**Supporting Information**

# Synthesis of a Polycyclic Halichondrin C1-C14 Fragment via Intermolecular Oxy-Michael / Trans-Ketalization

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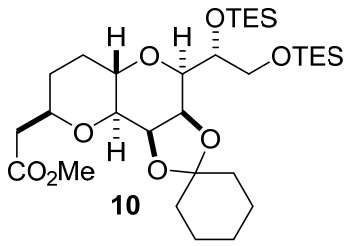
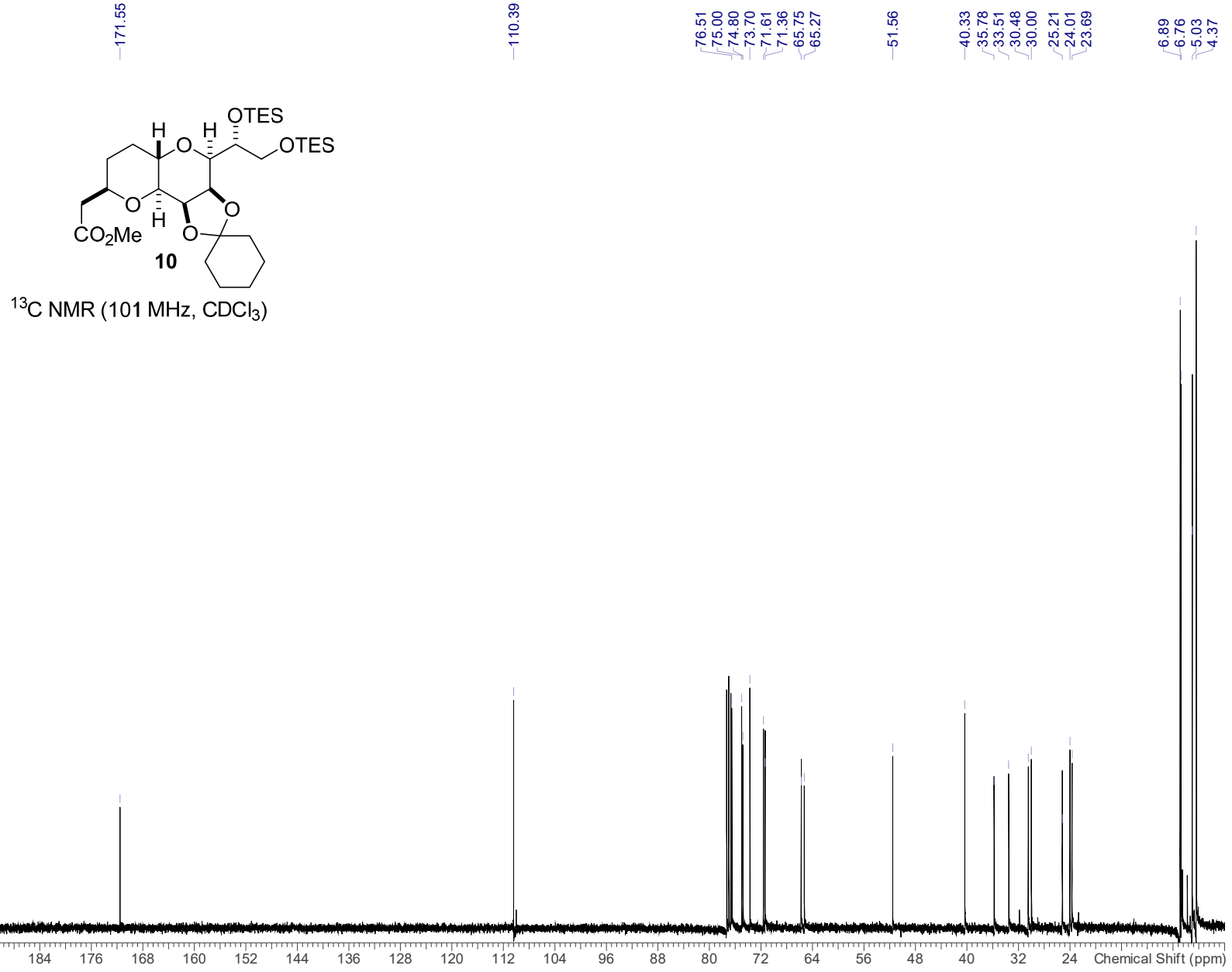
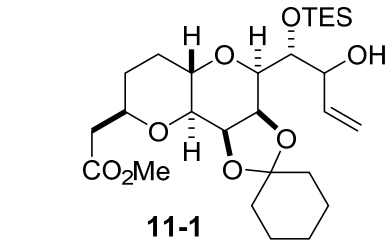



**10**

$^1$H NMR (400 MHz, $CDCl_3$)



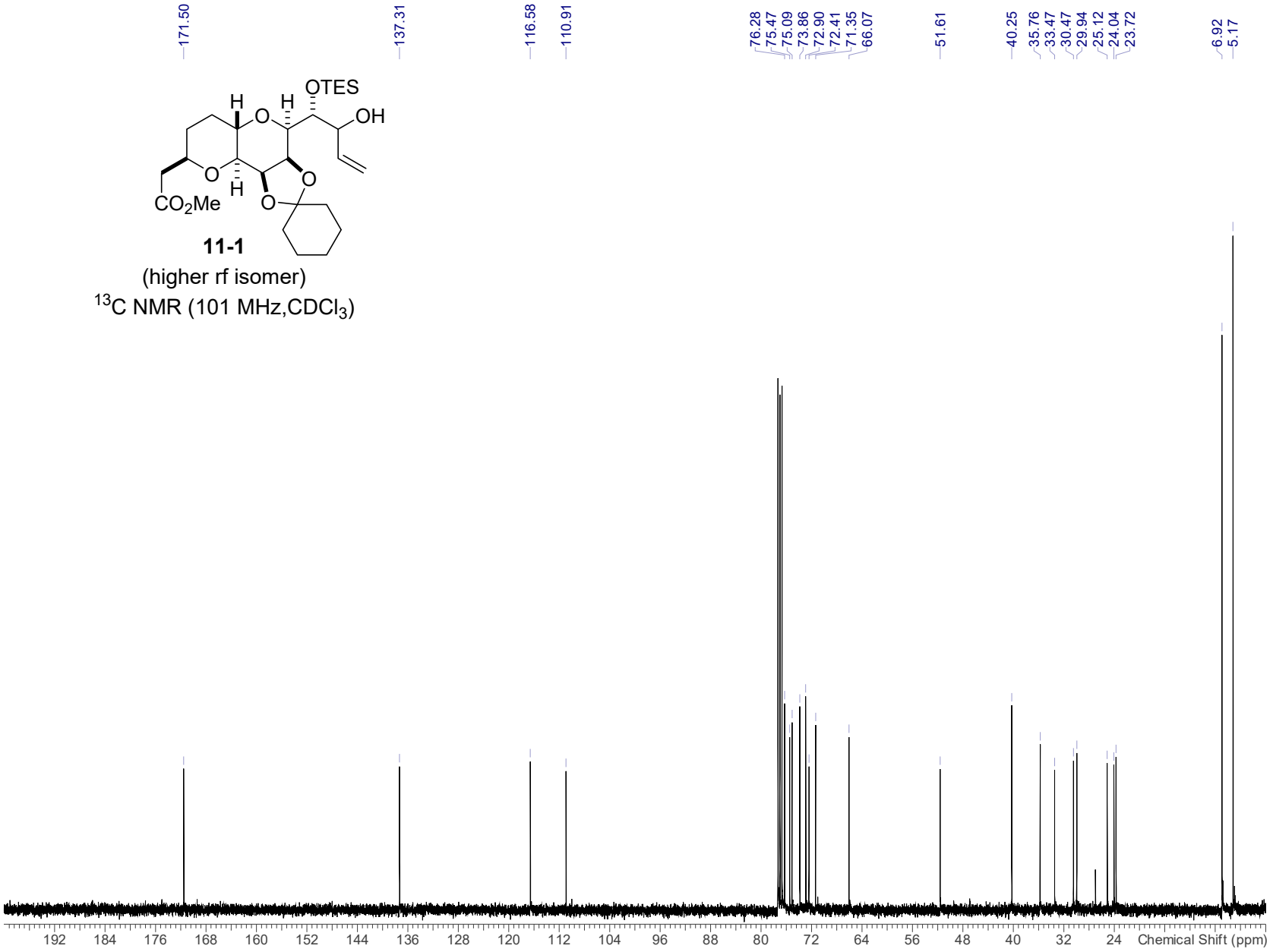

$^{13}$C NMR (101 MHz, $CDCl_3$)




**11-1**

(higher rf isomer)

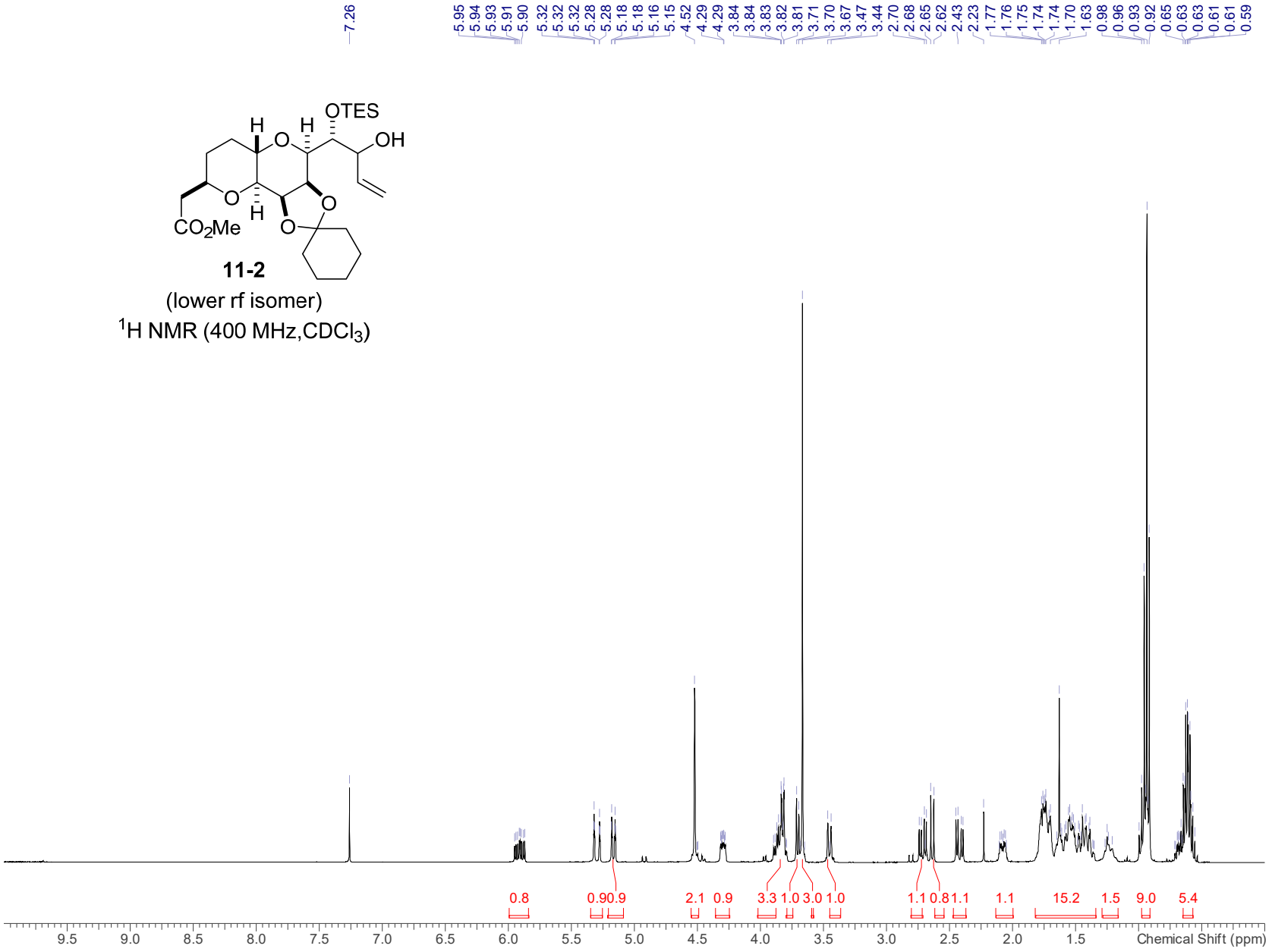
$^1$H NMR (400 MHz,$CDCl_3$)

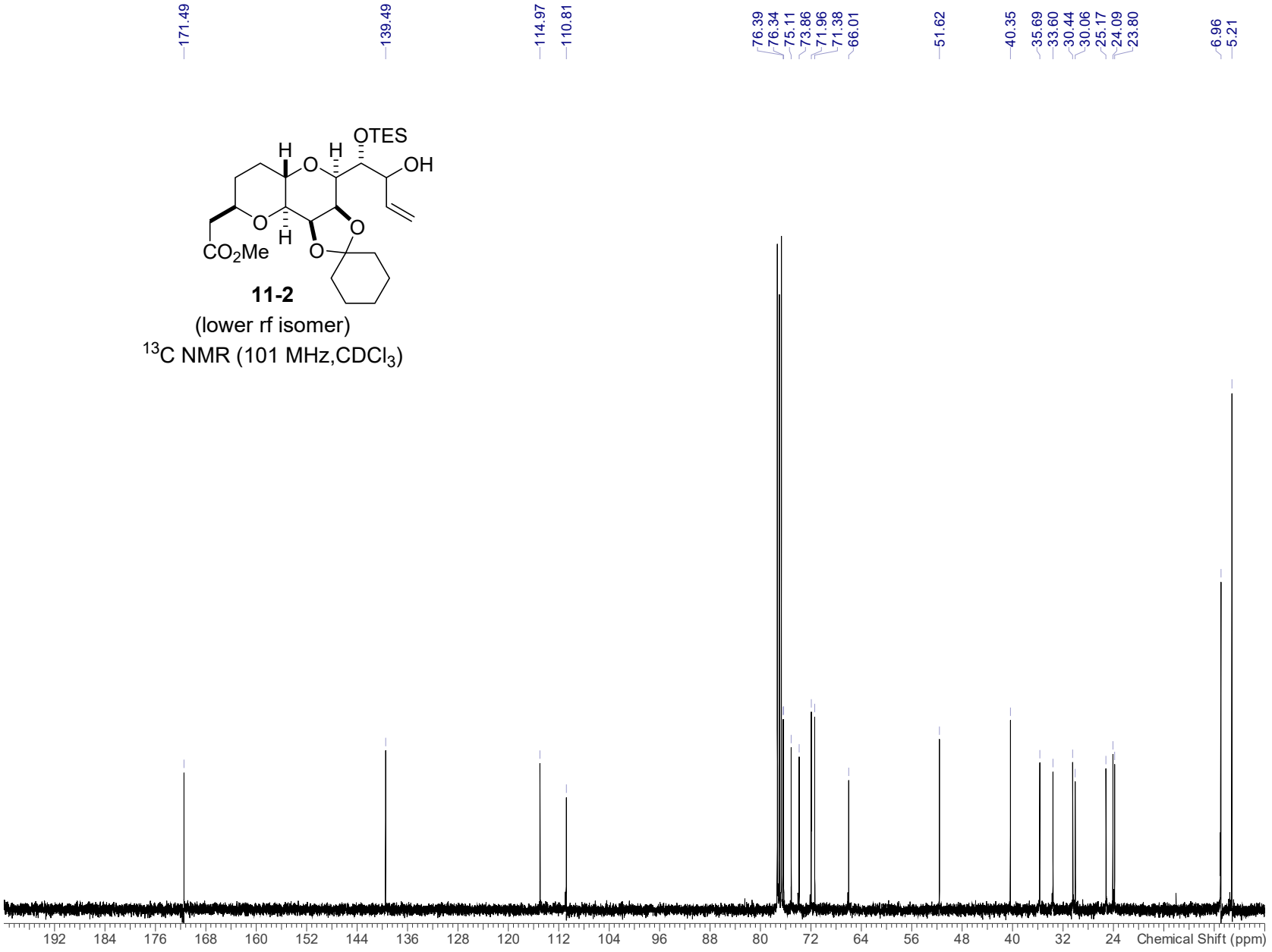



**11-1**

(higher rf isomer)

$^{13}C$ NMR (101 MHz,$CDCl_3$)

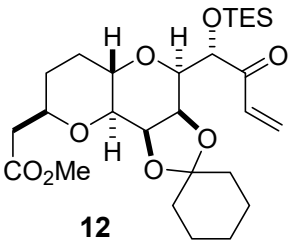

7.26
5.95
5.94
5.93
5.91
5.90
5.32
5.32
5.32
5.28
5.28
5.18
5.18
5.16
5.15
4.52
4.29
4.29
3.84
3.84
3.83
3.82
3.81
3.71
3.70
3.67
3.47
3.44
2.70
2.68
2.65
2.62
2.43
2.23
1.77
1.76
1.75
1.74
1.74
1.70
1.63
0.98
0.96
0.93
0.92
0.65
0.63
0.63
0.61
0.61
0.59
OTES
H
H
O
OH
O
H
O
O
CO2Me
11-2
(lower rf isomer)
1H NMR (400 MHz,CDCl3)
0.8
0.9
0.9
2.1
0.9
3.3
1.0
3.0
1.0
1.1
0.8
1.1
1.1
15.2
1.5
9.0
5.4
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
Chemical Shift (ppm)




**11-2**

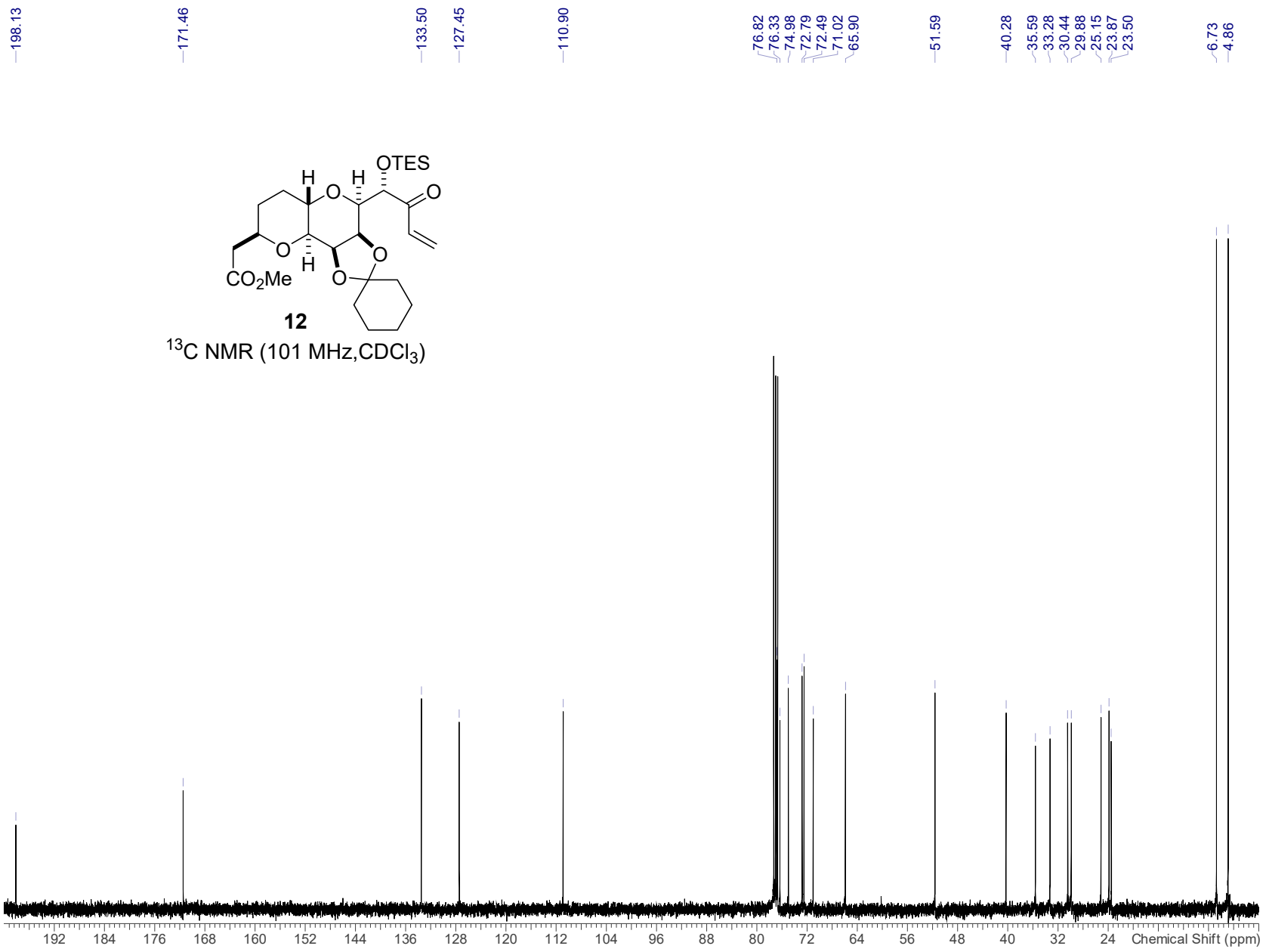
(lower rf isomer)

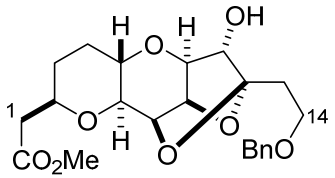
$^{13}C$ NMR (101 MHz,$CDCl_3$)




**12**

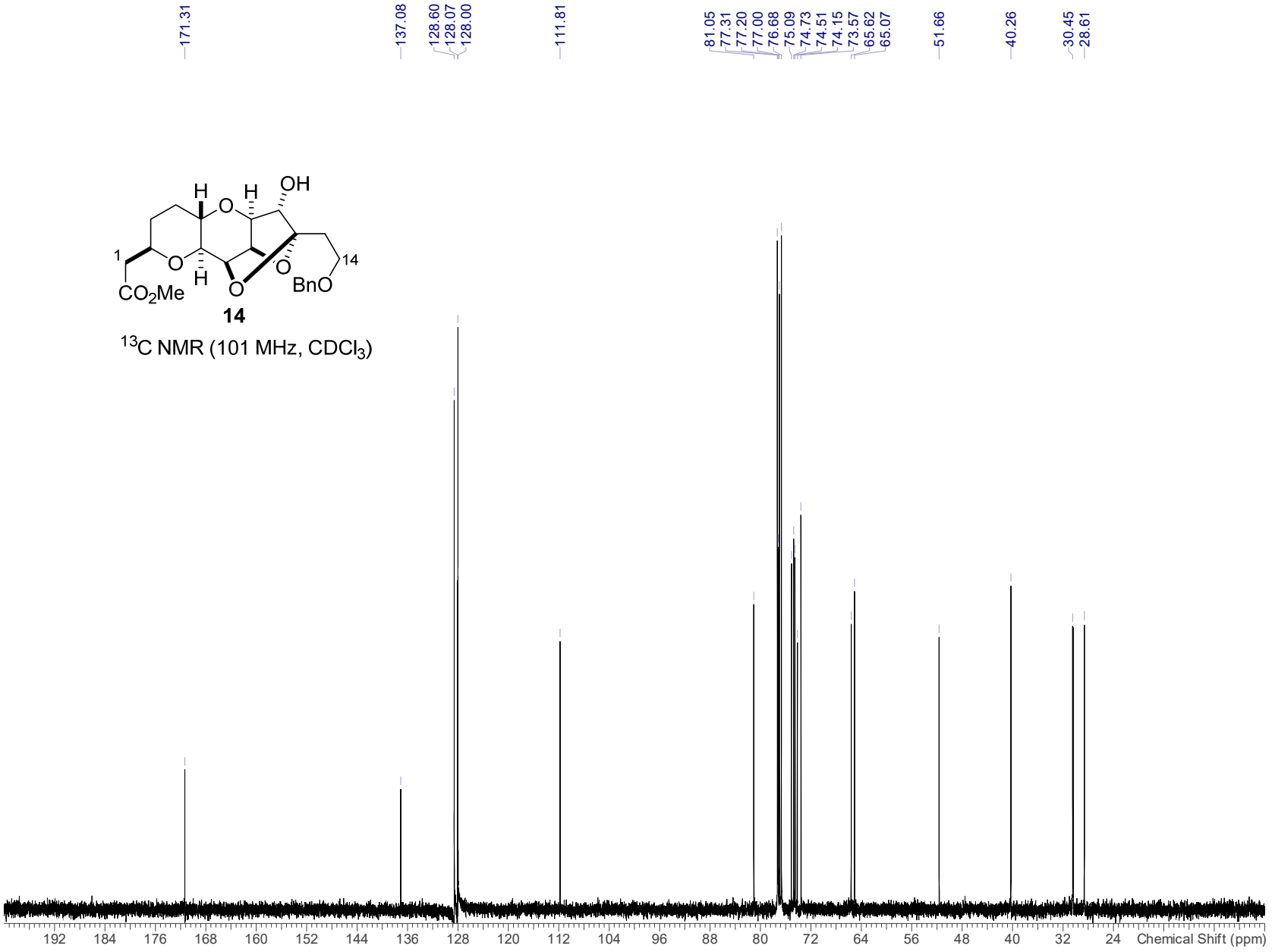
$^1$H NMR (400 MHz,$CDCl_3$)

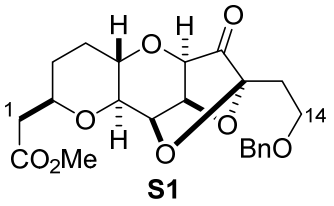

198.13
171.46
133.50
127.45
110.90
76.82
76.33
74.98
72.79
72.49
71.02
65.90
51.59
40.28
35.59
33.28
30.44
29.88
25.15
23.87
23.50
6.73
4.86
OTES
H
H
O
O
O
O
O
H
O
CO2Me
12
13C NMR (101 MHz,CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)




**14**

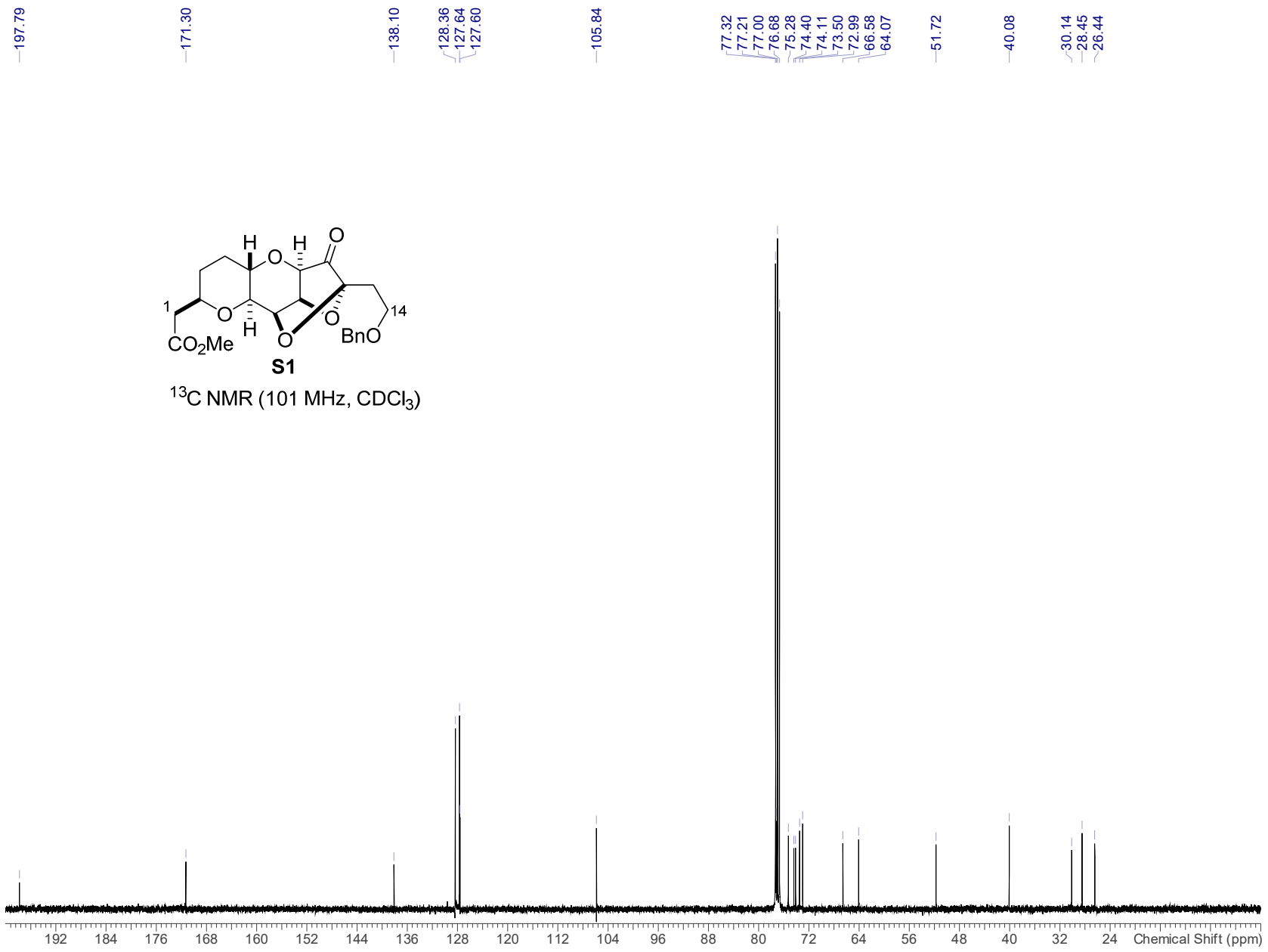
$^1$H NMR (400 MHz, $CDCl_3$)

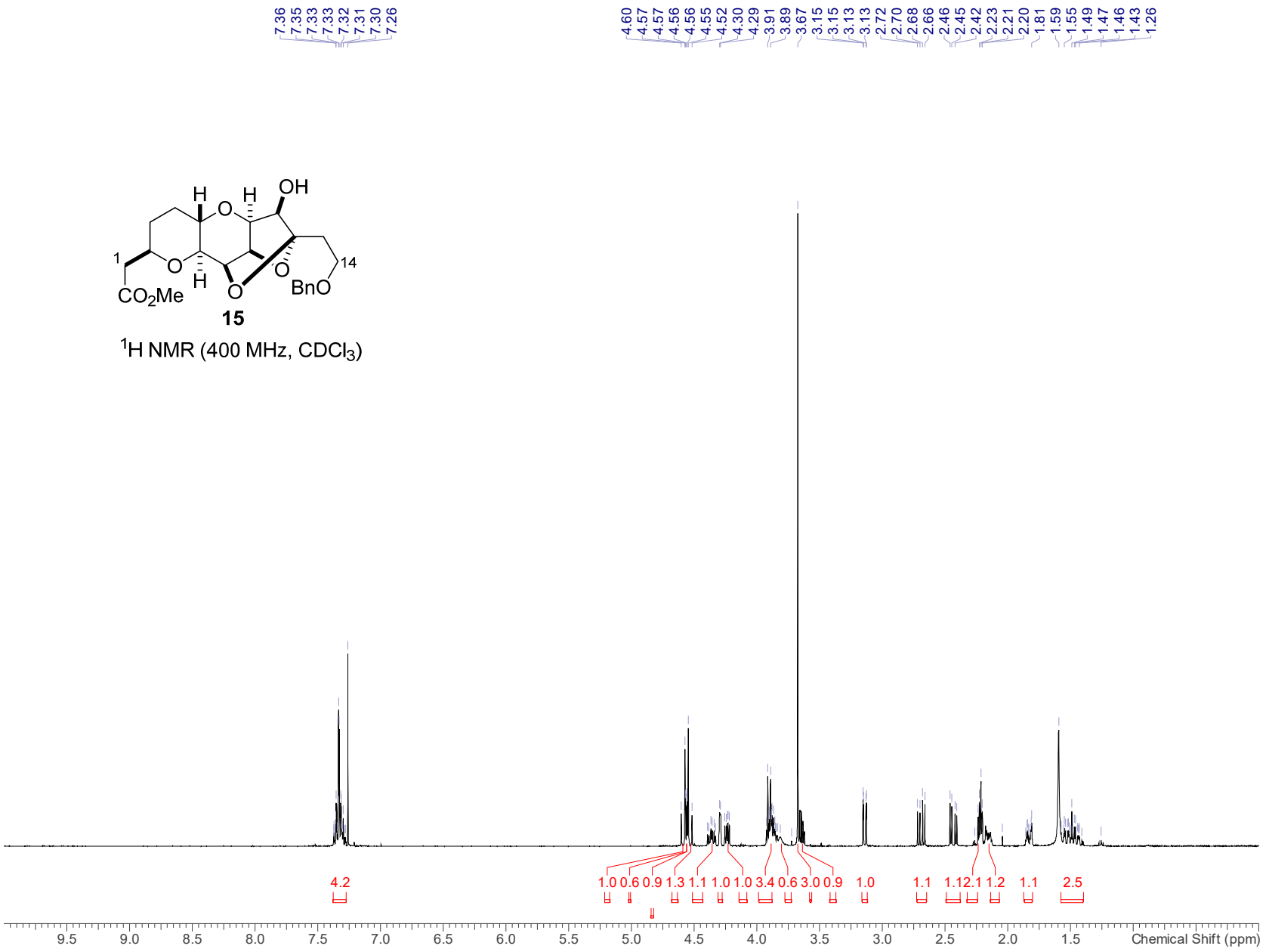

171.31
137.08
128.60
128.07
128.00
111.81
81.05
77.31
77.20
77.00
76.68
75.09
74.73
74.51
74.15
73.57
65.62
65.07
51.66
40.26
30.45
28.61
H
H
OH
O
1
O
H
O
O
14
CO2Me
BnO
14
13C NMR (101 MHz, CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)

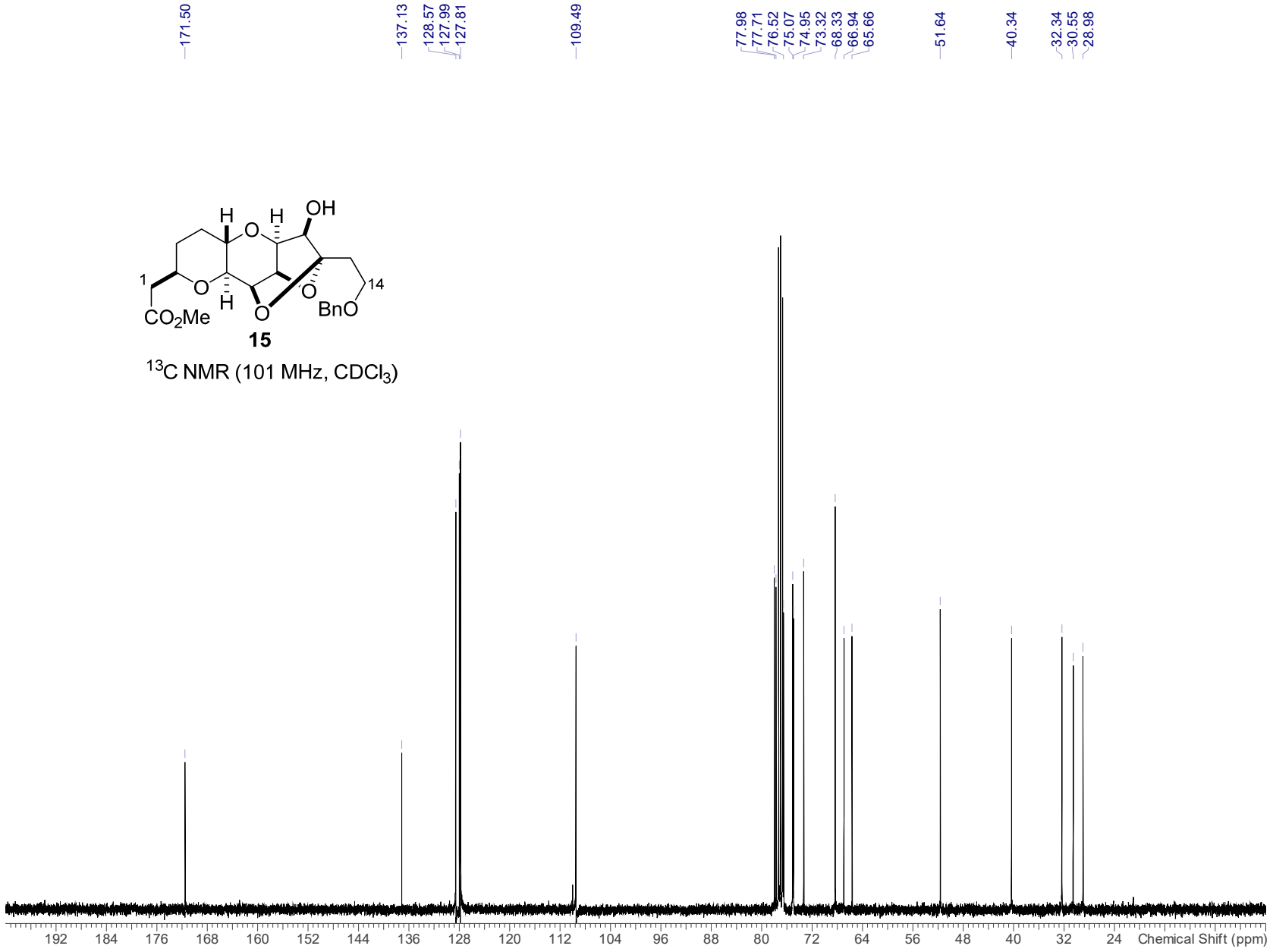


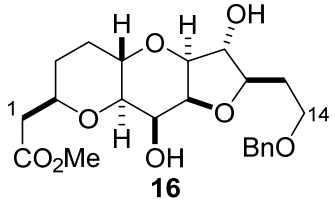

**S1**

$^1$H NMR (400 MHz, $CDCl_3$)


197.79
171.30
138.10
128.36
127.64
127.60
105.84
77.32
77.21
77.00
76.68
75.28
74.40
74.11
73.50
72.99
66.58
64.07
51.72
40.08
30.14
28.45
26.44
H
H
O
O
1
O
14
O
H
O
BnO
CO2Me
S1
13C NMR (101 MHz, CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)

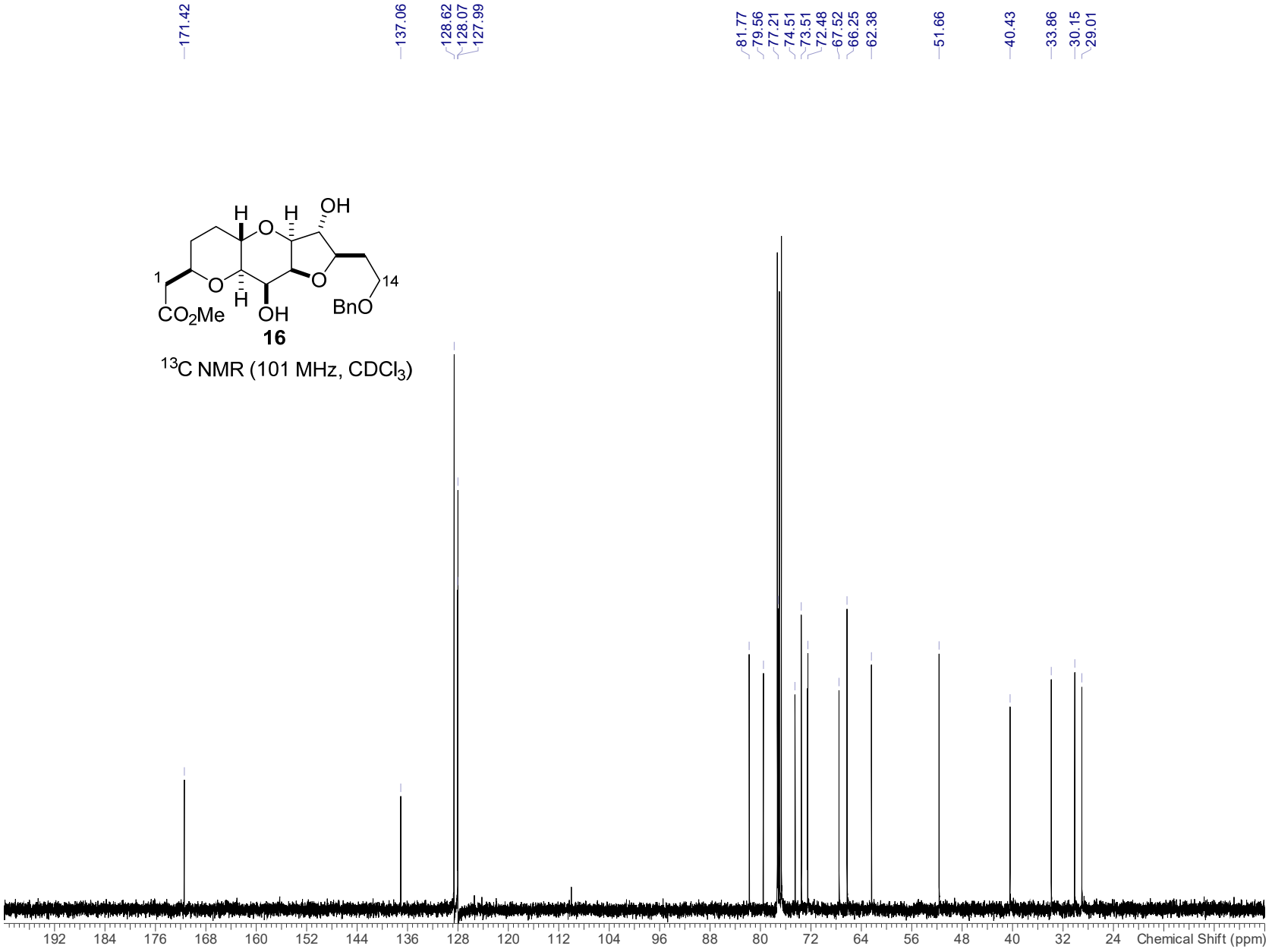

7.36
7.35
7.33
7.33
7.32
7.31
7.30
7.26
4.60
4.57
4.57
4.56
4.56
4.55
4.52
4.30
4.29
3.91
3.89
3.67
3.15
3.15
3.13
3.13
2.72
2.70
2.68
2.66
2.46
2.45
2.42
2.23
2.21
2.20
1.81
1.59
1.55
1.49
1.47
1.46
1.43
1.26
OH
H
H
O
O
1
14
O
H
O
O
BnO
CO2Me
15
1H NMR (400 MHz, CDCl3)
4.2
1.0 0.6 0.9 1.3 1.1 1.0 1.0 3.4 0.6 3.0 0.9 1.0 1.1 1.1 2.1 1.2 1.1 2.5
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
Chemical Shift (ppm)

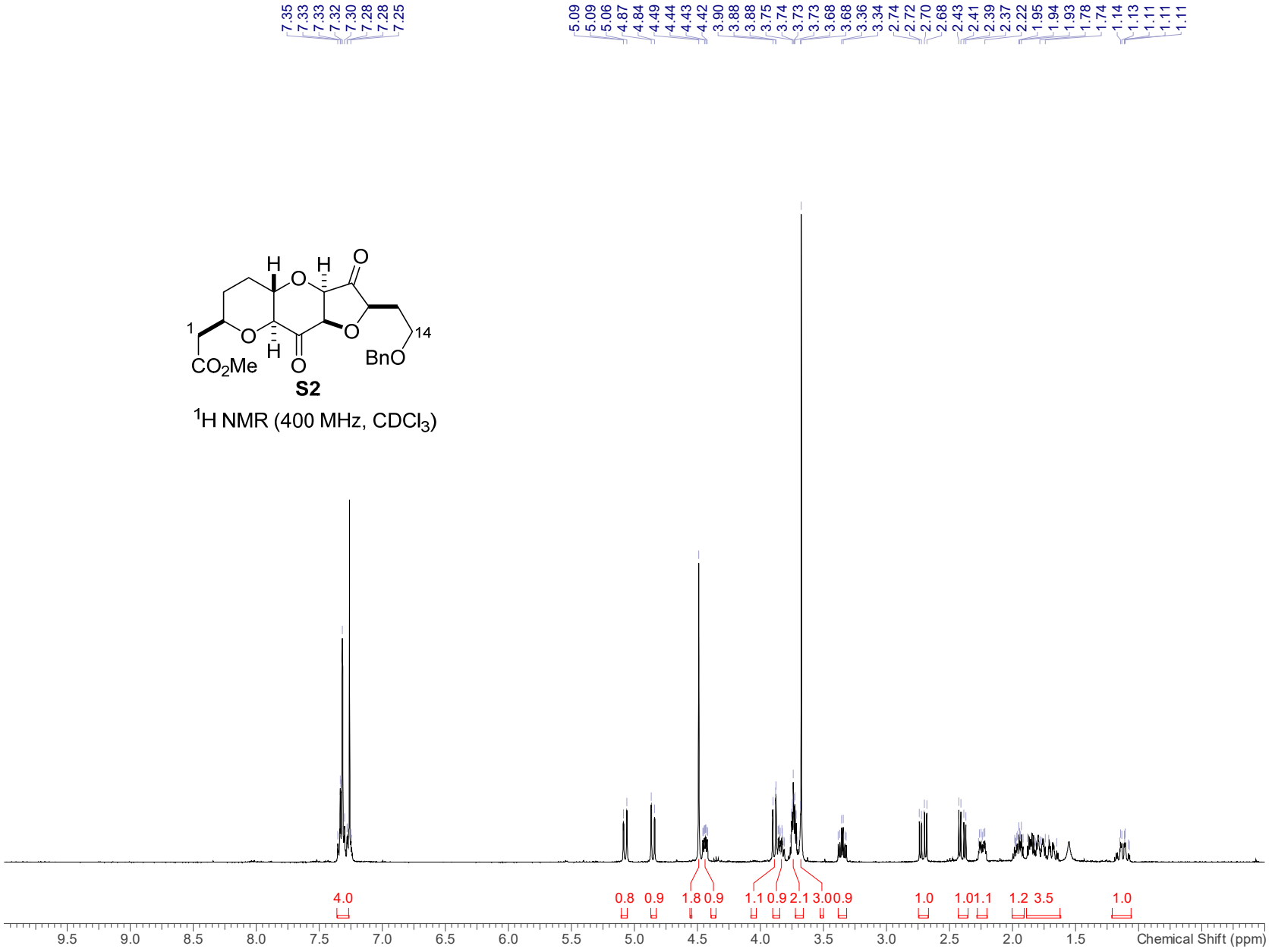

171.50
137.13
128.57
127.99
127.81
109.49
77.98
77.71
76.52
75.07
74.95
73.32
68.33
66.94
65.66
51.64
40.34
32.34
30.55
28.98
H
H
OH
O
O
1
14
O
H
O
O
BnO
CO2Me
15
13C NMR (101 MHz, CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)




**16**

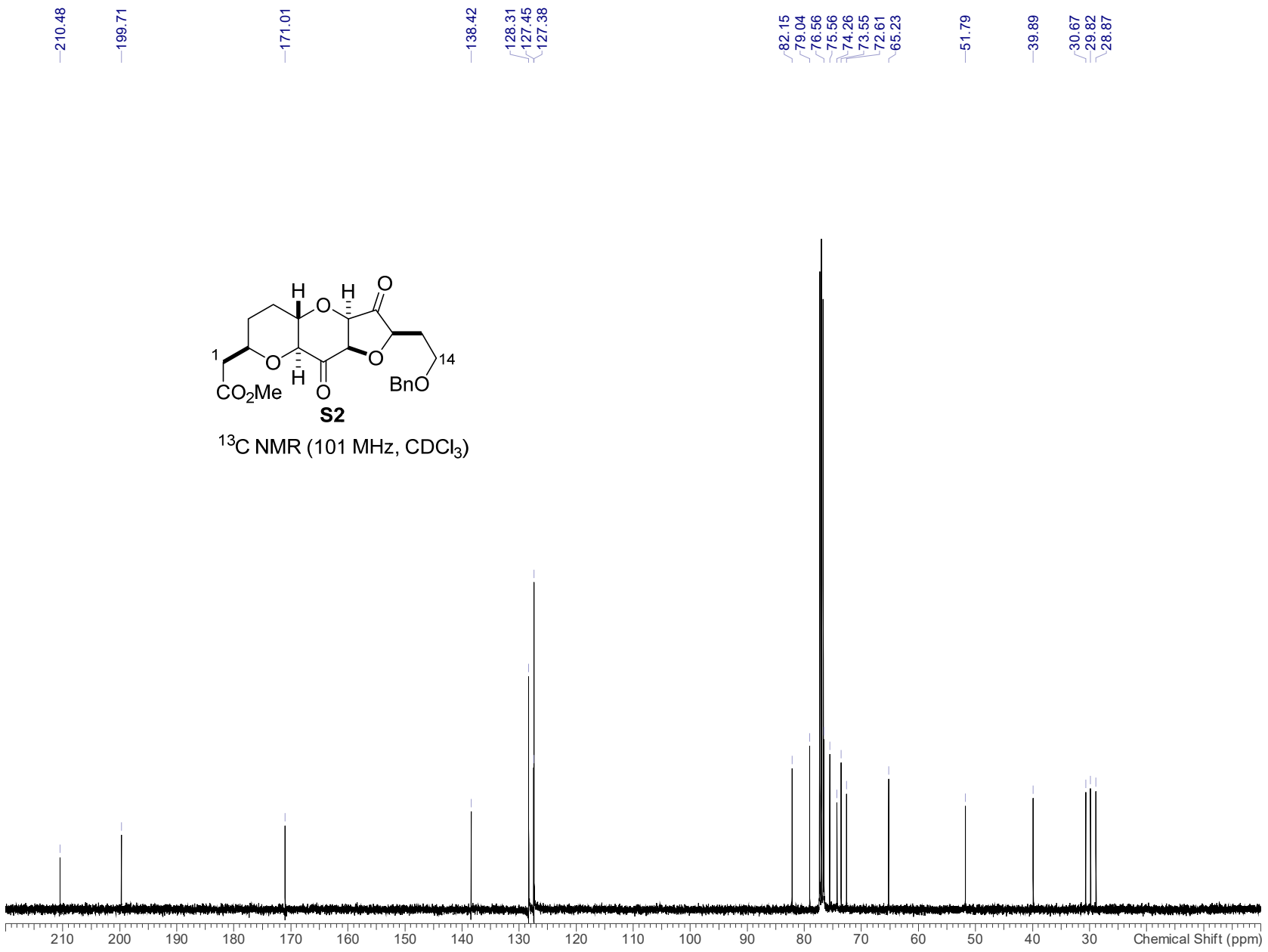
$^1$H NMR (400 MHz, $CDCl_3$)


171.42
137.06
128.62
128.07
127.99
81.77
79.56
77.21
74.51
73.51
72.48
67.52
66.25
62.38
51.66
40.43
33.86
30.15
29.01
H
H
OH
O
1
O
O
14
H
CO2Me
OH
BnO
16
13C NMR (101 MHz, CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)



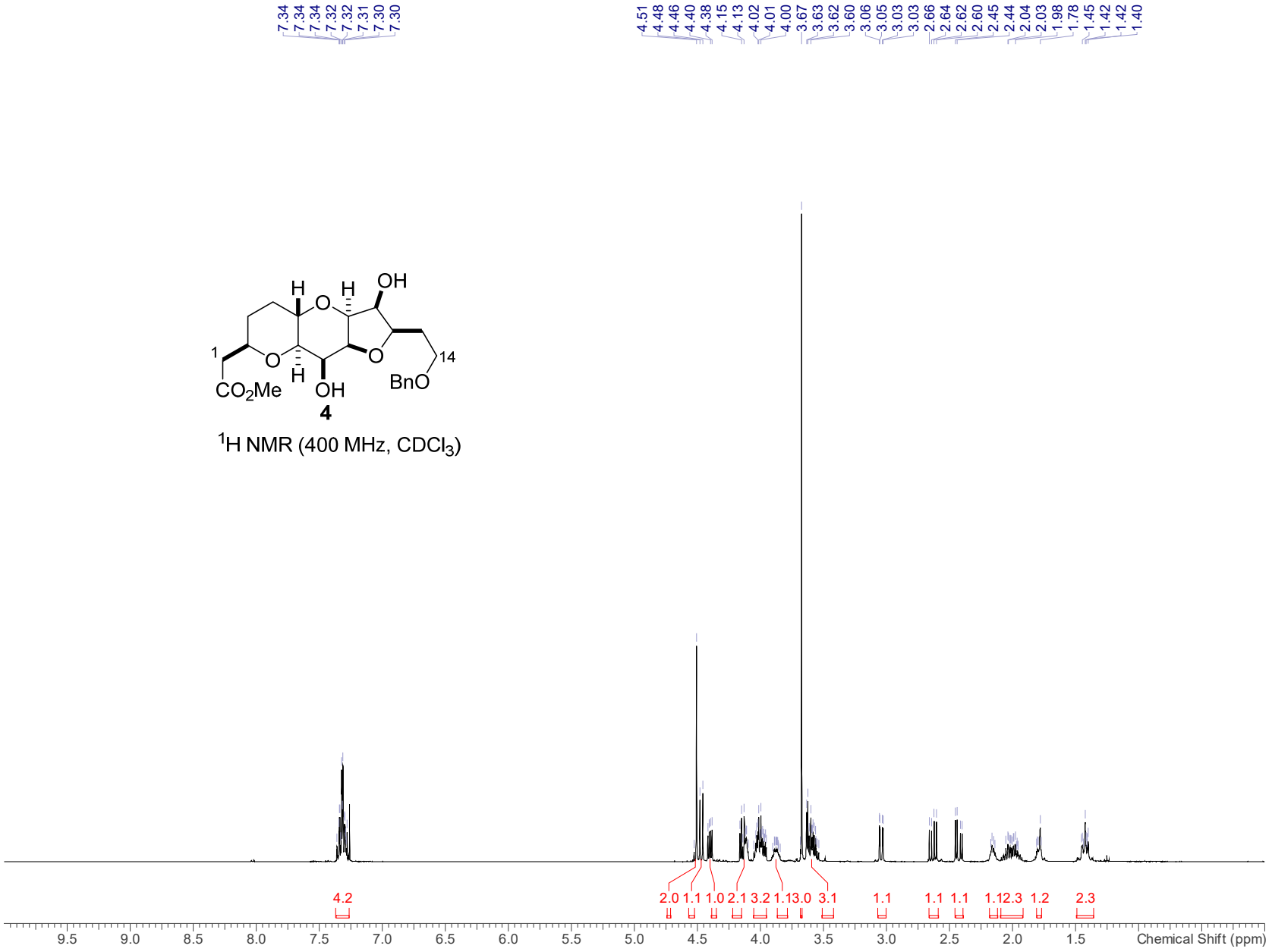

**S2**

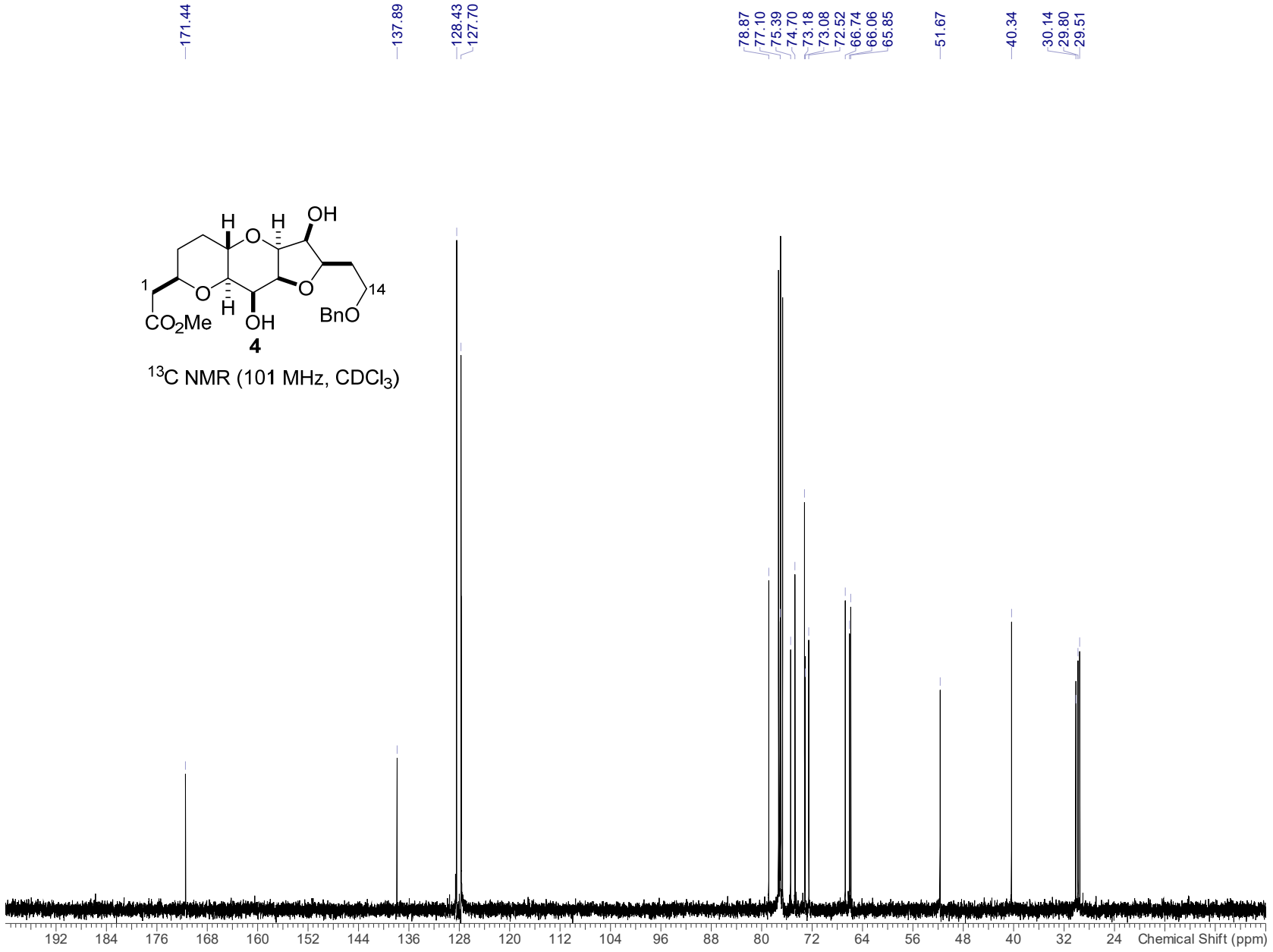
$^1$H NMR (400 MHz, $CDCl_3$)




**S2**

$^{13}C$ NMR (101 MHz, $CDCl_3$)

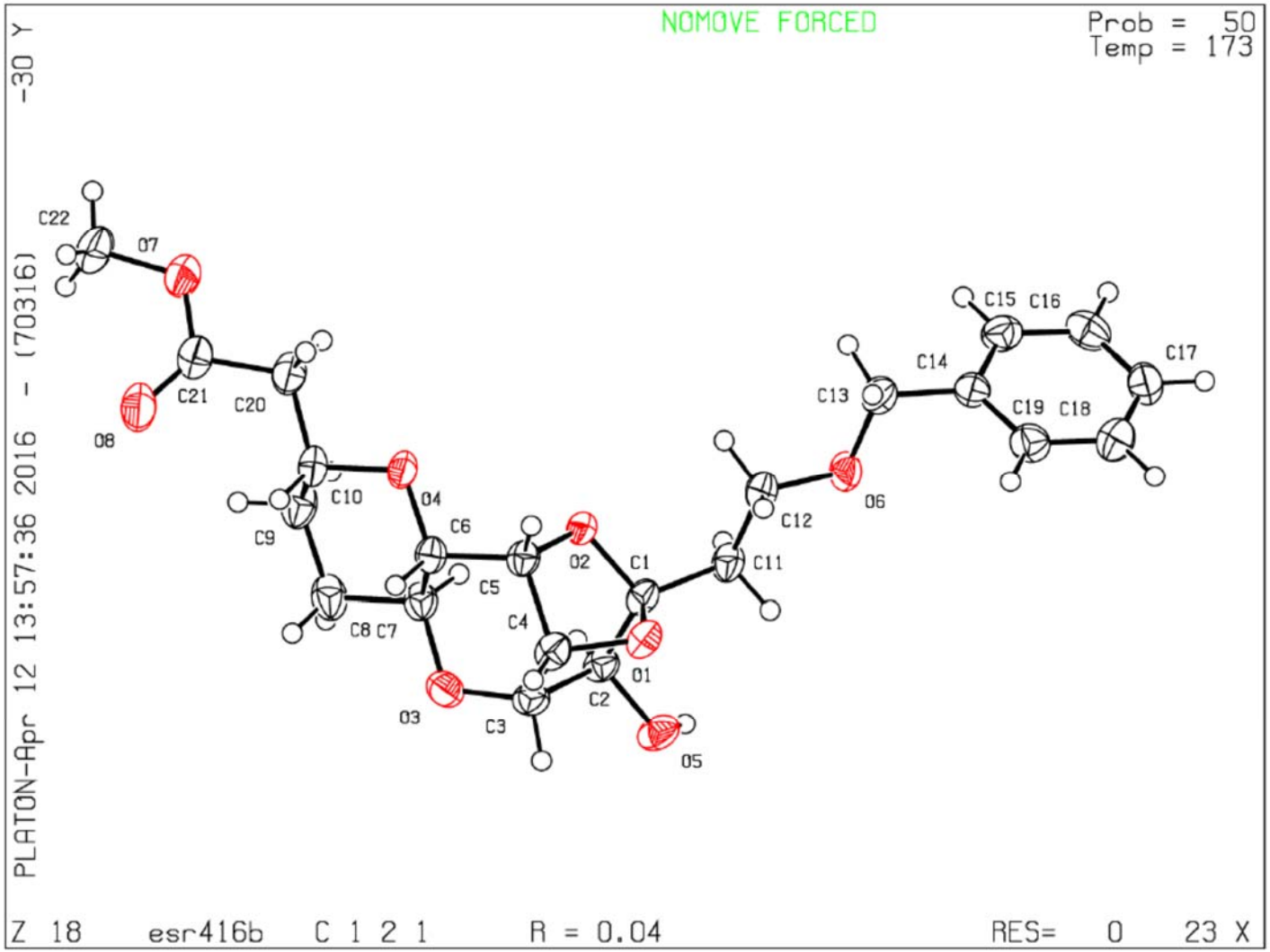

7.34
7.34
7.34
7.32
7.32
7.31
7.30
7.30
4.51
4.48
4.46
4.40
4.38
4.15
4.13
4.02
4.01
4.00
3.67
3.63
3.62
3.60
3.06
3.05
3.03
3.03
2.66
2.64
2.62
2.60
2.45
2.44
2.04
2.03
1.98
1.78
1.45
1.42
1.42
1.40
H
O
H
OH
1
O
O
14
H
CO2Me
OH
BnO
4
1H NMR (400 MHz, CDCl3)
4.2
2.0
1.1
1.0
2.1
3.2
1.1
3.0
3.1
1.1
1.1
1.1
1.1
2.3
1.2
2.3
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
Chemical Shift (ppm)


171.44
137.89
128.43
127.70
78.87
77.10
75.39
74.70
73.18
73.08
72.52
66.74
66.06
65.85
51.67
40.34
30.14
29.80
29.51
H
H
OH
O
O
O
O
H
1
14
CO2Me
OH
BnO
4
13C NMR (101 MHz, CDCl3)
192
184
176
168
160
152
144
136
128
120
112
104
96
88
80
72
64
56
48
40
32
24
Chemical Shift (ppm)

## X-ray data of compound 14

**Experimental.** Single colourless needle-shaped crystals of compound **14** were used as received. A suitable crystal (0.44×0.10×0.07) $mm^3$ was selected and mounted on a nylon loop with paratone oil on a Bruker APEX-II CCD diffractometer. The crystal was kept at $T$ = 173(2) K during data collection. Using **Olex2** (Dolomanov et al., 2009), the structure was solved with the **ShelXS** (Sheldrick, 2008) structure solution program, using the Direct Methods solution method. The model was refined with version of **XL** (Sheldrick, 2008) using Least Squares minimisation.

**Crystal Data.** $C_{22}H_{28}O_8$, Mr = 420.44, monoclinic, C2 (No. 5), a = 33.1345(5) Å, b = 5.78770(10) Å, c = 10.7579(2) Å, β = 92.1810(10)°, α = γ = 90°, V = 2061.58(6) $Å^3$, T = 173(2) K, Z = 4, Z' = 1, μ(Cu$K_\alpha$) = 0.859, 11841 reflections measured, 3862 unique ($R_{int}$ = 0.0391) which were used in all calculations. The final $wR_2$ was 0.0945 (all data) and $R_1$ was 0.0367 (I > 2(I)).

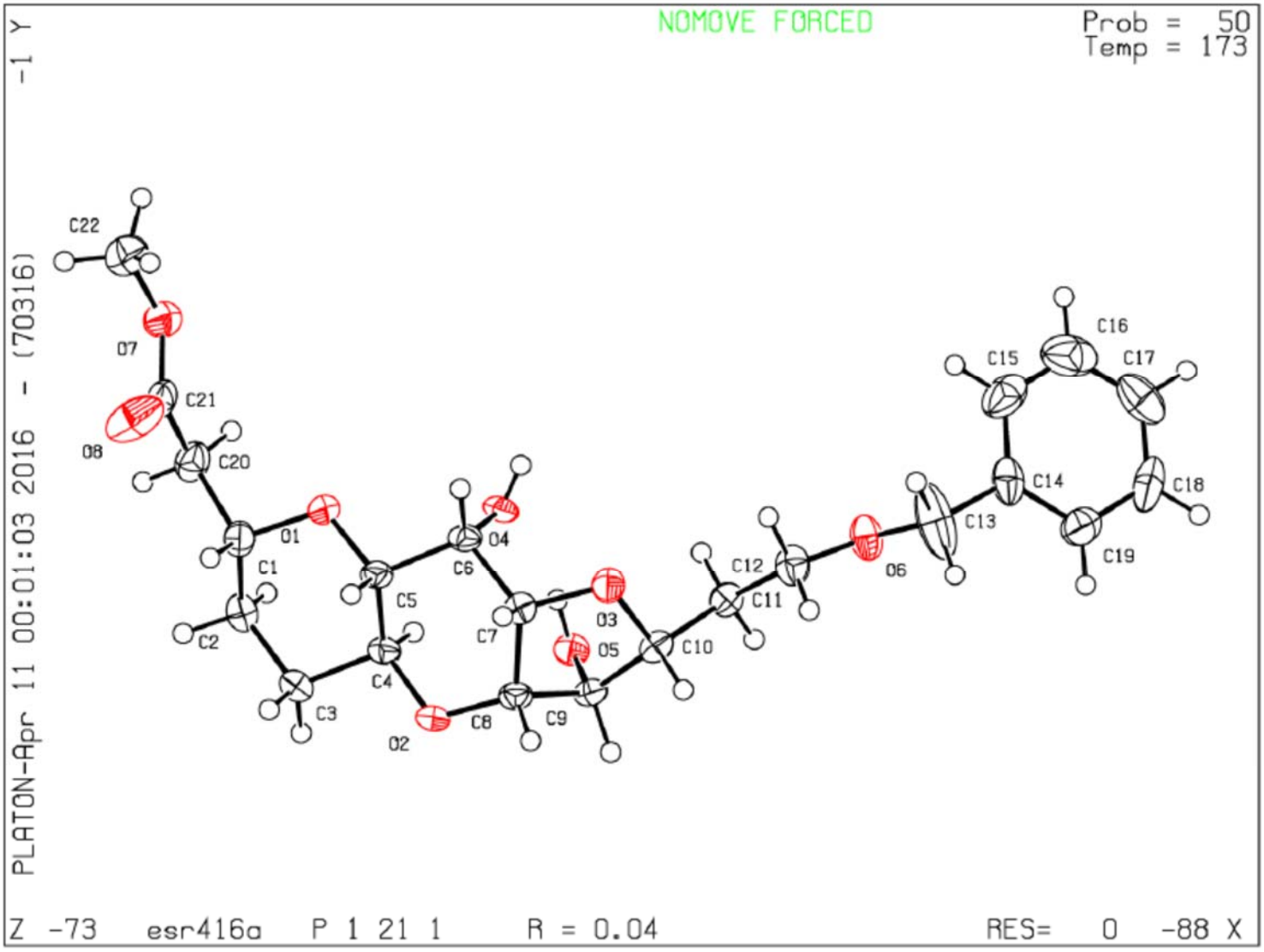



X-ray crystal structure of compound **14** (ellipsoids at 50% probability)

## X-ray data of compound 4

**Experimental.** Single colourless plate-shaped crystals of compound **4** were used as received. A suitable crystal (0.27×0.17×0.03) $mm^3$ was selected and mounted on a nylon loop with paratone oil on a Bruker APEX-II CCD diffractometer. The crystal was kept at $T$ = 173(2) K during data collection. Using Olex2 (Dolomanov et al., 2009), the structure was solved with the ShelXS (Sheldrick, 2008) structure solution program, using the Direct Methods solution method. The model was refined with version of XL (Sheldrick, 2008) using Least Squares minimisation.

**Crystal Data**. $C_{22}H_{30}O_8$, $M_r$ = 422.46, monoclinic, $P2_1$ (No. 4), a = 6.12890(10) Å, b = 9.1873(2) Å, c = 18.5609(3) Å, $b$ = 97.5180(10)°, $a$ = $g$ = 90°, $V$ = 1036.14(3) $Å^3$, $T$ = 173(2) K, $Z$ = 2, $Z'$ = 1, $m$($CuK_a$) = 0.855, 9574 reflections measured, 3976 unique ($R_{int}$ = 0.0335) which were used in all calculations. The final $wR_2$ was 0.0979 (all data) and $R_1$ was 0.0403 (I > 2(I)).




X-ray crystal structure of compound **4** (ellipsoids at 50% probability)