

Supporting information

Synthesis of Terpene and Steroid Dimers and Trimers Having Cyclobutadienyl-Co and Aromatic Tethers

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General Methods. Unless noted otherwise, all manipulations were carried out under an argon atmosphere using standard Schlenk techniques. All glassware was oven dried for approximately 1 h prior to use. THF and Et₂O were distilled from Na benzophenone ketyl under argon. DCM, toluene, xylenes and decalin were distilled from CaH₂. Other solvents were HPLC grade and were used without further purification. All reagents were obtained from commercial sources and used without further purification, unless noted otherwise. Silica gel 60 F₂₅₄ plates were used for TLC analysis. Flash column chromatography was performed using silica gel (Merk, n° 9385,230-400 mesh). ¹H and ¹³C NMR spectra were recorded at 200, 300, 400 and 500 MHz (¹H) using CDCl₃ as solvent and with the residual solvent signal as internal reference (CDCl₃, 7.25 and 77.0 ppm). The detailed peak assignment of ¹H and ¹³C NMR spectra was accomplished by gHMQC and gHMBC experiments.

The following abbreviations are used to describe peak patterns when appropriate: s (singlet), d (doublet), t (triplet), m (multiplet), and br (broad). Mass spectra were recorded using the electronic impact technique with ionization energy of 70 eV or using the atmospheric pressure chemical ionization (APCI) or electrospray (ES) chemical ionization techniques in its positive or negative modes.

Table 1. Crystal data and structure refinement for Compound **9** (C₂₉H₄₁O₂Co).

Identification code	data1		
Empirical formula	C ₂₉ H ₄₁ CoO ₂		
Formula weight	480.55		
Temperature	293(2) K		
Wavelength	0.71073 Å		
Crystal system	Orthorhombic		
Space group	P2(1)2(1)2(1)		
Unit cell dimensions	a = 7.2556(9) Å	α = 90°.	
	b = 10.8856(14) Å	β = 90°.	
	c = 31.743(4) Å	γ = 90°.	
Volume	2507.1(5) Å ³		
Z	4		
Density (calculated)	1.273 Mg/m ³		
Absorption coefficient	0.707 mm ⁻¹		
F(000)	1032		
Crystal size	0.08 x 0.10 x 0.33 mm ³		
Theta range for data collection	1.28 to 25.00°.		
Index ranges	-8<=h<=7, -12<=k<=9, -30<=l<=37		
Reflections collected	13255		
Independent reflections	4419 [R(int) = 0.1060]		
Completeness to theta = 25.00°	100.0 %		
Absorption correction	None		
Refinement method	Full-matrix least-squares on F ²		
Data / restraints / parameters	4419 / 0 / 296		
Goodness-of-fit on F ²	0.838		
Final R indices [I>2sigma(I)]	R1 = 0.0502, wR2 = 0.0759		
R indices (all data)	R1 = 0.1259, wR2 = 0.0908		
Absolute structure parameter	0.00		
Extinction coefficient	0.00139(14)		
Largest diff. peak and hole	0.245 and -0.281 e.Å ⁻³		

Table 2. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for C₂₉H₄₁O₂Co. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
Co(1)	8583(1)	3425(1)	757(1)	45(1)
O(1)	9347(5)	6323(4)	1125(1)	56(1)
O(2)	8716(7)	4846(4)	1853(1)	68(1)
C(1)	7077(7)	4802(5)	975(2)	36(2)
C(2)	7235(6)	3796(5)	1282(2)	33(2)
C(3)	6189(8)	3010(5)	1001(2)	45(2)
C(4)	6055(7)	4006(5)	704(2)	41(2)
C(5)	7545(8)	6128(6)	940(2)	41(2)
C(6)	7531(7)	6556(6)	468(2)	55(2)
C(7)	6092(9)	7569(6)	454(2)	63(2)
C(8)	4202(8)	6959(6)	527(2)	69(2)
C(9)	4248(7)	6646(6)	1004(2)	58(2)
C(10)	6175(8)	7073(5)	1144(2)	42(2)
C(11)	6457(10)	8269(6)	871(2)	63(2)
C(12)	4985(10)	9255(6)	952(2)	87(2)
C(13)	8342(9)	8882(5)	896(2)	91(2)
C(14)	6376(9)	7259(5)	1616(1)	65(2)
C(15)	11413(8)	3316(8)	764(2)	75(2)
C(16)	10614(8)	2123(7)	732(2)	67(2)
C(17)	9569(9)	2089(7)	370(2)	72(2)
C(18)	9701(10)	3227(9)	168(2)	77(2)
C(19)	10830(9)	4010(7)	414(3)	70(2)
C(5')	7607(8)	3789(6)	1758(2)	41(2)
C(6')	5717(7)	3873(6)	1993(2)	54(2)
C(7')	5722(8)	2702(6)	2269(2)	56(2)
C(8')	5569(8)	1577(7)	1982(2)	65(2)
C(9')	7527(8)	1498(7)	1794(2)	63(2)
C(10')	8537(8)	2631(5)	1965(2)	44(2)
C(11')	7720(8)	2659(7)	2429(2)	54(2)
C(12')	8180(8)	1495(6)	2688(2)	82(2)
C(13')	8320(9)	3776(6)	2694(2)	79(2)

C(14')	10590(6)	2550(6)	1922(2)	76(2)
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Table 3. Crystal data and structure refinement for compound **10** (C₃₀H₄₁CoO₃).

Identification code	ea501	
Empirical formula	C ₃₀ H ₄₁ Co O ₃	
Formula weight	508.56	
Temperature	293(2) K	
Wavelength	0.71073 Å	
Crystal system	Monoclinic	
Space group	P2(1)	
Unit cell dimensions	a = 11.8062(14) Å b = 12.4626(16) Å c = 18.529(3) Å	α = 90°. β = 108.153(3)°. γ = 90°.
Volume	2590.6(6) Å ³	
Z	4	
Density (calculated)	1.304 Mg/m ³	
Absorption coefficient	0.691 mm ⁻¹	
F(000)	1088	
Crystal size	0.03 x 0.10 x 0.33 mm ³	
Theta range for data collection	1.16 to 25.00°.	
Index ranges	-12<=h<=14, -14<=k<=14, -20<=l<=22	
Reflections collected	13782	
Independent reflections	8797 [R(int) = 0.1193]	
Completeness to theta = 25.00°	99.9 %	
Absorption correction	None	
Refinement method	Full-matrix-block least-squares on F ²	
Data / restraints / parameters	8797 / 37 / 631	
Goodness-of-fit on F ²	0.714	
Final R indices [I>2sigma(I)]	R1 = 0.0606, wR2 = 0.0789	
R indices (all data)	R1 = 0.2493, wR2 = 0.1194	
Absolute structure parameter	0.02(3)	
Extinction coefficient	0.00050(8)	
Largest diff. peak and hole	0.329 and -0.355 e.Å ⁻³	

Table 4. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters ($\text{\AA}^2 \times 10^3$)

for C₃₀H₄₁CoO₃. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
Co(1)	9616(2)	2439(2)	6345(1)	56(1)
O(1)	7895(8)	250(6)	6481(4)	59(2)
O(2)	8764(7)	451(6)	5291(4)	51(2)
O(1')	10948(7)	3204(6)	5039(4)	58(2)
C(6)	5312(9)	1868(8)	5262(5)	67(4)
C(2)	7165(9)	1189(9)	6188(6)	53(4)
C(3)	6795(10)	1698(8)	6838(5)	60(4)
C(4)	5428(10)	1626(11)	6556(7)	75(5)
C(5)	4960(11)	2431(10)	5901(6)	89(4)
C(1)	5953(9)	844(8)	5631(5)	51(3)
C(8)	5637(10)	-443(8)	6669(6)	85(5)
C(7)	5178(9)	522(9)	6139(6)	59(4)
C(9)	3842(9)	366(10)	5719(6)	98(5)
C(10)	6001(9)	-12(8)	5048(6)	67(4)
C(11)	7933(10)	1901(9)	5862(6)	38(3)
C(12)	8596(11)	1435(11)	5378(7)	48(4)
C(13)	9208(9)	2374(10)	5190(5)	40(3)
C(14)	8808(11)	3316(9)	5430(7)	56(4)
C(15)	7960(10)	3017(10)	5832(7)	63(4)
C(16)	11231(12)	1772(16)	6787(9)	82(5)
C(17)	11390(14)	2857(15)	6872(10)	94(6)
C(18)	10657(16)	3229(11)	7272(8)	82(5)
C(19)	10062(12)	2313(17)	7483(6)	86(5)
C(20)	10513(15)	1416(12)	7205(9)	83(6)
C(1')	9339(9)	2674(7)	3850(5)	52(4)
C(2')	10047(9)	2413(8)	4681(5)	40(3)
C(3')	10686(9)	1341(8)	4650(6)	57(4)
C(4')	10204(8)	1087(9)	3797(6)	67(4)

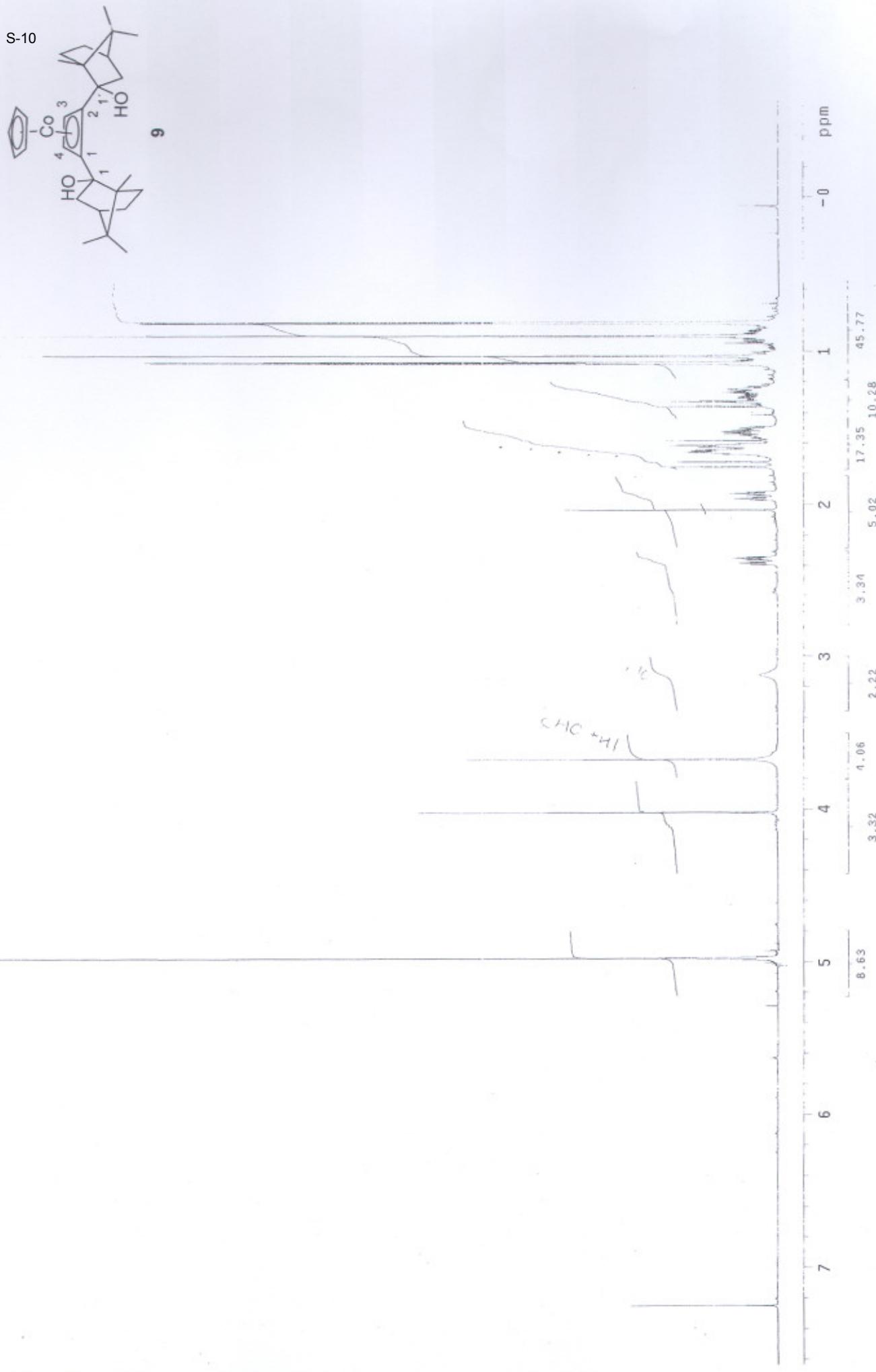
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C(6')	8295(7)	1872(7)	3611(5)	43(3)
C(7')	10168(8)	2186(9)	3413(6)	51(4)
C(8')	11397(8)	2723(9)	3586(6)	77(5)
C(9')	9581(10)	2165(10)	2546(6)	102(6)
C(10')	8977(9)	3854(7)	3691(5)	51(4)
Co(2)	4603(1)	829(2)	-558(1)	40(1)
O(3)	3161(5)	1416(5)	694(4)	38(2)
O(4)	5918(5)	-988(5)	651(4)	43(2)
O(3')	6655(6)	-1212(5)	-517(4)	47(2)
C(21)	4652(7)	956(7)	1927(5)	42(3)
C(22)	4155(8)	730(8)	1068(5)	33(3)
C(23)	3640(9)	-410(7)	1055(6)	58(4)
C(24)	3936(9)	-710(10)	1901(6)	60(4)
C(25)	5288(9)	-907(7)	2243(6)	62(4)
C(26)	5764(7)	242(7)	2233(6)	52(4)
C(27)	3740(8)	390(9)	2276(6)	57(4)
C(28)	4140(10)	379(10)	3150(5)	98(5)
C(29)	2457(9)	813(9)	2008(6)	88(4)
C(30)	4930(9)	2148(7)	2113(5)	67(4)
C(31)	5070(8)	803(9)	630(5)	38(3)
C(32)	5801(9)	-1(8)	441(7)	39(3)
C(33)	6356(9)	462(8)	-69(6)	33(3)
C(34)	6142(9)	1584(8)	-102(6)	40(3)
C(35)	5315(8)	1805(8)	302(6)	38(3)
C(36)	2788(10)	761(15)	-1000(7)	72(4)
C(37)	3271(12)	-205(11)	-1100(8)	61(4)
C(38)	4041(13)	-46(12)	-1531(7)	74(5)
C(39)	3993(10)	1076(14)	-1696(6)	70(5)
C(40)	3240(11)	1521(10)	-1350(7)	56(4)
C(21')	8494(8)	-165(7)	31(6)	46(3)
C(22')	7157(8)	-136(8)	-435(5)	36(3)
C(23')	7156(8)	284(8)	-1220(5)	52(3)
C(24')	8496(8)	438(9)	-1100(6)	56(4)
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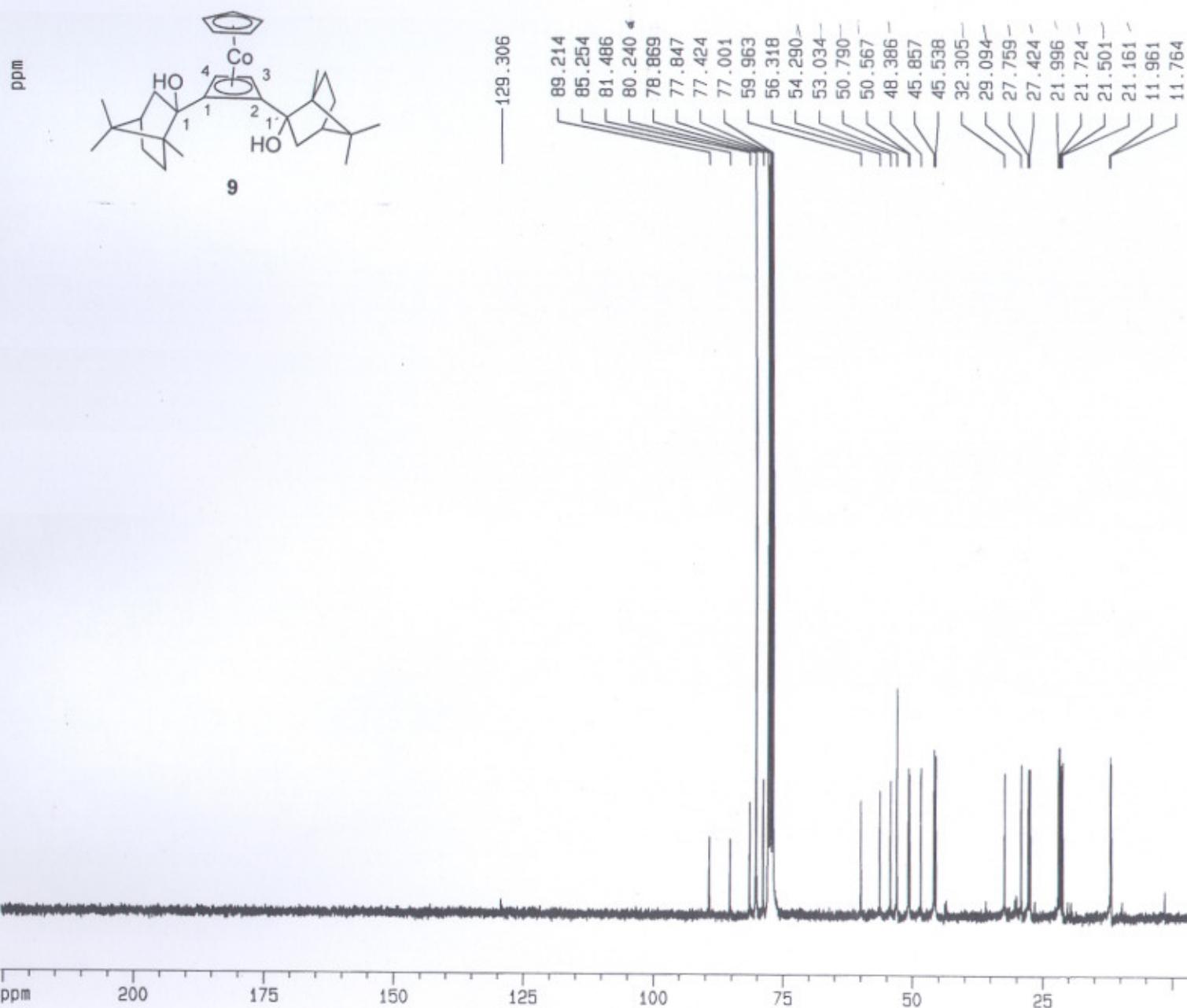
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C(29')	8753(9)	-1606(8)	-980(6)	60(4)
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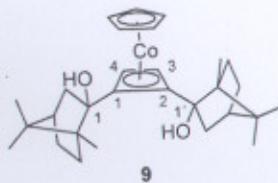
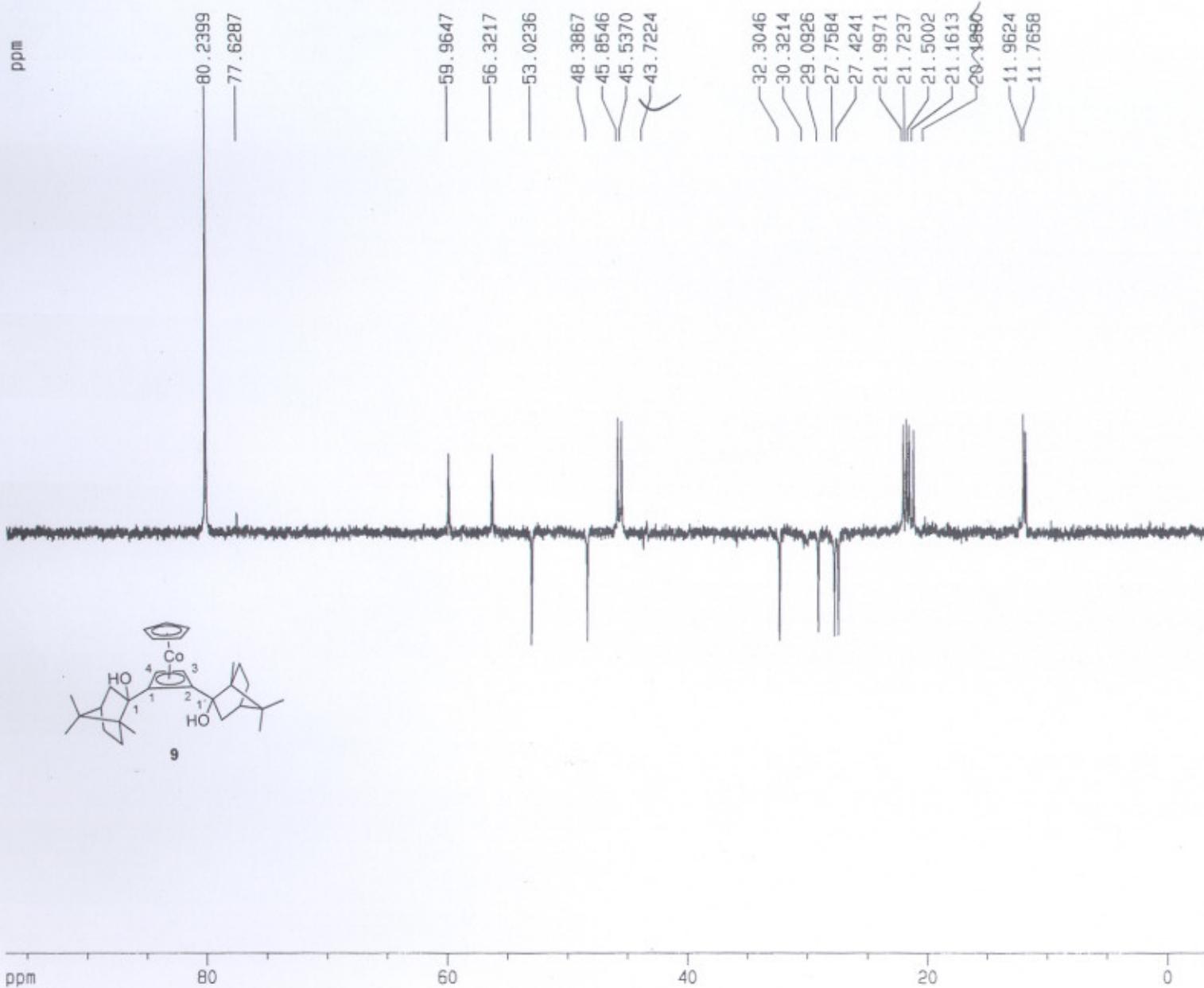
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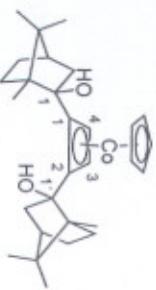
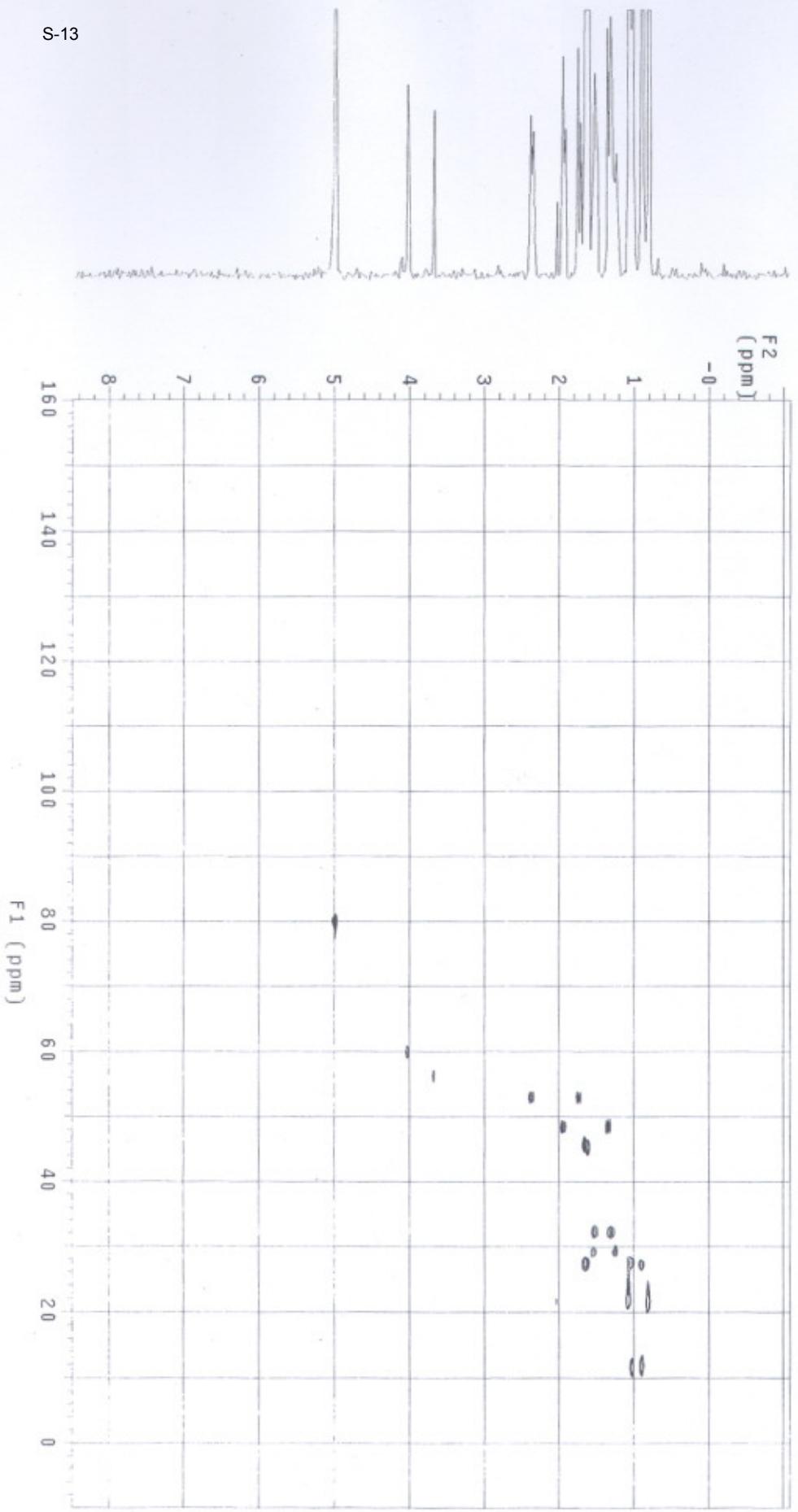
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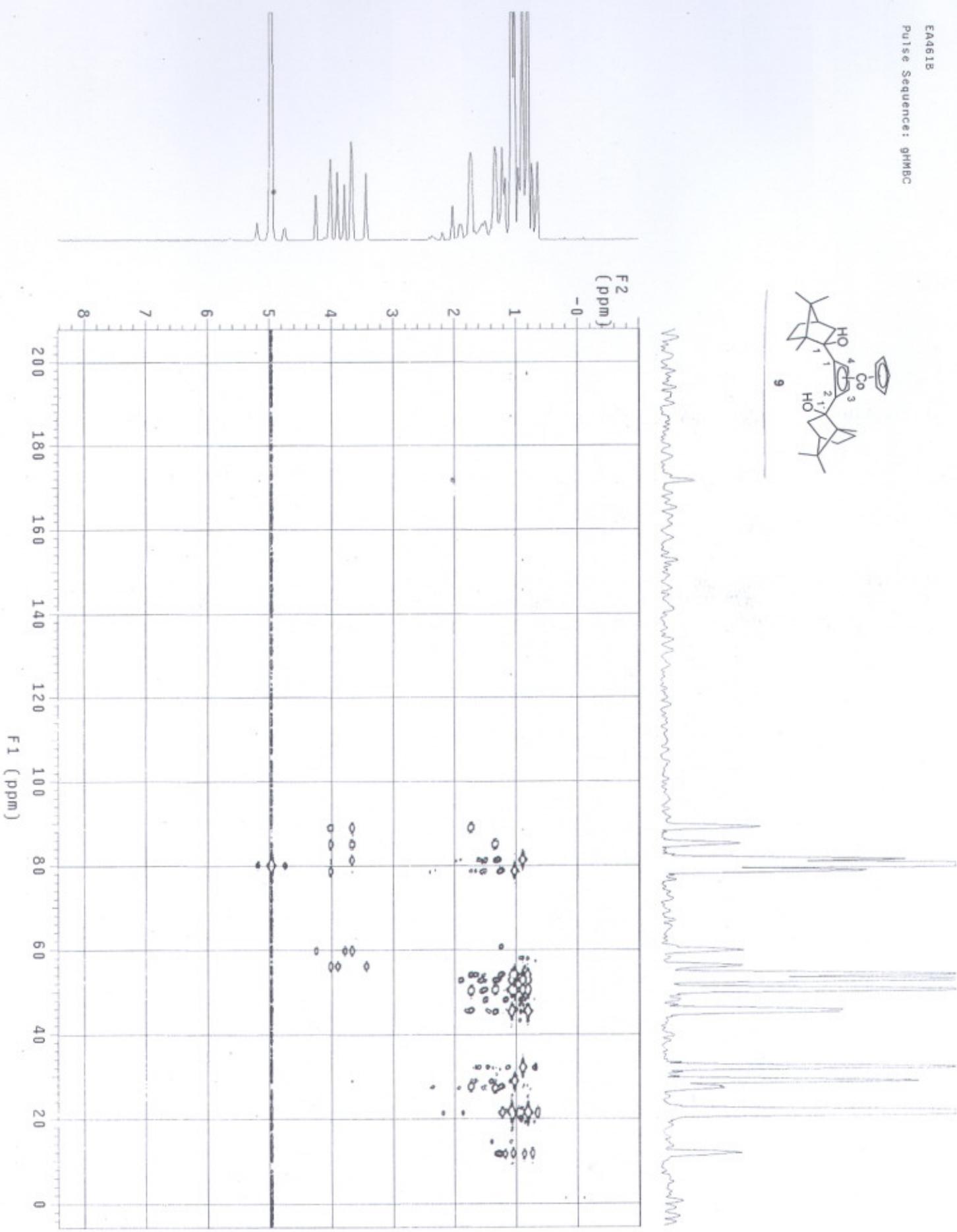
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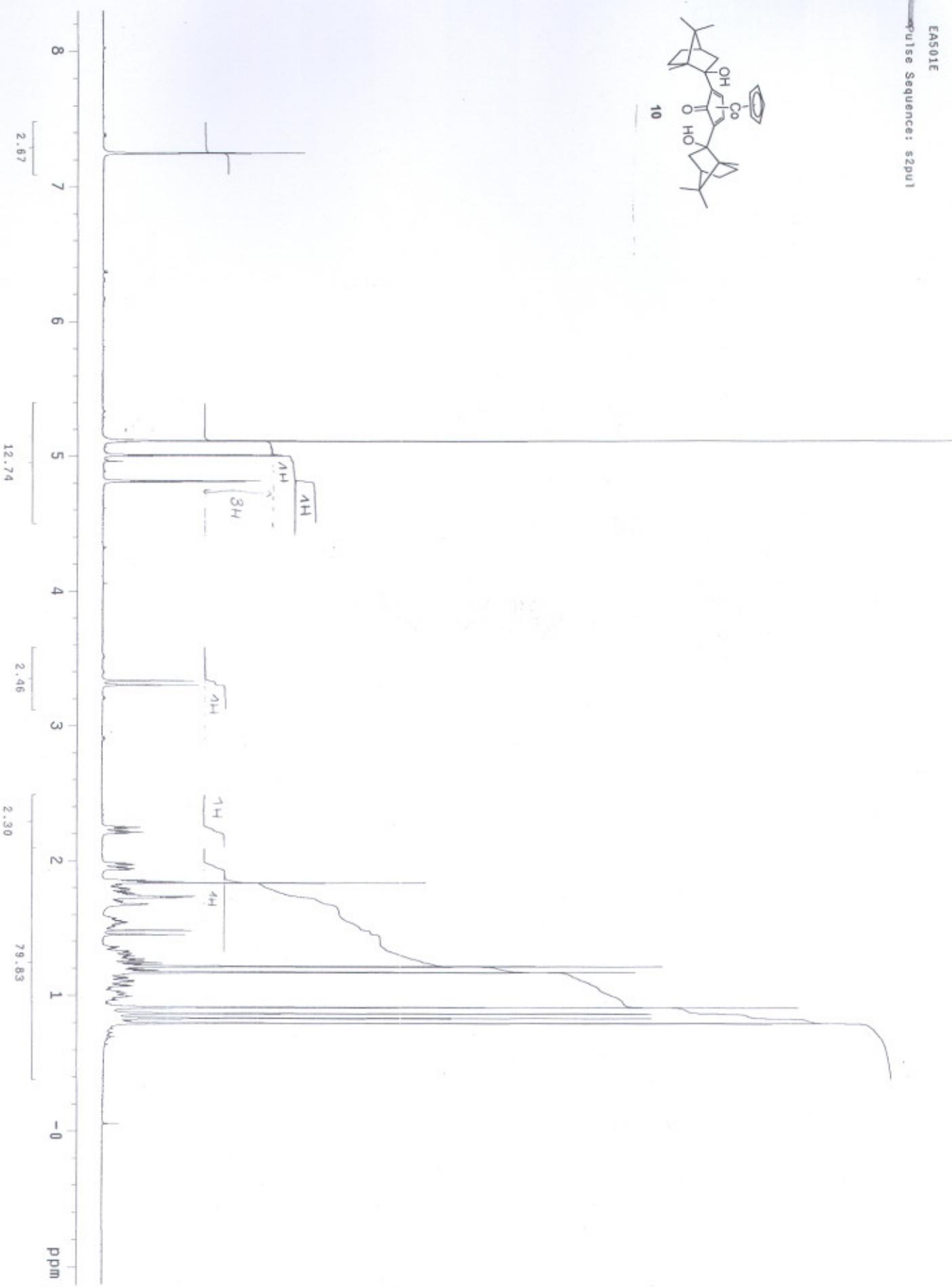
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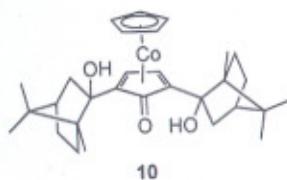
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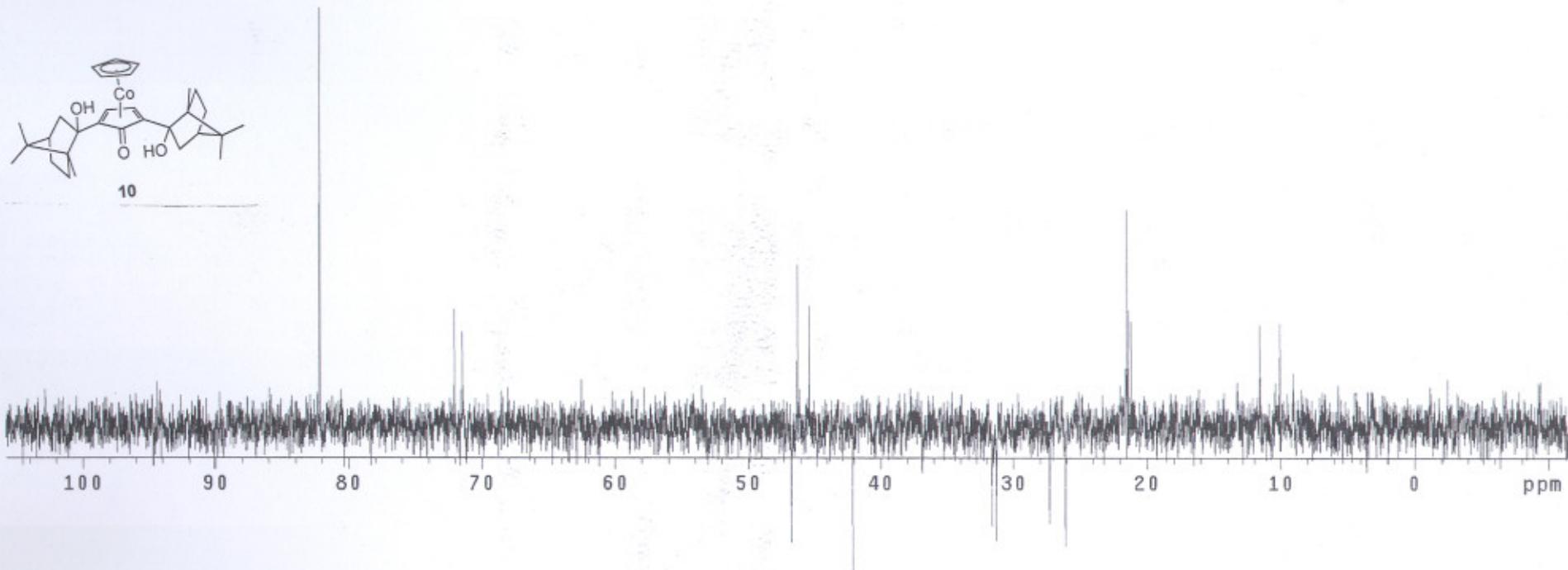
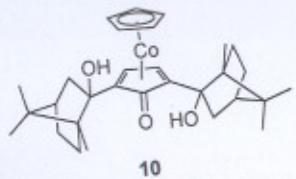
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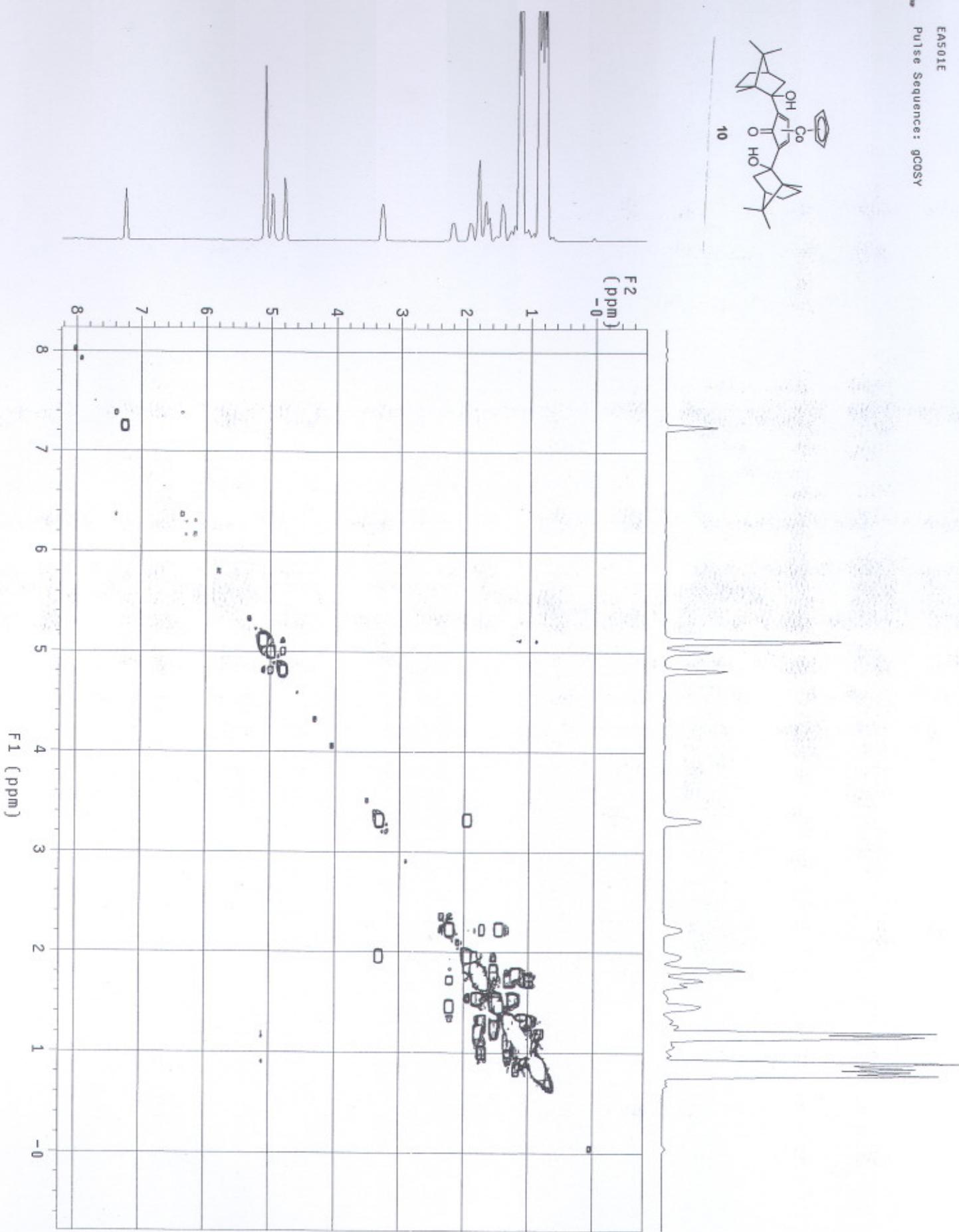
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2	9184.777	91.340	16.7
3	9098.562	90.483	16.7
4	8260.829	82.152	167.6
5	8215.051	81.697	26.5
6	8140.281	80.953	31.1
7	7774.821	77.319	189.0
8	7742.777	77.000	189.4
9	7711.495	76.689	186.8
10	7248.377	72.083	29.8
11	7185.814	71.461	28.2
12	5476.015	54.458	27.3
13	5449.311	54.192	31.8
14	5064.778	50.368	34.8
15	4993.822	49.662	27.6
16	4696.267	46.703	27.7
17	4652.778	46.271	36.1
18	4559.696	45.345	36.8
19	4230.859	42.075	32.0
20	3176.445	31.589	33.8
21	3145.926	31.285	32.0
22	2740.793	27.257	36.7
23	2621.008	26.065	32.5
24	2162.467	21.505	67.3
25	2152.549	21.407	43.2
26	2131.186	21.194	43.8
27	1162.223	11.558	33.6
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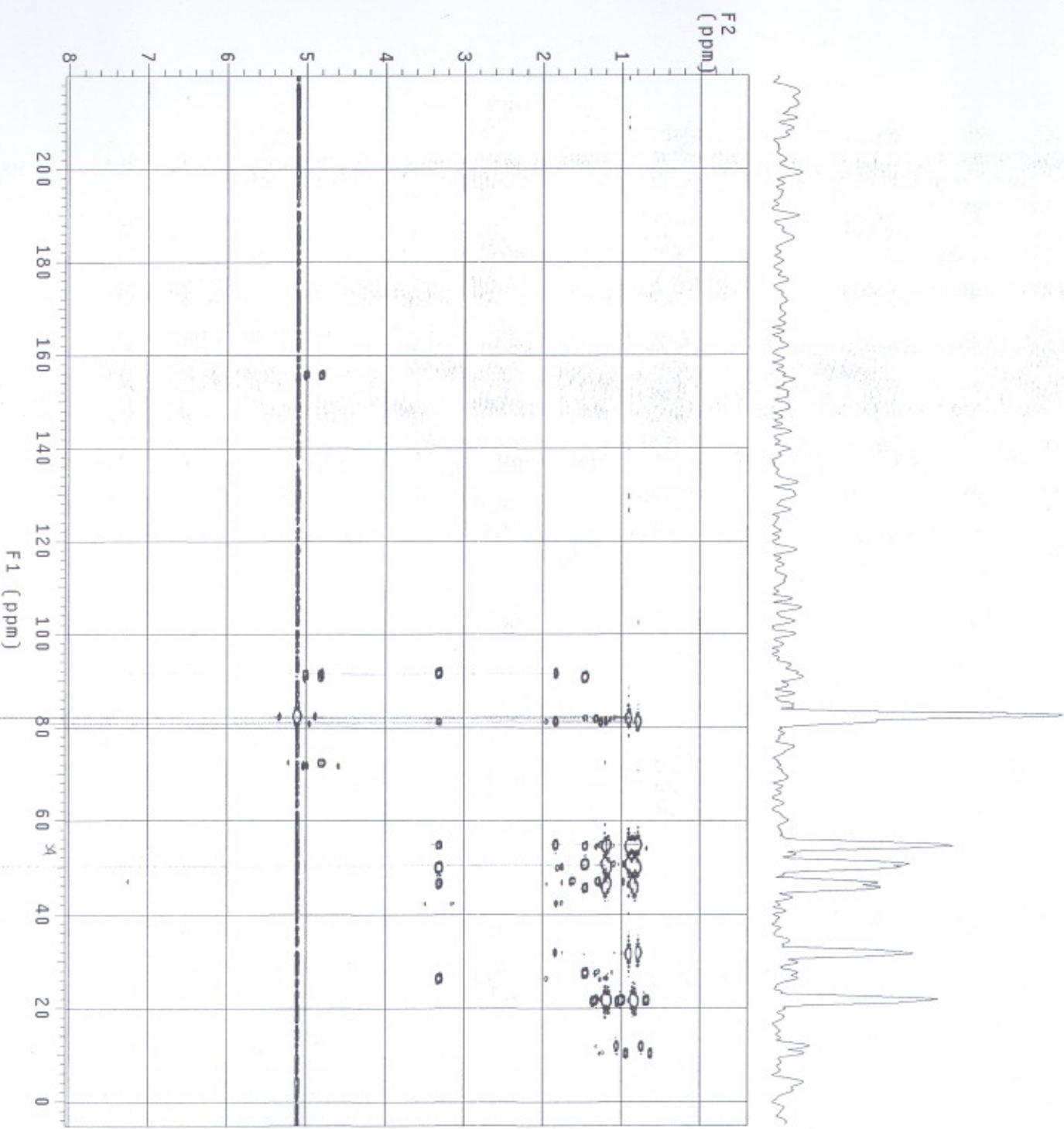
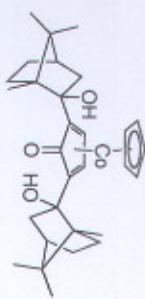
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4	4696.267	46.703	-18.4
5	4652.778	46.271	25.8
6	4559.696	45.345	19.3
7	4230.859	42.075	-23.3
8	3176.445	31.589	-15.9
9	3145.926	31.285	-18.2
10	2740.793	27.257	-15.5
11	2621.008	26.065	-19.1
12	2162.467	21.505	34.6
13	2152.549	21.407	18.6
14	2131.949	21.202	16.8
15	1162.986	11.566	16.3
16	1012.683	10.071	16.5



S-19

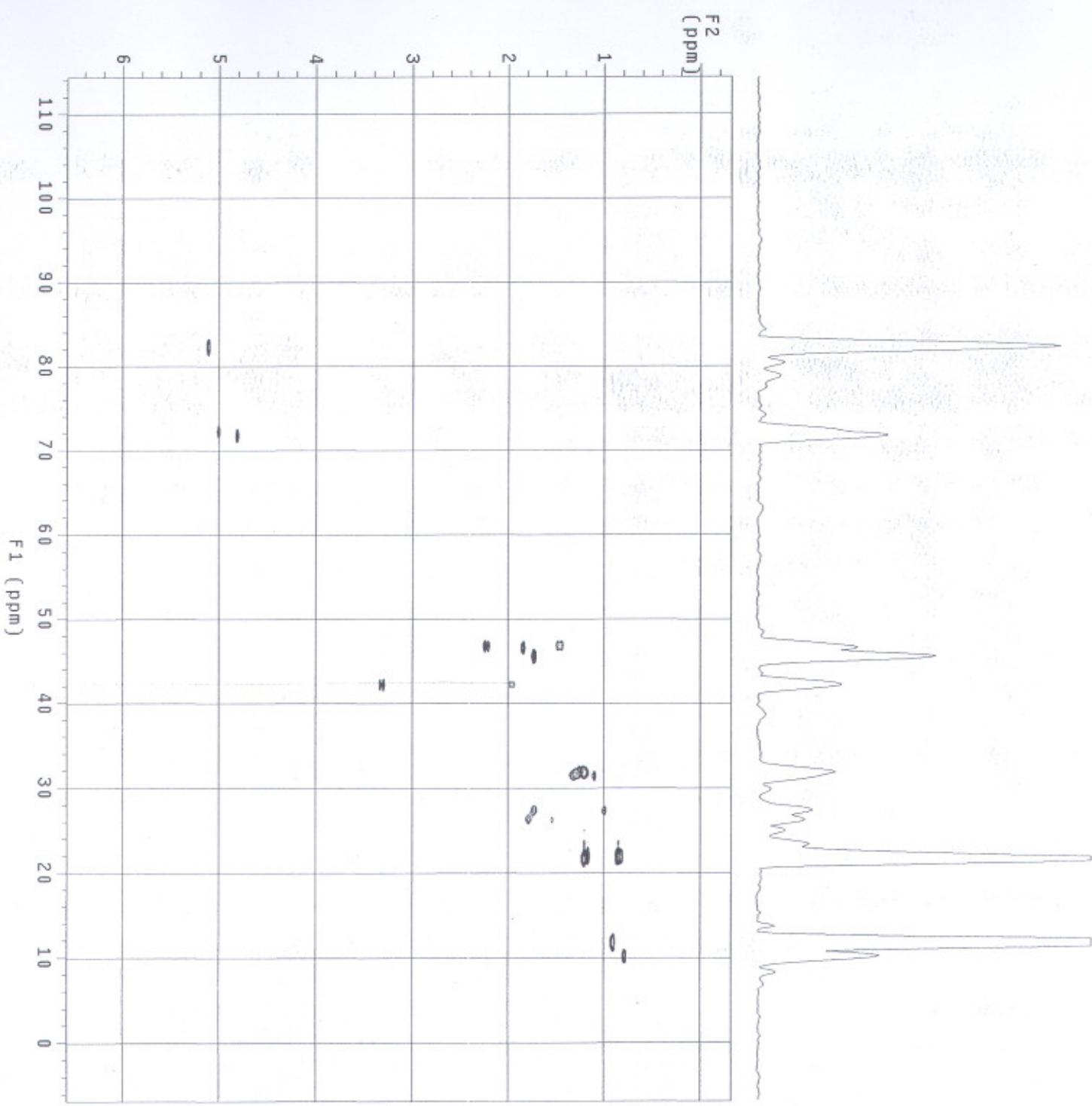
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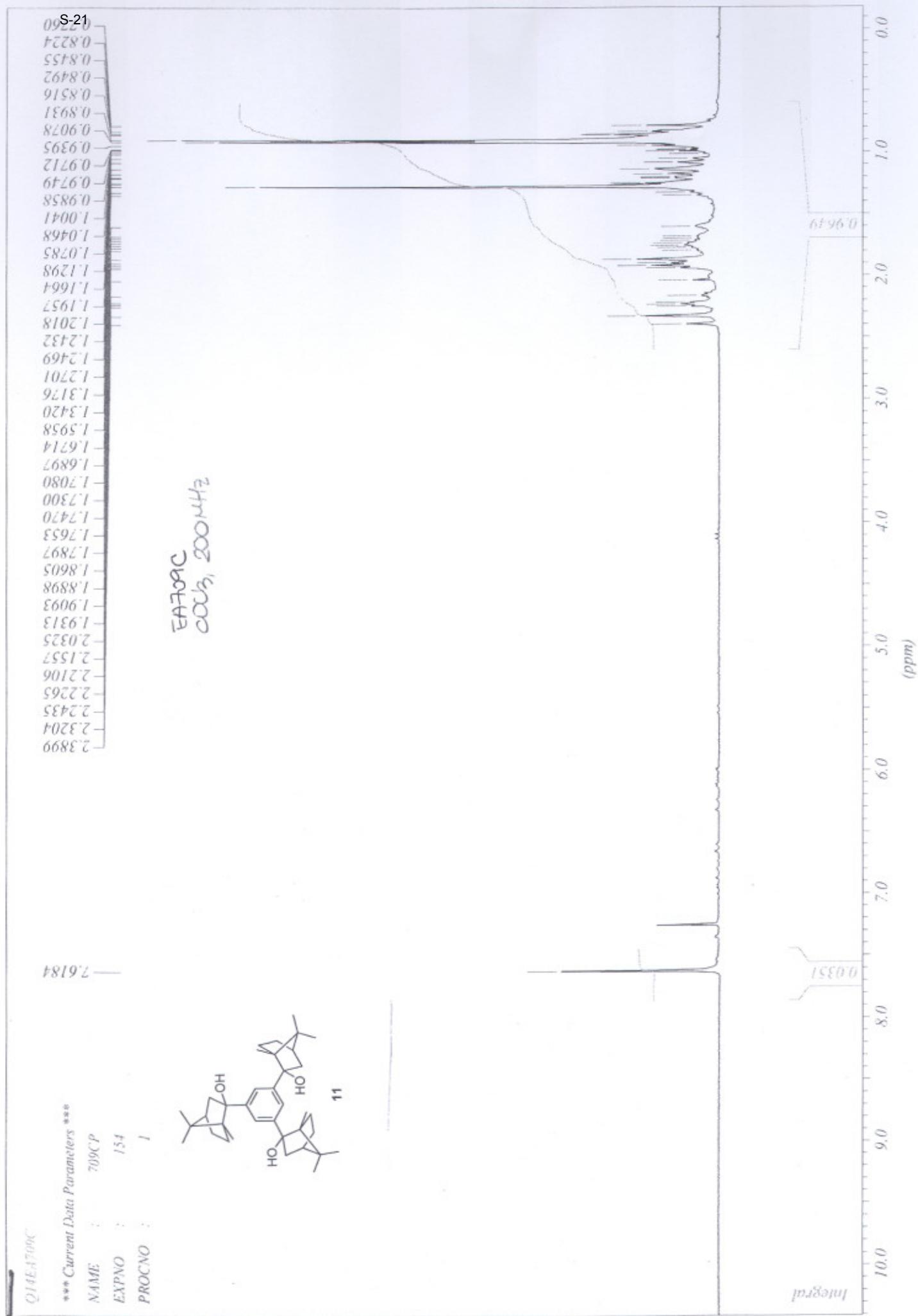
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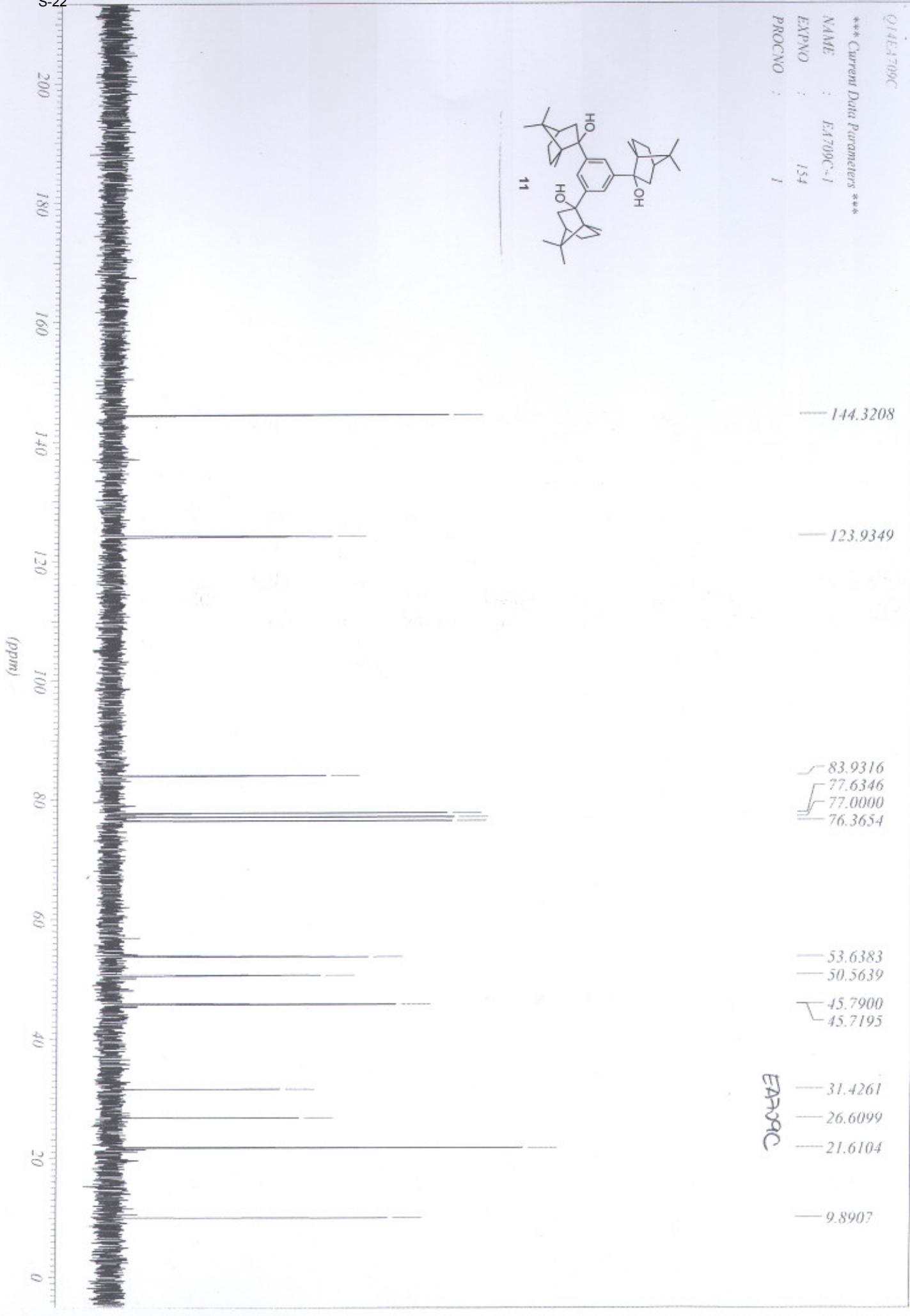


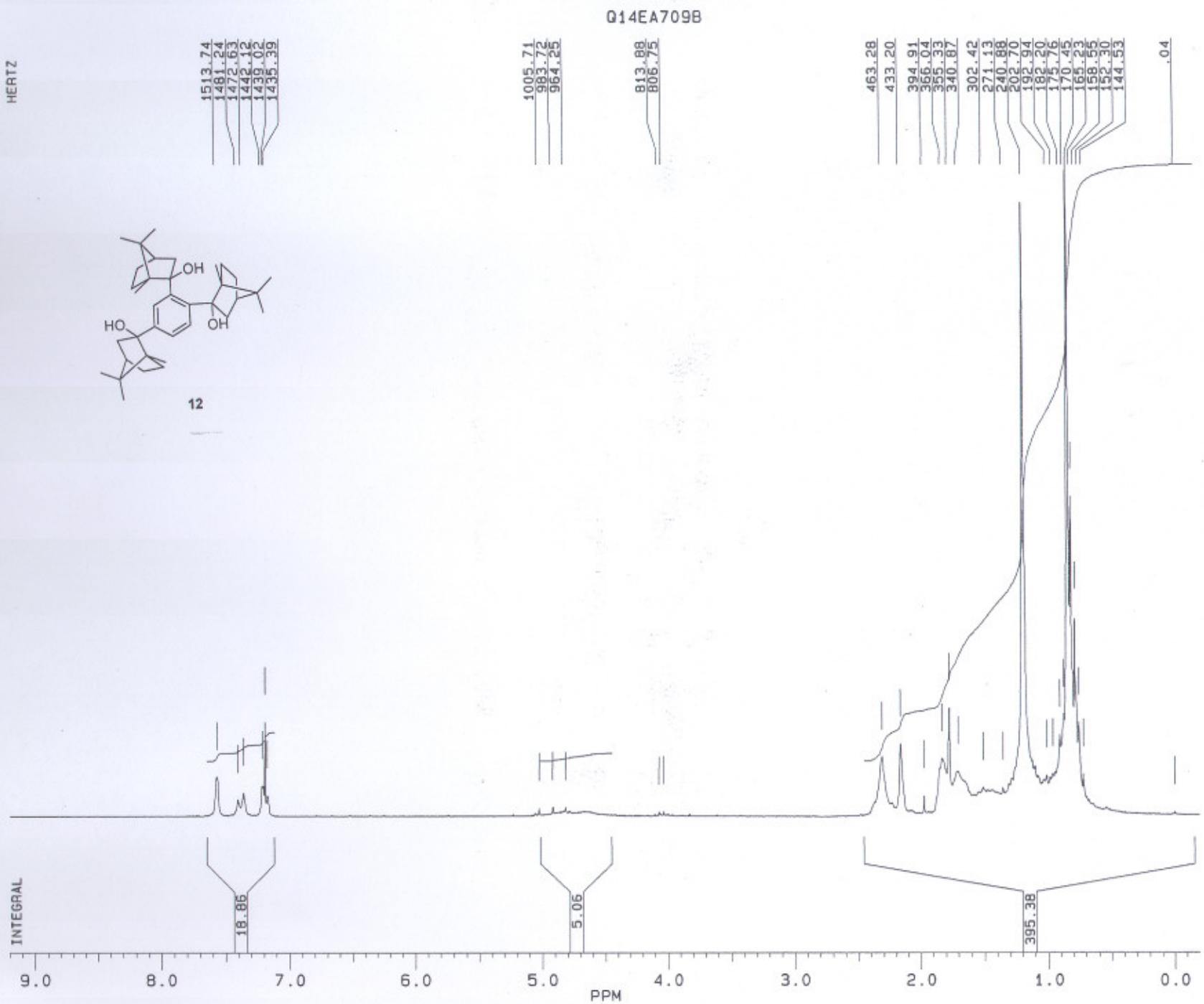
S-20

EA501E
Pulse Sequence: gHSQC









BRUKER

QQ310S.141
AU PROG:
X00.AU
DATE 31-5-5

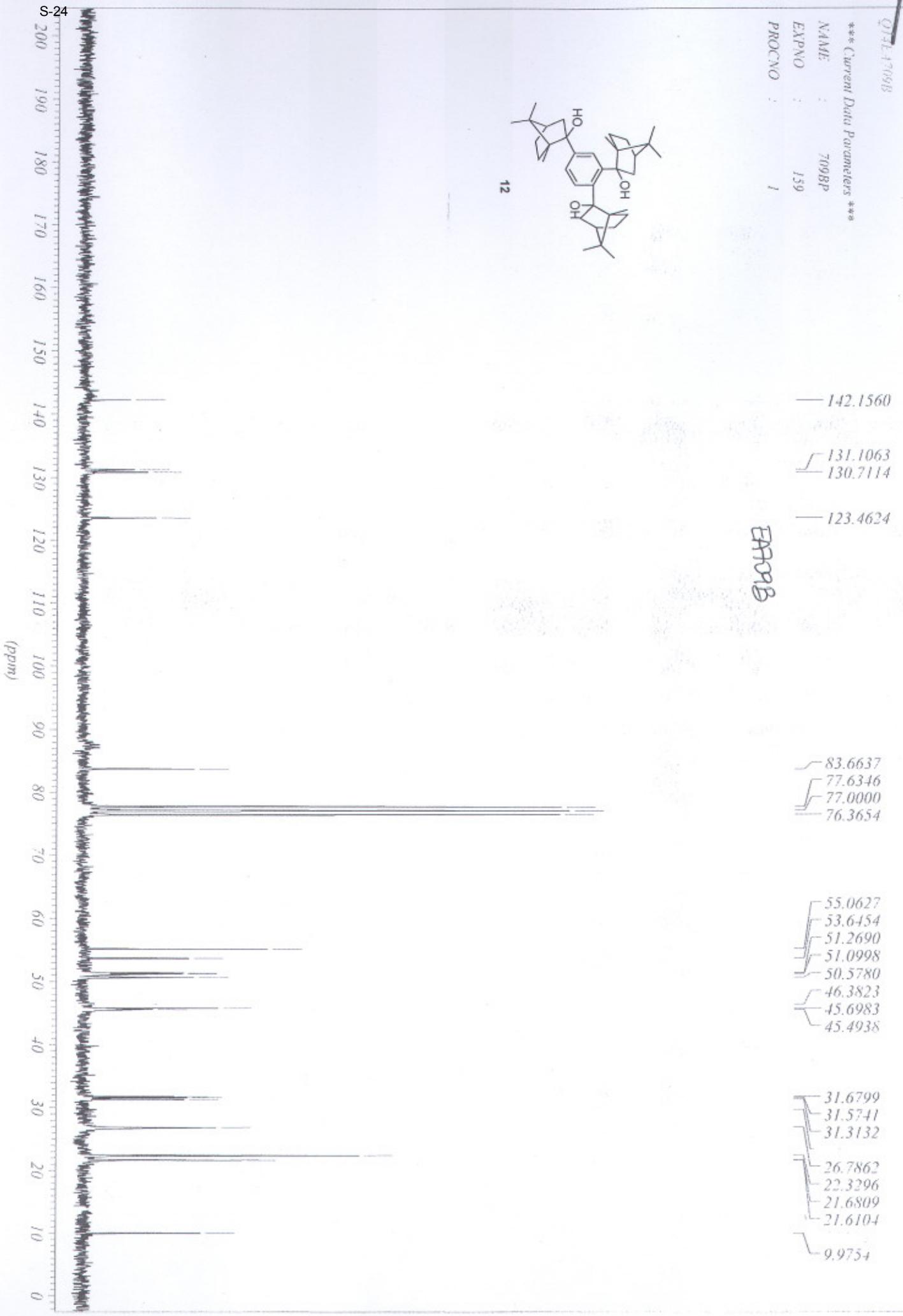
SF 200.132
SY 80.0
O1 3541.085
SI 32768
TD 32768
SW 4000.000
HZ/PT .244

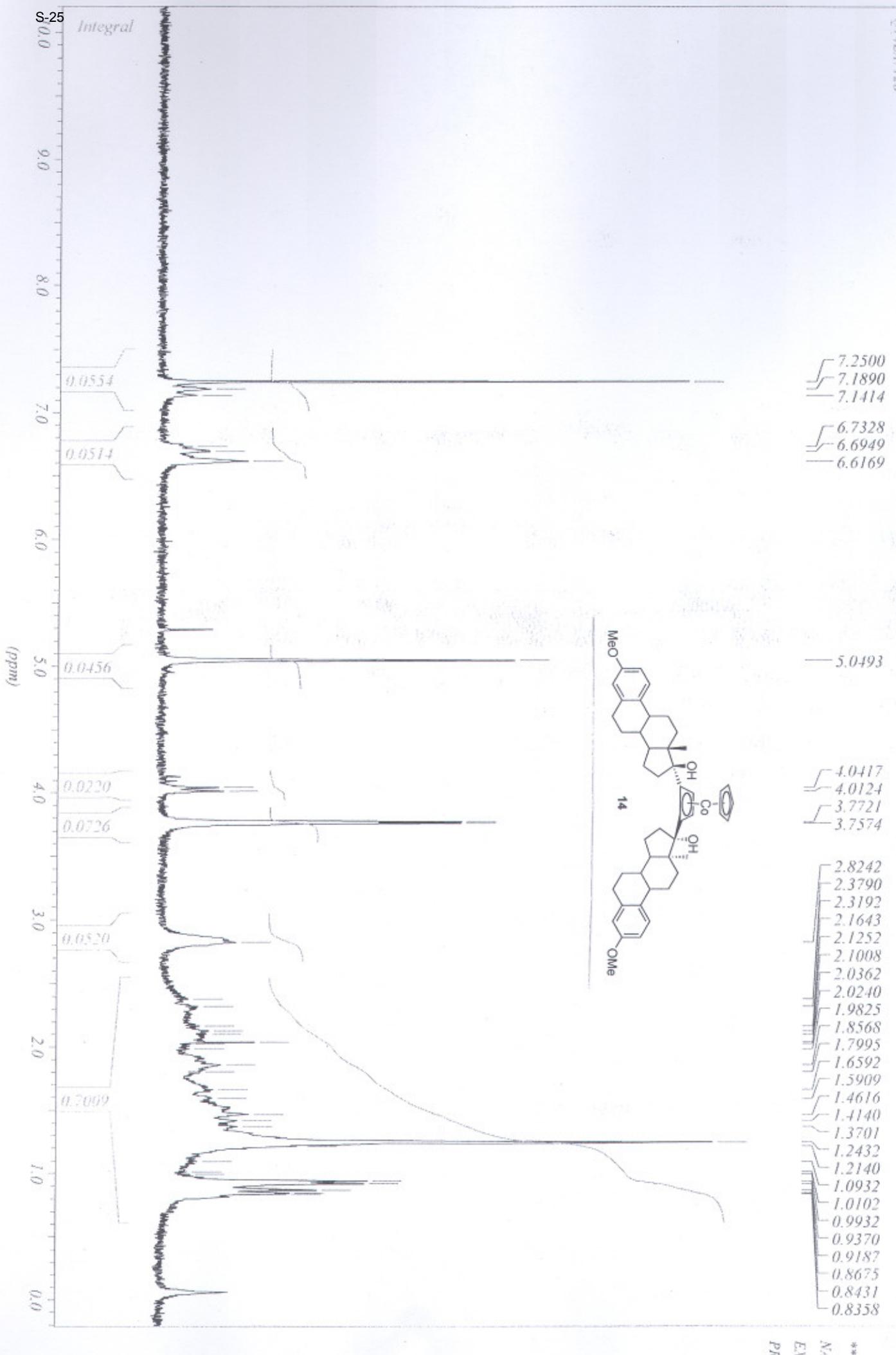
PW 0.0
RD 0.0
AQ 4.096
RG 16
NS 16
TE 297

FW 5000
O2 2228.997
DP 63L PO

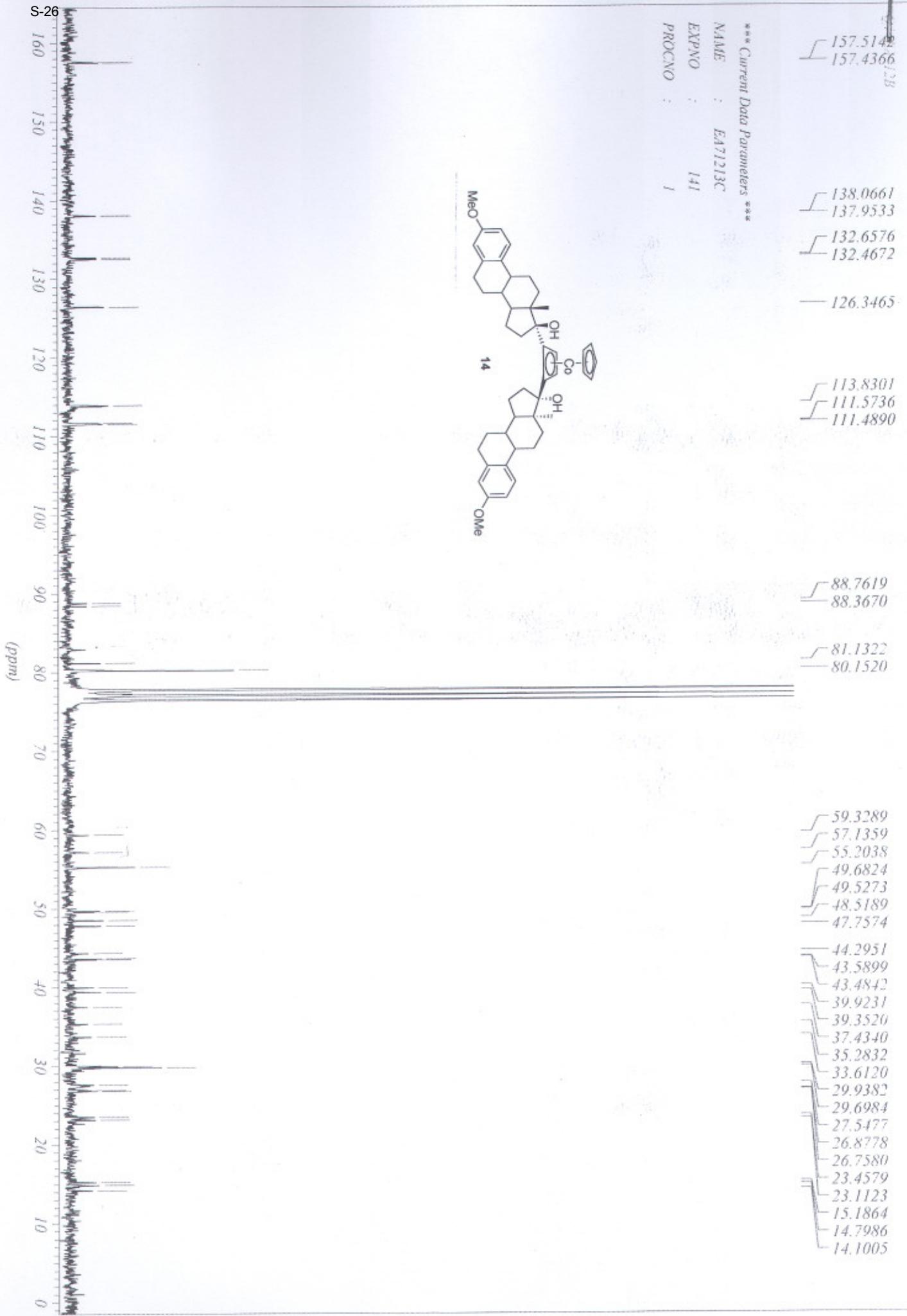
LB .300
GB 0.0
CX 22.00
CY 12.00
F1 9.200P
F2 -.199P
HZ/CM 85.505
PPM/CM .427
SR 2355.78

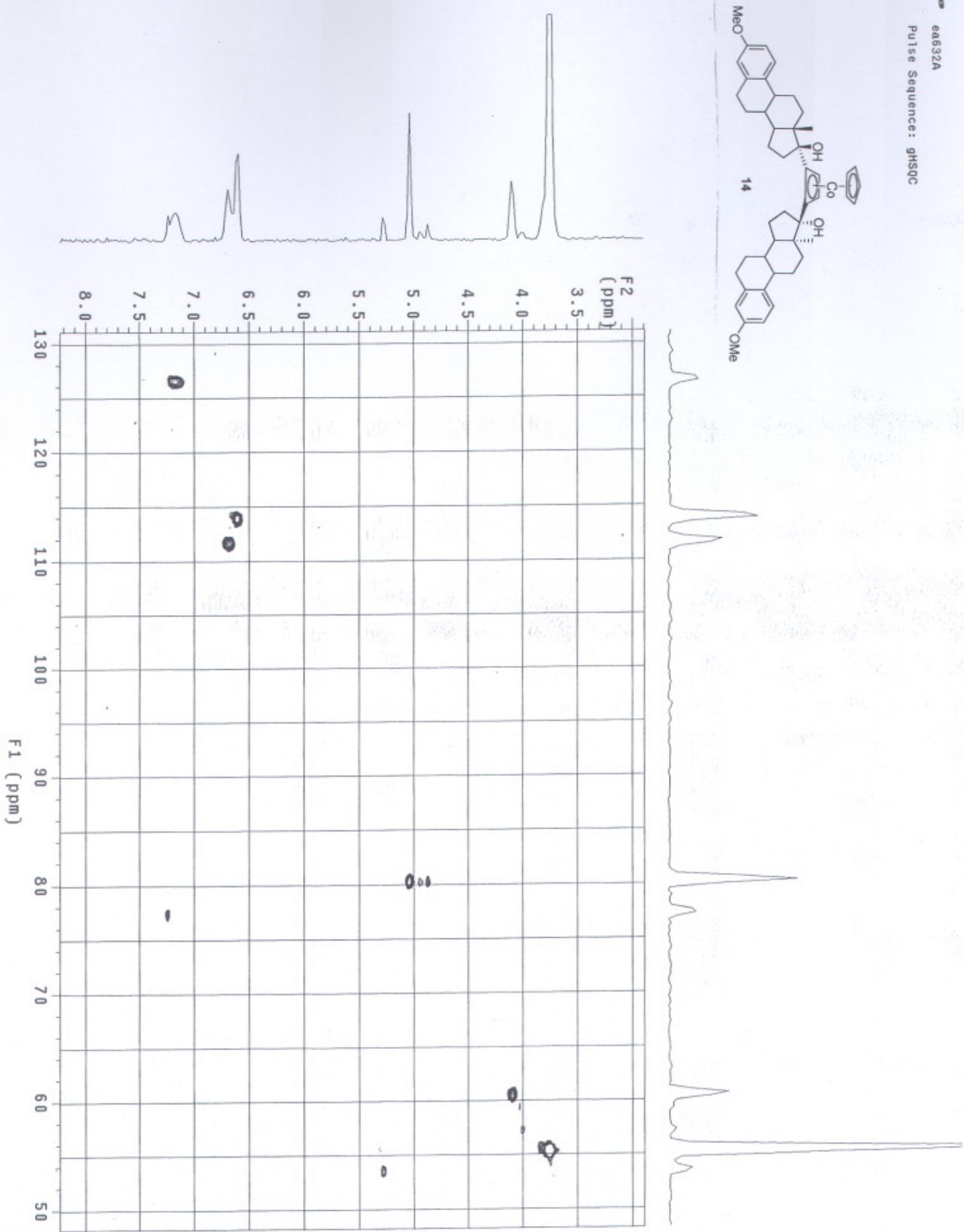
S-24





S-26

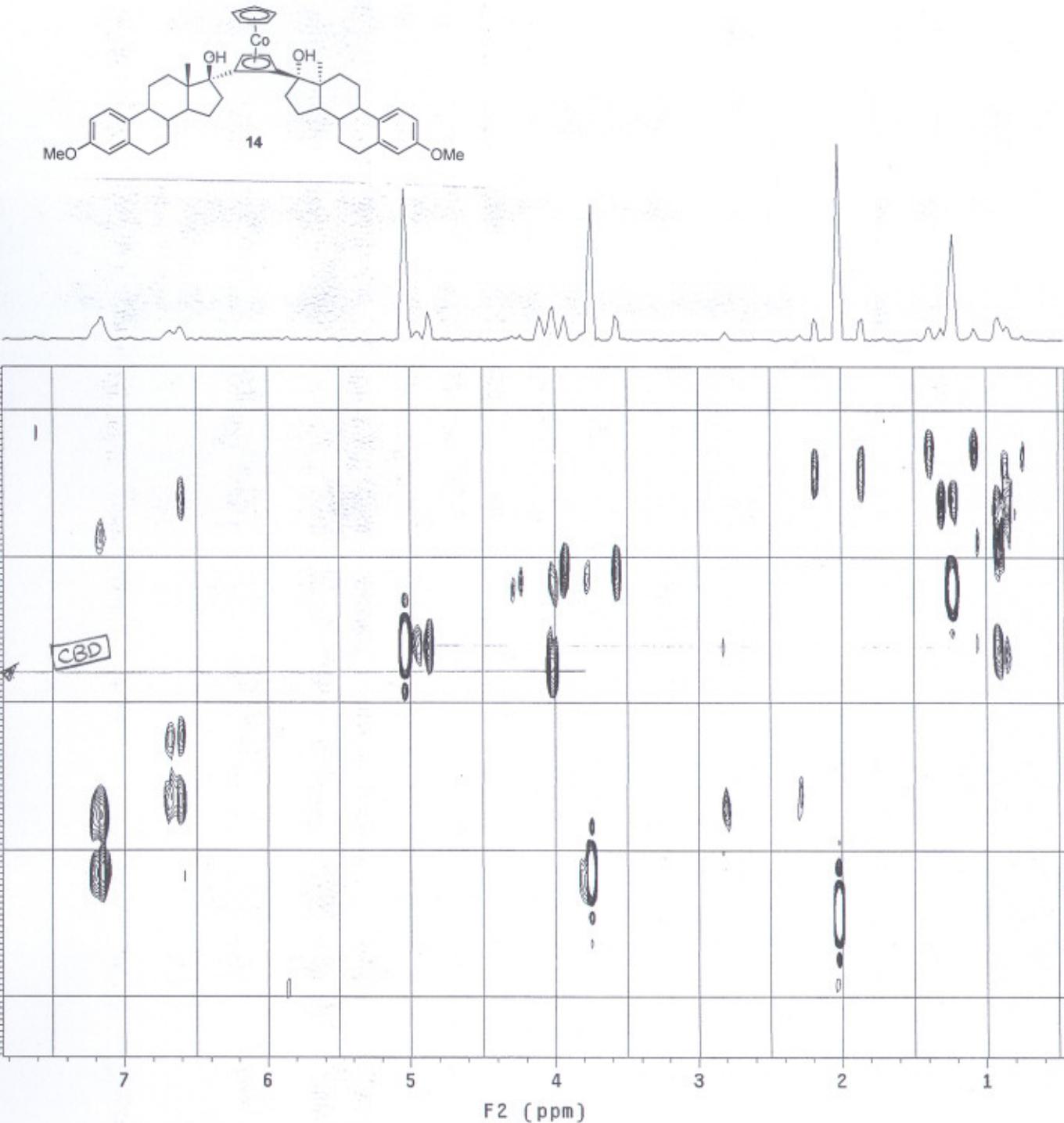




ea632A

exp28 gHMBC

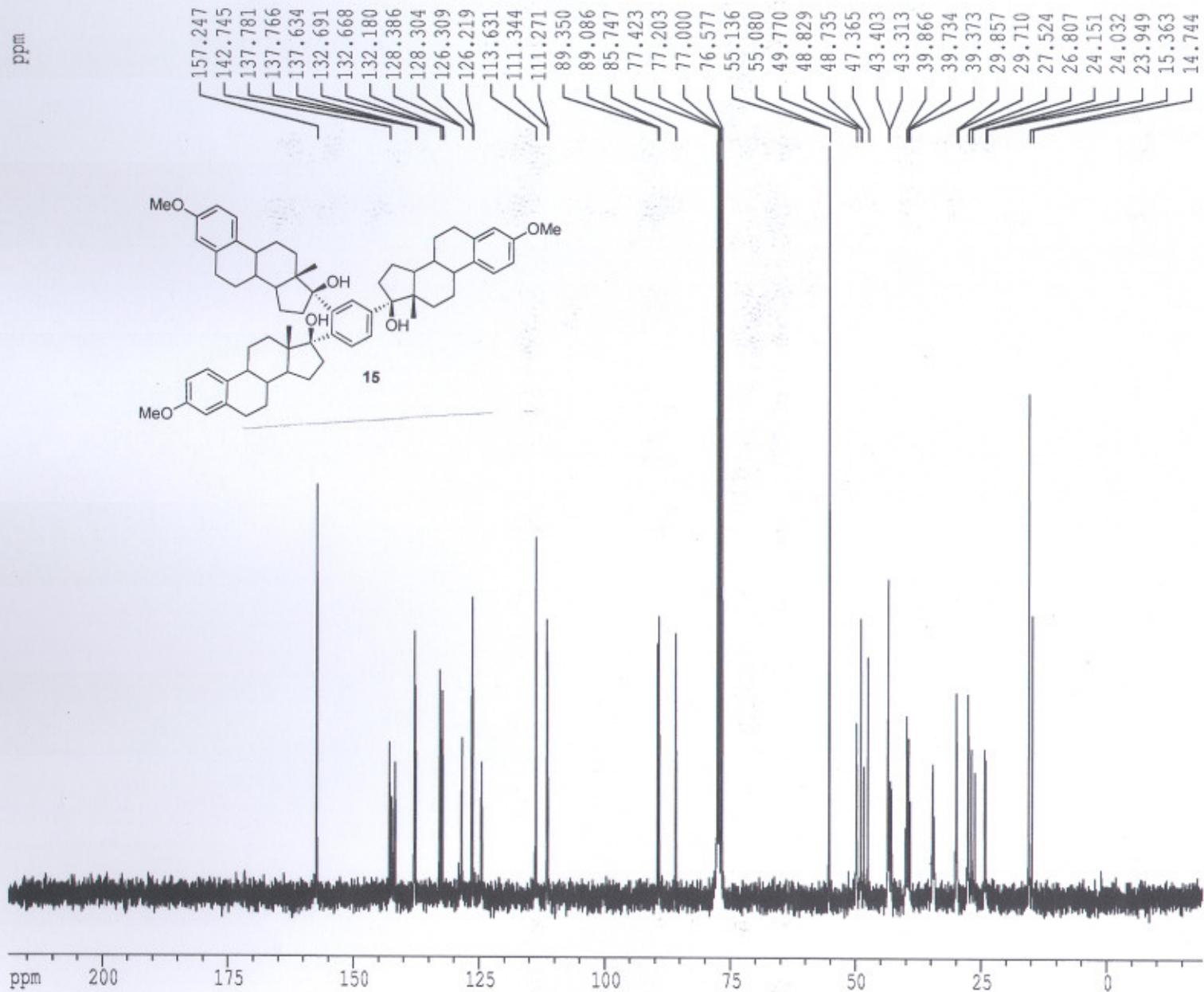
SAMPLE FLAGS
date Jan 10 2005 hs n
solvent CDCl₃ sspul n
sample undefined PFGflg y
ACQUISITION hsglv1 1944
sw 3840.1 SPECIAL
at 0.133 temp not used
np 1024 gain 60
fb 2000 spin 0
ss 32 GRADIENTS
d1 1.000 gzlv11 1944
nt 512 gt1 0.001000
2D ACQUISITION gzlv13 977
sw1 24132.7 gt3 0.001000
ni 32 gstab 0.000500
phase 0 F2 PROCESSING
TRANSMITTER sb 0.067
tn H1 sbs not used
sfrq 399.904 fn 1024
tof -402.3 F1 PROCESSING
tpwr 55 sb1 F 0.001
pw 8.200 sb2 not used
DECOUPLER C13 f1 0.001
dn 1042.9 sp 180.9
dof mnn wp 2953.9
dm ccc sp1 -14900.9
dmm dmf wpl 23660.9
dmf 16900 rfl 322.9
dpwr 43 rfp 150.9
pwxlvl 57 rfpl 40.9
px 12.500 rfp1 15.9
HMBC 140.0 PLOT
j1xh 8.0 wc 180.9
jnxh sc 160.9
 wc2 24210
 sc2 80
 v5 100
 th 120
 ai 140
 av 160
 CBP 180
 200
 220





EAG32B

ppm



Current Data Parameters

NAME EAG32B
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters

Date 20041227
Time 13.51
INSTRUM spect
PROBHD 5 mm QNP 1H/15
PULPROG zgpg30
TD 32768
SOLVENT CDCl₃
NS 1046
DS 4
SWH 17985.611 Hz
FIDRES 0.548877 Hz
AQ 0.9110004 sec
RG 2048
DW 27.800 usec
DE 10.00 usec
TE 300.0 K
D1 1.5000000 sec
d11 0.0300000 sec
d12 0.00002000 sec

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

NUC1 ¹³C
P1 5.80 usec
PL1 -3.00 dB
SF01 75.4752653 MHz

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

CPDPG2 waltz16
NUC2 ¹H
PCPD2 100.00 usec
PL2 -3.00 dB
PL12 22.00 dB
PL13 22.00 dB
SF02 300.1312005 MHz

F2 - Processing parameters

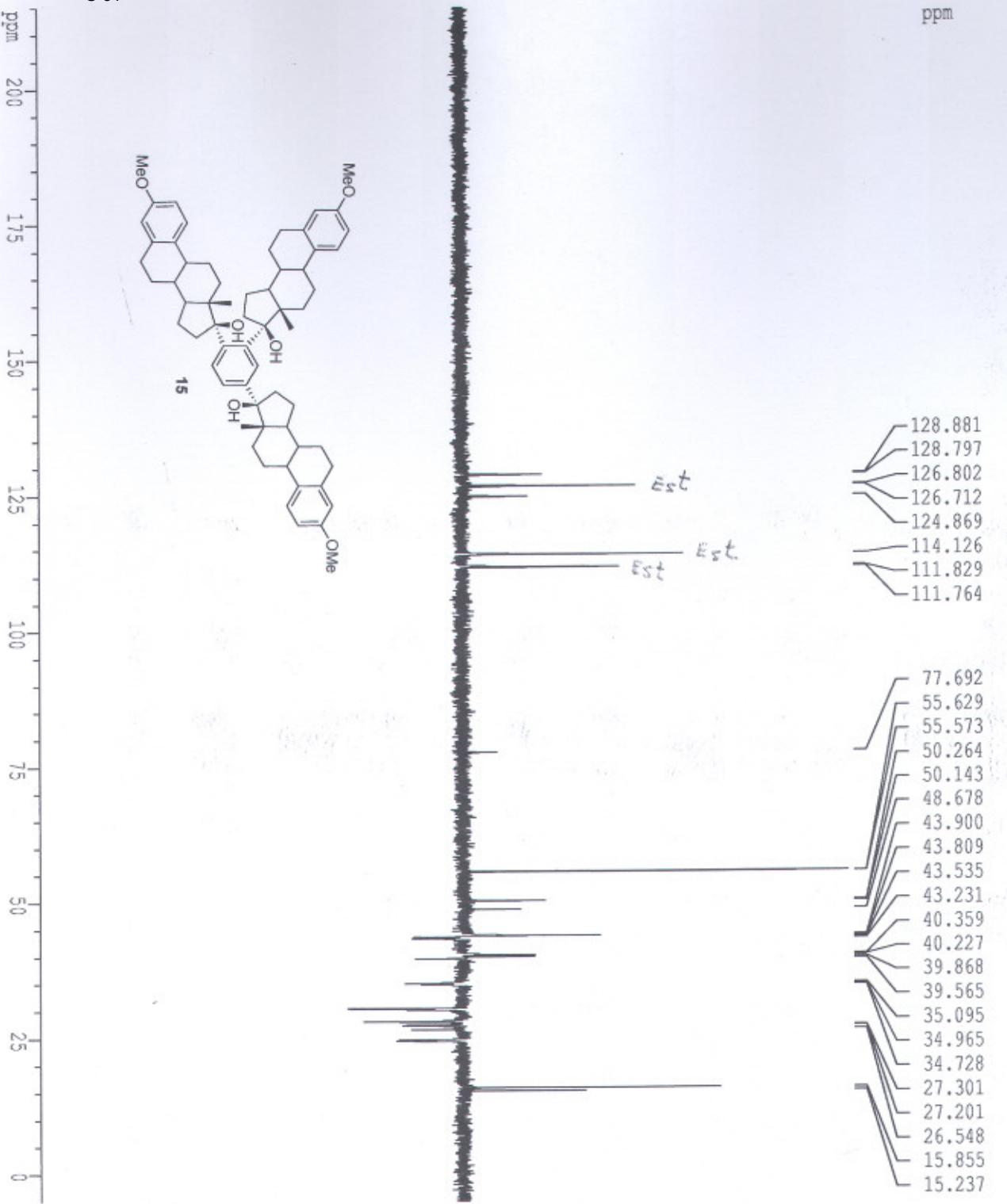
SI 32768
SF 75.4677562 MHz
NDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 20.00 cm
CY 12.50 cm
F1P 219.154 ppm
F1 16539.10 Hz
F2P -19.167 ppm
F2 -1446.52 Hz
PPCM 11.91610 ppm/cm
HZCM 899.28103 Hz/cm

ENG32B dept135

ppm



Current Data Parameters

NAME	ENG32B
ENENO	11
PHOCNO	1

F2 - Acquisition Parameters

Date_	2004/227
Time	14:10
INSTRUM	spect
PROBID	5 mm QND 1H15
PULPROG	dept135
TD	65536
SOLVENT	CDCl ₃
NS	251
DS	4
SWH	17985.611 Hz
FORES	0.27439 Hz
AQ	1.81908 sec
RG	16.84
DM	27.800 usec
DZ	10.00 usec
TE	300.0 °
CNST2	145.000000
D1	2.0000000 sec
d2	0.0034428 sec
d12	0.00002010 sec
DETA	0.00000738 sec

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

NUC1	13C
P1	5.80 usec
P2	11.60 usec
P1L	-3.00 dB
SP01	75.4712653 MHz

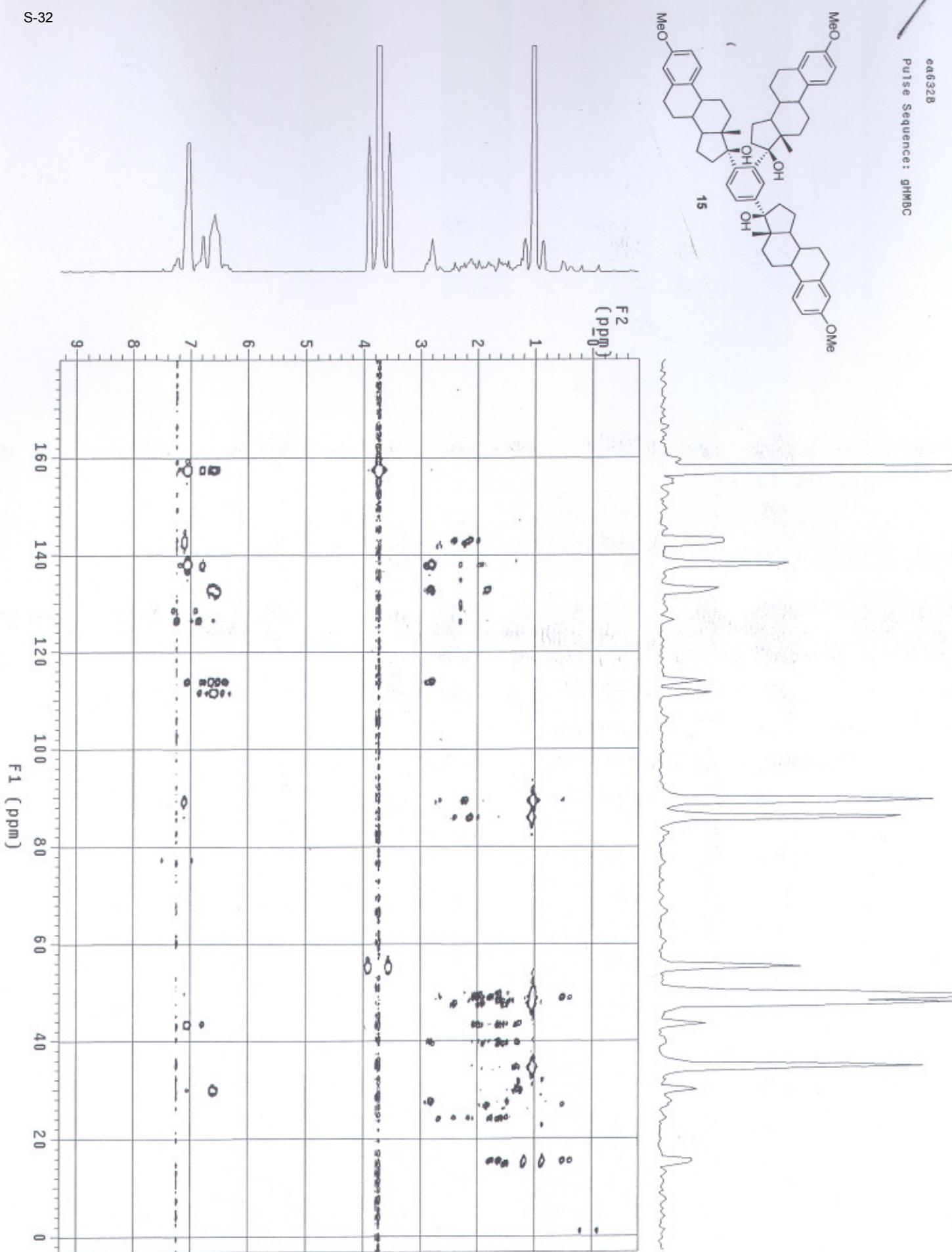
===== CHANNEL f2 =====

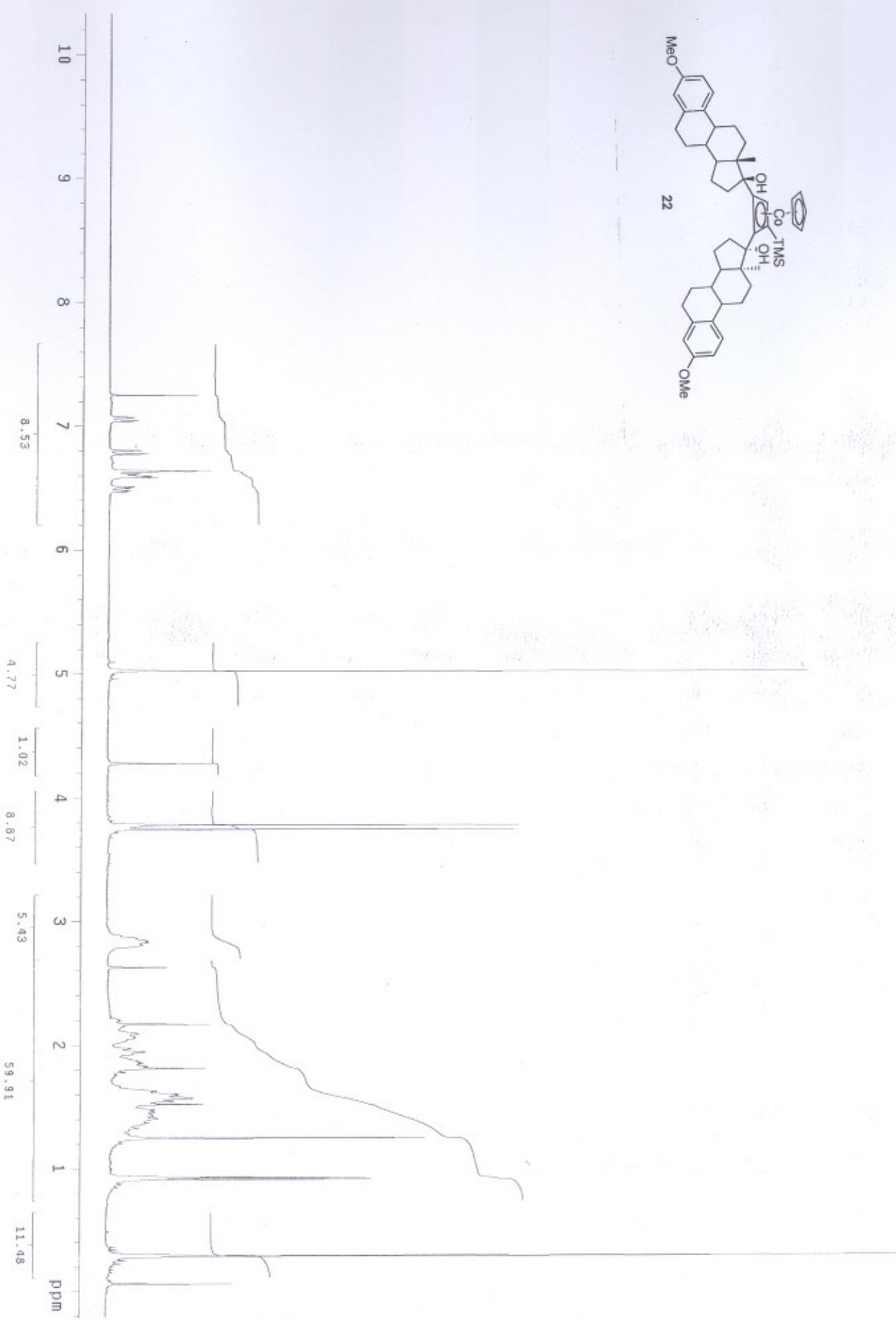
CPDPRG2	Waltz16
NUC2	1H
P3	5.80 usec
P4	11.60 usec
PCPD2	100.00 usec
P1L2	-3.00 dB
P1L2	22.00 dB
SP02	300.1312005 MHz

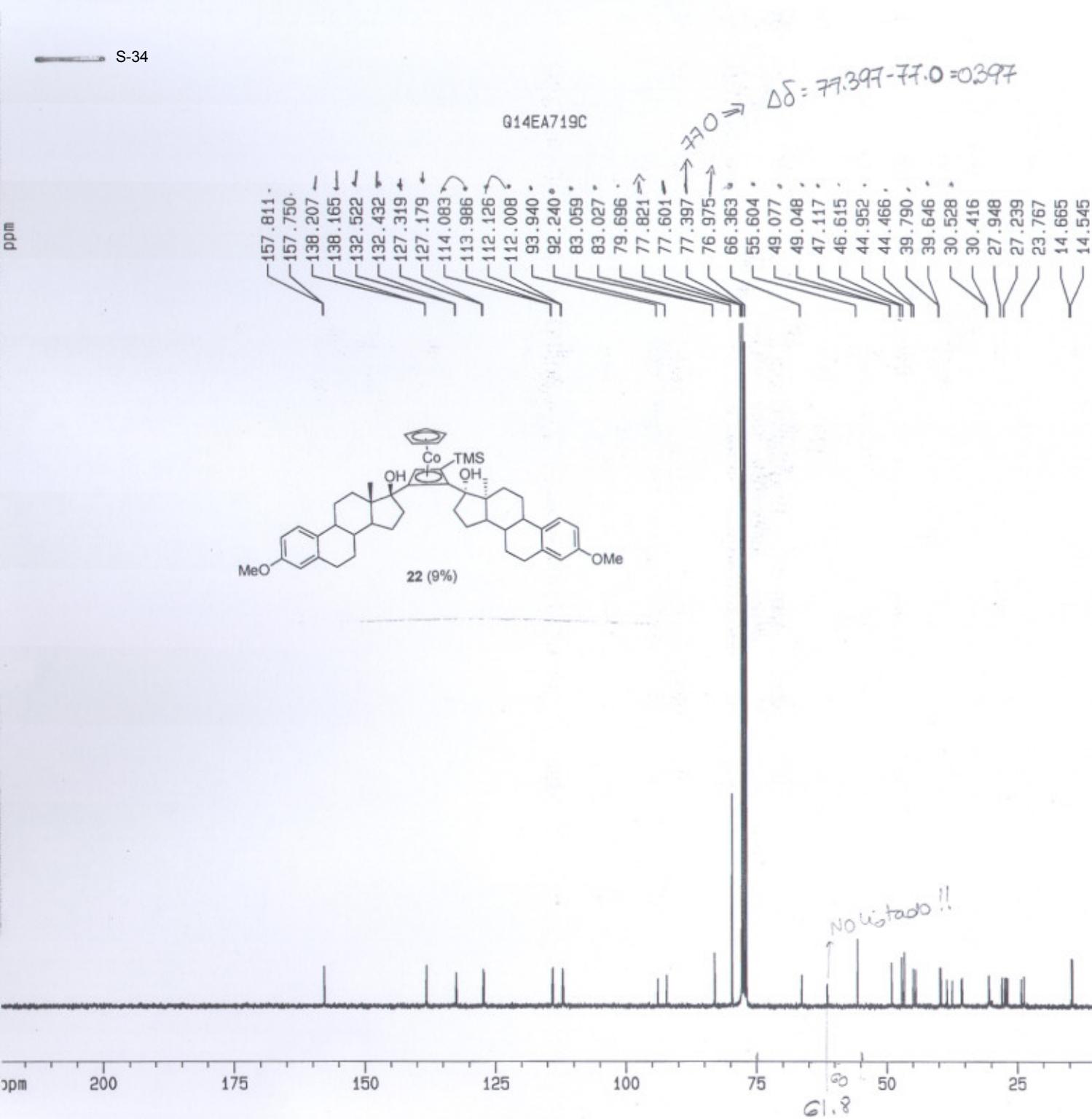
F2 - Processing parameters

SI	32768
SF	75.467190 MHz
W0W	EM
SSB	0
L3	1.00 Hz
G3	0
PC	1.40

1D NMR plot parameters
 CX 20.00 cm
 CI 6.50 cm
 F1P 215.000 ppm
 F1 1625.56 Hz
 F2P -5.000 ppm
 F2 -377.34 Hz
 PPM 11.00000 ppm/cm
 BPPM 830.14490 Hz/cm







Current Data Parameters

NAME Jul08-2005-iny
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters

Date_ 20050708
Time 6.19
INSTRUM spect
PROBHD 5 mm QNP 1H/15
PULPROG zgpg30
TD 65536
SOLVENT CDCl₃
NS 10000
DS 2
SWH 21097.047 Hz
FIDRES 0.321915 Hz
AQ 1.5532532 sec
RG 812.7
DW 23.700 usec
DE 6.50 usec
TE 300.0 K
D1 2.0000000 sec
D11 0.03000000 sec
D12 0.00002000 sec

----- CHANNEL f1 -----

NUC1 ¹³C
P1 5.70 usec
PL1 -6.00 dB
SF01 75.4775298 MHz

----- CHANNEL f2 -----

CPOPRG2 waltz16
NUC2 ¹H
PCPD2 80.00 usec
PL2 -6.00 dB
PL12 18.00 dB
PL13 18.00 dB
SF02 300.1312005 MHz

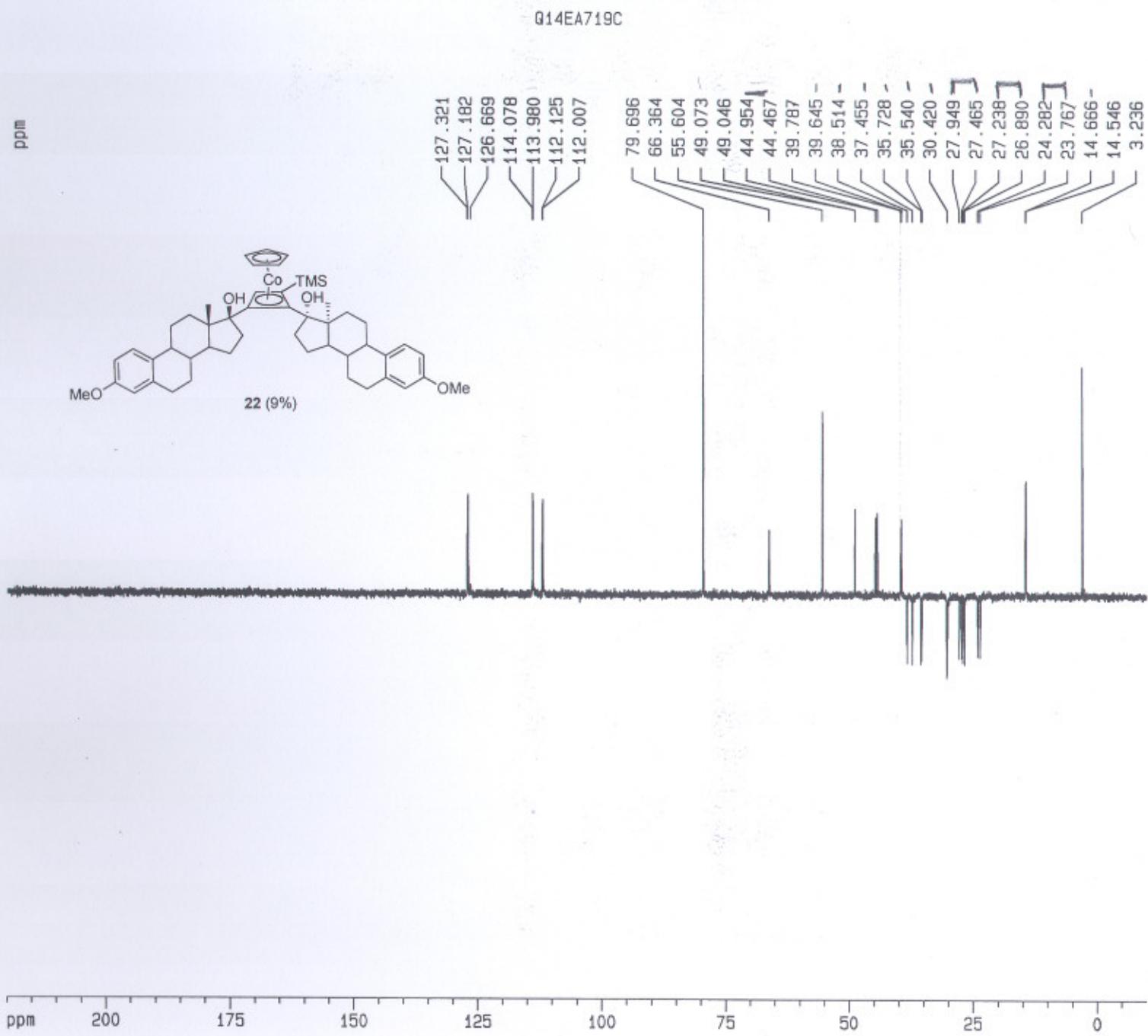
F2 - Processing parameters

SI 32768
SF 75.4677190 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

1D NMR plot parameters

CX 20.00 cm
F1P 220.000 ppm
F1 16602.90 Hz
F2P 10.000 ppm
F2 754.68 Hz
PPMCH 10.50000 ppm/cm
HZCM 792.41107 Hz/cm

ppm



Current Data Parameters
 NAME Jul08-2005-iny
 EXPNO 12
 PROCNO 1

F2 - Acquisition Parameters

Date_ 20050708
 Time 20.45
 INSTRUM spect
 PROBHD 5 mm QNP 1H/15
 PULPROG dept135
 TD 65536
 SOLVENT CDCl3
 NS 5000
 DS 4
 SWH 21097.047 Hz
 FIDRES 0.321915 Hz
 AQ 1.5532532 sec
 RG 13004
 DW 23.700 usec
 DE 6.00 usec
 TE 300.0 K
 D1 2.0000000 sec
 D2 0.00357143 sec
 D12 0.00002000 sec
 DELTA 0.00000726 sec

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

NUC1 13C
 P1 5.70 usec
 P2 11.40 usec
 PL1 -6.00 dB
 SF01 75.4775298 MHz

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

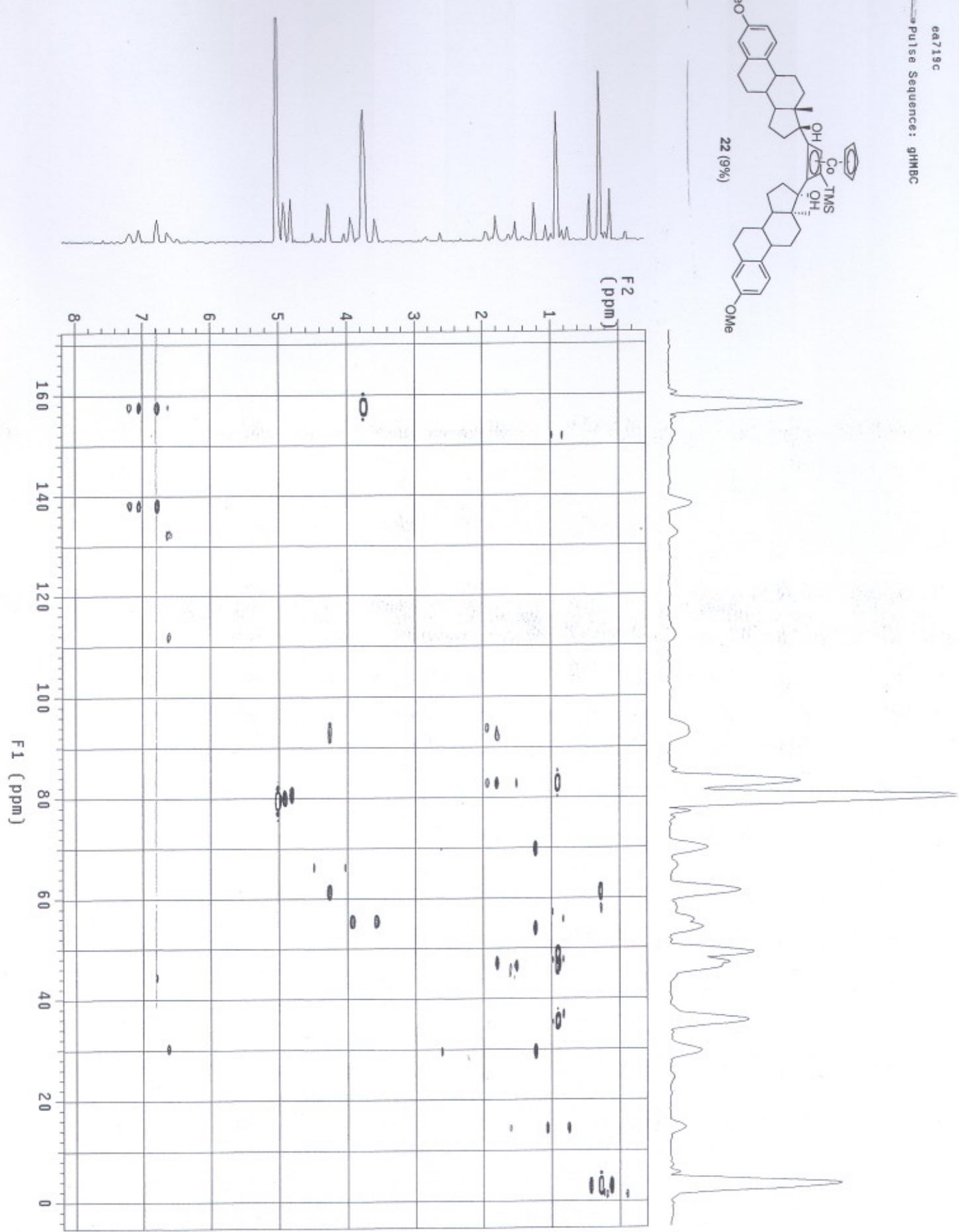
COPROG2 waltz16
 NUC2 1H
 P3 6.70 usec
 P4 13.40 usec
 PCPD2 80.00 usec
 PL2 -6.00 dB
 PL12 18.00 dB
 SF02 300.1312005 MHz

F2 - Processing parameters

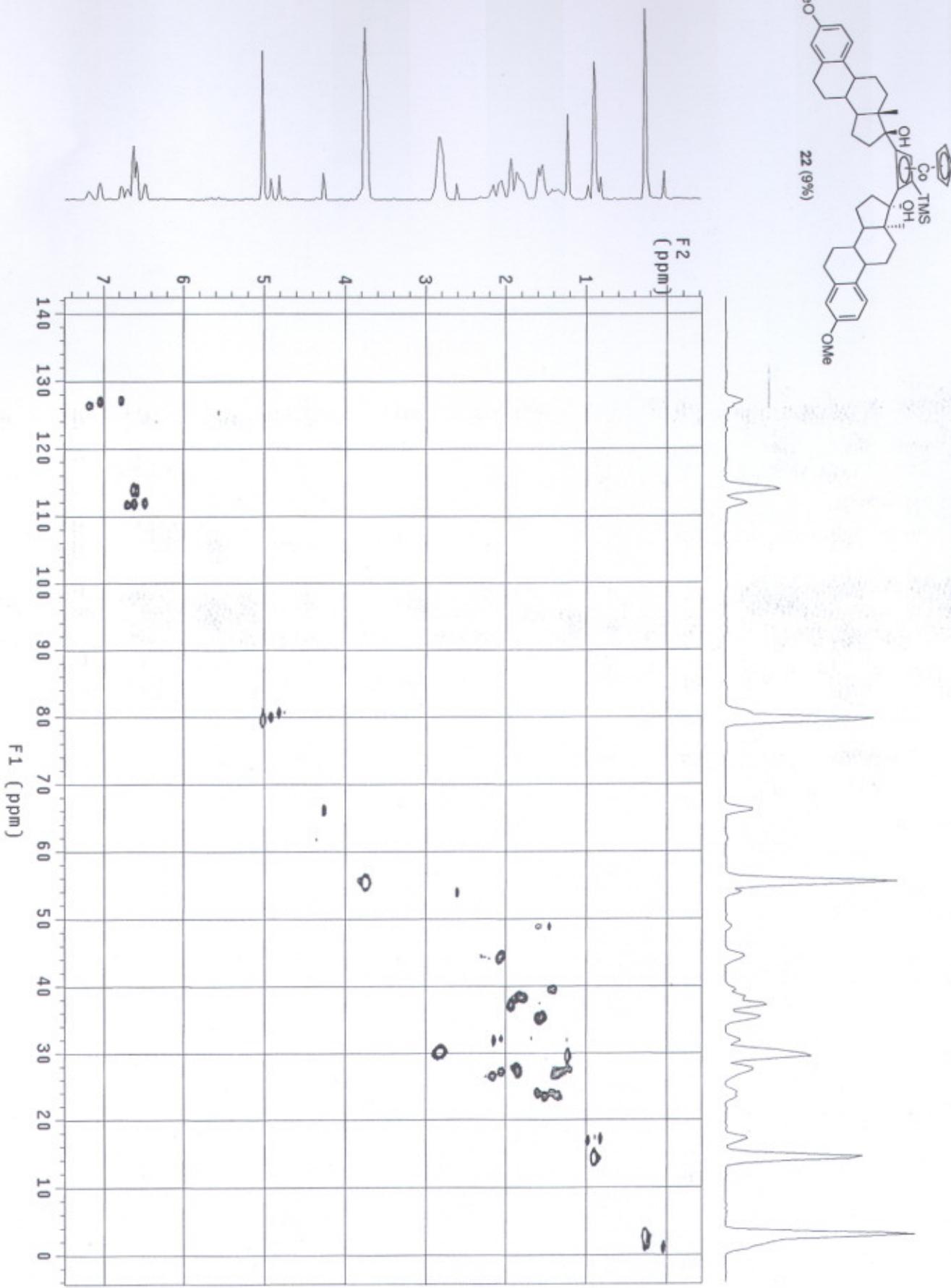
SI 32768
 SF 75.4677190 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

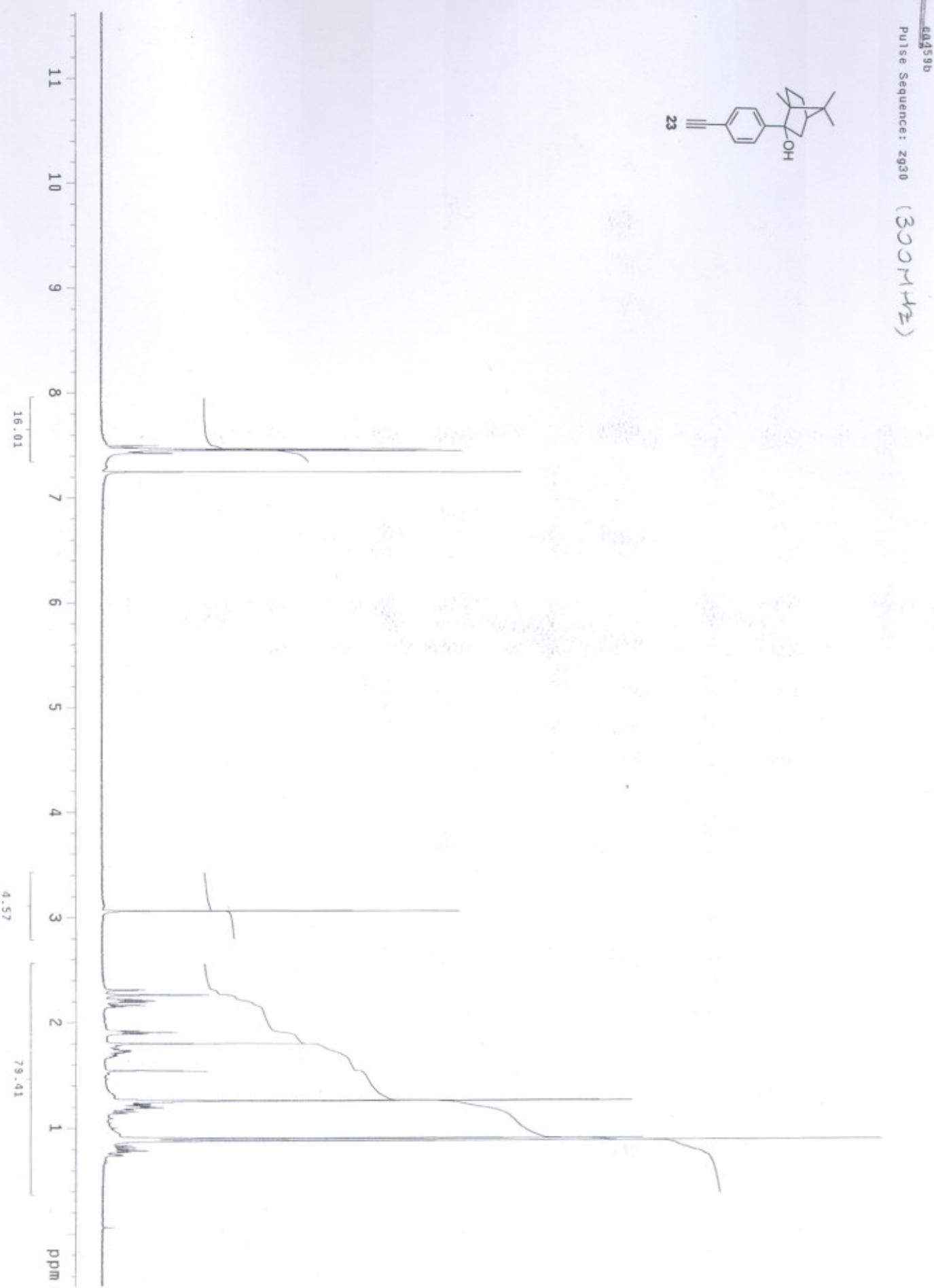
1D NMR plot parameters

CX 20.00 cm
 F1P 220.000 ppm
 F1 16602.90 Hz
 F2P -10.000 ppm
 F2 -754.68 Hz
 PPMCM 11.50000 ppm/cm
 HZCM 867.87678 Hz/cm



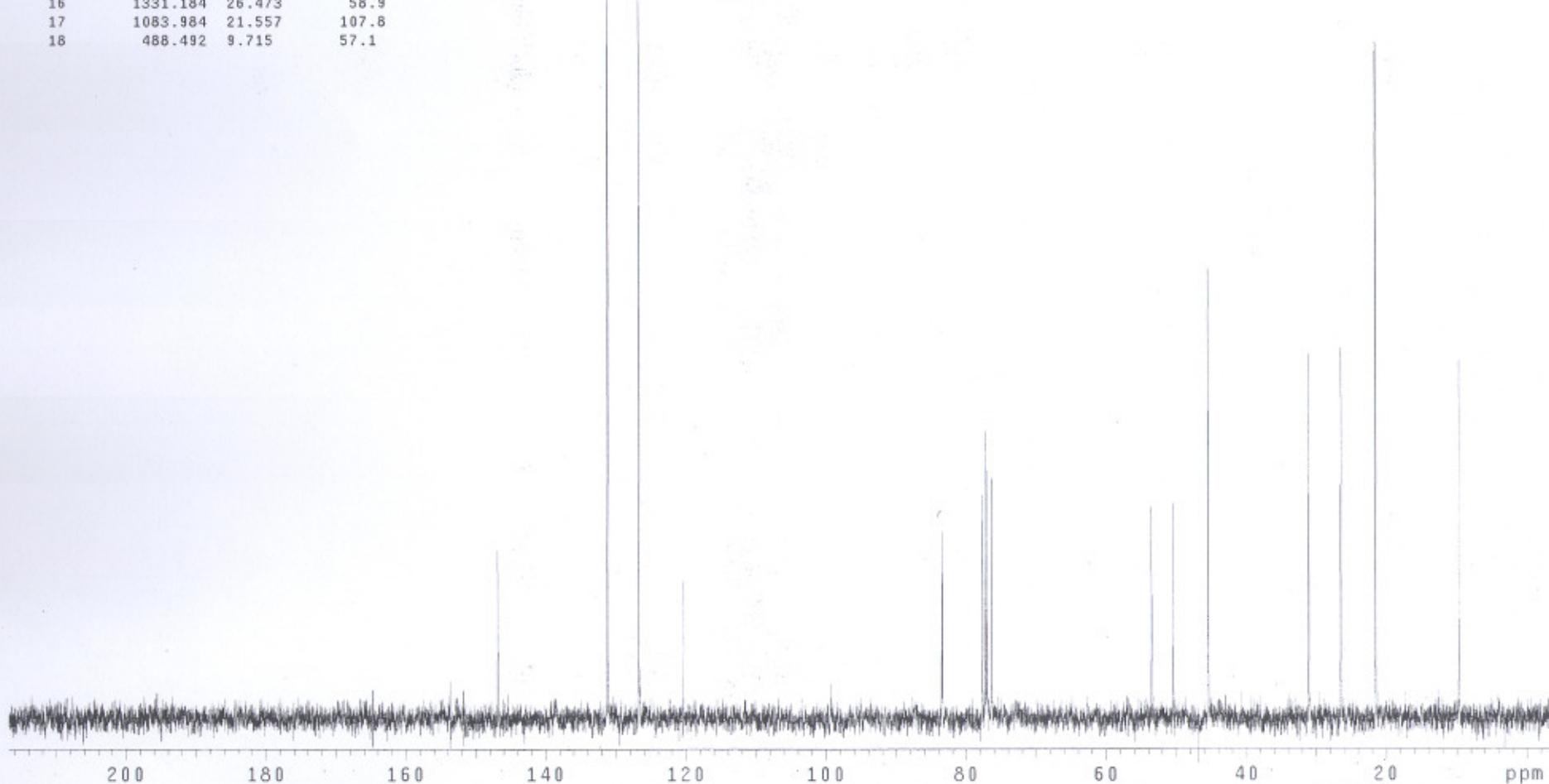
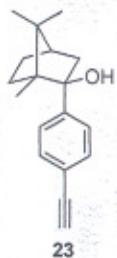
ea719c
Pulse Sequence: gHSQC



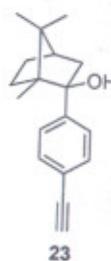


EA459B

INDEX	FREQUENCY	PPM	HEIGHT
S-39	7384.912	146.865	26.8
Pulse Sequence	6599.402	131.244	119.4
3	6373.986	126.760	114.5
4	6053.924	120.395	21.8
5	4199.924	83.524	21.4
6	4192.676	83.380	29.8
7	3903.895	77.637	35.5
8	3882.913	77.220	45.8
9	3871.850	77.000	39.3
10	3839.806	76.363	38.4
11	2691.547	53.527	33.6
12	2536.284	50.439	34.1
13	2287.558	45.493	71.6
14	2286.032	45.463	64.7
15	1561.599	31.056	57.9
16	1331.184	26.473	58.9
17	1083.984	21.557	107.8
18	488.492	9.715	57.1

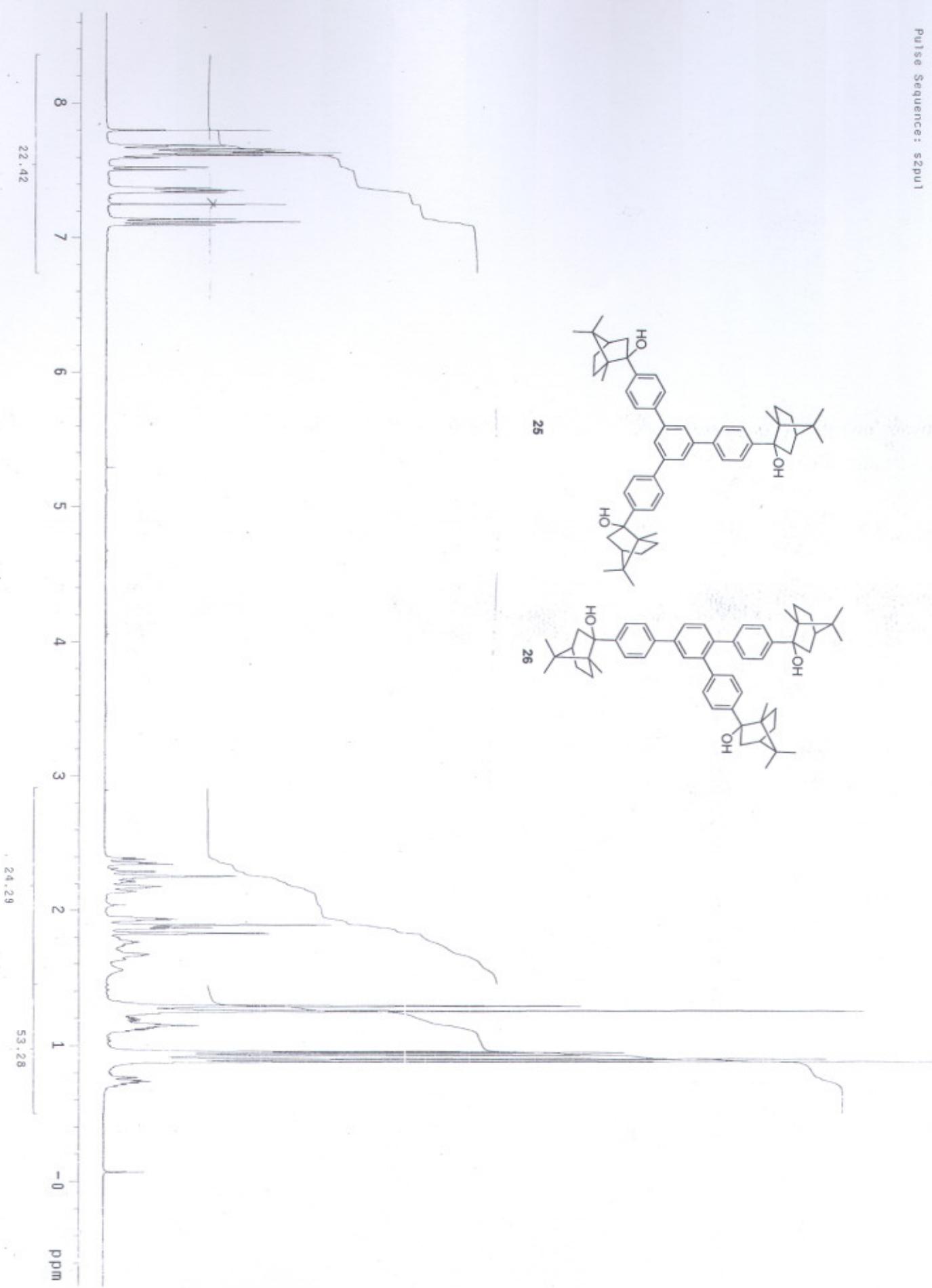


INDEX	FREQUENCY	PPM	HEIGHT
1	6599.442	131.244	121.9
2	6374.368	126.768	139.9
3	4199.543	83.517	9.3
4	2287.558	45.493	55.3
5	2285.651	45.455	-47.0
6	1561.599	31.056	-56.9
7	1330.803	26.466	-54.8
8	1083.984	21.557	91.9
9	488.492	9.715	50.1



200 180 160 140 120 100 80 60 40 20 0 ppm

EA471B
Pulse Sequence: s2pul

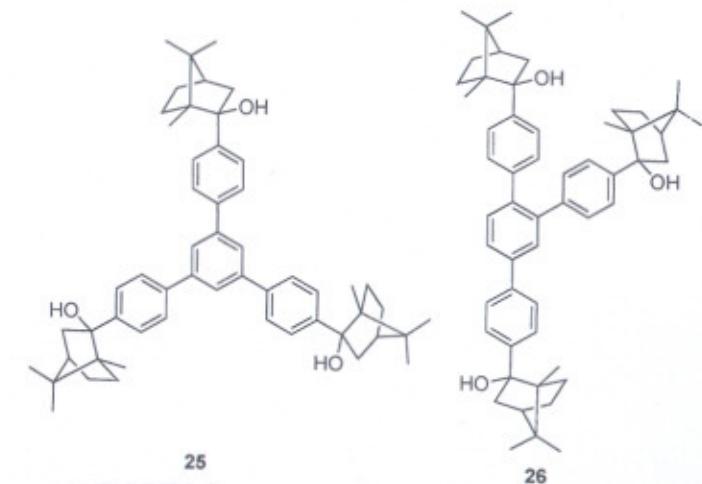


S-42_{1b}

Pulse Sequence: s2pul

INDEX	FREQUENCY	PPM	HEIGHT
1	7317.008	145.514	12.4
2	7310.905	145.393	15.2
3	7255.590	144.293	16.5
4	7251.775	144.217	16.6
5	7130.464	141.804	12.7
6	7074.386	140.689	15.8
7	7039.290	139.991	14.6
8	7031.279	139.832	15.5
9	7019.834	139.604	13.6
10	7013.731	139.483	11.3
11	6999.616	139.202	15.1
12	6985.501	138.922	13.2
13	6578.079	130.819	15.1
14	6491.483	129.097	43.5
15	6401.071	127.299	58.7
16	6356.438	126.411	30.4
17	6344.994	126.184	77.9
18	6333.549	125.956	14.2
19	6277.853	124.849	9.0
20	4200.305	83.532	32.2
21	4193.820	83.403	40.7
22	3903.894	77.637	162.0
23	3871.850	77.000	160.7
24	3840.187	76.370	159.6
25	2694.598	53.588	31.1
26	2689.258	53.482	42.5
27	2538.191	50.477	31.2
28	2530.180	50.318	42.7
29	2294.043	45.622	64.7
30	2271.536	45.174	24.3
31	1569.610	31.215	27.2
32	1338.051	26.610	26.2
33	1328.895	26.428	25.0
34	1088.943	21.656	97.7
35	1085.510	21.588	55.0
36	497.266	9.889	41.7
37	494.977	9.844	43.0

200 180 160 140 120 100 80 60 40 20 ppm



¹³S-43₀

Pulse Sequence: dept

INDEX	FREQUENCY	PPM	HEIGHT
1	7737.253	153.872	13.3
2	6584.798	130.953	27.4
3	6496.294	129.193	78.6
4	6407.790	127.433	99.7
5	6363.157	126.545	45.0
6	6351.331	126.310	135.0
7	6340.268	126.090	31.1
8	6284.572	124.982	17.6
9	5002.794	99.491	-13.0
10	2298.473	45.710	50.8
11	2277.873	45.300	-34.5
12	1575.947	31.341	-36.8
13	1344.388	26.736	-35.2
14	1335.995	26.569	-31.3
15	1095.662	21.790	118.4
16	1092.610	21.729	65.3
17	503.985	10.023	50.9
18	501.696	9.977	50.9

