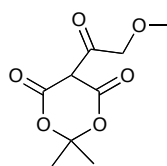
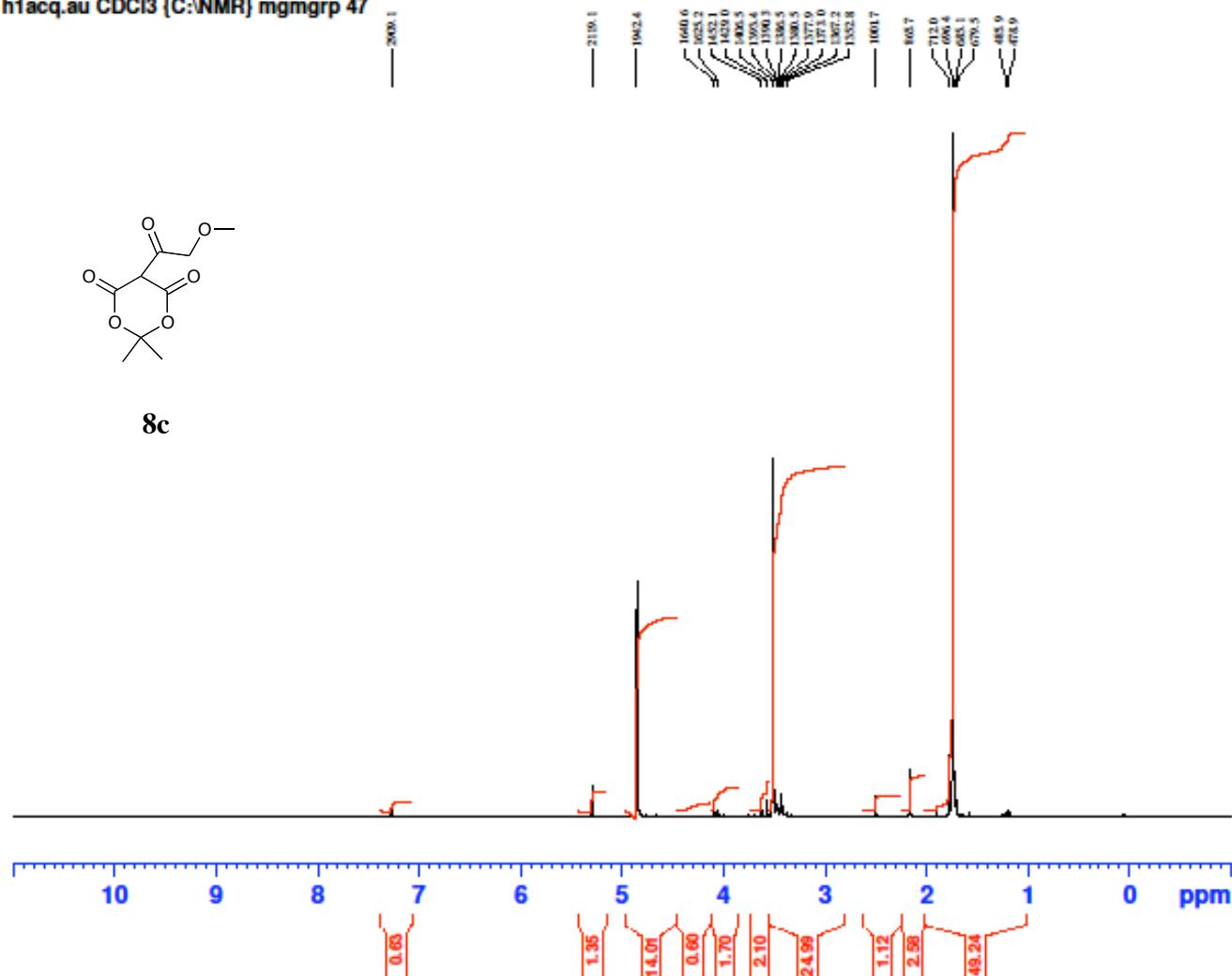


Instrument DQX400
Chemist PJF
Group MGM
PF026
h1acq.au CDCl3 {C:NMR} mgmgrp 47



8c



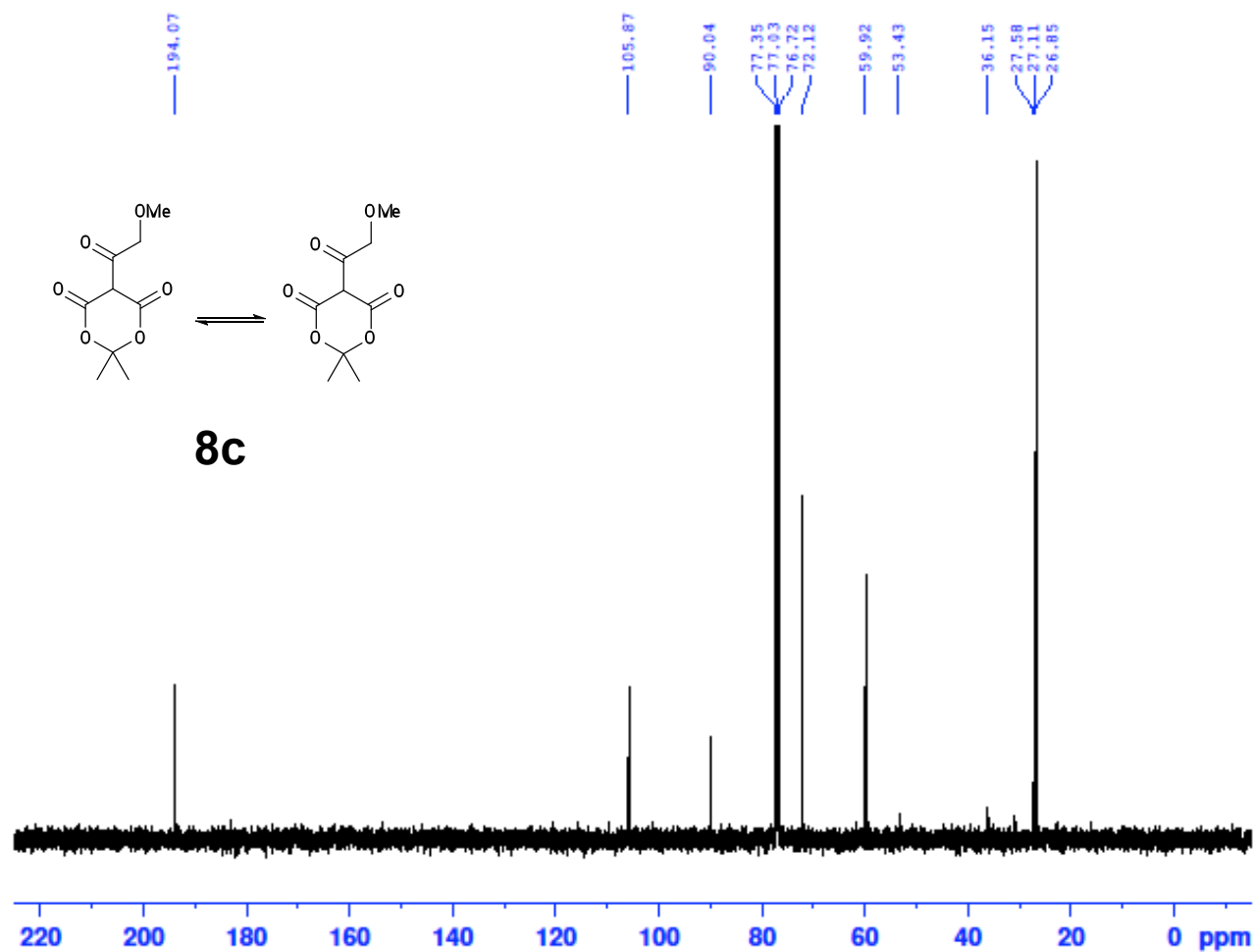
NMR@CHEM.OX

NAME Mar01-2010-47
EXPNO 1
PROCNO 1
Date_ 20100302
Time 0.10
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PJF
Group MGM
PF026
c13acq.au CDCl3 {C:NMR} mgmgrp 47

NMR@CHEM.OX

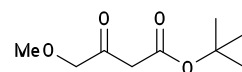


NAME Mar01-2010-47
EXPNO 2
PROCNO 1
Date_ 20100302
Time 0.18
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

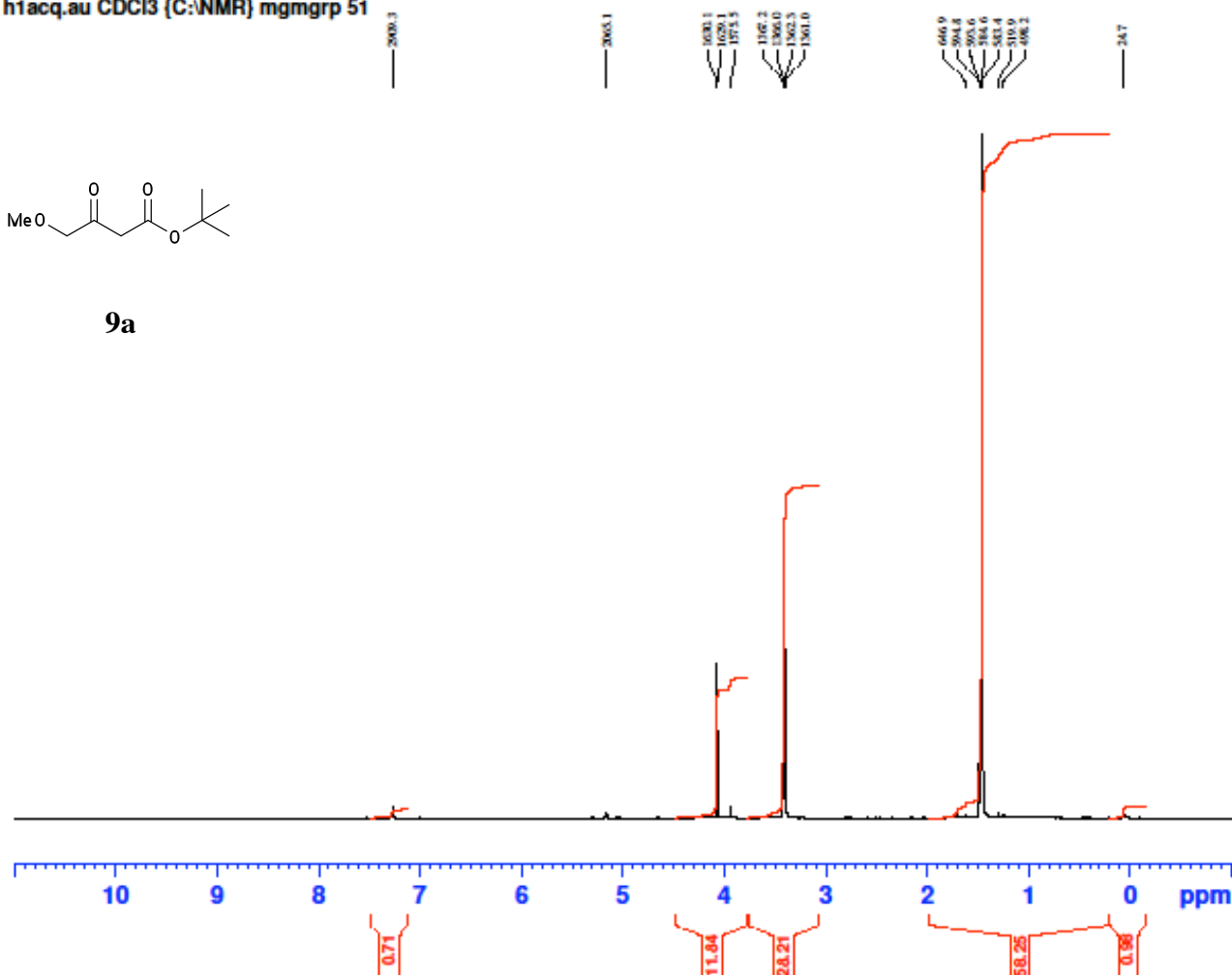
===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PJF
Group MGM
PF040
h1acq.au CDCl3 (C:NMR) mgmgrp 51



9a



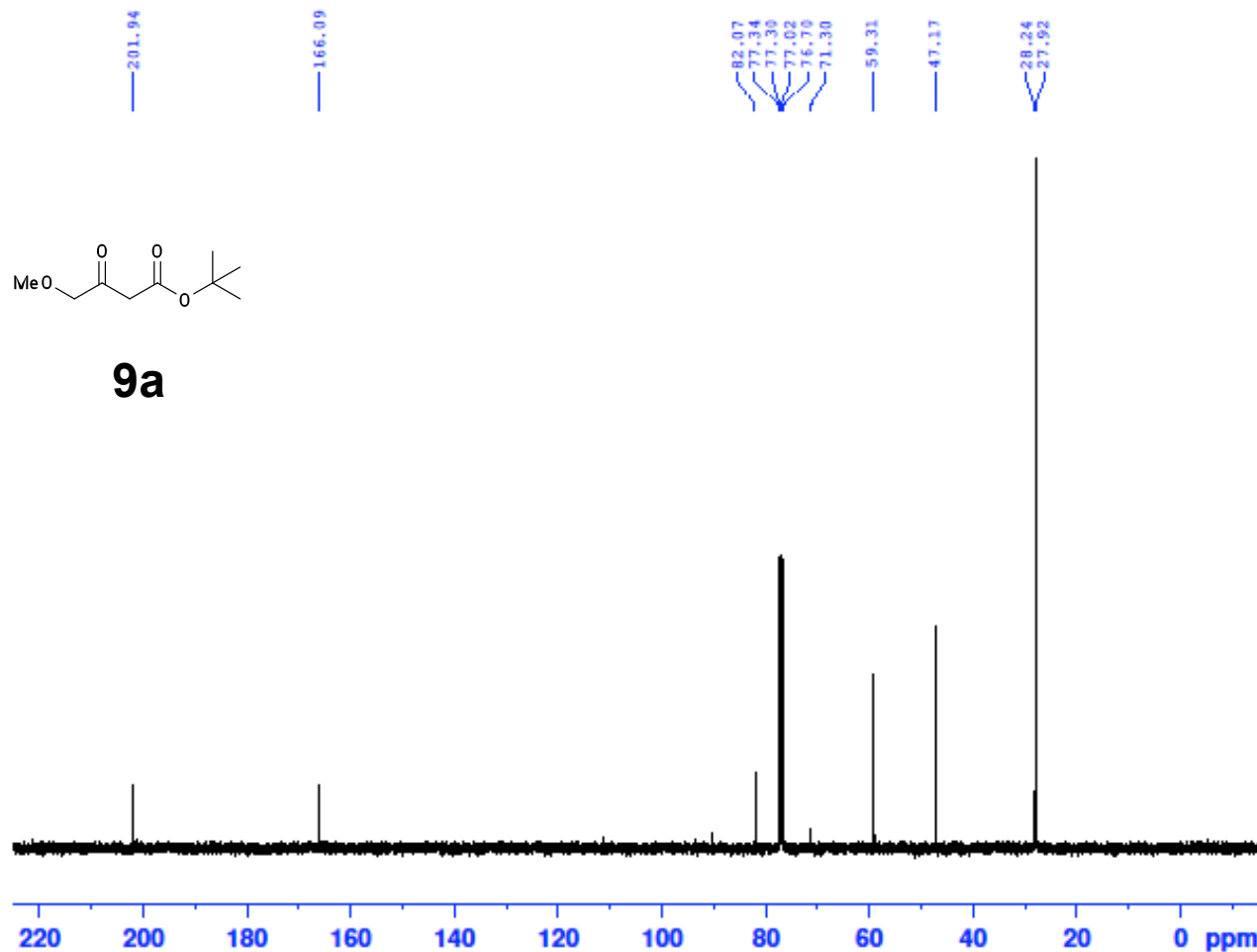
NMR@CHEM.OX

NAME Mar02-2010-51
EXPNO 1
PROCNO 1
Date_ 20100302
Time 21.20
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PJF
Group MGM
PF040
c13acq.au CDC13 (C:NMR) mgmgrp 51

NMR@CHEM.OX

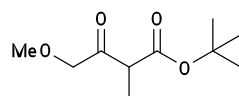


NAME Mar02-2010-51
EXPNO 2
PROCNO 1
Date_ 20100302
Time 21.27
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

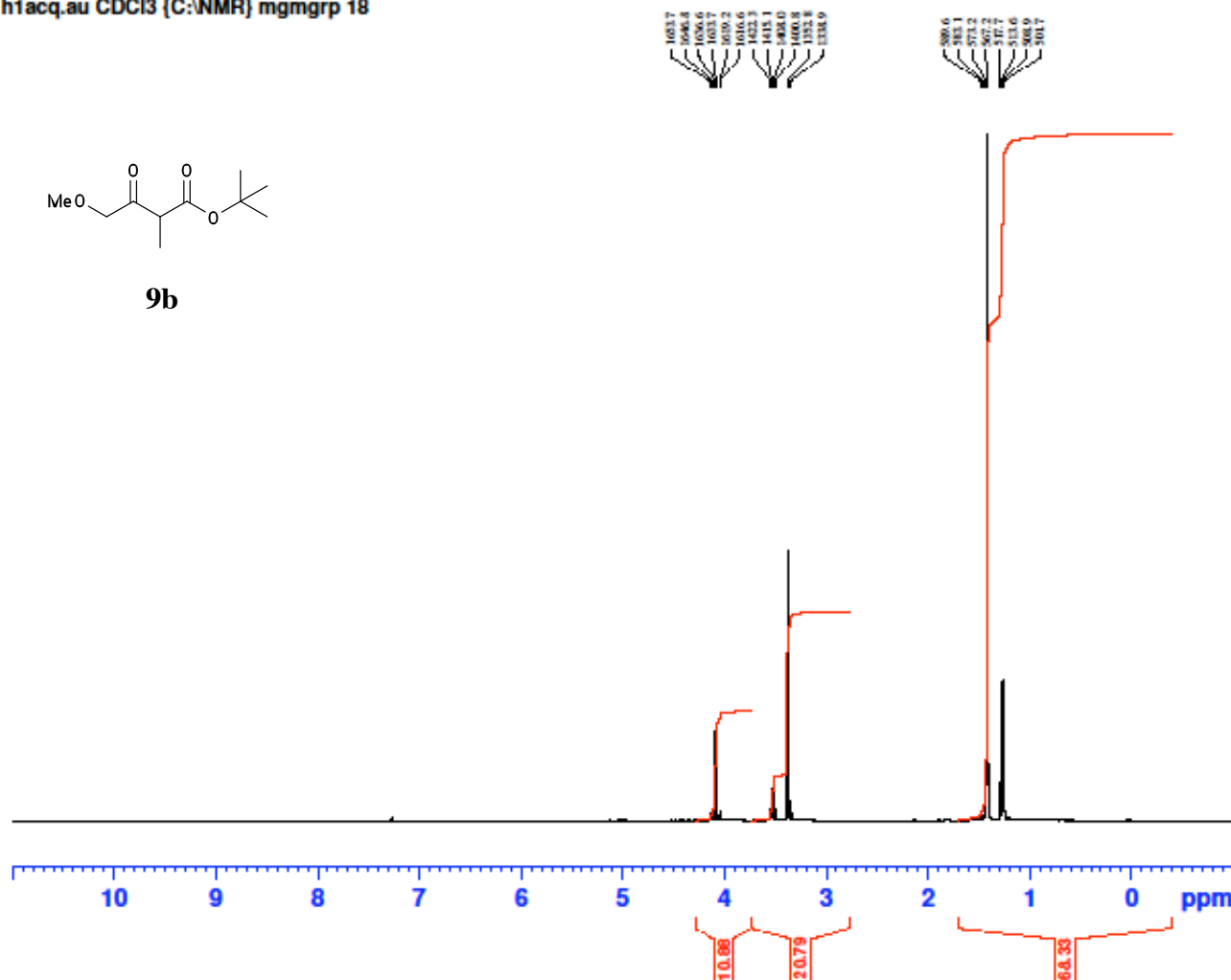
===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PJF
Group MGM
PF035
h1acq.au CDCI3 {C:NMR} mgmgrp 18



9b



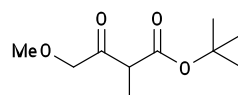
NMR@CHEM.OX

NAME Apr12-2010-18
EXPNO 1
PROCNO 1
Date_ 20100412
Time 18.13
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 32
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

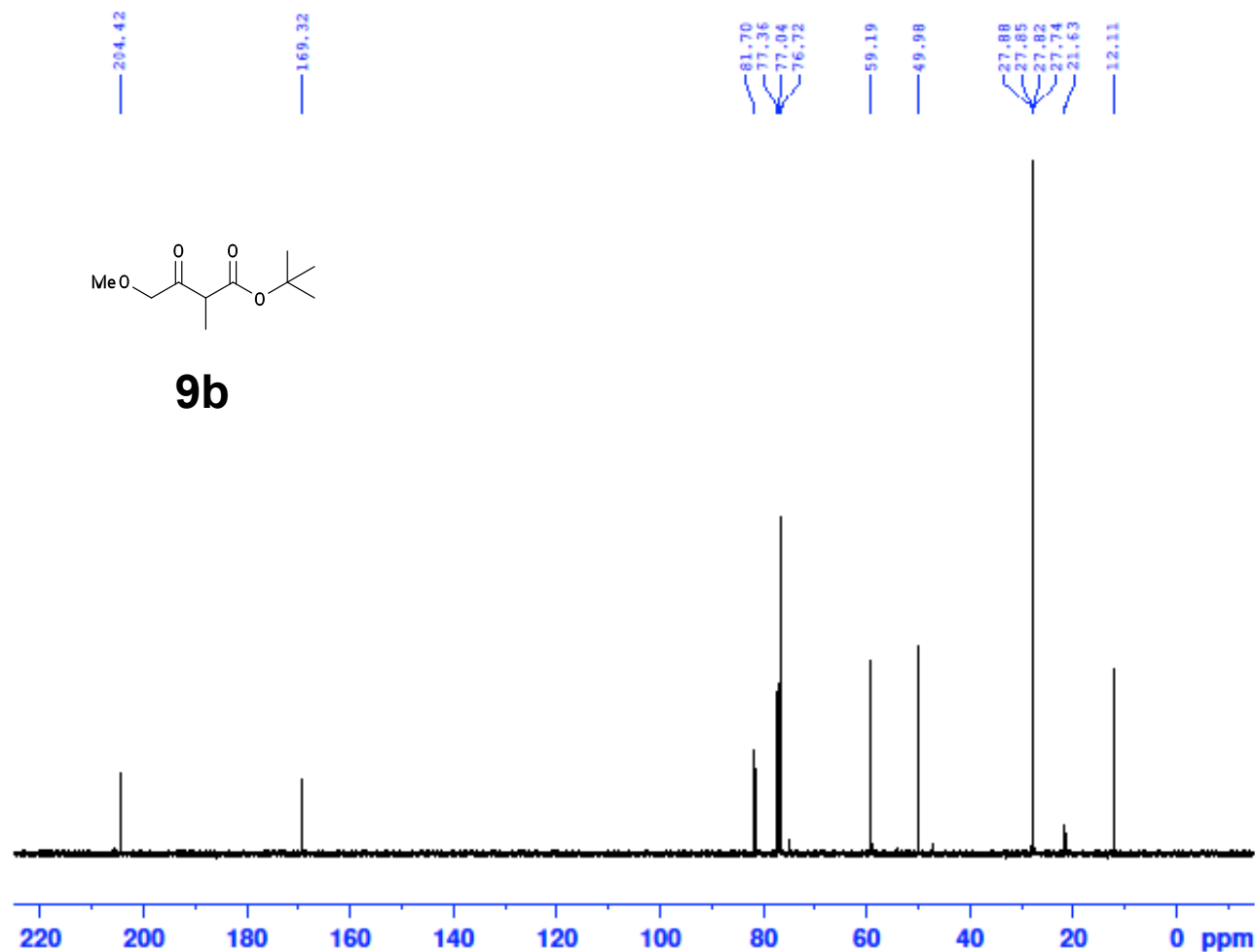
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PJF
Group MGM
PF035
c13acq.au CDCl3 {C:NMR} mgmgrp 18

NMR@CHEM.OX



9b

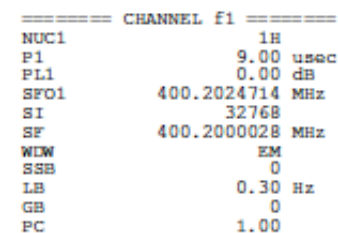


```

NAME      Apr12-2010-18
EXPNO     2
PROCNO    1
Date_     20100412
Time      18.21
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD        32768
SOLVENT   CDCl3
NS        256
DS        4
SWH       26178.010 Hz
FIDRES    0.798889 Hz
AQ        0.6259188 sec
RG        32768
DW        19.100 usec
DE        7.50 usec
TE        300.0 K
D1        1.00000000 sec
D11       0.03000000 sec
TD0       1

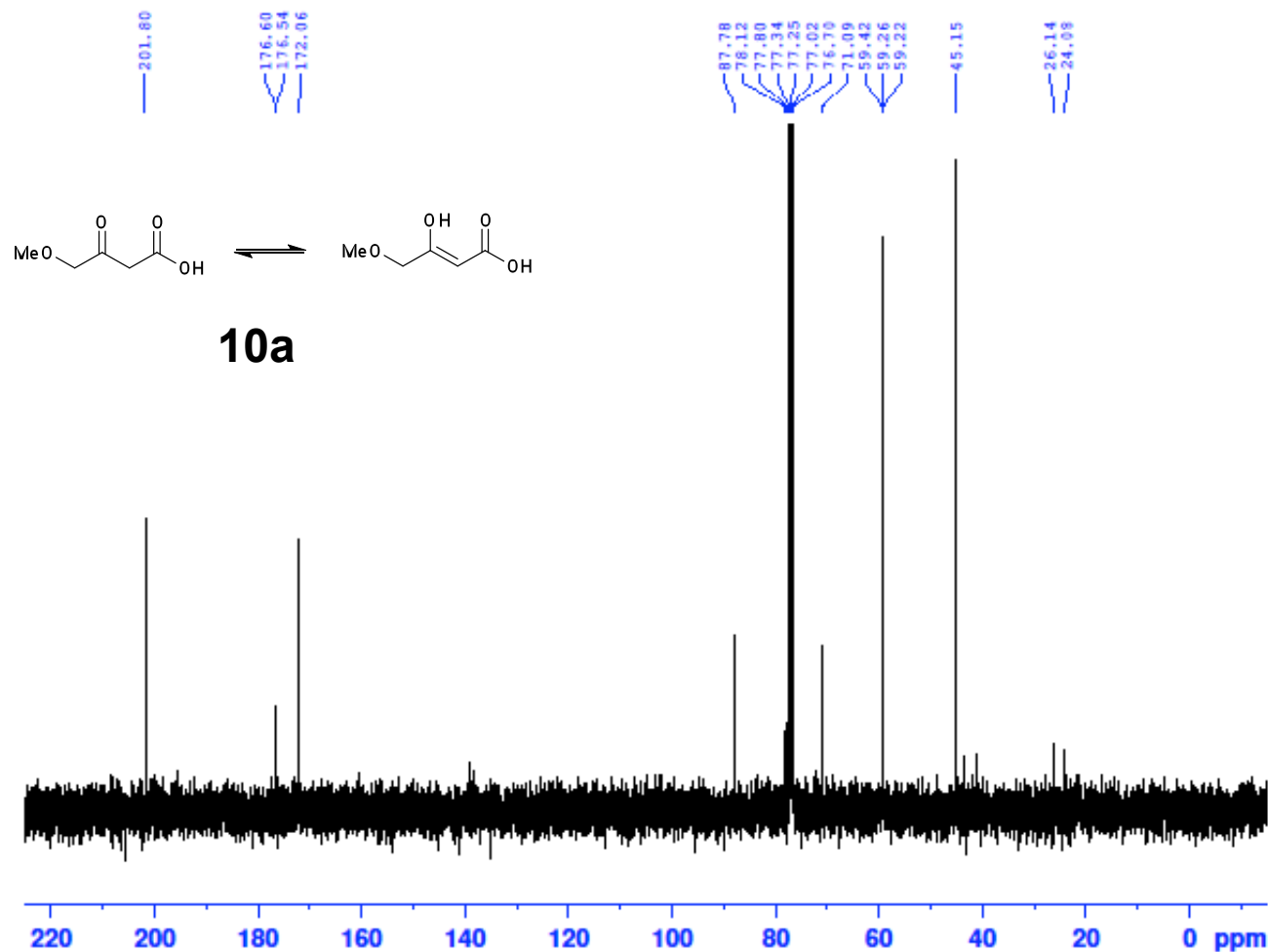
===== CHANNEL f1 =====
NUC1      13C
P1        9.50 usec
PL1       0.00 dB
SFO1     100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2   waltz16
NUC2      1H
PCPD2     80.00 usec
PL2       0.00 dB
PL12      19.00 dB
PL13      25.00 dB
SFO2     400.2016008 MHz
SI        32768
SF       100.6303718 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40
    
```



Instrument DQX400
Chemist PJF
Group MGM
PF028
c13acq.au CDCl3 {C:NMR} mgmgrp 11

NMR@CHEM.OX

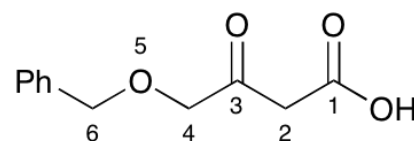


NAME Mar22-2010-11
EXPNO 2
PROCNO 1
Date_ 20100322
Time 12.51
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

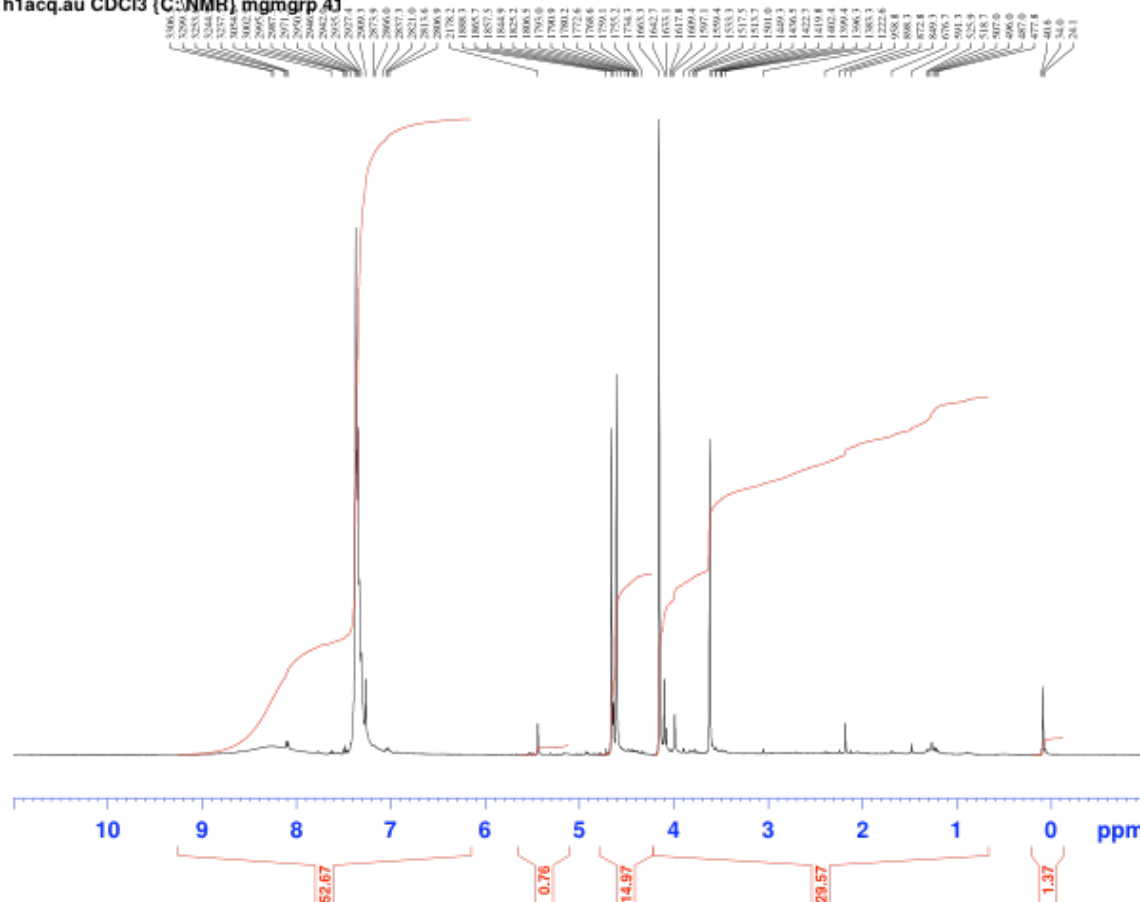
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

4 –Benzyloxy-3-oxobutanoic acid



10b

Instrument DQX400
Chemist ykschau
Group mgm
SC 086
h1acq.au CDC13 (C-NMR) mgmgrp 41



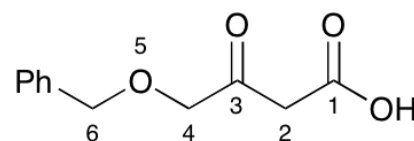
NMR@CHEM.OX

```

NAME      Mar29-2010-41
EXPNO     1
PROCNO    1
Date_     20100329
Time      17.51
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         161.3
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

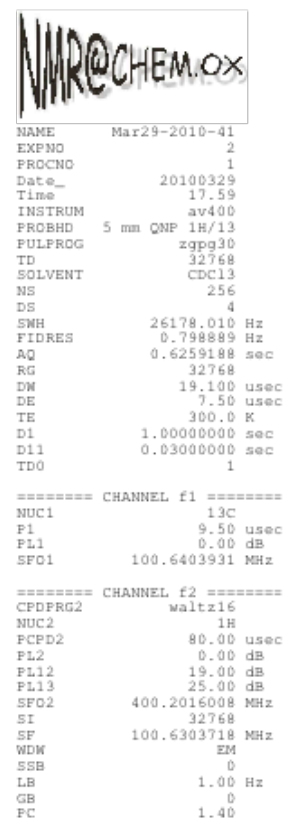
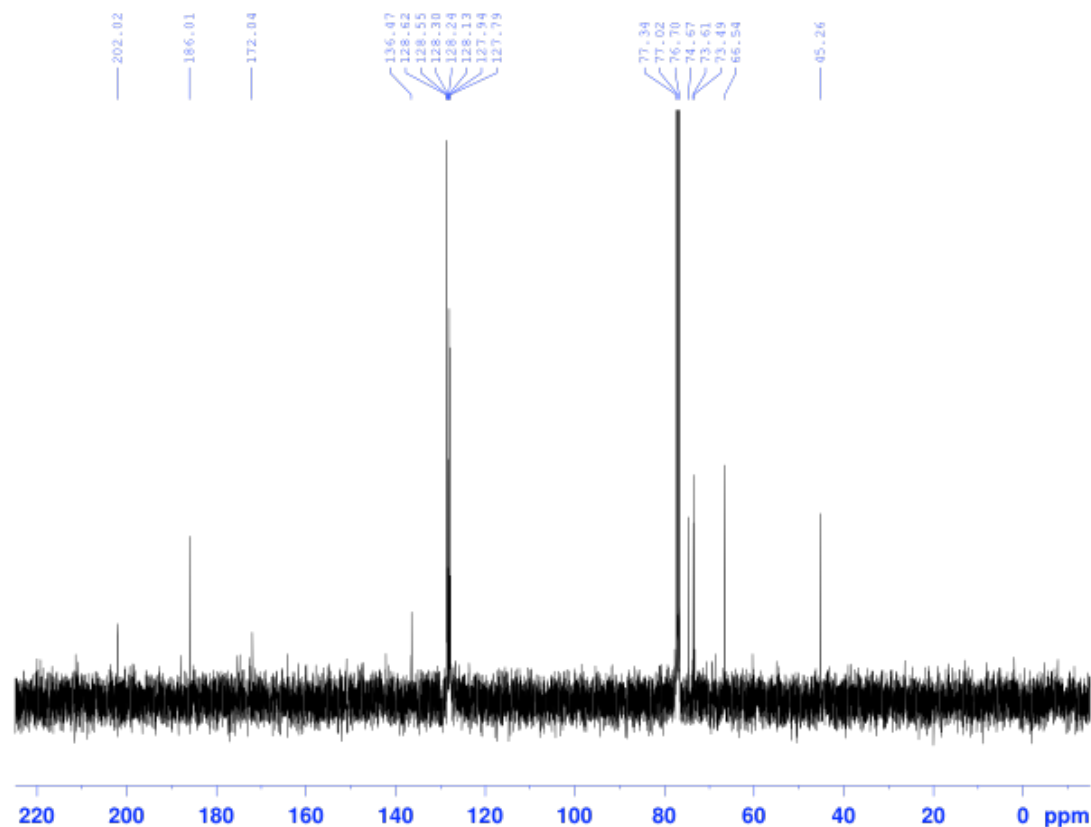
===== CHANNEL f1 =====
NUC1       13C
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
    
```

4 –Benzyloxy-3-oxobutanoic acid

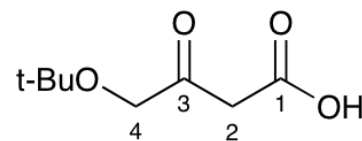


10b

Instrument DQX400
Chemist ykschau
Group mgm
SC 086
c13acq.au CDCl3 {C:NMR} mgmgrp 41

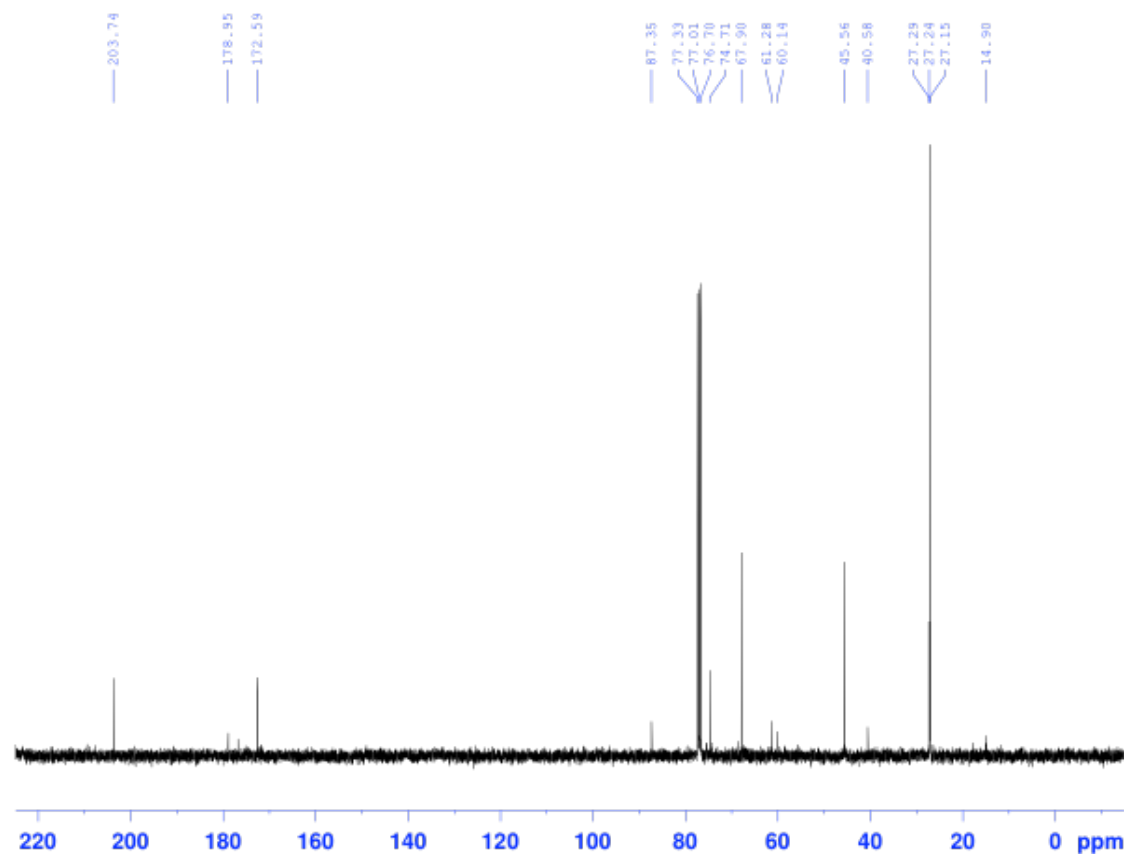


4-(*tert*-butoxy)-3-oxobutanoic acid



10c

Instrument DQX400
Chemist ykschau
Group mgm
SC 088
c13acq.au CDCl₃ {C:NMR} mgmgrp 34



NMR@CHEM.OX

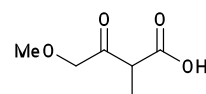
NAME Mar24-2010-34
EXPNO 2
PROCNO 1
Date_ 20100325
Time 13.11
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl₃
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DM 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

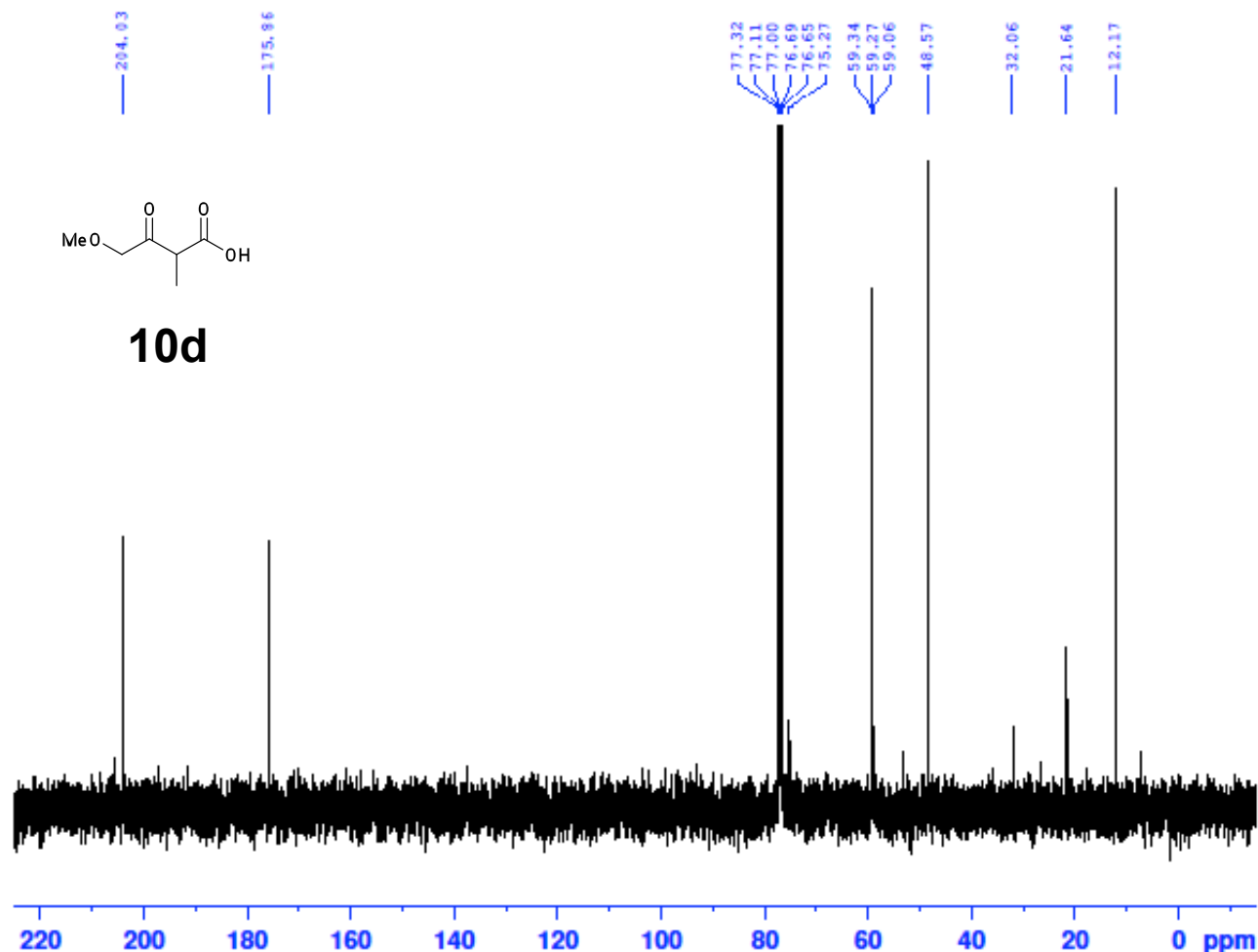
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDM EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PJF
Group MGM
PF035
c13acq.au CDCl3 {C:NMR} mgmgrp 17

NMR@CHEM.OX



10d

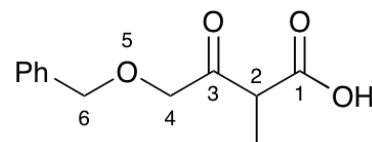


NAME Apr15-2010-17
EXPNO 2
PROCNO 1
Date_ 20100416
Time 1.01
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

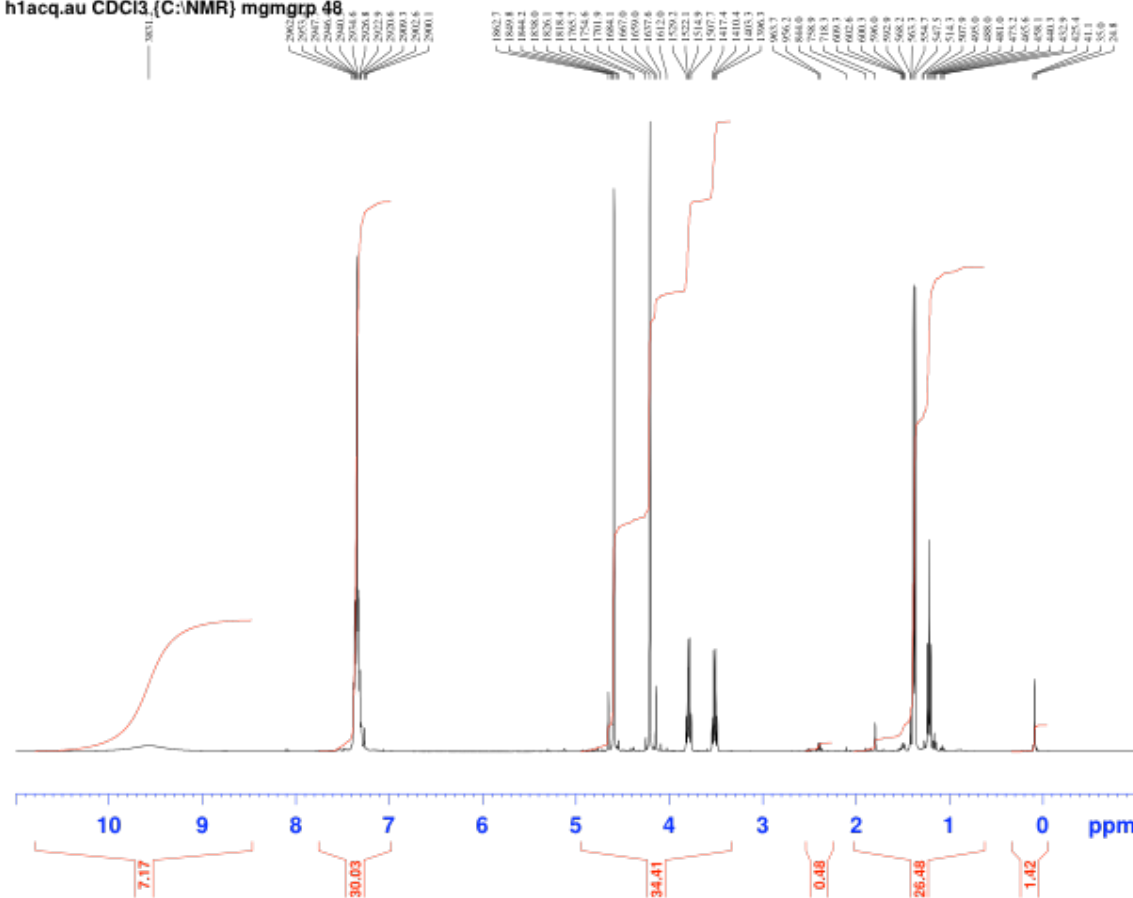
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

4-(benzyloxy)-2-methyl-3-oxobutanoic acid



10e

Instrument DQX400
Chemist ykschau
Group mgm
SC115 crude
h1acq.au CDCI3 {C:NMR} mgmgrp 48

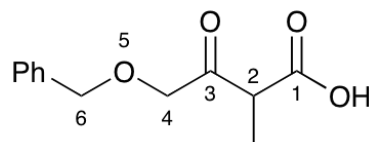


NMR@CHEM.OX

NAME May09-2010-48
EXPNO 1
PROCNO 1
Date_ 20100509
Time 22.03
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

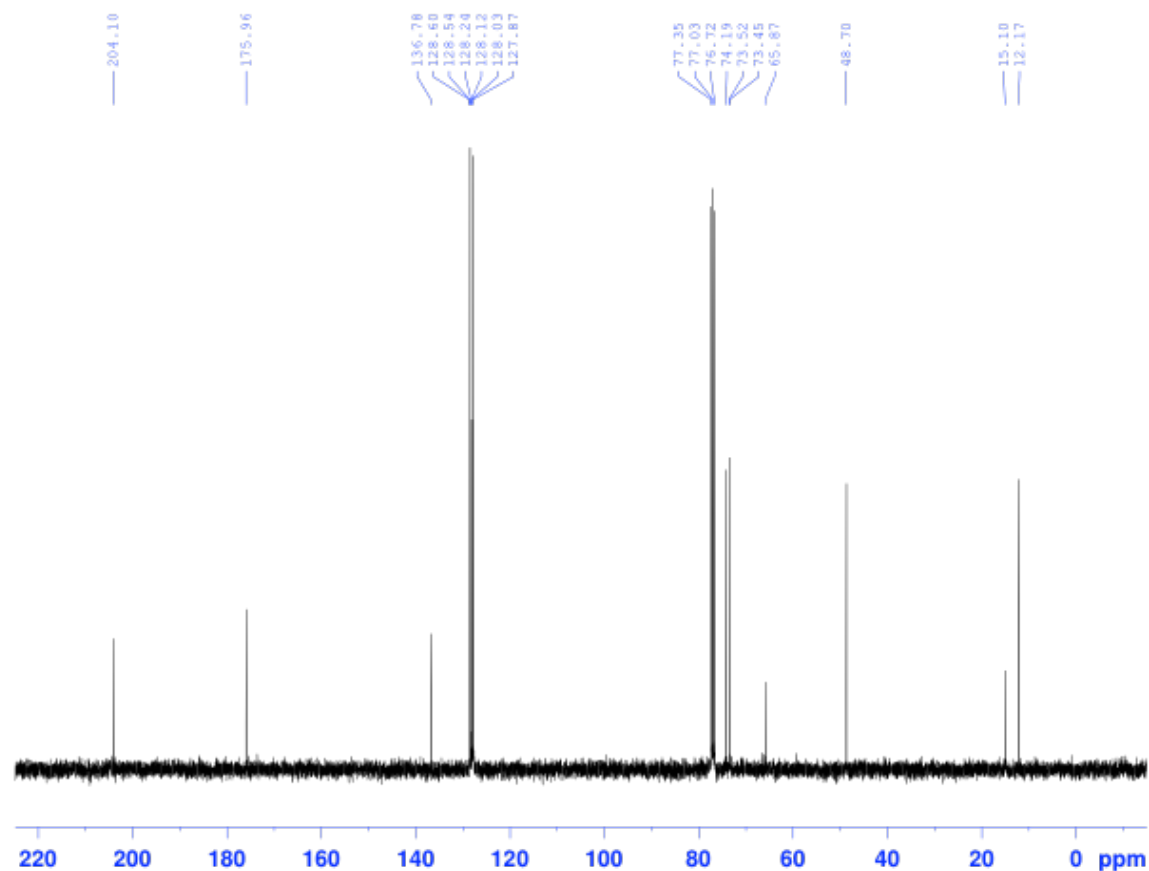
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

4-(benzyloxy)-2-methyl-3-oxobutanoic acid



10e

Instrument DQX400
Chemist ykschau
Group mgm
SC115 crude
c13acq.au CDCl3 {C:NMR} mgmgrp 48



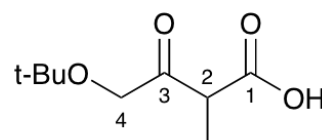
NMR@CHEM.OX

NAME May09-2010-48
EXPNO 2
PROCNO 1
Date_ 20100509
Time 22.11
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DM 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

4-(*tert*-butoxy)-2-methyl-3-oxobutanoic acid



10f

Instrument DPX200
Chemist ykschau
Group mgm
SC112 crude
h1acq.au CDCl3 (C:NMR) mgmgrp 20

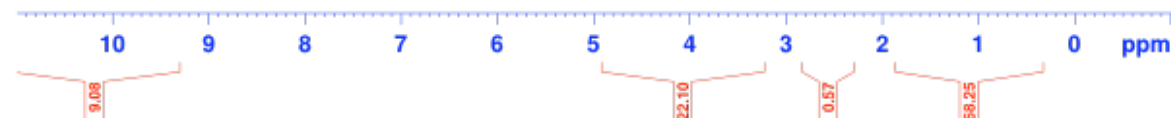


Current Data Parameters
NAME May06-2010-20
EXPNO 2
PROCNO 1

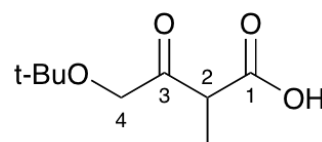
F2 - Acquisition Parameters
Date_ 20100506
Time 16.28
INSTRUM dpx200
PROBHD 5 mm Dual 13C/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 2796.421 Hz
FIDRES 0.170680 Hz
AQ 2.9295092 sec
RG 143.7
DM 178.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 7.80 usec
PL1 -3.00 dB
SFO1 200.1310007 MHz

F2 - Processing parameters
SI 32768
SF 200.1300125 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

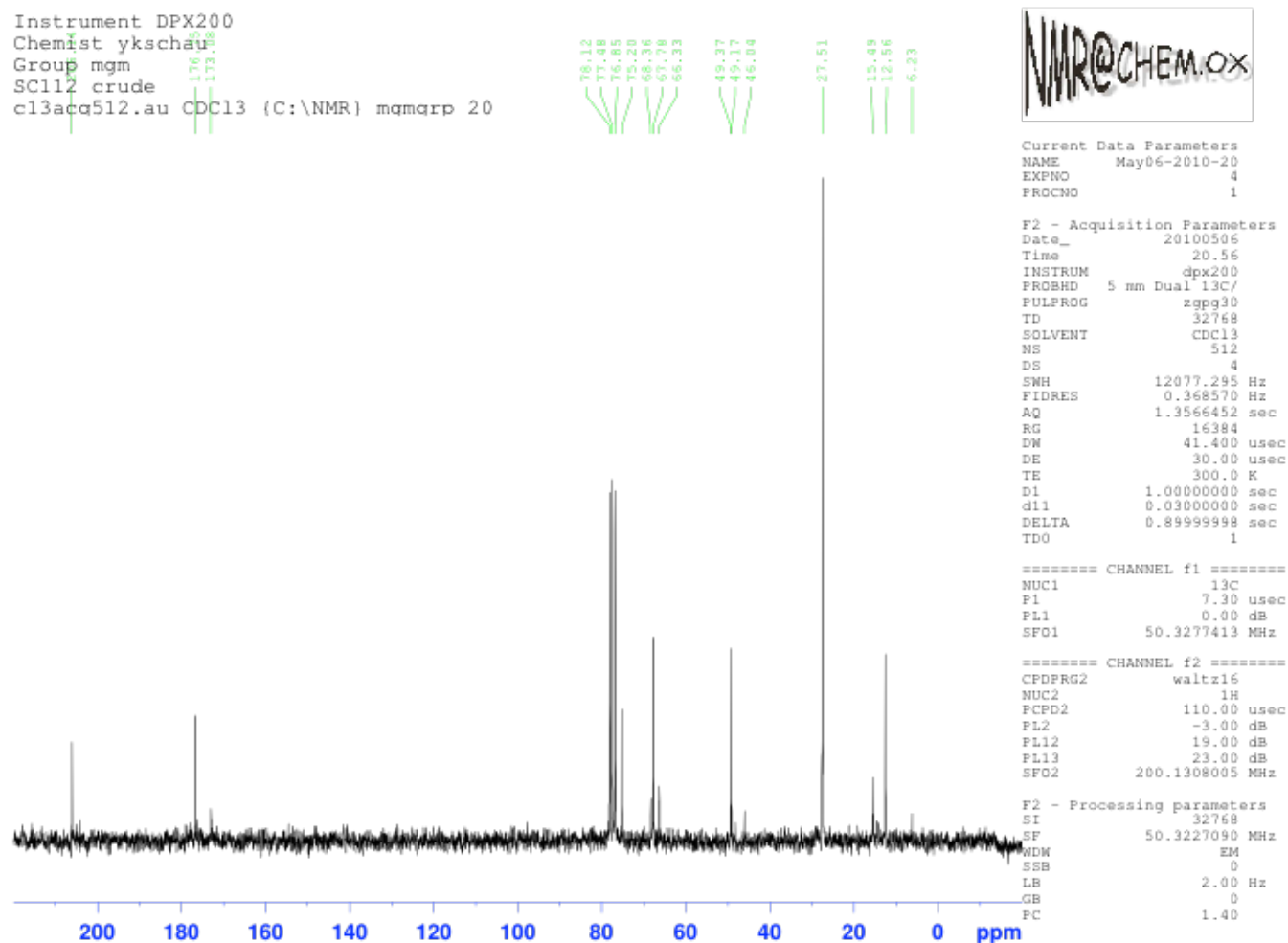


4-(*tert*-butoxy)-2-methyl-3-oxobutanoic acid

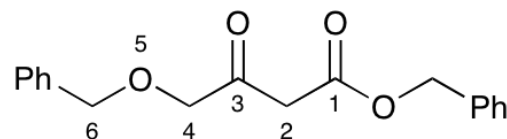


10f

Instrument DPX200
Chemist ykschau
Group mgm
SC112 crude
c13acq512.au CDC13 (C:\NMR) mgmarp 20



Benzyl 4-(benzyloxy)-3-oxobutanoate



11a

Instrument DQX400
Chemist SC
Group MGM
SC104

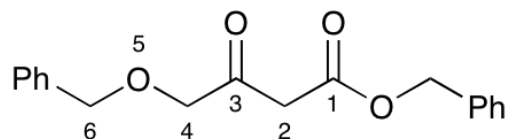
h1acq,au,CDCl3 (C:1NMB).mgmgrp 26



NAME Apr26-2010-26
EXPNO 1
PROCNO 1
Date_ 20100427
Time 16.21
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

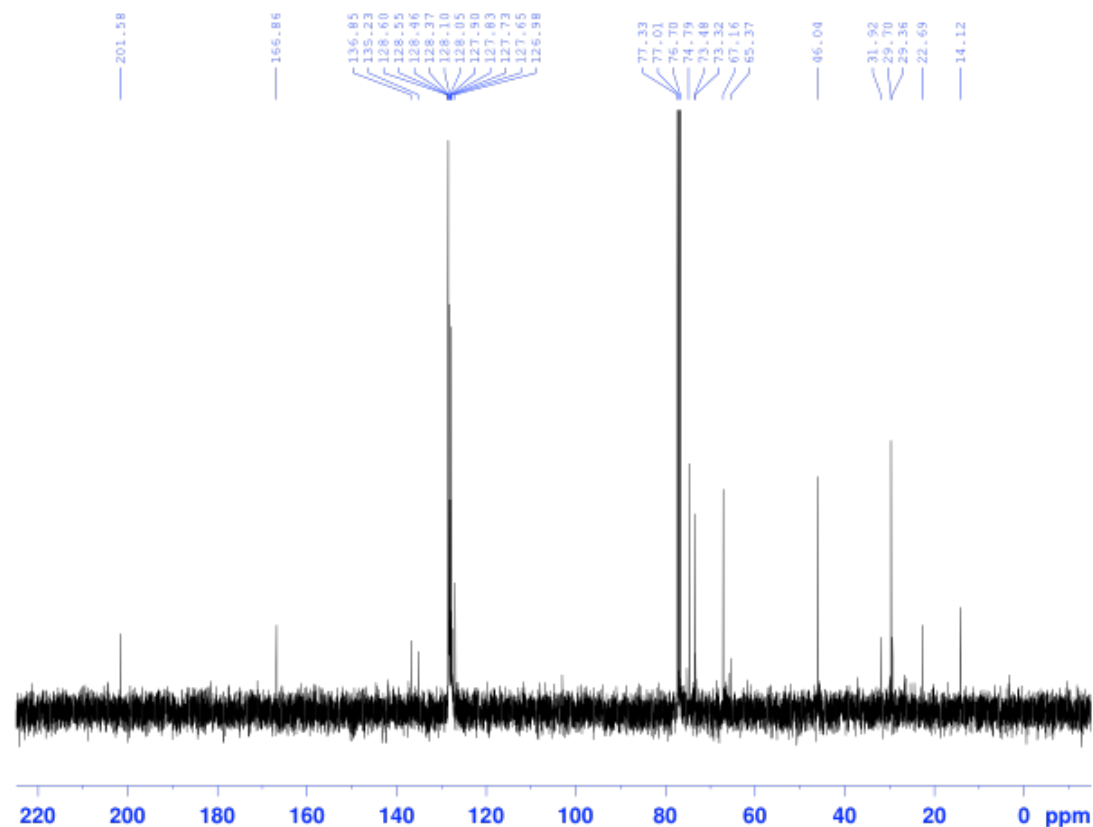
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Benzyl 4-(benzyloxy)-3-oxobutanoate



11a

Instrument DQX400
Chemist SC
Group MGM
SC104
c13acq.au CDCl3 {C:NMR} mgmgrp 26

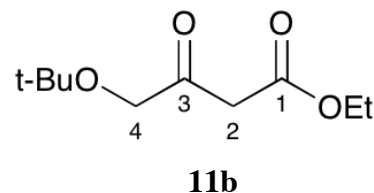


NAME Apr26-2010-26
EXPNO 2
PROCNO 1
Date_ 20100427
Time 16.29
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DM 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

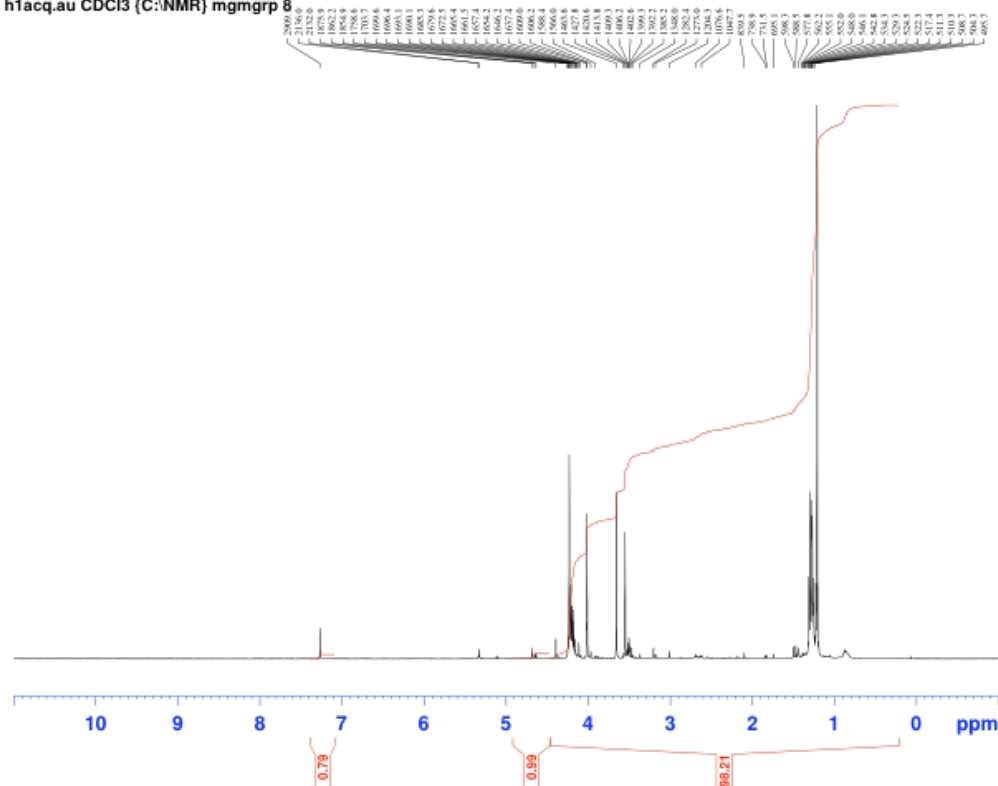
===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Ethyl 4-(*tert*-butoxy)-3-oxobutanoate



Instrument DQX400
Chemist ykschau
Group mgm
SC 055 distilled
h1acq.au CDCl3 (C:NMR) mgmgrp 8

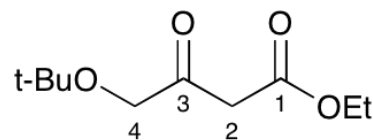


NMR@CHEM.OX

NAME Feb24-2010-8
EXPNO 1
PROCNO 1
Date_ 20100224
Time 22.19
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

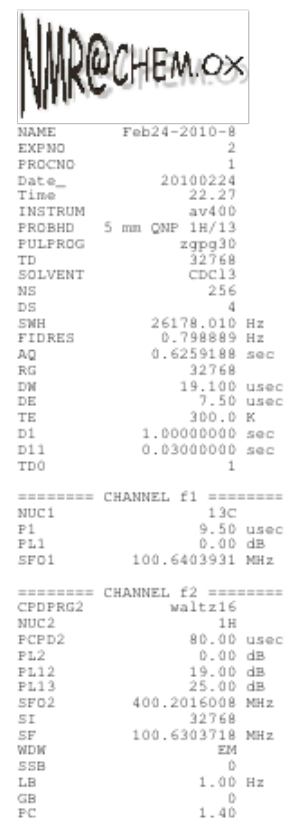
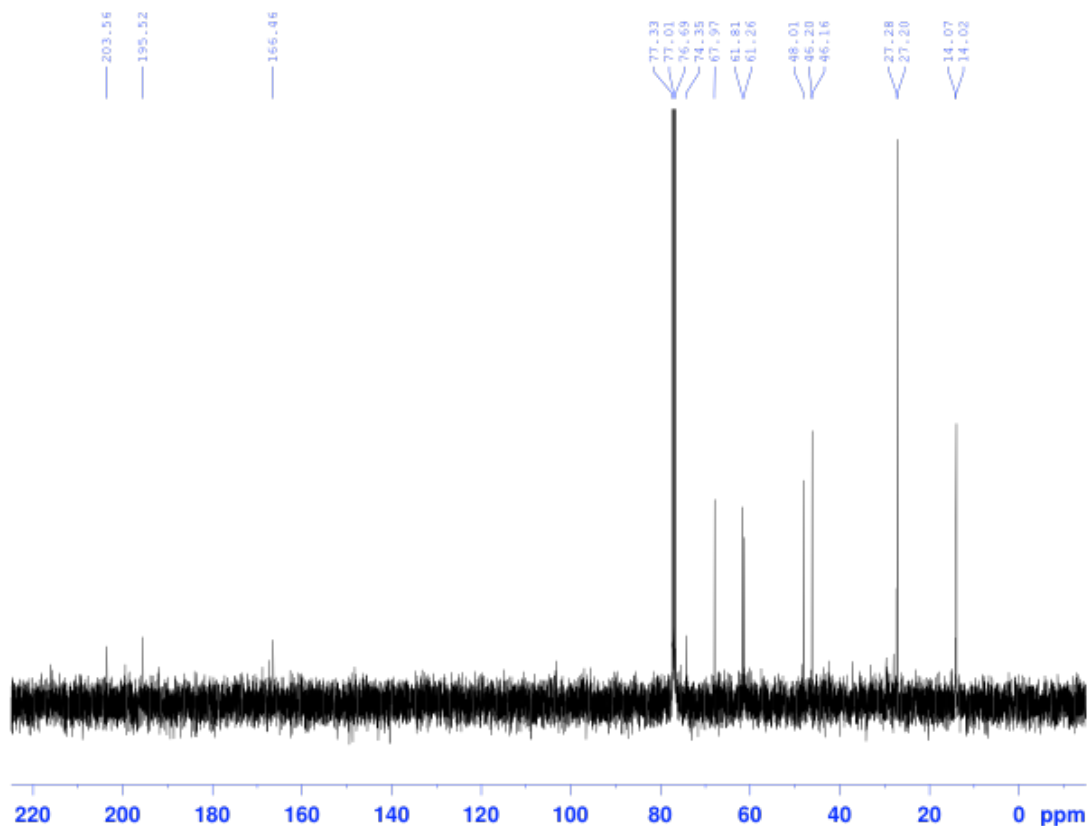
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Ethyl 4-(*tert*-butoxy)-3-oxobutanoate

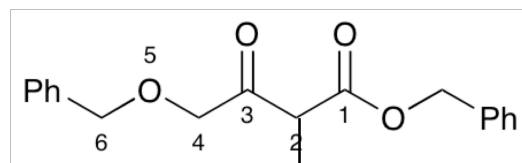


11b

Instrument DQX400
Chemist ykschau
Group mgm
SC 055 distilled
c13acq.au CDCl₃ {C:NMR} mgmgrp 8



Benzyl 4-(benzyloxy)-2-methyl-3-oxobutanoate



11c

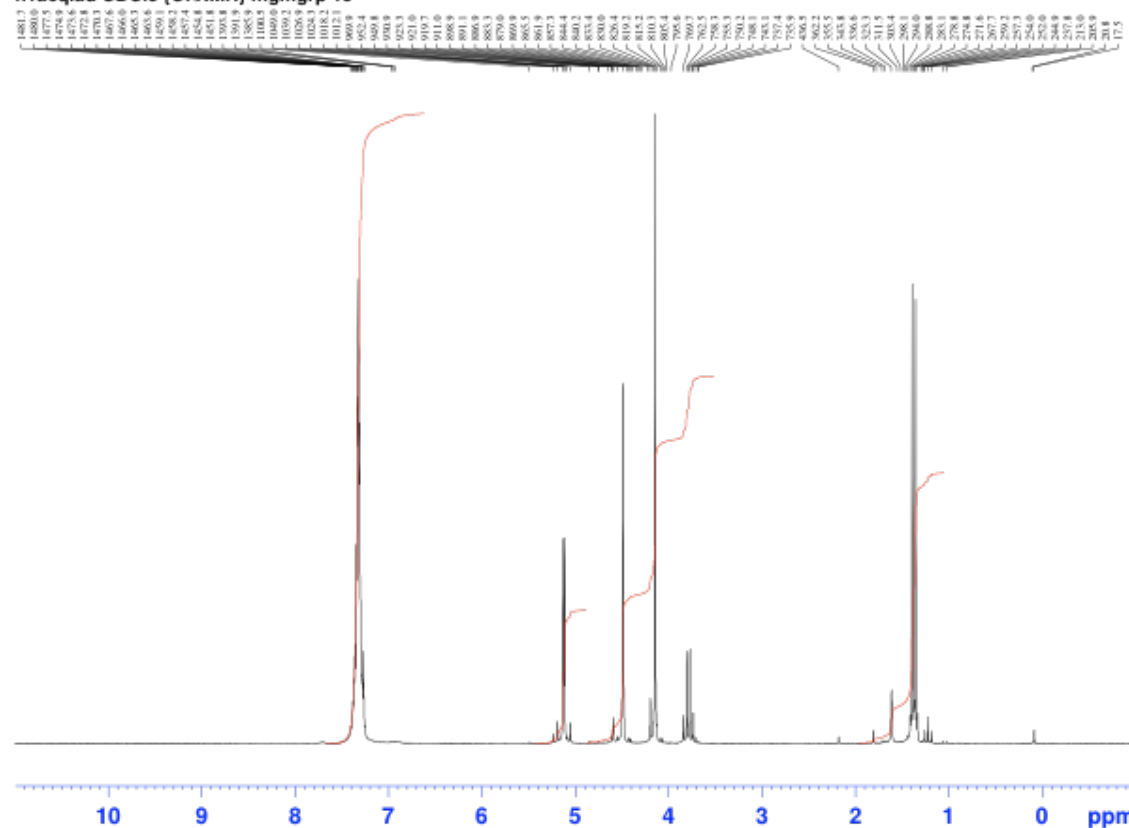
Instrument DPX200

Chemist ykschau

Group mgm

SC 110 column f2

h1acq.au CDCl3 {C:NMR} mgmgrp 13



NMR@CHEM.OX

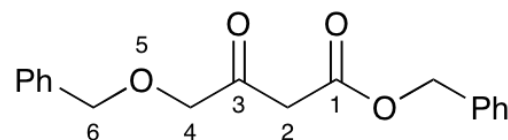
Current Data Parameters
NAME May03-2010-13
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100503
Time 13.56
INSTRUM dpx200
PROBHD 5 mm Dual 13C/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 2796.421 Hz
FIDRES 0.170680 Hz
AQ 2.9295092 sec
RG 456.1
DW 178.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 13C
P1 7.80 usec
PL1 -3.00 dB
SFO1 200.1310007 MHz

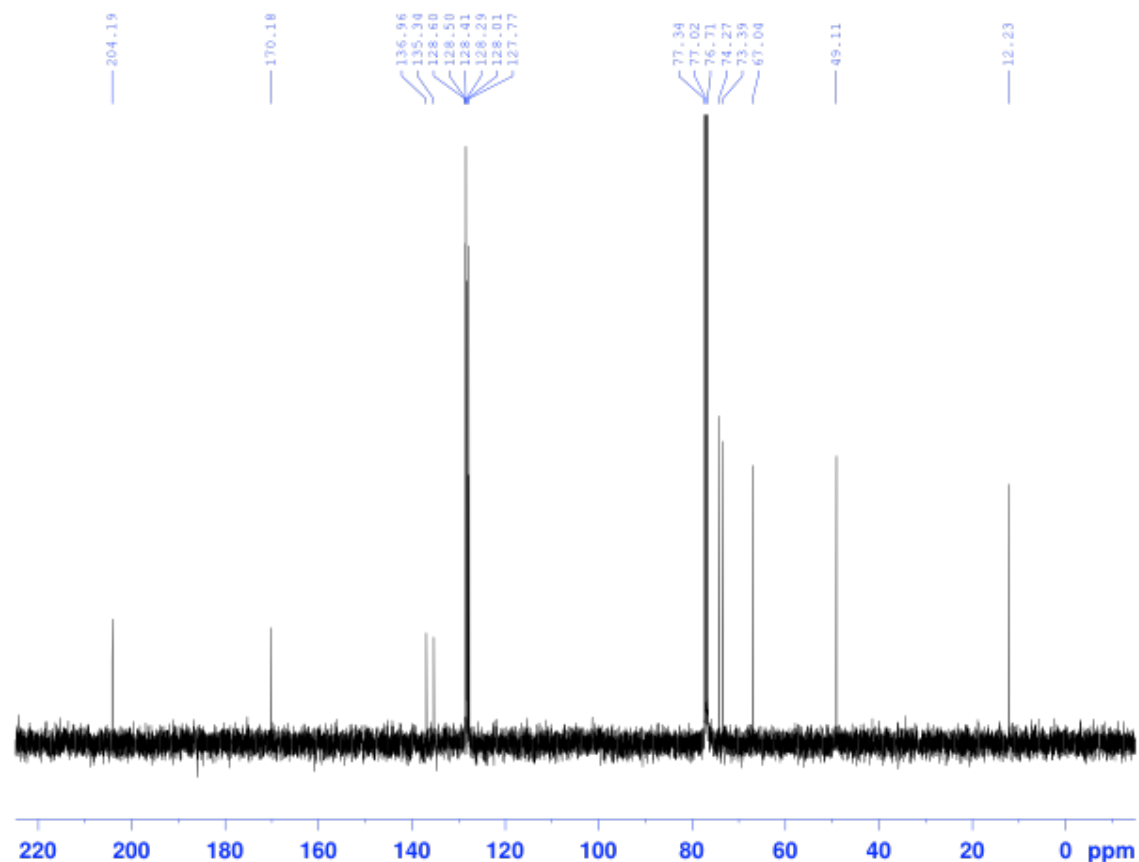
F2 - Processing parameters
SI 32768
SF 200.1300125 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Benzyl 4-(benzyloxy)-2-methyl-3-oxobutanoate



11c

Instrument DQX400
Chemist ykschau
Group mgm
SC 110 f2
c13acq.au CDCl3 (C:NMR) mgmgrp 43



NMR@CHEM.OX

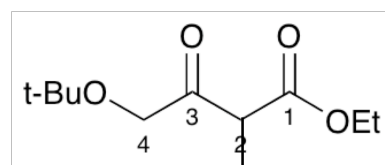
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NAME      May04-2010-43
EXPNO     2
PROCNO    1
Date_     20100505
Time      0.26
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         32768
SOLVENT   CDCl3
NS         256
DS         4
SWH        26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DW         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

===== CHANNEL f1 =====
NUC1       13C
P1         9.50 usec
PL1        0.00 dB
SFO1       100.6403931 MHz

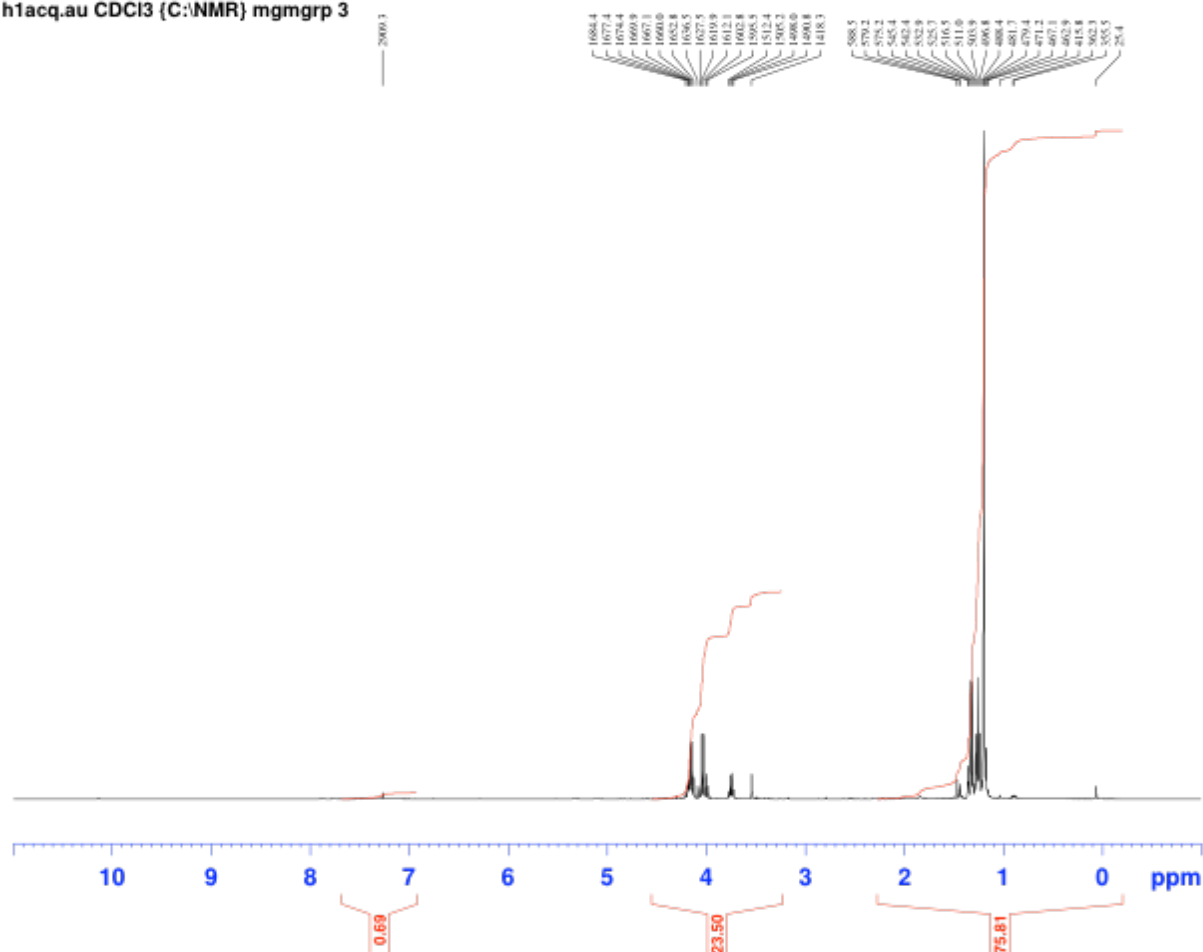
===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
PCPD2      80.00 usec
PL2        0.00 dB
PL12       19.00 dB
PL13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303718 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
    
```


Ethyl 4-(*tert*-butoxy)-2-methyl-3-oxobutanoate



11d

Instrument DQX400
Chemist ykschau
Group mgm
SC 101 f1
h1acq.au CDCl3 {C:NMR} mgmgrp 3

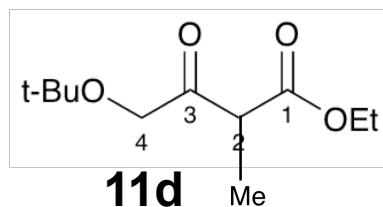


NMR@CHEM.OX

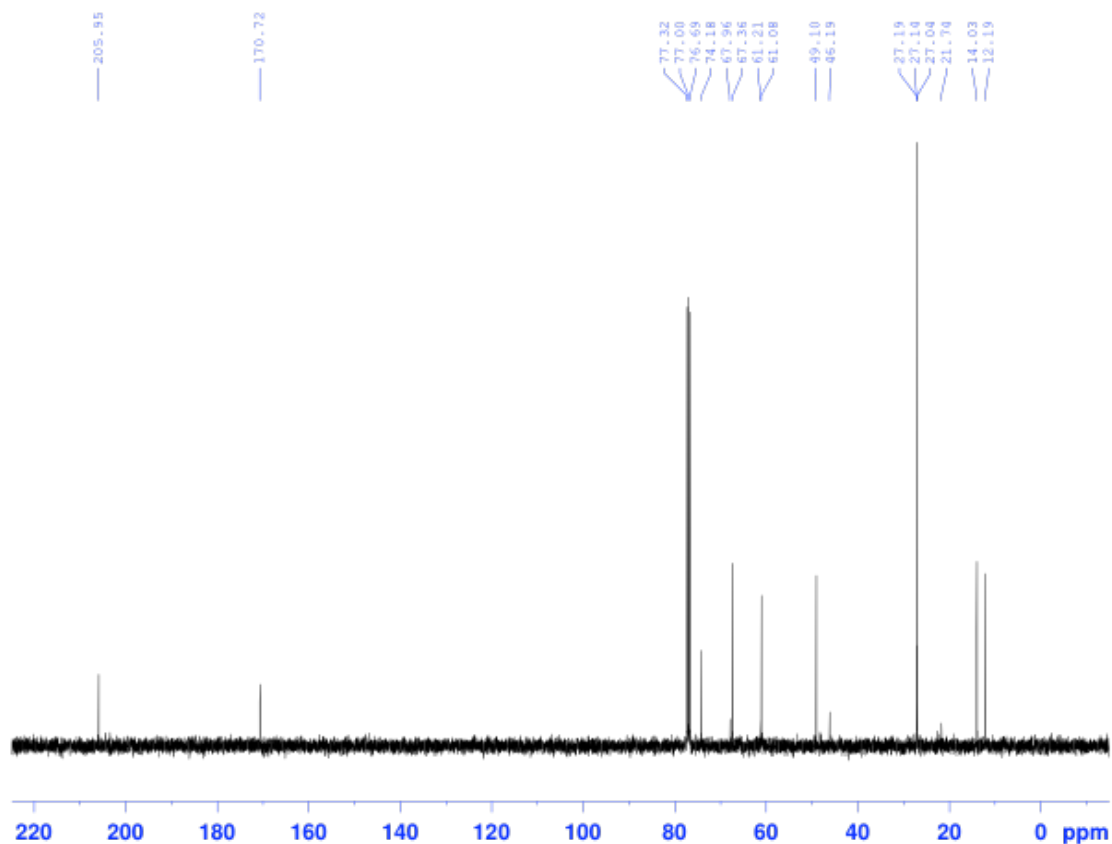
NAME Apr23-2010-3
EXPNO 1
PROCNO 1
Date_ 20100424
Time 11.34
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Ethyl 4-(*tert*-butoxy)-2-methyl-3-oxobutanoate



Instrument DQX400
Chemist ykschau
Group mgm
SC 101 f1
c13acq.au CDCl3 {C:NMR} mgmgrp 3



NMR@CHEM.OX

NAME Apr23-2010-3
EXPNO 2
PROCNO 1
Date_ 20100424
Time 11.42
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DM 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

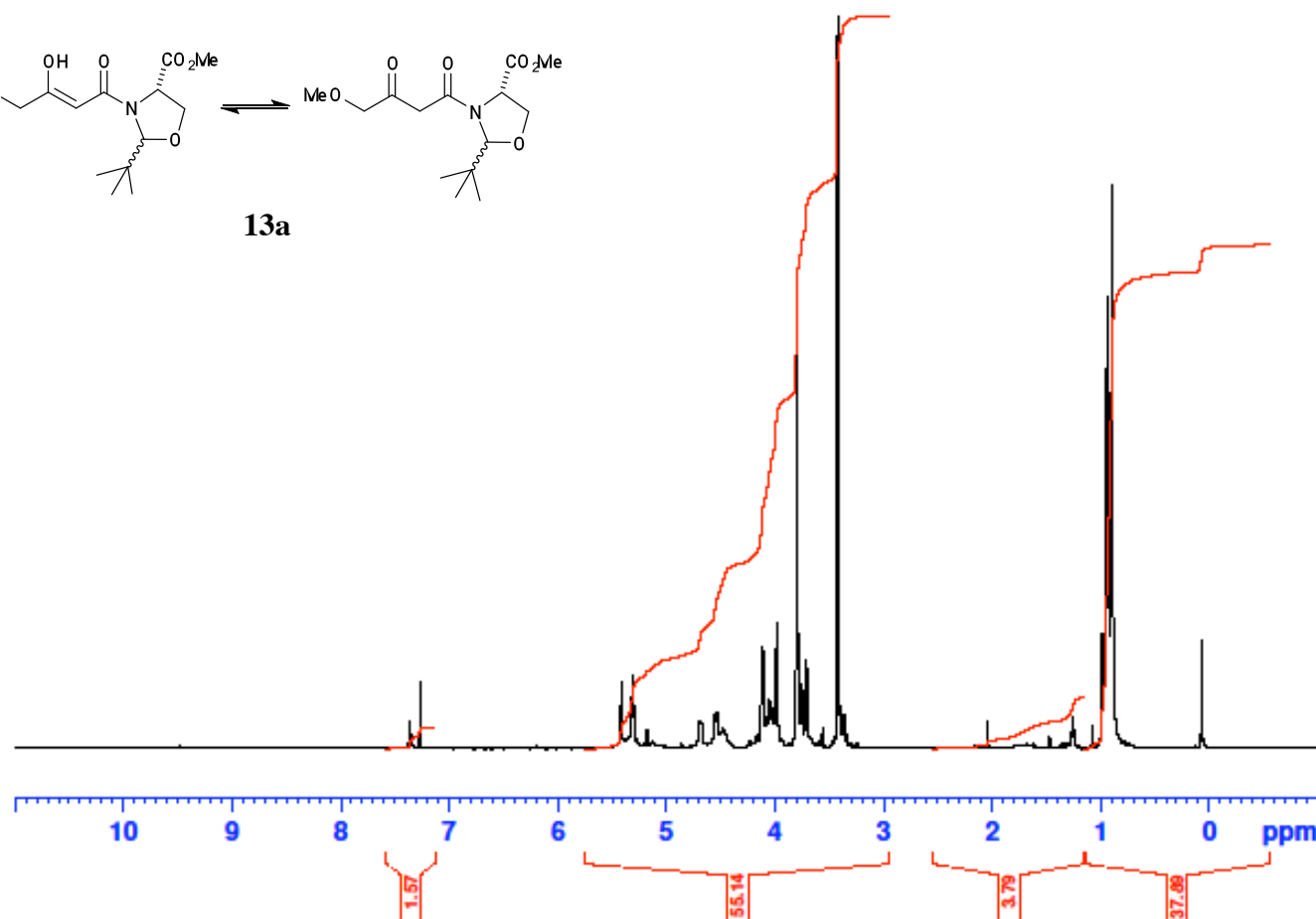
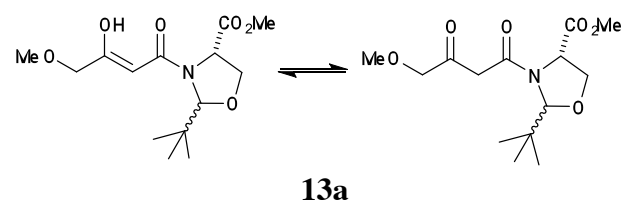
===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDM EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PJF
Group MGM
PF031
h1acq.au CDC13 (C-13)

NMR1 mgmgrp 27

NMR@CHEM.OX



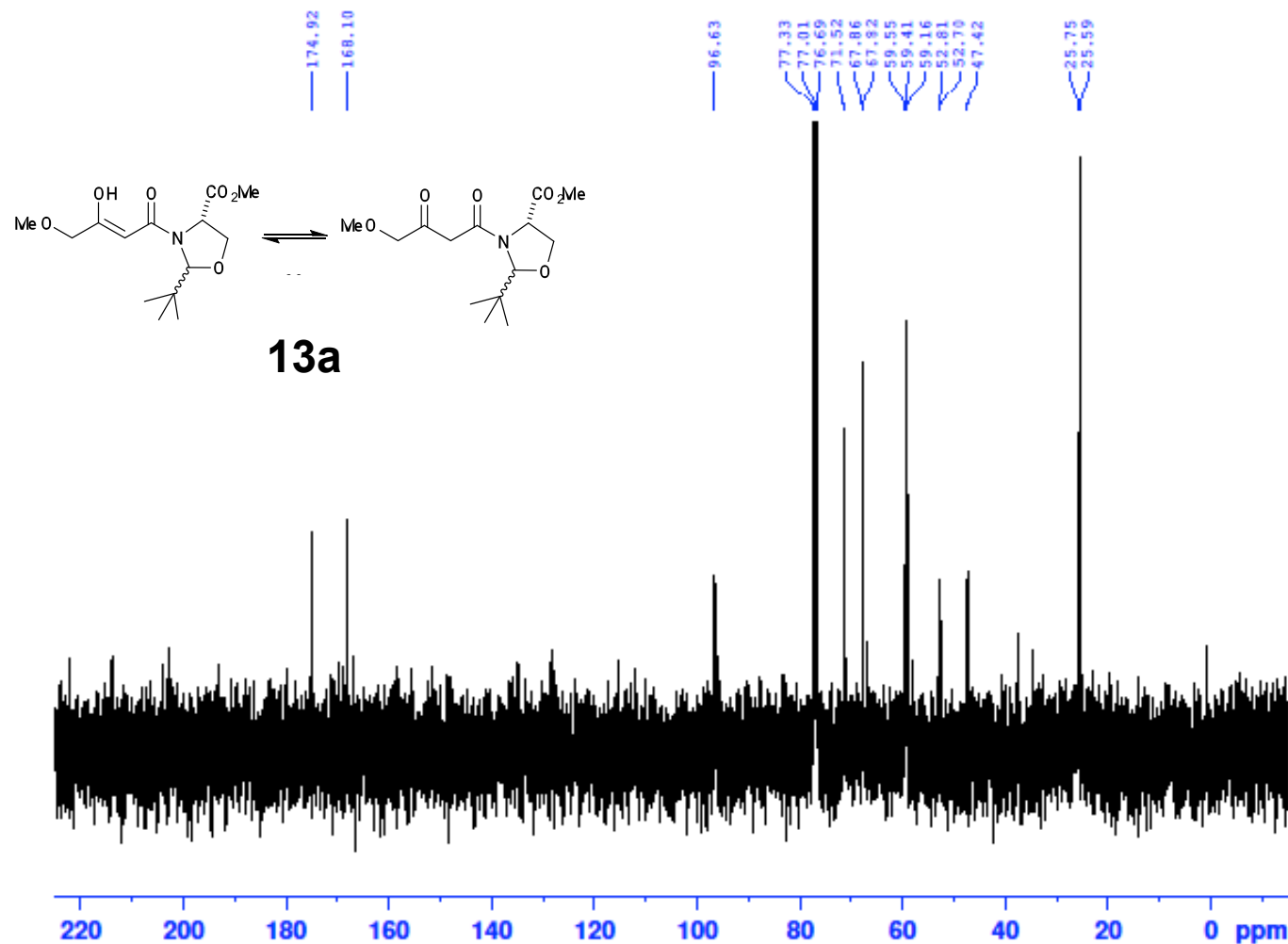
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NAME      Mar18-2010-27
EXPNO     1
PROCNO    1
Date_     20100319
Time      1.31
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zg60
TD         65536
SOLVENT   CDC13
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         90.5
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

===== CHANNEL f1 =====
NUC1       1H
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
    
```

Instrument DQX400
Chemist PJF
Group MGM
PF031
c13acq.au CDCl3 [C:NMR] mgmgrp 27

NMR@CHEM.OX

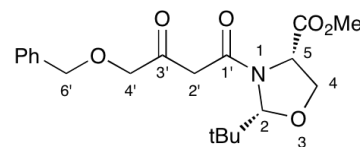


NAME Mar18-2010-27
EXPNO 2
PROCNO 1
Date_ 20100319
Time 1.38
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

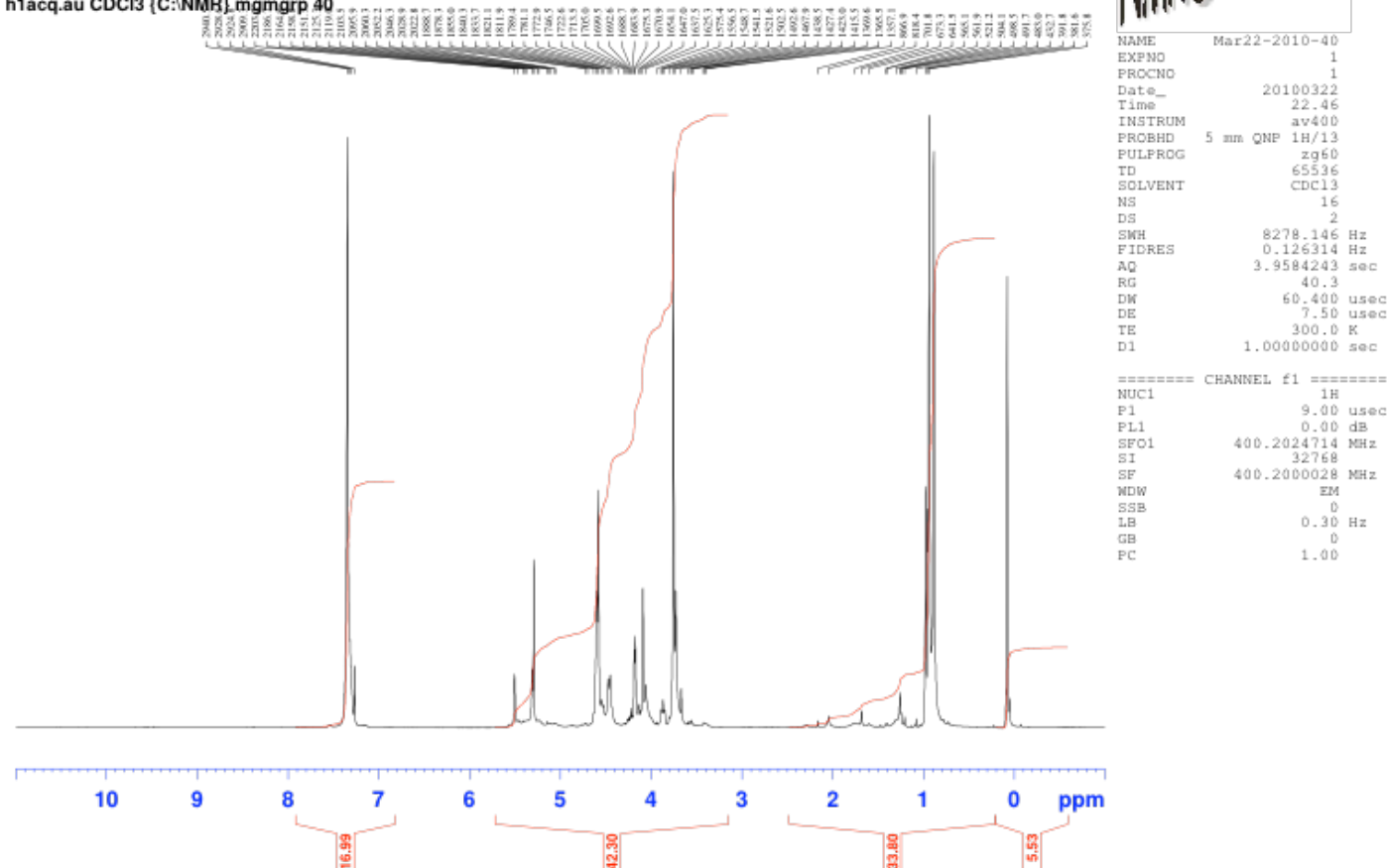
(2*R*, 5*S*)-methyl 1'-(4'-(benzyloxy)-3'-oxobutanoyl)-2-(*tert*-butyl)-5-carboxylate oxazolidine



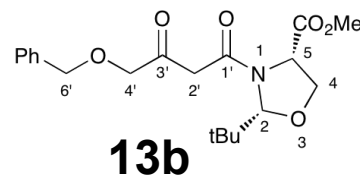
13b

Instrument DQX400
Chemist ykschau
Group mgm
SC 079 (columned ii)
h1acq.au CDCl₃ (C:NMR) mgmgrp 40

NMR@CHEM.OX

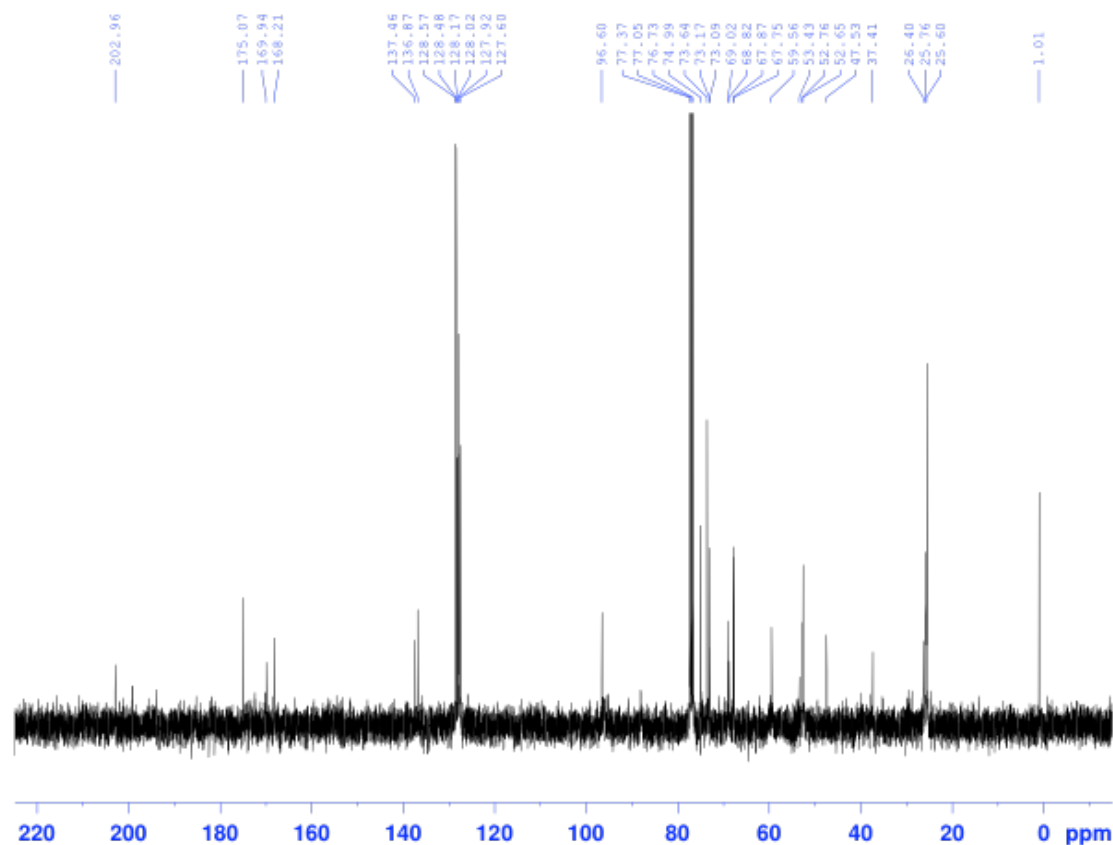


(2R, 5S)-methyl 1'-(4'-(benzyloxy)-3'-oxobutanoyl)-2-(tert-butyl)-5-carboxylate oxazolidine

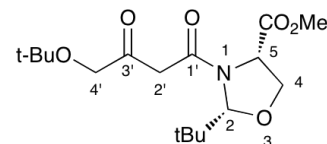


Instrument DQX400
Chemist ykschau
Group mgm
SC 079 (columned ii)
c13acq.au CDCl3 {C:NMR} mgmgrp 40

NAME		Mar22-2010-40
EXPNO		2
PROCNO		1
Date_		20100322
Time		22.54
INSTRUM		av400
PROBHD		5 mm QNP 1H/13
PULPROG		zgpg30
TD		32768
SOLVENT		CDCl3
NS		256
DS		4
SWH		26178.010 Hz
FIDRES		0.798889 Hz
AQ		0.6259188 sec
RG		32768
DW		19.100 usec
DE		7.50 usec
TE		300.0 K
D1		1.00000000 sec
D11		0.03000000 sec
TD0		1
===== CHANNEL f1 =====		
NUC1		13C
P1		9.50 usec
PL1		0.00 dB
SFO1		100.6403931 MHz
===== CHANNEL f2 =====		
CPDPRG2		waltz16
NUC2		1H
PCPD2		80.00 usec
PL2		0.00 dB
PL12		19.00 dB
PL13		25.00 dB
SFO2		400.2016008 MHz
SI		32768
SF		100.6303718 MHz
WDM		EM
SSB		0
LB		1.00 Hz
GB		0
PC		1.40

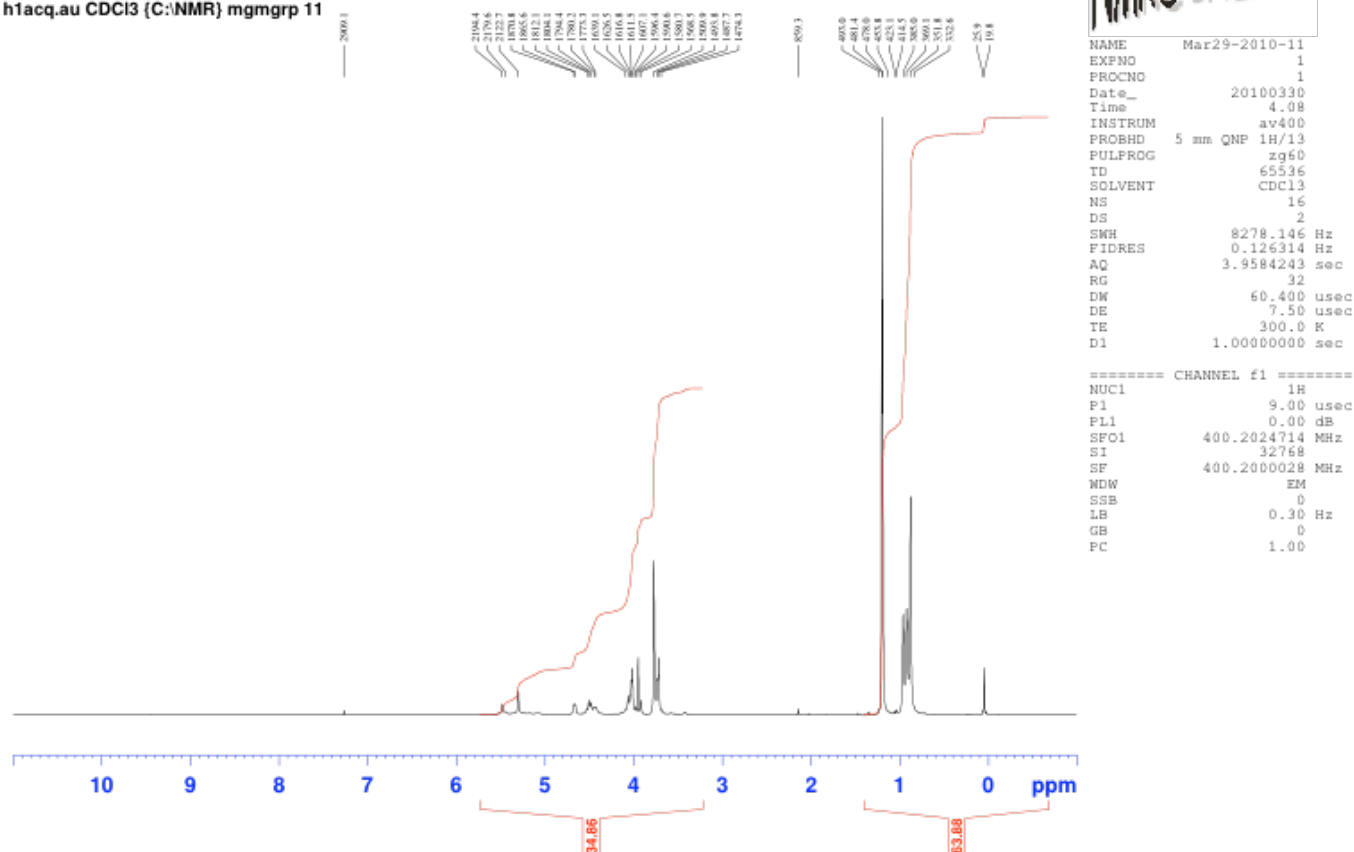


(2R, 5S)-methyl-1'-(4'-(*tert*-butoxy)-3'-oxobutanoyl)-2-(*tert*-butyl)-5-carboxylate oxazolidine



13c

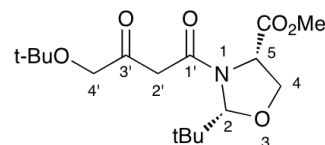
Instrument DQX400
Chemist ykschau
Group mgm
SC 091 columned
h1acq.au CDCl3 (C:NMR) mgmgrp 11



NAME Mar29-2010-11
EXPNO 1
PROCNO 1
Date_ 20100330
Time 4.08
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 32
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

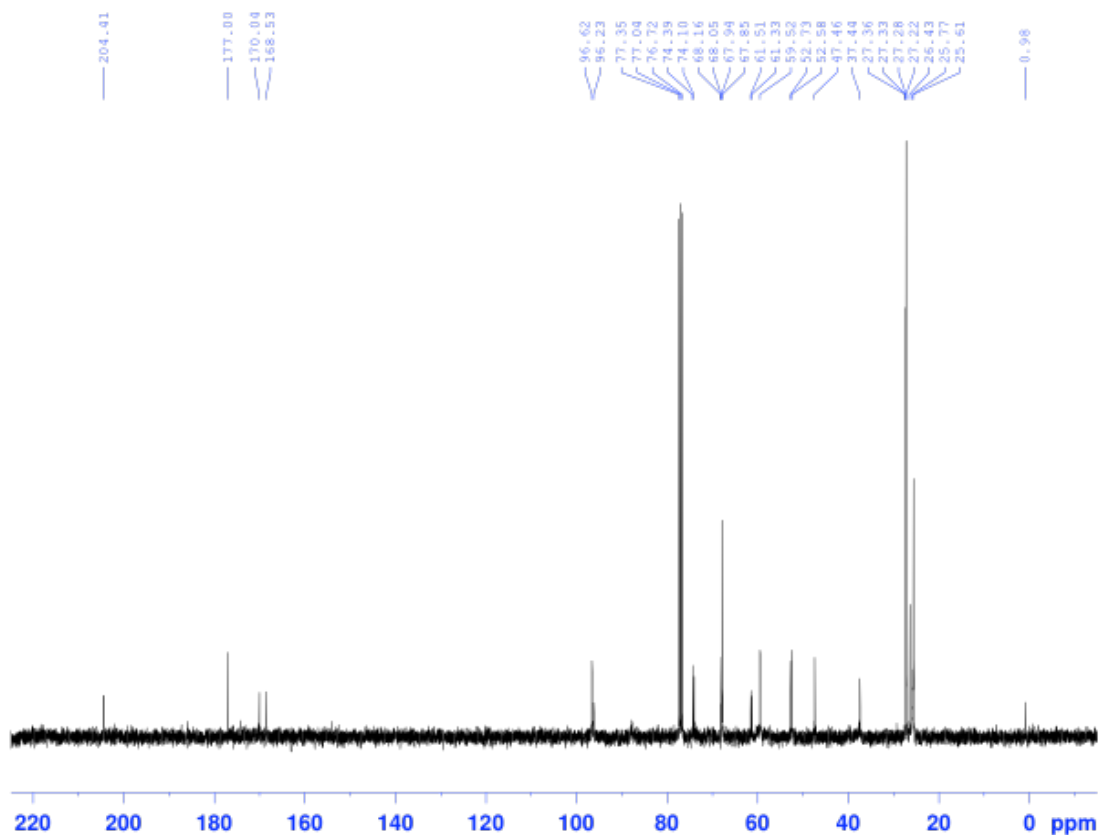
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

(2R, 5S)-methyl-1'-(4'-(*tert*-butoxy)-3'-oxobutanoyl)-2-(*tert*-butyl)-5-carboxylate oxazolidine

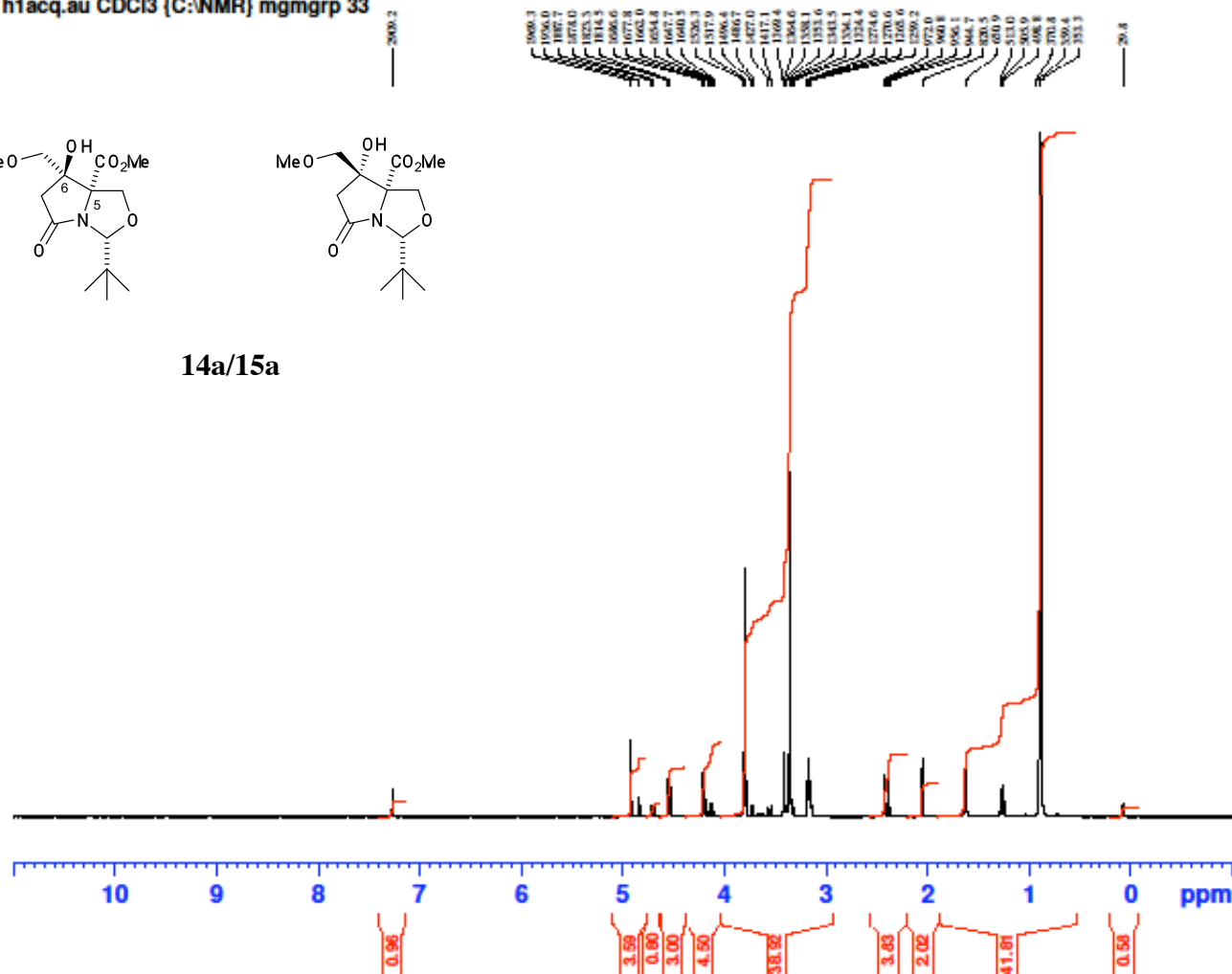


13c

Instrument DQX400
Chemist ykschau
Group mgm
SC 091 columned
c13acq.au CDCl₃ {C:NMR} mgmgrp 11

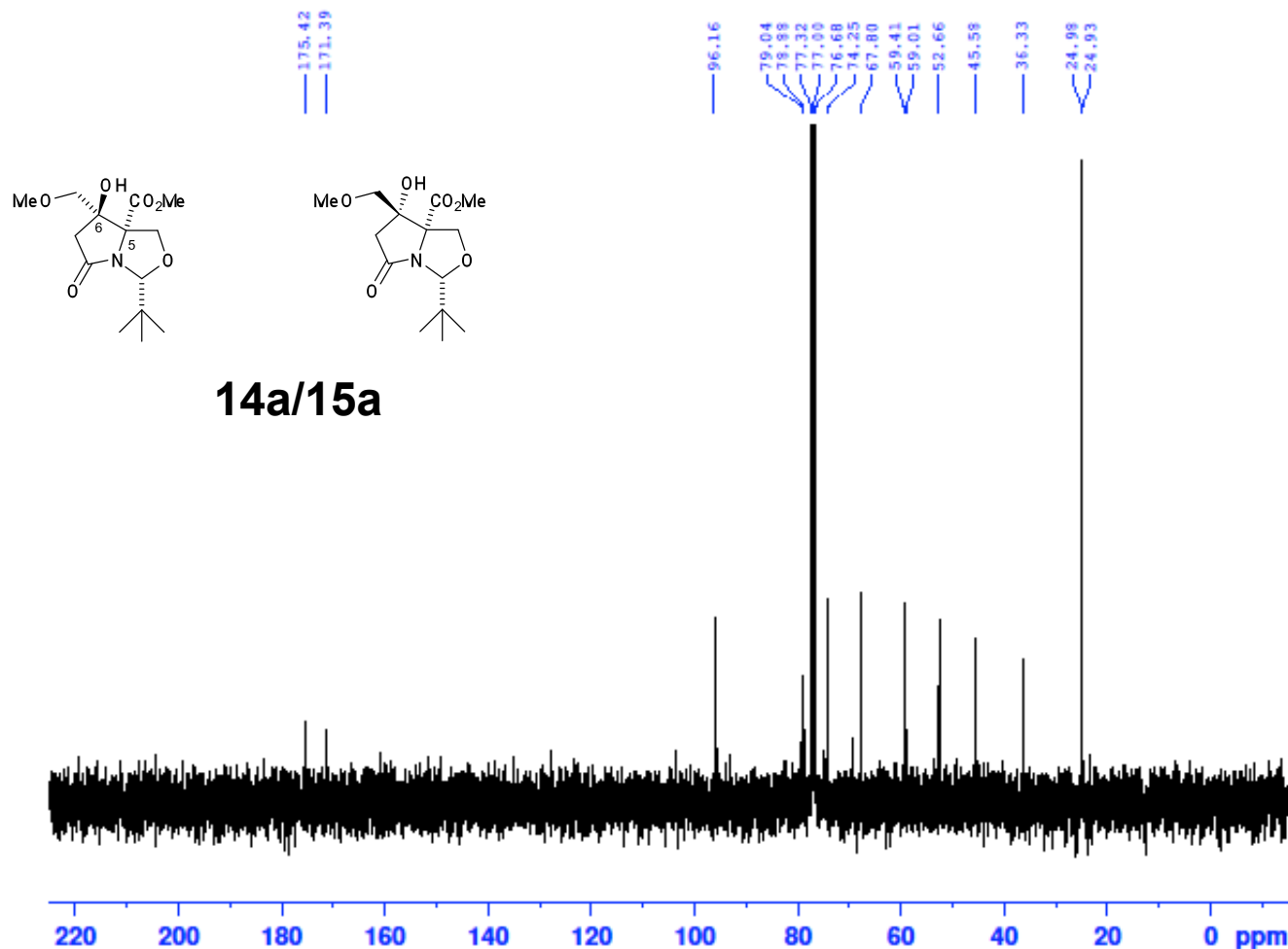


NAME Mar29-2010-11	
EXPNO	2
PROCNO	1
Date_	20100330
Time	4.16
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zgpg30
TD	32768
SOLVENT	CDCl ₃
NS	256
DS	4
SWH	26178.010 Hz
FIDRES	0.798889 Hz
AQ	0.6259188 sec
RG	32768
DW	19.100 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
===== CHANNEL f1 =====	
NUC1	13C
P1	9.50 usec
PL1	0.00 dB
SFO1	100.6403931 MHz
===== CHANNEL f2 =====	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	19.00 dB
PL13	25.00 dB
SFO2	400.2016008 MHz
SI	32768
SF	100.6303718 MHz
WDM	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



Instrument DQX400
Chemist PJF
Group MGM
PF032
c13acq.au CDCl3 [C:NMR] mgmgrp 33

NMR@CHEM.OX



NAME Mar24-2010-33
EXPNO 2
PROCNO 1
Date_ 20100325
Time 12.46
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

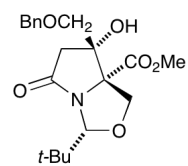
Instrument DQX400

Chemist PA

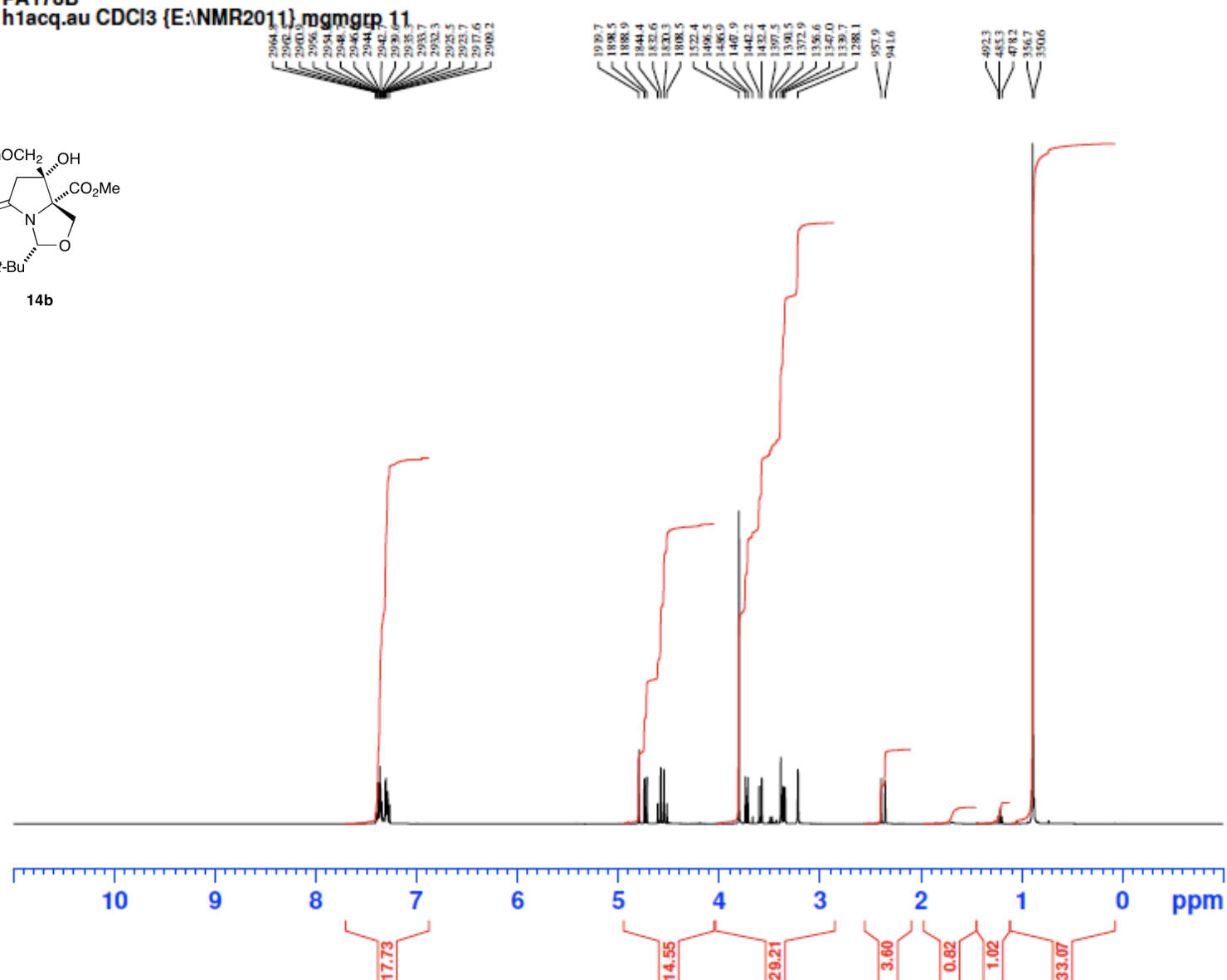
Group MGM

PA178B

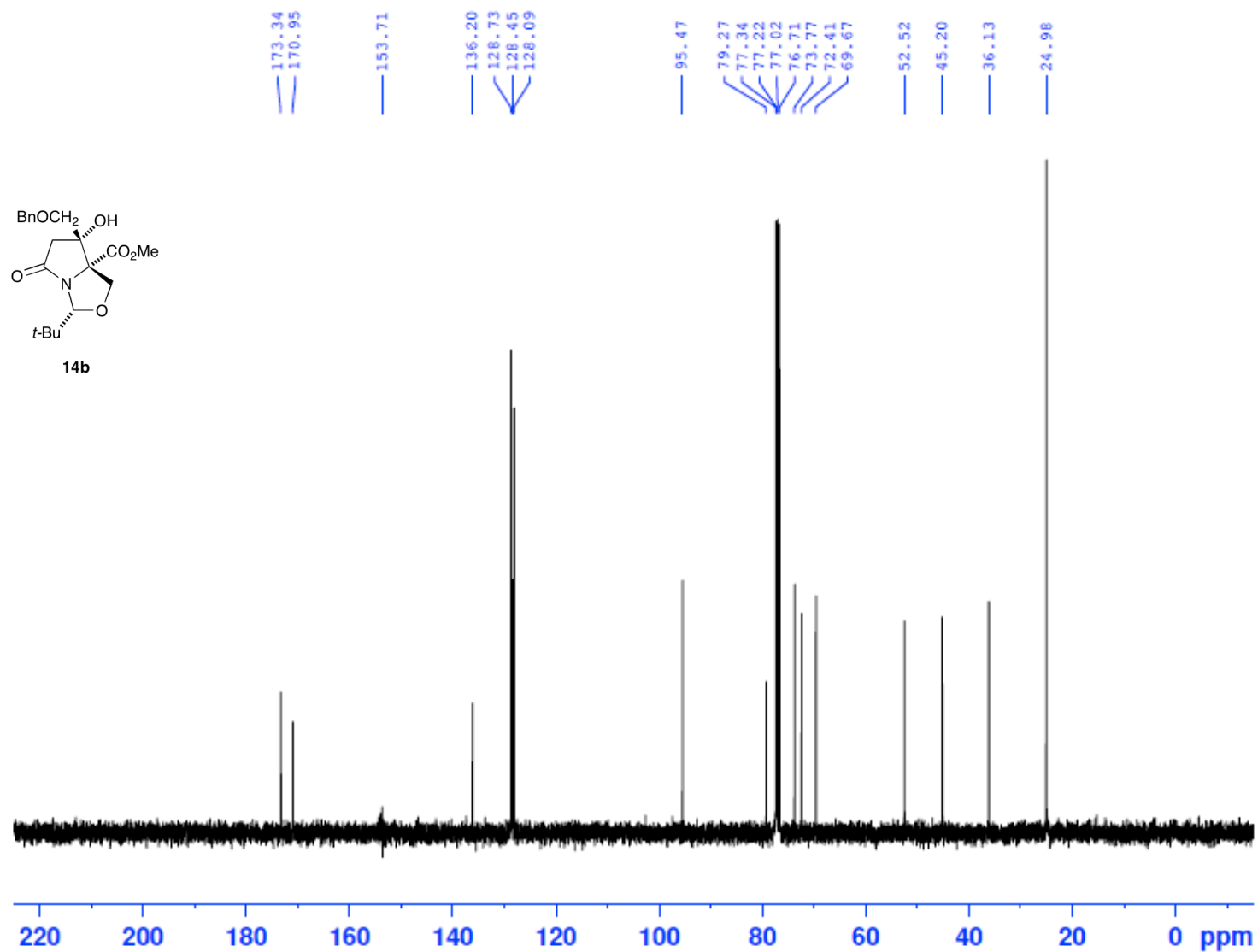
h1acq.au CDCl₃ (E:NMR2011).mgmgrp 11



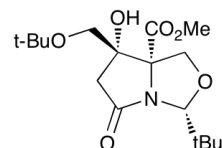
14b



Instrument DQX400
Chemist PA
Group MGM
PA178B
c13acq.au CDCl₃ {E:\NMR2011} mgmgrp 11

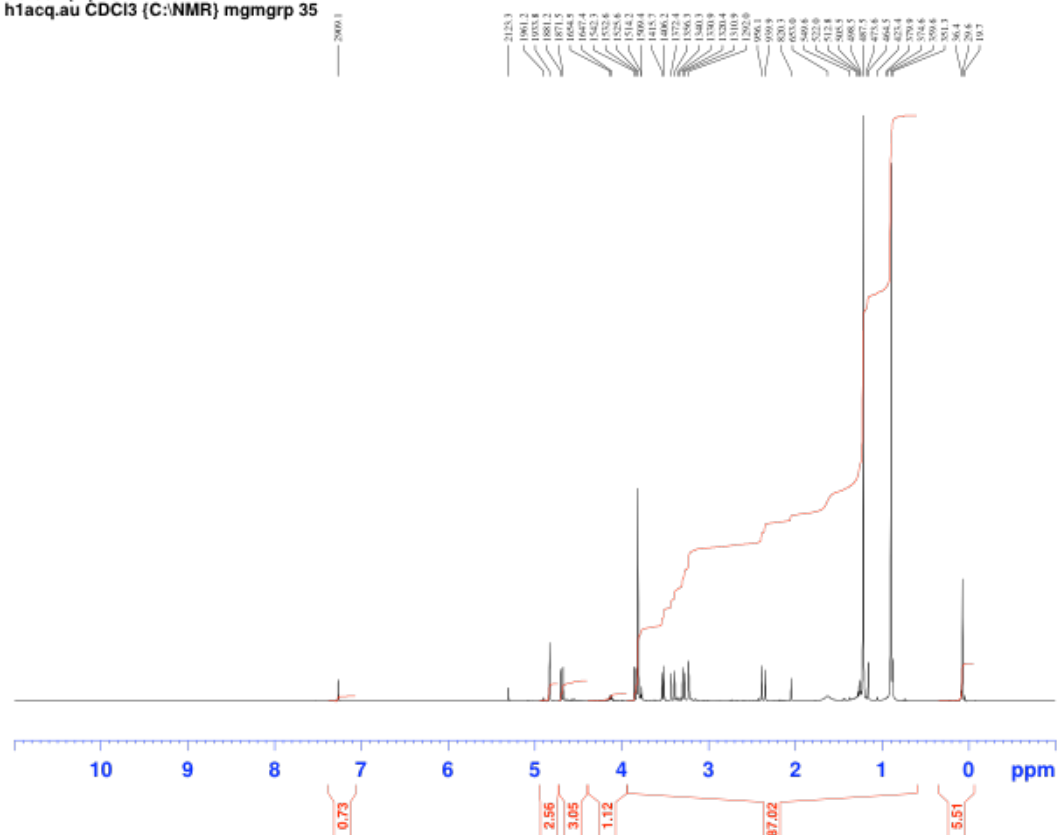


(2R, 5R, 6S)-1-Aza-2-(*tert*-butyl)-6-hydroxy-6-(*tert*-butoxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



14c

Instrument DQX400
Chemist ykschau
Group mgm
SC 094 (f2) columned
h1acq.au CDCl3 (C:\NMR) mgmgrp 35



NMR@CHEM.OX

```

NAME      Apr19-2010-35
EXPNO     1
PROCNO    1
Date_     20100420
Time      15.18
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         65536
SOLVENT   CDCl3
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         181
DM         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

===== CHANNEL f1 =====
NUC1       1H
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000028 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
    
```

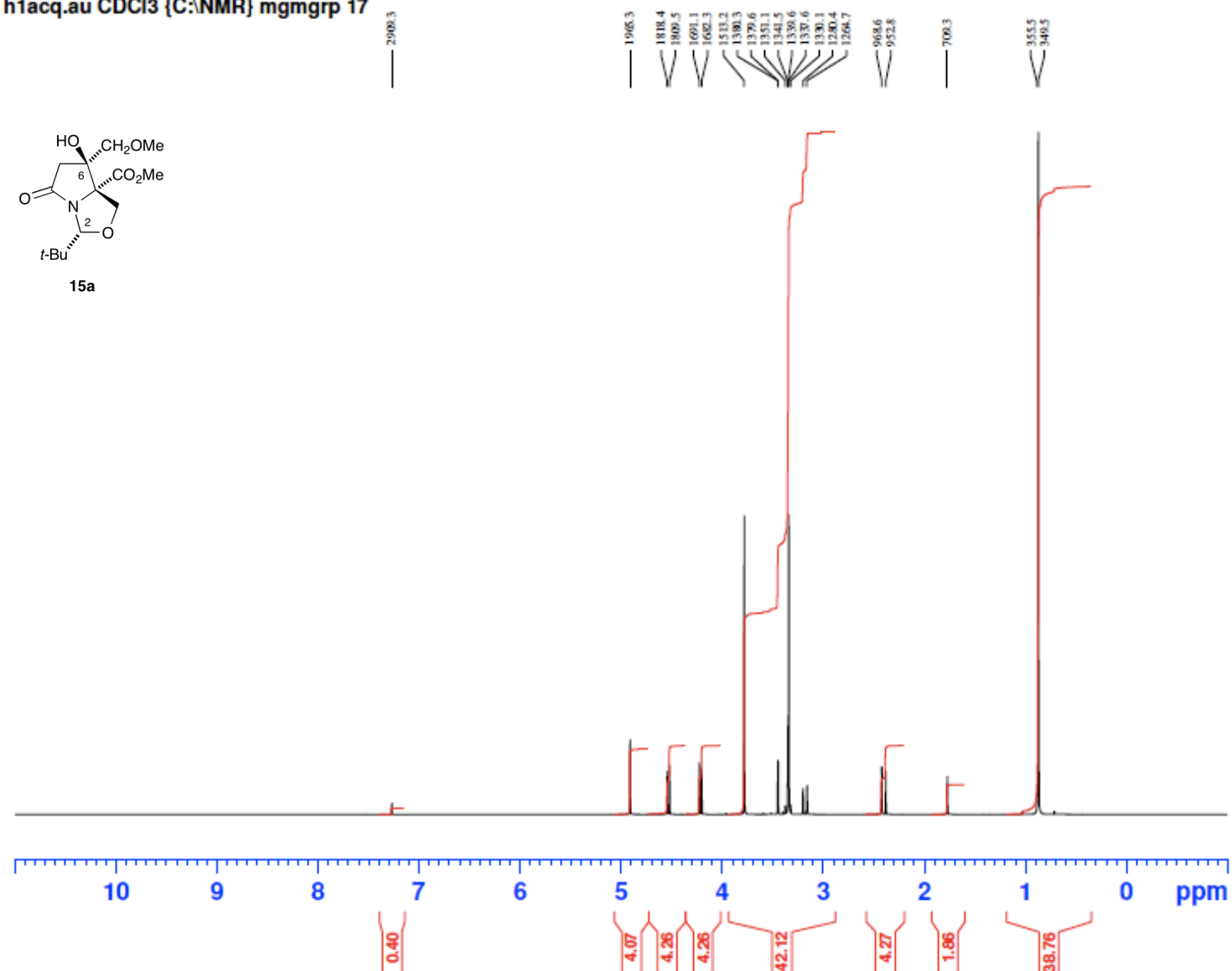
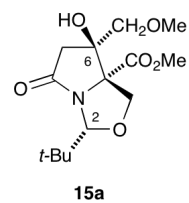
Instrument DQX400

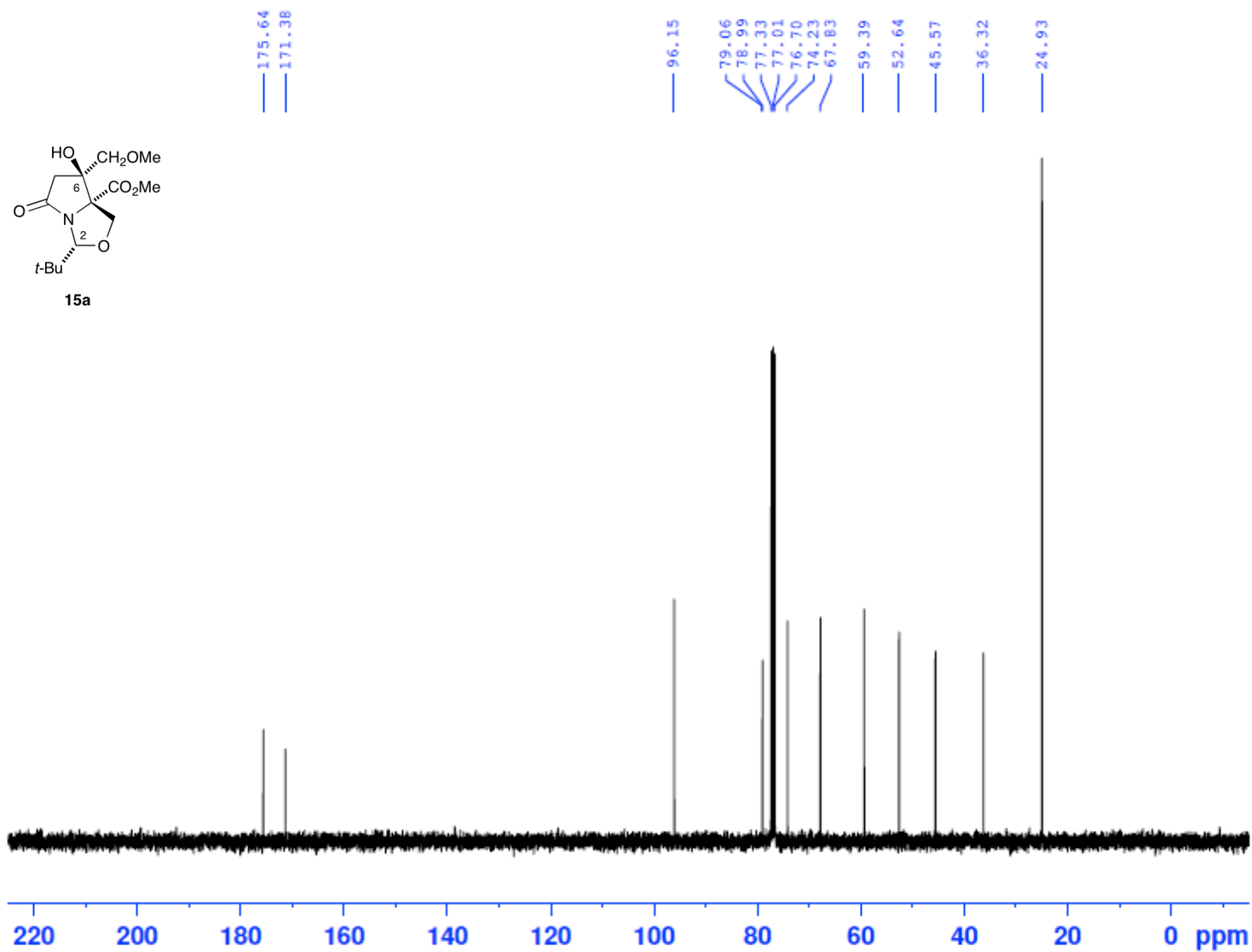
Chemist PA

Group MGM

PA135

h1acq.au CDCl₃ {C:NMR} mgmgrp 17





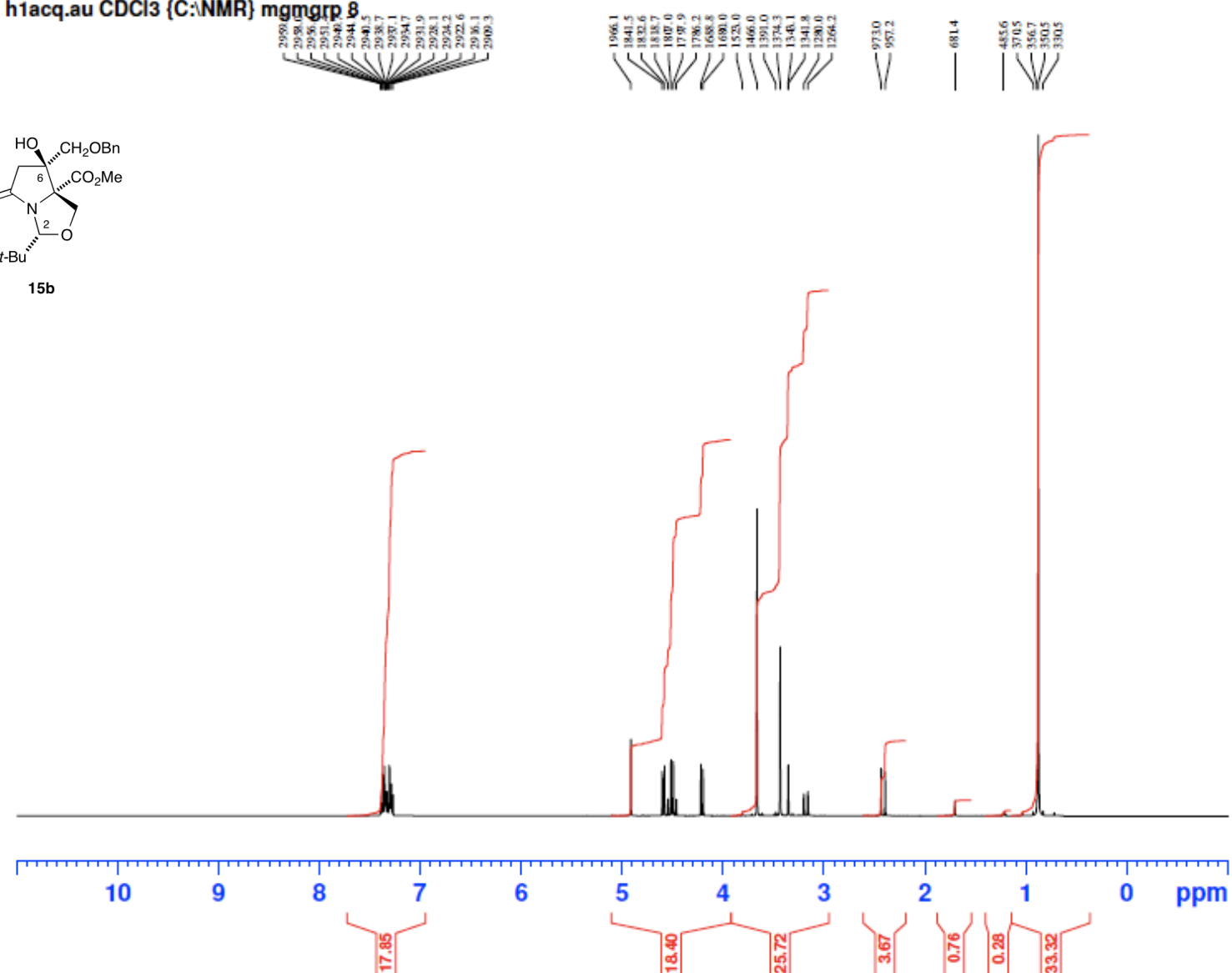
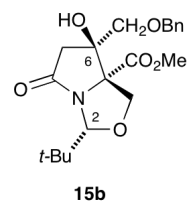
Instrument DQX400

Chemist PA

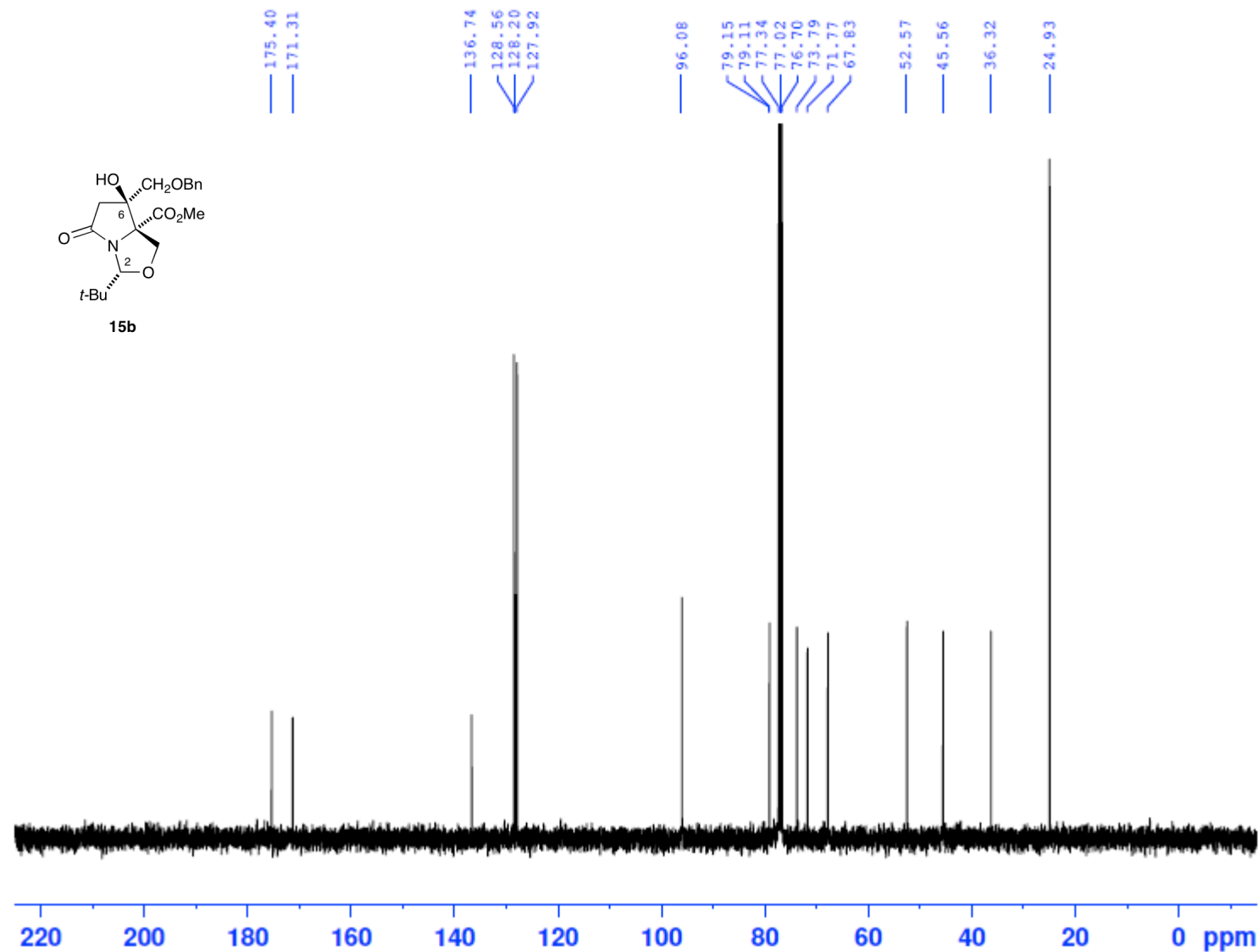
Group MGM

PA178A

h1acq.au CDCl₃ {C:NMR} mgmgrp 8

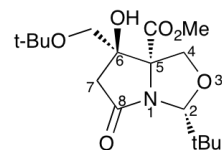


Instrument DQX400
Chemist PA
Group MGM
PA178A
c13acq.au CDCl₃ {C:\NMR} mgmgrp 8



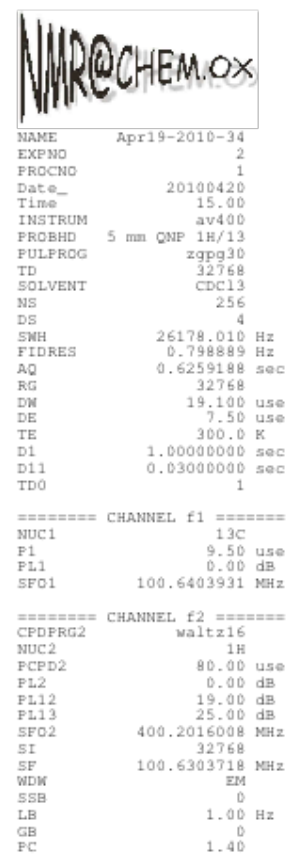
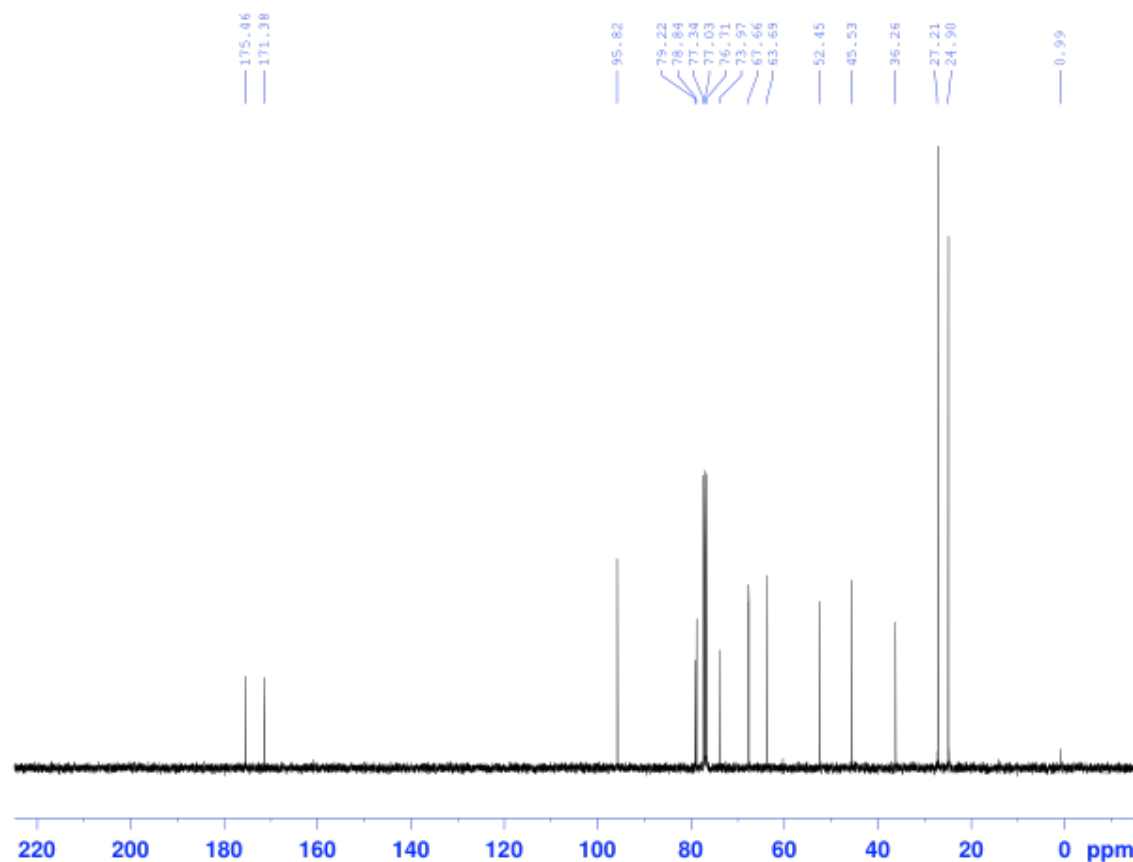
(2*R*, 5*R*, 6*R*)-1-Aza-2-(*tert*-butyl)-6-hydroxy-6-(*tert*-butoxymetyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane

(2R, 5R, 6R)-1-Aza-2-(*tert*-butyl)-6-hydroxy-6-(*tert*-butoxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



15c

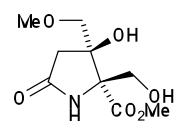
Instrument DQX400
Chemist ykschau
Group mgm
SC 094 (f1) columned
c13acq.au CDCl3 (C:NMR) mgmgrp 34



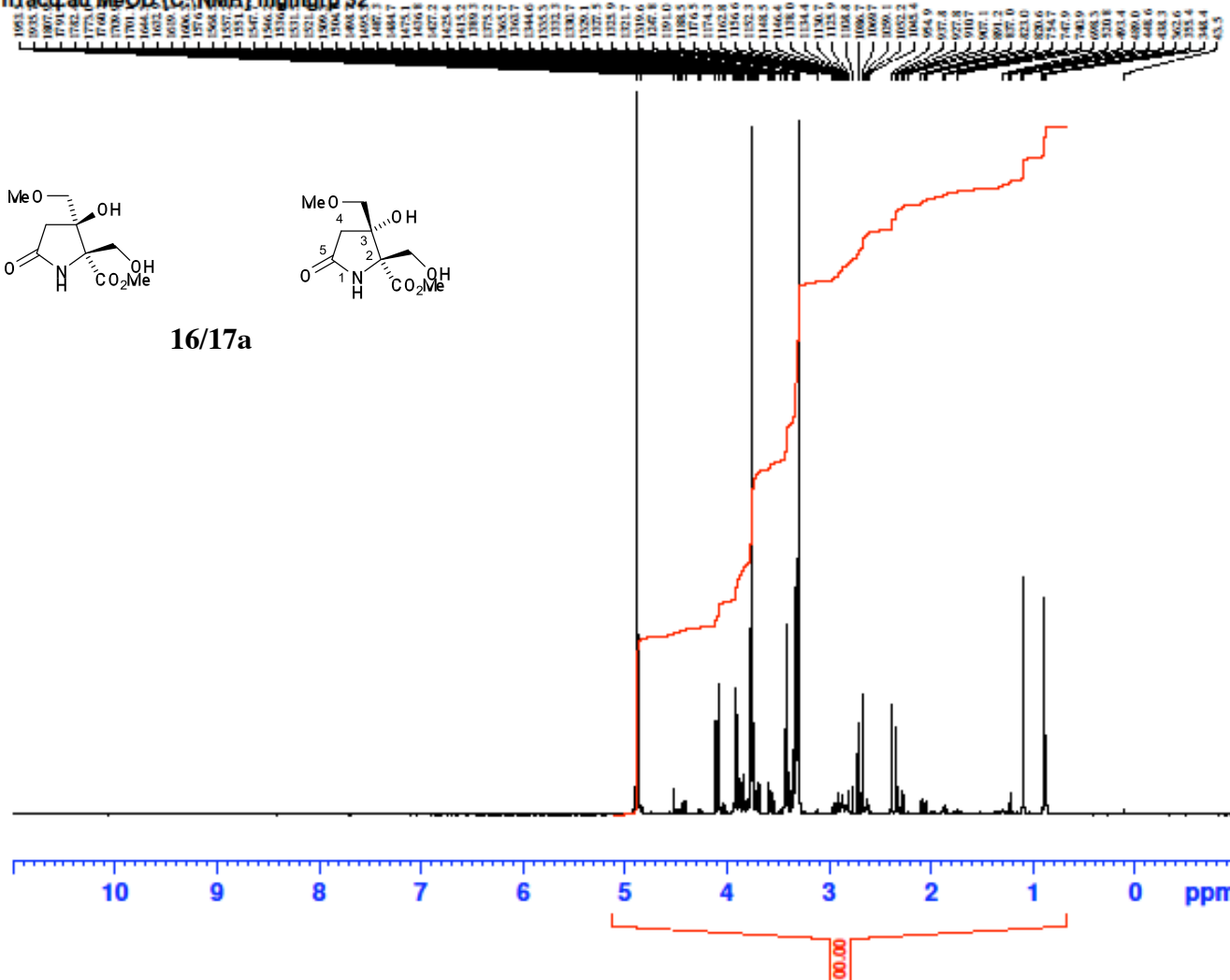
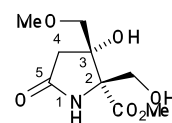
Instrument DQX400
Chemist PJF
Group MGM
PF036

h1acq au MeOD (C: NMR) mgmgrp 32

NMR@CHEM.OX



16/17a

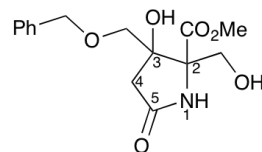


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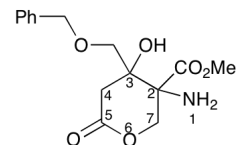
NAME      Apr30-2010-32
EXPNO     1
PROCNO    1
Date_     20100501
Time      6.53
INSTRUM   av400
PROBHD    5 mm QNP 1H/13
PULPROG   zgpg30
TD         65536
SOLVENT   MeOD
NS         16
DS         2
SWH        8278.146 Hz
FIDRES     0.126314 Hz
AQ         3.9584243 sec
RG         128
DW         60.400 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec

===== CHANNEL f1 =====
NUC1       1H
P1         9.00 usec
PL1        0.00 dB
SFO1       400.2024714 MHz
SI         32768
SF         400.2000000 MHz
WDW        EM
SSB        0
LB         0.30 Hz
GB         0
PC         1.00
    
```

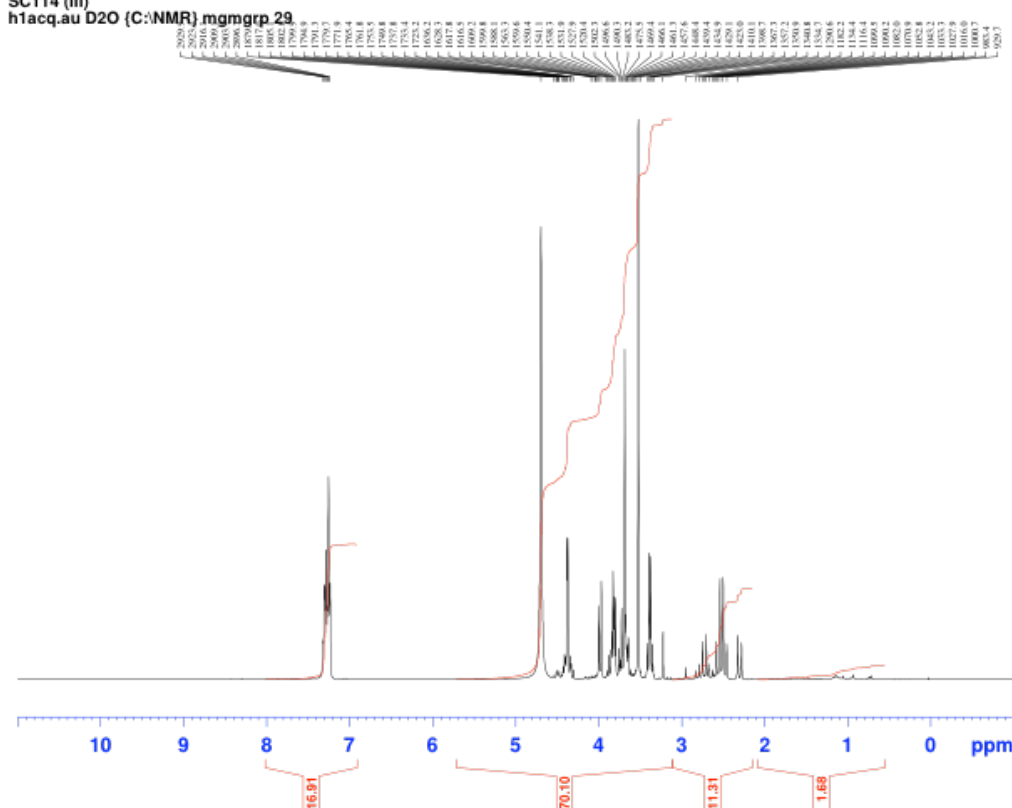
Methyl 2-hydroxymethyl-3-hydroxy-3-(benzyloxymethyl) pyroglutamate and 2-amino-2-(methoxycarbonyl)-3-hydroxy-3-(benzyloxymethyl)- δ -lactone



17b



Instrument DQX400
Chemist ykschau
Group mgm
SC114 (iii)
h1acq.au D2O (C:NMR) mgmgrp 29



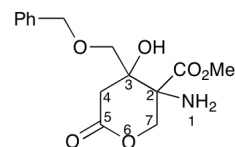
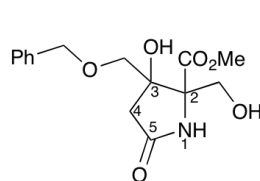
NMR@CHEM.OX

NAME	May13-2010-29
EXPNO	1
PROCNO	1
Date_	20100514
Time	6.43
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zgpg30
TD	65536
SOLVENT	D2O
NS	16
DS	2
SWH	8270.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	90.5
DW	60.400 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec

===== CHANNEL f1 =====

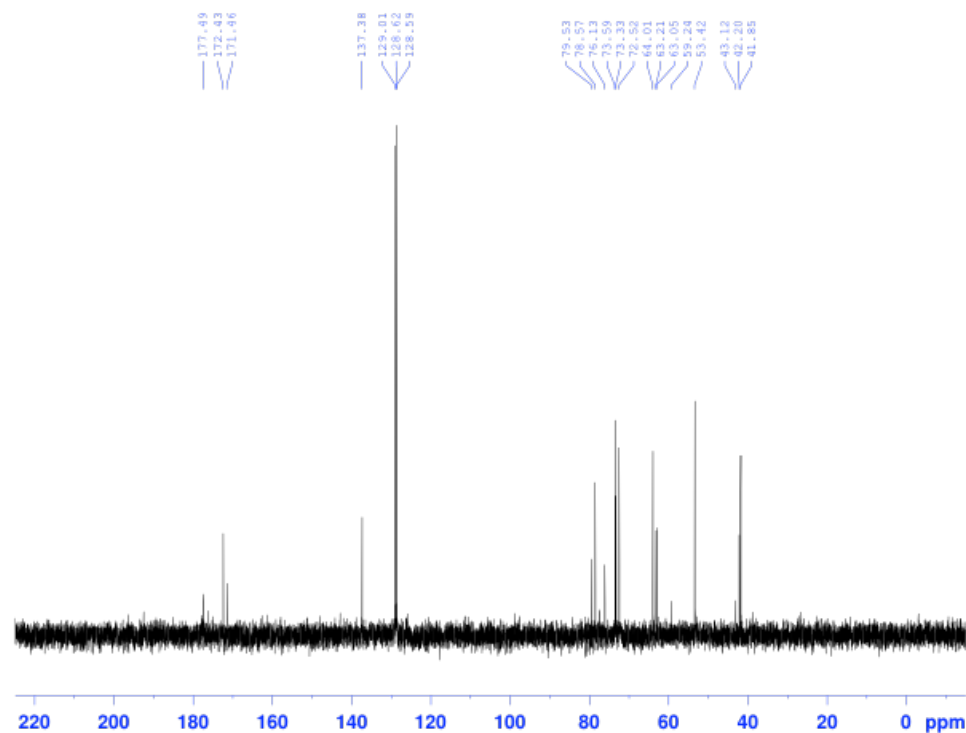
NUC1	1H
P1	9.00 usec
PL1	0.00 dB
SFO1	400.2024714 MHz
SI	32768
SF	400.2000000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

Methyl 2-hydroxymethyl-3-hydroxy-3-(benzyloxymethyl) pyroglutamate and 2-amino-2-(methoxycarbonyl)-3-hydroxy-3-(benzyloxymethyl)- δ -lactone



17b

Instrument DQX400
Chemist ykschau
Group mgm
SC114 (iii)
c13acq.au D2O (C:NMR) mgmgrp 29



NMR@CHEM.OX

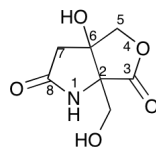
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NAME          May13-2010-29
EXPNO          2
PROCNO         1
Date_          20100514
Time           6.51
INSTRUM        av400
PROBHD         5 mm QNP 1H/13
PULPROG        zgpg30
TD             32768
SOLVENT        D2O
NS             256
DS             4
SWH            26178.010 Hz
FIDRES         0.798889 Hz
AQ            0.6259188 sec
RG            32768
DM            19.100 usec
DE            7.50 usec
TE            300.0 K
D1            1.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1           13C
P1            9.50 usec
PL1           0.00 dB
SFO1          100.6403931 MHz

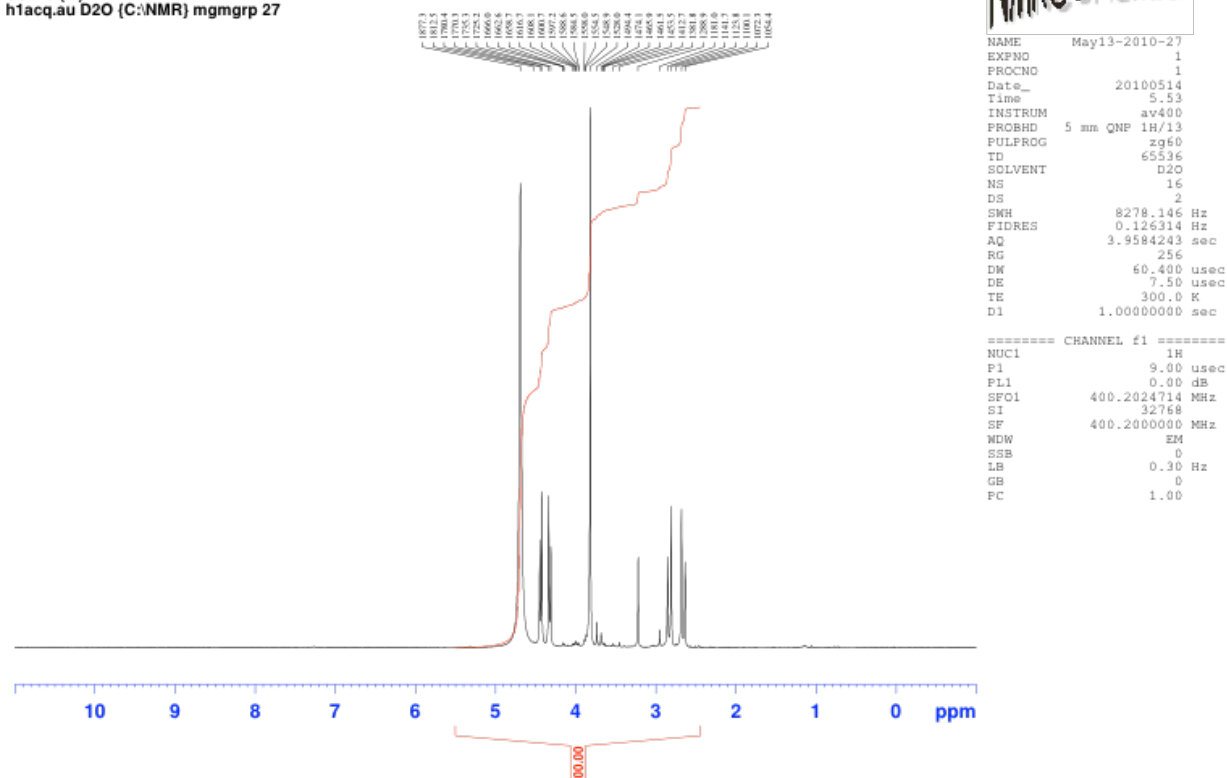
===== CHANNEL f2 =====
CPDPRG2        waltz16
NUC2           1H
PCPD2          80.00 usec
PL2           0.00 dB
PL12          19.00 dB
PL13          25.00 dB
SFO2          400.2016008 MHz
SI            32768
SF            100.6303300 MHz
WDW            EM
SSB            0
LB            1.00 Hz
GB            0
PC            1.40
  
```

1-Aza-2-(hydroxymethyl)-3-oxo-4-oxa-6-hydroxy-8-oxo[3.3.0]octane

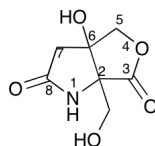


19

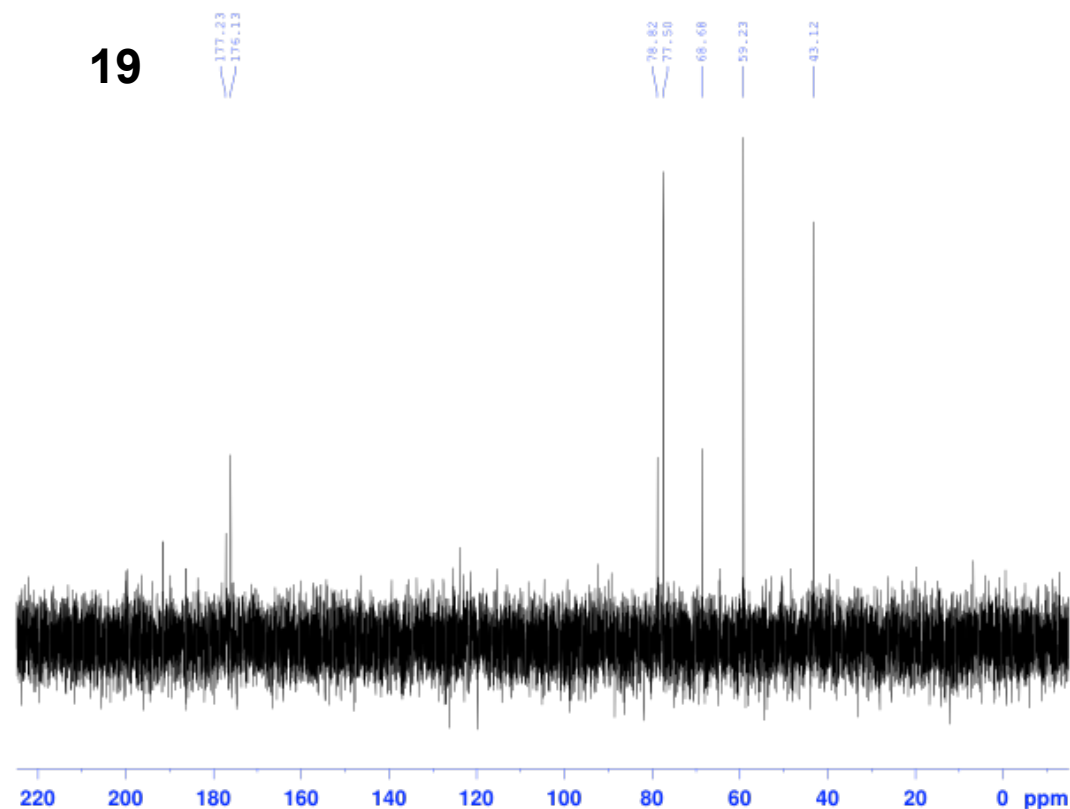
Instrument DQX400
Chemist ykschau
Group mgm
SC118 (iii)
h1acq.au D2O (C:NMR) mgmgrp 27



1-Aza-2-(hydroxymethyl)-3-oxo-4-oxa-6-hydroxy-8-oxo[3.3.0]octane



Instrument DQX400
Chemist ykschau
Group mgm
SC118 (iii)
c13acq.au D2O {C:NMR} mgmgrp 27



NMR@CHEM.OX

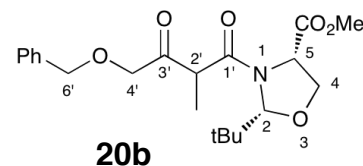
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NAME      May13-2010-27
EXPNO     2
PROCNO    1
Date_     20100514
Time      6.01
INSTRUM    av400
PROBHD     5 mm QNP 1H/13
PULPROG    zgpg30
TD         32768
SOLVENT    D2O
NS         256
DS         4
SWH         26178.010 Hz
FIDRES     0.798889 Hz
AQ         0.6259188 sec
RG         32768
DM         19.100 usec
DE         7.50 usec
TE         300.0 K
D1         1.00000000 sec
D11        0.03000000 sec
TD0        1

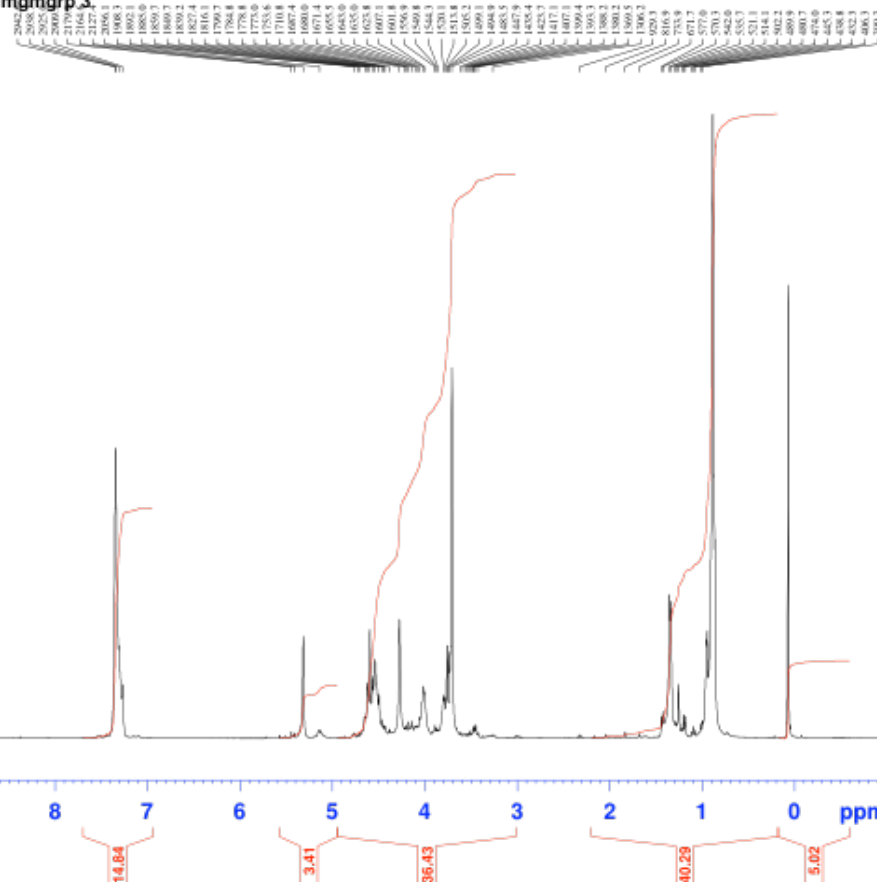
===== CHANNEL f1 =====
NUC1       13C
P1         9.50 usec
Pl1        0.00 dB
SFO1       100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2    waltz16
NUC2       1H
PCPD2      80.00 usec
Pl2        0.00 dB
Pl12       19.00 dB
Pl13       25.00 dB
SFO2       400.2016008 MHz
SI         32768
SF         100.6303300 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
    
```

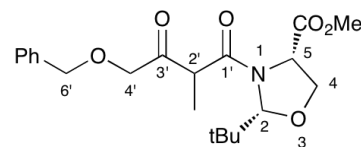

(2*R*, 5*S*)-methyl-1-(4'-(benzyloxy)-2'-methyl-3'-oxobutanoyl)-2-(*tert*-butyl)-5-carboxylate oxazolidine



Instrument DQX400
Chemist ykschau
Group mgm
SC117 f3
h1acq.au CDCl3 {C:NMR} mgmgrp.3

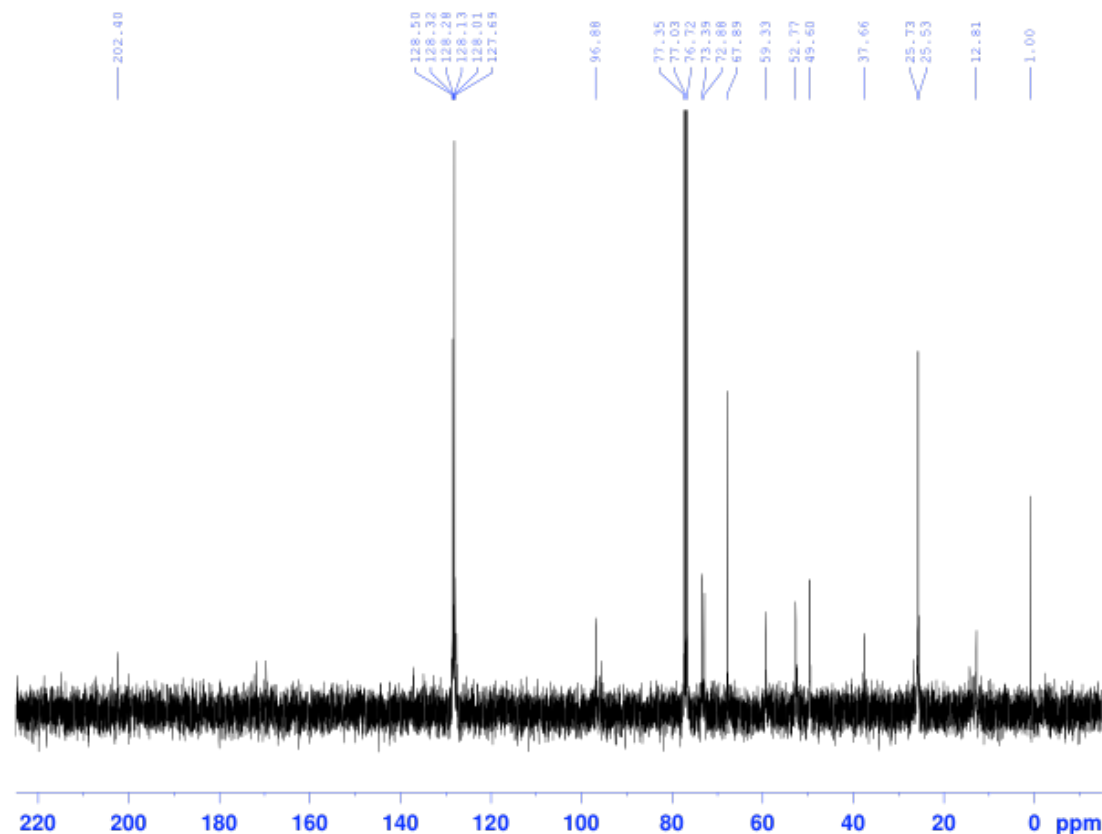


(2R, 5S)-methyl-1-(4'-(benzyloxy)-2'-methyl-3'-oxobutanoyl)-2-(tert-butyl)-5-carboxylate oxazolidine



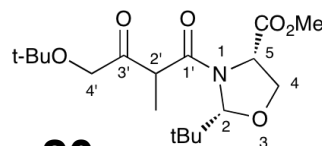
20b

Instrument DQX400
Chemist ykschau
Group mgm
SC117 f3
c13acq.au CDCl3 {C:NMR} mgmgrp 3



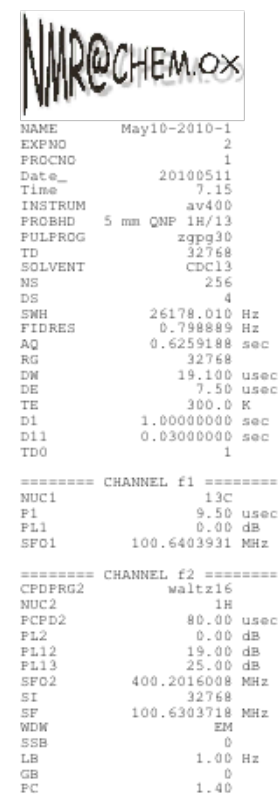
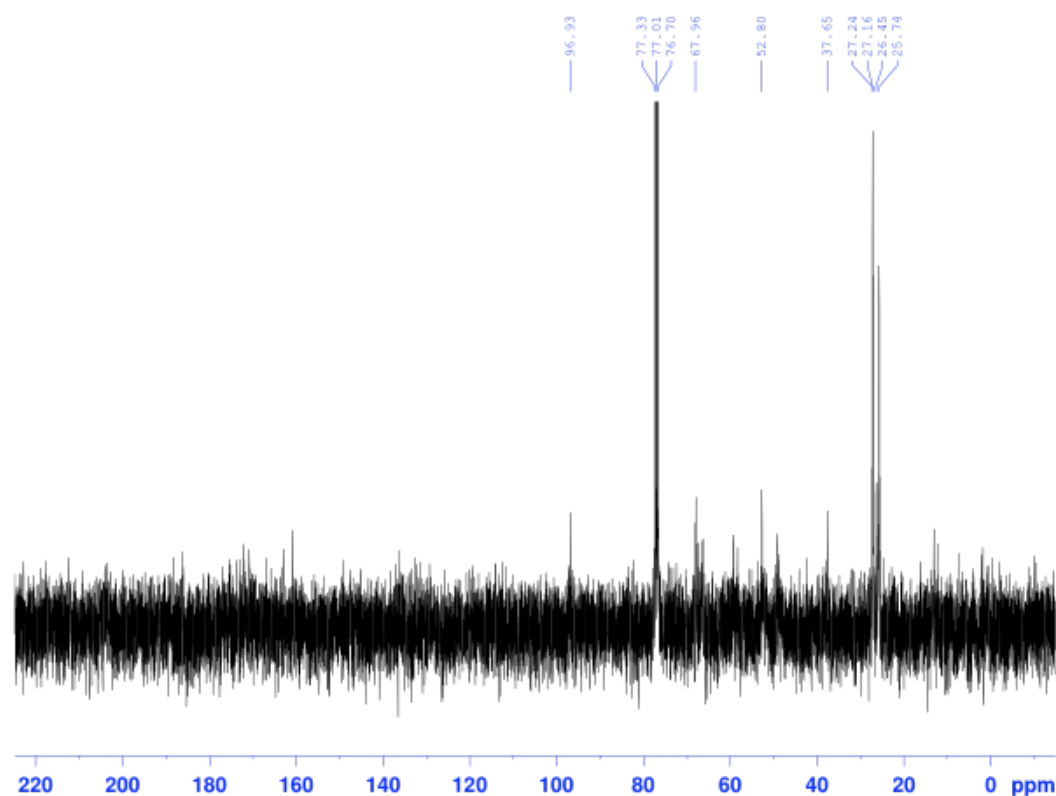
NAME May11-2010-3	
EXPNO	2
PROCNO	1
Date_	20100512
Time	7.05
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zgpg30
TD	32768
SOLVENT	CDCl3
NS	256
DS	4
SWH	26178.010 Hz
FIDRES	0.798889 Hz
AQ	0.6259188 sec
RG	32768
DW	19.100 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec
D11	0.03000000 sec
TD0	1
===== CHANNEL f1 =====	
NUC1	13C
P1	9.50 usec
PL1	0.00 dB
SFO1	100.6403931 MHz
===== CHANNEL f2 =====	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	0.00 dB
PL12	19.00 dB
PL13	25.00 dB
SFO2	400.2016008 MHz
SI	32768
SF	100.6303718 MHz
WDM	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

(2R, 5S)-methyl 1-(4'-(*tert*-butoxy)-2'-methyl-3'-oxobutanoyl)-2-(*tert*-butyl)-5-carboxylate oxazolidine



20c

Instrument DQX400
Chemist ykschau
Group mgm
SC116f1
c13acq.au CDCl3 {C:NMR} mgmgrp 1



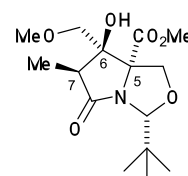
Instrument DPX200

Chemist PJF

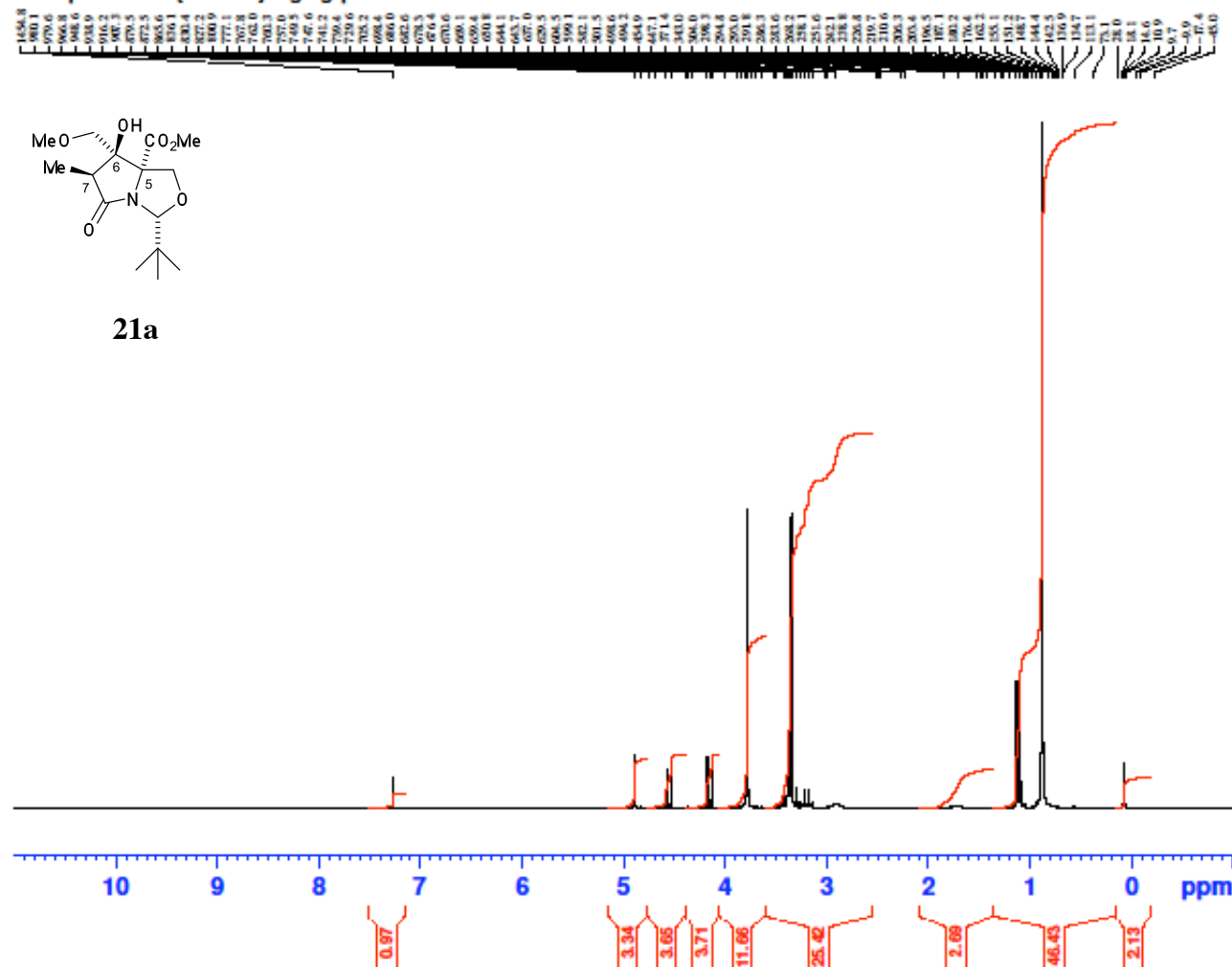
Group MGM

PF038(1)

h1acq.au CDCl3 {C:NMR} mgmgrp 22



21a



NMR@CHEM.OX

Current Data Parameters

NAME Apr28-2010-22

EXPNO 1

PROCNO 1

F2 - Acquisition Parameters

Date_ 20100428

Time 18.32

INSTRUM dpx200

PROBHD 5 mm Dual 13C/

PULPROG zg60

TD 16384

SOLVENT CDCl3

NS 16

DS 2

SWH 2796.421 Hz

FIDRES 0.170680 Hz

AQ 2.9295092 sec

RG 574.7

DW 178.800 usec

DE 6.00 usec

TE 300.0 K

D1 1.00000000 sec

===== CHANNEL f1 =====

NUC1 1H

P1 7.80 usec

PL1 -3.00 dB

SFO1 200.1310007 MHz

F2 - Processing parameters

SI 32768

SF 200.1300125 MHz

WDW EM

SSB 0

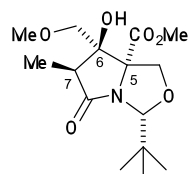
LB 0.30 Hz

GB 0

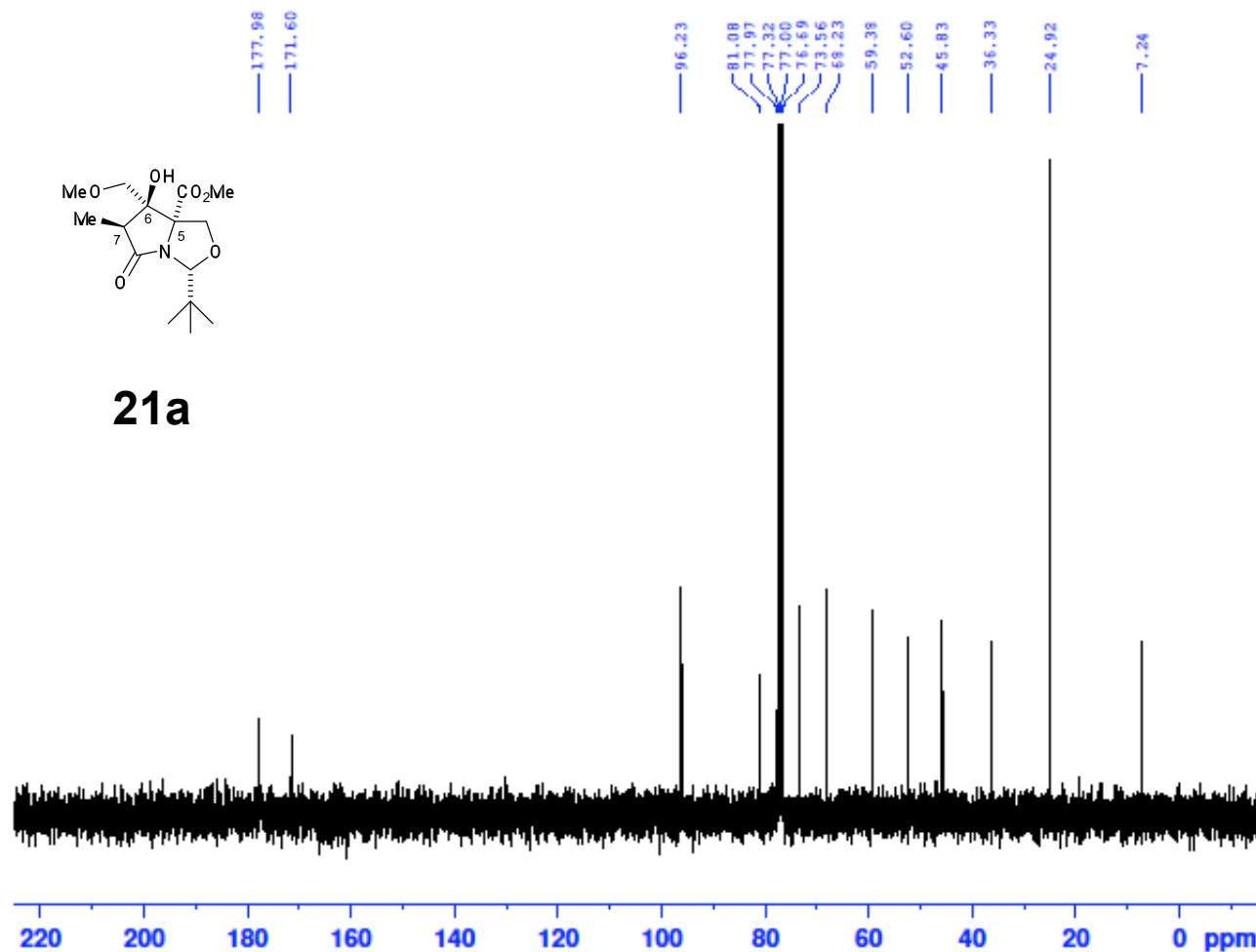
PC 1.00

Instrument DQX400
Chemist PJF
Group MGM
PF038
c13acq.au CDCl3 {C:NMR} mgmgrp 6

NMR@CHEM.OX



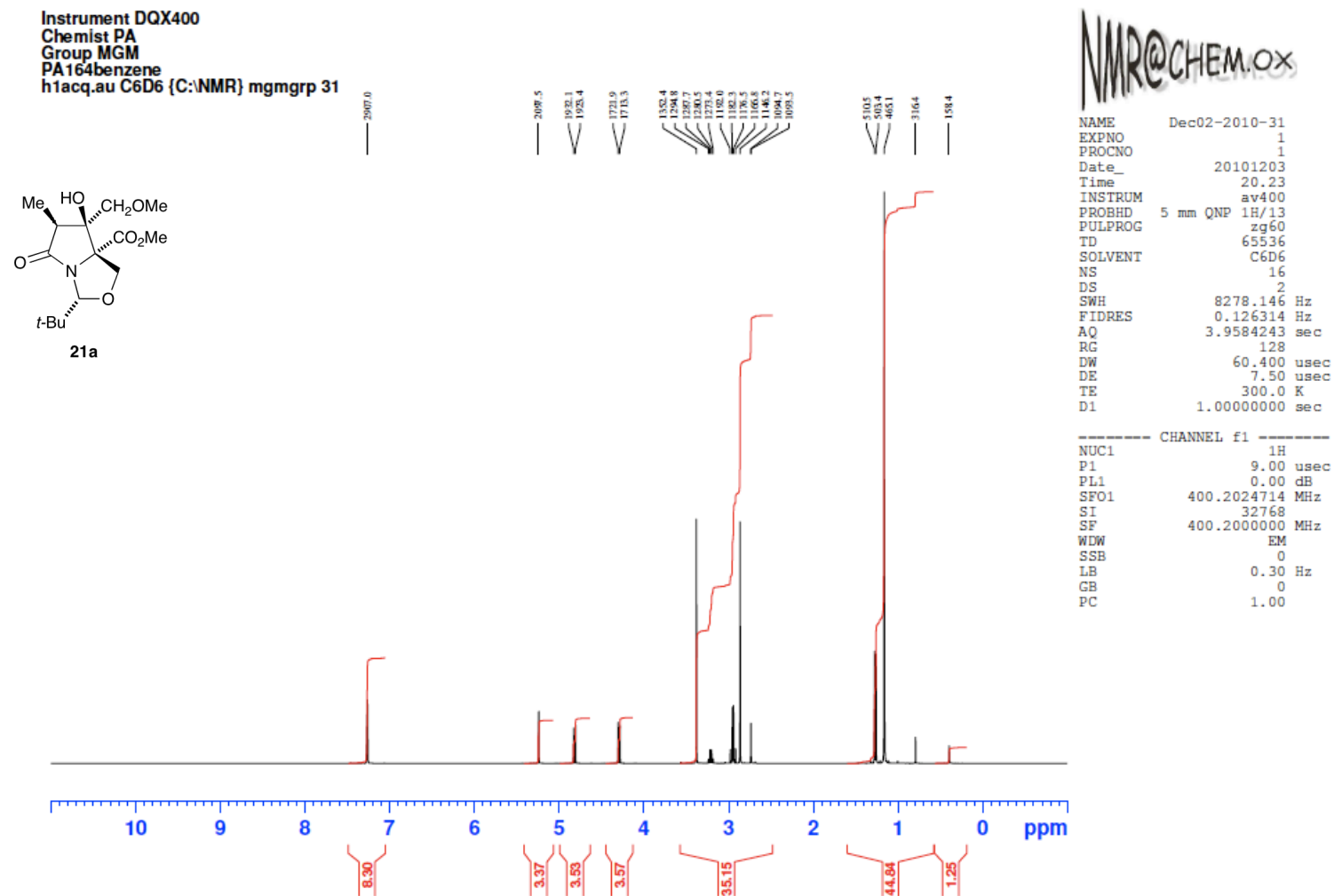
21a



NAME Apr30-2010-6
EXPNO 2
PROCNO 1
Date_ 20100430
Time 21.52
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



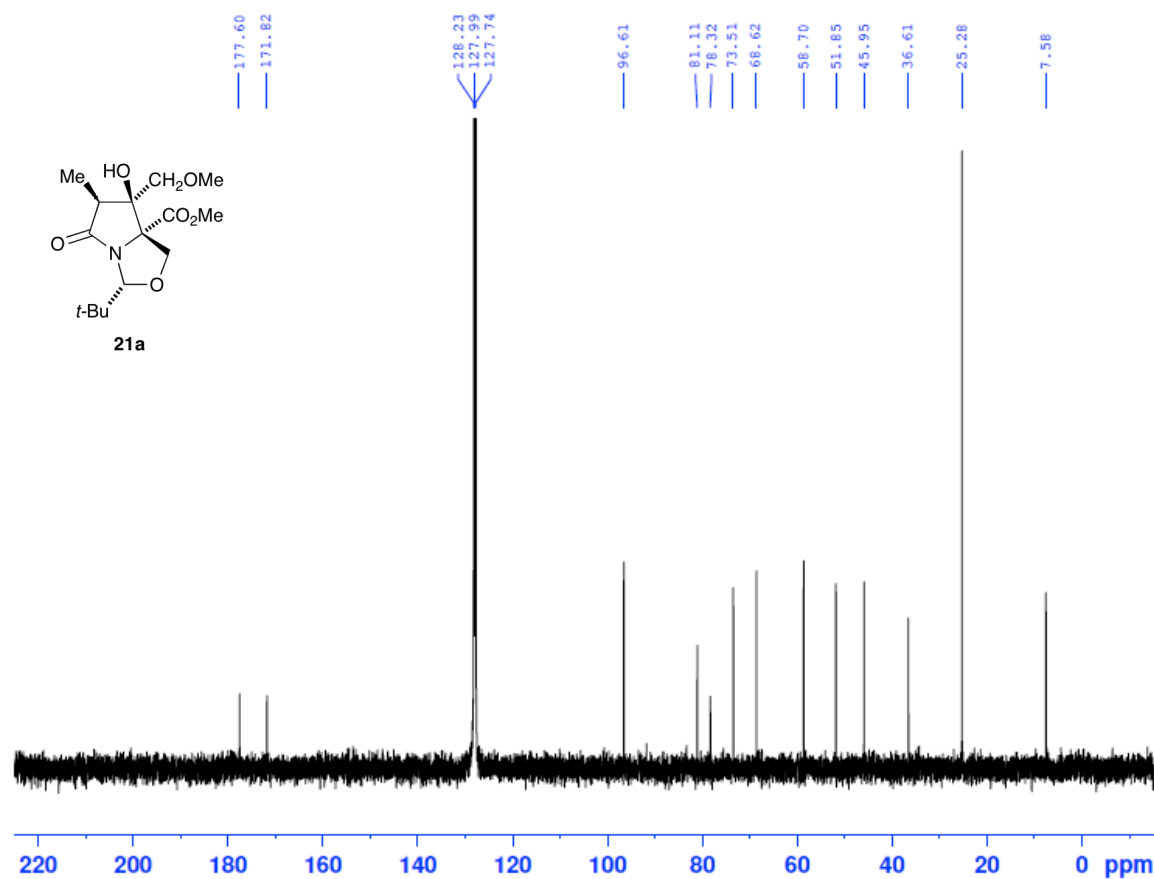
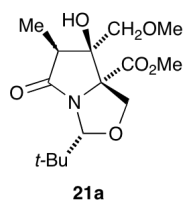
Instrument DQX400

Chemist PA

Group MGM

PA164benzene

c13acq.au C6D6 {C:NMR} mgmgrp 31

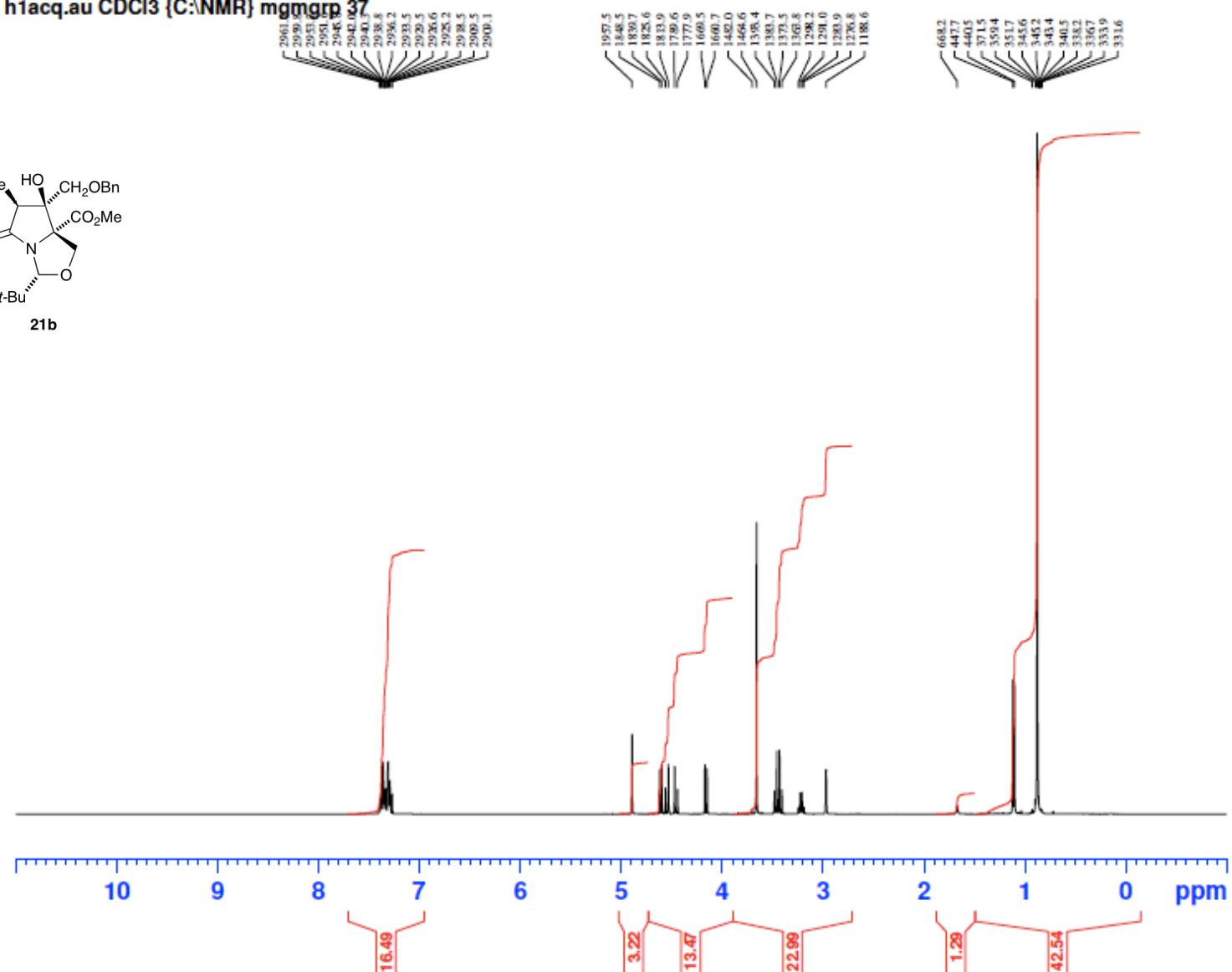


NMR@CHEM.OX

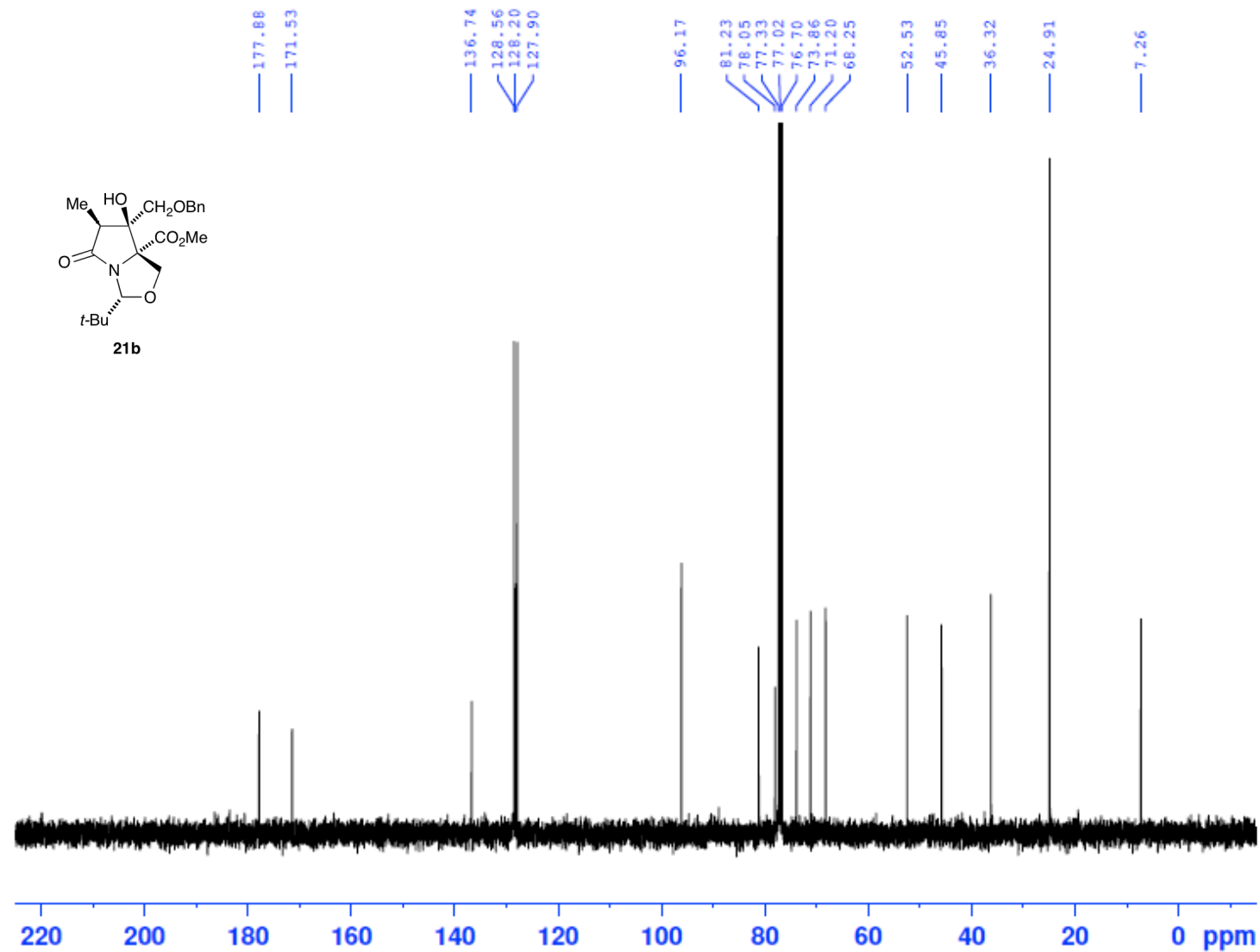
NAME Dec02-2010-31
EXPNO 4
PROCNO 1
Date_ 20101203
Time 20.41
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT C6D6
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

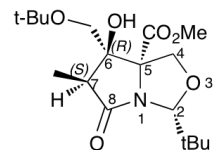
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303515 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



Instrument DQX400
Chemist PA
Group MGM
PA183
c13acq.au CDCl₃ {C:\NMR} mgmgrp 37

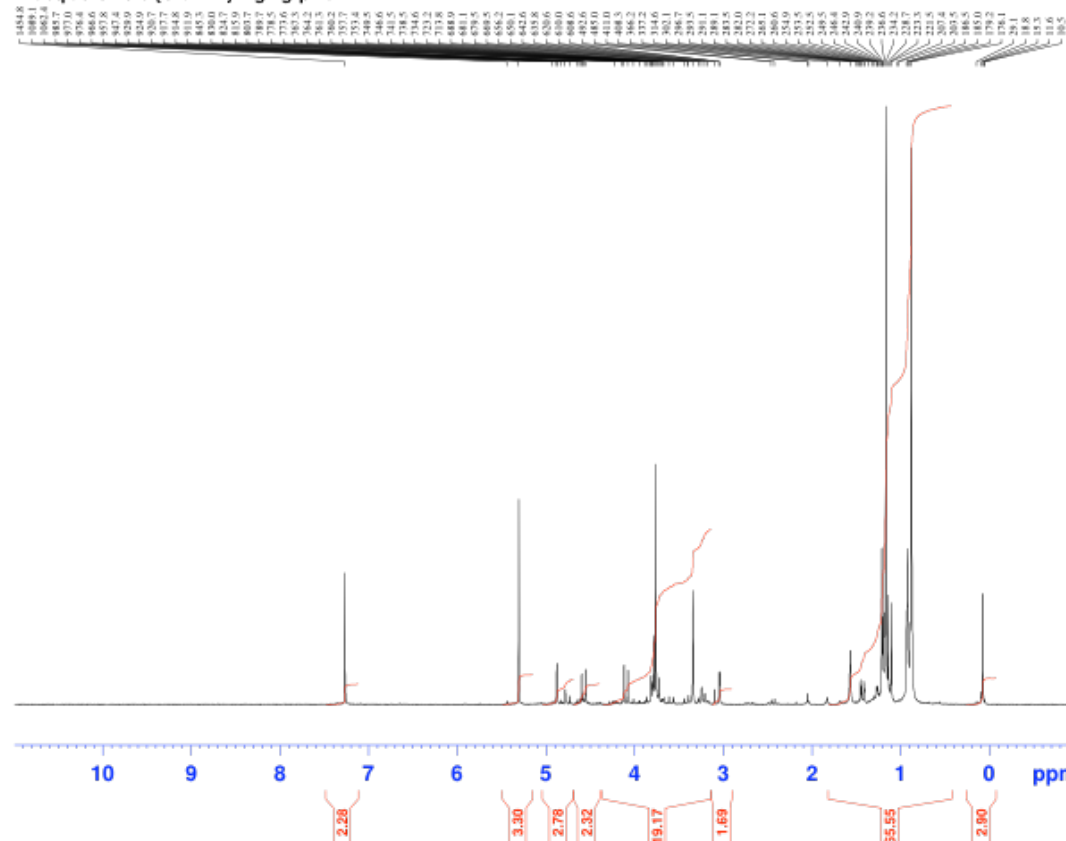


(2R, 5R, 6R, 7S)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



21c

Instrument DPX200
Chemist ykschau
Group mgm
SC119 f2
h1acq.au CDCl3 {C:NMR} mgmgrp 18



NMR@CHEM.OX

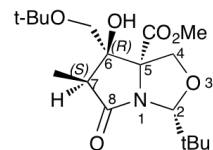
Current Data Parameters
NAME May12-2010-18
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20100512
Time 22.40
INSTRUM dpx200
PROBHD 5 mm Dual 13C/
PULPROG zgpg30
TD 16384
SOLVENT CDCl3
NS 16
DS 2
SWH 2796.421 Hz
FIDRES 0.170680 Hz
AQ 2.9295092 sec
RG 1024
DM 178.800 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec

===== CHANNEL f1 =====
NUC1 1H
P1 7.80 usec
PL1 -3.00 dB
SFO1 200.1310007 MHz

F2 - Processing parameters
SI 32768
SF 200.1300125 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

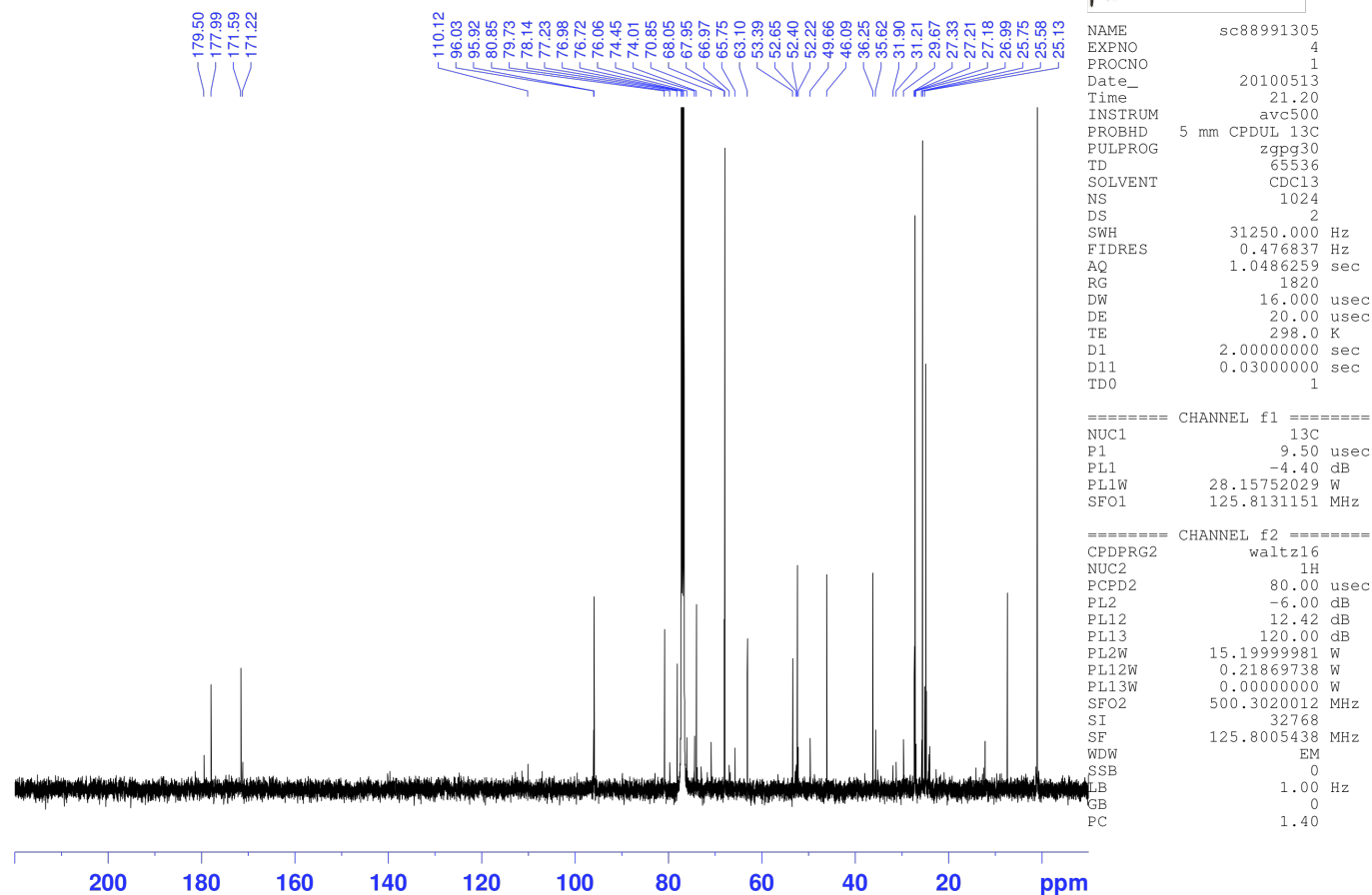
(2R, 5R, 6R, 7S)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



21c

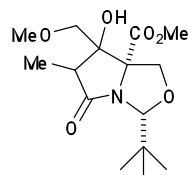
Instrument AVC500
Group MGM
8899 Sonia Chau 13/5/10

NMR@CHEM.OX

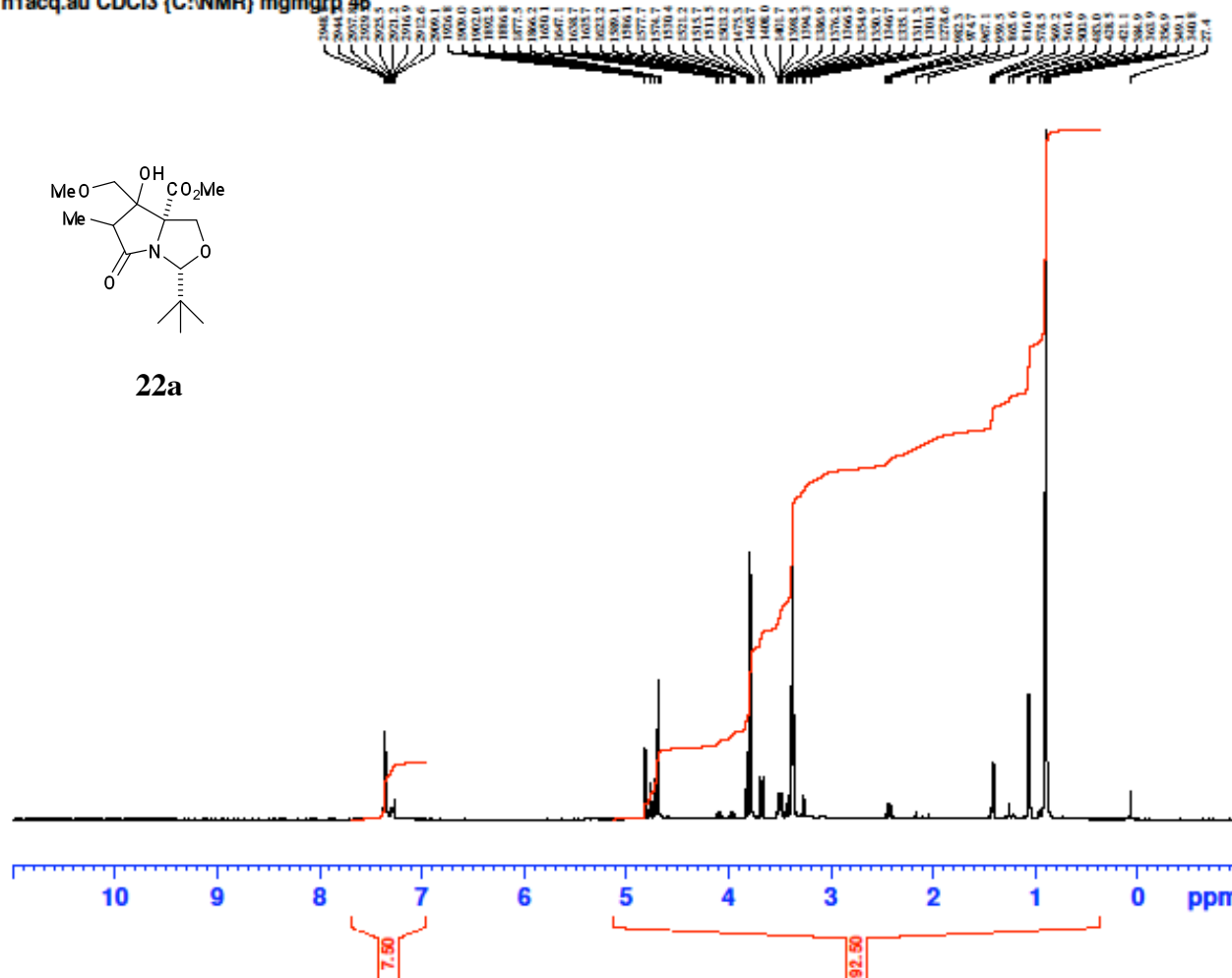


Instrument QX400
Chemist PJF
Group MGM
PF038-F3
h1acq.au CDCl3 (C:NMR) mgmgrp 46

NMR@CHEM.OX



22a

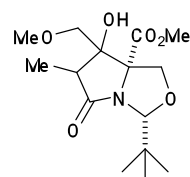


NAME May18-2010-46
EXPNO 1
PROCNO 1
Date_ 20100519
Time 13.06
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

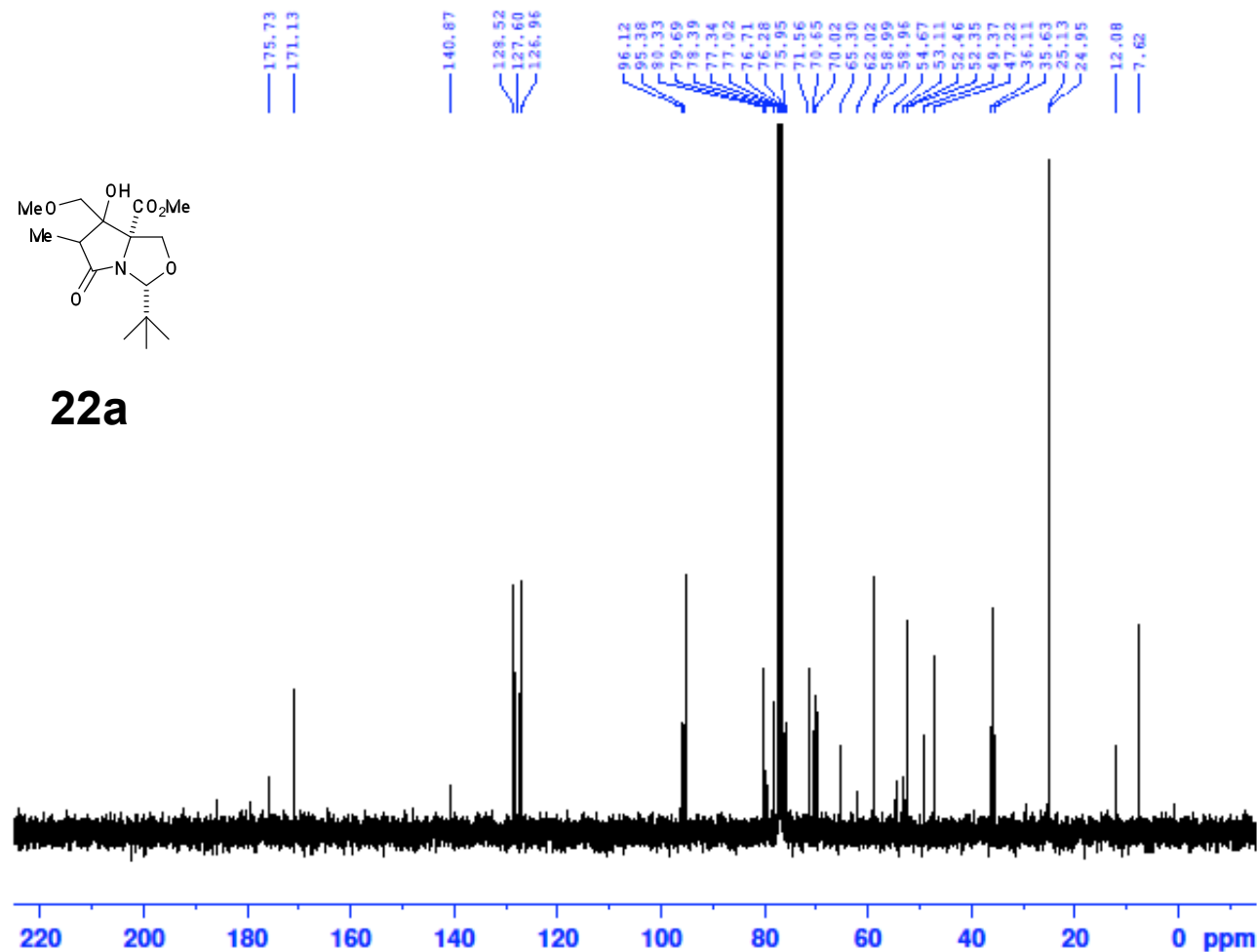
===== CHANNEL f1 =====
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PJF
Group MGM
PF038-F3
c13acq.au CDC13 {C:NMR} mgmgrp 46

NMR@CHEM.OX



22a

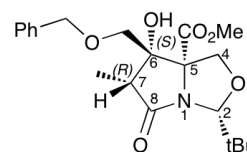


NAME May18-2010-46
EXPNO 2
PROCNO 1
Date_ 20100519
Time 13.14
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDC13
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

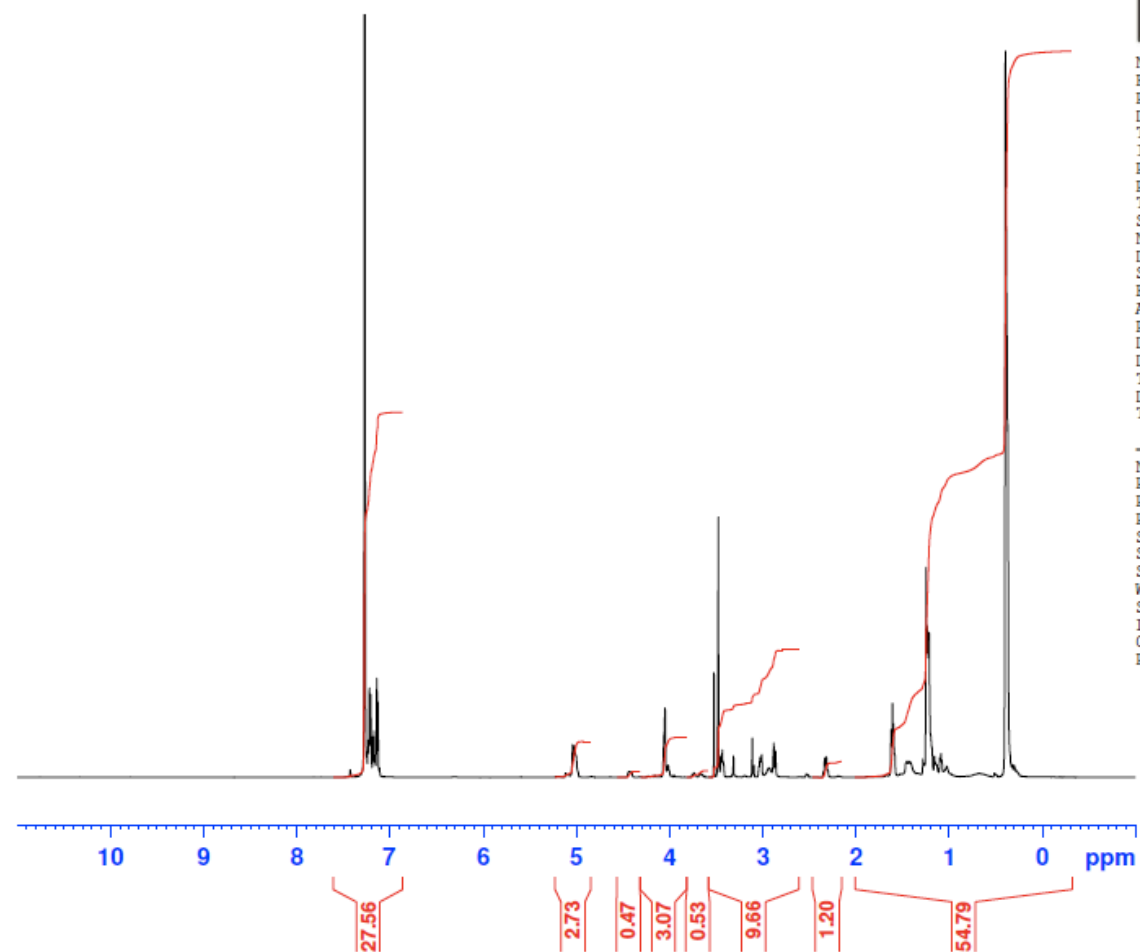
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

(2R, 5R, 6S, 7R)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



22b

Instrument AVC500
Group MGM
8984 Sonia Chau 18/5/10

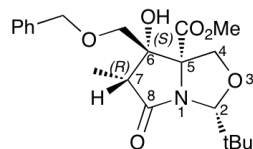


NMR@CHEM.OX

NAME sc89841805
EXPNO 1
PROCNO 1
Date_ 20100518
Time 21.32
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT C6D6
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

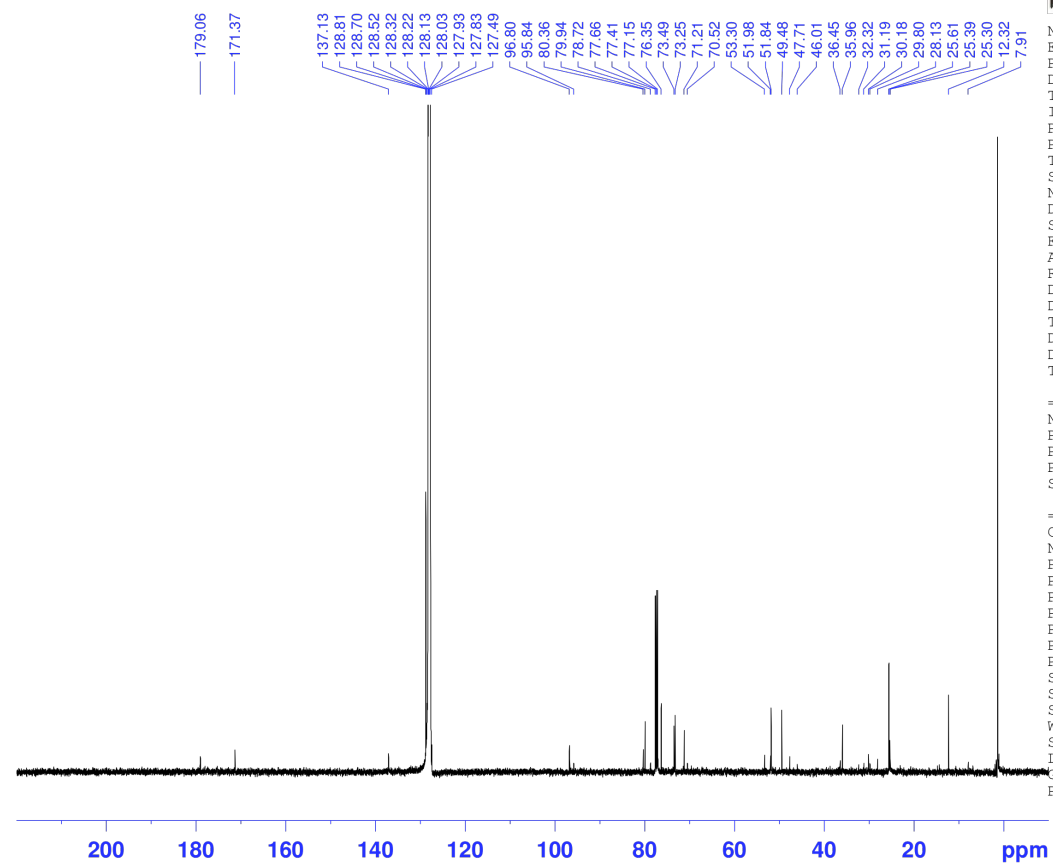
----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SF01 500.3030896 MHz
SI 32768
SF 500.3000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

(2R, 5R, 6S, 7R)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



22b

Instrument AVC500
Group MGM
8984 Sonia Chau 18/5/10



NMR@CHEM.OX

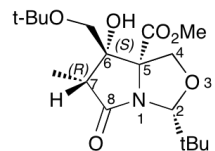
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NAME          sc89841805
EXPNO         4
PROCNO        1
Date_         20100518
Time          22.42
INSTRUM       avc500
PROBHD        5 mm CPDUL 13C
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            1024
DS            2
SWH           31250.000 Hz
FIDRES        0.476837 Hz
AQ            1.0486259 sec
RG            912
DW            16.000 usec
DE            20.00 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1

===== CHANNEL f1 =====
NUC1           13C
P1             9.50 usec
PL1            -4.40 dB
PL1W          28.15752029 W
SFO1           125.8131151 MHz

===== CHANNEL f2 =====
CPDPRG2       waltz16
NUC2           1H
PCPD2         80.00 usec
PL2            -6.00 dB
PL12          12.42 dB
PL13          120.00 dB
PL2W          15.19999981 W
PL12W         0.21869738 W
PL13W         0.00000000 W
SFO2           500.3020012 MHz
SI             32768
SF            125.8005073 MHz
WDW            EM
SSB            0
LB             1.00 Hz
GB            0
PC             1.40
    
```


(2*R*, 5*R*, 6*S*, 7*R*)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



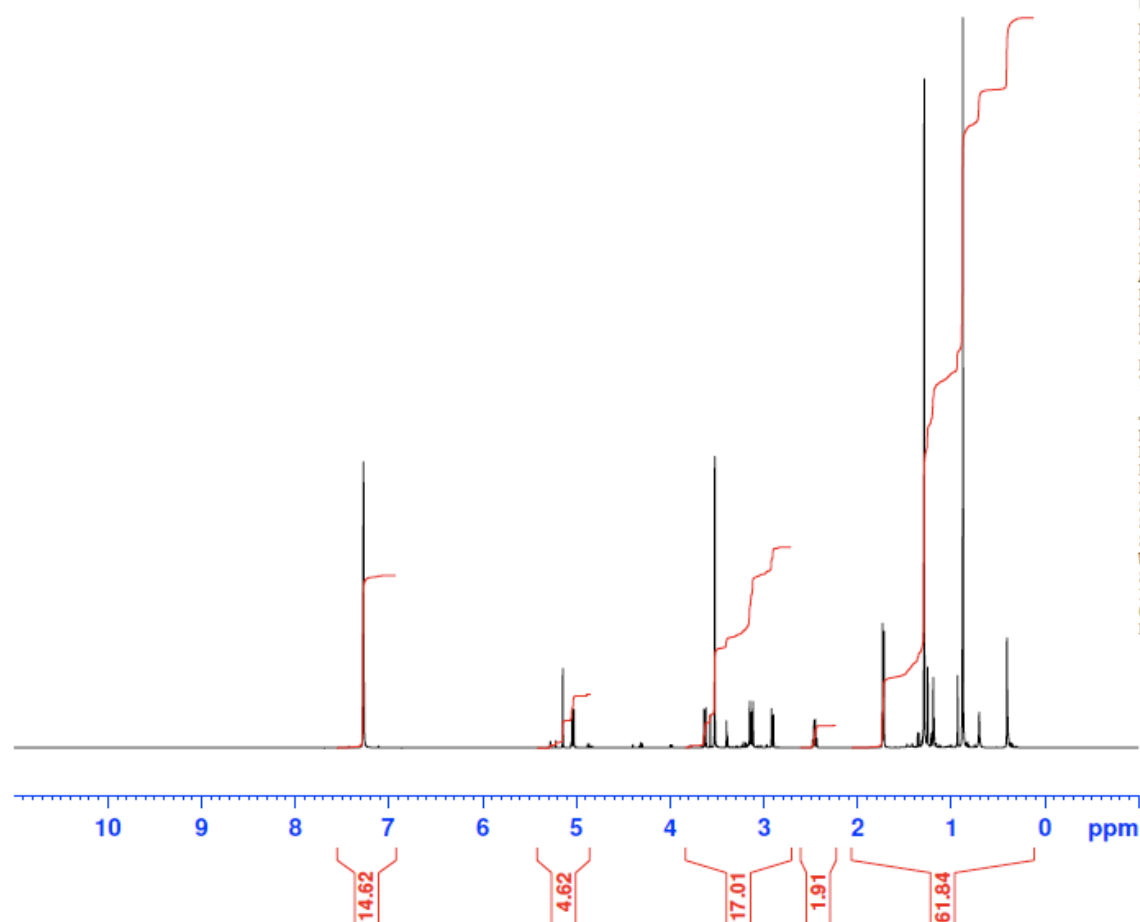
22c

Instrument AVC500
Group MGM
SONIA CHAN 8991 20/5/10

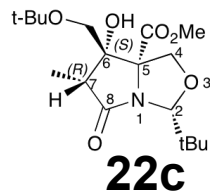
NMR@CHEM.OX

NAME sc89912005
EXPNO 1
PROCNO 1
Date_ 20100520
Time 23.28
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT C6D6
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

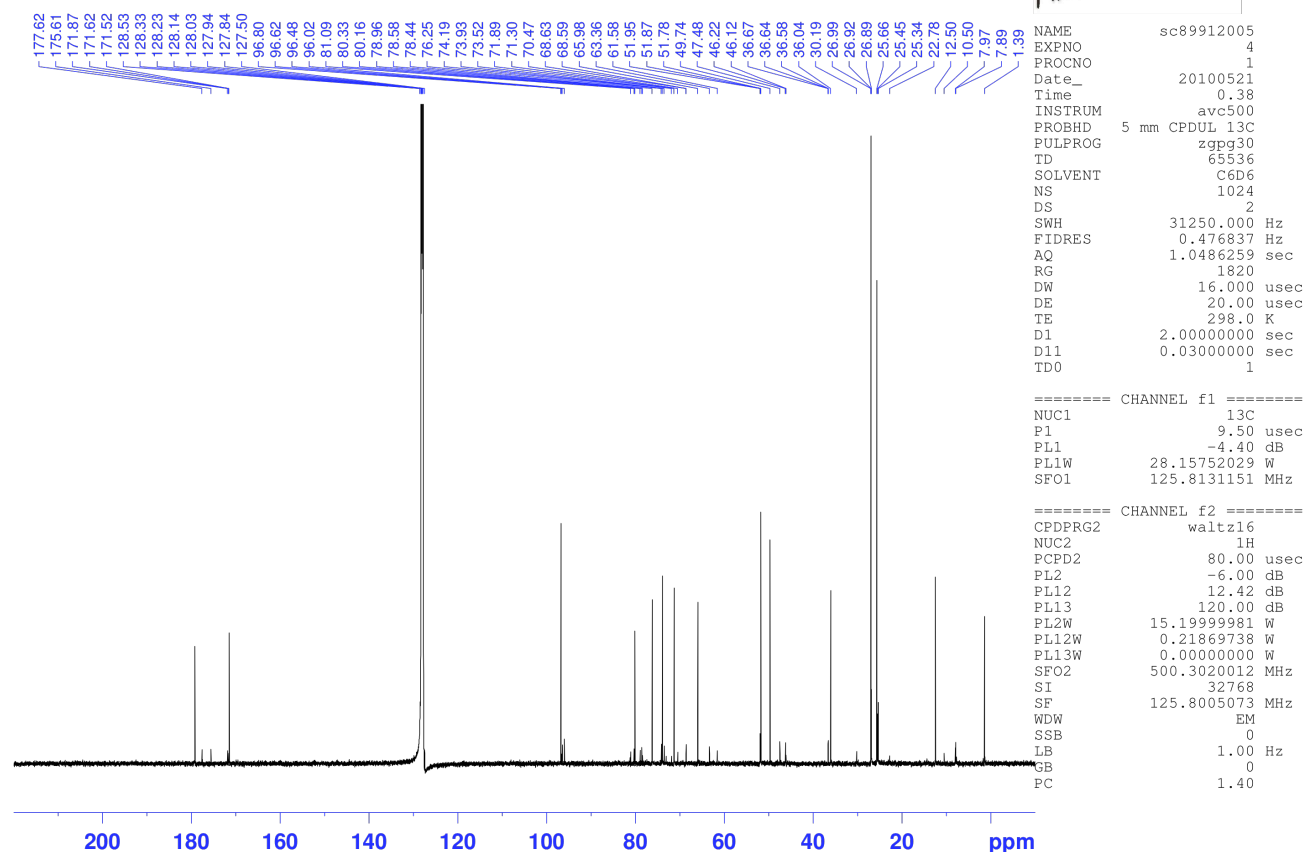


(2R, 5R, 6S, 7R)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane

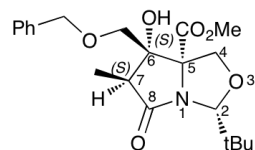


Instrument AVC500
Group MGM
SONIA CHAN 8991 20/5/10

NMR@CHEM.OX



(2*R*, 5*R*, 6*S*, 7*S*)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



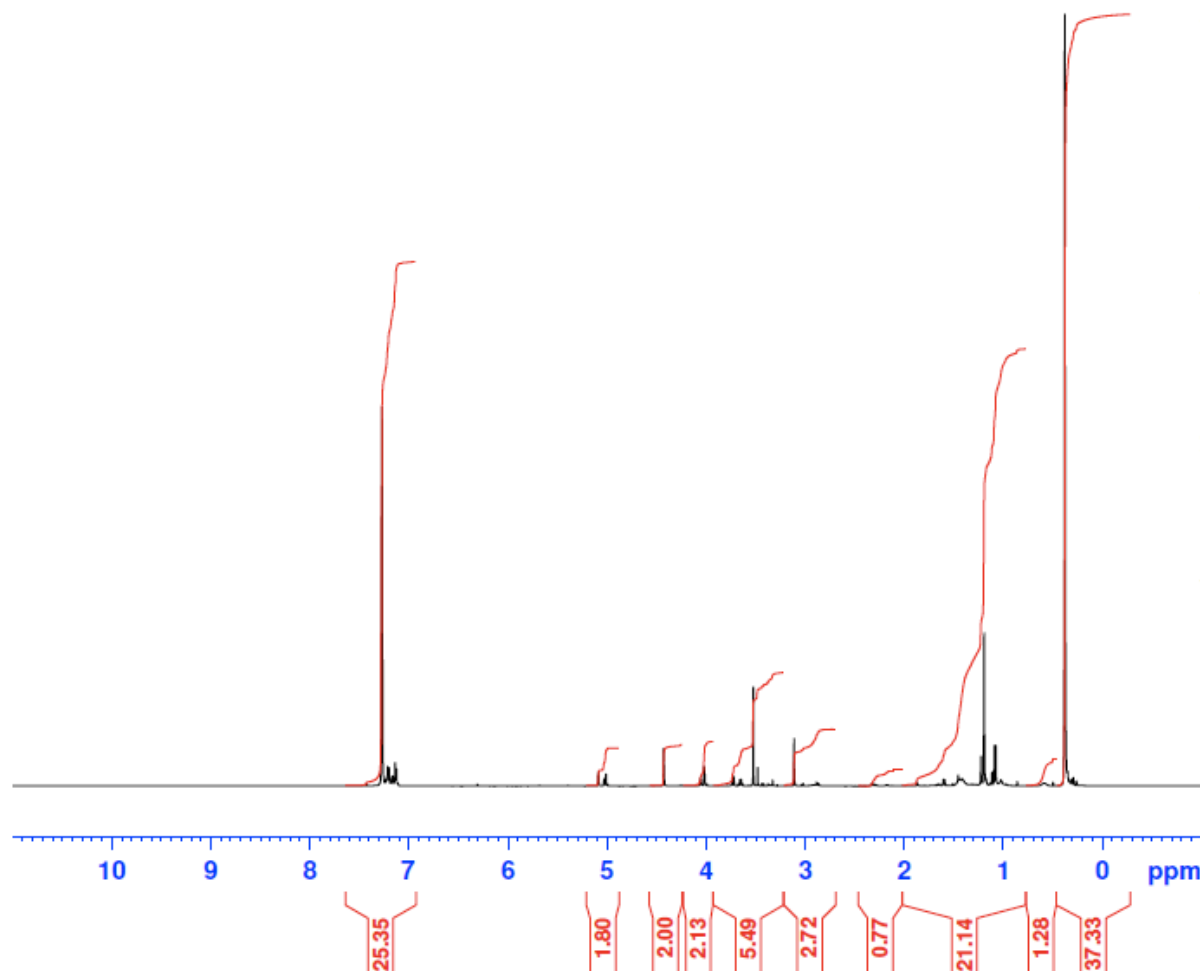
23b

Instrument AVC500
Group MGM
8992 Sonia Chau 19/5/10

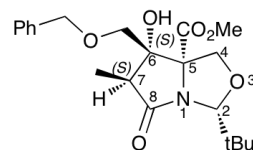
NMROCHEM.OX

NAME sc89921905
EXPNO 1
PROCNO 1
Date_ 20100519
Time 9.48
INSTRUM avc500
PROBHD 5 mm CPDUL 13C
PULPROG zg30
TD 65536
SOLVENT C6D6
NS 16
DS 2
SWH 10330.578 Hz
FIDRES 0.157632 Hz
AQ 3.1719923 sec
RG 4
DW 48.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 9.60 usec
PL1 -6.00 dB
PL1W 15.19999981 W
SFO1 500.3030896 MHz
SI 32768
SF 500.3000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

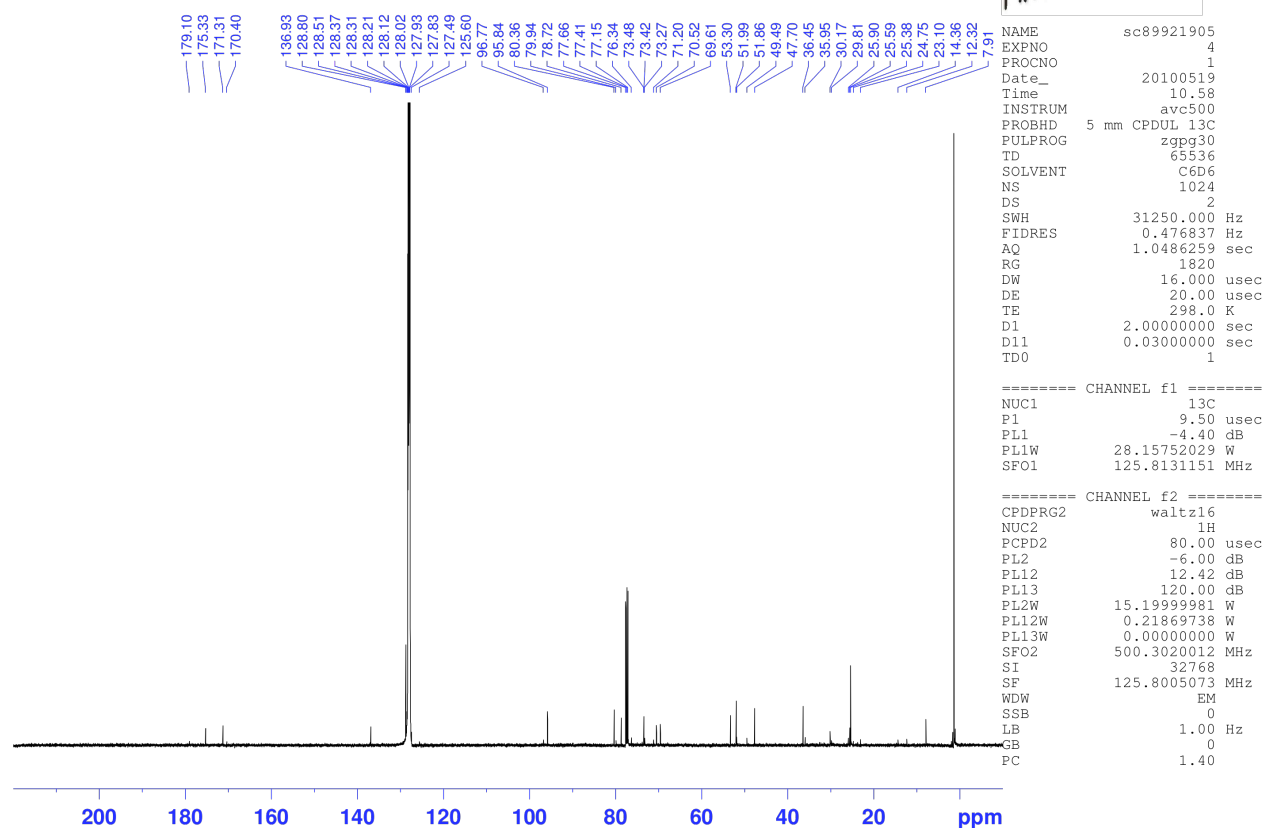


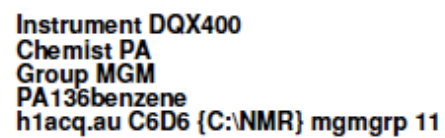
(2R, 5R, 6S, 7S)-1-Aza-2-(*tert*-butyl)-6-hydroxy-7-methyl-6-(benzyloxymethyl)-5-methoxycarbonyl-3-oxabicyclo[3.3.0]octane



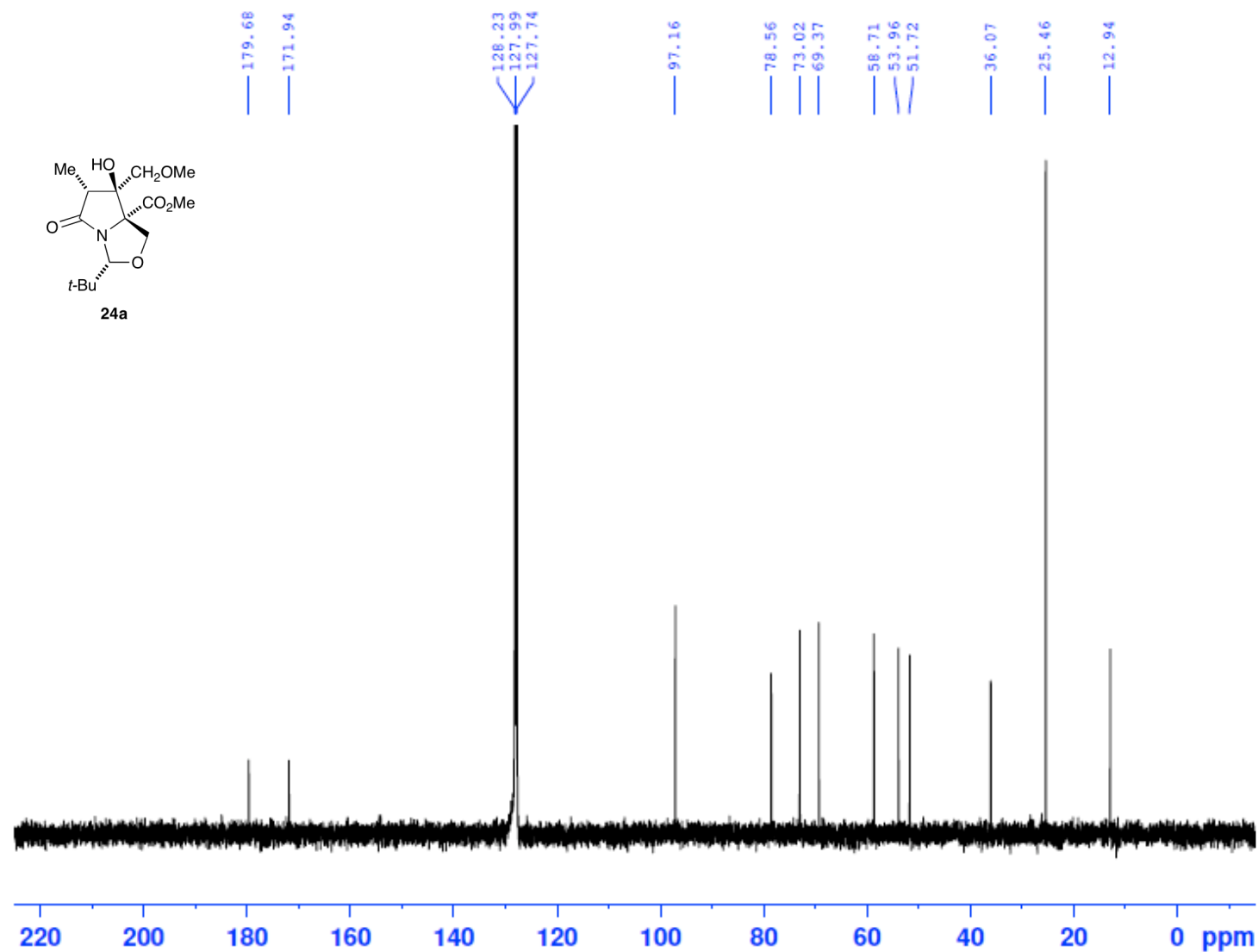
23b

Instrument AVC500
Group MGM
8992 Sonia Chau 19/5/10





Instrument DQX400
Chemist PA
Group MGM
PA136benzene
c13acq.au C6D6 {C:NMR} mgmgrp 11



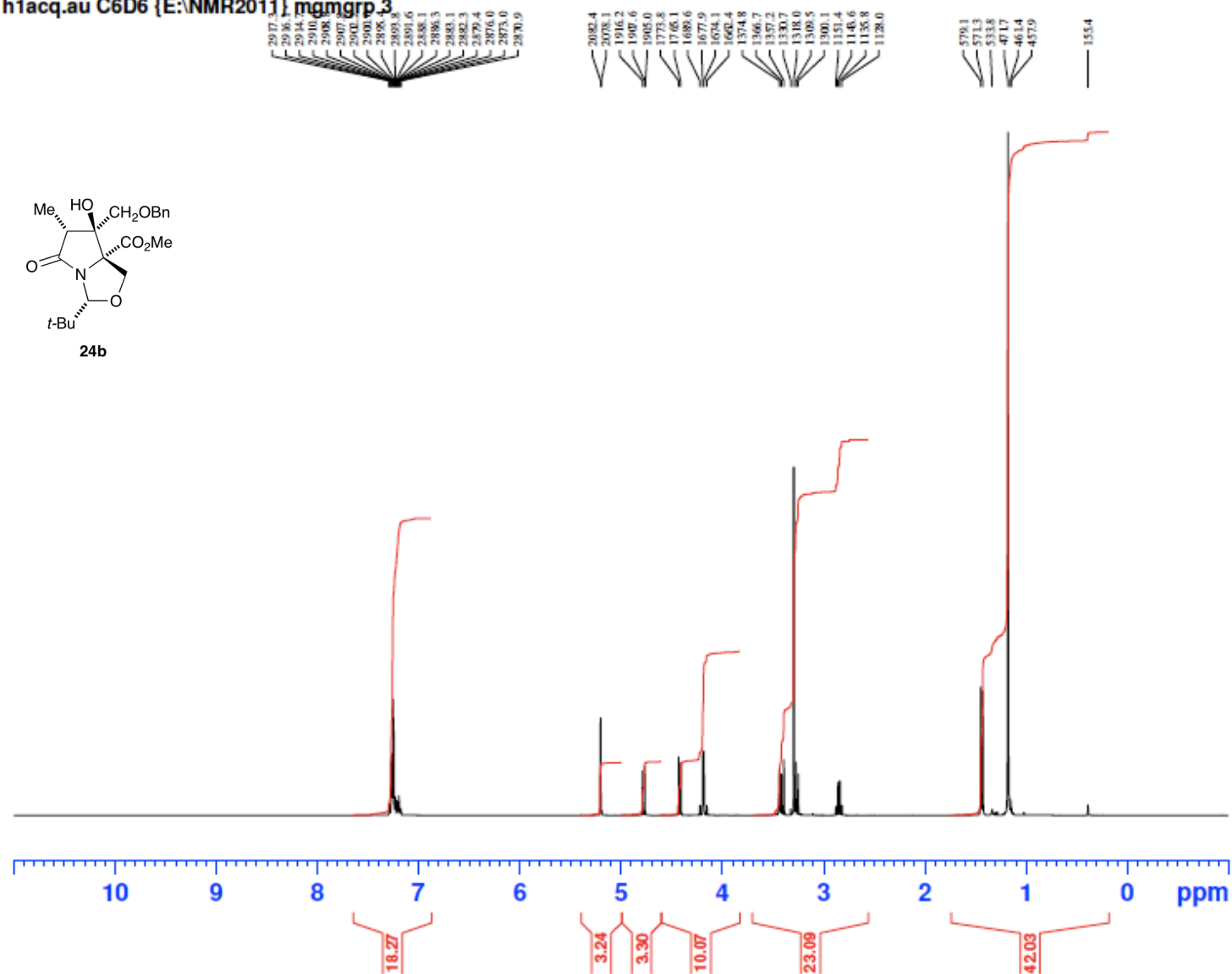
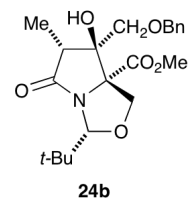
Instrument DQX400

Chemist PA

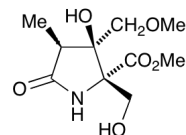
Group MGM

PA191B

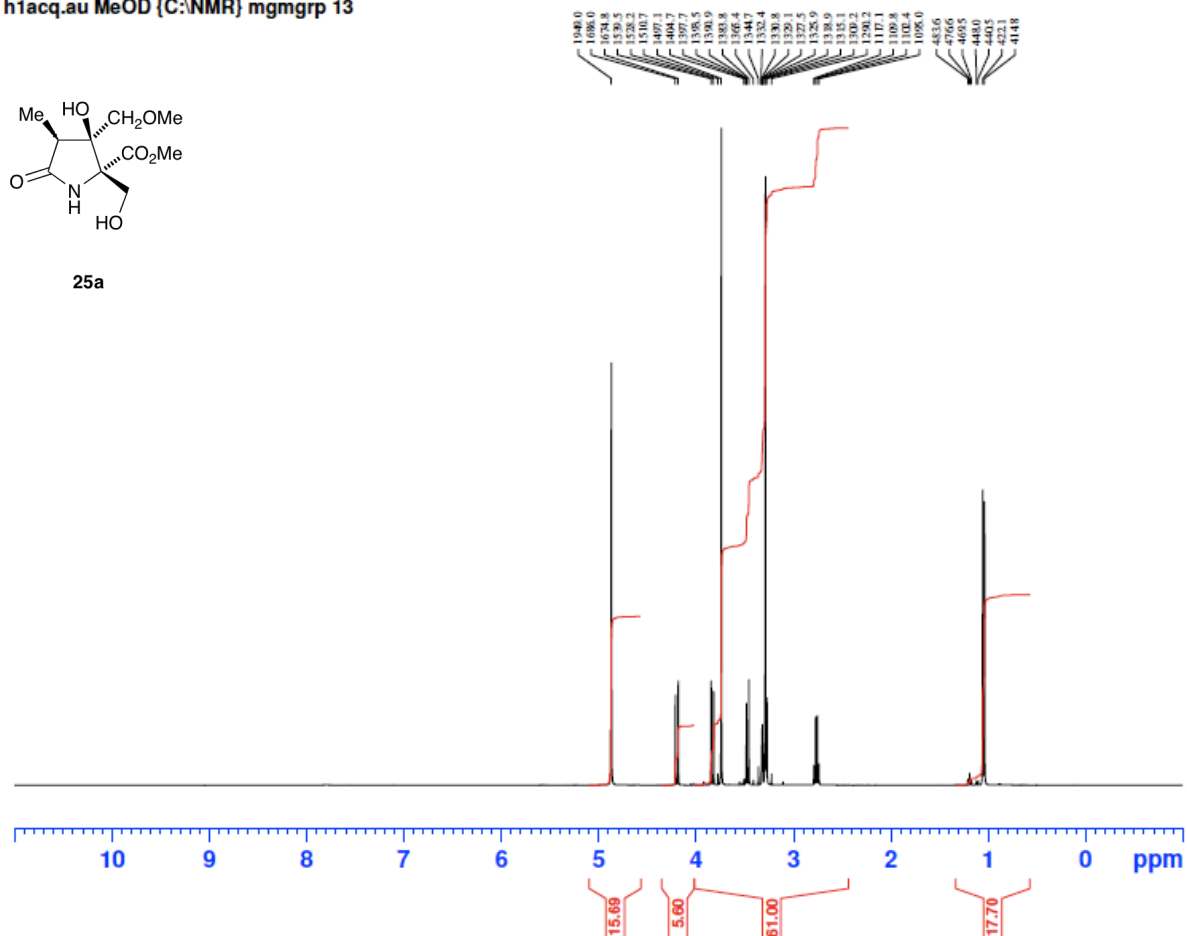
h1acq.au C6D6 {E:\NMR2011} mgmgrp.3



Instrument DQX400
Chemist PA
Group MGM
PA160-154
h1acq.au MeOD (C:NMR) mgmgrp 13



25a

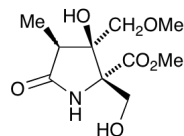


NMR@CHEM.OX

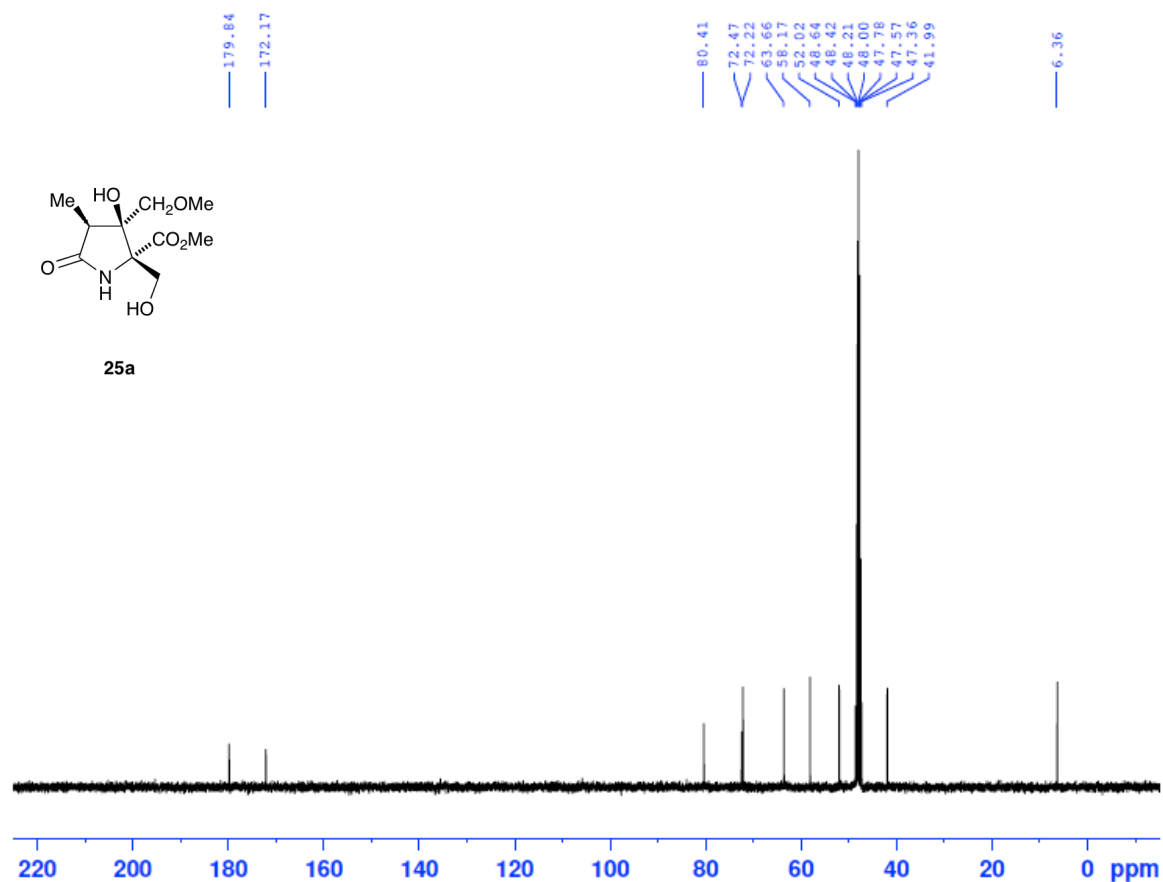
NAME Nov18-2010-13
EXPNO 1
PROCNO 1
Date_ 20101119
Time 18.31
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT MeOD
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PA
Group MGM
PA160-154
c13acq.au MeOD {C:NMR} mgmgrp 13



25a



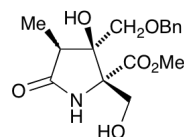
NMR@CHEM.OX

NAME Nov18-2010-13
EXPNO 4
PROCNO 1
Date_ 20101119
Time 18.49
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

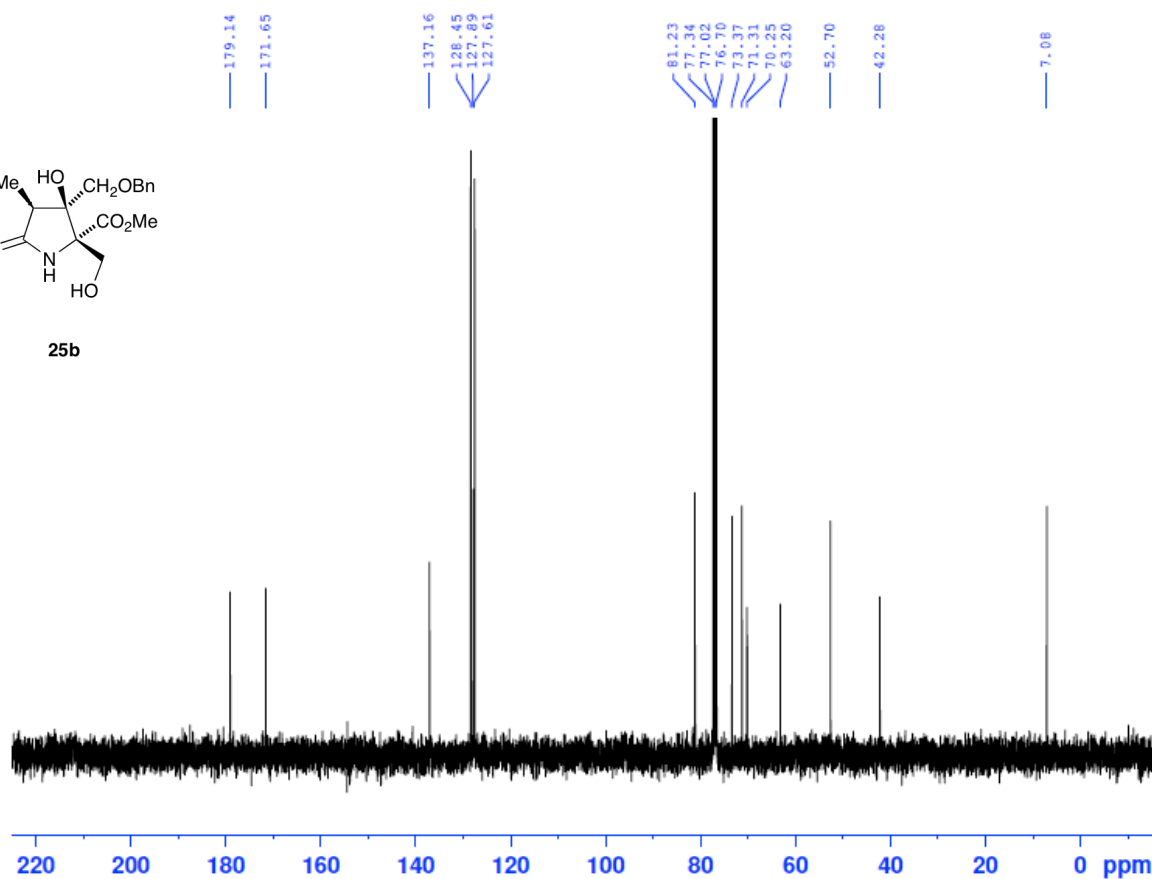
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303300 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PA
Group MGM
PA184B
c13acq.au CDCl3 {E:NMR2011} mgmgrp 57



25b



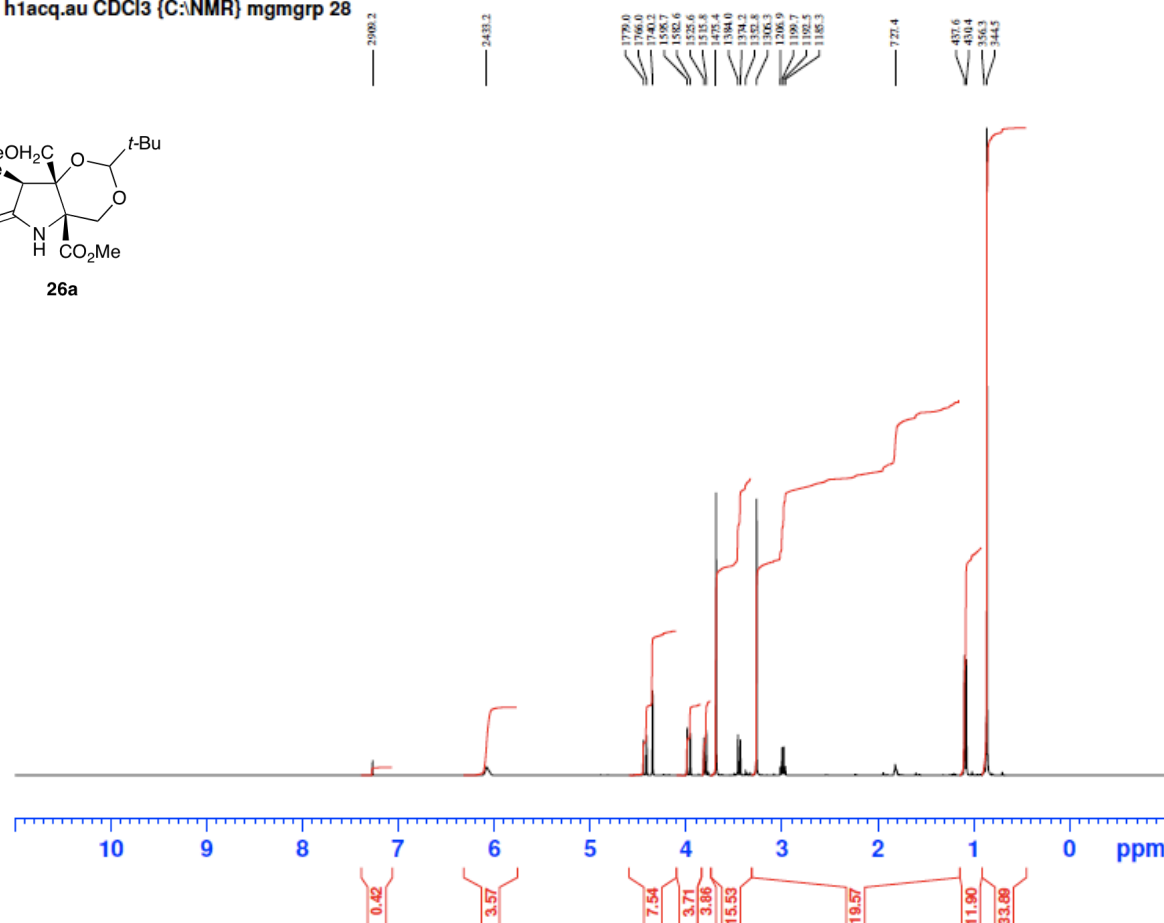
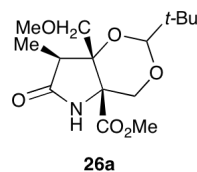
NMR@CHEM.OX

NAME Feb07-2011-57
EXPNO 2
PROCNO 1
Date_ 20110208
Time 16.50
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PA
Group MGM
PA146A
h1acq.au CDCl₃ (C:NMR) mgmgrp 28

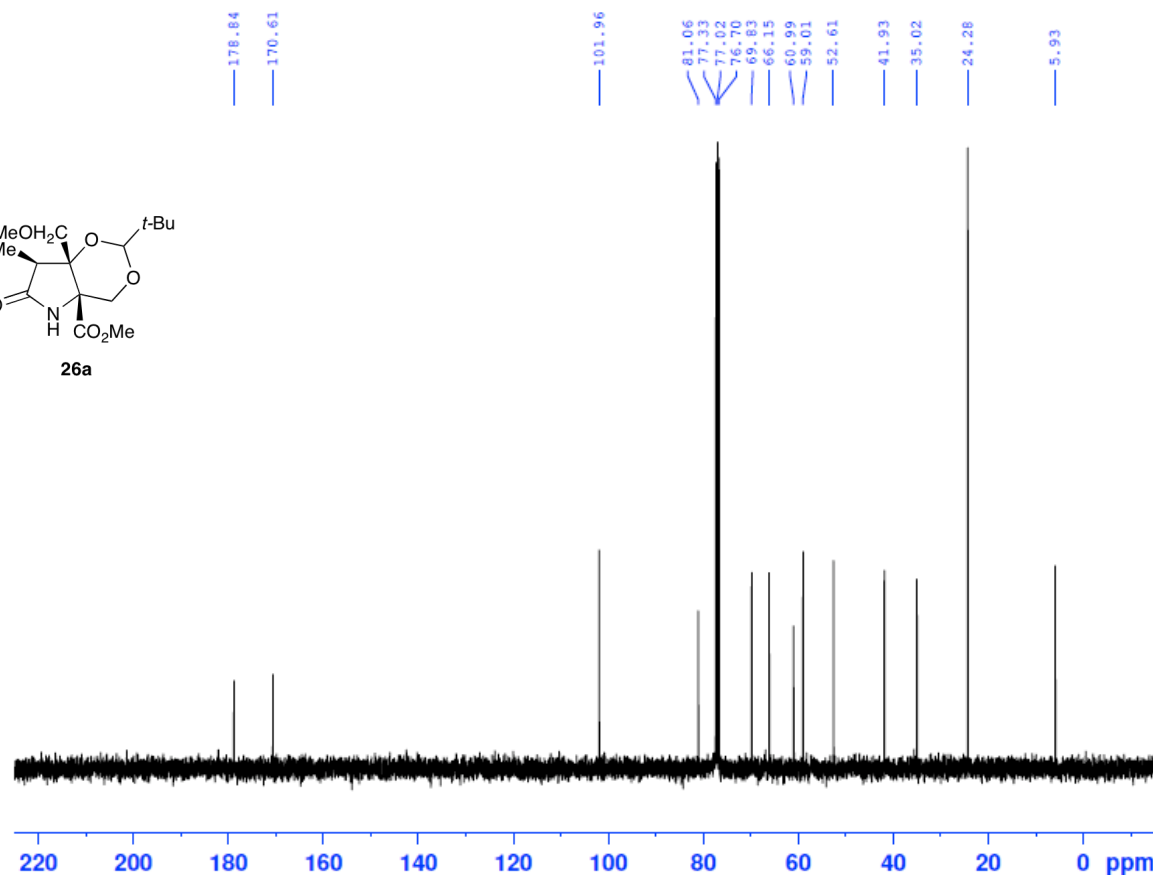
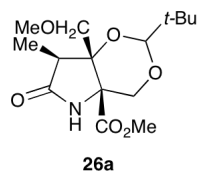


NMR@CHEM.OX

NAME Oct23-2010-28
EXPNO 1
PROCNO 1
Date_ 20101023
Time 18.14
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl₃
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

Instrument DQX400
Chemist PA
Group MGM
PA146A
c13acq.au CDCl₃ {C:NMR} mgmgrp 28



NMR@CHEM.OX

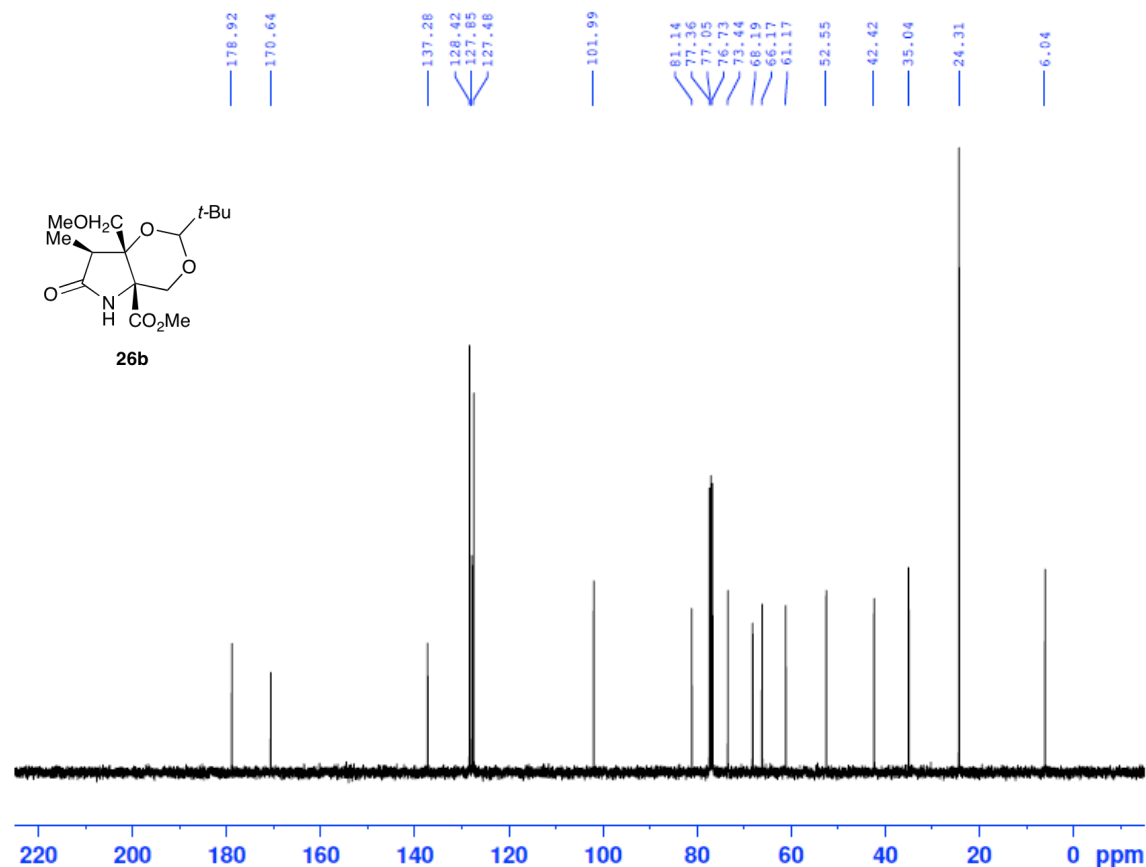
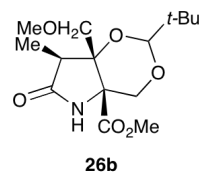
NAME Oct23-2010-28
EXPNO 4
PROCNO 1
Date_ 20101023
Time 18.31
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl₃
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PA
Group MGM
PA184A
c13acq.au CDCl3 {E:\NMR2011} mgmgrp 13

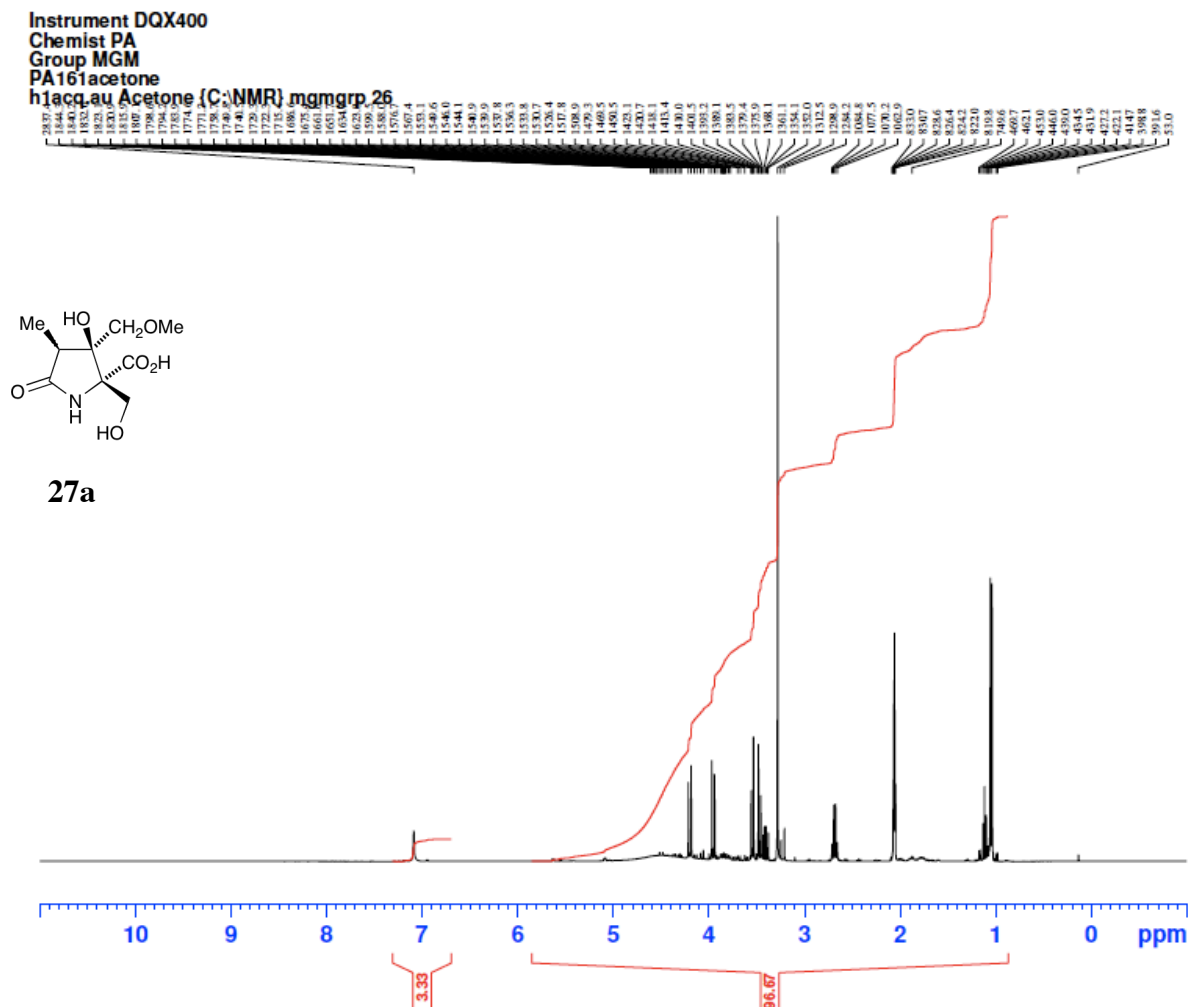
NMR@CHEM.OX



NAME Feb08-2011-13
EXPNO 2
PROCNO 1
Date_ 20110208
Time 23.19
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSE 0
LB 1.00 Hz
GB 0
PC 1.40



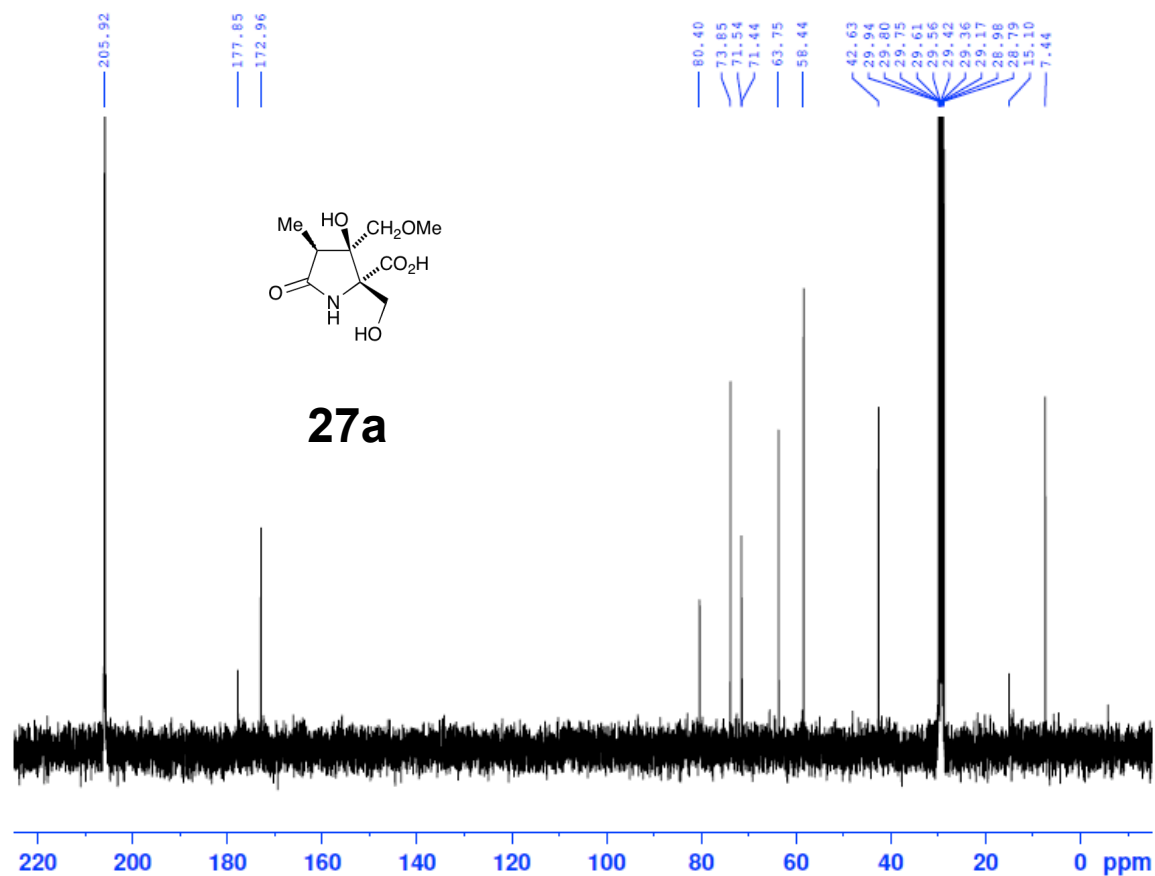
NMR@CHEM.OX

NAME	Nov23-2010-26
EXPNO	1
PROCNO	1
Date_	20101124
Time	9.08
INSTRUM	av400
PROBHD	5 mm QNP 1H/13
PULPROG	zg60
TD	65536
SOLVENT	Acetone
NS	16
DS	2
SWH	8278.146 Hz
FIDRES	0.126314 Hz
AQ	3.9584243 sec
RG	90.5
DW	60.400 usec
DE	7.50 usec
TE	300.0 K
D1	1.00000000 sec

----- CHANNEL f1 -----	
NUC1	13C
P1	9.00 usec
PL1	0.00 dB
SFO1	400.2024714 MHz
SI	32768
SF	400.2000000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

Instrument DQX400
Chemist PA
Group MGM
PA161acetone
c13acq.au Acetone (C:\NMR) mgmgrp 26

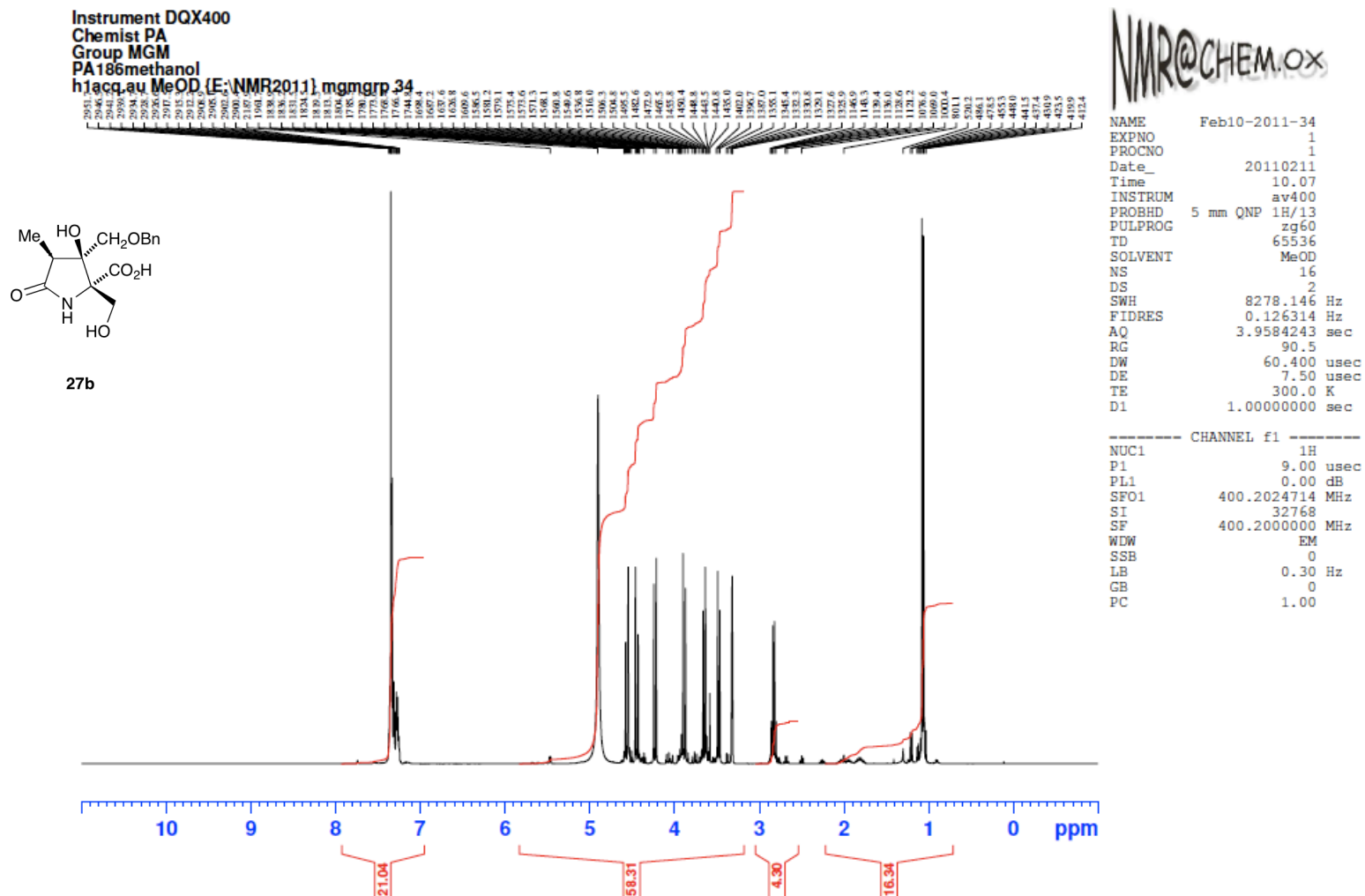
NMR@CHEM.OX



NAME Nov23-2010-26
EXPNO 4
PROCNO 1
Date_ 20101124
Time 9.25
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT Acetone
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

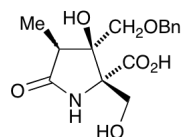
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303300 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

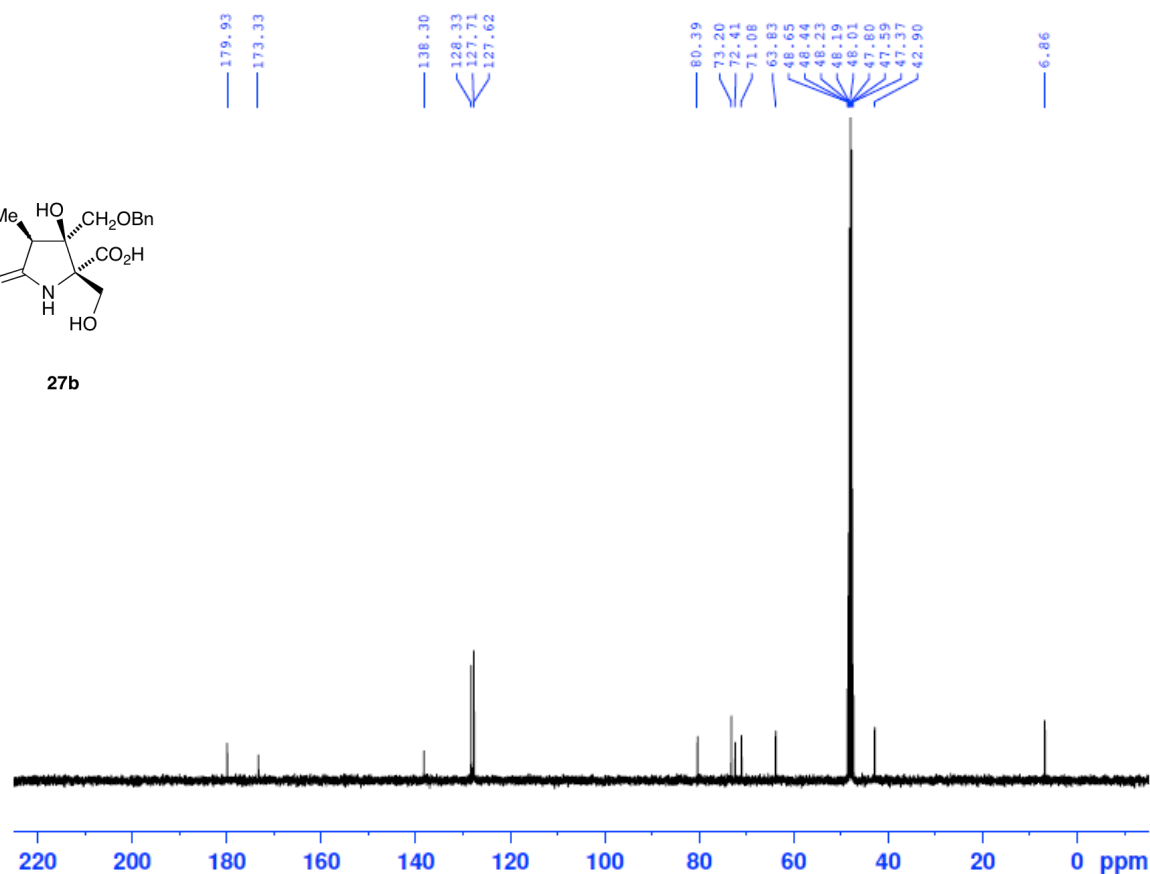


Instrument DQX400
Chemist PA
Group MGM
PA186methanol
c13acq.au MeOD {E:\NMR2011} mgmgrp 34

NMR@CHEM.OX



27b

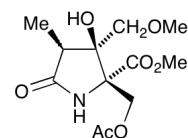


NAME Feb10-2011-34
EXPNO 2
PROCNO 1
Date_ 20110211
Time 10.15
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT MeOD
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

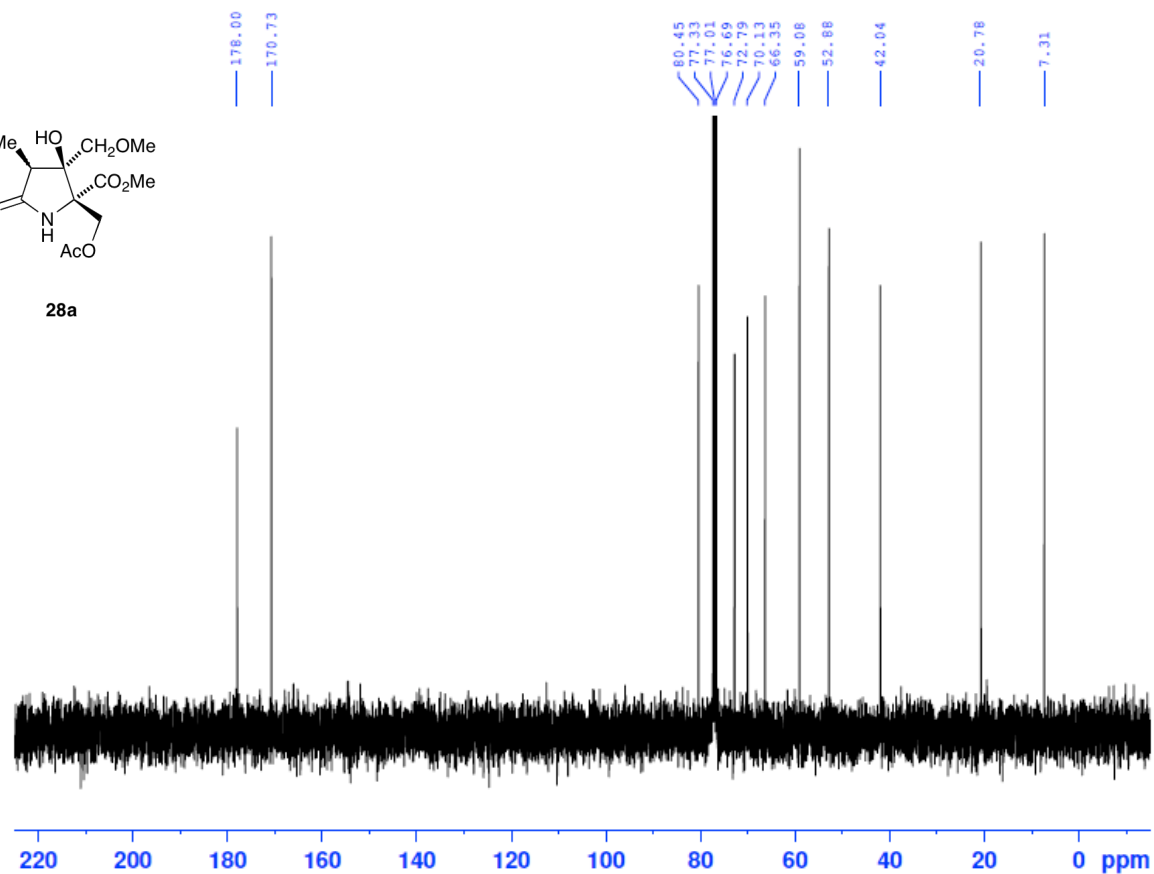
----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303300 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PA
Group MGM
PA192
c13acq.au CDCl₃ {E1:NMR2011} mgmgrp 58



28a



NMR@CHEM.OX

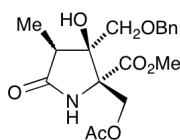
NAME Feb16-2011-58
EXPNO 2
PROCNO 1
Date_ 20110217
Time_ 9.37
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl₃
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

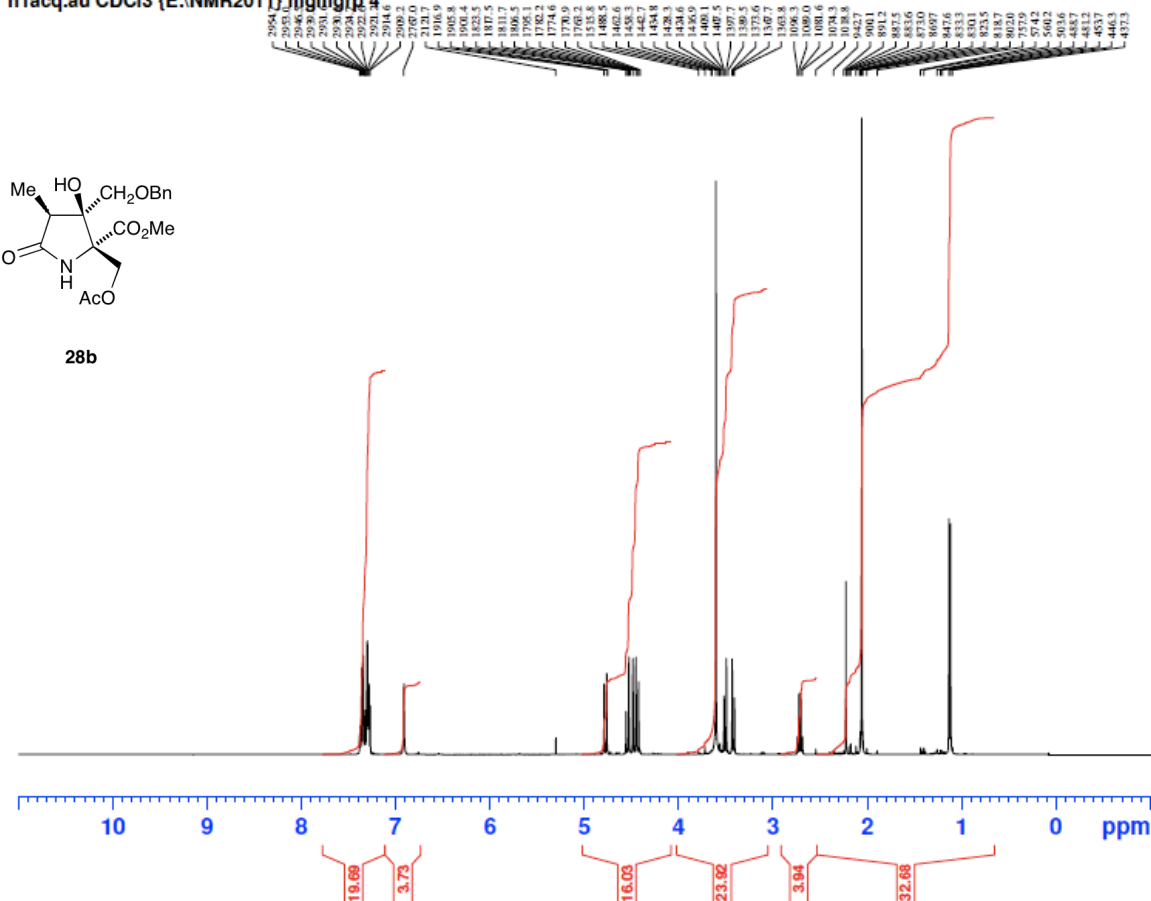
----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

Instrument DQX400
Chemist PA
Group MGM
PA197crude
h1acq.au CDCl3 (E:\NMR2011)\mgmgrp 4

NMR@CHEM.OX

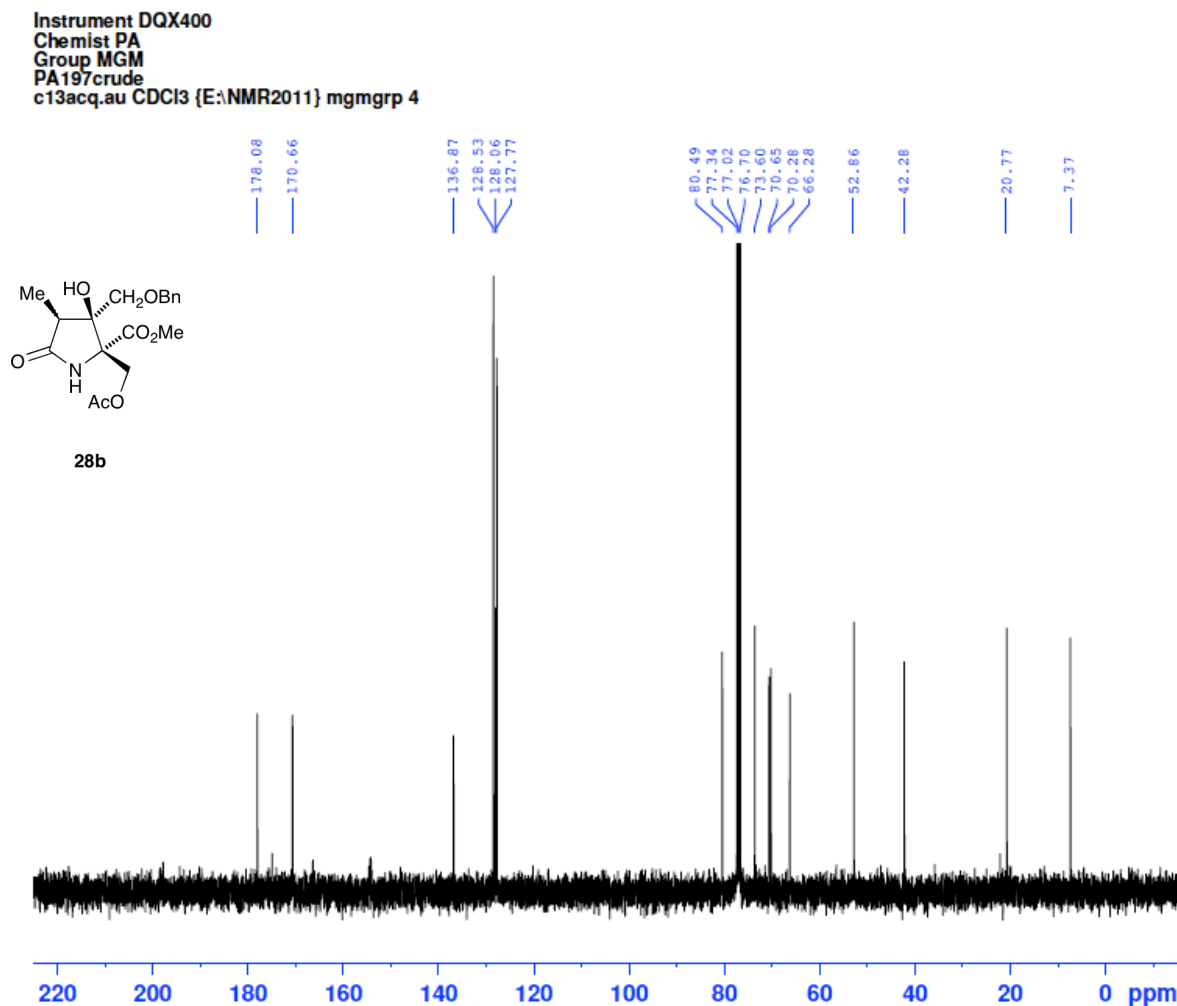


28b



NAME Feb22-2011-4
EXPNO 1
PROCNO 1
Date_ 20110222
Time 18.14
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg60
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8278.146 Hz
FIDRES 0.126314 Hz
AQ 3.9584243 sec
RG 90.5
DW 60.400 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec

----- CHANNEL f1 -----
NUC1 1H
P1 9.00 usec
PL1 0.00 dB
SFO1 400.2024714 MHz
SI 32768
SF 400.2000028 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



NMR@CHEM.OX

NAME Feb22-2011-4
EXPNO 2
PROCNO 1
Date_ 20110222
Time_ 18.22
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 256
DS 4
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 32768
DW 19.100 usec
DE 7.50 usec
TE 300.0 K
D1 1.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 9.50 usec
PL1 0.00 dB
SFO1 100.6403931 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 19.00 dB
PL13 25.00 dB
SFO2 400.2016008 MHz
SI 32768
SF 100.6303718 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40