

## Supporting information

Convenient Route to Calix[n]furano[m]pyrroles (n=3,4,6,8, m=2,4)

Nagarajan Arumugam, Yong-Sung Jang, and Chang-Hee Lee\*.

*Department of Chemistry, Kangwon National University Chun-chon 200-701, Korea*

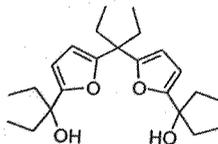
*chhlee@kangwon.ac.kr*

General : All compounds were characterized by <sup>1</sup>H NMR spectra (400 MHz, Bruker IFS 48), IR spectra (JASCO IR 100), absorption spectra (Kontron 941) and mass spectra. .

2906.34

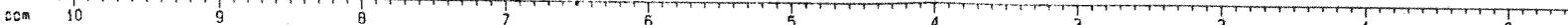
2442.55  
2439.46  
2403.83  
2400.50

817.89  
805.11  
797.67  
790.22  
782.86  
736.93  
730.30  
729.48  
722.95  
715.41  
707.86  
700.43  
693.67  
686.62  
503.61  
382.70  
375.39  
324.43  
316.99  
309.54  
293.65  
286.22  
278.76  
0.00



Integral

ppm



2.000  
1.968

4.619  
11.826

13.261  
7.567

Current Data Parameters  
NAME feb-20  
EXPNO 213  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20000223  
Time 15.53  
INSTRUM spect  
PROBHD 5 mm Dual 13  
PULPROG zg30  
TD 32768  
SOLVENT CDC13  
NS 16  
DS 2  
SWH 8223.685 Hz  
FIDRES 0.250967 Hz  
AQ 1.9923444 sec  
RG 181  
DW 60.800 usec  
DE 5.00 usec  
TE 300.0 K  
D1 1.00000000 sec

----- CHANNEL f1 -----  
NUC1 1H  
P1 11.20 usec  
PL1 0.00 dB  
SFO1 400.1324710 MHz

F2 - Processing parameters  
SI 16384  
SF 400.1300078 MHz  
WDW EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

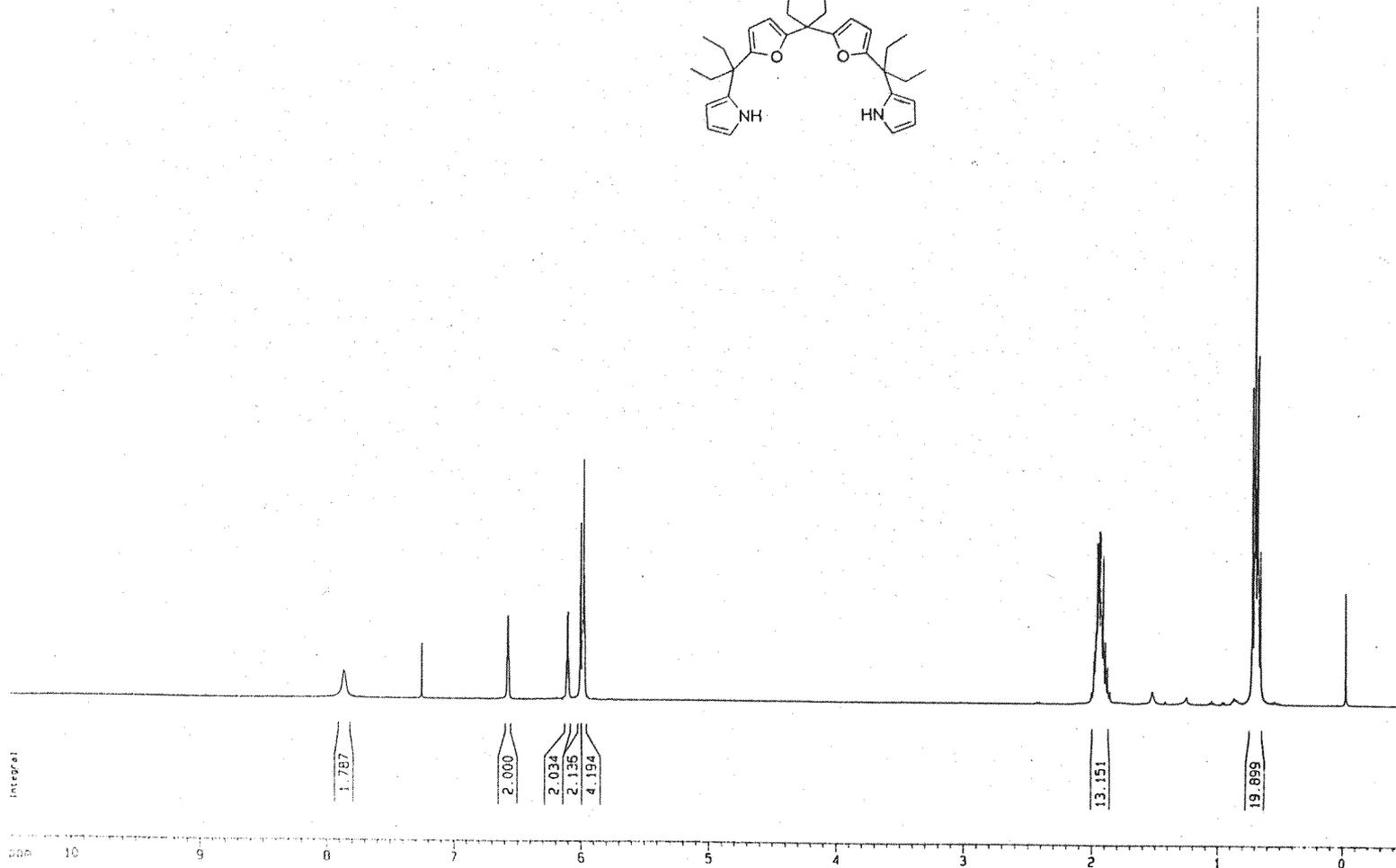
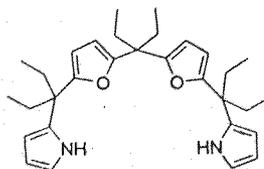
1D NMR plot parameters  
CX 30.00 cm  
F1P 10.500 ppm  
F1 4201.37 Hz  
F2P -0.500 ppm  
F2 -200.07 Hz  
PPMCM 0.36667 ppm/cm  
HZCM 146.71434 Hz/cm

3147.64

2902.55  
 2633.97  
 2631.40  
 2629.88  
 2627.38  
 2447.60  
 2444.81  
 2441.79  
 2439.00  
 2404.79  
 2401.60  
 2398.28  
 2392.90  
 2389.81

796.24  
 793.63  
 788.95  
 786.19  
 782.57  
 778.77  
 775.05  
 773.54  
 766.11  
 759.31  
 752.34  
 295.57  
 288.18  
 284.80  
 280.75  
 277.37  
 269.97

0.00



## Current Data Parameters

NAME may-20  
 EXPNO 71  
 PROCNO 1

## F2 - Acquisition Parameters

Date\_ 20000510  
 Time 21.54  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zg30  
 TD 32768  
 SOLVENT COC13  
 NS 16  
 DS 2  
 SWH 8223.685 Hz  
 FIDRES 0.250967 Hz  
 AQ 1.9923444 sec  
 RG 181  
 DW 60.800 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 1.00000000 sec

## ----- CHANNEL f1 -----

NUC1 1H  
 P1 11.20 usec  
 PL1 0.00 dB  
 SFO1 400.1324710 MHz

## F2 - Processing parameters

S1 16384  
 SF 400.1300114 MHz  
 MDM EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

## 1D NMR plot parameters

CX 30.00 cm  
 F1P 10.500 ppm  
 F1 4201.37 Hz  
 F2P -0.500 ppm  
 F2 -200.07 Hz  
 PPMCM 0.36667 ppm/cm  
 HZCM 145.71434 Hz/cm

0.00

157.375  
156.654

135.636

115.978  
107.474  
106.386  
106.277  
105.011

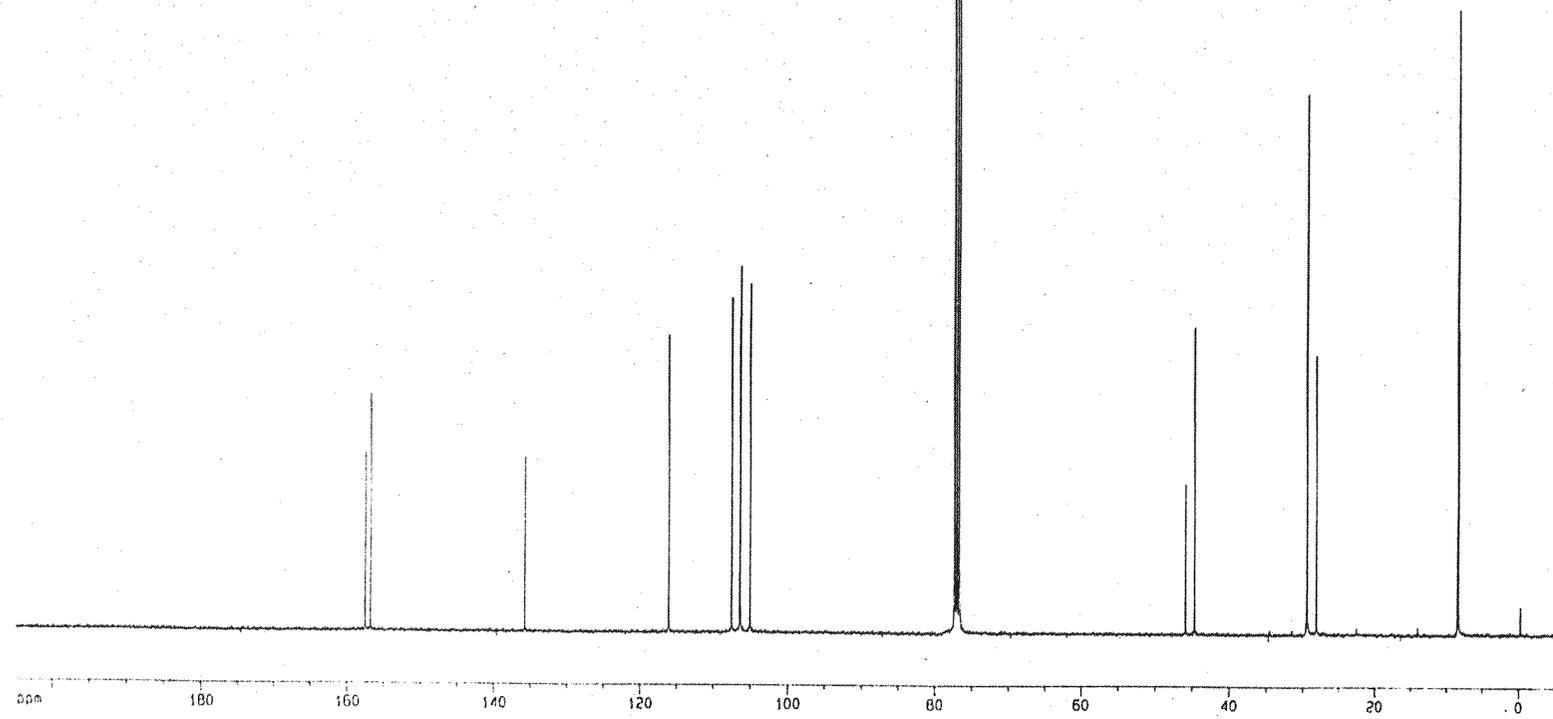
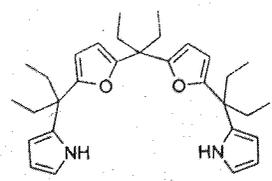
77.333  
77.219  
77.015  
76.698

45.982  
44.773

29.547  
28.256

8.616  
8.483

0.000



Current Data Parameters  
 NAME may-20  
 EXPNO 72  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20000511  
 Time 9.33  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDC13  
 NS 13662  
 DS 2  
 SWH 31847.133 Hz  
 FIDRES 0.485949 Hz  
 AQ 1.0289652 sec  
 RG 3649.1  
 DW 15.700 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec

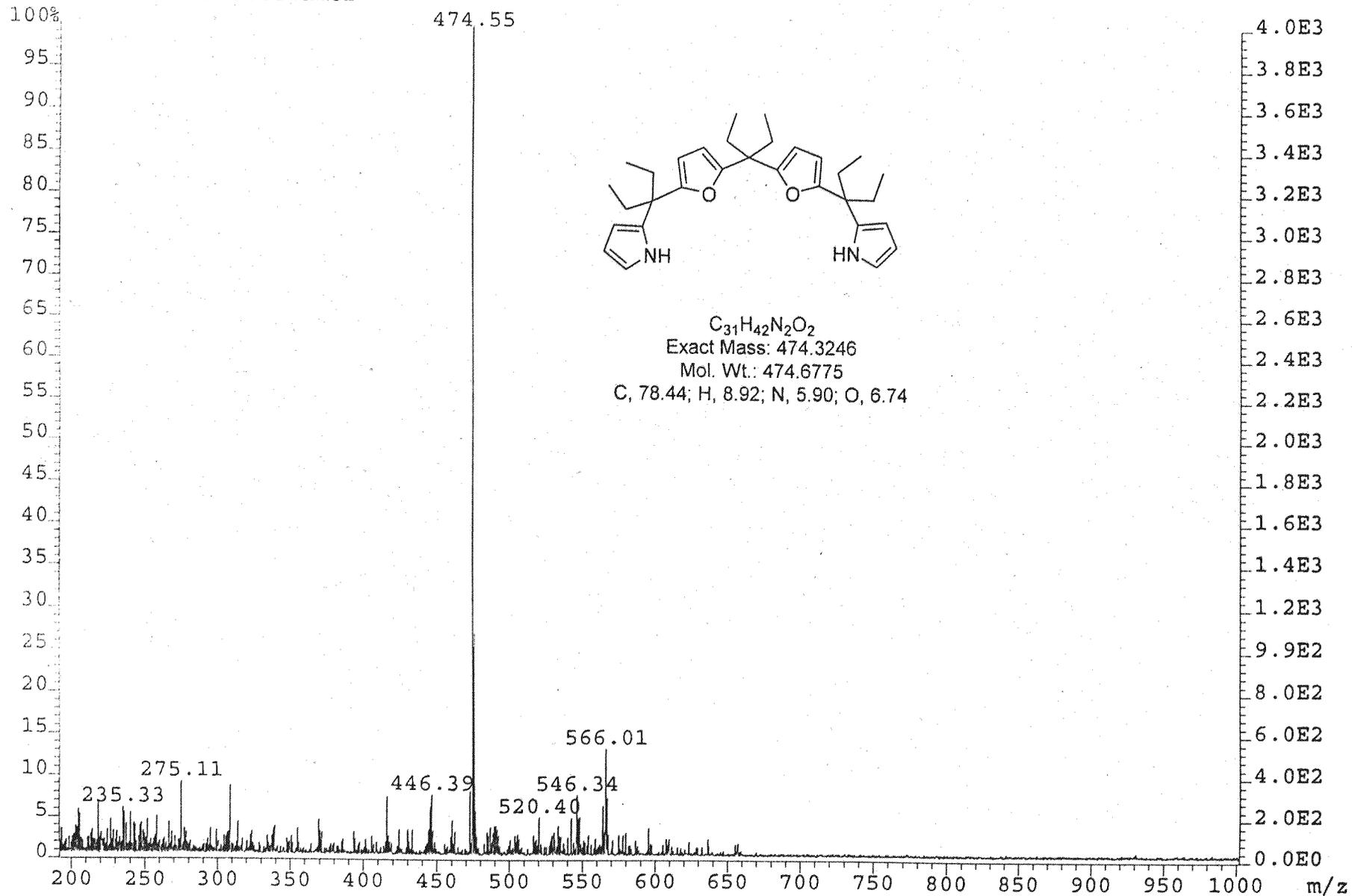
\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
 NUC1 13C  
 P1 10.80 usec  
 PL1 0.00 dB  
 SF01 100.6254358 MHz

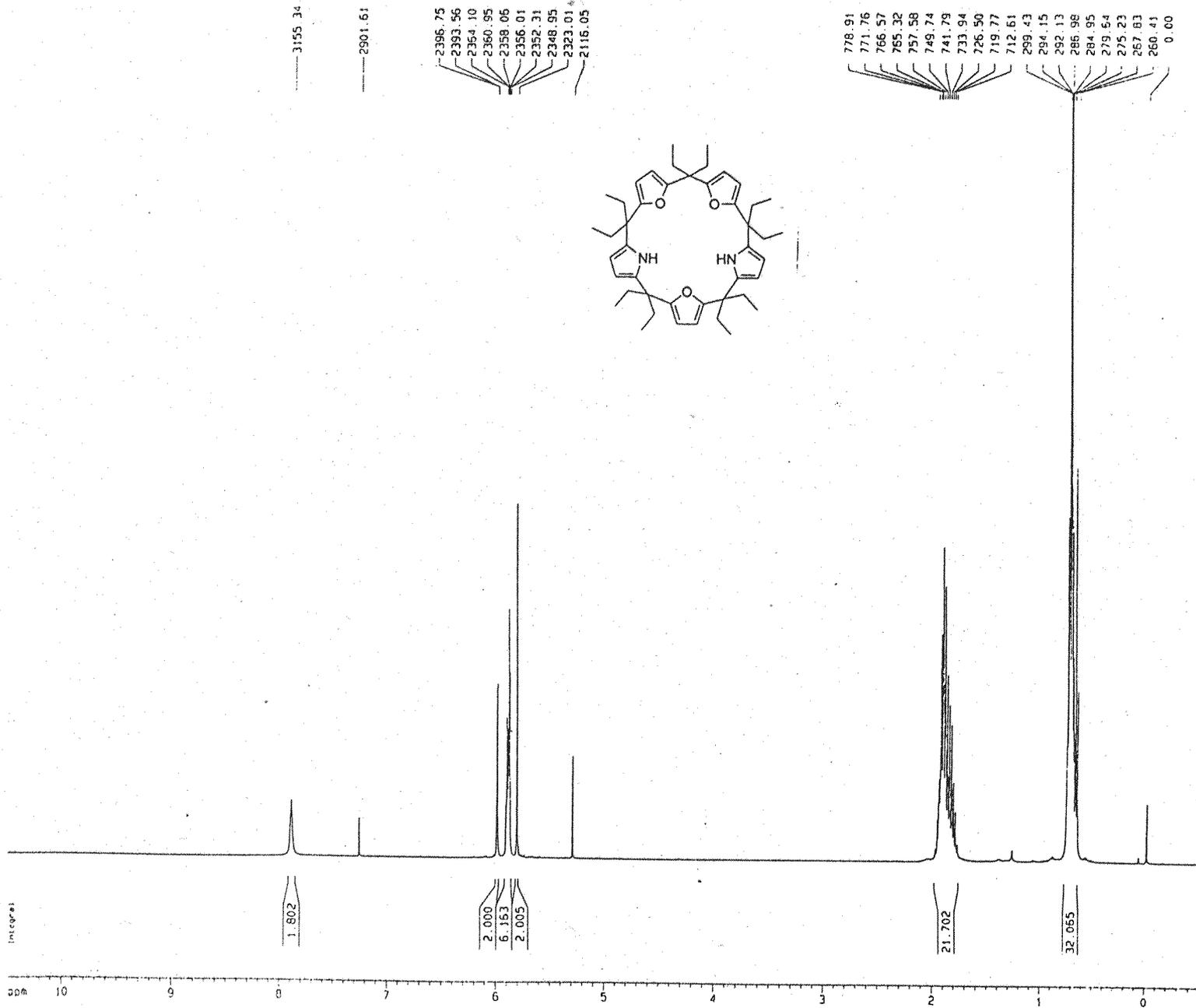
\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
 CPOPRG2 waltz16  
 NUC2 1H  
 PCPD2 95.00 usec  
 PL2 0.00 dB  
 PL12 18.00 dB  
 PL13 20.00 dB  
 SF02 400.1324708 MHz

F2 - Processing parameters  
 SI 32768  
 SF 100.6127679 MHz  
 NDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 205.000 ppm  
 F1 20625.62 Hz  
 F2P -5.000 ppm  
 F2 -503.06 Hz  
 PPMCM 7.00000 ppm/cm  
 HZCM 704.28937 Hz/cm

File:NAGARAJAN02 Ident:179 Acq:15-JUN-2000 15:32:53 +4:40 Cal:NAGARAJAN02  
AutoSpec FAB- Magnet BpI:3978 TIC:710840  
File Text:linear tetramer





Current Data Parameters  
 NAME apr-20  
 EXPNO 63  
 PROCNO 1

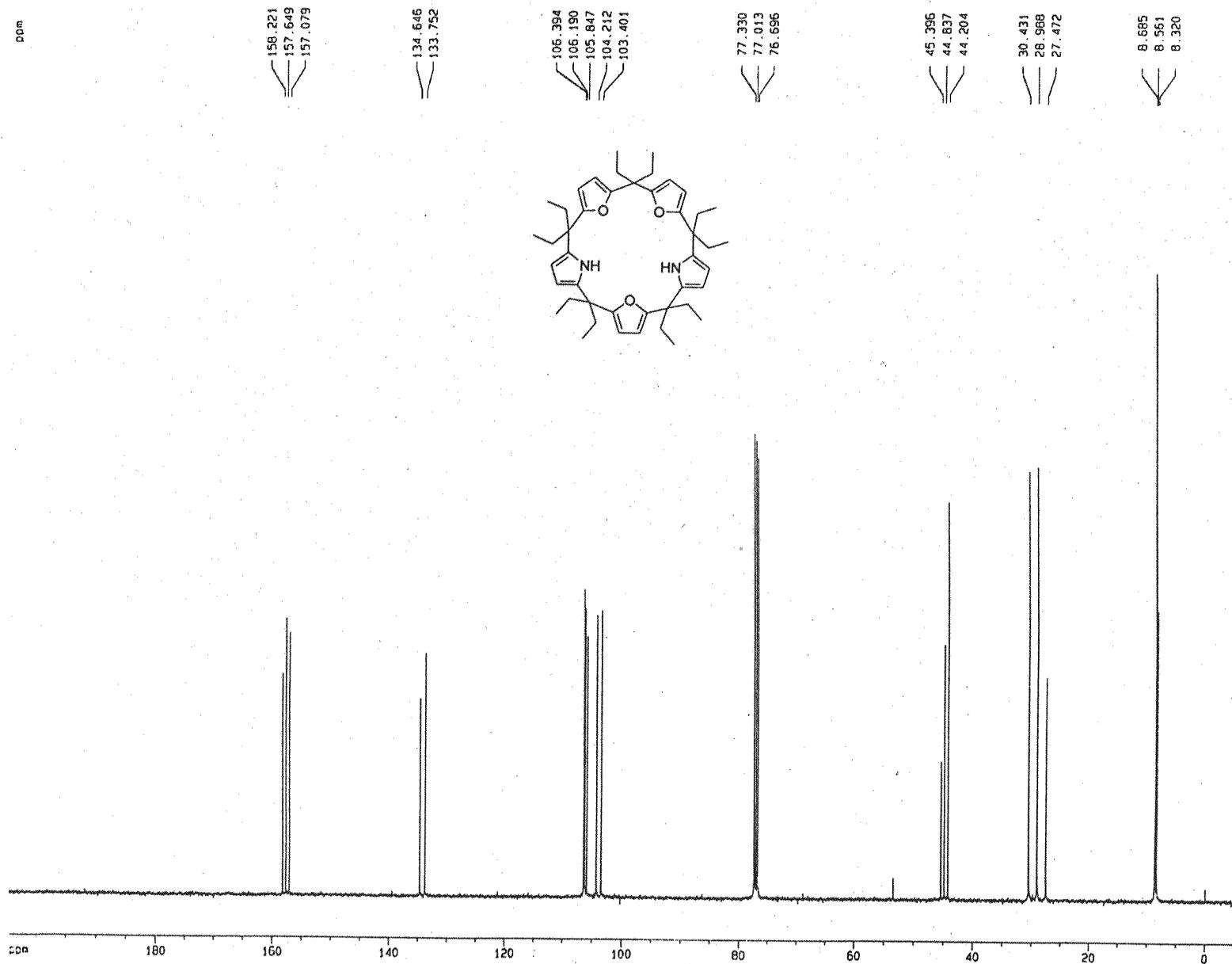
F2 - Acquisition Parameters  
 Date\_ 20000412  
 Time 16.53  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zg30  
 TO 32768  
 SOLVENT CDCl3  
 NS 16  
 OS 2  
 SWH 8012.820 Hz  
 FIDRES 0.244532 Hz  
 AQ 2.0447731 sec  
 RG 90.5  
 DW 62.400 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 1.00000000 sec

----- CHANNEL f1 -----  
 NUC1 1H  
 P1 11.20 usec  
 PL1 0.00 dB  
 SFO1 400.1324710 MHz

F2 - Processing parameters  
 SI 16384  
 SF 400.1300121 MHz  
 NDW EM  
 SSO 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 10.500 ppm  
 F1 4201.37 Hz  
 F2P -0.500 ppm  
 F2 -200.07 Hz  
 PPMCM 0.36667 ppm/cm  
 HZCM 146.71434 Hz/cm

ppm



Current Data Parameters  
 NAME apr-20  
 EXPNO 64  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20000412  
 Time 21.44  
 INSTRUM spect  
 PROBHD 5 mm Dvb1 13  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDCl3  
 NS 3303  
 DS 2  
 SWH 31047.133 Hz  
 FIDRES 0.485949 Hz  
 AQ 1.0289652 sec  
 RG 3649.1  
 DW 15.700 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 2.0000000 sec  
 D11 0.0300000 sec  
 D12 0.0002000 sec

\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
 NUC1 13C  
 P1 10.80 usec  
 PL1 0.00 dB  
 SFO1 100.6254358 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
 CPOPRG2 waltz16  
 NUC2 1H  
 PCPD2 95.00 usec  
 PL2 0.00 dB  
 PL12 18.00 dB  
 PL13 20.00 dB  
 SFO2 400.1324708 MHz

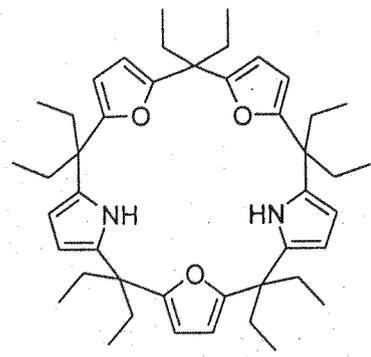
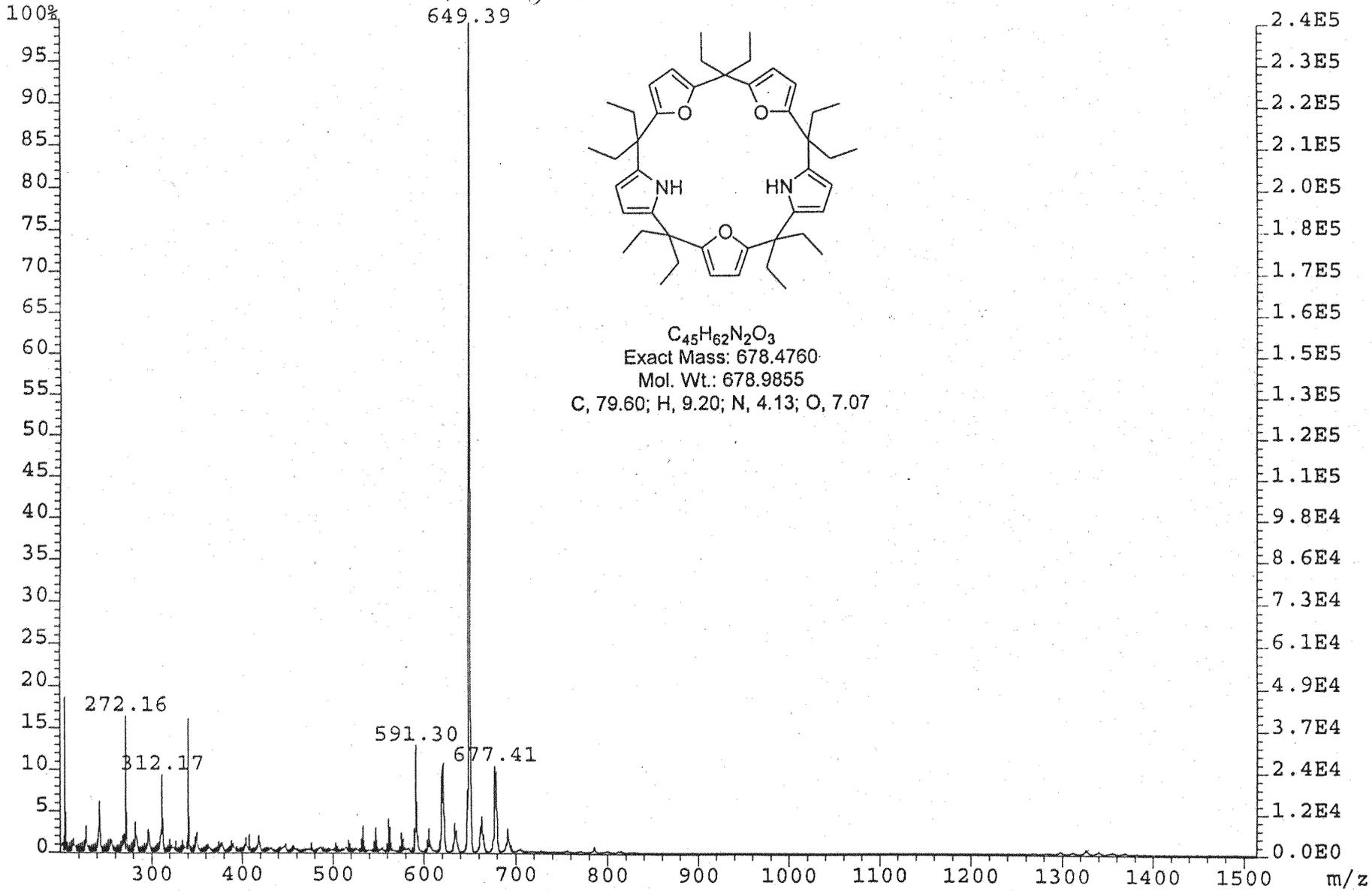
F2 - Processing parameters  
 SI 32768  
 SF 100.6127678 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 205.000 ppm  
 F1 20625.62 Hz  
 F2P -5.000 ppm  
 F2 -503.06 Hz  
 PPMCM 7.00000 ppm/cm  
 HZCM 704.28937 Hz/cm

File:NAGARAJAN01 Ident:365\_376 Acq:15-JUN-2000 14:36:02 +14:17 Cal:NAGARAJAN01

AutoSpec FAB+ Magnet BpI:244600 TIC:23049666

File Text:109-I, lineartetramer, SAM-5A-1



$C_{45}H_{62}N_2O_3$   
Exact Mass: 678.4760  
Mol. Wt.: 678.9855  
C, 79.60; H, 9.20; N, 4.13; O, 7.07

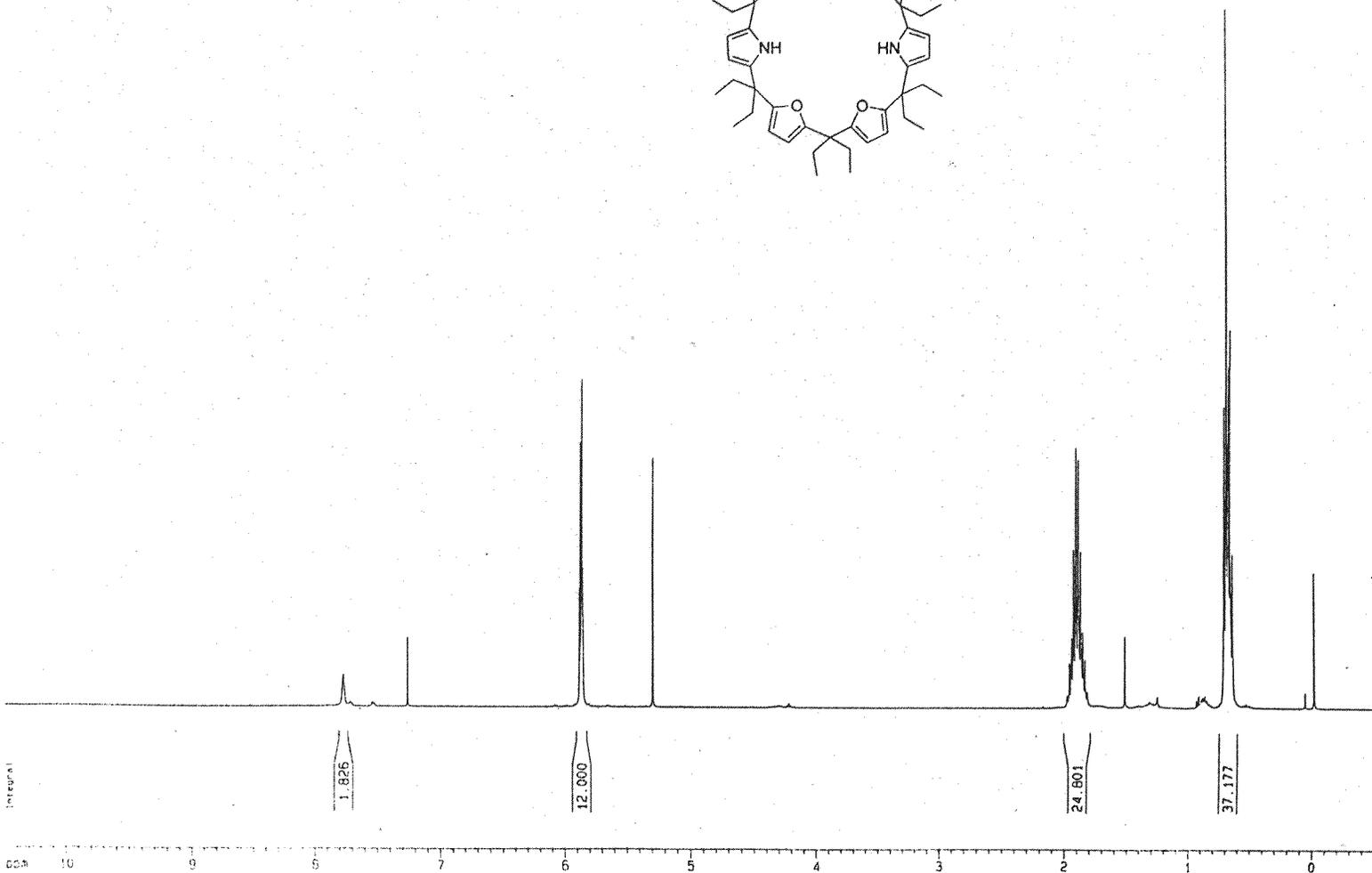
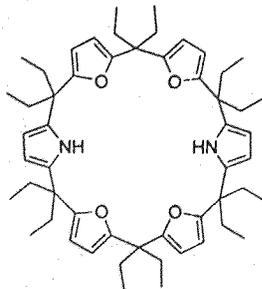
Hz

3108.73

2904.06

2353.17  
2350.08  
2346.86  
2345.07  
2342.10  
2119.21

784.69  
777.47  
771.05  
763.83  
756.30  
748.46  
741.76  
734.56  
607.17  
287.39  
280.06  
274.90  
272.70  
267.68  
260.28  
0.00



Current Data Parameters  
 NAME may-20  
 EXPNO 69  
 PROCNO 1

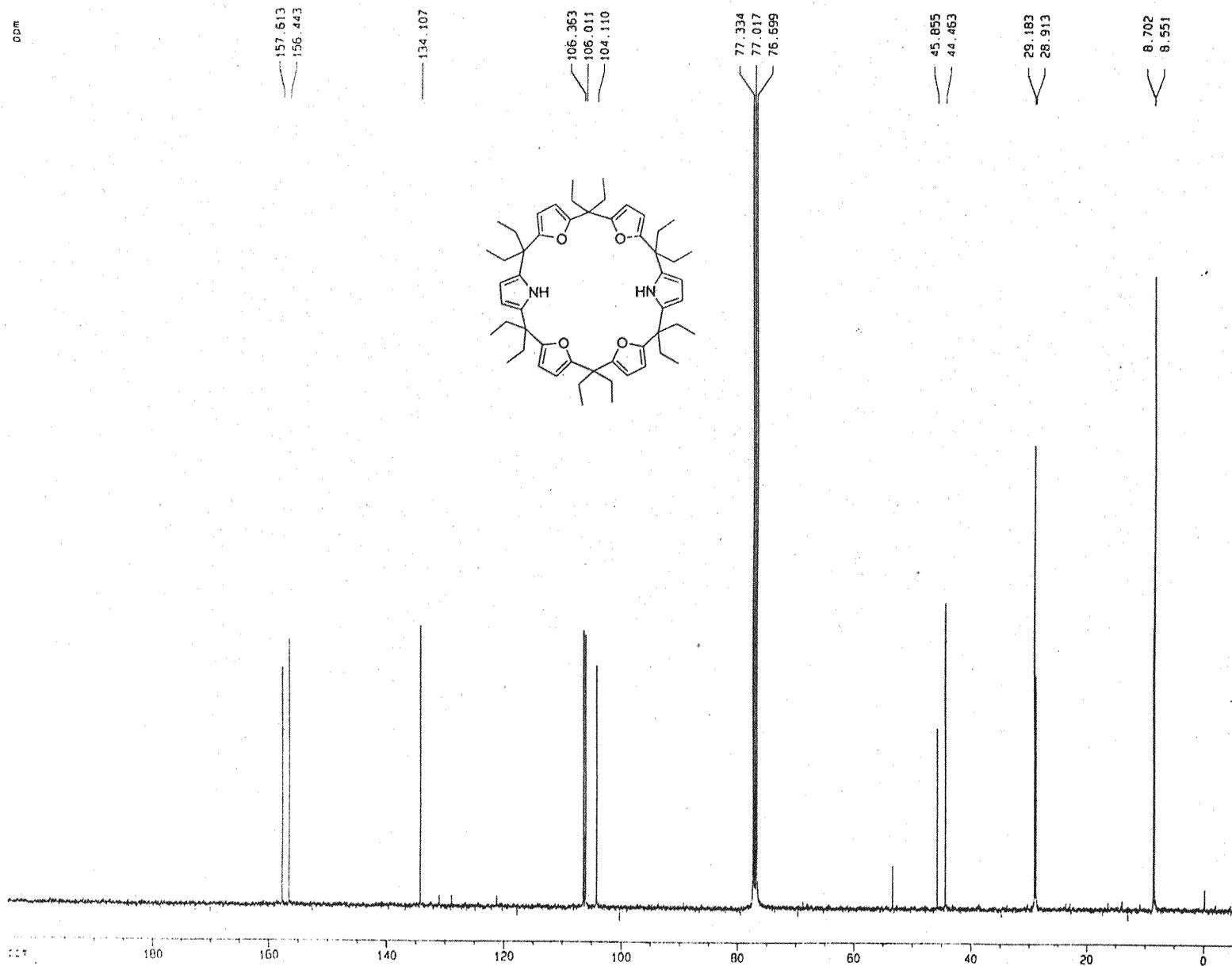
F2 - Acquisition Parameters  
 Date\_ 20000510  
 Time 17.22  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zg30  
 TD 32768  
 SOLVENT CDCl3  
 NS 16  
 DS 2  
 SWH 8223.685 Hz  
 FIDRES 0.250967 Hz  
 AQ 1.9923444 sec  
 RG 181  
 DN 60.800 usec  
 DE 6.00 usec  
 TE 300.0 K  
 O1 1.00000000 sec

----- CHANNEL f1 -----  
 NUC1 1H  
 P1 11.20 usec  
 PL1 0.00 dB  
 SFO1 400.1324710 MHz

F2 - Processing parameters  
 SI 16384  
 SF 400.1300099 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 10.500 ppm  
 F1 4201.37 Hz  
 F2P -0.500 ppm  
 F2 -200.07 Hz  
 PPHCM 0.36667 ppm/cm  
 HZCM 146.71434 Hz/cm

ppm



Current Data Parameters  
 NAME may-20  
 EXPNO 70  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20000510  
 Time 18.36  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT COC13  
 NS 4249  
 OS 2  
 SWH 31847.133 Hz  
 FIDRES 0.485949 Hz  
 AQ 1.0289652 sec  
 RG 2580.3  
 DW 15.700 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec

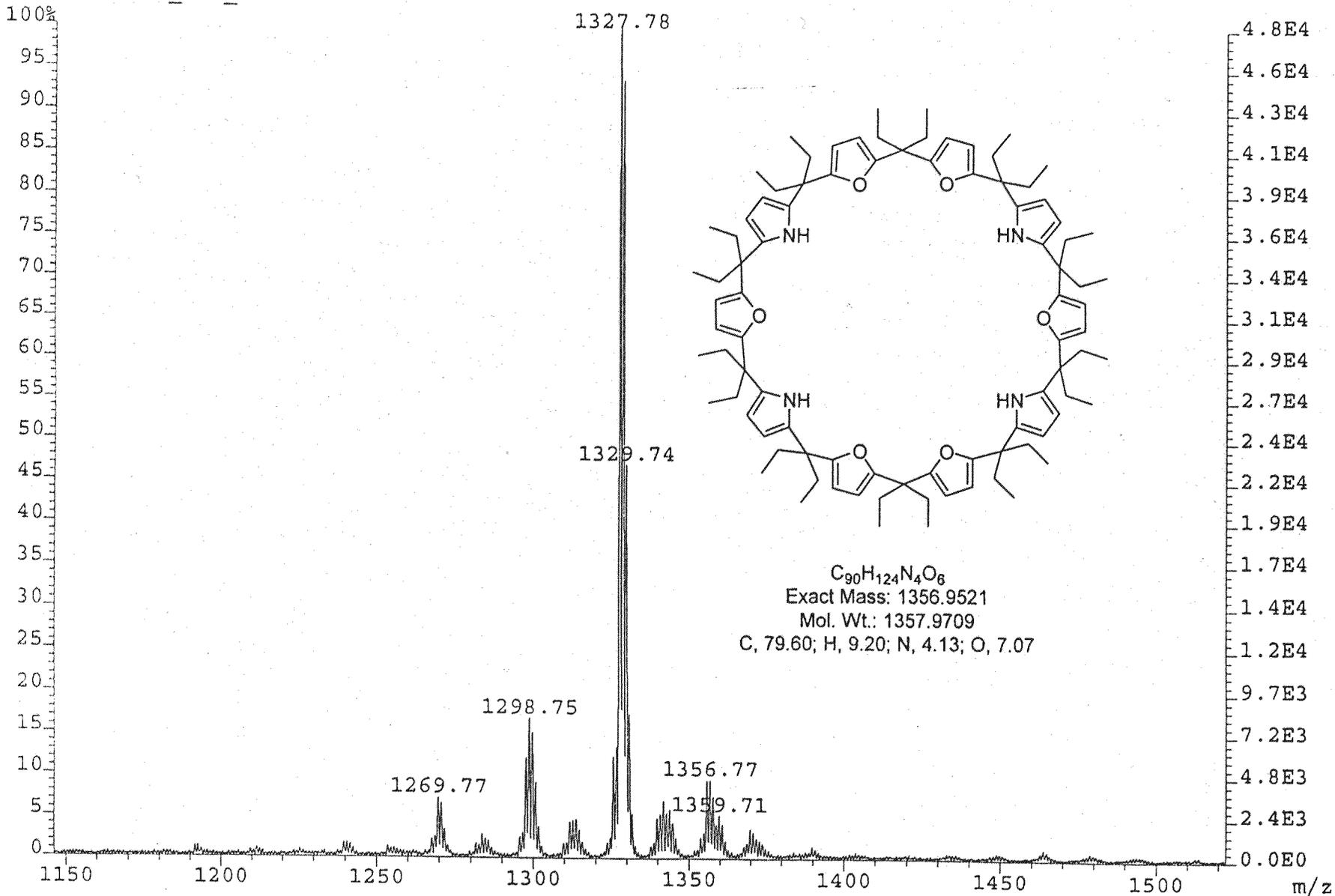
----- CHANNEL f1 -----  
 NUC1 13C  
 P1 10.80 usec  
 PL1 0.00 dB  
 SFO1 100.6254350 MHz

----- CHANNEL f2 -----  
 CPDPRG2 waltz16  
 NUC2 1H  
 PCPD2 95.00 usec  
 PL2 0.00 dB  
 PL12 18.00 dB  
 PL13 20.00 dB  
 SFO2 400.1324708 MHz

F2 - Processing parameters  
 SI 32768  
 SF 100.6127678 MHz  
 WDW EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 205.000 ppm  
 F1 20625.62 Hz  
 F2P -5.000 ppm  
 F2 -503.06 Hz  
 PPMCM 7.00000 ppm/cm  
 HZCM 704.28937 Hz/cm

File:NAGARAJAN01 Ident:203\_257-120\_169 Acq: 3-MAY-2000 15:06:18 +3:23 Cal:KHJ02  
AutoSpec FAB+ Magnet BpI:48314 TIC:4219789  
File Text:72\_SAM\_2



3042.53

2904.52

2360.86

2357.39

2355.36

2350.17

2333.93

784.46

777.09

770.52

762.79

754.98

747.44

738.19

731.35

724.03

717.37

710.21

502.16

277.61

270.26

261.08

258.17

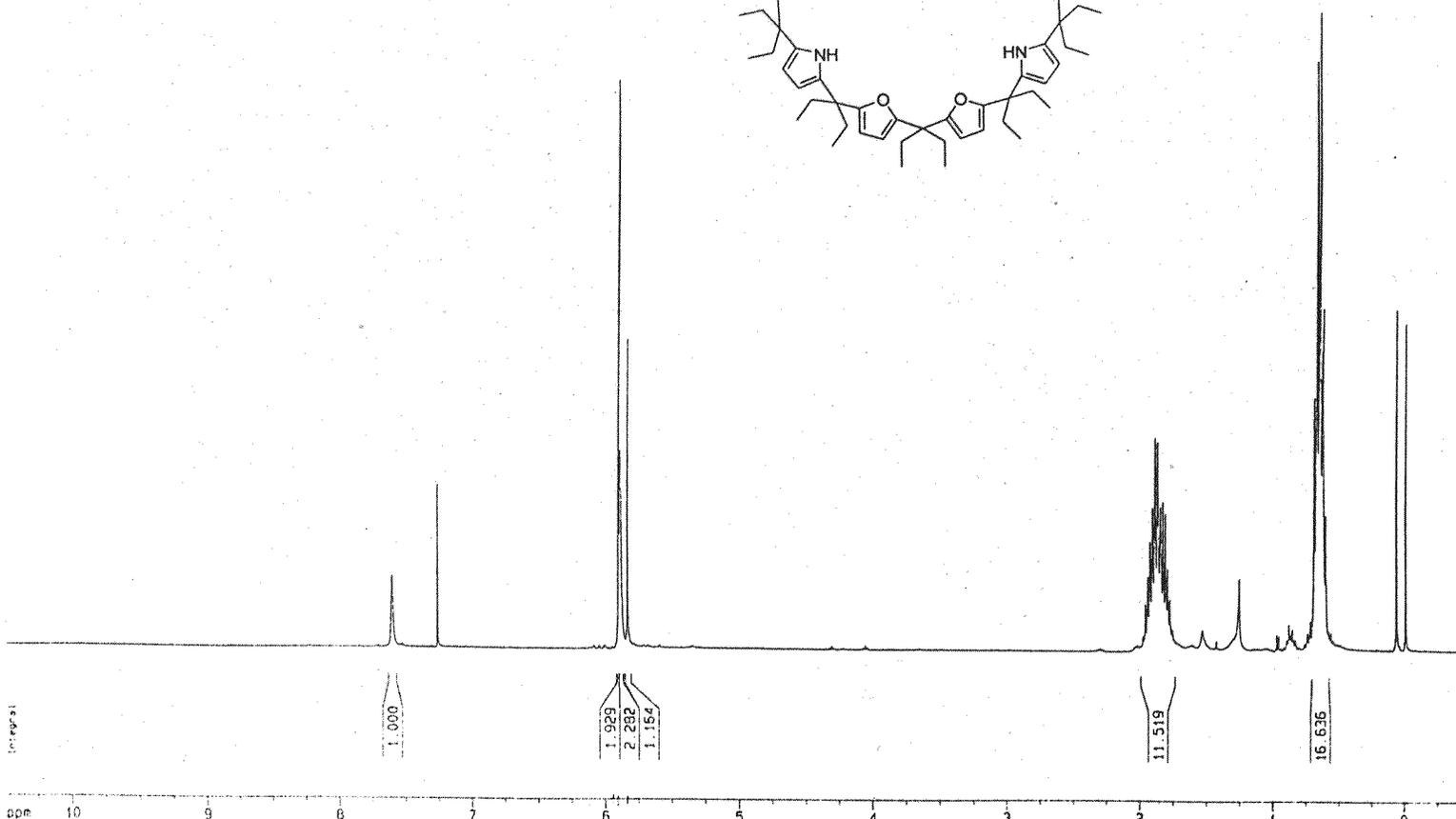
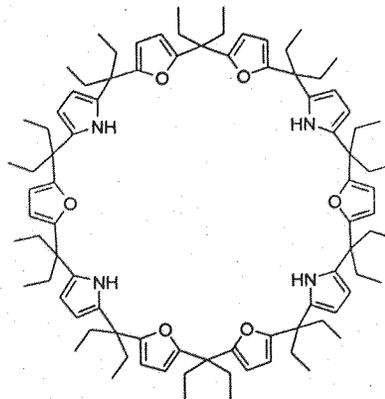
253.59

250.56

243.13

27.95

-0.03



Current Data Parameters  
 NAME may-20  
 EXPNO 14  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20000502  
 Time 16.47  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zg30  
 TD 32768  
 SOLVENT CDCl3  
 NS 16  
 DS 2  
 SWH 8223.685 Hz  
 FIDRES 0.250967 Hz  
 AQ 1.9923444 sec  
 RG 256  
 DH 60.800 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 1.00000000 sec

----- CHANNEL f1 -----  
 NUC1 1H  
 P1 11.20 usec  
 PL1 0.00 dB  
 SFO1 400.1324710 MHz

F2 - Processing parameters  
 SI 16384  
 SF 400.1300095 MHz  
 MDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 10.500 ppm  
 F1 4201.37 Hz  
 F2P -0.500 ppm  
 F2 -200.07 Hz  
 PPMCM 0.36667 ppm/cm  
 HZCM 146.71434 Hz/cm

DDM

157.923  
157.590  
156.190

133.735  
133.284

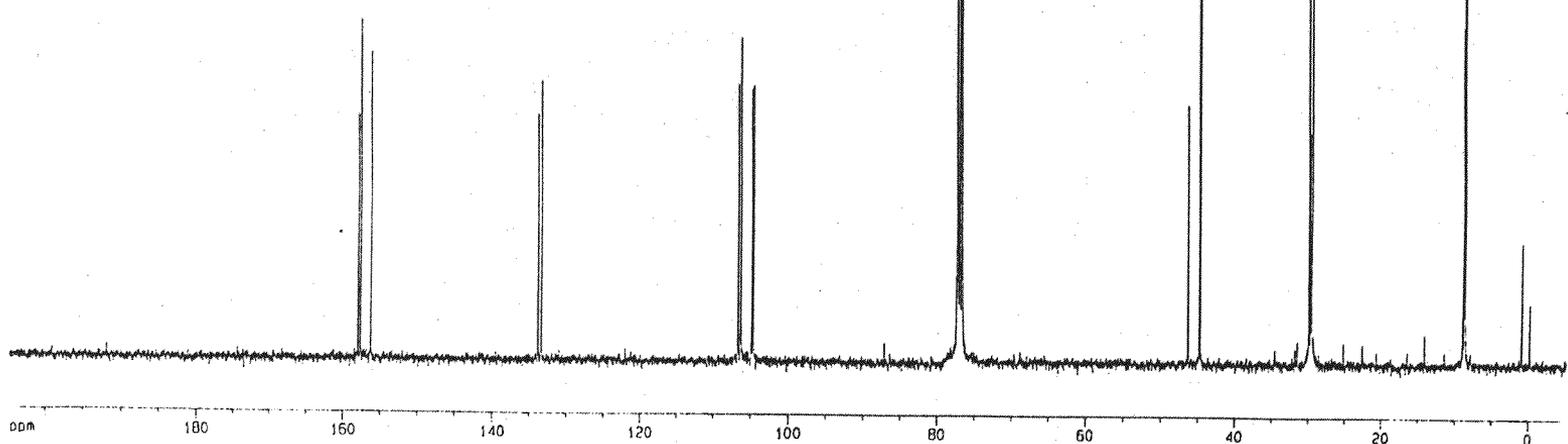
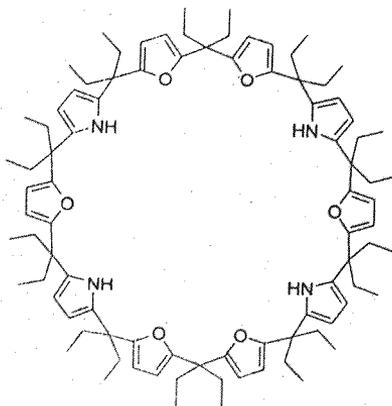
106.645  
106.300  
106.257  
104.820  
104.568

77.334  
77.220  
77.015  
76.698

46.406  
44.898  
44.734

30.006  
29.812  
29.714  
29.557

8.941  
8.756  
8.616  
1.032  
0.003



Current Data Parameters  
 NAME may-20  
 EXPNO 17  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20000503  
 Time 10.19  
 INSTRUM spect  
 PROBHD 5 mm Dui1 13  
 PULPROG zgpg30  
 TD 65536  
 SOLVENT CDC13  
 NS 14719  
 DS 2  
 SWH 31847.133 Hz  
 FIDRES 0.485949 Hz  
 AQ 1.0289652 sec  
 RG 2896.3  
 DW 15.700 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 2.00000000 sec  
 D11 0.03000000 sec  
 D12 0.00002000 sec

\*\*\*\*\* CHANNEL f1 \*\*\*\*\*  
 NUC1 13C  
 P1 10.00 usec  
 PL1 0.00 dB  
 SF01 100.6254358 MHz

\*\*\*\*\* CHANNEL f2 \*\*\*\*\*  
 CPDPRG2 waltz16  
 NUC2 1H  
 PCPD2 95.00 usec  
 PL2 0.00 dB  
 PL12 18.00 dB  
 PL13 20.00 dB  
 SF02 400.1324708 MHz

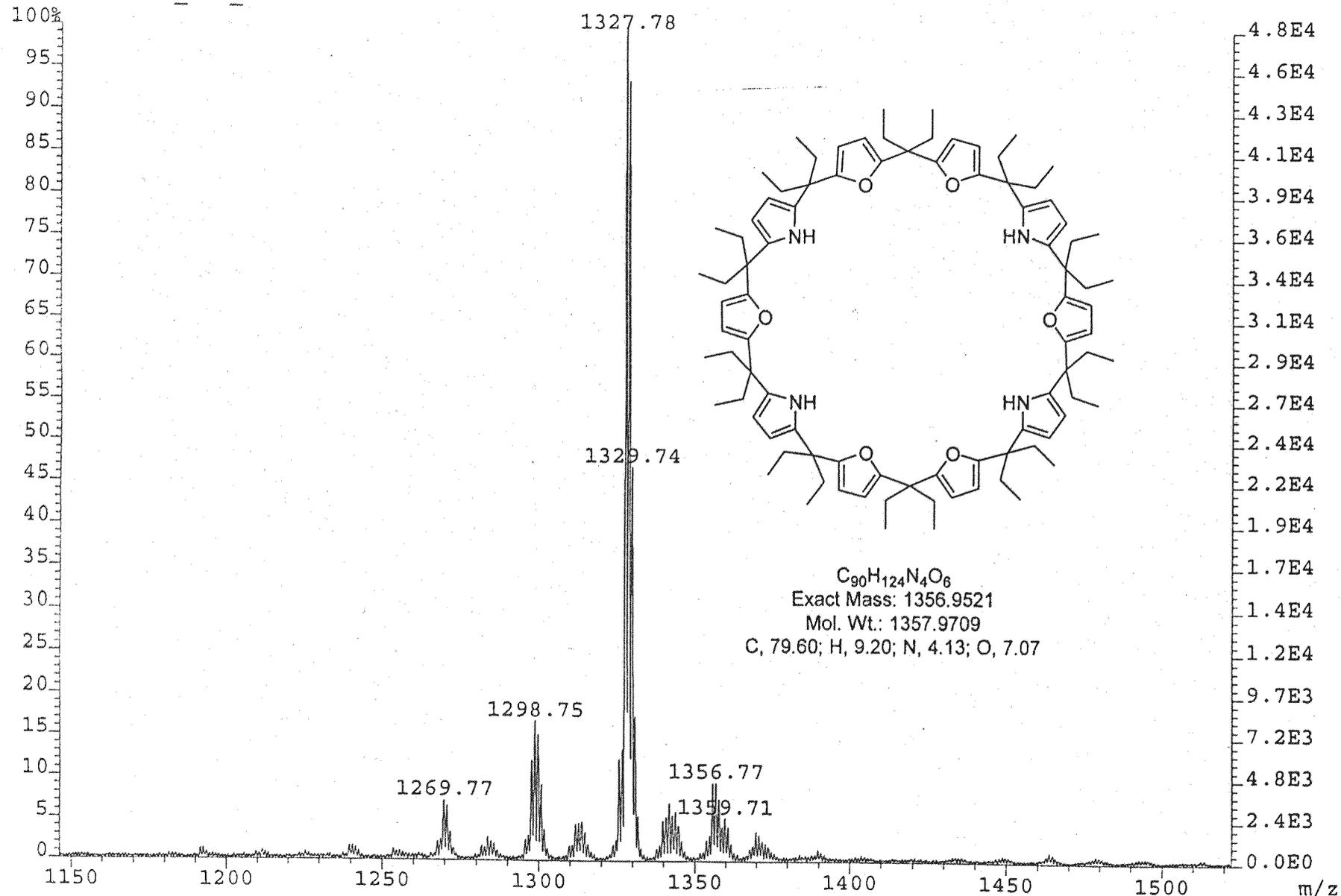
F2 - Processing parameters  
 SI 32768  
 SF 100.6127670 MHz  
 MDM EM  
 SSB 0  
 LB 1.00 Hz  
 GB 0  
 PC 1.40

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 205.000 ppm  
 F1 20625.62 Hz  
 F2P -5.000 ppm  
 F2 -503.06 Hz  
 PPMCM 7.00000 ppm/cm  
 HZCM 704.28937 Hz/cm

File:NAGARAJAN01 Ident:203\_257-120\_169 Acq: 3-MAY-2000 15:06:18 +3:23 Cal:KHJ02

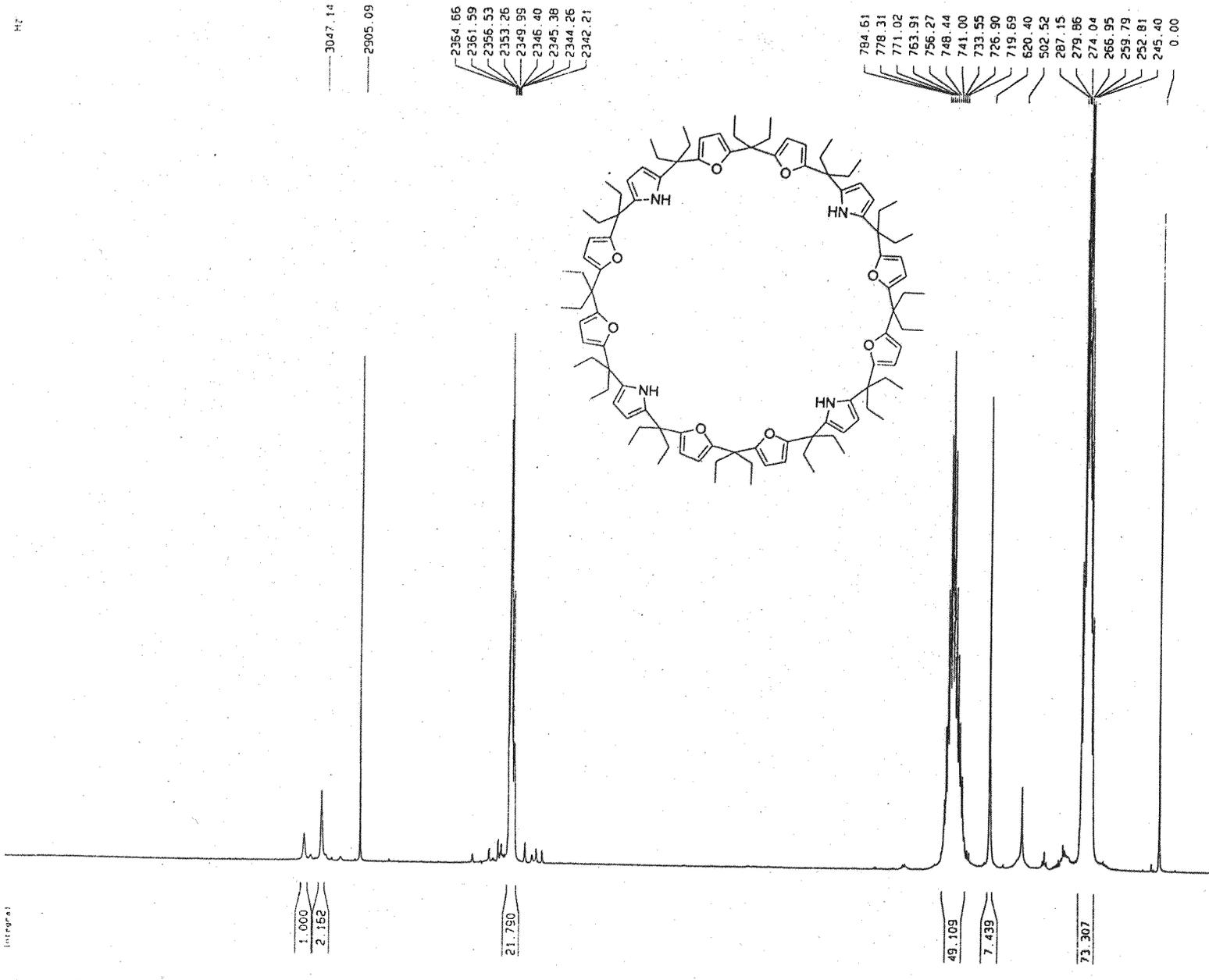
AutoSpec FAB+ Magnet BpI:48314 TIC:4219789

File Text:72\_SAM\_2



INTEGRAL

10 9 8 7 6 5 4 3 2 1 0



Current Data Parameters  
 NAME may-20  
 EXPNO 159  
 PROCNO 1

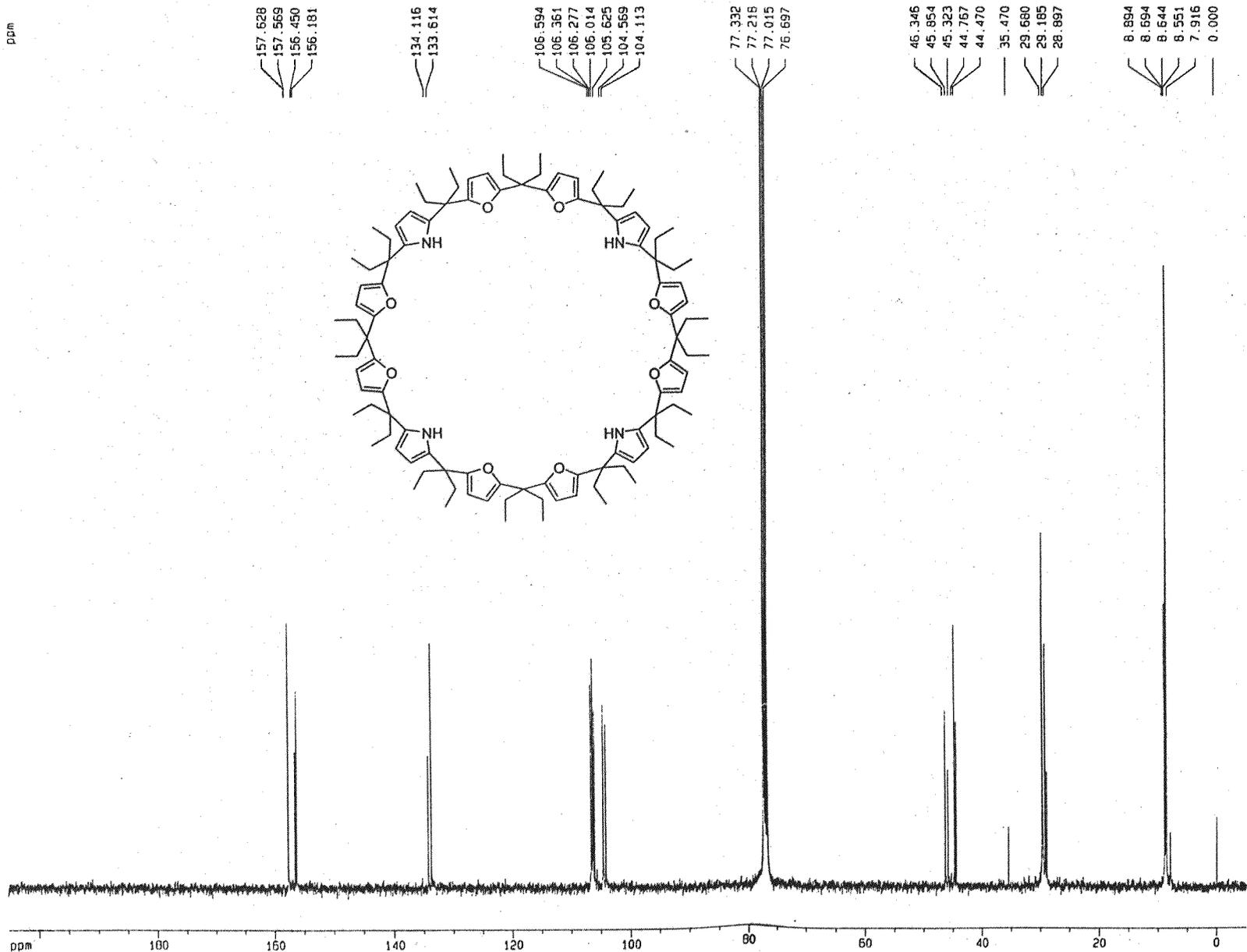
F2 - Acquisition Parameters  
 Date\_ 20000523  
 Time 15.04  
 INSTRUM spect  
 PROBHD 5 mm Dual 13  
 PULPROG zg30  
 TD 32768  
 SOLVENT CDC13  
 NS 16  
 DS 2  
 SWH 8223.685 Hz  
 FIDRES 0.250967 Hz  
 AQ 1.9923444 sec  
 RG 256  
 DW 60.800 usec  
 DE 6.00 usec  
 TE 300.0 K  
 D1 1.00000000 sec

----- CHANNEL f1 -----  
 NUC1 1H  
 P1 11.20 usec  
 PL1 0.00 dB  
 SFO1 400.1324710 MHz

F2 - Processing parameters  
 SI 16384  
 SF 400.1300089 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

1D NMR plot parameters  
 CX 30.00 cm  
 F1P 10.500 ppm  
 F1 4201.37 Hz  
 F2P -0.500 ppm  
 F2 -200.07 Hz  
 PPMCM 0.35667 ppm/cm  
 HZCM 146.71434 Hz/cm

ppm



## Current Data Parameters

NAME may-20  
EXPNO 200  
PROCNO 1

## F2 - Acquisition Parameters

Date\_ 20000527  
Time 9.47  
INSTRUM spect  
PROBHD 5 mm Dual 13  
PULPROG zgpg30  
TD 65536  
SOLVENT CDCl3  
NS 17652  
DS 2  
SWH 31847.133 Hz  
FIDRES 0.485949 Hz  
AQ 1.0289652 sec  
RG 812.7  
DN 15.700 usec  
DE 6.00 usec  
TE 300.0 K  
D1 2.00000000 sec  
D11 0.03000000 sec  
D12 0.00002000 sec

## ===== CHANNEL f1 =====

NUC1 13C  
P1 10.80 usec  
PL1 0.00 dB  
SFO1 100.6254358 MHz

## ===== CHANNEL f2 =====

CPDPRG2 waltz16  
NUC2 1H  
PCPD2 95.00 usec  
PL2 0.00 dB  
PL12 18.00 dB  
PL13 20.00 dB  
SFO2 400.1324708 MHz

## F2 - Processing parameters

SI 32768  
SF 100.6127671 MHz  
WDW EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40

## 1D NMR plot parameters

CX 30.00 cm  
F1P 205.000 ppm  
F1 20625.62 Hz  
F2P -5.000 ppm  
F2 -503.06 Hz  
PPMCM 7.00000 ppm/cm  
HZCM 704.28937 Hz/cm

File:RAJA04 Ident:280\_314 Acq:13-JUN-2000 11:33:25 +5:57 Cal:RAJA04  
AutoSpec FAB+ Magnet BpI:13191 TIC:12549927  
File Text:SAM-108, 107-III

