Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Tetranuclear Zinc cluster: a dual purpose catalyst for per-*O*-acetylation and de-*O*-acetylation of carbohydrates

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[♀] Authors have equal contribution

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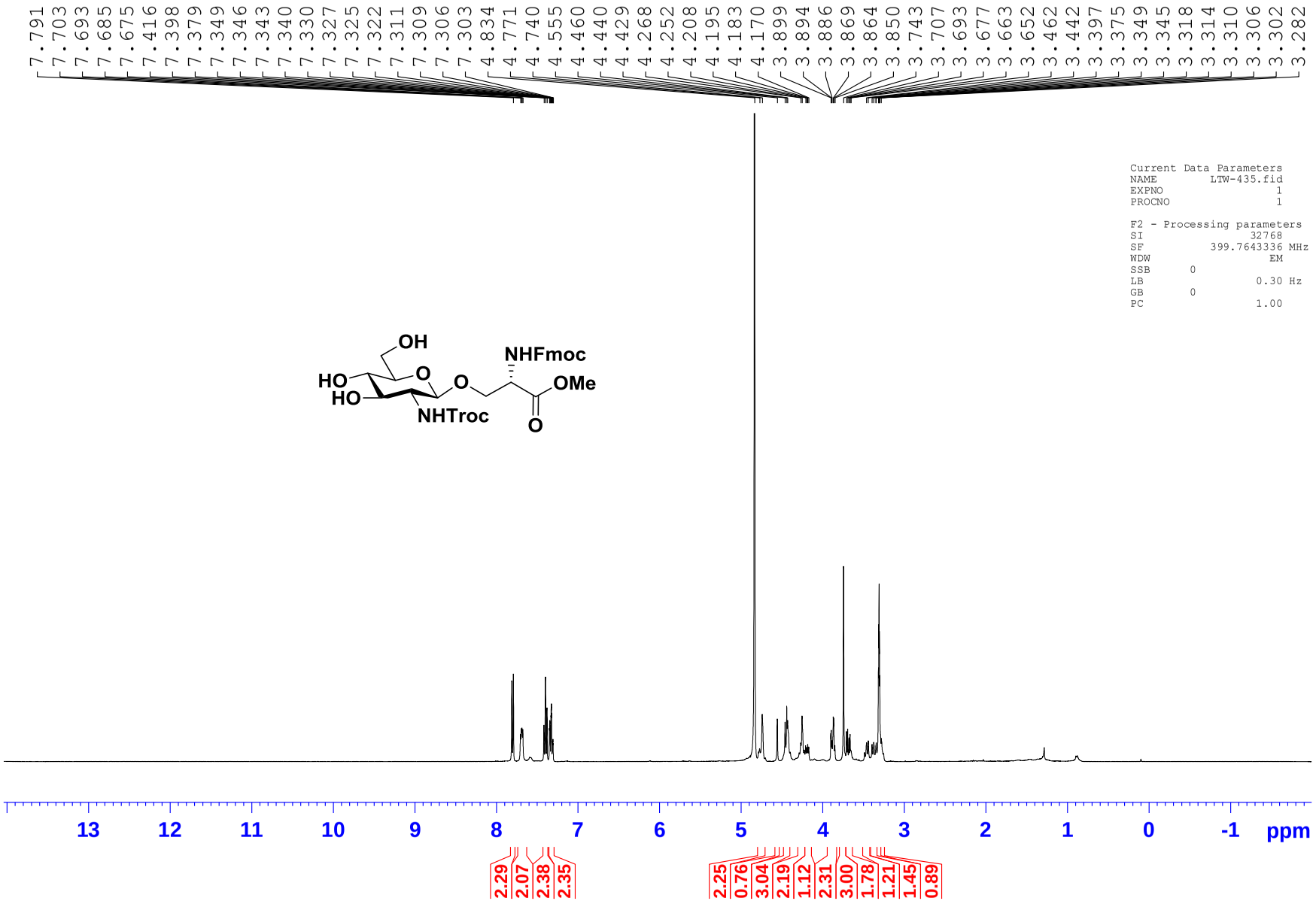
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7.379
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7.346
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7.330
7.327
7.325
7.322
7.311
7.309
7.306
7.303
4.834
4.771
4.740
4.555
4.460
4.440
4.429
4.268
4.252
4.208
4.195
4.183
4.170
3.899
3.894
3.886
3.869
3.864
3.850
3.743
3.707
3.693
3.677
3.663
3.652
3.462
3.442
3.397
3.375
3.349
3.345
3.318
3.314
3.310
3.306
3.302
3.282
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PROCNO 1
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GB 0
PC 1.00
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HO
HO
O
O
NHTroc
NHFmoc
OMe
O
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
ppm
2.29
2.07
2.38
2.35
2.25
0.76
3.04
2.19
1.12
2.31
3.00
1.78
1.21
1.45
0.89

Current Data Parameters
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EXPNO 7
PROCNO 1
F2 - Acquisition Parameters
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PULPROG zgpg30
TD 65536
SOLVENT MeOD
NS 582
DS 0
SWH 22727.273 Hz
FIDRES 0.346791 Hz
AQ 1.4418420 sec
RG 2050
DW 22.000 use
DE 6.00 use
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TDO 1
======== CHANNEL f1 ========
NUC1 13C
P1 9.70 use
PL1 -0.50 dB
SFO1 100.6288660 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 use
PL2 -2.40 dB
PL12 15.10 dB
PL13 18.10 dB
SFO2 400.1516010 MHz
F2 - Processing parameters
SI 32768
SF 100.6176604 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
OH
HO
HO
O
O
NHTroc
NHFmoc
OMe
O
ppm
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
48.30
48.37
48.58
48.79
49.00
49.22
49.43
49.64
53.10
55.75
58.96
62.67
68.33
69.79
71.97
75.50
75.67
78.01
97.04
102.92
120.95
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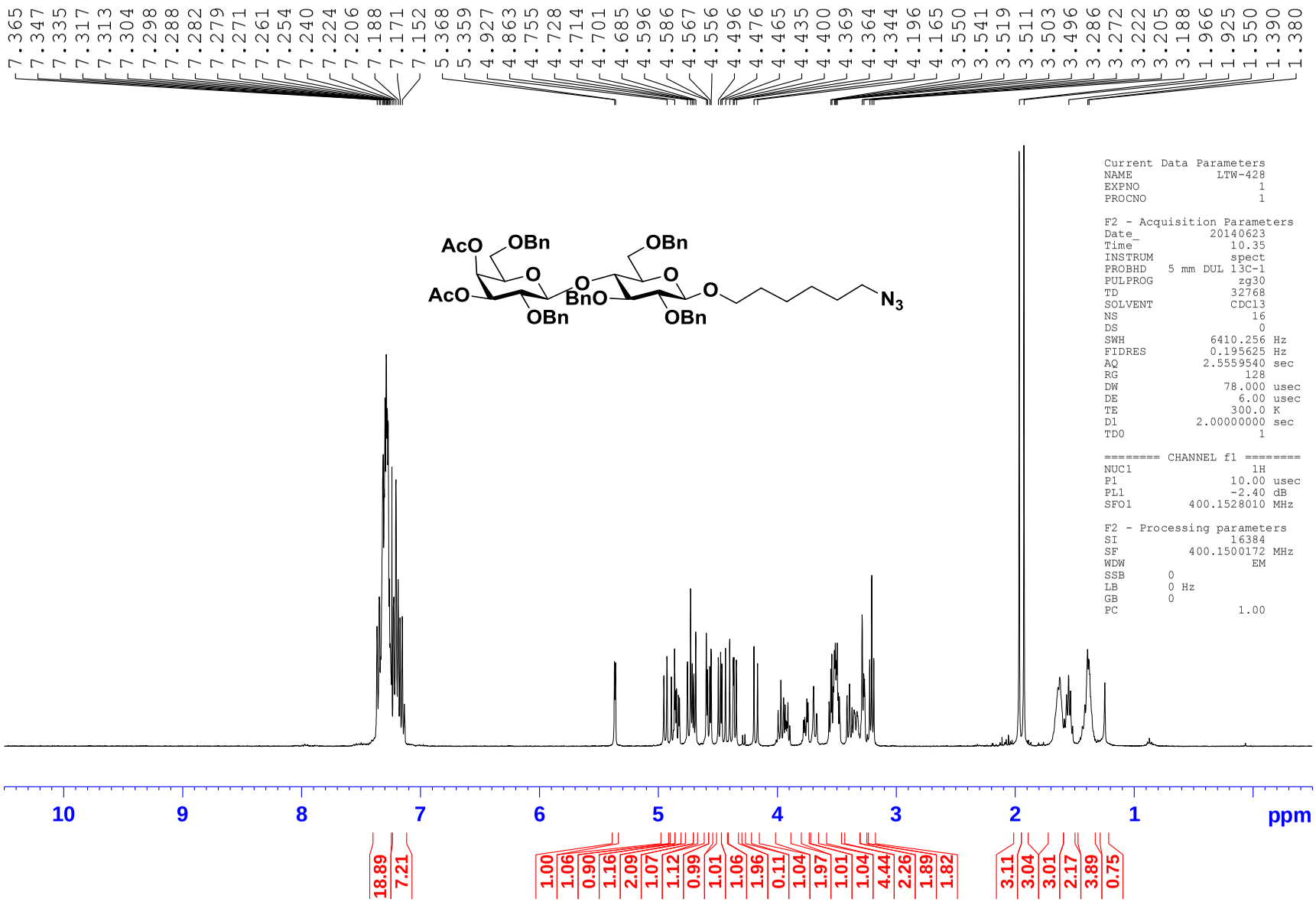
128.84
142.53
145.07
145.15
157.19
158.41
172.25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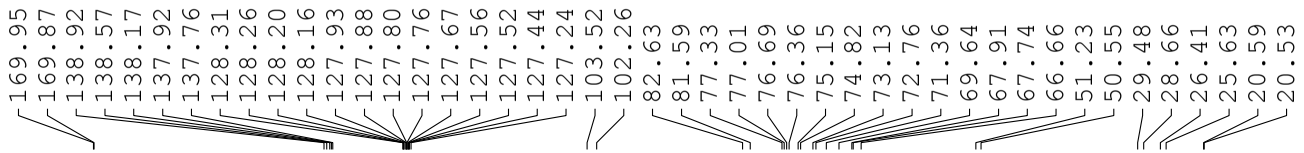
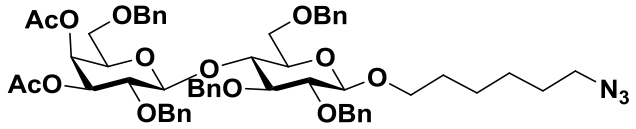
5.368 5.359 4.927 4.863 4.755 4.728 4.714 4.701 4.685 4.596 4.586 4.567 4.556 4.496 4.476 4.465 4.435 4.400 4.369 4.364 4.344 4.196 4.165 3.550 3.541 3.519 3.511 3.503 3.496 3.286 3.272 3.222 3.205 3.188 1.966 1.925 1.550 1.390 1.380
AcO
OBn
O
AcO
BnO
OBn
O
OBn
O
OBn
O
N3
Current Data Parameters
NAME LTW-428
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140623
Time 10.35
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 128
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500172 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
10 9 8 7 6 5 4 3 2 1 ppm
18.89 7.21
1.00 1.06 0.90 1.16 2.09 1.07 1.12 0.99 1.01 1.06 1.96 0.11 1.04 1.97 1.01 1.04 4.44 2.26 1.89 1.82
3.11 3.04 3.01 2.17 3.89 0.75



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Current Data Parameters
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EXPNO                 2
PROCNO                1

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PROBHD   5 mm DUL 13C-1
PULPROG         zgpg30
TD                65536
SOLVENT           CDCl3
NS                  200
DS                    0
SWH           22727.273 Hz
FIDRES         0.346791 Hz
AQ             1.4418420 sec
RG                 2050
DW               22.000 use
DE                6.00 use
TE                300.0 K
D1           2.00000000 sec
d11          0.03000000 sec
DELTA        1.89999998 sec
TD0                   1

======== CHANNEL f1 =======
NUC1                13C
P1                 9.70 use
PL1               -0.50 dB
SFO1       100.6288660 MHz

======== CHANNEL f2 =======
CPDPRG2          waltz16
NUC2                1H
PCPD2            90.00 use
PL2              -2.40 dB
PL12              15.10 dB
PL13              18.10 dB
SFO2       400.1516010 MHz

F2 - Processing parameters
SI                 32768
SF         100.6178138 MHz
WDW                   EM
SSB      0
LB                 3.00 Hz
GB       0
PC                 1.00
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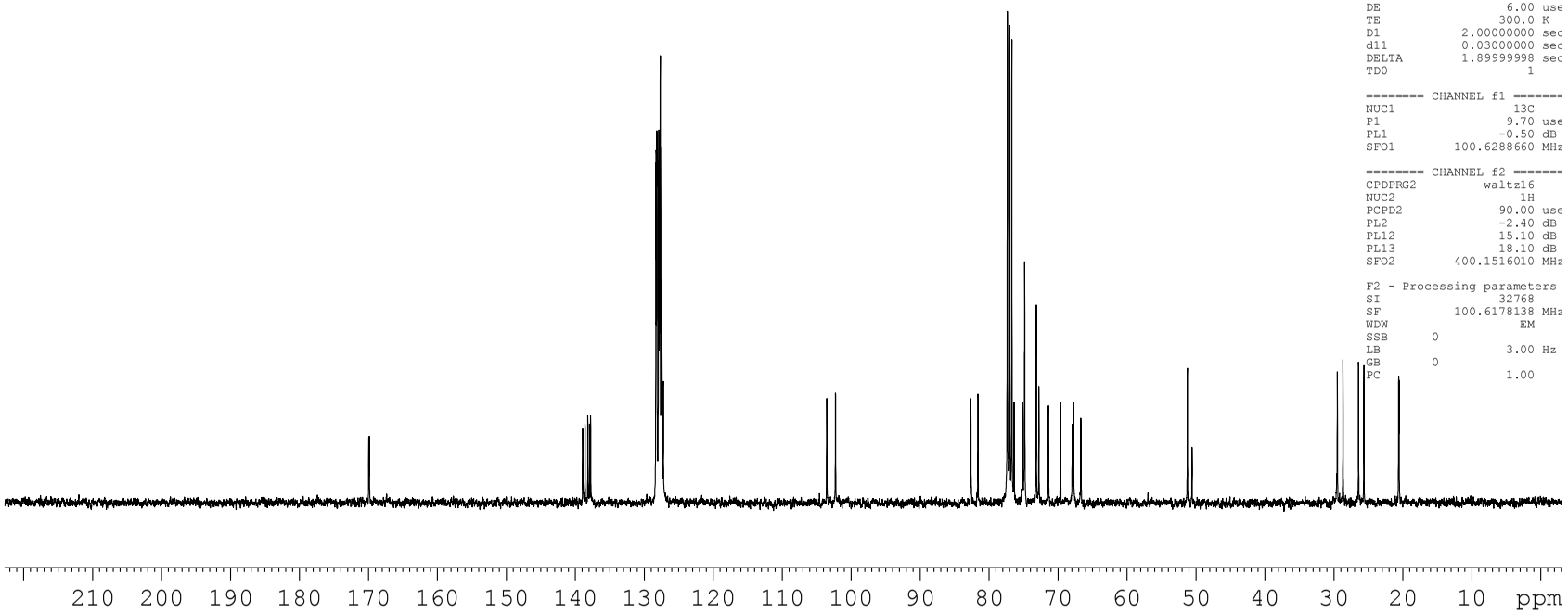

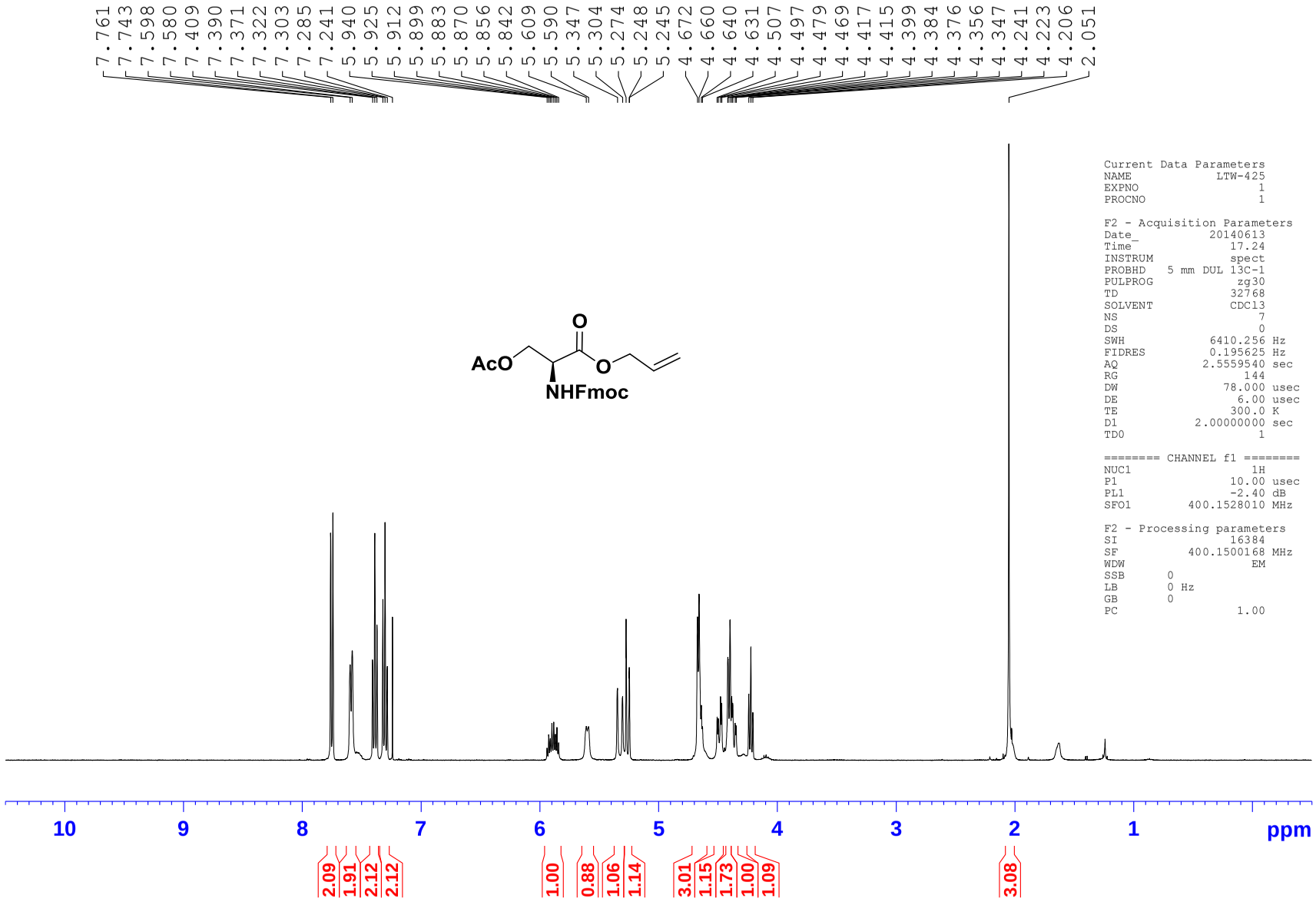
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7.580
7.409
7.390
7.371
7.322
7.303
7.285
7.241
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5.925
5.912
5.899
5.883
5.870
5.856
5.842
5.609
5.590
5.347
5.304
5.274
5.248
5.245
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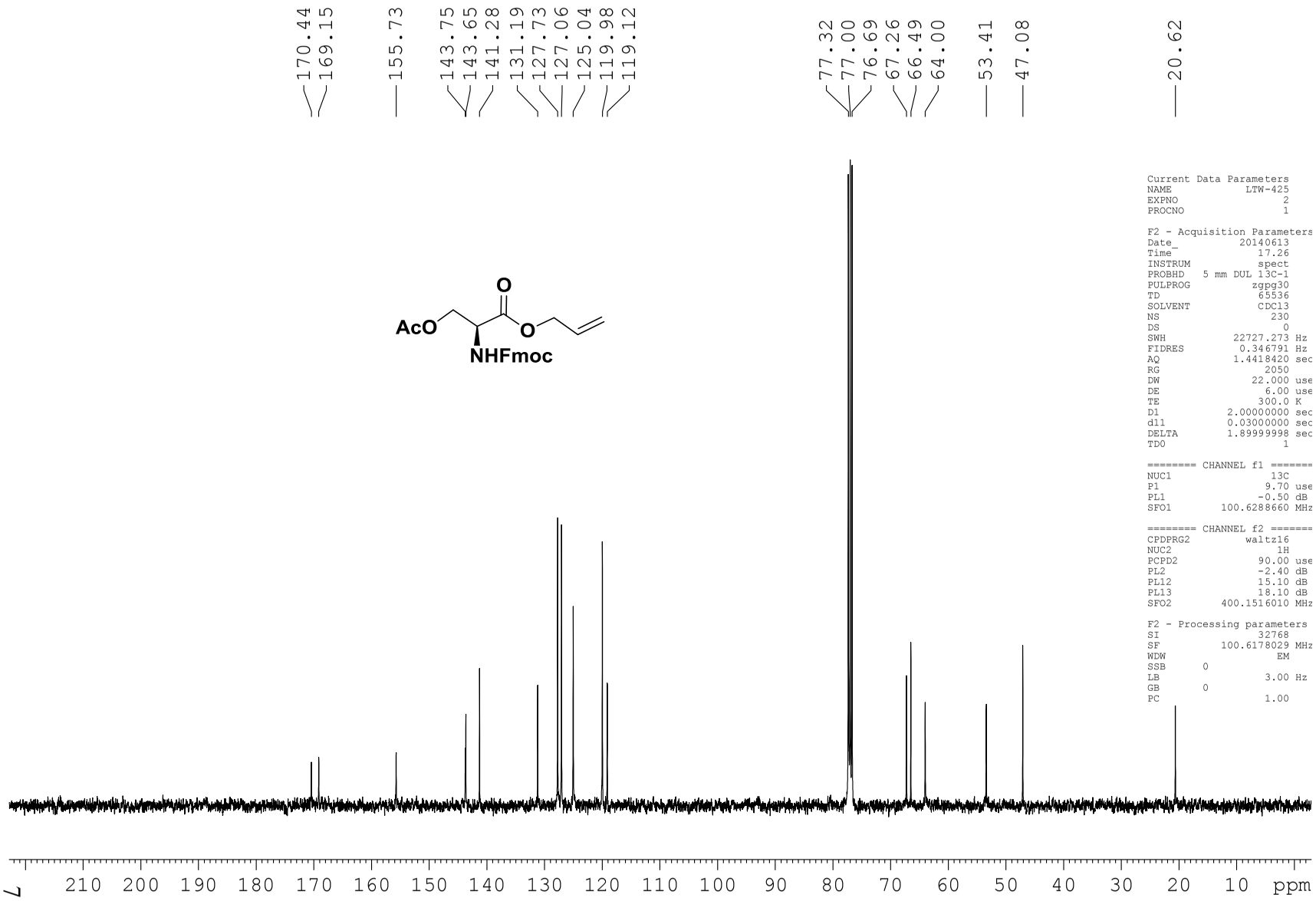
4.660
4.640
4.631
4.507
4.497
4.479
4.469
4.417
4.415
4.399
4.384
4.376
4.356
4.347
4.241
4.223
4.206
2.051
AcO
O
O
NHFmoc
Current Data Parameters
NAME LTW-425
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140613
Time 17.24
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 7
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 144
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500168 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
10
9
8
7
6
5
4
3
2
1
ppm
2.09
1.91
2.12
2.12
1.00
0.88
1.06
1.14
3.01
1.15
1.73
1.00
1.09
3.08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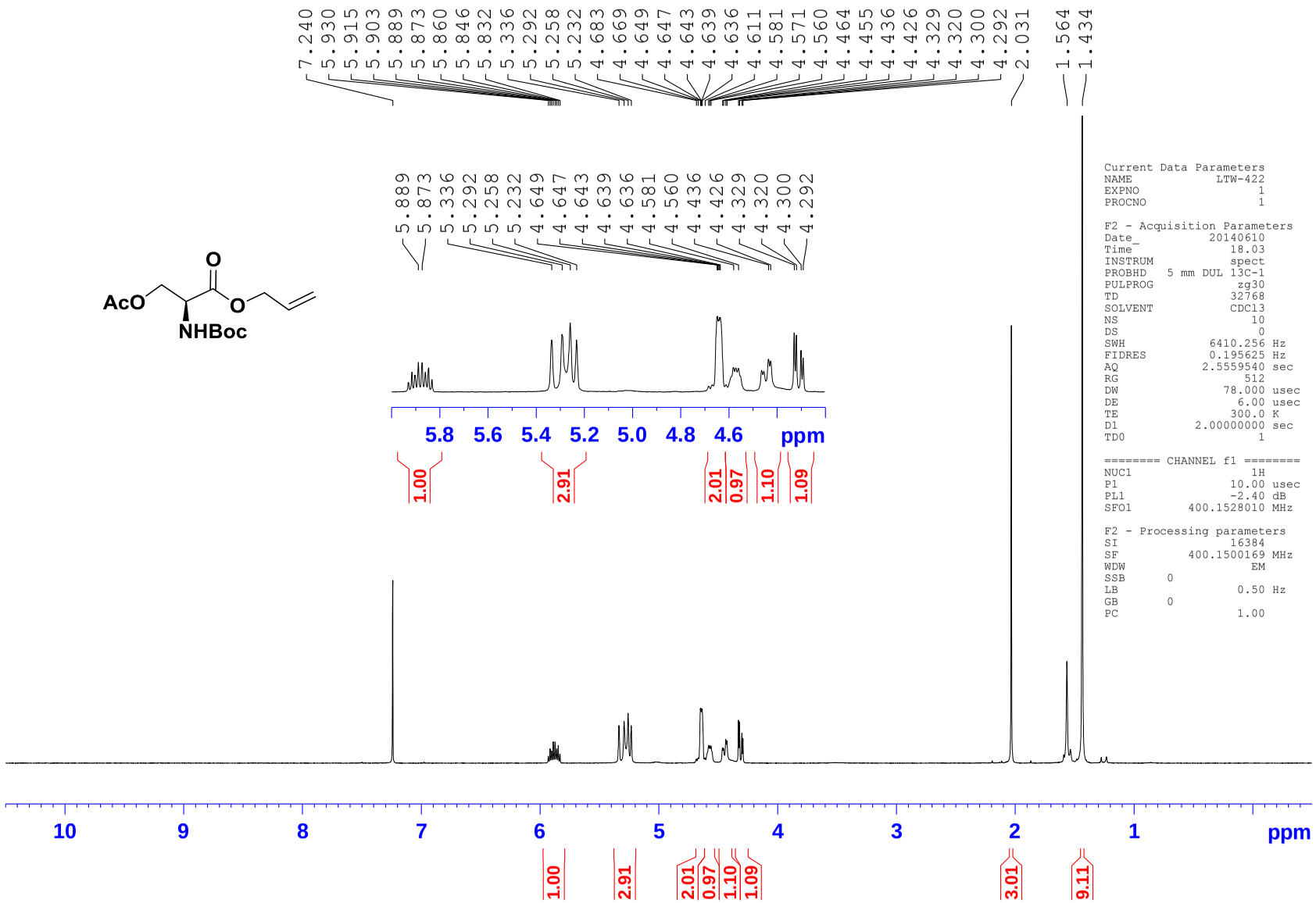
169.15
155.73
143.75
143.65
141.28
131.19
127.73
127.06
125.04
119.98
119.12
77.32
77.00
76.69
67.26
66.49
64.00
53.41
47.08
20.62
AcO
O
O
NHFmoc
Current Data Parameters
NAME LTW-425
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140613
Time_ 17.26
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 230
DS 0
SWH 22727.273 Hz
FIDRES 0.346791 Hz
AQ 1.4418420 sec
RG 2050
DW 22.000 use
DE 6.00 use
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 =======
NUC1 13C
P1 9.70 use
PL1 -0.50 dB
SFO1 100.6288660 MHz
======== CHANNEL f2 =======
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 use
PL2 -2.40 dB
PL12 15.10 dB
PL13 18.10 dB
SFO2 400.1516010 MHz
F2 - Processing parameters
SI 32768
SF 100.6178029 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

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Current Data Parameters
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EXPNO                       1
PROCNO                      1

F2 - Acquisition Parameters
Date_              20140610
Time                  18.03
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PROBHD   5 mm DUL 13C-1
PULPROG                zg30
TD                    32768
SOLVENT               CDCl3
NS                       10
DS                        0
SWH                6410.256 Hz
FIDRES            0.195625 Hz
AQ                2.5559540 sec
RG                      512
DW                   78.000 usec
DE                    6.00 usec
TE                   300.0 K
D1              2.00000000 sec
TD0                       1

======== CHANNEL f1 ========
NUC1                     1H
P1                   10.00 usec
PL1                  -2.40 dB
SFO1           400.1528010 MHz

F2 - Processing parameters
SI                    16384
SF             400.1500169 MHz
WDW                      EM
SSB       0
LB                    0.50 Hz
GB        0
PC                    1.00
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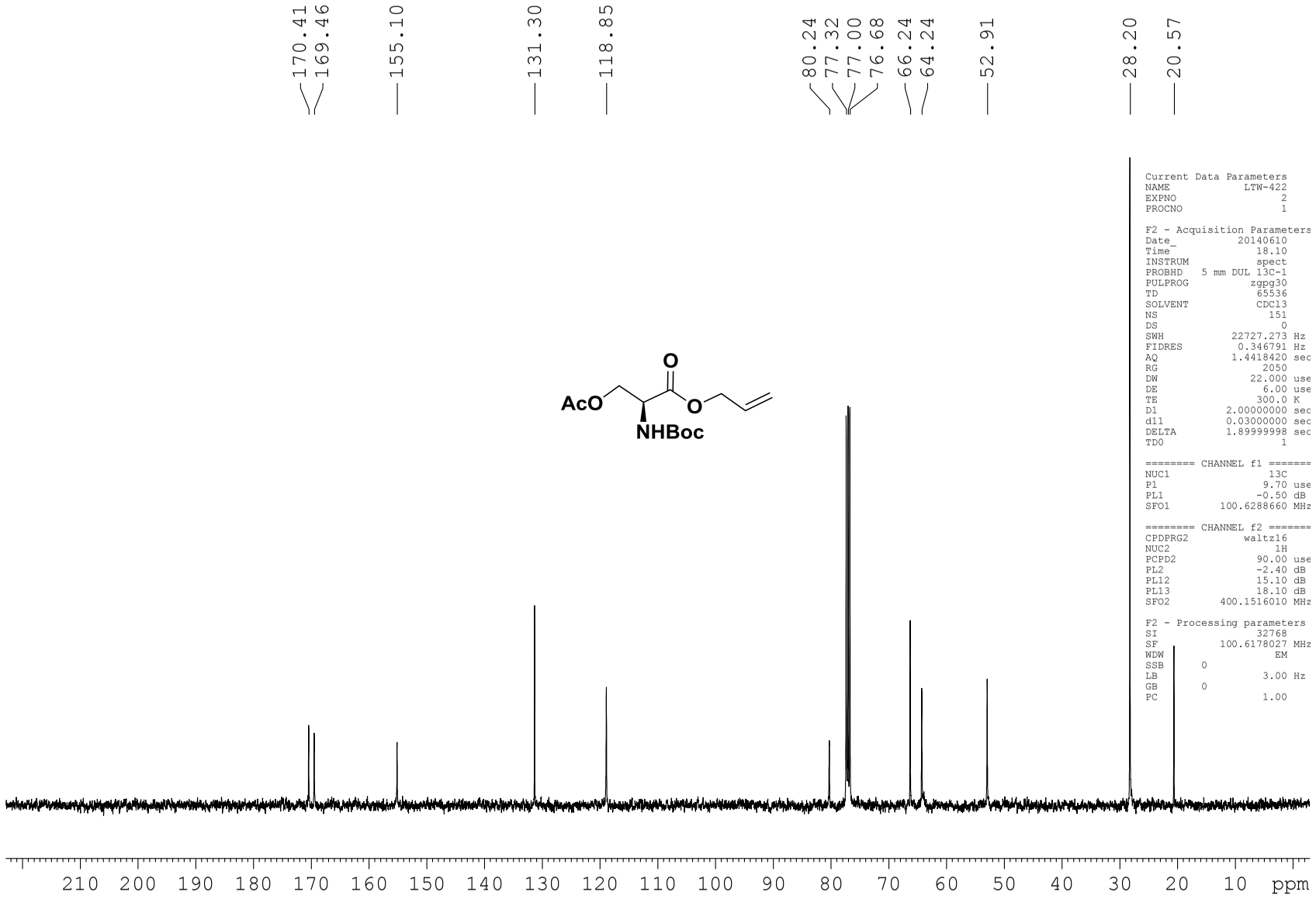
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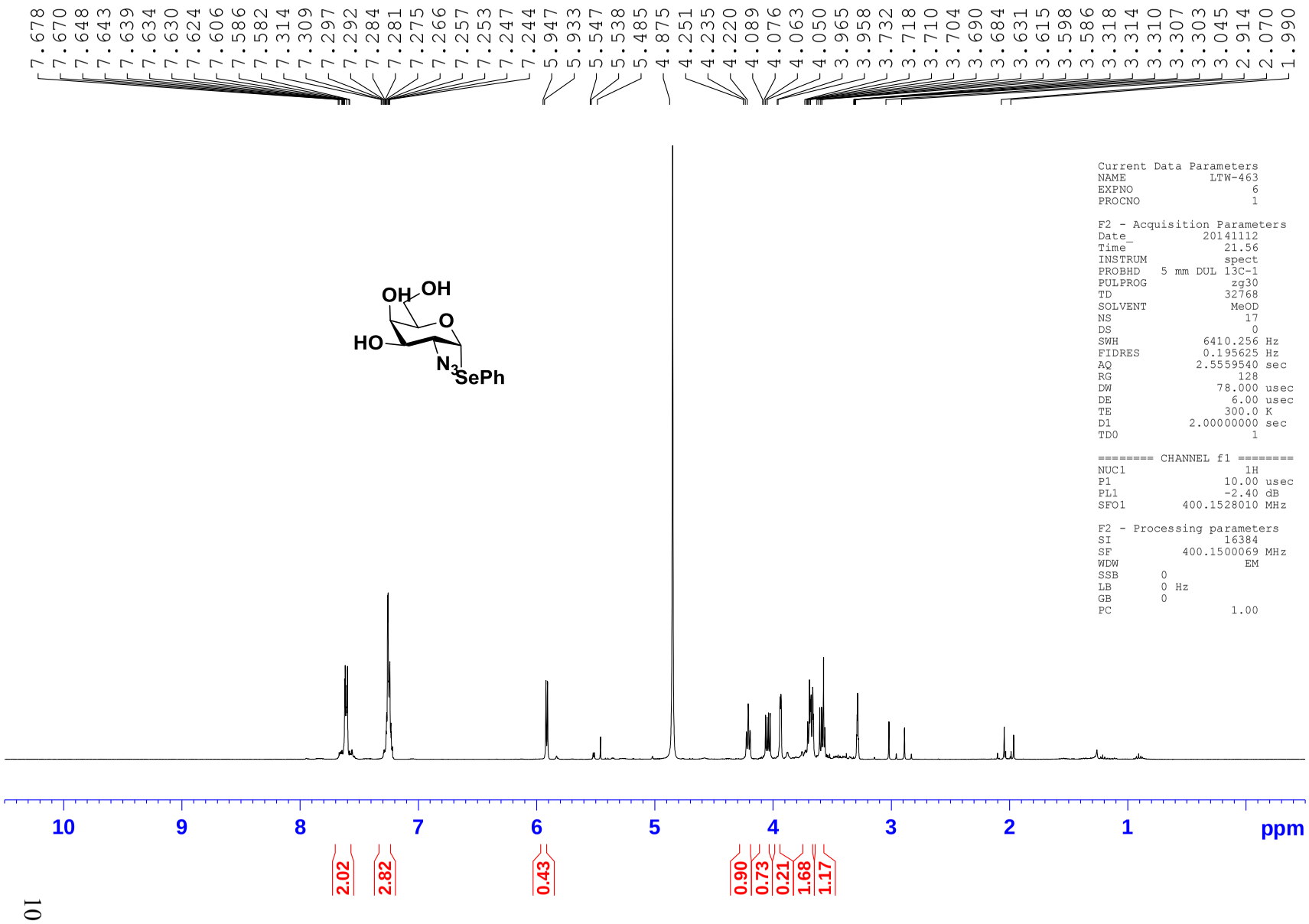
155.10
131.30
118.85
80.24
77.32
77.00
76.68
66.24
64.24
52.91
28.20
20.57
AcO
O
O
NHBoc
Current Data Parameters
NAME LTW-422
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20140610
Time 18.10
INSTRUM spect
PROBHD 5 mm DUL 13C-1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 151
DS 0
SWH 22727.273 Hz
FIDRES 0.346791 Hz
AQ 1.4418420 sec
RG 2050
DW 22.000 use
DE 6.00 use
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
======== CHANNEL f1 =======
NUC1 13C
P1 9.70 use
PL1 -0.50 dB
SFO1 100.6288660 MHz
======== CHANNEL f2 =======
CPDPRG2 waltz16
NUC2 1H
PCPD2 90.00 use
PL2 -2.40 dB
PL12 15.10 dB
PL13 18.10 dB
SFO2 400.1516010 MHz
F2 - Processing parameters
SI 32768
SF 100.6178027 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.00
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm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7.624
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7.586
7.582
7.314
7.309
7.297
7.292
7.284
7.281
7.275
7.266
7.257
7.253
7.247
7.244
5.947
5.933
5.547
5.538
5.485
4.875
4.251
4.235
4.220
4.089
4.076
4.063
4.050
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3.958
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3.718
3.710
3.704
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3.615
3.598
3.586
3.318
3.314
3.310
3.307
3.303
3.045
2.914
2.070
1.990
OH
OH
O
HO
N3
SePh
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NAME LTW-463
EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20141112
Time 21.56
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PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT MeOD
NS 17
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 128
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500069 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
10
9
8
7
6
5
4
3
2
1
ppm
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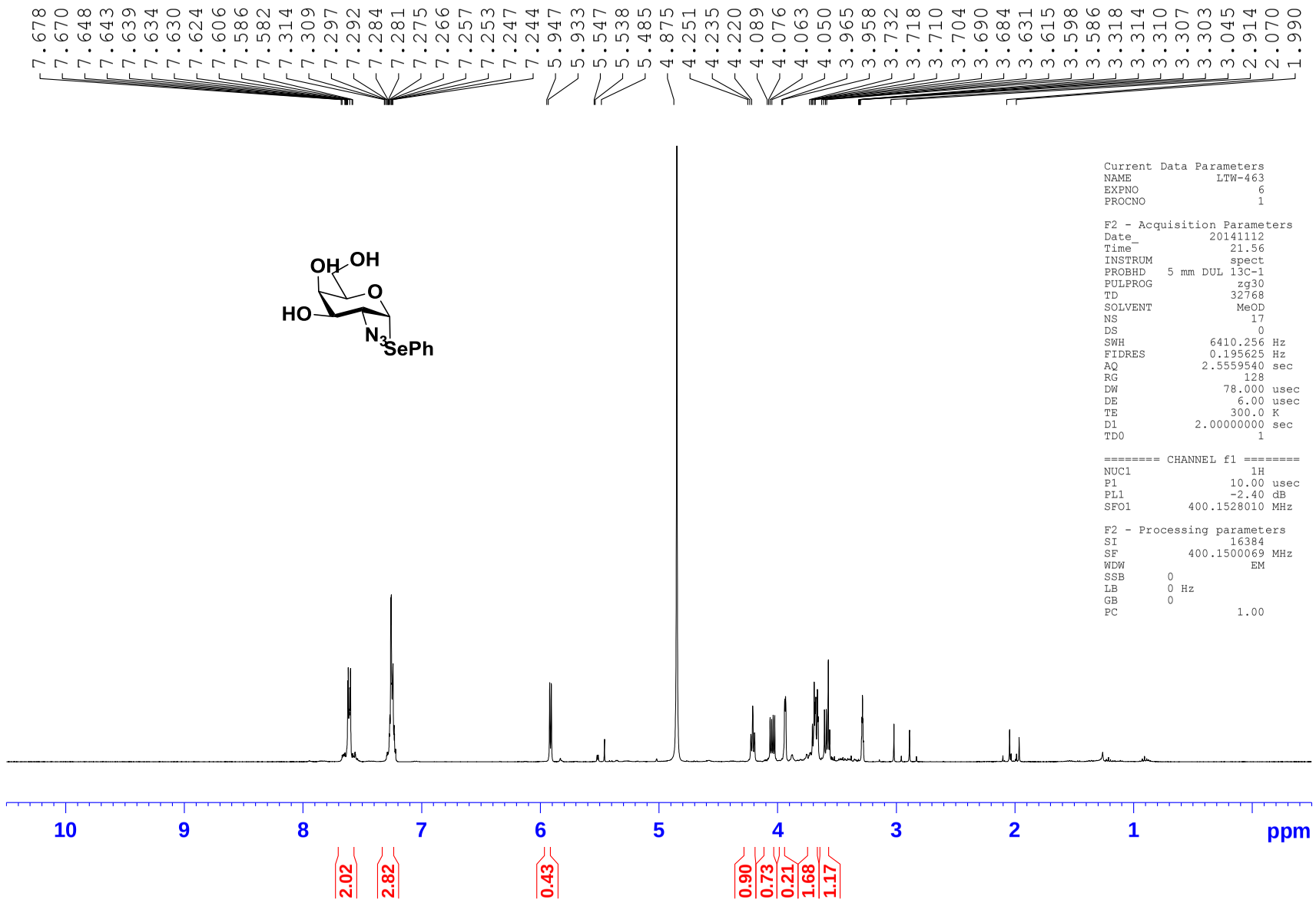
0.90
0.73
0.21
1.68
1.17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7.643
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7.634
7.630
7.624
7.606
7.586
7.582
7.314
7.309
7.297
7.292
7.284
7.281
7.275
7.266
7.257
7.253
7.247
7.244
5.947
5.933
5.547
5.538
5.485
4.875
4.251
4.235
4.220
4.089
4.076
4.063
4.050
3.965
3.958
3.732
3.718
3.710
3.704
3.690
3.684
3.631
3.615
3.598
3.586
3.318
3.314
3.310
3.307
3.303
3.045
2.914
2.070
1.990
OH
OH
O
HO
N3
SePh
Current Data Parameters
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EXPNO 6
PROCNO 1
F2 - Acquisition Parameters
Date_ 20141112
Time 21.56
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PROBHD 5 mm DUL 13C-1
PULPROG zg30
TD 32768
SOLVENT MeOD
NS 17
DS 0
SWH 6410.256 Hz
FIDRES 0.195625 Hz
AQ 2.5559540 sec
RG 128
DW 78.000 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 -2.40 dB
SFO1 400.1528010 MHz
F2 - Processing parameters
SI 16384
SF 400.1500069 MHz
WDW EM
SSB 0
LB 0 Hz
GB 0
PC 1.00
10
9
8
7
6
5
4
3
2
1
ppm
2.02
2.82
0.43
0.90
0.73
0.21
1.68
1.17