

SUPPORTING INFORMATION

Synthesis of (Phosphonomethyl)Phosphinate Pyrophosphate Analogues via the Phospha-Claisen Condensation

Fabien Gelat, Claire Lacomme, Olivier Berger, Laurent Gavara, and J.-L. Montchamp*

General Chemistry.

^1H NMR spectra were recorded on a 300-MHz Varian INOVA spectrometer or 400-MHz Bruker Avance spectrometer. Chemical shifts for ^1H NMR spectra (in parts per million) relative to internal tetramethylsilane (Me_4Si , $\delta = 0.00$ ppm) with deuterated chloroform. ^{13}C NMR spectra were recorded at 75 or 101 MHz. Chemical shifts for ^{13}C NMR spectra are reported (in parts per million) relative to CDCl_3 ($\delta = 77.0$ ppm). ^{31}P NMR spectra were recorded at 121 or 162 MHz, and chemical shifts reported (in parts per million) relative to external 85% phosphoric acid ($\delta = 0.0$ ppm). Flash chromatography experiments were carried out on Silica Gel premium Rf grade (40–75 μm). Ethyl acetate/hexane mixtures or dichloromethane/acetone were used as the eluent for chromatographic purifications. TLC plates were visualized by UV or immersion in permanganate potassium (3 g KMnO_4 , 20 g K_2CO_3 , 5 mL 5% aq. NaOH and 300 mL of water) followed by heating. High resolution mass spectra (HRMS) were obtained either by direct probe (EI/CI) and analyzed by magnetic sector, or by electrospray using a TOF analyzer.

Reagent and solvents.

All starting materials were purchased from commercial sources and used as received. The solvents were distilled under N_2 and dried according to standard procedures (THF from Na/ benzophenone ketyl; DMF from MgSO_4 ; CH_3CN , toluene and dichloromethane from CaH_2).

^{31}P NMR Yield Measurements.

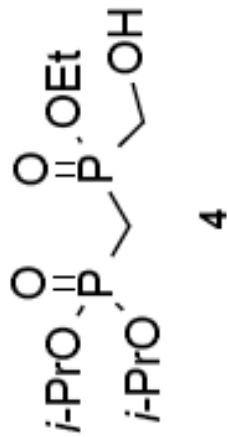
The NMR yields are determined by integration of all the resonances in the ^{31}P spectra, an approach which is valid if no phosphorus-containing gas (i.e. PH_3) evolves, or if the precipitate in a heterogeneous mixture does not contain phosphorus. The yields determined by NMR are generally accurate within ~10% of the value indicated, and are reproducible.

CL 43 (OH) org

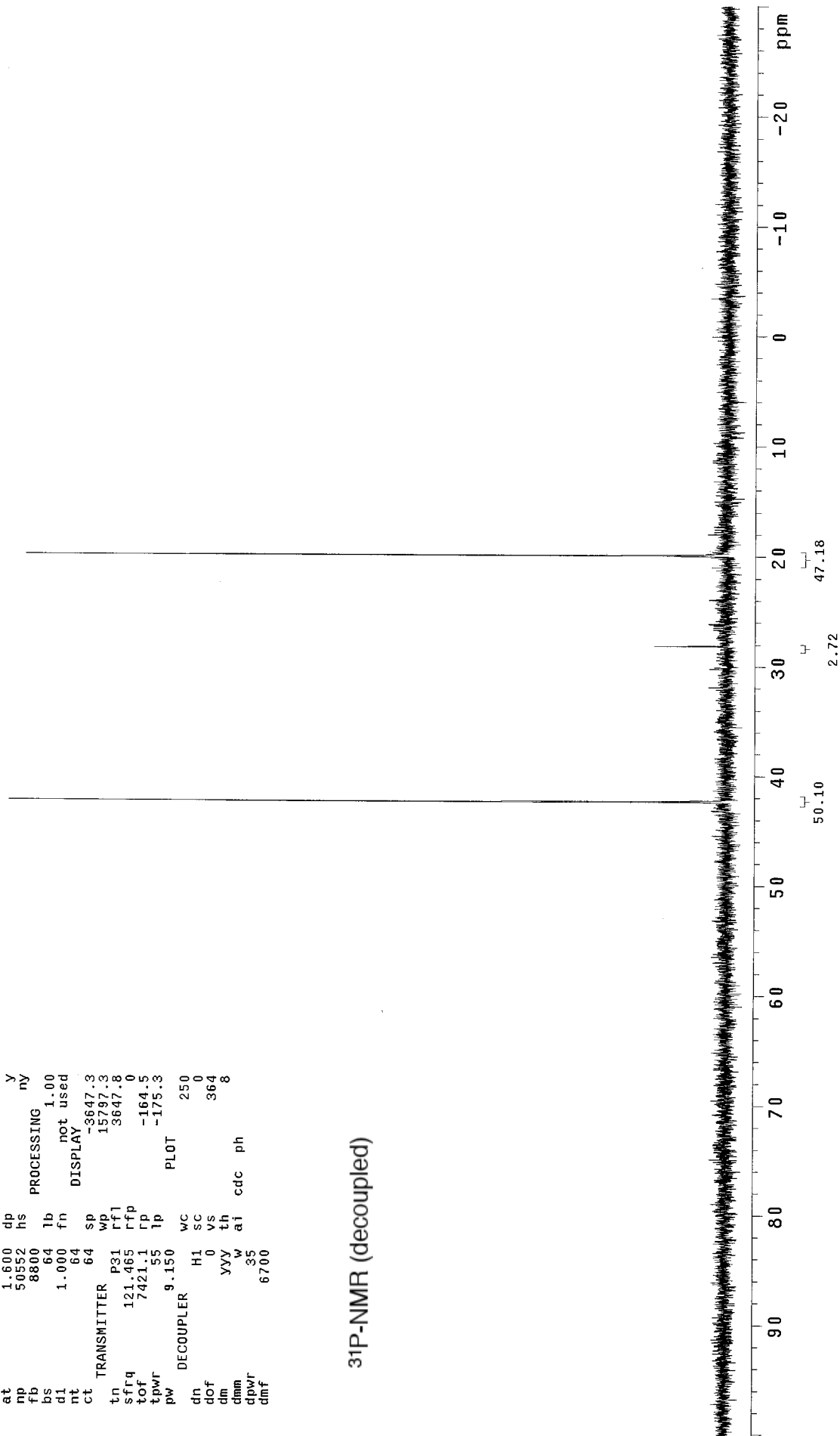
exp5 Phosphorus

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solvent	cdcl3	gain	20
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2012.07.15/s_2012~	pw90		18.300
0725_08/data/cdcl3~	alfa		10.000
02.fid	FLAGS		
ACQUISITION	il	n	
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800		
bs	64	lb	1.00
dl	1.000	fn	not used
nt	64		
ct	64		
TRANSMITTER	P31	sp	-3647.3
tn	121.465	wp	15797.3
sfrq	7421.1	rfl	3647.8
tof	55	rpf	0
tpwr	9.150	lp	-164.5
pw			-175.3
DECOUPLER	H1	wc	250
dn	0	sc	0
dof	0	vs	364
dm	yyv	th	8
dmm	ai	cdc	ph
dpwr	35		
dmt	6700		

INDEX	FREQUENCY	PPM	HEIGHT
1	5141.1	42.327	126.0
2	3414.2	28.109	12.7
3	2417.2	19.901	123.3



³¹P-NMR (decoupled)

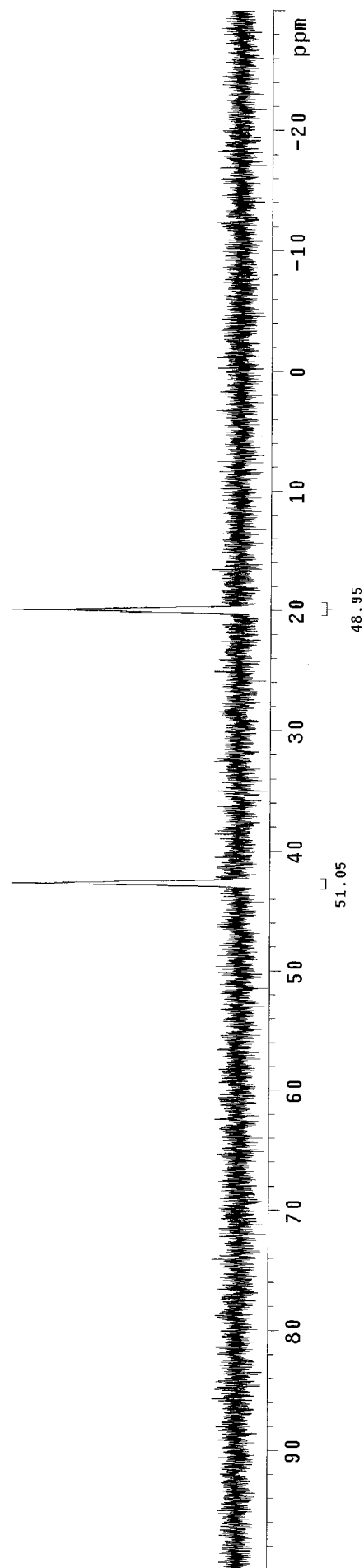
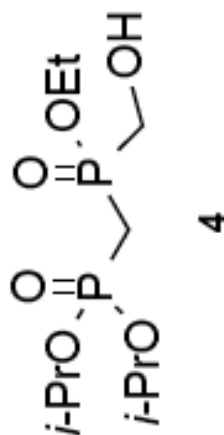


INDEX	FREQUENCY	PPM	HEIGHT
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2	2425.8	19.972	36.6

³¹P-NMR (coupled)

CL 32 (org)
exp6 Phosphorus

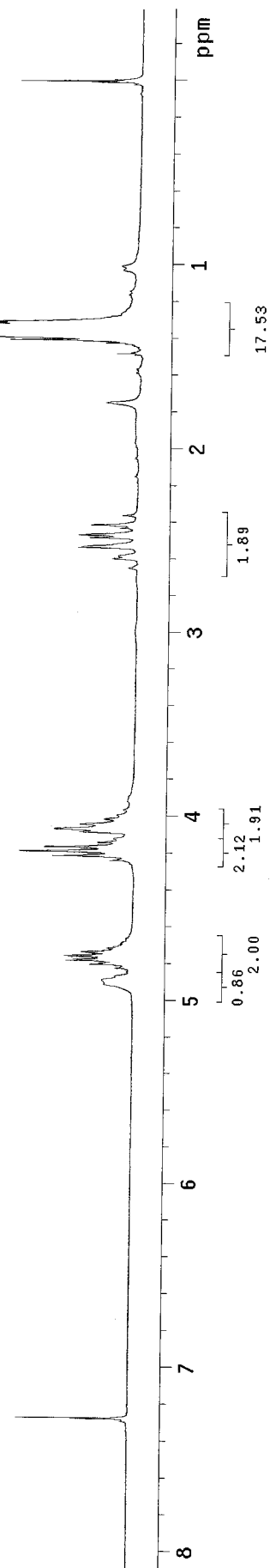
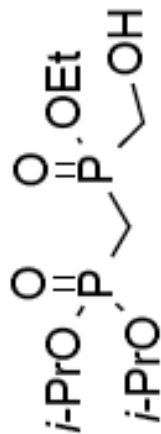
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/nmr	sys/data/autor~	hst	0.008
2012.07.15/S.2012~	pw90	18.300	
0718_17/data/cdcl3~	alfa	10.000	
ACQUISITION		FLAGS	
sw	15797.8	il	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800	PROCESSING	
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64	DISPLAY	
ct	64	sp	-3647.3
tn	P31	wp	15797.3
sfrq	121.465	rfl	3647.8
tof	7421.1	rpf	0
tpwr	55	lp	81.9
pw	9.150	lp	-228.3
DECOUPLER		wc	250
dn	H1	sc	0
dof	0	vs	348
dm	ynn	th	11
dmm	w	ai	cdc ph
dpwr	35		
dmf	6700		



FG245-1

exp1 Proton

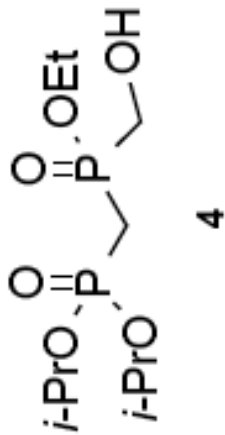
SAMPLE DEC. & VT
 date Dec 10 2012 dfrq 75.454
 solvent cdc13 dn C13
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 /vnmrSYS/data/autoc~ dof 0
 2012.12.07/s.2012~ dm nnn
 1210_02/data/cdc13~ dnm C
 02.fid dmf 13100
 ACQUISITION PROCESSING
 sfrq 300.047 wtfile
 tn H1
 at 1.998 ft
 np 19184 fn not used
 sw 4800.8 werr xmreact
 fb 2600 wexp abortoff flus~
 bs 16 h procplot aborton
 tpwr 55 wbs
 pw 7.9 wnt
 dl 1.000
 tof 277.9
 nt 32
 ct 32
 alock n
 gain not used
 il n
 in n
 dp y
 DISPLAY
 sp -115.4
 wp 2546.3
 vs 91
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 rfl 593.9
 rfp 0
 th 2
 ins 2.000
 ai cdc ph

¹H-NMR

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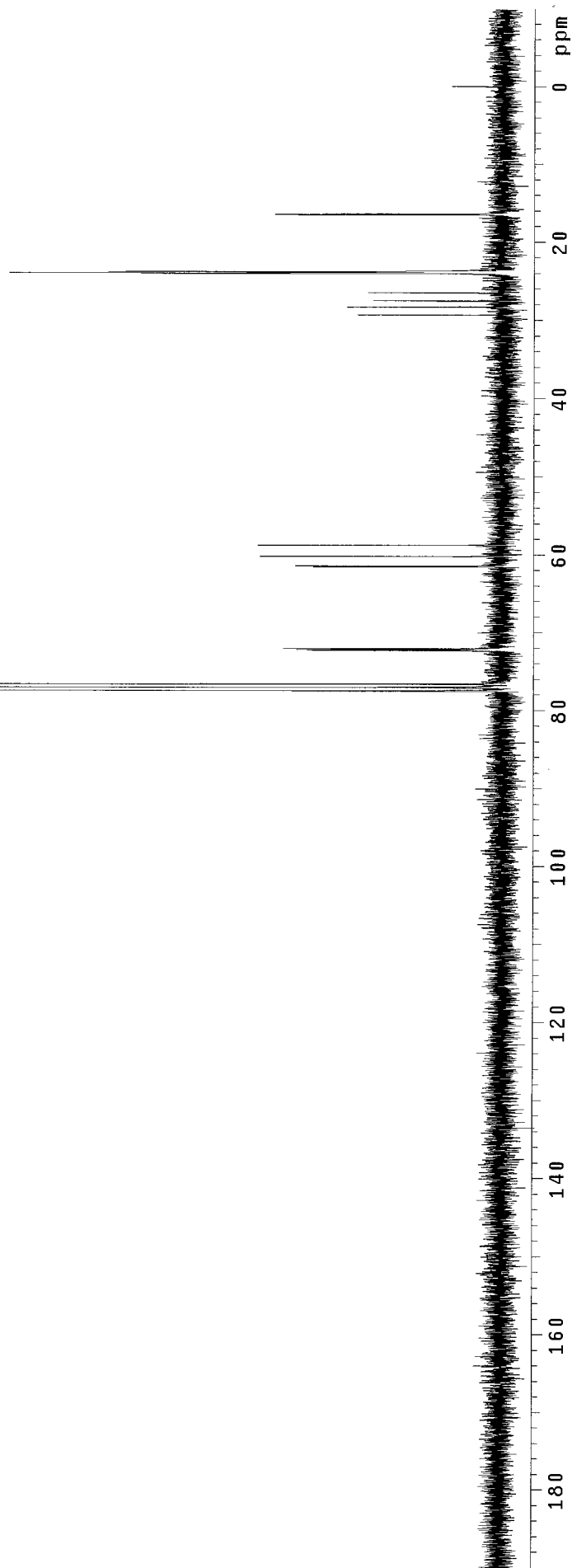
CL 43
pad=10 run with findz0 before acquisition
n
exp5 Carbon
SAMPLE
date Aug 6 2012 temp not used
solvent cdc13 gain 20
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/vnmrsys/data/autos hst 0.008
-2012.07.31/s_2012~ pw90 18.500
0806_20/data/cdc13~ alfa 10.000
01.fid
ACQUISITION
sw 15083.0 in n
at 1.301 dp y
np 39232 hs nn
fb 8400
bs 64 lb 0.50
d1 2.000 fn not used
nt 512
ct 512 sp
tn TRANSMITTER G13 wp 15082.5
sfrq 75.453 rfp 751.3
tof -365.7 rp 40.8
tpwr 58 lp -154.2
pw 9.250 PLOT
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dn H1 sc 0
dof 0 vs 1269
dm yyy th cdc ph
dpm w a1
dpwr 35
dmf 6700

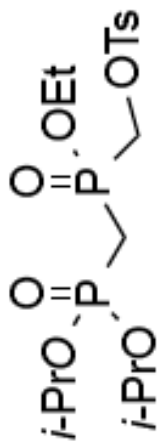
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¹³C-NMR

INDEX	FREQUENCY	PPM	HEIGHT
1	5845.2	77.475	97.4
2	5813.0	77.048	99.6
3	5781.2	76.627	99.4
4	5455.8	72.313	30.5
5	5448.9	72.222	31.4
6	5443.8	72.155	33.1
7	5436.9	72.063	35.2
8	4640.6	61.508	30.5
9	4634.1	61.423	33.3
10	4540.2	60.178	39.0
11	4432.5	58.751	39.4
12	2211.6	29.314	23.4
13	2134.3	28.289	25.1
14	2076.3	27.520	20.8
15	1999.4	26.501	21.8
16	1813.0	24.030	58.2
17	1809.3	23.981	79.6
18	1806.5	23.945	63.0
19	1799.6	23.853	59.0
20	1797.8	23.829	63.5
21	1794.1	23.780	60.2
22	1792.7	23.762	60.7
23	1245.0	16.502	33.0
24	1238.5	16.416	36.8
25	-3.3	-0.044	8.2





5

³¹P-NMR (decoupled)

34.105 —
14.943 —

```

Current Data Parameters
NAME      FG143p
EXPNO     10
PROCNO    1

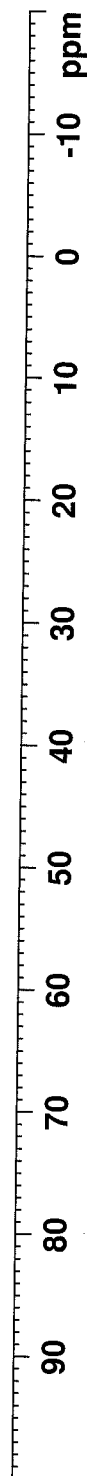
F2 - Acquisition Parameters
Date_     20140521
Time      18.54
INSTRUM   spect
PROBHD    5 mm PABBO BB/
PULPROG   zgpg30
TD        65536
SOLVENT   Acetone
NS        16
DS        4
SWH       64102.563 Hz
FIDRES    0.978127 Hz
AQ        0.5111808 sec
RG        203.57
DW        7.800 usec
DE        6.50 usec
TE        295.0 K
D1        2.00000000 sec
D11       0.03000000 sec
TD0       1

===== CHANNEL f1 =====
SFO1      161.9674942 MHz
NUC1      31P
P1        14.25 usec
PLW1      15.00000000 W

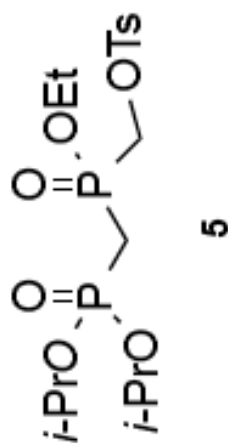
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SFO2      400.1316005 MHz
NUC2      1H
CPDPRG[2  waltz16
PCPD2     90.00 usec
PLW2      10.00000000 W
PLW12     0.31604999 W
PLW13     0.25600001 W

F2 - Processing parameters
SI        32768
SF        161.9755930 MHz
WDW       EM
SSB       0
LB        1.00 Hz
GB        0
PC        1.40

```



³¹P-NMR (coupled)



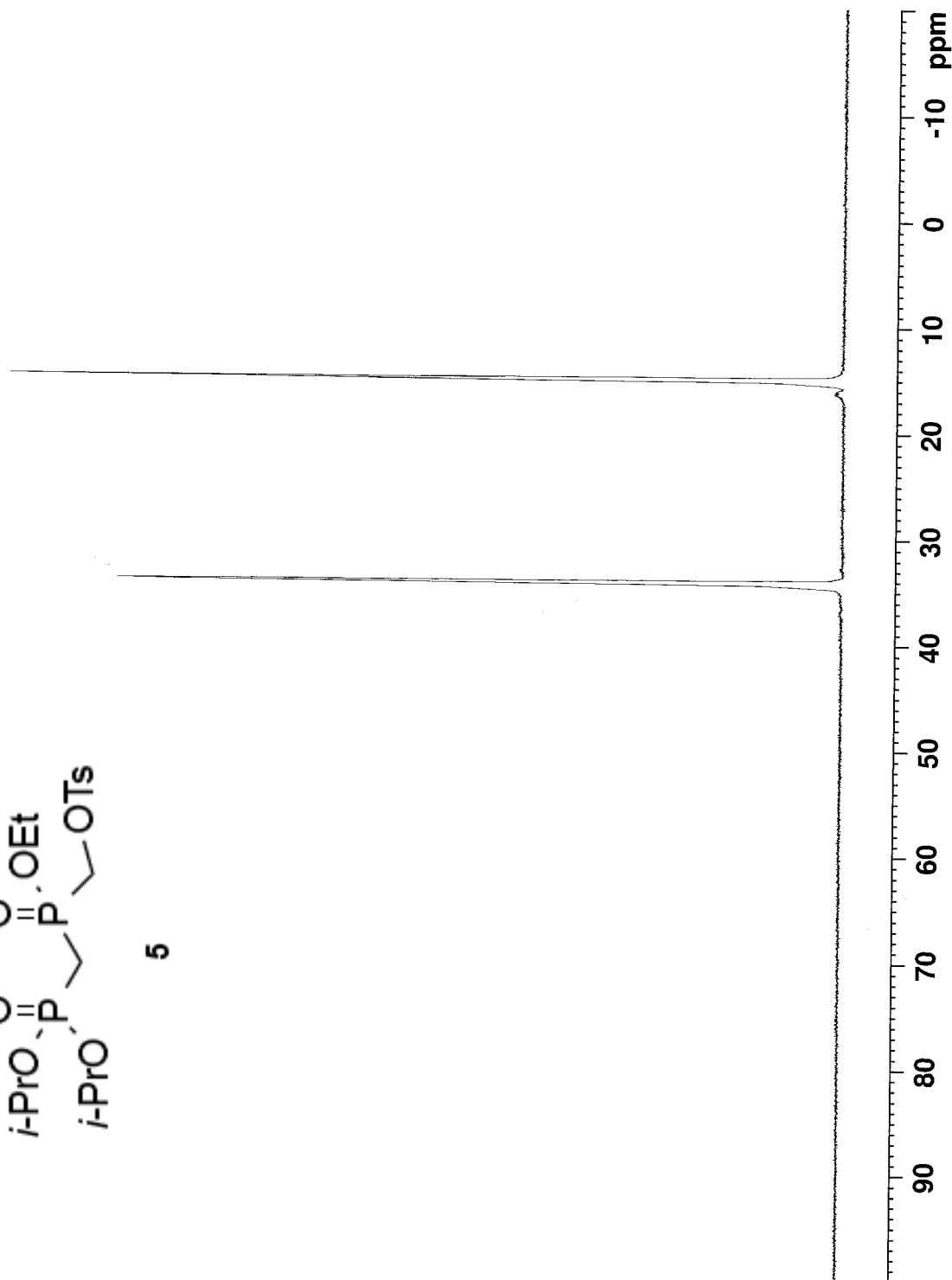
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EXPNO     11
PROCNO    1

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PULPROG   zg30
TD        65536
SOLVENT   Acetone
NS        32
DS        4
SWH        64102.563 Hz
FIDRES     0.978127 Hz
AQ         0.5111808 sec
RG         203.57
DW         7.800 usec
DE         6.50 usec
TE         294.7 K
D1         2.00000000 sec
TD0        1

===== CHANNEL f1 =====
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NUC1       31P
P1        14.25 usec
PLW1      15.00000000 W

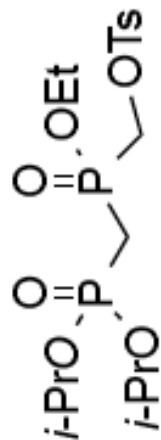
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SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
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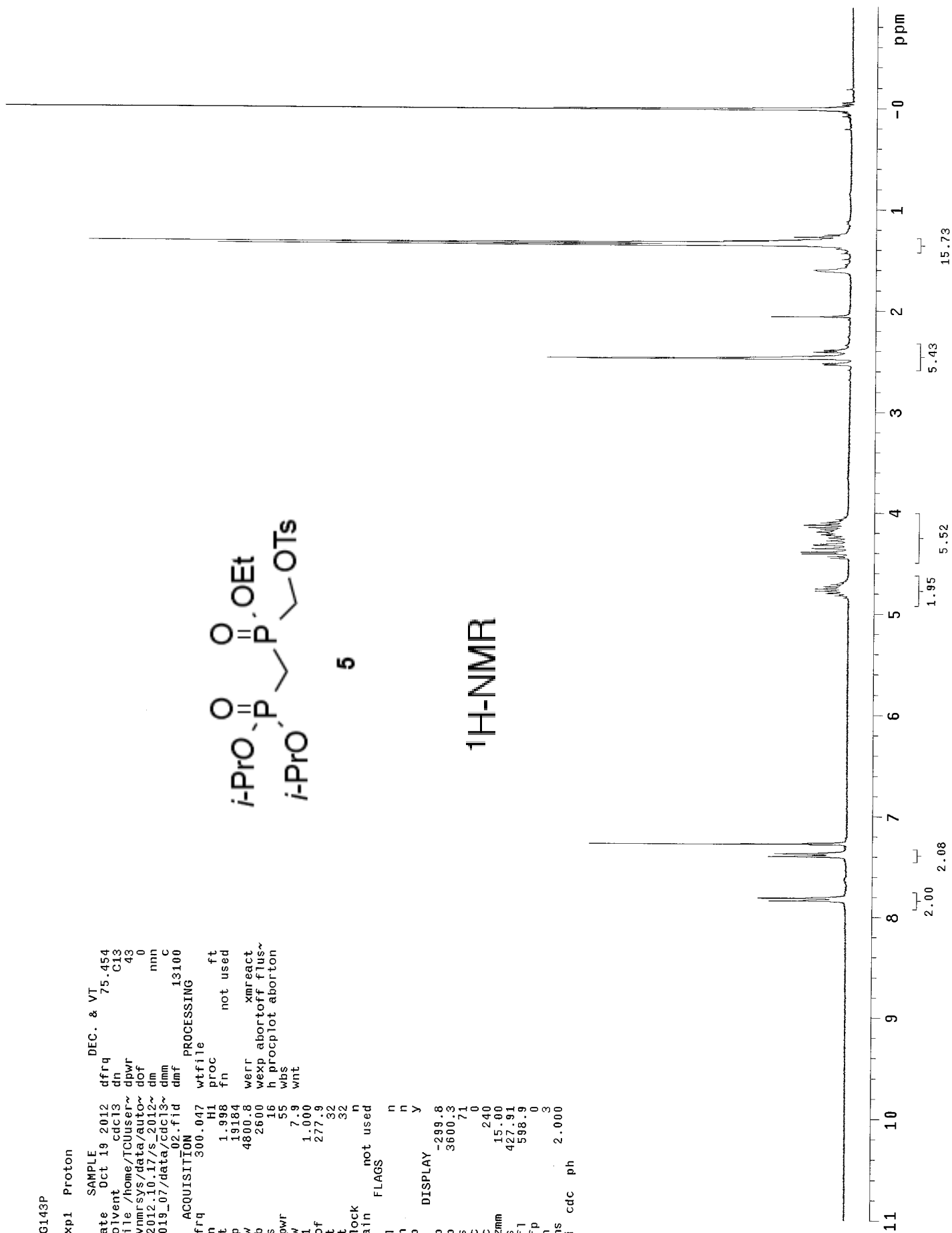
FG143P

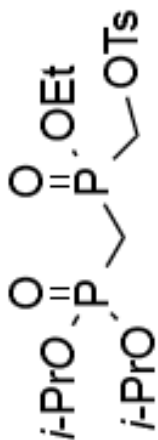
exp1 Proton

SAMPLE DEC. & VT
 date Oct 19 2012 dfrq 75.454
 solvent cdc13 dn C13
 file /home/TCUuser~ dpwr 43
 /vnmrsvs/data/autoc~ dof 0
 2012.10.17/s.2012~ nnn
 1019_07/data/cdc13~ dm C
 02.fid dmf 13100
 ACQUISITION
 sfrq 300.047 wtfile
 tn H1 ft
 at 1.998 fn not used
 np 19184
 sw 4800.8 werr xreact
 fb 2600 wexp abortoff flus~
 bs 16 h procplot aborton
 tpwr 55 was
 pw 7.9 wnt
 dl 1.000
 tof 277.9
 nt 32
 ct 32
 alock n
 gain not used
 flags
 il n
 in n
 dp y
 DISPLAY
 sp -299.8
 wp 3600.3
 vs 71
 sc 0
 wc 240
 hzmm 15.00
 ls 427.91
 rfl 598.9
 rfp 0
 th 3
 ins 2.000
 ai cdc ph



5

¹H-NMR



5

¹³C-NMR

```

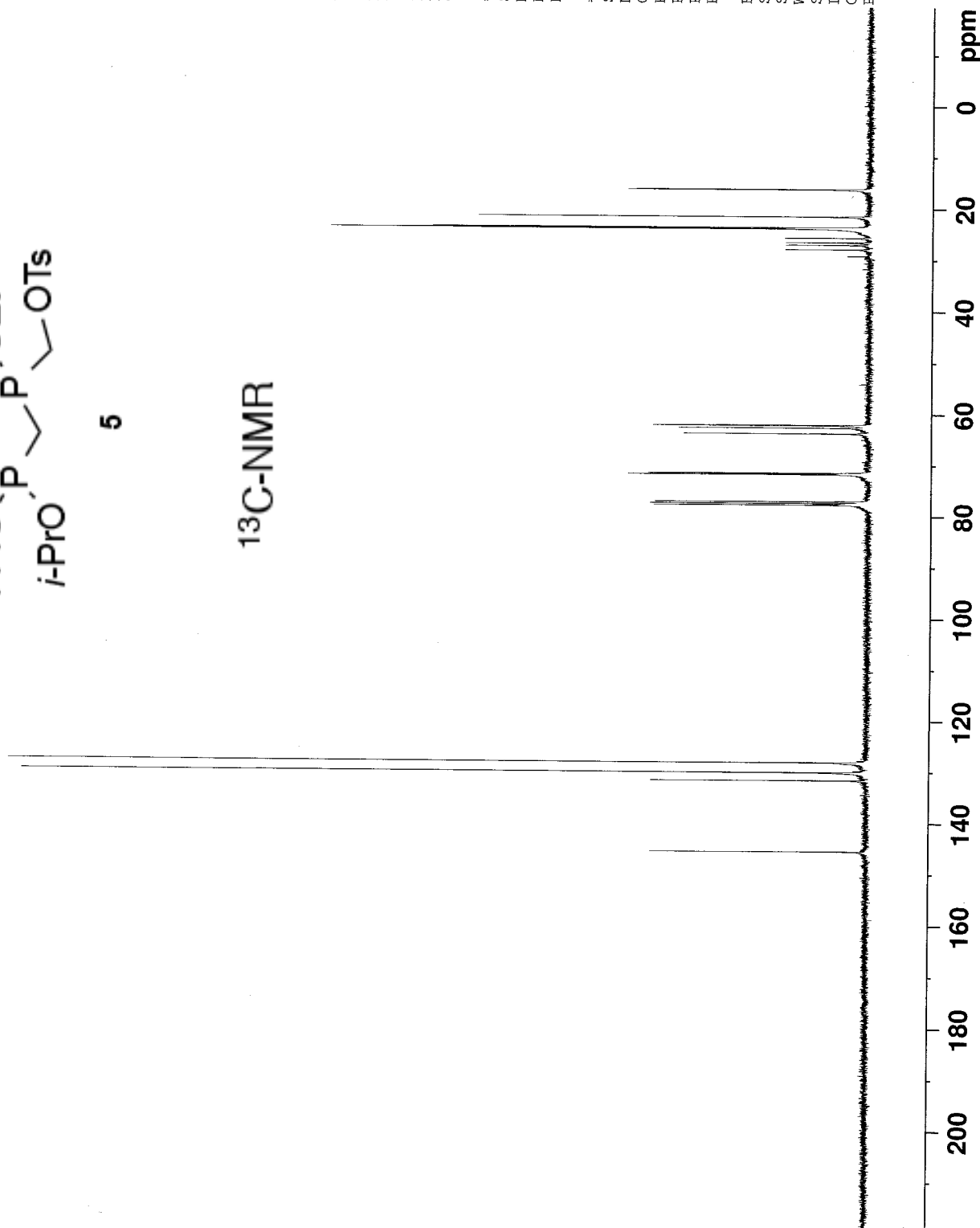
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EXPNO     14
PROCNO    1

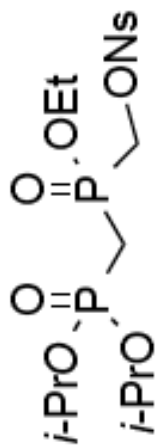
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PULPROG   zgpg30
TD        65536
SOLVENT   CDCl3
NS        335
DS        4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631488 sec
RG         203.57
DW         20.800 usec
DE         6.50 usec
TE         296.1 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        1

===== CHANNEL f1 =====
SFO1      100.6228293 MHz
NUC1      13C
P1         10.00 usec
PLW1      45.00000000 W

===== CHANNEL f2 =====
SFO2      400.1316005 MHz
NUC2      1H
CPDPRG[2  waltz16
PCPD2     90.00 usec
PLW2      10.00000000 W
PLW12     0.31604999 W
PLW13     0.25600001 W

F2 - Processing parameters
SI         32768
SF         100.6127690 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
  
```





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³¹P-NMR (decoupled)

34.113 —
16.079 —

```

Current Data Parameters
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EXPNO     10
PROCNO    1

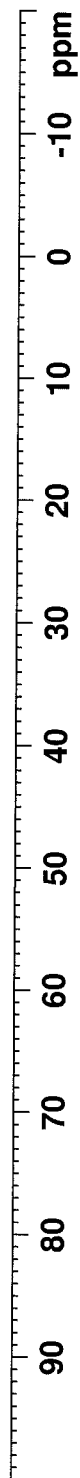
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Time      10.29
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PULPROG   zgpg30
ID        65536
SOLVENT   Acetone
NS        16
DS        4
SWH        64102.563 Hz
FIDRES     0.978127 Hz
AQ         0.5111808 sec
RG         203.57
DW         7.800 usec
DE         6.50 usec
TE         296.1 K
D1         2.0000000 sec
D11        0.0300000 sec
TD0        1

===== CHANNEL f1 =====
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NUC1       31P
P1        14.25 usec
PLW1      15.0000000 W

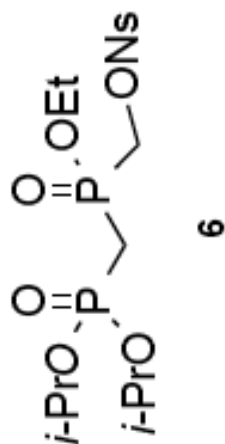
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NUC2       1H
CPDPRG2   waltz16
PCPD2     90.00 usec
PLW2      10.0000000 W
PLW12     0.31604999 W
PLW13     0.25600001 W

F2 - Processing parameters
SI         32768
SF         161.9755930 MHz
WDW        EM
SSB        0
LB         2.00 Hz
GB         0
PC         1.40

```



³¹P-NMR (coupled)



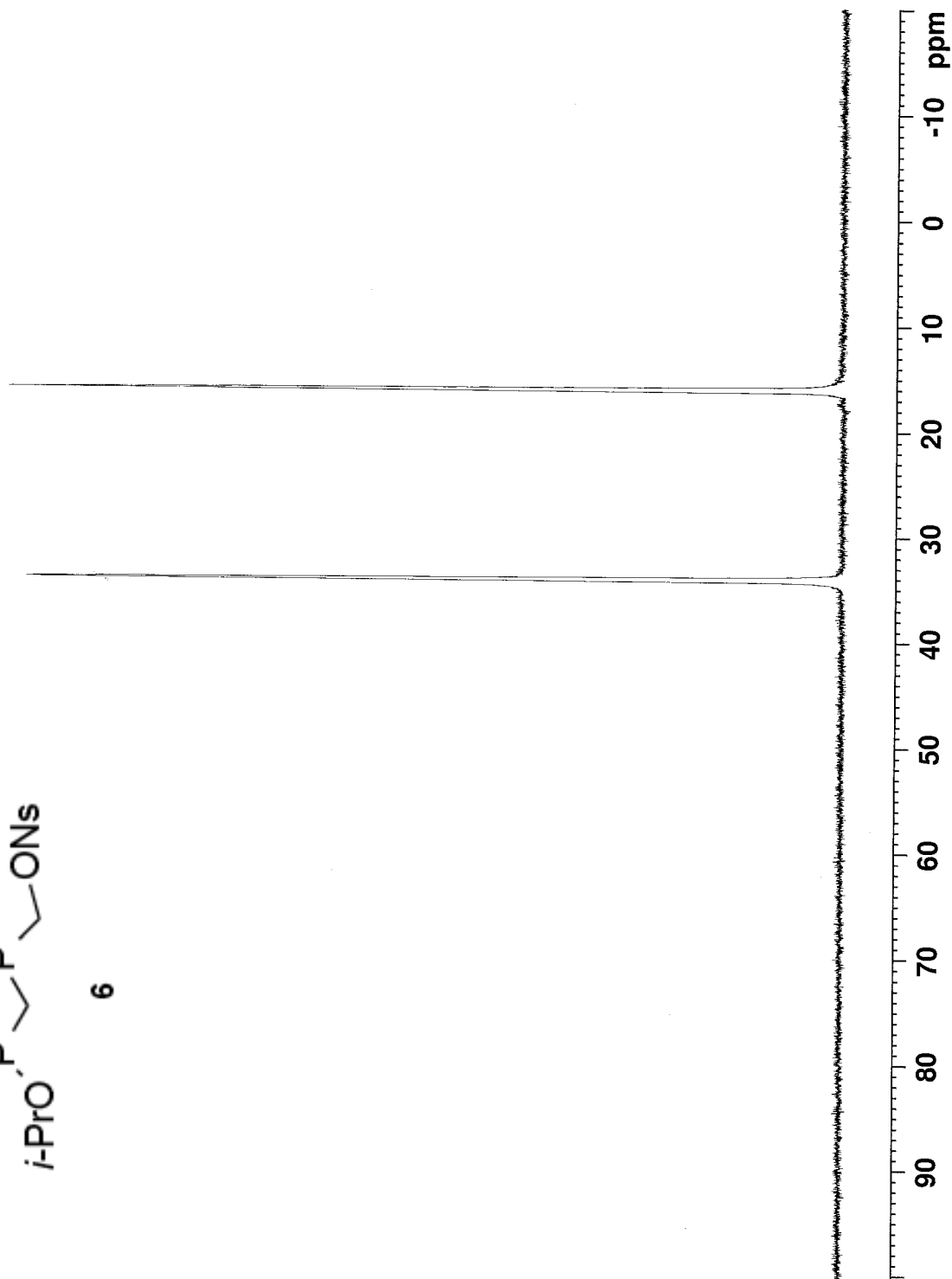
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Current Data Parameters
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EXPNO     11
PROCNO    1

F2 - Acquisition Parameters
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PULPROG   zg30
ID        65536
SOLVENT   Acetone
NS        32
DS        4
SWH       64102.563 Hz
FIDRES    0.978127 Hz
AQ        0.5111808 sec
RG        203.57
DW        7.800 usec
DE        6.50 usec
TE        295.6 K
D1        2.0000000 sec
TD0       1

===== CHANNEL f1 =====
SF01     161.9674942 MHz
NUC1     31P
P1       14.25 usec
PLW1     15.0000000 W

F2 - Processing parameters
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SF       161.9755930 MHz
WDW      EM
SSB      0
LB       1.00 Hz
GB       0
PC       1.40
  
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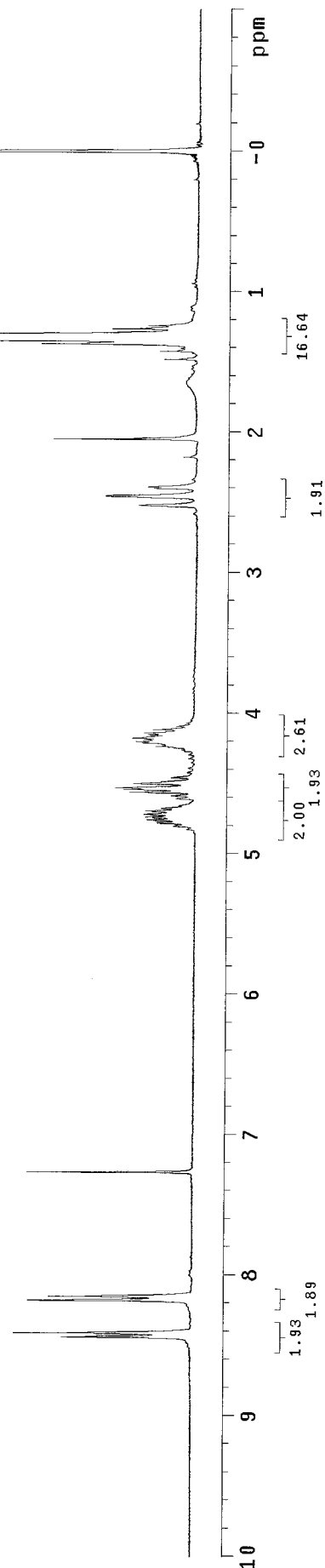
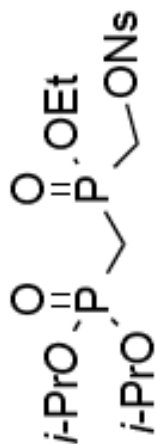
FG24P

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 2012.11.19/s_2012~ dm nnn
 1120_07/data/cdc13~ dmm c
 02.fid dmf 13100

ACQUISITION PROCESSING
 sfrq 300.047 wf file
 tn H1 proc ft
 at 1.998 fn not used
 np 19184
 sw 4800.8 werr xmreact
 fb 2600 wexp abortoff flus~
 bs 16 h procplot aborton
 tpwr 55 wbs
 pw 7.9 wnt
 d1 1.000
 tof 277.9
 nt 32
 ct 32
 alock not used
 gain n
 il n
 in n
 dp y

DISPLAY
 sp -301.2
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 rfp 0
 th 2
 ins 2.000
 al cdc ph

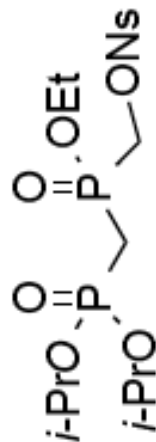
¹H-NMR

FG214P
pad=i0 run with findz0 before acquisition

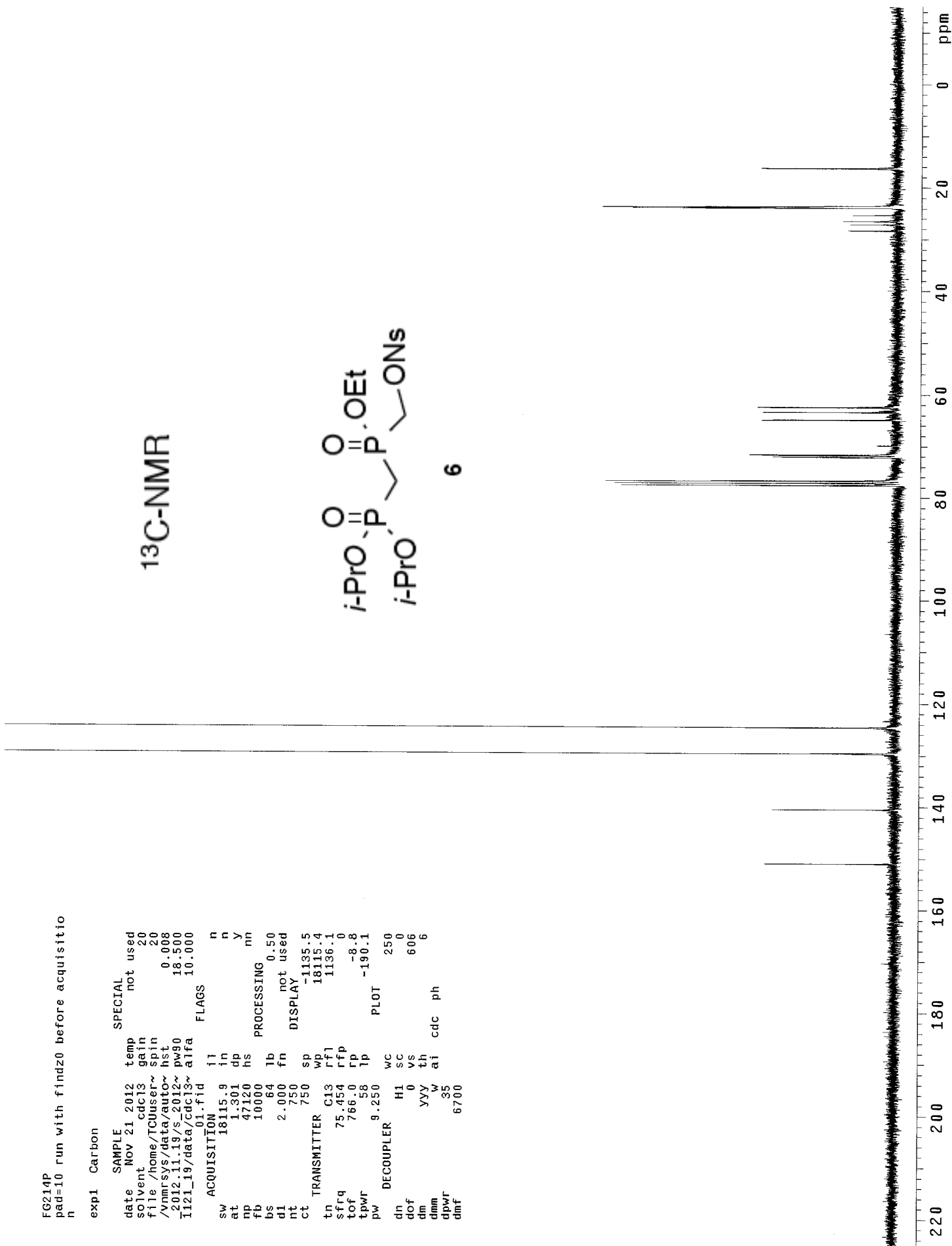
exp1 Carbon

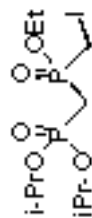
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date	Nov 21 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~	spin	20
	/vnmrsys/data/autoc~	hst	0.008
	2012.11.19/s_2012~	pw90	18.500
	1121_19/data/cdcl3~	alpha	10.000
ACQUISITION		FLAGS	
sw	18115.9	in	n
at	1.301	dp	y
np	47120	hs	nn
fb	10000	PROCESSING	
bs	64	lb	0.50
d1	2.000	fn	not used
nt	750	DISPLAY	
ct	750	SP	-1135.5
TRANSMITTER		WD	18115.4
tn	C13	rfl	1136.1
sfrq	75.454	rfp	0
tof	766.0	rp	-8.8
tpwr	58	lp	-190.1
pw	9.250	PLOT	
DECOUPLER		WC	250
dn	H1	SC	0
dof	0	VS	606
dm	YVY	th	6
dmm	W	ai	cdc
dpwr	35	ph	
dmf	6700		

¹³C-NMR



6





Compound 7
³¹P/¹H NMR decoupled



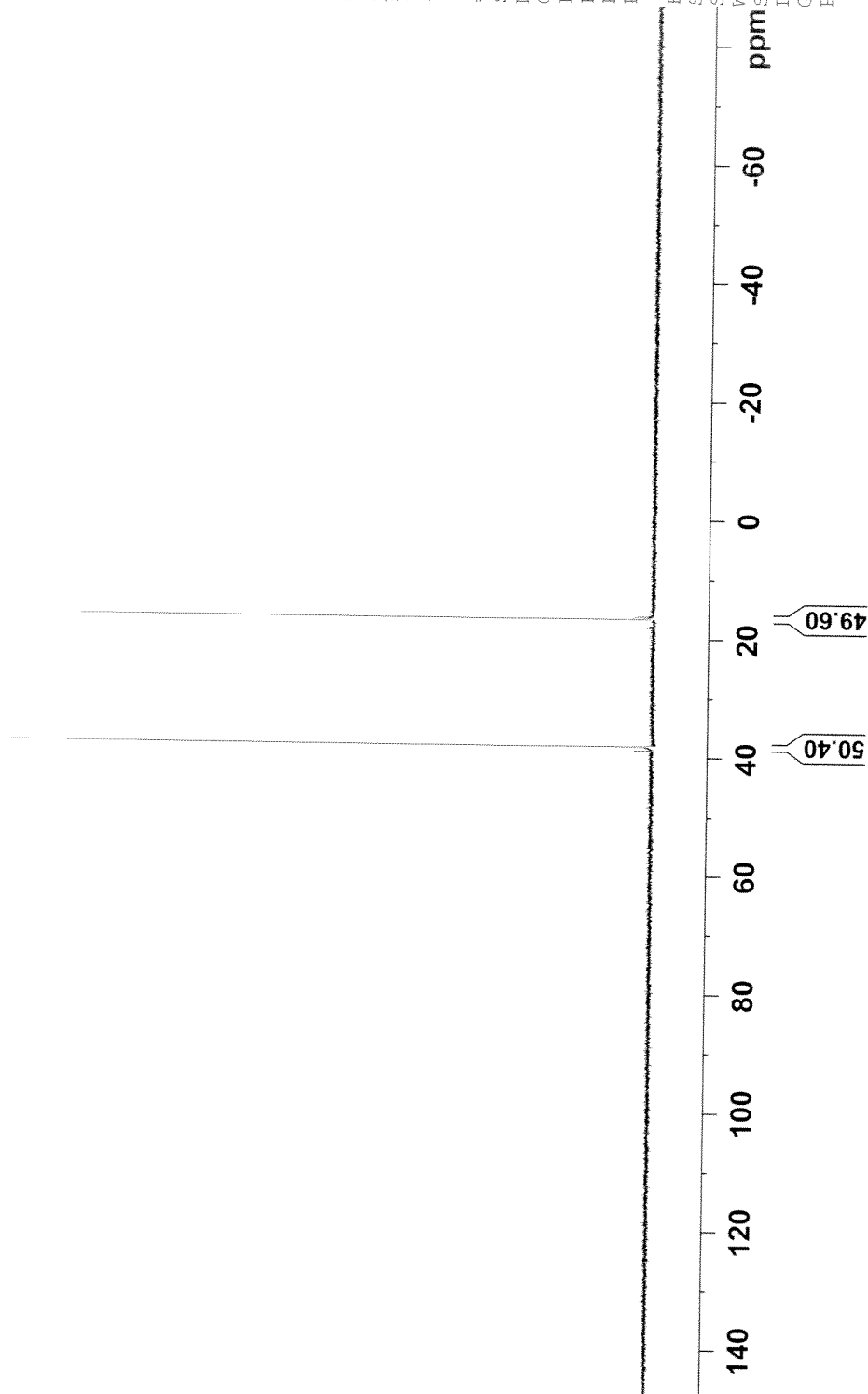
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 PROCNO 1

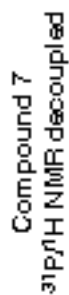
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 Time 17.03
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 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 295.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

===== CHANNEL f2 =====
 SFO2 400.1316005 MHz
 NUC2 1H
 CPDPRG[2] waltz16
 PCPD2 90.00 usec
 PLW2 10.00000000 W
 PLW12 0.31604999 W
 PLW13 0.25600001 W

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 WDW EM
 SSB 0
 LB 0
 GB 1.00 Hz
 PC 1.40





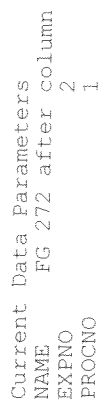
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Date_	20141020
Time--	17.35
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PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	16
DS	4
SWH	64102.563 Hz
FIDRES	0.978127 Hz
AQ	0.5111808 sec
RG	203.57
DDW	7.800 usec
DE	6.50 usec
TE	295.8 K
D1	2.00000000 sec
D11	0.03000000 sec
DD0	

```
=====
SFO1
NUC1
P1
PLW1
CHANNEL f1  =====
161.9674942 MHz
31P
14.25 usec
15.00000000 W
```

```
===== CHANNEL f2 =====
SF02      400.1316005 MHz
NUC2      1H
          waltz16
CPDPRG[2] 90.00 usec
CPD2      10.00000000 W
PLW1      0.31604999 W
PLW2      0.31604999 W
PLW3      0.25600000 W
```

F2 - Processing parameters





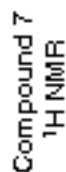
F2 - Acquisition Parameters

Date	20141020	requestion parameters
Time	17.37	
INSTRUM	spect	
PROBHD	5 mm PABBO BB/	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	32	
DS	4	
SWH	64102.563 Hz	
FIDRES	0.978127 Hz	
AQ	0.5111808 sec	
RG	203.57	
DW	7.800 usec	
DE	6.50 usec	
TE	295.3 K	
DD1	2.00000000 sec	
TD0	1	

```
===== CHANNEL f1 =====
SF01      161.9674942 MHz
NUC1      31P
P1        14.25 usec
PLW1      15.00000000 W
```

F2 - Processing parameters	
SI	32768
SF	161.975930 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





```

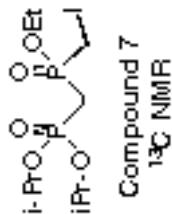
F2 - Acquisition Parameters
Date_      20141021
Time_      9.38
INSTRUM    spect
PROBHD     5 mm PABBO BB/
PULPROG    zg30
TD          65536
SOLVENT     CDCl3
NS          9
DS          2
SWH         8012.820 Hz
FIDRES     0.122266 Hz
AQ         4.0894465 sec
RG         158.63
WDW         62.400 usec
DE         6.50 usec
TE         295.9 K
D1         1.0000000 sec
DDO

```

```
===== CHANNEL f1 =====
SFO1      400.1324710 MHz
NUC1      1H
P1         10.00 usec
PLW1      25.00300026 W
```

F2 - Processing parameters	
SI	65536
SF	400.130000 MHz
WDW	EM
SSE	0
LB	0.30 Hz
GB	0
PC	1.00





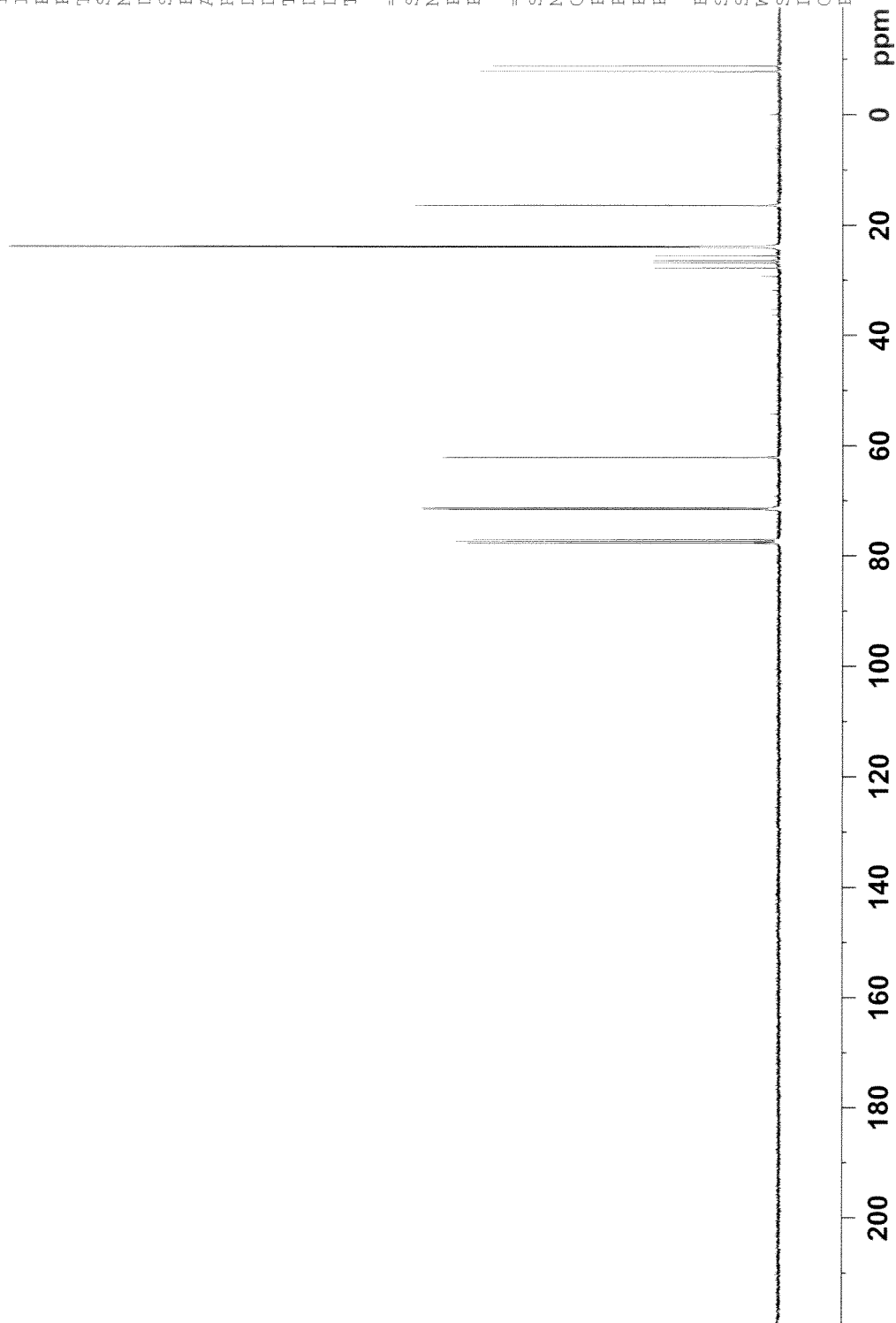
Current Data Parameters
 NAME FG 272 after vacuum
 EXPNO 4
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141021
 Time_ 10.13
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 262
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 203.57
 DW 20.800 usec
 DE 6.50 usec
 TE 296.7 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 100.6228293 MHz
 NUC1 13C
 P1 10.00 usec
 PLW1 45.00000000 W

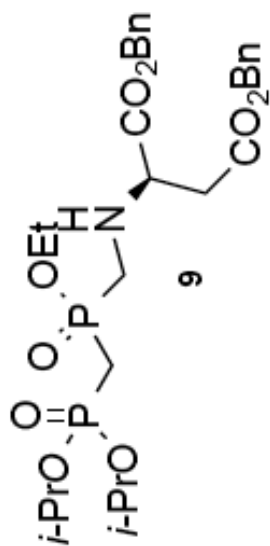
===== CHANNEL f2 =====
 SFO2 400.1316005 MHz
 NUC2 1H
 CPDPRG[2] waltz16
 PCPD2 90.00 usec
 PLW2 10.00000000 W
 PLW12 0.31604999 W
 PLW13 0.25600001 W

F2 - Processing parameters
 SI 32768
 SF 100.6127685 MHz
 WDW EM
 SSB 0
 LB 0
 GB 0
 PC 1.40

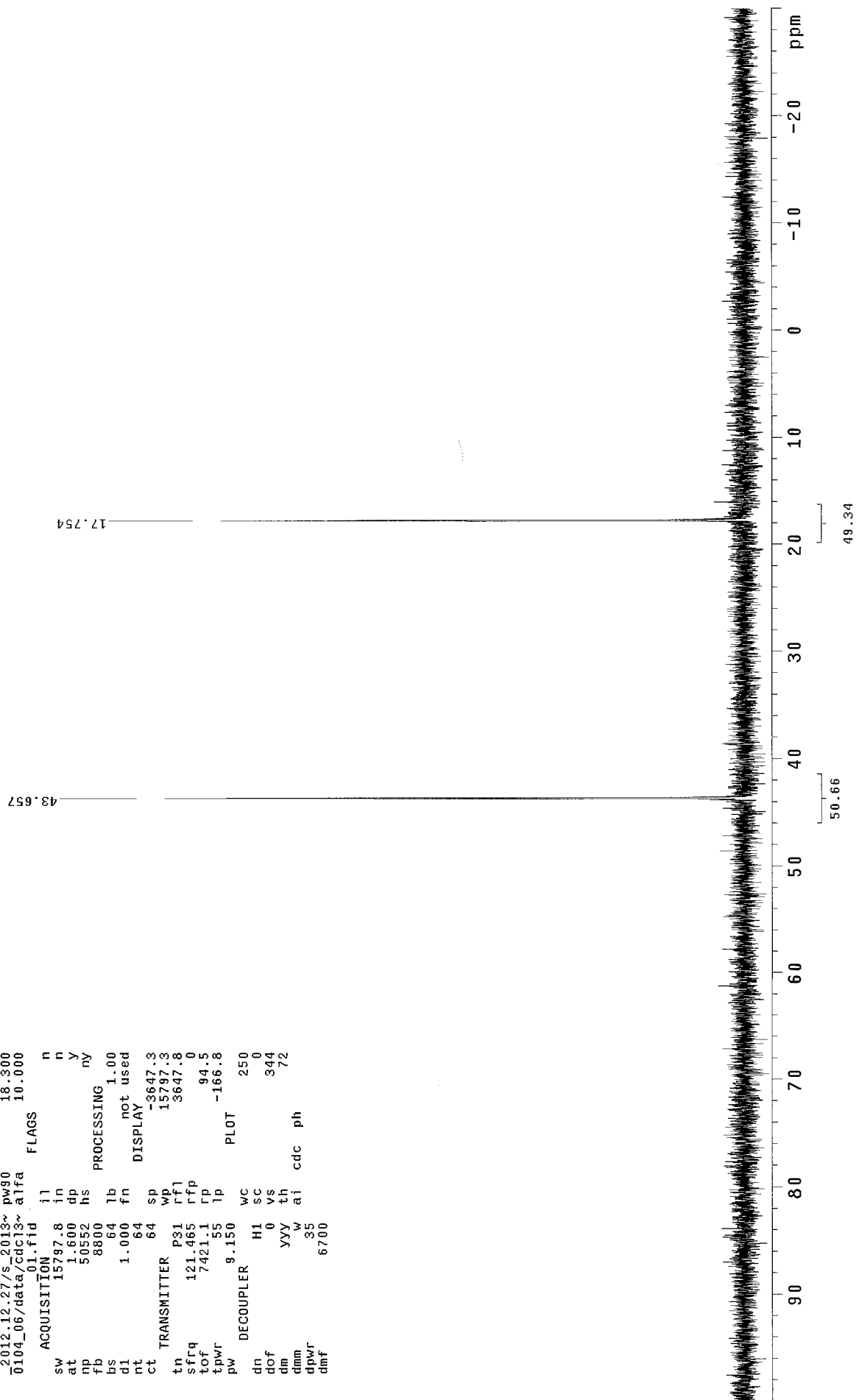


FG268P
pad=10 run with findz0 before acquisitio
n
exp4 Phosphorus

SAMPLE		SPECIAL	
date	Jan 4 2013	temp	not used
solvent	cdcl3	gain	25
file	/home/TCUuser~ spin	spin	20
	/vnmrSYS/data/autor~ hst	hst	0.008
	2012.12.27/s.2013~ pw90	pw90	18.300
	0104_06/data/cdcl3~ alfa	alfa	10.000
	01.fid	FLAGS	
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800	PROCESSING	
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64	DISPLAY	
ct	64	sp	-3647.3
TRANSMITTER			
tn	p31	wp	15797.3
sfrq	121.465	rfl	3647.8
tof	7421.1	rpf	0
tbwr	55	lp	94.5
pw	9.150	PLOT -166.8	
DECOUPLER			
dn	H1	wc	250
dof	0	sc	0
dm	yyv	th	344
dmm	w	ai	72
dpwr	35	cdc	ph
dmf	6700		



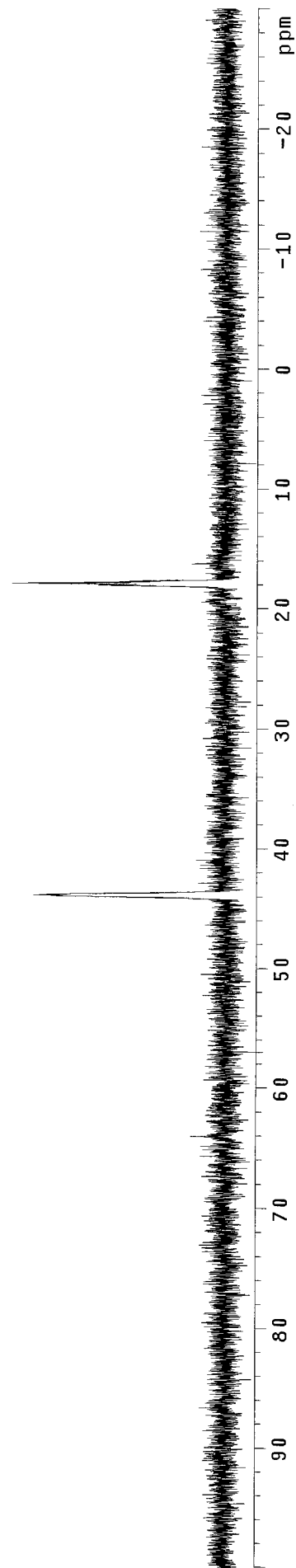
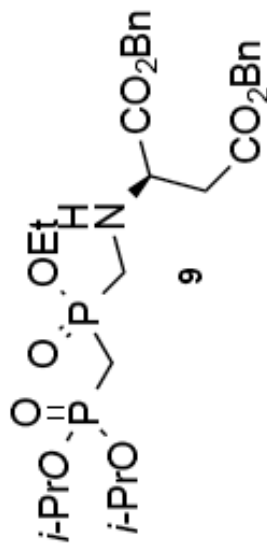
³¹P-NMR (decoupled)



CL 49

exp5 Phosphorus

SAMPLE		SPECIAL	
date	Aug 13 2012	temp	not used
solvent	cdcl3	gain	25
file	/home/TCUser/~	spin	20
	/vnmrSYS/data/autoc~	hst	0.008
	2012.08.11/s-2012~	pw90	18.300
0813_06/data/cdcl3~	alfa		10.000
03.fid	03.fid	FLAGS	
sw	15797.8	il	n
at	1.600	in	n
np	50552	dp	y
fb	8800	hs	ny
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64	fn	not used
ct	64	sp	-3647.3
	TRANSMITTER	wd	15797.3
tn	P31	rfl	3647.8
sfrq	121.465	rflp	0
tof	7421.1	rp	87.0
tpwr	55	lp	-234.0
pw	9.150		PLOT
	DECOUPLER	wc	250
dn	H1	sc	0
dof	0	vs	346
dm	ynn	th	12
dmm	w	ai	cdc
dpwr	35	ph	
dmf	6700		

³¹P-NMR (coupled)

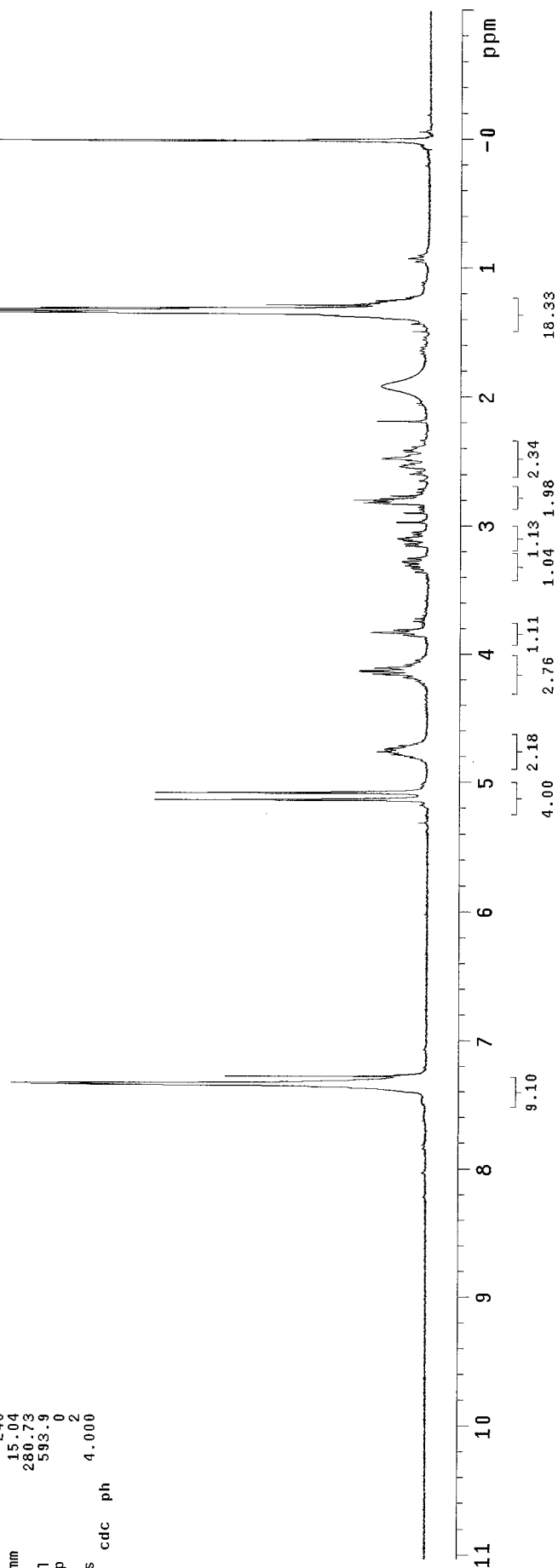
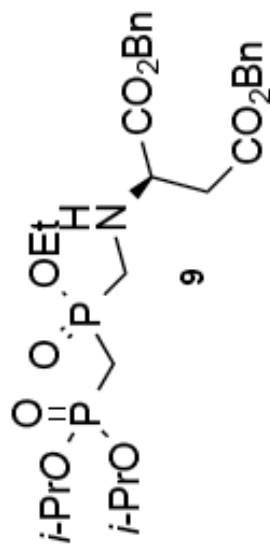
CL 49
pad=10 run with findz0 before acquisition

exp1 Proton

SAMPLE
date Aug 13 2012 DEC. & VT
solvent cdc13 dfrq 75.454
file /home/TCUser~ C13
/nmr/sys/data/auto~ dpwr 43
2012.08.11/s.2012~ dnm 0
0813_06/data/cdc13~ dnm nn
01.fid dm 13100
ACQUISITION
sfrq 300.047 wtfile
tn H1 proc ft
at 1.998 fn not used
np 19184
sw 4800.8 werr xmreact
fb 2600 wepp abortoff flus~
bs 16 h procplot aborton
tpwr 55 wbs
pw 7.9 wnt
dl 1.000
tof 277.9
nt 8
ct 8
alock y
gain not used
flags

DISPLAY
sp -300.3
wp 3610.2
vs 91
sc 0
wc 240
hzmm 15.04
ls 280.73
rfl 593.9
rfp 0
th 2
ins 4.000
ai cdc ph

¹H-NMR

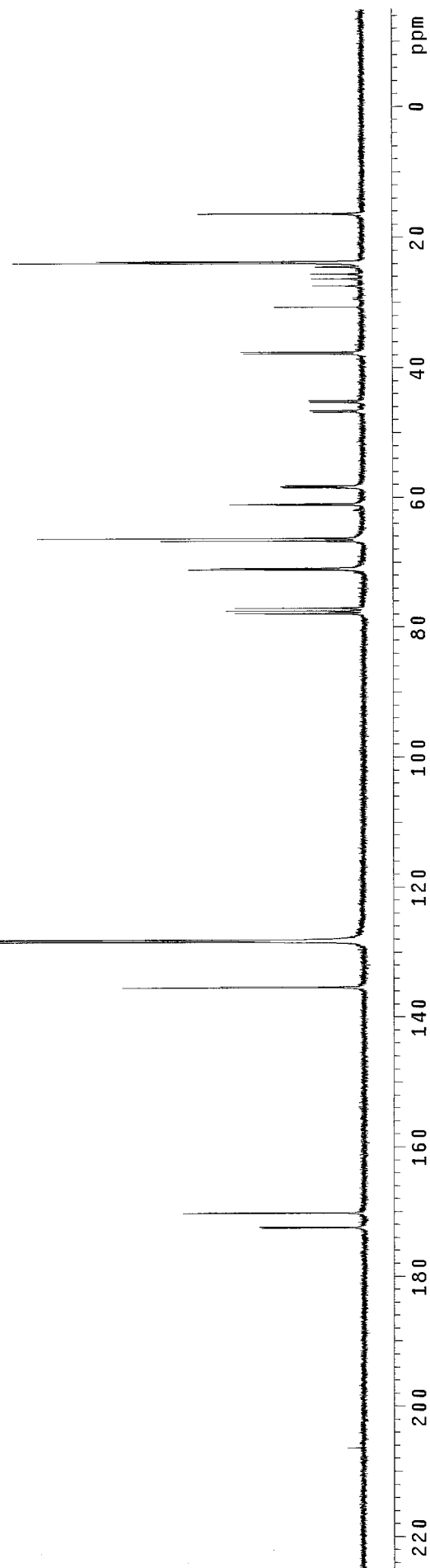
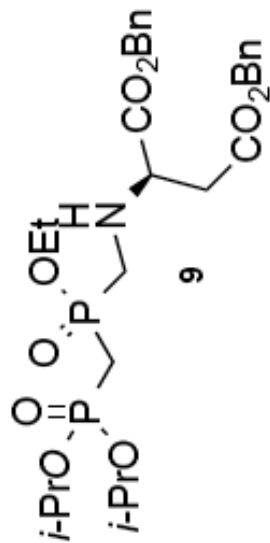


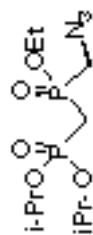
FG268P
pad=10 run with findz0 before acquisitio

exp1 Carbon

SAMPLE		SPECIAL	
date	Jan 10 2013	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser~	spin	20
	/vnmrSYS/data/autor~	hst	0.008
	2013.01.07.02/s.2~	pw90	18.500
	0130110_44/data/Cd~	alfa	10.000
0130110_44/data/Cd~			
ACQUISITION			
sw	18115.9	in	n
at	1.301	dp	y
np	47120	hs	nn
fb	10000		
bs	64	lb	0.50
dl	2.000	fn	not used
nt	1000		
ct	1000	sp	-1135.5
TRANSMITTER			
tn	C13	wp	18115.4
sfrq	75.454	rfl	1136.1
tof	766.0	rfp	0
twr	58	lp	47.3
pw	9.250		-218.5
DECOUPLER			
dn	H1	sc	250
dof	0	vs	0
dm	yy	th	289
dmm	w	ai	16
dpwr	35		
dmf	6700		

¹³C-NMR





Compound 10
³¹P/¹H NMR decoupled

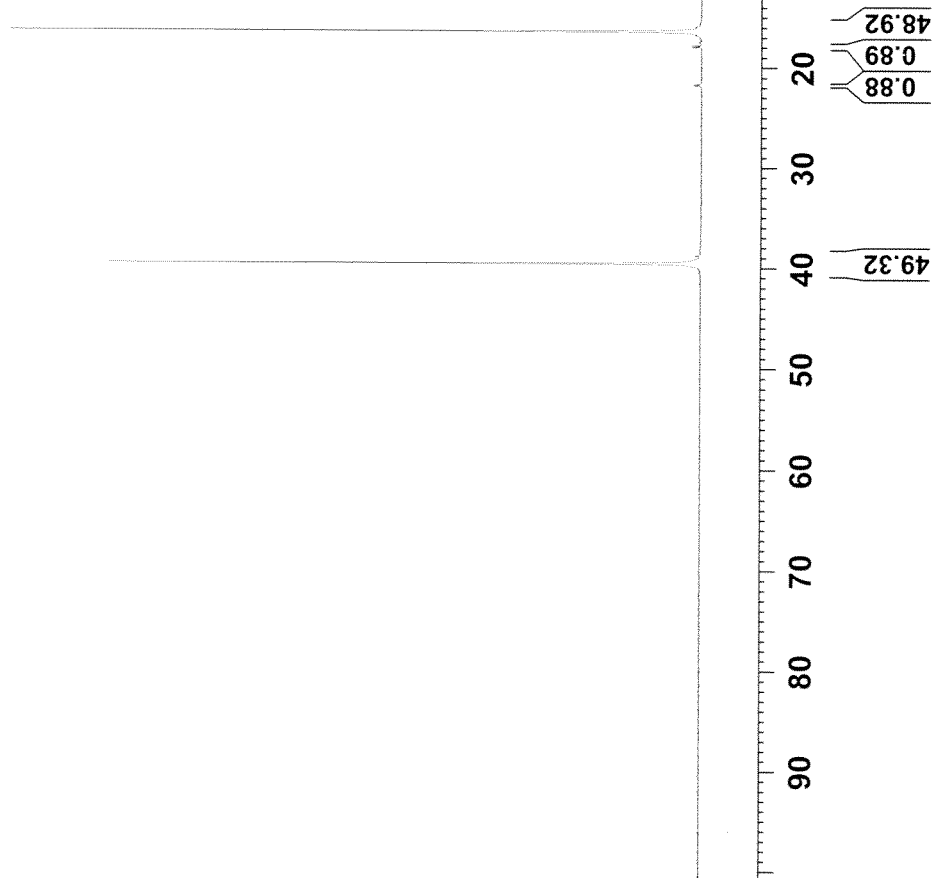
Current Data Parameters
 NAME FG 133 after column
 EXPNO 1
 PROCNO 1

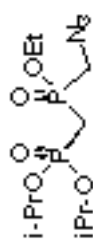
F2 - Acquisition Parameters
 Date_ 20141022
 Time_ 17.07
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 295.7 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

===== CHANNEL f2 =====
 SFO2 400.1316005 MHz
 NUC2 1H
 CPDPRG[2] waltz16
 PCPD2 90.00 usec
 PLW2 10.00000000 W
 PLW12 0.31604999 W
 PLW13 0.25600001 W

F2 - Processing parameters
 SI 32768
 SF 161.975930 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40





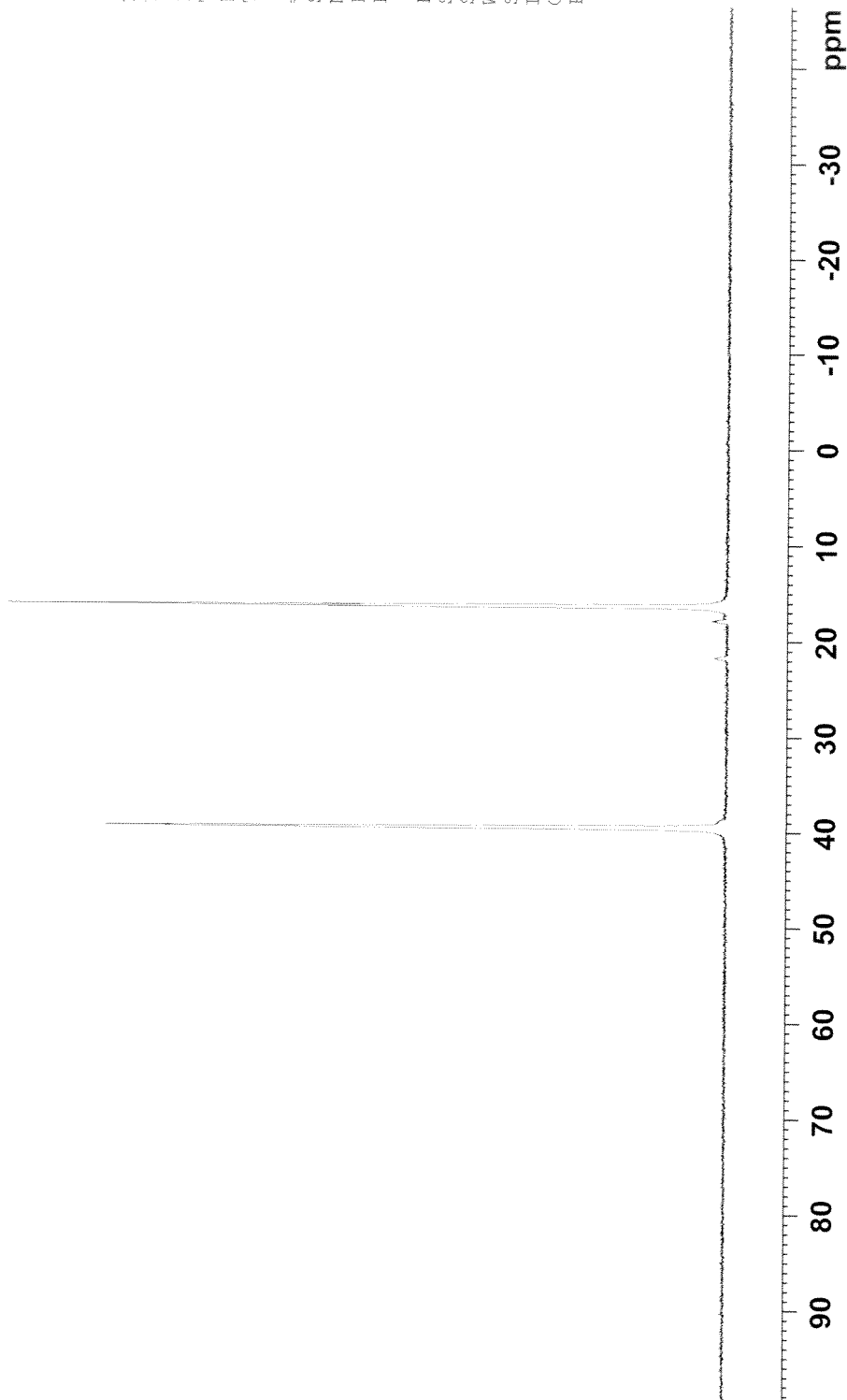
Compound 10
³¹P/¹H NMR coupled

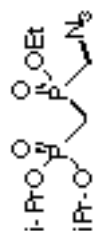
Current Data Parameters
 NAME FG 133 after column
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141022
 Time_ 17.09
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 32
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 295.2 K
 D1 2.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 SF01 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

F2 - Processing parameters
 SI 32768
 SF 161.9755930 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40





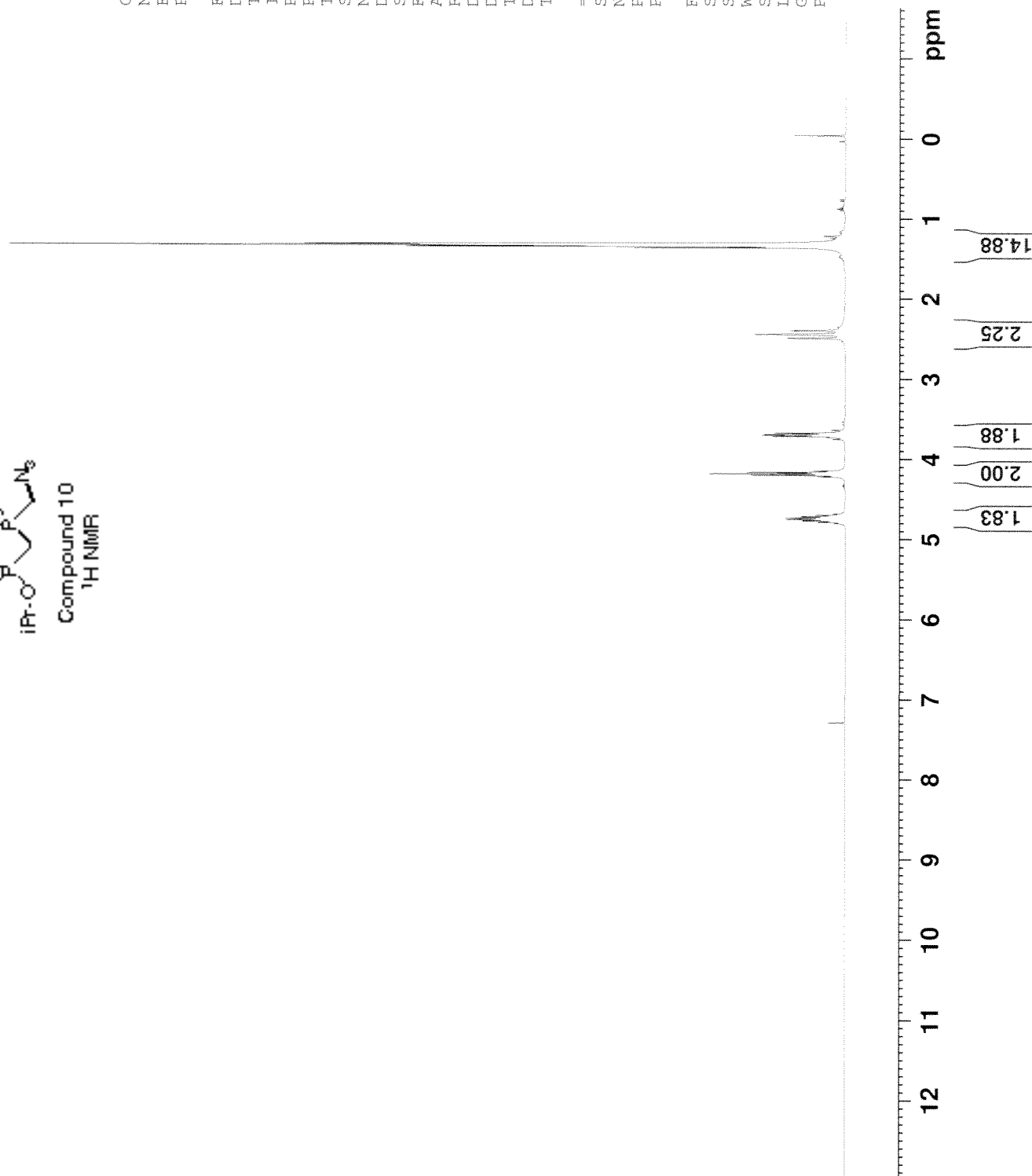
Compound 10
¹H NMR

Current Data Parameters
NAME FG 133 after column
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20141022
Time 17.10
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 9
DS 2
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894465 sec
RG 32.38
DW 62.400 usec
DE 6.50 usec
TE 295.1 K
D1 1.00000000 sec
TD0 1

==== CHANNEL f1 =====
SFO1 400.1324710 MHz
NUC1 1H
P1 10.00 usec
PLW1 25.00300026 W

F2 - Processing parameters
SI 65536
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

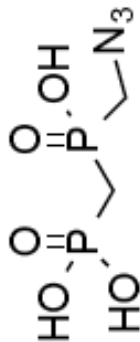


FG136

pad=10 run with findz0 before acquisition

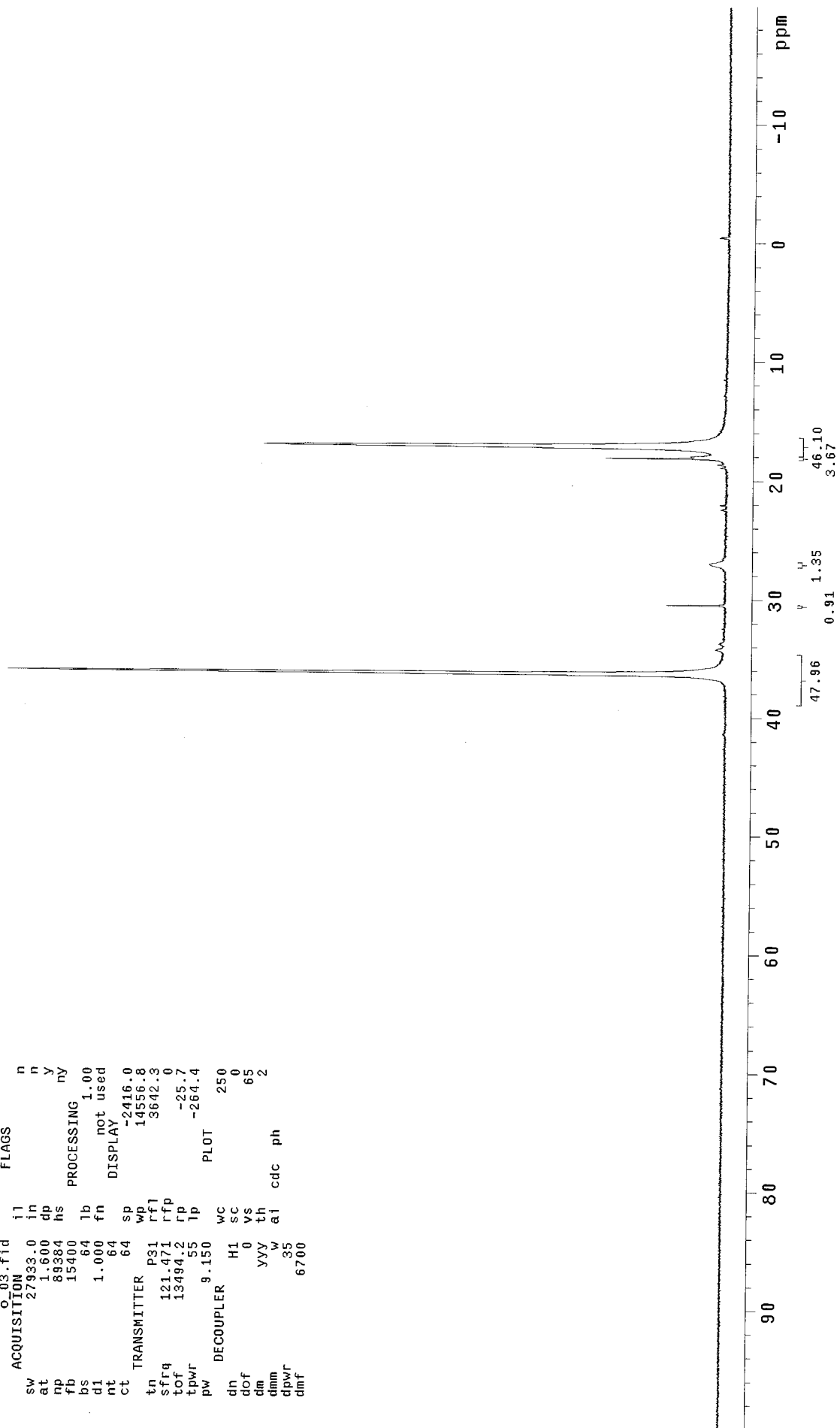
exp1 Phosphorus

SAMPLE		SPECIAL	
date	Oct 16 2012	temp	not used
solvent	d2o	gain	14
file	/home/TCUuser/~spin	spin	20
	/vmrsvs/data/auto~hst	hst	0.008
	2012.10.15_01/s_2~pw90	pw90	18.300
	0121016_26/data/d2~alfa	alfa	10.000
O03.fid		FLAGS	
ACQUISITION			
sw	27933.0	in	n
at	1.600	dp	y
np	89384	hs	ny
fb	15400		
bs	64	lb	1.00
di	1.000	fn	not used
nt	64		
ct	64	DISPLAY	
TRANSMITTER			
tn	P31	wp	-2416.0
sfrq	121.471	rfl	14556.8
tof	13494.2	rpf	3642.3
tpwr	55	lp	-25.7
pw	9.150		-264.4
DECOUPLER			
dn	H1	wc	250
dof	0	sc	0
dm	YVY	vs	65
dmm	W	th	2
dwr	35	ai	
dmf	6700	cdc	ph



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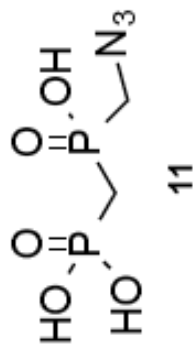
³¹P-NMR (decoupled)



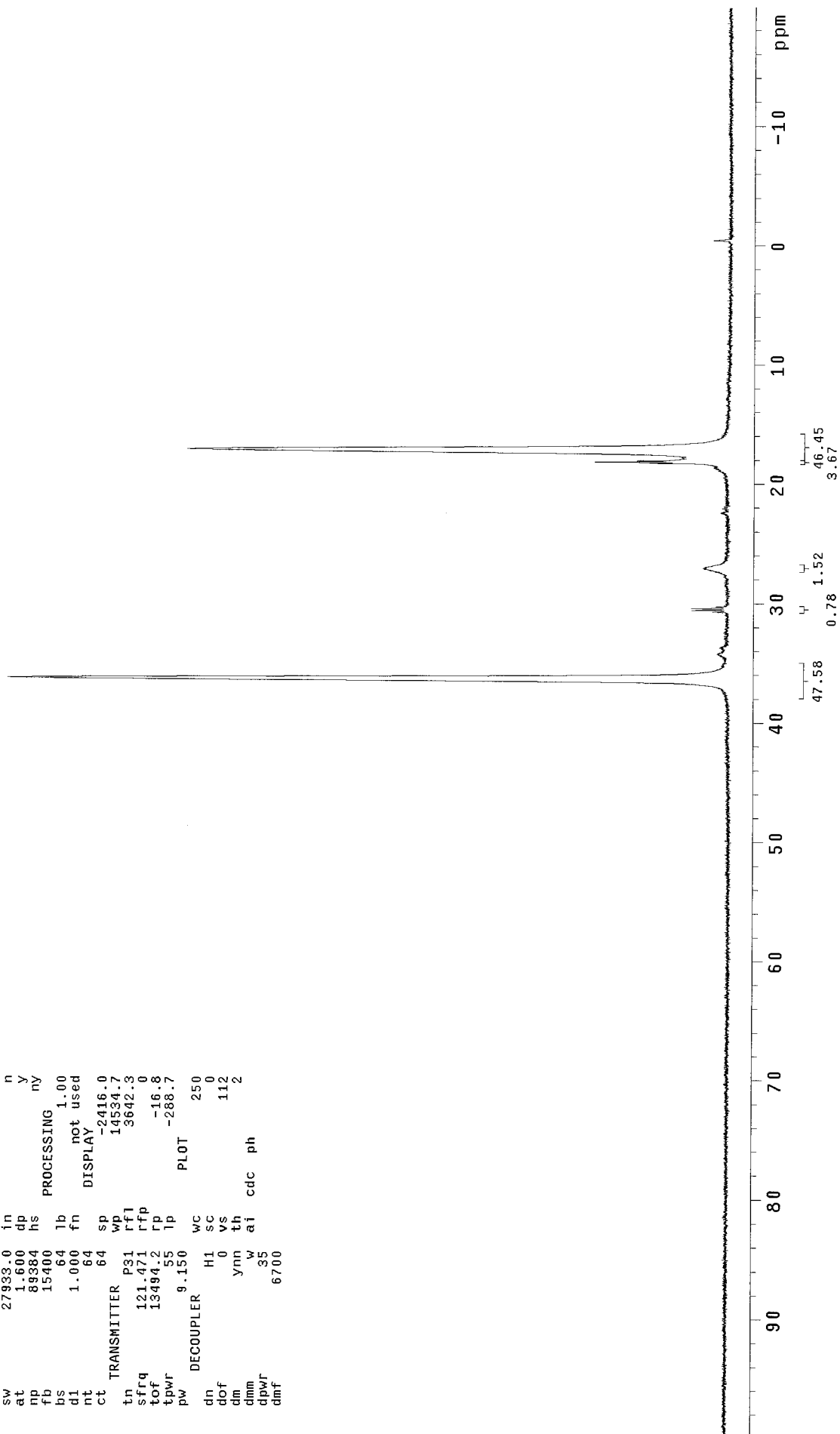
FG136

exp1 Phosphorus

date	Oct 16 2012	temp	not used
solvent	d2o	gain	14
file	/home/TCUuser~ spin	20	
/vnmrsvs/data/auto~	hst	0.008	
2012.10.15_01/s_2~	pw90	18.300	
0121010_26/data/d2~	alifa	10.000	
o_06.fid	FLAGS		
ACQUISITION	il	n	
sw	27933.0	in	n
at	1.600	dp	y
np	89384	hs	ny
fb	15400		
bs	64	lb	1.00
di	1.000	fn	not used
nt	64		
ct	64	DISPLAY	
TRANSMITTER	sp	-2416.0	
tn	P31	wp	14534.7
sfrq	121.471	rfl	3642.3
tof	13494.2	rfp	-16.8
tpwr	55	lp	-288.7
pw	9.150		
DECOUPLER	wc		
dn	H1	sc	250
dof	0	vs	0
dm	ynn	th	112
dmm	w	ai	2
dpwr	35		
dmf	6700		



³¹P-NMR (coupled)

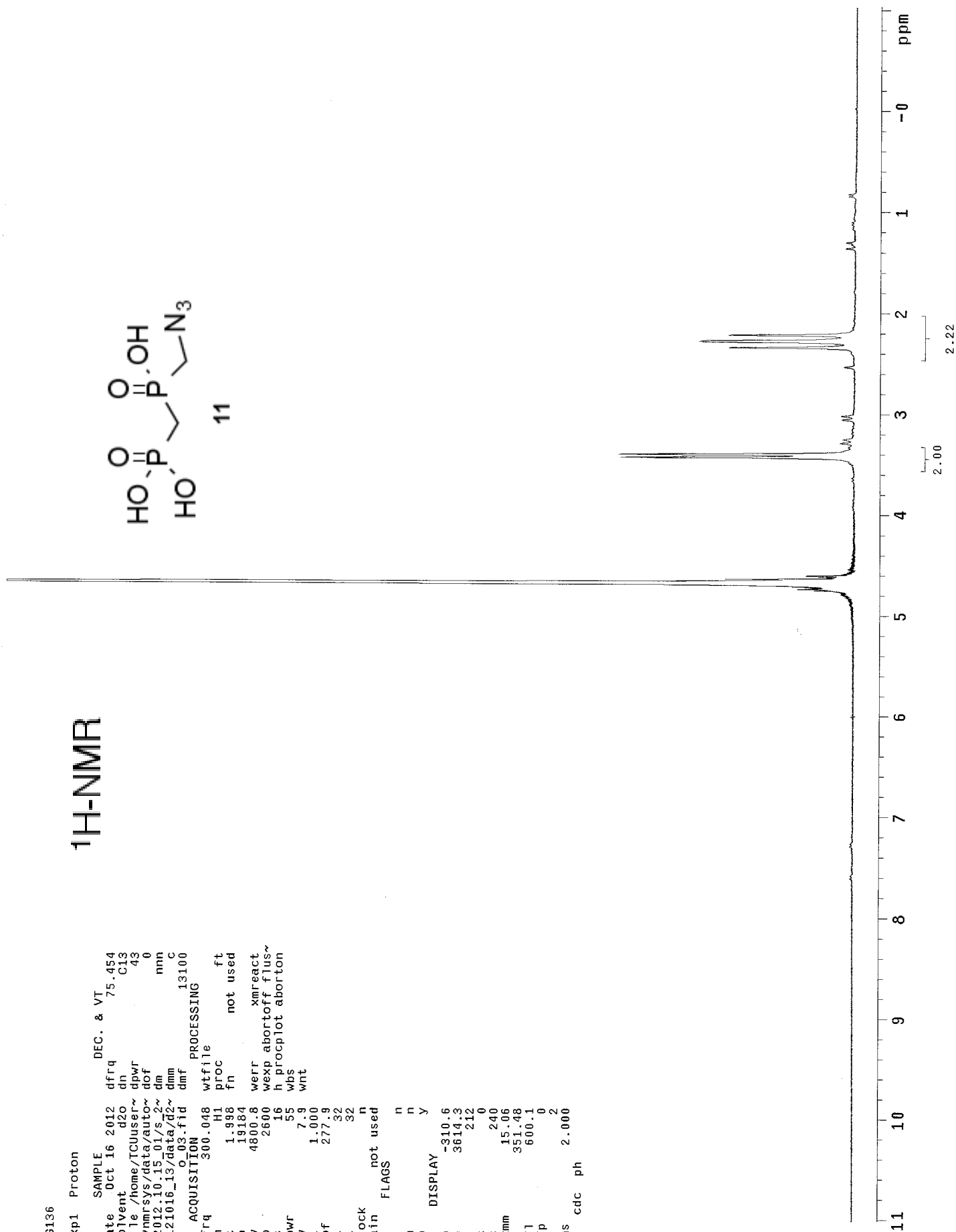
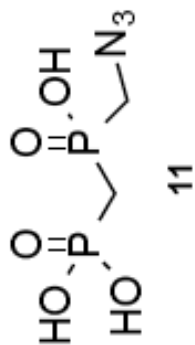


FG136

exp1 Proton

¹H-NMR

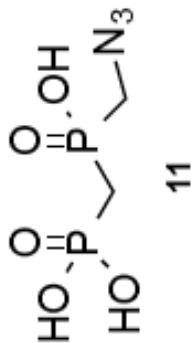
SAMPLE
 date Oct 16 2012 DEC. & VI 75.454
 solvent d2o C13
 file /home/TCUser~ dpwr 43
 /vnmrsys/data/autoc~ dof 0
 2012.10.15_01/s~2~ dnm nnn
 0121016_13/data/d2~ dmm C
 O_03.fid 13100
 O_03.fid dmf
 ACQUISITION
 sfrq 300.048 wfile
 tn H1
 at 1.998 ft
 np 19184 not used
 sw 4800.8
 fb 2600 werr xmreact
 bs 16 wexp abortoff flus~
 tpwr 55 h procplot aborton
 pw 7.9 wbs
 d1 1.000 wnt
 tof 277.9
 nt 32
 ct 32
 alock n
 gain not used
 FLAGS
 i1 n
 in n
 dp y
 DISPLAY
 sp -310.6
 wp 3614.3
 vs 212
 sc 0
 wc 240
 hzmm 15.06
 is 351.48
 rfl 600.1
 rfp 0
 th 2
 ins 2.000
 ai cdc ph



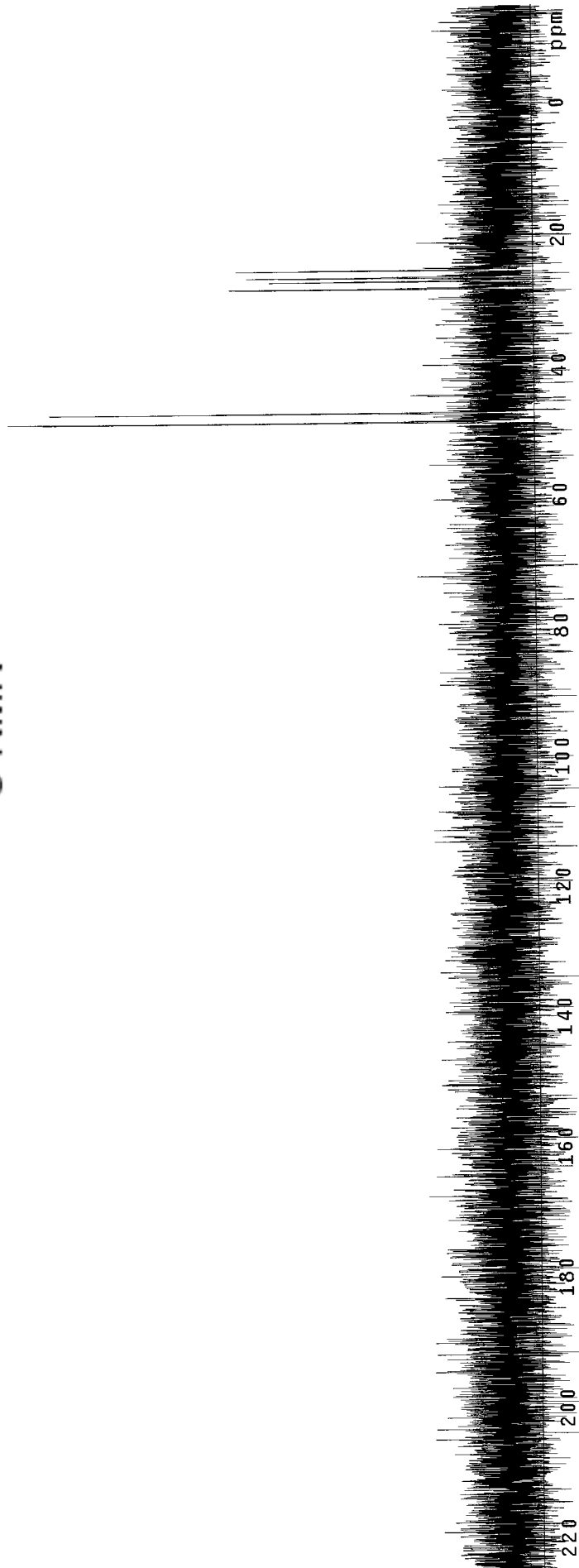
FG136
pad=10 run with findz0 before acquisition

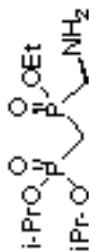
exp1 Carbon

SAMPLE		SPECIAL	
date	Oct 16 2012	temp	not used
solvent	d2o	gain	20
file	/home/TCUser~	spin	20
/vnmrsvs/data/autor~	hst	0.008	
2012.10.15_01/s_2~	pw90	18.500	
0121016_25/data/d2~	alfa	10.000	
o_01.fid	FLAGS		
ACQUISITION	il	n	
sw	18115.9	n	
at	1.301	dp	y
np	47120	hs	nn
fb	10000		
bs	64	lb	0.50
dl	2.000	fn	not used
nt	1000		
ct	1000	sp	-1135.5
TRANSMITTER	C13	wp	18115.4
tn	75.455	rfl	1136.1
sfrq	766.0	rfp	52.7
tof	58	lp	-130.6
tpwr	9.250	PLOT	
pw		WC	250
dn	H1	SC	0
dof	0	VS	4543
dm	YYY	th	29
dmm	w	ai	
dpwr	35		
dmf	6700		

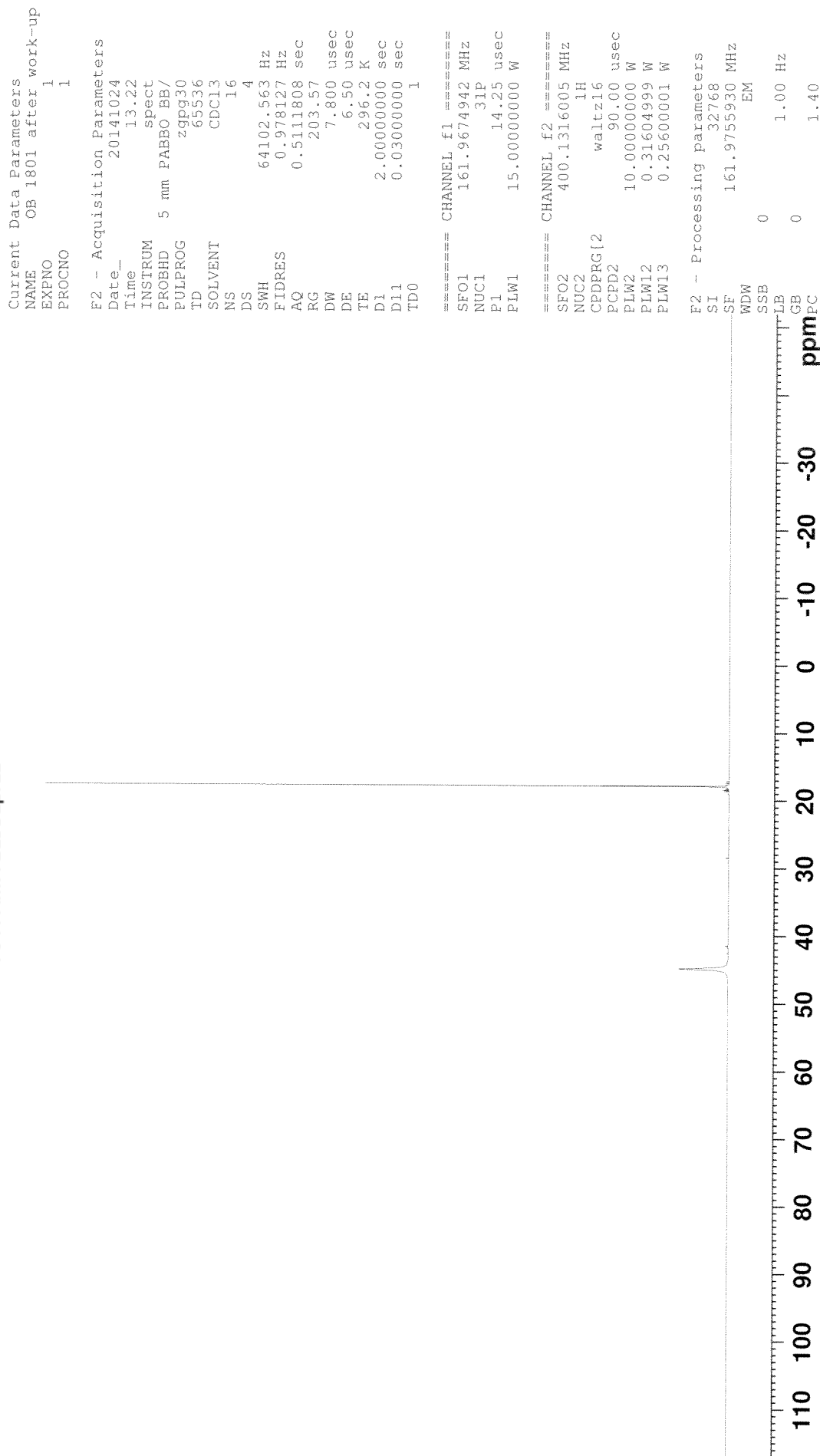


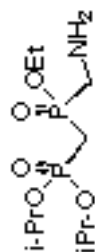
¹³C-NMR





Compound 12
³¹P NMR decoupled





Compound 12
³¹P/¹H NMR coupled

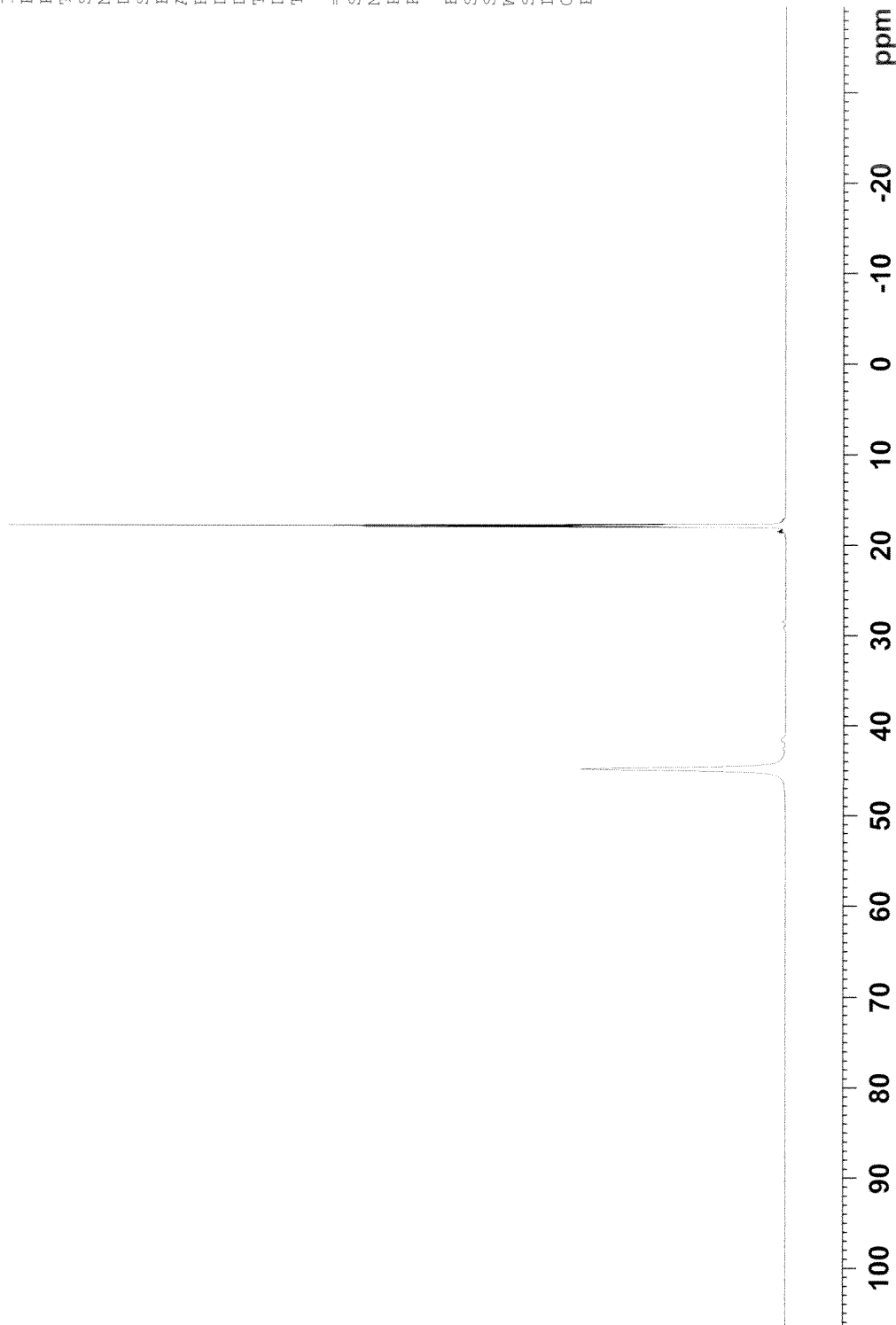
2.132

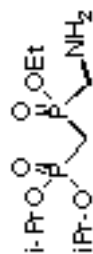
Current Data Parameters
 NAME OB 1801 after work-up
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141024
 Time_ 13.24
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDC13
 NS 32
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 295.8 K
 D1 2.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

F2 - Processing parameters
 SI 32768
 SF 161.9755930 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40





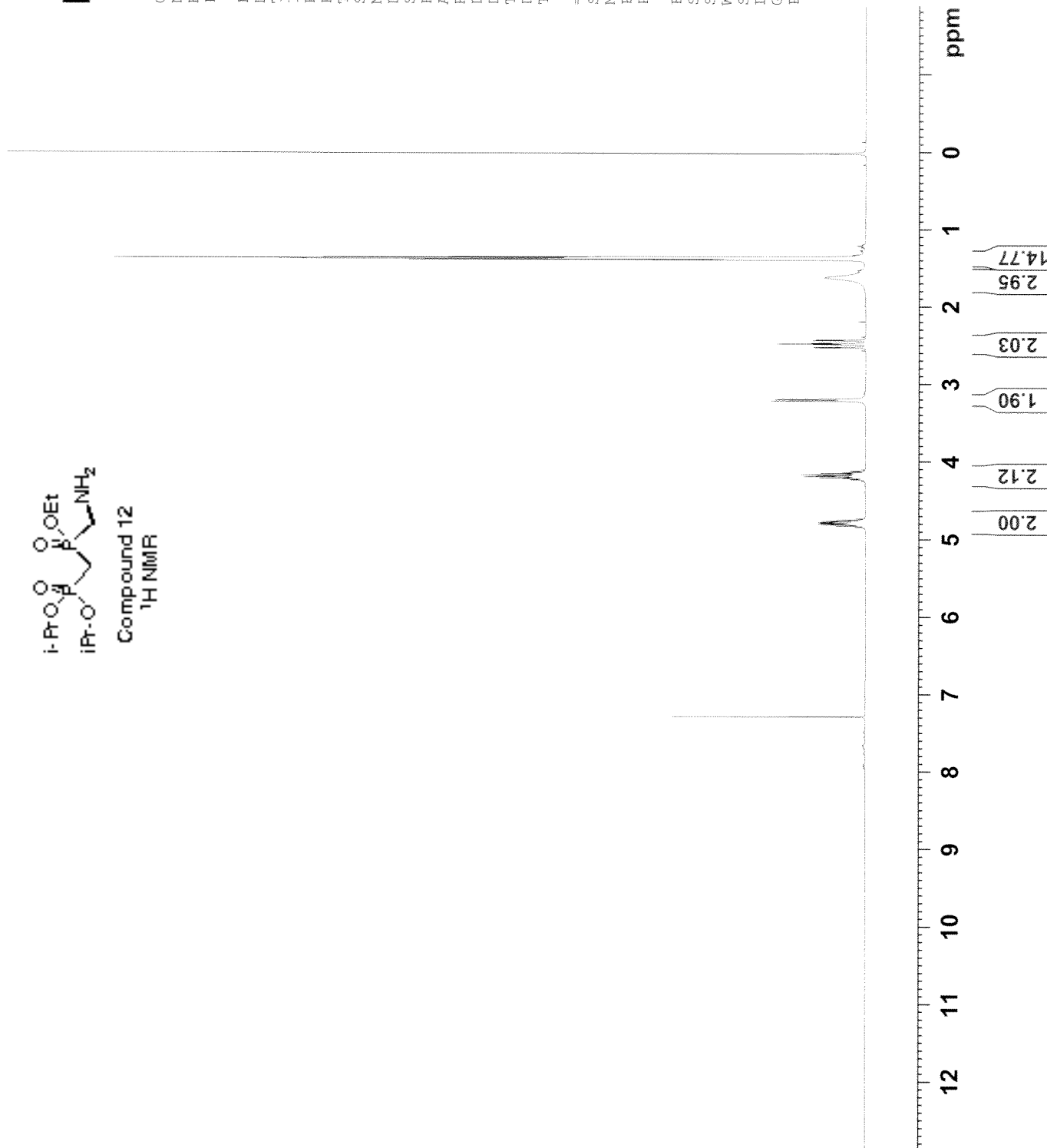
Compound 12
¹H NMR

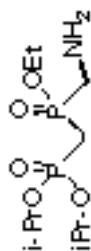
Current Data Parameters
 NAME OB 1801 after work-up
 EXPNO 3
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141024
 Time_ 13.15
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDC13
 NS 11
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.0894465 sec
 RG 158.63
 DW 62.400 usec
 DE 6.50 usec
 TE 295.8 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 400.1324710 MHz
 NUC1 1H
 P1 10.00 usec
 PLW1 25.00300026 W

F2 - Processing parameters
 SI 65536
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00





Compound 12
13C NMR

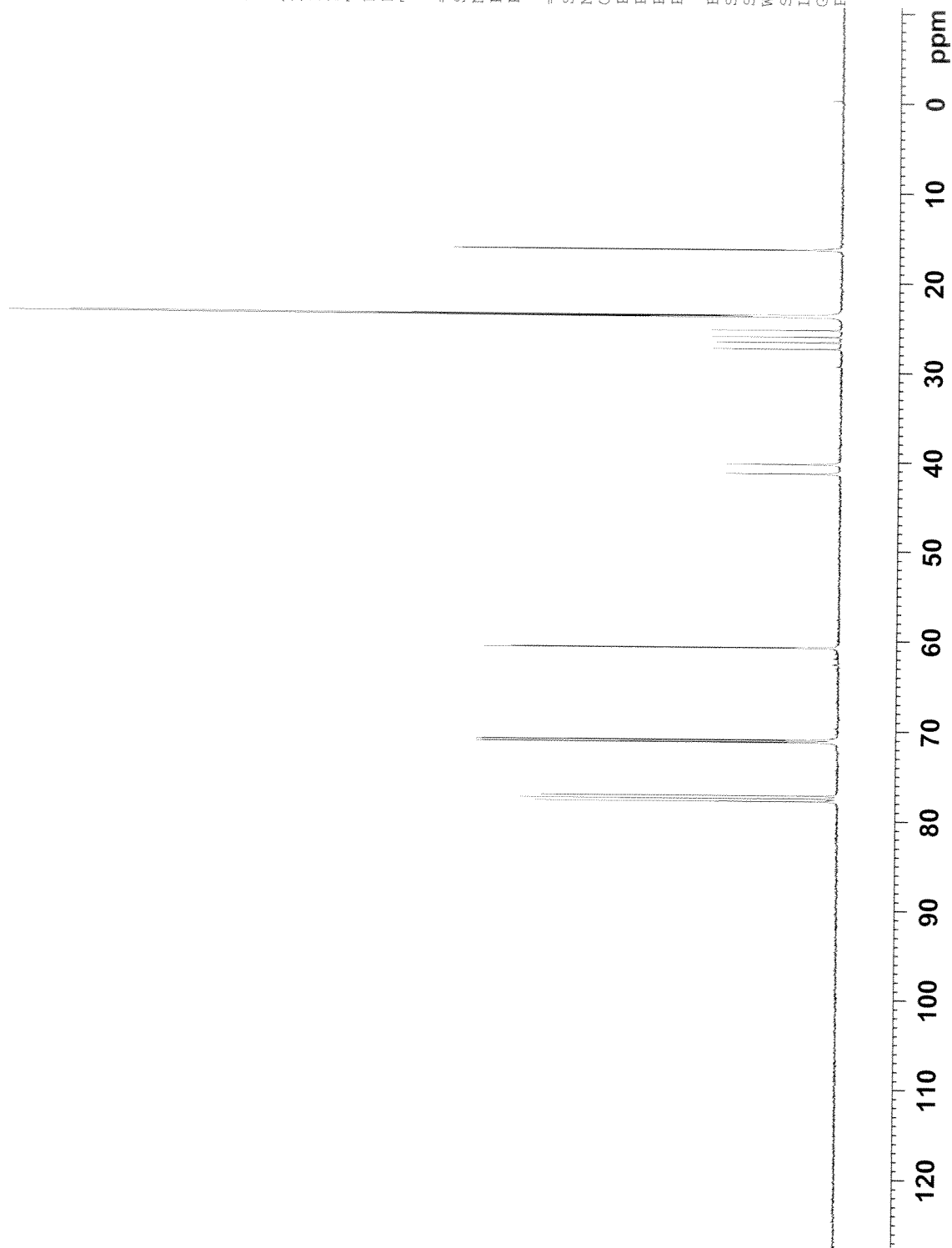
Current Data Parameters
NAME OB 1801 after work-up
EXPNO 4
PROCNO 1

F2 - Acquisition Parameters
Date_ 20141024
Time 13.50
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 396
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631488 sec
RG 203.57
DW 20.800 usec
DE 6.50 usec
TE 297.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
SFO1 100.6228293 MHz
NUC1 13C
P1 10.00 usec
PLW1 45.00000000 W

===== CHANNEL f2 =====
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG12 waltz16
PCPD2 90.00 usec
PLW2 10.00000000 W
PLW12 0.31604999 W
PLW13 0.25600001 W

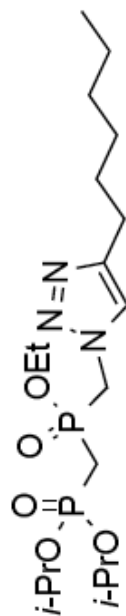
F2 - Processing parameters
SI 32768
SF 100.6127685 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



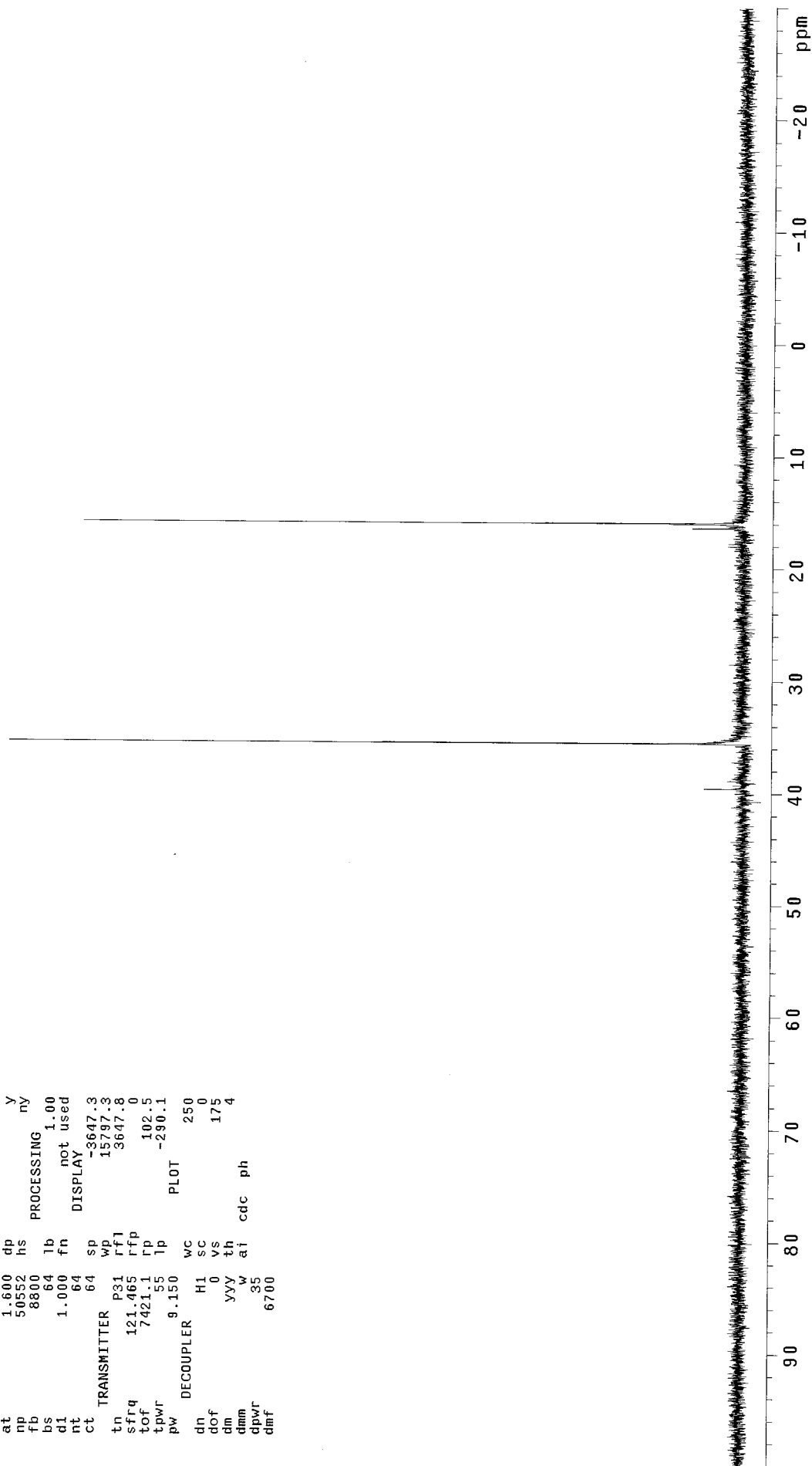
CL 42

exp5 Phosphorus

SAMPLE		SPECIAL	
date	Aug 13 2012	temp	not used
solvent	cdcl3	gain	25
file	/home/TCUser/~ spin	sp	20
	/vmrsvs/data/auto~ hst	hst	0.008
	2012.08.11/s_2012~ pw90	pw90	18.300
	0813_07/data/cdcl3~ alfa	alfa	10.000
ACQUISITION		FLAGS	
sw	15797.8	il	n
at	1.600	dp	n
np	50552	hs	y
fb	8800	ny	
bs	64	lb	
di	1.000	fn	1.00
nt	64	not used	
ct	64	DISPLAY	
TRANSMITTER		PLOT	
tn	P31	sp	-3647.3
sfrq	121.465	wp	15797.3
tof	7421.1	rfl	3647.8
tpwr	9.150	rfp	102.5
pw	9.150	lp	-290.1
DECOUPLER		PLOT	
dn	H1	wc	250
dof	0	sc	0
dm	0	vs	175
dmm	vvv	th	4
dpwr	w	ai	cdc
dmf	35	ph	
	6700		



13a

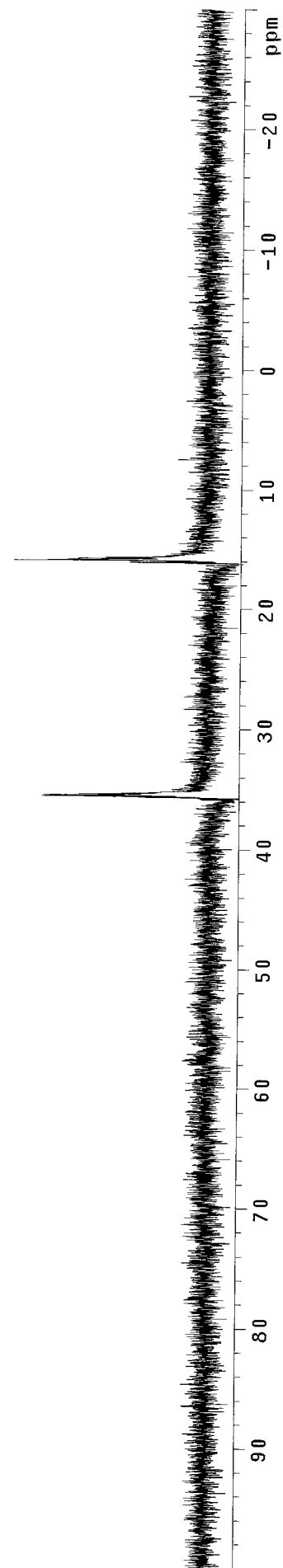
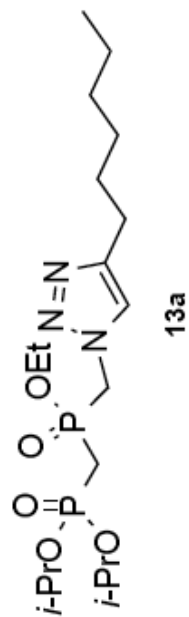
³¹P-NMR (decoupled)

CL 42

exp5 Phosphorus

SAMPLE		SPECIAL	
date	Aug 13 2012	temp	not used
solvent	cdcl3	gain	25
file	/home/TCUuser~	spin	20
/vnmrsvs/data/auto~	hst	0.008	
2012.08.11/s_2012~	pw90	18.300	
0813_07/data/cdcl3~	alfa	10.000	
03.fid		FLAGS	
sw	15797.8	il	n
at	1.600	in	n
np	50552	dp	y
fb	8800	hs	ny
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64	sp	-3647.3
ct	64	wp	15797.3
tn	P31	rfl	3647.8
sfrq	121.465	rfp	50.8
tof	7421.1	lp	-113.7
tpwr	55		
pw	9.150		
DECOUPLER		wc	250
dn	H1	sc	0
dof	0	vs	332
dm	ynn	th	17
dmm	w	ai	cdc
dpwr	35		ph
dmf	6700		

³¹P-NMR (coupled)



CL 42
pad=10 run with findz0 before acquisitio
n

exp5 Proton

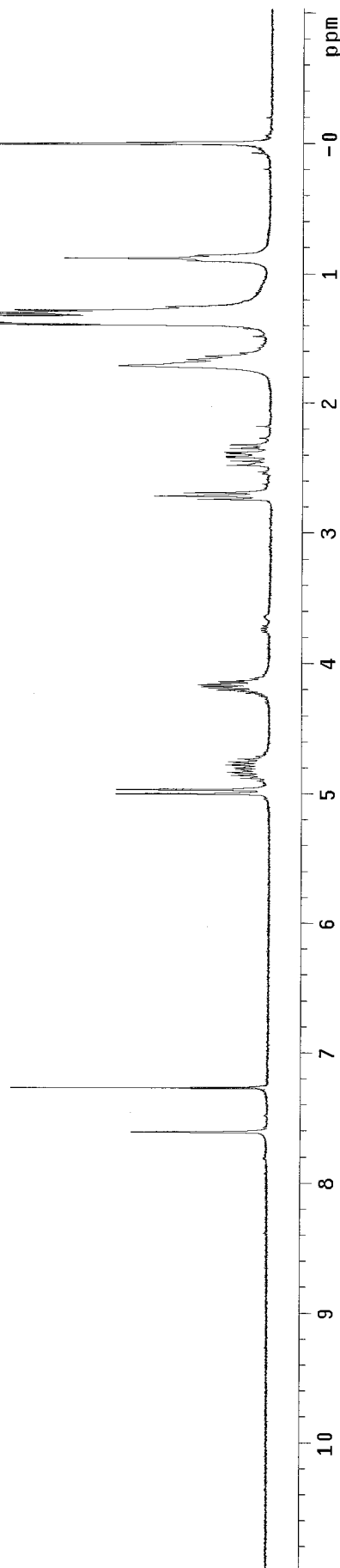
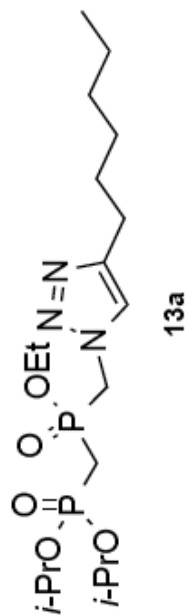
SAMPLE DEC. & VT
date Aug 13 2012 dfrq 75.454
solvent cdc13 dn C13
file /home/TCUser~ dpwr 43
/nmrSYS/data/auto~ dof 0
-2012.08.11/s.2012~ dnm nnn
0813_07/data/cdc13~ dmm c
01.fid 13100

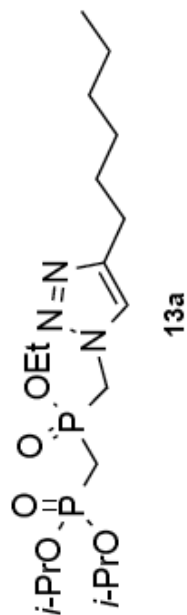
ACQUISITION
sfrq 300.047 wtfile
tn HI
at 1.998 fn not used
np 19184
sw 4800.8 werr xmreact
fb 2600 wep abortoff flus~
bs 16 h procplot aborton
tpwr 55
pw 7.9
d1 1.000
tof 277.9
nt 8
ct 8
alock Y
gain not used
FLAGS

il n
in n
dp y

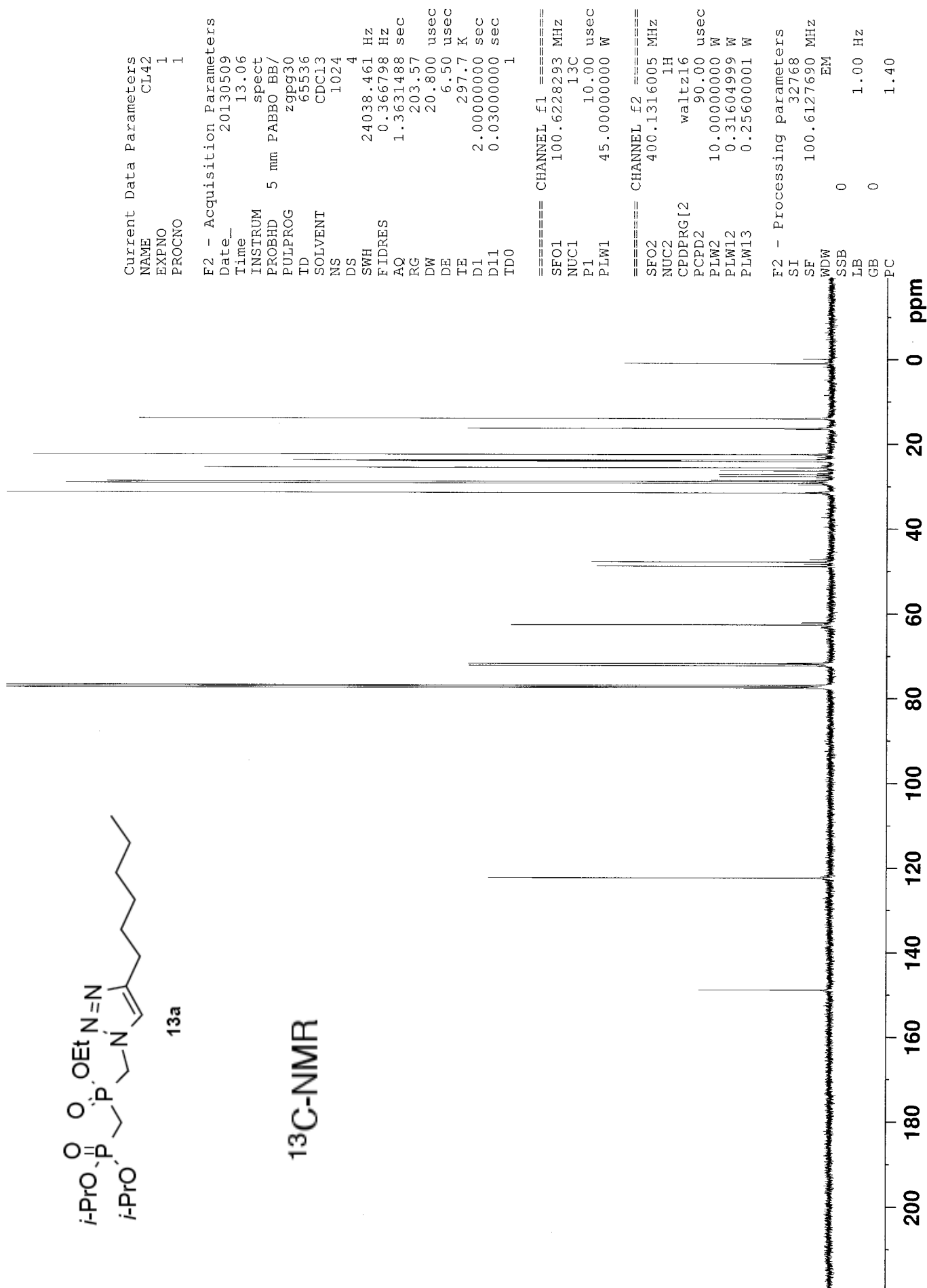
DISPLAY
sp -310.0
wp 3602.3
vs 116
sc 0
wc 240
hzmm 15.01
is 280.04
rfl 596.6
th 0
ins 3
ai cdc ph 1.000

¹H-NMR





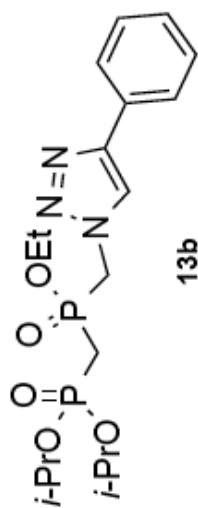
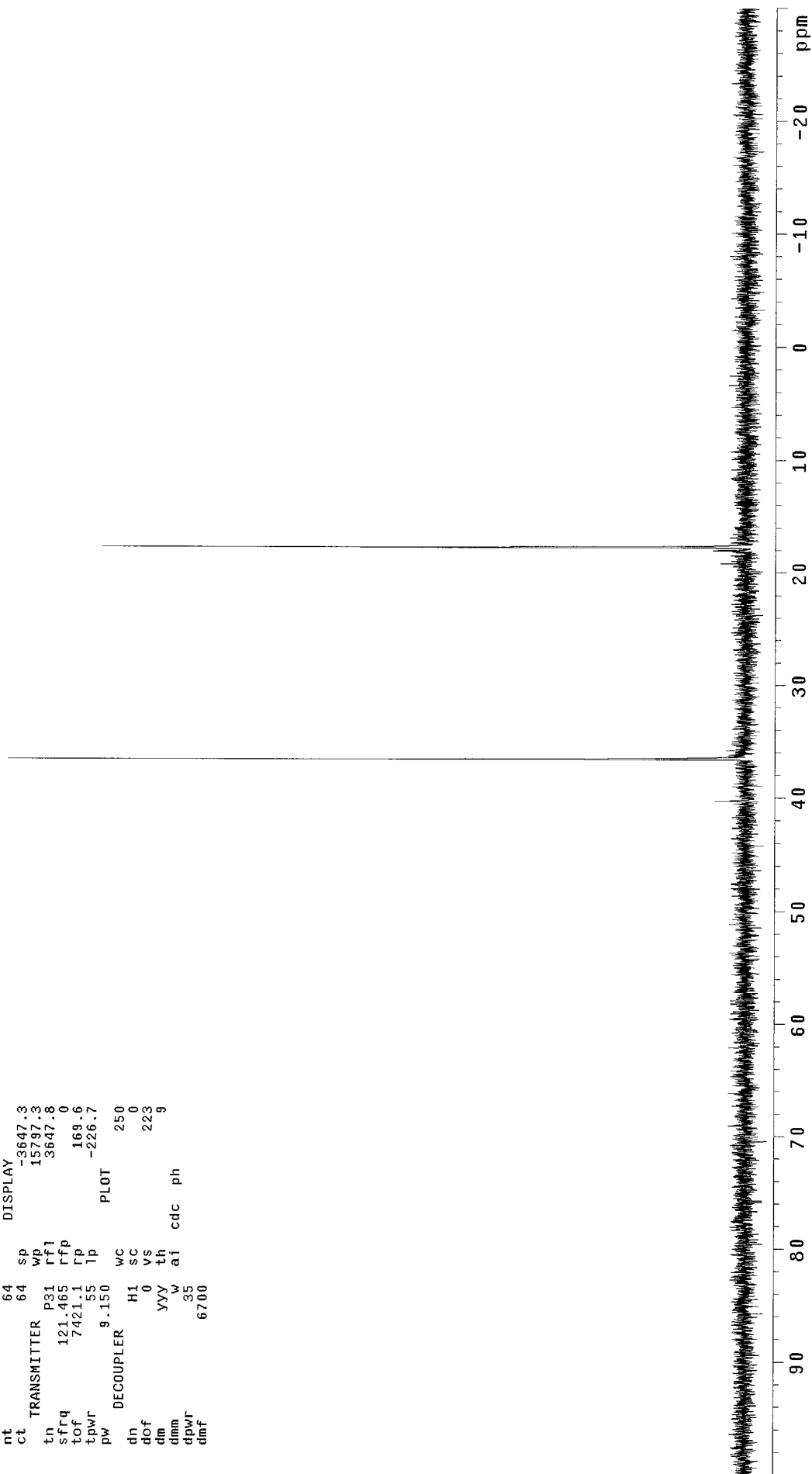
¹³C-NMR



CL 37

exp5 Phosphorus

SAMPLE		SPECIAL	
date	Jul 23 2012	temp	not used
solvent	cdcl3	gain	25
file	/home/TCUuser~ spin	20	
/vnmrsys/data/autoc~ hst		0.008	
2012.07.15/s.2012~ pw90		18.300	
0723_23/data/cdcl3~ alfa		10.000	
01.fid		FLAGS	
ACQUISITION			
sw	15797.8	il	n
at	1.600	in	n
np	50552	dp	y
fb	8800	hs	ny
bs	64	lb	1.00
di	1.000	fn	not used
nt	64	DISPLAY	
ct	64	SP	-3647.3
TRANSMITTER			
tn	P31	wp	15797.3
sfrq	121.465	rfl	3647.8
tof	7421.1	rpb	0
tpwr	55	lp	169.6
pw	9.150	PL0T	-226.7
DECOUPLER			
dn	H1	wc	250
dof	0	sc	0
dm	yyv	vs	223
dmm	w	th	g
dpwr	35	ai	cdc
dmf	6700	ph	

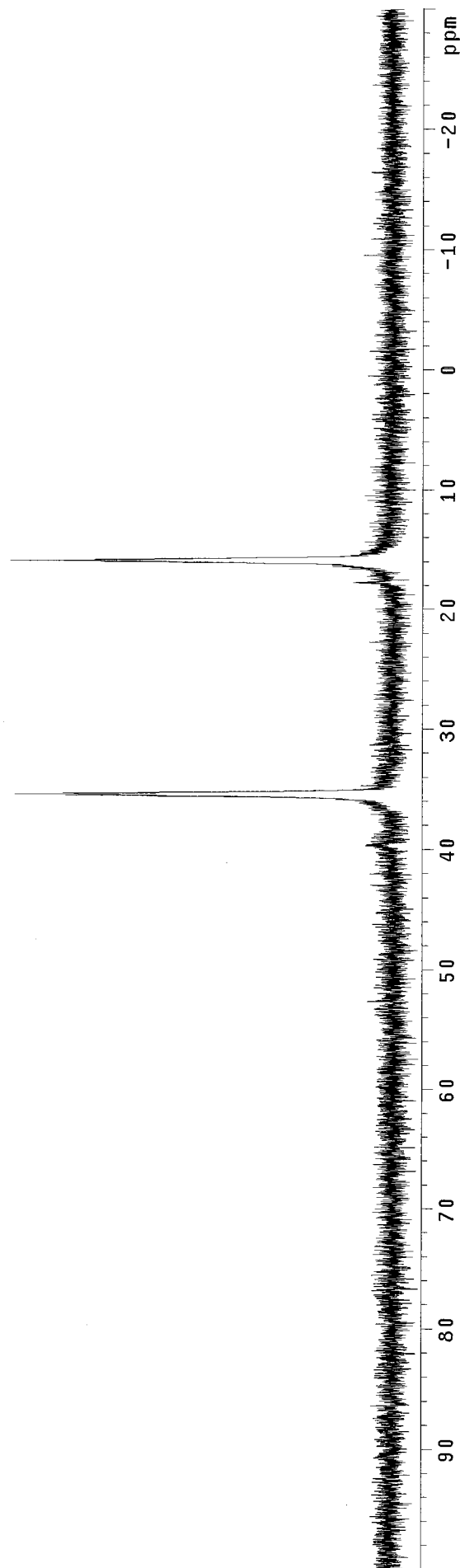
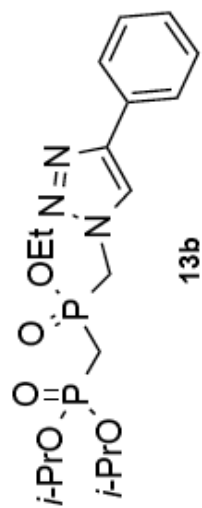
³¹P-NMR (decoupled)

CL 37

exp5 Phosphorus

³¹P-NMR (coupled)

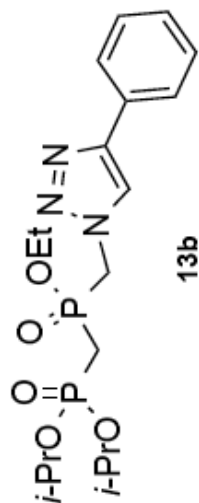
SAMPLE		SPECIAL	
date	Aug 15 2012	temp	not used
solvent	cd3od	gain	25
file	/home/TCUser~ spin		20
/vnmr/s/data/autos	hst		0.008
-2012.08.15/s-	2012~ pw90		18.300
0815_21/data/cd3od~	alfa		10.000
01.fid		FLAGS	
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800		
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		DISPLAY
ct	64	sp	-3647.3
TRANSMITTER			
tn	P31	wp	15797.8
sfrq	121.465	rfl	3647.8
tof	7421.1	rfp	0
tpwr	55	lp	131.3
pw	9.150		-170.6
DECOUPLER			
dn	H1	sc	250
dof	0	vs	0
d1m	ynn	th	341
dmm	w	al	11
dpwr	35		
d1mf	6700		



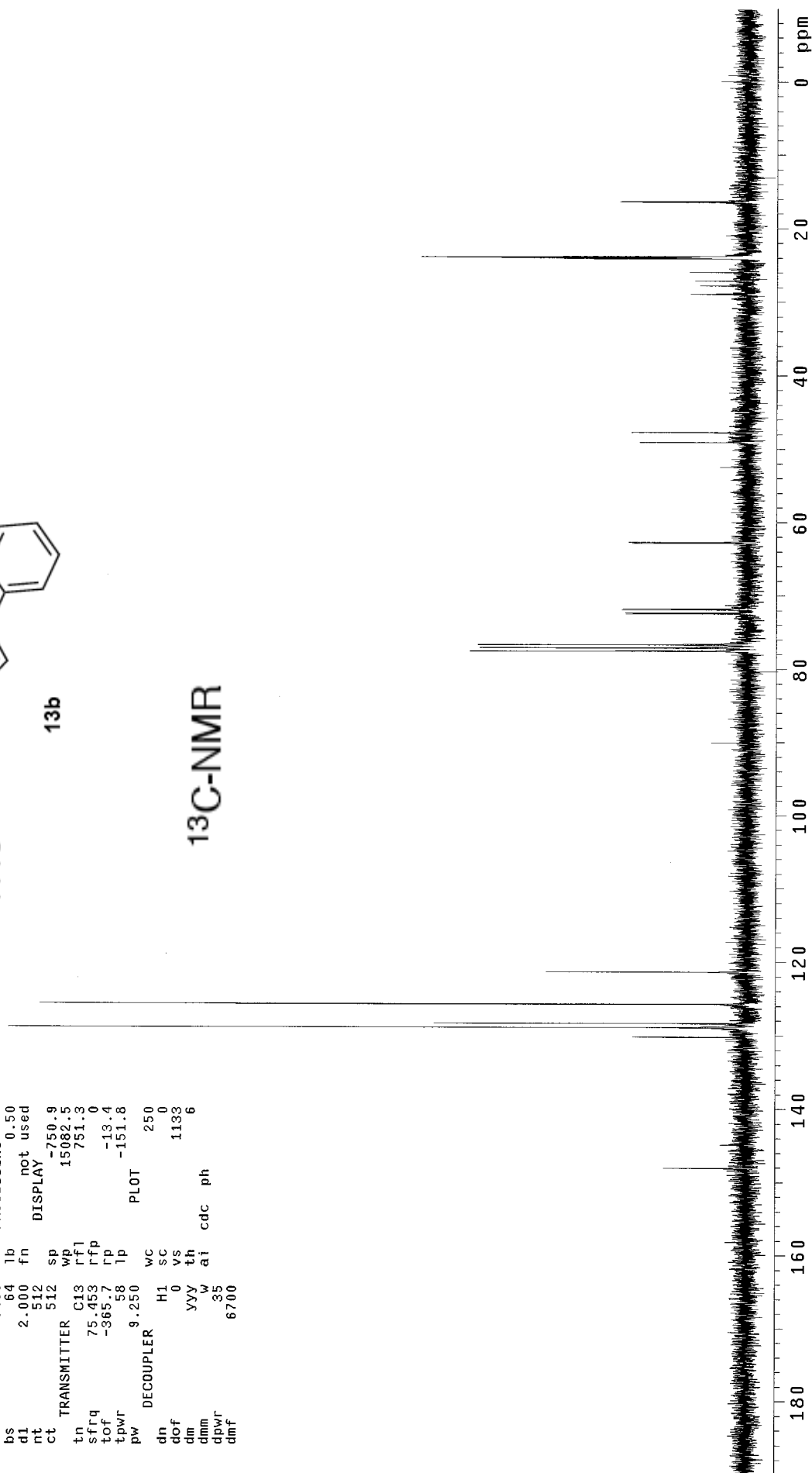
CL 37
pad=10 run with findz0 before acquisitio
n

exp5 Carbon

date	Aug 22 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~ spin	20	
/vnmr/s/data/autow	hst	0.008	
2012.08.20/s	2012~ pw90	18.500	
0822_43/data/cdcl3~	alfa	10.000	
01.fid	FLAGS		
ACQUISITION			
sw	15083.0	in	n
at	1.301	dp	y
np	39232	hs	nn
fb	8400		
bs	64	lb	0.50
d1	2.000	fn	not used
nt	512		
ct	512	sp	-750.9
tn	TRANSMITTER C13	wp	15082.5
tn	rfi		751.3
sfrq	75.453	rffp	0
tof	-365.7	rp	-13.4
tpwr	58	lp	-151.8
pw	9.250		PLOT
DECOUPLER		wc	250
dn	H1	sc	0
dof	0	vs	1133
dm	yy	th	6
dmm	w	ai	cdc
dpwr	35		ph
dmf	6700		



¹³C-NMR



CL 37
pad=10 run with findz0 before acquisition

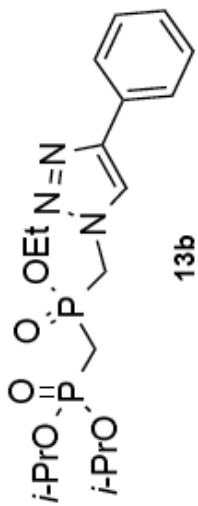
exp5 Proton

SAMPLE DEC. & VT
date Aug 10 2012 dfrq 75.454
solvent cdcl3 dn C13
file /home/TCUser~ dpwr 43
/nmr/s/data/auto~ dof 0
2012.07.31/s_2012~ dm nnn
0810_39/data/cdcl3~ dnm c
01.fid 13100

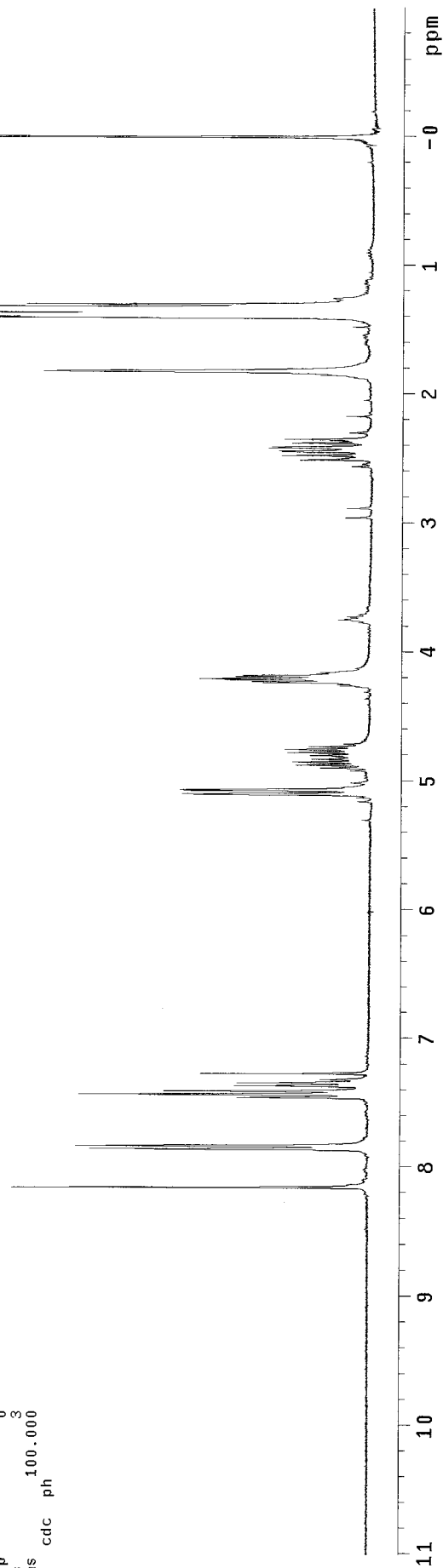
ACQUISITION PROCESSING
sfrq 300.047 wfile
tn H1 proc ft
at 1.998 fn not used
np 19184
sw 4800.8 werr xmreact
fb 2600 wexp abortoff flus~
bs 16 h procpot aborton
tpwr 55 wbs
pw 7.9 wnt
d1 1.000
tof 277.9
nt 8
ct 8
alock y
gain not used

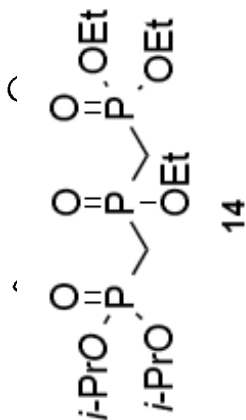
FLAGS
i1 n
in n
dp y

DISPLAY
sp -299.2
wp 3602.3
vs 298
sc 0
wc 240
hzmm 15.01
is 766.51
rf1 594.5
rfp 0
th 0
ins 3
ai cdc ph 100.000



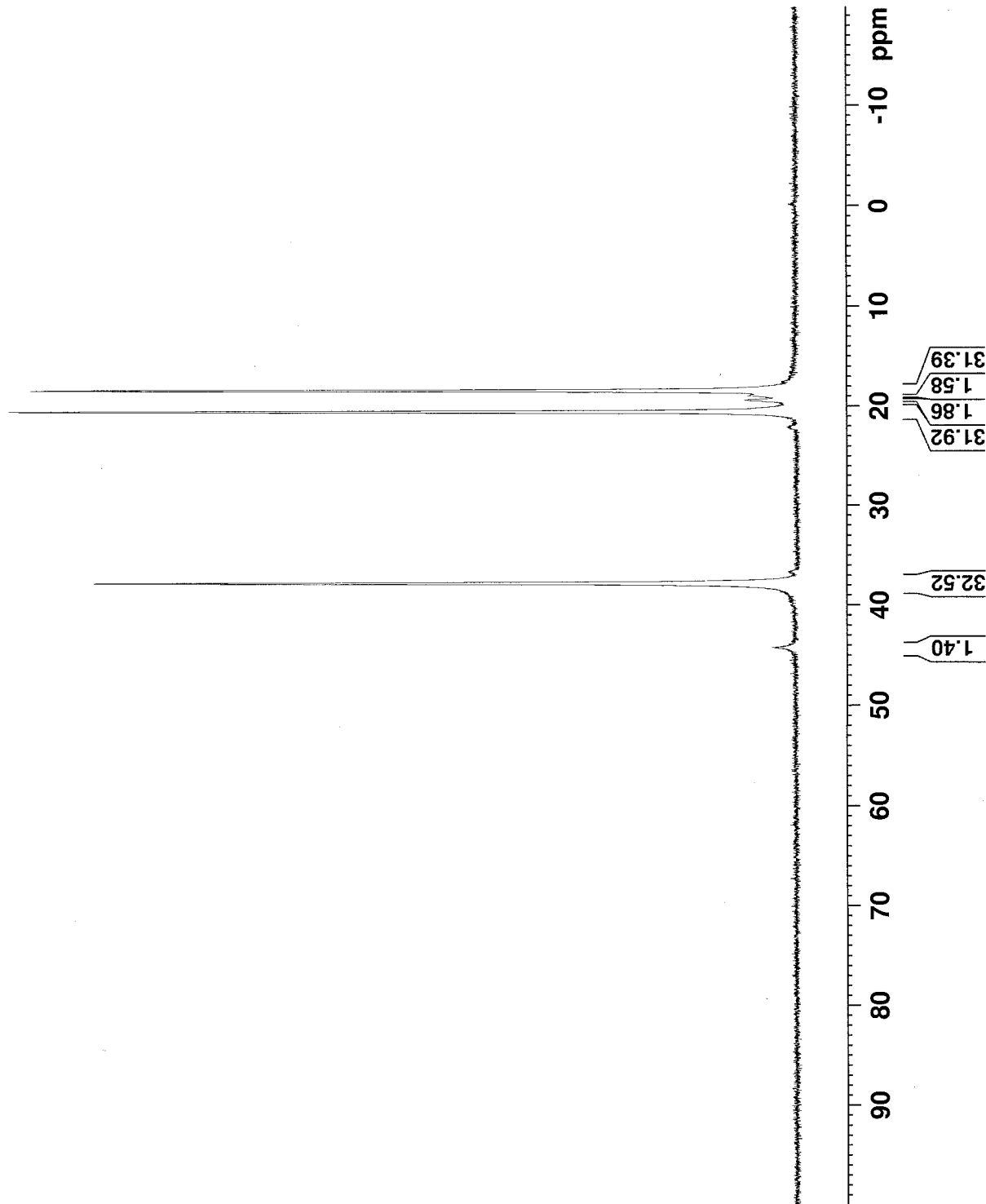
¹H-NMR





³¹P-NMR (decoupled)

37.805
20.586
18.461



Current Data Parameters
NAME FG238P
EXPNO 1
PROCNO 1

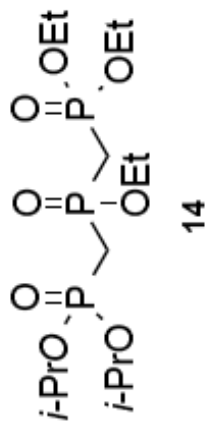
F2 - Acquisition Parameters
Date_ 20140522
Time 15.49
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 16
DS 4
SWH 64102.563 Hz
FIDRES 0.978127 Hz
AQ 0.5111808 sec
RG 203.57
DW 7.800 usec
DE 6.50 usec
TE 295.8 K
D1 2.0000000 sec
D11 0.0300000 sec
TD0 1

==== CHANNEL f1 =====
SFO1 161.9674942 MHz
NUC1 31P
P1 14.25 usec
PLW1 15.0000000 W

==== CHANNEL f2 =====
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 10.0000000 W
PLW12 0.31604999 W
PLW13 0.25600001 W

F2 - Processing parameters
SI 32768
SF 161.9755930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

³¹P-NMR (coupled)

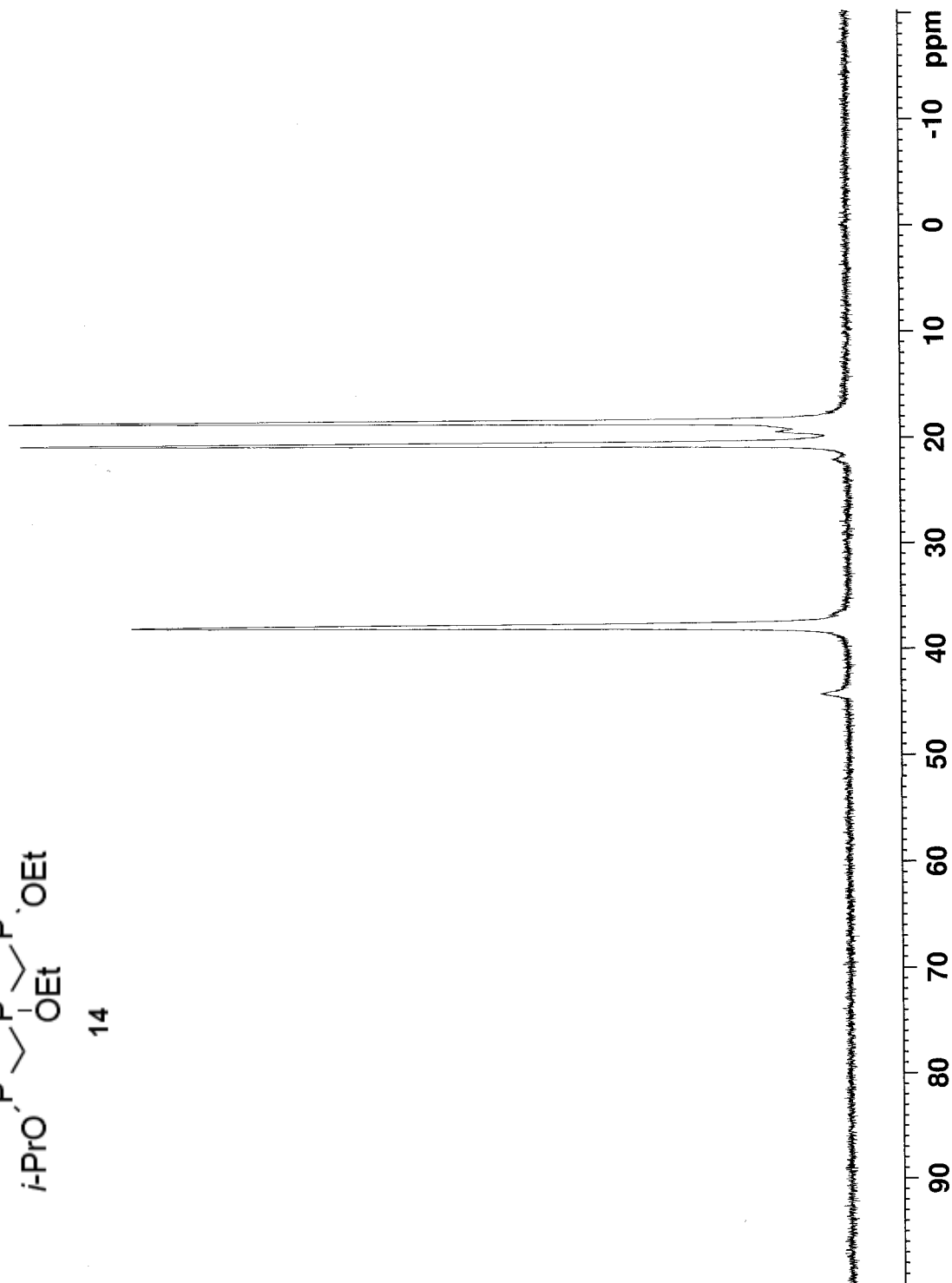


Current Data Parameters
 NAME FG238P
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140522
 Time 15.51
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 32
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 295.2 K
 D1 2.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

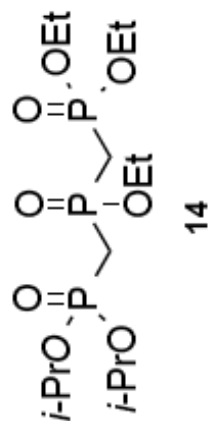
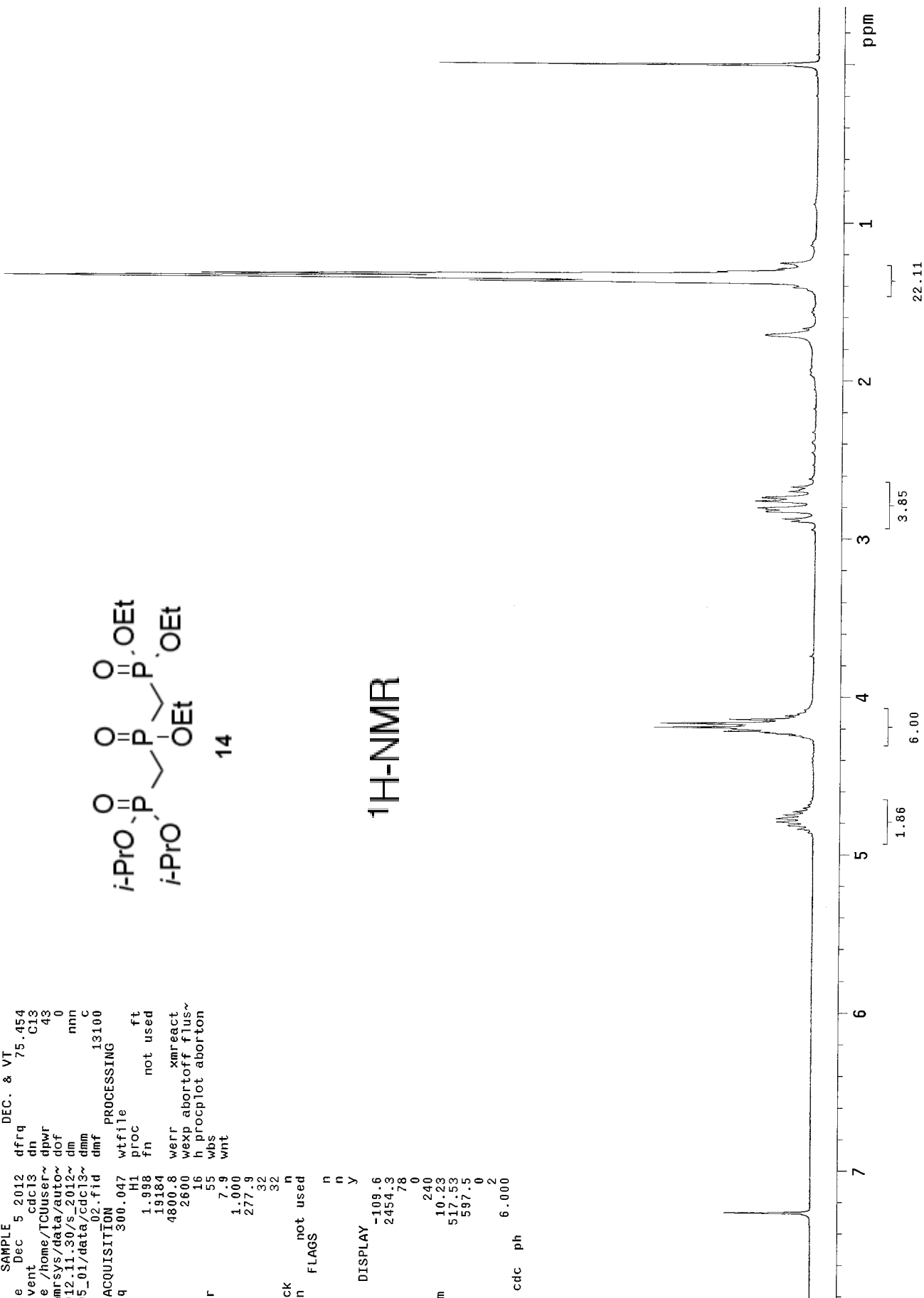
F2 - Processing parameters
 SI 32768
 SF 161.9755930 MHz
 EM
 WDW 0
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40



FG238P

exp1 Proton

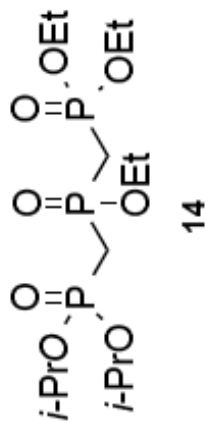
SAMPLE		DEC. & VT	
date	Dec 5 2012	dfrq	75.454
solvent	cdcl3	dn	C13
file	/home/TCUUser~ dpwr	43	
/vnmrsys/data/autow	dof	0	
2012-11-30/s	2012~	dm	nmn
1205_01/data/cdcl3~	dmm	c	
02.fid	dmmf	13100	
ACQUISITION			
sfrq	300.047	wtfile	
tn	H1	proc	ft
at	1.998	fn	not used
np	19184		
sw	4800.8	werr	xmreact
fb	2600	wexp	abortoff plus~
bs	16	h	procplot aborton
tpwr	55	wbs	
pw	7.9	wnt	
d1	1.000		
tof	277.9		
nt	32		
ct	32		
alock	n		
gain	not used		
FLAGS			
il	n		
in	n		
dp	y		
DISPLAY			
sp	-109.6		
wp	2454.3		
vs	78		
sc	0		
wc	240		
hzmm	10.23		
is	517.53		
rfl	597.5		
rfl	0		
th	2		
ins	6.000		
al	cdc	ph	

¹H-NMR

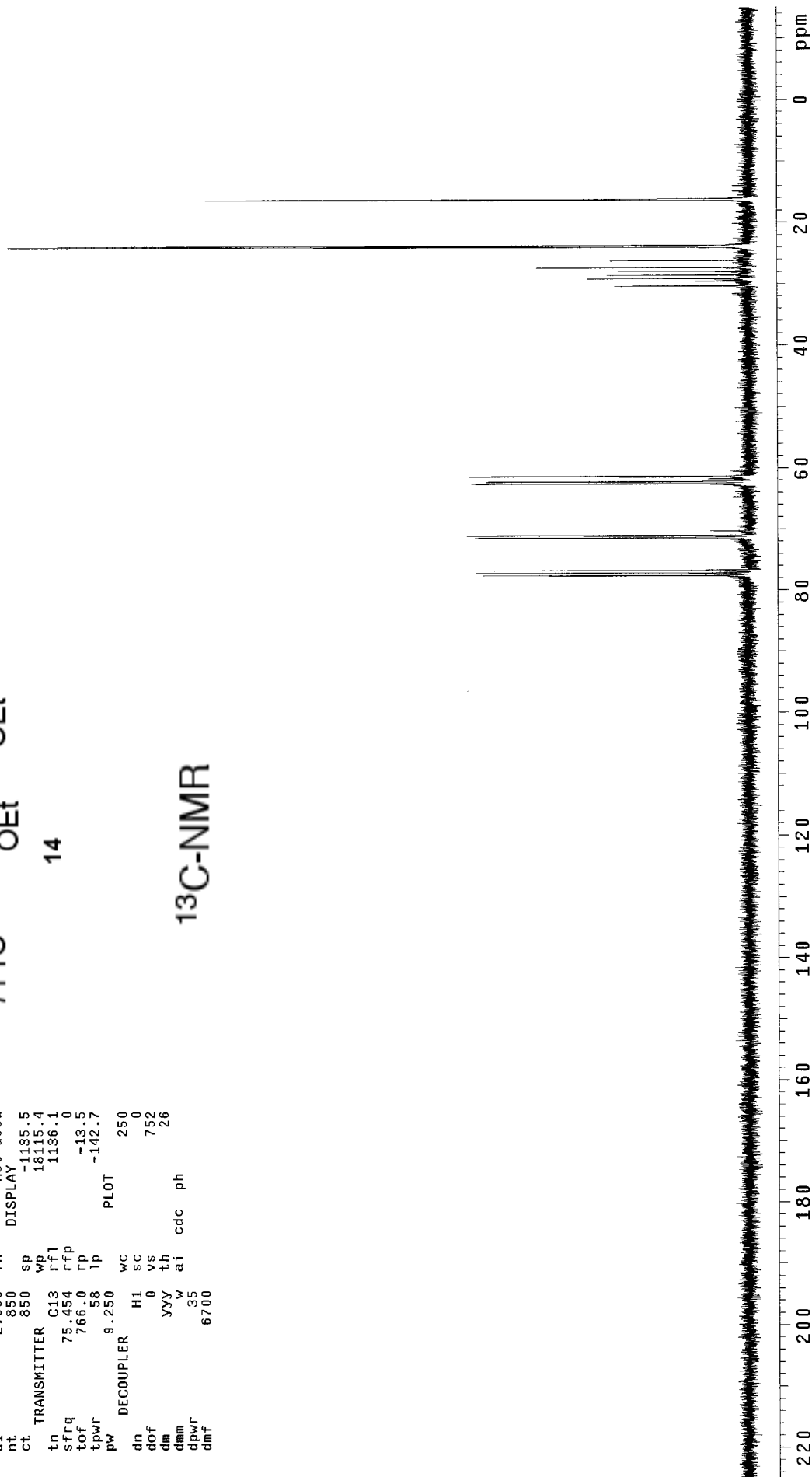
FG238P

exp1 Carbon

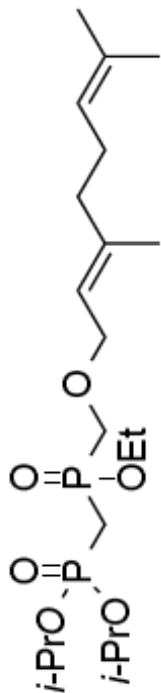
SAMPLE		SPECIAL	
date	Dec 5 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~	spin	20
	/vnmrSys/data/auto~	hst	0.008
	2012.11.30/s_2012~	pw90	18.500
1205_19/data/cdcl3~	alfa		10.000
07.fid	FLAGS		
ACQUISITION	il	n	
sw	18115.9	in	n
at	1.301	dp	y
np	47120	ns	
fb	10000	PROCESSING	nm
bs	64	lb	0.50
d1	2.000	fn	not used
nt	850	DISPLAY	
ct	850	SP	-1135.5
TRANSMITTER	C13	wp	18115.4
tn	75.454	rfl	1136.1
sfrq	75.454	rfp	1136.1
tof	766.0	rp	-13.5
tpwr	58	lp	-142.7
pw	9.250	PLOT	
DECOUPLER	H1	wc	250
dn	0	sc	0
dof	0	vs	752
dm	yy	th	26
dmm	w	ai	cdc
dpwr	35	ph	
dmf	6700		



¹³C-NMR



INDEX	FREQUENCY	PPM	HEIGHT
1	5004.0	41.199	119.3
2	4999.8	41.164	126.0
3	2122.3	17.473	112.0
4	2118.1	17.438	117.3



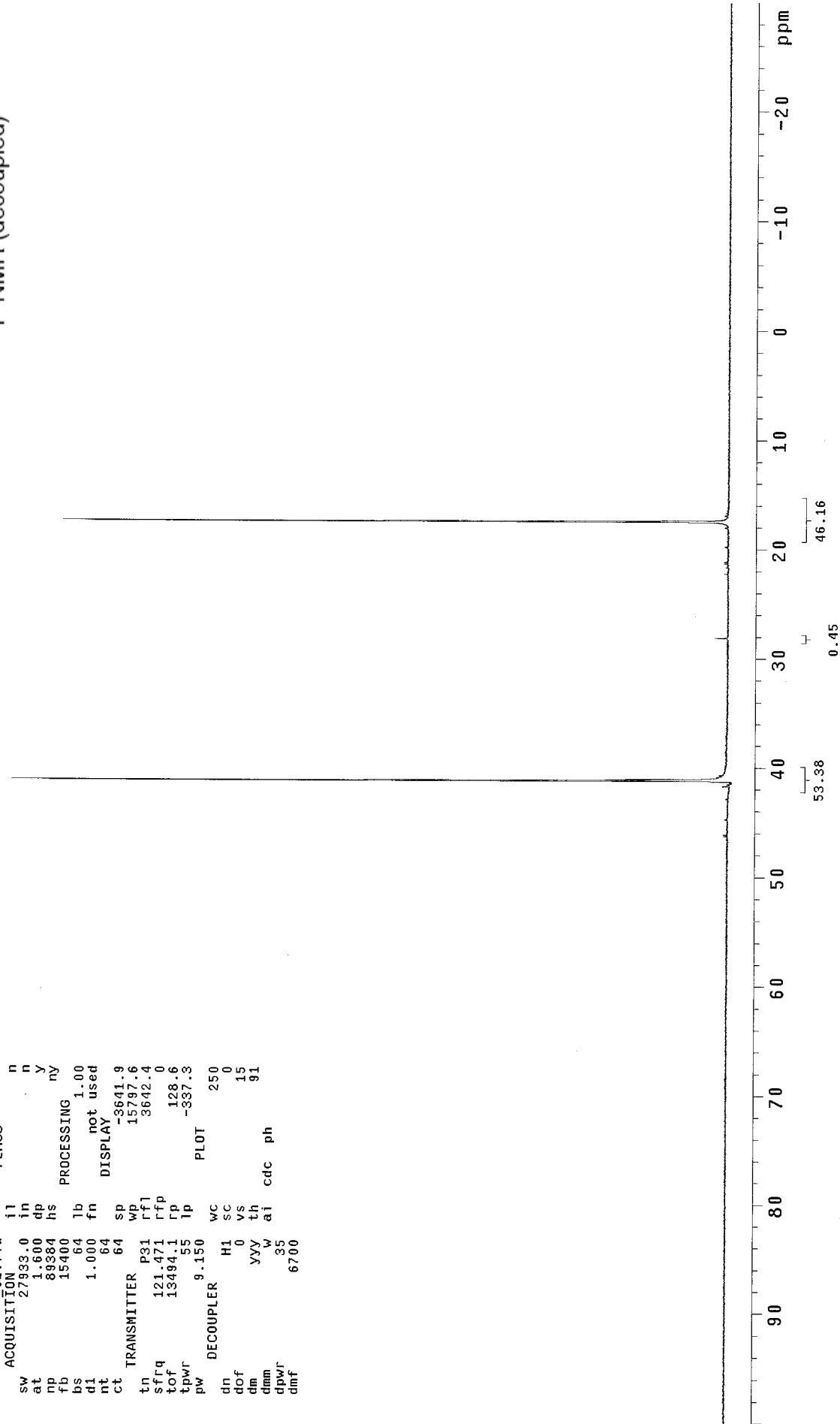
15

³¹P-NMR (decoupled)

FG247P
pad=10 run with findz0 before acquisition

exp1 Phosphorus

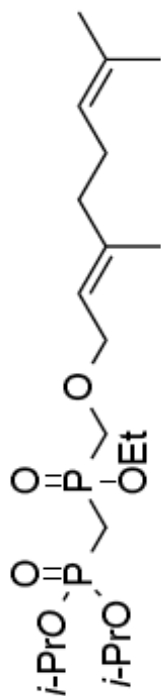
date	Dec 18 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~spin		20
/vnmrSYS/data/autos	hst	0.008	
2012_12_14/s	2012~pw90	18.300	
1218_24/data/cdcl3~	alpha	10.000	
02.fid	il		
sw	27933.0	in	n
at	1.600	dp	y
np	89384	hs	ny
fb	15400		
bs	64	lb	1.00
dl	1.000	fn	not used
nt	64		
ct	64	sp	DISPLAY
tn	3641.9		
transmitter	p31	wp	15797.6
rf1	3642.4		
sfrq	121.471	rfp	0
tof	13494.1	rp	128.6
tpwr	55	lp	-337.3
pw	9.150		PLOT
decopler	9.150	wc	250
h1	sc		0
dof	0	vs	15
dm	yy	th	91
dmm	w	ai	cdc
dpwr	35		ph
dmf	6700		



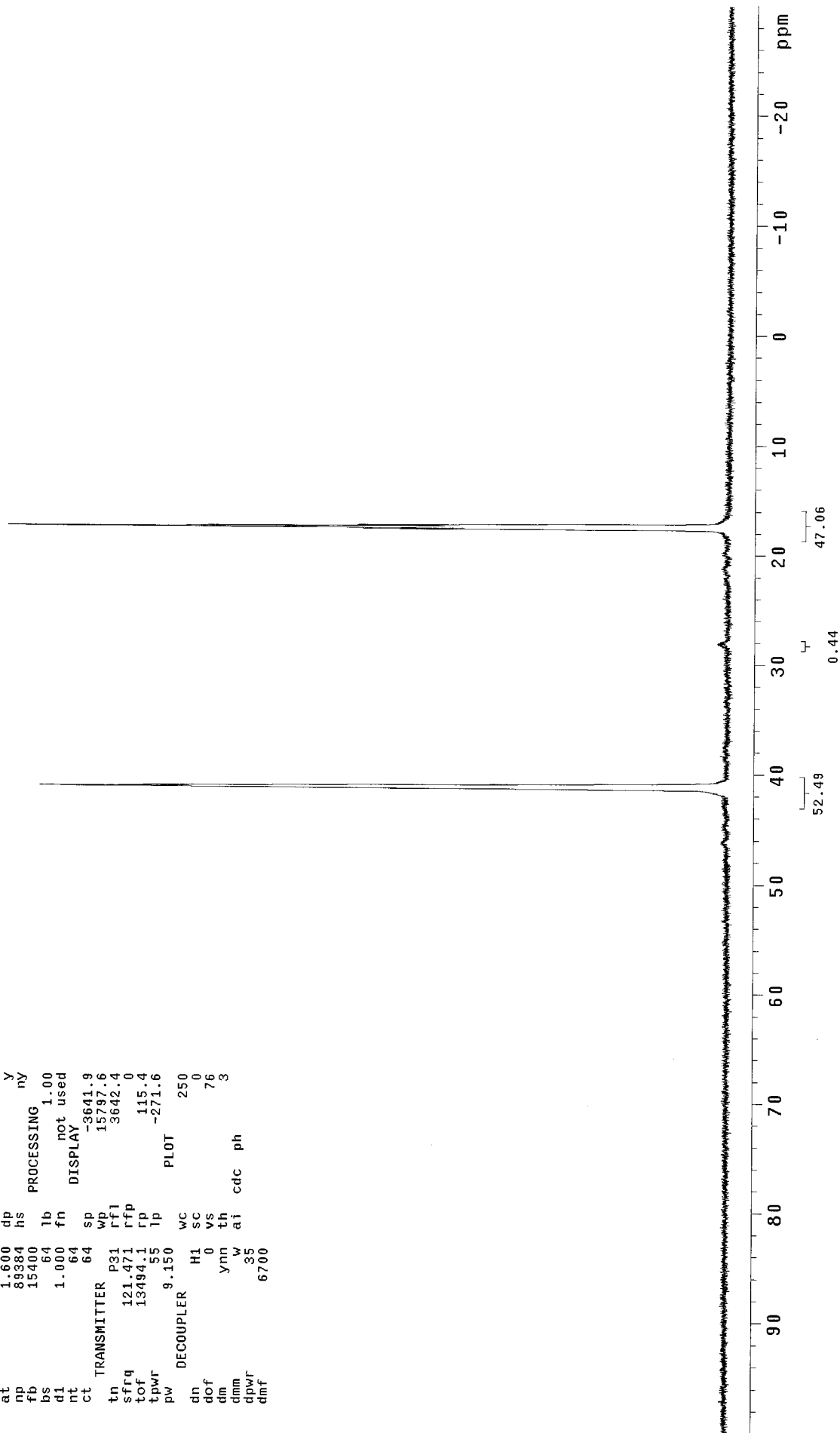
FG247P

exp1 Phosphorus

SAMPLE		SPECIAL	
date	Dec 18 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~	spin	20
/vnmrSYS/data/autow	hst	0.008	
2012.12.14/s.2012~	pw90	18.300	
1218_24/data/cdc13~	alpha	10.000	
04.fid	FLAGS		
ACQUISITION	il	n	
sw	27933.0	in	n
at	1.600	dp	y
np	89384	hs	ny
fb	15400		
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		
ct	64	DISPLAY	
tn	P31	sp	-3641.9
trf	rfl	wp	15797.6
sfrq	121.471	rfl	3642.4
tof	13494.1	rp	0
tpwr	55	lp	115.4
pw	9.150		-271.6
DECOUPLER	WC	PLOT	
dn	H1	250	
dof	0	SC	0
dm	vs	76	
dmm	ynn	th	3
dpwr	w	ai	cdc
dmf	6700	ph	



15

³¹P-NMR (coupled)

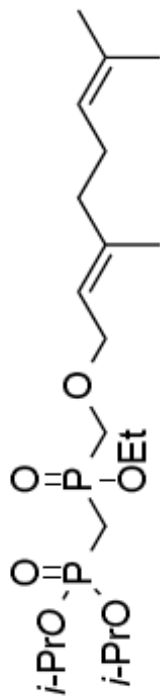
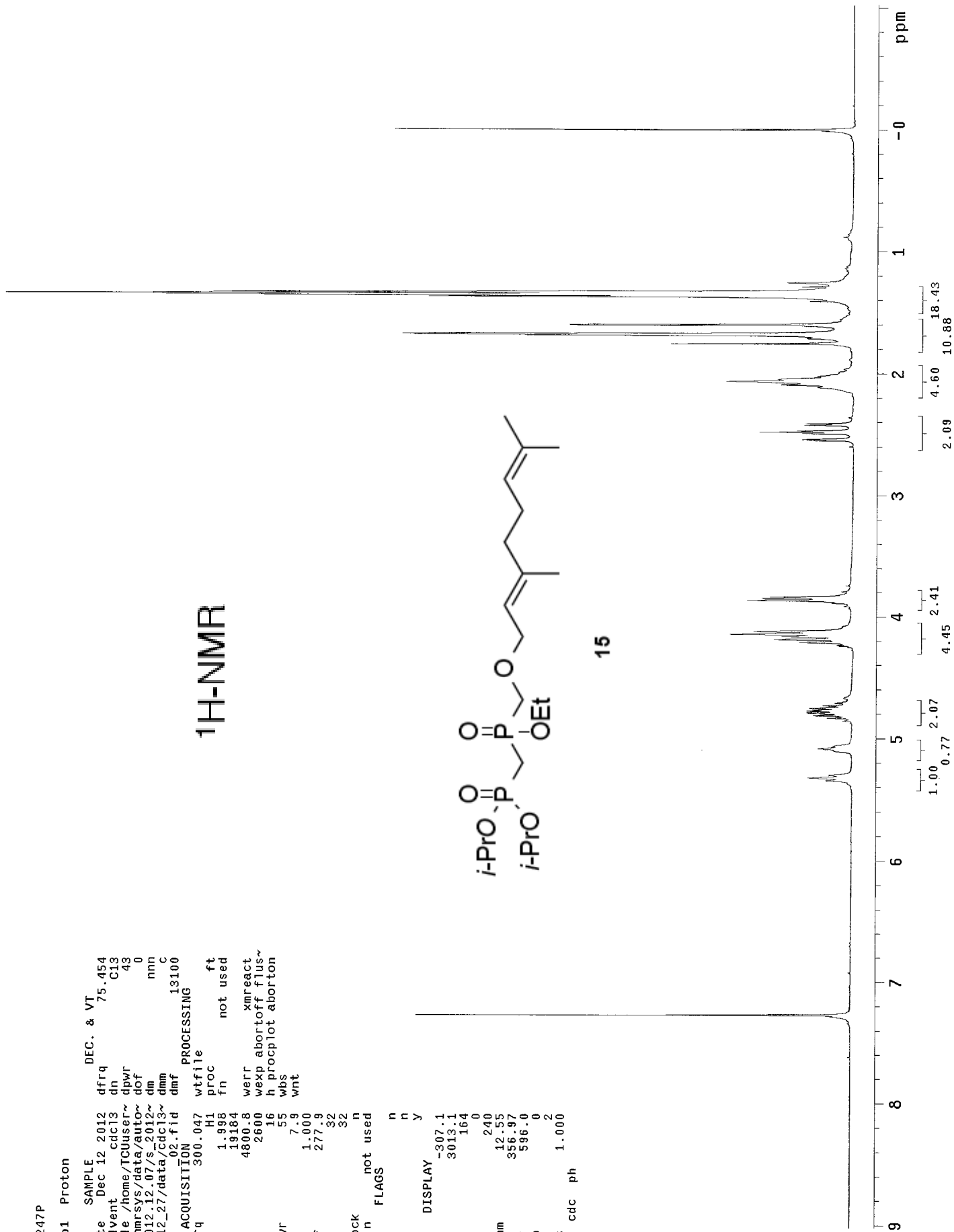
FG247P

exp1 Proton

SAMPLE DEC. & VT
 date Dec 12 2012 dfrq 75.454
 solvent cdc13 dn 43
 file /home/TCUuser~ dpwr 0
 /nmr/sys/data/autos~ dof nnn
 2012.12.07/s_2012~ dm c
 1212_27/data/cdc13~ dnm 13100
 02.fid dmf

ACQUISITION
 sfrq 300.047 wfile
 tn H1 proc ft
 at 1.998 fn not used
 np 18184
 sw 4800.8 werr xmreact
 fb 2600 wexp abortoff flus~
 bs 16 h procplot aborton
 tpwr 55 wbs
 pw 7.9 wnt
 d1 1.000
 tof 277.9
 nt 32
 ct 32
 alock not used
 gain
 FLAGS
 il n
 in n
 dp y

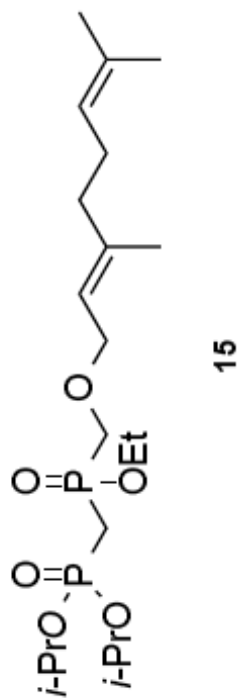
DISPLAY
 sp -307.1
 wp 3013.1
 vs 164
 sc 0
 wc 240
 hzmm 12.55
 is 356.97
 rfl 596.0
 rfp 2
 th 1.000
 ins
 ai cdc ph

¹H-NMR**15**

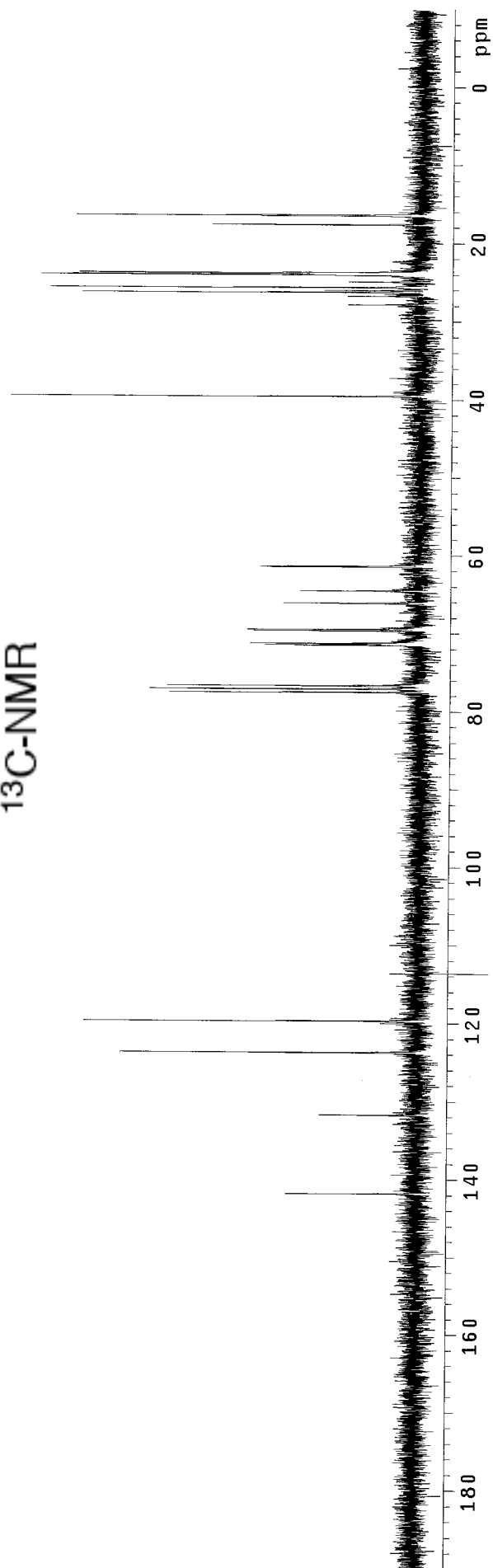
CL 54
pad=10 run with findz0 before acquisitio
n

exp6 Carbon

SAMPLE		SPECIAL	
date	Aug 23 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUuser~	spin	20
/nmr/sys/data/autow	hst	0.008	
2012.08.20/s	2012~	pw90	18.500
0823_14/data/cdcl3~	alfa	10.000	
01.fid		FLAGS	
ACQUISITION			
sw	15083.0	in	n
at	1.301	dp	y
np	39282	hs	nm
fb	8400		
bs	64	lb	0.50
d1	2.000	fn	not used
nt	512		
ct	512	sp	DISPLAY
TRANSMITTER			
tn	C13	wp	-750.9
sfrq	75.453	rfl	15082.5
tof	-365.7	rpf	751.3
tpwr	58	lp	20.7
pw	9.250		-186.2
DECOUPLER			
dn	H1	sc	250
dof	0	vs	0
dm	YVY	th	1239
dmm	W	ai	8
dpwr	35		
dmf	6700		



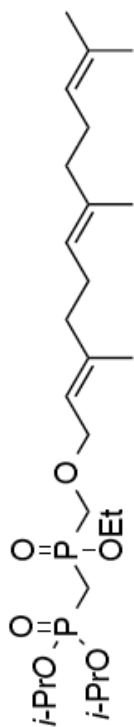
¹³C-NMR



³¹P-NMR (decoupled)

17.520

41.274



16

Current Data Parameters
NAME FG401P
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20140424
Time 17.38

INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536

SOLVENT CDCl3
NS 16
DS 4

SWH 64102.563 Hz
FIDRES 0.978127 Hz
AQ 0.5111808 sec

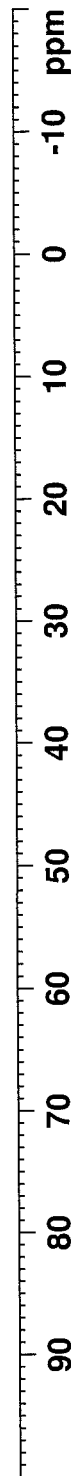
RG 203.57
DW 7.800 usec
DE 6.50 usec

TE 295.3 K
D1 2.0000000 sec
D11 0.0300000 sec
TD0 1

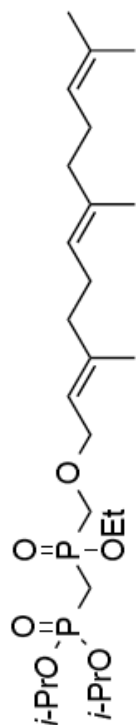
===== CHANNEL f1 =====
SFO1 161.9674942 MHz
NUC1 31P
F1 14.25 usec
PLW1 15.0000000 W

===== CHANNEL f2 =====
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2] waltz16
PCPD2 90.00 usec
PLW2 10.0000000 W
PLW12 0.31604999 W
PLW13 0.25600001 W

F2 - Processing parameters
SI 32768
SF 161.9755930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



³¹P-NMR (coupled)



16

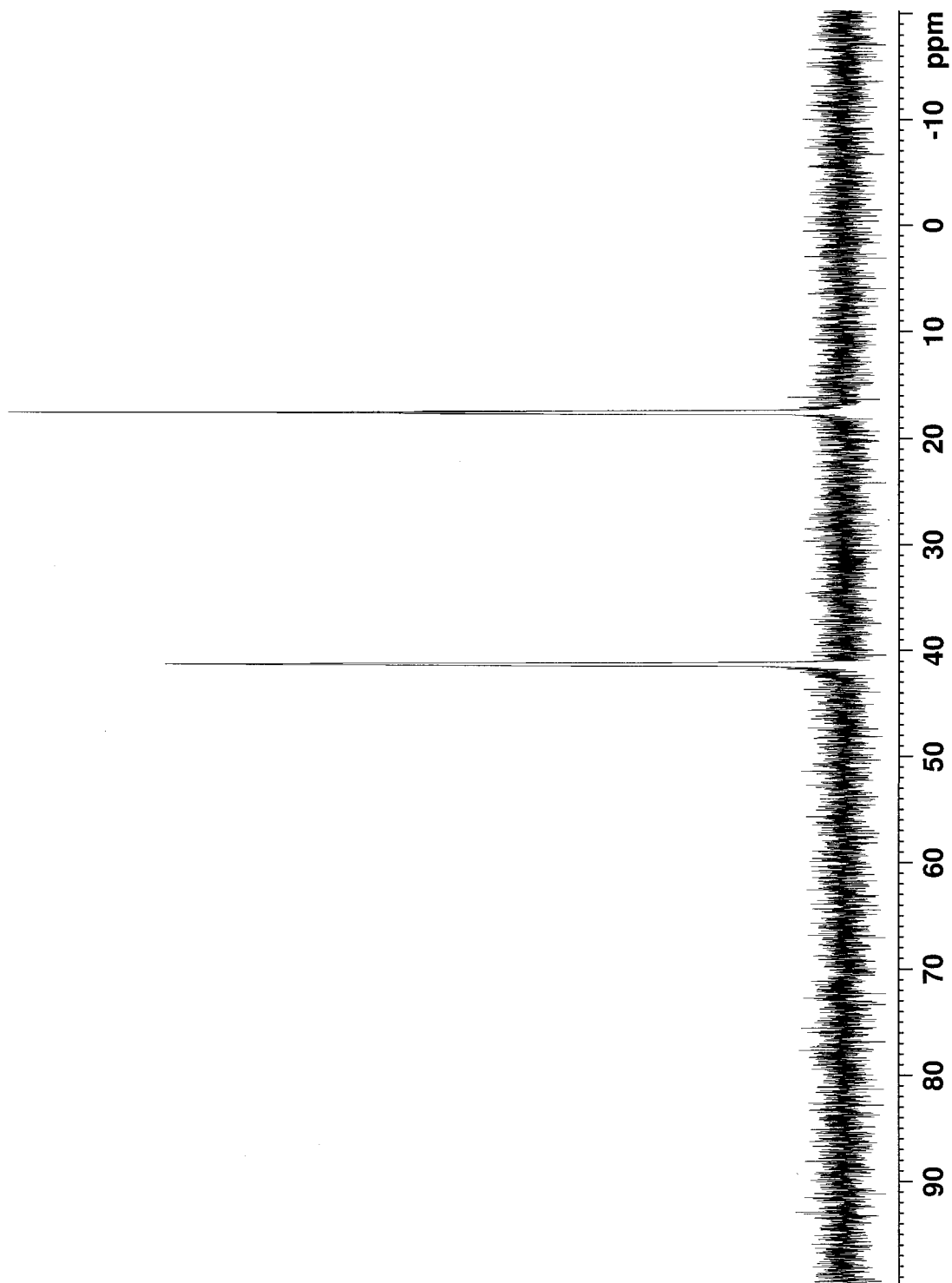
```

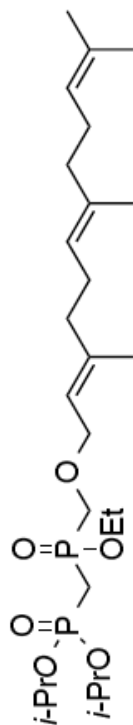
Current Data Parameters
NAME      FG40LP
EXPNO     3
PROCNO    1

F2 - Acquisition Parameters
Date_     20140424
Time      17.41
INSTRUM   spect
PROBHD    5 mm PABBO BB/
PULPROG   zg30
ID        65536
SOLVENT   CDCl3
NS        32
DS        4
SWH        64102.563 Hz
FIDRES     0.978127 Hz
AQ         0.5111808 sec
RG         203.57
DW         7.800 usec
DE         6.50 usec
TE         294.7 K
D1         2.00000000 sec
TD0        1

===== CHANNEL f1 =====
SF01      161.9674942 MHz
NUC1       31P
P1        14.25 usec
PLW1      15.00000000 W

F2 - Processing parameters
SI         32768
SF         161.9755930 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40
    
```



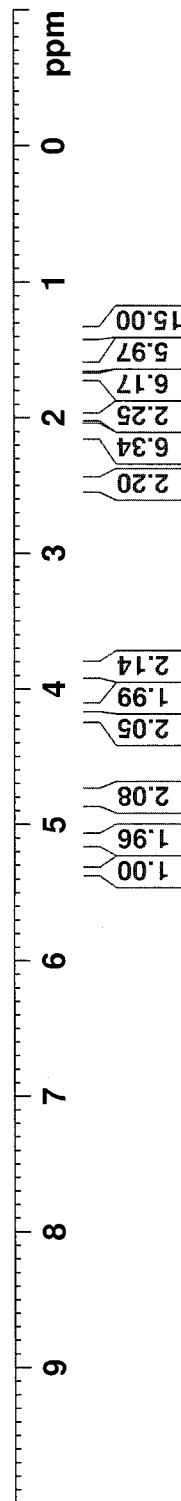


16

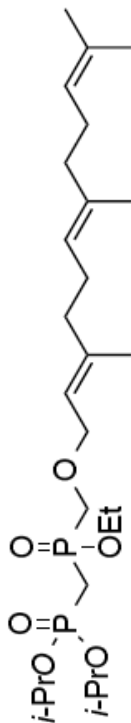
¹H-NMR

1.698
1.616

Current Data Parameters
 NAME FG401P
 EXPNO 1
 PROCNO 1
 F2 - Acquisition Parameters
 Date_ 20140424
 Time 17.36
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 8012.820 Hz
 FIDRES 0.122266 Hz
 AQ 4.089465 sec
 RG 128.8
 DW 62.400 usec
 DE 6.50 usec
 TE 294.8 K
 D1 1.00000000 sec
 TD0 1
 ===== CHANNEL f1 =====
 SFO1 400.1324710 MHz
 NUC1 1H
 P1 10.00 usec
 PLW1 25.00300026 W
 F2 - Processing parameters
 SI 65536
 SF 400.1300000 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



¹³C-NMR



16

71.30
71.24
71.08
71.02
69.52
69.40
65.97
64.79
61.28
61.22
39.58
39.51
27.52
26.58
26.19
25.57
25.34
24.00
23.96
23.92
23.80
23.69
23.57
23.73
17.59
16.44
16.39
15.9

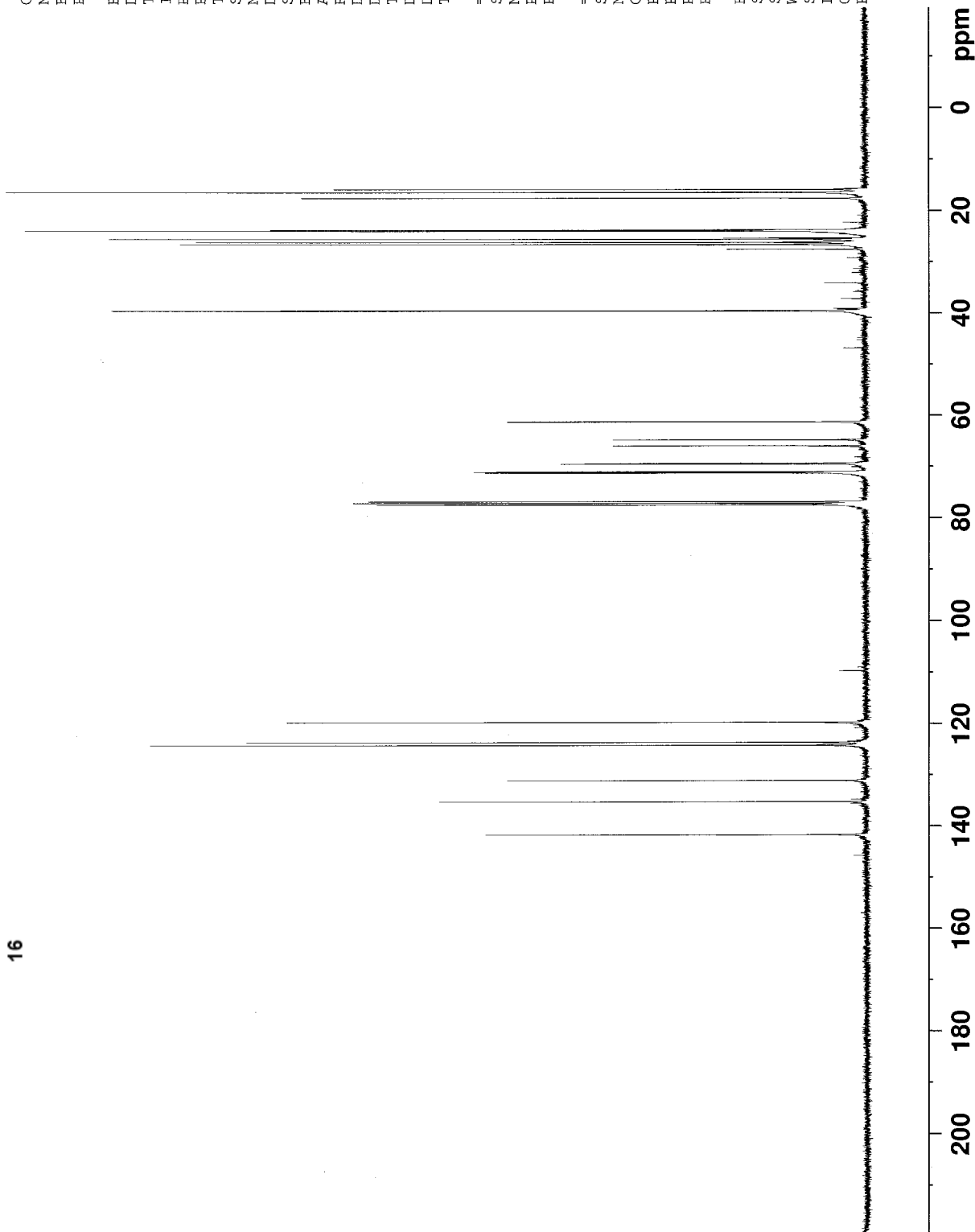
Current Data Parameters
NAME FG401P
EXPNO 5
PROCNO 1

F2 - Acquisition Parameters
Date_ 20140425
Time 17.59
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 910
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631488 sec
RG 203.57
DW 20.800 usec
DE 6.50 usec
TE 296.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

==== CHANNEL f1 =====
SFO1 100.6228293 MHz
NUC1 13C
P1 10.00 usec
PLW1 45.00000000 W

==== CHANNEL f2 =====
SFO2 400.1316005 MHz
NUC2 1H
CPDPRG[2] waltz16
PCPD2 90.00 usec
PLW2 10.00000000 W
PLW12 0.31604999 W
PLW13 0.25600001 W

F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 0
GB 0
PC 1.40



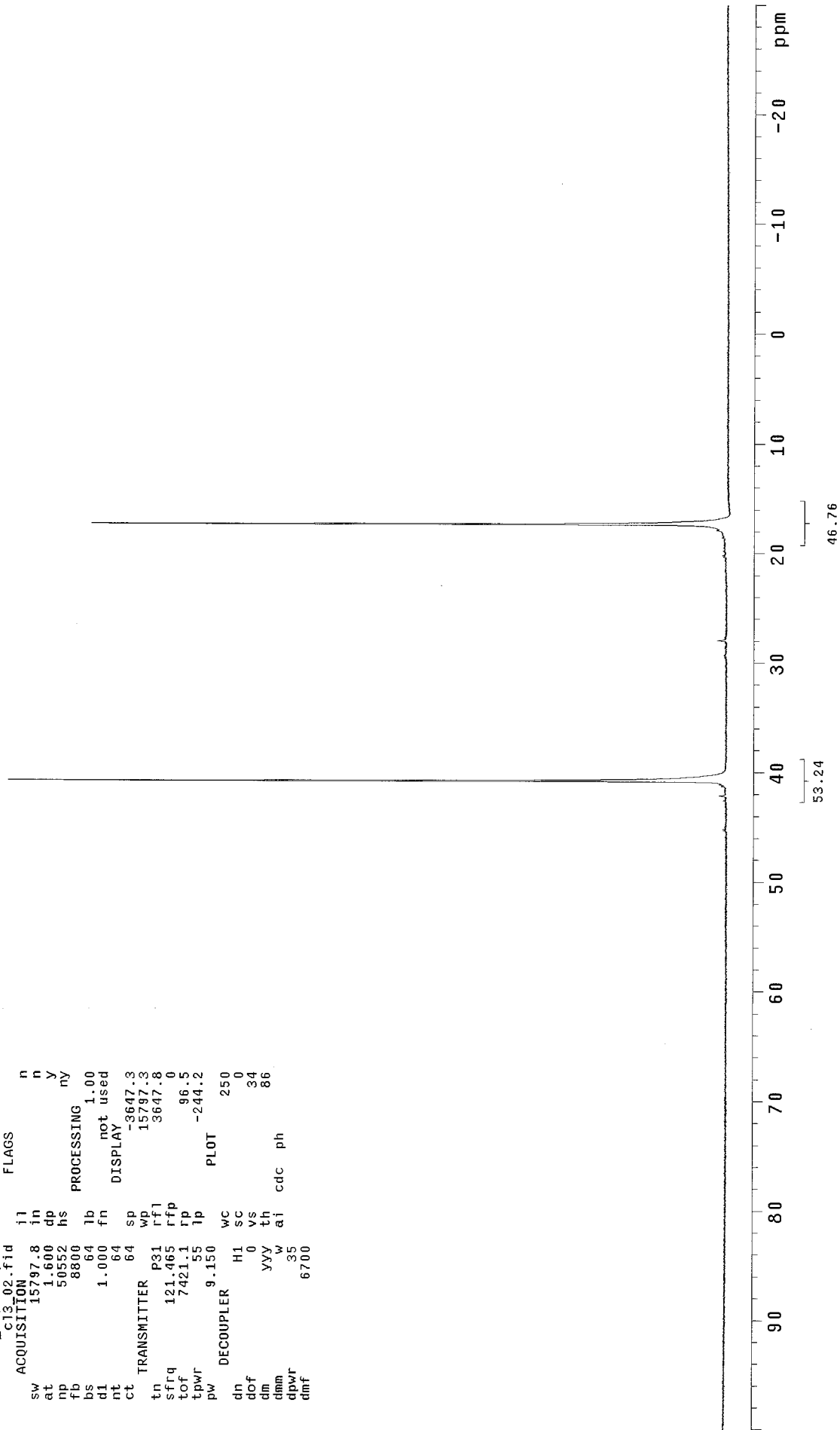
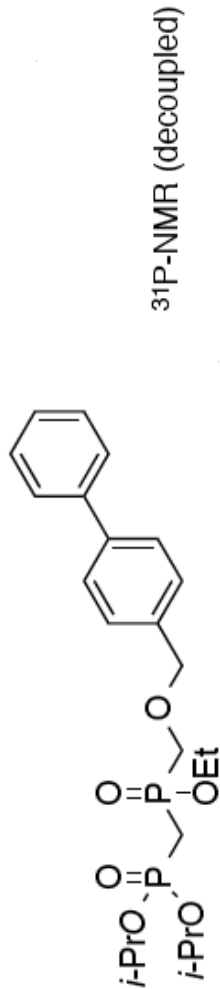
FG301P

pad=10 run with findz0 before acquisition

exp1 Phosphorus

date	Feb 4 2013	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~spin	spn	20
/vnmr	sys/data/autos	hst	0.008
2013.02.02.01/s_2~	pw90	18.300	
0130204_14/data/cd~	alpha	10.000	
CL3.02.fid	FLAGS		
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800		
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		
ct	64	sp	-3647.3
tn	TRANSMITTER	p31	15797.3
sfreq	121.465	rfl	3647.8
tof	7421.1	rfp	0
tpwr	55	lp	96.5
pw	9.150		-244.2
DECOUPLER		WC	PLOT
dn	H1	SC	250
dof	0	VS	0
dm	YY	th	34
dmm	w	ai	86
dpwr	35		
dmf	6700		

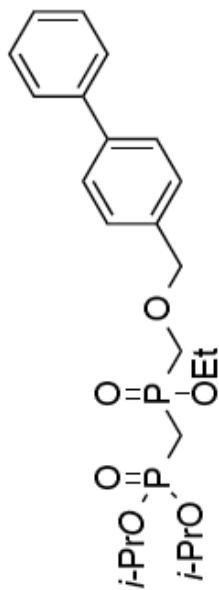
17



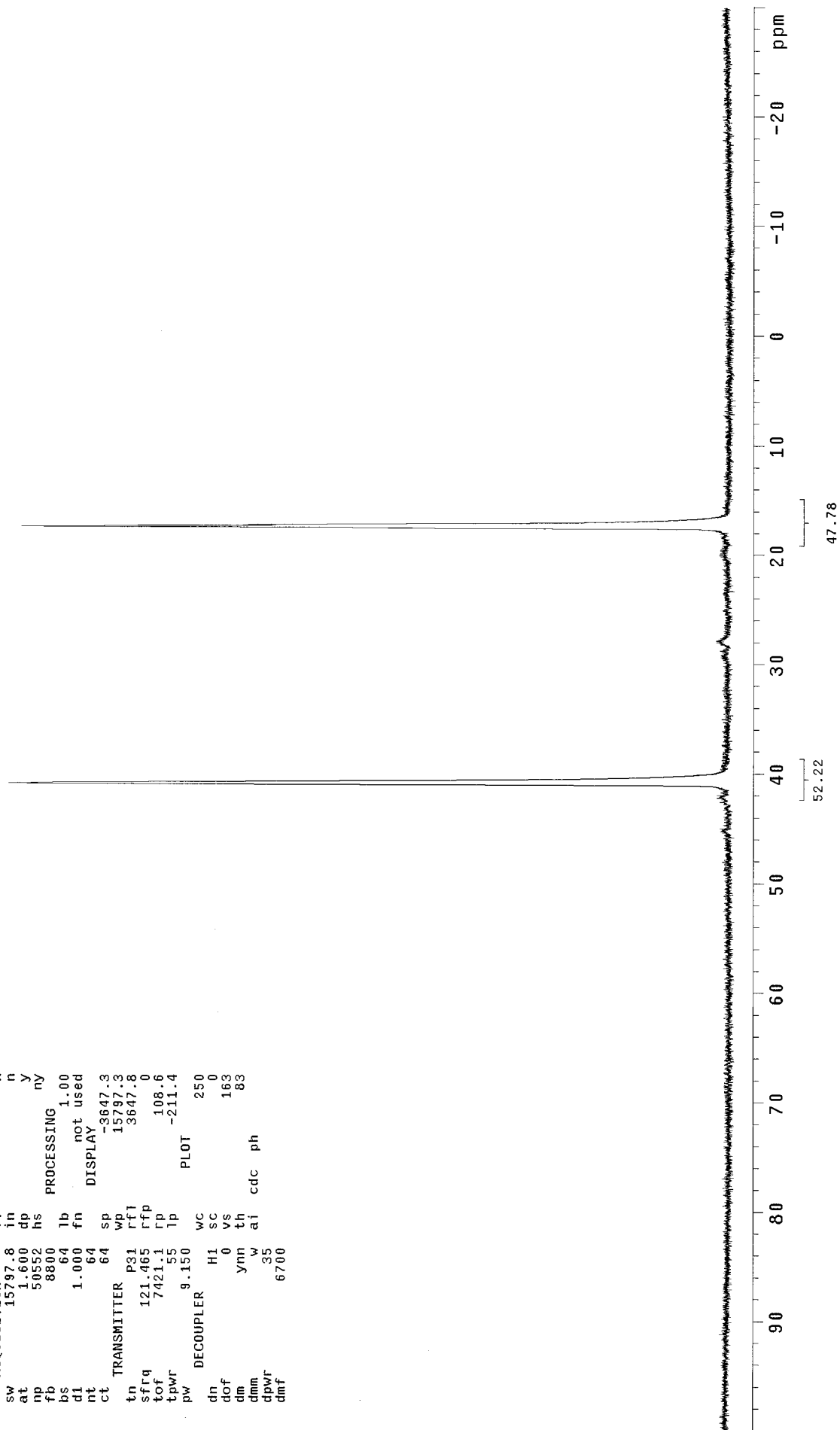
FG301P

exp1 Phosphorus

SAMPLE		SPECIAL	
date	Feb 4 2013	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser~ spin		20
/vnmr	sys/data/autos hst		0.008
2013.02.02.01/s_2~	pw90		18.300
0130204_14/data/cd~	alpha		10.000
cl3.04.fid	FLAGS		
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	n
np	50552	hs	y
fb	8800		ny
bs	64	lb	1.00
di	1.000	fn	not used
nt	64		DISPLAY
ct	64	sp	-3647.3
tn	TRANSMITTER	wp	15797.3
tn	P31	rfl	3647.8
sfrq	121.465	rfp	0
tof	7421.1	rp	108.6
tpwr	55	lp	-211.4
pw	9.150		PLOT
DECOUPLER			
dn	H1	sc	250
dof	0	vs	0
dm	ynn	th	163
dmm	w	ai	83
dpwr	35		cdc ph
dmf	6700		

³¹P-NMR (coupled)

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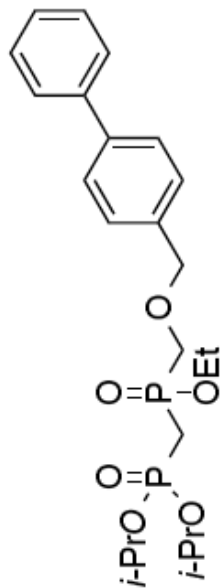
FG301P

pad=10 run with findz0 before acquisition

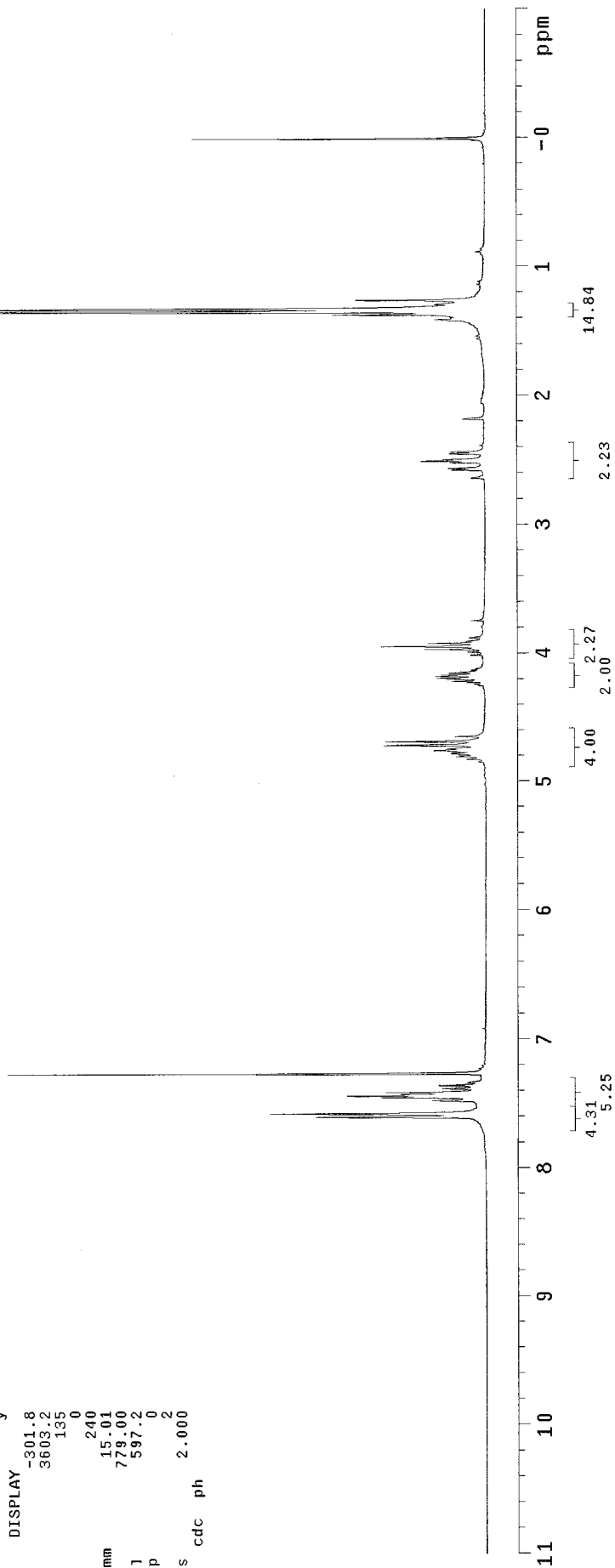
exp1 Proton

¹H-NMR

date Feb 4 2013 dfrq 75.454
 solvent cdc13 dn C13
 file /home/TCUser~ dpwr 43
 /vnmrsvs/data/auto~ dof 0
 2013-02-01/s 2~ dm nnn
 0130204_10/data/d~ dmm C
 c13_01.fid dmf 13100
 ACQUISITION
 sfrq 300.047 wfile
 tn H1 proc ft
 at 1.998 fn not used
 np 19184
 sw 4800.8 werr xmreact
 fb 2600 wexp abortoff flus~
 bs 16 n procpilot aborton
 tpwr 55 wbs
 pw 1.000 7.9 wnt
 d1 277.9
 tof 32
 nt 32
 ct
 alock y
 gain not used
 flags
 ll n
 in n
 dp y
 DISPLAY
 sp -301.8
 wp 3603.2
 vs 135
 sc 0
 wc 240
 hzmm 15.01
 is 779.00
 rf1 597.2
 rfp 0
 th 2
 ins 2.000
 al cdc ph



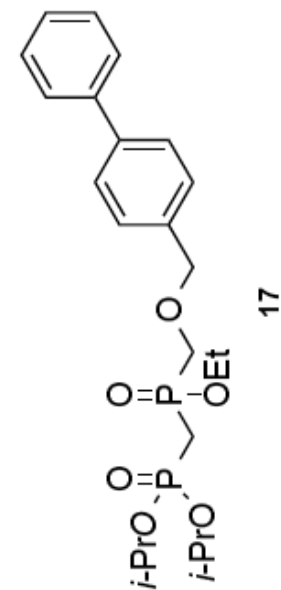
17



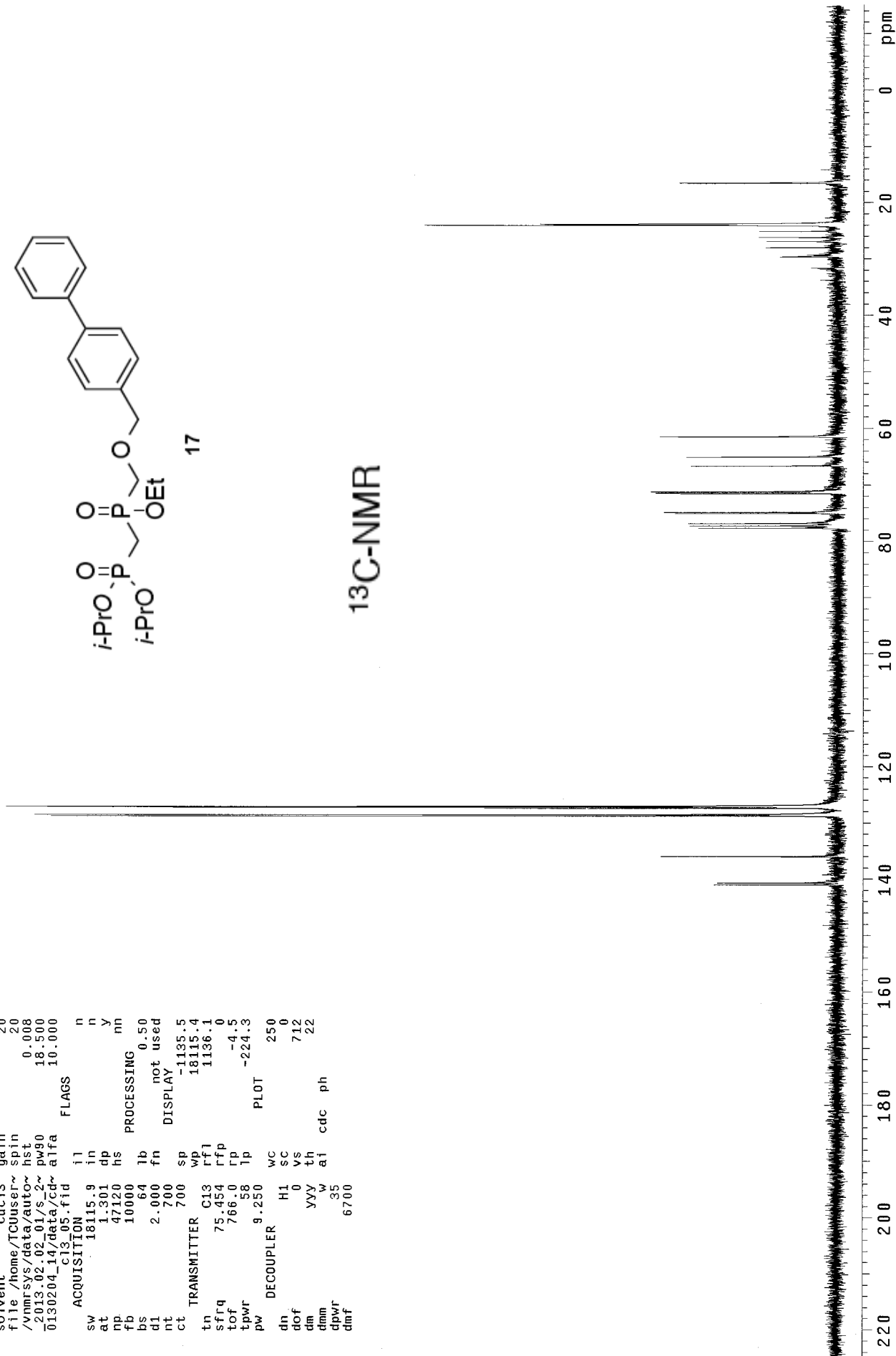
FG301P

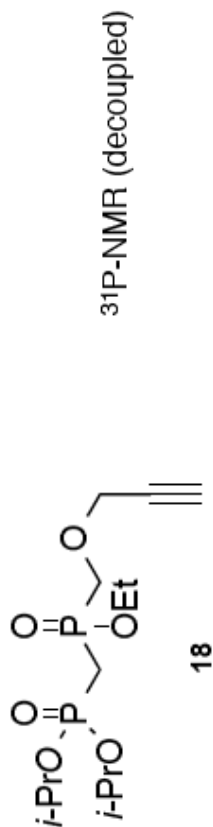
exp1 Carbon

SAMPLE		SPECIAL	
date	Feb 4 2013	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~	spin	20
/vnmrSYS/data/autow	hst	0.008	
-2013.02.02_01/s_2~	pw90	18.500	
0130204_14/data/cd~	alfa	10.000	
cl3.05.fid	FLAGS		
ACQUISITION			
sw	18115.9	in	n
at	1.301	dp	y
np	47120	hs	nn
fb	10000		
bs	64	lb	0.50
d1	2.000	fn	not used
nt	700		
ct	700	sp	-1135.5
TRANSMITTER			
tn	Q13	wp	18115.4
strq	75.454	rfl	1136.1
tof	766.0	rpf	0
tpwr	58	rp	-4.5
pw	9.250	lp	-224.3
DECOUPLER			
dn	H1	wc	250
dof	0	sc	0
dm	yyy	vs	712
dmm	w	th	22
dpwr	35	at	cdc
dmf	6700	ph	



17

¹³C-NMR

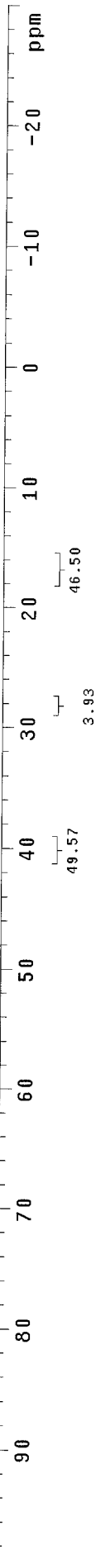


INDEX	FREQUENCY	PPM	HEIGHT
1	4864.4	40.049	122.1
2	4860.5	40.017	126.0
3	2071.5	17.055	110.0
4	2067.6	17.023	110.2

FG251P

exp1 Phosphorus

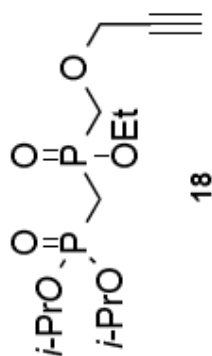
SAMPLE Dec 12 2012 temp not used
 solvent cdc13 gain 20
 file /home/TCUUser~ spin 20
 /vnmrSYS/data/autor~ hst 0.008
 2012_12_07/s_2012~ pw90 18.300
 1212_32/data/cdc13~ alfa 10.000
 04.fid
 ACQUISITION
 sw 15797.8 in n
 at 1.600 dp y
 np 50552 hs
 fb 8800
 bs 64 lb
 dl 1.000 fn not used
 nt 64
 ct 64
 TRANSMITTER P31
 tn wp
 sfrq 121.465 rfp
 tof 7421.1 rp
 tpwr 55 lp
 pw 9.150
 DECOUPLER H1 sc 250
 dn 0
 dof 0 vs 22
 dm YVY th ai cdc ph 75
 dmm w
 dpwr 35
 dmf 6700



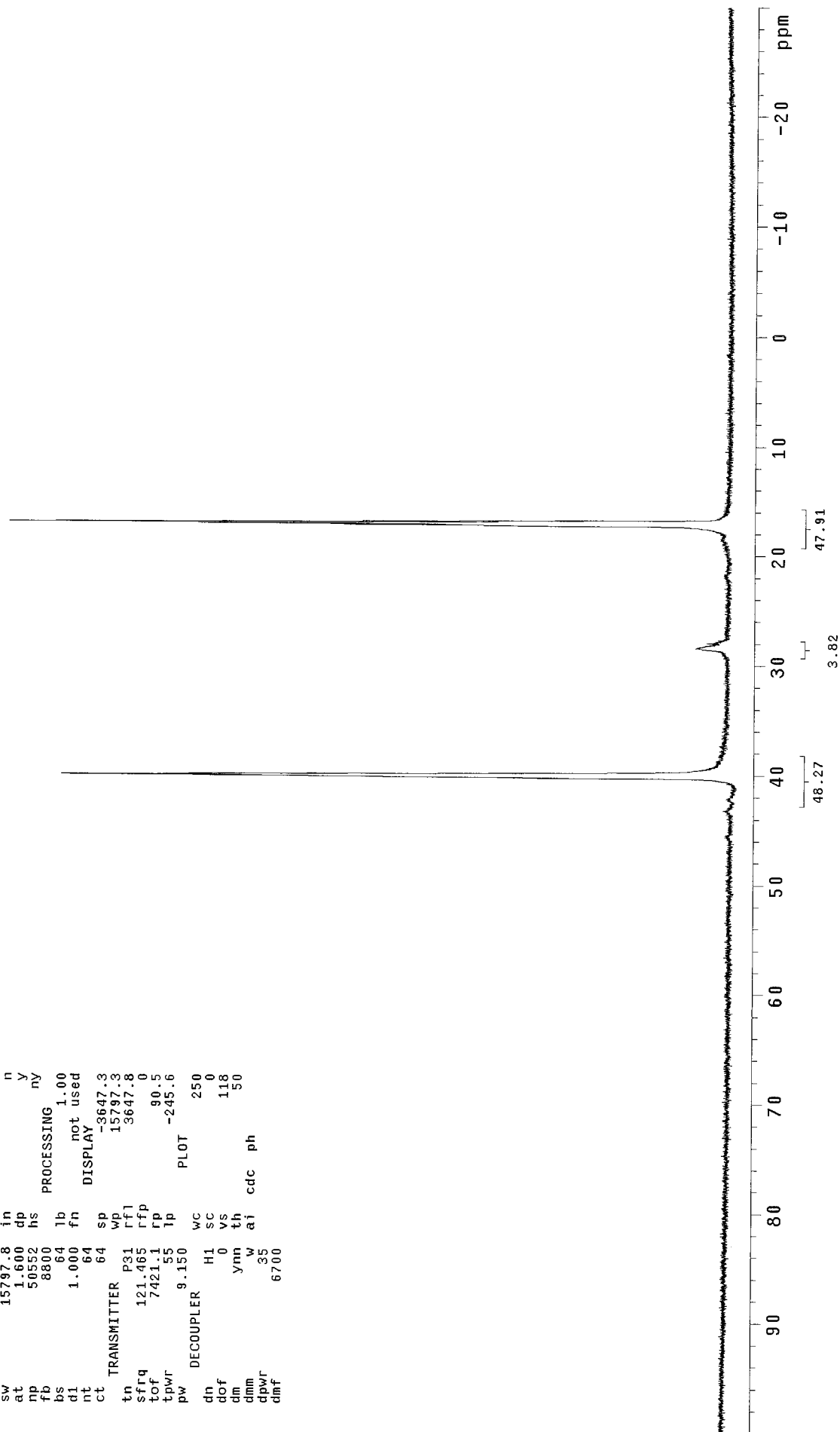
FG251

exp1 Phosphorus

date	Dec 12 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUuser~	spin	20
/vnmr	sys/data/autow	hst	0.008
2012_12.07/s_2012~	pw90	18.300	
1212_34/data/cdcl3~	alpha	10.000	
02.fid	FLAGS		
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800		
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		
ct	64		
TRANSMITTER			
tn	P31	wp	-3647.3
sfrq	121.465	rfl	15797.3
tof	7421.1	rfp	3647.8
tpwr	55	rp	90.5
pw	9.150	lp	-245.6
DECOUPLER			
dn	H1	wc	250
dof	0	sc	0
dm	ynn	th	118
dmm	w	ai	50
dwr	35		
dmf	6700		

³¹P-NMR (coupled)

18



FG251P
pad=10 run with findz0 before acquisitio
n

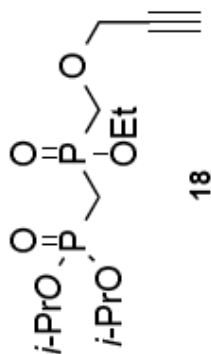
exp1 Proton

SAMPLE DEC. & VT
date Dec 12 2012 dfrq 75.454
solvent cdc13 dn C13
file /home/TCUuser~ dpwr 43
/vnmrsys/data/autoc~ dof 0
2012.12.07/s_2012~ dm nnn
1212_30/data/cdc13~ dmm C
01.fid dmf 13100

ACQUISITION PROCESSING
sfrq 300.047 wfile
tn H1 proc ft
at 1.998 fn not used
np 19184
sw 4800.8 werr xmreact
fb 2600 wexp abortoff flus~
bs 16 h procpot aborton
tpwr 55 wbs
pw 7.9 wnt
d1 1.000
tof 277.9
nt 32
ct 32
alock
gain not used
FLAGS

il in
in in
dp y
sp -88.5
wp 2506.7
vs 103
sc 0
wc 240
hzmm 10.44
is 445.99
rfl 536.9
rfp 0
th 0
ins 3
ai cdc ph 2.000

¹H-NMR



ppm

1

2

3

4

5

6

7

8

17.82

2.99

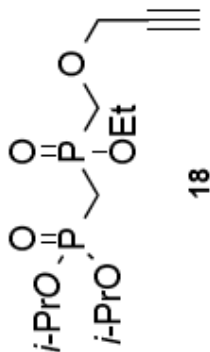
2.22
1.99 2.23

2.00

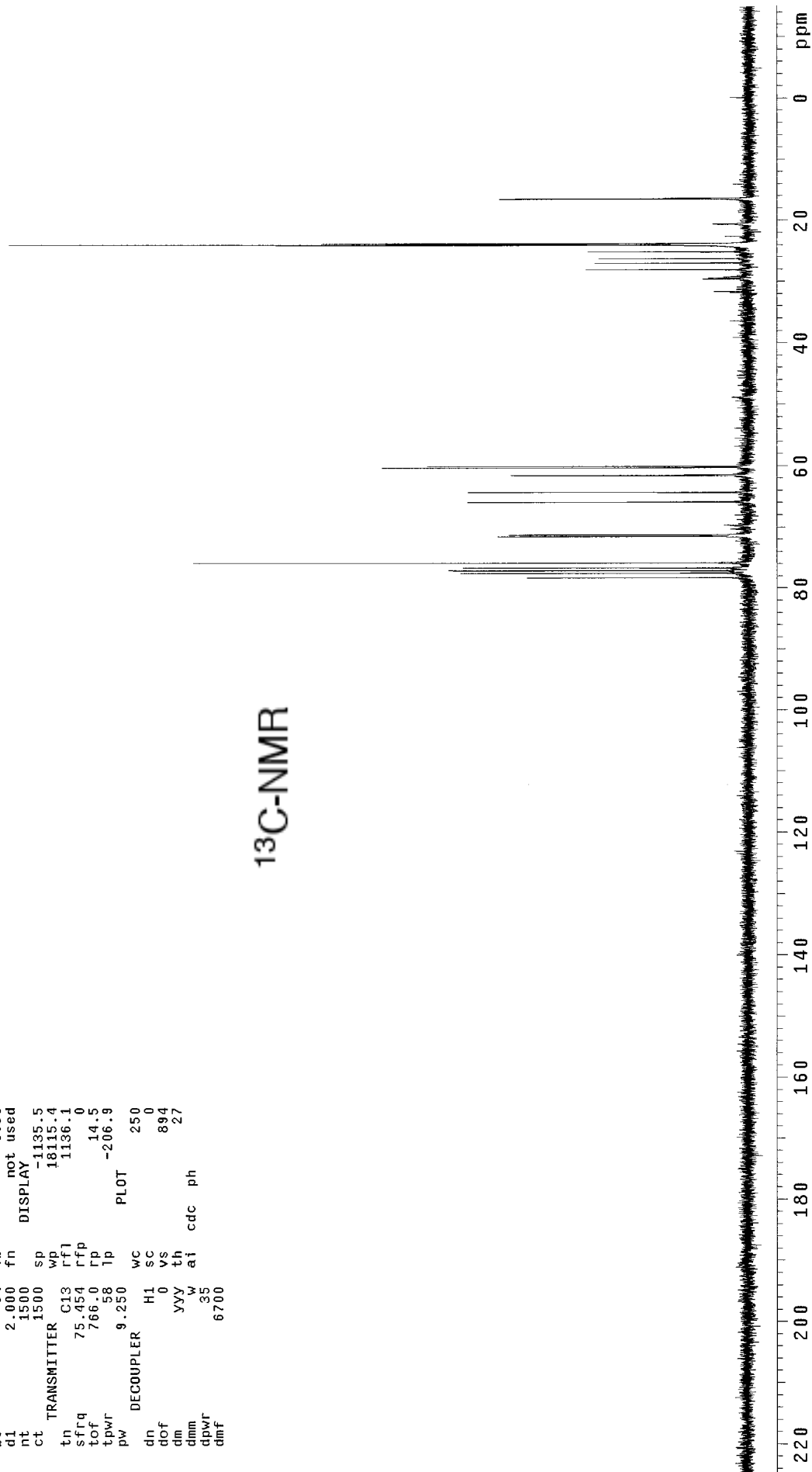
FG251P

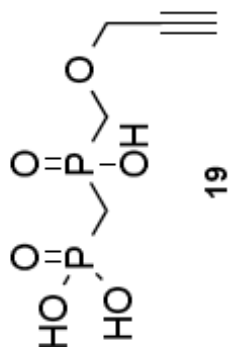
exp1 Carbon

SAMPLE		SPECIAL	
date	Dec 12 2012	temp	not used
solvent	cdcl3	gain	20
file	/home/TCUser/~ spin	hst	0.008
/vnmr	/data/autos	pw90	18.500
1212_12_07/s_2012~	alfa	10.000	
1212_32/data/cdcl3~	05.fid	FLAGS	
ACQUISITION			
sw	18115.9	in	n
at	1.301	dp	y
np	47120	hs	nn
fb	10000	PROCESSING	
bs	64	lb	0.50
d1	2.000	fn	not used
nt	1500	DISPLAY	
ct	1500	sp	-1135.5
TRANSMITTER			
tn	G13	rf1	18115.4
sfrq	75.454	rfp	1136.1
tof	766.0	rp	14.5
tpwr	58	lp	-206.9
pw	9.250	PLOT	
DECOUPLER			
dn	H1	sc	250
dof	0	vs	894
dm	yyy	th	27
dmm	w	at	cdc
dpwr	35	ph	
dmf	6700		



¹³C-NMR





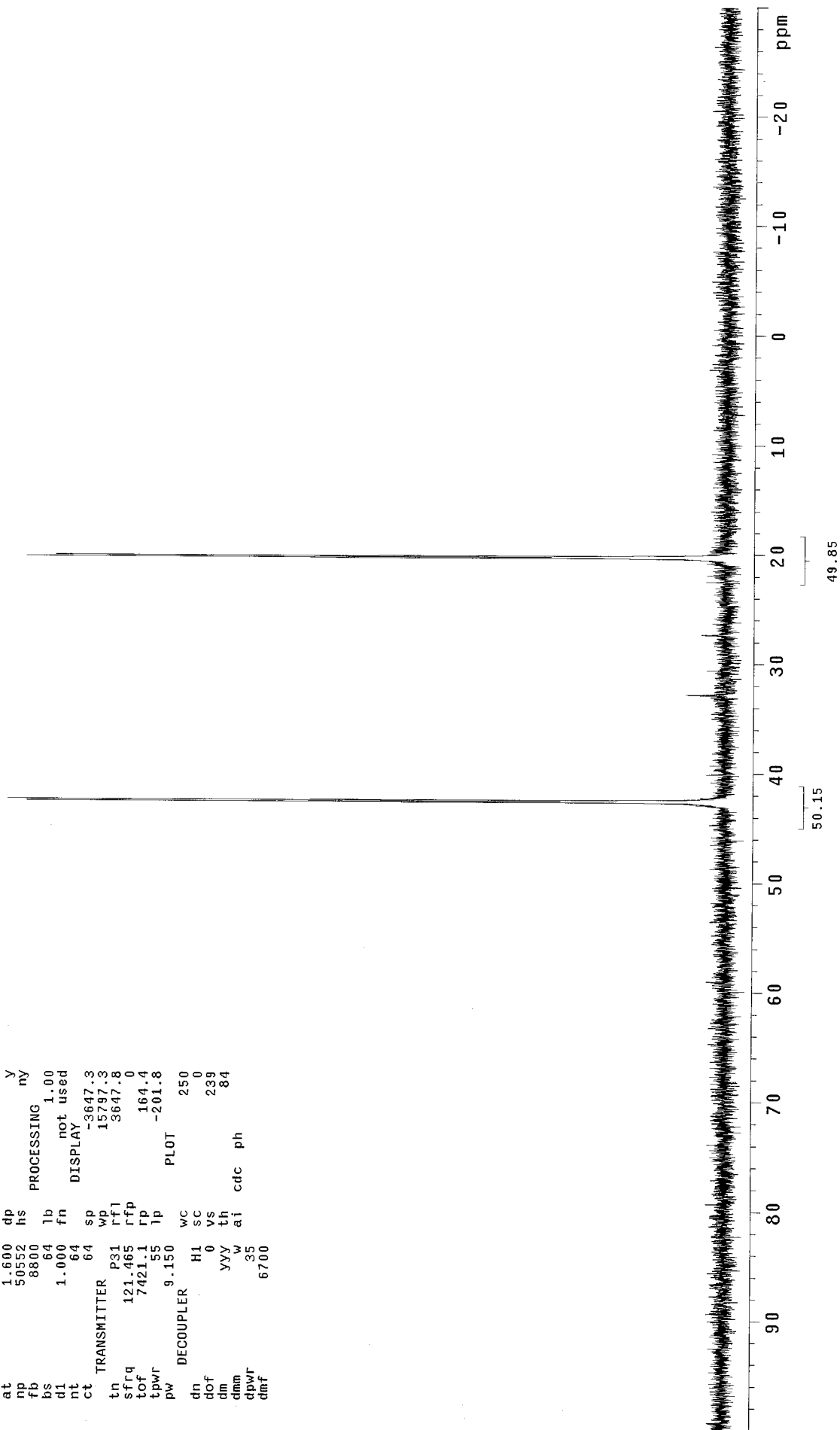
FG274-2

exp1 Phosphorus

SAMPLE		SPECIAL	
date	Jan 9 2013	temp	not used
solvent	D2O	gain	25
file	/home/TCUuser~	spin	20
	/nmrSYS/data/auto~	hst	0.008
	_2013.01.07_02/s_2~	pw90	18.300
	0130109_05/data/D2~	alpha	10.000
	0_01.fid	FLAGS	
ACQUISITION			
sw	15797.8	in	n
at	1.600	dp	y
np	50552	hs	ny
fb	8800		
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		
ct	64	sp	-3647.3
TRANSMITTER			
tn	P31	wp	15797.3
	rfl		3647.8
sfrq	121.465	rfp	0
tof	7421.1	rp	164.4
tpwr	55	lp	-201.8
pw	9.150	wc	250
DECOUPLER			
dn	H1	sc	0
dof	0	vs	239
dm	yyv	th	84
dmm	w	ai	cdc
dppwr	35		
dmf	6700		

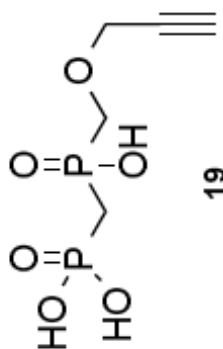
INDEX	FREQUENCY	PPM	HEIGHT
1	5177.3	42.625	122.7
2	5161.4	42.494	126.0
3	2467.8	20.318	123.0
4	2451.4	20.183	117.8

³¹P-NMR (decoupled)



T 0 2

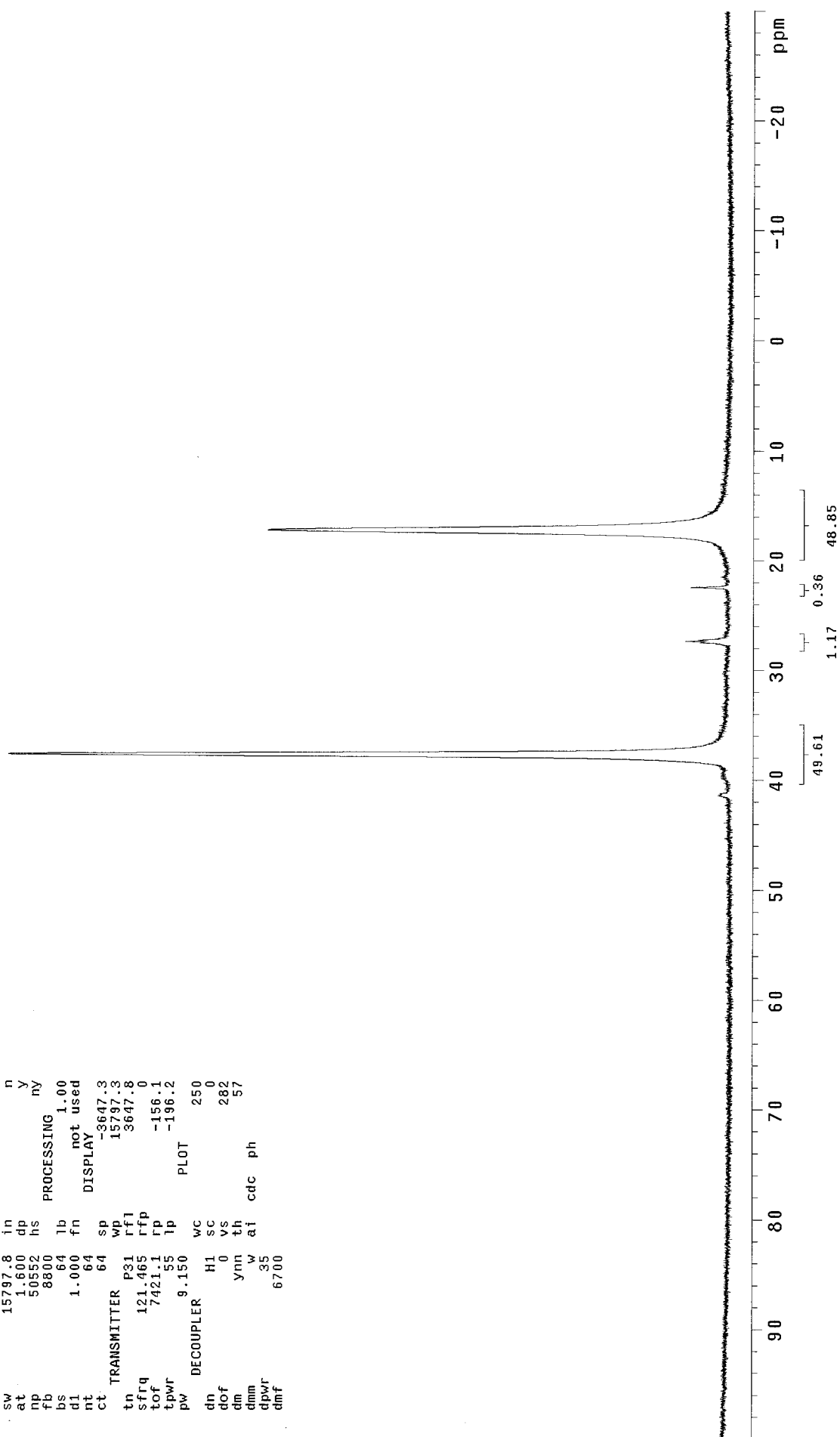
³¹P-NMR (coupled)



FG279

exp1 Phosphorus

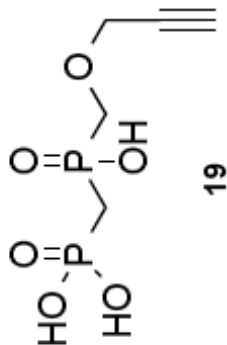
SAMPLE		SPECIAL	
date	Jan 11 2013	temp	not used
solvent	d2o	gain	14
file	/home/TCUser~ spin		20
/vnmr	/data/autos	hst	0.008
2013.01.07_02/s	2~	pw80	18.300
0130111_54/data/d2~	alfa		10.000
0.07.fid		FLAGS	
ACQUISITION			
sw	15797.8	il	n
at	1.600	dp	n
np	50552	hs	y
fb	8800		ny
bs	64	lb	1.00
d1	1.000	fn	not used
nt	64		DISPLAY
ct	64	sp	-3647.3
TRANSMITTER			
tn	p31	wp	15797.3
rf1			3647.8
sfrq	121.465	rtp	0
tof	7421.1	fp	-156.1
tpwr	55	lp	-196.2
pw	9.150		PLOT
DECOUPLER			
dn	H1	sc	250
dof	0	vs	0
dm	ynn	th	282
dmm	w	ai	57
dpwr	35		
dmf	6700		



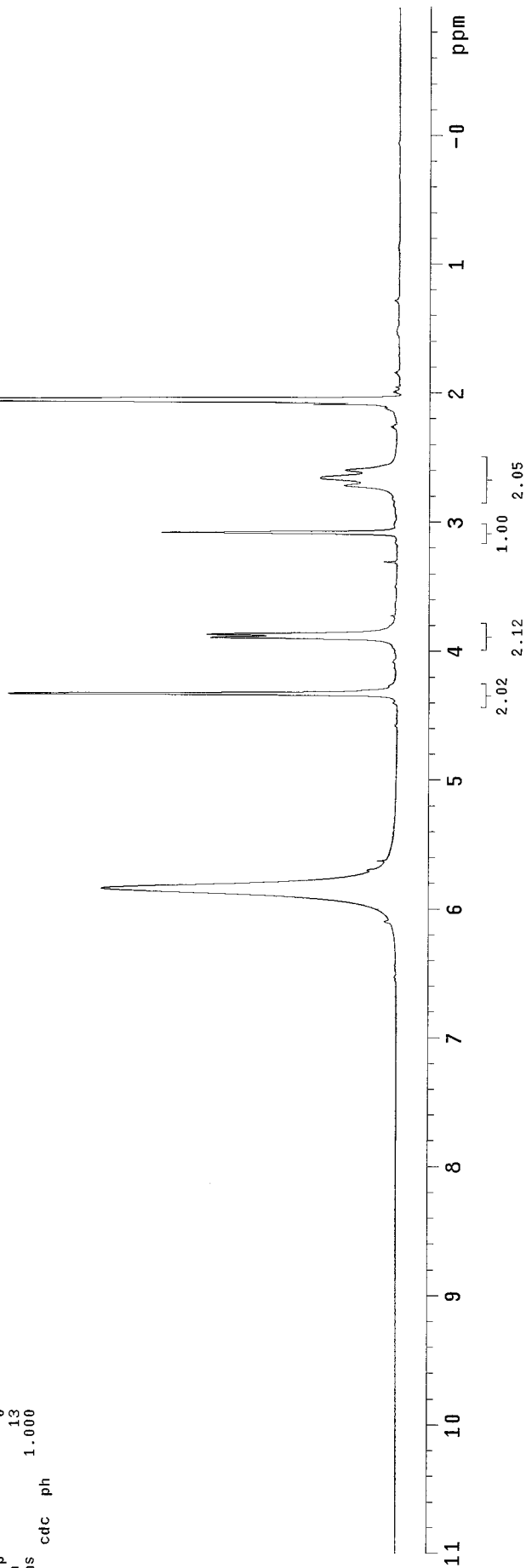
FG287

exp1 Proton

SAMPLE		DEC. & VT	
date	Jan 22, 2013	dfrq	75.454
solvent	acetone	dn	C13
file	/home/TCUser~	dpwr	43
	/nmrsys/data/autow	dof	0
	2013.01.20/s_2013~	dm	nmn
	0122_23/data/acetow	dmm	c
	ne_02.fid	dmf	13100
ACQUISITION			
sfrq	300.049	wfile	ft
tn	1.998	proc	not used
at	13184	fn	
np	4800.8	werr	xmreact
sw	2600	wexp	abortoff flus~
fb	16	h	procplot aborton
bs	55	wbs	
tpwr	7.9	wnt	
pw	1.000		
d1	277.9		
tof	32		
nt	32		
ct	32		
alock	not used		
gain	not used		
FLAGS			
il	n		
in	n		
dp	y		
DISPLAY			
sp	-298.6		
wp	3599.1		
vs	204		
sc	0		
wc	240		
h2mm	15.00		
is	842.93		
rfl	600.1		
rfp	0		
th	13		
ins	1.000		
ai	cdc	ph	



¹H-NMR

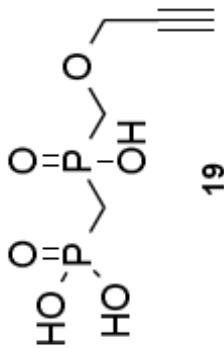


FG279

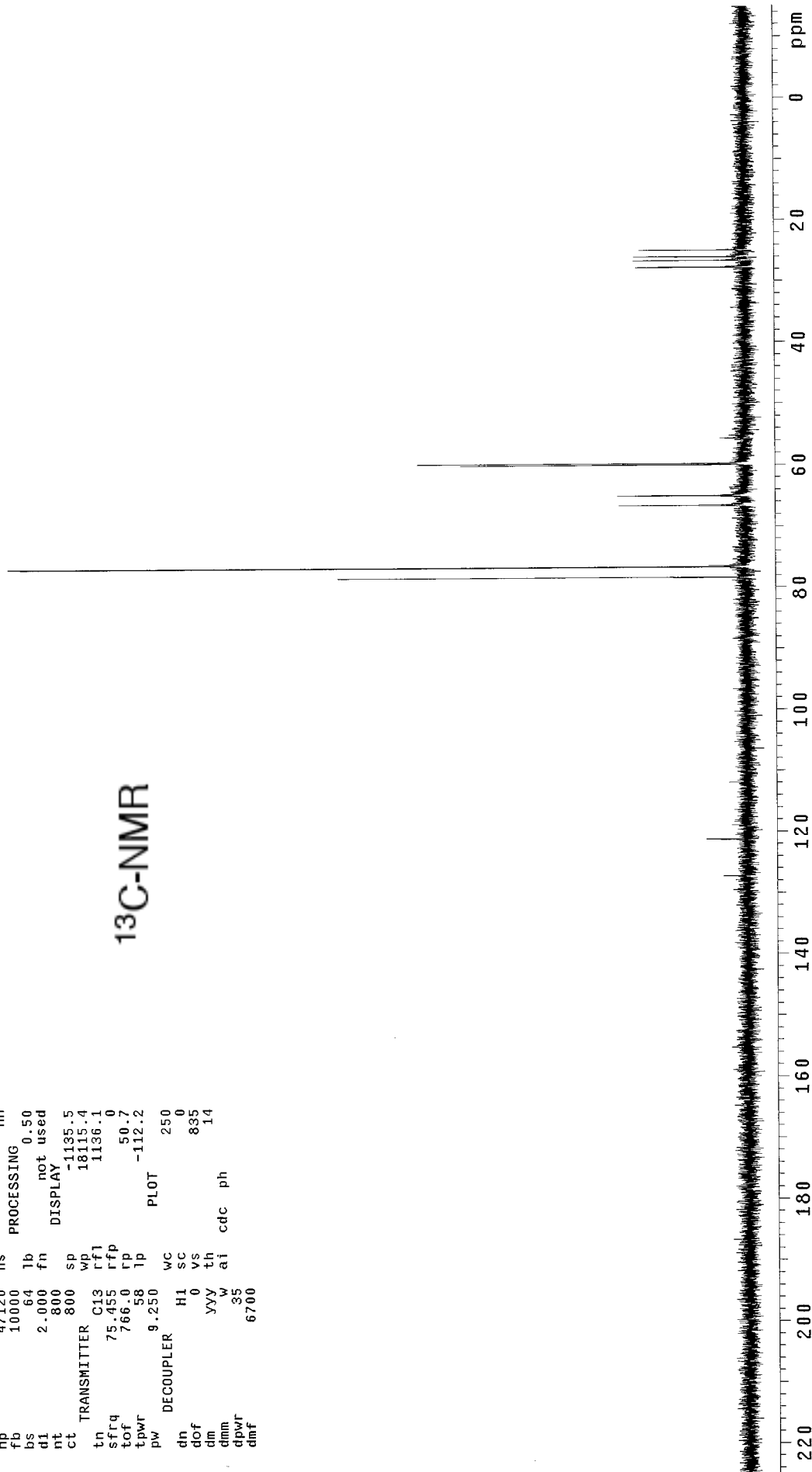
pad=10 run with findz0 before acquisitio
n

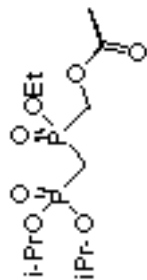
expl Carbon

SAMPLE		SPECIAL	
date	Jan 11 2013	temp	not used
solvent	d2o	gain	20
file	/home/TCUuser~	spin	20
	/vnmrSys/data/auto~	hst	0.008
	2013.01.07_02/s_2~	pw90	18.500
	0130111_54/data/d2~	alifa	10.000
	o_01.fid	FLAGS	
ACQUISITION		n	
sw	18115.9	in	n
at	1.301	dp	y
np	47120	hs	nn
fb	10000		
bs	64	lb	0.50
dl	2.000	fn	not used
nt	800		
ct	800	sp	-1135.5
		wp	18115.4
tn	TRANSMITTER C13	rf1	1136.1
sfrq	75.455	rfp	0
tof	766.0	rp	50.7
tpwr	58	lp	-112.2
pw	9.250		
DECOUPLER		PLOT	
dn	H1	wc	250
dof	0	sc	0
dm	0	vs	835
dmm	YVY	th	14
dpmr	W	ai	cdc
dmr	35	ph	
	6700		



¹³C-NMR

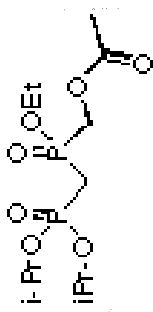




Compound 20

³¹P/¹H NMR decoupled





Compound 20
³¹P/¹H NMR coupled

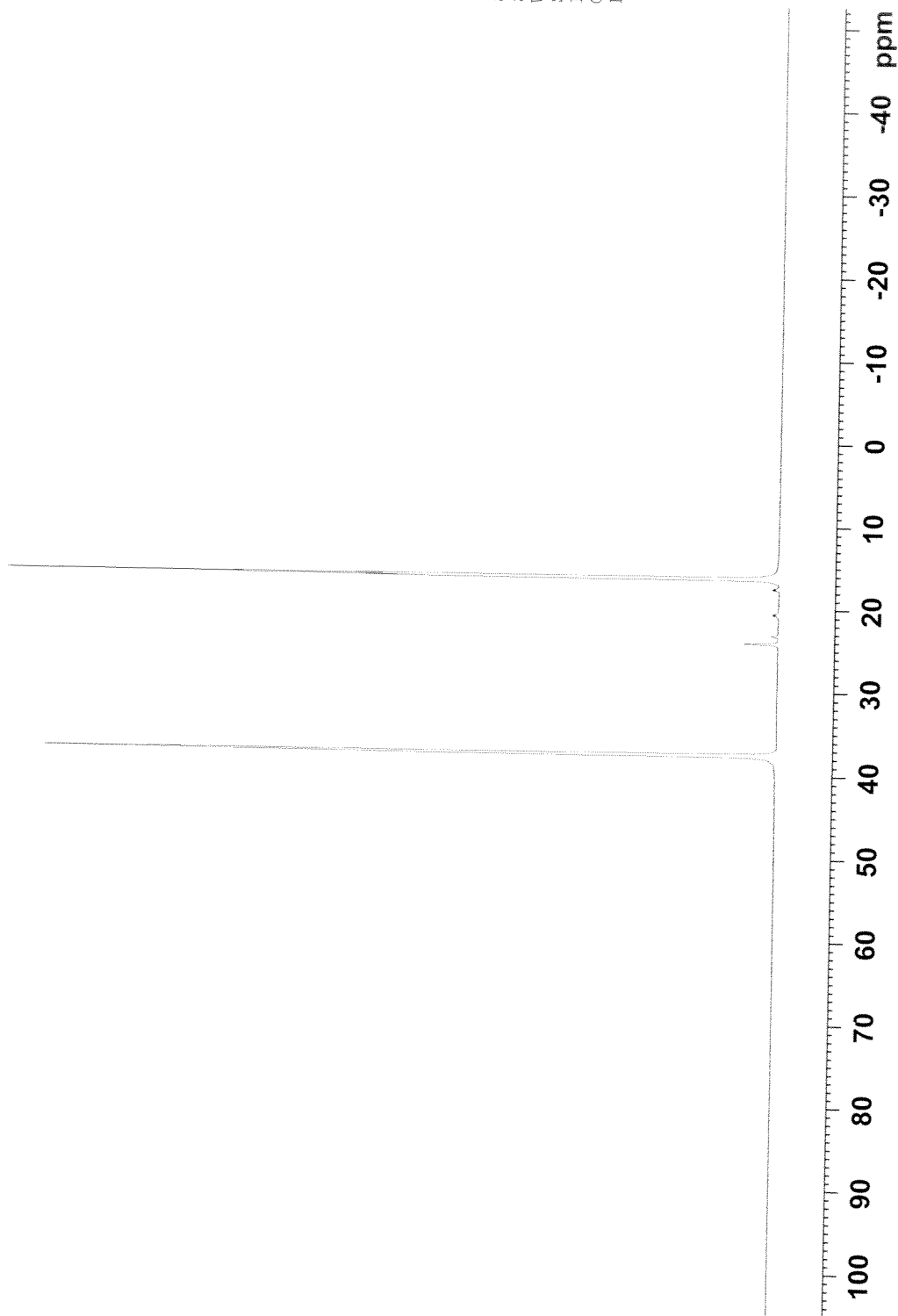


Current Data Parameters
 NAME OB 1796 after vacuum
 EXPNO 2
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141024
 Time_ 9.25
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 32
 DS 4
 SWH 64102.563 Hz
 FIDRES 0.978127 Hz
 AQ 0.5111808 sec
 RG 203.57
 DW 7.800 usec
 DE 6.50 usec
 TE 296.1 K
 D1 2.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 161.9674942 MHz
 NUC1 31P
 P1 14.25 usec
 PLW1 15.00000000 W

F2 - Processing parameters
 SI 32768
 SF 161.9755930 MHz
 WDW EM
 SSB 0
 LB 0
 GB 1.00 Hz
 PC 1.40





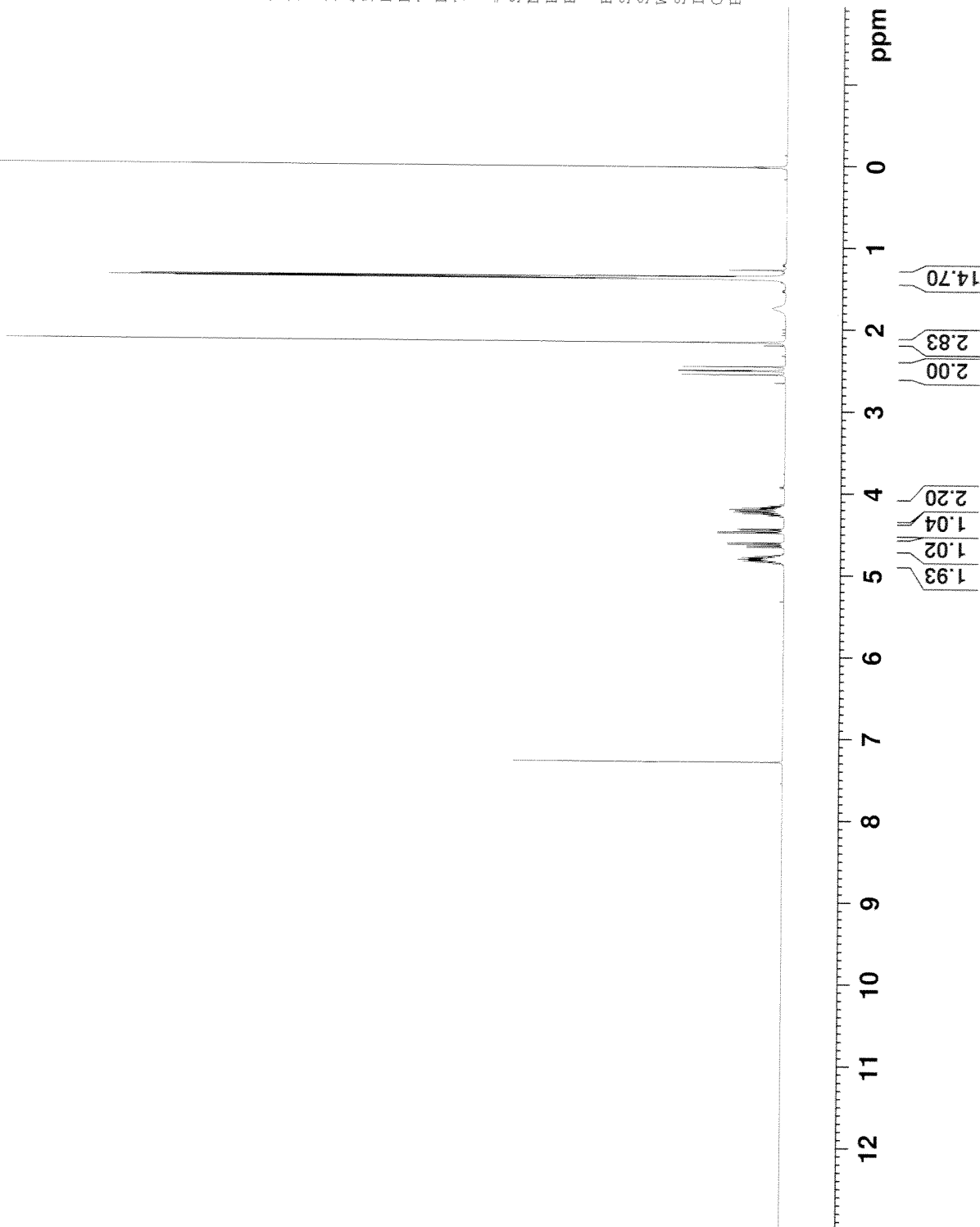
Compound 20
1H NMR

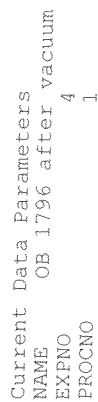
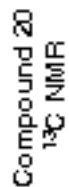
Current Data Parameters
NAME OB 1796 after vacuum
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters
Date_ 20141024
Time 9.15
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 11
DS 2
SWH 8012.820 Hz
FIDRES 0.122266 Hz
AQ 4.0894465 sec
RG 144.26
DW 62.400 usec
DE 6.50 usec
TE 295.9 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
SFO1 400.1324710 MHz
NUC1 1H
P1 10.00 usec
PLW1 25.00300026 W

F2 - Processing parameters
SI 65536
SF 400.1300000 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





F2 - Acquisition Parameters	
Date	20141024
Time	9.44
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	281
DS	4
SWH	24038.461 Hz
FIDRES	0.366798 Hz
AQ	1.3631488 sec
RG	203.57
DW	20.800 usec
DE	6.50 usec
TE	297.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1

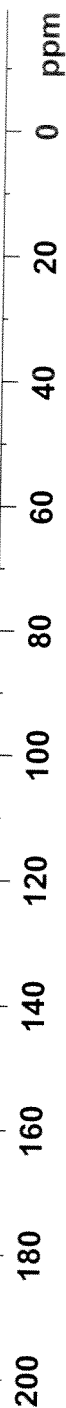
```

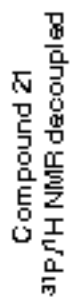
===== CHANNEL f1 =====
SFO1      100.6228293 MHz
NUC1      13C
P1         10.00 usec
PLW1      45.00000000 W
=====

```

```
===== CHANNEL f2 =====
SF02      400.131605 MHz
NUC2      1H
CPDFRG{2  waltz16
PCPD2     90.00 usec
PLW2      10.00000000 W
PLW12     0.31604999 W
PLW13     0.25600001 W
```

F2 - Processing parameters	
SI	32768
SF	100.6127685 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





F2 - Acquisition Parameters

```

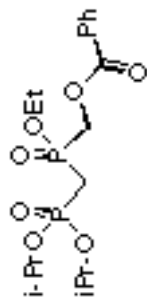
000 000 000 000 000 000 000 000 CHANNEL f1      000 000 000 000 000 000 000
SFO1    161.9674942 MHz
NUC1          31P
P1           14.25 usec
PLW1       15.00000000 W

```

```
===== CHANNEL f2 =====
SFO2      400.1316005 MHz
NUC2      1H
CPDPRG[2] waltz16
PCPD2     90.00 usec
PLW2      10.00000000 W
PLW12     0.31604999 W
PLW1      0.25600000 W
```

F2 - Processing parameters	
SI	32768
SF	161.9755930 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





Compound 21
31P NMR coupled



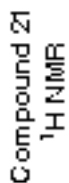
Current Data Parameters
NAME OB 1795 after column
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20141023
Time 15.18
INSTRUM spect
PROBHD 5 mm FAPBO BB/
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 32
DS 4
SWH 64102.563 Hz
FIDRES 0.978127 Hz
AQ 0.5111808 sec
RG 203.57
DW 7.800 usec
DE 6.50 usec
TE 295.9 K
D1 2.00000000 sec
TD0 1

===== CHANNEL f1 =====
SFO1 161.9674942 MHz
NUC1 31P
P1 14.25 usec
PLW1 15.00000000 W

F2 - Processing parameters
SI 32768
SF 161.9755930 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40





```

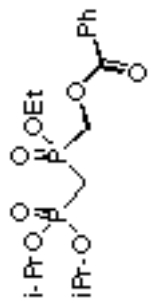
F2 - Acquisition Parameters
Date_      20141023
Time       15.09
INSTRUM    spect
PROBHD     5 mm PABBO BB/
PULPROG    zg30
ID         65536
SOLVENT    CDC13
NS         16
DS         2
SWH        8012.820 Hz
FIDRES     0.122266 Hz
AQ         4.0894465 sec
RG         144.26
DW         62.400 usec
DE         6.50 usec
TE         295.5 K
D1         1.00000000 sec
ID0        1

```

SFO1	CHANNEL f1
NUC1	400.1324710 MHz
P1	1H
PLW1	10.00 usec
	25.00300026 W

F2 - Processing parameters	
SI	65536
SF	400.130000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





Compound 21
13C NMR

Current Data Parameters
 NAME OB 1795 after column
 EXPNO 4
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141023
 Time 15.42
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 372
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 203.57
 DW 20.800 usec
 DE 6.50 usec
 TE 297.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 SFO1 100.6228293 MHz
 NUC1 13C
 P1 10.00 usec
 PLW1 45.00000000 W

===== CHANNEL f2 =====
 SFO2 400.1316005 MHz
 NUC2 1H
 CPDPRG12 waltz16
 PCPD2 90.00 usec
 PLW2 10.00000000 W
 PLW12 0.31604999 W
 PLW13 0.25600001 W

F2 - Processing parameters
 SI 32768
 SF 100.6127685 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

