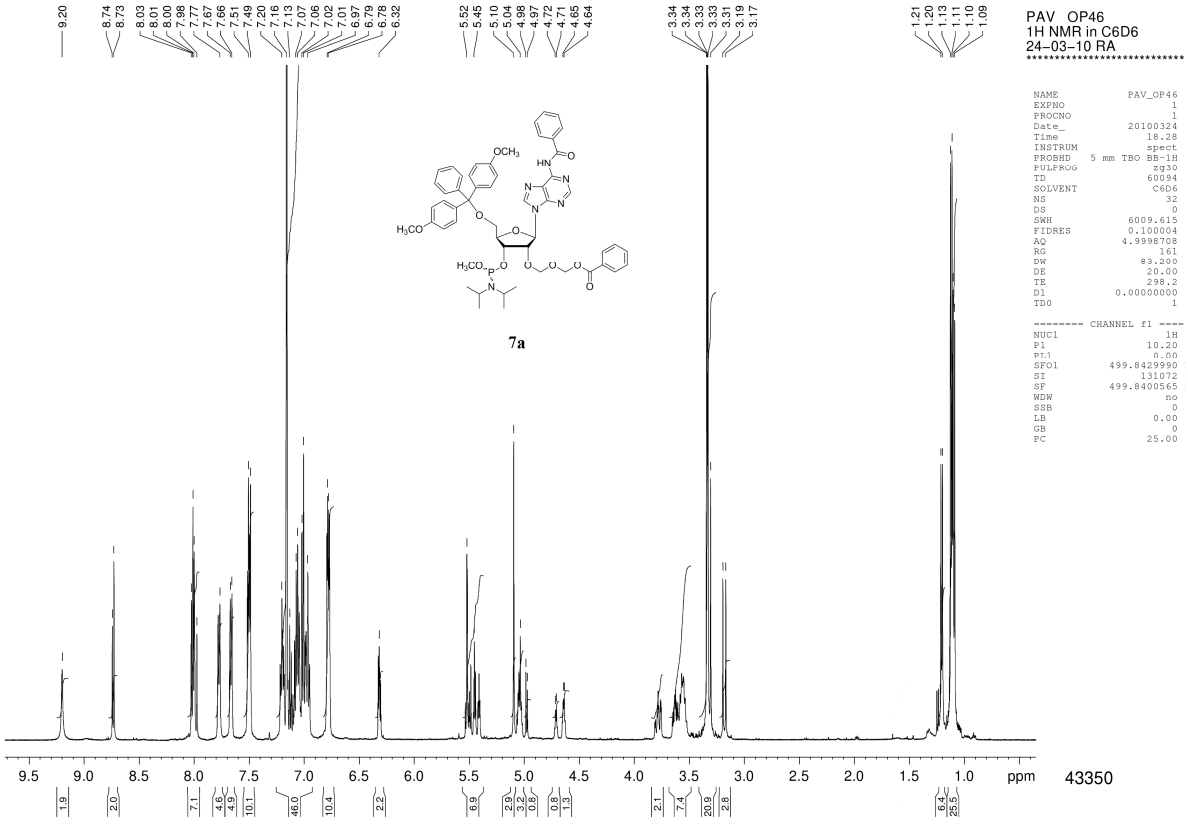

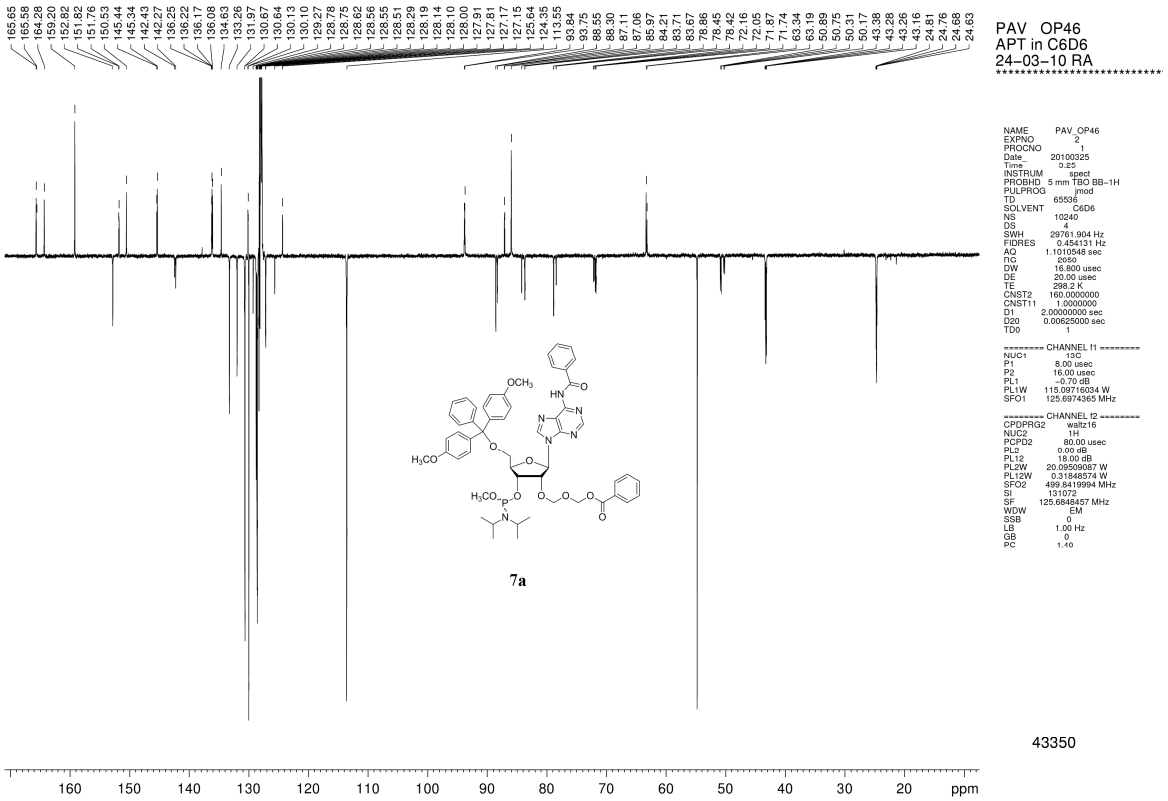

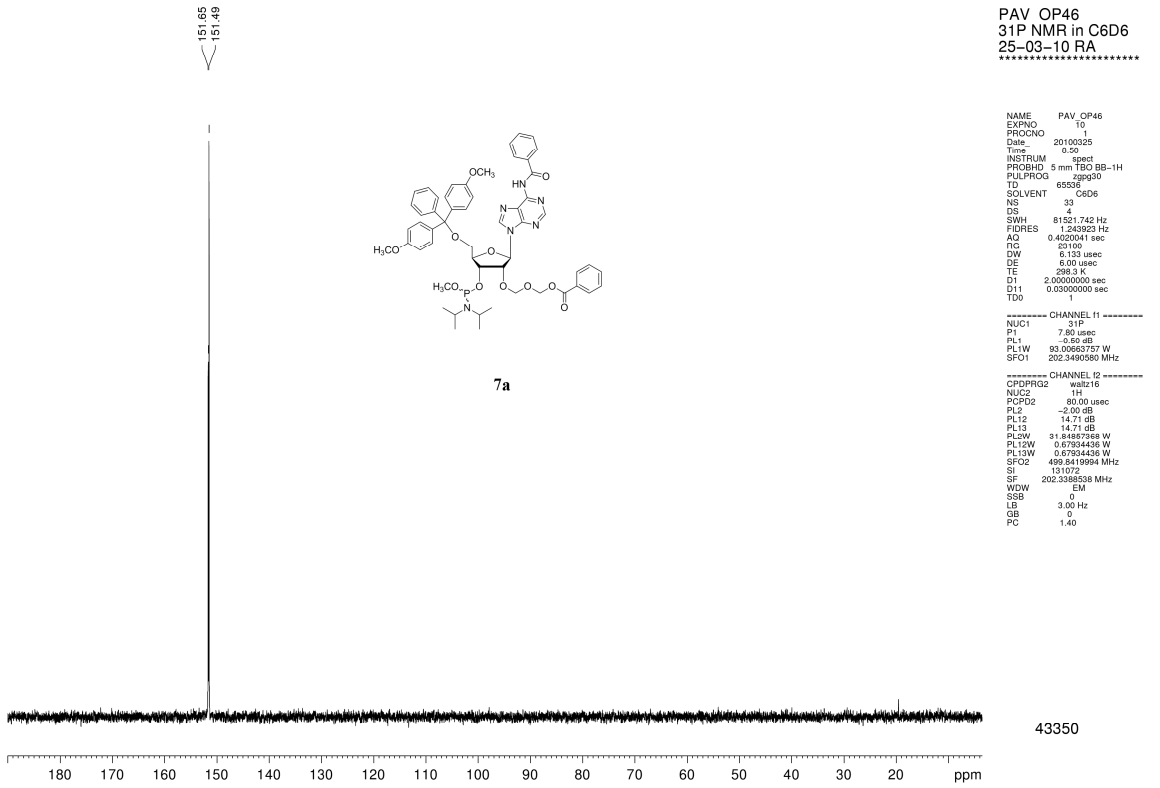

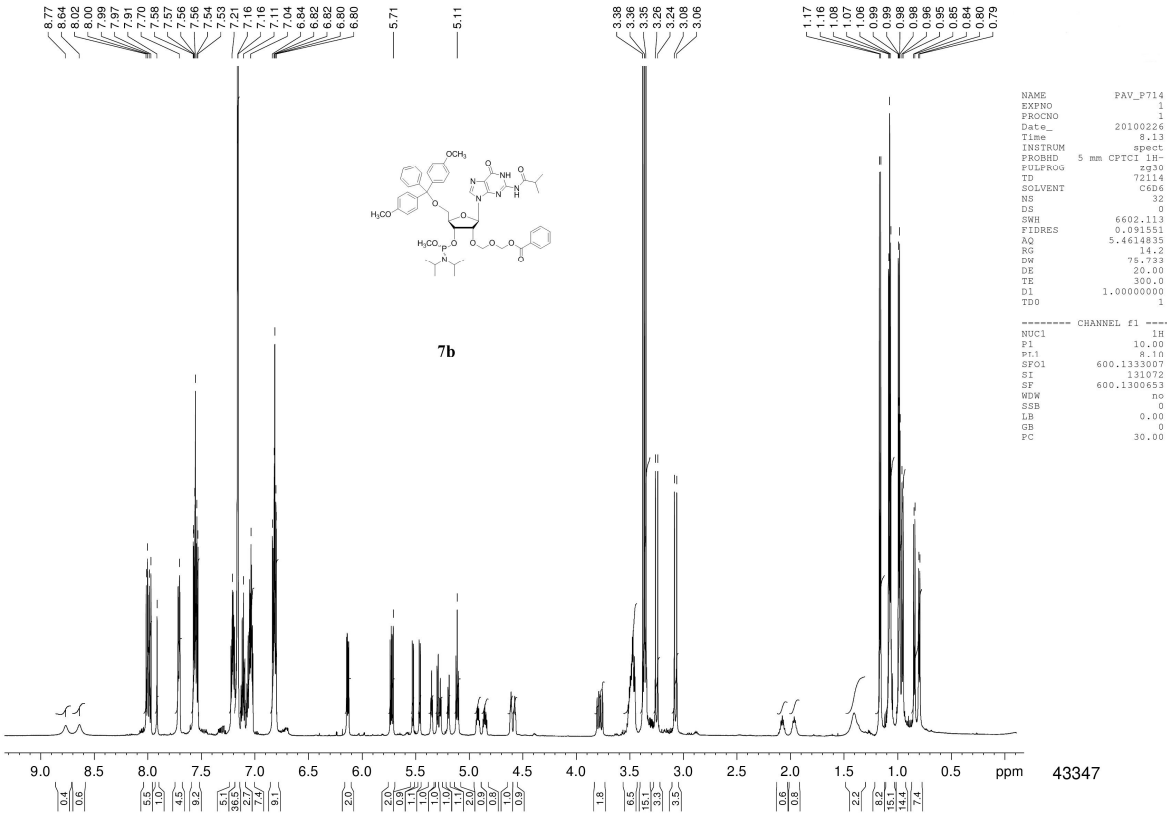

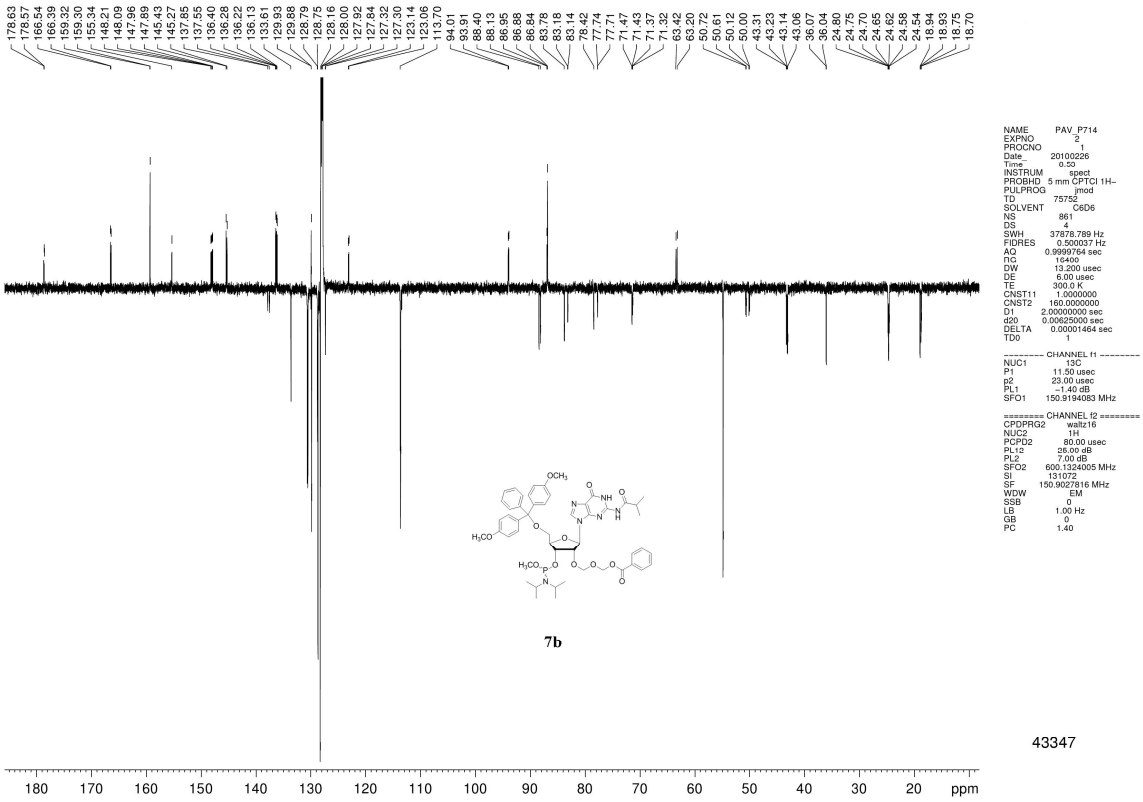

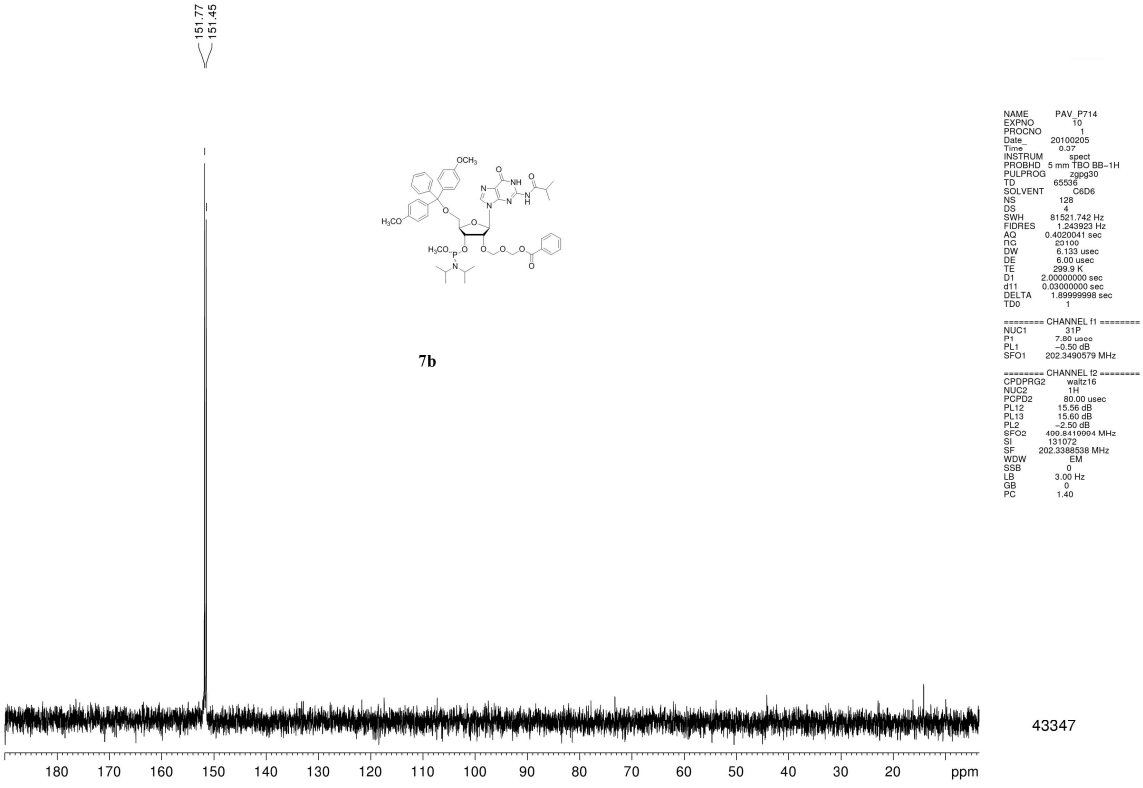

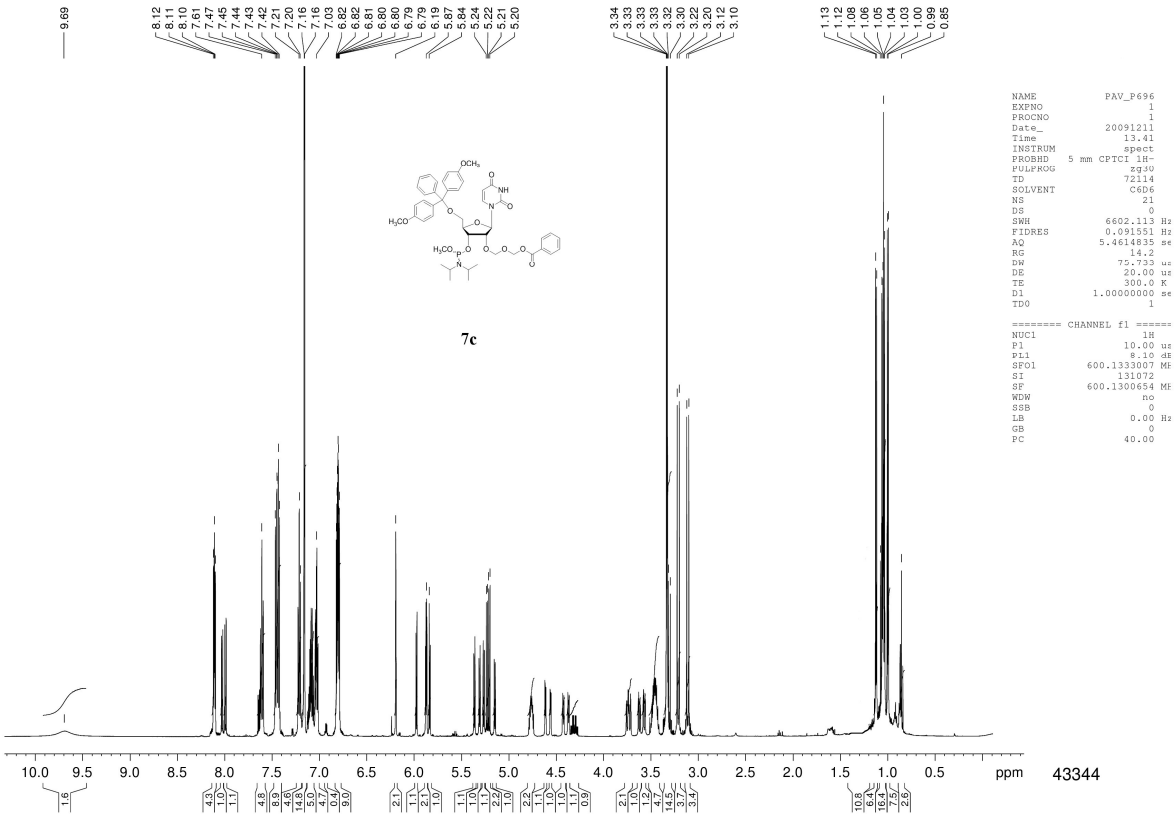

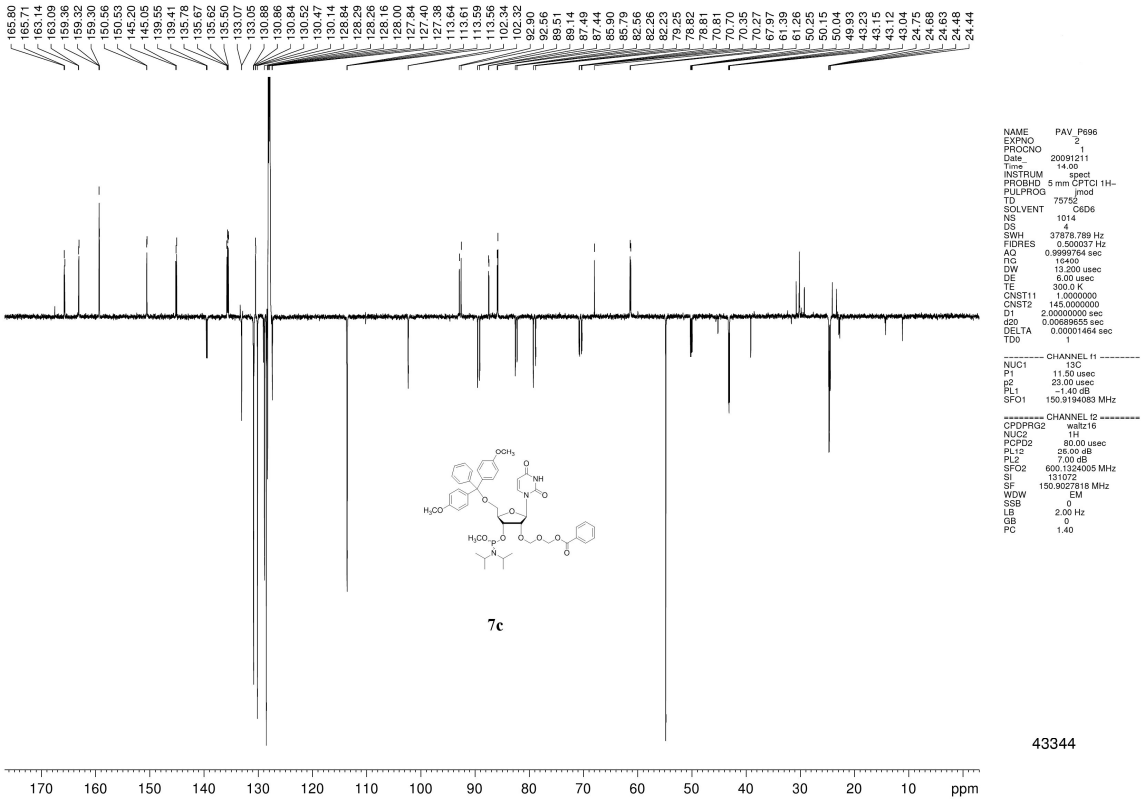

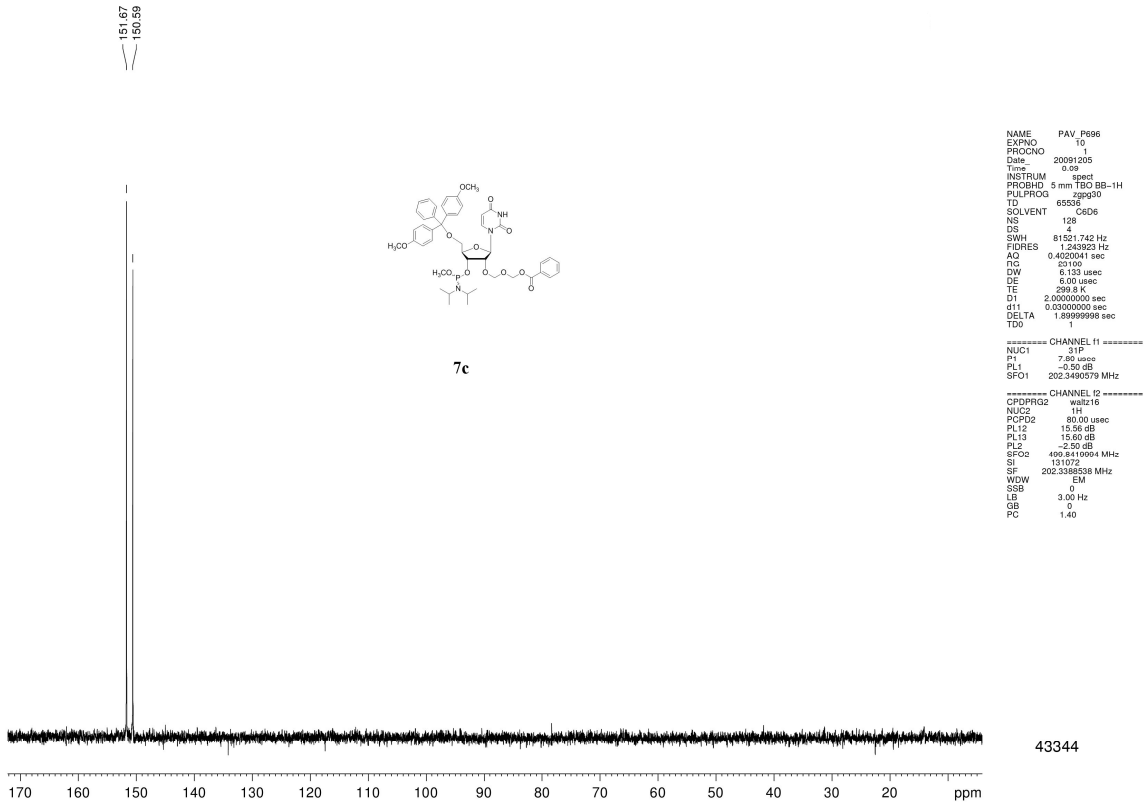

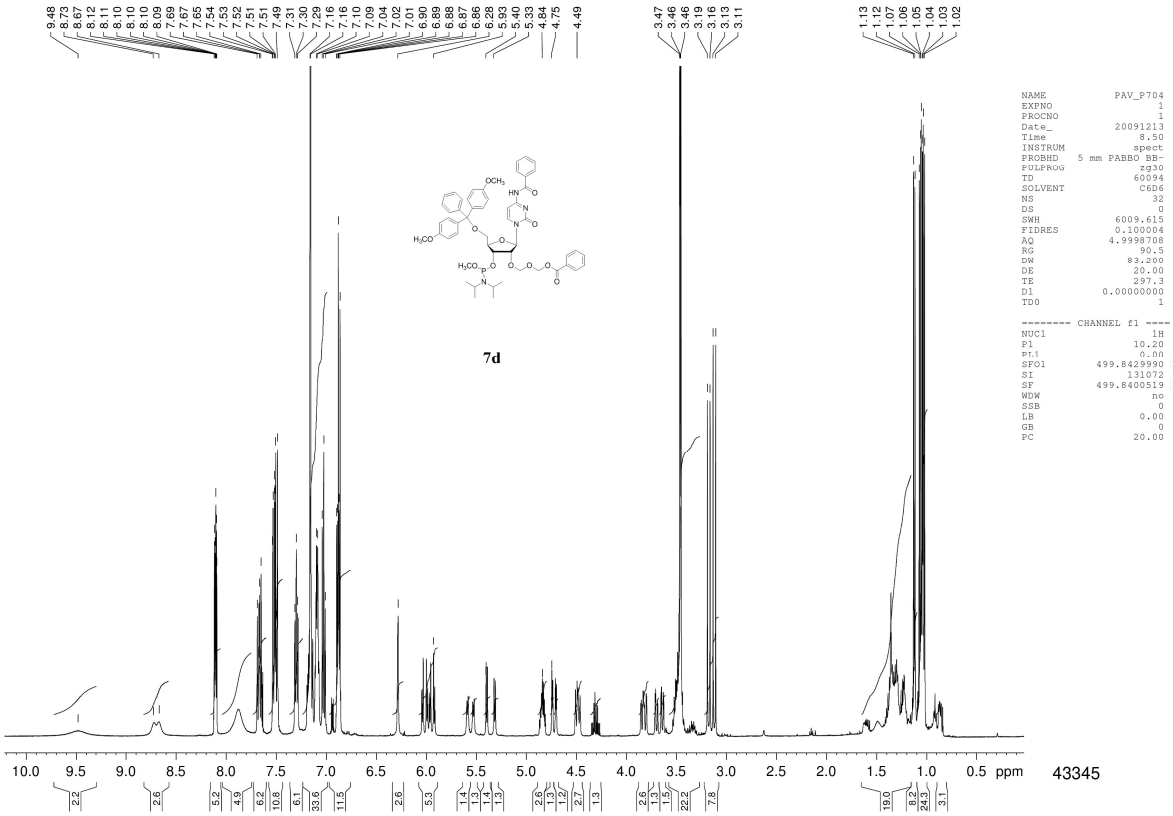

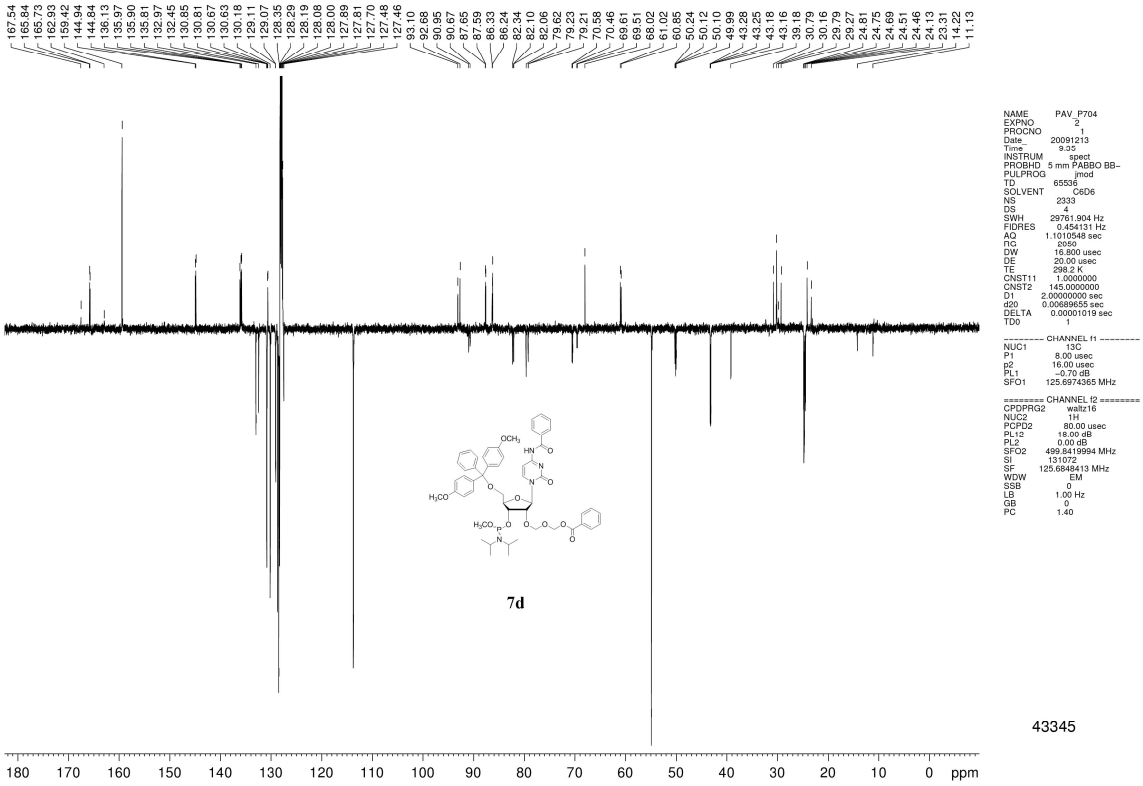

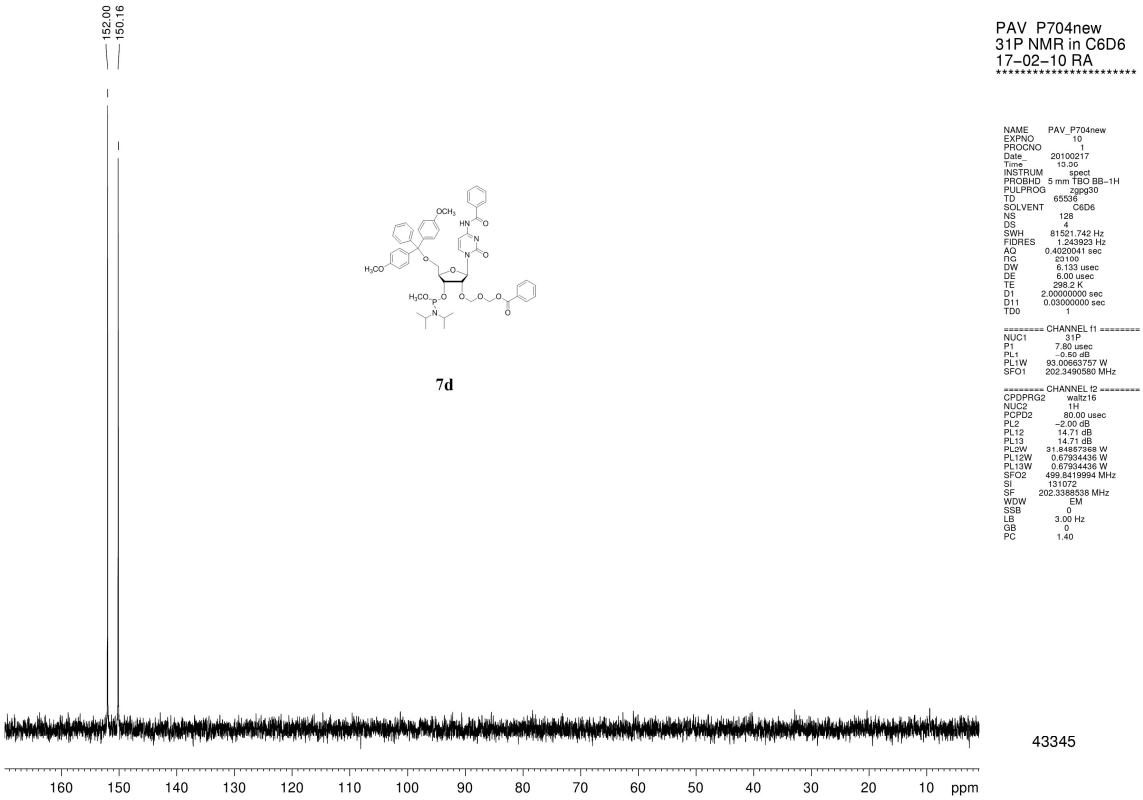

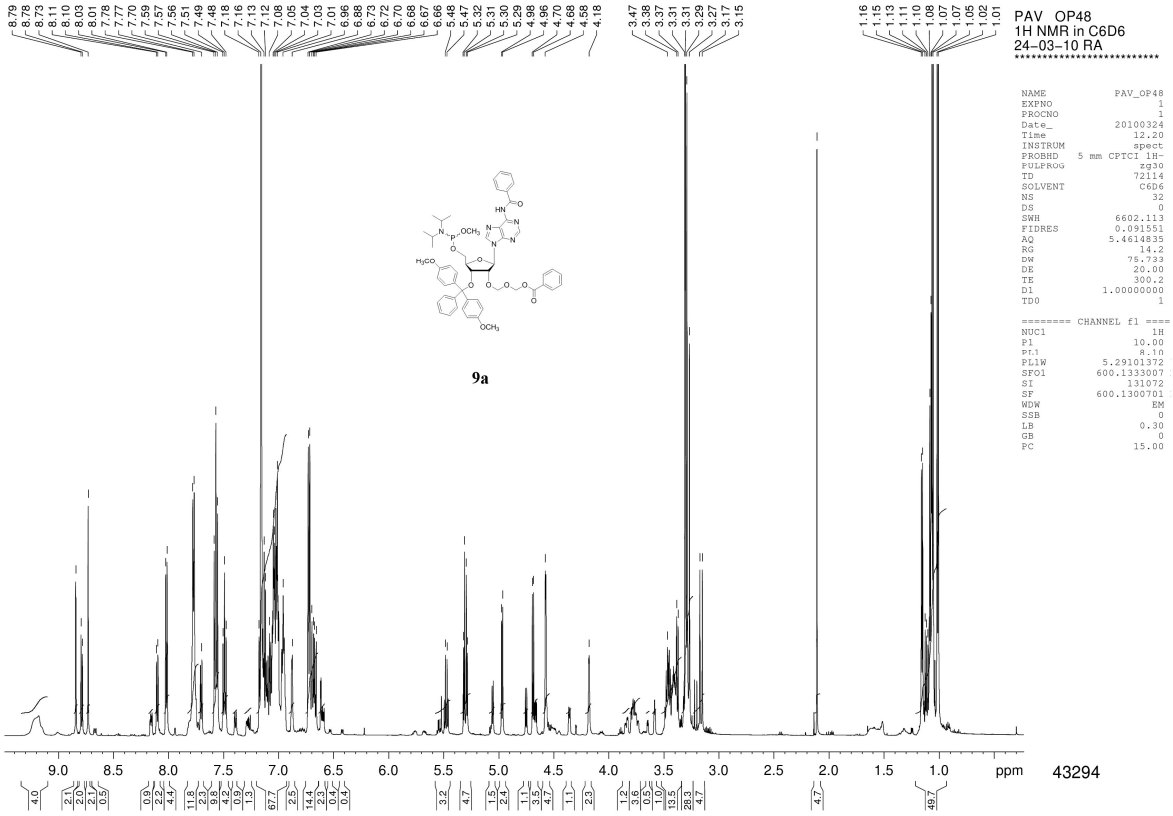

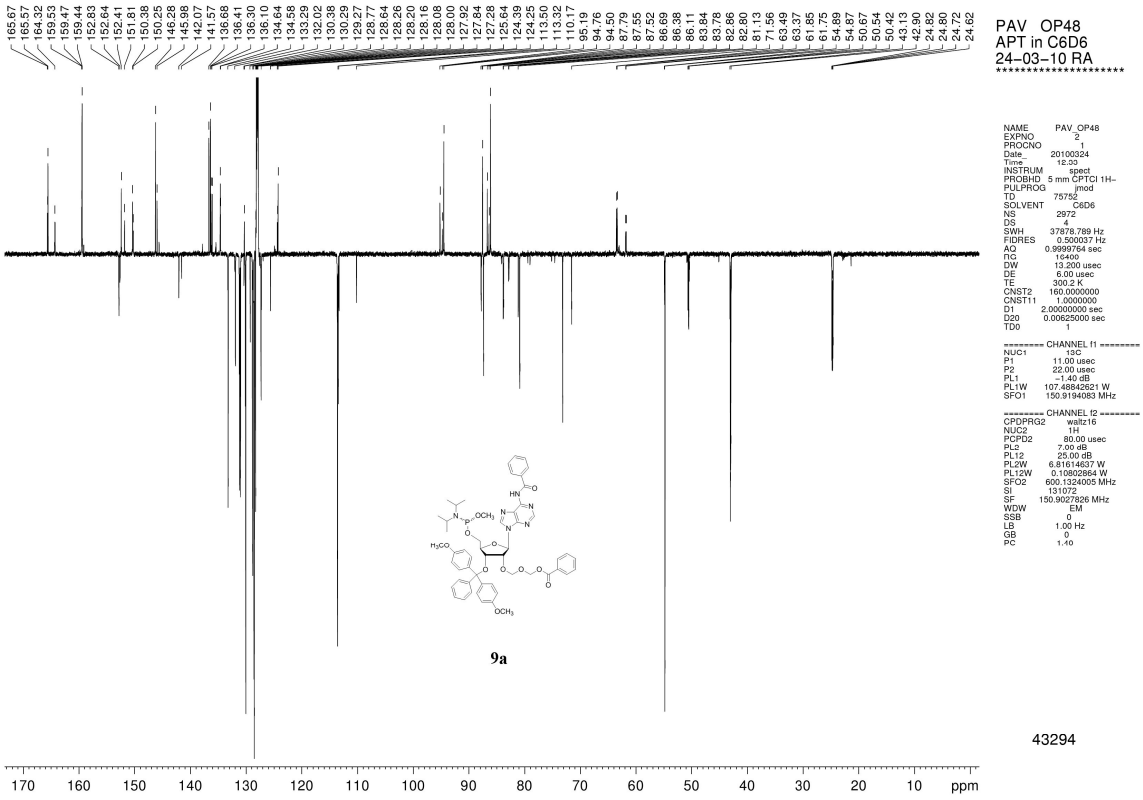

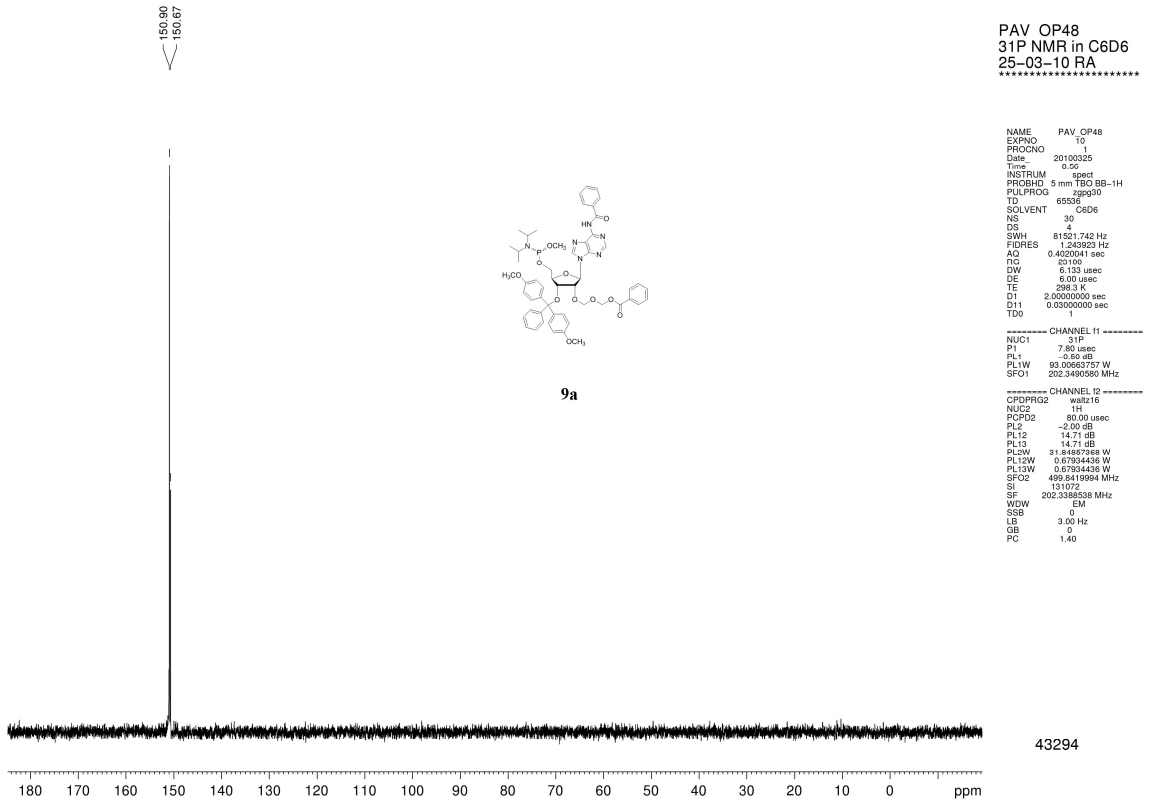

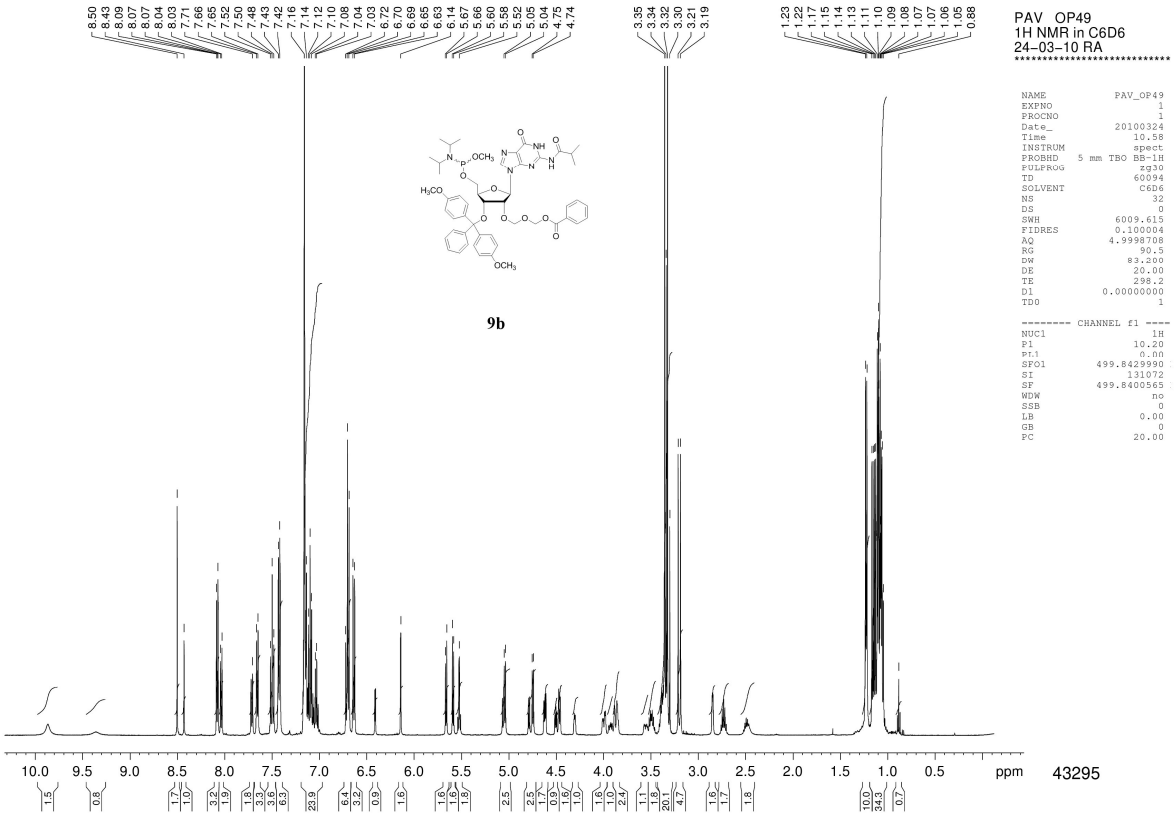

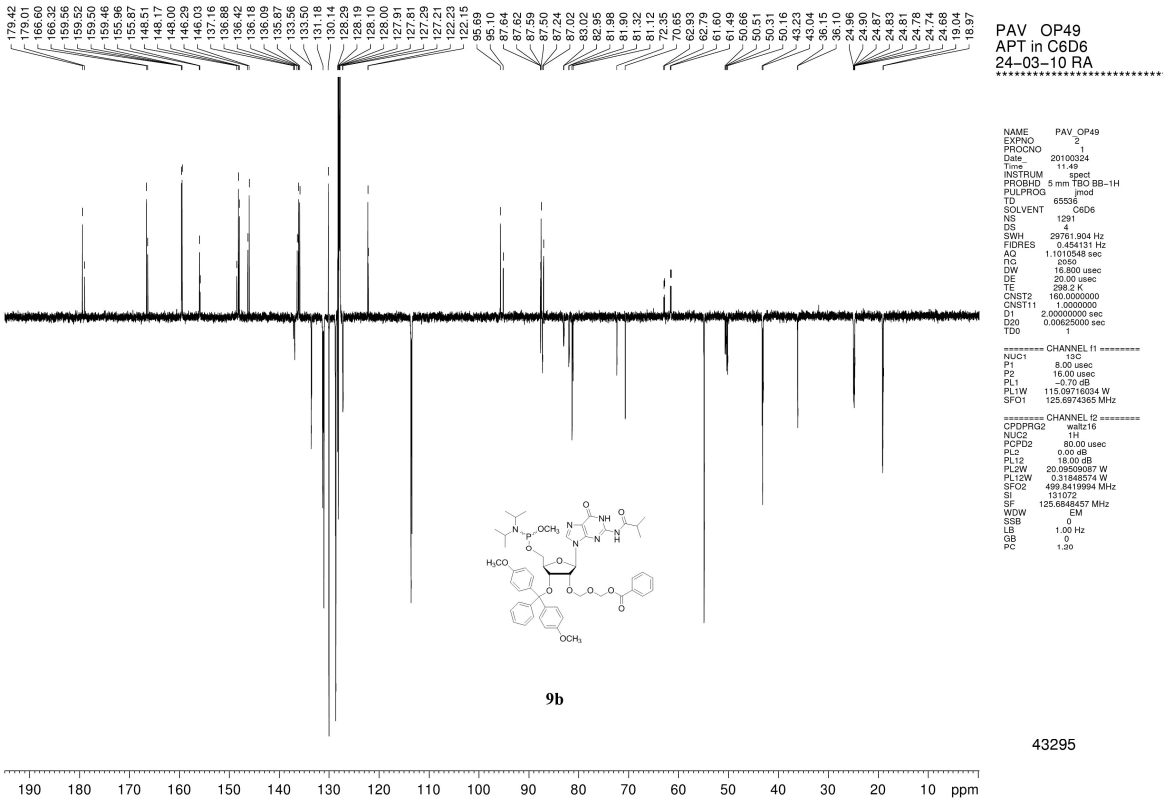
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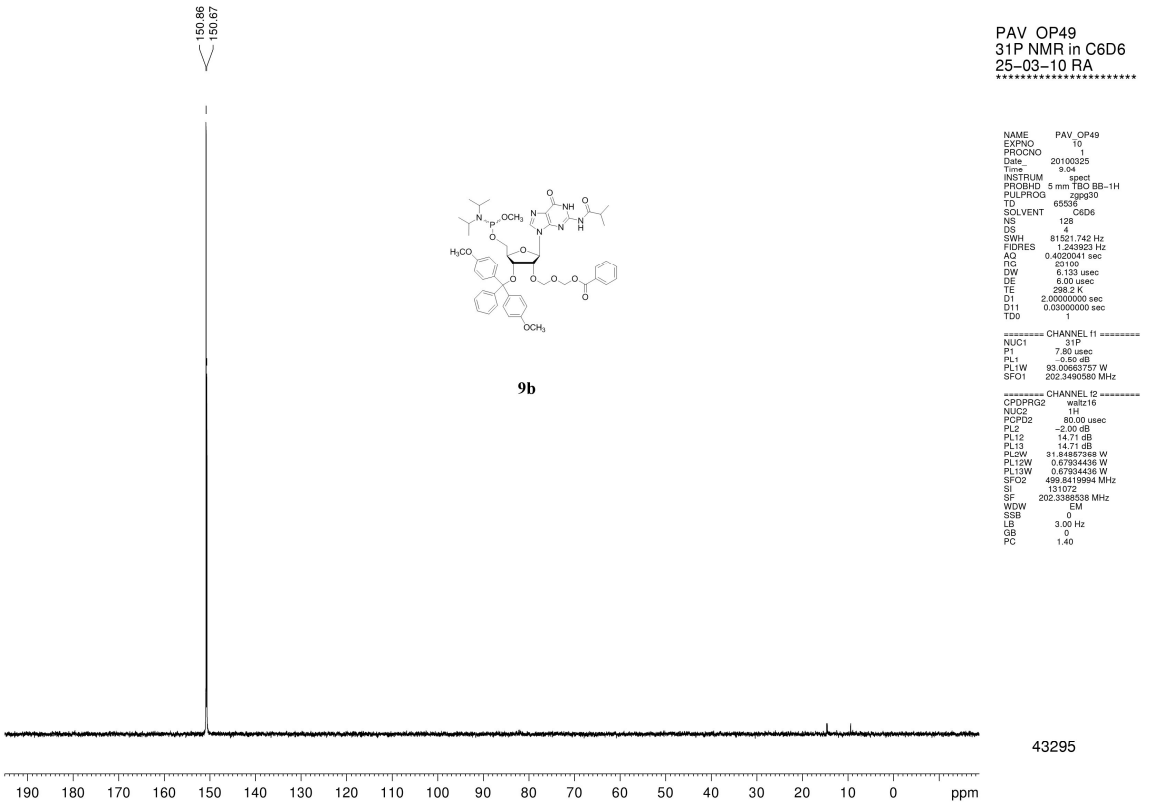
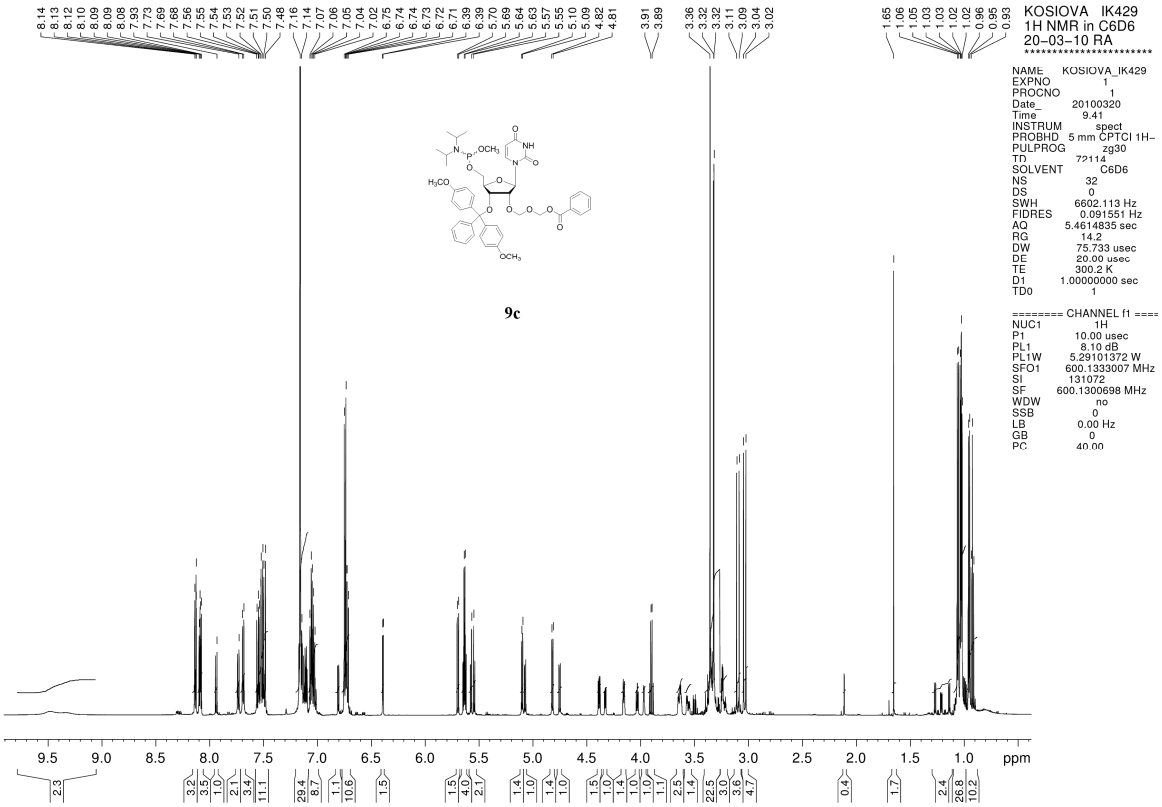
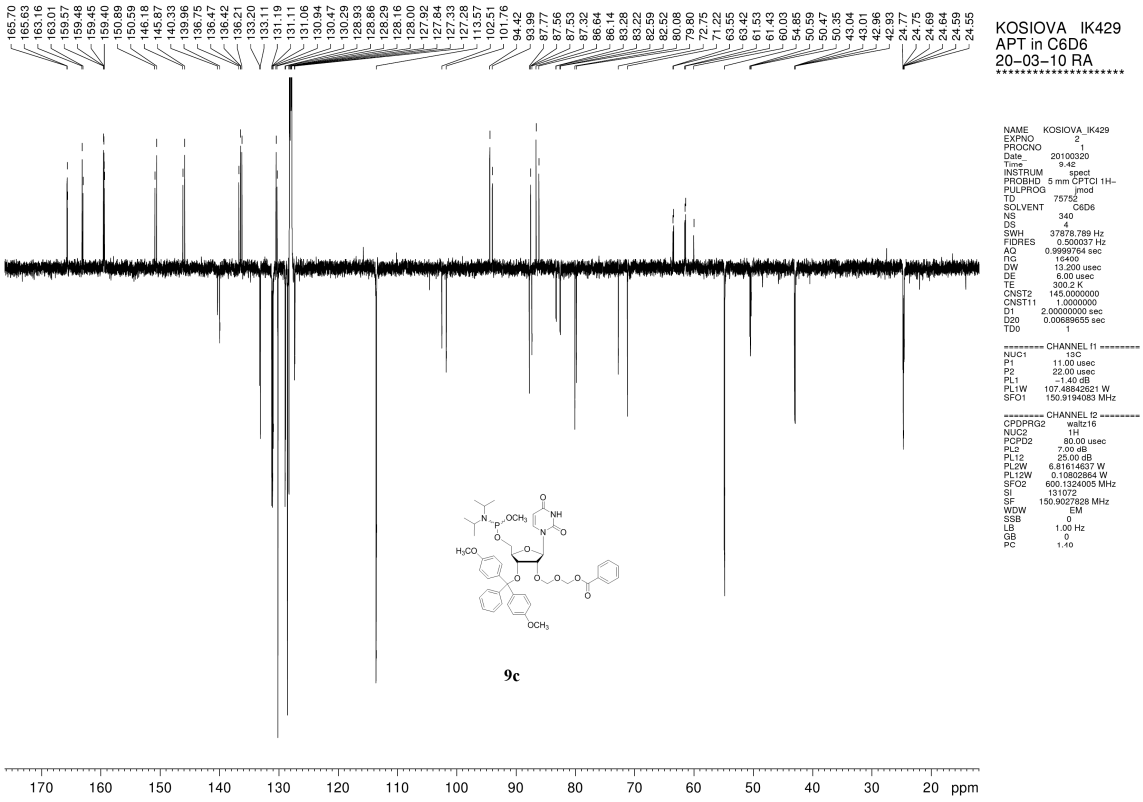
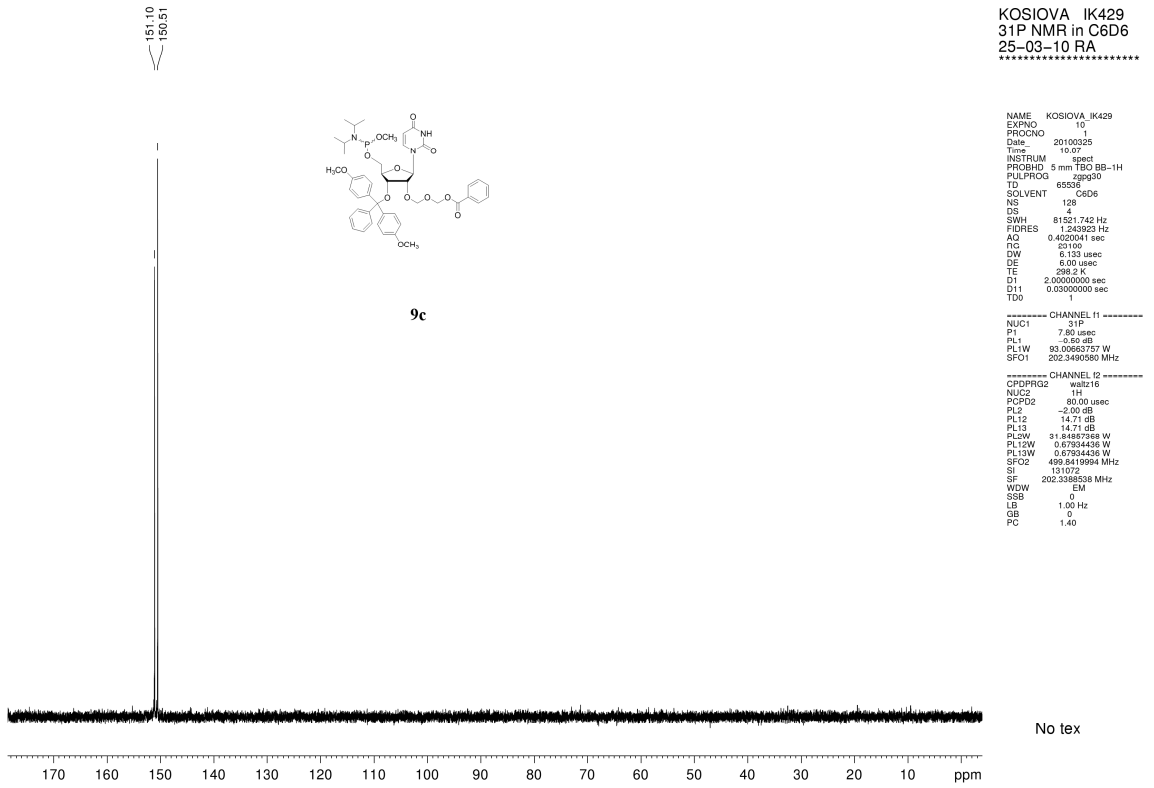
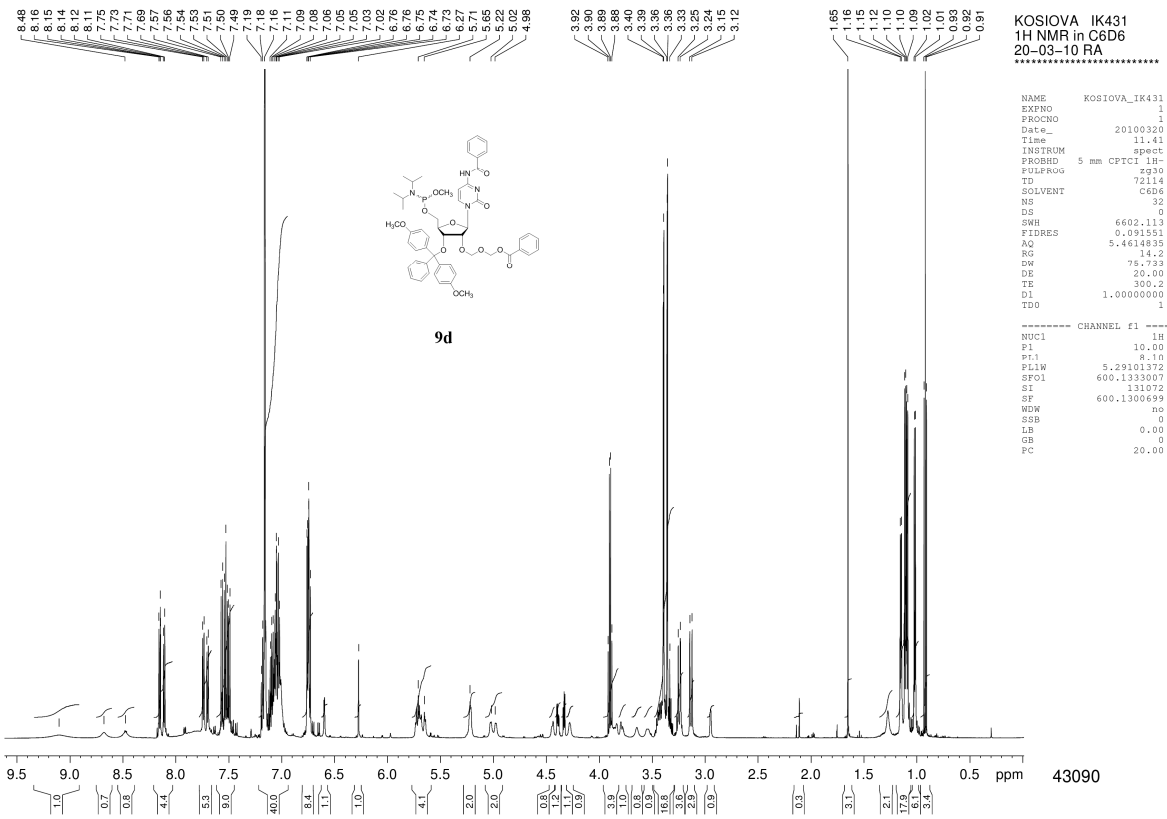
166.60
166.32
159.56
159.52
159.50
159.46
155.96
155.87
149.51
148.17
148.00
146.29
146.03
137.16
136.88
136.42
136.18
136.09
135.87
133.56
133.50
131.18
130.14
128.29
128.19
128.10
128.00
127.91
127.81
127.29
127.21
122.23
122.15
95.69
95.10
87.64
87.62
87.59
87.50
87.24
87.02
83.02
82.95
81.98
81.90
81.12
81.12
72.35
70.65
62.93
62.79
61.60
61.49
50.66
50.51
50.31
50.16
43.23
43.04
36.15
36.10
24.96
24.90
24.87
24.83
24.81
24.78
24.74
24.68
19.04
18.97
PAV OP49
APT in C6D6
24-03-10 RA
NAME PAV_OP49
EXPNO 2
PROCNO 1
Date_ 20100324
Time 11.49
INSTRUM spect
PROBHD 5 mm TBO BB-1H
PULPROG jmod
TD 65536
SOLVENT C6D6
NS 1291
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010548 sec
RG 2050
DW 16.800 usec
DE 20.00 usec
TE 298.2 K
CNST2 160.0000000
CNST11 1.0000000
D1 2.00000000 sec
D20 0.00625000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 13C
P1 8.00 usec
P2 16.00 usec
PL1 -0.70 dB
PL1W 115.09716034 W
SFO1 125.6974365 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 0.00 dB
PL12 18.00 dB
PL2W 20.09509087 W
PL12W 0.31848574 W
SFO2 499.8419994 MHz
SI 131072
SF 125.6848457 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.20
9b
43295
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm


150.86
150.67
PAV OP49
31P NMR in C6D6
25-03-10 RA
NAME PAV_OP49
EXPNO 10
PROCNO 1
Date_ 20100325
Time 9.04
INSTRUM spect
PROBHD 5 mm TBO BB-1H
PULPROG zgpg30
TD 65536
SOLVENT C6D6
NS 128
DS 4
SWH 81521.742 Hz
FIDRES 1.243923 Hz
AQ 0.4020041 sec
RG 20160
DW 6.133 usec
DE 6.00 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 31P
P1 7.80 usec
PL1 -0.50 dB
PL1W 93.00663757 W
SFO1 202.3490580 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -2.00 dB
PL12 14.71 dB
PL13 14.71 dB
PL2W 31.84887968 W
PL12W 0.67934436 W
PL13W 0.67934436 W
SFO2 499.8419994 MHz
SI 131072
SF 202.3388538 MHz
WDW EM
SSB 0
LB 3.00 Hz
GB 0
PC 1.40
9b
43295
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ppm

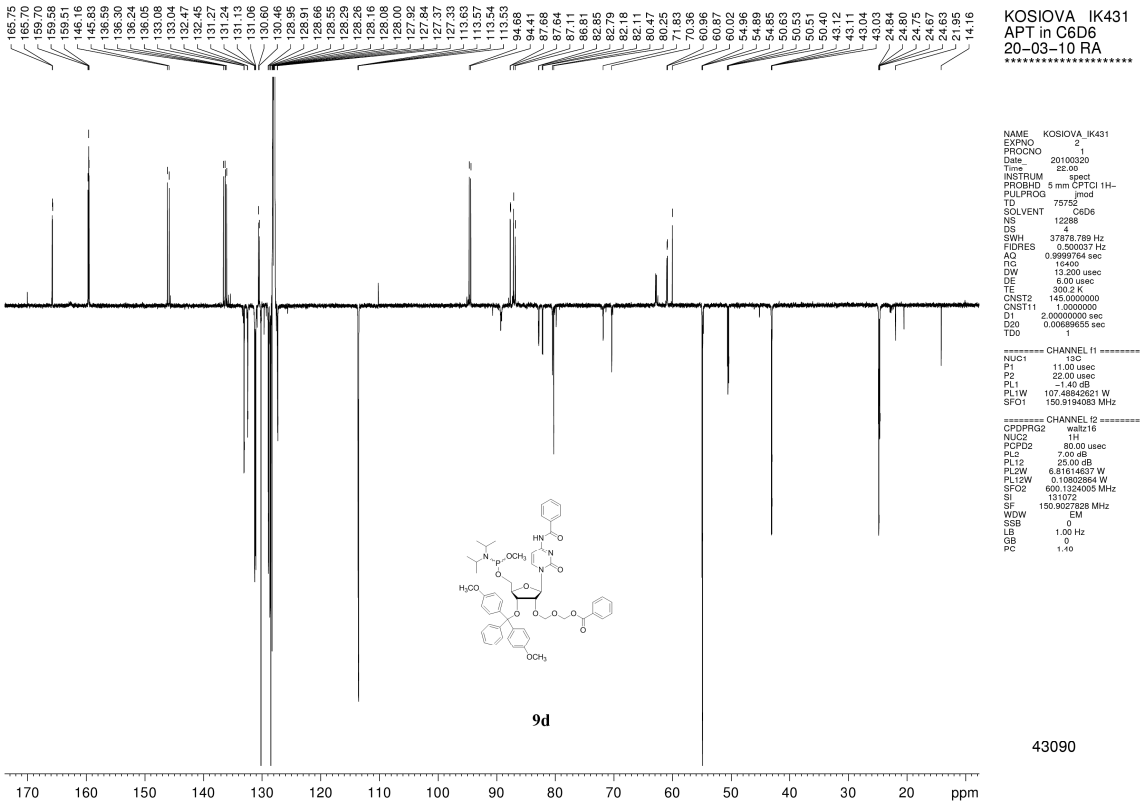

KOSIOVA IK429
1H NMR in C6D6
20-03-10 RA
9c

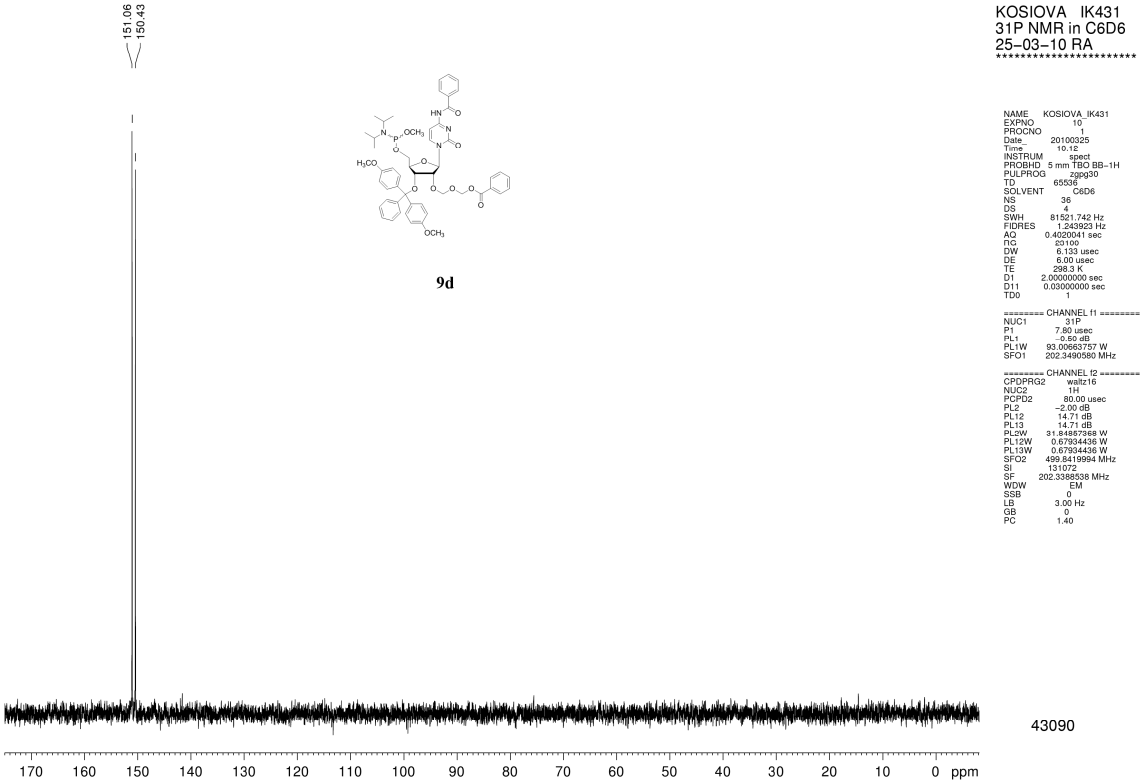

KOSIOVA IK429
APT in C6D6
20-03-10 RA
9c

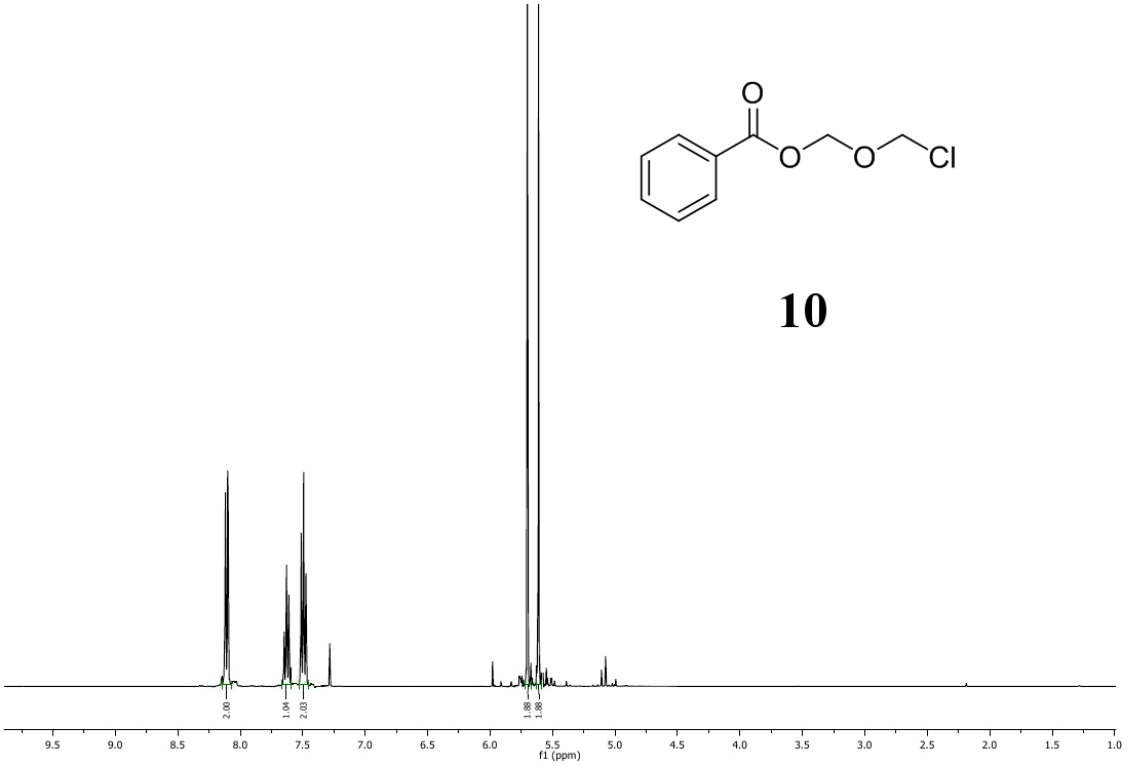


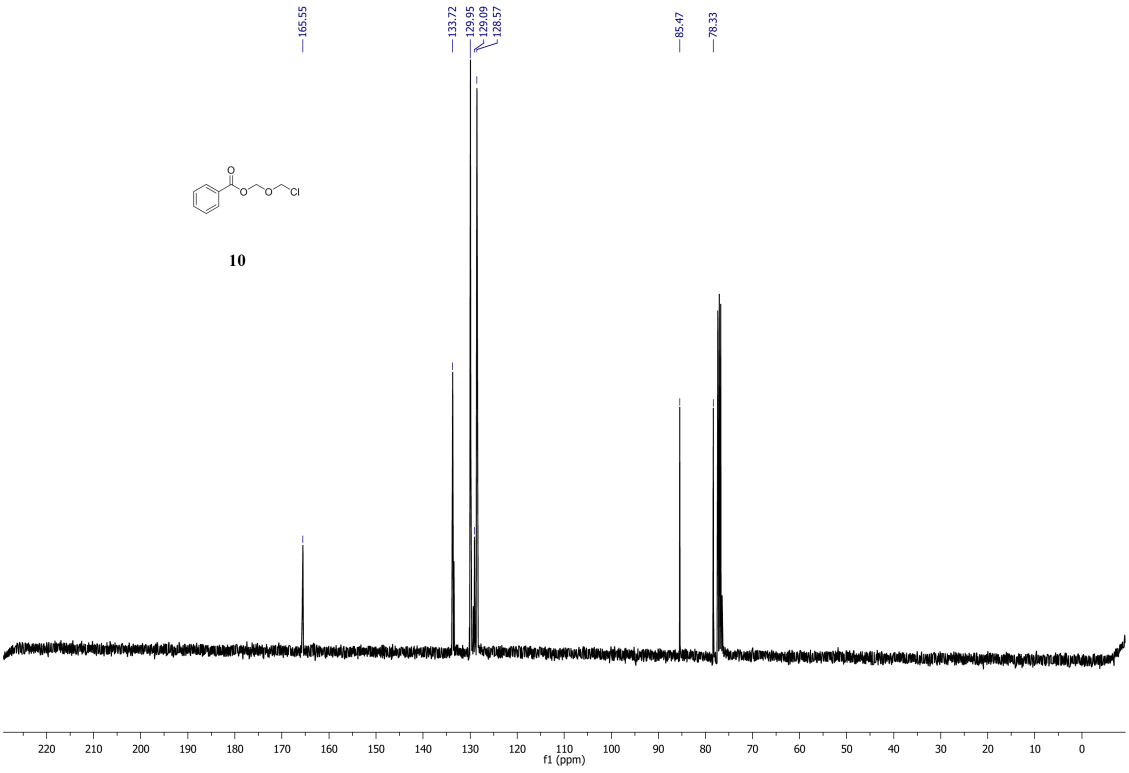


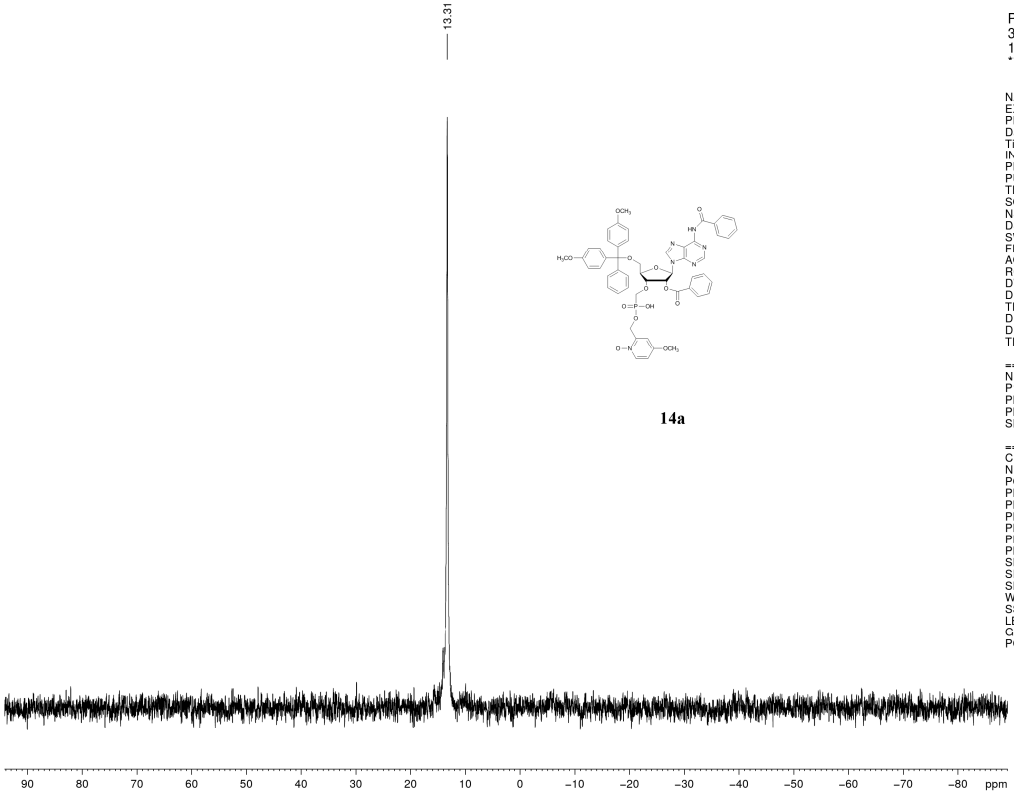
43090











14a

PAV PO14a
31P{1H} NMR in DMSO-d
14-03-11 RA

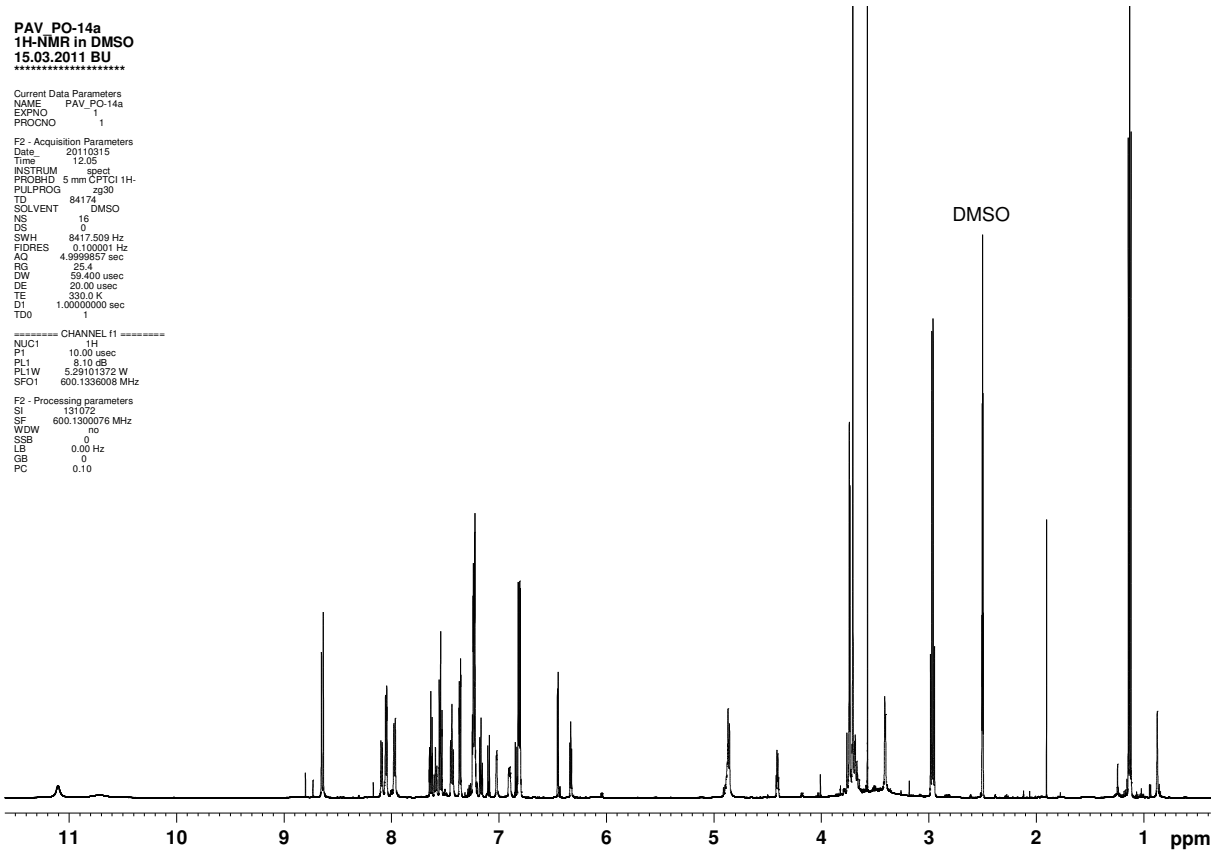
NAME	PAV_PO14a
EXPNO	10
PROCNO	1
Date_	20110314
Time	15.15
INSTRUM	spect
PROBHD	5 mm TBO BB-1H
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	128
DS	4
SWH	81521.742 Hz
FIDRES	1.243923 Hz
AQ	0.4020041 sec
RG	23100
DW	6.133 usec
DE	6.00 usec
TE	298.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1

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

NUC1	31P
P1	7.80 usec
PL1	−0.50 dB
PL1W	93.00663757 W
SFO1	202.3288239 MHz

======== CHANNEL f2 ======

CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	−2.50 dB
PL12	15.56 dB
PL13	15.60 dB
PL2W	35.73468781 W
PL12W	0.55858588 W
PL13W	0.55346471 W
SFO2	499.8419994 MHz
SI	131072
SF	202.3387197 MHz
WDW	EM
SSB	0
LB	5.00 Hz
GB	0
PC	1.40



PAV_PO-14a
1H-NMR in DMSO
15.03.2011 BU

Current Data Parameters

NAME	PAV_PO-14a
EXPNO	1
PROCNO	1

F2 - Acquisition Parameters

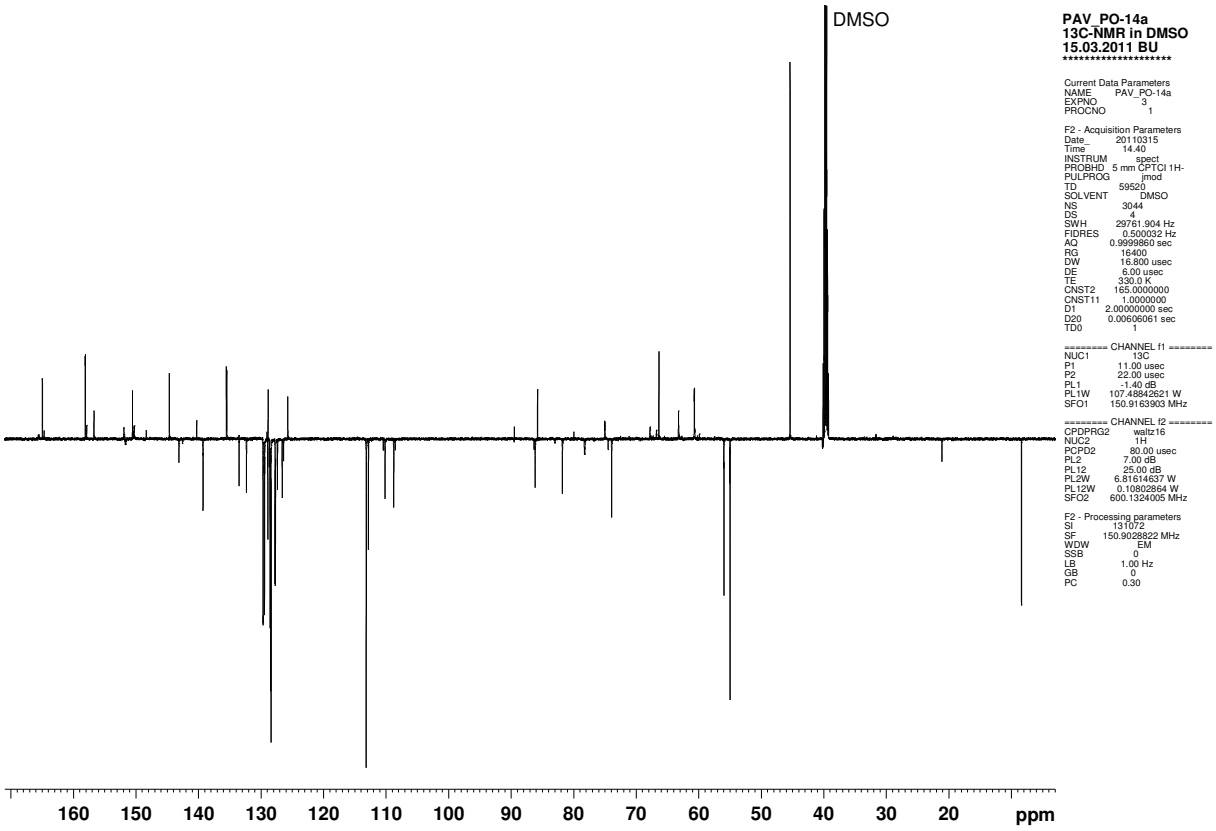
Date_	20110315
Time	12.05
INSTRUM	spect
PROBHD	5 mm CPTCI 1H-
PULPROG	zg30
TD	84174
SOLVENT	DMSO
NS	16
DS	0
SWH	8417.509 Hz
FIDRES	0.100001 Hz
AQ	4.9999857 sec
RG	25.4
DW	59.400 usec
DE	20.00 usec
TE	330.0 K
D1	1.00000000 sec
TD0	1

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

NUC1	1H
P1	10.00 usec
PL1	8.10 dB
PL1W	5.29101372 W
SFO1	600.1336008 MHz

F2 - Processing parameters

SI	131072
SF	600.1300076 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	0.10



PAV_PO-14a
13C-NMR in DMSO
15.03.2011 BU
****

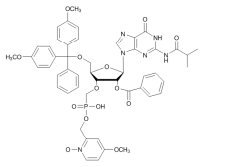
Current Data Parameters
NAME PAV_PO-14a
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date 20110315
Time 14.40
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG jmod
TD 59520
SOLVENT DMSO
NS 3044
DS 4
SWH 29761.904 Hz
FIDRES 0.500032 Hz
AQ 0.9999860 sec
RG 16400
DW 16.800 usec
DE 6.00 usec
TE 330.0 K
CNST2 165.0000000
CNST11 1.0000000
D1 2.00000000 sec
D20 0.00606061 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 11.00 usec
P2 22.00 usec
PL1 -1.40 dB
PL1W 107.48842621 W
SFO1 150.9163903 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 7.00 dB
PL12 25.00 dB
PL2W 6.81614637 W
PL12W 0.10802864 W
SFO2 600.1324005 MHz

F2 - Processing parameters
SI 131072
SF 150.9028822 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.30



14b

PAV_PO14b
31P{1H} NMR in DMSO-d6
14-03-11 RA
****

NAME	PAV_PO14b
EXPNO	10
PROCNO	1
Date_	20110314
Time	15.22
INSTRUM	spect
PROBHD	5 mm TBO BB-1H
PULPROG	zgpg30
TD	65536
SOLVENT	DMSO
NS	48
DS	4
SWH	81521.742 Hz
FIDRES	1.243923 Hz
AQ	0.4020041 sec
RG	23100
DW	6.133 usec
DE	6.00 usec
TE	298.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ======	
NUC1	31P
P1	7.80 usec
PL1	−0.50 dB
PL1W	93.00663757 W
SFO1	202.3288239 MHz
======== CHANNEL f2 ======	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	−2.50 dB
PL12	15.56 dB
PL13	15.60 dB
PL2W	35.73468781 W
PL12W	0.55858588 W
PL13W	0.55346471 W
SFO2	499.8419994 MHz
SI	131072
SF	202.3387197 MHz
WDW	EM
SSB	0
LB	5.00 Hz
GB	0
PC	1.40

PAV_PO-14b
1H-NMR in DMSO
15.03.2011 BU
****

Current Data Parameters

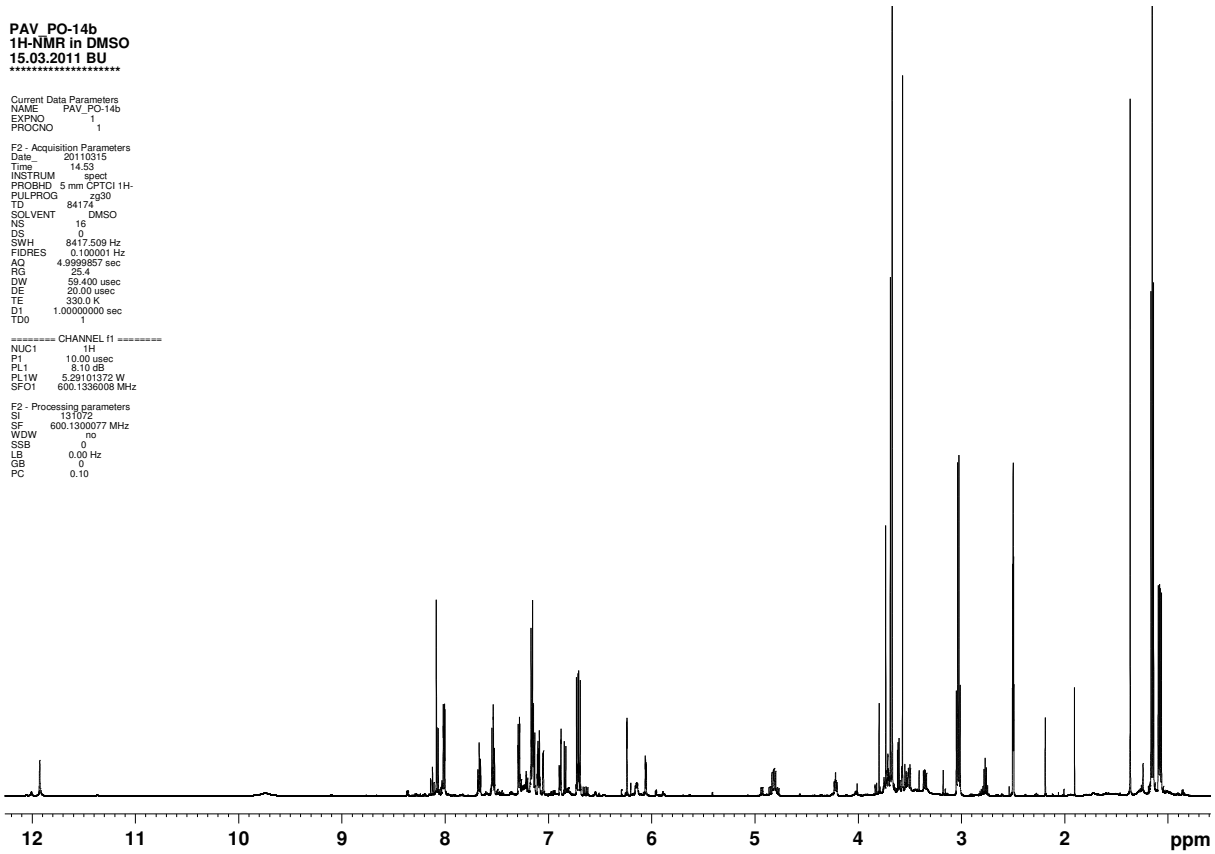
NAME	PAV_PO-14b
EXPNO	1
PROCNO	1

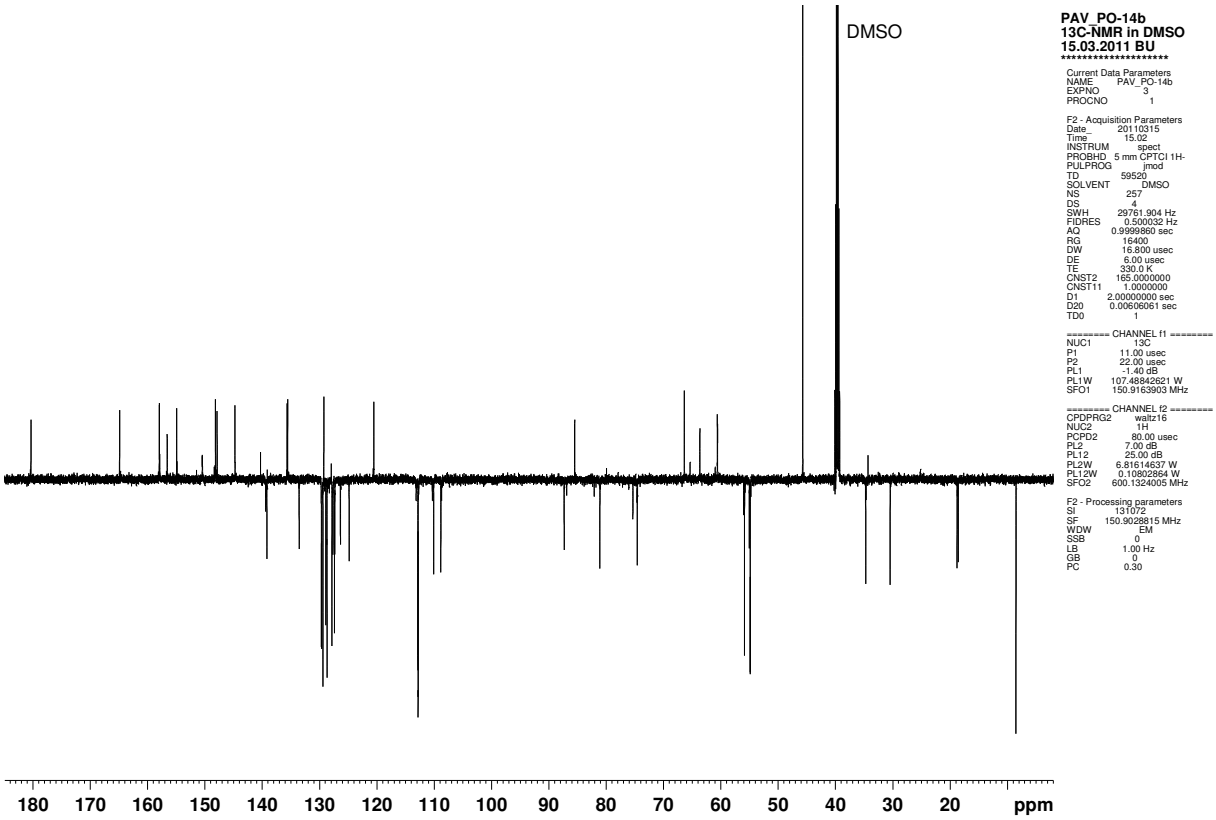
F2 - Acquisition Parameters

Date_	20110315
Time	14.53
INSTRUM	spect
PROBHD	5 mm CPTCI 1H-
PULPROG	zg30
TD	84174
SOLVENT	DMSO
NS	16
DS	0
SWH	8417.509 Hz
FIDRES	0.100001 Hz
AQ	4.9999857 sec
RG	25.4
DW	59.400 usec
DE	20.00 usec
TE	330.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	10.00 usec
PL1	8.10 dB
PL1W	5.29101372 W
SFO1	600.1336008 MHz

F2 - Processing parameters

SI	131072
SF	600.1300077 MHz
WDW	no
SSB	0
LB	0.00 Hz
GB	0
PC	0.10





PAV_PO-14b
13C-NMR in DMSO
15.03.2011 BU
****

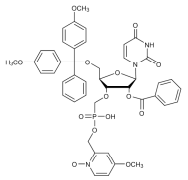
Current Data Parameters
NAME PAV_PO-14b
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110315
Time 15.02
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG zgpg30
TD 59520
SOLVENT DMSO
NS 257
DS 4
SWH 29761.904 Hz
FIDRES 0.500032 Hz
AQ 0.9999860 sec
RG 16400
DW 16.800 usec
DE 6.00 usec
TE 330.0 K
CNST2 165.0000000
CNST11 1.0000000
D1 2.00000000 sec
D20 0.00606061 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 11.00 usec
P2 22.00 usec
PL1 -1.40 dB
PL1W 107.48842621 W
SFO1 150.9163903 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 7.00 dB
PL12 25.00 dB
PL2W 6.81614637 W
PL12W 0.13802864 W
SFO2 600.1324005 MHz

F2 - Processing parameters
SI 131072
SF 150.9028815 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.30



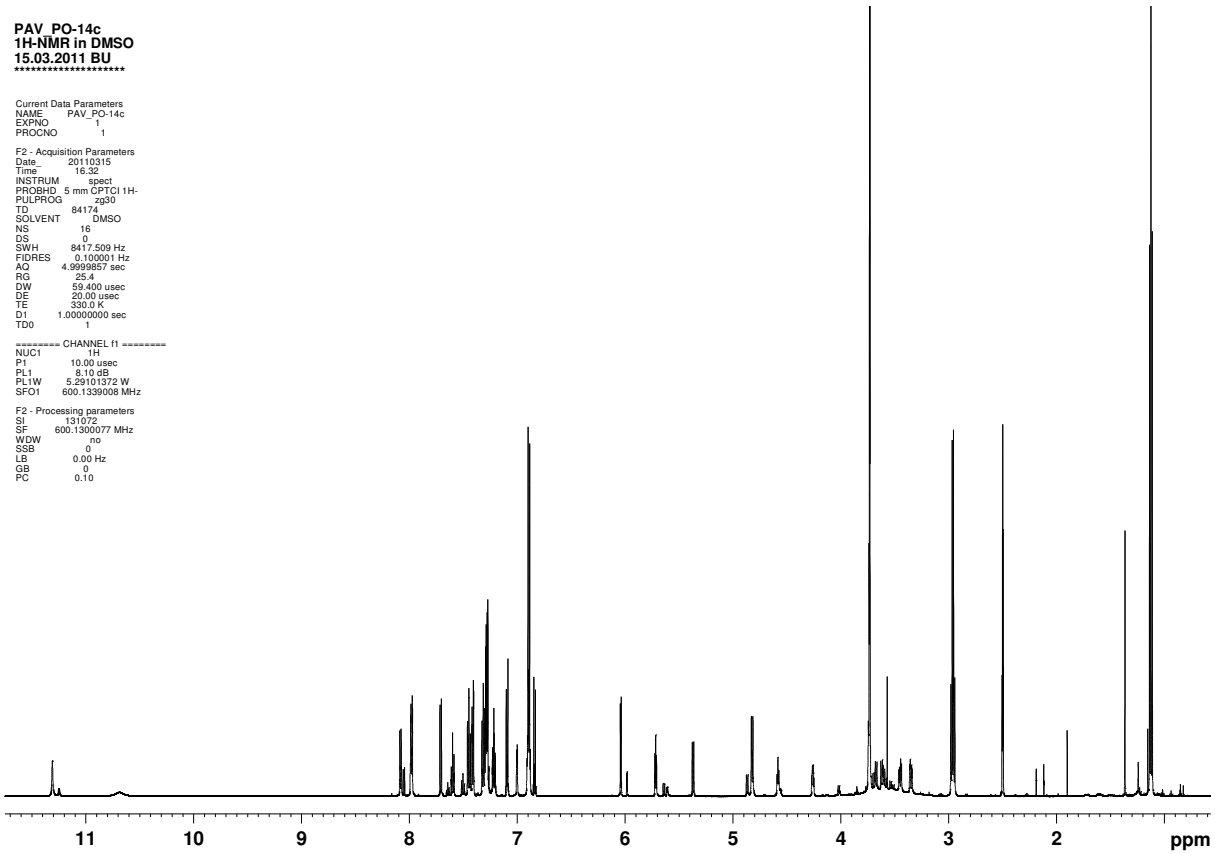
14c

PAV PO14c
31P{1H} NMR in DMSO−d6
14−03−11 RA
****

NAME PAV_PO14c
EXPNO 10
PROCNO 1
Date_ 20110314
Time 15.25
INSTRUM spect
PROBHD 5 mm TBO BB−1H
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 68
DS 4
SWH 81521.742 Hz
FIDRES 1.243923 Hz
AQ 0.4020041 sec
RG 23100
DW 6.133 usec
DE 6.00 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ======
NUC1 31P
P1 7.80 usec
PL1 −0.50 dB
PL1W 93.00663757 W
SFO1 202.3288239 MHz

======== CHANNEL f2 ======
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 −2.50 dB
PL12 15.56 dB
PL13 15.60 dB
PL2W 35.73468781 W
PL12W 0.55858588 W
PL13W 0.55346471 W
SFO2 499.8419994 MHz
SI 131072
SF 202.3387197 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40



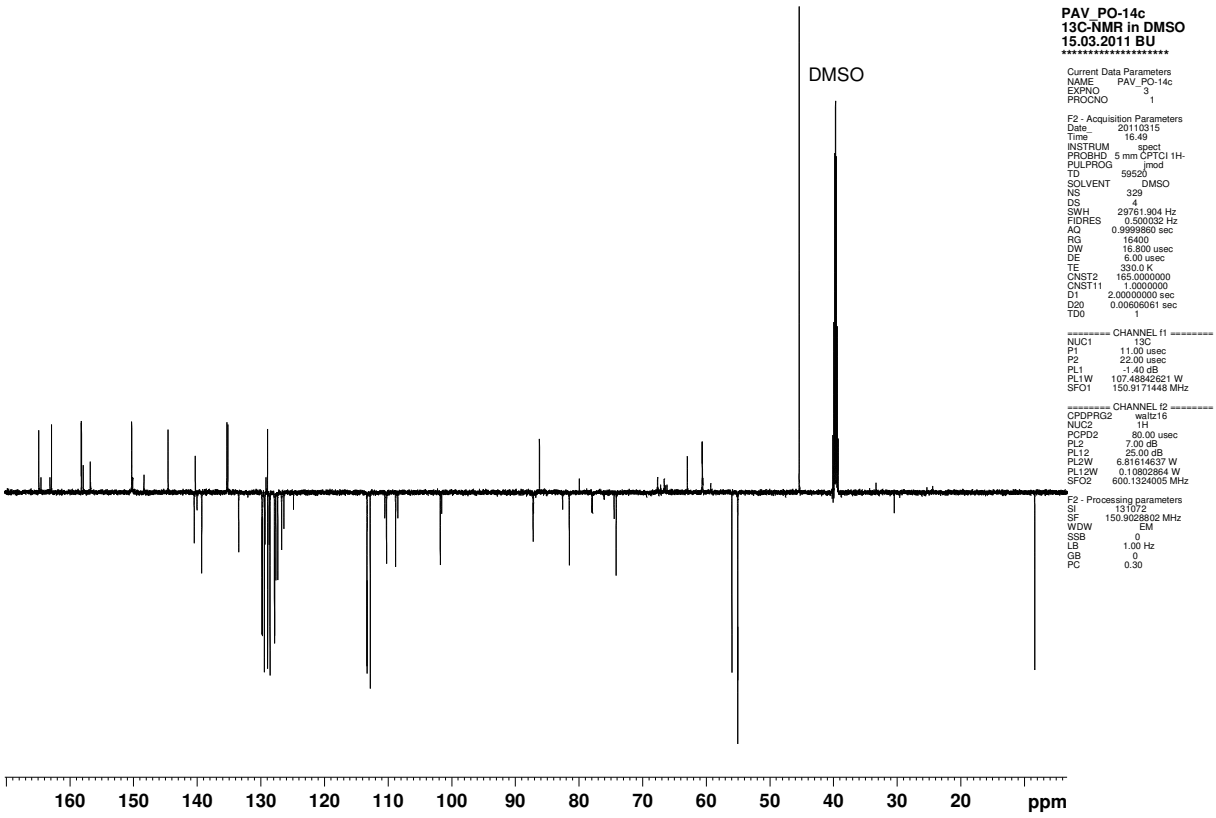
PAV_PO-14c
1H-NMR in DMSO
15.03.2011 BU
****

Current Data Parameters
NAME PAV_PO-14c
EXPNO 1
PROCNO 1

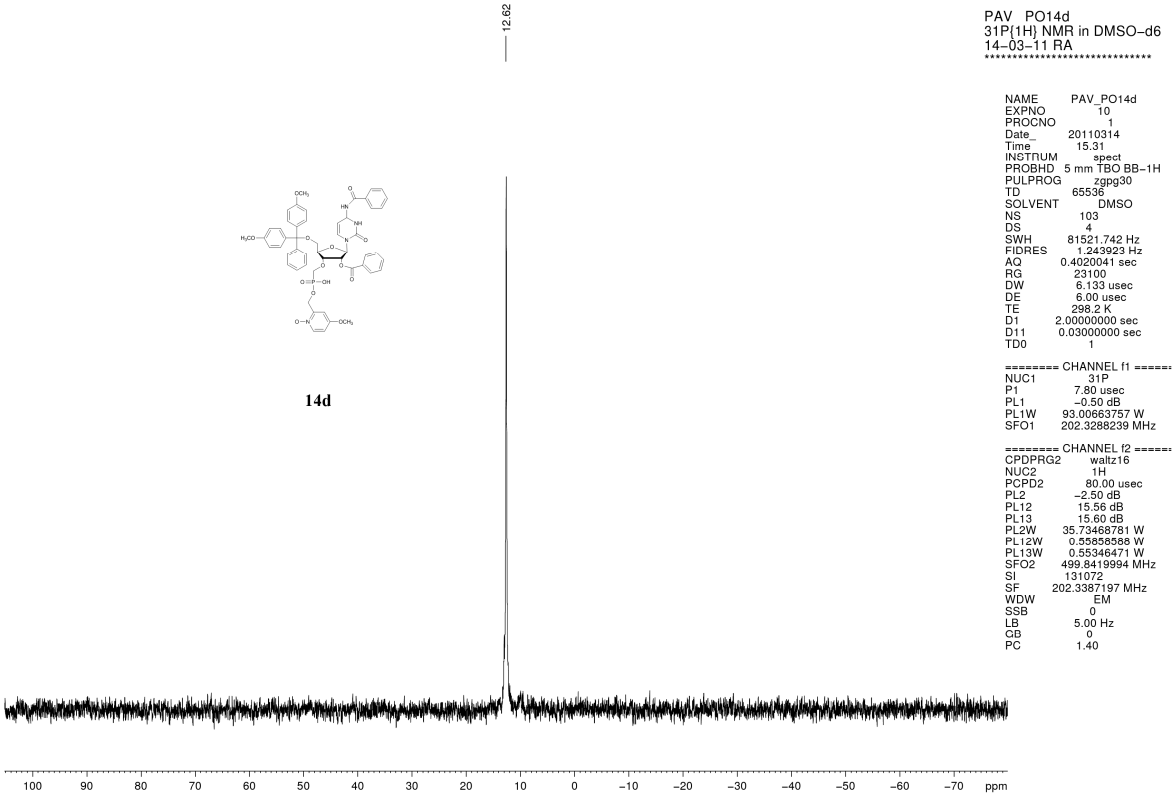
F2 - Acquisition Parameters
Date_ 20110315
Time 16.32
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG zg30
TD 84174
SOLVENT DMSO
NS 16
DS 0
SWH 8417.509 Hz
FIDRES 0.100001 Hz
AQ 4.9999857 sec
RG 25.4
DW 59.400 usec
DE 20.00 usec
TE 330.0 K
D1 1.00000000 sec
TD0 1

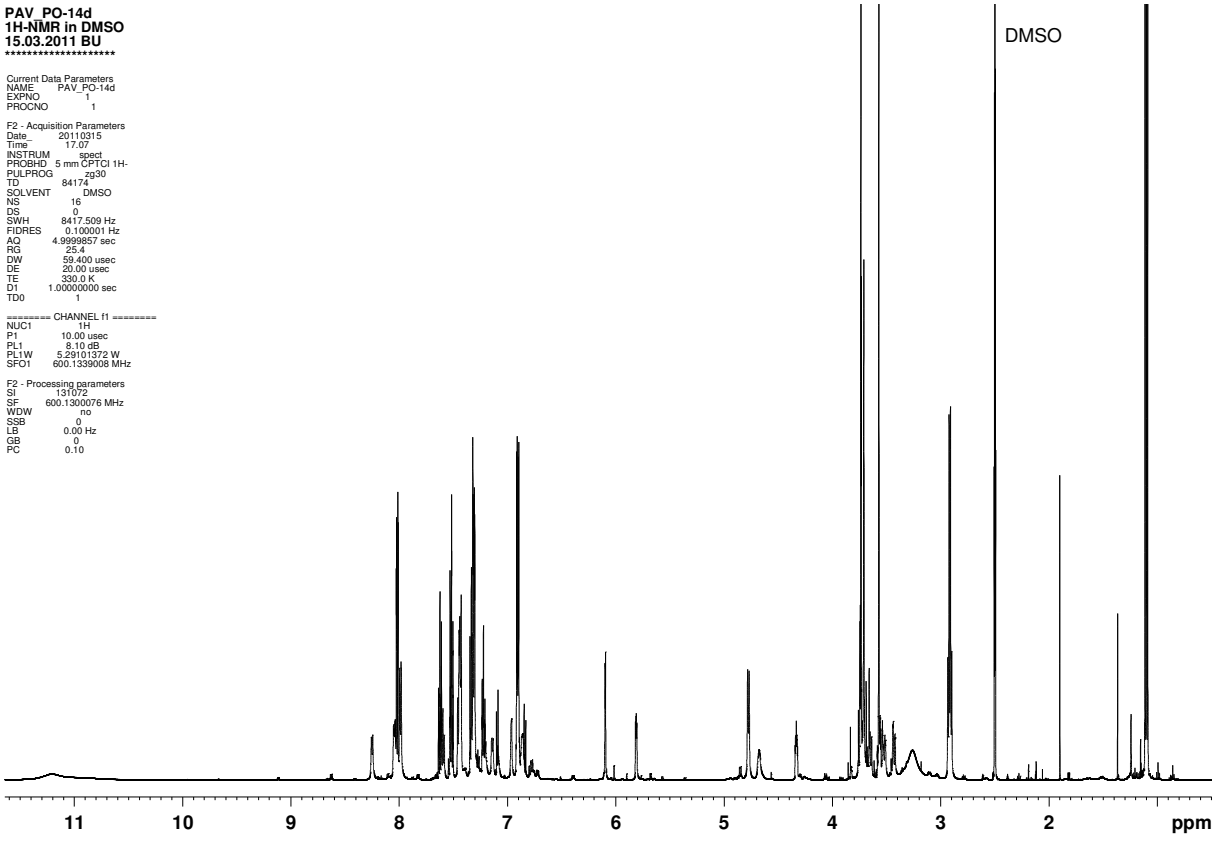
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 8.10 dB
PL1W 5.29101372 W
SFO1 600.1339008 MHz

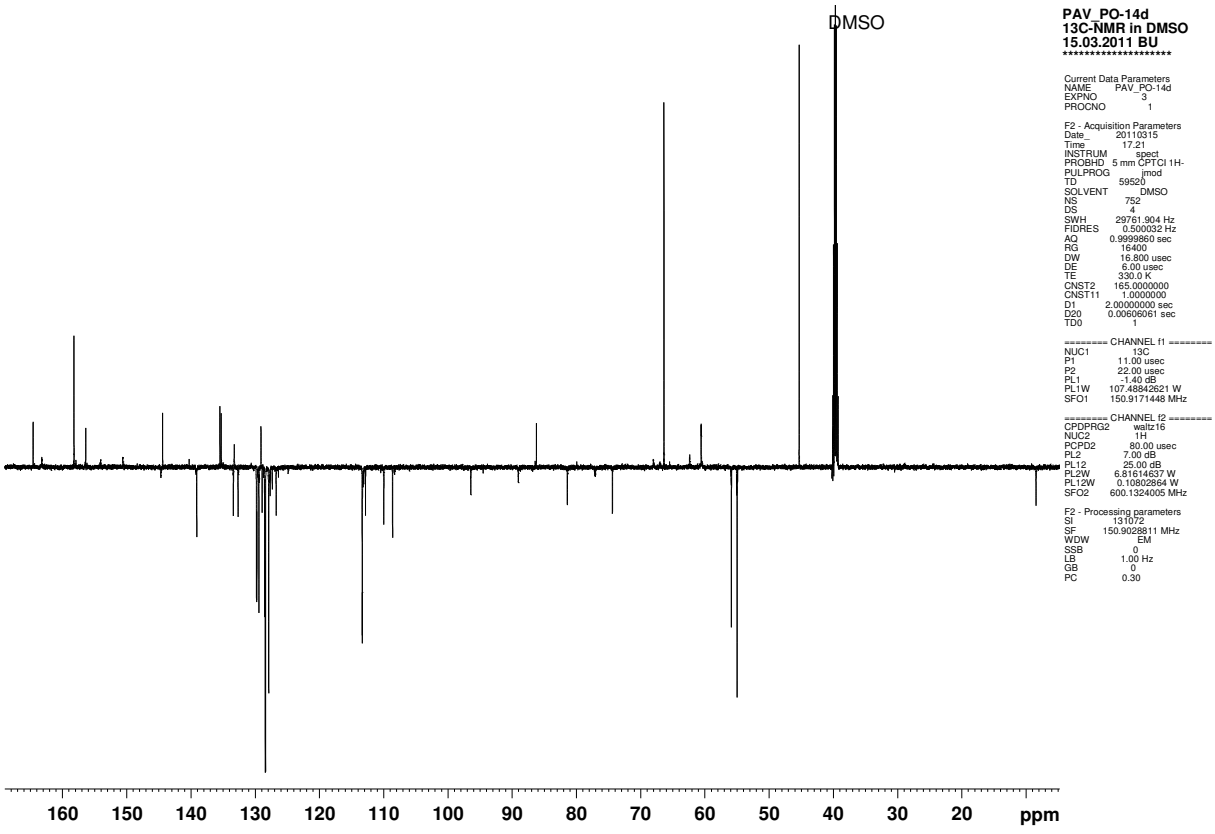
F2 - Processing parameters
SI 131072
SF 600.1300077 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 0.10

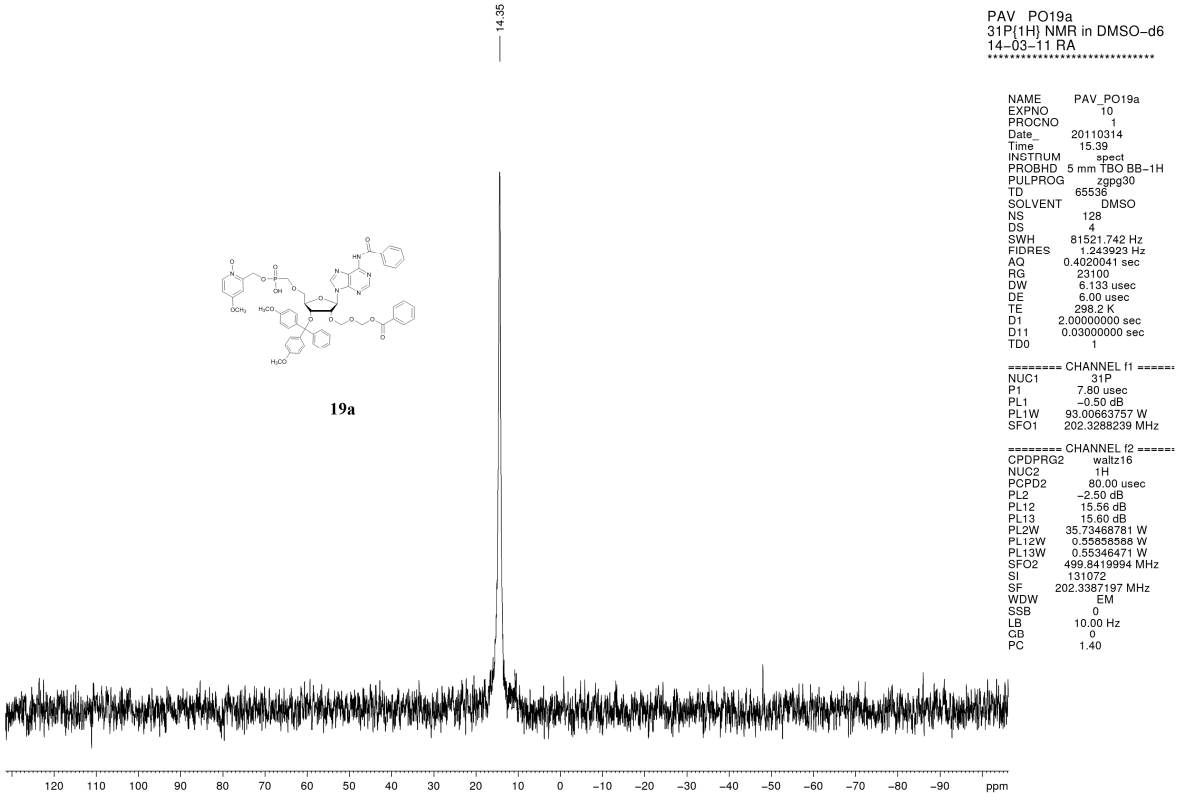


Impurity seen in ^{31}P spectra of compound **14c** was characterized by LC-MS as bis(MOP)ester; ESI MS calcd for $C_{54}H_{56}N_4O_{18}P$ $(M+H)^+$ 1079.33, found 1079.38. We were not able to separate this impurity even after several chromatografies. Nevertheless, this impurity does not interfere solid phase synthesis.

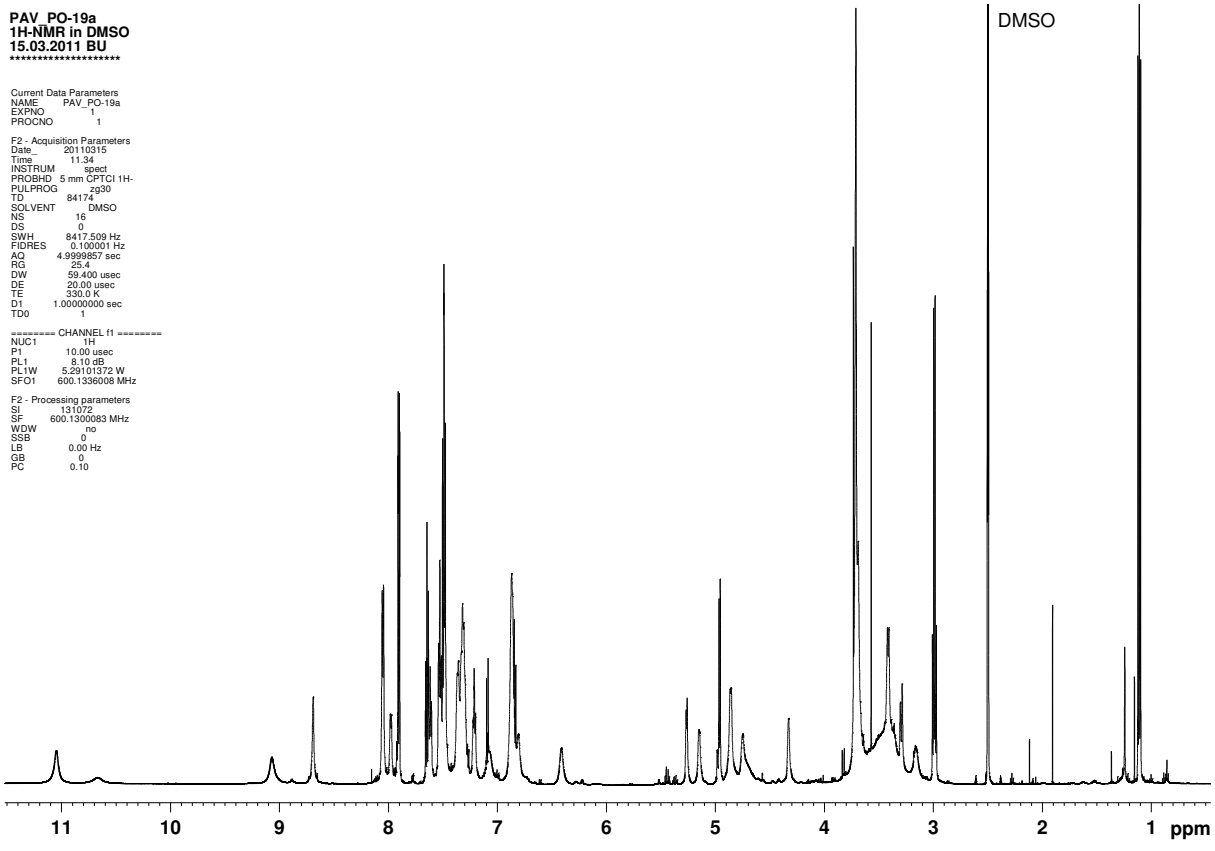

12.62
PAV PO14d
31P{1H} NMR in DMSO–d6
14–03–11 RA
****
NAME PAV_PO14d
EXPNO 10
PROCNO 1
Date_ 20110314
Time 15.31
INSTRUM spect
PROBHD 5 mm TBO BB–1H
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 103
DS 4
SWH 81521.742 Hz
FIDRES 1.243923 Hz
AQ 0.4020041 sec
RG 23100
DW 6.133 usec
DE 6.00 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
======== CHANNEL f1 ======
NUC1 31P
P1 7.80 usec
PL1 –0.50 dB
PL1W 93.00663757 W
SFO1 202.3288239 MHz
======== CHANNEL f2 ======
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 –2.50 dB
PL12 15.56 dB
PL13 15.60 dB
PL2W 35.73468781 W
PL12W 0.55858588 W
PL13W 0.55346471 W
SFO2 499.8419994 MHz
SI 131072
SF 202.3387197 MHz
WDW EM
SSB 0
LB 5.00 Hz
GB 0
PC 1.40
14d
100 90 80 70 60 50 40 30 20 10 0 –10 –20 –30 –40 –50 –60 –70 ppm

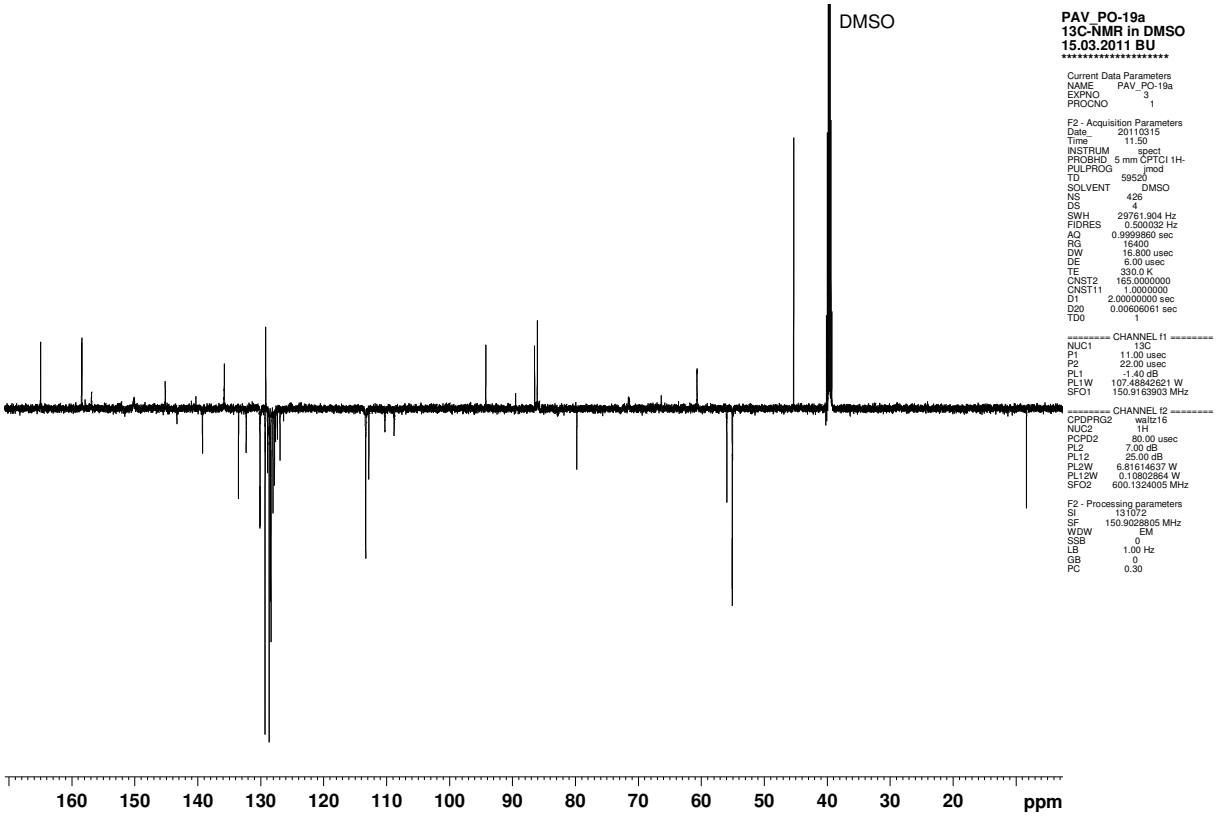

PAV_PO-14d
1H-NMR in DMSO
15.03.2011 BU
****
Current Data Parameters
NAME PAV_PO-14d
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20110315
Time 17.07
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG zg30
TD 84174
SOLVENT DMSO
NS 16
DS 0
SWH 8417.509 Hz
FIDRES 0.100001 Hz
AQ 4.9999857 sec
RG 25.4
DW 59.400 usec
DE 20.00 usec
TE 330.0 K
D1 1.00000000 sec
TD0 1
======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 8.10 dB
PL1W 5.29101372 W
SFO1 600.1339008 MHz
F2 - Processing parameters
SI 131072
SF 600.1300076 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 0.10
DMSO
11 10 9 8 7 6 5 4 3 2 ppm

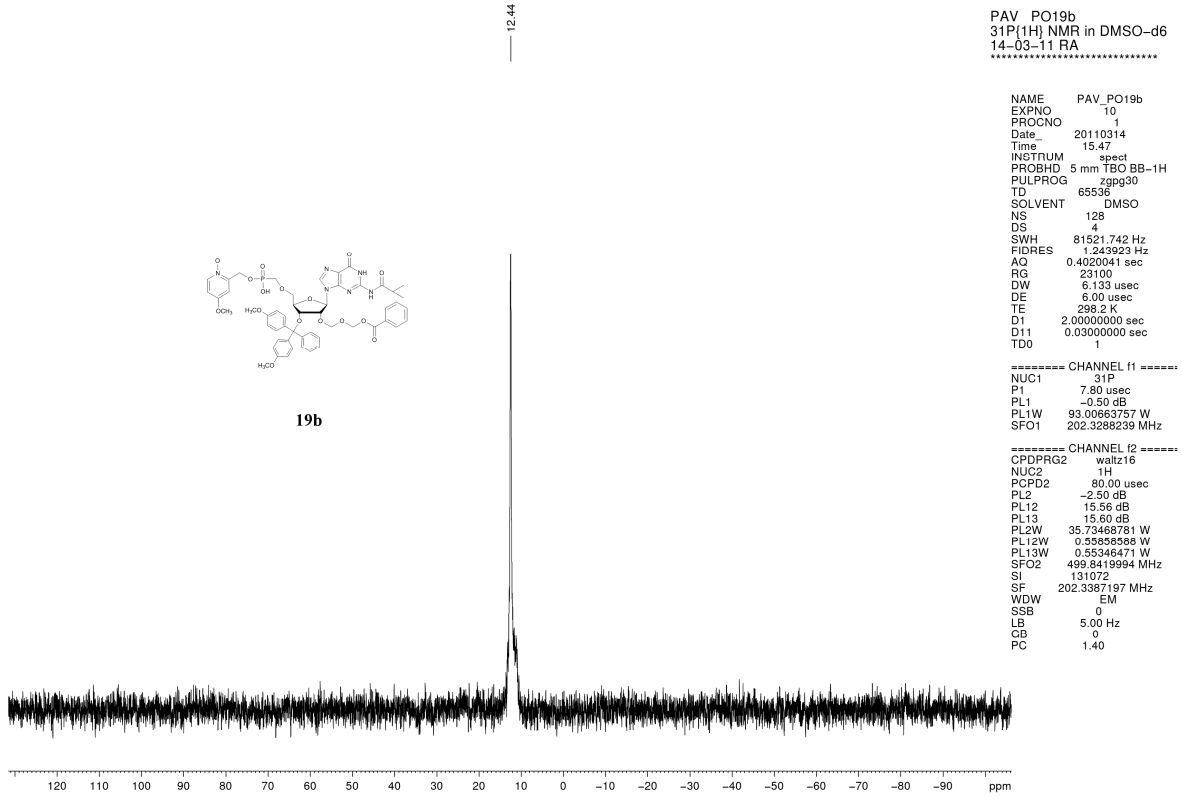




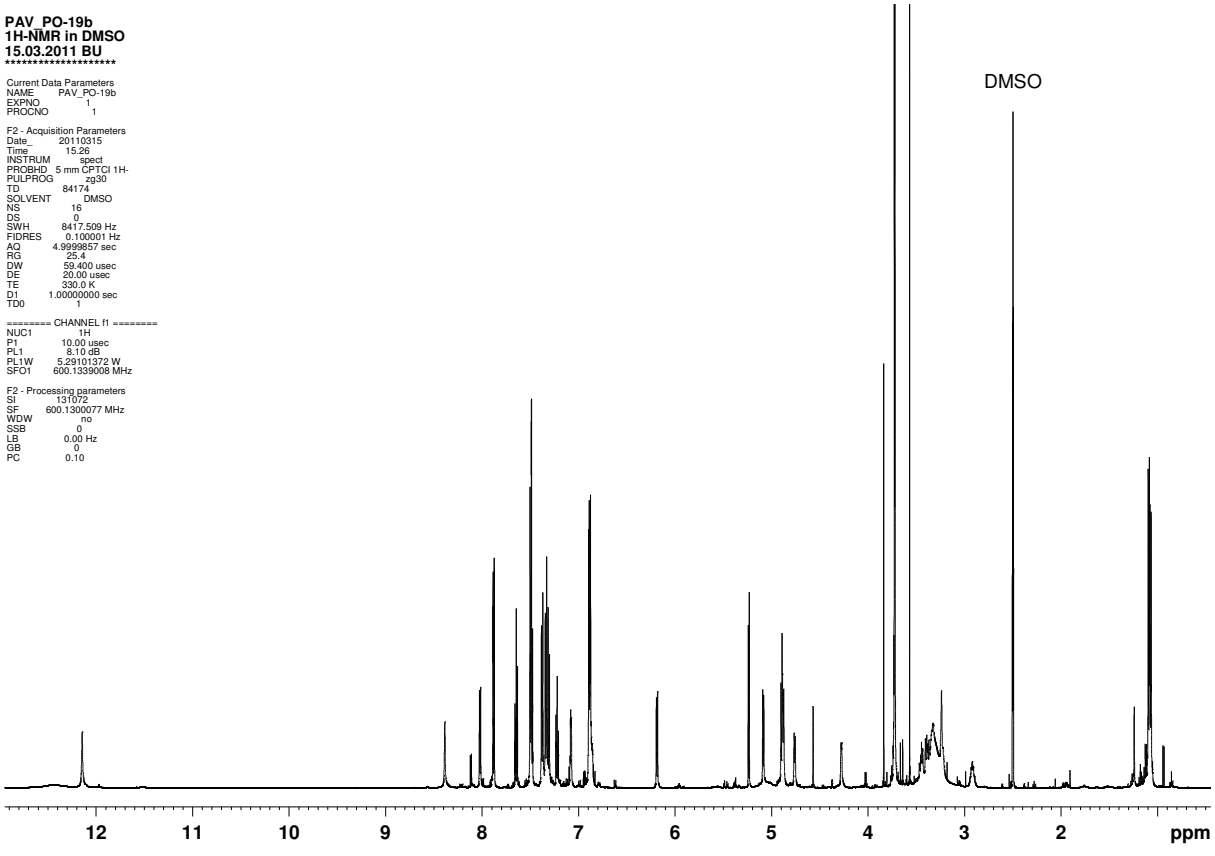
19a

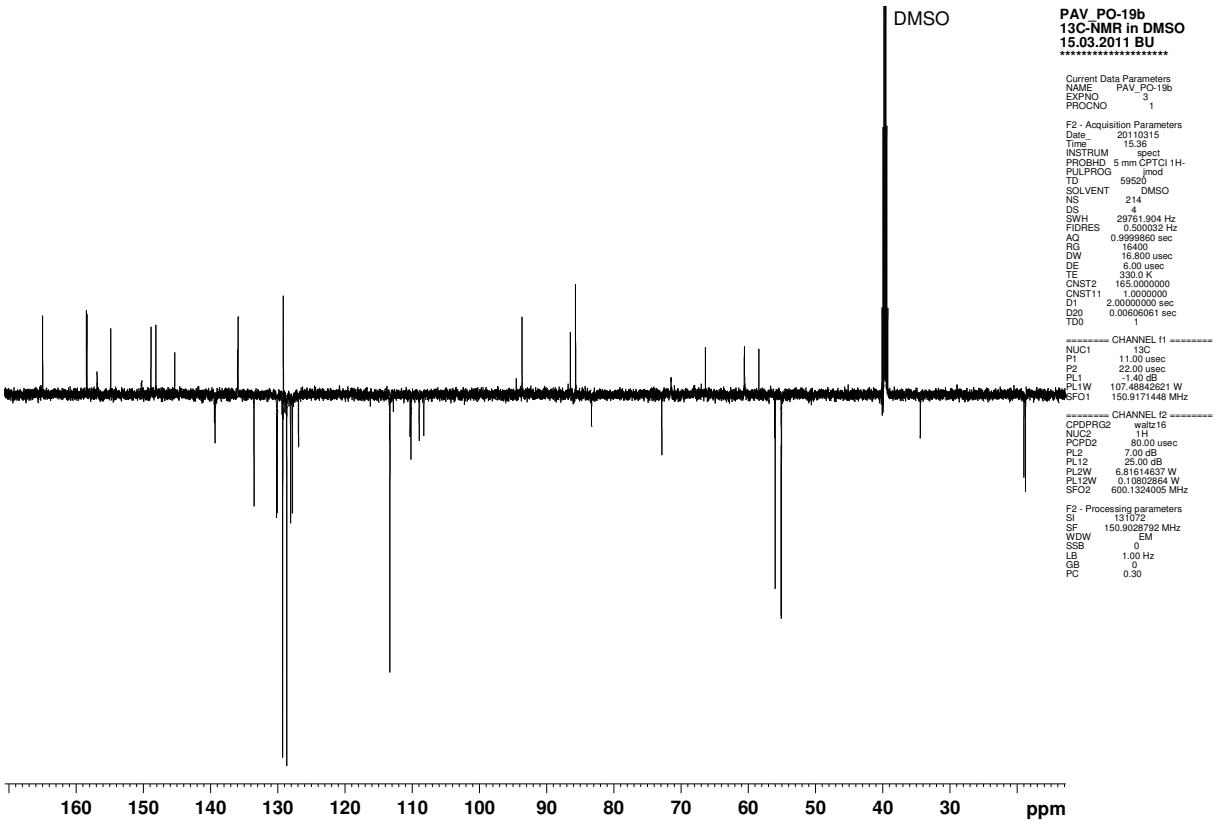


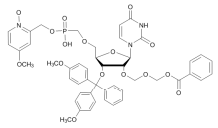




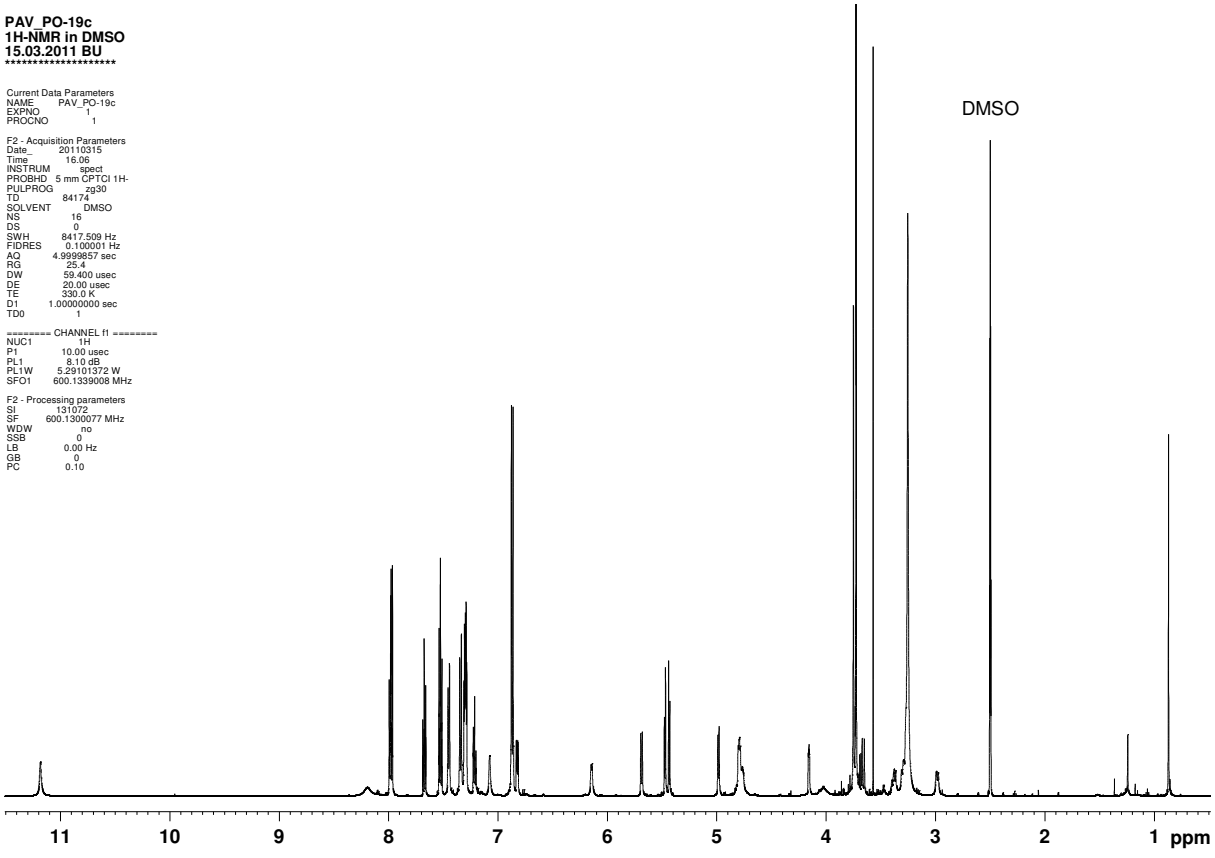
19b

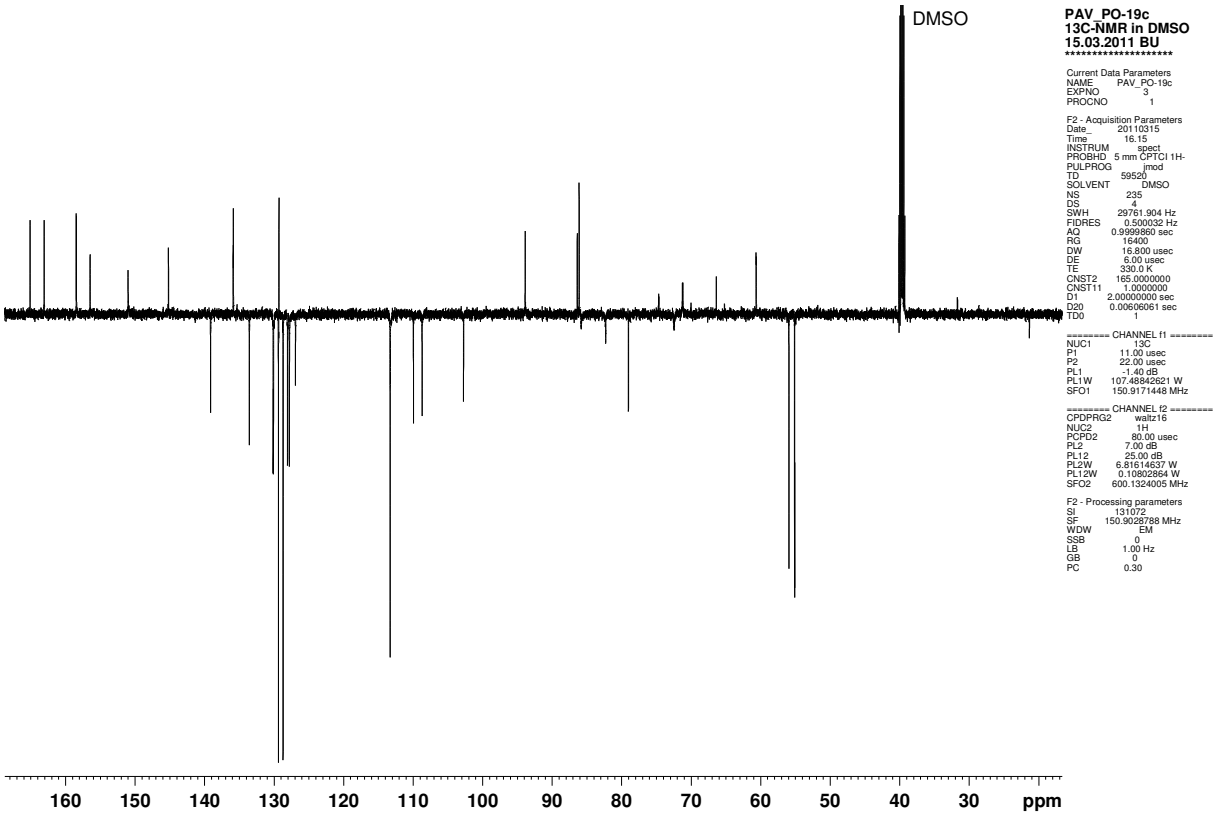






19c





PAV_PO-19c
13C-NMR in DMSO
15.03.2011 BU
****

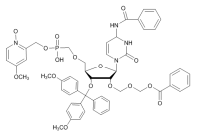
Current Data Parameters
NAME PAV_PO-19c
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110315
Time 16.15
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG zgpg30
TD 59520
SOLVENT DMSO
NS 235
DS 4
SWH 29761.904 Hz
FIDRES 0.500032 Hz
AQ 0.9999860 sec
RG 16400
DW 16.800 usec
DE 6.00 usec
TE 330.0 K
CNST2 165.0000000
CNST11 1.0000000
D1 2.00000000 sec
D20 0.00606061 sec
TD0 1

======== CHANNEL f1 ========
NUC1 13C
P1 11.00 usec
P2 22.00 usec
PL1 -1.40 dB
PL1W 107.48842621 W
SFO1 150.9171448 MHz

======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 7.00 dB
PL12 25.00 dB
PL2W 6.81614637 W
PL12W 0.10802864 W
SFO2 600.1324005 MHz

F2 - Processing parameters
SI 131072
SF 150.9028788 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 0.30



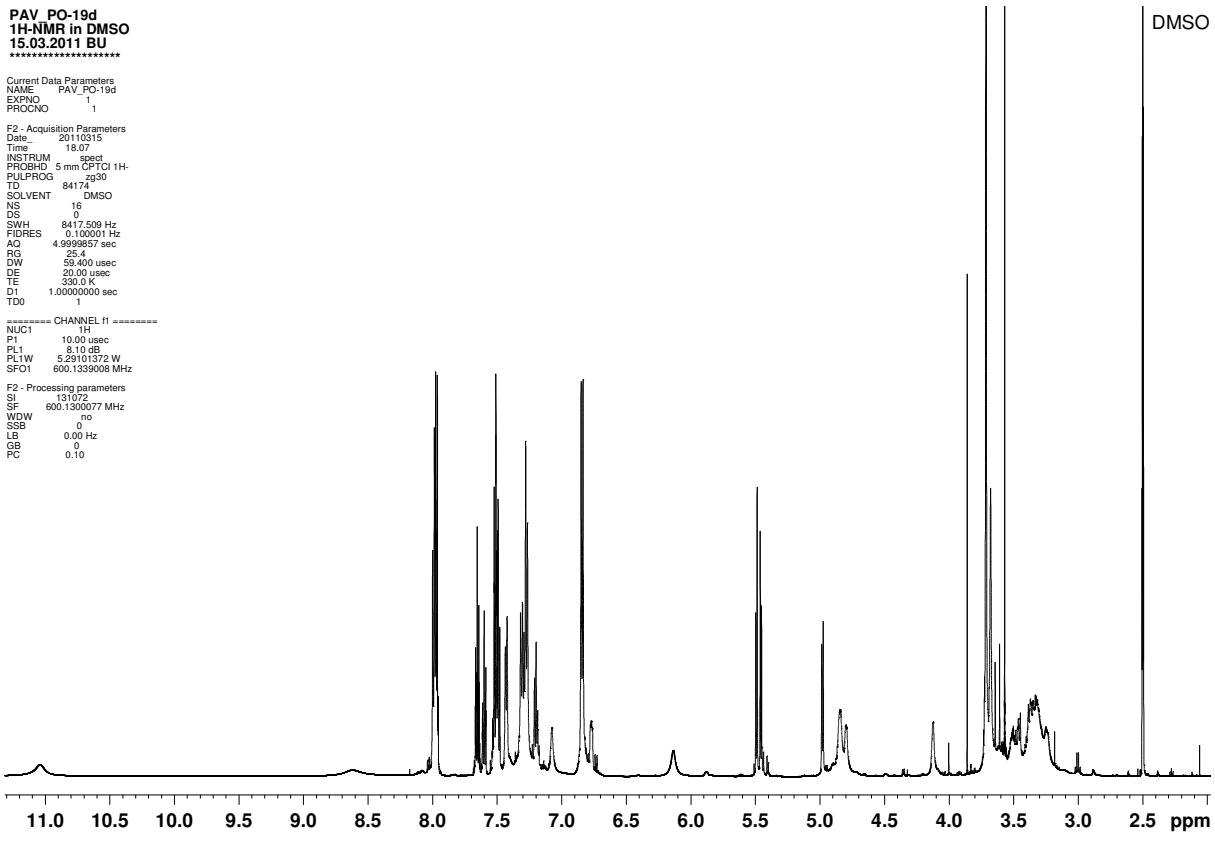
19d

PAV_PO19d
31P{1H} NMR in DMSO−d6
14−03−11 RA
****

NAME PAV_PO19d
EXPNO 10
PROCNO 1
Date_ 20110314
Time 16.00
INSTRUM spect
PROBHD 5 mm TBO BB−1H
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 128
DS 4
SWH 81521.742 Hz
FIDRES 1.243923 Hz
AQ 0.4020041 sec
RG 23100
DW 6.133 usec
DE 6.00 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

======== CHANNEL f1 ======
NUC1 31P
P1 7.80 usec
PL1 −0.50 dB
PL1W 93.00663757 W
SFO1 202.3288239 MHz

======== CHANNEL f2 ======
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 −2.50 dB
PL12 15.56 dB
PL13 15.60 dB
PL2W 35.73468781 W
PL12W 0.55858588 W
PL13W 0.55346471 W
SFO2 499.8419994 MHz
SI 131072
SF 202.3387197 MHz
WDW EM
SSB 0
LB 10.00 Hz
GB 0
PC 1.40



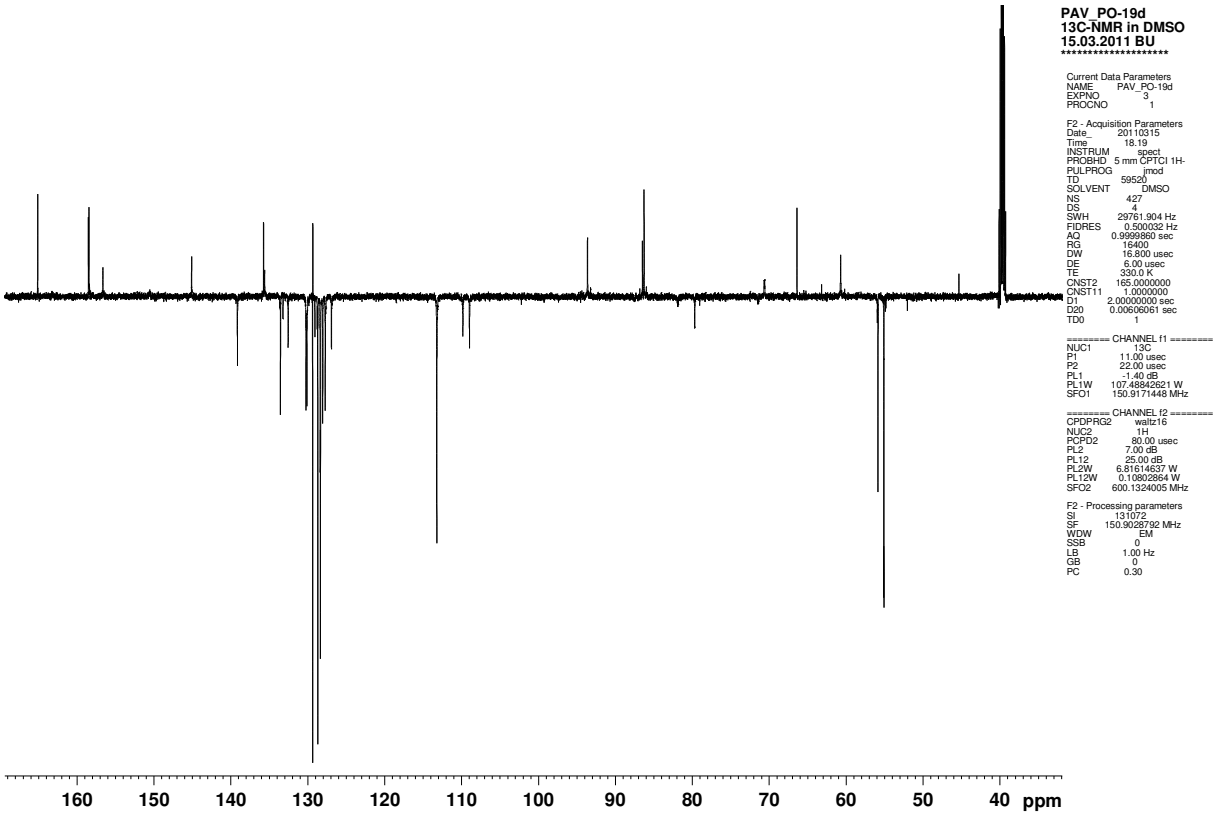
PAV_PO-19d
1H-NMR in DMSO
15.03.2011 BU
****

Current Data Parameters
NAME PAV_PO-19d
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20110315
Time 18.07
INSTRUM spect
PROBHD 5 mm CPTCI 1H-
PULPROG zg30
TD 84174
SOLVENT DMSO
NS 16
DS 0
SWH 8417.509 Hz
FIDRES 0.100001 Hz
AQ 4.9999857 sec
RG 25.4
DW 59.400 usec
DE 20.00 usec
TE 330.0 K
D1 1.00000000 sec
TD0 1

======== CHANNEL f1 ========
NUC1 1H
P1 10.00 usec
PL1 8.10 dB
PL1W 5.29101372 W
SFO1 600.1339008 MHz

F2 - Processing parameters
SI 131072
SF 600.1300077 MHz
WDW no
SSB 0
LB 0.00 Hz
GB 0
PC 0.10



Impurity seen in ^{31}P spectra of compound **19d** was characterized by LC-MS as bis(MOP)ester; ESI MS calcd for $C_{61}H_{63}N_5O_{18}P$ $(M+H)^+$ 1184.39, found 1184.36. We were not able to separate this impurity even after several chromatografies. Nevertheless, this impurity does not interfere solid phase synthesis.