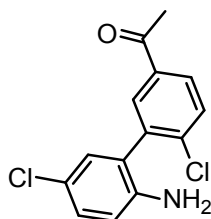


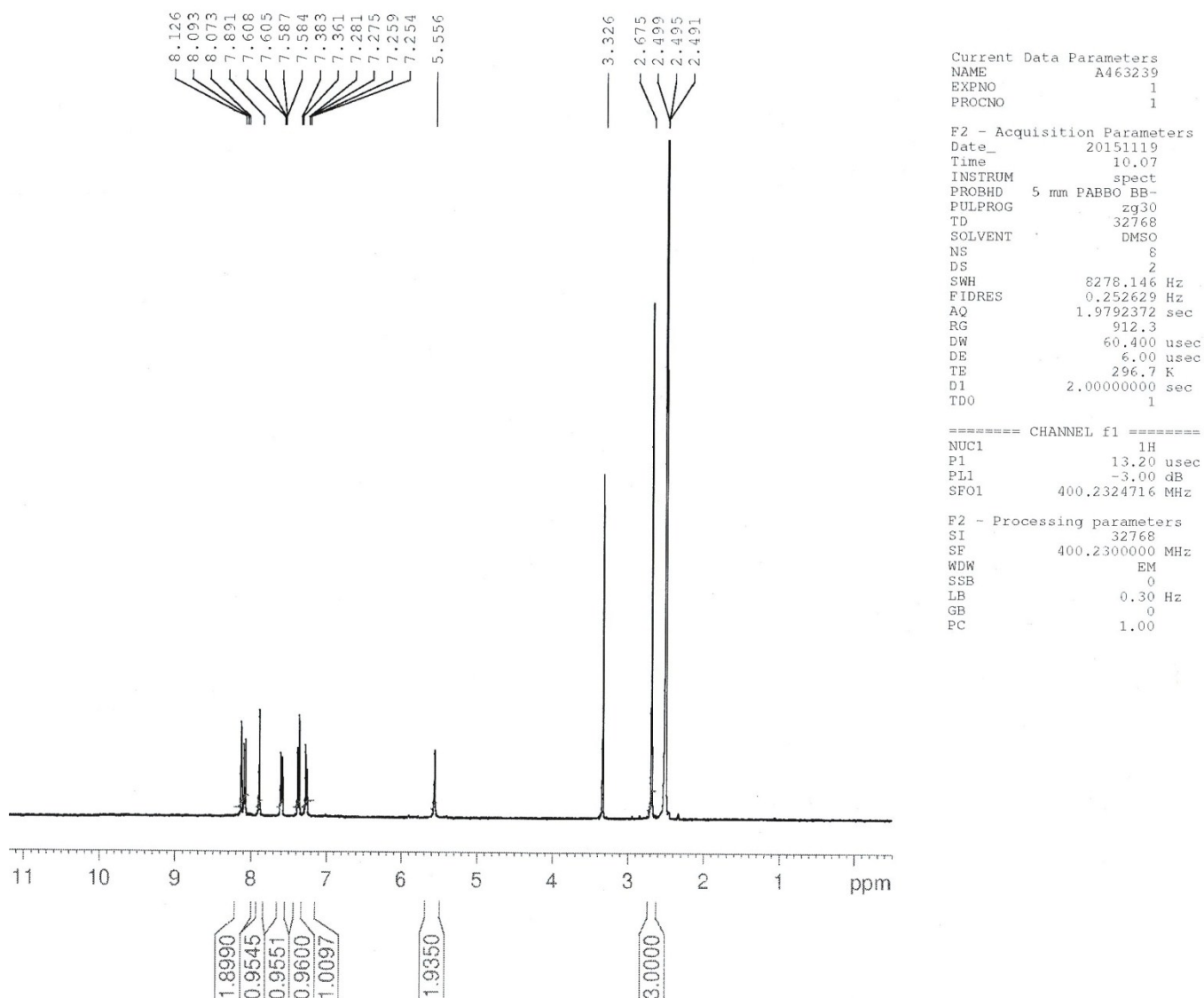
Supplementary Information

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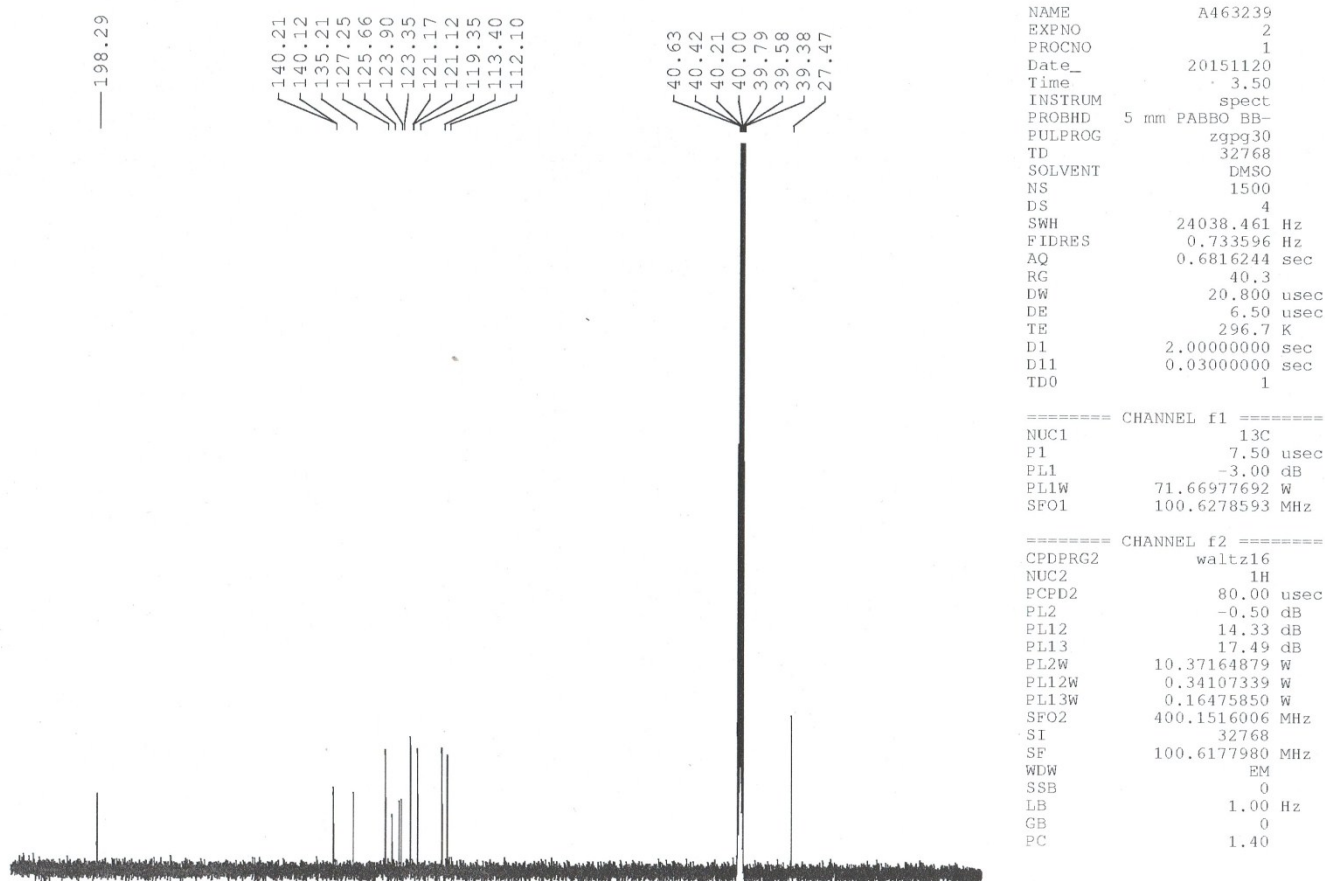
Spectral characterisation of compound 1a.....	SI-01
Spectral characterisation of compound 1b.....	SI-02
Spectral characterisation of compound 1c.....	SI-03
Spectral characterisation of compound 3a.....	SI-04
Spectral characterisation of compound 3b.....	SI-05
Spectral characterisation of compound 3c.....	SI-06
Spectral characterisation of compound 3d.....	SI-07
Spectral characterisation of compound 3e.....	SI-08
Spectral characterisation of compound 3f.....	SI-09
Spectral characterisation of compound 3g.....	SI-10
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Spectral characterisation of compound 3i.....	SI-12
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Spectral characterisation of compound 3k.....	SI-14
Spectral characterisation of compound 3l.....	SI-15
Spectral characterisation of compound 3m.....	SI-16
Spectral characterisation of compound 3n.....	SI-17
Spectral characterisation of compound 3o.....	SI-18



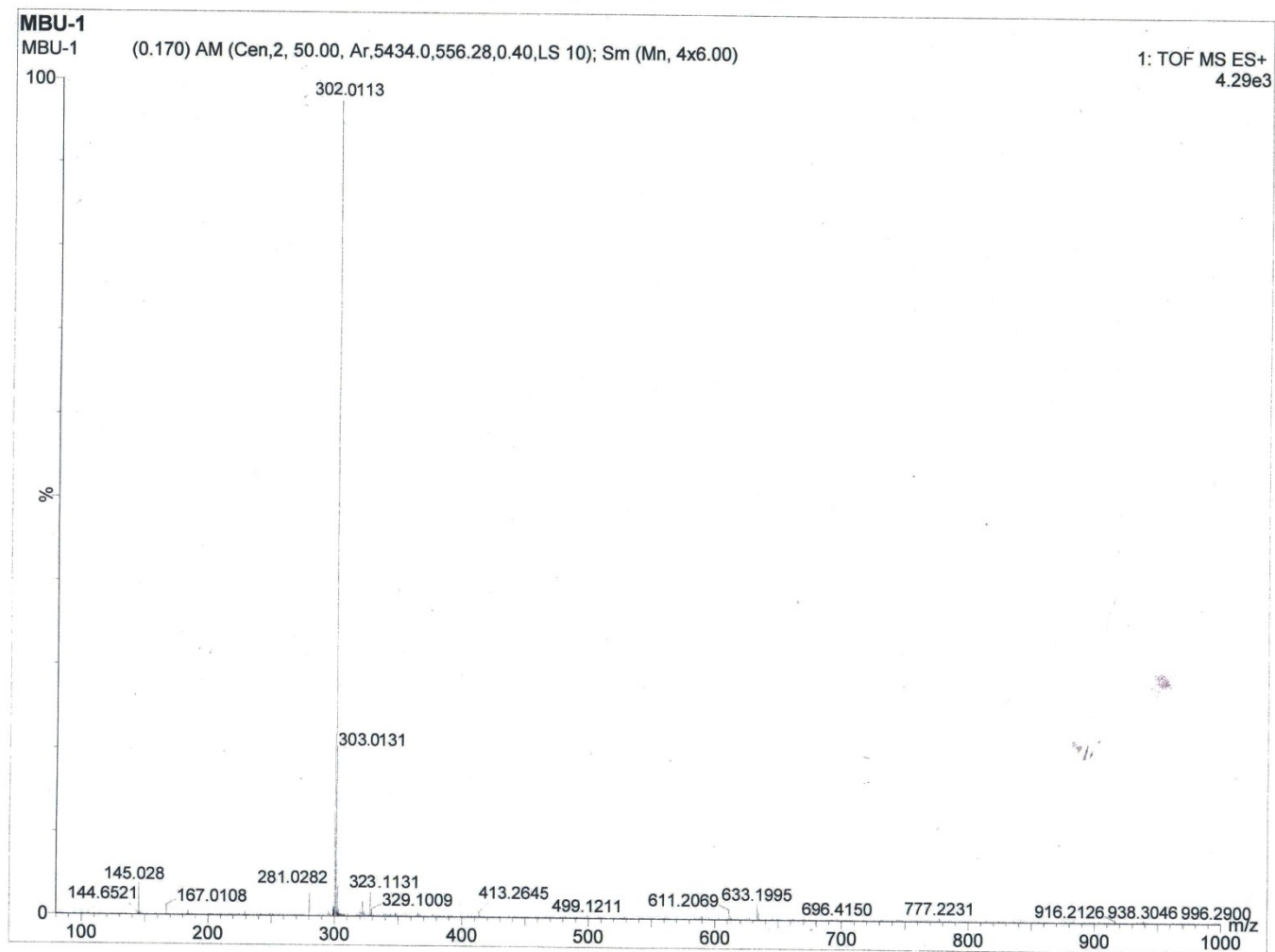
SI- 0I - Characterization of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanone (**1a**);



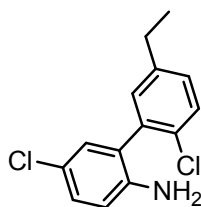
SI- 0I - ¹H NMR of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanone (**1a**);



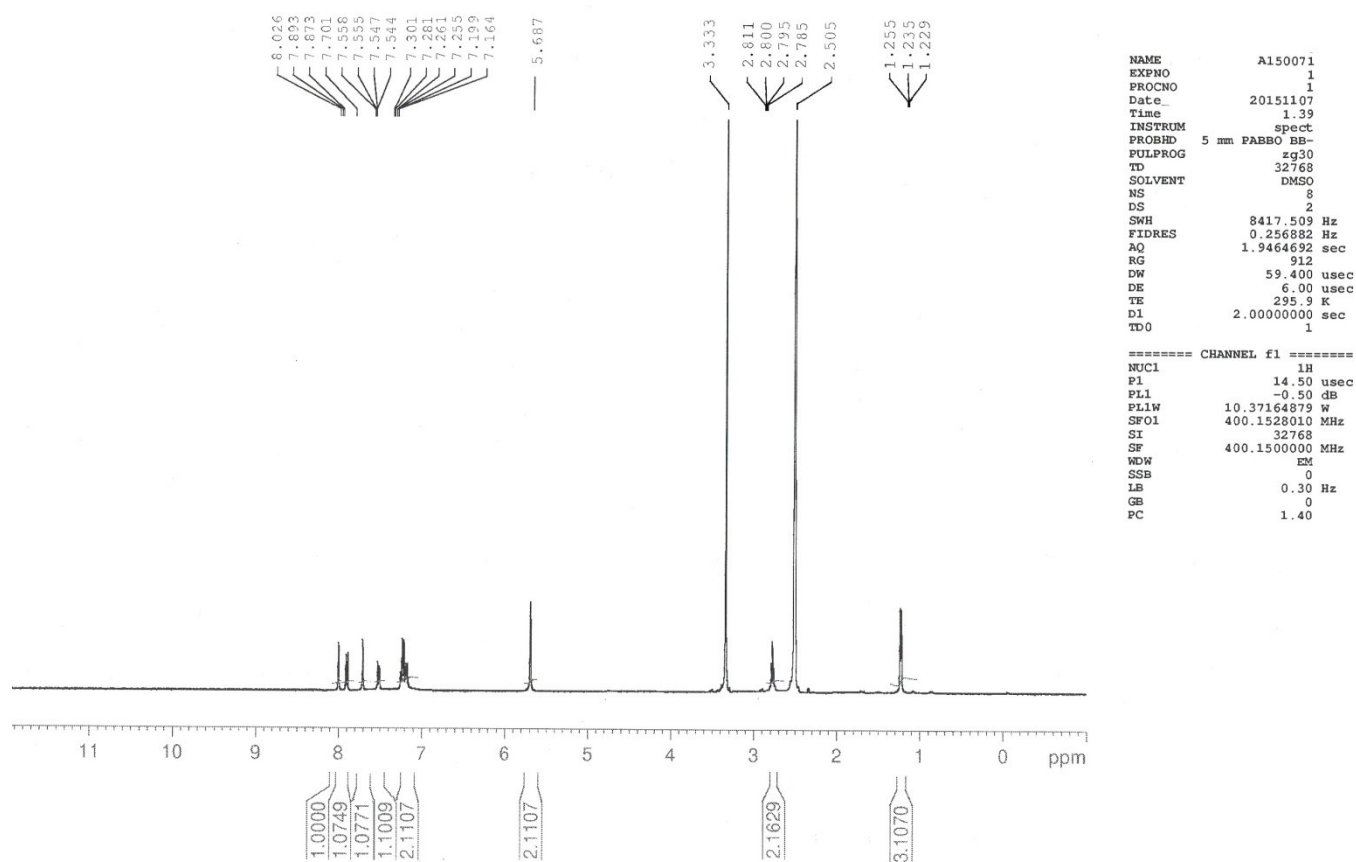
SI- 0I – ^{13}C NMR of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanone (**1a**);



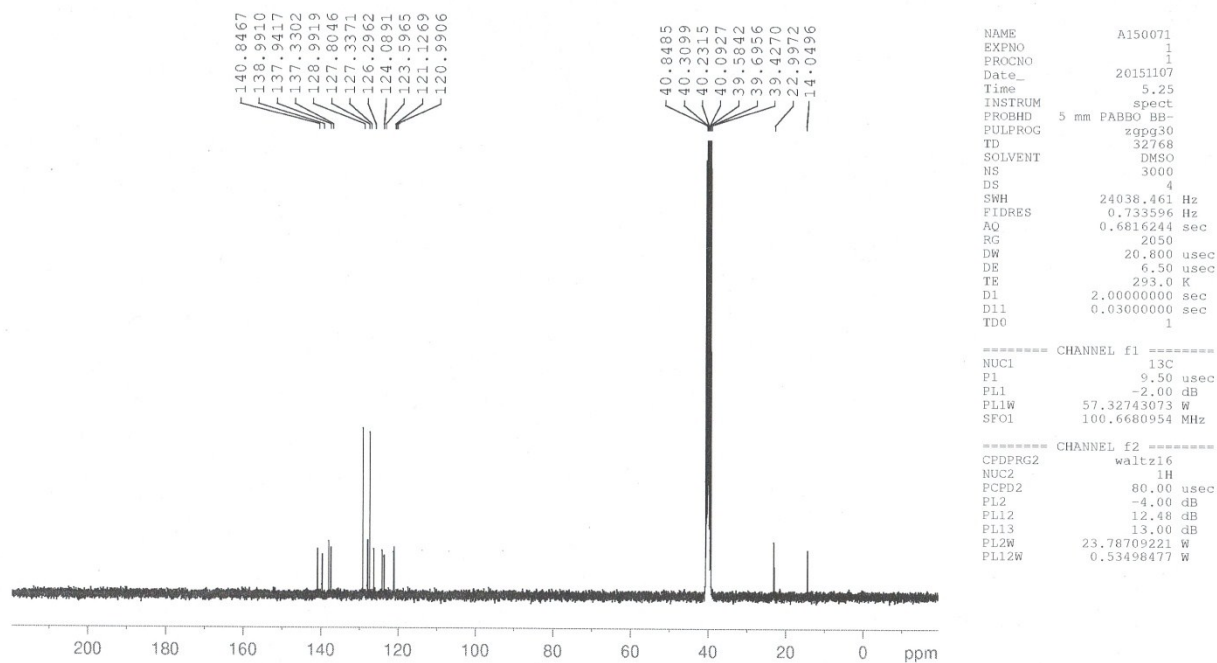
SI- 0I – Mass spectrum of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanone (**1a**);



SI – 02 - Characterization of 2',5-dichloro-5'-ethyl-[1,1'-biphenyl]-2-amine (**1b**).

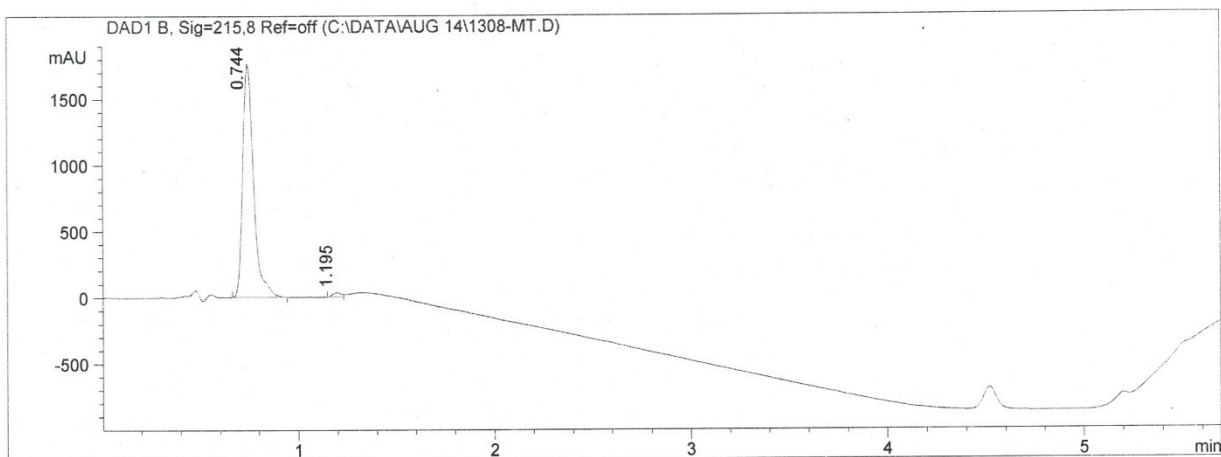


SI – 02 – H NMR of 2',5-dichloro-5'-ethyl-[1,1'-biphenyl]-2-amine (**1b**).

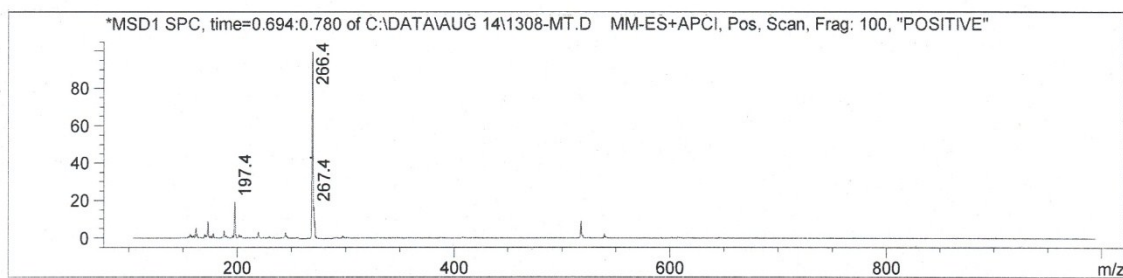


SI – 02 – ^{13}C NMR of 2',5-dichloro-5'-ethyl-[1,1'-biphenyl]-2-amine (**1b**).

Method info :MOBILE PHASE:A-0.1%HCOOH;B-ACN, Flow: 1.5ml/min,
 COLUMN:Atlantis d C18 (50X4.6mm-5µm,)
 TIME (MIN) : 0--3.0 3.0-4.0 4.0--4.5 4.5-6.0
 %B 5-95 95 95-5 5



Peak	RT	Area	Area
No	min		%
1	0.744	6.920e+003	98.352
2	1.195	1.160e+002	1.648



SI – 02 – Mass spectrum of 2',5-dichloro-5'-ethyl-[1,1'-biphenyl]-2-amine (**1b**).

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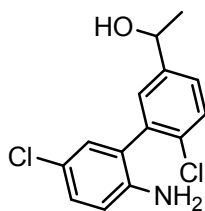
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20 BS15002437;90000018581	63.20	5.40	5.25
Mean value [%]	63.19	5.29	5.28
Deviation, abs. [%]	0.01	0.16	0.04
Deviation, rel. [%]	0.02	2.94	0.80
Delta [%]	0.00	0.04	0.01

Name: eassuperuser, Access: VarioMICRO superuser

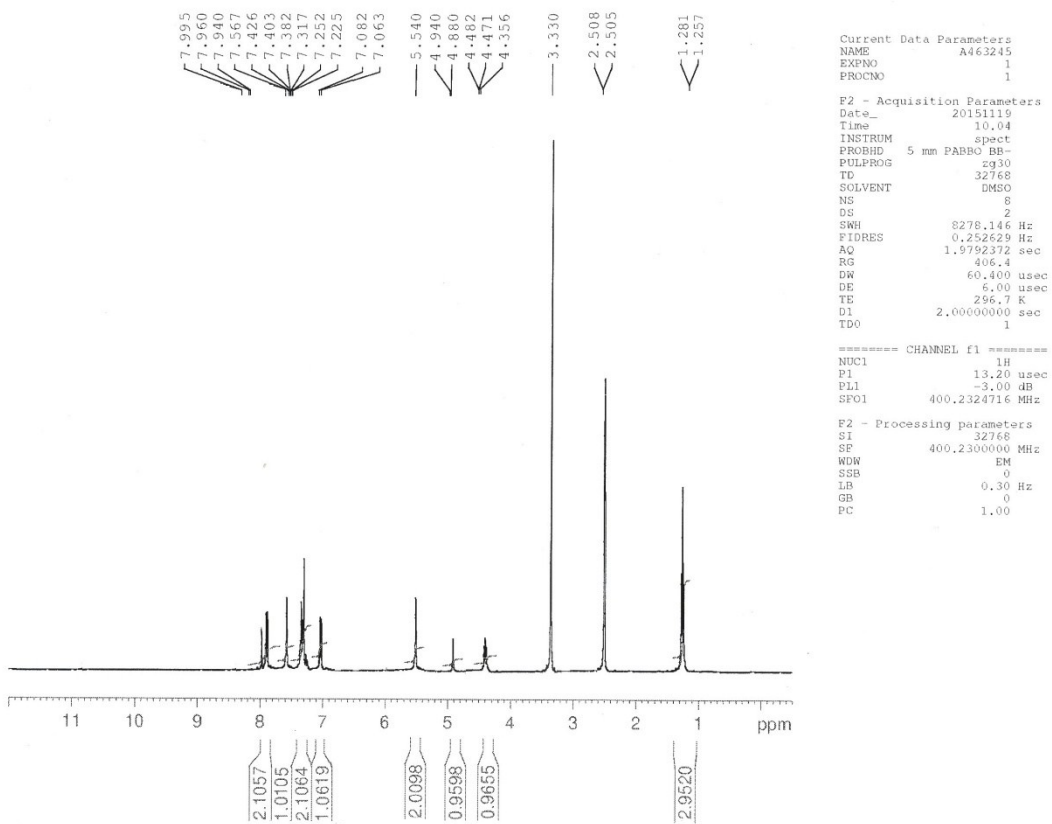
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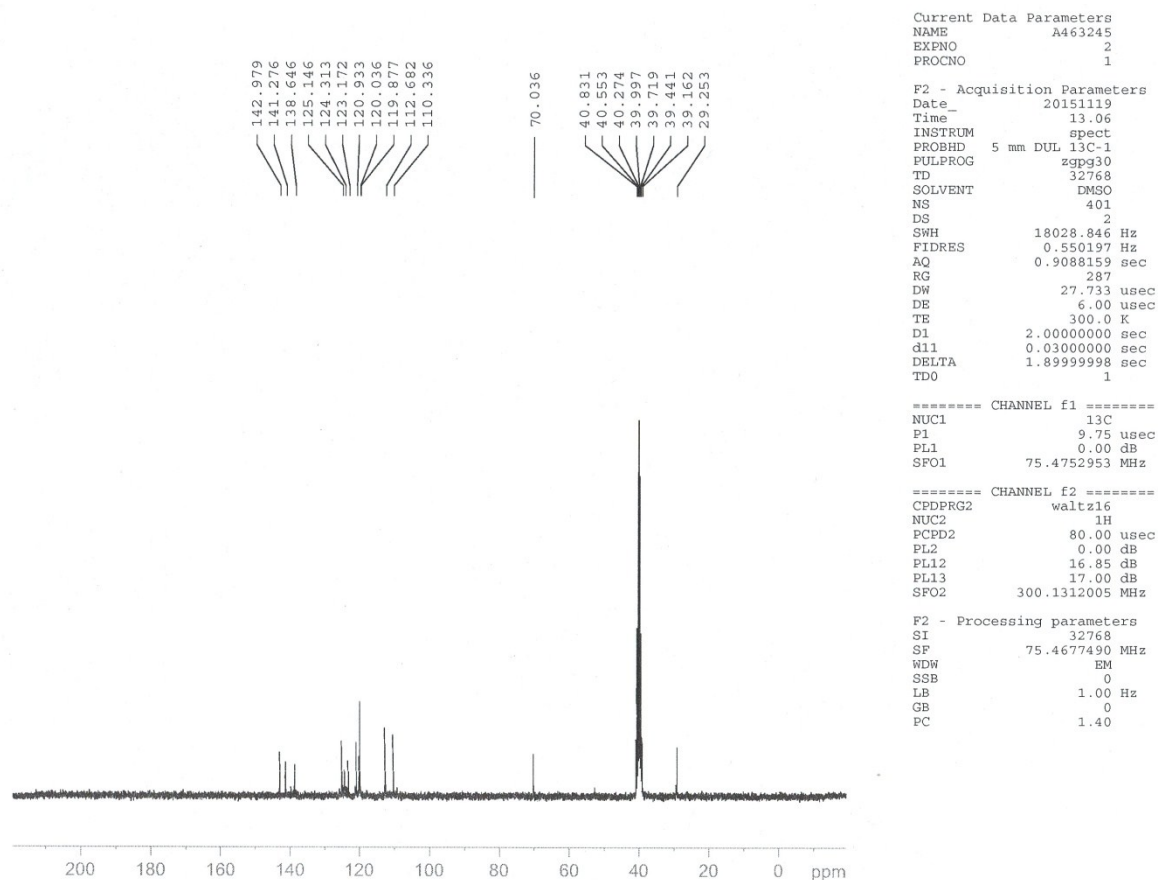
SI – 02 – Elemental analysis data of 2',5-dichloro-5'-ethyl-[1,1'-biphenyl]-2-amine (**1b**).



SI- 03- Characterization of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanol (**1c**):

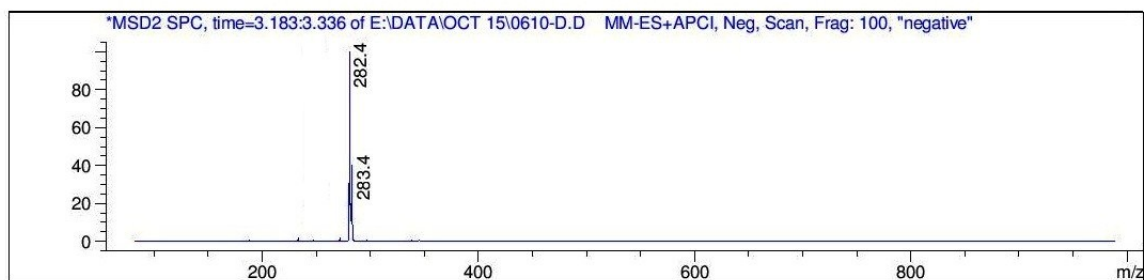
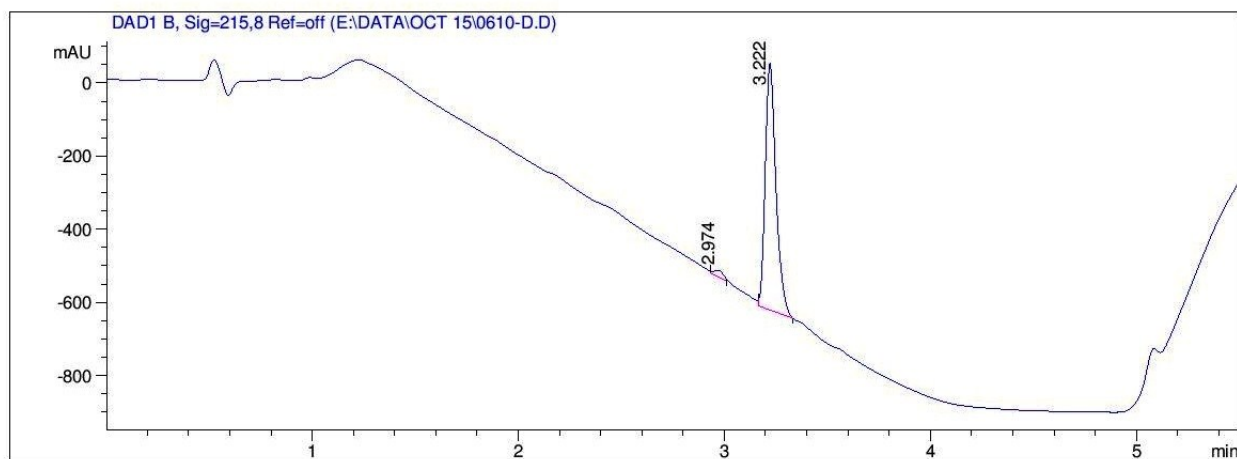


SI- 03- ¹H NMR of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanol (**1c**):



SI- 03- ^{13}C NMR of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanol (**1c**):

Method info :MOBILE PHASE:A-0.1%HCOOH;B-ACN, Flow: 1.5ml/min,
 COLUMN:Atlantis d C18 (50X4.6mm-5µm,)
 TIME (MIN) : 0--3.0 3.0-4.0 4.0--4.5 4.5-6.0
 %B 5-95 95 95-5 5



SI- 03- Mass spectrum of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanol (**1c**):

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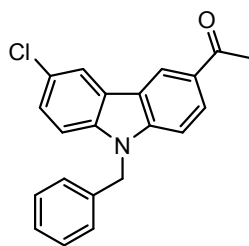
Name	C [%]	H [%]	N [%]
21 BS15002438;90000018581	60.30	4.60	4.92
22 BS15002438;90000018581	60.90	4.70	5.04
Mean value [%]	60.60	4.65	4.98
Deviation, abs. [%]	0.42	0.07	0.08
Deviation, rel. [%]	0.70	1.52	1.70
Delta [%]	0.01	0.01	0.02

Name: eassuperuser, Access: VarioMICRO superuser

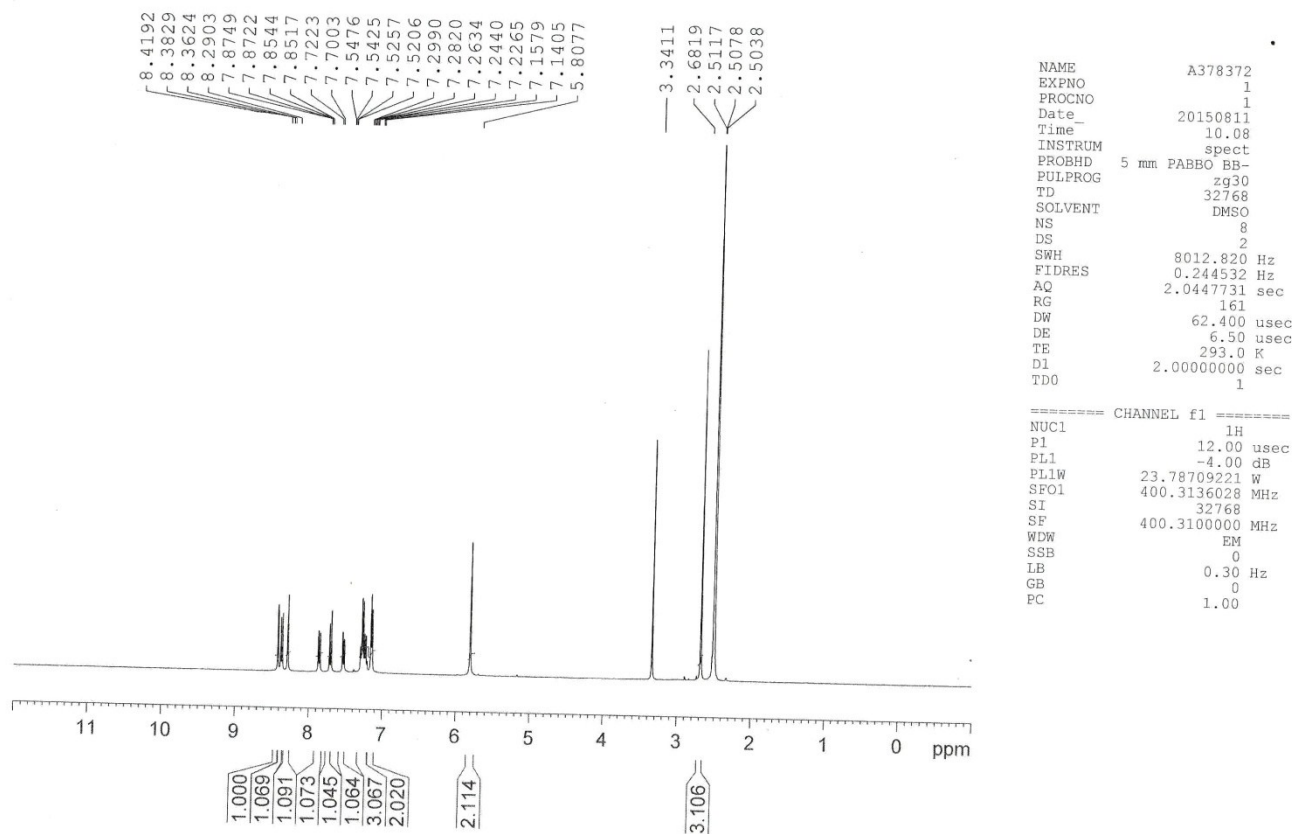
12/18/2015

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SI- 03- Elemental analysis data of 1-(2'-amino-5',6-dichloro-[1,1'-biphenyl]-3-yl)ethanol (**1c**)

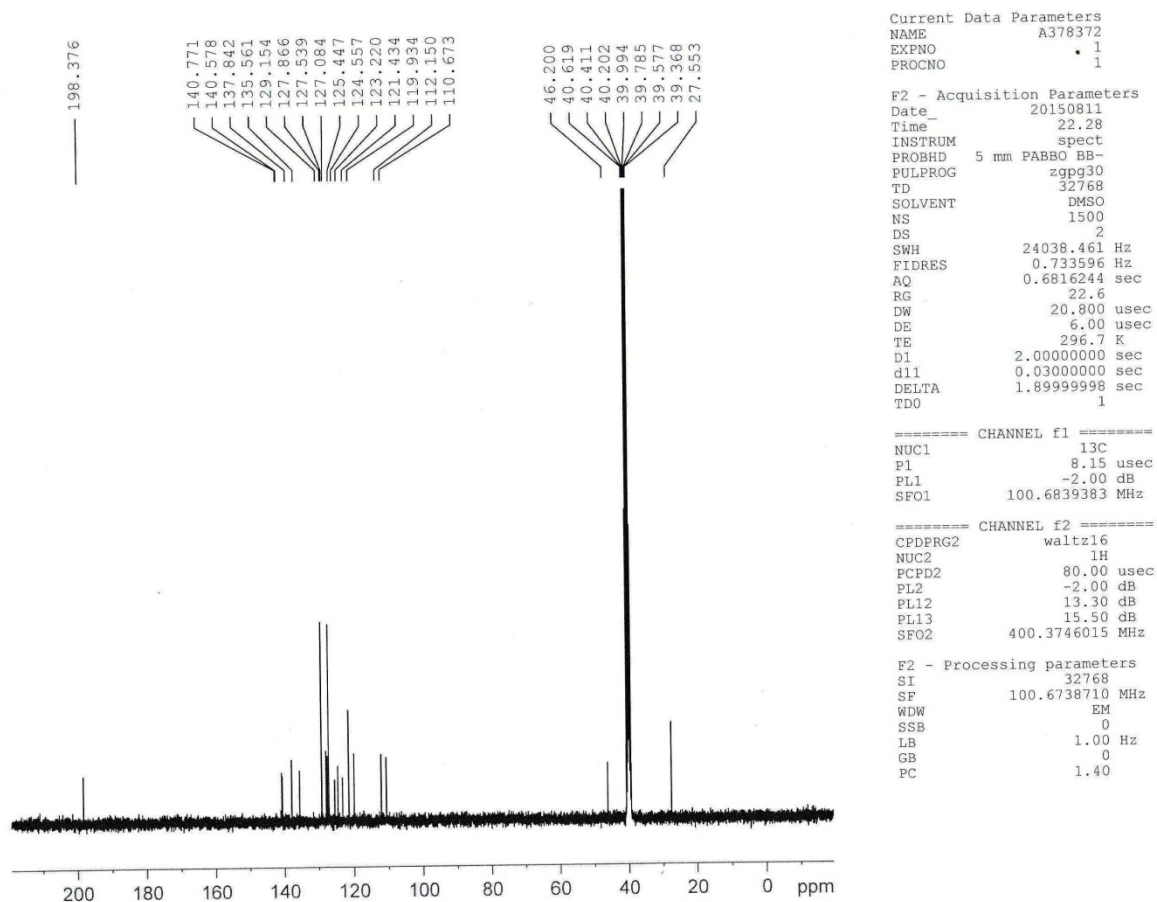


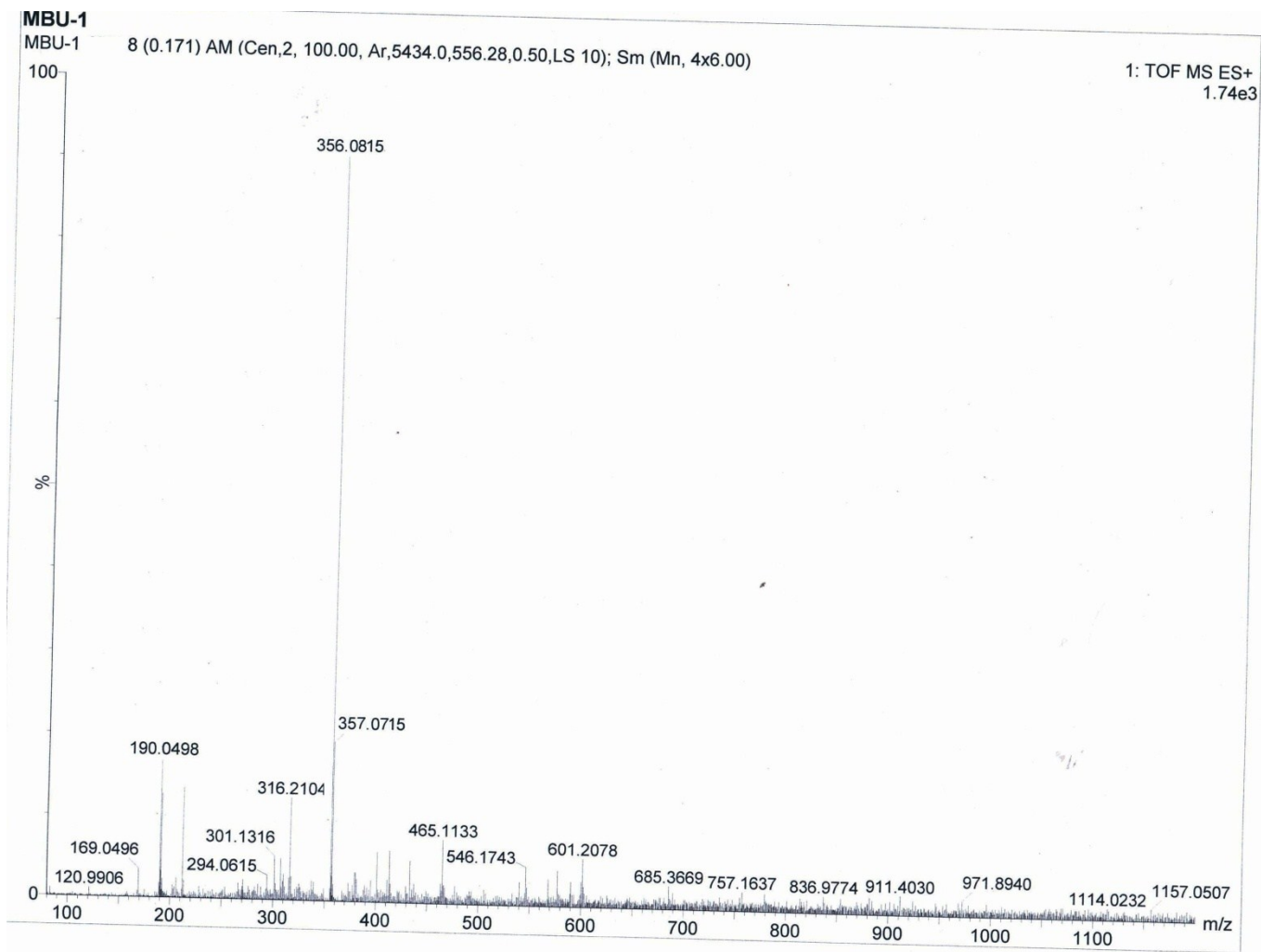
SI-04 -Characterization of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanone (**3a**)



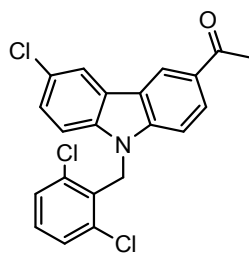
SI-04 – H NMR of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanone (**3a**)

A378372

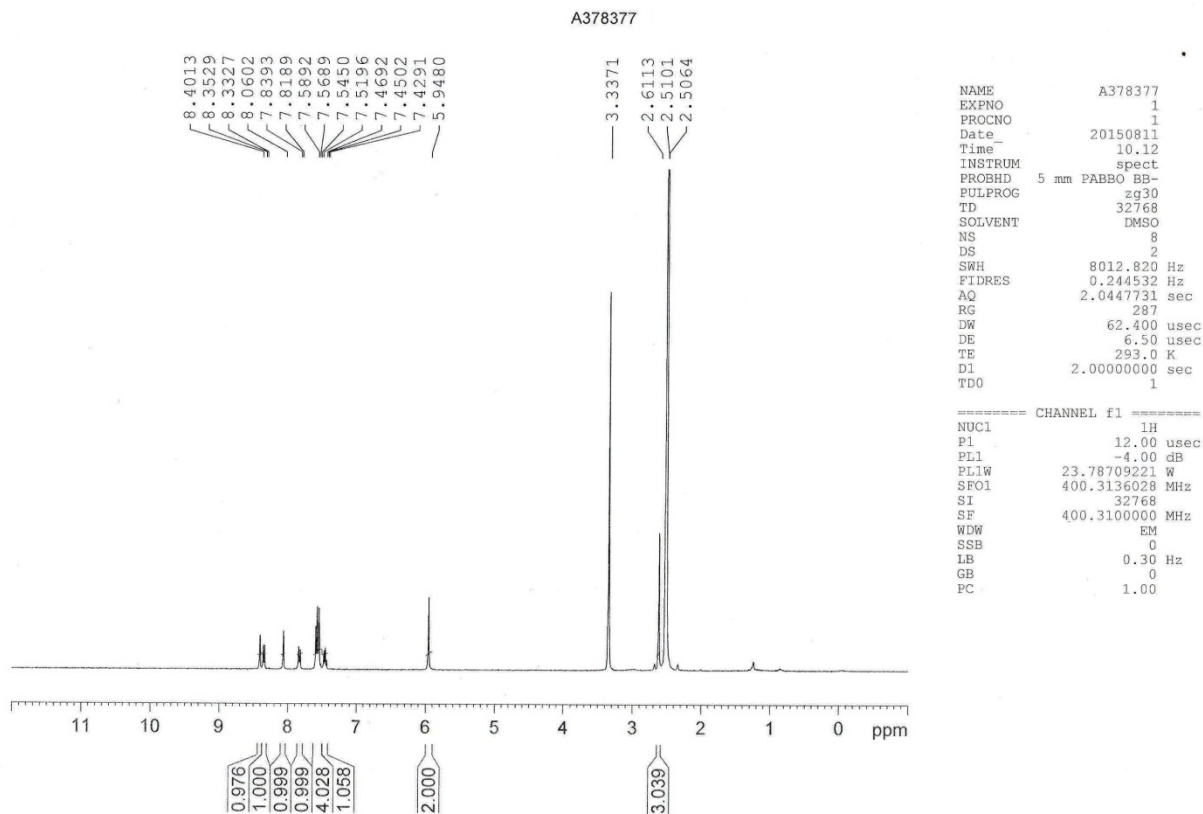
SI-04 – ^{13}C NMR of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanone (**3a**)



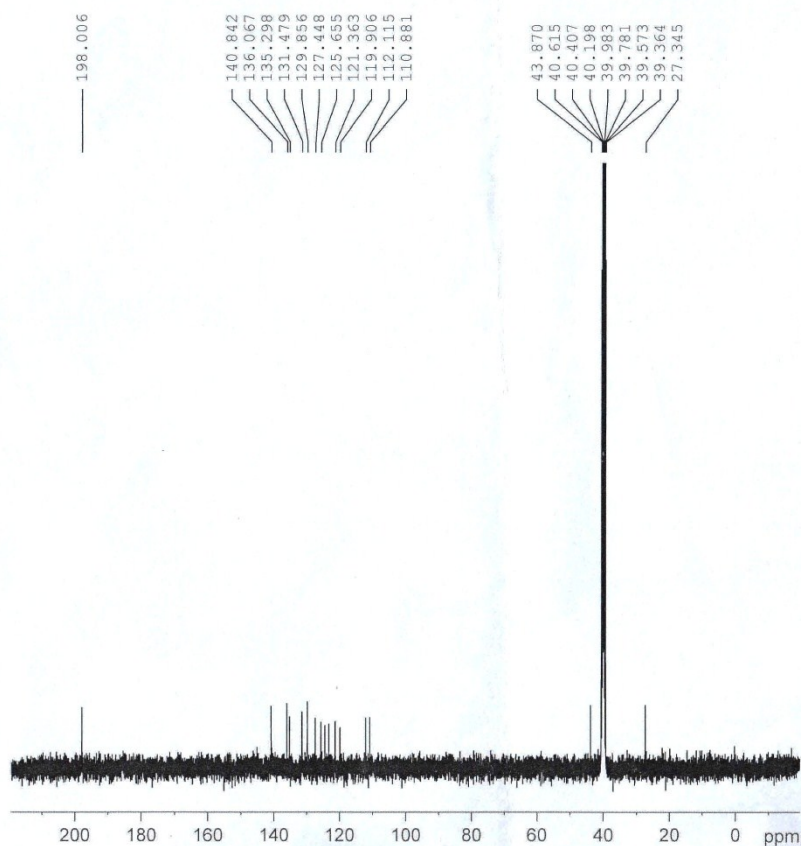
SI-04 – Mass spectrum of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanone (**3a**)



SI-05-Characterization of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanone (**3b**)



SI-05- ¹H NMR of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanone (**3b**)



```

Current Data Parameters
NAME      A378377
EXPNO     2
PROCNO    1

F2 - Acquisition Parameters
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Time      23.20
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PULPROG   zgpg30
TD        32768
SOLVENT   DMSO
NS         1024
DS         2
SWH        24038.461 Hz
FIDRES     0.733596 Hz
AQ         0.6816244 sec
RG         25.4
DW         20.800 usec
DE         6.00 usec
TE         296.7 K
D1         2.00000000 sec
d11        0.03000000 sec
DELTA     1.89999998 sec
TD0        1

===== CHANNEL f1 =====
NUC1       13C
P1         8.15 usec
PL1        -2.00 dB
SFO1       100.6239383 MHz

===== CHANNEL f2 =====
CPDPRG2    waltz16
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PCPD2      80.00 usec
PL2         -2.00 dB
PL12       13.30 dB
PL13       15.50 dB
SFO2       400.3746015 MHz

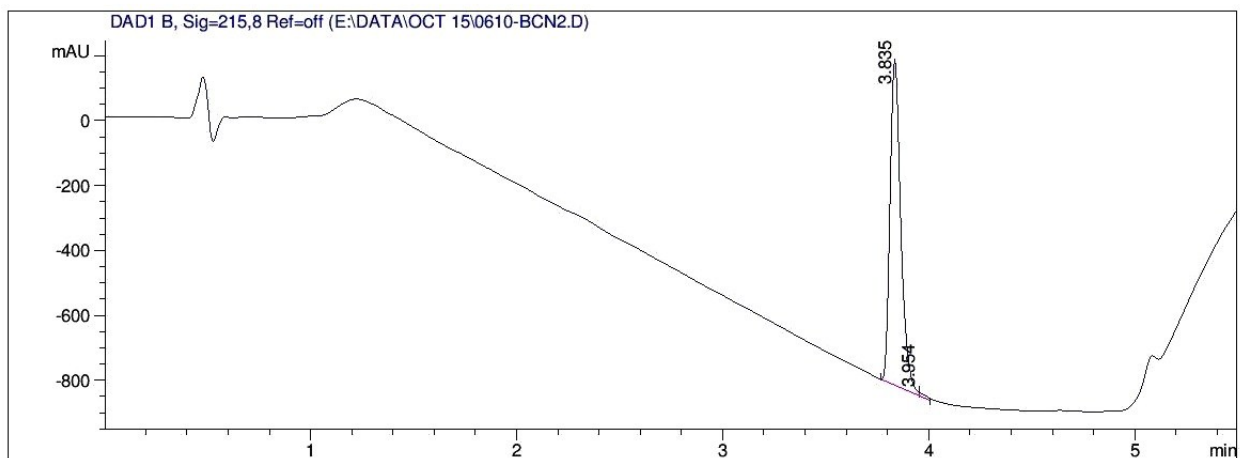
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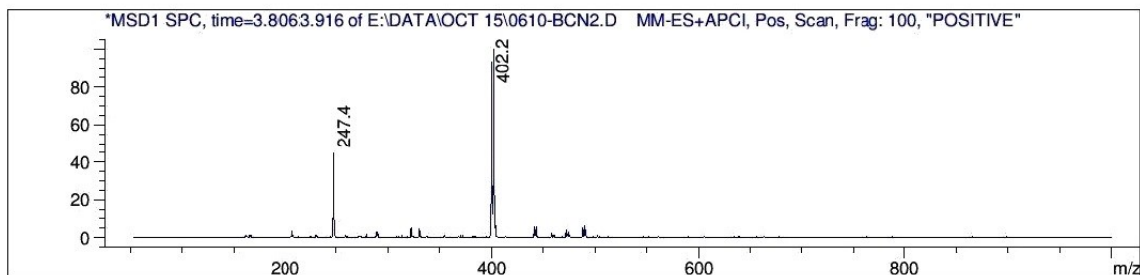
SI-05-¹³C NMR of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanone (**3b**)

```

=====
Method info :MOBILE PHASE:A-0.1%HCOOH;B-ACN, Flow: 1.5ml/min,
              COLUMN:Atlantis d C18 (50X4.6mm-5µm, )
              TIME (MIN) : 0--3.0 3.0-4.0 4.0--4.5 4.5-6.0
                          %B      5-95      95      95-5      5
  
```



Peak No	RT min	Area	Area %
1	3.835	3.636e+003	99.286
2	3.954	2.614e+001	0.714



SI-05- Mass spectrum of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanone (**3b**)

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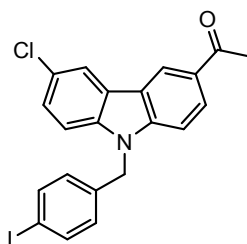
Name	C [%]	H [%]	N [%]
23 BS15002440 ;90000018581	62.15	3.44	3.45
24 BS15002440 ;90000018581	63.12	3.56	3.50
Mean value [%]	62.64	3.50	3.48
Deviation, abs. [%]	0.69	0.08	0.04
Deviation, rel. [%]	1.10	2.42	1.02
Delta [%]	0.02	0.03	0.01

Name: eassuperuser, Access: VarioMICRO superuser

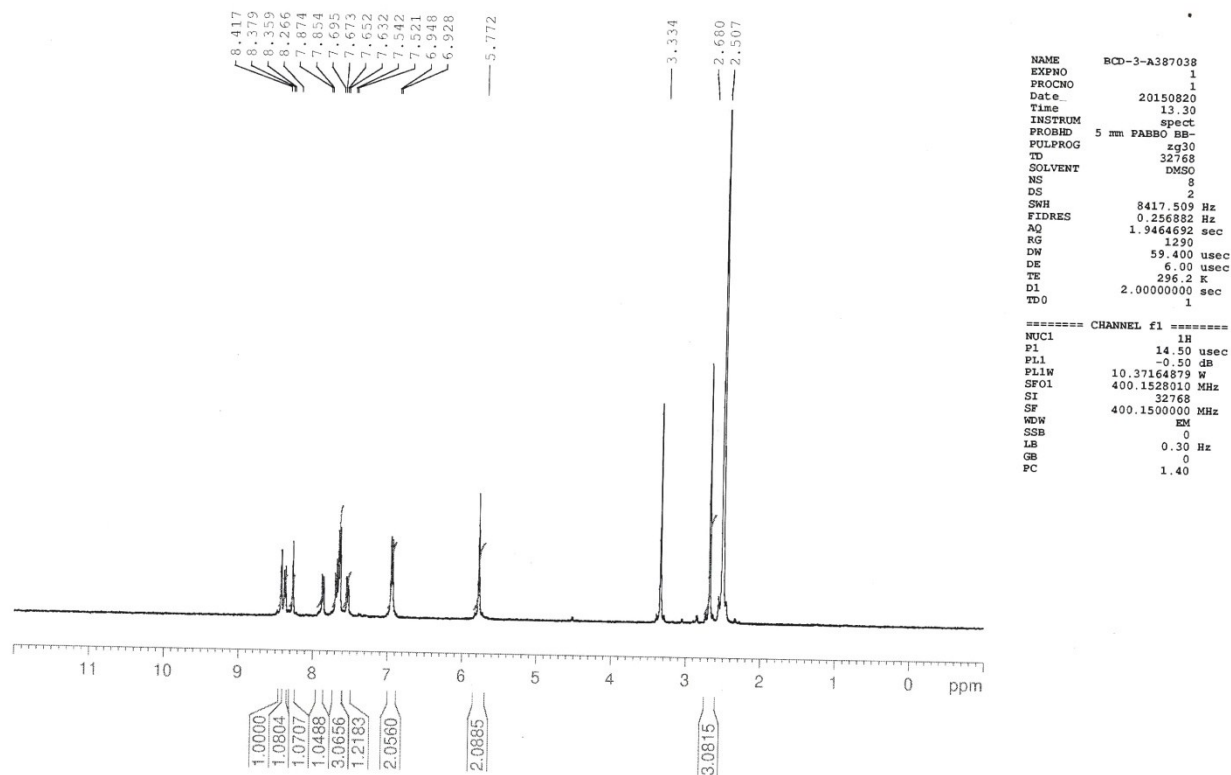
12/18/2015

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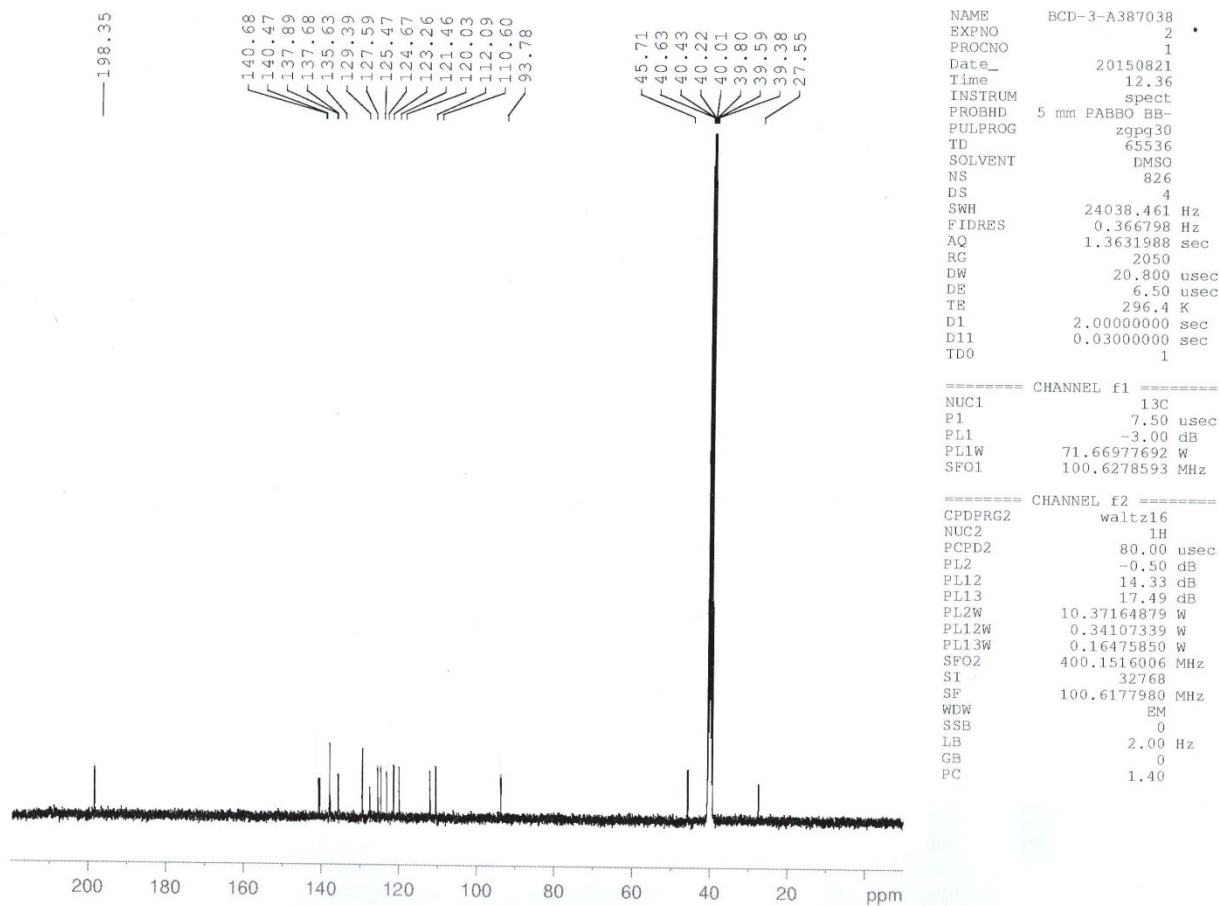
SI-05- Elemental analysis data of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanone (**3b**)



SI-06-Characterization of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanone (**3c**)



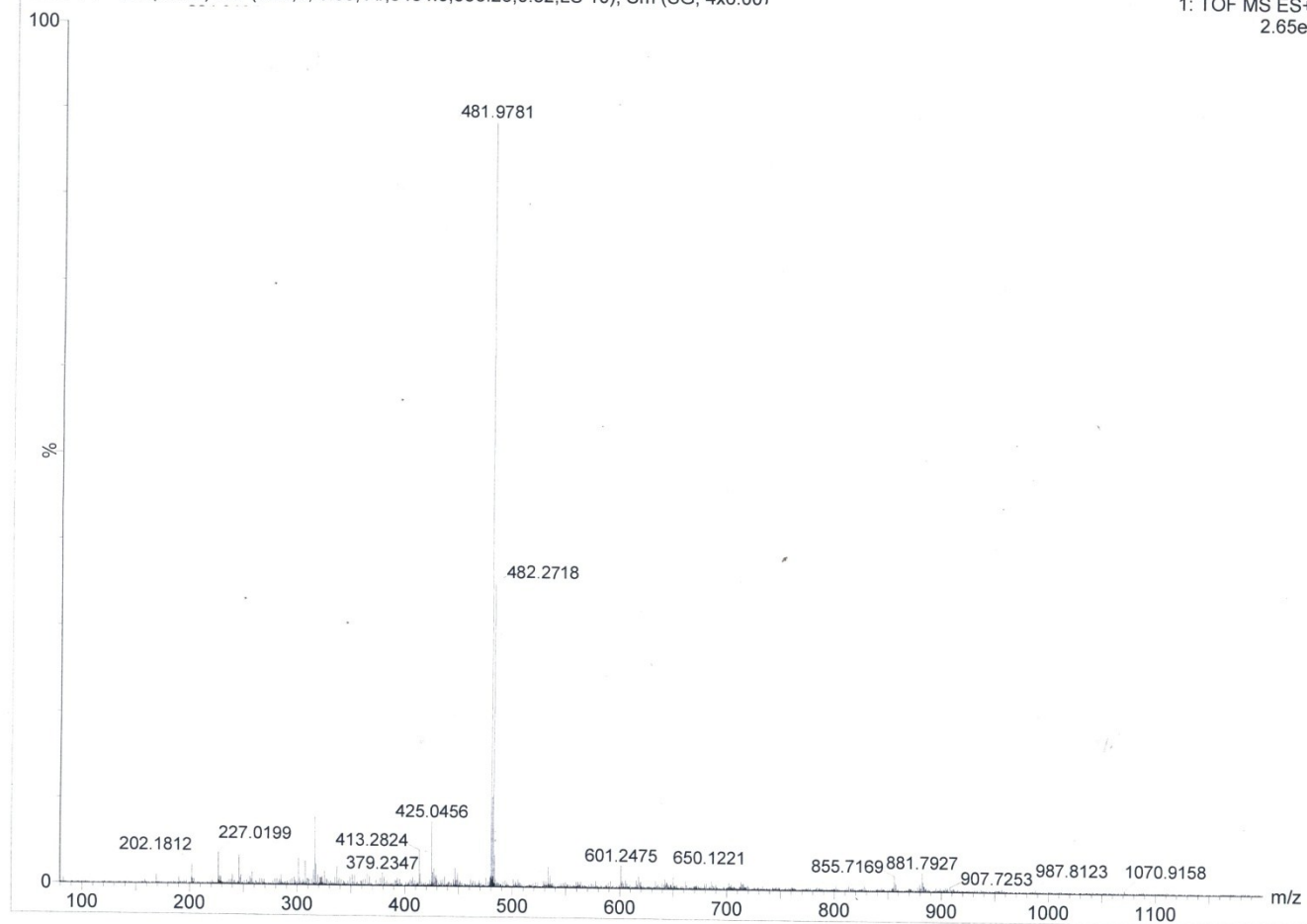
SI-06- ¹H NMR of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanone (**3c**)

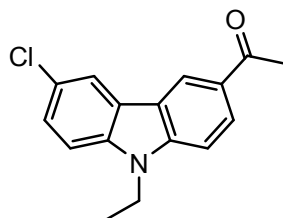


SI-06- ^{13}C NMR of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanone (**3c**)

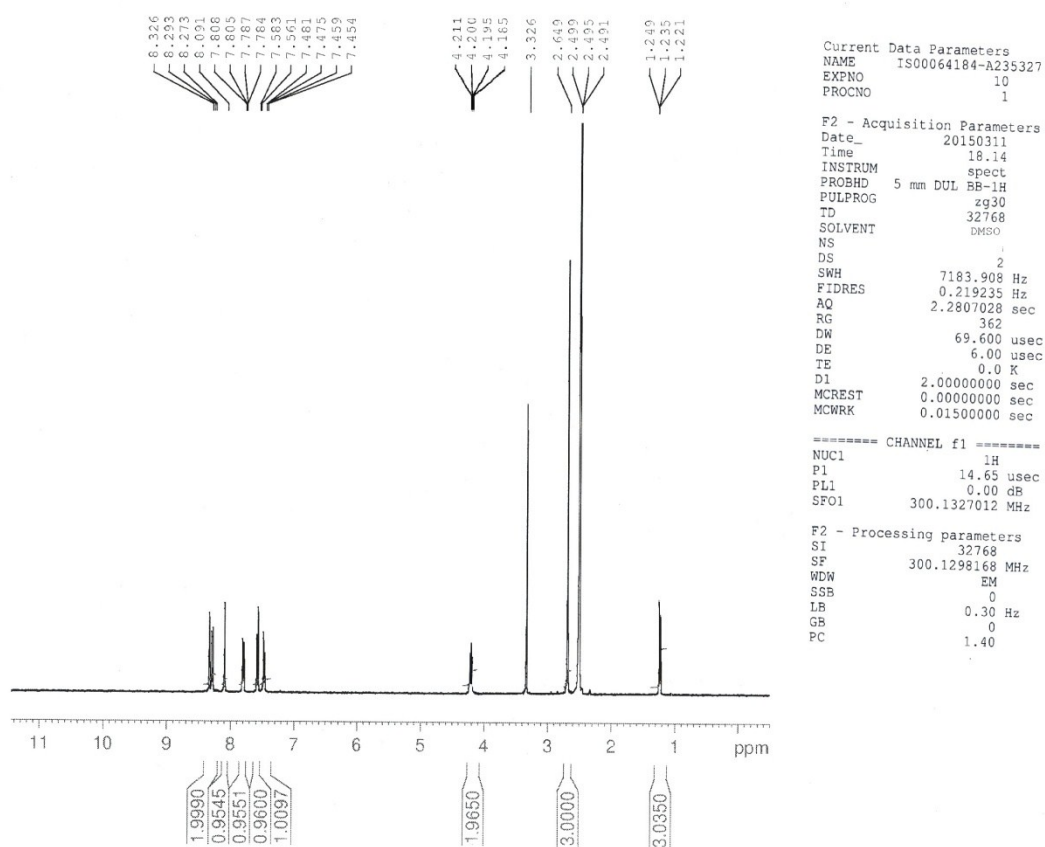
AMR-1-6

AMR-1-6 21 (0.498) AM (Cen,2, 0.05, Ar,5434.0,556.28,0.32,LS 10); Sm (SG, 4x6.00)

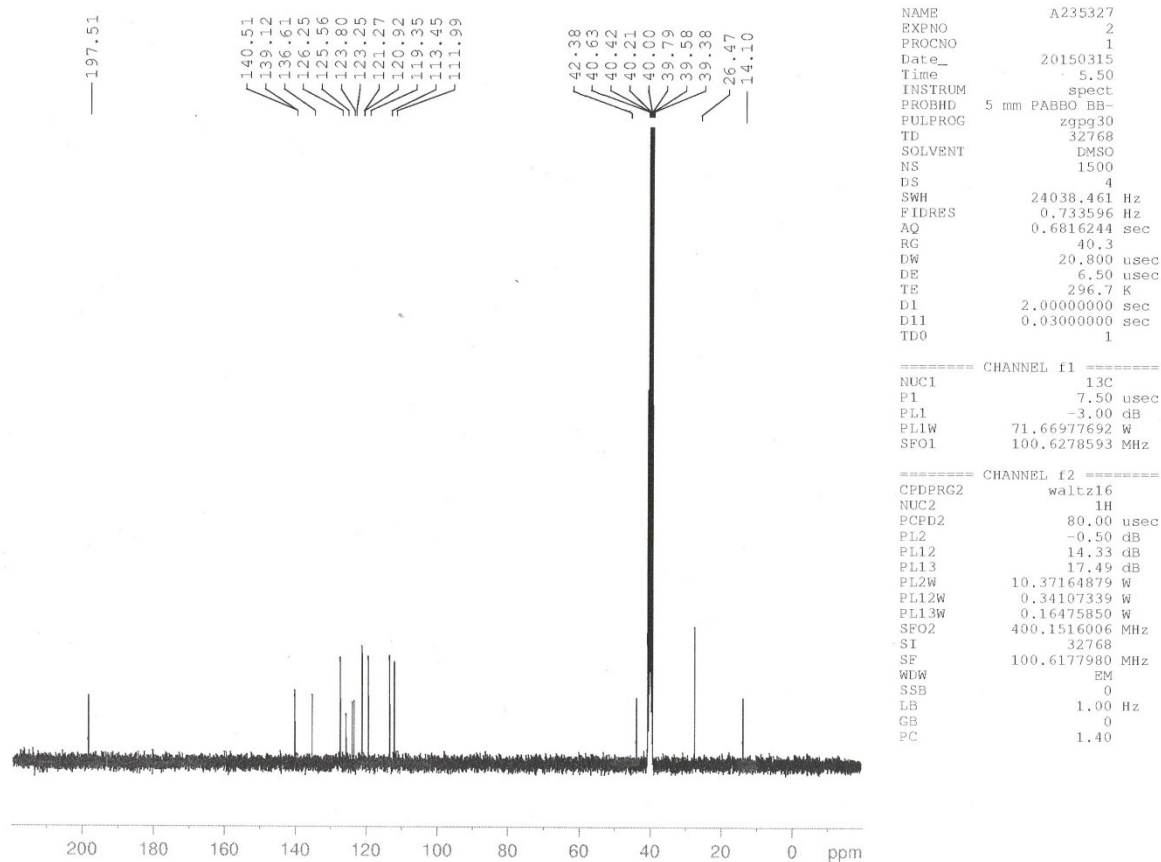
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2.65e3SI-06- Mass spectrum of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanone (**3c**)



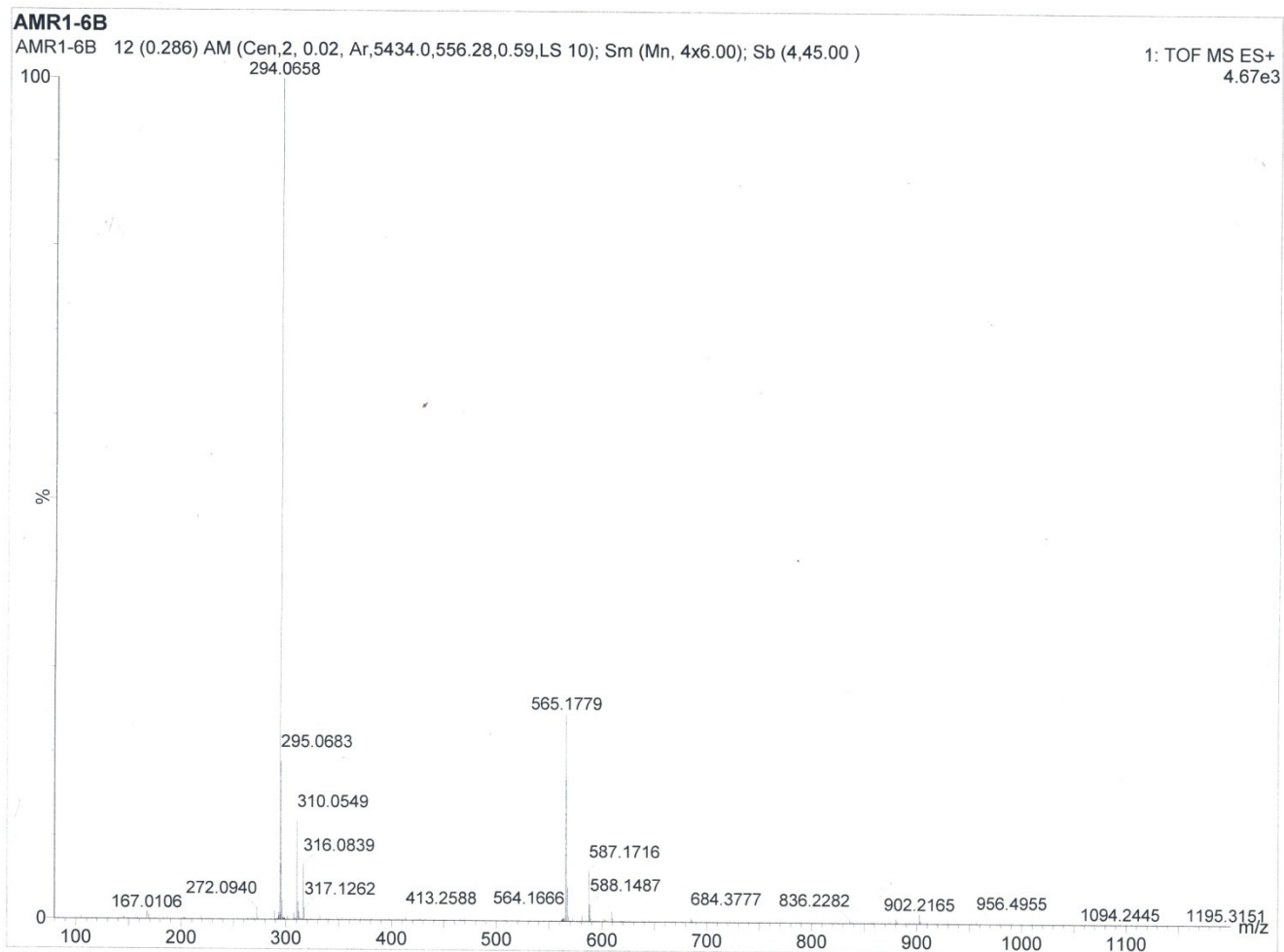
SI-07-Characterization of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanone (**3d**)



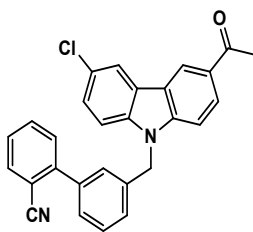
SI-07- ¹H NMR of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanone (**3d**)



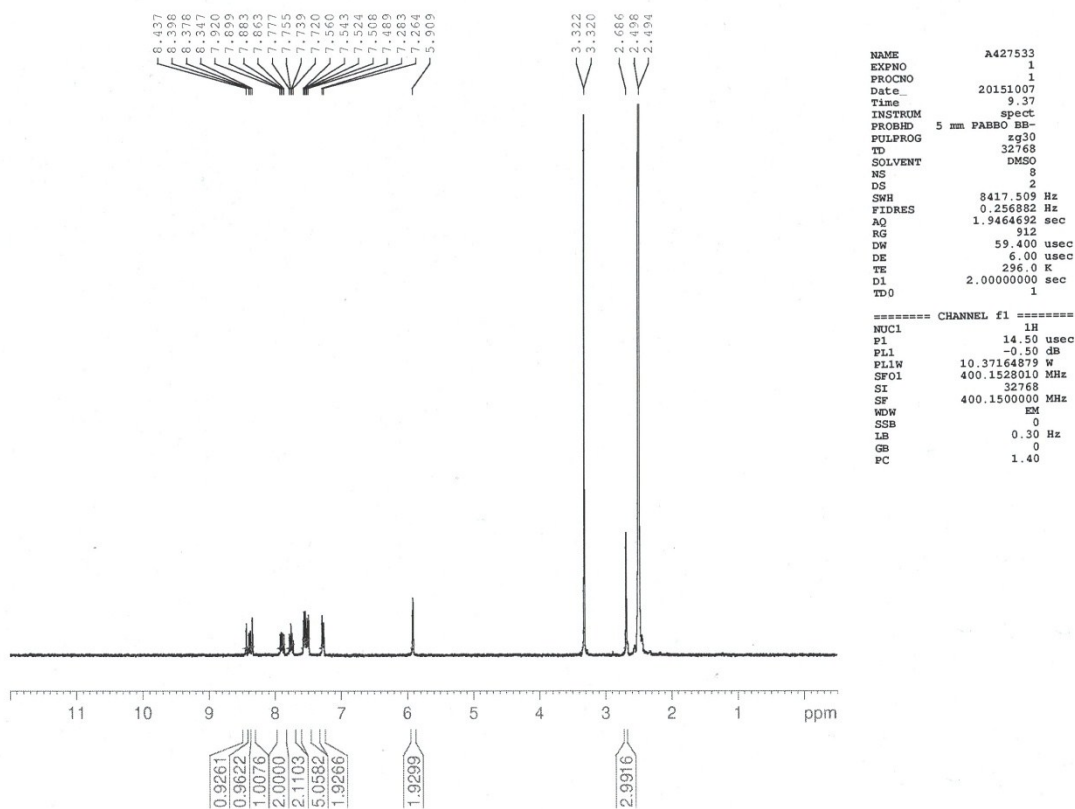
SI-07- ¹³C NMR of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanone (**3d**)



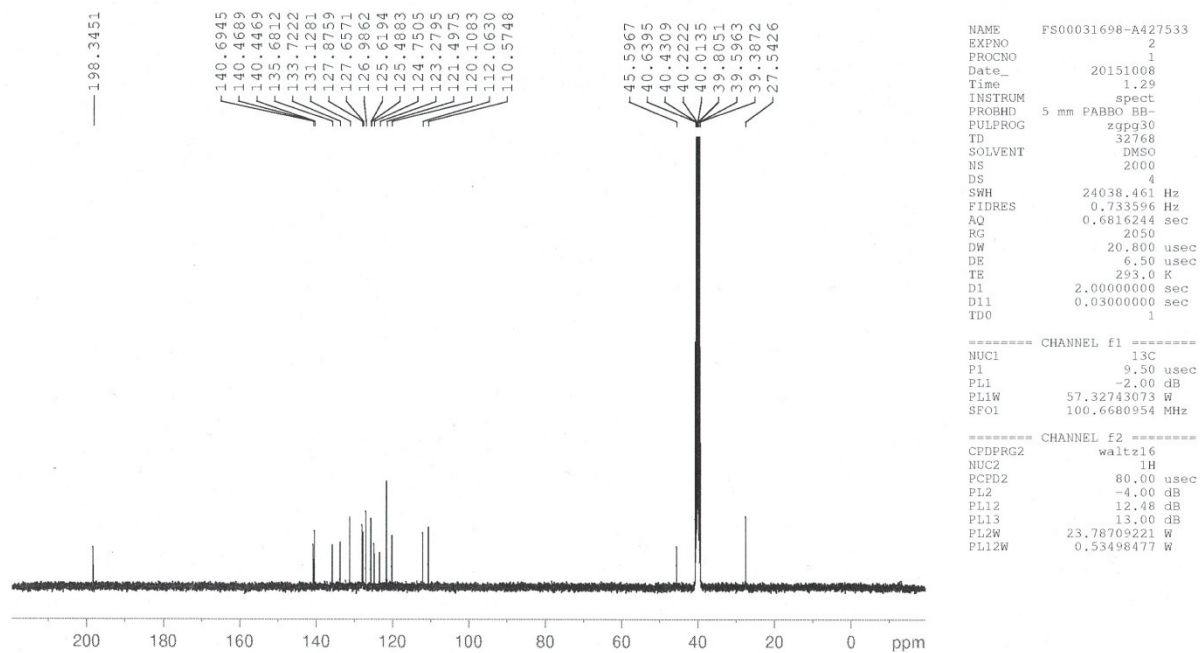
SI-07- Mass spectrum of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanone (**3d**)



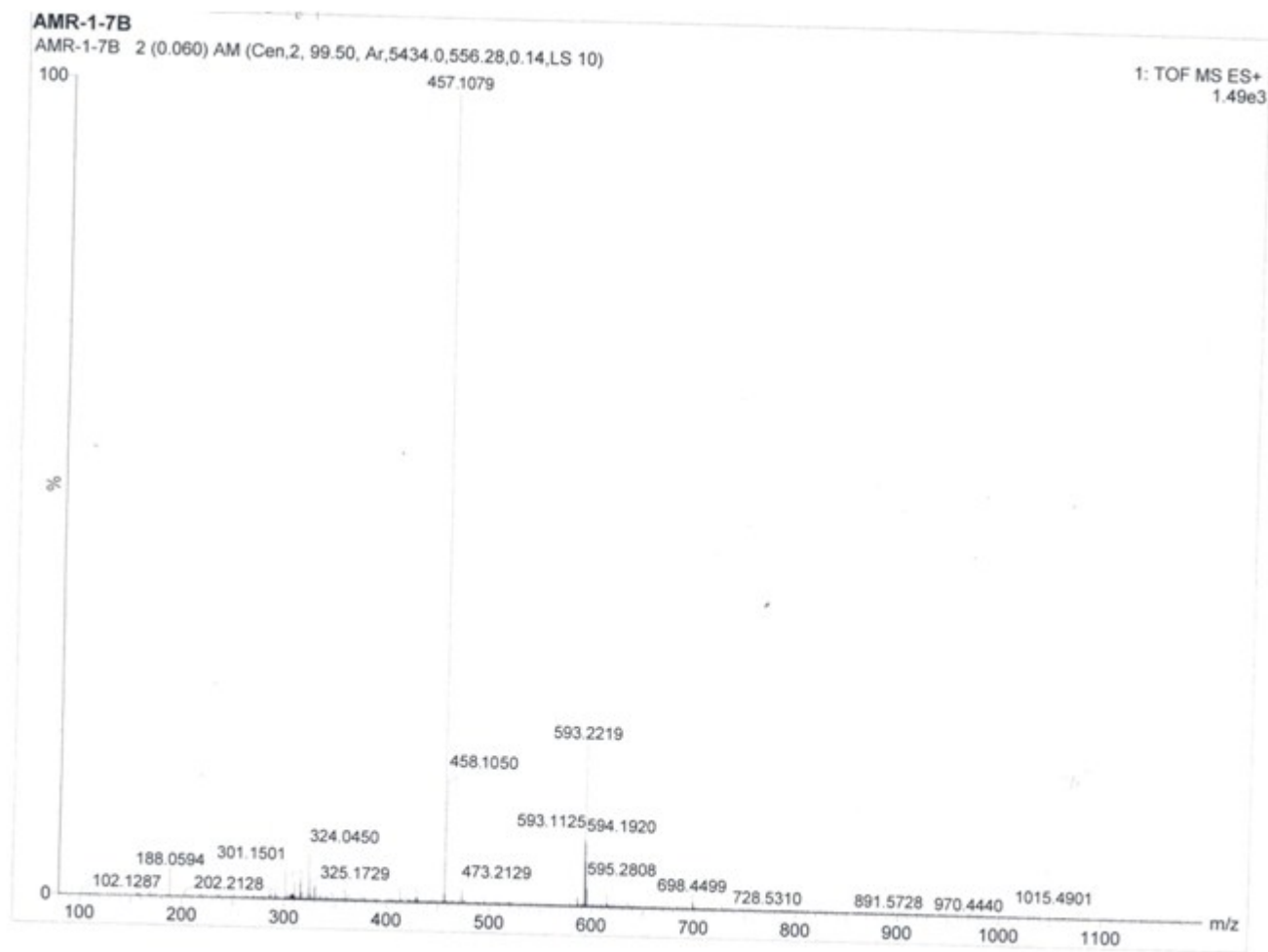
SI-08- 3'-((3-acetyl-6-chloro-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3e**)



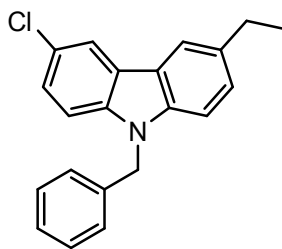
SI-08- ¹H NMR of 3'-((3-acetyl-6-chloro-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3e**)



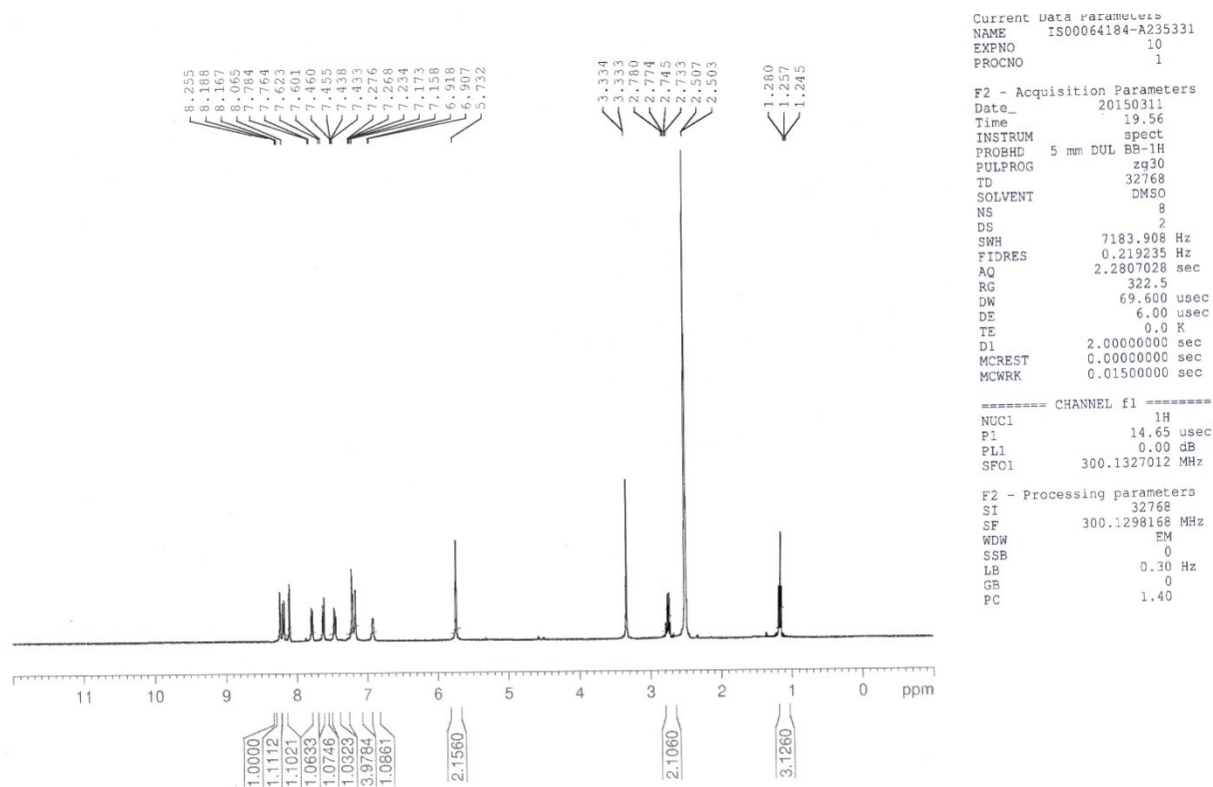
SI-08- ^{13}C NMR of 3'-((3-acetyl-6-chloro-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3e**)



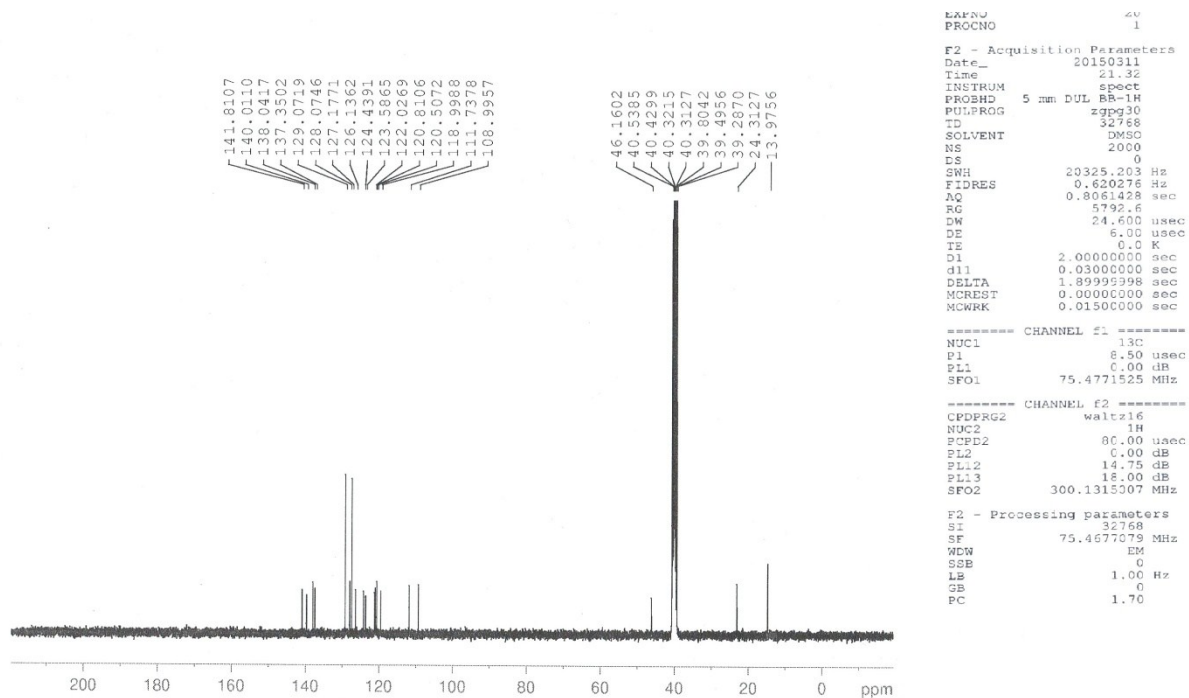
SI-08- Mass spectrum of 3'-((3-acetyl-6-chloro-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (3e)



SI-09-Characterization of 9-benzyl-3-chloro-6-ethyl-9H-carbazole (**3f**)



SI-09- ¹H NMR of 9-benzyl-3-chloro-6-ethyl-9H-carbazole (**3f**)

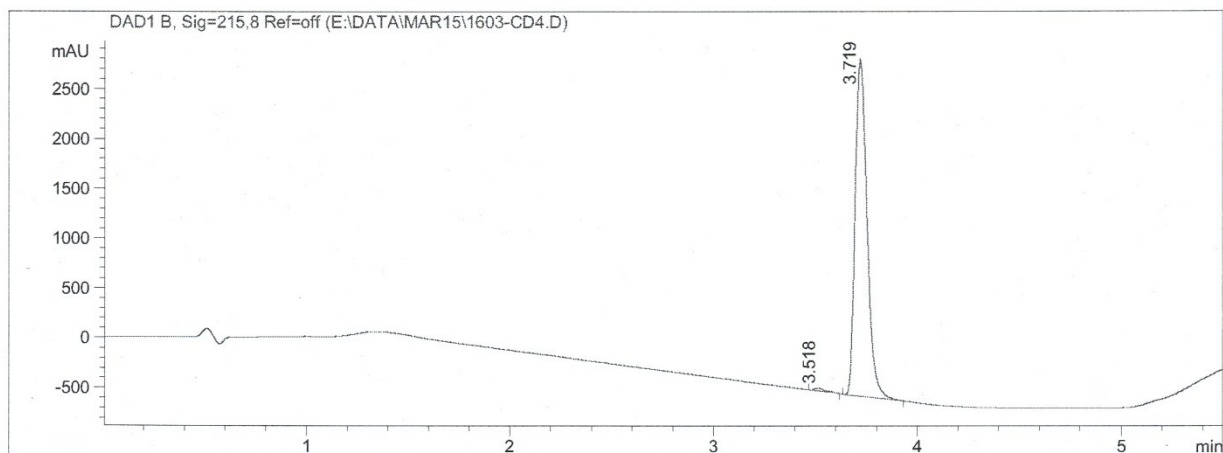


SI-09- ¹³C NMR of 9-benzyl-3-chloro-6-ethyl-9H-carbazole (3f)

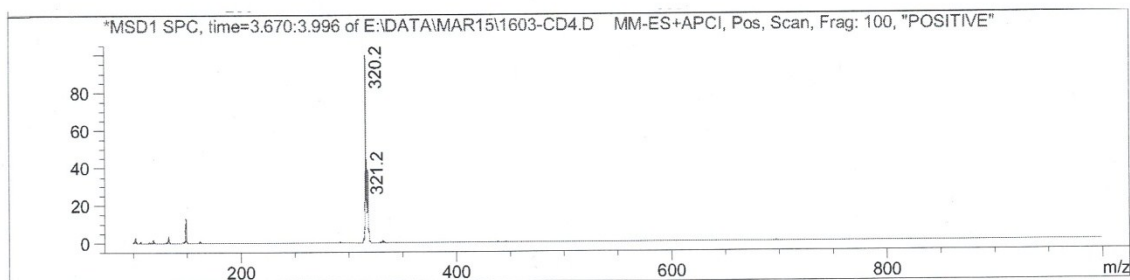
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Method info :MOBILE PHASE:A-0.1%HCOOH;B-ACN, Flow: 1.5ml/min,
             COLUMN:Atlantis d C18 (50X4.6mm-5µm, )
             TIME (MIN) : 0--3.0 3.0-4.0 4.0--4.5 4.5-6.0
                        %B      5-95      95      95-5      5
=====

```



Peak	RT	Area	Area
No	min		%
1	3.518	9.435e+001	0.686
2	3.719	1.365e+004	99.314



SI-09- Mass spectrum of 9-benzyl-3-chloro-6-ethyl-9H-carbazole (**3f**)

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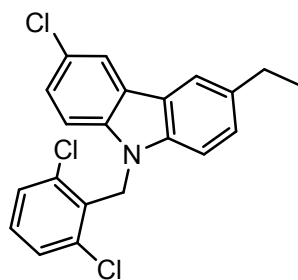
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29 BS15002445;90000018581	79.40	5.74	4.45
Mean value [%]	78.88	5.68	4.39
Deviation, abs. [%]	0.74	0.09	0.19
Deviation, rel. [%]	0.94	1.62	2.10
Delta [%]	0.01	0.02	0.03

Name: eassuperuser, Access: VarioMICRO superuser

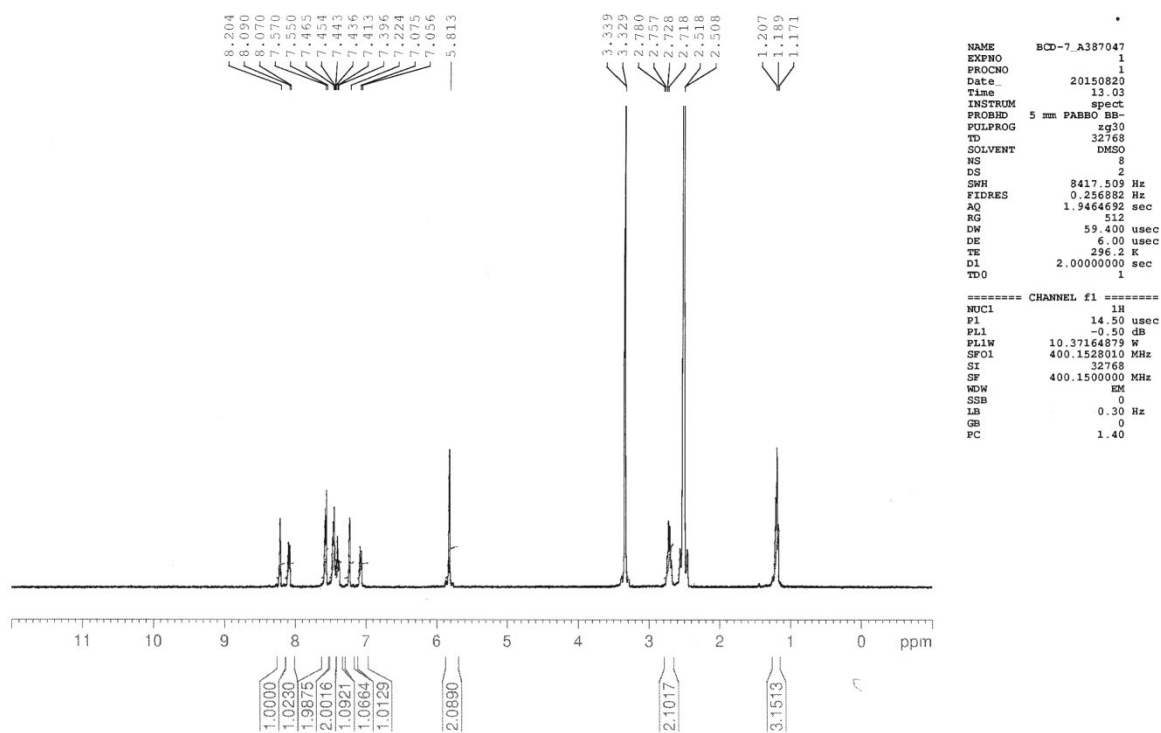
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Elementar Analysensysteme GmbH

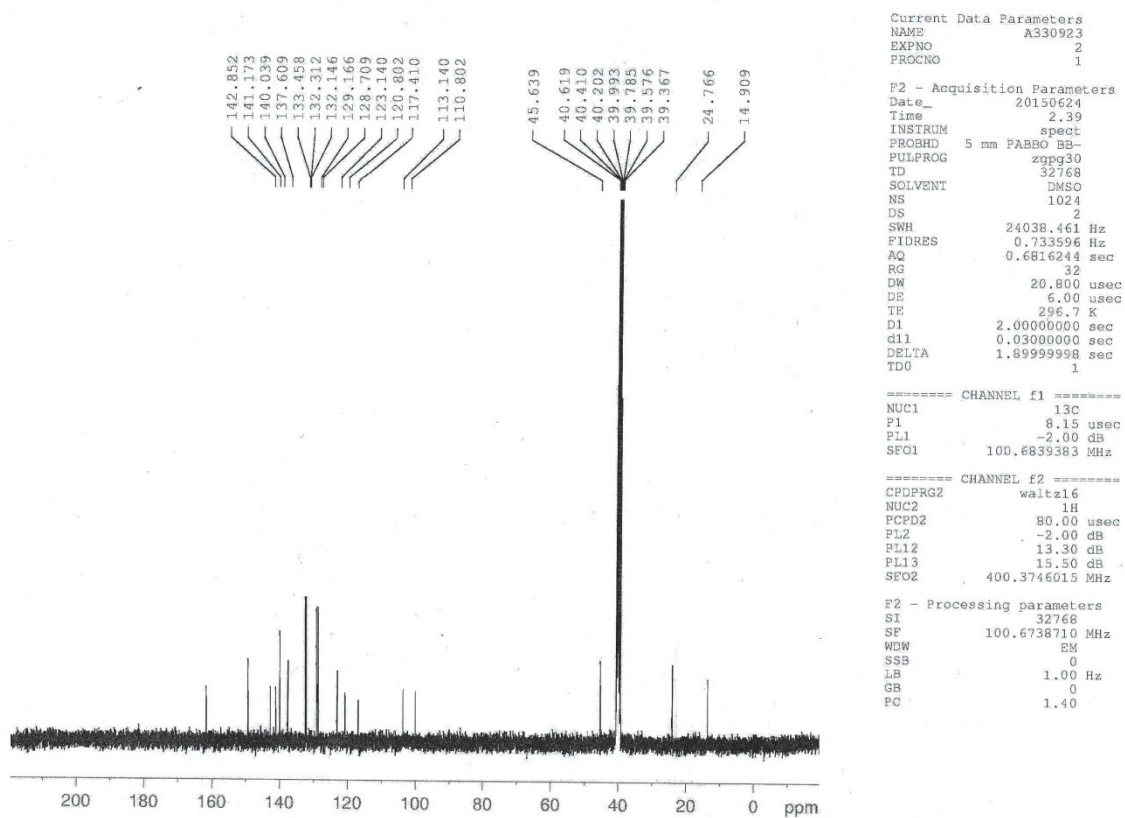
SI-09- Elemental analysis data of 9-benzyl-3-chloro-6-ethyl-9H-carbazole (**3f**)



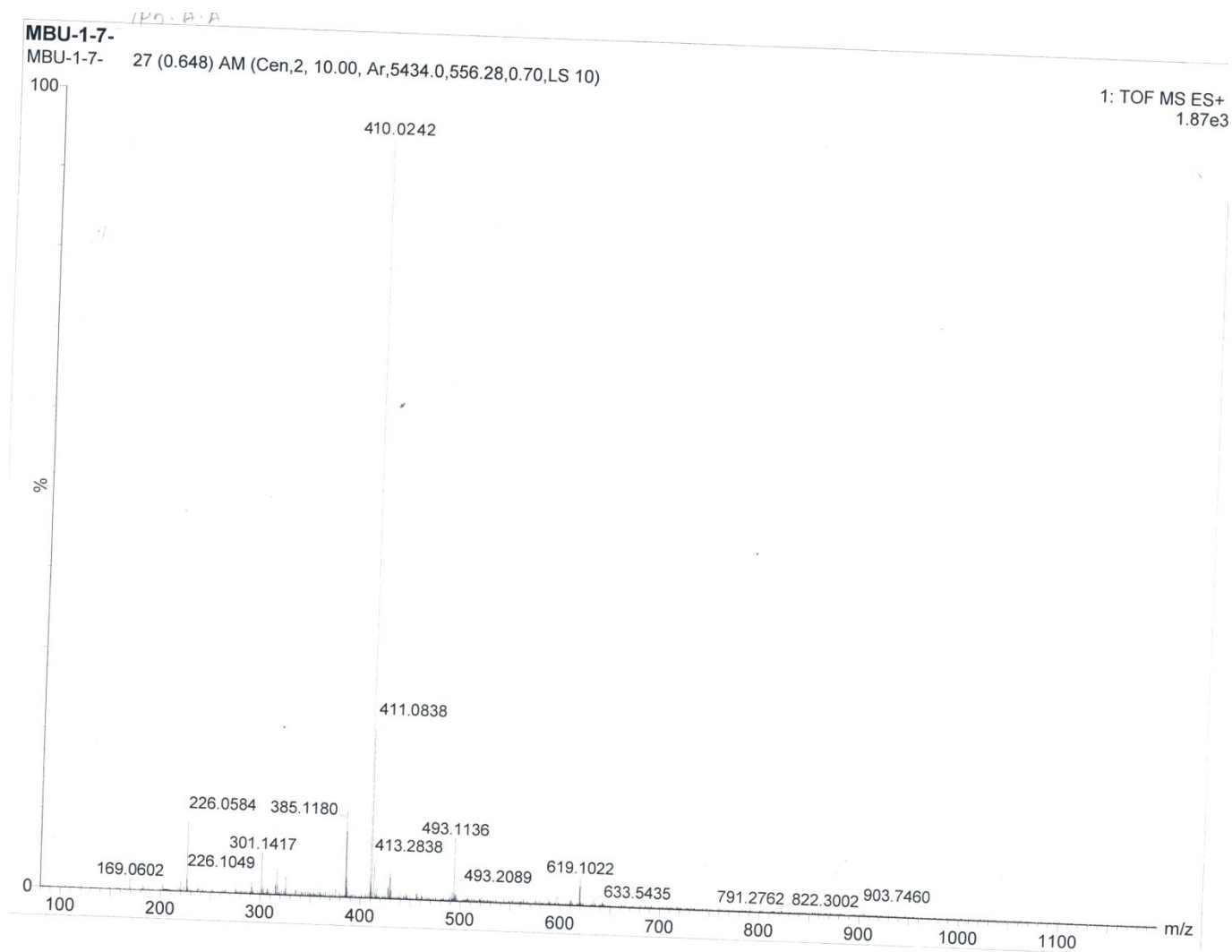
SI-10- Characterization of 3-chloro-9-(2,6-dichlorobenzyl)-6-ethyl-9H-carbazole (**3g**)



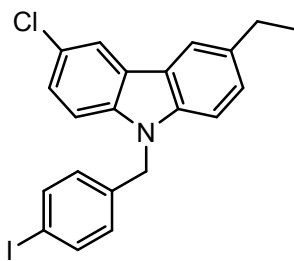
SI-10- ¹H NMR of 3-chloro-9-(2,6-dichlorobenzyl)-6-ethyl-9H-carbazole (**3g**)



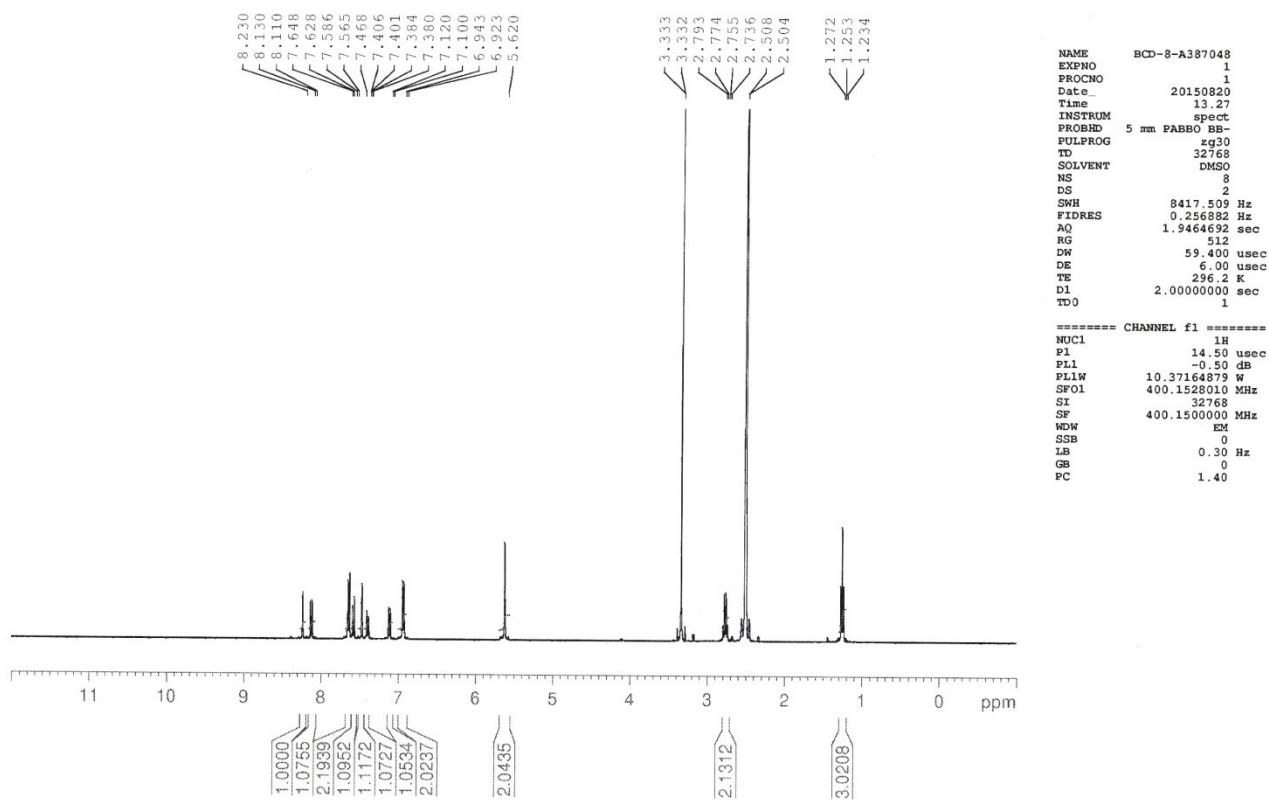
SI-10- ^{13}C NMR of 3-chloro-9-(2,6-dichlorobenzyl)-6-ethyl-9H-carbazole (**3g**)



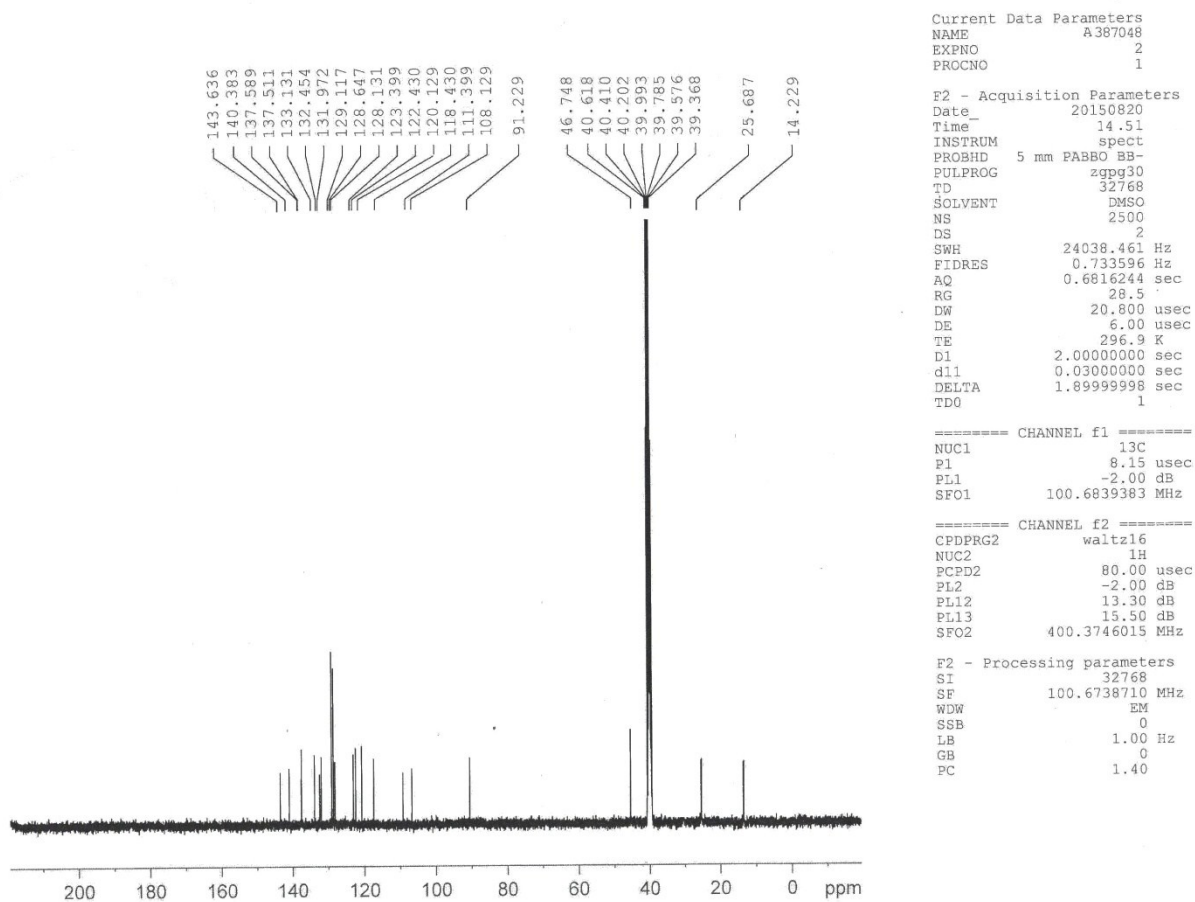
SI-10- Mass spectrum of 3-chloro-9-(2,6-dichlorobenzyl)-6-ethyl-9H-carbazole (**3g**)



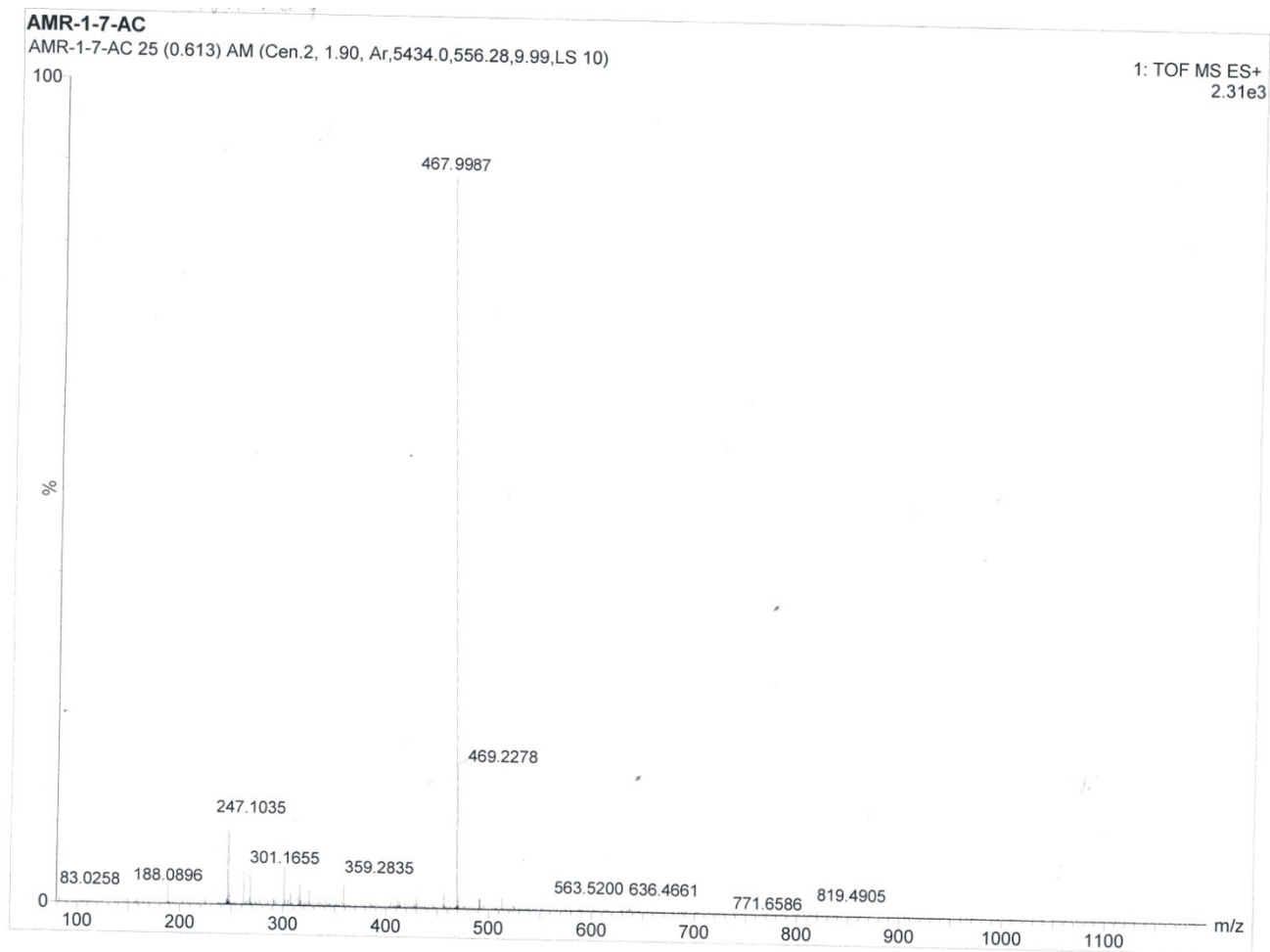
SI-11- Characterization of 3-chloro-6-ethyl-9-(4-iodobenzyl)-9H-carbazole (**3h**)



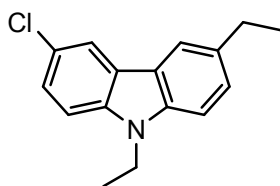
SI-11- ¹H NMR of 3-chloro-6-ethyl-9-(4-iodobenzyl)-9H-carbazole (**3h**)



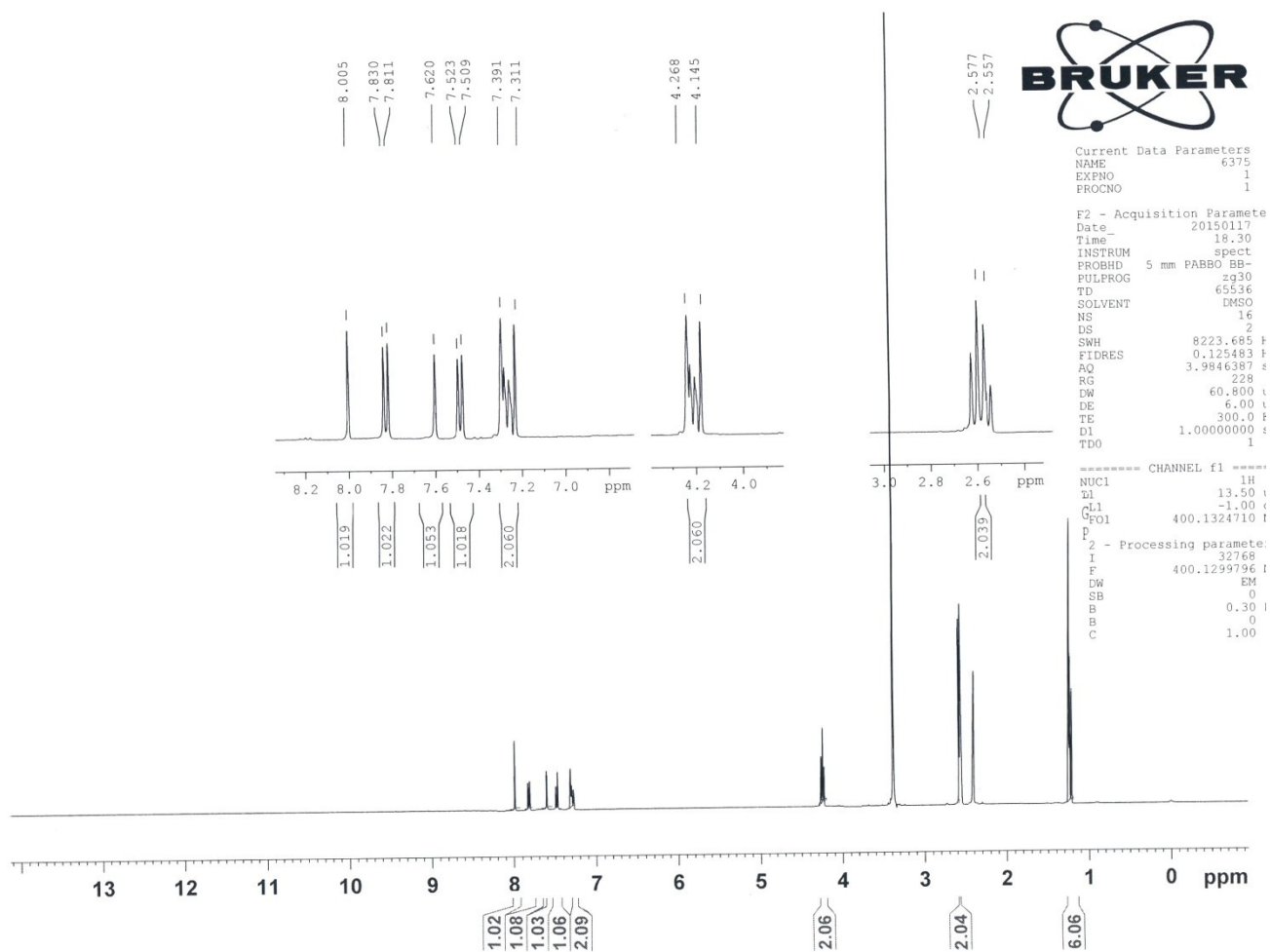
SI-11- ^{13}C NMR of 3-chloro-6-ethyl-9-(4-iodobenzyl)-9H-carbazole (**3h**)



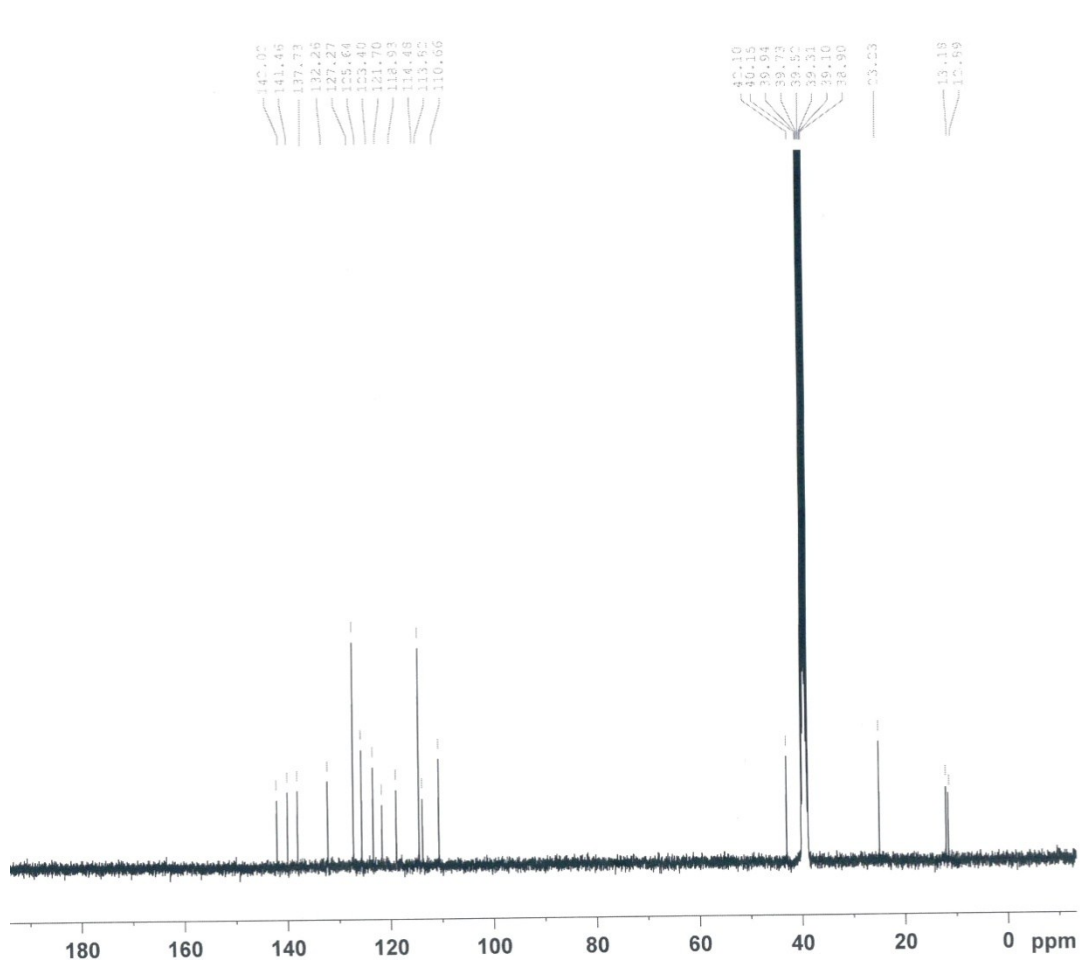
SI-11- Mass spectrum of 3-chloro-6-ethyl-9-(4-iodobenzyl)-9H-carbazole (**3h**)



SI-12- 3-chloro-6,9-diethyl-9H-carbazole (**3i**)



SI-12- ¹H NMR of 3-chloro-6,9-diethyl-9H-carbazole (**3i**)



Current Data Parameters
NAME 6375
EXPNO 2
PROCNO 1

F2 - Acquisition Parameters
Date_ 20150117
Time 23.43
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zgpg30
TD 65536
SOLVENT DMSO
NS 5000
DS 4
SWH 24038.461 Hz
FIDRES 0.366798 Hz
AQ 1.3631989 sec
RG 128
DW 20.800 usec
DE 6.00 usec
TE 300.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1

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NUC1 13C
P1 8.35 usec
PL1 -2.00 dB
SFO1 100.6228298 MHz

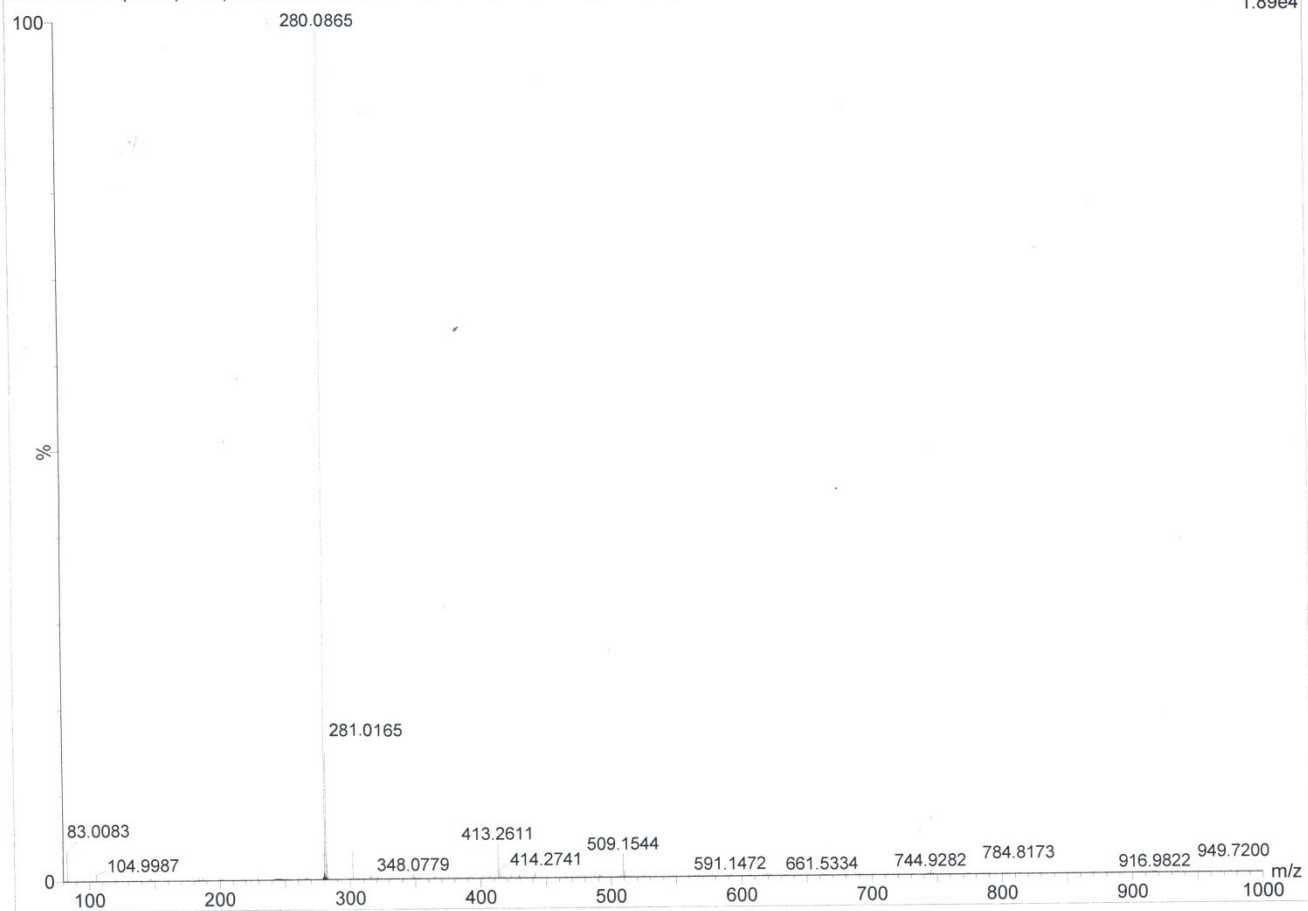
===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 -1.00 dB
PL12 16.39 dB
PL13 17.00 dB
SFO2 400.1316005 MHz

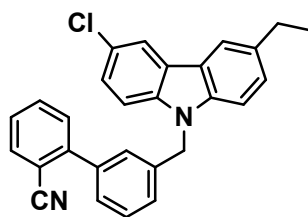
F2 - Processing parameters
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SF 100.6128193 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

SI-12- ¹³C NMR of 3-chloro-6,9-diethyl-9H-carbazole (**3i**)

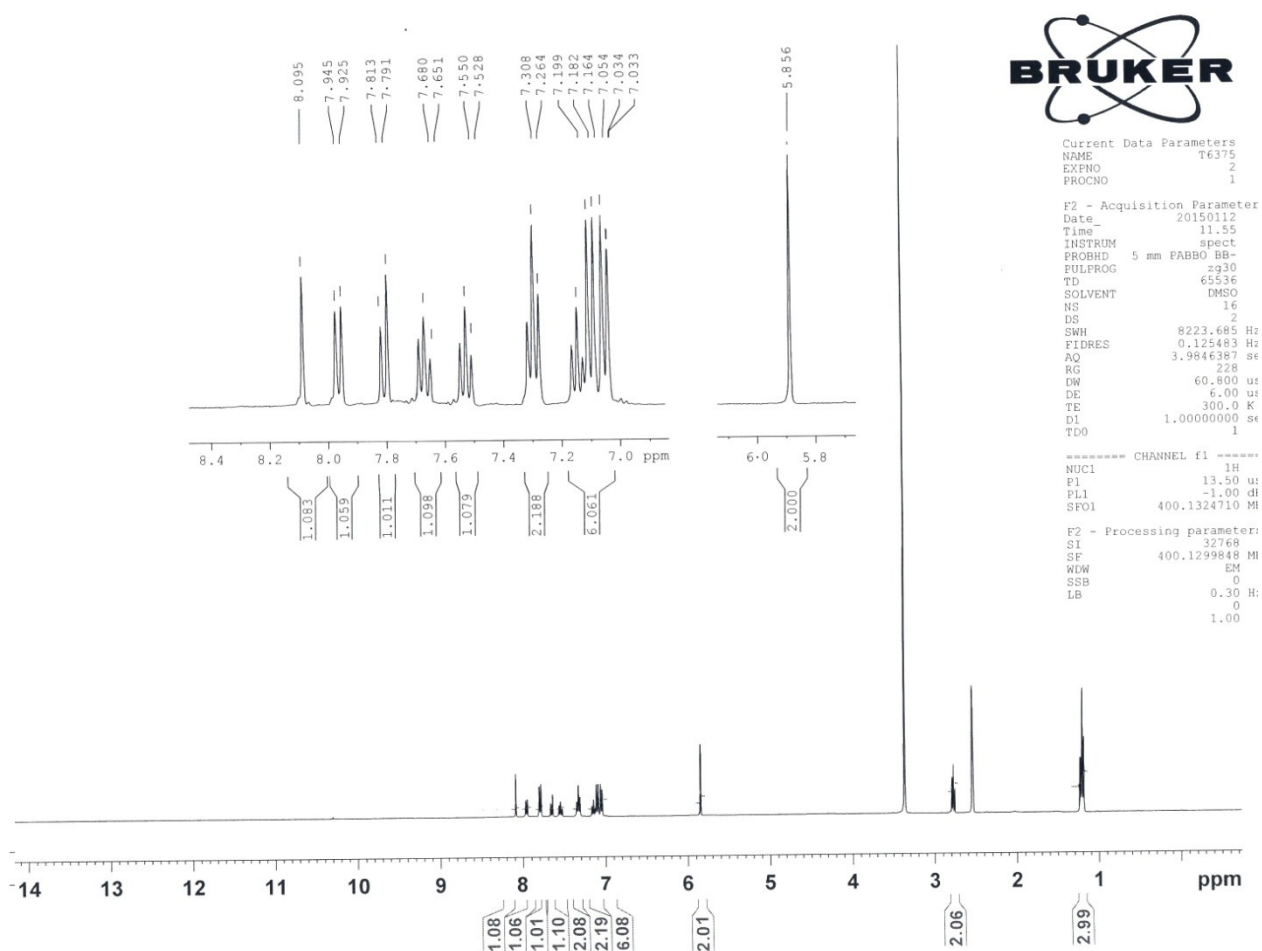
AMR-2-AC

AMR-2-AC 1 (0.041) AM (Cen,2, 35.00, Ar,5434.0,556.28,0.15,LS 10); Cm (1:7)

1: TOF MS ES+
1.89e4SI-12- Mass spectrum of 3-chloro-6,9-diethyl-9H-carbazole (**3i**)



SI-13-Characterization of 3'-((3-chloro-6-ethyl-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (3j)

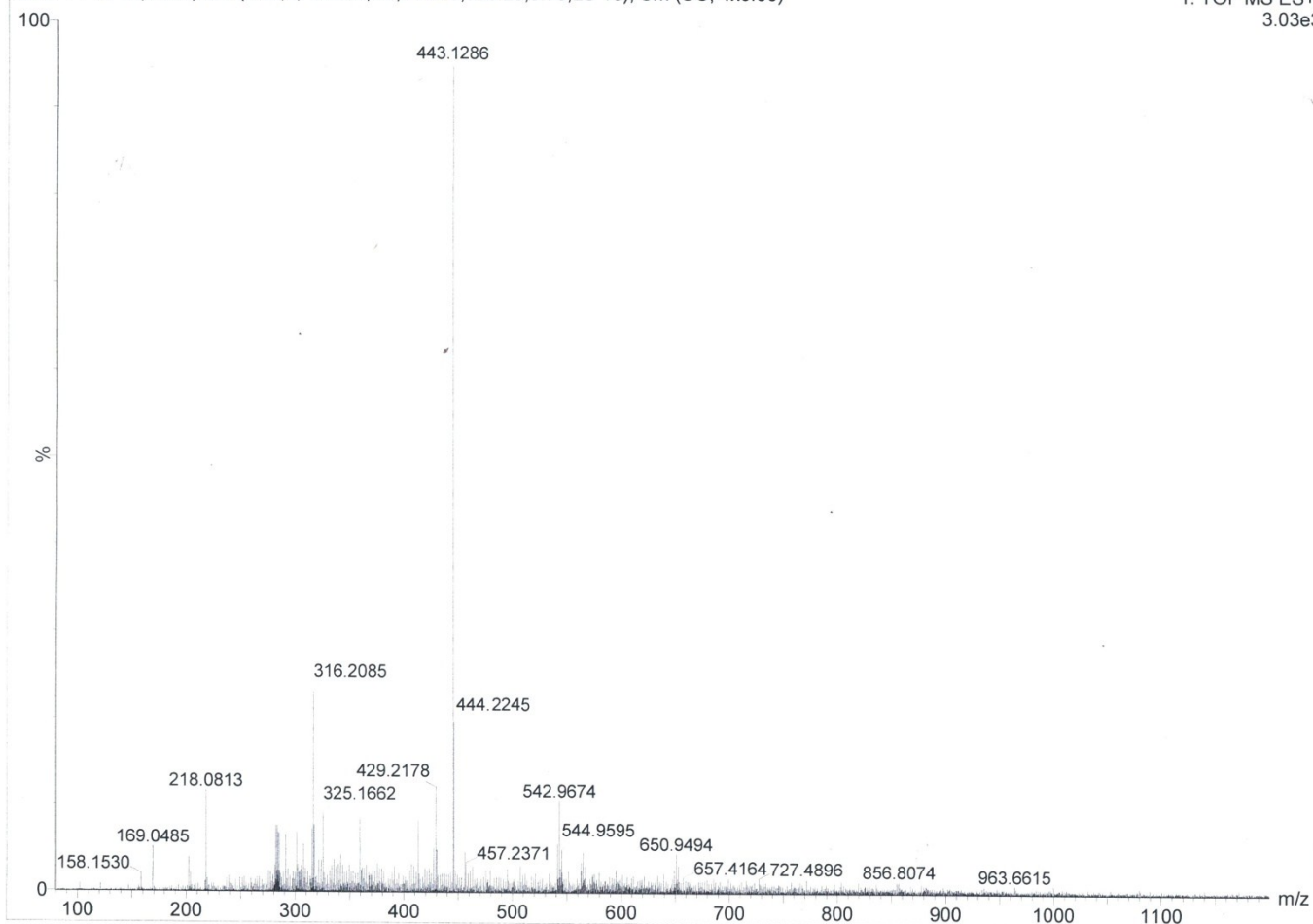


SI-13- ¹H NMR of 3'-((3-chloro-6-ethyl-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (3j)

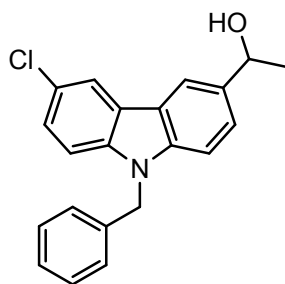
SI-13- ¹³C NMR of 3'-((3-chloro-6-ethyl-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3j**)

MBU-1-7-B

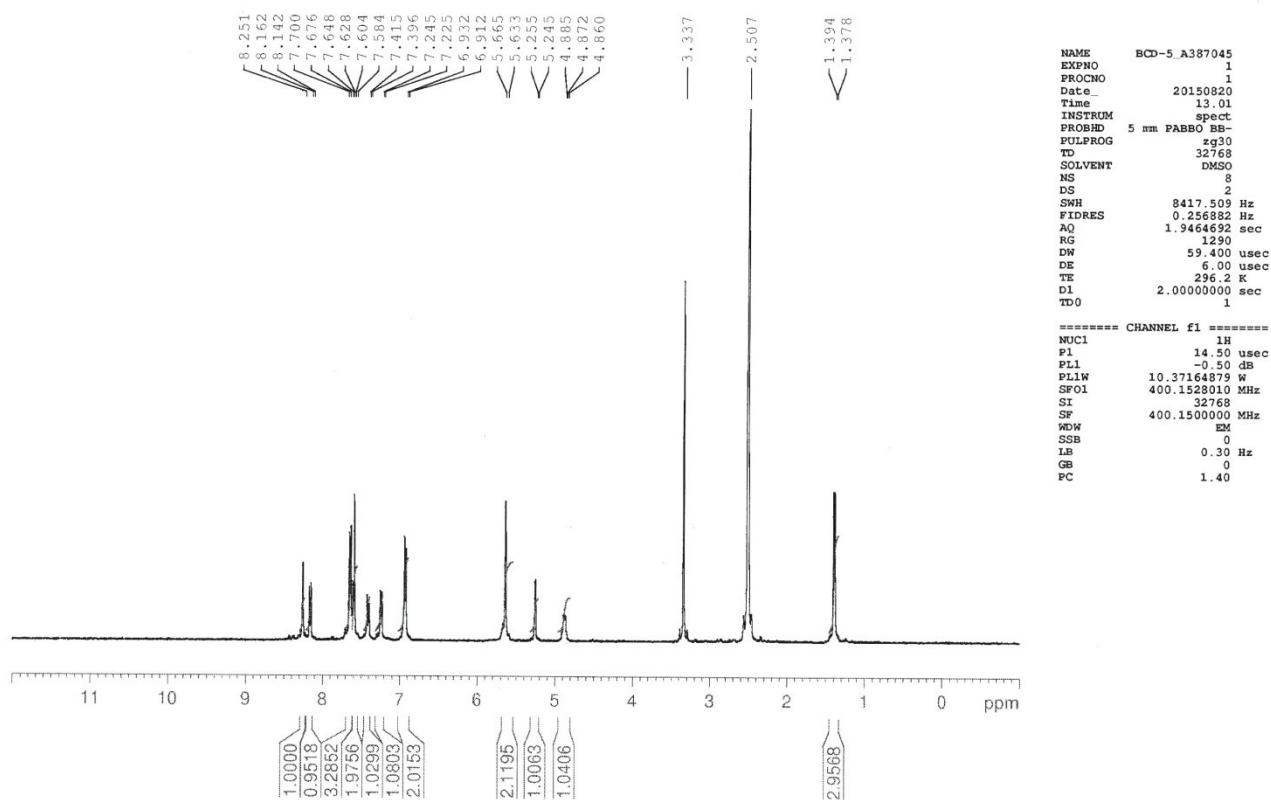
MBU-1-7-B 2 (0.059) AM (Cen,2, 100.00, Ar,5434.0,556.28,0.70,LS 10); Sm (SG, 4x6.00)

1: TOF MS ES+
3.03e3

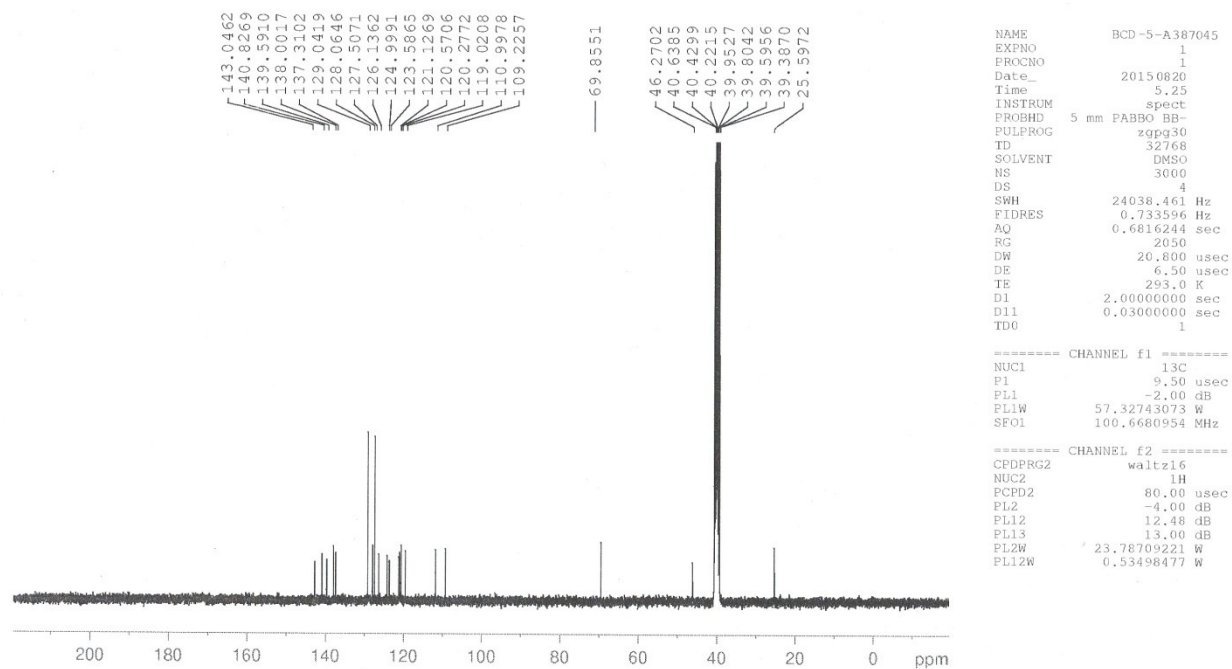
SI-13- Mass spectrum of 3'-((3-chloro-6-ethyl-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile
(3j)



SI-14- Characterization of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanol (**3k**)



SI-14- ¹H NMR of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanol (**3k**)

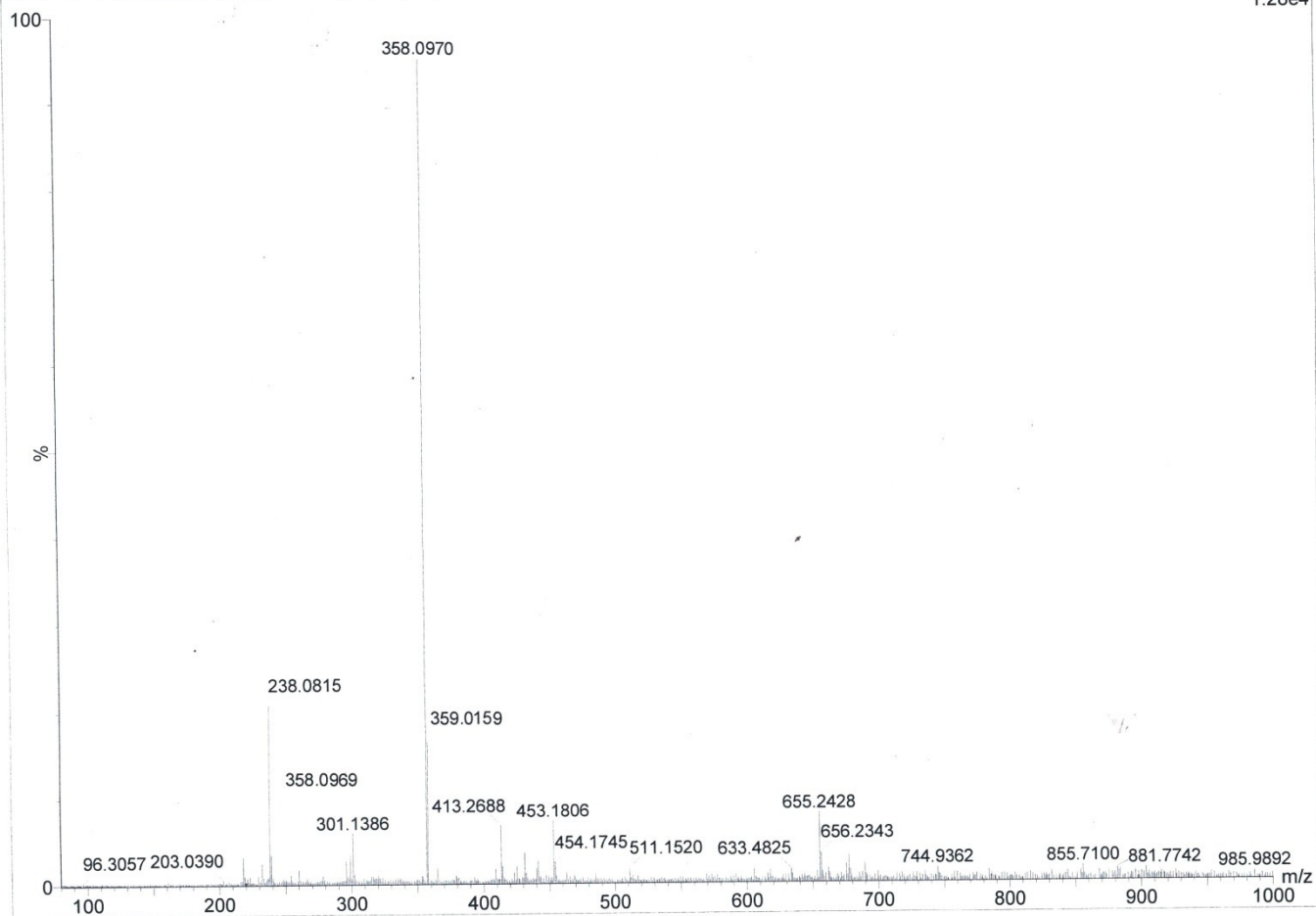


SI-14- ^{13}C NMR of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanol (**3k**)

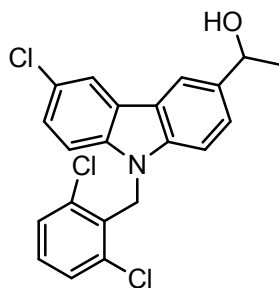
MBU- M

MBU- M 5 (0.115) AM (Cen,2, 100.00, Ar,5434.0,556.28,0.55,LS 10); Sm (Mn, 9x9.00); Cm (1:6)

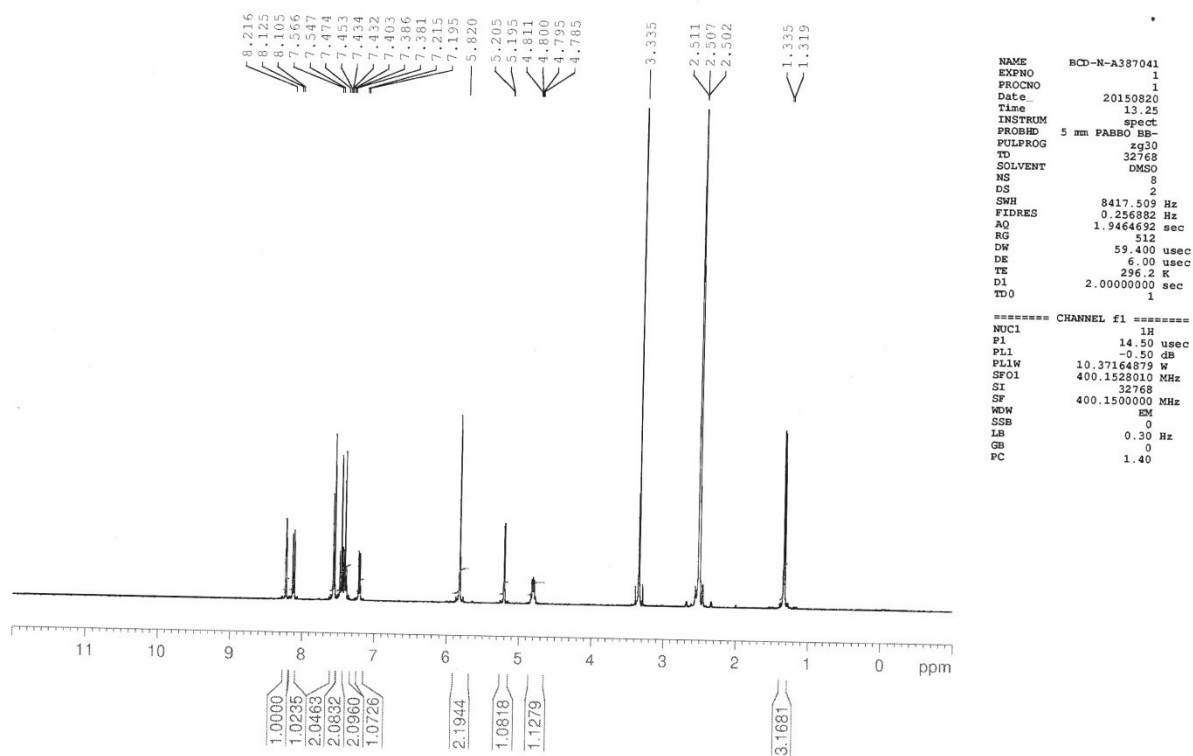
1: TOF MS ES+
1.28e4



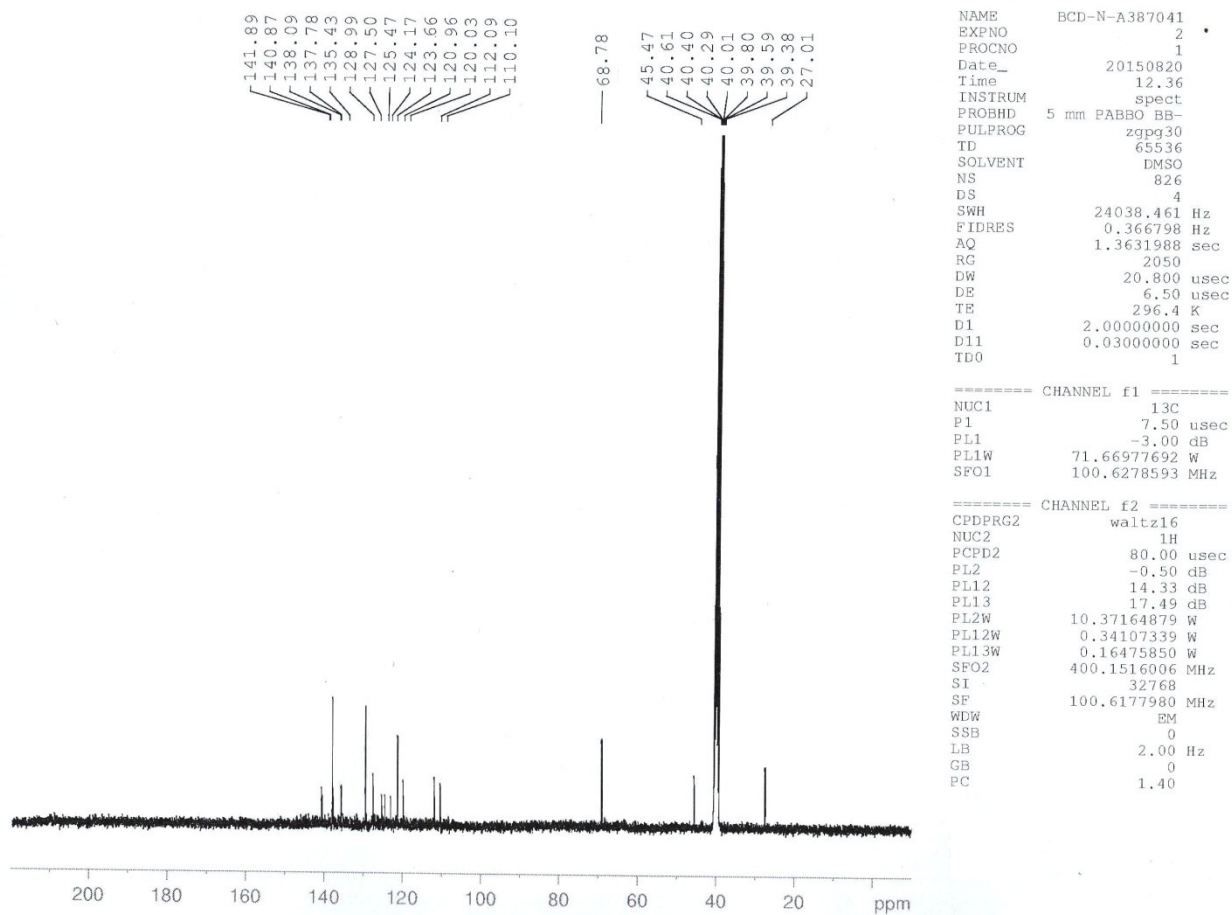
SI-14- Mass spectrum of 1-(9-benzyl-6-chloro-9H-carbazol-3-yl)ethanol (**3k**)



SI-15-Characterization of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanol (**31**)



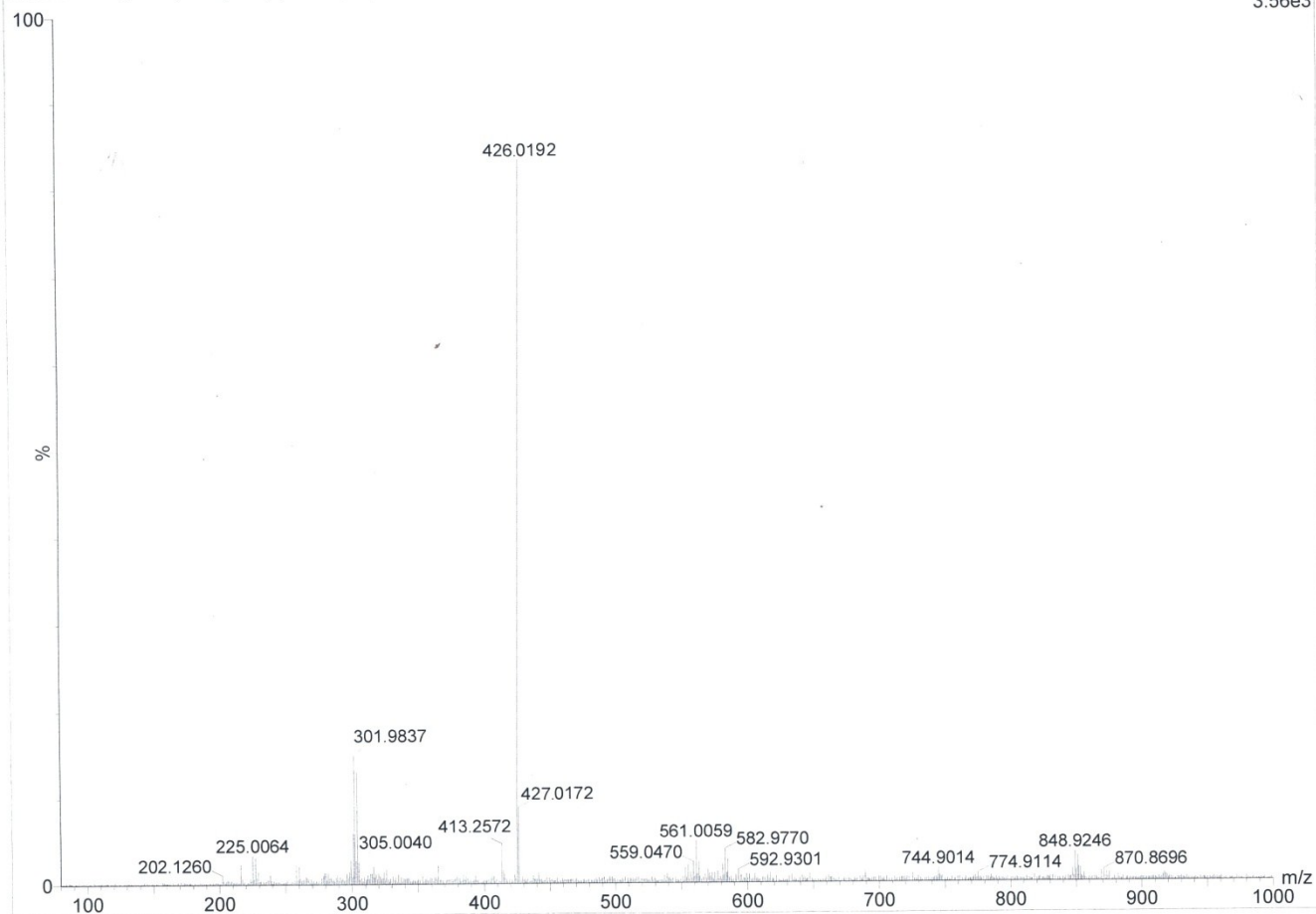
SI-15- ¹H NMR of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanol (**31**)

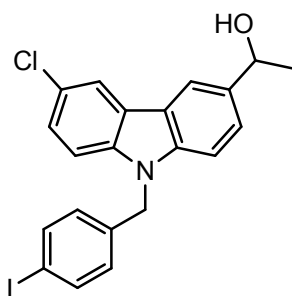


SI-15- ^{13}C NMR of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanol (**3I**)

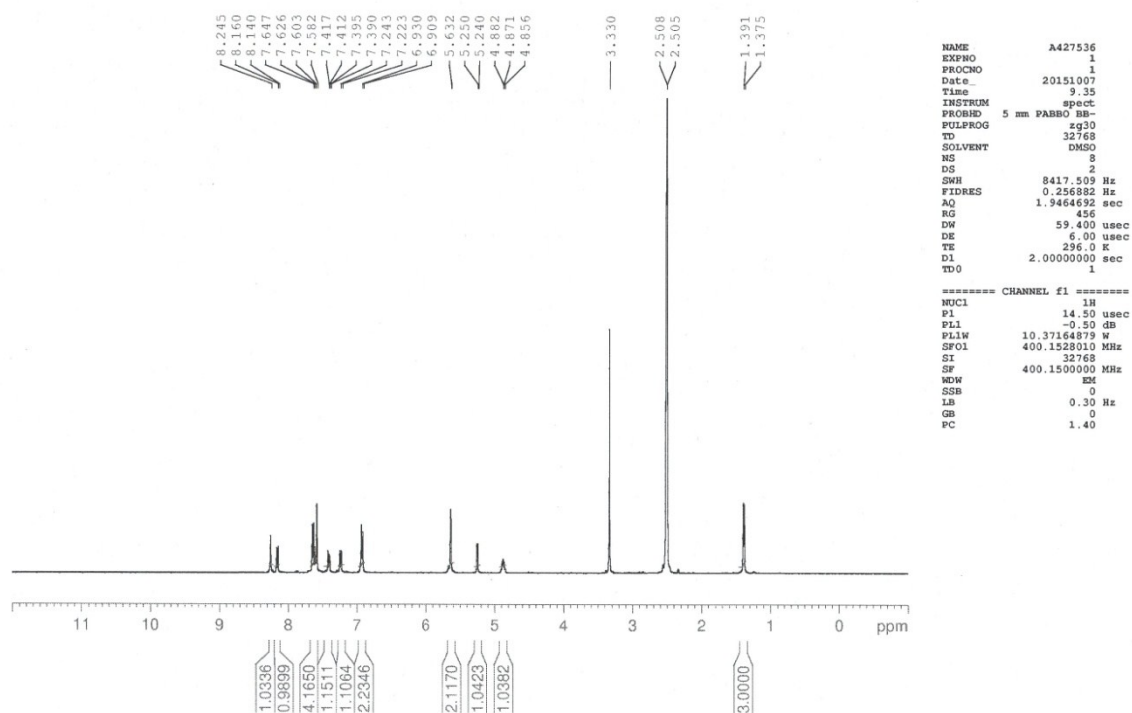
AMR-2-B

AMR-2-B 1 (0.041) AM (Cen,2, 80.00, Ar,5434.0,556.28,0.40,LS 10); Sm (Mn, 9x9.00); Cm (1:6)

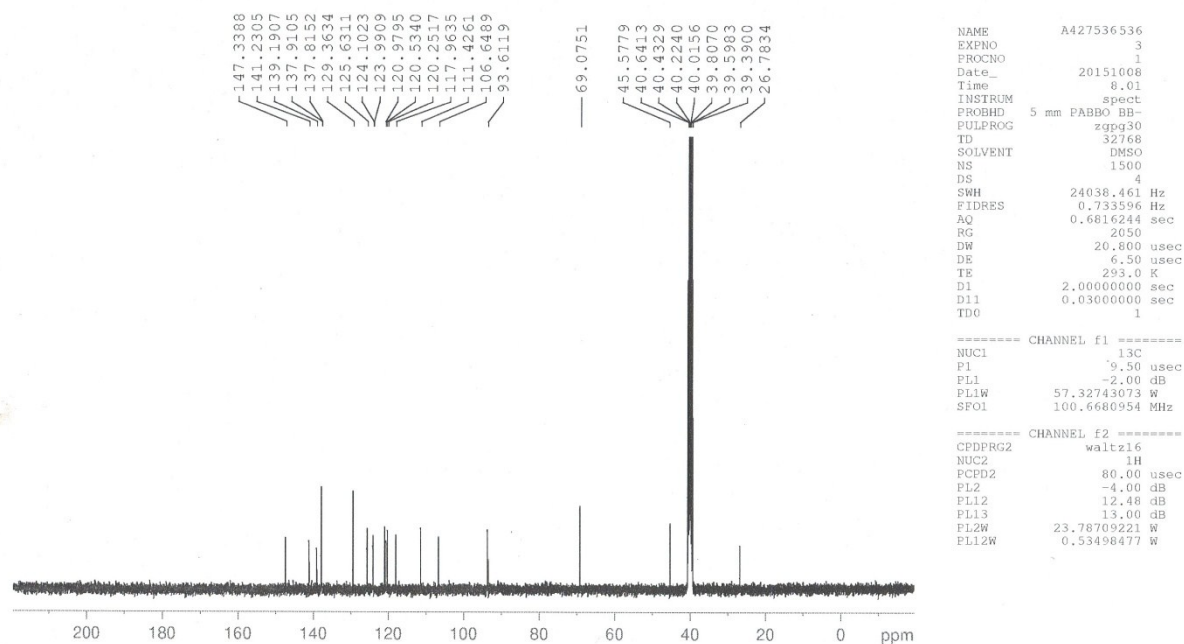
1: TOF MS ES+
3.56e3SI-15- Mass spectrum of 1-(6-chloro-9-(2,6-dichlorobenzyl)-9H-carbazol-3-yl)ethanol (**31**)



SI-16- Characterization of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanol (**3m**)



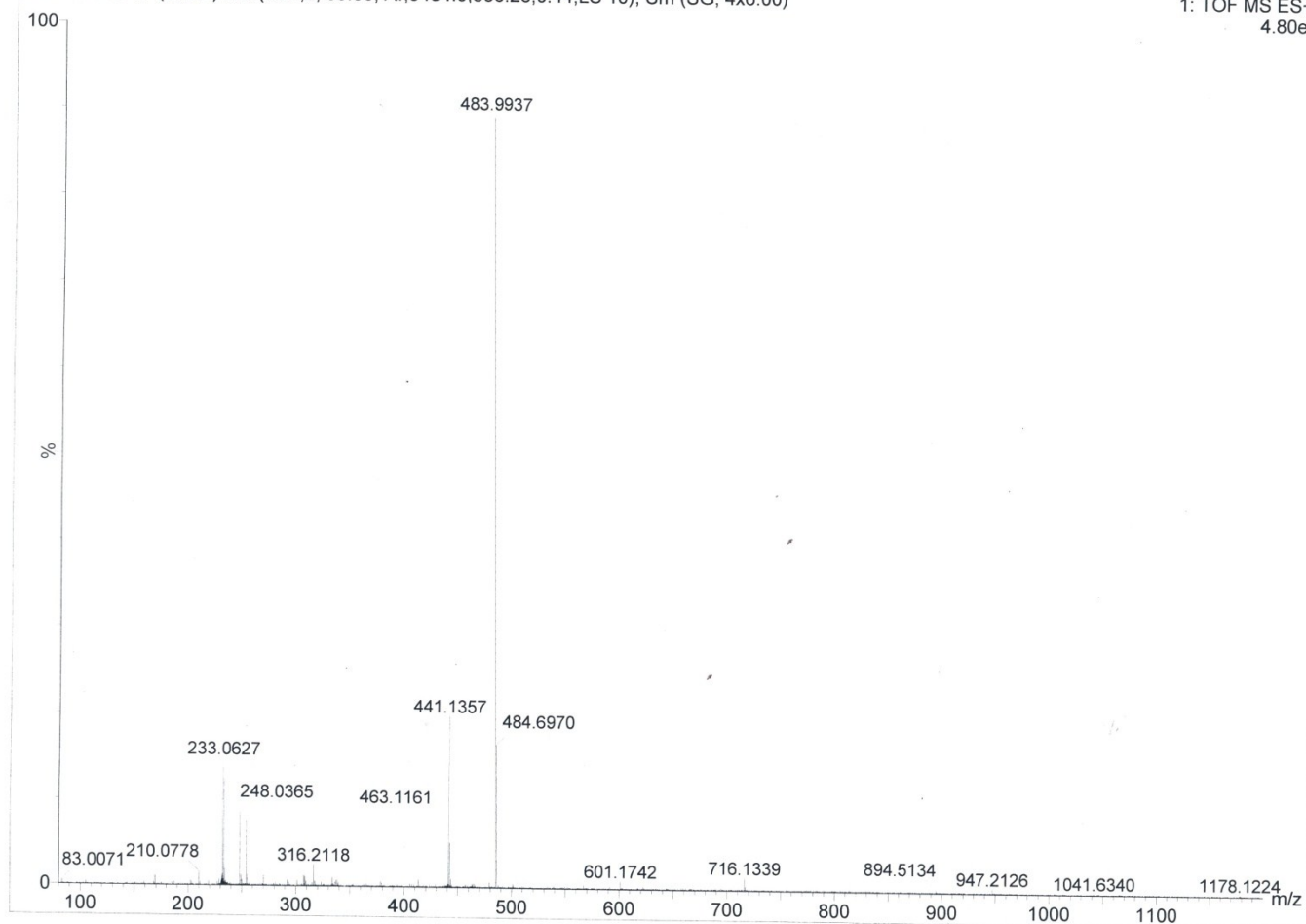
SI-16- ¹H NMR of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanol (**3m**)

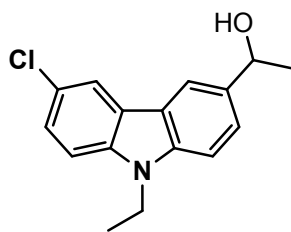


SI-16- ¹³C NMR of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanol (**3m**)

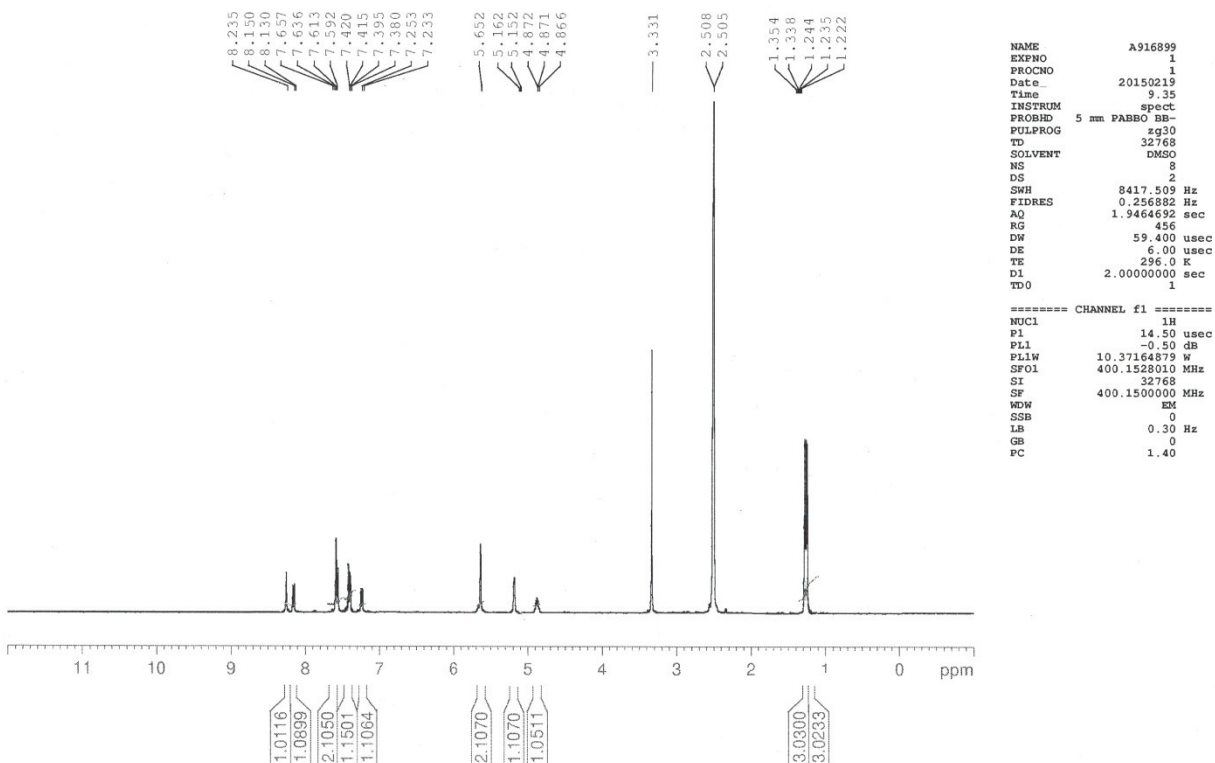
AMR-1-6AC

AMR-1-6AC 17 (0.422) AM (Cen,2, 99.00, Ar,5434.0,556.28,0.44,LS 10); Sm (SG, 4x6.00)

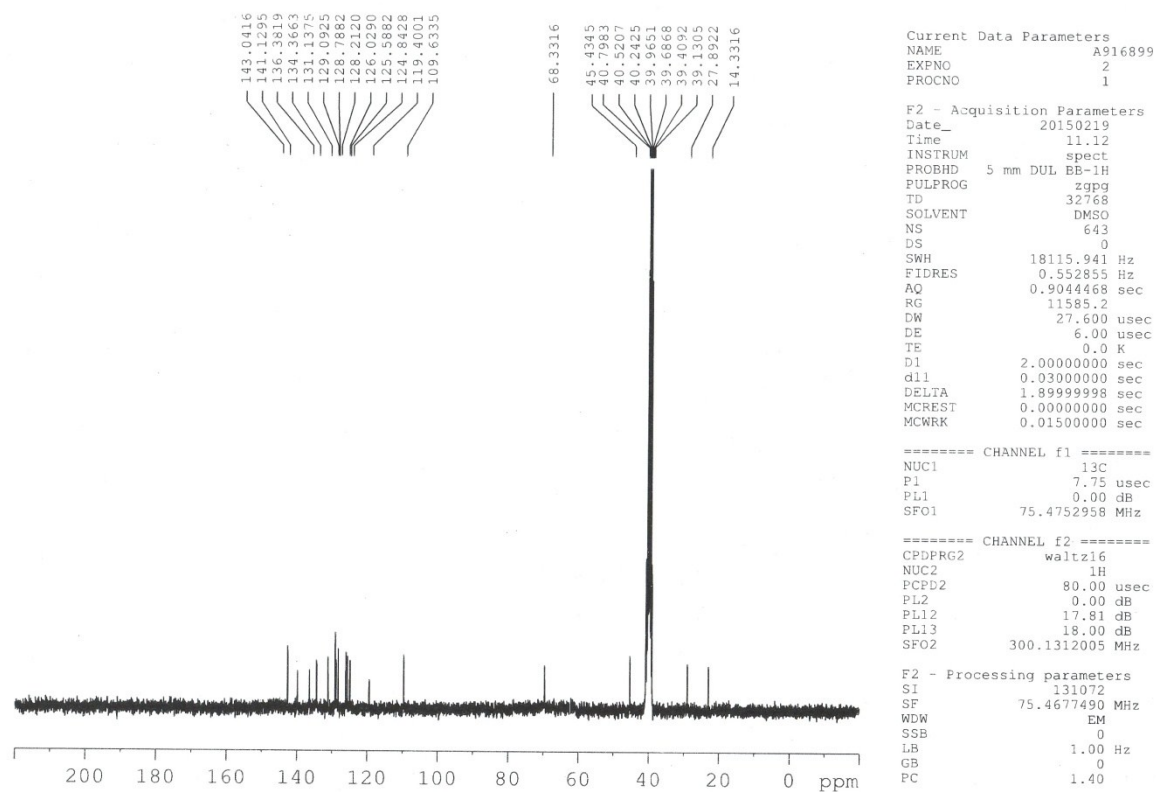
1: TOF MS ES+
4.80e3SI-16- Mass spectrum of 1-(6-chloro-9-(4-iodobenzyl)-9H-carbazol-3-yl)ethanol (**3m**)



SI-17- Characterization of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanol (**3n**)



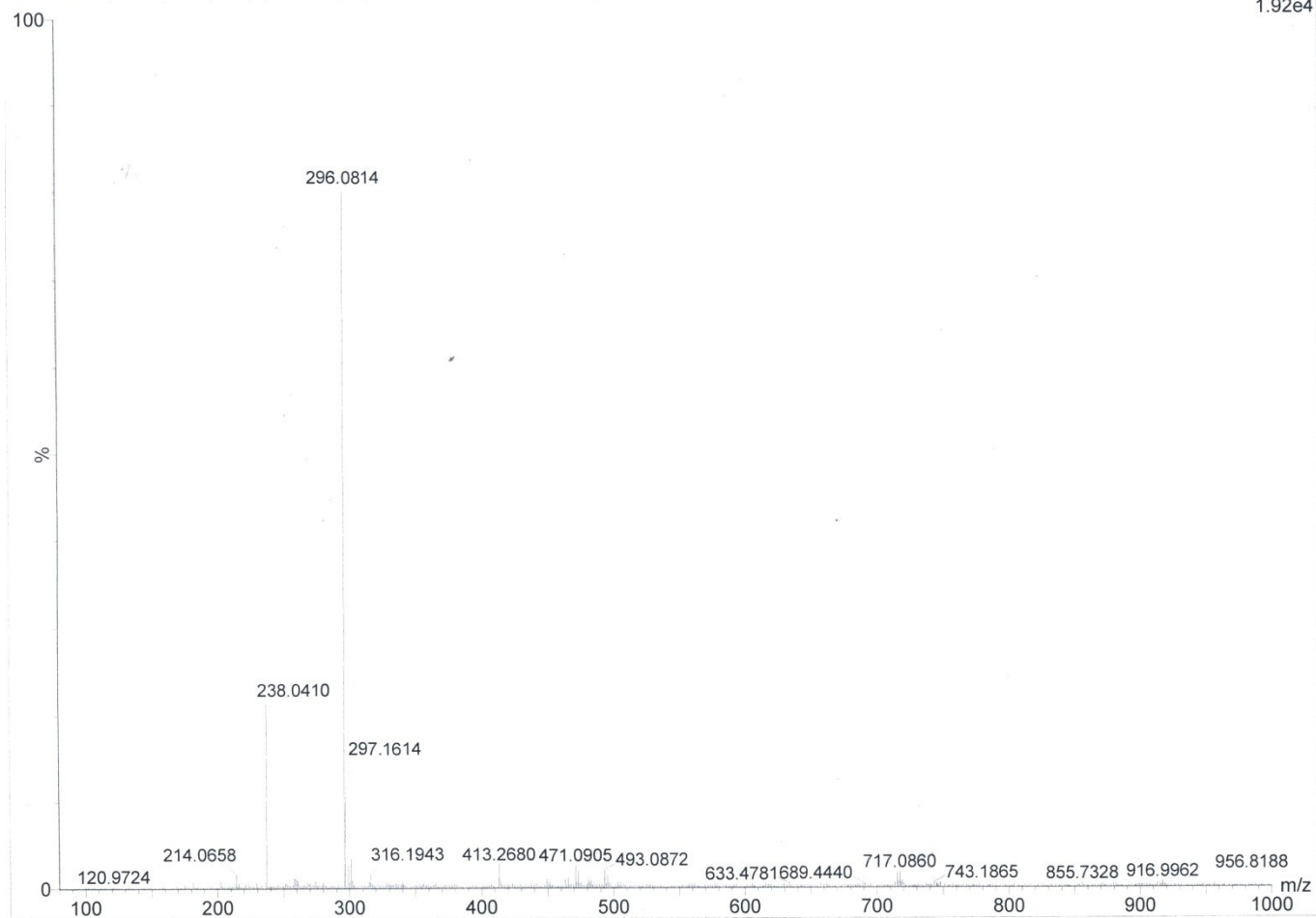
SI-17- ¹H NMR of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanol (**3n**)

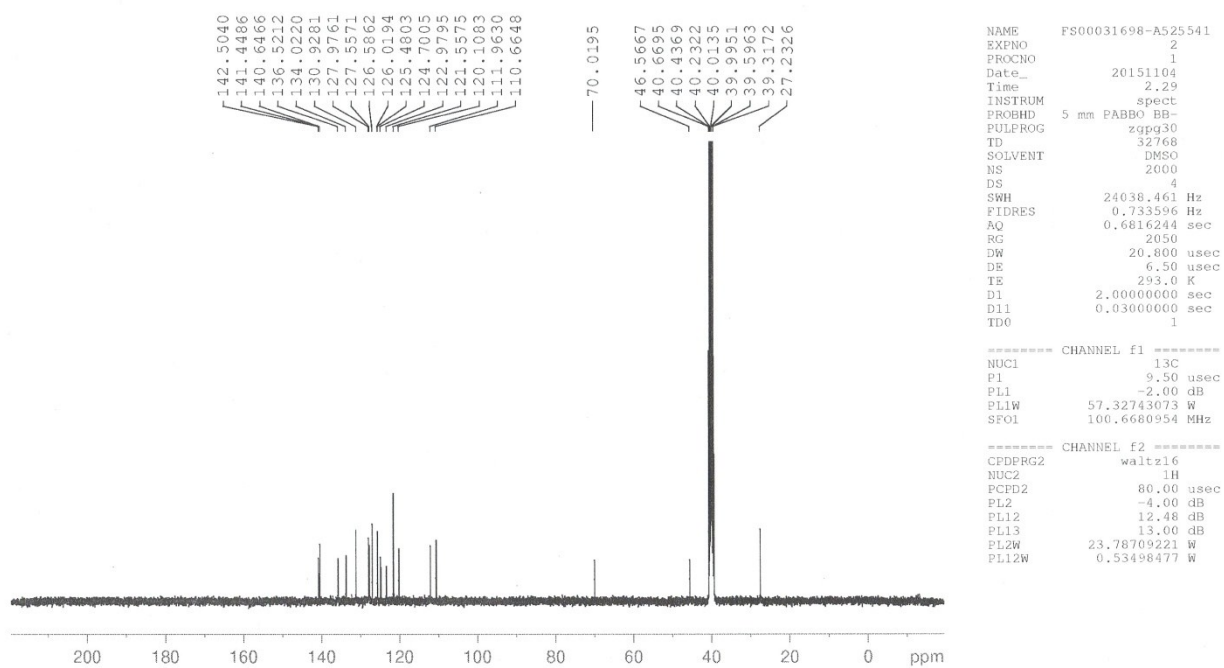


SI-17- ^{13}C NMR of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanol (**3n**)

MBU-2C

MBU-2Cl 6 (0.135) AM (Cen,2, 100.00, Ar,5434.0,556.28,0.55,LS 10); Sm (Mn, 9x9.00); Cm (1:7)

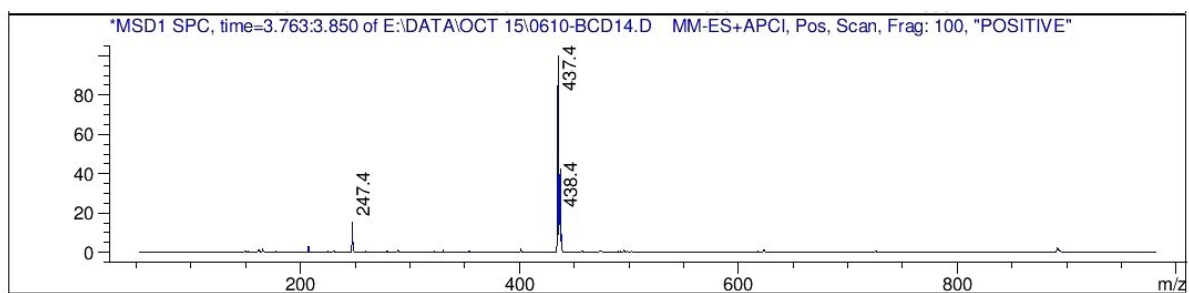
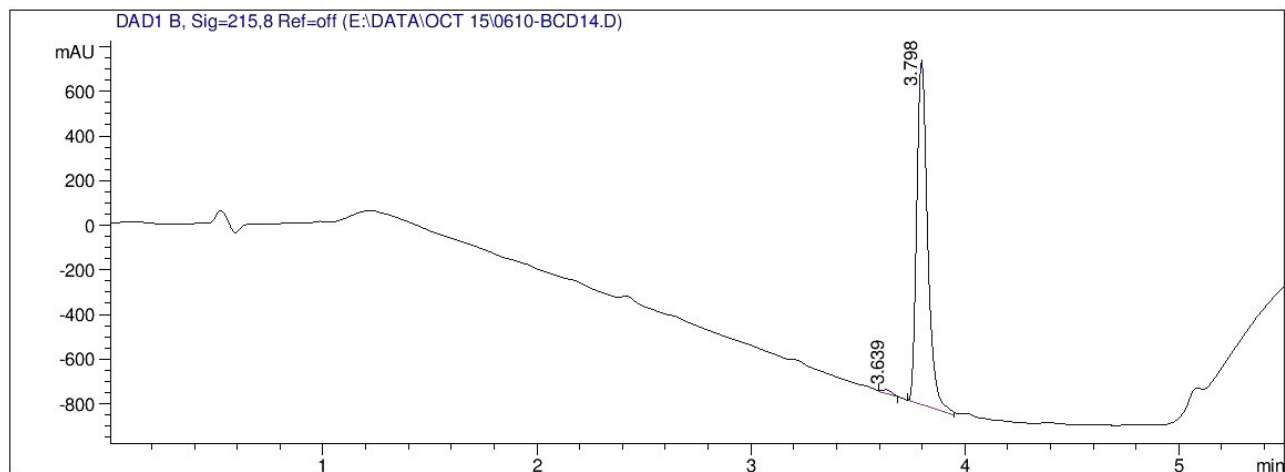
1: TOF MS ES+
1.92e4SI-17- Mass spectrum of 1-(6-chloro-9-ethyl-9H-carbazol-3-yl)ethanol (**3n**)



SI-18- ^{13}C NMR of 3'-((3-chloro-6-(1-hydroxyethyl)-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**30**)

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=====
Method info :MOBILE PHASE:A-0.1%HCOOH;B-ACN, Flow: 1.5ml/min,
             COLUMN:Atlantis d C18 (50X4.6mm-5µm, )
             TIME (MIN) : 0--3.0 3.0-4.0 4.0--4.5 4.5-6.0
                        %B      5-95      95      95-5      5
  
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SI-18- Mass spectrum of 3'-((3-chloro-6-(1-hydroxyethyl)-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3o**)

Document: 12/18/2015 (VarioMICRO) from: --- (modified)

varioMICRO CHNS
Elemental

Statistic report

Name	C [%]	H [%]	N [%]
38 BS15002450;90000018581	76.93	4.84	6.42
39 BS15002450;90000018581	77.05	4.88	6.44
Mean value [%]	76.99	4.86	6.43
Deviation, abs. [%]	0.08	0.03	0.01
Deviation, rel. [%]	0.11	0.58	0.22
Delta [%]	0.01	0.02	0.01

Name: eassuperuser, Access: VarioMICRO superuser

12/18/2015

varioMICRO V1.3.2 20-Mar-07, CHNS Mode, Ser. No.: 15062021
Elementar Analysensysteme GmbH

SI-18- Elemental analysis data of 3'-((3-chloro-6-(1-hydroxyethyl)-9H-carbazol-9-yl)methyl)-[1,1'-biphenyl]-2-carbonitrile (**3o**)