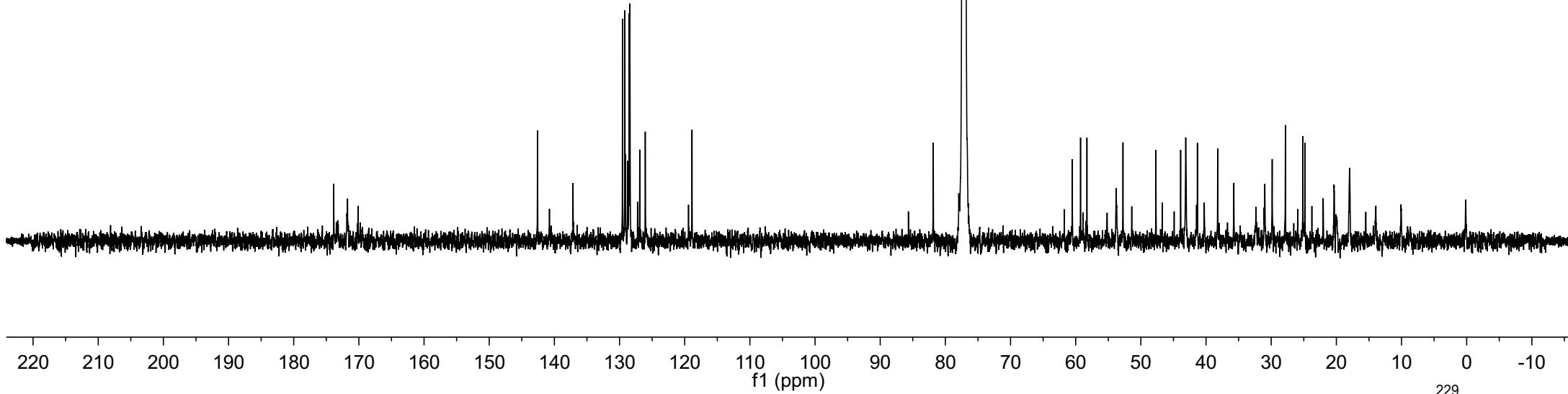
142.591  
 140.759  
 137.136  
 129.553  
 129.180  
 128.534  
 128.410  
 126.055  
 118.879

-85.672  
 -81.856

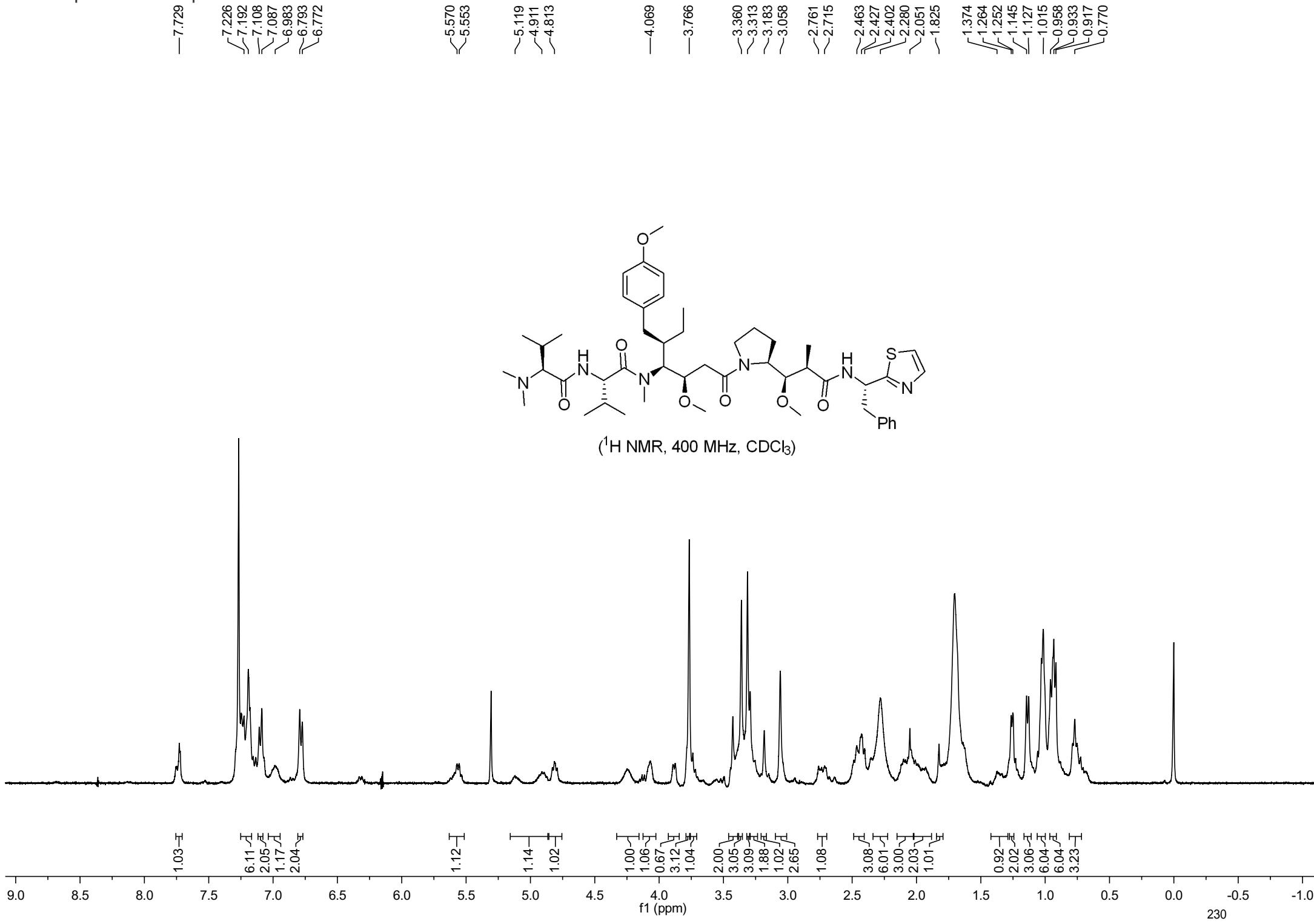
61.742  
 60.530  
 59.258  
 58.275  
 53.788  
 52.746  
 51.398  
 47.692  
 46.717  
 44.890  
 43.895  
 43.115  
 41.459  
 41.327  
 40.275  
 38.212  
 35.729  
 32.340  
 30.980  
 29.848  
 27.818  
 25.931  
 25.138  
 24.813  
 23.760  
 22.024  
 20.361  
 17.973  
 13.938  
 10.078



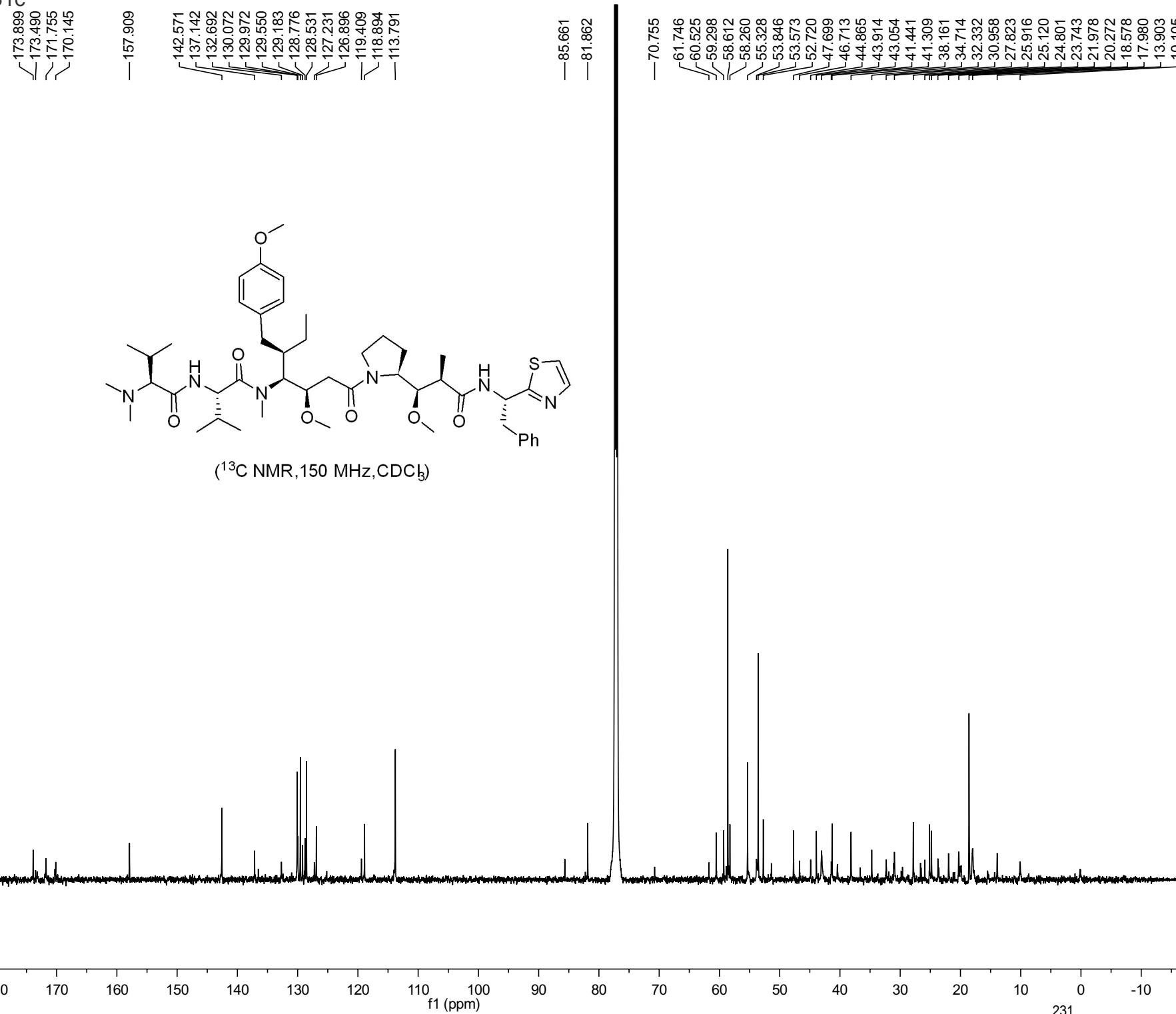
(<sup>13</sup>C NMR, 150 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 31c



NMR spectra of compound 31c



NMR spectra of compound 31d

7.746, 7.727, 7.225, 7.206, 7.187, 6.977, 6.960, 6.910, 6.883, 6.854, 6.333

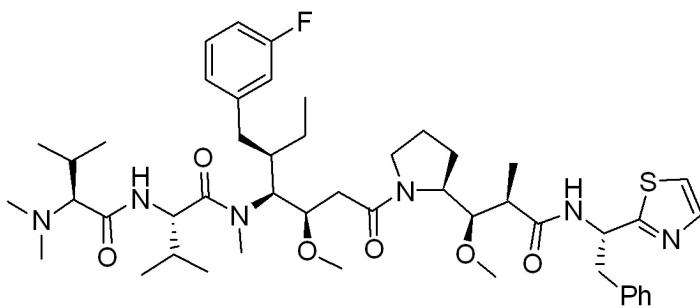
5.588, 5.570, 5.554

4.880, 4.815, 4.795, 4.778

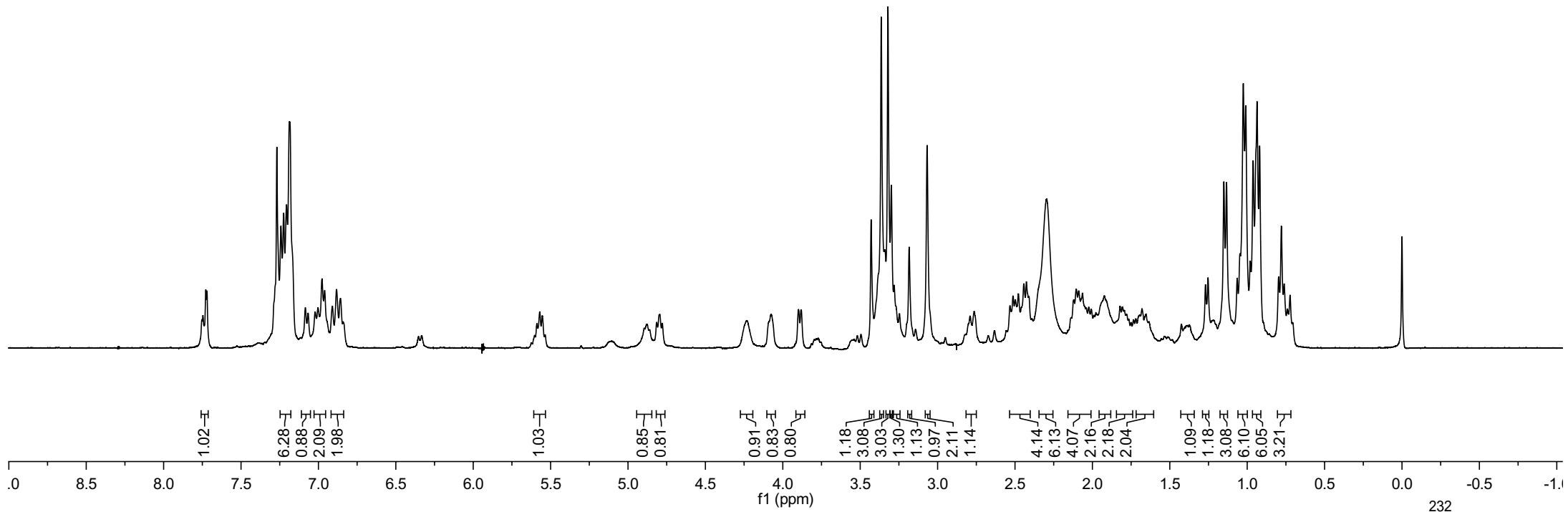
-4.232, -4.075, -3.899, -3.881

3.429, 3.364, 3.321, 3.299, 3.184, 3.068

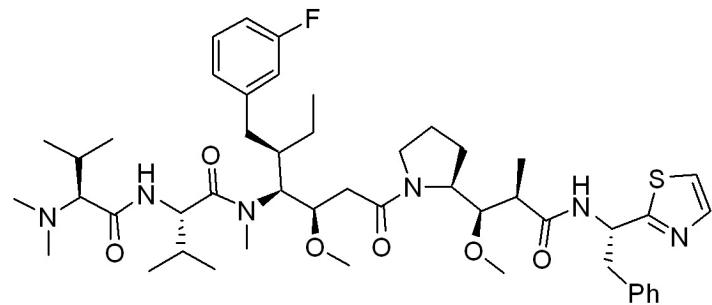
-2.763, 2.479, 2.442, 2.426, 2.296, 2.104, 2.088, 2.064, 1.923, 1.822, 1.806, 1.680, 1.655, 1.425, 1.270, 1.151, 1.134, 1.025, 1.009, 0.962, 0.936, 0.920, 0.797, 0.779, 0.761



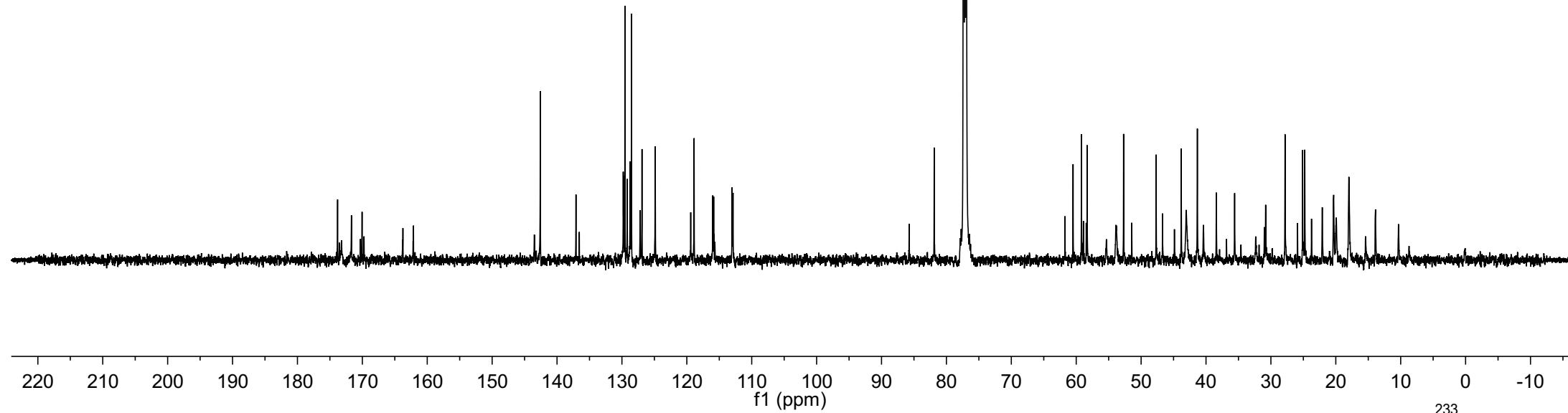
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)



NMR spectra of compound 31d

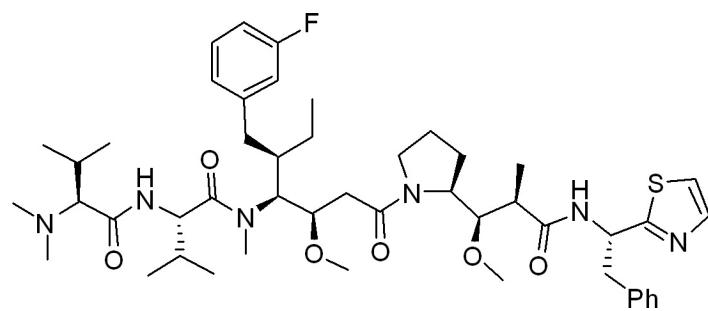


( $^{13}\text{C}$  NMR, 150 MHz,  $\text{CDCl}_3$ )

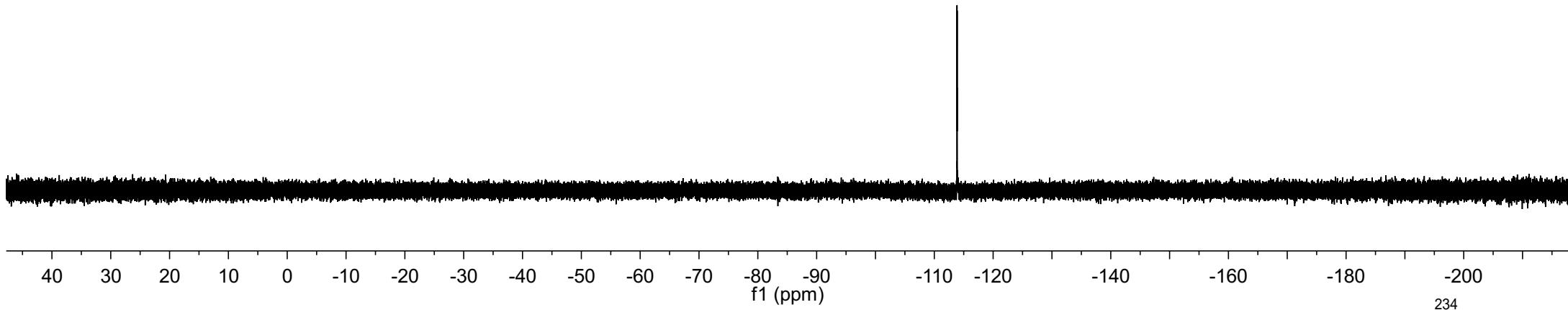


NMR spectra of compound 31d

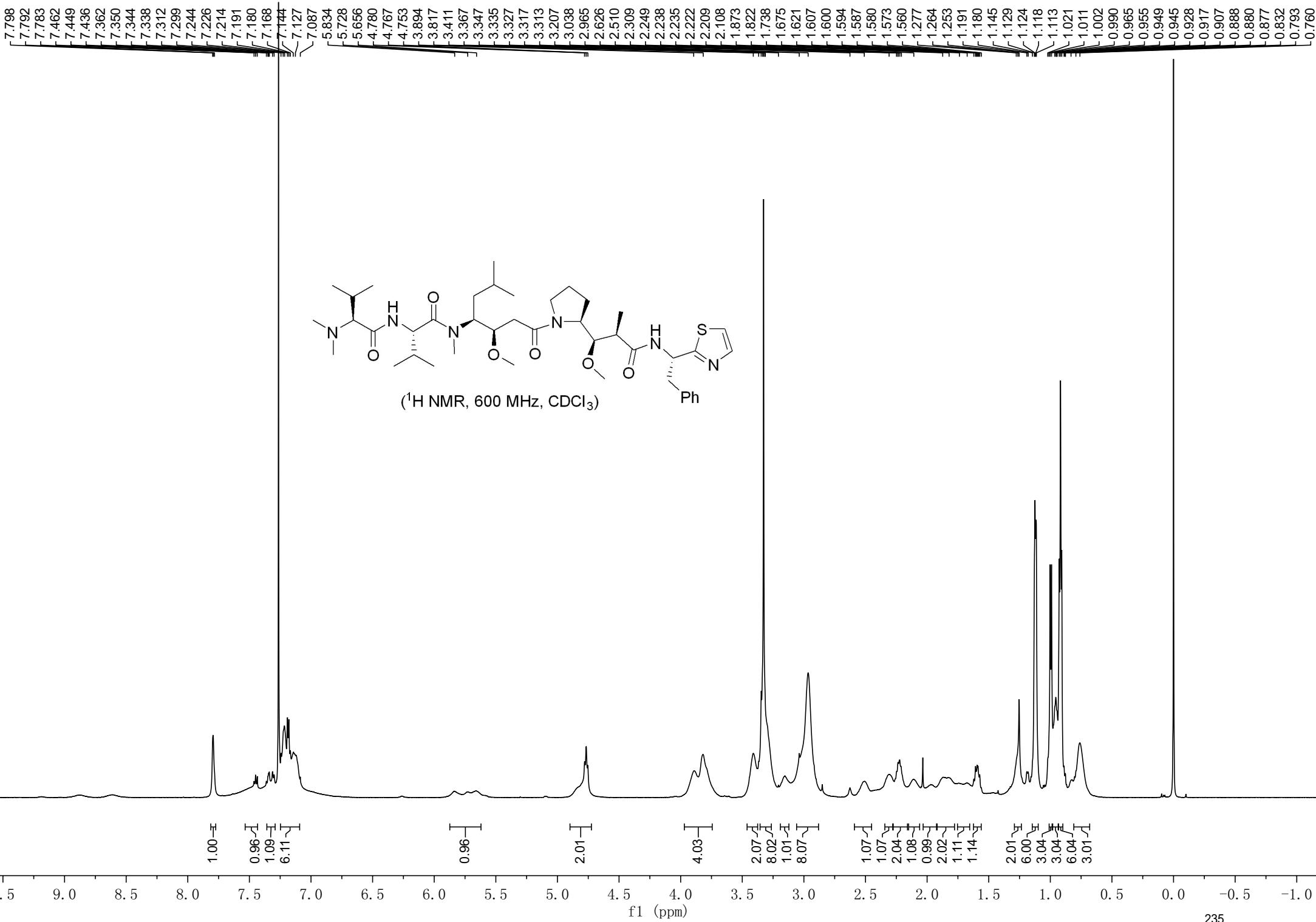
-113.862



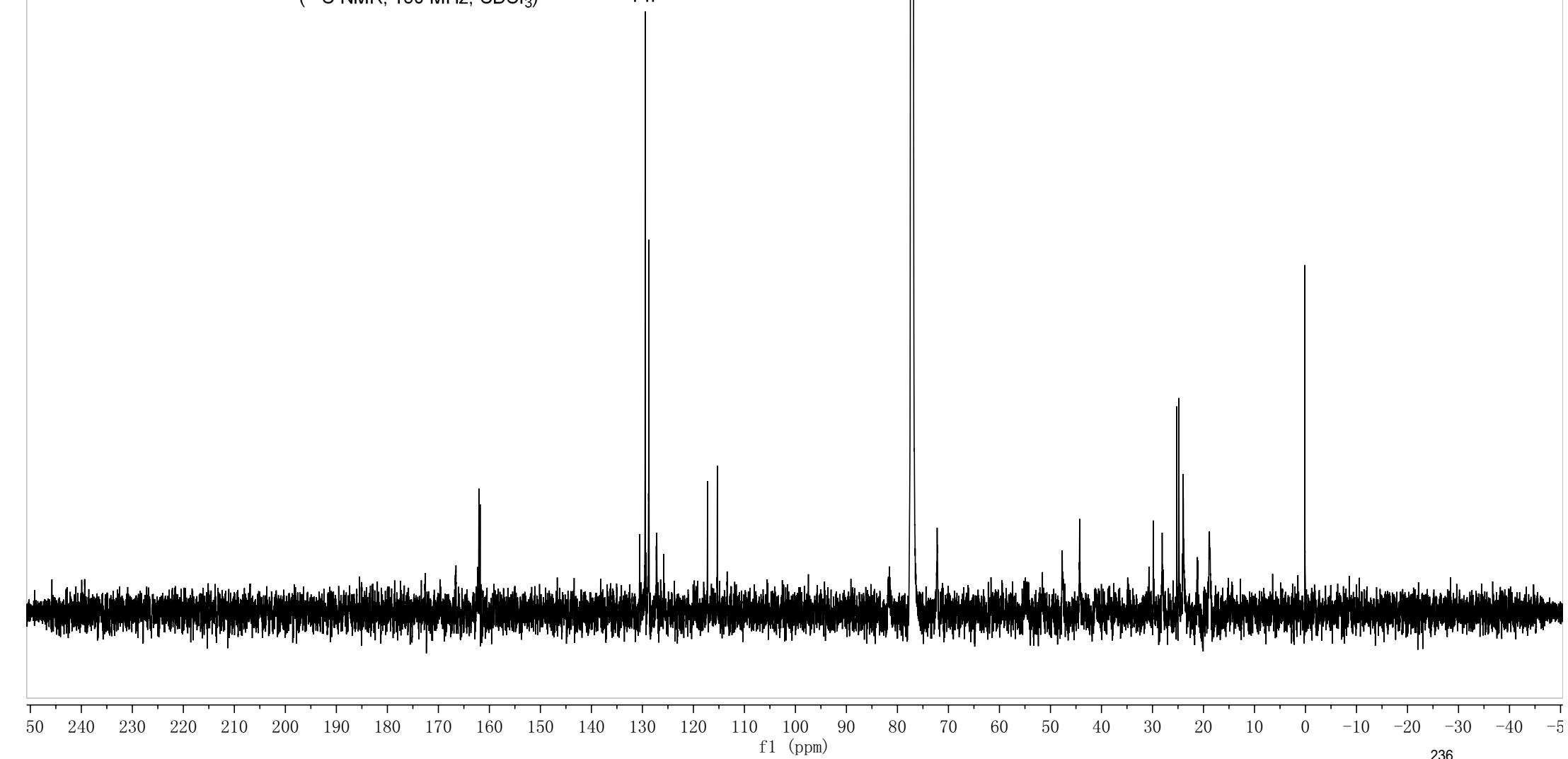
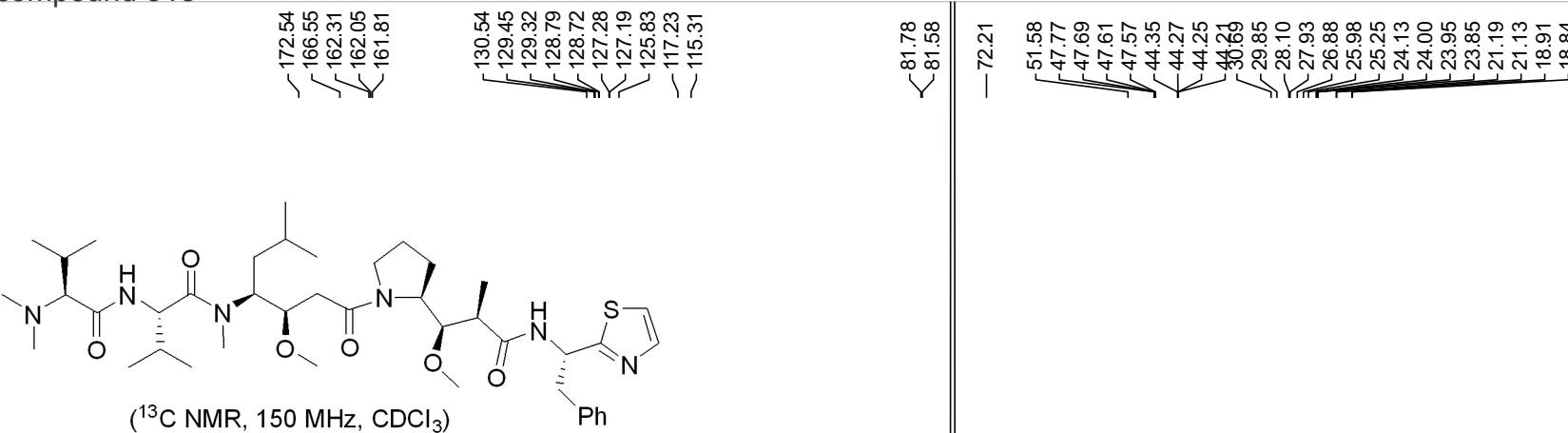
(<sup>19</sup>F NMR, 376 MHz, CDCl<sub>3</sub>)



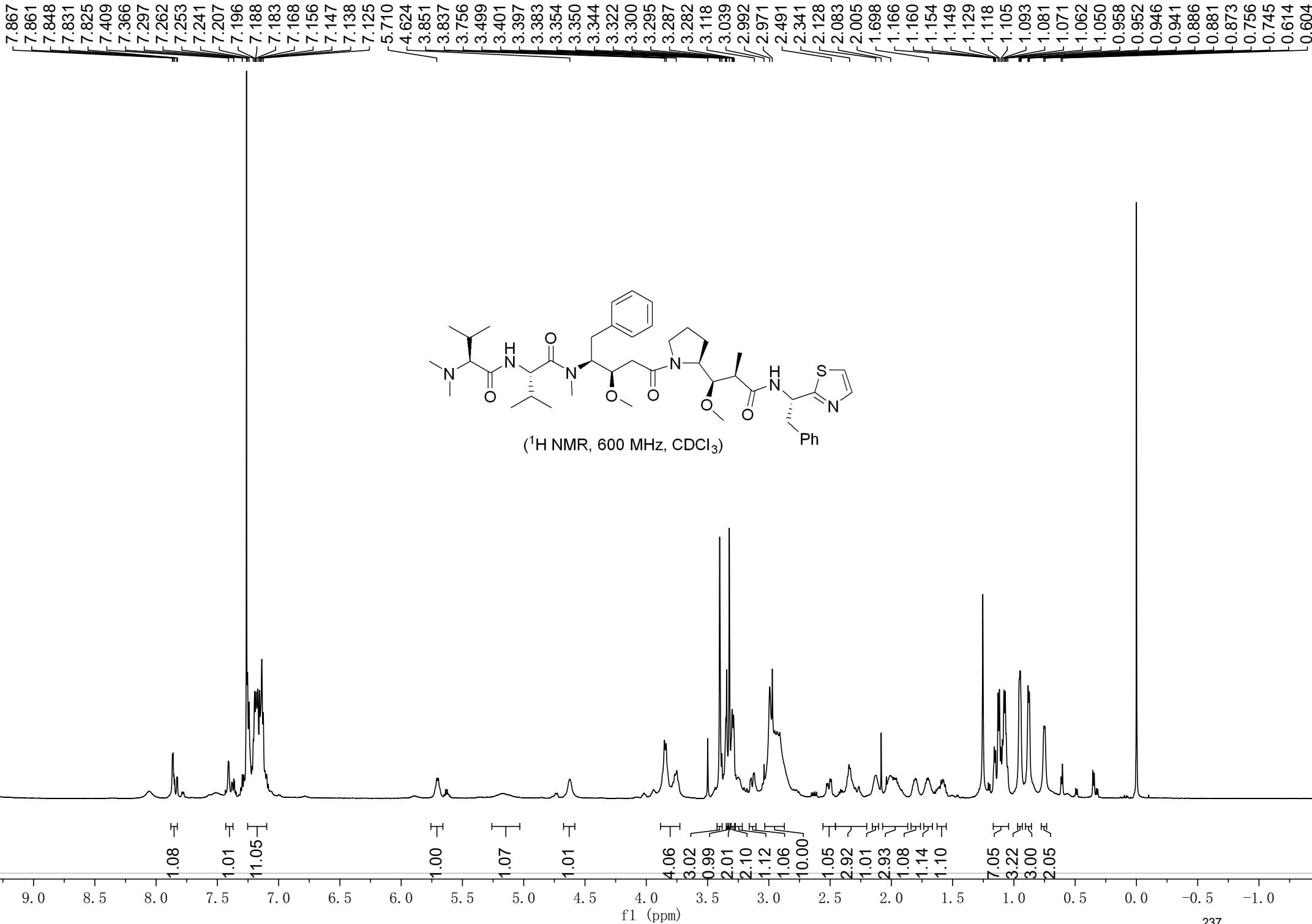
## NMR spectra of compound 31e

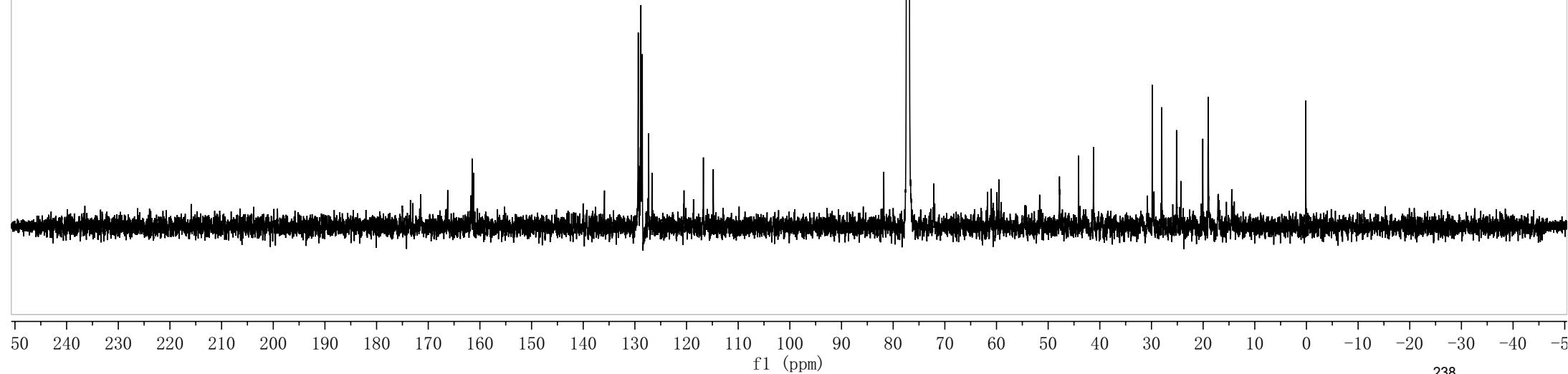
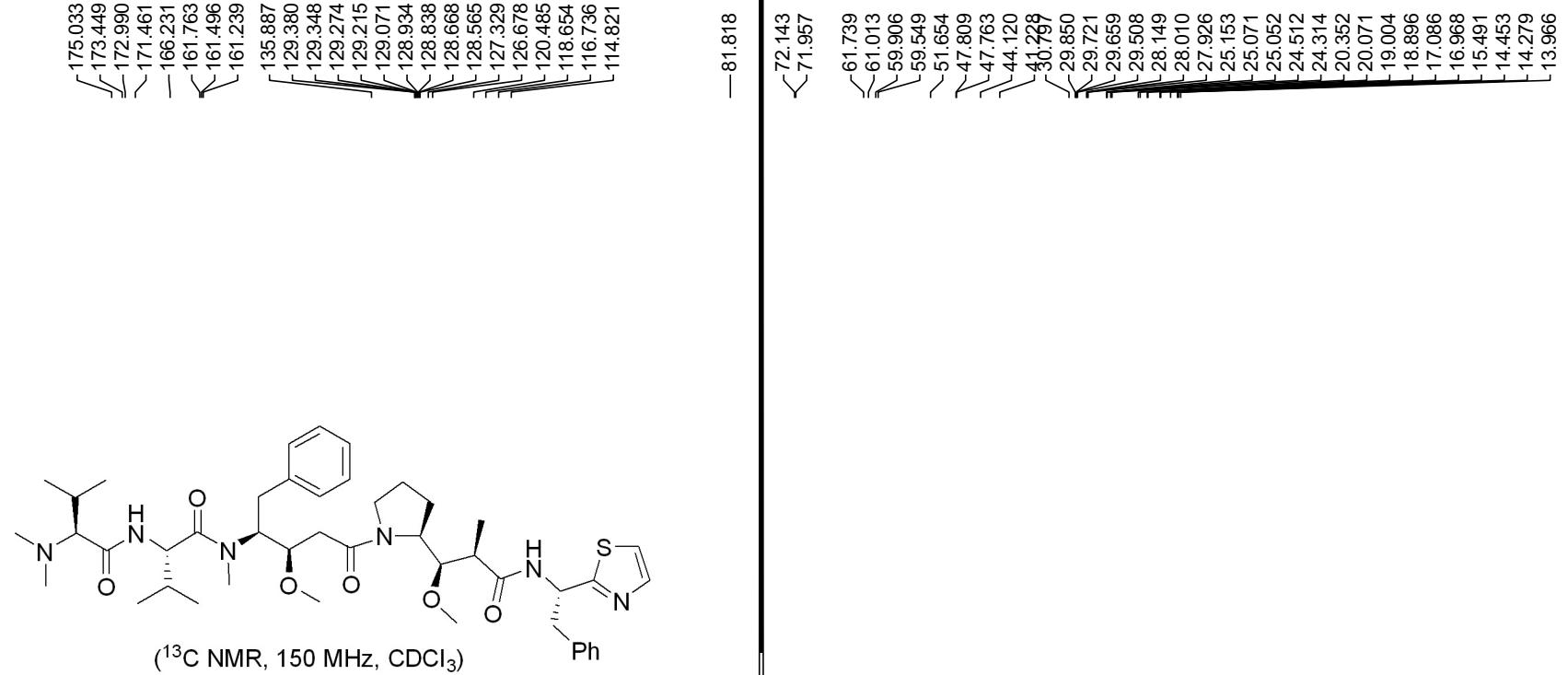


# NMR spectra of compound 31e



## NMR spectra of compound 31f





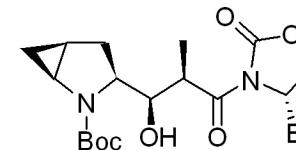
NMR spectra of compound 34

7.350  
7.333  
7.315  
7.294  
7.208  
7.205  
7.188

4.695  
4.676  
4.672  
4.663  
4.653  
4.240  
4.218  
4.199  
4.189

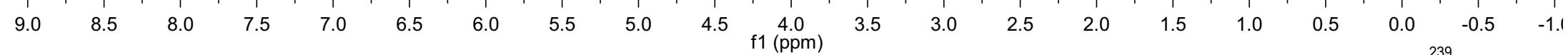
3.246  
3.238  
3.213  
3.205  
3.200  
2.775  
2.765  
2.742

-2.197  
1.496  
1.450  
1.441  
1.425  
1.306  
1.289  
0.860  
0.704  
0.689  
0.667

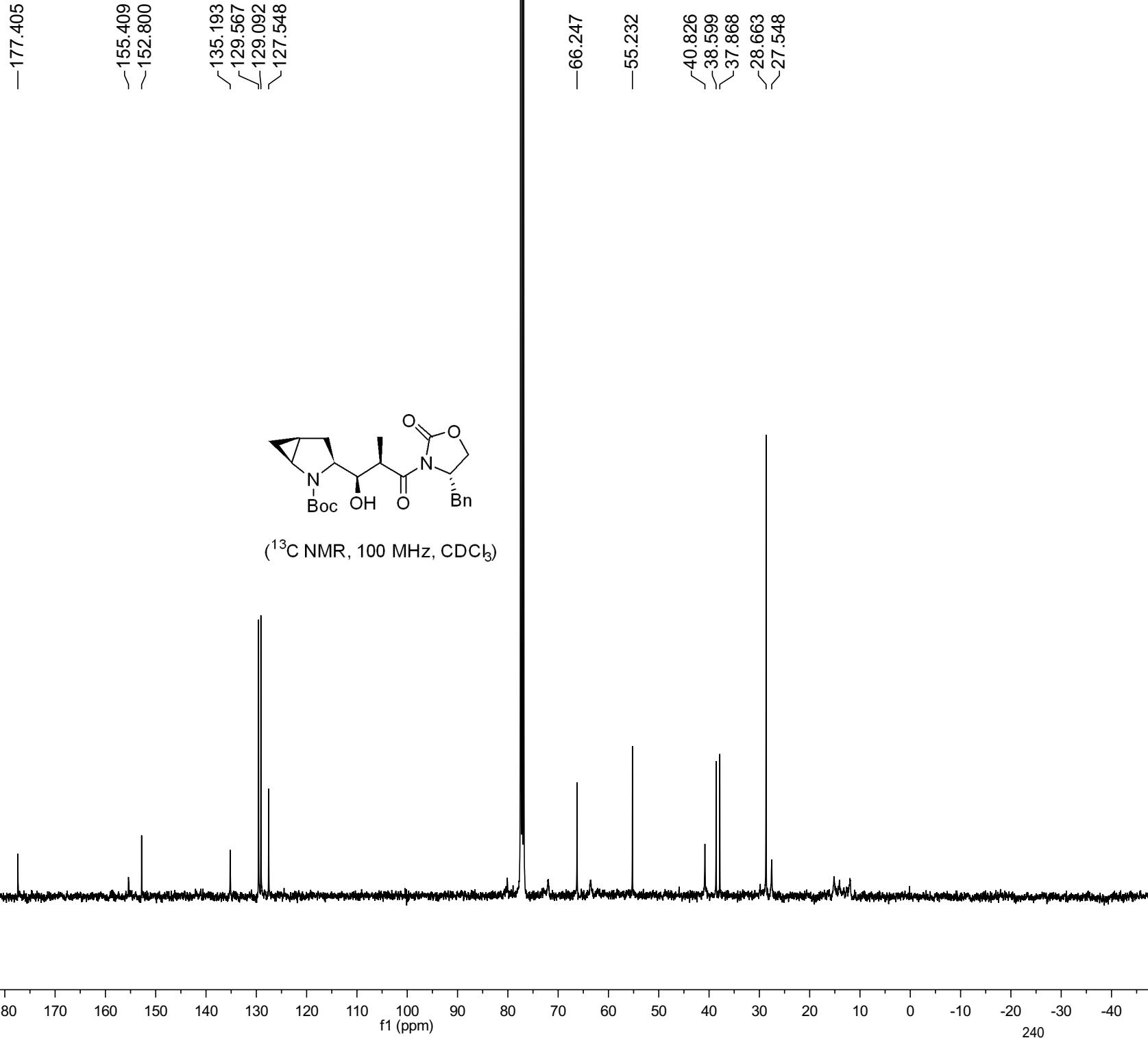


(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>)

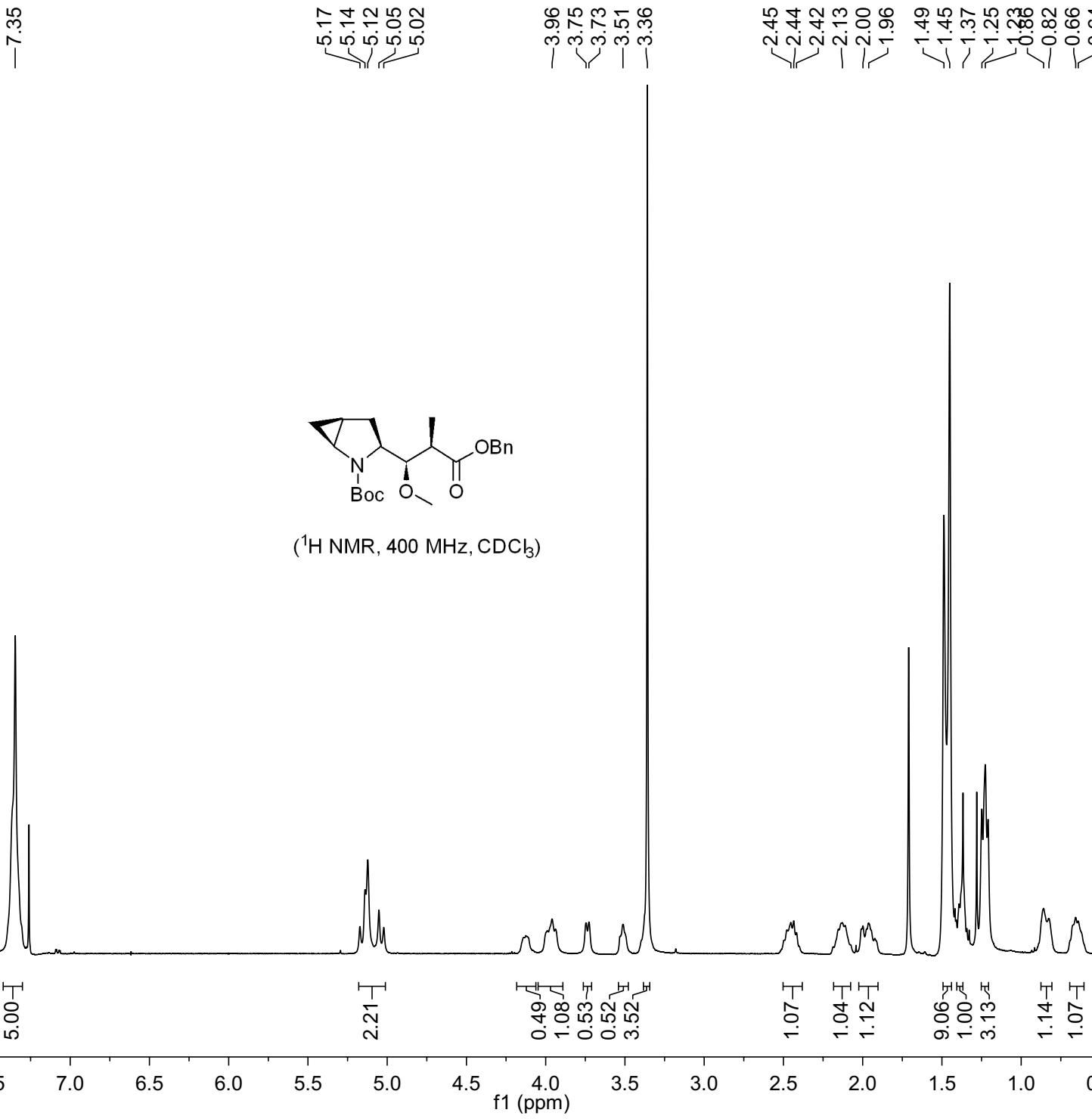
3.61  
2.12



NMR spectra of compound 34



NMR spectra of compound 35



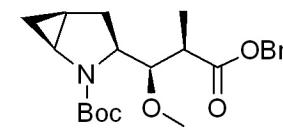
NMR spectra of compound 35

—174.389

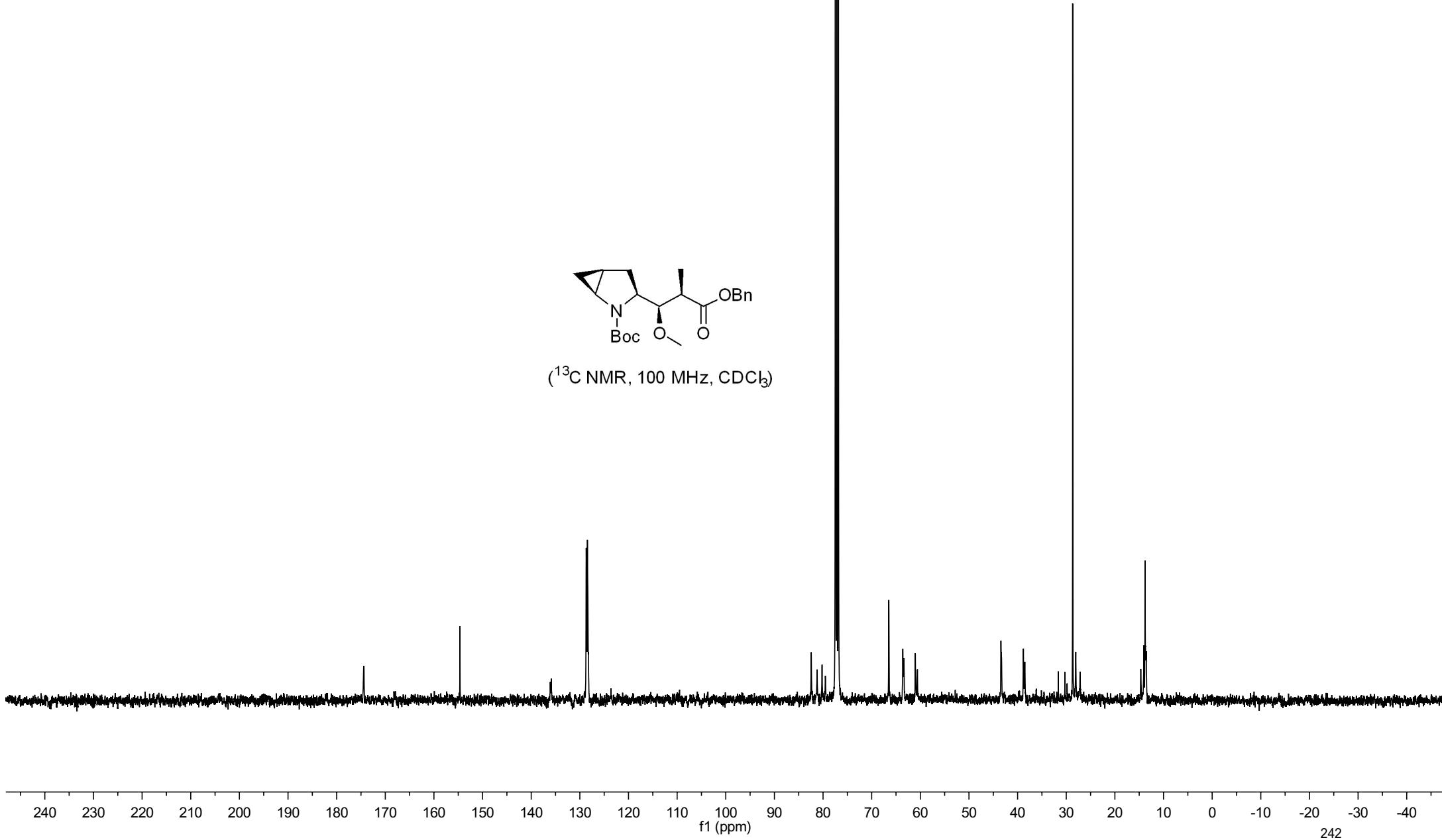
—154.653

—135.869  
∠128.690  
∠128.442

82.431  
81.229  
80.200  
79.525  
66.476  
63.604  
63.371  
61.035  
60.599  
43.432  
38.809  
38.512  
31.640  
30.272  
28.681  
28.039  
27.153  
14.030  
13.797

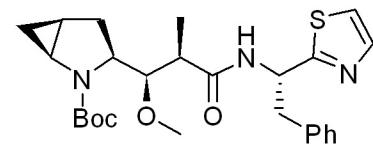


(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>)

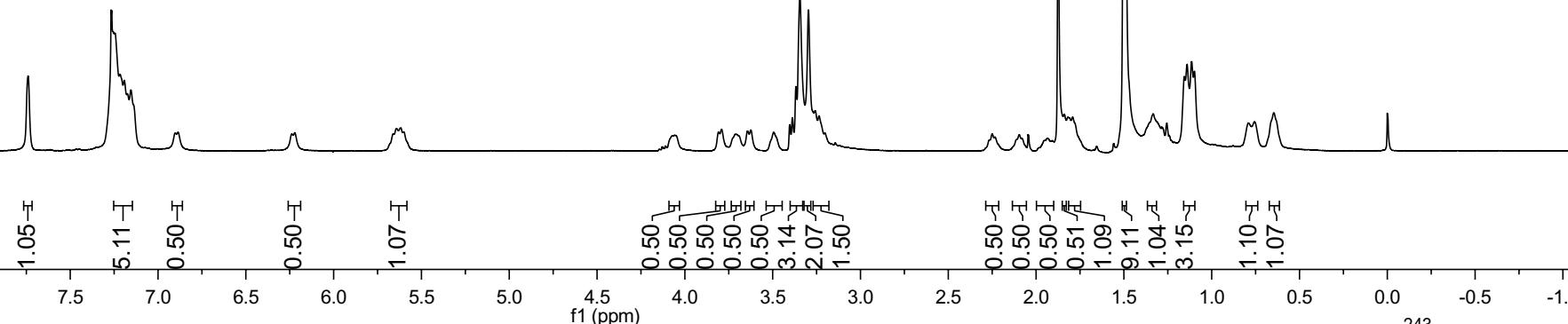


NMR spectra of compound 38

-7.739  
 7.216  
 7.192  
 7.154  
 6.903  
 6.887  
 -6.221  
 5.643  
 5.619  
 4.058  
 3.807  
 3.791  
 3.710  
 3.643  
 3.624  
 3.495  
 3.367  
 3.345  
 3.296  
 3.258  
 3.235  
 2.250  
 2.096  
 1.936  
 1.909  
 1.839  
 1.819  
 1.792  
 1.499  
 1.333  
 1.156  
 1.140  
 1.114  
 1.098  
 0.792  
 0.756  
 0.647



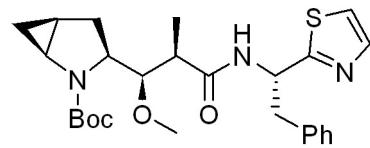
(<sup>1</sup>H NMR, 400 MHz, CDCl<sub>3</sub>, rotamers)



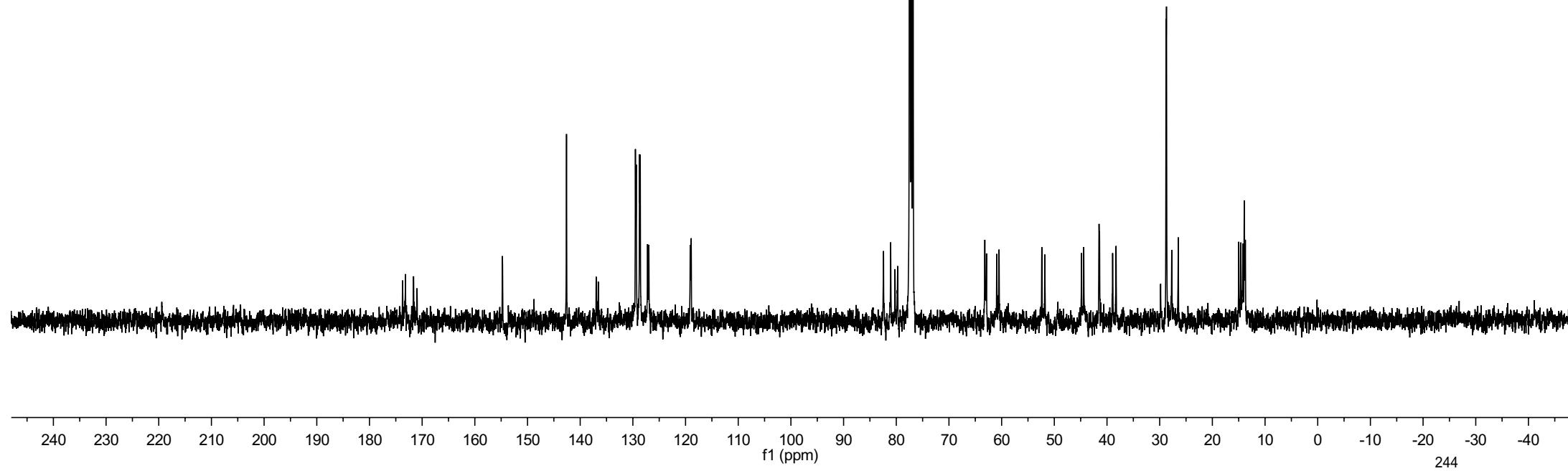
NMR spectra of compound 38

173.721  
173.167  
171.630  
170.969  
154.766  
142.595  
136.957  
136.565  
129.515  
129.355  
128.727  
128.604  
127.208  
126.970  
119.105  
118.932

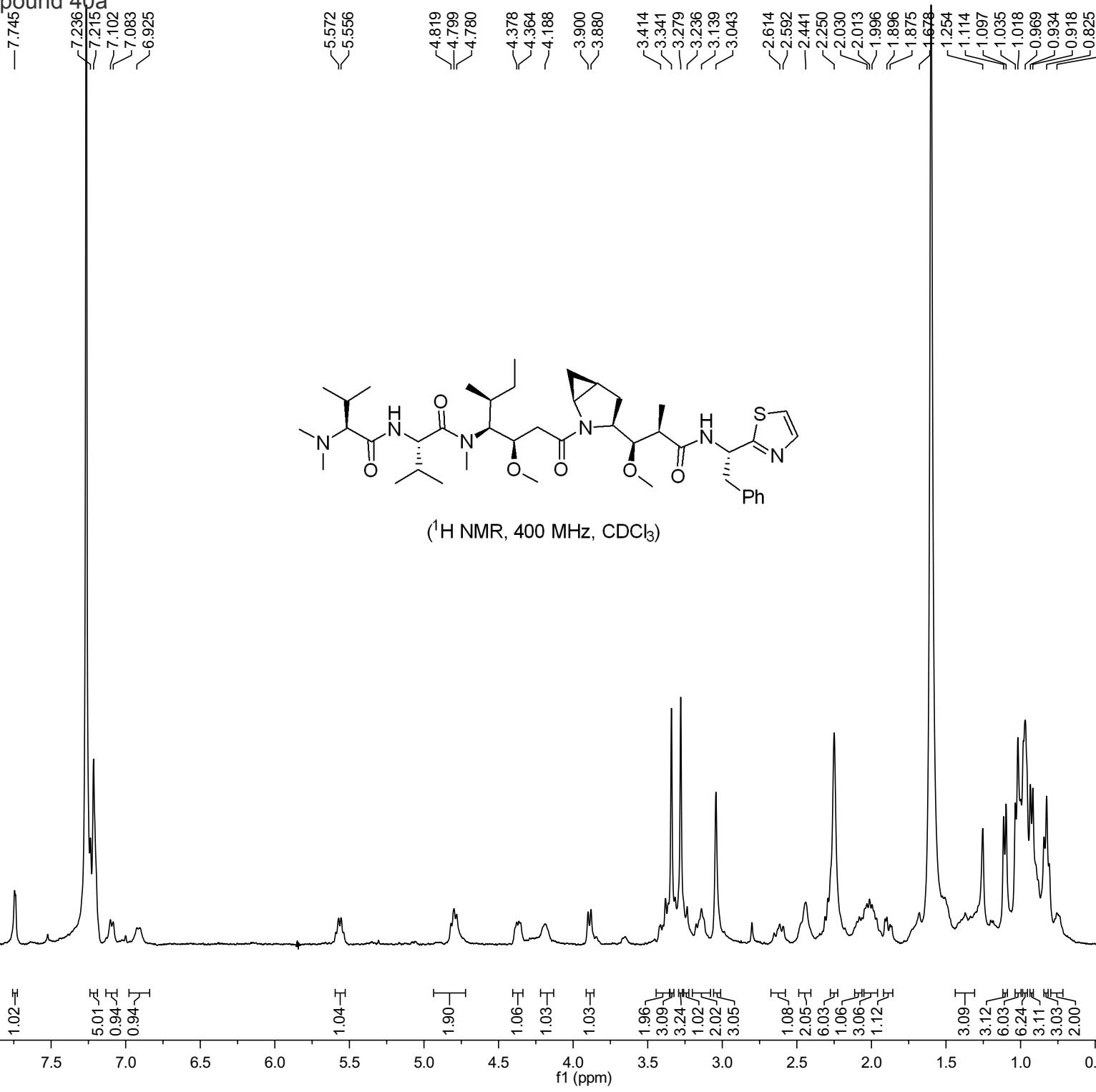
82.423  
81.066  
80.254  
79.737  
63.188  
62.873  
60.500  
52.374  
44.843  
44.415  
41.510  
38.930  
38.276  
28.710  
27.712  
26.466  
14.590  
14.198  
13.931  
13.739



(<sup>13</sup>C NMR, 100 MHz, CDCl<sub>3</sub>, rotamers)

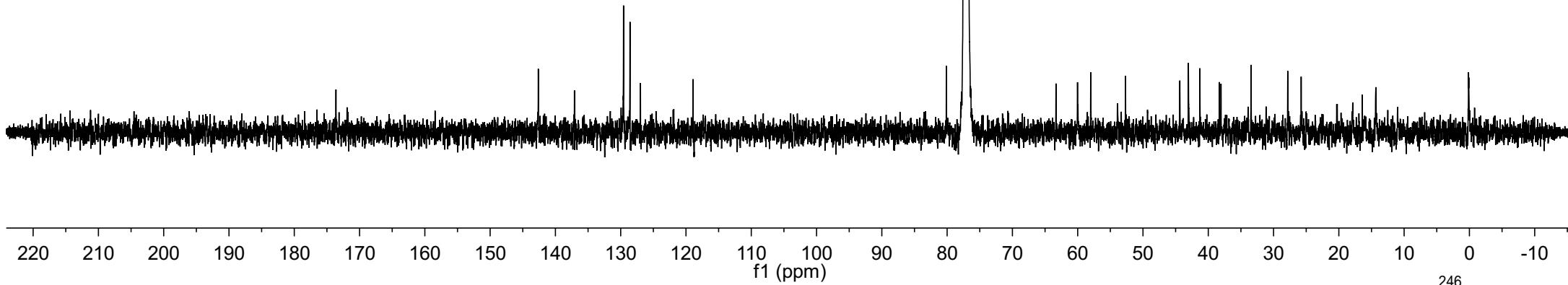
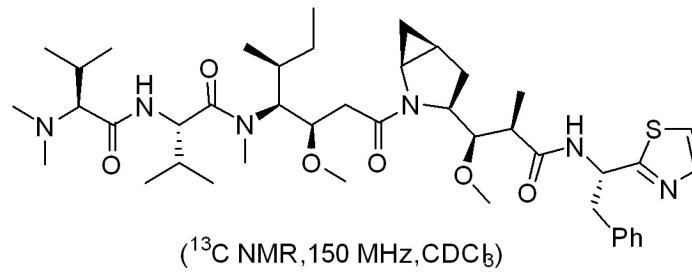


NMR spectra of compound 40a



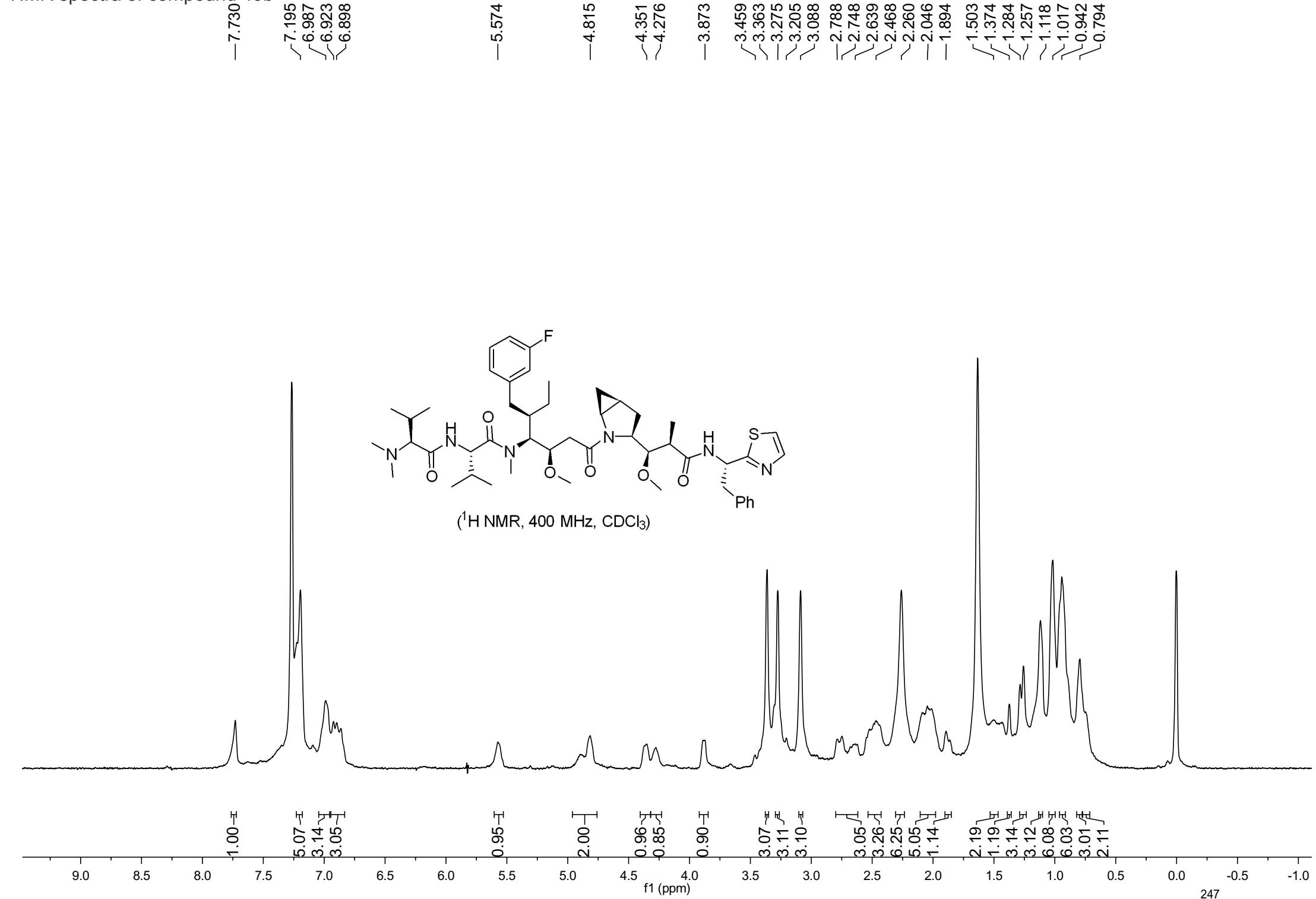
NMR spectra of compound 40a

173.613  
171.916  
165.460  
163.118  
158.431  
156.489  
142.619  
137.084  
132.446  
129.931  
129.565  
128.573  
126.974  
121.960  
121.869  
118.922  
118.765  
80.122  
63.329  
60.029  
58.012  
53.890  
53.329  
52.673  
52.502  
44.359  
43.047  
41.288  
38.308  
38.050  
33.448  
31.148  
27.830  
25.770  
18.789  
17.876  
16.417  
14.328



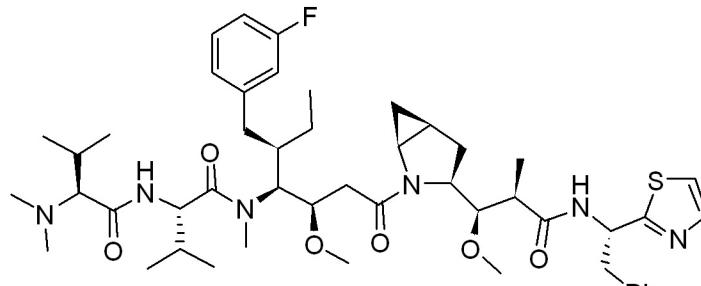
220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

NMR spectra of compound 40b

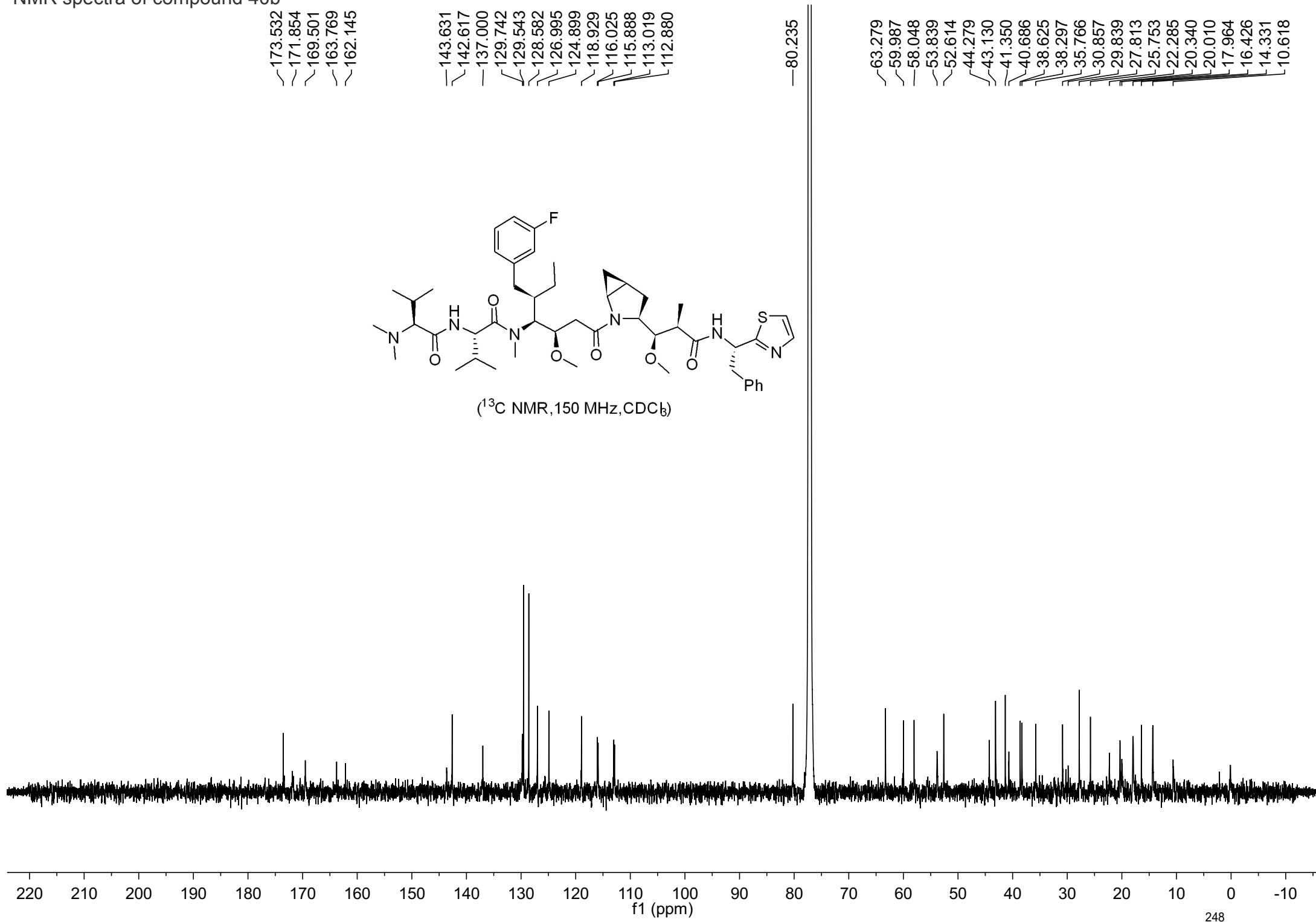


NMR spectra of compound 40b

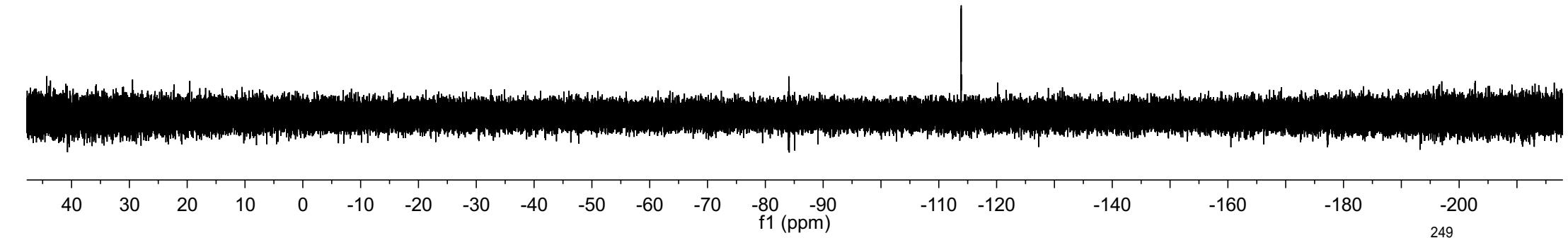
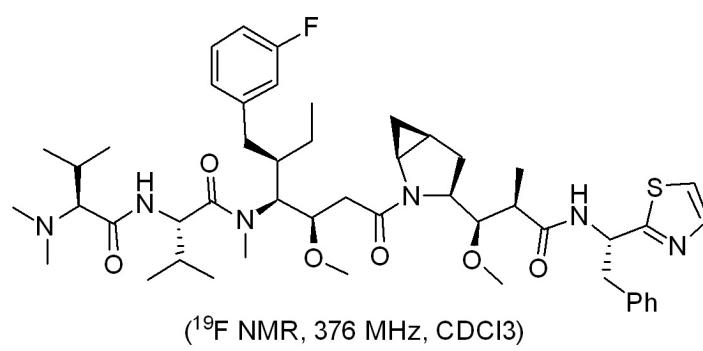
~173.532  
 ~171.854  
 ~169.501  
 ~163.769  
 ~162.145  
 ~143.631  
 ~142.617  
 ~137.000  
 ~129.742  
 ~129.543  
 ~128.582  
 ~126.995  
 ~124.899  
 ~118.929  
 ~116.025  
 ~115.888  
 ~113.019  
 ~112.880



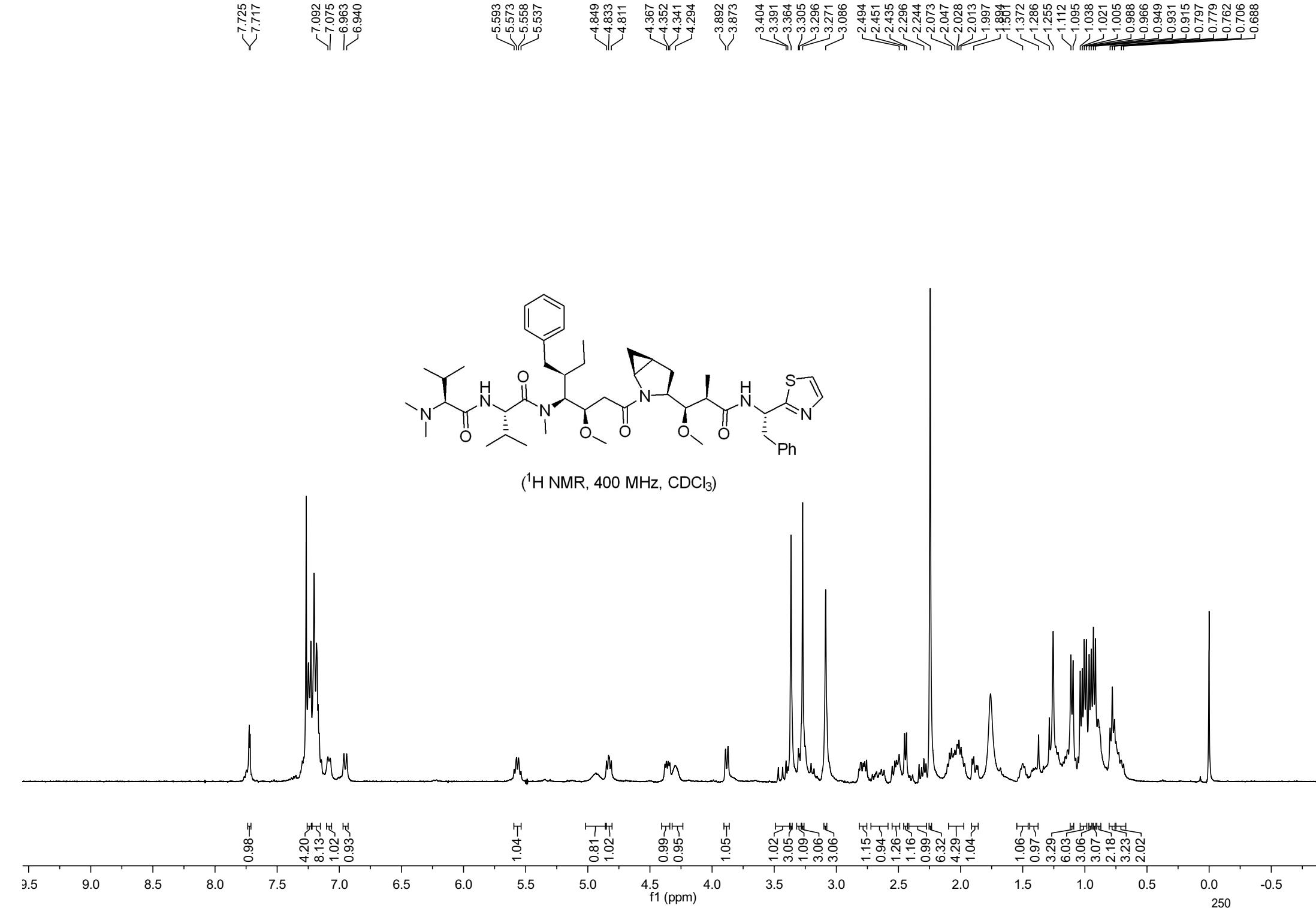
( $^{13}\text{C}$  NMR, 150 MHz,  $\text{CDCl}_3$ )



— -113.878

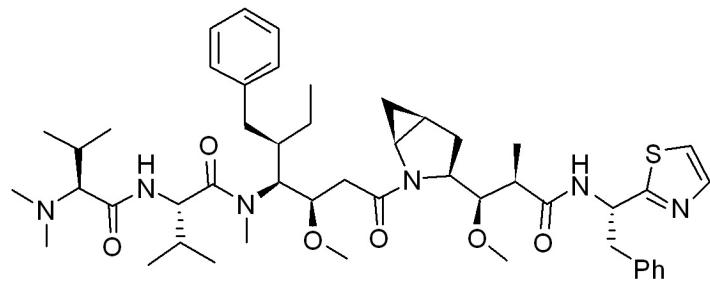


NMR spectra of compound 40c

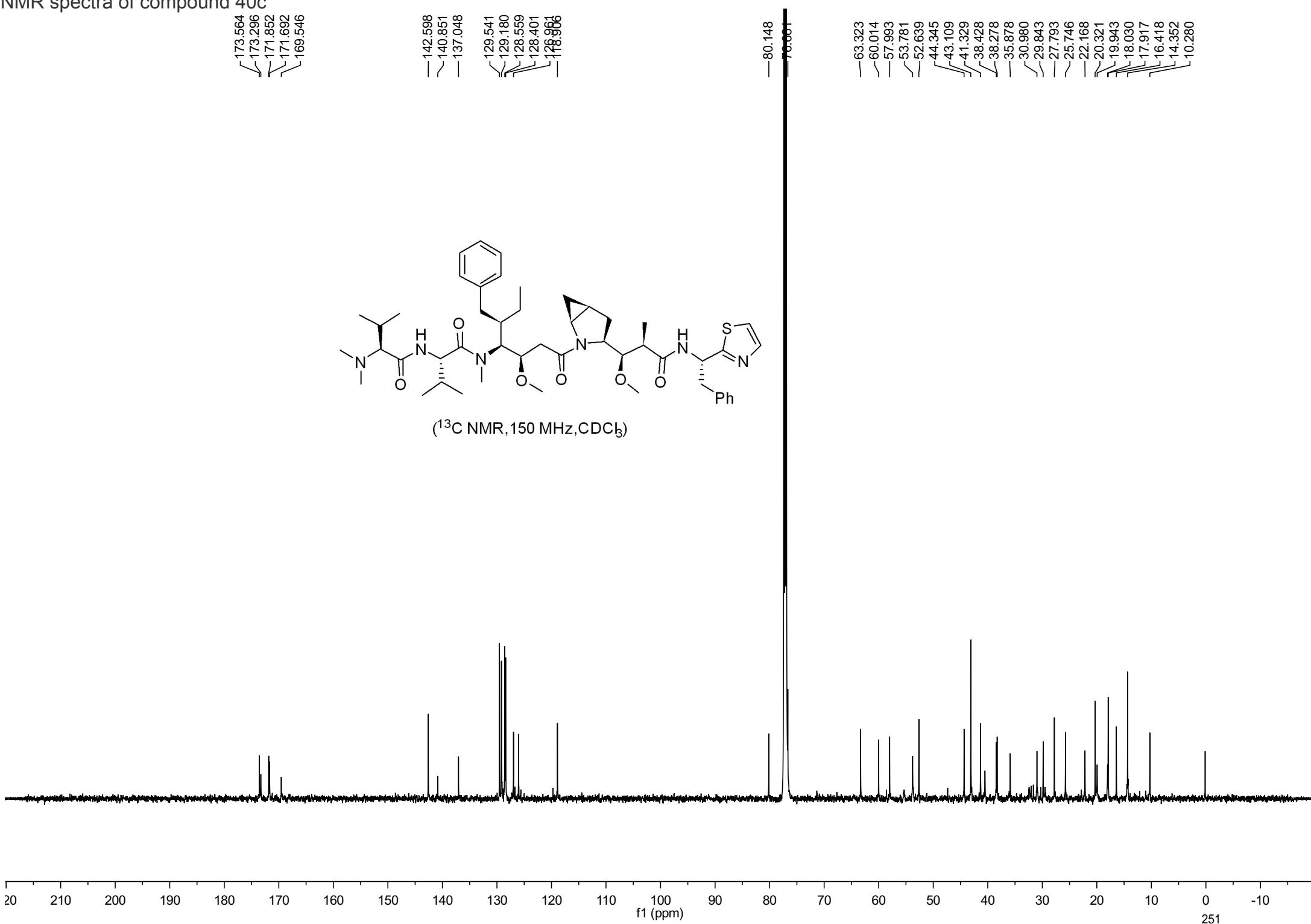


NMR spectra of compound 40c

173.564	173.296	171.852	171.692	169.546	142.598	140.851	137.048	129.541	129.180	128.559	128.401	126.961	-80.148	-76.001
---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------



( $^{13}\text{C}$  NMR, 150 MHz,  $\text{CDCl}_3$ )



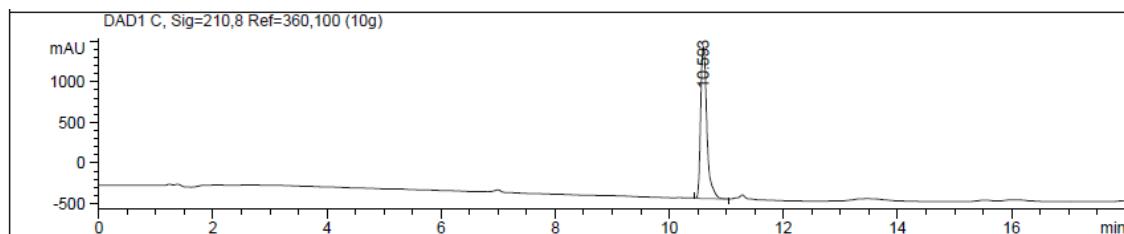
# Analysis Report

## <Sample Information>

Sample Name	: 10g		
Sample ID	: 3		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 1-1	Injection Volume	: 5 ul
Date Acquired	: 2019-10-11 16: 22: 09	Acquired by	: System Administrator
Date Processed	: 2019-10-11 16: 42: 10	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	10.593	1.41540e4	1869.14478	100.0000
Total		1.41540e4	1869.14478	

---

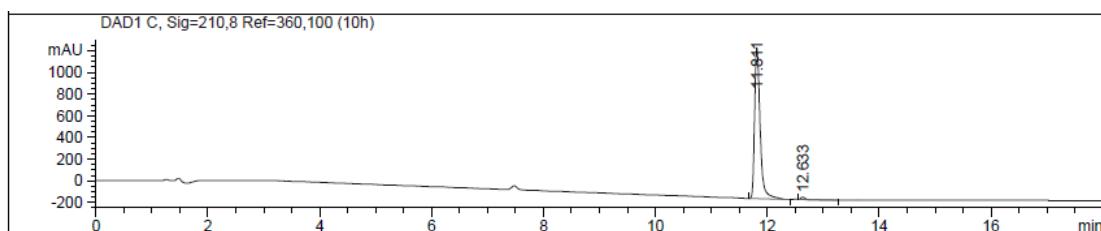
# Analysis Report

## <Sample Information>

Sample Name : 10h  
Sample ID : 4  
Sample Type : Unknown  
Method Filename : NXD191011.lcm Data Filename : NXD.lcd  
Vial # : 1-2 Injection Volume : 5 ul  
Date Acquired : 2019-10-12 8: 32: 29 Acquired by : System Administrator  
Date Processed : 2019-10-12 8: 52: 30 Processed by : System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	11.811	9674.88574	1391.82336	98.5991
2	12.633	137.45810	24.73040	1.4009
Total		9812.34384	1416.55376	

---

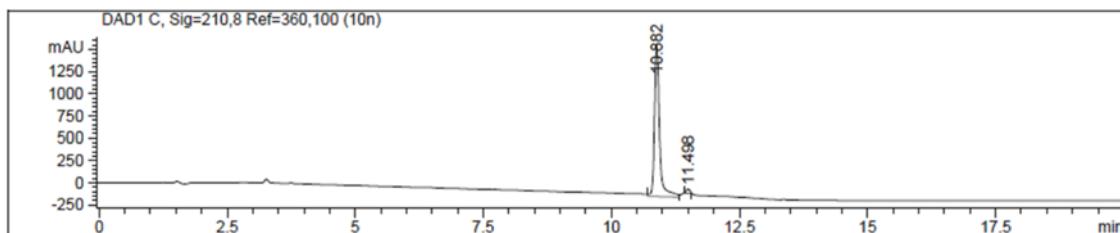
# Analysis Report

## <Sample Information>

Sample Name	: 10n		
Sample ID	: 5		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 1-2	Injection Volume	: 5 ul
Date Acquired	: 2019-10-12 8: 58: 29	Acquired by	: System Administrator
Date Processed	: 2019-10-12 9: 18: 30	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	10.882	1.17746e4	1703.94885	97.8419
2	11.498	259.71341	49.54277	2.1581
Total		1.20343e4	1753.49162	

---

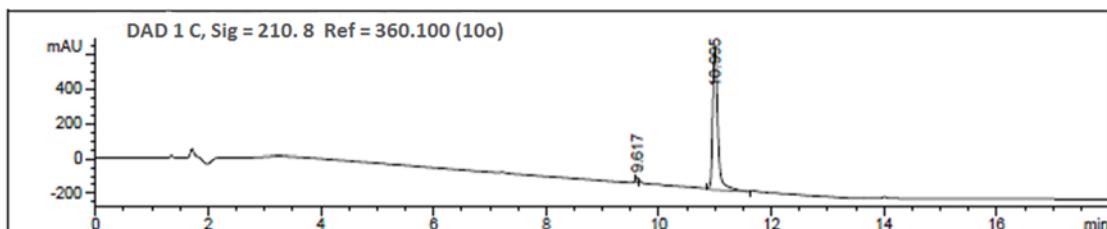
# Analysis Report

## <Sample Information>

Sample Name : 10o  
Sample ID : 35  
Sample Type : Unknown  
Method Filename : NXD191011.lcm Data Filename : NXD.lcd  
Vial # : 1-4 Injection Volume : 5 ul  
Date Acquired : 2019-10-12 10: 02: 29 Acquired by : System Administrator  
Date Processed : 2019-10-12 10: 22: 30 Processed by : System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.617	72.77796	22.71483	1.3655
2	10.995	5256.94043	830.00879	98.6345
Total		5329.71839	852.72362	

---

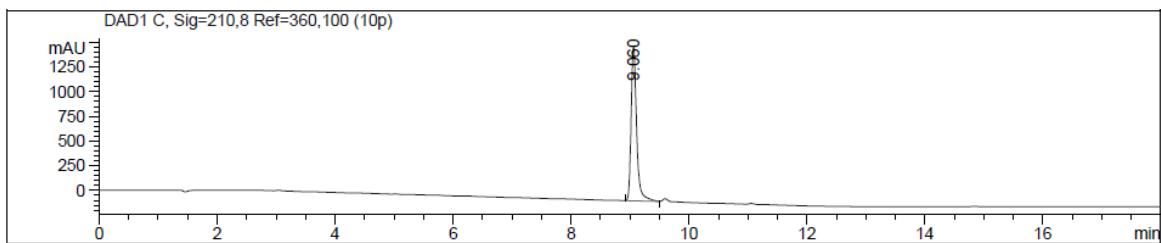
# Analysis Report

## <Sample Information>

Sample Name	: 10p		
Sample ID	: 6		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 1-5	Injection Volume	: 15 ul
Date Acquired	: 2019-10-12 10: 45: 15	Acquired by	: System Administrator
Date Processed	: 2019-10-12 11: 05: 17	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.060	1.01124e4	1561.50439	100.0000
Total		1.01124e4	1561.50439	

---

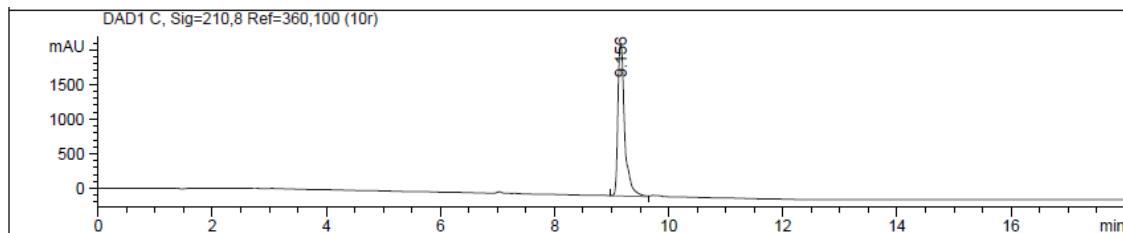
# Analysis Report

## <Sample Information>

Sample Name	: 10r		
Sample ID	: 7		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 1-6	Injection Volume	: 15 ul
Date Acquired	: 2019-10-12 11: 21: 19	Acquired by	: System Administrator
Date Processed	: 2019-10-12 11: 41: 20	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.156	1.82893e4	2186.57349	100.0000
Total		1.82893e4	2186.57349	

---

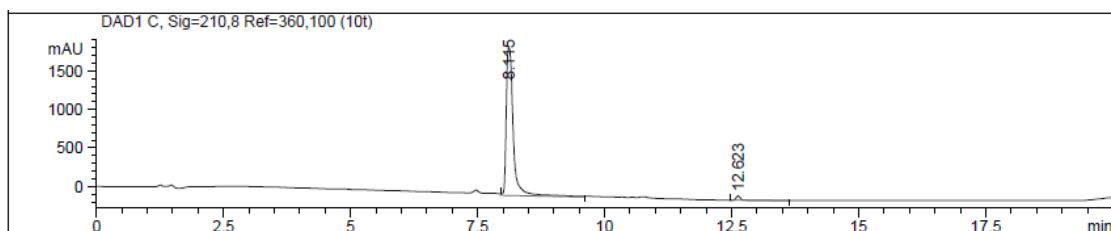
# Analysis Report

## <Sample Information>

Sample Name : 10t  
Sample ID : 8  
Sample Type : Unknown  
Method Filename : NXD191011.lcm Data Filename : NXD.lcd  
Vial # : 1-7 Injection Volume : 5 ul  
Date Acquired : 2019-10-12 12: 03: 34 Acquired by : System Administrator  
Date Processed : 2019-10-12 12: 23: 35 Processed by : System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	8.115	1.86556e4	1918.72888	98.3096
2	12.623	320.78537	56.87433	1.6904
Total		1.89764e4	1975.60321	

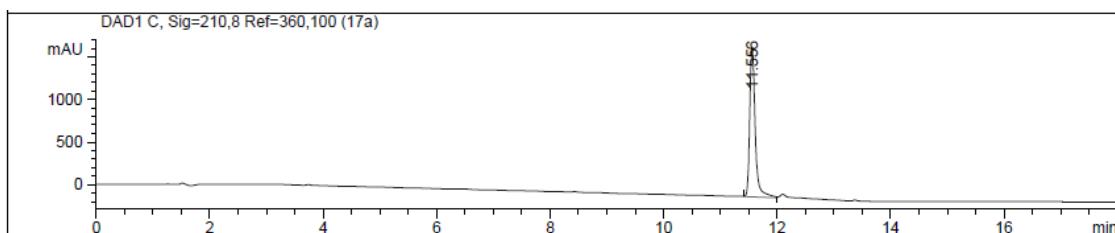
# Analysis Report

## <Sample Information>

Sample Name	:	17a	
Sample ID	:	9	
Sample Type	:	Unknown	
Method Filename	:	NXD191011.lcm	Data Filename : NXD.lcd
Vial #	:	1-7	Injection Volume : 10 ul
Date Acquired	:	2019-10-12 12: 45: 03	Acquired by : System Administrator
Date Processed	:	2019-10-12 13: 05: 04	Processed by : System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	11.556	1.19113e4	1758.26379	100.0000
Total		1.19113e4	1758.26379	

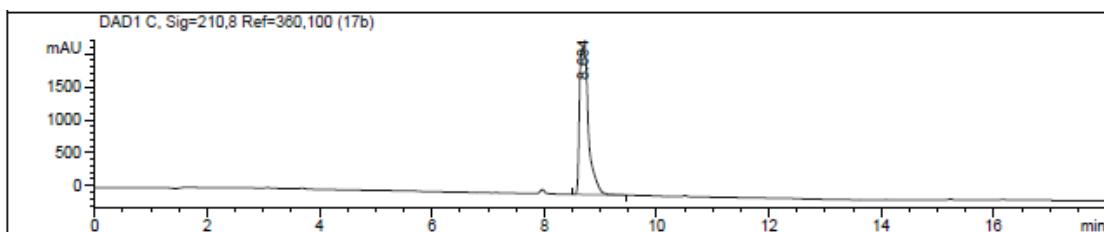
# Analysis Report

## <Sample Information>

Sample Name : 17b  
Sample ID : 18  
Sample Type : Unknown  
Method Filename : NXD191011.lcm Data Filename : NXD.lcd  
Vial # : 3-1 Injection Volume : 10 ul  
Date Acquired : 2019-10-12 16: 42: 56 Acquired by : System Administrator  
Date Processed : 2019-10-12 17: 02: 58 Processed by : System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	8.684	2.51062e4	2231.94019	100.0000
Total		2.51062e4	2231.94019	

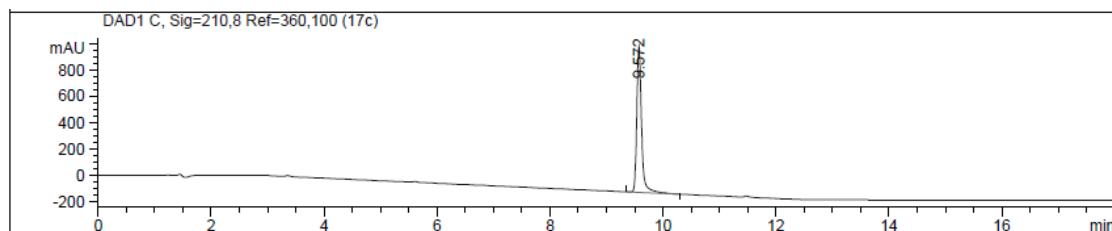
# Analysis Report

## <Sample Information>

Sample Name	: 17c		
Sample ID	: 12		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-3	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 14: 01: 56	Acquired by	: System Administrator
Date Processed	: 2019-10-12 14: 21: 58	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.572	6585.07227	1104.81592	100.0000
Total		6585.07227	1104.81592	

---

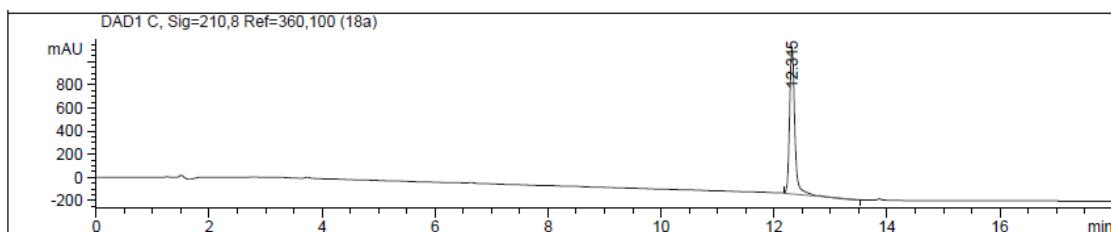
# Analysis Report

## <Sample Information>

Sample Name	: 18a		
Sample ID	: 13		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-5	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 14:34:06	Acquired by	: System Administrator
Date Processed	: 2019-10-12 14:54:07	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	12.315	8147.56201	1269.44788	100.0000
Total		8147.56201	1269.44788	

---

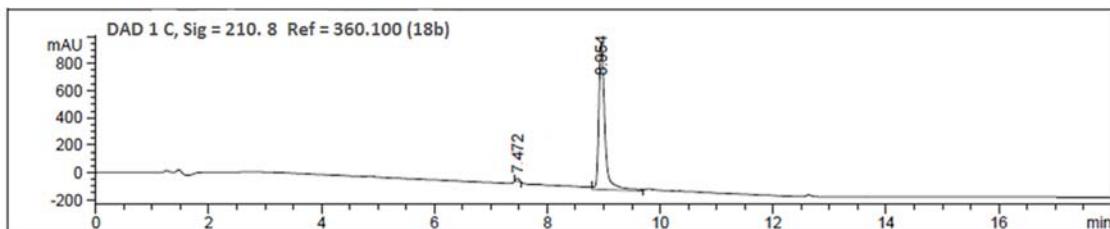
# Analysis Report

## <Sample Information>

Sample Name	: 18b		
Sample ID	: 15		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-8	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 15:07:26	Acquired by	: System Administrator
Date Processed	: 2019-10-12 15:27:27	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	7.472	87.89386	22.09830	1.0683
2	8.954	8139.51514	1073.03271	98.9317
Total		8227.40900	1095.13101	

---

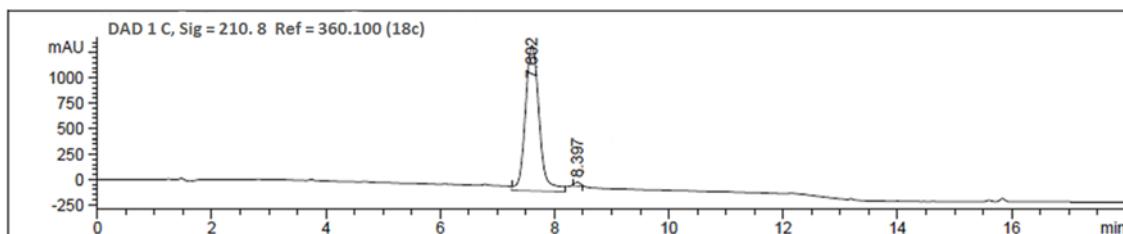
# Analysis Report

## <Sample Information>

Sample Name	: 18c		
Sample ID	: 16		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-10	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 15: 34: 24	Acquired by	: System Administrator
Date Processed	: 2019-10-12 15: 54: 25	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	7.602	2.42330e4	1435.10669	98.8189
2	8.397	289.64276	39.44547	1.1811
Total		2.45226e4	1474.55215	

---

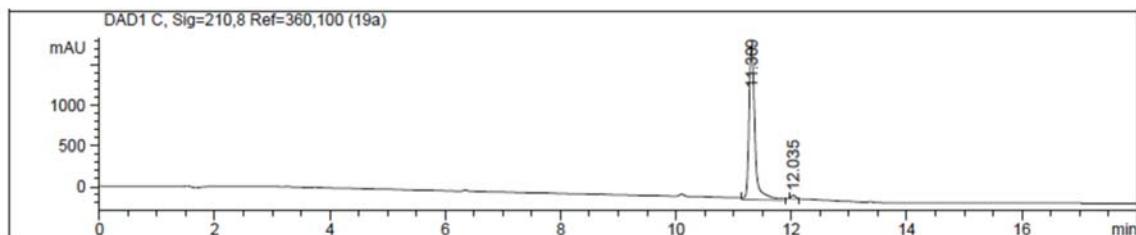
# Analysis Report

## <Sample Information>

Sample Name	: 19a		
Sample ID	: 17		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-12	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 16:11:02	Acquired by	: System Administrator
Date Processed	: 2019-10-12 16:31:03	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	11.309	1.38318e4	1898.20081	98.0337
2	12.035	277.43576	48.50030	1.9663
Total		1.41093e4	1946.70110	

---

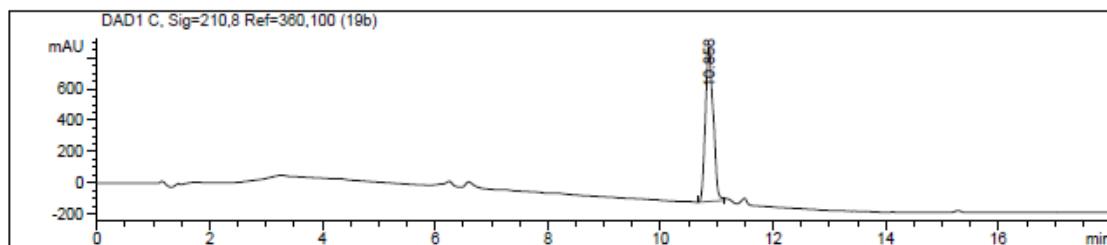
# Analysis Report

## <Sample Information>

Sample Name	: 19b		
Sample ID	: 10		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 2-1	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 13: 09: 33	Acquired by	: System Administrator
Date Processed	: 2019-10-12 13: 29: 35	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	10.858	9477.46289	989.14374	100.0000
Total		9477.46289	989.14374	

---

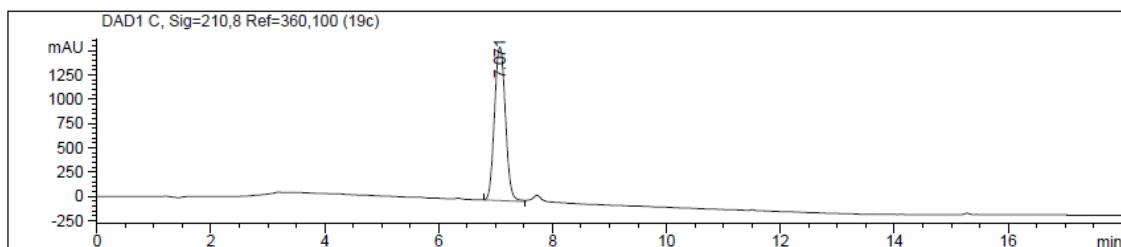
# Analysis Report

## <Sample Information>

Sample Name	: 19c		
Sample ID	: 19		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 3-2	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 17: 11: 36	Acquired by	: System Administrator
Date Processed	: 2019-10-12 17: 31: 38	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	7.071	2.11248e4	1581.00696	100.0000
Total		2.11248e4	1581.00696	

---

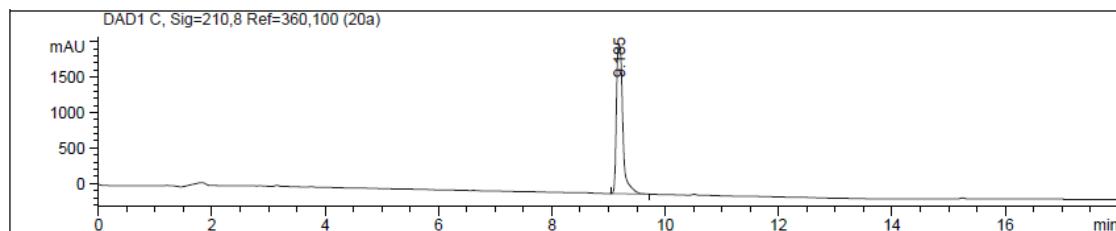
# Analysis Report

## <Sample Information>

Sample Name	: 20a		
Sample ID	: 21		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 3-4	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 17:43: 19	Acquired by	: System Administrator
Date Processed	: 2019-10-12 18: 03: 20	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.185	1.63816e4	2093.99146	100.0000
Total		1.63816e4	2093.99146	

---

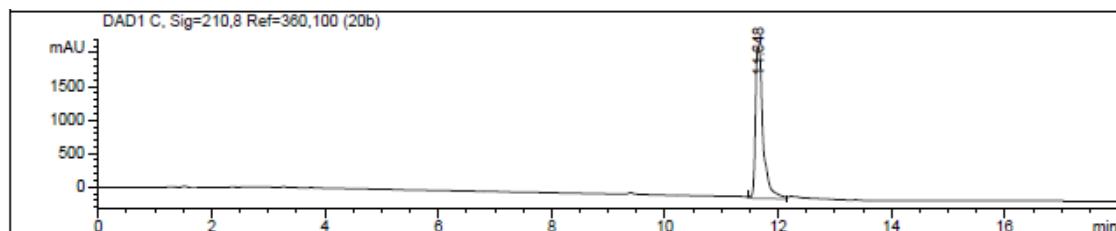
# Analysis Report

## <Sample Information>

Sample Name	: 20b		
Sample ID	: 22		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 3-5	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 18: 11: 34	Acquired by	: System Administrator
Date Processed	: 2019-10-12 18: 31: 35	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	11.648	2.10985e4	2257.05884	100.0000
Total		2.10985e4	2257.05884	

---

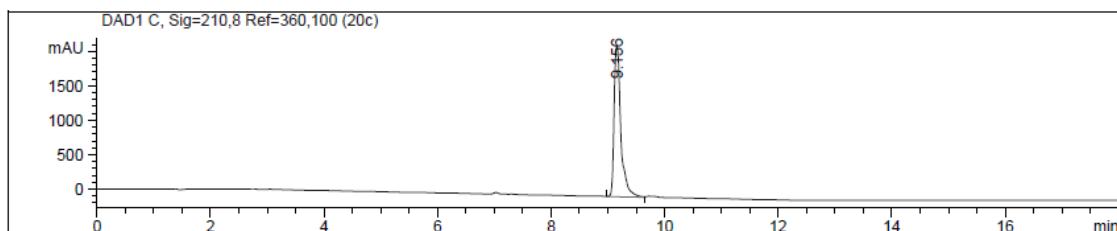
# Analysis Report

## <Sample Information>

Sample Name	: 20c		
Sample ID	: 22		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 3-6	Injection Volume	: 10 ul
Date Acquired	: 2019-10-12 18: 43: 02	Acquired by	: System Administrator
Date Processed	: 2019-10-12 19: 03: 03	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

---

Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	9.156	1.82893e4	2186.57349	100.0000
Total		1.82893e4	2186.57349	

---

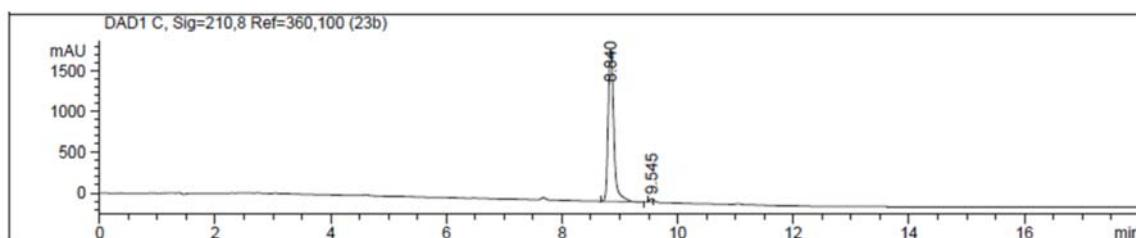
# Analysis Report

## <Sample Information>

Sample Name	: 23b		
Sample ID	: 18		
Sample Type	: Unknown		
Method Filename	: NXD191011.lcm	Data Filename	: NXD.lcd
Vial #	: 1-1	Injection Volume	: 10 ul
Date Acquired	: 2019-10-19 10:07:26	Acquired by	: System Administrator
Date Processed	: 2019-10-19 10:27:27	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

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Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	8.840	1.27843e4	1866.60632	98.8124
2	9.545	153.65303	40.33503	1.1876
Total		1.29380e4	1906.94135	

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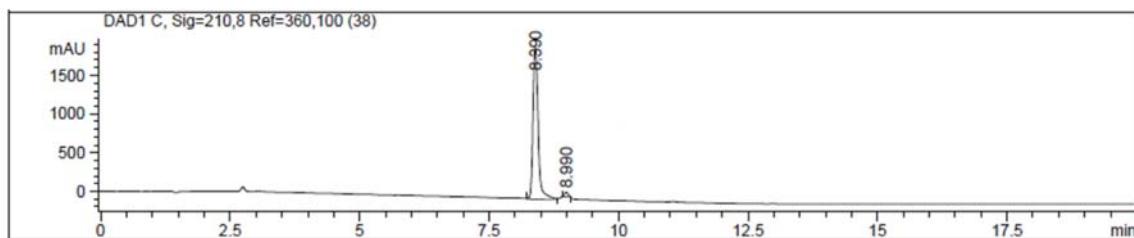
# Analysis Report

## <Sample Information>

Sample Name	: 38		
Sample ID	: 21		
Sample Type	: Unknown		
Method Filename	: NXD191019.lcm	Data Filename	: NXD.lcd
Vial #	: 1-3	Injection Volume	: 10 ul
Date Acquired	: 2019-10-19 14:09:18	Acquired by	: System Administrator
Date Processed	: 2019-10-19 14:29:19	Processed by	: System Administrator

---

## <Chromatogram >



## <Peak Table>

DAD 1 C, Sig = 210. 8 Ref = 360.100

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Peak	Ret.Time (min)	Area (mAU*S)	Height (mAU)	Area %
1	8.390	1.38279e4	1974.17688	97.5335
2	8.990	349.69510	65.51511	2.4665
Total		1.41776e4	2039.69199	

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