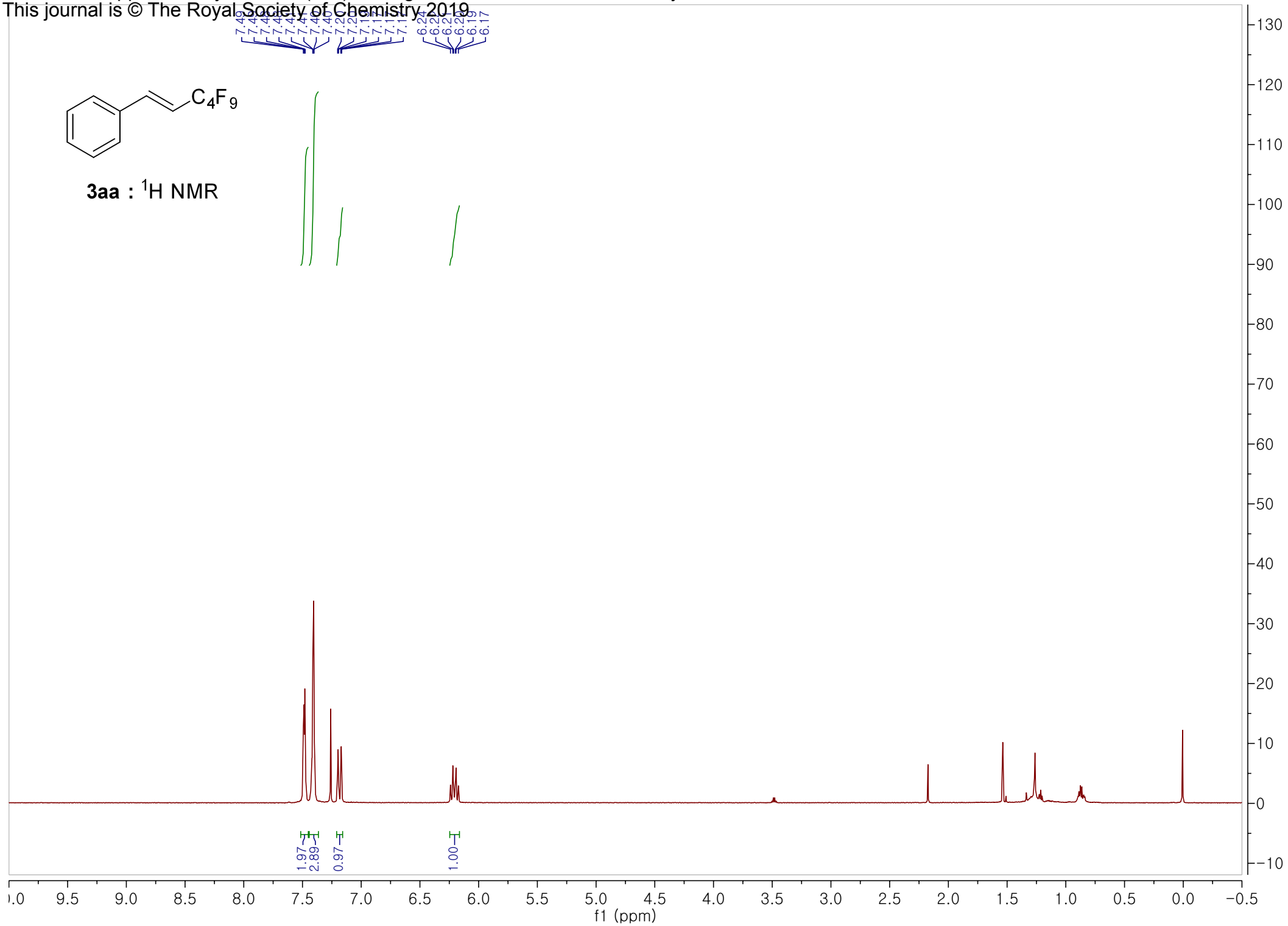
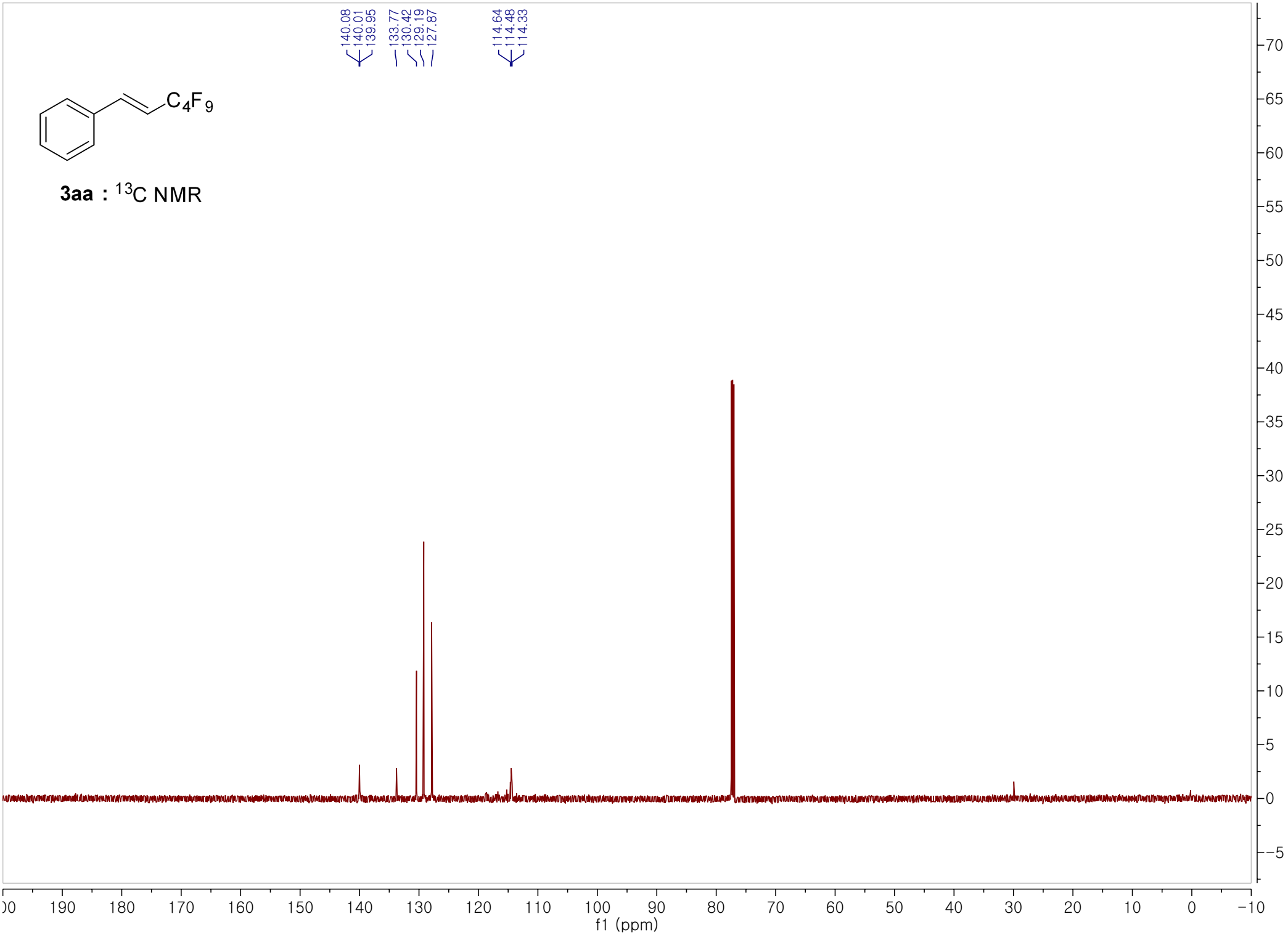
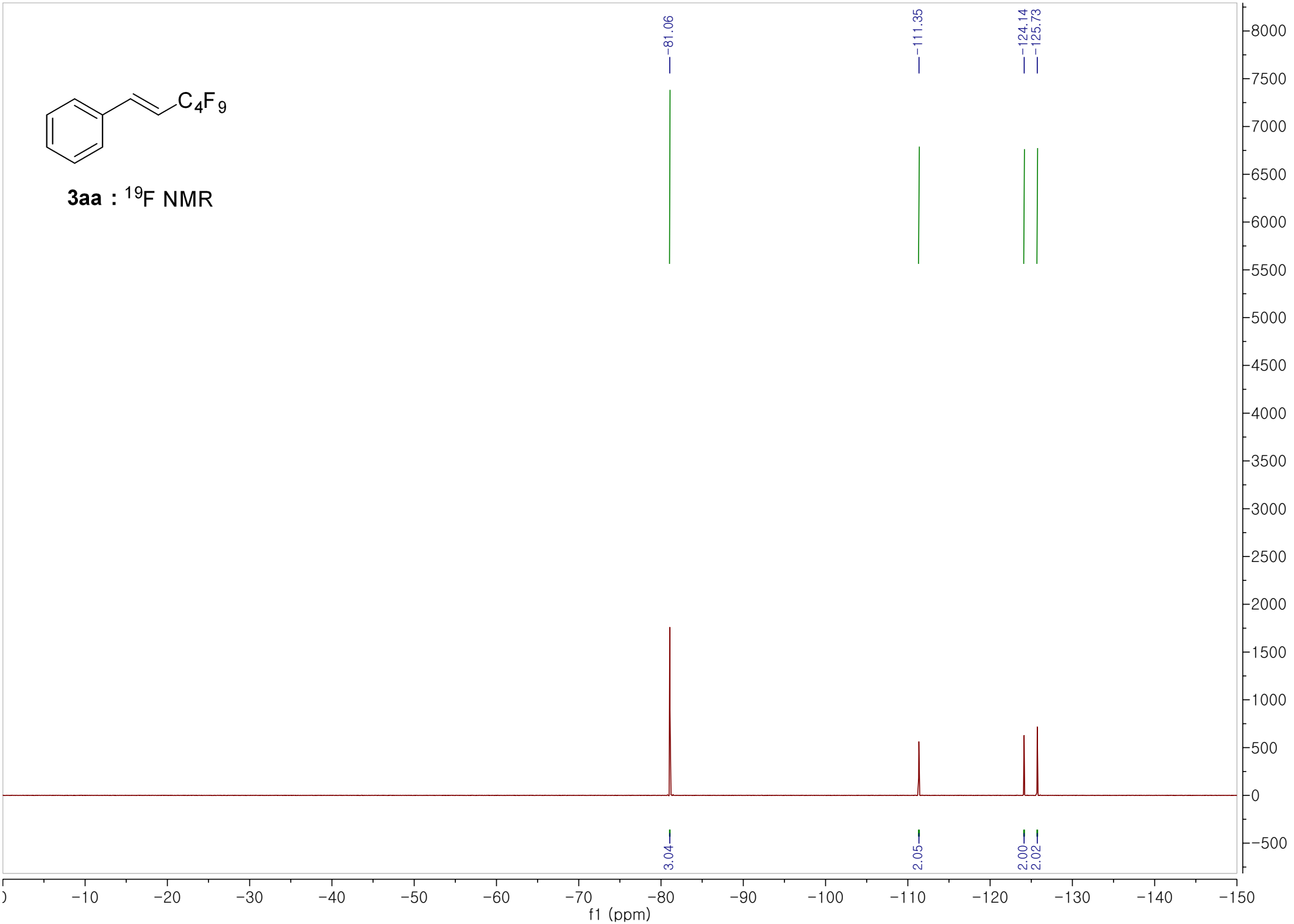
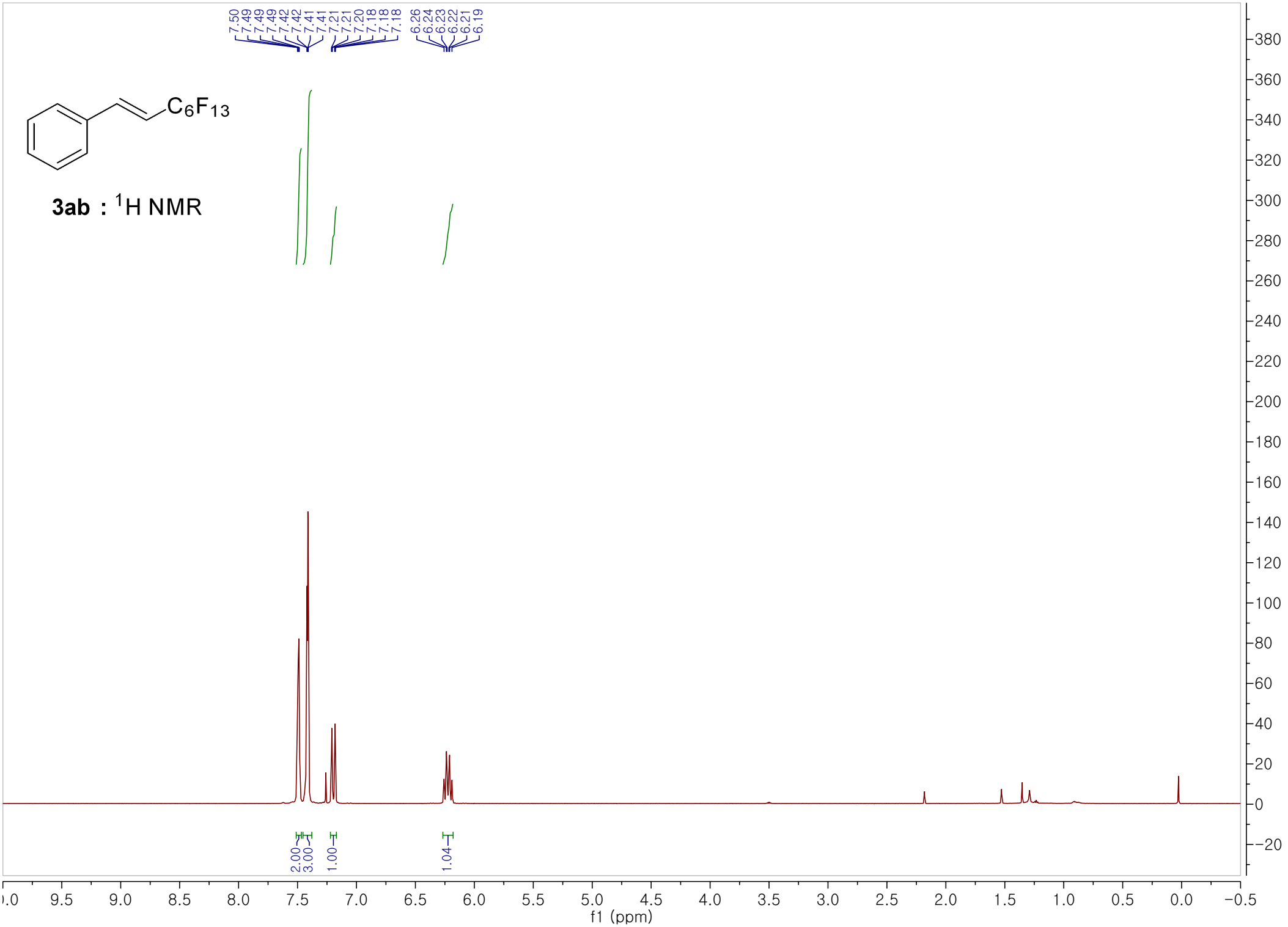
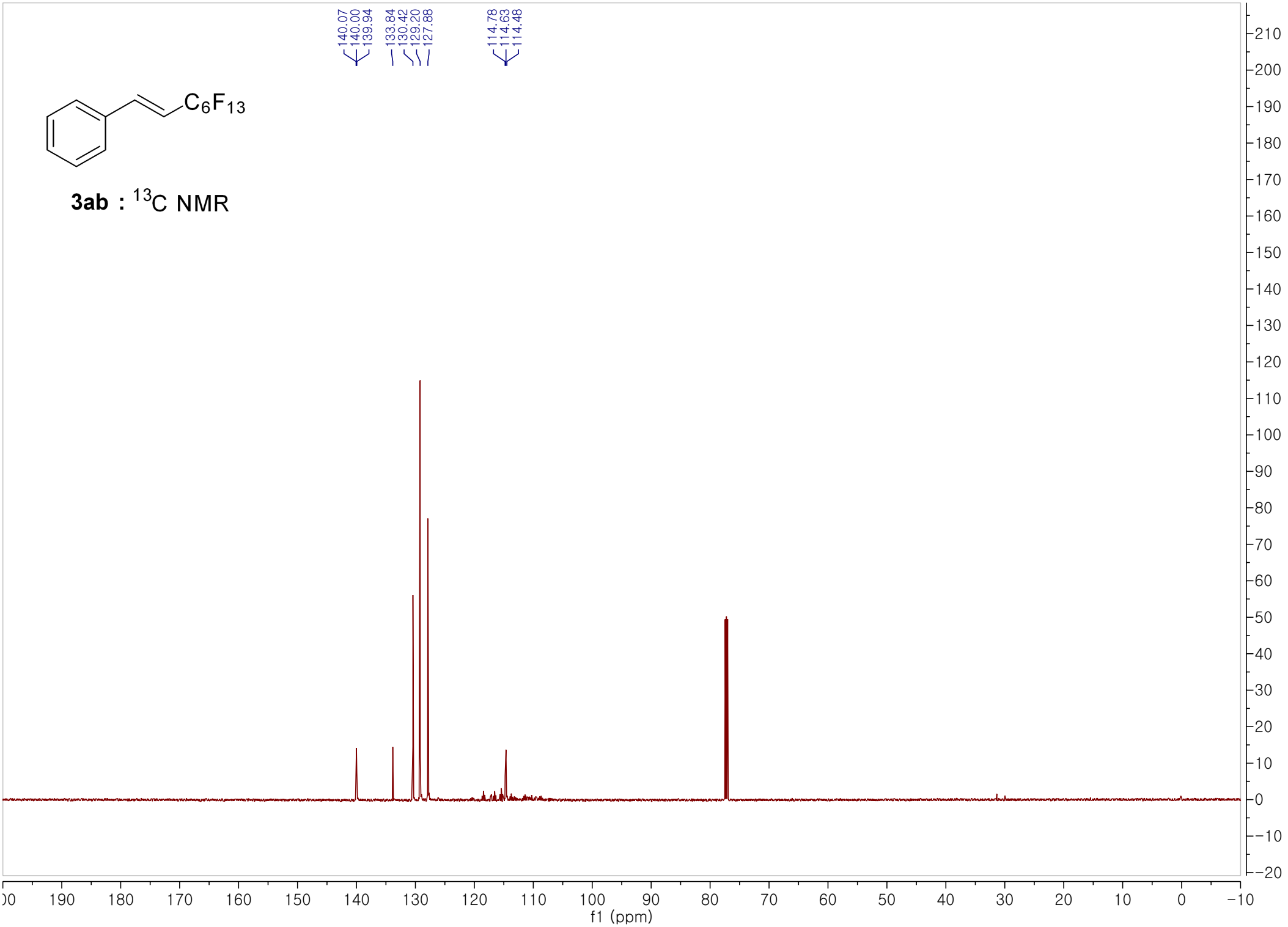
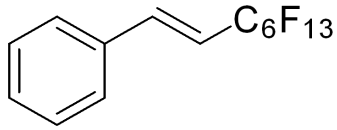



140.08
140.01
139.95
133.77
130.42
129.19
127.87
114.64
114.48
114.33
C_4F_9
3aa : ^{13}C NMR
f1 (ppm)


C4F9
3aa : 19F NMR
-81.06
-111.35
-124.14
-125.73
3.04
2.05
2.00
2.02
f1 (ppm)

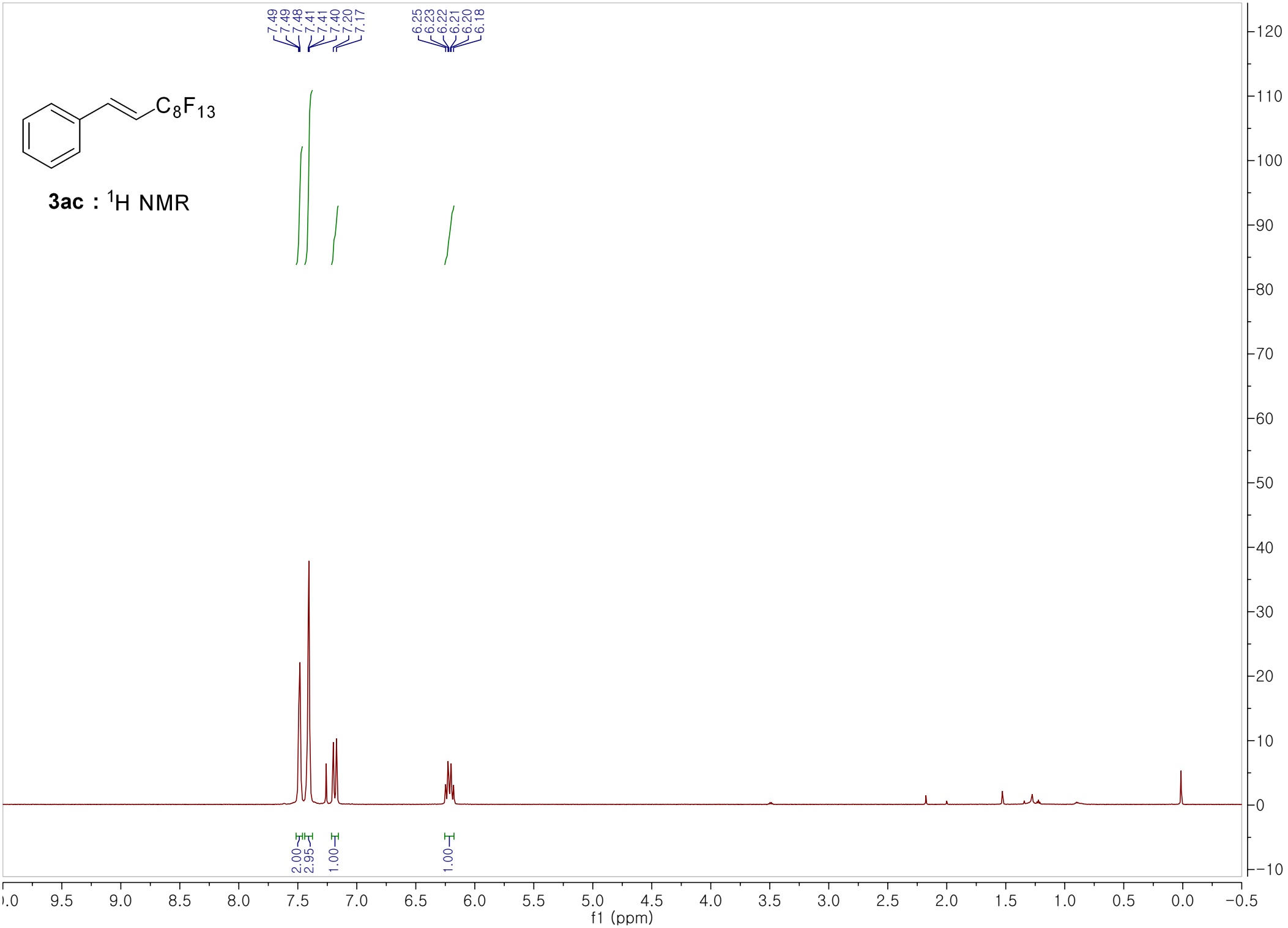

7.50
7.49
7.49
7.49
7.42
7.42
7.41
7.41
7.21
7.21
7.20
7.18
7.18
7.18
6.26
6.24
6.23
6.22
6.21
6.19
C6F13
3ab : 1H NMR
2.00
3.00
1.00
1.04
f1 (ppm)

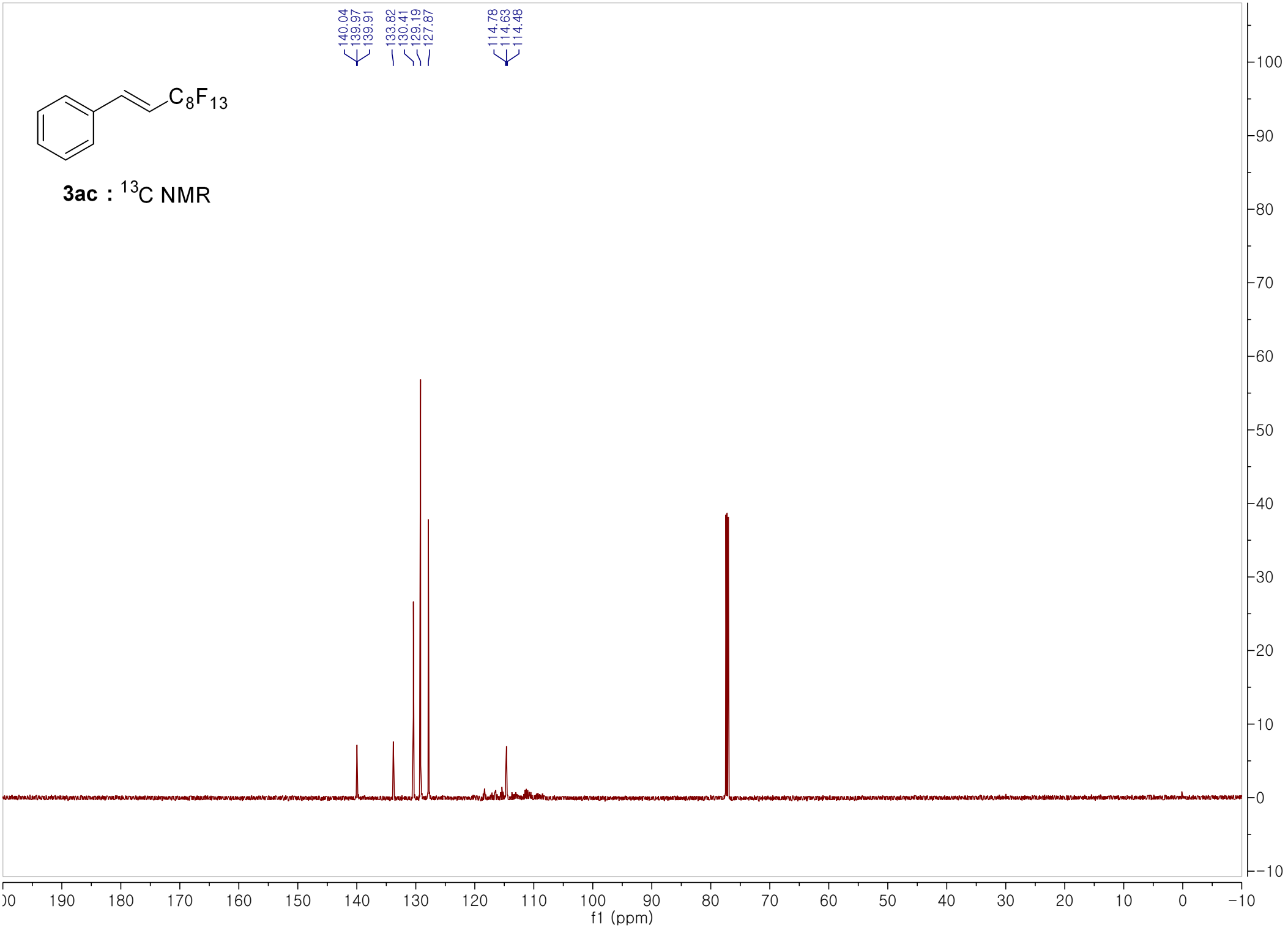

140.07
140.00
139.94
133.84
130.42
129.20
127.88
114.78
114.63
114.48
C_6F_{13}
3ab : ^{13}C NMR
f1 (ppm)

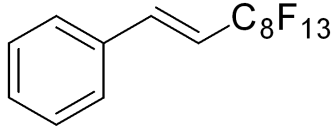

C_6F_{13}

3ab : ^{19}F NMR

-80.99
-111.22
-121.69
-122.95
-123.33
-126.28
3.02
2.04
2.04
2.06
2.06
2.07
f1 (ppm)

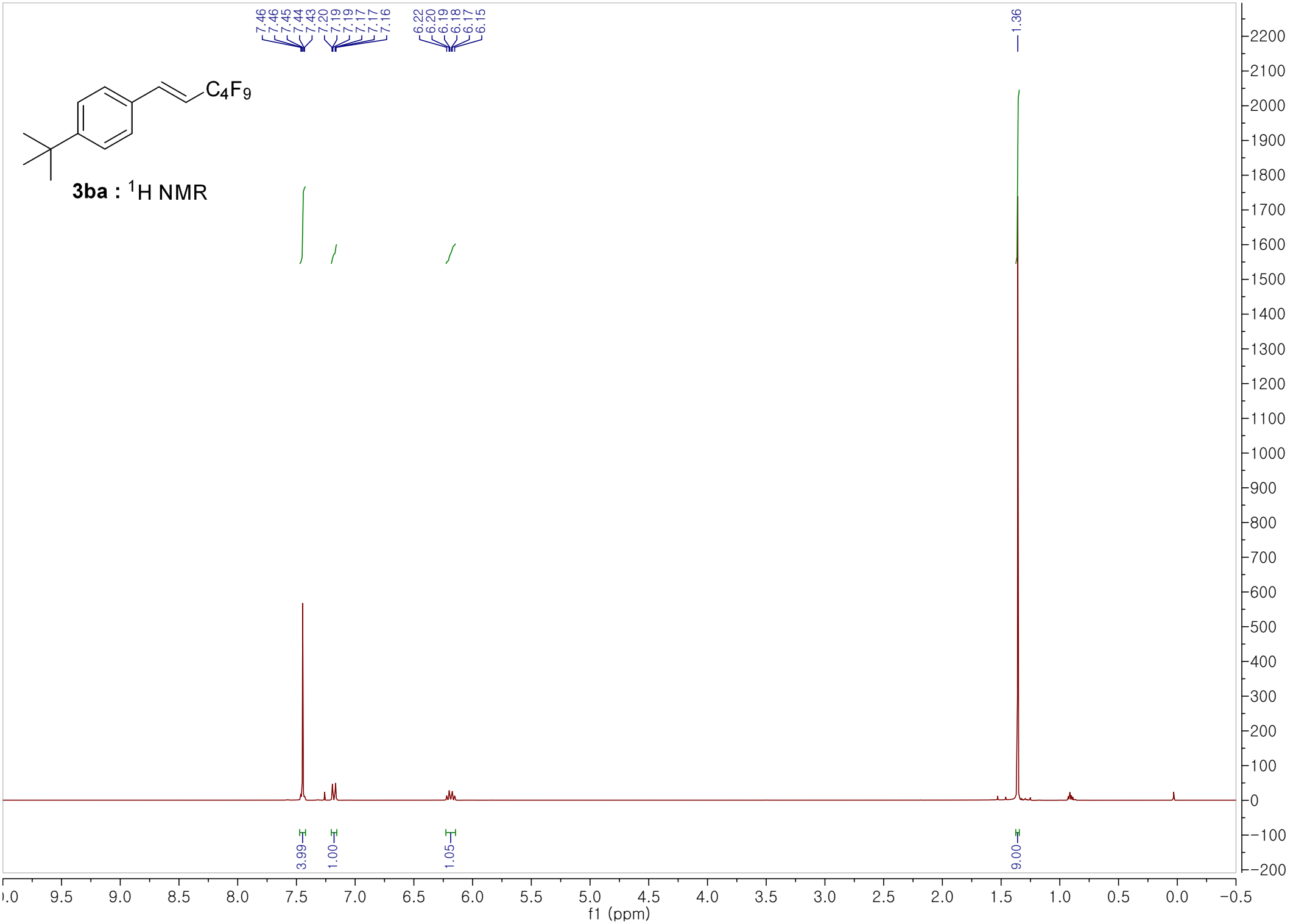

7.49
7.49
7.48
7.41
7.41
7.40
7.20
7.17
6.25
6.23
6.22
6.21
6.20
6.18
C_8F_{13}
3ac : ^{1}H NMR
2.00
2.95
1.00
1.00
f1 (ppm)

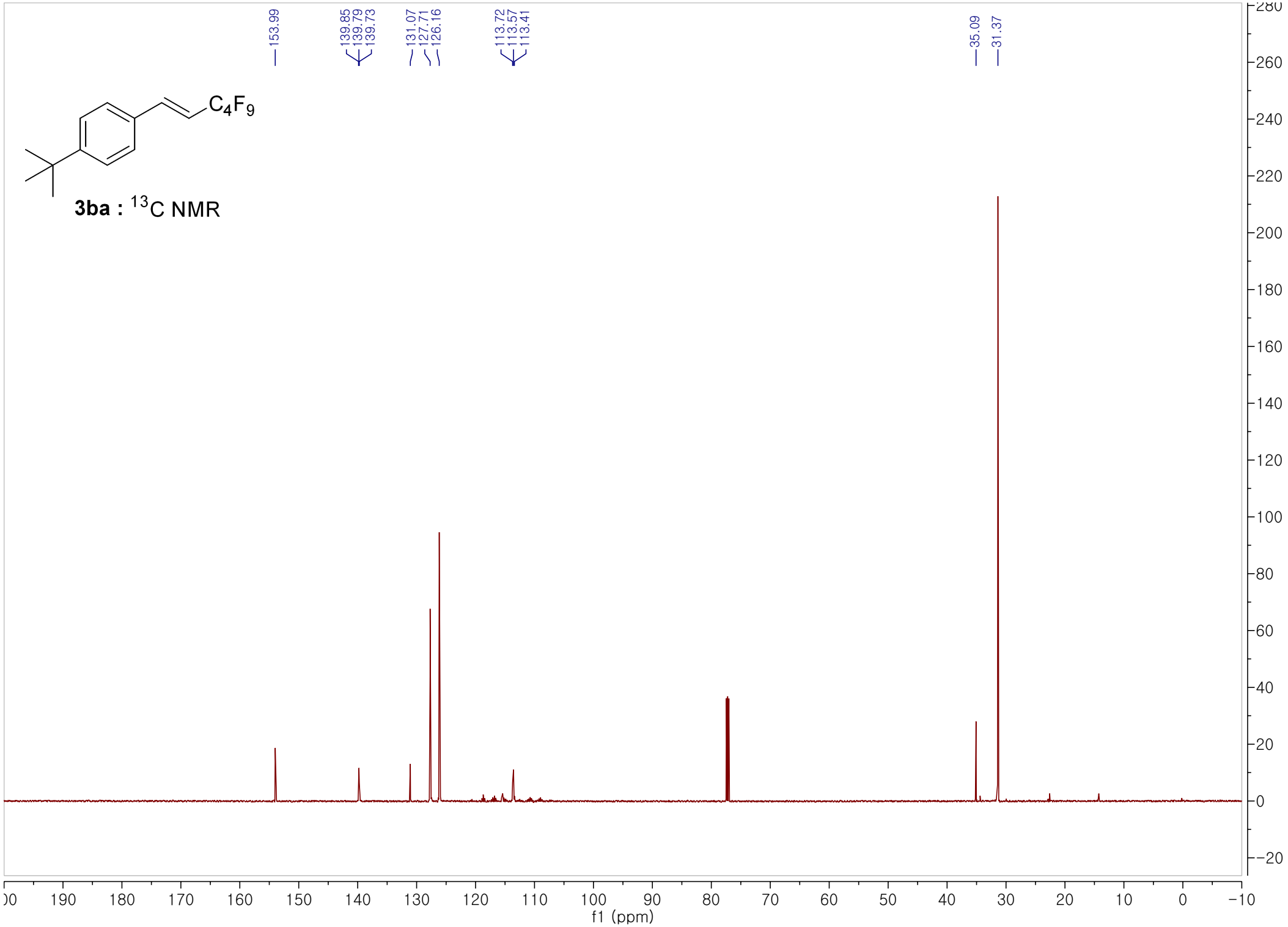

140.04
139.97
139.91
133.82
130.41
129.19
127.87
114.78
114.63
114.48
C_8F_{13}
3ac : ^{13}C NMR
f1 (ppm)

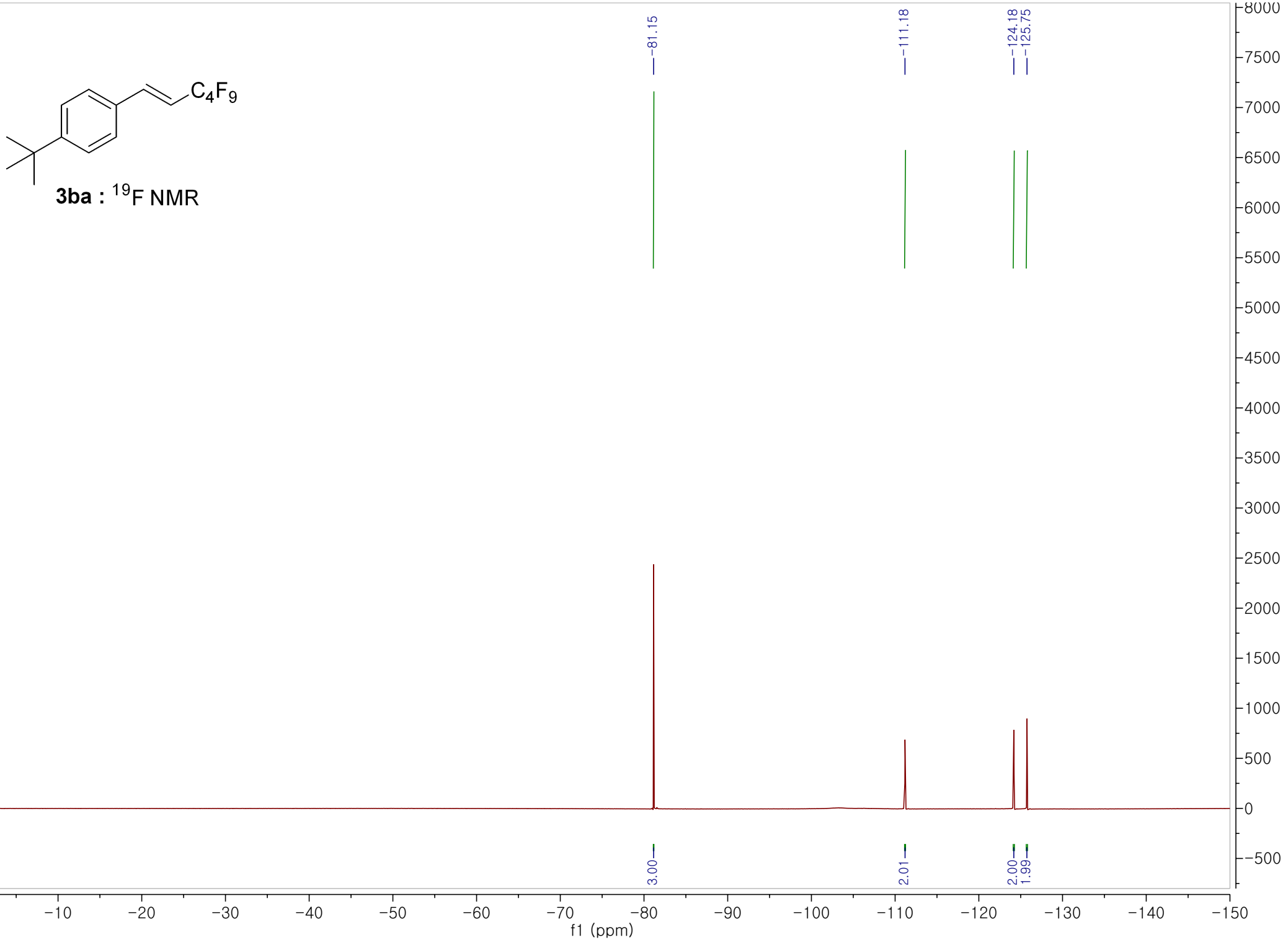

C_8F_{13}

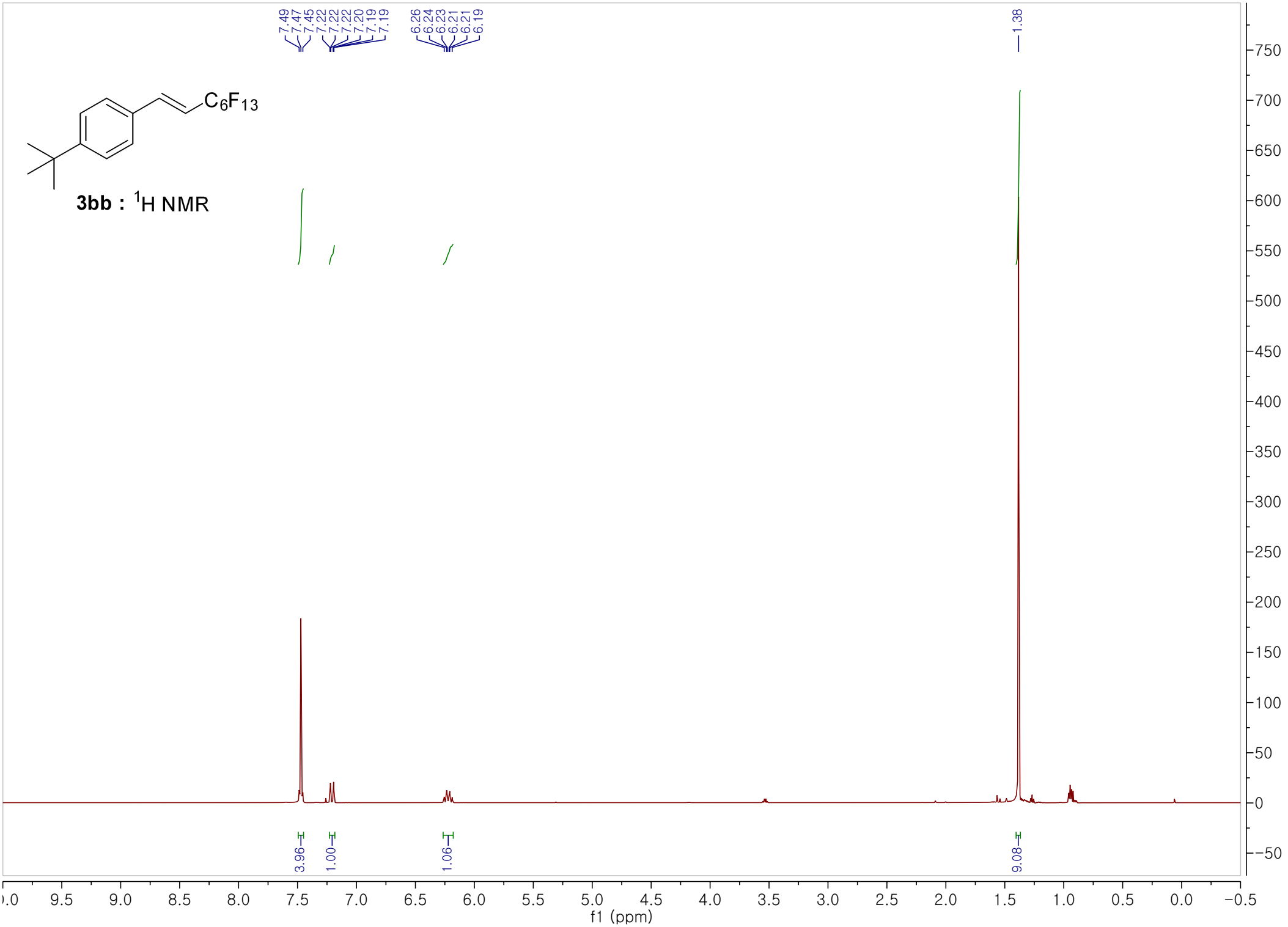
3ac : ^{19}F NMR

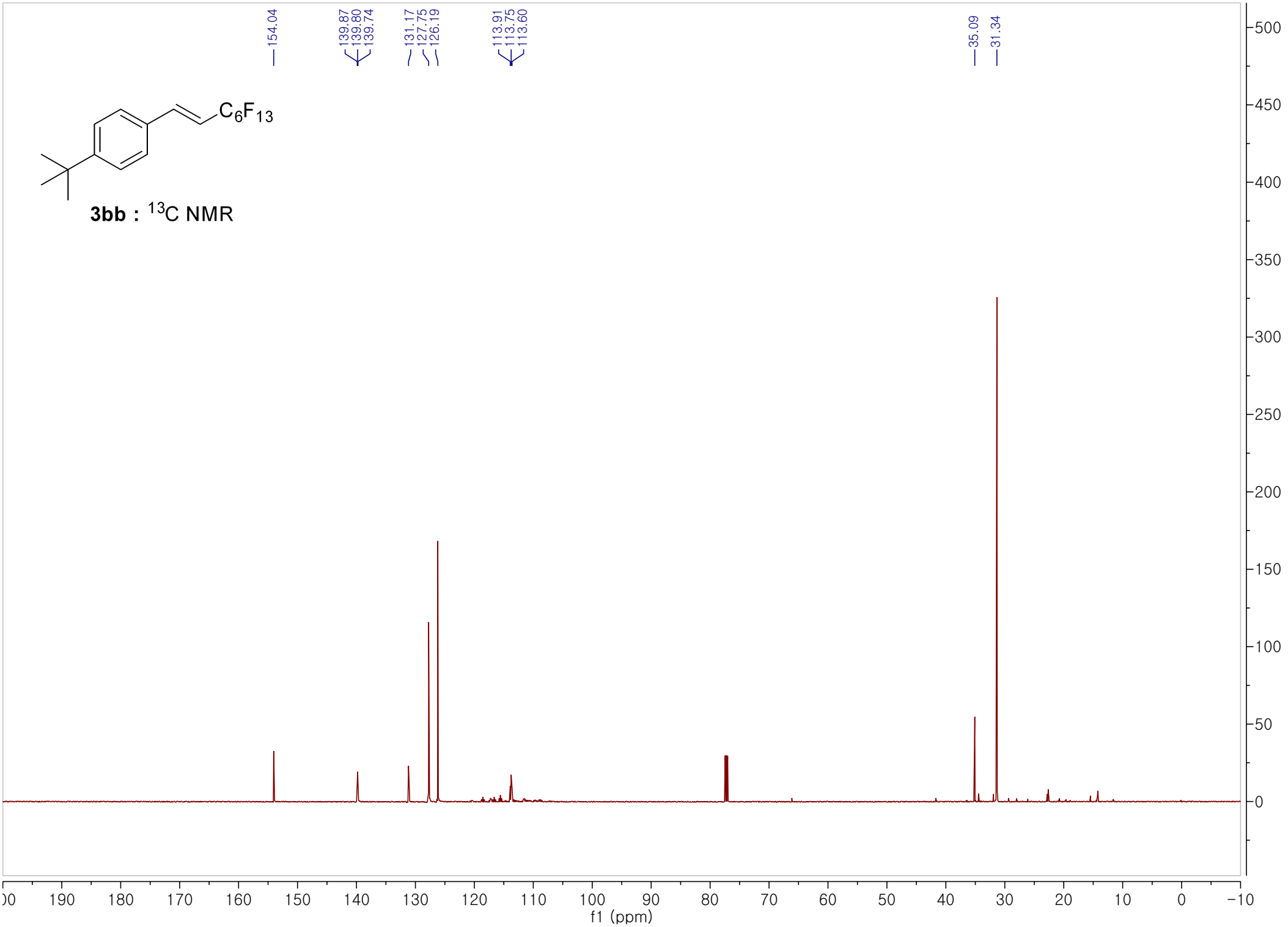
-80.93
-111.19
-121.45
-122.00
-122.81
-123.26
-126.22
3.00
2.01
2.00
4.04
1.96
1.93
1.94
f1 (ppm)

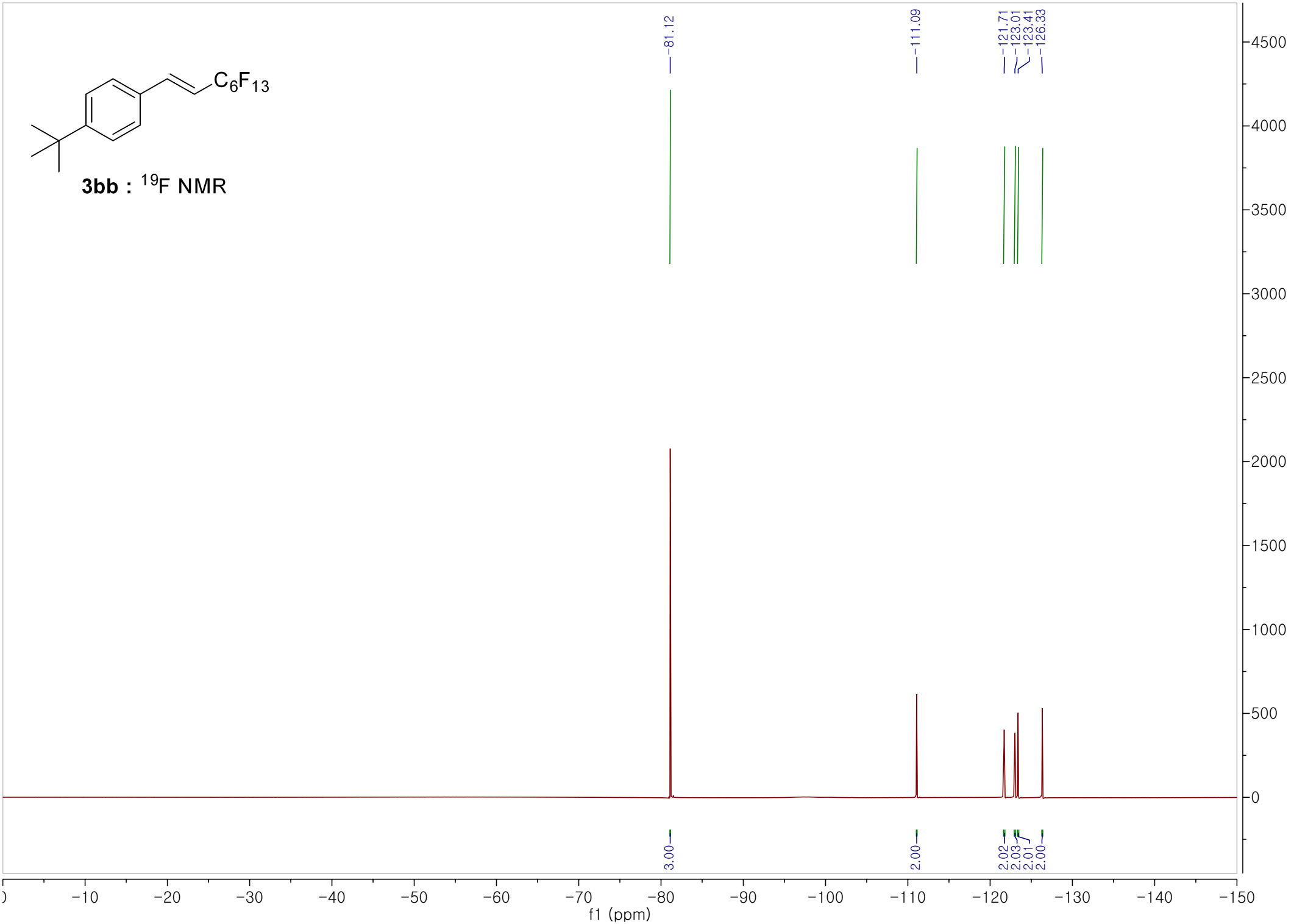

7.46
7.46
7.45
7.44
7.43
7.20
7.19
7.19
7.17
7.17
7.16
6.22
6.20
6.19
6.18
6.17
6.15
1.36
C_4F_9
3ba : ^{1}H NMR
3.99
1.00
1.05
9.00
f1 (ppm)

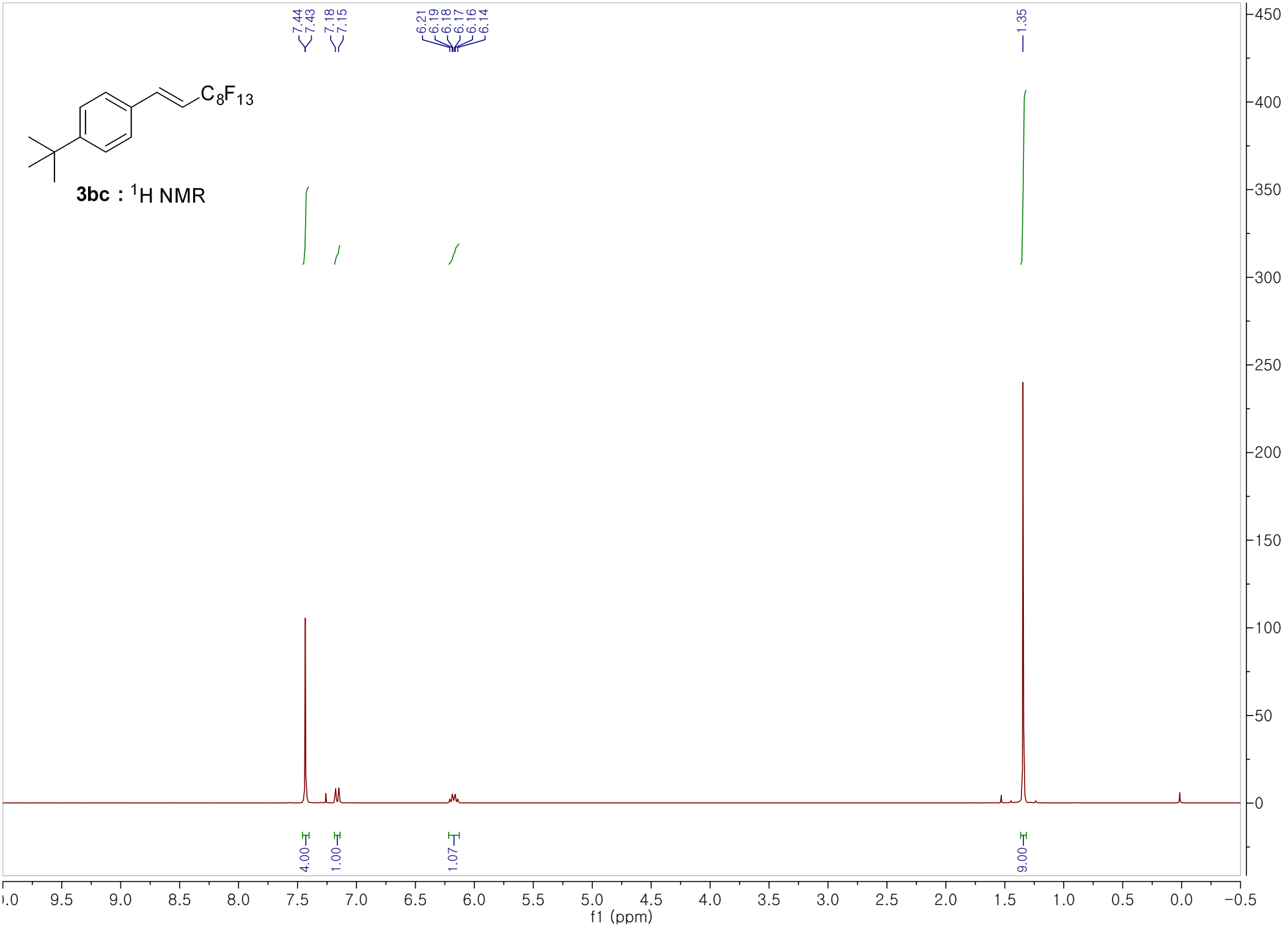

153.99
139.85
139.79
139.73
131.07
127.71
126.16
113.72
113.57
113.41
35.09
31.37
C_4F_9
3ba : ^{13}C NMR
f1 (ppm)

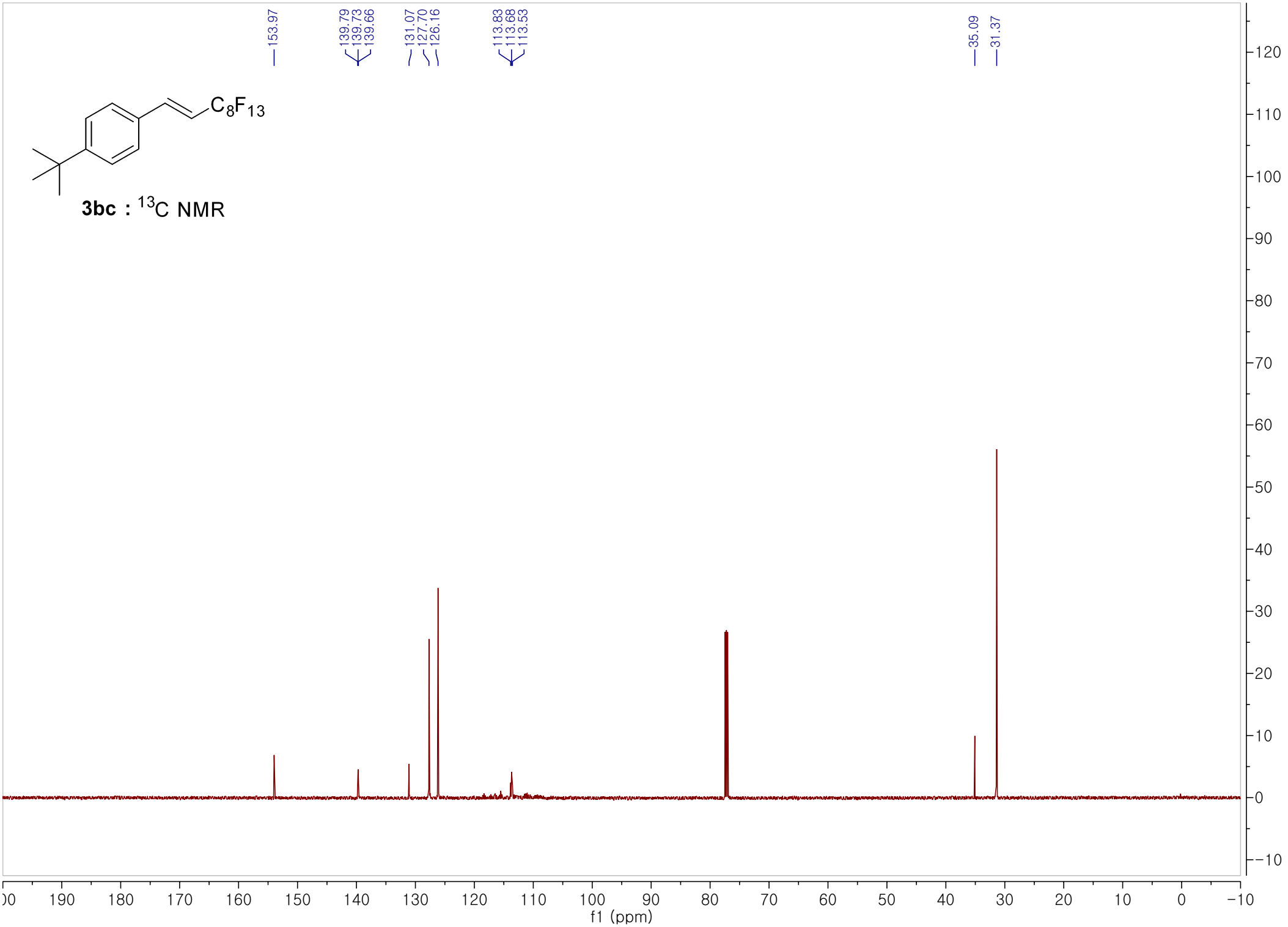

C_4F_9
3ba : ^{19}F NMR
-81.15
-111.18
-124.18
-125.75
3.00
2.01
2.00
1.99
f1 (ppm)

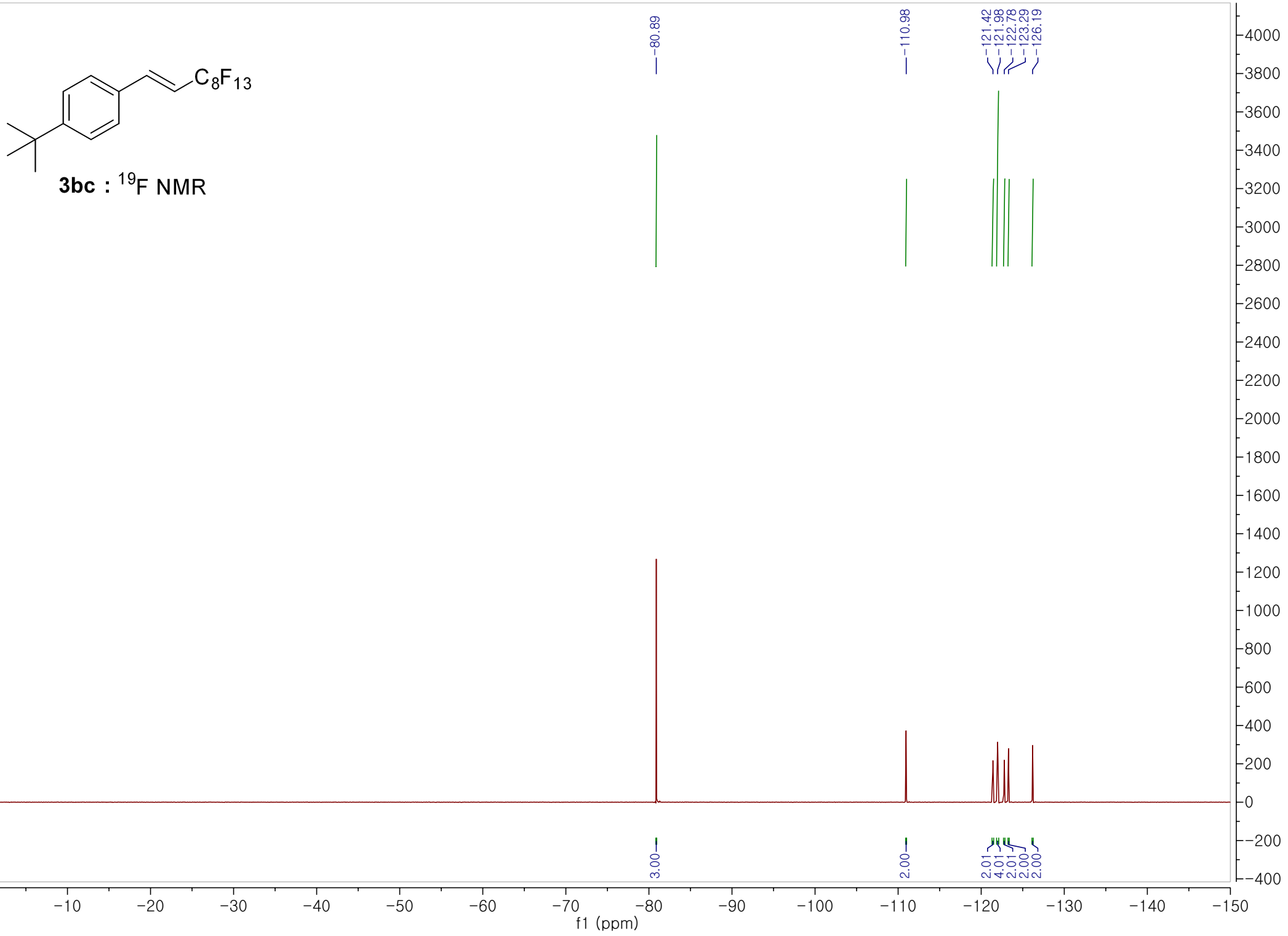

7.49
7.47
7.45
7.22
7.22
7.22
7.20
7.19
7.19
6.26
6.24
6.23
6.21
6.21
6.19
1.38
C_6F_{13}
3bb : ^{1}H NMR
3.96
1.00
1.06
9.08
f1 (ppm)

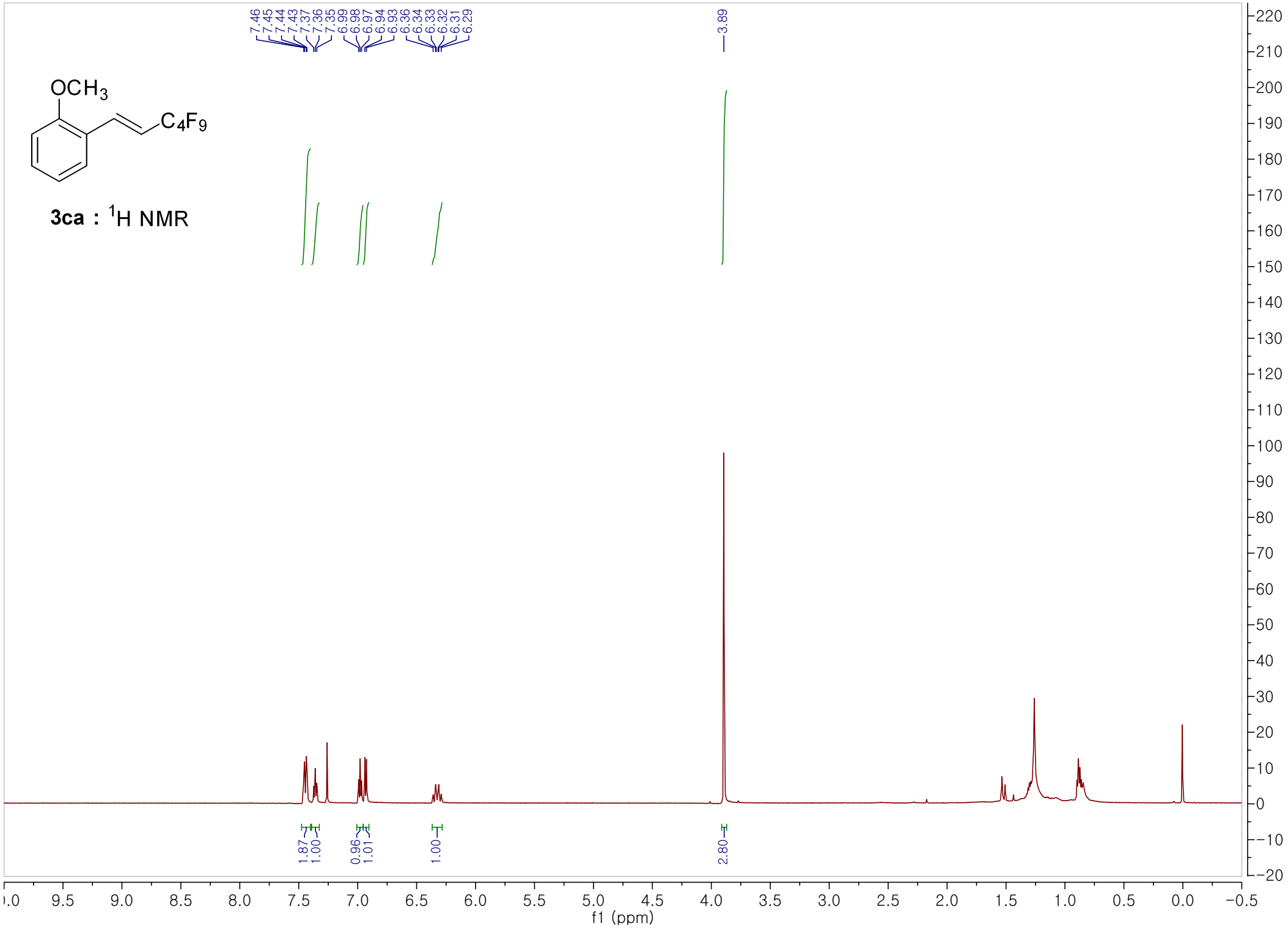

154.04
139.87
139.80
139.74
131.17
127.75
126.19
113.91
113.75
113.60
35.09
31.34
C_6F_{13}
3bb : ^{13}C NMR
f1 (ppm)

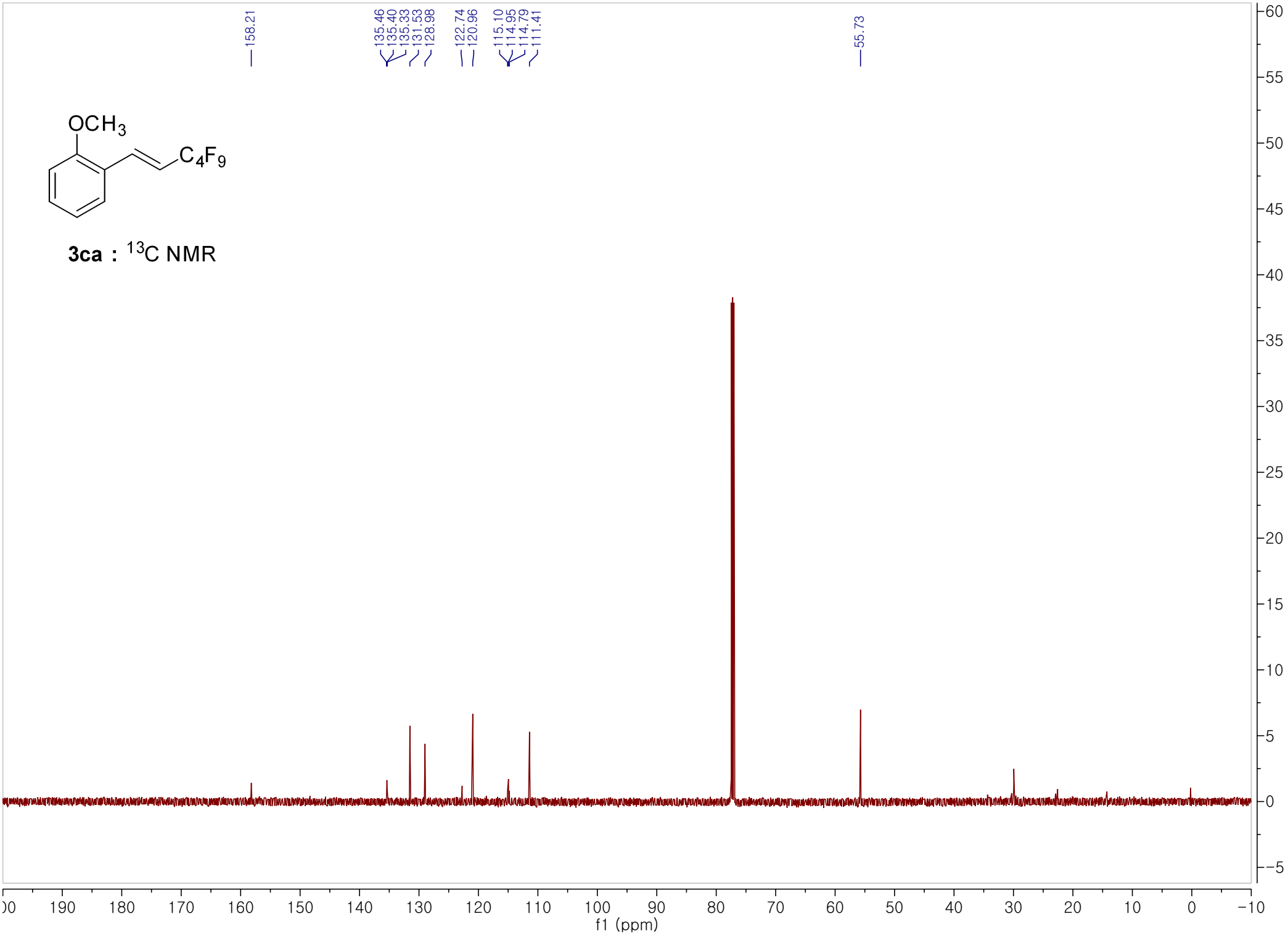

C_6F_{13}
3bb : ^{19}F NMR
-81.12
-111.09
-121.71
-123.01
-123.41
-126.33
3.00
2.00
2.02
2.03
2.01
2.00
f1 (ppm)

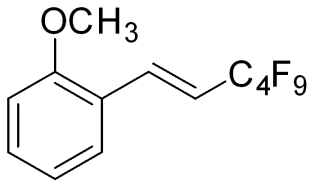

7.44
7.43
7.18
7.15
6.21
6.19
6.18
6.17
6.16
6.14
1.35
C_8F_{13}
3bc : ^{1}H NMR
4.00
1.00
1.07
9.00
f1 (ppm)


153.97
139.79
139.73
139.66
131.07
127.70
126.16
113.83
113.68
113.53
35.09
31.37
C_8F_{13}
3bc : ^{13}C NMR
f1 (ppm)

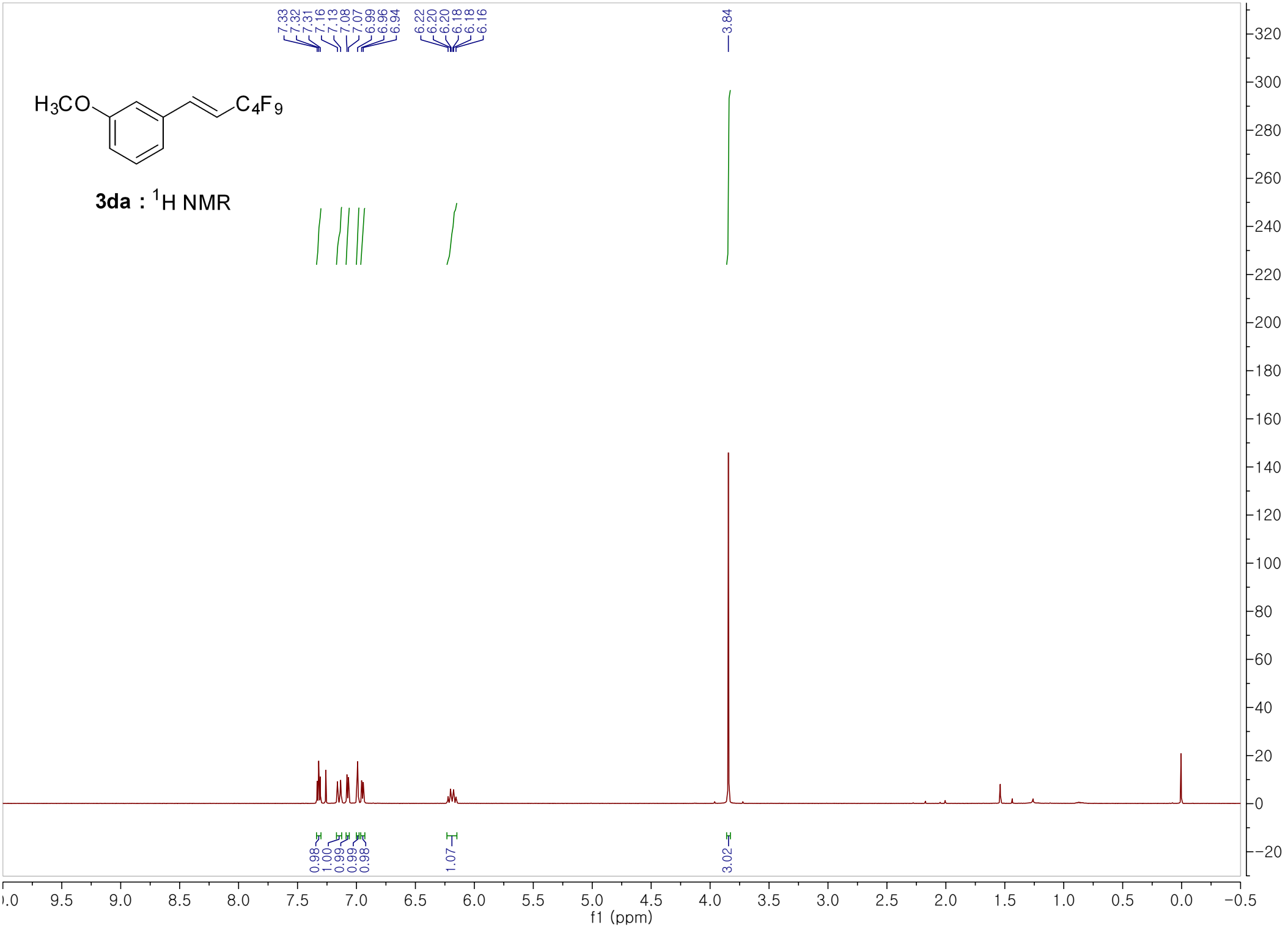

C8F13
3bc : 19F NMR
-80.89
-110.98
-121.42
-121.98
-122.78
-123.29
-126.19
3.00
2.00
2.01
4.01
2.01
2.00
2.00
f1 (ppm)

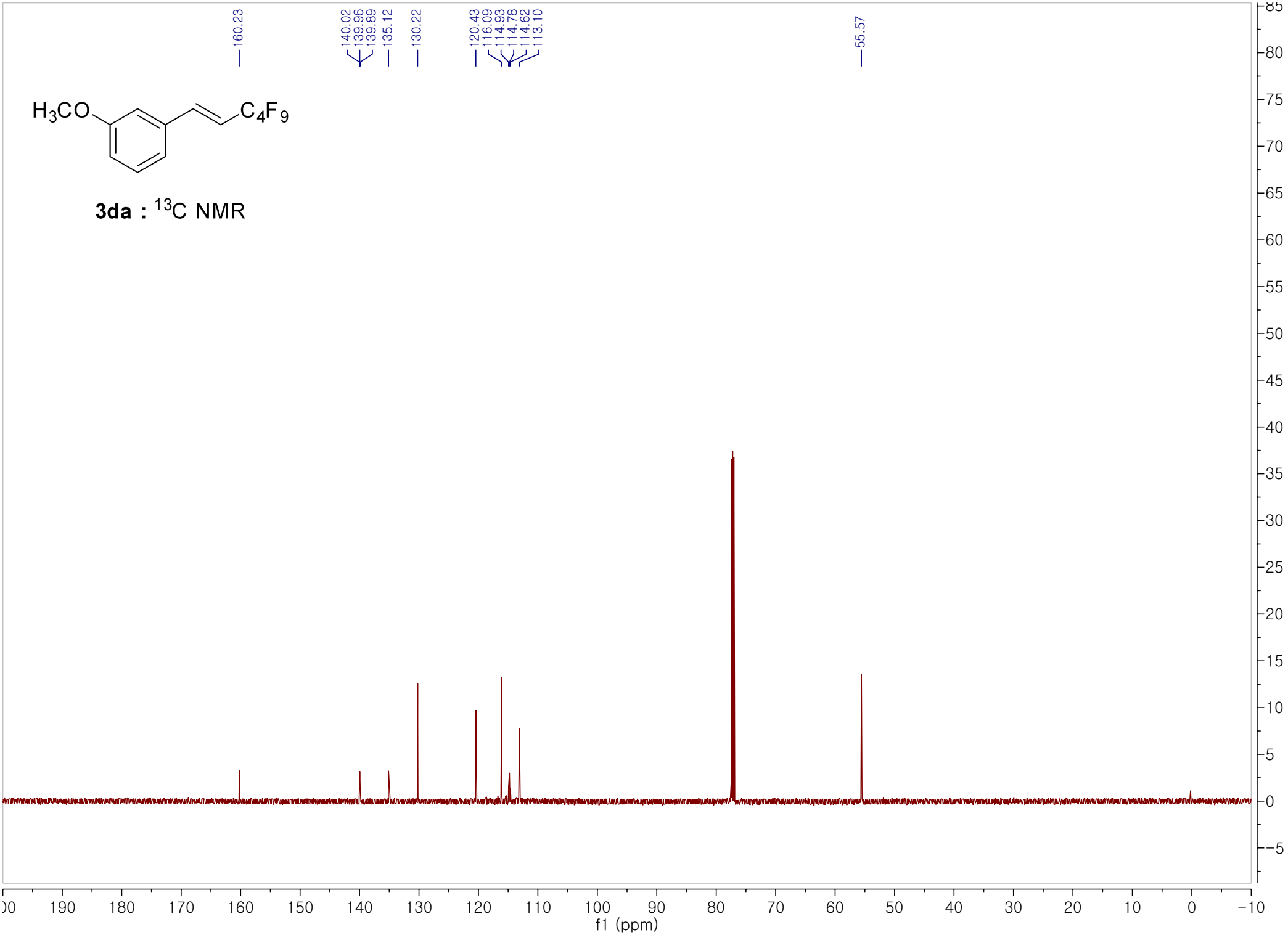

OCH3
C4F9
3ca : 1H NMR
7.46
7.45
7.44
7.43
7.37
7.36
7.35
6.99
6.98
6.97
6.94
6.93
6.36
6.34
6.33
6.32
6.31
6.29
3.89
1.87
1.00
0.96
1.01
1.00
2.80
f1 (ppm)

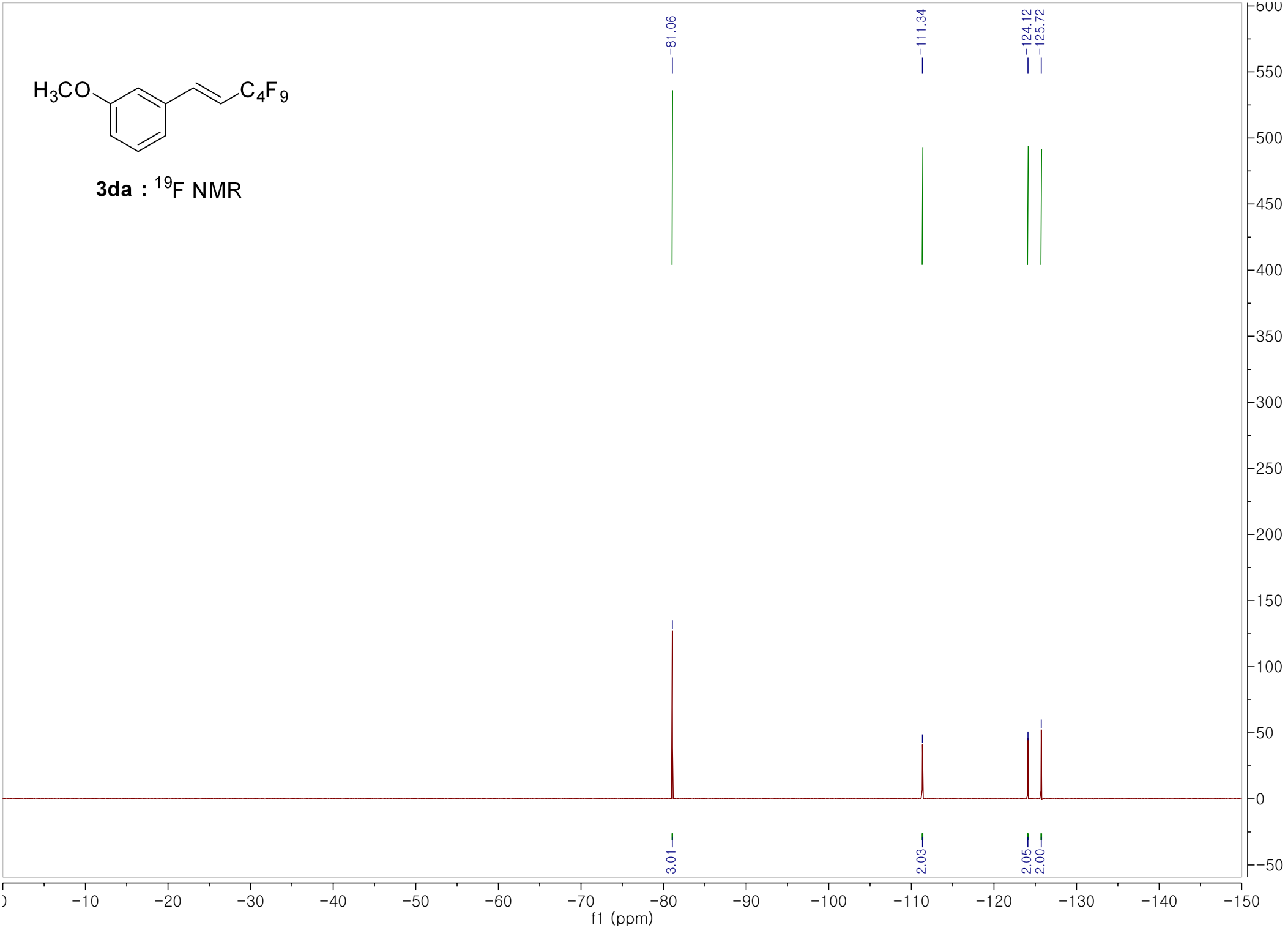

158.21
135.46
135.40
135.33
131.53
128.98
122.74
120.96
115.10
114.95
114.79
111.41
55.73
OCH3
C4F9
3ca : 13C NMR
f1 (ppm)

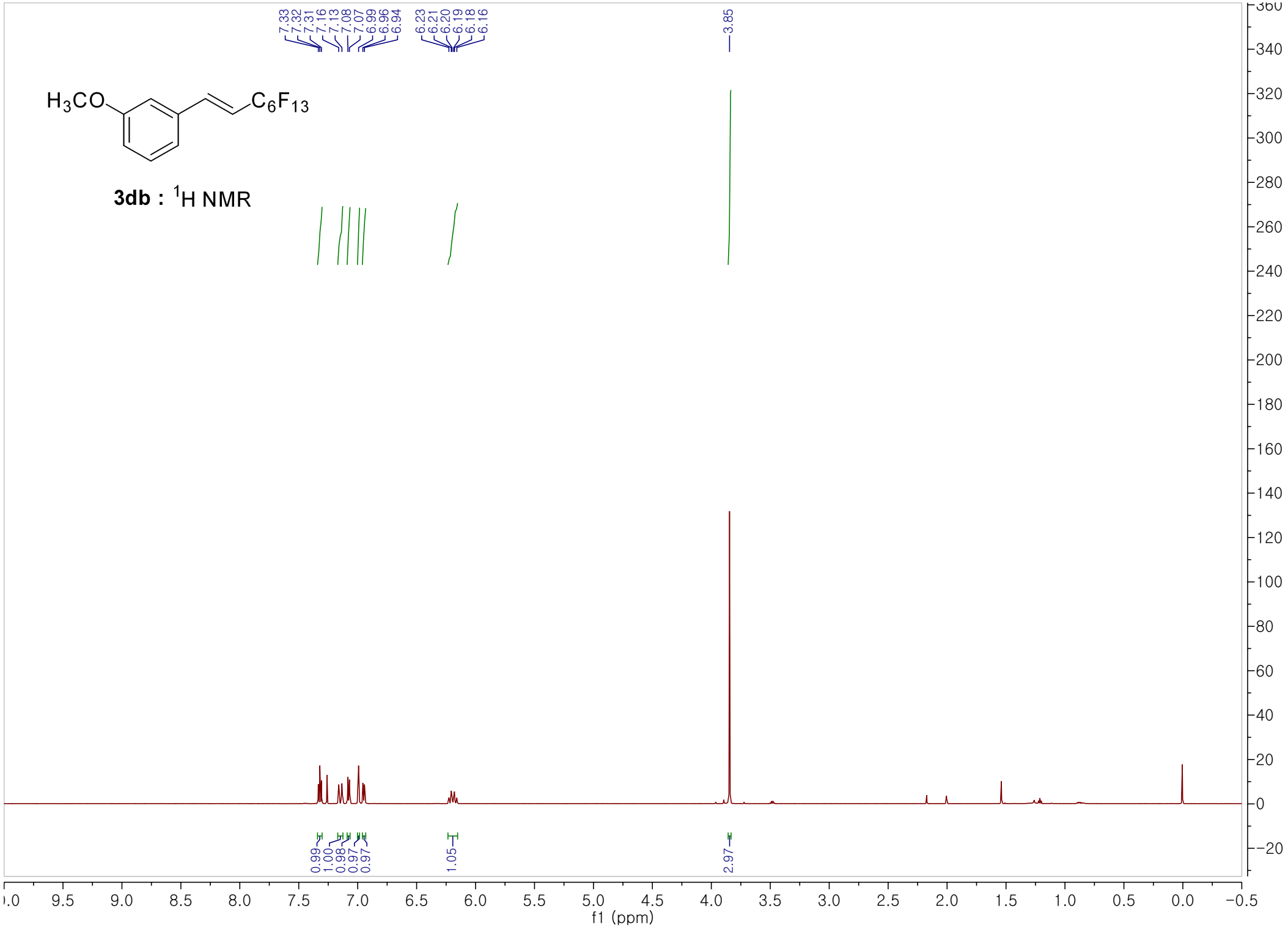


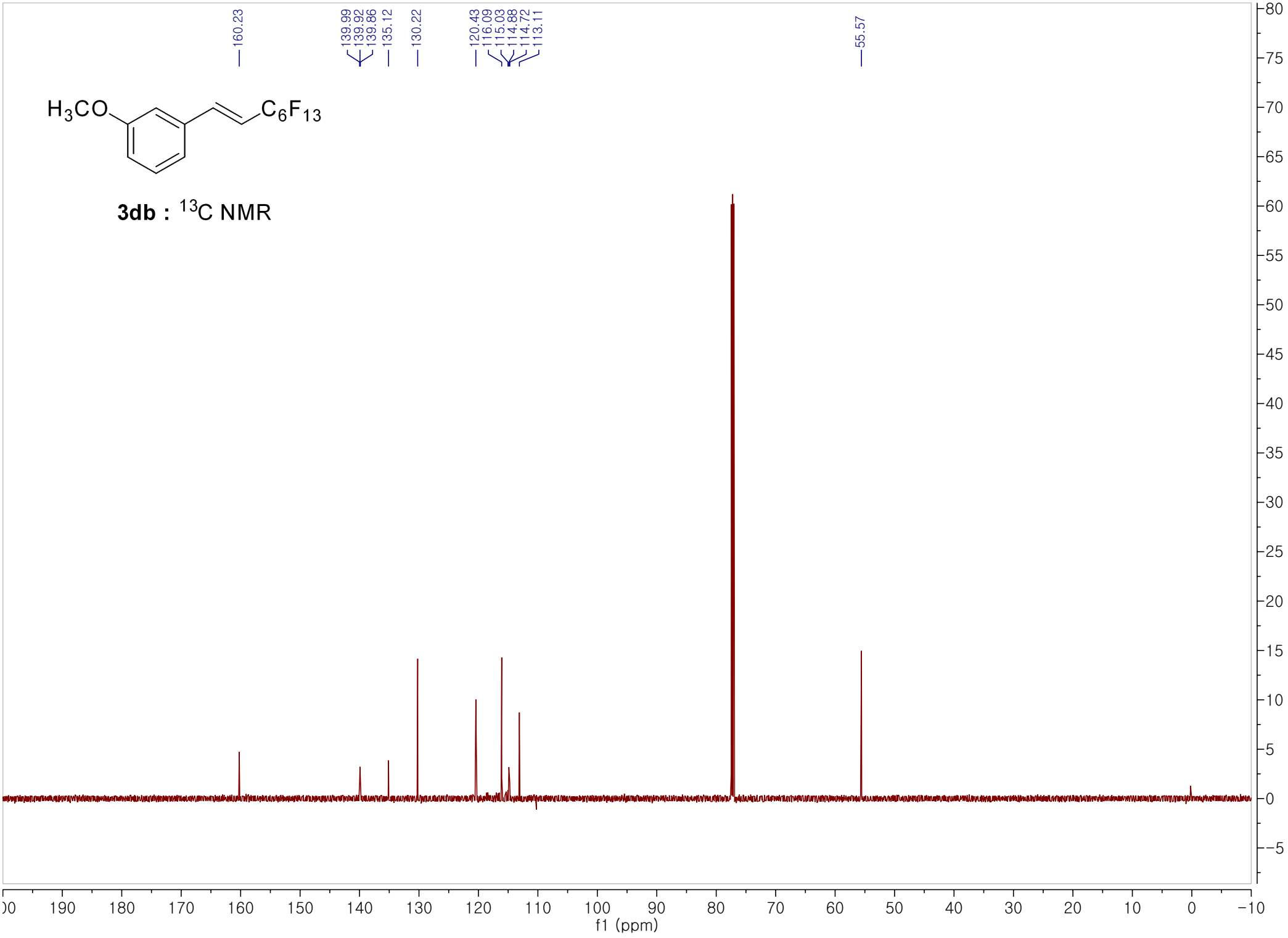
3ca : ^{19}F NMR

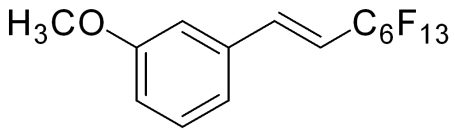

7.33
7.32
7.31
7.16
7.13
7.08
7.07
6.99
6.96
6.94
6.22
6.20
6.20
6.18
6.18
6.16
3.84
H3CO
C4F9
3da : 1H NMR
0.98
1.00
0.99
0.99
0.98
1.07
3.02
f1 (ppm)


160.23
140.02
139.96
139.89
135.12
130.22
120.43
116.09
114.93
114.78
114.62
113.10
55.57
H3CO
C4F9
3da : 13C NMR
f1 (ppm)


H3CO
C4F9
3da : 19F NMR
-81.06
-111.34
-124.12
-125.72
3.01
2.03
2.05
2.00
f1 (ppm)

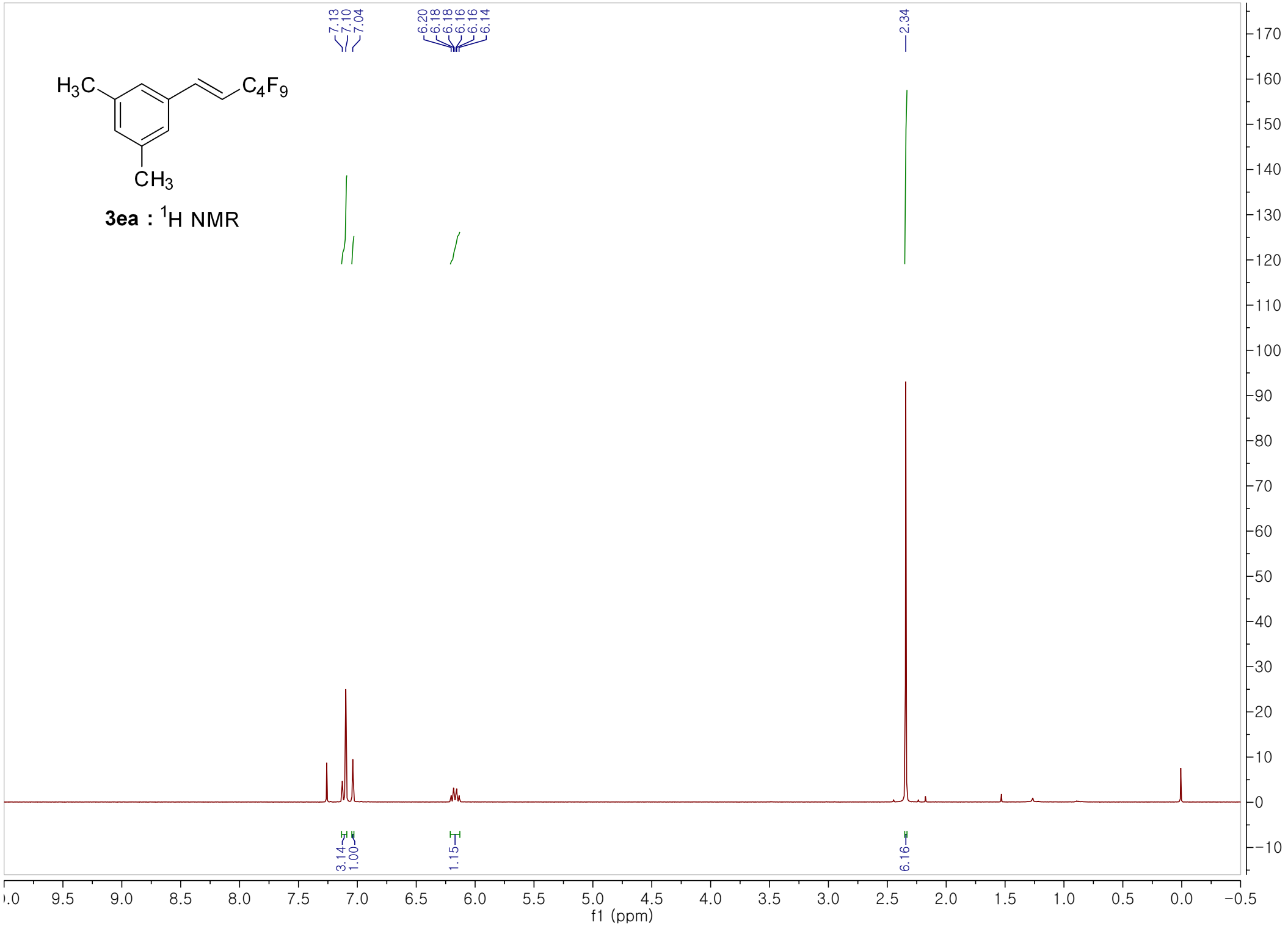

7.33
7.32
7.31
7.16
7.13
7.08
7.07
6.99
6.96
6.94
6.23
6.21
6.20
6.19
6.18
6.16
3.85
H3CO
C6F13
3db : 1H NMR
0.99
1.00
0.98
0.97
0.97
1.05
2.97
f1 (ppm)

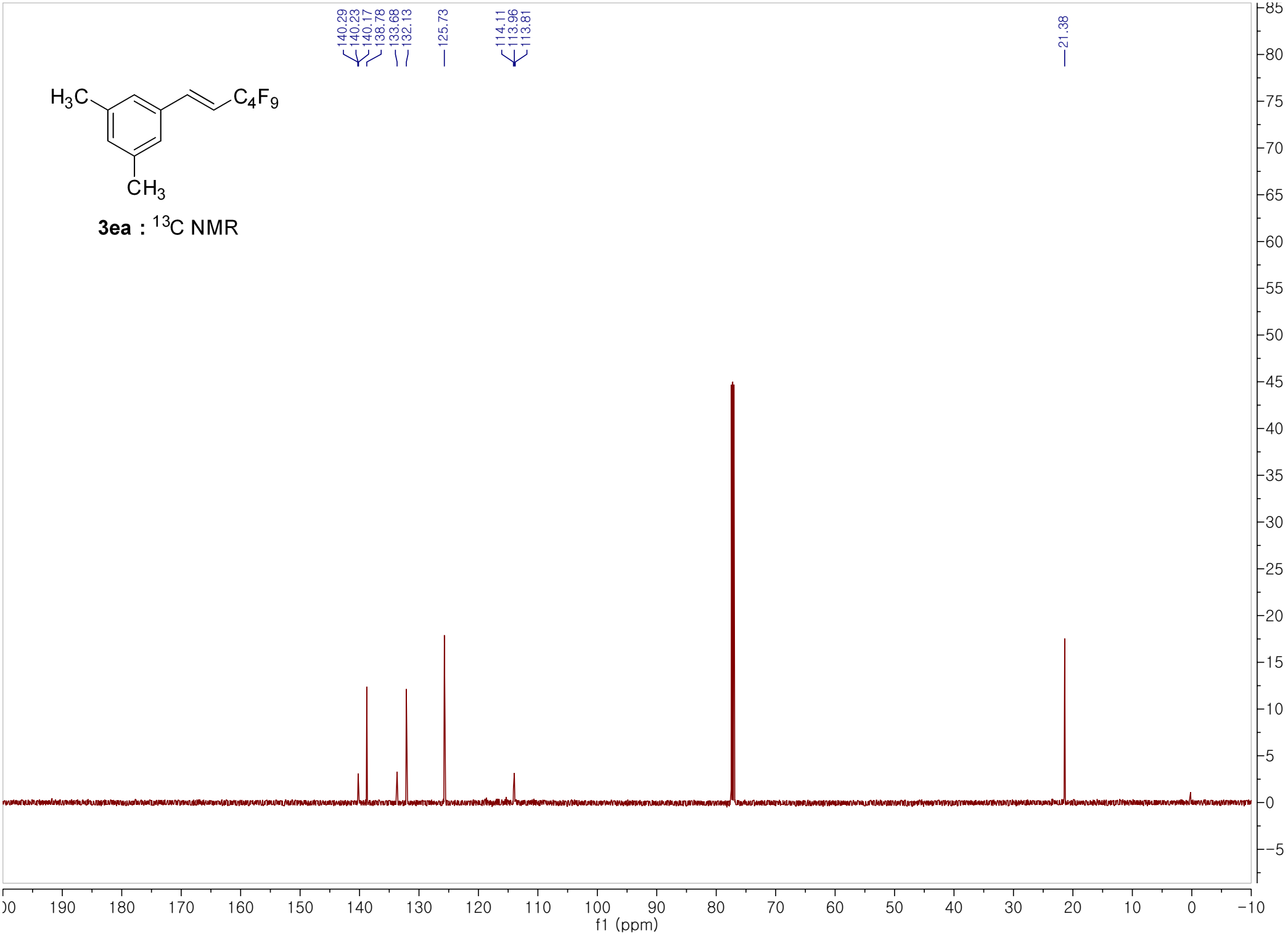

160.23
139.99
139.92
139.86
135.12
130.22
120.43
116.09
115.03
114.88
114.72
113.11
55.57
H3CO
C6F13
3db : 13C NMR
f1 (ppm)

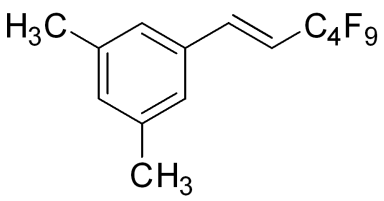

H_3CO
C_6F_{13}

3db : ^{19}F NMR

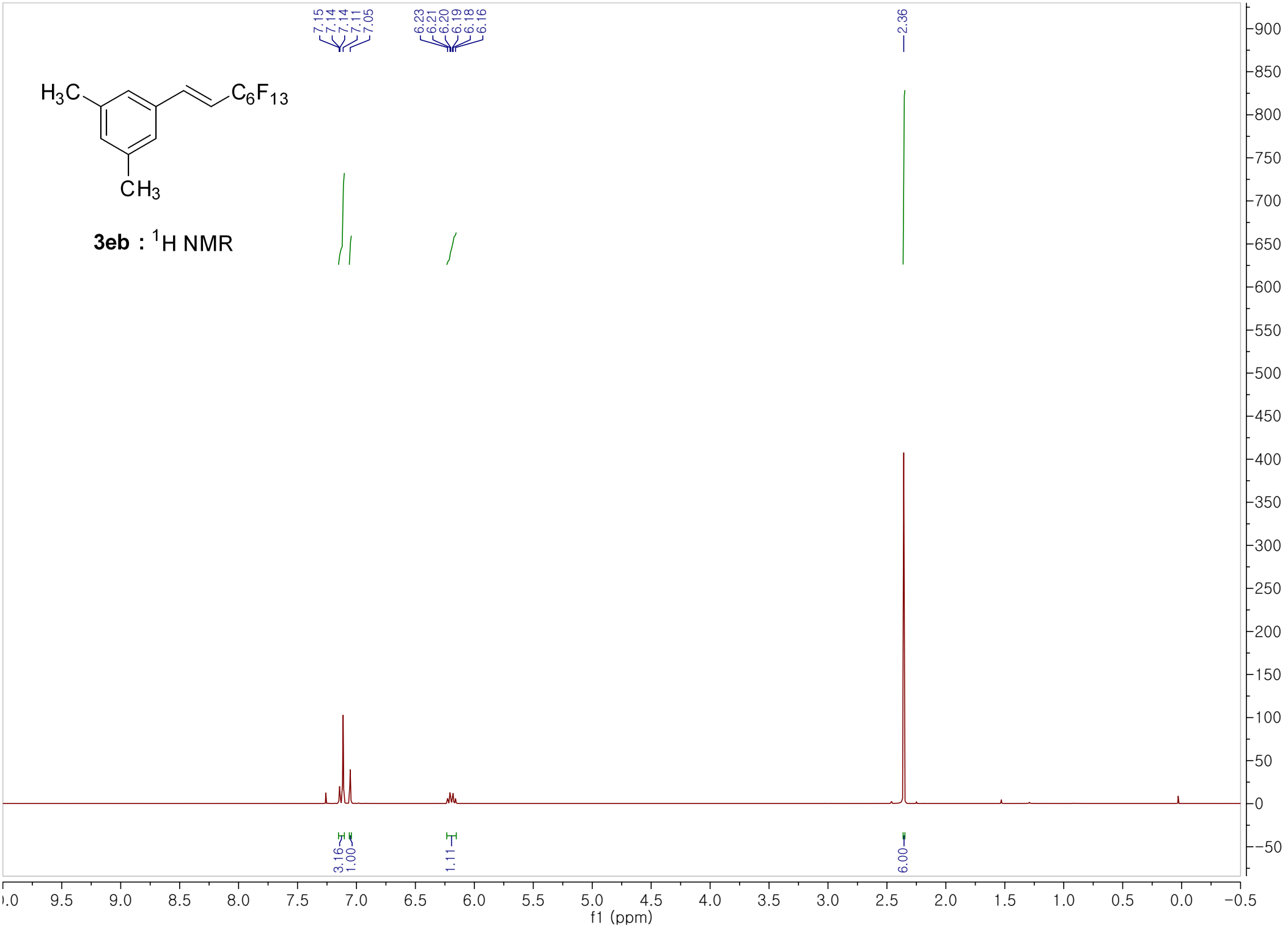
-80.82
-111.13
-121.61
-122.87
-123.23
-126.16
3.00
2.05
2.02
2.04
2.09
2.04
3000
2500
2000
1500
1000
500
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
f1 (ppm)

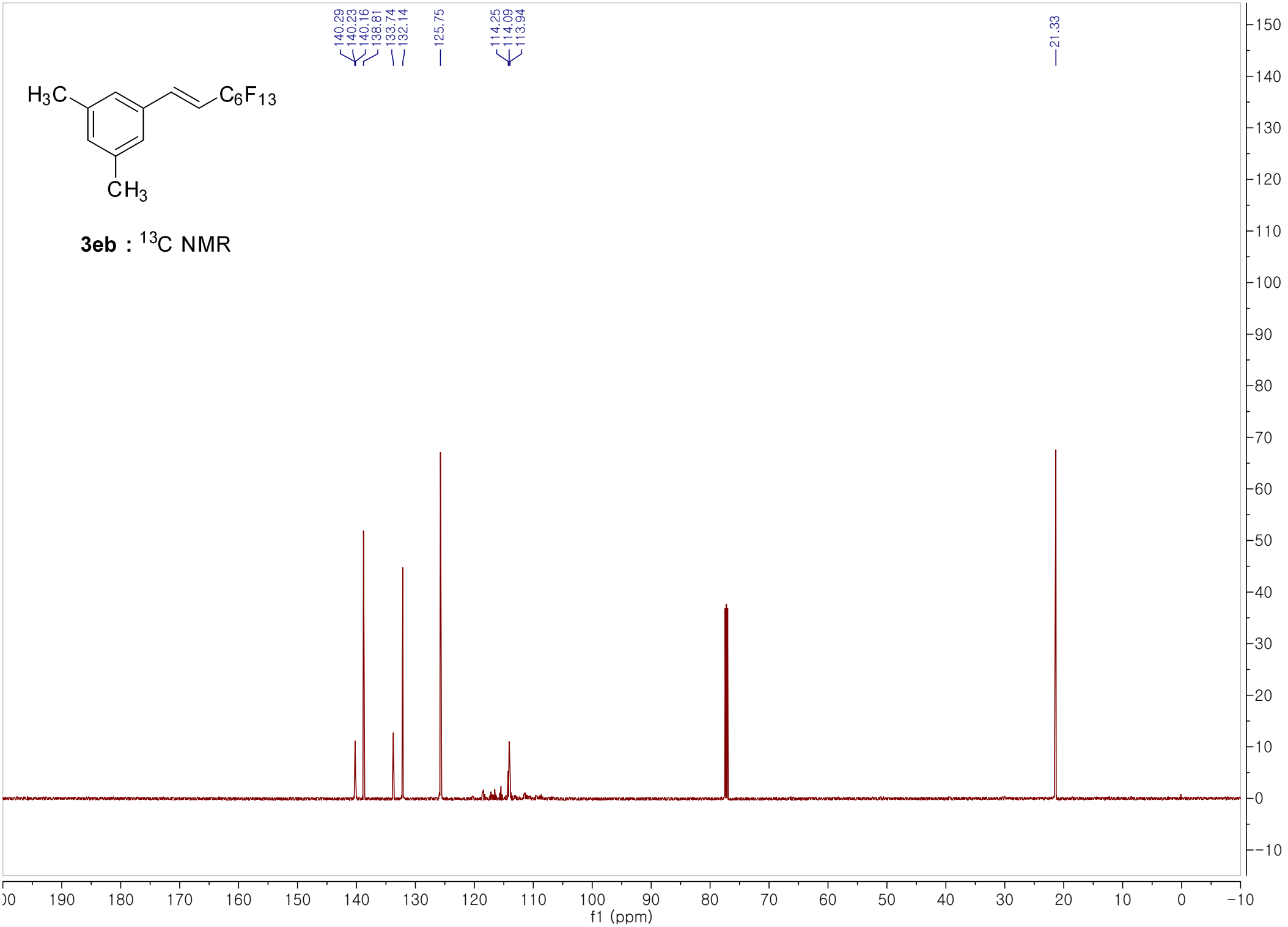

7.13
7.10
7.04
6.20
6.18
6.16
6.16
6.14
2.34
H3C
C4F9
CH3
3ea : 1H NMR
3.14
1.00
1.15
6.16
f1 (ppm)

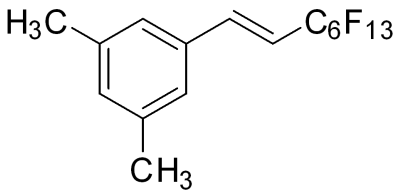

140.29
140.23
140.17
138.78
133.68
132.13
125.73
114.11
113.96
113.81
21.38
H3C
C4F9
CH3
3ea : 13C NMR
f1 (ppm)



3ea : ^{19}F NMR

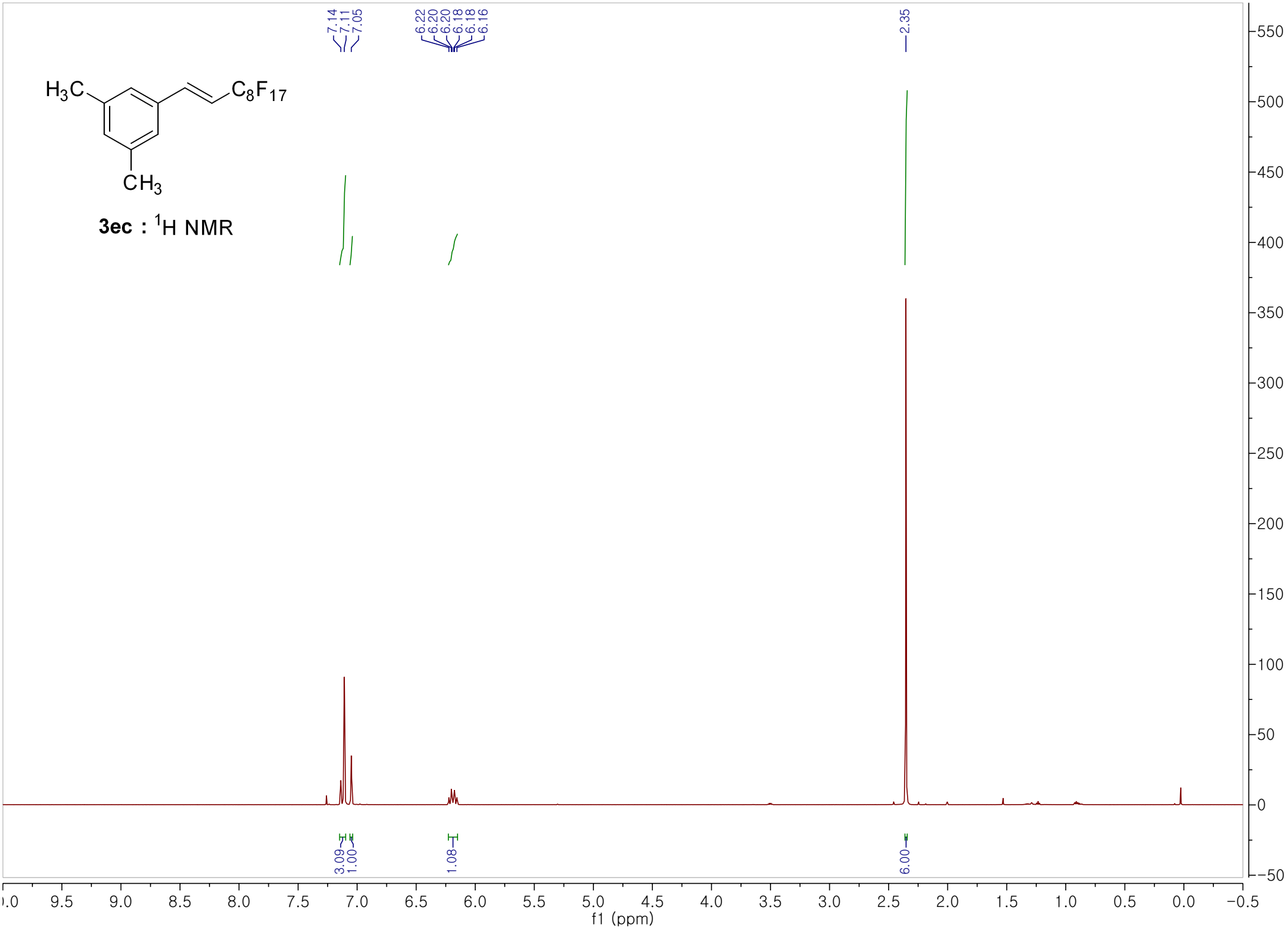

7.15
7.14
7.14
7.11
7.05
6.23
6.21
6.20
6.19
6.18
6.16
2.36
H3C
C6F13
CH3
3eb : 1H NMR
3.16
1.00
1.11
6.00
f1 (ppm)

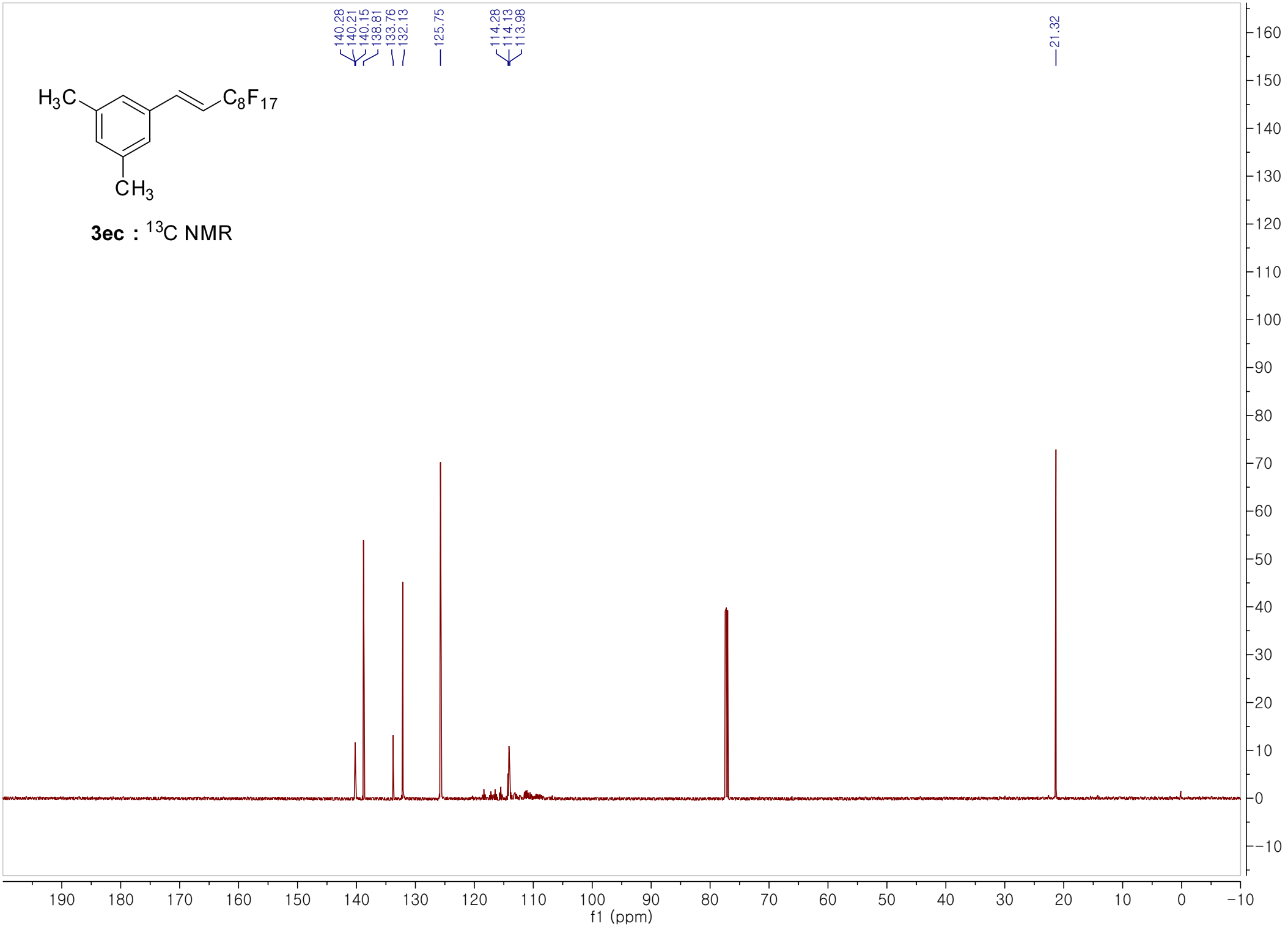

140.29
140.23
140.16
138.81
133.74
132.14
125.75
114.25
114.09
113.94
21.33
H3C
C6F13
CH3
3eb : 13C NMR
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
−10
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
−10
f1 (ppm)

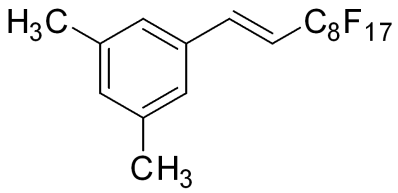

H3C
C6F13
CH3

3eb : ^{19}F NMR

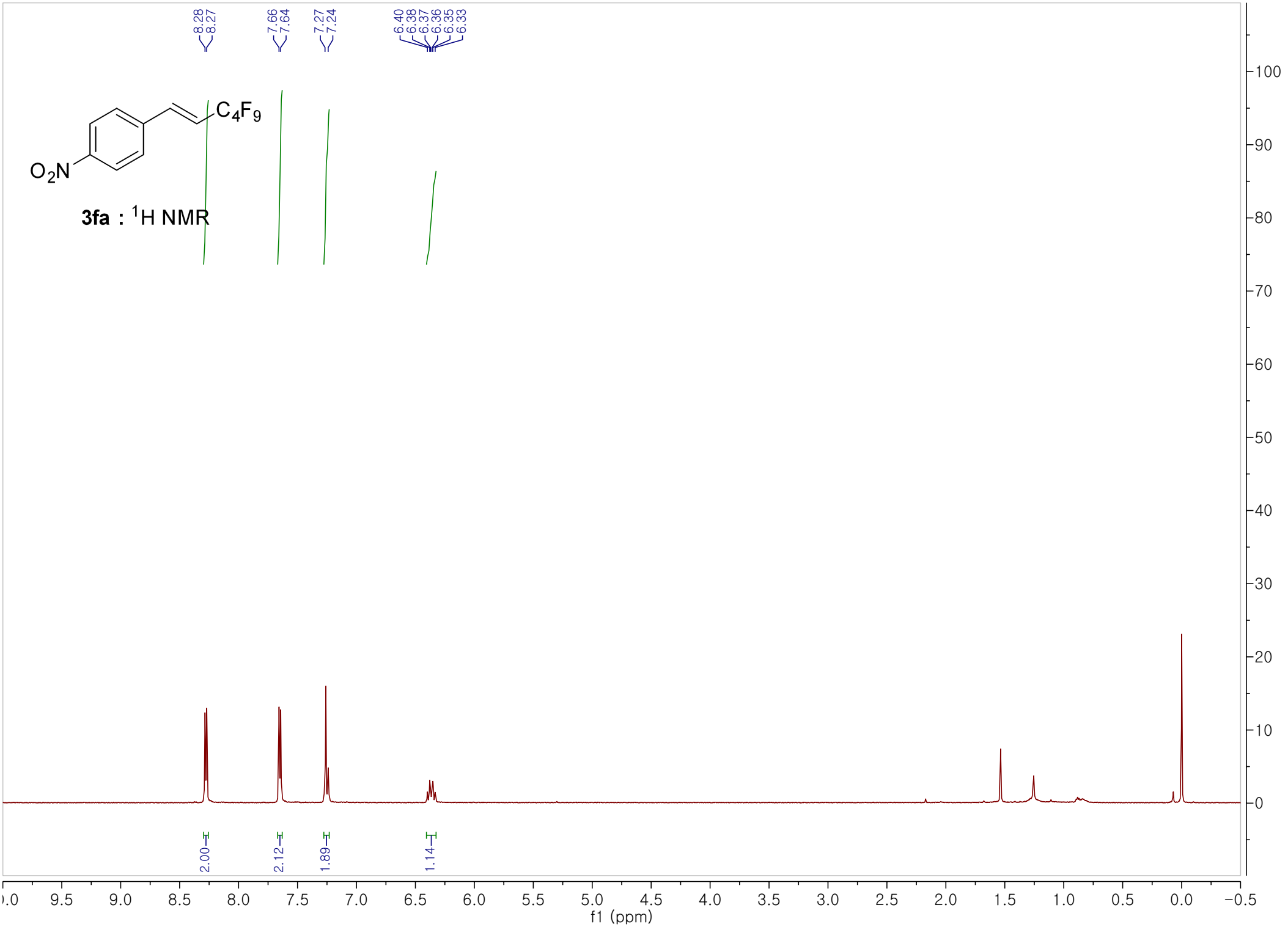
-80.96
-111.07
-121.66
-122.94
-123.34
-126.26
3.00
2.01
1.99
1.99
1.97
1.96
f1 (ppm)

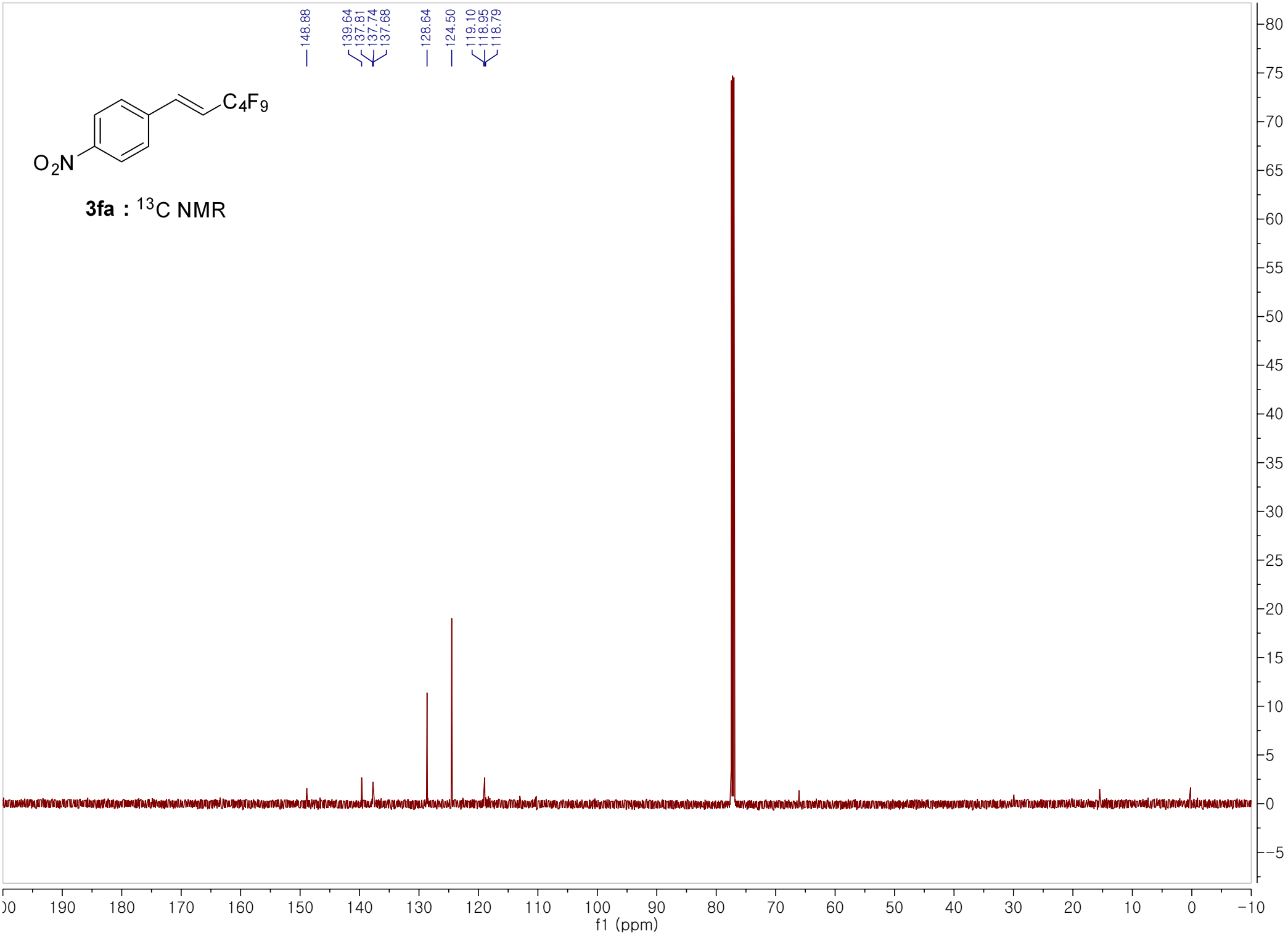

7.14
7.11
7.05
6.22
6.20
6.20
6.18
6.18
6.16
2.35
H3C
C8F17
CH3
3ec : 1H NMR
3.09
1.00
1.08
6.00
f1 (ppm)

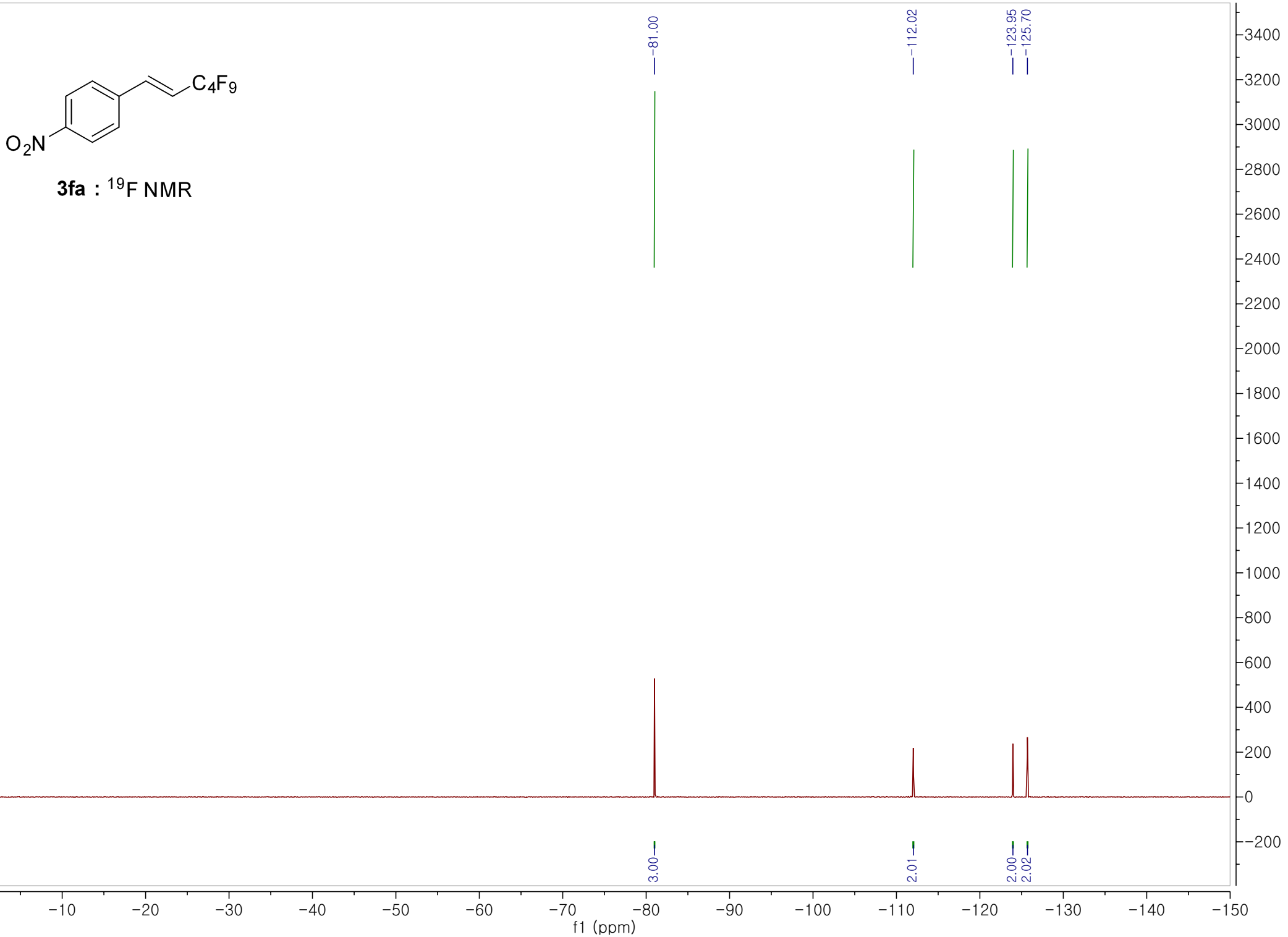

140.28
140.21
140.15
138.81
133.76
132.13
125.75
114.28
114.13
113.98
21.32
H3C
C8F17
CH3
3ec : 13C NMR
f1 (ppm)

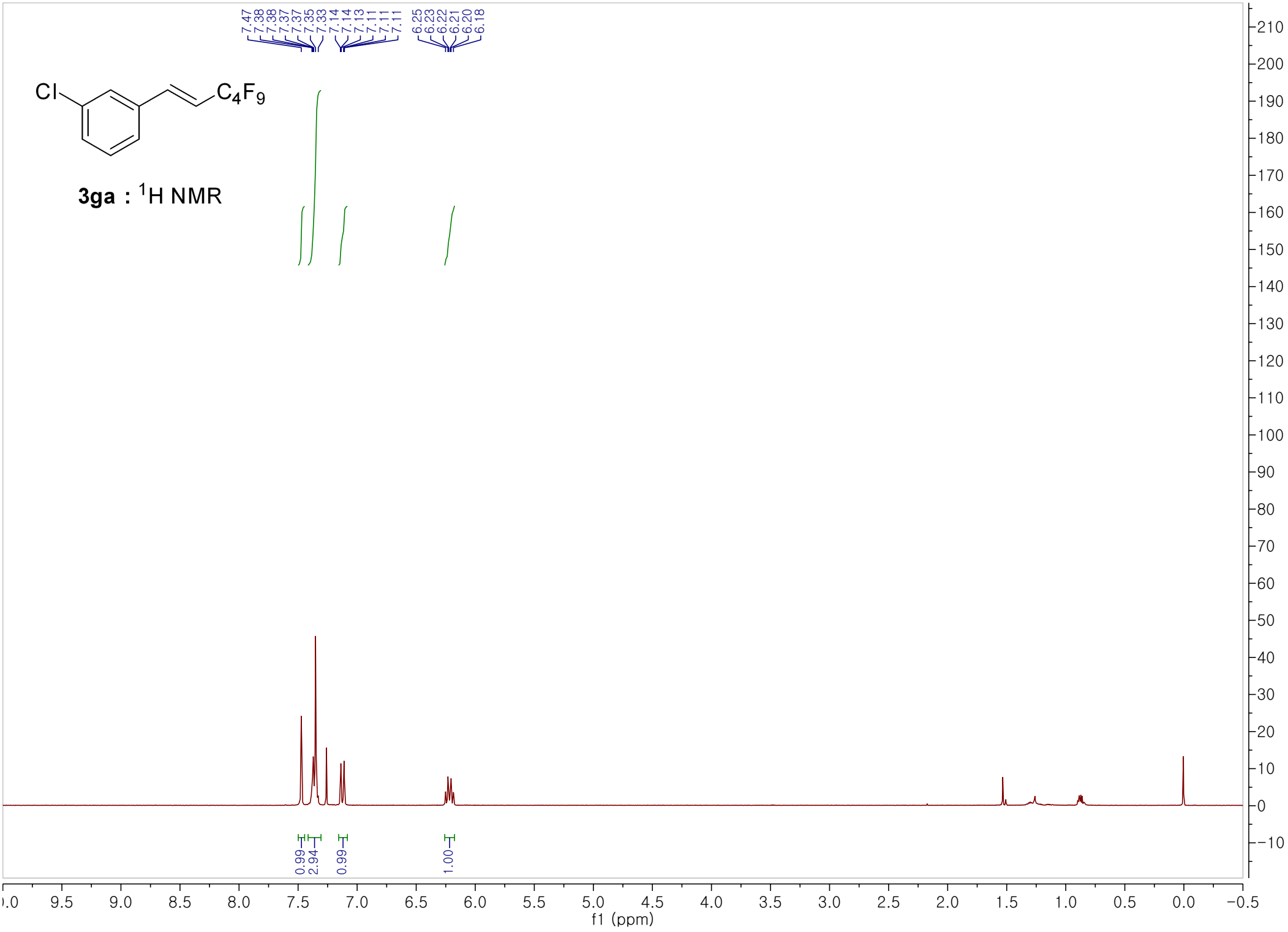


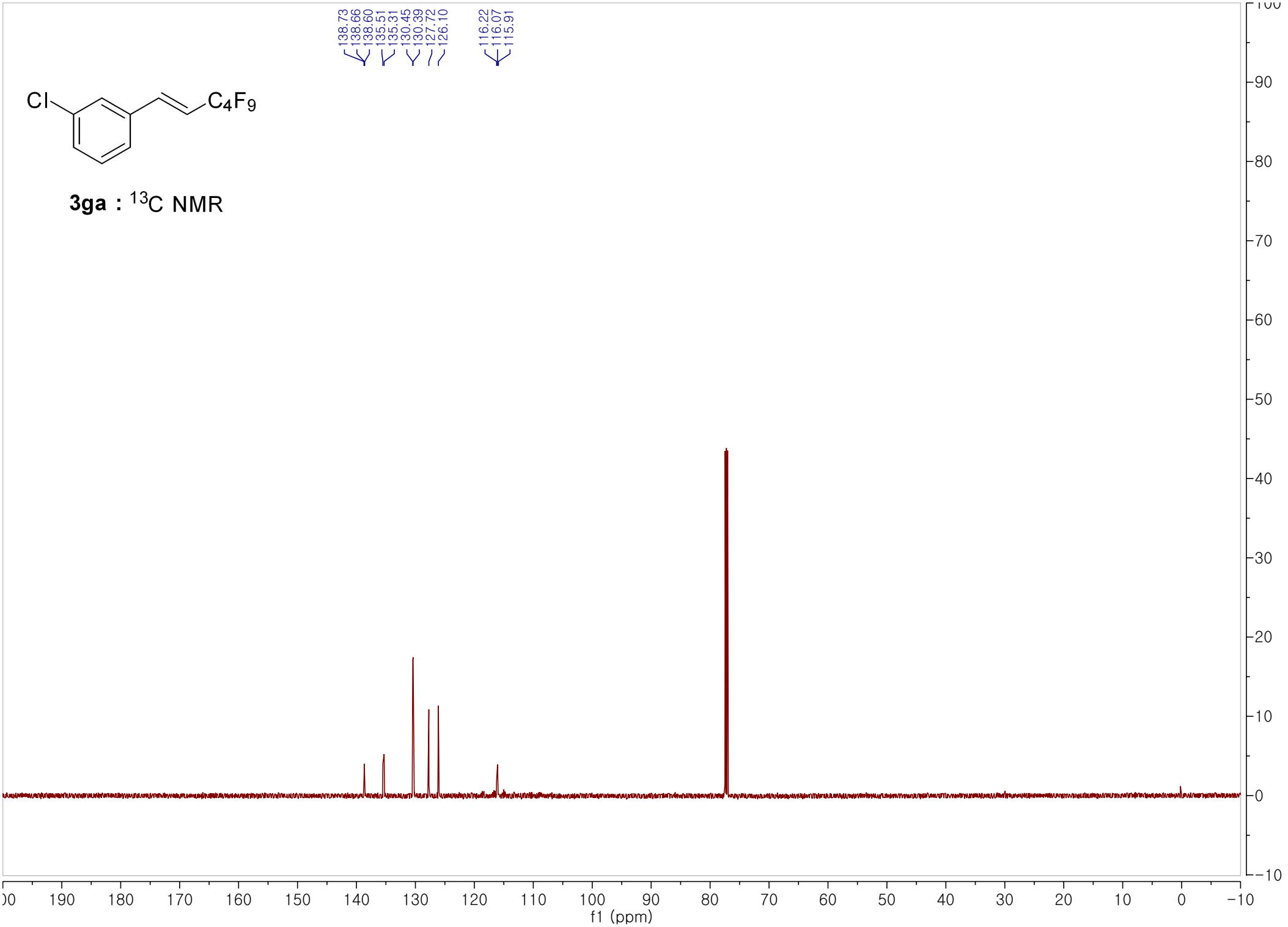
3ec : ^{19}F NMR


8.28
8.27
7.66
7.64
7.27
7.24
6.40
6.38
6.37
6.36
6.35
6.33
C_4F_9
O_2N
3fa : ^{1}H NMR
2.00
2.12
1.89
1.14
f1 (ppm)

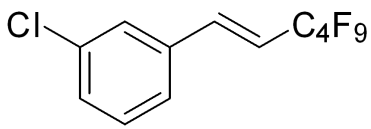

148.88
139.64
137.81
137.74
137.68
128.64
124.50
119.10
118.95
118.79
C_4F_9
O_2N
3fa : ^{13}C NMR
f1 (ppm)


C_4F_9
O_2N
3fa : ^{19}F NMR
-81.00
-112.02
-123.95
-125.70
3.00
2.01
2.00
2.02
f1 (ppm)

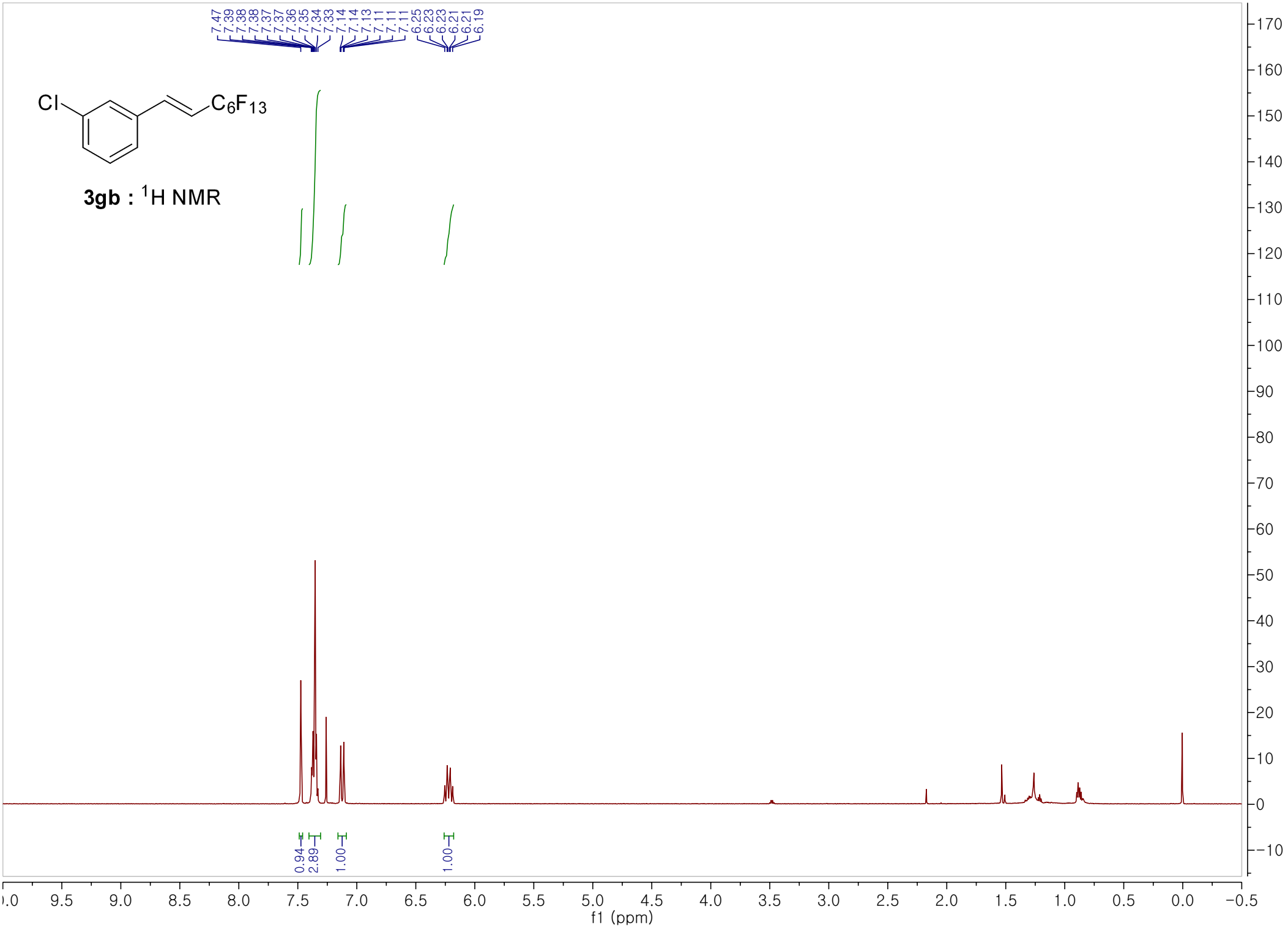

7.47
7.38
7.38
7.37
7.37
7.35
7.33
7.14
7.14
7.13
7.11
7.11
7.11
6.25
6.23
6.22
6.21
6.20
6.18
Cl
C_4F_9
3ga : ^{1}H NMR
0.99
2.94
0.99
1.00
f1 (ppm)

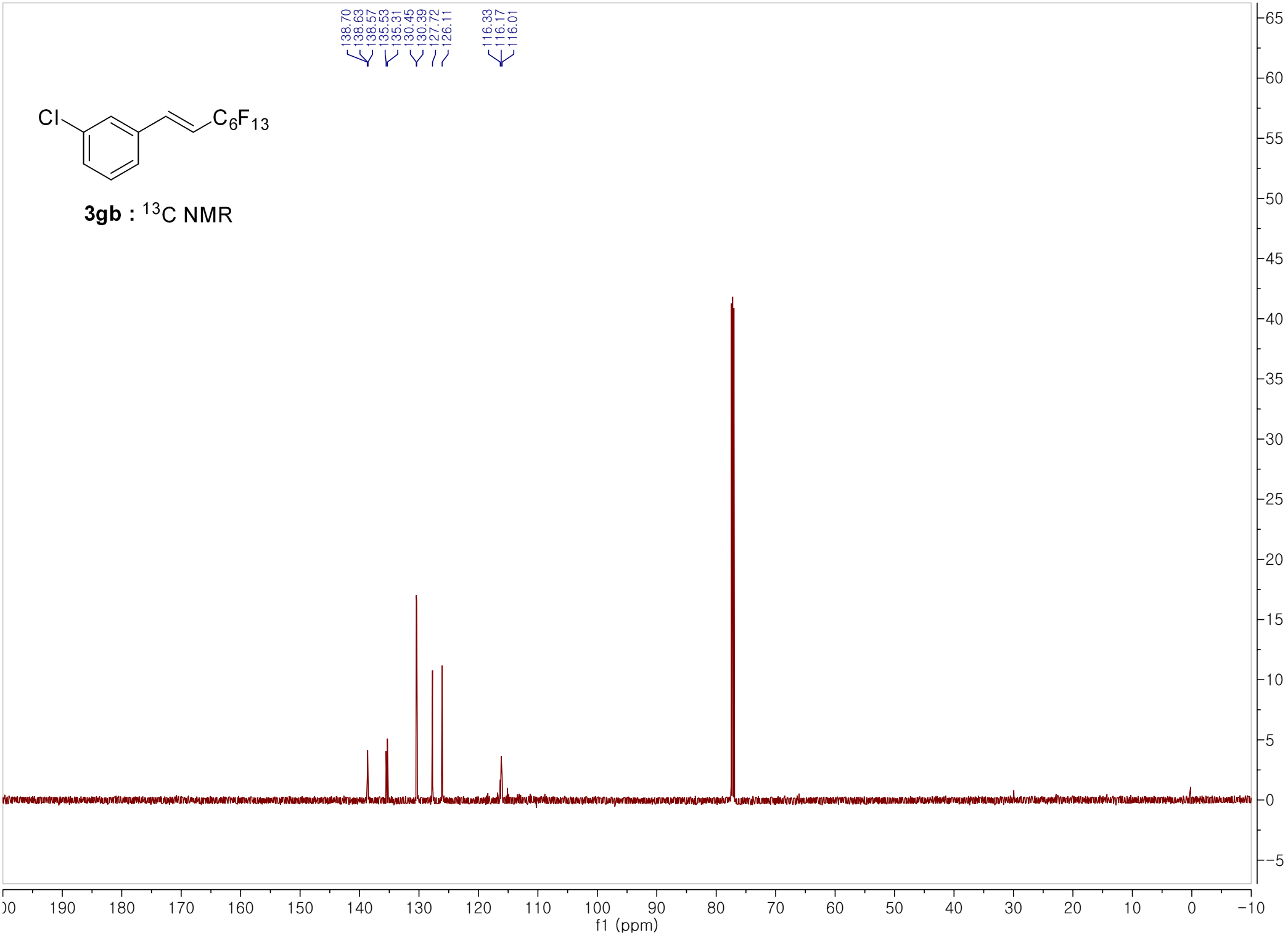

138.73
138.66
138.60
135.51
135.31
130.45
130.39
127.72
126.10
116.22
116.07
115.91
Cl
C_4F_9
f1 (ppm)

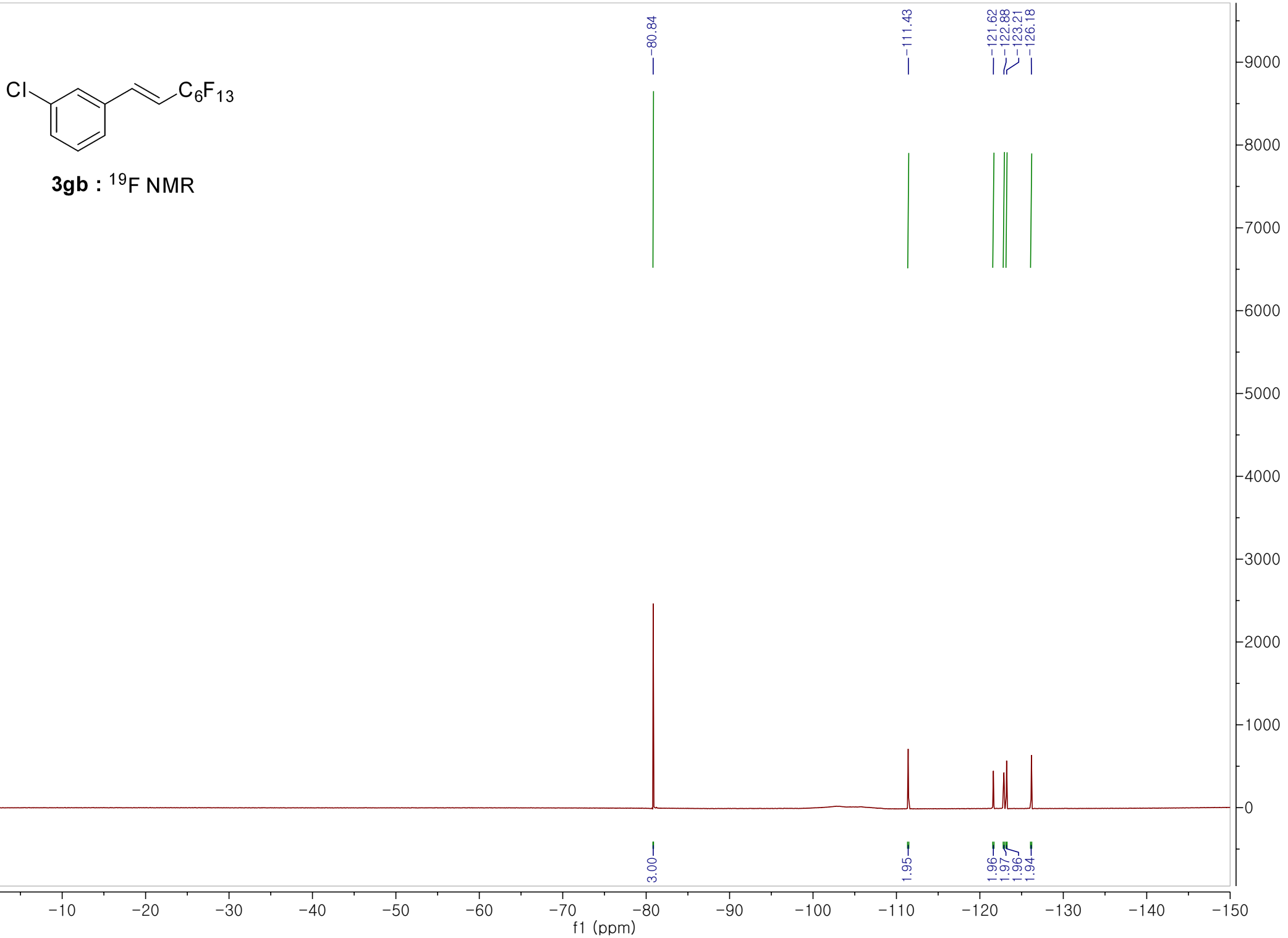
3ga : ^{13}C NMR

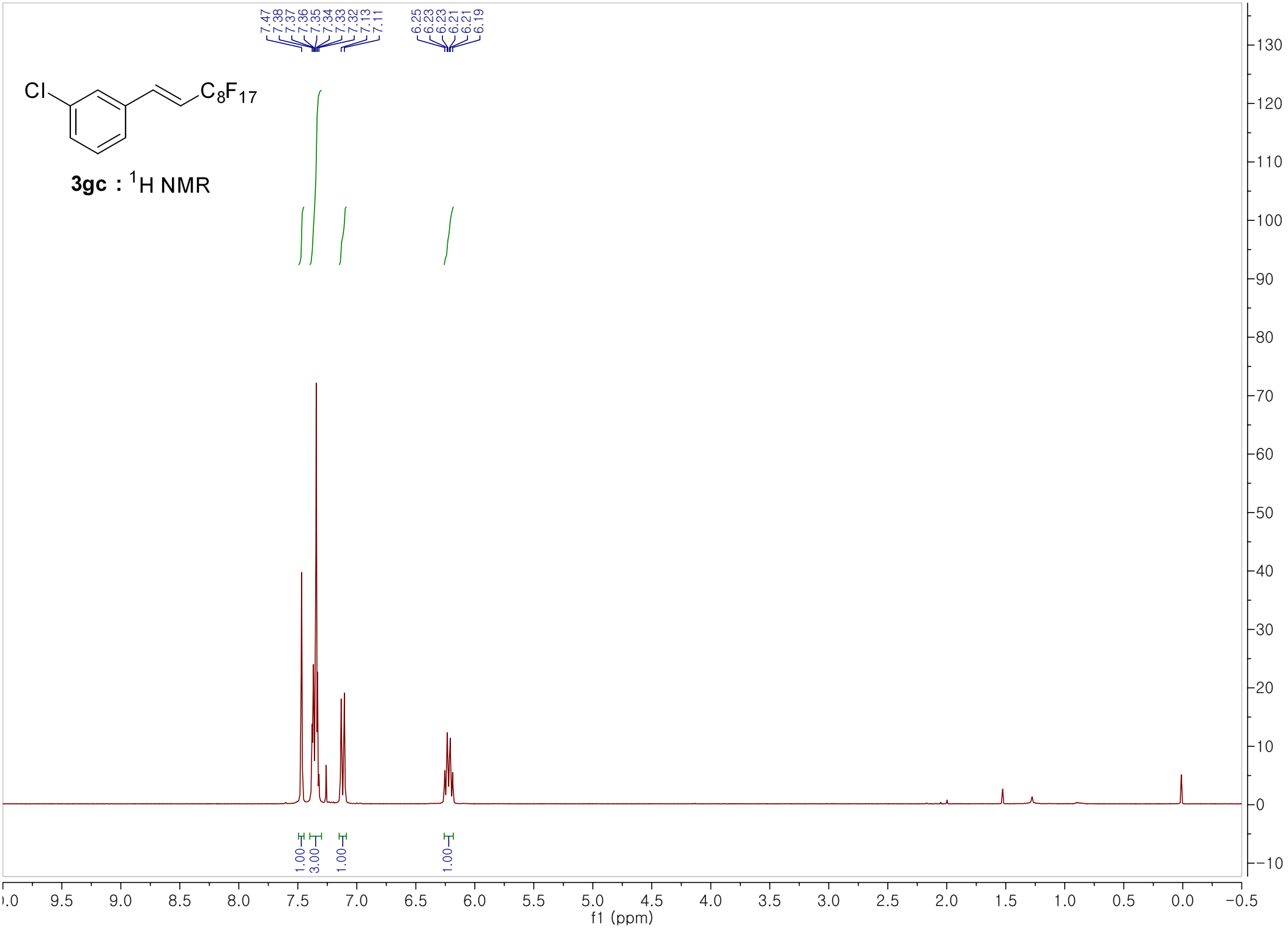


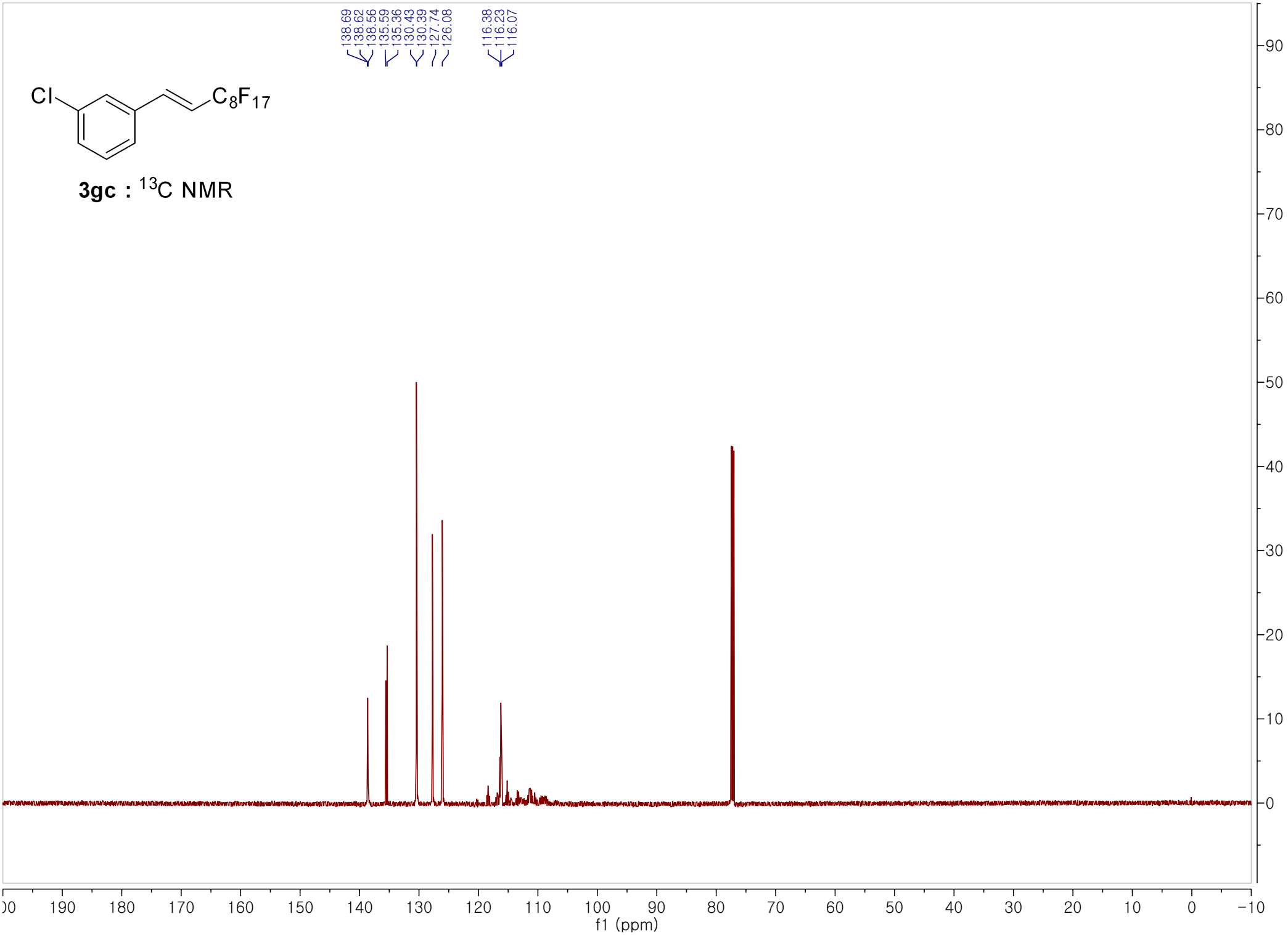
3ga : ^{19}F NMR

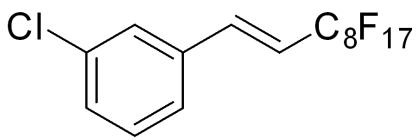

7.47
7.39
7.38
7.38
7.37
7.37
7.36
7.35
7.34
7.33
7.14
7.14
7.13
7.11
7.11
7.11
6.25
6.23
6.23
6.21
6.21
6.19
Cl
C_6F_{13}
3gb : ^{1}H NMR
0.94
2.89
1.00
1.00
f1 (ppm)


138.70
138.63
138.57
135.53
135.31
130.45
130.39
127.72
126.11
116.33
116.17
116.01
Cl
C_6F_{13}
3gb : ^{13}C NMR
f1 (ppm)


Cl
C_6F_{13}
3gb : ^{19}F NMR
-80.84
-111.43
-121.62
-122.88
-123.21
-126.18
3.00
1.95
1.96
1.97
1.96
1.94
f1 (ppm)

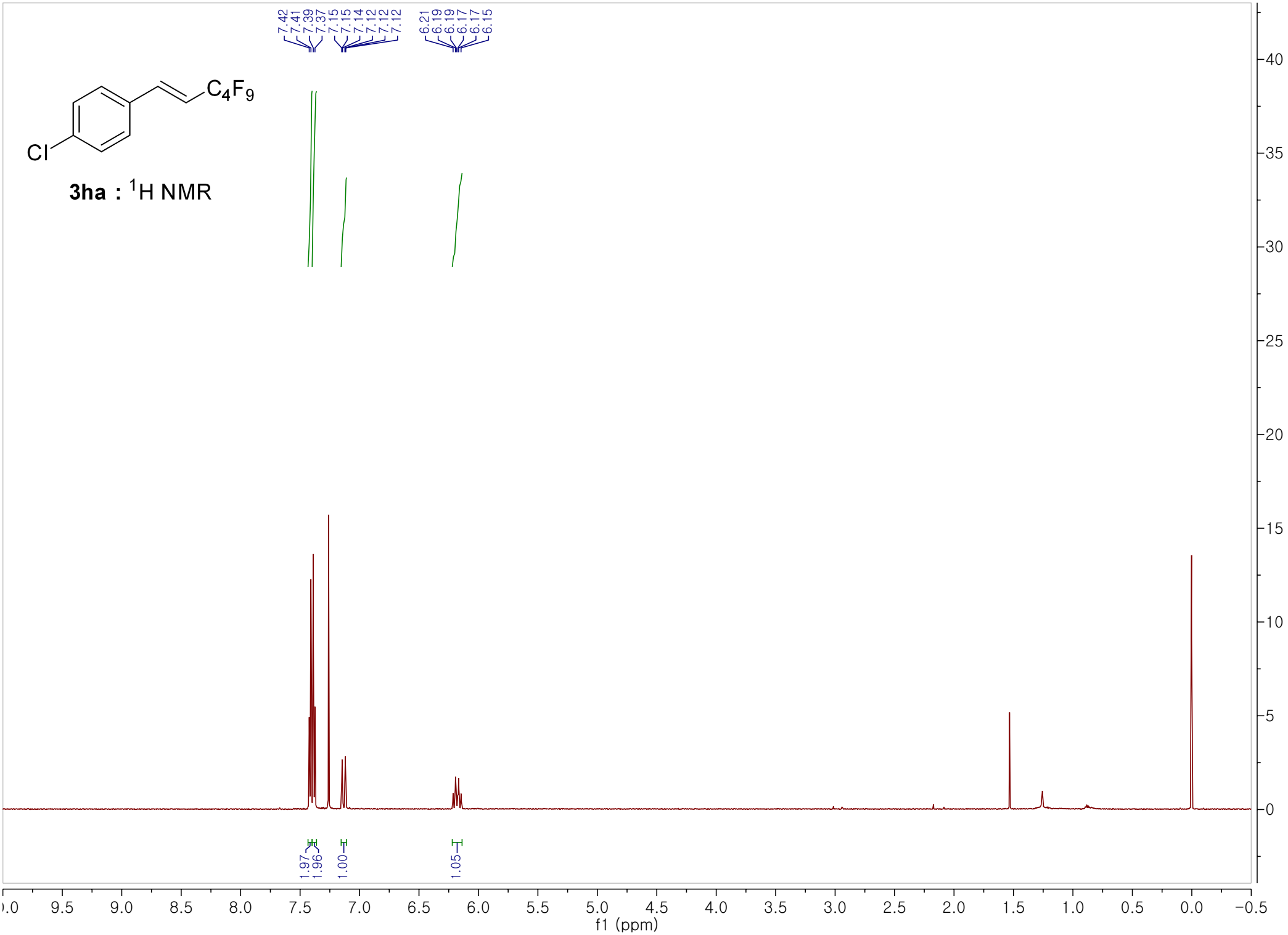

7.47
7.38
7.37
7.36
7.35
7.34
7.33
7.32
7.13
7.11
6.25
6.23
6.23
6.21
6.21
6.19
Cl
C_8F_{17}
3gc : ^{1}H NMR
1.00
3.00
1.00
1.00
f1 (ppm)

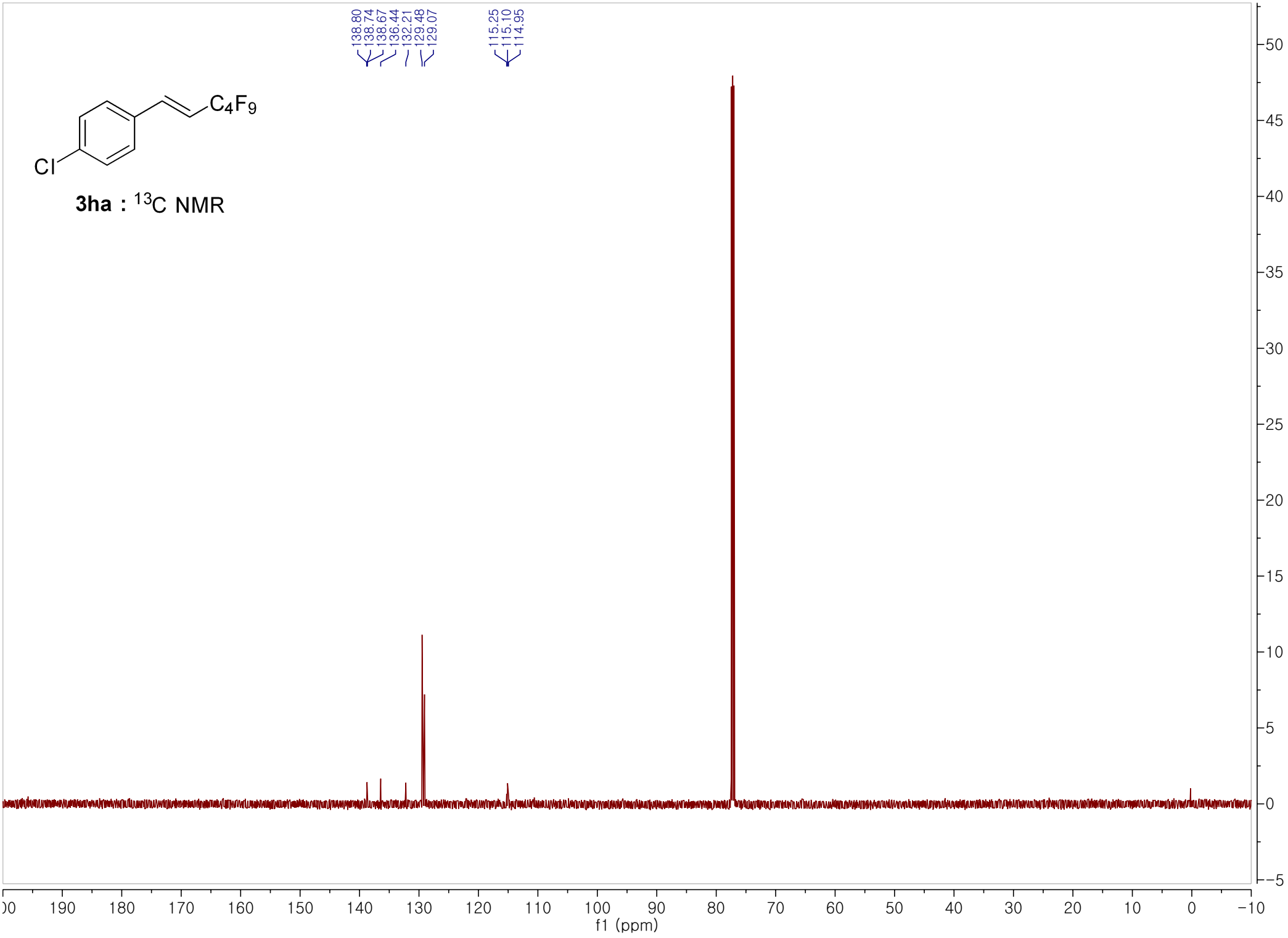

138.69
138.62
138.56
135.59
135.36
130.43
130.39
127.74
126.08
116.38
116.23
116.07
Cl
C_8F_{17}
3gc : ^{13}C NMR
f1 (ppm)

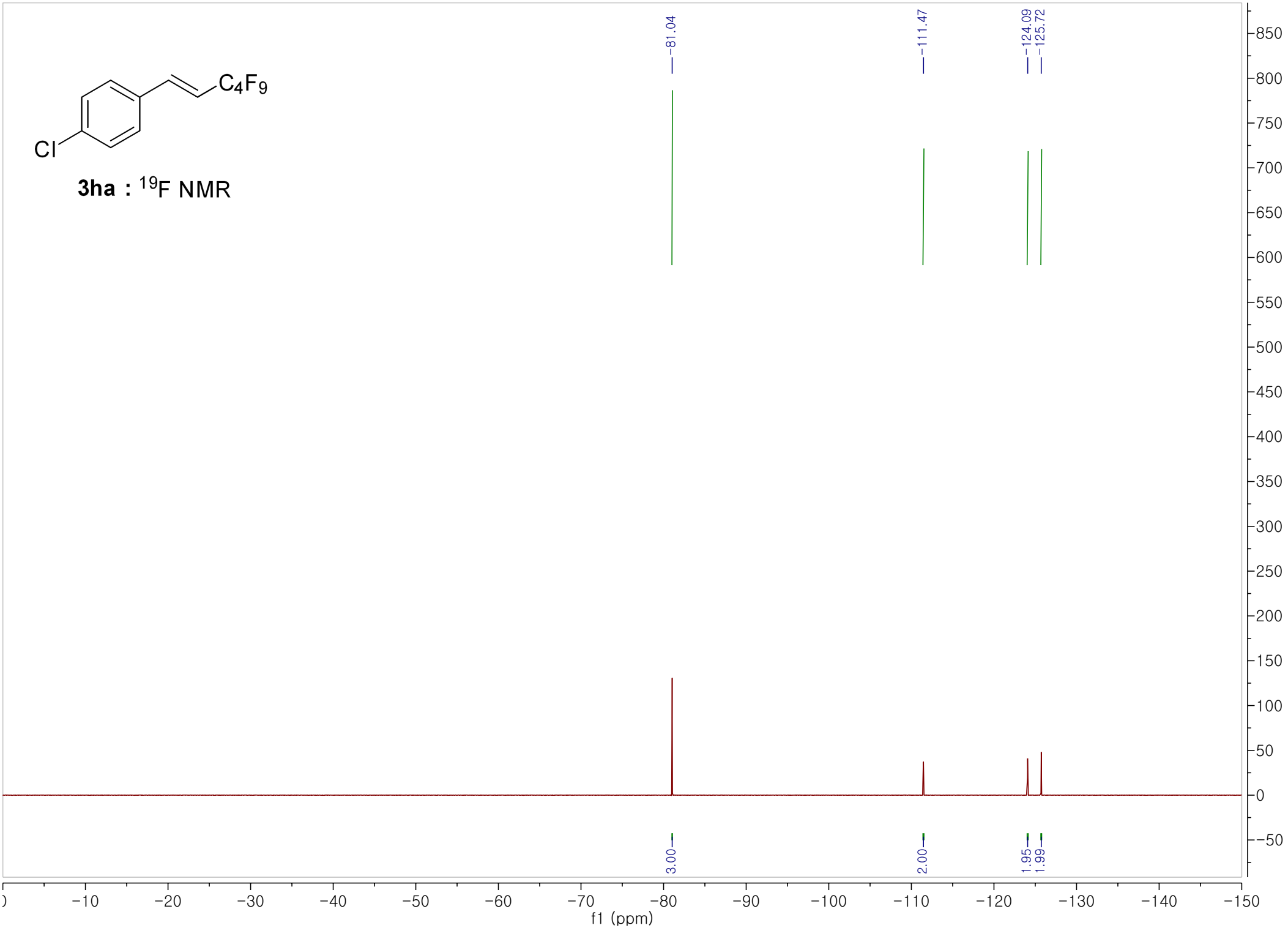

Cl
C_8F_{17}

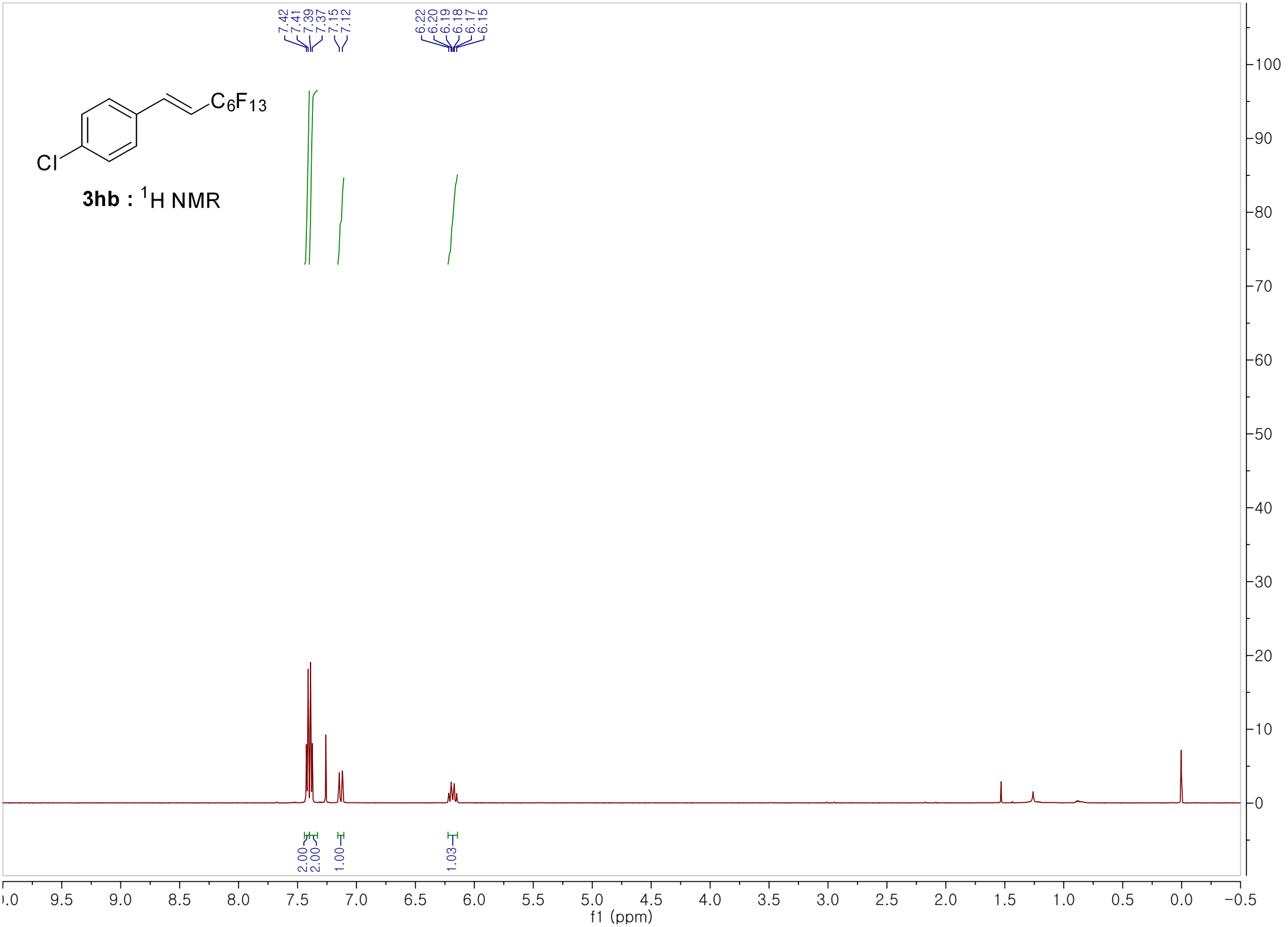
3gc : ^{19}F NMR

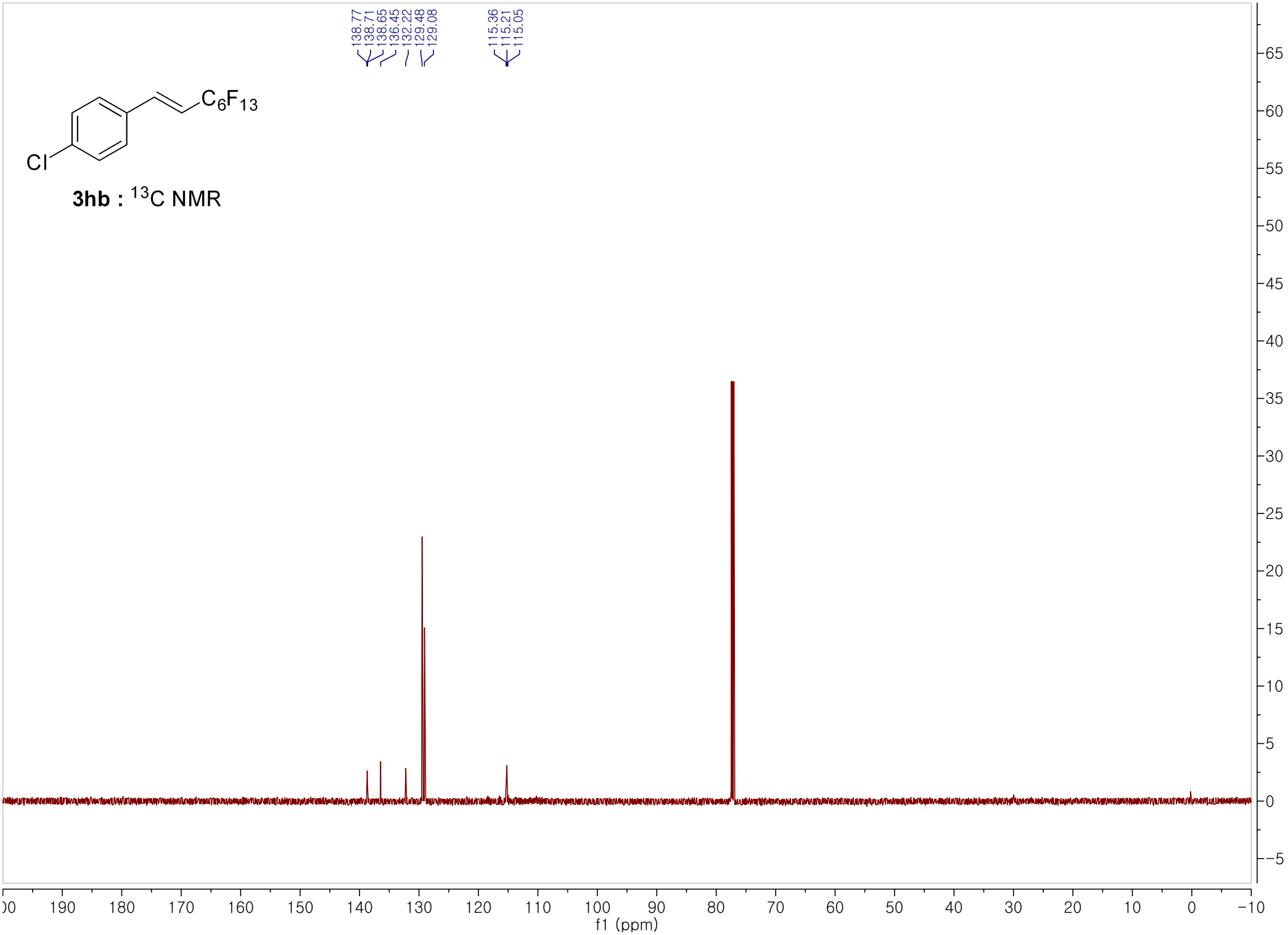
-81.08
-111.58
-121.52
-122.07
-122.89
-123.26
-126.33
3.00
2.01
2.08
4.02
2.00
1.99
2.01
f1 (ppm)

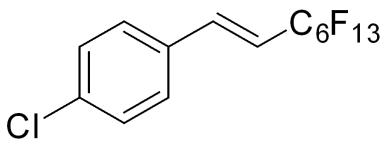

7.42
7.41
7.39
7.37
7.15
7.15
7.14
7.12
7.12
7.12
6.21
6.19
6.19
6.17
6.17
6.15
Cl
C_4F_9
3ha : ^{1}H NMR
1.97
1.96
1.00
1.05
f1 (ppm)


138.80
138.74
138.67
136.44
132.21
129.48
129.07
115.25
115.10
114.95
Cl
C_4F_9
3ha : ^{13}C NMR
f1 (ppm)


Cl
C_4F_9
3ha : ^{19}F NMR
-81.04
-111.47
-124.09
-125.72
3.00
2.00
1.95
1.99
f1 (ppm)

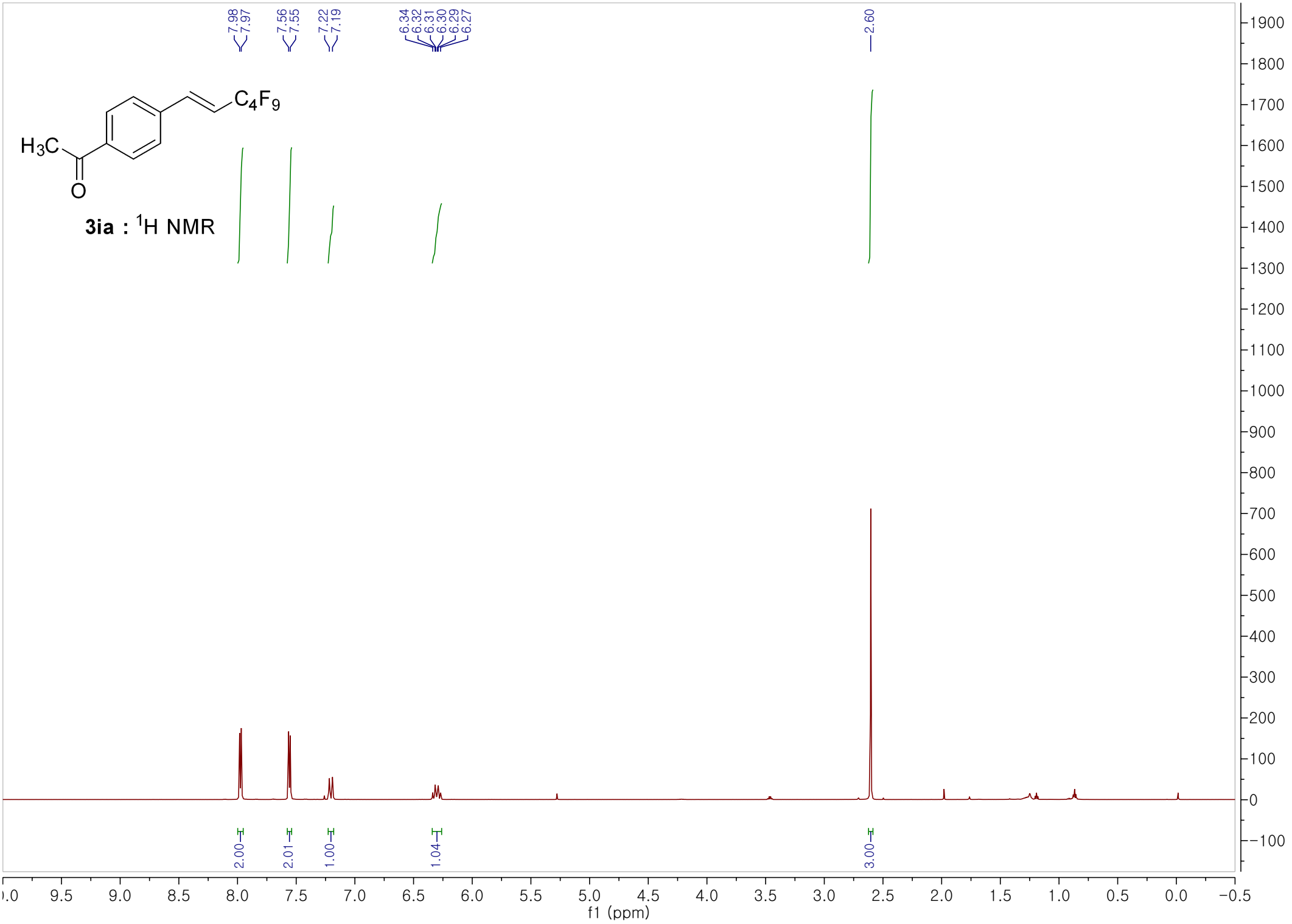

7.42
7.41
7.39
7.37
7.15
7.12
6.22
6.20
6.19
6.18
6.17
6.15
Cl
C_6F_{13}
3hb : ^{1}H NMR
2.00
2.00
1.00
1.03
f1 (ppm)

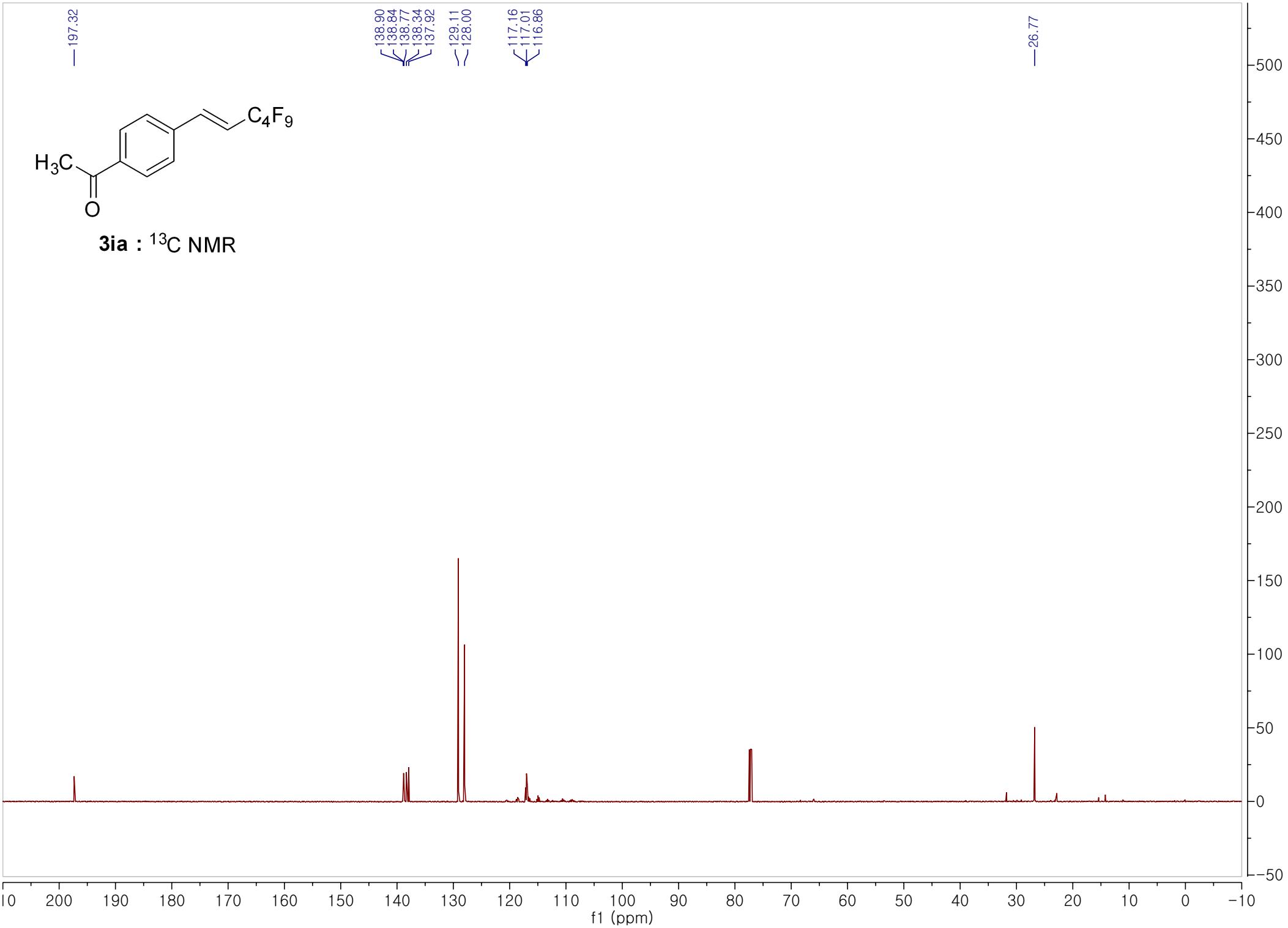

138.77
138.71
138.65
136.45
132.22
129.48
129.08
115.36
115.21
115.05
Cl
C_6F_{13}
3hb : ^{13}C NMR
f1 (ppm)

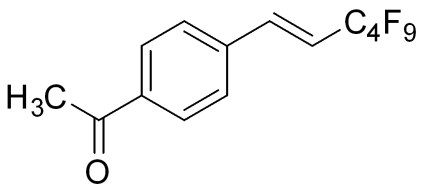

C6F13
Cl

3hb : ^{19}F NMR

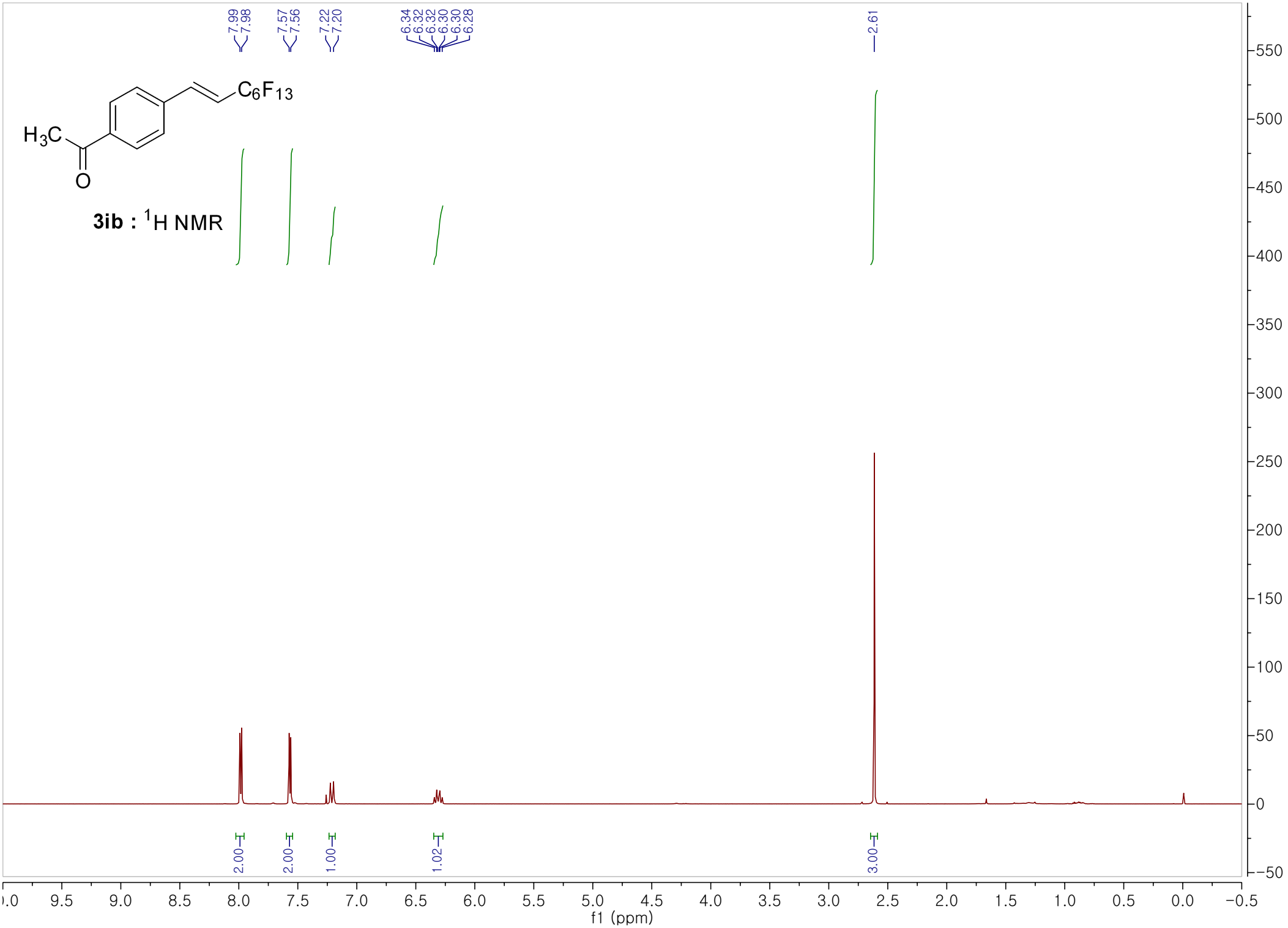
-80.83
-111.24
-121.62
-122.88
-123.19
-126.17
3.04
2.05
2.06
2.06
2.04
2.06
f1 (ppm)

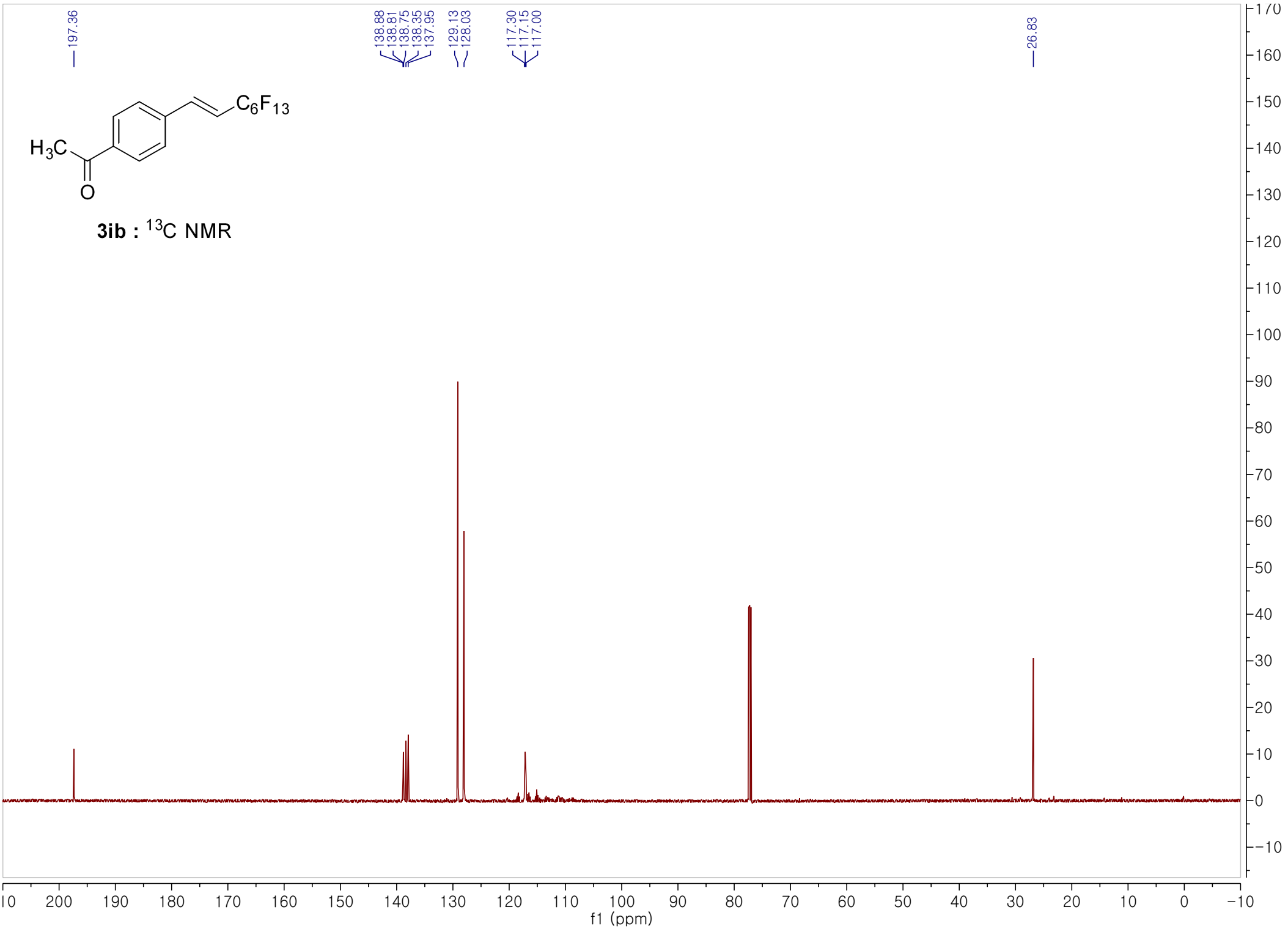

7.98
7.97
7.56
7.55
7.22
7.19
6.34
6.32
6.31
6.30
6.29
6.27
2.60
C_4F_9
H_3C
O
3ia : ^{1}H NMR
2.00
2.01
1.00
1.04
3.00
f1 (ppm)


197.32
138.90
138.84
138.77
138.34
137.92
129.11
128.00
117.16
117.01
116.86
26.77
C_4F_9
H_3C
O
3ia : ^{13}C NMR
f1 (ppm)

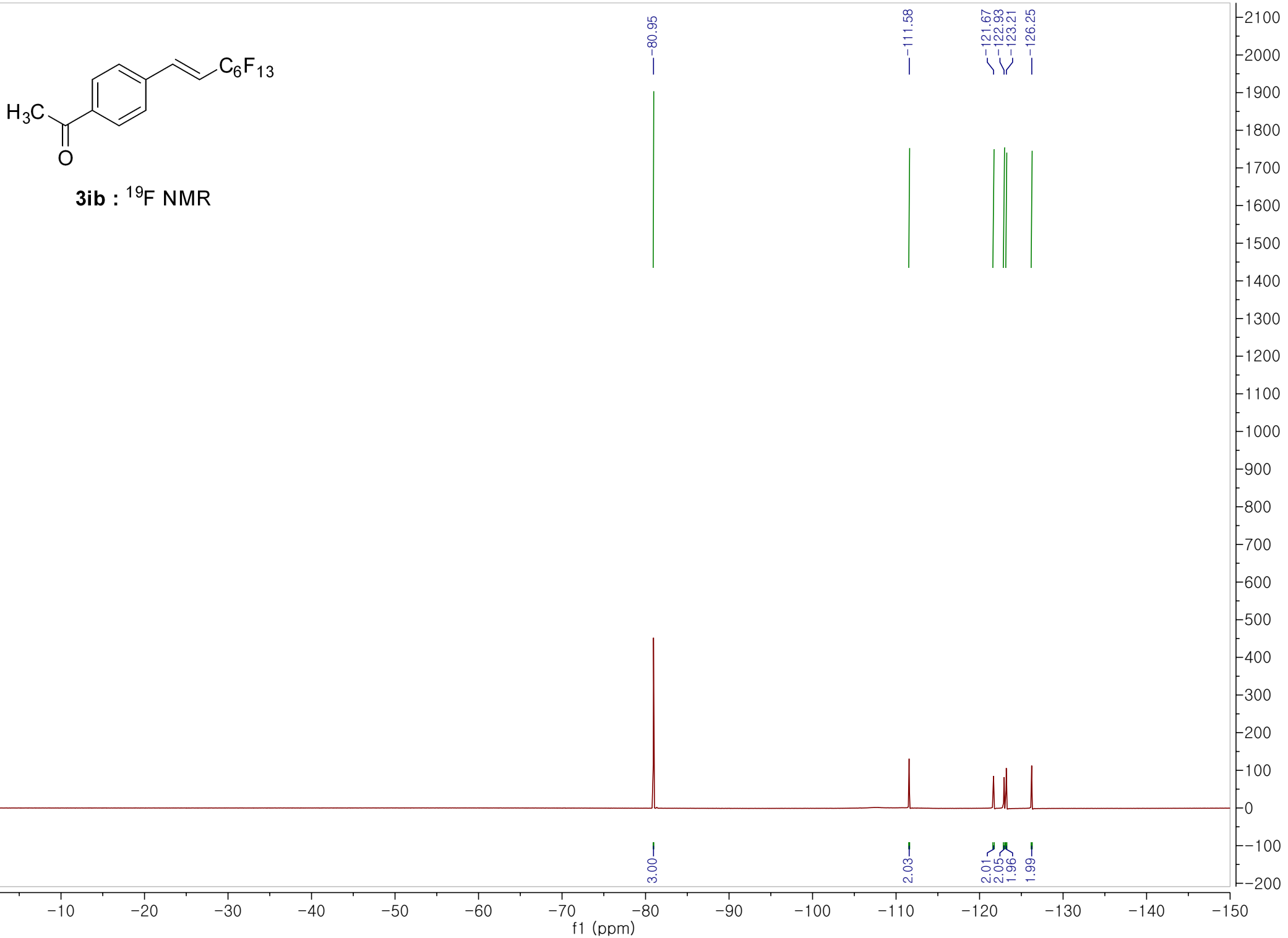


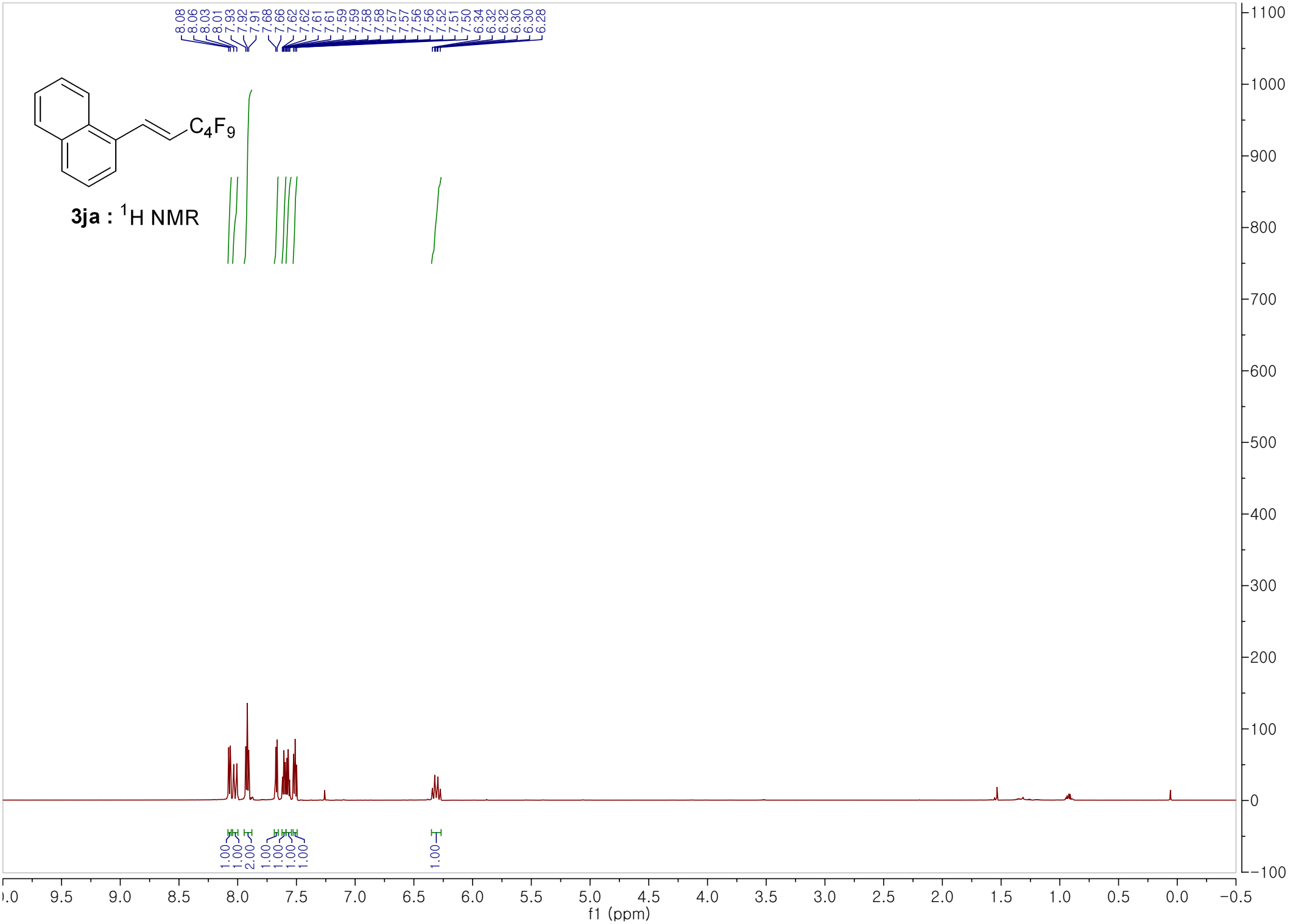
3ia : ^{19}F NMR

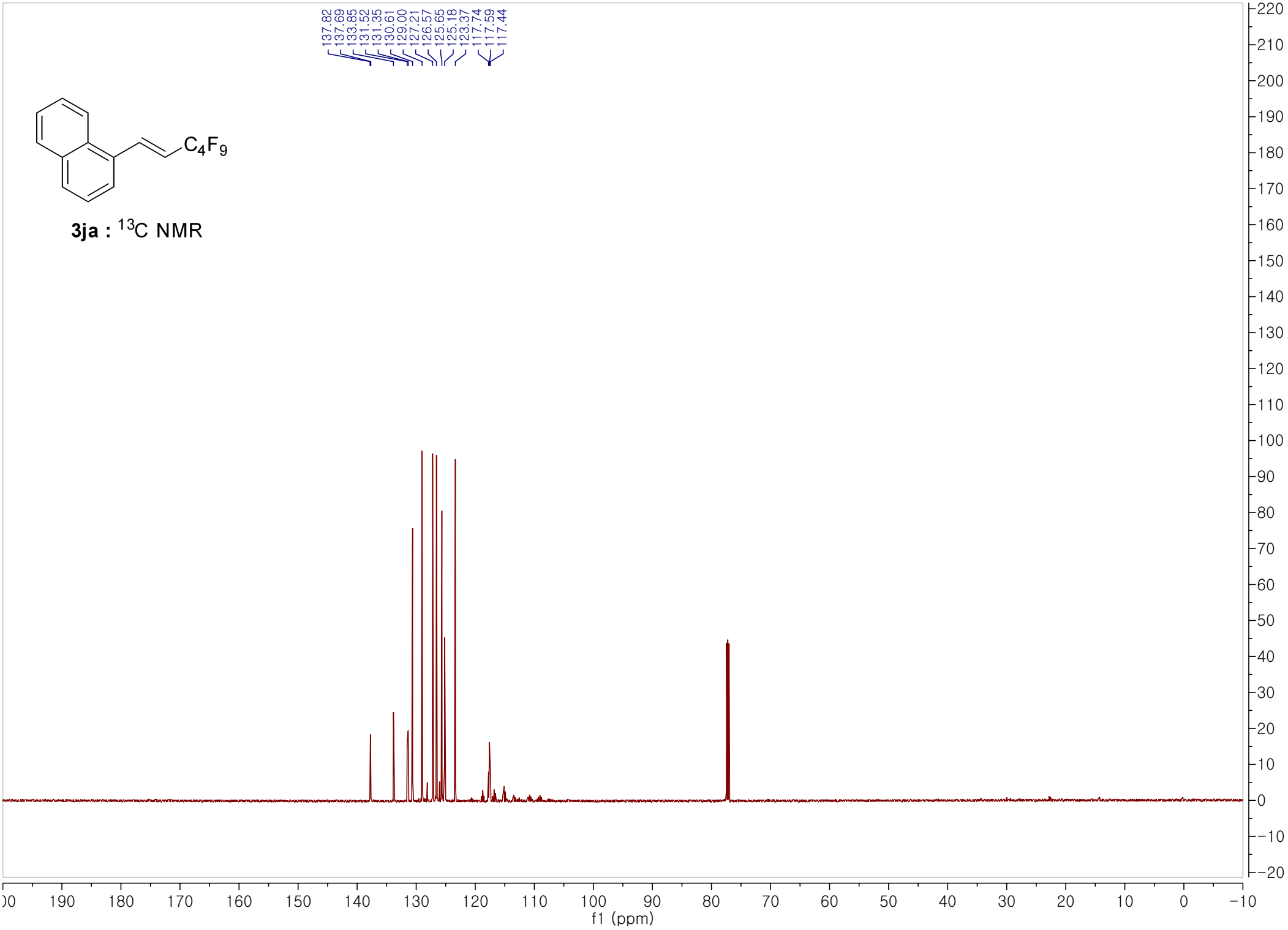

7.99
7.98
7.57
7.56
7.22
7.20
6.34
6.32
6.32
6.30
6.30
6.28
2.61
C_6F_{13}
H_3C
O
3ib : ^{1}H NMR
2.00
2.00
1.00
1.02
3.00
f1 (ppm)

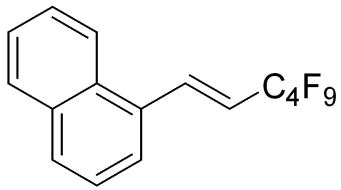

197.36
138.88
138.81
138.75
138.35
137.95
129.13
128.03
117.30
117.15
117.00
26.83
H_3C
O
C_6F_{13}
f1 (ppm)

3ib : ^{13}C NMR


H3C
O
C6F13
3ib : 19F NMR
-80.95
-111.58
-121.67
-122.93
-123.21
-126.25
3.00
2.03
2.01
2.05
1.96
1.99
f1 (ppm)

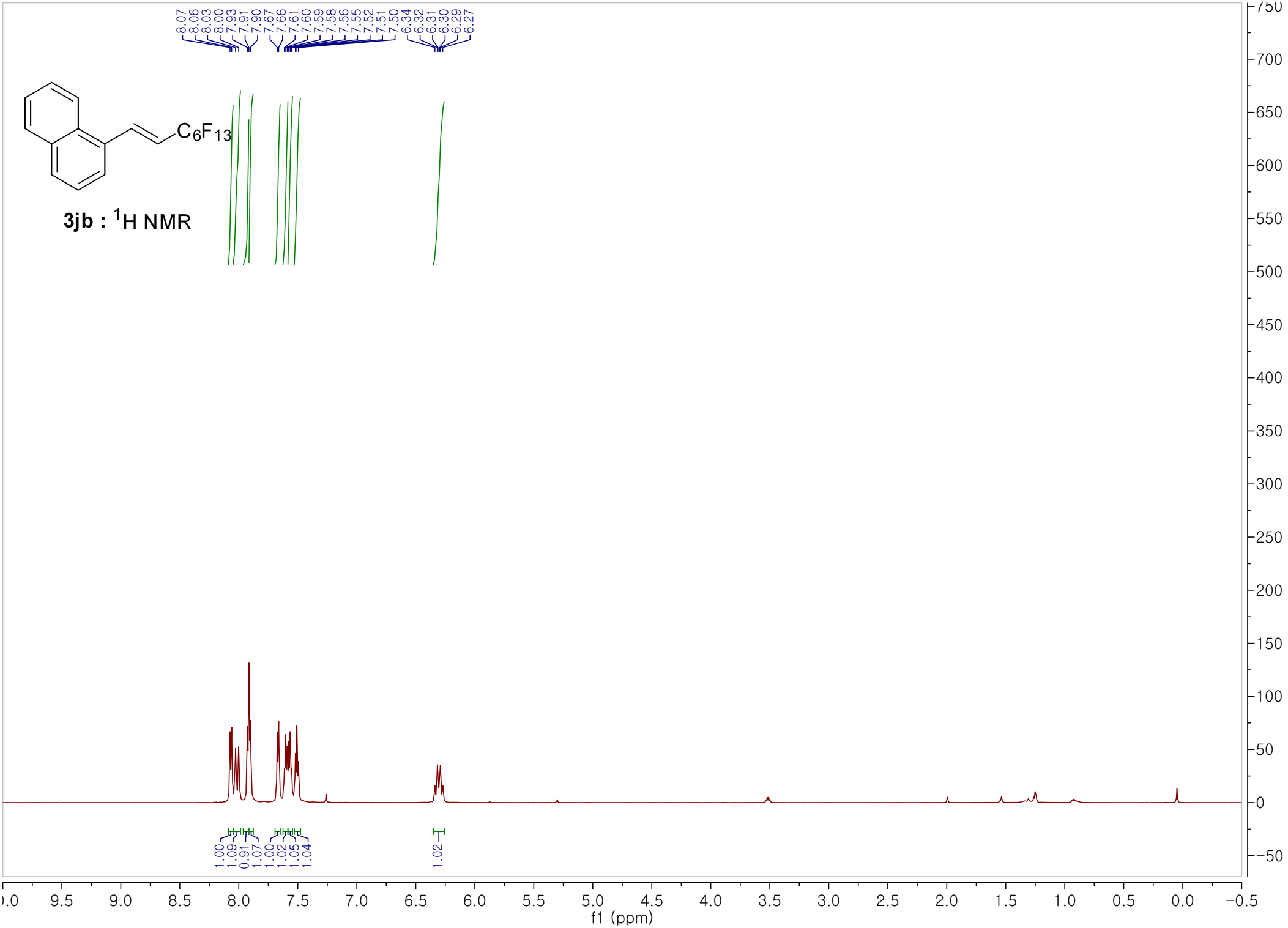

8.08
8.06
8.03
8.01
7.93
7.92
7.91
7.68
7.66
7.62
7.62
7.61
7.61
7.59
7.59
7.58
7.58
7.57
7.57
7.56
7.56
7.52
7.51
7.50
6.34
6.32
6.32
6.30
6.30
6.28
C_4F_9
3ja : ^{1}H NMR
1.00
1.00
2.00
1.00
1.00
1.00
1.00
1.00
1100
1000
900
800
700
600
500
400
300
200
100
0
−100
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
f1 (ppm)

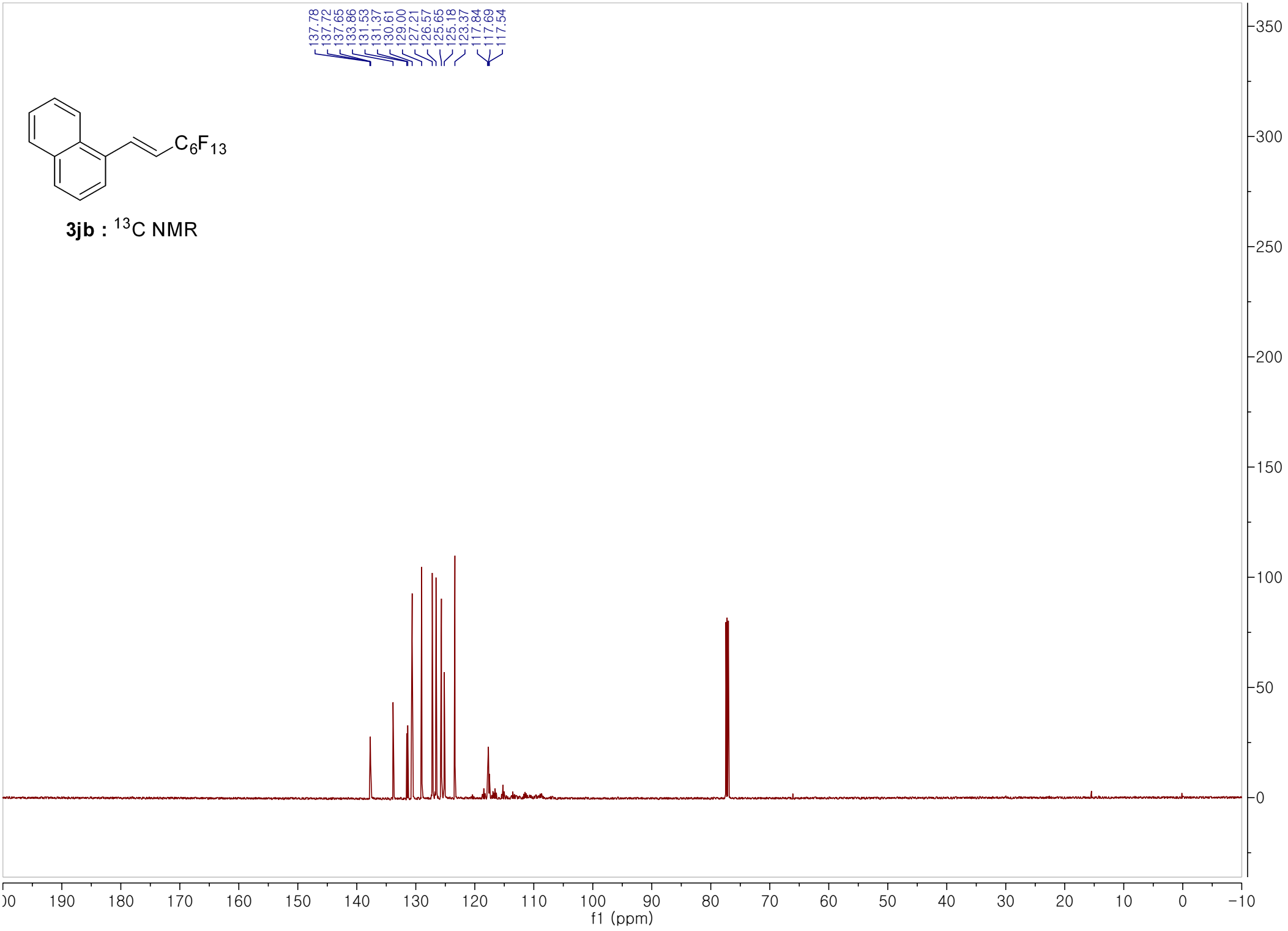

137.82
137.69
133.85
131.52
131.35
130.61
129.00
127.21
126.57
125.65
125.18
123.37
117.74
117.59
117.44
C_4F_9
3ja : ^{13}C NMR
f1 (ppm)

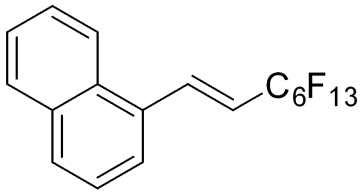

C_4F_9

3ja : ^{19}F NMR

-81.06
-111.28
-124.10
-125.63
3.00
2.01
2.01
2.01
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
f1 (ppm)

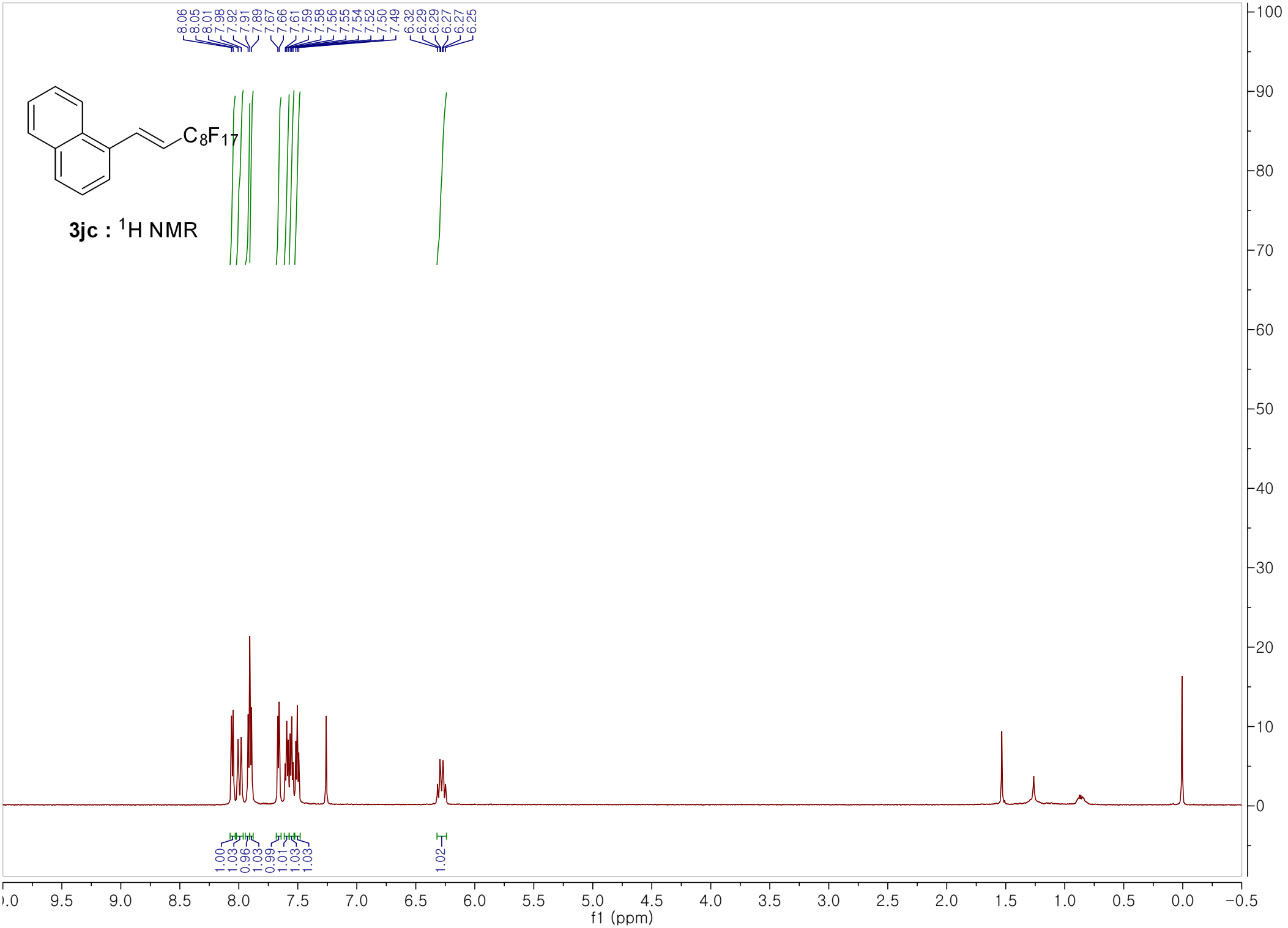

8.07
8.06
8.03
8.00
7.93
7.91
7.90
7.67
7.66
7.61
7.60
7.59
7.58
7.56
7.55
7.52
7.51
7.50
6.34
6.32
6.31
6.30
6.29
6.27
C6F13
3jb : 1H NMR
1.00
1.09
0.91
1.07
1.00
1.02
1.05
1.04
1.02
f1 (ppm)

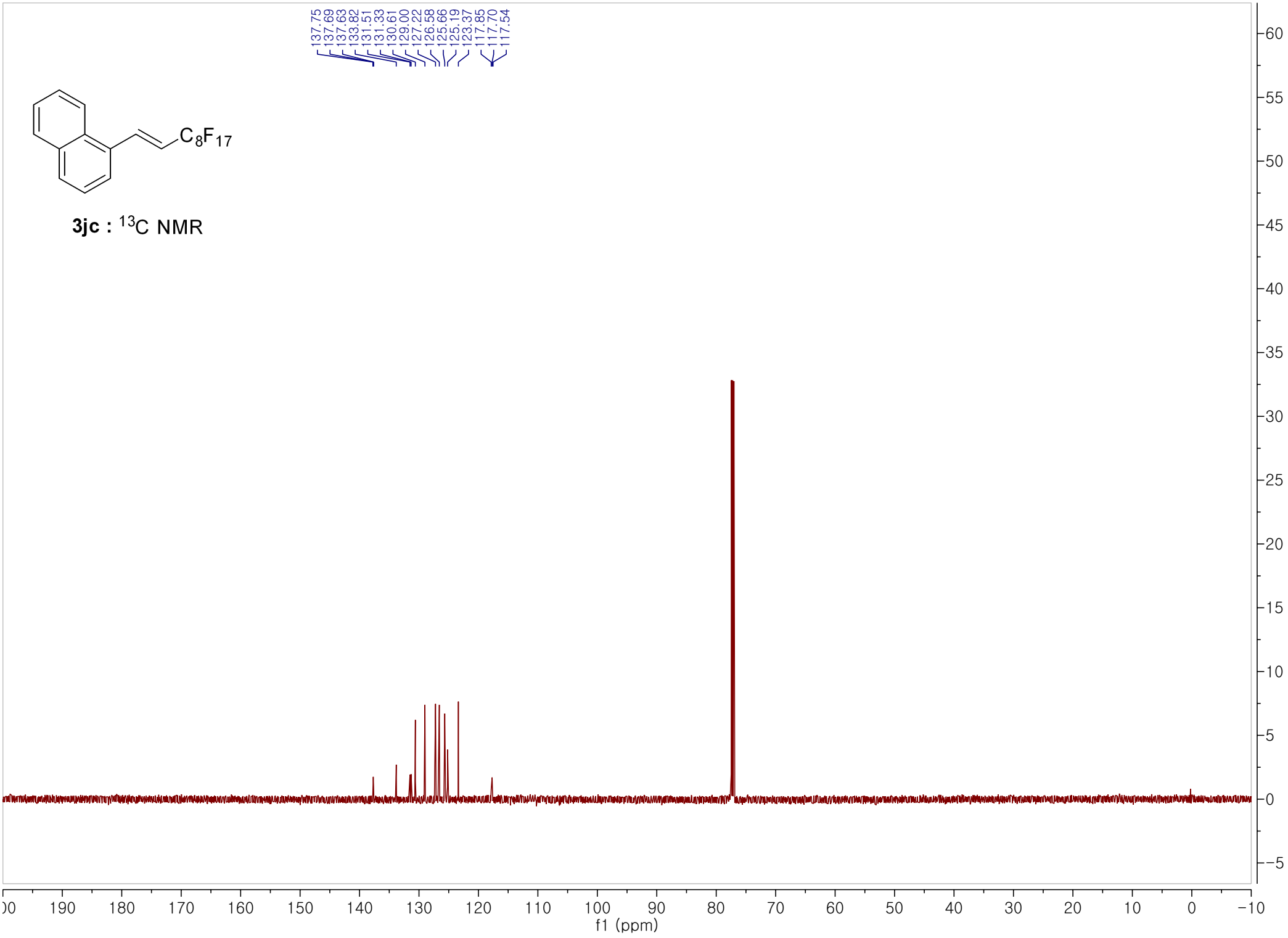

137.78
137.72
137.65
133.86
131.53
131.37
130.61
129.00
127.21
126.57
125.65
125.18
123.37
117.84
117.69
117.54
C_6F_{13}
3jb : ^{13}C NMR
350
300
250
200
150
100
50
0
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
−10
f1 (ppm)

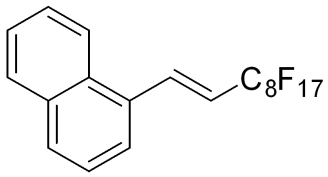

C_6F_{13}

3jb : ^{19}F NMR

-80.92
-111.09
-121.55
-122.87
-123.23
-126.20
3.02
2.05
2.10
2.10
2.08
2.06
f1 (ppm)

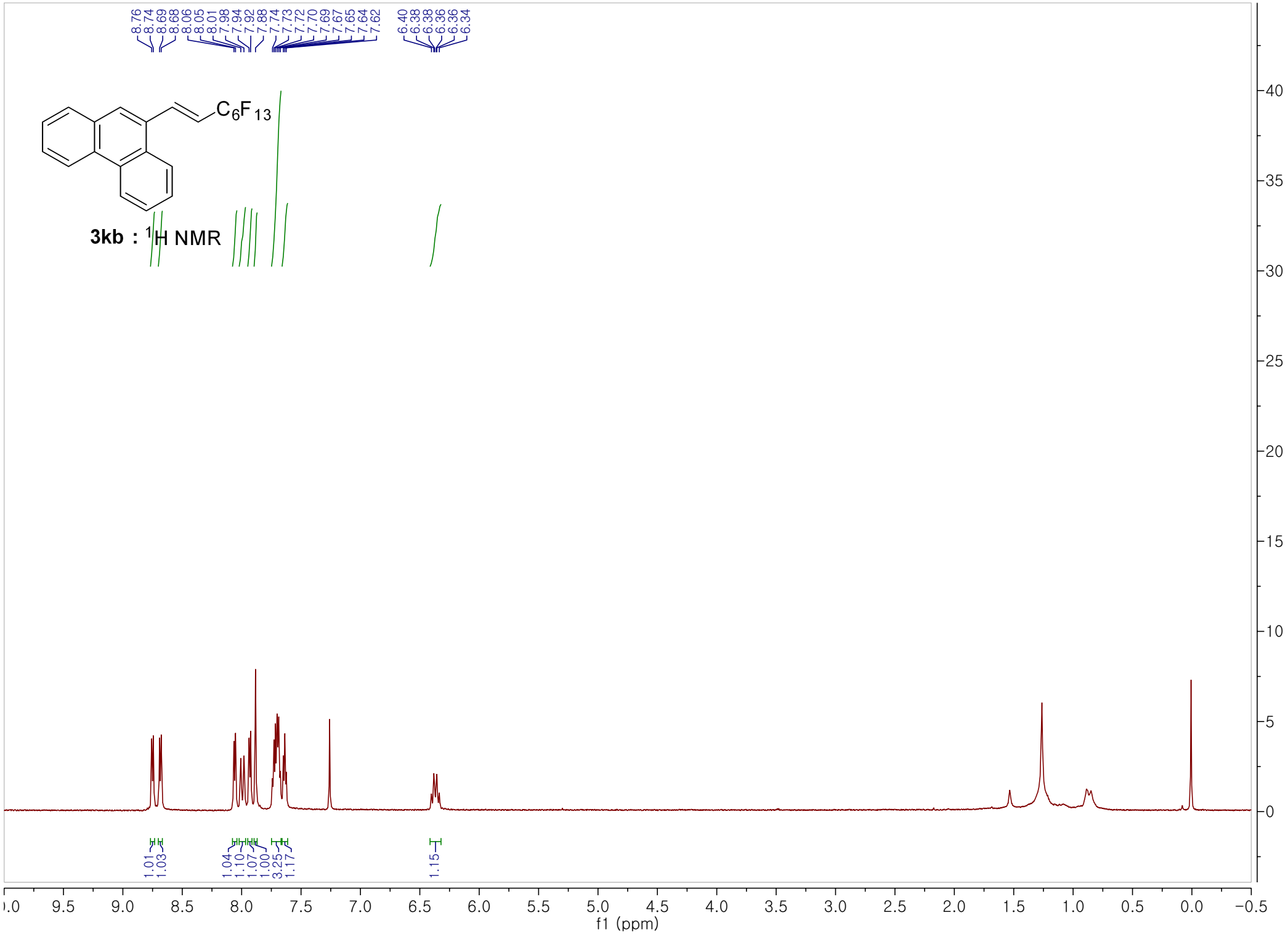

8.06
8.05
8.01
7.98
7.92
7.91
7.89
7.67
7.66
7.61
7.59
7.58
7.56
7.55
7.54
7.52
7.50
7.49
6.32
6.29
6.29
6.27
6.27
6.25
C8F17
3jc : 1H NMR
1.00
1.03
0.96
1.03
0.99
1.01
1.03
1.03
1.02
f1 (ppm)

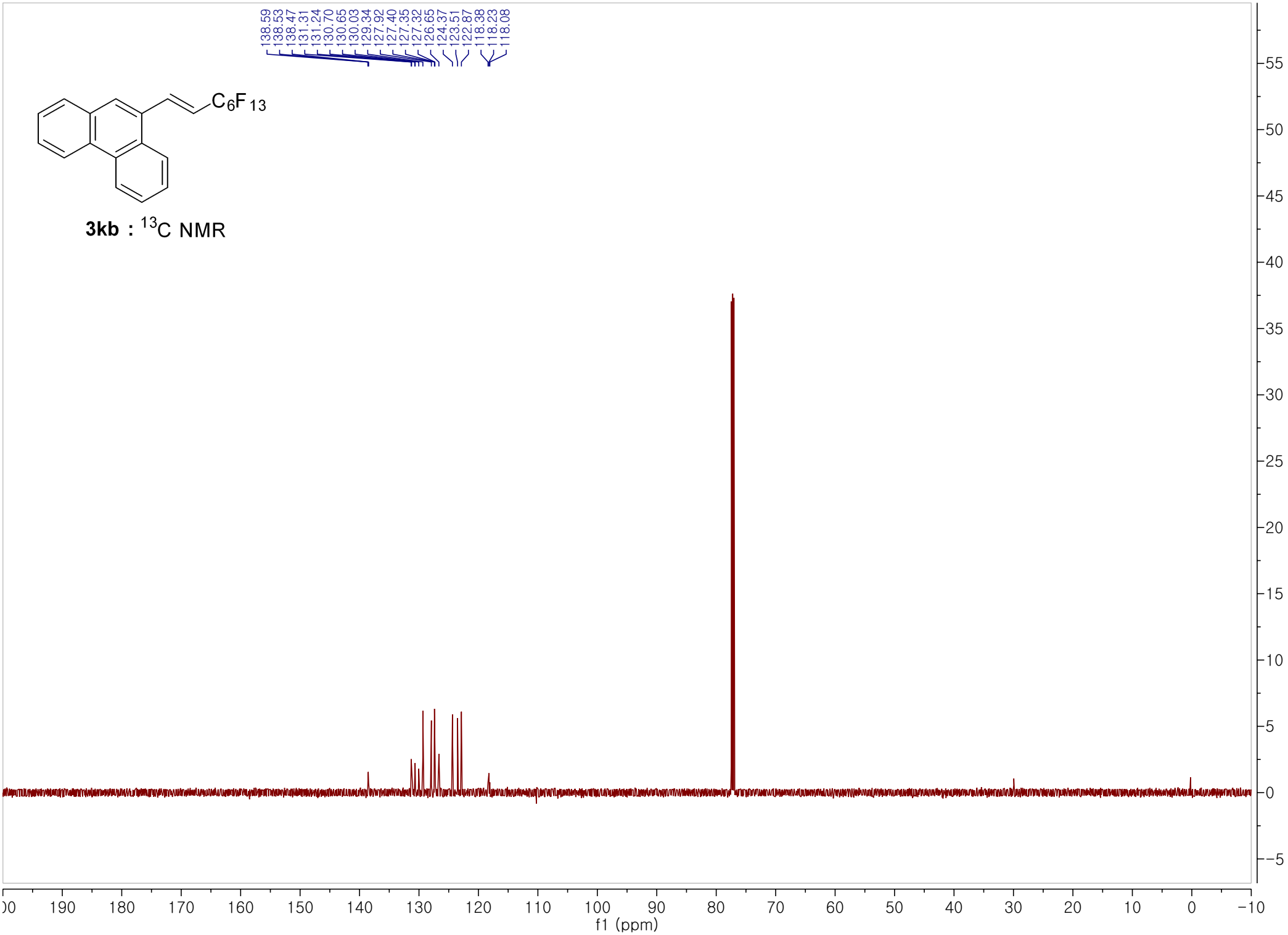

137.75
137.69
137.63
133.82
131.51
131.33
130.61
129.00
127.22
126.58
125.66
125.19
123.37
117.85
117.70
117.54
C_8F_{17}
3jc : ^{13}C NMR
f1 (ppm)

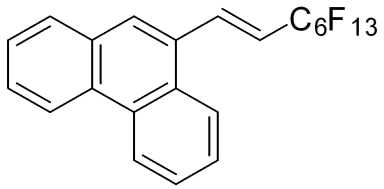

C_8F_{17}

3jc : ^{19}F NMR

-80.78
-111.02
-121.28
-121.88
-122.70
-123.14
-126.10
3.04
2.04
2.05
4.14
2.05
2.05
2500
2000
1500
1000
500
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
f1 (ppm)

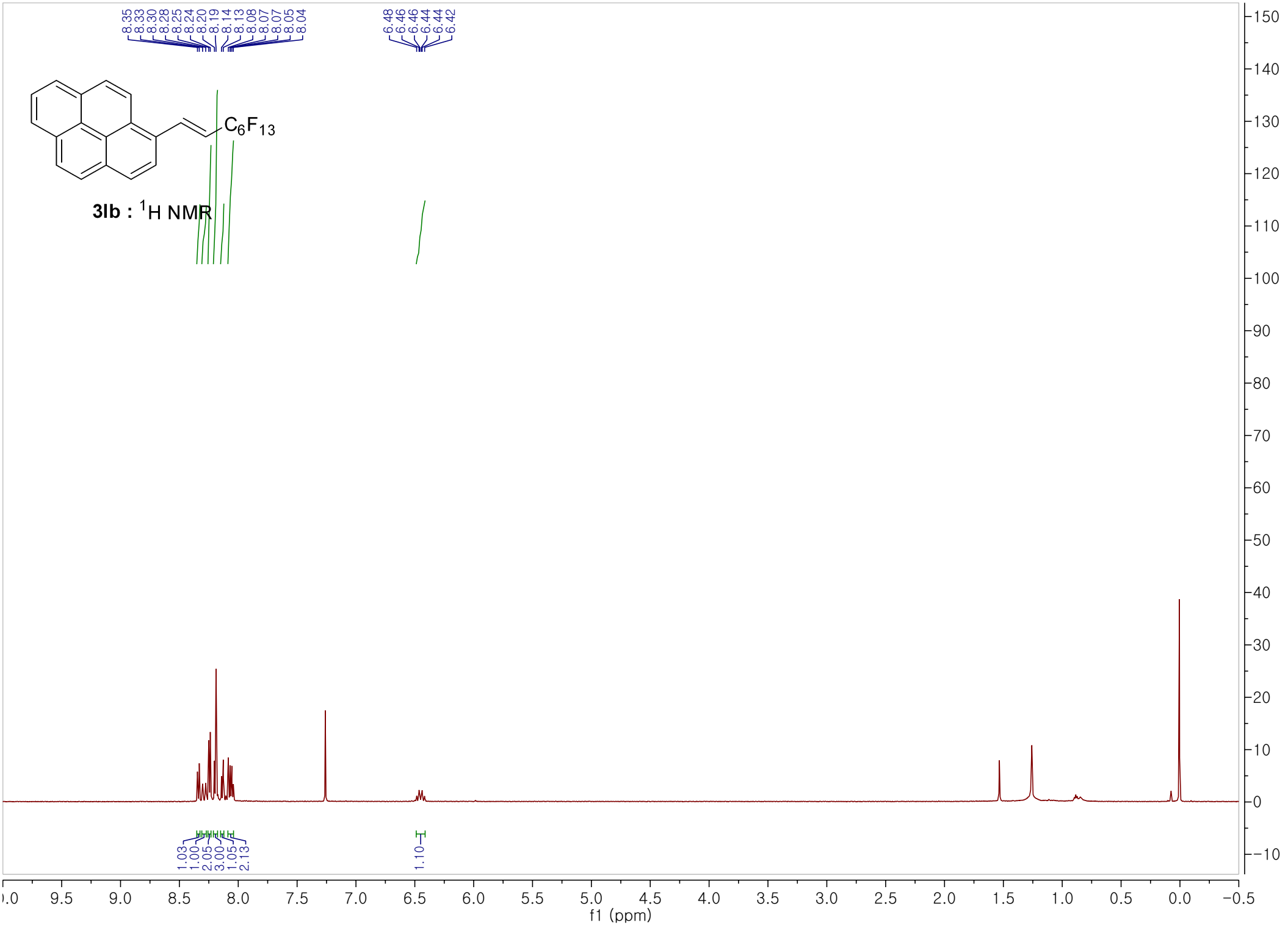

8.76
8.74
8.69
8.68
8.06
8.05
8.01
7.98
7.94
7.92
7.88
7.74
7.73
7.72
7.70
7.69
7.67
7.65
7.64
7.62
6.40
6.38
6.38
6.36
6.36
6.34
C6F13
3kb : 1H NMR
1.01
1.03
1.04
1.10
1.07
1.00
3.25
1.17
1.15
f1 (ppm)

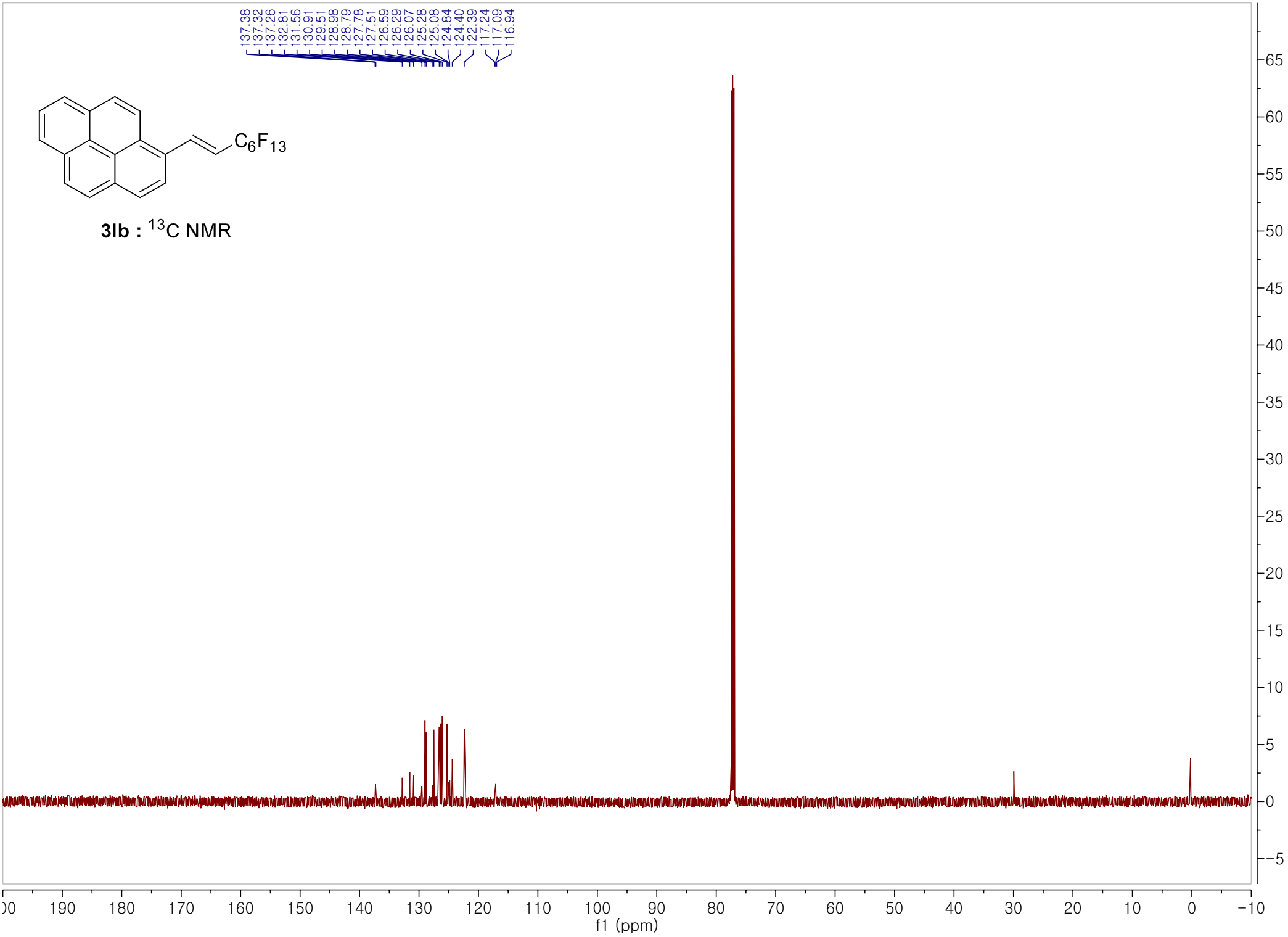

138.59
138.53
138.47
131.31
131.24
130.70
130.65
130.03
129.34
127.92
127.40
127.35
127.32
126.65
124.37
123.51
122.87
118.38
118.23
118.08
C_6F_{13}
3kb : ^{13}C NMR
55
50
45
40
35
30
25
20
15
10
5
0
−5
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
−10
f1 (ppm)


C_6F_{13}

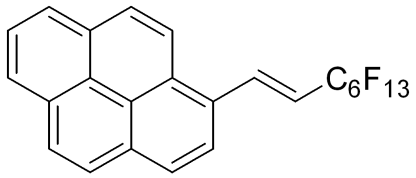
3kb : ^{19}F NMR

-80.77
-111.02
-121.47
-122.79
-123.08
-126.09
3.00
1.99
2.03
2.05
2.00
2.01
f1 (ppm)


8.35
8.33
8.30
8.28
8.25
8.24
8.20
8.19
8.14
8.13
8.08
8.07
8.07
8.05
8.04
6.48
6.46
6.46
6.44
6.44
6.42
C_6F_{13}
3Ib : ^{1}H NMR
1.03
1.00
2.05
3.00
1.05
2.13
1.10
f1 (ppm)

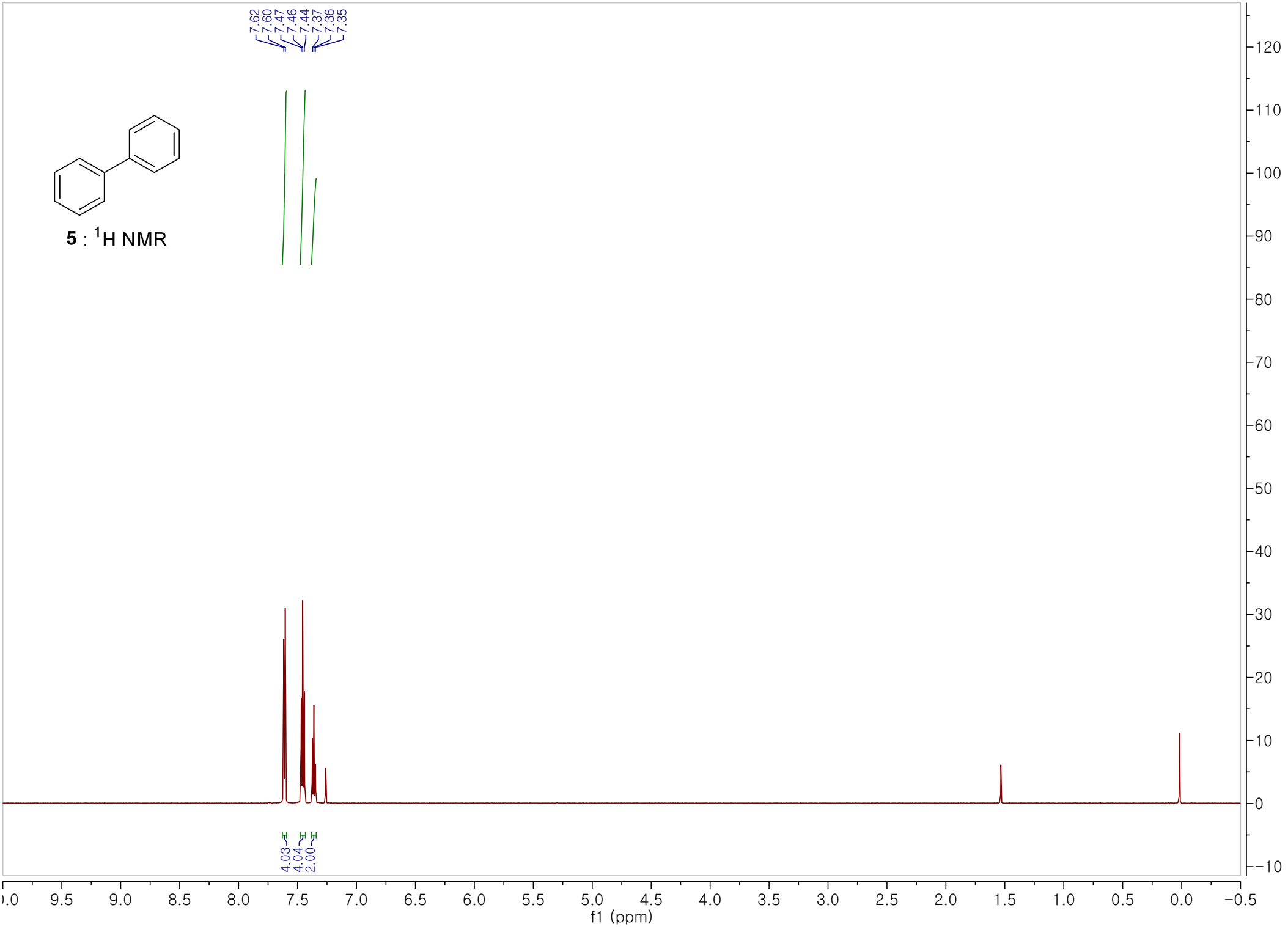

137.38
137.32
137.26
132.81
131.56
130.91
129.51
128.98
128.79
127.78
127.51
126.59
126.29
126.07
125.28
125.08
124.84
124.40
122.39
117.24
117.09
116.94
C_6F_{13}
f1 (ppm)

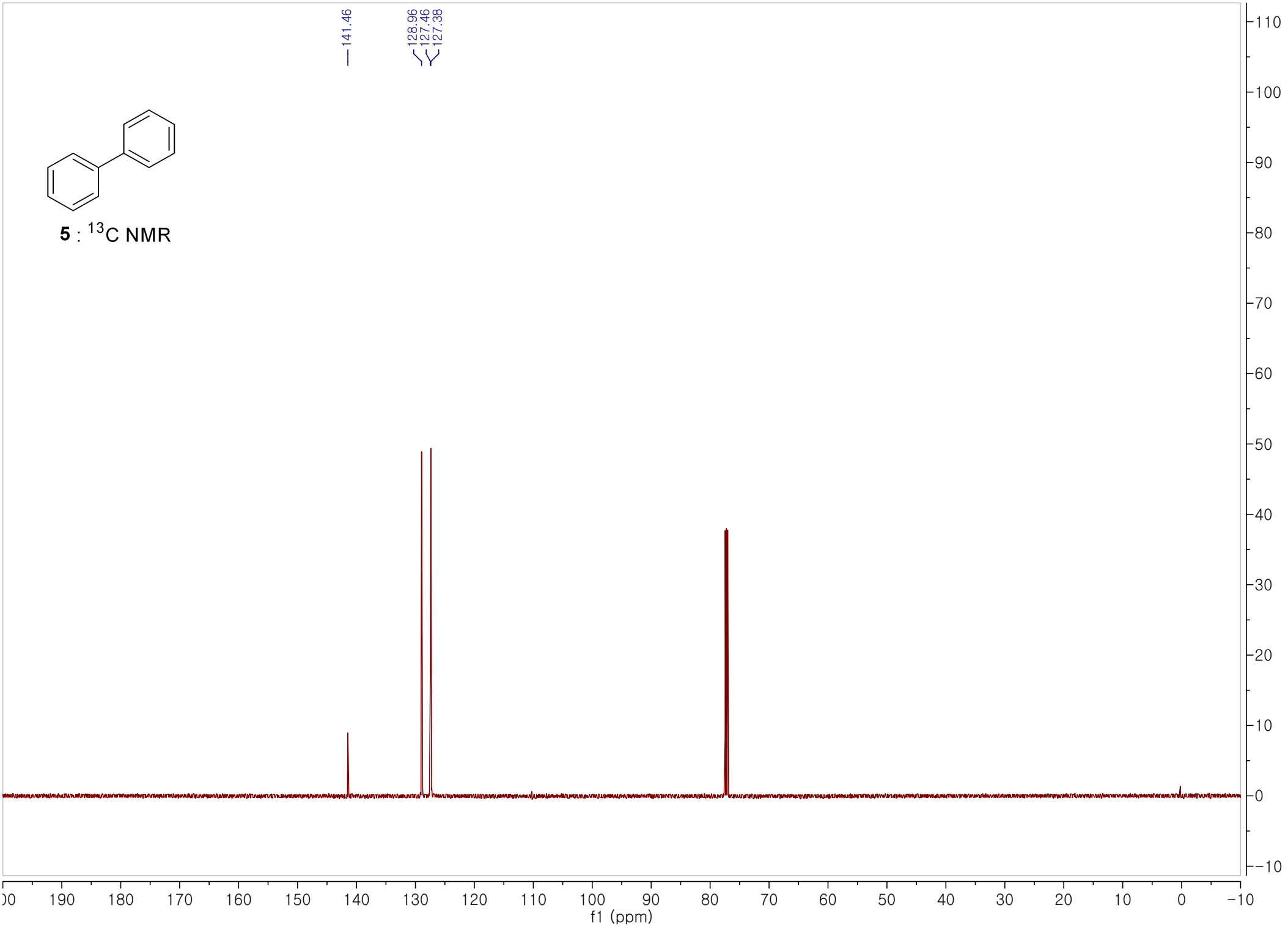
3Ib : ^{13}C NMR

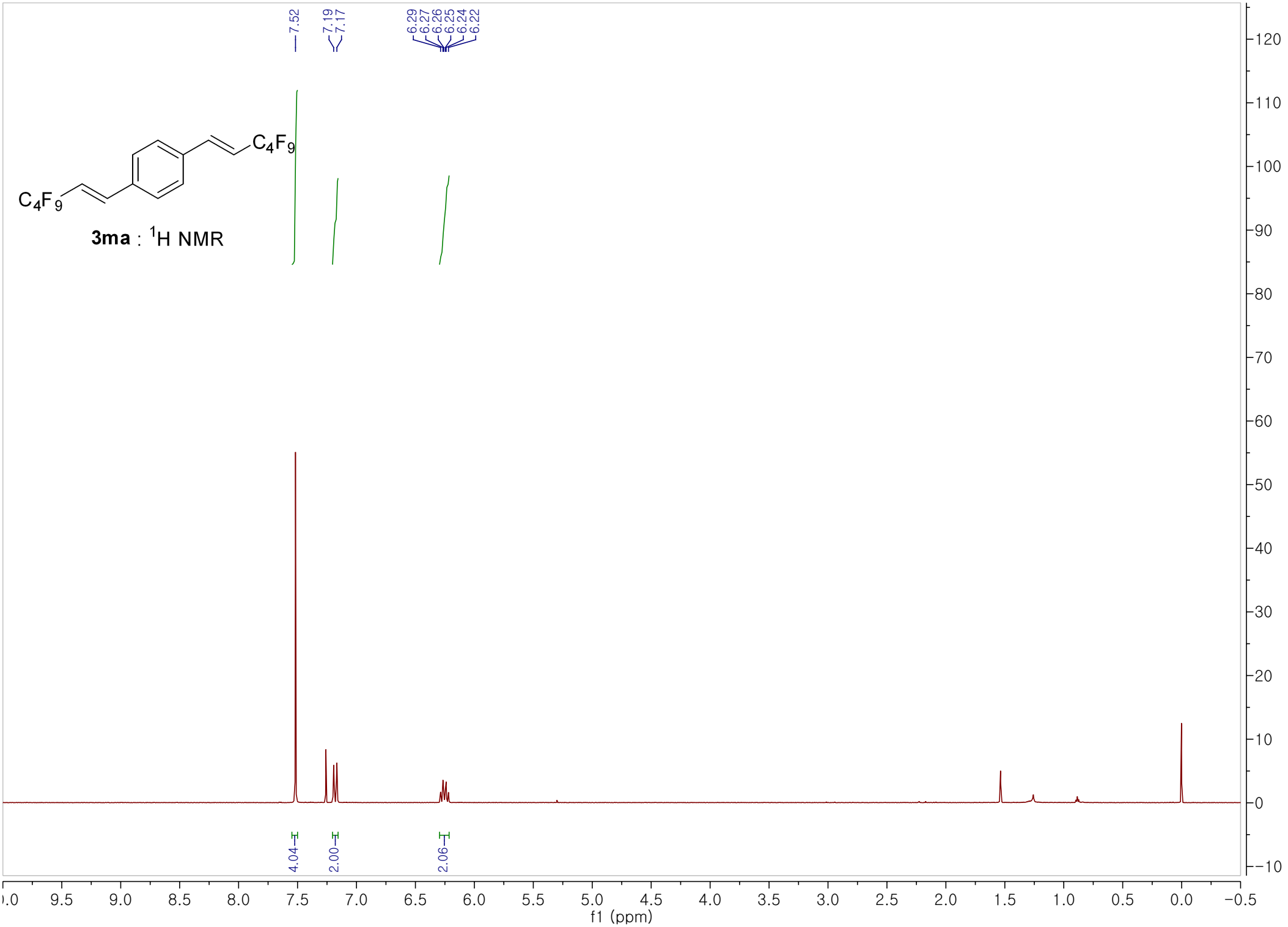

C_6F_{13}

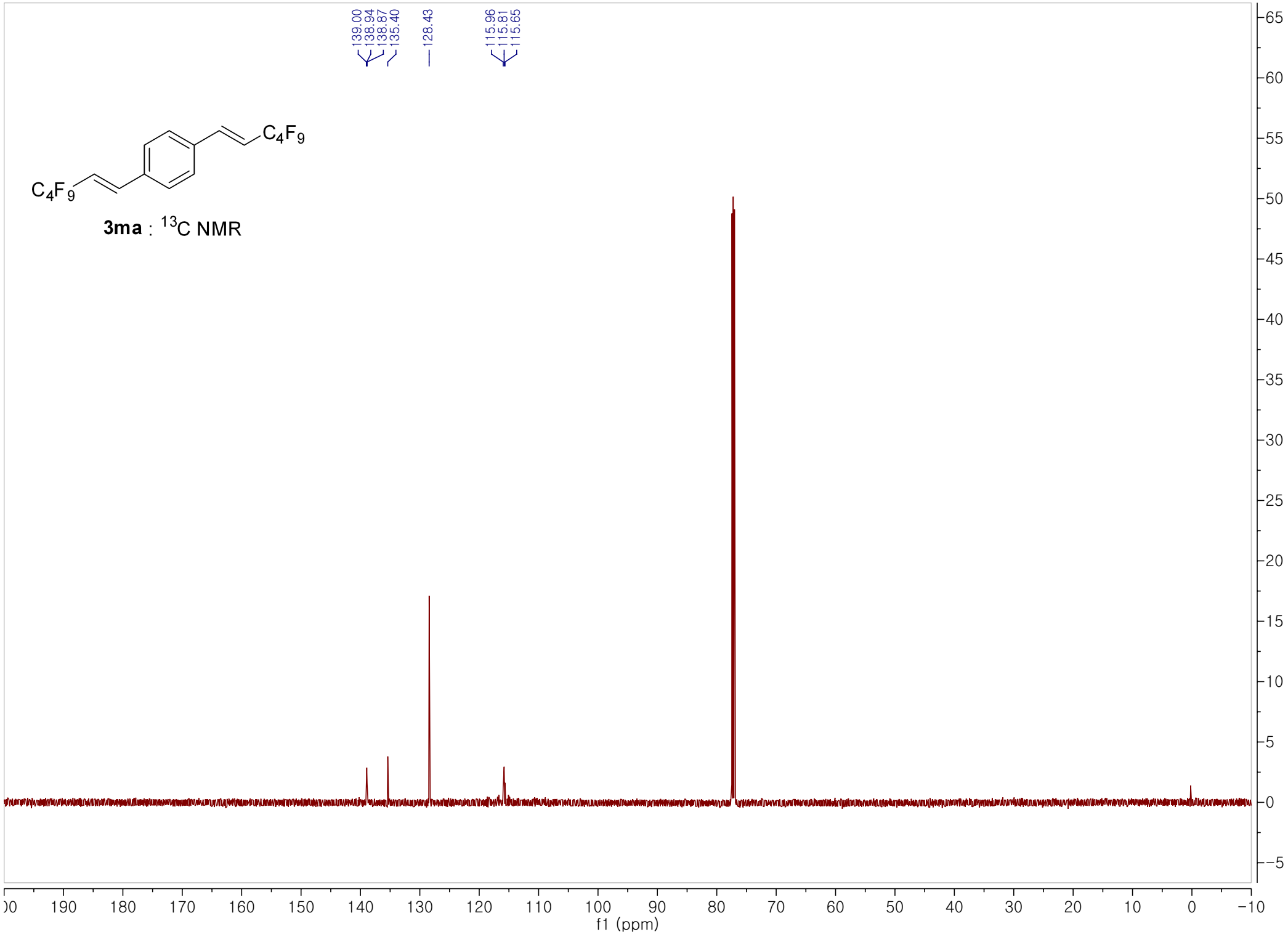
3Ib : ^{19}F NMR

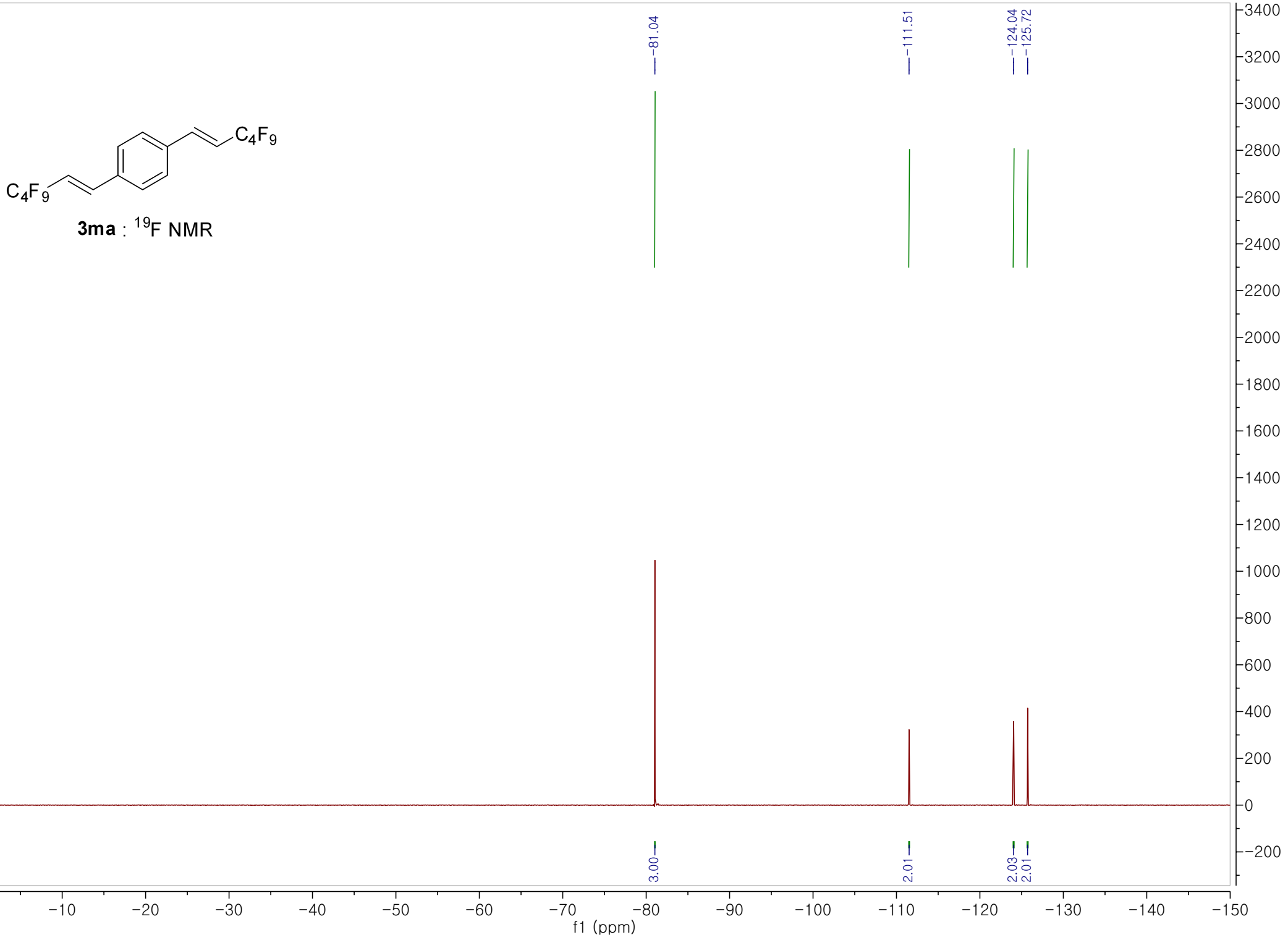
-80.76
-110.64
-121.45
-122.77
-122.98
-126.07
3.00
1.94
2.04
2.01
1.99
2.00
f1 (ppm)

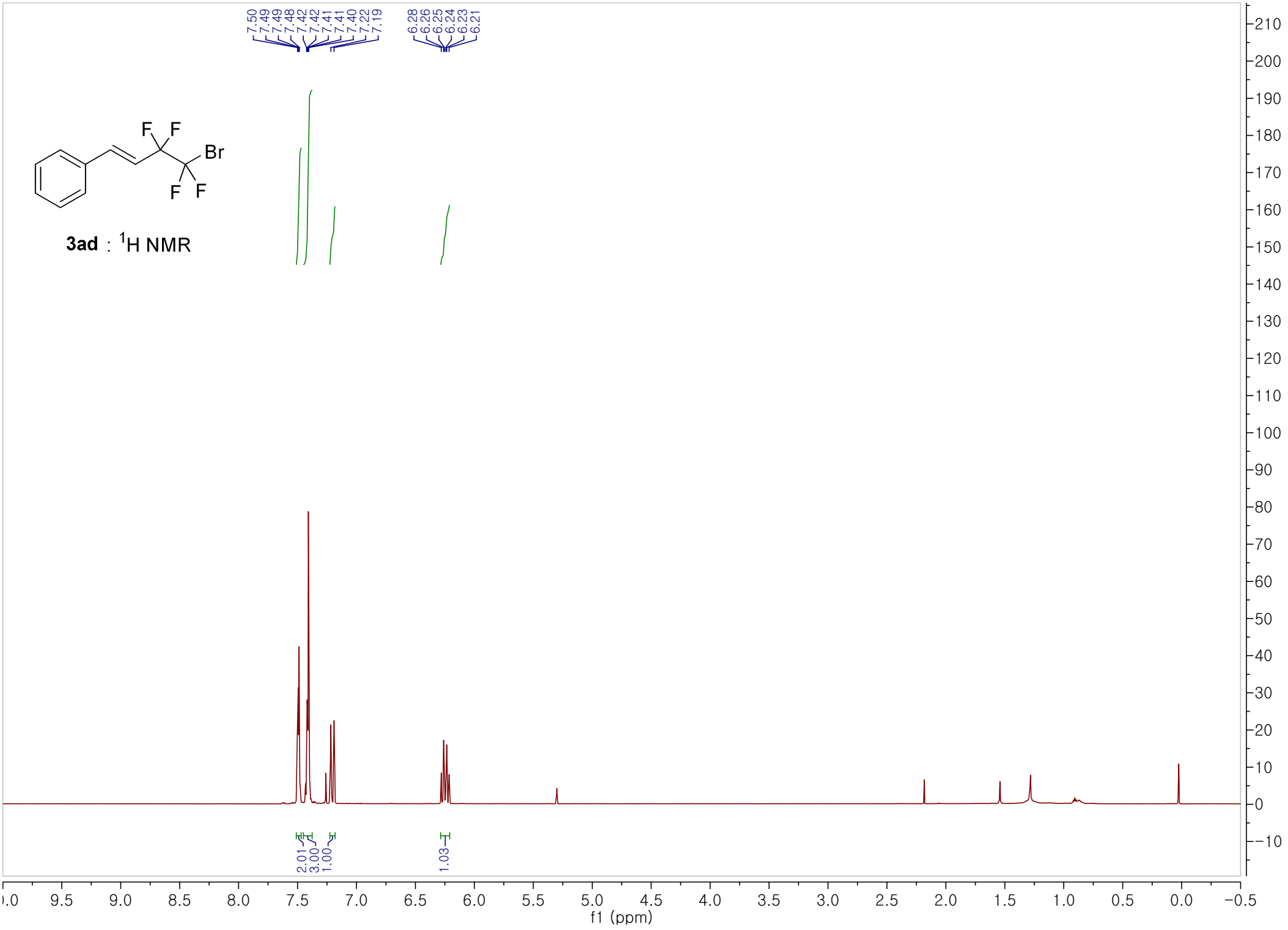

7.62
7.60
7.47
7.46
7.44
7.37
7.36
7.35
5 : 1H NMR
4.03
4.04
2.00
f1 (ppm)

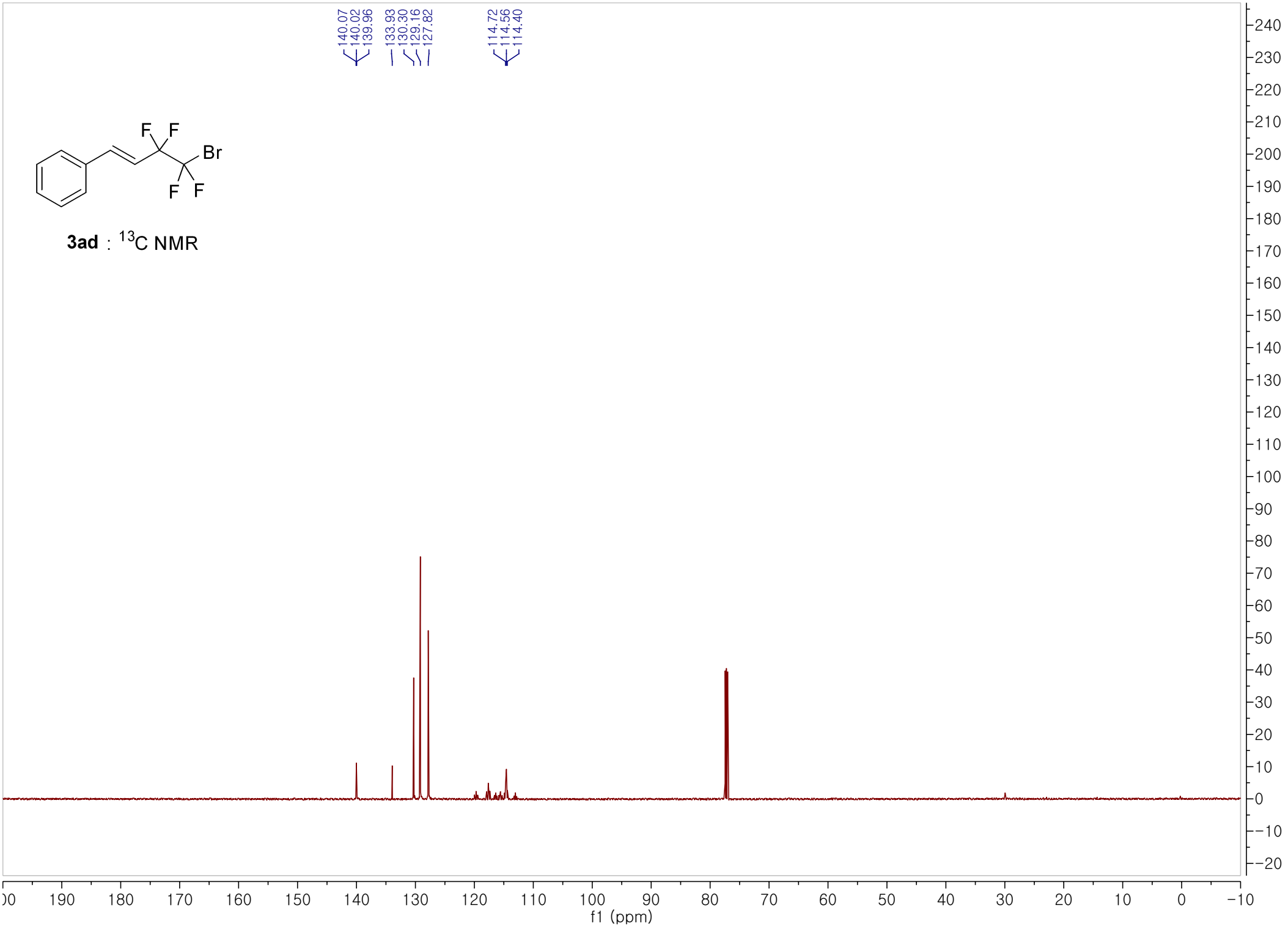

141.46
128.96
127.46
127.38
5 : 13C NMR
f1 (ppm)

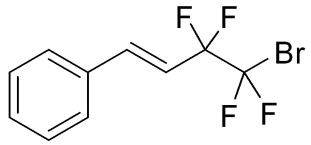

7.52
7.19
7.17
6.29
6.27
6.26
6.25
6.24
6.22
C4F9
C4F9
3ma : 1H NMR
4.04
2.00
2.06
f1 (ppm)


139.00
138.94
138.87
135.40
128.43
115.96
115.81
115.65
C_4F_9
C_4F_9
3ma : ^{13}C NMR
f1 (ppm)


C4F9
C4F9
3ma : 19F NMR
-81.04
-111.51
-124.04
-125.72
3.00
2.01
2.03
2.01
f1 (ppm)

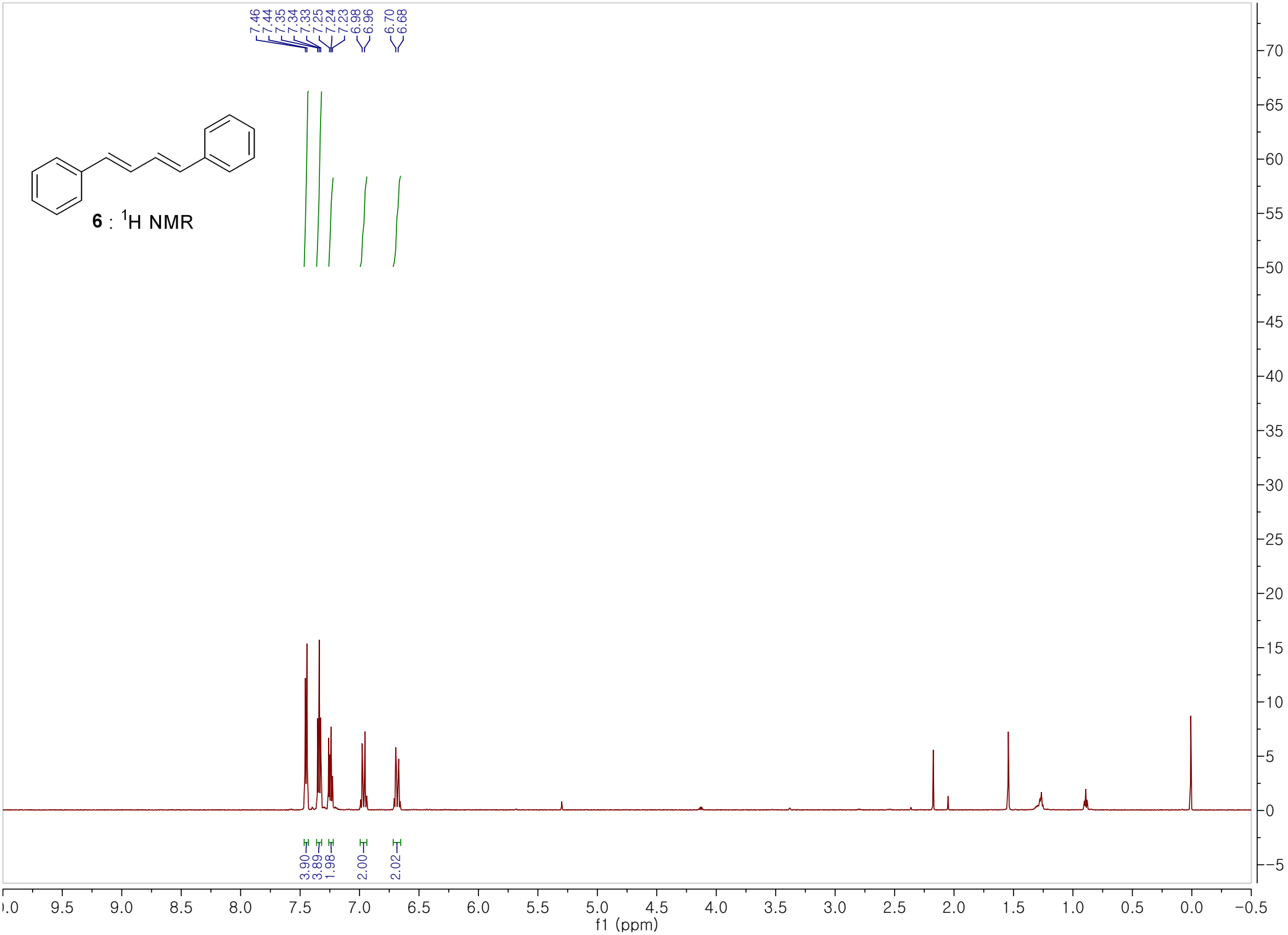

7.50
7.49
7.49
7.48
7.42
7.42
7.41
7.41
7.40
7.22
7.19
6.28
6.26
6.25
6.24
6.23
6.21
F
F
Br
F
F
3ad : 1H NMR
2.01
3.00
1.00
1.03
f1 (ppm)

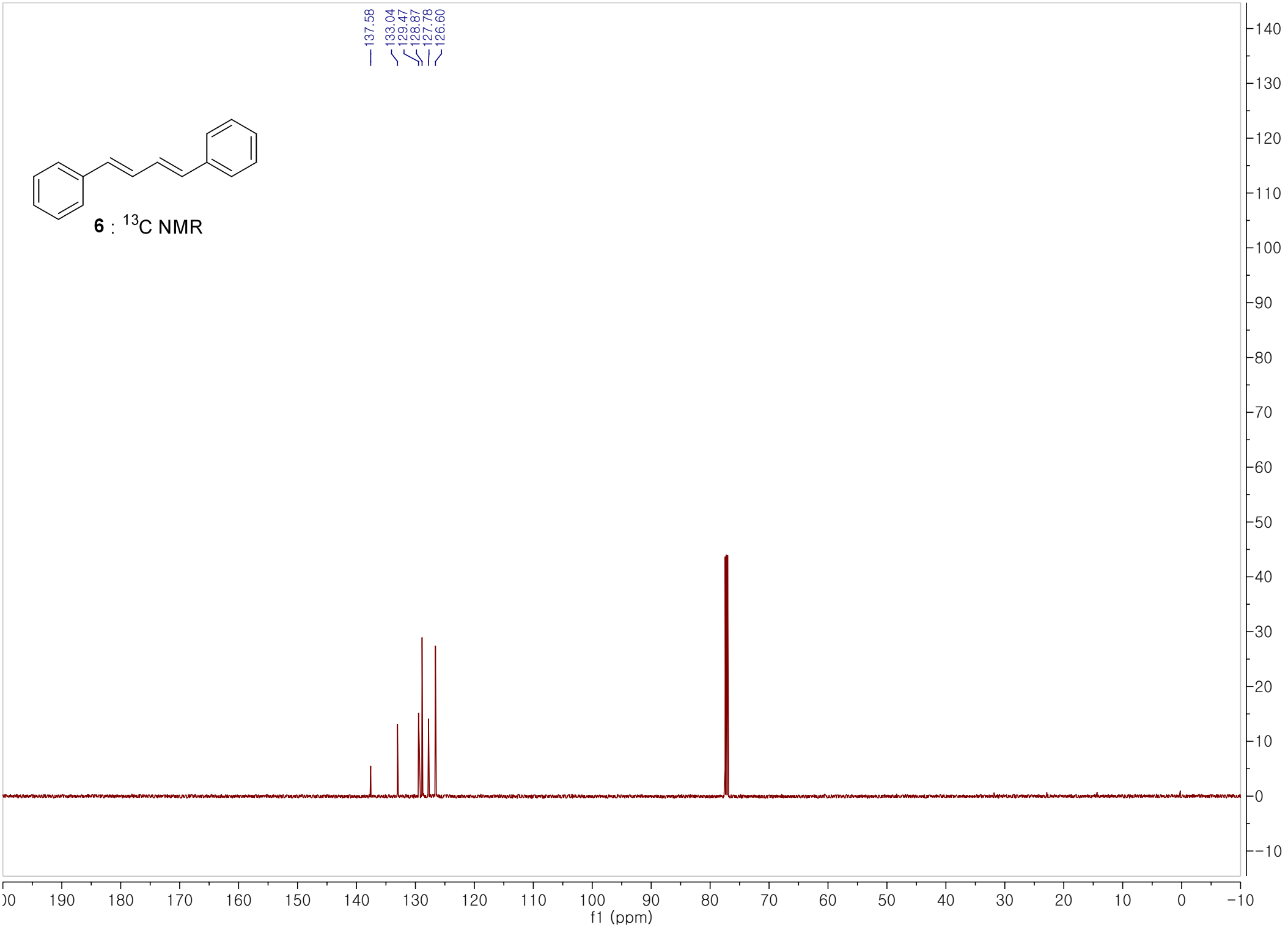

140.07
140.02
139.96
133.93
130.30
129.16
127.82
114.72
114.56
114.40
F
F
Br
F
F
3ad : 13C NMR
f1 (ppm)

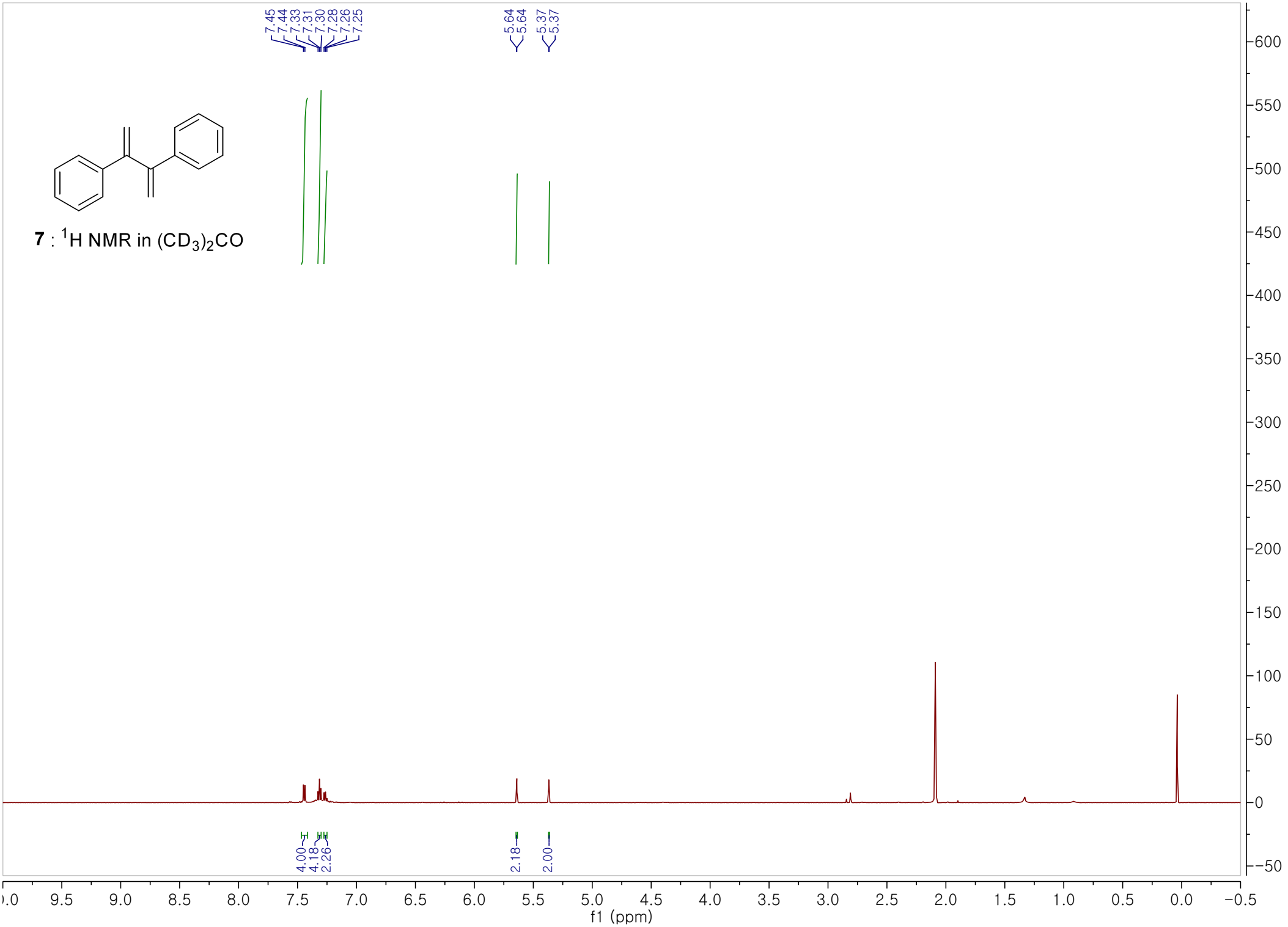

F
F
Br
F
F

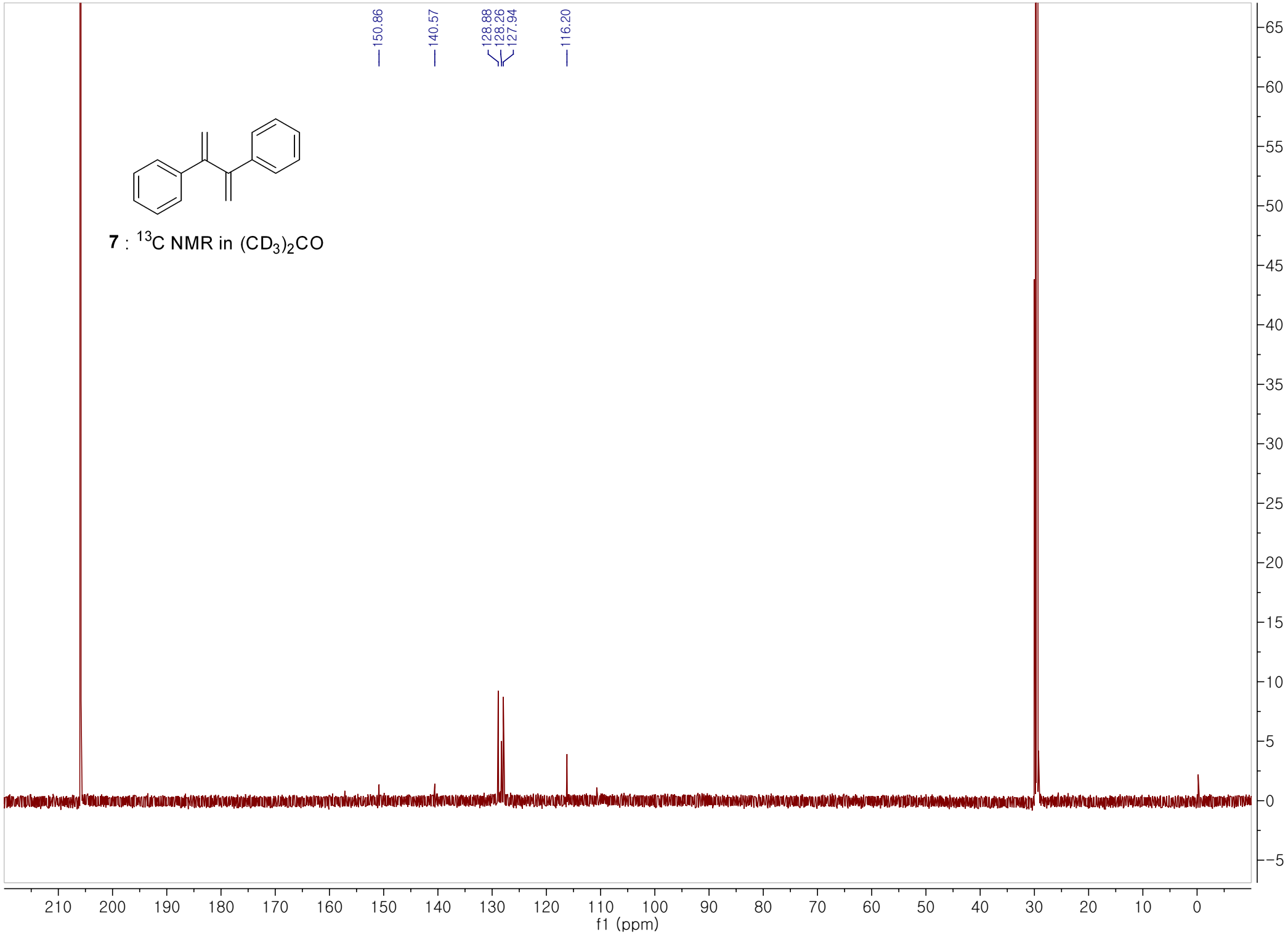
3ad : ^{19}F NMR

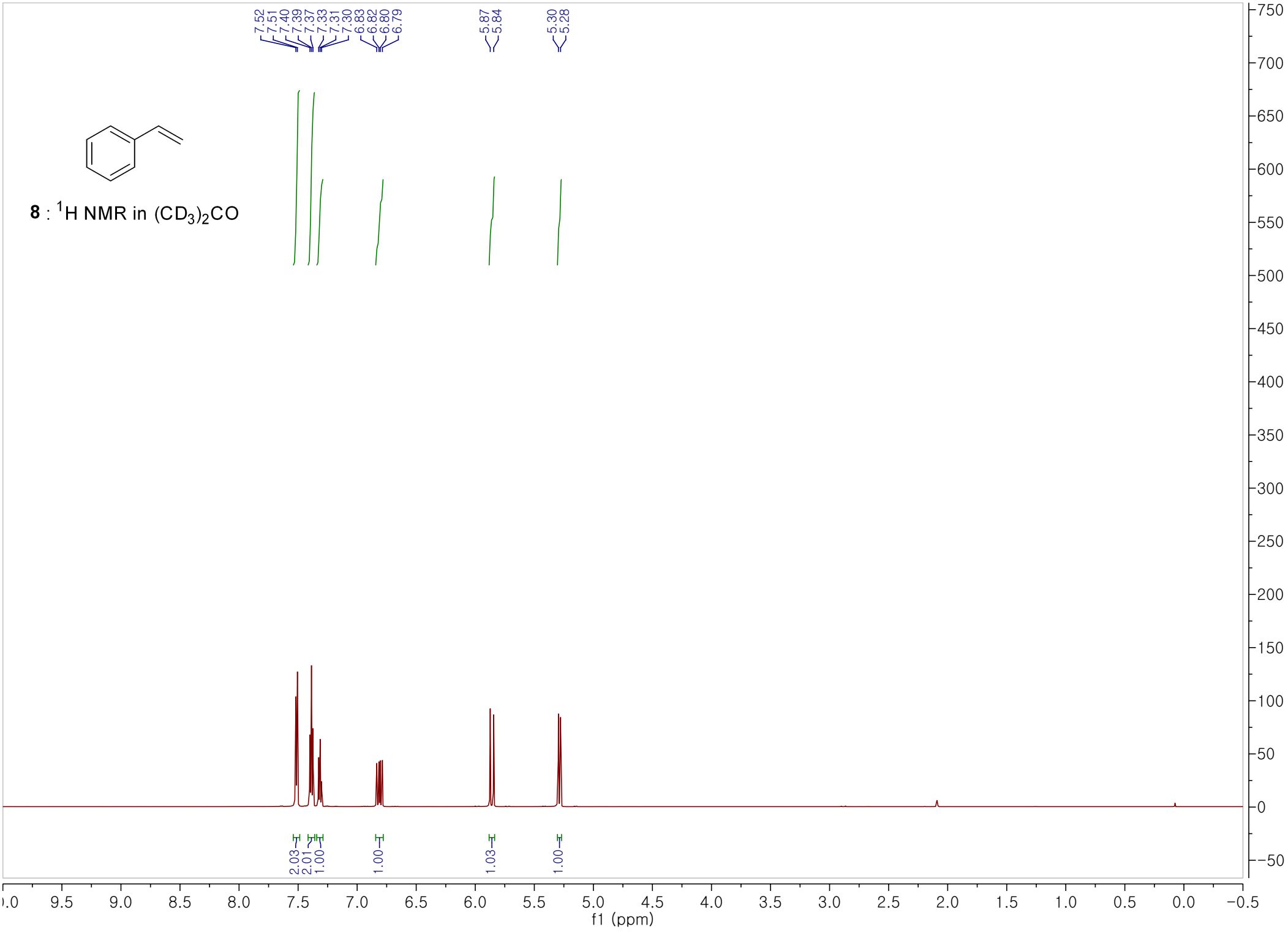
-65.65
-109.04
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
f1 (ppm)


7.46
7.44
7.35
7.34
7.33
7.25
7.24
7.23
6.98
6.96
6.70
6.68
6 : 1H NMR
3.90
3.89
1.98
2.00
2.02
f1 (ppm)

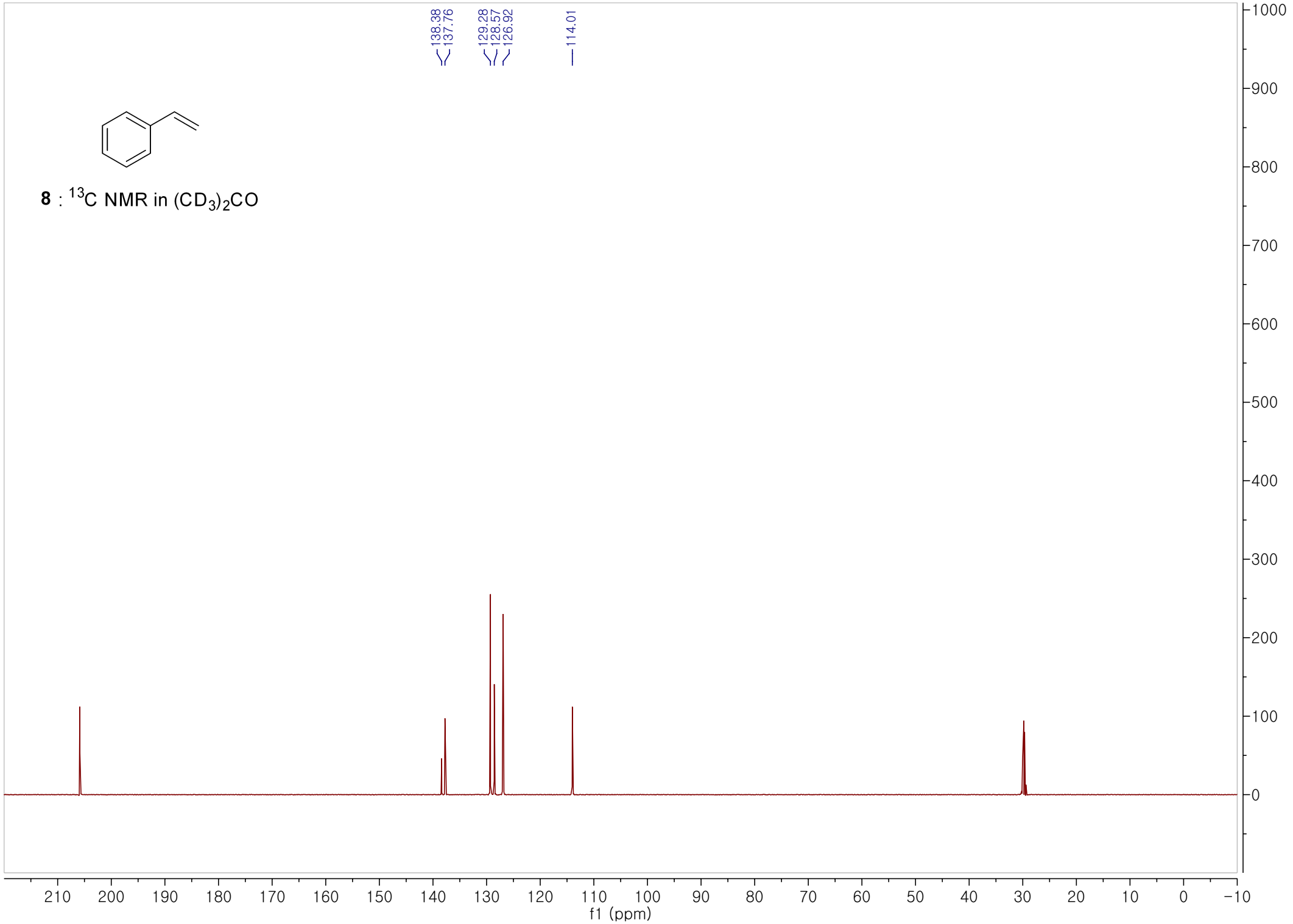

137.58
133.04
129.47
128.87
127.78
126.60
6 : 13C NMR
f1 (ppm)


7.45
7.44
7.33
7.31
7.30
7.28
7.26
7.25
5.64
5.64
5.37
5.37
7 : 1H NMR in (CD3)2CO
4.00
4.18
2.26
2.18
2.00
f1 (ppm)


150.86
140.57
128.88
128.26
127.94
116.20
7 : 13C NMR in (CD3)2CO
f1 (ppm)



8 : ^{1}H NMR in $(CD_3)_2CO$



8 : ^{13}C NMR in $(CD_3)_2CO$