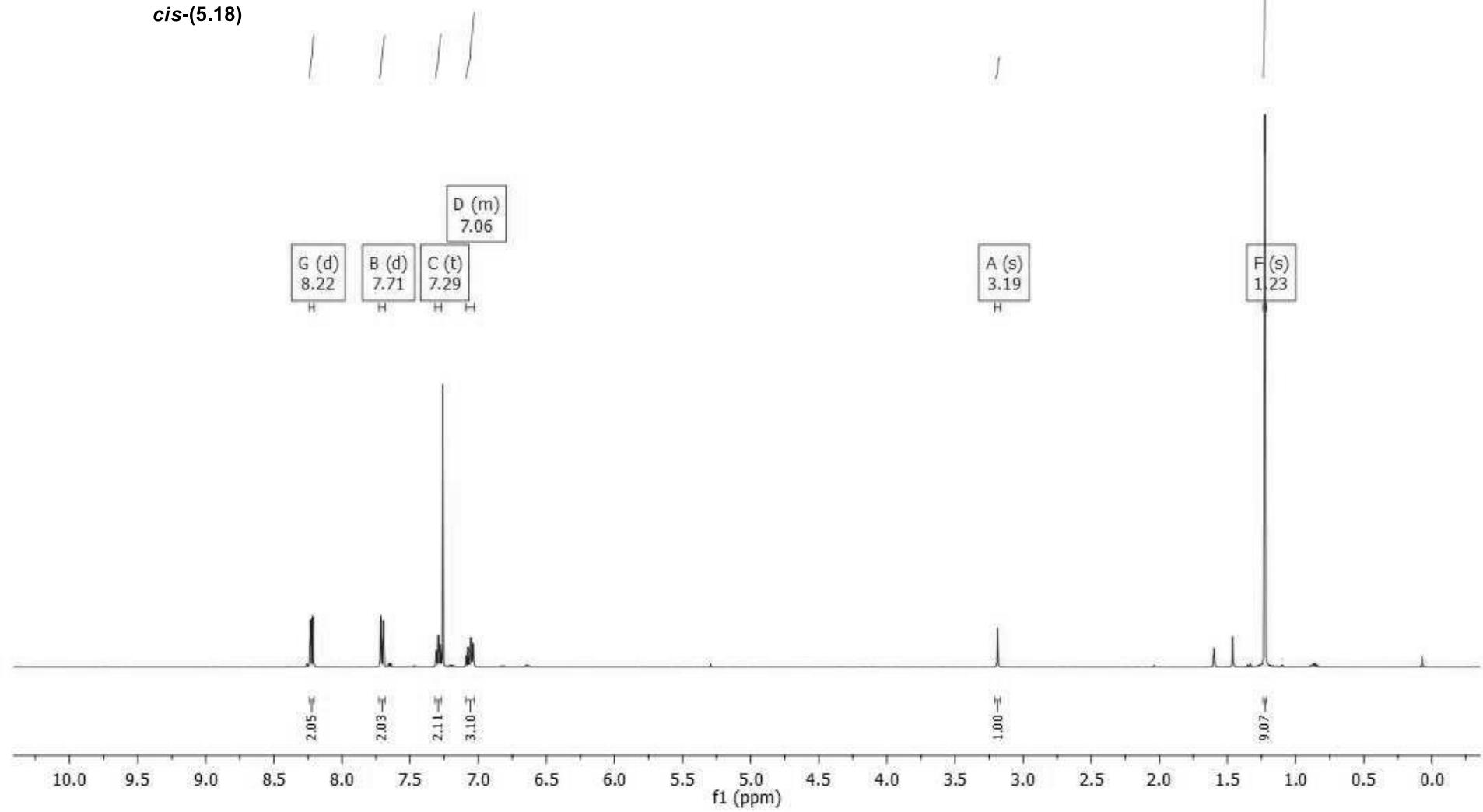
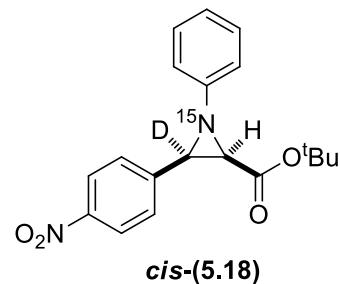
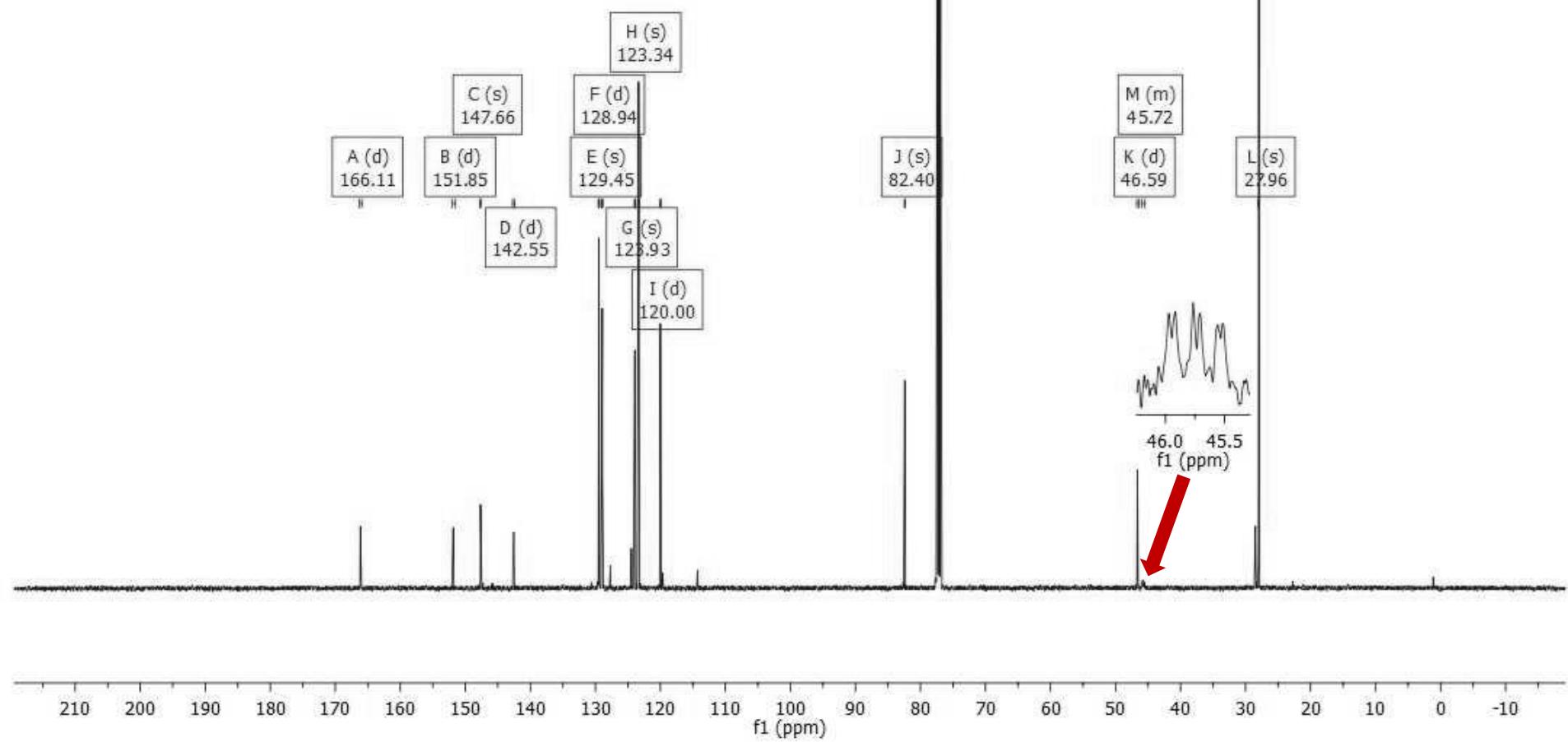
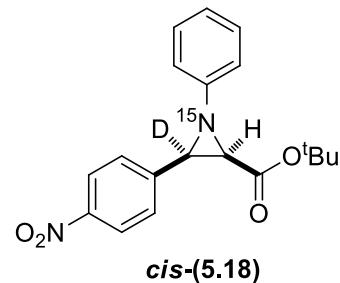


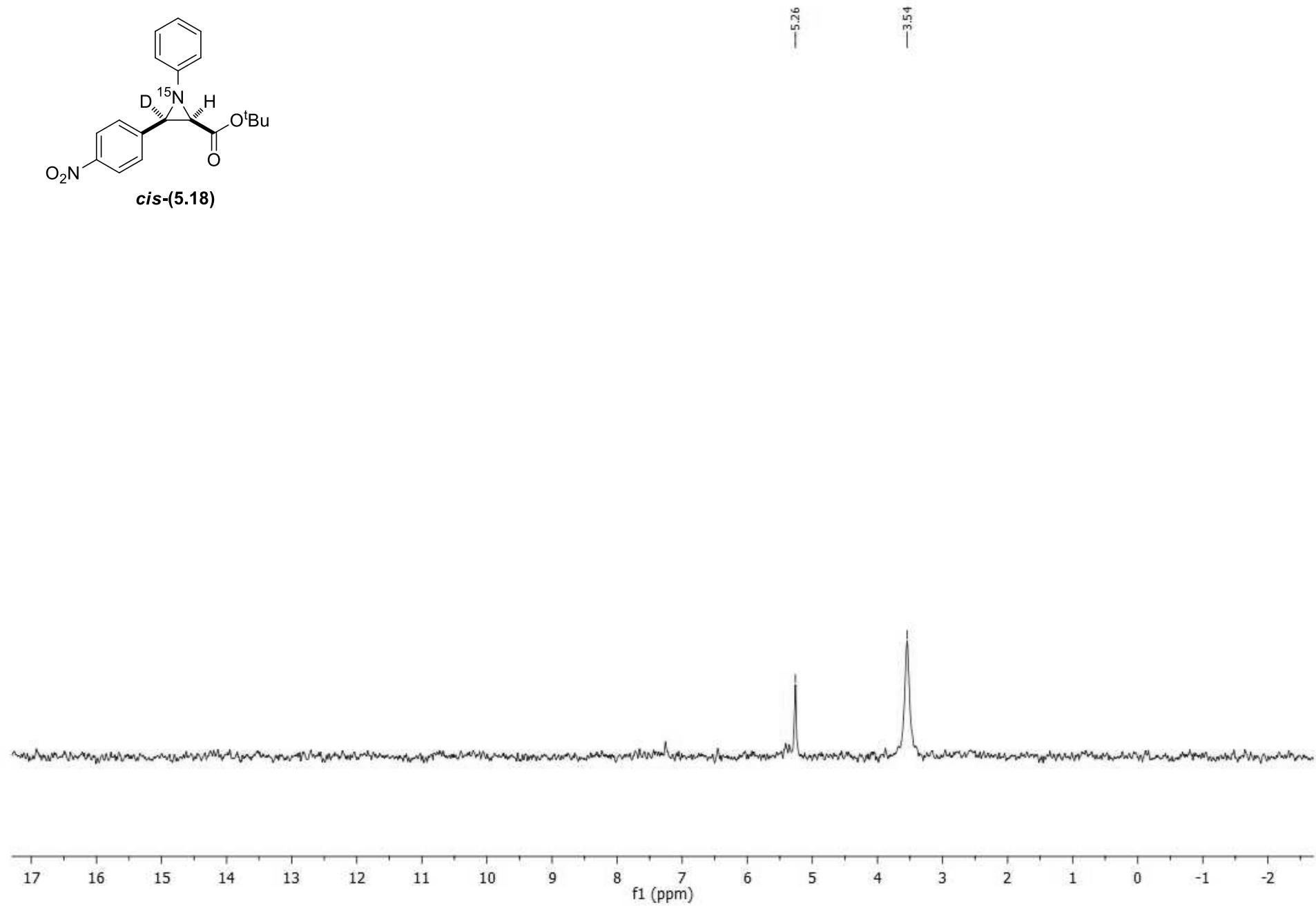
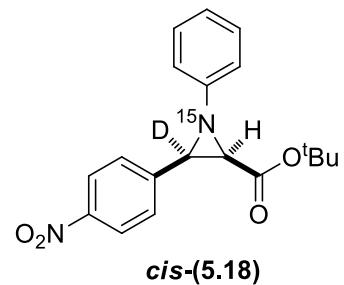
¹H-NMR (CDCl₃, 500 MHz)



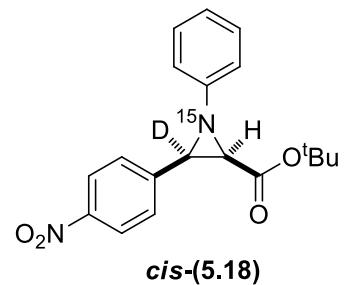
¹³C-NMR (CDCl₃, 126 MHz)



^2H -NMR (CH_2Cl_2 , 77 MHz)



¹⁵N-NMR (CDCl₃, 51 MHz)

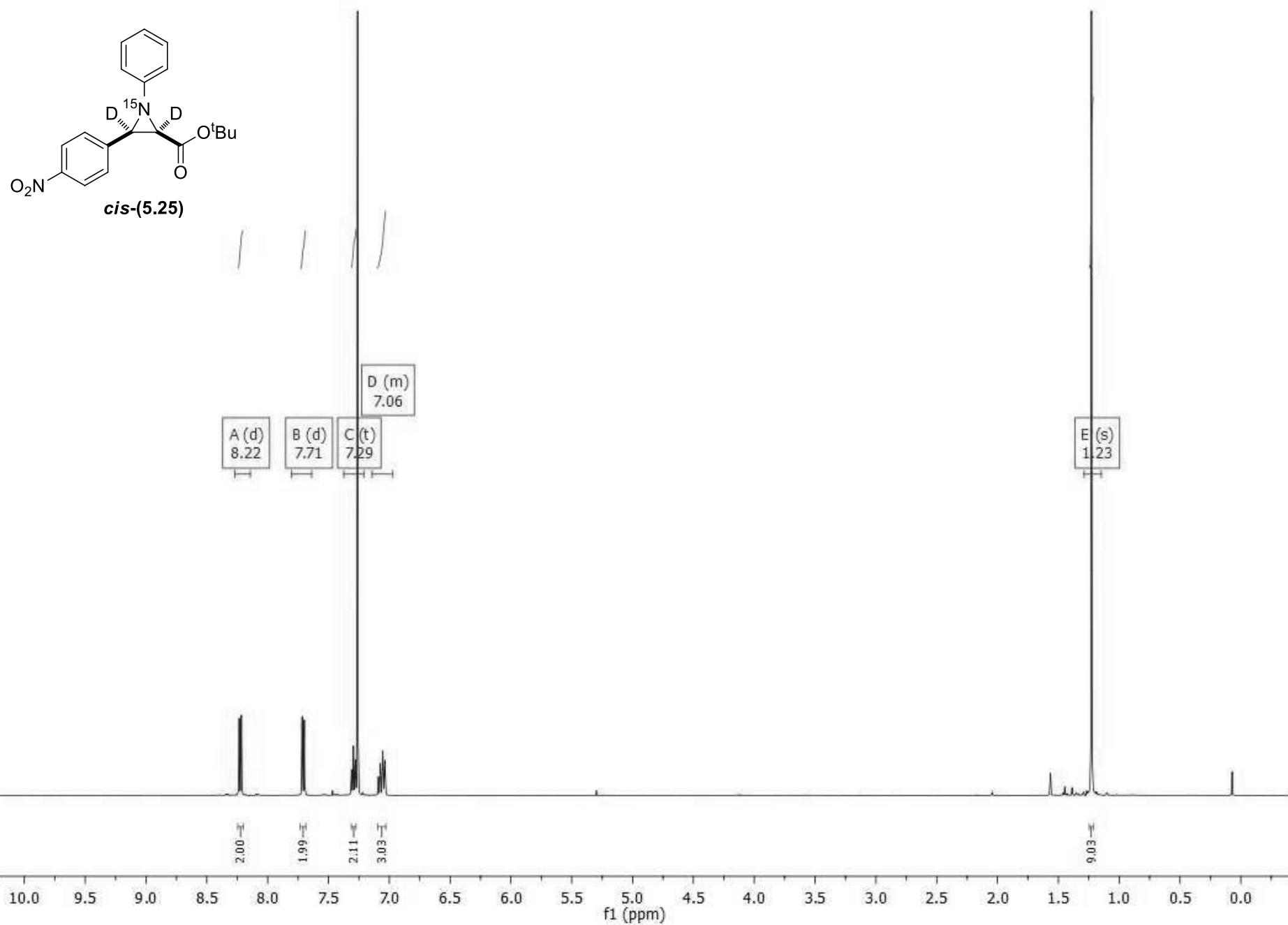


66.41

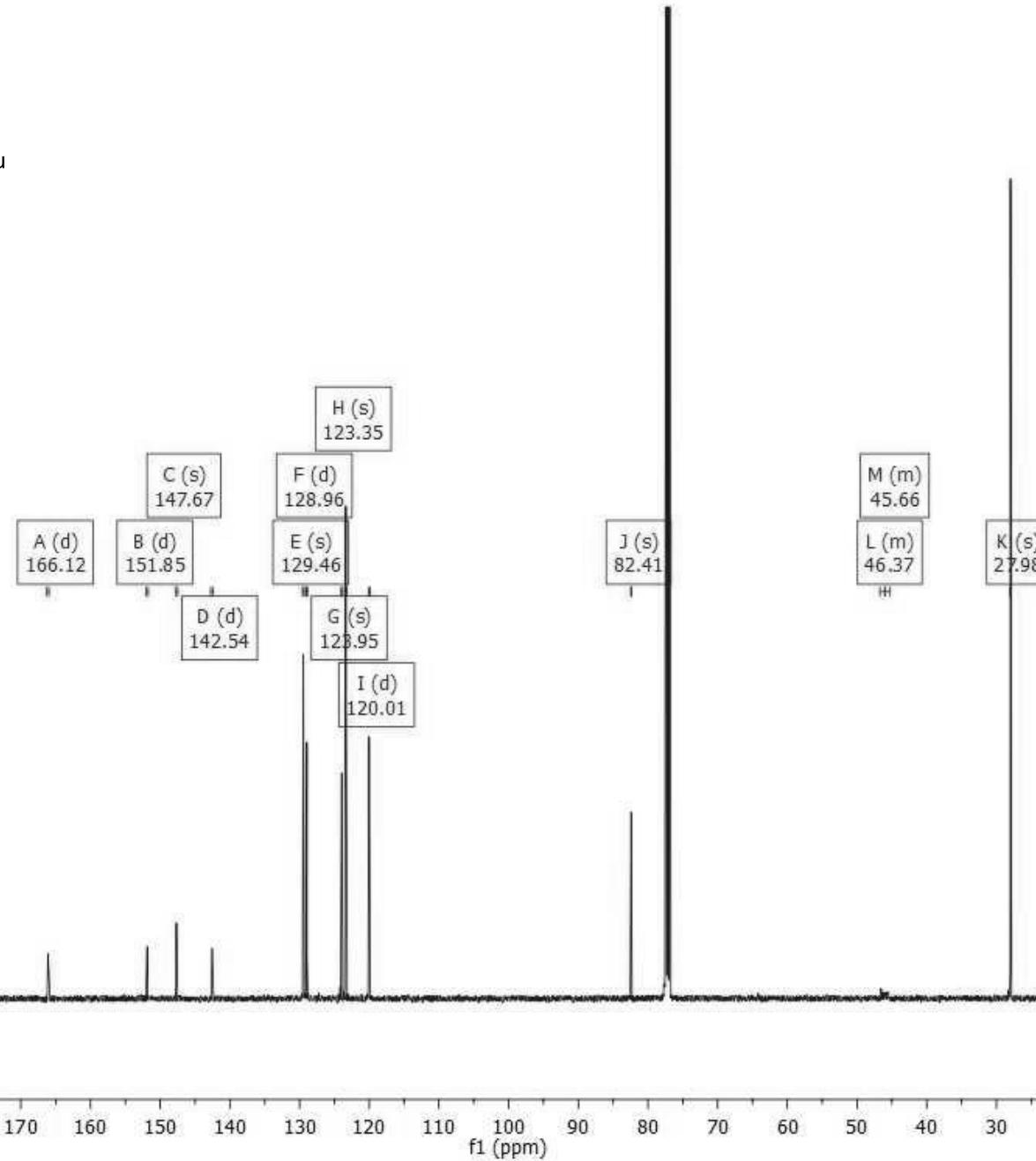
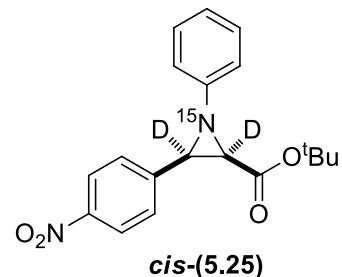
400 350 300 250 200 150 100 50 0

f1 (ppm)

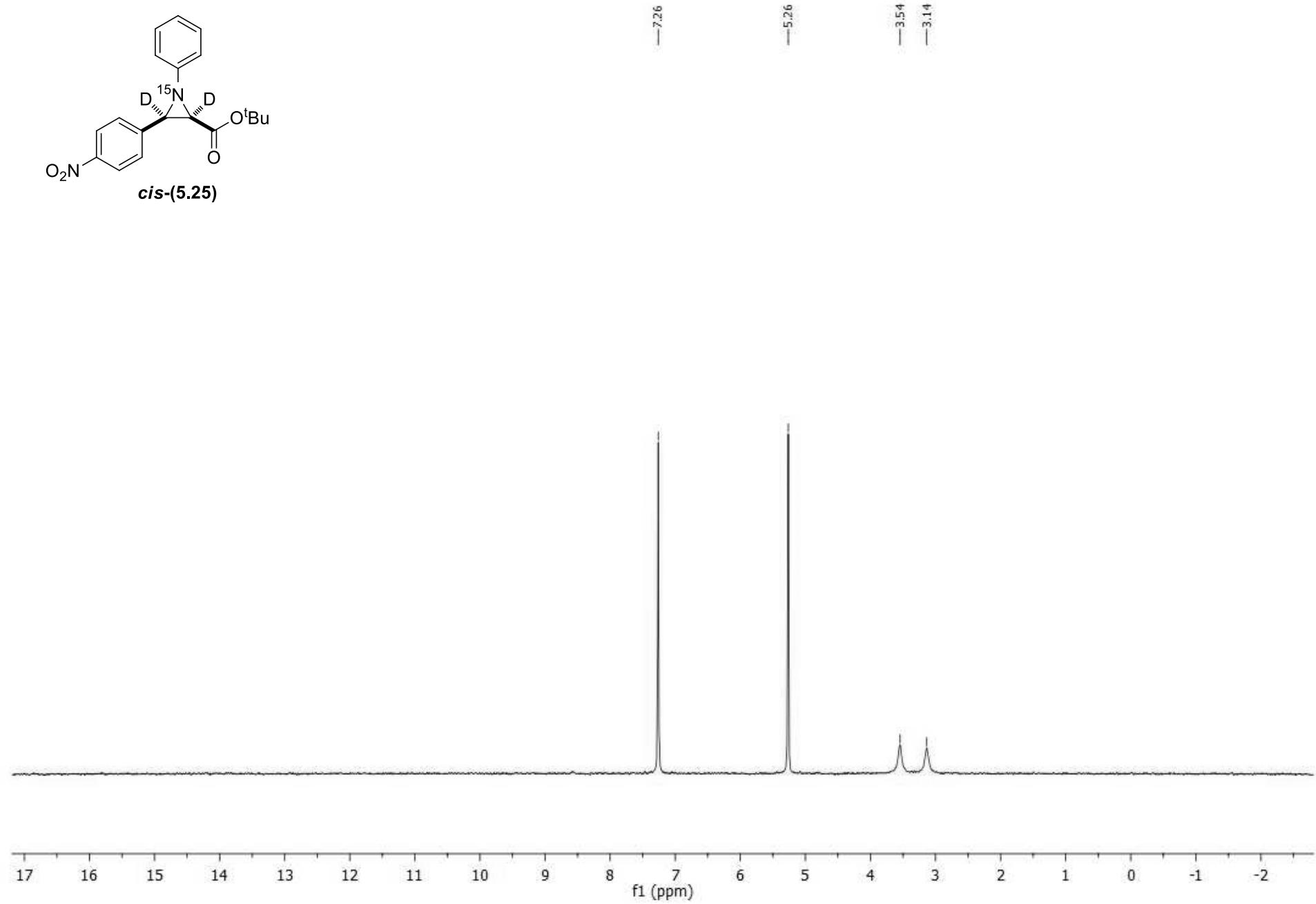
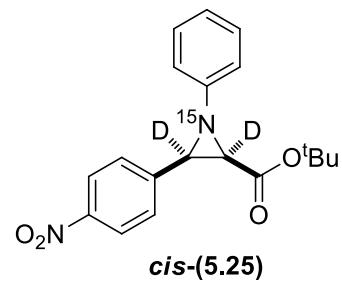
¹H-NMR (CDCl₃, 500 MHz)



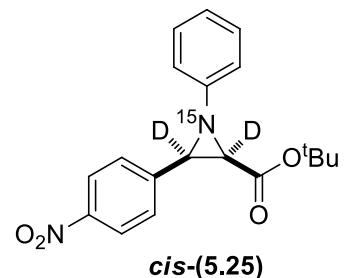
¹³C-NMR (CDCl₃, 126 MHz)



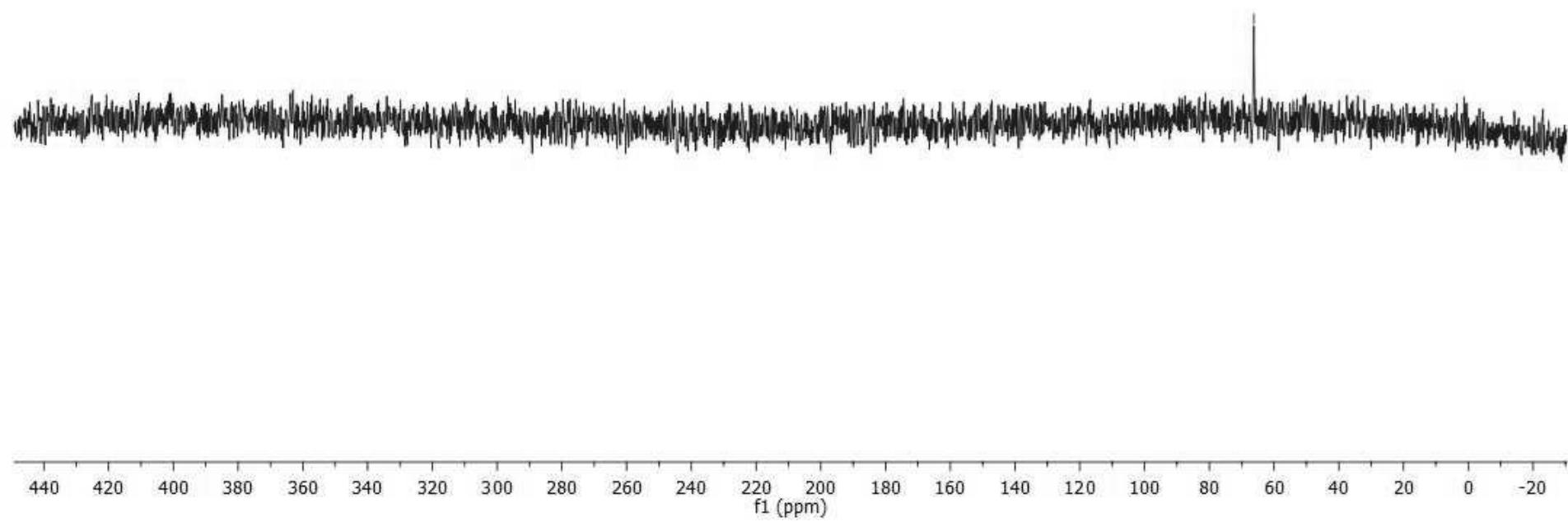
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



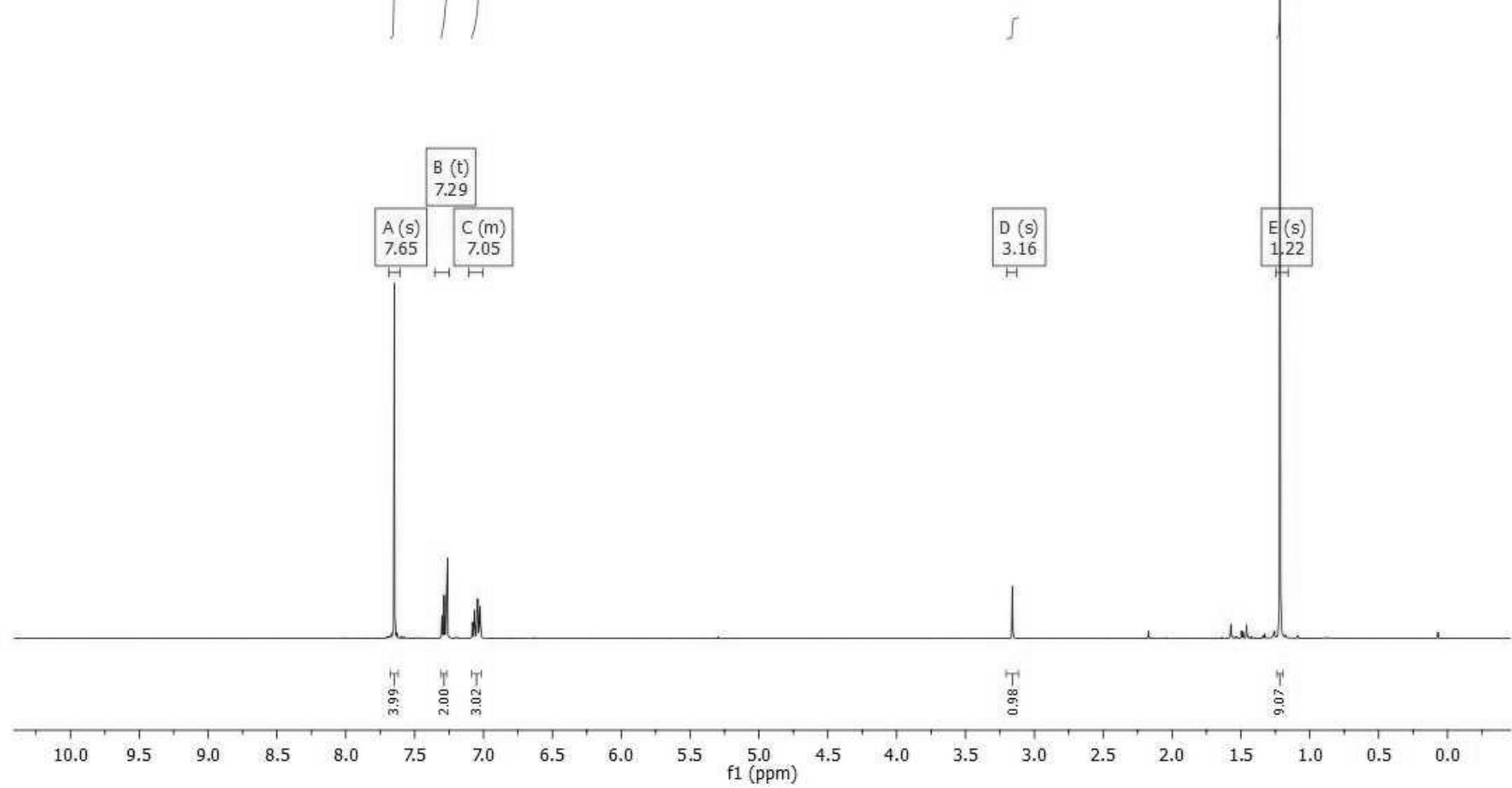
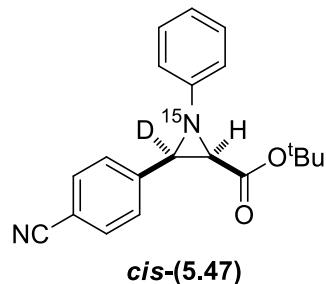
¹⁵N-NMR (CDCl₃, 51 MHz)



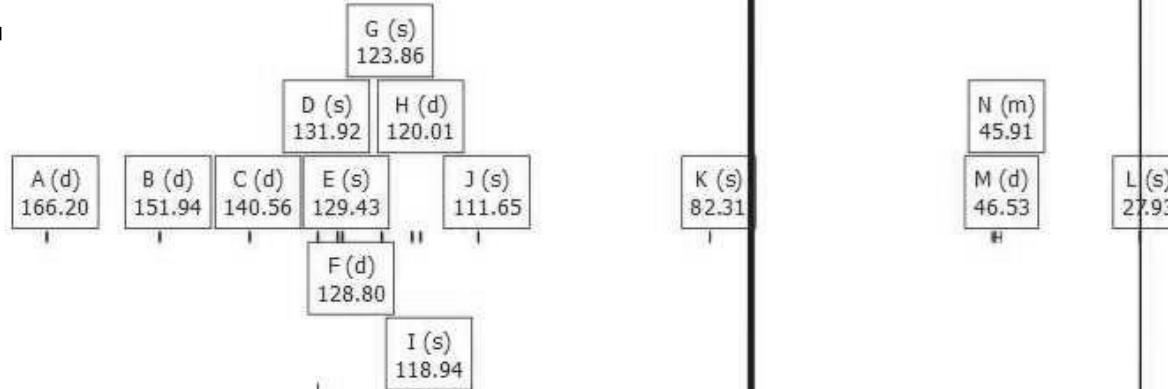
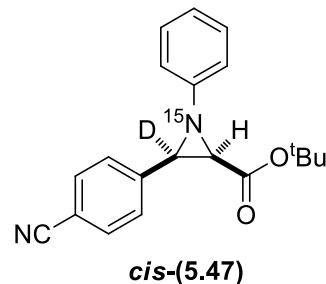
—66.22



¹H-NMR (CDCl₃, 500 MHz)



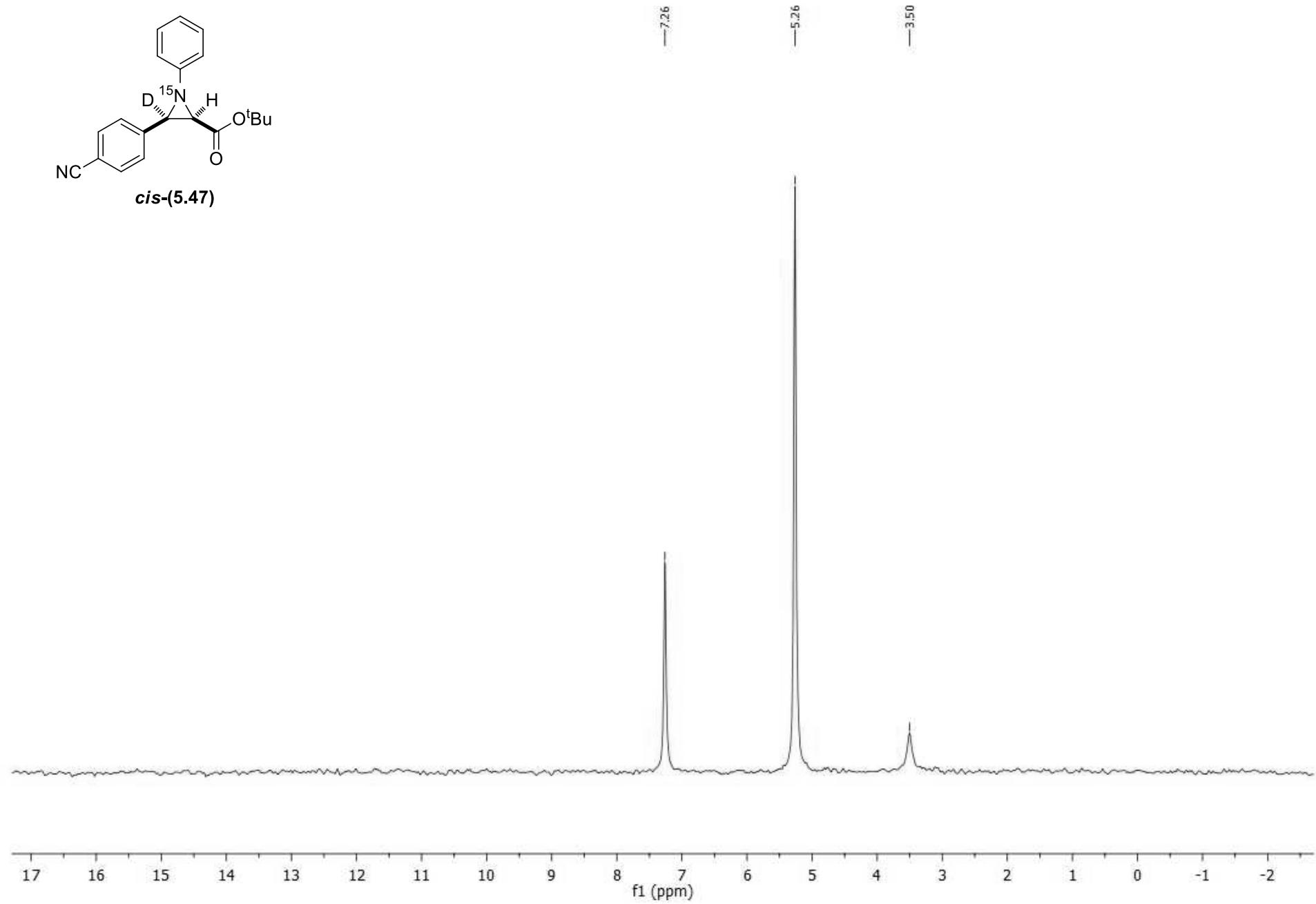
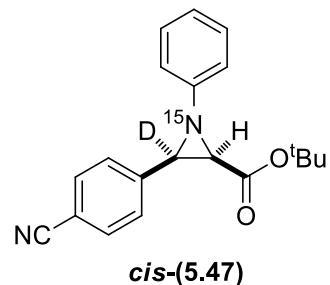
¹³C-NMR (CDCl₃, 126 MHz)



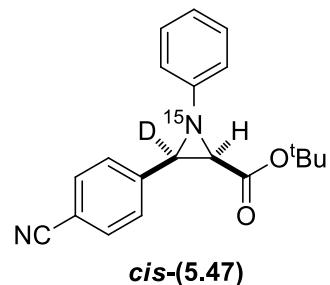
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

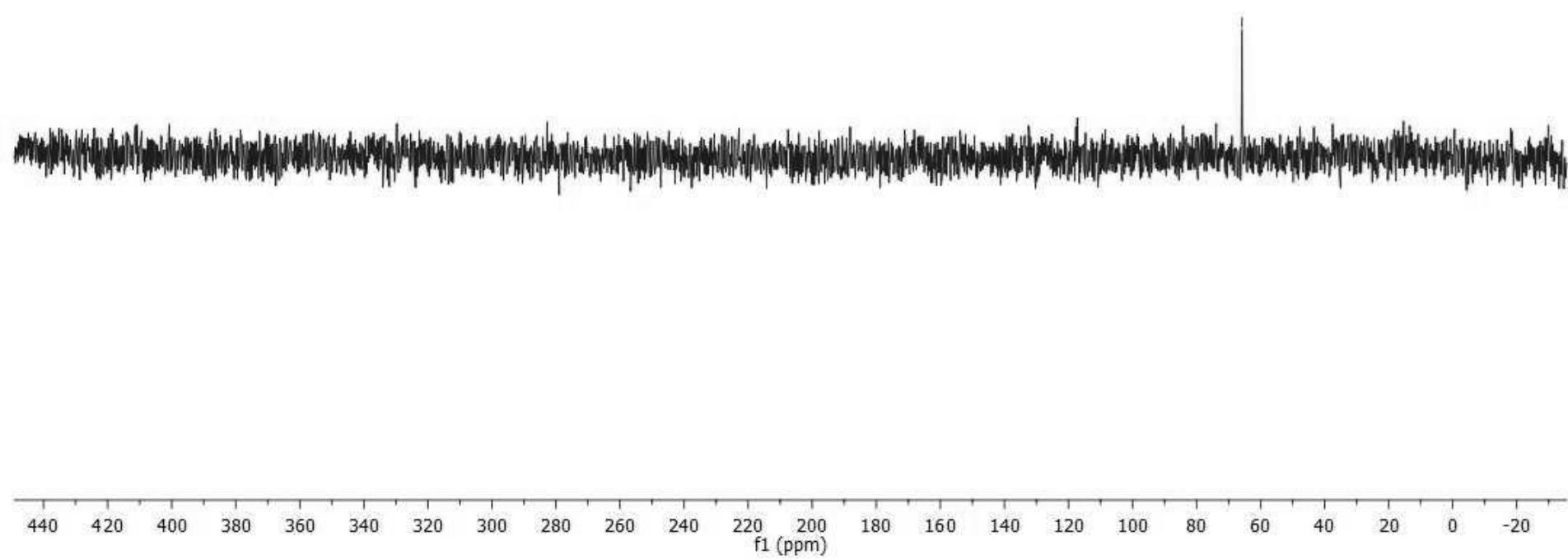
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



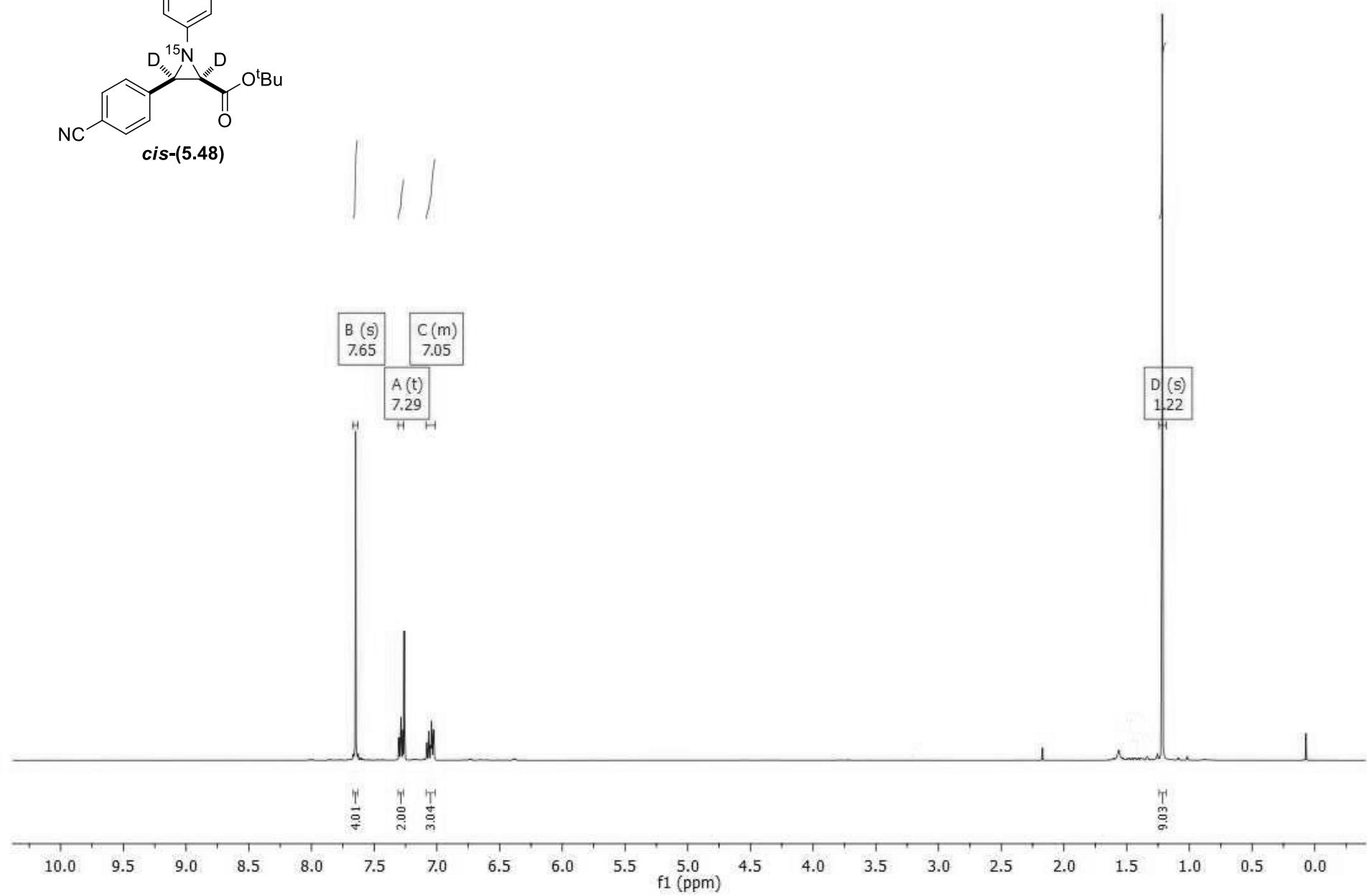
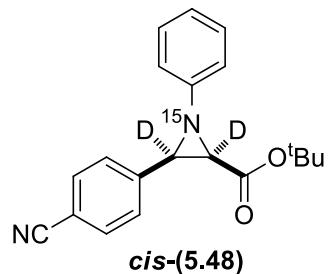
¹⁵N-NMR (CDCl₃, 51 MHz)



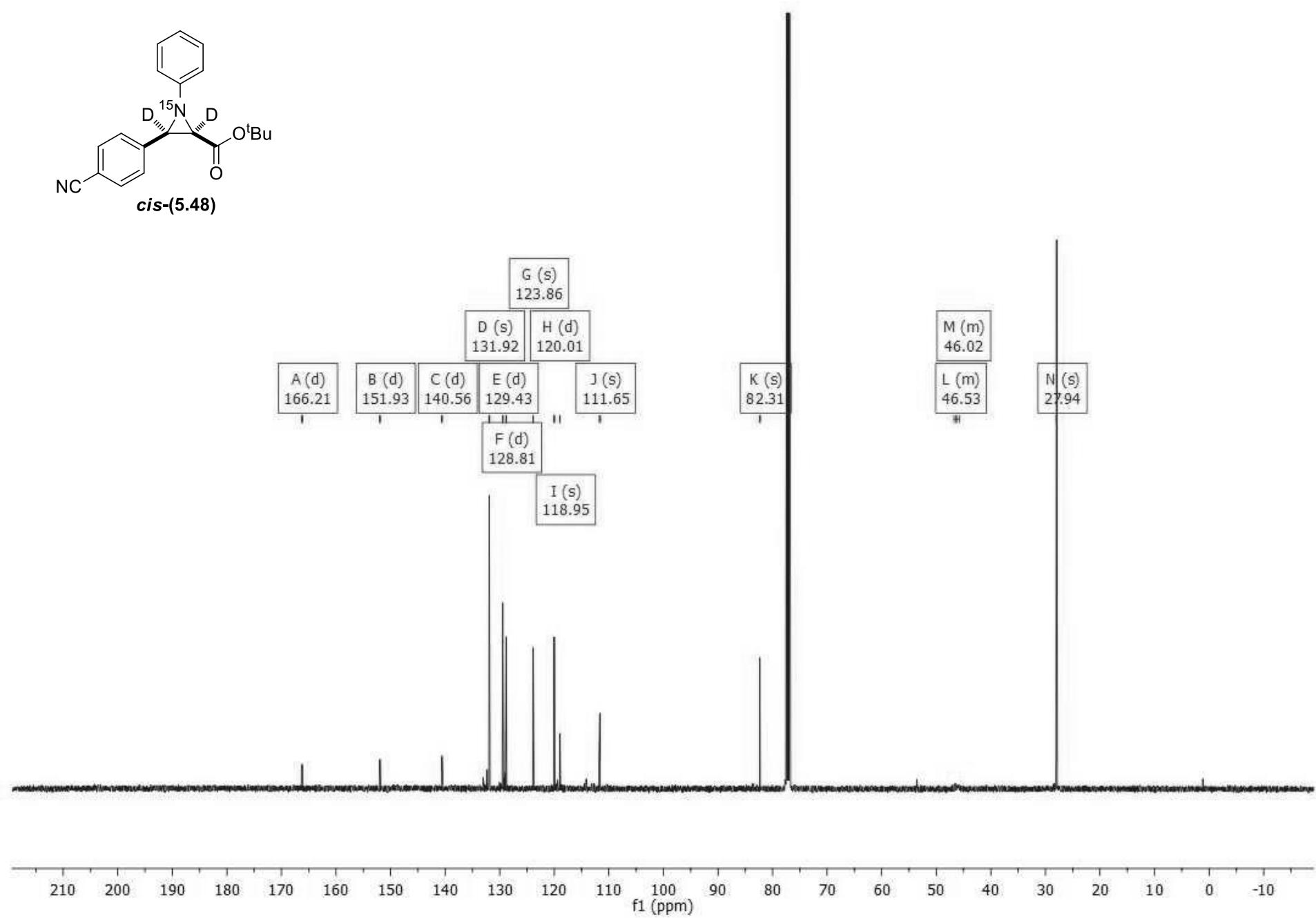
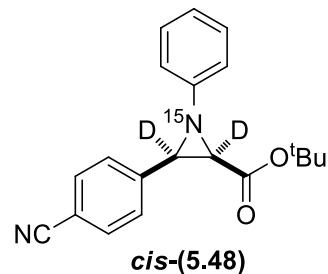
—65.78



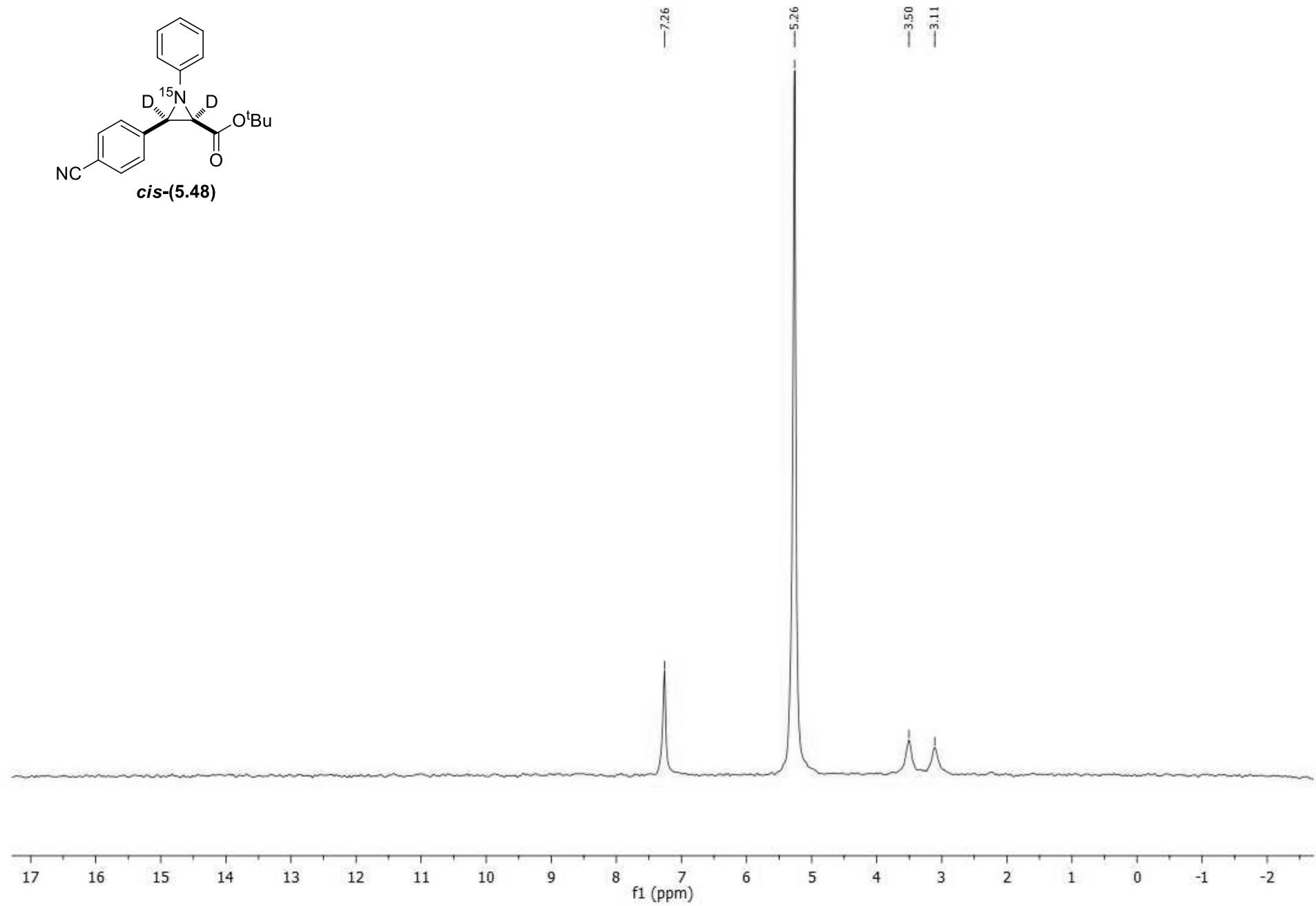
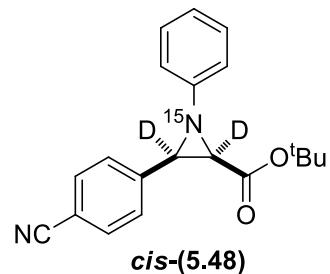
¹H-NMR (CDCl₃, 500 MHz)



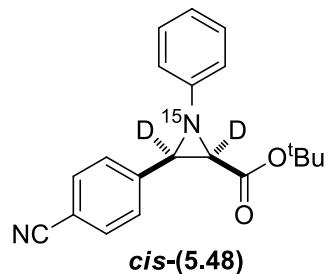
¹³C-NMR (CDCl₃, 126 MHz)



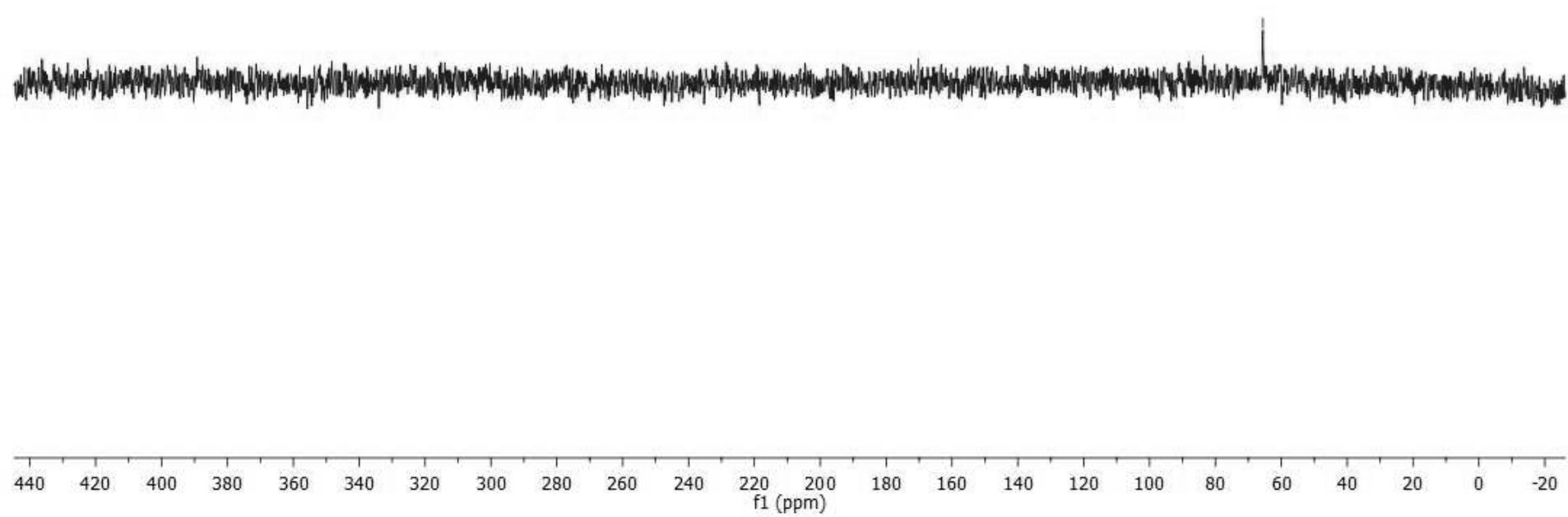
²H-NMR (CH_2Cl_2 , 77 MHz)



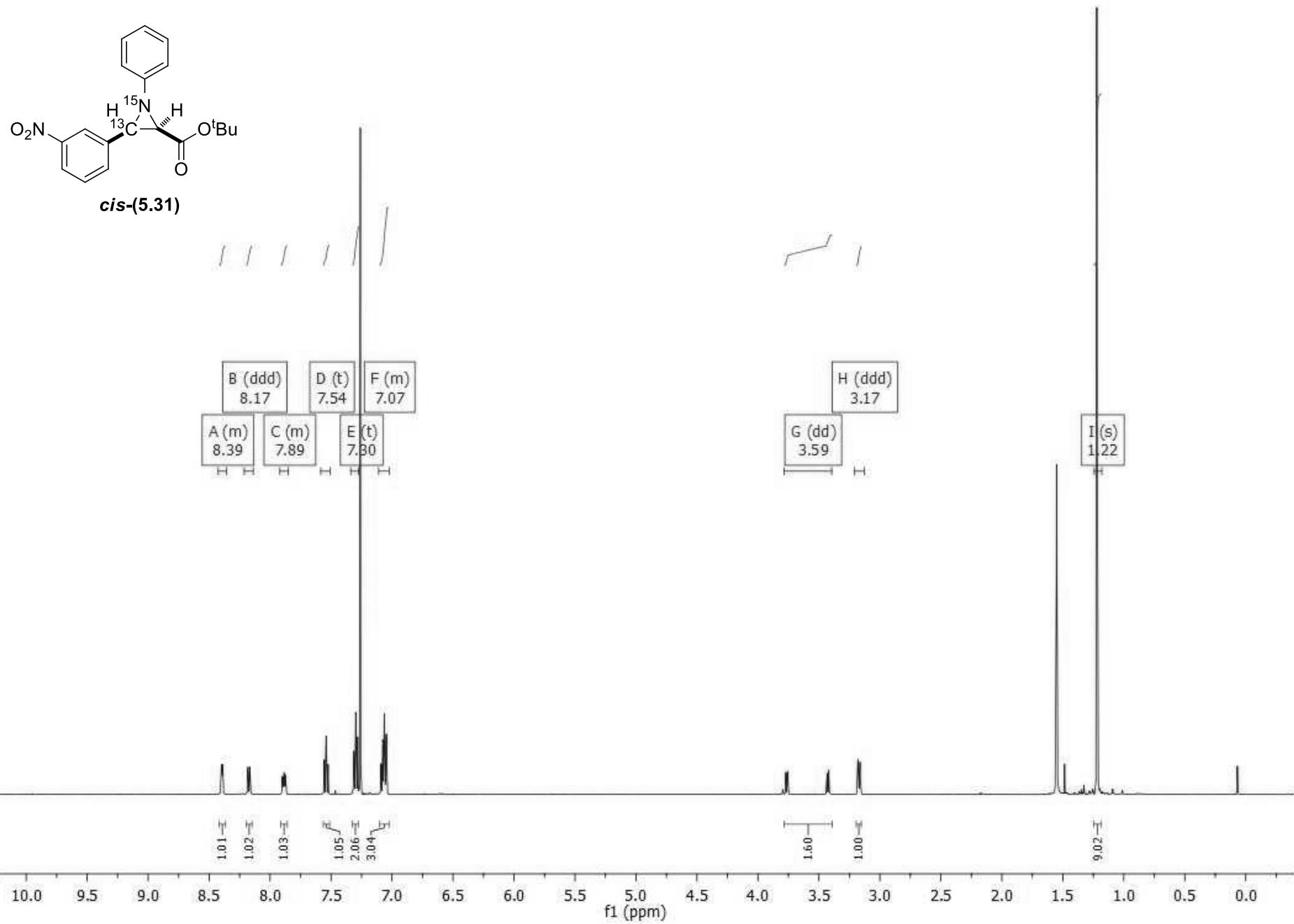
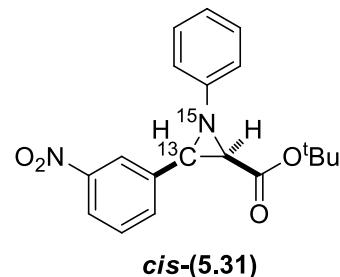
¹⁵N-NMR (CDCl₃, 51 MHz)



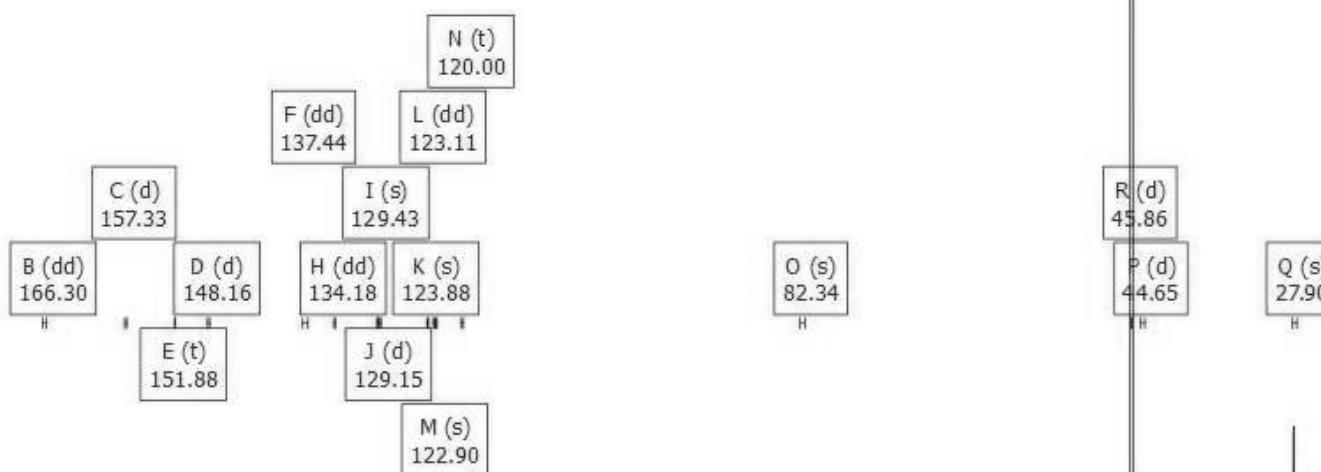
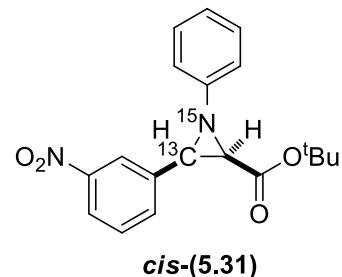
— 65.60 —



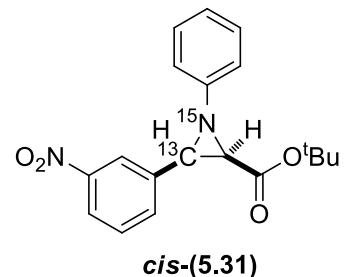
¹H-NMR (CDCl₃, 500 MHz)



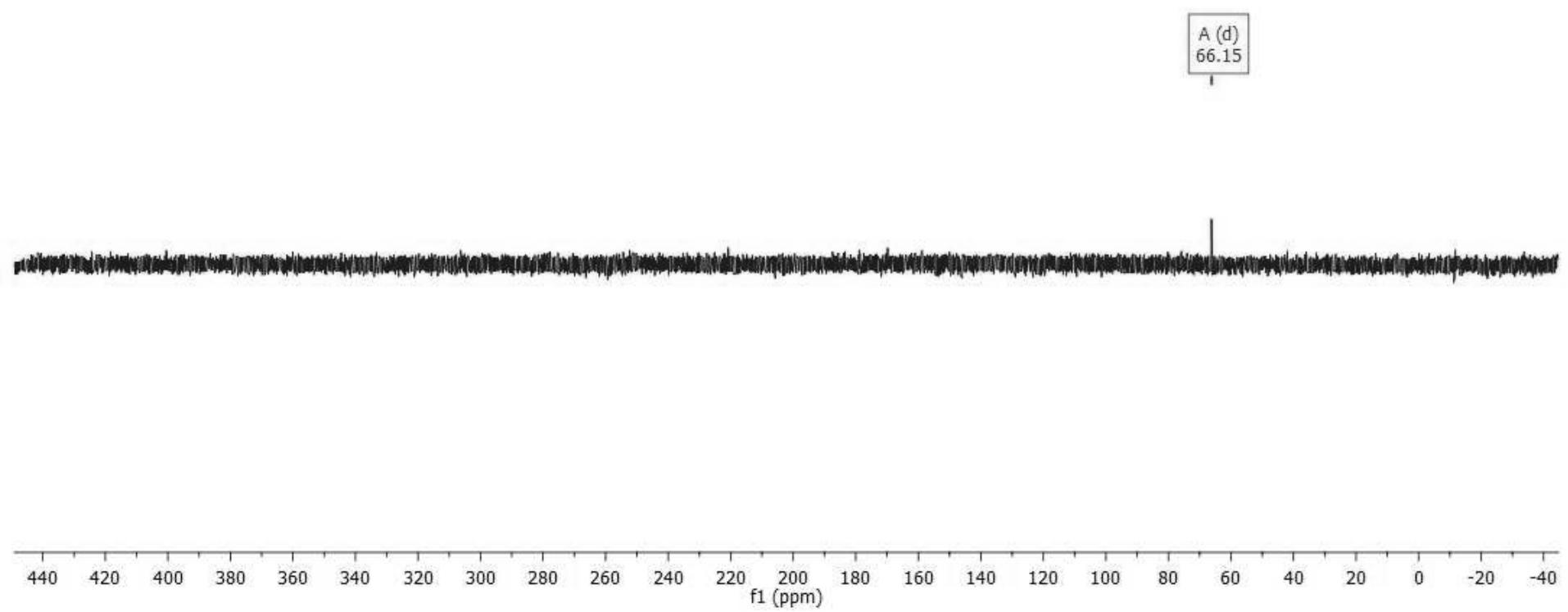
¹³C-NMR (CDCl₃, 126 MHz)



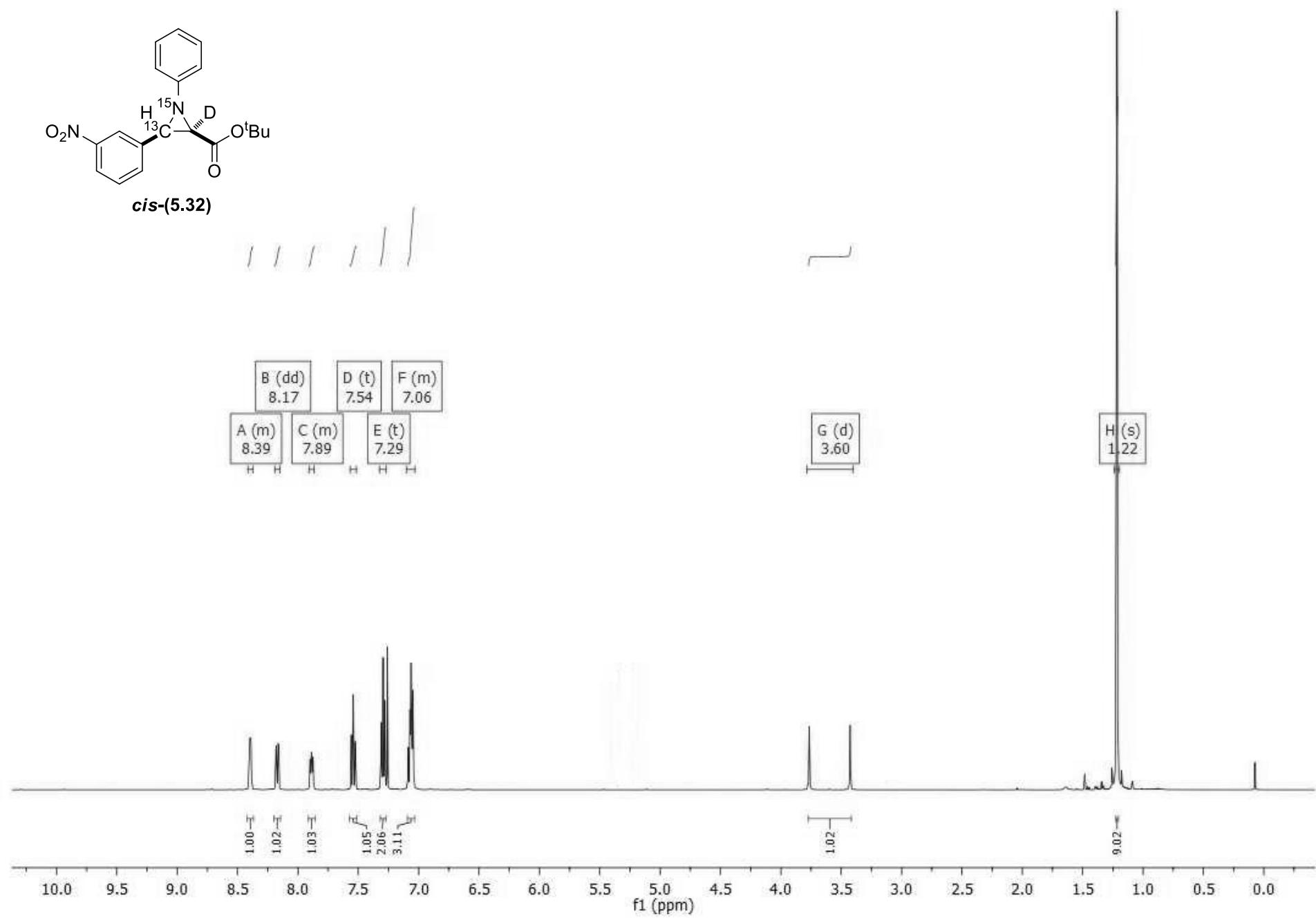
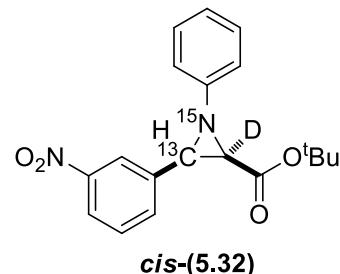
¹⁵N-NMR (CDCl₃, 51 MHz)



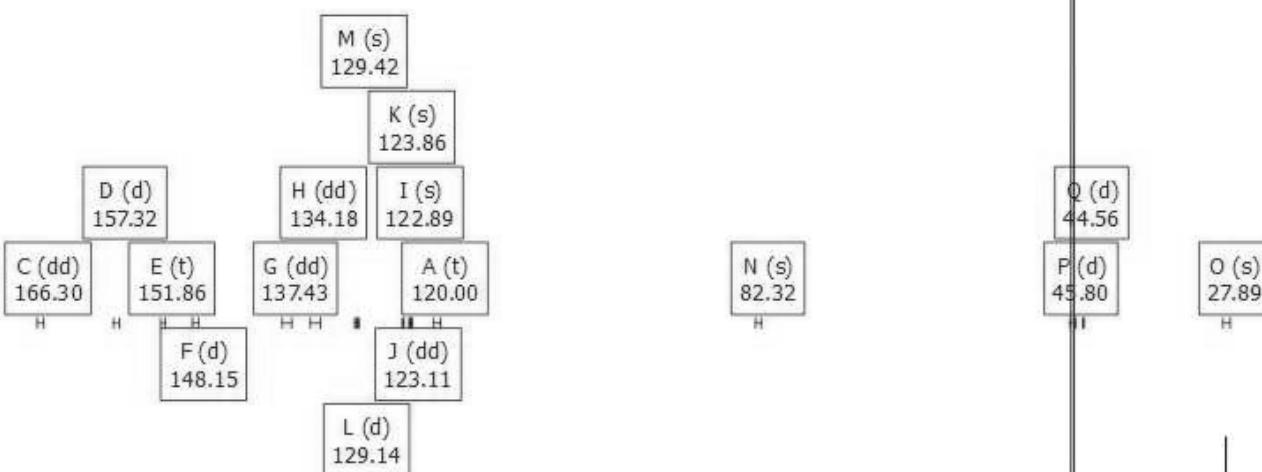
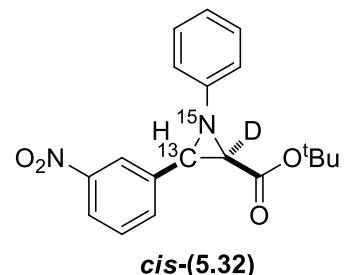
A (d)
66.15



¹H-NMR (CDCl₃, 500 MHz)



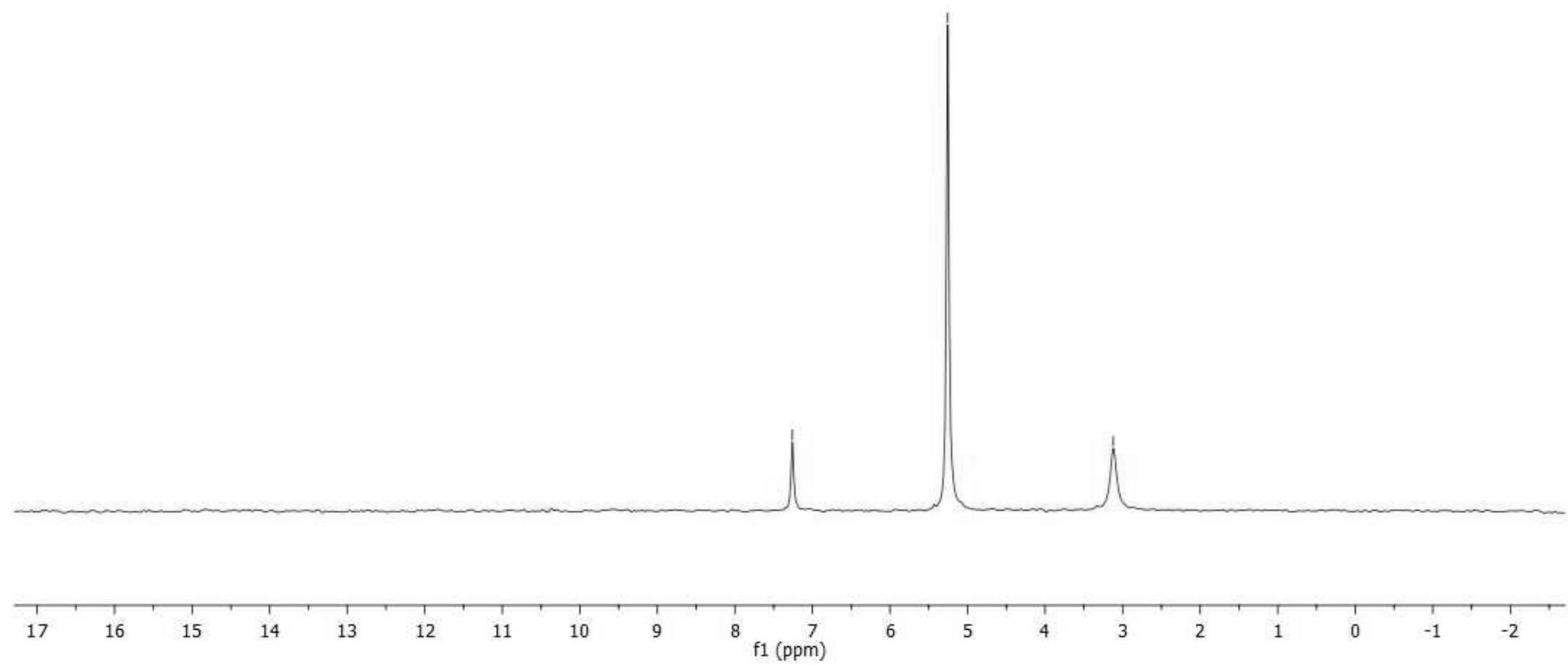
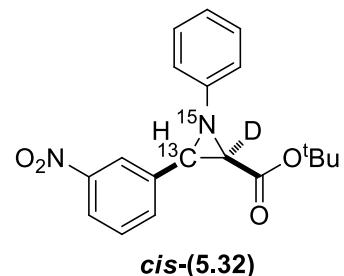
¹³C-NMR (CDCl₃, 126 MHz)



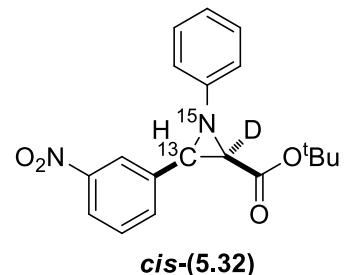
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

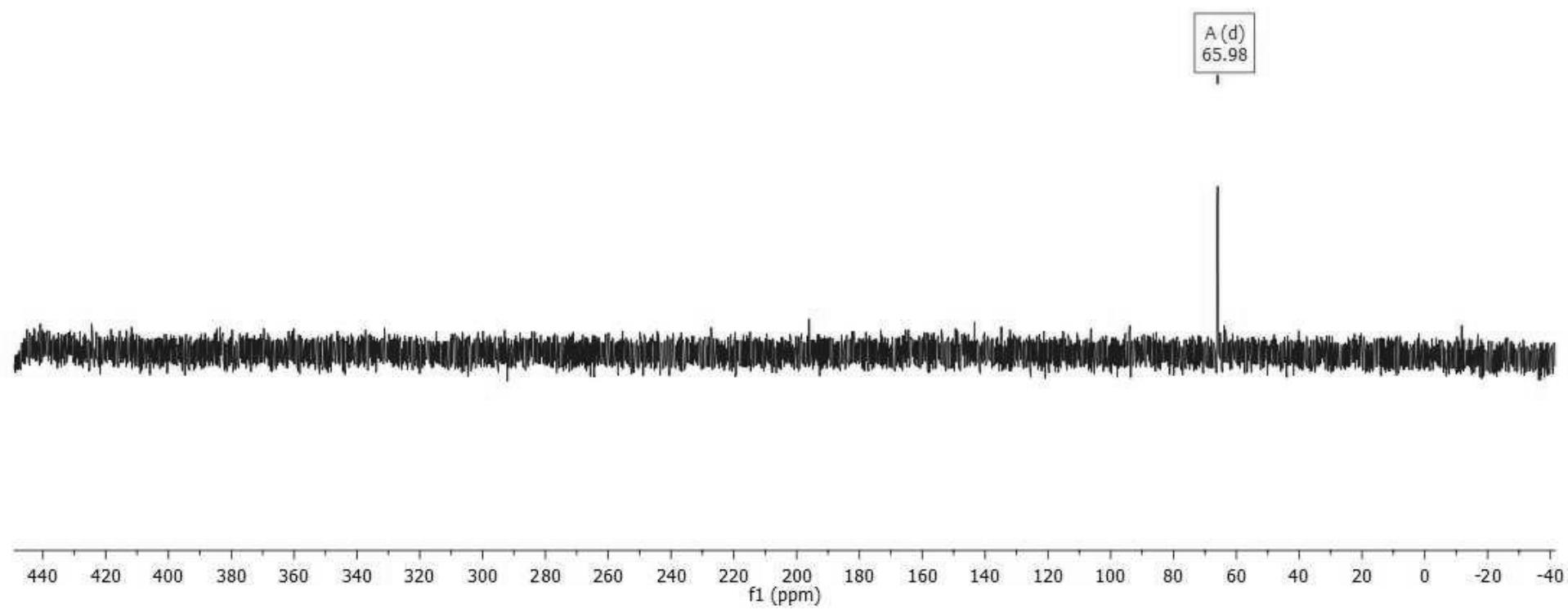
²H-NMR (CH_2Cl_2 , 77 MHz)



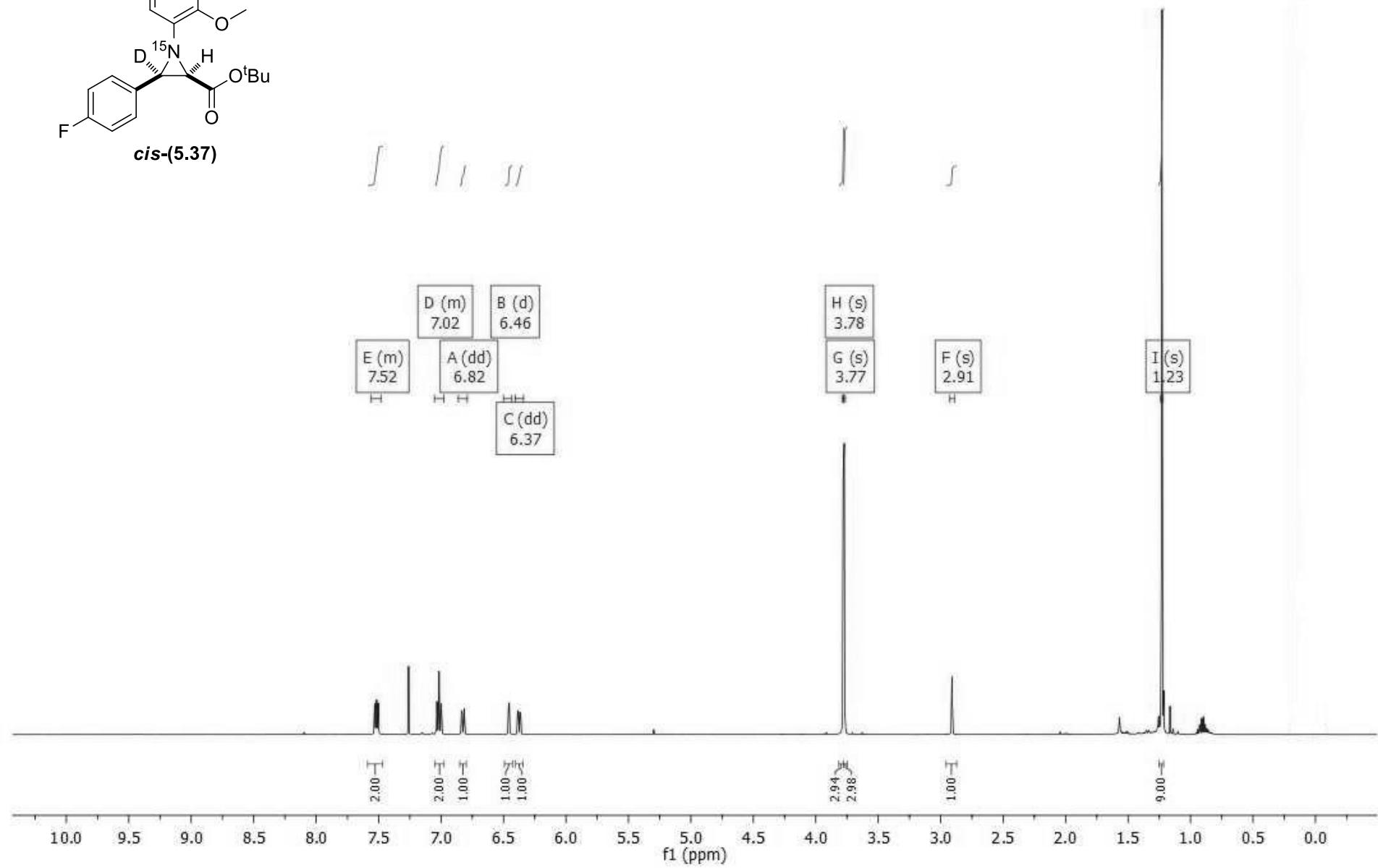
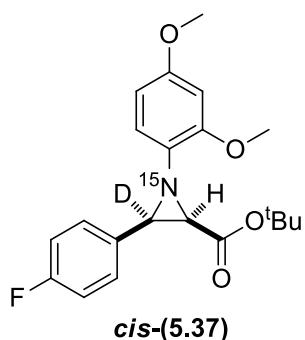
¹⁵N-NMR (CDCl₃, 51 MHz)



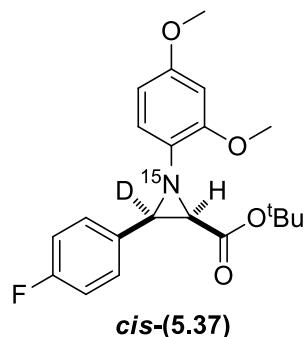
A (d)
65.98



¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)

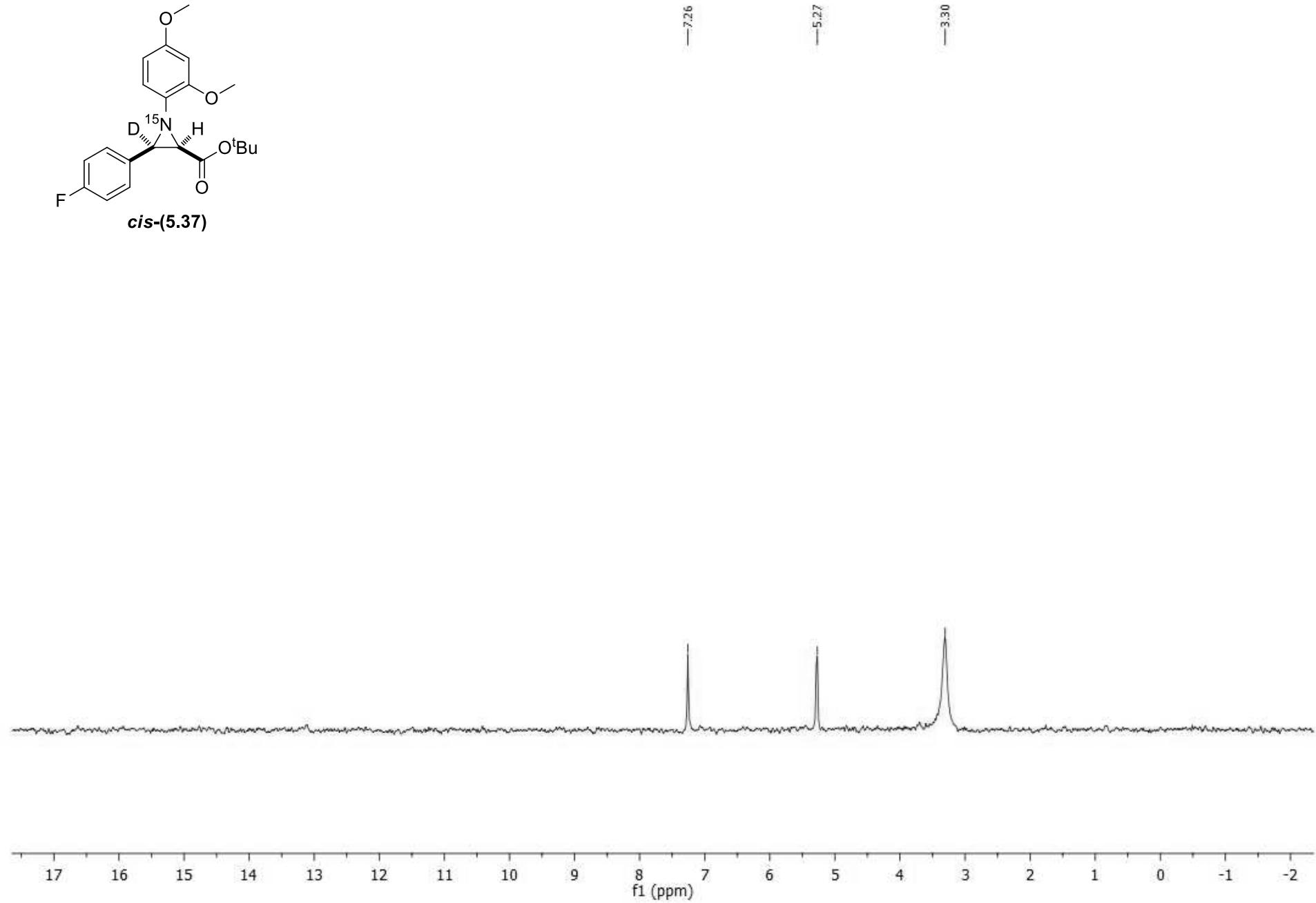
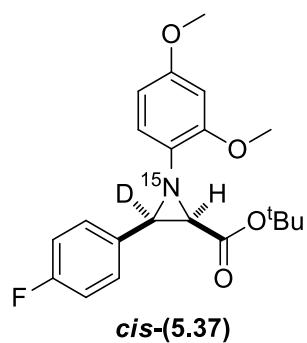


B (d) 162.41	F (dd) 131.20	I (d) 114.76	K (s) 99.80
A (d) 167.38	C (s) 156.70	E (d) 134.96	H (d) 119.86
D (d) 153.16		G (dd) 129.79	J (s) 103.69
L (s) 81.53			
Q (s) 55.81		P (m) 46.97	N (d) 46.76
M (s) 55.71			
O (s) 27.97			

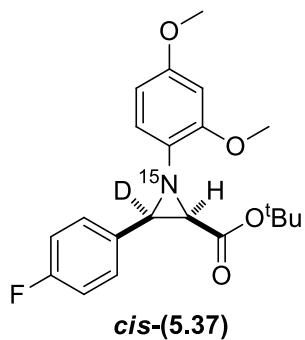
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

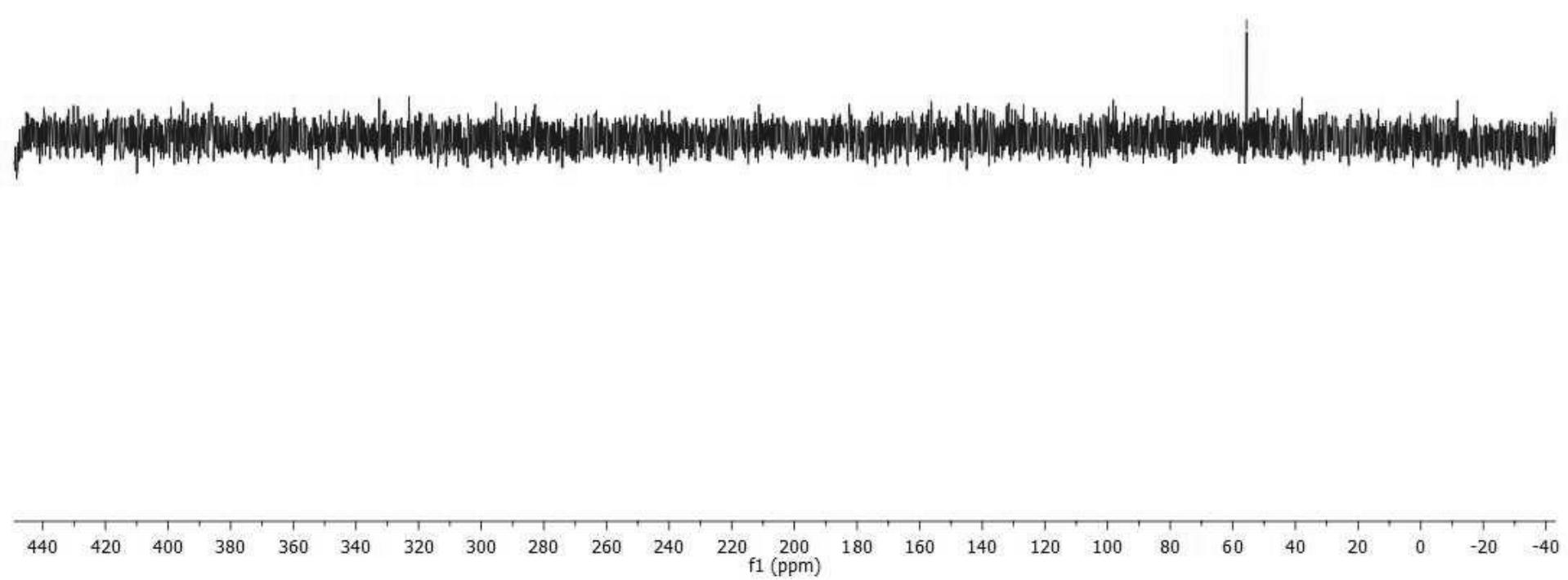
^2H -NMR (CH_2Cl_2 , 77 MHz)



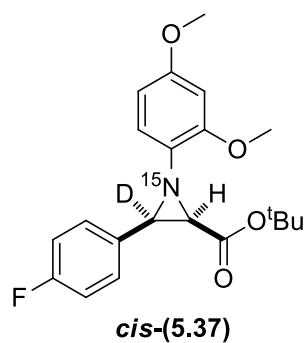
¹⁵N-NMR (CDCl₃, 51 MHz)



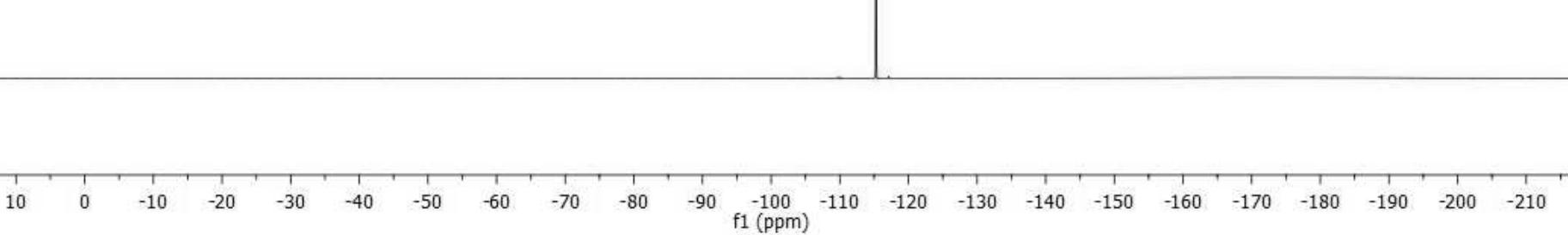
—55.60



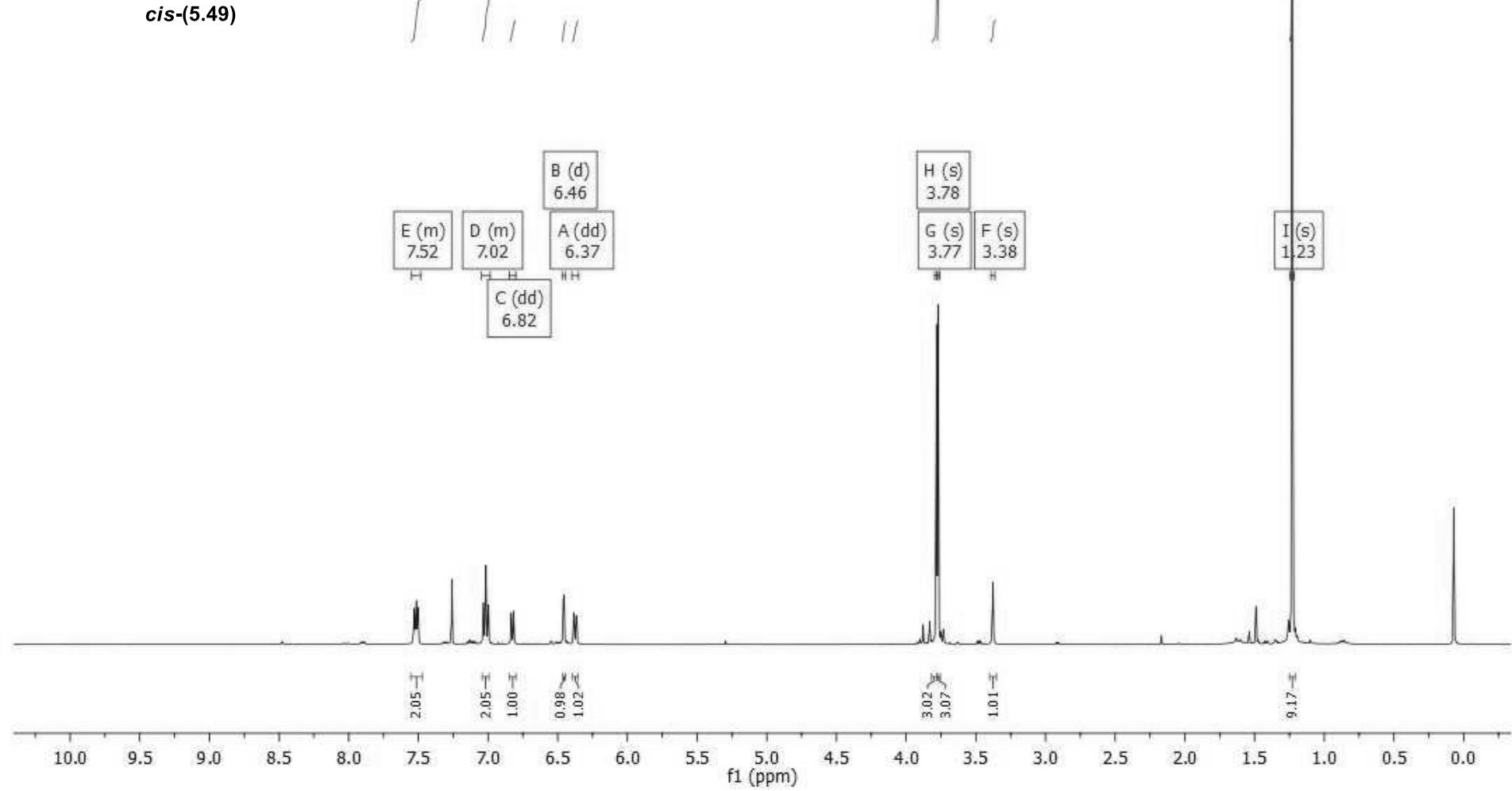
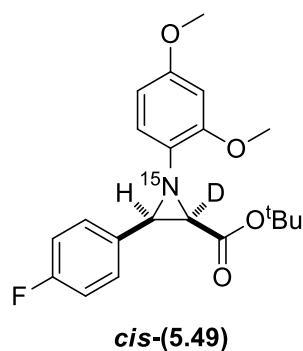
¹⁹F-NMR (CDCl₃, 471 MHz)



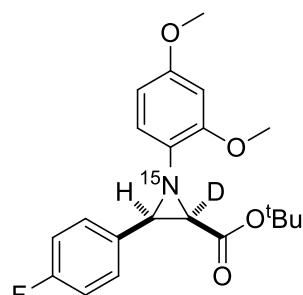
115.24



¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



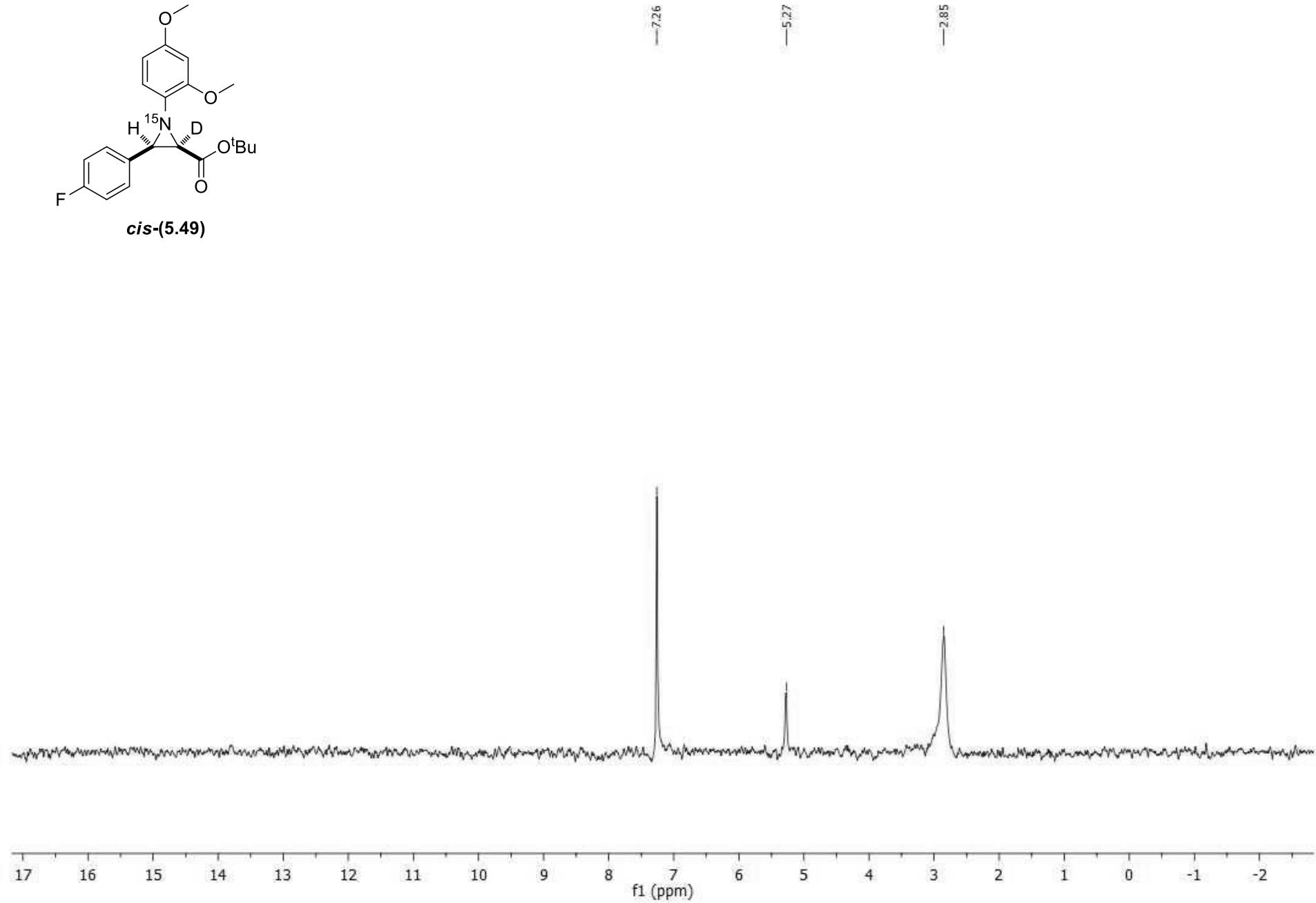
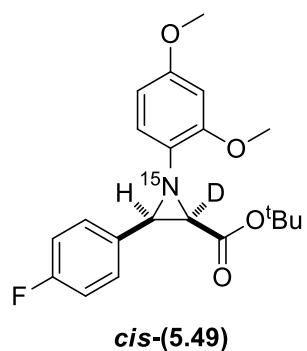
O (s)
156.69
Q (d)
167.37
P (d)
162.39

L (dd)
131.27
K (dd)
129.78
M (d)
134.95
J (d)
119.84
I (d)
114.75
H (s)
103.68
G (s)
99.79
F (s)
81.52

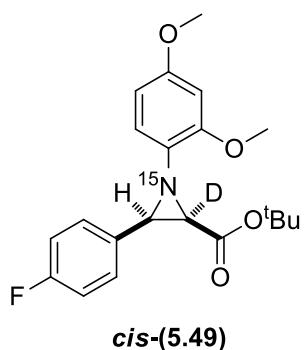
E (s)
55.80
C (m)
46.73
B (d)
47.05
D (s)
55.70

A (s)
27.96

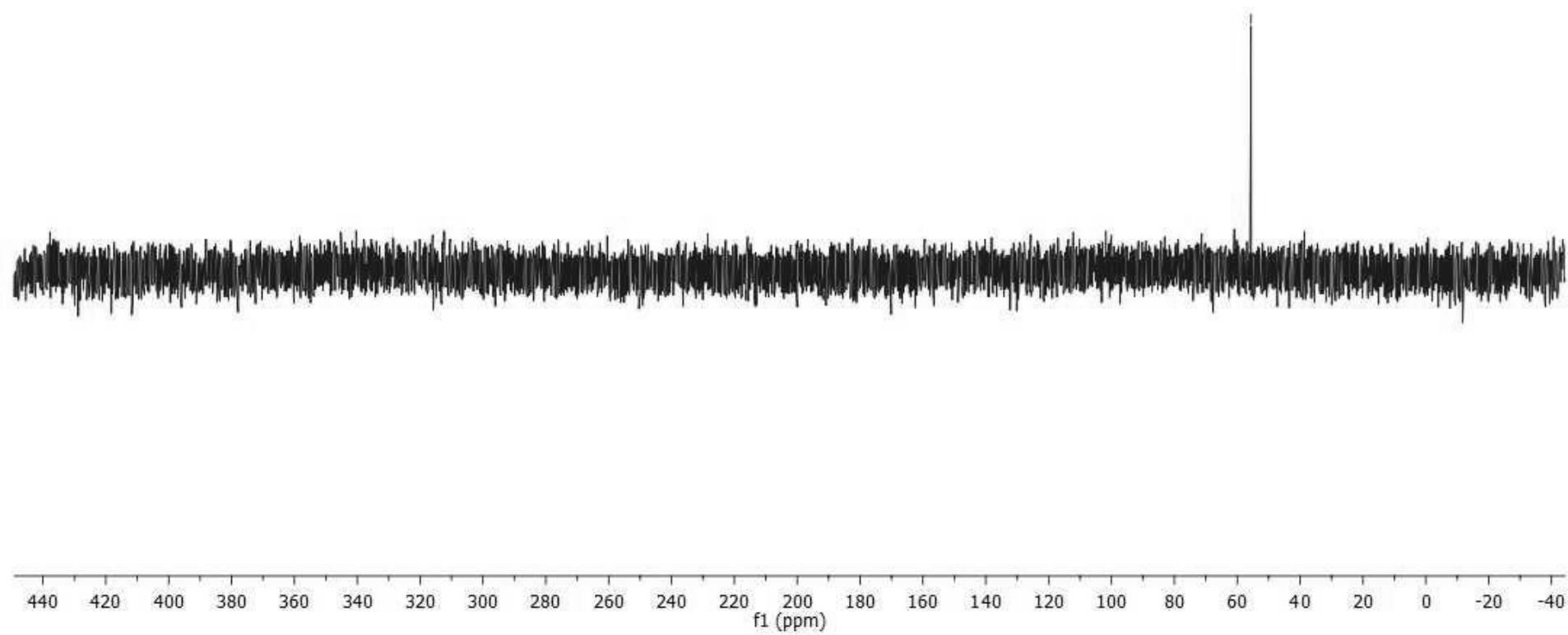
²H-NMR (CH_2Cl_2 , 77 MHz)



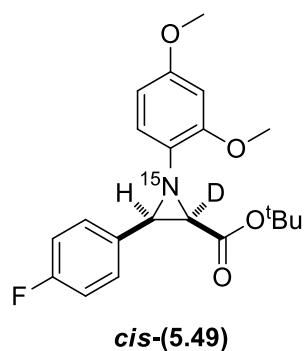
¹⁵N-NMR (CDCl₃, 51 MHz)



-55.62



¹⁹F-NMR (CDCl₃, 471 MHz)

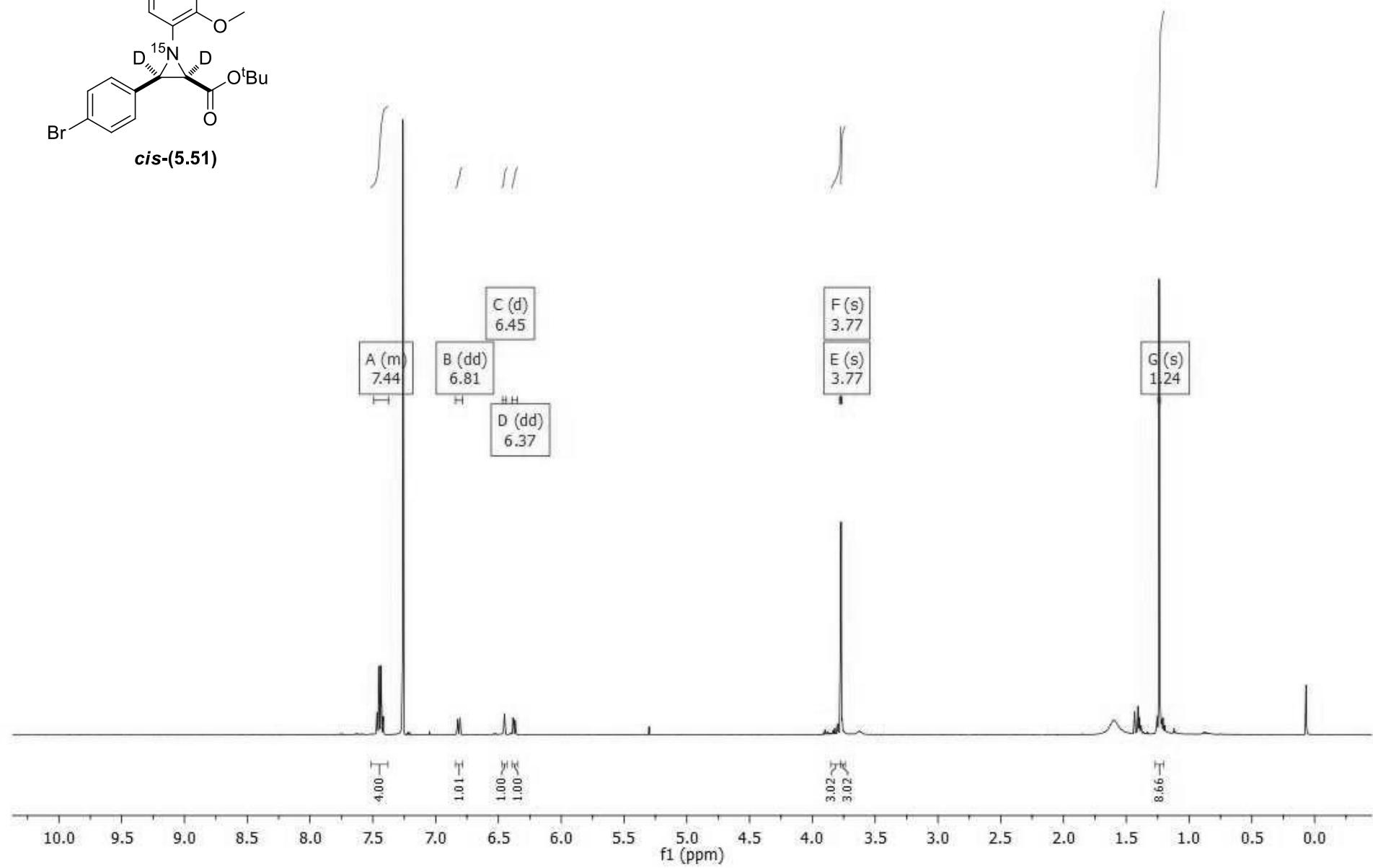
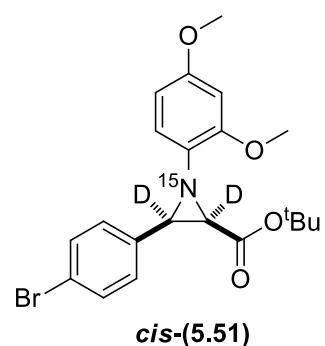


115.29

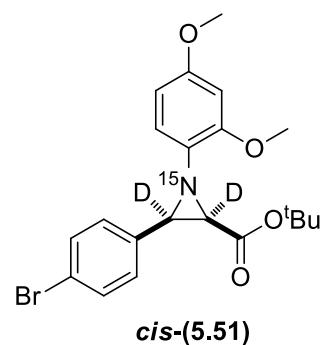
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210

f1 (ppm)

¹H-NMR (CDCl₃, 500 MHz)

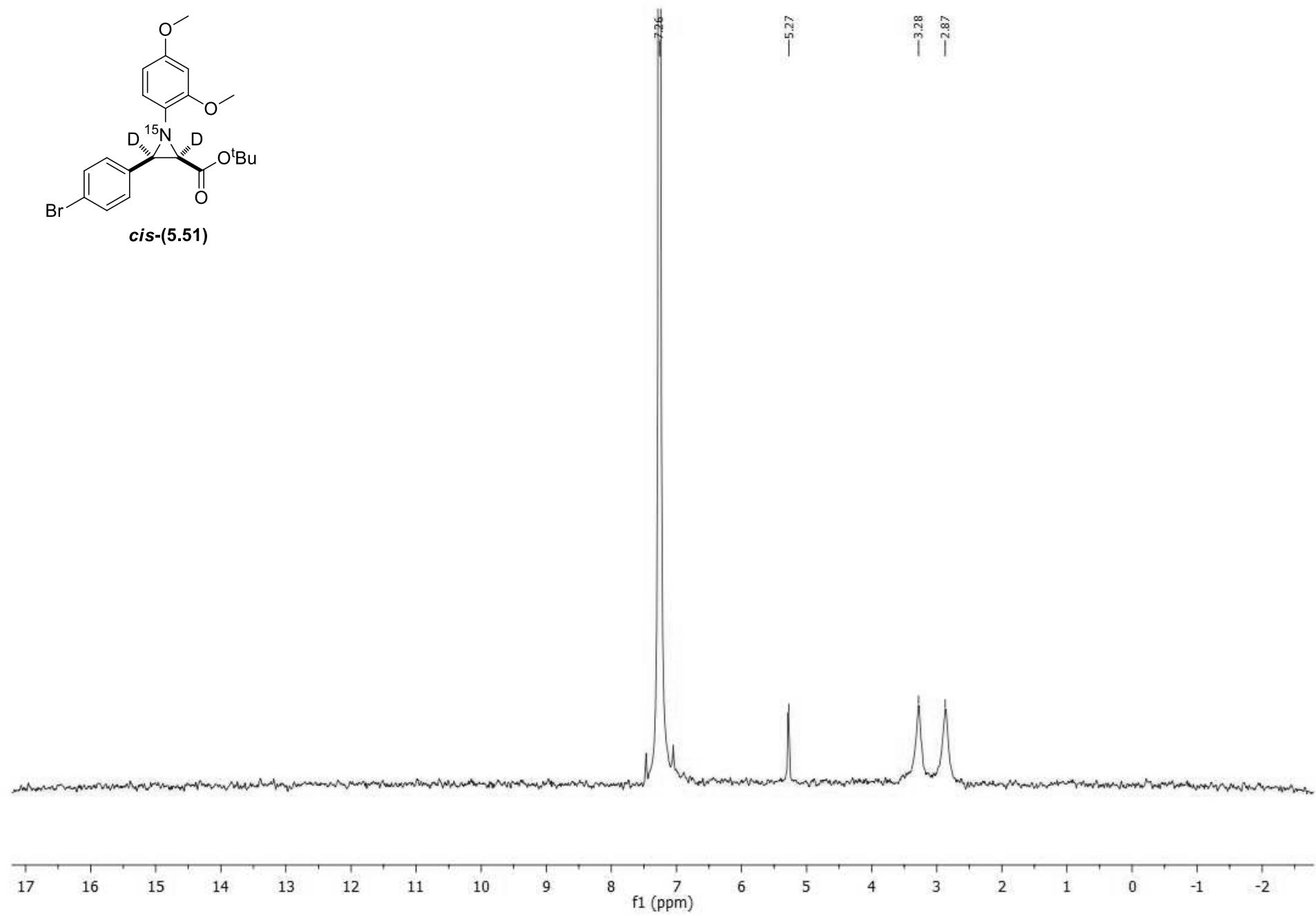
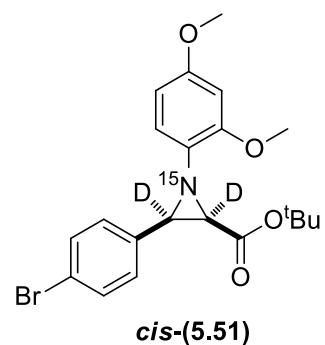


¹³C-NMR (CDCl₃, 126 MHz)

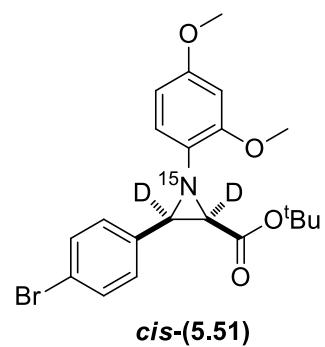


A (d) 167.24	B (s) 156.75	C (d) 153.14	D (d) 134.78	E (d) 134.58	F (s) 130.98	G (d) 129.96	H (s) 121.40	I (d) 119.85	J (s) 103.68	K (s) 99.79	L (s) 81.66	M (s) 55.71	Q (s) 55.80	P (m) 46.72	O (m) 47.06	N (s) 27.99
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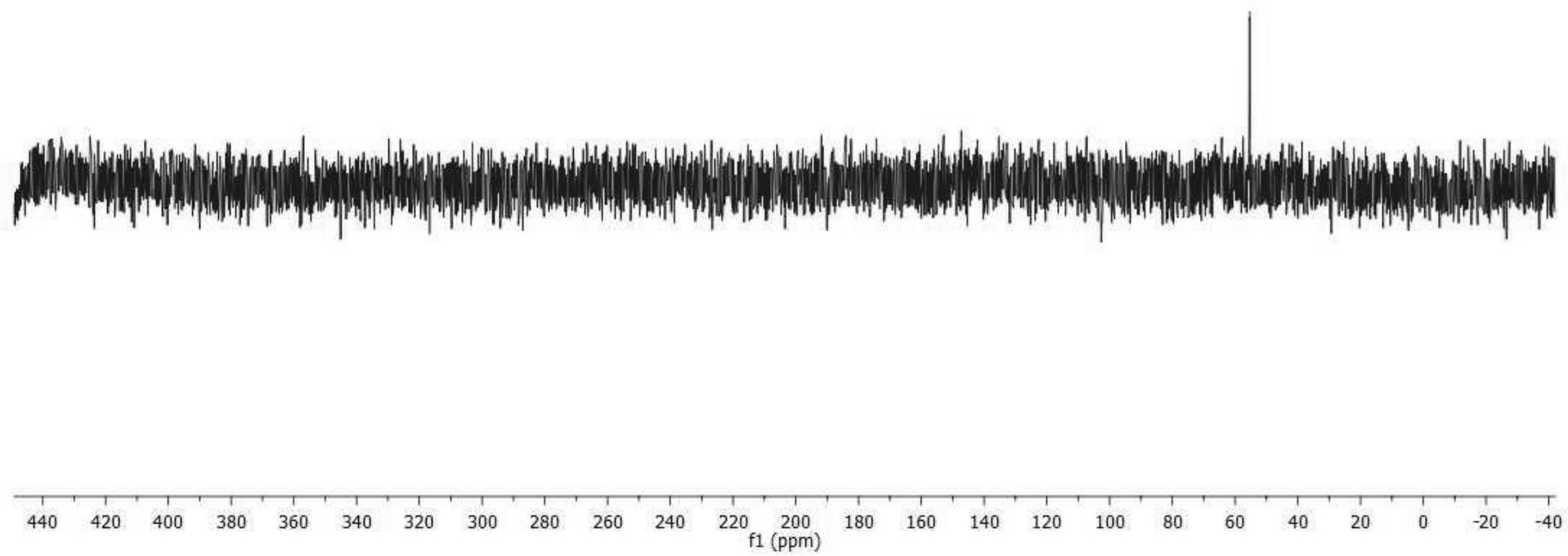
^2H -NMR (CH_2Cl_2 , 77 MHz)



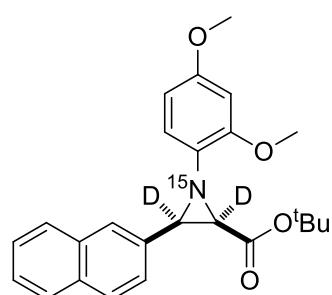
¹⁵N-NMR (CDCl₃, 51 MHz)



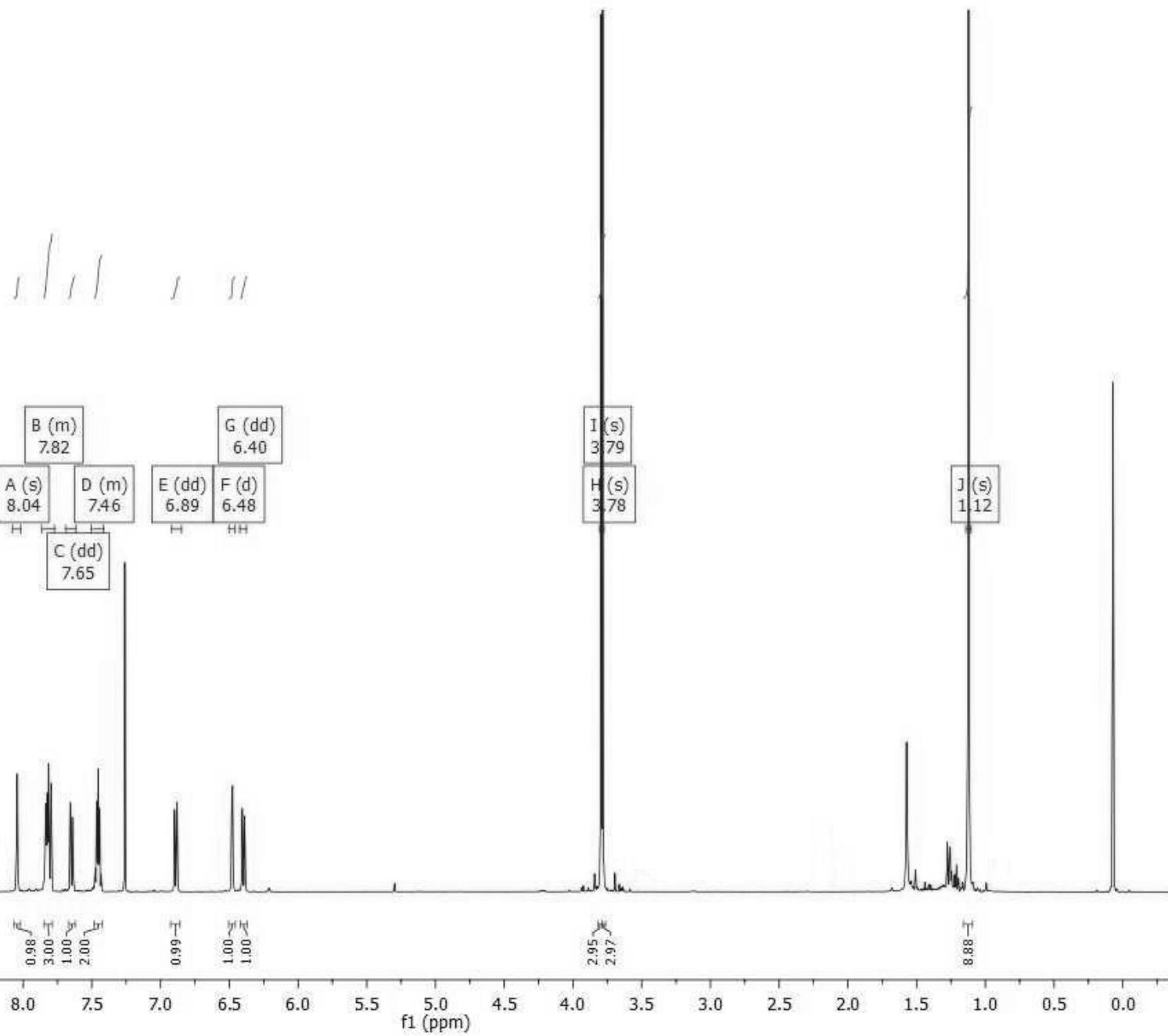
—55.35



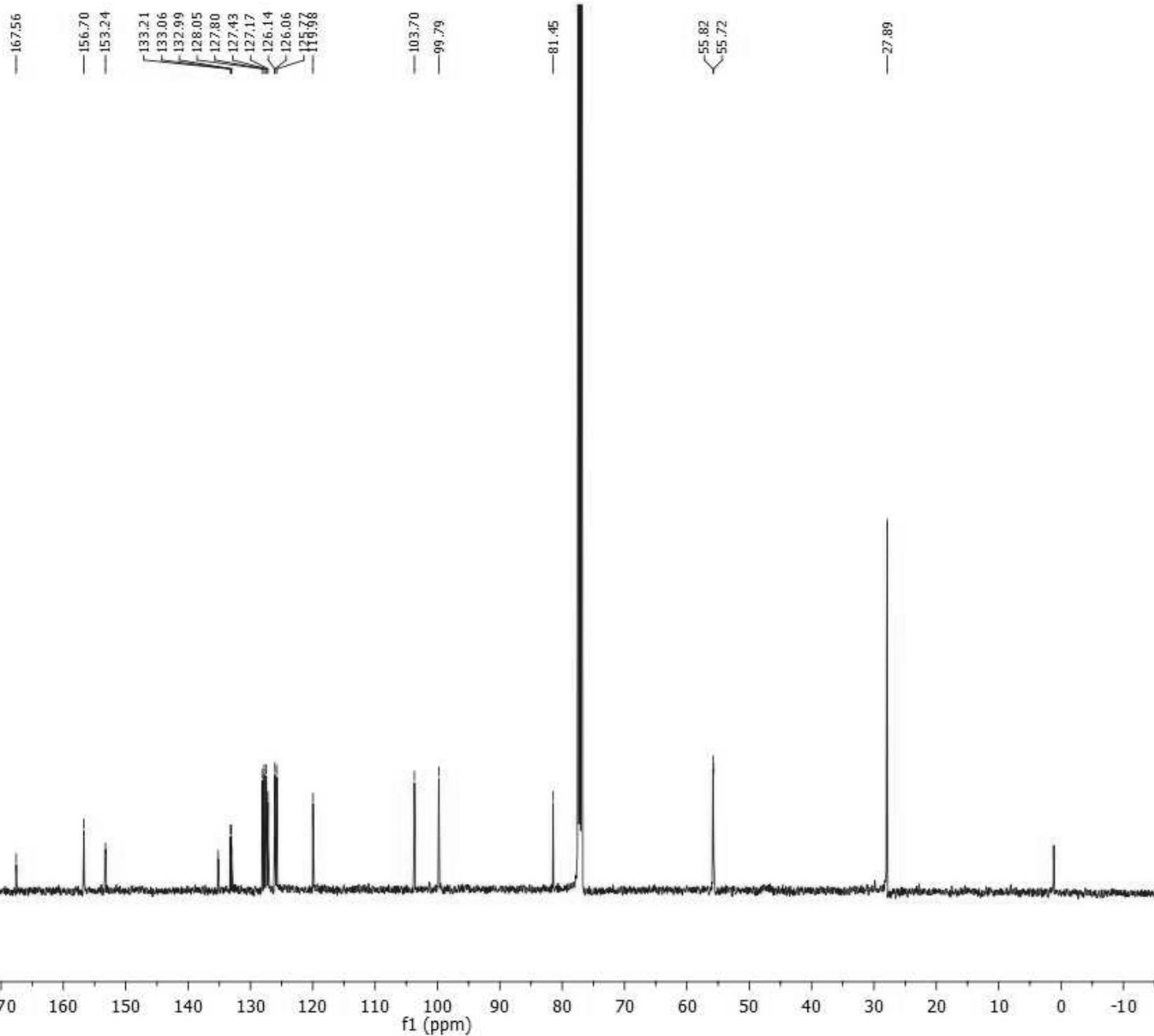
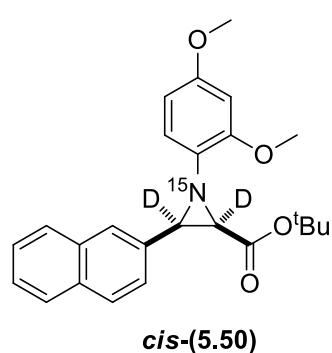
¹H-NMR (CDCl₃, 500 MHz)



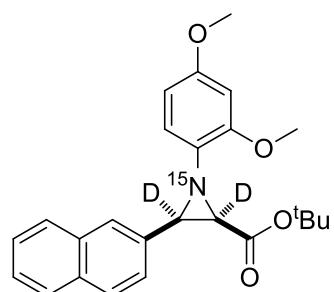
cis-(5.50)



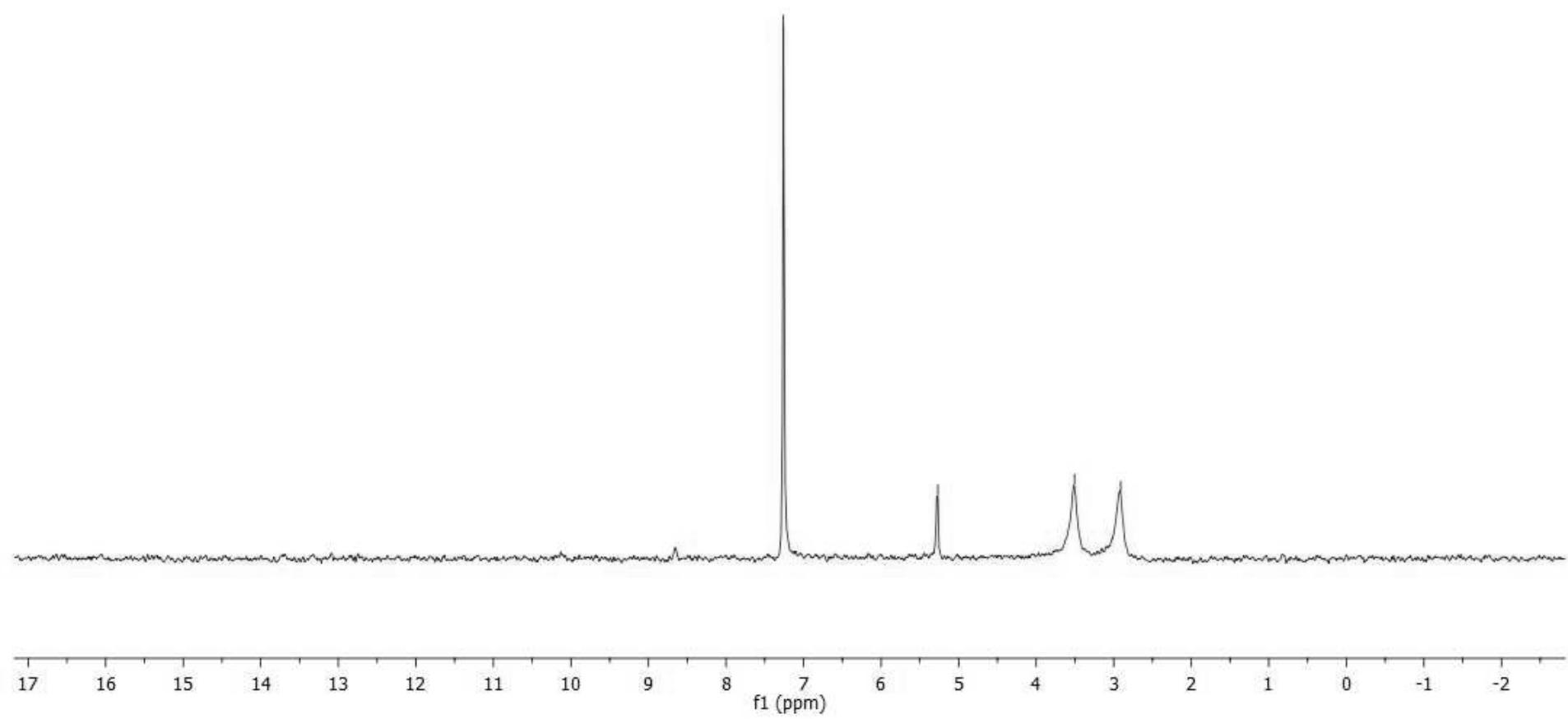
¹³C-NMR (CDCl₃, 126 MHz)



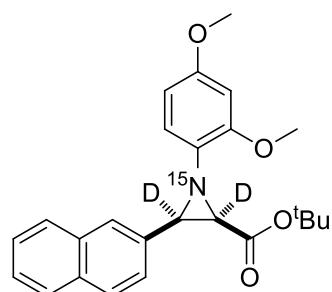
²H-NMR (CH_2Cl_2 , 77 MHz)



cis-(5.50)

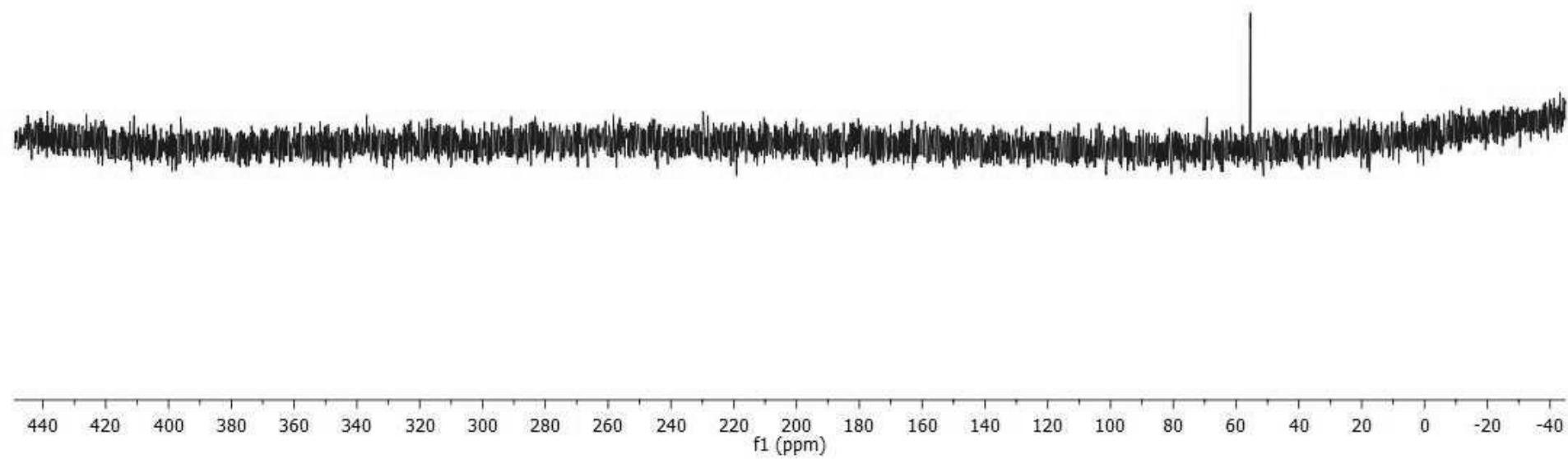


¹⁵N-NMR (CDCl₃, 51 MHz)

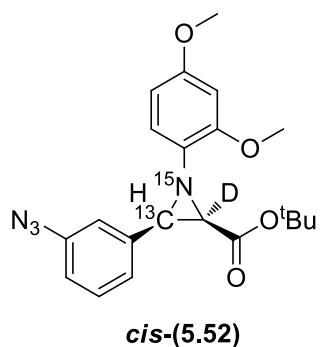


cis-(5.50)

—55.50



¹H-NMR (CDCl₃, 500 MHz)



|| ||

A (m)
7.30

B (m)
6.93

C (dd)
6.83

D (d)
6.46

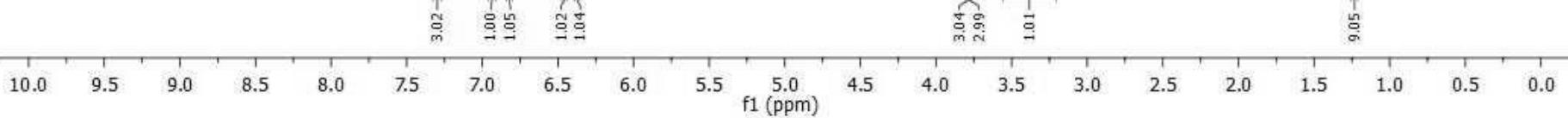
E (dd)
6.38

F (s)
3.79

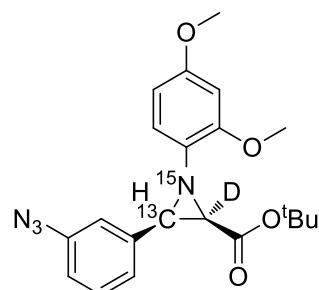
G (s)
3.77

H (d)
3.38

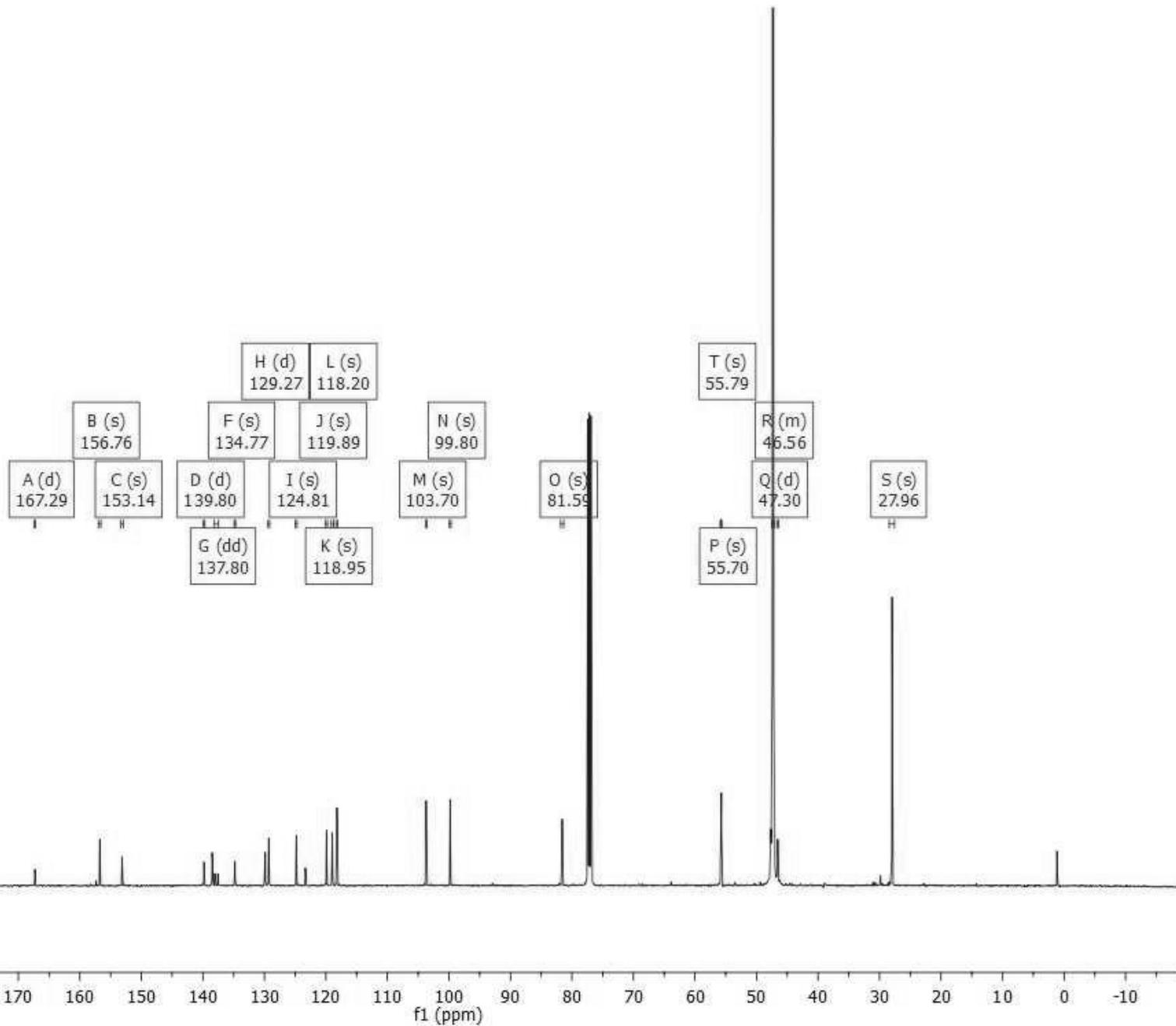
I (s)
1.24



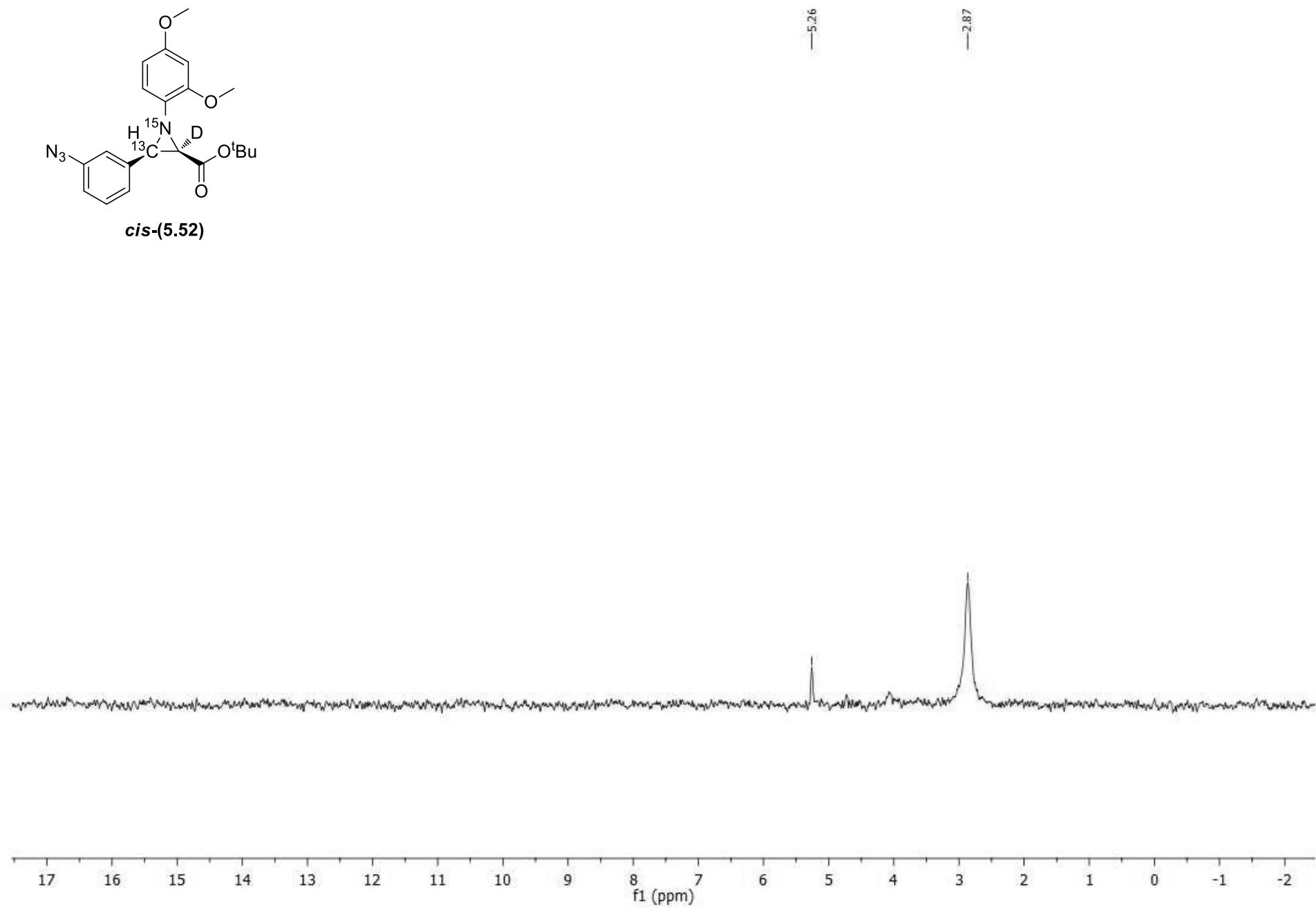
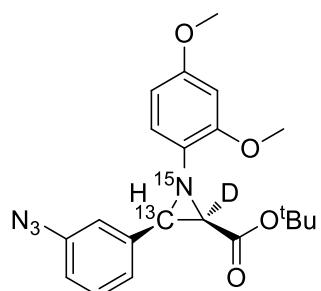
¹³C-NMR (CDCl₃, 126 MHz)



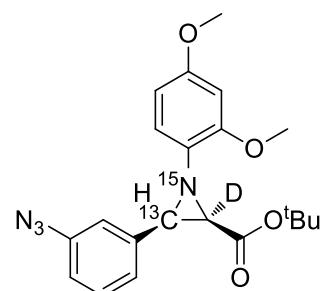
cis-(5.52)



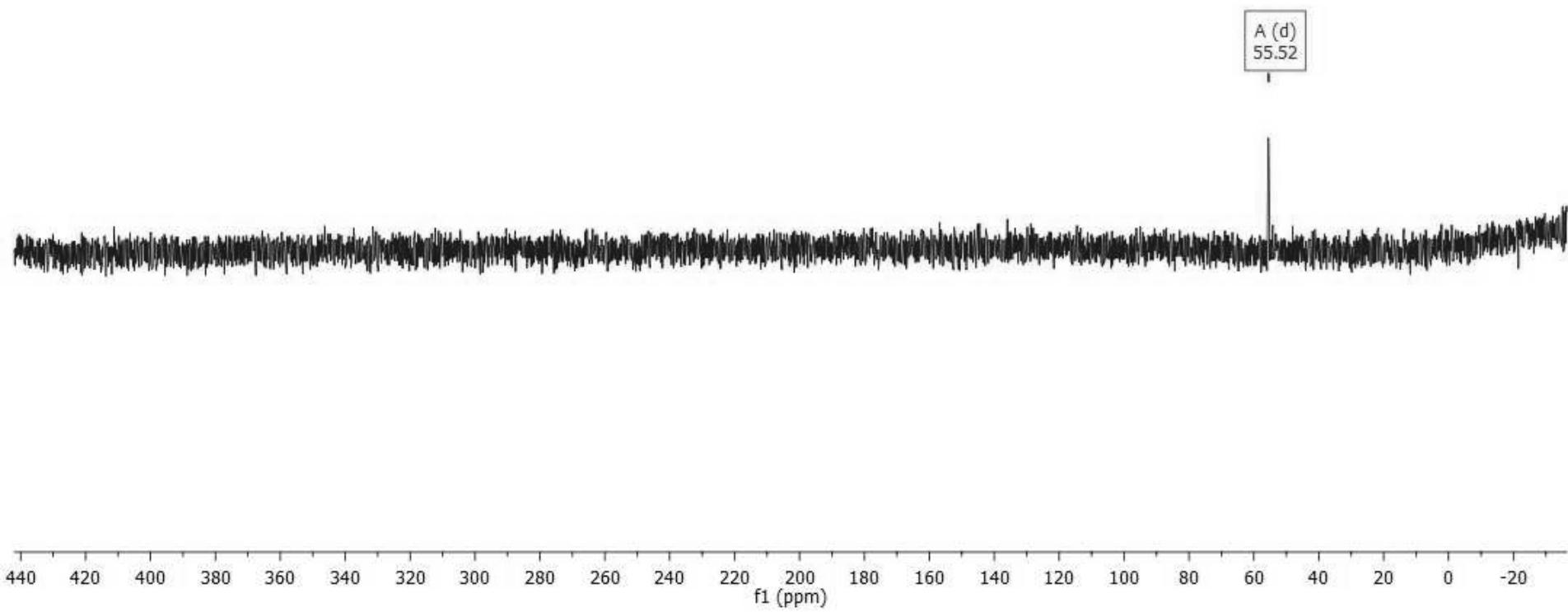
²H-NMR (CH_2Cl_2 , 77 MHz)



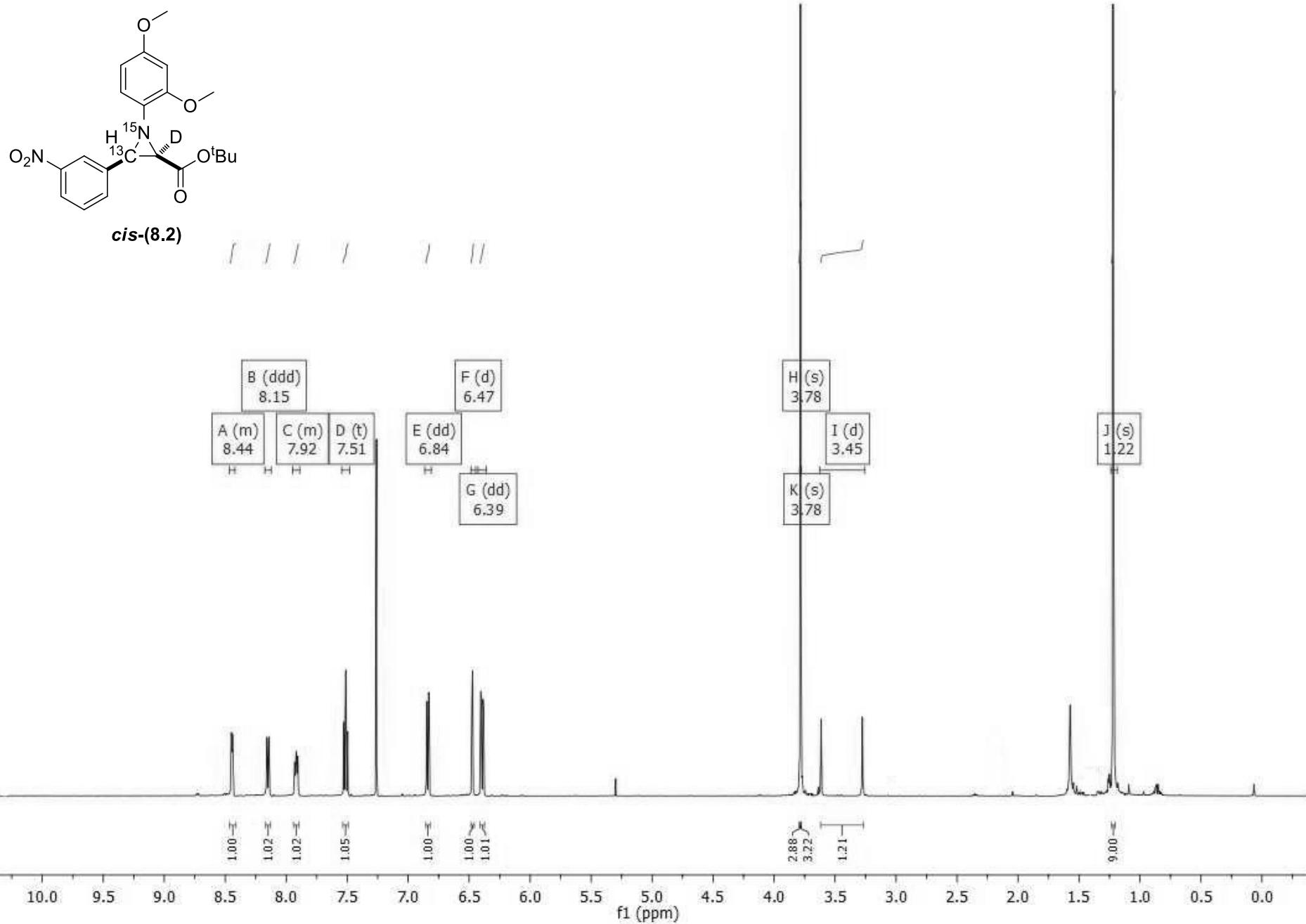
¹⁵N-NMR (CDCl₃, 51 MHz)



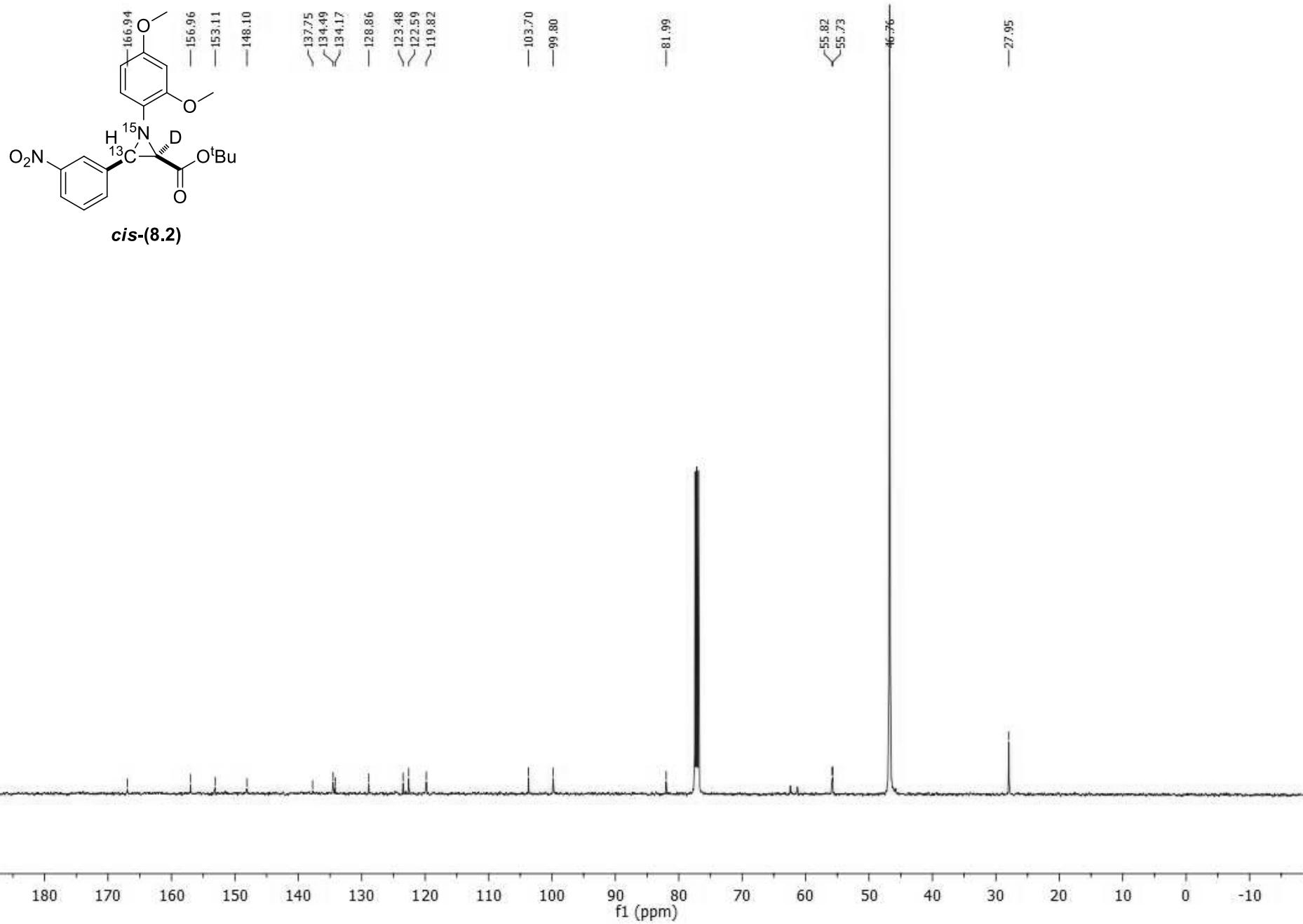
cis-(5.52)



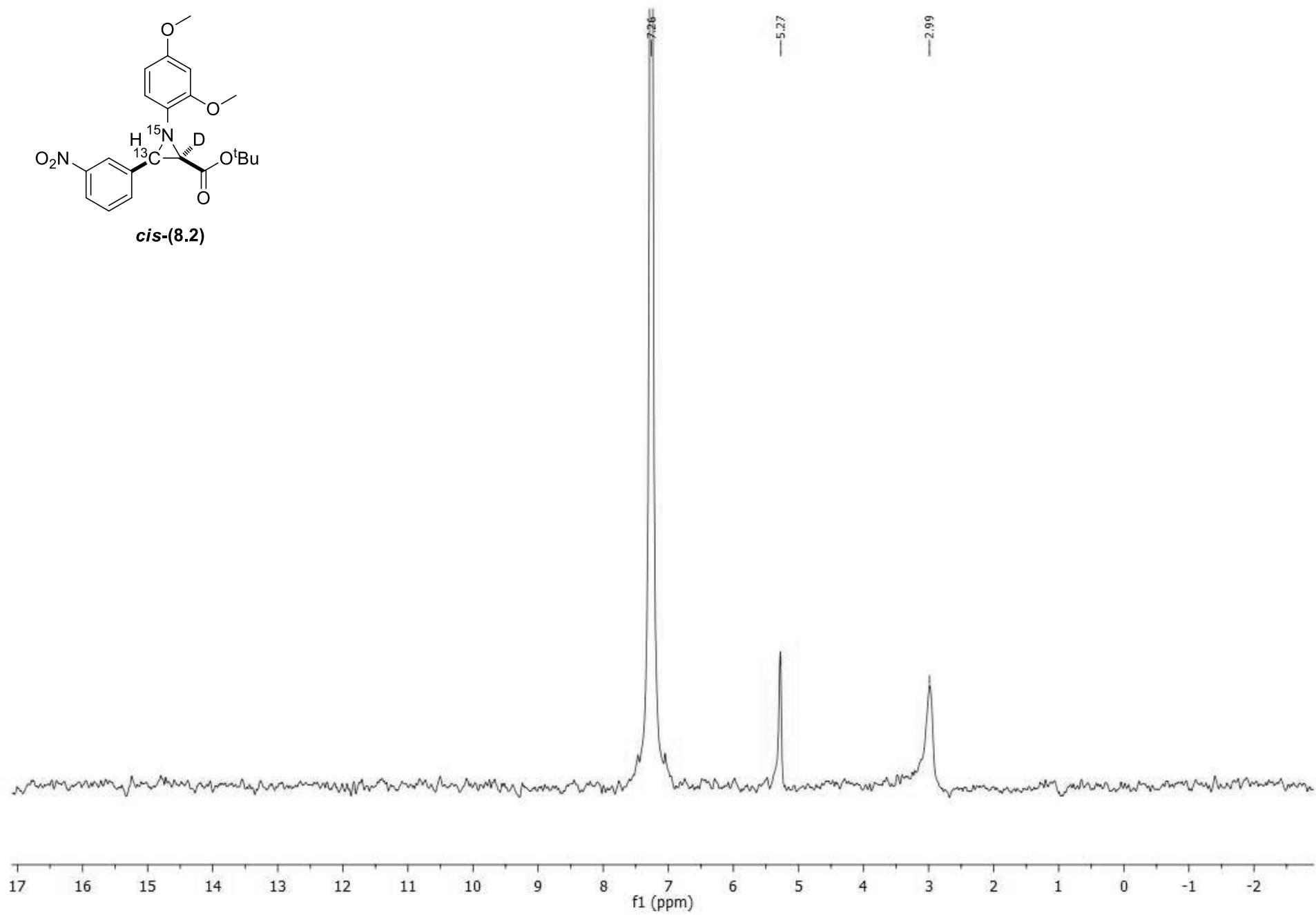
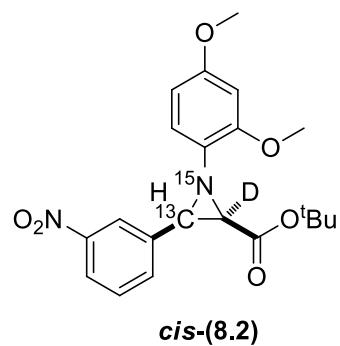
¹H-NMR (CDCl₃, 500 MHz)



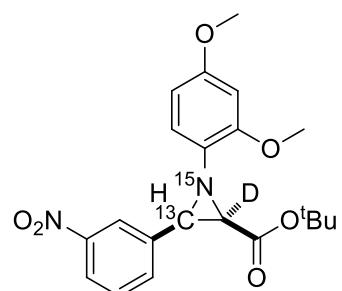
¹³C-NMR (CDCl₃, 126 MHz)



²H-NMR (CH_2Cl_2 , 77 MHz)

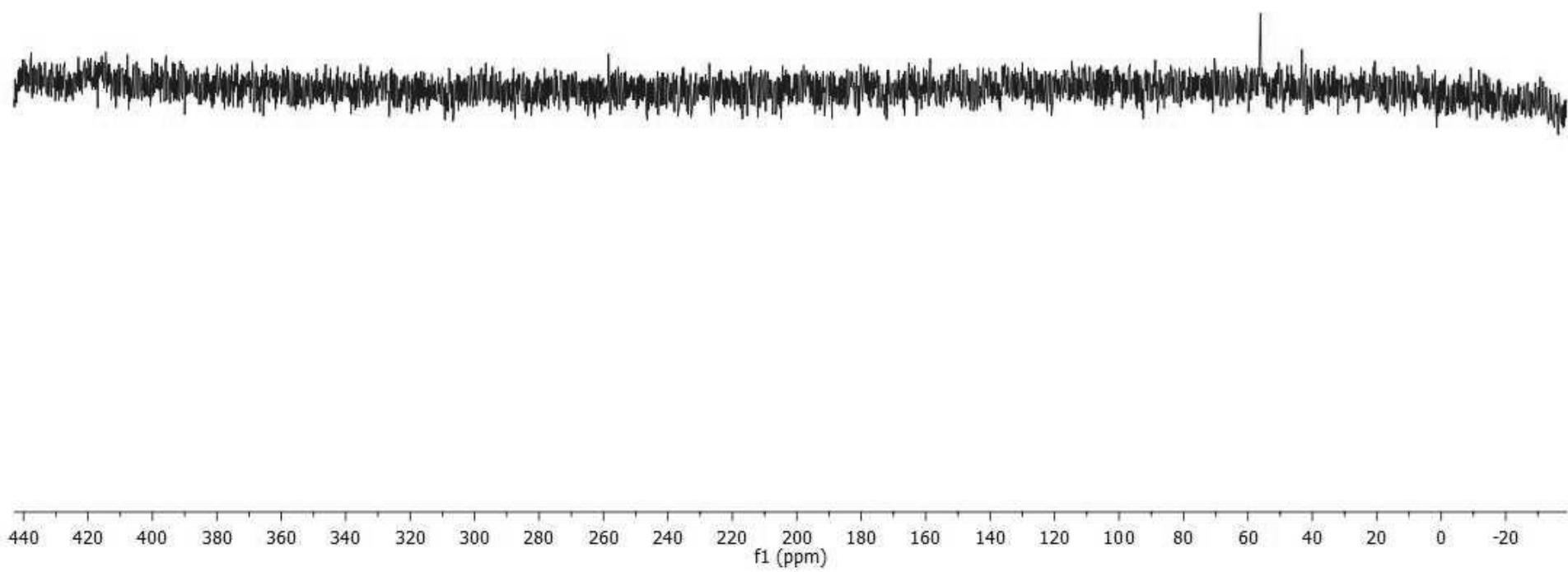


¹⁵N-NMR (CDCl₃, 51 MHz)

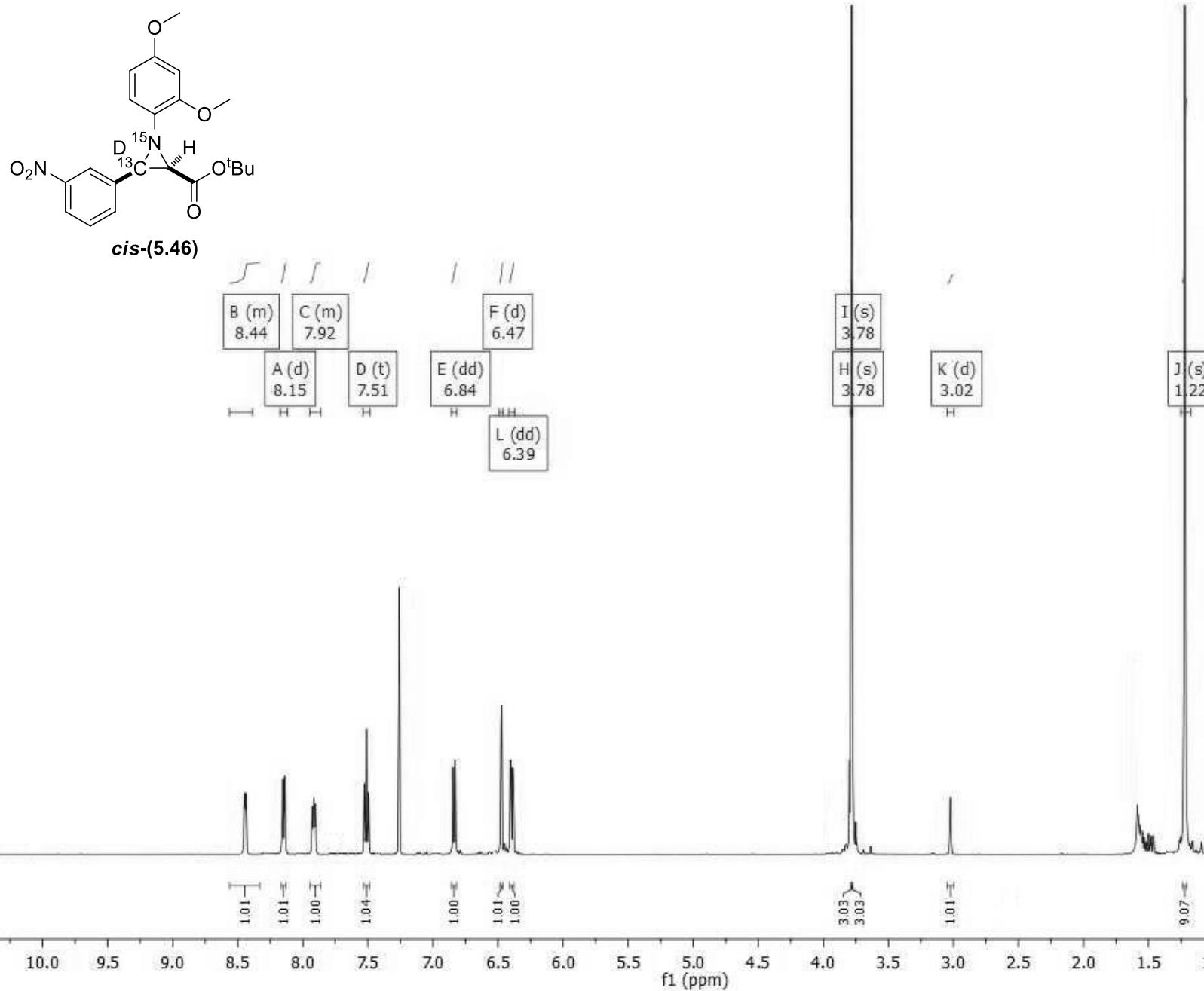


cis-(8.2)

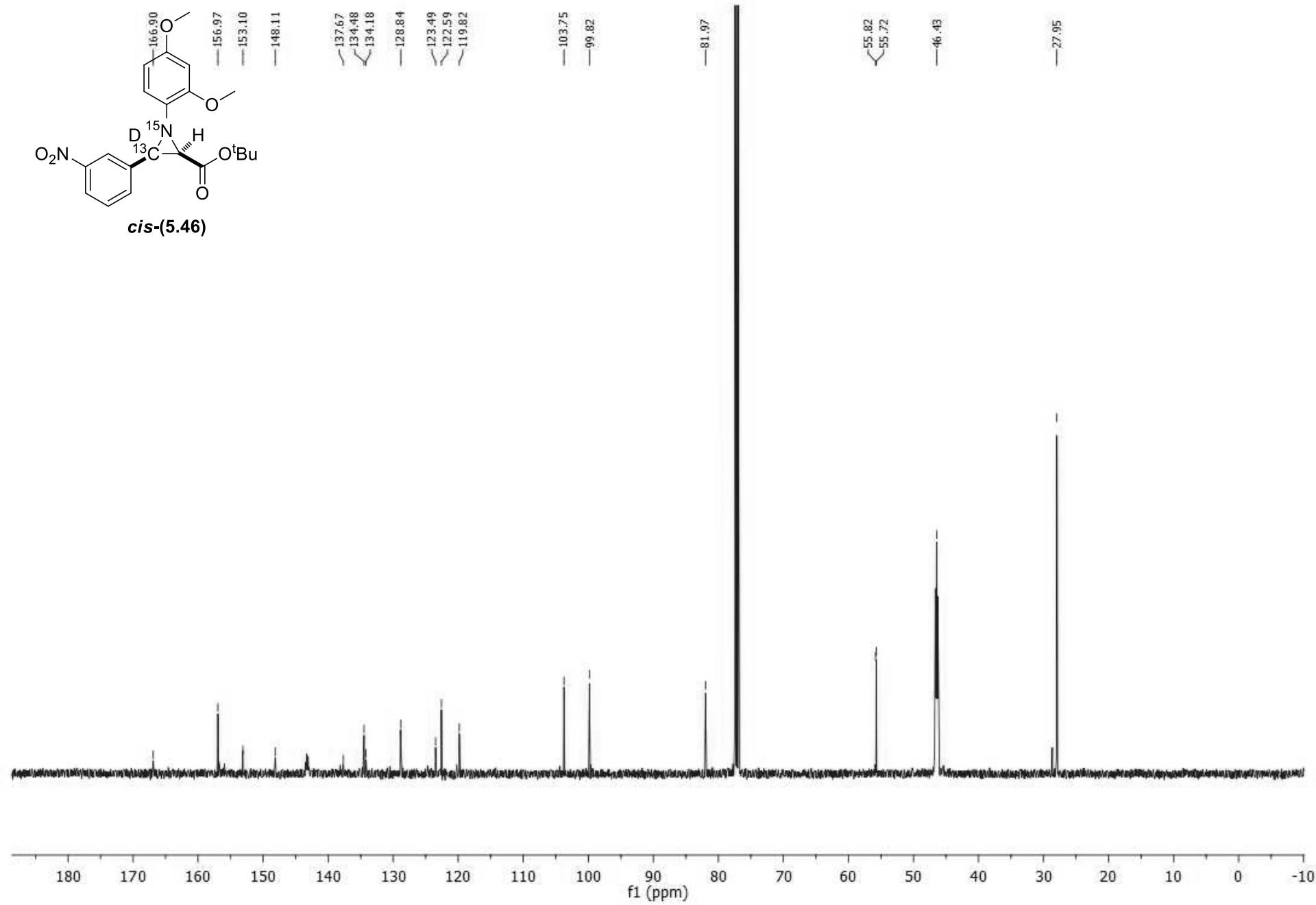
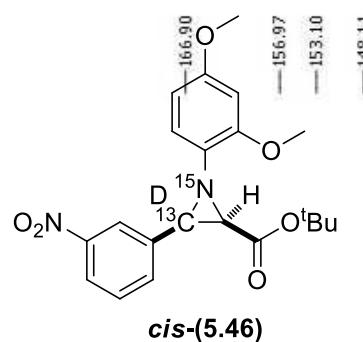
A (d)
56.00



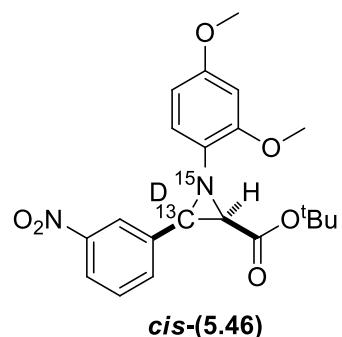
¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)

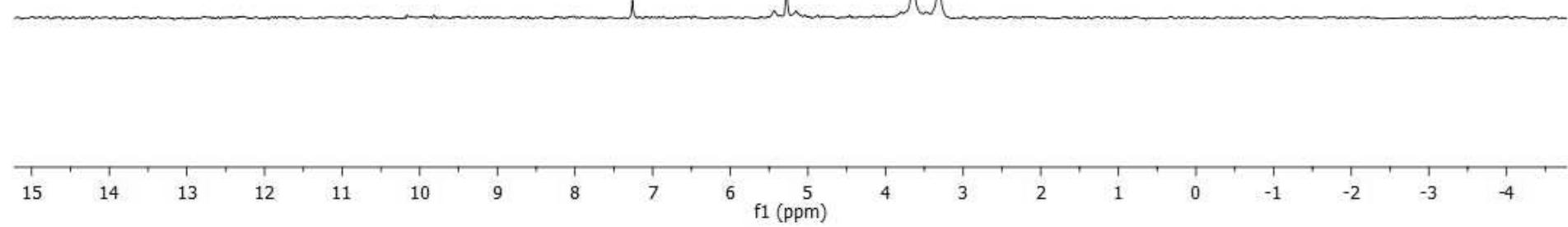


²H-NMR (CH_2Cl_2 , 77 MHz)

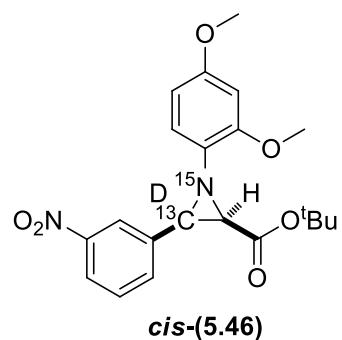


—7.26
—5.27

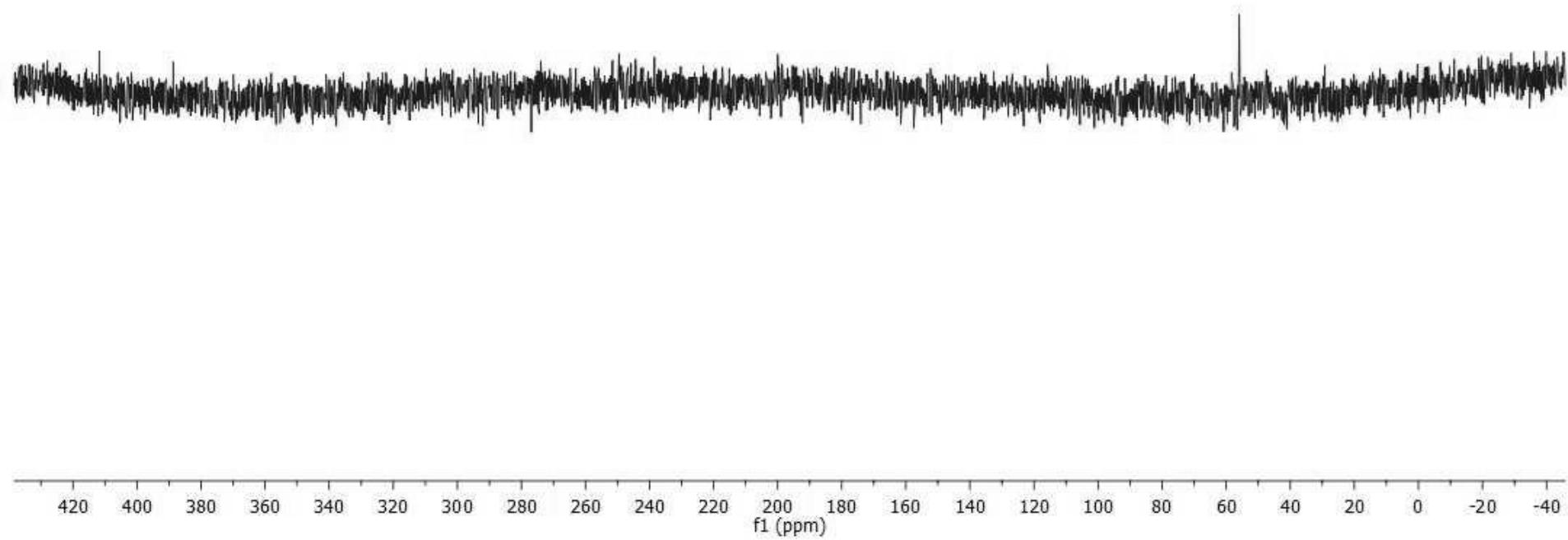
A (d)
3.48



¹⁵N-NMR (CDCl₃, 51 MHz)



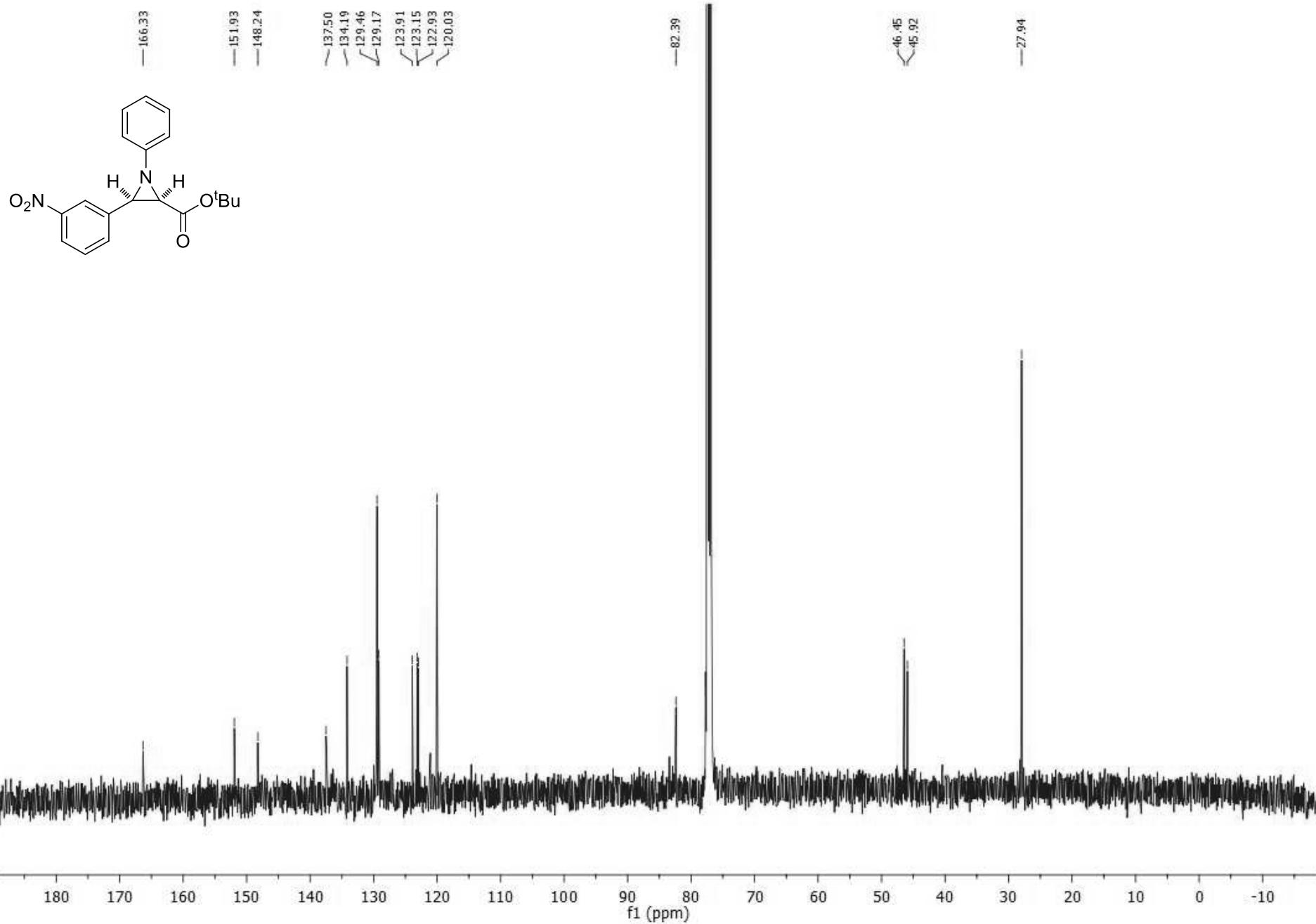
A (d)
56.04



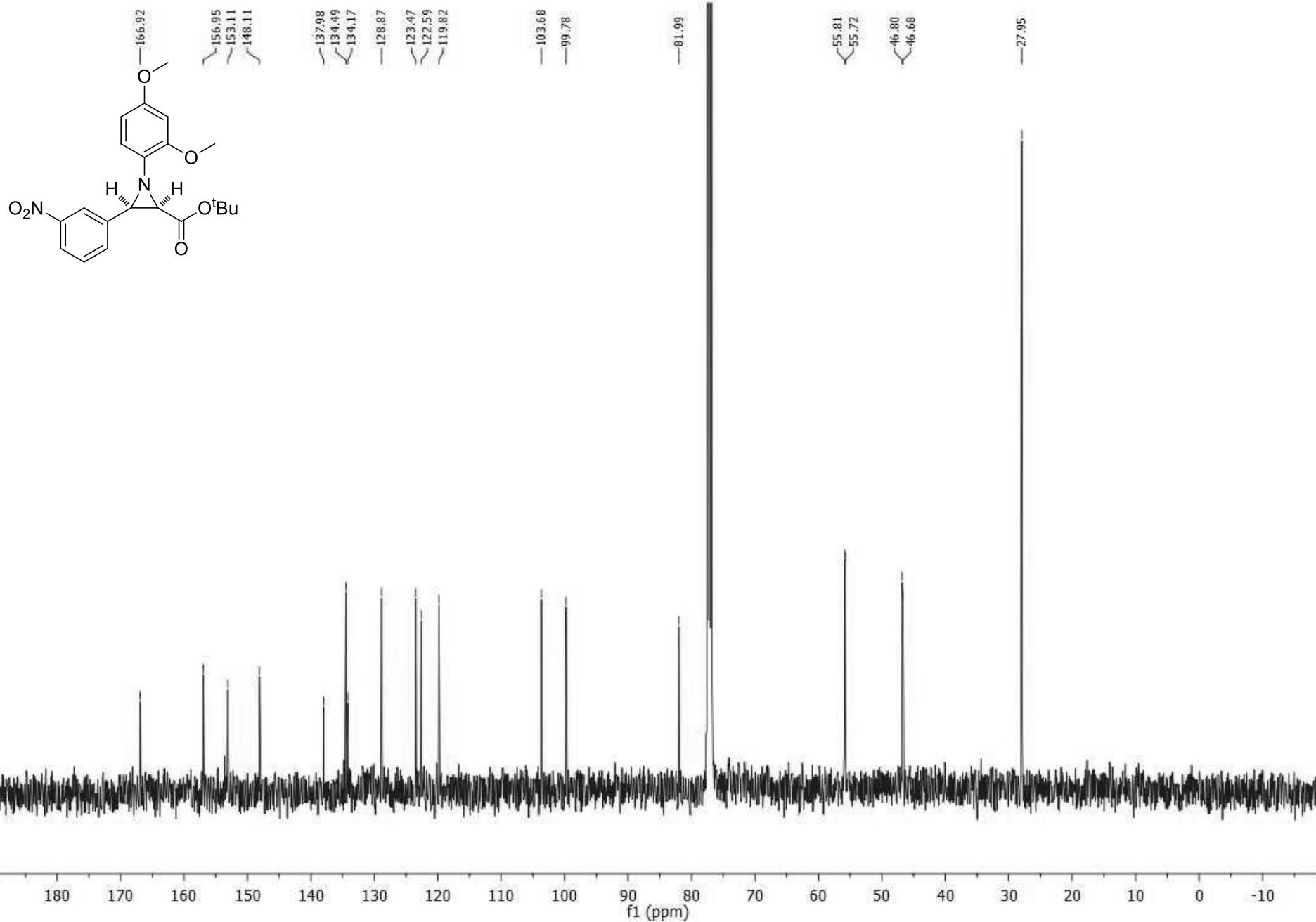
Racemic spectra

- Due to ^{13}C suppression of the carbon spectra of ^{13}C labelled compounds, the spectra of racemic non-labelled compounds are attached below for the peak comparison.

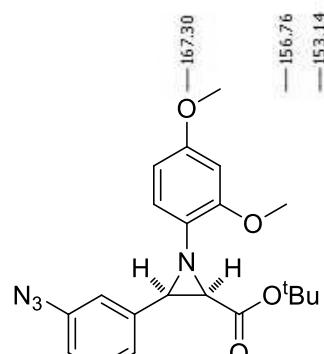
¹³C-NMR (CDCl₃, 126 MHz)



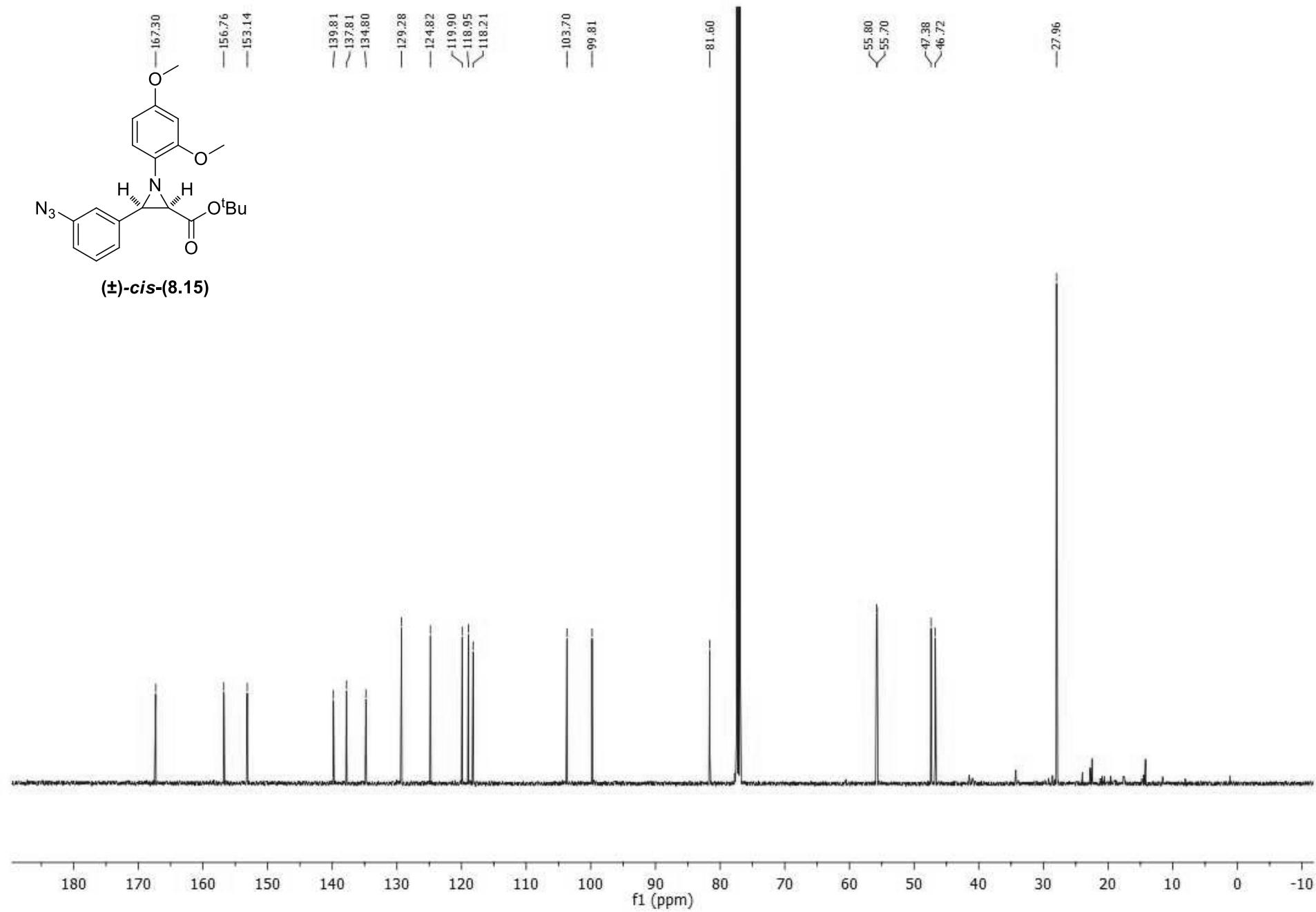
¹³C-NMR (CDCl₃, 126 MHz)



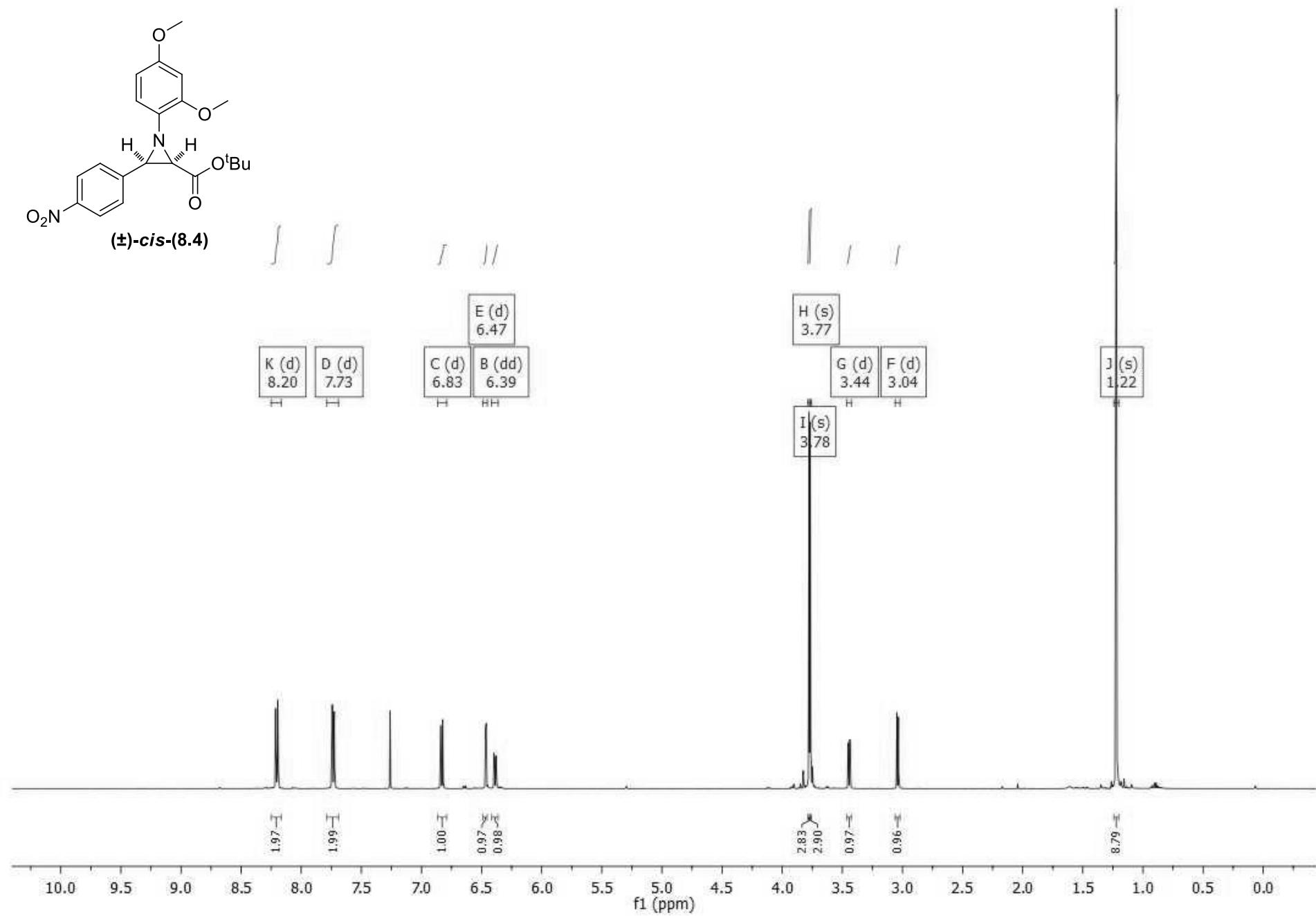
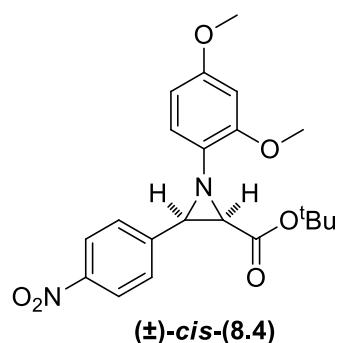
¹³C-NMR (CDCl₃, 126 MHz)



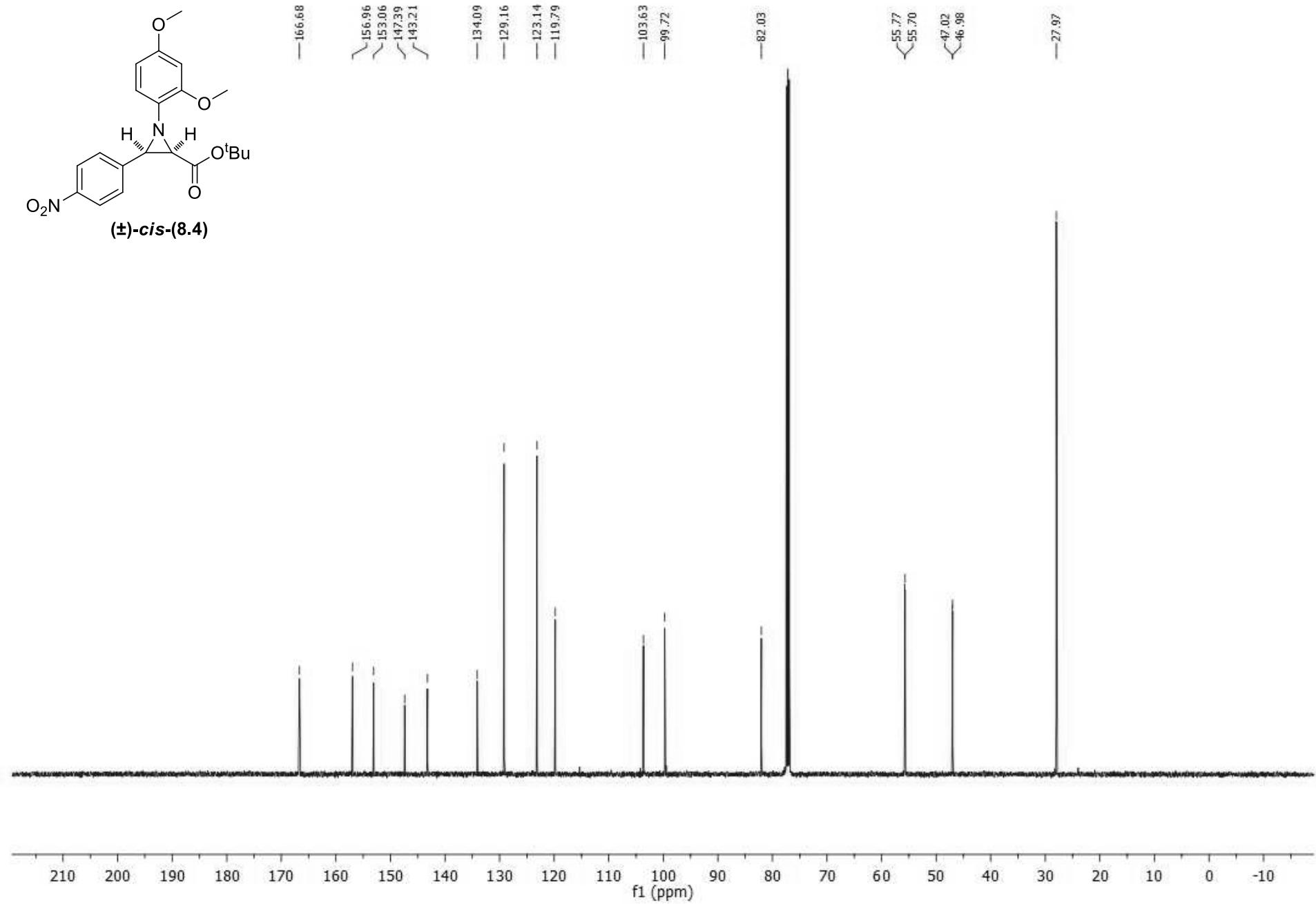
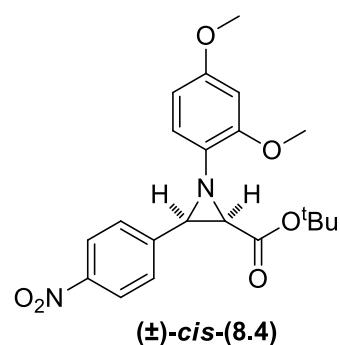
(±)-*cis*-(8.15)



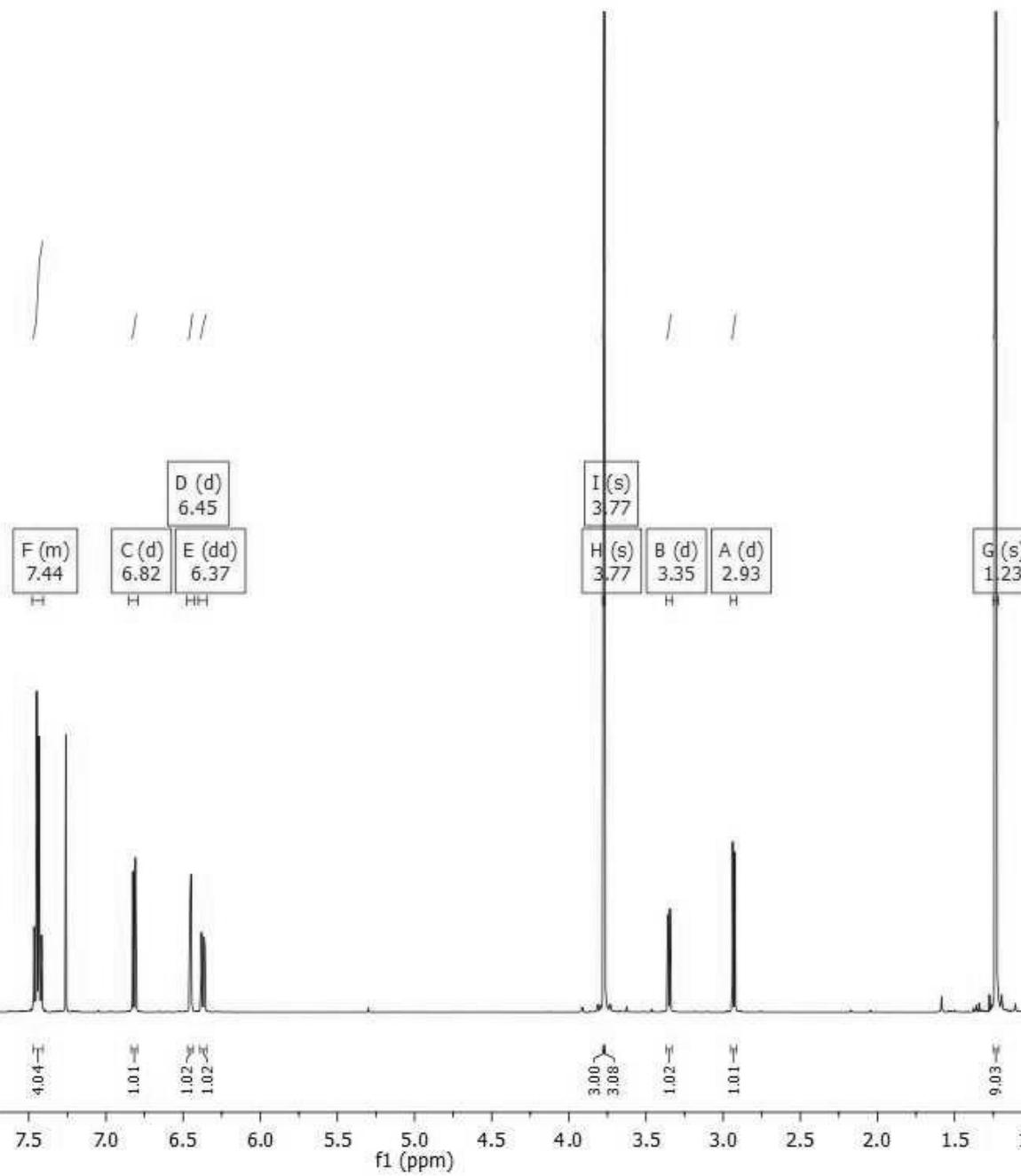
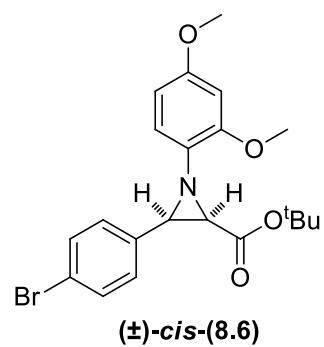
¹H-NMR (CDCl₃, 500 MHz)



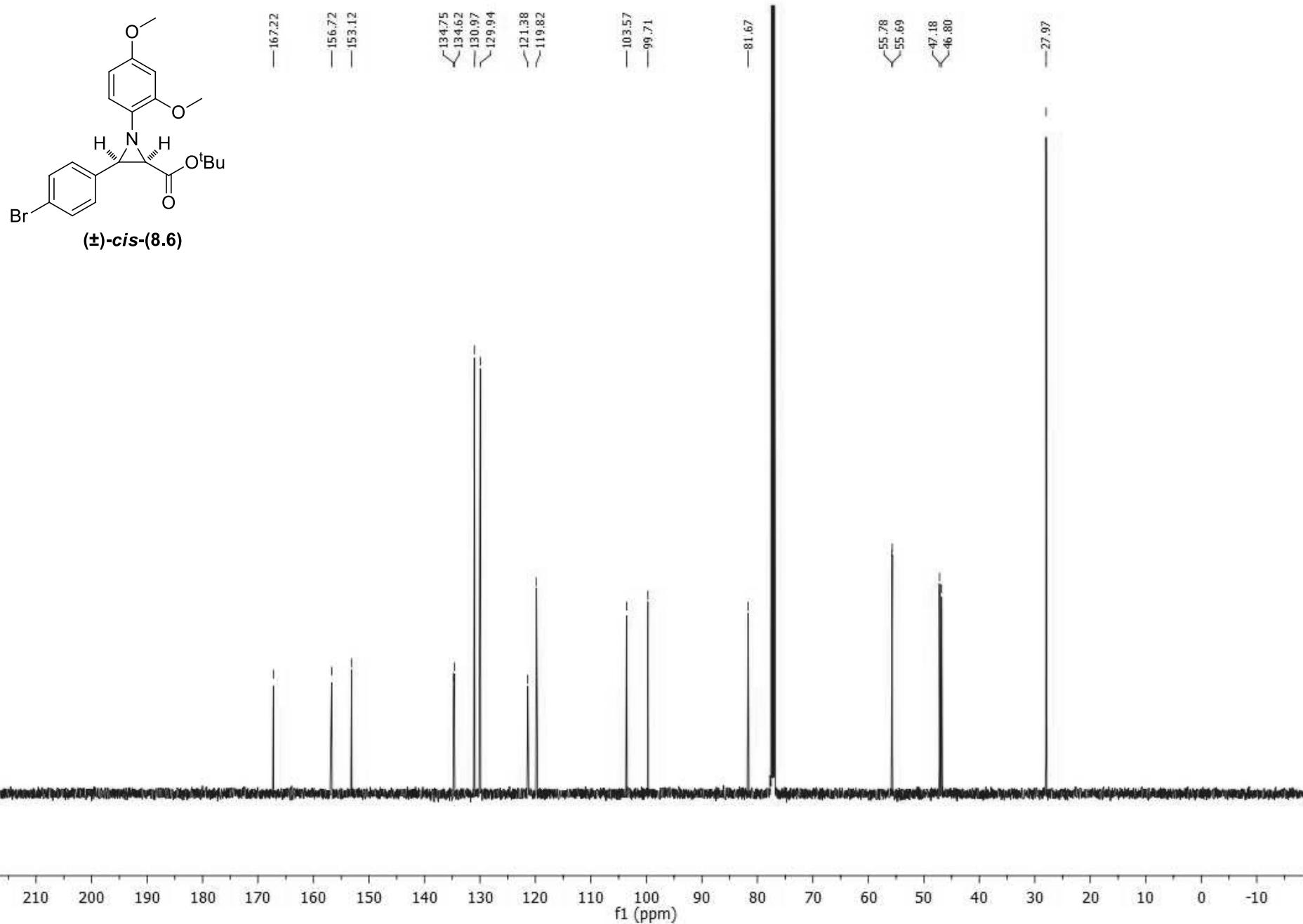
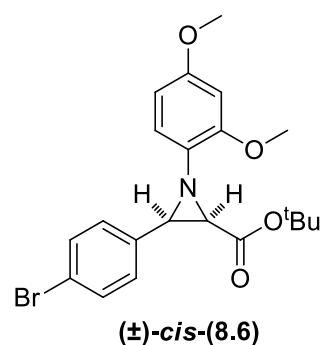
¹³C-NMR (CDCl₃, 126 MHz)



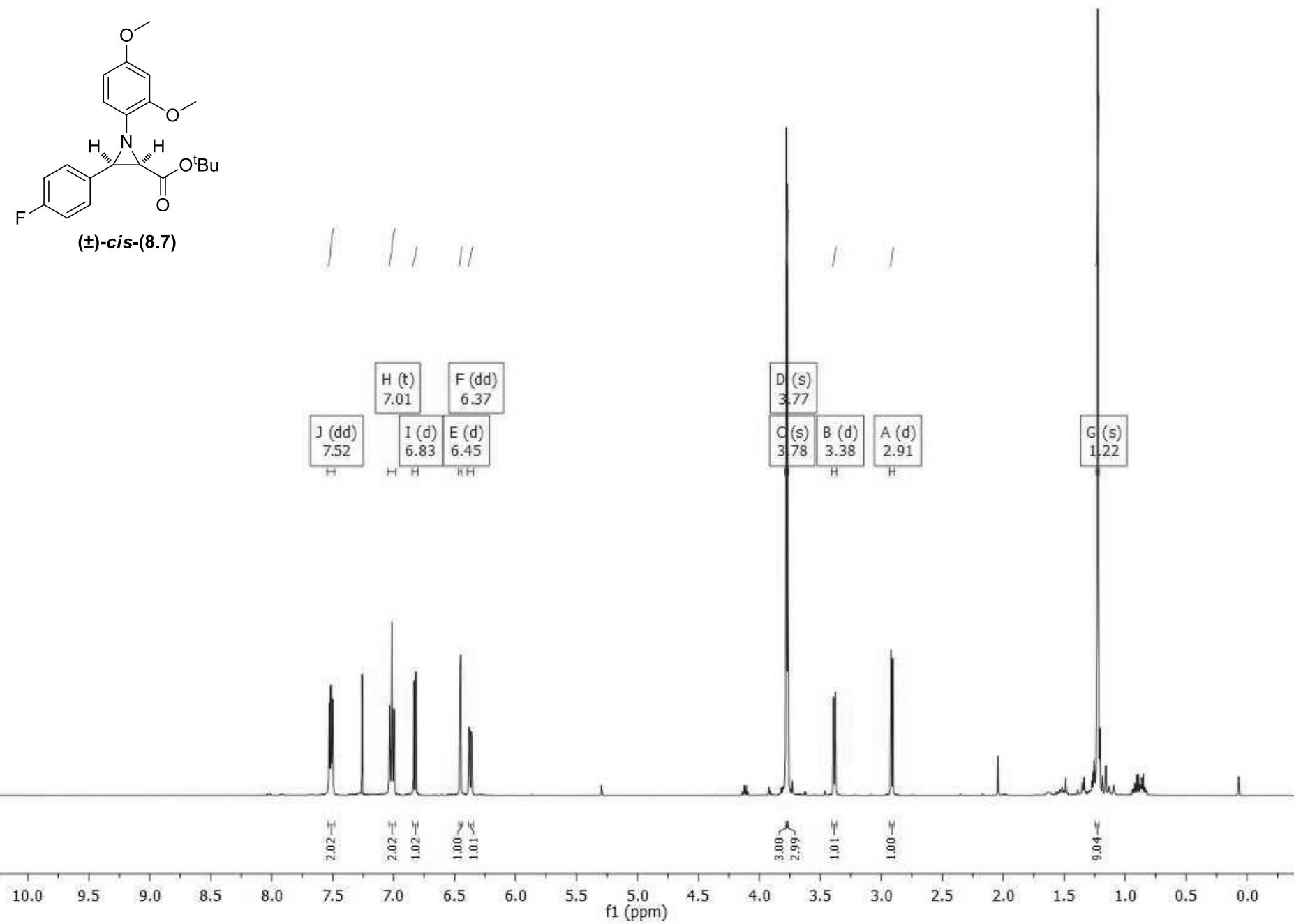
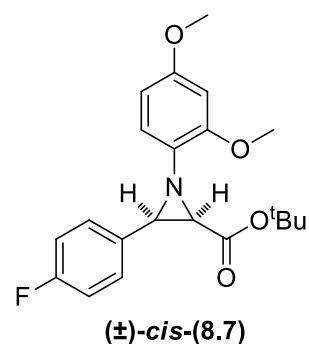
¹H-NMR (CDCl₃, 500 MHz)



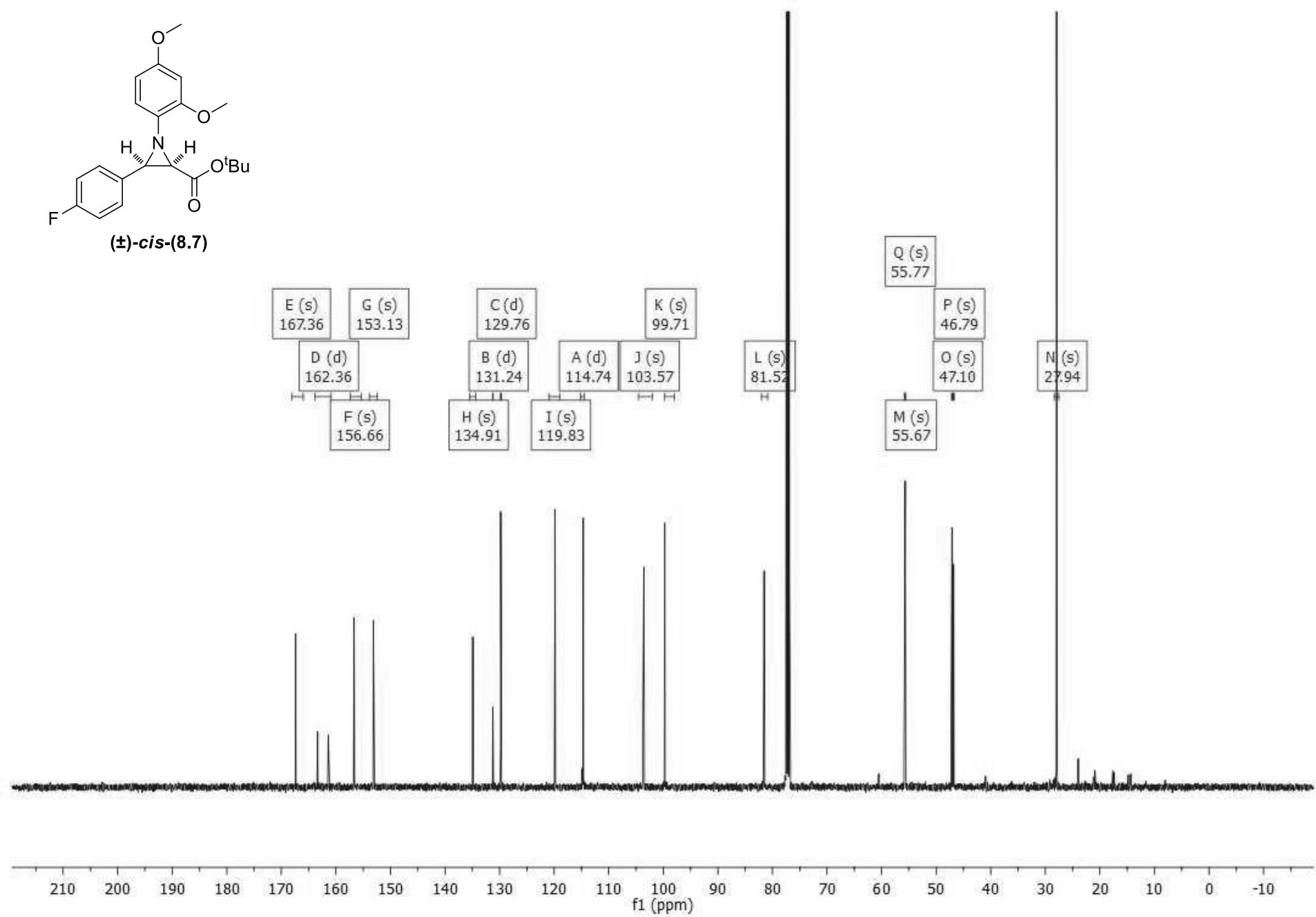
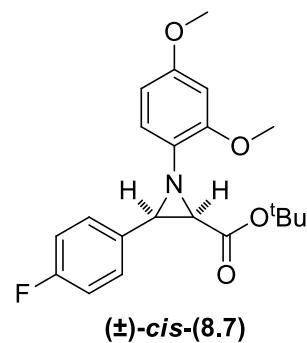
¹³C-NMR (CDCl₃, 126 MHz)



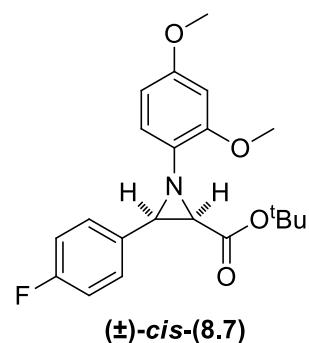
¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



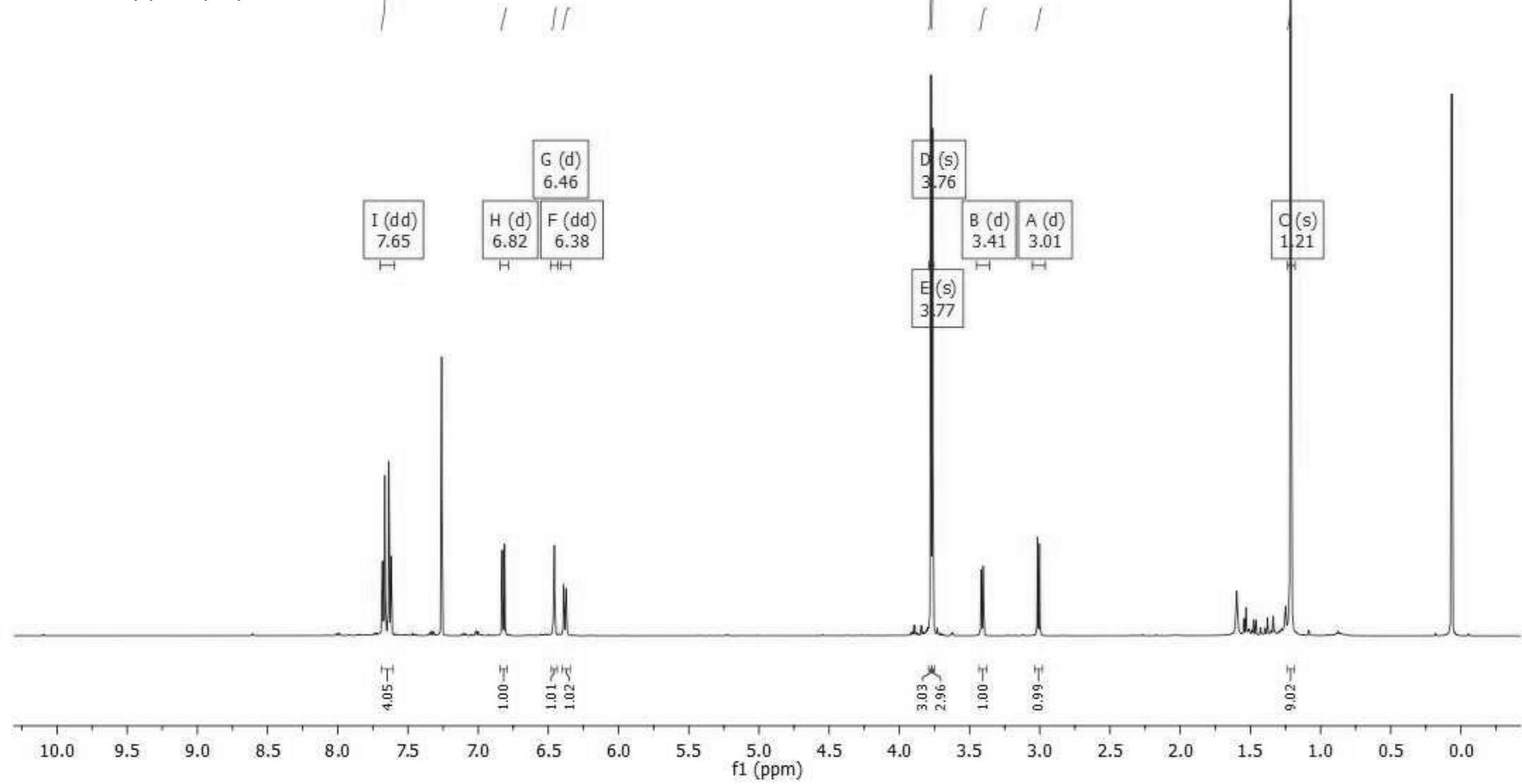
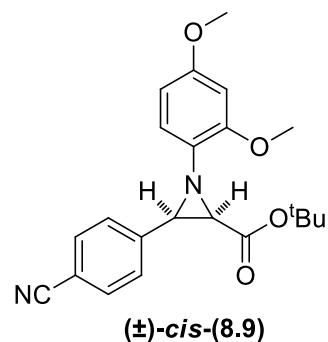
¹⁹F-NMR (CDCl₃, 471 MHz)



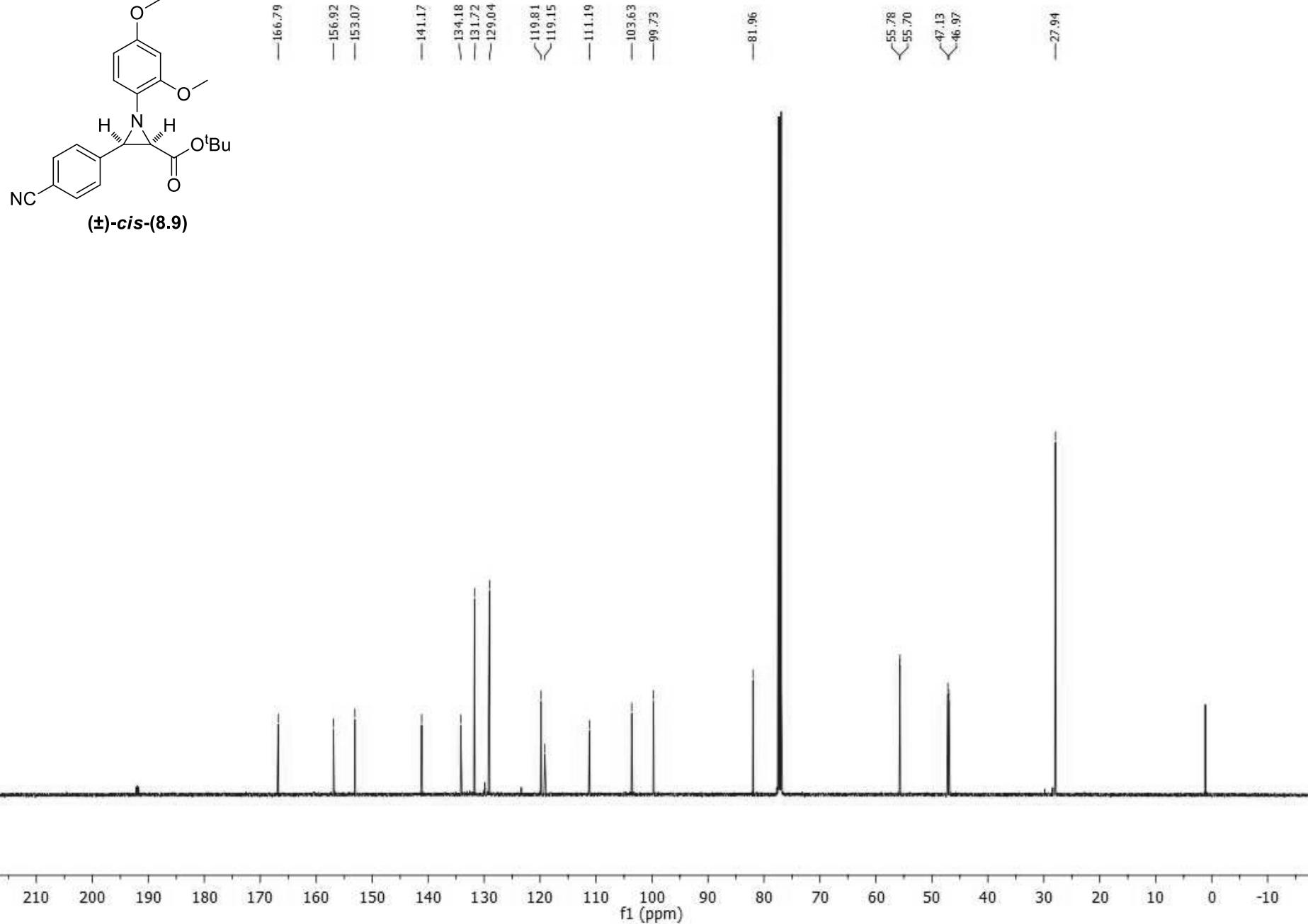
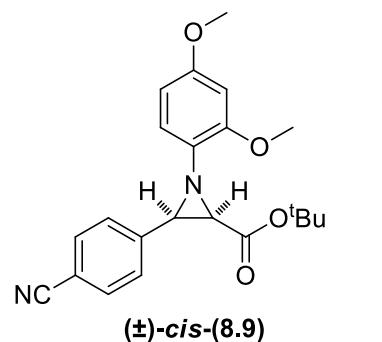
115.25

10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

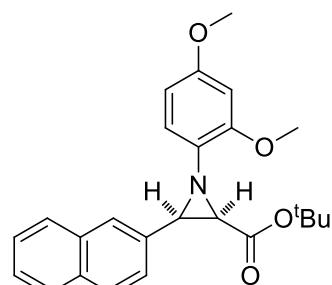
¹H-NMR (CDCl₃, 500 MHz)



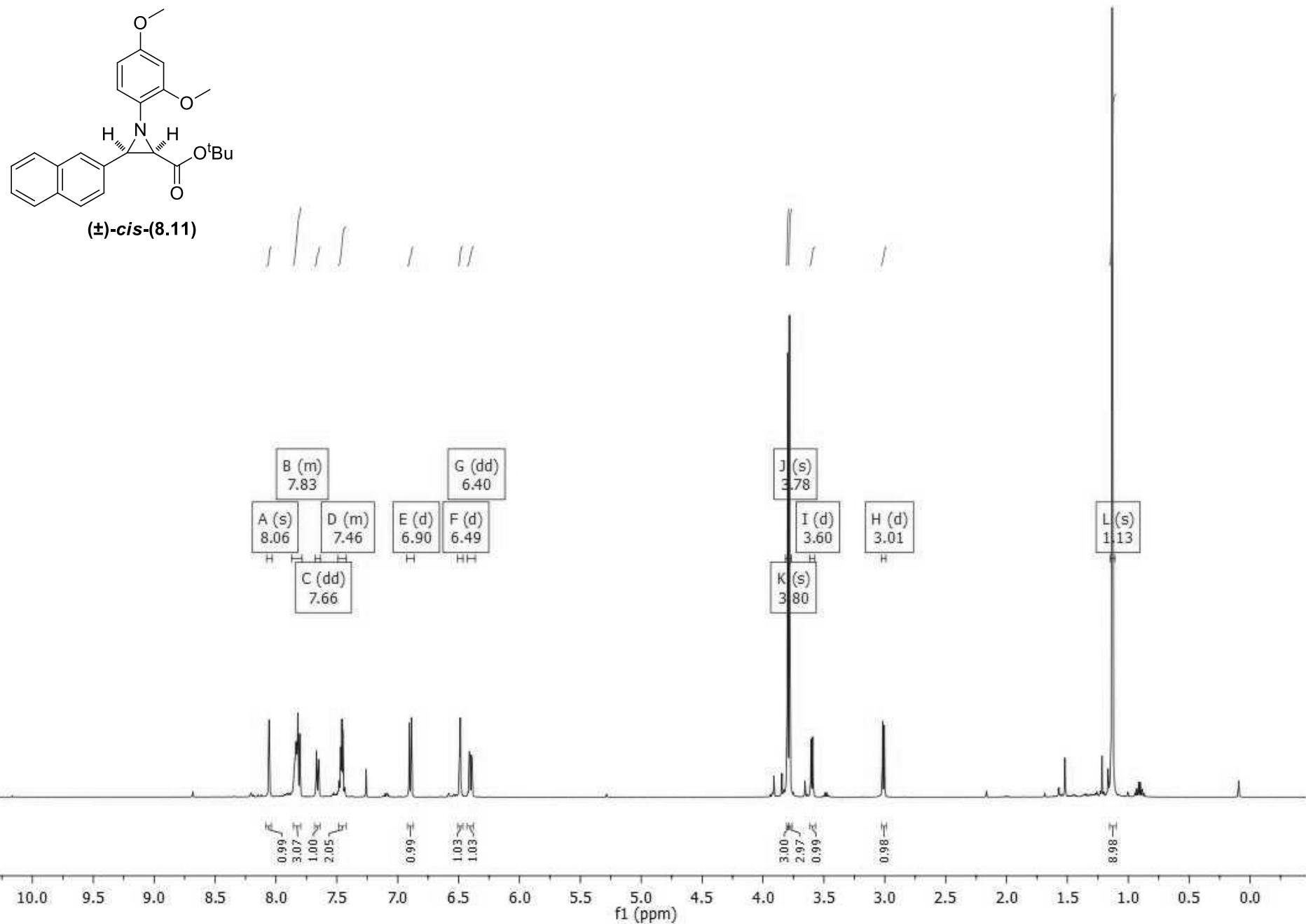
¹³C-NMR (CDCl₃, 126 MHz)



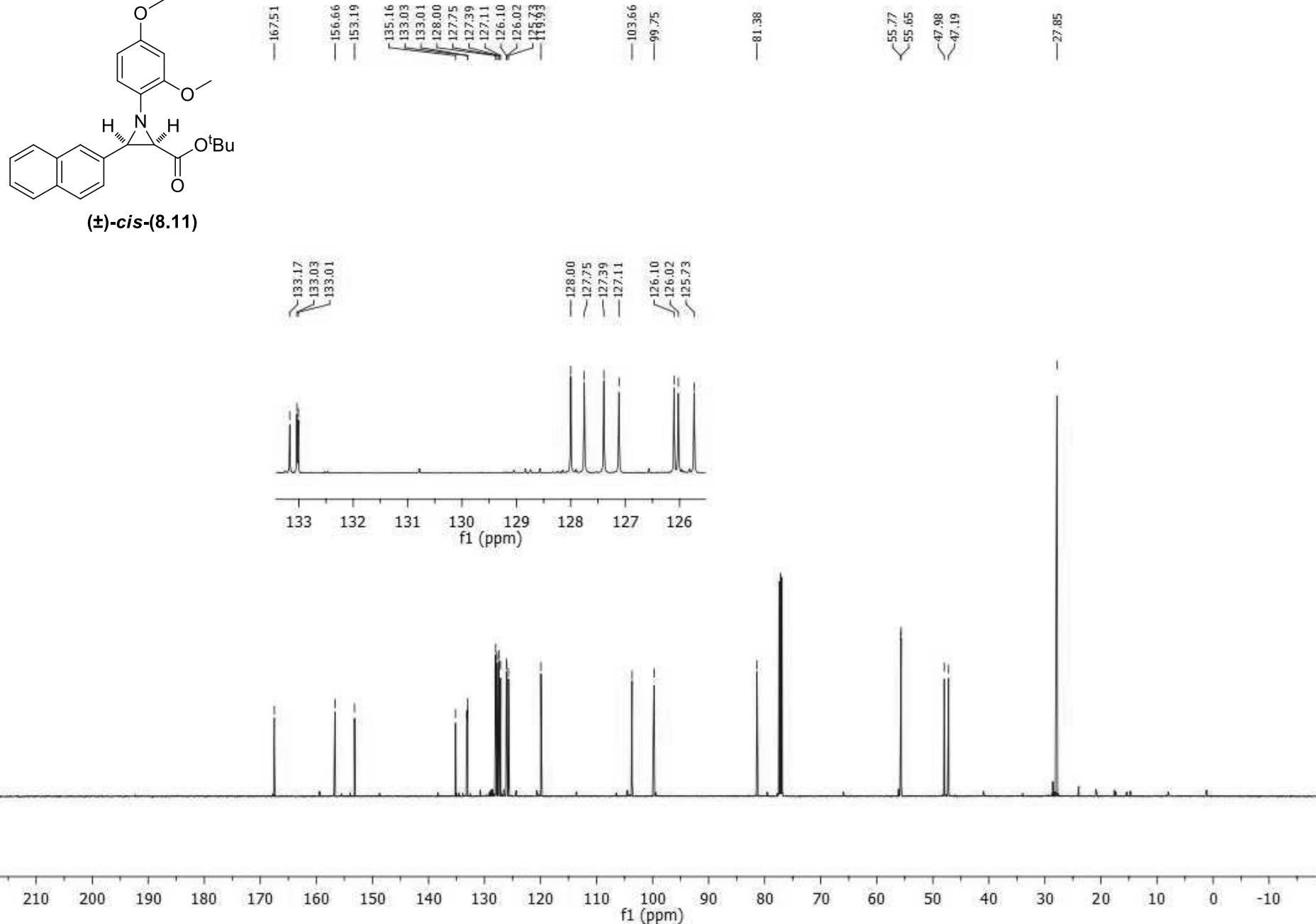
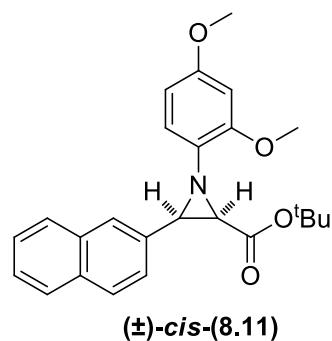
¹H-NMR (CDCl₃, 500 MHz)



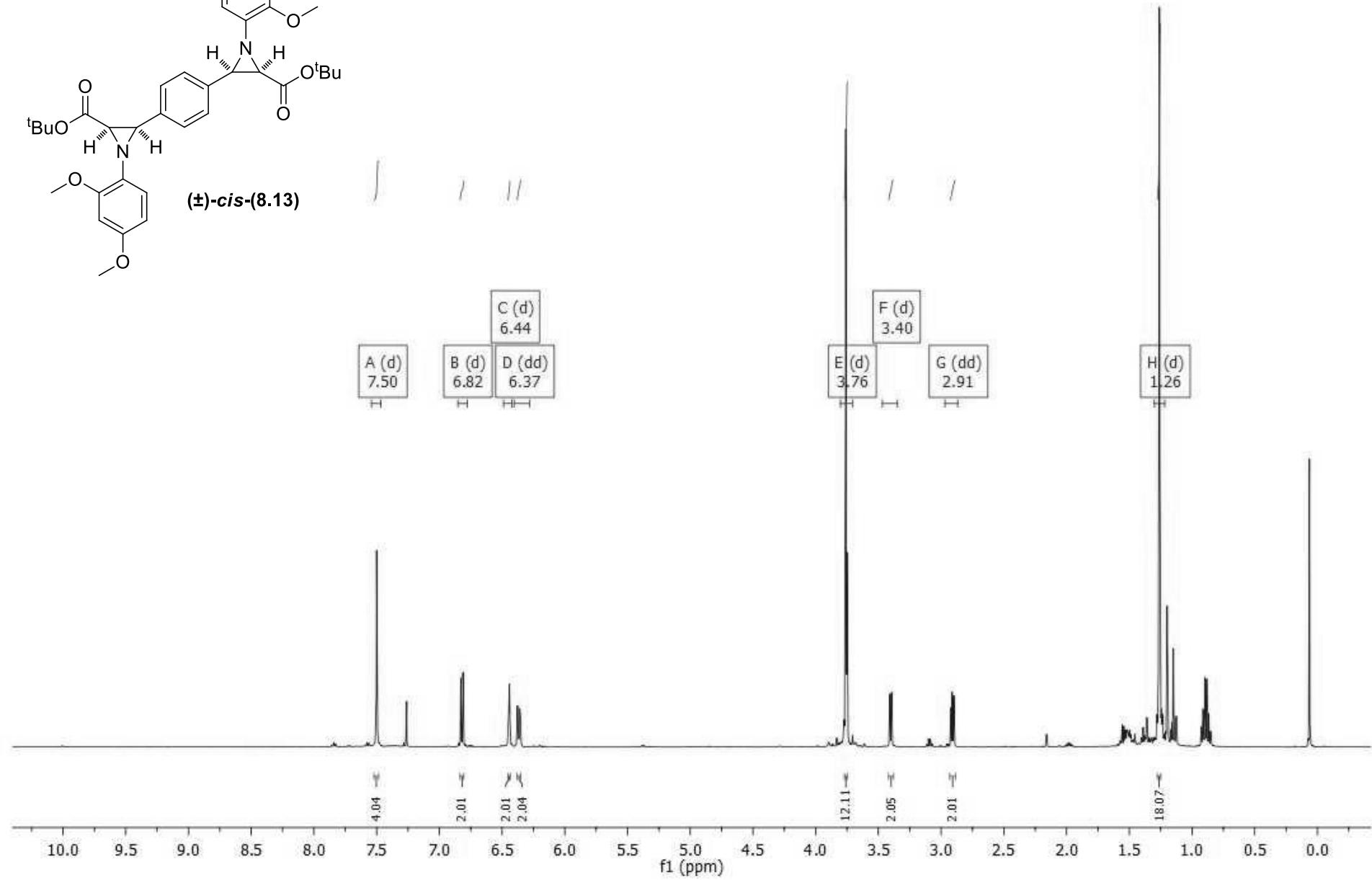
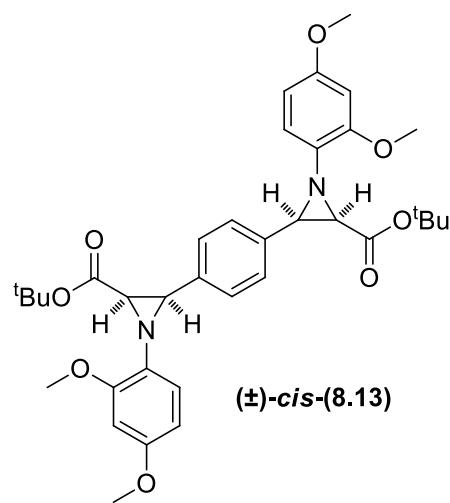
(±)-*cis*-(8.11)



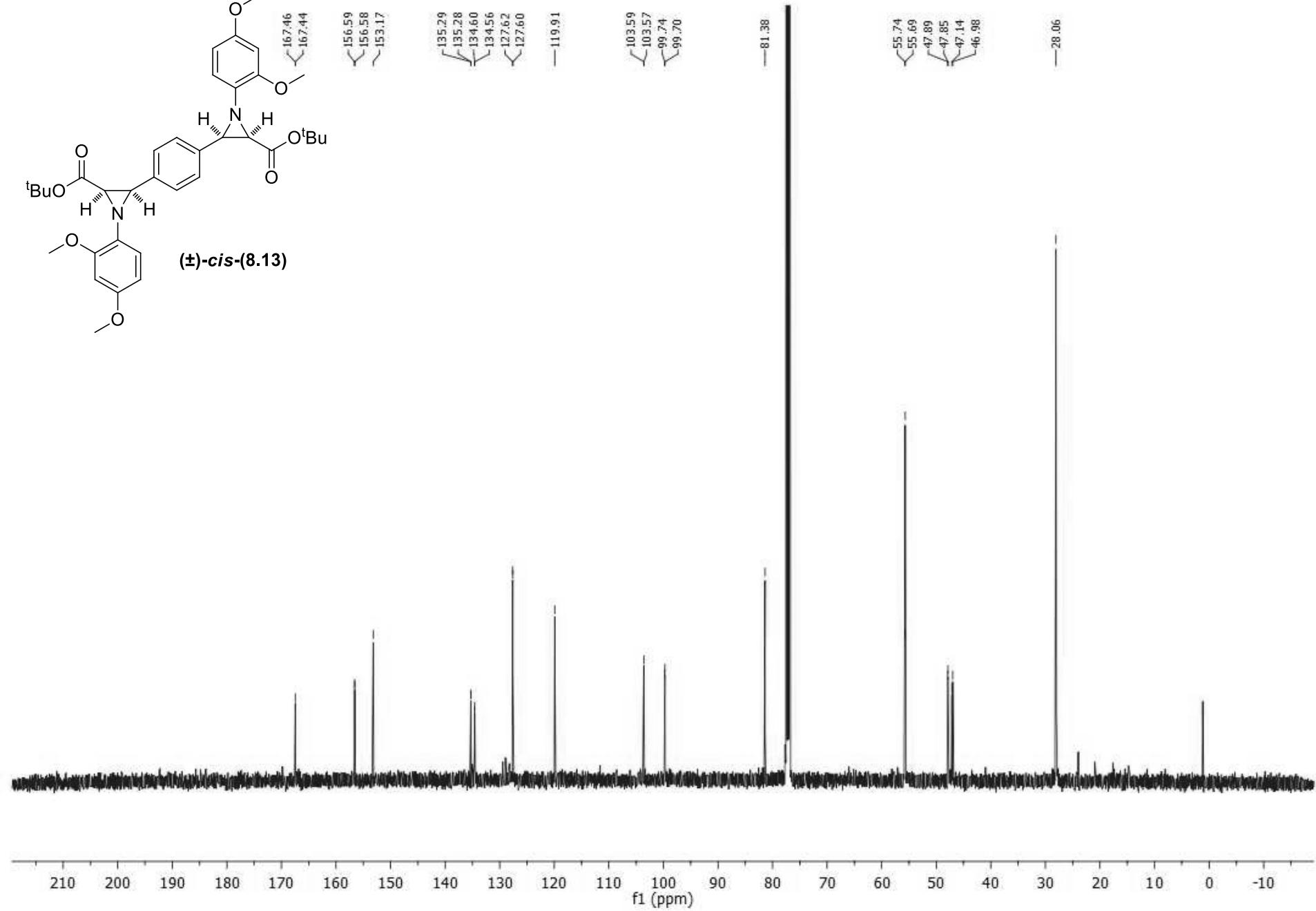
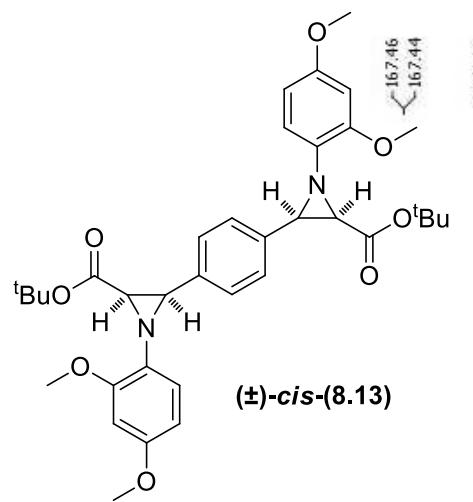
¹³C-NMR (CDCl₃, 126 MHz)



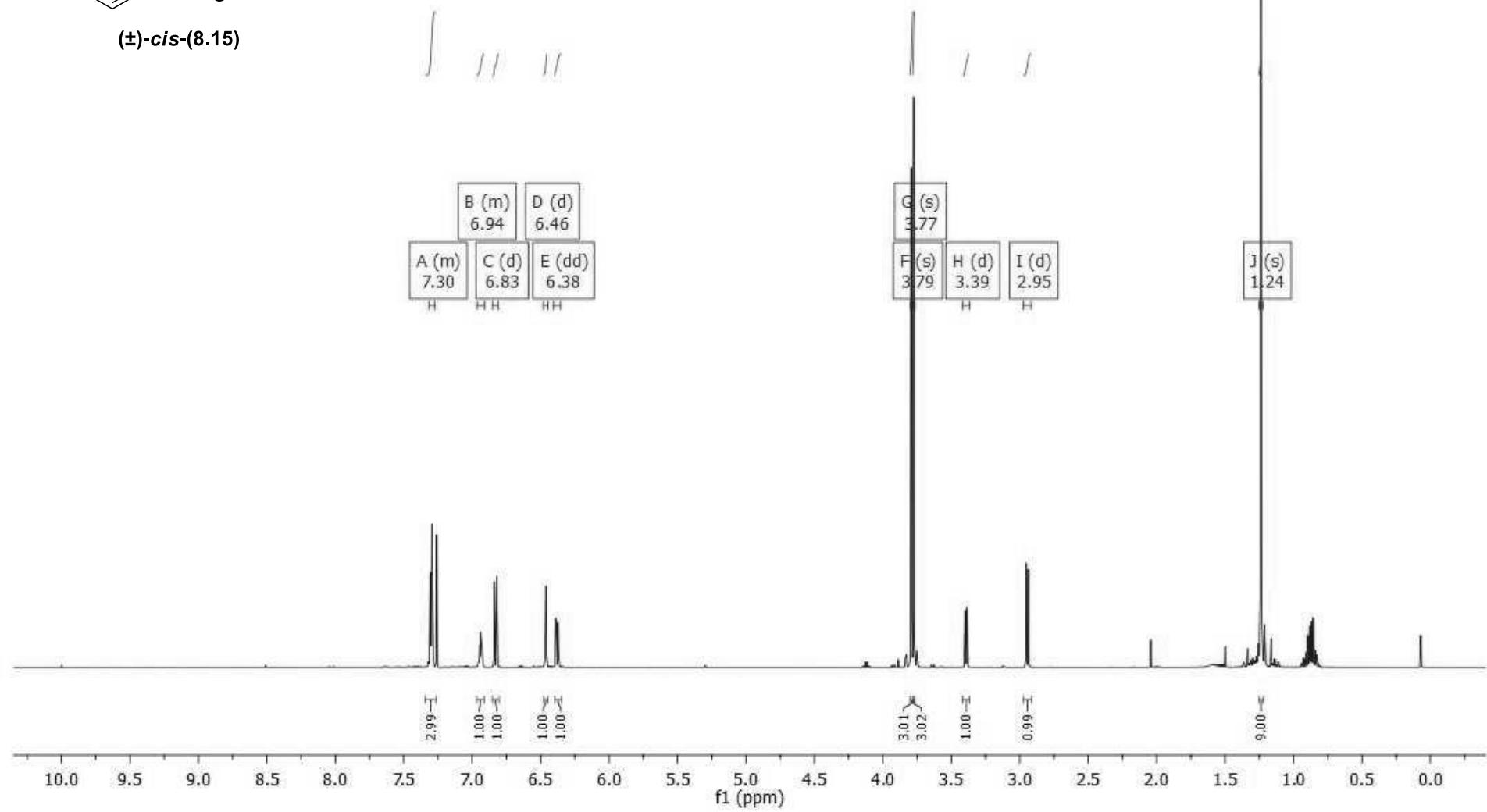
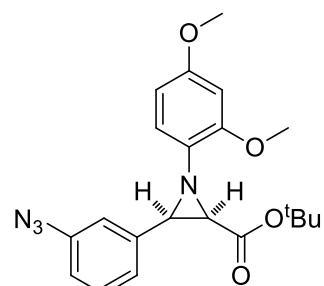
¹H-NMR (CDCl₃, 500 MHz)



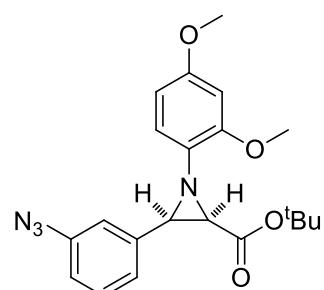
¹³C-NMR (CDCl₃, 126 MHz)



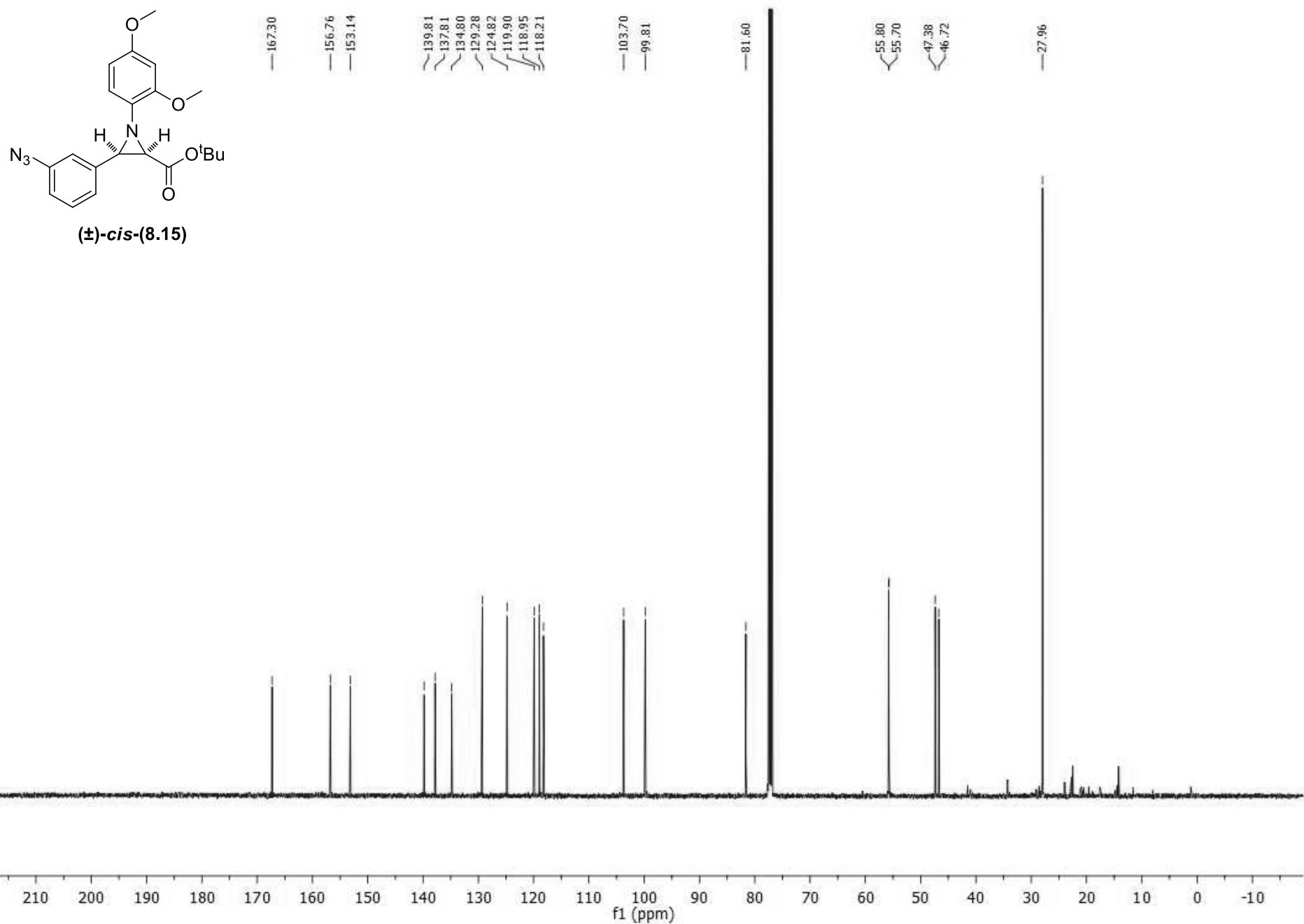
¹H-NMR (CDCl₃, 500 MHz)



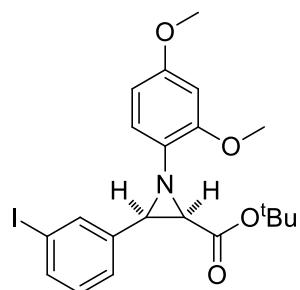
¹³C-NMR (CDCl₃, 126 MHz)



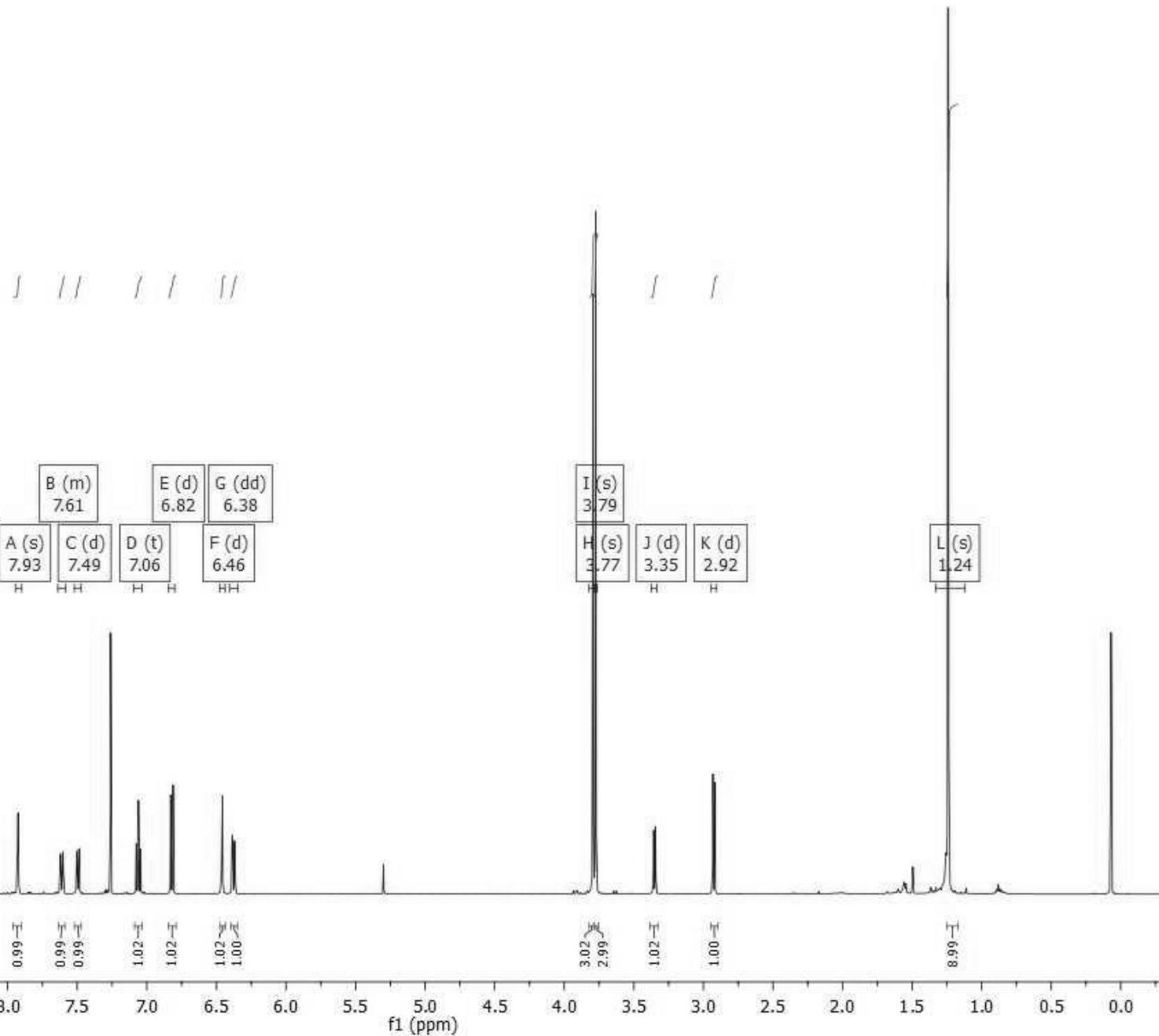
(±)-cis-(8.15)



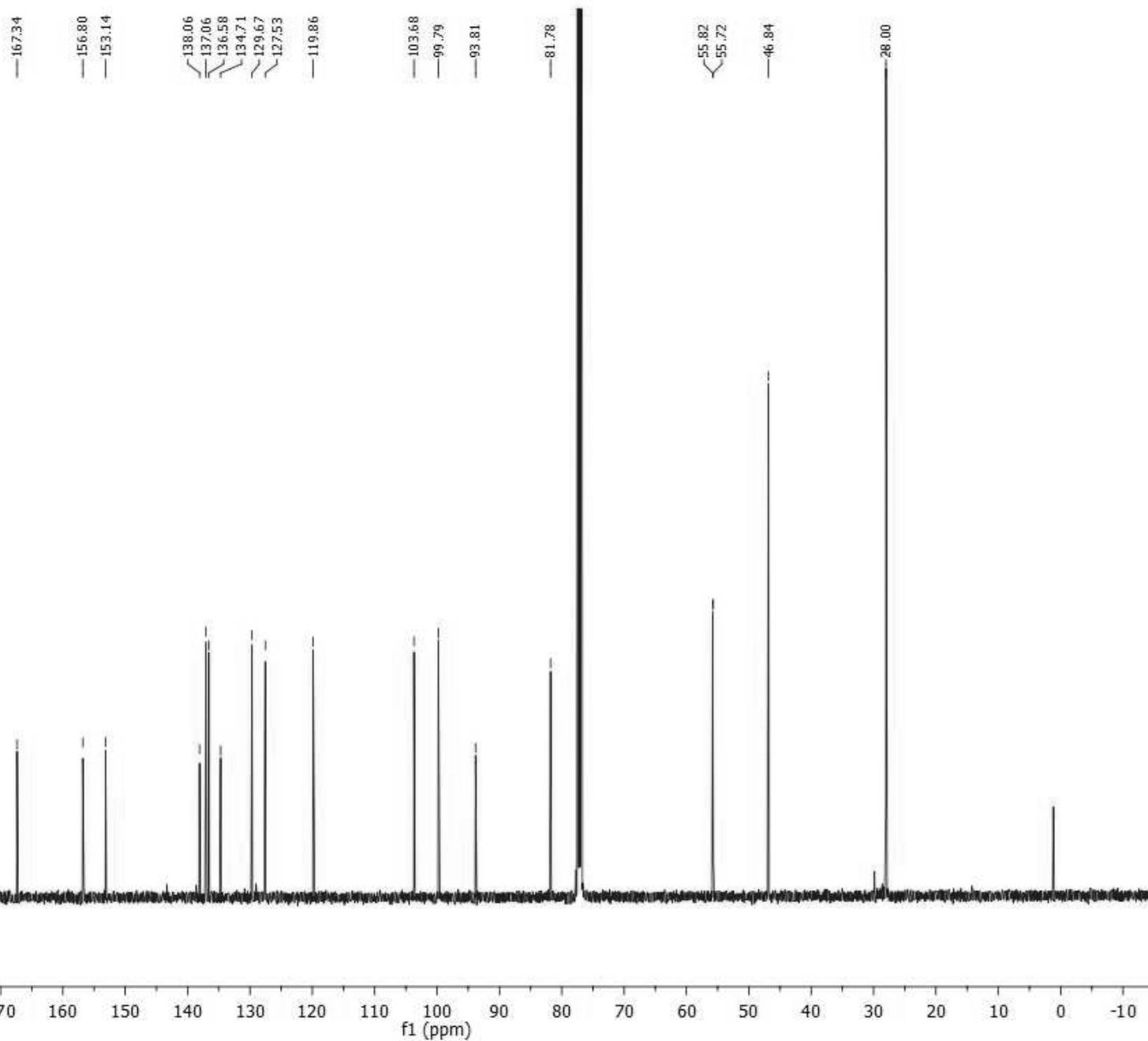
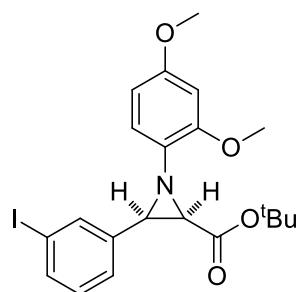
¹H-NMR (CDCl₃, 500 MHz)



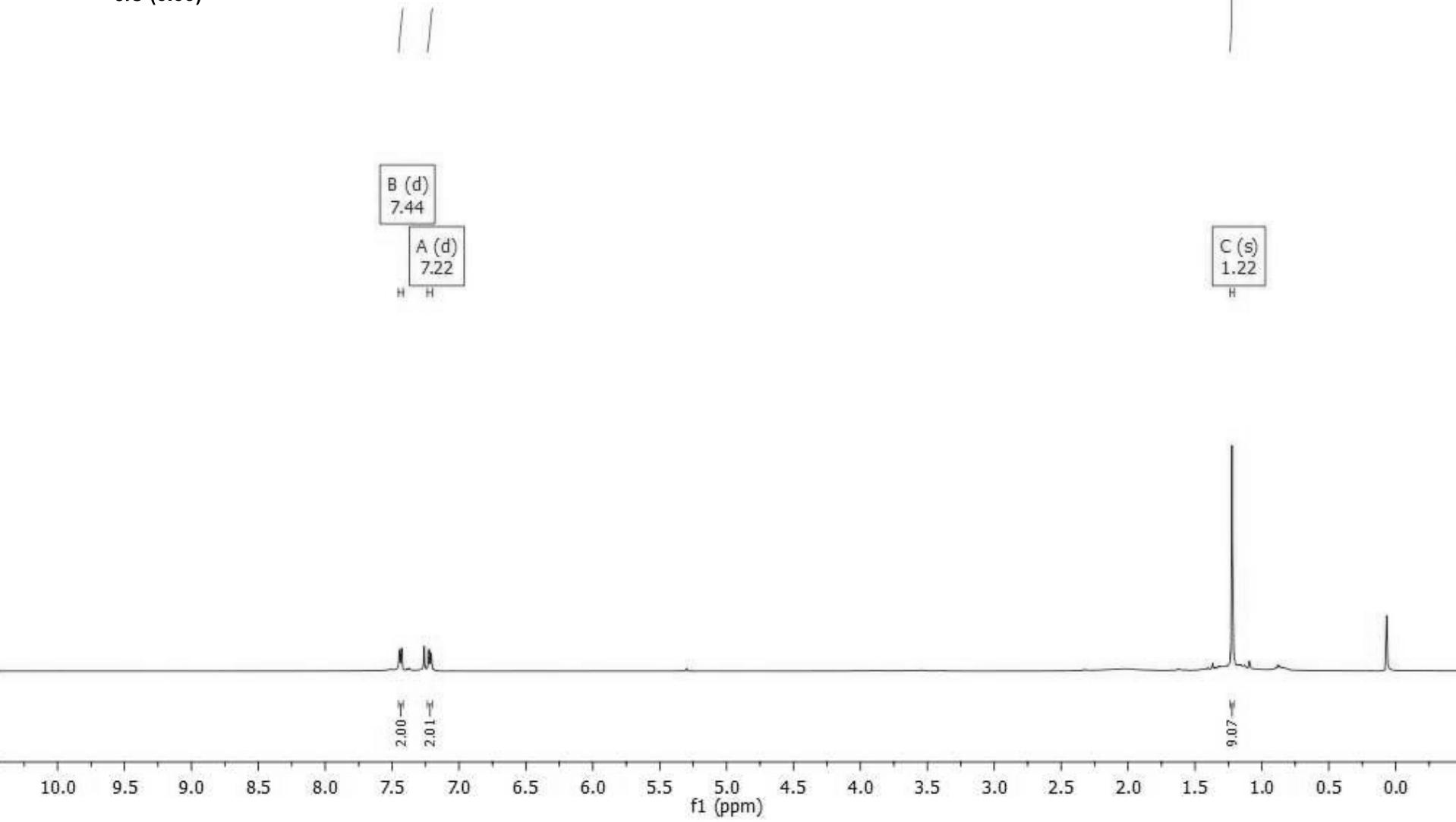
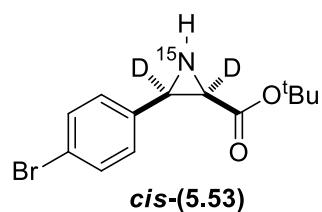
(±)-*cis*-(8.17)



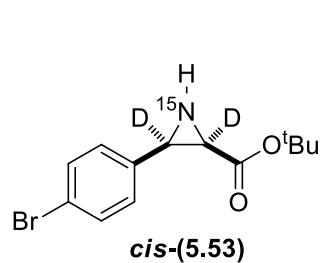
¹³C-NMR (CDCl₃, 126 MHz)



¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



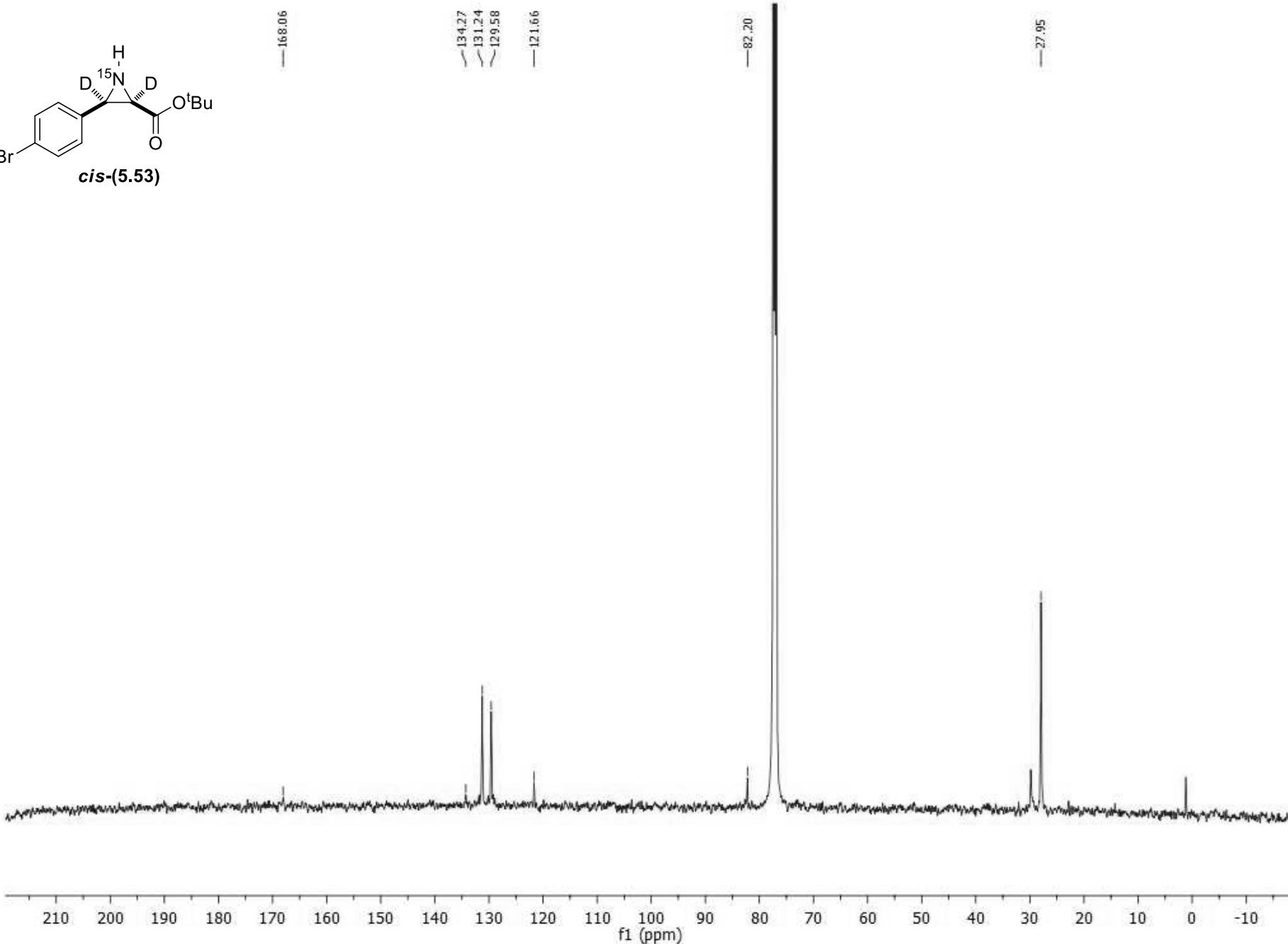
—168.06

—134.27
—131.24
—129.58

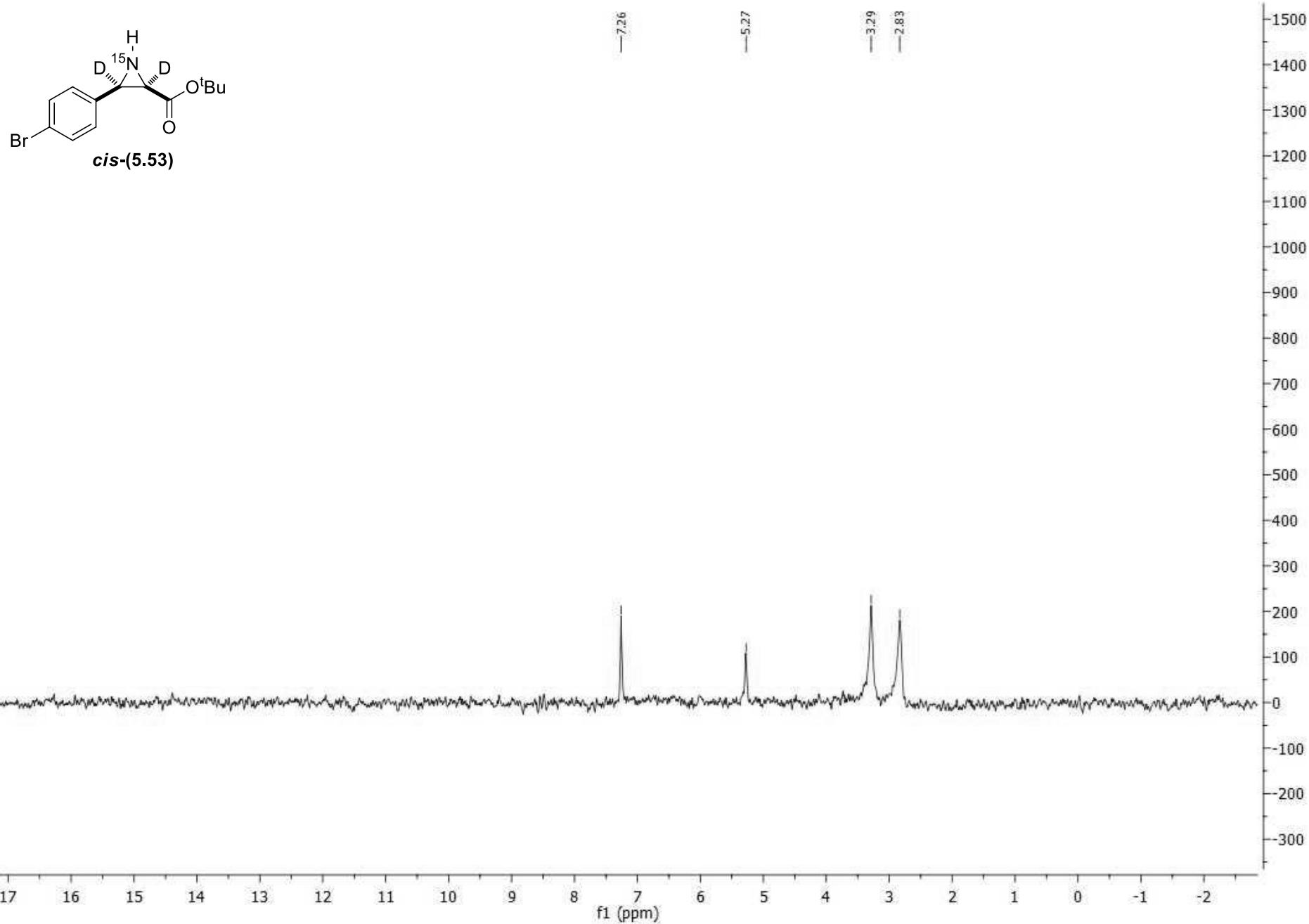
—121.66

—87.20

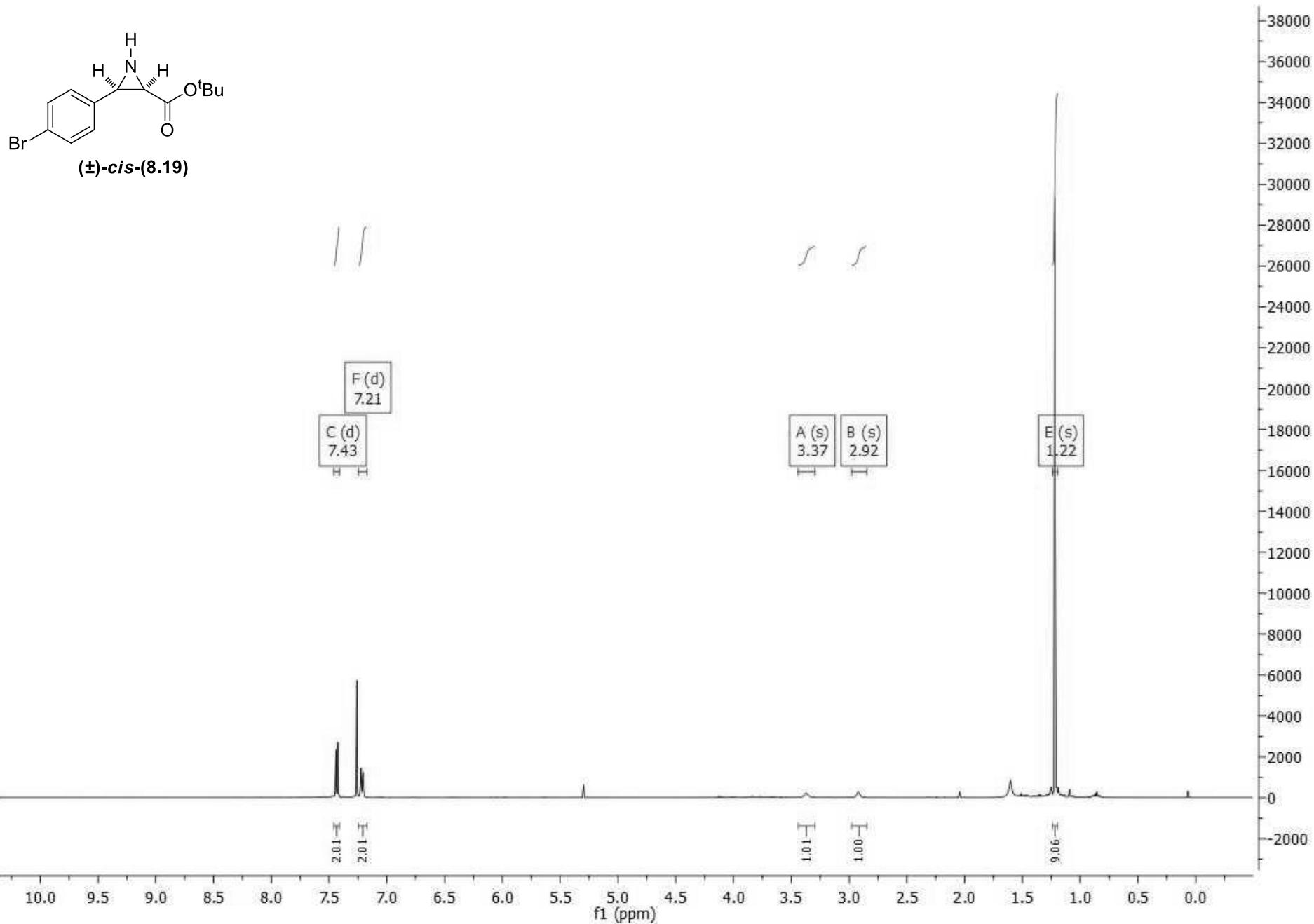
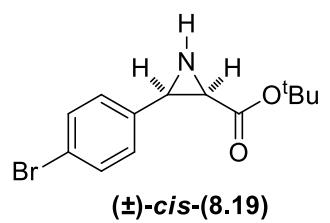
—27.95



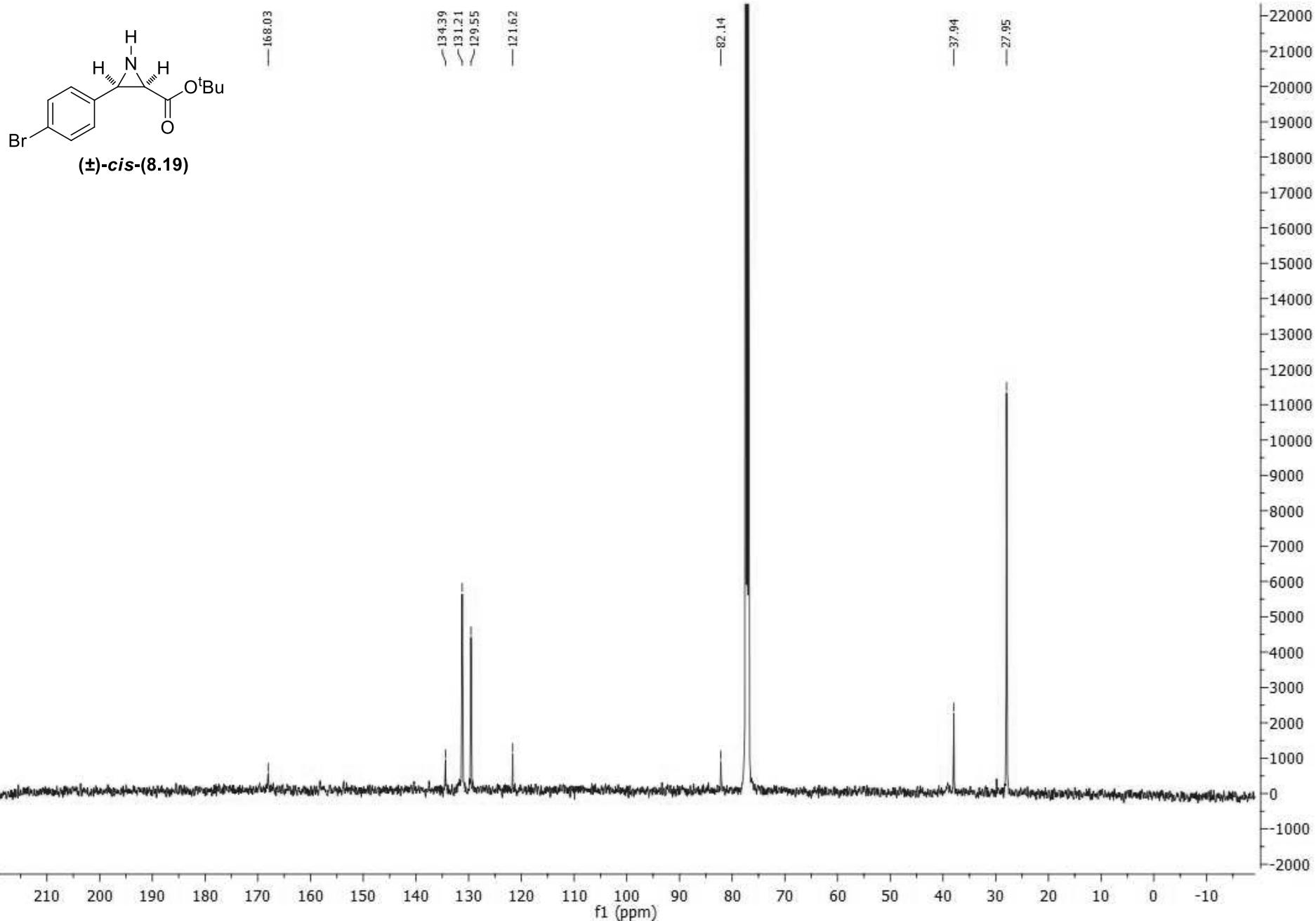
^2H -NMR (CH_2Cl_2 , 77 MHz)



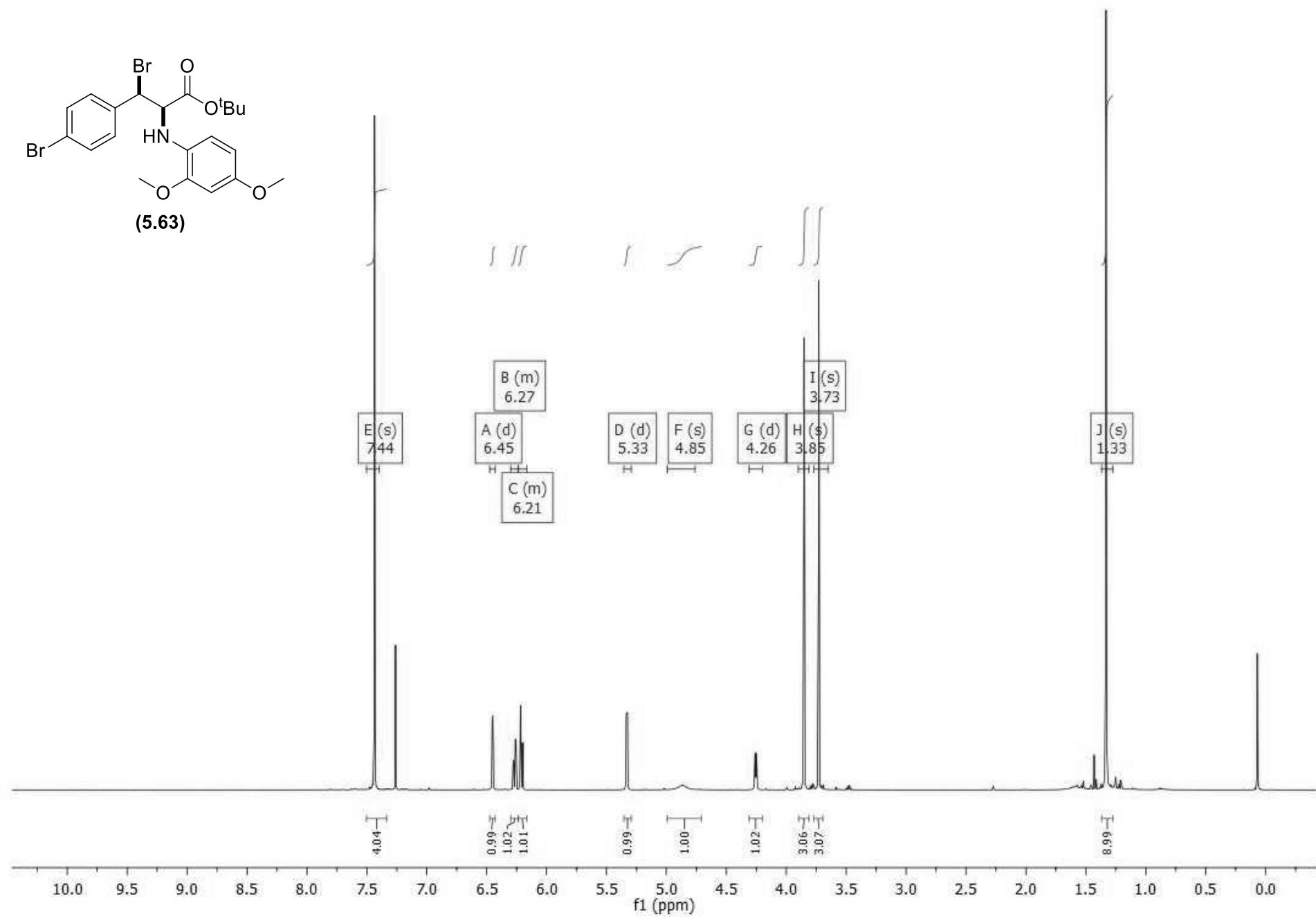
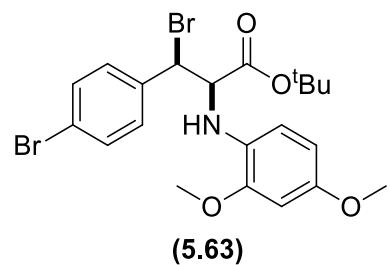
¹H-NMR (CDCl₃, 500 MHz)



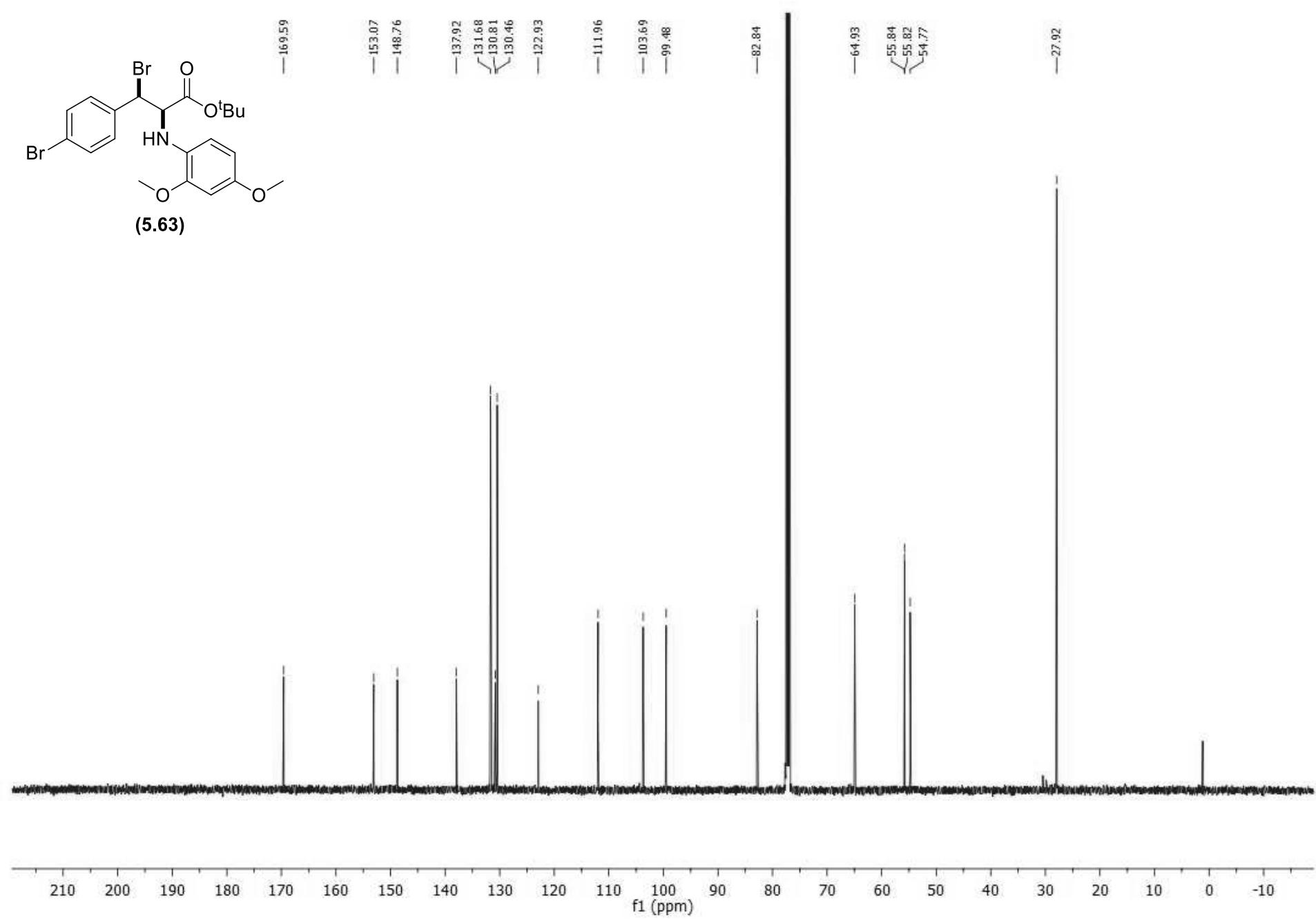
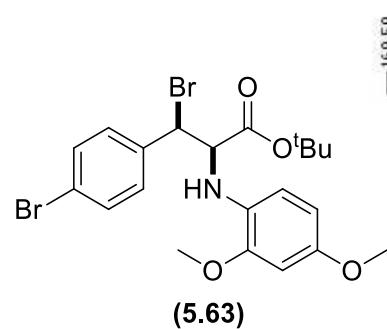
¹³C-NMR (CDCl₃, 126 MHz)



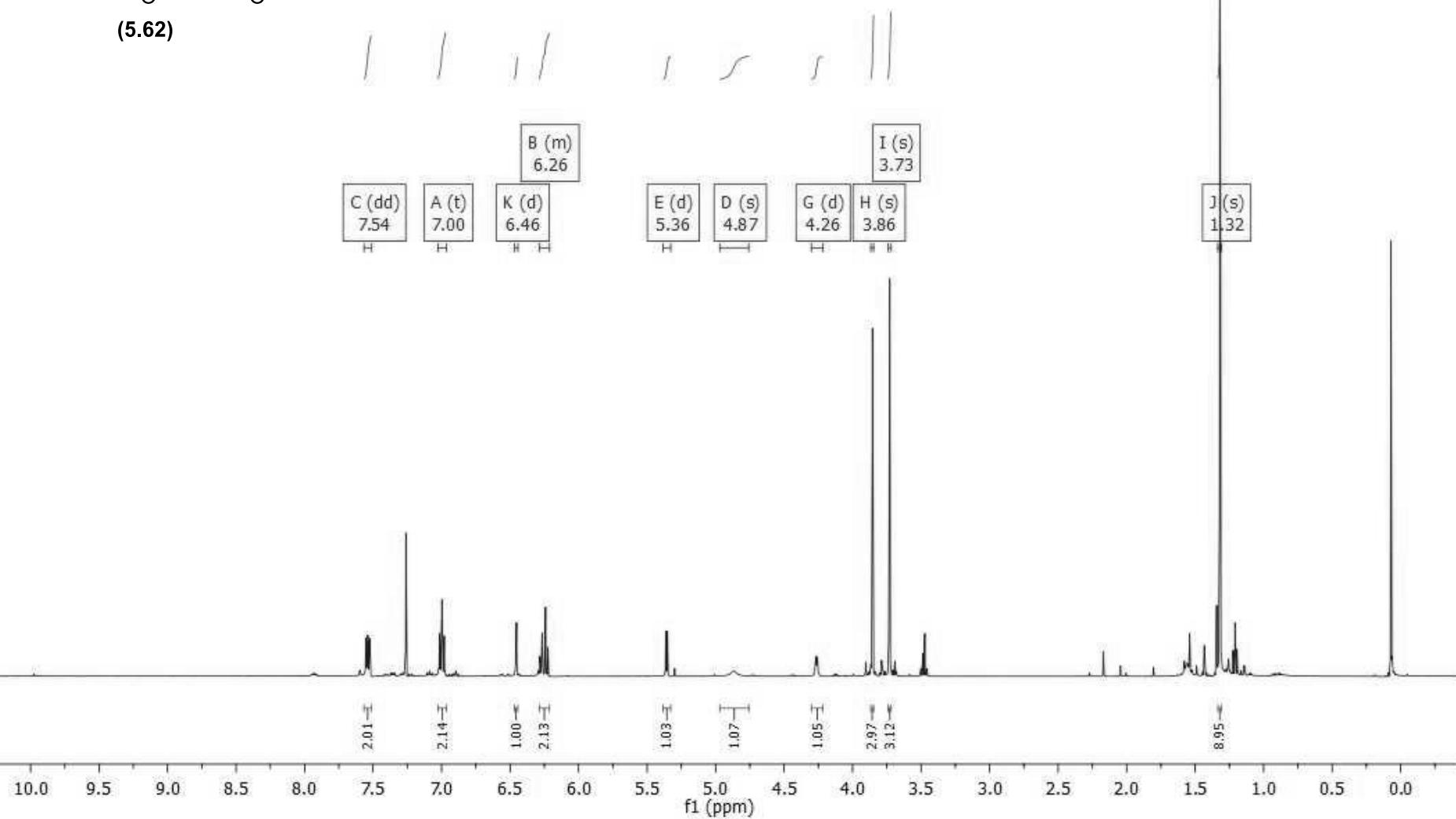
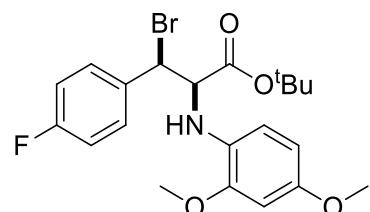
¹H-NMR (CDCl₃, 500 MHz)



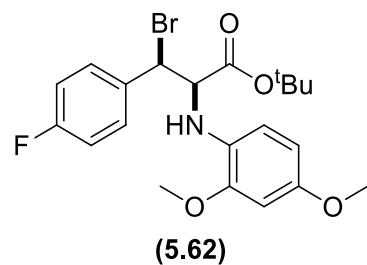
¹³C-NMR (CDCl₃, 126 MHz)



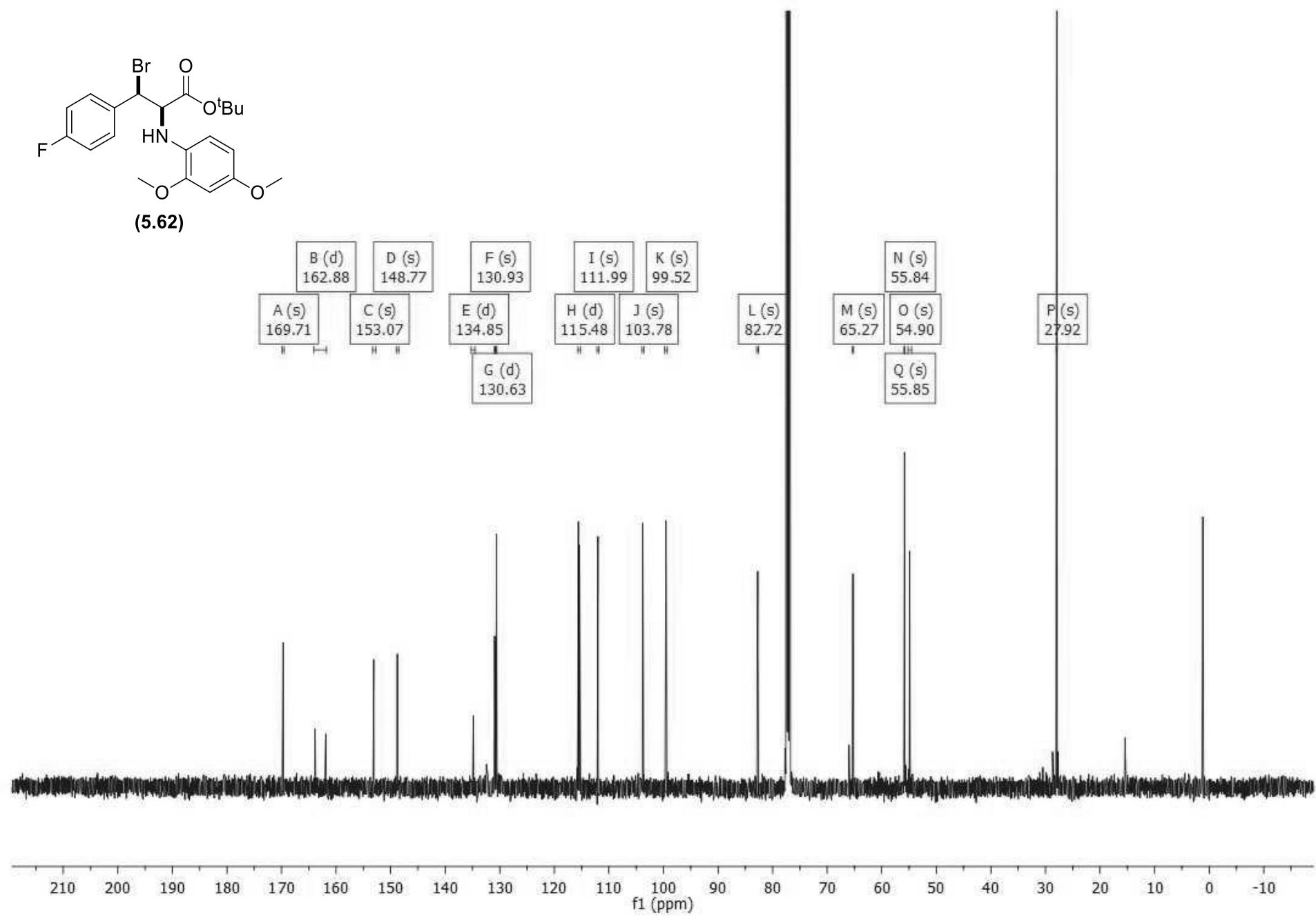
¹H-NMR (CDCl₃, 500 MHz)



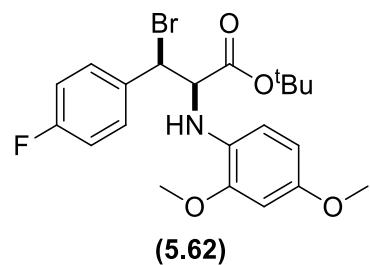
¹³C-NMR (CDCl₃, 126 MHz)



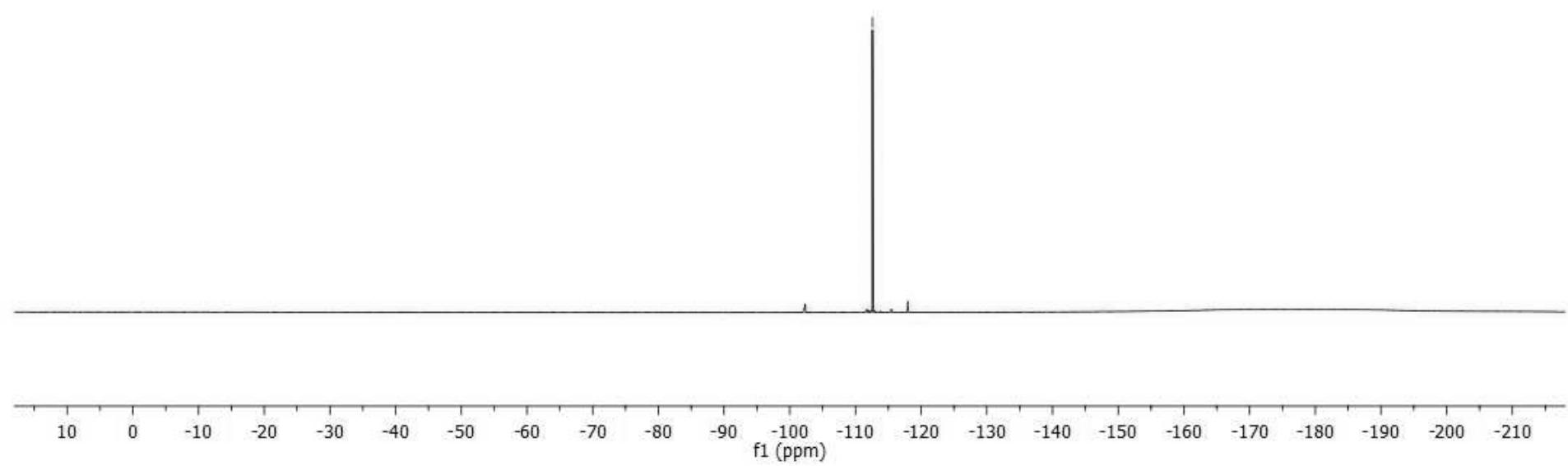
B (d) 162.88	D (s) 148.77	F (s) 130.93	I (s) 111.99	K (s) 99.52	N (s) 55.84	P (s) 27.92
A (s) 169.71	C (s) 153.07	E (d) 134.85	H (d) 115.48	J (s) 103.78	M (s) 65.27	O (s) 54.90
		G (d) 130.63			Q (s) 55.85	



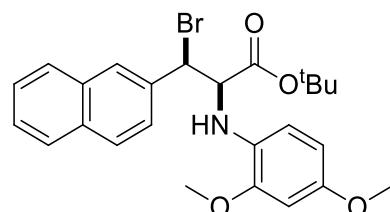
¹⁹F-NMR (CDCl₃, 471 MHz)



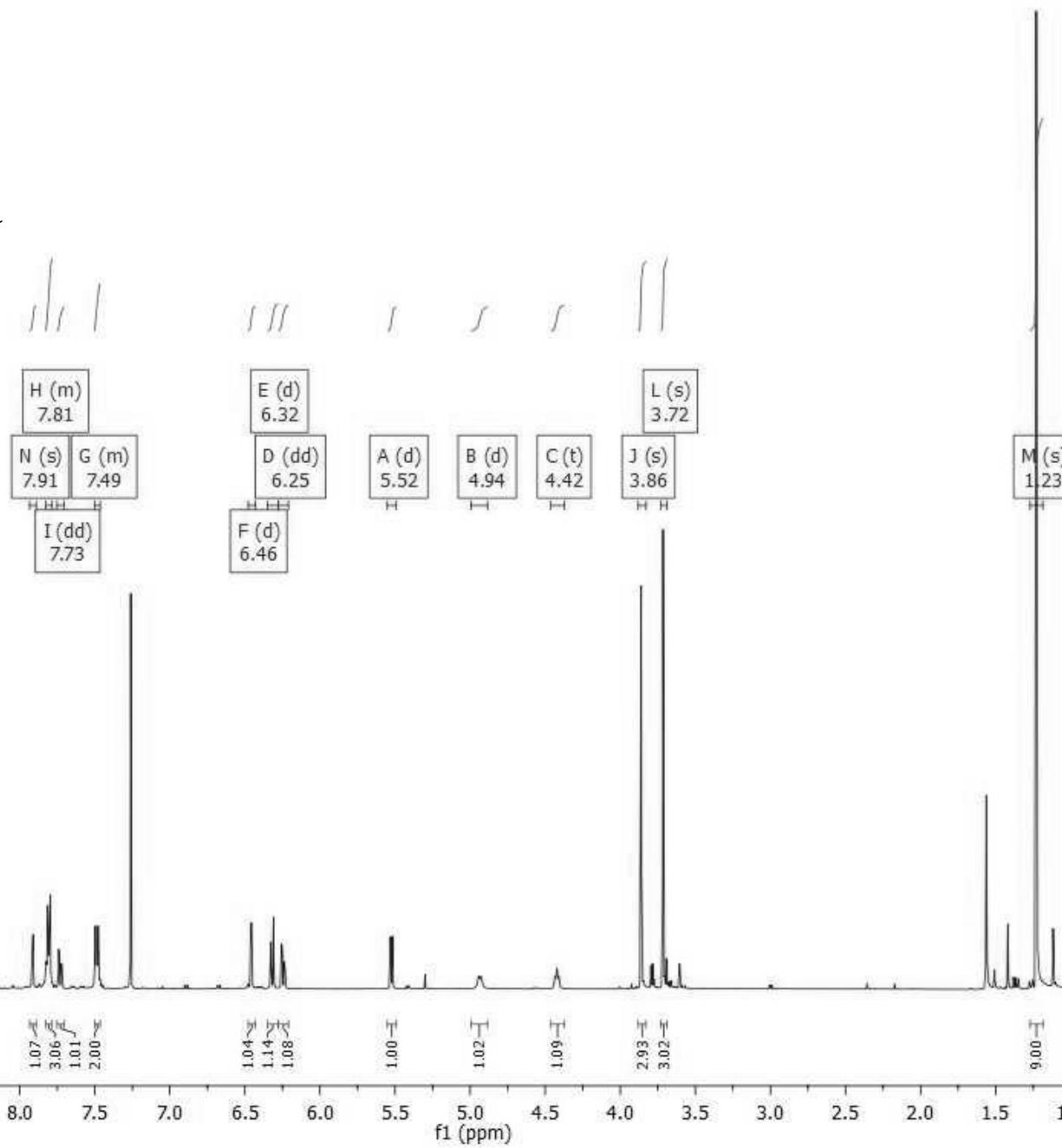
-112.59



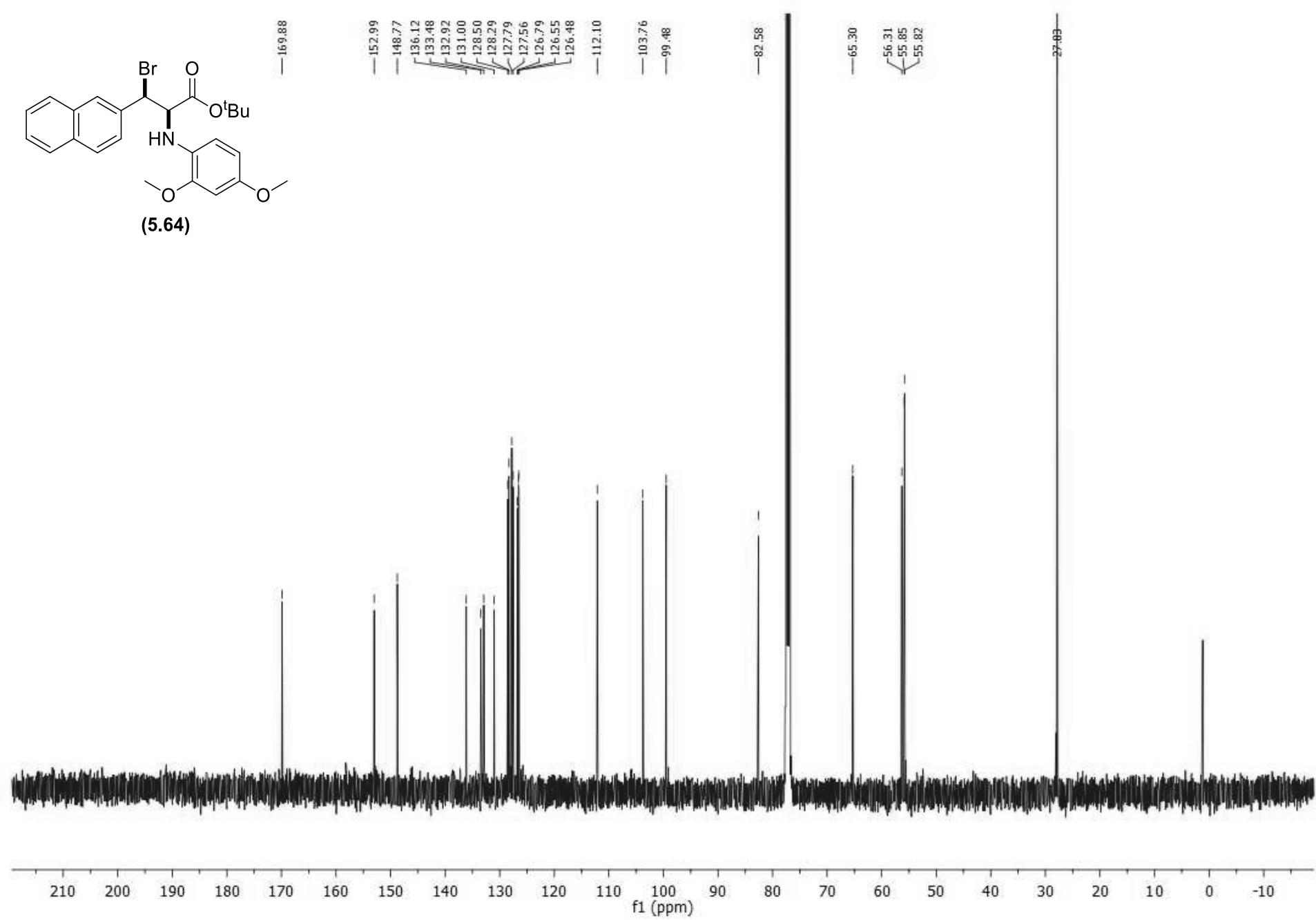
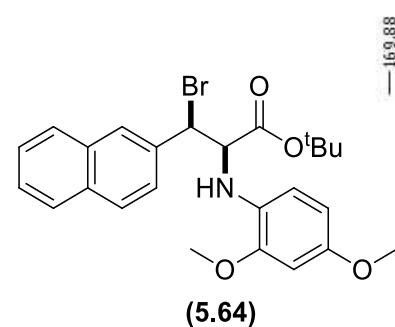
¹H-NMR (CDCl₃, 500 MHz)



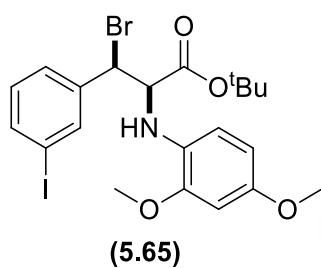
(5.64)



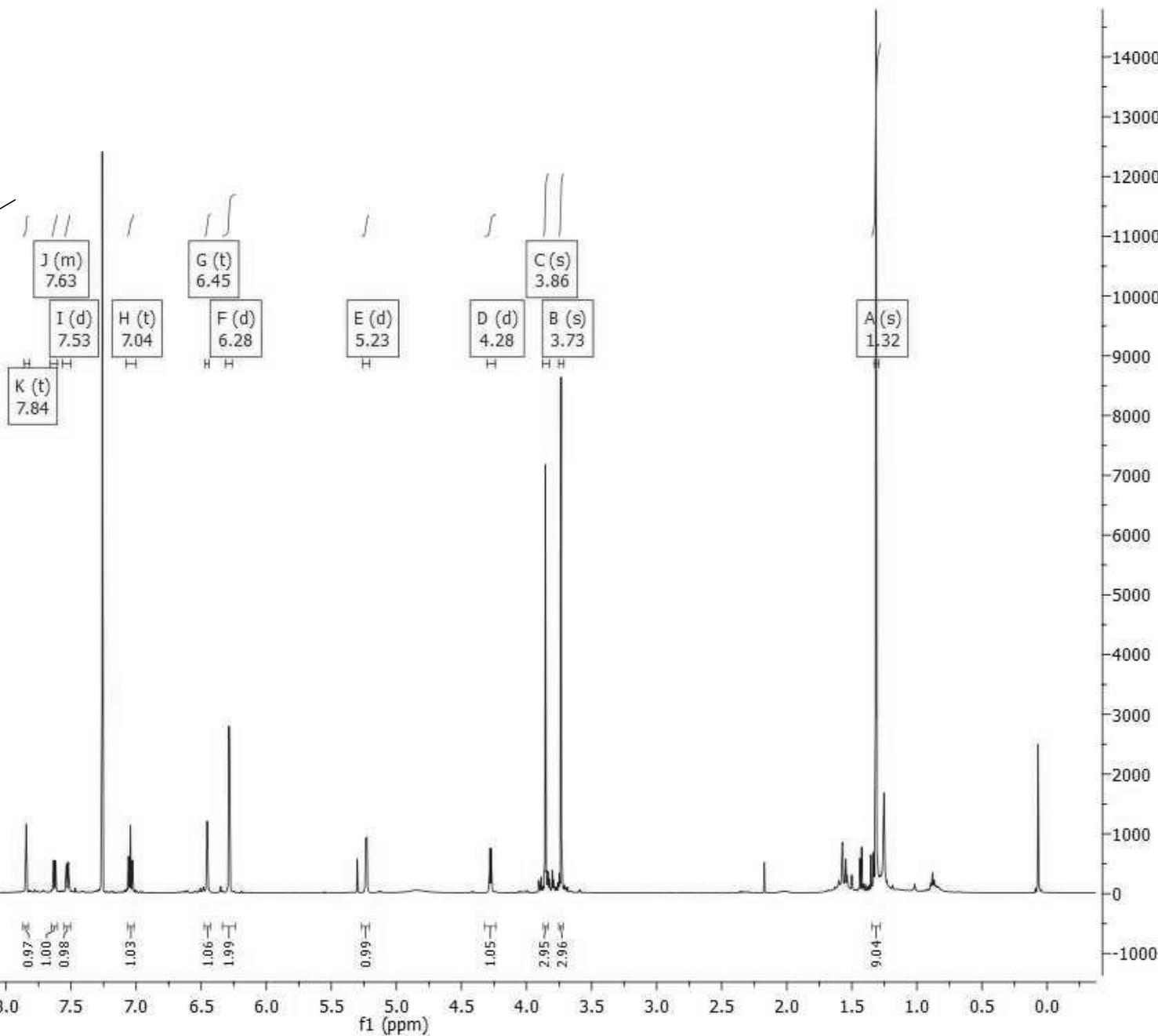
¹³C-NMR (CDCl₃, 126 MHz)



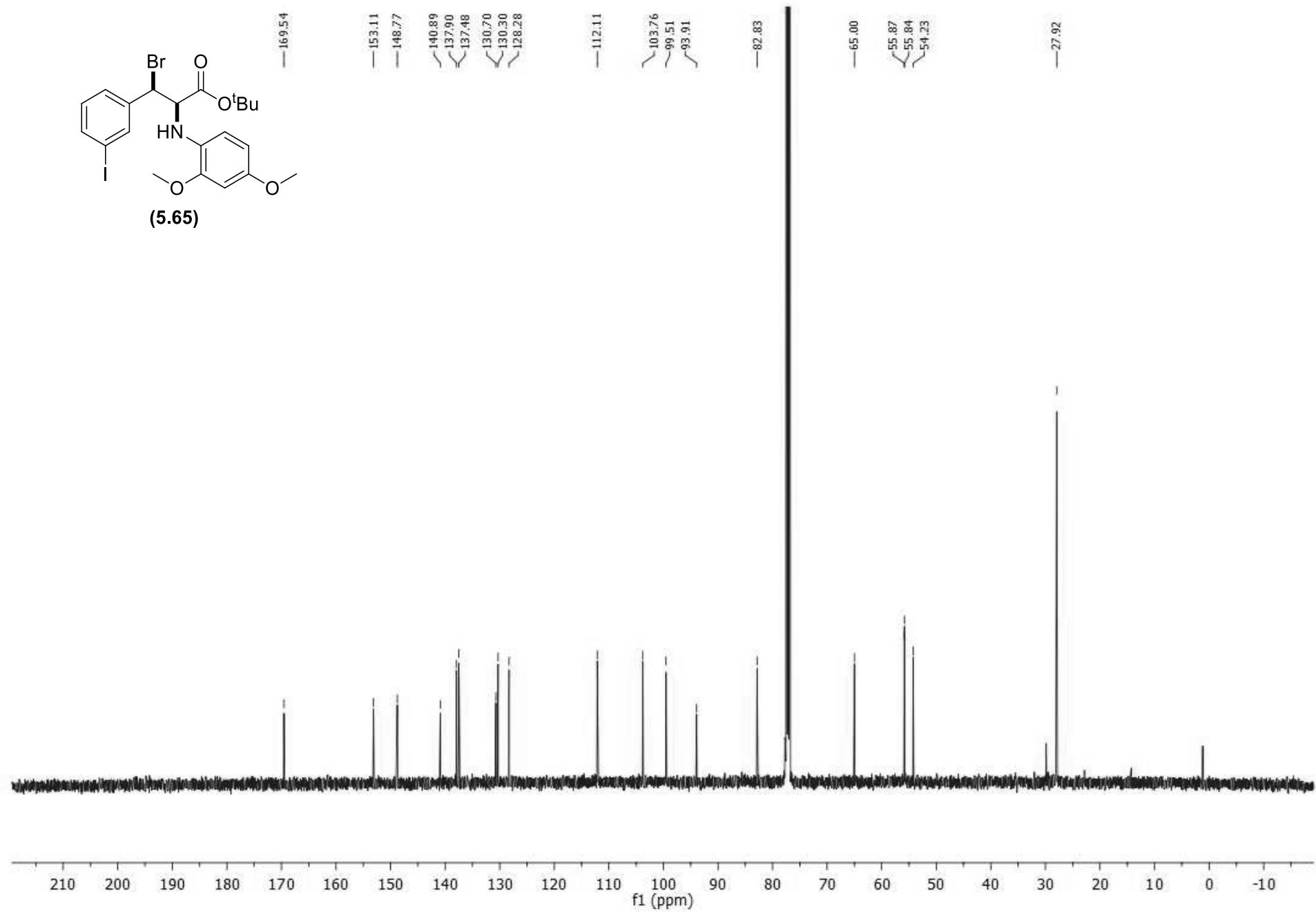
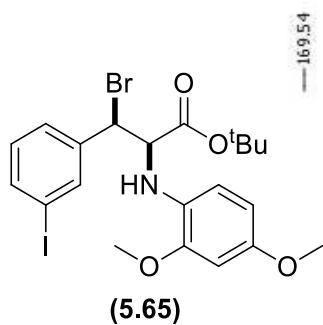
¹H-NMR (CDCl₃, 500 MHz)



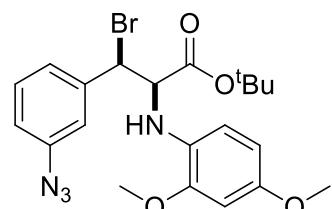
(5.65)



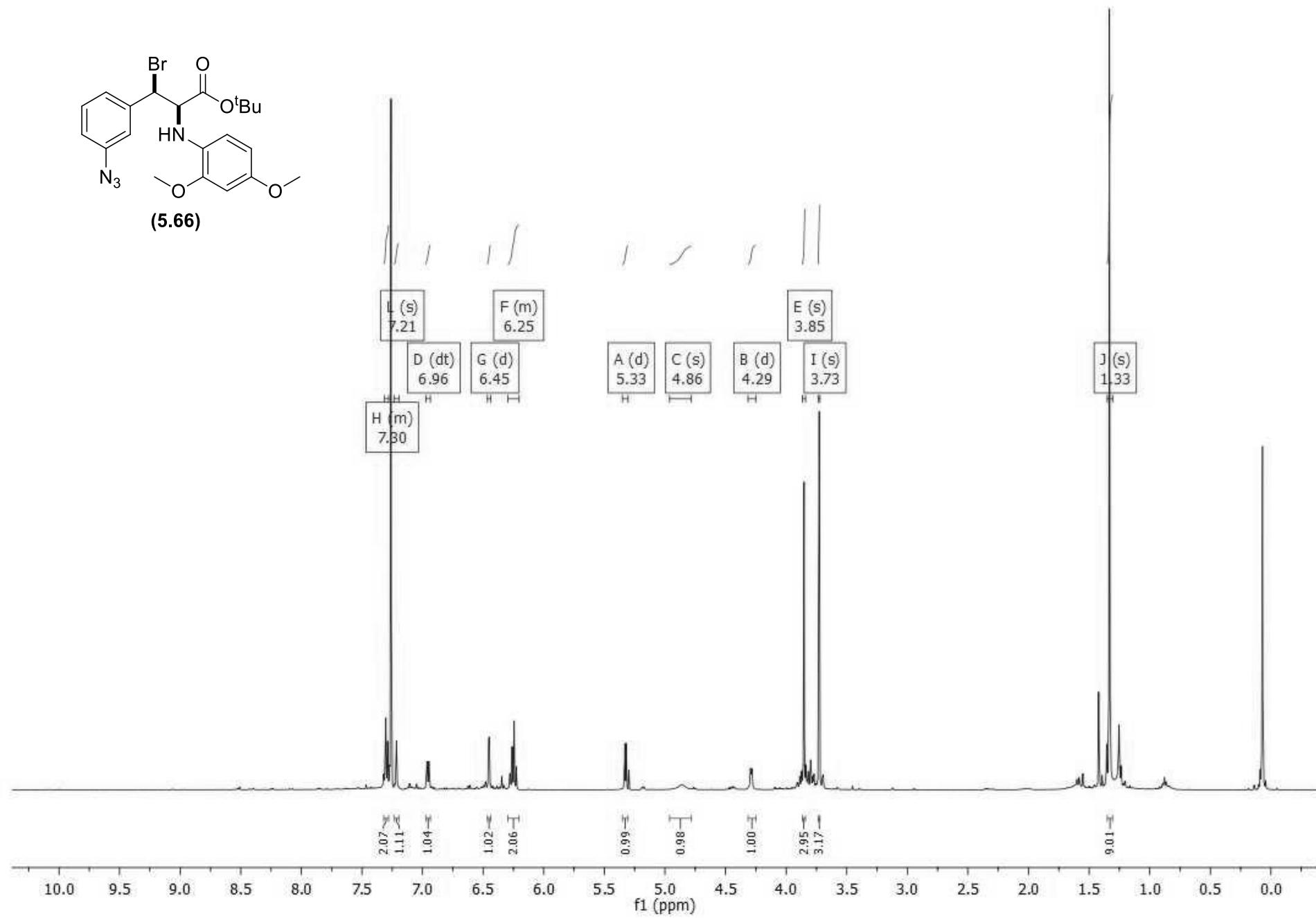
¹³C-NMR (CDCl₃, 126 MHz)



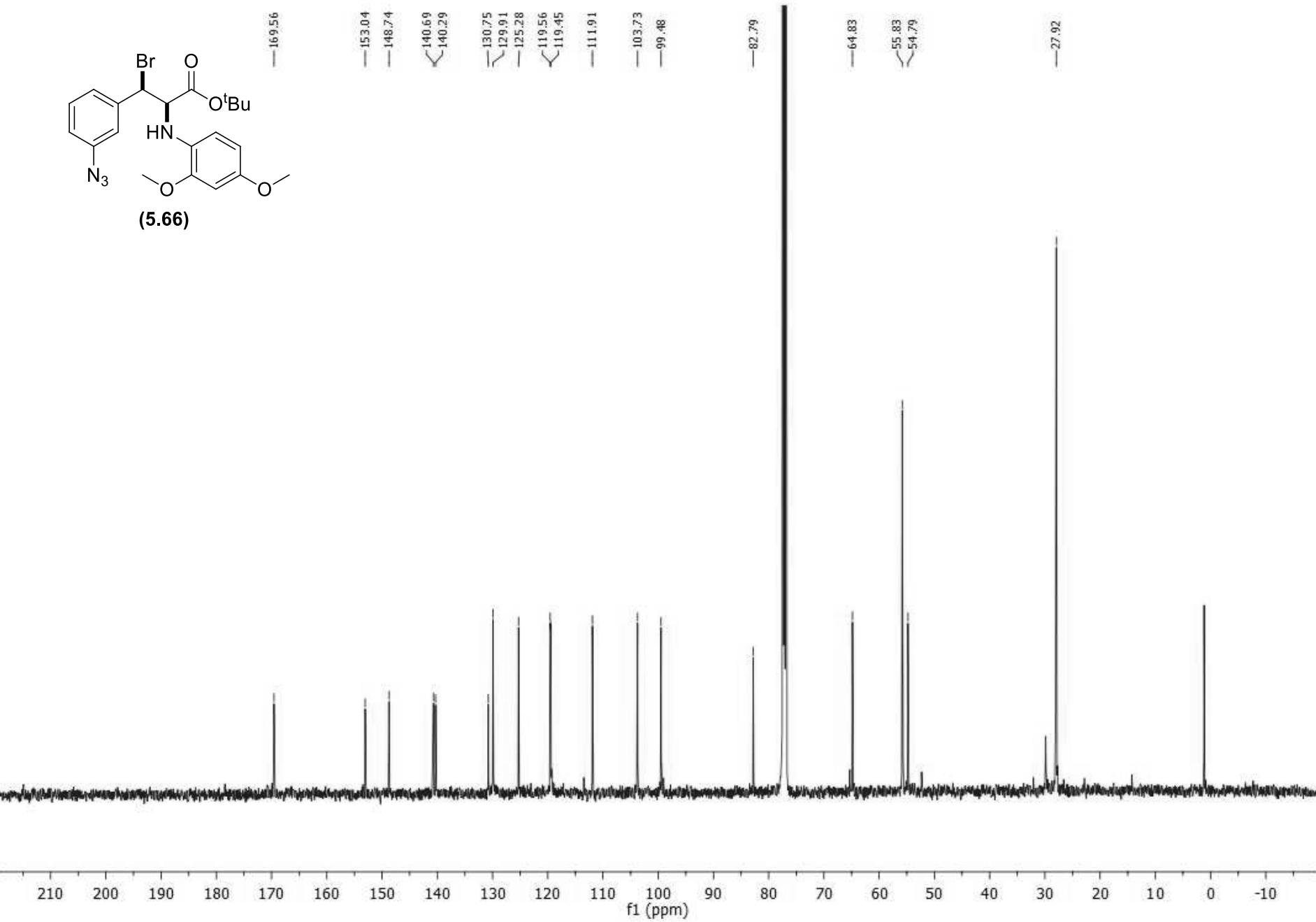
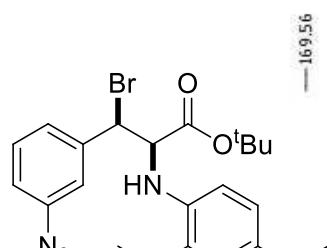
¹H-NMR (CDCl₃, 500 MHz)



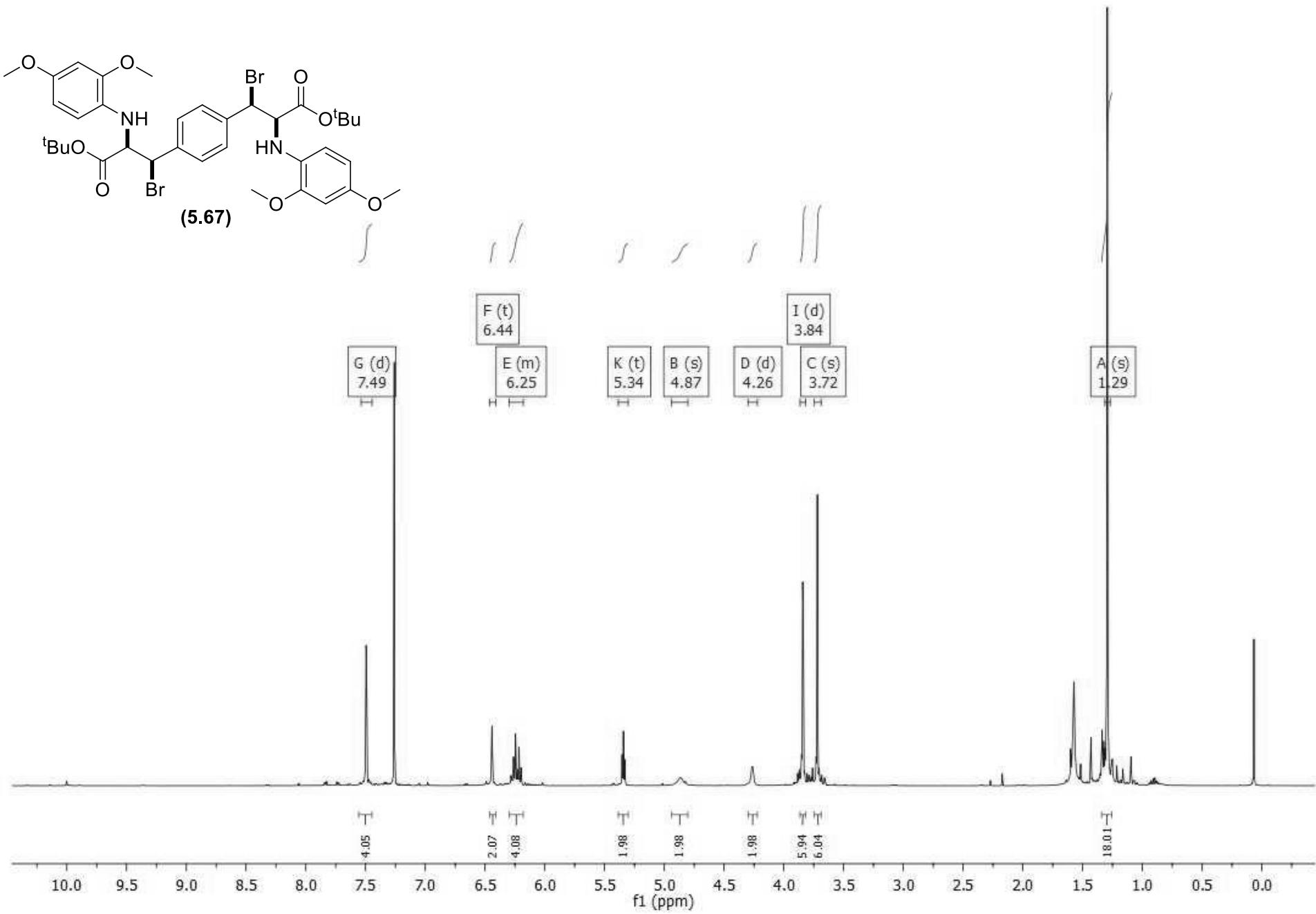
(5.66)



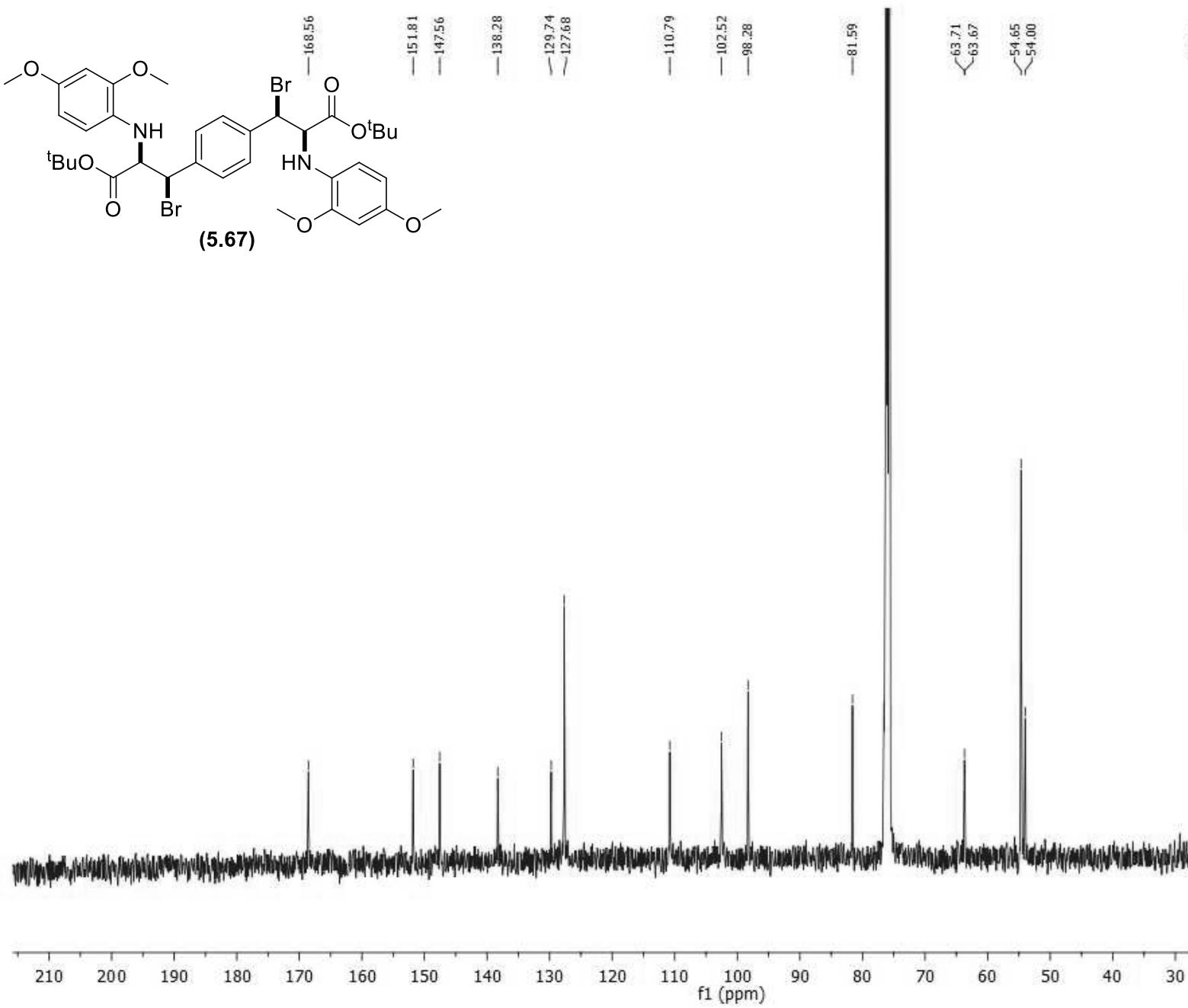
¹³C-NMR (CDCl₃, 126 MHz)



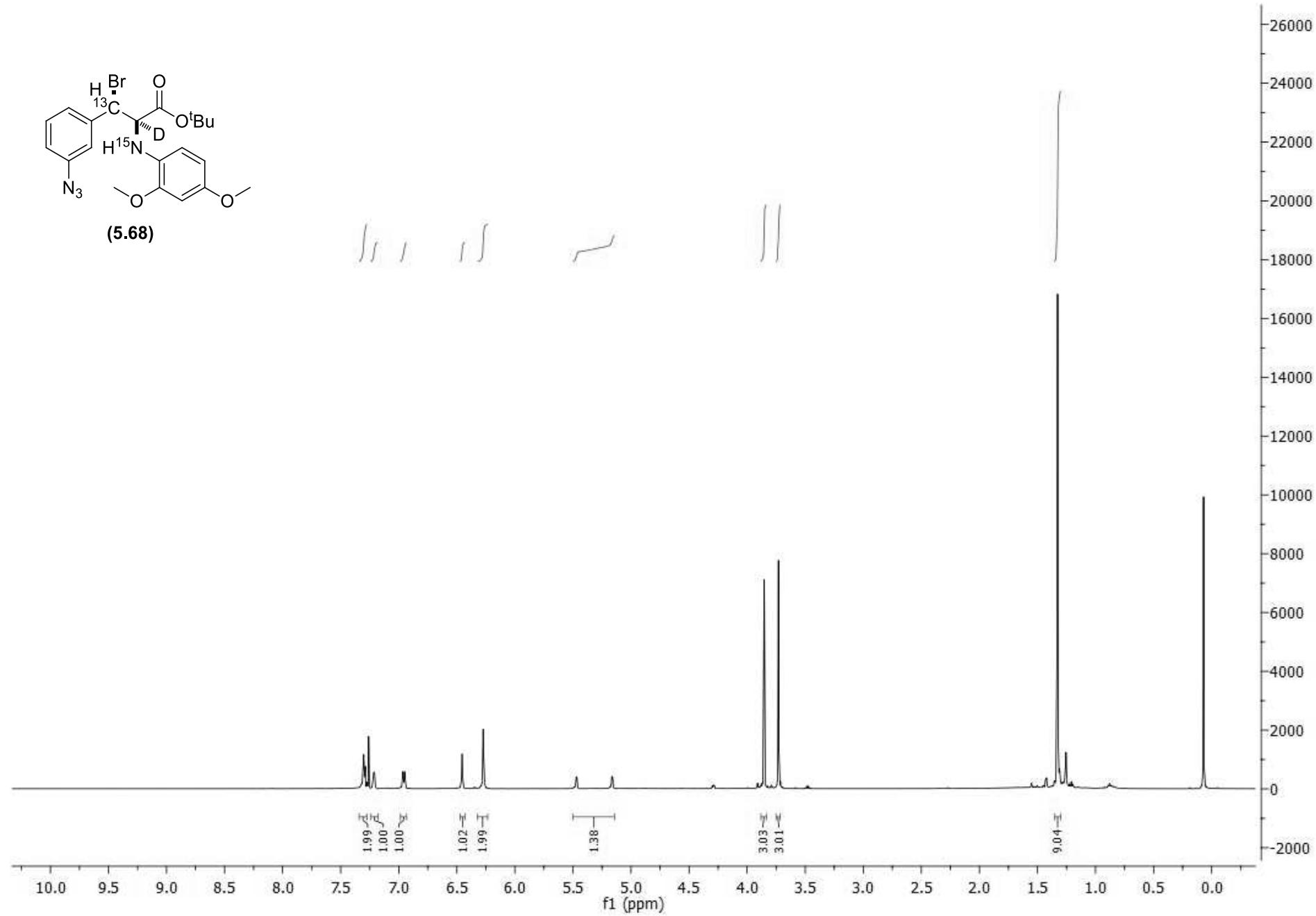
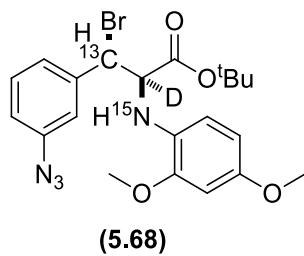
¹H-NMR (CDCl₃, 500 MHz)



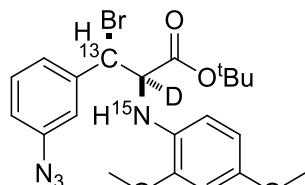
¹³C-NMR exp254 (CDCl₃, 126 MHz)



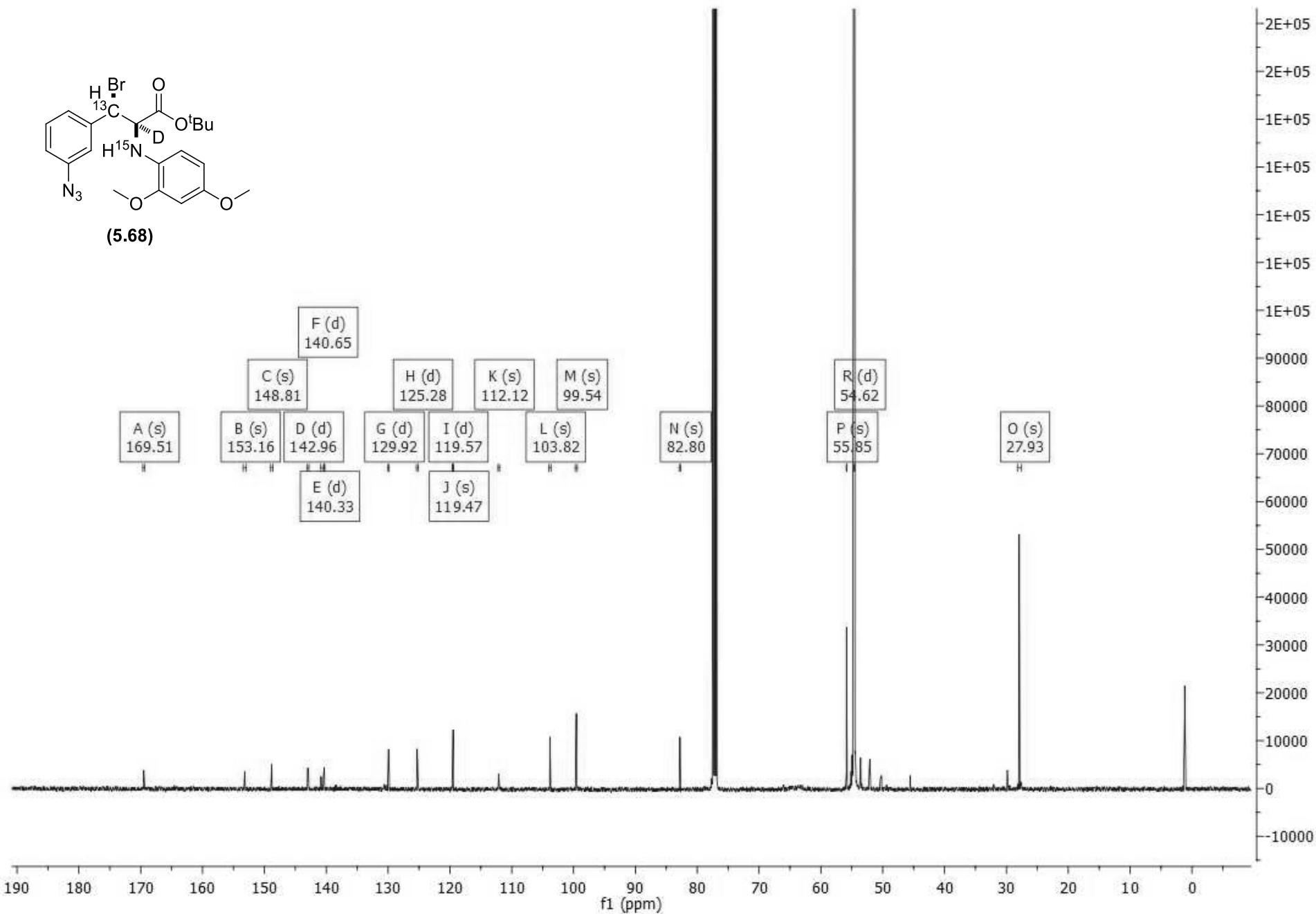
¹H-NMR (CDCl₃, 500 MHz)



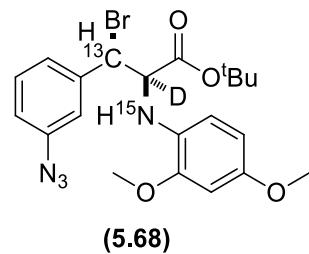
¹³C-NMR (CDCl₃, 126 MHz)



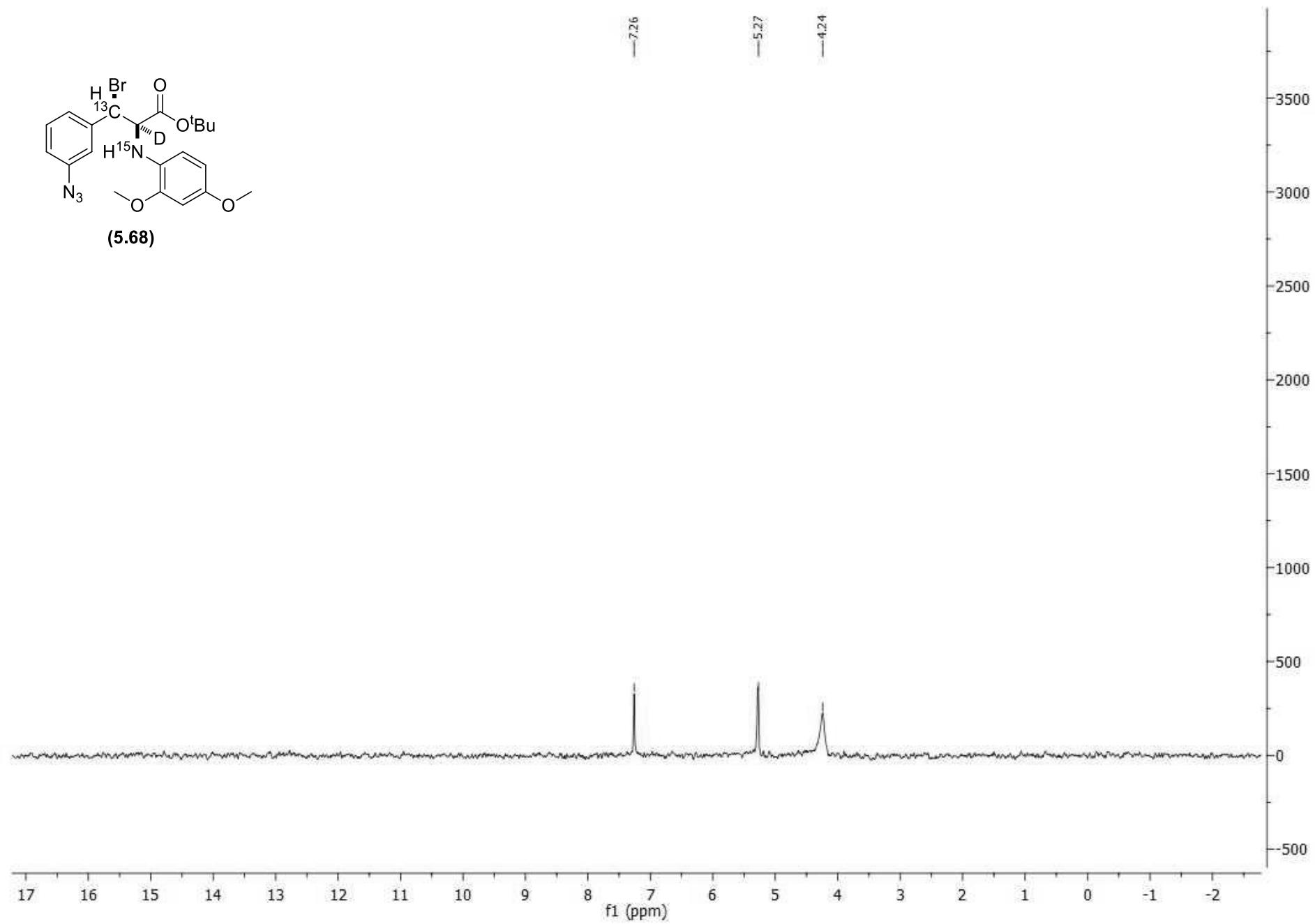
(5.68)



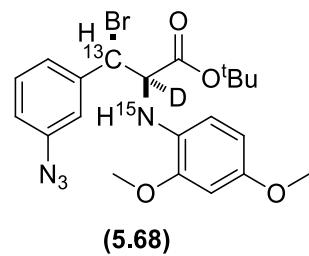
²H-NMR (CH_2Cl_2 , 77 MHz)



—7.26
—5.27
—4.24



¹⁵N-NMR (CDCl₃, 51 MHz)



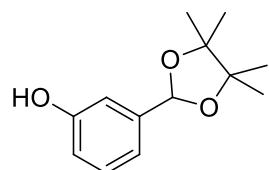
A (d)
54.27

400 350 300 250 200 150 100 50 0

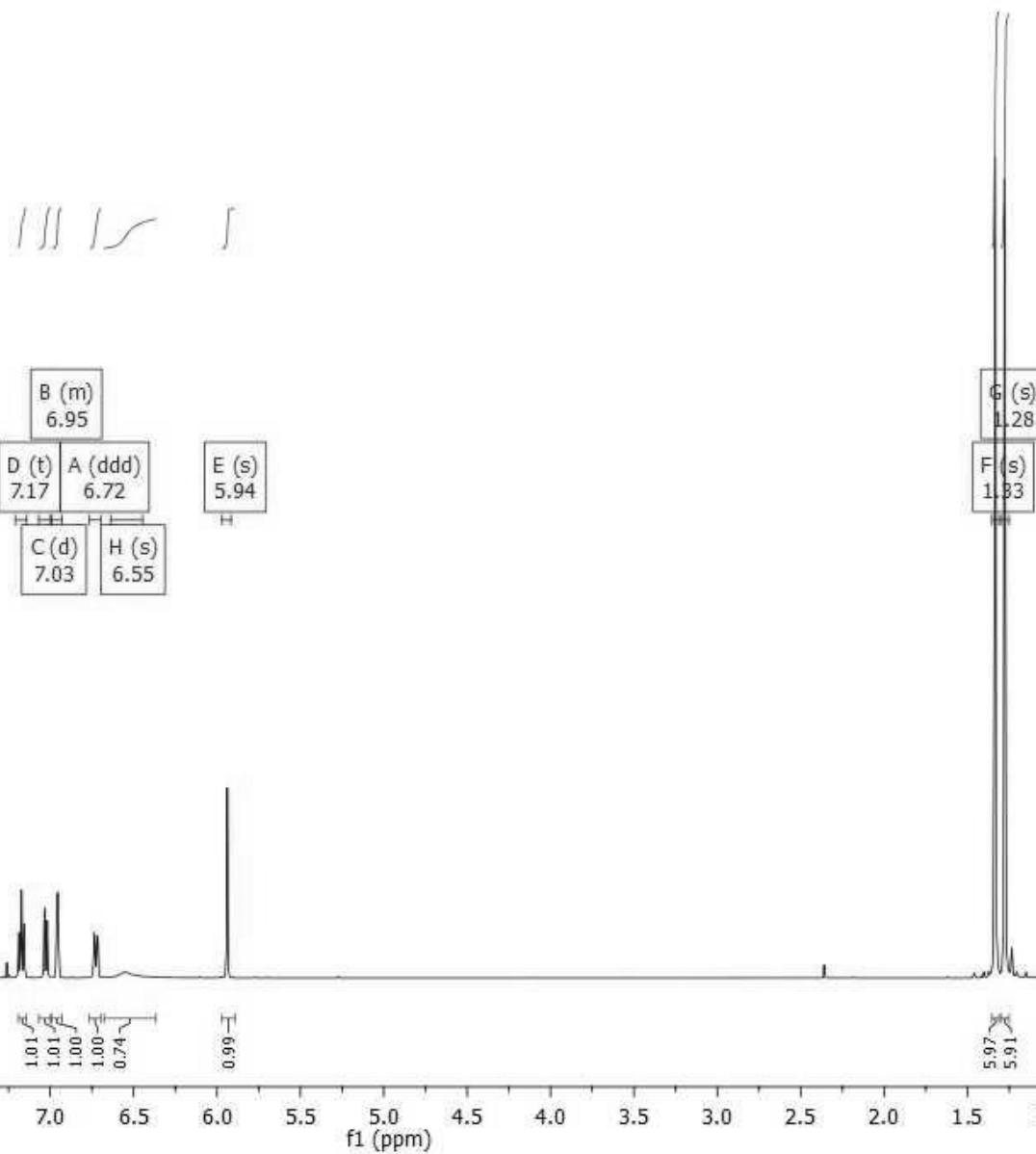
f1 (ppm)

55
50
45
40
35
30
25
20
15
10
5
0
-5
-10

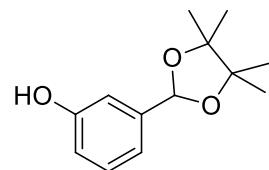
¹H-NMR (CDCl₃, 500 MHz)



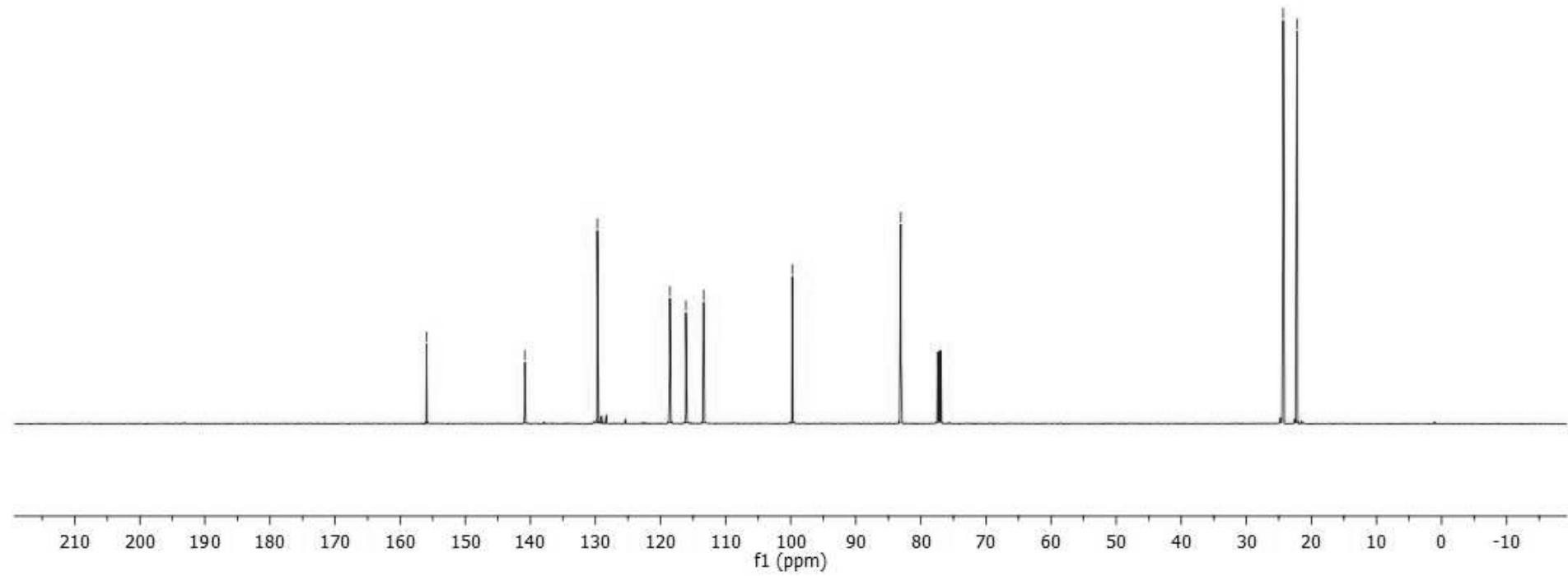
(6.19)



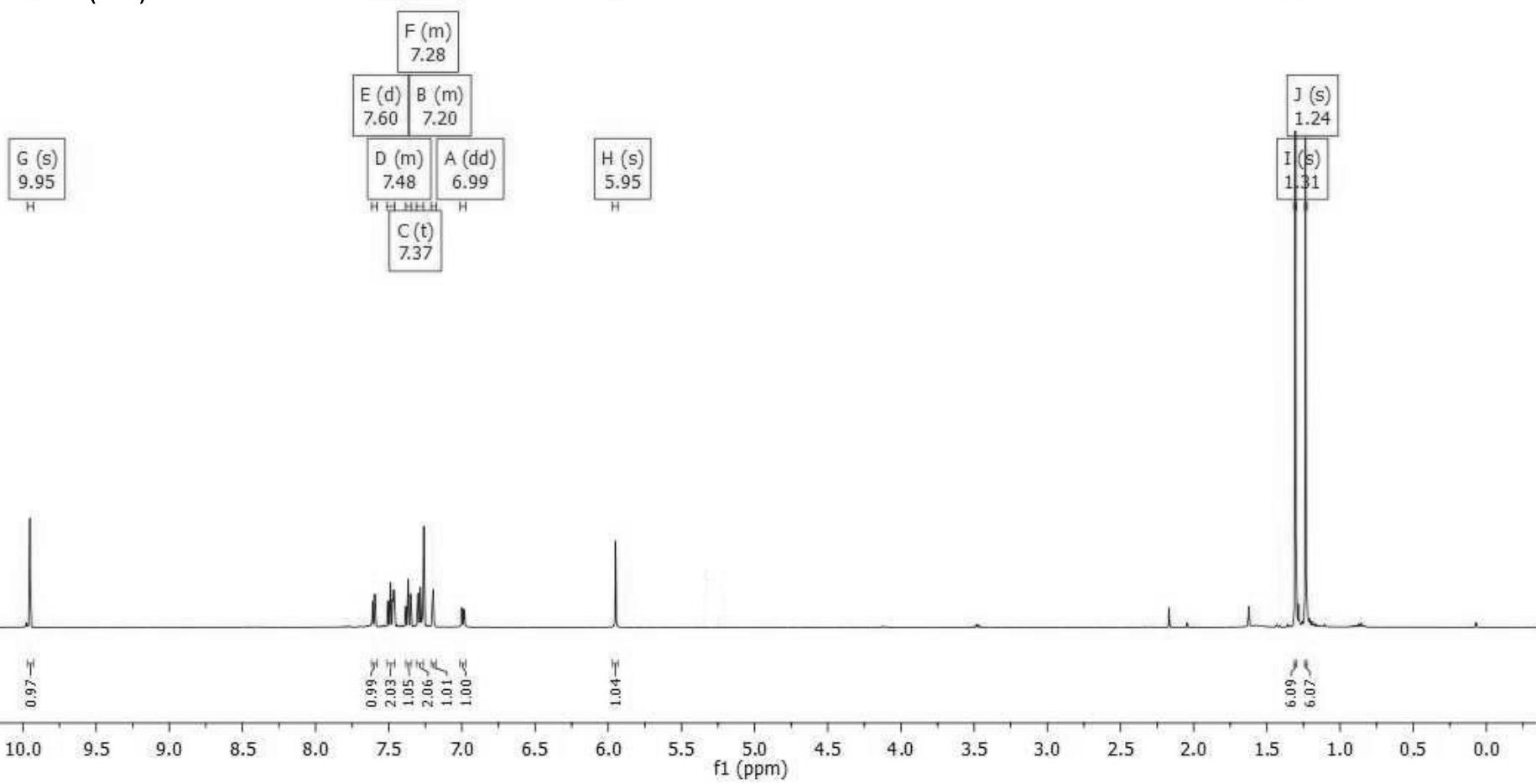
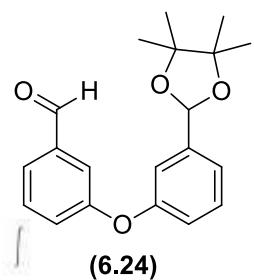
¹³C-NMR (CDCl₃, 126 MHz)



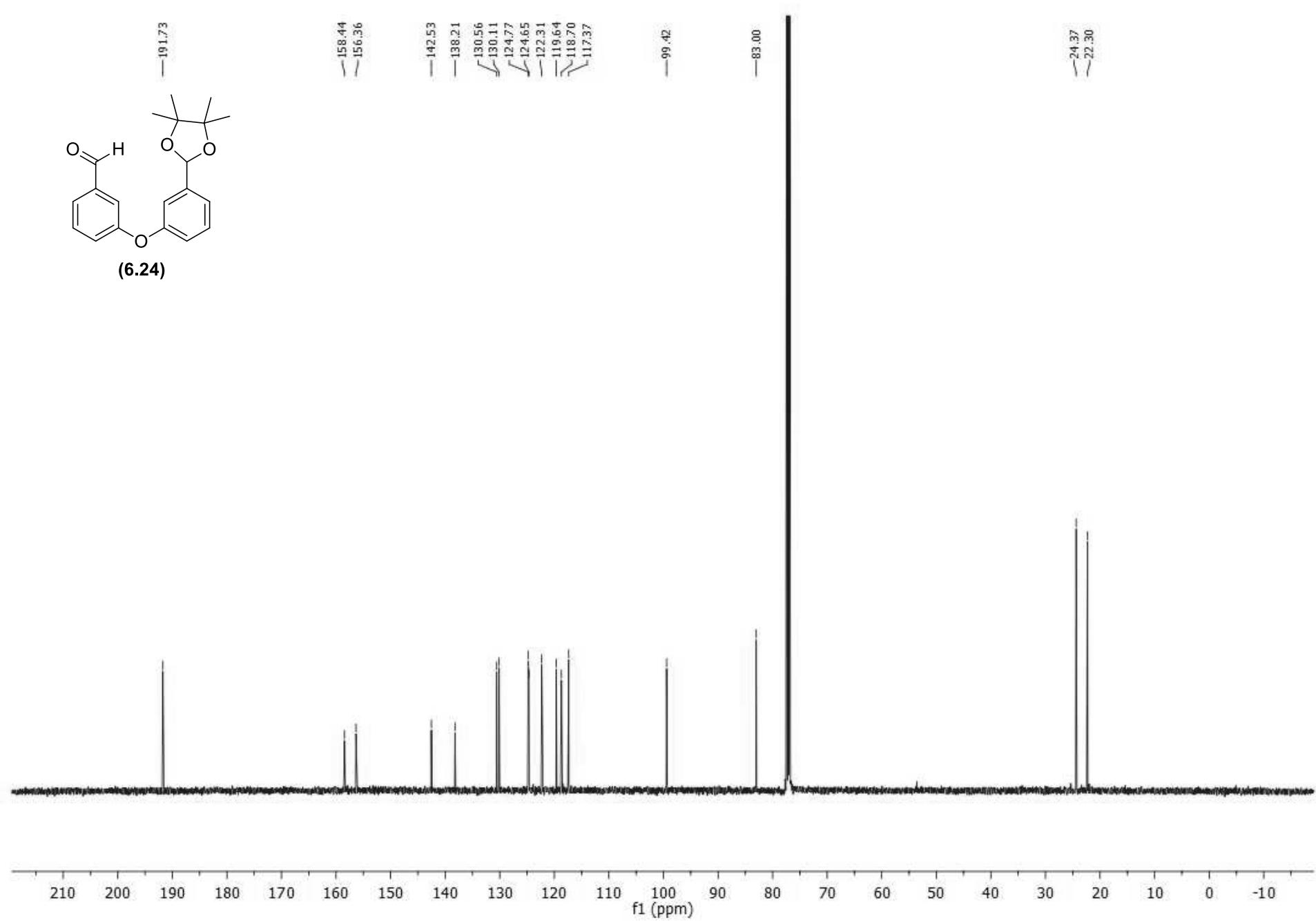
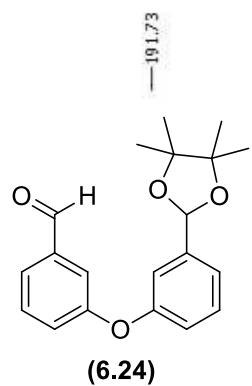
—155.95
—140.85
—129.71
—118.56
—116.10
—113.38
—99.75
—83.09
—24.34
—22.20



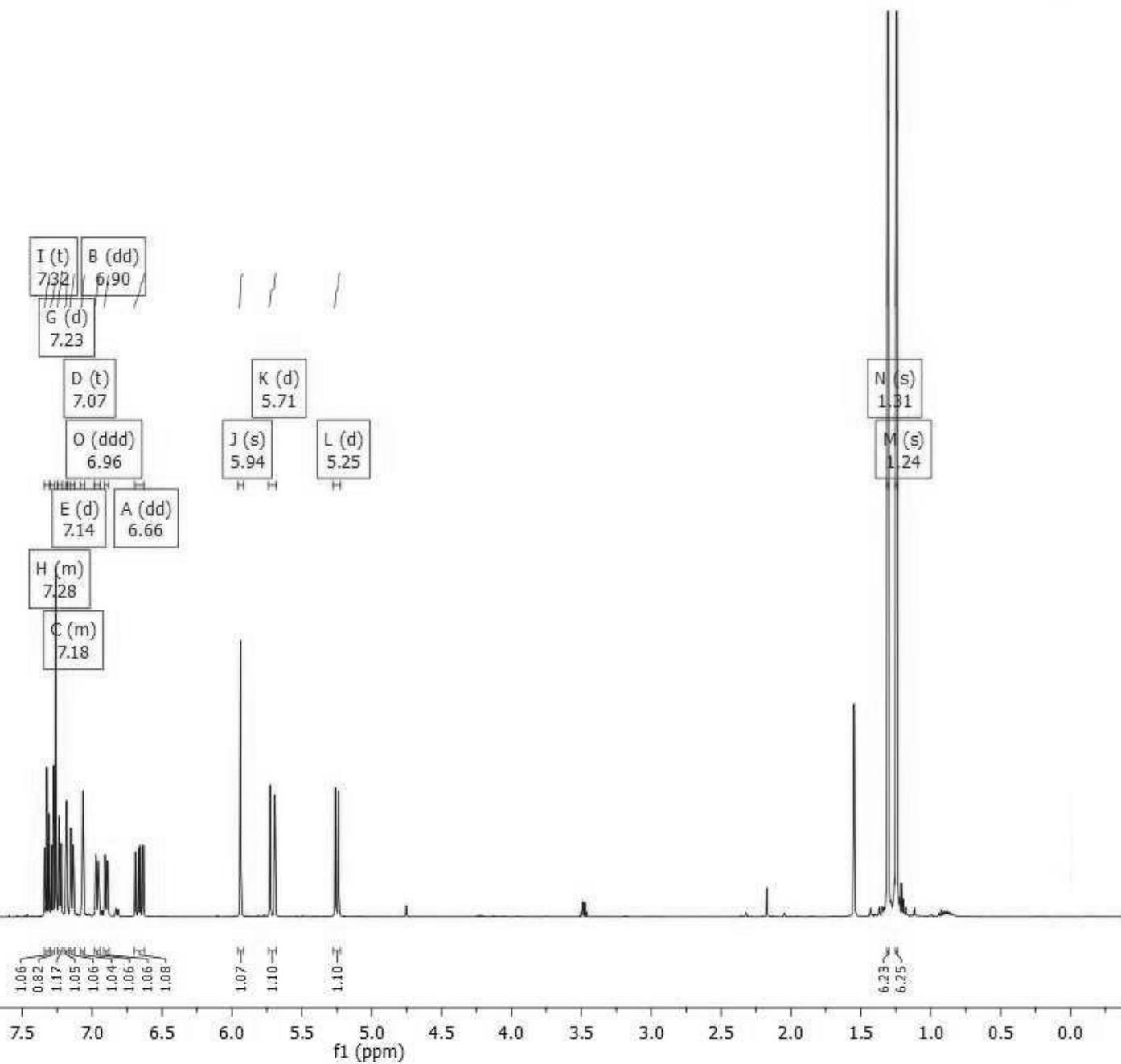
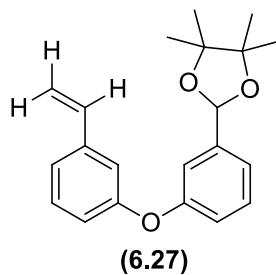
¹H-NMR (CDCl₃, 500 MHz)



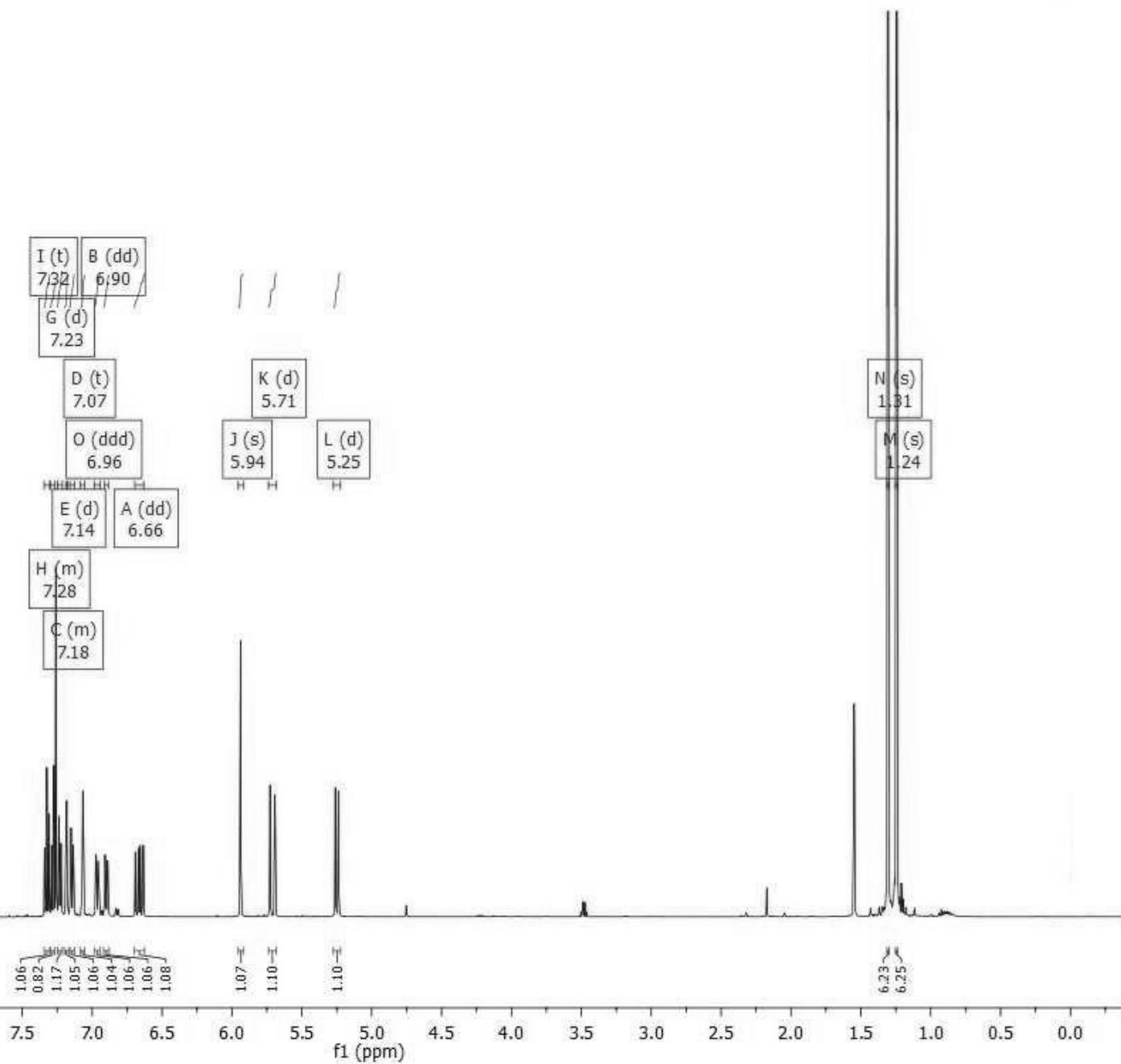
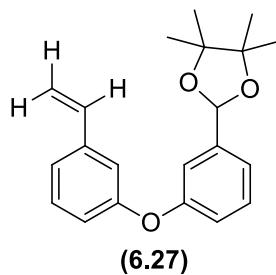
¹³C-NMR (CDCl₃, 126 MHz)



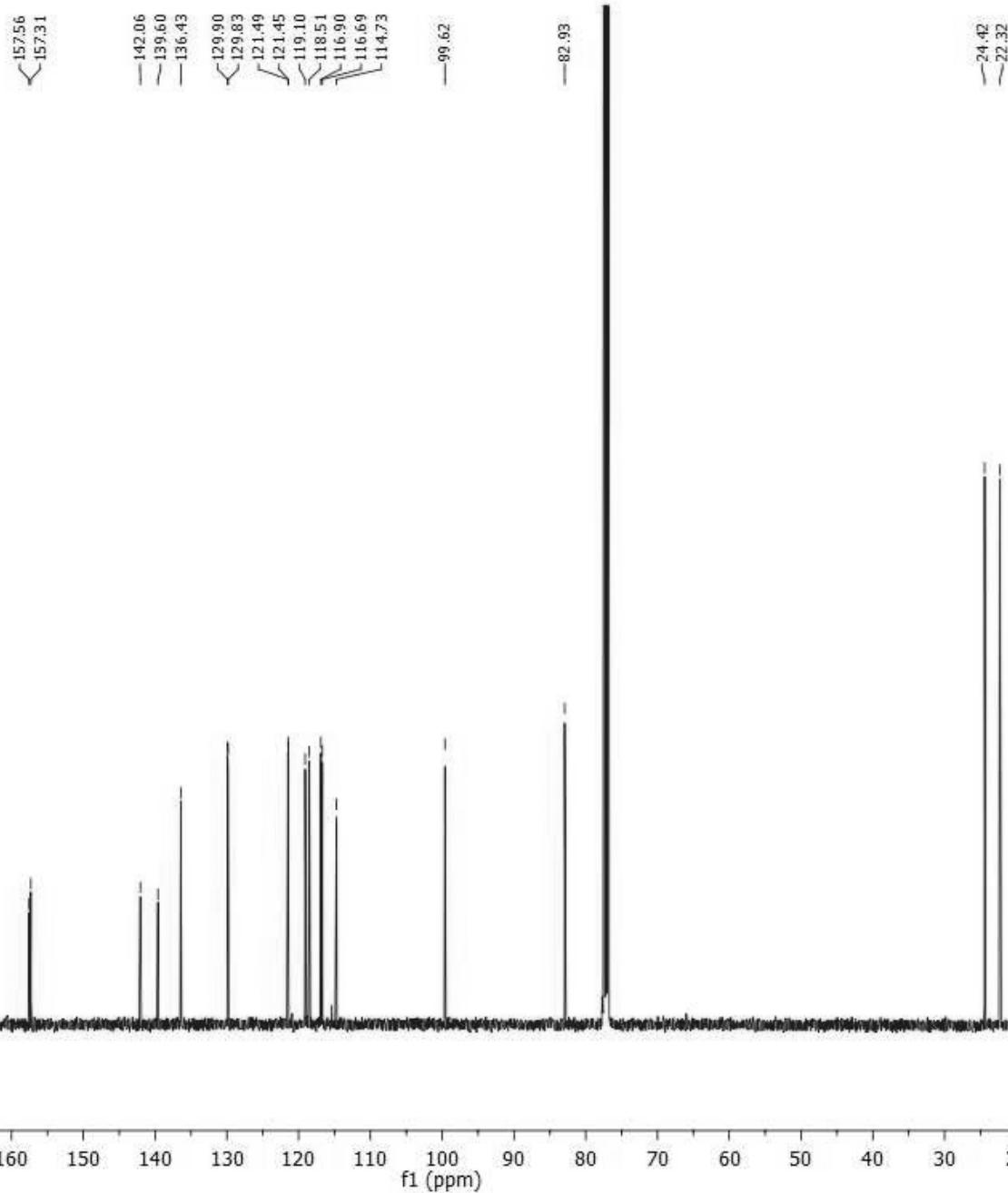
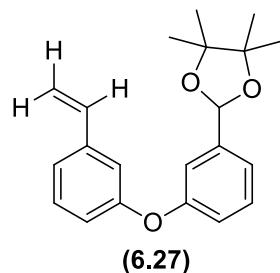
¹H-NMR (CDCl₃, 500 MHz)



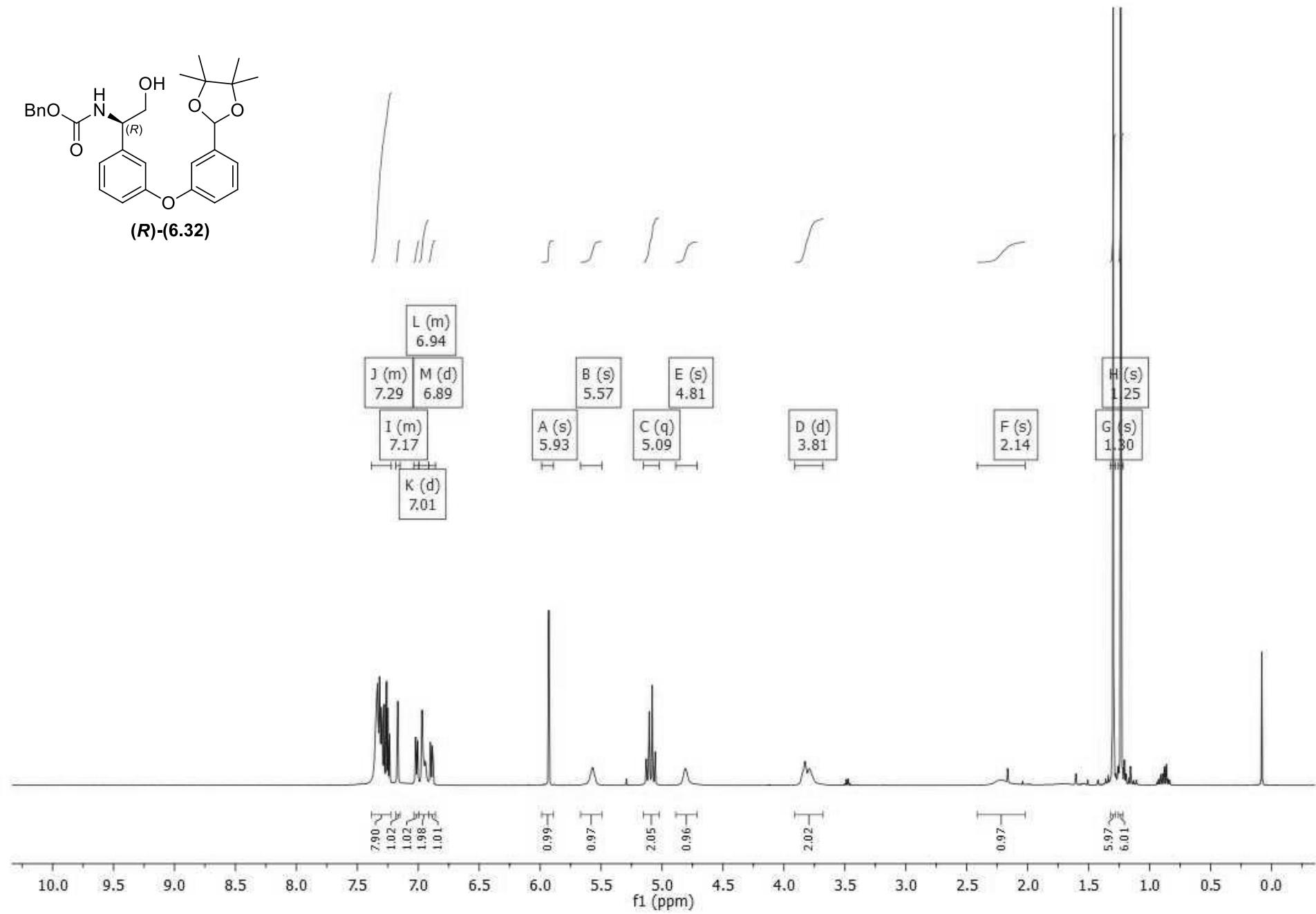
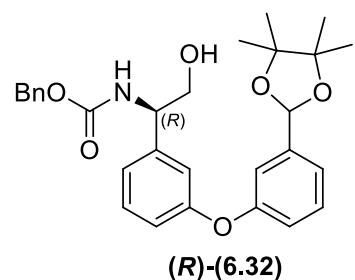
¹H-NMR (CDCl₃, 500 MHz)



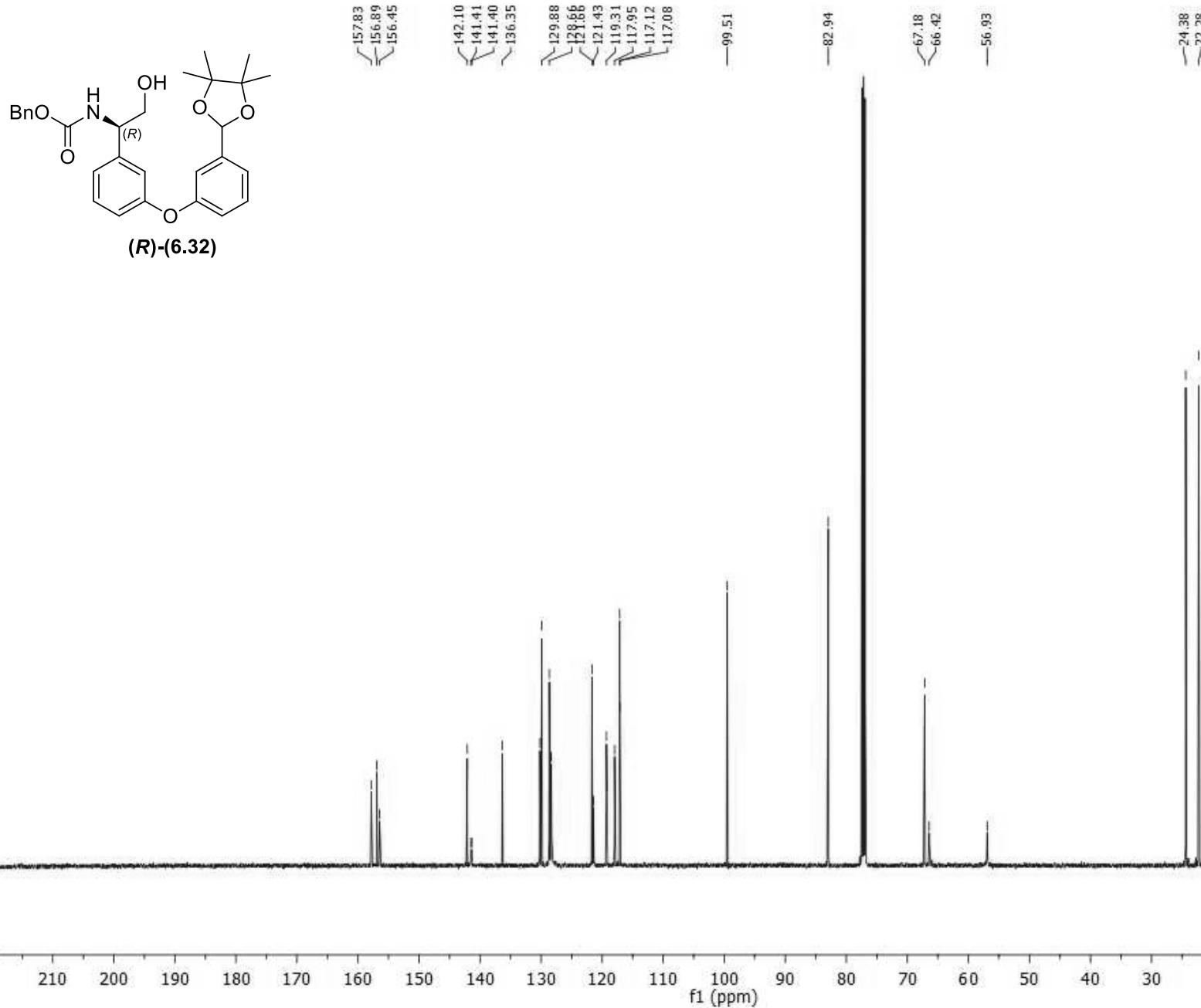
¹³C-NMR (CDCl₃, 126 MHz)



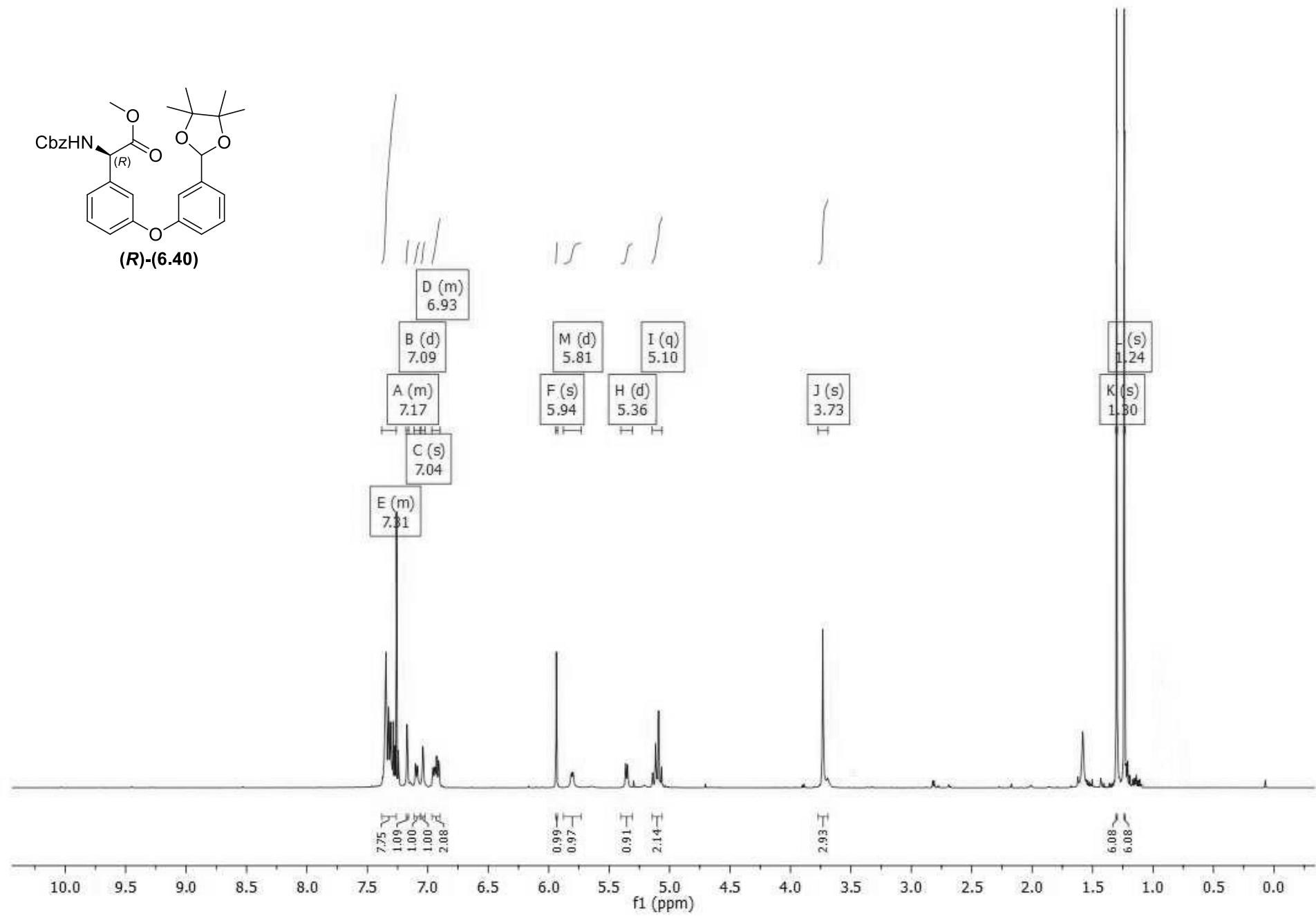
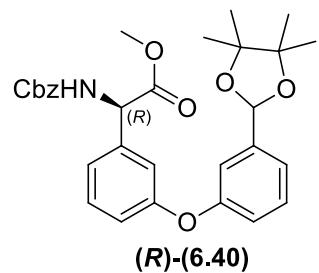
¹H-NMR (CDCl₃, 500 MHz)



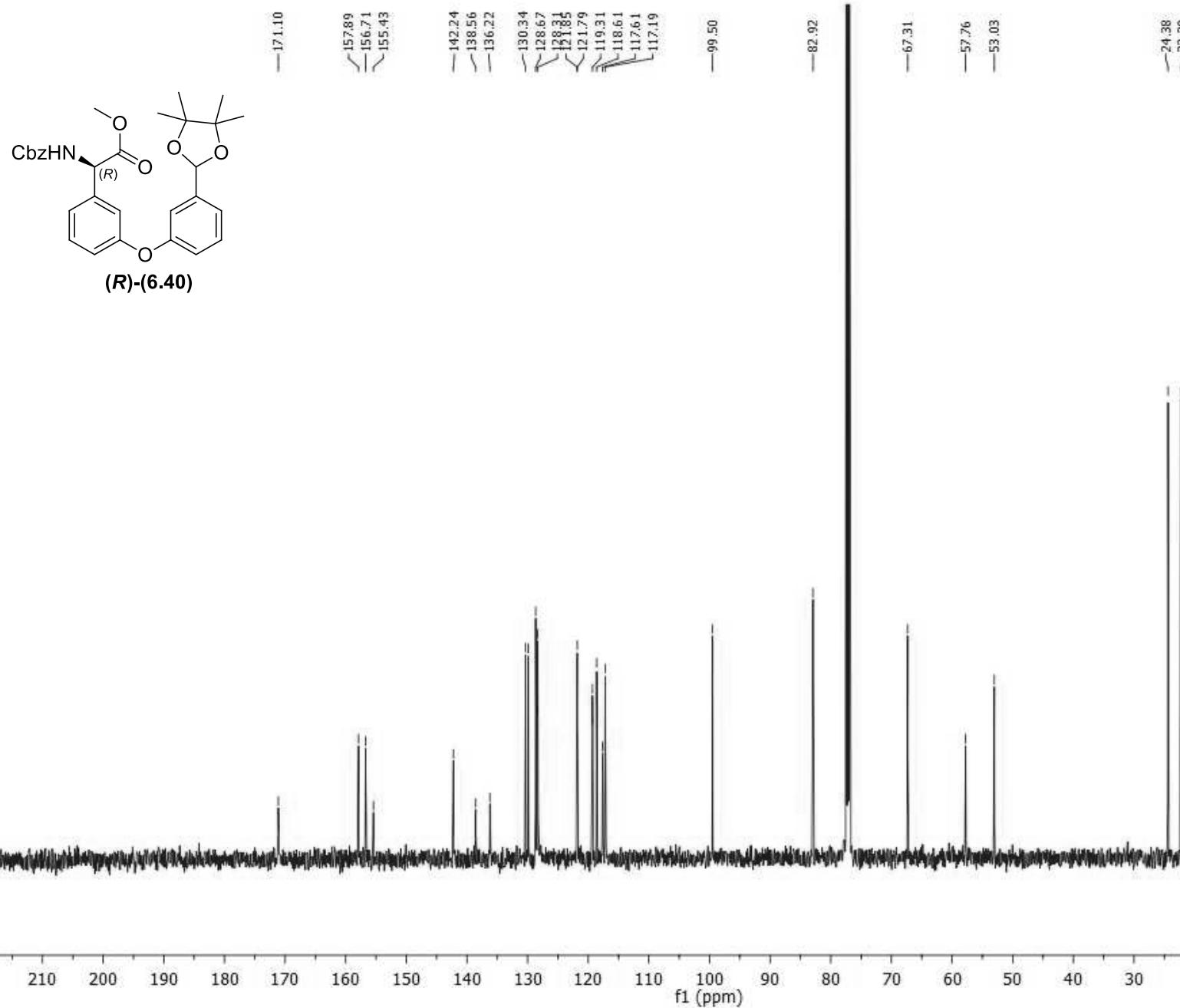
¹³C-NMR (CDCl₃, 126 MHz)



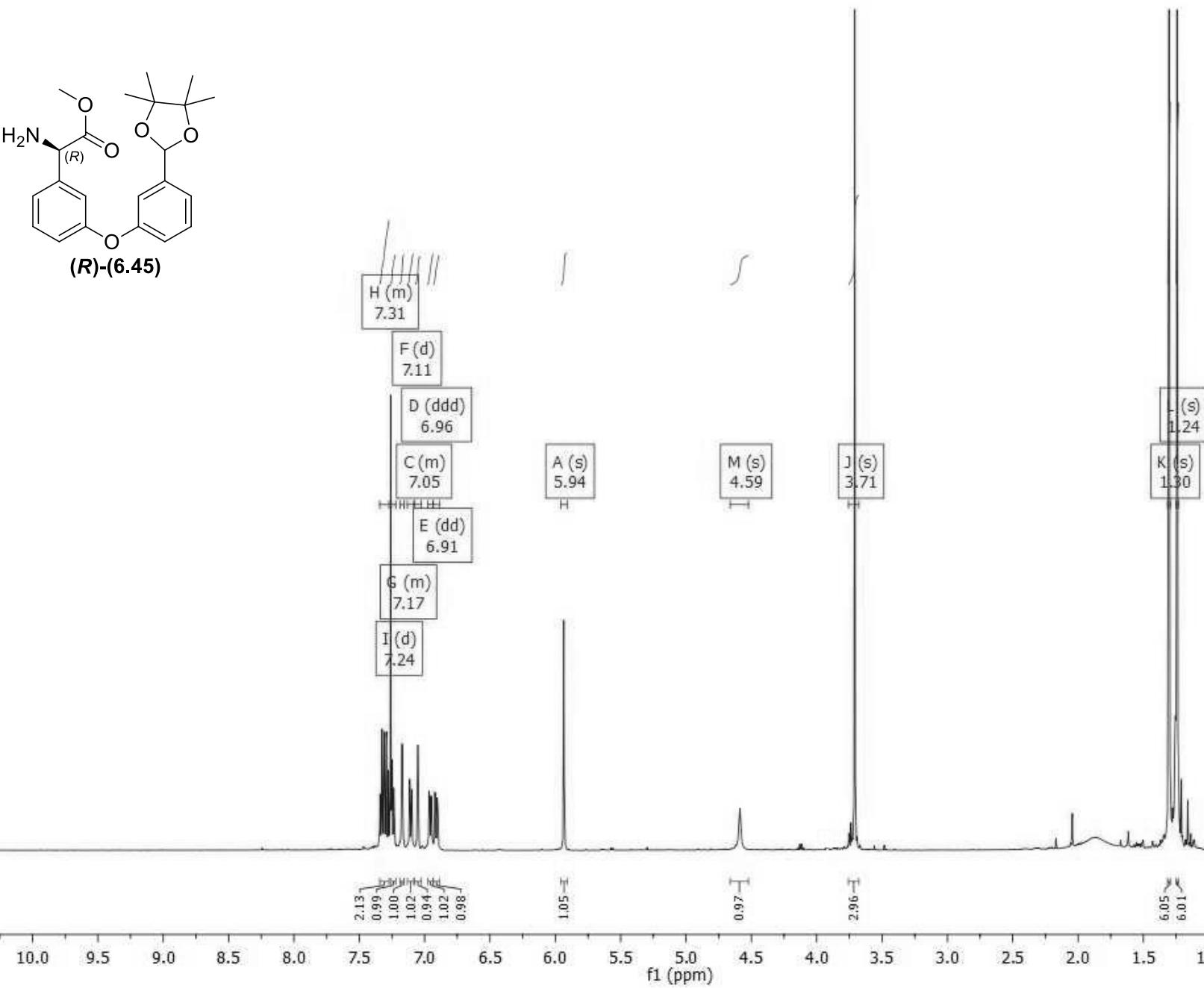
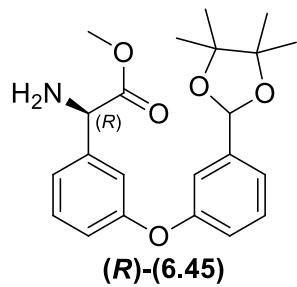
¹H-NMR (CDCl₃, 500 MHz)



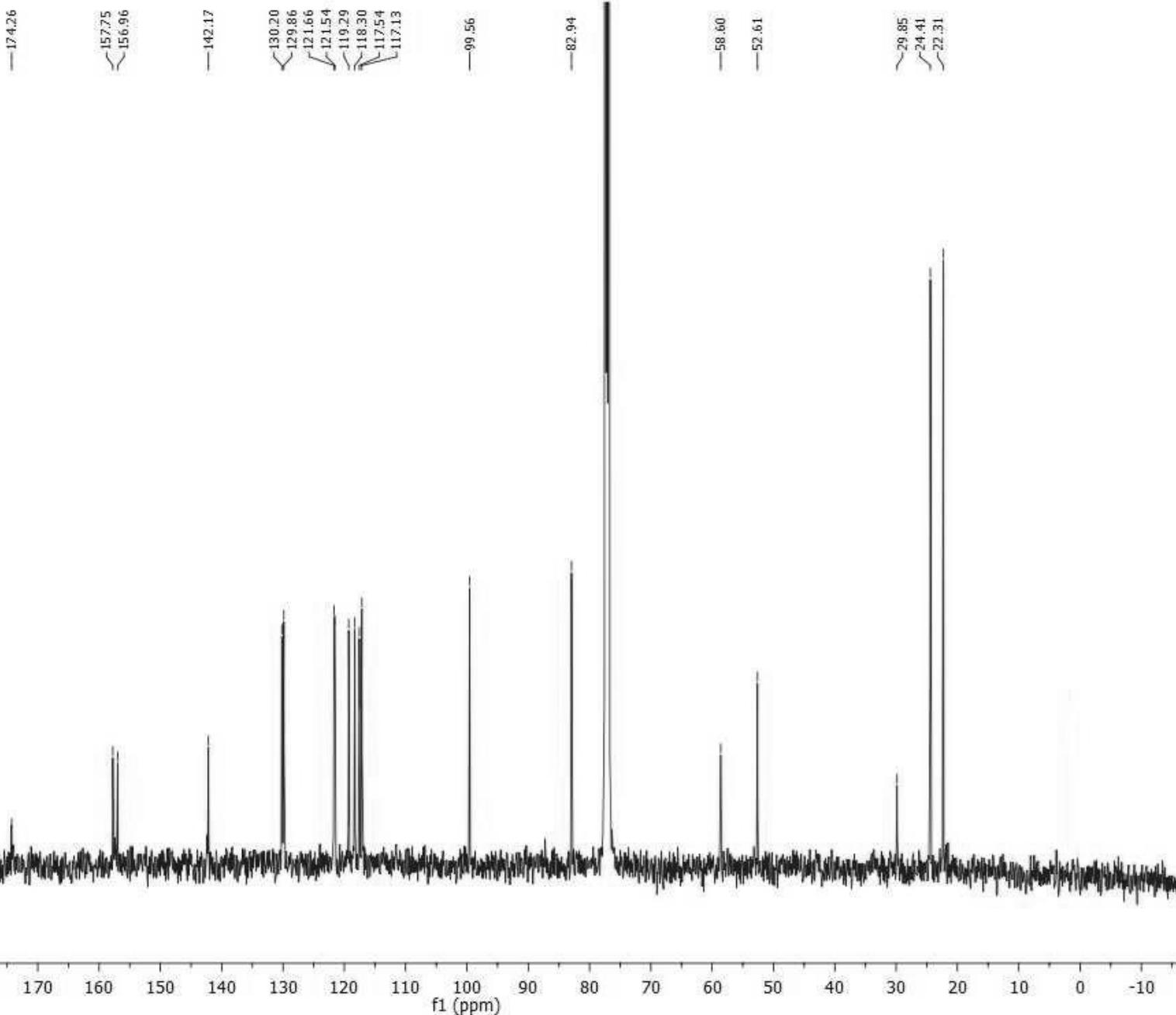
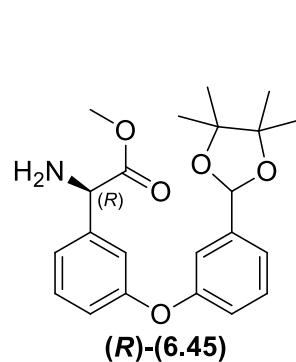
¹³C-NMR (CDCl₃, 126 MHz)



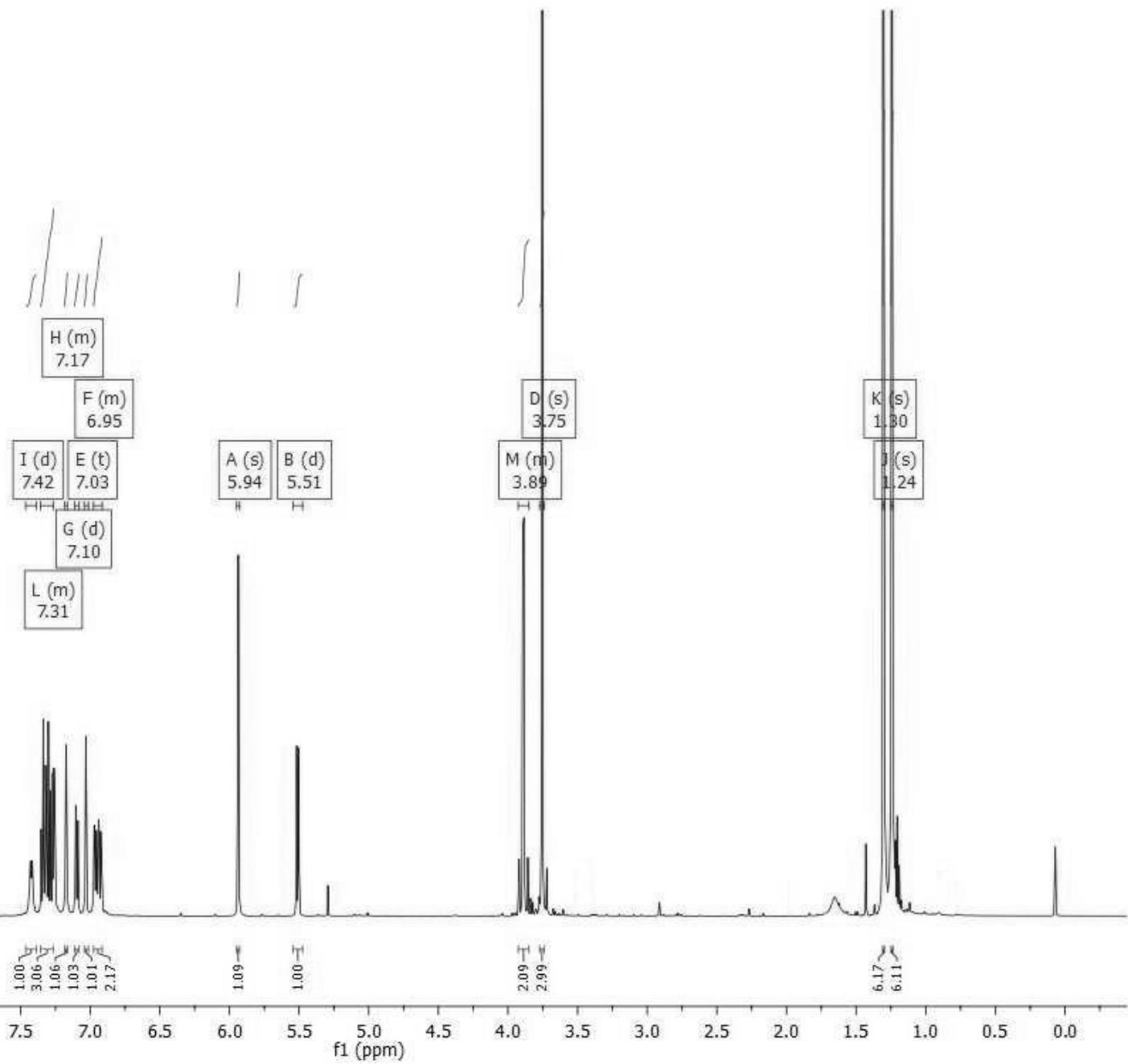
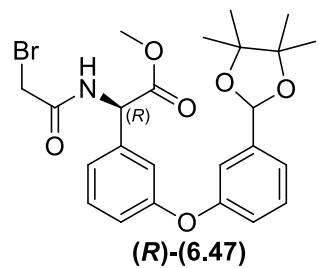
¹H-NMR (CDCl₃, 500 MHz)



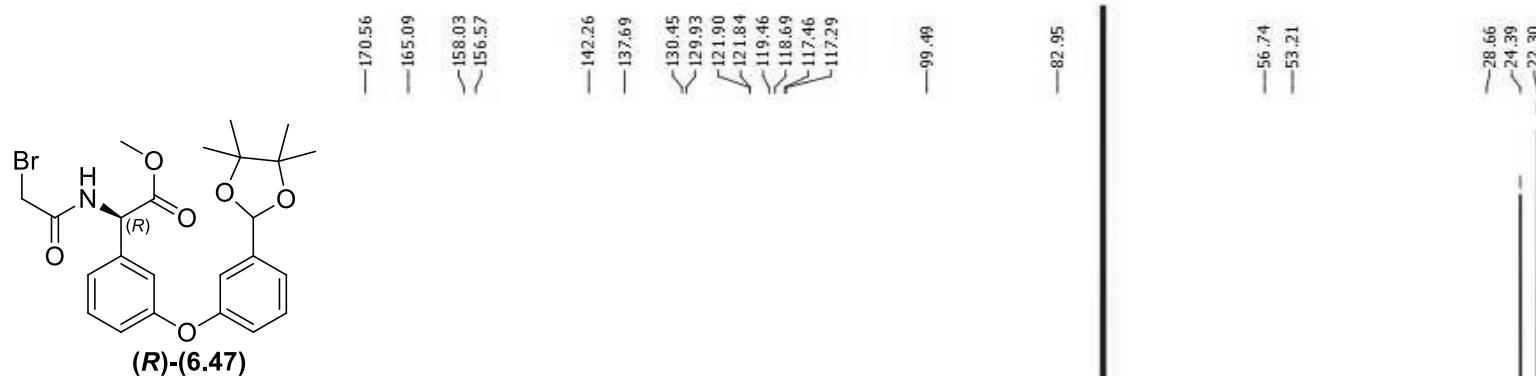
¹³C-NMR (CDCl₃, 126 MHz)



¹H-NMR (CDCl₃, 500 MHz)



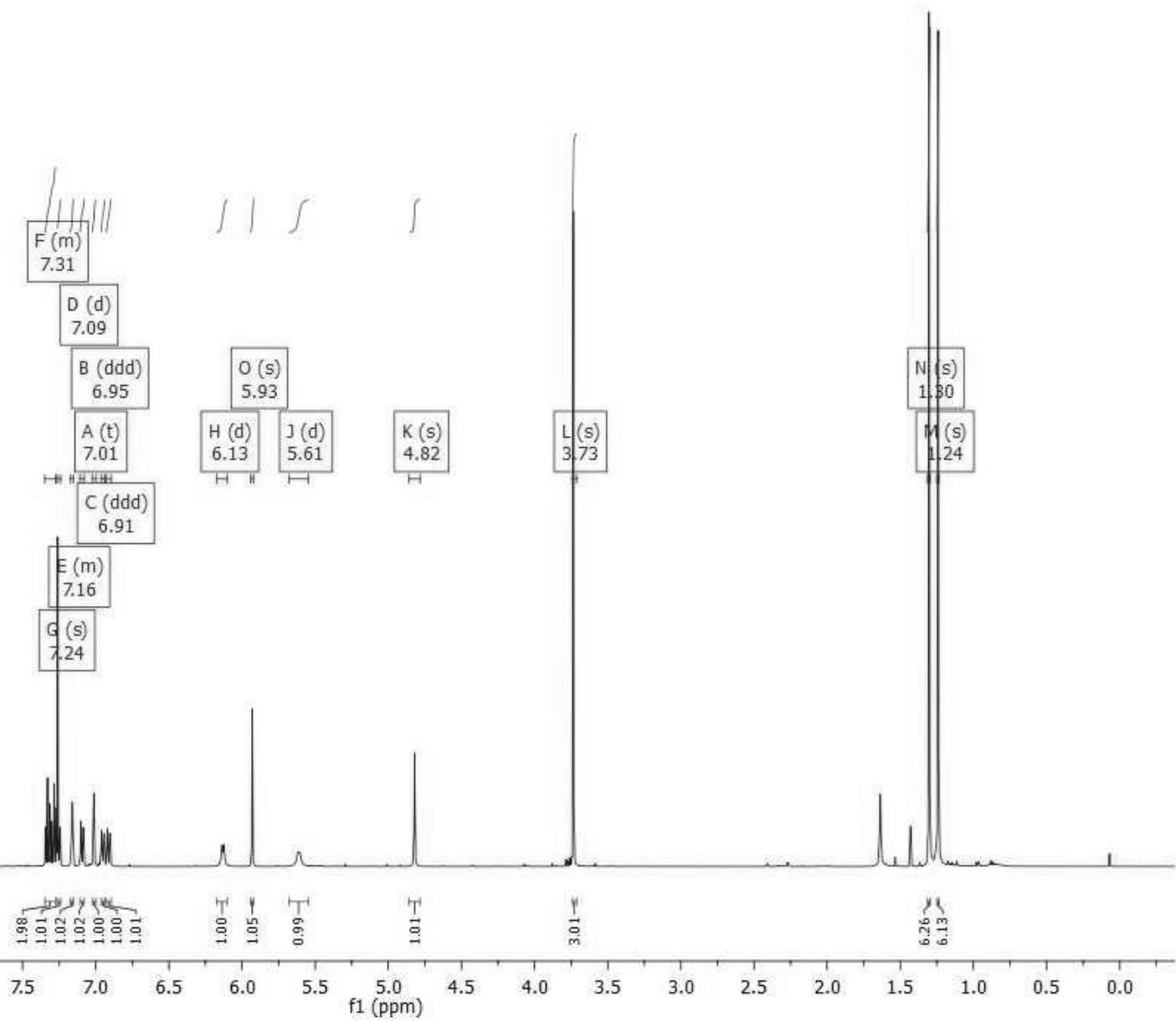
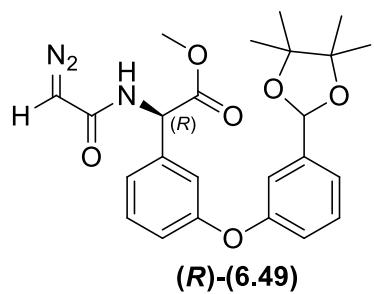
¹³C-NMR (CDCl₃, 126 MHz)



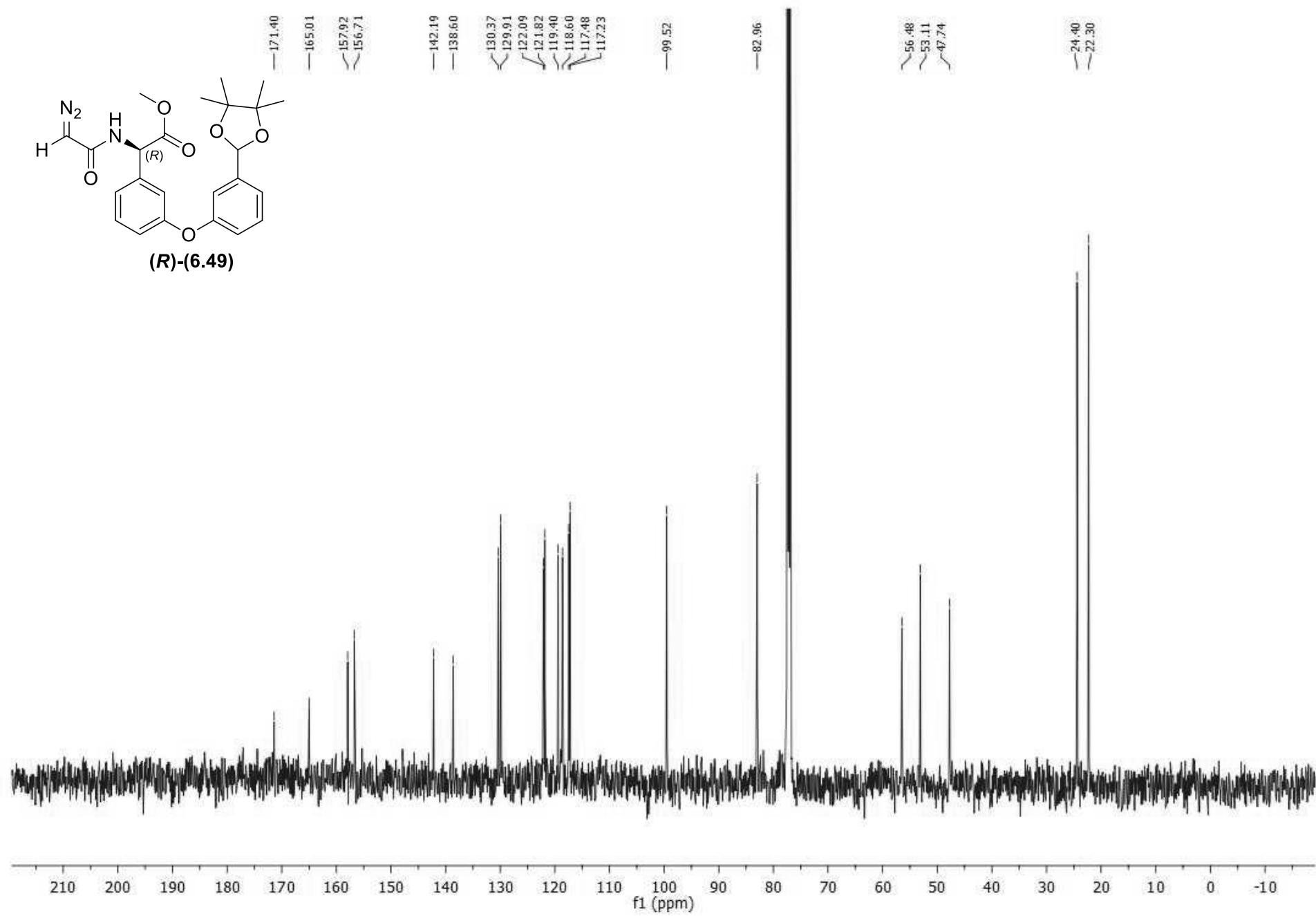
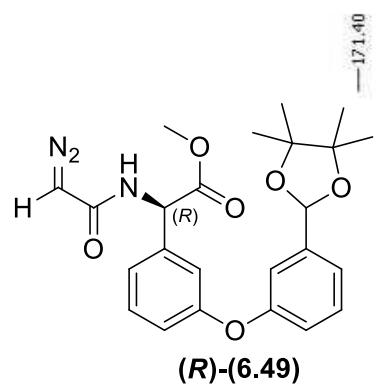
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

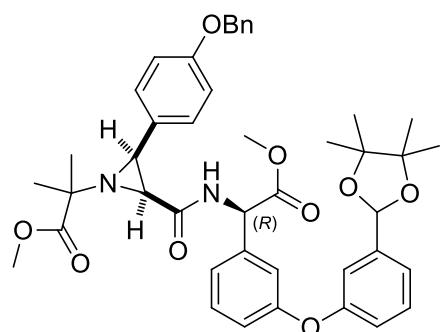
¹H-NMR (CDCl₃, 500 MHz)



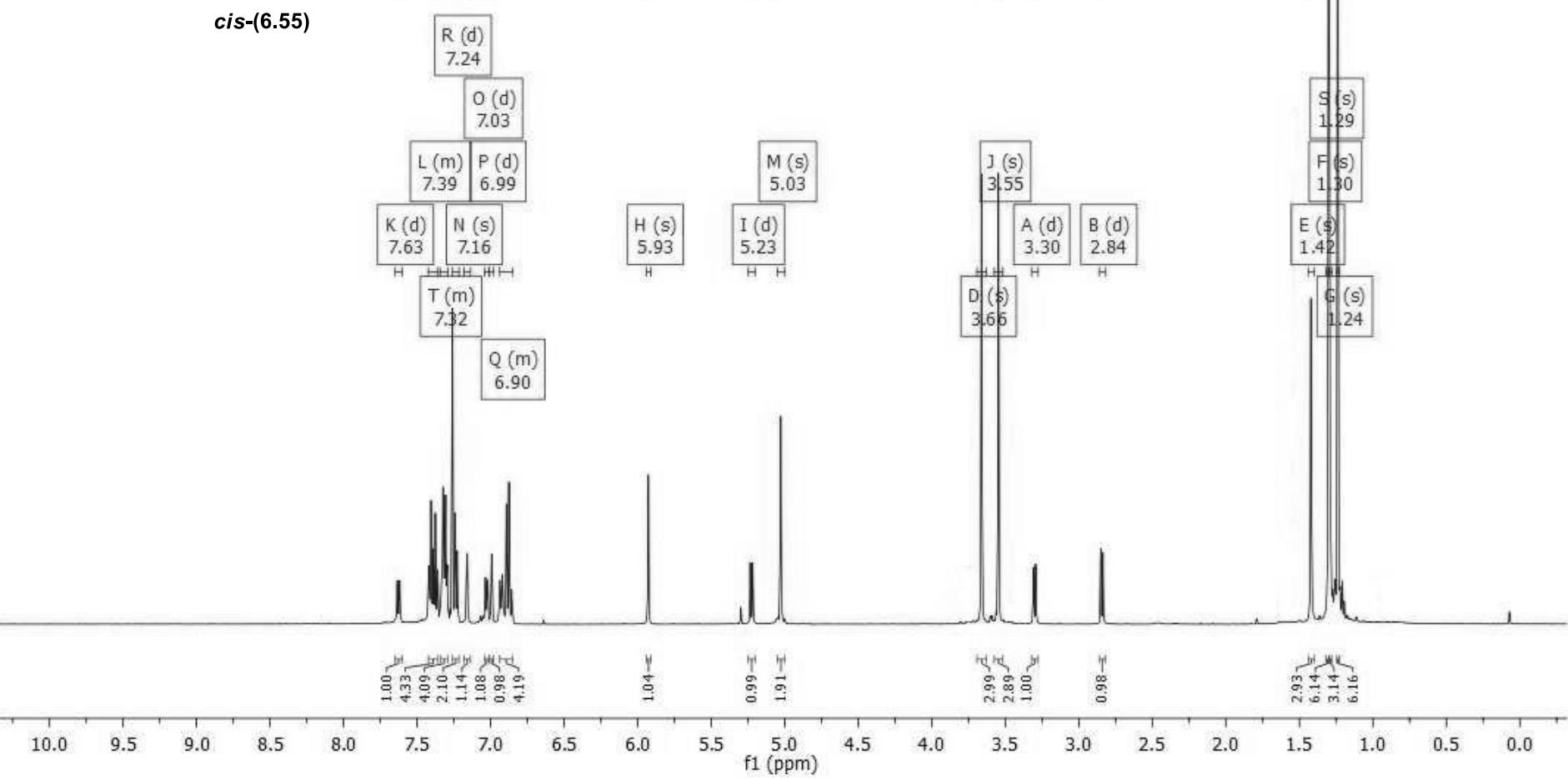
¹³C-NMR (CDCl₃, 126 MHz)



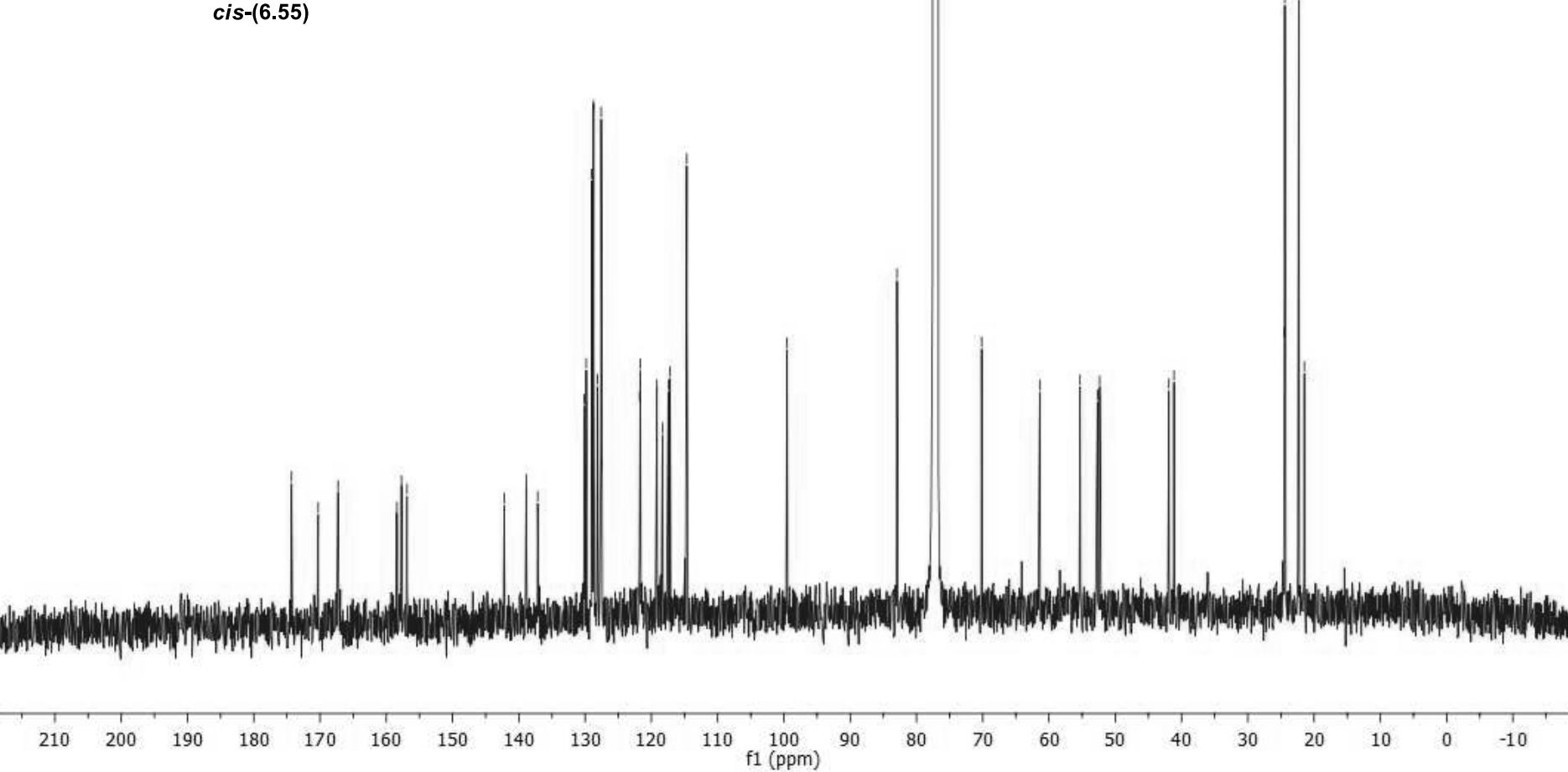
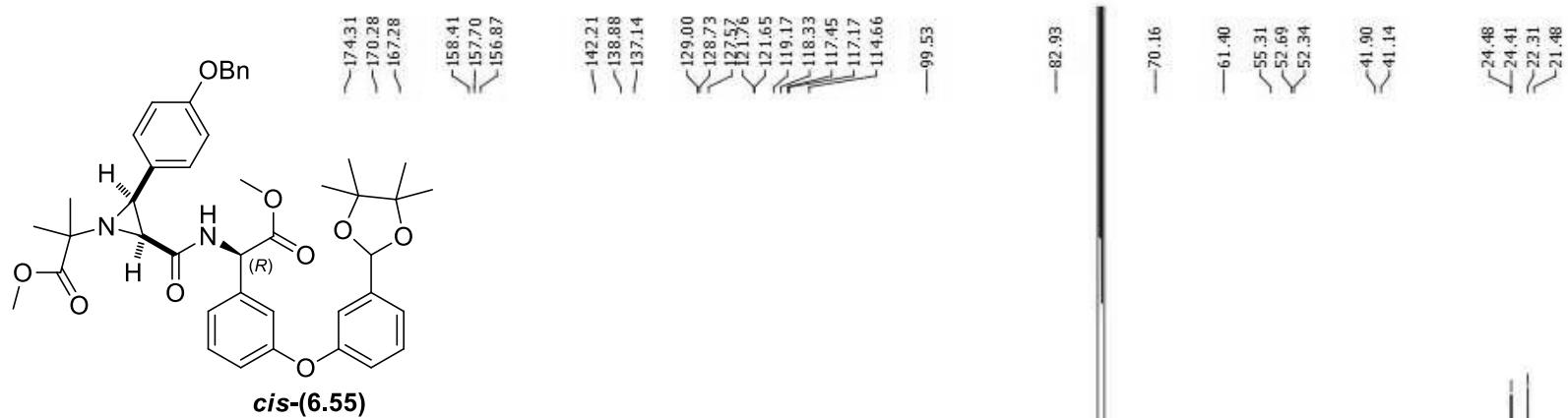
¹H-NMR (CDCl₃, 500 MHz)



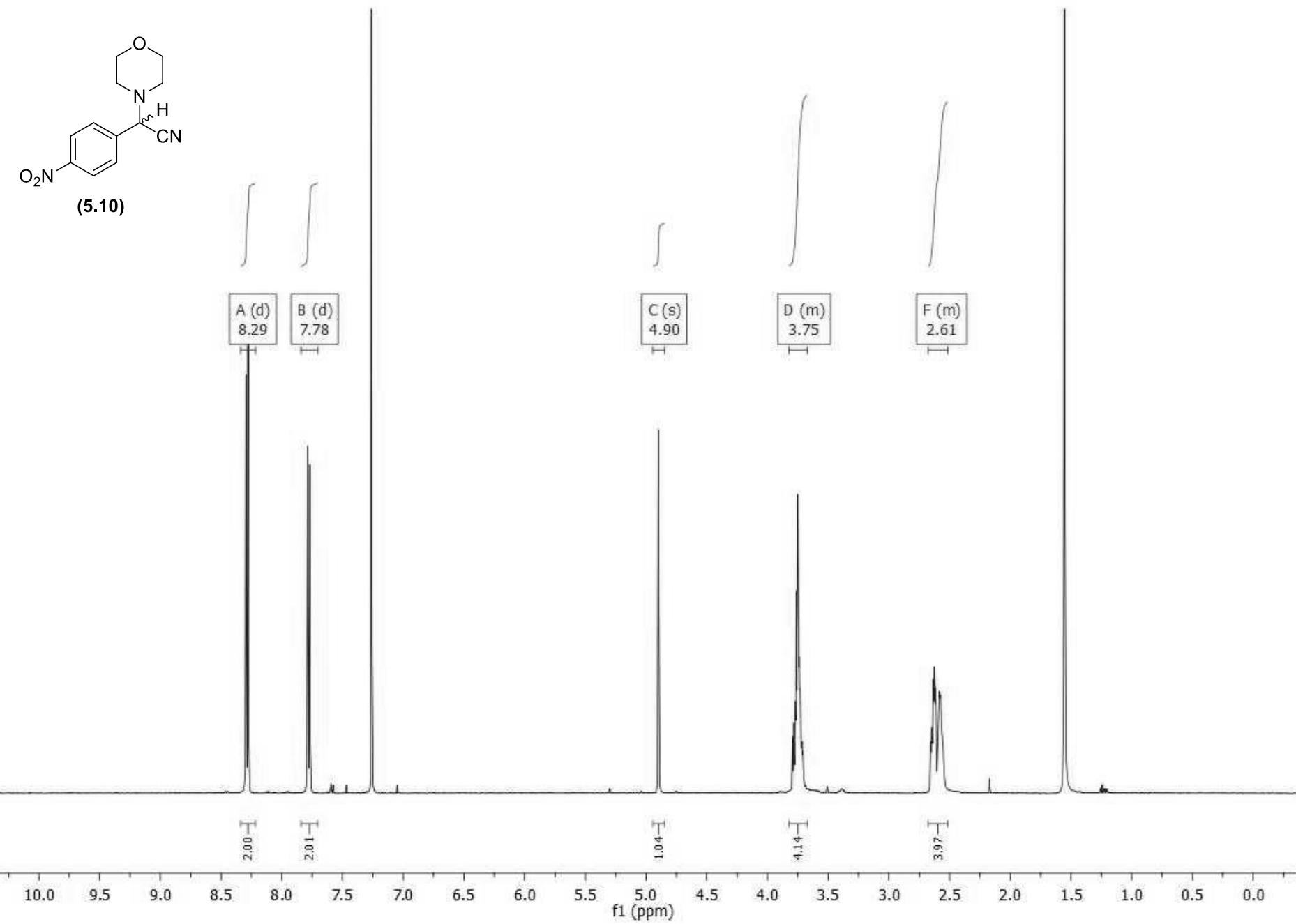
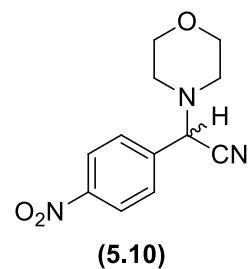
cis-(6.55)



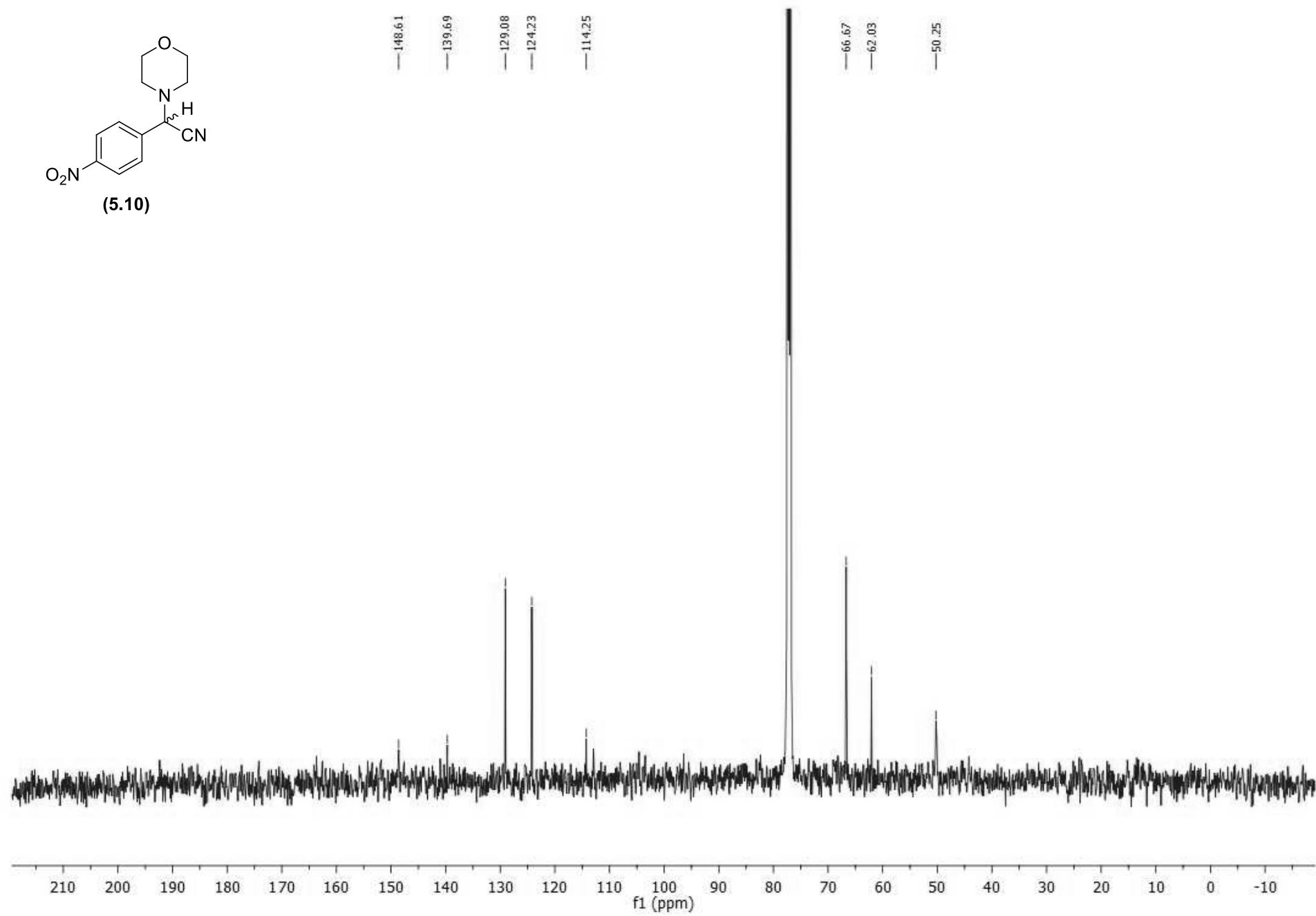
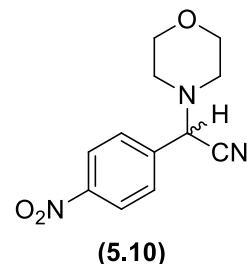
¹³C-NMR (CDCl₃, 126 MHz)



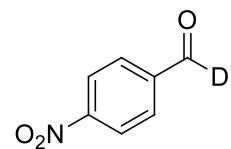
¹H-NMR (CDCl₃, 500 MHz)



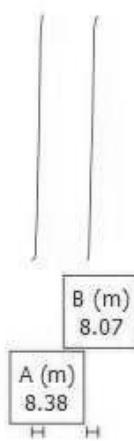
¹³C-NMR (CDCl₃, 126 MHz)



¹H-NMR (CDCl₃, 500 MHz)



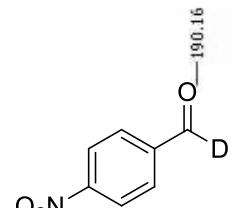
(5.11)



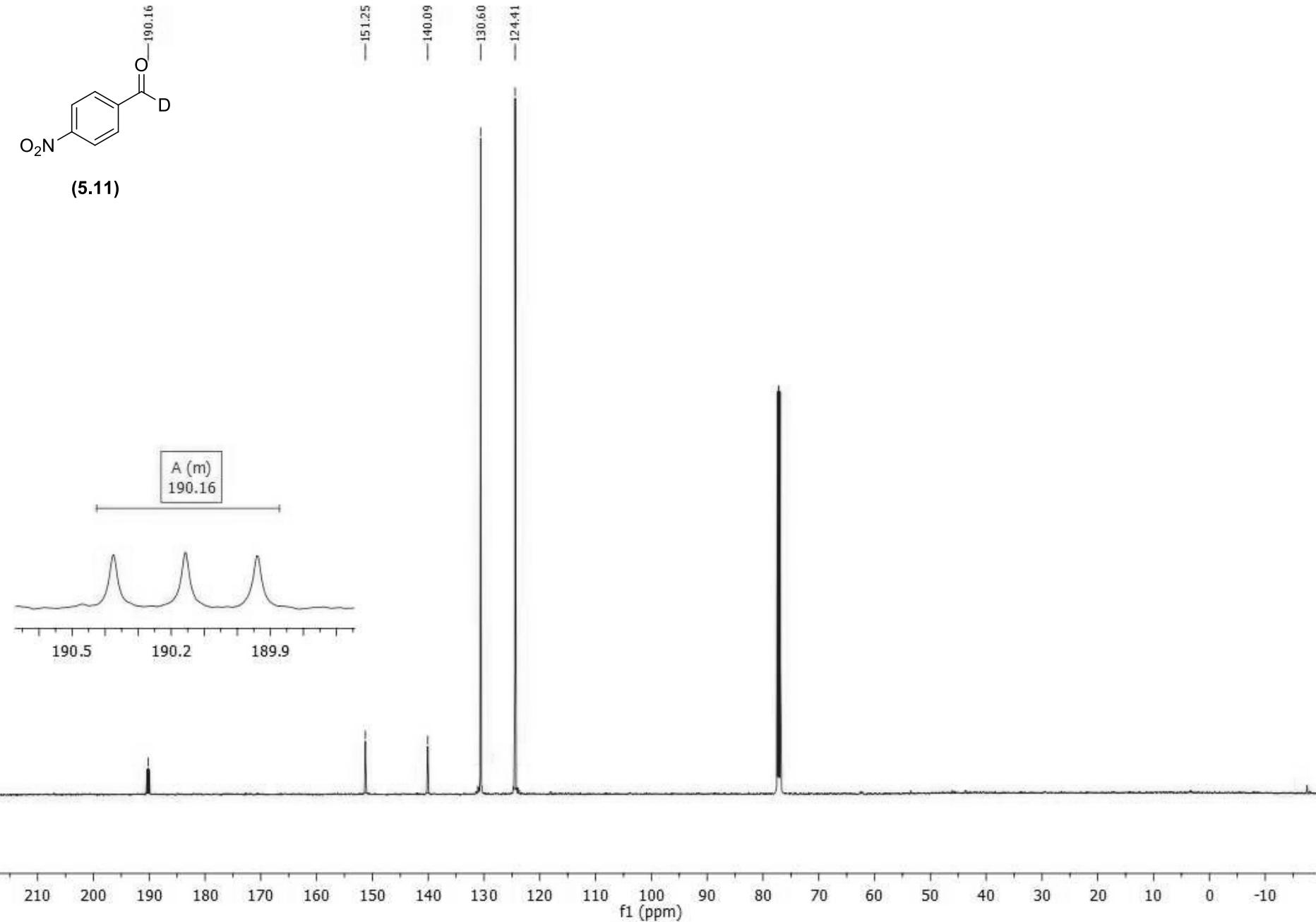
2.00
1.98

10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

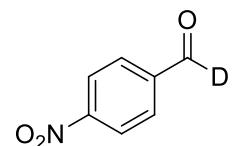
¹³C-NMR (CDCl₃, 126 MHz)



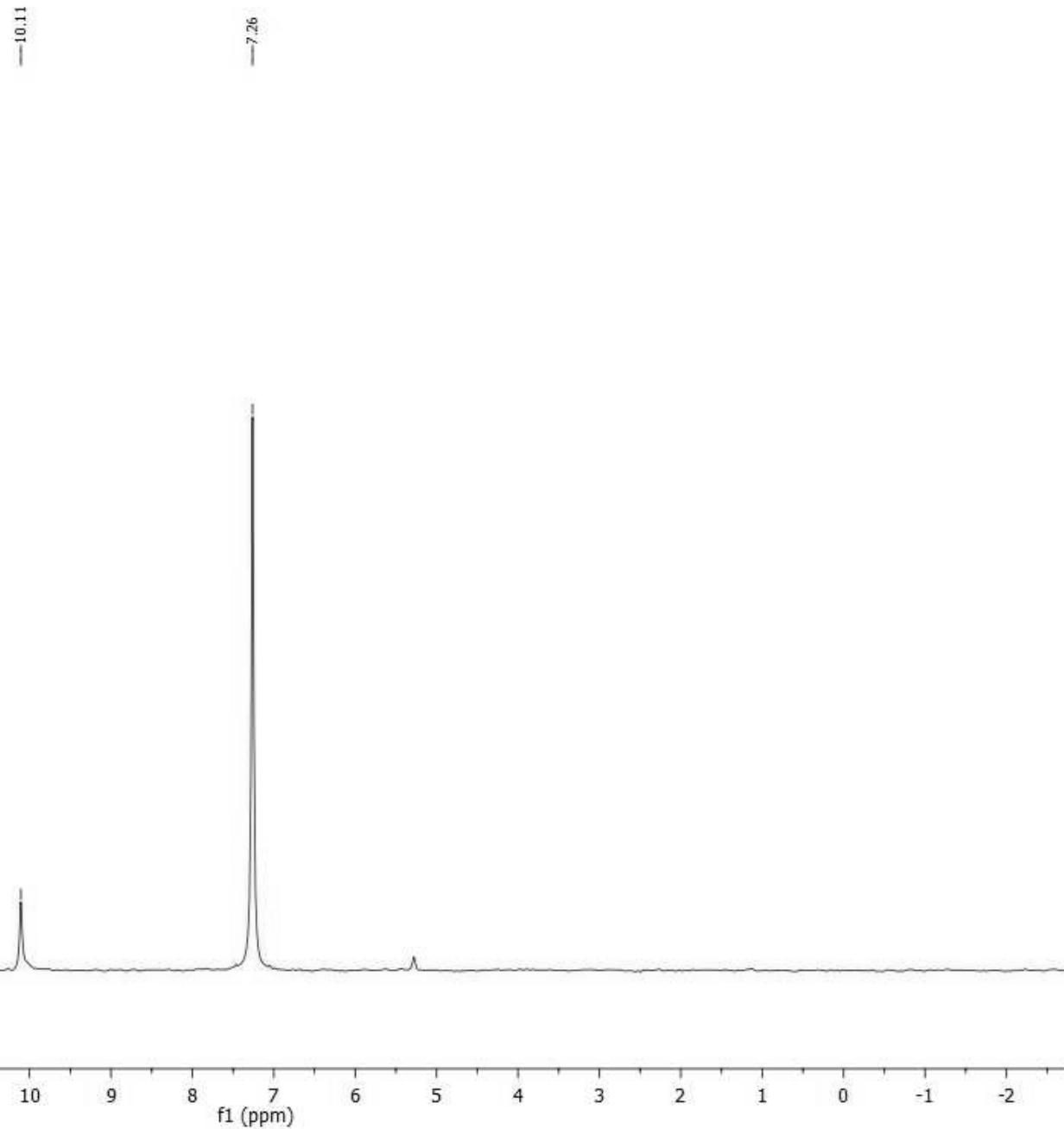
(5.11)



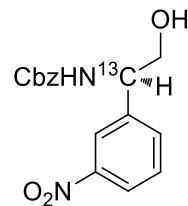
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



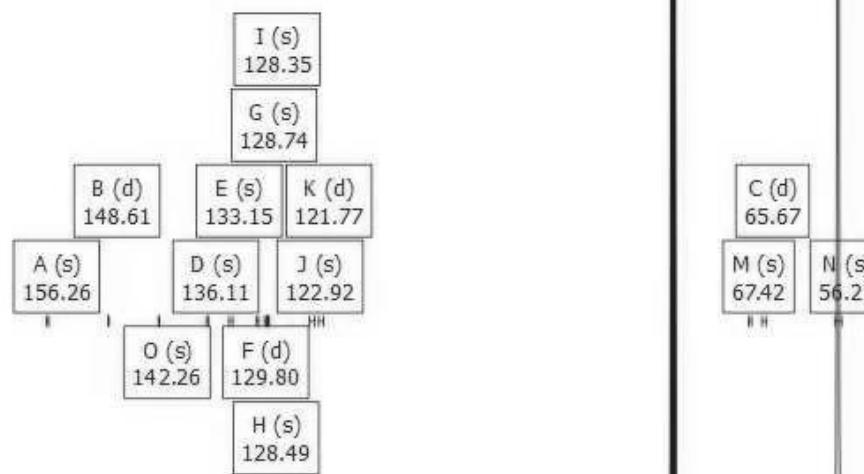
(5.11)



¹³C-NMR (CDCl₃, 126 MHz)



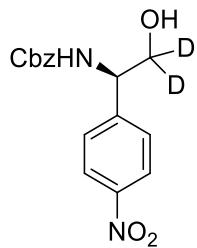
(R)-(7.7)



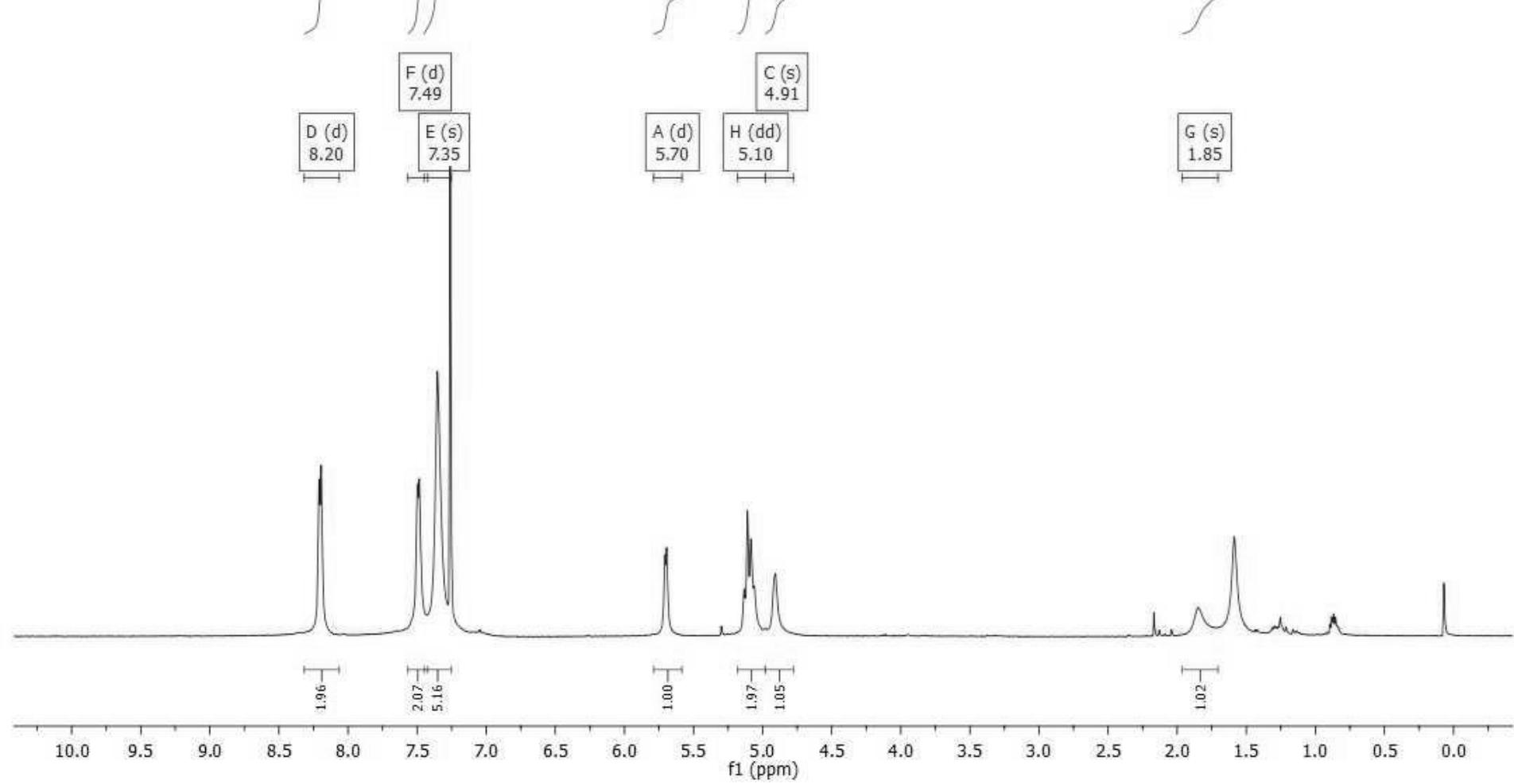
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f₁ (ppm)

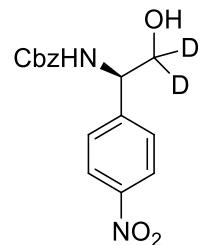
¹H-NMR (CDCl₃, 500 MHz)



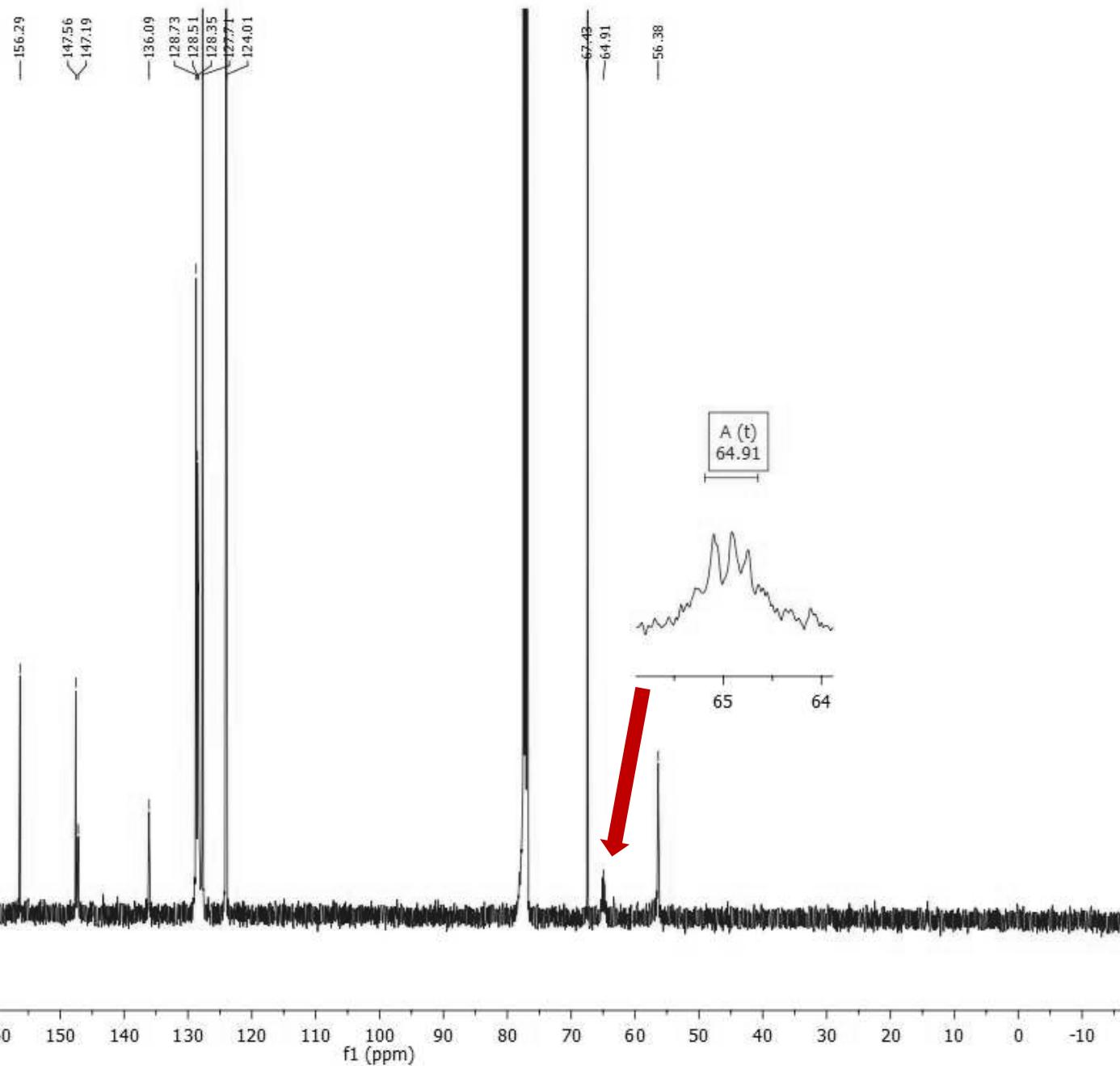
(R)-(7.13)



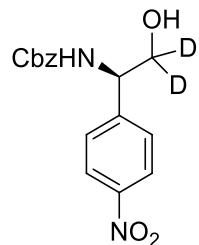
¹³C-NMR (CDCl₃, 126 MHz)



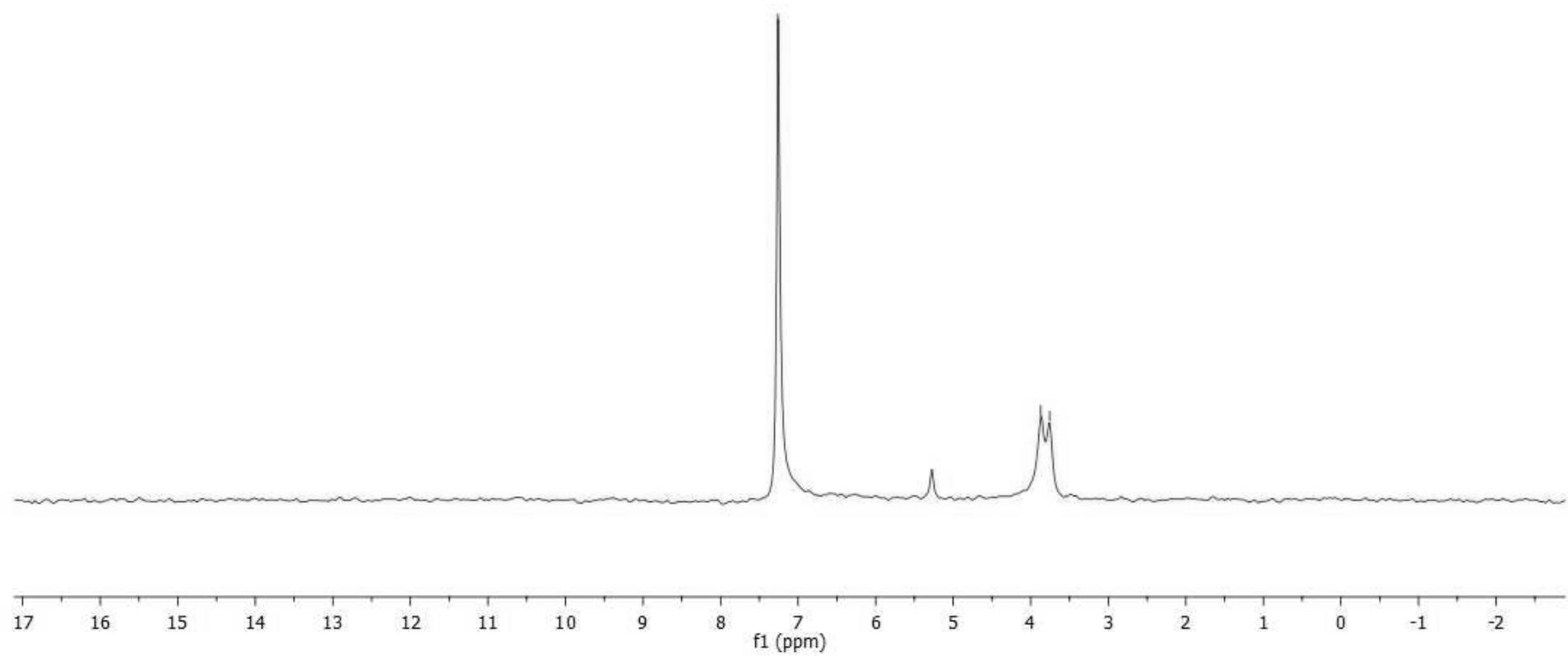
(R)-(7.13)



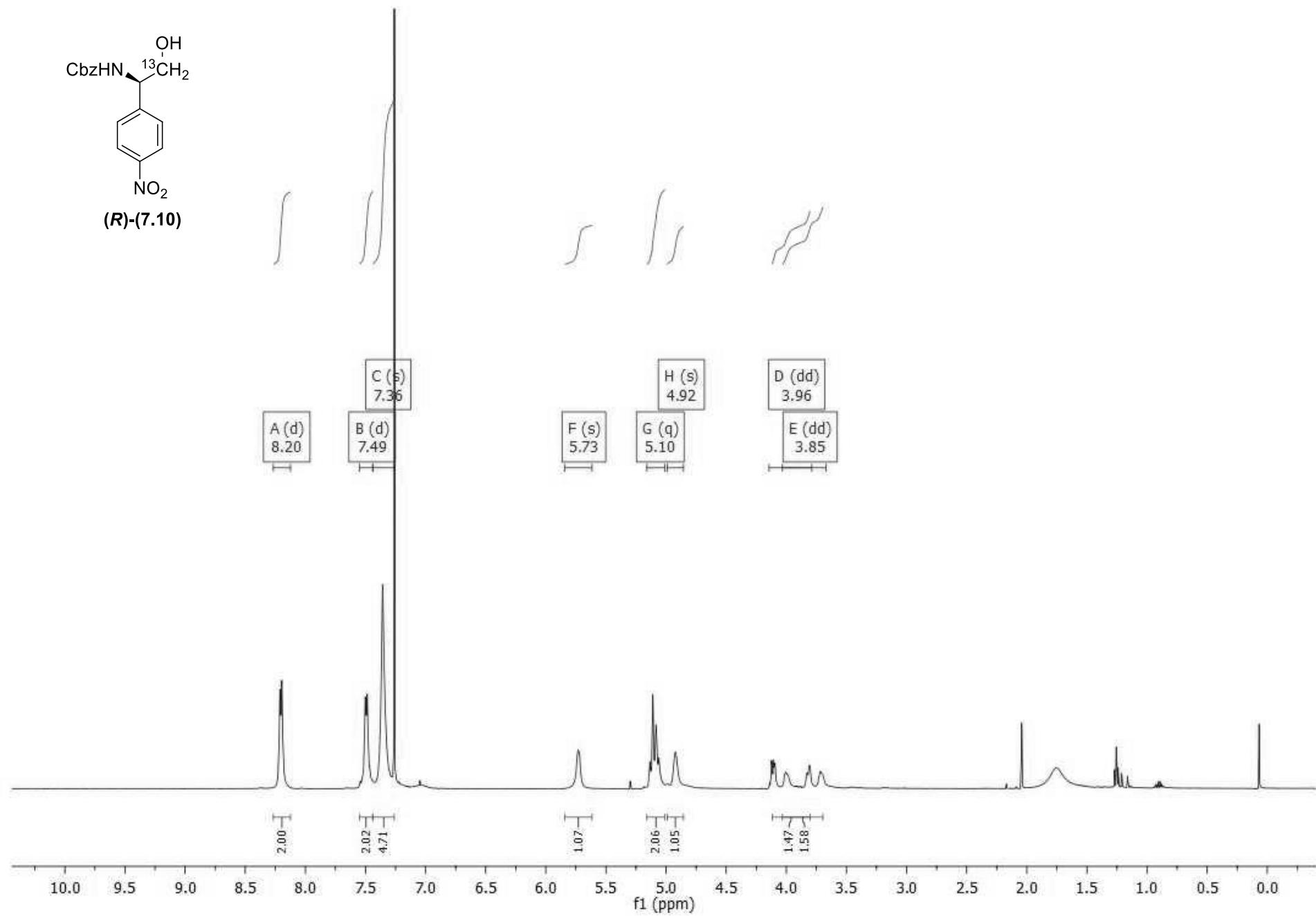
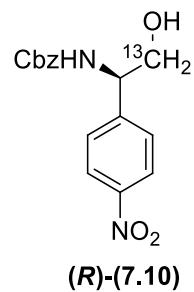
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



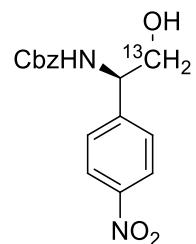
(*R*)-(7.13)



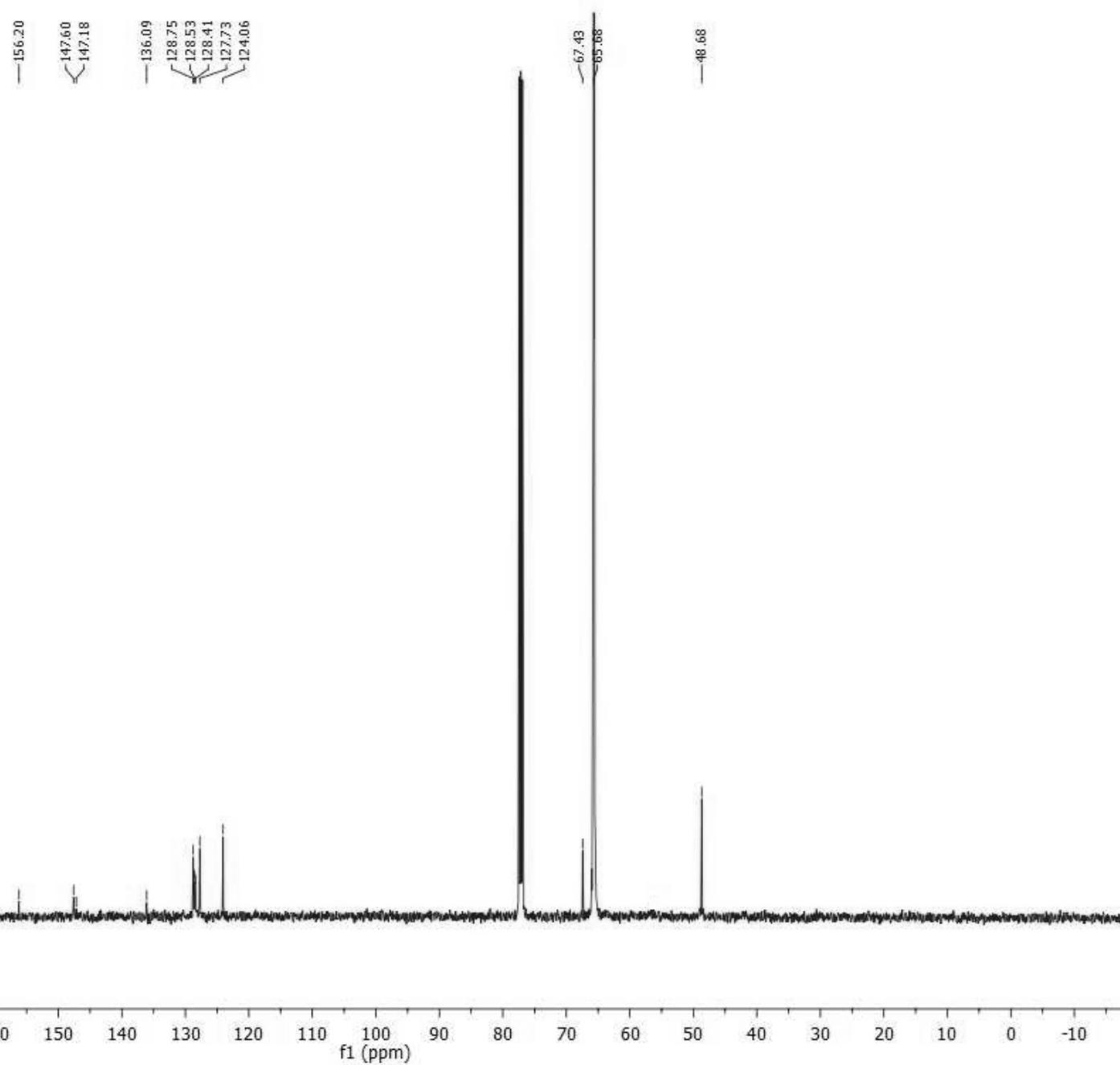
¹H-NMR (CDCl₃, 500 MHz)



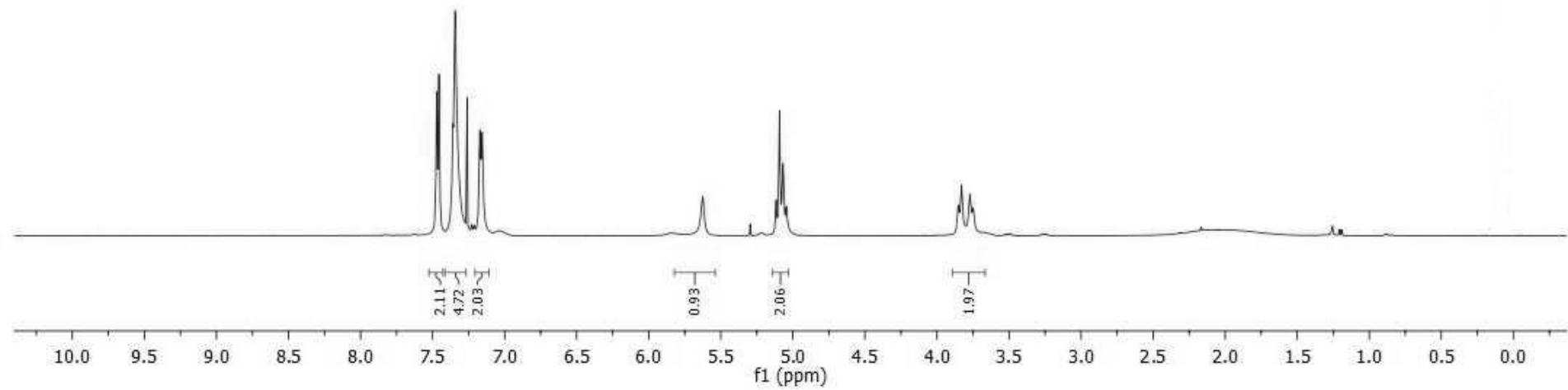
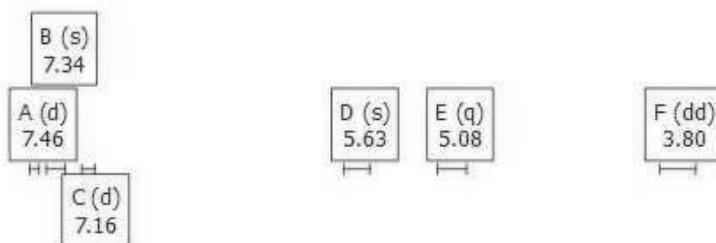
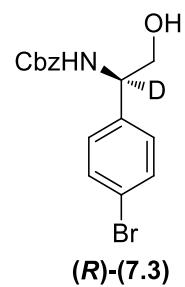
¹³C-NMR (CDCl₃, 126 MHz)



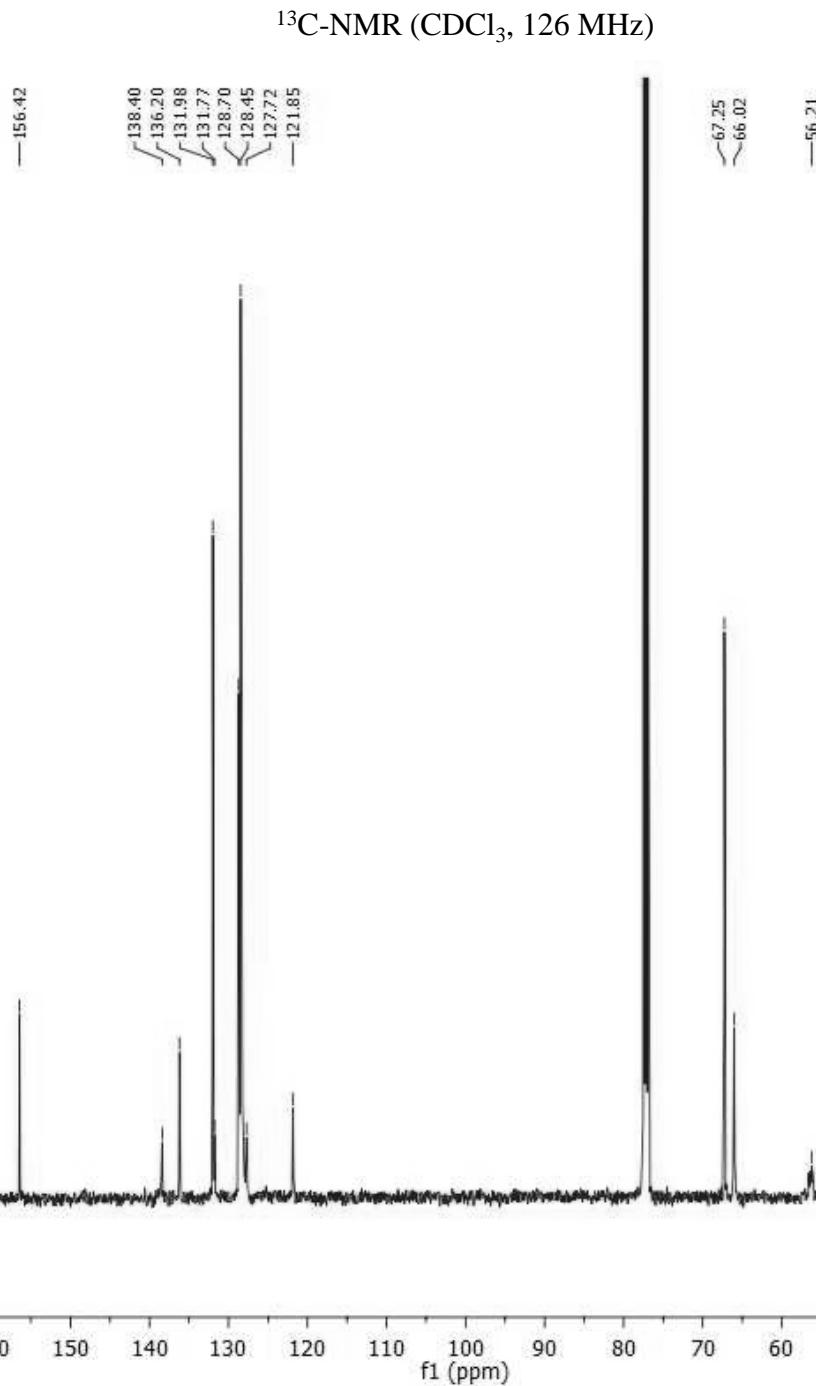
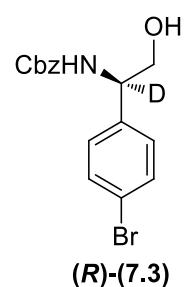
(R)-(7.10)



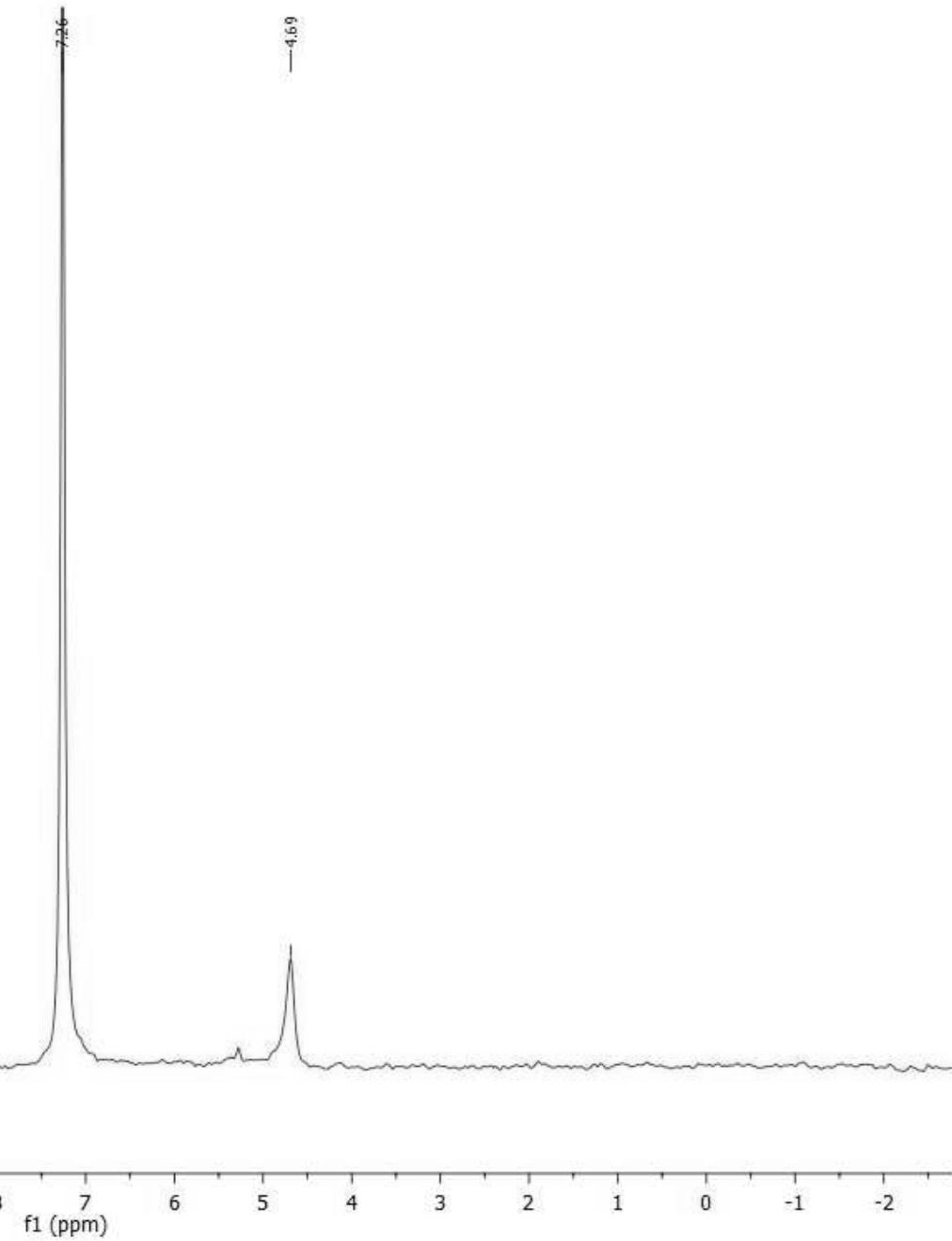
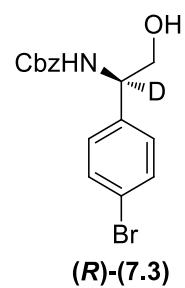
¹H-NMR (CDCl₃, 500 MHz)



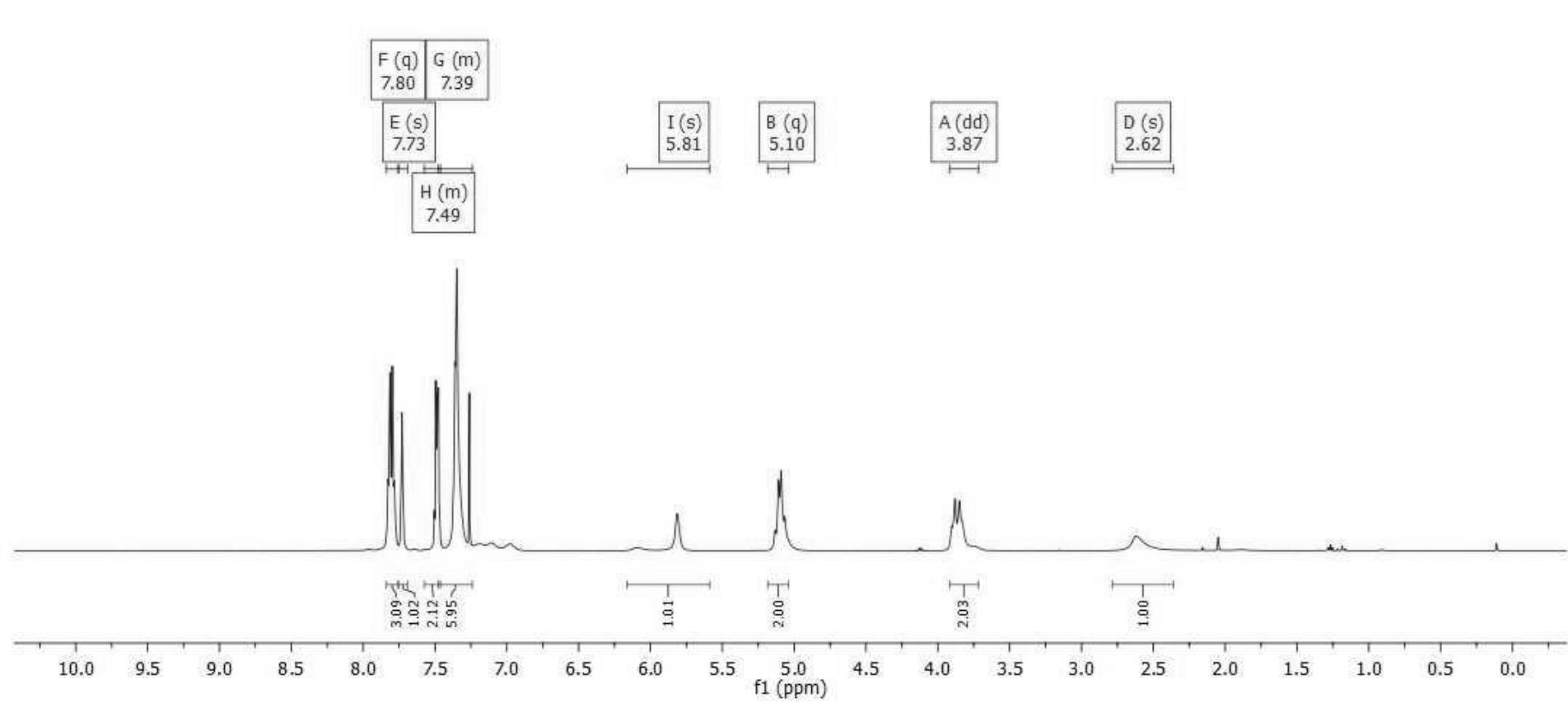
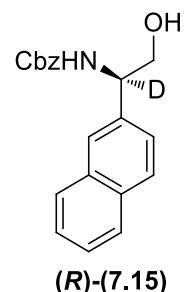
¹³C-NMR (CDCl₃, 126 MHz)



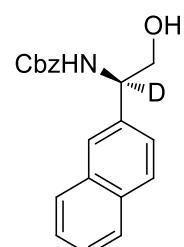
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



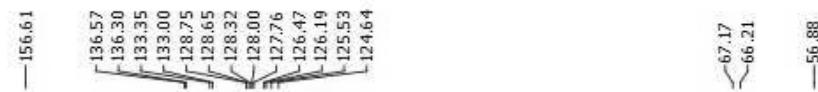
¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



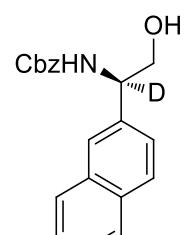
(R)-(7.15)



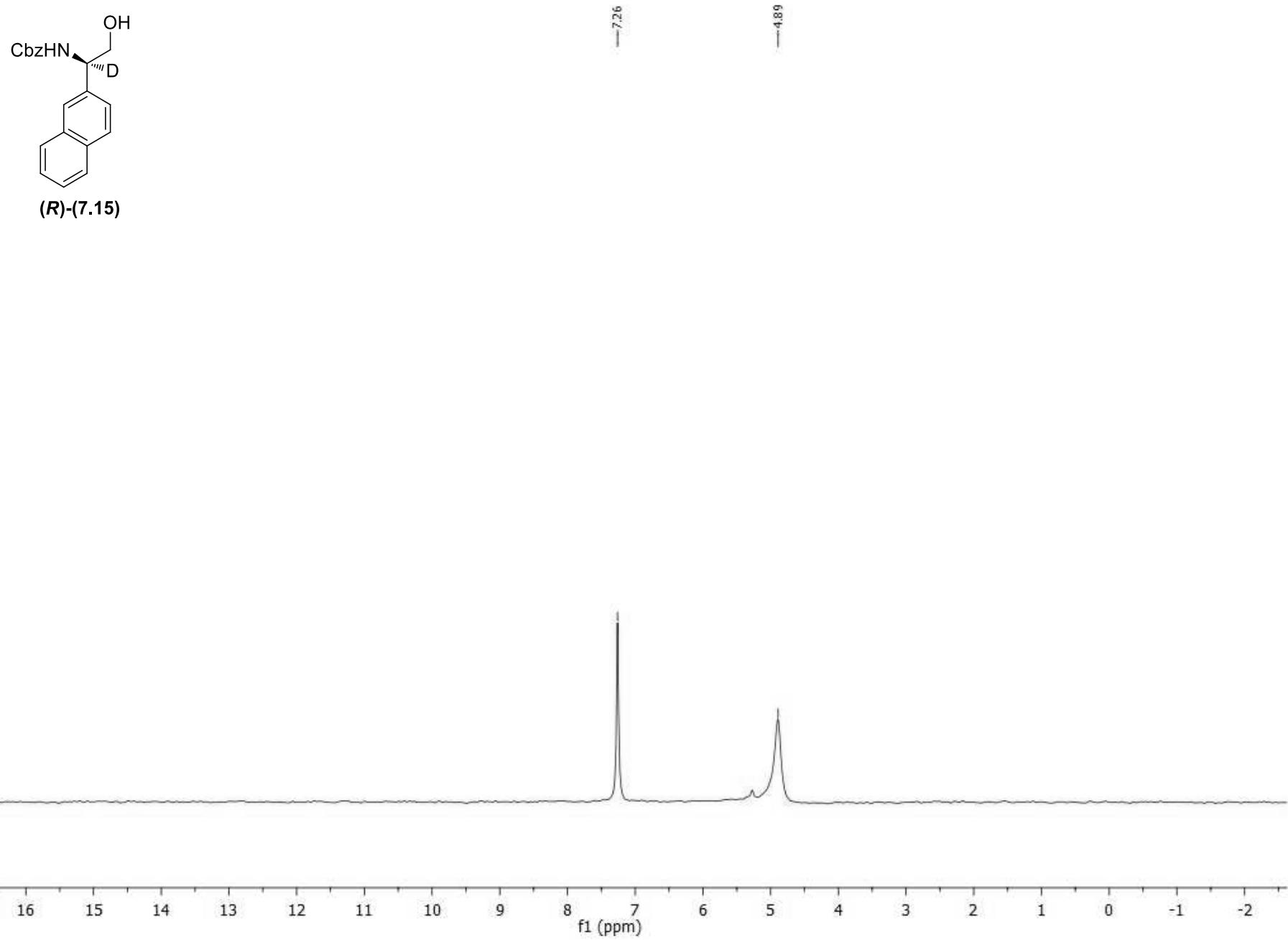
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

f1 (ppm)

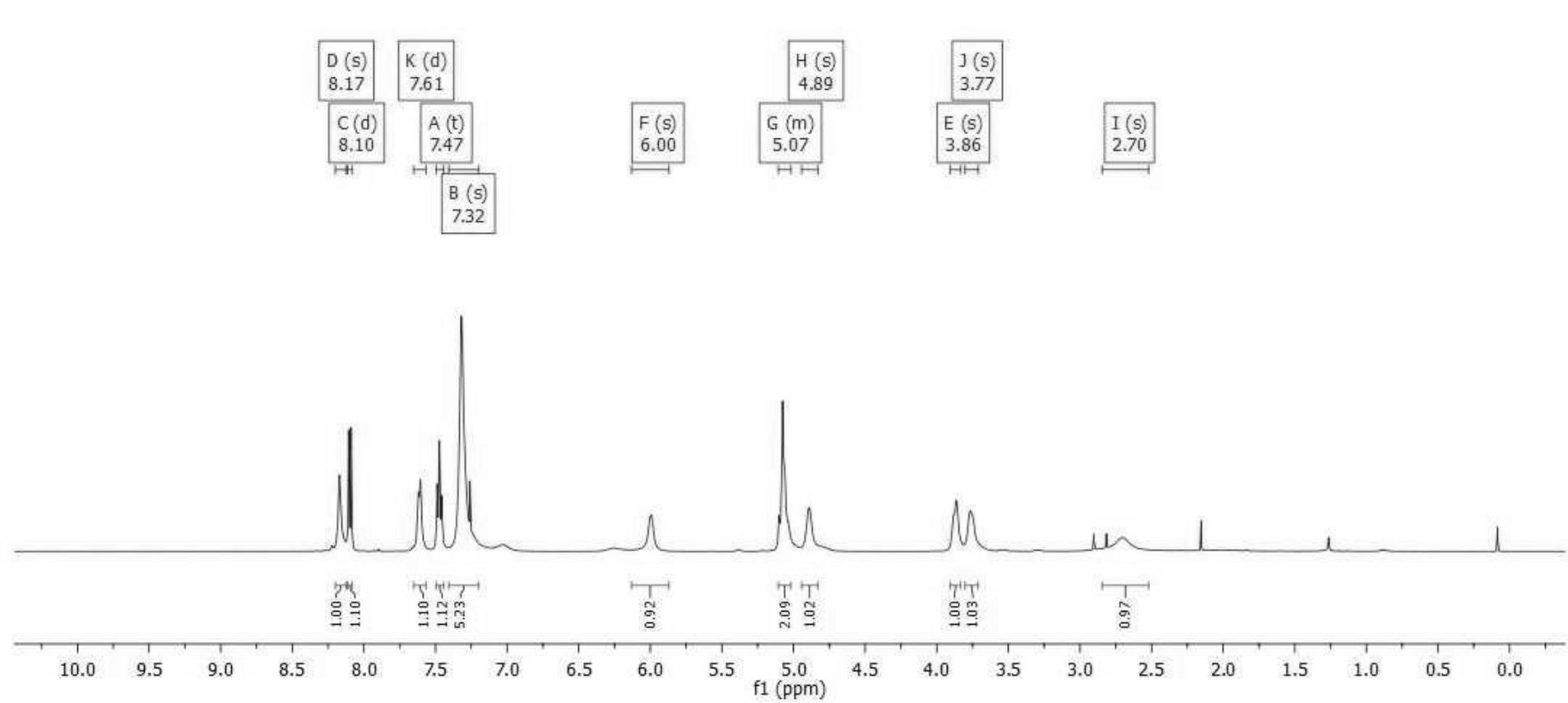
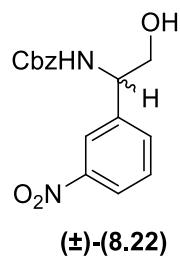
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



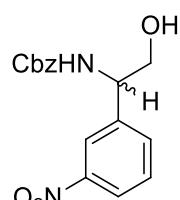
(*R*)-(7.15)



¹H-NMR (CDCl₃, 500 MHz)

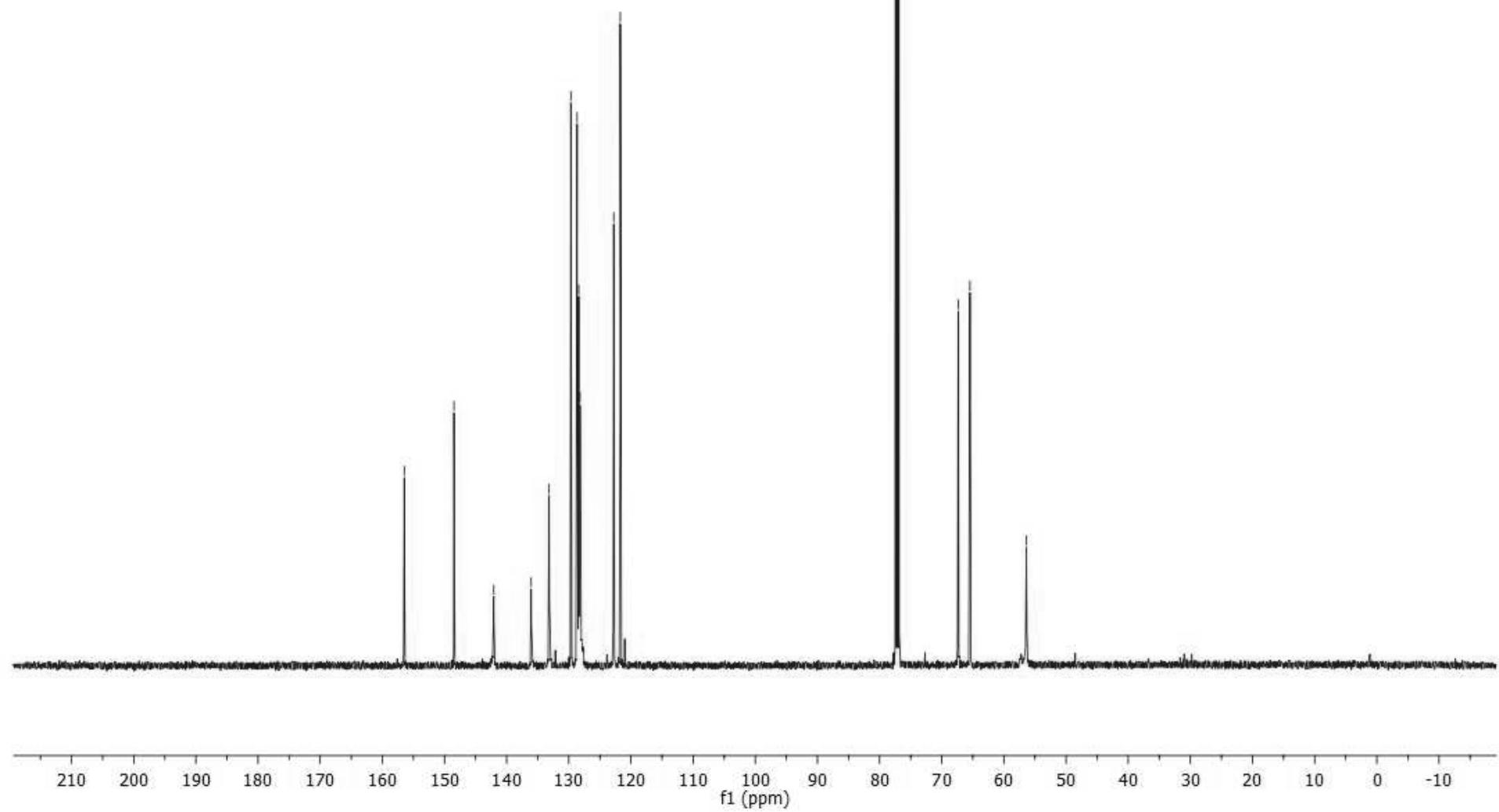


¹³C-NMR (CDCl₃, 126 MHz)

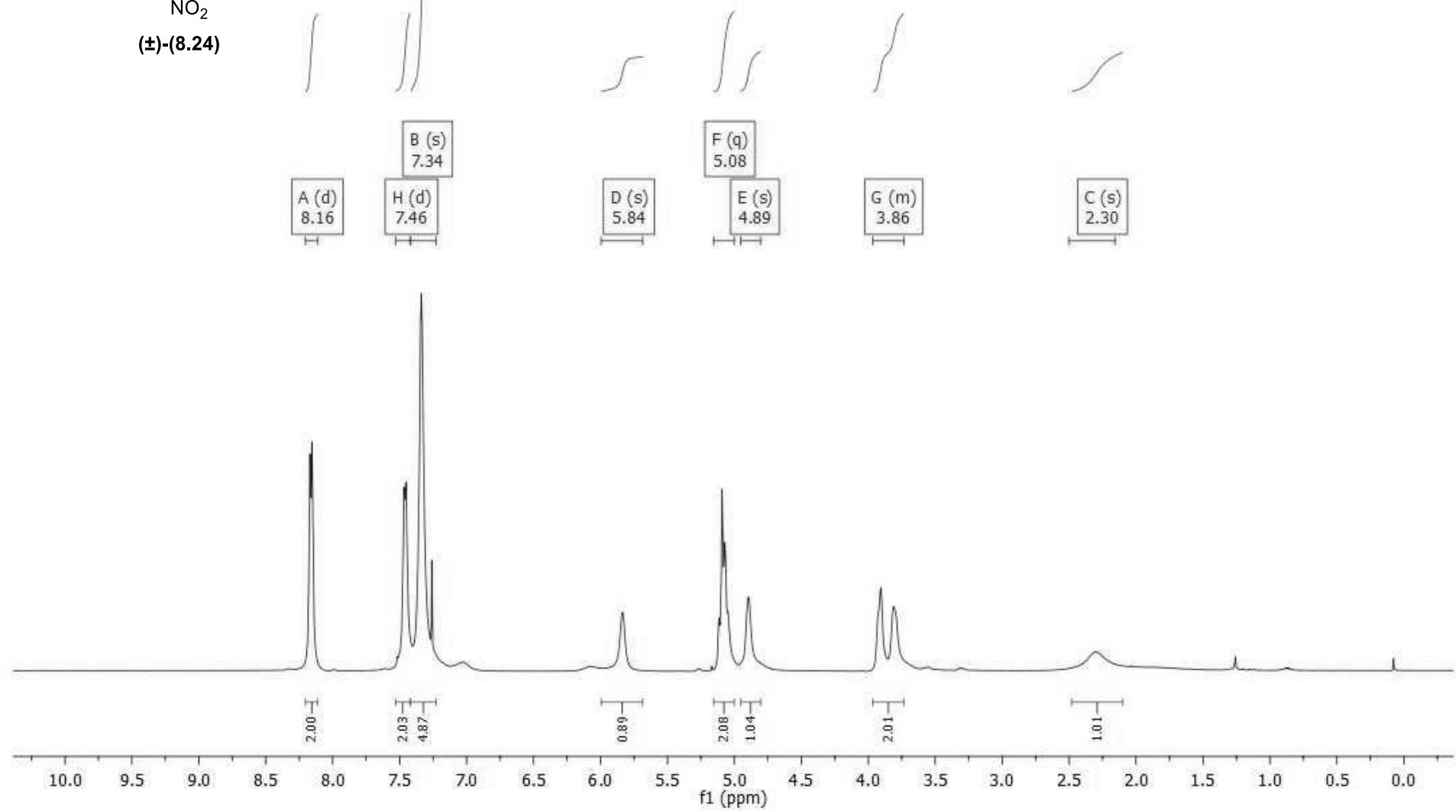
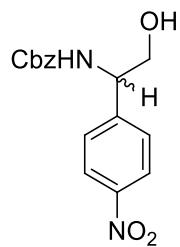


(±)-(8.22)

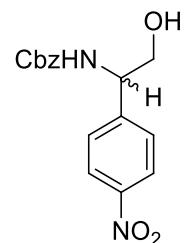
—156.47
—148.47
—142.08
—136.05
—133.17
—129.68
—128.66
—128.40
—128.20
—122.77
—121.71
—67.36
—65.45
—56.37



¹H-NMR (CDCl₃, 500 MHz)

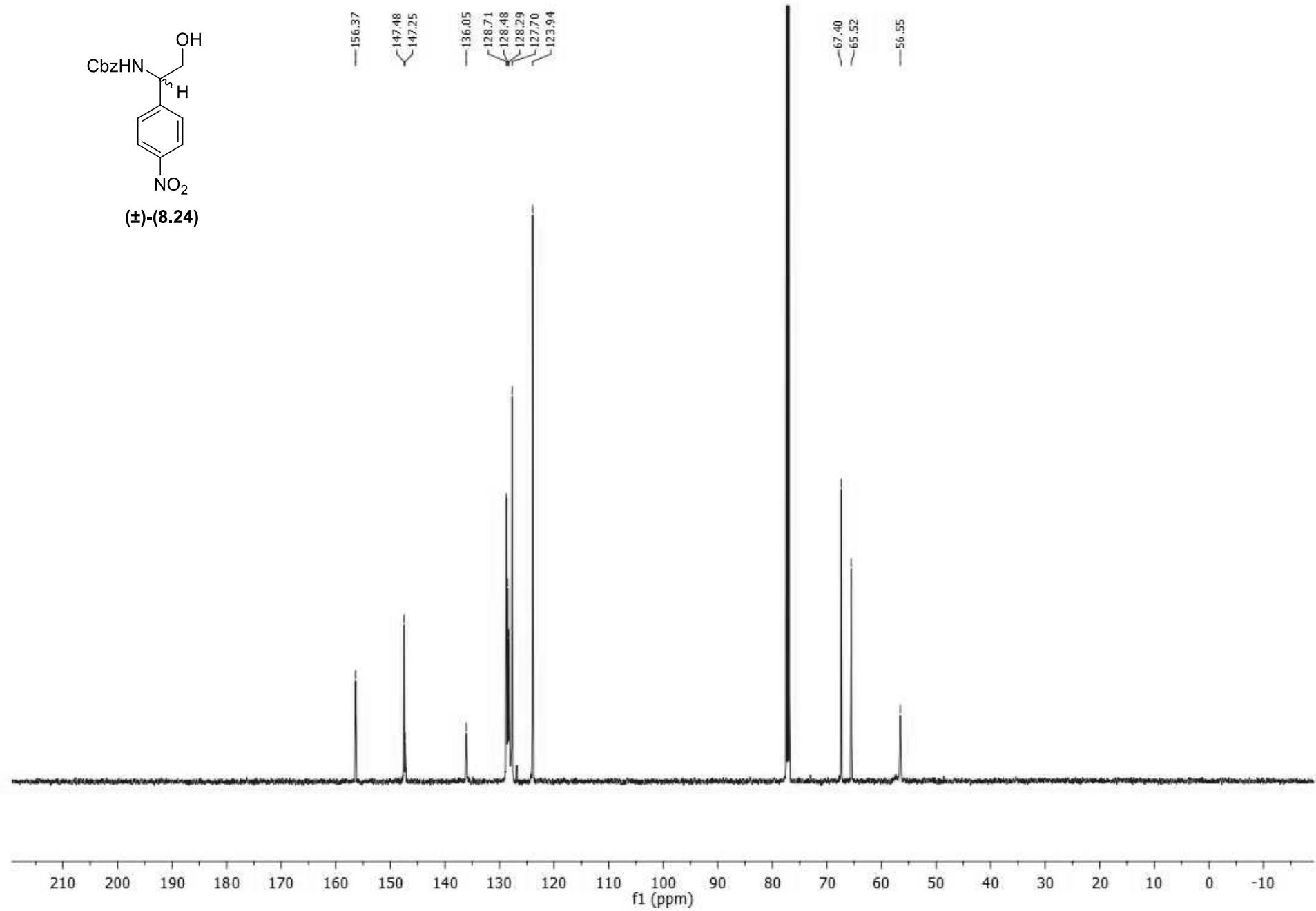


¹³C-NMR (CDCl₃, 126 MHz)

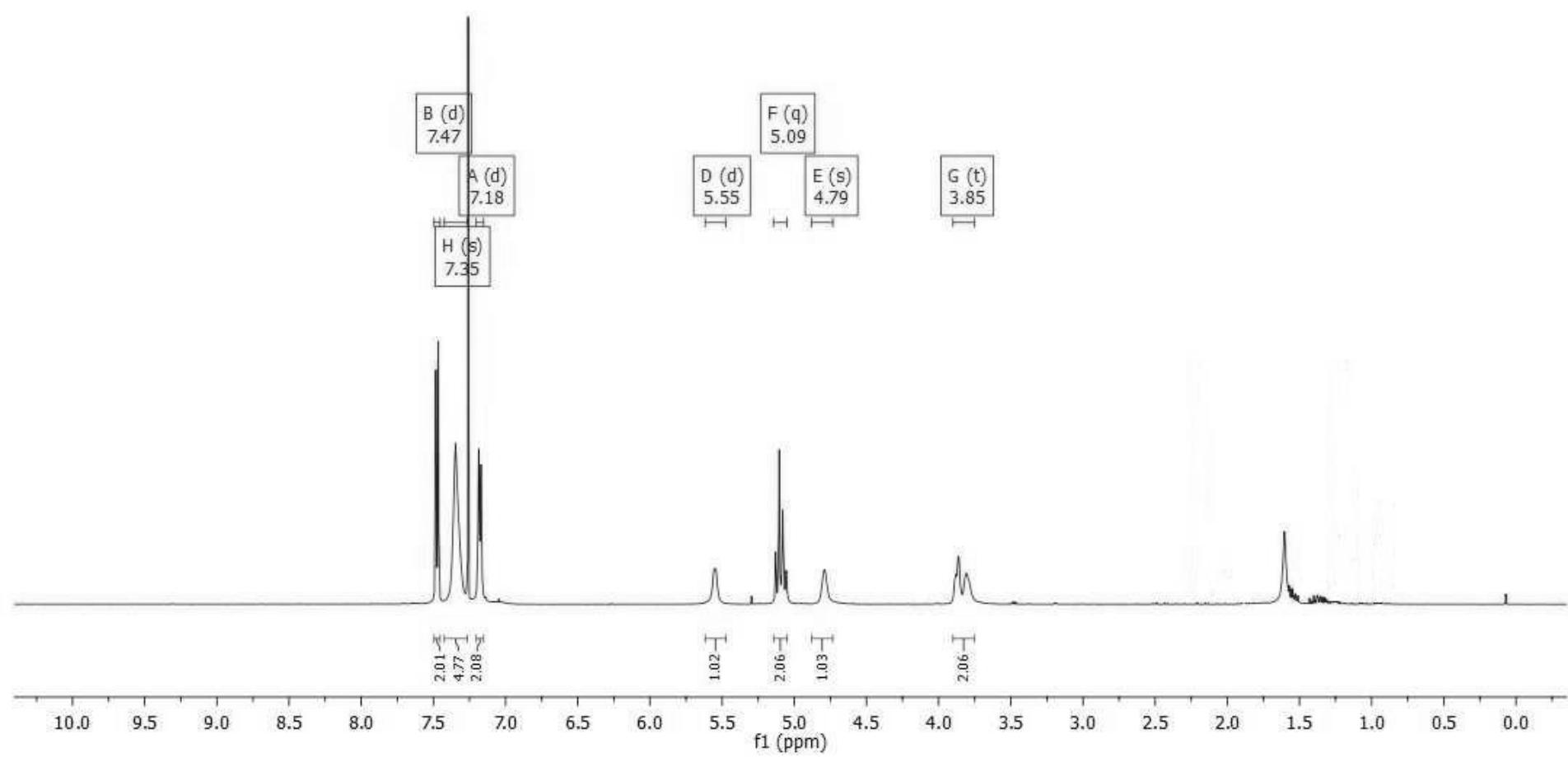
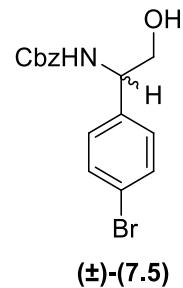


(±)-(8.24)

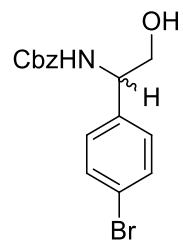
— 156.37
— 147.48
— 147.25
— 136.05
— 128.71
— 128.48
— 128.29
— 127.70
— 123.94
— 67.40
— 65.52
— 56.55



¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



(±)-(7.5)

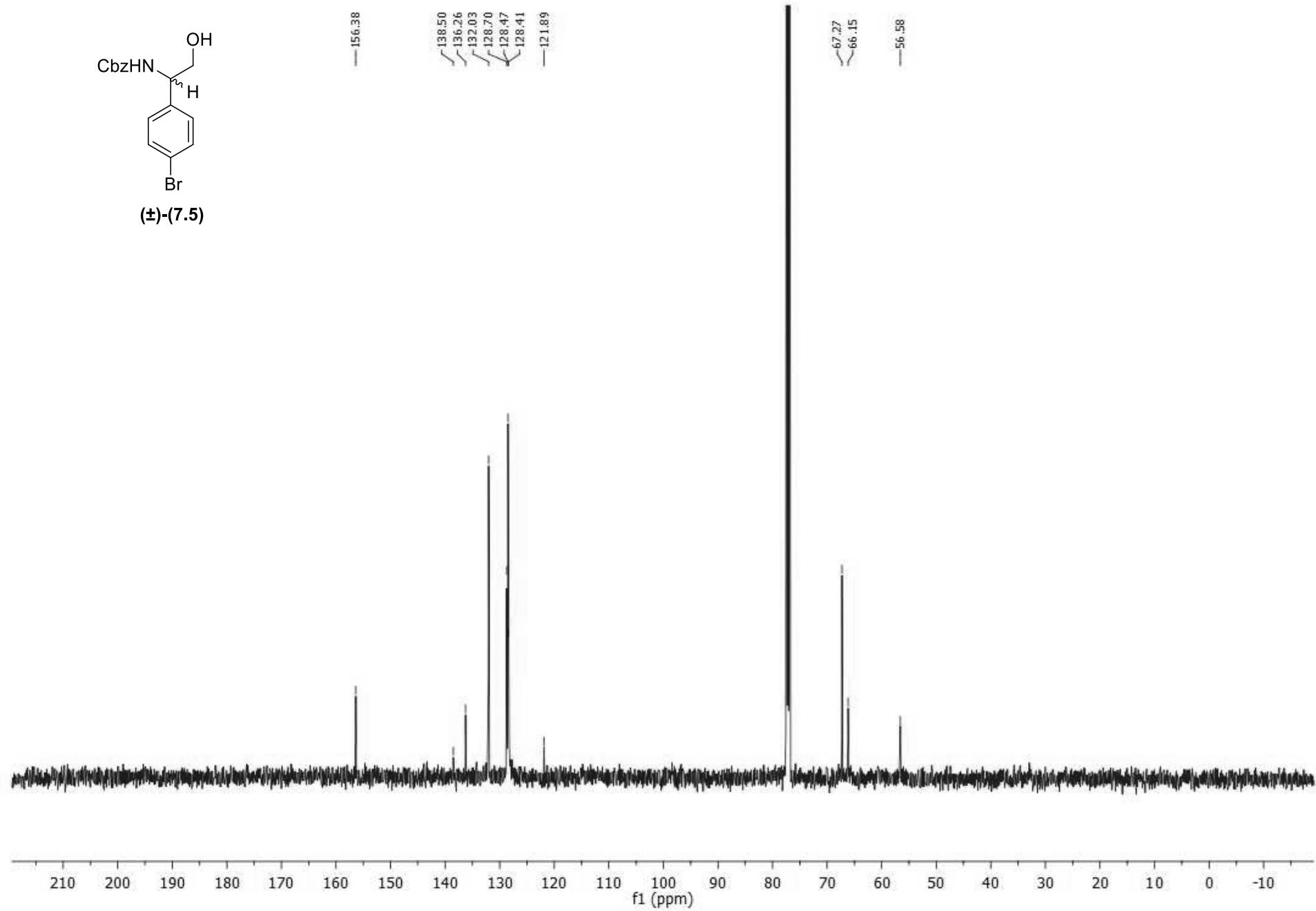
— 156.38

✓ 138.50
✓ 136.26
✓ 132.03
✓ 128.70
✓ 128.47
✓ 128.41

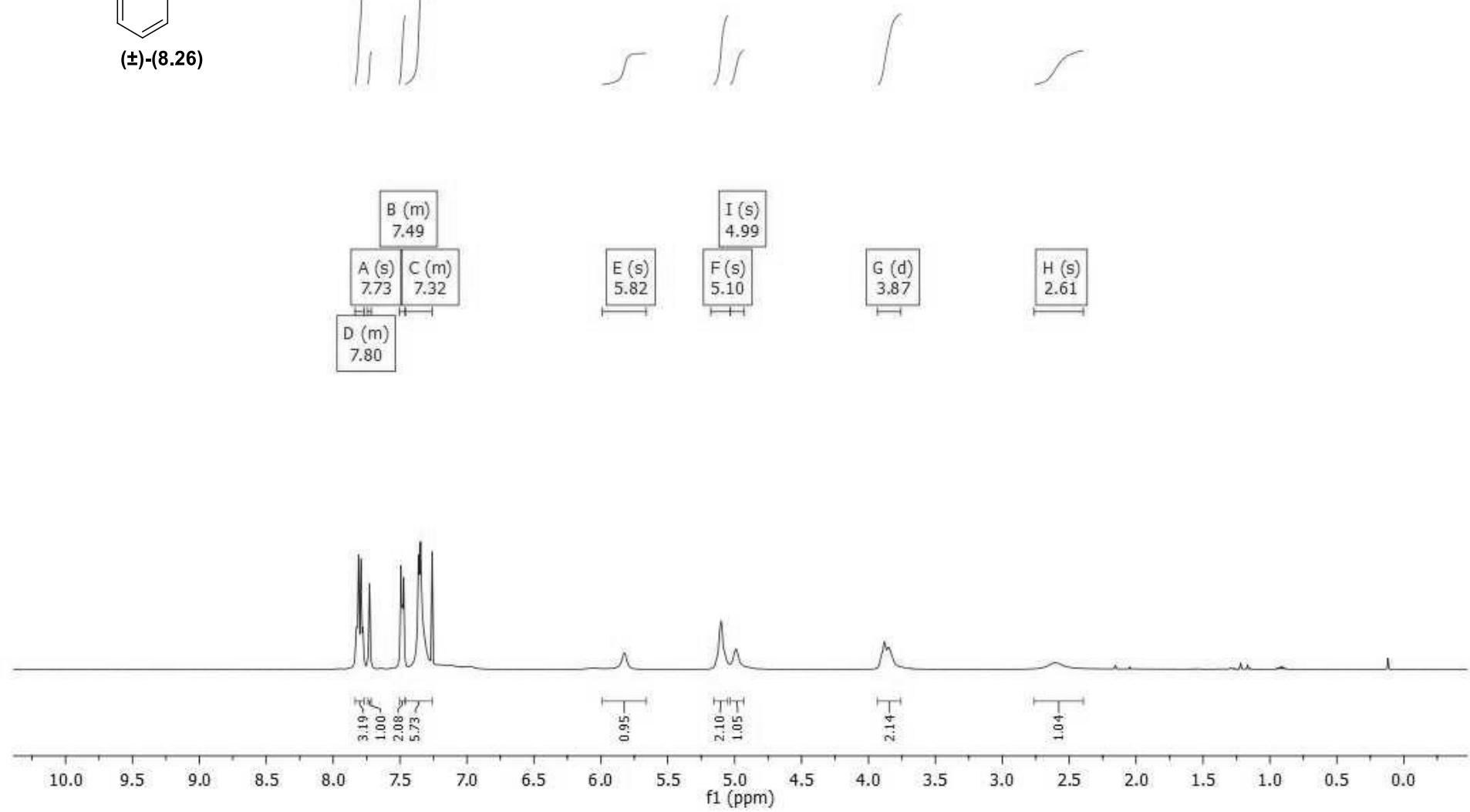
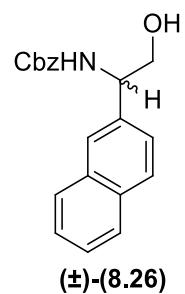
— 121.89

✓ 67.27
✓ 66.15

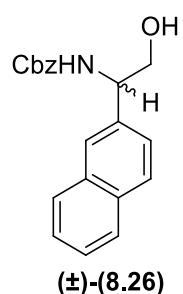
— 56.58



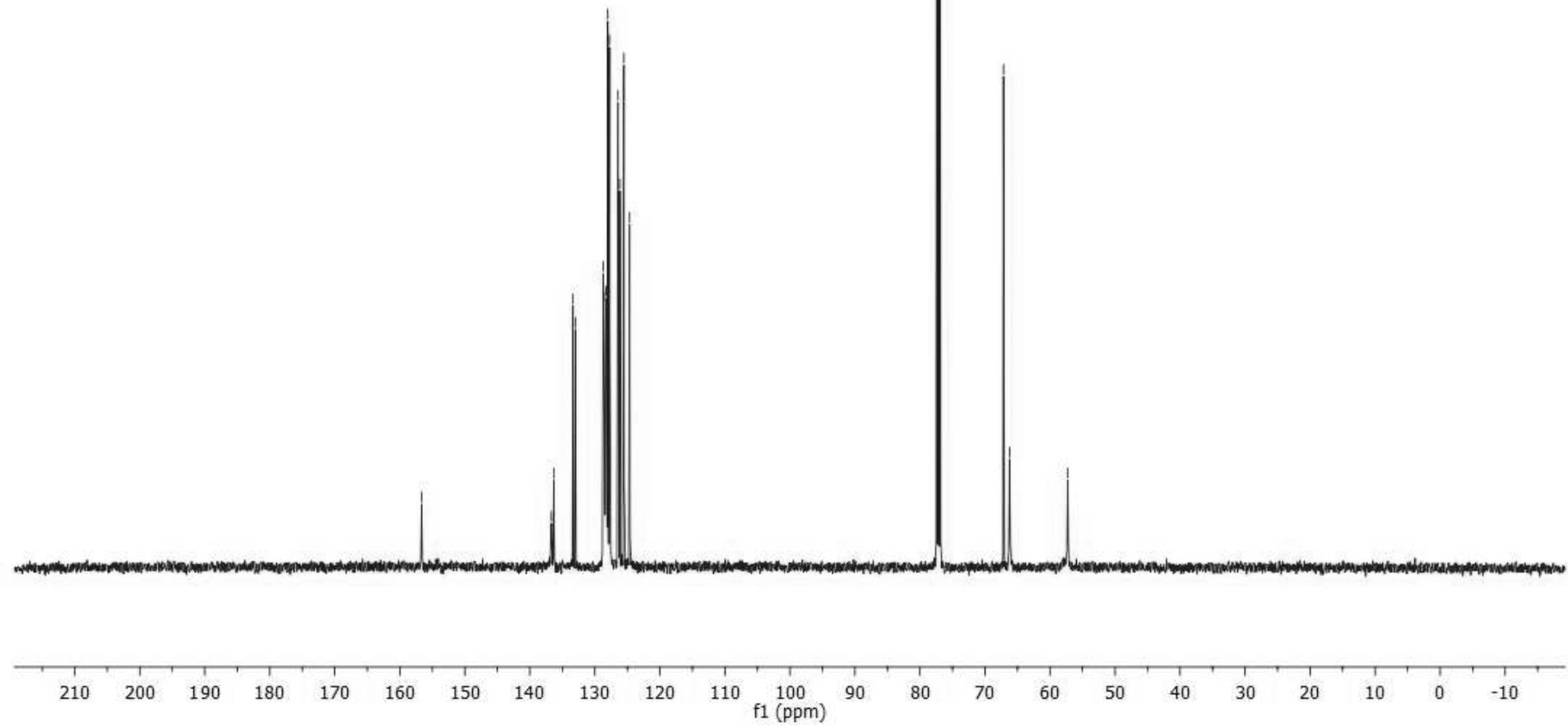
¹H-NMR (CDCl₃, 500 MHz)



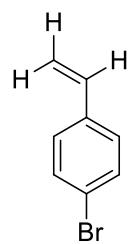
¹³C-NMR (CDCl₃, 126 MHz)



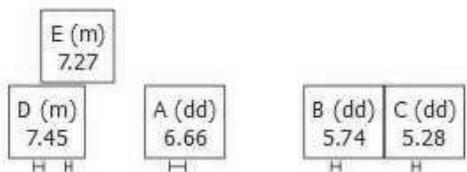
156.63
136.68
136.33
133.37
133.00
128.70
128.63
128.29
128.00
127.75
126.44
126.16
125.53
124.66
67.15
66.22
-57.26



¹H-NMR (CDCl₃, 500 MHz)

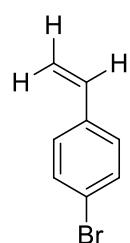


(7.4)



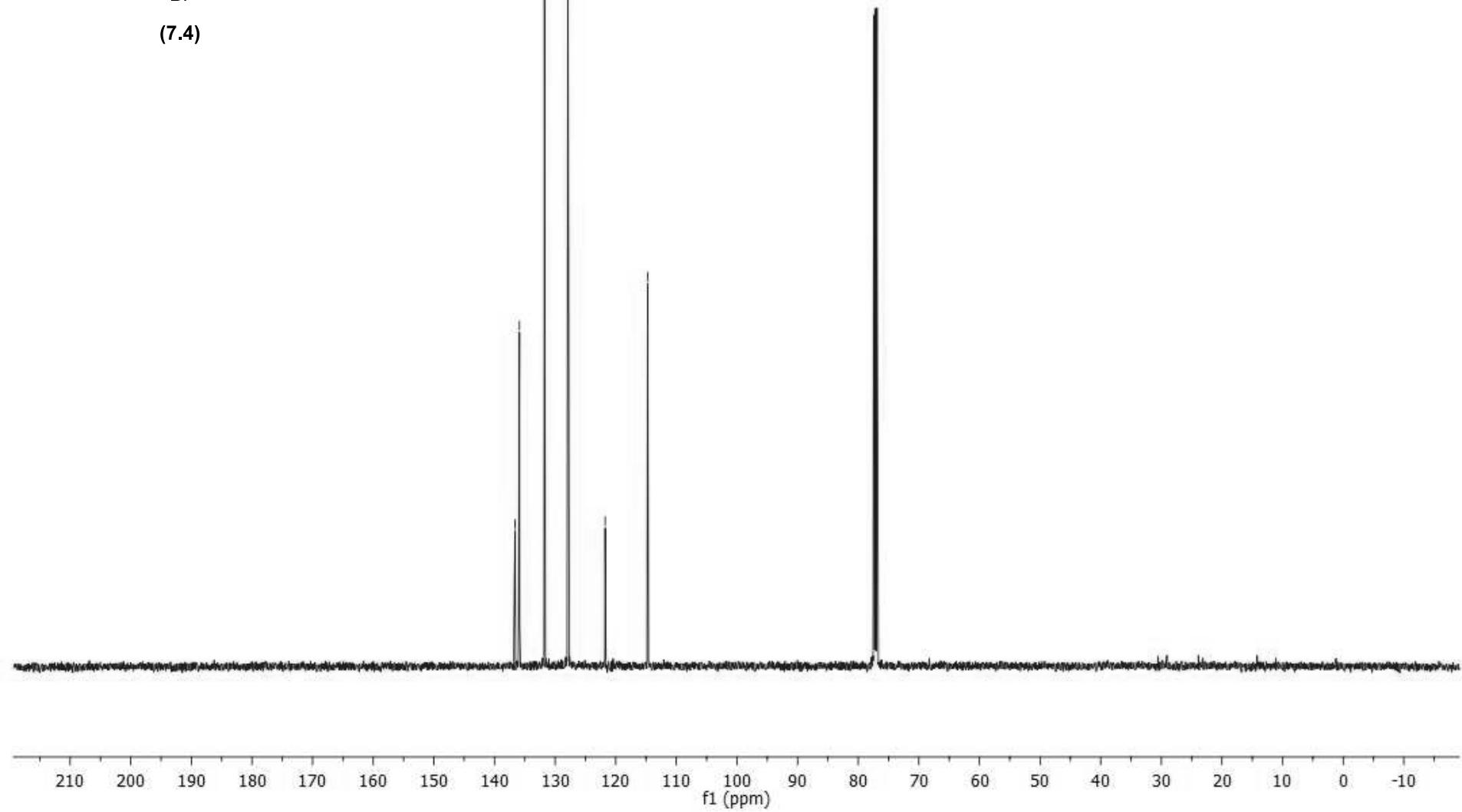
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

¹³C-NMR (CDCl₃, 126 MHz)

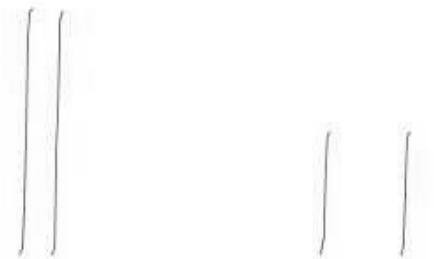
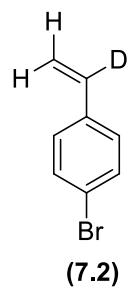


(7.4)

136.62
135.87
131.76
127.90
— 121.74
— 114.74



¹H-NMR (CDCl₃, 500 MHz)

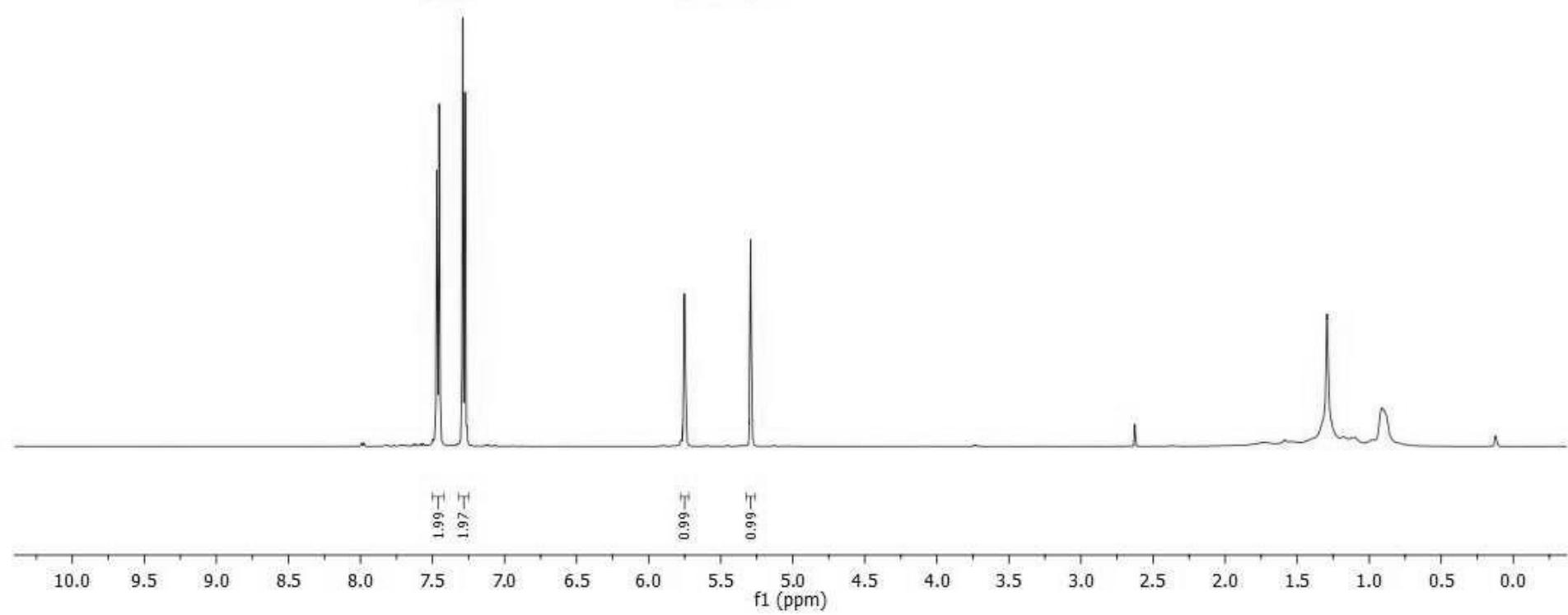


B (d)
7.28

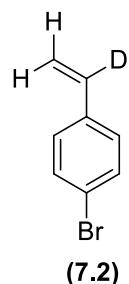
A (d)
7.46

C (s)
5.75
H

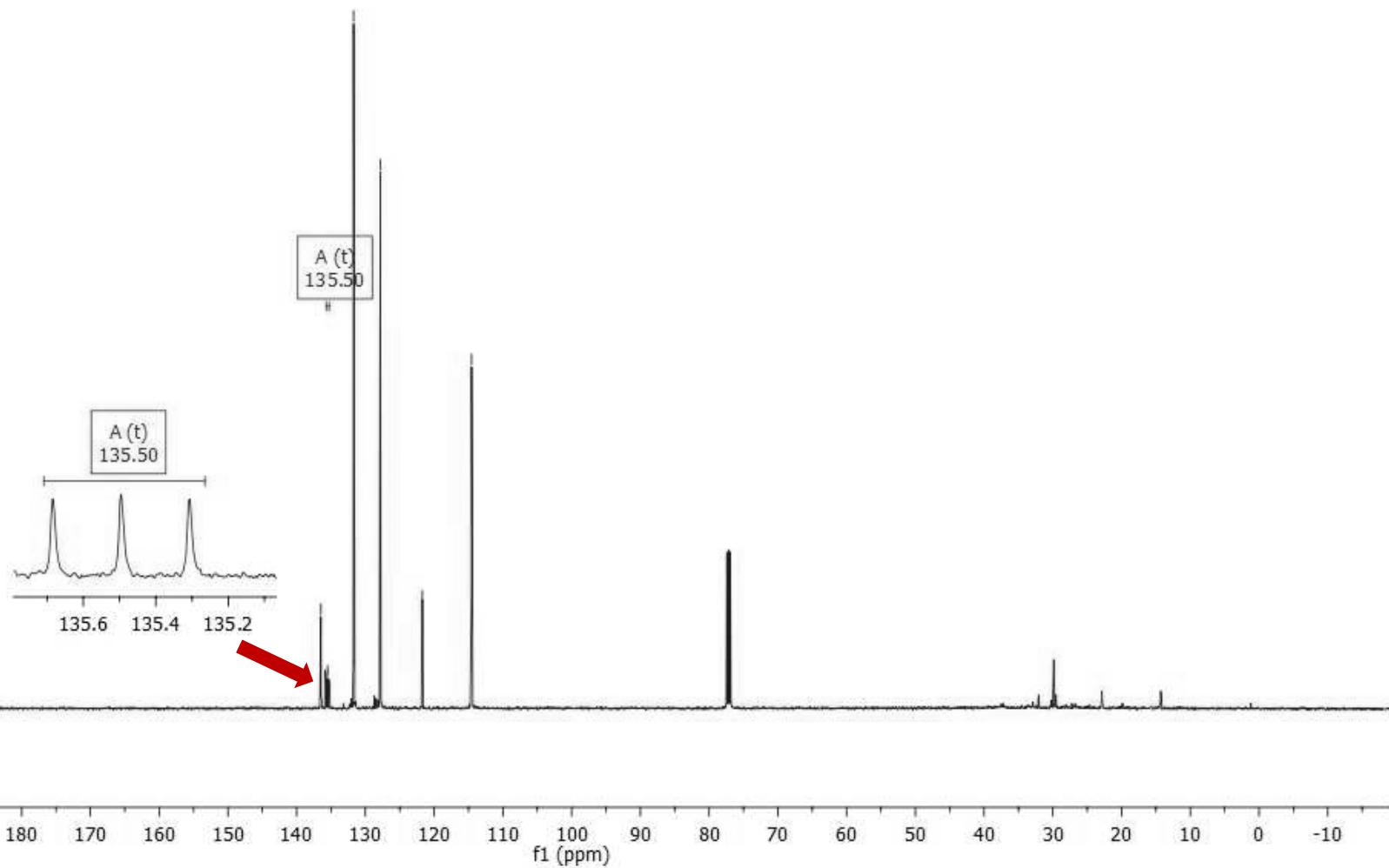
D (s)
5.29
H



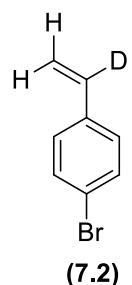
¹³C-NMR (CDCl₃, 126 MHz)



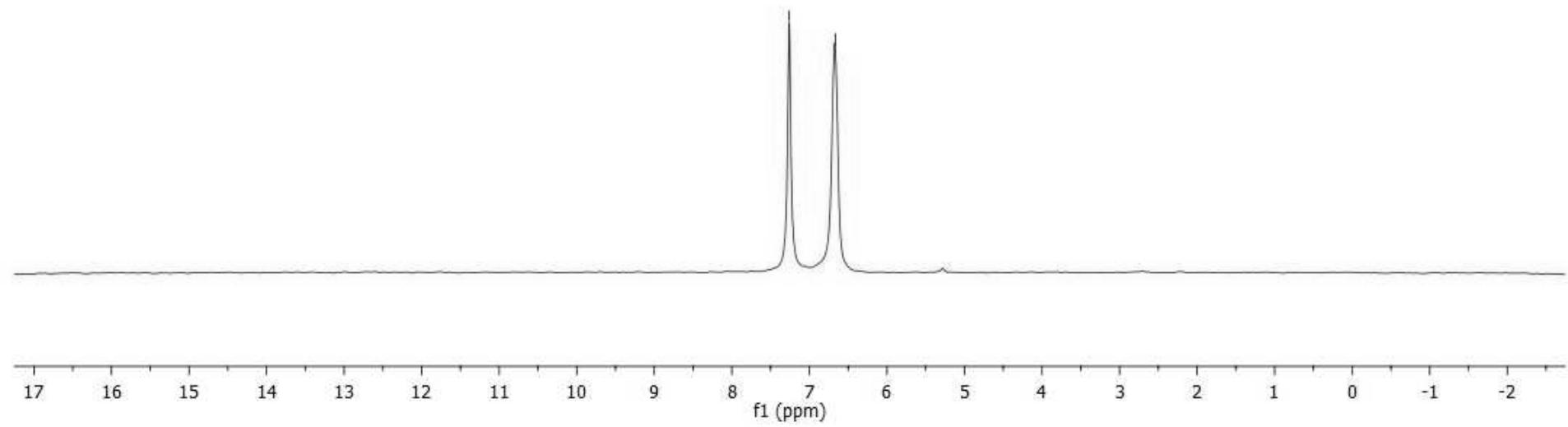
136.47
135.50
131.72
127.84
— 121.71
— 114.55



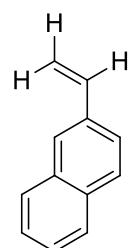
$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)



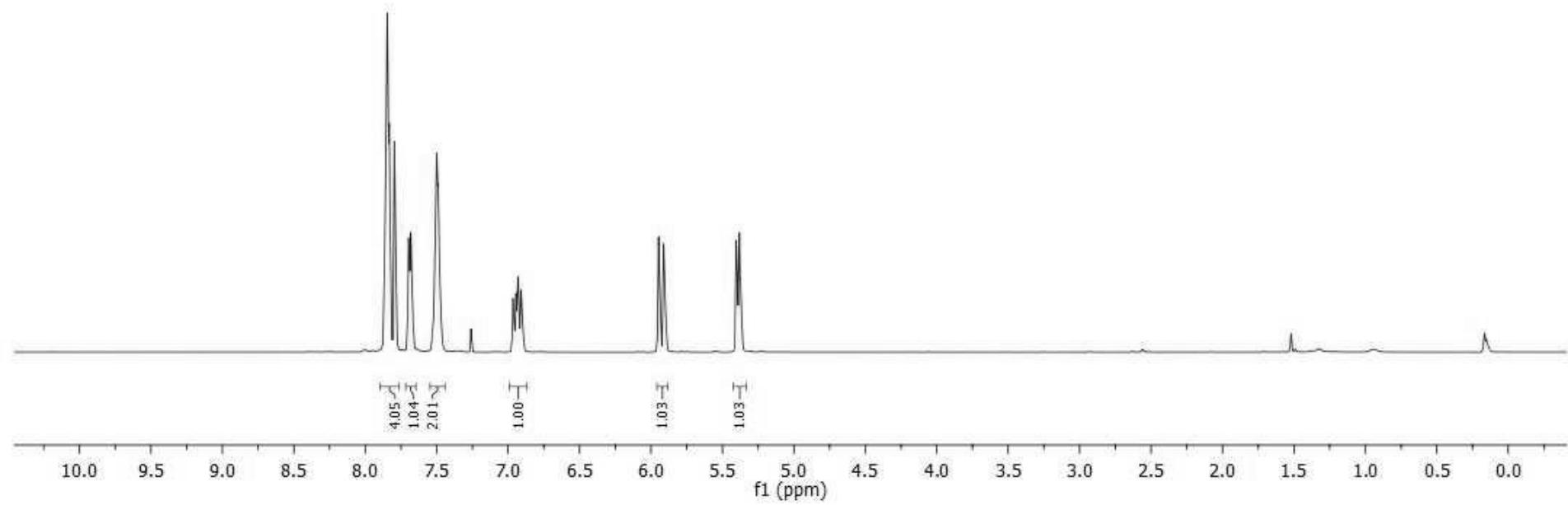
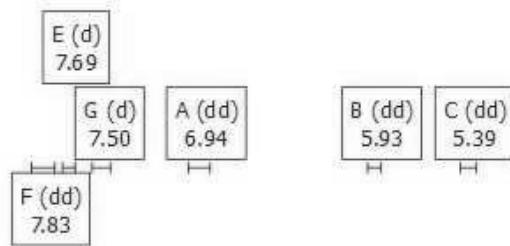
—7.26
—6.67



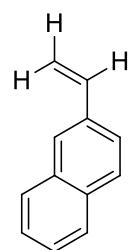
¹H-NMR (CDCl₃, 500 MHz)



(8.25)

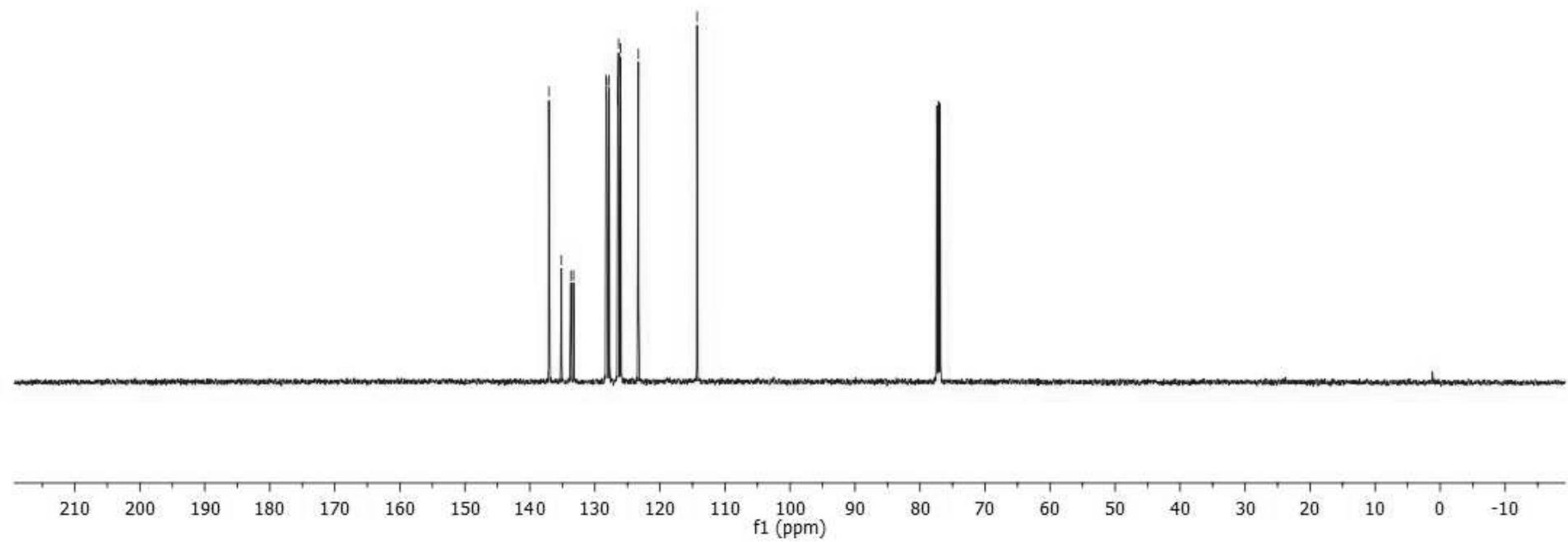


¹³C-NMR (CDCl₃, 126 MHz)

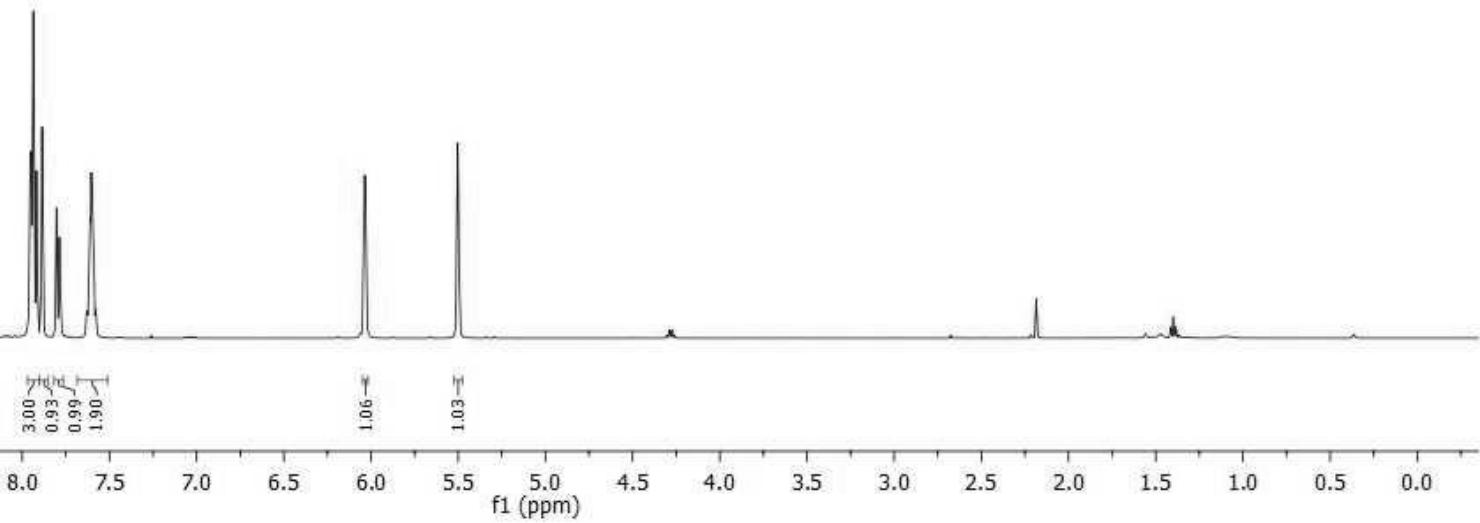
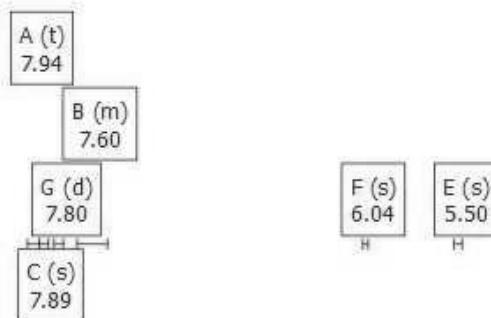
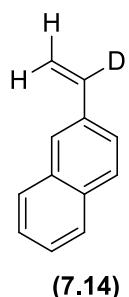


(8.25)

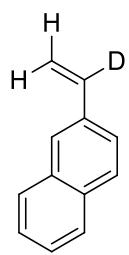
137.07
135.14
133.70
133.29
128.29
128.18
127.80
126.51
126.36
126.04
123.30
114.29



¹H-NMR (CDCl₃, 500 MHz)

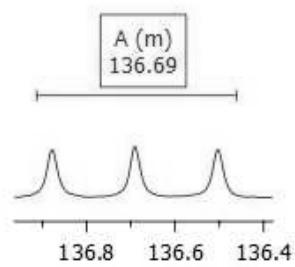


¹³C-NMR (CDCl₃, 126 MHz)



(7.14)

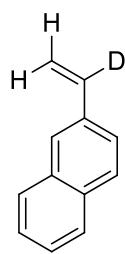
136.69
135.00
133.64
133.24
128.25
128.15
127.76
126.50
126.30
125.98
123.19
114.06



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

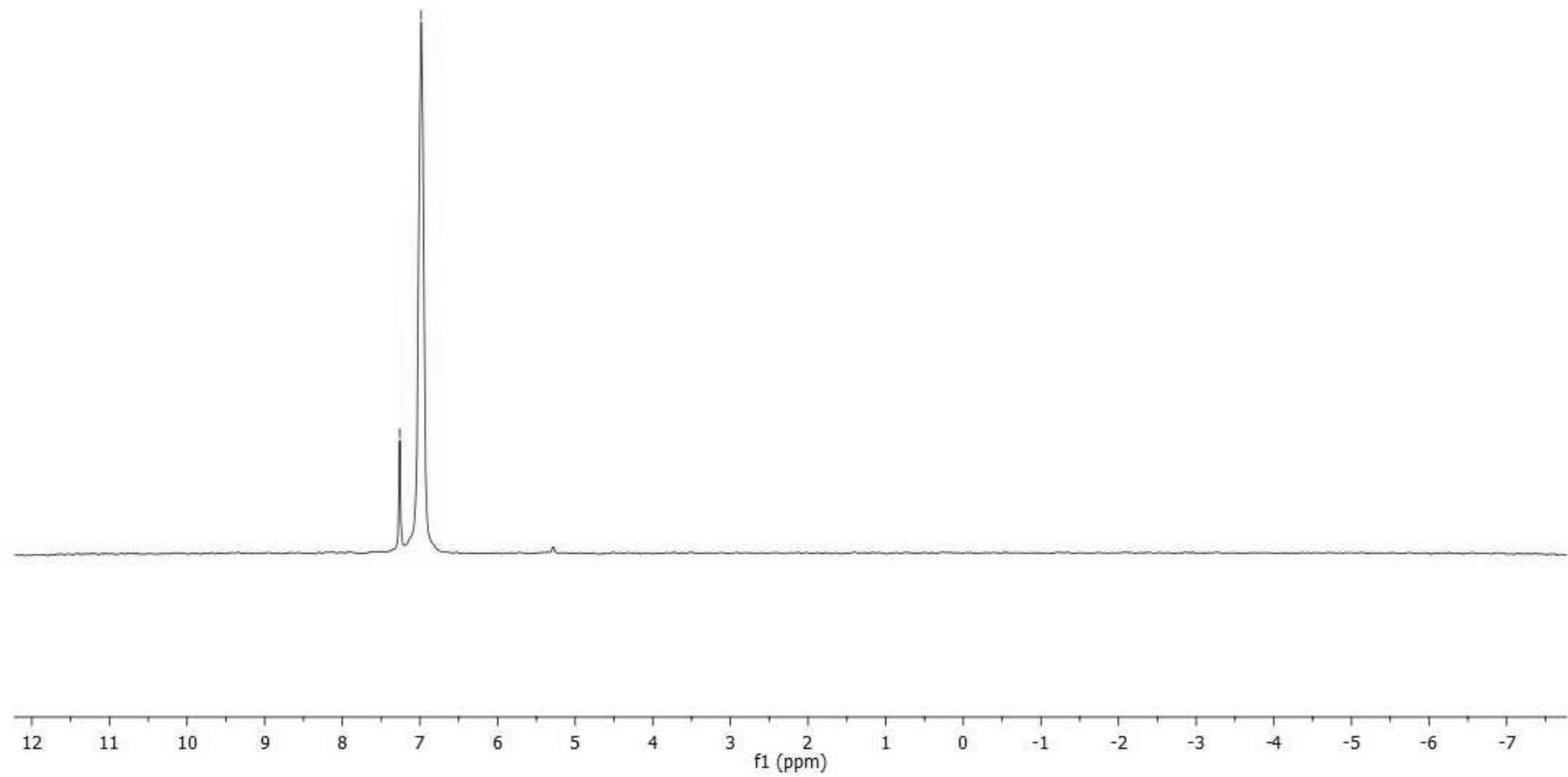
f1 (ppm)

$^2\text{H-NMR}$ (CH_2Cl_2 , 77 MHz)

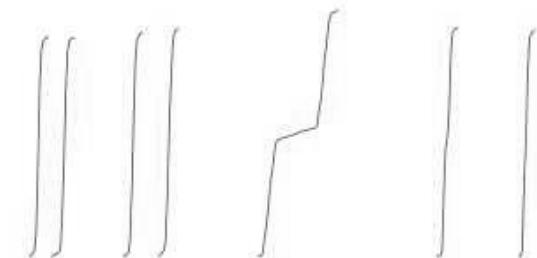
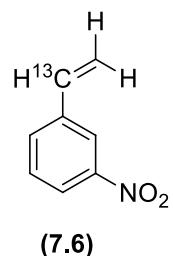


(7.14)

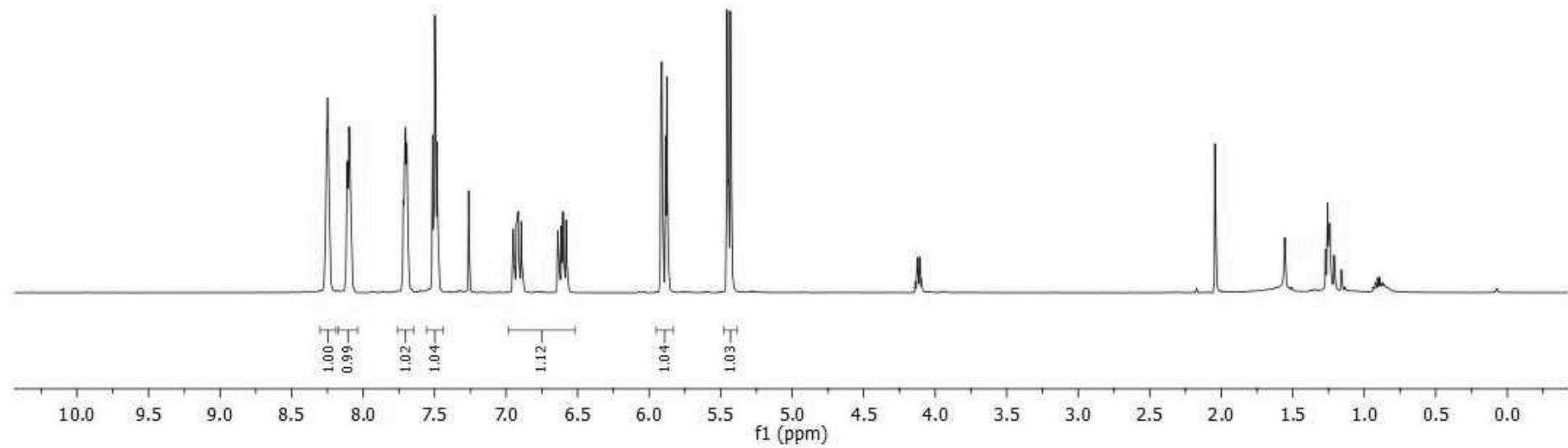
—7.26
—6.98



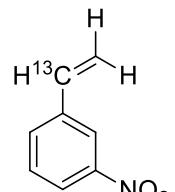
¹H-NMR (CDCl₃, 500 MHz)



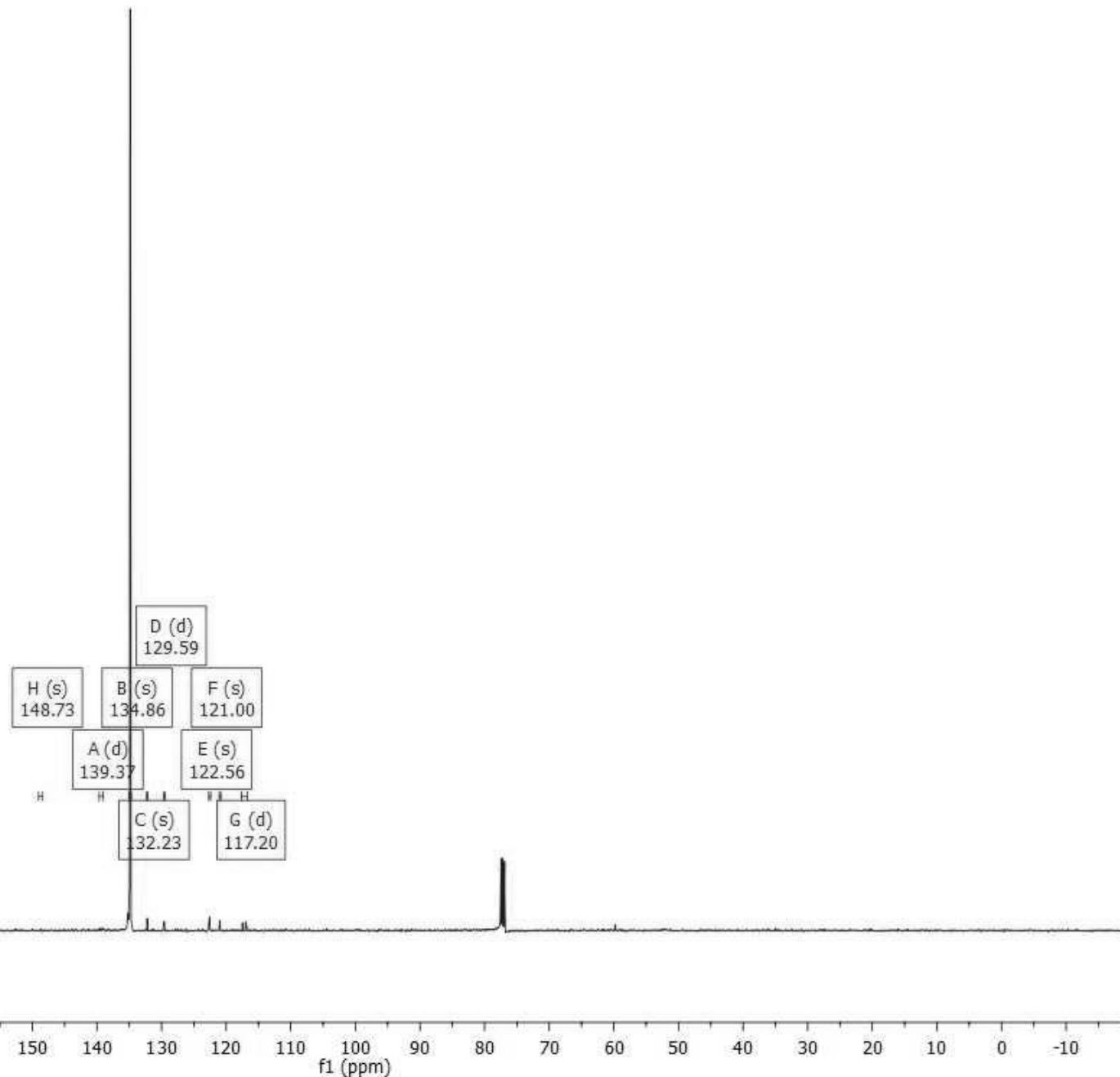
A (m) 8.25 B (m) 8.10 C (m) 7.70 D (m) 7.50
E (ddd) 6.77 G (dd) 5.90 H (dd) 5.44



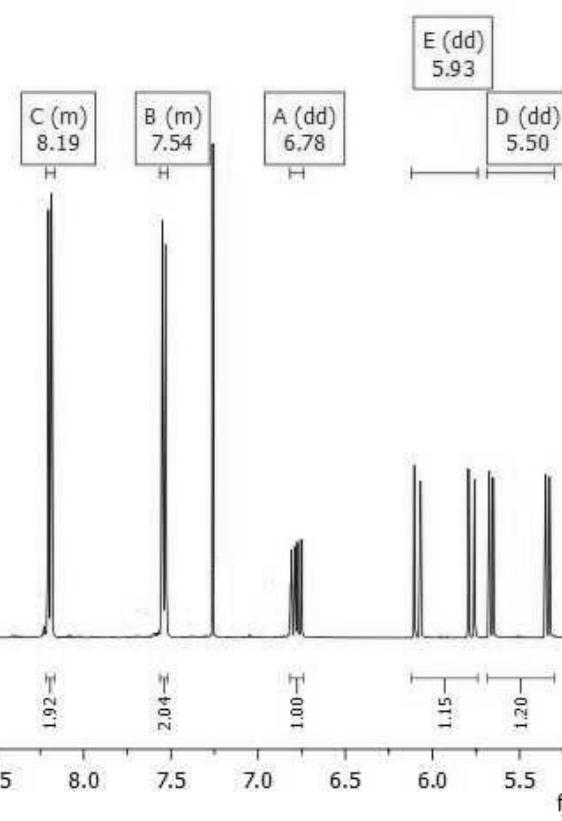
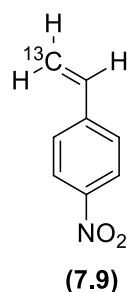
¹³C-NMR (CDCl₃, 126 MHz)



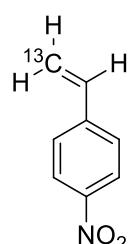
(7.6)



¹H-NMR (CDCl₃, 500 MHz)



¹³C-NMR (CDCl₃, 126 MHz)



(7.9)

E (d)	B (s)
135.09	124.11
F (s)	D (s)
143.95	132.69
C (d)	A (s)
126.95	118.76

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