

# ***Supporting Information***

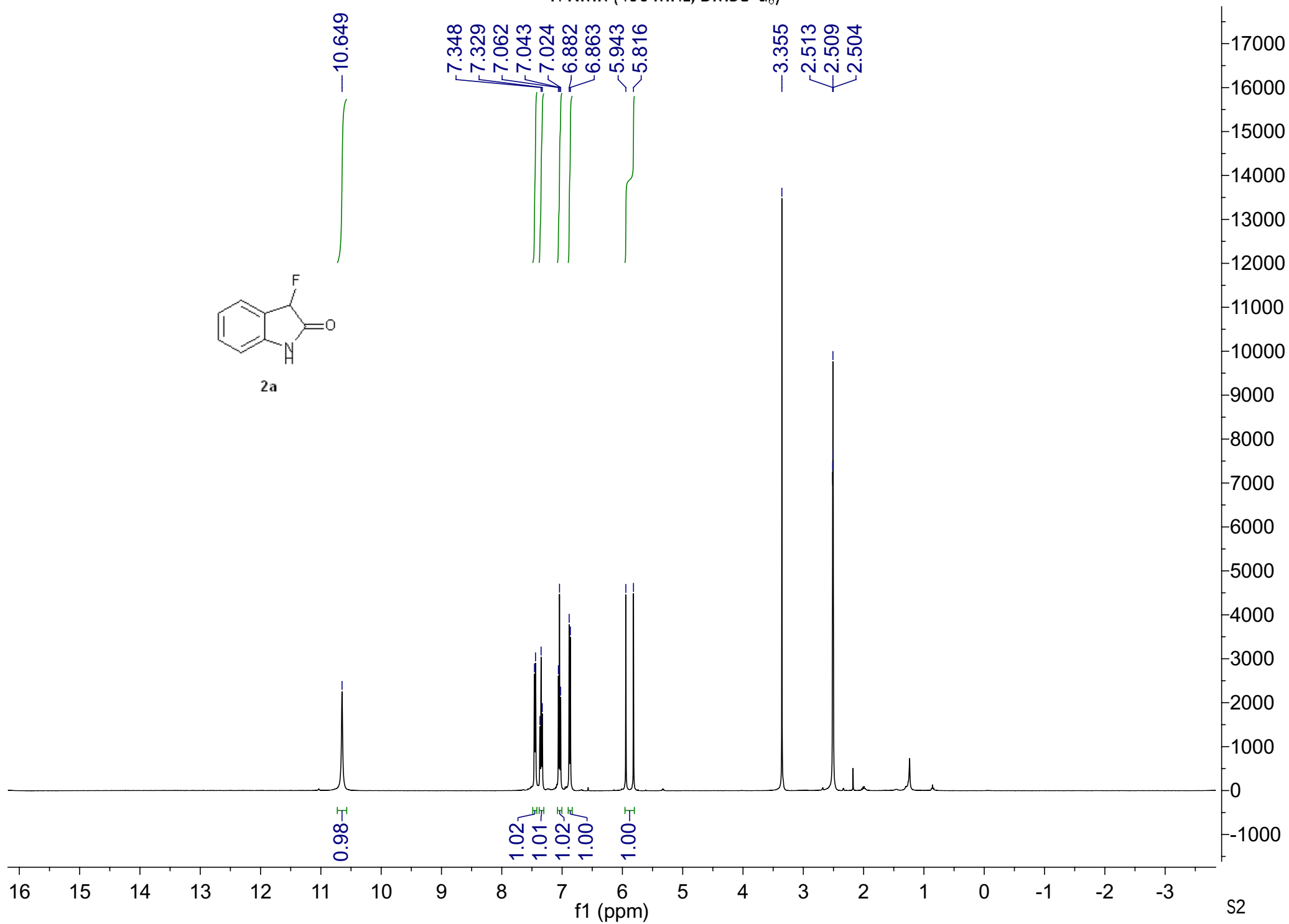
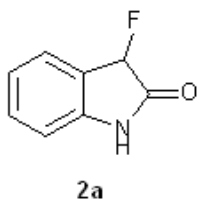
## Solvent Effects: Syntheses of 3, 3-Difluorooxindoles and 3-Fluorooxindoles from Hydrazonoindolin-2-one by Selectfluor

Qiong Yang,<sup>a</sup> Guo-Li Dai,<sup>a</sup> Yu-Ming Yang,<sup>a</sup> Zhuangzhu Luo<sup>\*,b</sup>, and Zhen-Yu  
Tang<sup>\*,a,b</sup>

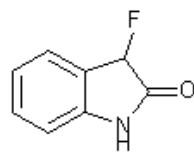
<sup>a</sup> Address: Department of Pharmaceutical Engineering, College of  
Chemistry and Chemical Engineering, Central South University, Changsha  
410083, China. E-mail:zytang@csu.edu.cn

<sup>b</sup> School of Chemical Engineering and Technology, Sun Yat-sen University,  
Guangzhou 510275, China. E-mail:luozhzhzhu@mail.sysu.edu.cn

<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



2a

172.94  
172.76

143.82  
143.76

131.81  
131.78

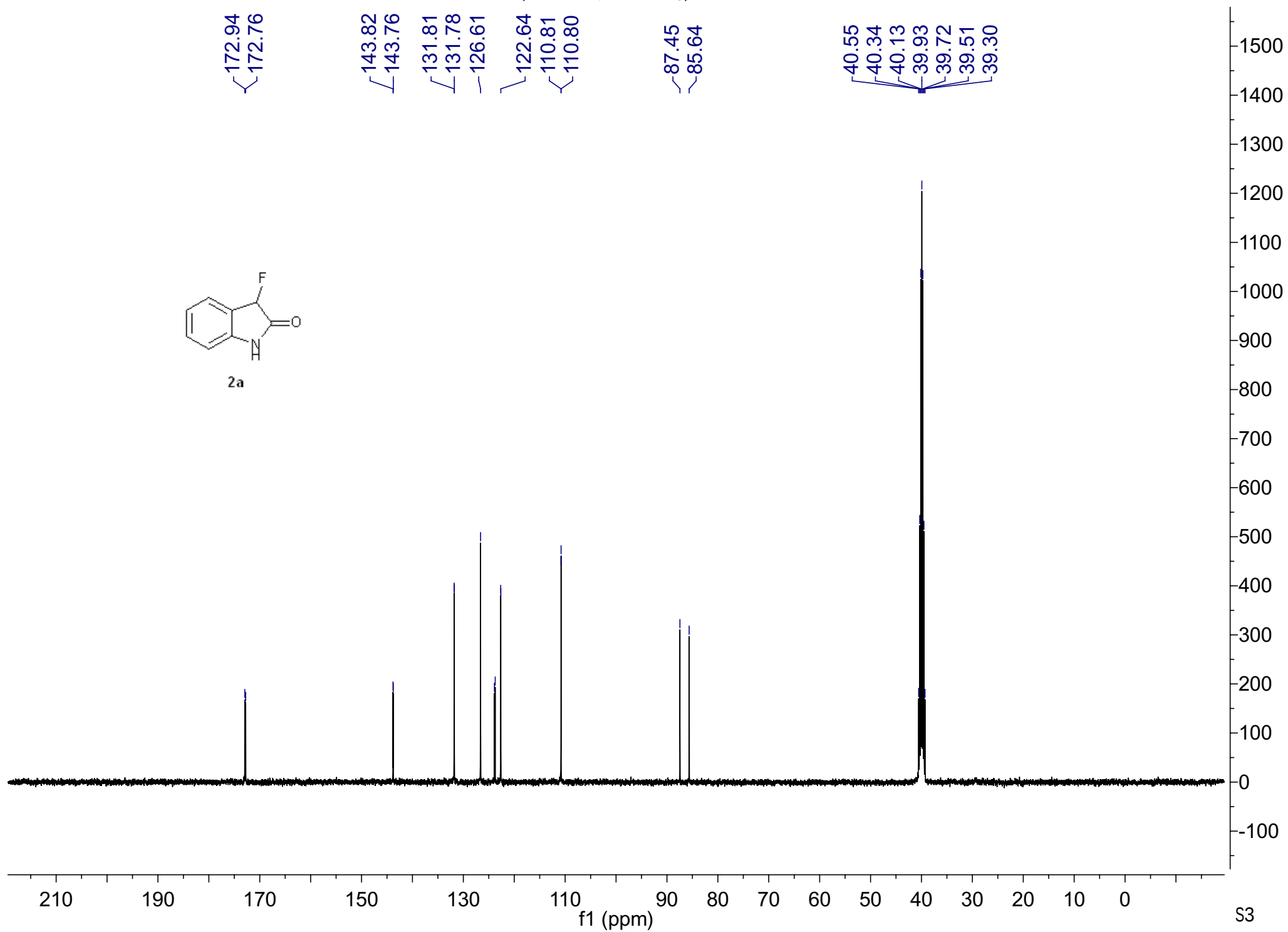
126.61

122.64

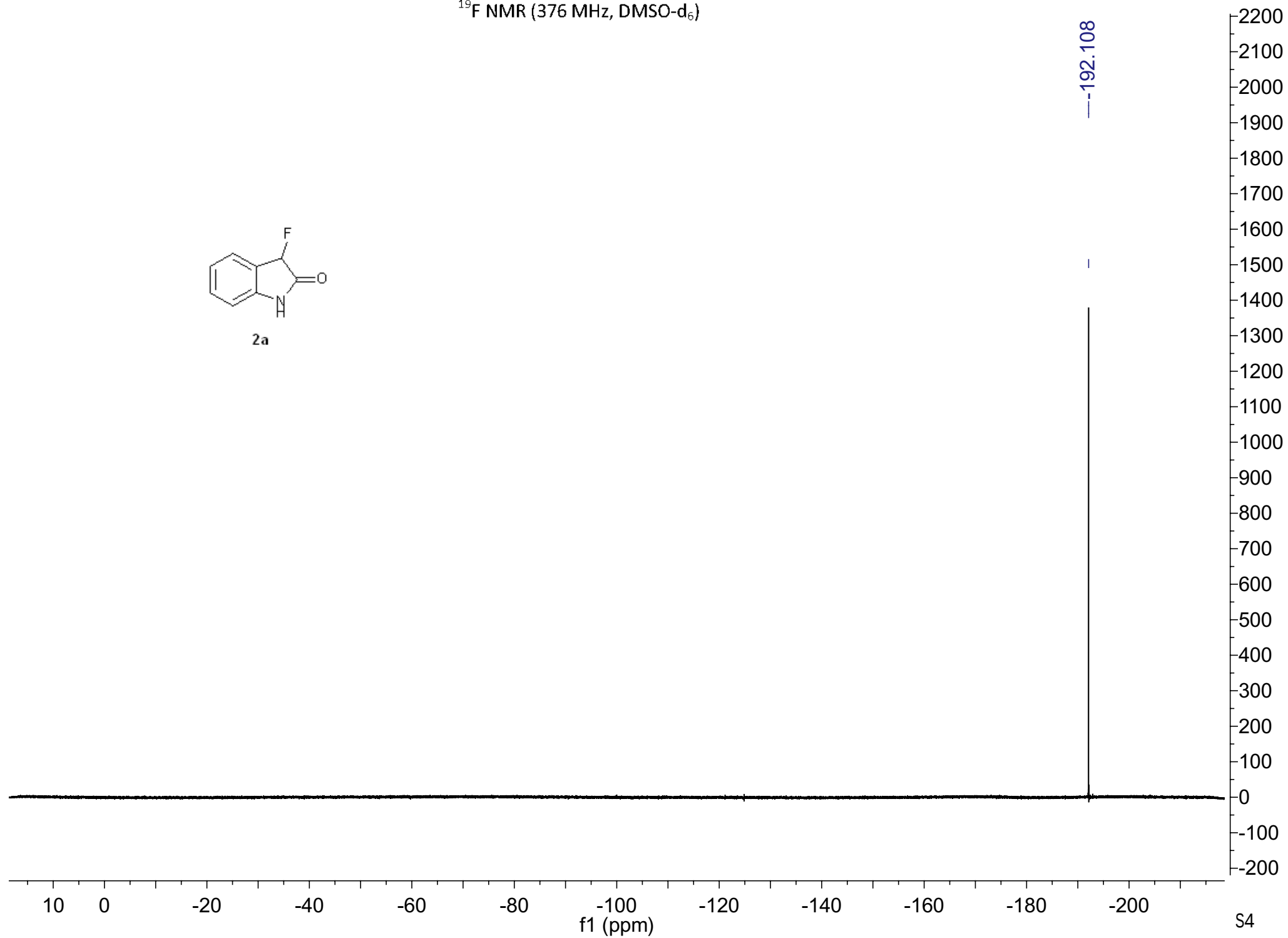
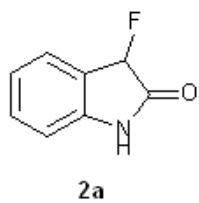
110.81  
110.80

87.45  
85.64

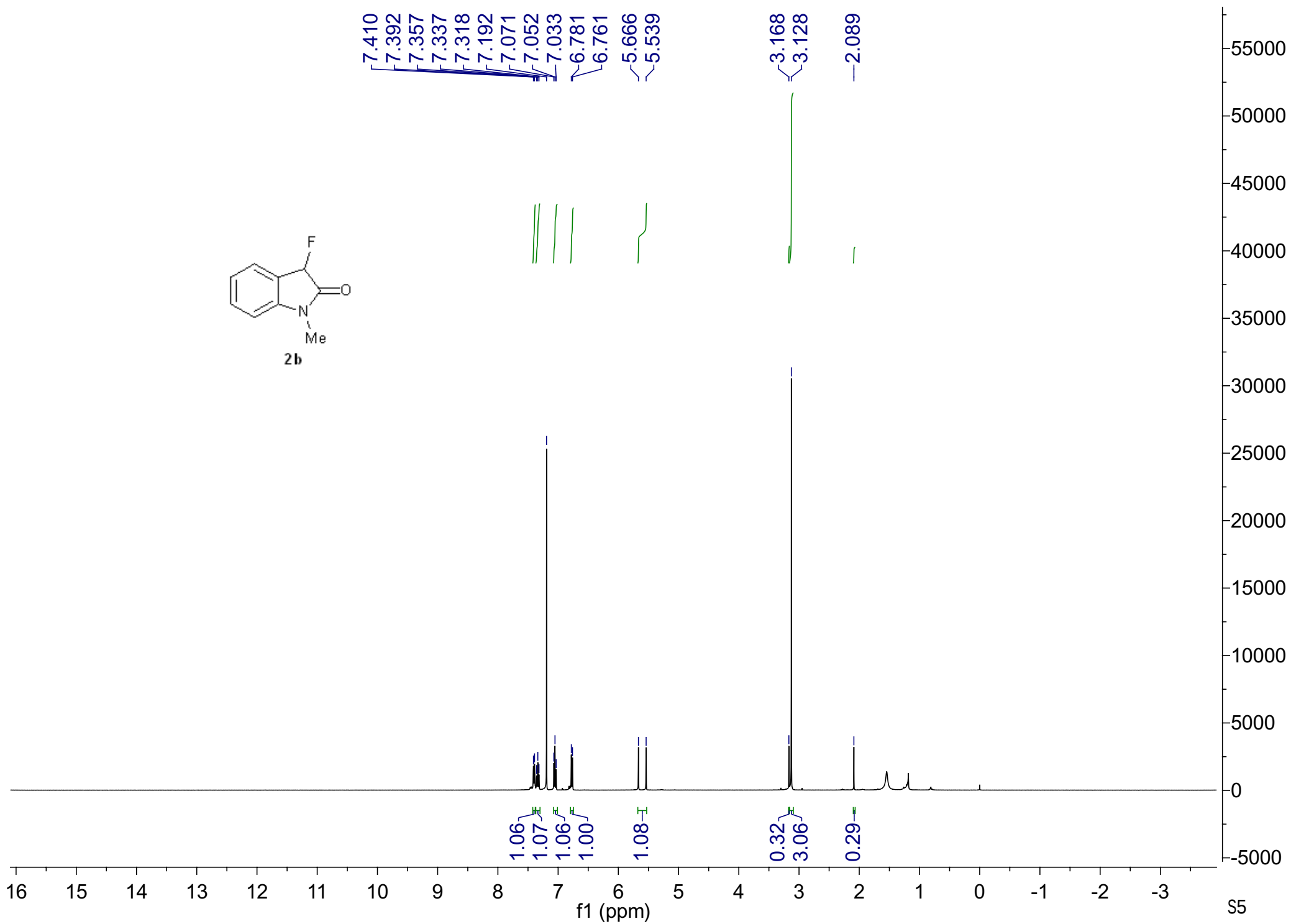
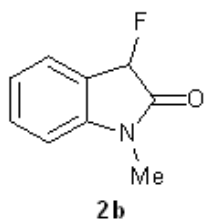
40.55  
40.34  
40.13  
39.93  
39.72  
39.51  
39.30



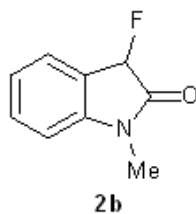
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



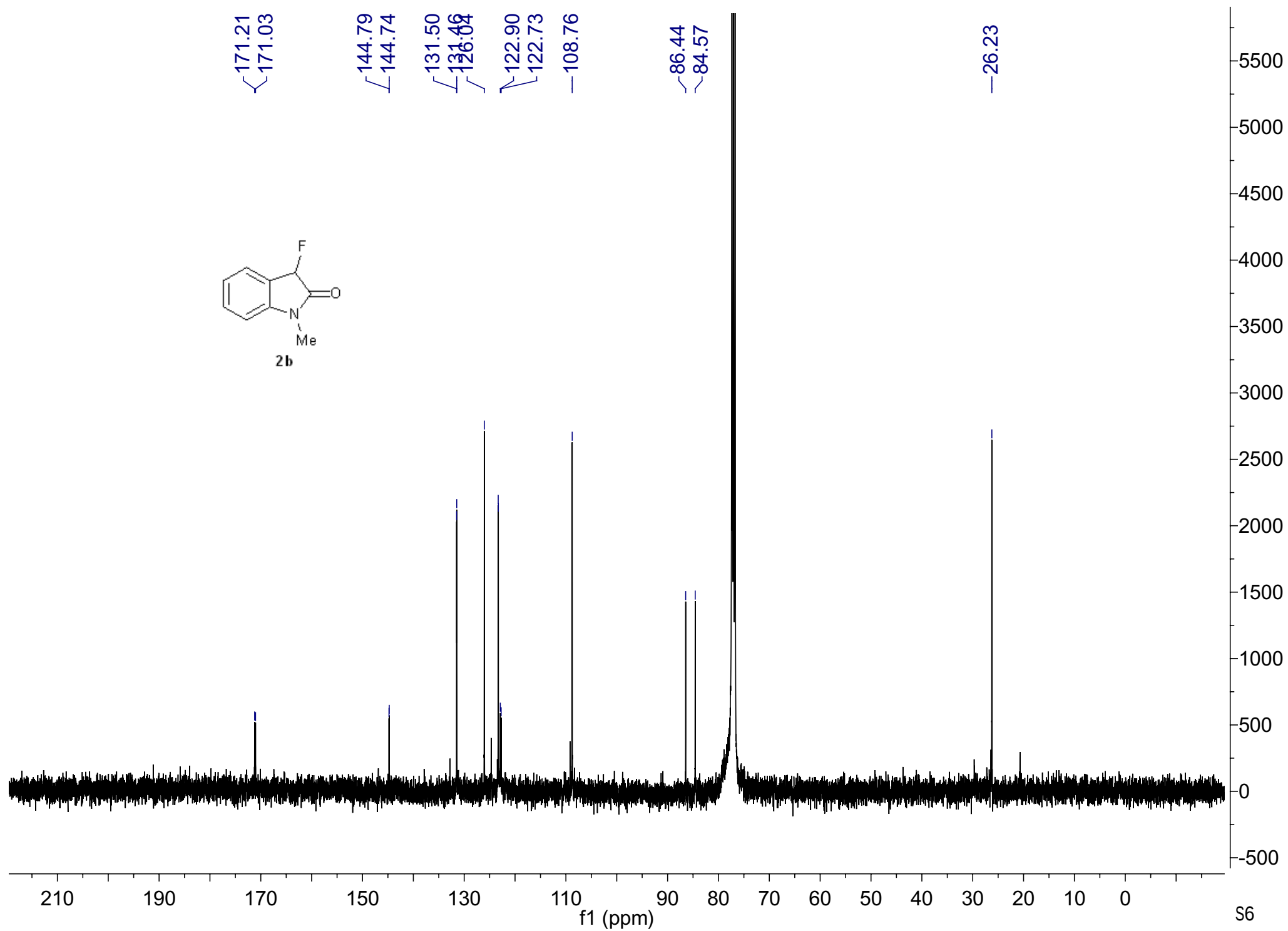
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)



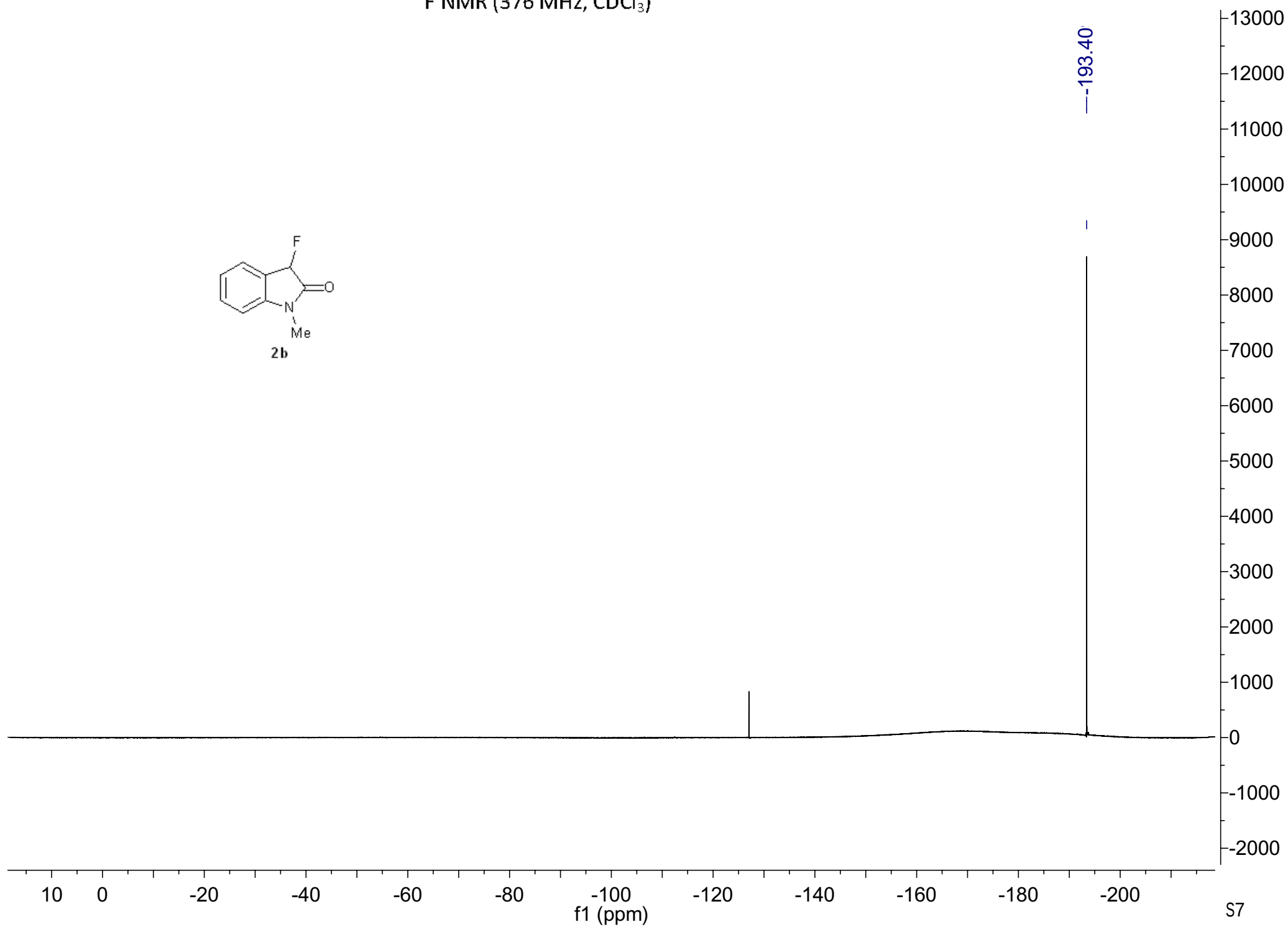
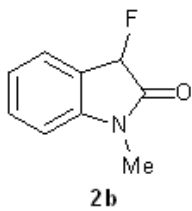
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



171.21  
171.03  
144.79  
144.74  
131.50  
131.46  
126.04  
122.90  
122.73  
108.76  
86.44  
84.57  
26.23

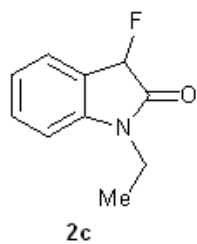


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

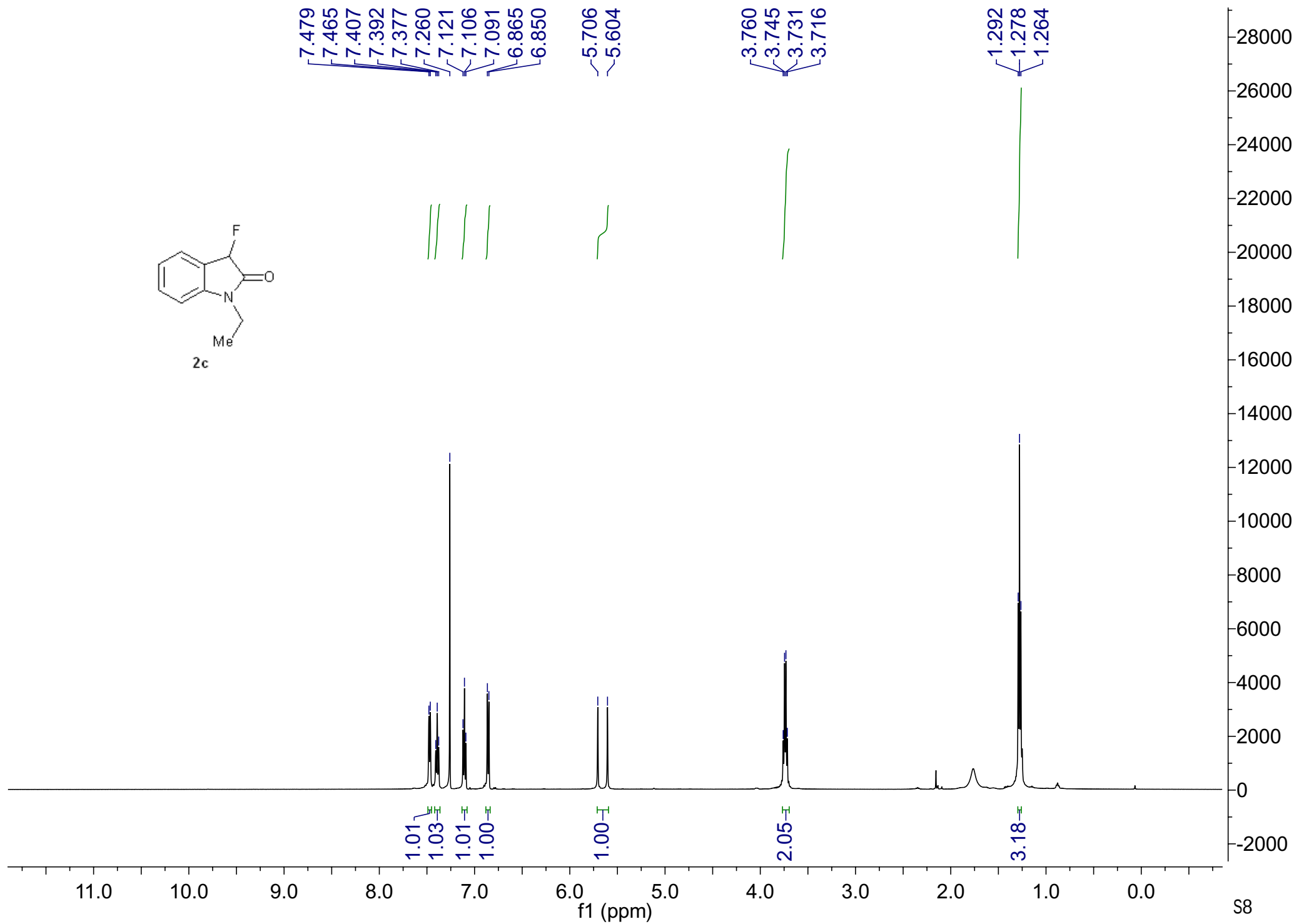


S7

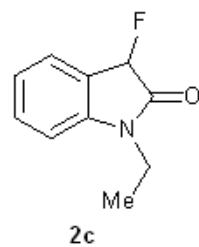
<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>)



7.479  
7.465  
7.407  
7.392  
7.377  
7.260  
7.121  
7.106  
7.091  
6.865  
6.850  
5.706  
5.604  
3.760  
3.745  
3.731  
3.716  
1.292  
1.278  
1.264



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



170.84  
170.66

143.85  
143.80

131.46  
131.43

126.21  
123.08

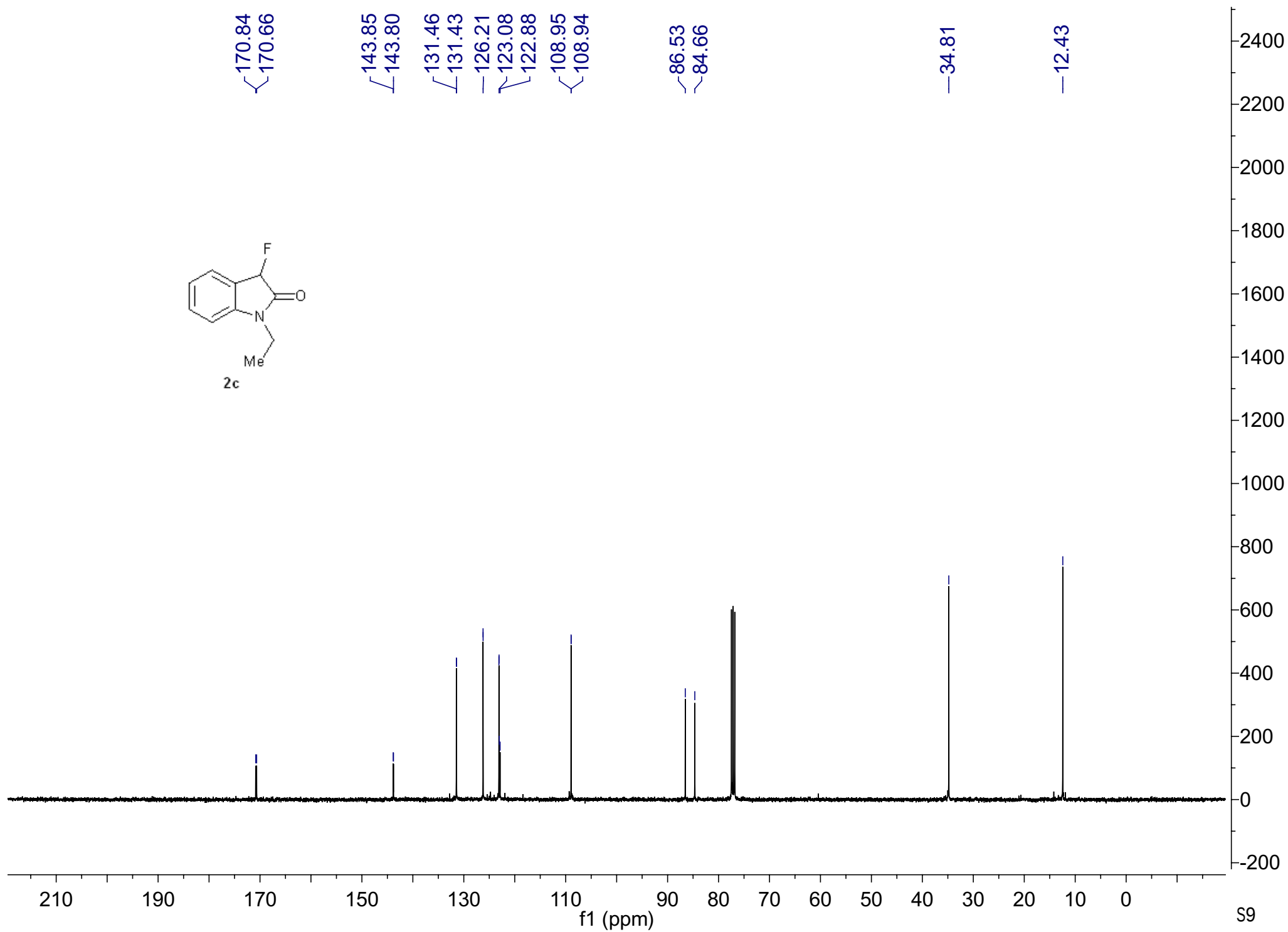
122.88  
108.95

108.94

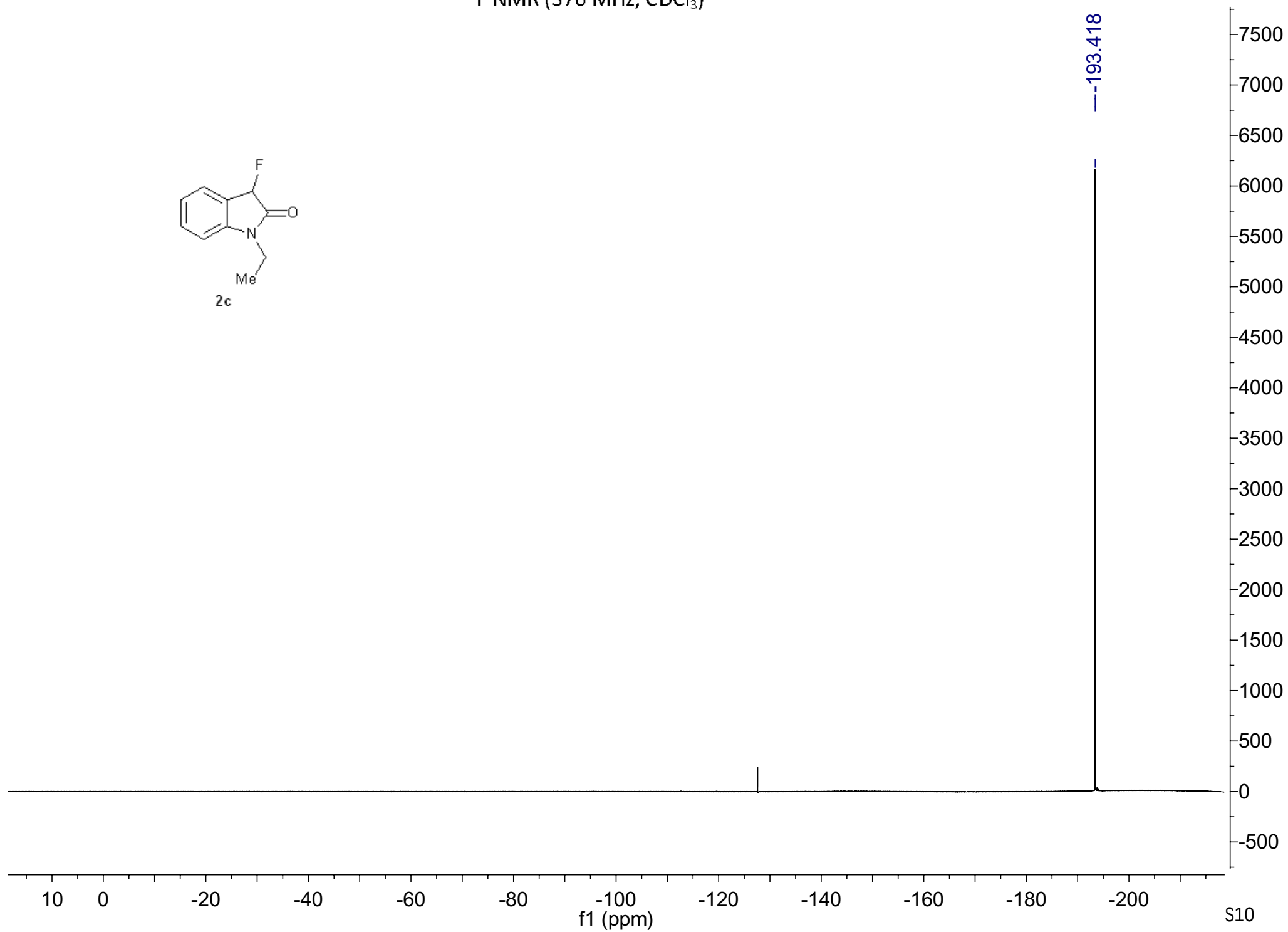
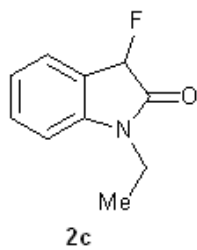
86.53  
84.66

34.81

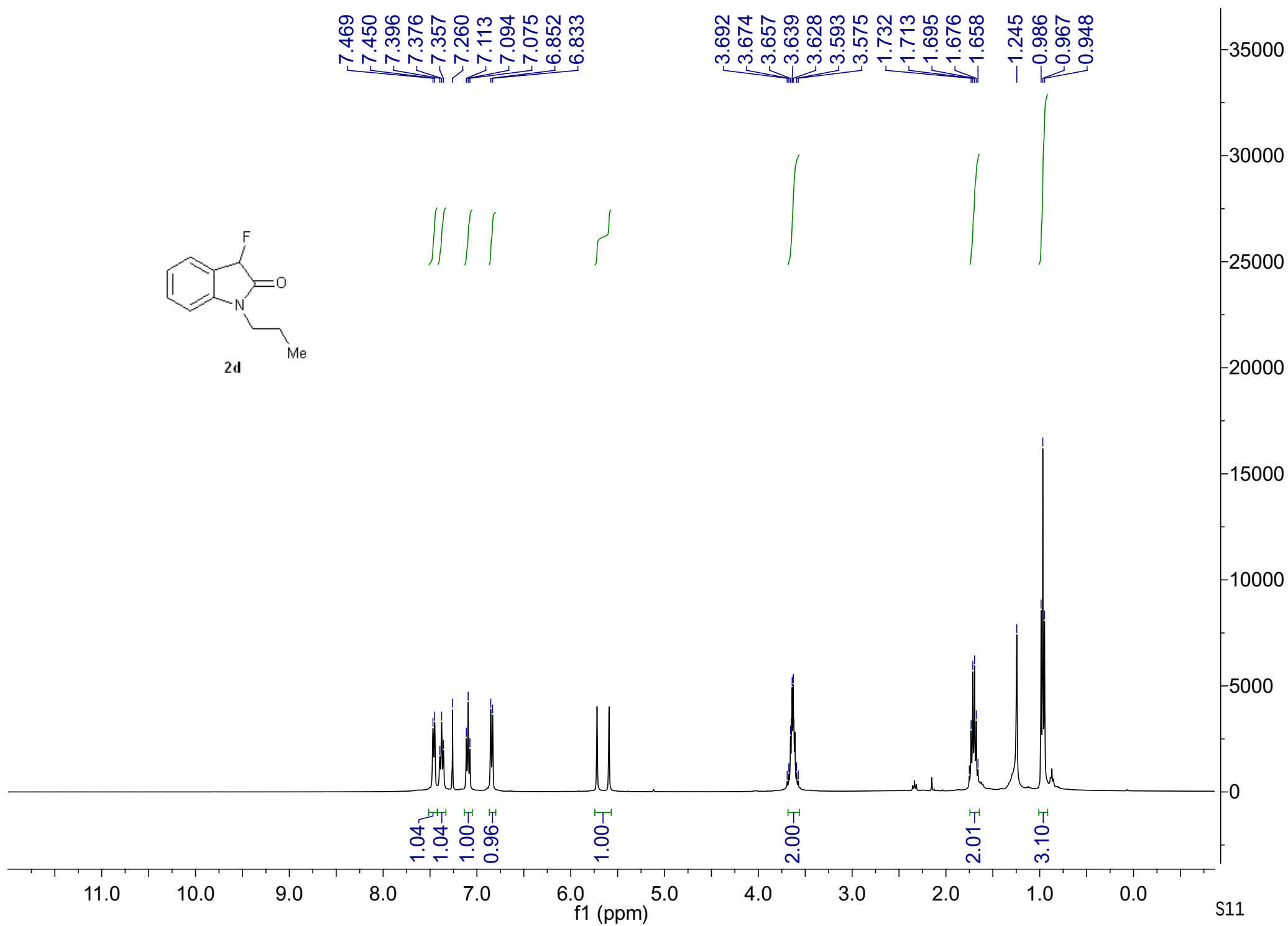
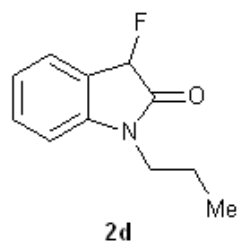
12.43



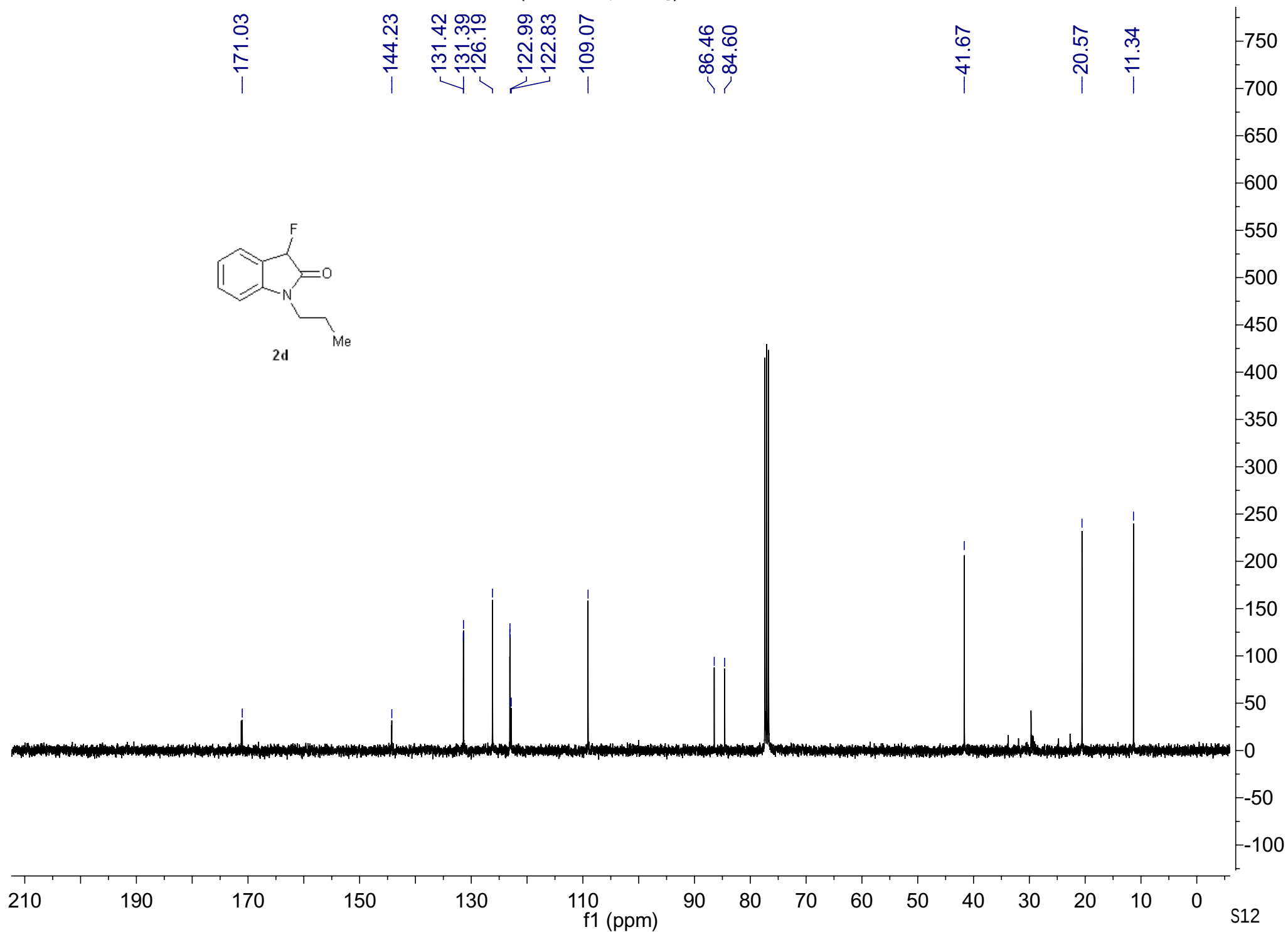
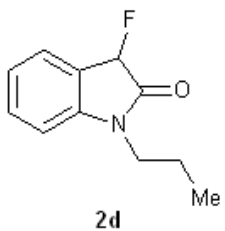
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



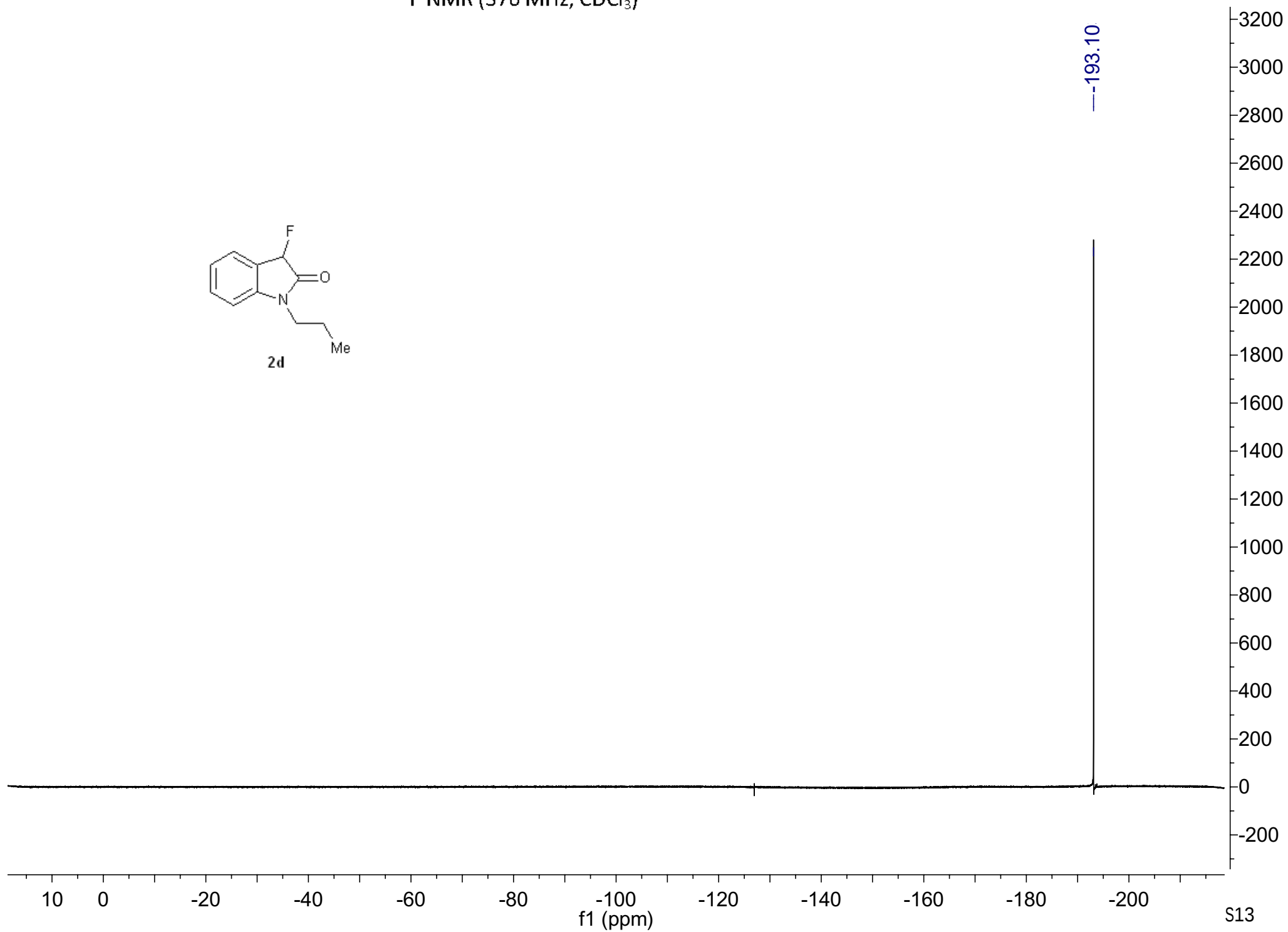
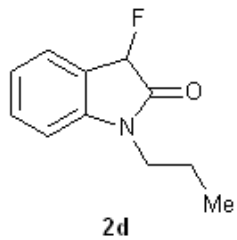
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)



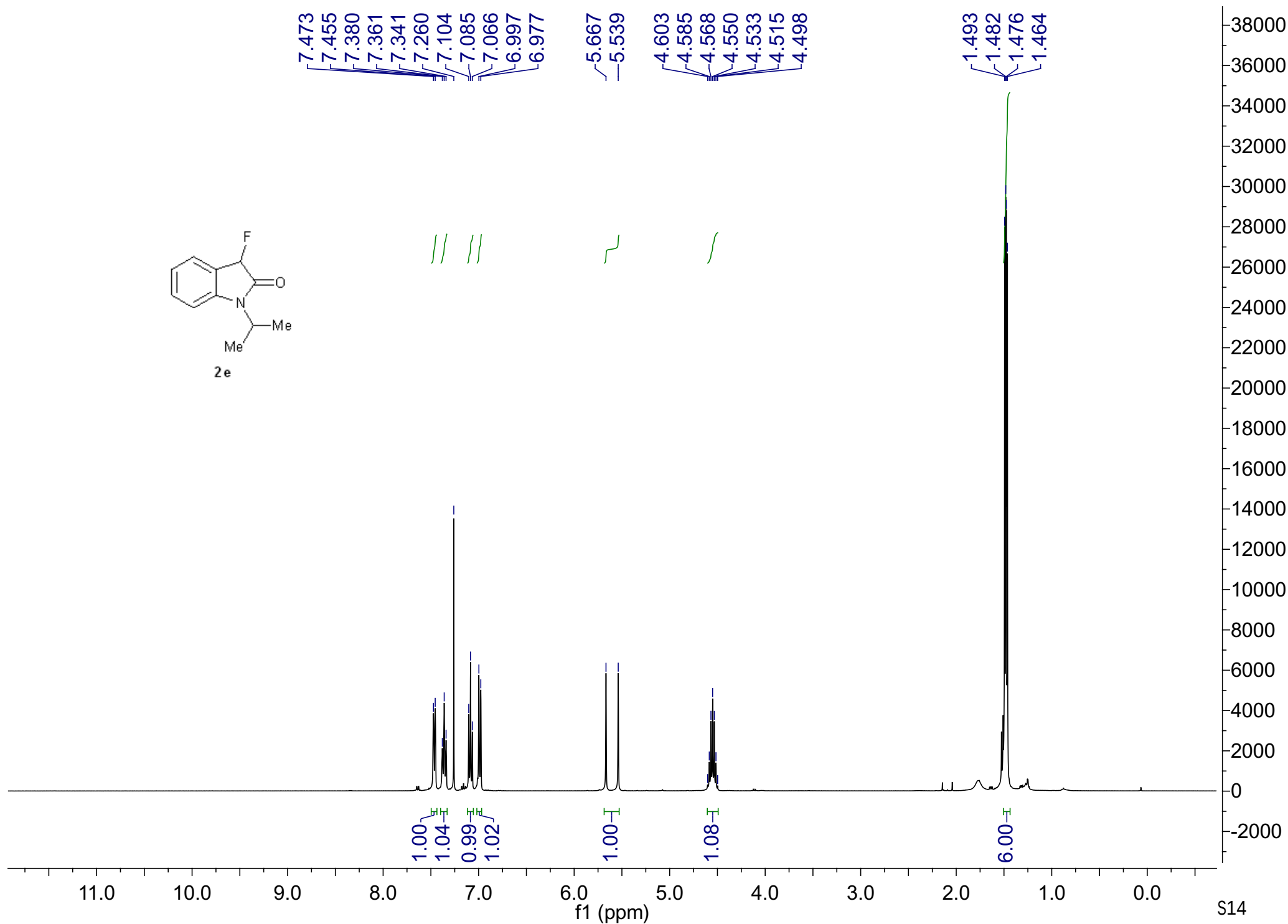
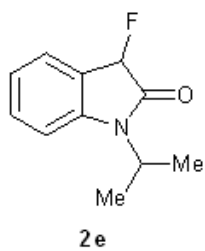
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



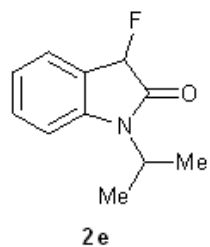
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



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



<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)



170.88  
170.74

143.49  
143.45

131.21  
131.19  
126.31

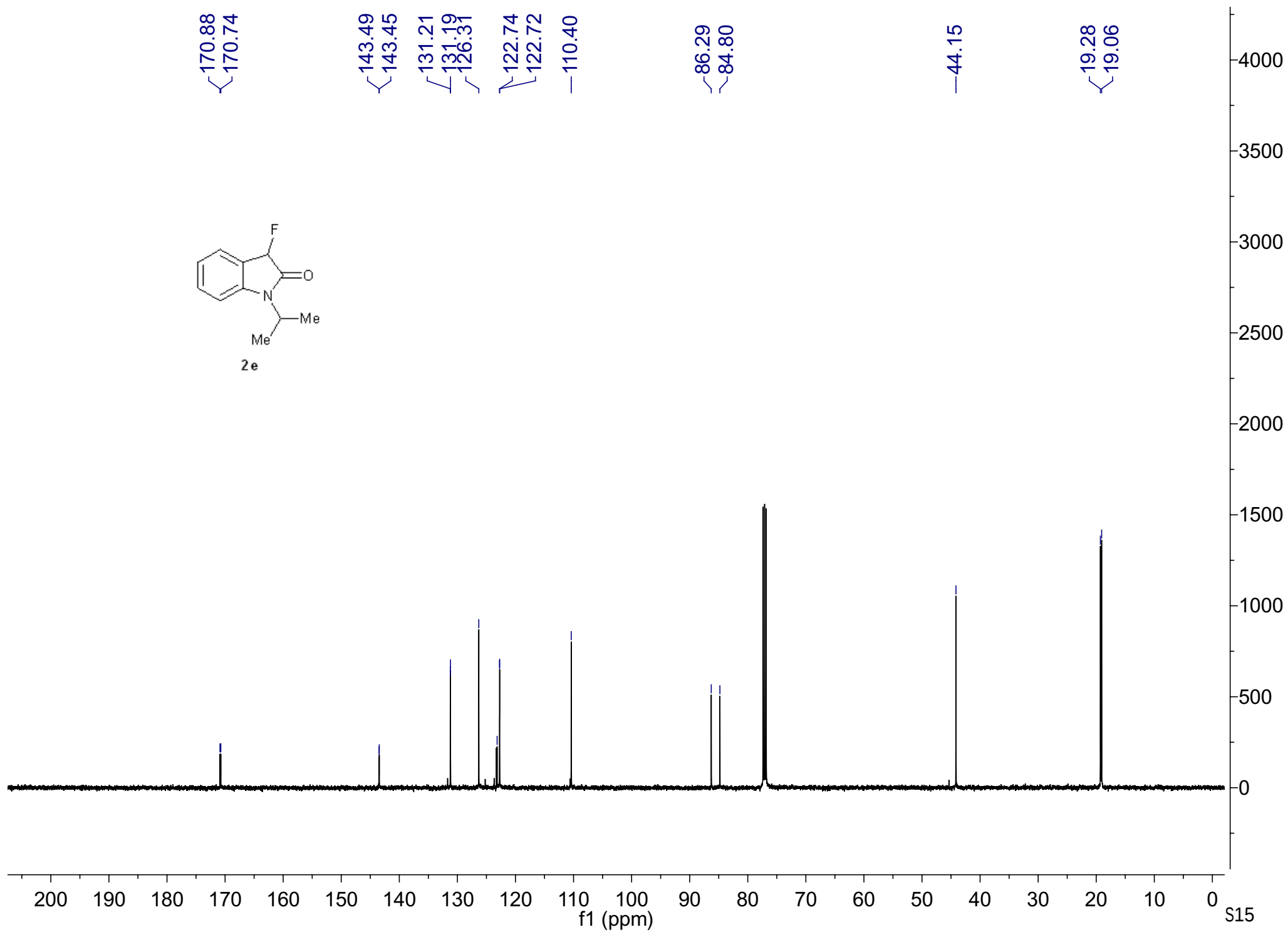
122.74  
122.72

110.40

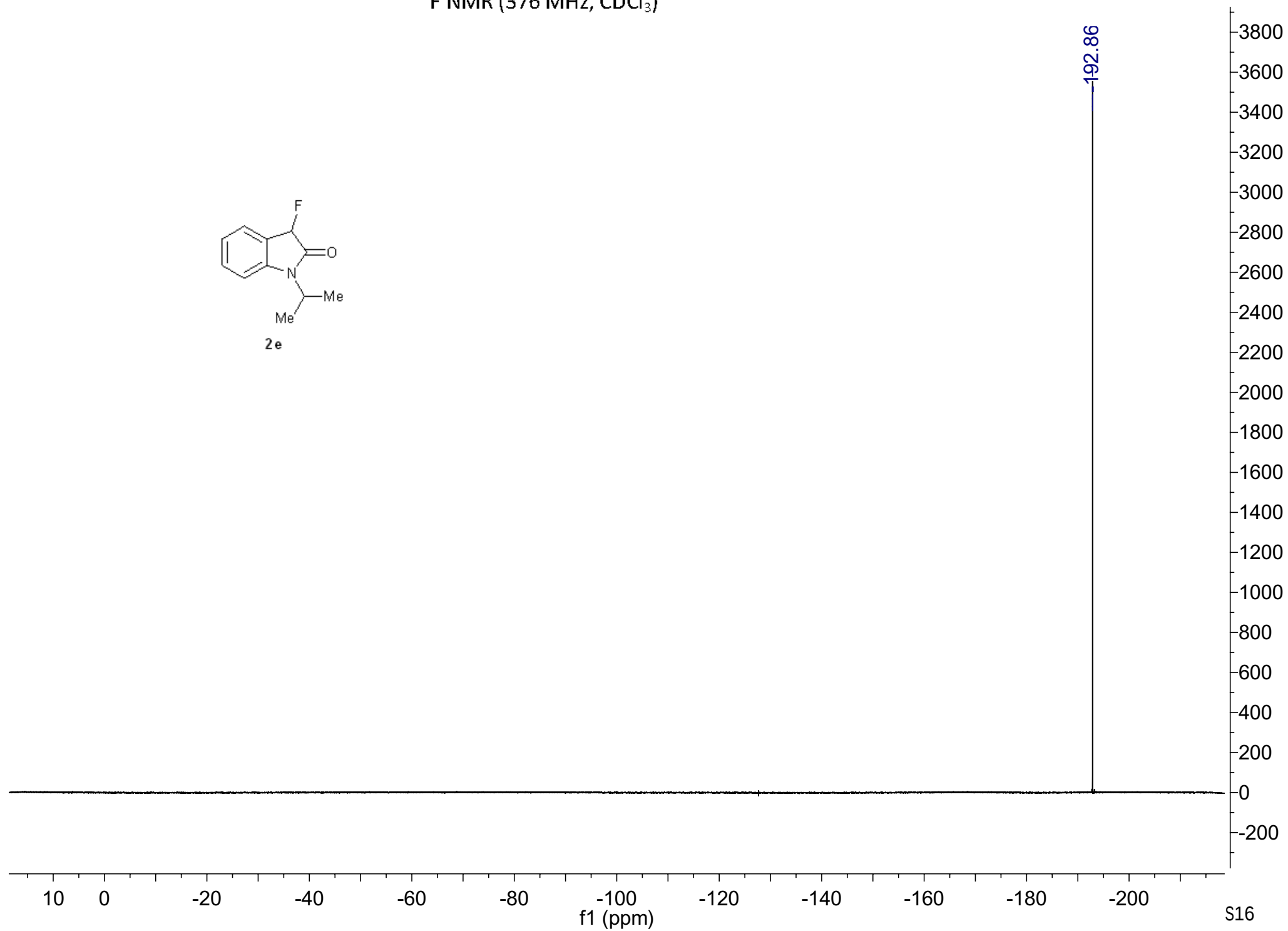
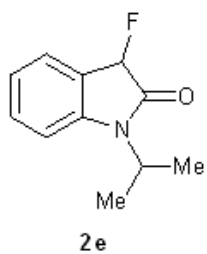
86.29  
84.80

44.15

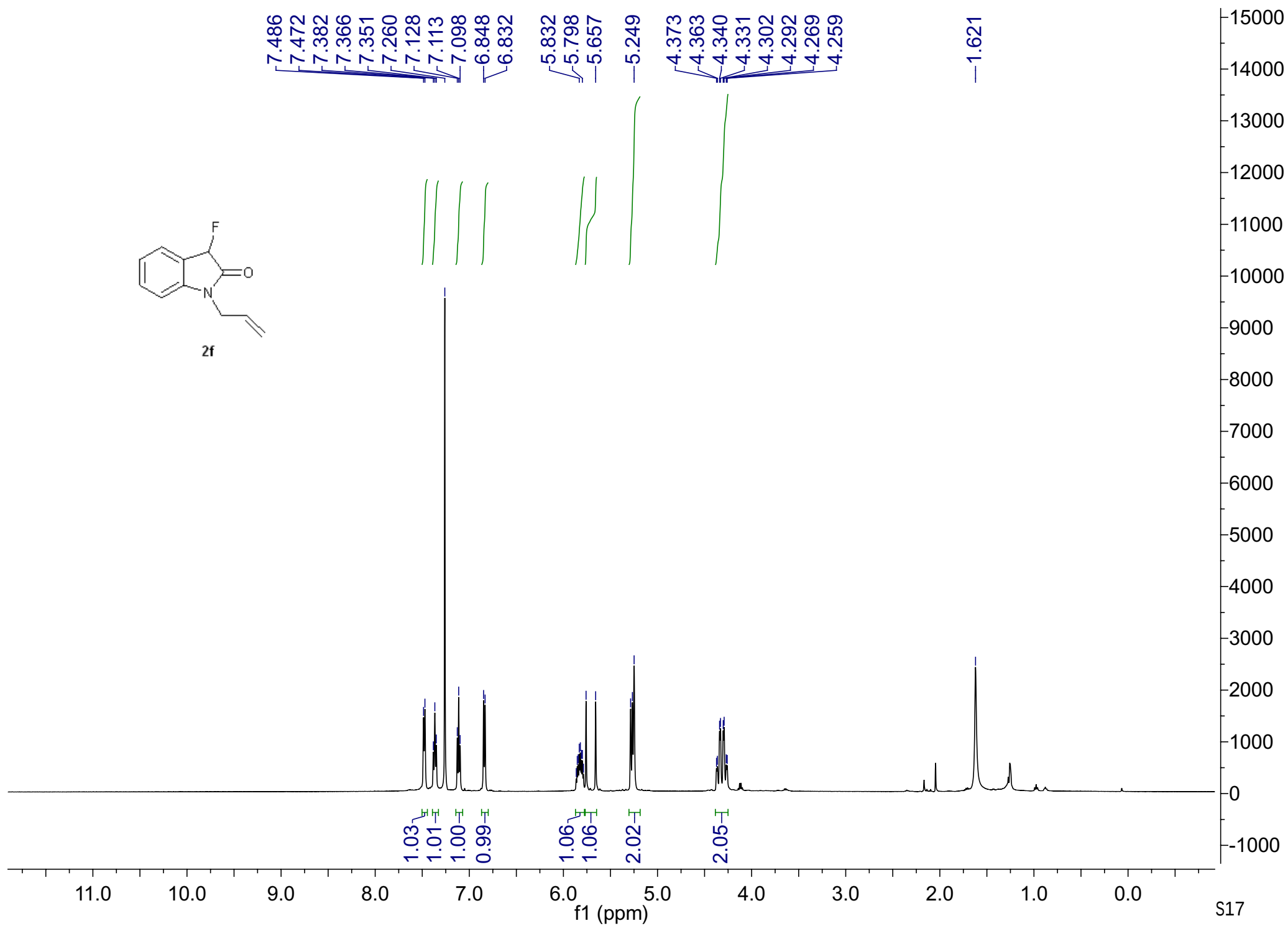
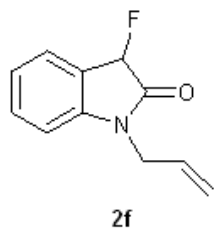
19.28  
19.06



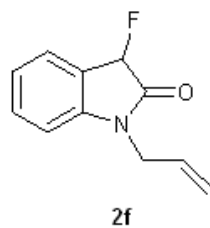
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>)



<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)



170.92  
170.77

143.98  
143.94

131.37  
130.68

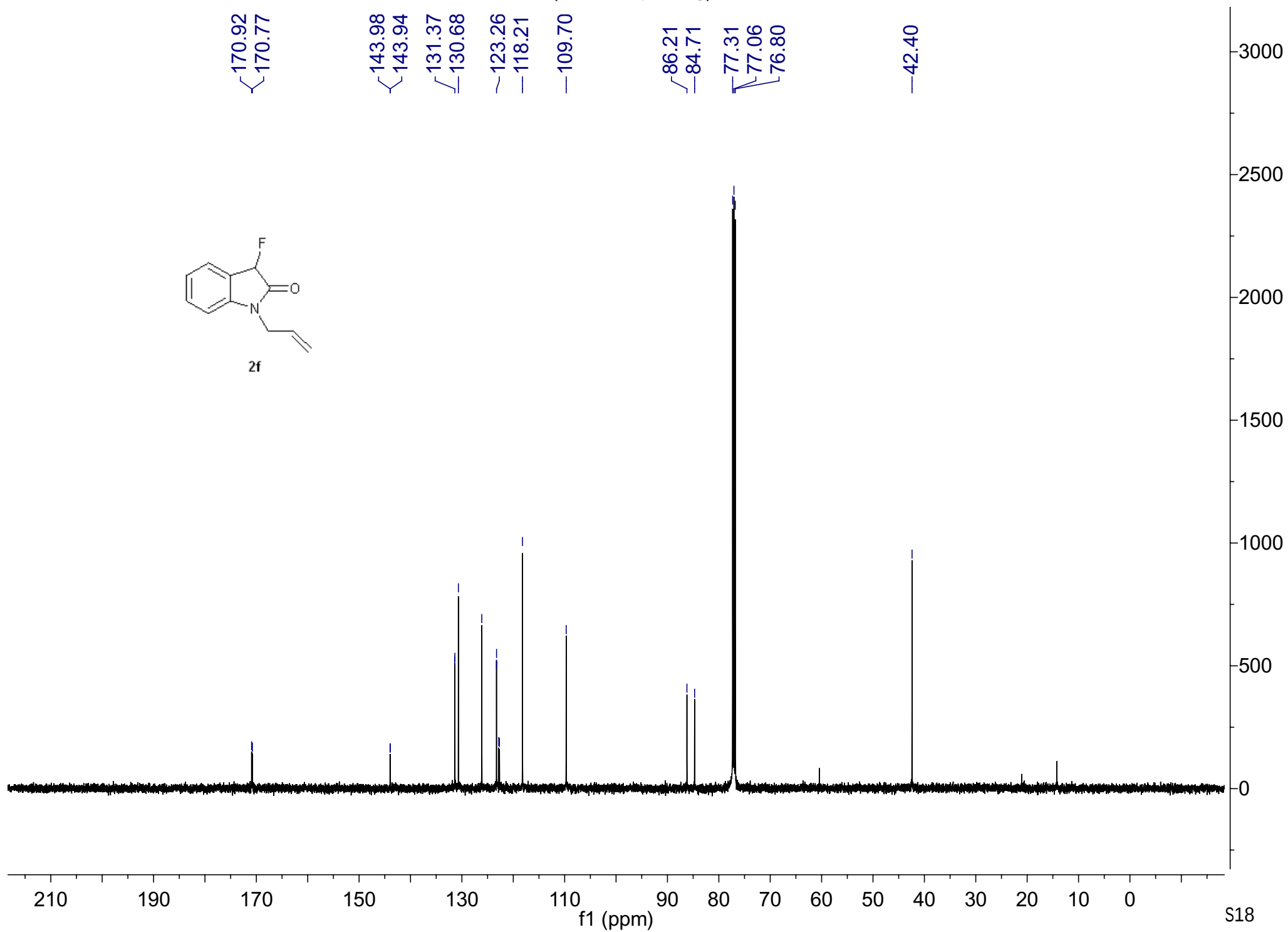
123.26  
118.21

109.70

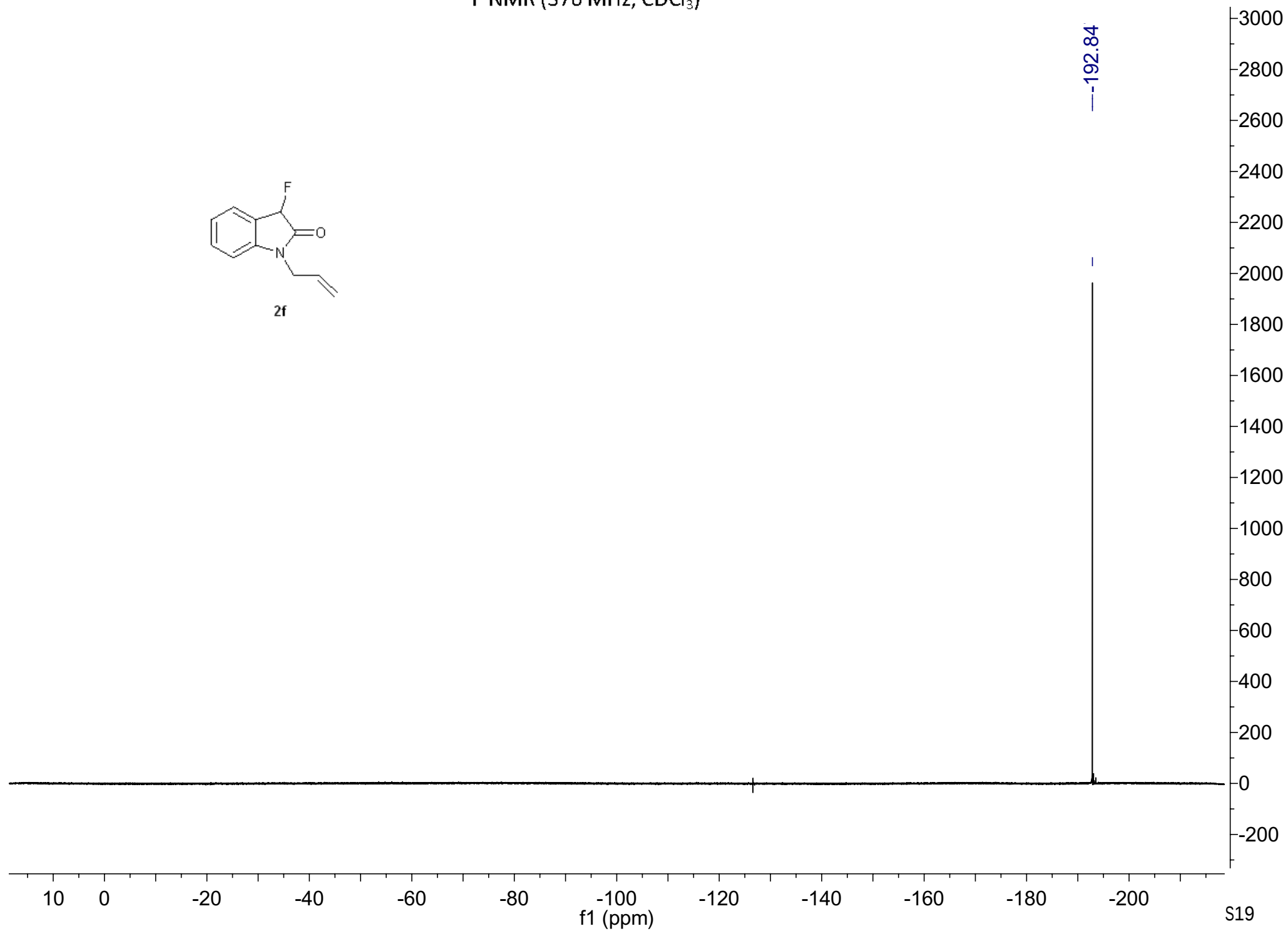
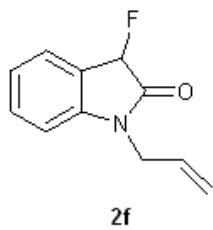
86.21  
84.71

77.31  
77.06  
76.80

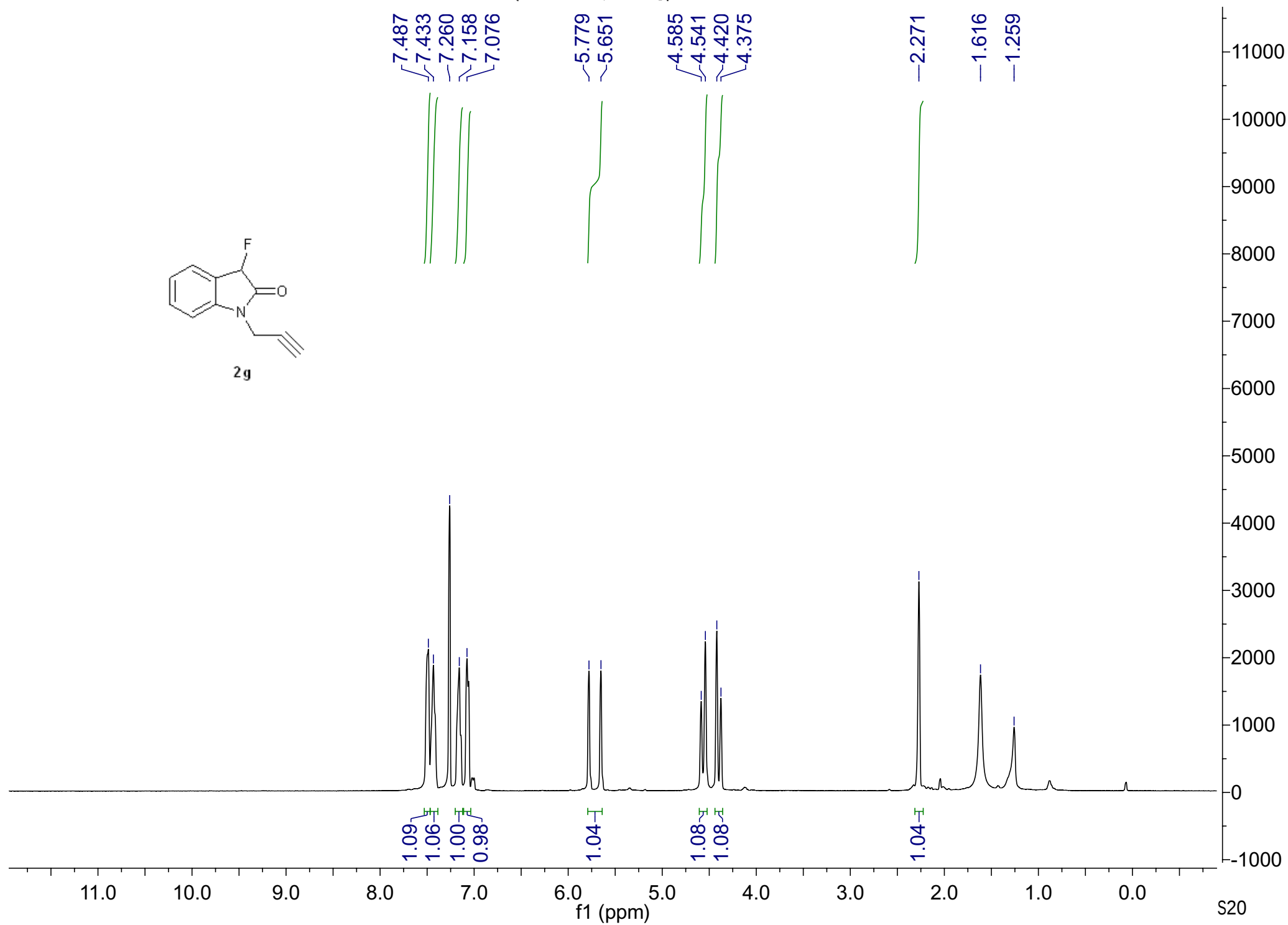
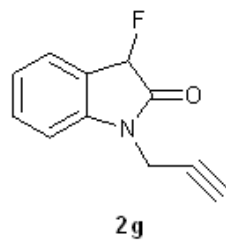
42.40



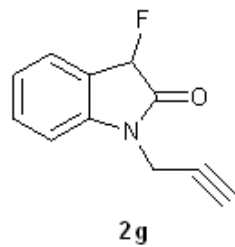
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



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



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



170.22  
170.04

142.83  
142.78

131.51  
131.47

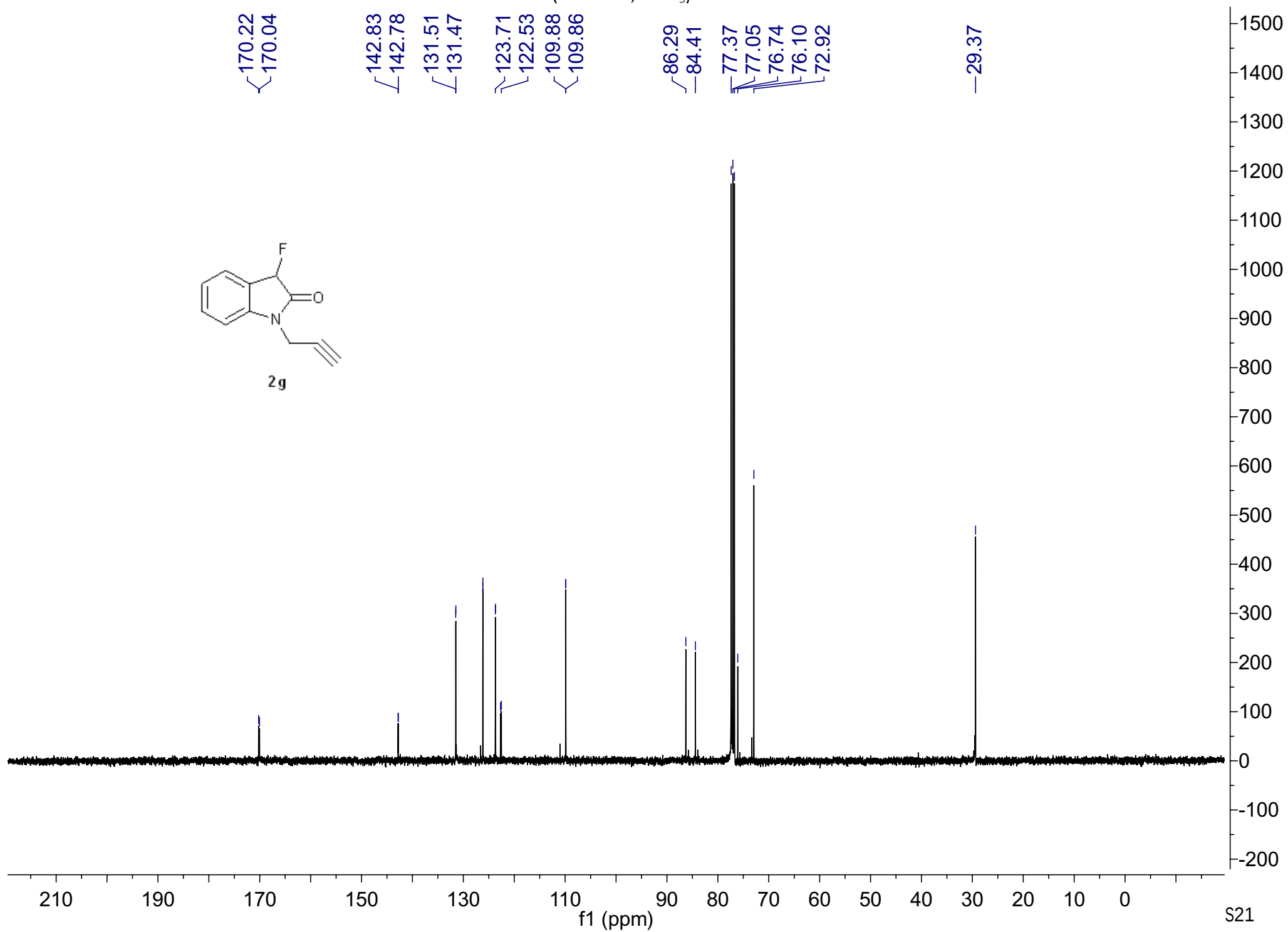
123.71  
122.53

109.88  
109.86

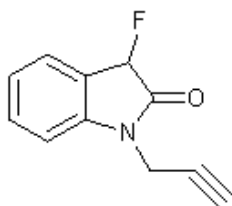
86.29  
84.41

77.37  
77.05  
76.74  
76.10  
72.92

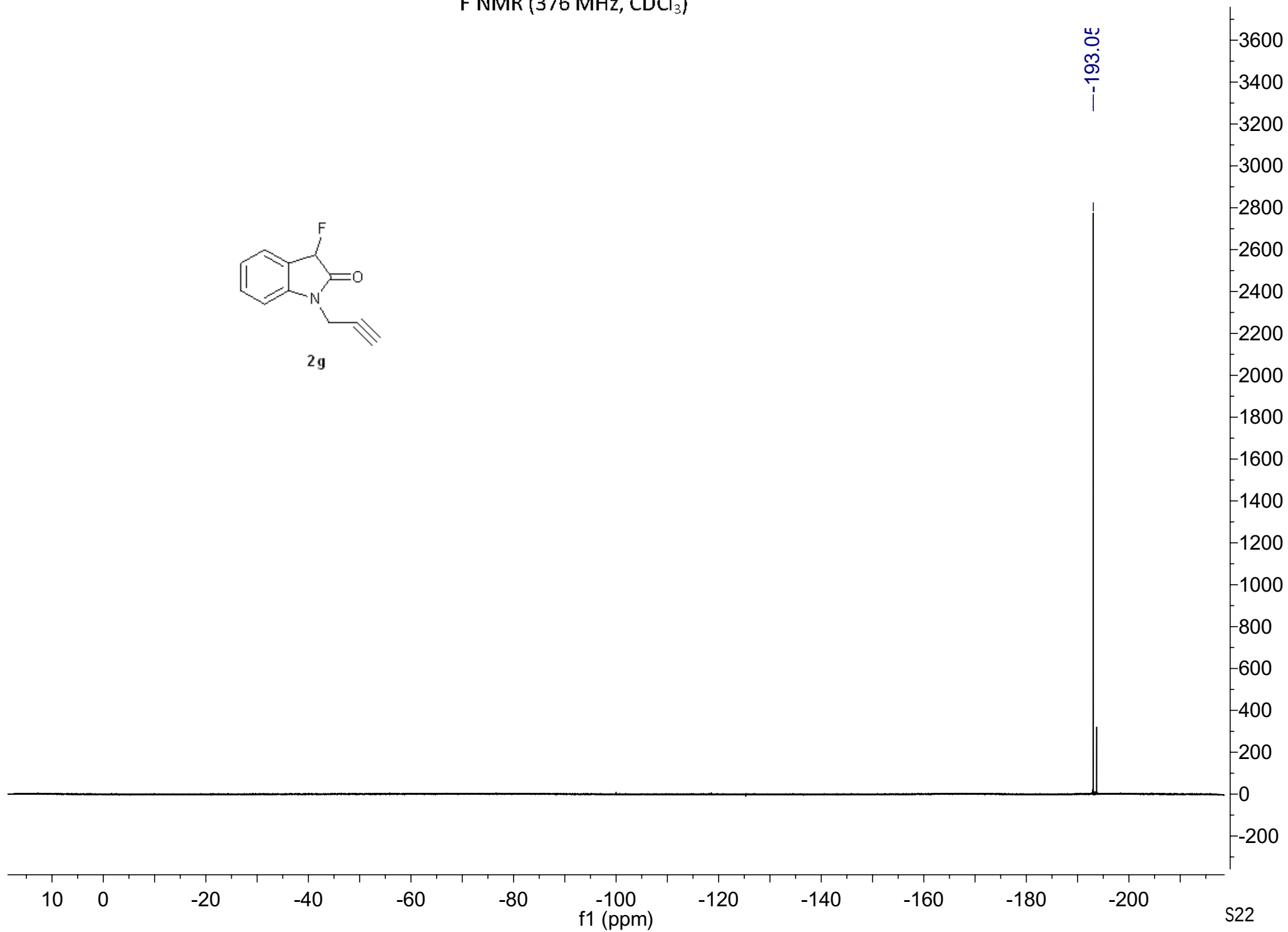
29.37



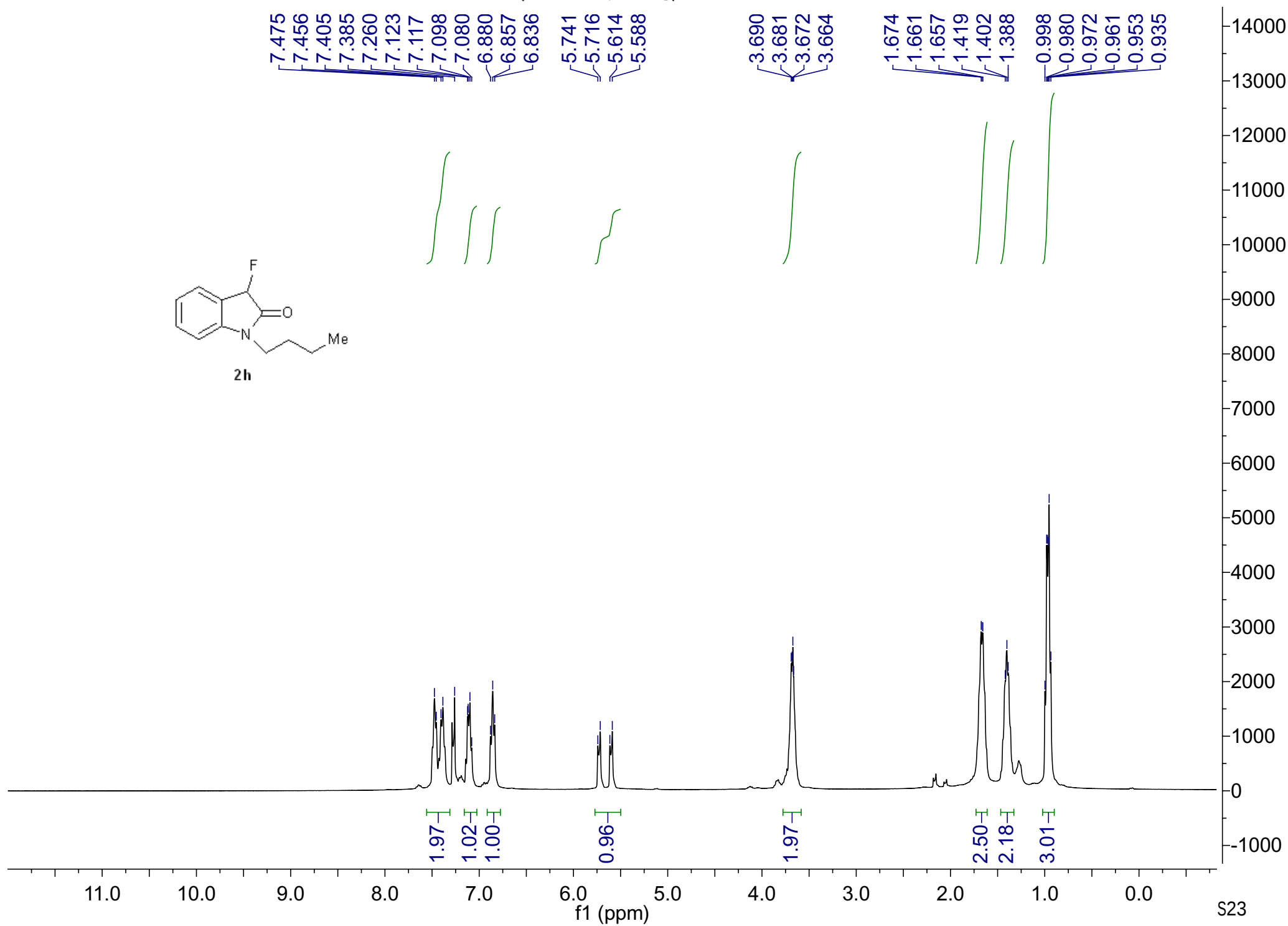
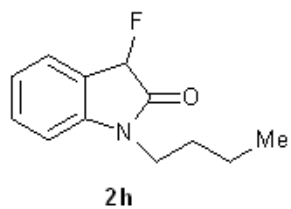
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



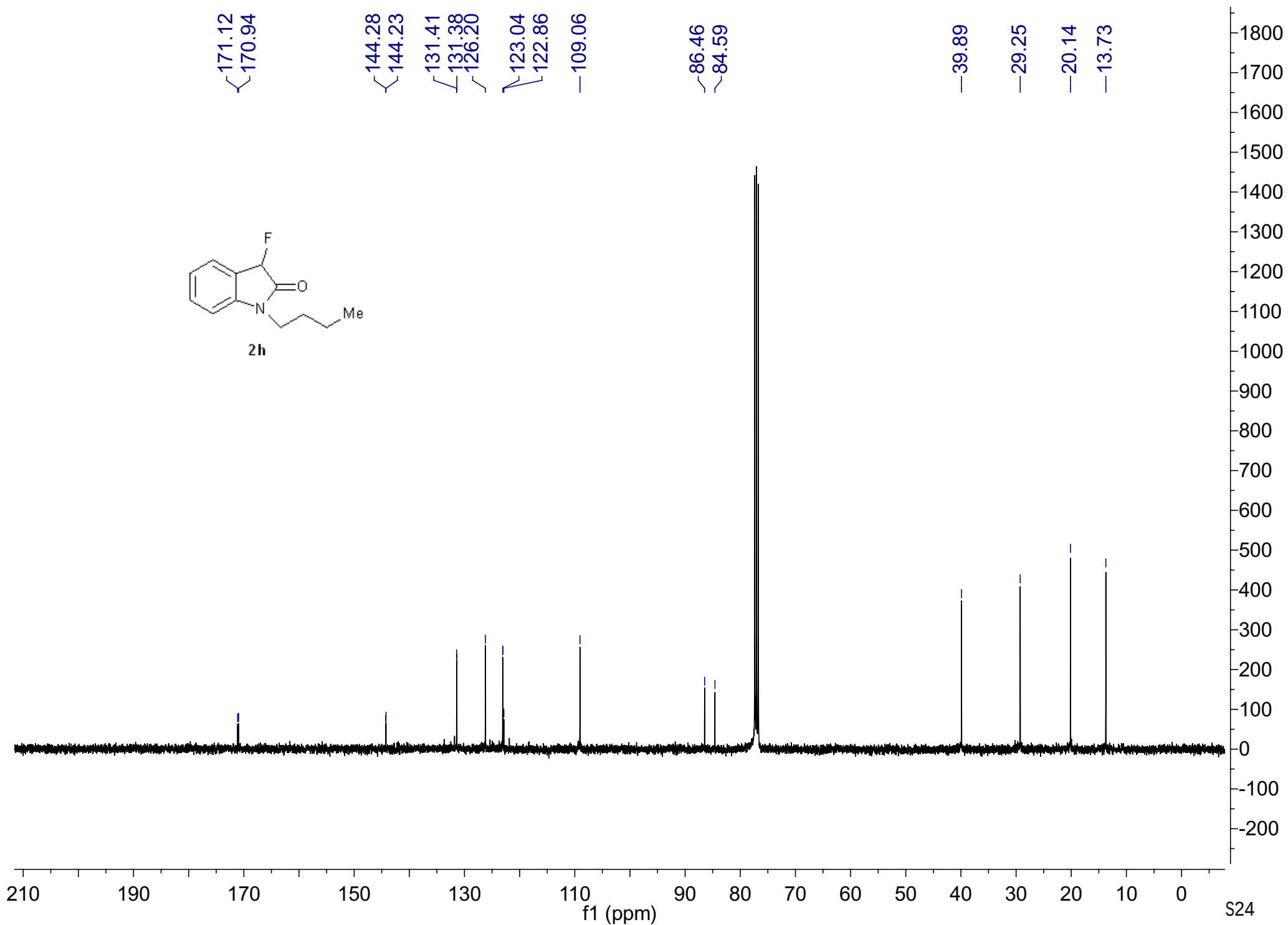
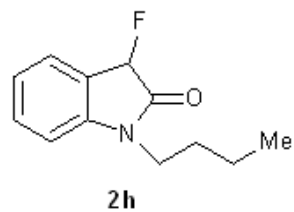
**2g**



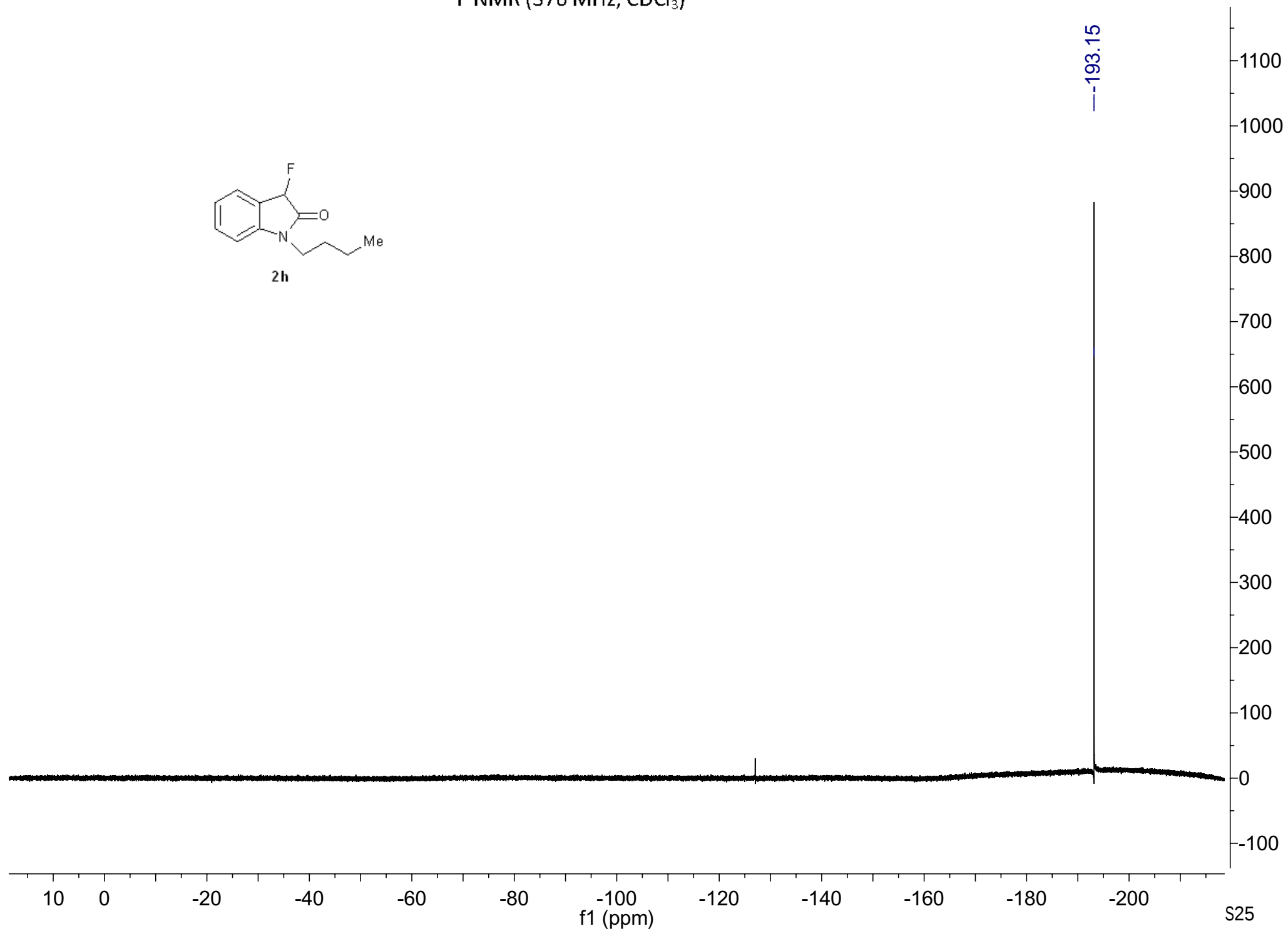
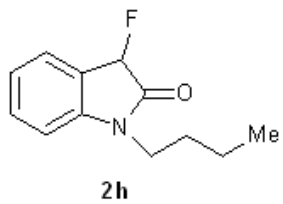
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)



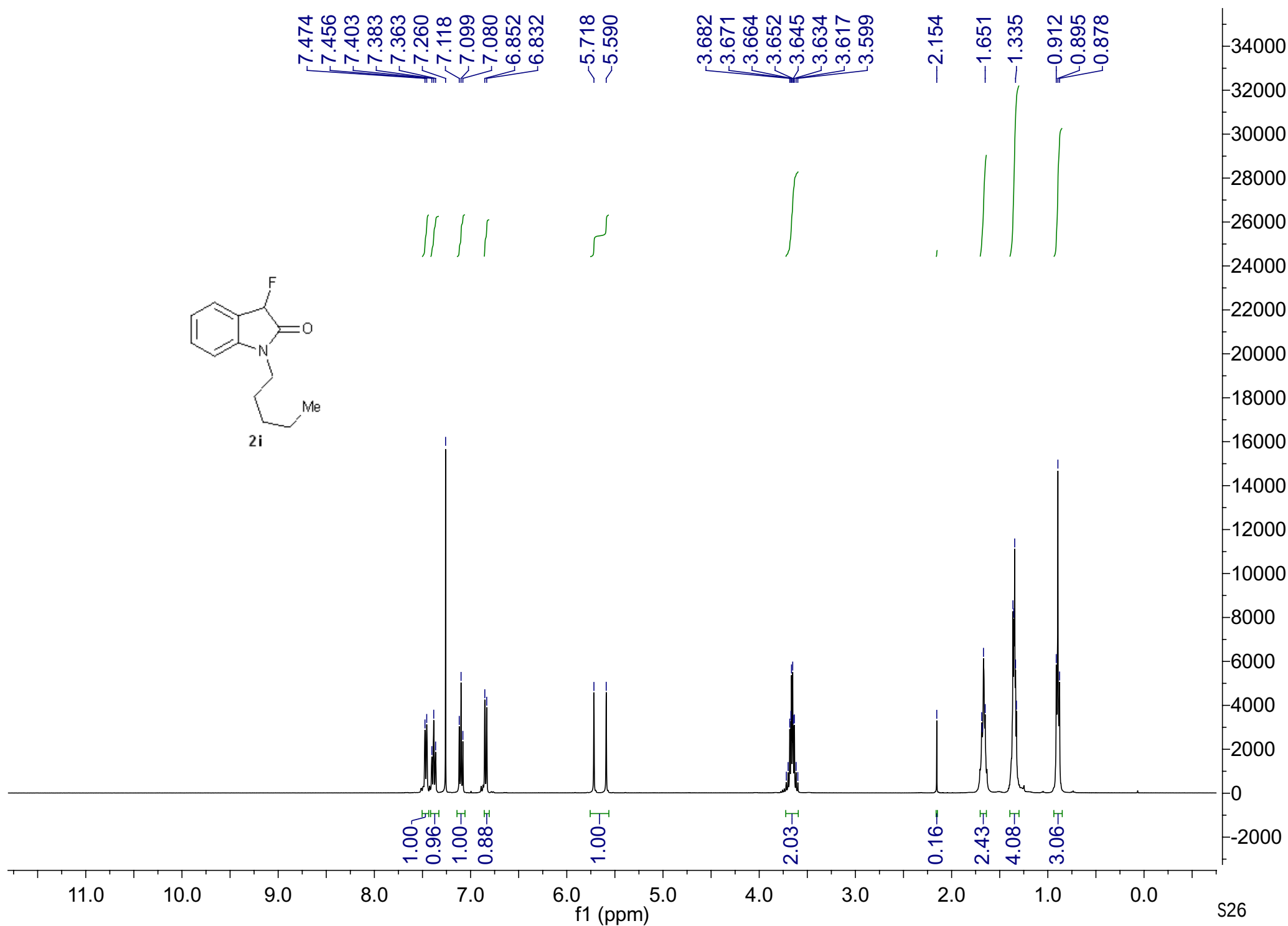
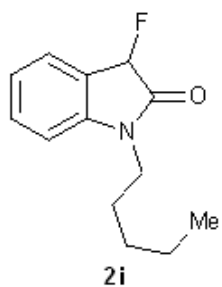
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



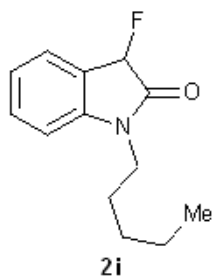
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



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



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



171.10  
170.92

144.26  
144.21

131.43  
131.40  
126.19

123.00  
122.84

109.06

86.47  
84.60

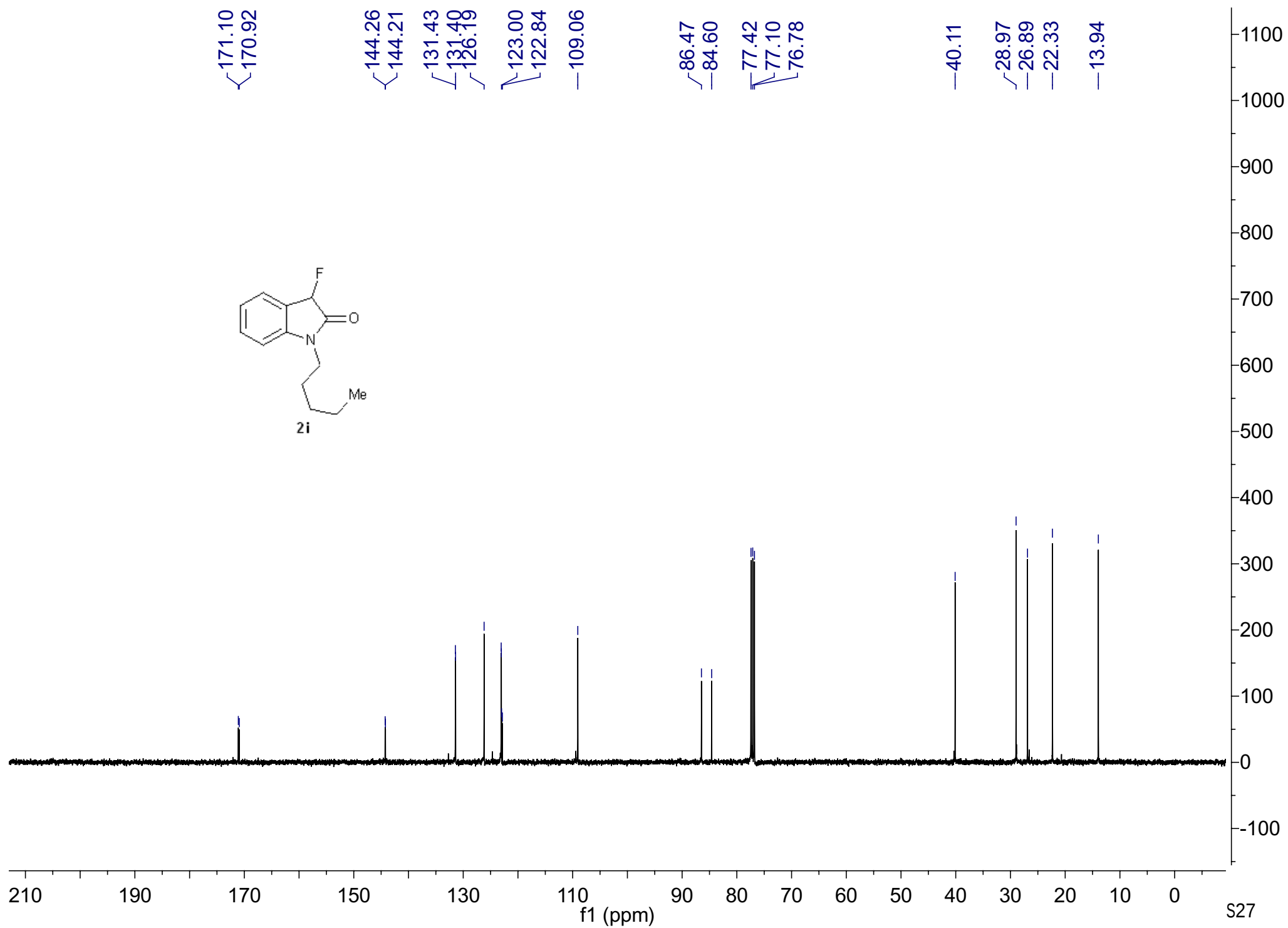
77.42  
77.10  
76.78

40.11

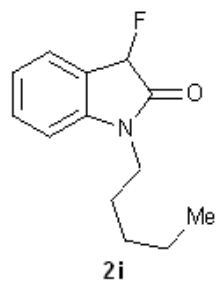
28.97  
26.89

22.33

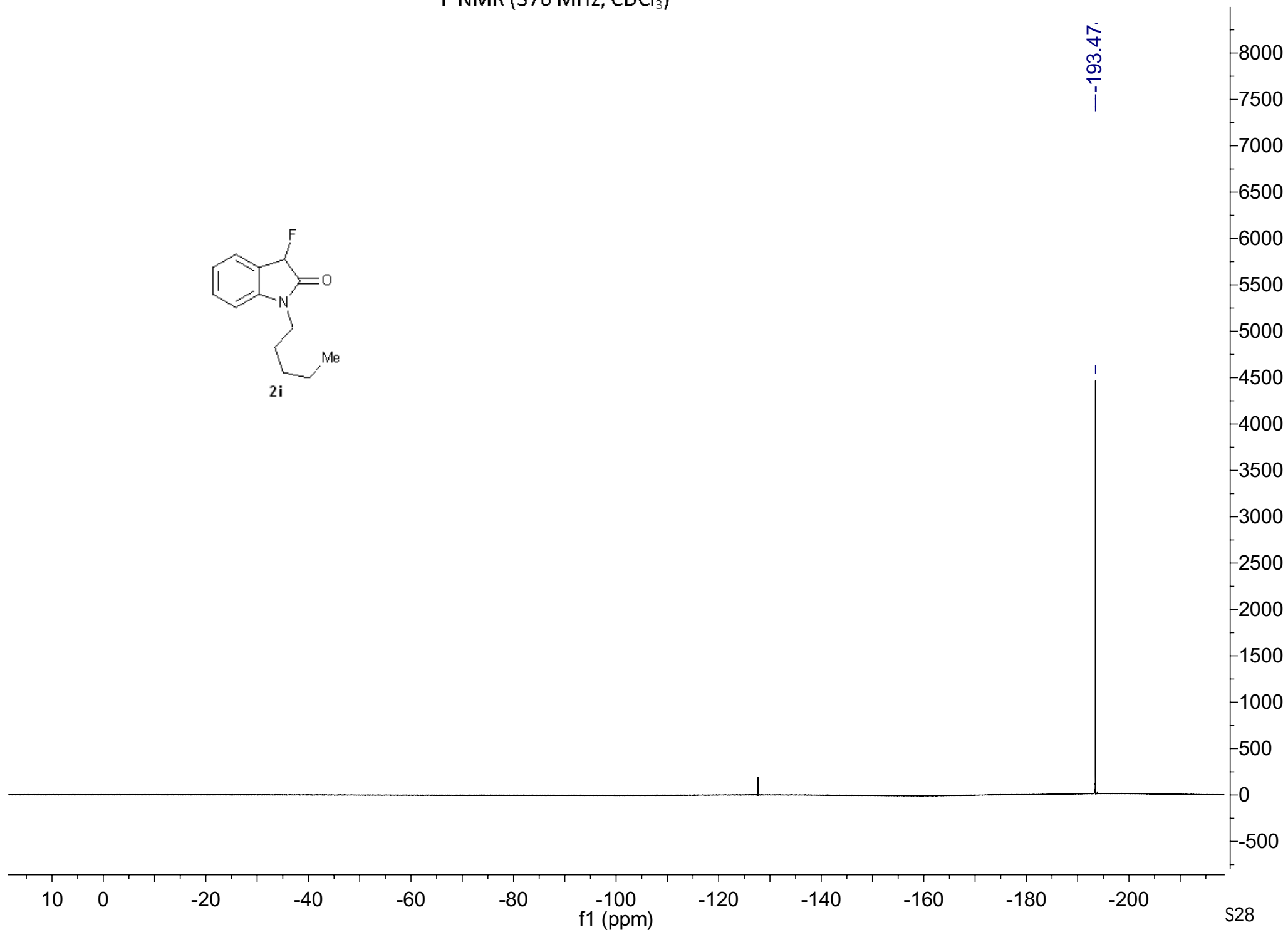
13.94



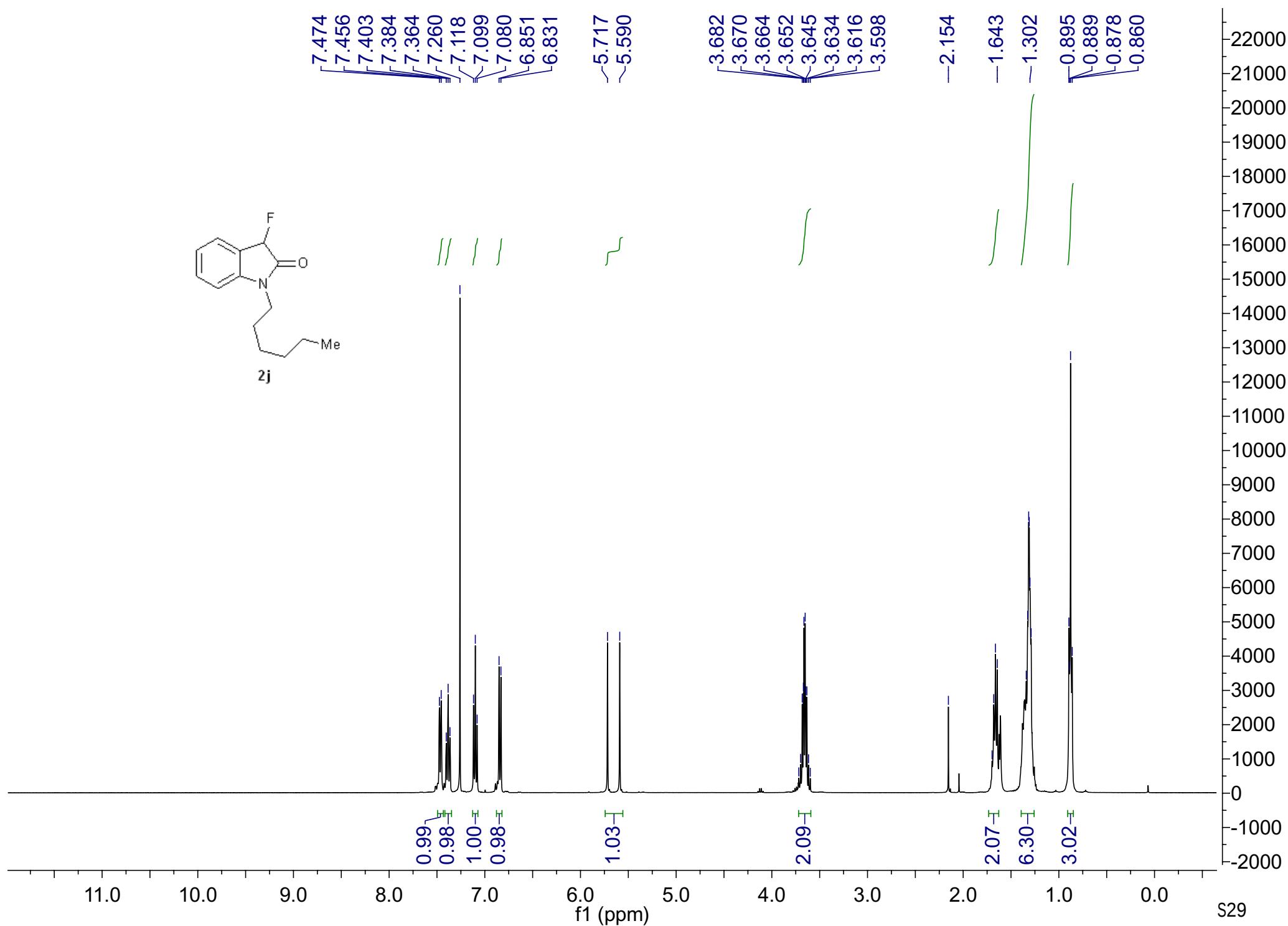
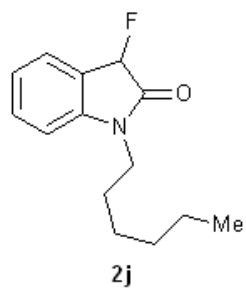
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



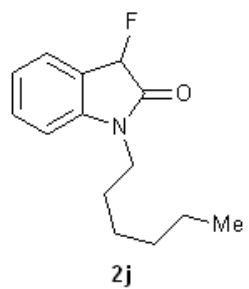
--193.47.



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



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



171.08  
170.90

144.27  
144.22

131.42  
131.39  
126.18

123.03  
122.85

109.06

86.46  
84.59

77.40  
77.09  
76.77

40.14

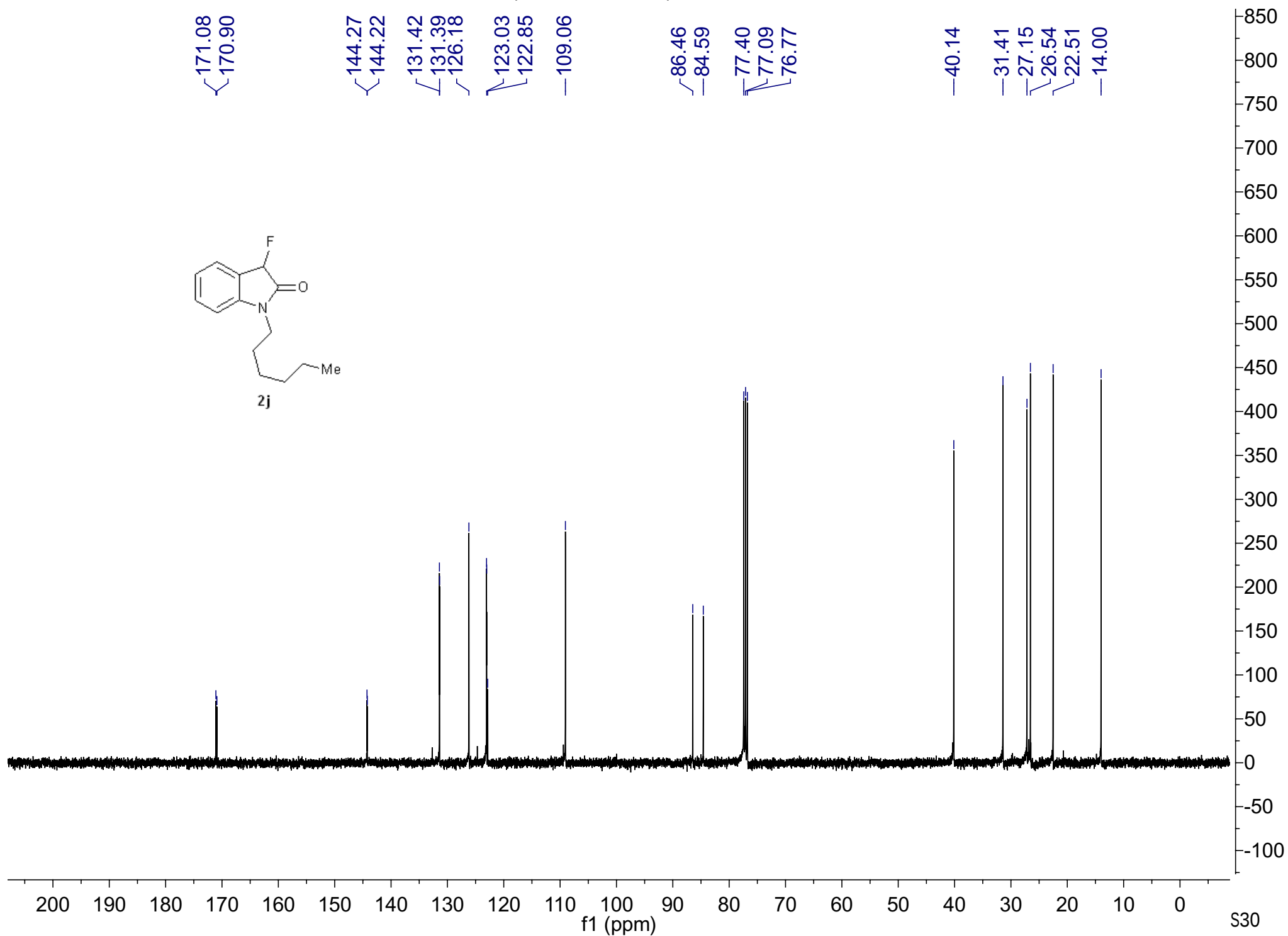
31.41

27.15

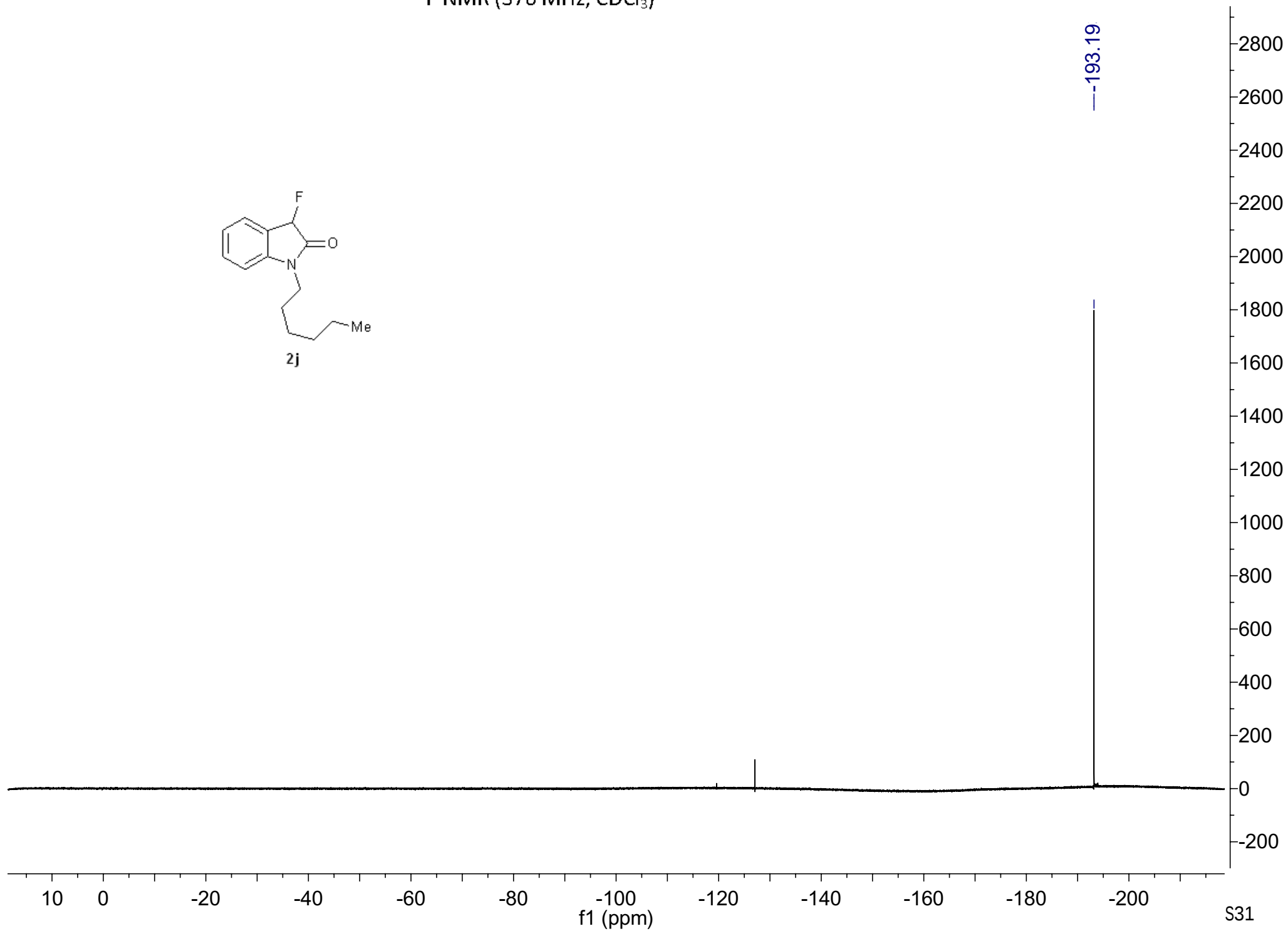
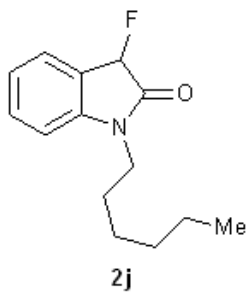
26.54

22.51

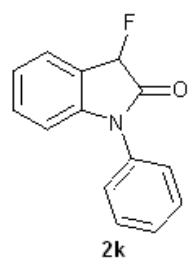
14.00



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

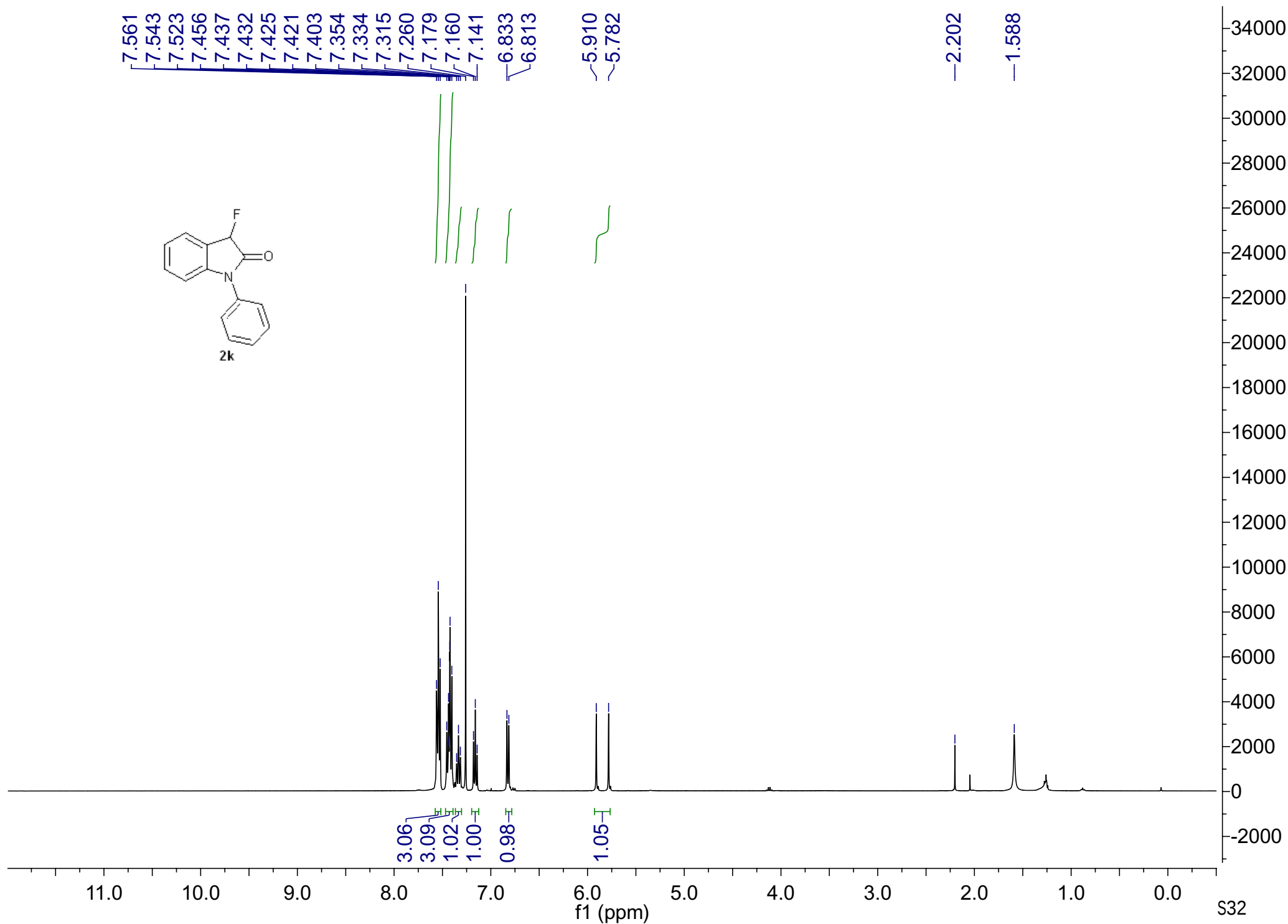


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)

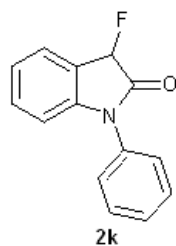


7.561  
7.543  
7.523  
7.456  
7.437  
7.432  
7.425  
7.421  
7.403  
7.354  
7.334  
7.315  
7.260  
7.179  
7.160  
7.141  
6.833  
6.813  
5.910  
5.782

2.202  
1.588



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



170.28

144.88

144.83

131.45

128.57

126.32

123.78

122.49

110.12

110.11

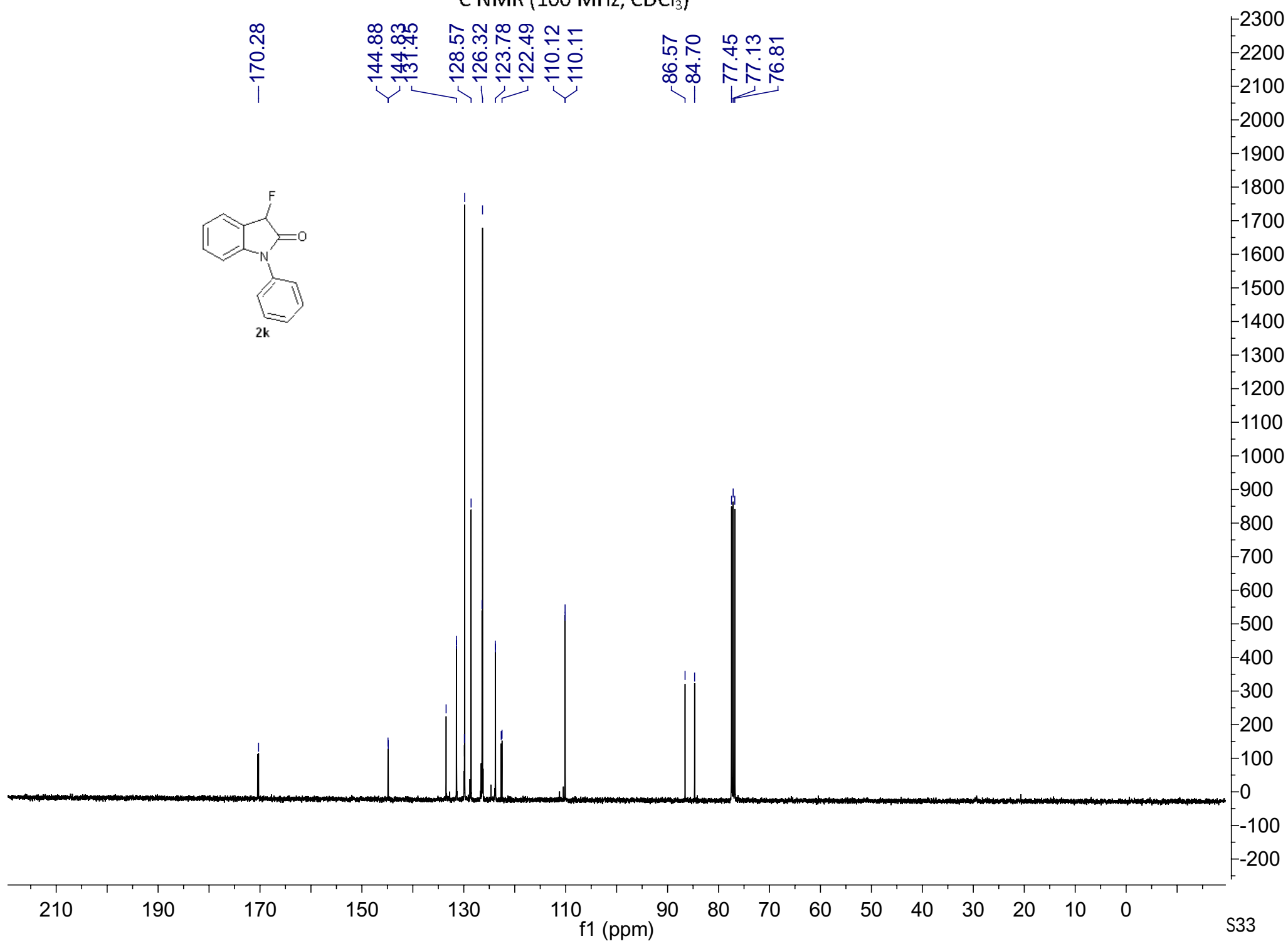
86.57

84.70

77.45

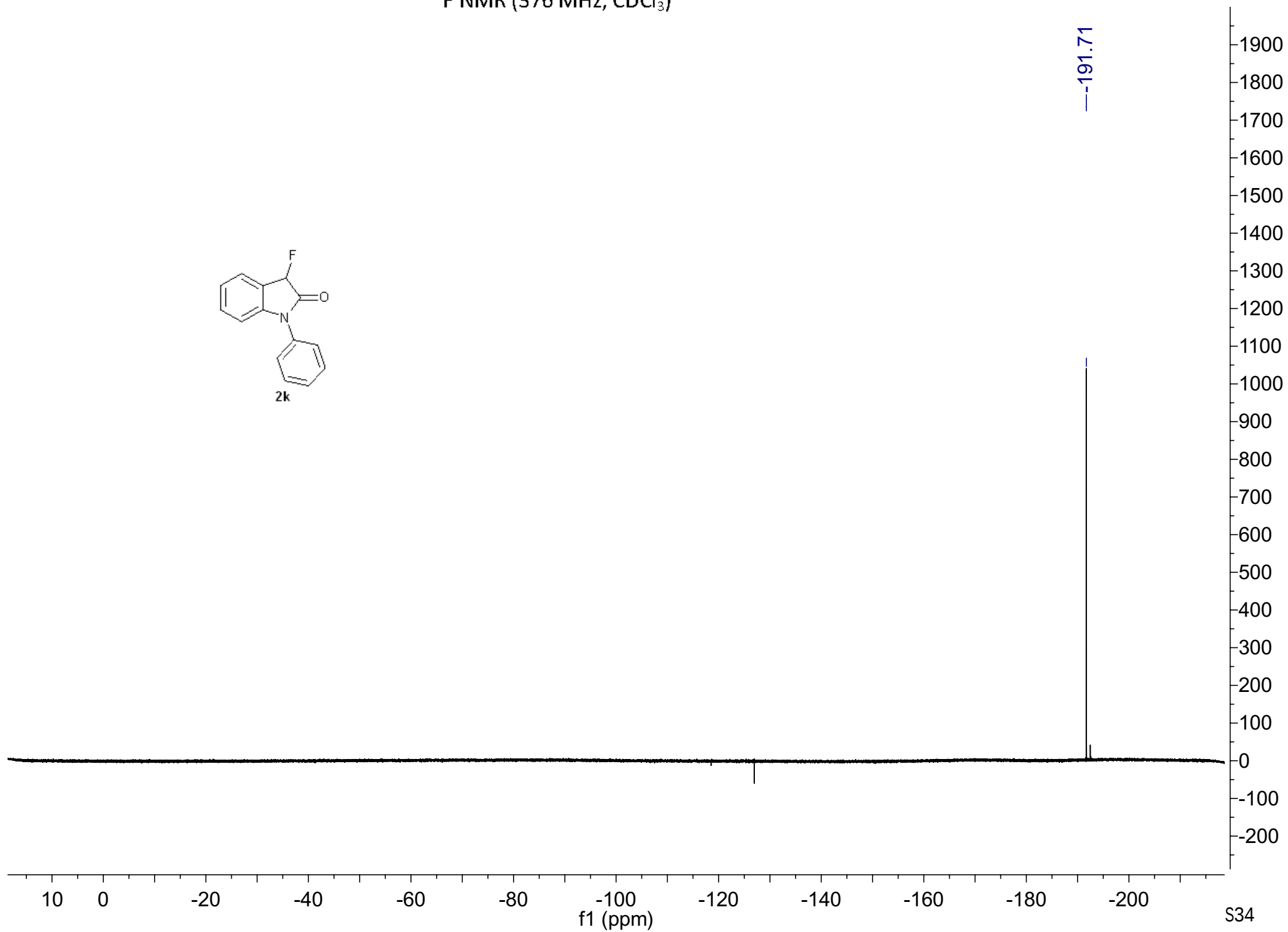
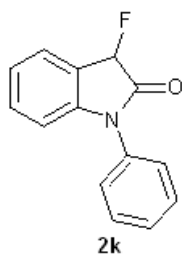
77.13

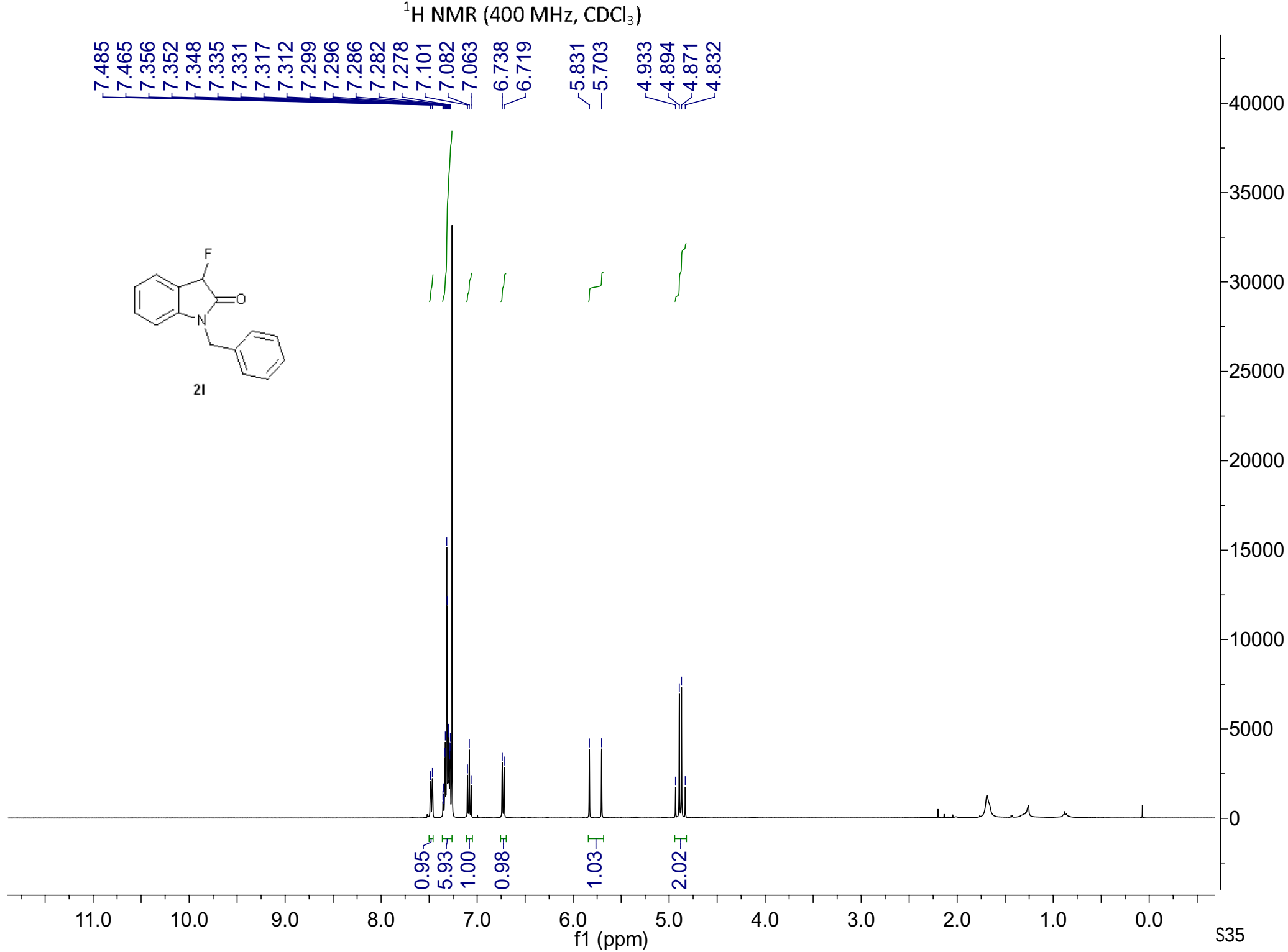
76.81



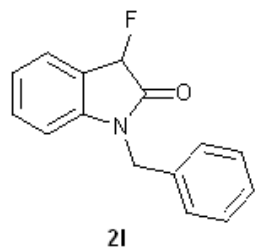
S33

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





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



171.30  
171.12

143.95  
143.90

127.37  
126.15

123.33  
123.30

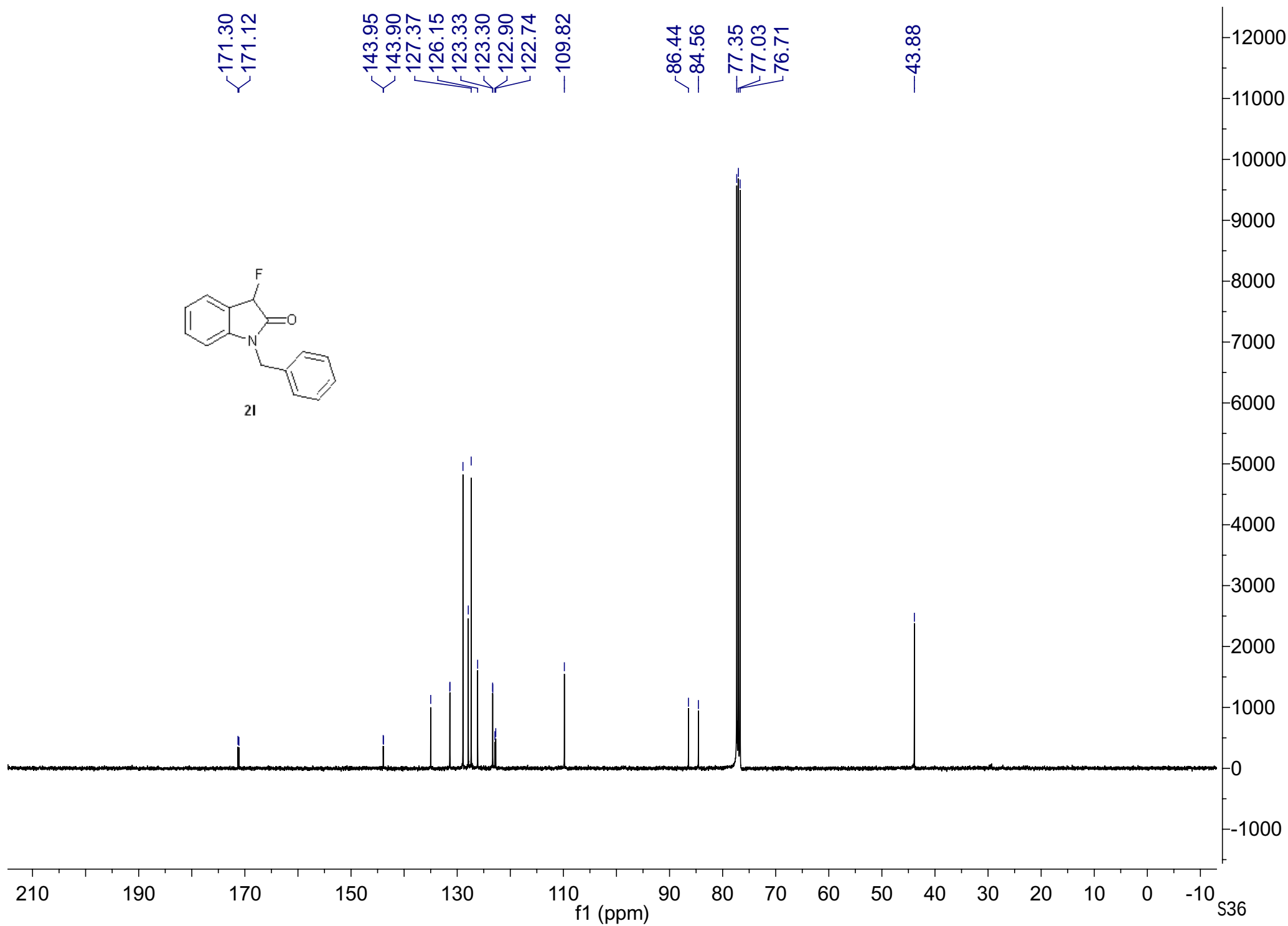
122.90  
122.74

109.82

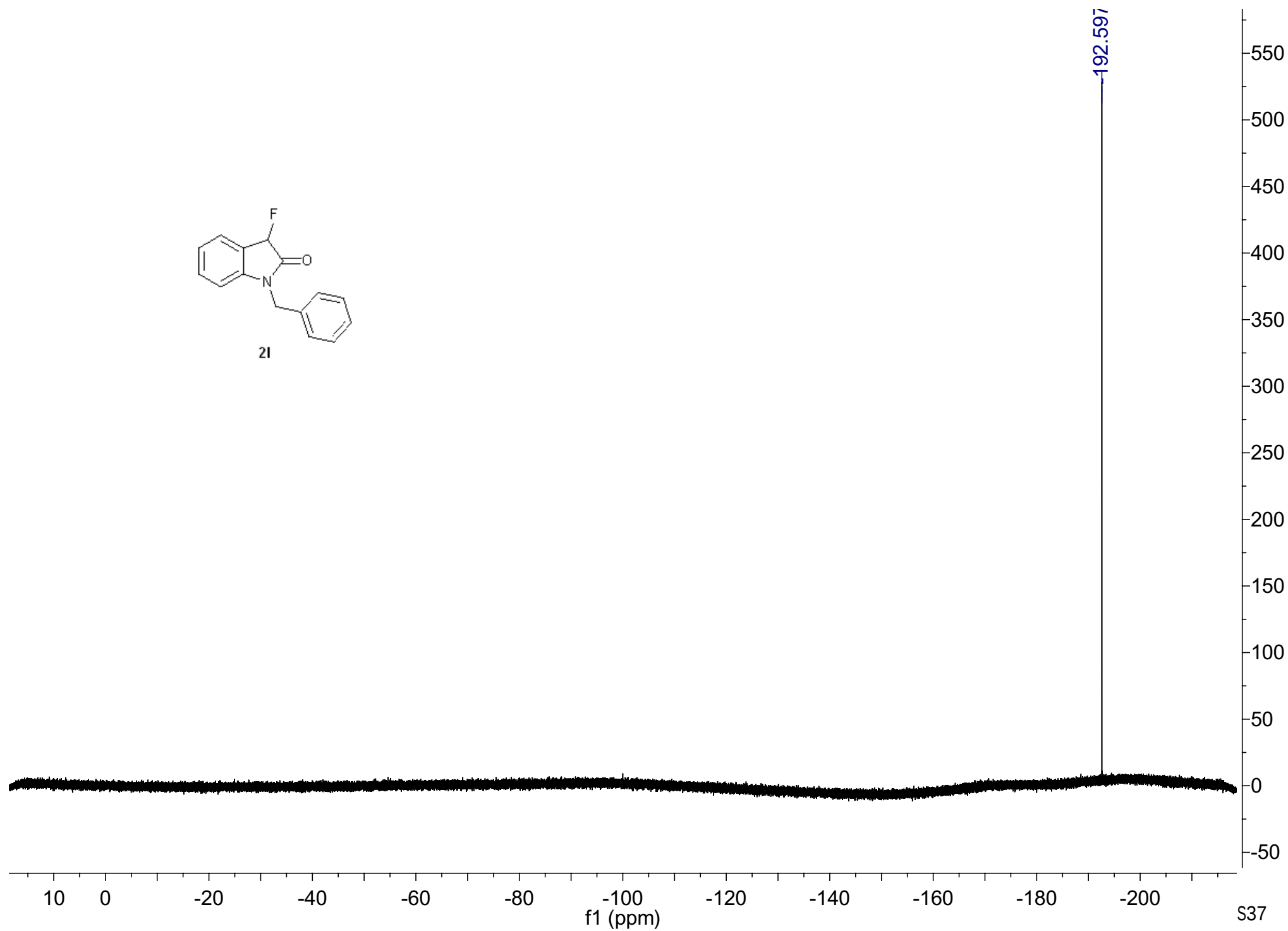
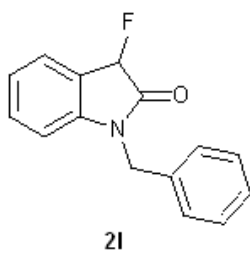
86.44  
84.56

77.35  
77.03  
76.71

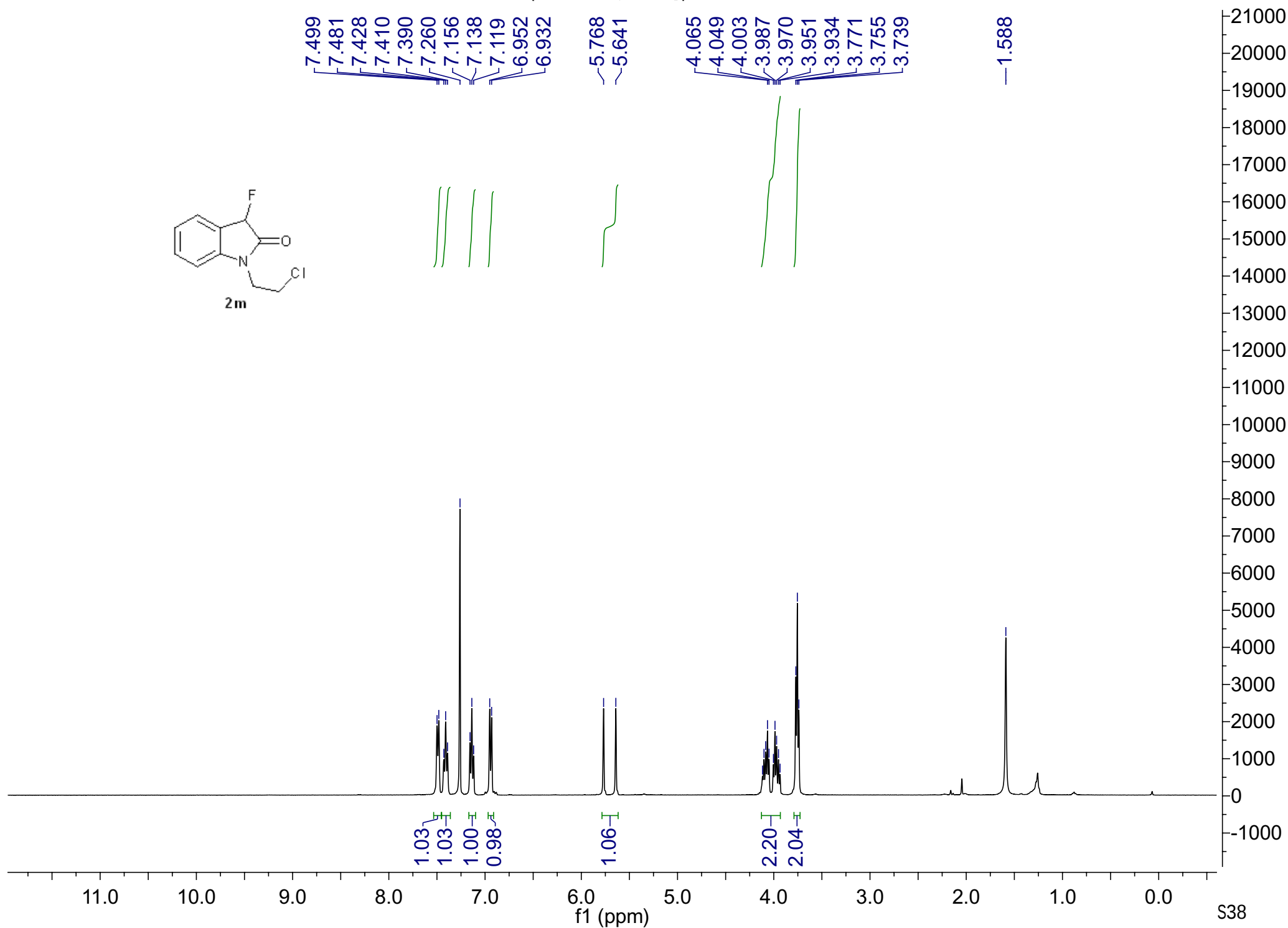
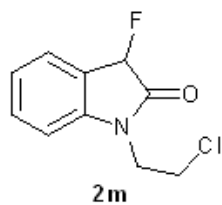
43.88



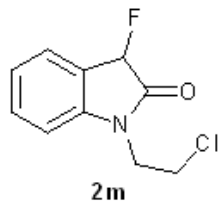
$^{19}\text{F}$  NMR (376 MHz,  $\text{CDCl}_3$ )



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



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



171.41  
171.23

143.77  
143.72

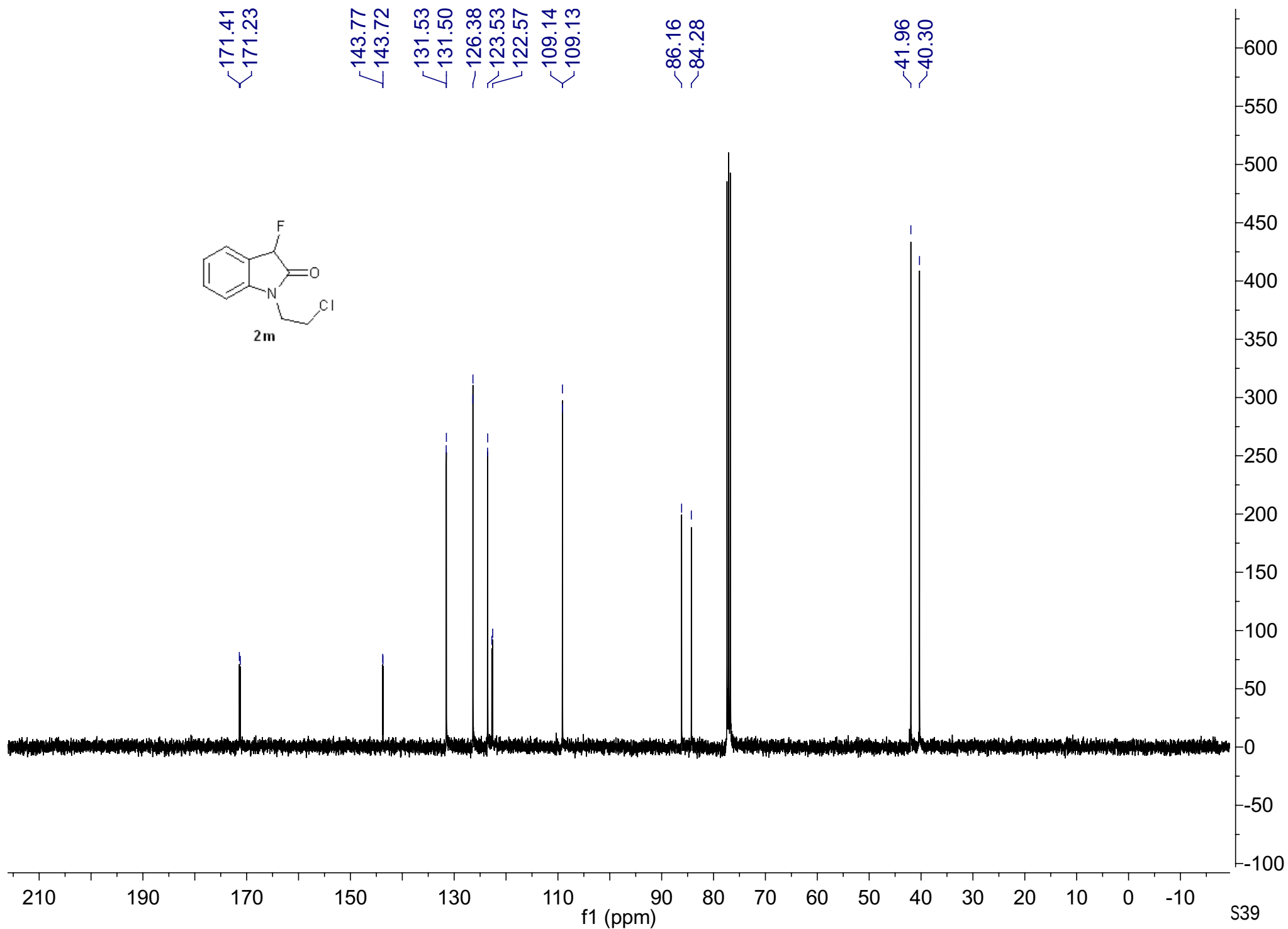
131.53  
131.50

126.38  
123.53  
122.57

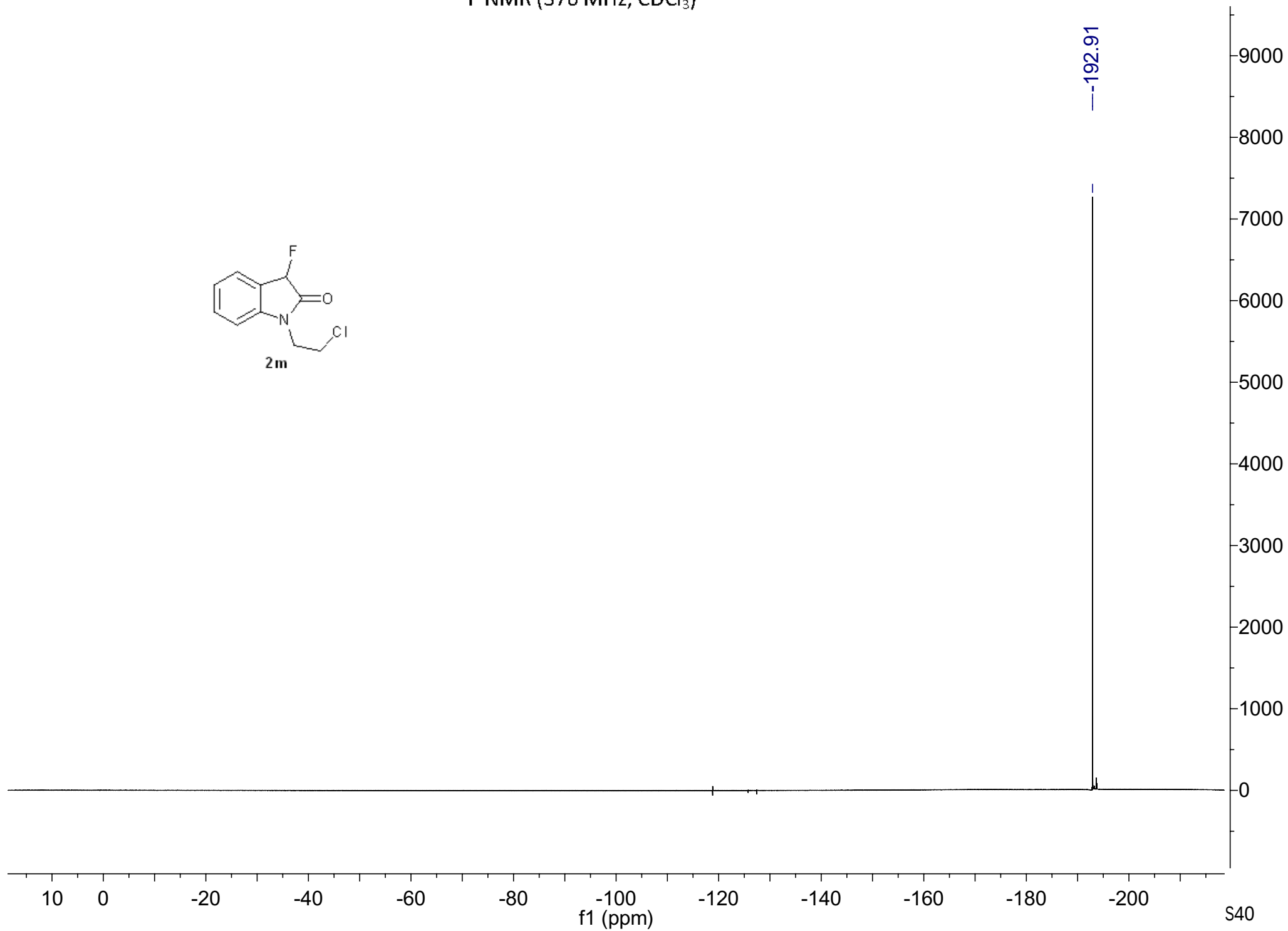
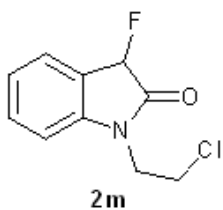
109.14  
109.13

86.16  
84.28

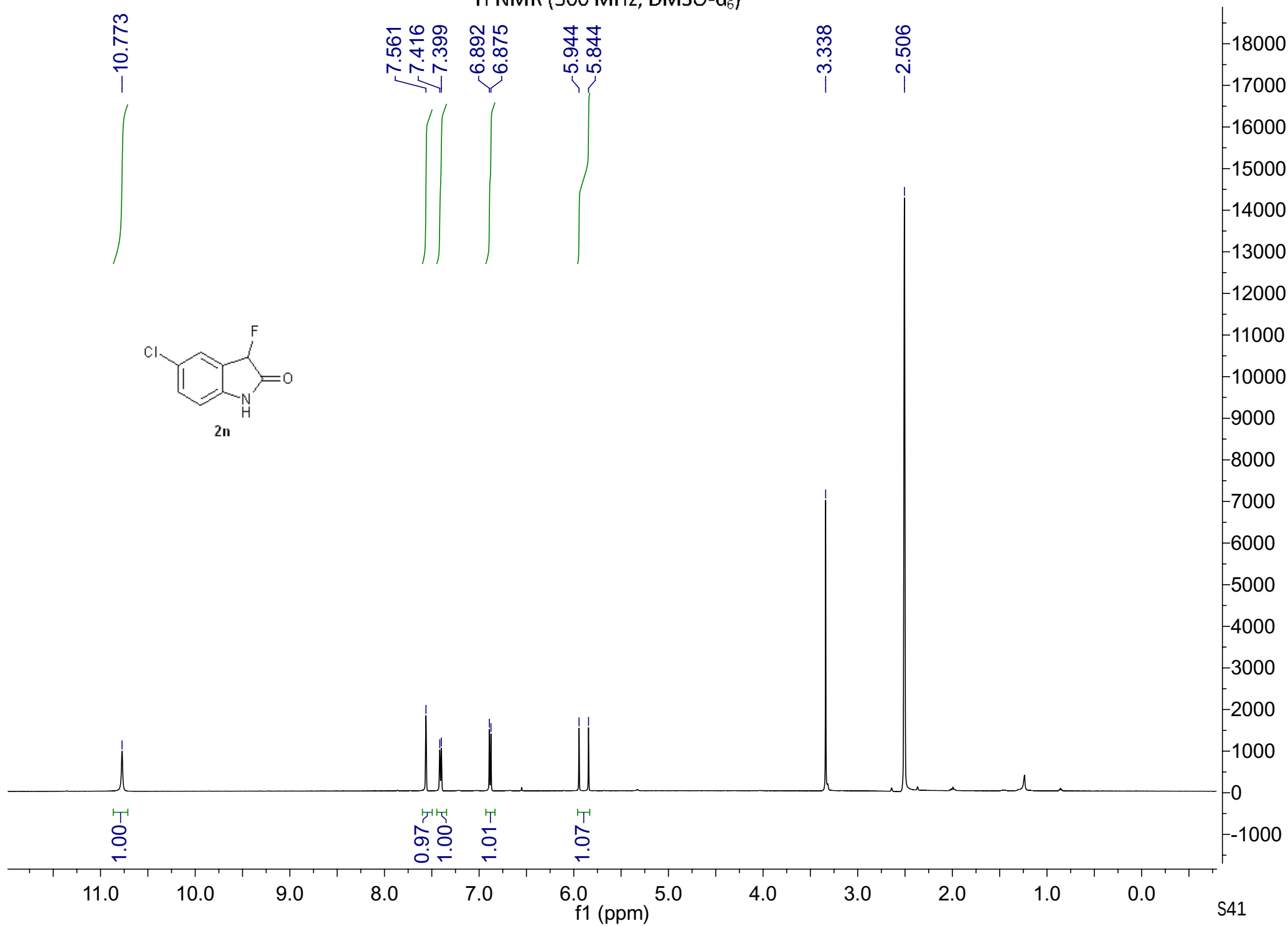
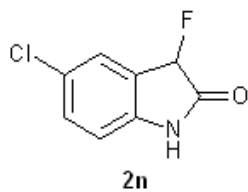
41.96  
40.30



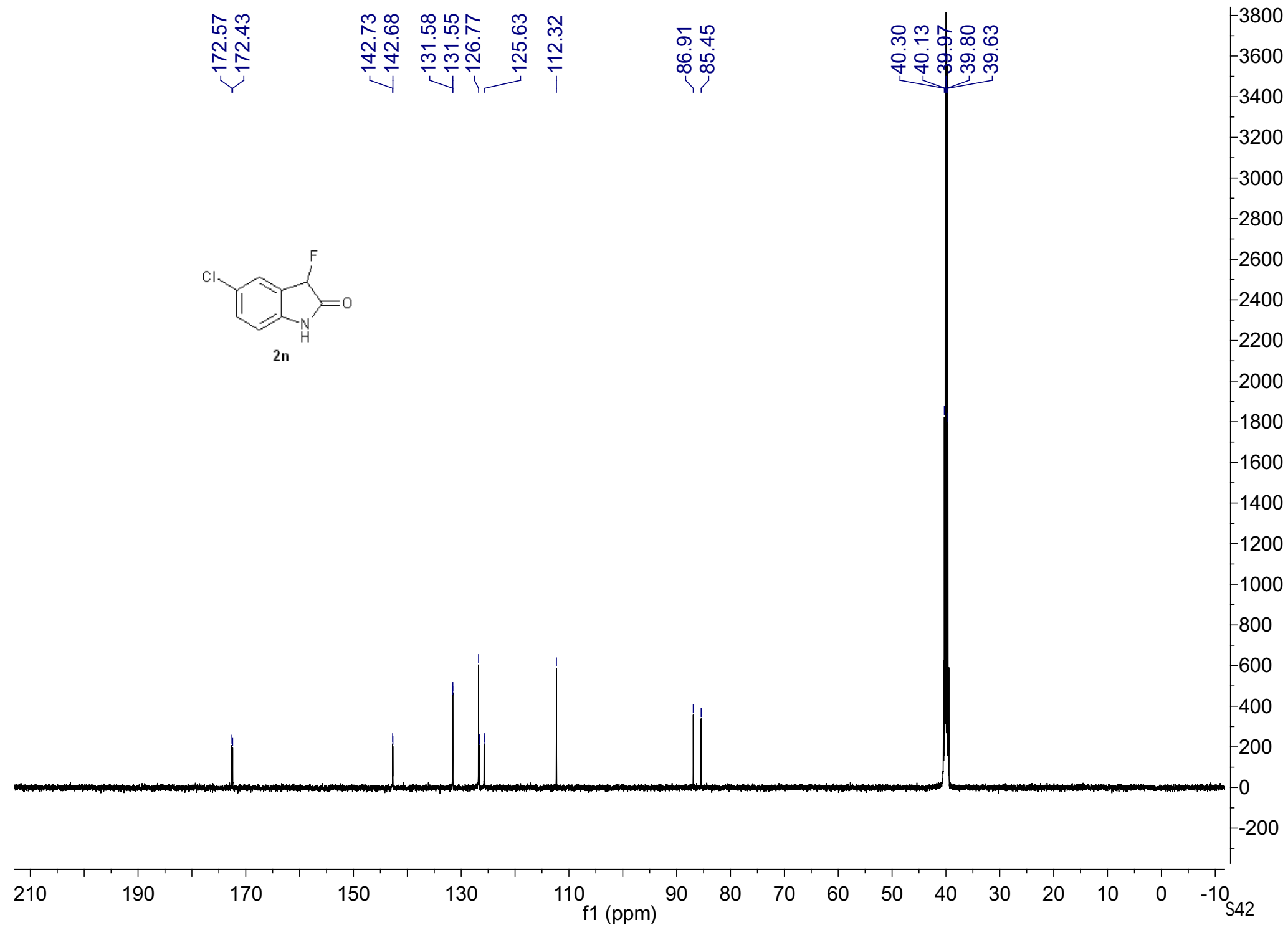
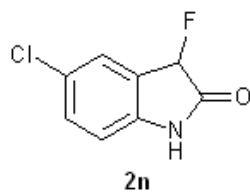
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



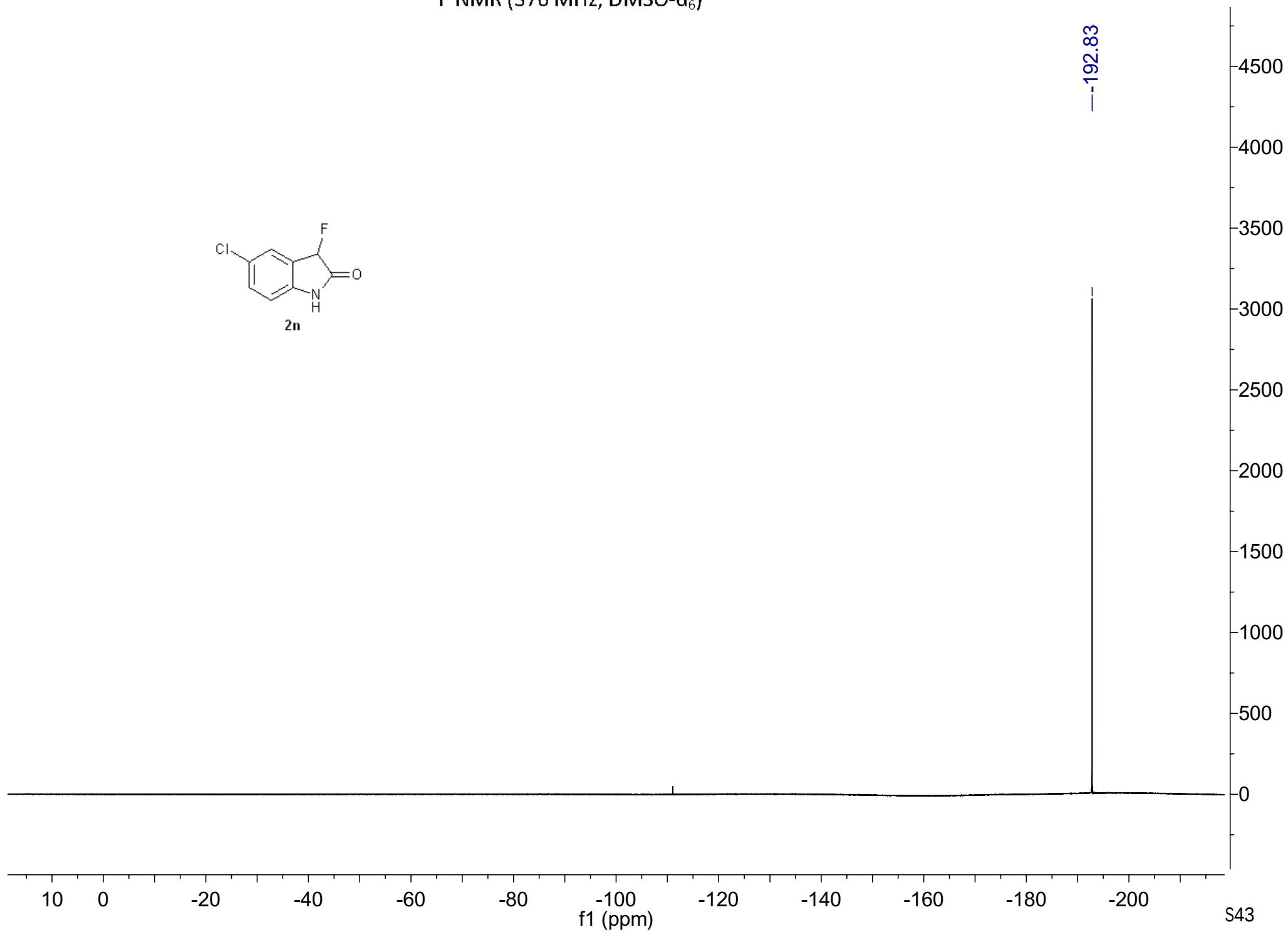
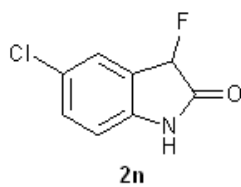
<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>)



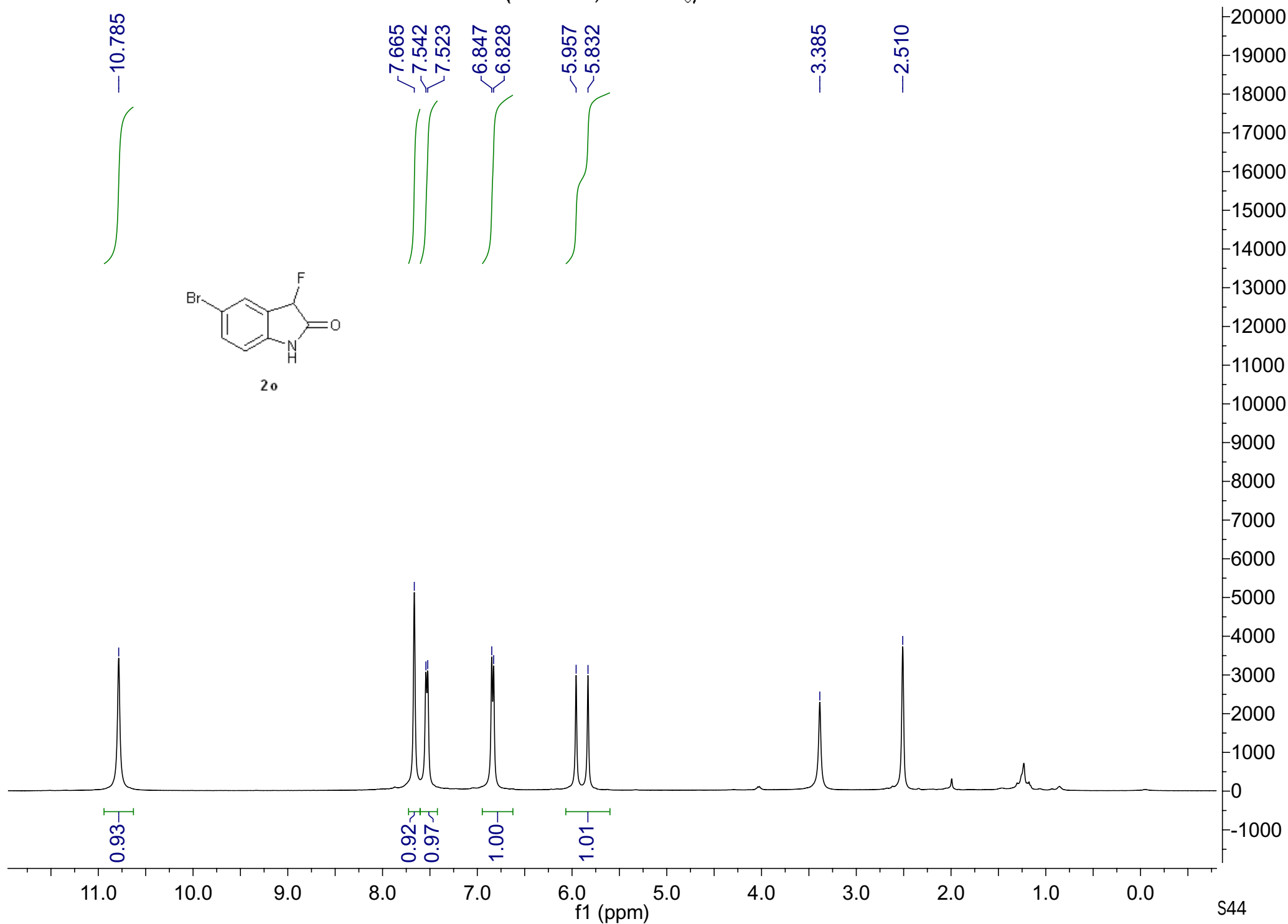
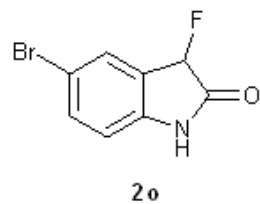
<sup>13</sup>C NMR (125 MHz, DMSO-d<sub>6</sub>)



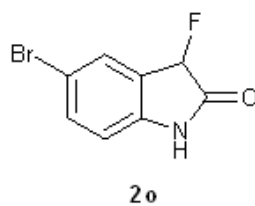
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



177.23  
177.05

147.90  
147.85

139.16

130.77

118.94

118.91

117.56

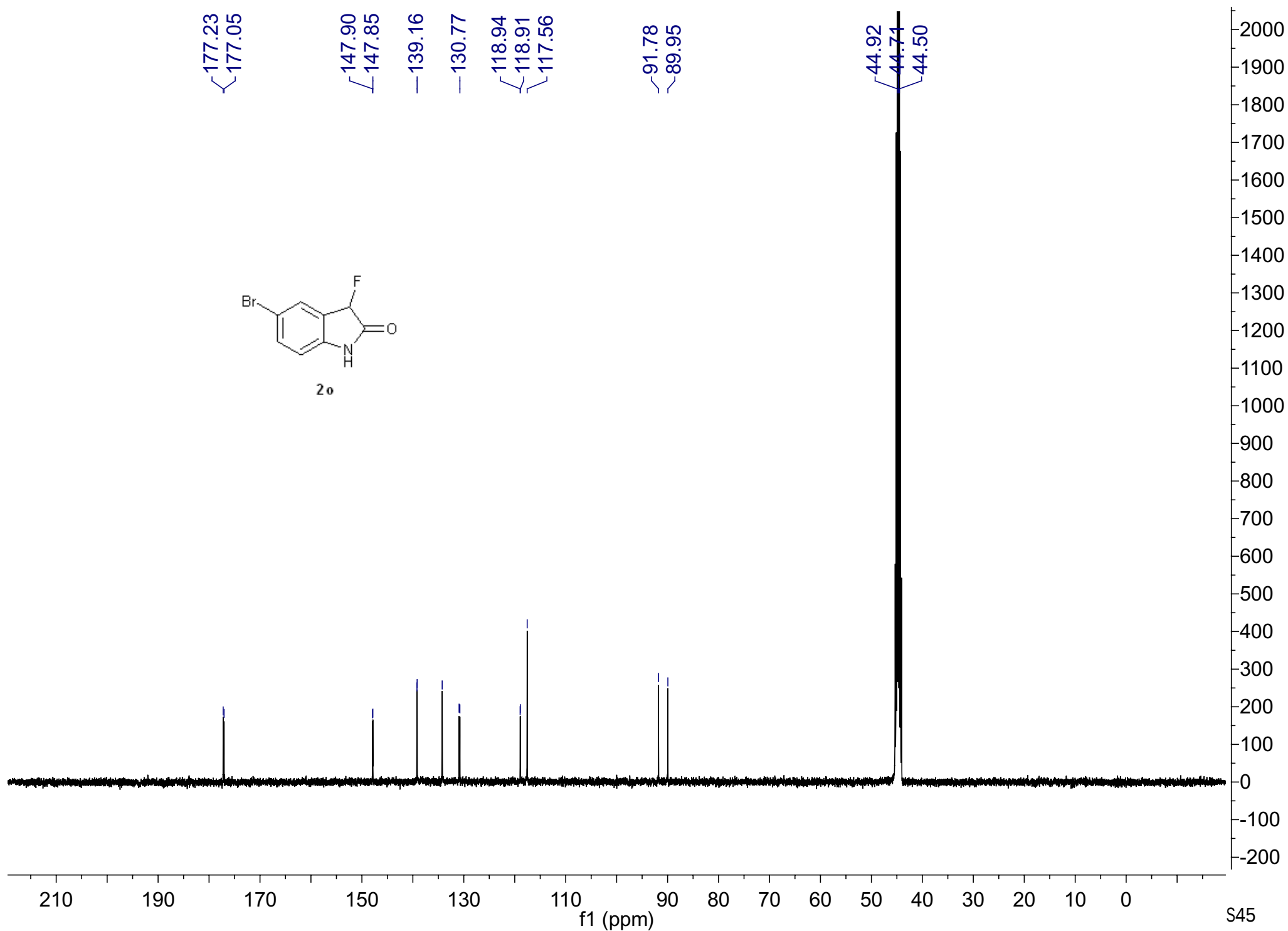
91.78

89.95

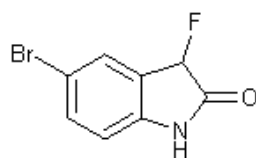
44.92

44.71

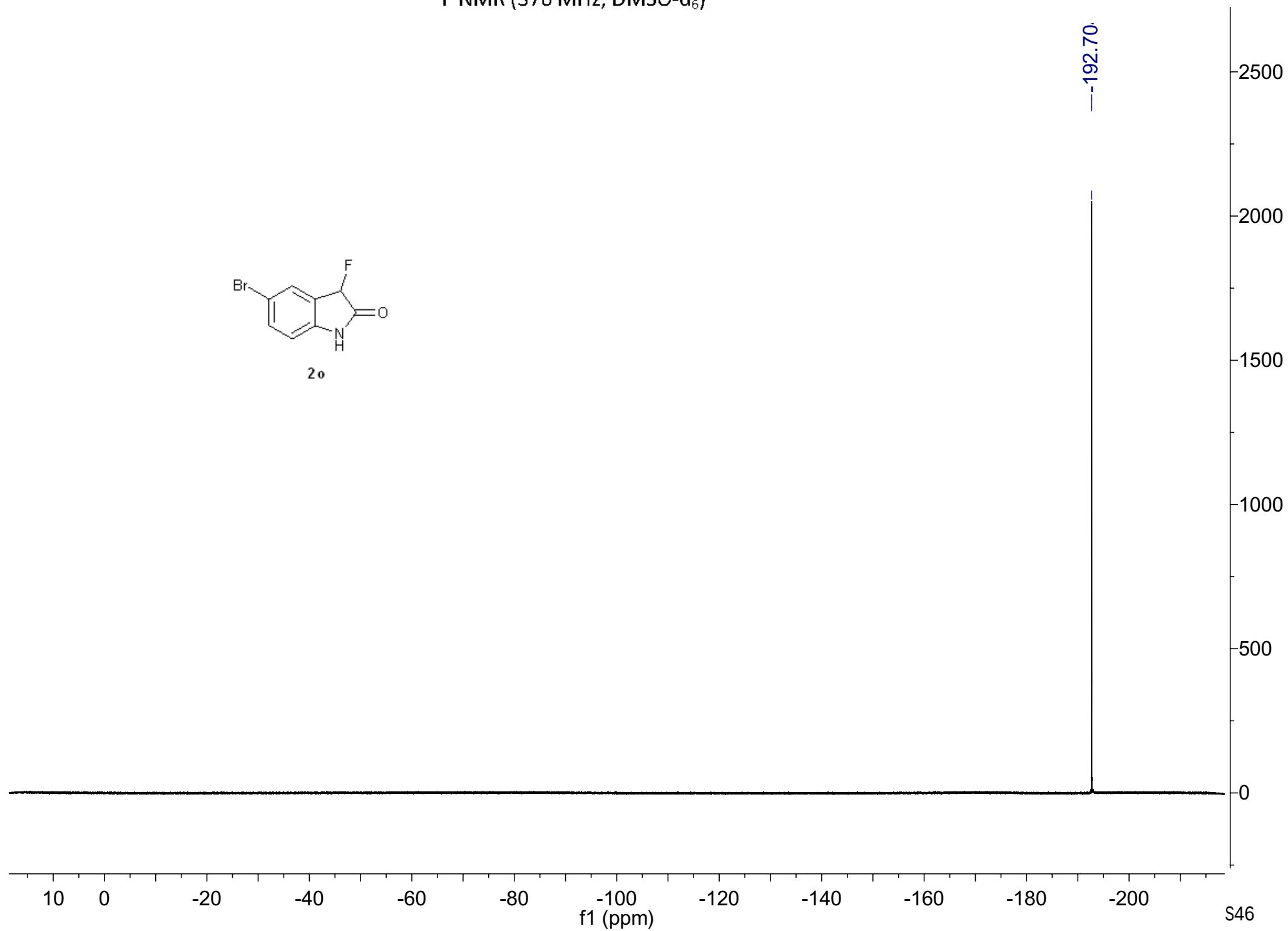
44.50



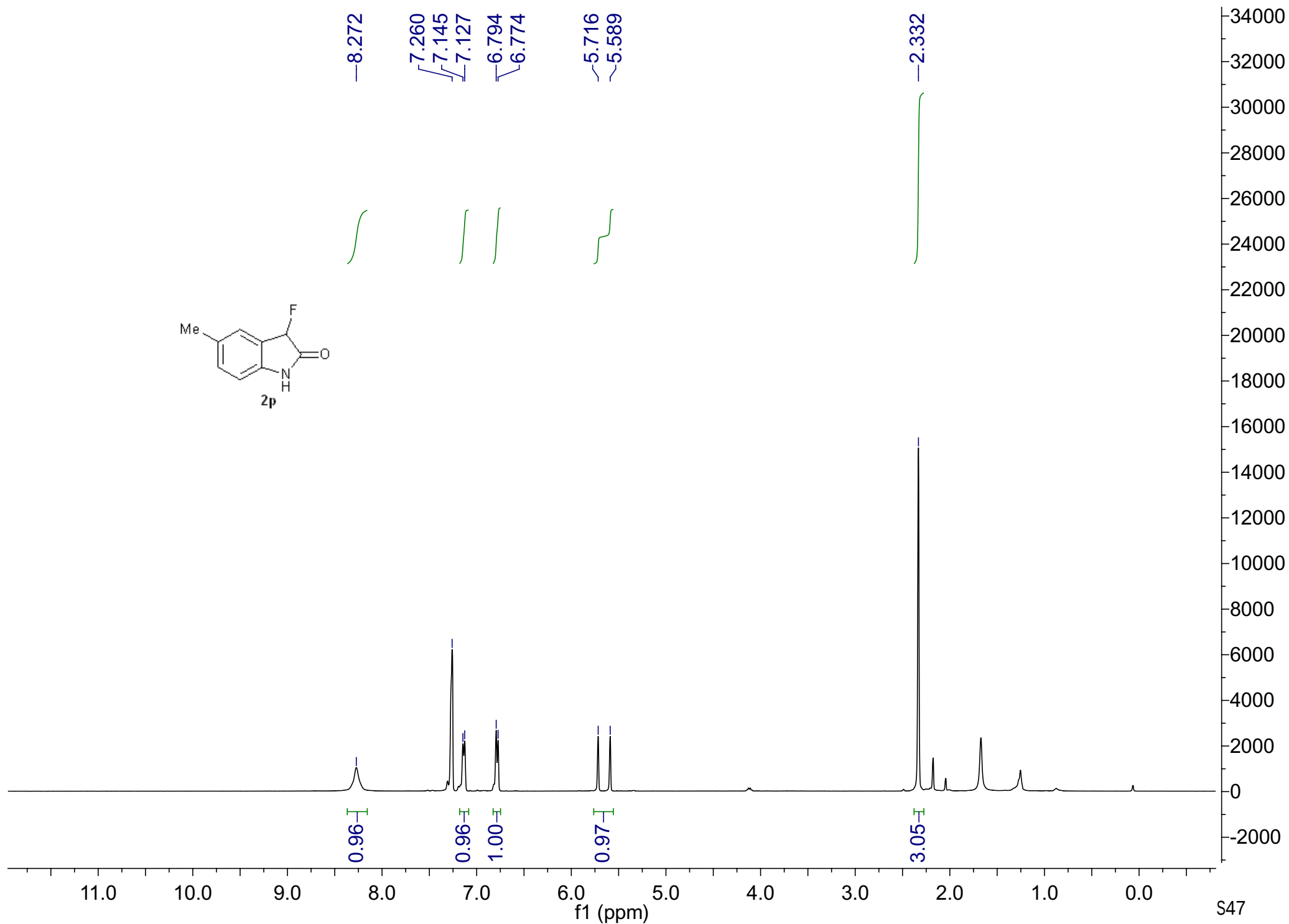
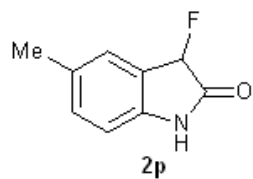
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



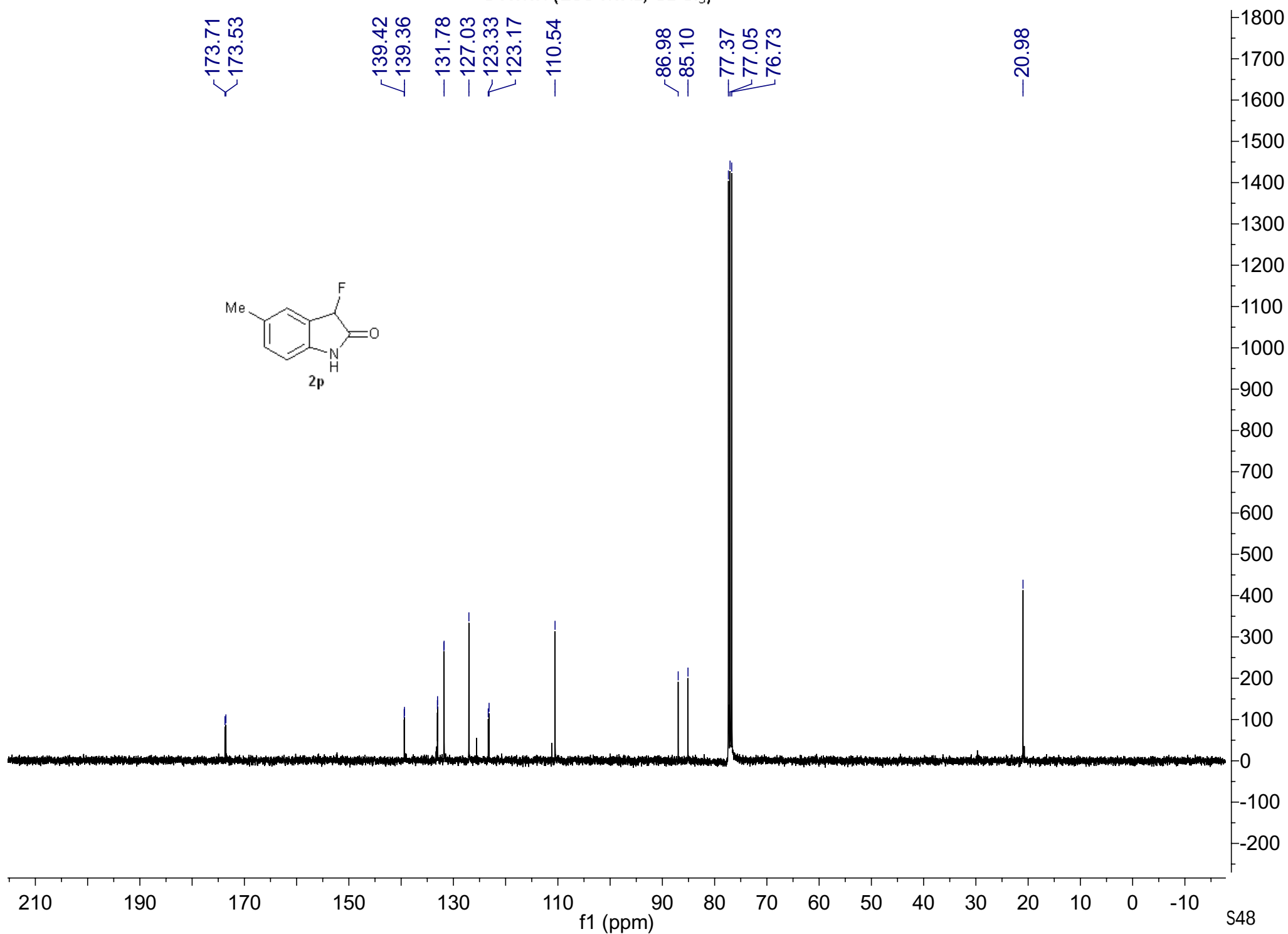
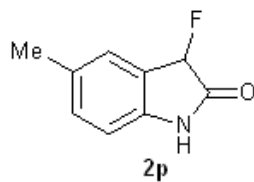
2o



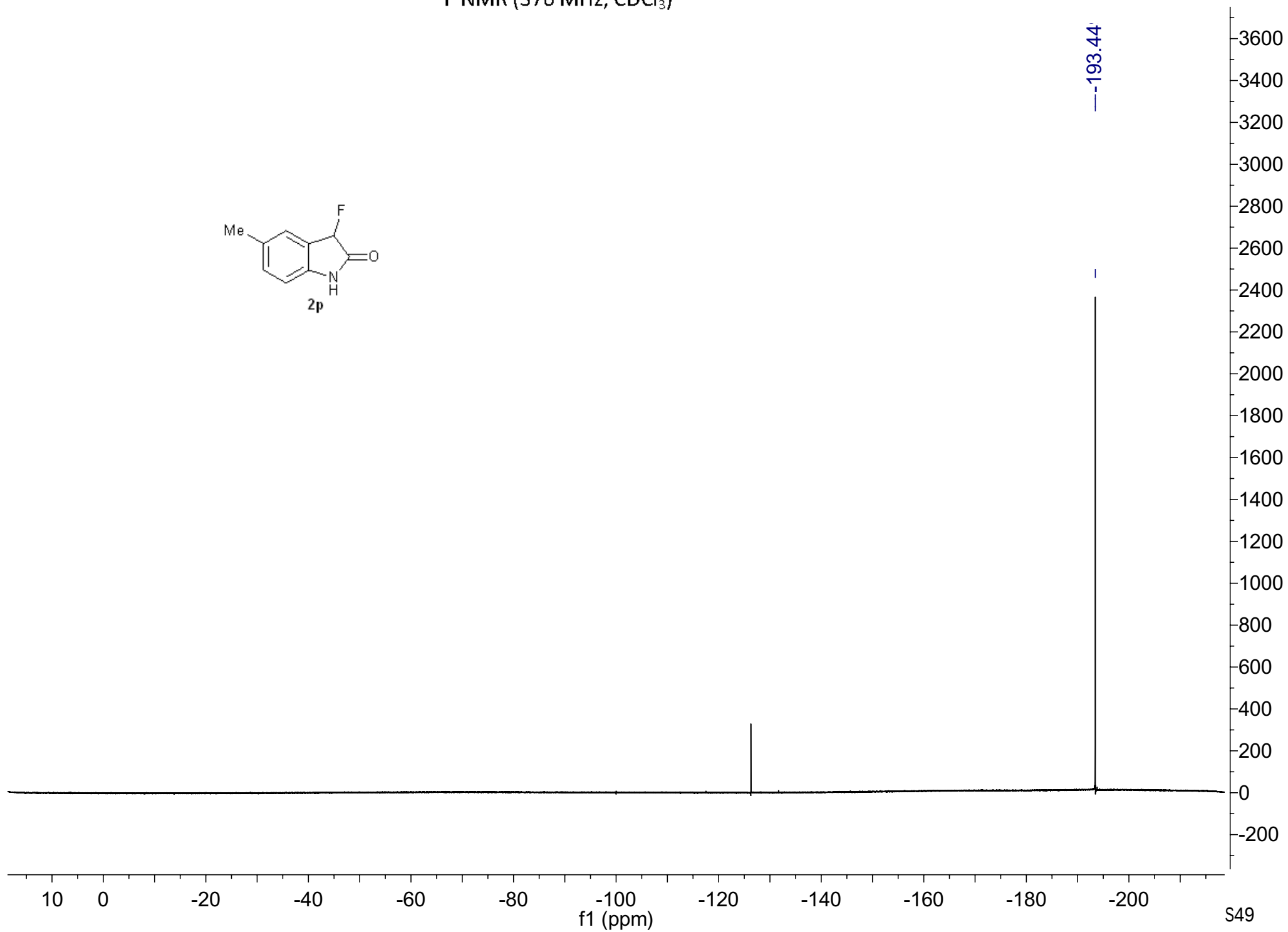
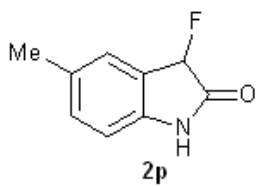
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)

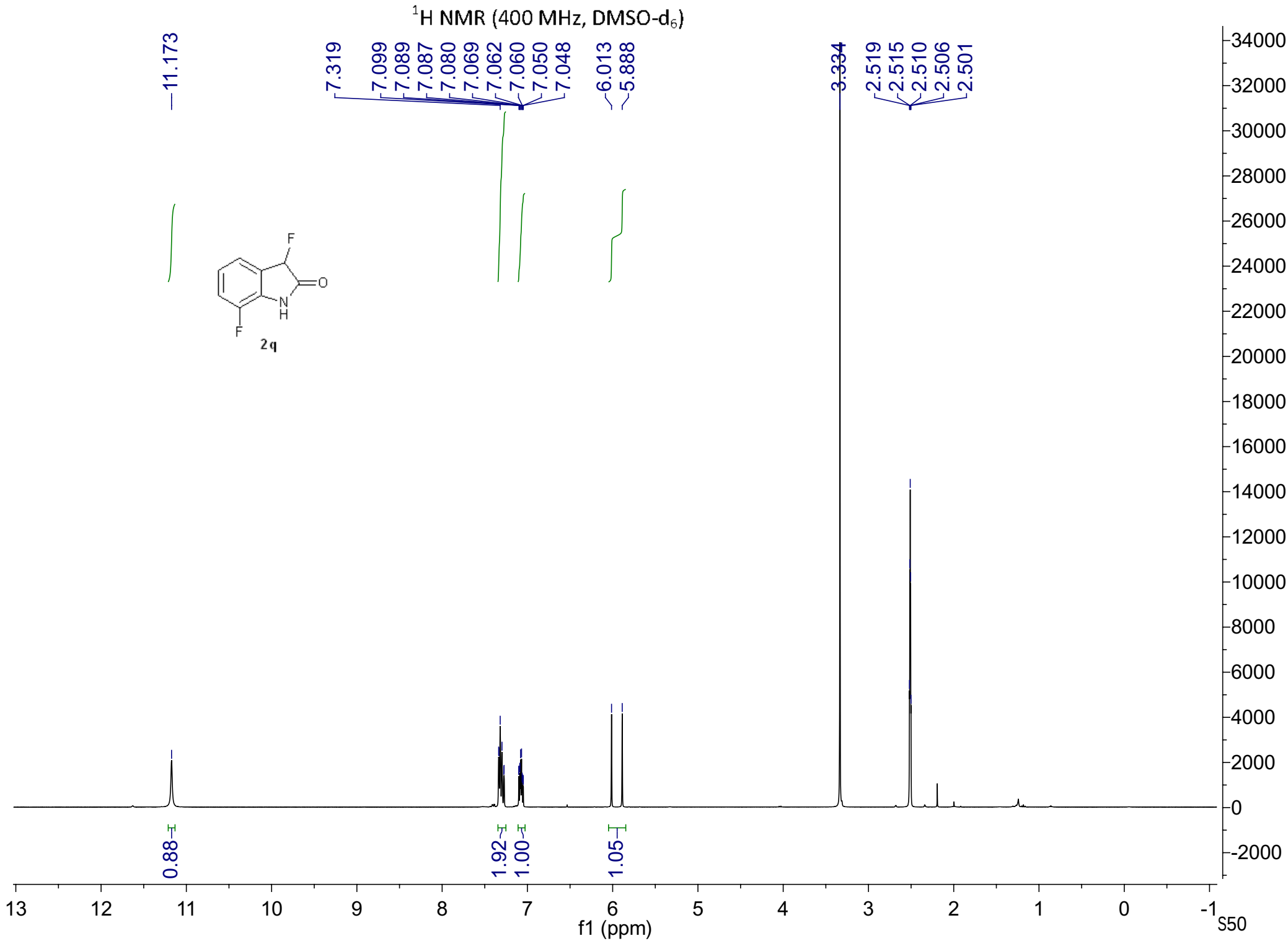


<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

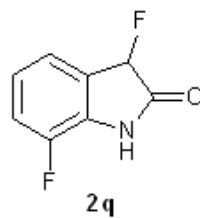


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)





<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



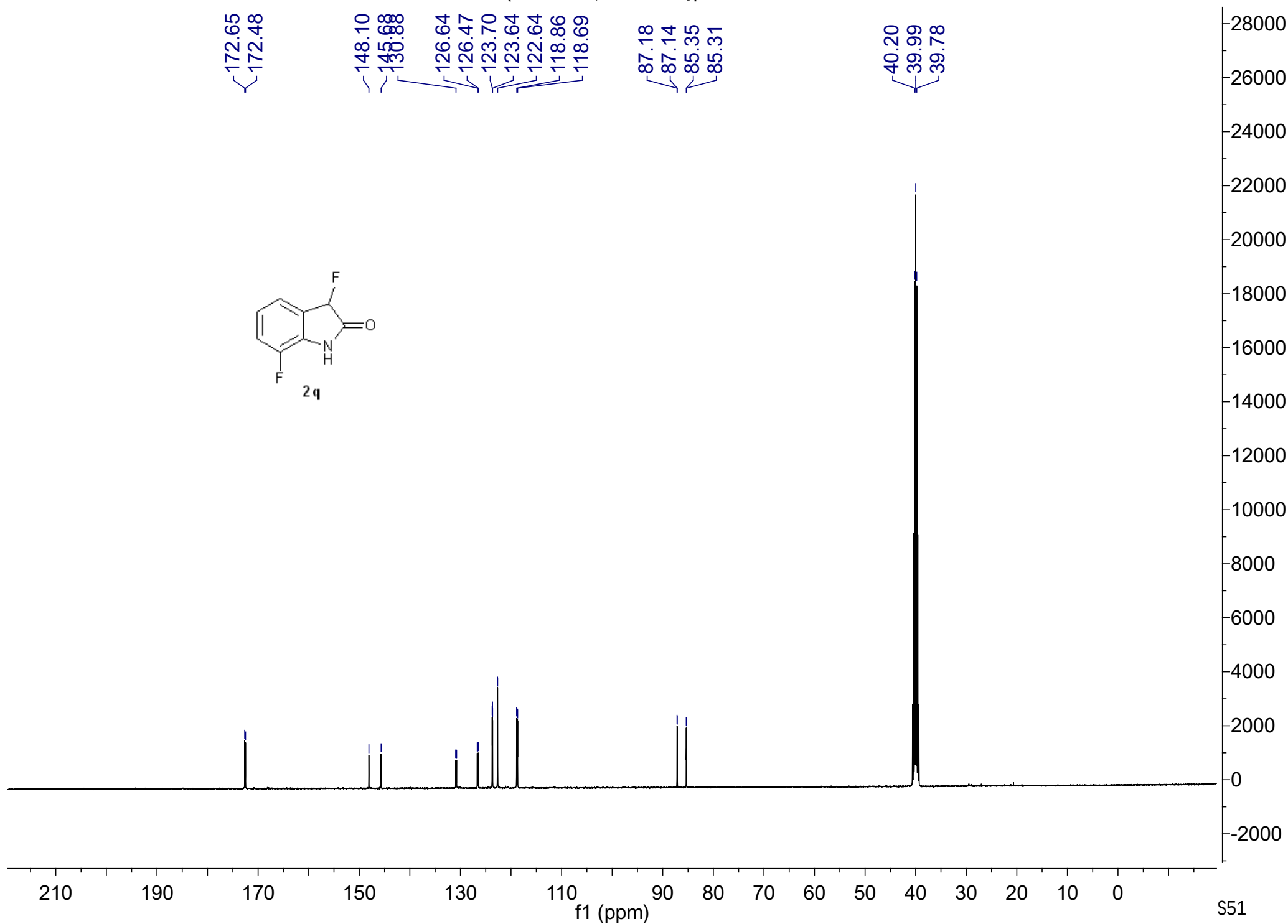
172.65  
172.48

148.10  
145.68  
136.88

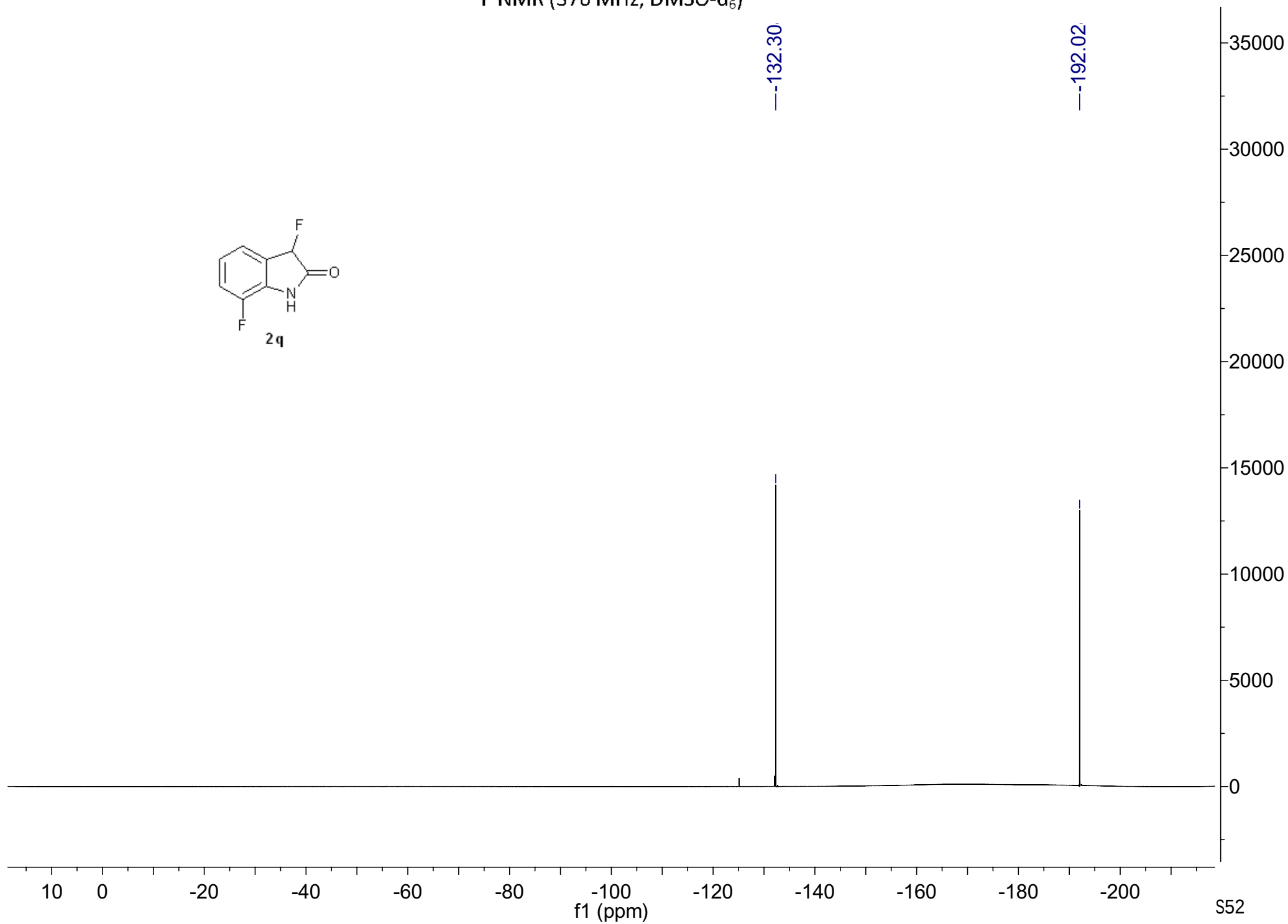
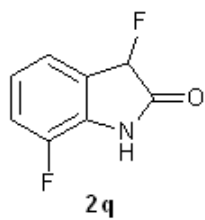
126.64  
126.47  
123.70  
123.64  
122.64  
118.86  
118.69

87.18  
87.14  
85.35  
85.31

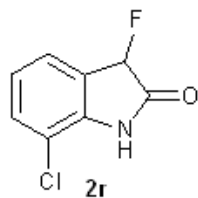
40.20  
39.99  
39.78



$^{19}\text{F}$  NMR (376 MHz,  $\text{DMSO-d}_6$ )



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



—11.100

7.450

7.430

7.096

7.076

6.027

5.902

—3.348

2.512

2.508

—2.198

—1.241

1.00

1.96

1.03

1.04

13

12

11

10

9

8

7

f1 (ppm)

5

4

3

2

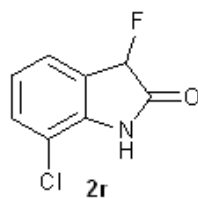
1

0

-1

S53

<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



172.81  
172.64

141.54  
141.48

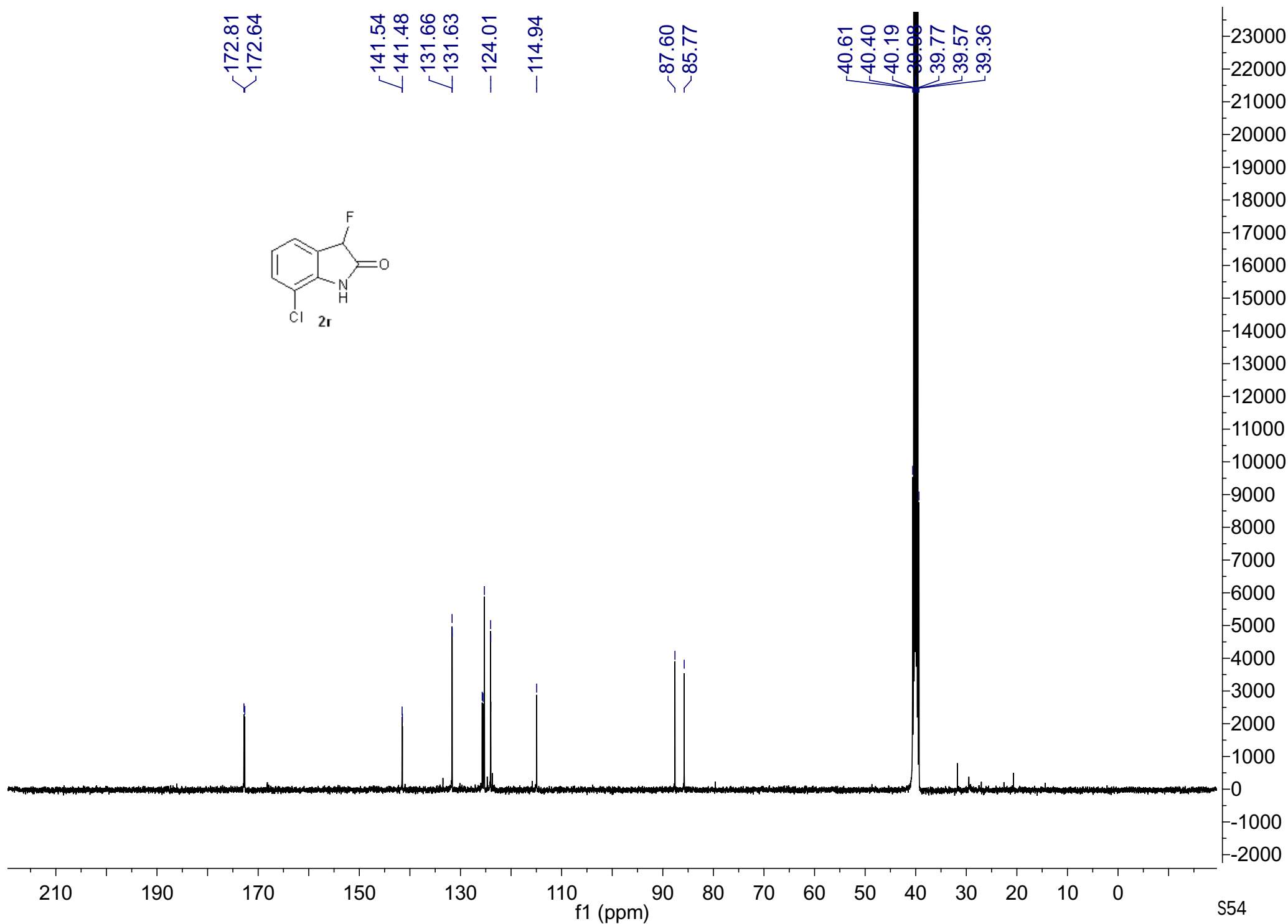
131.66  
131.63

124.01

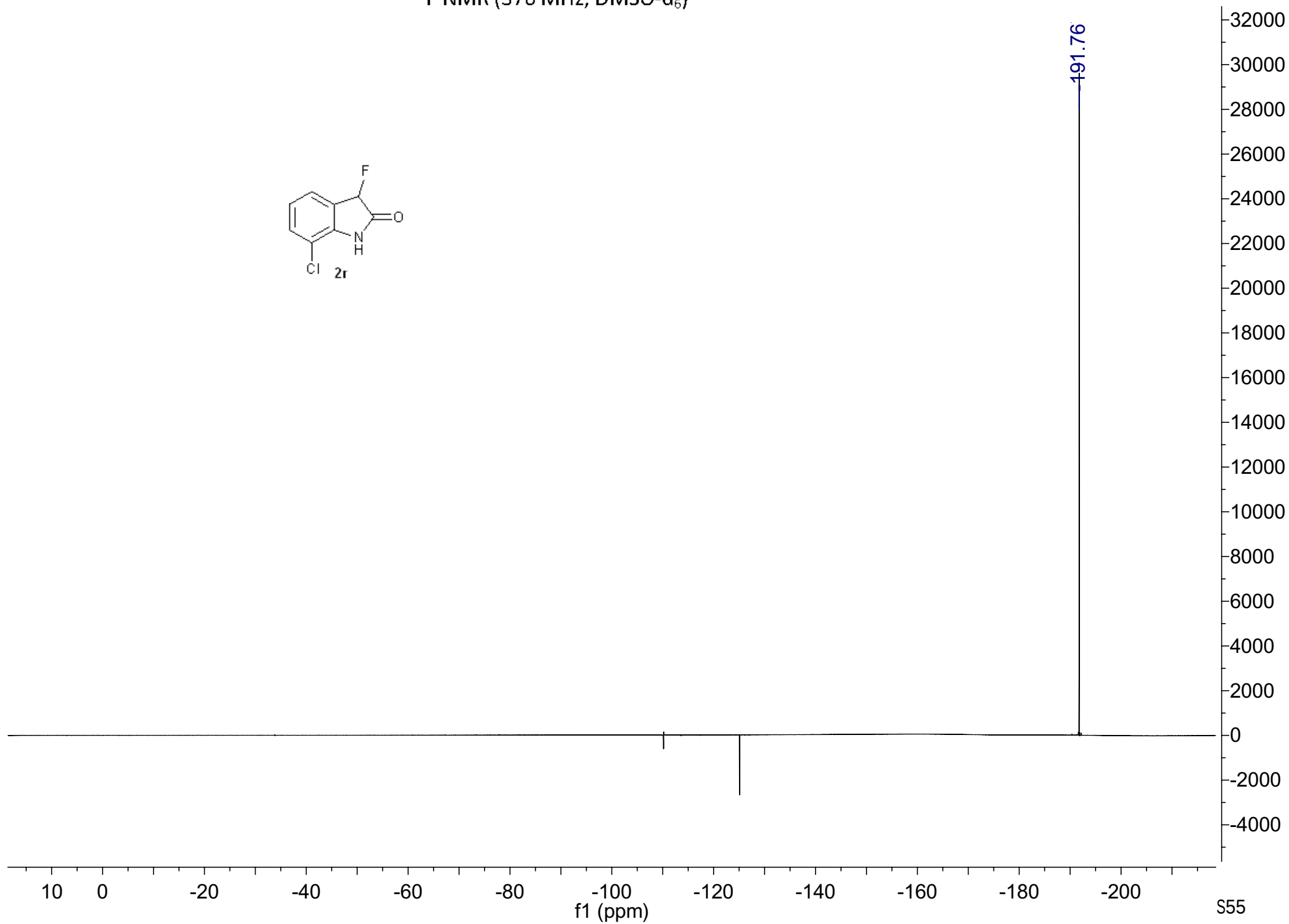
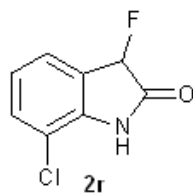
114.94

87.60  
85.77

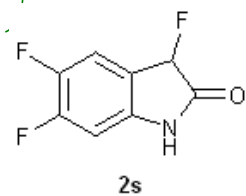
40.61  
40.40  
40.19  
39.98  
39.77  
39.57  
39.36



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



10.782

7.706

7.686

7.666

7.646

6.943

6.933

6.916

5.927

5.801

3.341

2.522

2.517

2.513

2.508

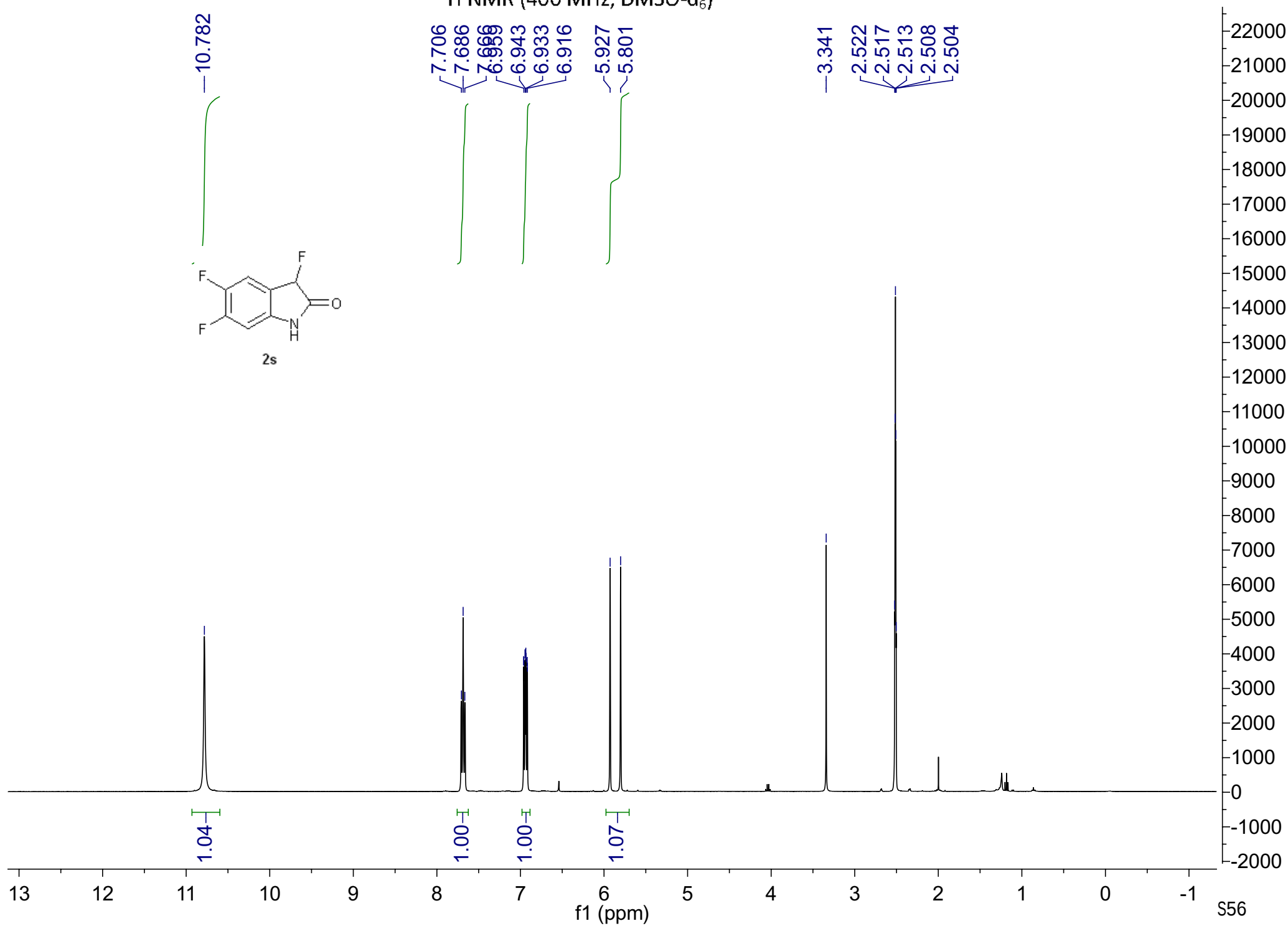
2.504

1.04

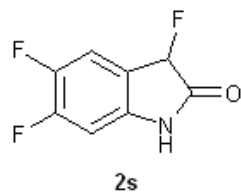
1.00

1.00

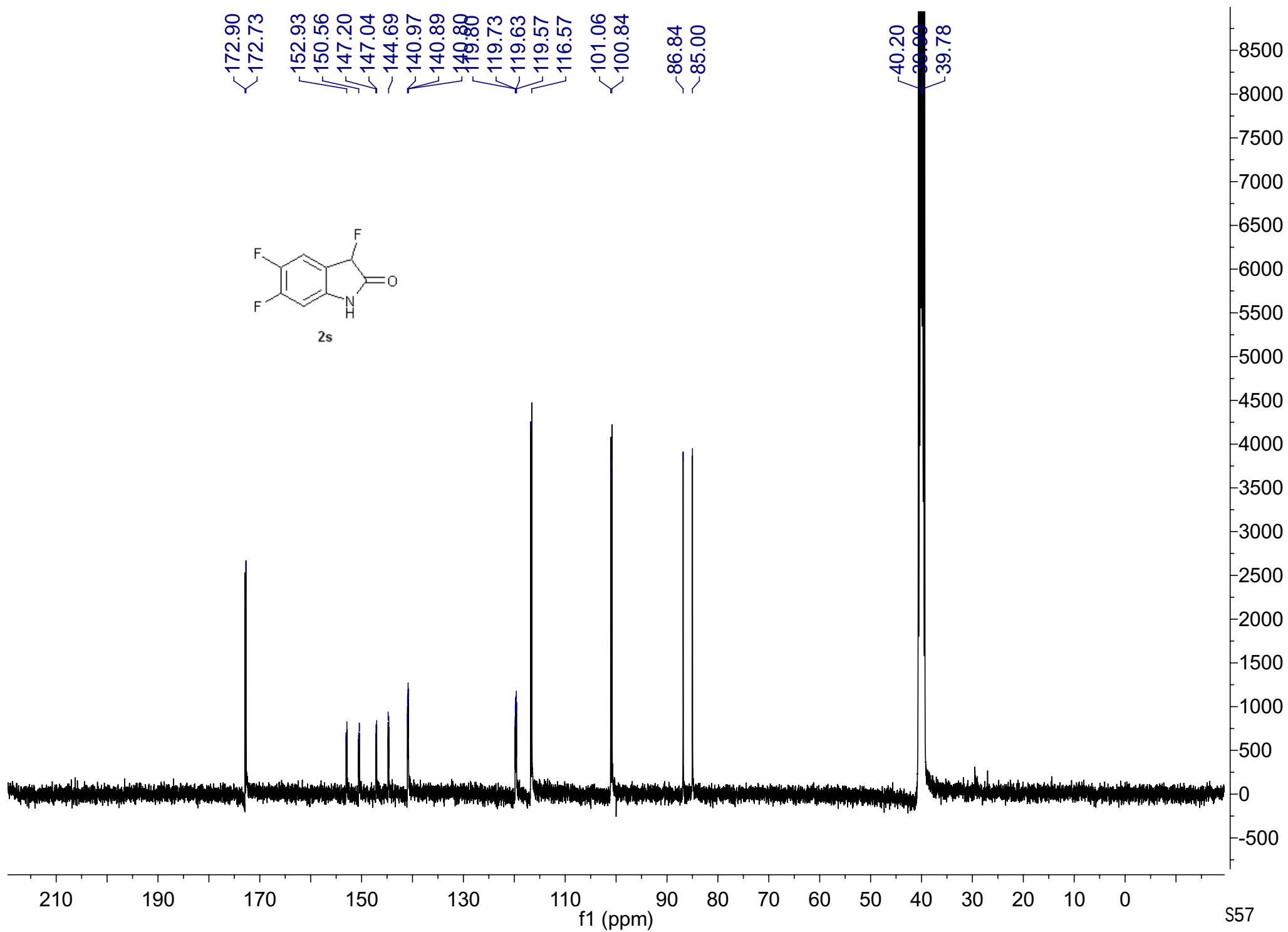
1.07



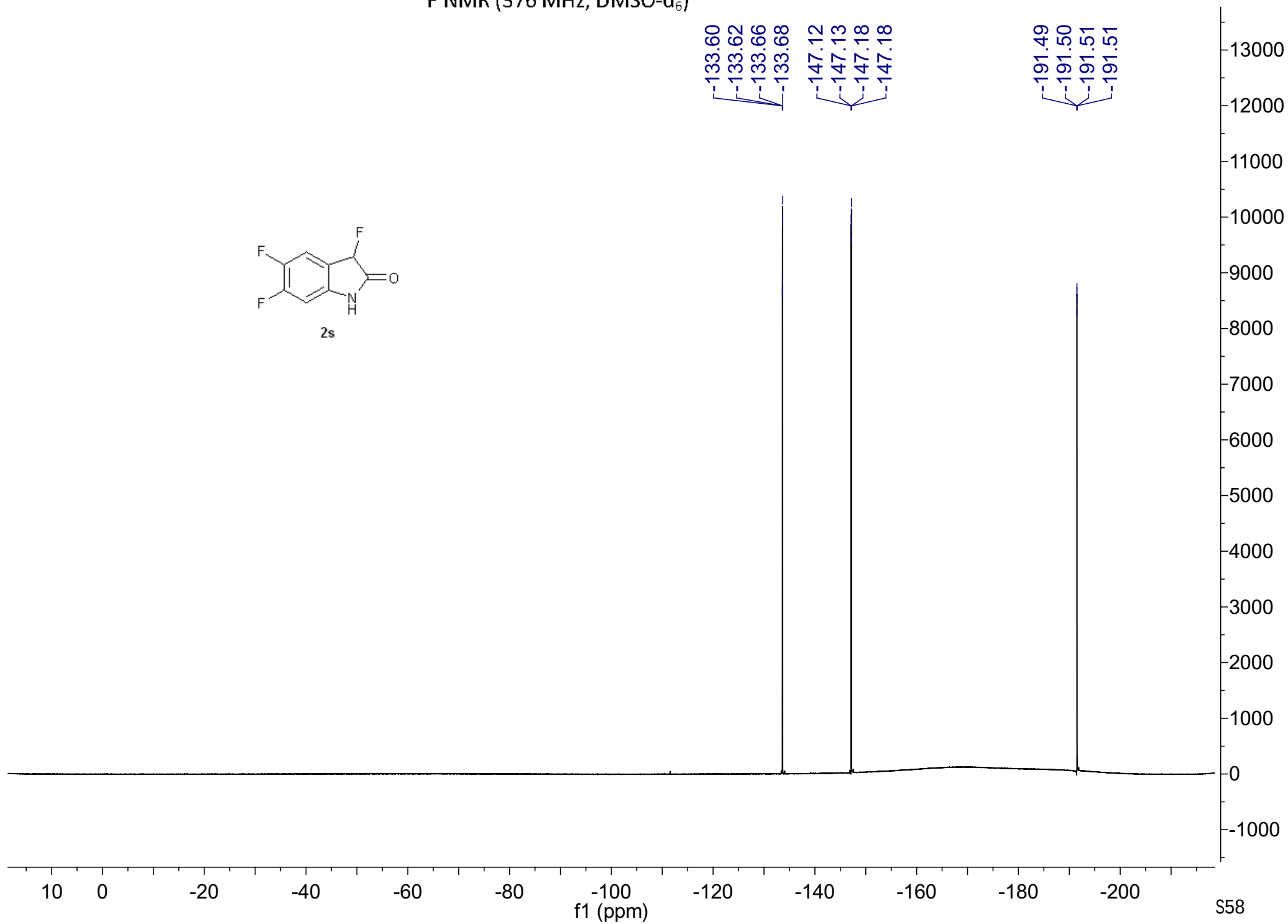
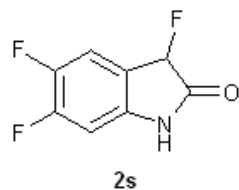
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



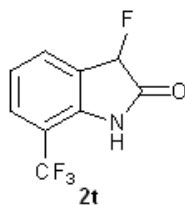
172.90  
172.73  
152.93  
150.56  
147.20  
147.04  
144.69  
140.97  
140.89  
140.80  
139.80  
119.73  
119.63  
119.57  
116.57  
101.06  
100.84  
86.84  
85.00  
40.20  
39.99  
39.78



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.145

7.774

7.756

7.665

7.645

7.256

7.237

7.217

6.029

5.903

3.333

2.515

2.510

2.506

0.98

0.96

0.96

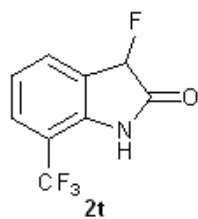
1.00

1.01

f1 (ppm)

S59

<sup>13</sup>C NMR (125 MHz, DMSO-d<sub>6</sub>)



173.30  
173.16

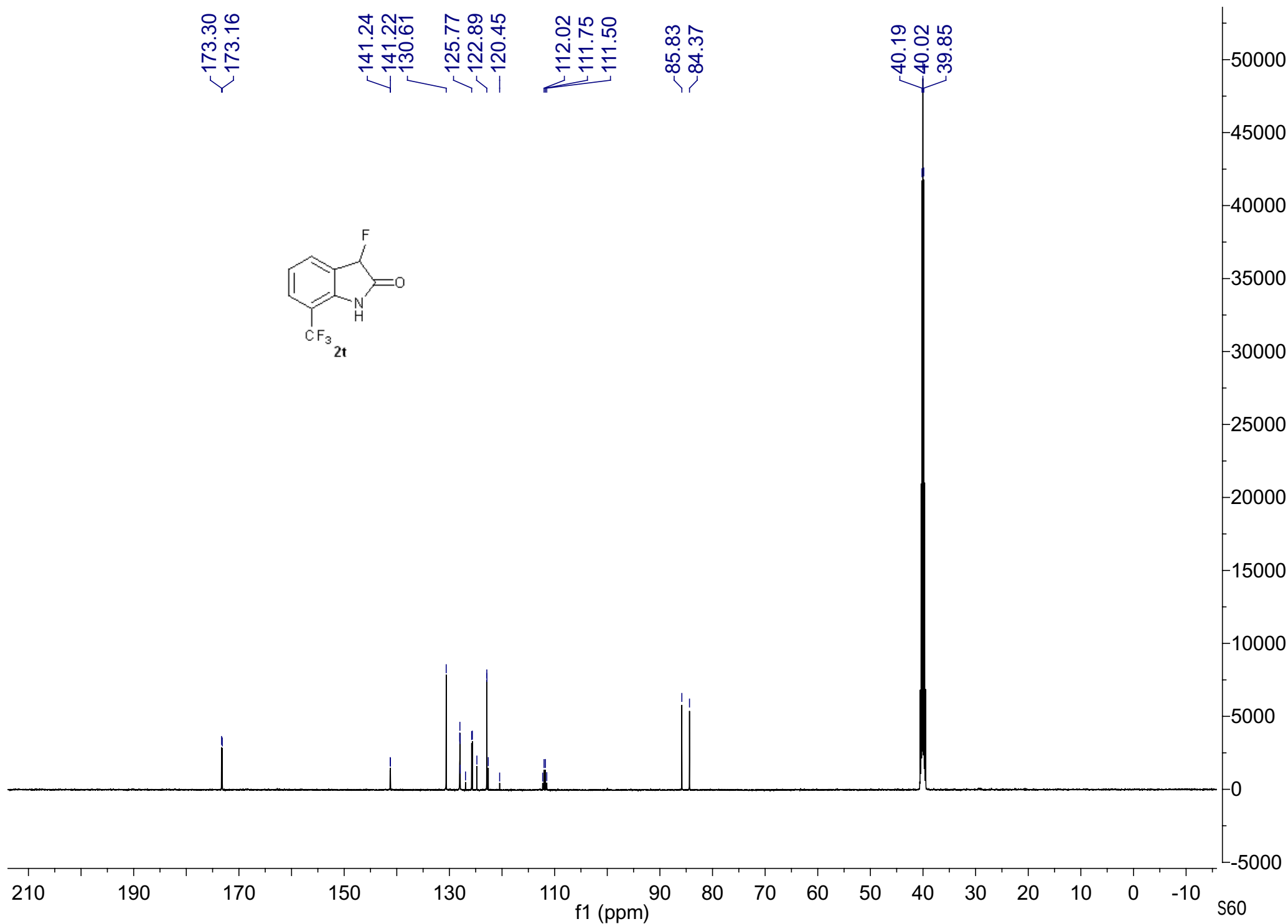
141.24  
141.22  
130.61

125.77  
122.89  
120.45

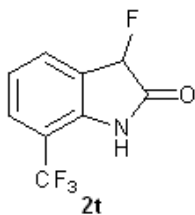
112.02  
111.75  
111.50

85.83  
84.37

40.19  
40.02  
39.85

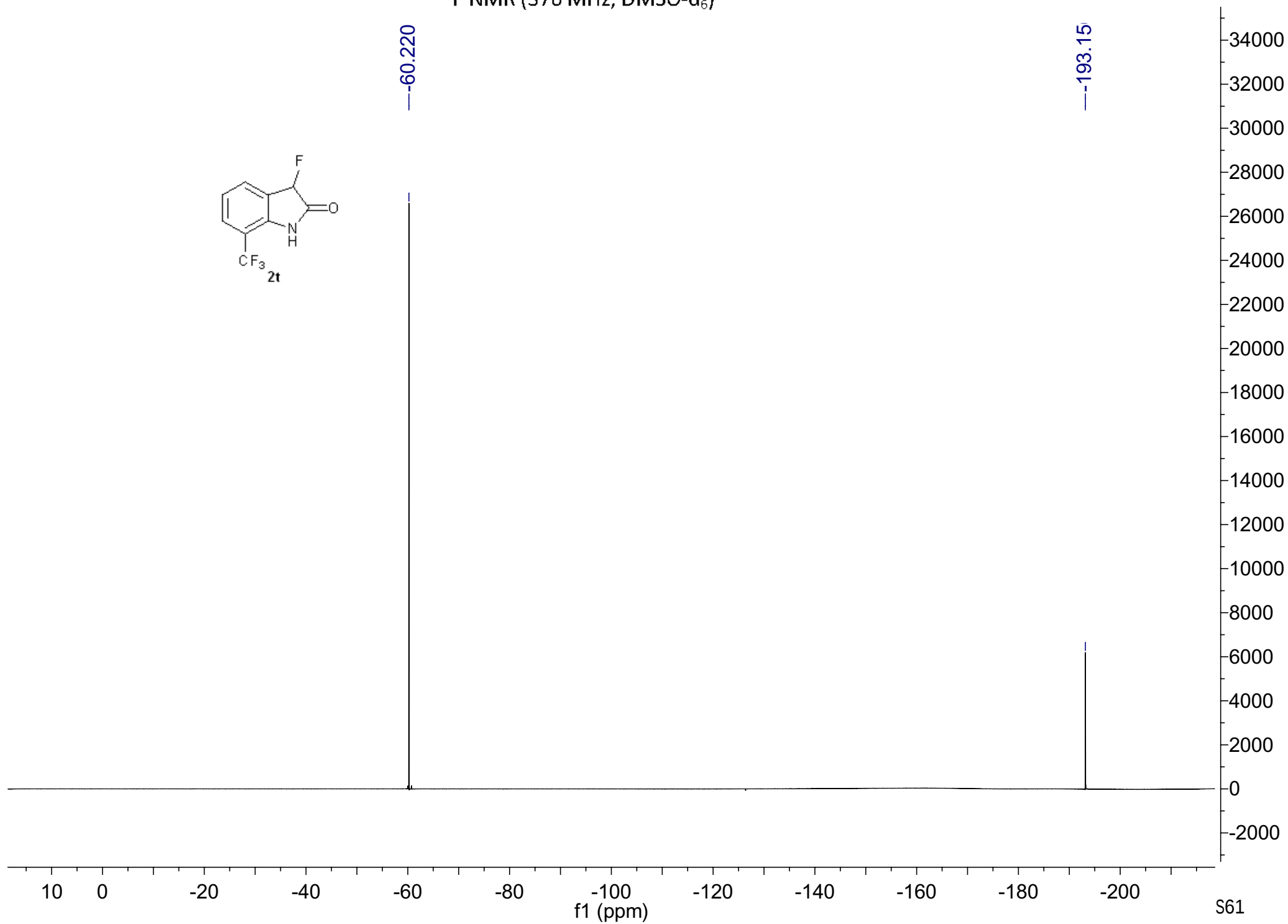


<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)

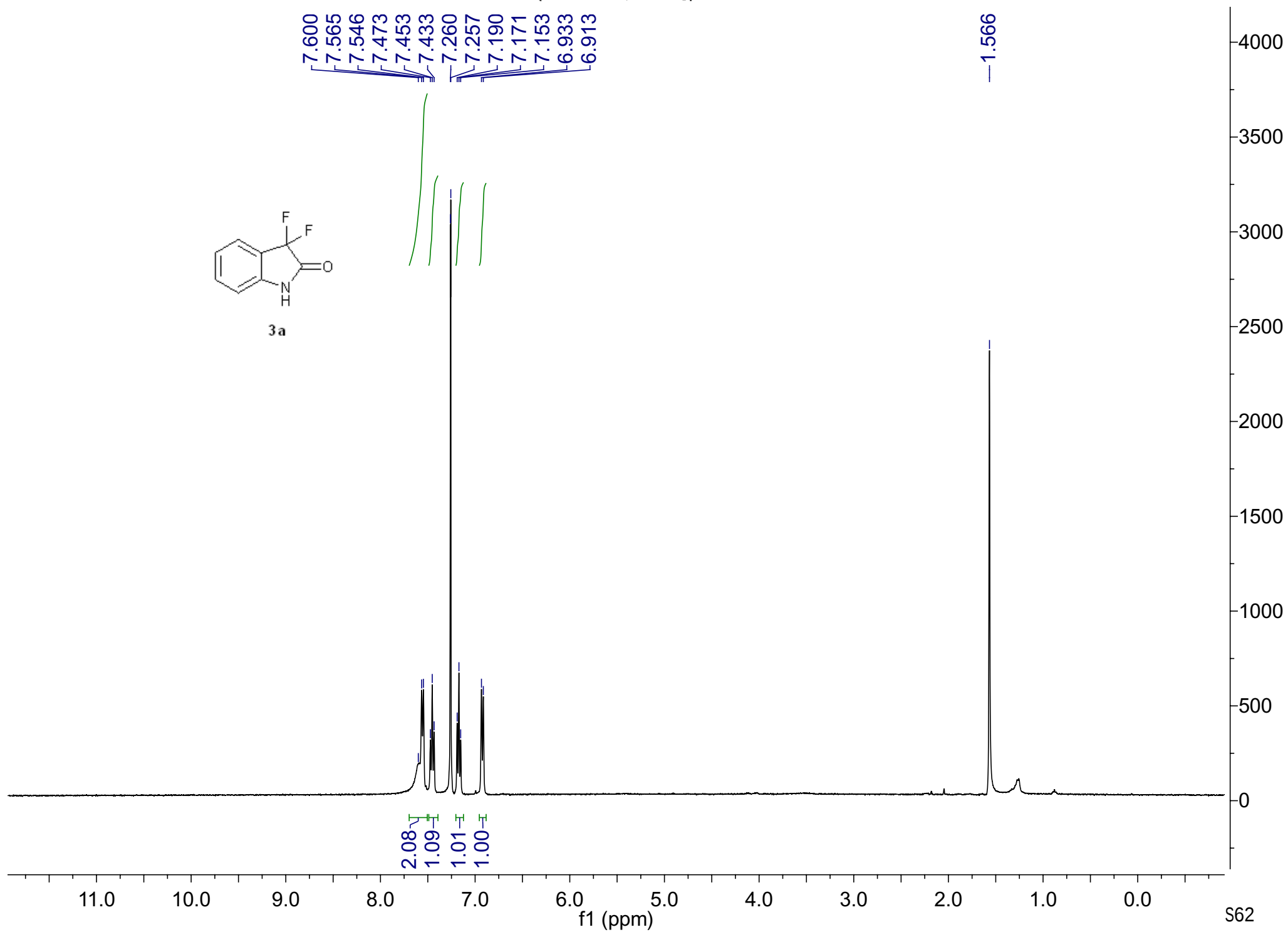
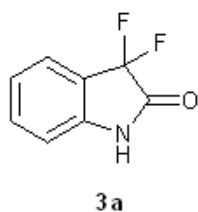


-60.220

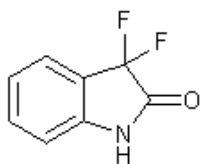
-193.15



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



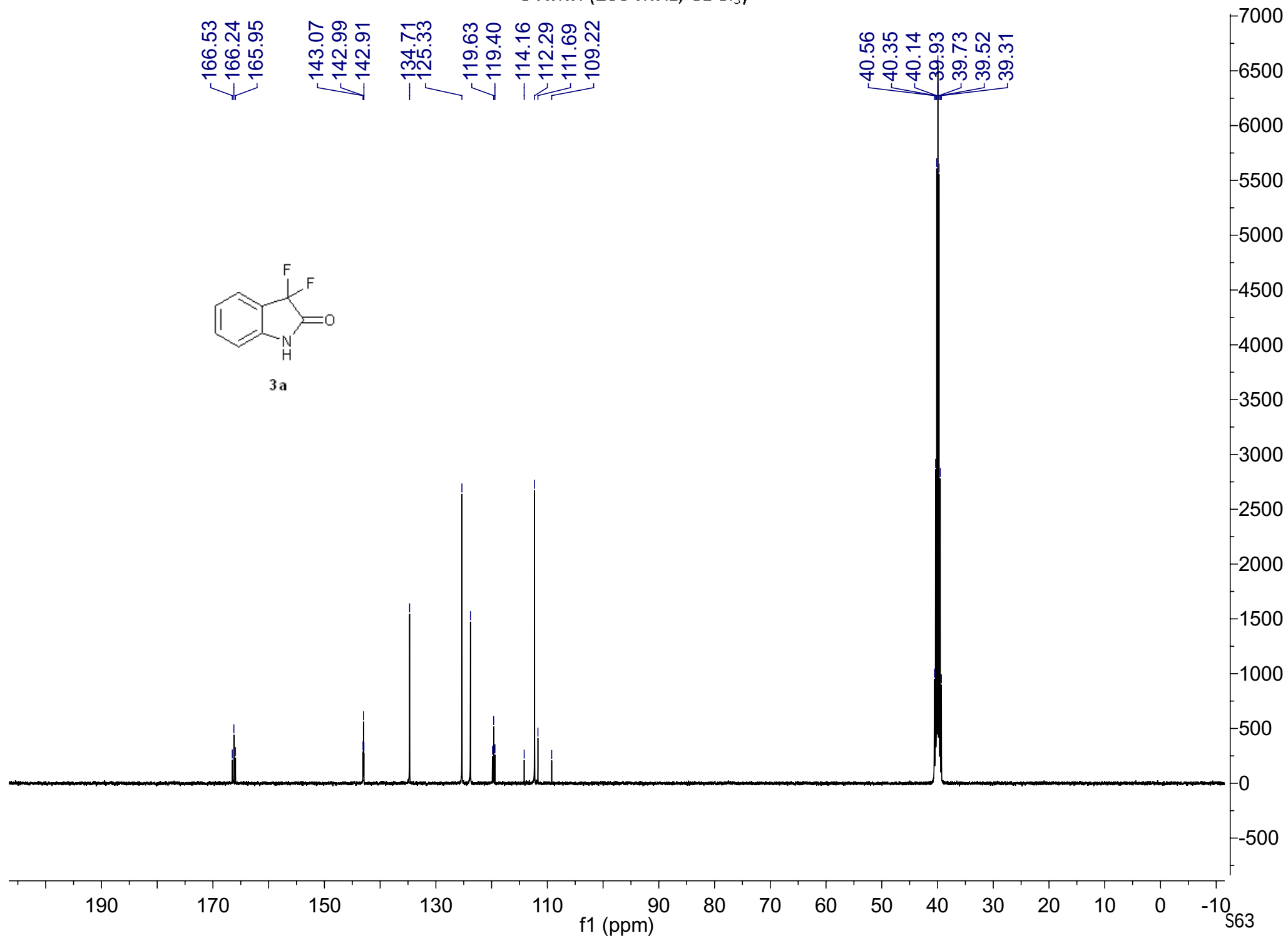
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



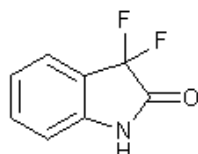
**3a**

166.53  
166.24  
165.95  
143.07  
142.99  
142.91  
134.71  
125.33  
119.63  
119.40  
114.16  
112.29  
111.69  
109.22

40.56  
40.35  
40.14  
39.93  
39.73  
39.52  
39.31

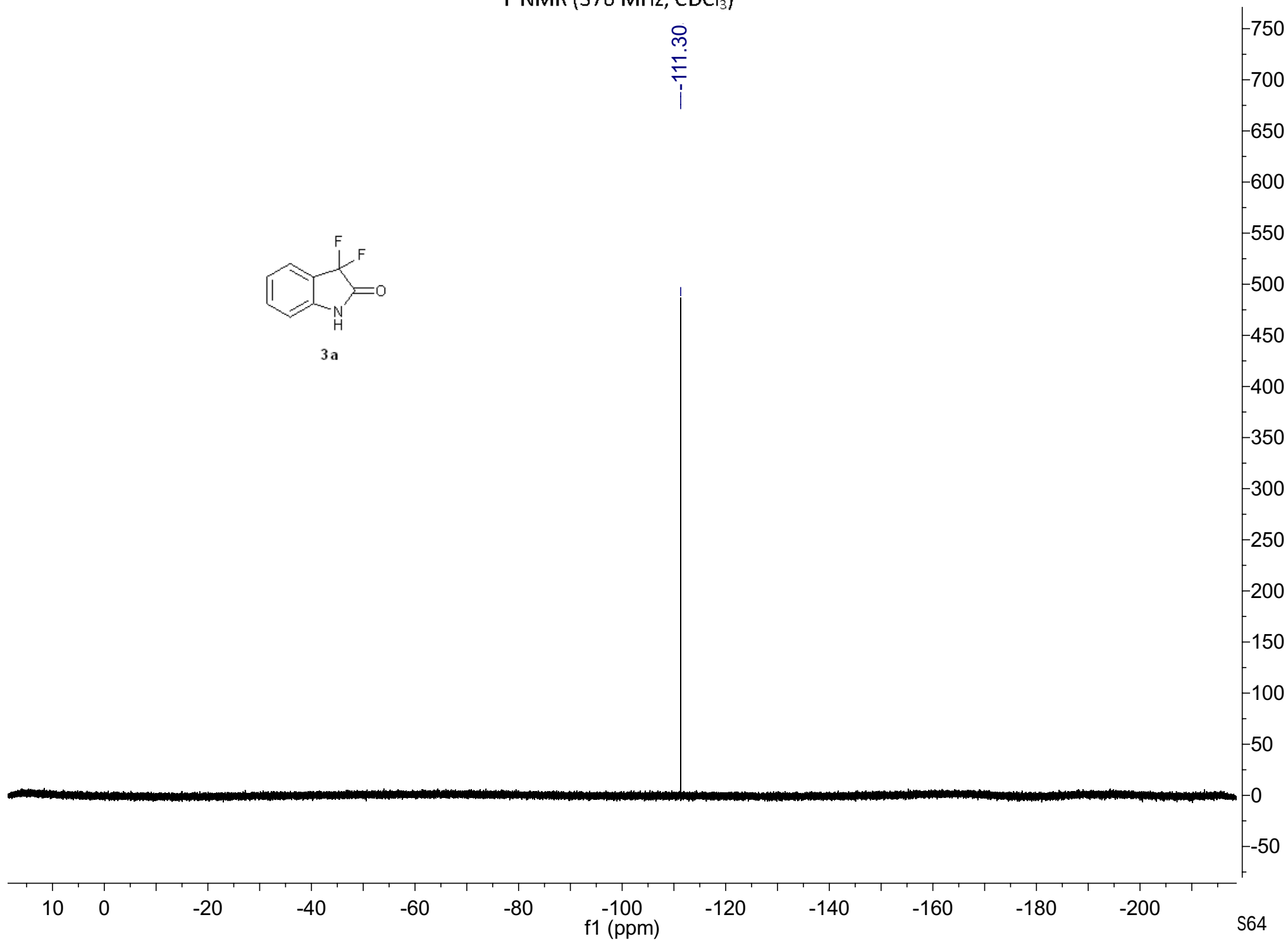


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

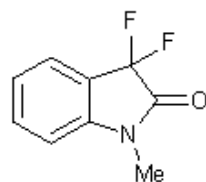


**3a**

--111.30



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



**3b**

7.559  
7.541  
7.525  
7.506  
7.486  
7.260  
7.200  
7.181  
7.162  
6.910  
6.890

3.223

1.567

1.02

1.01

1.02

1.00

3.03

11.0

10.0

9.0

8.0

7.0

6.0

5.0

4.0

3.0

2.0

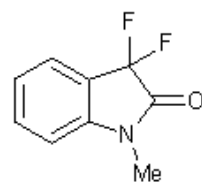
1.0

0.0

f1 (ppm)

S65

<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)



**3b**

165.53  
165.29  
165.05

144.00  
143.94  
143.89

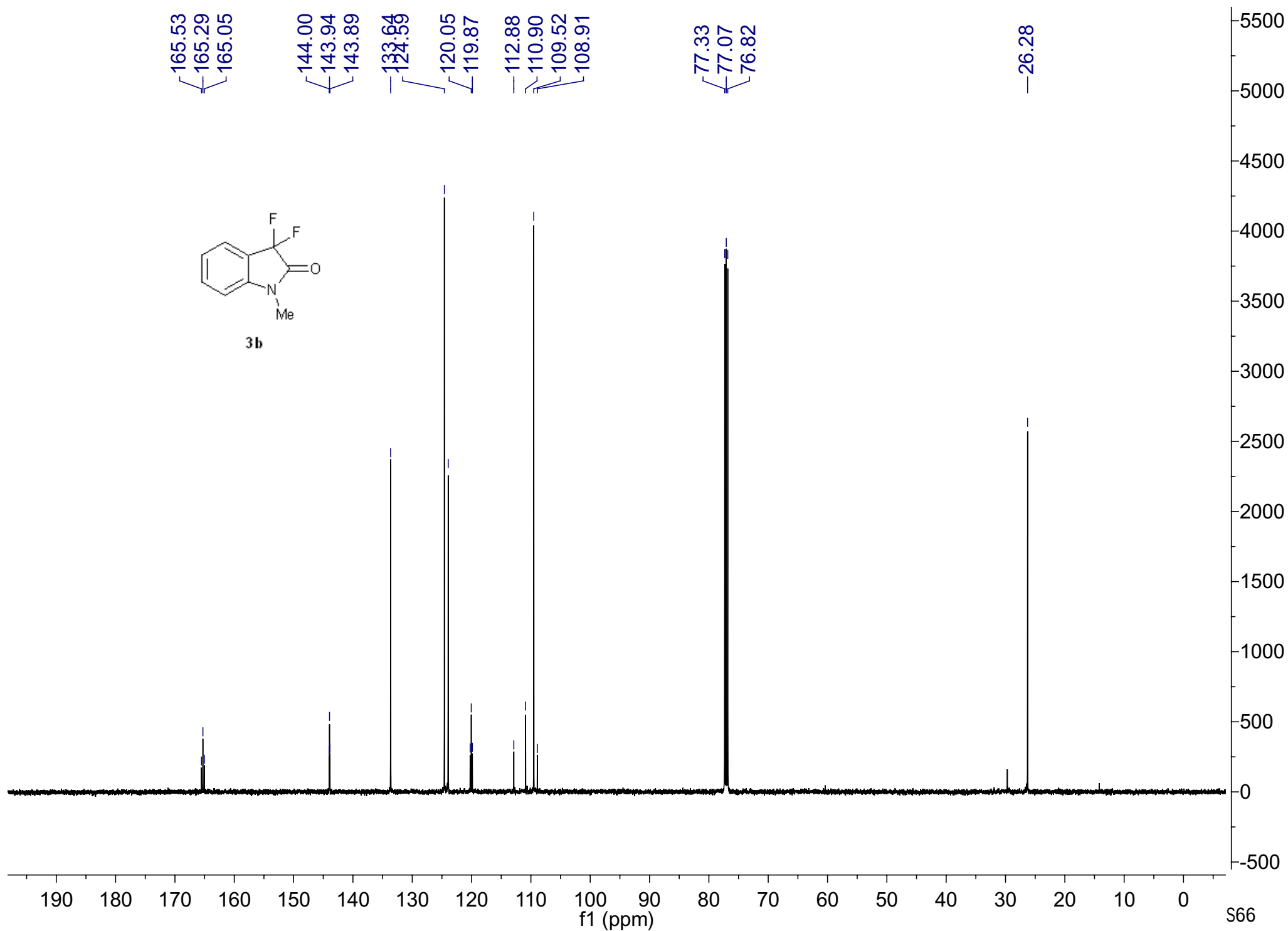
133.64  
124.56

120.05  
119.87

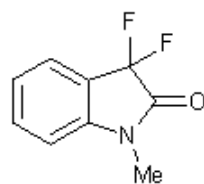
112.88  
110.90  
109.52  
108.91

77.33  
77.07  
76.82

26.28

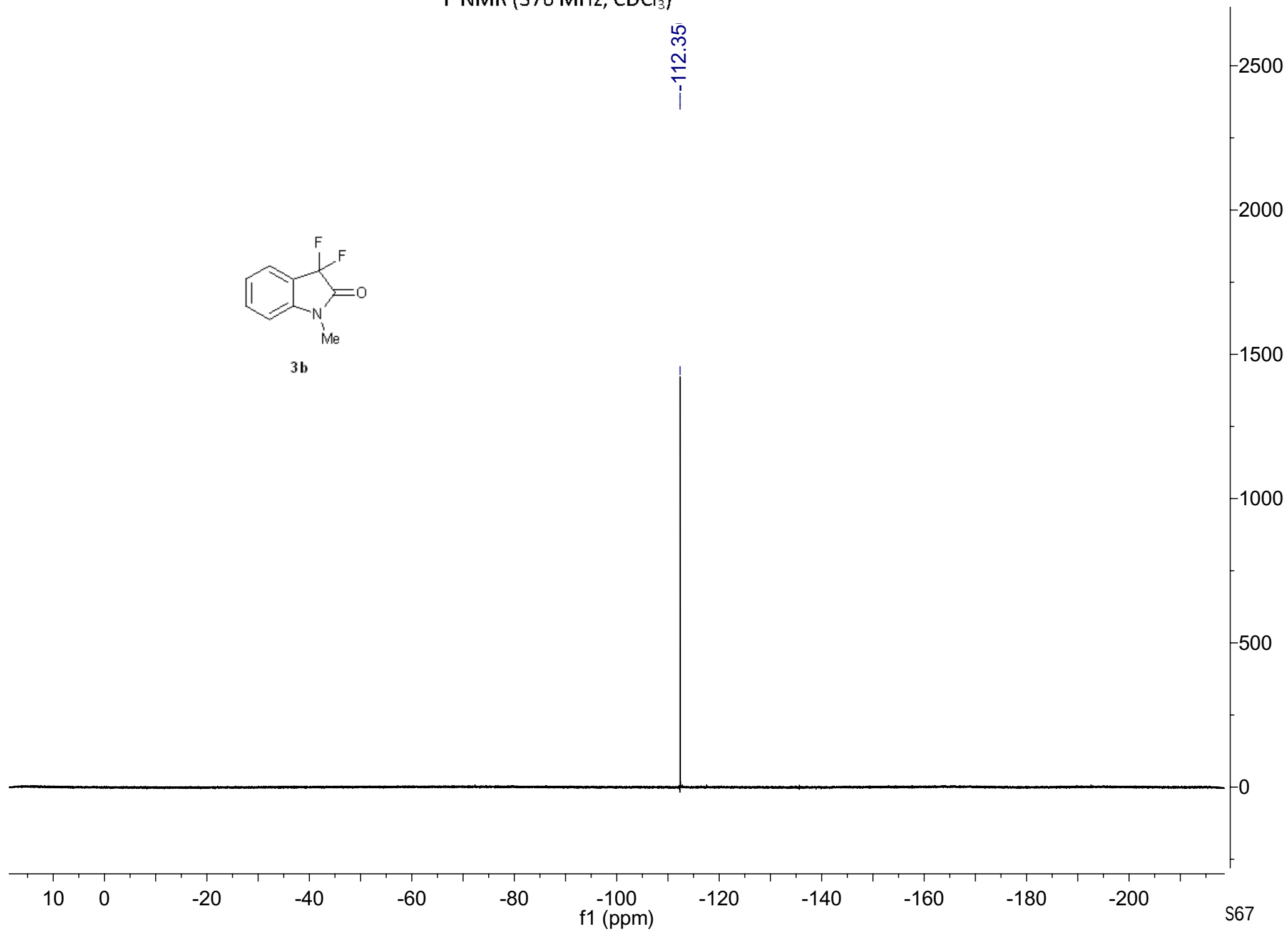


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

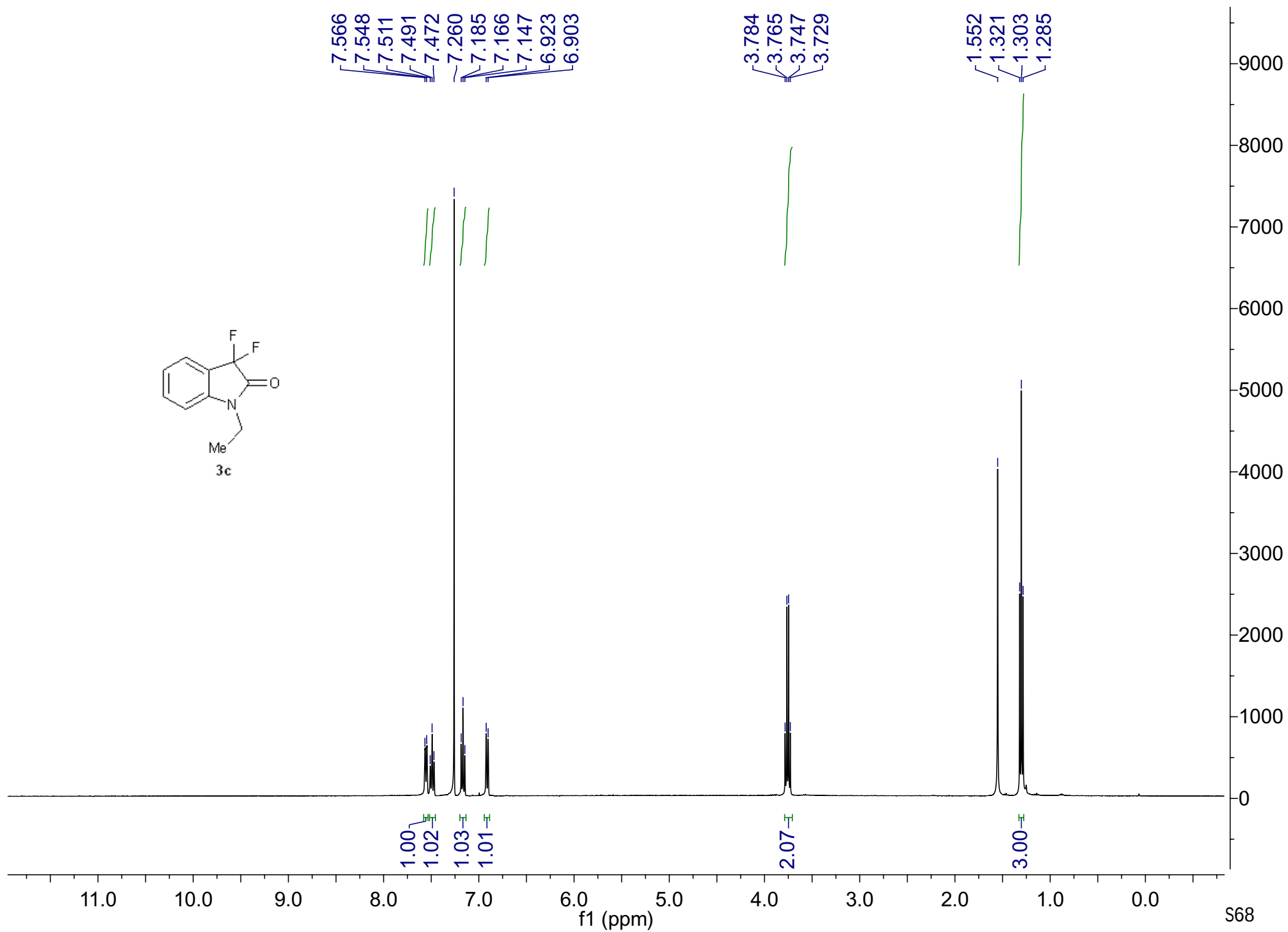
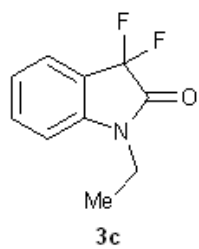


**3b**

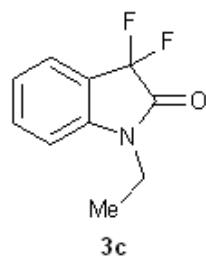
--112.35



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



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



165.24  
164.94  
164.64

143.17  
143.10  
143.03

133.60  
133.58  
124.80

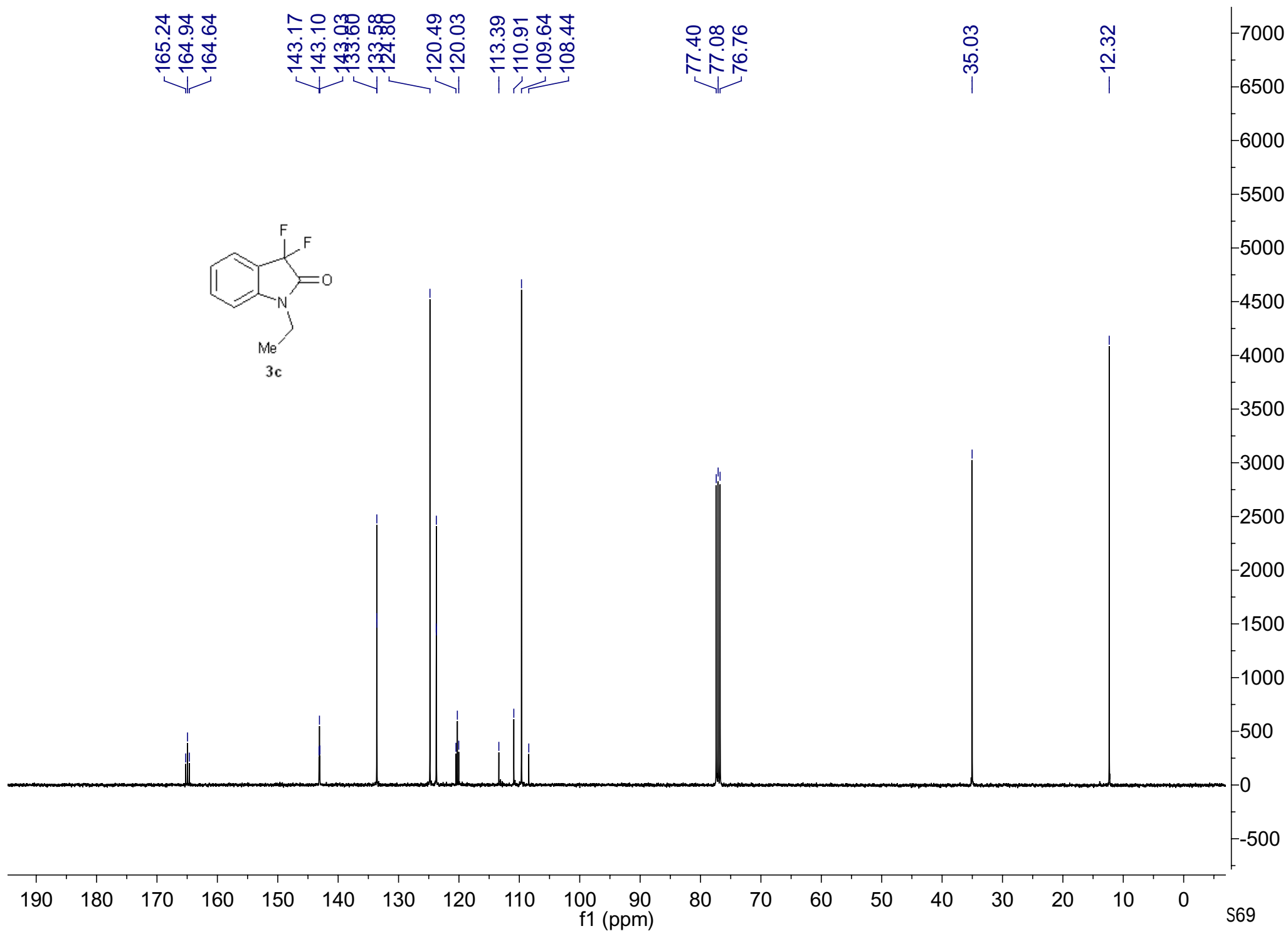
120.49  
120.03

113.39  
110.91  
109.64  
108.44

77.40  
77.08  
76.76

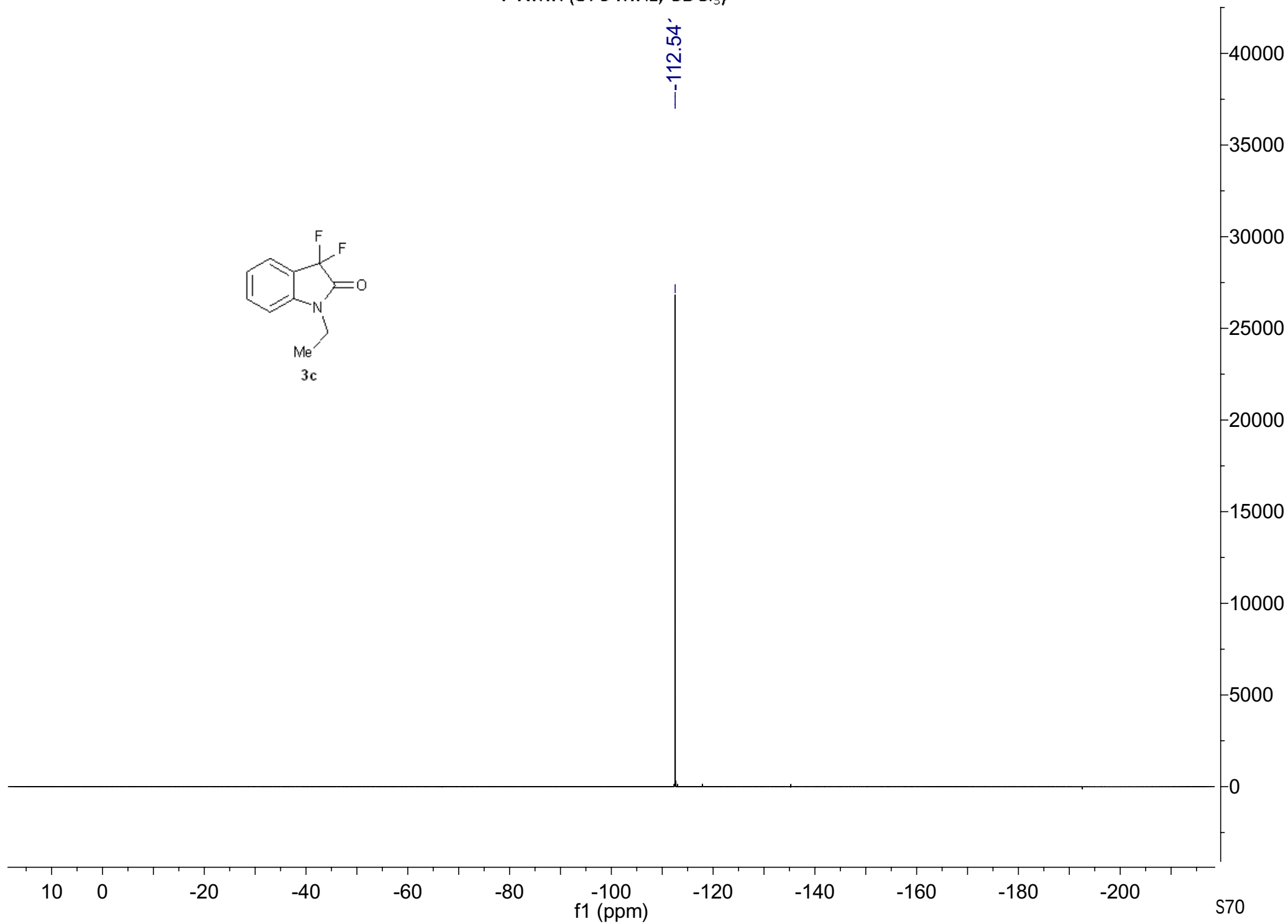
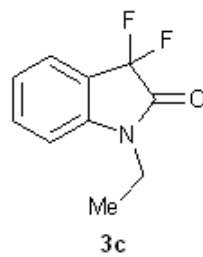
35.03

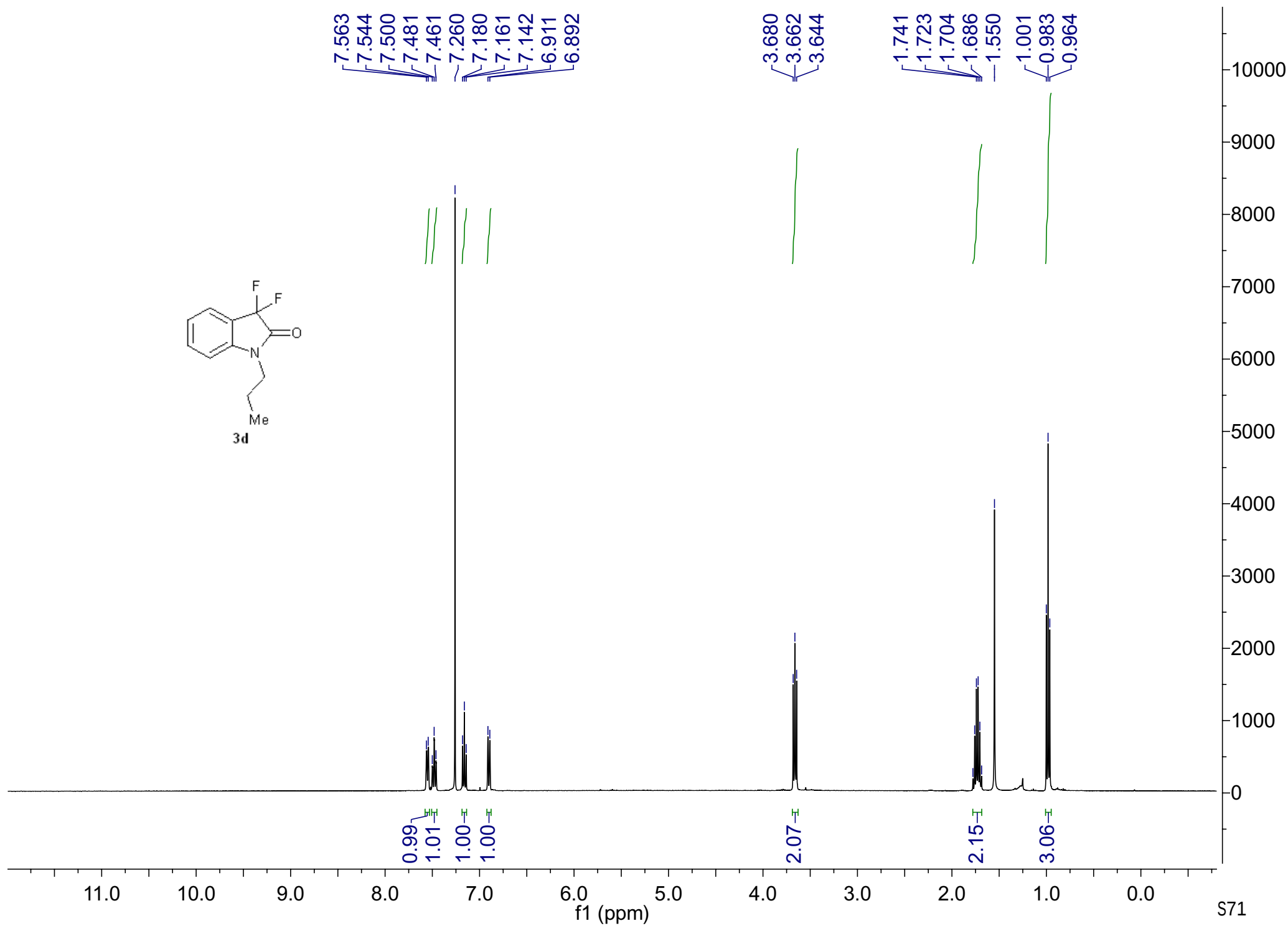
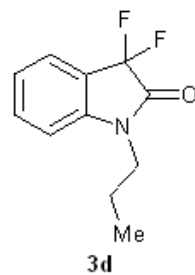
12.32



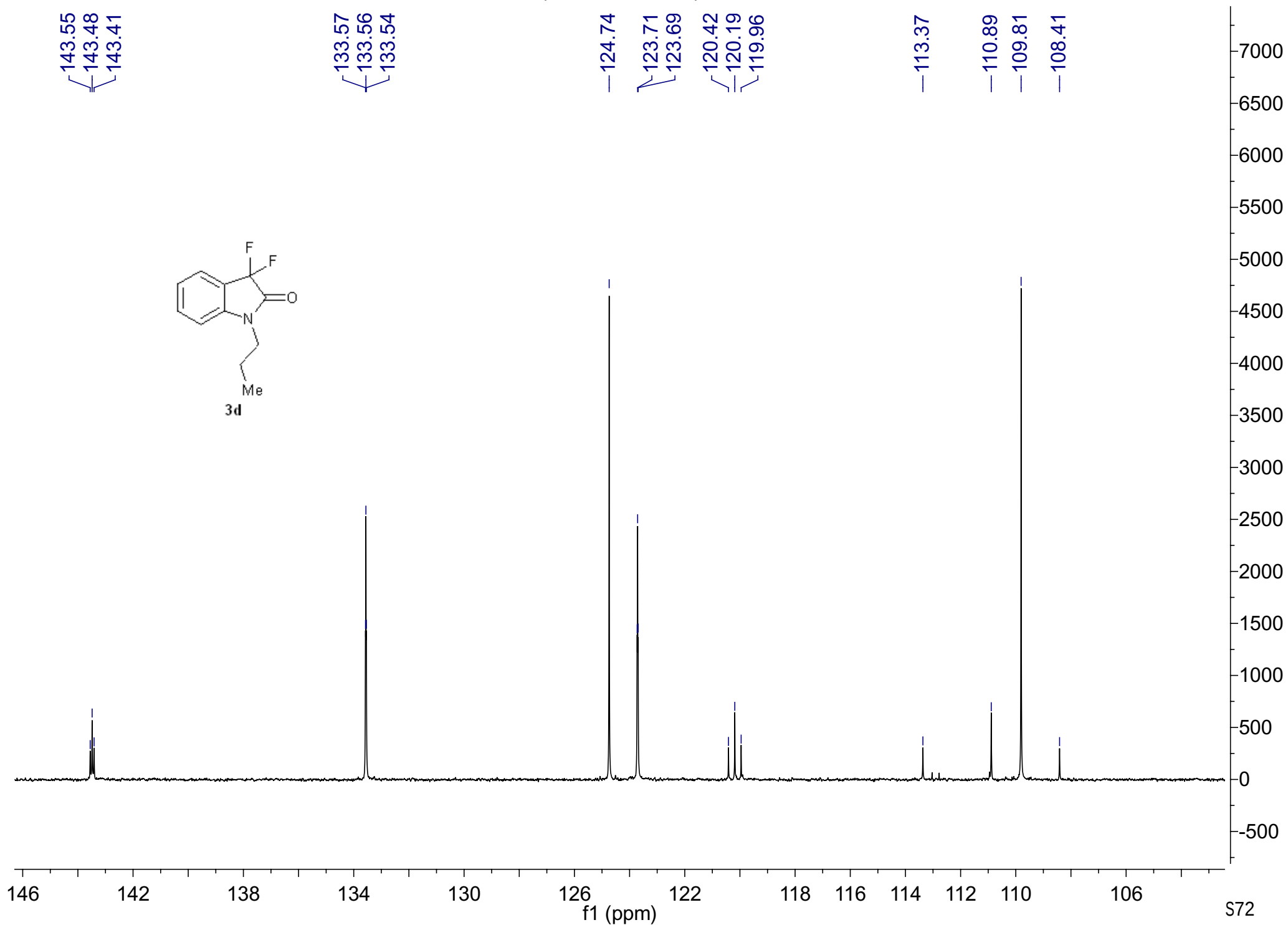
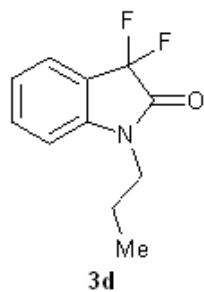
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

--112.54--

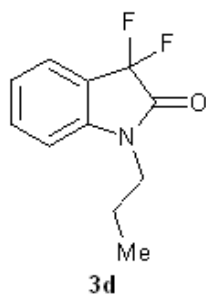




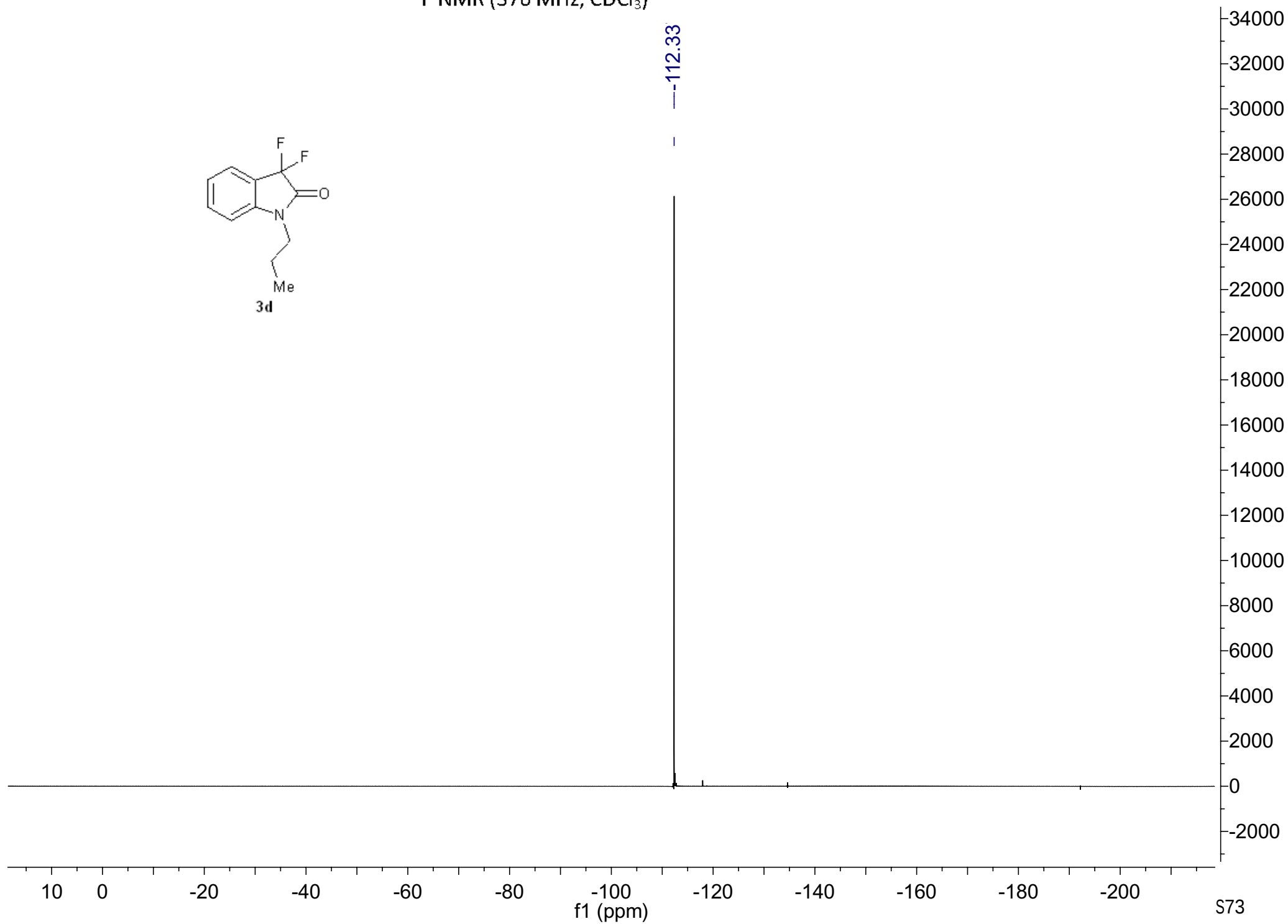
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



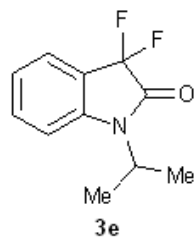
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



-112.33

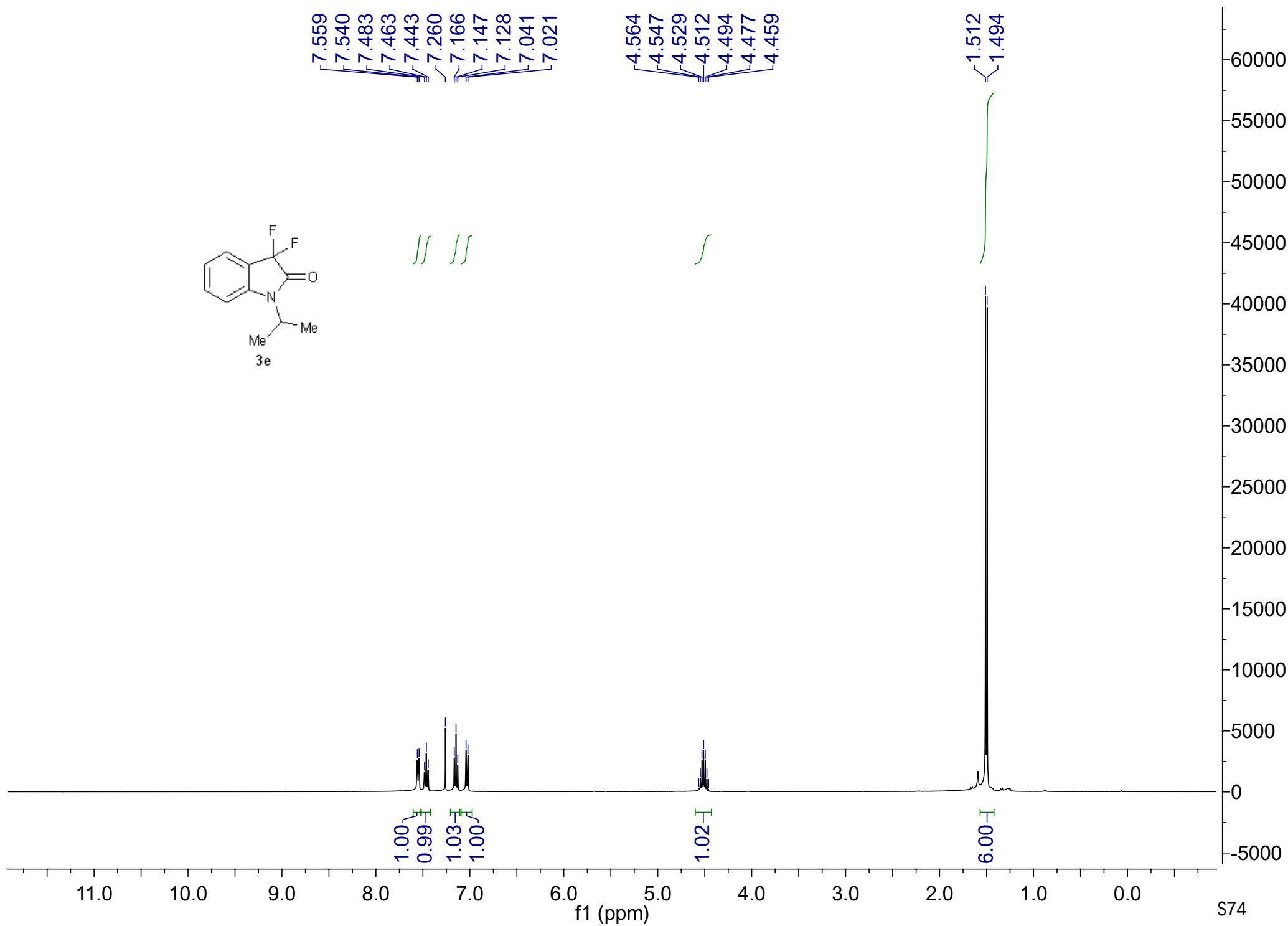


<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)

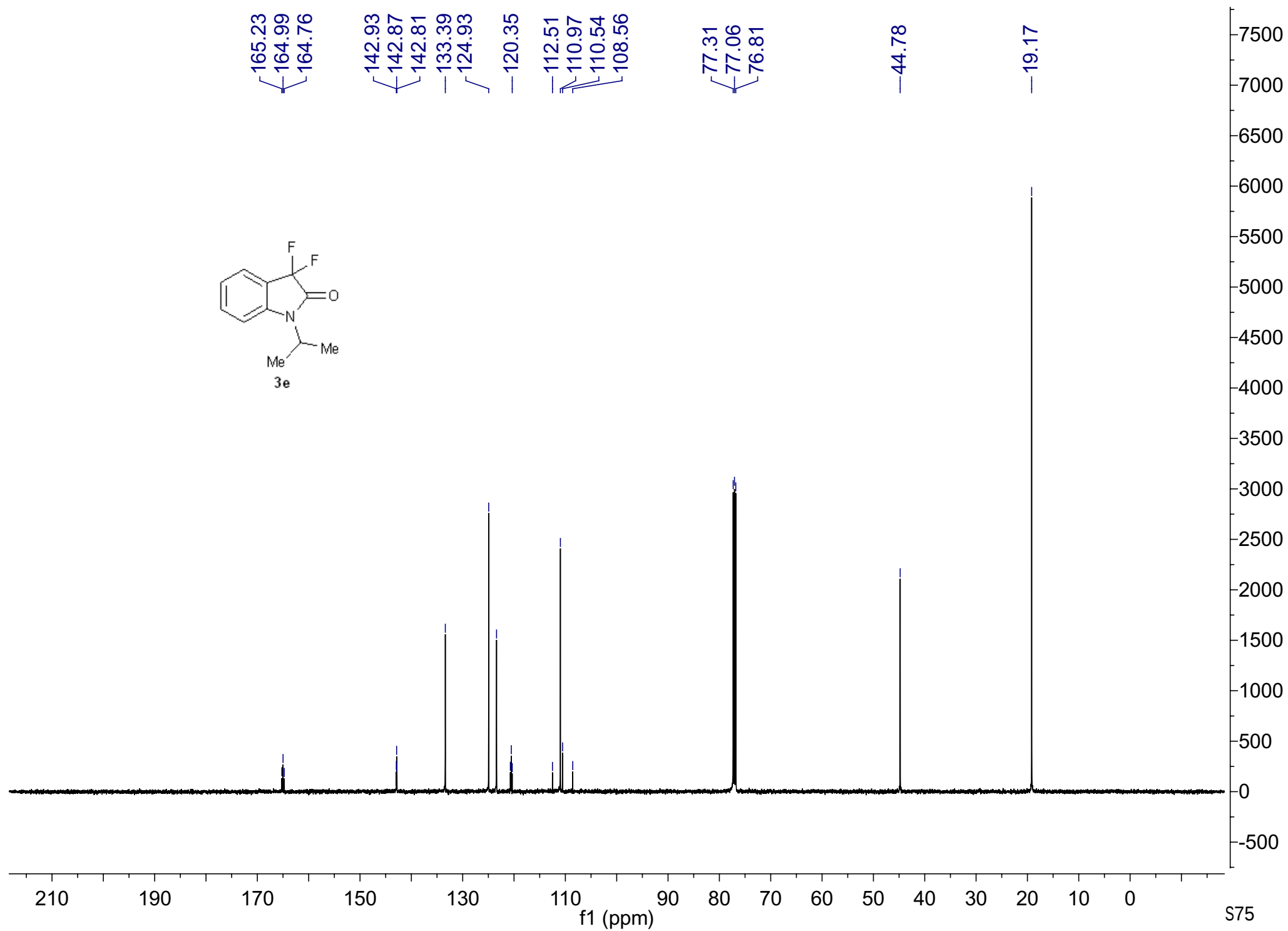
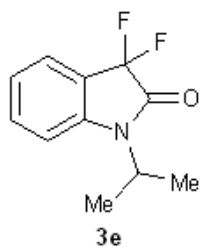


7.559  
7.540  
7.483  
7.463  
7.443  
7.260  
7.166  
7.147  
7.128  
7.041  
7.021  
4.564  
4.547  
4.529  
4.512  
4.494  
4.477  
4.459

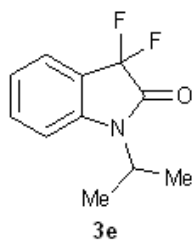
1.512  
1.494



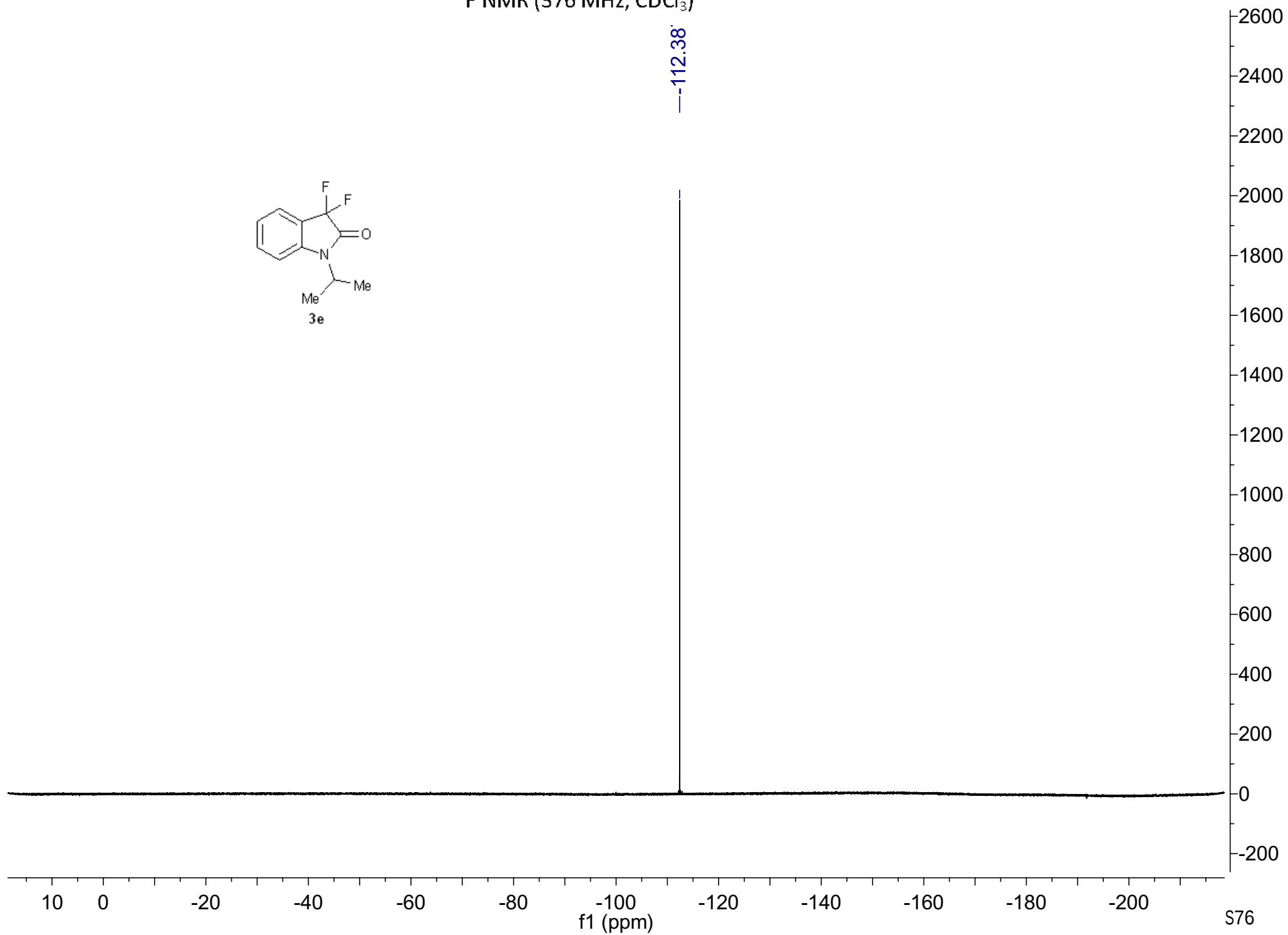
<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)



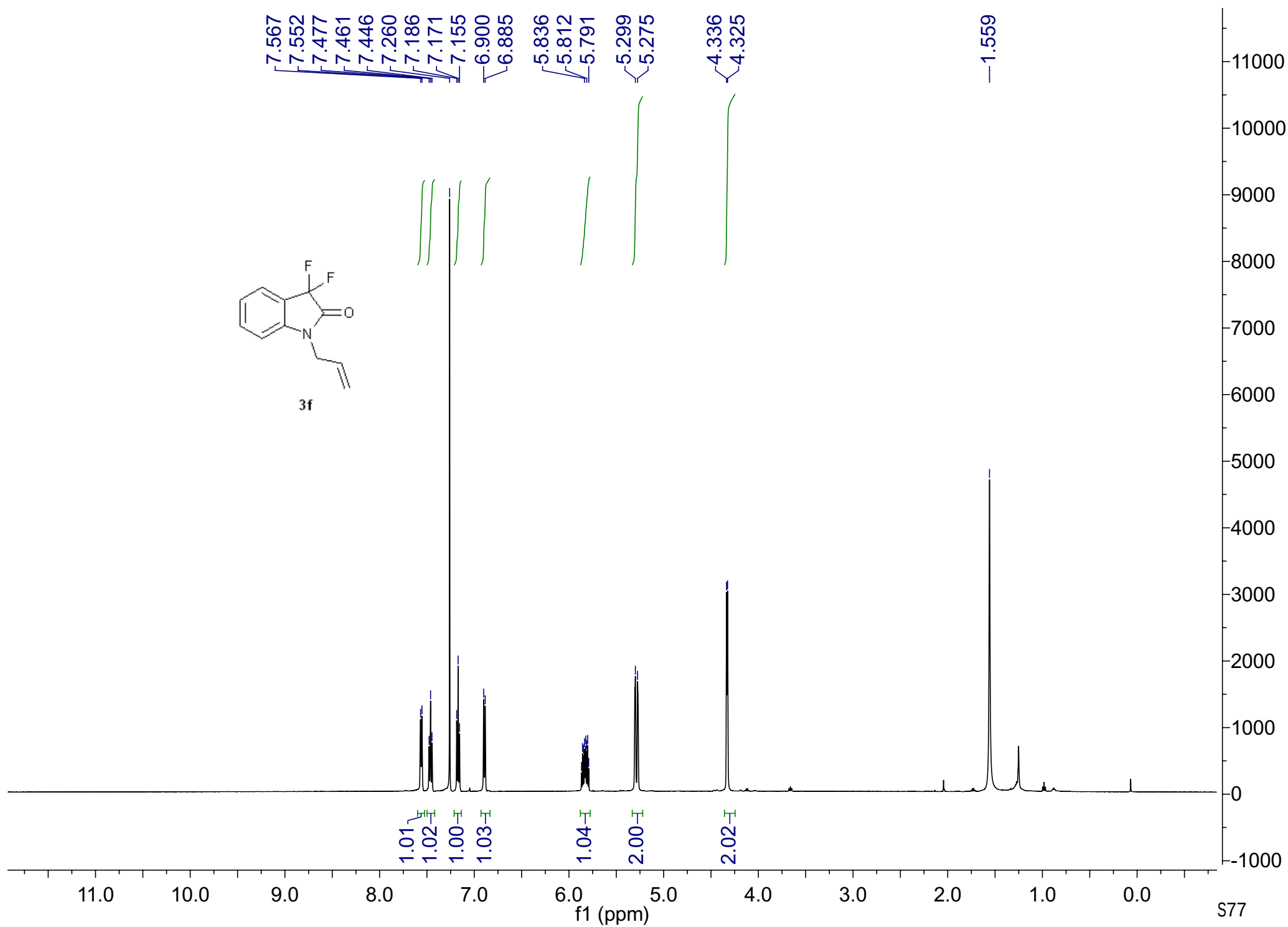
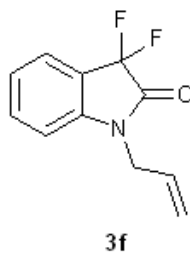
$^{19}\text{F}$  NMR (376 MHz,  $\text{CDCl}_3$ )



-112.38



<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>)

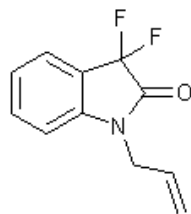


<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)

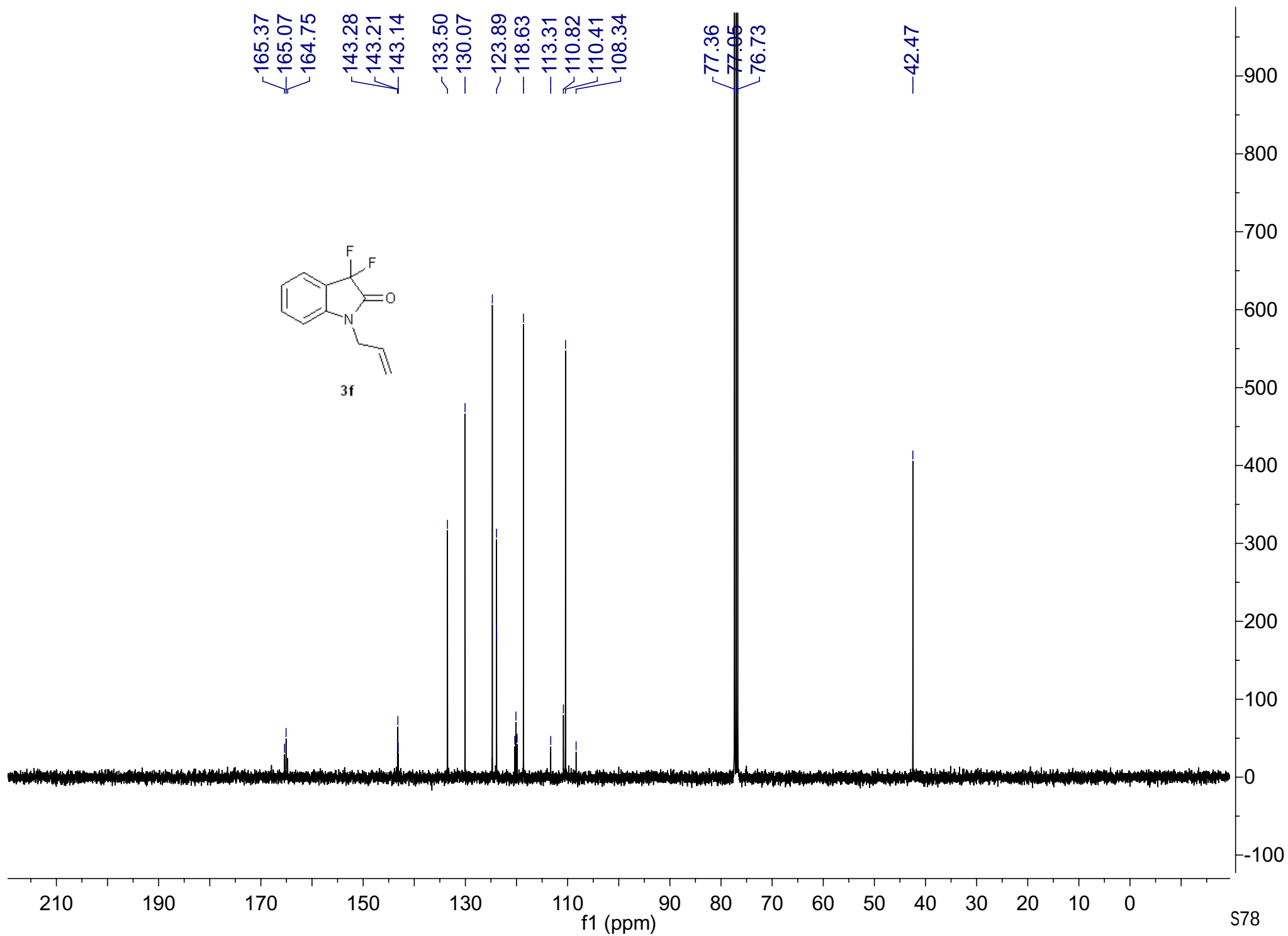
165.37  
165.07  
164.75  
143.28  
143.21  
143.14  
133.50  
130.07  
123.89  
118.63  
113.31  
110.82  
110.41  
108.34

77.36  
77.05  
76.73

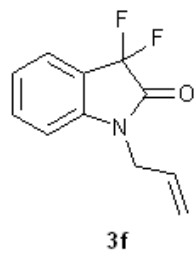
42.47



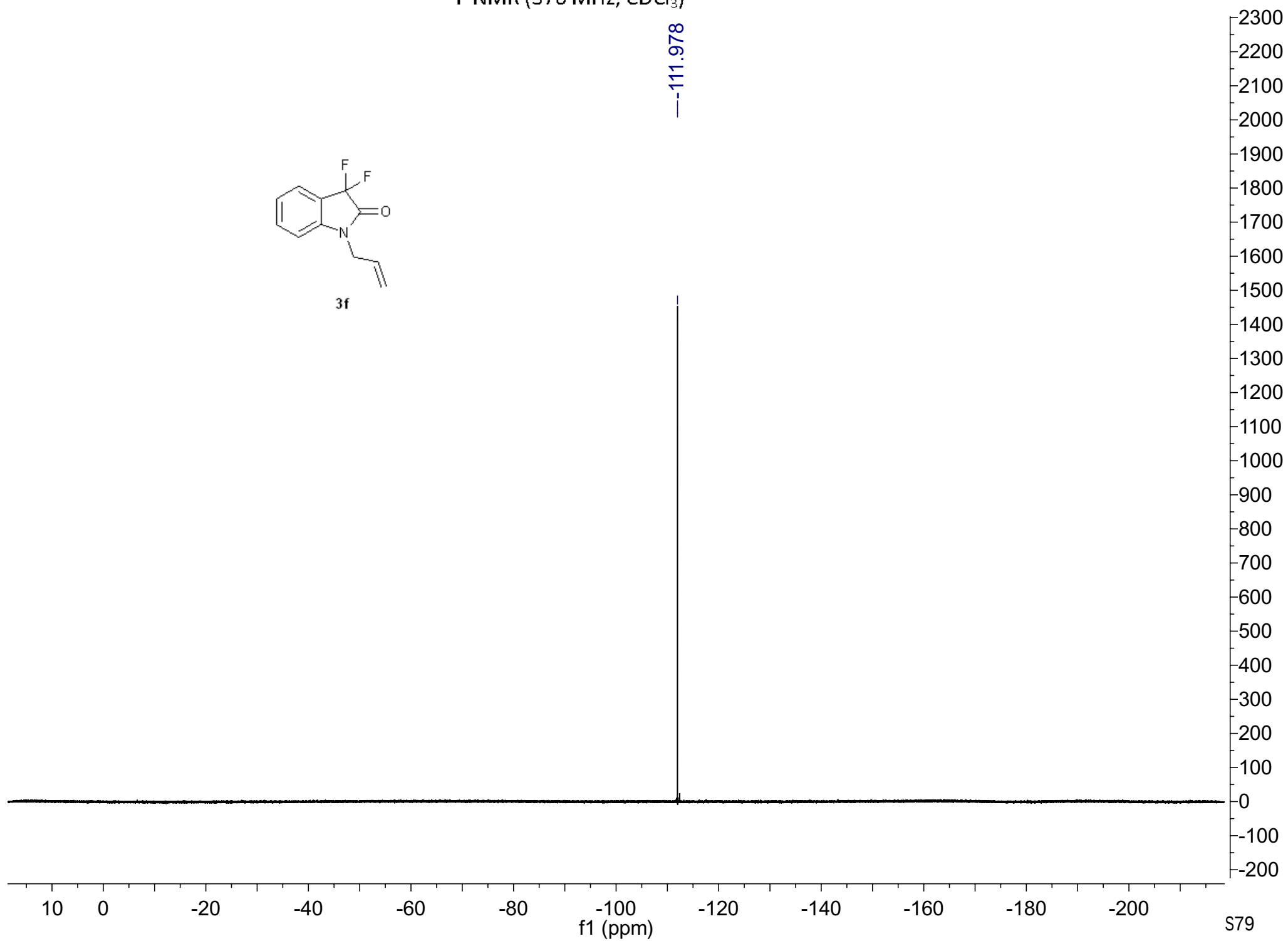
3f



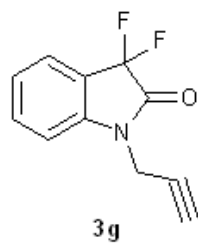
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



--111.978



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



7.591  
7.573  
7.557  
7.537  
7.517  
7.260  
7.242  
7.223  
7.204  
7.141  
7.122

4.502  
4.496

2.315  
2.309  
2.302

1.557

1.06  
1.06

1.06  
1.00

2.02

0.97

11.0

10.0

9.0

8.0

7.0

6.0

5.0

4.0

3.0

2.0

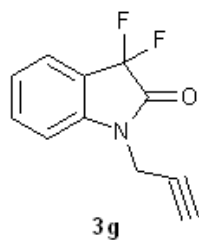
1.0

0.0

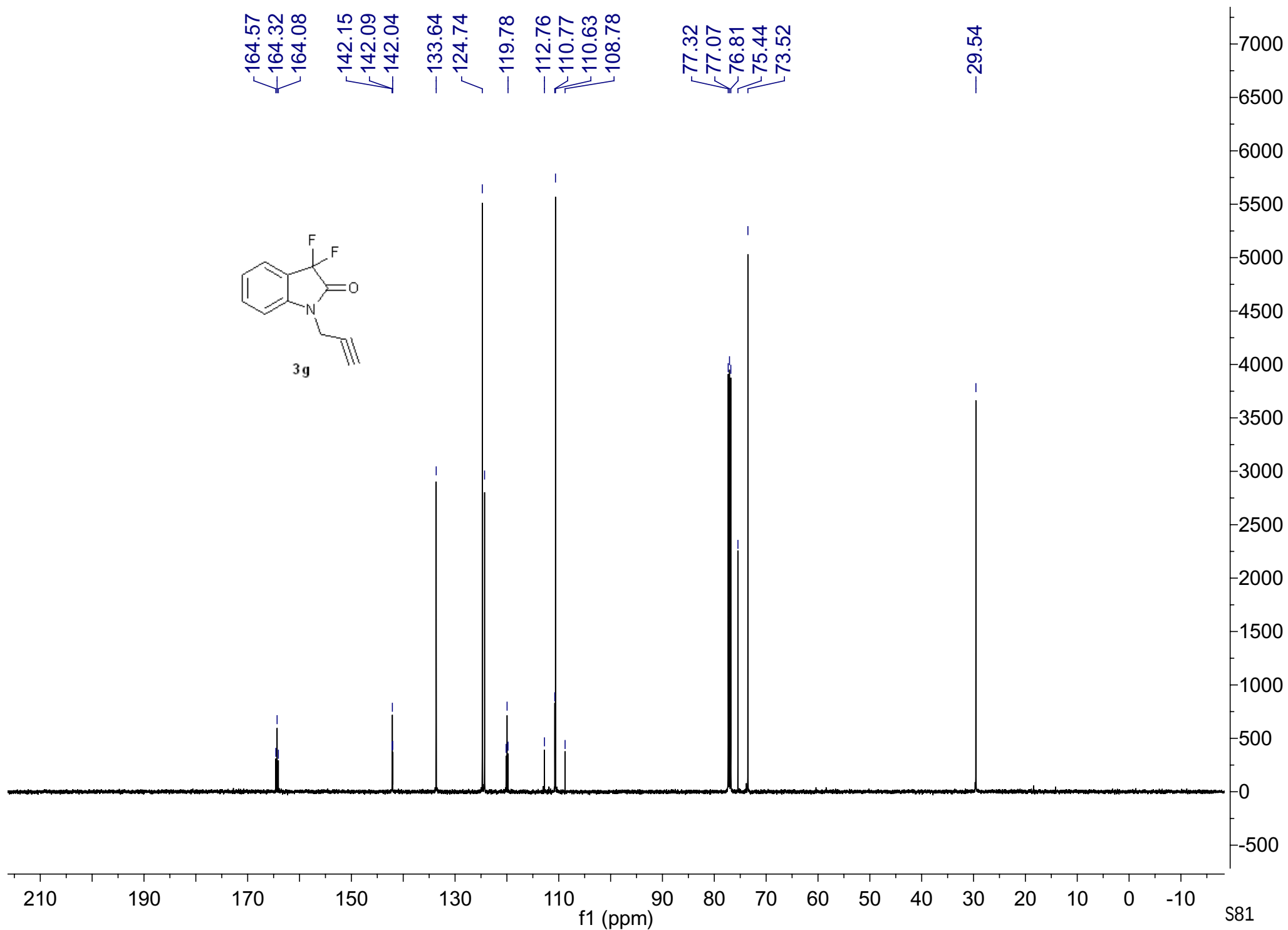
f1 (ppm)

S80

<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)

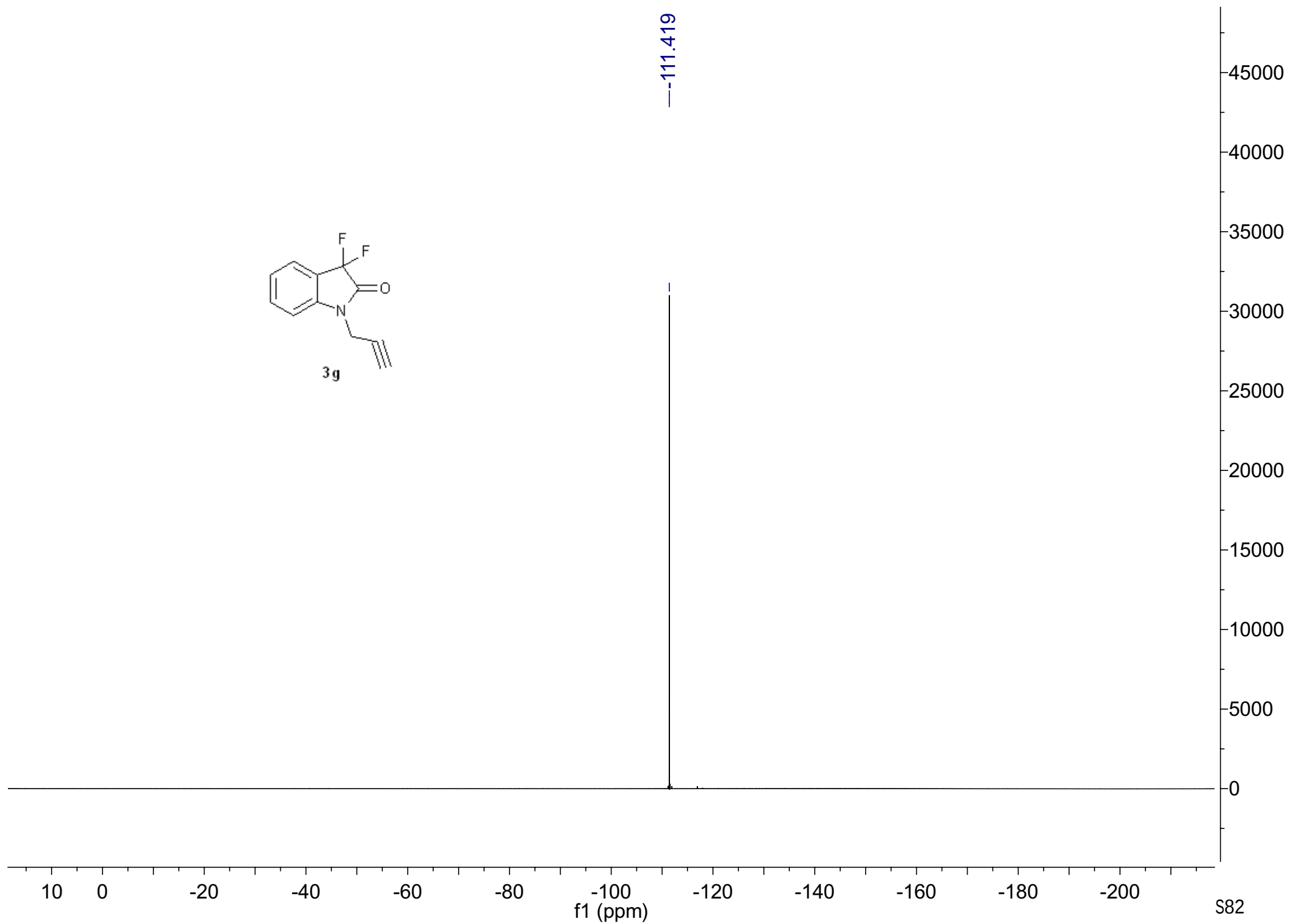
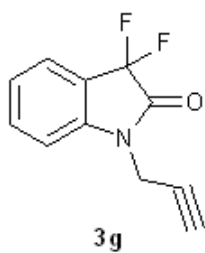


164.57  
164.32  
164.08  
142.15  
142.09  
142.04  
133.64  
124.74  
119.78  
112.76  
110.77  
110.63  
108.78  
77.32  
77.07  
76.81  
75.44  
73.52  
29.54

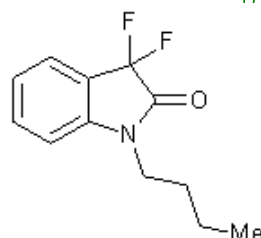


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

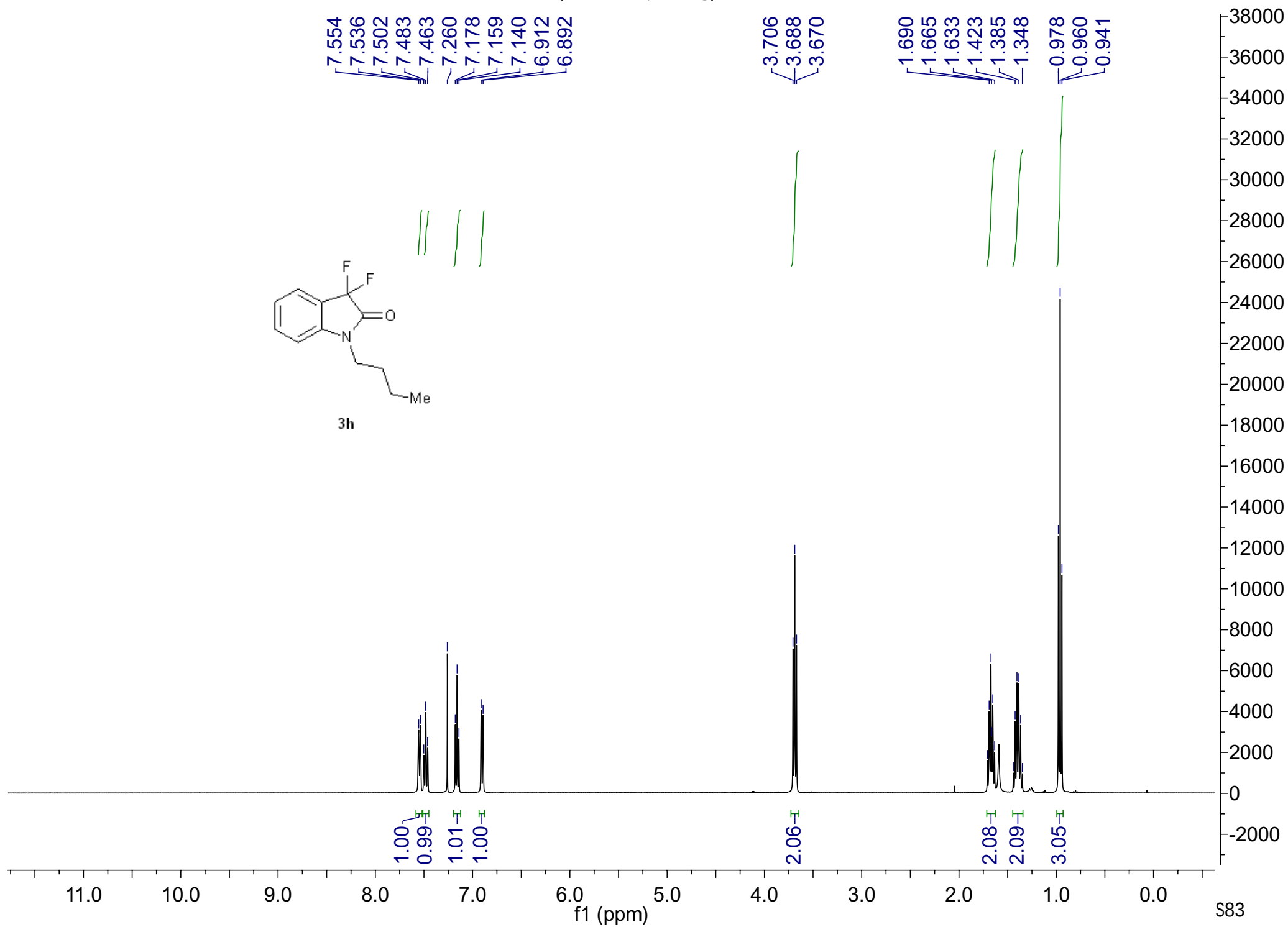
--111.419



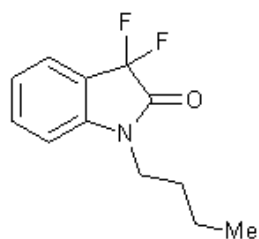
<sup>1</sup>H NMR (400 MHz, CDCl<sub>3</sub>)



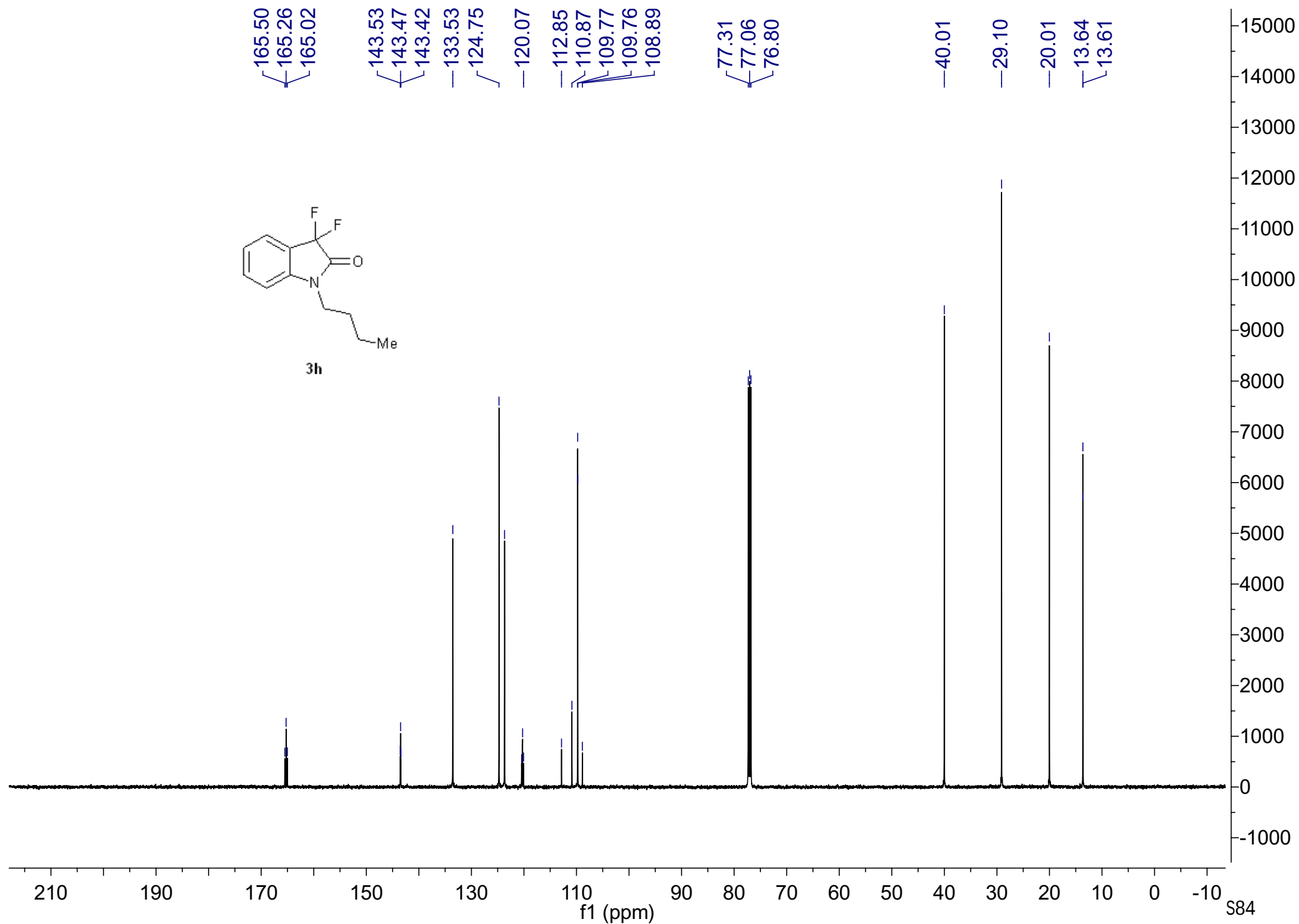
3h



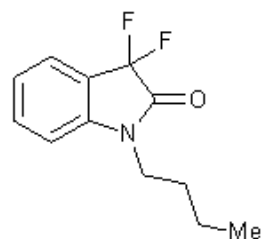
<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)



3h

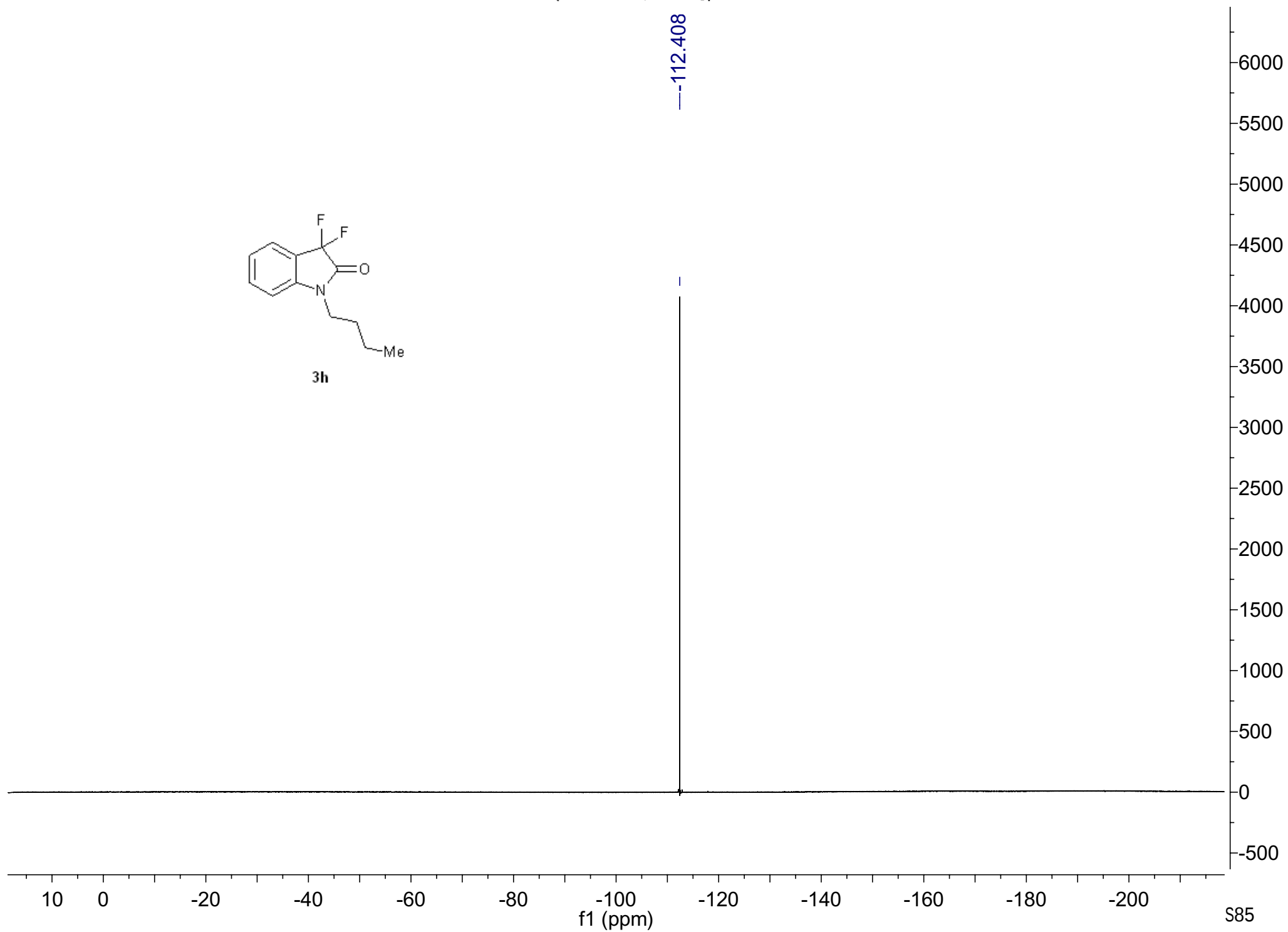


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)

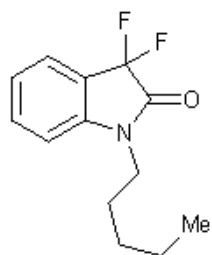


**3h**

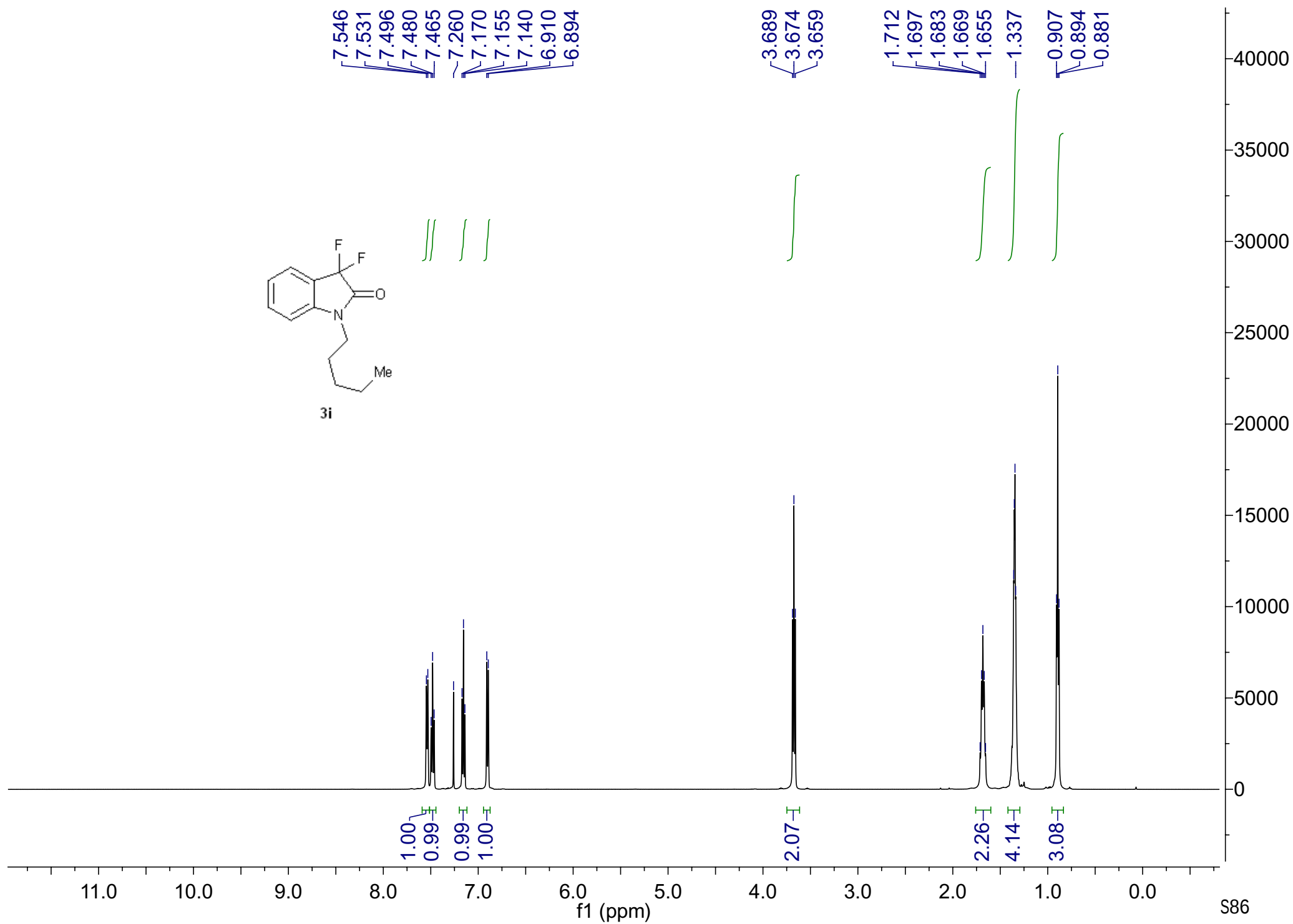
— -112.408



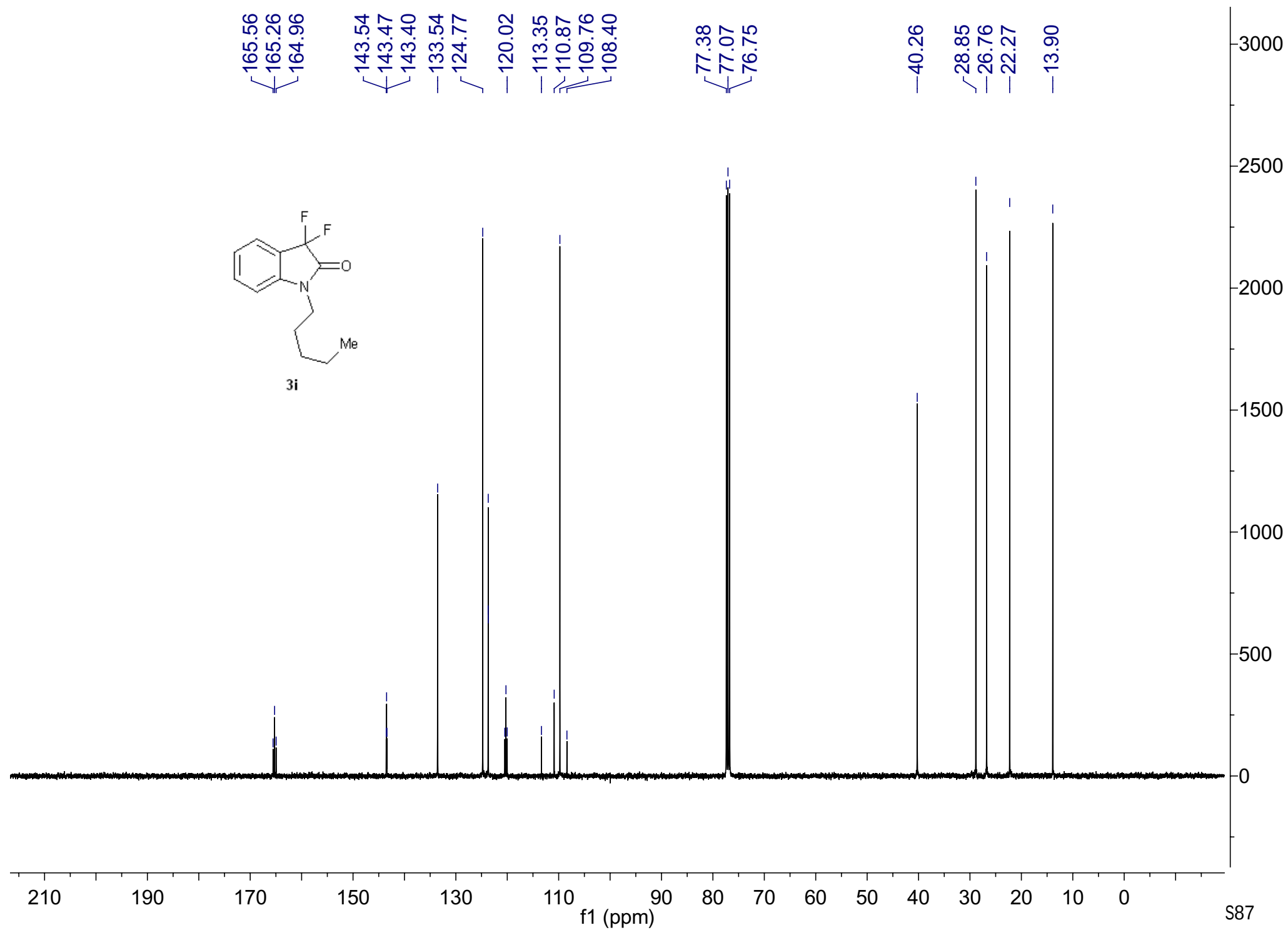
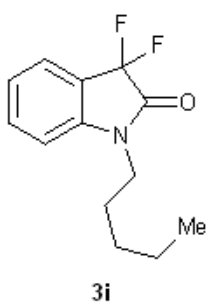
<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>)



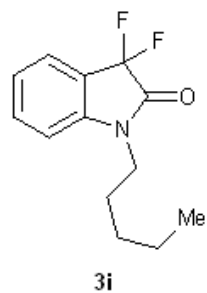
3i



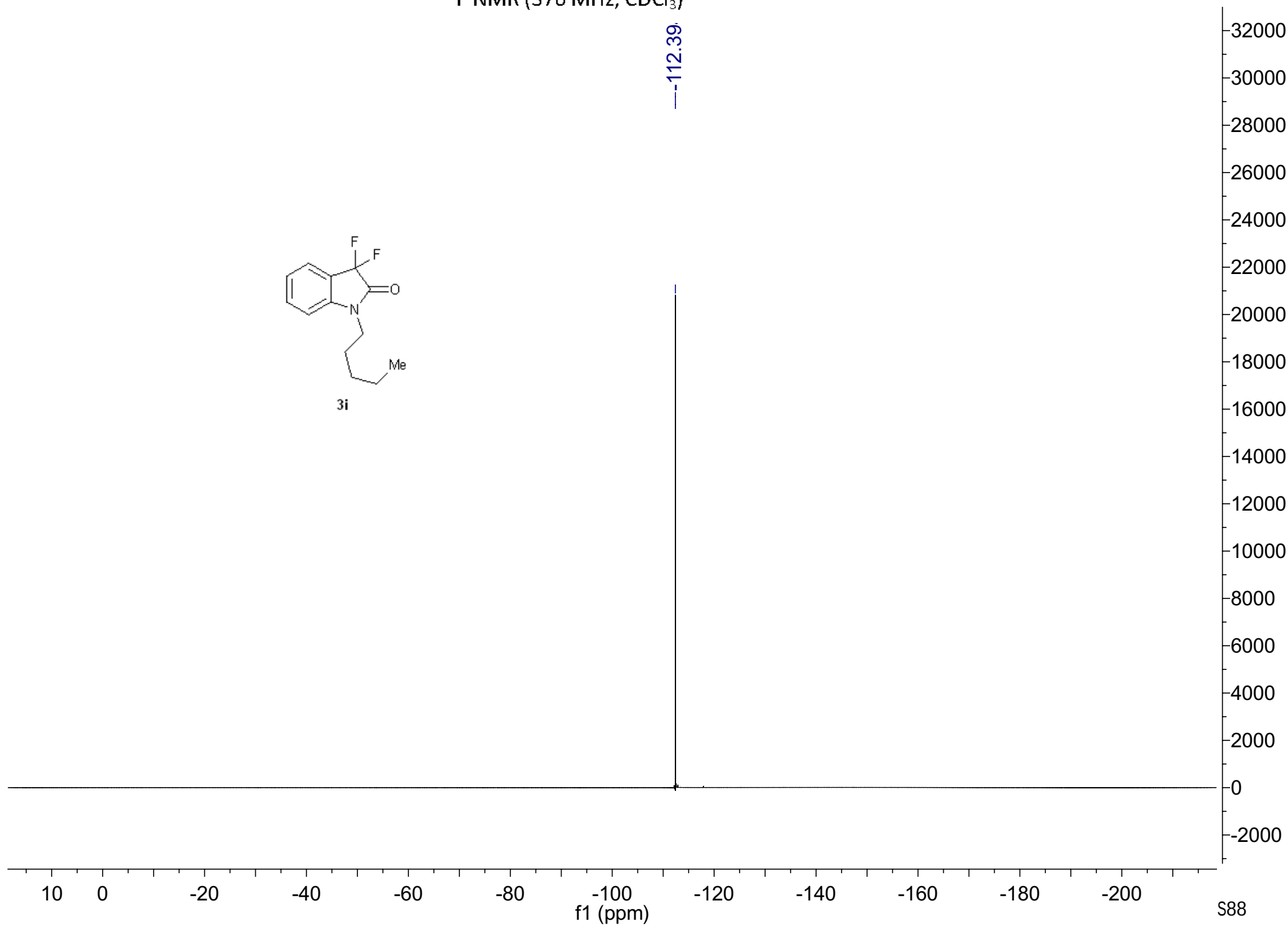
<sup>13</sup>C NMR (100 MHz, CDCl<sub>3</sub>)



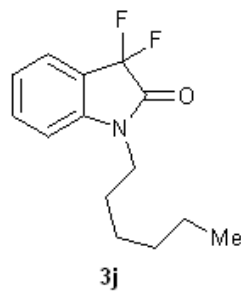
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



— -112.39



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



7.555  
7.537  
7.502  
7.482  
7.463  
7.260  
7.178  
7.159  
7.140  
6.907  
6.887

3.696  
3.677  
3.659

1.680  
1.377  
1.355  
1.329  
1.313  
1.295  
0.897  
0.879  
0.862

1.02  
1.00  
1.02  
1.00

2.06

2.07  
6.34

3.17

11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0

f1 (ppm)

S89

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

165.54  
165.24  
164.94

143.54  
143.47  
143.40

133.55  
124.74

120.01

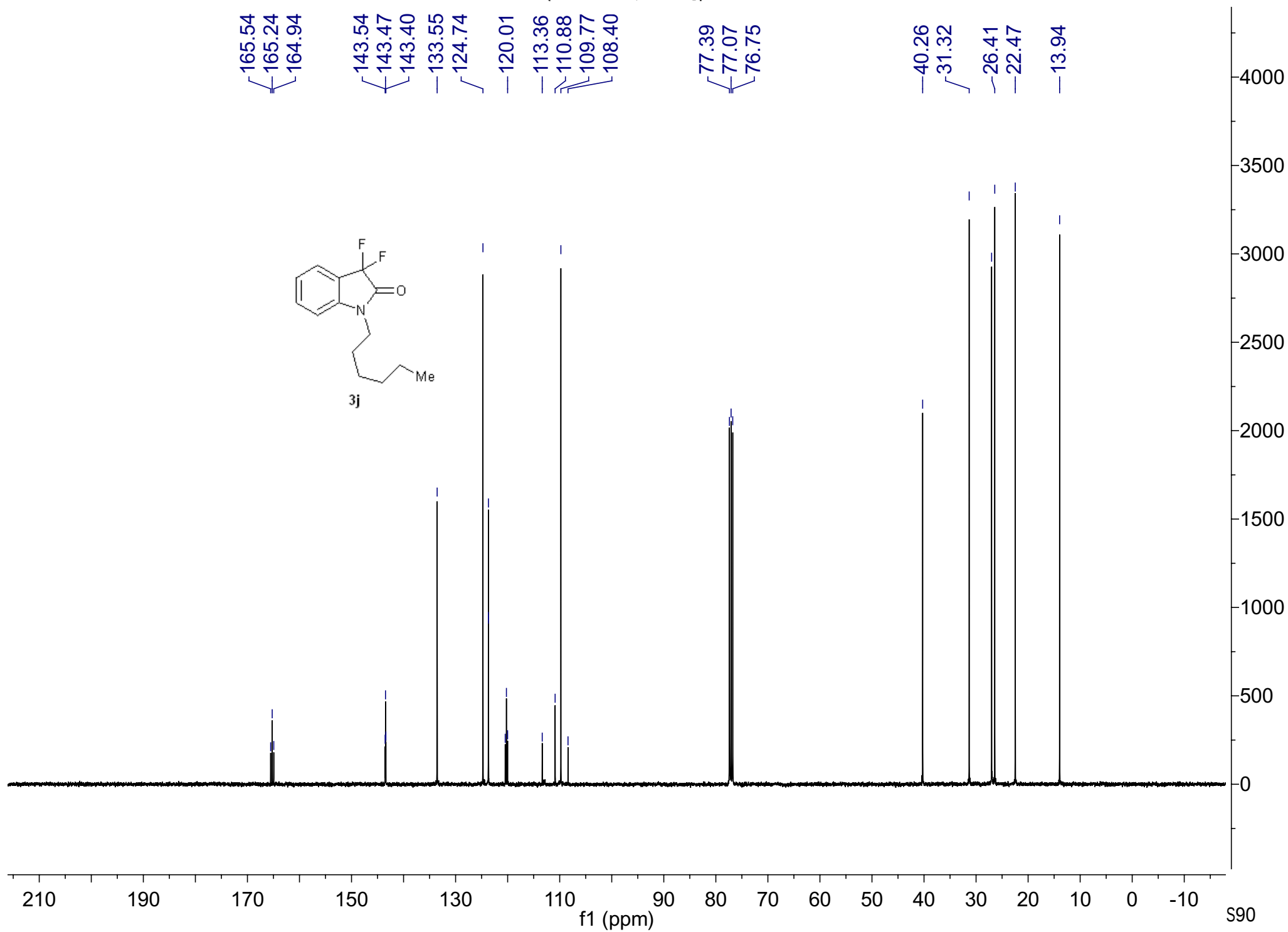
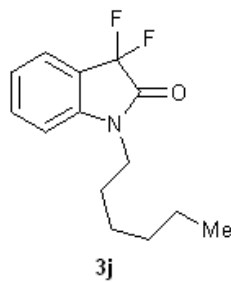
113.36  
110.88  
109.77  
108.40

77.39  
77.07  
76.75

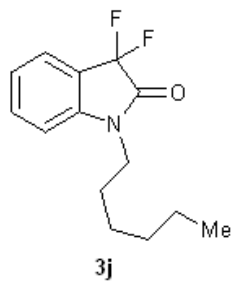
40.26  
31.32

26.41  
22.47

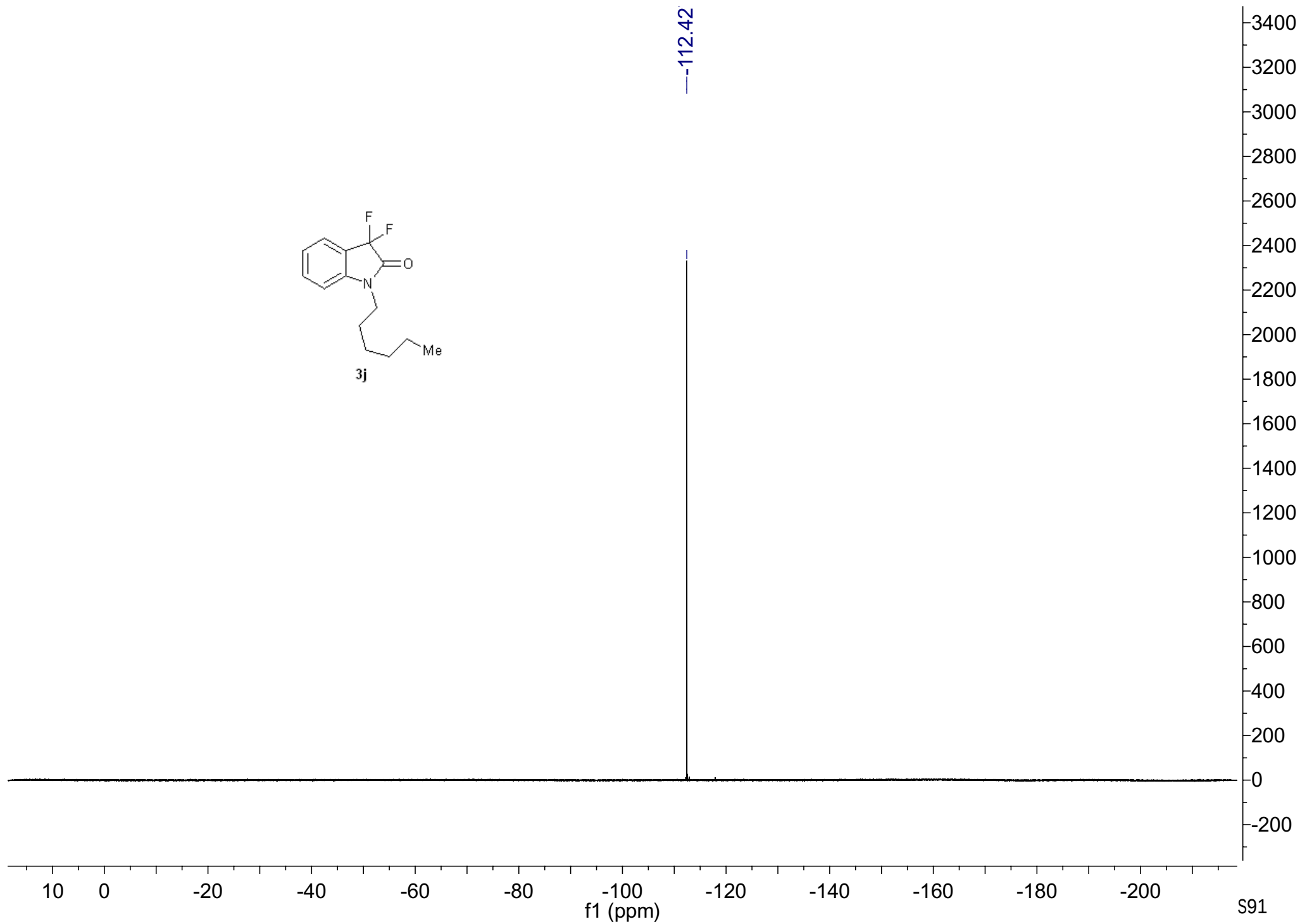
13.94



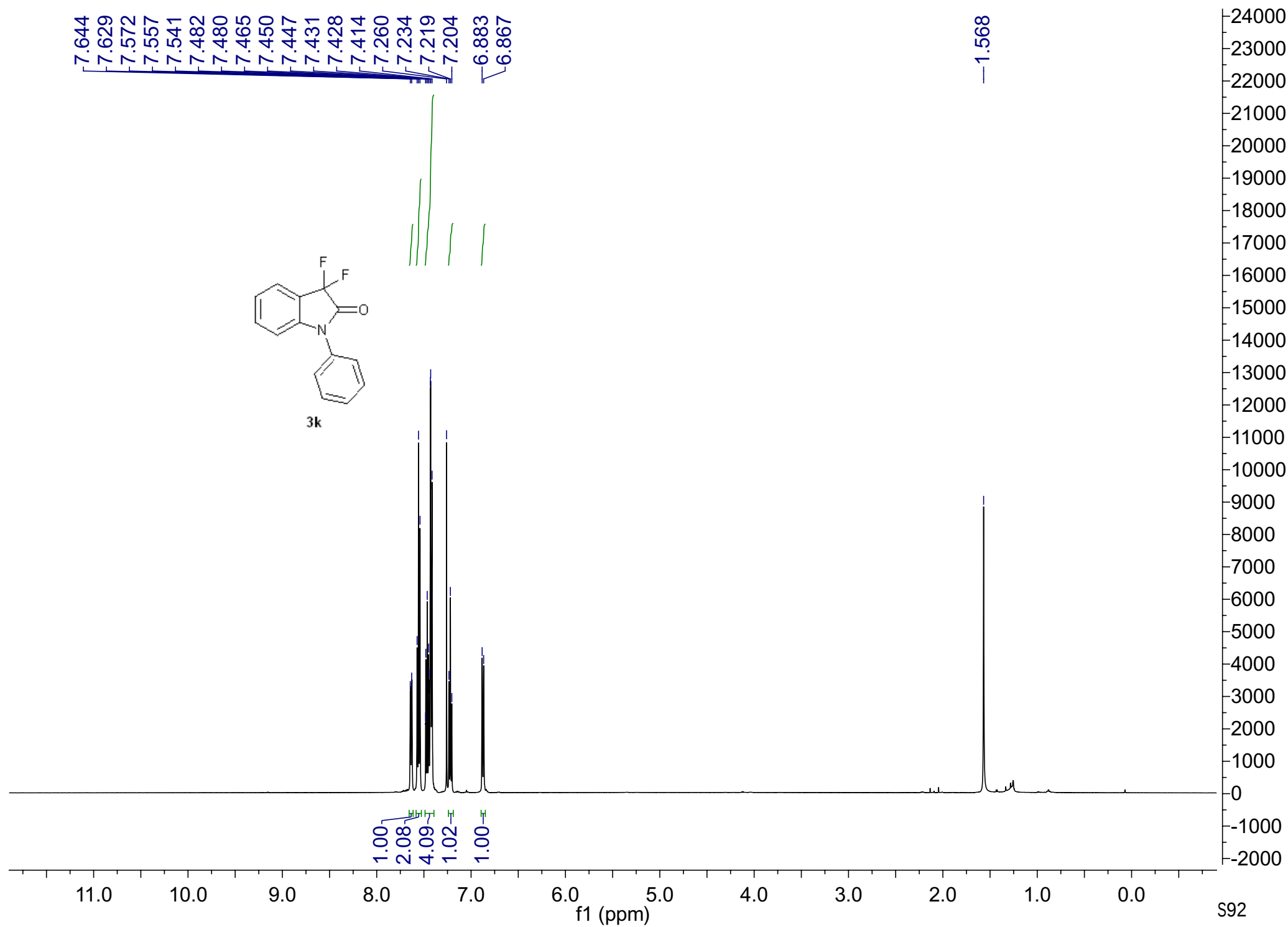
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



-112.42



<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>)



<sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>)

164.81  
164.56  
164.32

144.25  
144.20  
144.14

132.65

128.96

125.00

120.10

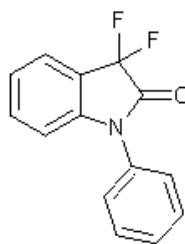
119.73

112.76

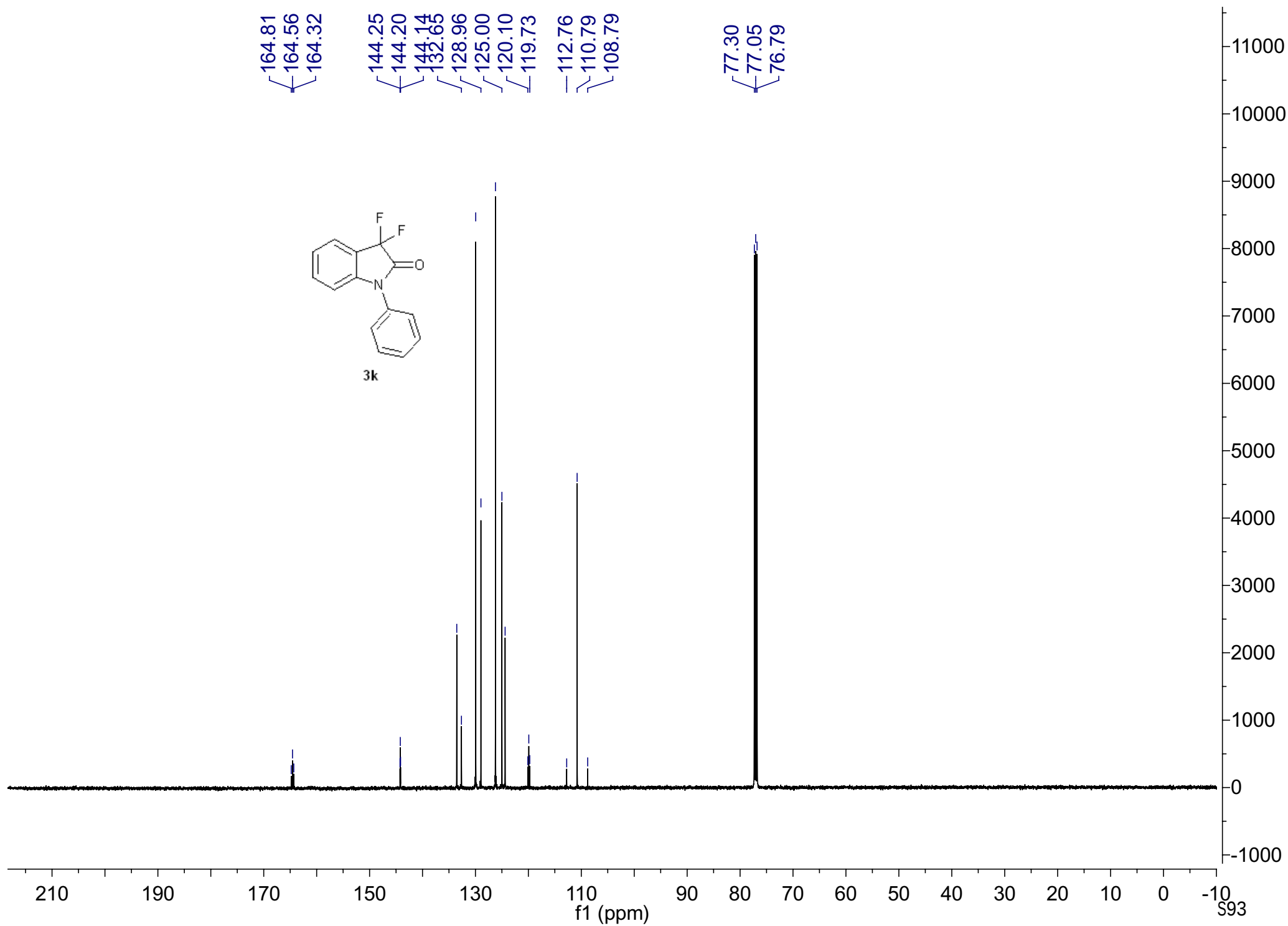
110.79

108.79

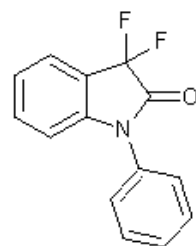
77.30  
77.05  
76.79



3k

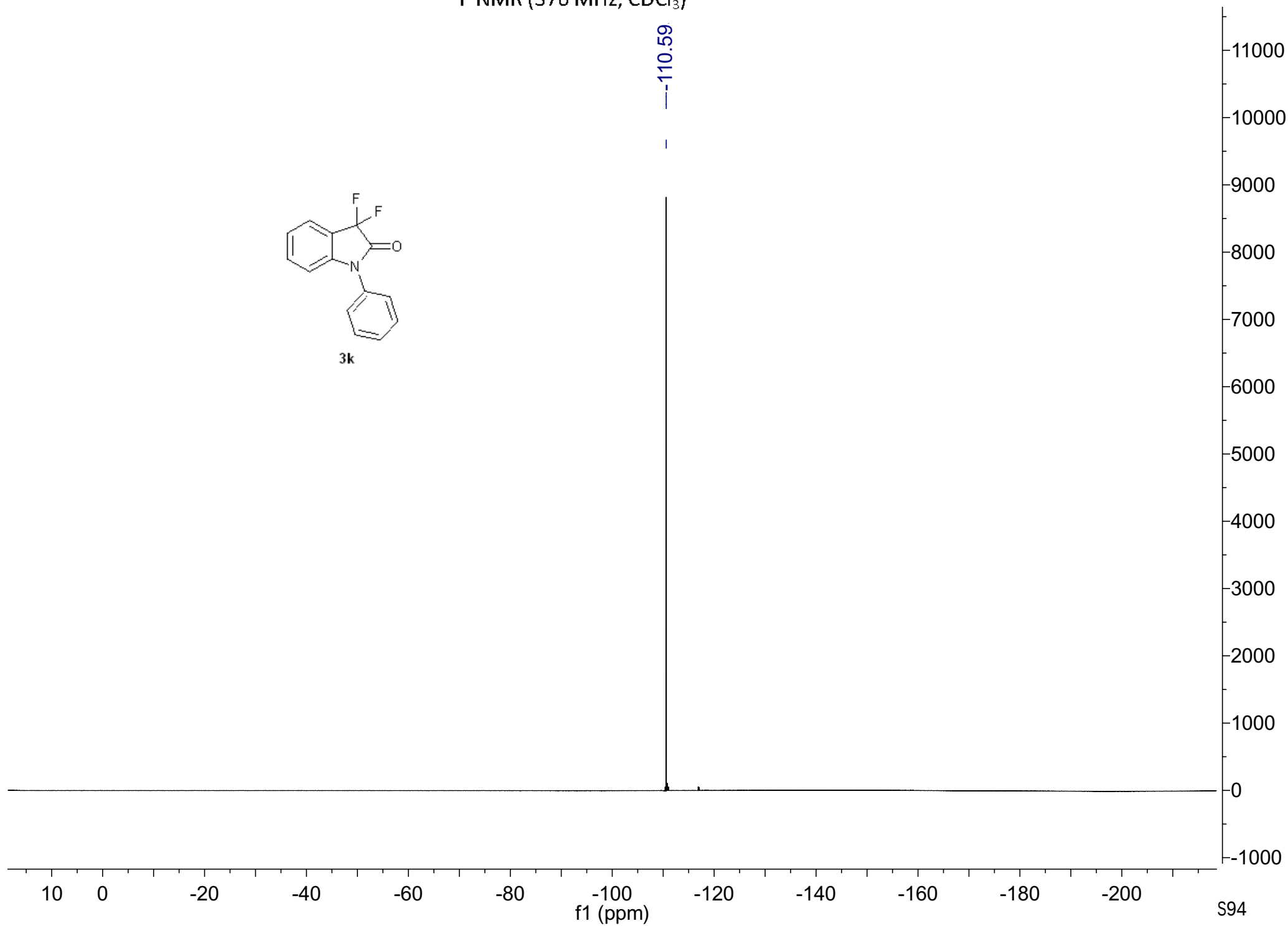


<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



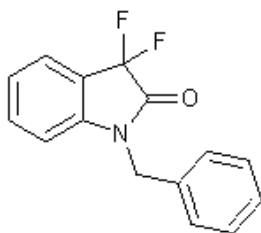
3k

-110.59



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

7.568  
7.550  
7.392  
7.372  
7.350  
7.332  
7.309  
7.291  
7.281  
7.260  
7.157  
7.138  
7.119  
6.778  
6.759  
4.898  
1.547



3l

1.07  
6.08  
1.04  
1.00  
1.95

11.0

10.0

9.0

8.0

7.0

6.0

5.0

4.0

3.0

2.0

1.0

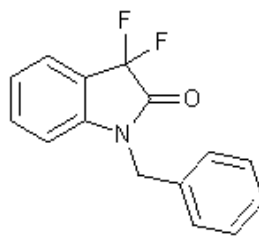
0.0

f1 (ppm)

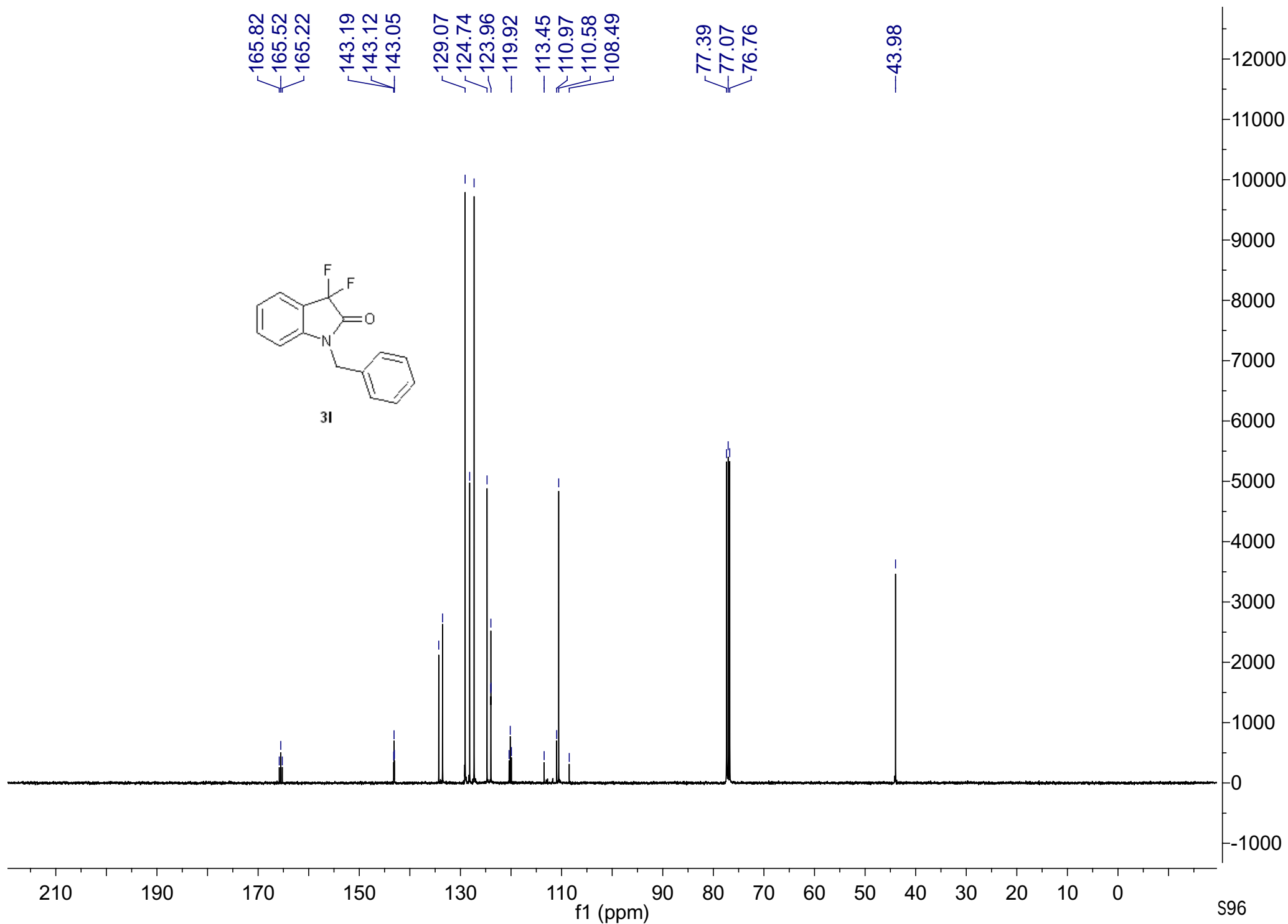
S95

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

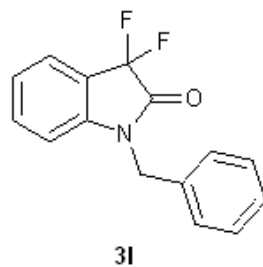
165.82  
165.52  
165.22  
143.19  
143.12  
143.05  
129.07  
124.74  
123.96  
119.92  
113.45  
110.97  
110.58  
108.49  
77.39  
77.07  
76.76  
43.98



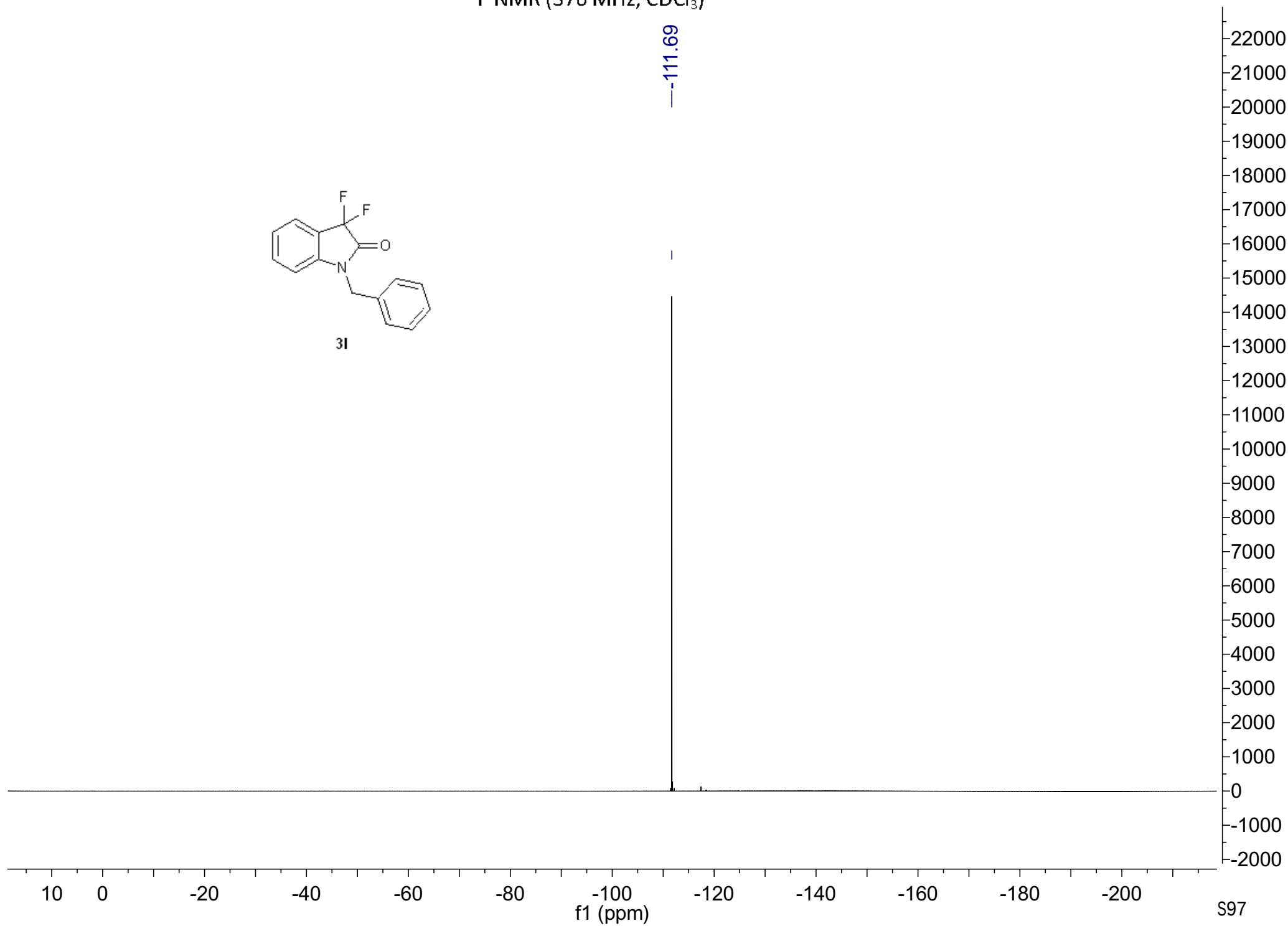
31



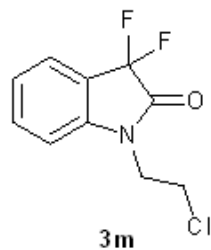
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



--111.69



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



7.579  
7.560  
7.530  
7.510  
7.491  
7.260  
7.216  
7.197  
7.178  
7.014  
6.994

4.061  
4.045  
4.029  
3.788  
3.773  
3.756

1.01

0.95

0.99

1.00

2.09

2.07

f1 (ppm)

S98

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

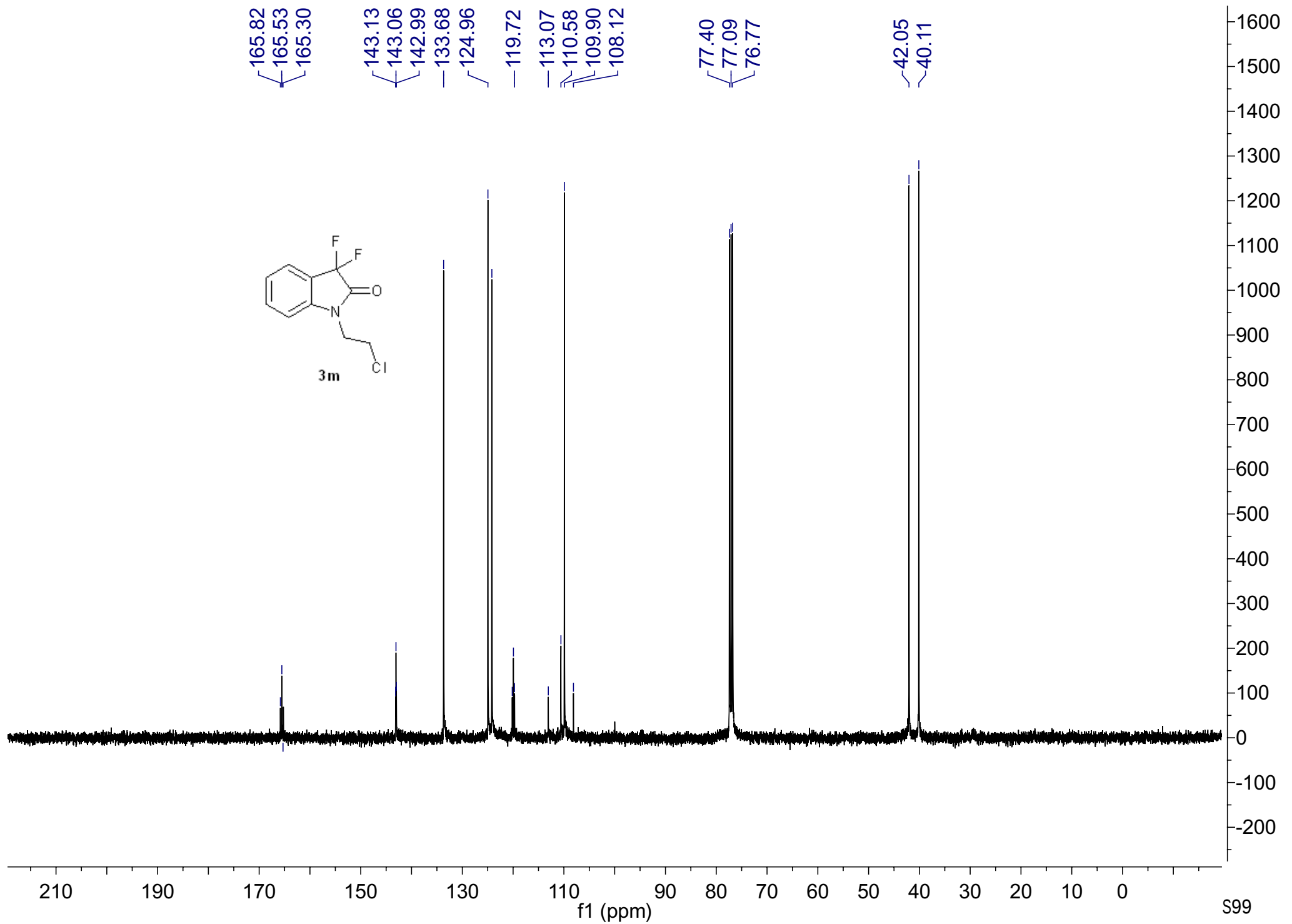
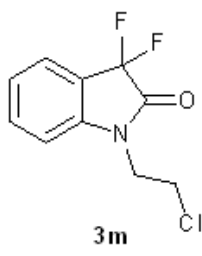
165.82  
165.53  
165.30

143.13  
143.06  
142.99  
133.68  
124.96

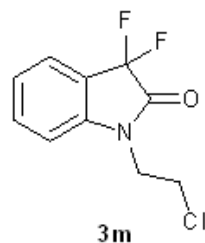
119.72  
113.07  
110.58  
109.90  
108.12

77.40  
77.09  
76.77

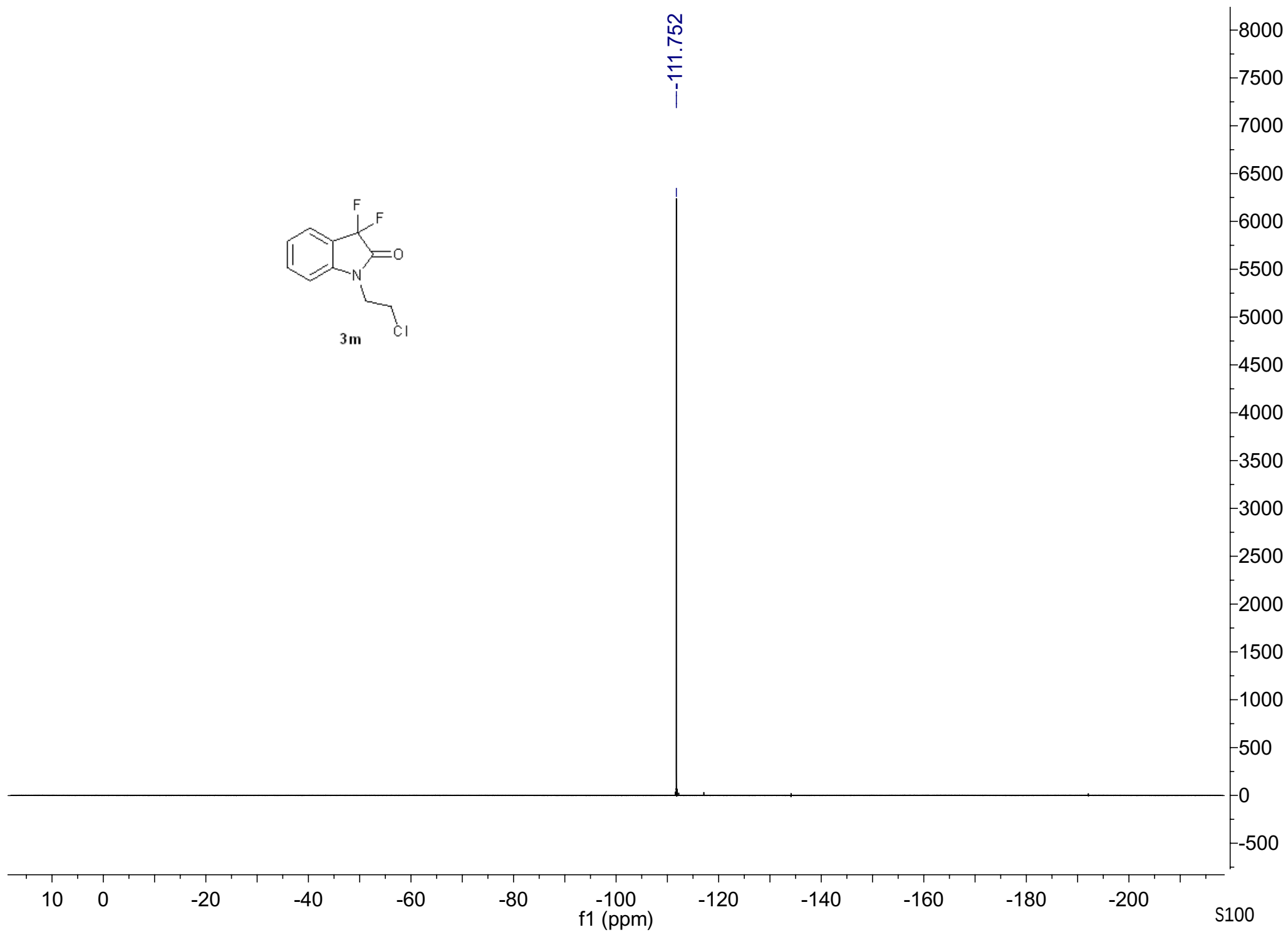
42.05  
40.11



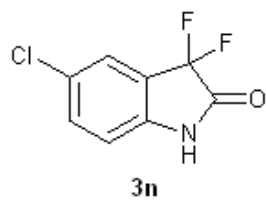
<sup>19</sup>F NMR (376 MHz, CDCl<sub>3</sub>)



--111.752



<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>)



11.349

7.832

7.582

7.565

7.016

6.999

3.365

2.506

0.97

0.94

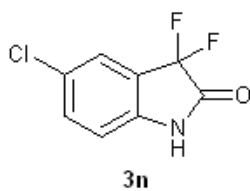
0.97

1.00

f1 (ppm)

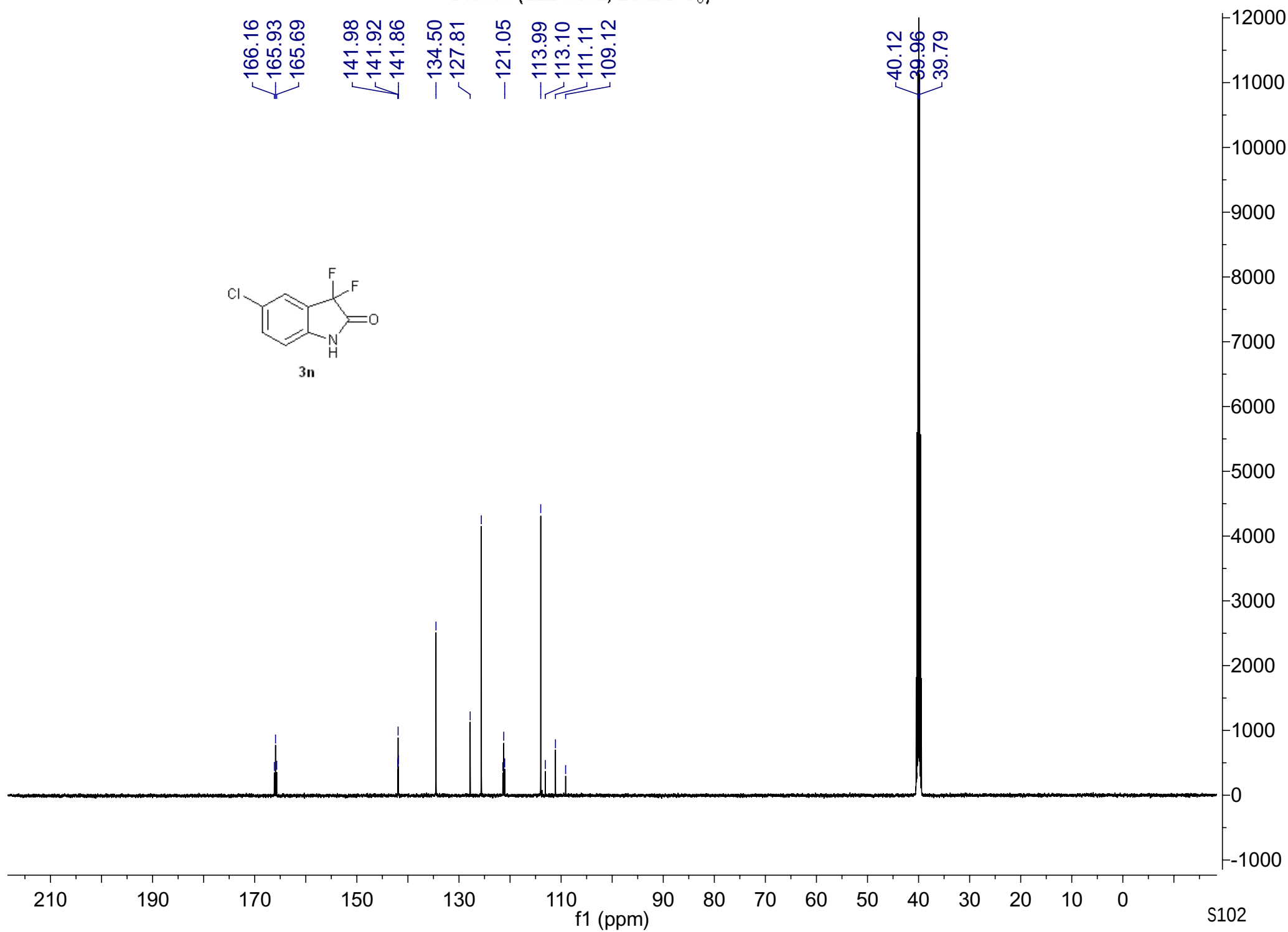
S101

<sup>13</sup>C NMR (125 MHz, DMSO-d<sub>6</sub>)

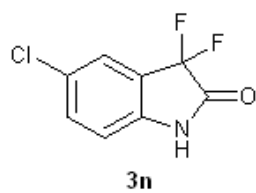


166.16  
165.93  
165.69  
141.98  
141.92  
141.86  
134.50  
127.81  
121.05  
113.99  
113.10  
111.11  
109.12

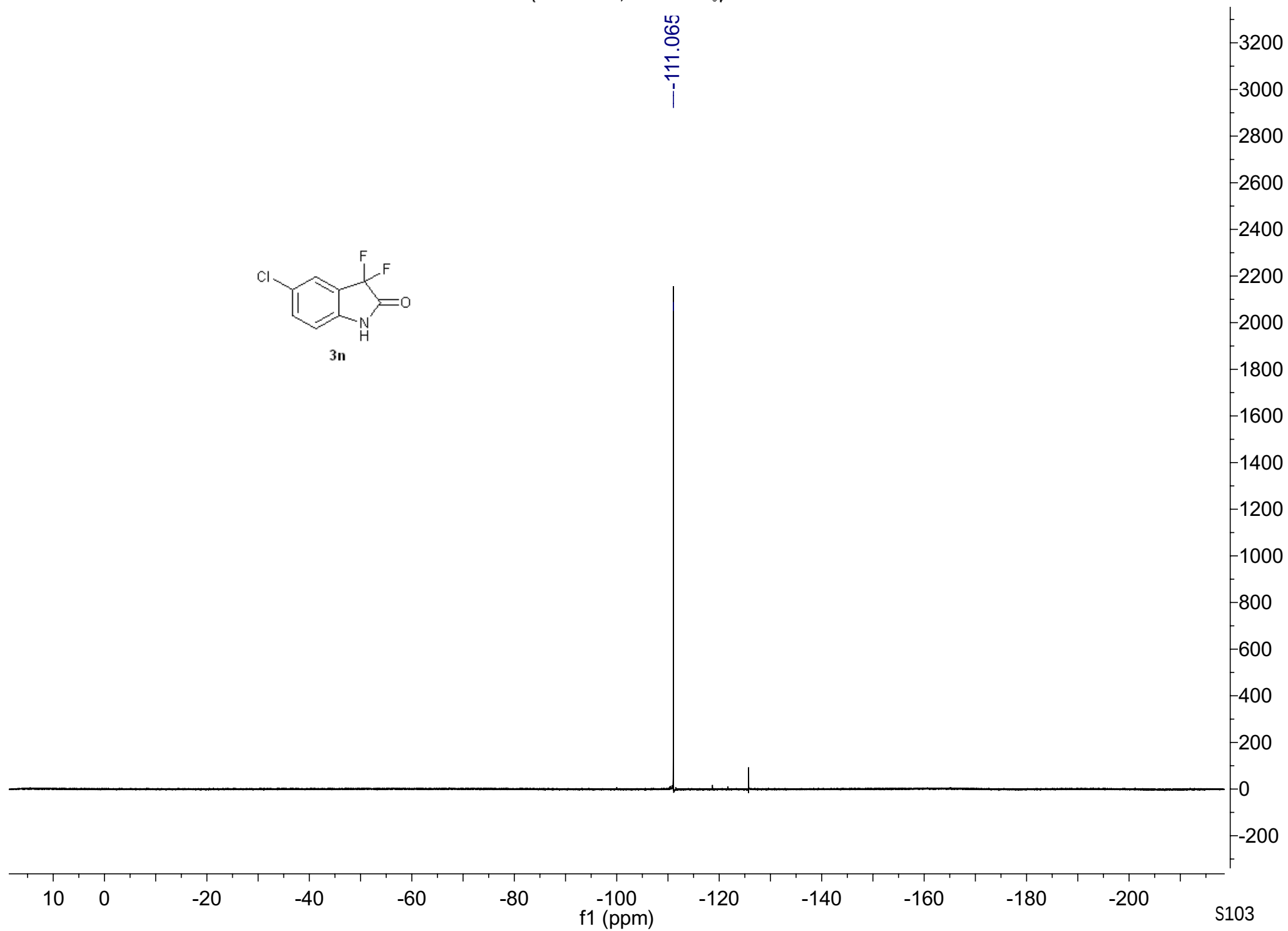
40.12  
39.96  
39.79



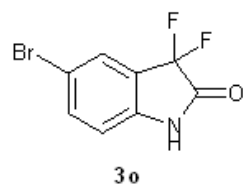
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



--111.065



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.363

7.957

7.726

7.705

6.971

6.950

3.351

2.512

2.507

2.503

1.00

0.96

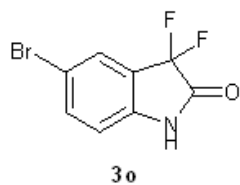
0.98

1.00

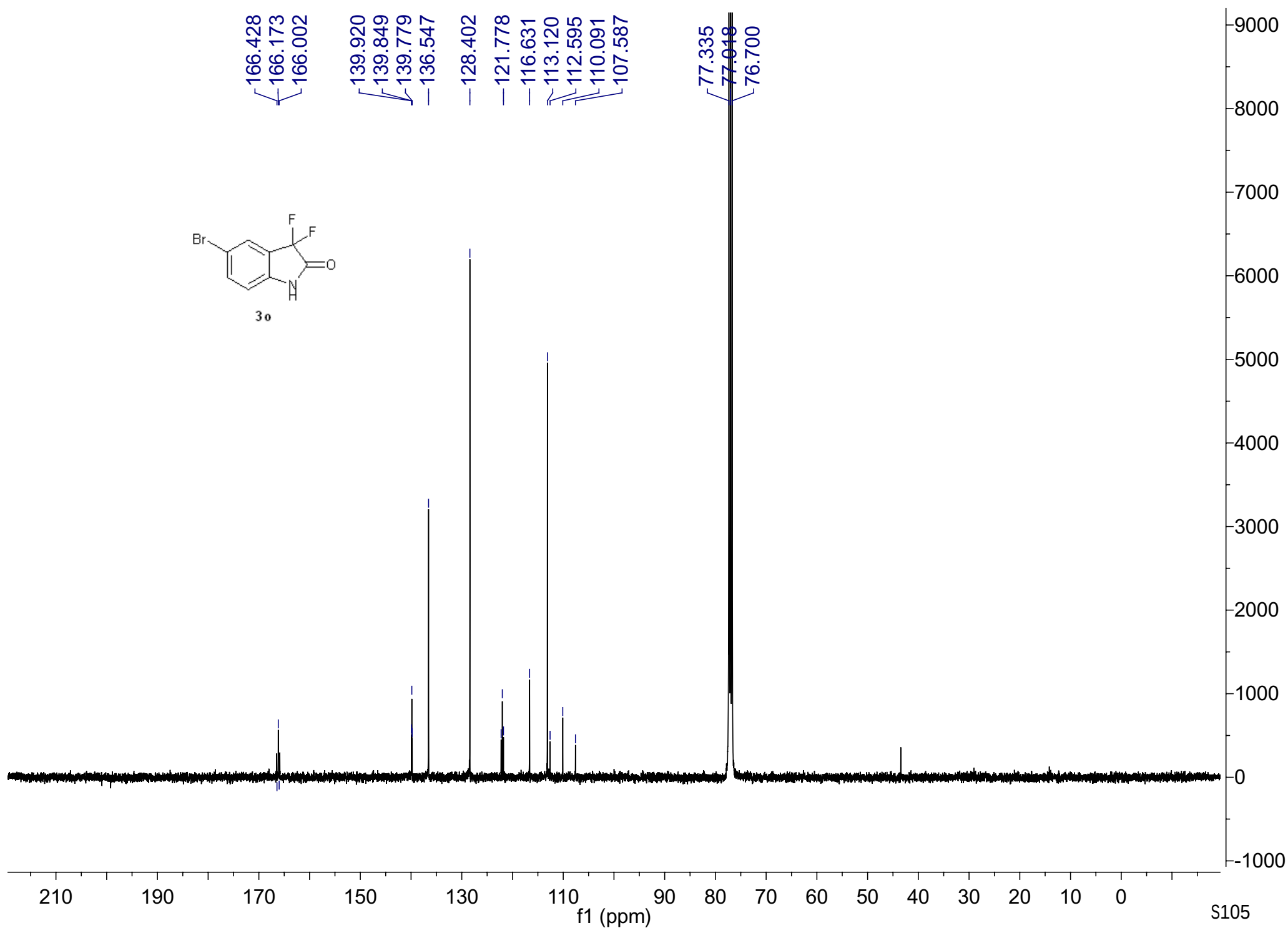
f1 (ppm)

S104

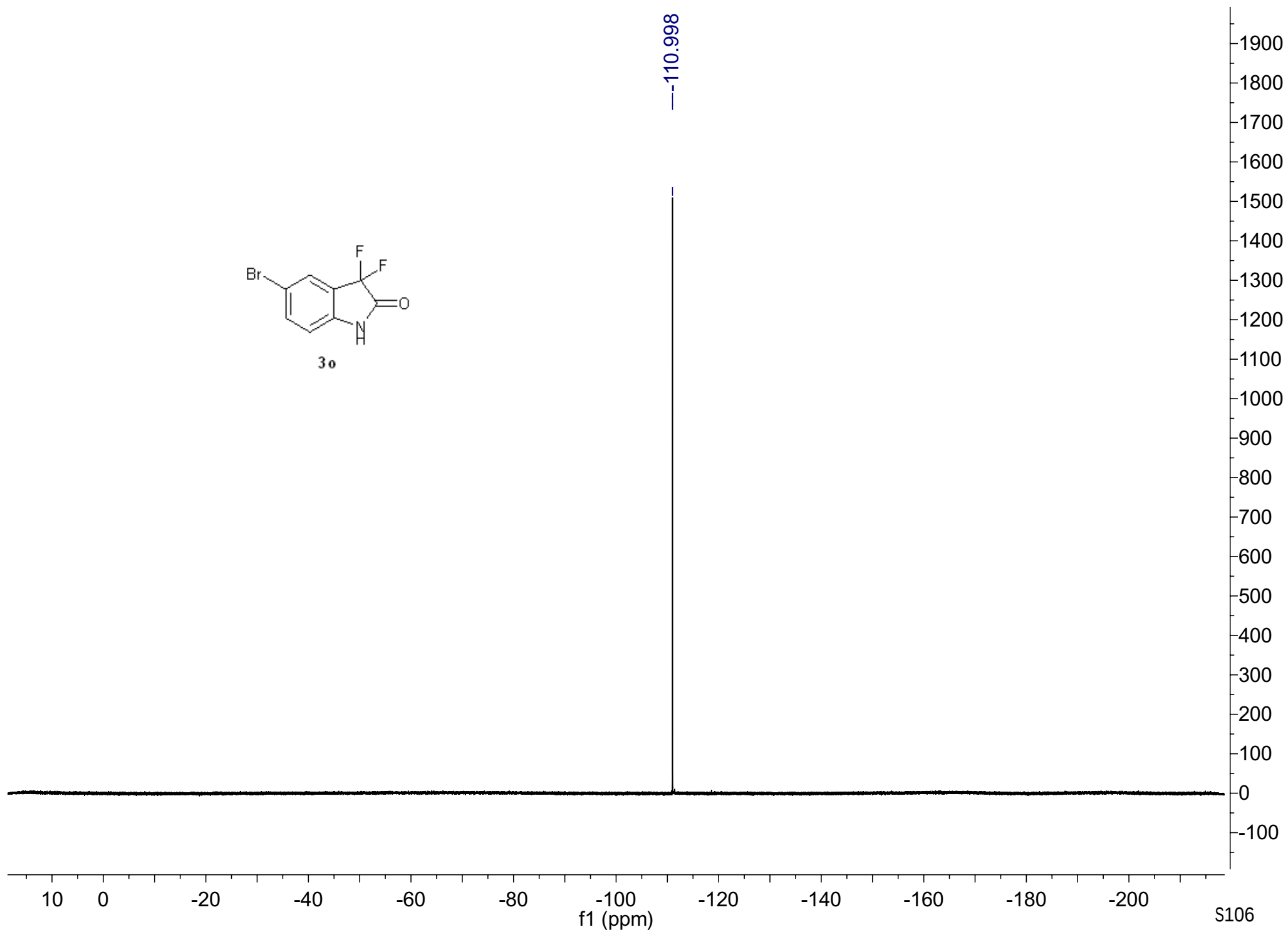
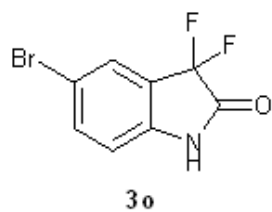
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



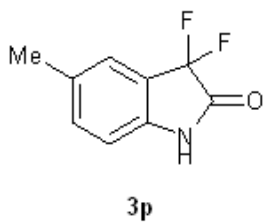
166.428  
166.173  
166.002  
139.920  
139.849  
139.779  
136.547  
128.402  
121.778  
116.631  
113.120  
112.595  
110.091  
107.587  
77.335  
77.048  
76.700



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



—11.100

7.480

7.341

7.321

6.901

6.881

—3.346

2.512

2.508

2.503

2.299

—1.237

0.99

1.01

1.00

1.00

3.00

13

12

11

10

9

8

f1 (ppm)

6

5

4

3

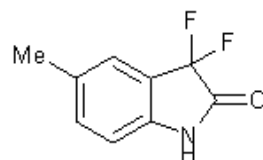
2

1

0

S107

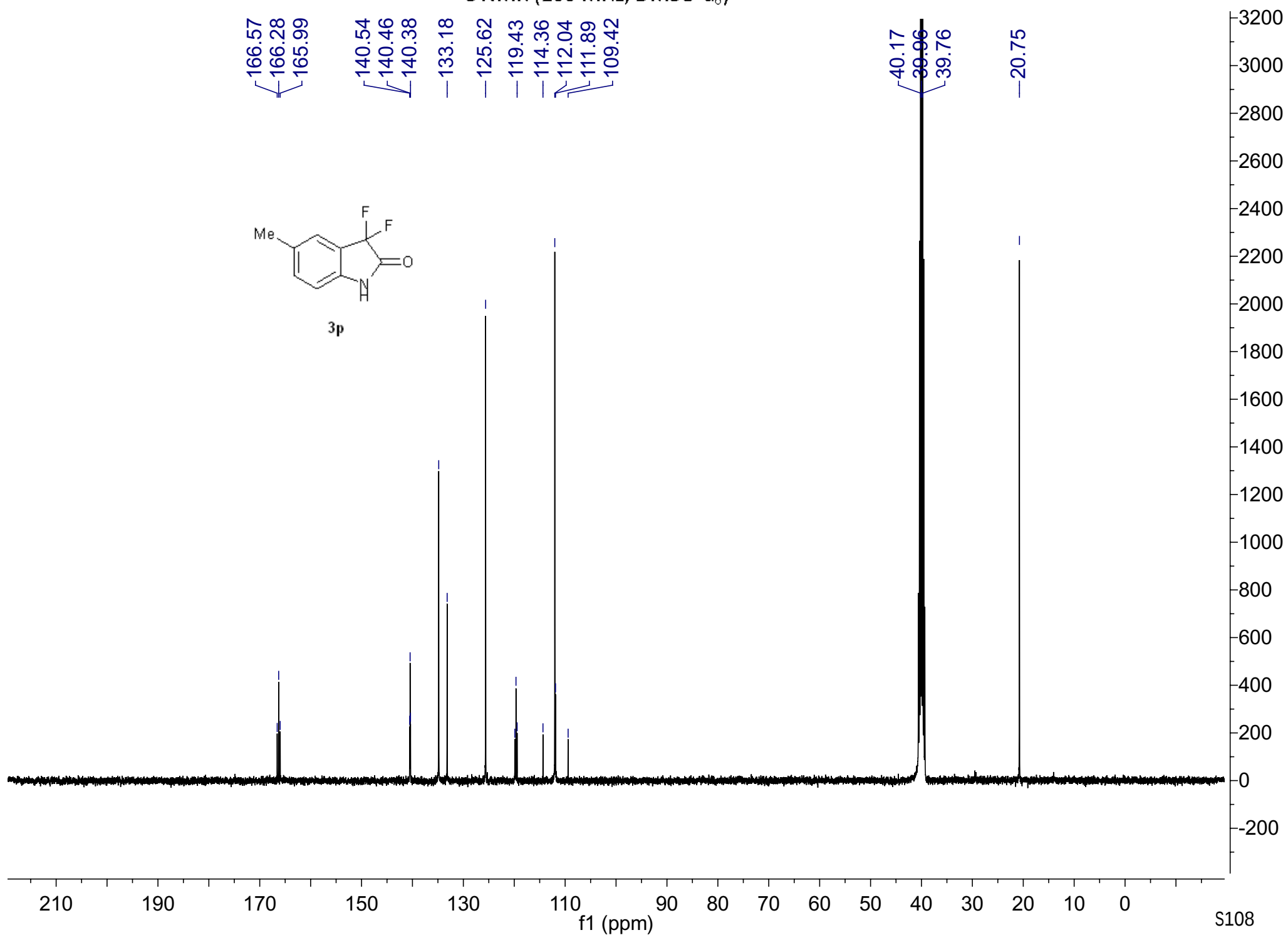
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



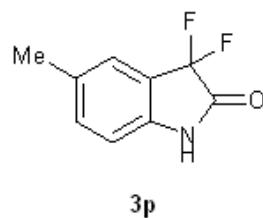
3p

166.57  
166.28  
165.99  
140.54  
140.46  
140.38  
133.18  
125.62  
119.43  
114.36  
112.04  
111.89  
109.42

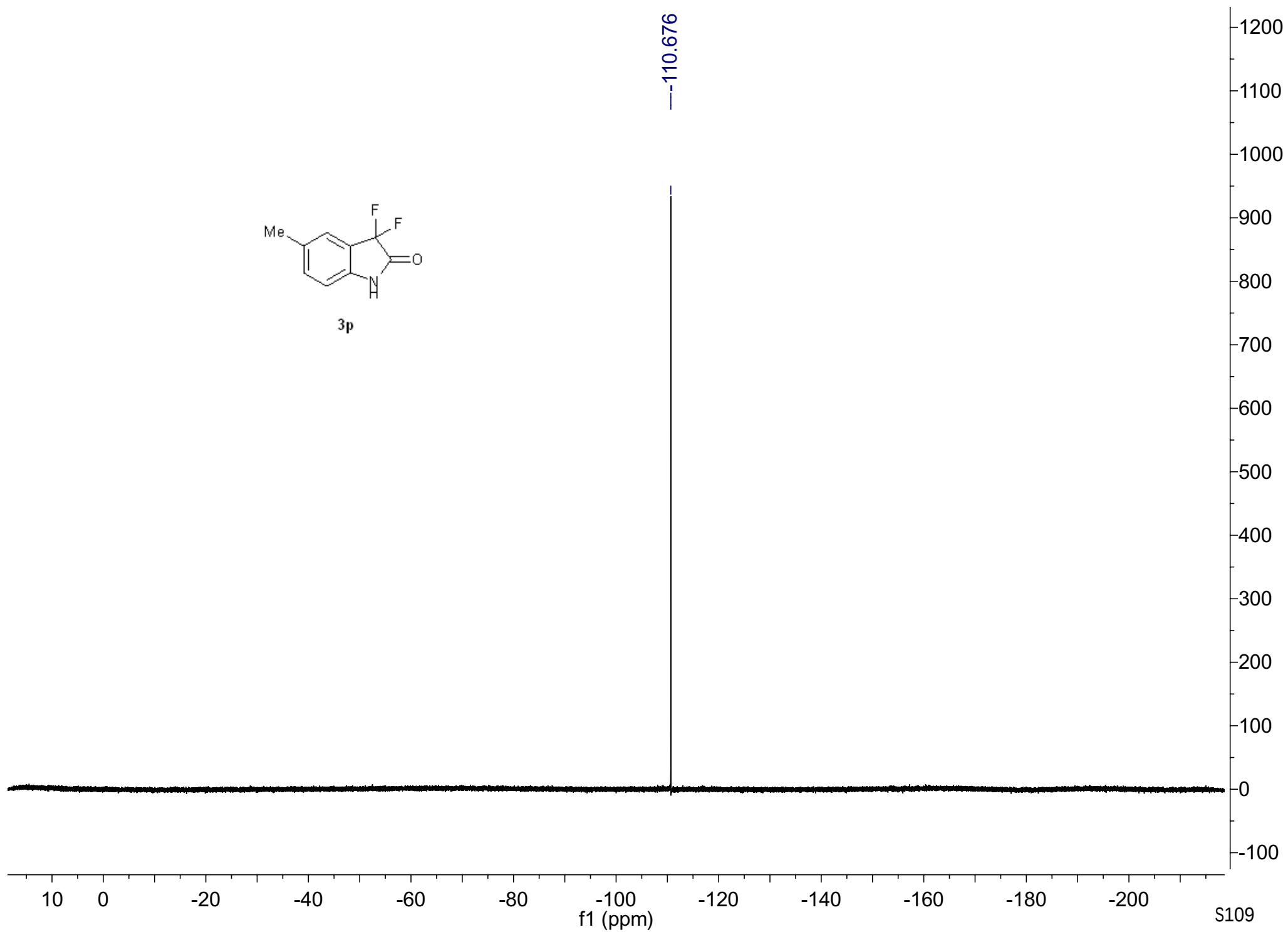
40.17  
39.96  
39.76  
20.75



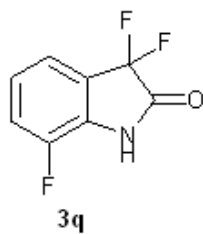
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



-110.676



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



—11.817

7.545  
7.527  
7.524  
7.494  
7.468  
7.227  
7.216  
7.208  
7.197  
7.187  
7.176

—3.349

2.512  
2.508  
2.503

0.95

1.99

1.00

13

12

11

10

9

8

7

6

5

4

3

2

1

0

f1 (ppm)

S110

<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)

166.29  
166.00  
165.71

148.56  
146.13

130.37  
130.23

121.31

113.50  
113.44

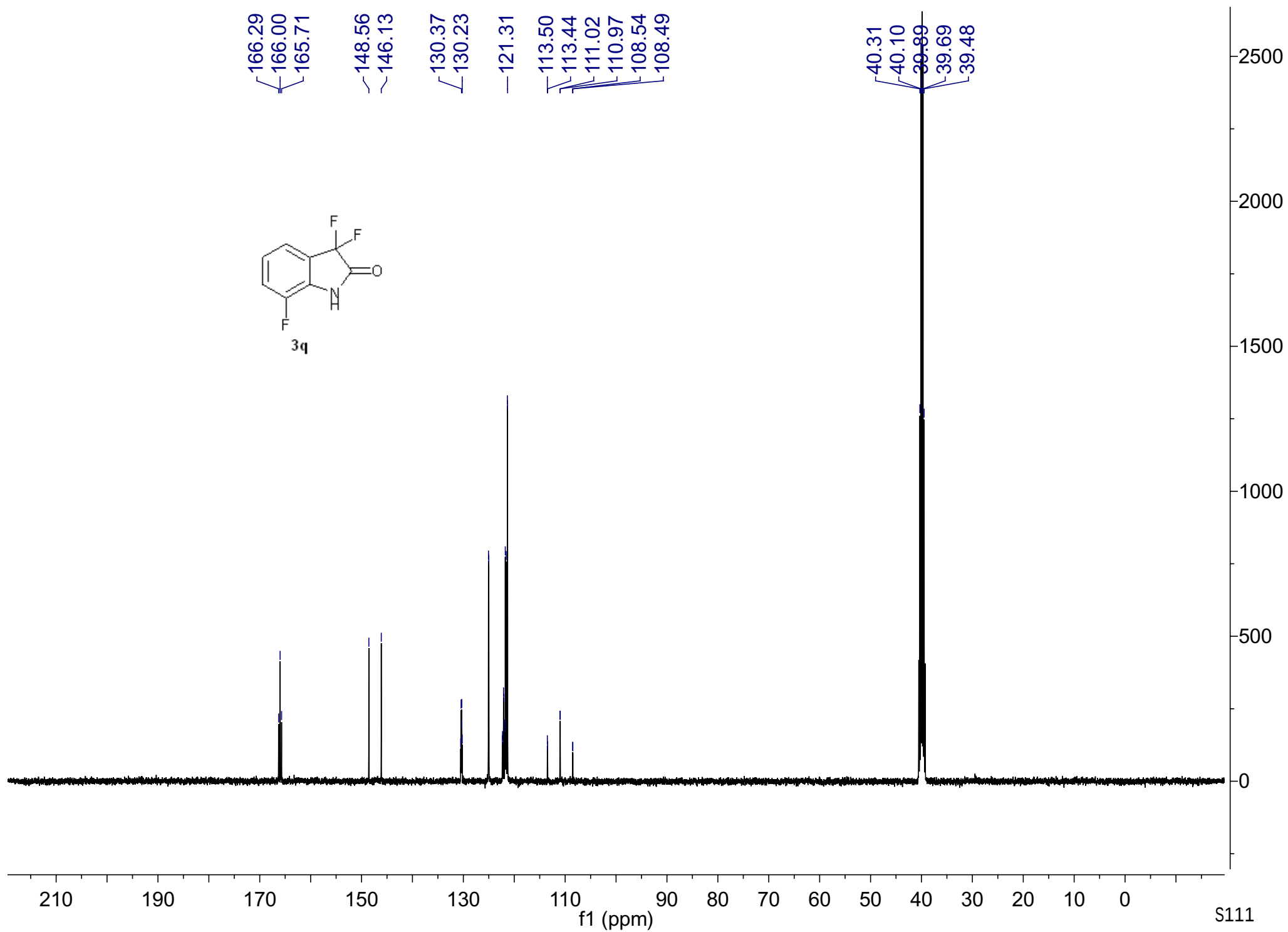
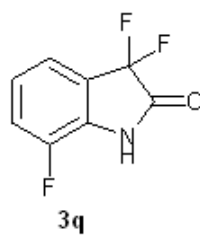
111.02

110.97

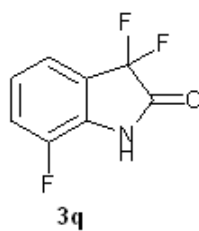
108.54

108.49

40.31  
40.10  
39.89  
39.69  
39.48

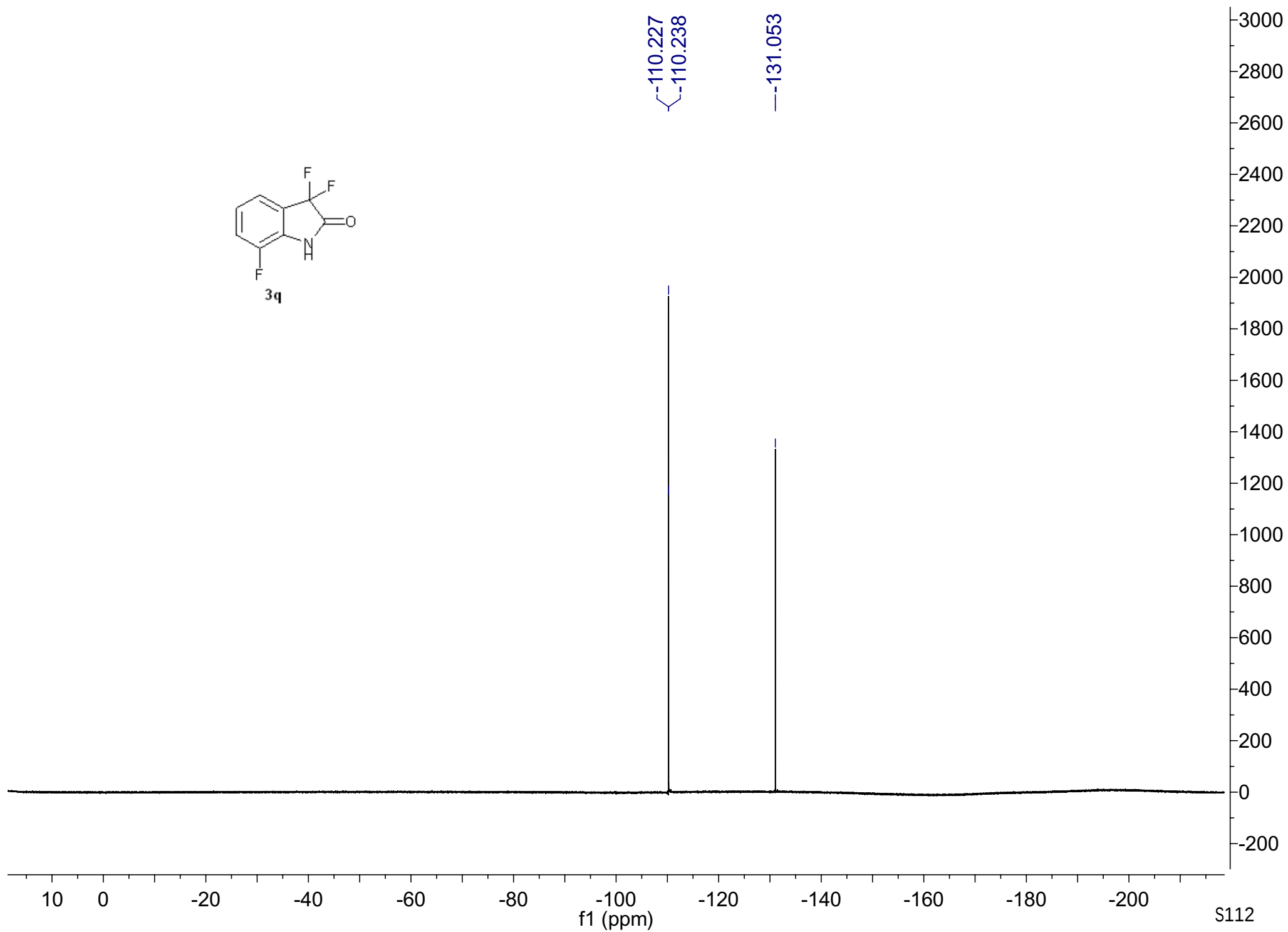


<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)

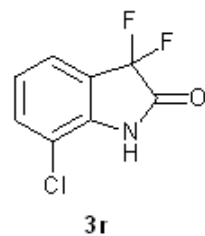


-110.227  
-110.238

-131.053



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



—11.725

7.675

7.656

7.644

7.624

7.219

7.200

7.180

—3.350

2.512

2.508

2.503

1.06

1.92

1.00

13

12

11

10

9

8

f1 (ppm)

6

5

4

3

2

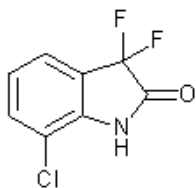
1

0

S113

17000  
16000  
15000  
14000  
13000  
12000  
11000  
10000  
9000  
8000  
7000  
6000  
5000  
4000  
3000  
2000  
1000  
0  
-1000

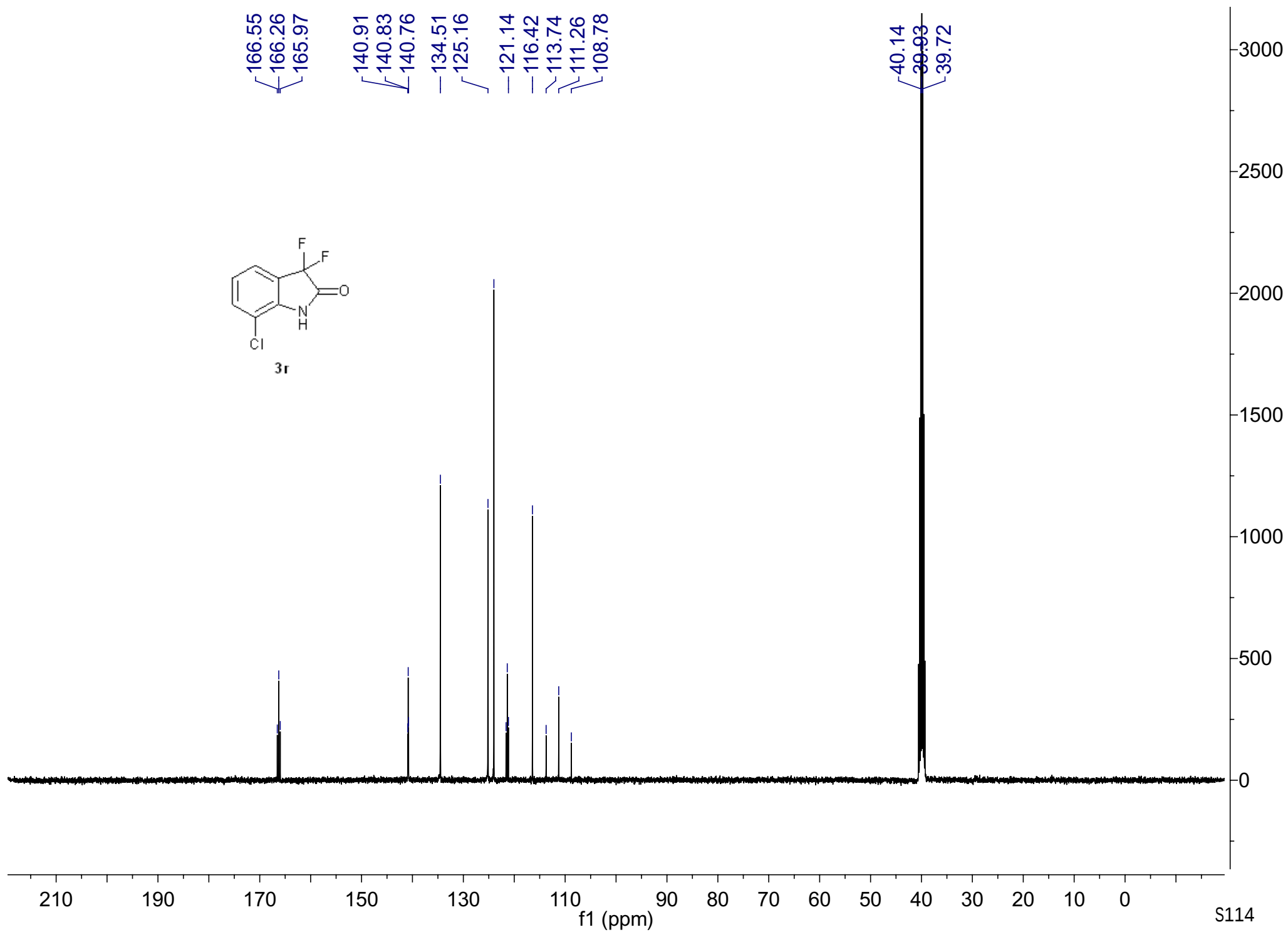
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



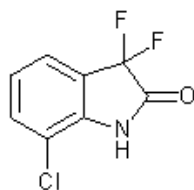
**3r**

166.55  
166.26  
165.97  
140.91  
140.83  
140.76  
134.51  
125.16  
121.14  
116.42  
113.74  
111.26  
108.78

40.14  
39.93  
39.72

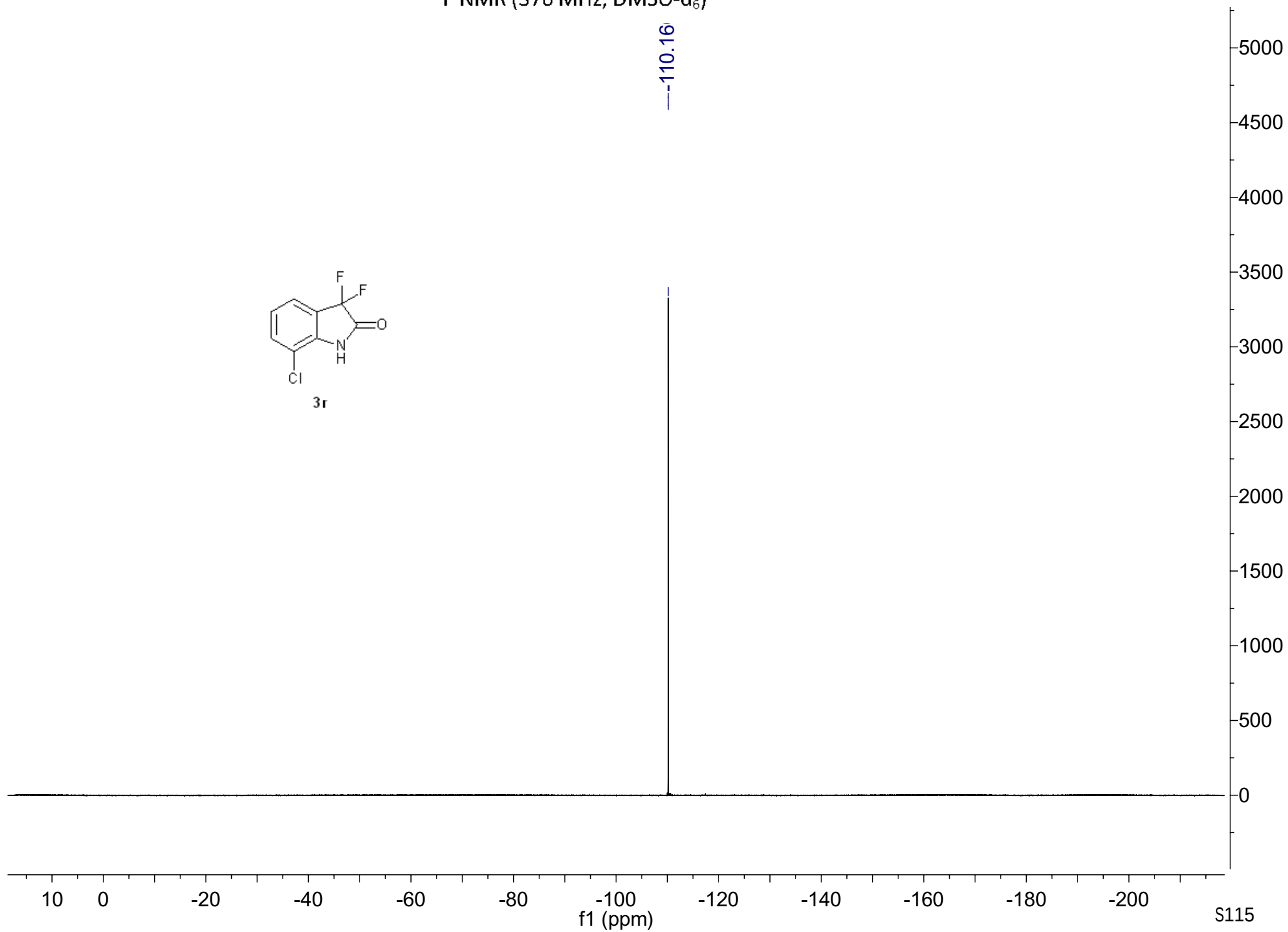


<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)

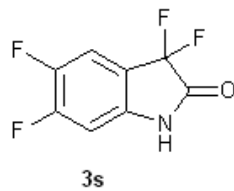


**3r**

--110.16



<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>)



11.391

8.045

8.028

8.011

7.126

7.113

7.107

7.093

3.339

2.506

1.02

1.00

1.06

13

12

11

10

9

8

7

6

5

4

3

2

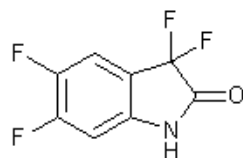
1

0

f1 (ppm)

S116

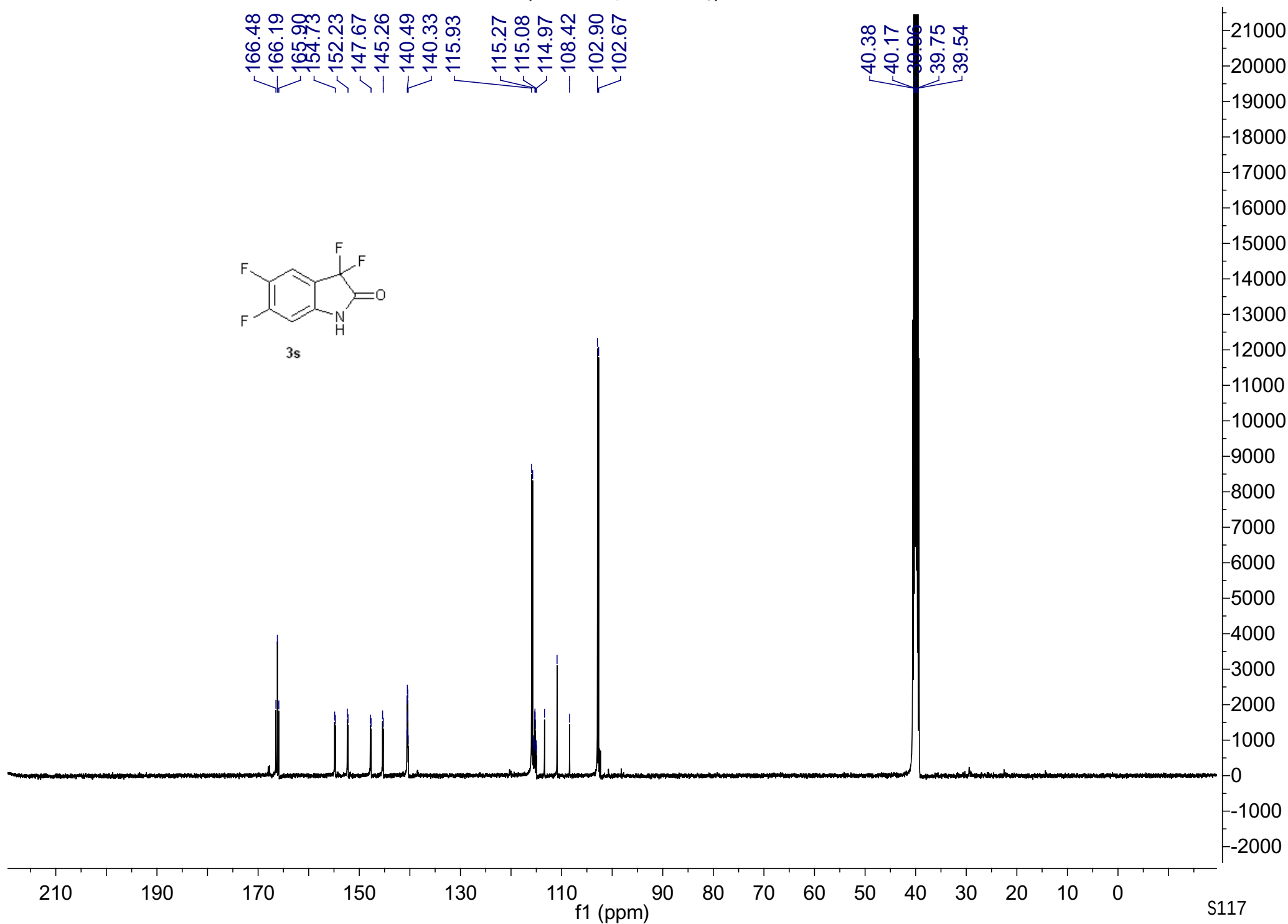
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)



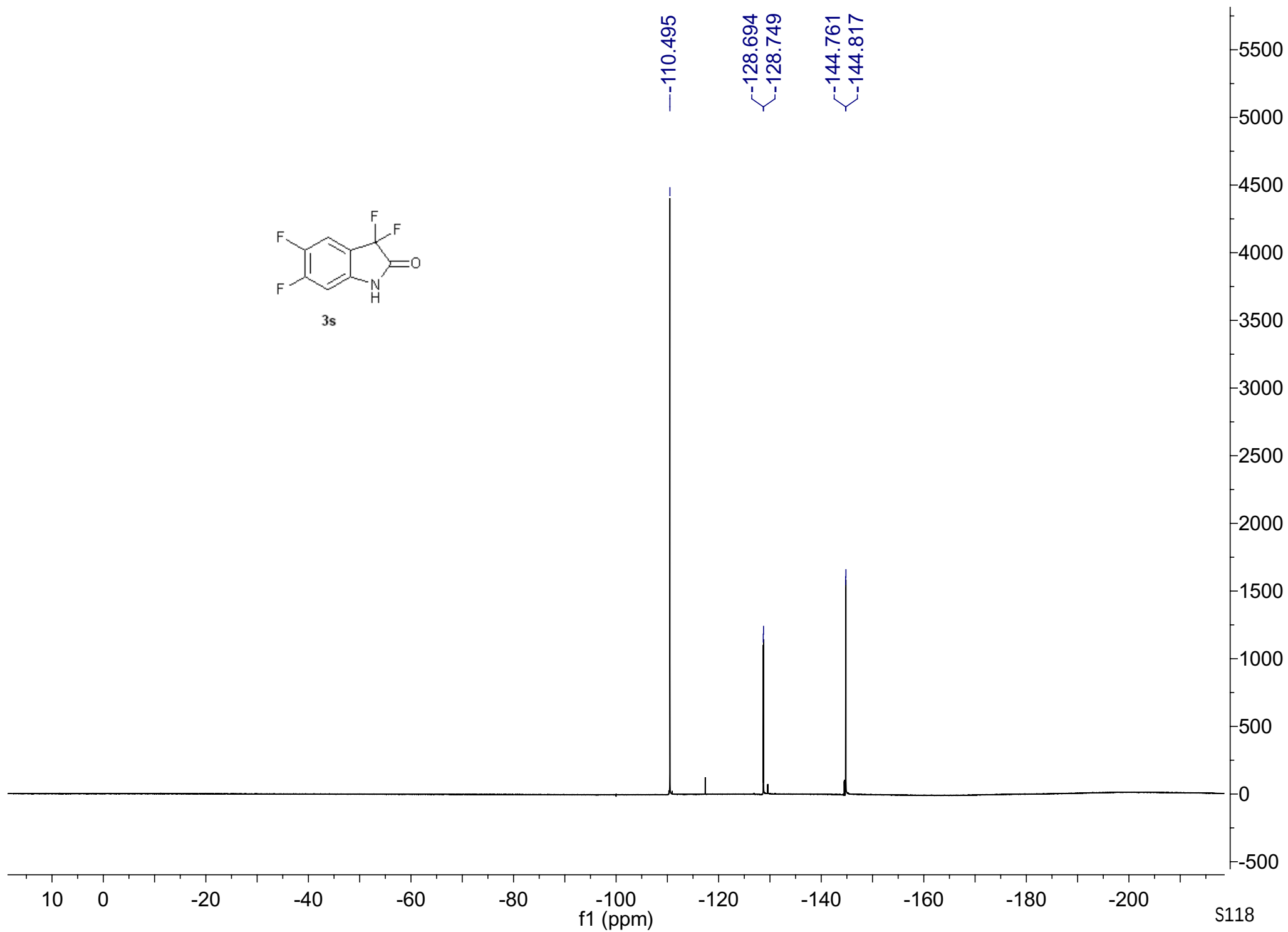
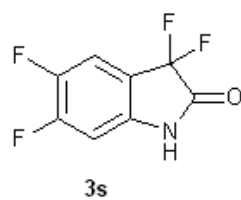
3s

166.48  
166.19  
165.90  
154.73  
152.23  
147.67  
145.26  
140.49  
140.33  
115.93  
115.27  
115.08  
114.97  
108.42  
102.90  
102.67

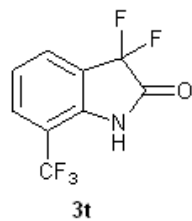
40.38  
40.17  
39.96  
39.75  
39.54



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.744  
1.02

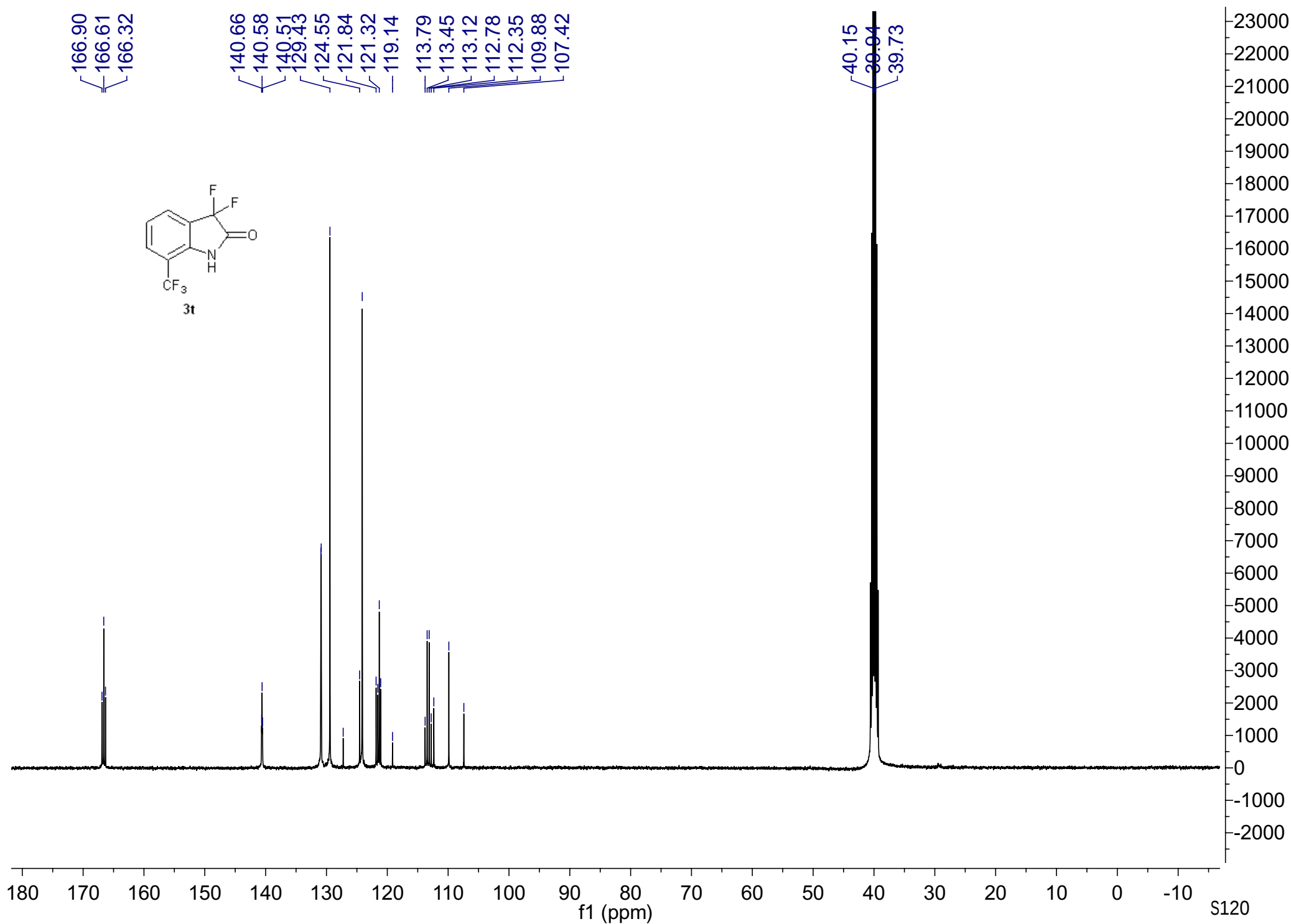
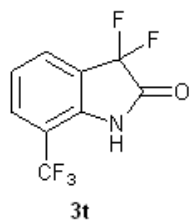
8.013  
7.994  
7.860  
7.840  
7.385  
7.365  
7.346  
1.00  
1.03  
1.03

3.347  
2.512  
2.508  
2.503

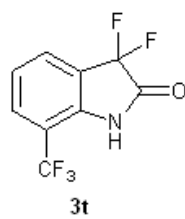
f1 (ppm)

S119

<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)

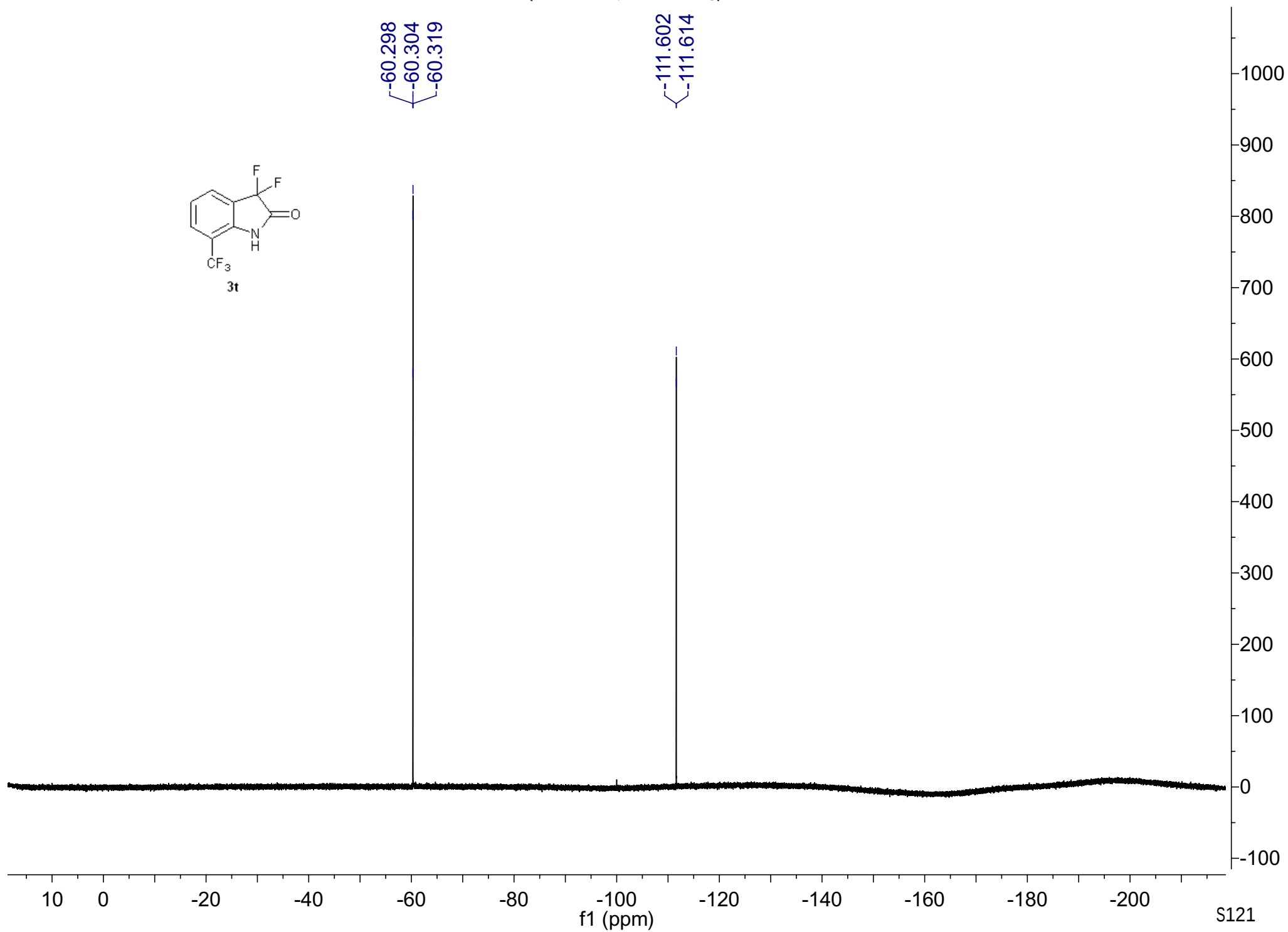


<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)

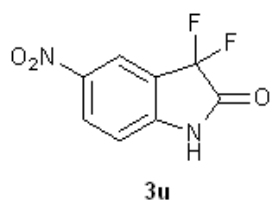


-60.298  
-60.304  
-60.319

-111.602  
-111.614



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.915

8.600  
8.453  
8.431

7.194  
7.160

3.349

2.512  
2.508  
2.503

1.07

0.93

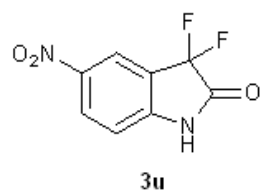
1.01

1.00

f1 (ppm)

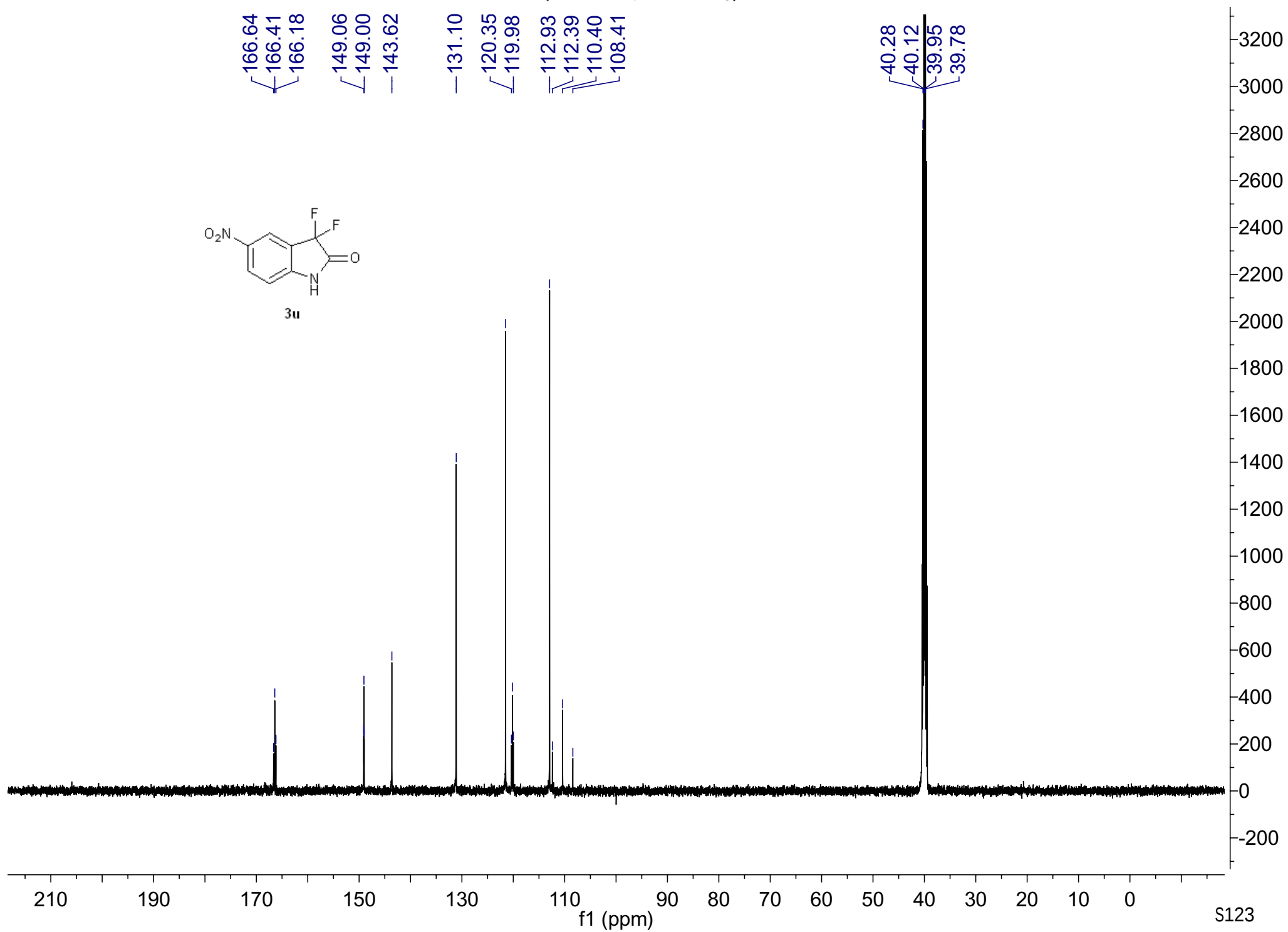
S122

<sup>13</sup>C NMR (125 MHz, DMSO-d<sub>6</sub>)

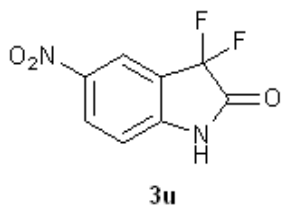


166.64  
166.41  
166.18  
149.06  
149.00  
143.62  
131.10  
120.35  
119.98  
112.93  
112.39  
110.40  
108.41

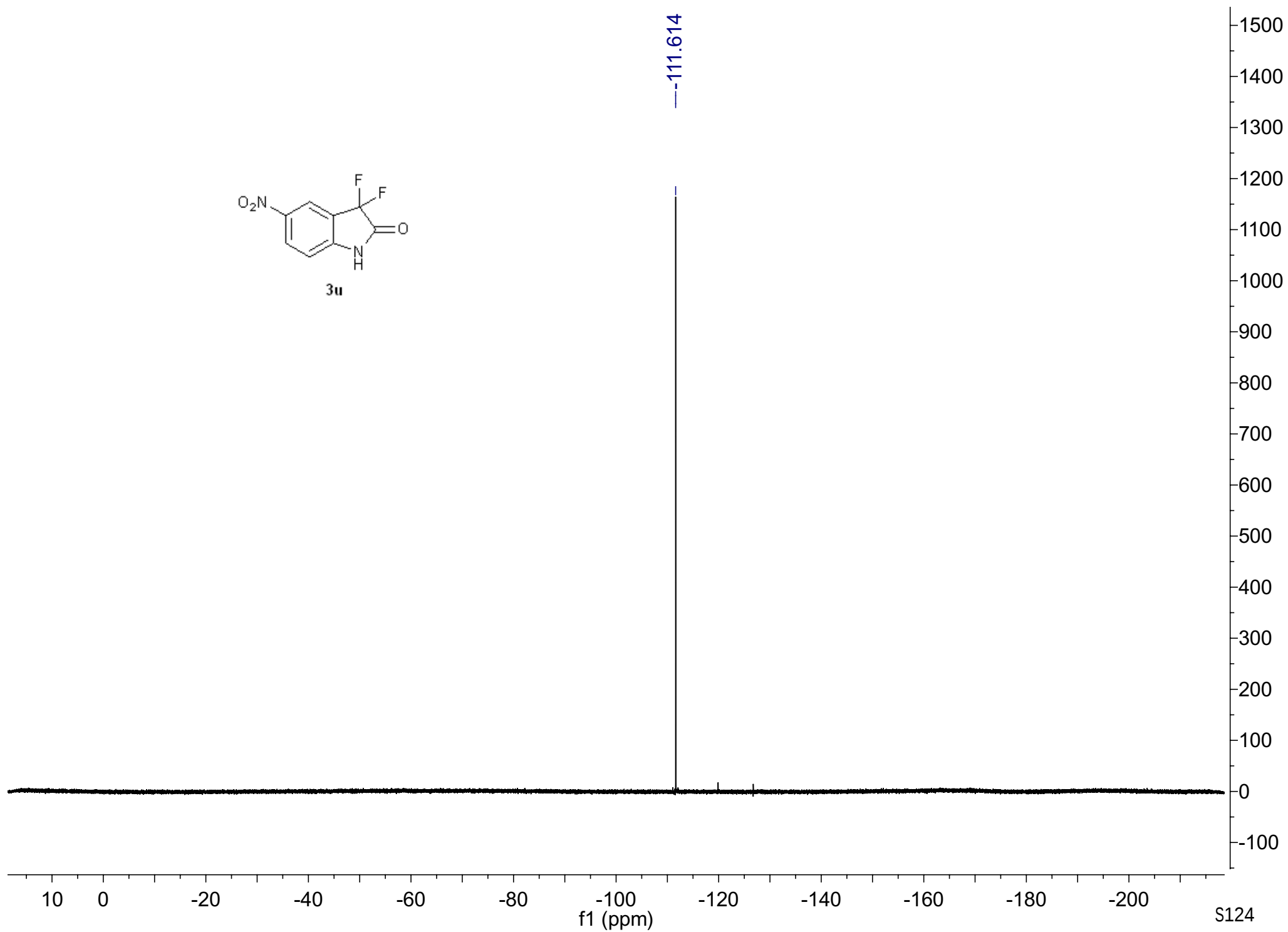
40.28  
40.12  
39.95  
39.78



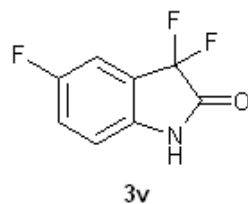
<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



---111.614



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.250

7.696

7.369

7.025

7.017

7.004

6.996

3.353

2.512

2.507

2.503

1.02

1.01

1.05

1.00

13

12

10

9

8

f1 (ppm)

5

4

3

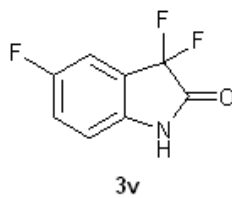
2

1

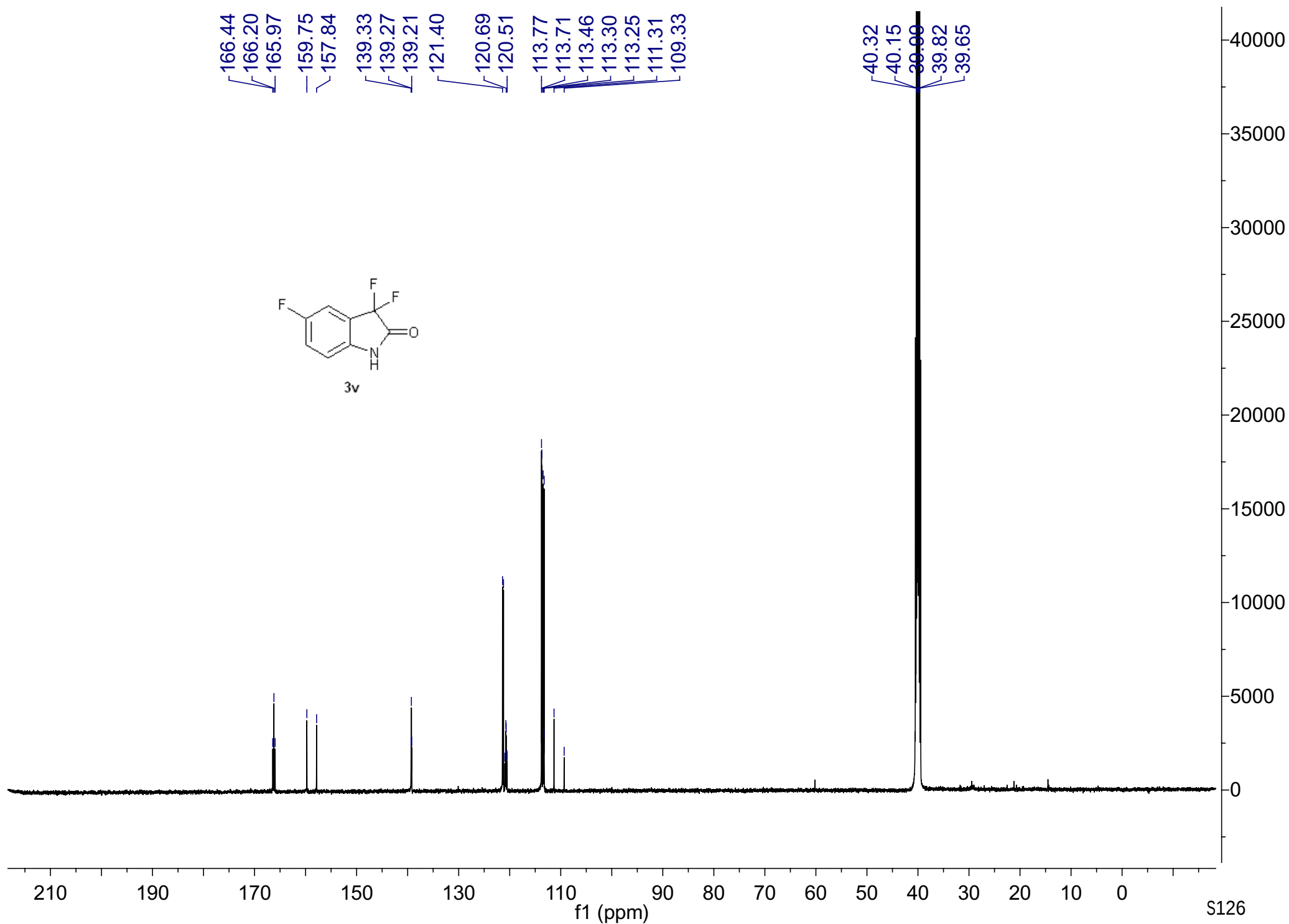
0

S125

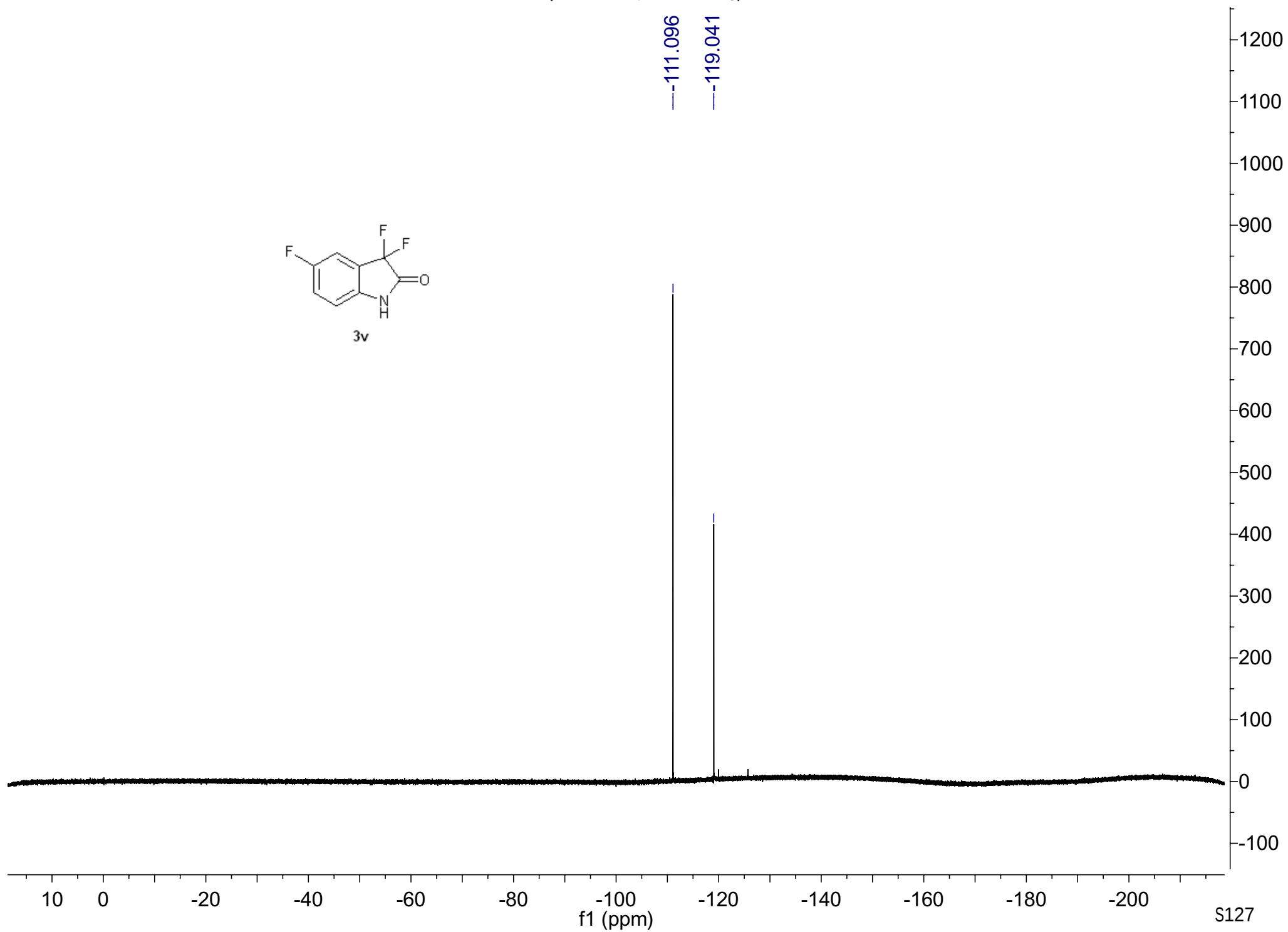
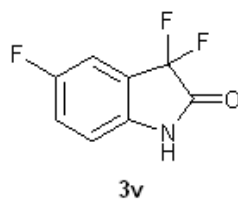
<sup>13</sup>C NMR (125 MHz, DMSO-d<sub>6</sub>)



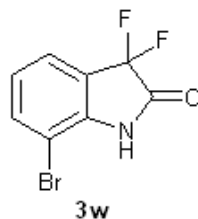
166.44  
166.20  
165.97  
159.75  
157.84  
139.33  
139.27  
139.21  
121.40  
120.69  
120.51  
113.77  
113.71  
113.46  
113.30  
113.25  
111.31  
109.33  
40.32  
40.15  
39.99  
39.82  
39.65



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



<sup>1</sup>H NMR (400 MHz, DMSO-d<sub>6</sub>)



11.571

7.753

7.732

7.694

7.676

7.140

7.120

7.101

3.344

2.500

2.496

2.492

1.02

1.03

0.99

1.00

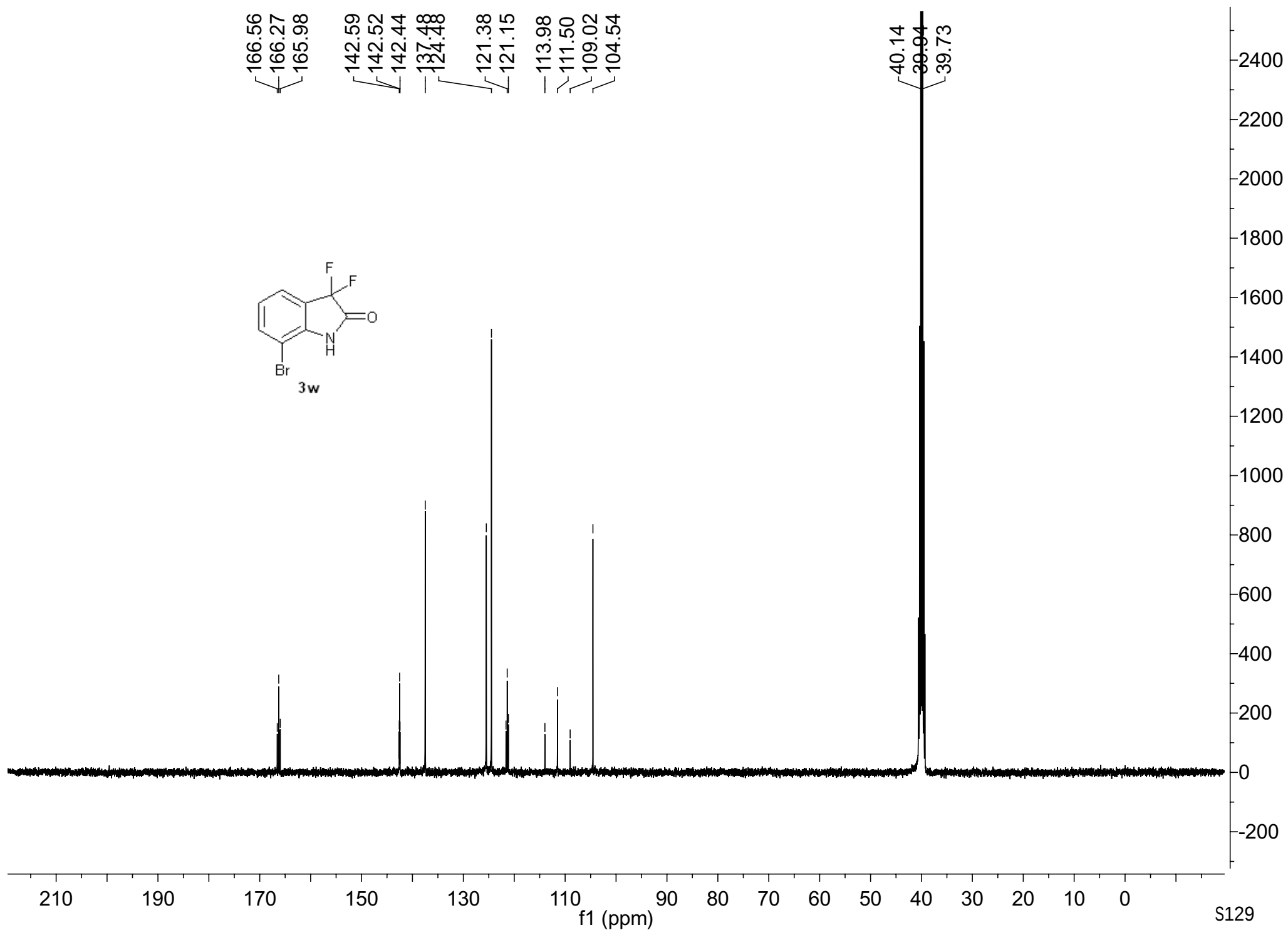
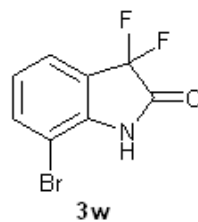
f1 (ppm)

S128

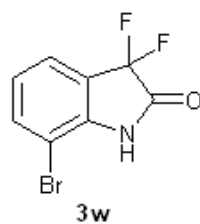
<sup>13</sup>C NMR (100 MHz, DMSO-d<sub>6</sub>)

166.56  
166.27  
165.98  
142.59  
142.52  
142.44  
137.48  
124.48  
121.38  
121.15  
113.98  
111.50  
109.02  
104.54

40.14  
39.94  
39.73



<sup>19</sup>F NMR (376 MHz, DMSO-d<sub>6</sub>)



--109.99

