

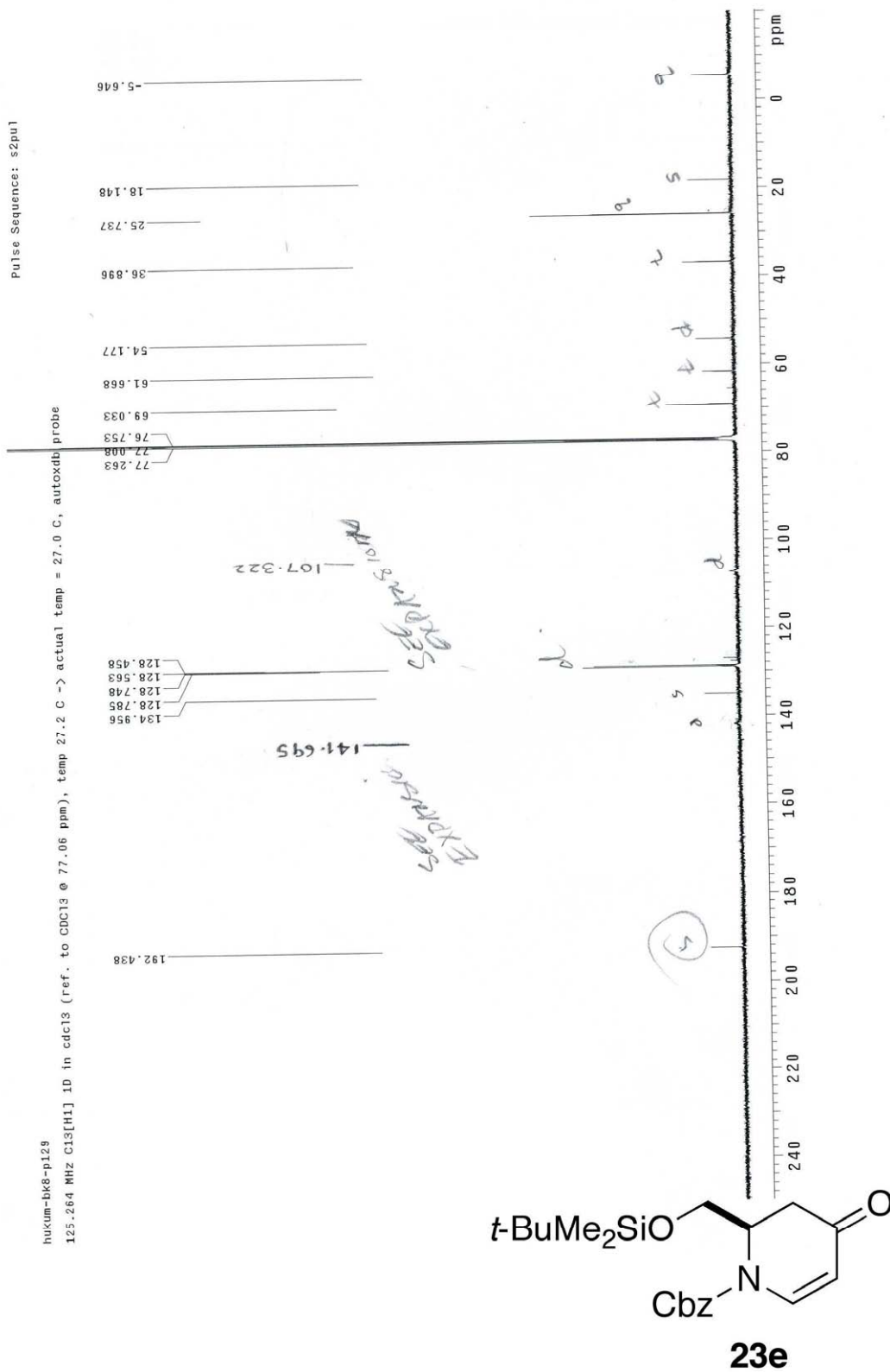
SUPPORTING INFORMATION (part d)

**2,6-Disubstituted and 2,2,6-Trisubstituted Piperidines from Serine:
Asymmetric Synthesis and further Elaboration**

Hukum P. Acharya and Derrick L. J. Clive*

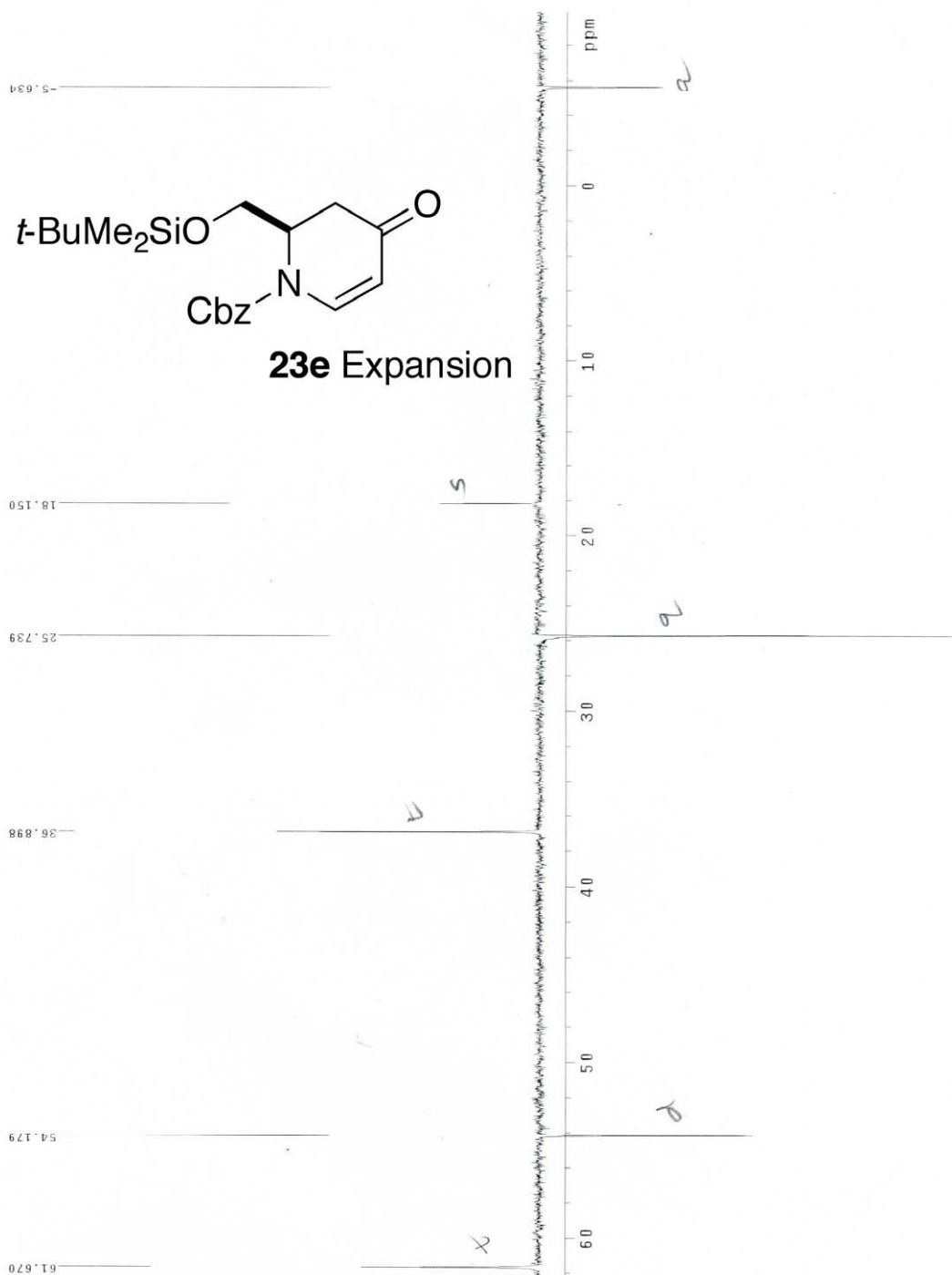
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E-mail: derrick.clive@ualberta.ca



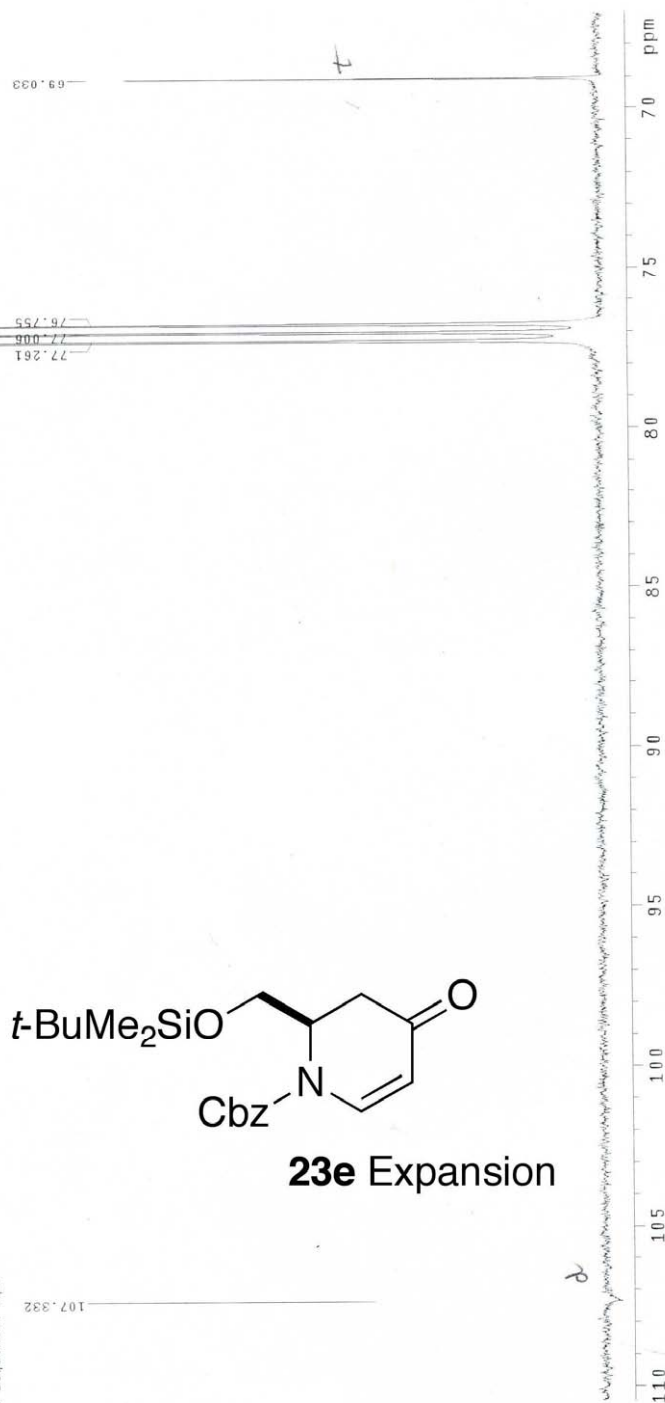
hukun-bk8-pl29
125.266 MHz C13[H1] apt in cdc13 (ref. to CDCl3 @ 77.06 ppm), temp 27.2 C -> actual temp = 27.0 C, autotdb probe
C & CH2 same, CH & CH3 opposite side of solvent signal

Pulse Sequence: apt



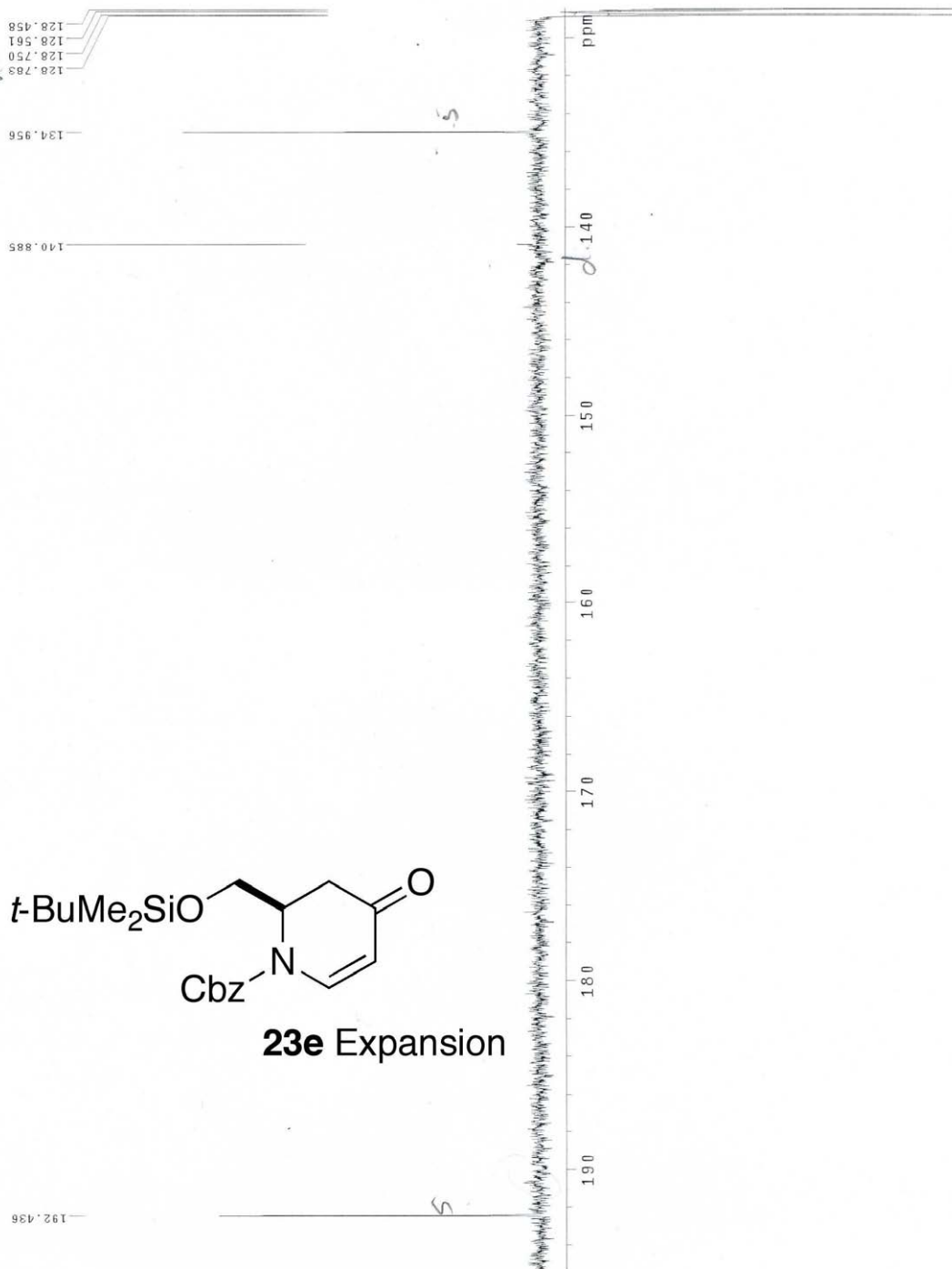
hukum-bx8-p129
125.266 MHz C13[H1] apt in cdcl3 (ref. to CDCl3 @ 77.06 ppm), temp 27.2 C -> actual temp = 27.0 C, autotxdb probe
C & CH2 same, CH & CH3 opposite side of solvent signal

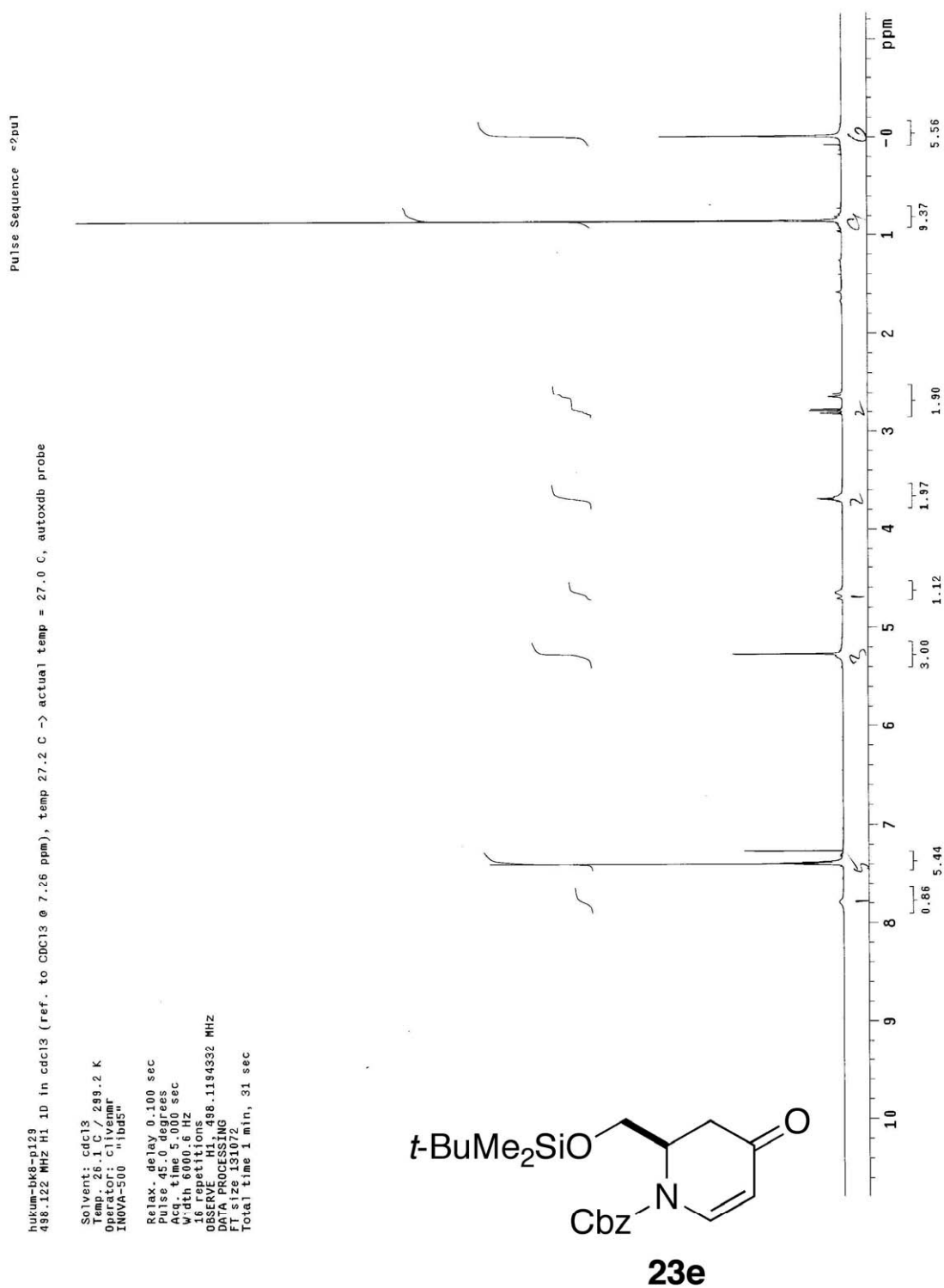
Pulse Sequence: apt

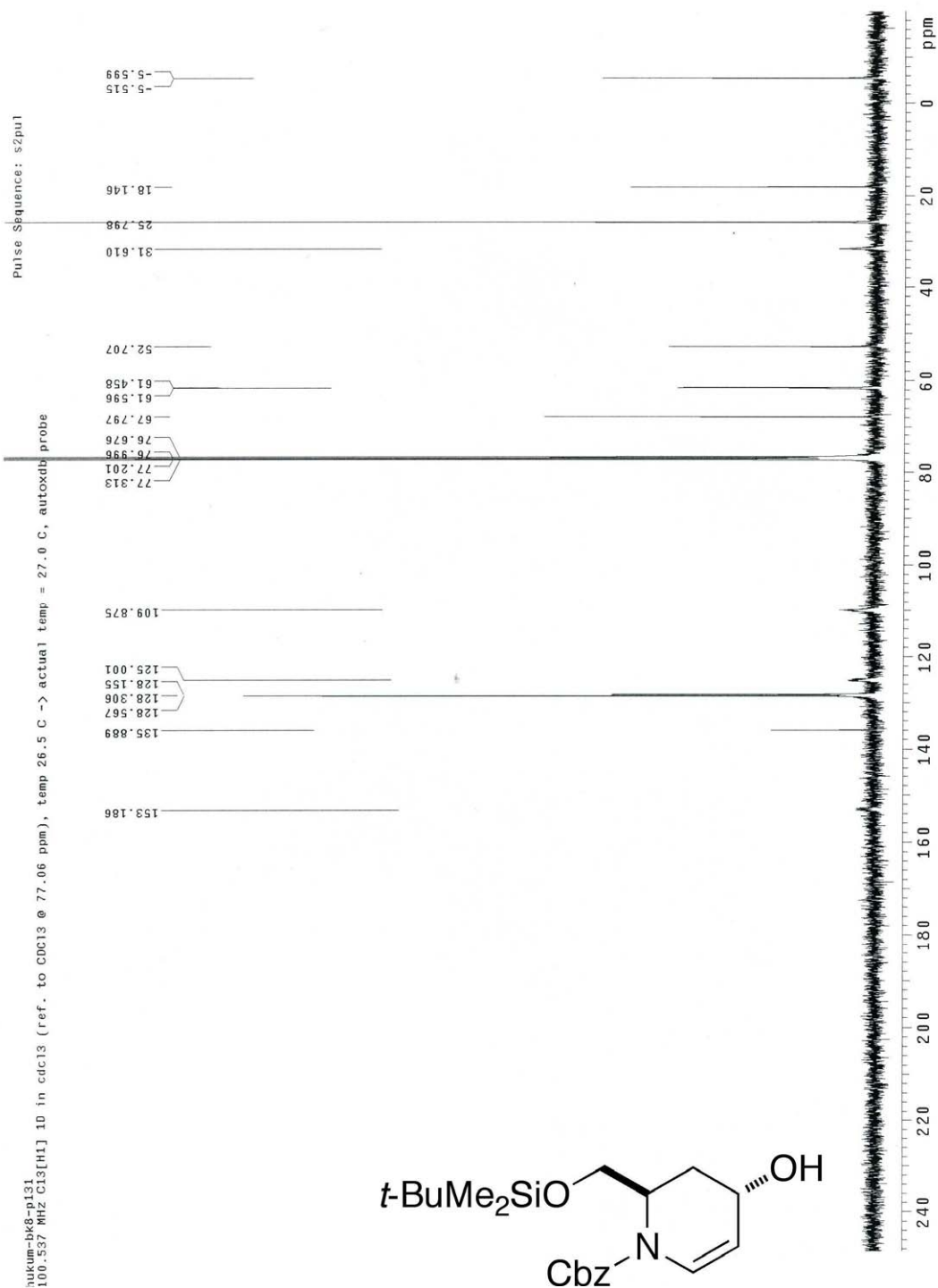


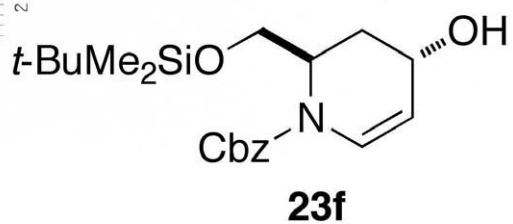
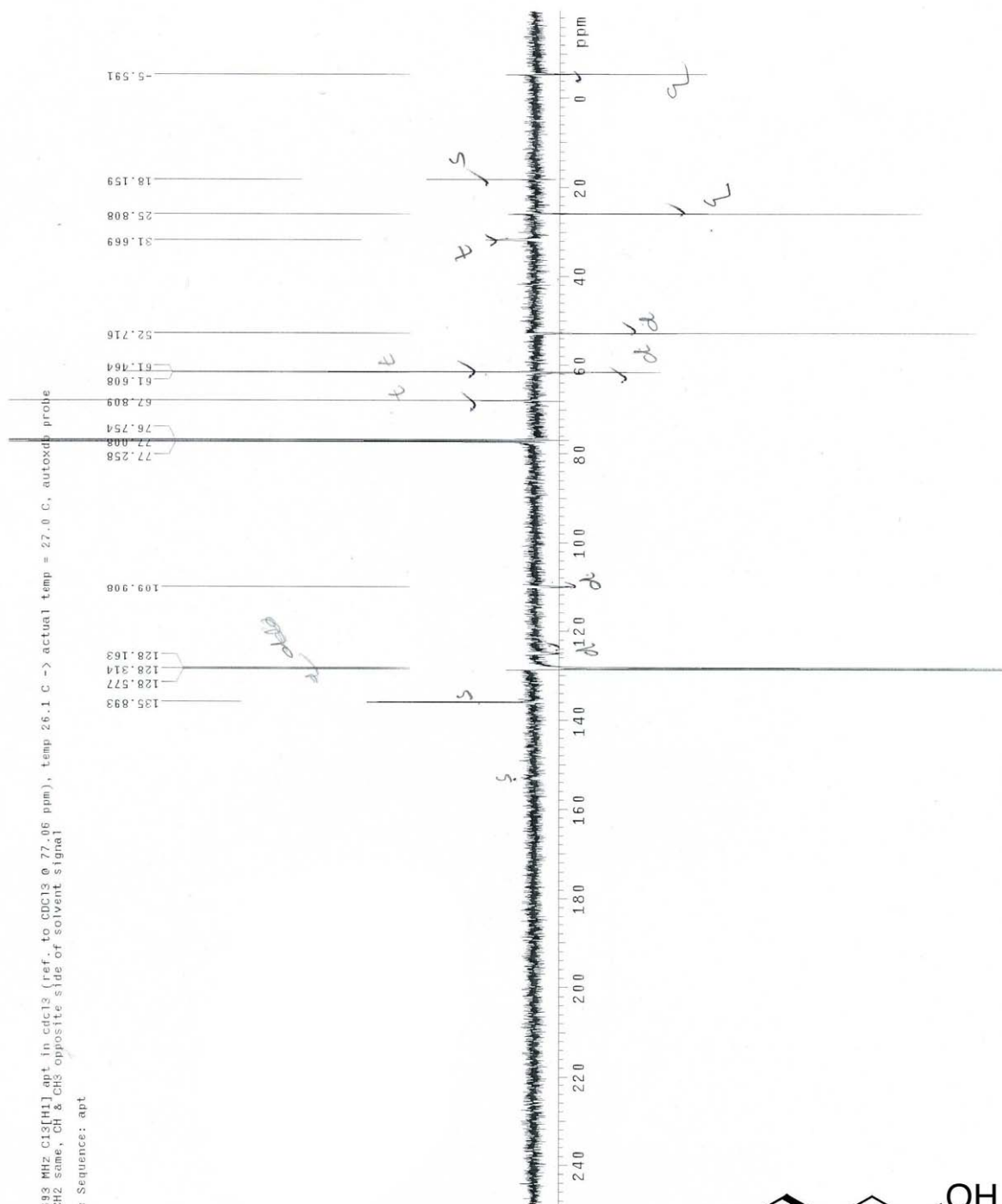
hukum-bx8-p129
125.266 MHz C13[H1] apt in cdcl3 (ref. to CDC13 @ 77.06 ppm), temp 27.2 C -> actual temp = 27.0 C, autoxid probe
C & CH2 same, CH & CH3 opposite side of solvent signal

Pulse Sequence: apt





**23f**



hukum-bk8-p131
499.921 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.1 C -> actual temp = 27.0 C, autotdb probe

Pulse Sequence: s2pul

Solvent: cdcl3

Temp: 26.1 C / 289.2 K

Operator: Clivenmr

VNMR5-500 "u500"

Relax. delay 0.100 sec

Pulse 45.0 degrees

Acq. time 5.000 sec

Width 6009.6 Hz

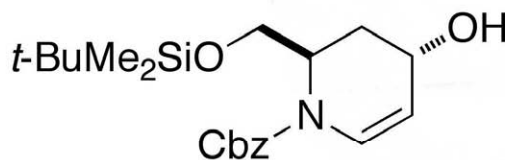
16 repetitions

Observed freq 499.8189171 MHz

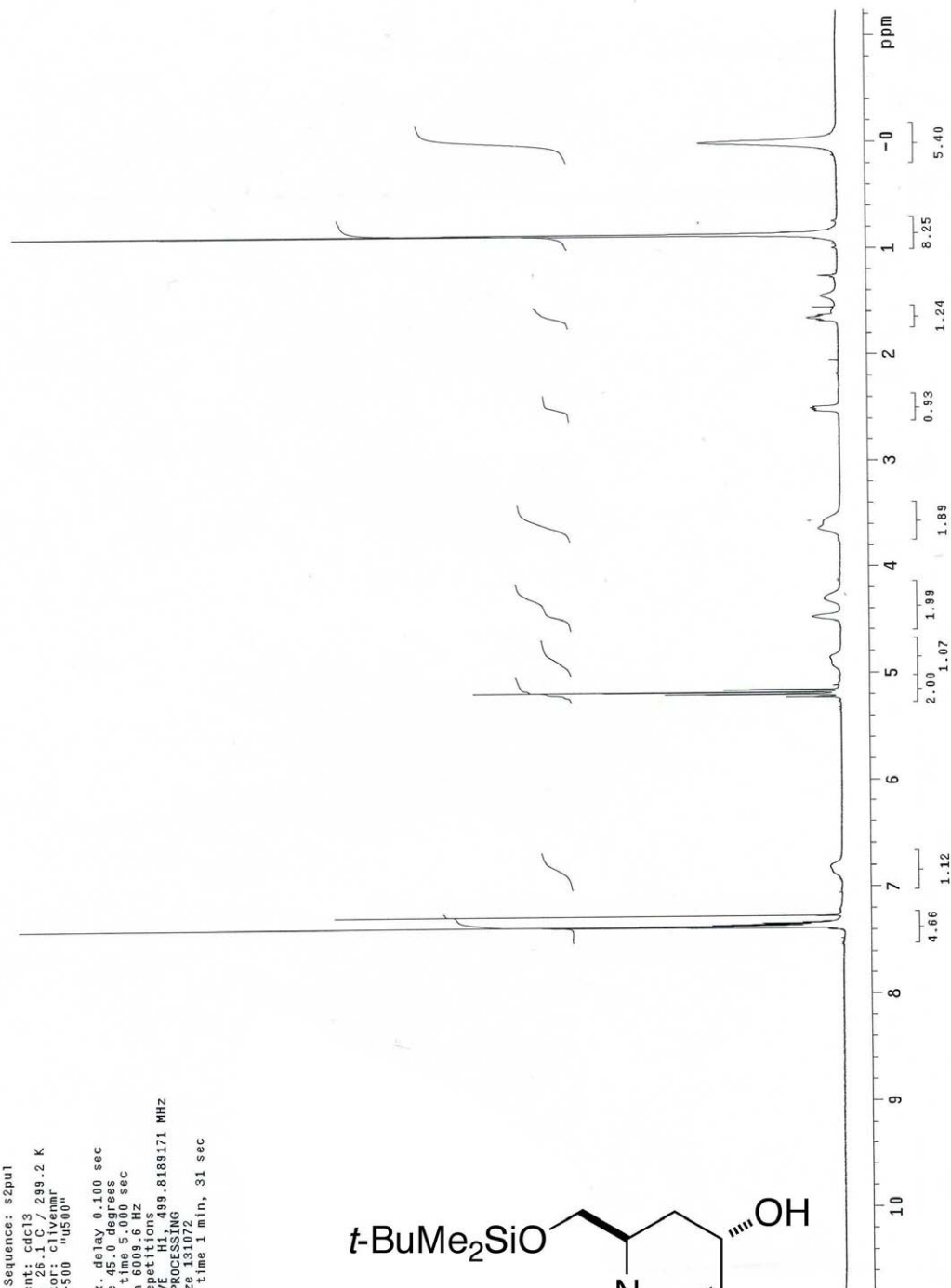
Processing

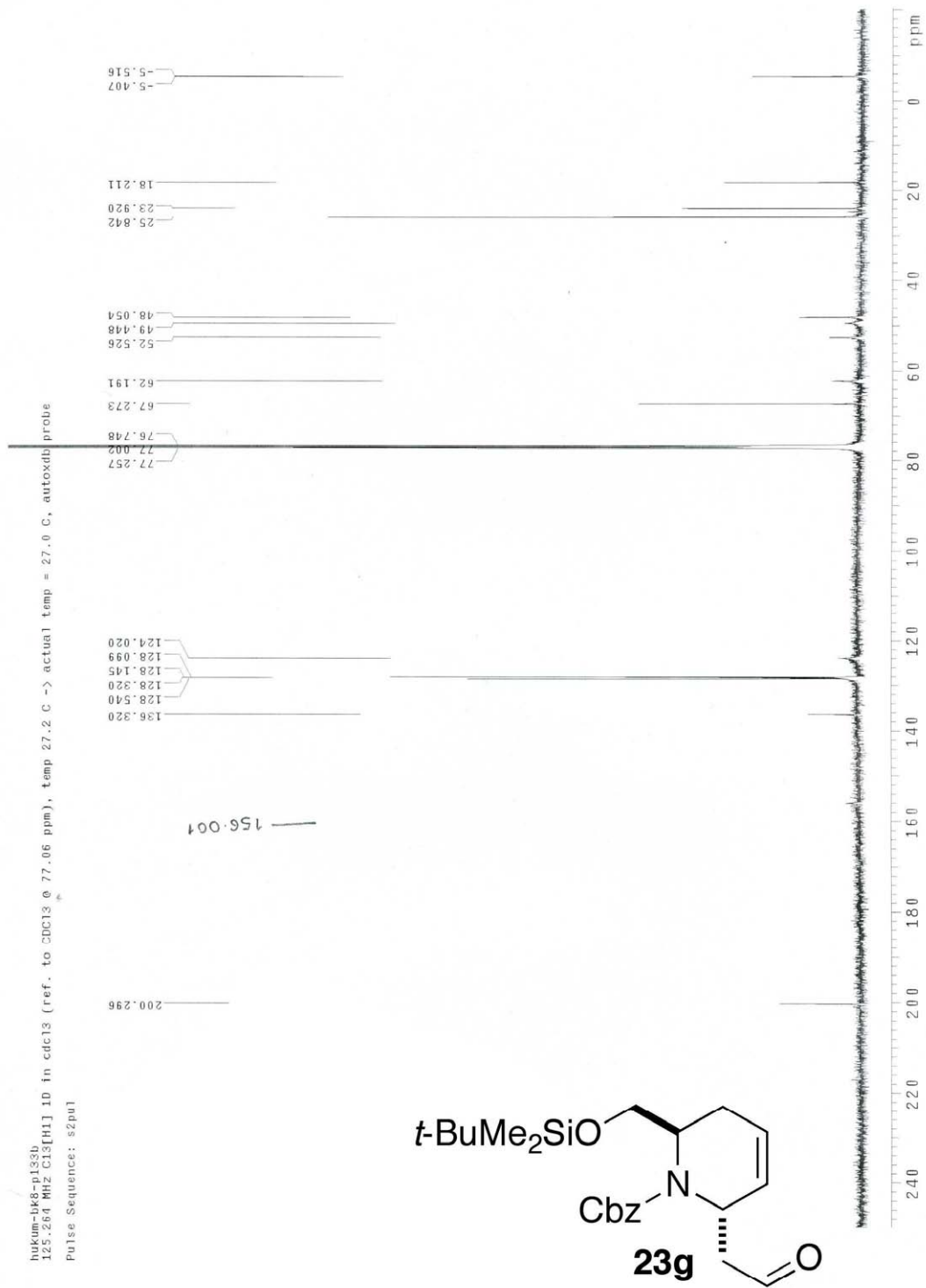
FT size 131072

Total time 1 min, 31 sec

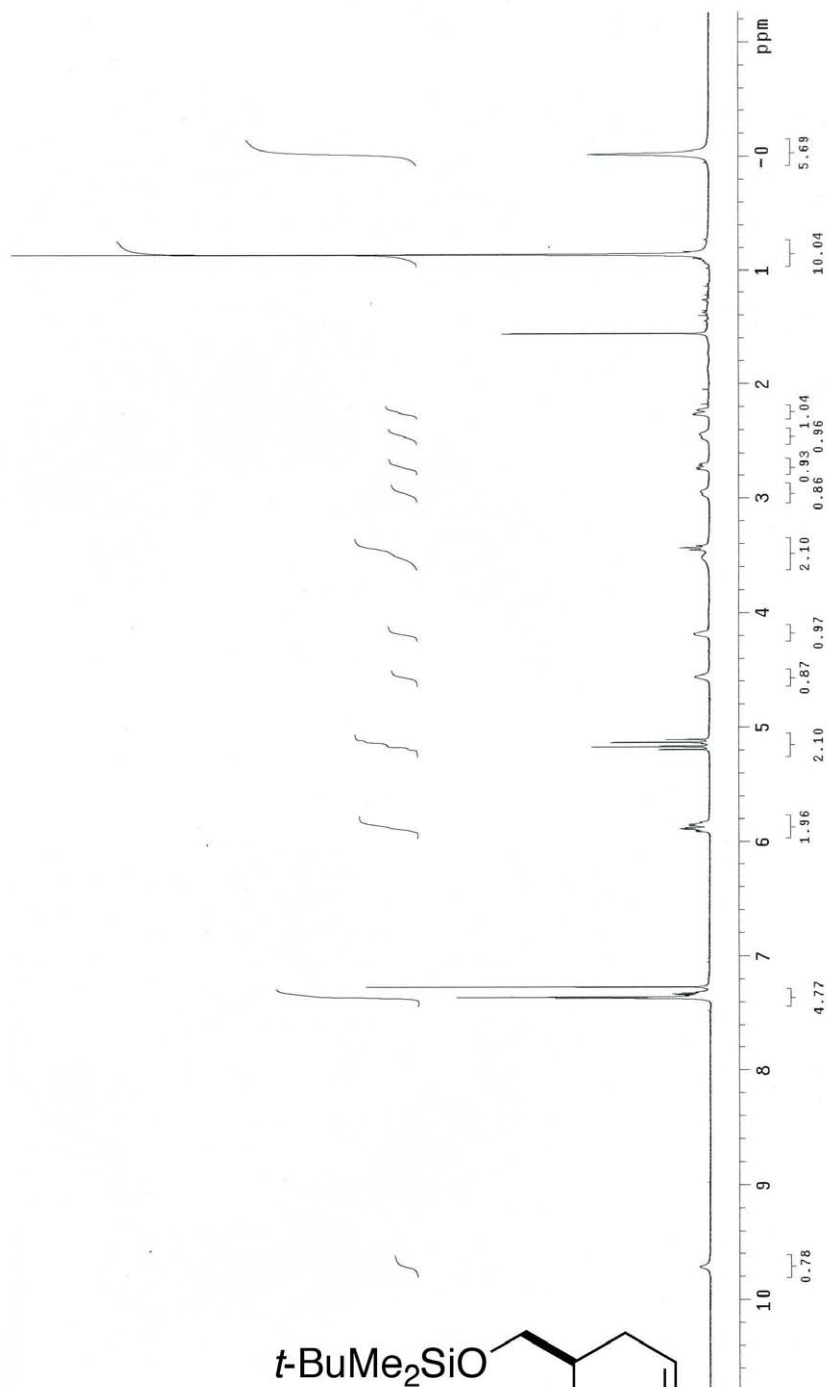
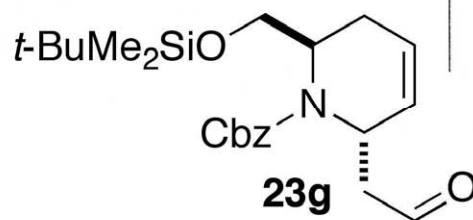


23f



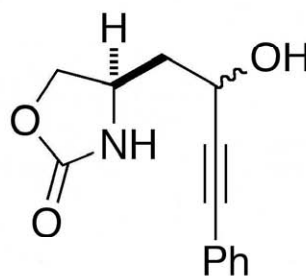
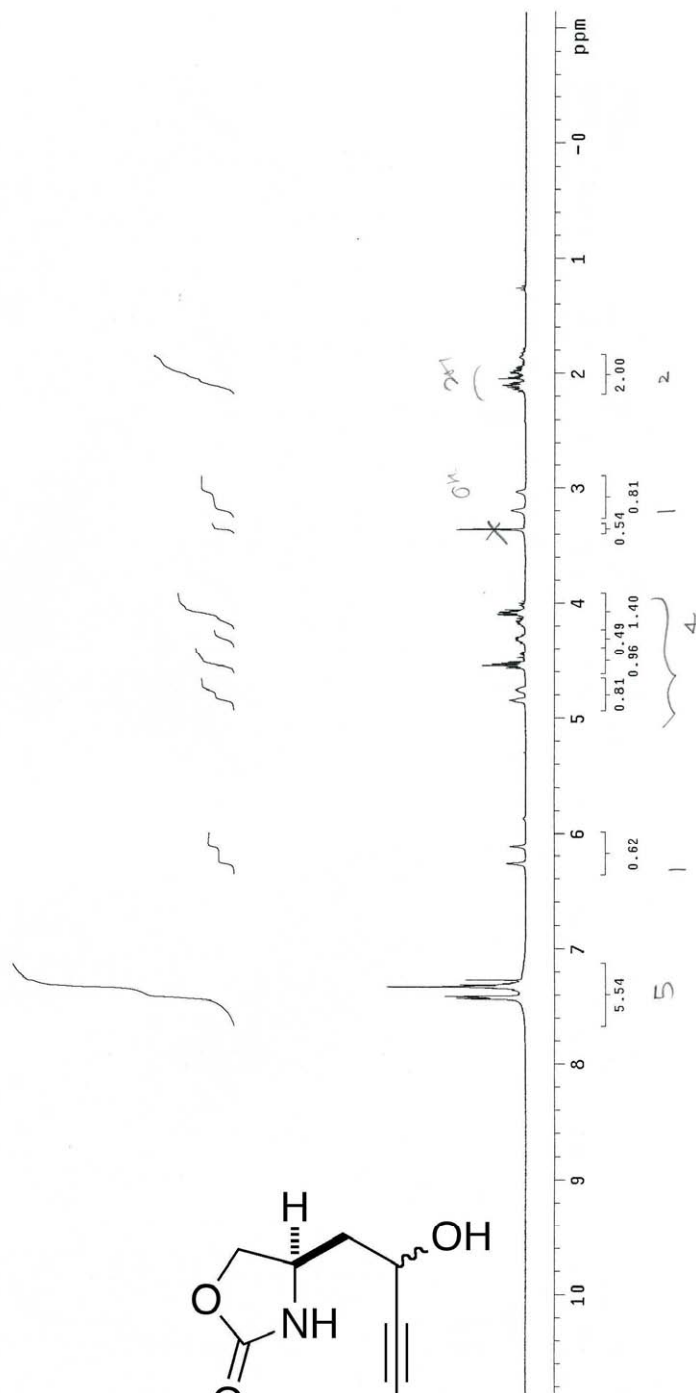


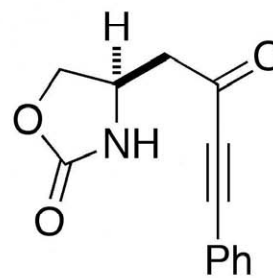
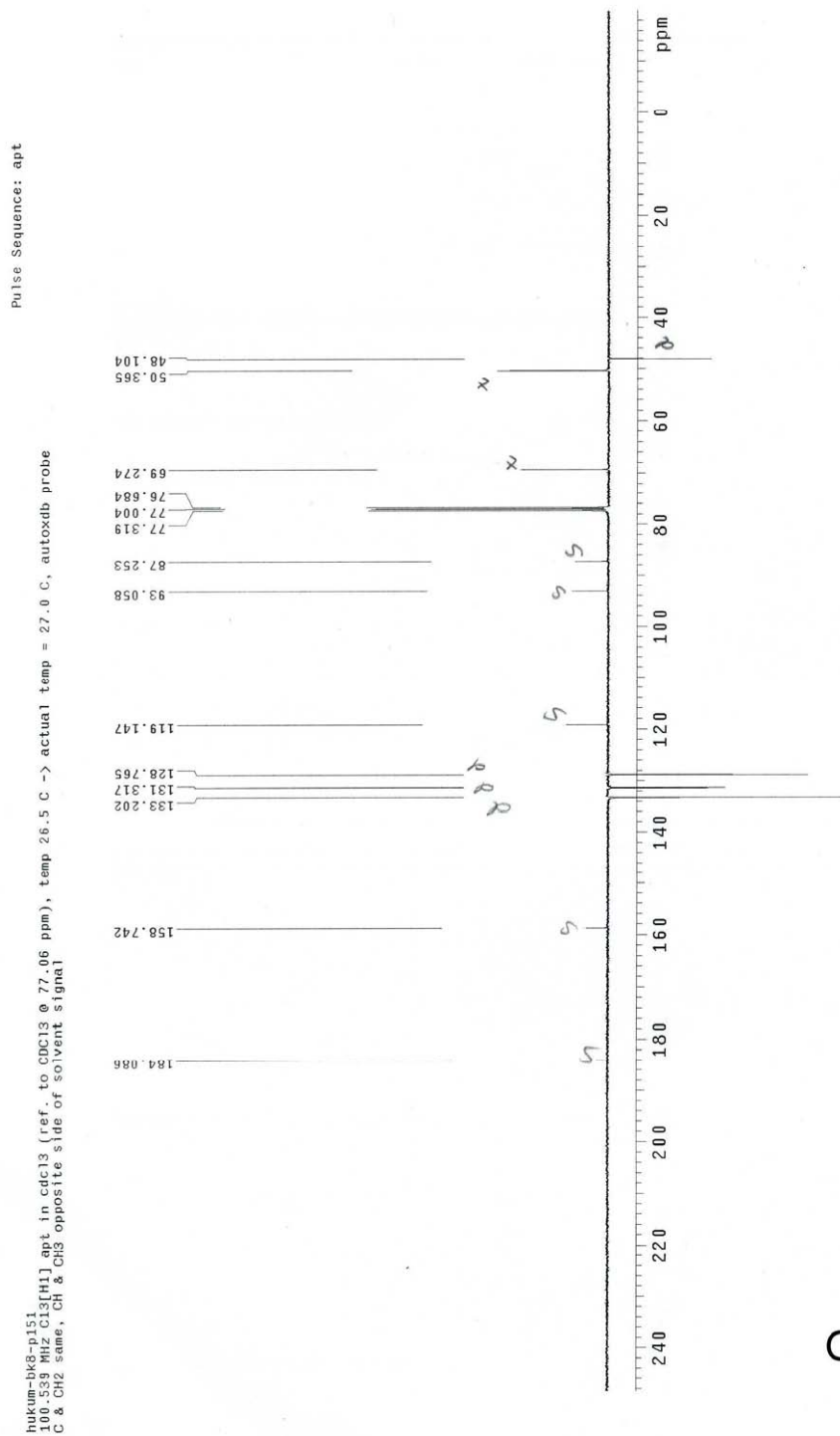
Pulse Sequence: s2pul

hukun-hk8-p133
498.122 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 27.2 C -> actual temp = 27.0 C, autoxdb probe

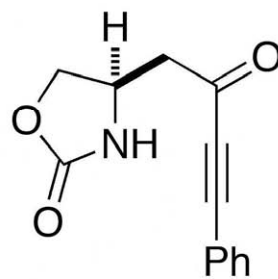
Pulse Sequence: s2pu1

399.794 MHz H1 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.8 C -> actual temp = 27.0 C, asw400 probe

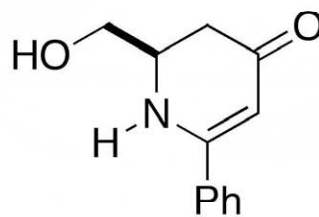
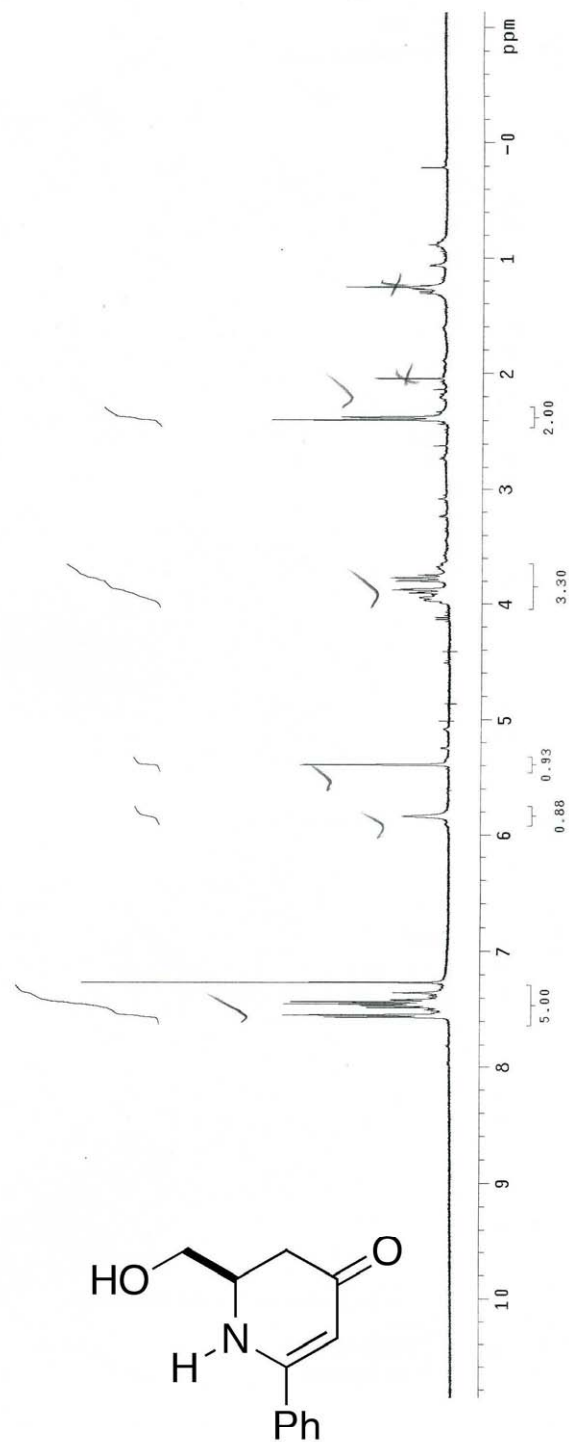
**24a**

**24b**

Pulse Sequence: szpul

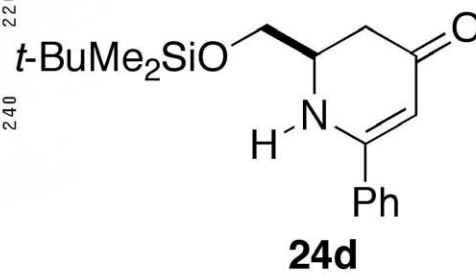
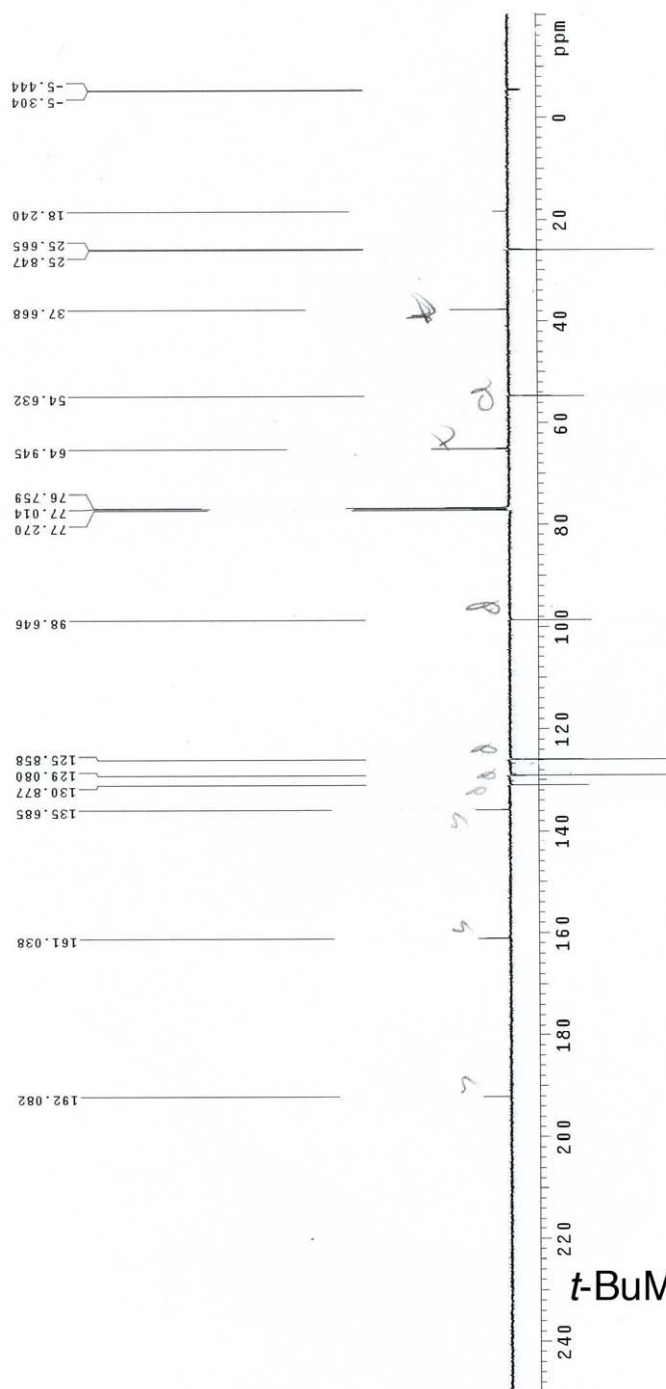
brukm-bv8-p151
399.794 MHz H1 1D in cdc13 (ref. to CDC13 @ 7.26 ppm), temp 26.5 C -> actual temp = 27.0 C, autotdb probe**24b**

Pulse Sequence: s2pu1

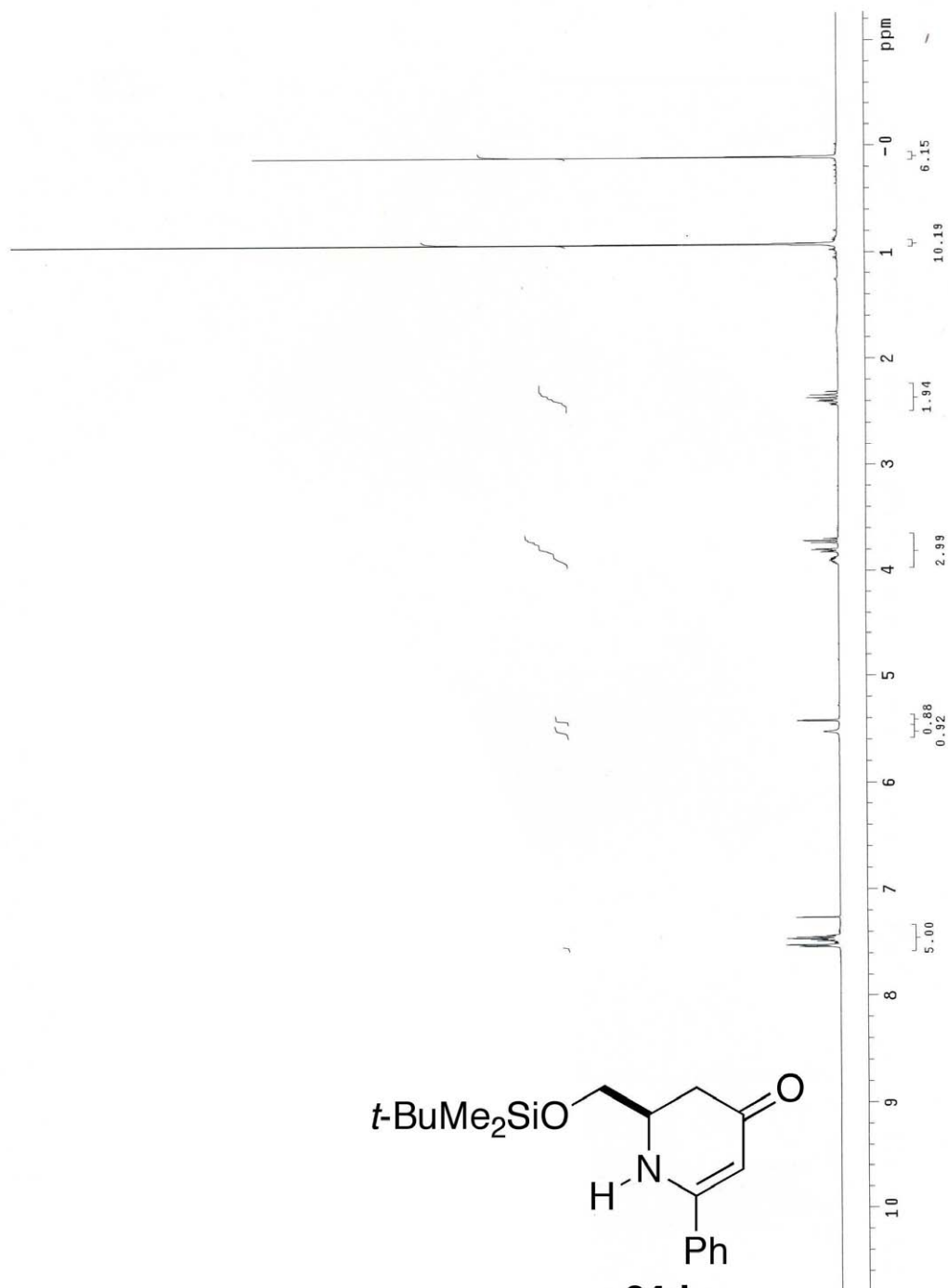
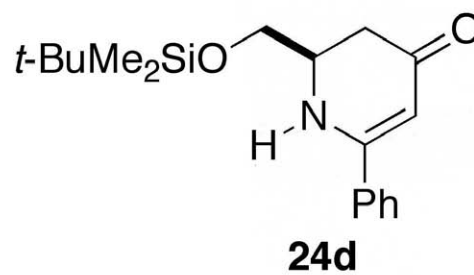
hakum-bx8-p153-crude
399.794 MHz H1 1D in cdc13 (ref. to CDC13 @ 7.26 ppm), temp 26.5 C -> actual temp = 27.0 C, autotdb probe**24c**

Pulse Sequence: apt

hukum-bk8-p155
 125.266 MHz ¹³C[1H] apt in cdcl₃ (ref. to CDCl₃ @ 77.06 ppm), temp 27.2 C → actual temp = 27.0 C, autoxldb probe
 C & CH₂ same, CH & CH₃ opposite side of solvent signal

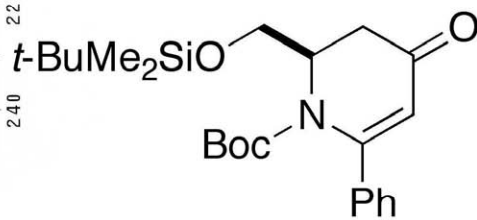
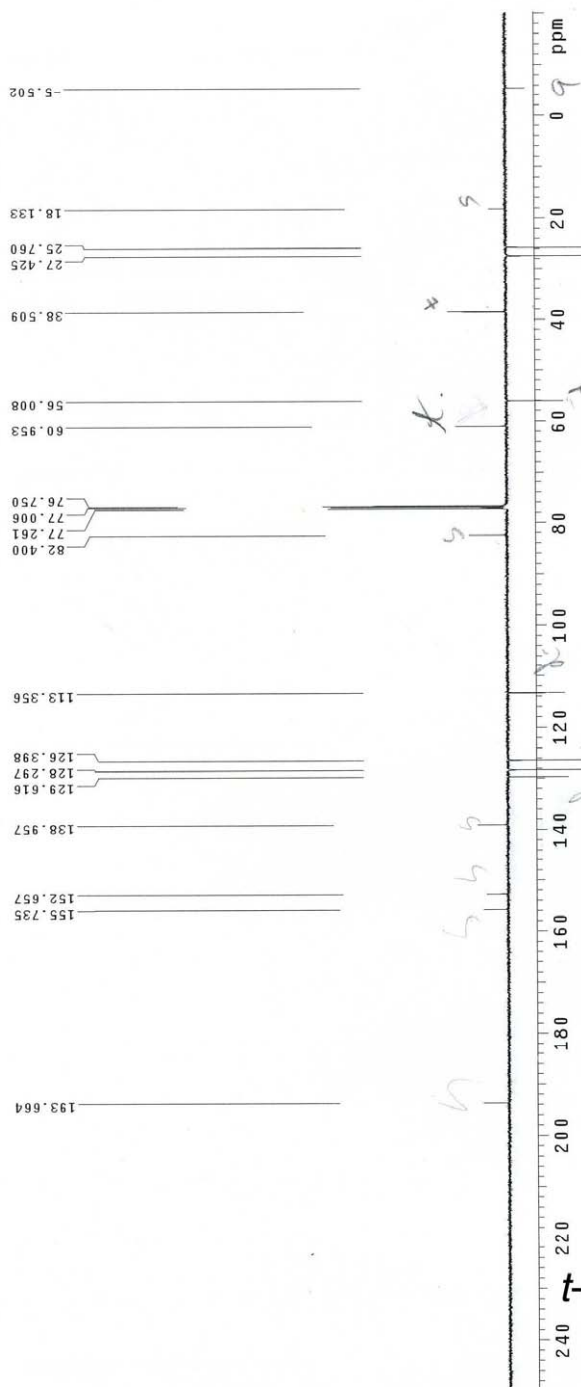


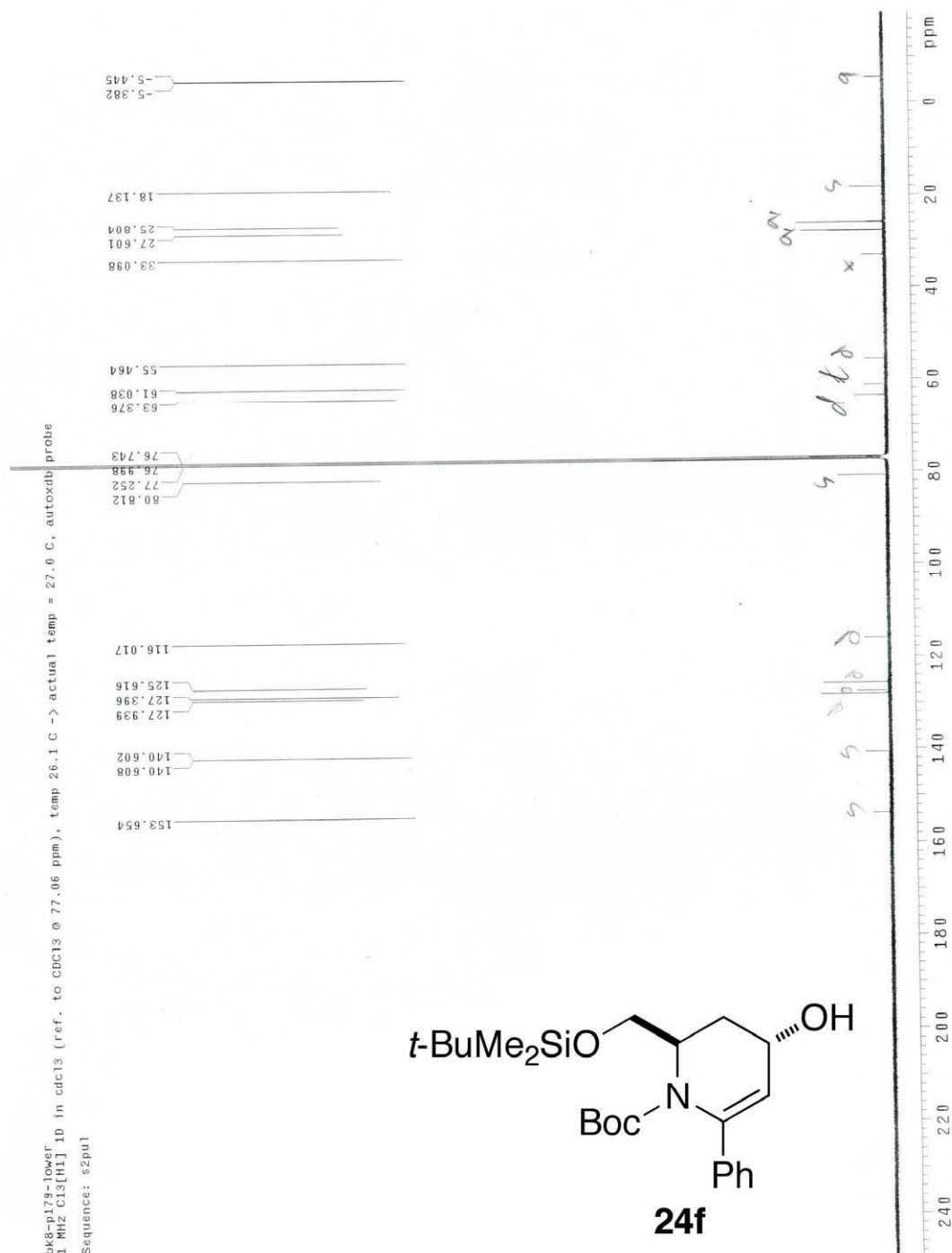
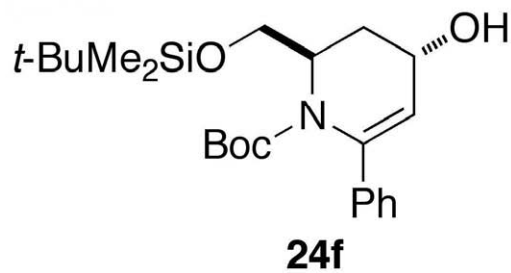
Pulse Sequence: s2pul

hukum-bk8-p155
498.122 MHz ¹H 1D in cdcl₃ (ref. to cdcl₃ @ 7.26 ppm), temp 27.2 C -> actual temp = 27.0 C, autotxdr probe

Pulse Sequence: apt

hukun-bk8-p177
 125.266 MHz $^{13}\text{C}\{^1\text{H}\}$ apt in cdCl_3 (ref. to CDCl_3 @ 77.06 ppm), temp 27.2 C \rightarrow actual temp = 27.0 C, autoxldb probe
 C & CH2 same, CH & CH3 opposite side of solvent signal

**24e**

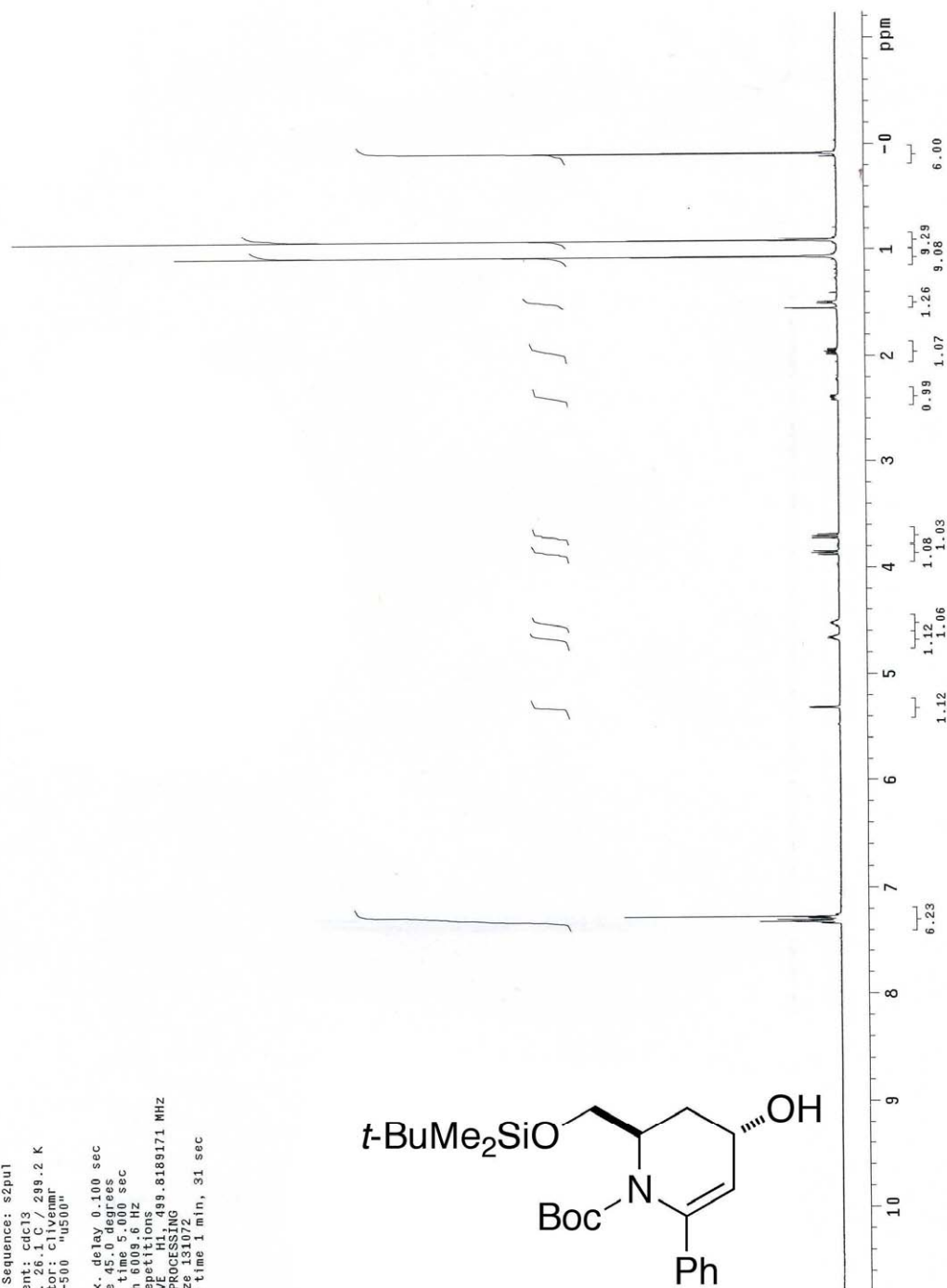
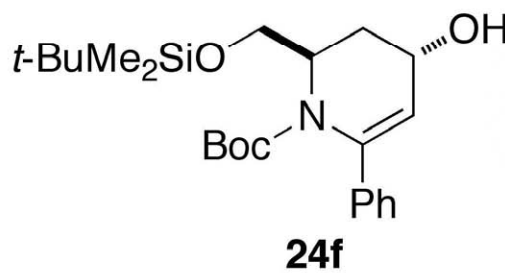


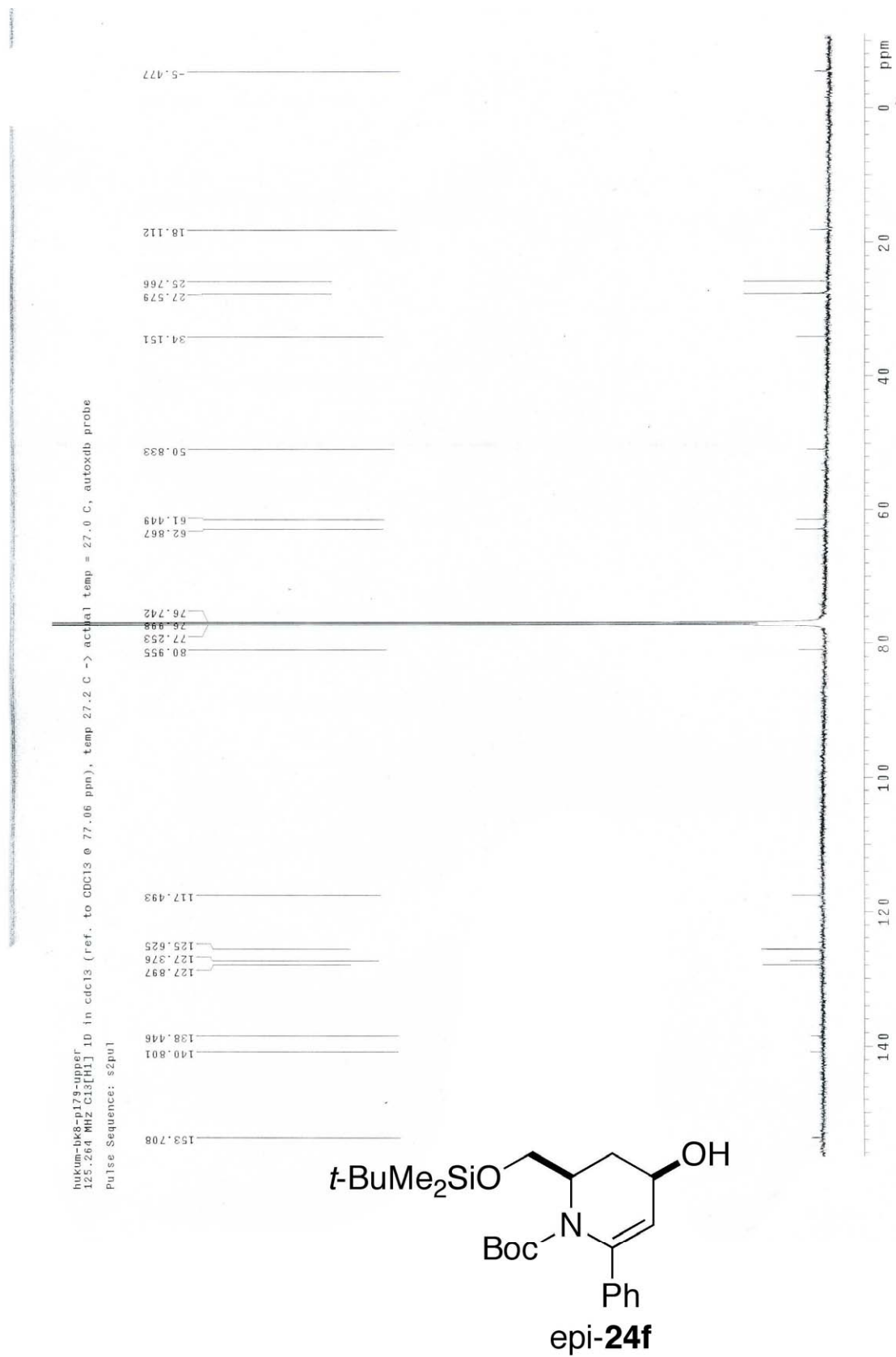
hukum-bk8-pl79-lower
499.821 MHz H1 ID in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.1 C -> actual temp = 27.0 C, autotdb probe

Pulse Sequence: s2pul

Solvent: cdcl3
Temp: 26.1 C / 299.2 K
Operator: nivenm
VNMR-500 "4500"

Relax. delay 0.100 sec
Acq. time 5.000 sec
Width 6009.6 Hz
16 Repetitions
OBSERVE H1, 499.8189171 MHz
DATA PROCESSING
FT size 131072
Total time 1 min, 31 sec





hukum-bk8-r179-upper
499.821 MHz H1 1D in cdc13 (ref. to CDC13 @ 7.26 ppm), temp 26.1 C -> actual temp = 27.0 C, autotdb probe

Pulse Sequence: s2pul

Solvent: cdc13
Temp: 26.1 C / 299.2 K
Operator: cllivnmr
VNMRS-500 "u500"

Relax. delay 0.100 sec

Pulse 45.0 degrees

Acq. time 5.000 sec

Width 5009.6 Hz

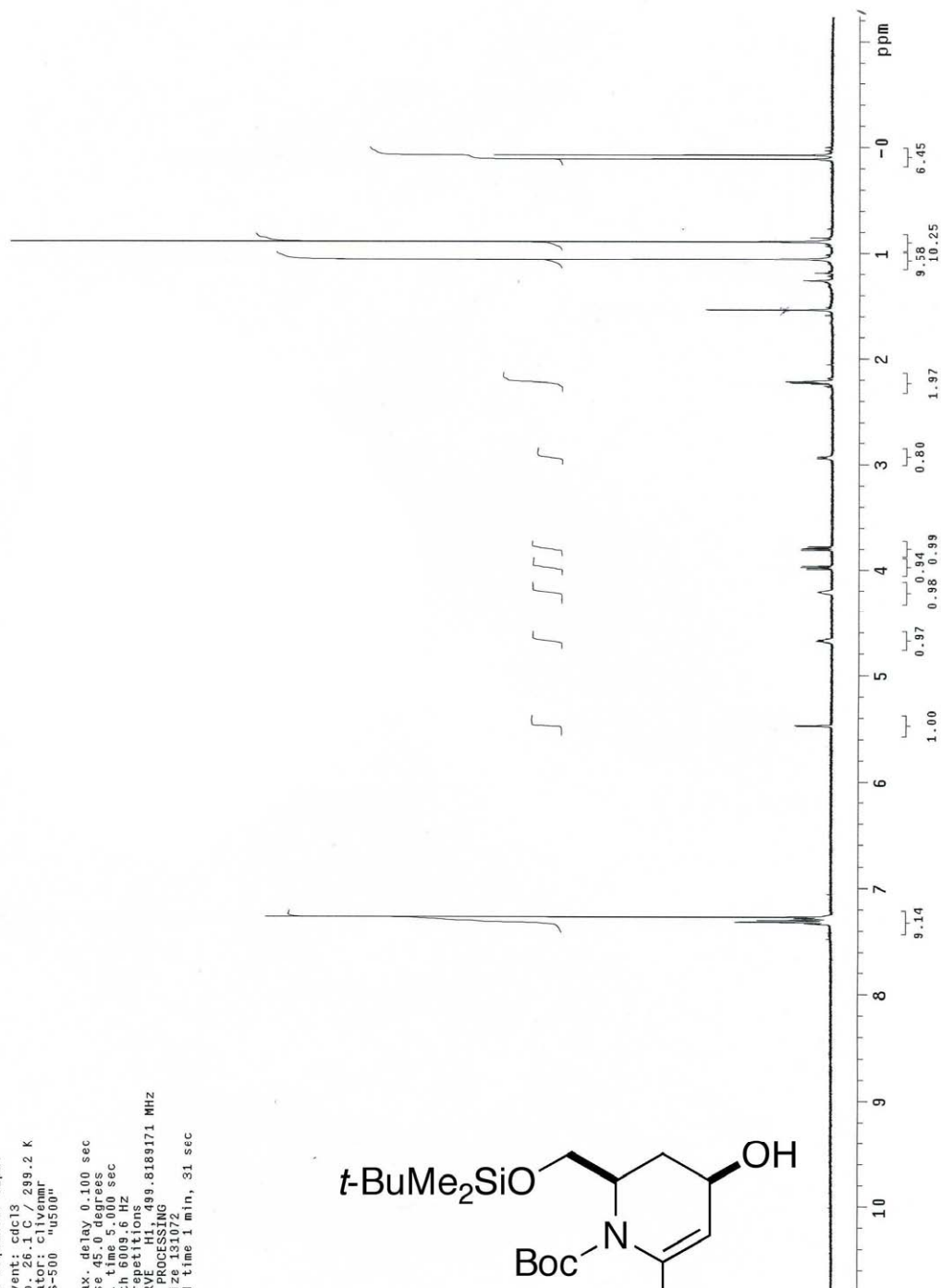
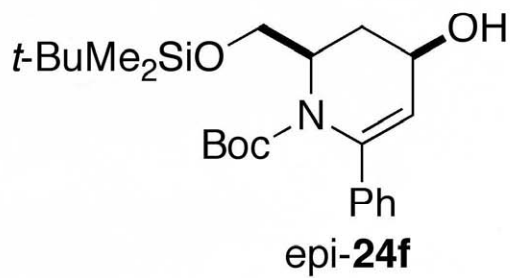
Resolution 0.0019 Hz

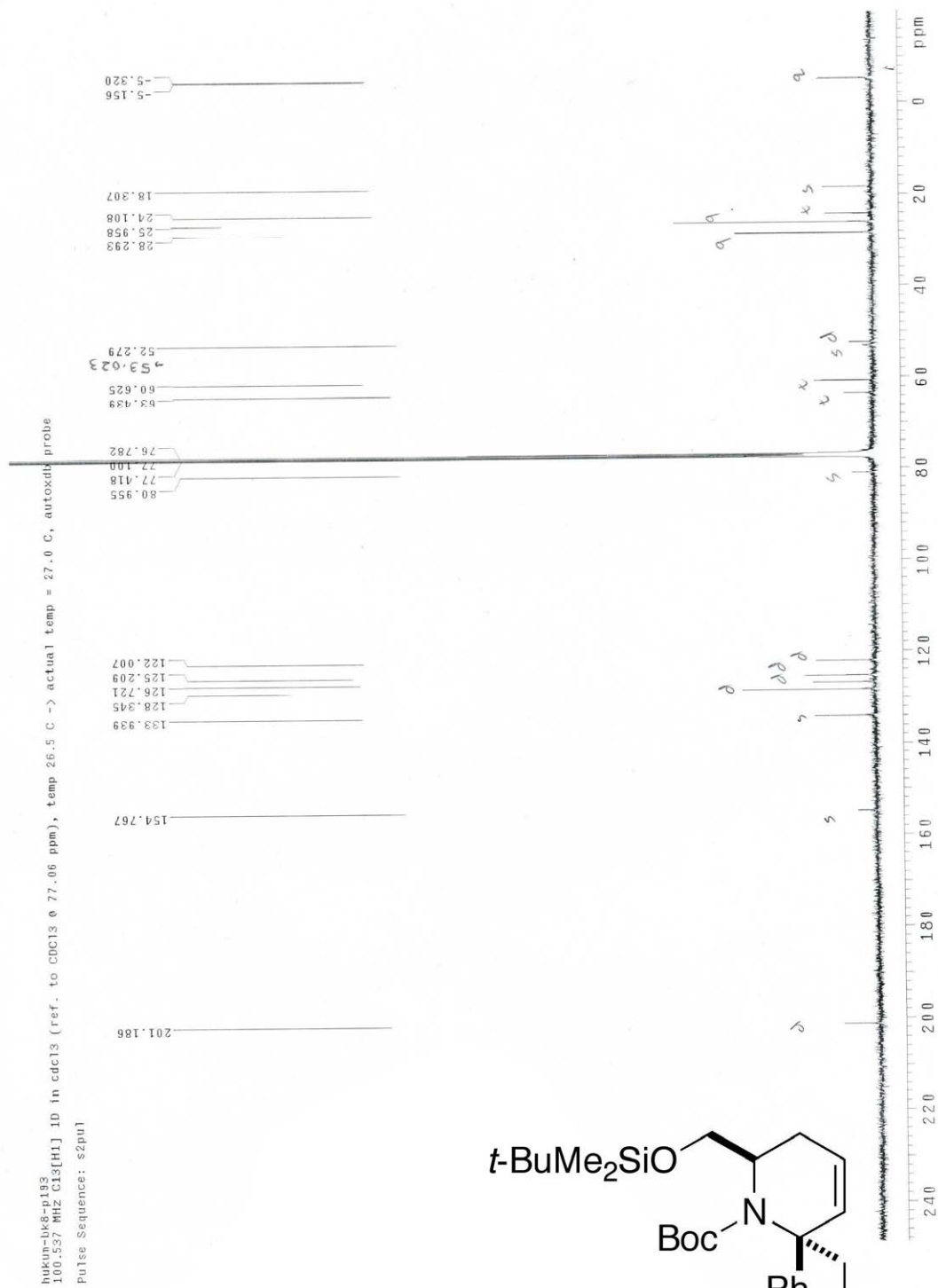
OBSERVE H1

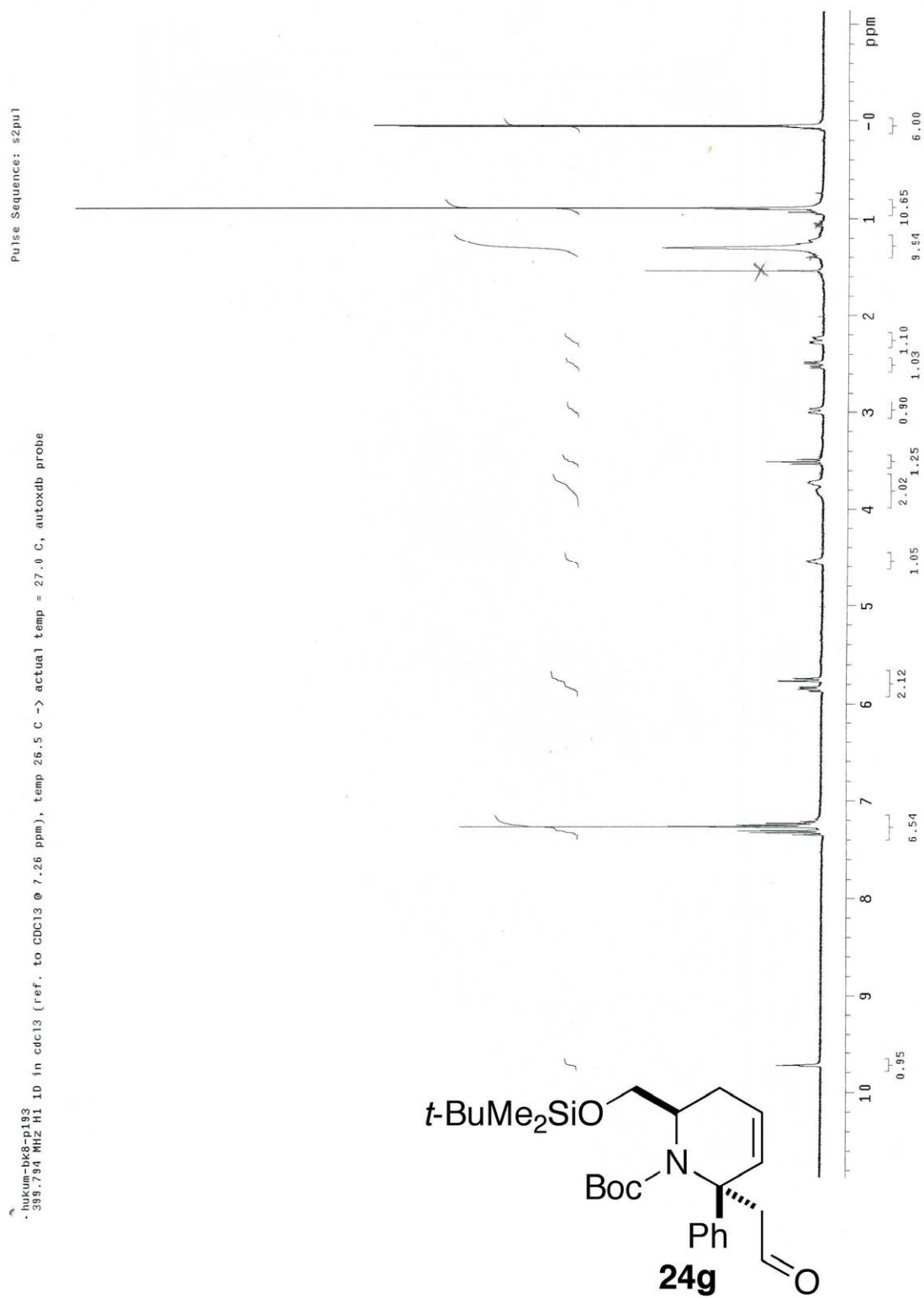
DATA PROCESSING

FT size 131072

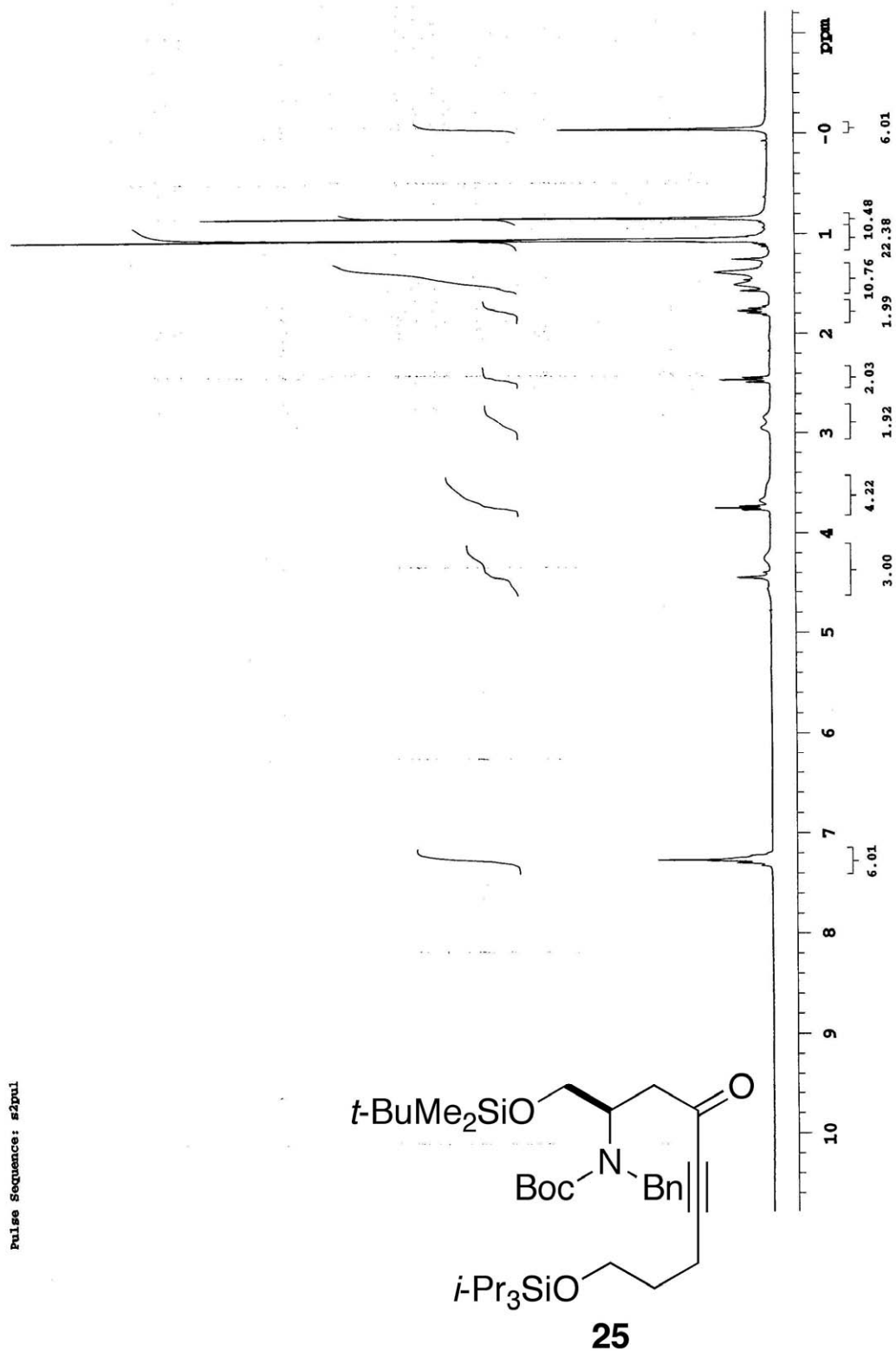
Total time 1 min, 31 sec

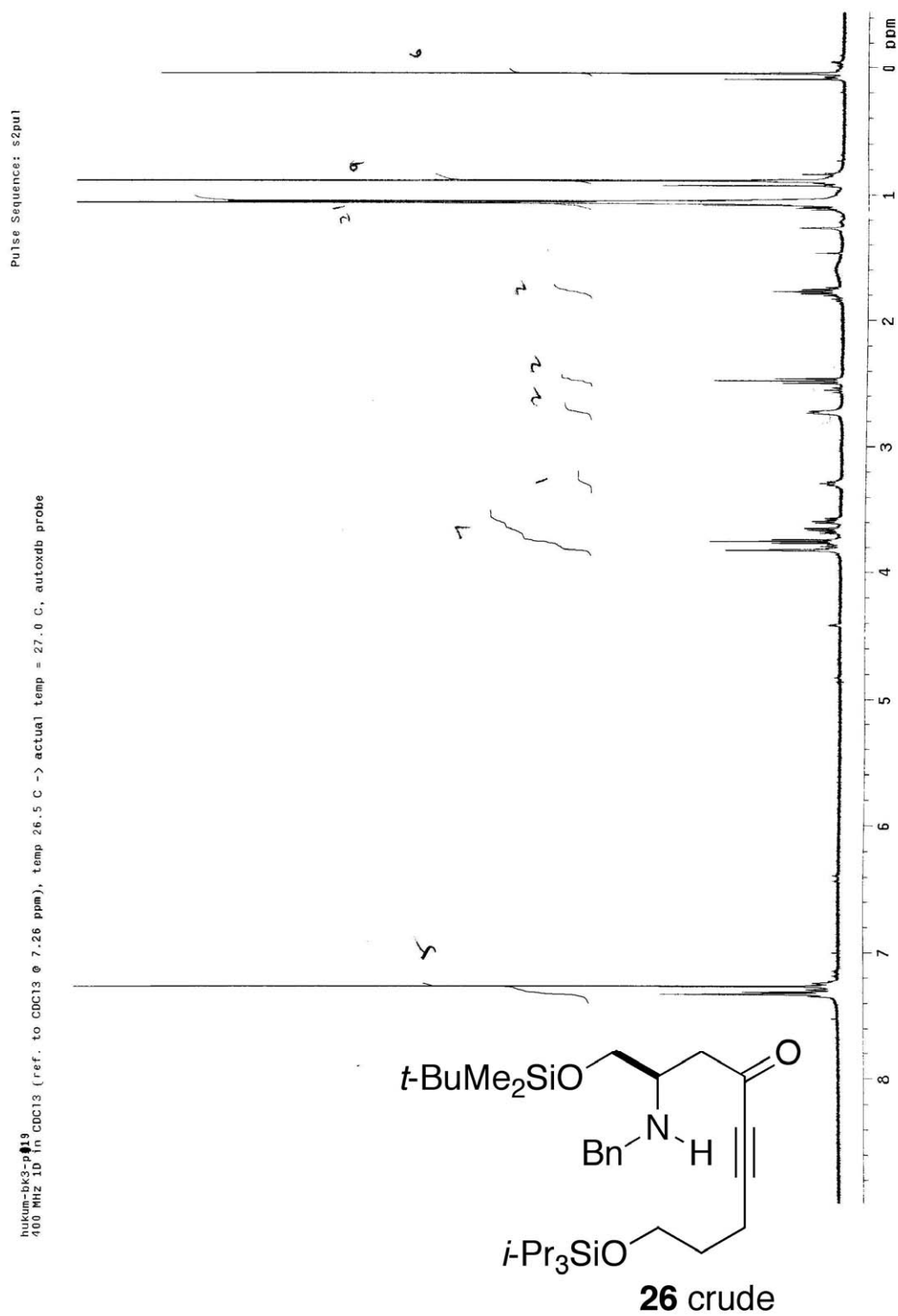






hukum-bk1-p187
300 MHz 1D in CDCl₃ (ref. to CDCl₃ @ 7.26 ppm), temp 27.5 C -> actual temp = 27.0 C, 1d probe
Pulse Sequence: s2pul



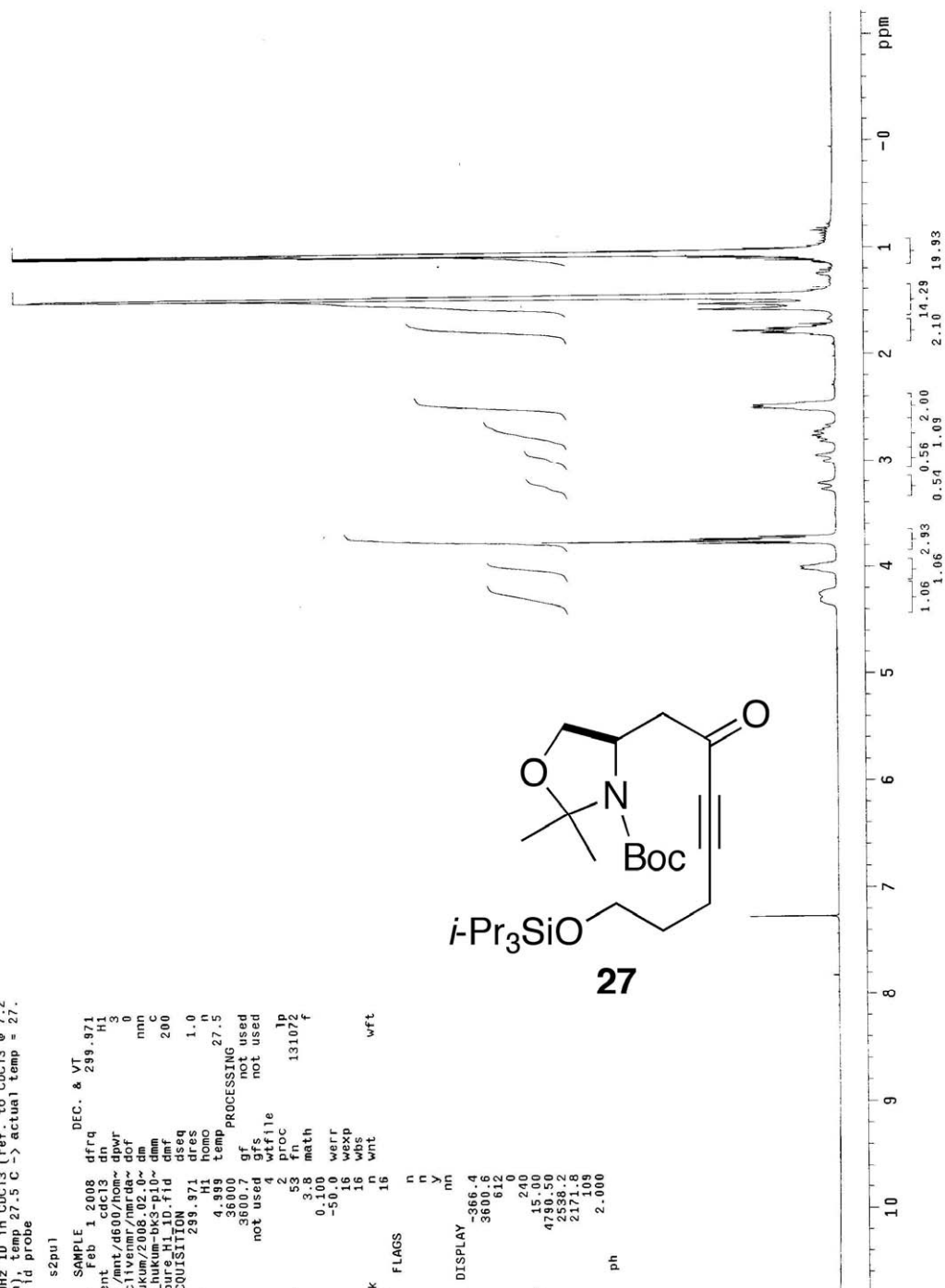
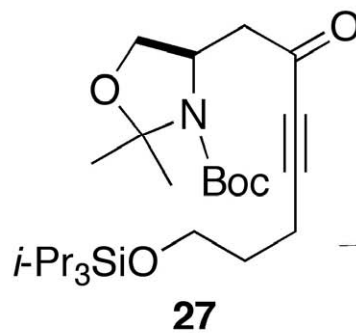


hukue-bk3-p103
300 MHz 1D in CDC13 (ref. to CDC13 @ 7.2
6 ppm), temp 27.5 C -> actual temp = 27.
0 C, id probe

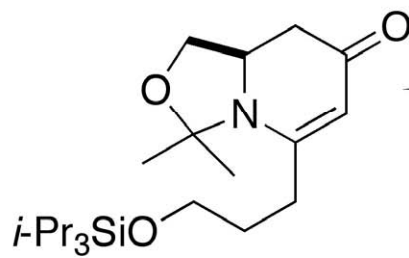
exp3 s2pul

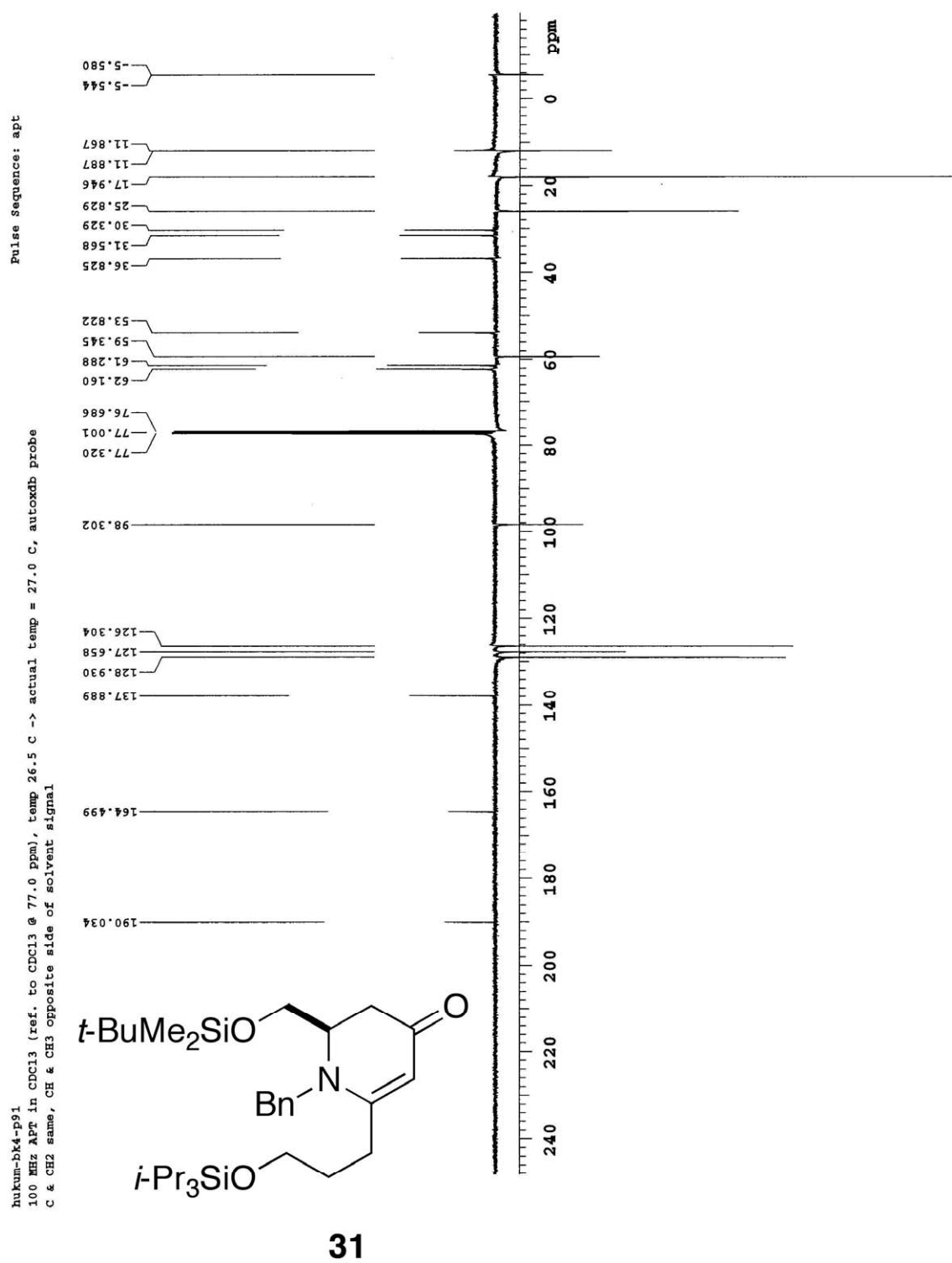
SAMPLE DEC. & VT
date Feb 1 2008 dfrq 299.971
solvent cdc13 dn H1
file /mnt/d600/hom~ dpwr 3
e14/clivemr/nmrda~ dof 0
ta/hukue/2008.02.0~ dm mn
1.13_hukue-bk3-p10~ dm 200
-s2pul-1d-p10~ dm
ACQUISITION dseq 1.0
sfrq 299.971 dres
tn H1 homo n
at 4.989 temp PROCESSING 27.5
np 3600.7 qf not used
sw 3600.7 qfs not used
hs not used 4 wfile
ss 2 proc lp
tpwr 53 fn 131072
pw 3.8 math
dl 0.100 werr
tof -50.0 werr
nt 18 werr
rt 18 werr
alock n wnt
gain 15 wft

FLAGS
il n
in n
dp y
hs nm
DISPLAY
sp -366.4
wp 3600.6
vs 612
sc 0
wc 24.0
ls 15.00
ls 4790.50
rfl 2538.2
rfl 2171.8
th 109
ins 2.000
nm ph



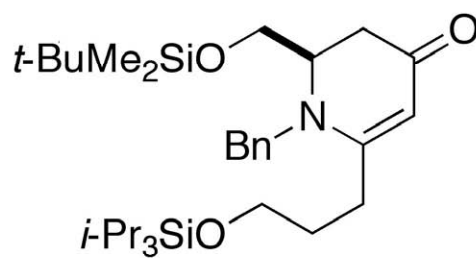
hukun-bk3-p189
300 MHz 1D in CDCl3 (ref. to CDCl3 @ 7.26 ppm), temp 27.5 C -> actual temp = 27.0 C, id probe
Pulse Sequence: s2pul

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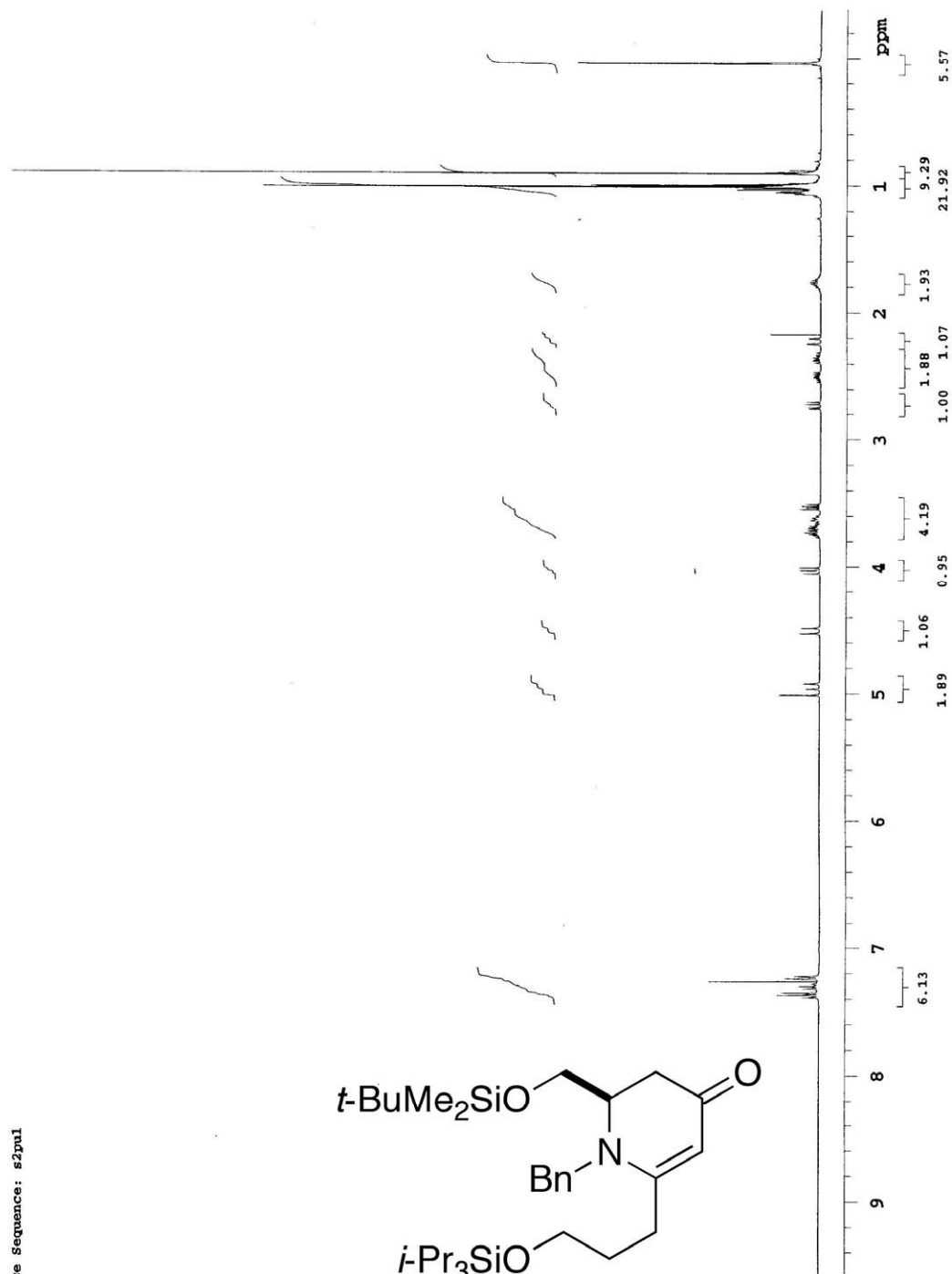


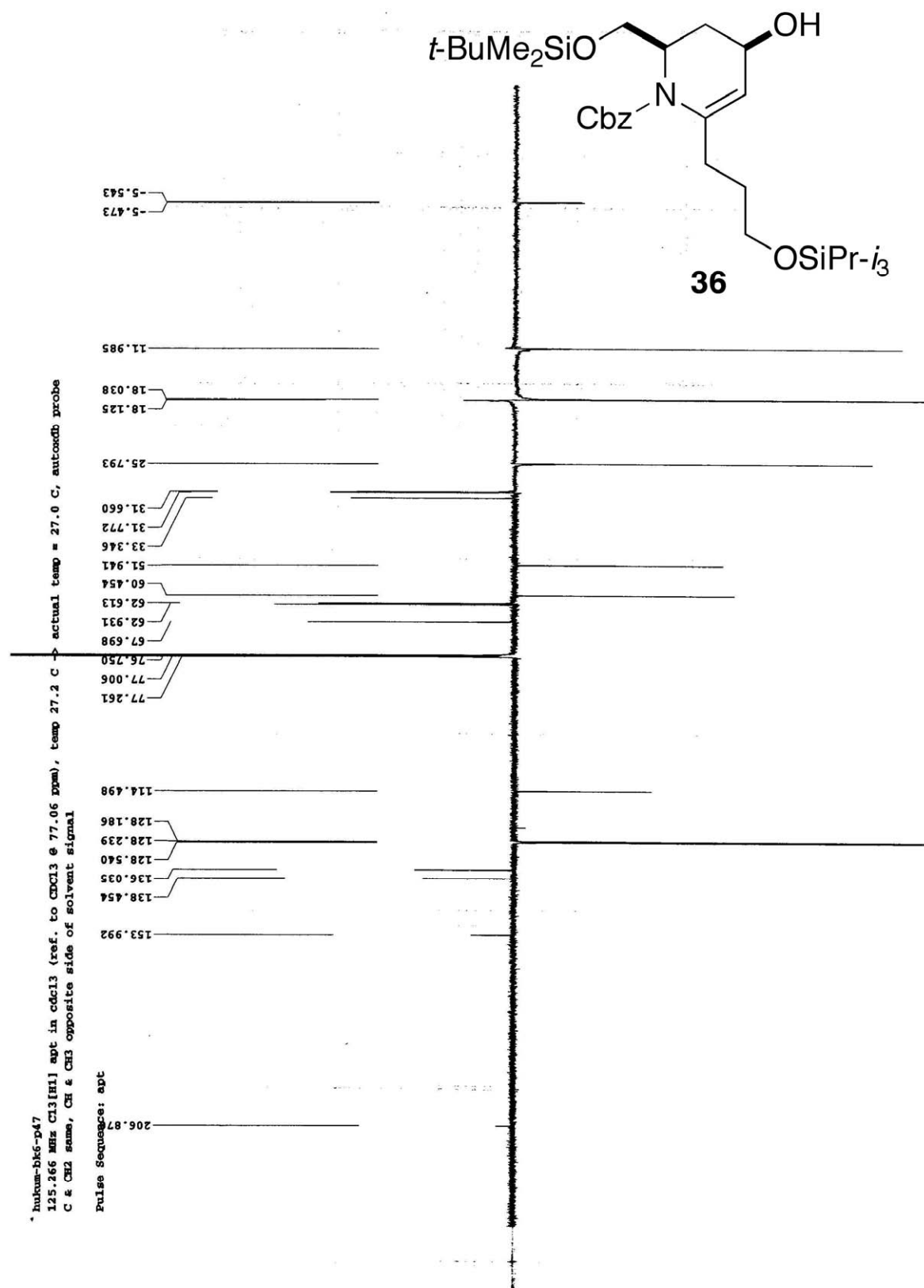
hufum-bk4-p91
400 MHz 1D in CDCl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.5 C -> actual temp = 27.0 C, autordb probe

Pulse Sequence: s2pul



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hukum-bt6-p47
399.794 MHz 1D in cdcl3 (ref. to CDCl3 @ 7.26 ppm), temp 26.5 C -> actual temp = 27.0 C, autokdf probe
Pulse sequence: s2pul

