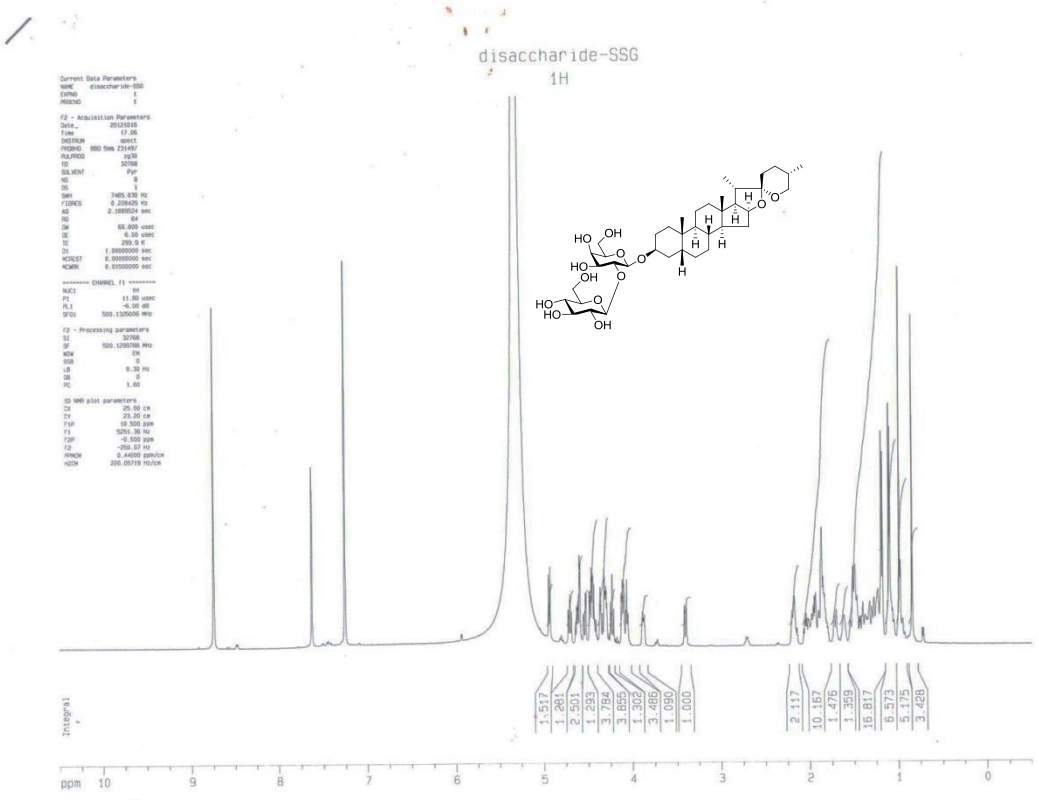
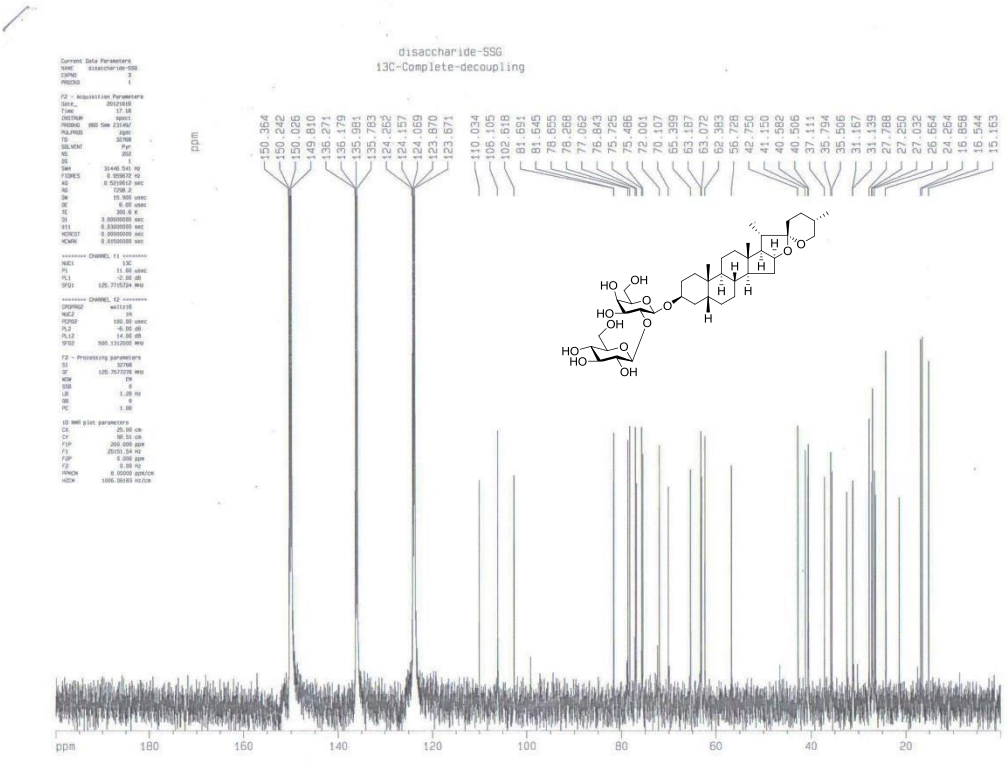
Appendix I

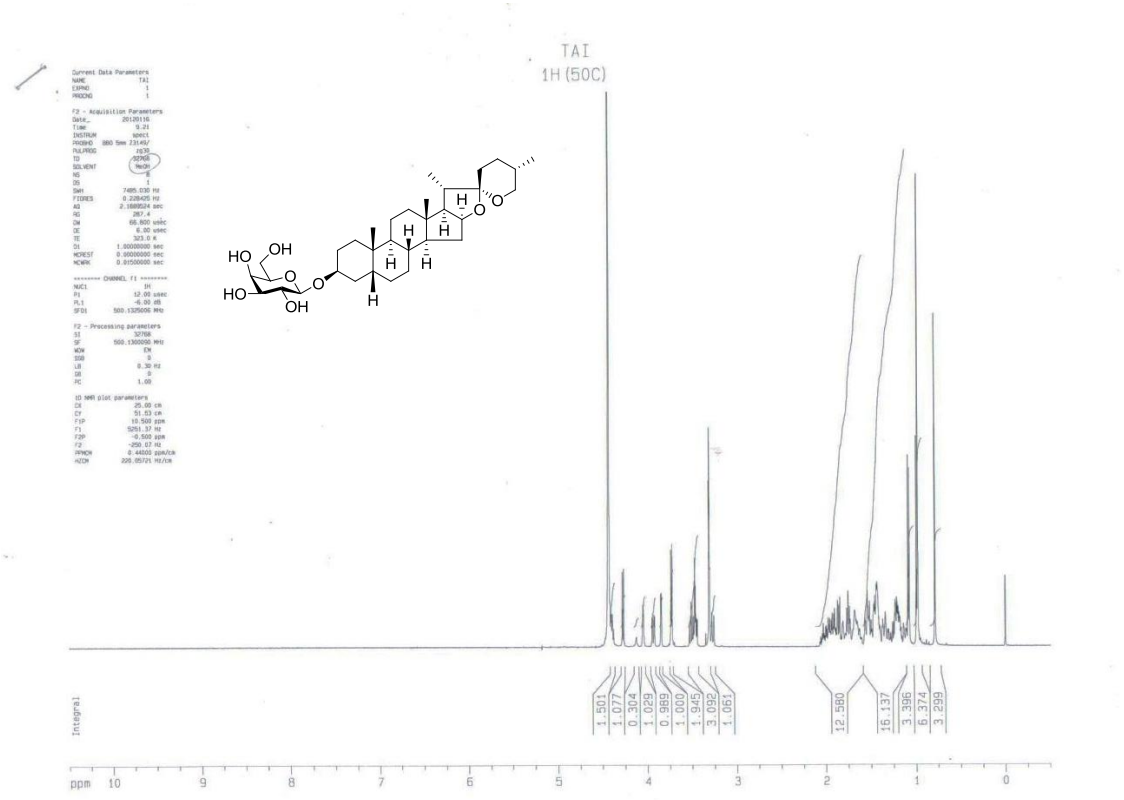
^{1}H NMR of Timosaponin A III (**2**)



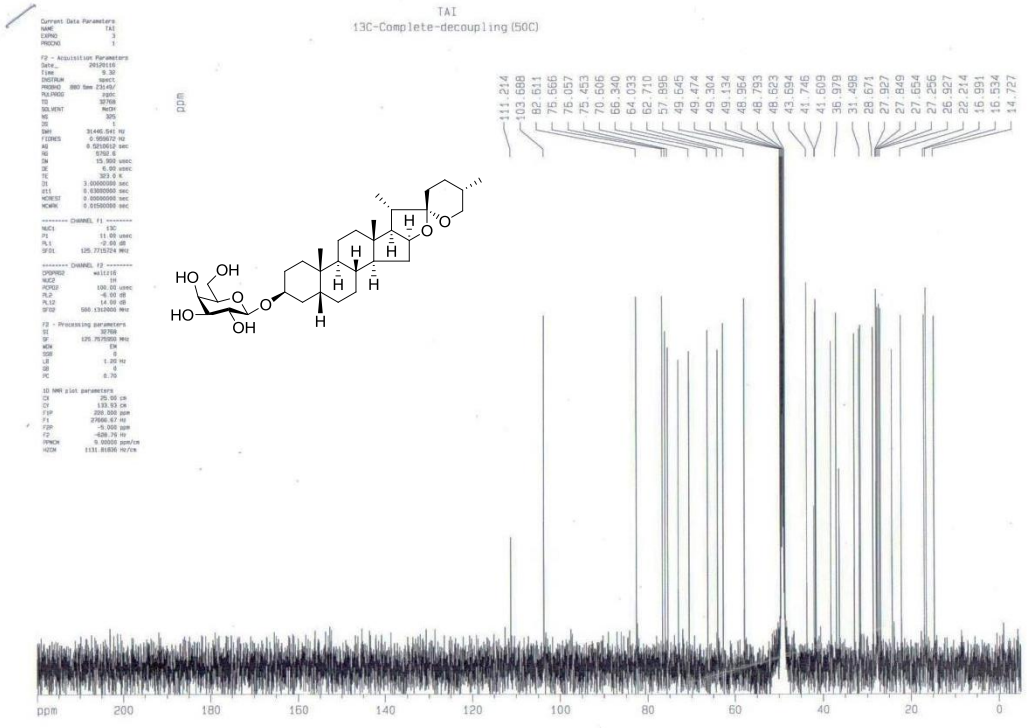
^{13}C NMR of Timosaponin A III (**2**)



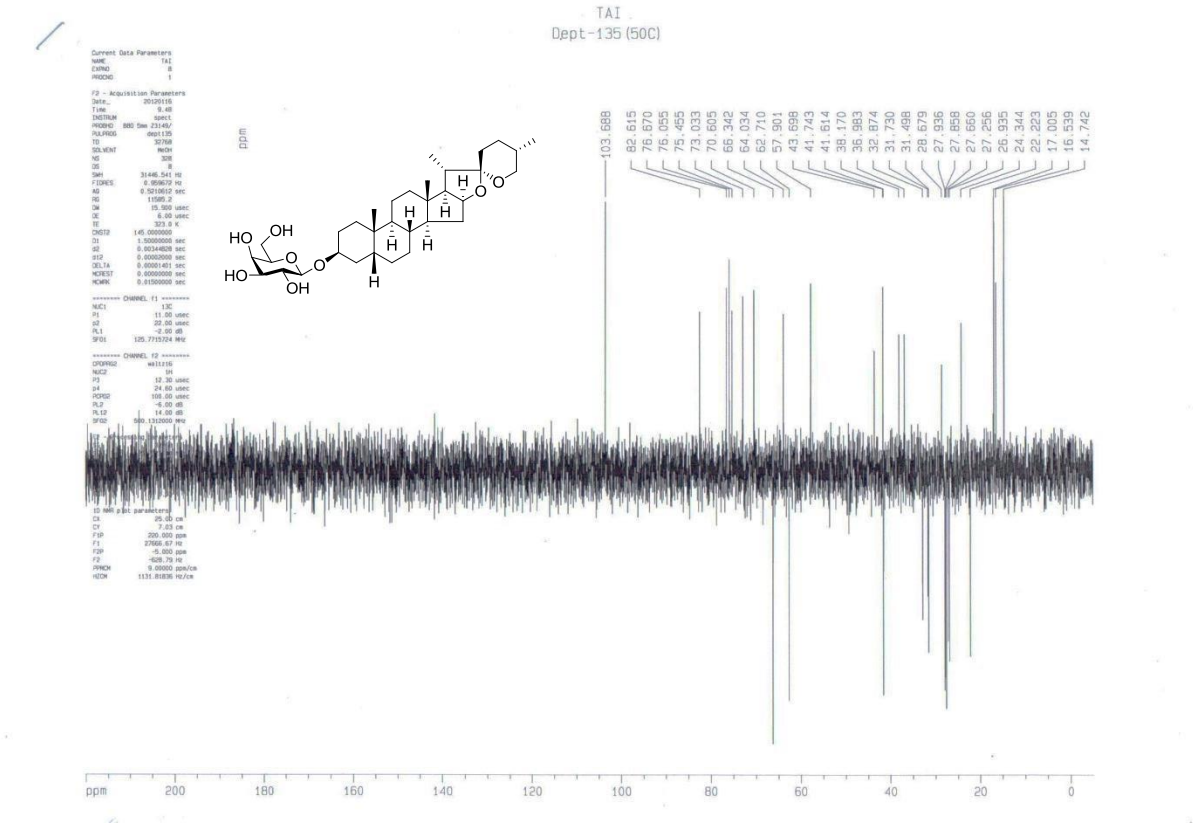
^{1}H NMR of Timosaponin A I (**3**)



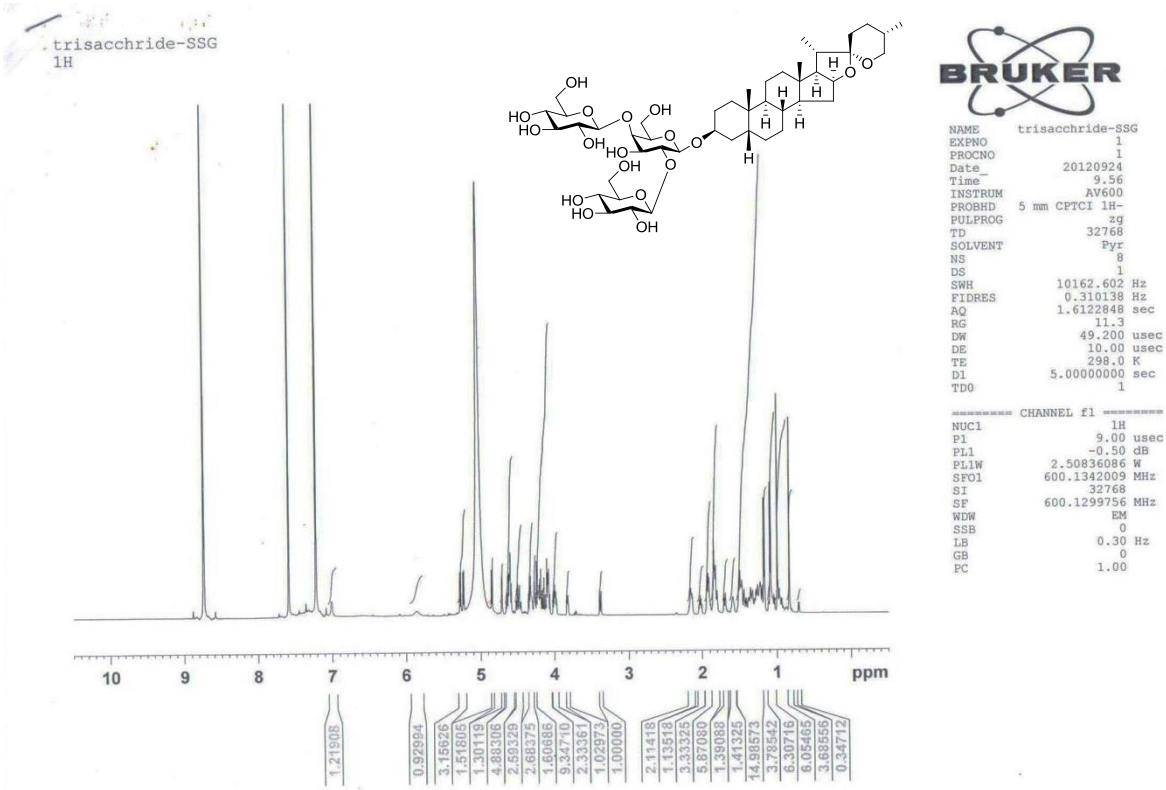
^{13}C NMR of Timosaponin A I (**3**)



Dept-135 of Timosaponin A I (**3**)



^{1}H NMR of Timosaponin A V (**4**)



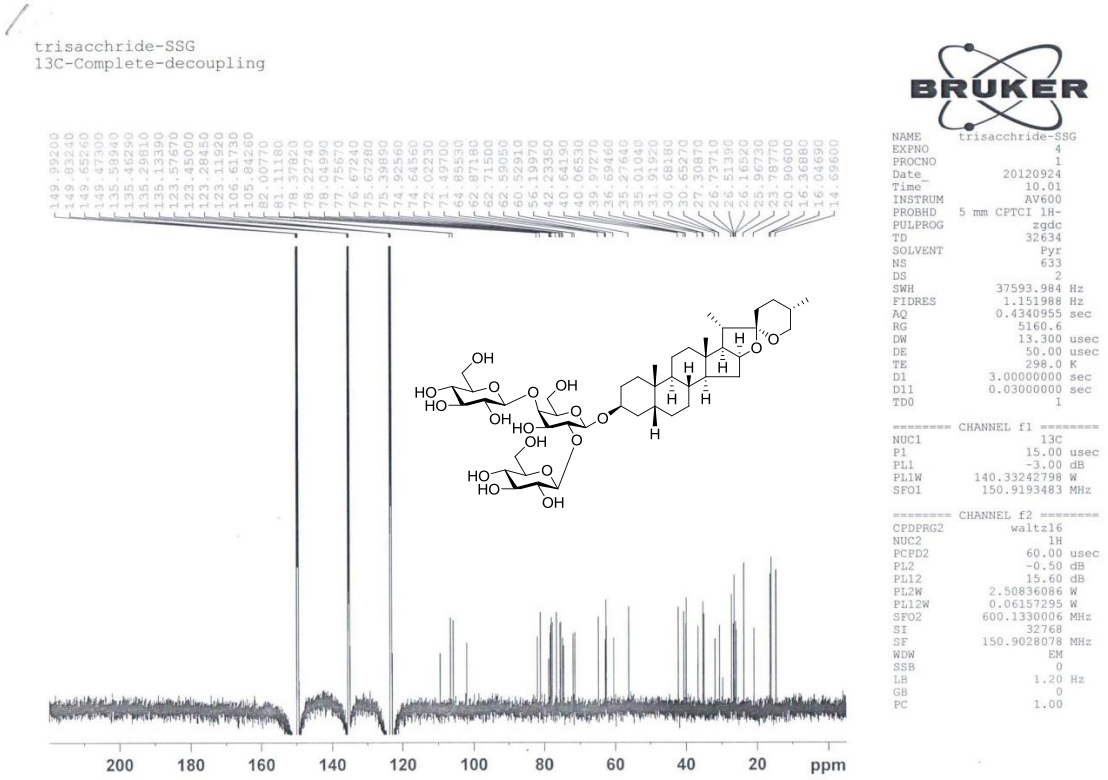
BRUKER

NAME	trisacchride-SSG
EXPNO	1
PROCNO	1
Date_	20120924
Time	9.56
INSTRUM	AV600
PROBHD	5 mm CPTCI 1H-
PULPROG	zg
TD	32768
SOLVENT	Pyr
NS	8
DS	1
SWH	10162.602 Hz
FIDRES	0.310138 Hz
AQ	1.6122848 sec
RG	11.3
DW	49.200 usec
DE	10.00 usec
TE	298.0 K
D1	5.00000000 sec
TD0	1

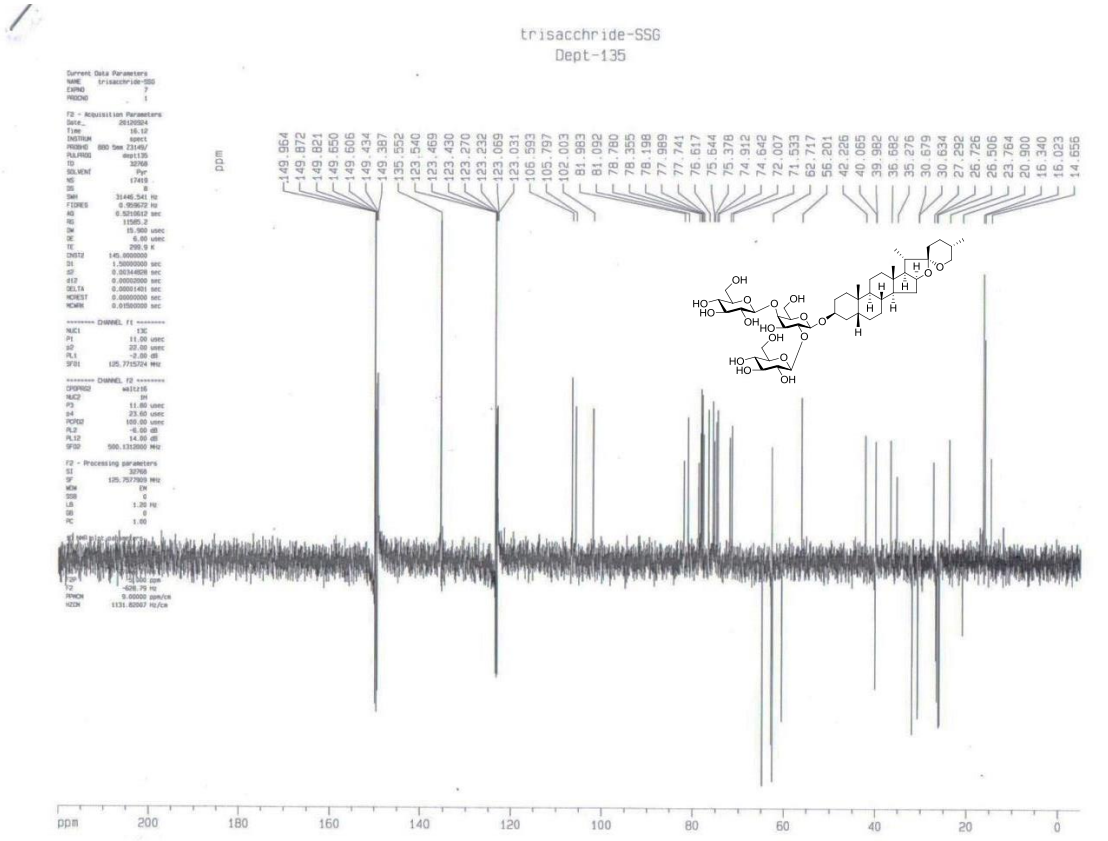
======== CHANNEL f1 ========

NUC1	1H
P1	9.00 usec
PL1	-0.50 dB
PL1W	2.50836086 W
SFO1	600.1342009 MHz
SI	32768
SF	600.1299756 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

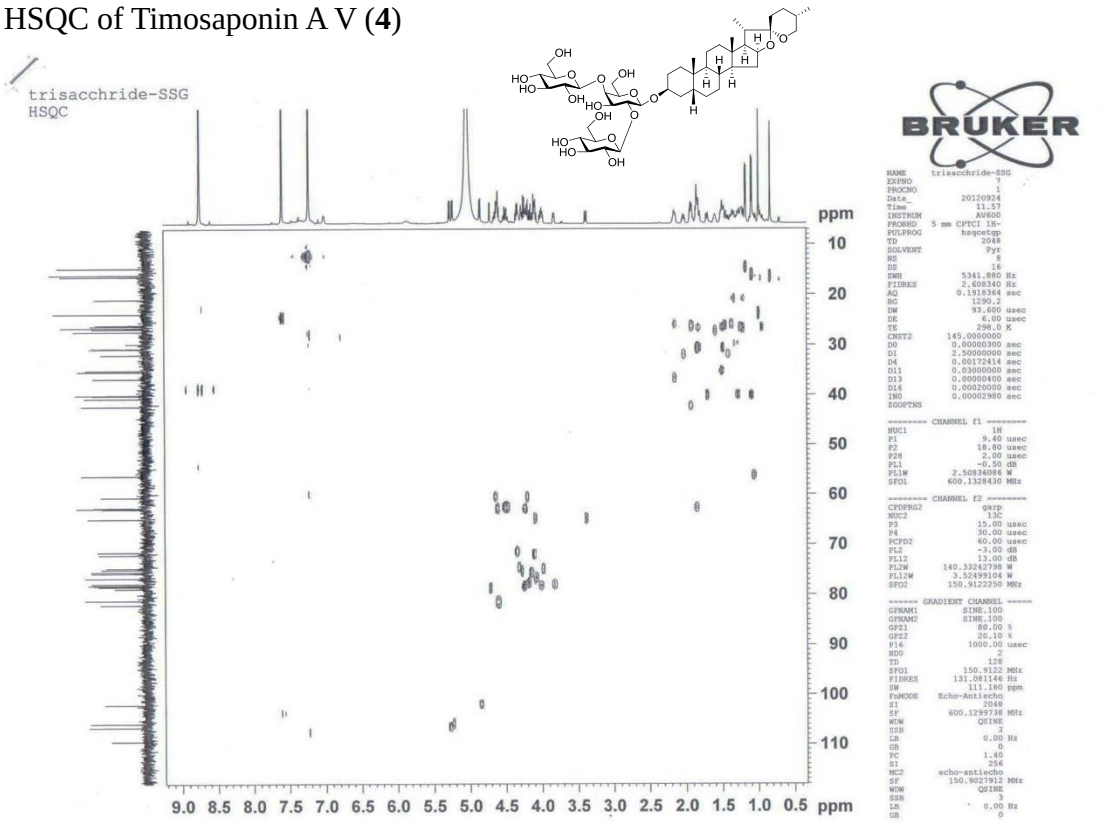
^{13}C NMR of Timosaponin A V (**4**)

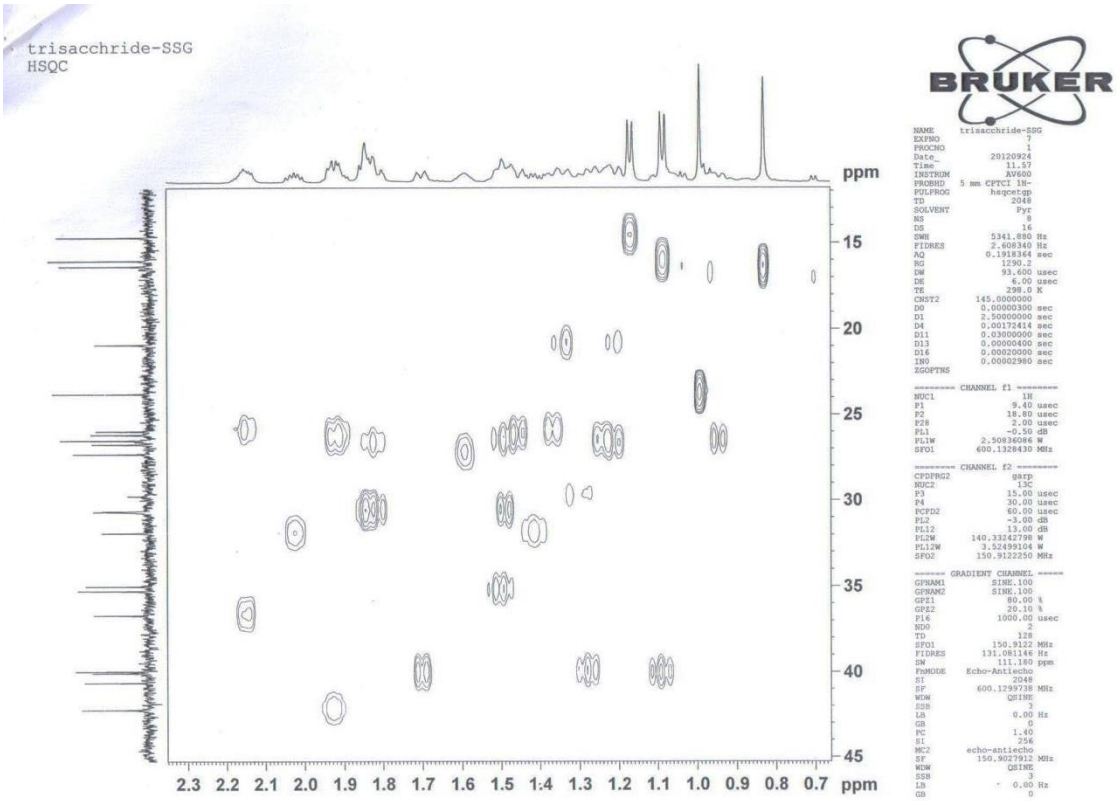


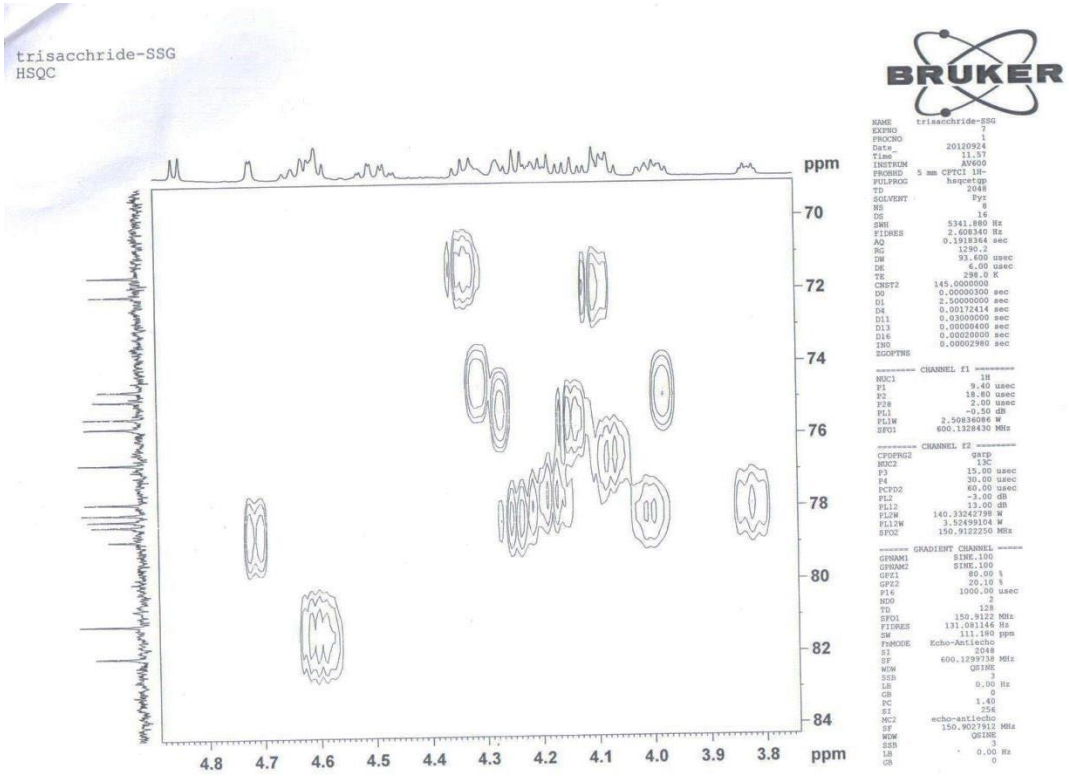
Dept-135 of Timosaponin A V (**4**)



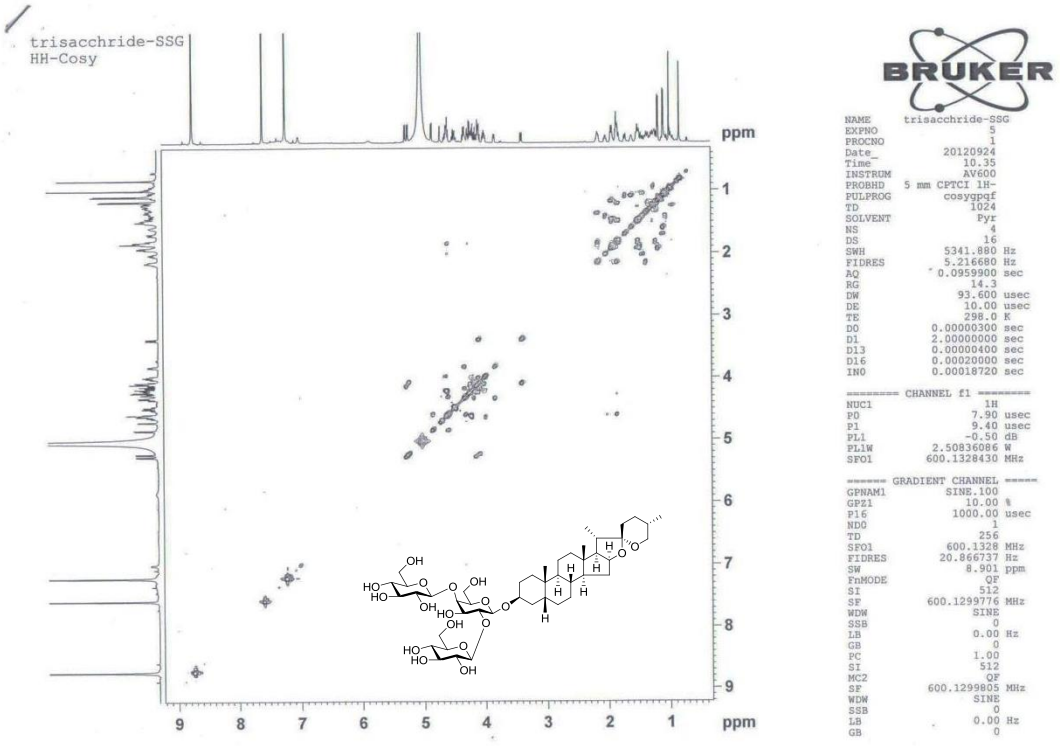
HSQC of Timosaponin A V (**4**)



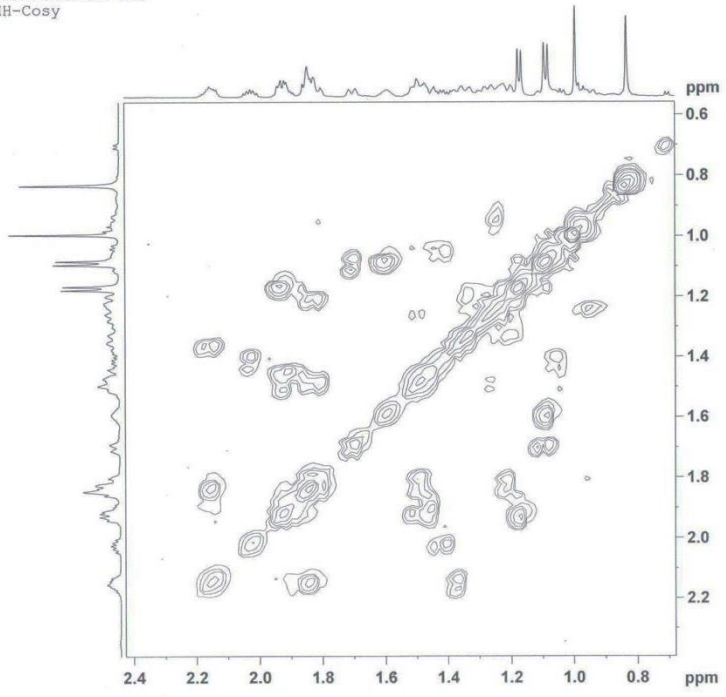




HH-COSY of Timosaponin A V (**4**)



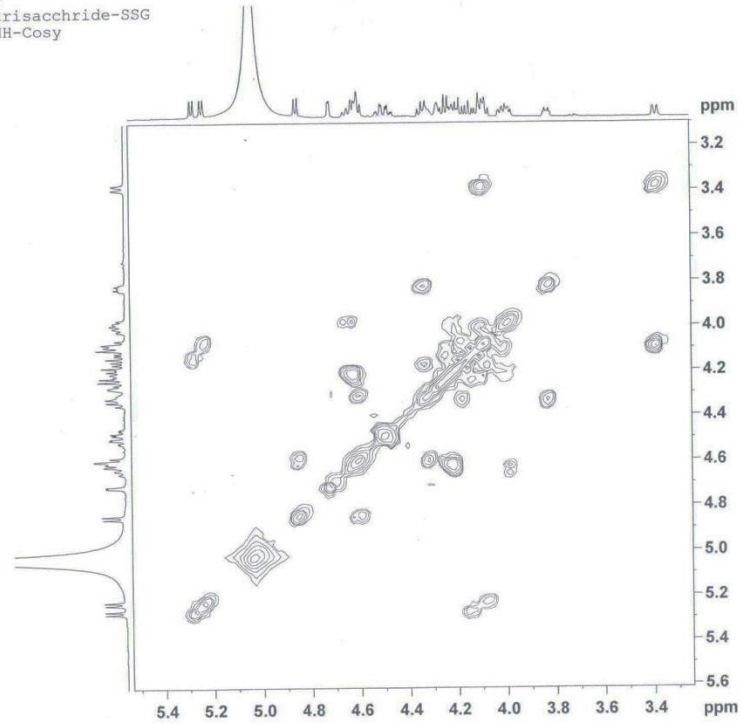
trisacchride-SSG
HH-Cosy



BRUKER

NAME	trisacchride-SSG	
EXPNO	5	
PROCNO	1	
Date_	20120924	
Time	10.35	
INSTRUM	AV600	
PROBHD	5 mm CPTCI 1H-	
PULPROG	cosygpqf	
TD	1024	
SOLVENT	Pyr	
NS	4	
DS	16	
SWH	5341.880	Hz
FIDRES	5.216680	Hz
AQ	0.0959900	sec
RG	14.3	
DW	93.600	usec
DE	10.00	usec
TE	298.0	K
D0	0.00000300	sec
D1	2.00000000	sec
D13	0.00000400	sec
D16	0.00020000	sec
IN0	0.00018720	sec
========== CHANNEL f1 ==========		
NUC1	1H	
P0	7.90	usec
P1	9.40	usec
PL1	-0.50	dB
PL1W	2.50836086	W
SFO1	600.1328430	MHz
======= GRADIENT CHANNEL ======		
GPNAM1	SINE.100	
GPZ1	10.00	%
P16	1000.00	usec
NDO	1	
TD	256	
SFO1	600.1328	MHz
FIDRES	20.866737	Hz
SW	8.901	ppm
FnMODE	QF	
SI	512	
SF	600.1299776	MHz
WDW	SINE	
SSB	0	
LB	0.00	Hz
GB	0	
PC	1.00	
SI	512	
MC2	QF	
SF	600.1299805	MHz
WDW	SINE	
SSB	0	
LB	0.00	Hz
GB	0	

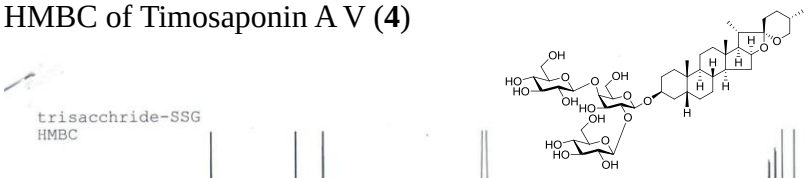
trisacchride-SSG
HH-Cosy

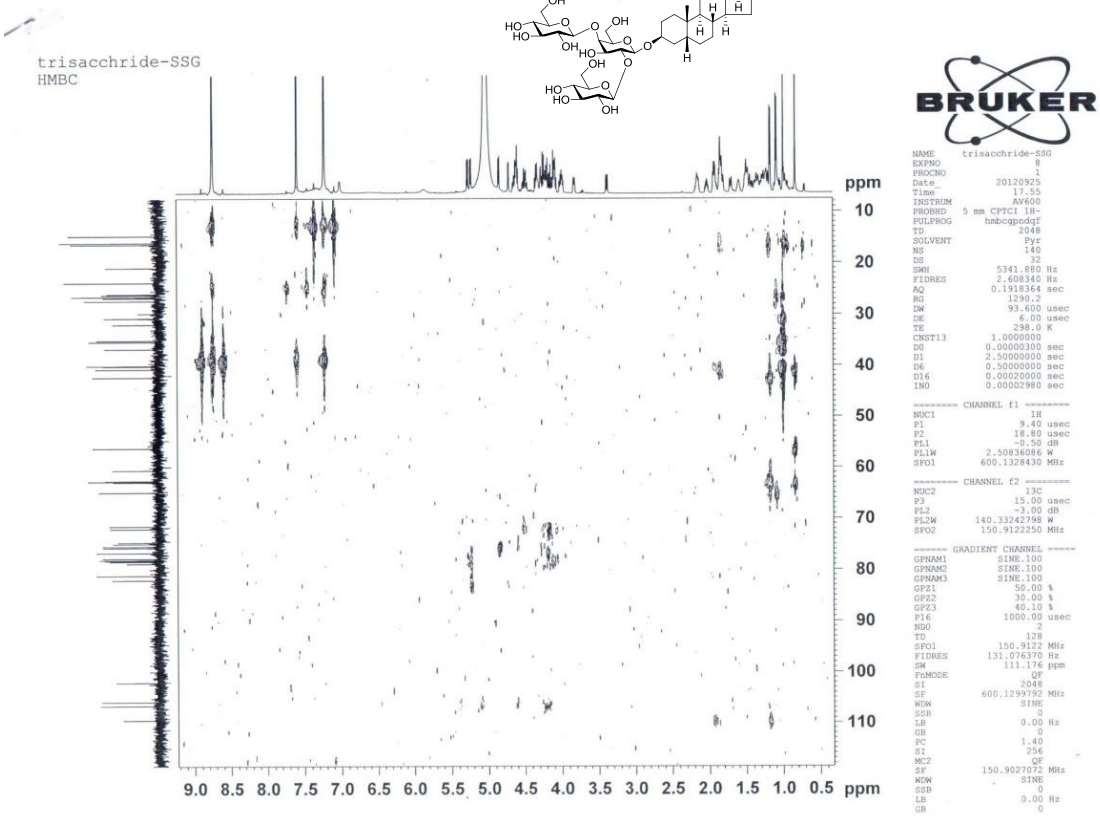


BRUKER

NAME	trisacchride-SSG	
EXPNO	5	
PROCNO	1	
Date_	20120924	
Time	10.35	
INSTRUM	AV600	
PROBHD	5 mm CPTCI 1H-	
PULPROG	cosygpqf	
TD	1024	
SOLVENT	Pyr	
NS	4	
DS	16	
SWH	5341.880	Hz
FIDRES	5.216680	Hz
AQ	0.0959900	sec
RG	14.3	
DW	93.600	usec
DE	10.00	usec
TE	298.0	K
D0	0.00000300	sec
D1	2.00000000	sec
D13	0.00000400	sec
D16	0.00020000	sec
IN0	0.00018720	sec
========== CHANNEL f1 ==========		
NUC1	1H	
P0	7.90	usec
P1	9.40	usec
PL1	-0.50	dB
PL1W	2.50836086	W
SFO1	600.1328430	MHz
======= GRADIENT CHANNEL ======		
GPNAM1	SINE.100	
GPZ1	10.00	%
P16	1000.00	usec
NDO	1	
TD	256	
SFO1	600.1328	MHz
FIDRES	20.866737	Hz
SW	8.901	ppm
FnMODE	QF	
SI	512	
SF	600.1299776	MHz
WDW	SINE	
SSB	0	
LB	0.00	Hz
GB	0	
PC	1.00	
SI	512	
MC2	QF	
SF	600.1299805	MHz
WDW	SINE	
SSB	0	
LB	0.00	Hz
GB	0	

HMBC of Timosaponin A V (**4**)





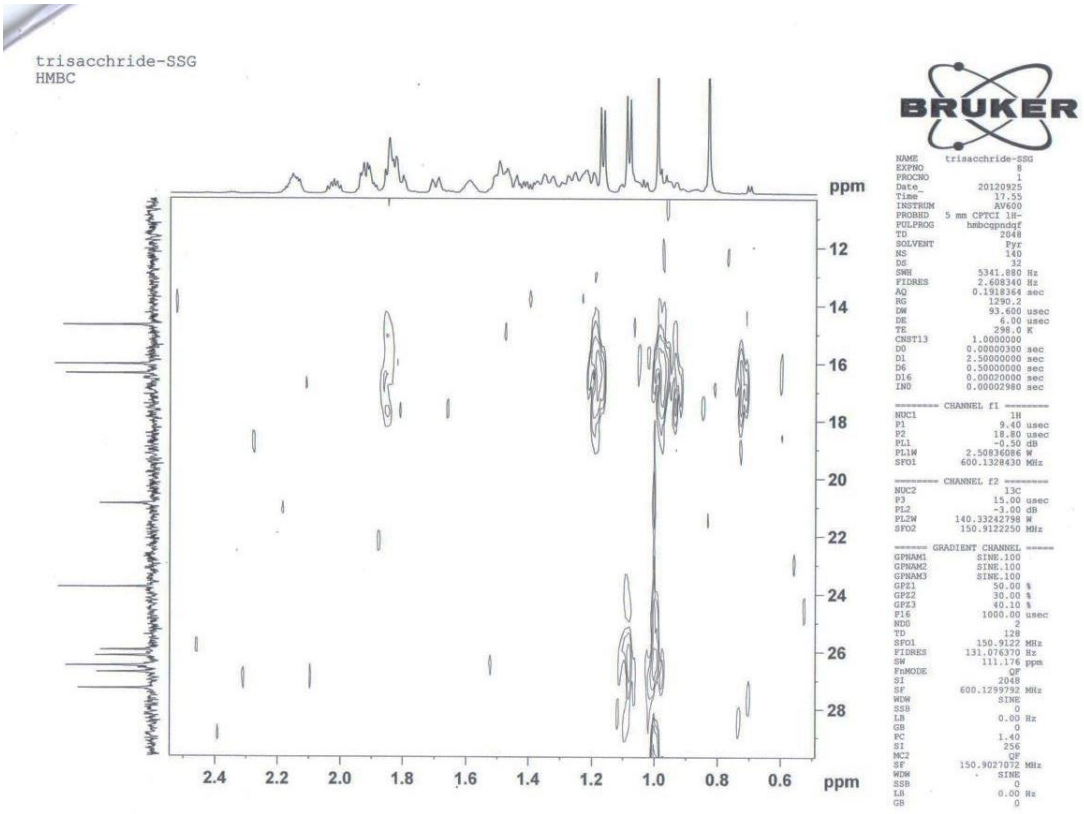
BRUKER

```
NAME          trisacchride-SSG
EXPNO                       8
PROCNO                      1
Date_              20120925
Time                   17.55
INSTRUM                AV600
PROBHD  5 mm CPTCI 1H-
PULPROG        hmbcgpndqf
TD                       2048
SOLVENT                   Pyr
NS                        140
DS                         32
SWH                5341.880 Hz
FIDRES             2.608340 Hz
AQ                 0.1918364 sec
RG                    1290.2
DW                   93.600 usec
DE                    6.00 usec
TE                   298.0 K
CNST13             1.0000000
D0                 0.00000300 sec
D1                 2.50000000 sec
D6                 0.50000000 sec
D16                0.00020000 sec
IN0                0.00002980 sec

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.40 usec
P2                      18.80 usec
PL1                     -0.50 dB
PL1W               2.50836086 W
SFO1             600.1328430 MHz

======== CHANNEL f2 ========
NUC2                      13C
P3                      15.00 usec
PL2                      -3.00 dB
PL2W             140.33242798 W
SFO2             150.9122250 MHz

======= GRADIENT CHANNEL =====
GPNAM1               SINE.100
GPNAM2               SINE.100
GPNAM3               SINE.100
GPZ1                    50.00 %
GPZ2                    30.00 %
GPZ3                    40.10 %
P16                   1000.00 usec
NDO                          2
TD                         128
SFO1             150.9122 MHz
FIDRES           131.076370 Hz
SW                   111.176 ppm
FnMODE                    QF
SI                        2048
SF               600.1299792 MHz
WDW                     SINE
SSB                        0
LB                      0.00 Hz
GB                         0
PC                      1.40
SI                       256
MC2                       QF
SF               150.9027072 MHz
WDW                     SINE
SSB                        0
LB                      0.00 Hz
GB                         0
```



BRUKER

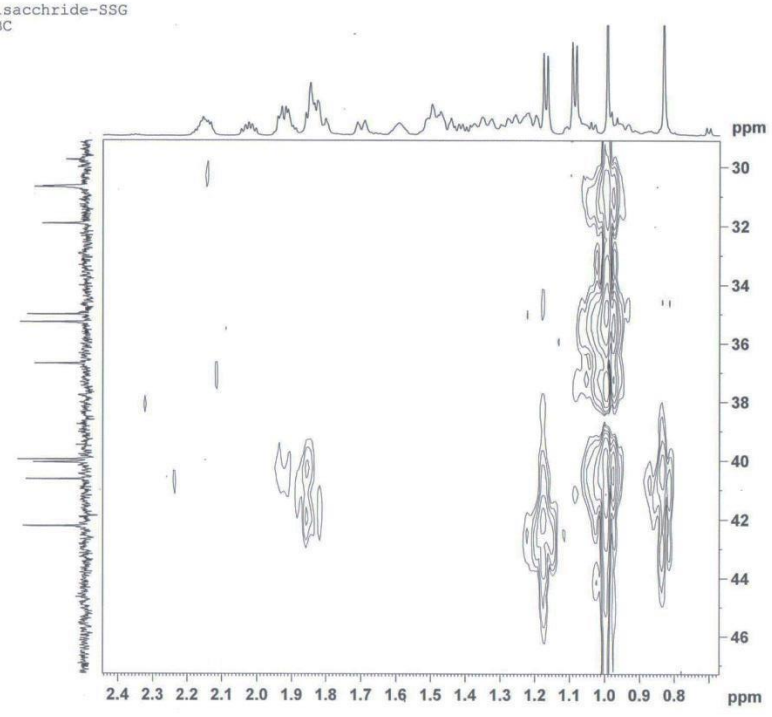
```
NAME          trisacchride-SSG
EXPNO                       8
PROCNO                      1
Date_              20120925
Time                   17.55
INSTRUM                AV600
PROBHD  5 mm CPTCI 1H-
PULPROG        hmbcgpndqf
TD                       2048
SOLVENT                   Pyr
NS                        140
DS                         32
SWH                5341.880 Hz
FIDRES             2.608340 Hz
AQ                 0.1918364 sec
RG                    1290.2
DW                   93.600 usec
DE                    6.00 usec
TE                   298.0 K
CNST13             1.0000000
D0                 0.00000300 sec
D1                 2.50000000 sec
D6                 0.50000000 sec
D16                0.00020000 sec
IN0                0.00002980 sec

======== CHANNEL f1 ========
NUC1                       1H
P1                       9.40 usec
P2                      18.80 usec
PL1                     -0.50 dB
PL1W               2.50836086 W
SFO1             600.1328430 MHz

======== CHANNEL f2 ========
NUC2                      13C
P3                      15.00 usec
PL2                      -3.00 dB
PL2W             140.33242798 W
SFO2             150.9122250 MHz

======= GRADIENT CHANNEL =====
GPNAM1               SINE.100
GPNAM2               SINE.100
GPNAM3               SINE.100
GPZ1                    50.00 %
GPZ2                    30.00 %
GPZ3                    40.10 %
P16                   1000.00 usec
NDO                          2
TD                         128
SFO1             150.9122 MHz
FIDRES           131.076370 Hz
SW                   111.176 ppm
FnMODE                    QF
SI                        2048
SF               600.1299792 MHz
WDW                     SINE
SSB                        0
LB                      0.00 Hz
GB                         0
PC                      1.40
SI                       256
MC2                       QF
SF               150.9027072 MHz
WDW                     SINE
SSB                        0
LB                      0.00 Hz
GB                         0
```

trisacchride-SSG
HMBC



BRUKER

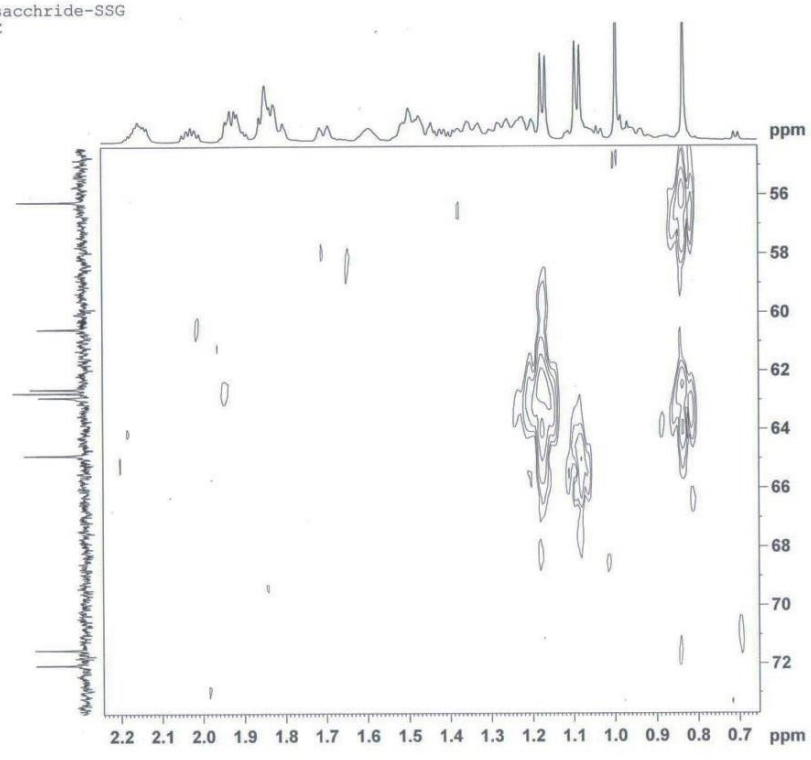
```
NAME        trisacchride-SSG
EXPNO                     8
PROCNO                    1
Date_              20120925
Time                  17.55
INSTRUM               AV600
PROBHD   5 mm CPTCI 1H-
PULPROG        hmbcgpndqf
TD                     2048
SOLVENT                Pyr
NS                     140
DS                      32
SWH               5341.880 Hz
FIDRES            2.608340 Hz
AQ                0.1918364 sec
RG                   1290.2
DW                  93.600 usec
DE                   6.00 usec
TE                  298.0 K
CNST13           1.0000000
D0               0.00000300 sec
D1               2.50000000 sec
D6               0.50000000 sec
D16              0.00020000 sec
IN0              0.00002980 sec

======== CHANNEL f1 ========
NUC1                    1H
P1                   9.40 usec
P2                  18.80 usec
PL1                 -0.50 dB
PL1W          2.50836086 W
SFO1        600.1328430 MHz

======== CHANNEL f2 ========
NUC2                   13C
P3                  15.00 usec
PL2                 -3.00 dB
PL2W        140.33242798 W
SFO2        150.9122250 MHz

======= GRADIENT CHANNEL =====
GPNAM1            SINE.100
GPNAM2            SINE.100
GPNAM3            SINE.100
GPZ1                 50.00 %
GPZ2                 30.00 %
GPZ3                 40.10 %
P16                1000.00 usec
ND0                     2
TD                    128
SFO1           150.9122 MHz
FIDRES         131.076370 Hz
SW             111.176 ppm
FnMODE                 QF
SI                   2048
SF          600.1299792 MHz
WDW                  SINE
SSB                     0
LB                   0.00 Hz
GB                      0
PC                   1.40
SI                    256
MC2                    QF
SF          150.9027072 MHz
WDW                  SINE
SSB                     0
LB                   0.00 Hz
GB                      0
```

trisacchride-SSG
HMBC



BRUKER

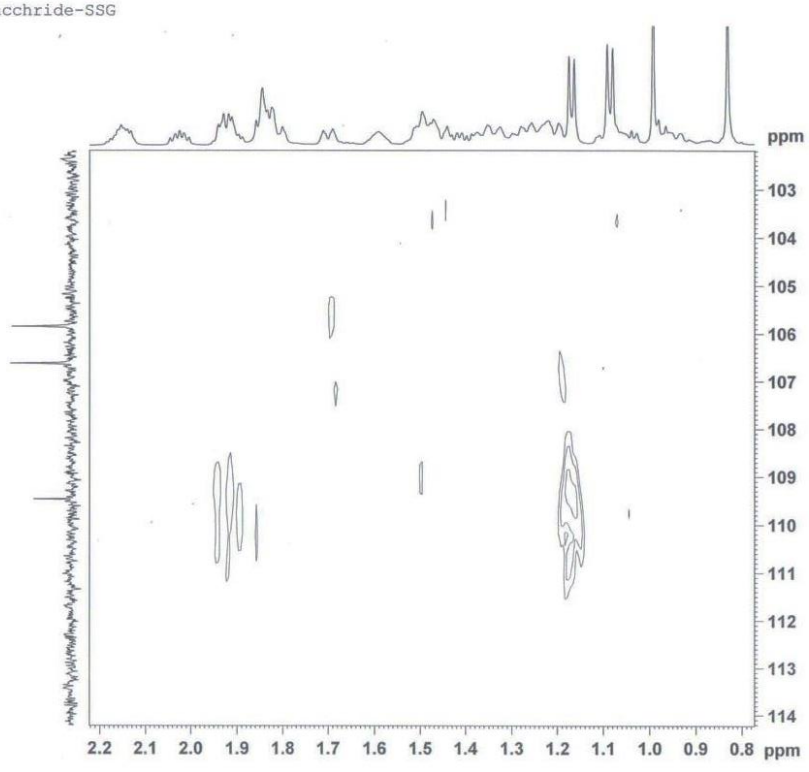
```
NAME        trisacchride-SSG
EXPNO                     8
PROCNO                    1
Date_              20120925
Time                  17.55
INSTRUM               AV600
PROBHD   5 mm CPTCI 1H-
PULPROG        hmbcgpndqf
TD                     2048
SOLVENT                Pyr
NS                     140
DS                      32
SWH               5341.880 Hz
FIDRES            2.608340 Hz
AQ                0.1918364 sec
RG                   1290.2
DW                  93.600 usec
DE                   6.00 usec
TE                  298.0 K
CNST13           1.0000000
D0               0.00000300 sec
D1               2.50000000 sec
D6               0.50000000 sec
D16              0.00020000 sec
IN0              0.00002980 sec

======== CHANNEL f1 ========
NUC1                    1H
P1                   9.40 usec
P2                  18.80 usec
PL1                 -0.50 dB
PL1W          2.50836086 W
SFO1        600.1328430 MHz

======== CHANNEL f2 ========
NUC2                   13C
P3                  15.00 usec
PL2                 -3.00 dB
PL2W        140.33242798 W
SFO2        150.9122250 MHz

======= GRADIENT CHANNEL =====
GPNAM1            SINE.100
GPNAM2            SINE.100
GPNAM3            SINE.100
GPZ1                 50.00 %
GPZ2                 30.00 %
GPZ3                 40.10 %
P16                1000.00 usec
ND0                     2
TD                    128
SFO1           150.9122 MHz
FIDRES         131.076370 Hz
SW             111.176 ppm
FnMODE                 QF
SI                   2048
SF          600.1299792 MHz
WDW                  SINE
SSB                     0
LB                   0.00 Hz
GB                      0
PC                   1.40
SI                    256
MC2                    QF
SF          150.9027072 MHz
WDW                  SINE
SSB                     0
LB                   0.00 Hz
GB                      0
```

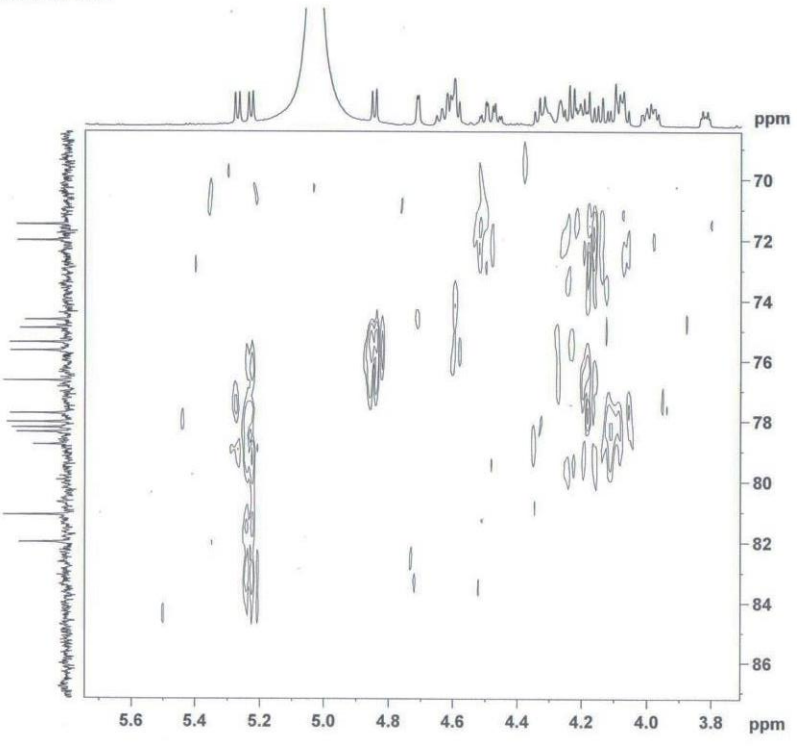
trisacchride-SSG
HMBC



BRUKER

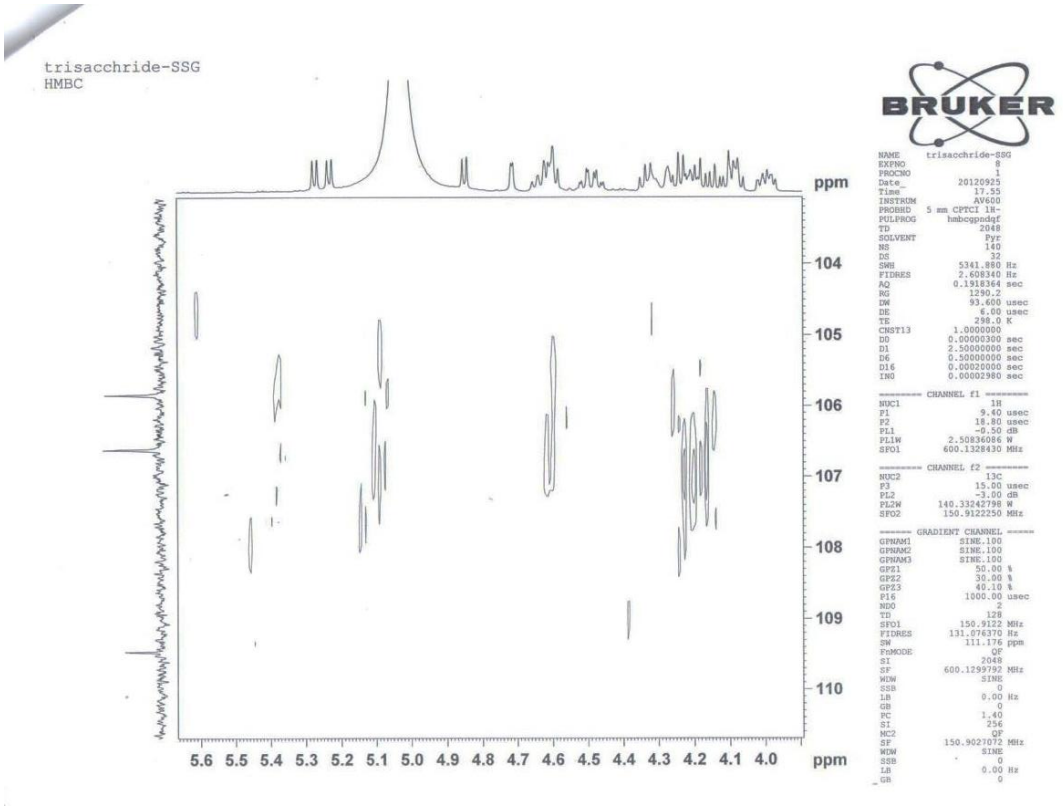
NAME	trisacchride-SSG
EXPNO	8
PROCNO	1
Date_	20120925
Time	17.55
INSTRUM	AV600
PROBHD	5 mm CPTCI 1H-
PULPROG	hmbcgpndqf
TD	2048
SOLVENT	Pyr
NS	140
DS	32
SWH	5341.880 Hz
FIDRES	2.608340 Hz
AQ	0.1918364 sec
RG	1290.2
DW	93.600 usec
DE	6.00 usec
TE	298.0 K
CNST13	1.0000000
D0	0.00000300 sec
D1	2.50000000 sec
D6	0.50000000 sec
D16	0.00020000 sec
IN0	0.00002980 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	9.40 usec
P2	18.80 usec
PL1	-0.50 dB
PL1W	2.50836086 W
SFO1	600.1328430 MHz
======== CHANNEL f2 ========	
NUC2	13C
P3	15.00 usec
PL2	-3.00 dB
PL2W	140.33242798 W
SFO2	150.9122250 MHz
======= GRADIENT CHANNEL =====	
GPNAM1	SINE.100
GPNAM2	SINE.100
GPNAM3	SINE.100
GPZ1	50.00 %
GPZ2	30.00 %
GPZ3	40.10 %
P16	1000.00 usec
ND0	2
TD	128
SFO1	150.9122 MHz
FIDRES	131.076370 Hz
SW	111.176 ppm
FnMODE	QF
SI	2048
SF	600.1299792 MHz
WDW	SINE
SSB	0
LB	0.00 Hz
GB	0
PC	1.40
SI	256
MC2	QF
SF	150.9027072 MHz
WDW	SINE
SSB	0
LB	0.00 Hz
GB	0

trisacchride-SSG
HMBC

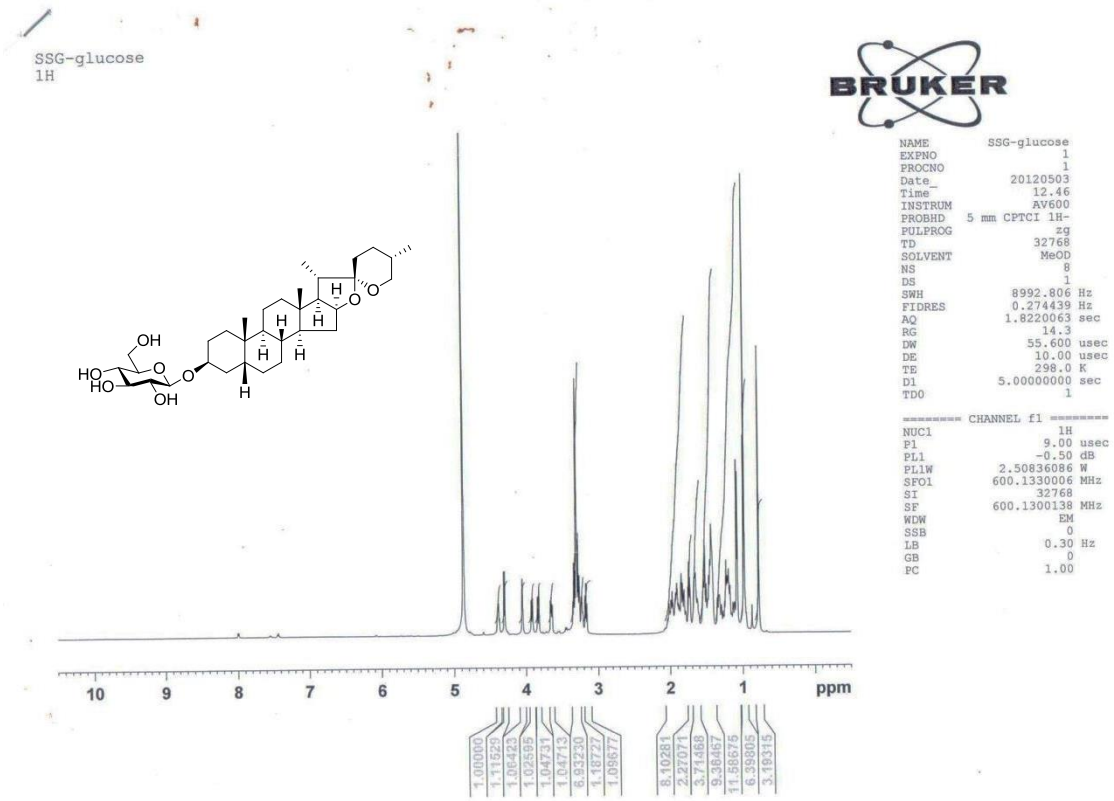


BRUKER

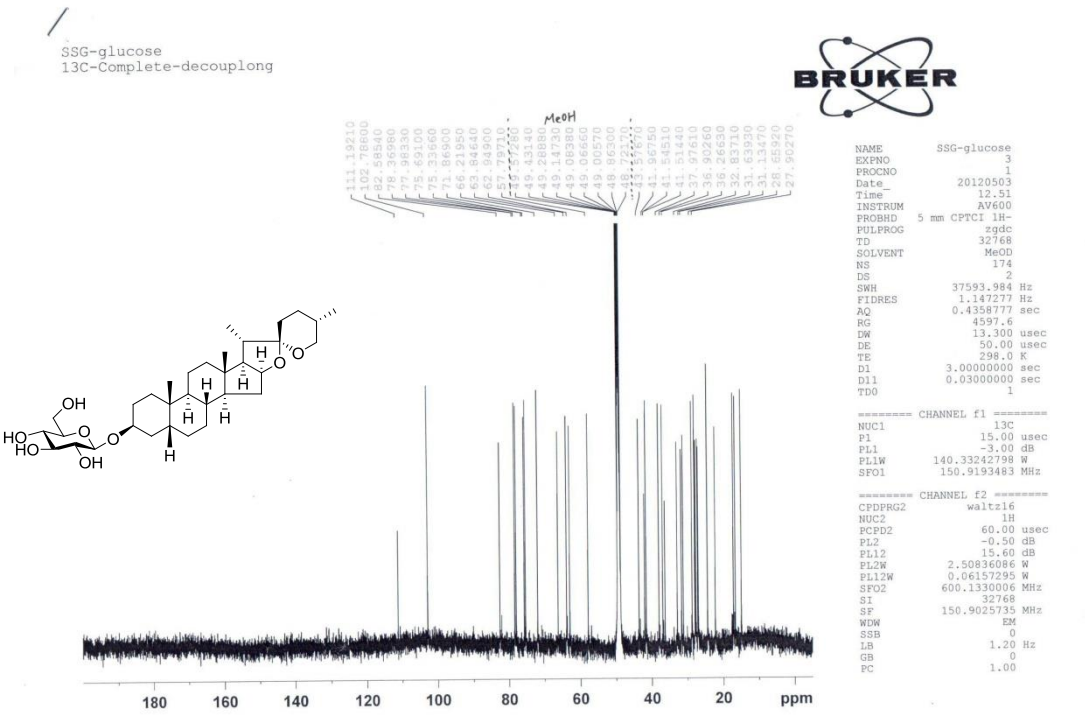
NAME	trisacchride-SSG
EXPNO	8
PROCNO	1
Date_	20120925
Time	17.55
INSTRUM	AV600
PROBHD	5 mm CPTCI 1H-
PULPROG	hmbcgpndqf
TD	2048
SOLVENT	Pyr
NS	140
DS	32
SWH	5341.880 Hz
FIDRES	2.608340 Hz
AQ	0.1918364 sec
RG	1290.2
DW	93.600 usec
DE	6.00 usec
TE	298.0 K
CNST13	1.0000000
D0	0.00000300 sec
D1	2.50000000 sec
D6	0.50000000 sec
D16	0.00020000 sec
IN0	0.00002980 sec
======== CHANNEL f1 ========	
NUC1	1H
P1	9.40 usec
P2	18.80 usec
PL1	-0.50 dB
PL1W	2.50836086 W
SFO1	600.1328430 MHz
======== CHANNEL f2 ========	
NUC2	13C
P3	15.00 usec
PL2	-3.00 dB
PL2W	140.33242798 W
SFO2	150.9122250 MHz
======= GRADIENT CHANNEL =====	
GPNAM1	SINE.100
GPNAM2	SINE.100
GPNAM3	SINE.100
GPZ1	50.00 %
GPZ2	30.00 %
GPZ3	40.10 %
P16	1000.00 usec
ND0	2
TD	128
SFO1	150.9122 MHz
FIDRES	131.076370 Hz
SW	111.176 ppm
FnMODE	QF
SI	2048
SF	600.1299792 MHz
WDW	SINE
SSB	0
LB	0.00 Hz
GB	0
PC	1.40
SI	256
MC2	QF
SF	150.9027072 MHz
WDW	SINE
SSB	0
LB	0.00 Hz
GB	0



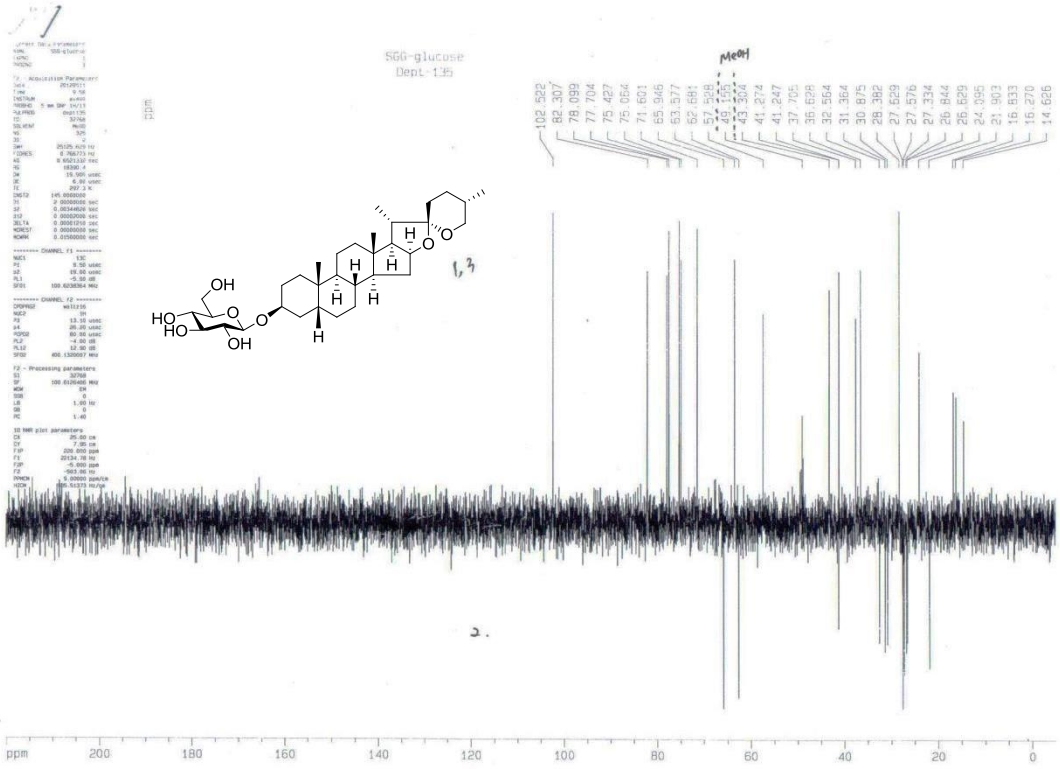
^{1}H NMR of Asparagoside A (**5**)



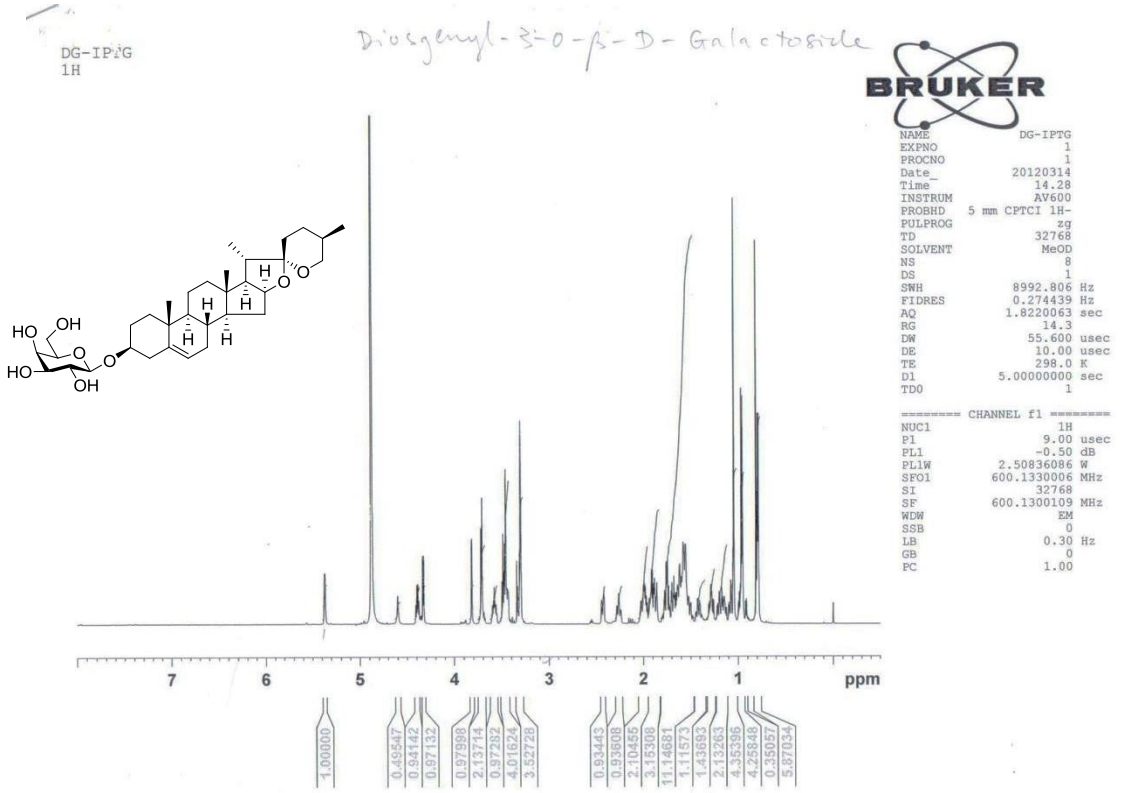
^{13}C NMR of Asparagoside A (**5**)



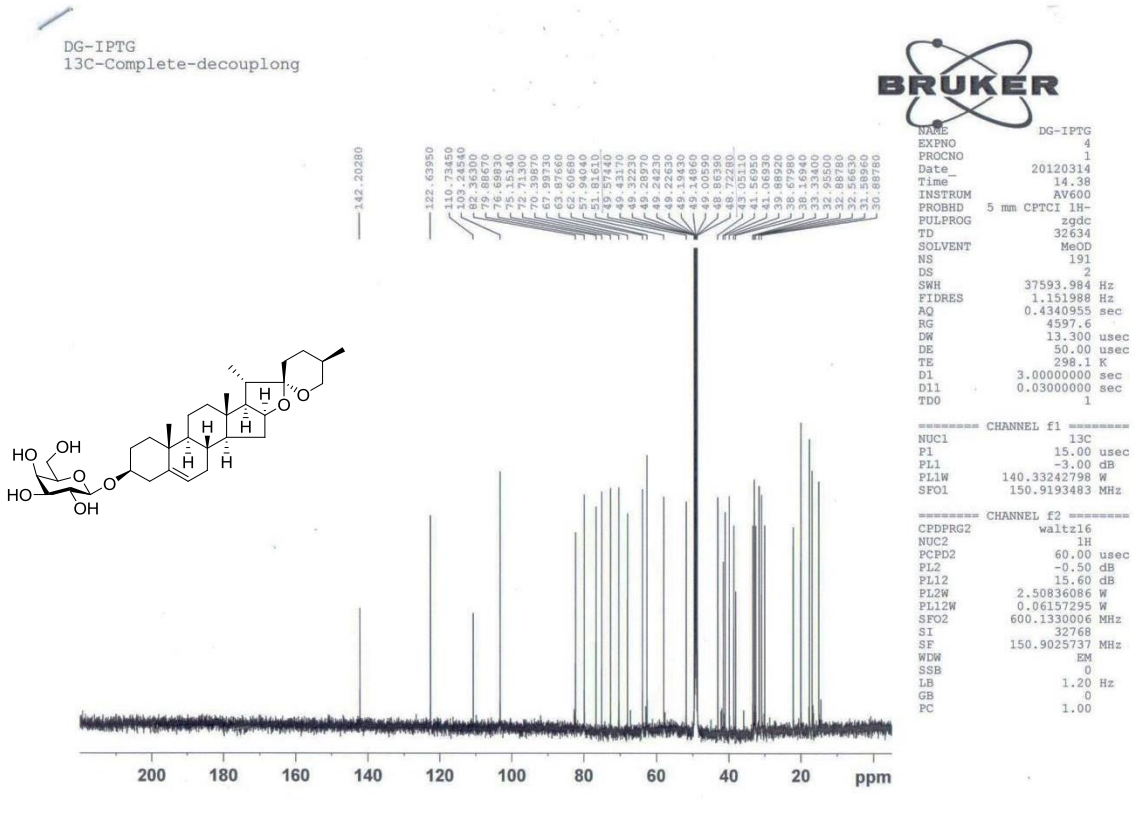
Dept-135 of Asparagoside A (**5**)



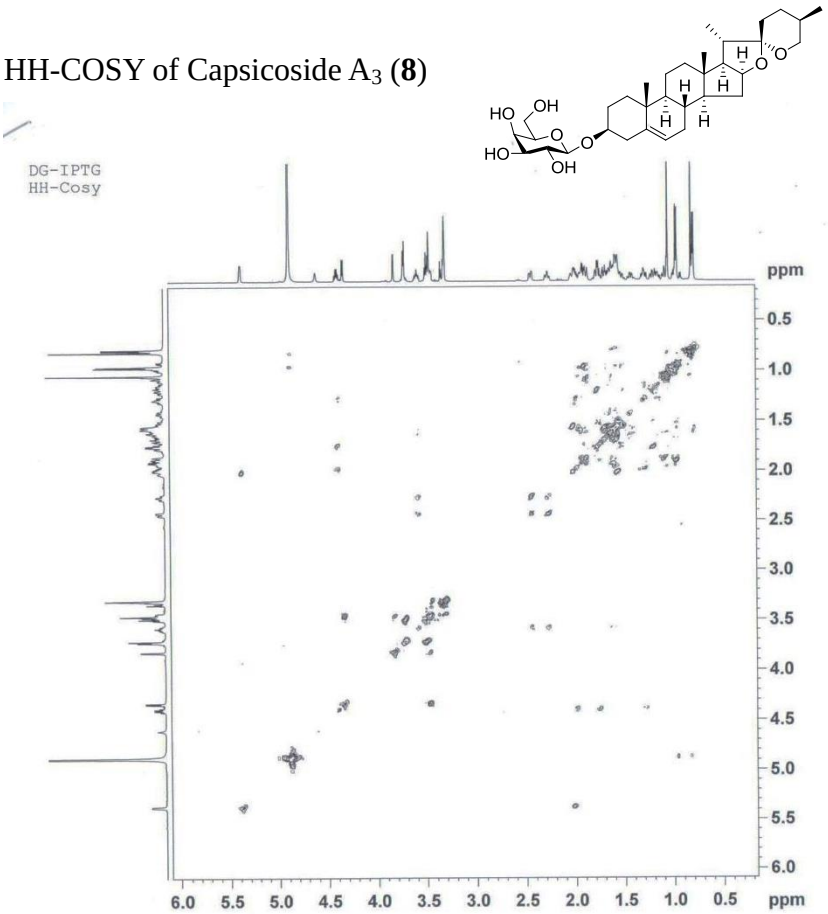
^{1}H NMR of Capsicoside A_3 (**8**)



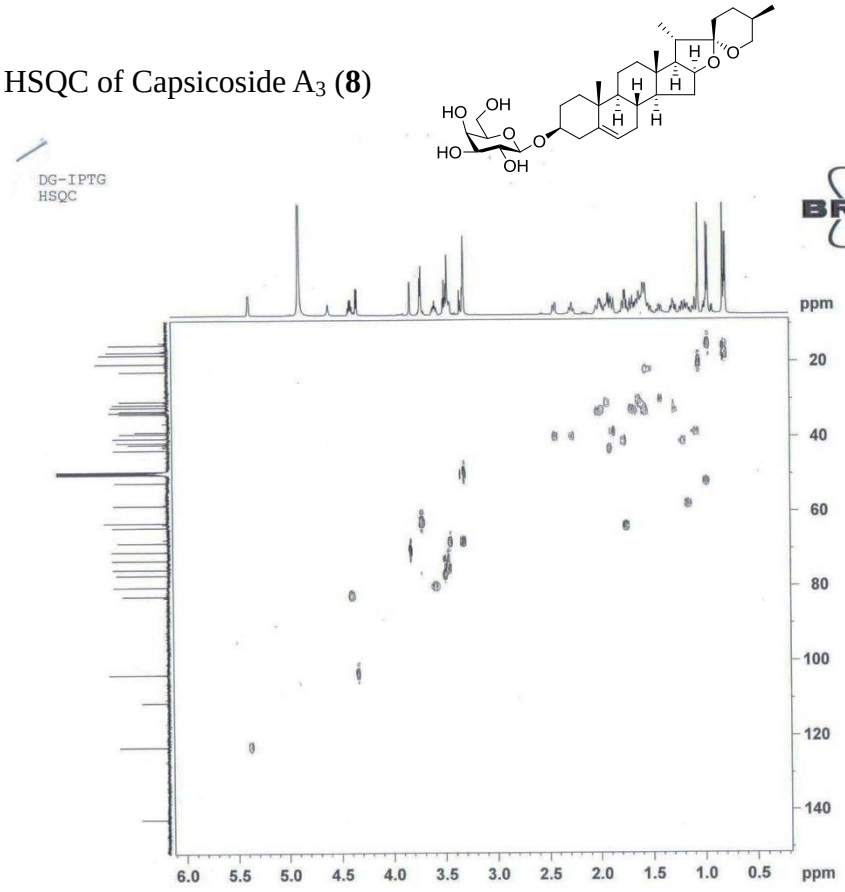
^{13}C NMR of Capsicoside A_3 (**8**)



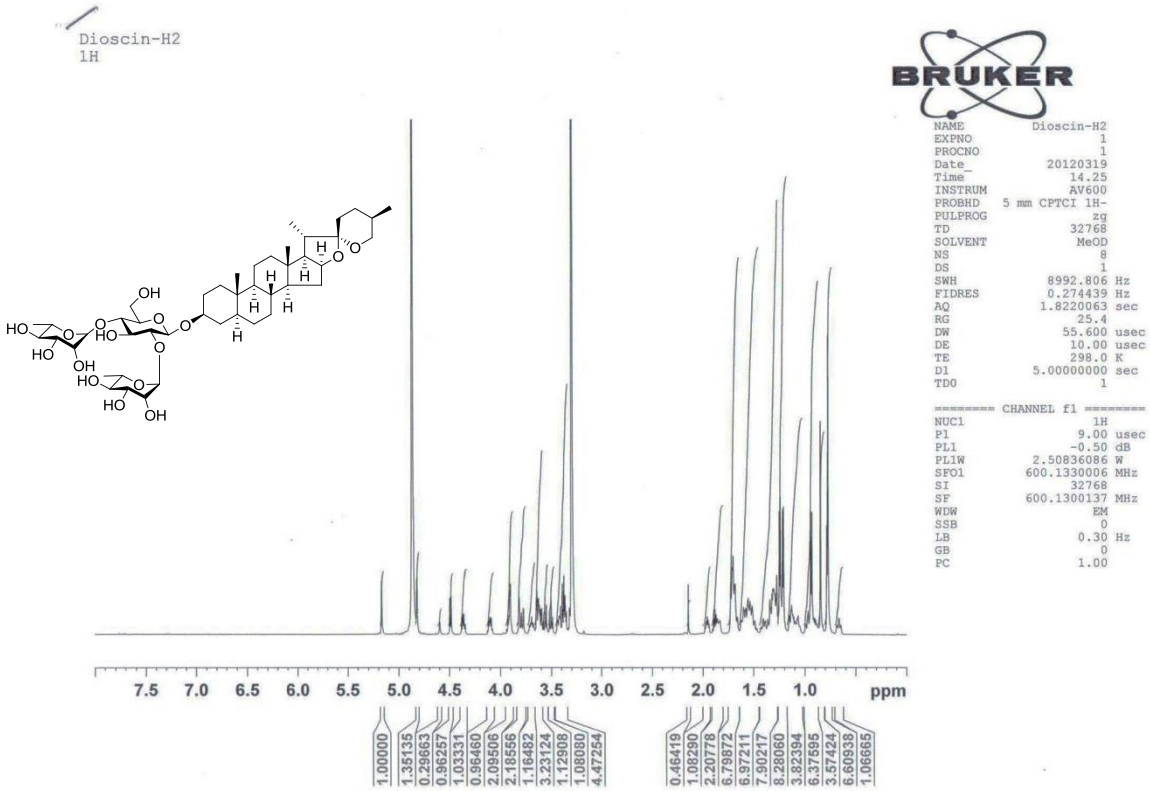
HH-COSY of Capsicoside A_3 (**8**)



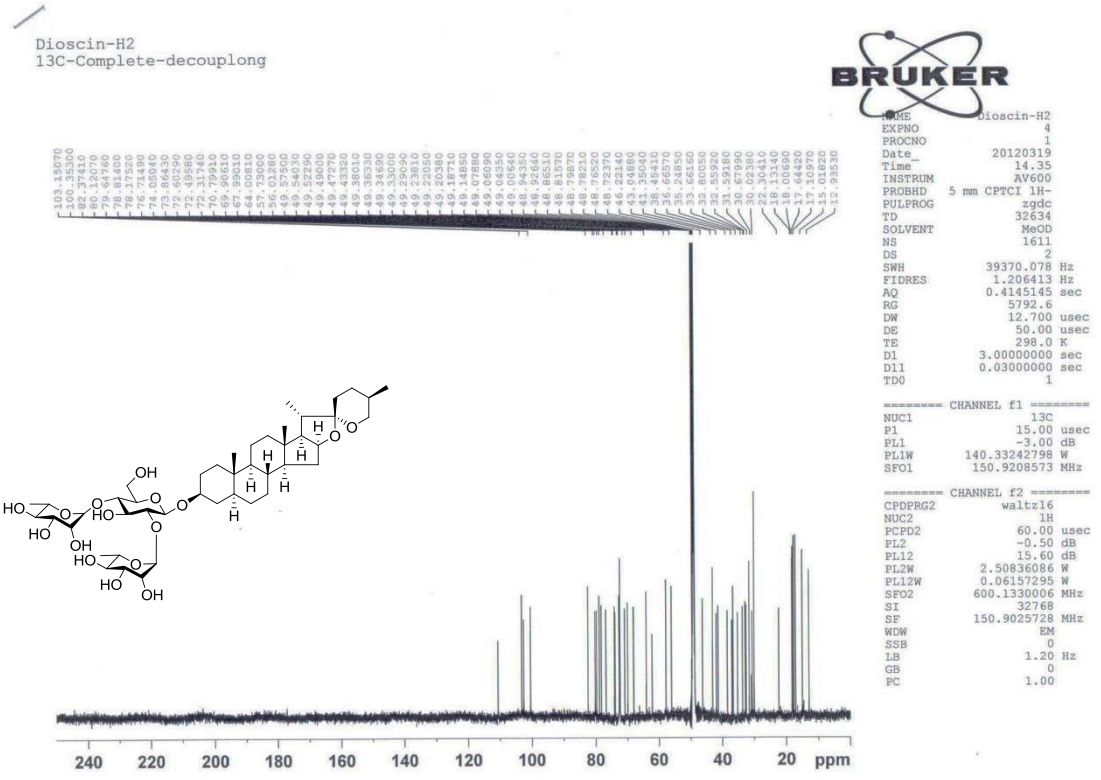
HSQC of Capsicoside A_3 (**8**)



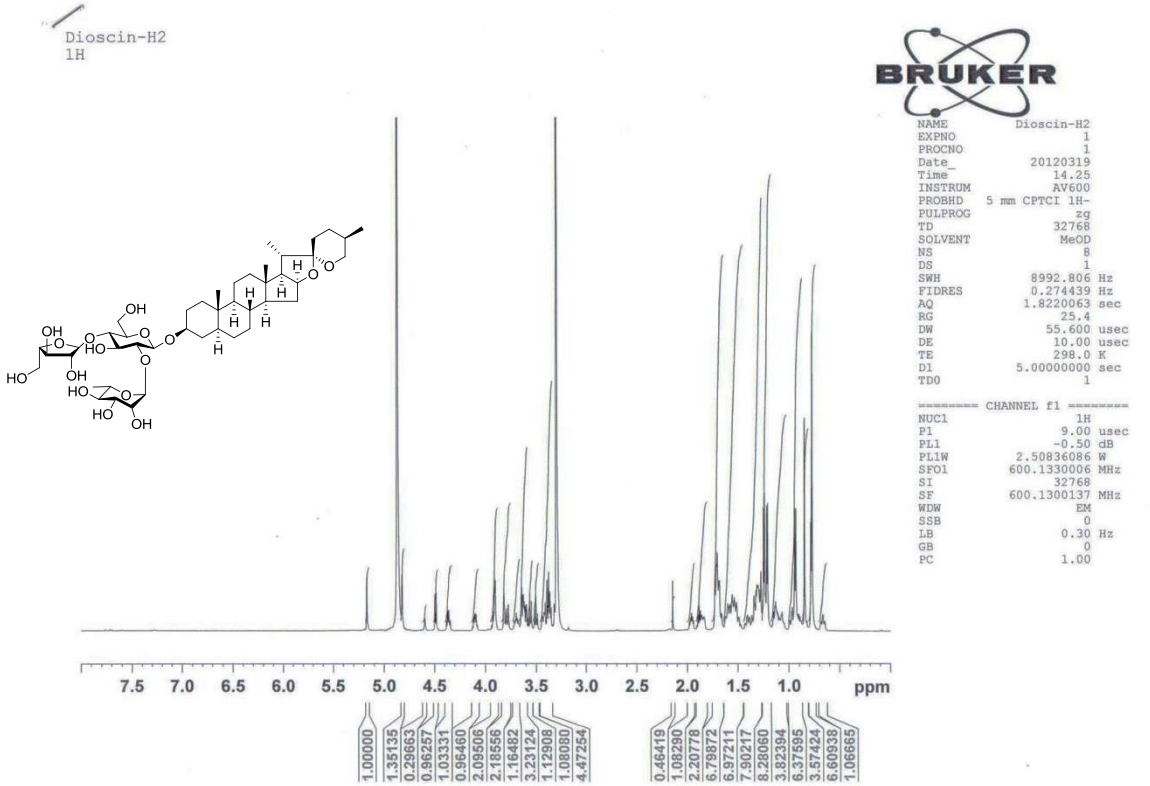
^{1}H NMR of Dihydrodioscin (**11**)



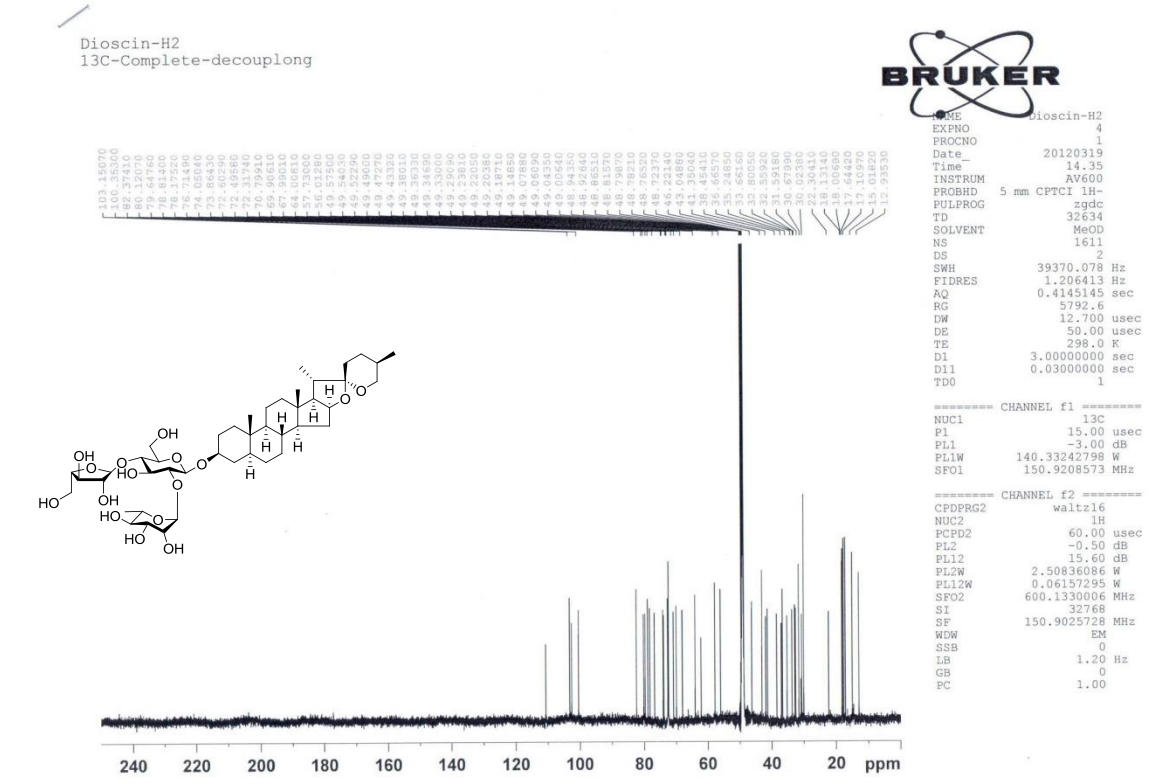
^{13}C NMR of Dihydrodioscin (**11**)



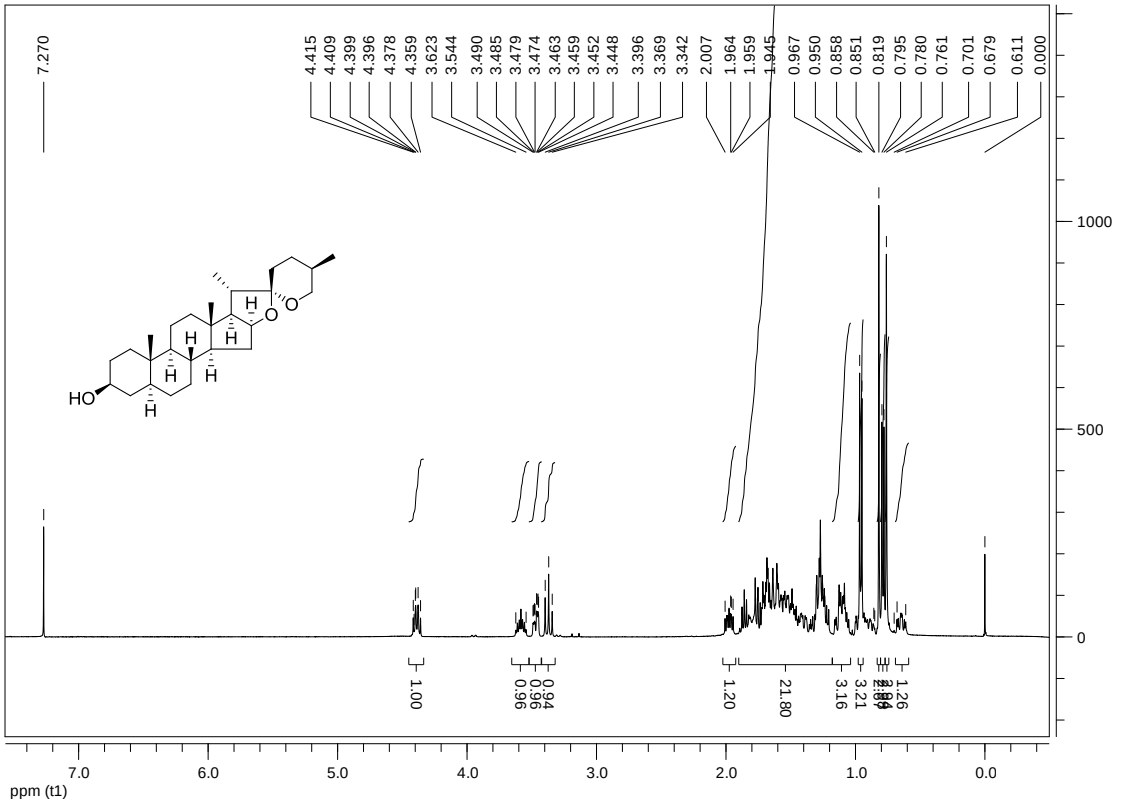
^{1}H NMR of Dihydropolyphyllin D (**12**)



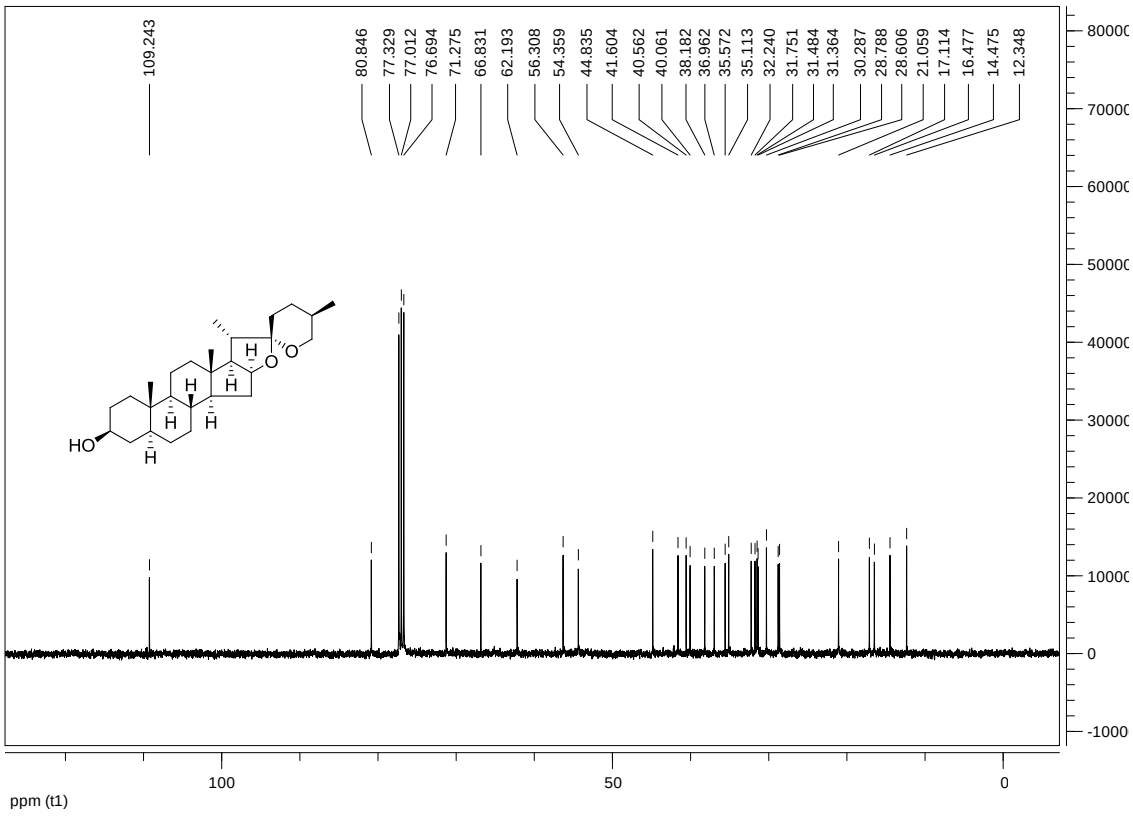
^{13}C NMR of Dihydropolyphyllin D (**12**)



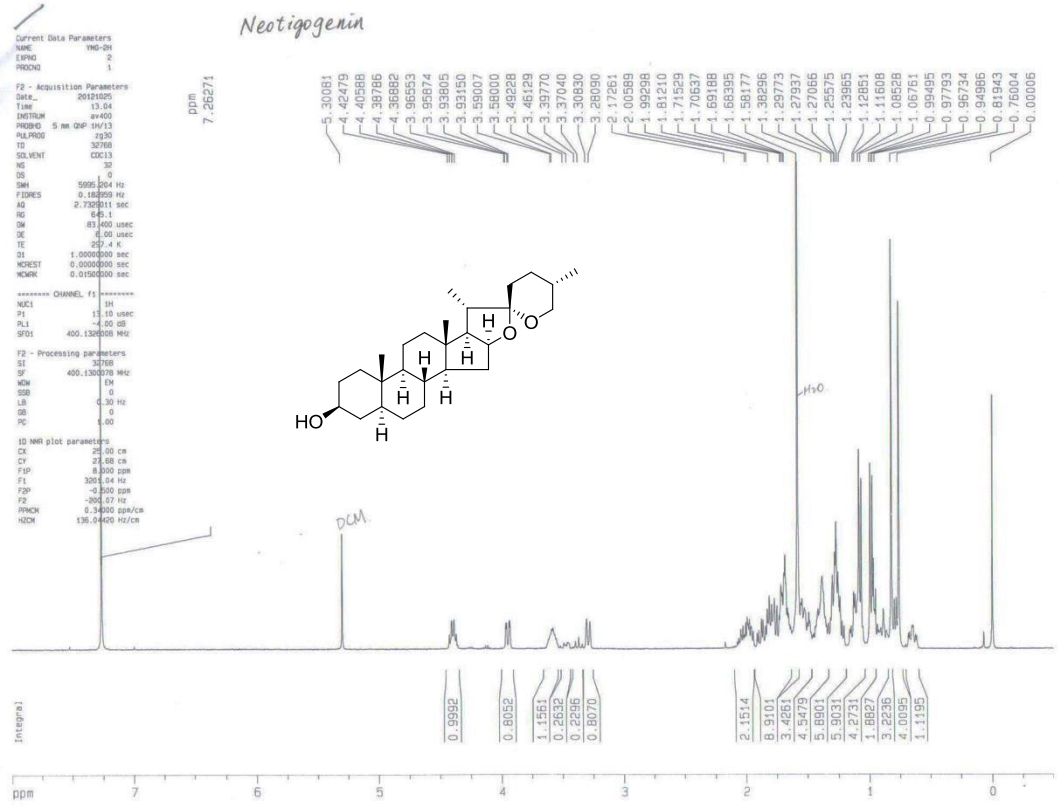
^{1}H NMR of Tigogenin (**13**)



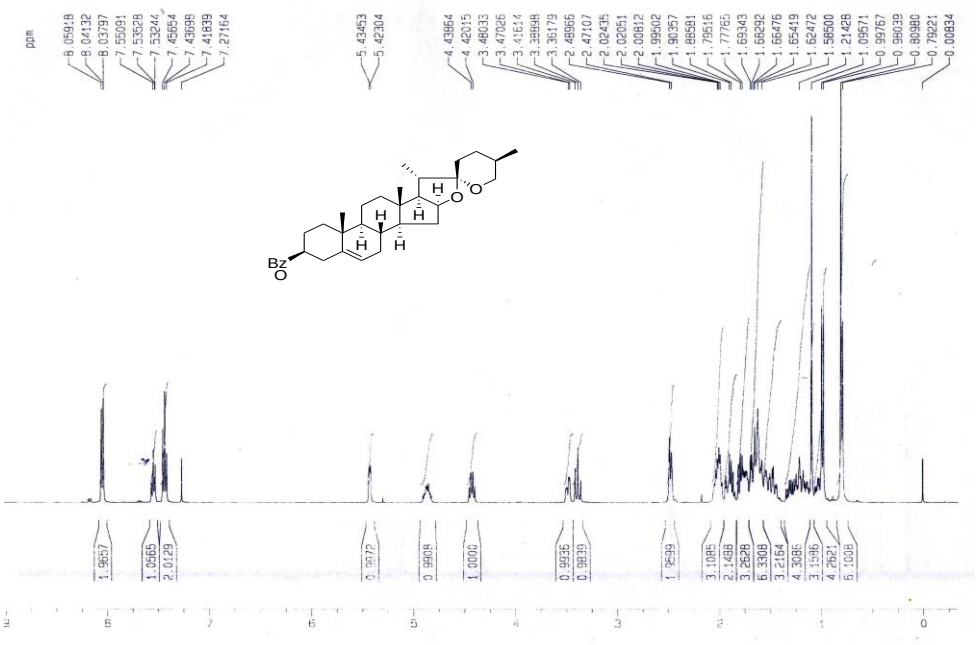
^{13}C NMR of Tigogenin (**13**)



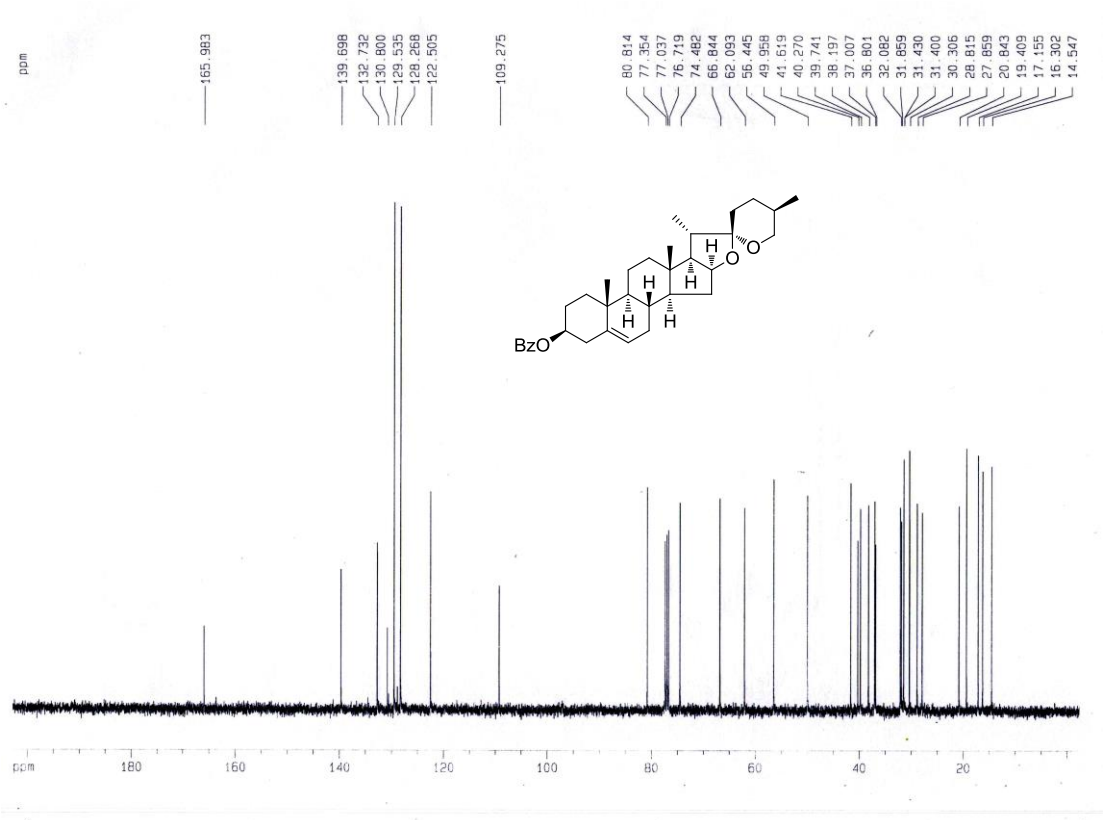
^{1}H NMR of Neotigogenin (**14**)



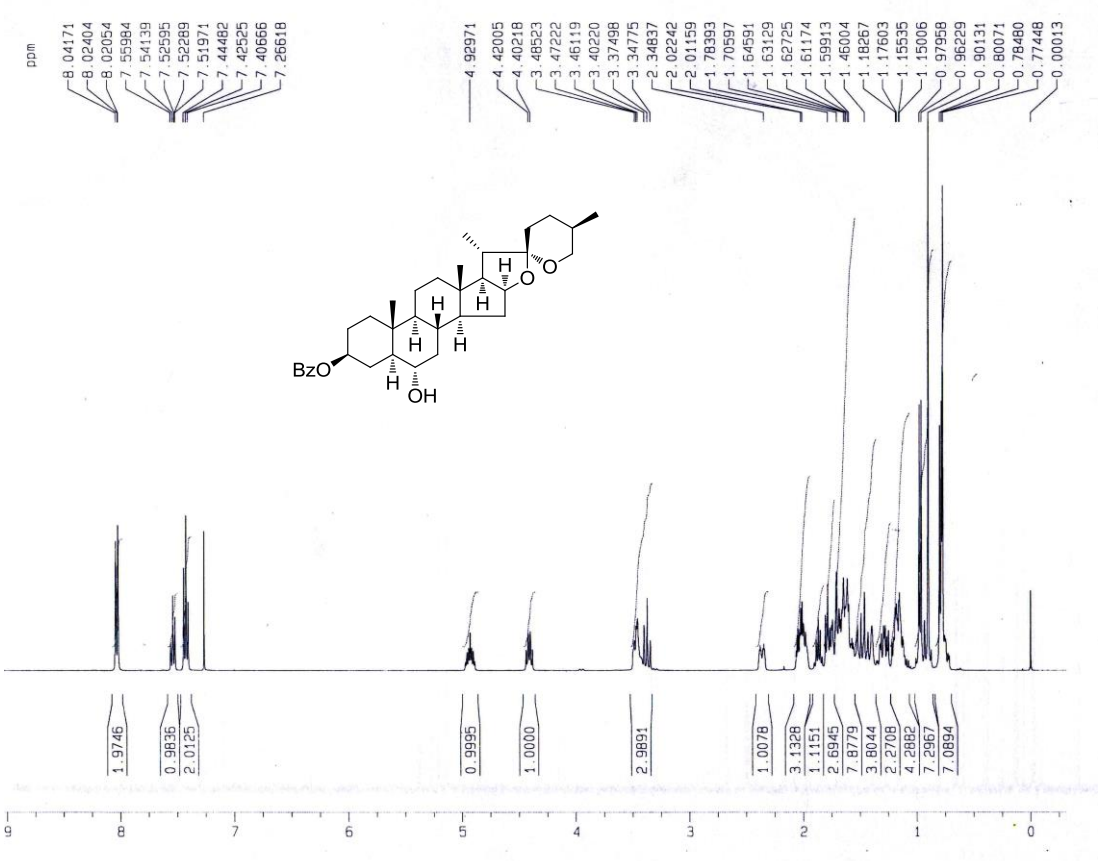
^{1}H NMR of 3-benzoylated diosgenin



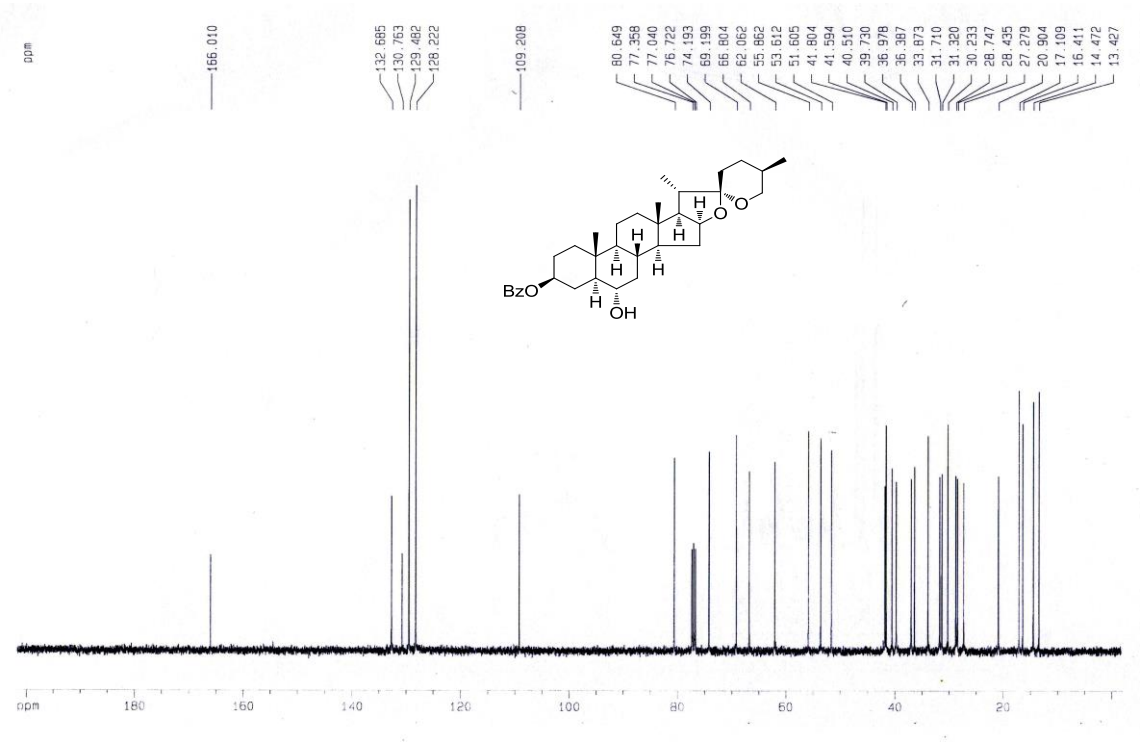
^{13}C NMR of 3-benzoylated diosgenin



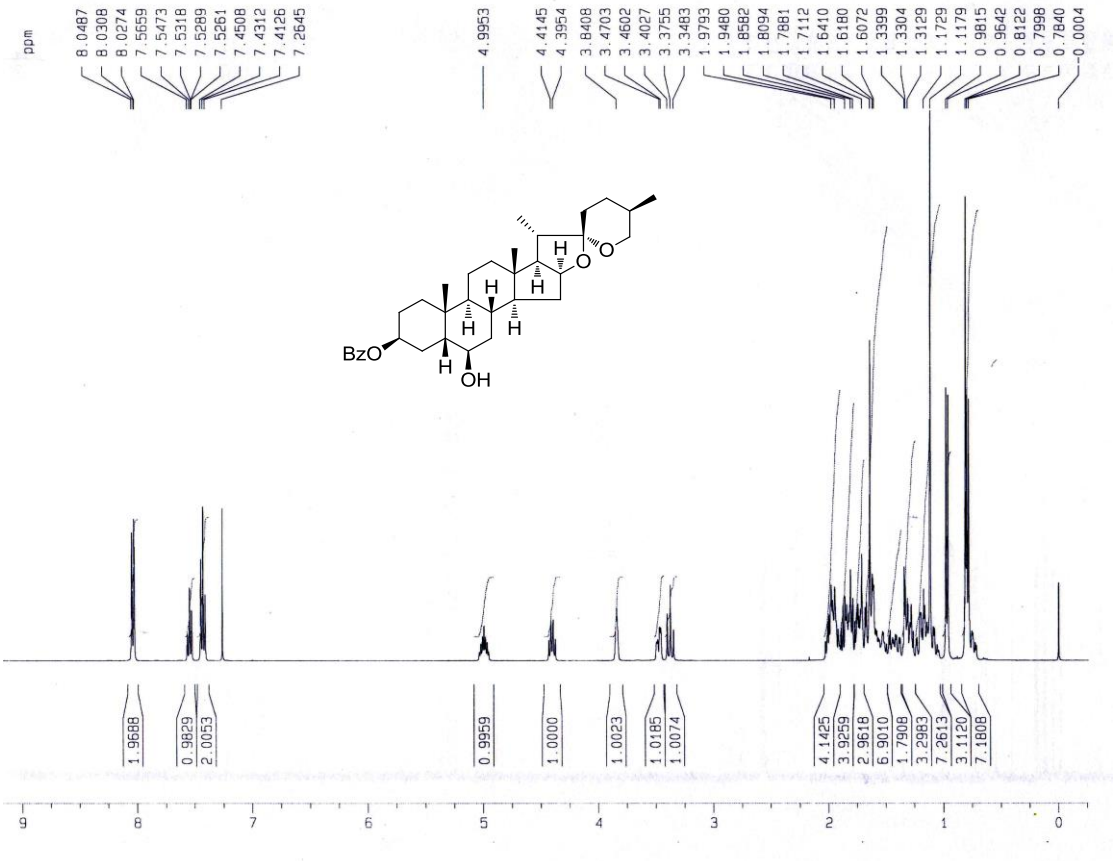
^{1}H NMR of 3-benzoylated 5α-H, 6α-OH diosgenin



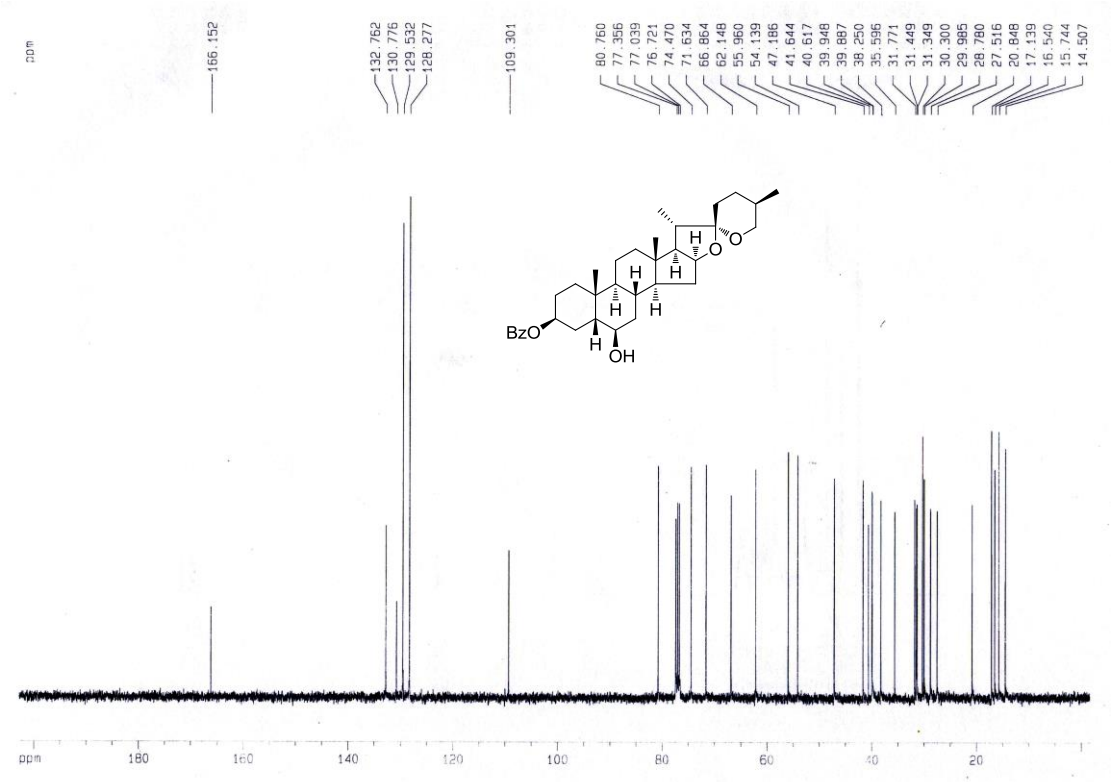
^{13}C NMR of 3-benzoylated 5α-H, 6α-OH diosgenin



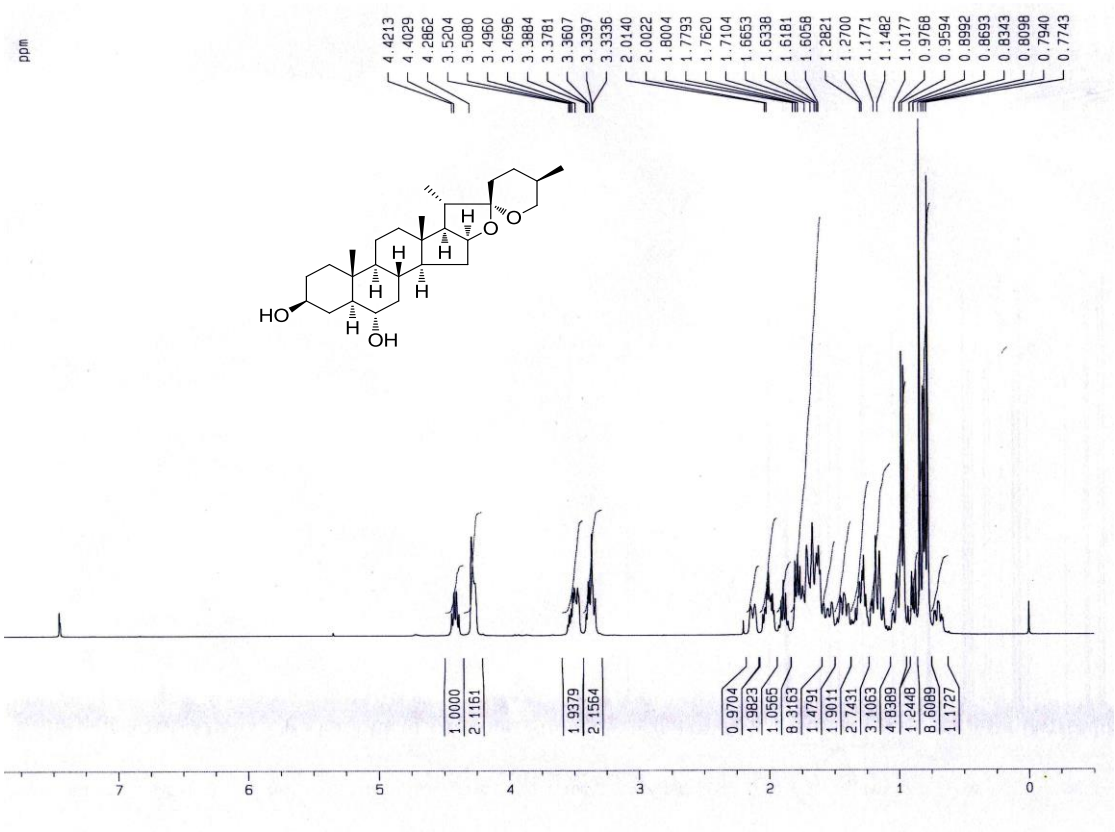
^{1}H NMR of 3-benzoylated 5β-H, 6β-OH diosgenin



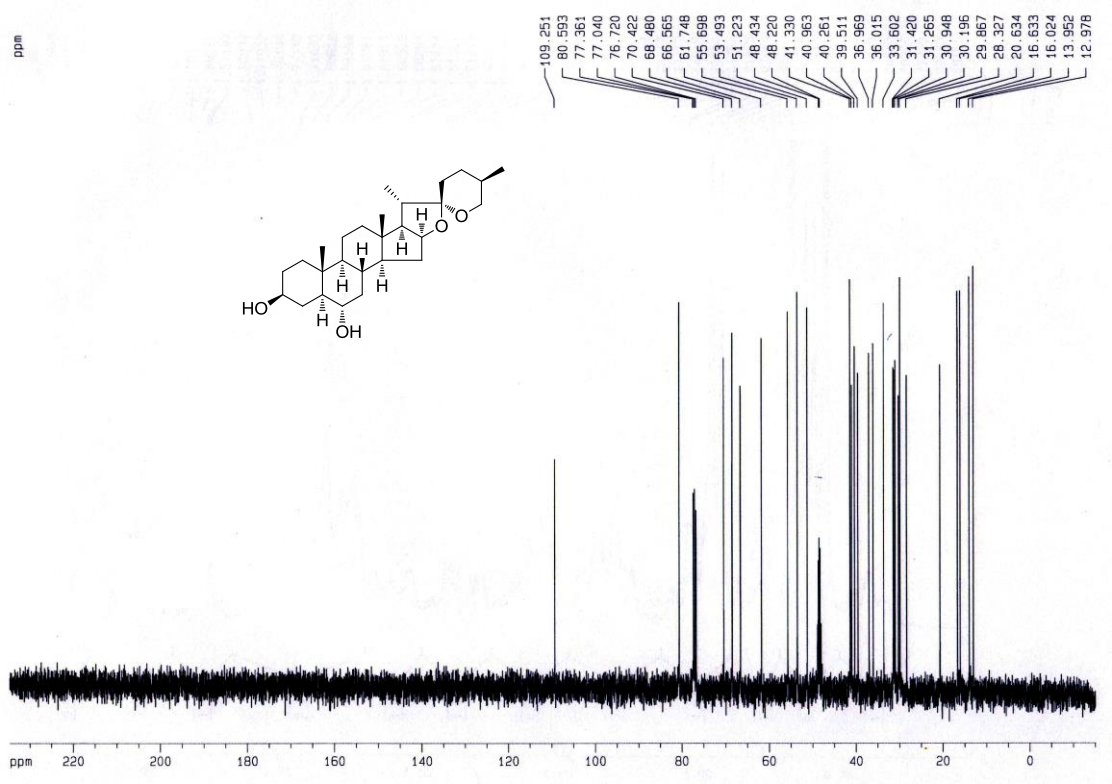
^{13}CNMR of 3-benzoylated 5β-H, 6β-OH diosgenin



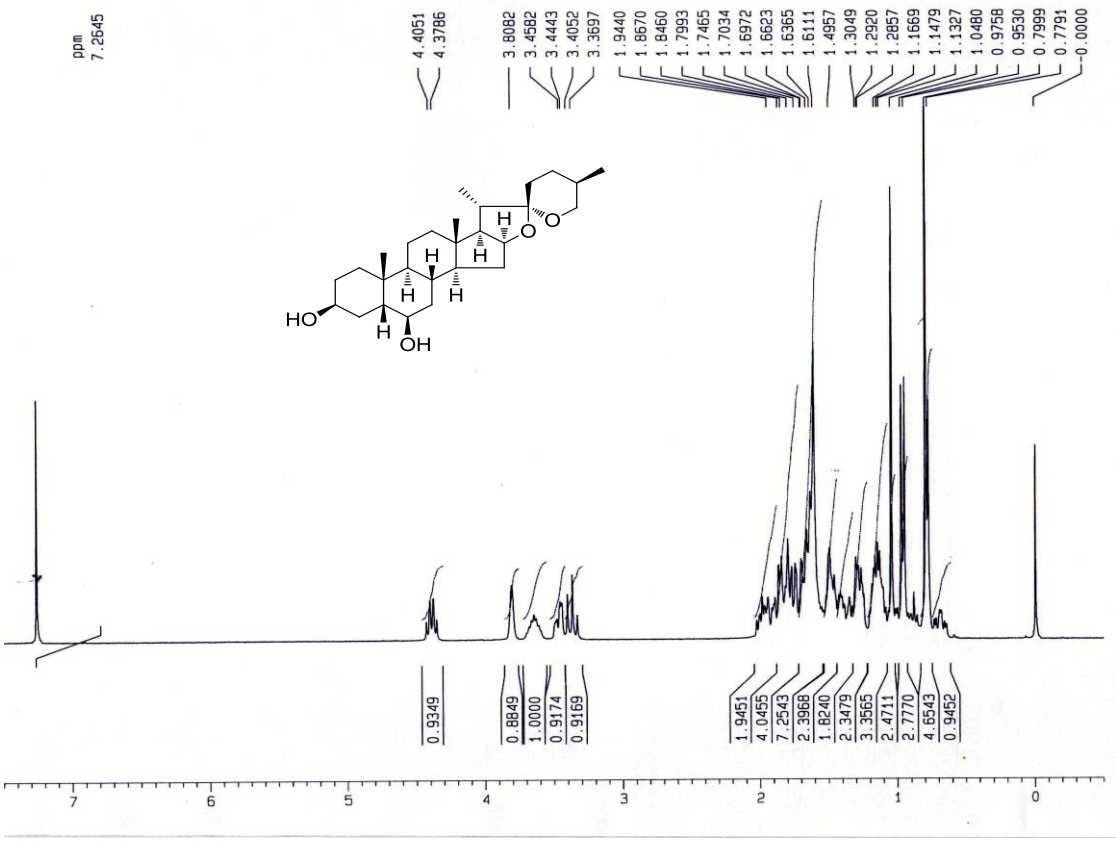
^{1}H NMR of 5α-H, 6α-OH diosgenin (**15**)



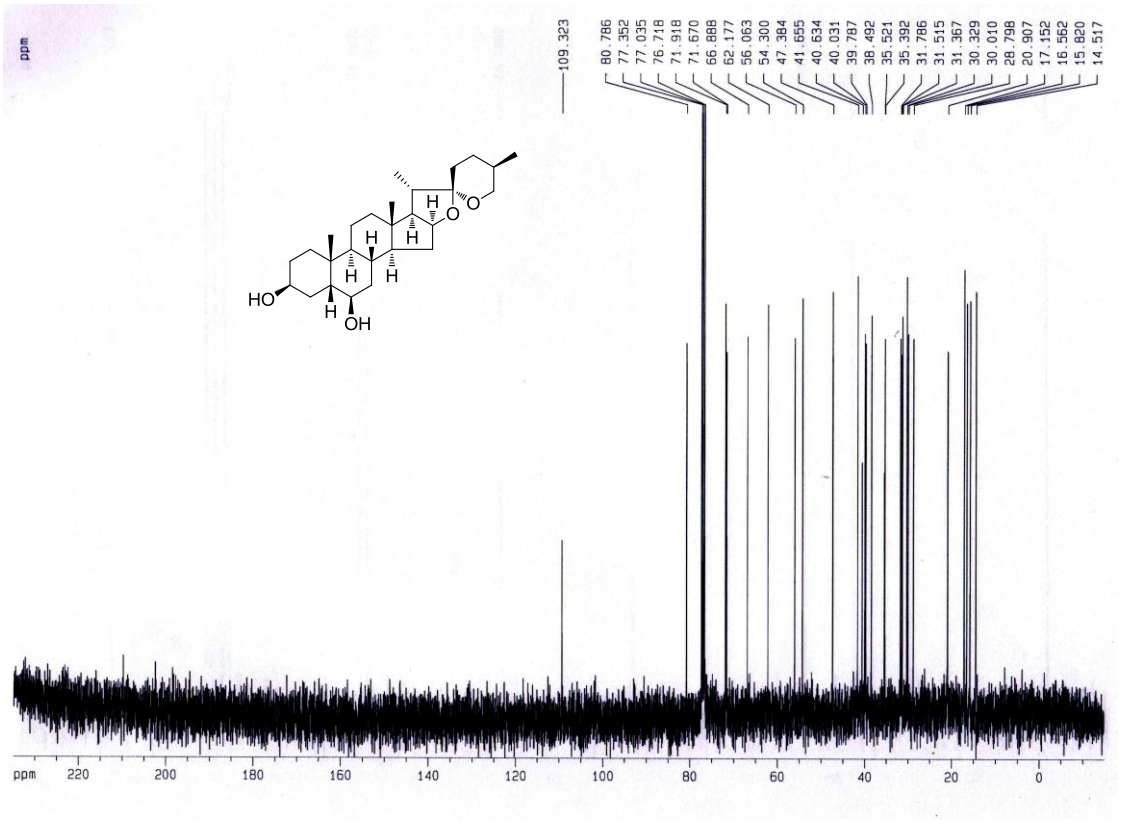
^{13}C NMR of 5α-H, 6α-OH diosgenin (**15**)



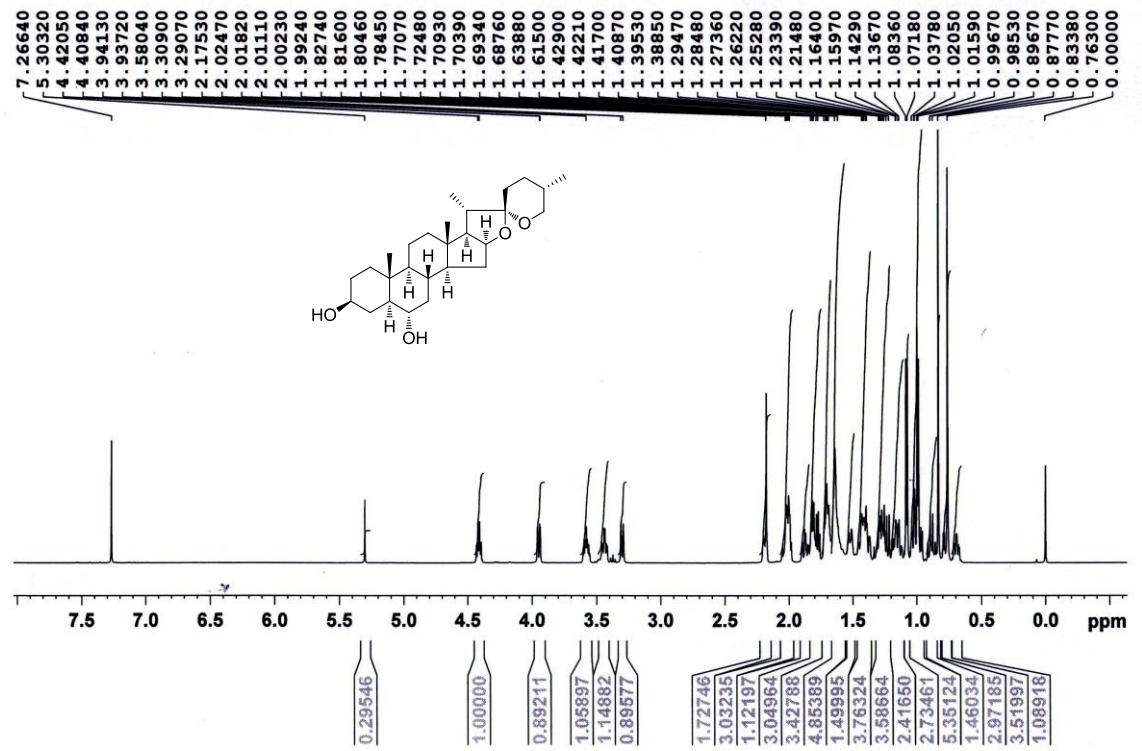
^{1}H NMR of 5β-H, 6β-OH diosgenin (**16**)



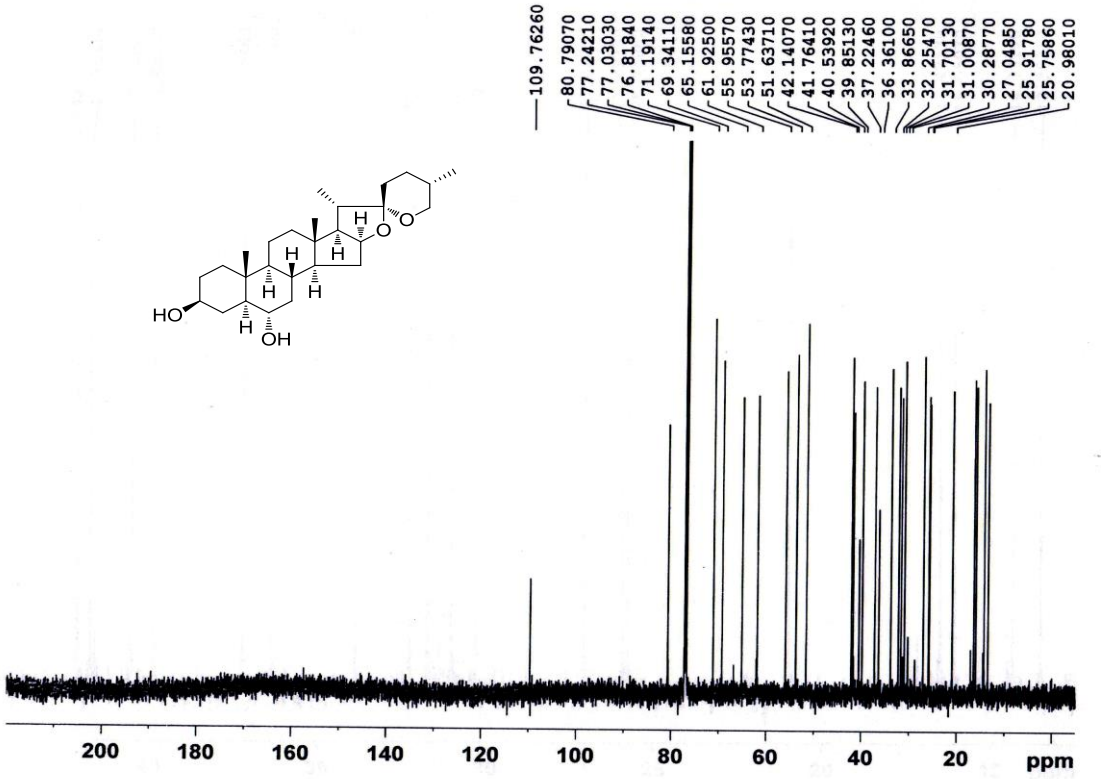
^{13}C NMR of 5β-H, 6β-OH diosgenin (**16**)



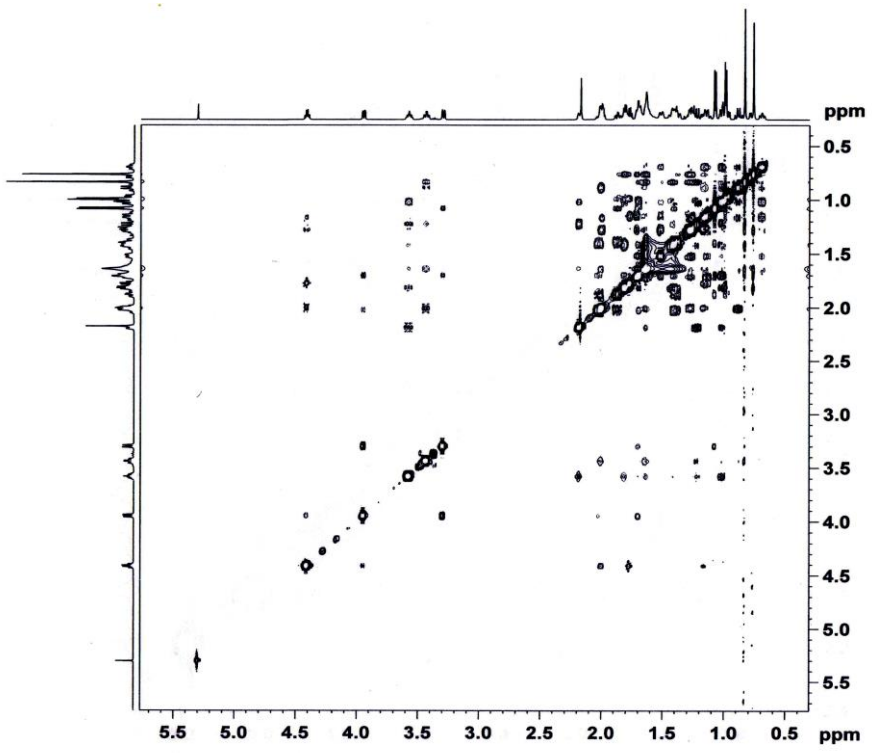
^{1}H NMR of 5α-H, 6α-OH yamogenin (**17**)

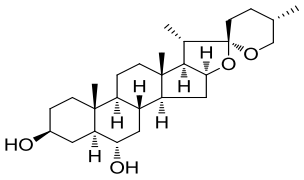


^{13}C NMR of 5α-H, 6α-OH yamogenin (**17**)

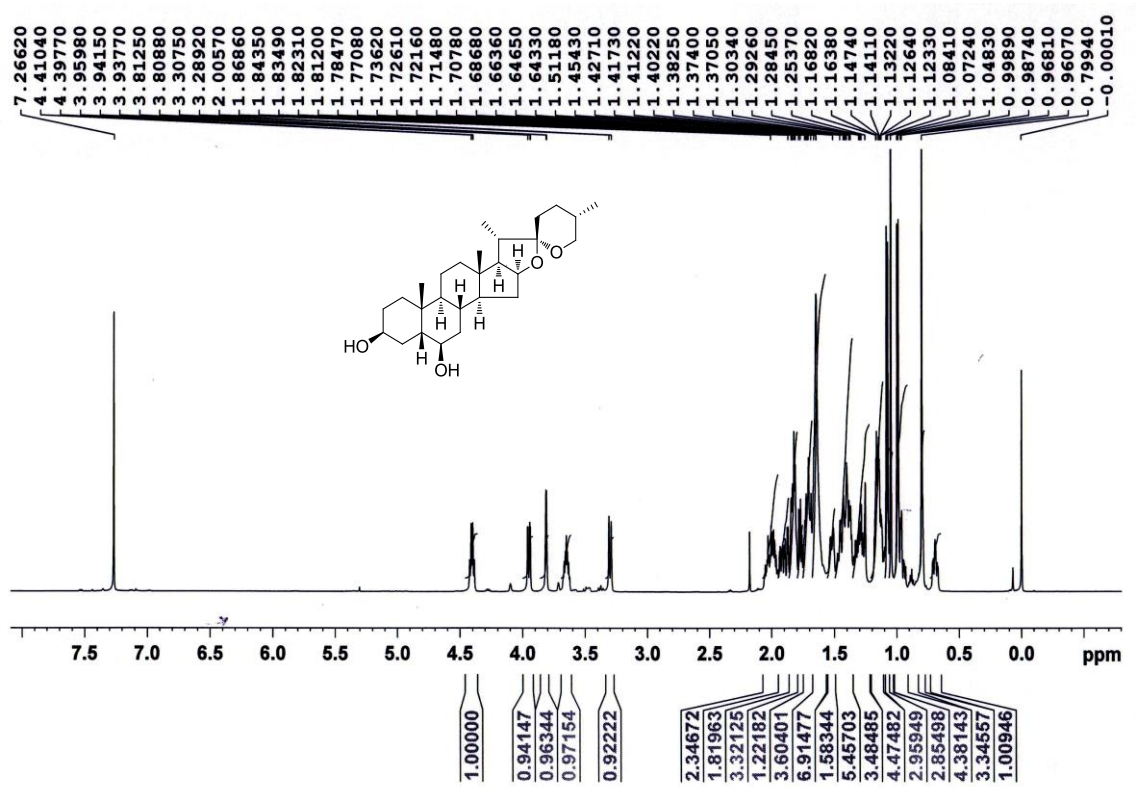


NOE of 5α-H 6α-OH yamogenin (**17**)

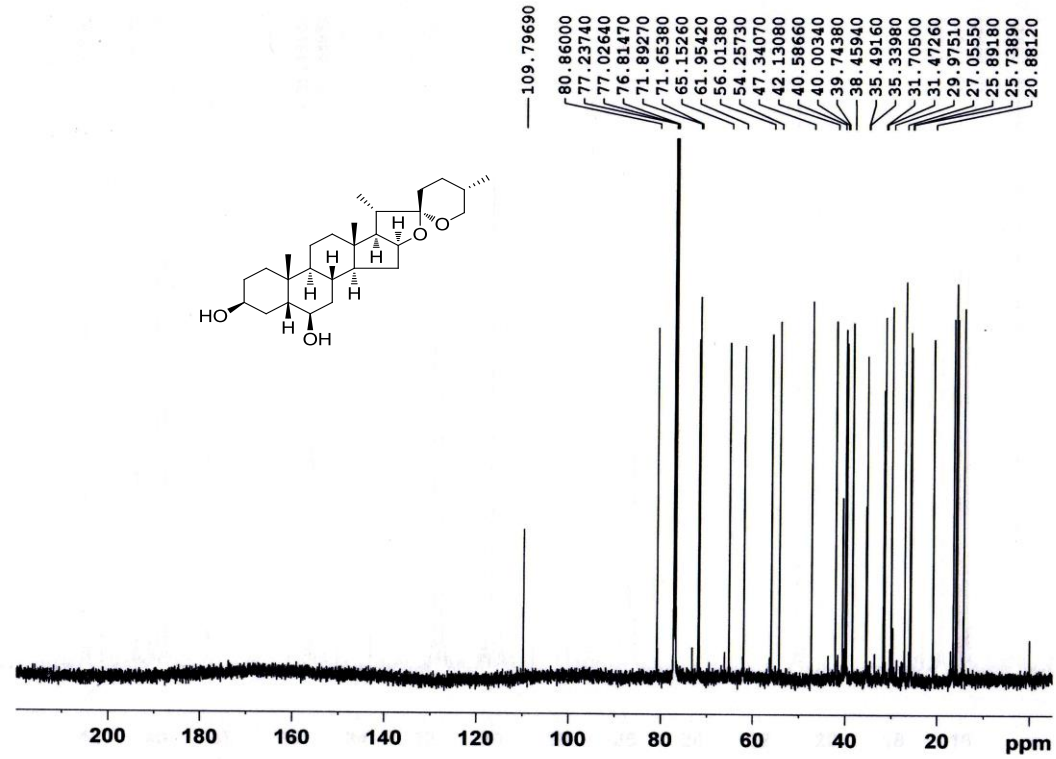




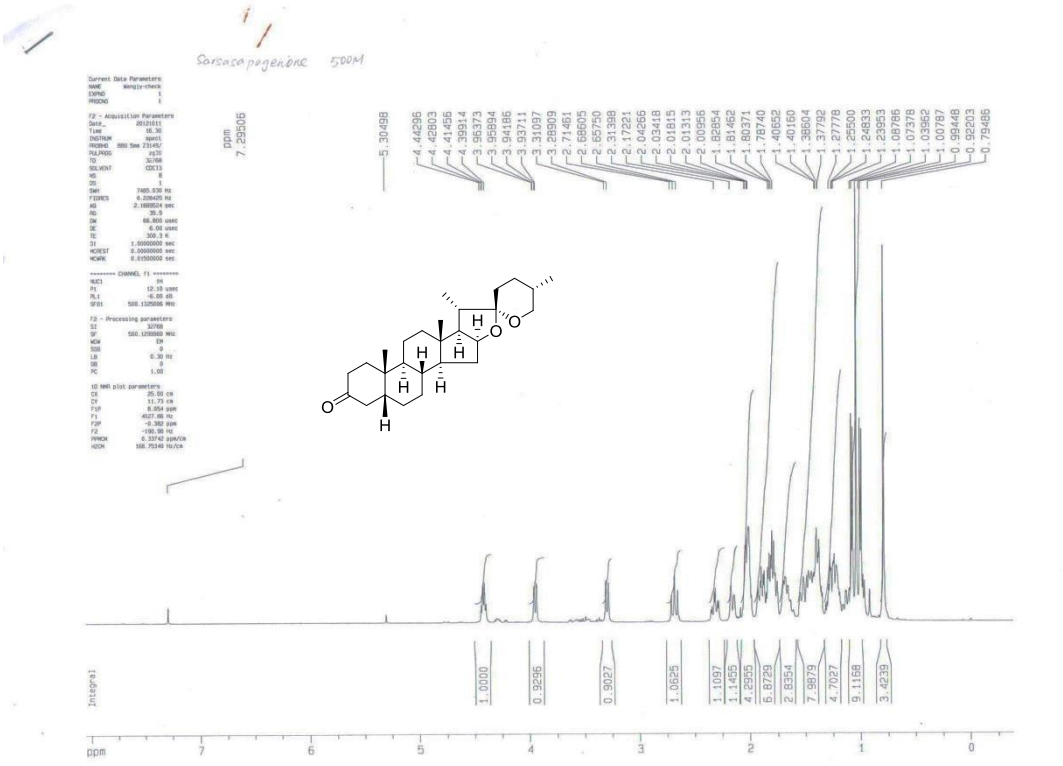
^{1}H NMR of 5β-H, 6β-OH yamogenin (**18**)



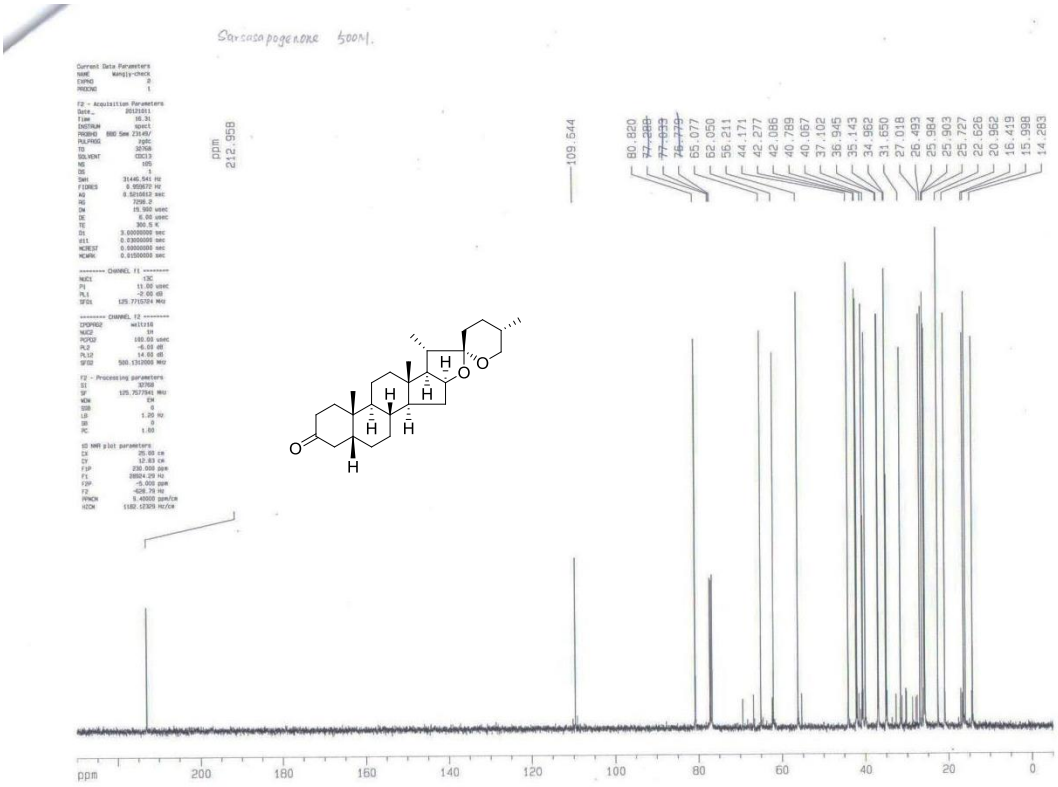
^{13}C NMR of 5β-H, 6β-OH yamogenin (**18**)



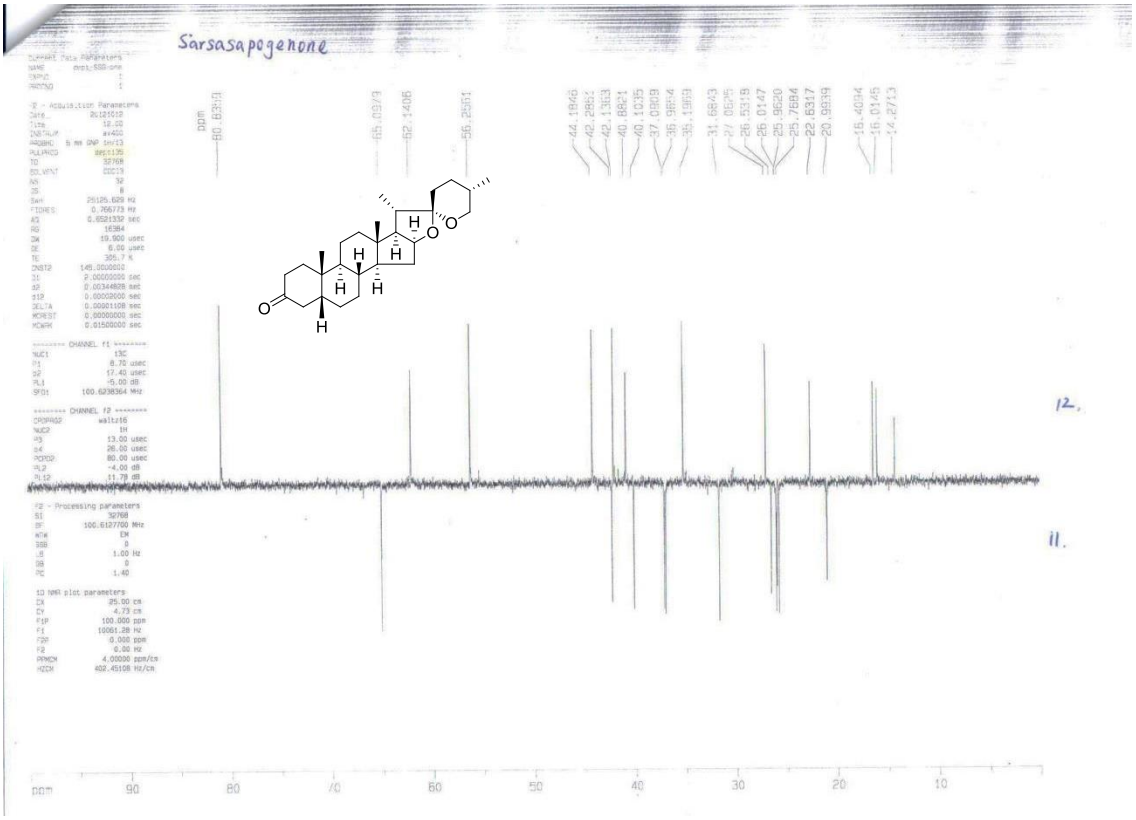
^{1}H NMR of Sarsasapogenone (**19**)



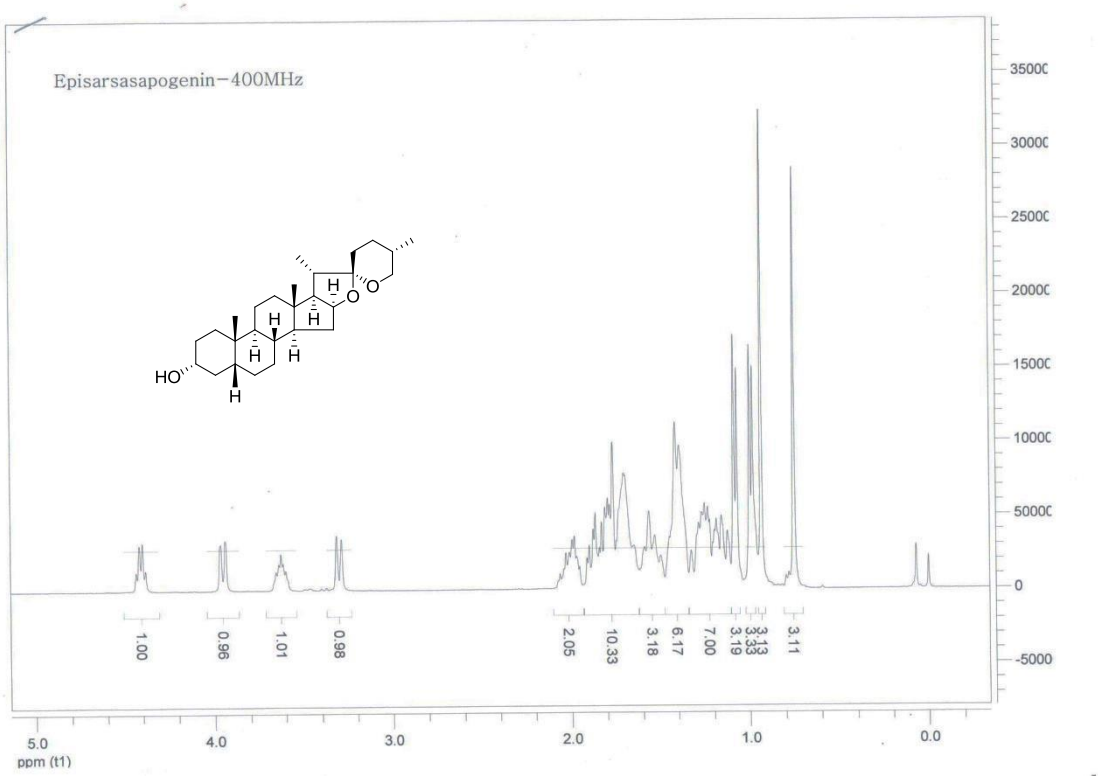
^{13}C NMR of Sarsasapogenone (**19**)



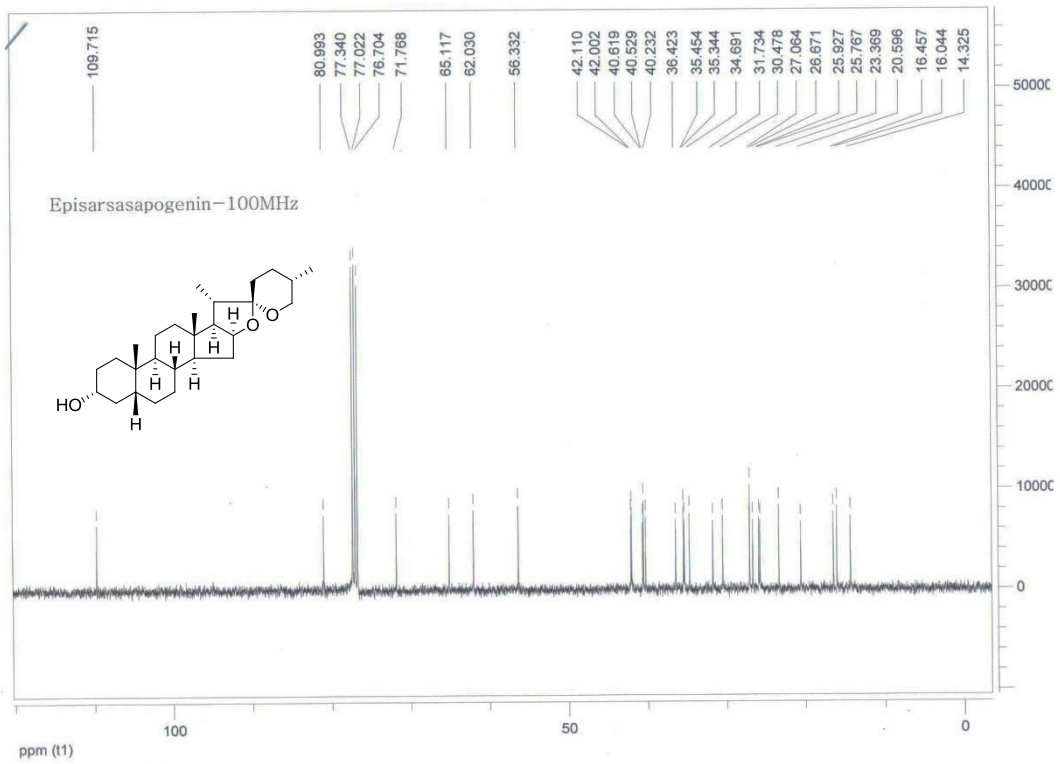
Dept-135 of Sarsasapogenone (**19**)



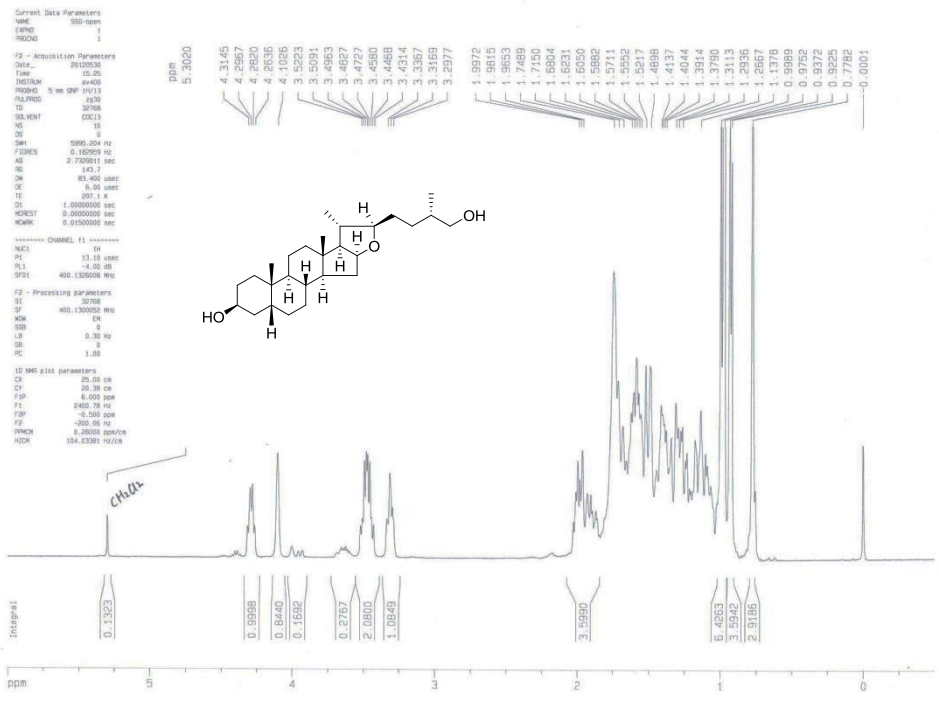
^{1}H NMR of Episarsasapogenin (**20**)



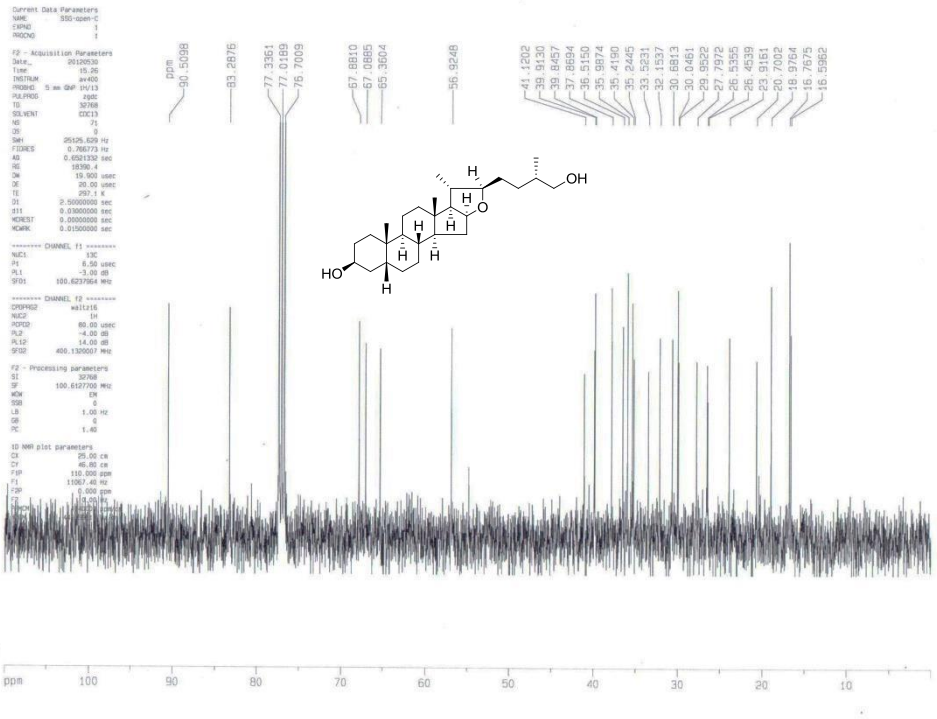
^{13}C NMR of Episarsasapogenin (**20**)



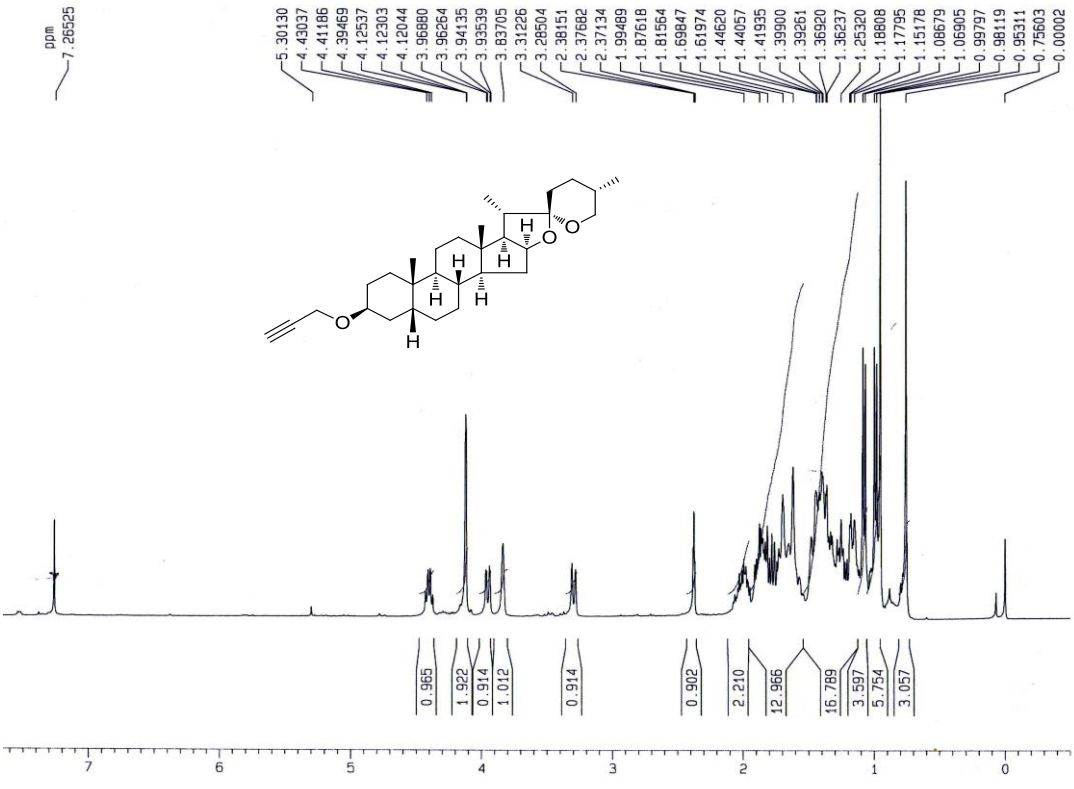
^{1}H NMR of dihydrosarsasapogenin (dSSG, **21**)



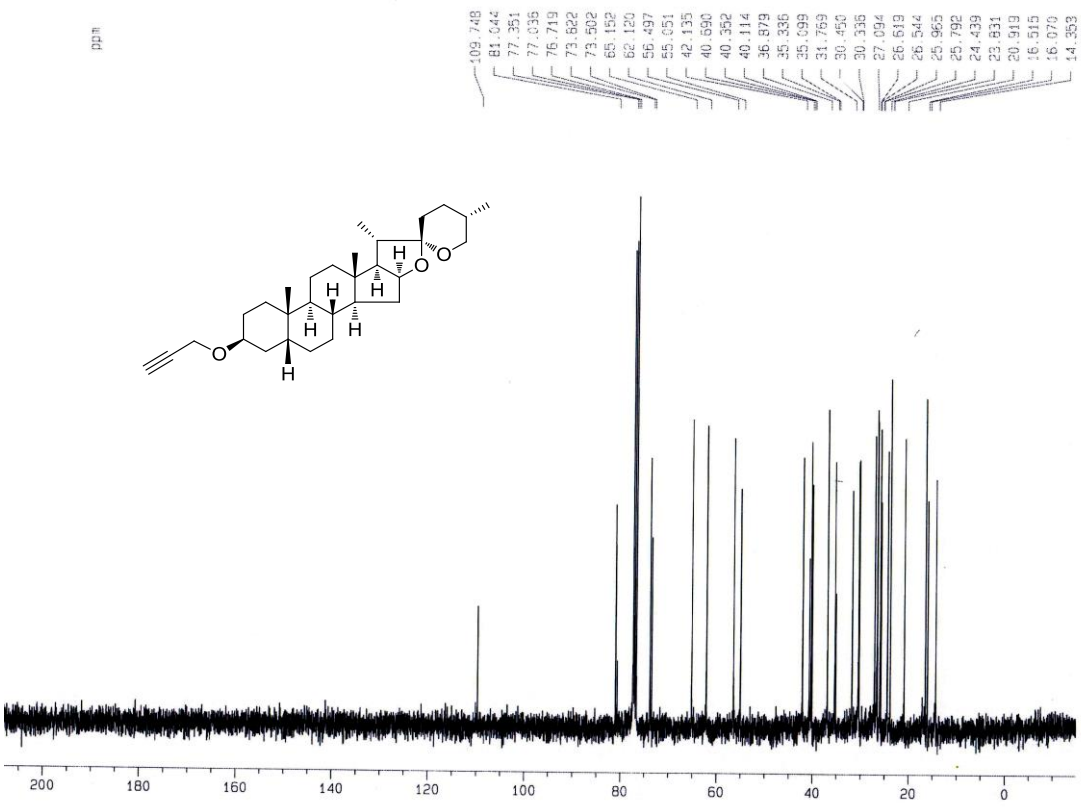
^{13}C NMR of dihydrosarsasapogenin (dSSG, **21**)



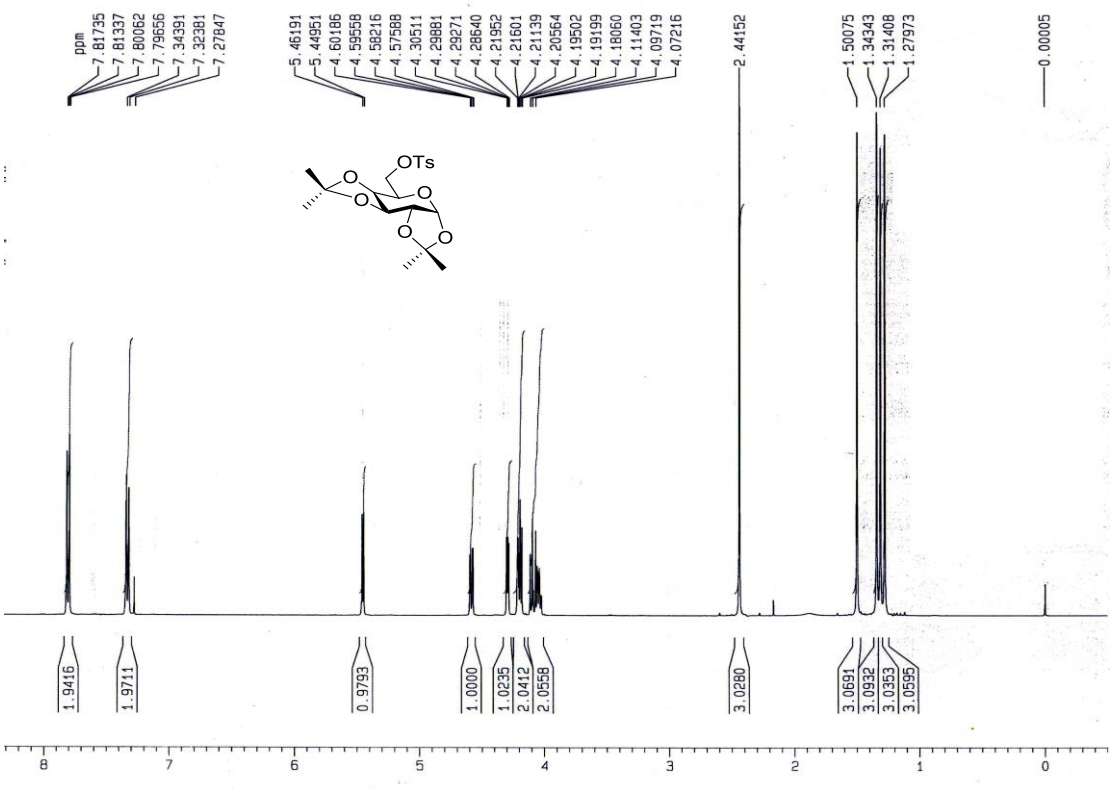
^{1}H NMR of Propargyl SSG (**25**)



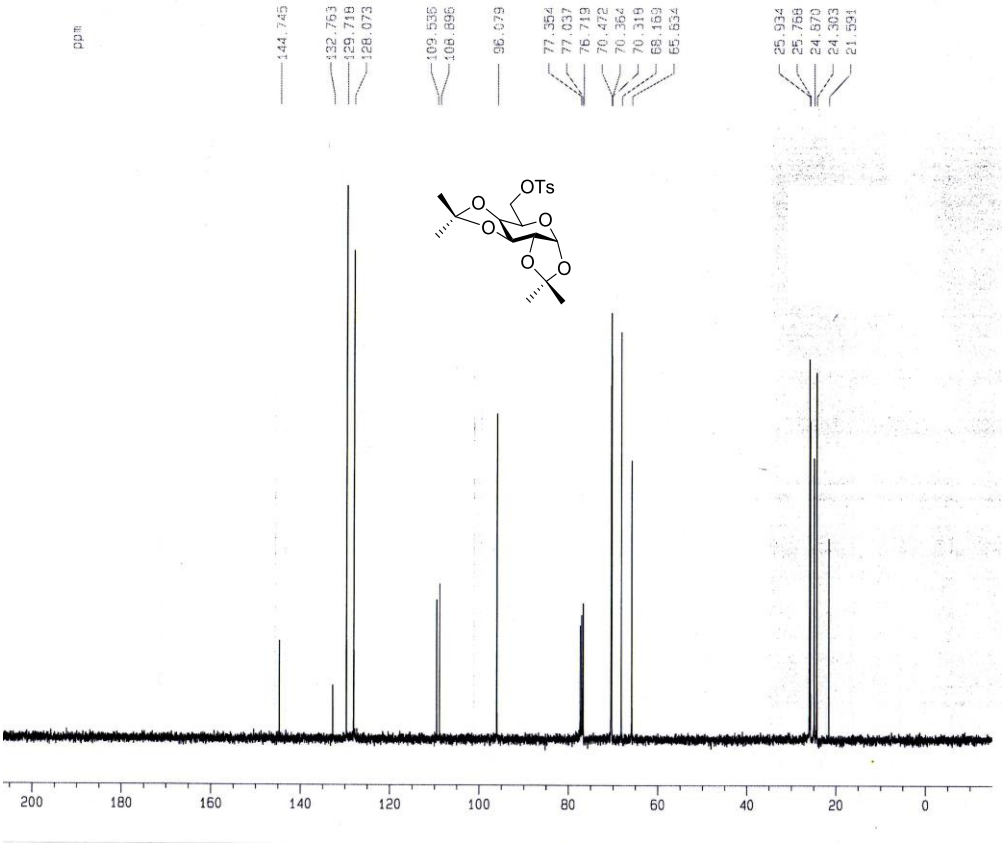
^{13}C NMR of Propargyl SSG (**25**)



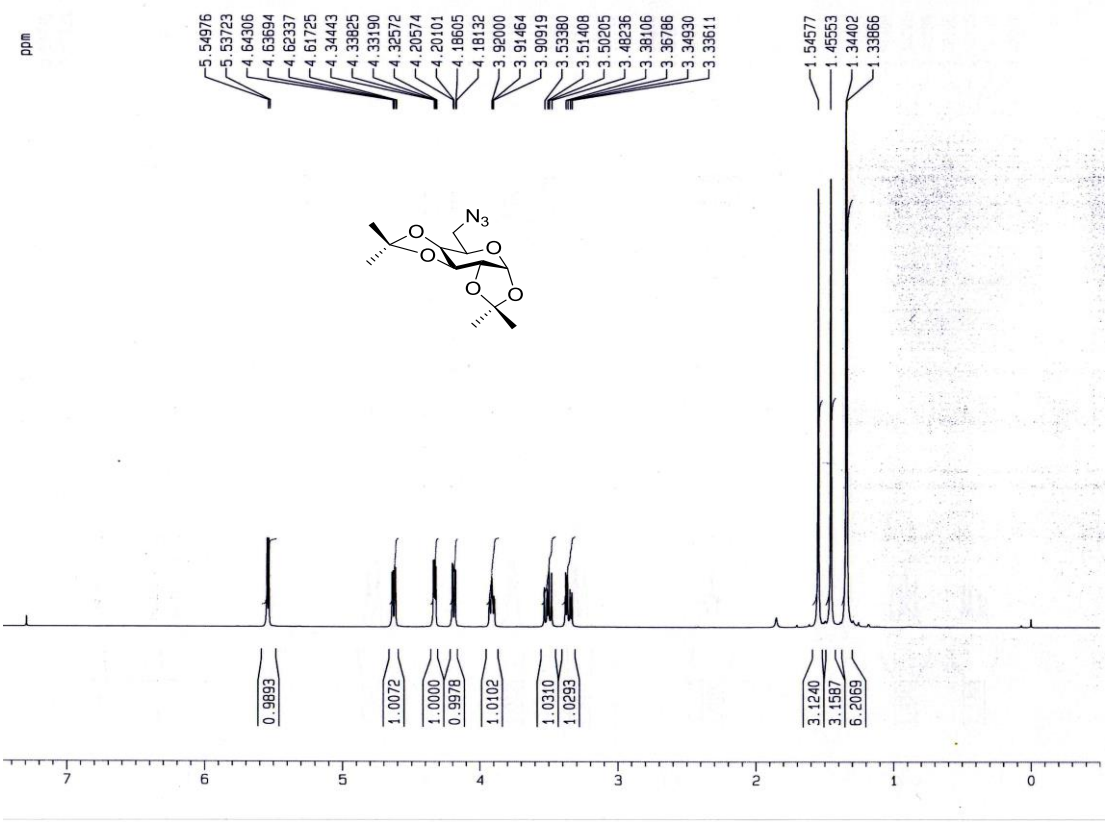
^{1}H NMR of Compound **26a**



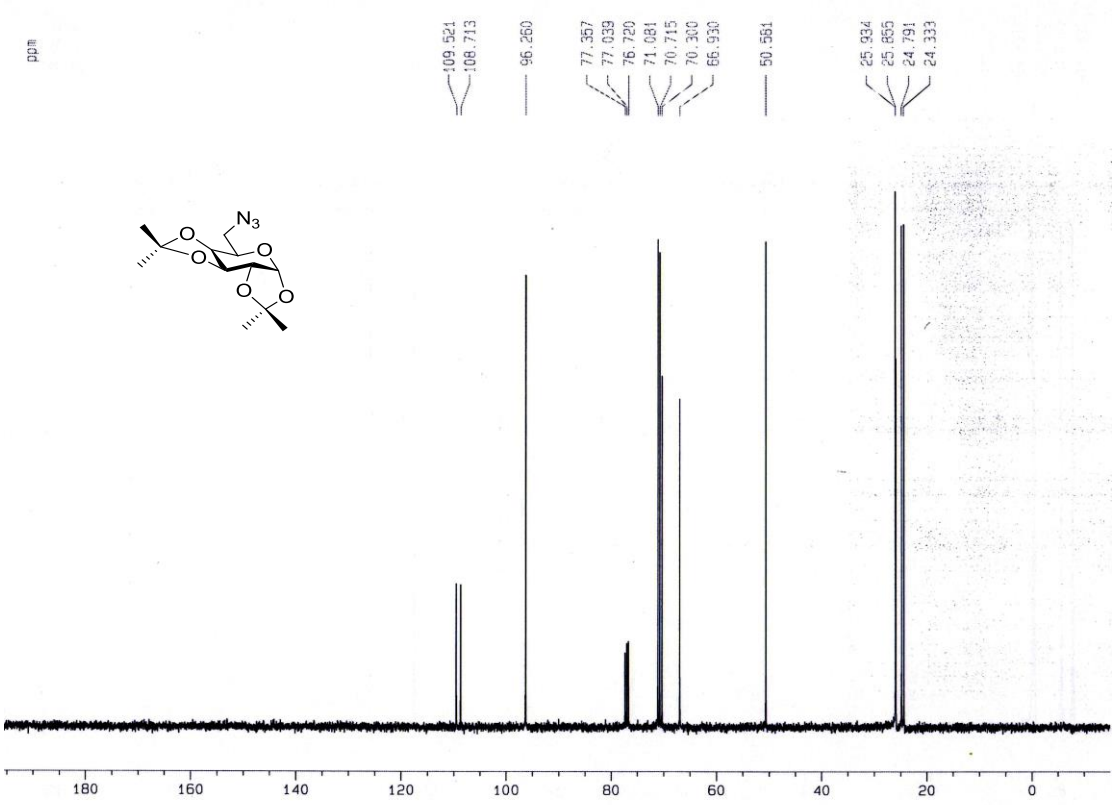
^{13}C NMR of Compound **26a**



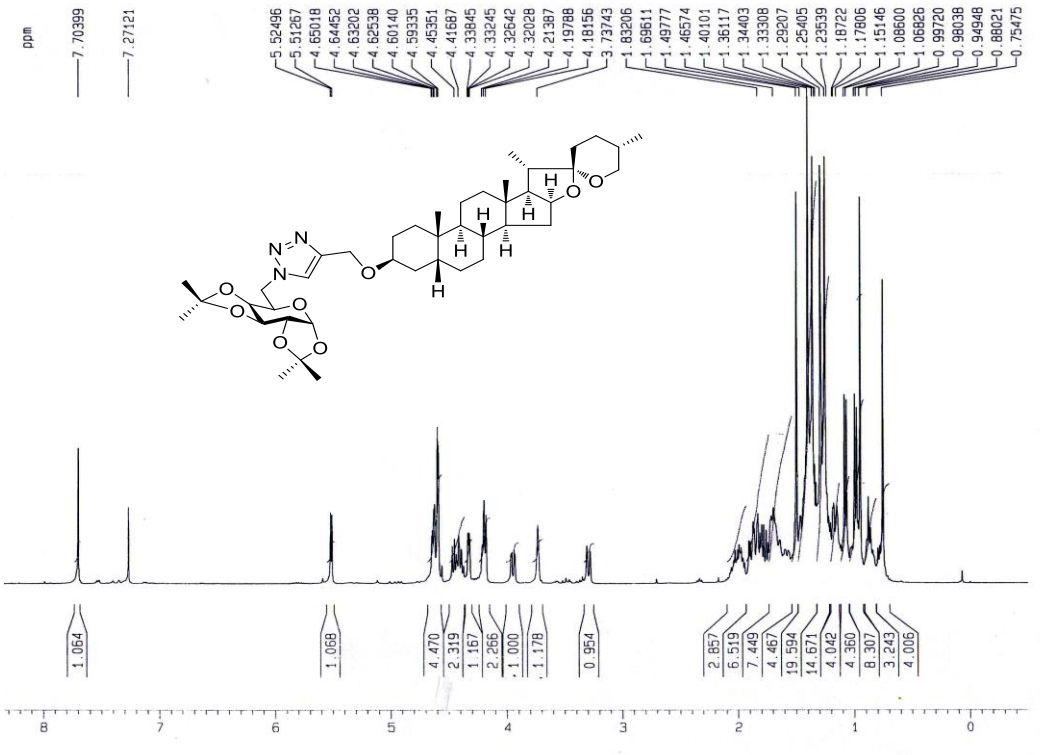
^{1}H NMR of Compound **26**



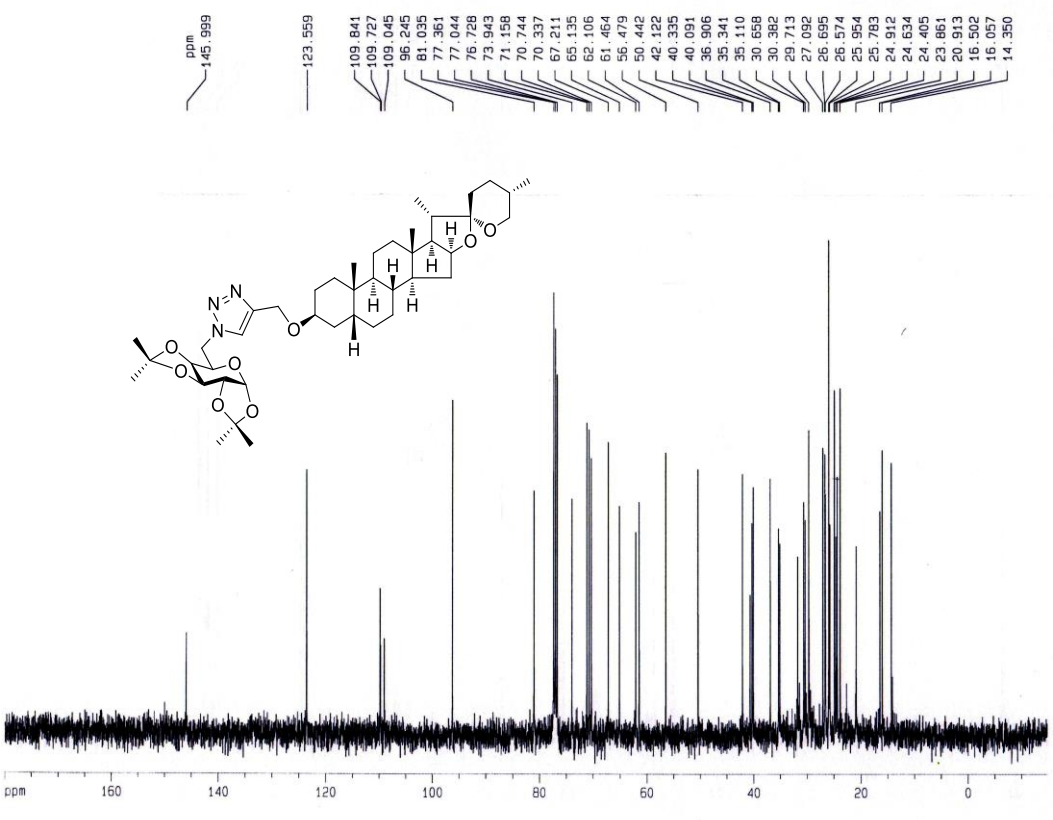
^{13}C NMR of Compound **26**



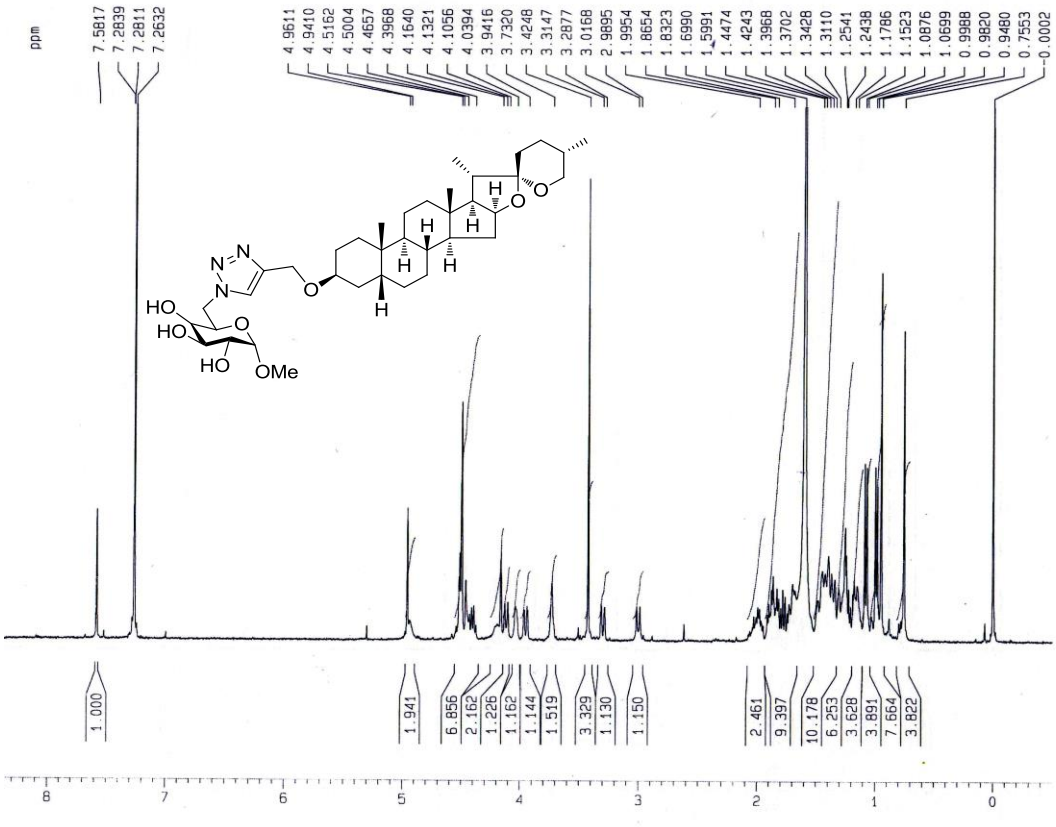
^{1}H NMR of Triazole SSG (**27**)



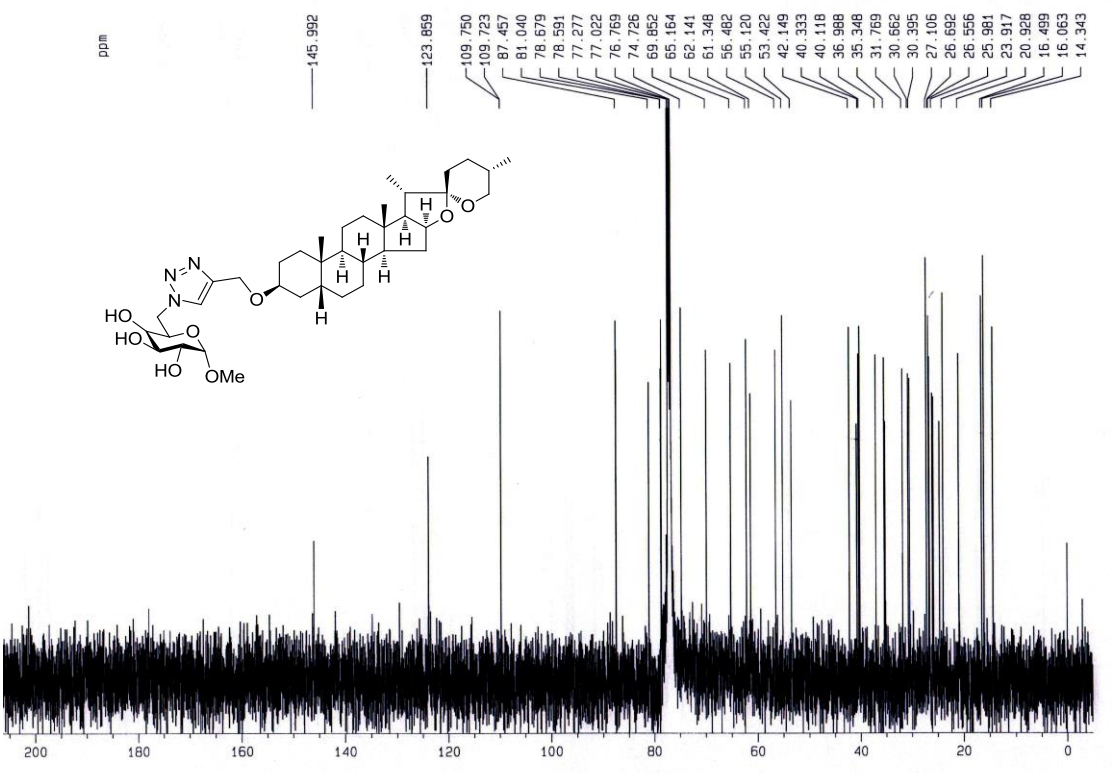
^{13}C NMR of Triazole SSG (**27**)



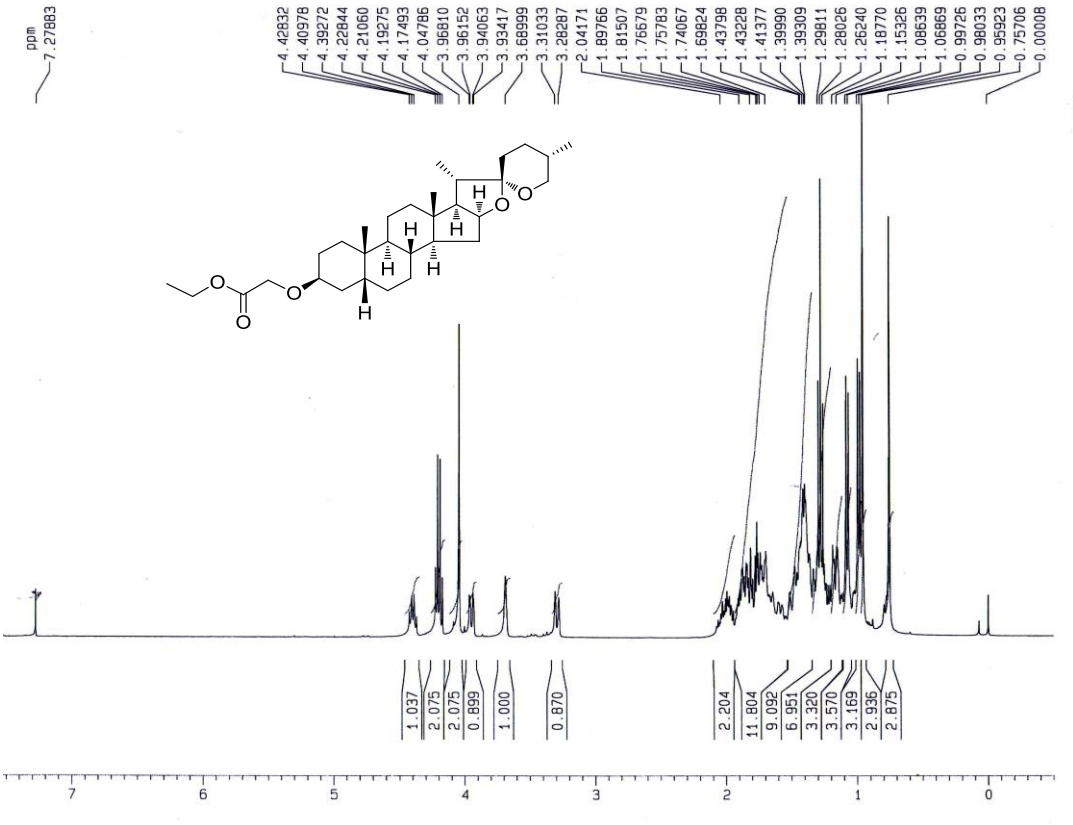
^{1}H NMR of α-OMe triazole SSG (**28**)



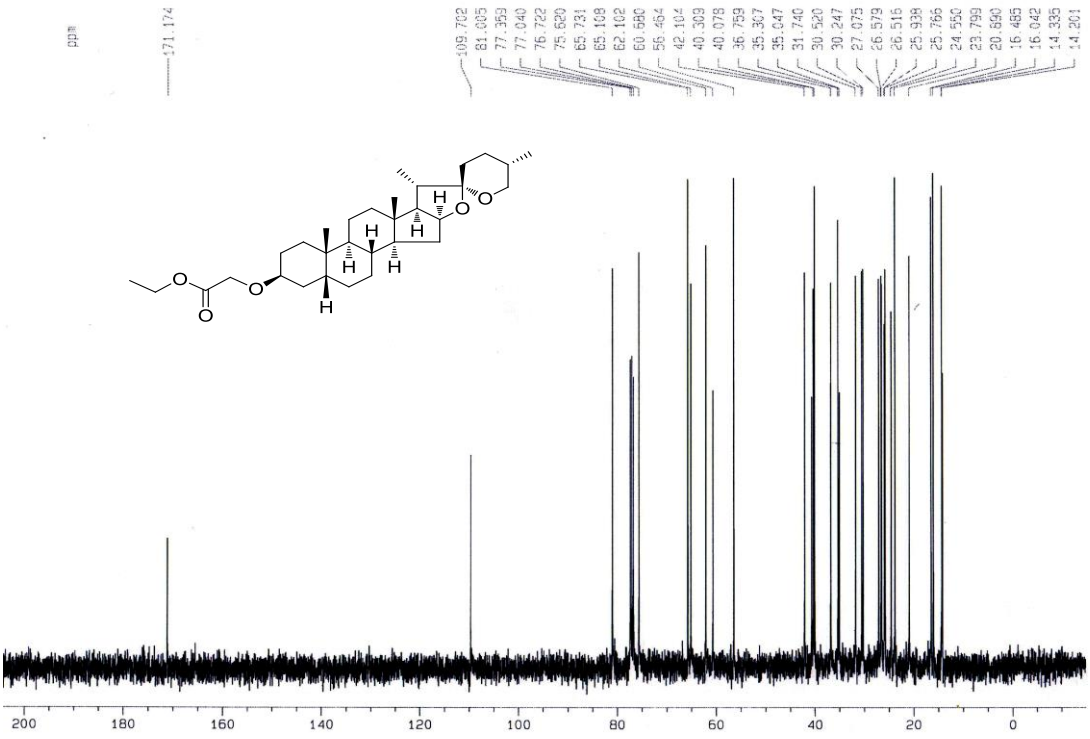
^{13}C NMR of α-OMe triazole SSG (**28**)



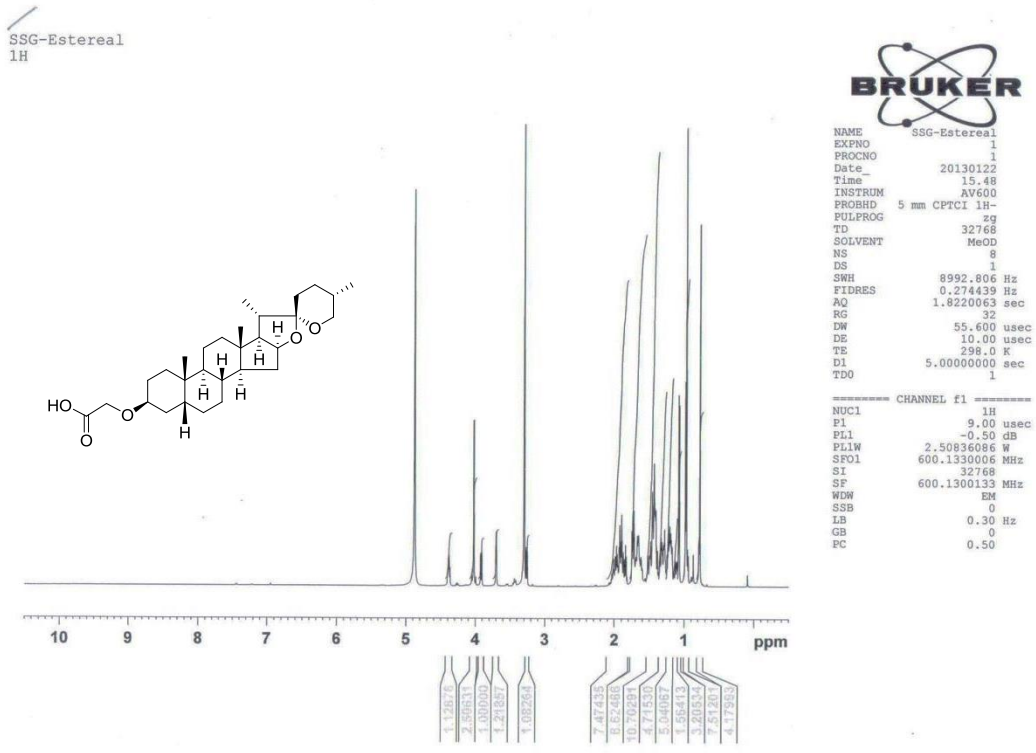
^{1}H NMR of Carboxylate ethereal SSG (**29a**)



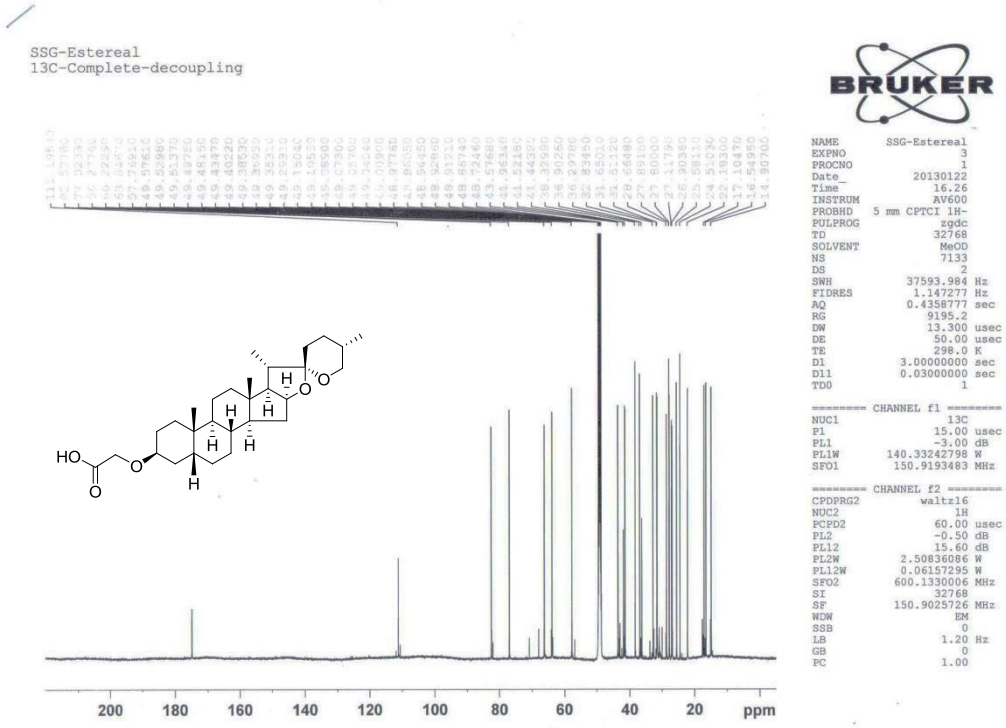
^{13}C NMR of Carboxylate ethereal SSG (**29a**)



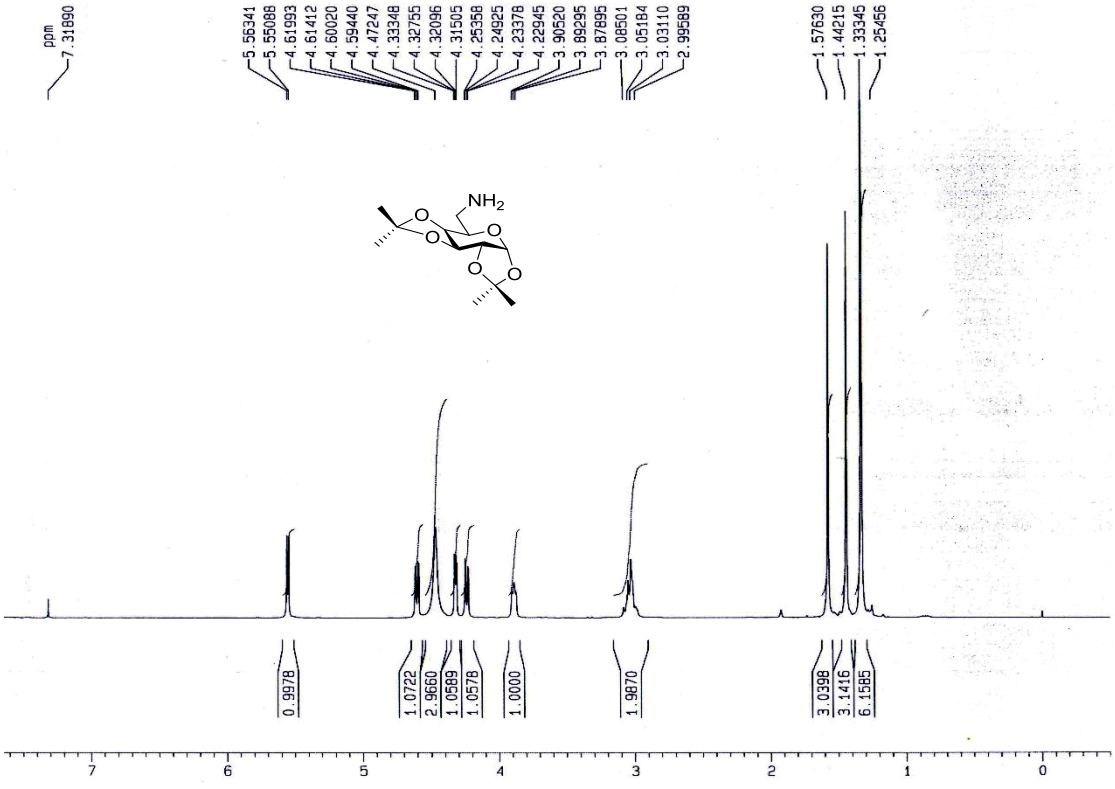
^{1}H NMR of Ethereal SSG (**29**)



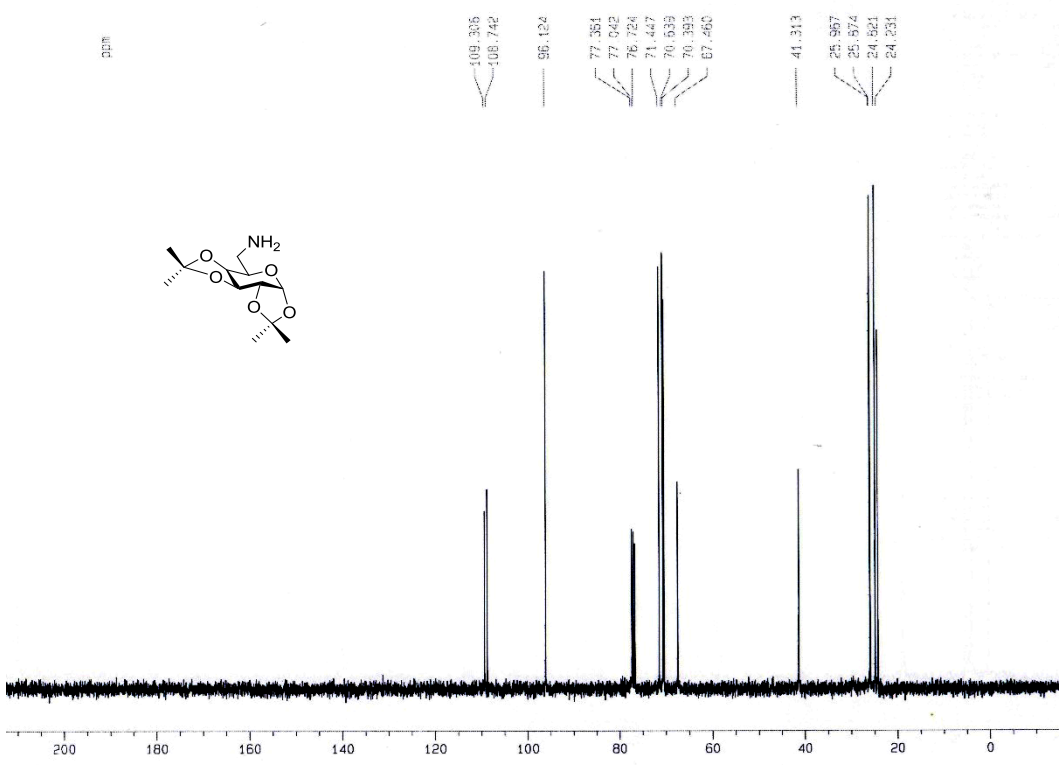
^{13}C NMR of Ethereal SSG (**29**)



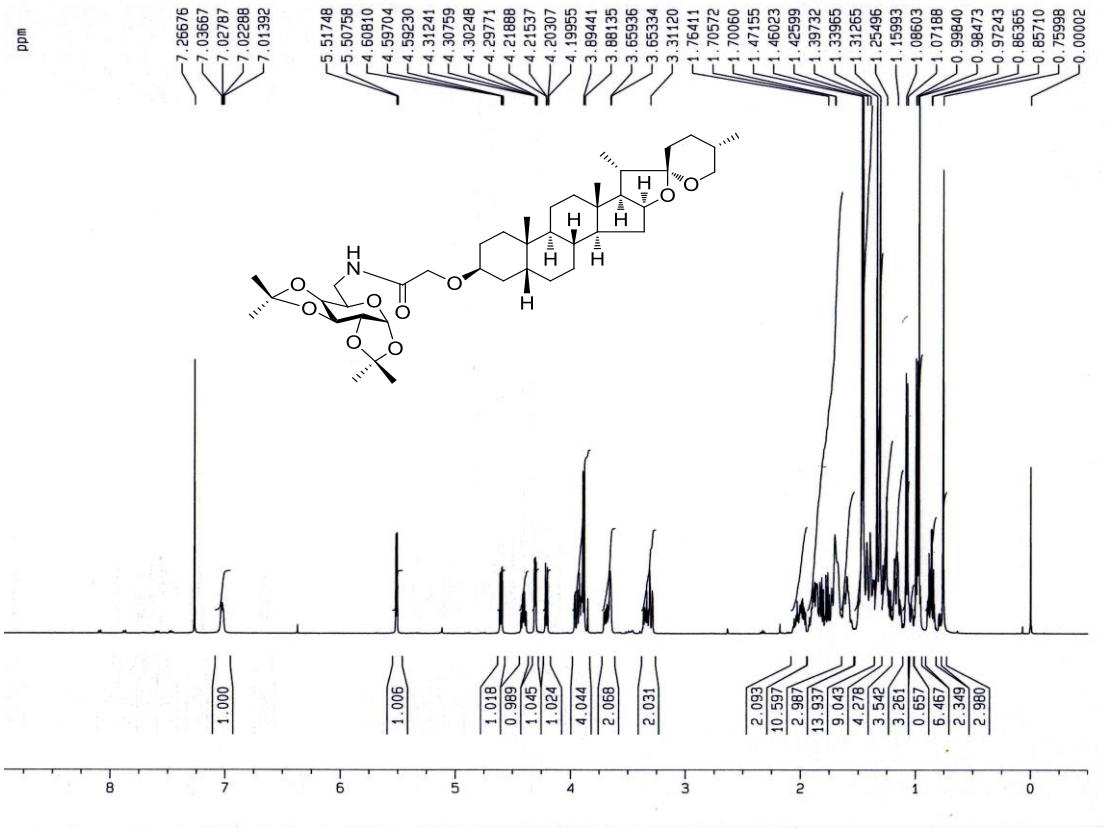
^{1}H NMR of Compound **30**



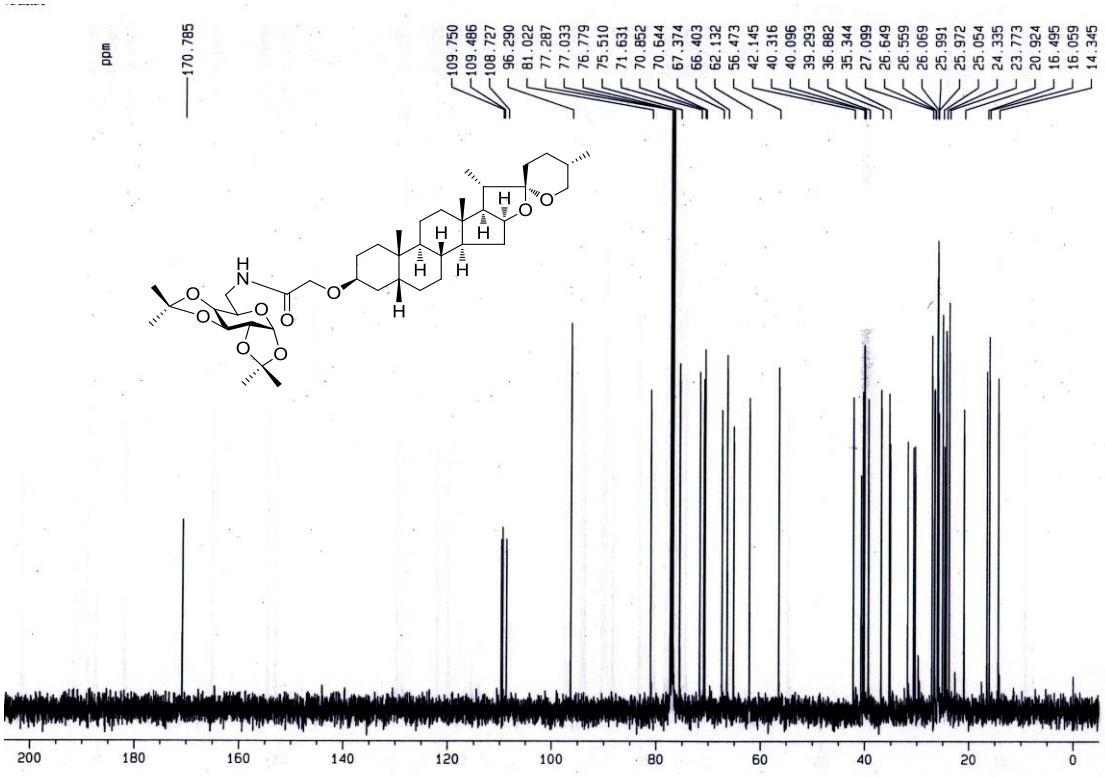
^{13}C NMR of Compound **30**



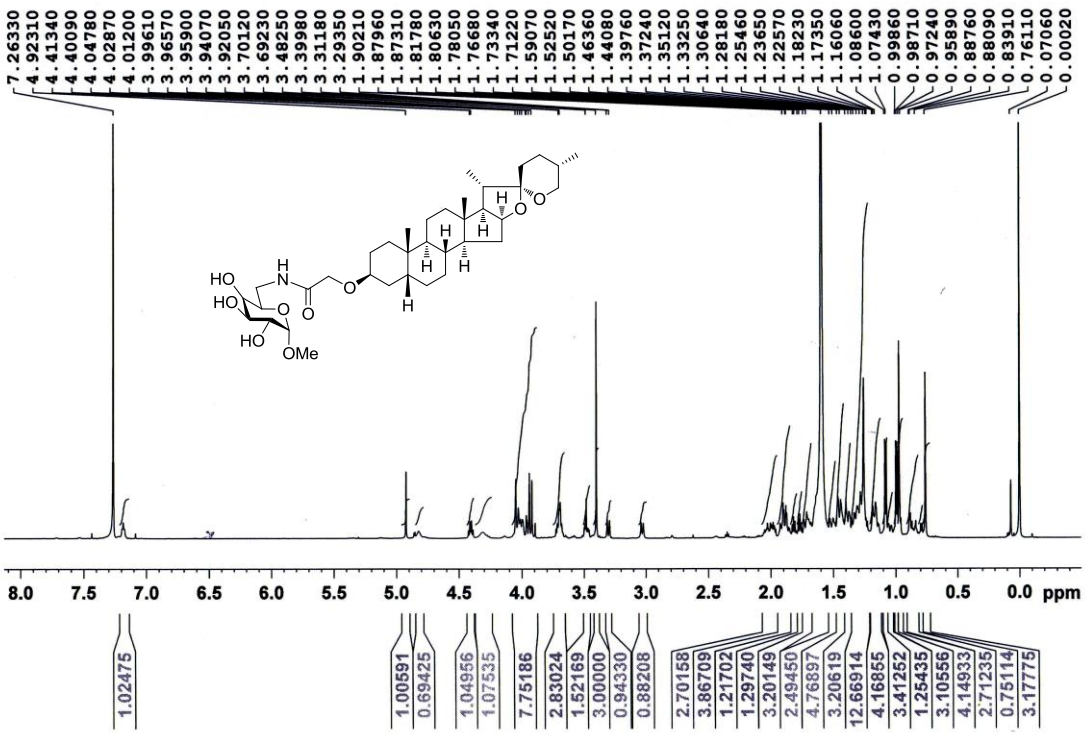
^{1}H NMR of Amide SSG (**31**)



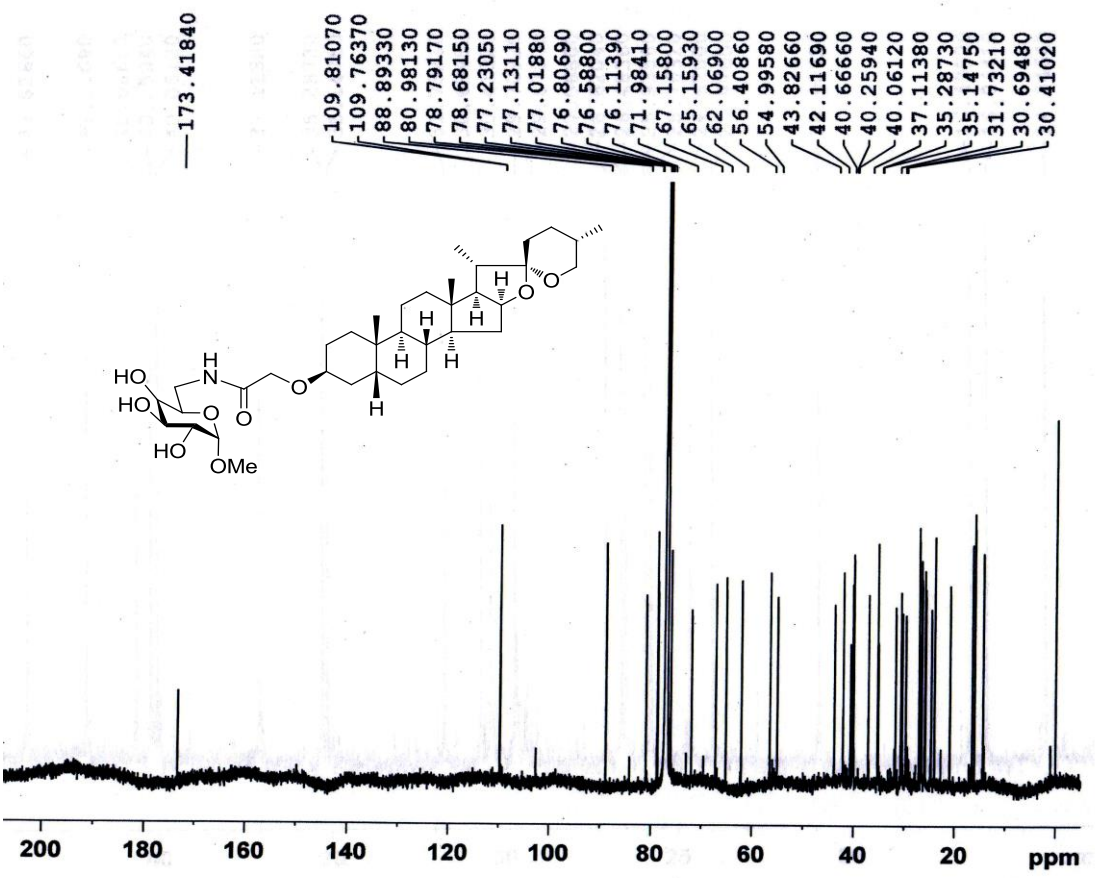
^{13}C NMR of Amide SSG (**31**)



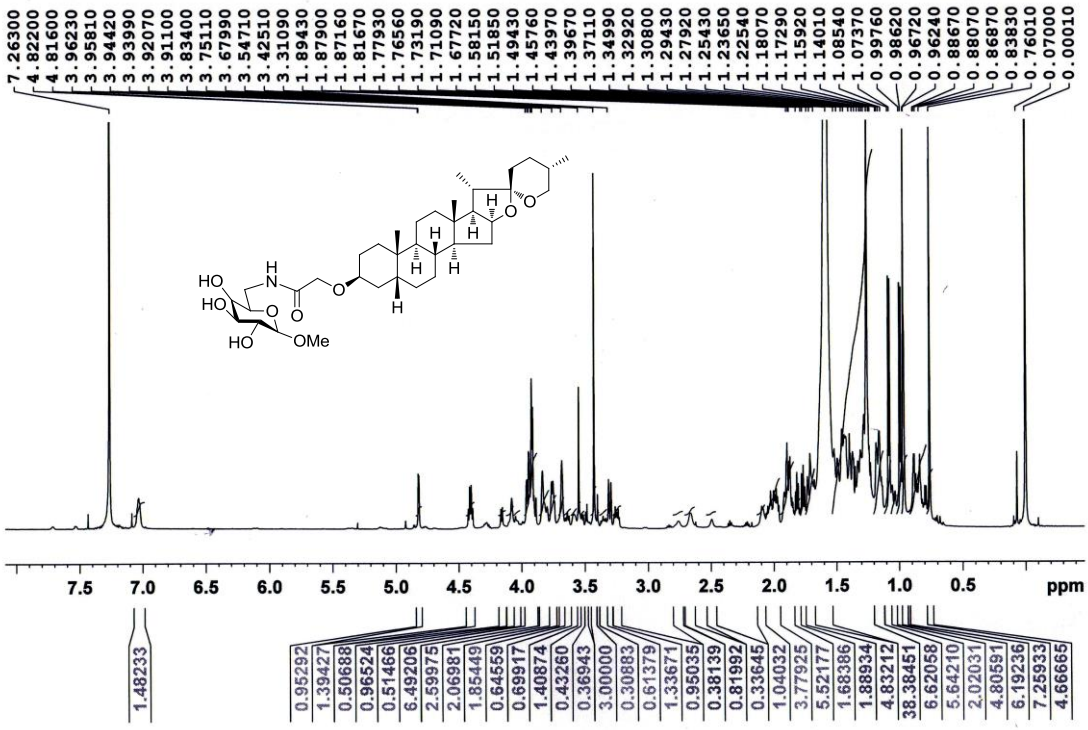
^{1}H NMR of α-OMe SSG (**32**)



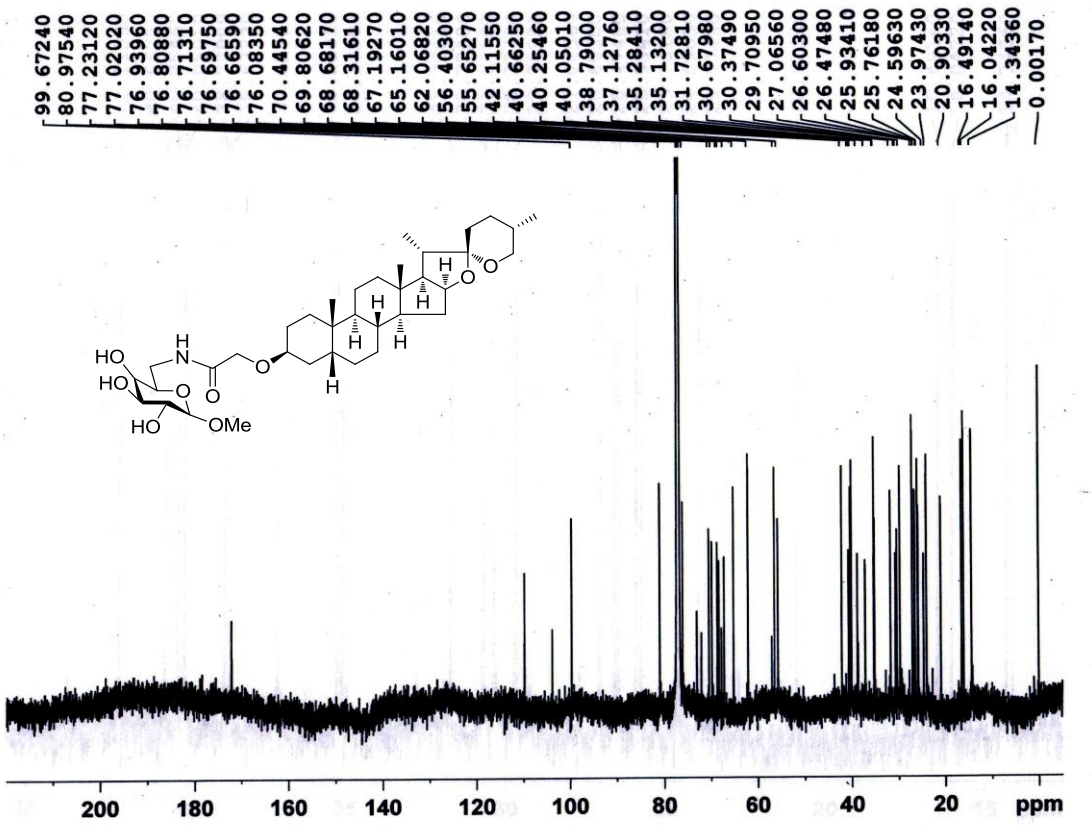
^{13}C NMR of α-OMe SSG (**32**)



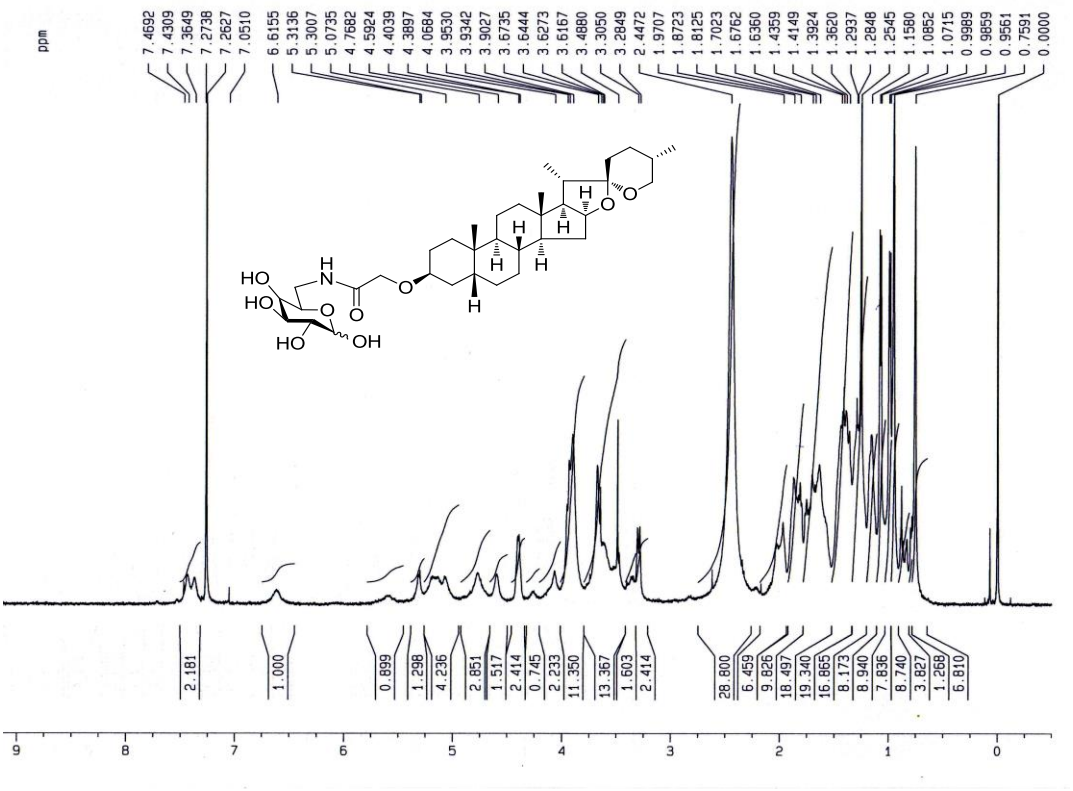
^{1}H NMR of β-OMe SSG (**33**)



^{13}C NMR of β-OMe SSG (**33**)



^{1}H NMR of α-,β-OH SSG (**34**)



^{13}C NMR of α-,β-OH SSG (**34**)