

## Supplementary material

# Diastereoselective Synthesis of ( $\pm$ ) 1',4'-Dimethyluridine

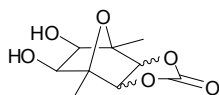
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1705, Place Eugène Bataillon, 34095 Montpellier Cedex 5, France.

## $^1\text{H}$ and $^{13}\text{C}$ NMR Spectral Data



Compound 4



Major isomer

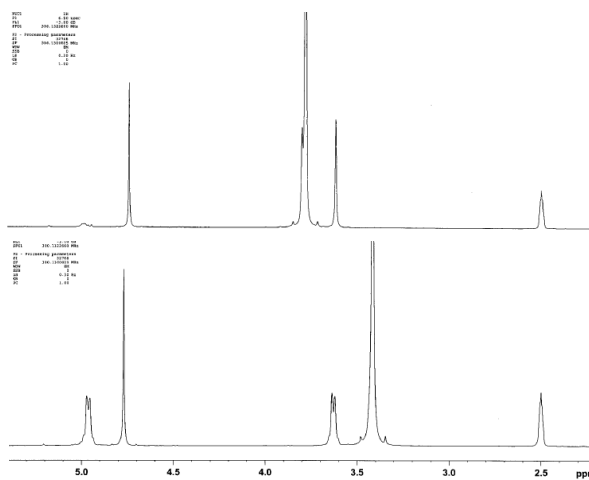
```

Current Data Parameters
NAME: 41-qp-05072009
EXPNO: 11
PROCNO: 1

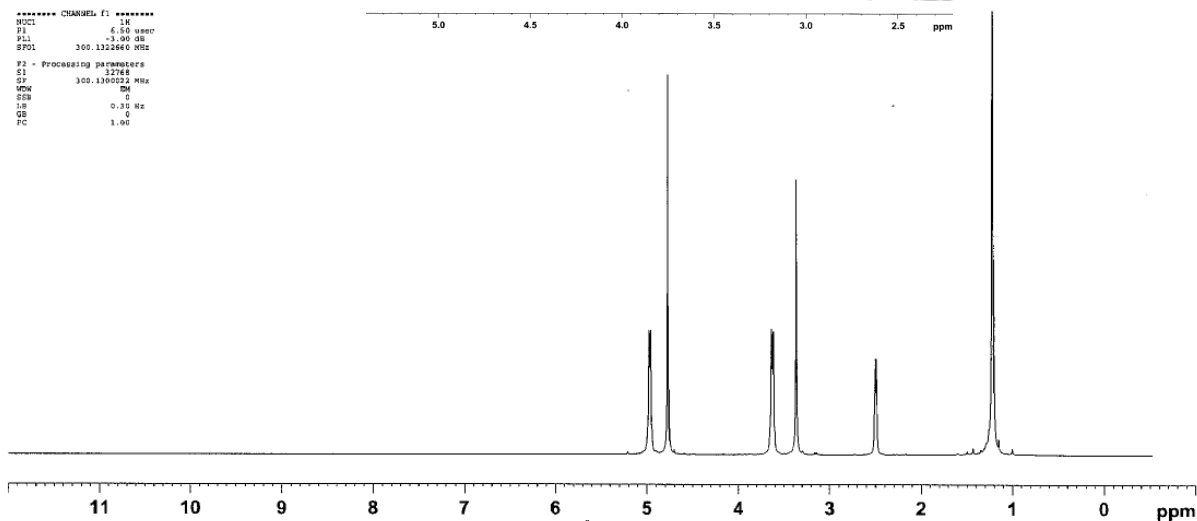
F1 - Acquisition Parameters
Date_ 20090907
Time: 22:49
INSTRUM: spect
PROBHD: 5 mm QNP 1H/13
PULPROG: zgpg30
TD: 65536
SOLVENT: DMSO
NS: 16
DS: 2
SWH: 4844.561 Hz
FIDRES: 0.247856 Hz
AQ: 3.3817277 sec
RG: 256
DQ: 103.200 usec
DE: 8.90 usec
TE: 300.2 K
SI: 1.0000000 sec

***** CHANNEL f1 *****
NUC1: 13C
P1: 6.50 usec
PL1: -3.00 dB
SFO1: 300.1322660 MHz

F2 - Processing parameters
SI: 32768
SF: 300.1300222 MHz
WDW: EM
SSB: 0
LB: 0.10 Hz
GB: 0
PC: 1.00
    
```



(with D<sub>2</sub>O)



```

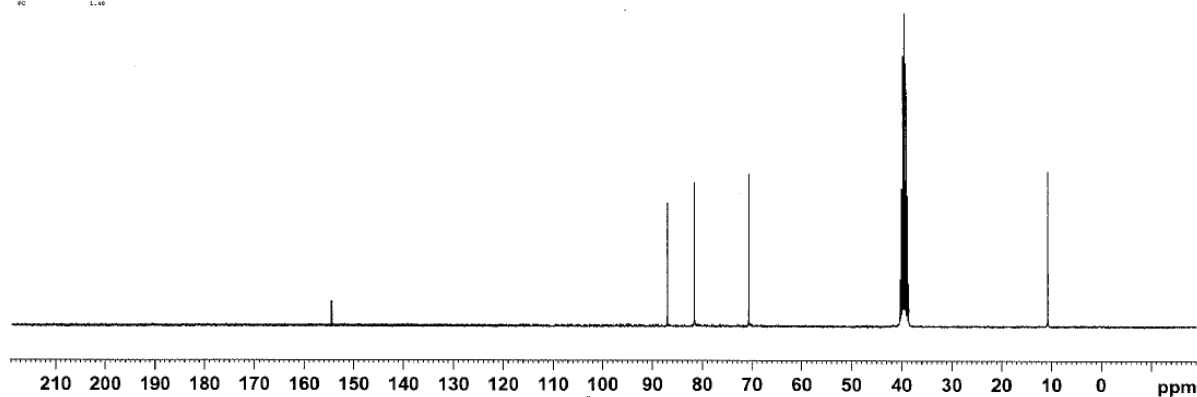
Current Data Parameters
NAME: 41-qp-05072009
EXPNO: 11
PROCNO: 1

F2 - Acquisition Parameters
Date_ 20090907
Time: 22:49
INSTRUM: spect
PROBHD: 5 mm QNP 1H/13
PULPROG: zgpg30
TD: 65536
SOLVENT: DMSO
NS: 16
DS: 2
SWH: 12946.412 Hz
FIDRES: 0.277649 Hz
AQ: 1.122834 sec
RG: 256
DQ: 103.200 usec
DE: 8.90 usec
TE: 300.2 K
SI: 1.0000000 sec
SFO1: 125.7611350 MHz
SFO2: 101.6261250 MHz

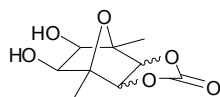
***** CHANNEL f1 *****
NUC1: 13C
P1: 6.50 usec
PL1: -3.00 dB
SFO1: 125.7611350 MHz

***** CHANNEL f2 *****
CPDPRG2: waltz16
NUC2: 1H
P2: 100.00 usec
PL2: 0.00 dB
SFO2: 500.1364260 MHz

F2 - Processing parameters
SI: 32768
SF: 125.7611350 MHz
WDW: EM
SSB: 0
LB: 1.00 Hz
GB: 0
PC: 1.00
    
```



Compound 4



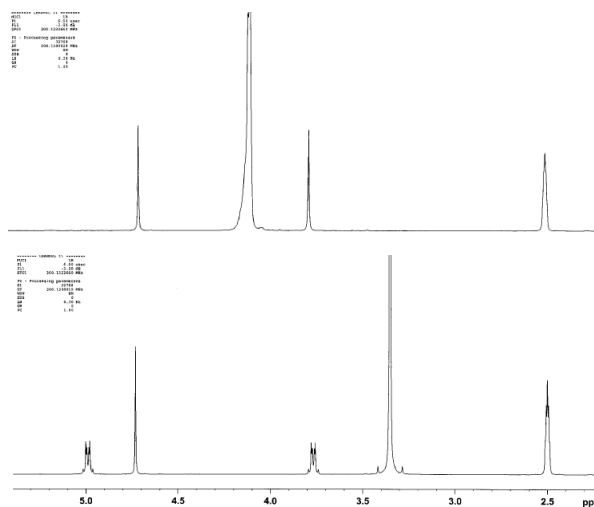
Minor isomer

```
Current Data Parameters
NAME 10-ep-0324209
EXPNO 11
PROCNO 1

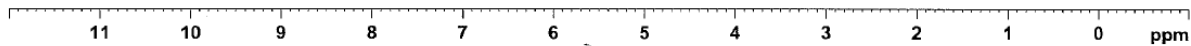
F2 - Acquisition Parameters
Date_ 20070315
Time 2.48
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT H2O
AQ 12.568
RG 320
SR 409.4
SWH 4844.961 Hz
FIDRES 0.147656 Hz
AQ 3.3817077 sec
RG 409.4
SW 103.200 kHz
WDW 8.00 usec
SSB 0
GB 0
DC 1.0000000 sec

----- CHANNEL f1 -----
NUC1 13C
P1 6.50 usec
PL1 -2.00 dB
SFO1 300.1322660 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```



(with D<sub>2</sub>O)



```
Current Data Parameters
NAME 10-ep-0324209
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20070315
Time 21.45
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 65536
SOLVENT H2O
AQ 12.568
RG 320
SR 409.4
SWH 4844.961 Hz
FIDRES 0.147656 Hz
AQ 3.3817077 sec
RG 409.4
SW 103.200 kHz
WDW 8.00 usec
SSB 0
GB 0
DC 1.0000000 sec

----- CHANNEL f1 -----
NUC1 13C
P1 6.50 usec
PL1 -2.00 dB
SFO1 300.1322660 MHz

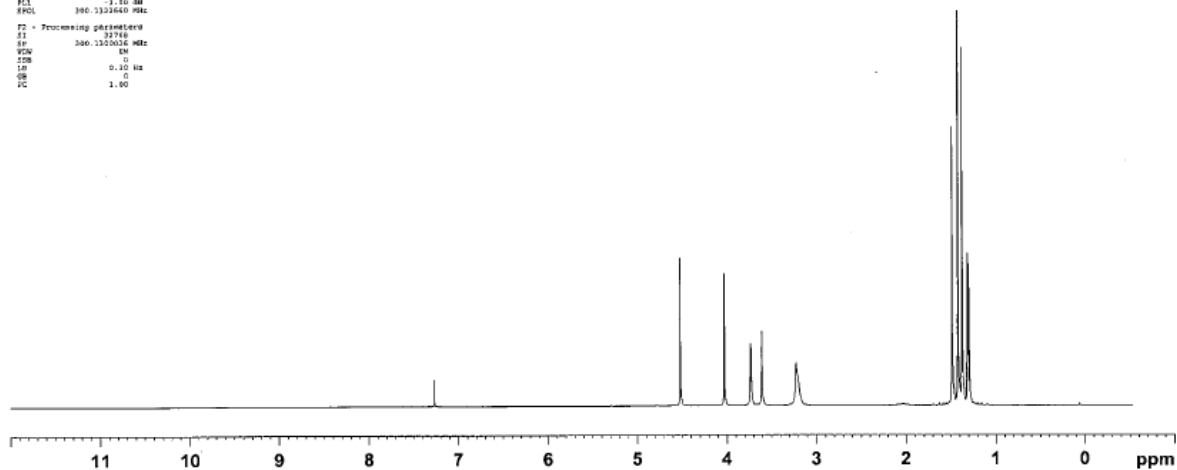
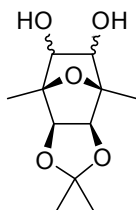
----- CHANNEL f2 -----
NUC2 1H
P2 13.00 usec
PL2 0.00 dB
SFO2 500.1360540 MHz

F2 - Processing parameters
SI 32768
SF 300.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.40
```

Compound 5 (mixture of isomers)

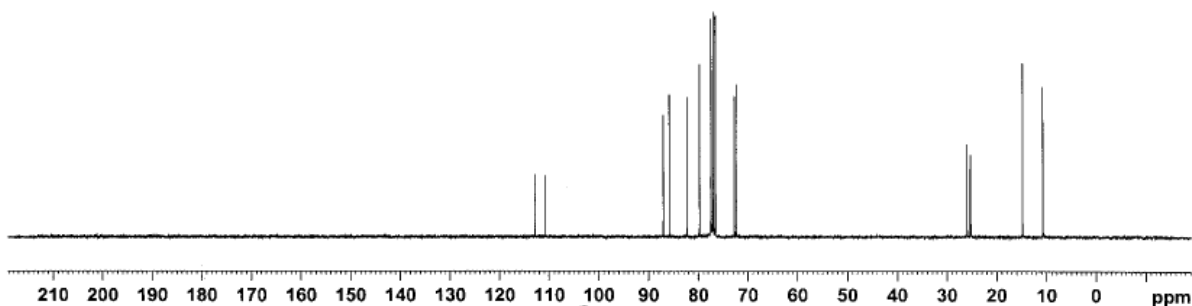
```

Current Data Parameters
NAME 49-09-03164009
EXPNO 20
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090217
Time 2:01
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
RG 327.00
SOLVENT CDCl3
NS 2
DS 2
SWH 4844.801 Hz
FIDRES 0.147856 Hz
AQ 1.2817771 sec
RG 361.9
AQ 163.263 usec
SE 8.00 usec
TE 300.2 K
SI 1.0260700 sec
===== CHANNEL f1 =====
NUC1 13C
P1 4.30 usec
PL1 -2.50 dB
RFCL 360.333660 MHz
F2 - Processing parameters
SI 32768
SF 360.335016 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
    
```

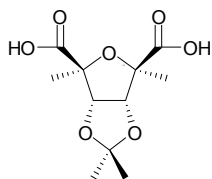


```

Current Data Parameters
NAME 49-09-03164009
EXPNO 20
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090217
Time 2:01
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
RG 327.00
SOLVENT CDCl3
NS 2
DS 2
SWH 4844.801 Hz
FIDRES 0.147856 Hz
AQ 1.2817771 sec
RG 361.9
AQ 163.263 usec
SE 8.00 usec
TE 300.2 K
SI 1.0260700 sec
===== CHANNEL f1 =====
NUC1 13C
P1 4.30 usec
PL1 -2.50 dB
RFCL 360.333660 MHz
F2 - Processing parameters
SI 32768
SF 360.335016 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
    
```



Compound 6



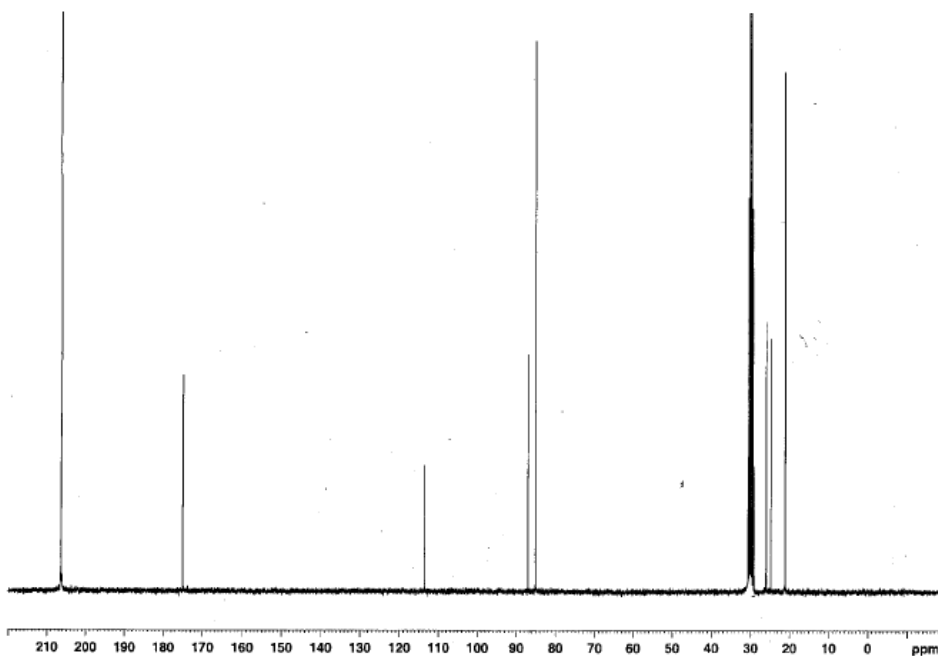
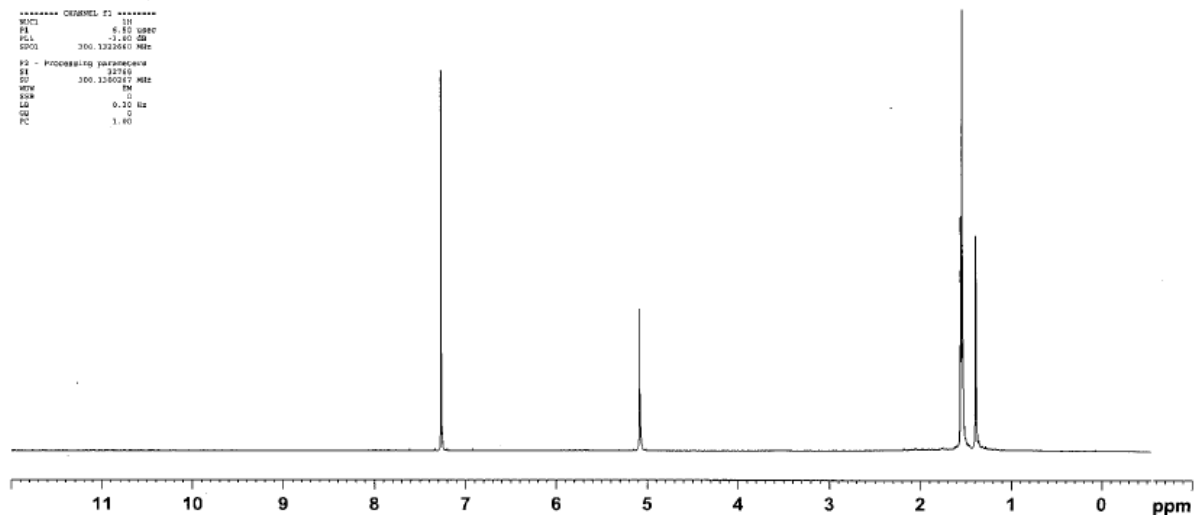
```

Current Data Parameters
NAME 32-cp-01201015
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20080210
Time 12.10
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 32768
SOLVENT ACETONE
NS 2
DS 2
SWH 4844.814 Hz
FIDRES 0.147050 Hz
AQ 0.0417070 sec
RG 1280.0
DM 103.090 usec
DE 6.80 usec
TE 300.2 K
DQ 1.0000000 sec

***** CHANNEL F1 *****
NUC1 13C
P1 6.80 usec
PL1 -1.80 dB
SFO1 100.1252660 MHz

F2 - Processing parameters
SI 32768
SF 100.1252660 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.80
    
```



```

Current Data Parameters
NAME 32-cp-01201015
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20080210
Time 4.22
INSTRUM spect
PROBHD 5 mm QNP 1H/1
PULPROG zgpg30
TD 65536
SOLVENT ACETONE
NS 4
DS 4
SWH 17985.611 MHz
FIDRES 0.274430 Hz
AQ 1.8219508 sec
RG 2896.0
DM 27.890 usec
DE 6.90 usec
TE 300.2 K
DQ 1.0000000 sec
SFO1 100.6250000 MHz
SFO2 75.4752853 MHz

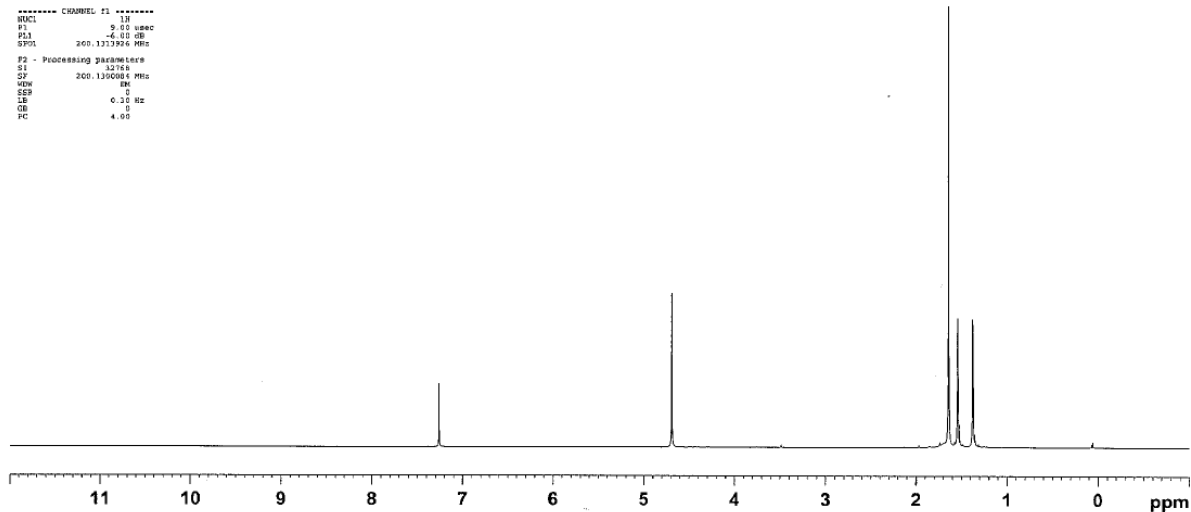
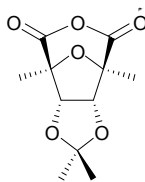
***** CHANNEL F1 *****
NUC1 13C
P1 6.70 usec
PL1 -2.00 dB
SFO1 100.6250000 MHz

***** CHANNEL F2 *****
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 0.00 dB
PL12 22.00 dB
PL13 22.00 dB
SFO2 500.1311000 MHz

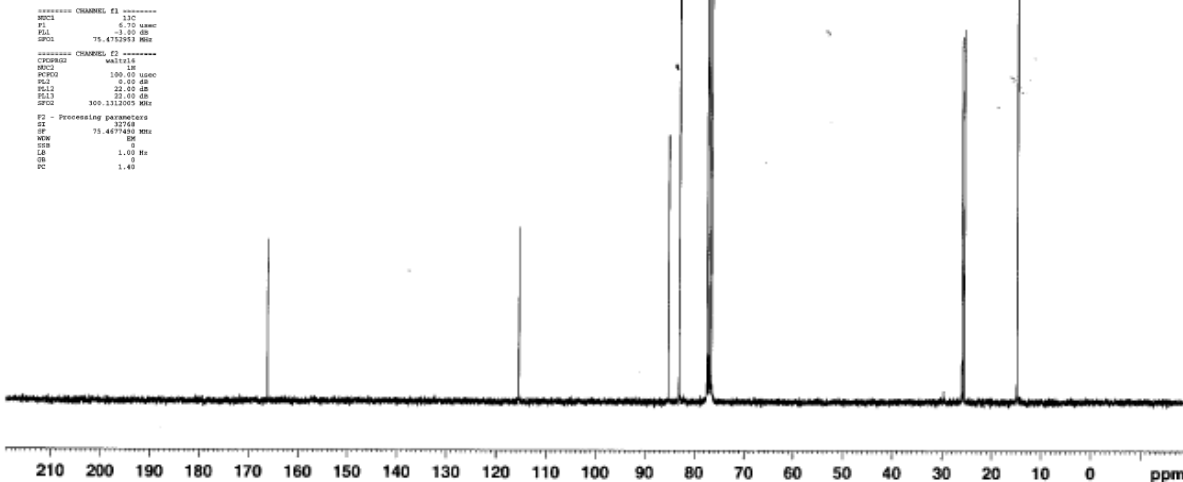
F2 - Processing parameters
SI 65536
SF 100.6250000 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
    
```

### Compound 7

```
Current Data Parameters
NAME 11-cp-05042009
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090504
Time 17:55
INSTRUM spect
PROBHD 5 mm QNP 1H/29
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 2
DS 2
SWH 3221.649 Hz
FIDRES 0.000589 Hz
AQ 10.1712170 sec
RG 312.2
AQ 155.200 usec
DE 16.00 usec
TE 296.2 K
SI 1.0000000 sec
TEU 1
```



```
Current Data Parameters
NAME 08-cp-03112008
EXPNO 10
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080311
Time 21:14
INSTRUM spect
PROBHD 5 mm QNP 1H/29
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 4
DS 4
SWH 17985.413 Hz
FIDRES 0.274430 Hz
AQ 1.6110100 sec
RG 2854.3
AQ 77.100 usec
DE 8.00 usec
TE 300.2 K
SI 1.0000000 sec
d11 0.0300000 sec
d12 0.0000000 sec
```



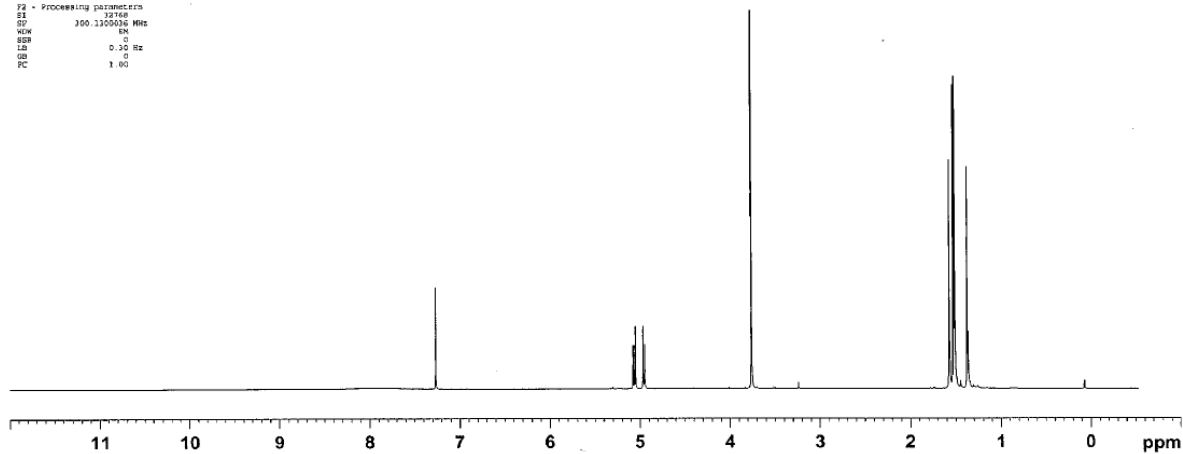
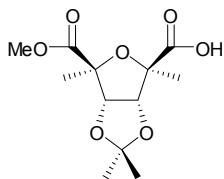
### Compound 8

```
Current Data Parameters
NAME 42-cp-05102008
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20080311
Time 8:42
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 4944.961 Hz
FIDRES 0.149506 Hz
AQ 3.3817077 sec
RG 300
SM 103.200 uSBC
SC 0.00 uSBC
TE 300.2 K
SI 1.00000000 sec

***** CHANNEL f1 *****
NUC1 13C
P1 6.70 uSBC
PL1 -3.90 dB
SFO1 300.3222660 MHz

F2 - Processing parameters
SI 32768
SF 300.320036 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
```



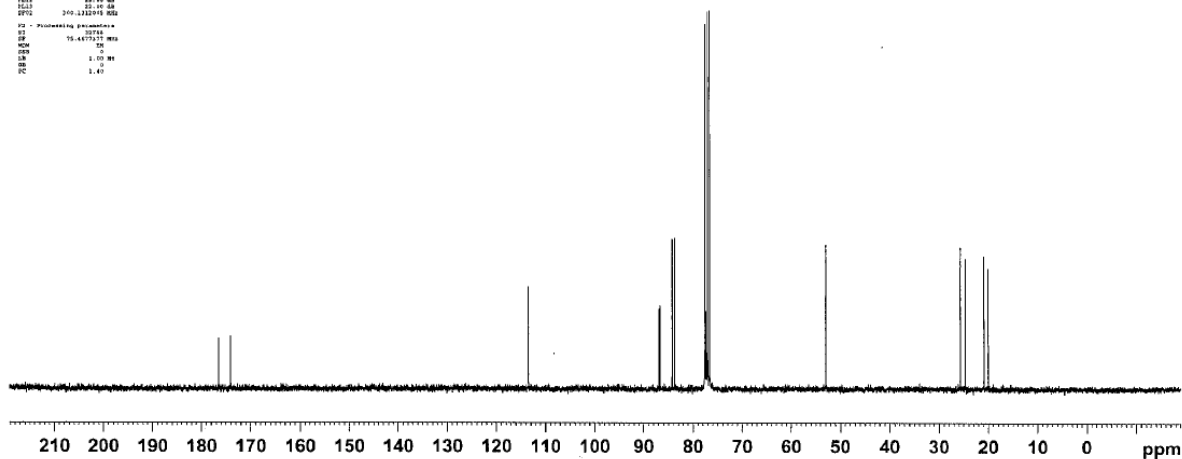
```
Current Data Parameters
NAME 42-cp-05102008
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20080311
Time 8:42
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 12744.11 Hz
FIDRES 1.274519 Hz
AQ 3.3817077 sec
RG 300
SM 27.440 uSBC
SC 0.00 uSBC
TE 300.2 K
SI 1.00000000 sec
SFO1 101.6251250 MHz

***** CHANNEL f1 *****
NUC1 13C
P1 6.70 uSBC
PL1 -3.90 dB
SFO1 101.6251250 MHz

***** CHANNEL f2 *****
PULPROG waltz16
NUC2 13C
PCPD2 100.00 uSBC
PL12 0.00 dB
PL22 0.00 dB
SFO2 125.7613500 MHz
SFO3 300.3222660 MHz

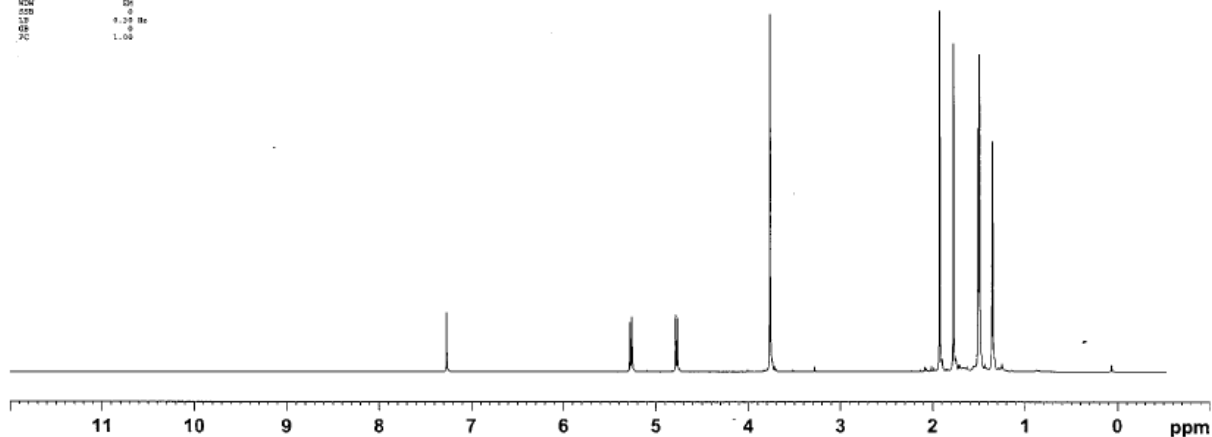
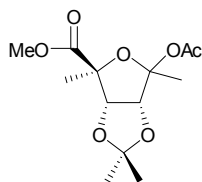
F2 - Processing parameters
SI 32768
SF 125.761350 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.00
```



Compound 9

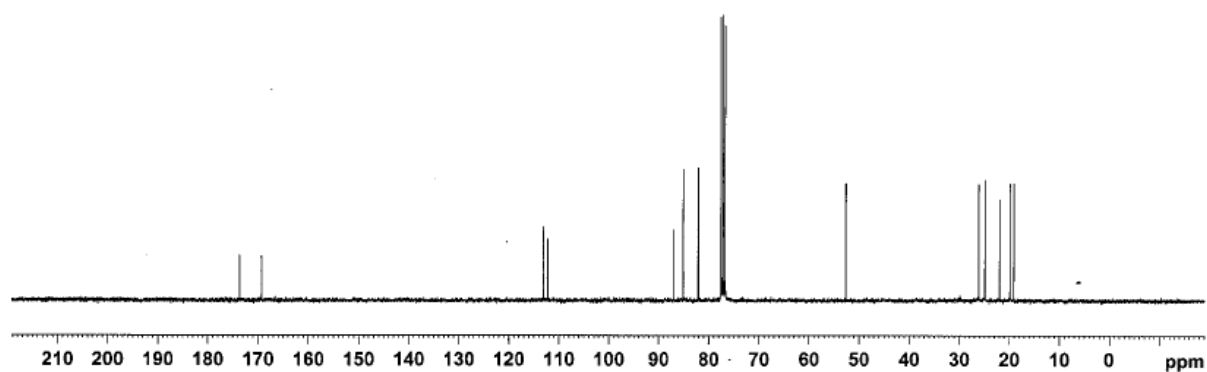
```

Current Data Parameters
NAME: 14-cp-12012806
EXPNO: 1
PROCNO: 1
F2 - Acquisition Parameters
Date_ 20081201
Time 10.35
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 4004.841 MHz
FIDRES 0.147856 MHz
AQ 0.2617870 sec
RG 256
RW 103.2400 MHz
DE 8.00 MHz
TE 300.2 K
D1 1.00000000 sec
===== CHANNEL f1 =====
NUC1 13C
P1 18.00
PL1 0.00 dB
SFO1 101.625361 MHz
===== CHANNEL f2 =====
NUC2 1H
P2 13.00
PL2 19.00 dB
SFO2 500.1362601 MHz
F2 - Processing parameters
SI 32768
SF 500.1362601 MHz
WDW EM
SSB 0
LB 9.20 Hz
GB 0
PC 1.00
    
```



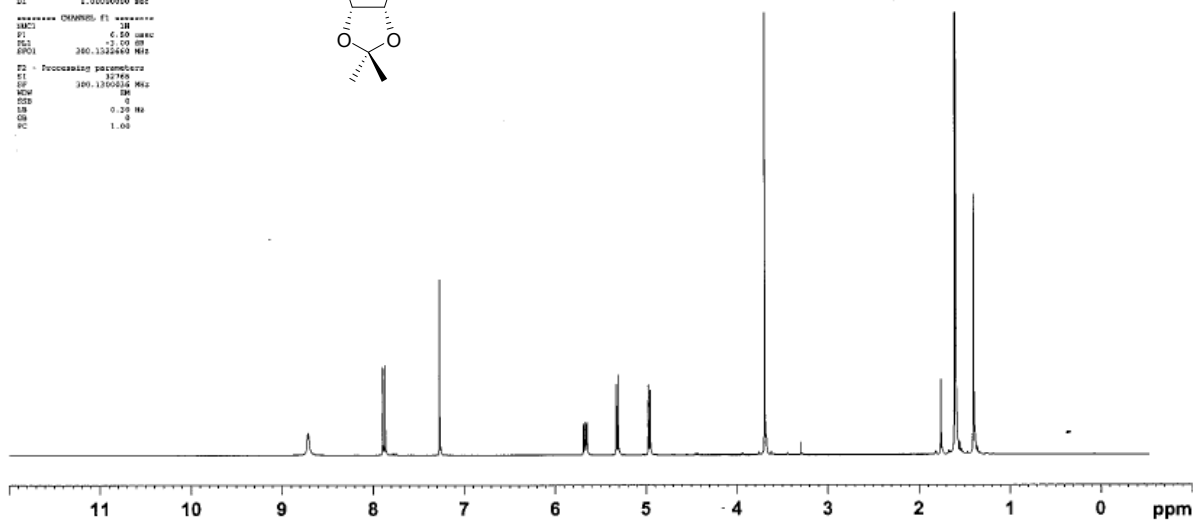
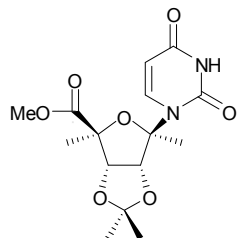
```

Current Data Parameters
NAME: 14-cp-12012810
EXPNO: 1
PROCNO: 1
F2 - Acquisition Parameters
Date_ 20081201
Time 11.44
INSTRUM spect
PROBHD 5 mm QNP 1H/13
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 16
DS 2
SWH 4004.841 MHz
FIDRES 0.147856 MHz
AQ 0.2617870 sec
RG 256
RW 103.2400 MHz
DE 8.00 MHz
TE 300.2 K
D1 1.00000000 sec
===== CHANNEL f1 =====
NUC1 13C
P1 18.00
PL1 0.00 dB
SFO1 101.625361 MHz
===== CHANNEL f2 =====
NUC2 1H
P2 13.00
PL2 19.00 dB
SFO2 500.1362601 MHz
F2 - Processing parameters
SI 32768
SF 500.1362601 MHz
WDW EM
SSB 0
LB 9.20 Hz
GB 0
PC 1.00
    
```

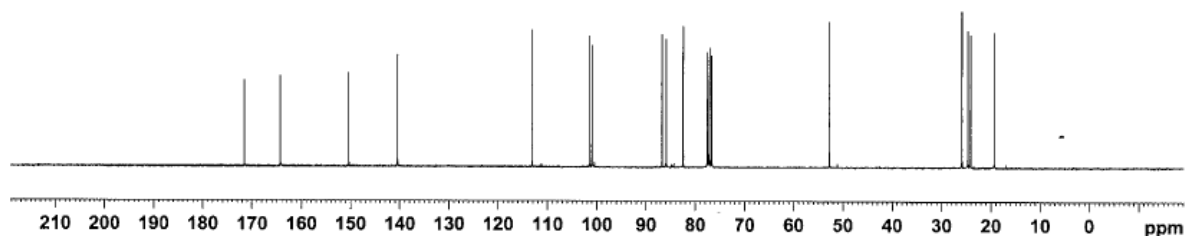


### Compound 10

```
===== CHANNEL F1 =====  
NAME 45-01010101  
PROCNO 1  
F2 - Acquisition Parameters  
DATE_ 20090218  
TIME 11.18  
INSTRUM spect  
PROBHD 5 mm CNP 1H/13  
PULPROG zgpg30  
TD 32768  
SOLVENT CDCl3  
NS 16  
DS 2  
SWH 4044.861 Hz  
FIDRES 0.147656 Hz  
AQ 1.1817077 sec  
RG 456.1  
CFW 100.2500 MHz  
SE 8.50 MHz  
TE 300.0 K  
D1 1.01000000 sec  
===== CHANNEL F2 =====  
NAME 13  
F1 C 130 MHz  
P1 2.00 sec  
SFO1 100.625440 MHz  
F2 - Processing parameters  
SI 32768  
SF 100.625440 MHz  
WDW EM  
SSB 0  
LB 0.20 Hz  
GB 0  
PC 1.00
```



```
===== CHANNEL F1 =====  
NAME 45-01010101  
PROCNO 1  
F2 - Acquisition Parameters  
DATE_ 20090218  
TIME 11.18  
INSTRUM spect  
PROBHD 5 mm CNP 1H/13  
PULPROG zgpg30  
TD 32768  
SOLVENT CDCl3  
NS 16  
DS 2  
SWH 4044.861 Hz  
FIDRES 0.147656 Hz  
AQ 1.1817077 sec  
RG 456.1  
CFW 100.2500 MHz  
SE 8.50 MHz  
TE 300.0 K  
D1 1.01000000 sec  
===== CHANNEL F2 =====  
NAME 13  
F1 C 130 MHz  
P1 2.00 sec  
SFO1 100.625440 MHz  
F2 - Processing parameters  
SI 32768  
SF 100.625440 MHz  
WDW EM  
SSB 0  
LB 0.20 Hz  
GB 0  
PC 1.00
```



Compound 11

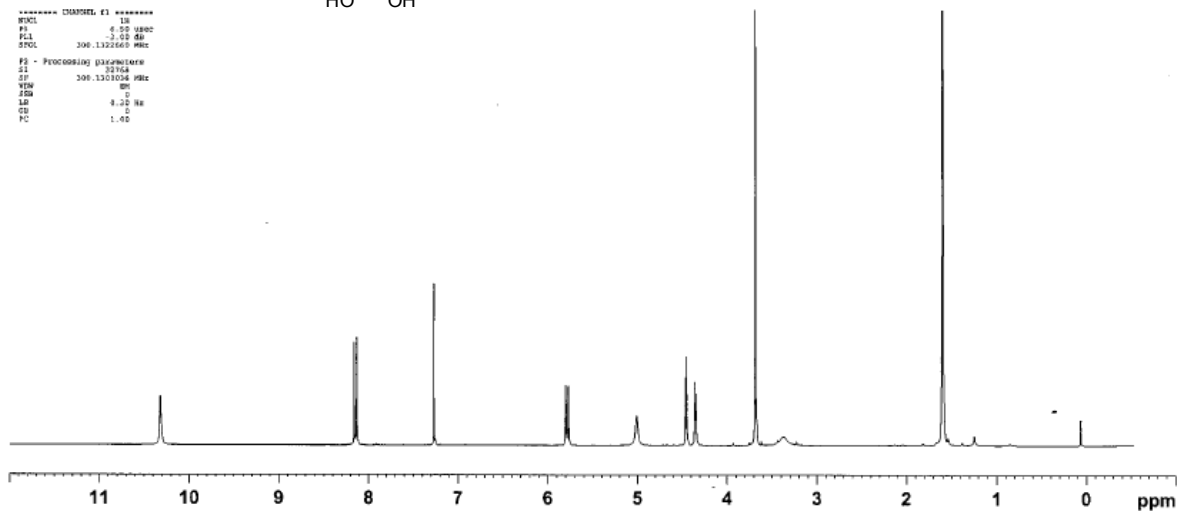
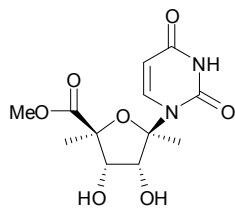
```

Current Data Parameters
NAME  11-11-11111111
EXPNO  1
PROCNO  1

F2 - Acquisition Parameters
Date_  20090311
Time  11.25
INSTRUM  spect
PROBHD  5 mm QNP 1H/13
PULPROG  zgpg30
TD  65536
SOLVENT  CDCl3
NS  16
DS  2
SWH  4004.961 Hz
FIDRES  0.147866 Hz
AQ  3.2817077 sec
RG  256
AQ  103.208 usec
DE  1.00 usec
TE  300.2 K
SI  1.50000000 sec

===== CHANNEL f1 =====
NUC1  13
P1  4.100 usec
PL1  -2.00 dB
SFO1  100.628360 MHz

F2 - Processing parameters
SI  32768
SF  100.628360 MHz
WDW  EM
SSB  0
LB  0.30 Hz
GB  0
PC  1.00
    
```



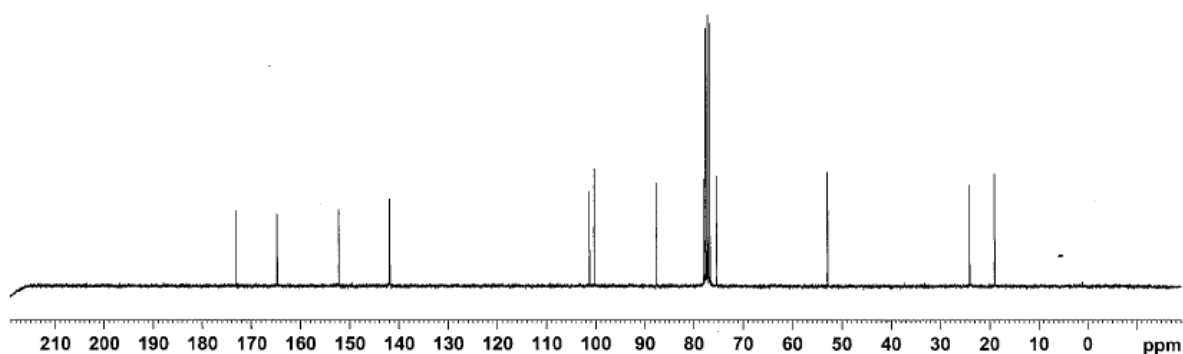
```

Current Data Parameters
NAME  11-11-11111111
EXPNO  1
PROCNO  1

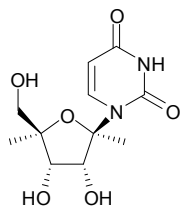
F1 - Acquisition Parameters
Date_  20090311
Time  11.25
INSTRUM  spect
PROBHD  5 mm QNP 1H/13
PULPROG  zgpg30
TD  65536
SOLVENT  CDCl3
NS  16
DS  2
SWH  4004.961 Hz
FIDRES  0.147866 Hz
AQ  3.2817077 sec
RG  256
AQ  103.208 usec
DE  1.00 usec
TE  300.2 K
SI  1.50000000 sec

===== CHANNEL f1 =====
NUC1  13
P1  4.100 usec
PL1  -2.00 dB
SFO1  100.628360 MHz

F2 - Processing parameters
SI  32768
SF  100.628360 MHz
WDW  EM
SSB  0
LB  0.30 Hz
GB  0
PC  1.00
    
```



Compound 12



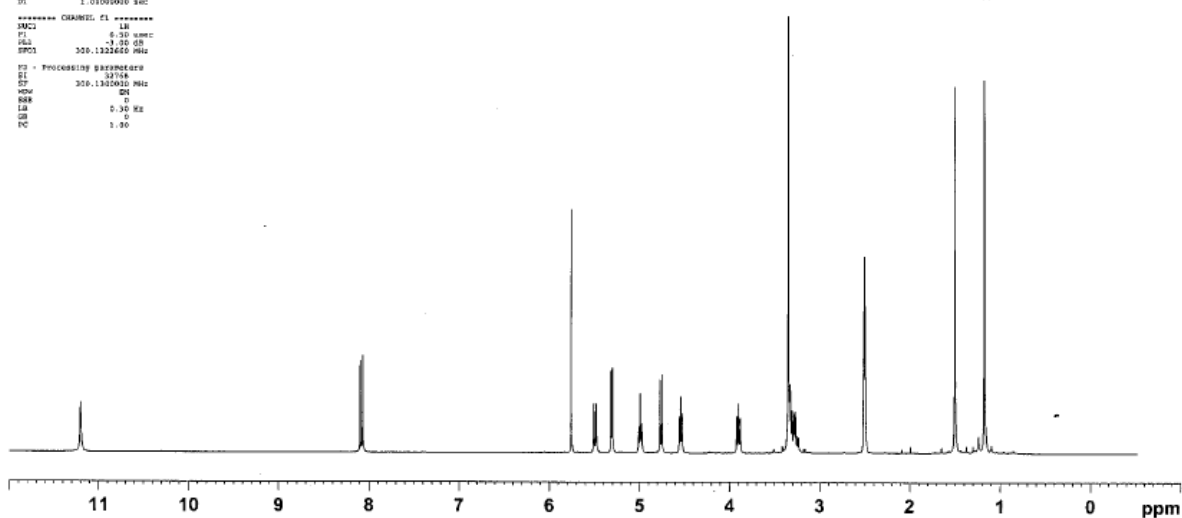
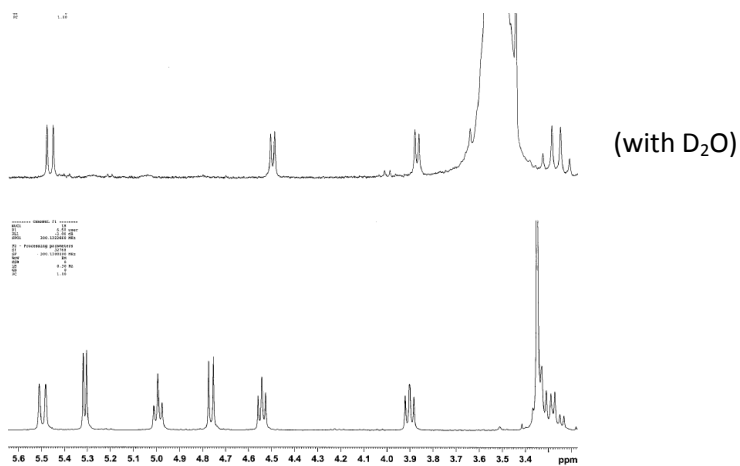
```

===== Data Parameters =====
NAME: 12-12-12-12-12-12
EXPNO: 1
PROCNO: 1

F2 - Acquisition Parameters
Date_ : 20090110
Time : 14.32
INSTRUM : spect
PROBHD : 5 mm QNP 1H/13
PULPROG : zgpg30
TD : 32768
SOLVENT : DMSO
DS : 4
AQ : 0.14
RG : 684
AQ : 0.147864 Hz
RG : 2.121707 Hz
RG : 406.4
RG : 109.230 Hz
RG : 3.061.0 Hz
RG : 1.0100000 Hz

===== CHANNEL f1 =====
NUC1 : 13
P1 : 0.30 sec
RG : 3.00 Hz
RG : 300.1320000 MHz

F2 - Processing parameters
SI : 32768
SF : 300.1320000 MHz
WDW : EM
SSB : 0
LB : 0.30 Hz
GB : 0
PC : 1.00
    
```



```

===== Data Parameters =====
NAME: 12-12-12-12-12-12
EXPNO: 1
PROCNO: 1

F2 - Acquisition Parameters
Date_ : 20090110
Time : 14.32
INSTRUM : spect
PROBHD : 5 mm QNP 1H/13
PULPROG : zgpg30
TD : 32768
SOLVENT : DMSO
DS : 4
AQ : 0.14
RG : 684
AQ : 0.147864 Hz
RG : 2.121707 Hz
RG : 406.4
RG : 109.230 Hz
RG : 3.061.0 Hz
RG : 1.0100000 Hz

===== CHANNEL f1 =====
NUC1 : 13
P1 : 0.30 sec
RG : 3.00 Hz
RG : 300.1320000 MHz

F2 - Processing parameters
SI : 32768
SF : 300.1320000 MHz
WDW : EM
SSB : 0
LB : 0.30 Hz
GB : 0
PC : 1.00
    
```

