

Application of the Synthetic Aminosugars for Glyco- diversification: Synthesis and Antimicrobial Studies of Pyranmycin

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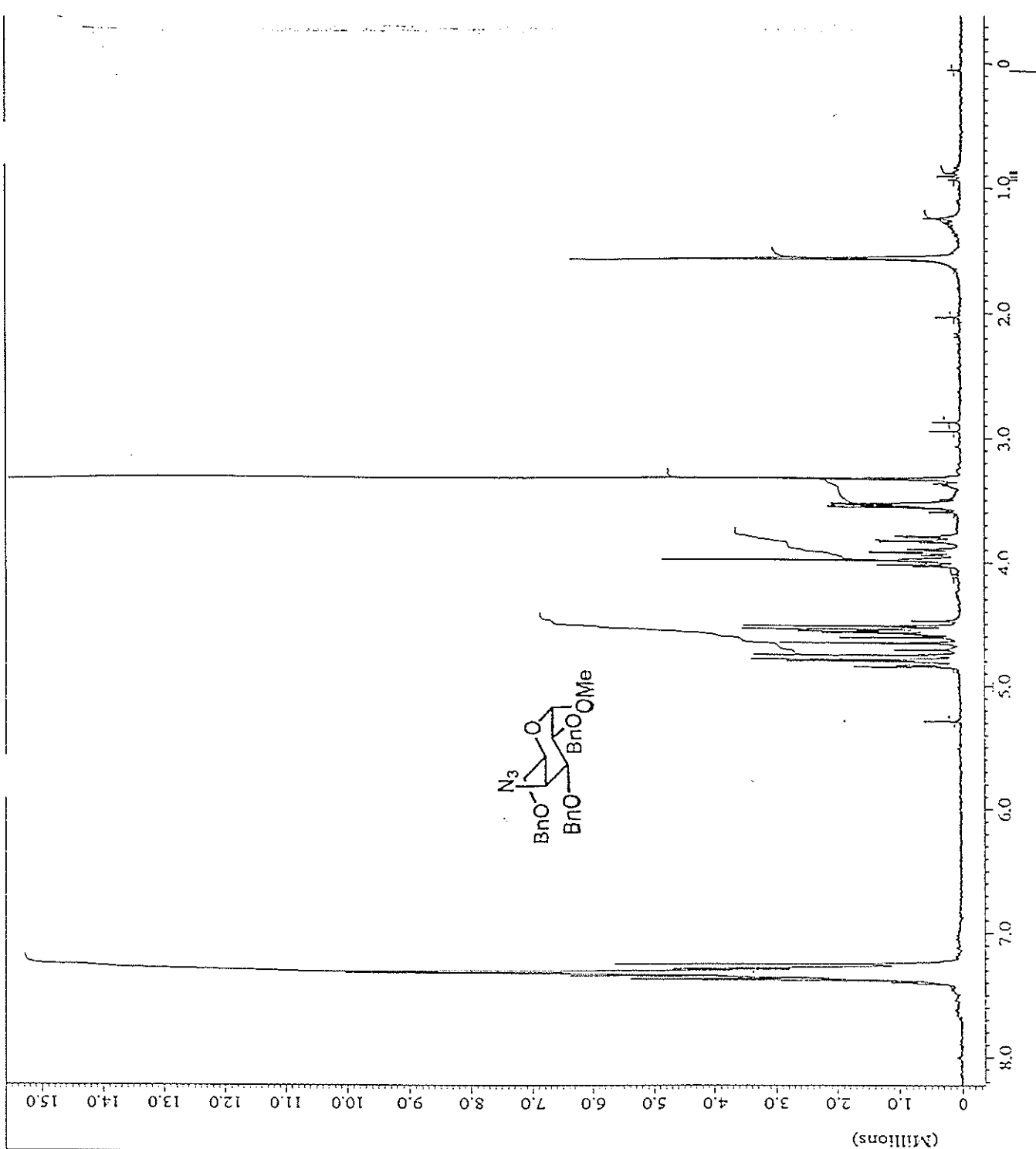
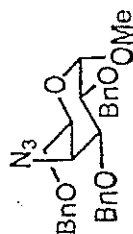
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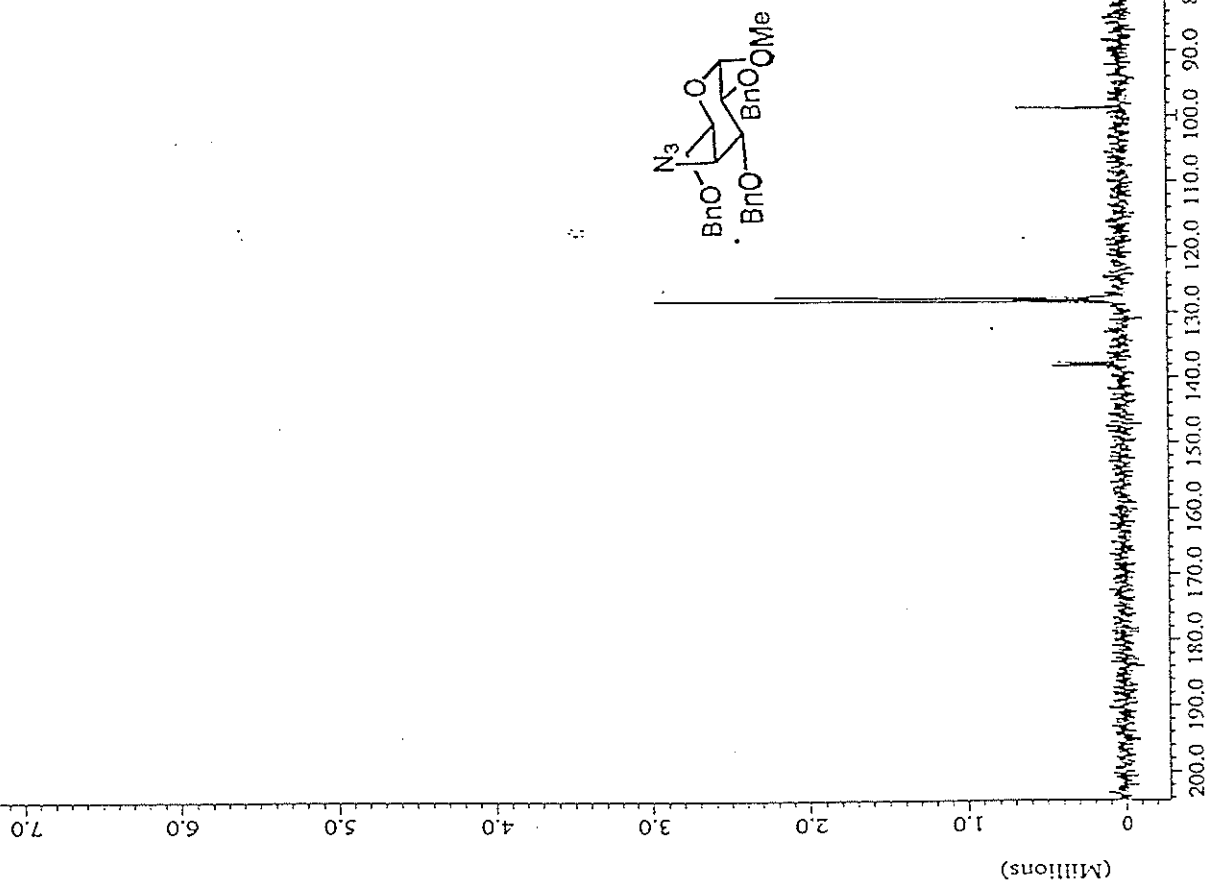
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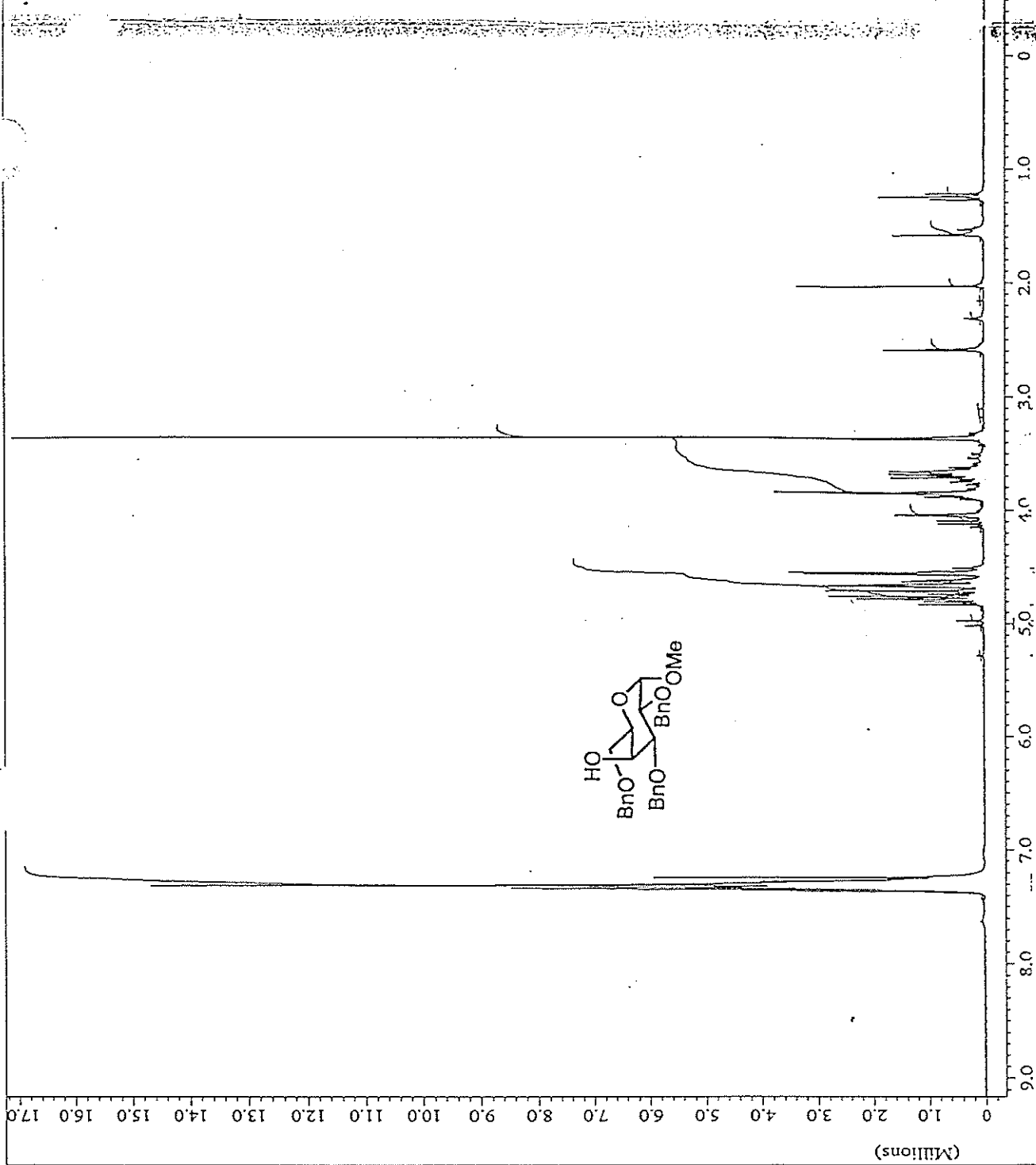
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Methyl 4-azido-2,3,6-tri-O-benzyl-4-deoxy-α-D-galactopyranoside (4).

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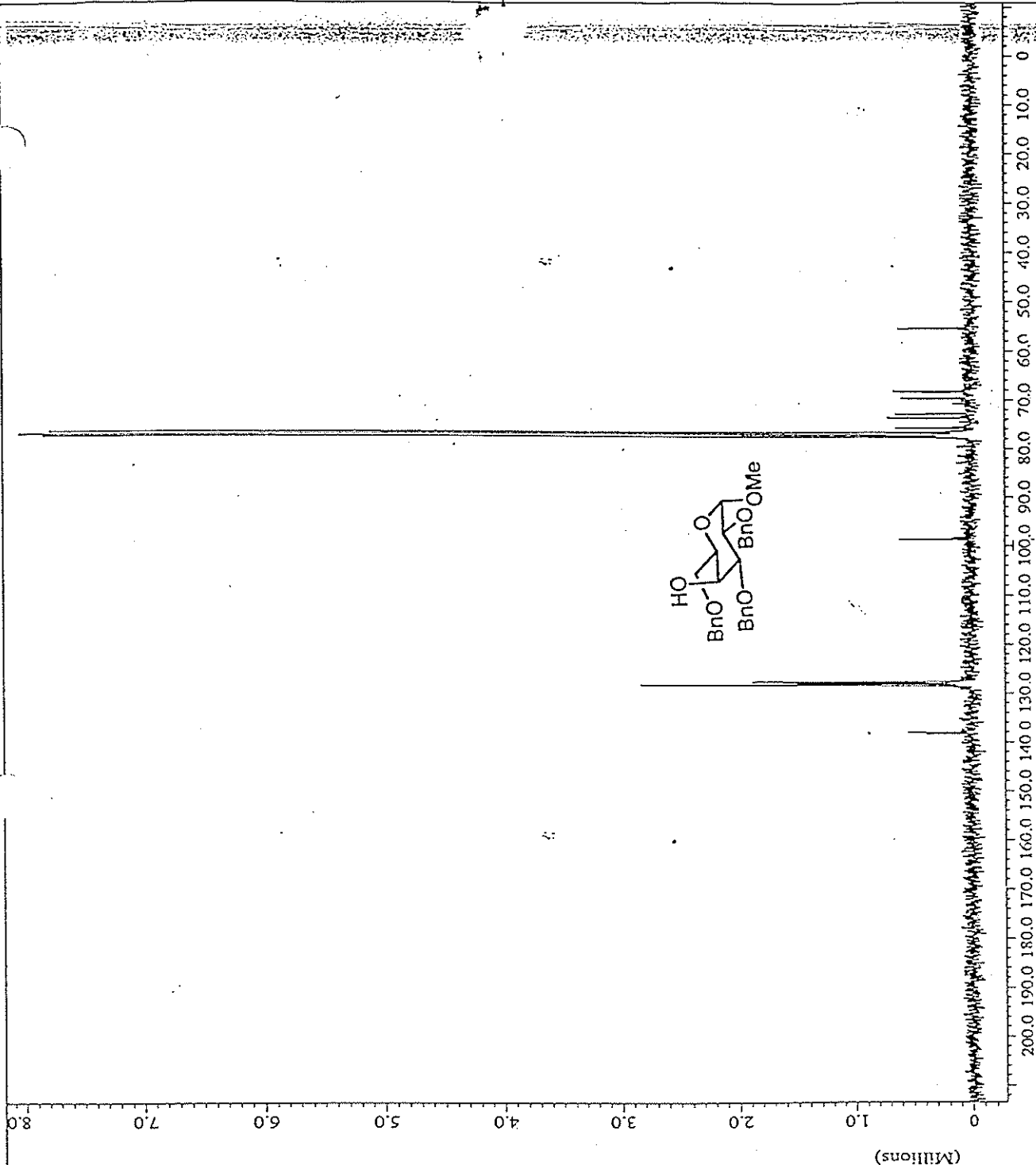
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Methyl 2,3,6-tri-O-benzyl-α-D-galactopyranoside (5).

X : parts per Million : 1H

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 X_sweep



Methyl 2,3,6-tri-O-benzyl-α-D-galactopyranoside (5).

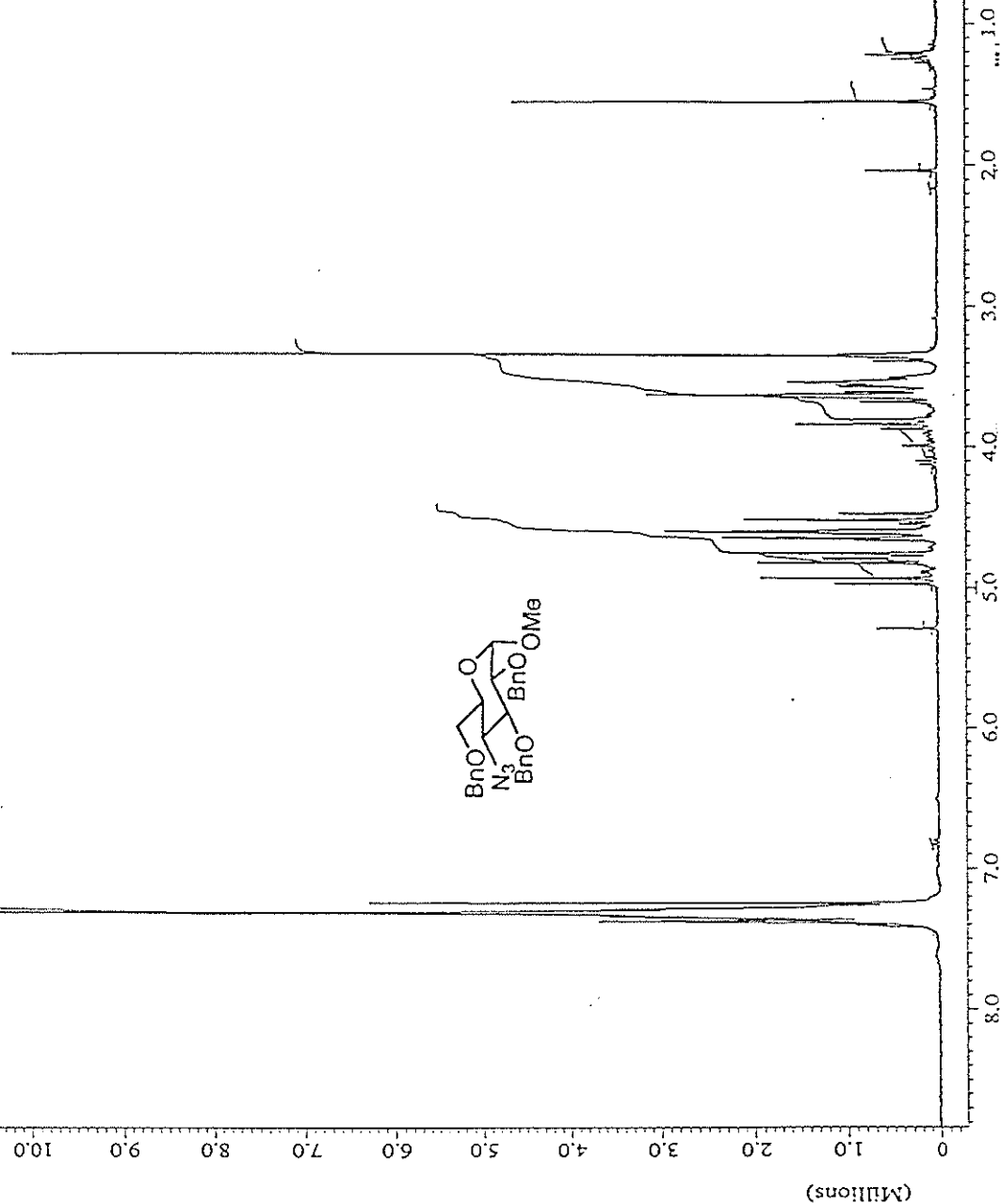
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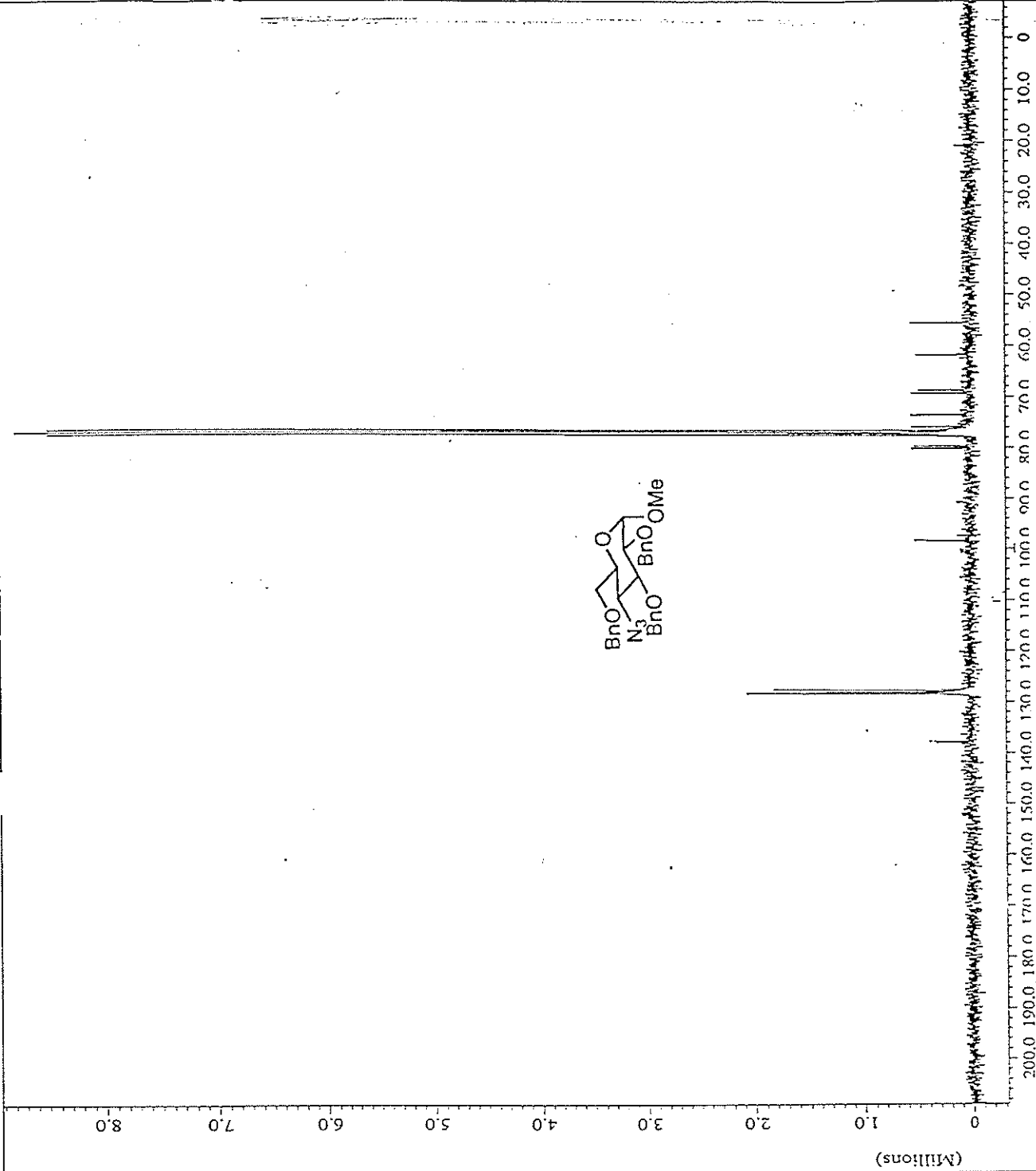
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Methyl 4-azido-2,3,6-tri-O-benzyl-4-deoxy- α -D-glucopyranoside (6).

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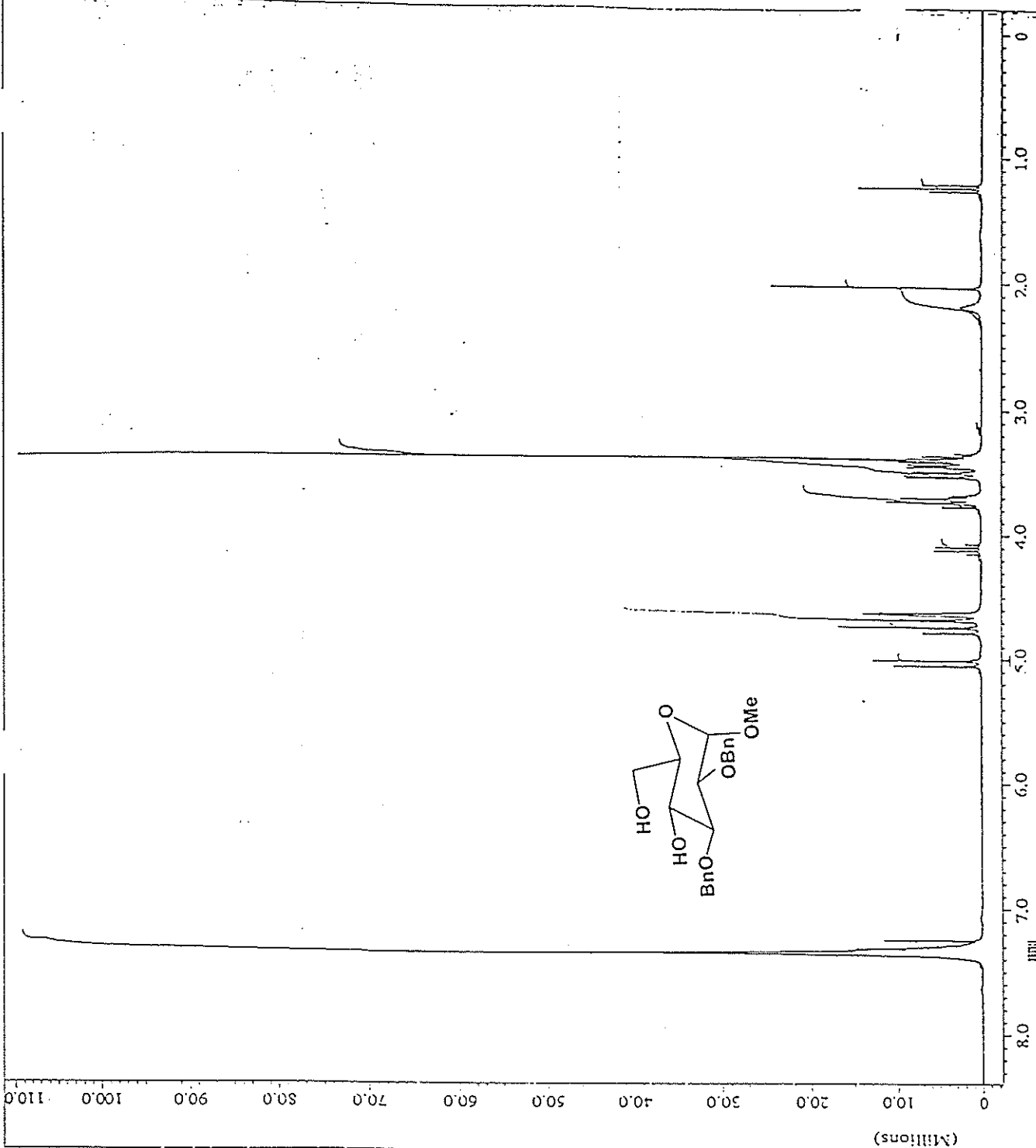
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Revision Date  = 2-JAN-2001 22:35:49

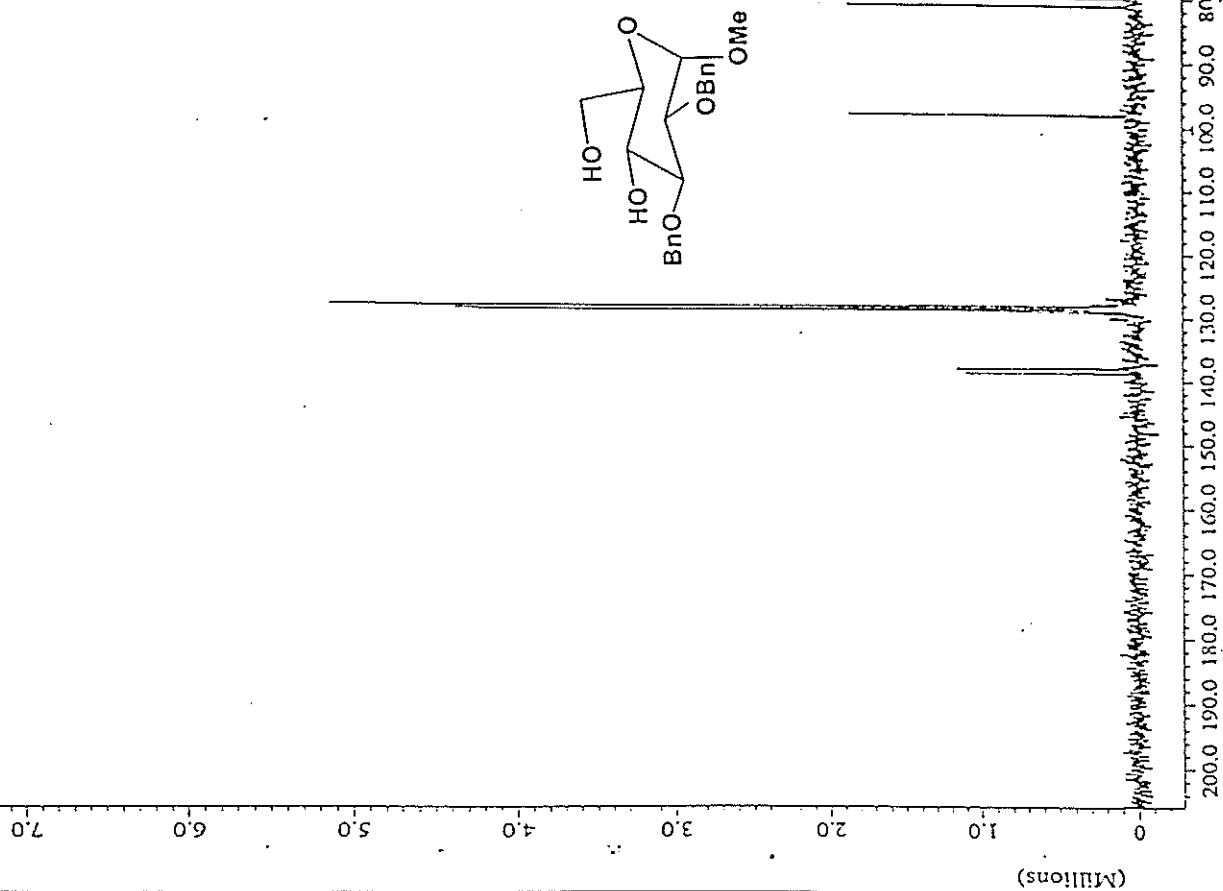
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Recvr_gain     = 28
Relaxation_delay = 4[s]
Scans          = 16
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Spin_set       = 15[Hz]
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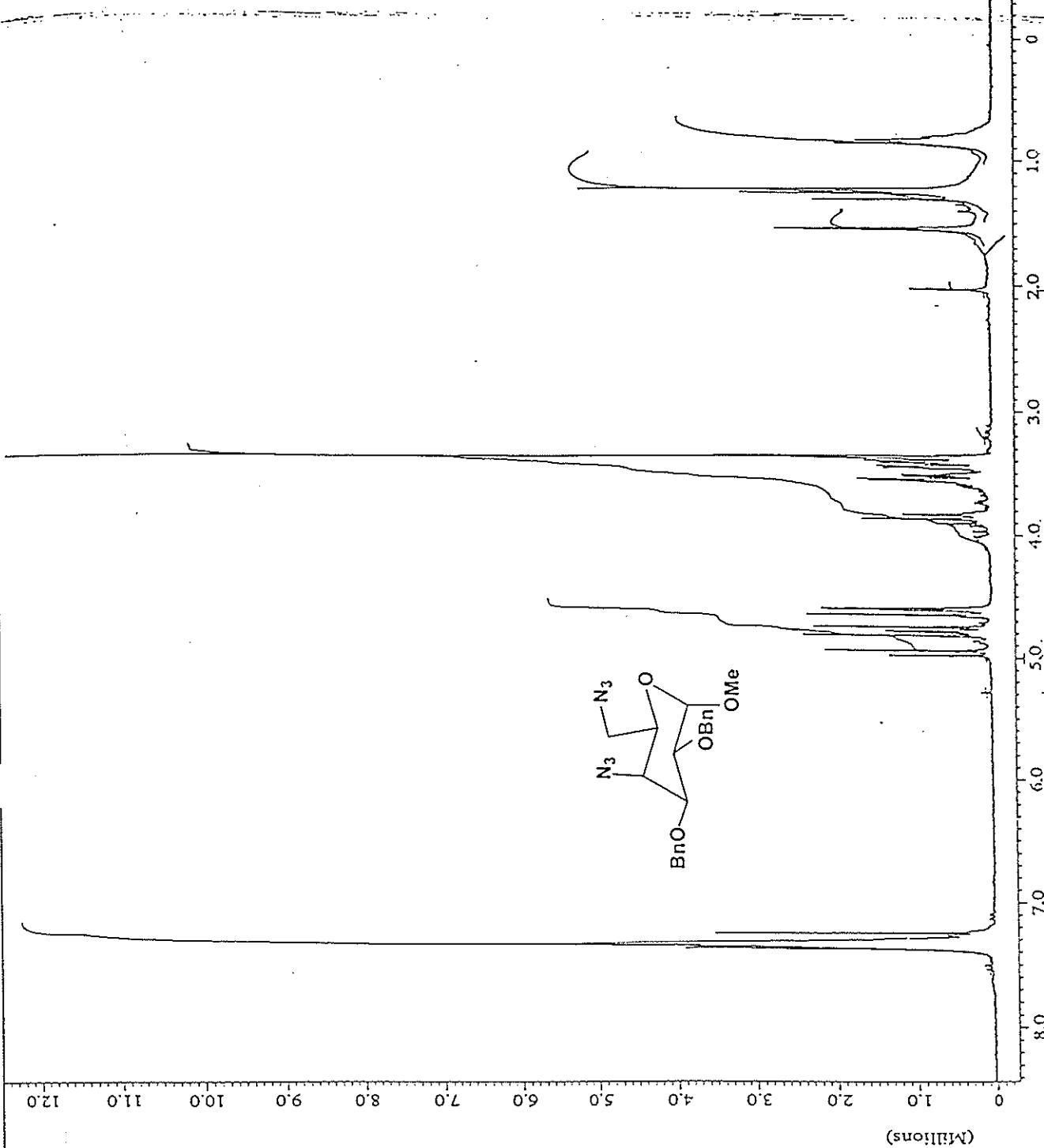
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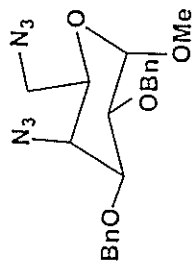
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 X_pulse = 5.65 [us]
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Methyl 4,6-diazido-2,3-di-O-benzyl-4,6-dideoxy-α-D-galactopyranoside (8).

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 Creation Date = 24-FEB-2001 20:10:06
 Revision Date = 24-FEB-2001 20:10:55
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345436[T]
 Ixr90_hi = 11.3[us]
 Ixr90_lo = 36[us]
 Ixr_domain = 1H
 Ixr_width = 36[us]
 Lock_status = IDLZ
 Recvr_gain = 15
 Relaxation_delay_1[s] = 1315
 Scans = 1315
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.4[deg]
 Temp_set = 25[deg]
 Temp_status = TRIP OFF
 Temp_status = TRIP OFF
 X90_hi = 8[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[Fpm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



Methyl 4,6-diazido-2,3-di-O-benzyl-4,6-dideoxy- α -D-galactopyranoside (8).

X : parts per million : 13C

File Name = proton.221
 Author = S#297142
 Sample ID = Single Pulse Experiment
 Content = 29-JUN-2000 08:16:37
 Revision Date = 29-JUN-2000 08:17:08
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = ID COMPLEX
 Dimensions = 1H
 Dim Title = 16384
 Dim Size = [ppm]
 Dim Units = 0.1822 [ms]
 Acq_delay = 0
 Changer_sample = single_pulse.exp
 Experiment = 6.345446 [T]
 Field_strength = 11.3 [us]
 Irr90_h1 = 18 [us]
 Irr90_lo = 36 [us]
 Irr90_wdth = 36 [us]
 Lock_status = IDH
 Lock_gain = 27
 Recvz_gain = 27
 Relaxation_delay = 4 [s]
 Scans = 4
 Solvent = CHLOROFORM-D
 Spin_get = 18 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_on = SPIN ON
 Spin_off = SPIN OFF
 Spin_status = 20 [dc]
 Temp_get = 21 [dc]
 Temp_set = 21 [dc]
 Temp_status = 21 [dc]
 Temp_off = 21 [dc]
 X90 = 11.3 [us]
 X90_h1 = 18 [us]
 X90_lo = 36 [us]
 X90_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540341 [kHz]

(Millions)

0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0



Methyl 2,3-di-O-benzyl-6-deoxy-α-D-glucopyranoside (9).

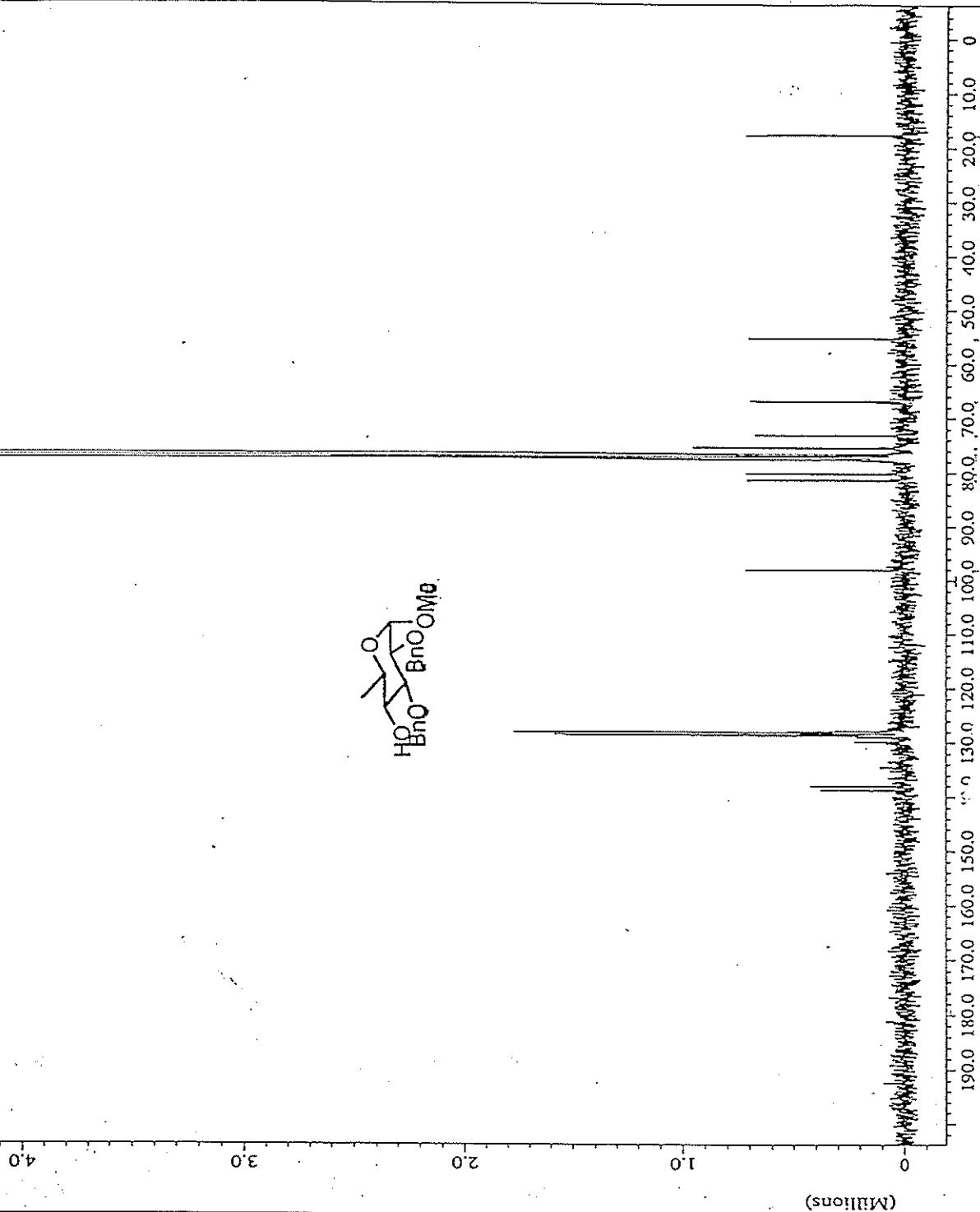
X : parts per Million : 1H

```

File Name      = 1d_13c_spectrum.32
Author         =
Sample ID      = J8734440
Experiment     = Single Pulse with Broa
Acquisition Date = 24-FEB-2001 21:23:13
Processing Date = 24-FEB-2001 21:58:27

SpecSite      = GSX 270
SpecType      = DELTA_NMR
DataFormat    = 1D COMPLEX
Dimensions    = X
Dim1Title     = 13C
Dim1Size      = 32768
Dim1Units     = [ppm]
AcqDelay      = 57.5[us]
Charger_Sample = 0
Experiment     = single_pulse_dec
Field Strength = 6.345446[T]
Irr90         = 11.3[us]
Irr90_lo      = 18[us]
Irr90_hi      = 36[us]
IrrDomain     = 1H
IrrWidth      = 26[us]
Lock_Status   = IDLX
LockGain      = 15
Relaxation_Delay = 494
Scans         = 404
Solvent       = CHLOROFORM-D
SpinLock      = 16[Hz]
SpinLock_90   = 0.1[us]
SpinLock_attn = 29[db]
SpinSet       = 15[Hz]
SpinStatus    = SPIN ON
SpinStatus    = 21.2[dc]
TempGet       = 25[dc]
TempSet       = 25[dc]
TempStatus    = TEM OFF
TempSet       = 8[us]
X90           = 8.9[us]
X90_lo        = 39[us]
X90_hi        = 1.9267584[s]
XAcqDuration  = 13C
XDomain       = 67.94010394[MHz]
XFreq         = 100.0[ppm]
XOffset       = 32768
XPoints       = 4
XPreStans     = 2.66666667[us]
XPulse        = 0.51900643[Hz]
XResolution   = 17.00680272[MHz]
X_Sweep

```



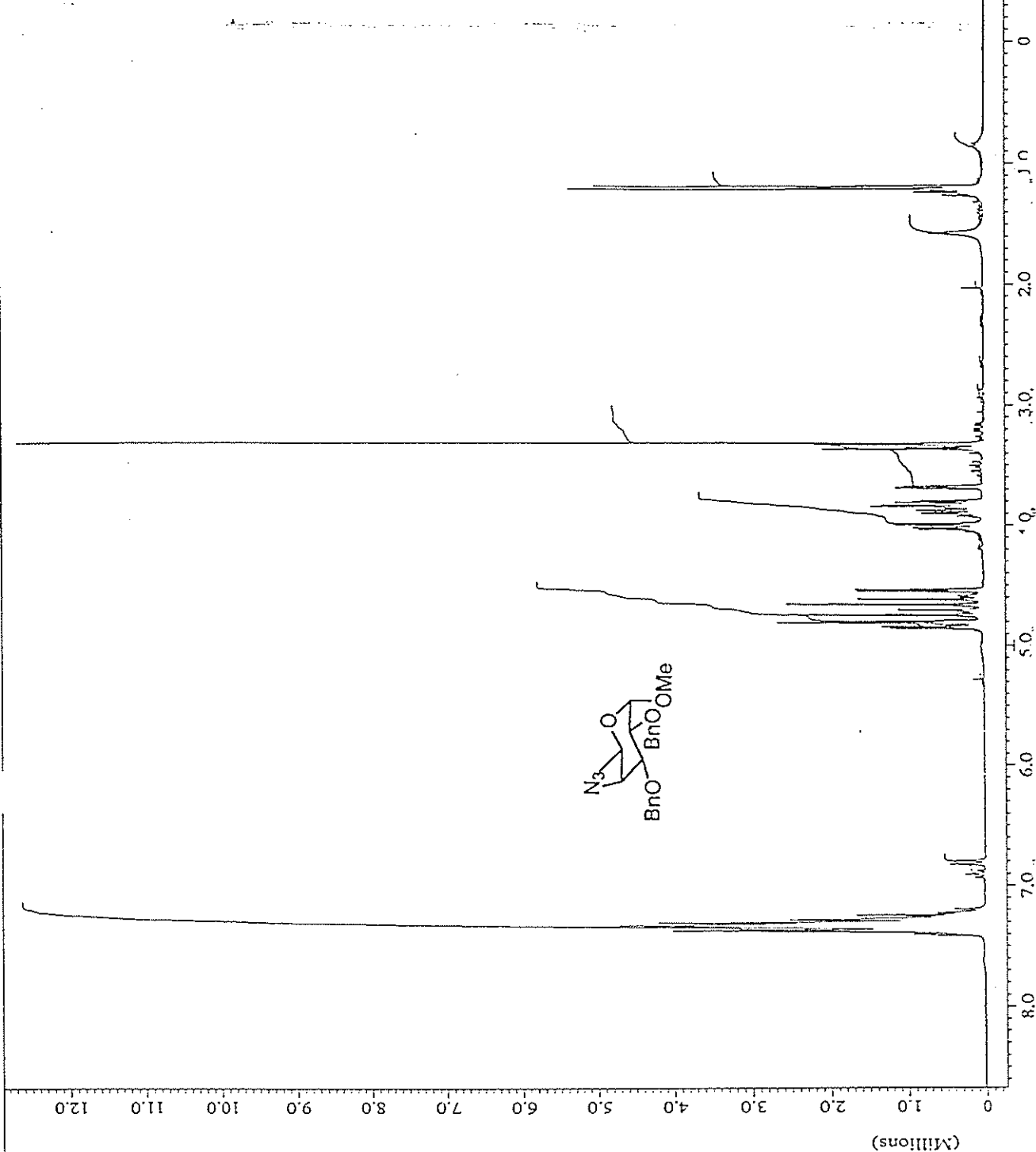
Methyl 2,3-di-O-benzyl-6-deoxy-α-D-glucopyranoside (9).

X : parts per Million : 13C

File Name = proton.235
 Author = 58743632
 Sample ID = Single Pulse Experiment
 Content = 2-JUL-2000 20:40:32
 Revision Date = 2-JUL-2000 20:40:54

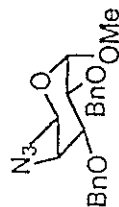
Spec Site = GSX 270
 Spec Type = DELTA-VRM

Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1822[ms]
 Changer_sample = single_pulse.exp
 Experiment = 6.345446[T]
 Field_strength = 11.3[us]
 Irr90_h1 = 18[us]
 Irr90_lo = 36[us]
 Irr90_width = 36[us]
 Lock_status = IDLE
 Recvr_gain = 23
 Relaxation_delay = 4[s]
 Scans = 4
 Solvent = CHLOROFORM-D
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 20.4[dc]
 Temp_set = 21[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 11.3[us]
 X90_h1 = 18[us]
 X90_lo = 36[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65[us]
 X_resolution = 0.32391976[MHz]
 X_sweep = 5.40340541[MHz]



Methyl 4-azido-2,3-di-O-benzyl-4,6-dideoxy-α-D-galactopyranoside (10).

File Name = Id_13c_spectrum_31
 Author = SM727494
 Sample ID = Single Pulse with Broa
 Content = 24-FEB-2001 20:53:20
 Creation Date = 24-FEB-2001 20:53:56
 Revision Date
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345436[T]
 Irr90_hi = 11.3[us]
 Irr90_lo = 18[us]
 Irr90_lo = 36[us]
 Irr_domain = 1H
 Irr_pwidth = 36[us]
 Lock_status = IDLX
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 782
 Solvent = CHLOROFORM-D
 Spin_get = 14[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.4[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.5190643[Hz]
 X_sweep = 17.00680272[Hz]



Methyl 4-azido-2,3-di-O-benzyl-4,6-dideoxy-α-D-galactopyranoside (10).

X : parts per Million : 13C

```

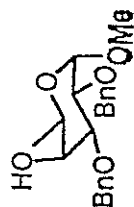
File Name      = proton.227
Author        = S843202
Sample ID     = Single pulse Experiment
Content       = 1-JUL-2000 12:20:03
Revision Date = 1-JUL-2000 12:20:23

Spec Site     = CSX 270
Spec Type     = DELTA_100R

Data Format    = ID COMPLEX
Dimensions    = X
P1 Title      = 1H
P1m Sire      = 16384
P1m Units     = [ppm]
Acq_delay     = 0.1822 [ms]
Changer_sample = 0
Experiment    = single pulse.exp
Field_strength = 6.345446 [T]
Irr90         = 11.3 [us]
Irr90_hi      = 18 [us]
Irr90_lo      = 36 [us]
Irr_pwidth    = 36 [us]
Lock_status   = IDLX
Recvr_gain    = 27
Relaxation_delay = 4 [s]
Scans         = 4
Solvent       = CHLOROFORM-D
Spin_get      = 13 [Hz]
Spin_lock_90  = 0.1 [ms]
Spin_lock_attn = 29 [dB]
Spin_set      = 15 [Hz]
Spin_status   = SPIN ON
Spin_status    = SPIN ON
Temp_get      = 18.3 [dC]
Temp_set      = 21 [dC]
Temp_status   = TEMP OFF
Temp_status    = TEMP OFF
X90           = 11.3 [us]
X90_hi        = 18 [us]
X90_lo        = 36 [us]
X90_duration  = 3.03104 [s]
X_domain      = 1H
X_freq        = 270.16743928 [MHz]
X_offset      = 5.0 [ppm]
X_points      = 16384
X_prescans    = 0
X_pulse       = 5.65 [us]
X_resolution  = 0.32891976 [Hz]
X_sweep       = 5.40540541 [kHz]

```

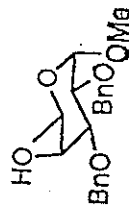
(Millions)



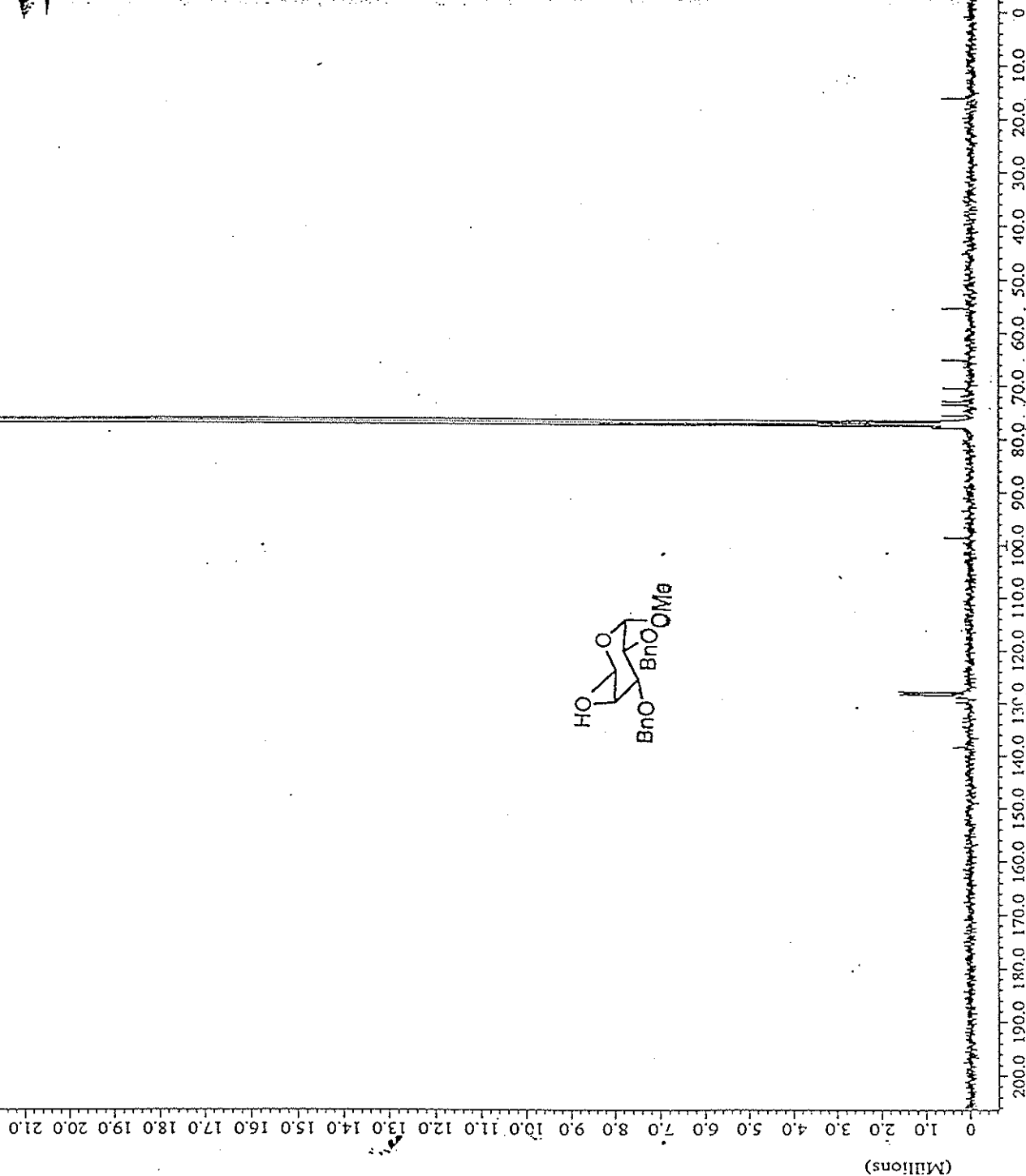
Methyl 2,3-di-O-benzyl-6-deoxy-α-D-galactopyranoside (11).

X : parts per Million : 1H

File Name = id_13c_spectrum.22
 Author =
 Sample ID = S8297338
 Content = Single pulse with Brox
 Creation Date = 24-FEB-2001 10:08:38
 Revision Date = 24-FEB-2001 10:09:33
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.34546[T]
 Irr90_hl = 11.3[us]
 Irr90_lo = 18[us]
 Irr90_domain = 1H
 Irr_width = 36[us]
 Lock_status = IDLX
 Recv_gain = 15
 Relaxation_delay = 1[s]
 Scans = 2309
 Solvent = CHLOROFORM-D
 Spin_get = 15[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 21.9[dc]
 Temp_set = 23[dc]
 Temp_status = TEMP OFF
 X90_hl = 8[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900843[Hz]
 X_sweep = 17.00680272[kHz]



Methyl 2,3-di-O-benzyl-6-deoxy-α-D-galactopyranoside (11).



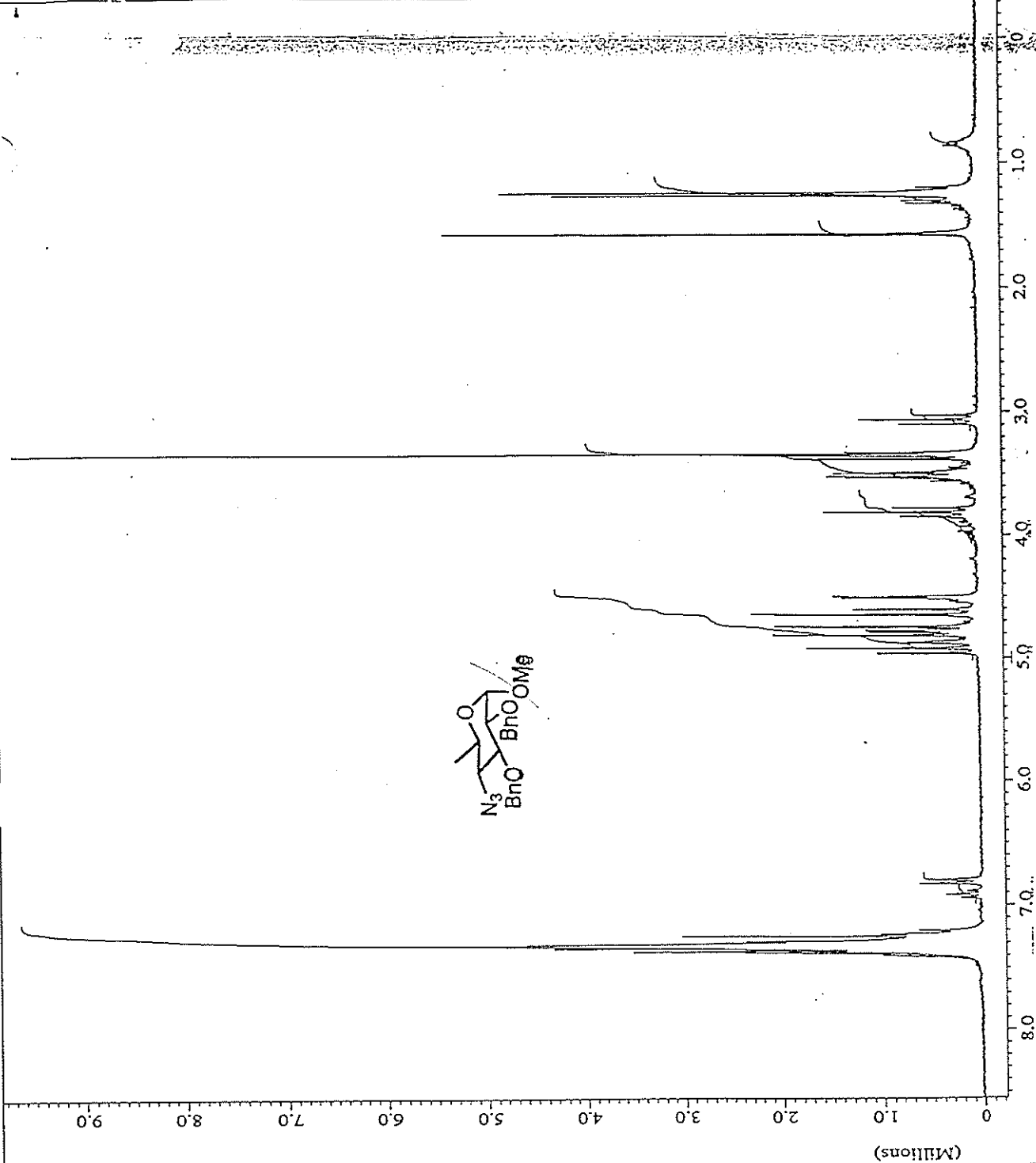
X : parts per Million : 13C

```

File Name      = proton.239
Author        = S#324035
Sample ID     = Single Pulse Experiment
Content       = 6-JUL-2000 09:01:55
Revision Date = 6-JUL-2000 09:02:16

Spec Site     = GSX 270
Spec Type     = DELTA RMR

Data Format    = 1D COMPLEX
Dimensions    = X
Dim Title     = 1H
Dim Size      = 16384
Dim Units     = [ppm]
Acq_delay     = 0.1822[ms]
Changer_sample = 0
Experiment    = single_pulse.exp
Field_strength = 6.345446[T]
Irr90_h1      = 11.3[us]
Irr90_lo      = 18[us]
Irr90_wdth    = 36[us]
Lock_status   = 36[us]
Lock_gain     = 25
Relaxation_delay = 4[us]
Scans         = 4
Solvent       = CHLOROFORM-D
Spin_get      = 11[Hz]
Spin_lock_90  = 0.1[ms]
Spin_lock_attn = 23[db]
Spin_set      = 15[Hz]
Spin_status   = SPIN ON
Spin_status   = 18.4[dc]
Temp_get      = 21[dc]
Temp_set      = TEMP OFF
Temp_status   = TEMP OFF
Temp_status   = 11.3[us]
X90_h1        = 18[us]
X90_lo        = 36[us]
X_acq_duration = 3.03104[s]
X_domain      = 1H
X_freq        = 270.16743928[MHz]
X_offset      = 5.0[ppm]
X_points      = 16384
X_prescans    = 0
X_pulse       = 5.65[us]
X_resolution  = 0.32891976[Hz]
X_sweep       = 5.40540541[MHz]
  
```



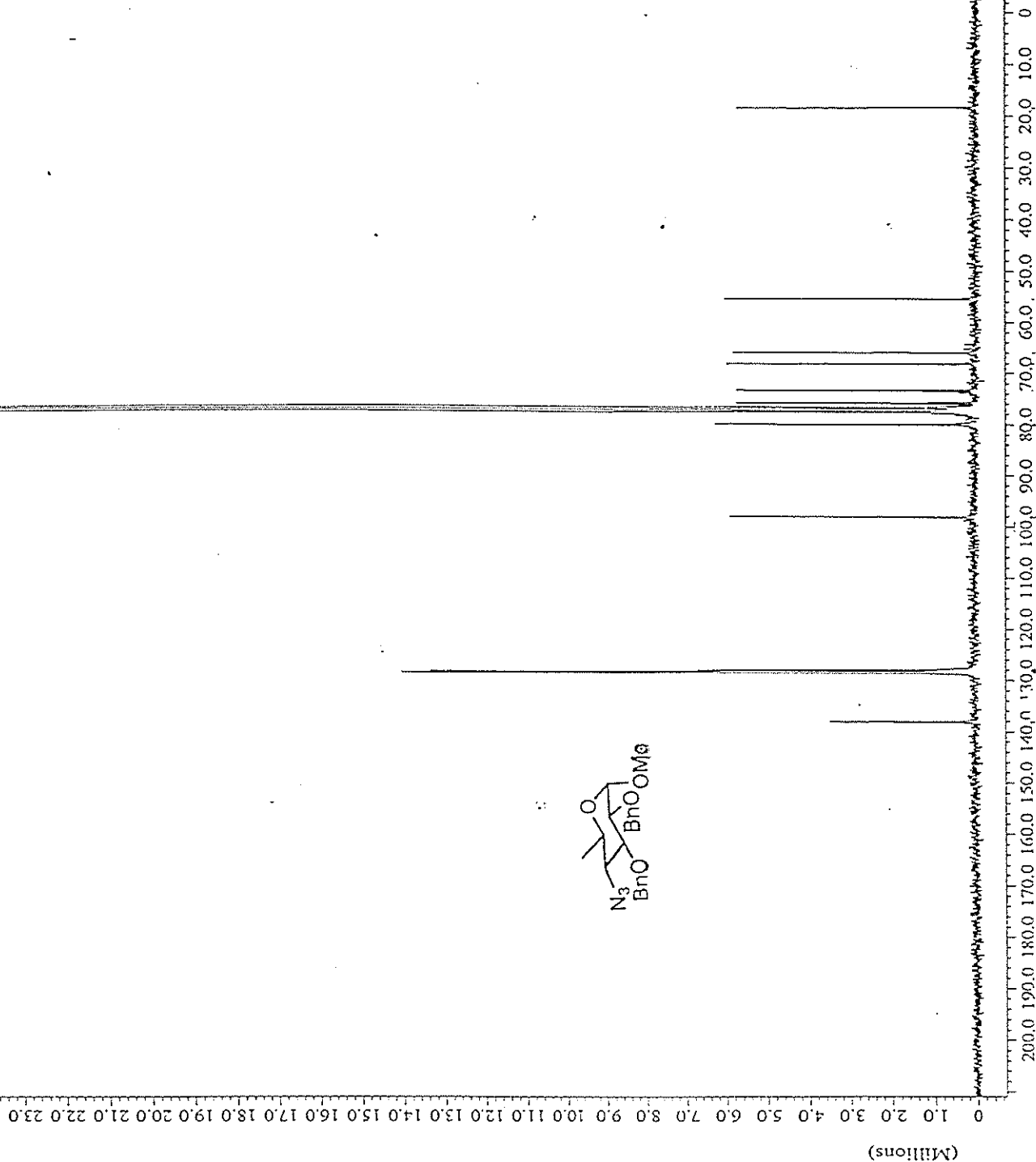
Methyl 4-azido-2,3-di-O-benzyl-4,6-dideoxy-α-D-glucopyranoside (12).

X : parts per Million : 1H

File Name = ld_13c_spectrum.20
 Author =
 Sample ID = SM649392
 Content = Single Pulse with Broa
 Creation Date = 23-FEB-2001 20:10:07
 Revision Date = 23-FEB-2001 20:11:01
 Spec Site = CSX 270
 Spec Type = DELTA NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_hi = 11.3[us]
 Irr90_lo = 18[us]
 Irr90_domain = 36[us]
 Irr90_width = 36[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 32611
 Solvent = CHLOROFORM-D
 Spin_get = 14[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_get = 21.9[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 8.9[us]
 X90_hi = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



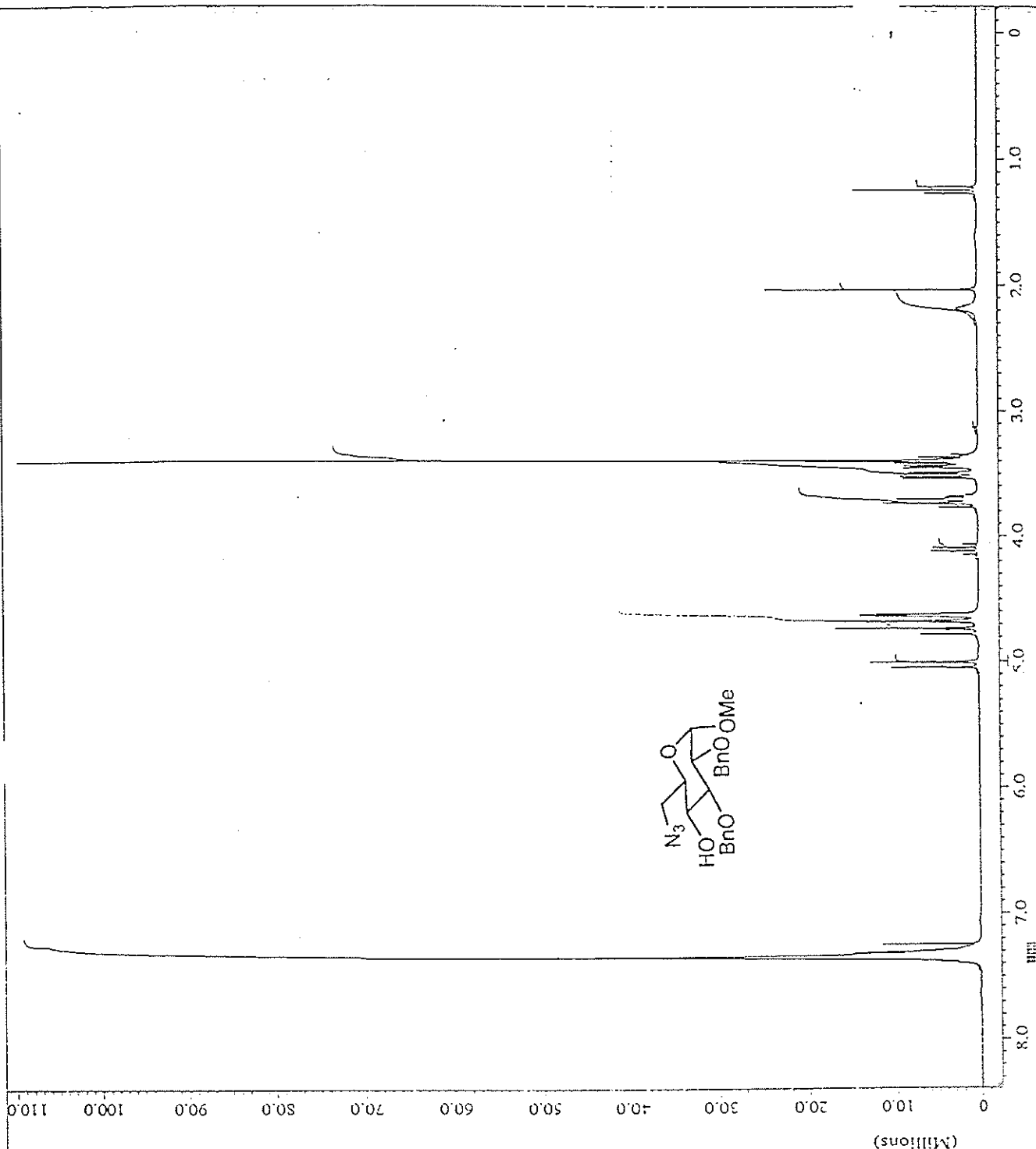
Methyl 4-azido-2,3-di-O-benzyl-4,6-dideoxy-α-D-glucopyranoside (12).



X : parts per Million : 13C

File Name = proton.779
 Author = S811365
 Sample ID = Single Pulse Experiment
 Content = 2-JAN-2001 22:35:32
 Revision Date = 2-JAN-2001 22:35:49

Spec Site = CSX 270
 Spec Type = DELTA INK
 Data Format = ID COMPLEX
 Dimensions = 1D
 Dim Title = 1D
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1822 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Irr90_strength = 10 [us]
 Irr90_hi = 10 [us]
 Irr90_lo = 10 [us]
 Irr90_width = 1 [us]
 Lock_status = IDLE
 Recv_gain = 28
 Relaxation_delay = 4 [s]
 Scans = 16
 Solvent = CHLOROFORM-D
 Spin_get = 9 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 16.1 [dC]
 Temp_set = 21.0 [dC]
 Temp_status = TEMP OFF
 X90 = 11.3 [us]
 X90_lo = 10 [us]
 X90_hi = 36 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Methyl 6-azido-2,3-di-O-benzyl-6-deoxy-α-D-glucopyranoside (13).

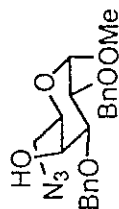
File Name = 1d_13c_spectrum.33
 Author = SM793396
 Sample ID = Single Pulse with Broa
 Content = 24-FEB-2001 22:43:54
 Creation Date = 24-FEB-2001 22:44:39
 Revision Date = 24-FEB-2001 22:44:39
 Spec Site = CSX 270
 Spec Type = DELTA_RMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Sire = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Yield_strength = 6.34546[T]
 Irr90 = 11.3[us]
 Irr90_hi = 18[us]
 Irr90_lo = 36[us]
 Irr_dmain = 1H
 Irr_pwidth = 36[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 797
 Solvent = CHLOROFORM-D
 Spin_get = 14[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_state = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.3[dc]
 Temp_set = 25[dc]
 Temp_stat = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267504[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



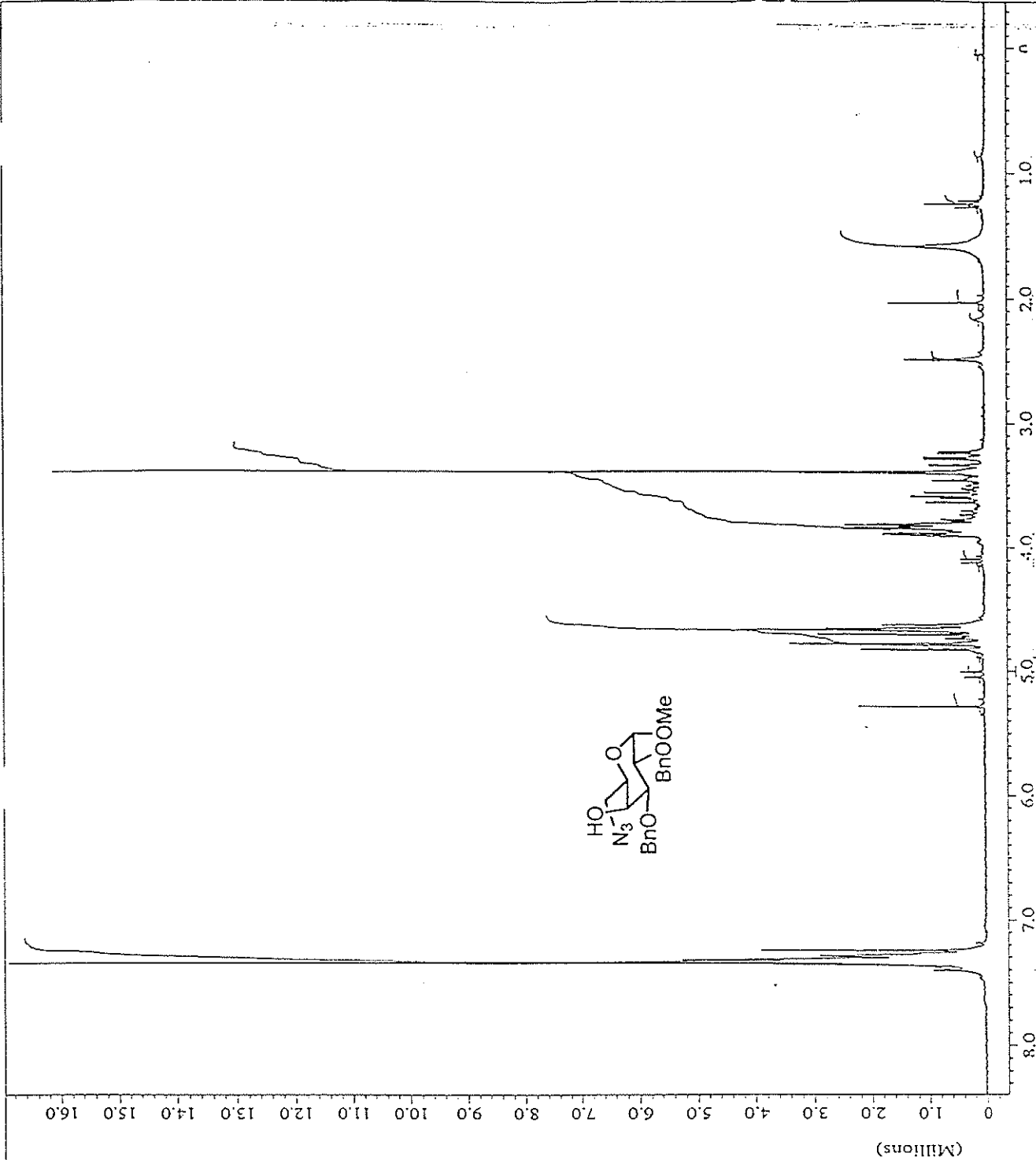
Methyl 6-azido-2,3-di-O-benzyl-6-deoxy-α-D-glucopyranoside (13).

X : parts per Million : 13C

File Name = proton.414
 Author =
 Sample ID = 58302708
 Content = Single Pulse Experiment
 Creation Date = 21-AUG-2000 08:26:23
 Revision Date = 21-AUG-2000 08:26:43
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = ID COMPLEX
 Dimensions = 1H
 Dim Title = 16384
 Dim Size = {ppm}
 Dim Units =
 Acq delay = 0.1022[ms]
 Changer_sample =
 Experiment = single_pulse.exp
 Field_strength = 6.345446[T]
 Irr90 = 11.3[us]
 Irr90_hi = 18[us]
 Irr90_lo = 36[us]
 Irr_pwidth = 36[us]
 Lock_status = IDLX
 Recvr_gain = 26
 Relaxation_delay = 4[s]
 Scans = 4
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 17.4[dc]
 Temp_set = 21[dc]
 Temp_status = TEMP OFF
 X90 = 11.3[us]
 X90_hi = 18[us]
 X90_lo = 36[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescan = 0
 X_pulse = 5.65[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40340541[MHz]

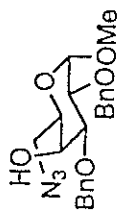


Methyl 6-azido-2,3-di-O-benzyl-6-deoxy- α -D-galactopyranoside (14)



File Name = 1d_13c_spectrum.61
 Author =
 Sample ID = SM727085
 Content = Single Pulse with Broa
 Creation Date = 1-Mar-2001 20:41:06
 Revision Date = 1-Mar-2001 20:48:57
 Spec Site = GSX 270
 Spec Type = DELTA NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.34546[T]
 Irr90_hi = 18[us]
 Irr90_lo = 36[us]
 Irr_domain = 1H
 Irr_width = 36[us]
 Lock_status = IDLX
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 547
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 20[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]

5.0
 4.0
 3.0
 2.0
 1.0
 0
 (Millions)



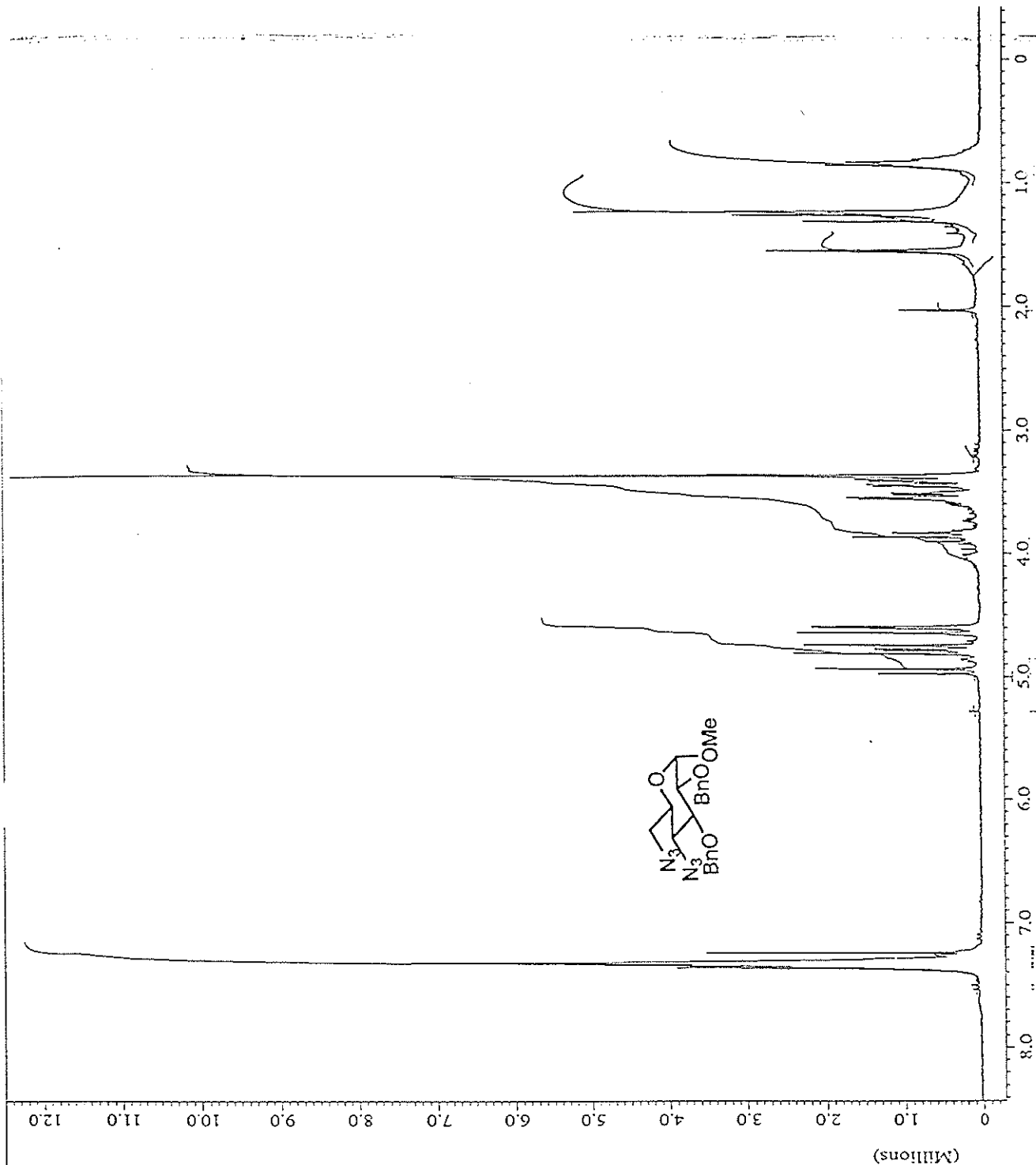
Methyl 6-azido-2,3-di-O-benzyl-6-deoxy-α-D-galactopyranoside (14)

File Name = proton.233
 Author = SM740688
 Sample ID = Single Pulse Experiment
 Content = 2-JUL-2000 20:36:07
 Revision Date = 2-JUL-2000 20:36:29

Spec Site = GSX 270
 Spec Type = DELTA_RMR

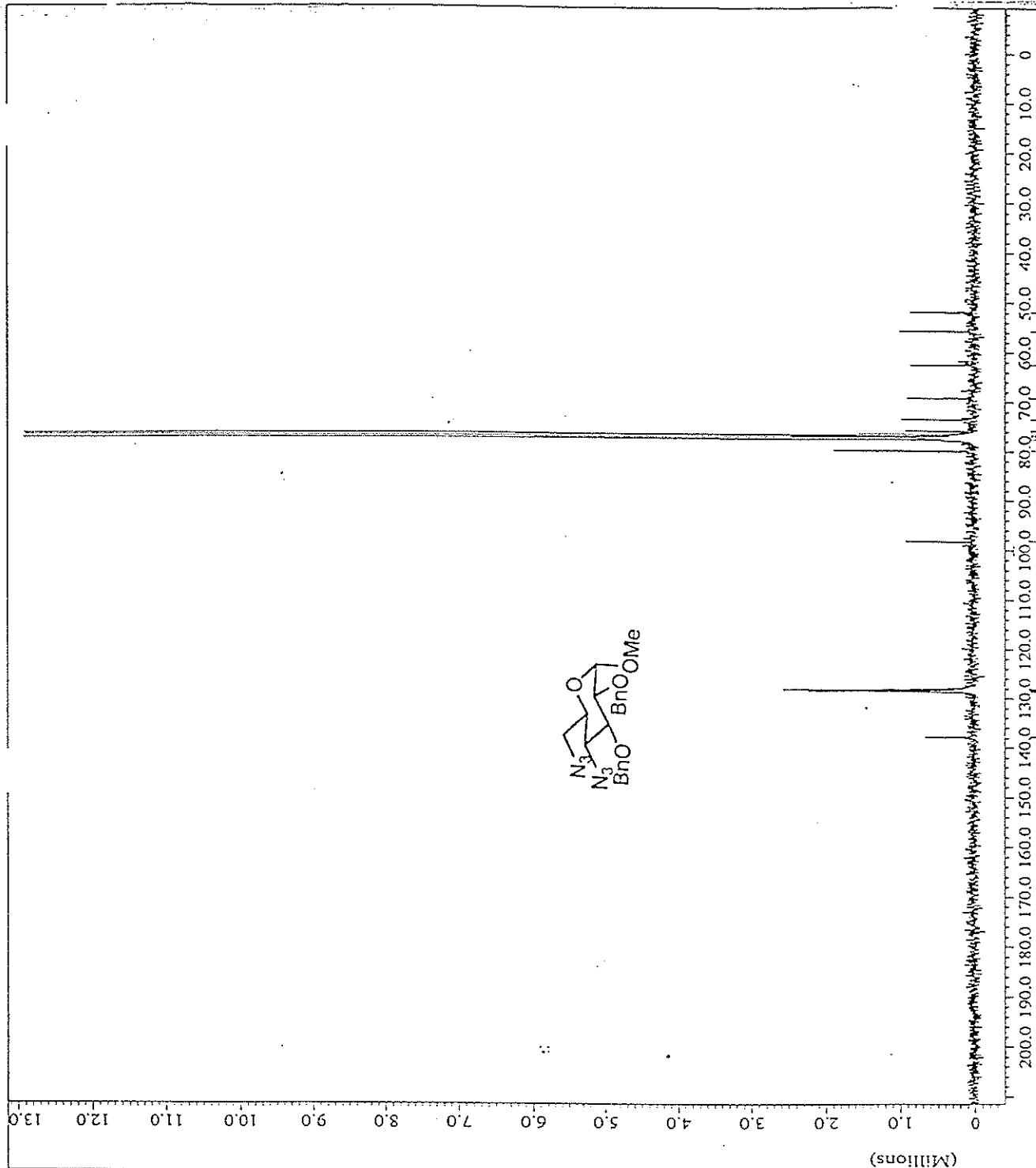
Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = {ppm}
 Acq_delay = 0.1822 [ms]
 Change_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345436 [T]
 Irr90_hl = 11.3 [us]
 Irr90_lo = 18 [us]
 Irr90_lo = 36 [us]
 Irr_pwidth = 36 [us]
 Lock_status = IDLX
 Recv_gain = 25
 Relaxation_delay = 4 [s]
 Scans = 4

Solvent = CHLOROFORM-D
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 20.3 [dC]
 Temp_set = 21 [dC]
 Temp_status = TRKP OFF
 Temp_status = TRKP OFF
 X90_hl = 11.3 [us]
 X90_lo = 18 [us]
 X90_lo = 36 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Methyl 4,6-diazo-2,3-di-O-benzyl-4,6-dideoxy- α -D-glucopyranoside (15).

File Name = 1d_13c_spectrum.30
 Author = S#606101
 Sample ID = Single Pulse with Broa
 Content = 24-FEB-2001 20:10:06
 Creation Date = 24-FEB-2001 20:10:55
 Revision Date = 24-FEB-2001 20:10:55
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Unit = [ppm]
 Acq_delay = 57.5 [us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345436 [T]
 Irr90_h1 = 11.3 [us]
 Irr90_lo = 18 [us]
 Irr90_lo = 36 [us]
 Irr_domain = 1H
 Irr_width = 36 [us]
 Lock_status = IDIZ
 Recvr_gain = 15
 Relaxation_delay = 1 [s]
 Scans = 1315
 Solvent = CHLOROFORM-D
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.4 [dc]
 Temp_set = 25 [dc]
 Temp_status = TEMP OFF
 X90 = 8 [us]
 X90_h1 = 8.9 [us]
 X90_lo = 39 [us]
 X_acq_duration = 1.9267584 [s]
 X_domain = 13C
 X_freq = 67.94010394 [MHz]
 X_offset = 100.0 [ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667 [us]
 X_resolution = 0.51900643 [Hz]
 X_sweep = 17.00680272 [kHz]



Methyl 4,6-diazo-2,3-di-O-benzyl-4,6-dideoxy-α-D-glucopyranoside (15).

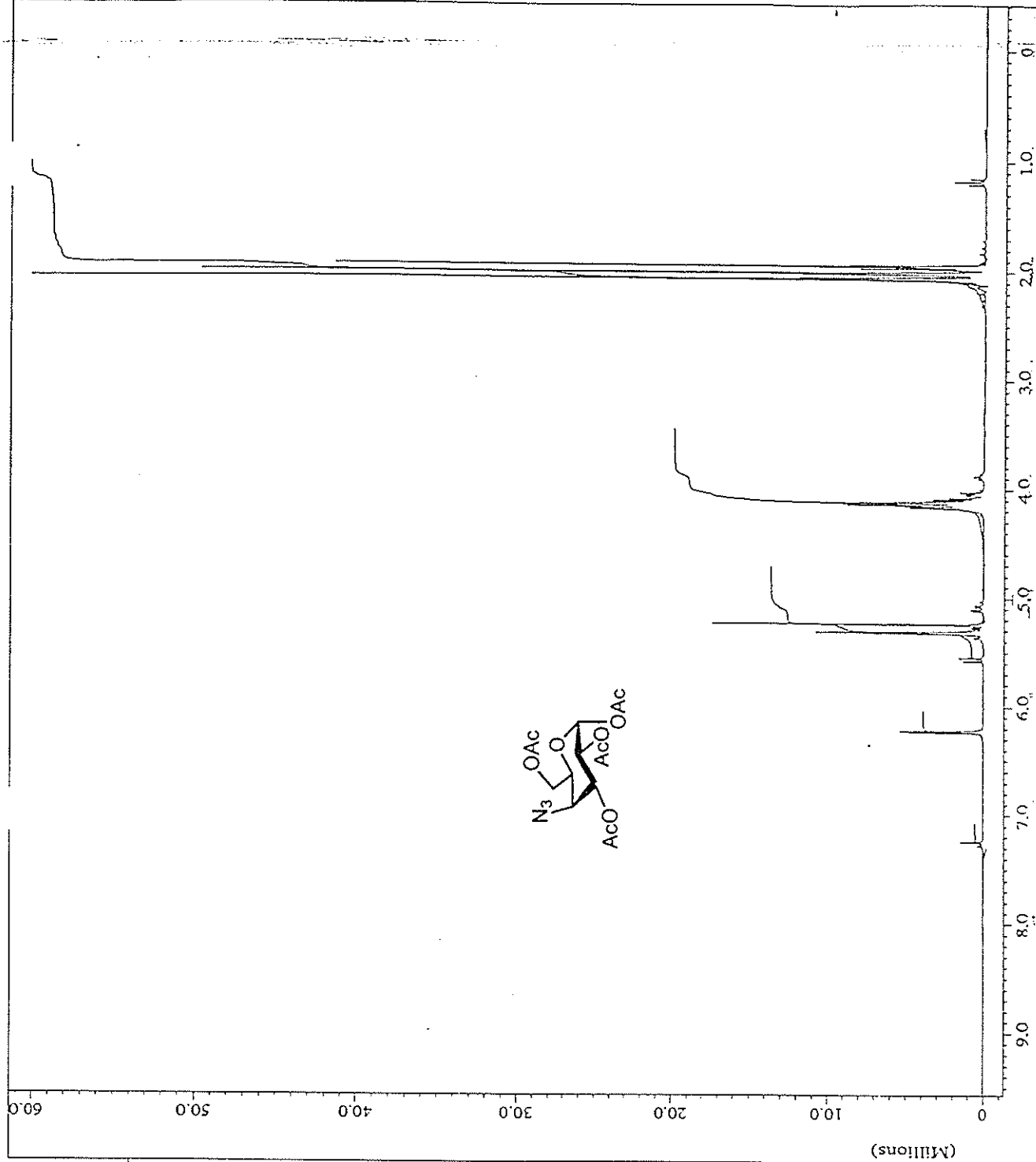
```

File Name      = proton.2351
Author         = S1386278
Sample ID      = Single Pulse Experiment
Content        = 19-FEB-2002 10:45:54
Revision Date  = 19-FEB-2002 10:46:15

Spec Site      = GSX 270
Spec Type      = DELTA_RMR

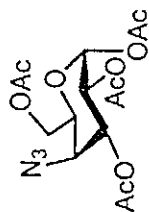
Data Format     = ID COMPLEX
Dimensions     = X
Dim Title      = 1H
Dim Size       = 16384
Dim Units      = [ppm]
Acq_delay      = 0.1021 [ms]
Charger_sample = 0
Experiment      = single_pulse.exp
Field_strength = 6.345446 [T]
Irr90          = 11.6 [us]
Irr90_hl      = 18 [us]
Irr90_lo      = 41 [us]
Irr_pwidth     = 41 [us]
Lock_status    = IDH1
Recv_gain      = 17
Relaxation_delay = 4 [s]
Scans          = 8
Solvent        = CHLOROFORM-D
Spin_get       = 16 [Hz]
Spin_lock_90   = 0.1 [ms]
Spin_lock_attn = 24 [dB]
Spin_set       = 15 [Hz]
Spin_status    = SPIN ON
Temp_get       = 20.8 [dC]
Temp_set       = 25 [dC]
Temp_status    = TEMP OFF
Temp_off       = 11.6 [us]
X90_hl        = 18 [us]
X90_lo        = 41 [us]
X_acq_duration = 3.03104 [s]
X_domain       = 1H
X_freq        = 270.16743928 [kHz]
X_offset       = 5.0 [ppm]
X_points       = 16384
X_prescans     = 0
X_pulse        = 5.8 [us]
X_resolution   = 0.32991976 [Hz]
X_sweep        = 5.40540541 [kHz]

```



Acetyl 4-azido-2,3,6-tri-O-acetyl- α -D-galactopyranoside (16).

File Name = 1d_13c_spectrum.300
 Author = SF386314
 Sample ID = Single Pulse With Broa
 Content = 19-JUN-2002 11:06:59
 Revision Date = 19-JUN-2002 11:07:40
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90 = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr_domain = 1H
 Irr_pwidth = 41[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay_1[s] = 15
 Scans = 423
 Solvent = CHLOROFORM-D
 Spin_get = 18[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 22.5[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.8267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



60
 50
 40
 30
 20
 10
 0
 (Millions)

Acetyl 4-azido-2,3,6-tri-O-acetyl-α-D-galactopyranoside (16).

```

File Name      = proton.2211
Author         = SM454216
Sample ID      = Single Pulse Experiment
Content        = 2-FEB-2002 12:39:06
Revision Date  = 2-FEB-2002 12:39:24

Spec Site      = GSX 270
Spec Type      = DELTA_RMR

Data Format     = 1D COMPLEX
Dimensions     = X
Dim Title      = 1H
Dim Size       = 16384
Dim Units      = [ppm]
Acq delay      = 0.1821[ms]
Changer sample = 0
Experiment     = single_pulse.exp
Field_strength = 6.34546[T]
Irr90          = 11.6[us]
Irr90_hi       = 18[us]
Irr90_lo       = 41[us]
Irr_pwidth     = 41[us]
Lock_status    = IDLX
Recvr_gain     = 29
Relaxation_delay = 4[s]
Scans          = 8
Solvent        = CHLOROFORM-D
Spin_get       = 14[Hz]
Spin_lock_90   = 0.1[ms]
Spin_lock_attn = 24[dB]
Spin_reset     = 15[Hz]
Spin_status    = SPIN ON
Temp_get       = 19.8[degC]
Temp_set       = 25[degC]
Temp_status    = TEMP OFF
X90            = 11.6[us]
X90_hi         = 18[us]
X90_lo         = 41[us]
X_acq_duration = 3.03104[s]
X_domain       = 1H
X_freq         = 270.16743928[MHz]
X_offset       = 5.0[ppm]
X_points       = 16384
X_prescans     = 0
X_pulse        = 5.8[us]
X_resolution   = 0.32901976[Hz]
X_sweep        = 5.40540541[kHz]

```



Acetyl 4-azido-2,3,6-tri-O-acetyl-4-deoxy- α -D-glucopyranoside (17).

X : parts per Million : 1H

File Name = 1d_13c_spectrum.271
 Author =
 Sample ID = S8320432
 Content = Single Pulse with Broa
 Creation Date = 3-FEB-2002 09:46:06
 Revision Date = 3-FEB-2002 09:46:26
 Spec Site = GSX 270
 Spec Type = DELTA_PMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.34546[T]
 Irr90_lo = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr_domain = 1H
 Irr_width = 41[us]
 Lock_status = IDLX
 Lock_gain = 15
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 1021.0
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 22[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90_lo = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[MHz]



Acetyl 4-azido-2,3,6-tri-O-acetyl-4-deoxy-α-D-glucopyranoside (17).

X : parts per Million : 13C

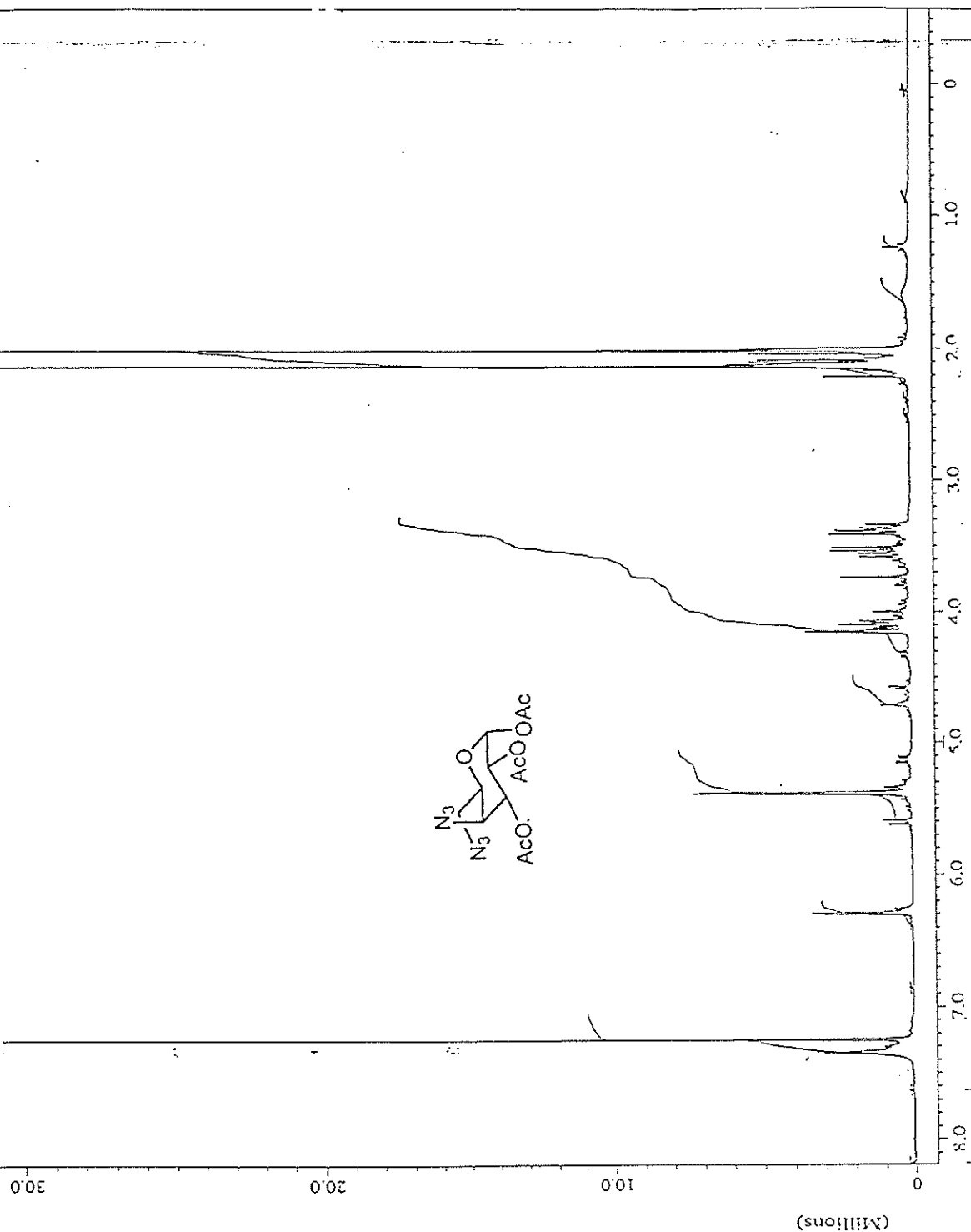
```

File Name      = proton.1028
Author         =
Sample ID      = S#704378
Content        = Single Pulse Experiment
Creation Date  = 28-FEB-2001 19:36:04
Revision Date  = 28-FEB-2001 19:36:23

Spec Site     = GSX 270
Spec Type     = DELTA_NMR

Data Format    = 1D COMPLEX
Dimensions    = X
Dim Title     = 1H
Dim Size      = 16384
Dim Units     = [ppm]
Acq_delay     = 0.1022[ms]
Changer_sample = 0
Experiment     = single_pulse.exp
Field_strength = 6.345446[T]
Irr90_strength = 11.3[us]
Irr90_hi      = 18[us]
Irr90_lo      = 36[us]
Irr_pwidth    = 36[us]
Lock_status   = IDLE
Recvr_gain    = 25
Relaxation_delay = 4[s]
Scans         = 8
Solvent       = CHLOROFORM-D
Spin_get      = 17[Hz]
Spin_lock_90  = 0.1[ms]
Spin_lock_atn = 29[dB]
Spin_set      = 15[Hz]
Spin_status   = SPIN ON
Spin_get      = 18.2[dC]
Temp_get      = 25[dC]
Temp_set      = TEMP OFF
Temp_status   = TEMP OFF
X90           = 11.3[us]
X90_hi        = 18[us]
X90_lo        = 36[us]
X_acq_duration = 3.03104[s]
X_domain      = 1H
X_freq        = 270.16743928[MHz]
X_offset      = 5.0[ppm]
X_points      = 16384
X_prescan     = 0
X_pulse       = 5.65[us]
X_resolution  = 0.32991976[Hz]
X_sweep       = 5.40540541[kHz]

```



Acetyl 4,6-diazo-2,3-di-O-acetyl-4,6-dideoxy- α -D-galactopyranoside (18).

File Name = proton.1654
 Author =
 Sample ID = S#465320
 Content = Single Pulse Experiment
 Creation Date = 29-SEP-2001 12:57:51
 Revision Date = 29-SEP-2001 12:58:08
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1822 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.34546 [T]
 Irr90_lo = 11.3 [us]
 Irr90_hi = 18 [us]
 Irr90_lo = 36 [us]
 Irr90_hi = 36 [us]
 Lock_status = IDLX
 Recv_gain = 18
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 15 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 20 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 20 [deg]
 Temp_set = 23 [deg]
 Temp_status = TEMP OFF
 X90_lo = 11.3 [us]
 X90_hi = 18 [us]
 X90_lo = 36 [us]
 X90_hi = 3.03104 [s]
 X_acq_duration = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32291976 [Hz]
 X_sweep = 5.40540541 [kHz]



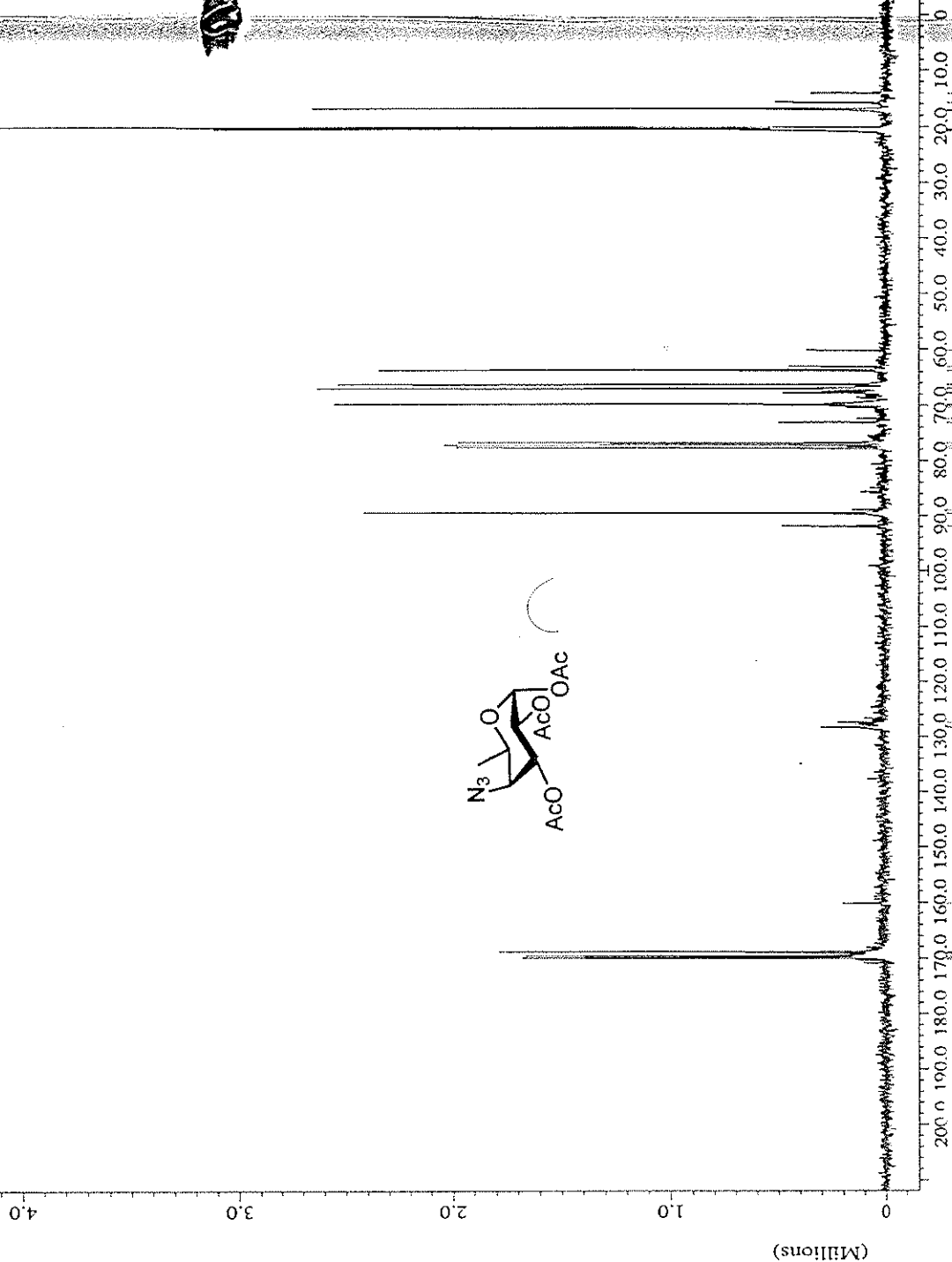
Acetyl 4,6-diazido-2,3-di-O-acetyl-4,6-dideoxy- α -D-galactopyranoside (18).

File Name = proton.1654
 Author = S8465320
 Sample ID = Single Pulse Experiment
 Content = 29-SEP-2001 12:57:51
 Revision Date = 29-SEP-2001 12:58:08
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1822 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Irr90 = 11.3 [us]
 Irr90_hi = 18 [us]
 Irr90_lo = 36 [us]
 Irr_pwidth = 36 [us]
 Lock_status = roll
 Recvr_gain = 18
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 15 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 23 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 20 [deg]
 Temp_set = 25 [deg]
 Temp_status = TEMP OFF
 X90 = 11.3 [us]
 X90_lo = 36 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Acetyl 4-azido-2,3-di-O-acetyl-4,6-dideoxy- α -D-galactopyranoside (19).

File Name = 1d_13c_spectrum.223
 Author = SM396842
 Sample ID = Single Pulse with Broa
 Content = 3-JAN-2002 11:12:28
 Revision Date = 3-JAN-2002 11:12:53
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = 1D COSYEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer sample = 0
 Experiment = single pulse_dec
 Field_strength = 6.345446[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 18[us]
 Irr90 = 41[us]
 Irr_domain = 1H
 Irr_pwidth = 41[us]
 Lock_status = IDLK
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 188
 Solvent = CHLOROFORM-D
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_state = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.8[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.31900643[Hz]
 X_sweep = 17.00680272[kHz]



Acetyl 4-azido-2,3-di-O-acetyl-4,6-dideoxy- α -D-galactopyranoside (19).

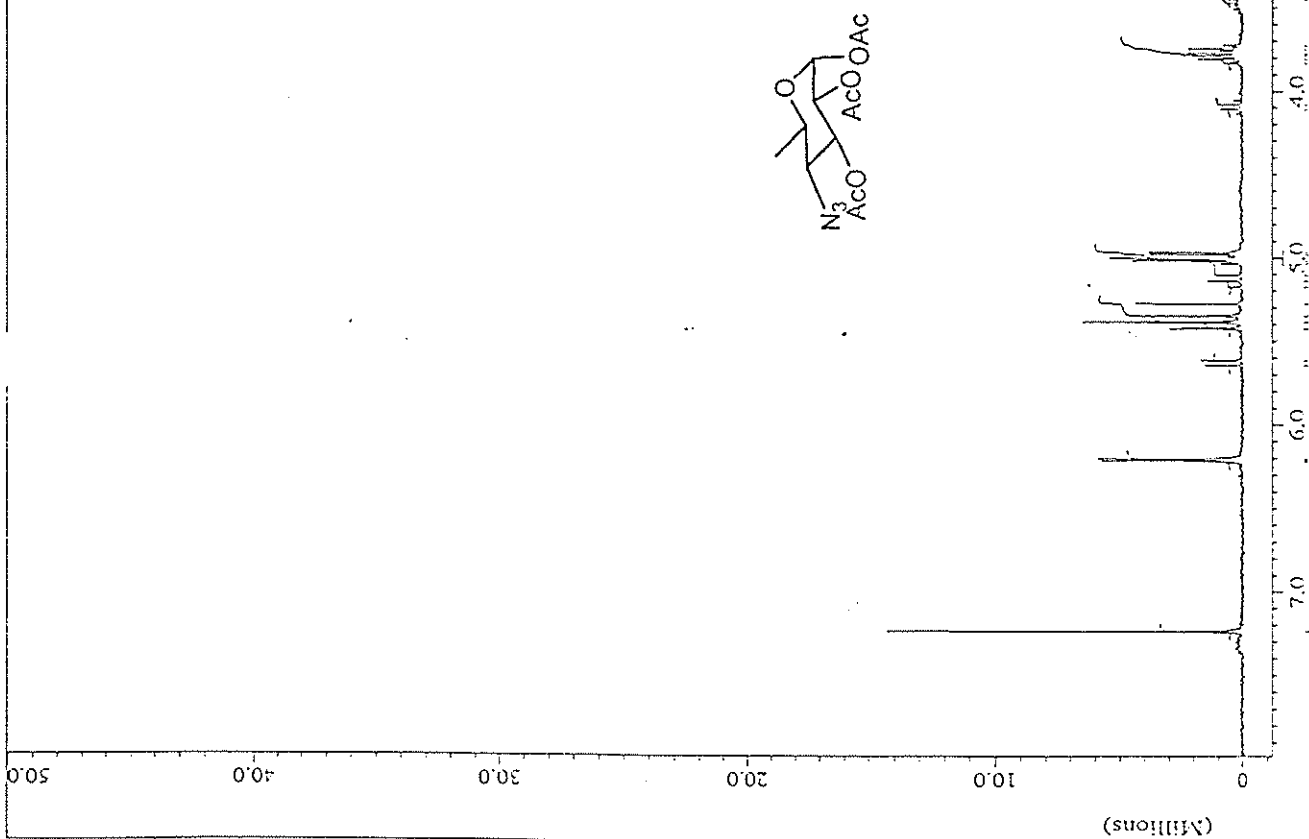
X : parts per million, ppm

```

File Name      = proton.030
Author         =
Sample ID      = S8601689
Content        = Single Pulse Experiment
Creation Date   = 11-JAN-2001 16:46:05
Revision Date  = 11-JAN-2001 16:46:35

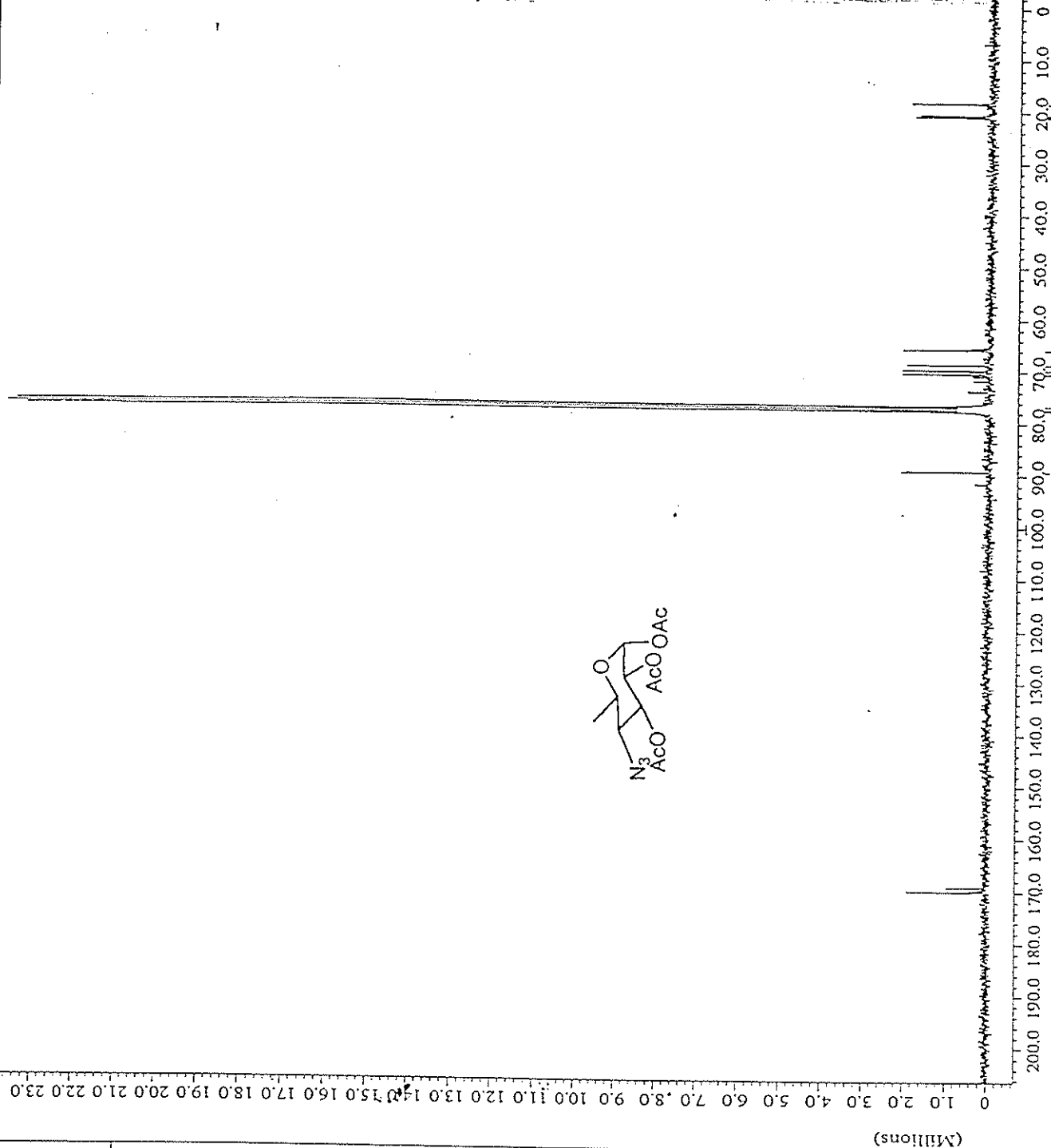
Spec Site      = GSX 270
Spec Type      = DELTA_NMR

Data Format     = 1D COMPLEX
Dimensions     = X
Dim Title      = 1H
Dim Size       = 16384
Dim Units      = [ppm]
Acq_delay      = 0.1822 [ms]
Charger_sample = single_pulse.exp
Experiment     = 6.345446 [r]
Field_strength = 11.3 [us]
Irr90_lo      = 18 [us]
Irr90_lo      = 36 [us]
Irr90_lo      = 36 [us]
Irr_width     = 30
Lock_status    = LOCK
Recvr_gain     = 30
Relaxation_delay = 4 [s]
Scans         = 16
Solvent        = CHLOROFORM-D
Spin_get       = 13 [Hz]
Spin_lock_90   = 0.1 [ms]
Spin_lock_attn = 29 [dB]
Spin_set       = 15 [Hz]
Spin_status    = SPIN ON
Spin_status    = SPIN ON
Temp_get       = 19.3 [dC]
Temp_set       = 21.0 [dC]
Temp_status    = TEMP ON
Temp_status    = TEMP OFF
X90            = 11.3 [us]
X90_lo        = 36 [us]
X90_lo        = 3.03104 [s]
X_acq_duration = 1H
X_domain       = 270.16743928 [MHz]
X_freq         = 5.0 [ppm]
X_offset       = 16384
X_points       = 0
X_prescans     = 5.65 [us]
X_pulse        = 0.32991976 [Hz]
X_resolution   = 5.40540541 [kHz]
X_sweep
  
```



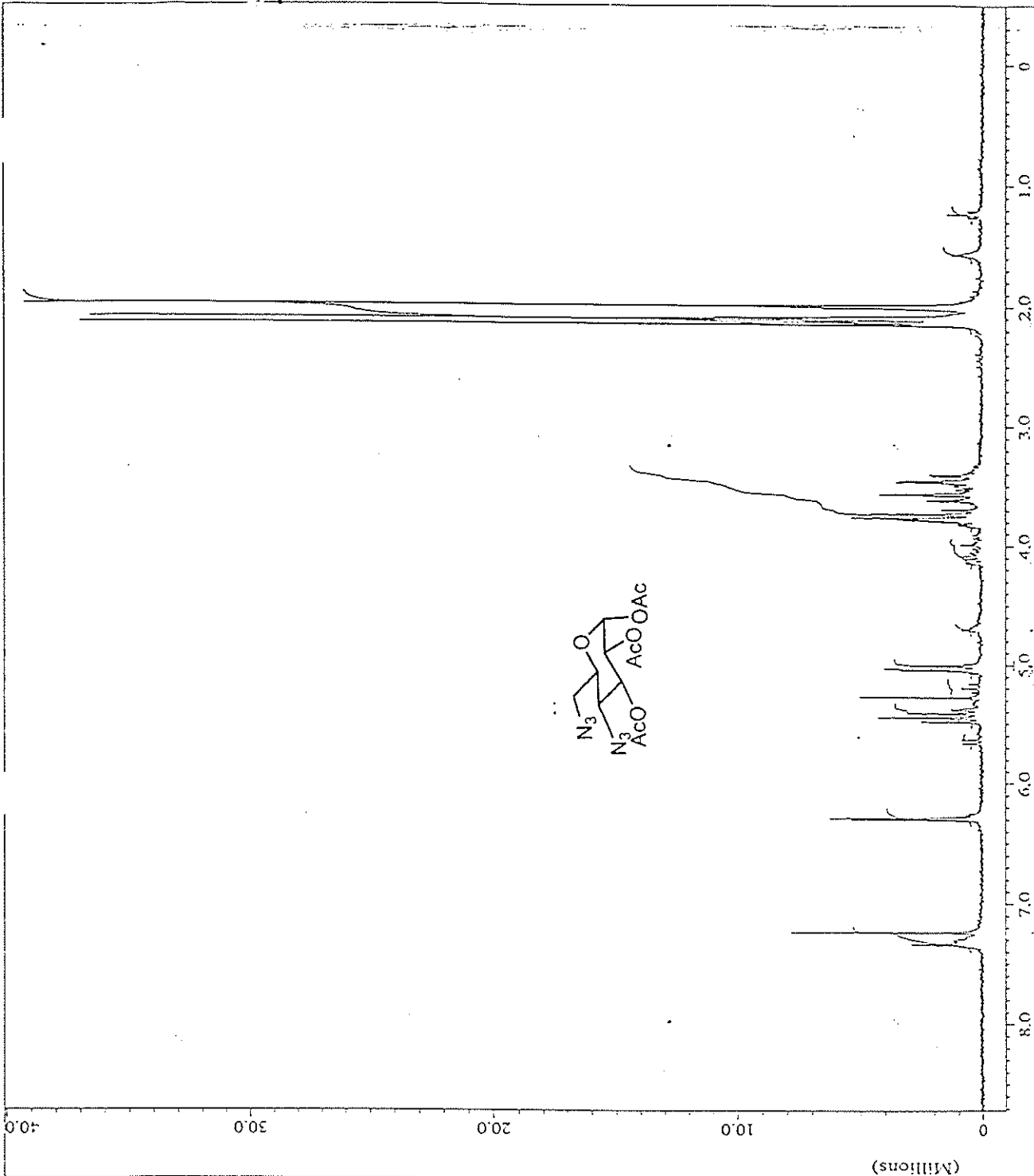
Acetyl 4,6-diazido-2,3-di-O-acetyl-4,6-dideoxy- α -D-glucopyranoside (20).

File Name = 1d_13c_spectrum.29
 Author =
 Sample ID = S8611525
 Content = Single Pulse with Broad
 Creation Date = 24-FEB-2001 19:01:06
 Revision Date = 24-FEB-2001 19:01:55
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COSYEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Yield_strength = 6.345446[1]
 Irr90_hi = 11.3[us]
 Irr90_lo = 18[us]
 Irr_domain = 1H
 Irr_width = 36[us]
 Lock_status = 36[us]
 Lock_gain = DMZ
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 2448
 Solvent = CHLOROFORM-D
 Spin_get = 13[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 21.2[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



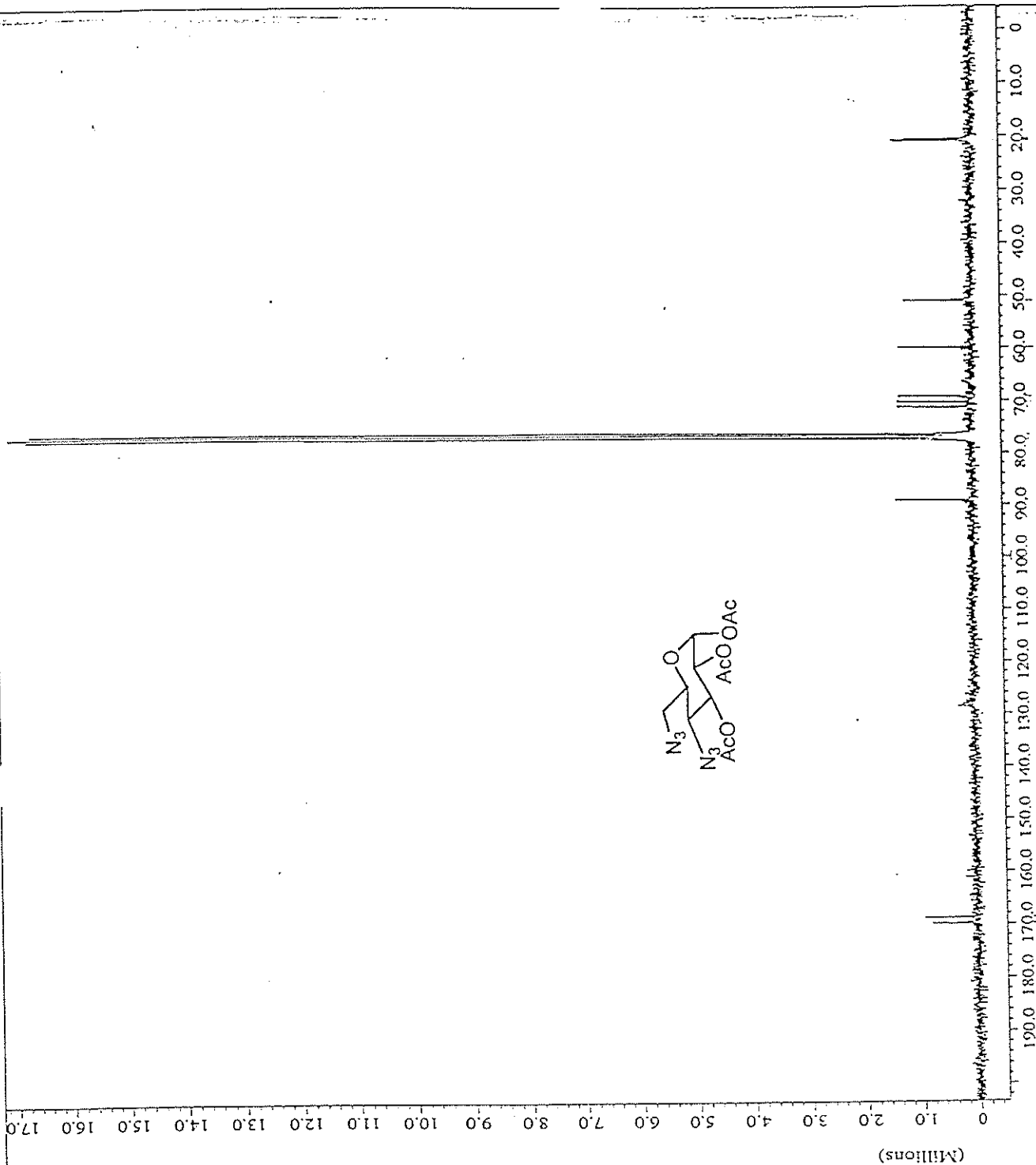
Acetyl 4,6-diaido-2,3-di-O-acetyl-4,6-dideoxy- α -D-glucopyranoside (20).

File Name = proton.828
 Author = S#592105
 Sample ID = Single Pulse Experiment
 Content = 11-JAN-2001 16:30:06
 Revision Date = 11-JAN-2001 16:30:30
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = {ppm}
 Acq_delay = 0.1822[ms]
 Changer_sample = single_pulse.exp
 Experiment = 6.345446[T]
 Field_strength = 11.3[us]
 Irr90_lo = 18[us]
 Irr90_hi = 36[us]
 Irr90_lo = 36[us]
 Irr90_hi = 36[us]
 Lock_status = IDLE
 Lock_gain = 30
 Recvr_gain = 30
 Relaxation_delay = 4[s]
 Scans = 16
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 19.3[deg]
 Temp_set = 21.0[deg]
 Temp_status = TEMP OFF
 X90 = 11.3[us]
 X90_lo = 18[us]
 X90_hi = 36[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_preacqs = 0
 X_pulse = 5.65[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]



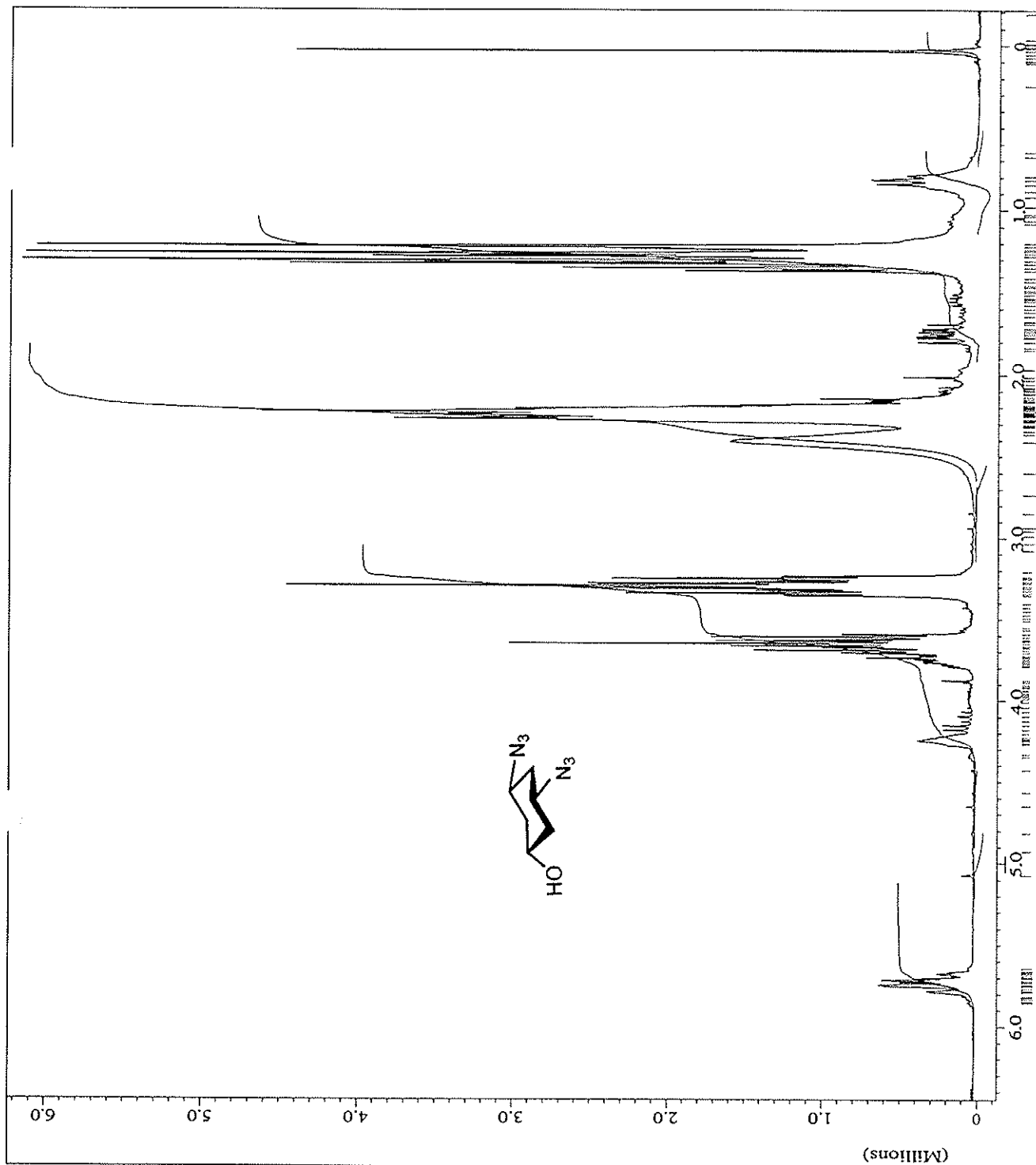
Acetyl 4,6-diazo-2,3-di-O-acetyl-4,6-dideoxy- α -D-glucopyranoside (22).

File Name = 1d_13c_spectrum.28
 Author =
 Sample ID = S852921
 Content = Single Pulse with Broa
 Creation Date = 24-FEB-2001 16:56:10
 Revision Date = 24-FEB-2001 16:56:44
 Spec Site = GSK 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345646[T]
 Irr90 = 11.3[us]
 Irr90_hi = 18[us]
 Irr90_lo = 36[us]
 Irr_domain = 1H
 Irr_width = 36[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 1890
 Solvent = CHLOROFORM-D
 Spin_get = 14[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 29[db]
 Spin_set = 15[Hz]
 Spin_state = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.5[dc]
 Temp_set = 25[dc]
 Temp_state = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[KHz]



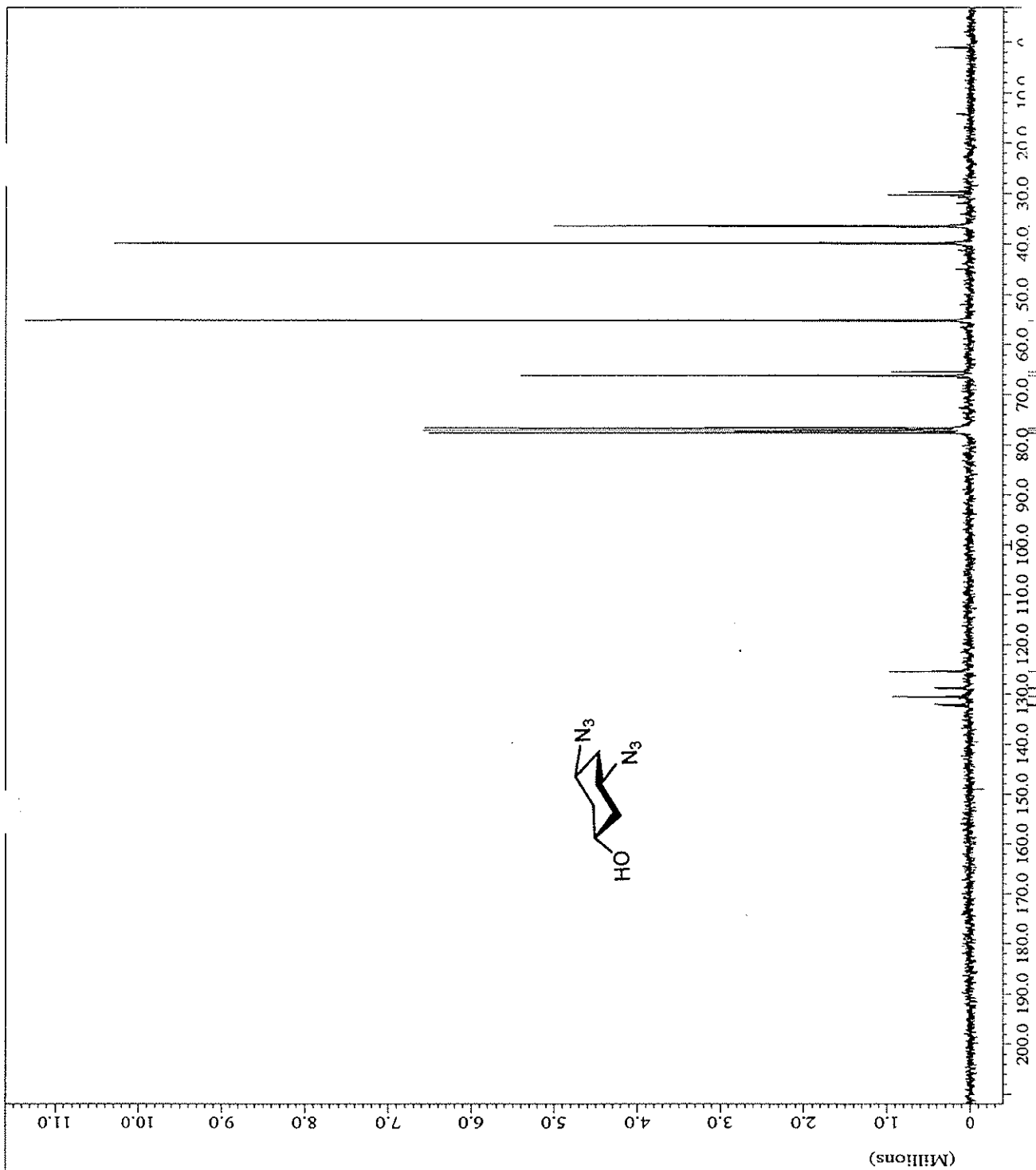
Acetyl 4,6-diaido-2,3-di-O-acetyl-4,6-dideoxy- α -D-glucopyranoside (22).

File Name = proton.2988
 Author = S#571566
 Sample ID = Single Pulse Experiment
 Content = 26-JUN-2002 15:54:55
 Revision Date = 26-JUN-2002 15:55:18
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821[ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446[T]
 Irr90 = 10[us]
 Irr90_hi = 10[us]
 Irr90_lo = 50[us]
 Irr_width = 41[us]
 Lock_status = IDK
 Lock_gain = 17
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 19.9[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90_hi = 11.6[us]
 X90_lo = 18[us]
 X90_lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.3291976[Hz]
 X_sweep = 5.40540541[kHz]



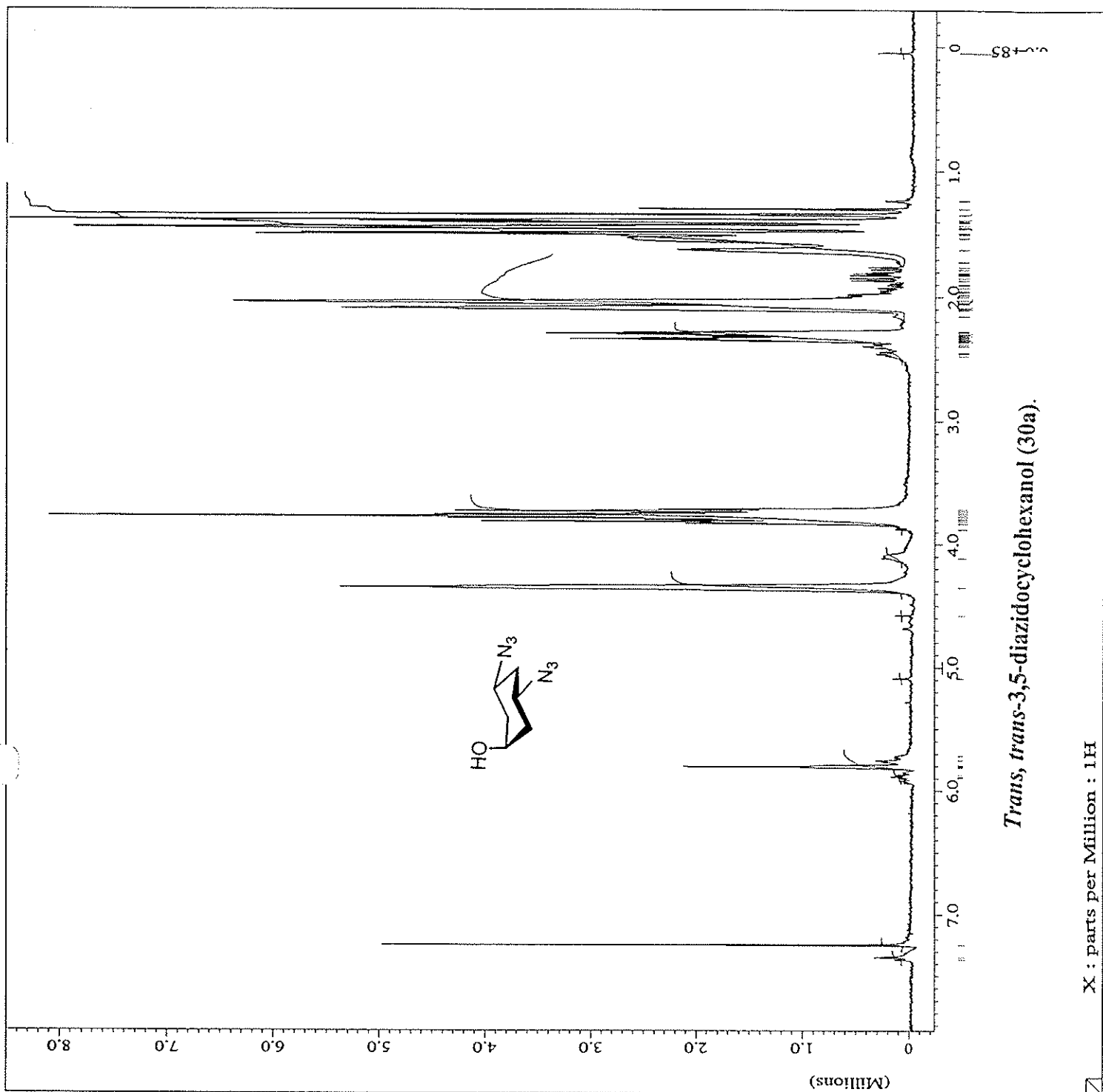
Cis, cis-3,5-diazidocyclohexanol (30).

File Name = id_13c_spectrum.461
 Author = S4571761
 Sample ID = Single Pulse with Broa
 Content = 26-JUN-2002 16:26:18
 Revision Date = 26-JUN-2002 16:27:16
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 18[us]
 Irr_domain = 41[us]
 Irr_width = 1H
 Lock_status = IDLE
 Recvz_gain = 15
 Relaxation_delay = 1[s]
 Scans = 634
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 21.8[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[MHz]



Cis, cis-3,5-diazidocyclohexanol (30).

File Name = proton.124
 Author = S8538422
 Sample ID = Single Pulse Experiment
 Content = 11-AUG-2001 14:59:28
 Revision Date = 11-AUG-2001 15:00:21
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1822 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Irr90 = 11.3 [us]
 Irr90_bi = 18 [us]
 Irr90_lo = 36 [us]
 Irr90_tw = 36 [us]
 Lock_status = IDIX
 Recvr_gain = 25
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 16 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 20.1 [dC]
 Temp_set = 25.3 [dC]
 Temp_status = TEMP OFF
 X90 = 11.3 [us]
 X90_bi = 18 [us]
 X90_lo = 36 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Trans, trans-3,5-diazidocyclohexanol (30a).

X : parts per Million : 1H

Current Data Parameters

NAME 090301
EXPNO 3
PROCNO 1

F2 - Acquisition Parameters

Date_ 500000
Time 15.27
INSTRUM arx400
PROBHD 5 mm Multinu
PULPROG zgpg
TD 65536
SOLVENT CDC13
NS 7000
DS 2
SMH 25000.000 Hz
FIDRES 0.381470 Hz
AQ 1.3107700 sec
RG 32768
DM 20.000 usec
DE 25.00 usec
TE 300.0 K
D12 0.0002000 sec
DLS 20.00 dB
CPDPRG waltz16
P31 100.00 usec
D1 0.40000001 sec
P1 6.00 usec
DE 25.00 usec
SF01 100.623179 MHz
NUCLEUS 13C
D11 0.03000000 sec

F2 - Processing parameters

SI 32768
SF 100.612820 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

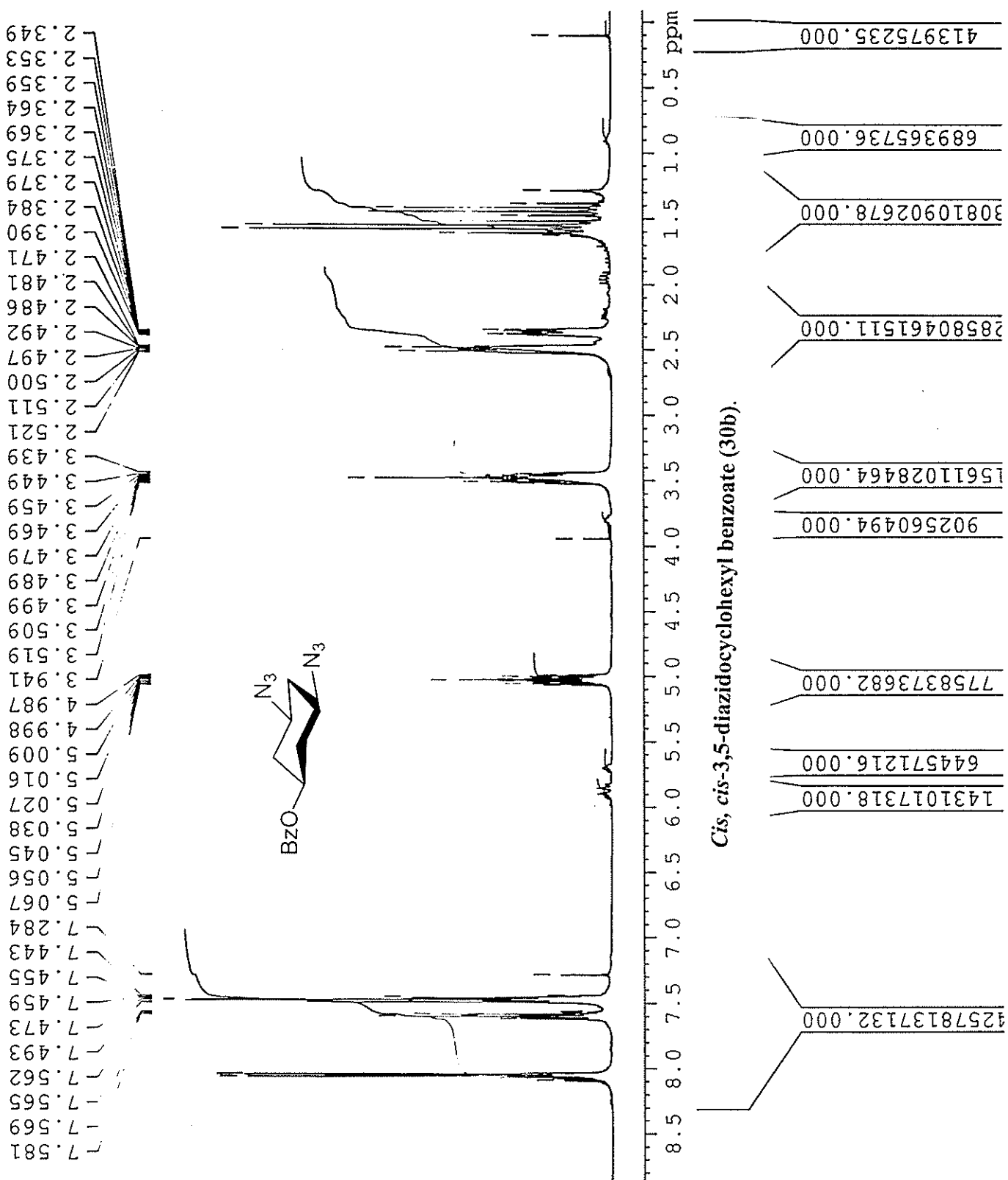
1D NMR plot parameters

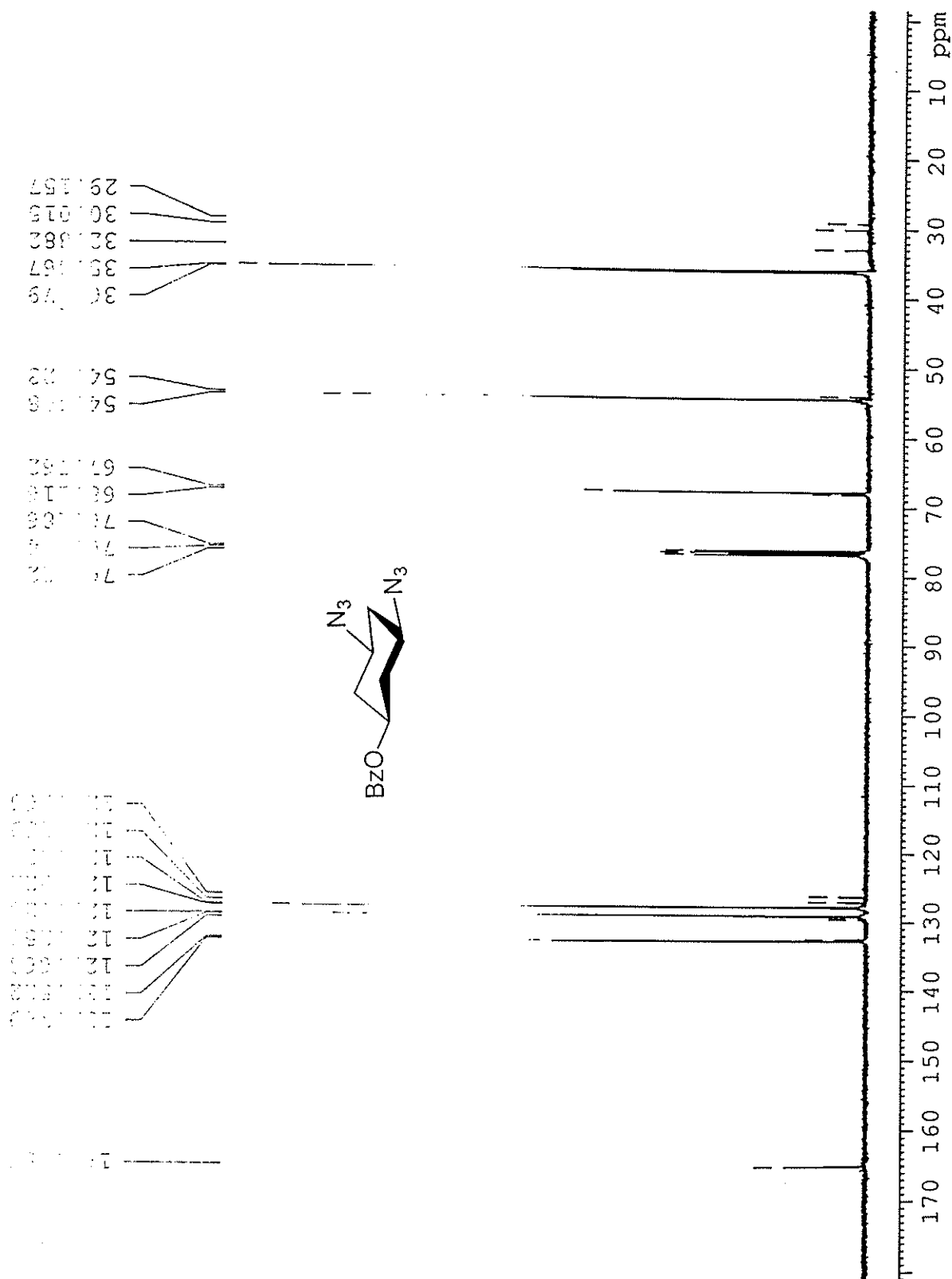
CX 20.00 cm
F1P 180.000 ppm
F1 18110.31 Hz
F2P 0.000 ppm
F2 0.00 Hz
PPMCM 9.00000 ppm/cm
HZCM 905.51538 Hz/cm



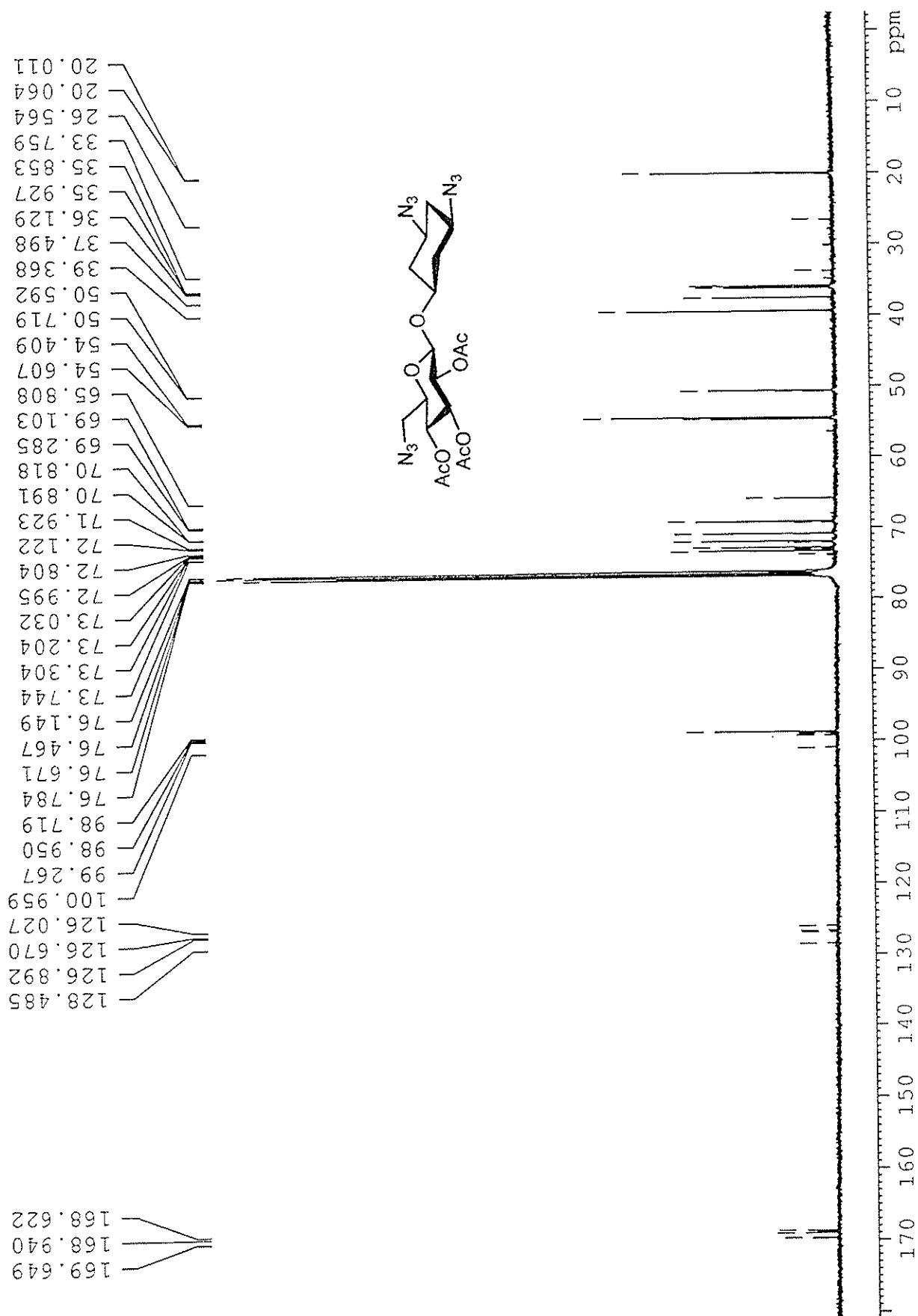
Trans, trans-3,5-diazidocyclohexanol (30a).



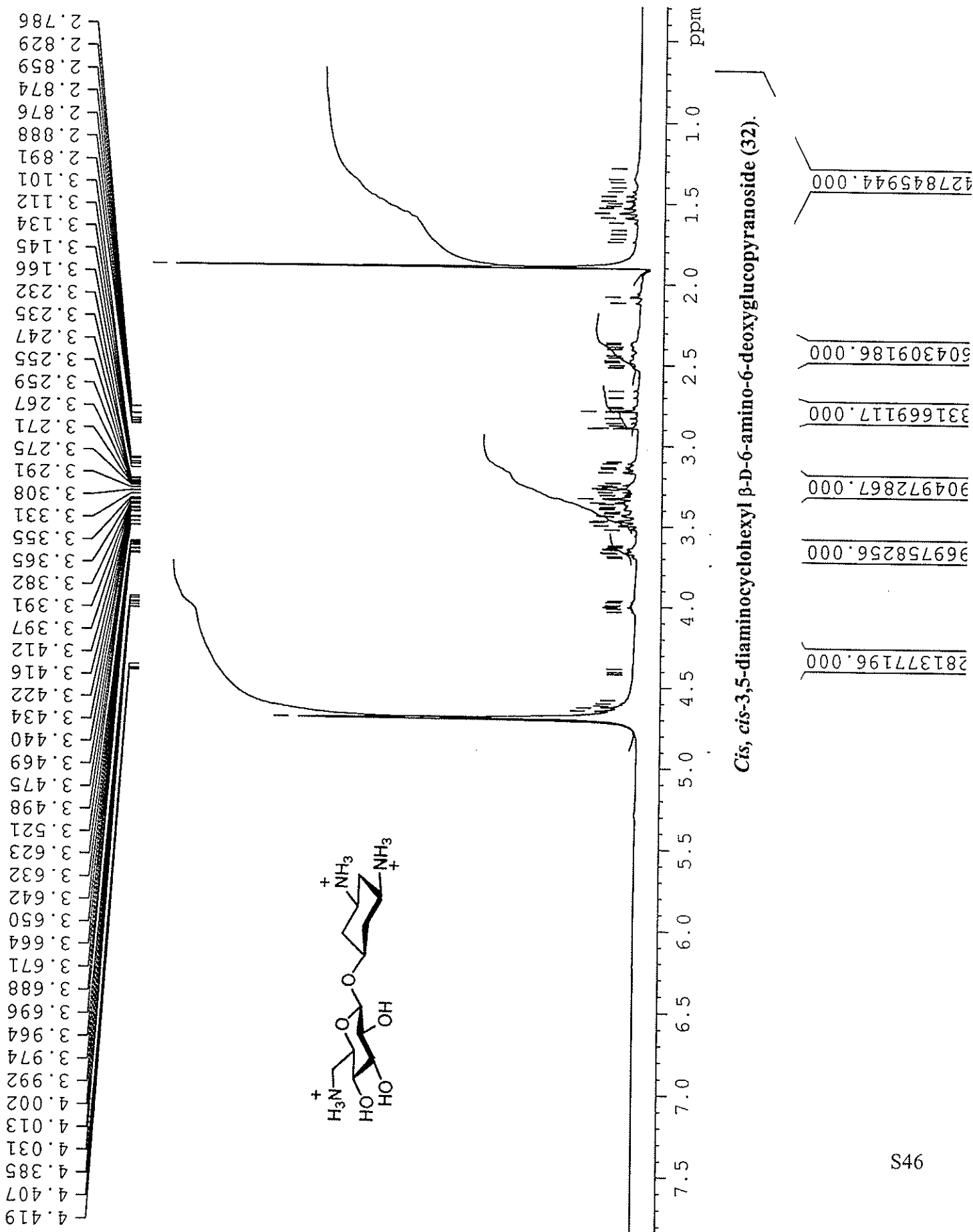




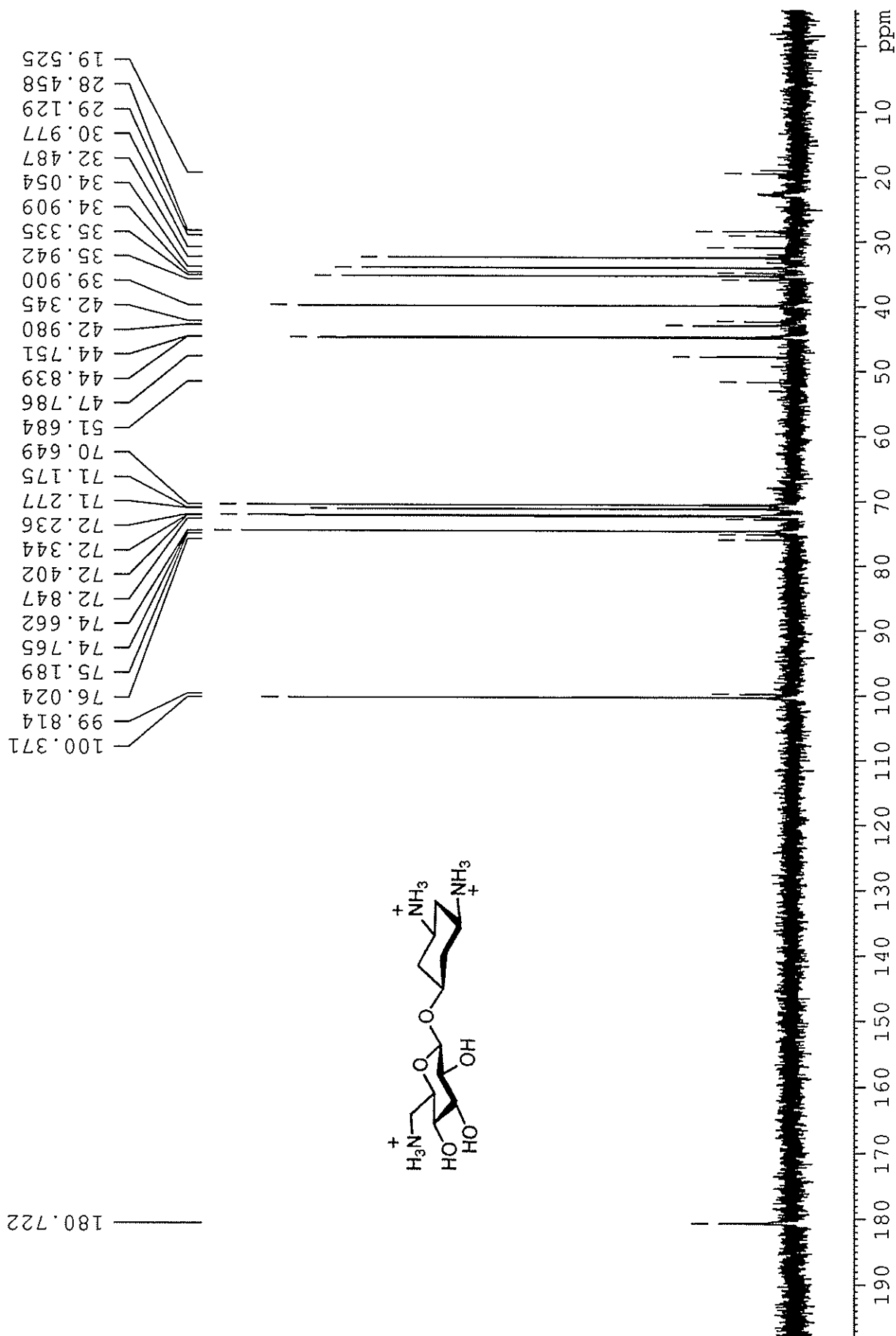
Cis, cis-3,5-diazidocyclohexyl benzoate (30b).



Cis, cis-3,5-diaminocyclohexyl β -D-6-amino-6-deoxyglucopyranoside (32).



Cis, *cis*-3,5-diaminocyclohexyl β -D-6-amino-6-deoxyglucopyranoside (32).

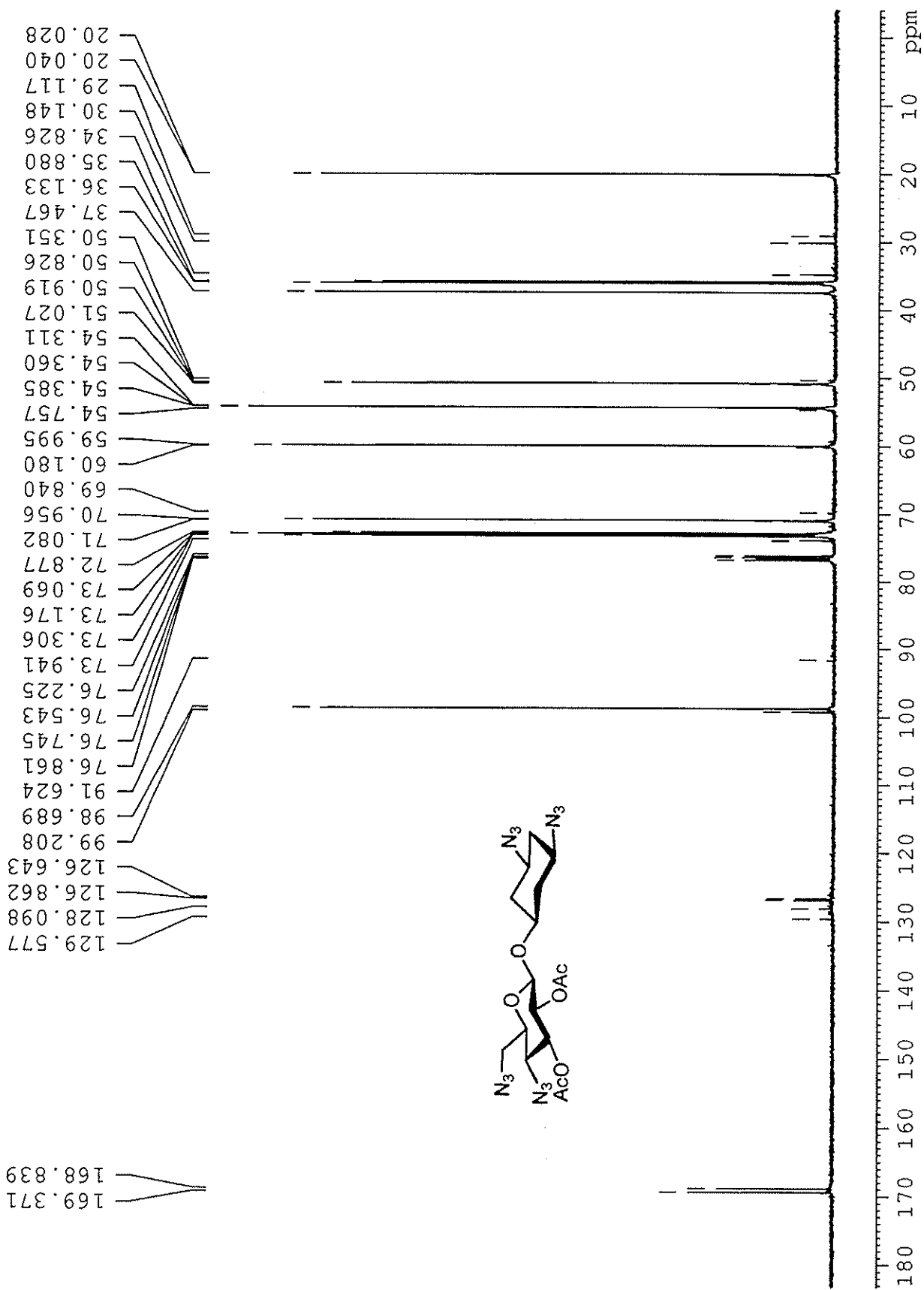


File Name = proton.1741
 Author = S#546053
 Sample ID = Single Pulse Experiment
 Content = 18-OCT-2001 15:12:24
 Creation Date = 18-OCT-2001 15:12:24
 Revision Date = 18-OCT-2001 15:12:40
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq delay = 0.1822 [ms]
 Changer sample = single_pulse.exp
 Experiment = 6.345446 [T]
 Field_strength = 11.3 [us]
 Irr90 hi = 18 [us]
 Irr90 lo = 36 [us]
 Irr pwidh = 36 [us]
 Lock status = IDLE
 Recv gain = 18
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin get = 16 [Hz]
 Spin lock 90 = 0.1 [ms]
 Spin_lock_attn = 29 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin ON = SPIN ON
 Temp_get = 19.1 [dc]
 Temp_set = 25 [dc]
 Temp_status = TEMP OFF
 X90 hi = 11.3 [us]
 X90 lo = 36 [us]
 X90 domain = 1H
 X_acq_duration = 3.03104 [s]
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.65 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



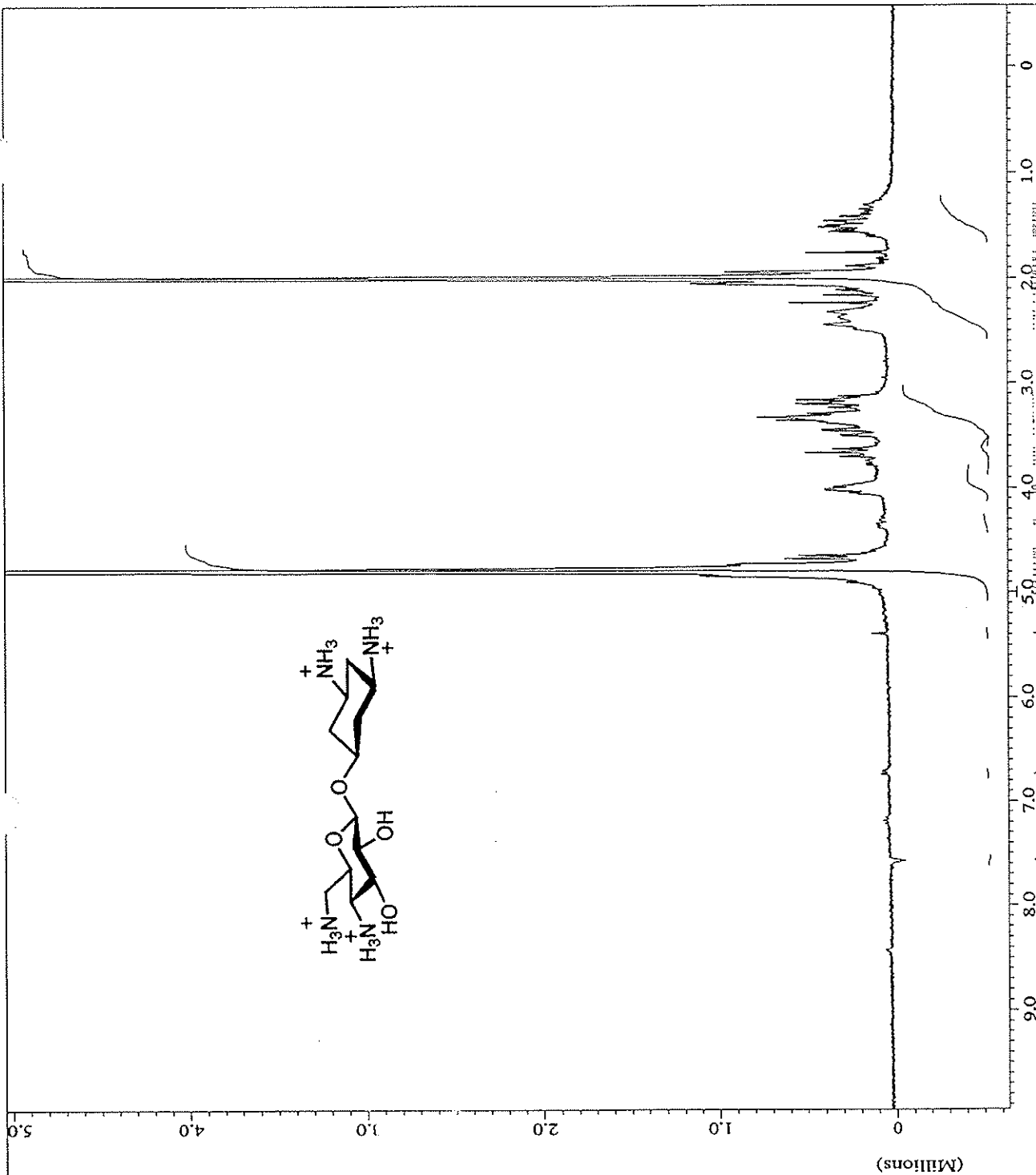
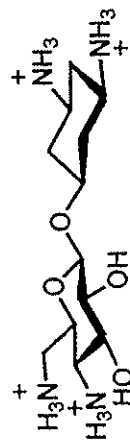
Cis, cis-3,5-diazidocyclohexyl β-D-2,3-di-O-acetyl-4,6-dideoxyglucopyranoside (33).

X : parts per Million : 1H



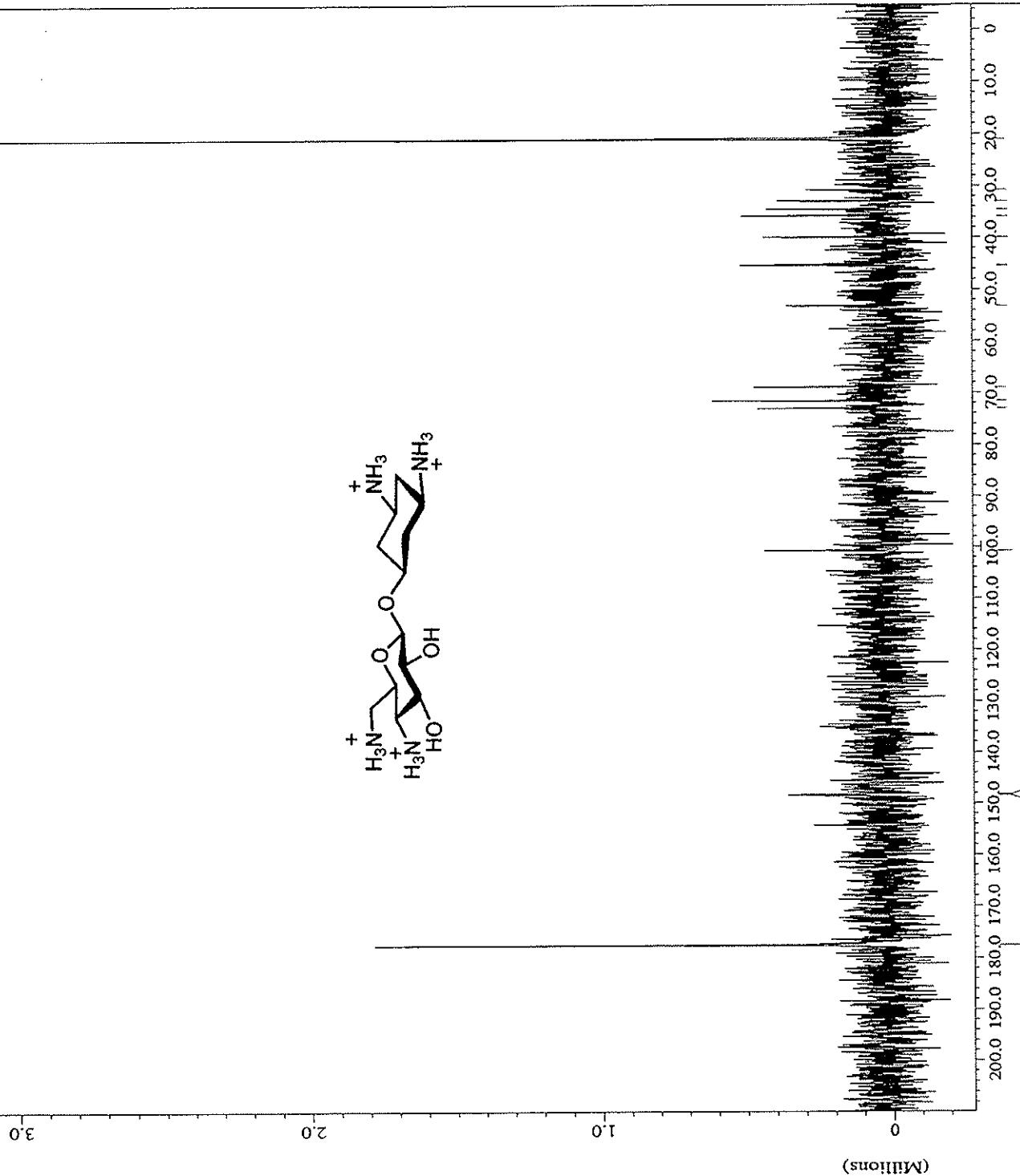
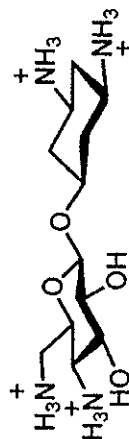
Cis, *cis*-3,5-diazidocyclohexyl β-D-2,3-di-O-acetyl-4,6-dideoxyglucopyranoside (33).

File Name = proton.2853
 Author = S#412791
 Sample ID = Single Pulse Experiment
 Content = 2-JUN-2002 12:30:19
 Creation Date = 2-JUN-2002 11:30:59
 Revision Date = 2-JUN-2002 11:30:59
 Spec Site = GSX 270
 Spec Type = DELTA_RMC
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Sire = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345476 [T]
 Irr90_hi = 11.6 [us]
 Irr90_lo = 18 [us]
 Irr90_lo = 41 [us]
 Irr_pwidth = 41 [us]
 Lock_status = IDIX
 Recv_gain = 22
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = D2O
 Spin_get = 15 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 19.1 [dC]
 Temp_set = 25 [dC]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90_hi = 11.6 [us]
 X90_lo = 18 [us]
 X90_lo = 41 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Cis, cis-3,5-diaminocyclohexyl β -D-4,6-dideoxygluco-pyranoside (34).

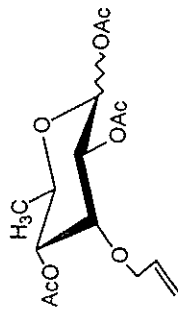
File Name = ld_13c_spectrum.430
 Author = S865283
 Sample ID = Single Pulse with Broca
 Creation Date = 2-JUN-2002 22:36:04
 Revision Date = 2-JUN-2002 21:37:08
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5 [us]
 Changer_sample = 0
 Experiment = single pulse dec
 Field_strength = 6.34546 [T]
 Irr90_hi = 11.6 [us]
 Irr90_lo = 18 [us]
 Irr_domain = 1H
 Irr_pwidth = 41 [us]
 Lock_status = IDLE
 Recv_gain = 15
 Relaxation_delay = 1 [s]
 Scans = 4172
 Solvent = D2O
 Spin_get = 15 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_state = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.1 [dC]
 Temp_set = 25 [dC]
 Temp_status = TEMP OFF
 X90_hi = 8 [us]
 X90_lo = 8.9 [us]
 X90_duration = 1.9267584 [s]
 X_domain = 13C
 X_freq = 67.94010394 [MHz]
 X_offset = 100.0 [ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667 [us]
 X_resolution = 0.51900643 [Hz]
 X_sweep = 17.00680272 [kHz]



Cis, cis-3,5-diaminocyclohexyl β-D-4,6-diamino-4,6-dideoxygluco-pyranoside (34).

λ : parts per Million : 13C

File Name = proton.3481
 Author = S#344746
 Sample ID = Single Pulse Experiment
 Content = 26-NOV-2002 09:36:41
 Revision Date = 26-NOV-2002 09:36:59
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim1Title = 1H
 Dim1Size = 16384
 Dim1Units = [ppm]
 Acq_delay = 0.1821 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Irf90_hi = 11.6 [us]
 Irf90_lo = 18 [us]
 Irf90_width = 41 [us]
 Lock_status = IDLR
 Recv_gain = 29
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 19.6 [degC]
 Temp_set = 25.3 [degC]
 Temp_status = TEMP OFF
 X90 = 11.6 [us]
 X90_hi = 18 [us]
 X90_lo = 41 [us]
 X90_width = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



Acetyl 2,4-di-O-acetyl-3-O-allyl-6-deoxy-D-glucopyranoside (37).

X : parts per Million : 1H

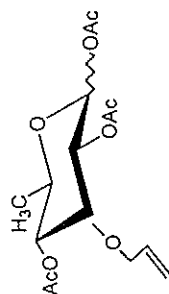
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File Name      = id_13c_spectrum.651
Author        =
Sample ID     = 58770679
Content       = Single Pulse with Bros
Creation Date  = 20-JUN-2003 07:10:16
Revision Date = 20-JUN-2003 08:39:37

Spec Site     = GSX 270
Spec Type     = DELTA_NMR

Data Format    = ID COMPLEX
Dimensions    = X
Dim Title     = 13C
Dim Size      = 32768
Dim Units     = [ppm]
Acq_delay     = 57.5[us]
Changer       = 0
Experiment    = single_pulse_dec
Field strength = 6.345476[T]
Irr90_hi     = 11.6[us]
Irr90_lo     = 18[us]
Irr_domain   = 1H
Irr_pwidth   = 41[us]
Lock_status  = IDLE
Recvr_gain   = 15
Relaxation_delay = 1[s]
Scans        = 12000
Solvent      = CHLOROFORM-D
Spin_get     = 16[Hz]
Spin_lock_90 = 0.1[ms]
Spin_lock_attn = 24[dB]
Spin_set     = 15[Hz]
Spin_state   = SPIN ON
Spin_status  = SPIN ON
Temp_get     = 22.3[dc]
Temp_set     = 40.3[dc]
Temp_status  = TEMP OFF
Temp_status  = TEMP OFF
X90_hi      = 8[us]
X90_lo      = 8.9[us]
X90_lo      = 39[us]
X_acq_duration = 1.9267584[s]
X_domain     = 13C
X_freq       = 67.94010394[Mhz]
X_offset     = 100.0[ppm]
X_points     = 32768
X_prescans   = 4
X_pulse      = 2.66666667[us]
X_resolution = 0.51906643[Hz]
X_sweep      = 17.00680272[kHz]

```

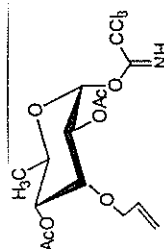


Acetyl 2,4-di-O-acetyl-3-O-allyl-6-deoxy-D-glucopyranoside (37).

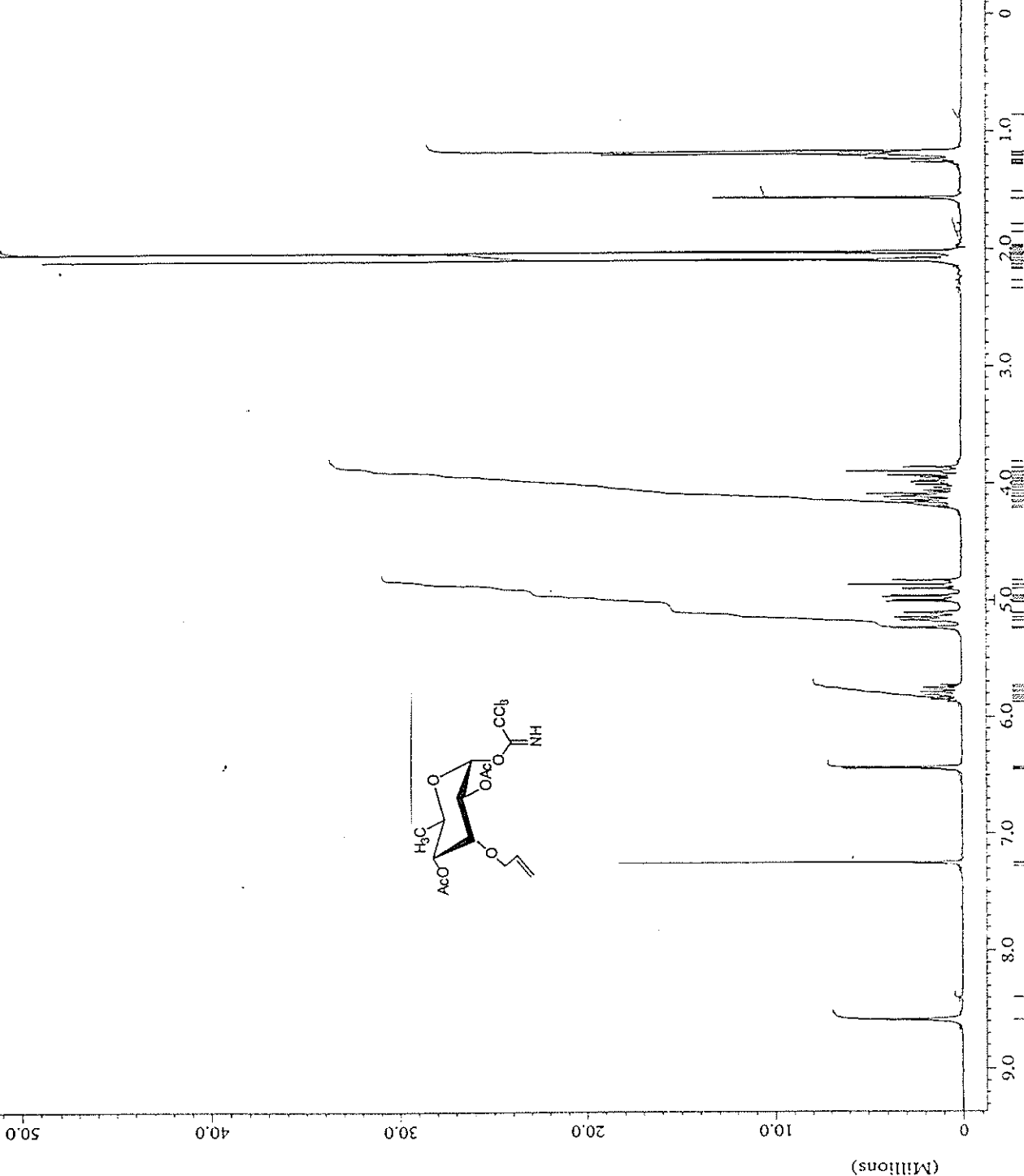
X : parts per Million : 13C

File Name = proton.3295
 Author = S231628
 Sample ID = Sample Pulse Experiment
 Date = 19-SEP-2002 09:20:03
 Revision Date = 19-SEP-2002 09:20:25

Site = GSX 270
 Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = 1H
 Dim Title = 16384
 Dim Size = 16384
 Dim Units = [ppm]
 Acq delay = 0.1821[ms]
 Change sample = 0
 Experiment = single_pulse.exp
 Field strength = 6.345476[T]
 Irr90_hl = 11.6[us]
 Irr90_lo = 18[us]
 Irr90_wdth = 41[us]
 Lock status = 41[us]
 Lock status = IDLT
 Recvr gain = 26
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin get = 17[Hz]
 Spin lock_90 = 0.1[ms]
 Spin lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 20.5[dc]
 Temp_set = 25.3[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90_hl = 11.6[us]
 X90_lo = 18[us]
 X90_wdth = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]



2,4-Di-O-acetyl-3-O-allyl-6-deoxy-α-D-glucopyranosyl trichloroacetimidate (38).

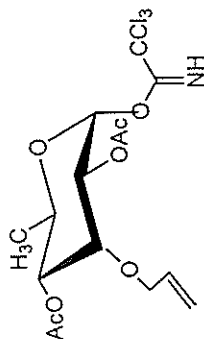


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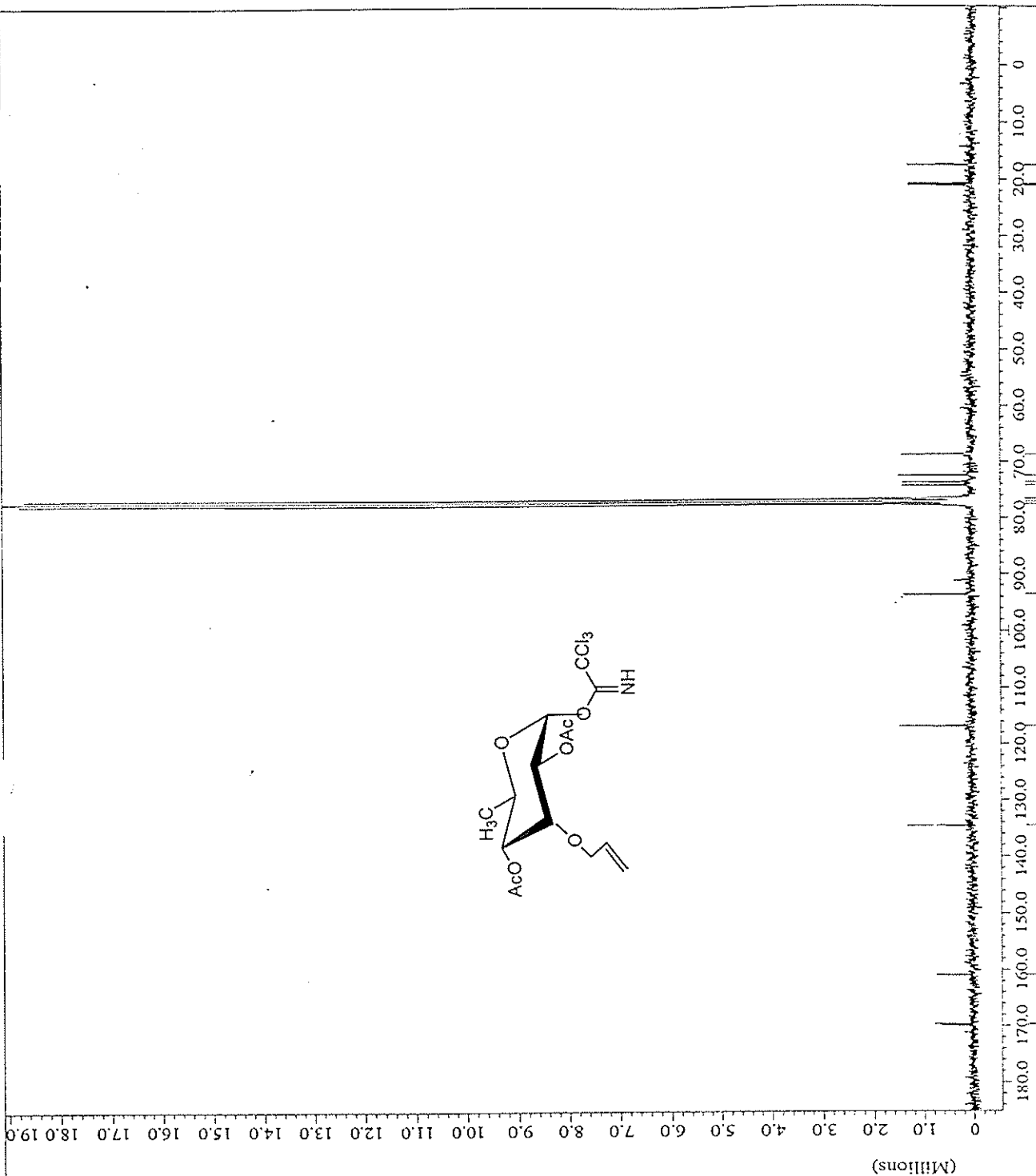
File Name      = Id_13c_spectrum.536
Author         = SM748860
Sample ID      = Single Pulse with Broa
Content        = 20-SEP-2002 22:39:39
Creation Date  = 20-SEP-2002 22:40:56
Revision Date = 20-SEP-2002 22:40:56

Spec site      = GSX 270
Spec Type      = DELTA_NMR

Data Format     = ID COMPLEX
Dimensions     = X
Dim title      = 13C
Dim size       = 32768
Dim units      = [ppm]
Acq delay      = 57.5[us]
Changer sample = 0
Experiment     = single_pulse_dec
Field strength = 6.34546[T]
Irr90 hi       = 11.6[us]
Irr90 lo       = 18[us]
Irr90 pw       = 41[us]
Irr domain     = 1H
Irr width      = 41[us]
Lock status    = IDLE
Recvr gain     = 15
Relaxation_delay = 1[s]
Scans          = 2278
Solvent        = CHLOROFORM-D
Spin_lock_get  = 17[Hz]
Spin_lock_90   = 0.1[us]
Spin_lock_attn = 24[db]
Spin_set       = 15[Hz]
Spin_status    = SPIN ON
Spin_status    = SPIN ON
Temp_get       = 22.9[dc]
Temp_set       = 25[dc]
Temp_status    = TEMP OFF
Temp_status    = TEMP OFF
X90            = 8[us]
X90 hi         = 8.9[us]
X90 lo         = 39[us]
X_acq_duration = 1.9267584[s]
X_domain       = 13C
X_freq         = 67.94010394[MHz]
X_offset       = 100.0[ppm]
X_points       = 32768
X_prescans     = 4
X_pulse        = 2.66666667[us]
X_resolution   = 0.51900643[Hz]
X_sweep        = 17.00680272[kHz]
  
```

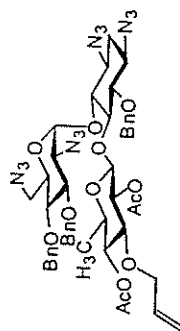


2,4-Di-O-acetyl-3-O-allyl-6-deoxy-α-D-glucopyranosyl trichloroacetimidate (38).



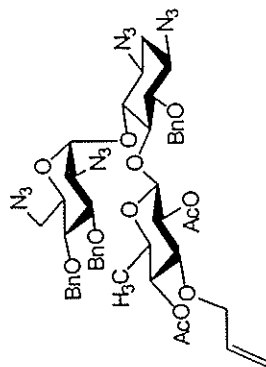
File Name = proton.3336
 Author = S8379693
 Content = Single Pulse Experiment
 Creation Date = 5-OCT-2002 10:34:55
 Revision Date = 5-OCT-2002 10:35:16
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Ixr90 = 11.6 [us]
 Ixr90_hi = 18 [us]
 Ixr90_lo = 41 [us]
 Ixr_pwidth = 41 [us]
 Lock_status = YDLX
 Lock_gain = 25
 Recv_gain = 25
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 20.4 [dC]
 Temp_set = 25 [dC]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 11.6 [us]
 X90_hi = 18 [us]
 X90_lo = 41 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_preacqs = 0
 X_pulse = 5.8 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40340341 [kHz]

(Millions)



5'-O-(2,4-Di-O-acetyl-3-O-allyl-6-deoxy- β -D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (39).

File Name = ld_13c_spectrum.550
 Author = S#752726
 Sample ID = Single Pulse with Broa
 Content = 6-OCT-2002 23:55:53
 Creation Date = 7-OCT-2002 08:21:41
 Revision Date =
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5 [us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345436[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 18[us]
 Irr90_lo = 41[us]
 Irr_domain = 1H
 Irr_pwidth = 41[us]
 Lock_status = IDLE
 Recvz_gain = 15
 Relaxation_delay = 1[s]
 Scans = 3709
 Solvent = CHLOROFORM-D
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 22.5[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267384[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



5'-O-(2,4-Di-O-acetyl-3-O-allyl-6-deoxy- β -D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (39).

X : parts per Million : 13C

File Name = proton.3527
 Author =
 Sample ID = S8364253
 Content = Single Pulse Experiment
 Creation Date = 16-DEC-2002 10:09:11
 Revision Date = 16-DEC-2002 10:09:29
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821[ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345426[T]
 Irr90 = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Lock_status = 41[us]
 Lock_gain = IDLE
 Relaxation_delay = 29
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 14[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 19.4[dc]
 Temp_set = 22.2[dc]
 Temp_status = TEMP OFF
 X90 = 11.6[us]
 X90_hi = 18[us]
 X90_lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]

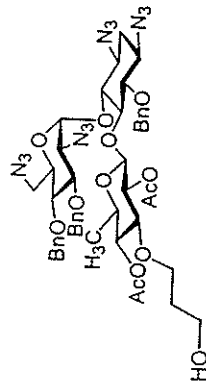
30.0

20.0

10.0

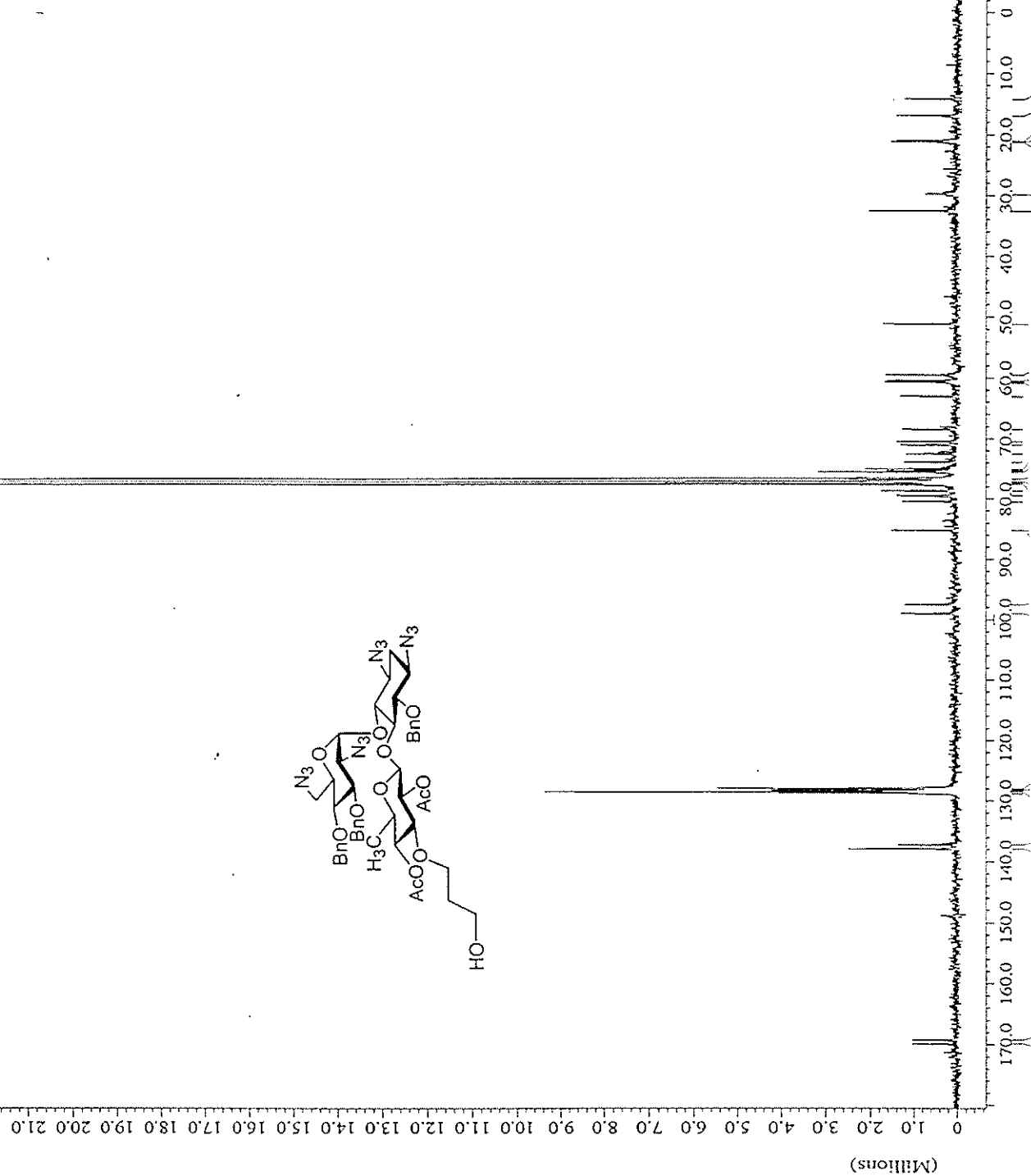
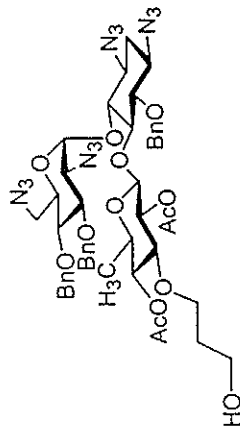
(Millions)

9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0



5'-O-(2,4-Di-O-acetyl-3-O-(3-hydroxypropyl)-6-deoxy-β-D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (40).
 X : parts per Million : 1H

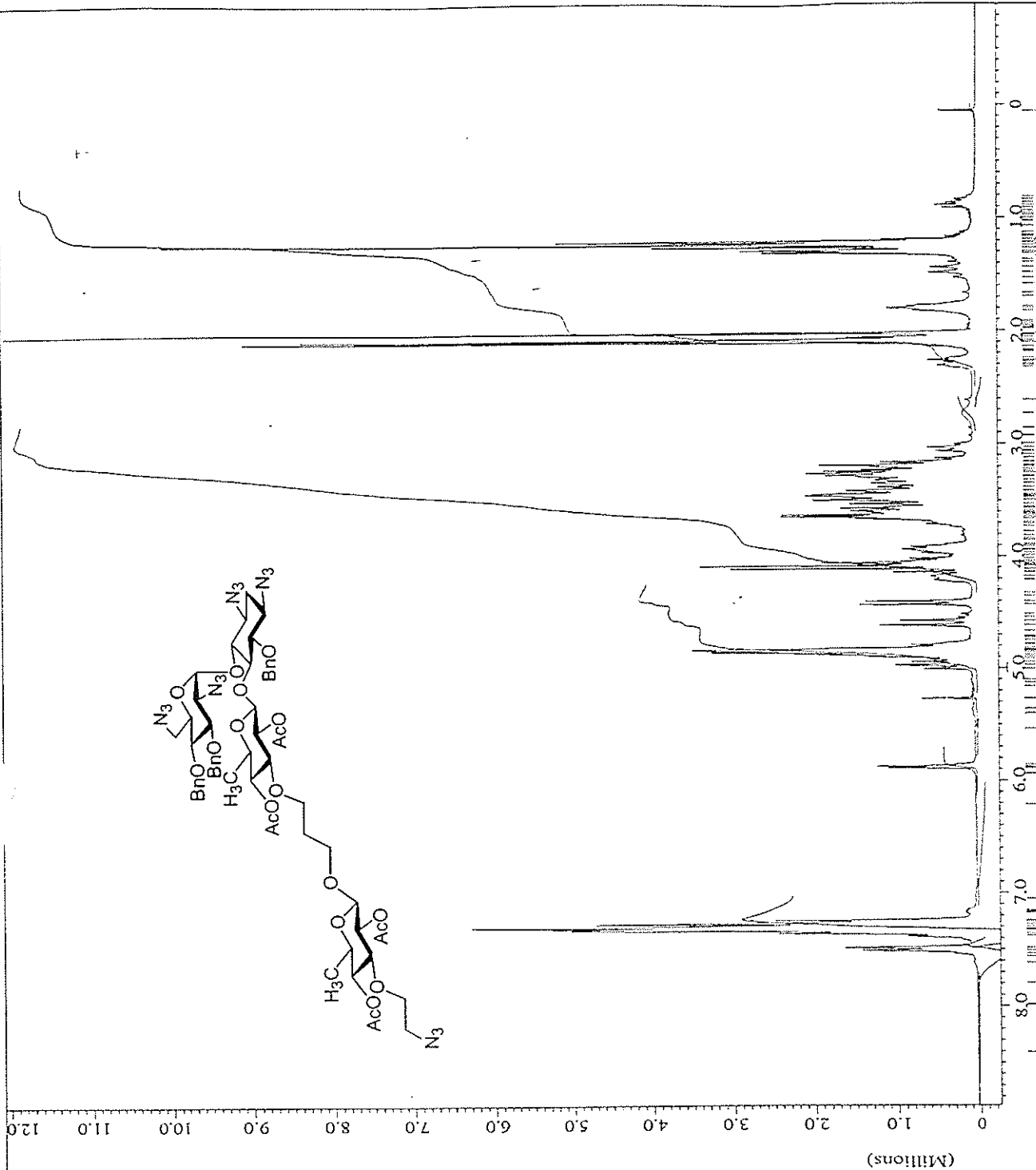
File Name = 1d_13c_spectrum.580
 Author = S#412560
 Sample ID = Single Pulse with Broa
 Content = 14-DEC-2002 13:13:37
 Creation Date = 14-DEC-2002 13:14:00
 Revision Date =
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Iir90 = 11.6[us]
 Iir90_hi = 18[us]
 Iir90_lo = 41[us]
 Iir_domain = 1H
 Iir_width = 41[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 2165
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_on = SPIN ON
 Temp_get = 21.8[dc]
 Temp_set = 22.2[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[KHz]



5'-O-(2,4-Di-O-acetyl-3-O-(3-hydroxypropyl)-6-deoxy- β -D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (40).
 X : parts per Million : 13C

File Name = proton.3570
 Author = 58598472
 Sample ID = Single Pulse Experiment
 Content = 31-DIC-2002 16:39:48
 Revision Date = 31-DIC-2002 16:40:09

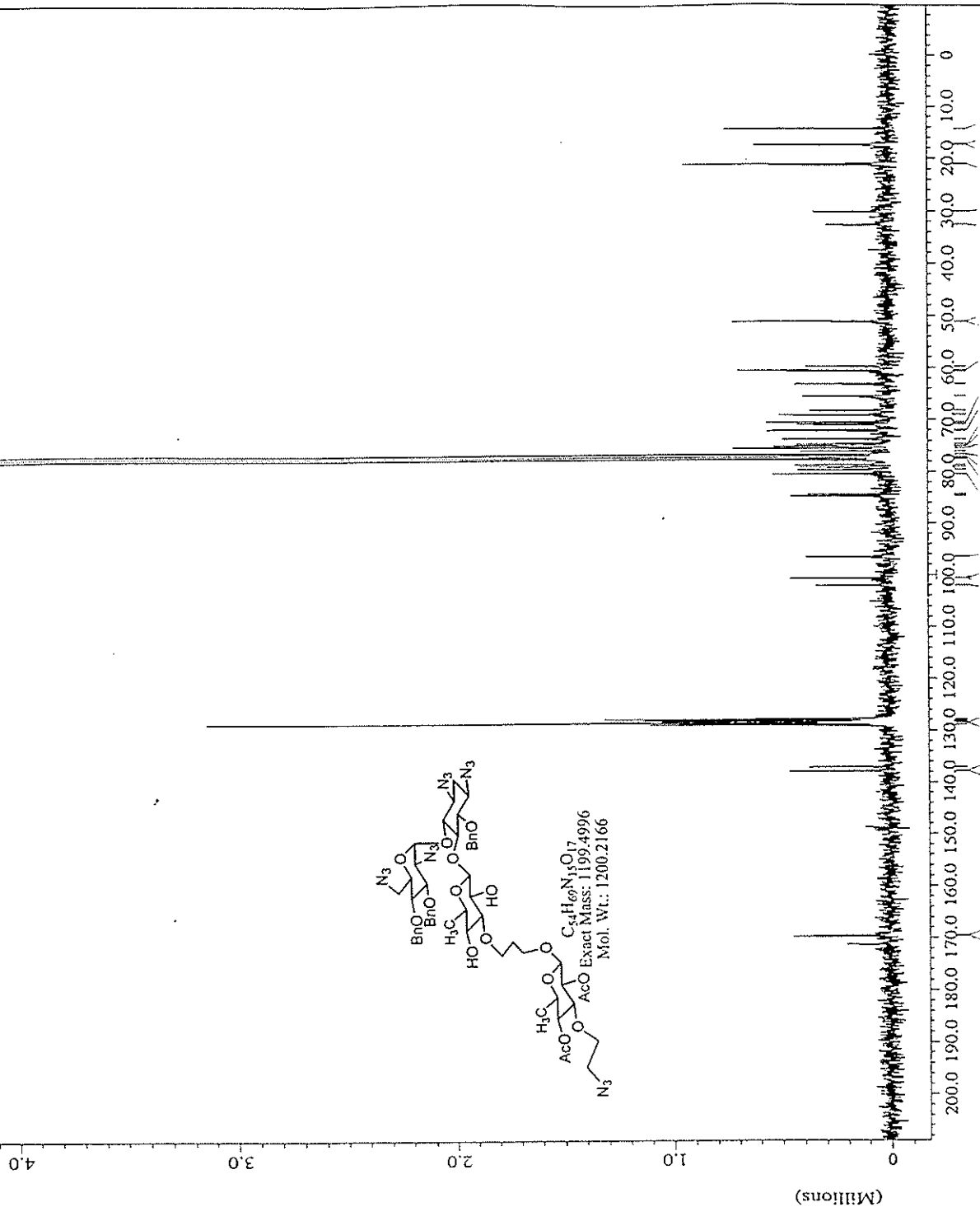
Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = 1H
 Dim Title = 16384
 Dim Size = [ppm]
 Dim Units = 0.1821[ms]
 Acq_delay = 0
 Changer sample = single_pulse.exp
 Experiment = 6.345446[T]
 Field_strength = 11.6[us]
 Irr90 hi = 18[us]
 Irr90 lo = 41[us]
 Irr pwid = 41[us]
 Lock status = IDLX
 Lock gain = 18
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_sat = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 19.6[dc]
 Temp_set = 22.2[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 11.6[us]
 X90 hi = 18[us]
 X90 lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]



5'-O-(2,4-Di-O-acetyl-3-O-(3-(2',4'-di-O-acetyl-3'-O-(2''-azidoethyl)-6'-deoxy-β-D-glucopyranosyl)-propyl)-6-deoxy-β-D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (42).

X : parts per Million : 1H

File Name = 1d_13c_spectrum.588
 Author =
 Sample ID = S860602
 Content = Single Pulse with Broa
 Creation Date = 31-DEC-2002 17:03:01
 Revision Date = 31-DEC-2002 19:44:50
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_lo = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr domain = 1H
 Irr_pwidth = 41[us]
 Lock_status = IDLX
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 443
 Solvent = CHLOROFORM-D
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.7[dc]
 Temp_set = 22.2[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 8.9[us]
 X90_hi = 39[us]
 Acq_duration = 1.9267584[s]
 Domain = 13C
 Freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00880272[MHz]



5'-O-(2,4-Di-O-acetyl-3-O-(3-(2',4'-di-O-acetyl-3'-O-(2''-azidoethyl)-6'-deoxy-β-D-glucopyranosyl)-propyl)-6-deoxy-β-D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (42).

X : parts per Million : 13C

File Name = proton.3619
 Author = S4310690
 Sample ID = Single Pulse Experiment
 Acquisition Date = 14-JAN-2003 08:39:54
 Revision Date = 14-JAN-2003 08:40:14

Spec Site = GSX 270
 Spec Type = DELTA_NMR

Data Format = 1D COMPLEX

Dimensions = X

Dim Title = 1H

Dim Size = 16384

Dim Units = [ppm]

Acq_delay = 0.1821[ms]

Changer_sample = 0

Experiment = single_pulse.exp

Field_strength = 6.345446[T]

Irr90_lo = 11.6[us]

Irr90_hi = 18[us]

Irr90_lo = 41[us]

Irr90_hi = 41[us]

Lock_status = IDLE

Recvr_gain = 25

Relaxation_delay = 4[s]

Scans = 8

Solvent = CHLOROFORM-D

Spin_get = 17[Hz]

Spin_lock_90 = 0.1[ms]

Spin_lock_attn = 24[db]

Spin_set = 15[Hz]

Spin_status = SPIN ON

Temp_get = 20.1[dc]

Temp_set = 38.0[dc]

Temp_status = TEMP OFF

X90_lo = 11.6[us]

X90_hi = 18[us]

X90_lo = 41[us]

X90_hi = 3.03104[s]

X_acq_duration = 1H

X_domain = 270.16743928[MHz]

X_freq = 5.01ppm

X_offset = 16384

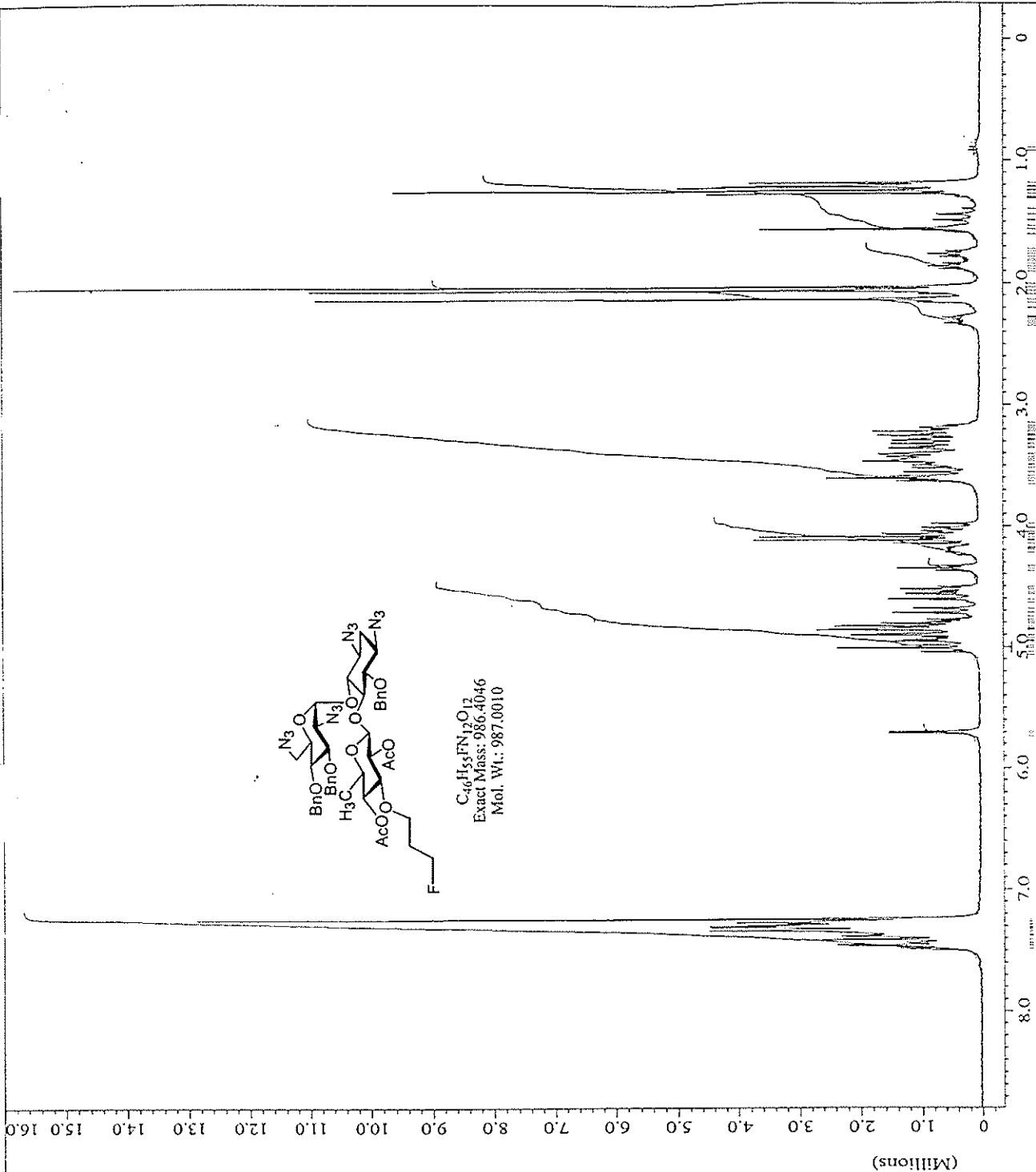
X_points = 0

X_prescans = 5.8[us]

X_pulse = 0.32991976[Hz]

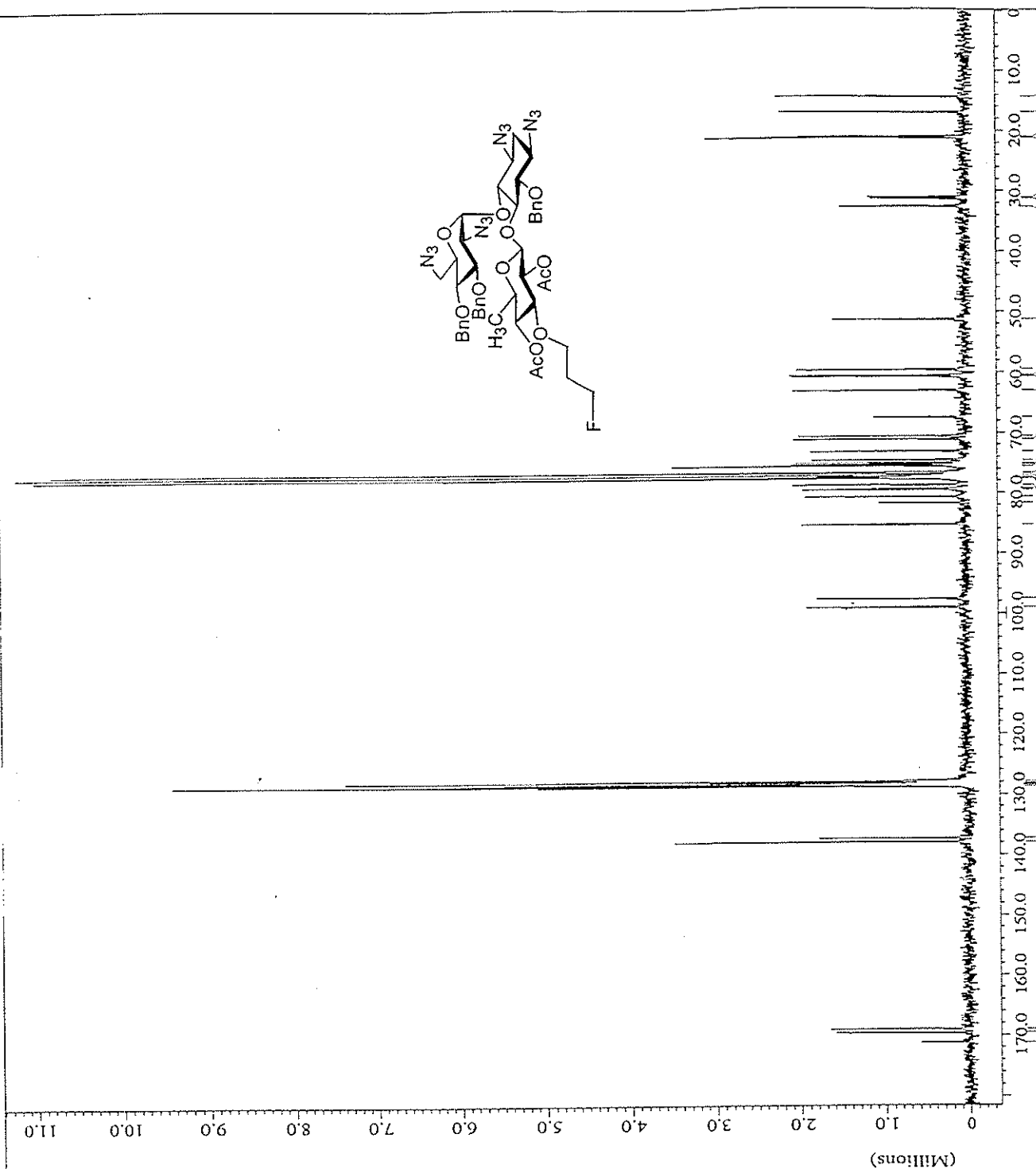
X_resolution = 5.40540541[kHz]

X_sweep = 0



5'-O-(2,4-Di-O-acetyl-3-O-(3-fluoropropyl)-6-deoxy- β -D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (43).

File Name = id_13c_spectrum.595
 Author = S832796
 Sample ID = Single Pulse with Proa
 Content = 14-JAN-2003 10:14:18
 Revision Date = 14-JAN-2003 10:14:38
 Spec Site = GSX 270
 Spec Type = DELTA_RMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 41[us]
 Irr domain = 1H
 Irr_pwidth = 41[us]
 Lock status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Solvent = CHLOROFORM-D
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_state = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.8[dc]
 Temp_set = 38.0[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



5'-O-(2,4-Di-O-acetyl-3-O-(3-fluoropropyl)-6-deoxy-β-D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2'6'-tetraazidoneamine (43).

X : parts per Million : 13C

File Name = proton.221
 Author =
 Sample ID = S#535862
 Content = Single Pulse Experiment
 Creation Date = 15-JUN-2002 14:54:59
 Revision Date = 15-JUN-2002 14:55:27
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821[us]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446[T]
 Irr90 = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr_width = 41[us]
 Lock_status = TDLX
 Recvr_gain = 19
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 15[Hz]
 Spin_lock_90 = 0.1[us]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SWIN ON
 Spin_status = SWIN ON
 Temp_get = 19.3[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 11.6[us]
 X90_hi = 18[us]
 X90_lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]



S64

40.0

30.0

20.0

10.0

(Millions)

8.0

7.0

6.0

5.0

4.0

3.0

2.0

1.0

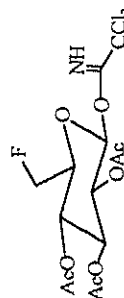
0

2,3,4-Tri-O-acetyl-6-deoxy-6-fluoro-α-D-glucopyranosyl trichloroacetimidate (46).

X : parts per Million : 1H

0.0265

File Name = 1d_13c_spectrum.41
 Author =
 Sample ID = S8538660
 Content = Single Pulse with Broa
 Creation Date = 15-JUN-2002 15:03:13
 Revision Date = 15-JUN-2002 15:03:28
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 18[us]
 Irr90_lo = 41[us]
 Irr_domain = 1H
 Irr_width = 41[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 103
 Solvent = CHLOROFORM-D
 Spin_get = 15[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.3[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 8.9[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]

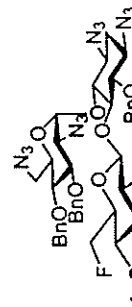


(Millions)

170.0 160.0 150.0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0

2,3,4-Tri-O-acetyl-6-deoxy-6-fluoro-α-D-glucopyranosyl trichloroacetimidate (46).

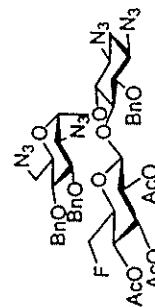
File Name = proton.223
 Author =
 Sample ID = S8581203
 Content = Single Pulse Experiment
 Creation Date = 17-JUN-2002 16:10:18
 Revision Date = 17-JUN-2002 16:10:45
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821 [ms]
 Changer_sample = 0
 Experiment = single pulse.exp
 Field_strength = 6.345446 [T]
 Irr90_hi = 11.6 [us]
 Irr90_lo = 18 [us]
 Irr90_width = 41 [us]
 Lock_status = LOCK
 Recvr_gain = 23
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = CHLOROFORM-D
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 20 [dC]
 Temp_set = 25 [dC]
 Temp_status = TEMP OFF
 X90_hi = 11.6 [us]
 X90_lo = 18 [us]
 X90_width = 41 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



5'-O-(2,3,4-Tri-O-acetyl-6-deoxy-6-fluoro- β -D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (47).

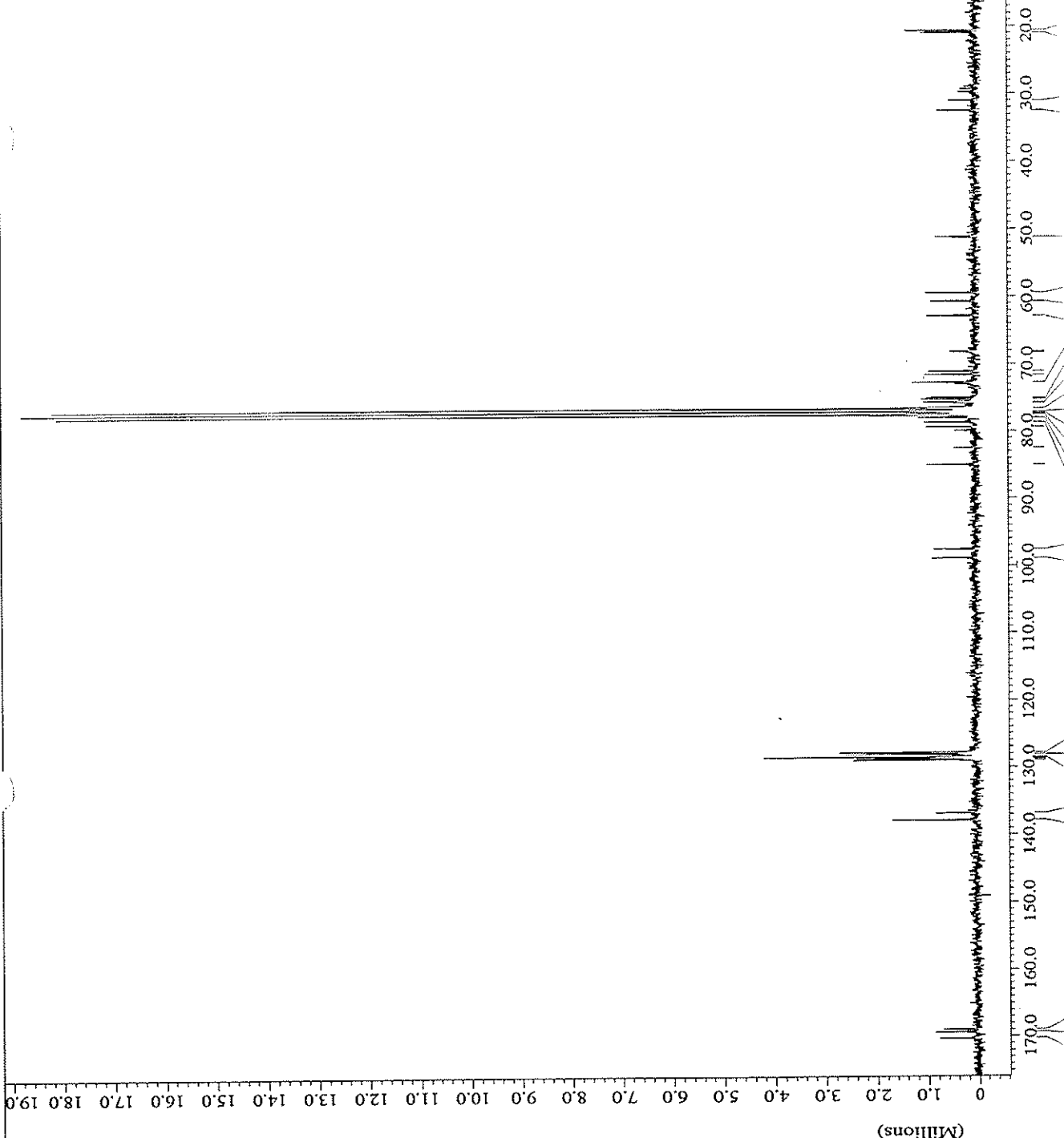
X : parts per Million : 1H

File Name = id_13c_spectrum.42
 Author =
 Sample ID = S#638992
 Content = Single Pulse with Broa
 Creation Date = 18-JUN-2002 19:15:57
 Revision Date = 18-JUN-2002 19:16:26
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq delay = 57.5[us]
 Changer sample = 0
 Experiment = single_pulse_dec
 Field strength = 6.345446[T]
 Irr90 = 11.6[us]
 Irr90_lo = 18[us]
 Irr90_hi = 41[us]
 Irr_domain = 1H
 Irr_width = 41[us]
 Lock_status = FDLX
 Lock_gain = 15
 Relaxation_delay = 1[s]
 Scans = 1856
 Solvent = CHLOROFORM-D
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_on = SPIN ON
 Temp_get = 21.7[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 8.9[us]
 X90_hi = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.01[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]

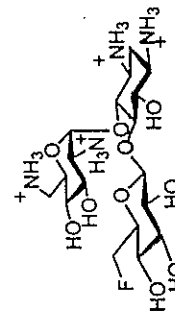


5'-O-(2,3,4-Tri-O-acetyl-6-deoxy-6-fluoro-beta-D-glucopyranosyl)-6,3',4'-tri-O-benzyl-1,3,2',6'-tetraazidoneamine (47).

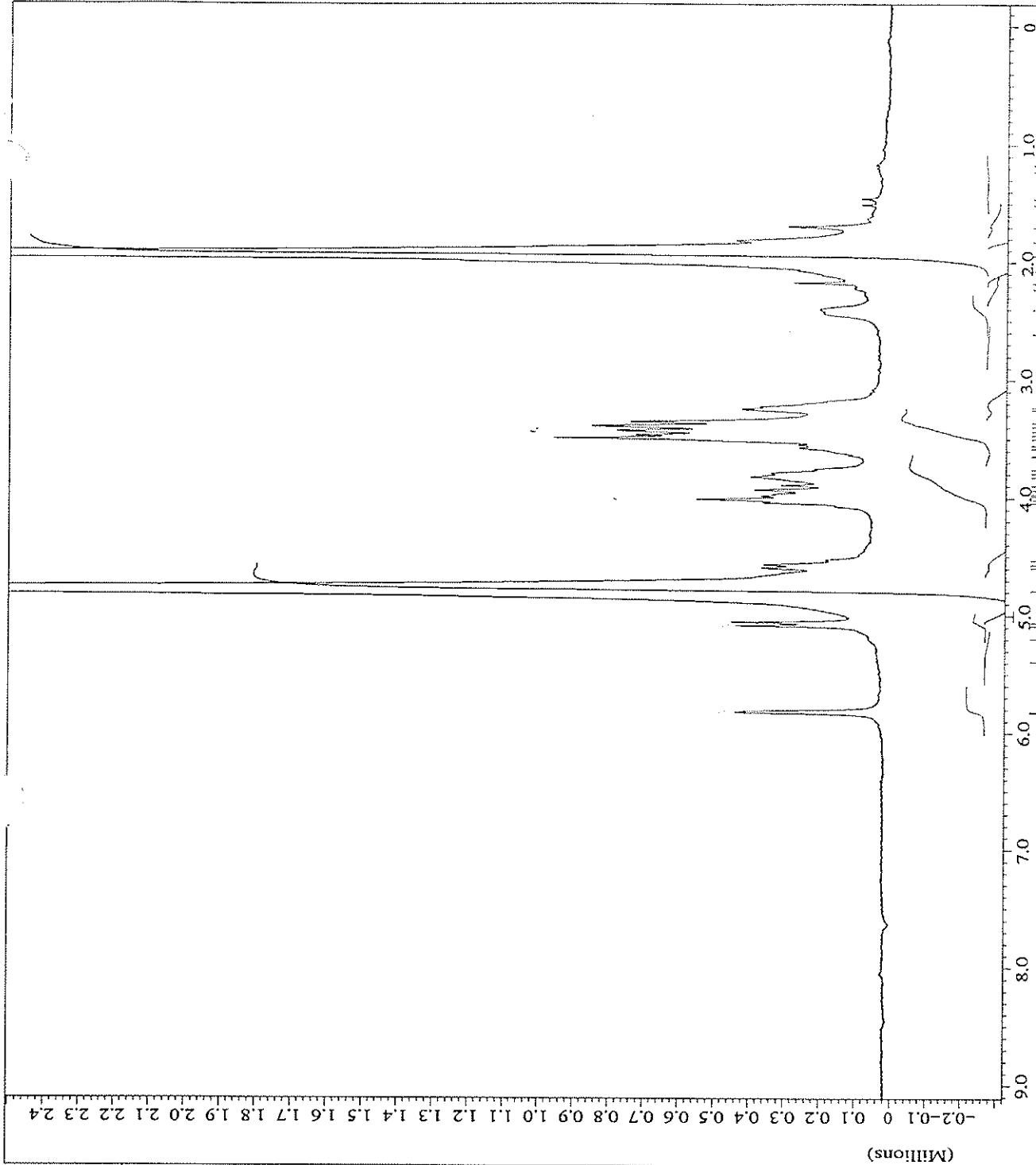
X : parts per Million : 13C



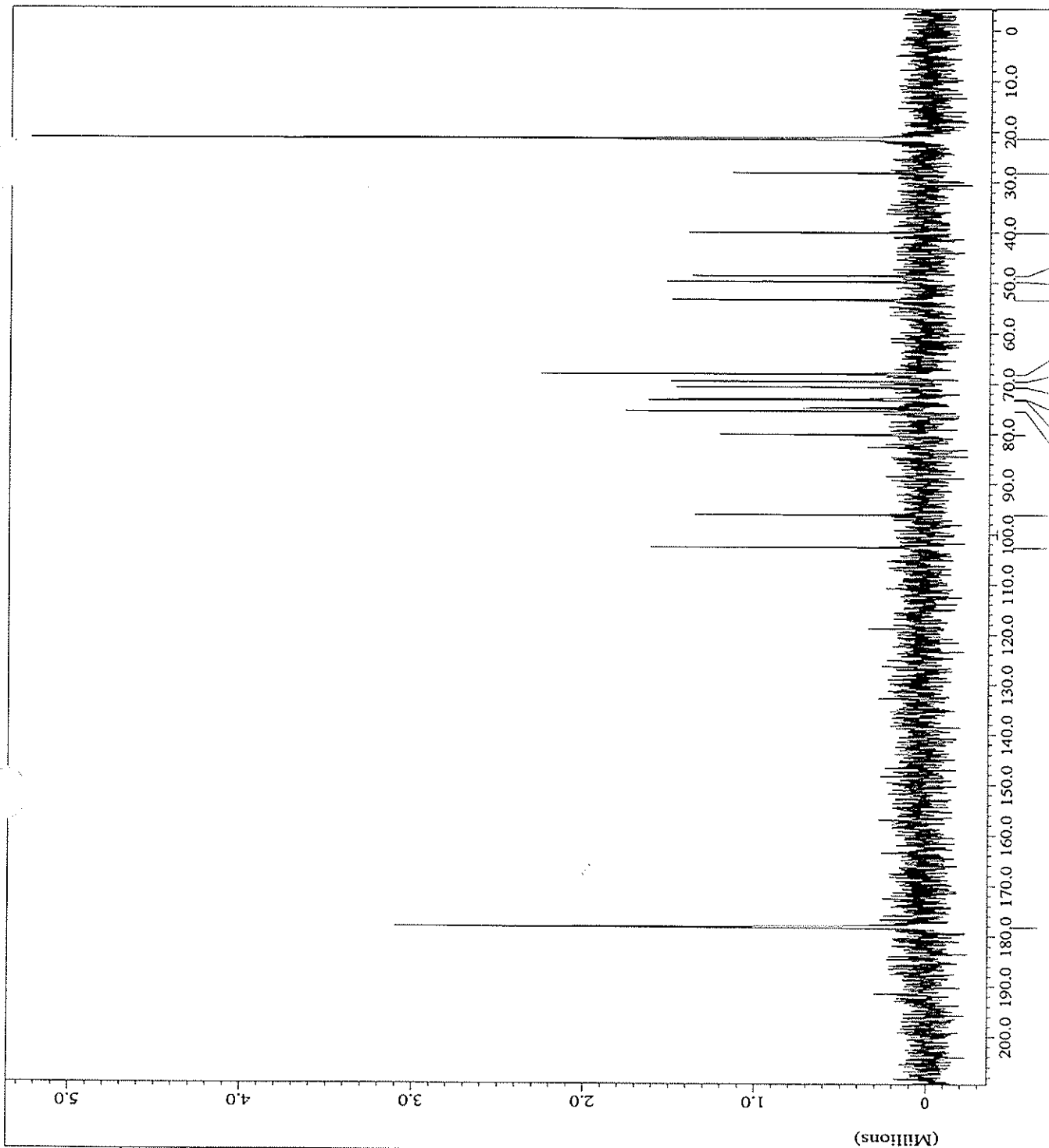
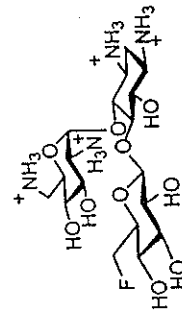
File Name = proton.3005
 Author = S#357971
 Sample ID = Single Pulse Experiment
 Content = 1-JUL-2002 09:58:58
 Creation Date = 1-JUL-2002 10:05:20
 Revision Date = 1-JUL-2002 10:05:20
 Spec Site = GSK 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821[ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345476[T]
 Irr90_hi = 10[us]
 Irr90_lo = 10[us]
 Irr90_pw = 50[us]
 Irr90_width = 41[us]
 Lock_status = IDLE
 Recvr_gain = 18
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = D2O
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 20[degC]
 Temp_set = 25[degC]
 Temp_status = TEMP OFF
 X90 = 11.6[us]
 X90_hi = 18[us]
 X90_lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40540541[kHz]



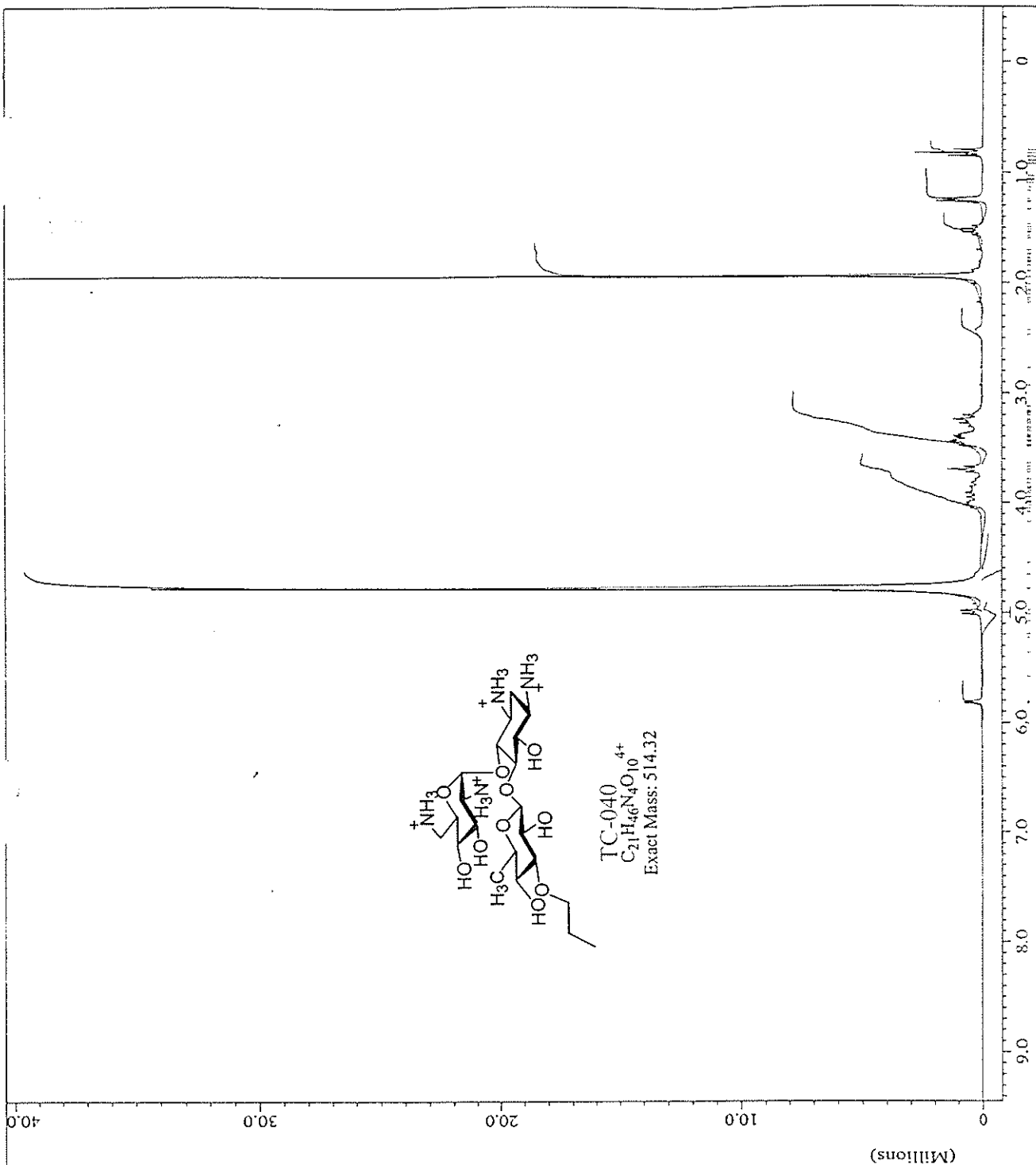
5'-O-(6-Deoxy-6-fluoro- β -D-glucopyranosyl)neamine (TC033).



File Name = 1d_13c_spectrum.44
 Author = S#630161
 Sample ID = Single Pulse with Broa
 Content = 1-JUL-2002 22:47:28
 Revision Date = 1-JUL-2002 22:47:52
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Change_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_lo = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr90_hi = 1H
 Irr_domain = 41[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 6494
 Solvent = D2O
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 22.2[dc]
 Temp_set = 25[dc]
 Temp_status = TEMP OFF
 X90_lo = 8[us]
 X90_hi = 8.9[us]
 X90_lo = 39[us]
 X90_hi = 1.9267584[s]
 X_acq_duration = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]

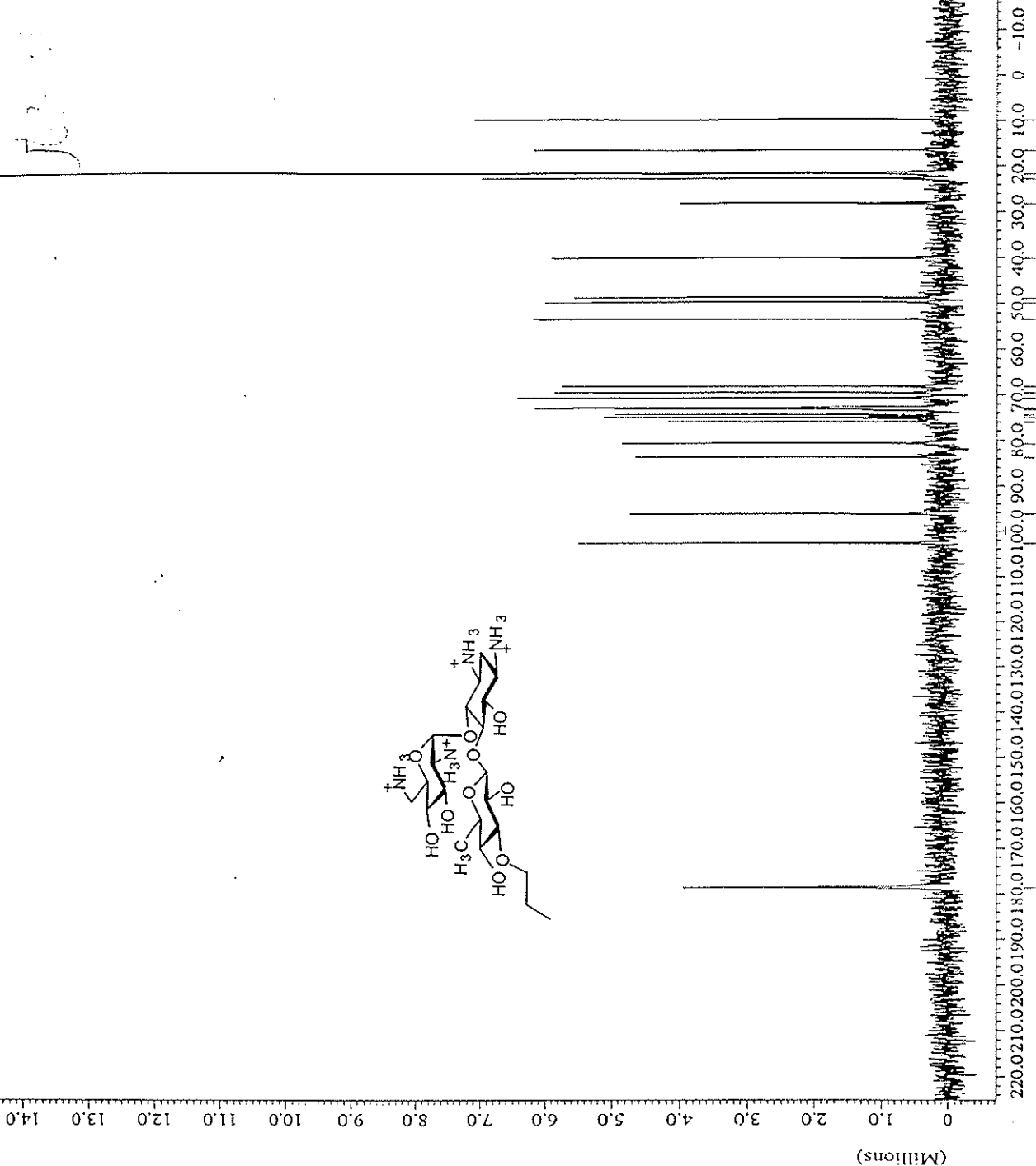


File Name = proton.3625
 Author = S4342841
 Sample ID = Single Pulse Experiment
 Content = 15-JAN-2003 09:33:43
 Revision Date = 15-JAN-2003 09:34:00
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345436[T]
 Irr90_hi = 11.6[us]
 Irr90_lo = 18[us]
 Irr90_width = 41[us]
 Lock_status = IDLE
 Recvr_gain = 18
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = D2O
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_get = 20[dc]
 Temp_get = 38.0[dc]
 Temp_set = TEMP OFF
 Temp_status = 11.6[us]
 X90 = 18[us]
 X90_lo = 41[us]
 X90_hi = 3.03104[s]
 X_acq_duration = 1H
 X_domain = 270.16743928[MHz]
 X_freq = 5.0[ppm]
 X_offset = 16384
 X_points = 0
 X_prescans = 5.8[us]
 X_pulse = 0.32991976[Hz]
 X_resolution = 5.40540541[kHz]
 X_sweep =



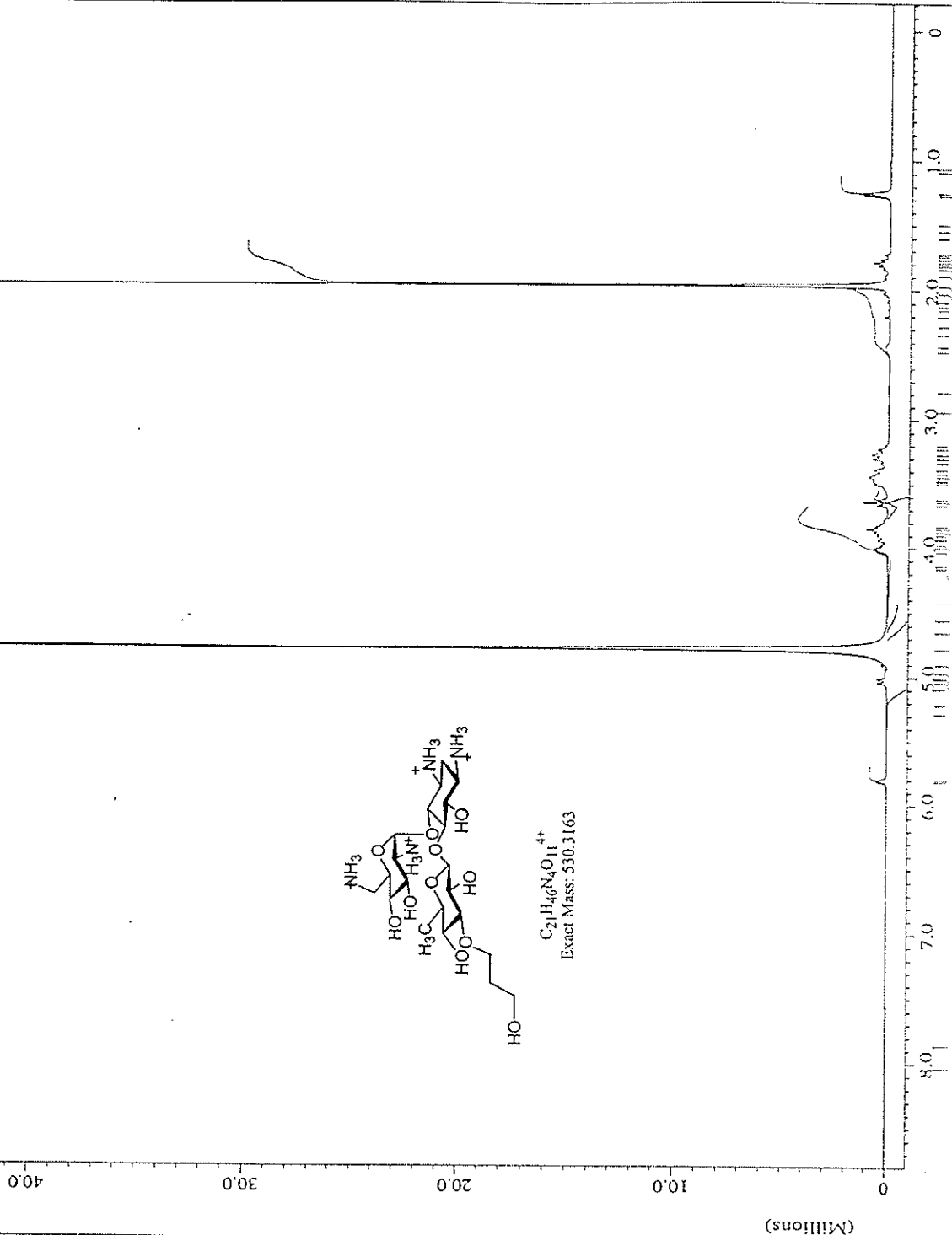
5'-O-(3-O-n-Propyl-6-deoxy-β-D-glucopyranosyl)neamine (TC040).

File Name = ld_13c_spectrum.596
 Author = SW659644
 Sample ID = Single Pulse with Broa
 Content = 17-JAN-2003 09:05:14
 Creation Date = 17-JAN-2003 09:05:14
 Revision Date = 17-JAN-2003 09:05:14
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Ixir90 = 11.6[us]
 Ixir90_hi = 18[us]
 Ixir90_lo = 41[us]
 Ixir90_main = 1K
 Ixir90_width = 41[us]
 Lock_gain = 15
 Lock_status = IDLE
 Relaxation_delay = 1[us]
 Scans = 18151
 Solvent = D2O
 Spin_get = 17[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Temp_get = 21.8[dc]
 Temp_set = 38.0[dc]
 Temp_status = TEMP OFF
 X90 = 8[us]
 X90_lo = 8.9[us]
 X90_hi = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



5'-O-(3-O-n-Propyl-6-deoxy-β-D-glucopyranosyl)neamine (TC040).

File Name = proton.3594
 Author = S4385025
 Sample ID = Single Pulse Experiment
 Content = 7-JAN-2003 10:43:34
 Revision Date = 7-JAN-2003 10:43:52
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821 [ms]
 Changer_sample = 0
 Experiment = single_pulse.exp
 Field_strength = 6.345446 [T]
 Ixr90 = 11.6 [us]
 Ixr90_lo = 18 [us]
 Ixr90_hi = 41 [us]
 Ixr_pwidth = 41 [us]
 Lock_status = YDLX
 Recvr_gain = 19
 Relaxation_delay = 4 [s]
 Scans = 8
 Solvent = D2O
 Spin_get = 17 [Hz]
 Spin_lock_90 = 0.1 [ms]
 Spin_lock_attn = 24 [dB]
 Spin_set = 15 [Hz]
 Spin_status = SPIN ON
 Temp_get = 19.8 [dC]
 Temp_set = 22.2 [dC]
 Temp_status = TEMP OFF
 X90 = 11.6 [us]
 X90_lo = 18 [us]
 X90_hi = 41 [us]
 X_acq_duration = 3.03104 [s]
 X_domain = 1H
 X_freq = 270.16743928 [MHz]
 X_offset = 5.0 [ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8 [us]
 X_resolution = 0.32991976 [Hz]
 X_sweep = 5.40540541 [kHz]



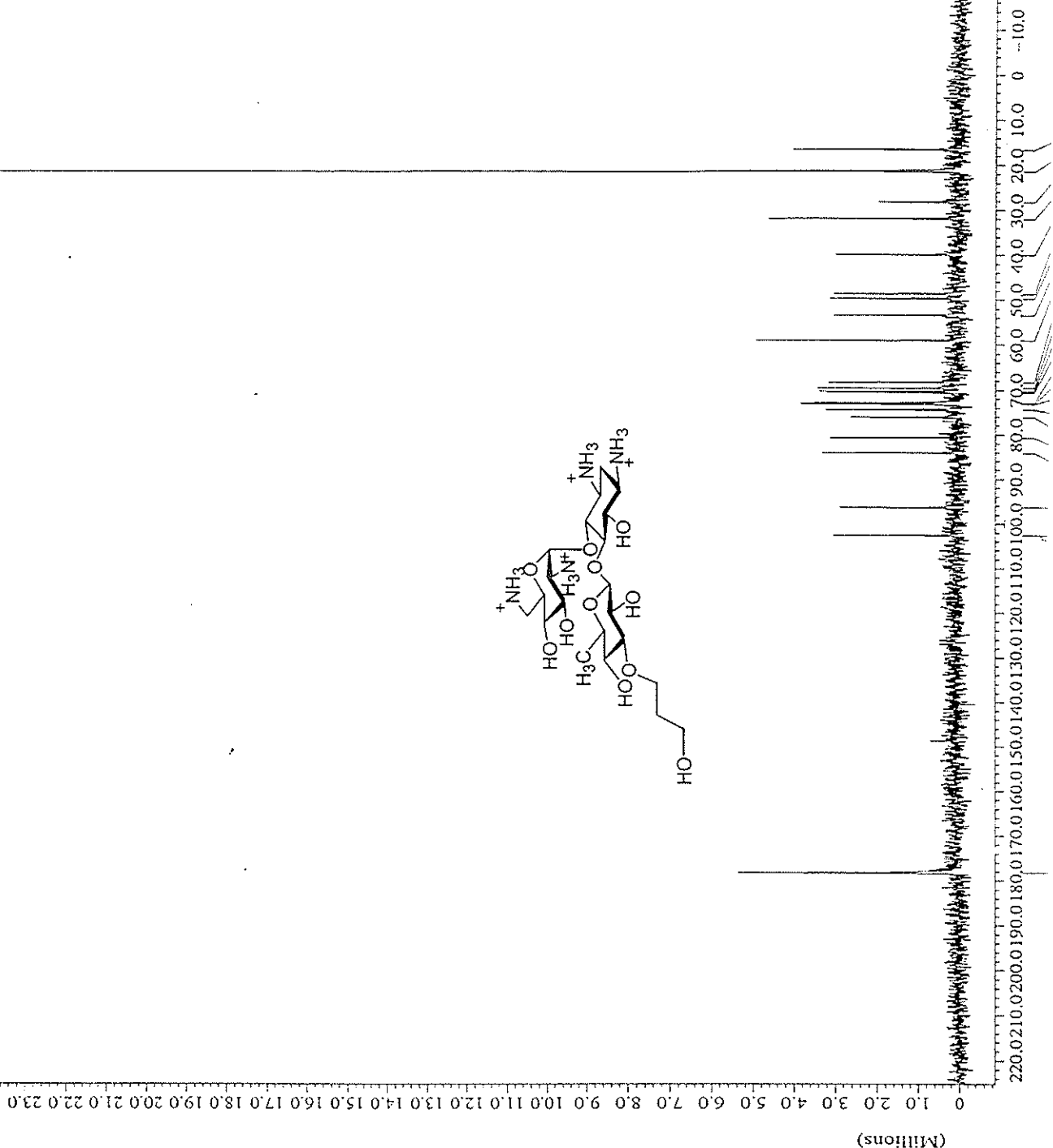
5'-O-(3-O-(3-Hydroxypropyl)-6-deoxy-β-D-glucopyranosyl)neamine (TC041).

```

File Name      = ld_13c_spectrum.590
Author        = SW638524
Sample ID     = Single Pulse with Broa
Content       = 8-JAN-2003 08:53:54
Creation Date = 8-JAN-2003 08:54:18
Revision Date =
Spec Site     = GSX 270
Spec Type     = DELTA_RMR

Data Format    = 1D COMPLEX
Dimensions    = X
  1D Title    = 13C
  1D Size     = 32768
  1D Dim Units = [ppm]
  Acq Delay   = 57.5[us]
  Changer sample = 0
  Field_strength = 6.34544[T]_dec
  Irr90_hi    = 11.6[us]
  Irr90_lo    = 18[us]
  Irr domain  = 1H
  Irr width   = 41[us]
  Lock status = IDLE
  Recvz_gain  = 15
  Relaxation_delay = 1[s]
  Scans       = 18640
  Solvent     = D2O
  Spin get    = 17[Hz]
  Spin lock_90 = 0.1[ms]
  Spin_lock_attn = 24[db]
  Spin_set    = 15[Hz]
  Spin_status = SPIN ON
  Temp get    = SPIN ON
  Temp set    = 21.5[dc]
  Temp_status = 25.1[dc]
  Temp_offset = TEMP OFF
  Temp_status = TEMP OFF
  X90         = 8[us]
  X90_hi     = 8.9[us]
  X90_lo     = 39[us]
  X_acq_duration = 1.9267504[s]
  X_domain   = 13C
  X_freq     = 67.94019394[MHz]
  X_offset   = 100.0[ppm]
  X_points   = 32768
  X_prescans = 4
  X_pulse    = 2.66666667[us]
  X_resolution = 0.51900843[Hz]
  X_sweep    = 17.00680272[kHz]

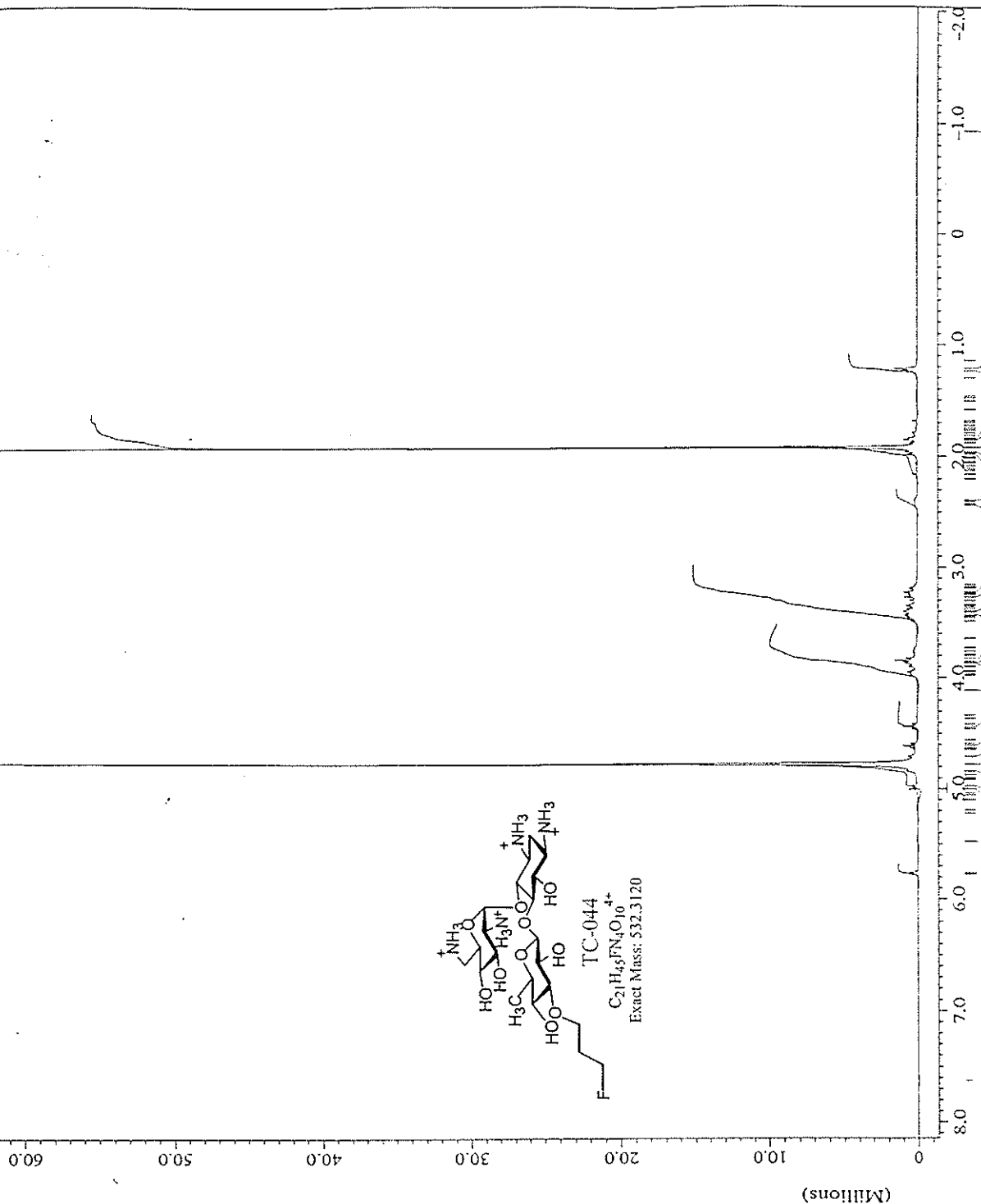
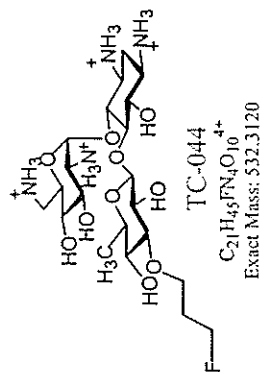
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5'-O-(3-O-(3-Hydroxypropyl)-6-deoxy-β-D-glucopyranosyl)neamine (TC041).

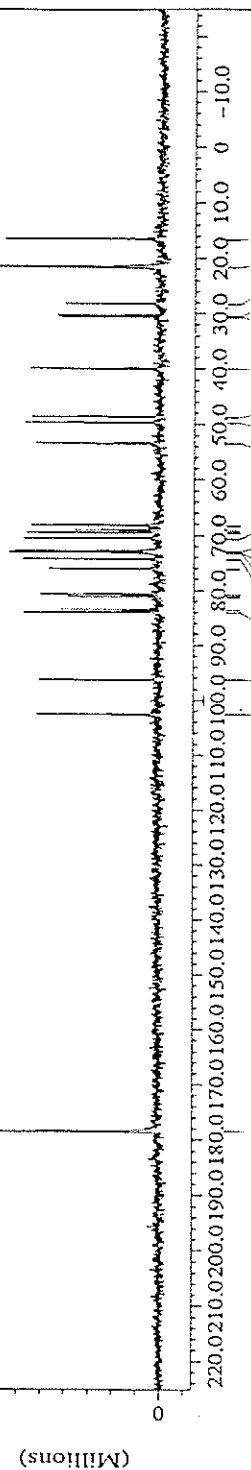
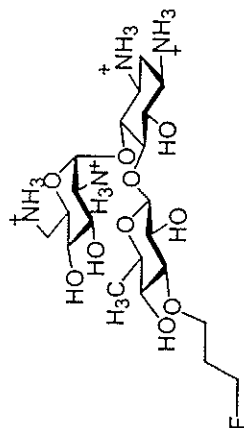
X : parts per Million : 13C

File Name = proton.3628
 Author = S#402415
 Sample ID = Single Pulse Experiment
 Content = 18-JAN-2003 11:12:47
 Creation Date = 18-JAN-2003 11:13:05
 Revision Date
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = 1H
 Dim Title = 16384
 Dim Size = [ppm]
 Dim Units = 0.1821[ms]
 Acq_delay = 0
 (Change sample)
 Experiment = single_pulse.exp
 Field strength = 6.345436[T]
 Irr90 = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr_pwidth = 41[us]
 Lock_status = idle
 Recvz_gain = 17
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = D2O
 Spin_get = 18[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_get = 19.9[dc]
 Temp_get = 38.0[dc]
 Temp_set = TEMP OFF
 Temp_status = TEMP OFF
 X90 = 11.6[us]
 X90_hi = 18[us]
 X90_lo = 41[us]
 X_acq_duration = 3.03104[s]
 X_domain = 1H
 X_freq = 270.16743928[MHz]
 X_offset = 5.0[ppm]
 X_points = 16384
 X_prescans = 0
 X_pulse = 5.8[us]
 X_resolution = 0.32991976[Hz]
 X_sweep = 5.40340541[kHz]



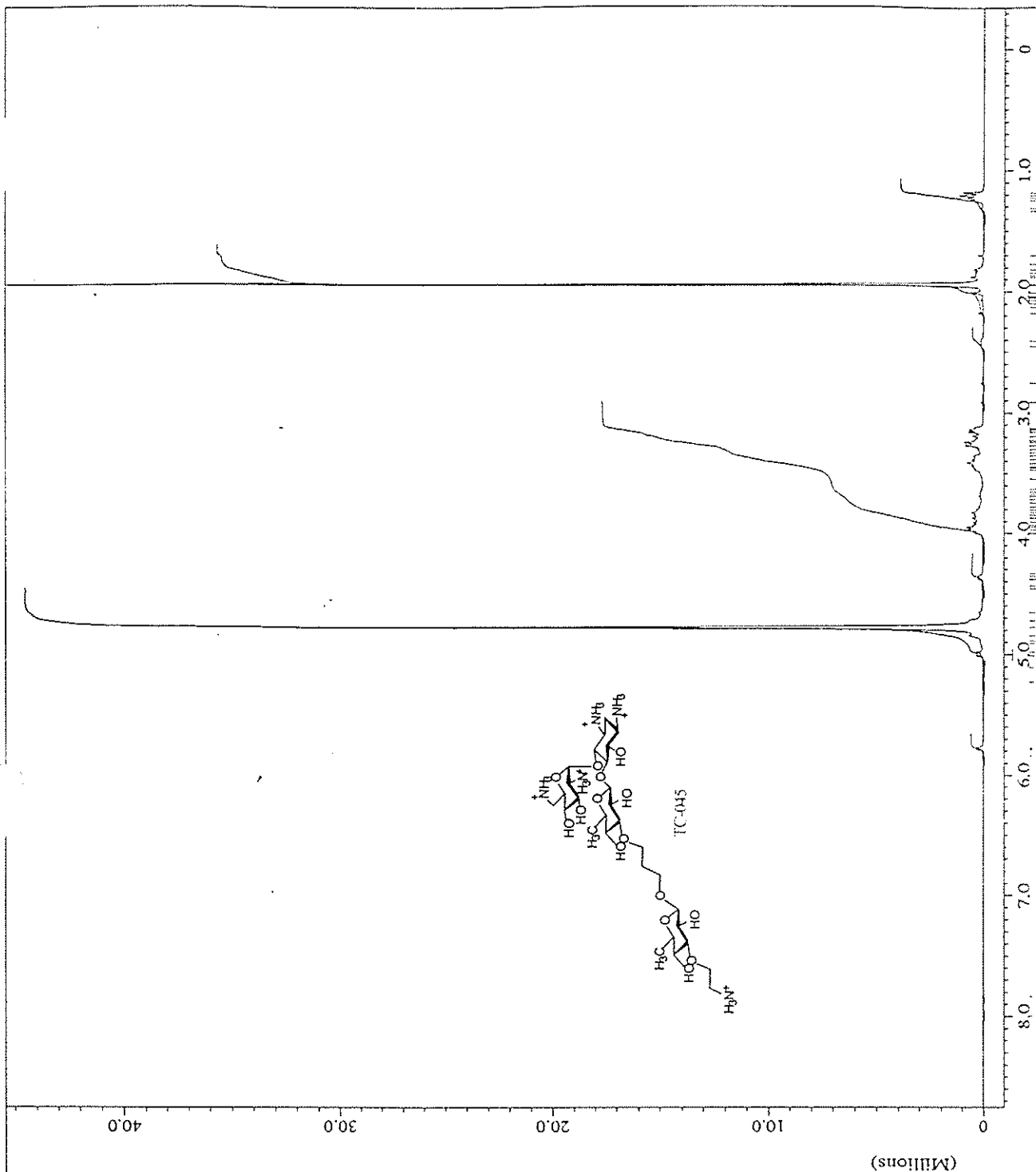
5'-O-(3-O-(3-Fluoropropyl)-6-deoxy-beta-D-glucopyranosyl)neamine (TC044).

File Name = ld_13c_spectrum.598
 Author = S#672481
 Sample ID = Single Pulse with Broa
 Content = 19-JAN-2003 09:09:48
 Creation Date = 19-JAN-2003 09:10:07
 Revision Date =
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single pulse_dec
 Field_strength = 6.345436[T]
 Irr90_strength = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr_domain = 1H
 Irr_width = 41[us]
 Lock_status = IDLE
 Recvr_gain = 15
 Relaxation_delay = 1[s]
 Scans = 17806
 Solvent = D2O
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set_attn = 15[Hz]
 Spin_status = SPIN ON
 Spin_on = SPIN ON
 Temp_get = 21.7[dc]
 Temp_set = 38.0[dc]
 Temp_status = TEMP OFF
 X90_hi = 8[us]
 X90_lo = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[MHz]



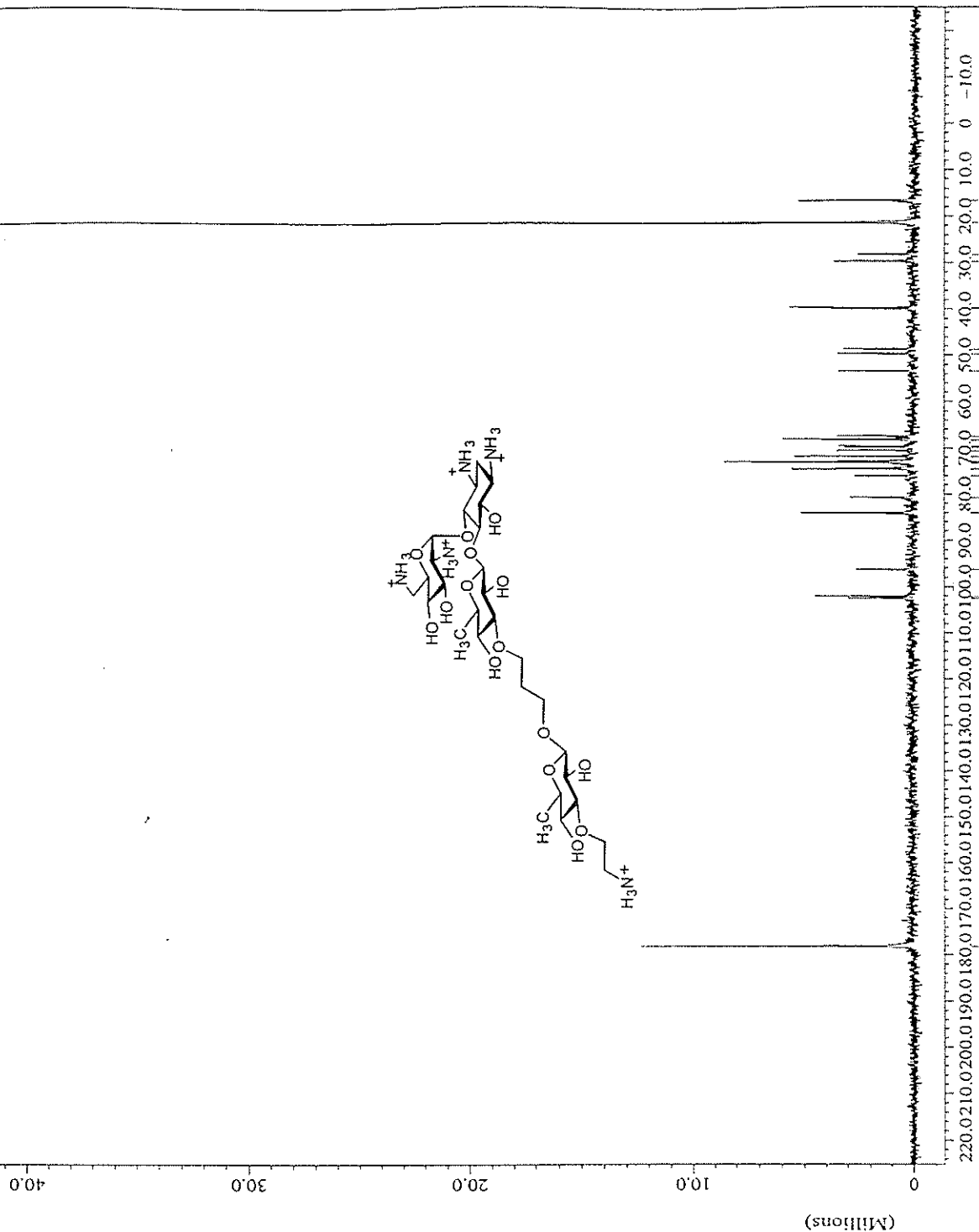
5'-O-(3-Fluoropropyl)-6-deoxy-β-D-glucopyranosyl)neamine (TC044).

File Name = proton.3607
 Author = S8503004
 Content = Single Pulse Experiment
 Creation Date = 8-JAN-2003 14:00:40
 Revision Date = 8-JAN-2003 14:00:54
 Spec Site = GSX 270
 Spec Type = DELTA_NMR
 Data Format = 1D COMPLEX
 Dimensions = X
 Dim Title = 1H
 Dim Size = 16384
 Dim Units = [ppm]
 Acq_delay = 0.1821[ms]
 Changer_sample = single_pulse.exp
 Experiment = 6.345436[T]
 Field_strength = 11.6[us]
 Irr90 = 18[us]
 Irr90_lo = 41[us]
 Irr90_hi = 41[us]
 Irr_width = 41[us]
 Lock_status = IDLX
 Lock_gain = 17
 Relaxation_delay = 4[s]
 Scans = 8
 Solvent = D2O
 Spin_get = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[db]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_get = 20[dc]
 Temp_set = 25.1[dc]
 Temp_status = TEMP OFF
 Temp_get = 11.6[us]
 X90 = 41[us]
 X90_lo = 3.03104[us]
 X90_hi = 1H
 X_acq_duration = 270.16743928[MHz]
 X_domain = 5.0[ppm]
 X_freq = 16384
 X_offset = 0
 X_points = 5.8[us]
 X_prescans = 0.32991976[Hz]
 X_pulse = 5.40540541[kHz]
 X_resolution = 5.40540541[kHz]
 X_sweep = 5.40540541[kHz]



5'-O-(3-O-(2-aminoethyl)-6-deoxy-β-D-glucopyranosyl)propyl)-6-deoxy-β-D-glucopyranosyl)neamine (TC045).

File Name = ld_13c_spectrum.591
 Author = #639755
 Sample ID = Single Pulse With Broa
 Content = 9-JAN-2003 08:57:22
 Creation Date = 9-JAN-2003 08:57:47
 Revision Date
 Spec Site = CSX 270
 Spec Type = DELTA_NMR
 Data Format = ID COMPLEX
 Dimensions = X
 Dim Title = 13C
 Dim Size = 32768
 Dim Units = [ppm]
 Acq_delay = 57.5[us]
 Changer_sample = 0
 Experiment = single_pulse_dec
 Field_strength = 6.345446[T]
 Irr90_lo = 11.6[us]
 Irr90_hi = 18[us]
 Irr90_lo = 41[us]
 Irr90_hi = 41[us]
 Irr_domain = 1H
 Irr_width = 41[us]
 Lock_status = IDLK
 Recv_gain = 15
 Relaxation_delay = 1[s]
 Scans = 18669
 Solvent = D2O
 Spin_lock = 16[Hz]
 Spin_lock_90 = 0.1[ms]
 Spin_lock_attn = 24[dB]
 Spin_set = 15[Hz]
 Spin_status = SPIN ON
 Spin_status = SPIN ON
 Temp_get = 21.6[dc]
 Temp_set = 25.1[dc]
 Temp_off = TEMP OFF
 Temp_status = TEMP OFF
 X90_lo = 8[us]
 X90_hi = 39[us]
 X_acq_duration = 1.9267584[s]
 X_domain = 13C
 X_freq = 67.94010394[MHz]
 X_offset = 100.0[ppm]
 X_points = 32768
 X_prescans = 4
 X_pulse = 2.66666667[us]
 X_resolution = 0.51900643[Hz]
 X_sweep = 17.00680272[kHz]



Proton magnetic resonance spectra were recorded using spectrometers at 270 or 400 MHz. Chemical shifts were reported as parts per million (ppm) downfield from tetramethylsilane in δ unit, and coupling constants were given in cycles per second (Hz). Splitting patterns were designed as s, singlet; d, doublet; t, triplet; q, quartet; m, multiplet. ^{13}C spectra were obtained using spectrometers at 68 MHz or 100 MHz. Routine ^{13}C NMR spectra were fully decoupled by broadband waltz decoupling. All NMR spectra were recorded at ambient temperature unless otherwise noted. Purchased chemical reagents and starting materials were used without purification unless otherwise noted. Dichloromethane was distilled over CaH_2 . Other solvents were used without purification.

Methyl 4-azido-2,3,6-tri-*O*-benzyl-4-deoxy- α -D-glucopyranoside (6). Please refer to the procedure for the preparation of **4**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 15H), 4.95 (d, J = 11.6 Hz, 1H), 4.80 (d, J = 11.6 Hz, 1H), 4.78 (d, J = 12.2 Hz, 1H), 4.63 (d, J = 12.2 Hz, 1H), 4.62 (d, J = 12.2 Hz, 1H), 4.60 (d, J = 3.3 Hz, 1H), 4.49 (d, J = 12.2 Hz, 1H), 3.84 (dd, J = 9.2 Hz, J = 9.6 Hz, 1H), 3.5 - 3.7 (m, 5H), 3.33 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 138.10 (s), 137.95 (s), 137.81 (s), 128.6 (s), 128.5 (s), 128.4 (s), 128.2 (s), 128.1 (s), 127.9 (s), 127.8 (s), 98.4 (s), 80.2 (s), 79.7 (s), 75.8 (s), 73.6 (s), 73.4 (s), 69.3 (s), 68.7 (s), 61.8 (s), 55.5 (s); LRFAB m/e 507 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{28}\text{H}_{35}\text{N}_4\text{O}_5$ $[\text{M}+\text{NH}_4]^+$ m/e 507.2607; measure m/e 507.2611.

Methyl 4,6-diazido-2,3-di-*O*-benzyl-4,6-dideoxy- α -D-galactopyranoside (8). Please refer to the procedure for the preparation of **4**. ^1H NMR (270 MHz, CDCl_3) δ 7.2-7.4 (m, 10H), 4.85 (d, J = 11.7 Hz, 1H), 4.84 (d, J = 12.1 Hz, 1H), 4.75 (d, J = 11.7 Hz, 1H), 4.65 (d, J = 12.1 Hz, 1H), 4.61 (d, J = 3.8 Hz, 1H), 4.04 (dd, J = 9.7 Hz, J = 3.8 Hz, 1H), 3.85 (dd, J = 9.7 Hz, J = 3.8 Hz, 1H),

3.8 – 3.9 (m, 2H), 3.53 (dd, $J = 12.6$ Hz, $J = 7.9$ Hz, 1H), 3.38 (s, 3H), 3.19 (dd, $J = 12.6$ Hz, $J = 5.1$ Hz, 1H); ^{13}C NMR (68 MHz, CDCl_3) δ 137.9 (s), 137.8 (s), 128.4 (s), 128.3 (s), 127.9 (s), 127.8 (s), 127.7 (s), 127.6 (s), 98.5 (s), 77.5 (s), 75.7 (s), 73.7 (s), 73.2 (s), 67.4 (s), 61.4 (s), 55.4 (s), 51.5 (s); LRCI m/e 442.4 $[\text{M}+\text{NH}_4]^+$; HRCI Calcd for $\text{C}_{21}\text{H}_{28}\text{N}_7\text{O}_5$ $[\text{M}+\text{NH}_4]^+$ m/e 442.2203; measure m/e 442.2198.

Methyl 4-azido-2,3-di-*O*-benzyl-4,6-dideoxy- α -D-galactopyranoside (10). Please refer to the procedure for the preparation of **4**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 10H), 4.84 (d, $J = 11.9$ Hz, 1H), 4.82 (d, $J = 12.2$ Hz, 1H), 4.73 (d, $J = 11.9$ Hz, 1H), 4.64 (d, $J = 12.2$ Hz, 1H), 4.54 (d, $J = 3.6$ Hz, 1H), 4.01 (dd, $J = 9.8$ Hz, $J = 3.6$ Hz, 1H), 3.89 (dq, $J = 6.3$ Hz, $J = 1.3$ Hz, 1H), 3.82 (dd, $J = 9.8$ Hz, $J = 3.6$ Hz, 1H), 3.69 (dd, $J = 3.6$ Hz, $J = 1.3$ Hz, 1H), 3.33 (s, 3H), 1.21 (d, $J = 6.3$ Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 138.34 (s), 138.29 (s), 128.54 (s), 128.48 (s), 128.2 (s), 127.90 (s), 127.84 (s), 127.8 (s), 98.8 (s), 78.1 (s), 76.0 (s), 73.8 (s), 73.3 (s), 65.1 (s), 64.3 (s), 55.5 (s), 17.4 (s); LRFAB m/e 401 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{21}\text{H}_{29}\text{N}_4\text{O}_4$ $[\text{M}+\text{NH}_4]^+$ m/e 401.2189; measure m/e 401.2204.

Methyl 2,3-di-*O*-benzyl-6-deoxy- α -D-galactopyranoside (11). Please refer to the procedure for the preparation of **5**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 10H), 4.79 (d, $J = 11.9$ Hz, 2H), 4.69 (d, $J = 11.6$ Hz, 1H), 4.65 (d, $J = 11.9$ Hz, 1H), 4.60 (d, $J = 3.3$ Hz, 1H), 3.7 - 3.9 (m, 4H), 3.36 (s, 3H), 2.42 (broad, 1H, 4-OH), 1.25 (d, $J = 6.6$ Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 138.4 (s), 138.2 (s), 128.6 (s), 128.5 (s), 128.1 (s), 127.95 (s), 127.88 (s), 98.6 (s), 78.0 (s), 75.5 (s), 73.5 (s), 72.9 (s), 70.4 (s), 65.1 (s), 55.4 (s), 16.2 (s); LRFAB m/e 376 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{21}\text{H}_{30}\text{N}_1\text{O}_5$ $[\text{M}+\text{NH}_4]^+$ m/e 376.2124; measure m/e 376.2131.

Methyl 4-azido-2,3-di-*O*-benzyl-4,6-dideoxy- α -D-glucopyranoside (12). Please refer to the procedure for the preparation of **4**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 10H), 4.94 (d, J = 10.5 Hz, 1H), 4.78 (d, J = 10.5 Hz, 1H), 4.76 (d, J = 12.0 Hz, 1H), 4.63 (d, J = 12.0 Hz, 1H), 4.51 (d, J = 3.7 Hz, 1H), 3.81 (dd, J = 9.6 Hz, J = 9.6 Hz, 1H), 3.50 (dd, J = 9.6 Hz, J = 3.7 Hz, 1H), 3.4 - 3.5 (m, 1H), 3.35 (s, 3H), 3.06 (dd, J = 9.6 Hz, J = 9.9 Hz, 1H), 1.25 (d, J = 5.9 Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 138.1 (s), 138.0 (s), 128.6 (s), 128.5 (s), 128.4 (s), 128.2 (s), 128.1 (s), 127.9 (s), 98.1 (s), 80.7 (s), 79.9 (s), 75.8 (s), 73.4 (s), 68.1 (s), 65.9 (s), 55.4 (s), 18.5 (s); LRFAB m/e 401 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{21}\text{H}_{29}\text{N}_4\text{O}_4$ $[\text{M}+\text{NH}_4]^+$ m/e 401.2189; measure m/e 401.2203.

Methyl 6-azido-2,3-di-*O*-benzyl-6-deoxy- α -D-galactopyranoside (14). Please refer to the procedure for the preparation of **5**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 10H), 4.80 (d, J = 11.5 Hz, 1H), 4.75 (d, J = 11.5 Hz, 1H), 4.69 (d, J = 8.6 Hz, 1H), 4.66 (d, J = 3.6 Hz, 1H), 4.64 (d, J = 8.6 Hz, 1H), 3.8 - 3.9 (m, 3H), 3.83 (dd, J = 8.2 Hz, J = 3.6 Hz, 1H), 3.59 (dd, J = 12.8 Hz, J = 8.4 Hz, 1H), 3.40 (s, 3H), 3.26 (dd, J = 12.8 Hz, J = 4.3 Hz, 1H), 2.48 (s, 1H, 4-OH); ^{13}C NMR (68 MHz, CDCl_3) δ 138.3 (s), 138.0 (s), 128.7 (s), 128.5 (s), 128.1 (s), 127.99 (s), 127.96 (s), 98.6 (s), 77.3 (s), 75.6 (s), 73.6 (s), 73.2 (s), 69.8 (s), 68.3 (s), 55.6 (s), 51.3 (s); LRFAB m/e 417 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{21}\text{H}_{29}\text{N}_4\text{O}_5$ $[\text{M}+\text{NH}_4]^+$ m/e 417.2138; measure m/e 417.2122.

Methyl 4,6-diazido-2,3-di-*O*-benzyl-4,6-dideoxy- α -D-glucopyranoside (15). Please refer to the procedure for the preparation of **4**. ^1H NMR (270 MHz, CDCl_3) δ 7.2 - 7.4 (m, 10H), 4.97 (d, J = 10.6 Hz, 1H), 4.79 (d, J = 10.6 Hz, 1H), 4.77 (d, J = 12.0 Hz, 1H), 4.63 (d, J = 12.0 Hz, 1H), 4.60

(d, $J = 2.6$ Hz, 1H), 3.87 (dd, $J = 9.6$ Hz, $J = 9.0$ Hz, 1H), 3.5 - 3.6 (m, 3H), 3.4 - 3.5 (m, 2H), 3.36 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 137.9(s), 137.8 (s), 128.6 (s), 128.5 (s), 128.4 (s), 128.20 (s), 128.16 (s), 128.0 (s), 98.2 (s), 79.86 (s), 79.85 (s), 75.8 (s), 73.5 (s), 69.2 (s), 62.5 (s), 55.7 (s), 51.8 (s); LRFAB m/e 442 $[\text{M}+\text{NH}_4]^+$; HRFAB Calcd for $\text{C}_{21}\text{H}_{28}\text{N}_7\text{O}_5$ $[\text{M}+\text{NH}_4]^+$ m/e 442.2203; measure m/e 442.2216.

Acetyl 4-azido-2,3,6-tri-*O*-acetyl-4-deoxy- α -D-galactopyranoside (16). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.23 (d, $J = 2.6$ Hz, 1H), 5.32 (m, 2H), 4.0 - 4.2 (m, 4H), 2.072 (s, 3H), 2.070 (s, 3H), 2.01 (s, 3H), 1.95 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 170.4 (s), 170.1 (s), 169.7 (s), 168.8 (s), 89.5 (s), 69.5 (s), 68.5 (s), 66.5 (s), 62.5 (s), 60.4 (s), 20.8 (s), 20.7 (s), 20.5 (s, 2 carbons); LRFAB m/e 380.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{14}\text{H}_{19}\text{N}_3\text{O}_9\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 380.1281; measure m/e 380.1274.

Acetyl 4-azido-2,3,6-tri-*O*-acetyl-4-deoxy- α -D-glucopyranoside (17). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.27 (d, $J = 4.0$ Hz, 1H), 5.45 (dd, $J = 10.2$ Hz, $J = 9.9$ Hz, 1H), 5.03 (dd, $J = 10.2$ Hz, $J = 4.0$ Hz, 1H), 4.35 (dd, $J = 12.5$ Hz, $J = 2.5$ Hz, 1H), 4.26 (dd, $J = 12.5$ Hz, $J = 3.6$ Hz, 1H), 3.87 (ddd, $J = 10.2$ Hz, $J = 3.6$ Hz, $J = 2.5$ Hz, 1H), 3.67 (dd, $J = 10.2$ Hz, $J = 9.9$ Hz, 1H), 2.16 (s, 3H), 2.12 (s, 6H), 2.00 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 170.5 (s), 169.90 (s), 169.84 (s), 168.4 (s), 89.2 (s), 70.5 (s), 70.2 (s), 69.3 (s), 62.4 (s), 59.9 (s, C-4), 21.0 (s), 20.82 (s), 20.77 (s), 20.5 (s); LRFAB m/e 380.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{14}\text{H}_{19}\text{N}_3\text{O}_9\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 380.1281; measure m/e 380.1272.

Acetyl 4,6-diazido-2,3-di-*O*-acetyl-4,6-dideoxy- α -D-galactopyranoside (18). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.30 (d, $J = 2.6$ Hz, 1H), 5.38 (m, 2H), 4.14 (m, 1H), 4.09 (ddd, $J = 6.6$ Hz, $J = 6.9$ Hz, $J = 1.3$ Hz, 1H), 3.54 (dd, $J = 12.5$ Hz, $J = 6.6$ Hz, 1H), 3.37 (dd, $J = 12.5$ Hz, $J = 6.9$ Hz, 1H), 2.14 (s, 3H), 2.13 (s, 3H), 2.01 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 170.2 (s), 169.8 (s), 168.8 (s), 89.5 (s), 69.7 (s), 69.5 (s), 66.5 (s), 60.4 (s), 50.8 (s), 20.9 (s), 20.60 (s), 20.56 (s); LRFAB m/e 363.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{16}\text{N}_6\text{O}_7\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 363.1241; measure m/e 363.1234.

Acetyl 4-azido-2,3-di-*O*-acetyl-4,6-dideoxy- α -D-galactopyranoside (19). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.22 (d, $J = 2.6$ Hz, 1H), 5.30 (m, 2H), 4.16 (qd, $J = 6.3$ Hz, $J = 1.0$ Hz, 1H), 3.92 (m, 1H), 2.09 (s, 3H), 2.08 (s, 3H), 1.97 (s, 3H), 1.24 (d, $J = 6.3$ Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 170.0 (s), 169.6 (s), 168.9 (s), 89.6 (s), 69.9 (s), 67.1 (s), 66.4 (s), 63.8 (s, C-4), 20.7 (s), 20.5 (s, 2 carbons), 17.0 (s); LRFAB m/e 322.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{17}\text{N}_3\text{O}_7\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 322.1227; measure m/e 322.1235.

Acetyl 4-azido-2,3-di-*O*-acetyl-4,6-dideoxy- α -D-glucopyranoside (20). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.22 (d, $J = 2.6$ Hz, 1H), 5.3 (m, 2H), 4.16 (qd, $J = 6.3$ Hz, $J = 1.0$ Hz, 1H), 3.92 (m, 1H), 2.09 (s, 3H), 2.08 (s, 3H), 1.97 (s, 3H), 1.24 (d, $J = 6.3$ Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 170.0 (s), 169.1 (s), 89.2 (s), 70.4 (s), 69.7 (s), 68.6 (s), 65.7 (s), 20.1 (s), 20.8 (s), 20.6 (s), 18.3 (s); LRFAB m/e 363.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{16}\text{N}_6\text{O}_7\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 363.1241; measure m/e 363.1231.

Acetyl 4,6-diazido-2,3-di-*O*-acetyl-4,6-dideoxy- α -D-glucopyranoside (22). ^1H NMR (270 MHz, CDCl_3) (α anomer) δ 6.29 (d, $J = 3.6$ Hz, 1H), 5.45 (dd, $J = 10.1$ Hz, $J = 9.6$ Hz, 1H), 5.02 (dd, $J = 10.1$ Hz, $J = 3.6$ Hz, 1H), 3.77 (dd, $J = 10.2$ Hz, $J = 9.6$ Hz, 1H), 3.58 (dd, $J = 13.6$ Hz, $J = 2.0$ Hz, 1H), 3.50 (ddd, $J = 10.2$ Hz, $J = 3.4$ Hz, $J = 2.0$ Hz, 1H), 3.43 (dd, $J = 13.6$ Hz, $J = 3.4$ Hz, 1H), 2.15 (s, 3H), 2.10 (s, 3H), 1.99 (s, 3H); ^{13}C NMR (68 MHz, CDCl_3) (α anomer) δ 169.9 (s), 169.8 (s), 168.8 (s), 89.2 (s), 71.4 (s), 69.3 (s), 69.3(s), 60.0 (s), 51.0 (s), 21.0 (s), 20.8 (s), 20.5 (s); LRFAB m/e 363.1 $[\text{M}+\text{Li}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{16}\text{N}_6\text{O}_7\text{Li}$ $[\text{M}+\text{Li}]^+$ m/e 363.1241; measure m/e 363.1231.

For the synthesis of **23** - **29**, please refer to reference 28.

2,4-Di-*O*-acetyl-3-*O*-allyl-6-deoxy- α -D-glucopyranosyl trichloroacetimidate (38). Please refer the general procedure for the preparation of glycosyl trichloroacetimidate. ^1H NMR (270 MHz, CDCl_3) δ 8.58 (s, NHCCl_3), 6.44 (d, $J = 3.6$ Hz, 1H), 5.80 (dddd, $J = 17.4$ Hz, $J = 10.2$ Hz, $J = 5.3$ Hz, $J = 5.6$ Hz, 1H), 5.21 (dd, $J = 17.4$ Hz, $J = 1.6$ Hz, 1H), 5.12 (dd, $J = 10.2$ Hz, $J = 1.6$ Hz, 1H), 4.98 (dd, $J = 9.9$ Hz, $J = 3.6$ Hz, 1H), 4.87 (dd, $J = 9.9$ Hz, $J = 9.6$ Hz, 1H), 4.17 (dd, $J = 12.9$ Hz, $J = 5.3$ Hz, 1H), 4.07 (dd, $J = 12.9$ Hz, $J = 5.6$ Hz, 1H), 3.97(dq, $J = 9.9$ Hz, $J = 6.3$ Hz, 1H), 3.90 (dd, $J = 9.9$ Hz, $J = 9.6$ Hz, 1H), 2.10 (s, 3H), 2.03 (s, 3H), 1.19 (d, $J = 6.3$ Hz, 3H); ^{13}C NMR (68MHz, CDCl_3) δ 169.9 (s), 169.6 (s), 160.9 (s), 134.5 (s), 116.8 (s), 93.6 (s), 76.5 (s), 74.2 (s), 73.6 (s), 72.4 (s), 68.7 (s), 21.0 (s), 20.7 (s), 17.4 (s).

2,3,4-Tri-*O*-acetyl-6-deoxy-6-fluoro- α -D-glucopyranosyl trichloroacetimidate (46). Please refer the general procedure for the preparation of glycosyl trichloroacetimidate. ^1H NMR (270

MHz, CDCl₃) δ 8.67 (s, 1H), 6.54 (d, $J = 5.4$ Hz, 1H), 5.55 (t, $J = 10.8$ Hz, 1H), 5.15 (t, $J = 10.8$ Hz, 1H), 5.05 (dd, $J = 8.1$ Hz, $J = 5.4$ Hz, 1H), 4.6 – 4.5 (m, 1H), 4.4 – 4.3 (m, 1H), 4.2 – 4.1 (m, 1H), 2.03 (s, 3H), 2.0 (s, 3H), 1.9 (s, 3H); ¹³C NMR (68 MHz, CDCl₃) δ 170.1 (s), 169.8 (s), 169.5 (s), 160.8 (s), 92.9 (s), 90.7 (s), 80.7 (d, $J_{CF} = 177$ Hz), 70.7 (d, $J_{CF} = 19$ Hz), 69.7 (d, $J_{CF} = 8.8$ Hz), 67.6 (s), 67.4 (s), 20.8 (s), 20.6 (s), 20.5 (s).

***Cis*, cis-3,5-diazidocyclohexyl β-D-2,3,4-tri-*O*-acetyl-6-azido-6-deoxyglucopyranoside (31).**

Please refer to the general procedure for glycosylation. The compound is mixed with inseparable impurities, and characterized only by ¹H and ¹³C NMR. ¹H NMR (270 MHz, CDCl₃) δ 5.19 (t, $J = 9.6$ Hz, 1H), 4.94 (dd, $J = 9.6$ Hz, $J = 7.9$ Hz, 1H), 4.93 (t, $J = 9.6$ Hz, 1H), 4.63 (d, $J = 7.9$ Hz, 1H), 3.67 (ddd, $J = 9.6$ Hz, $J = 4.7$ Hz, $J = 2.3$ Hz, 1H), 3.60-3.78 (m, 1H), 3.30-3.51 (m, 1H), 3.32 (tt, $J = 11.9$ Hz, $J = 4.1$ Hz, 2H), 3.11 (dd, $J = 13.2$ Hz, $J = 2.3$ Hz), 2.16-2.38 (m, 3H), 2.04 (s, 3H), 2.02 (s, 3H), 1.99(s, 3H), 1.18-1.46(m, 3H); ¹³C NMR (68 MHz, CDCl₃) δ 169.6 (s), 168.9 (s), 168.6 (s), 98.7 (s), 73.7 (s), 73.3 (s), 71.9 (s), 70.8 (s), 69.1 (s), 54.6 (s), 54.4 (s), 50.6 (s), 37.5 (s), 36.1 (s), 35.9 (s), 35.8 (s), 20.1 (s), 20.0 (s).

***Cis*, cis-3,5-diazidocyclohexyl β-D-2,3,4-tri-*O*-acetyl-6-azido-6-deoxyglucopyranoside (31).**

Please refer to the general procedure for glycosylation. The compound is mixed with inseparable impurities, and characterized only by ¹H and ¹³C NMR. ¹H NMR (270 MHz, CDCl₃) δ 5.19 (t, $J = 9.6$ Hz, 1H), 4.94 (dd, $J = 9.6$ Hz, $J = 7.9$ Hz, 1H), 4.93 (t, $J = 9.6$ Hz, 1H), 4.63 (d, $J = 7.9$ Hz, 1H), 3.67 (ddd, $J = 9.6$ Hz, $J = 4.7$ Hz, $J = 2.3$ Hz, 1H), 3.60-3.78 (m, 1H), 3.30-3.51 (m, 1H), 3.32 (tt, $J = 11.9$ Hz, $J = 4.1$ Hz, 2H), 3.11 (dd, $J = 13.2$ Hz, $J = 2.3$ Hz), 2.16-2.38 (m, 3H), 2.04 (s, 3H), 2.02 (s, 3H), 1.99(s, 3H), 1.18-1.46(m, 3H); ¹³C NMR (68 MHz, CDCl₃) δ 169.6 (s), 168.9 (s), 168.6 (s),

98.7 (s), 73.7 (s), 73.3 (s), 71.9 (s), 70.8 (s), 69.1 (s), 54.6 (s), 54.4 (s), 50.6 (s), 37.5 (s), 36.1 (s), 35.9 (s), 35.8 (s), 20.1 (s), 20.0 (s).

Cis, cis-3,5-diazidocyclohexyl b-D-2,3-di-O-acetyl-4,6-diazido-4,6-dideoxyglucopyranoside (33). Please refer to the general procedure for glycosylation. ^1H NMR (270 MHz, CDCl_3) δ 5.11 (t, $J = 9.6$ Hz, 1H), 4.85 (dd, $J = 9.6$ Hz, $J = 7.9$ Hz, 1H), 4.58 (d, $J = 7.9$ Hz, 1H), 3.64 (tt, $J = 12.0$ Hz, $J = 4.3$ Hz, 1H), 3.57 (t, $J = 9.6$ Hz, 1H), 3.45 (d, $J = 4.3$ Hz, 1H), 3.40 (dt, $J = 9.6$ Hz, $J = 4.3$ Hz, 1H), 3.25 (tt, $J = 12.0$ Hz, $J = 4.3$ Hz, 2H), 2.27-2.38 (m, 1H), 2.15-2.26 (m, 2H), 2.06 (s, 3H), 2.00 (s, 3H), 1.27 (q, $J = 12.0$ Hz, 2H), 1.15-1.45 (m, 1H); ^{13}C NMR (68 MHz, CDCl_3) δ 169.4 (s), 168.8 (s), 98.7 (s), 73.3 (s), 73.1 (s), 72.9 (s), 71.0 (s), 60.0 (s), 54.4 (s), 54.3 (s), 50.8 (s), 37.5 (s), 36.1 (s), 35.9 (s), 20.1 (s), 20.0 (s); LRFAB m/e 501 $[\text{M}+\text{Na}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{22}\text{N}_{12}\text{O}_6\text{Na}$ $[\text{M}+\text{Na}]^+$ m/e 501.1683; measure m/e 501.1692.

5-O-(2,4-Di-O-acetyl-3-O-allyl-6-deoxy-b-D-glucopyranosyl)-6,3'4'-tri-O-benzyl-1,3,2'6'-tetra-azidoneamine (39). Please refer to the general procedure for glycosylation. ^1H NMR (270 MHz, CDCl_3) δ 7.2 – 7.5 (m, 15H), 5.76 (dddd, $J = 17.1$ Hz, $J = 10.2$ Hz, $J = 5.6$ Hz, $J = 5.6$ Hz, 1H), 5.71 (d, $J = 3.6$ Hz, 1H), 5.20 (dd, $J = 17.1$ Hz, $J = 1.6$ Hz, 1H), 5.14 (dd, $J = 10.2$ Hz, $J = 1.6$ Hz, 1H), 5.03 (d, $J = 11.2$ Hz, 1H), 5.00 (d, $J = 11.9$ Hz, 1H), 4.8 - 4.9 (m, 5H), 4.70 (d, $J = 9.9$ Hz, 1H), 4.59 (d, $J = 11.2$ Hz, 1H), 4.20 (m, 1H), 4.0 - 4.1 (m, 4H), 3.2 - 3.6 (m, 10H), 2.30 (ddd, $J = 13.5$ Hz, $J = 4.6$ Hz, $J = 4.6$ Hz, 1H), 2.13 (s, 3H), 2.06 (s, 3H), 1.46 (ddd, $J = 13.5$ Hz, $J = 12.5$ Hz, $J = 12.5$ Hz, 1H), 1.20 (d, $J = 6.3$ Hz, 3H); ^{13}C NMR (68 MHz, CDCl_3) δ 169.5(s), 168.8(s), 137.9 (s, 2C), 137.2 (s), 134.5 (s), 128.7 (s), 128.7 (s), 128.5 (s), 128.4 (s), 128.2 (s), 127.9 (s), 117.0 (s), 99.0 (s), 97.5 (s), 85.2 (s), 79.7 (s), 79.5 (s), 78.7 (s), 77.3 (s), 75.5 (s, 2 carbons), 75.3

(s), 75.0 (s), 74.4 (s), 72.9 (s), 72.3 (s), 71.1 (s), 70.6 (s), 63.0 (s), 60.7 (s), 59.5 (s), 51.2 (s), 32.6 (s), 21.2 (s), 21.1 (s), 17.0 (s); MALDI Calcd for C₄₆H₅₄N₁₇O₁₂K [M+K]⁺ m/e 1005.3616; measure m/e 1005.3566.

5-*O*-(3-*O*-(3-(2,4-Di-*O*-acetyl-3-*O*-(2-azidoethyl)-6-deoxy-*b*-D-glucopyranosyl)-*n*-propyl)-6-deoxy-*b*-D-glucopyranosyl)-6,3'4'-tri-*O*-benzyl-1,3,2'6'-tetraazidoneamine (42). Please refer to the general procedure for glycosylation. ¹H NMR (270 MHz, CDCl₃) δ 7.3-7.5 (m, 15H), 5.88 (d, *J* = 3.9 Hz, 1H), 4.8 - 5.0 (m, 8H), 4.60 (d, *J* = 11.2 Hz, 1H), 4.32 (d, *J* = 7.9 Hz, 1H), 3.9 - 4.2 (m, 4H), 3.0 - 3.7 (m, 21H), 2.28 (ddd, *J* = 13.3 Hz, *J* = 4.3 Hz, *J* = 4.0 Hz, 1H), 2.10 (s, 3H), 2.08 (s, 3H), 1.80 (m, 2H), 1.46 (ddd, *J* = 13.3 Hz, *J* = 12.5 Hz, *J* = 12.5 Hz, 1H), 1.30 (d, *J* = 5.3 Hz, 3H), 1.23 (d, *J* = 5.9 Hz, 3H); ¹³C NMR (68 MHz, CDCl₃) δ 169.7 (s), 169.5 (s), 137.9 (s), 137.8 (s), 137.1 (s), 128.9 (s), 128.6 (s), 128.5 (s), 128.2 (s), 128.0 (s), 127.8 (s), 102.0 (s), 100.6 (s), 96.5 (s), 84.7 (s), 84.3 (s), 80.4 (s), 79.6 (s), 79.1 (s), 78.7 (s), 76.0 (s), 75.5 (s), 75.1 (s), 75.0 (s), 74.6 (s), 73.7 (s), 72.1 (s), 72.0 (s), 70.9 (s), 70.5 (s), 69.1 (s), 68.3 (s), 65.5 (s), 63.2 (s), 60.7 (s), 60.5 (s), 59.8 (s), 51.2 (s), 51.1 (s), 32.6 (s), 30.1 (s), 21.1 (s), 21.0 (s), 17.4 (s), 17.2 (s); MALDI Calcd for C₅₄H₆₉N₁₅O₁₇Na [M+Na]⁺ m/e 1222.4888; measure m/e 1222.4854.

5-*O*-(2,3,4-Tri-*O*-acetyl-6-deoxy-6-fluoro-*b*-D-glucopyranosyl)-6,3'4'-tri-*O*-benzyl-1,3,2'6'-tetraazidoneamine (47). Please refer to the general procedure for glycosylation. ¹H NMR (270 MHz, CDCl₃) δ 7.2 - 7.5 (m, 15H), 5.66 (d, *J* = 2.7 Hz, 1H), 5.20 (d, *J* = 7.6 Hz, 1H), 5.0 - 5.1 (m, 3H), 4.8 - 5.0 (m, 3H), 4.5 - 4.7 (m, 2H), 4.21 (ddd, *J* = 9.9 Hz, *J* = 4.9 Hz, *J* = 2.6 Hz, 1H), 4.09 (dd, *J* = 8.9 Hz, *J* = 9.2 Hz, 1H), 4.03 (dd, *J* = 8.9 Hz, *J* = 8.6 Hz, 1H), 3.2 - 3.6 (m, 10H), 2.32 (ddd, *J* = 13.2 Hz, *J* = 4.3 Hz, *J* = 4.3 Hz, 1H), 2.10 (s, 3H), 2.015 (s, 3H), 2.010 (s, 3H), 1.48 (ddd,

$J = 13.2$ Hz, $J = 12.5$ Hz, $J = 12.5$ Hz, 1H); ^{13}C NMR (68 MHz, CDCl_3) δ 170.3 (s), 169.4 (s), 168.9 (s), 137.9 (s), 136.8 (s), 129.0 (s), 128.8 (s), 128.7 (s), 128.5 (s), 128.2 (s), 128.0 (s), 98.9 (s), 97.6 (s), 85.0 (s), 80.9 (d, $J = 213$ Hz), 79.4 (s), 78.7 (s), 78.0 (s), 77.3 (s), 75.8 (s), 75.7 (s), 75.3 (s), 75.0 (s), 72.8 (s), 71.6 (s), 71.1 (s), 68.2 (d, $J = 7.5$ Hz), 62.9 (s), 60.7 (s), 59.5 (s), 51.2 (s), 32.5 (s), 21.0 (s), 20.7 (s), 20.6 (s); MALDI Calcd for $\text{C}_{45}\text{H}_{51}\text{O}_{13}\text{N}_{12}\text{FNa}$ $[\text{M}+\text{Na}]^+$ m/e 1009.3575; measure m/e 1009.3602.

***Cis*, *cis*-3,5-diaminocyclohexyl β -D-4,6-diamino-4,6-dideoxygluco-pyranoside (34).** Please refer to the procedure for the synthesis of **32**. ^1H NMR (270 MHz, D_2O) (acetate salt) δ 4.66 (d, $J = 7.9$ Hz, 1H), 4.0 (m, 2H), 3.66 (dd, $J = 9.9$ Hz, $J = 9.9$ Hz, 1H), 3.48 (d, $J = 13.2$ Hz, 1H), 3.3 - 3.4 (m, 3H), 3.1 - 3.2 (m, 2H), 2.3 - 2.5 (m, 3H), 2.00 (s, 12H), 1.3 - 1.6 (m, 3H); ^{13}C NMR (68 MHz, D_2O) (acetate salt) δ 177.6 (s), 100.8 (s), 73.04 (s), 73.00 (s), 71.6 (s), 68.9 (s), 53.3 (s), 45.4 (s), 45.3 (s), 40.0 (s), 35.8 (s), 34.6 (s), 33.0 (s), 21.0 (s). LRFAB m/e 291 $[\text{MH}]^+$; HRFAB Calcd for $\text{C}_{12}\text{H}_{27}\text{N}_4\text{O}_4$ $[\text{MH}]^+$ m/e 291.2032; measure m/e 291.2025.

5-*O*-(6-Deoxy-6-fluoro- β -D-glucopyranosyl)neamine (TC033). Please refer to the procedure for the final synthesis. ^1H NMR (270 MHz, D_2O) (chloride salt) δ 5.83 (d, $J = 2.7$ Hz, 1H), 5.08 (d, $J = 8.1$ Hz, 1H), 4.55 (d, $J = 8.1$ Hz, 1H), 4.0 - 3.8 (m, 8H), 3.6 - 3.3 (m, 8H), 2.4 (m, 2H); ^{13}C NMR (68 MHz, D_2O) (acetate salt) δ 178.2 (s), 102.6 (s), 96.1 (s), 81.4 (d, $J_{\text{CF}} = 163$ Hz), 80.1 (s), 75.5 (s), 75.4 (s), 74.9 (d, $J_{\text{CF}} = 13.6$ Hz), 73.3 (s), 73.0 (s), 70.7 (s), 69.6 (s), 68.1 (s, 2 carbons), 53.4 (s), 49.8 (s), 48.6 (s), 40.0 (s), 28.2 (s), 21.4 (s). LRFAB m/e 487 $[\text{MH}]^+$; HRFAB Calcd for $\text{C}_{18}\text{H}_{36}\text{O}_{10}\text{N}_4\text{F}$ $[\text{MH}]^+$ m/e 487.2415; measure m/e 487.2427.

5-*O*-(3-*O*-*n*-Propyl-6-deoxy- β -D-glucopyranosyl)neamine (TC040). Please refer to the procedure for the final synthesis. ^1H NMR (270 M Hz, D_2O) (acetate salt) δ 5.81 (d, J = 3.6 Hz, 1H), 5.00 (d, J = 7.9 Hz, 1H), 3.8 - 4.0 (m, 5H), 3.70 (dd, J = 6.6 Hz, J = 6.9 Hz, 2H), 3.1 - 3.5 (m, 10H), 2.45 (m, 1H), 1.94 (s, 12H), 1.83 (m, 1H), 1.53 (m, 2H), 1.25 (d, J = 5.9 Hz, 3H), 0.82 (t, J = 7.5 Hz, 3H); ^{13}C NMR (68 MHz, D_2O) (acetate salt) δ 178.7 (s), 102.7 (s), 96.3 (s), 83.7 (s), 80.7 (s), 76.0 (s), 75.1 (s), 74.5 (s), 73.3 (s), 73.1 (s), 72.9 (s), 70.8 (s), 69.6 (s), 68.2 (s), 53.5 (s), 49.8 (s), 48.8 (s), 40.1 (s), 28.2 (s), 22.8 (s), 21.7 (s), 16.6 (s), 9.8 (s); MALDI Calcd for $\text{C}_{21}\text{H}_{46}\text{N}_4\text{O}_{10}\text{Na}$ $[\text{M}+\text{Na}]^+$ m/e 533.2793; measure m/e 533.2817.

5-*O*-(3-*O*-(3-Hydroxypropyl)-6-deoxy- β -D-glucopyranosyl)neamine (TC041). Please refer to the procedure for the final synthesis. ^1H NMR (270 M Hz, D_2O) (acetate salt) δ 5.80 (d, J = 3.6 Hz, 1H), 5.02 (d, J = 7.9 Hz, 1H), 3.8 - 4.0 (m, 7H), 3.64 (dd, J = 6.3 Hz, J = 6.3 Hz, 2H), 3.2 - 3.5 (m, 10H), 2.45 (m, 1H), 1.92 (s, 12H), 1.7 - 2.0 (m, 3H), 1.26 (d, J = 6.0 Hz, 3H); ^{13}C NMR (68 MHz, D_2O) (acetate salt) δ 178.2 (s), 102.6 (s), 96.4 (s), 84.1 (s), 80.7 (s), 76.1 (s), 74.4 (s), 73.2 (s), 73.1 (s), 72.9 (s), 70.6 (s), 70.3 (s), 69.6 (s), 68.3 (s), 59.0 (s), 53.4 (s), 49.7 (s), 48.7 (s), 40.0 (s), 31.9 (s), 28.2 (s), 21.4 (s), 16.6 (s); MALDI Calcd for $\text{C}_{21}\text{H}_{46}\text{N}_4\text{O}_{11}\text{Na}$ $[\text{M}+\text{Na}]^+$ m/e 549.2742; measure m/e 549.2738.

5-*O*-(3-*O*-(3-Fluoropropyl)-6-deoxy- β -D-glucopyranosyl)neamine (TC044). Please refer to the procedure for the final synthesis. ^1H NMR (270 M Hz, D_2O) (acetate salt) δ 5.77 (d, J = 4.0 Hz, 1H), 4.99 (d, J = 7.9 Hz, 1H), 4.61 (dd, J = 5.9 Hz, J = 5.6 Hz, 1H), 4.44 (dd, J = 5.9 Hz, J = 5.9 Hz, 1H), 3.7 - 4.0 (m, 7H), 3.1 - 3.6 (m, 10H), 2.42 (ddd, J = 12.5 Hz, J = 4.3 Hz, J = 4.3 Hz, 1H), 1.92 (s, 12H), 1.8 - 2.0 (m, 3H), 1.23 (d, J = 6.3 Hz, 3H); ^{13}C NMR (68 M Hz, D_2O) (acetate salt)

δ 178.5 (s), 102.6 (s), 96.3 (s), 84.1 (s), 82.4 (d, $J_{\text{CF}} = 157.8$ Hz), 80.7 (s), 76.1 (s), 74.4 (s), 73.2 (s), 73.1 (s), 72.9 (s), 70.6 (s), 69.6 (s), 69.1 (d, $J_{\text{CF}} = 5.2$ Hz), 68.3 (s), 53.4 (s), 49.7 (s), 48.7 (s), 40.0 (s), 30.5 (d, $J_{\text{CF}} = 19.2$ Hz), 28.2 (s), 21.6 (s), 16.6 (s); MALDI Calcd for $\text{C}_{21}\text{H}_{45}\text{FN}_4\text{O}_{10}\text{Na}$ $[\text{M}+\text{Na}]^+$ m/e 551.2699; measure m/e 551.2719.

5-*O*-(3-*O*-(3-*O*-(2-aminoethyl)-6-deoxy- β -D-glucopyranosyl)-*n*-propyl)-6-deoxy- β -D-glucopyranosyl)neamine (TC045). Please refer to the procedure for the final synthesis. ^1H NMR (270 MHz, D_2O) (acetate salt) δ 5.78 (d, $J = 3.6$ Hz, 1H), 4.99 (d, $J = 7.9$ Hz, 1H), 4.35 (m, 1H), 3.6 - 4.0 (m, 10H), 3.1 - 3.5 (m, 17H), 2.43 (m, 1H), 1.94 (s, 15H), 1.8 - 2.0 (m, 3H), 1.24 (d, $J = 5.9$ Hz, 3H), 1.20 (d, $J = 5.9$ Hz, 3H); ^{13}C NMR (68 MHz, D_2O) (acetate salt) δ 178.2 (s), 102.6 (s), 102.1 (s), 96.4 (s), 84.2 (s), 84.1 (s), 80.8 (s), 76.1 (s), 74.6 (s), 74.4 (s), 73.3 (s), 73.1 (s, 2 carbons), 72.9 (s), 71.9 (s), 70.6 (s), 70.0 (s), 69.6 (s), 68.3 (s), 68.2 (s), 67.5 (s), 53.4 (s), 49.7 (s), 48.7 (s), 40.0 (s), 39.7 (s), 29.7 (s), 28.2 (s), 21.4 (s), 16.7 (s), 16.6 (s); MALDI Calcd for $\text{C}_{29}\text{H}_{57}\text{N}_5\text{O}_{15}\text{Na}$ $[\text{M}+\text{Na}]^+$ m/e 738.3743; measure m/e 738.3786.