

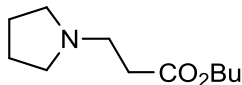
Waste Corn-cob Cellulose Supported Bio-Heterogeneous Copper Nanoparticles for Aza-Michael Reactions

Shaheen M. Sarkar*, Tahnim Sultana, Tapan Kumar Biswas, Md. Lutfor Rahman*, Mashitah Mohd Yusoff

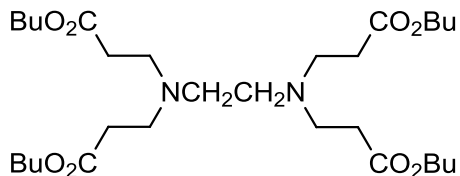
Faculty of Industrial Sciences & Technology, University Malaysia Pahang, 26300 Gambang, Kuantan, Pahang, Malaysia. Fax: +609 5492766; Tel: +609 5492399; E-mail: sha_inha@yahoo.com; shaheen@ump.edu.my

Supporting information

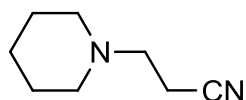
Characterization of Aza-Michael Products



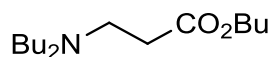
¹H NMR (CDCl₃, 500 MHz) δ 4.08 (t, *J* = 5.0 Hz, 2 H), 2.77 (t, *J* = 5.0 Hz, 2 H), 2.055-2.48 (m, 6 H), 1.80-1.62 (m, 4 H), 1.64-1.57 (m, 2 H), 1.42-1.35 (m, 2 H), 0.94 (t, *J* = 5.0 Hz, 3 H). ¹³C NMR (CDCl₃, 125 MHz) δ 172.38, 64.08, 53.84, 51.28, 34.05, 30.53, 23.32, 18.98, 13.55. MS-EI, *m/z* 199 (M⁺).



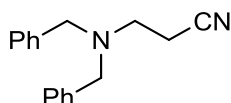
¹H NMR (CDCl₃, 500 MHz) δ 4.06 (t, *J* = 7.0 Hz, 8 H), 2.77 (t, *J* = 7.0 Hz, 8 H), 2.52 (m, 4 H), 2.27-2.40 (m, 8 H), 1.67-1.57 (m, 8 H), 1.43-1.34 (m, 8 H), 0.93 (t, *J* = 7.0 Hz, 12 H). ¹³C NMR (CDCl₃, 125 MHz) δ 172.03, 63.72, 51.97, 49.52, 32.43, 30.37, 18.80, 13.32. MS-EI, *m/z* 572 (M⁺).



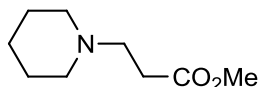
^1H NMR (CDCl_3 , 500 MHz) δ 2.68 (t, $J = 7.0$ Hz, 2 H), 2.50 (t, $J = 7.0$ Hz, 2 H), 2.45-2.39 (m, 4 H), 1.62-1.56 (m, 4 H), 1.44-1.41 (m, 2 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 119.13, 54.19, 25.86, 24.13, 15.69. MS-EI, m/z 138 (M^+).



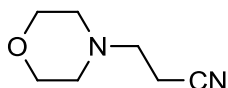
^1H NMR (CDCl_3 , 500 MHz) δ 4.07 (t, $J = 7.0$ Hz, 2 H), 2.78 (t, $J = 7.0$ Hz, 2 H), 2.45-2.37 (m, 6 H), 1.63-1.57 (m, 2 H), 1.45-1.41 (m, 6 H), 1.35-1.26 (m, 4 H), 0.93 (t, $J = 7.0$ Hz, 9 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 172.89, 53.65, 49.49, 32.48, 30.71, 29.34, 20.60, 19.15, 13.99, 13.65. MS-EI, m/z 157 (M^+).



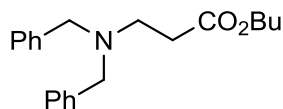
^1H NMR (CDCl_3 , 500 MHz) δ 7.38 (dd, $J = 7.5$ Hz, 4 H), 7.32 (dd, $J = 7.5$ Hz, 4 H), 7.24 (dd, $J = 7.5$ Hz, 2 H), 2.77 (t, $J = 7.0$ Hz, 2 H), 2.37 (t, $J = 7.0$ Hz, 2 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 138.48, 128.60, 128.48, 128.30, 127.16, 118.75, 57.99, 48.56, 16.12. MS-EI, m/z 250 (M^+).



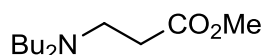
^1H NMR (CDCl_3 , 500 MHz) δ 3.67 (s, 3 H), 2.66 (t, $J = 7.0$ Hz, 2 H), 2.54-2.50 (m, 2 H), 2.43-2.36 (m, 4 H), 1.61-1.54 (m, 4 H), 1.41-1.40 (m, 2 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 173.28, 54.35, 53.30, 51.71, 32.08, 25.97, 24.35. MS-EI, m/z 171 (M^+).



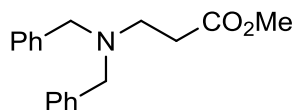
^1H NMR (CDCl_3 , 500 MHz) δ 3.71 (t, $J = 7.0$ Hz, 4 H), 2.67 (t, $J = 7.0$ Hz, 2 H), 2.55-2.47 (m, 6 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 118.61, 66.52, 53.42, 52.86, 15.48. MS-EI, m/z 140 (M^+).



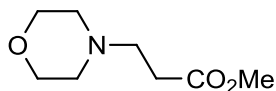
^1H NMR (CDCl_3 , 500 MHz) δ 7.32 (dd, $J = 7.5$ Hz, 4 H), 7.28 (dd, $J = 7.5$ Hz, 4 H), 7.20 (dd, $J = 7.5$ Hz, 2 H), 4.00 (t, $J = 7.0$ Hz, 2 H), 3.54 (s, 4 H), 2.79 (t, $J = 7.0$ Hz, 2 H), 2.47 (t, $J = 7.0$ Hz, 2 H), 1.54-1.47 (m, 2 H), 1.34-1.28 (m, 2 H), 0.89 (t, $J = 7.0$ Hz, 3 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 172.30, 139.19, 128.68, 128.09, 126.84, 64.02, 57.95, 49.17, 32.71, 30.53, 19.04, 13.64. MS-EI, m/z 325 (M^+).



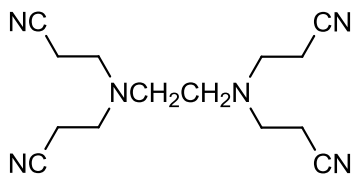
^1H NMR (CDCl_3 , 500 MHz) δ 3.66 (s, 3 H), 2.77 (t, $J = 7.0$ Hz, 2 H), 2.42 (t, $J = 7.0$ Hz, 2 H), 2.39 (t, $J = 7.0$ Hz, 4 H), 1.44-1.38 (m, 4 H), 1.32-1.28 (m, 4 H), 0.90 (t, $J = 7.0$ Hz, 6 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 173.16, 53.60, 51.29, 49.36, 32.24, 29.26, 20.53, 13.98. MS-EI, m/z 215 (M^+).



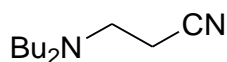
^1H NMR (CDCl_3 , 500 MHz) δ 7.33-7.27 (m, 8 H), 7.21 (dd, $J = 7.5$ Hz, 2 H), 3.59 (s, 3 H), 3.55 (s, 4 H), 2.78 (t, $J = 7.0$ Hz, 2 H), 2.48 (t, $J = 7.0$ Hz, 2 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 172.48, 139.14, 128.62, 128.05, 126.81, 57.91, 51.10, 48.99, 32.47. MS-EI, m/z 283 (M^+).



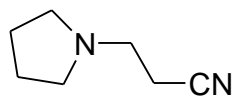
^1H NMR (CDCl_3 , 500 MHz) δ 3.66 (s, 7 H), 2.68 (t, $J = 7.0$ Hz, 2 H), 2.51 (t, $J = 7.0$ Hz, 2 H), 2.47-2.44 (m, 4 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 172.50, 66.62, 53.73, 53.20, 51.36, 31.64. MS-EI, m/z 173 (M^+).



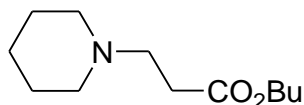
^1H NMR (CDCl_3 , 500 MHz) δ 2.92 (t, $J = 7.0$ Hz, 4 H), 2.85 (t, $J = 7.0$ Hz, 4 H), 2.70 (s, 4 H), 2.53 (t, $J = 7.0$ Hz, 8 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 118.93, 52.92, 52.31, 49.27, 48.00, 46.38, 44.85, 44.62, 18.46, 16.82. MS-EI, m/z 272 (M^+).



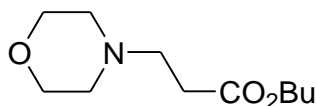
^1H NMR (CDCl_3 , 500 MHz) δ 2.77 (t, $J = 7.0$ Hz, 2 H), 2.44-2.40 (m, 6 H), 1.44-1.39 (m, 4 H), 1.38-1.29 (m, 4 H), 0.91 (t, $J = 7.0$ Hz, 6 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 119.05, 53.45, 49.57, 29.44, 20.38, 16.12, 13.90. MS-EI, m/z 182 (M^+).



^1H NMR (CDCl_3 , 500 MHz) δ 2.78 (t, $J = 7.0$ Hz, 2 H), 2.58-2.52 (m, 6 H), 1.80-1.77 (m, 4 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 119.02, 53.97, 51.45, 23.69, 17.74. MS-EI, m/z 124 (M^+).

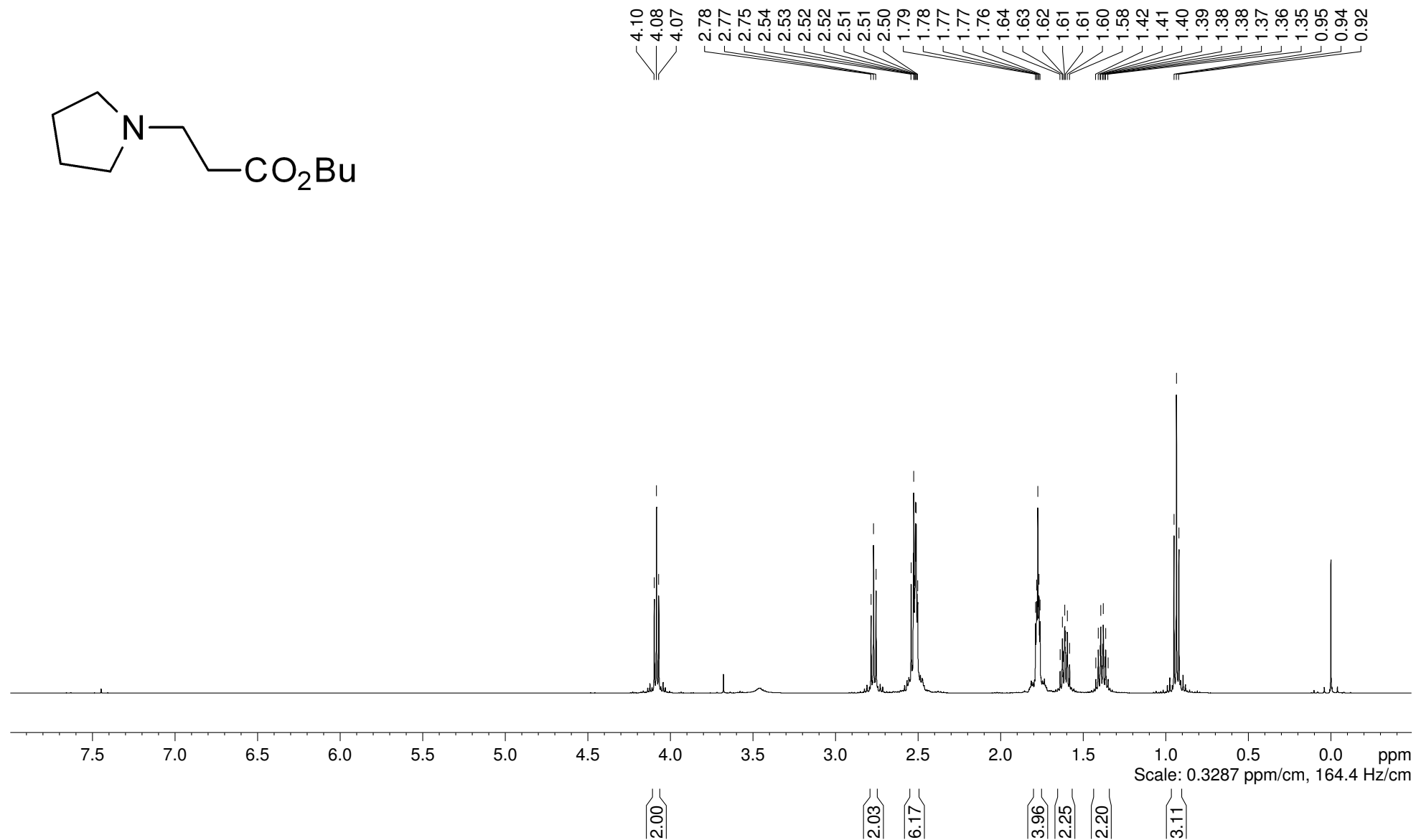
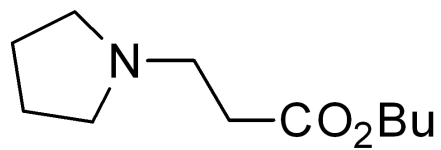


^1H NMR (CDCl_3 , 500 MHz) δ 4.08 (t, $J = 7.0$ Hz, 2 H), 2.65 (t, $J = 7.0$ Hz, 2 H), 2.50 (t, $J = 7.0$ Hz, 2 H), 2.45-2.33 (m, 4 H), 1.62-1.55 (m, 6 H), 1.42-1.36 (m, 4 H), 0.91 (t, $J = 7.0$ Hz, 3 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 172.18, 63.31, 53.44, 31.44, 29.82, 25.03, 23.42, 18.25, 12.80. MS-EI, m/z 213 (M^+).

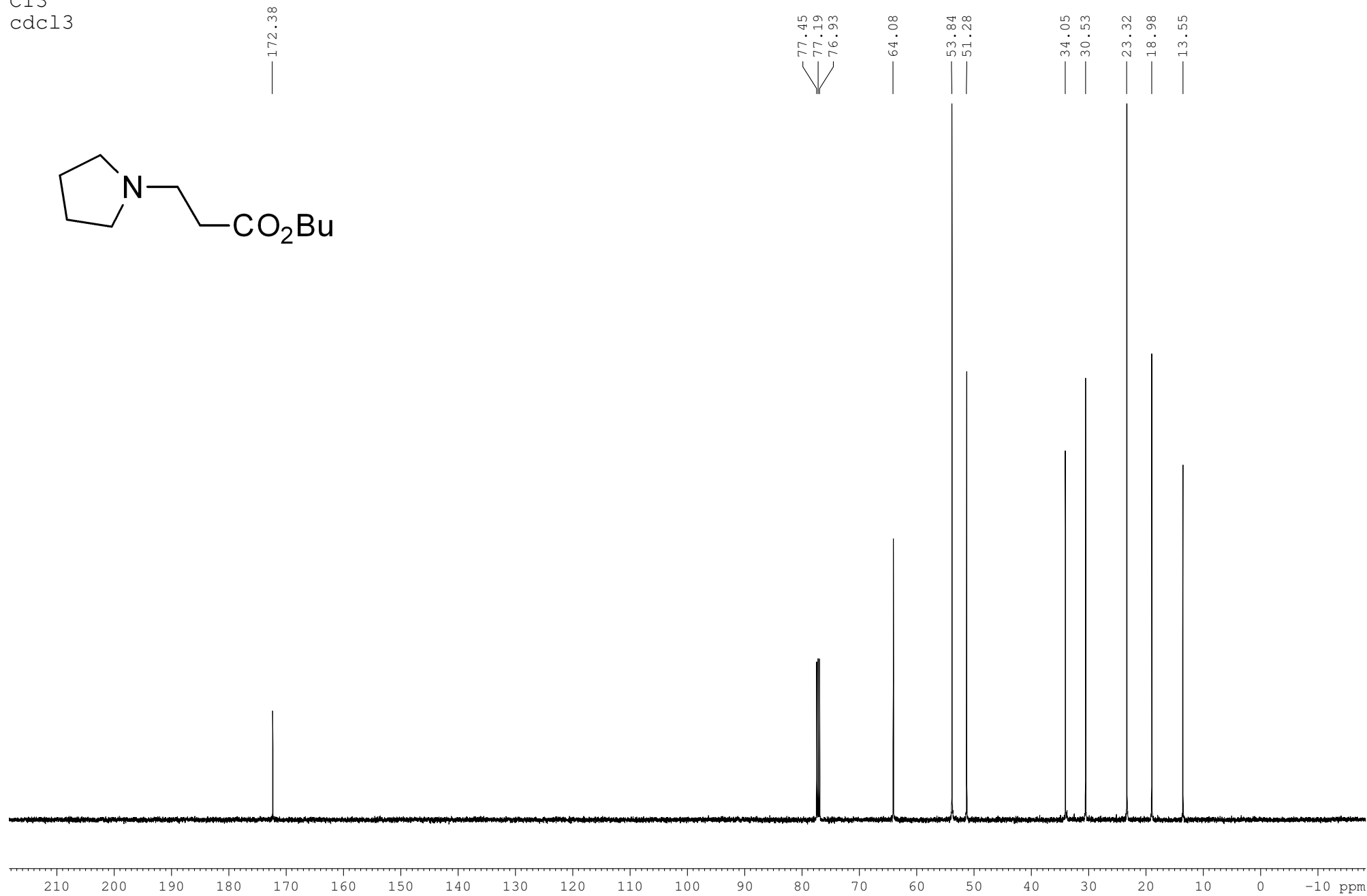
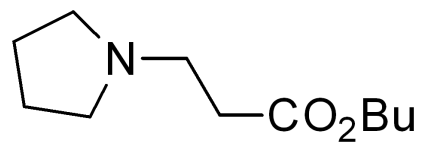


^1H NMR (CDCl_3 , 500 MHz) δ 4.09 (t, $J = 7.0$ Hz, 2 H), 3.69 (t, $J = 7.0$ Hz, 4 H), 2.68 (t, $J = 7.0$ Hz, 2 H), 2.52-2.44 (m, 6 H), 1.63-1.57 (m, 2 H), 1.42-1.36 (m, 2 H), 0.93 (t, $J = 7.0$ Hz, 3 H). ^{13}C NMR (CDCl_3 , 125 MHz) δ 171.96, 66.52, 63.86, 53.73, 53.12, 31.85, 30.40, 18.81, 13.38. MS-EI, m/z 215 (M^+).

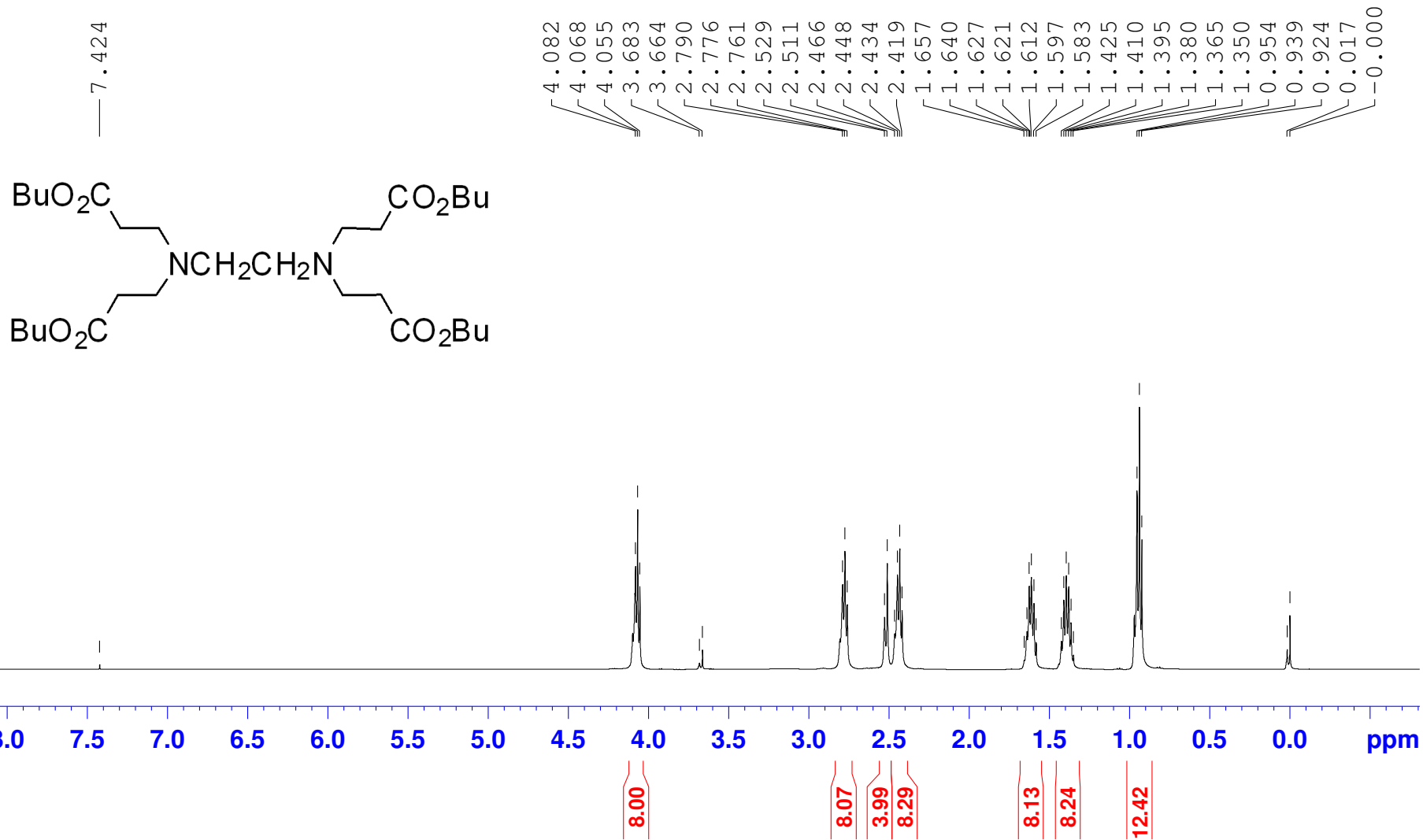
sample 1
proton
cdcl3



sample 1
C13
cdcl3



sample 2
proton
cdcl3



sample 2
C13
cdcl3

172.03

77.48
77.23
76.97

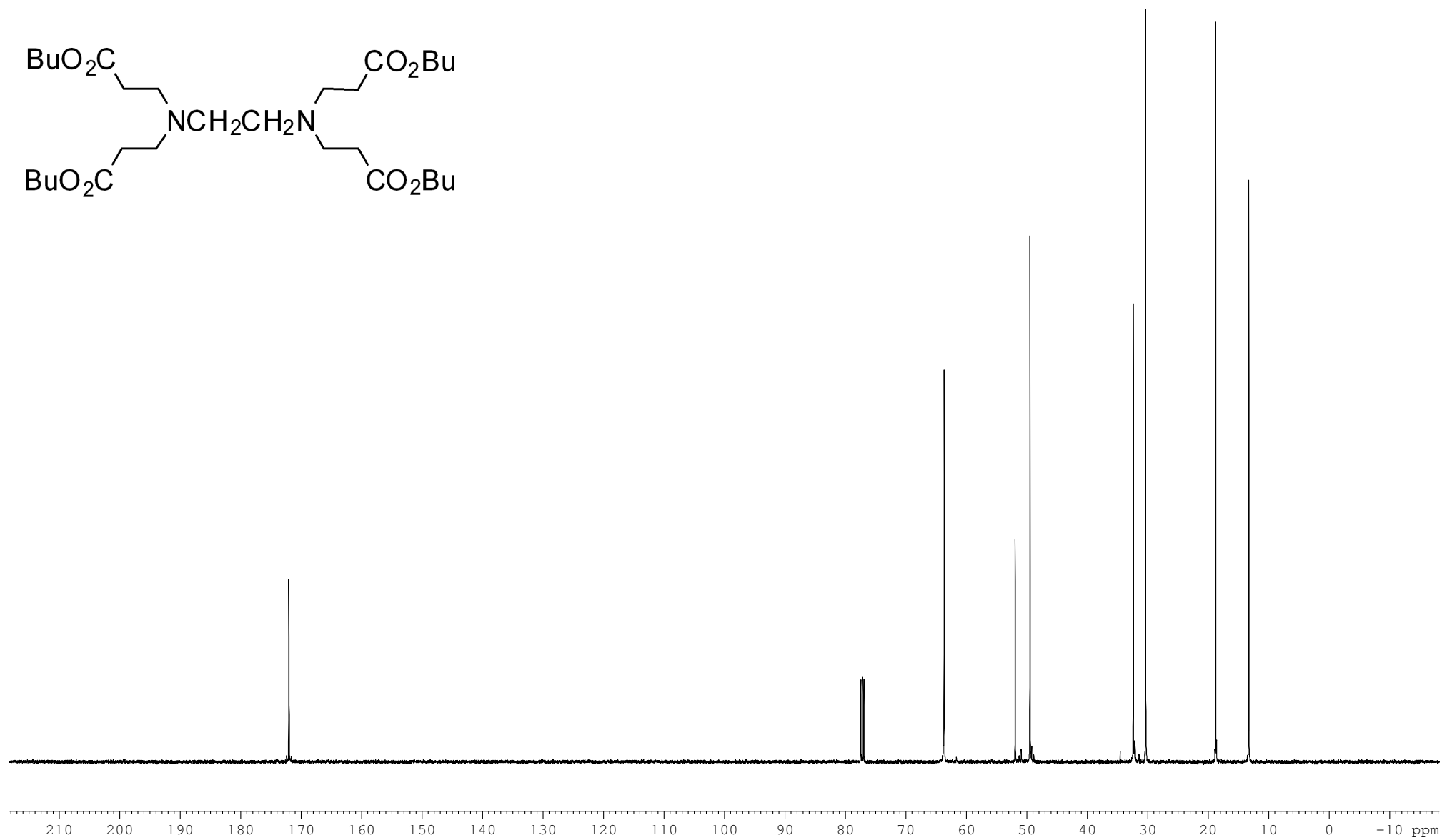
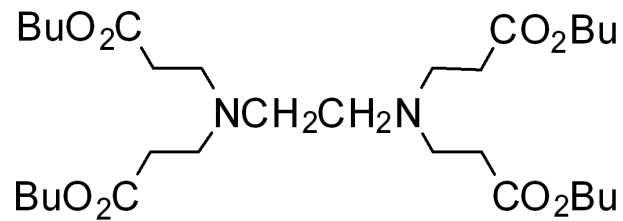
63.72

51.97
49.52

32.43
30.37

18.80

13.32



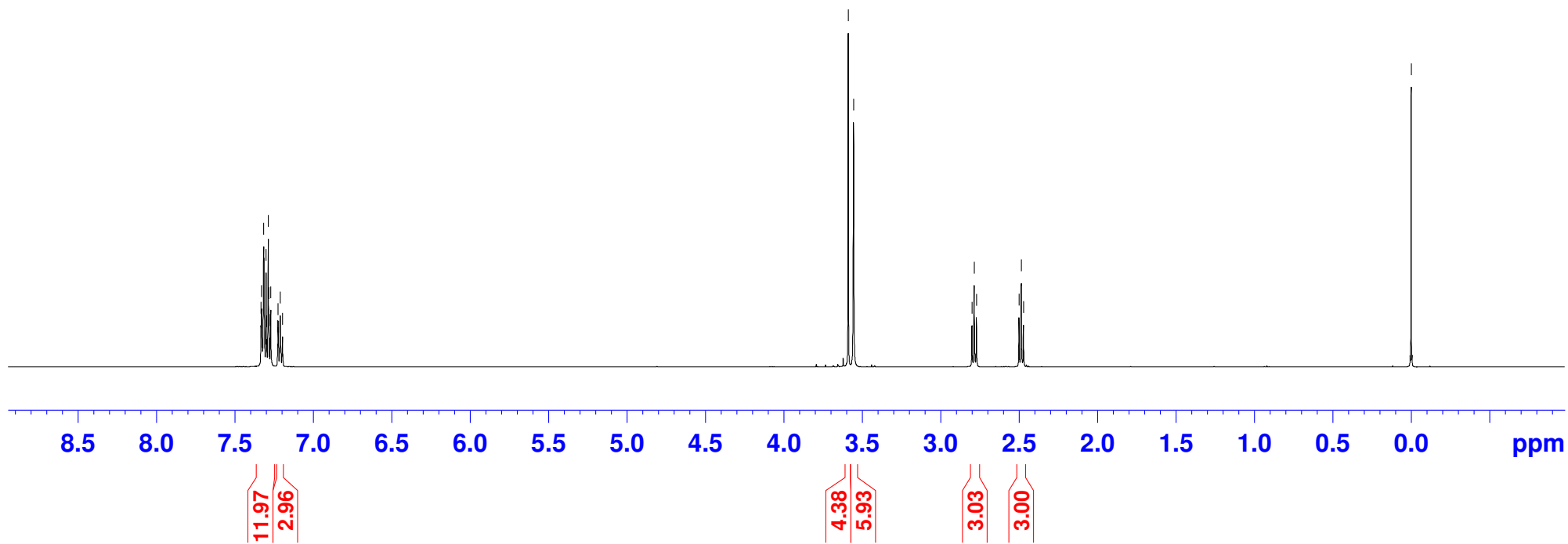
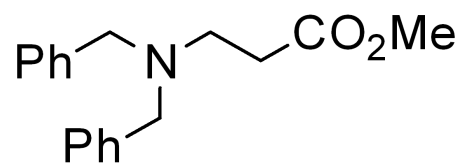
sample 3
proton
cdcl3

7.334
7.331
7.317
7.302
7.298
7.287
7.285
7.275
7.272
7.229
7.226
7.222
7.211
7.197

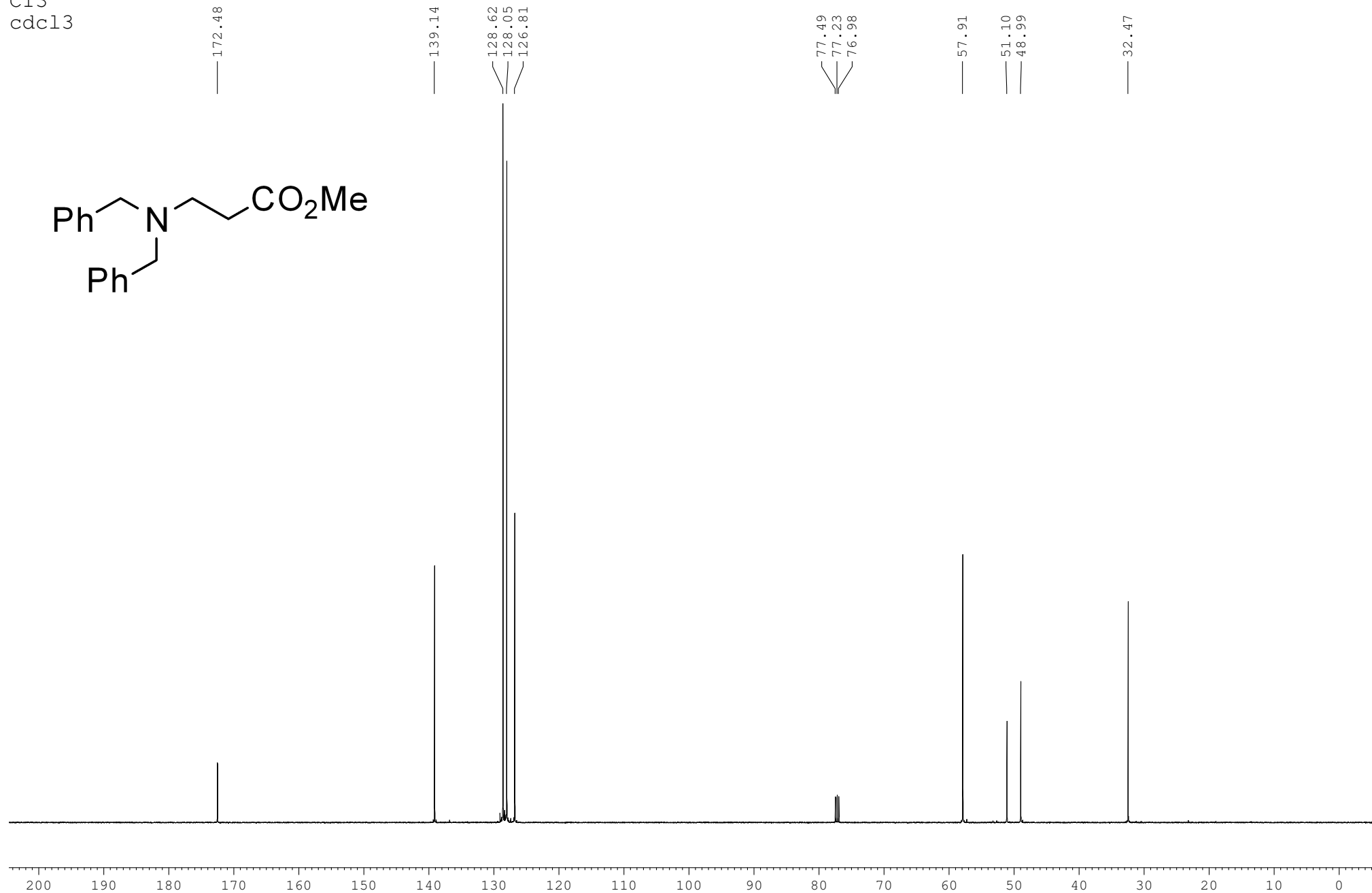
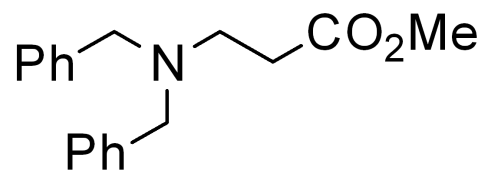
3.590
3.555

2.801
2.786
2.772
2.501
2.486
2.472

—0.000

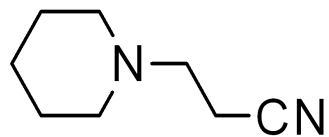


sample 3
C13
cdcl3



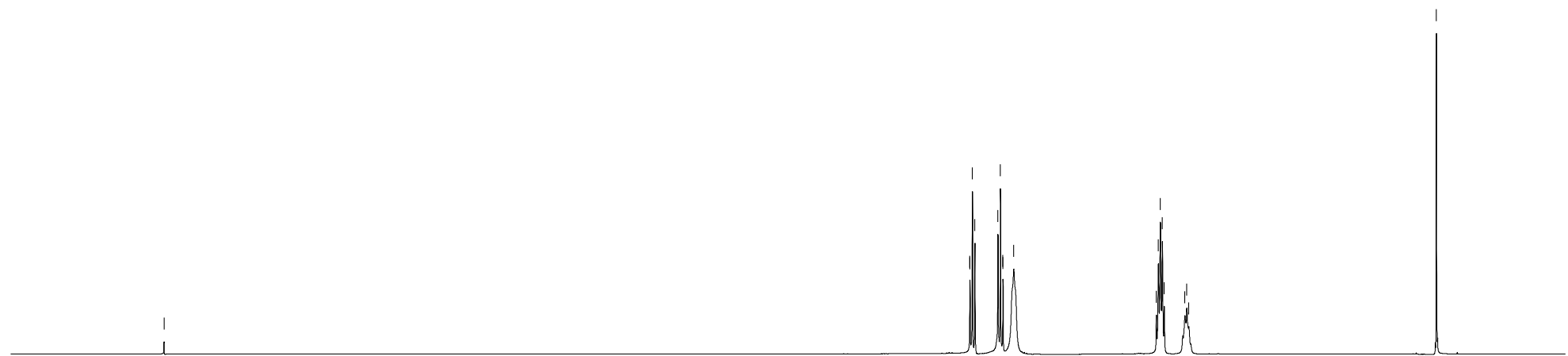
sample 4
proton
cdcl3

—7.318



2.684
2.683
2.669
2.655
2.522
2.508
2.494
2.493
2.431
1.611
1.599
1.588
1.576
1.565
1.447
1.436
1.424

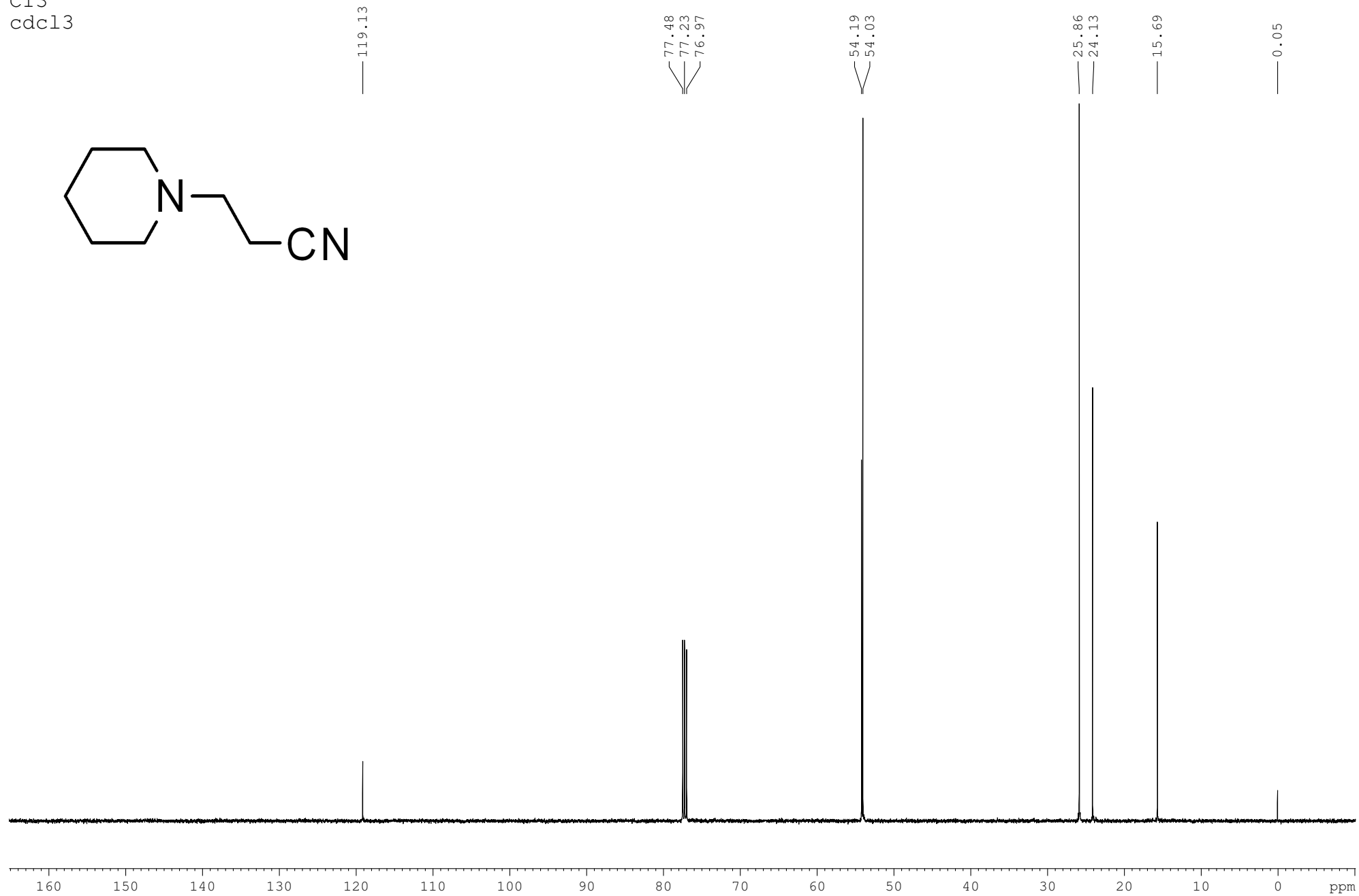
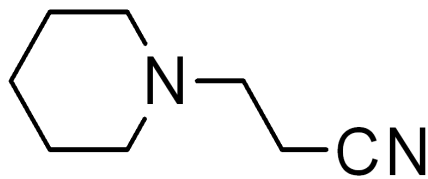
—0.000



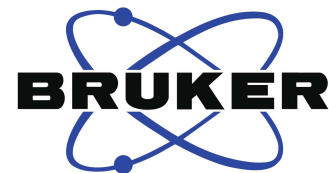
8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 ppm

2.14
2.50
3.83
4.13
2.00

sample 4
C13
cdcl3



sample 5
proton
cdcl3

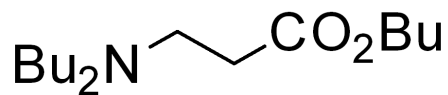


Current Data Parameters
NAME Tapan_2015
EXPNO 55
PROCNO 1

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Time 14.39
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 22.6
DW 48.400 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec

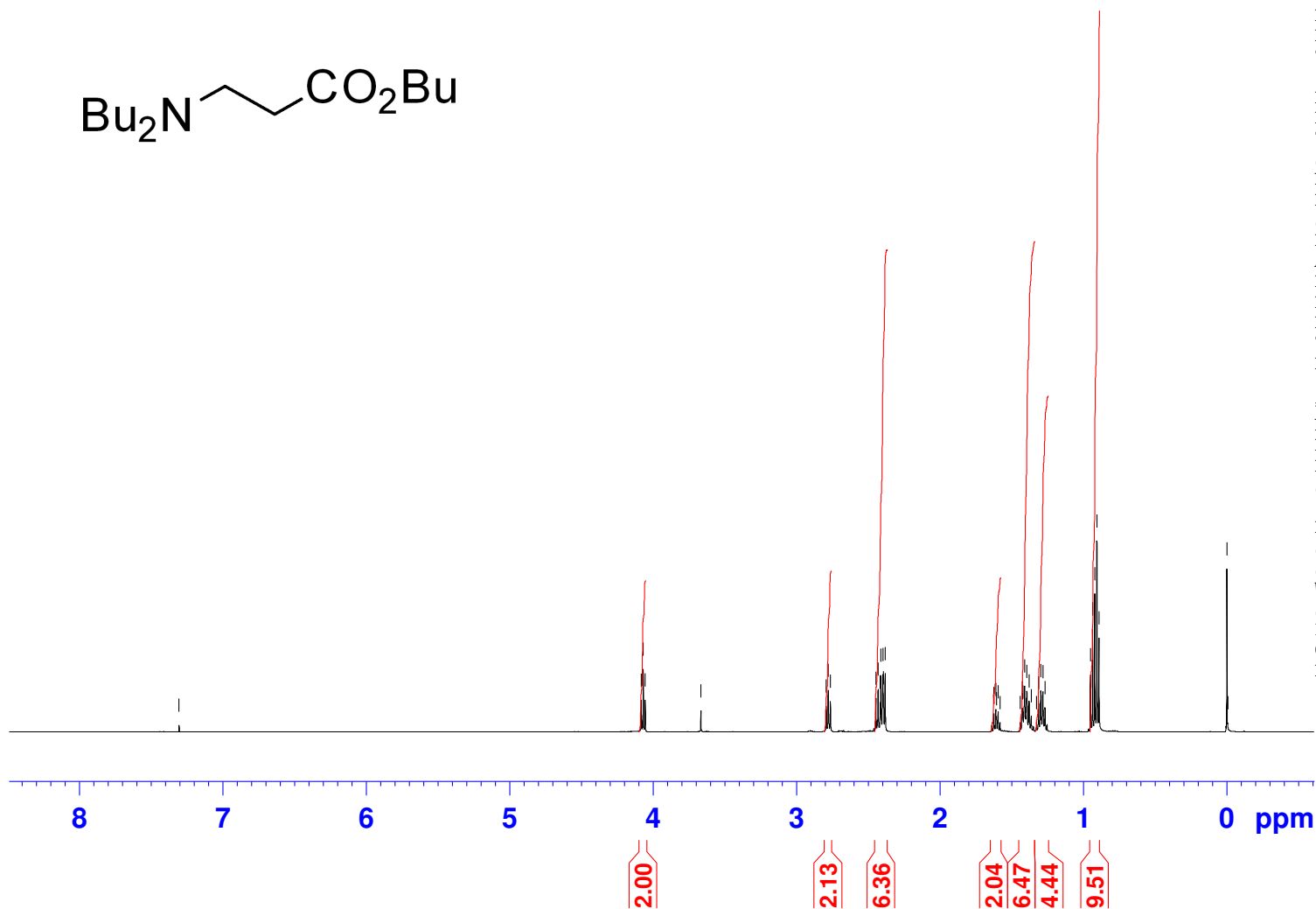
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NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299897 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



— 7.307

4.083
4.070
4.057
3.668
2.794
2.780
2.765
2.447
2.432
2.418
2.413
2.398
2.395
2.383
1.625
1.611
1.607
1.595
1.582
1.441
1.427
1.425
1.422
1.410
1.396
1.379
1.364
1.328
1.313



sample 5
C13
cdcl3

172.89

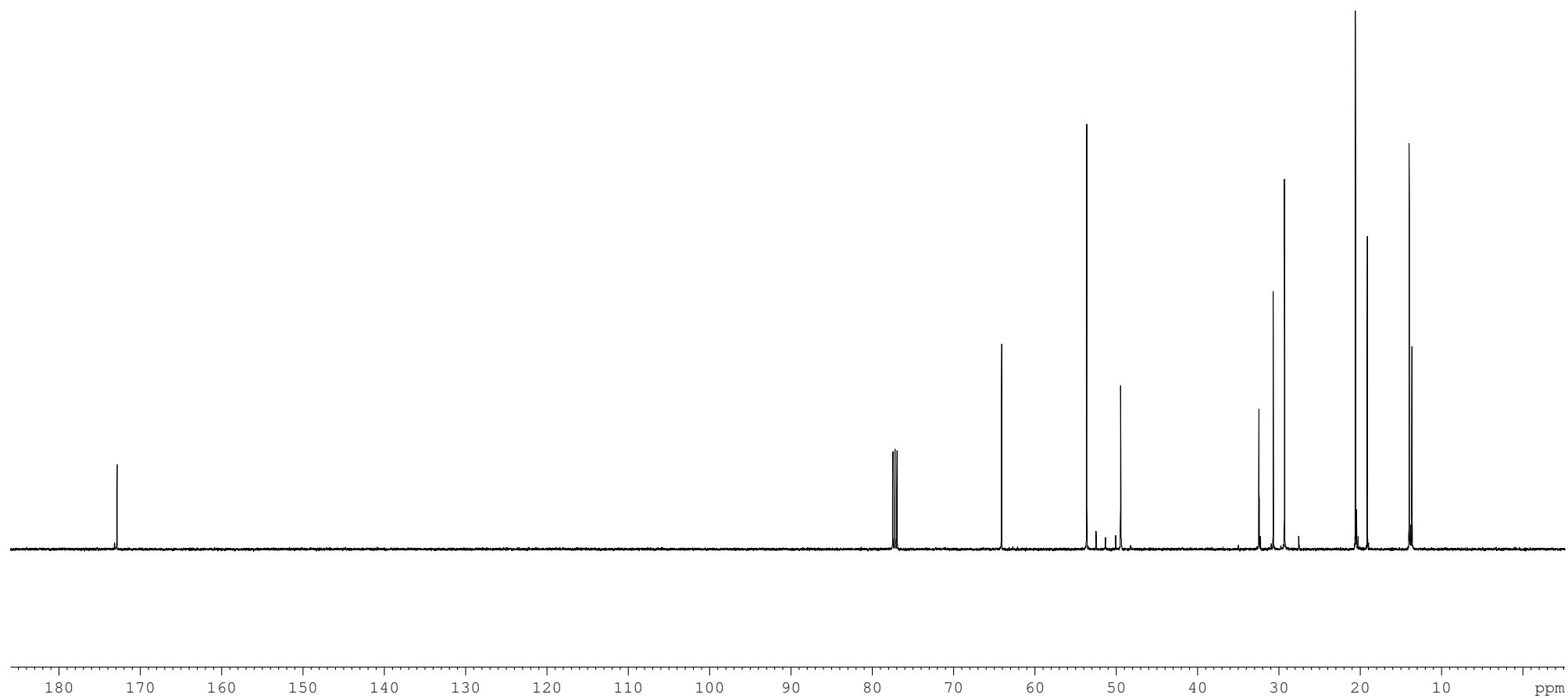
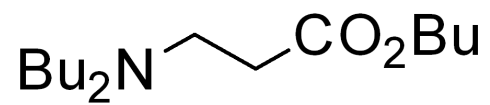
77.48
77.23
76.97

64.11

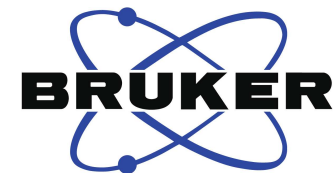
53.65
49.49

32.48
30.71
29.34

20.60
20.47
19.15
13.99
13.65



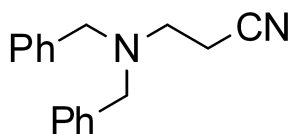
sample 7
proton
cdcl3



7.388
7.373
7.335
7.331
7.320
7.305
7.262
7.260
7.257
7.249
7.245
7.241
7.230
7.213

3.616
2.776
2.762
2.748
2.387
2.373
2.359

— — — 0.000

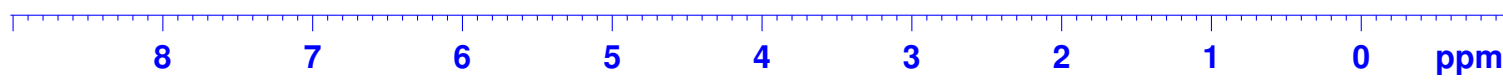


Current Data Parameters
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EXPNO 57
PROCNO 1

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INSTRUM spect
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PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 40.3
DW 48.400 usec
DE 6.50 usec
TE 293.3 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1300372 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



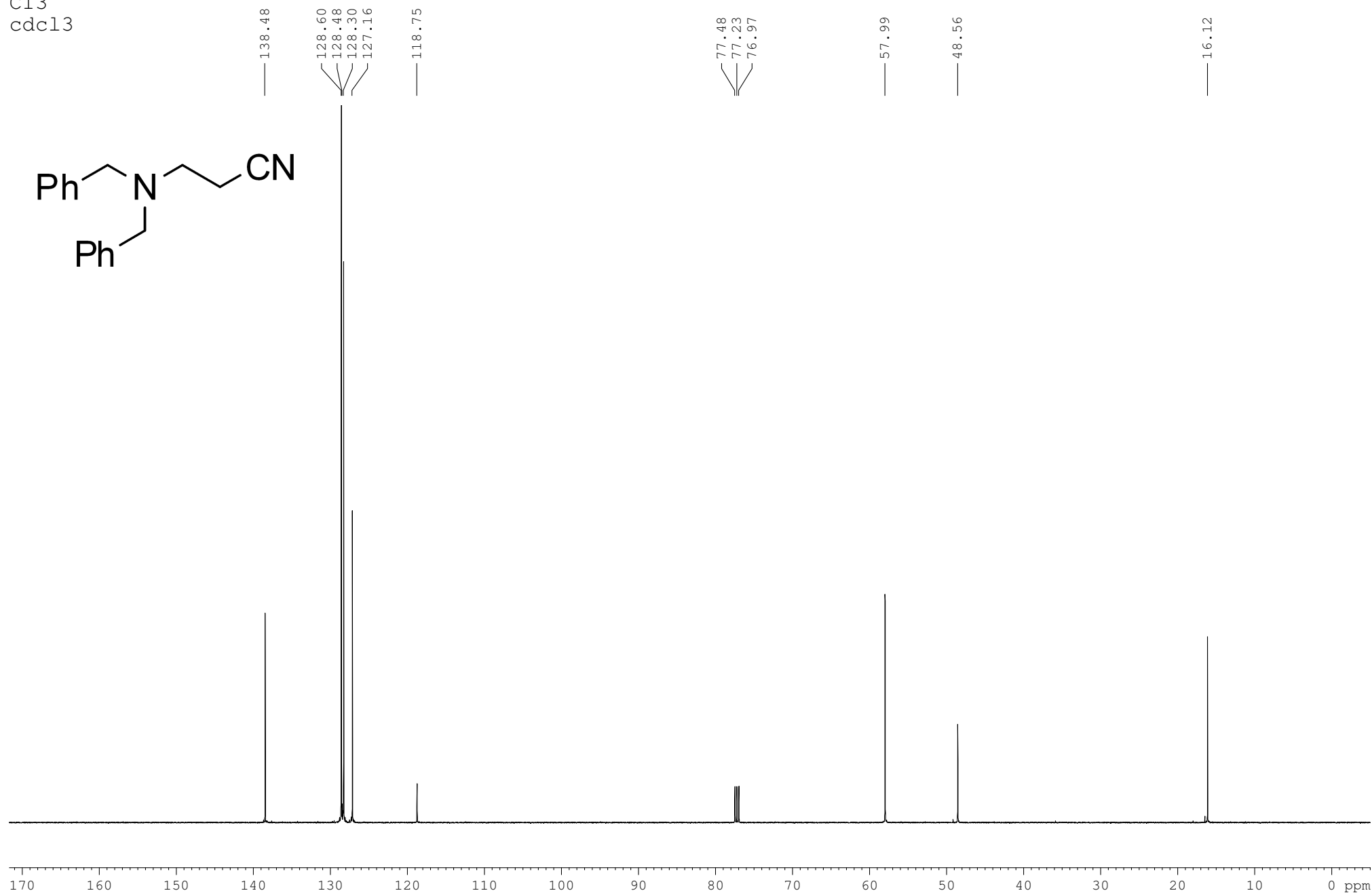
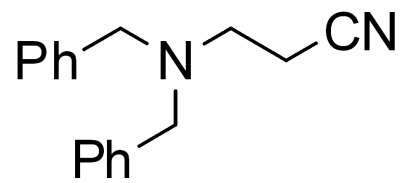
4.00
4.12
2.15

4.23

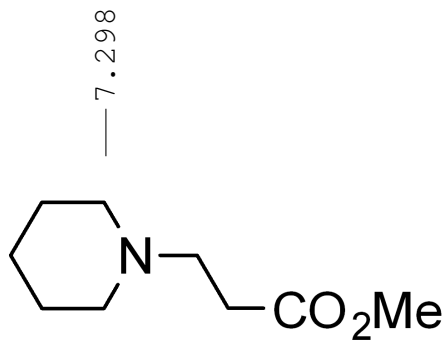
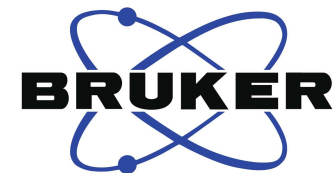
2.10
2.10



sample 7
C13
cdcl3



sample 9
proton
cdcl3



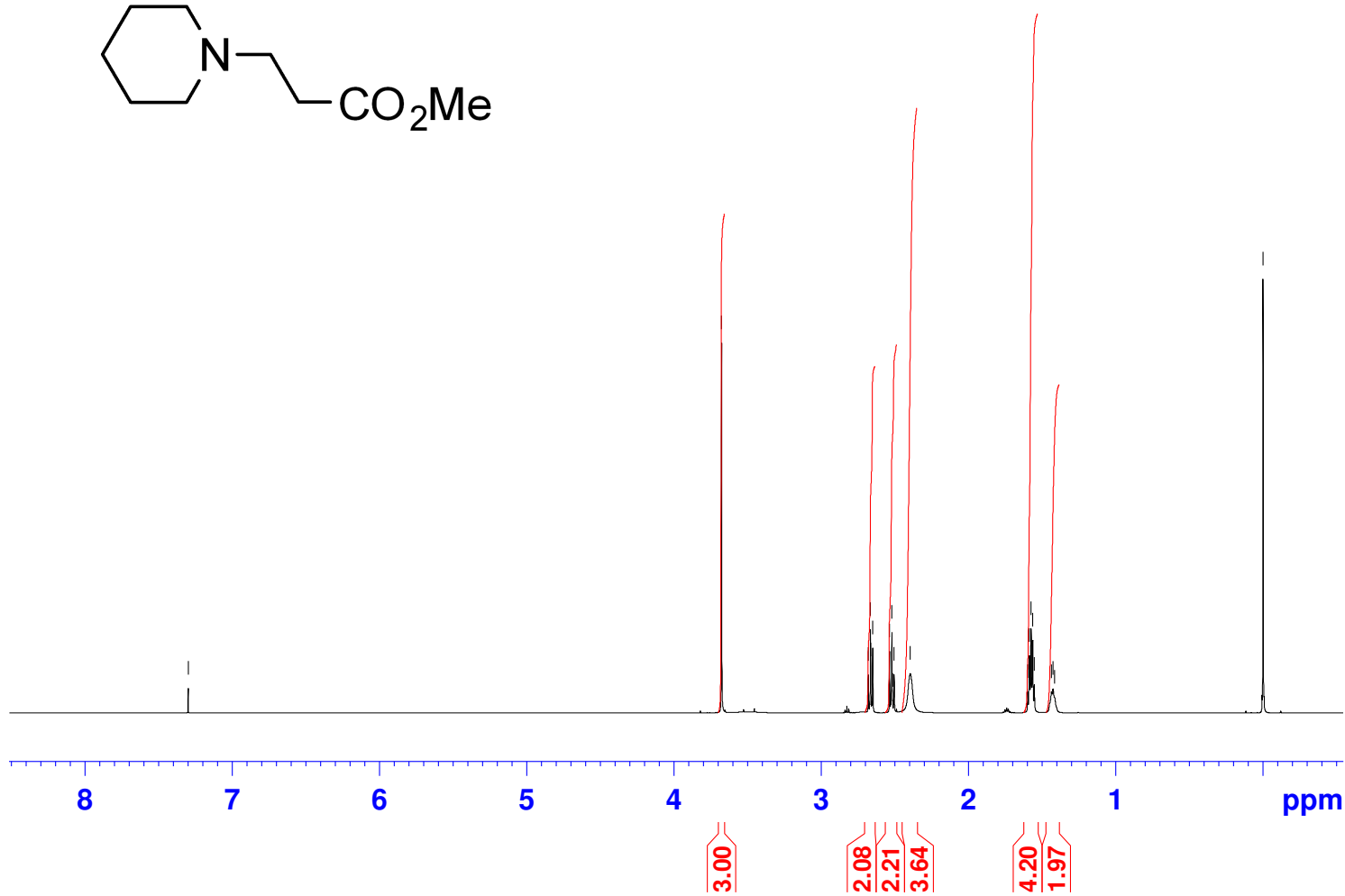
3.678
2.681
2.667
2.664
2.651
2.537
2.521
2.516
2.506
2.396
1.599
1.587
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1.564
1.553
1.437
1.426
1.416
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Current Data Parameters
NAME Tapan_2015
EXPNO 59
PROCNO 1

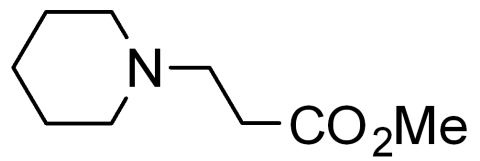
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Time 15.54
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PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 50.8
DW 48.400 usec
DE 6.50 usec
TE 293.4 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299945 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



sample 9
C13
cdcl3



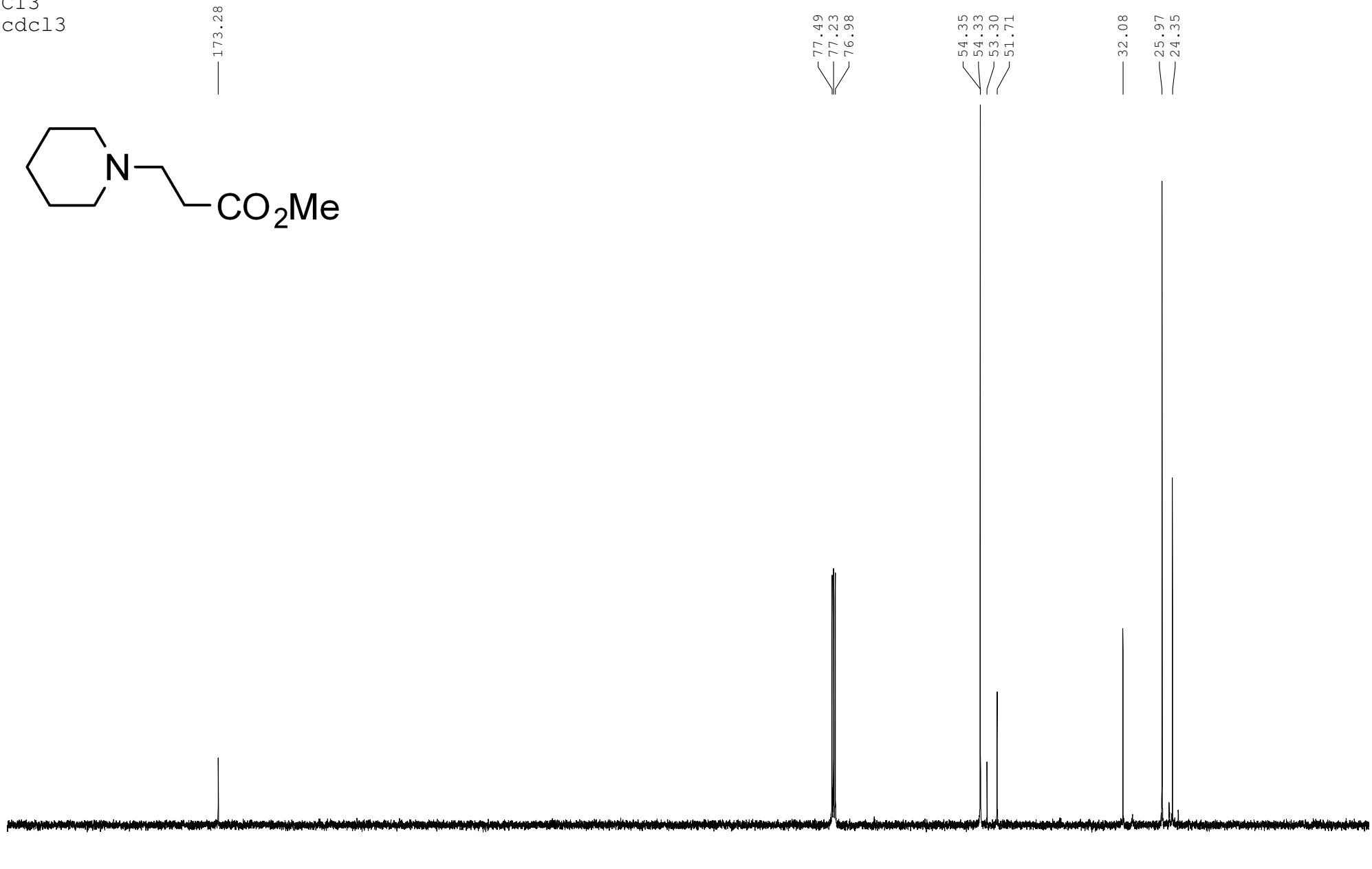
173.28

77.49
77.23
76.98

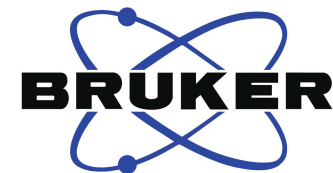
54.35
54.33
53.30
51.71

32.08
25.97
24.35

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



sample 10
proton
cdcl3



Current Data Parameters
NAME Tapan_2015
EXPNO 60
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150706
Time 14.55
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 22.6
DW 48.400 usec
DE 6.50 usec
TE 293.3 K
D1 1.00000000 sec

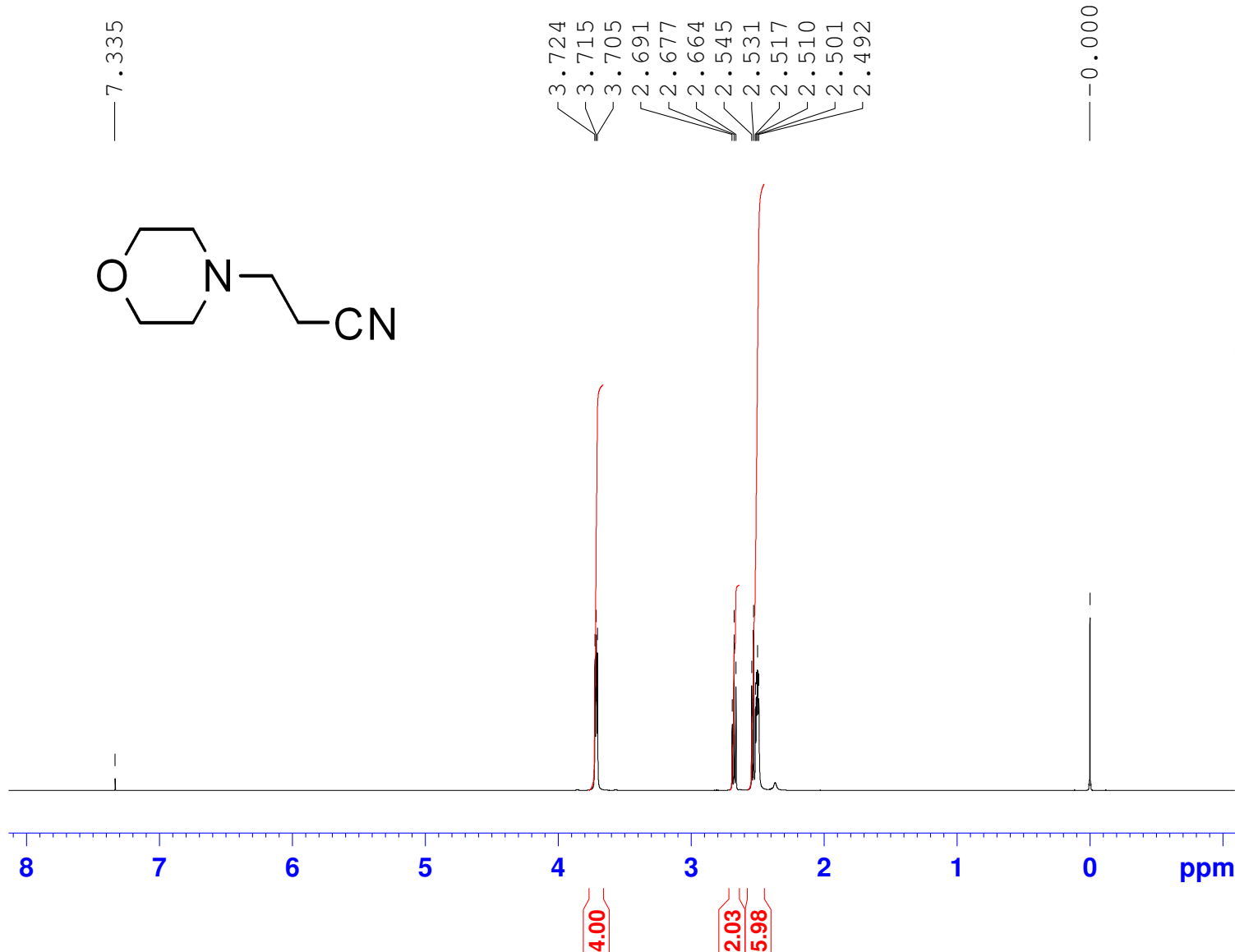
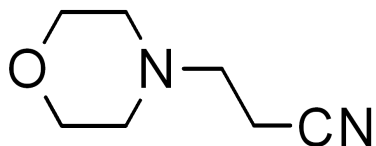
===== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299762 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

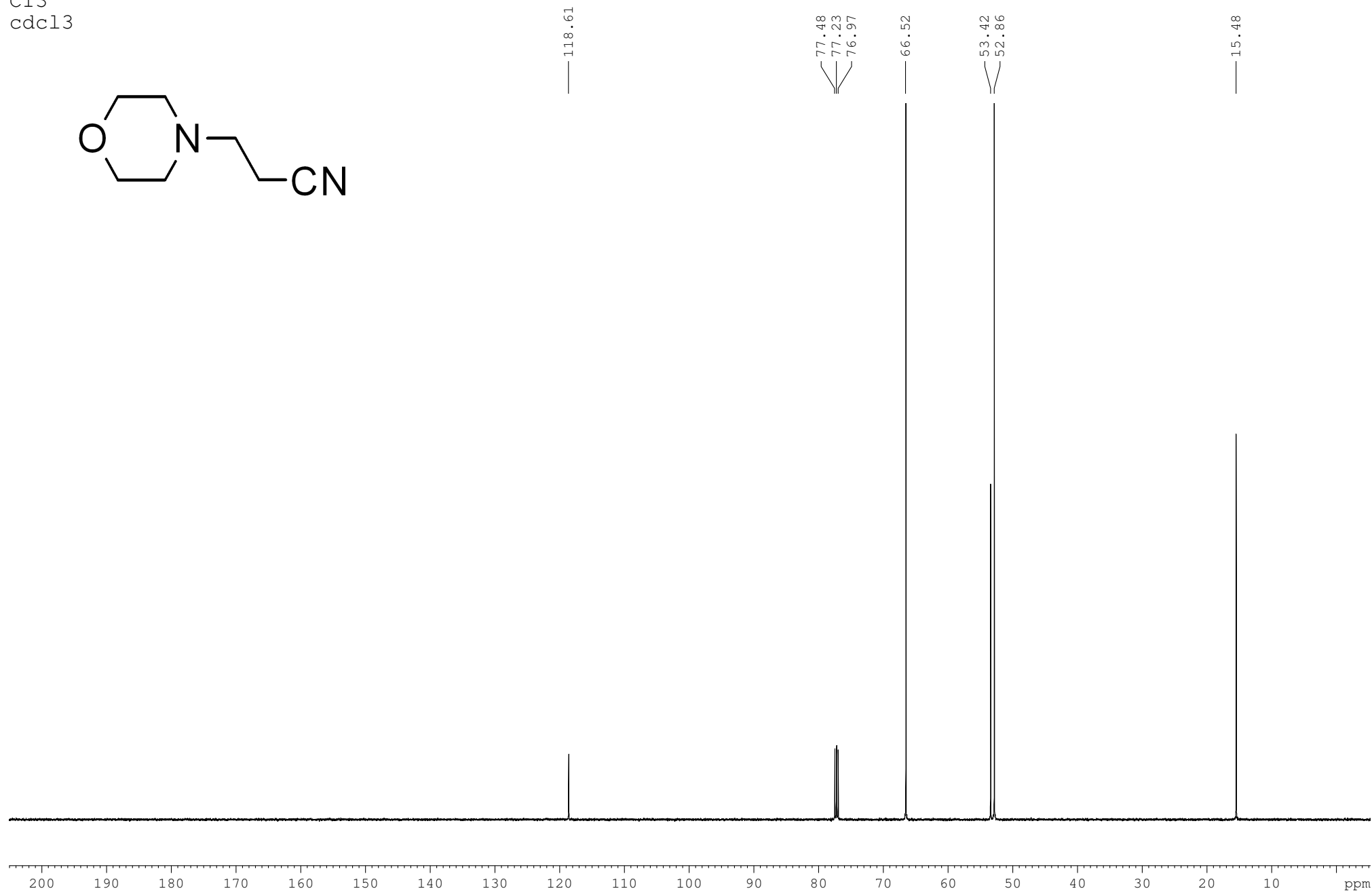
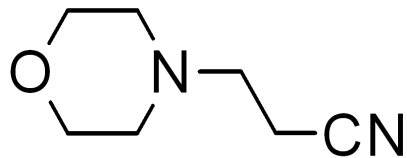
7.335

3.724
3.715
3.705
2.691
2.677
2.664
2.545
2.531
2.517
2.510
2.501
2.492

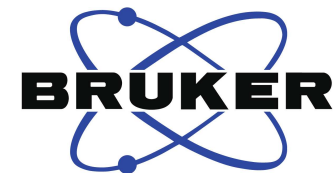
0.000



sample 10
C13
cdcl3



sample 11
proton
cdcl3



Current Data Parameters
NAME Tapan_2015
EXPNO 61
PROCNO 1

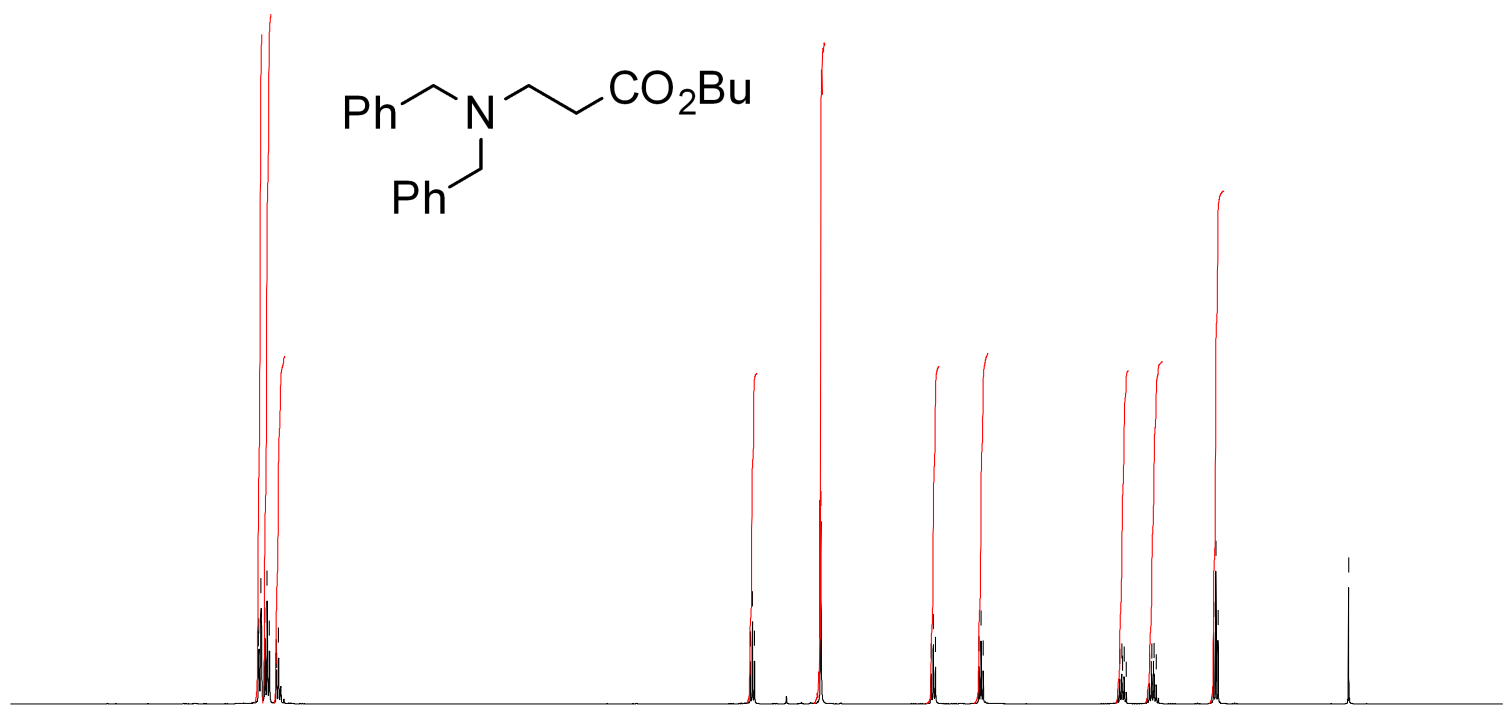
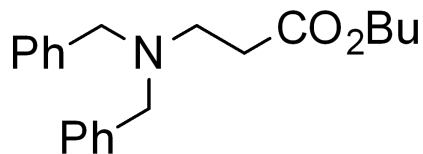
F2 - Acquisition Parameters
Date_ 20150706
Time 15.02
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 14.2
DW 48.400 usec
DE 6.50 usec
TE 293.3 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1300624 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

7.331
7.329
7.314
7.288
7.284
7.273
7.258
7.213
7.211
7.208
7.196

4.023
4.009
3.996
3.549
2.807
2.793
2.779
2.486
2.472
2.458
1.539
1.525
1.521
1.509
1.496
1.339
1.327
1.324
1.313
1.309
1.294
0.907
0.892
0.878
0.000



3.88
4.00
2.02

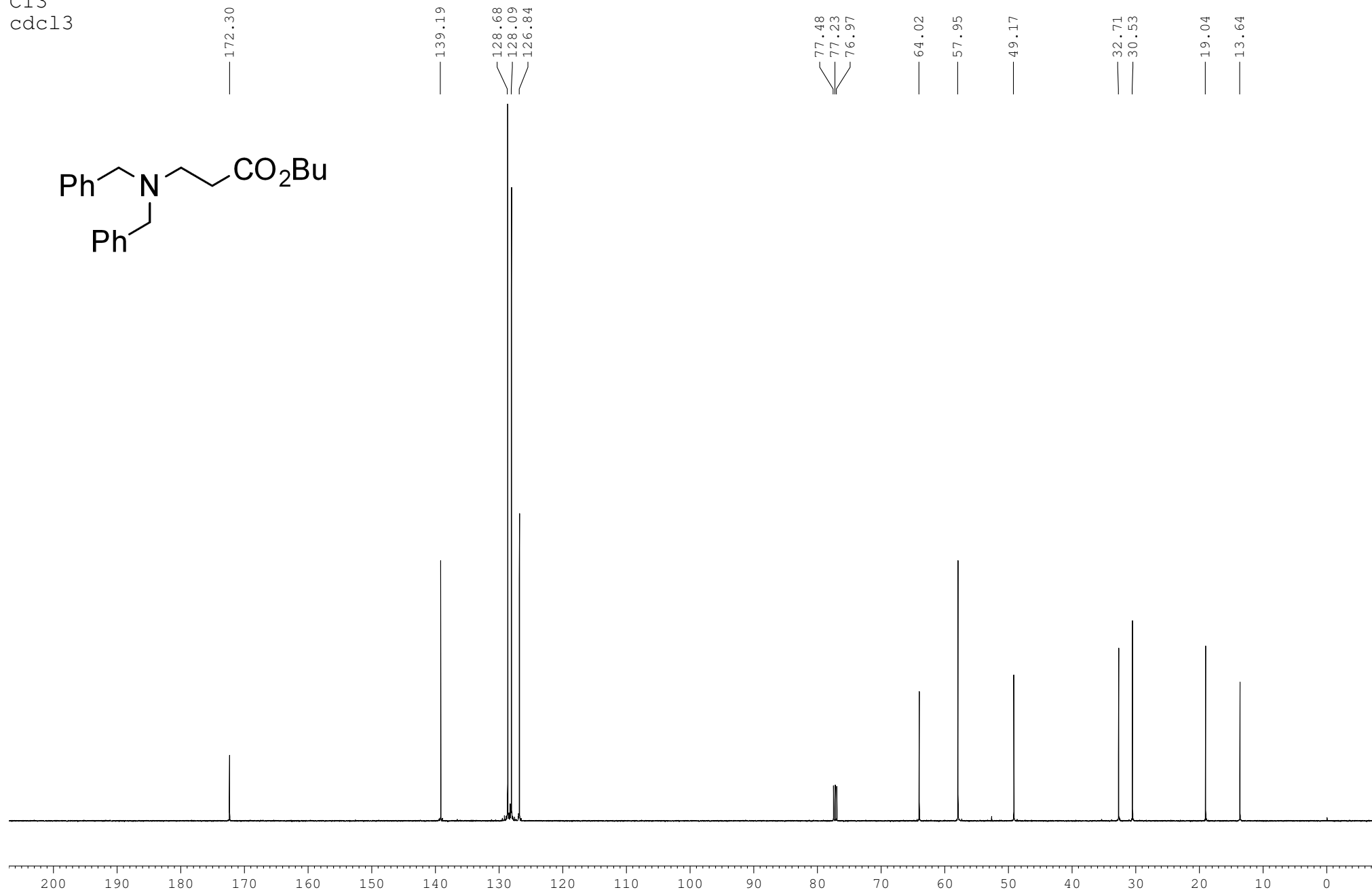
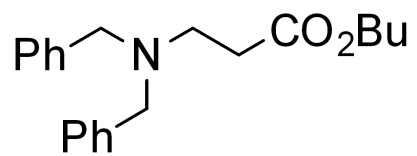
1.92
3.84

1.96
2.04

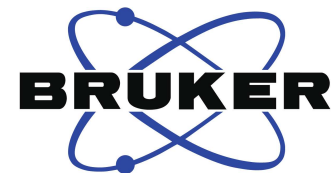
1.93
1.99
2.98

8 7 6 5 4 3 2 1 0 ppm

sample 11
C13
cdcl3



sample 13
proton
cdcl3



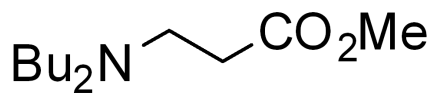
Current Data Parameters
NAME Tapan_2015
EXPNO 63
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150706
Time 15.16
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 12.7
DW 48.400 usec
DE 6.50 usec
TE 293.2 K
D1 1.00000000 sec

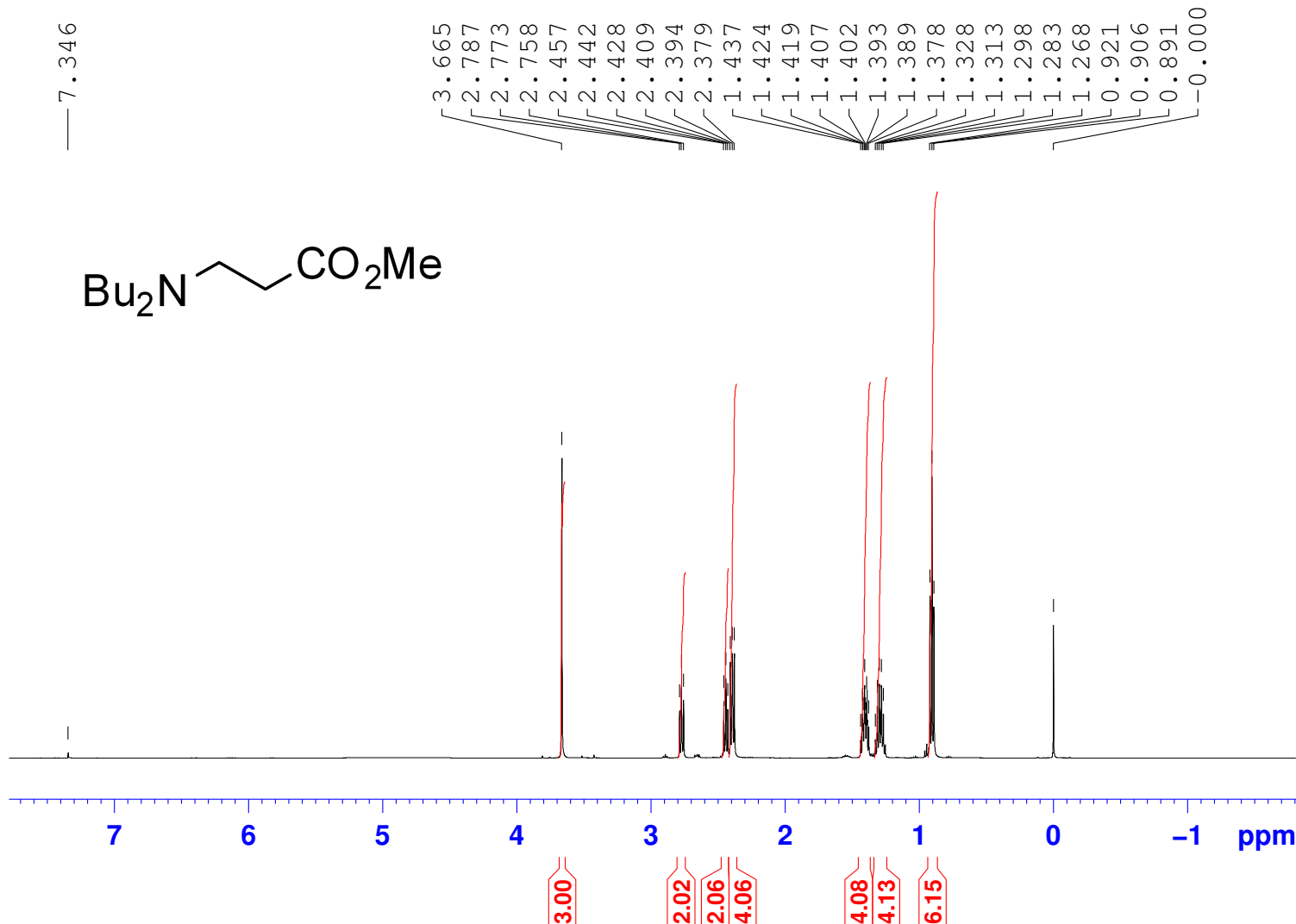
==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299704 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

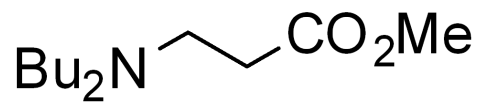
7.346



3.665
2.787
2.773
2.758
2.457
2.442
2.428
2.409
2.394
2.379
1.437
1.424
1.419
1.407
1.402
1.393
1.389
1.378
1.328
1.313
1.298
1.283
1.268
0.921
0.906
0.891
-0.000



sample 13
C13
cdcl3



173.16

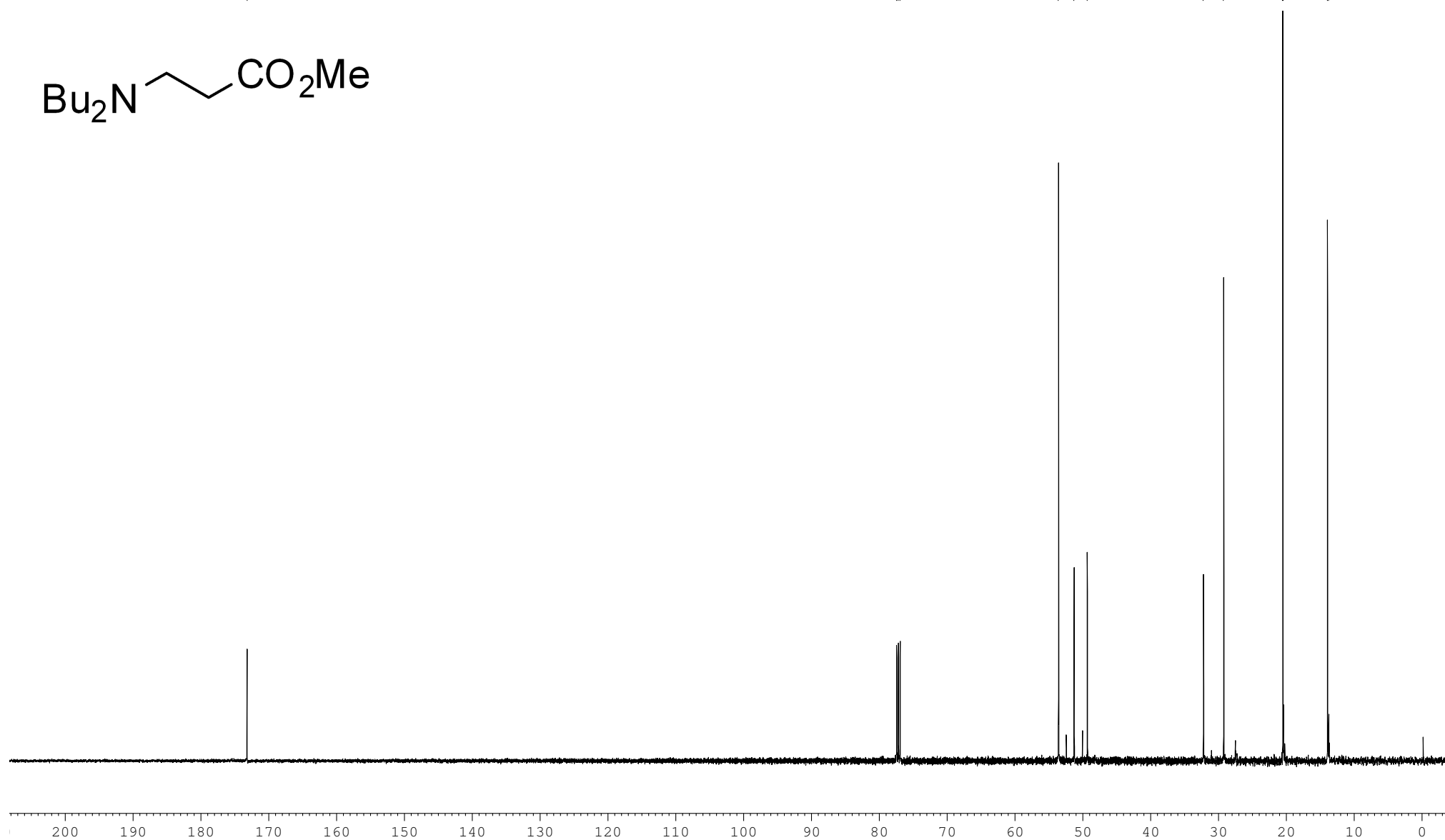
77.46
77.21
76.95

53.60
51.29
49.36

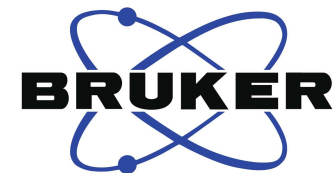
32.24
29.26

20.53
20.43

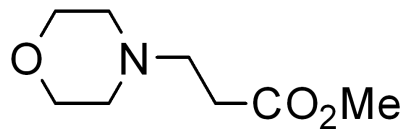
13.94
13.77



sample 15
proton
cdcl3



7.402



3.685
2.877
2.698
2.684
2.669
2.528
2.513
2.499
2.467
2.458
2.450

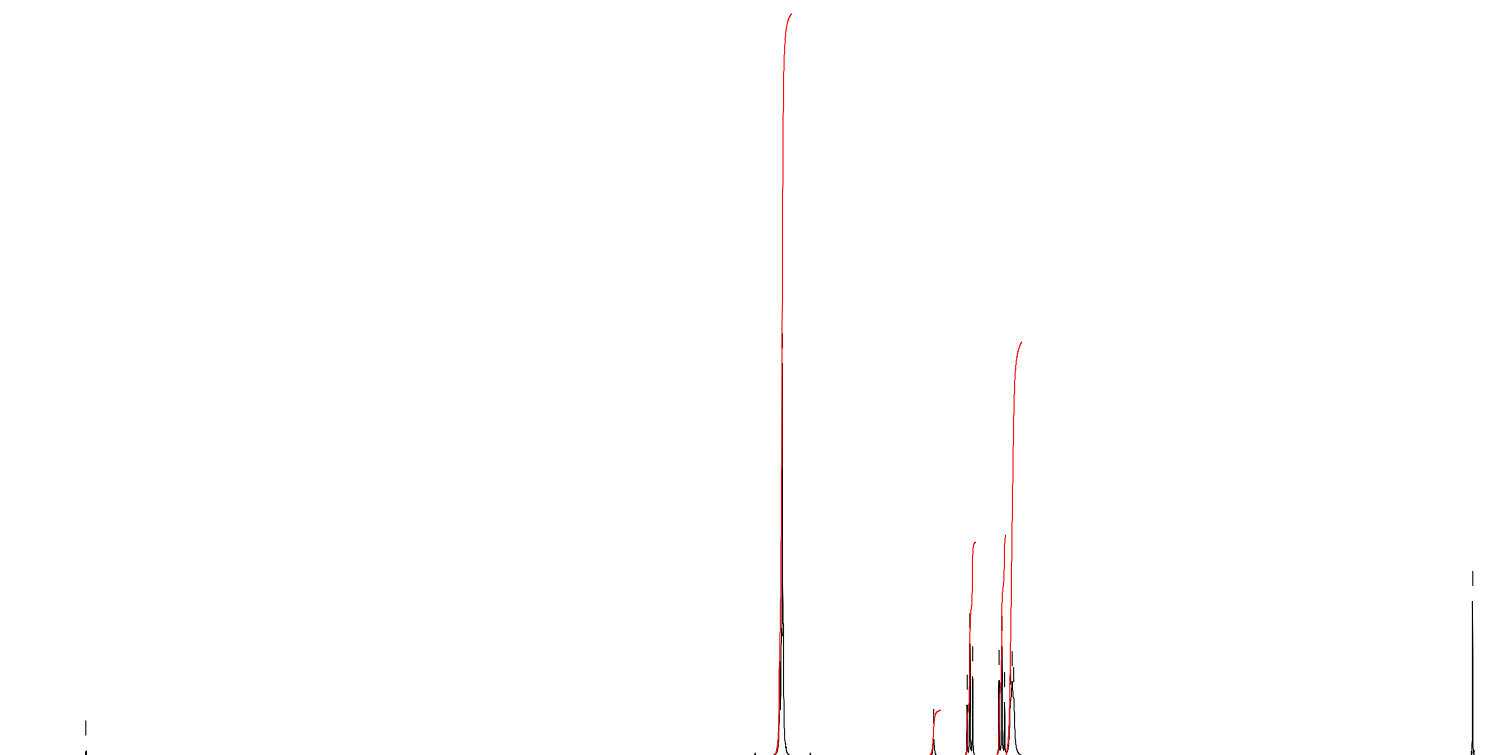
0.000

Current Data Parameters
NAME Tapan_2015
EXPNO 65
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150707
Time 10.08
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 16
DW 48.400 usec
DE 6.50 usec
TE 292.5 K
D1 1.00000000 sec

==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

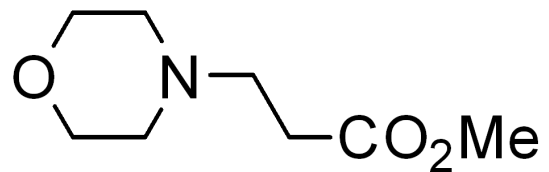
F2 - Processing parameters
SI 65536
SF 500.1299418 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



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 ppm

3.00
0.19
0.87
0.90
1.68

sample 15
C13
cdcl3



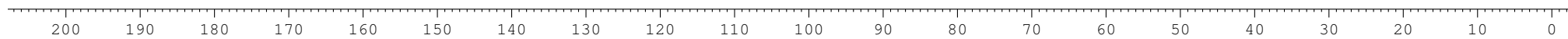
172.50

77.49
77.23
76.97

66.62

53.73
53.20
51.36

31.64



sample 16
proton
cdcl3

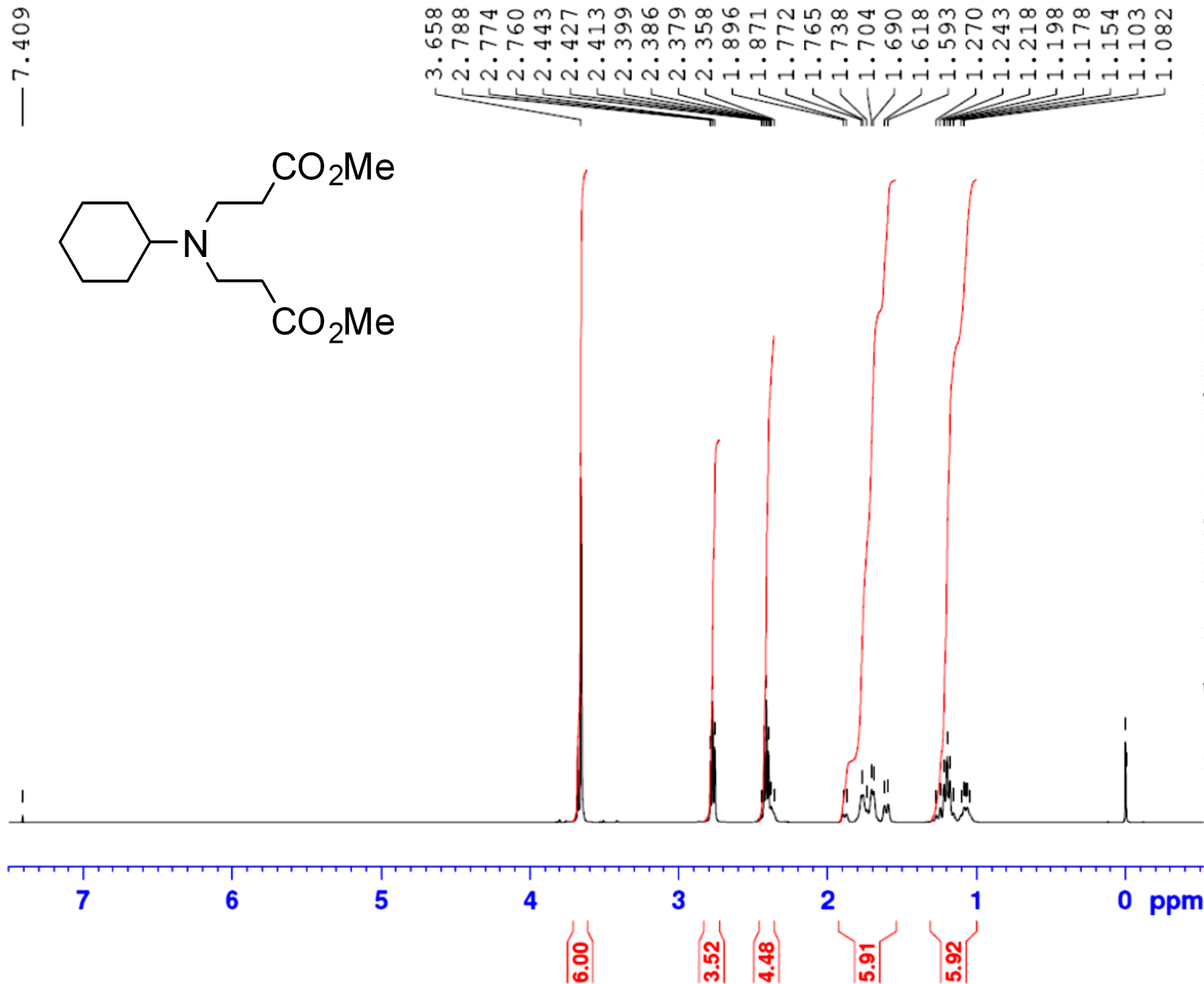


Current Data Parameters
NAME Tapan_2015
EXPNO 66
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150707
Time 10.28
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.171923 sec
RG 16
DW 48.400 usec
DE 6.50 usec
TE 292.5 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

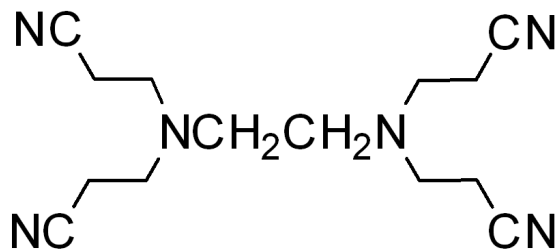
F2 - Processing parameters
SI 65536
SF 500.1299383 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



sample 17
proton
cdcl3



7.364



2.939
2.928
2.915
2.866
2.853
2.840
2.702
2.557
2.551
2.543
2.538
2.530
2.525

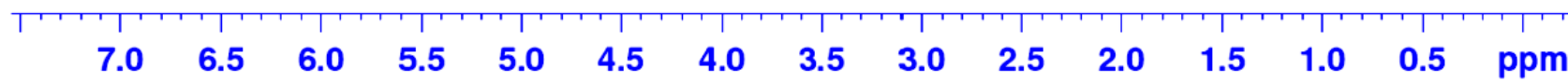
0.000

Current Data Parameters
NAME Tapan_2015
EXPNO 67
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150707
Time 10.35
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 17
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 28.5
DW 48.400 usec
DE 6.50 usec
TE 292.5 K
D1 1.00000000 sec

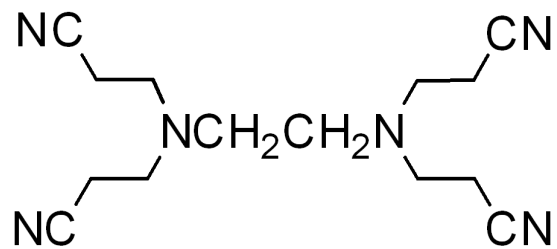
==== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299615 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



4.00
3.78
4.05
7.92

sample 17
C13
cdcl3



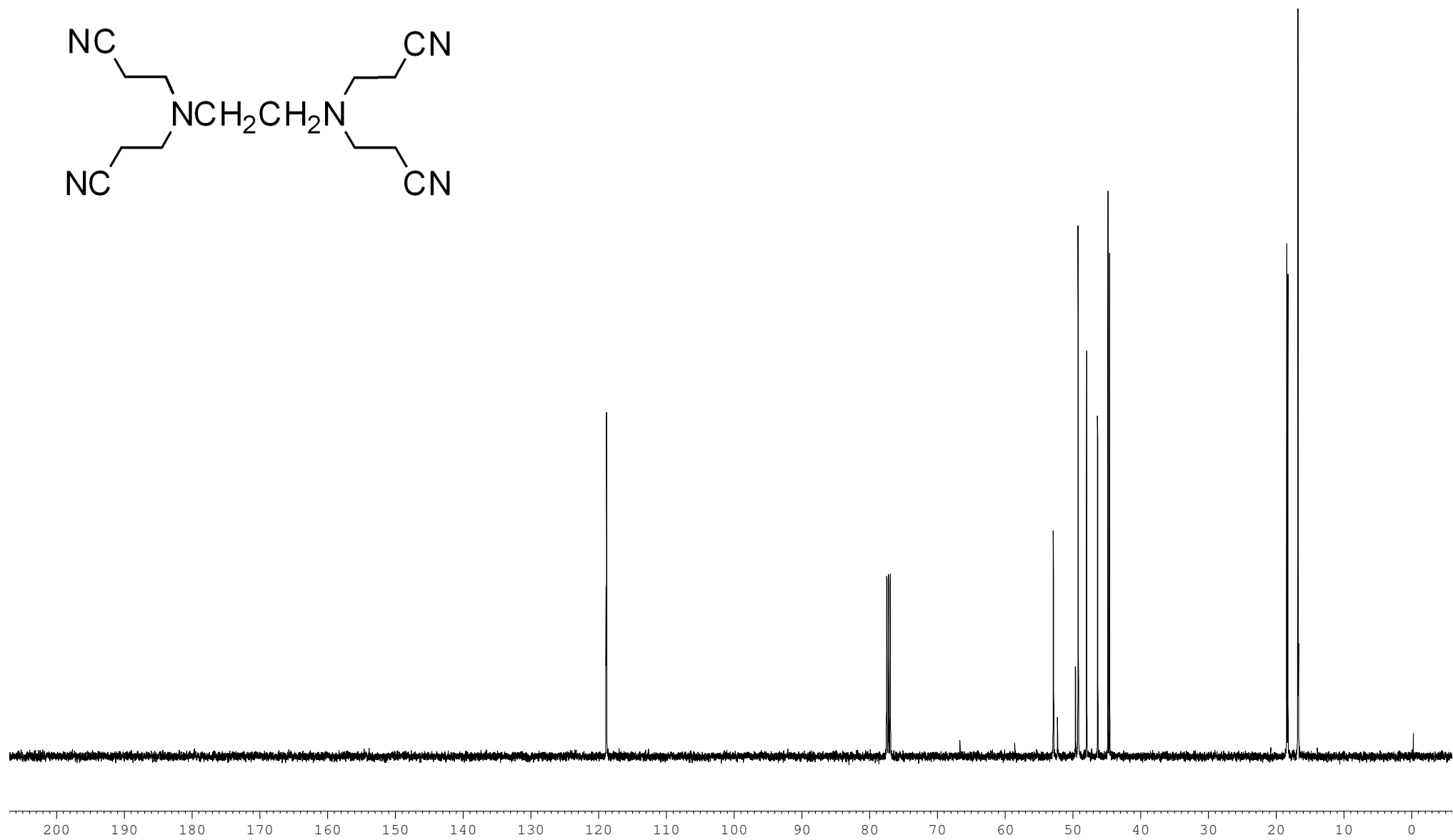
118.93
118.85

77.49
77.23
76.98

52.92
52.31
49.64
49.27
48.00
46.38
44.85
44.62

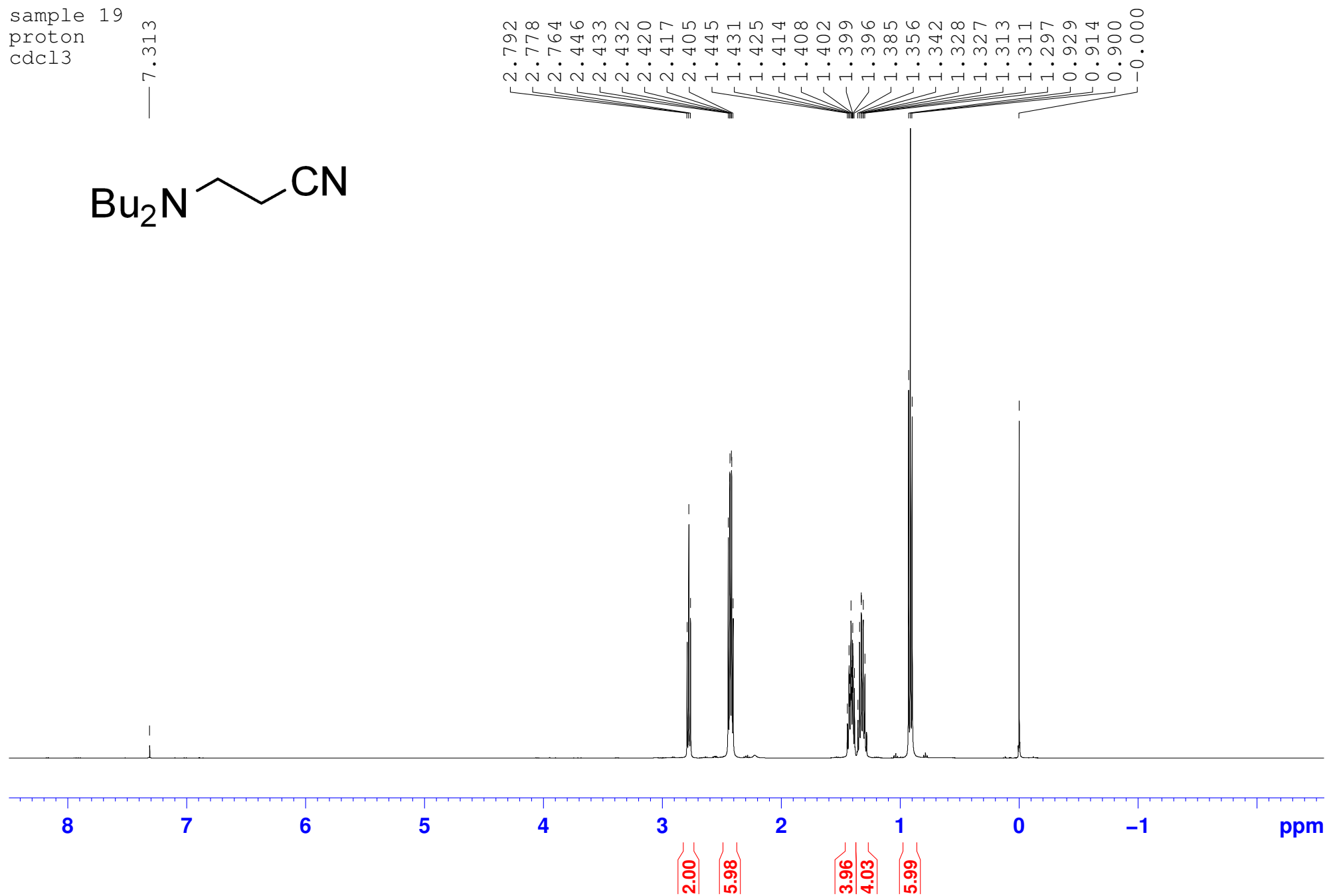
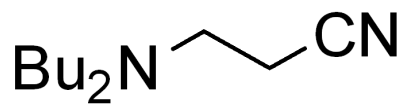
18.46
18.30
16.82

-0.22

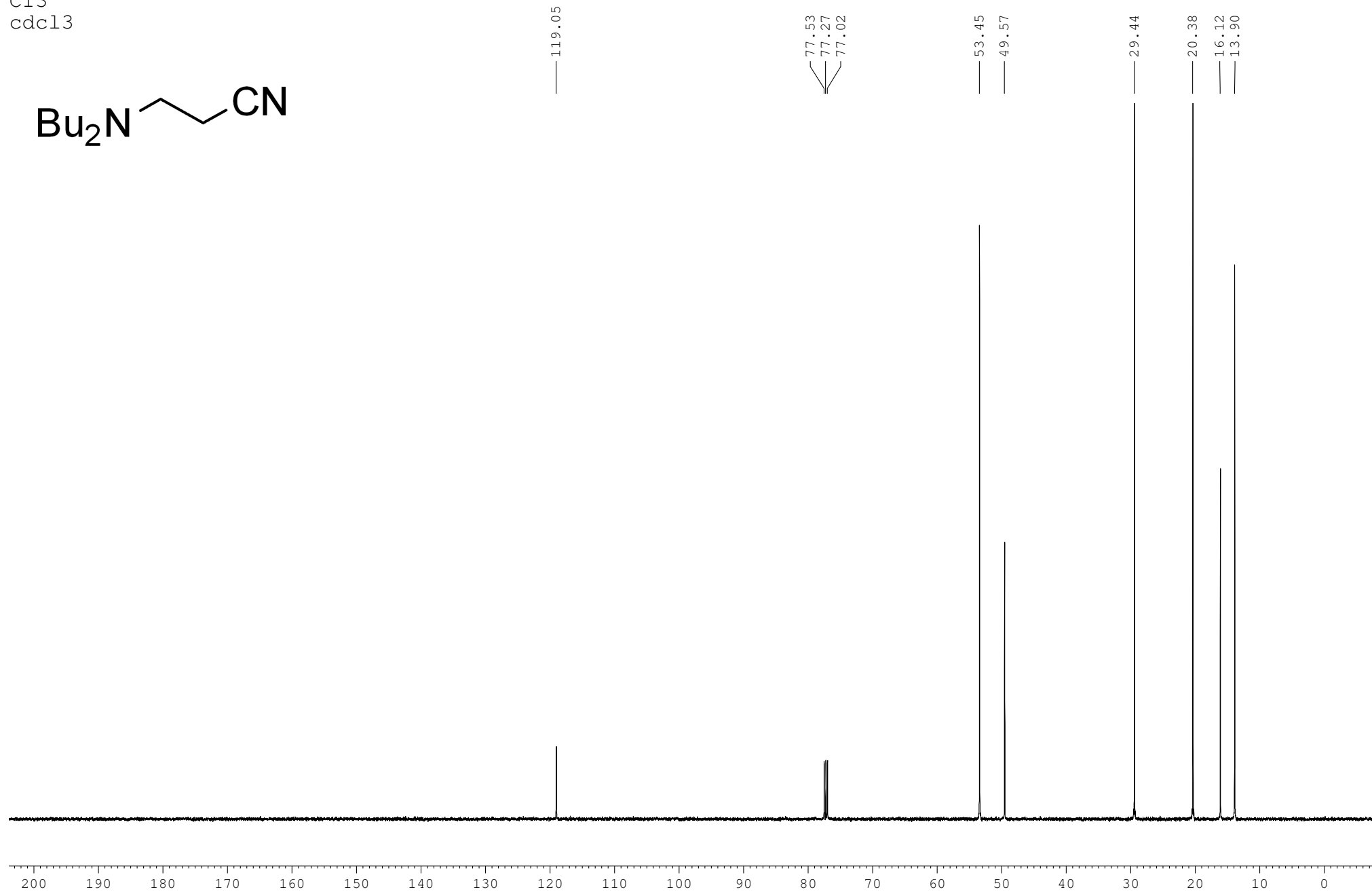
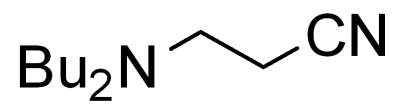


sample 19
proton
cdcl3

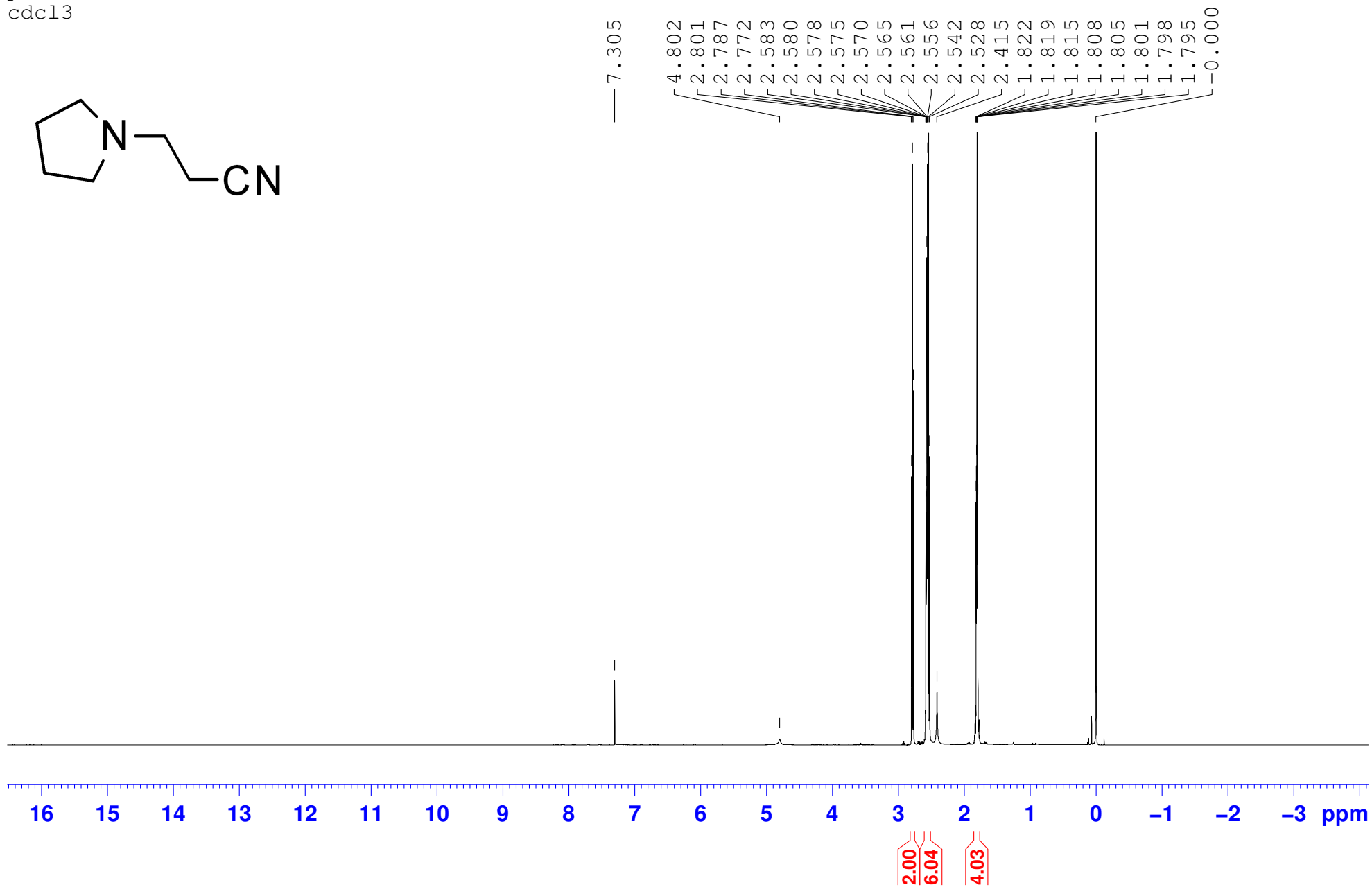
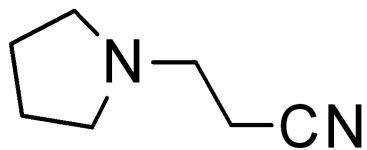
— 7.313



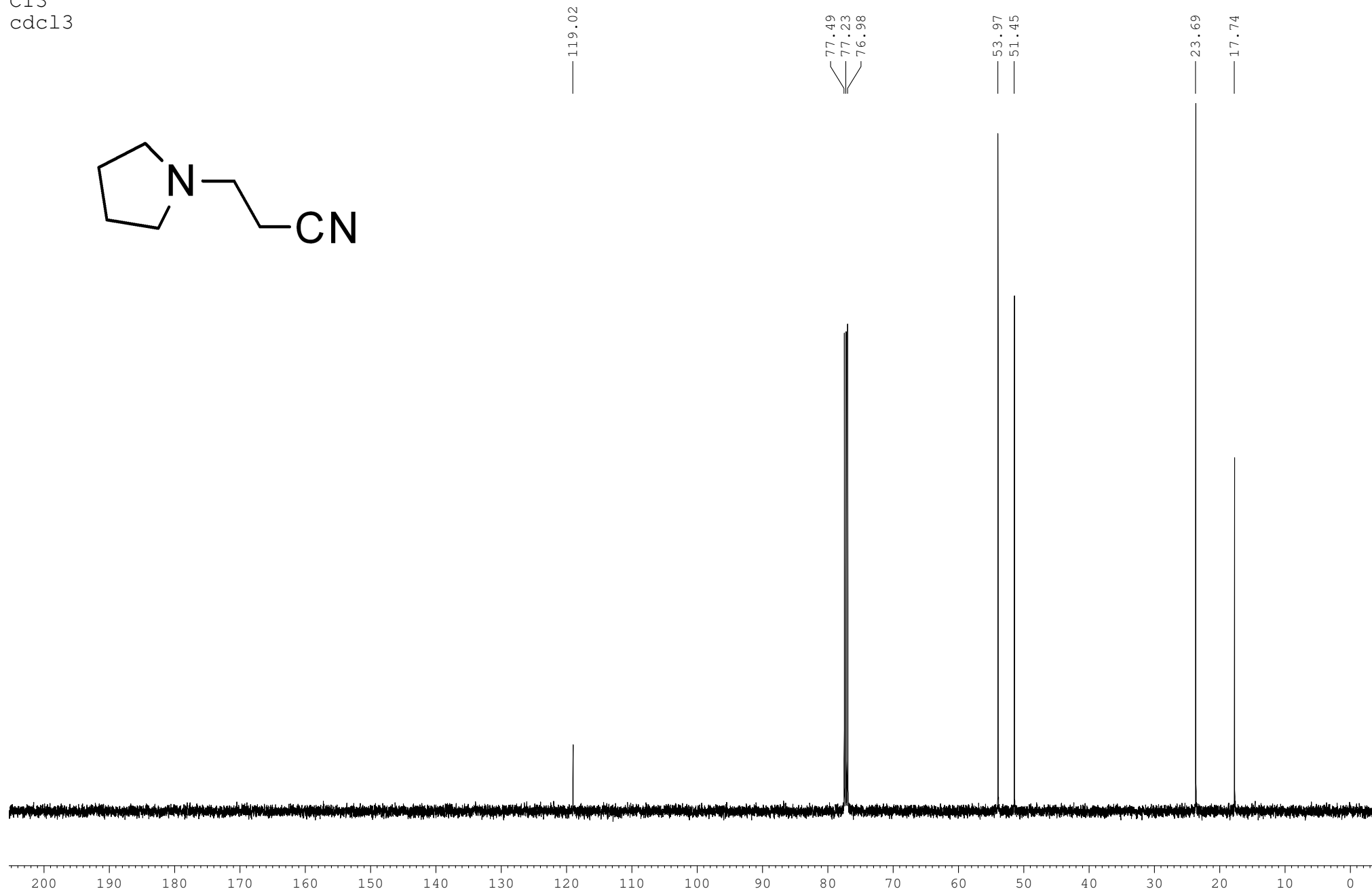
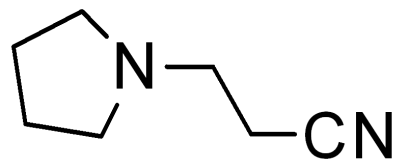
sample 19
C13
cdcl3



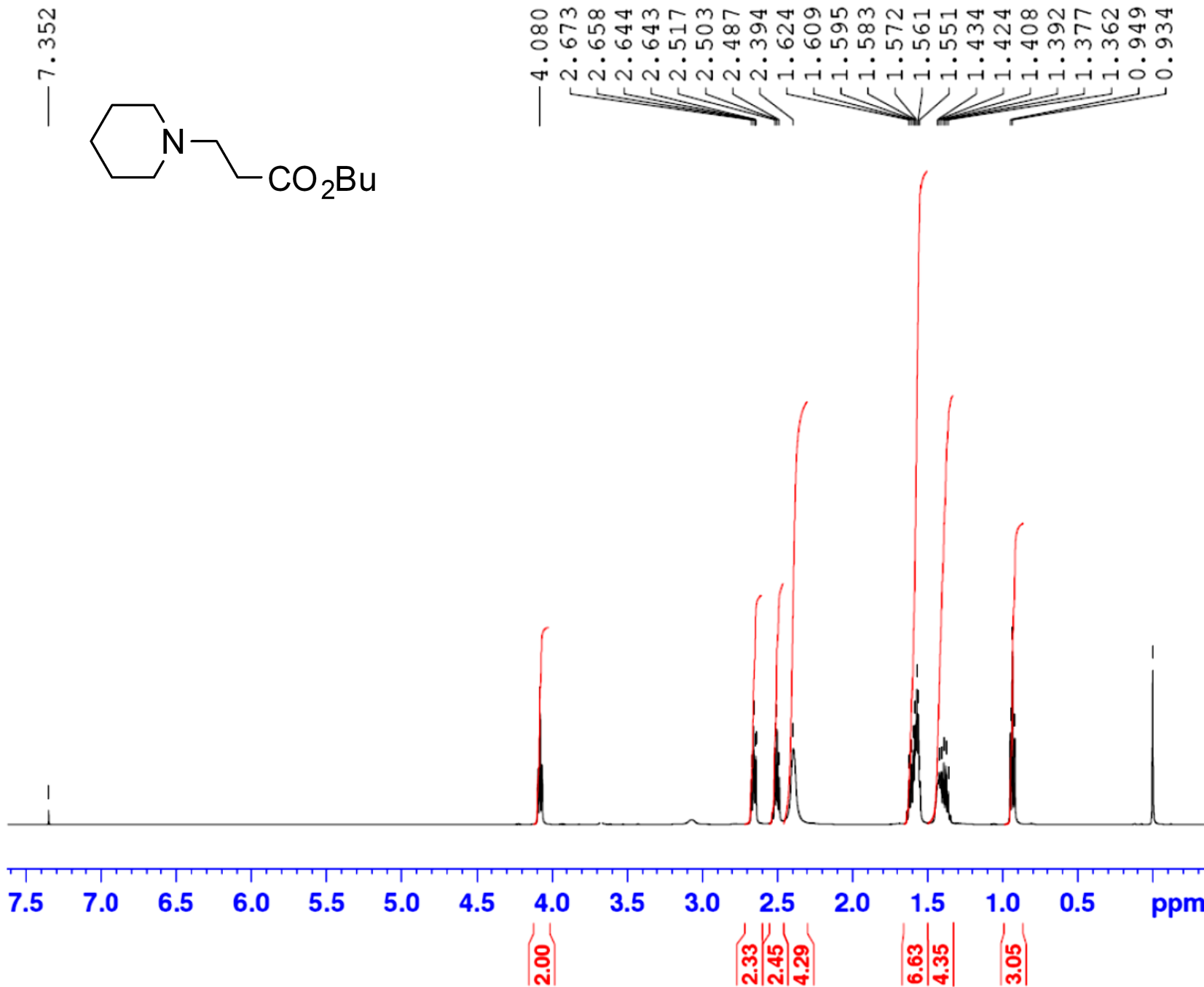
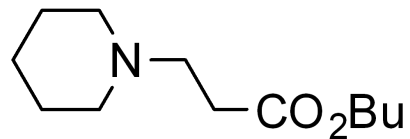
sample 20
proton
cdcl3



sample 20
C13
cdcl3



sample 21
proton
cdcl3



Current Data Parameters
NAME Tapan_2015
EXPNO 70
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150707
Time 10.50
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 18
DW 48.400 usec
DE 6.50 usec
TE 292.5 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299676 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

sample 21
C13
cdcl3

172.18
171.85

76.68
76.42
76.16

63.31

53.44
53.37

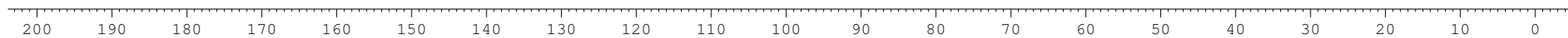
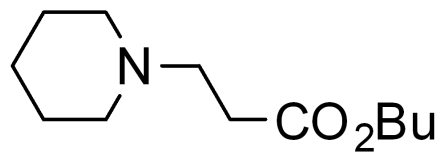
31.44
29.82

25.03
23.42

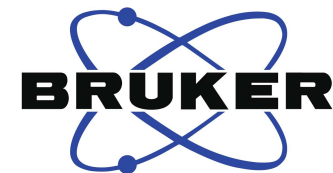
18.25

12.80

0.12



sample 24
proton
cdcl3

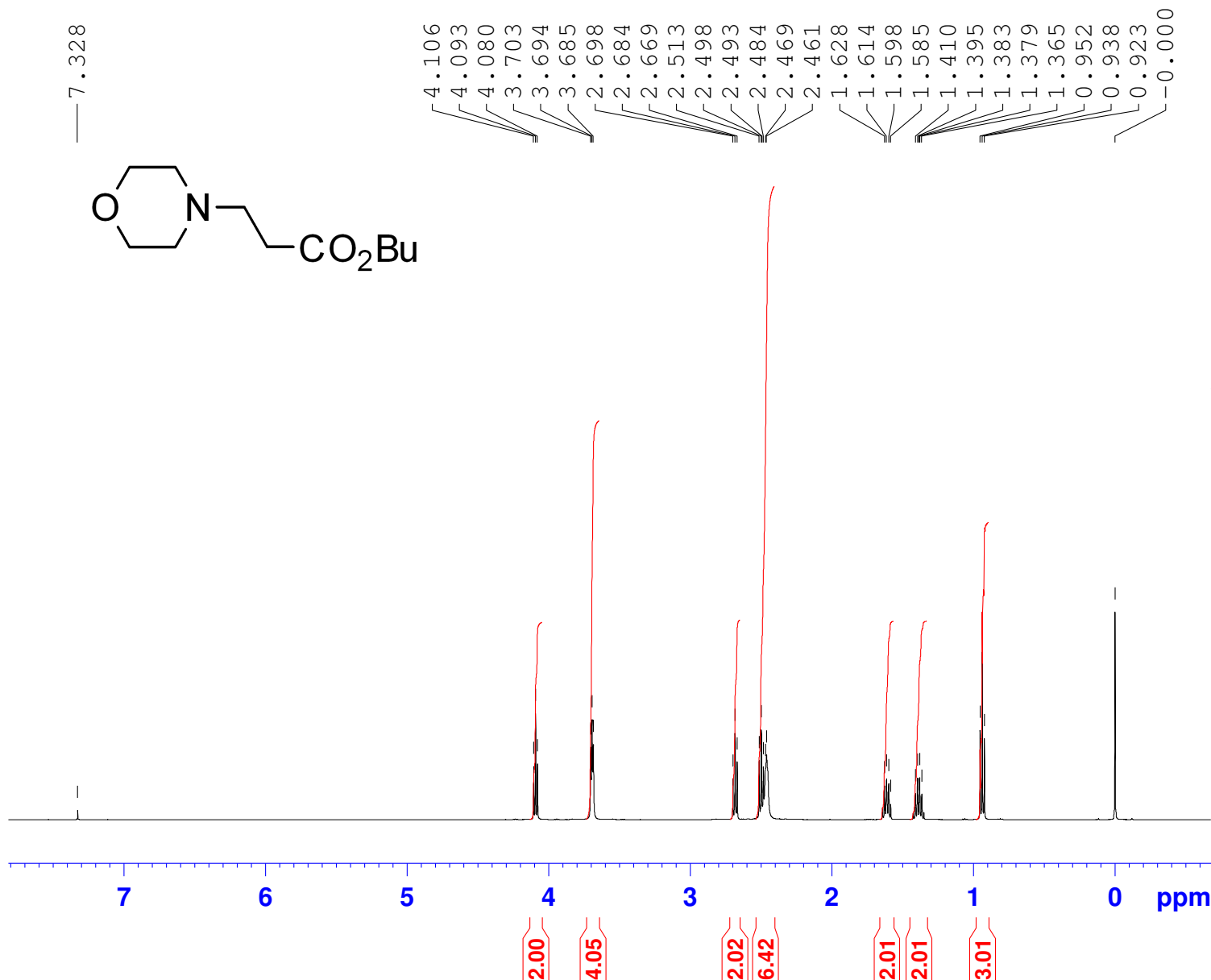


Current Data Parameters
NAME Tapan_2015
EXPNO 74
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150706
Time 11.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 32
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 20.2
DW 48.400 usec
DE 6.50 usec
TE 292.8 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 16.00 usec
PLW1 13.00000000 W
SFO1 500.1330885 MHz

F2 - Processing parameters
SI 65536
SF 500.1299791 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



sample 24
C13
cdcl3

