

## Supporting Information on

# Microwave-Assisted Chemoselective Synthesis and Photophysical Properties of 2-aryazo-biphenyl-4-carboxamides from Hydrazonals

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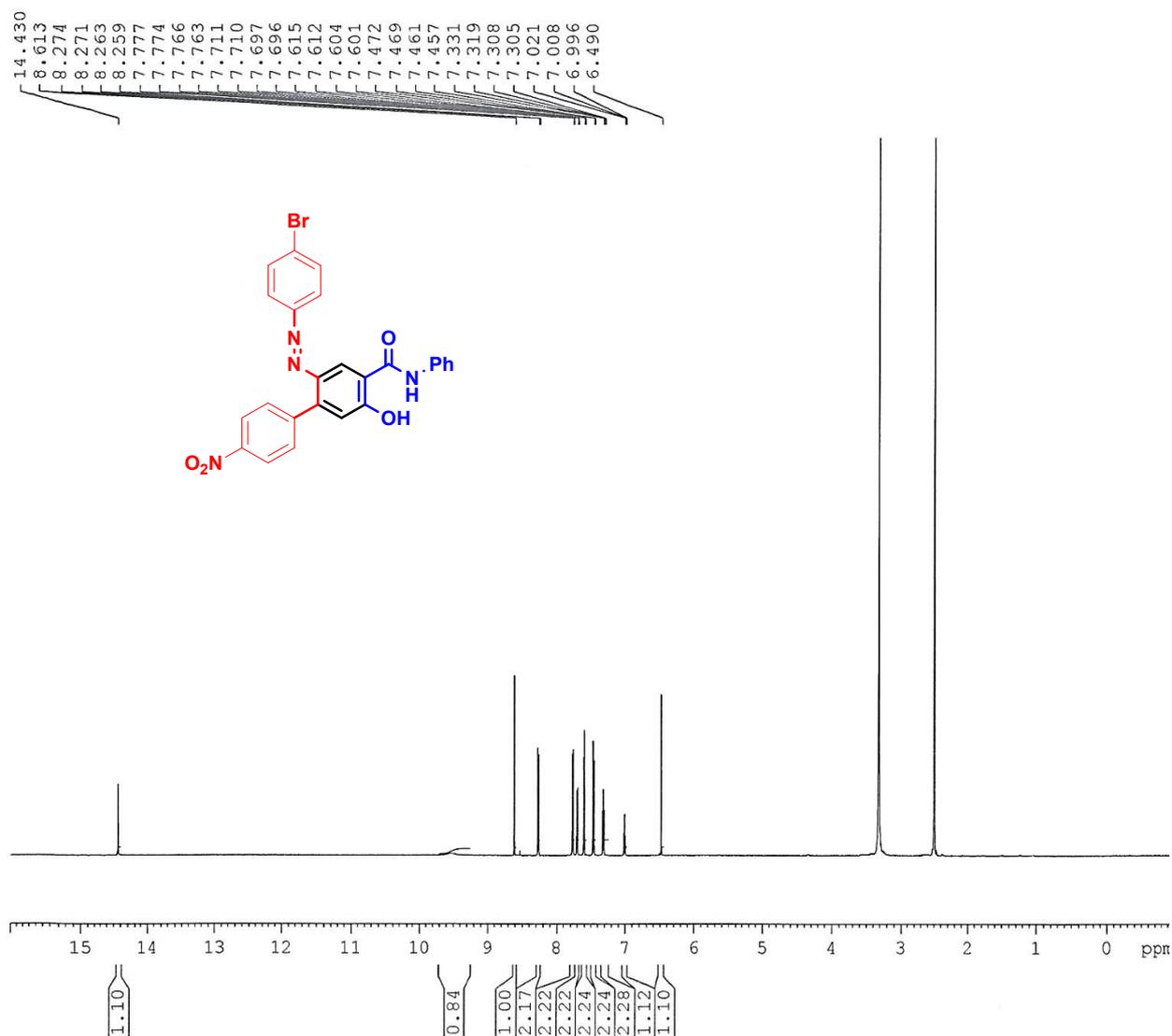
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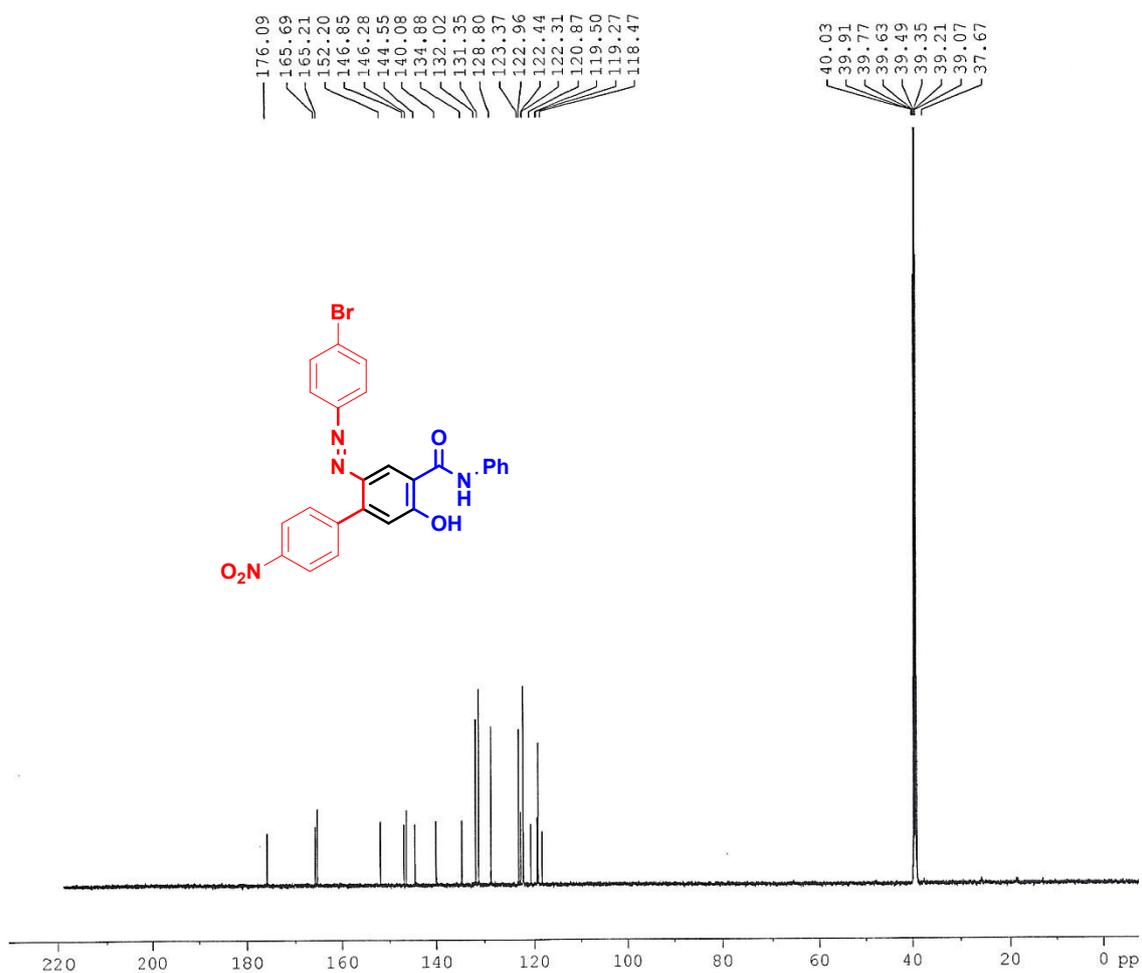
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## 2-(4-Bromophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3a)

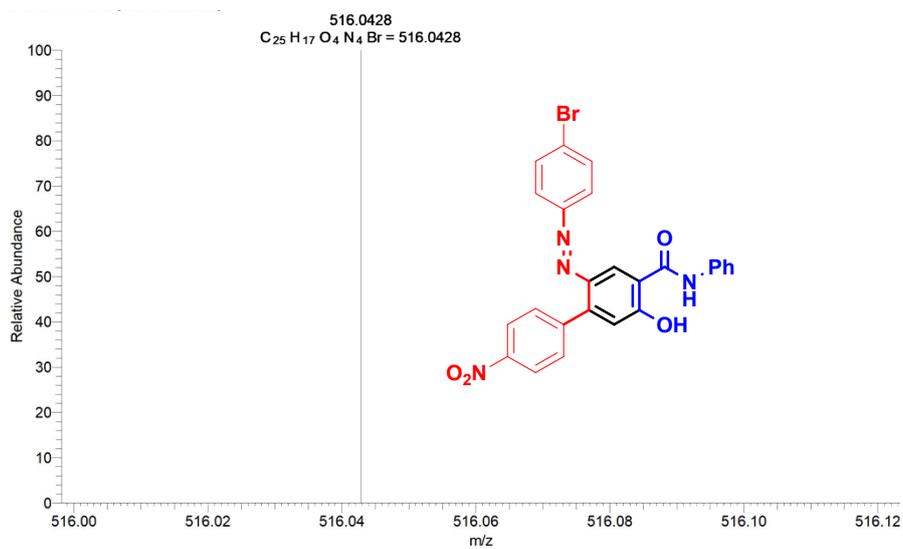


<sup>1</sup>H NMR spectrum of compound 3a

## 2-(4-Bromophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3a)

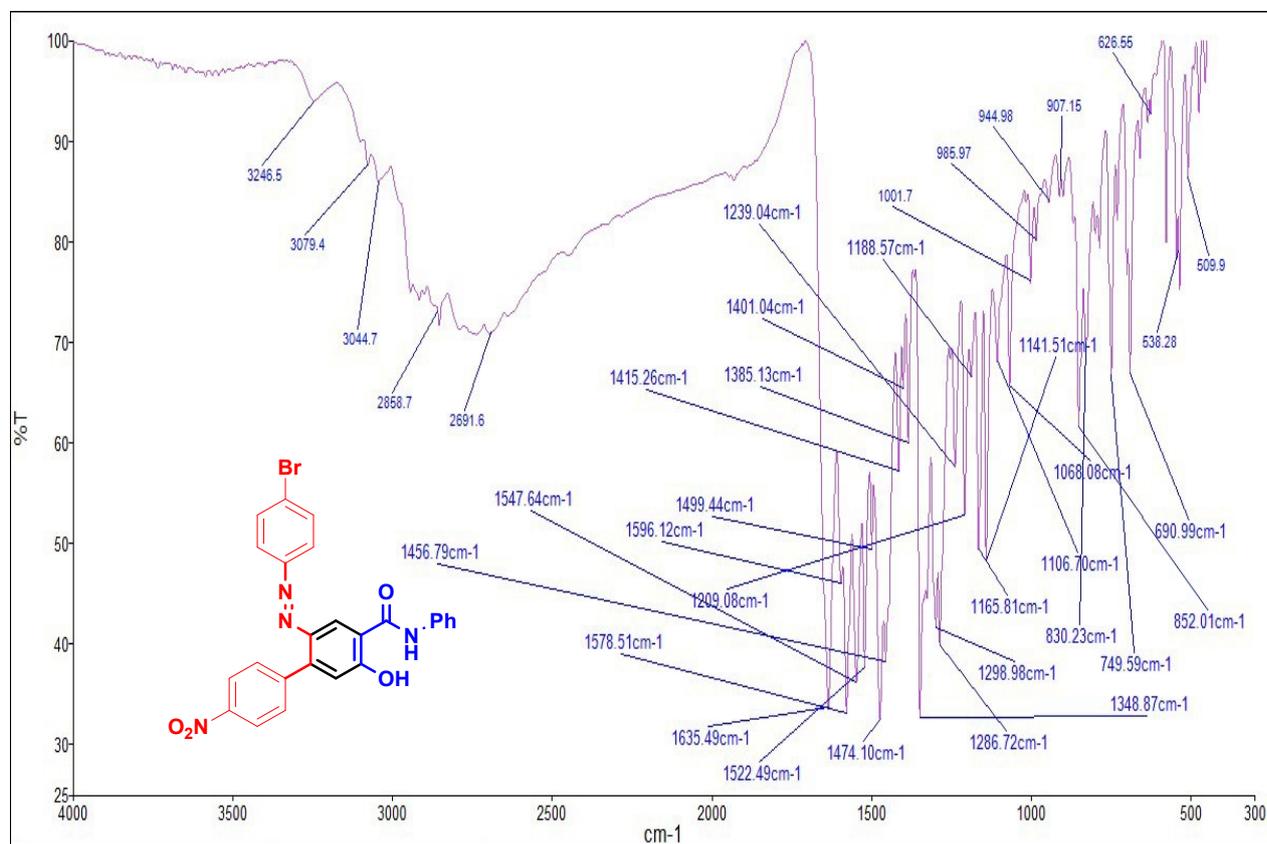


## <sup>13</sup>C NMR spectrum of compound 3a



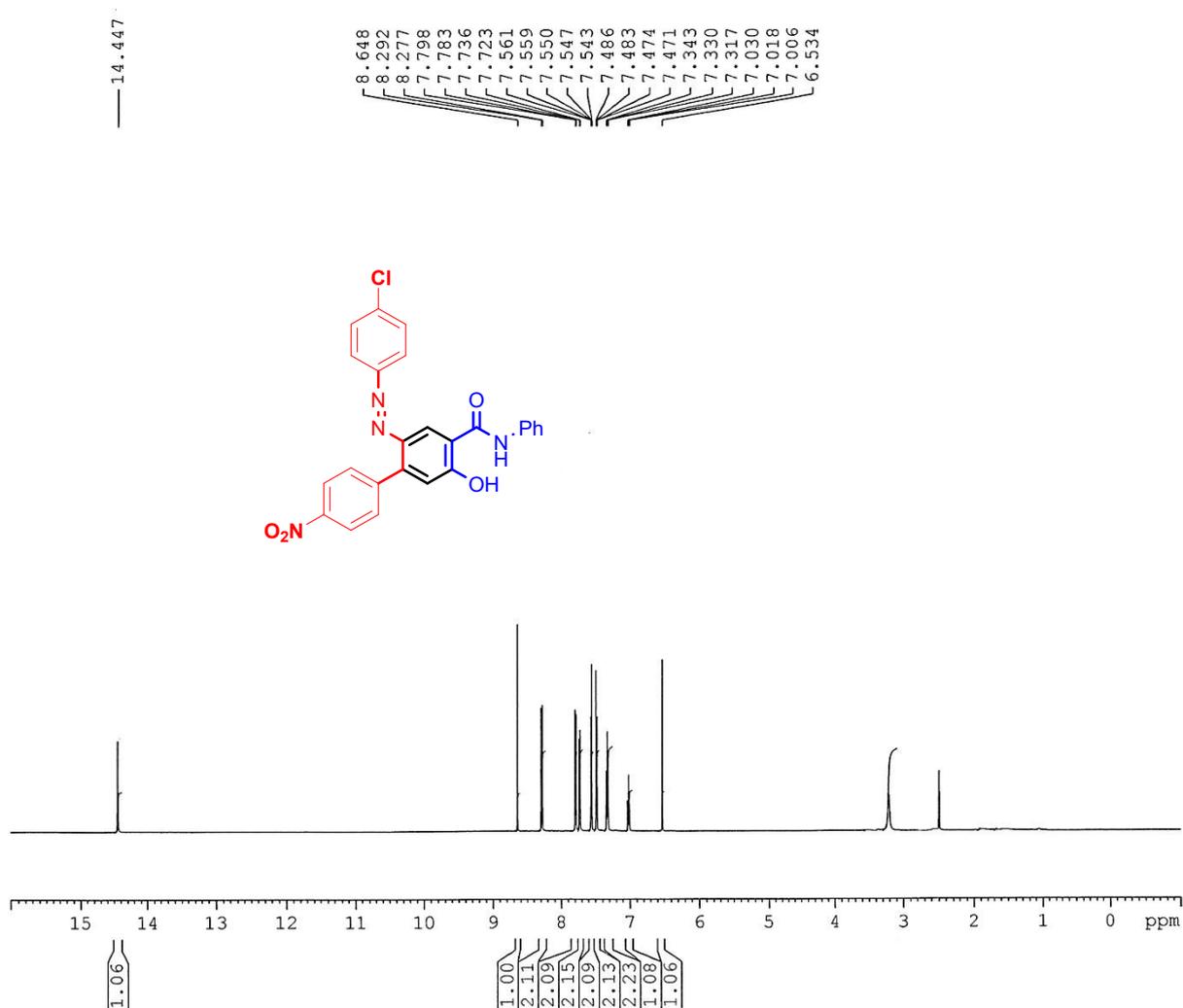
## HRMS spectrum of compound 3a

## 2-(4-Bromophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3a)



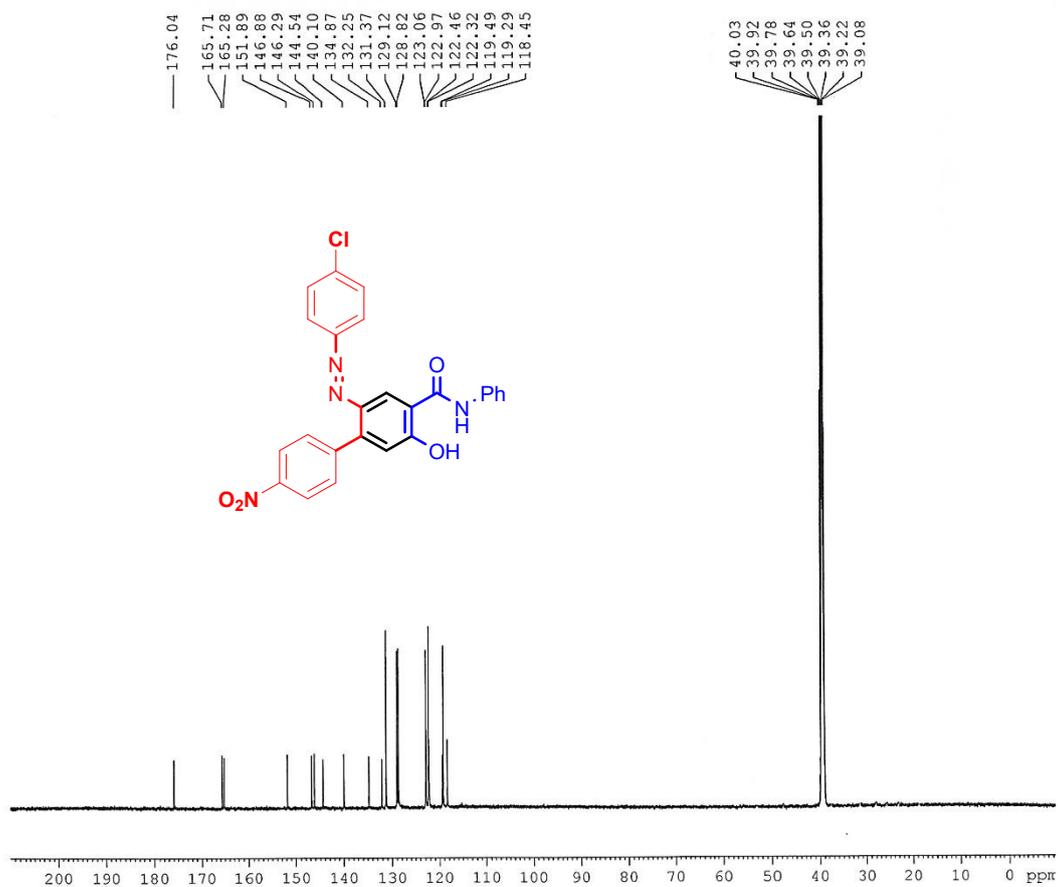
FT-IR spectrum of compound 3a

## 2-(4-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3b)

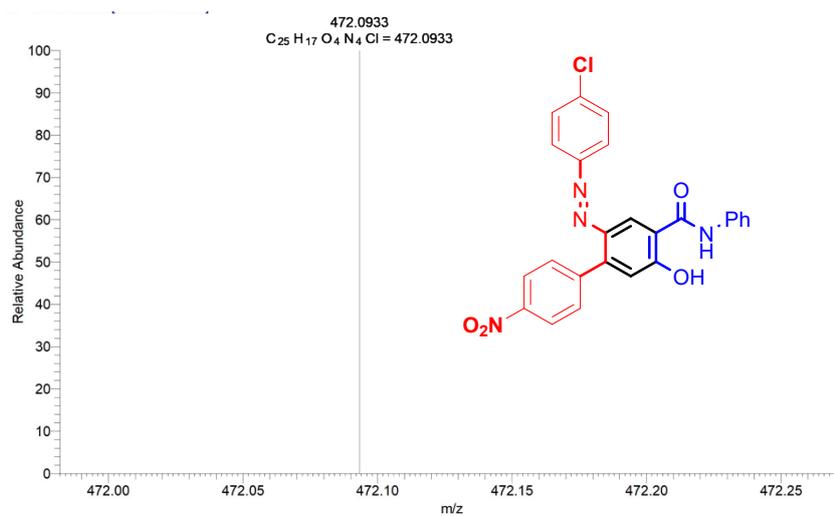


<sup>1</sup>H NMR spectrum of compound 3b

## 2-(4-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3b)

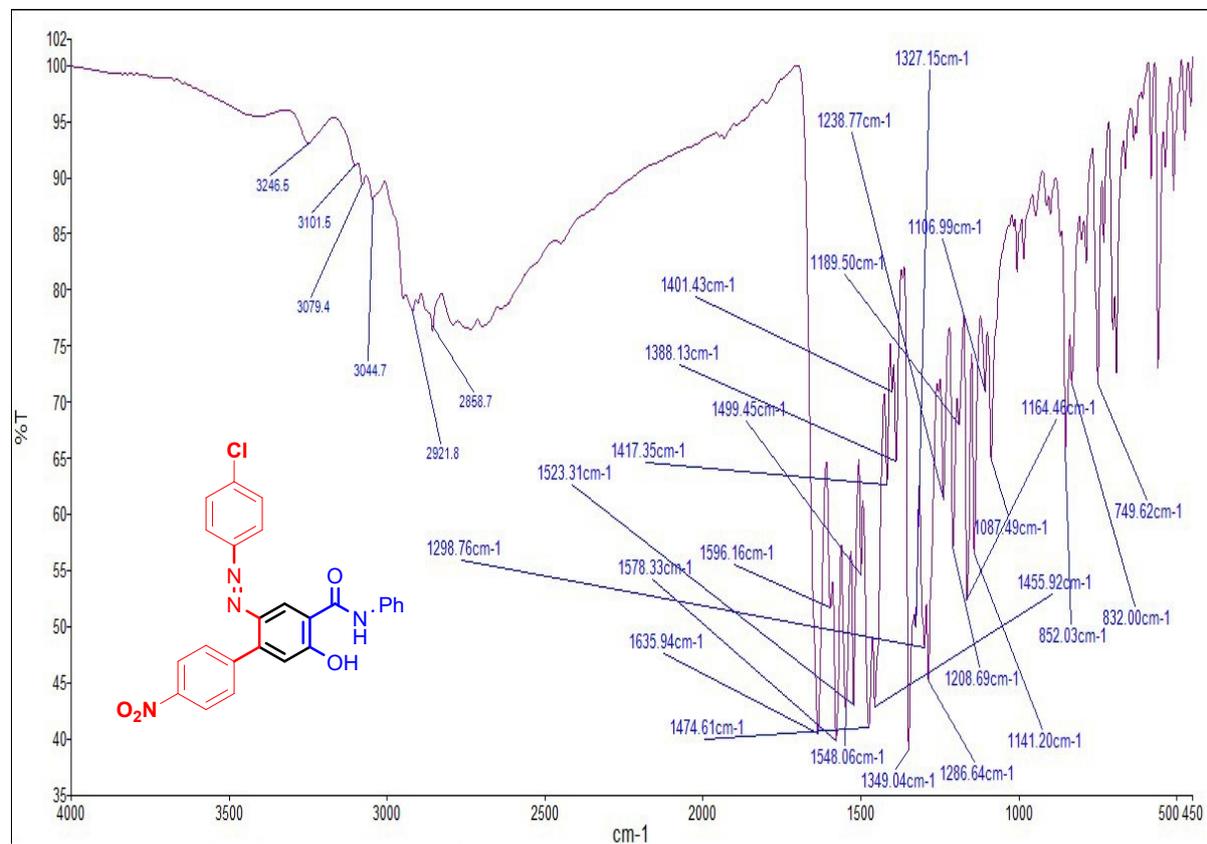


## <sup>13</sup>C NMR spectrum of compound 3b



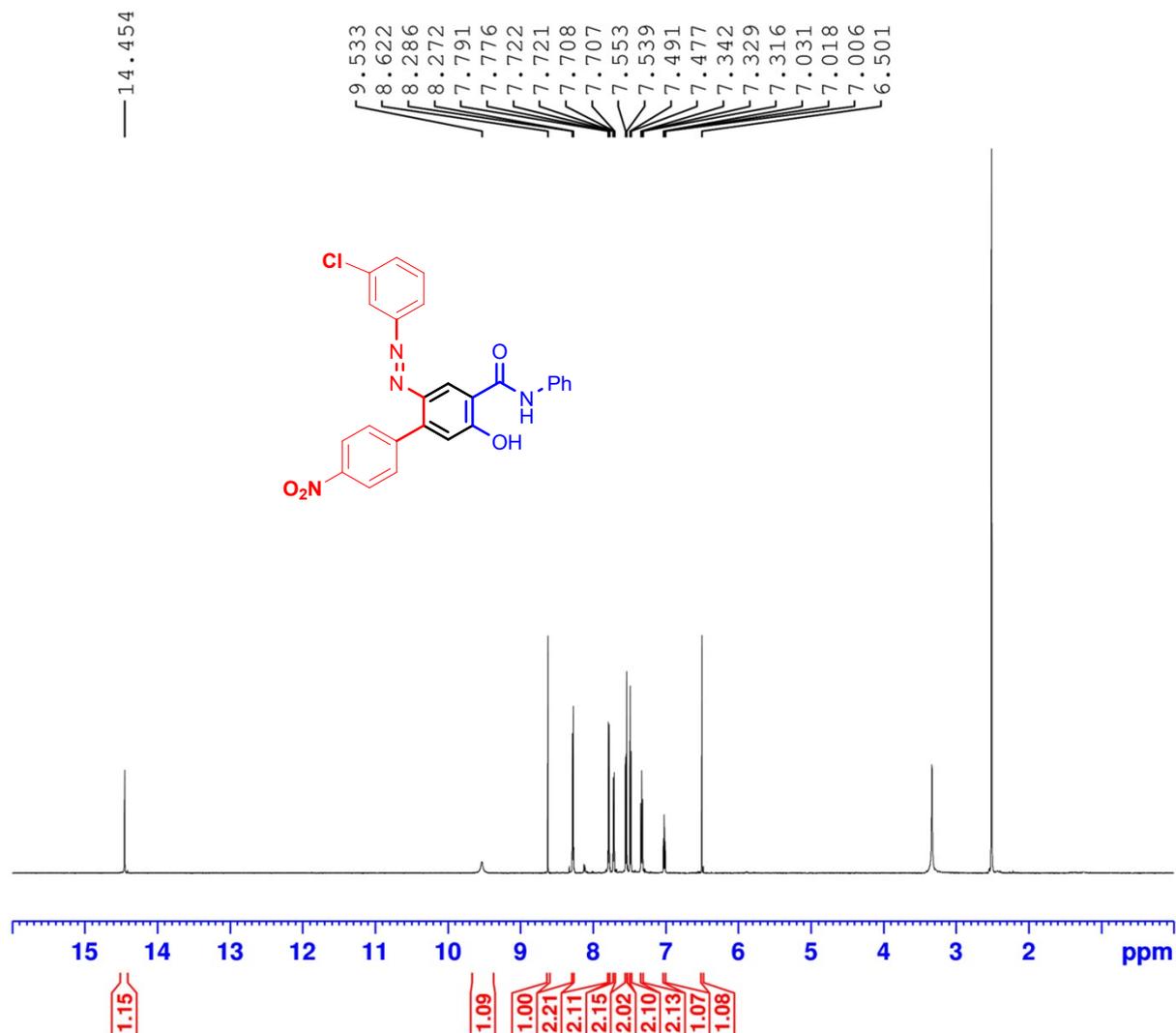
## HRMS spectrum of compound 3b

## 2-(4-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3b)



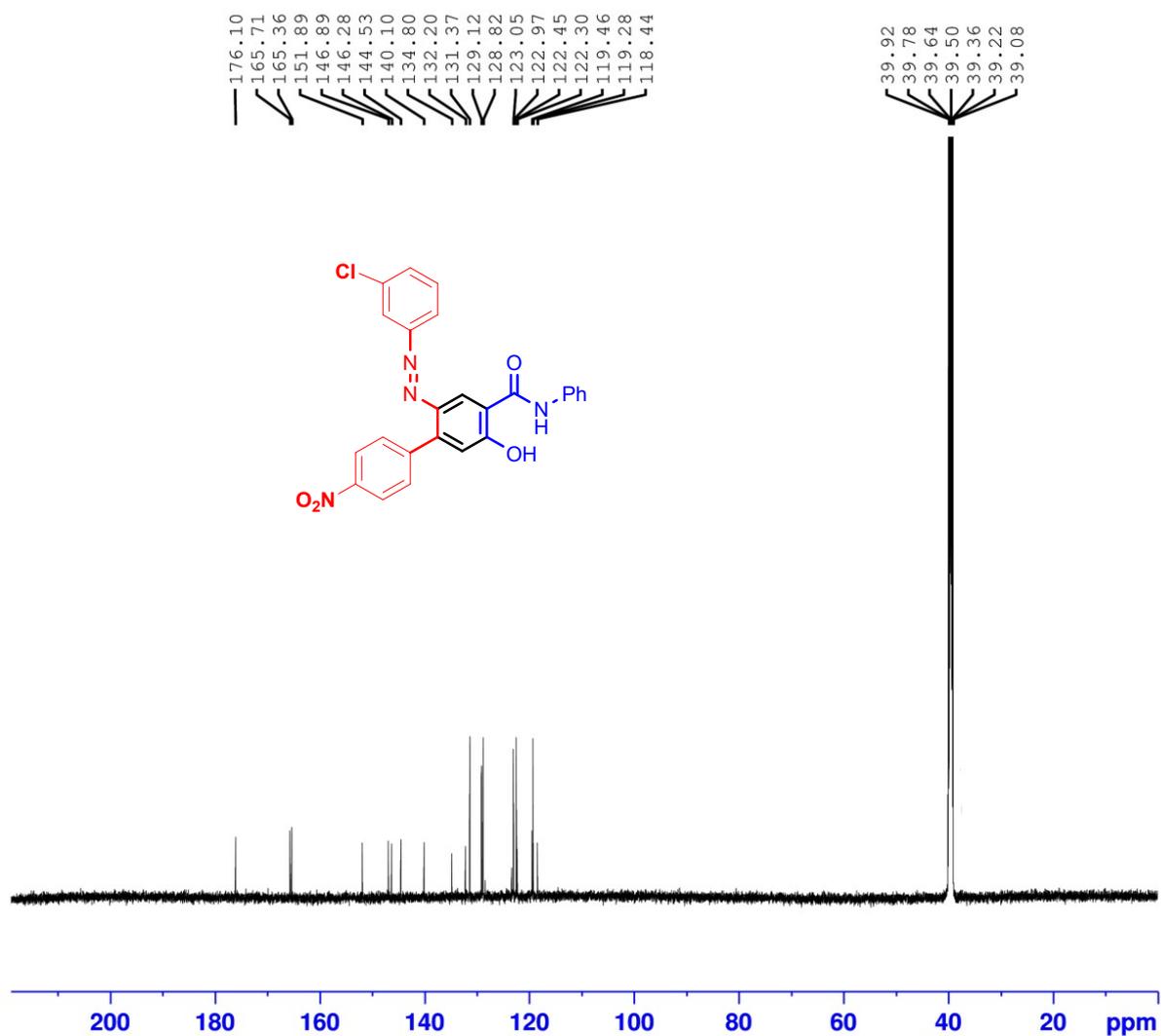
FT-IR spectrum of compound 3b

2-(3-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3c)



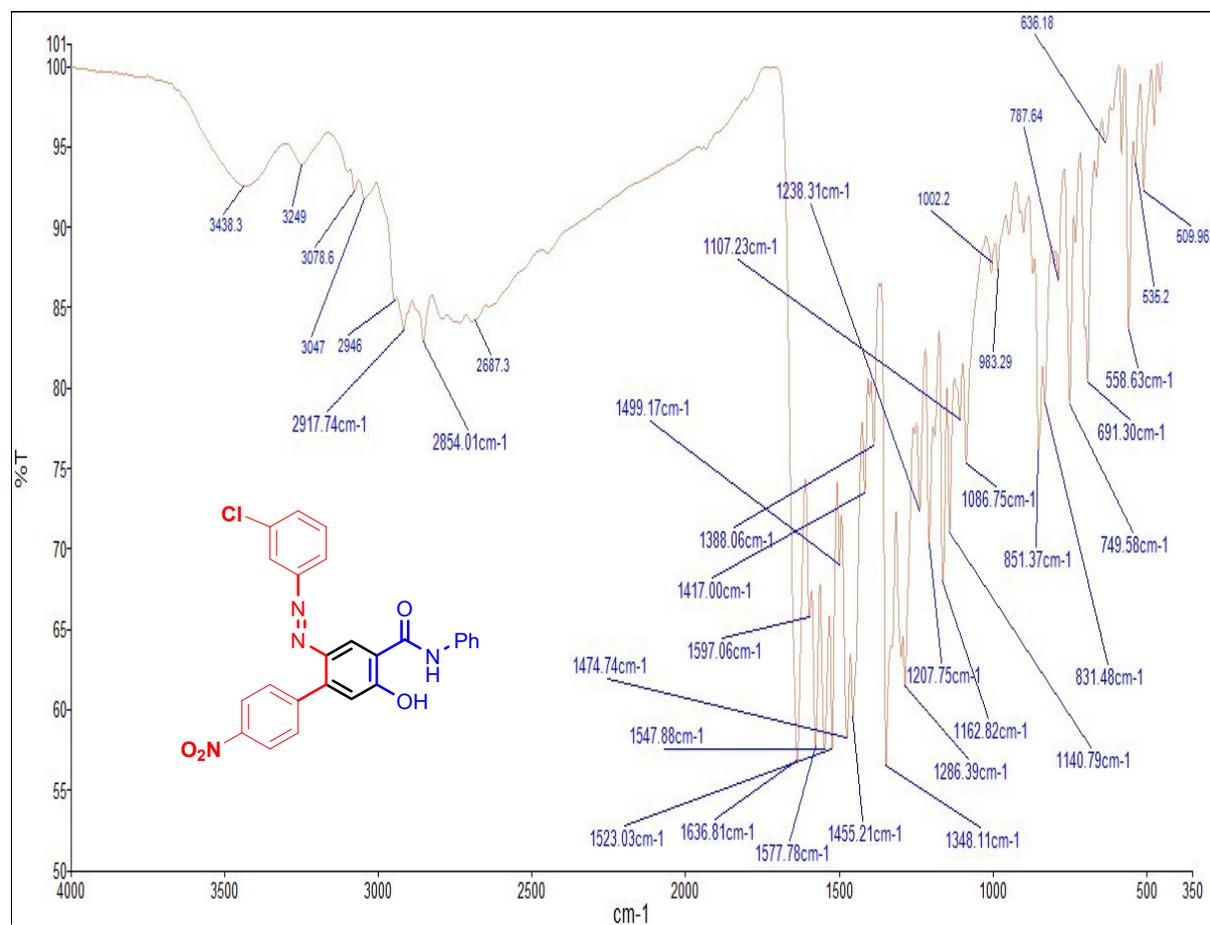
<sup>1</sup>H NMR spectrum of compound 3c

2-(3-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3c)



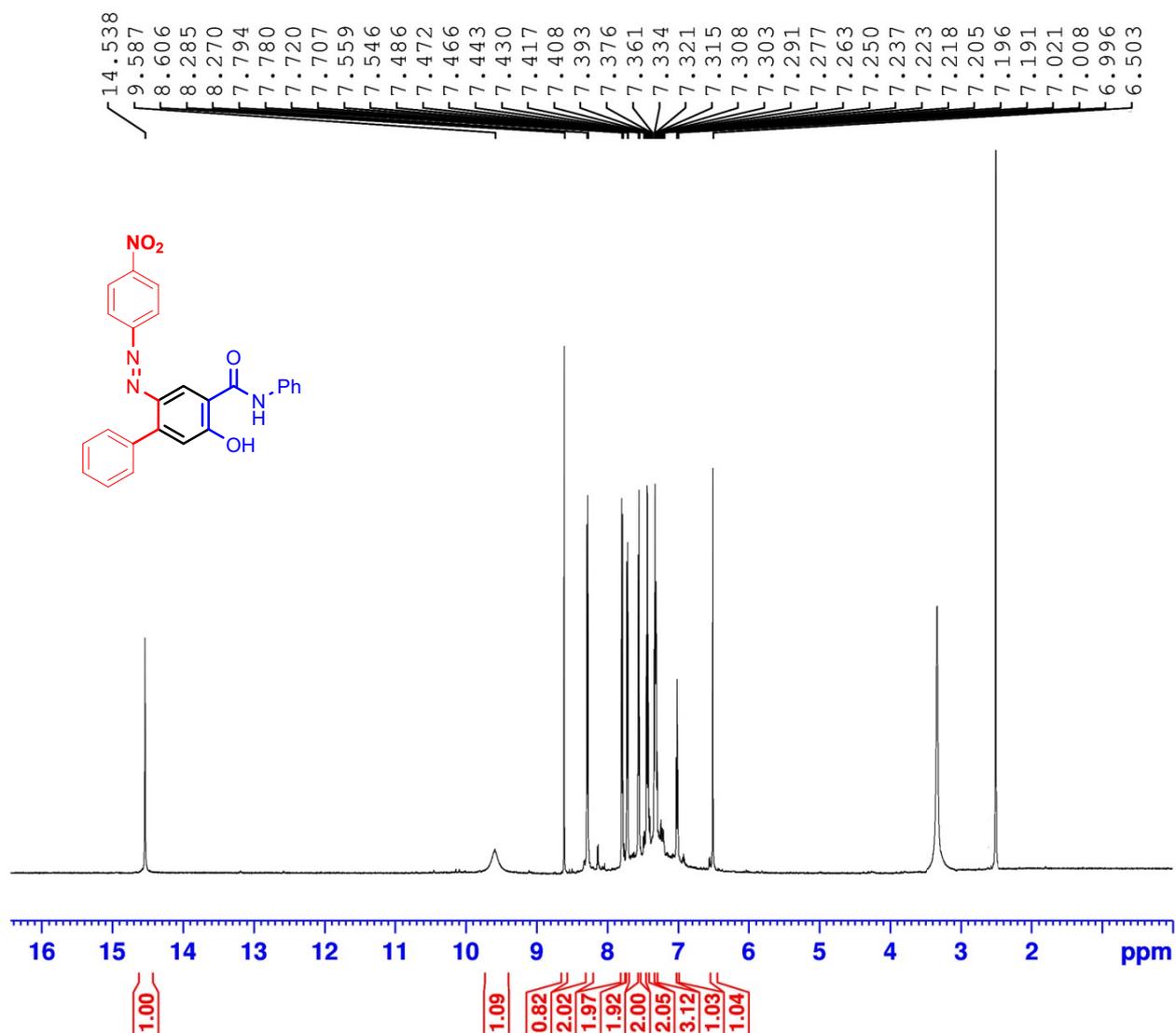
<sup>13</sup>C NMR spectrum of compound 3c

## 2-(3-Chlorophenylazo)-5-hydroxy-4'-nitro-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3c)



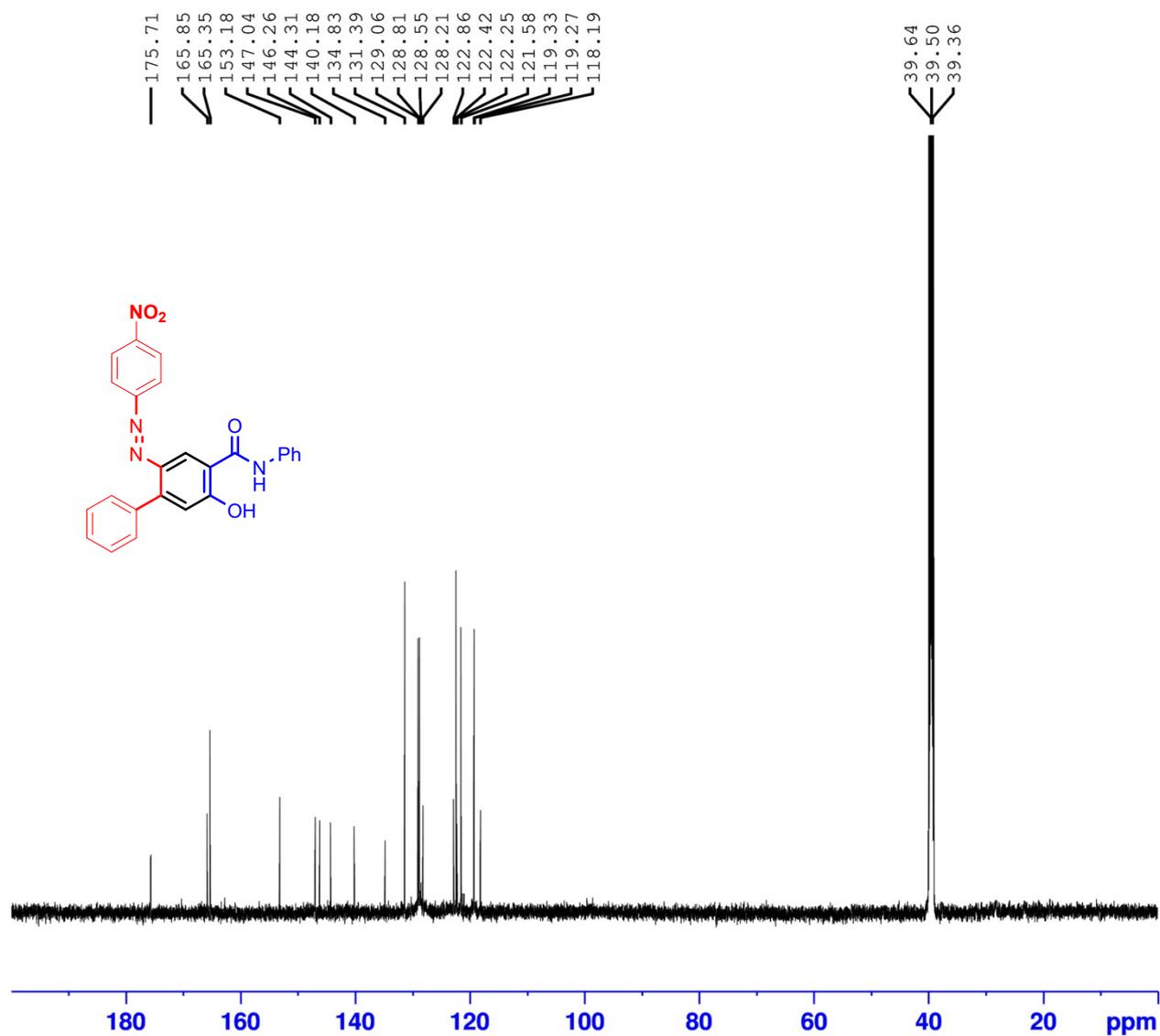
FT-IR spectrum of compound 3c

### 5-Hydroxy-2-(4-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3d)



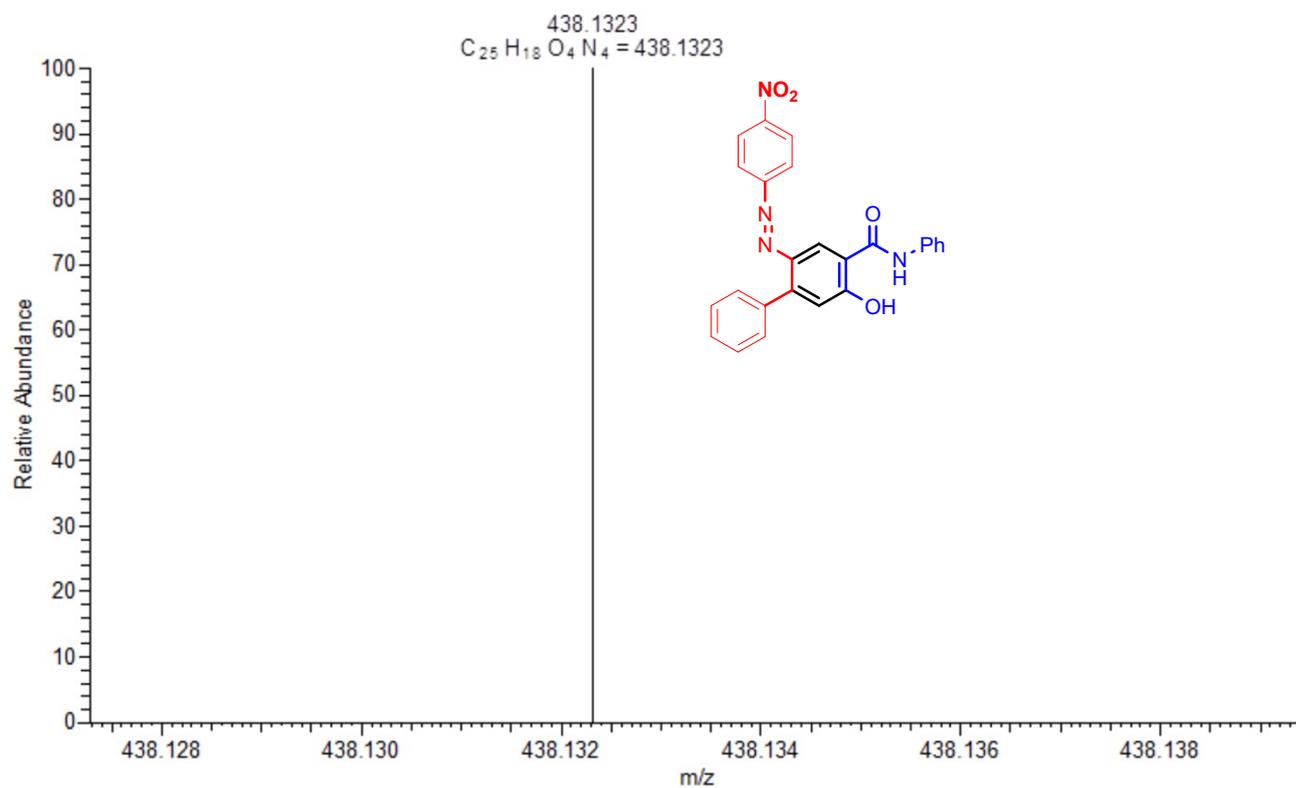
<sup>1</sup>H NMR spectrum of compound 3d

**5-Hydroxy-2-(4-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3d)**



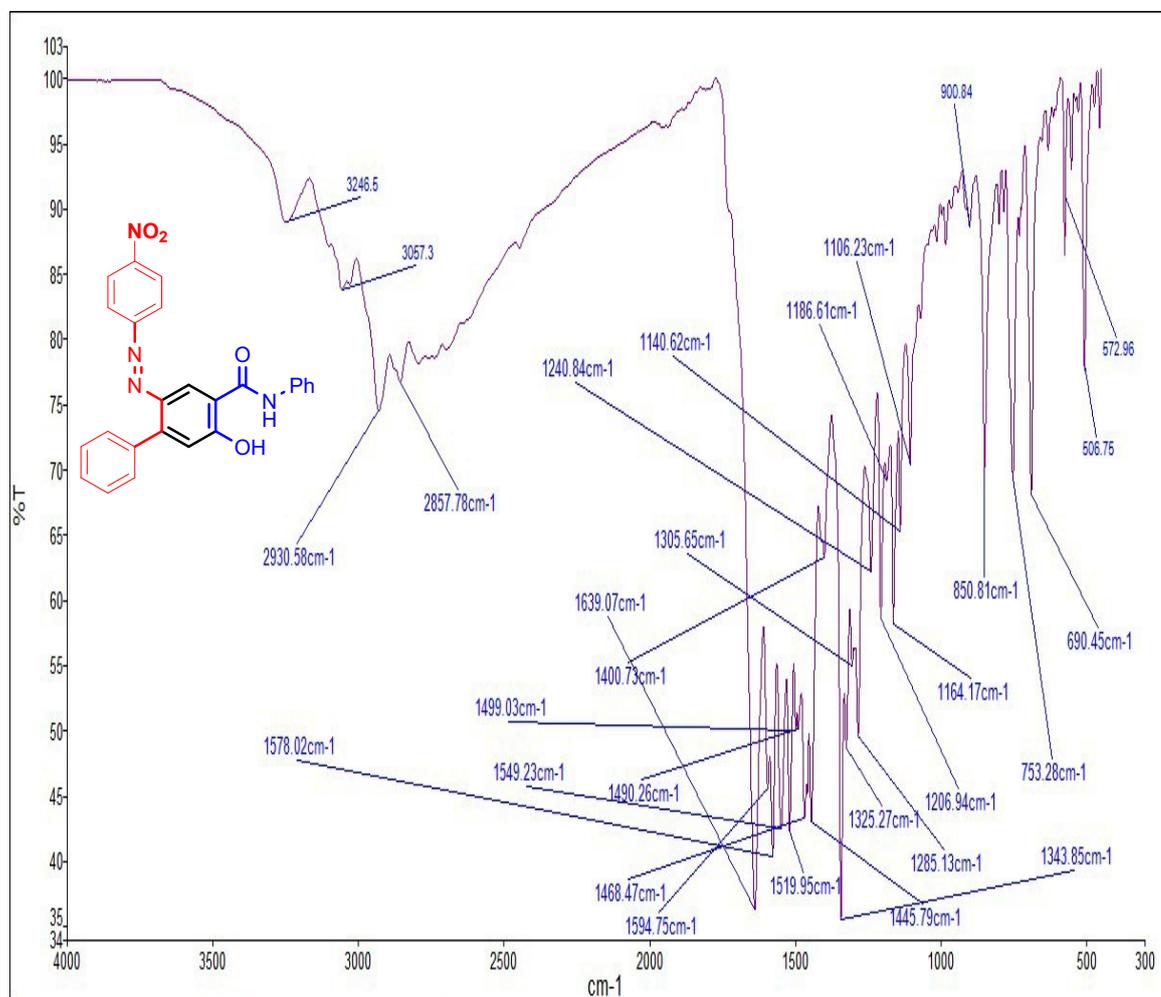
**<sup>13</sup>C NMR spectrum of compound 3d**

### 5-Hydroxy-2-(4-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3d)



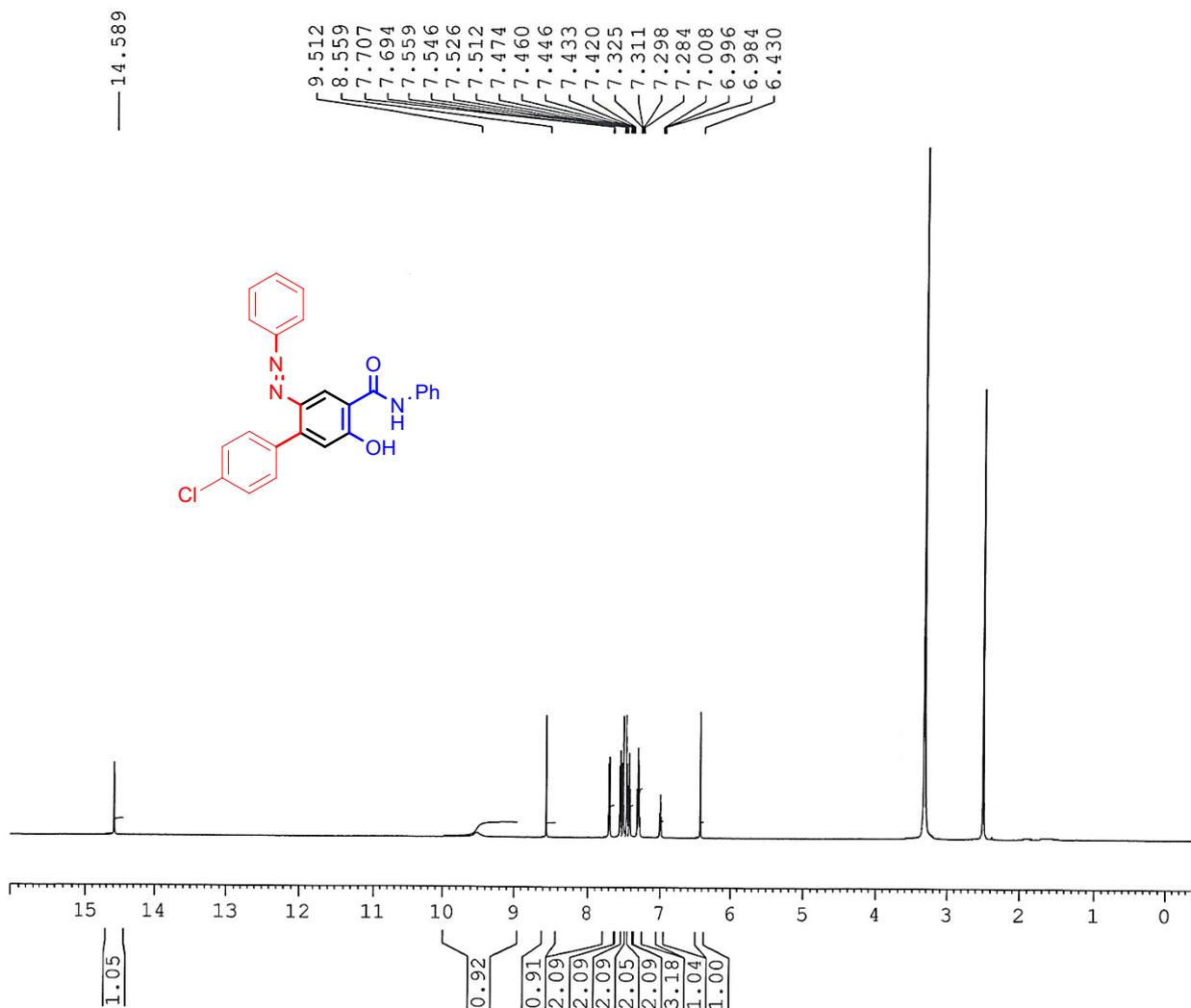
HRMS spectrum of compound 3d

### 5-Hydroxy-2-(4-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3d)



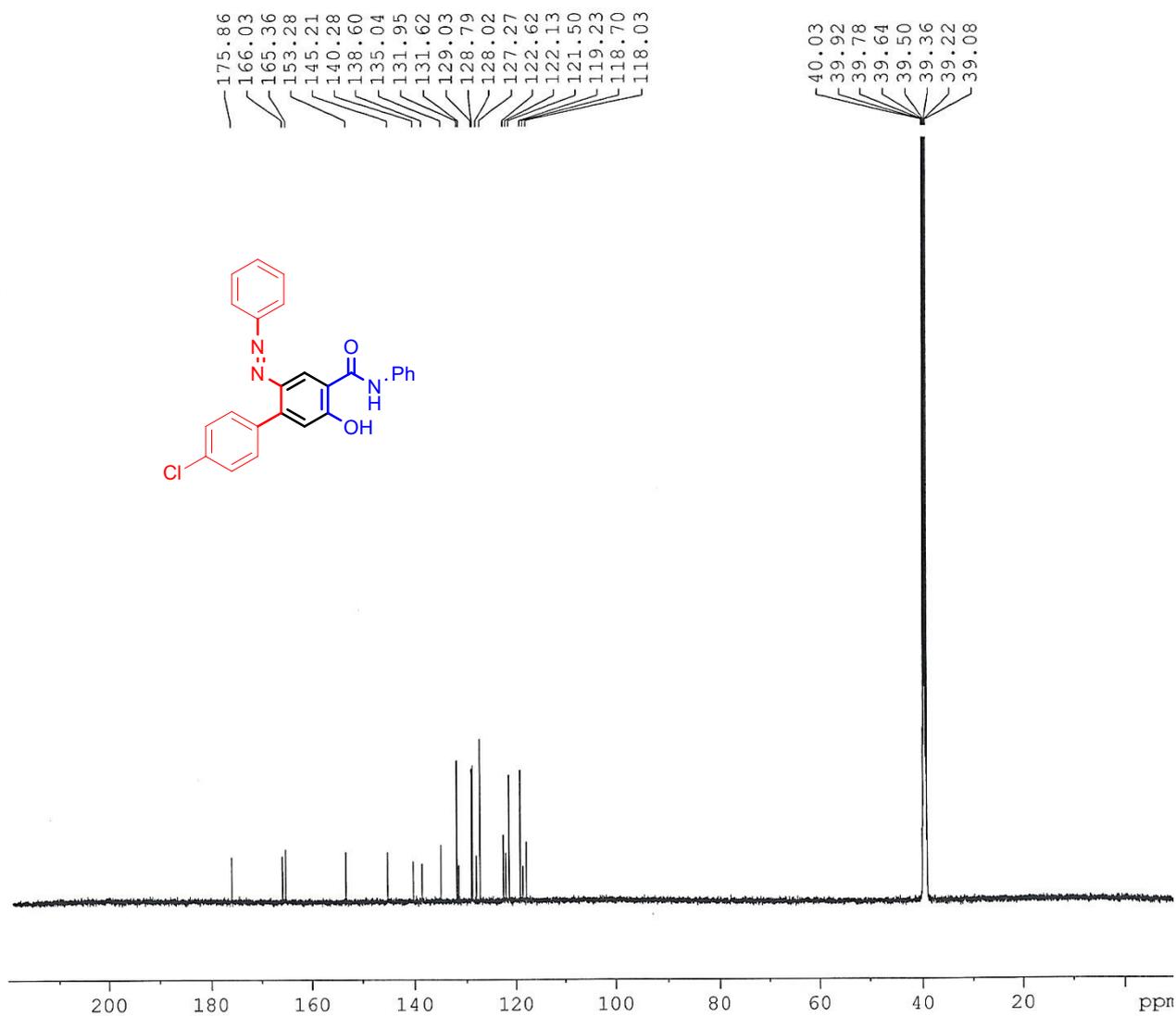
**FT-IR spectrum of compound 3d**

**4'-Chloro-5-hydroxy-N-phenyl-2-(phenylazo)-[1,1'-biphenyl]-4-carboxamide (3e)**



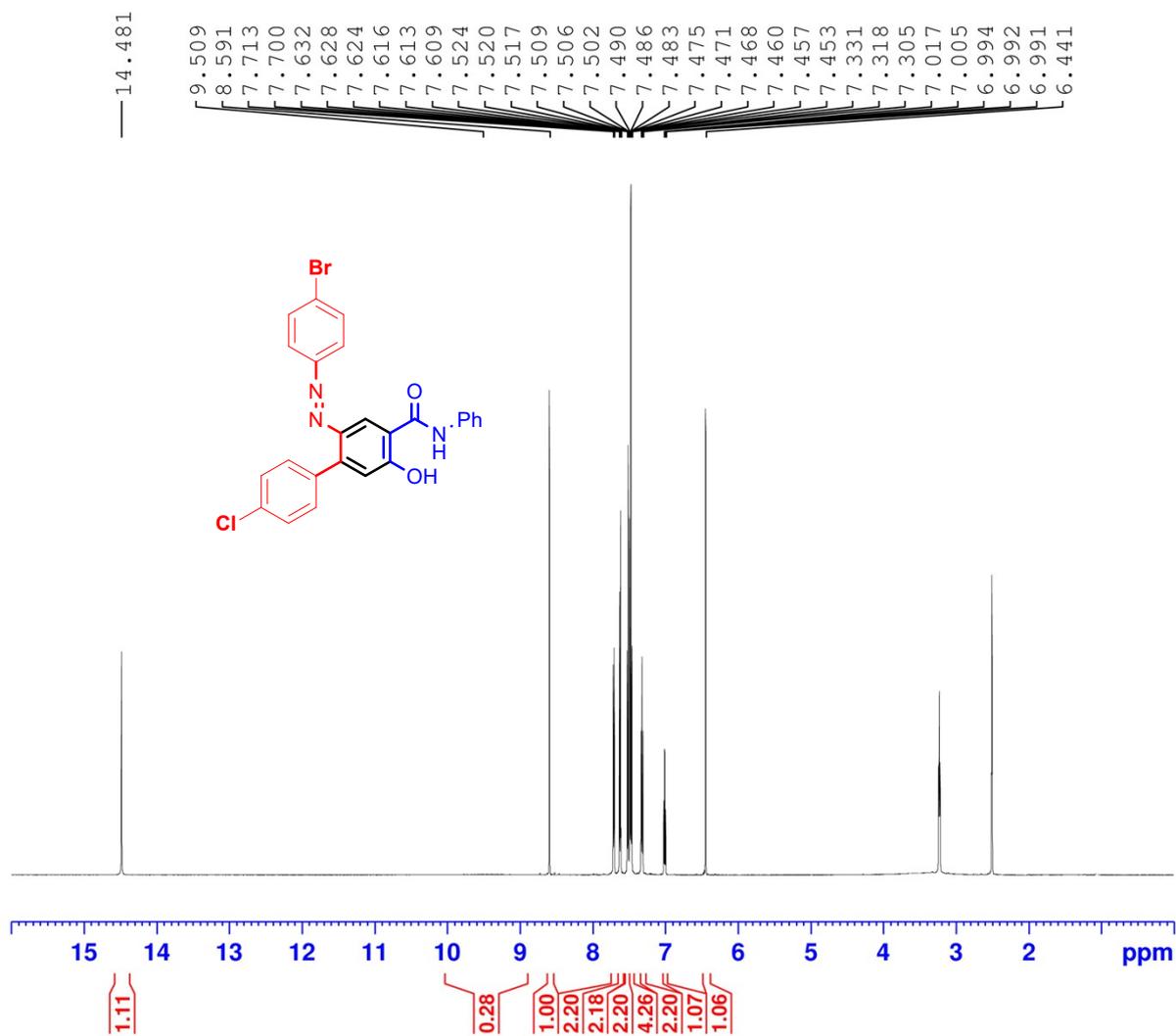
**<sup>1</sup>H NMR spectrum of compound 3e**

**4'-Chloro-5-hydroxy-N-phenyl-2-(phenylazo)-[1,1'-biphenyl]-4-carboxamide (3e)**



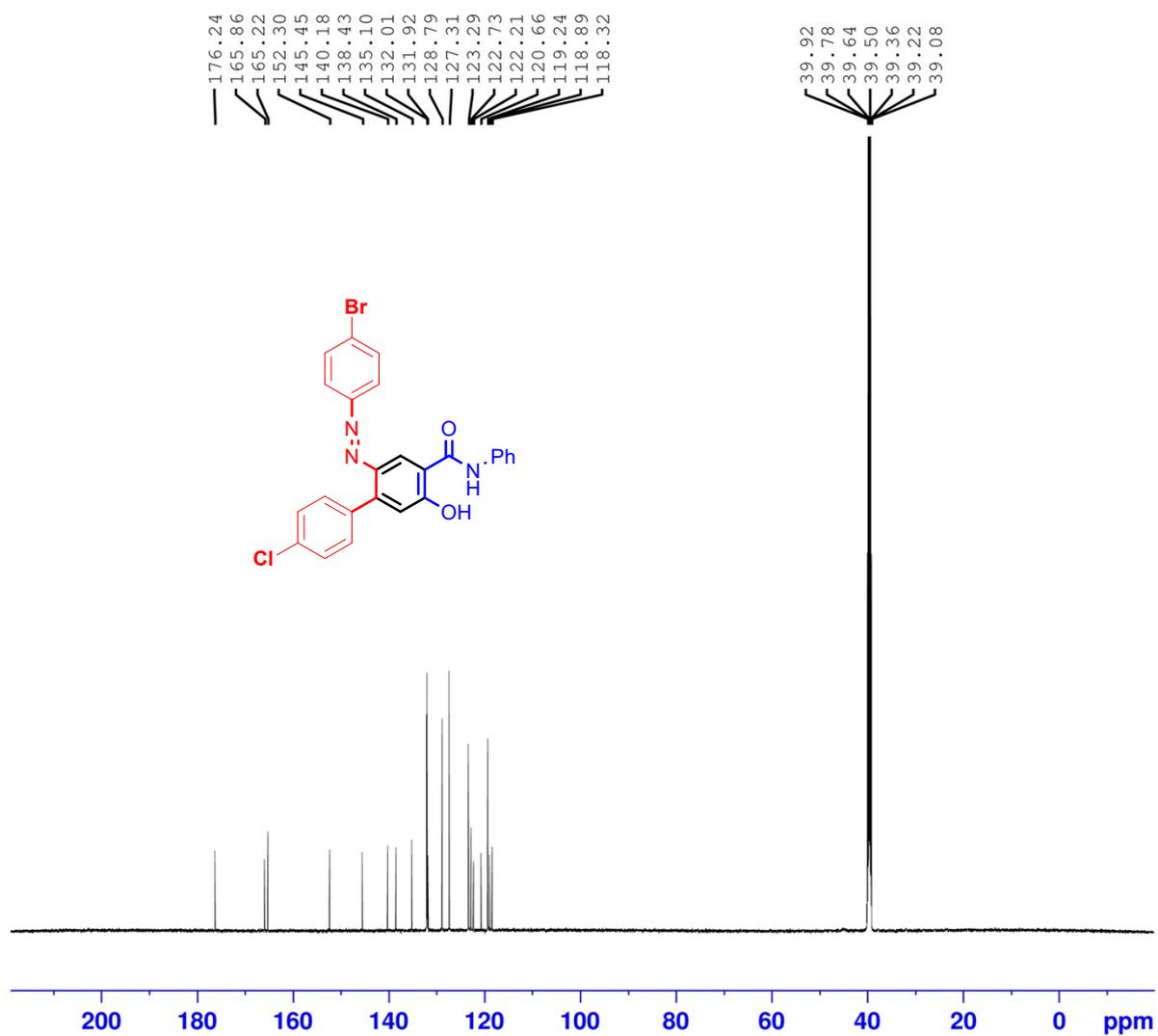
**<sup>13</sup>C NMR spectrum of compound 3e**

**2-(4-Bromophenylazo)-4'-chloro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3f)**



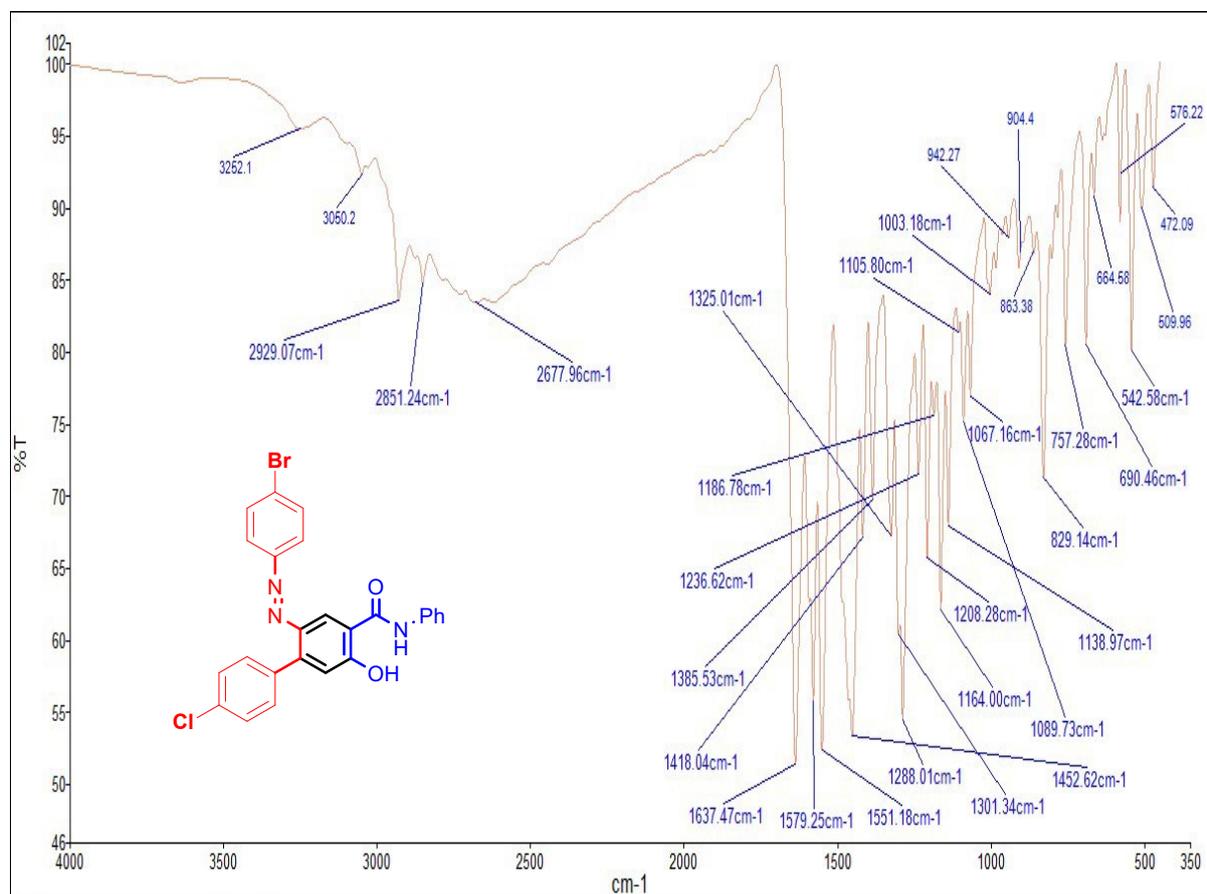
**<sup>1</sup>H NMR spectrum of compound 3f**

**2-(4-Bromophenylazo)-4'-chloro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3f)**



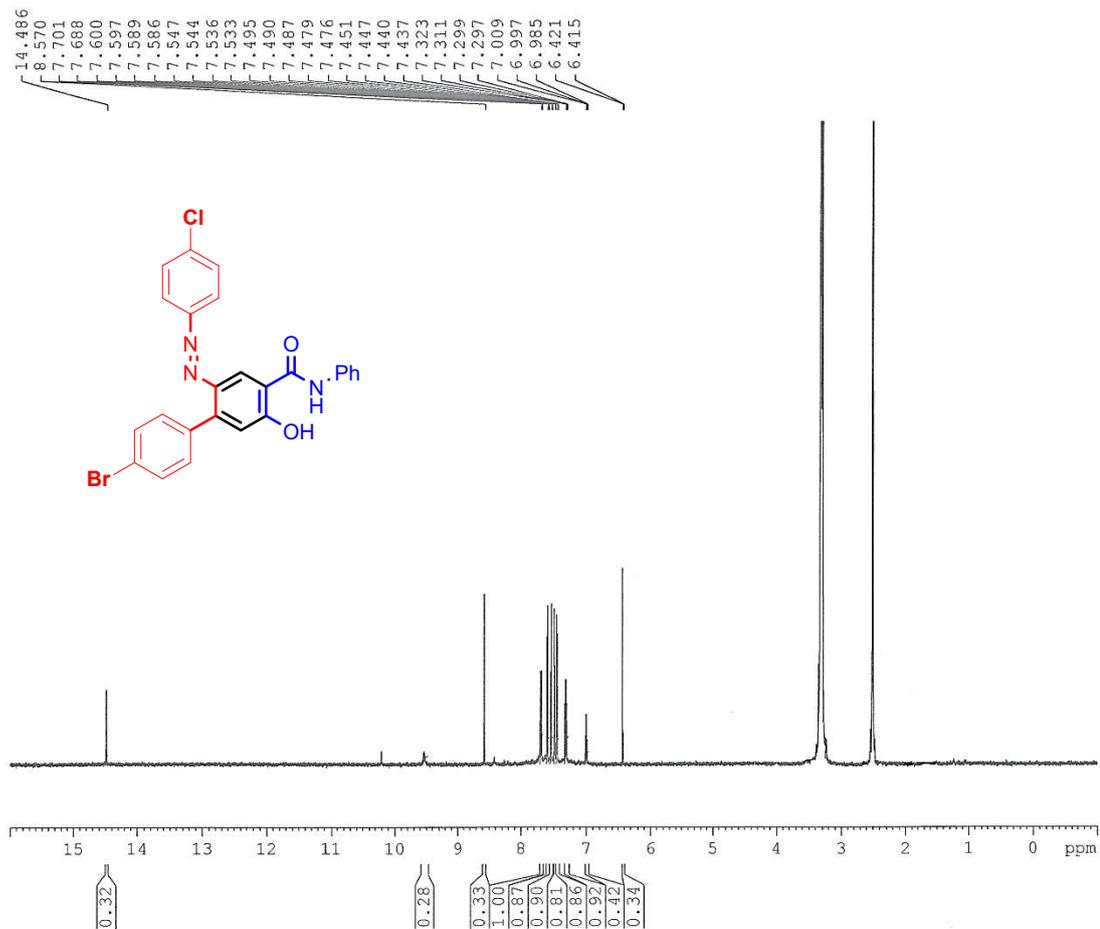
<sup>13</sup>C NMR spectrum of compound 3f

**2-(4-Bromophenylazo)-4'-chloro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3f)**



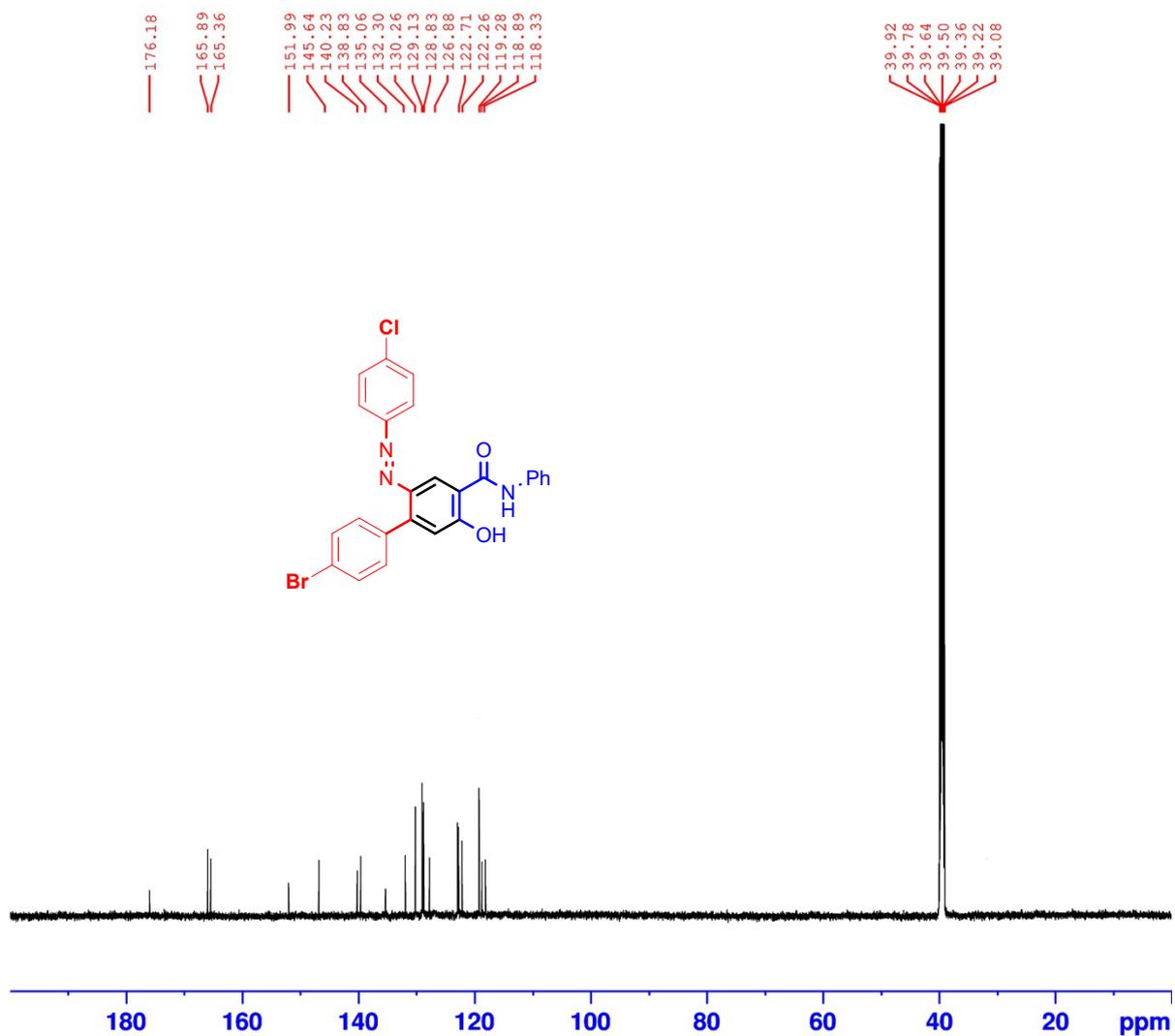
**FT-IR spectrum of compound 3f**

**4'-Bromo-2-(4-chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3g)**



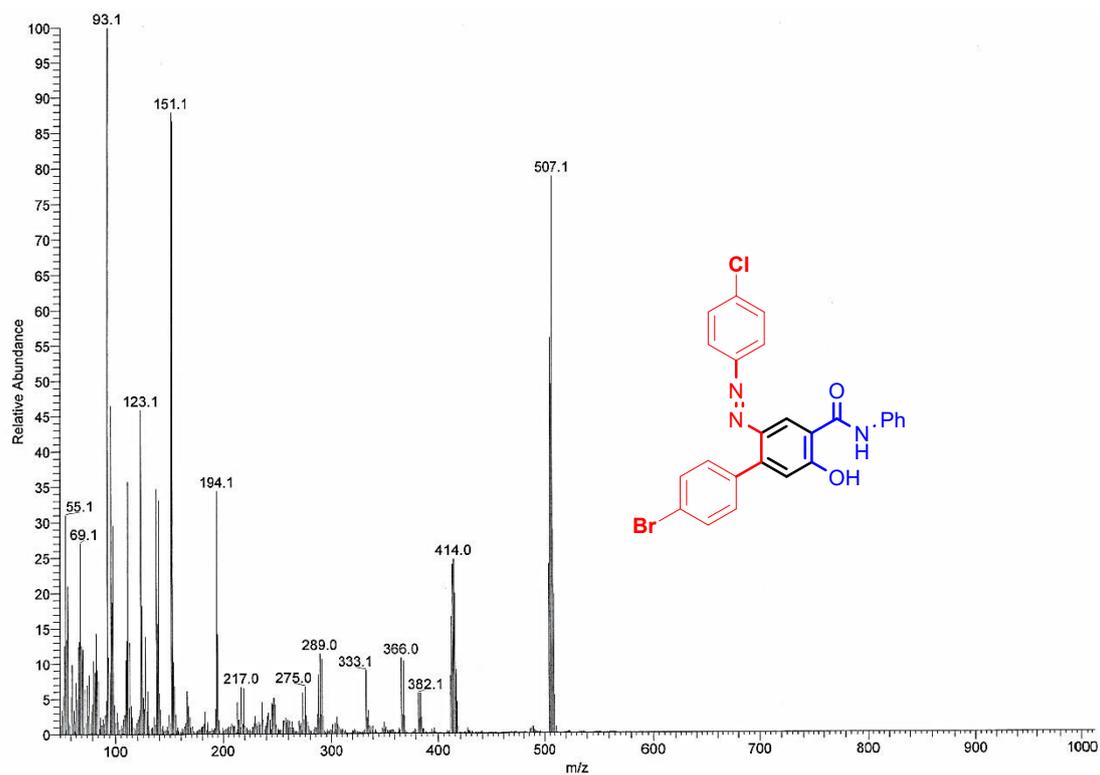
<sup>1</sup>H NMR spectrum of compound 3g

**4'-Bromo-2-(4-chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3g)**

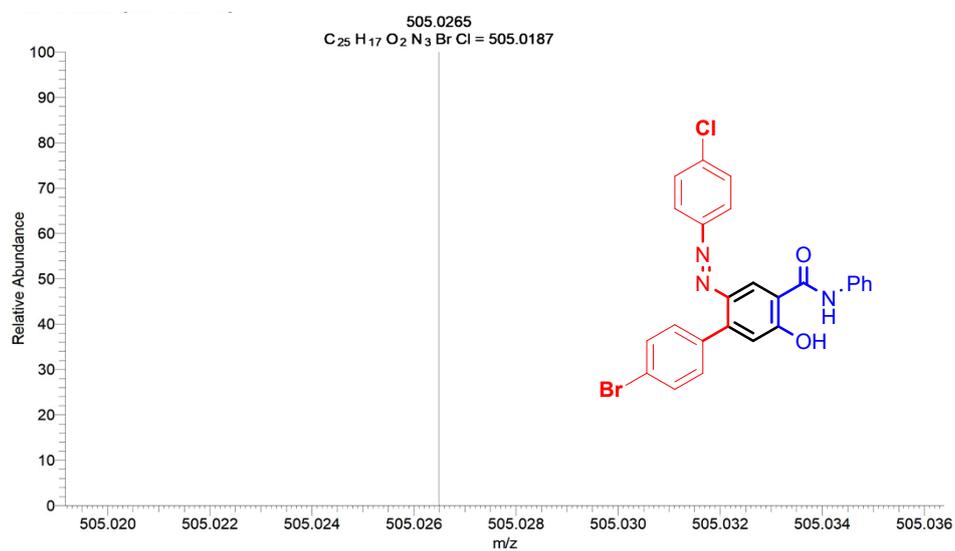


<sup>13</sup>C NMR spectrum of compound 3g

**4'-Bromo-2-(4-chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3g)**

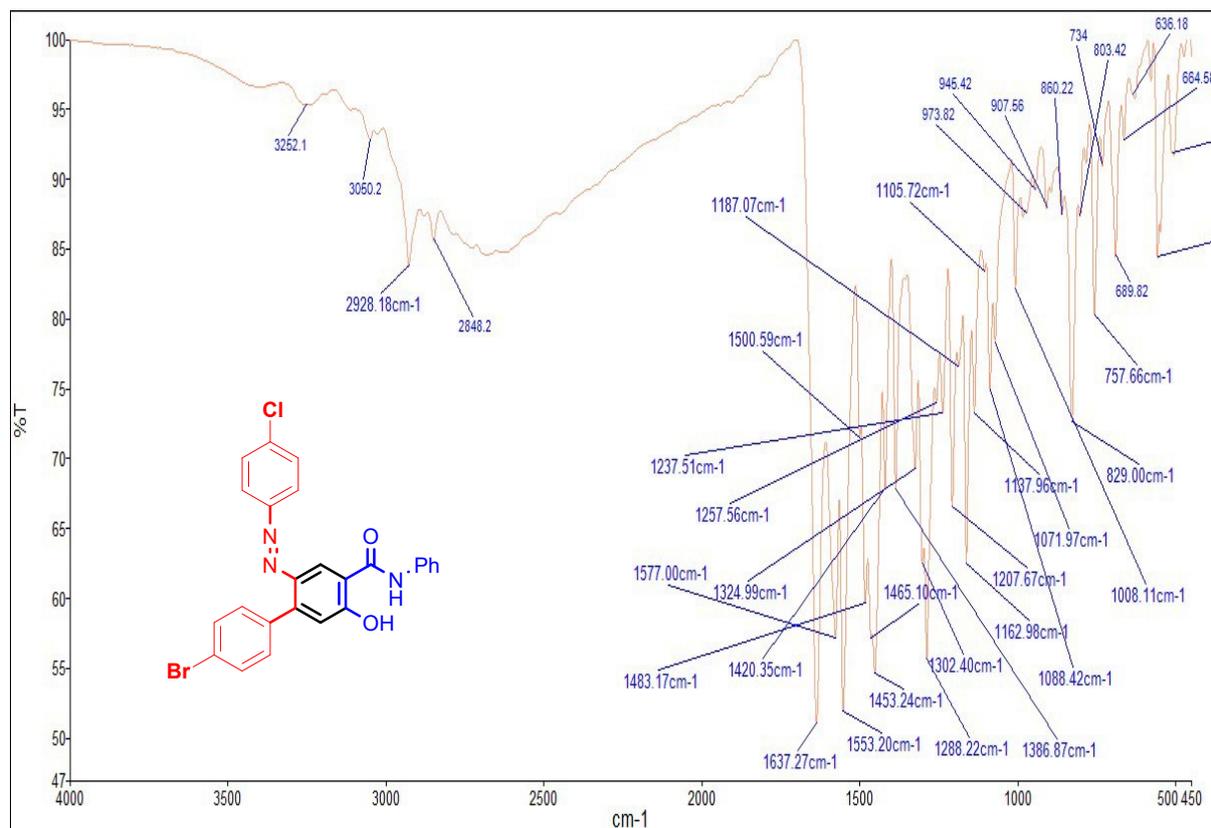


**Mass spectrum of compound 3g**



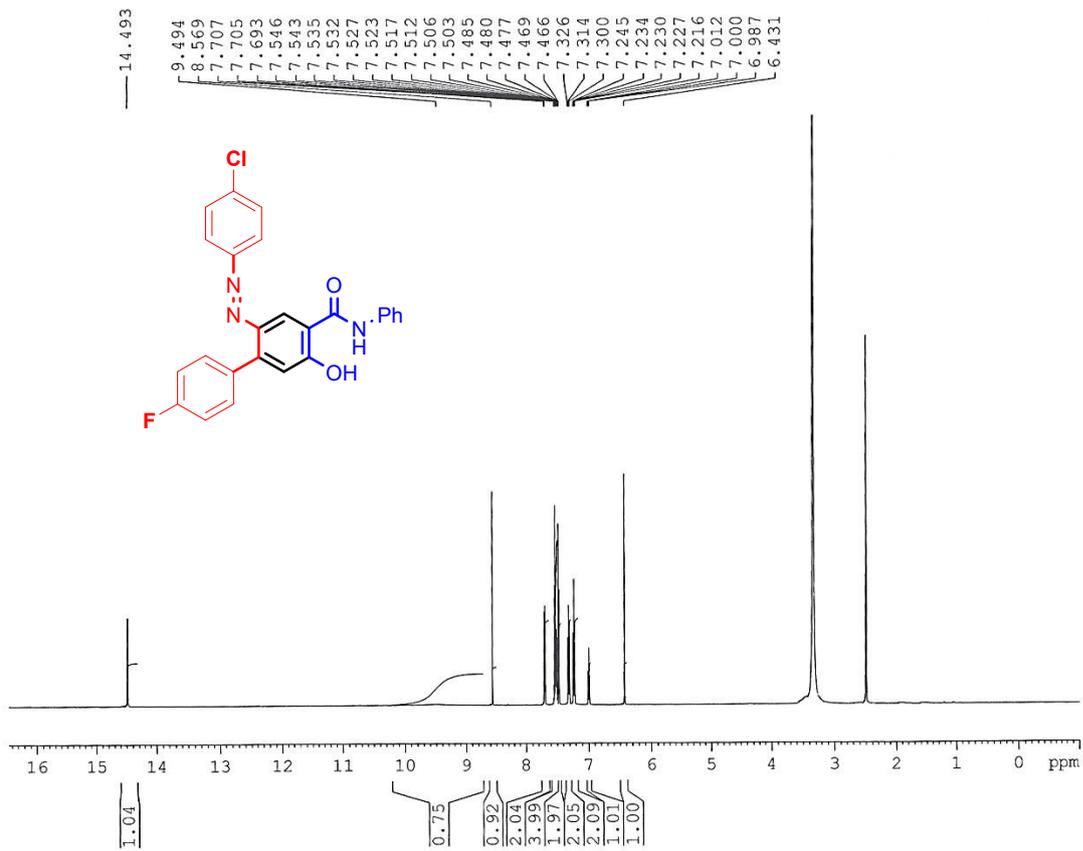
**HRMS spectrum of compound 3g**

**4'-Bromo-2-(4-chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3g)**



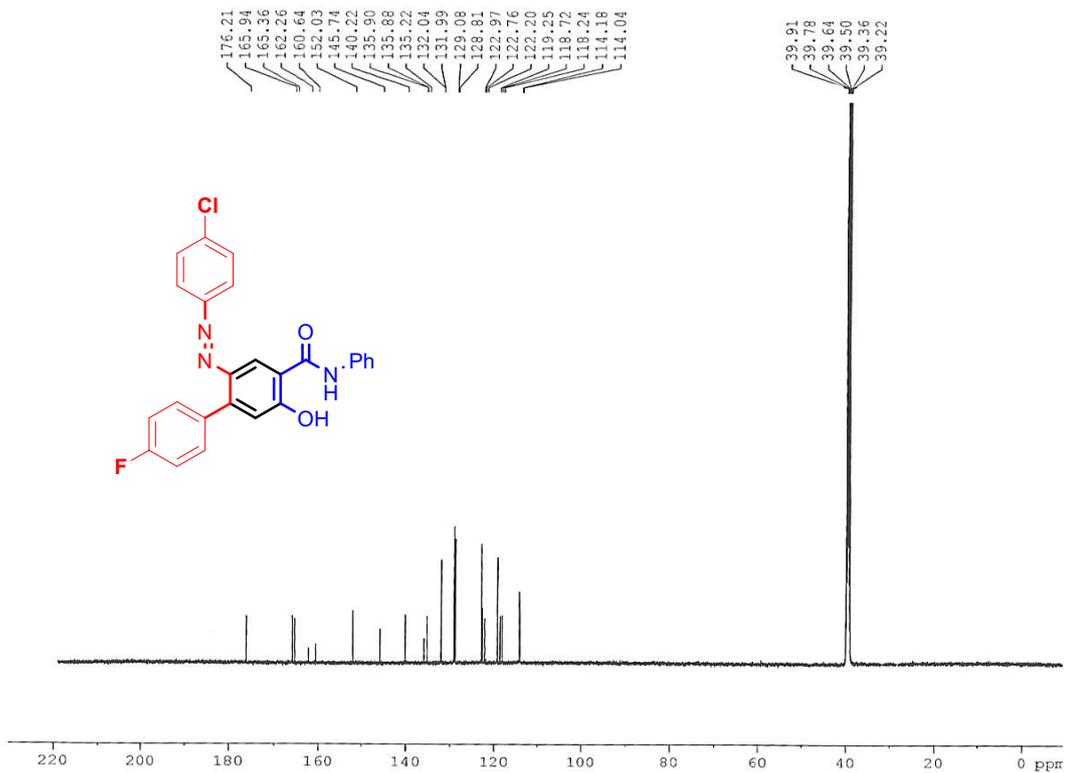
**FT-IR spectrum of compound 3g**

**2-(4-Chlorophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3i)**

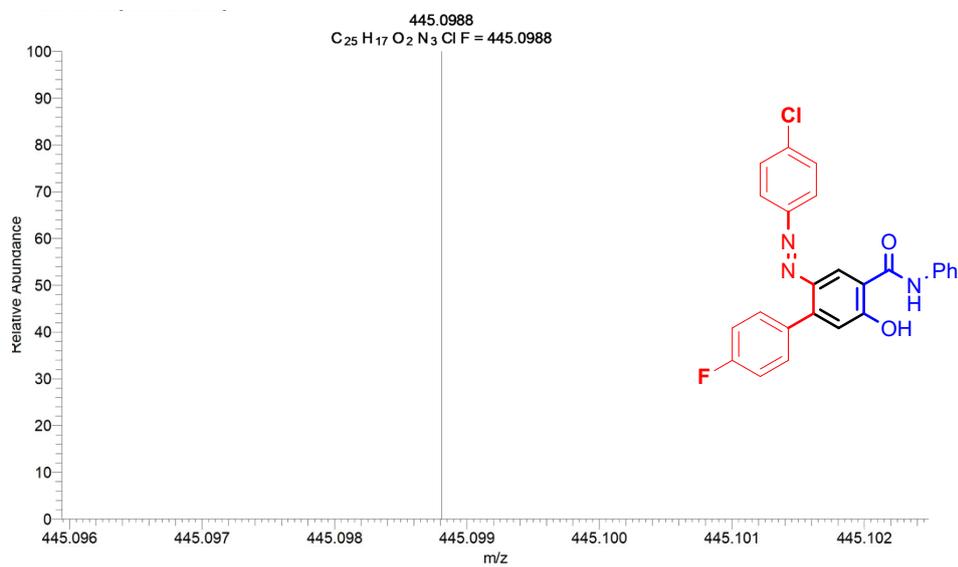


**<sup>1</sup>H NMR spectrum of compound 3i**

**2-(4-Chlorophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3i):**

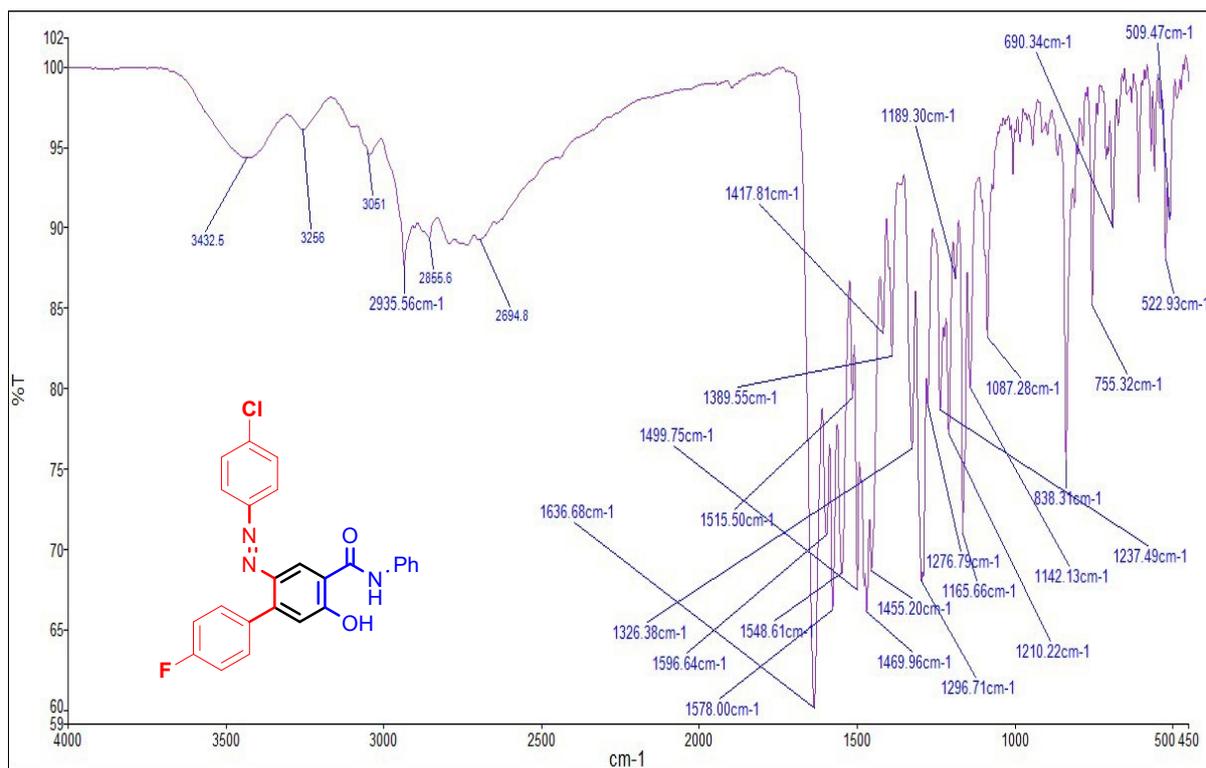


**<sup>13</sup>C NMR spectrum of compound 3i**



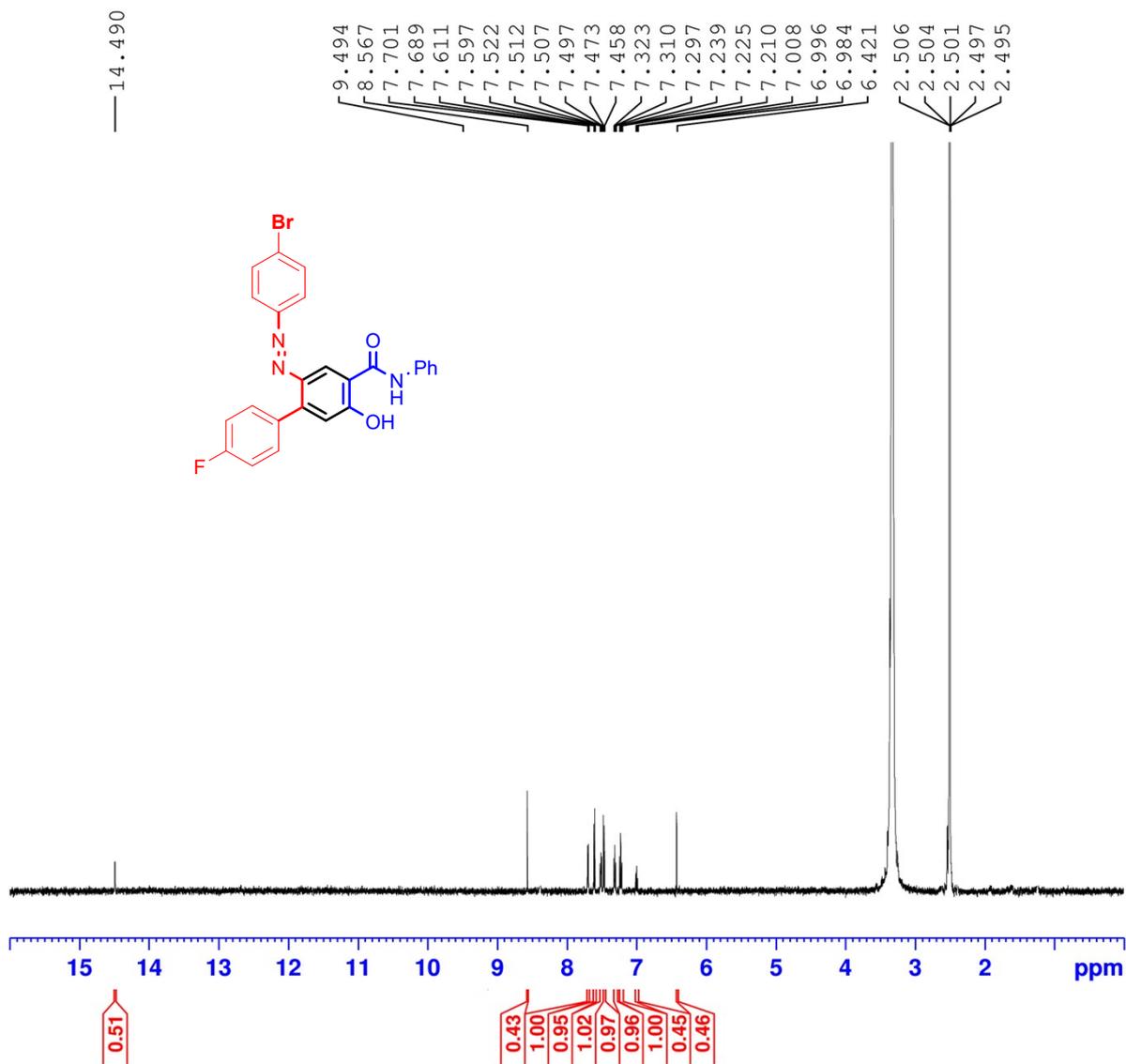
**HRMS spectrum of compound 3i**

**2-(4-Chlorophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3i):**



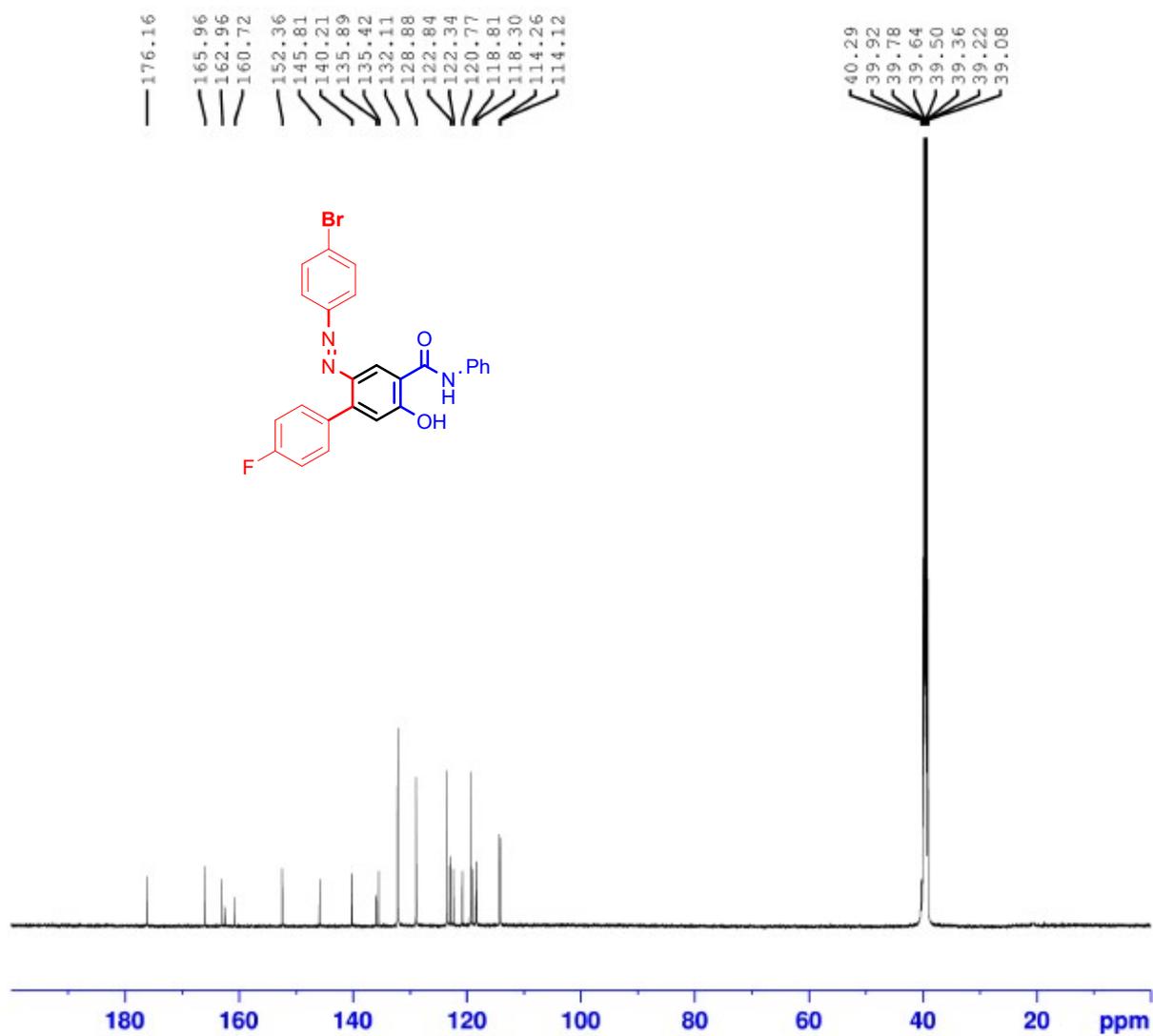
**FT-IR spectrum of compound 3i**

**2-(4-Bromophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3j)**



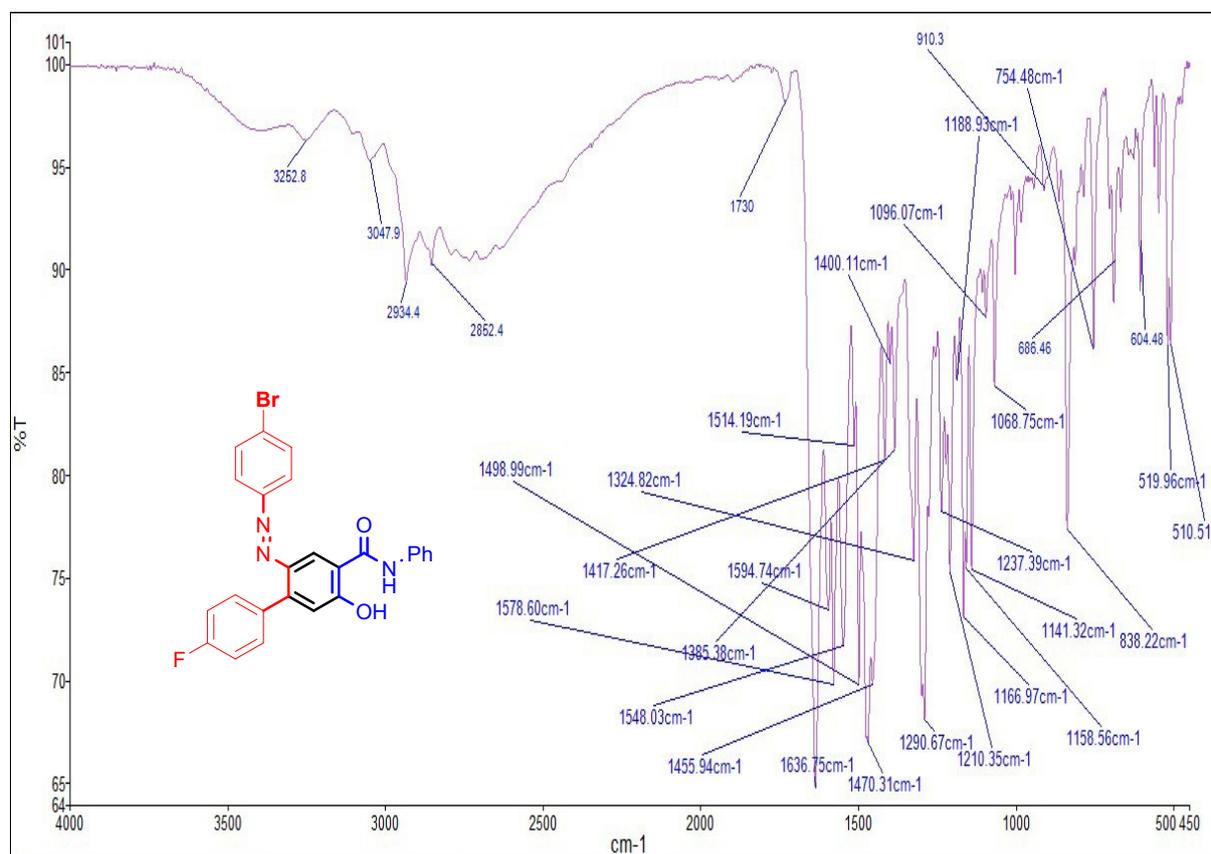
<sup>1</sup>H NMR spectrum of compound 3j

**2-(4-Bromophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3j)**



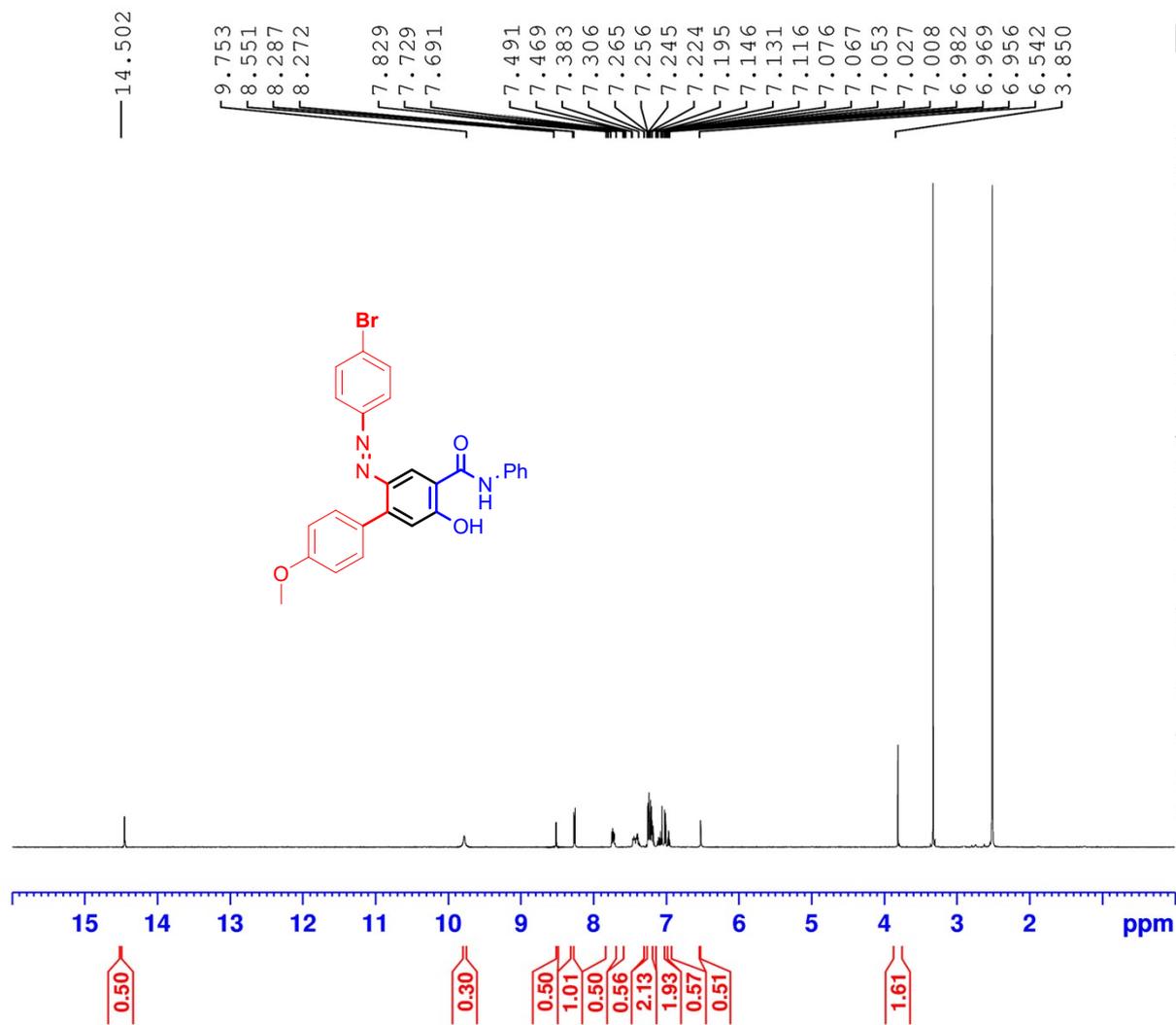
<sup>13</sup>C NMR spectrum of compound 3j

**2-(4-Bromophenylazo)-4'-fluoro-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3j)**

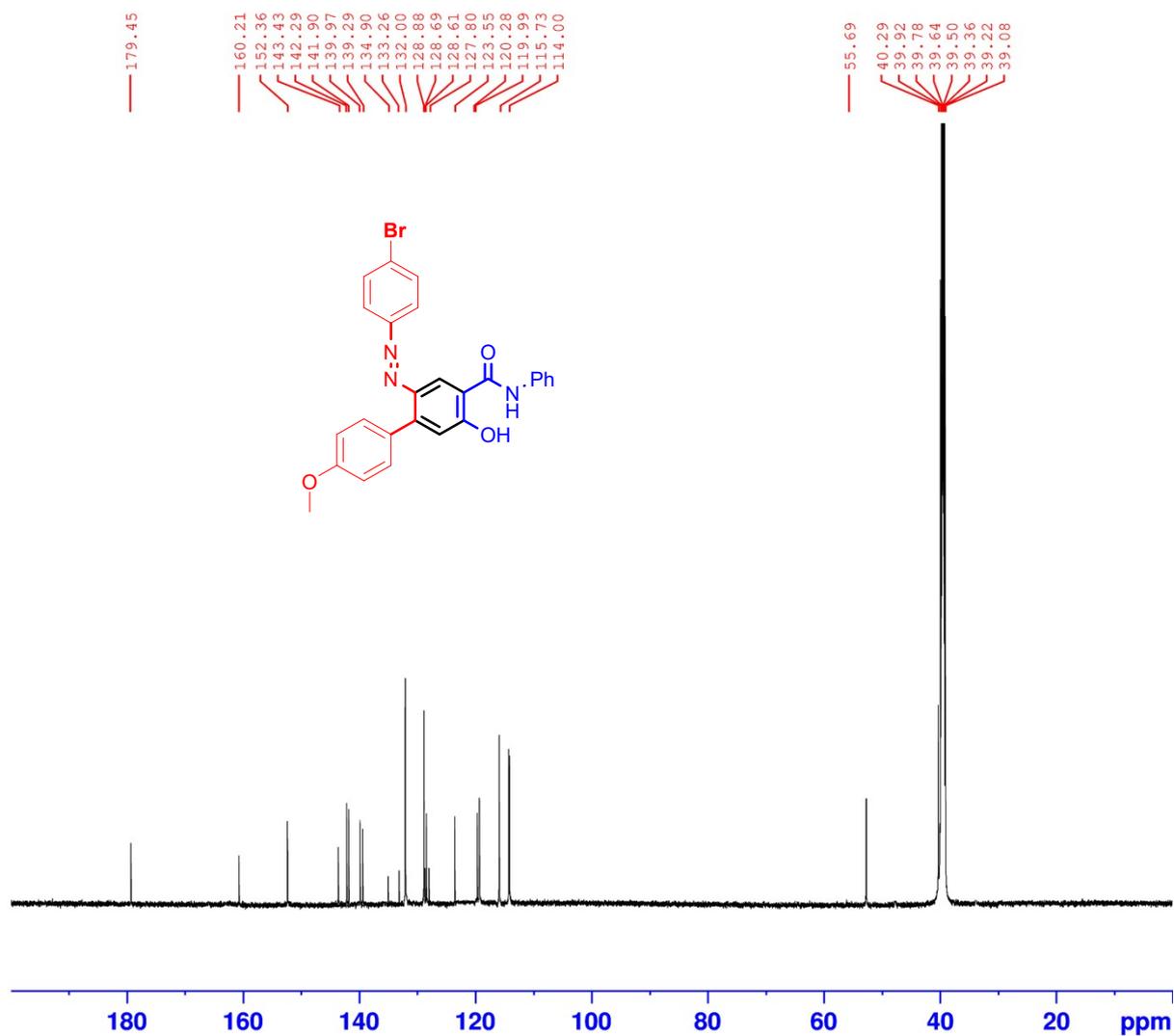


**FT-IR spectrum of compound 3j**

**2-(4-Bromophenylazo)-5-hydroxy-4'-methoxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(3k)**

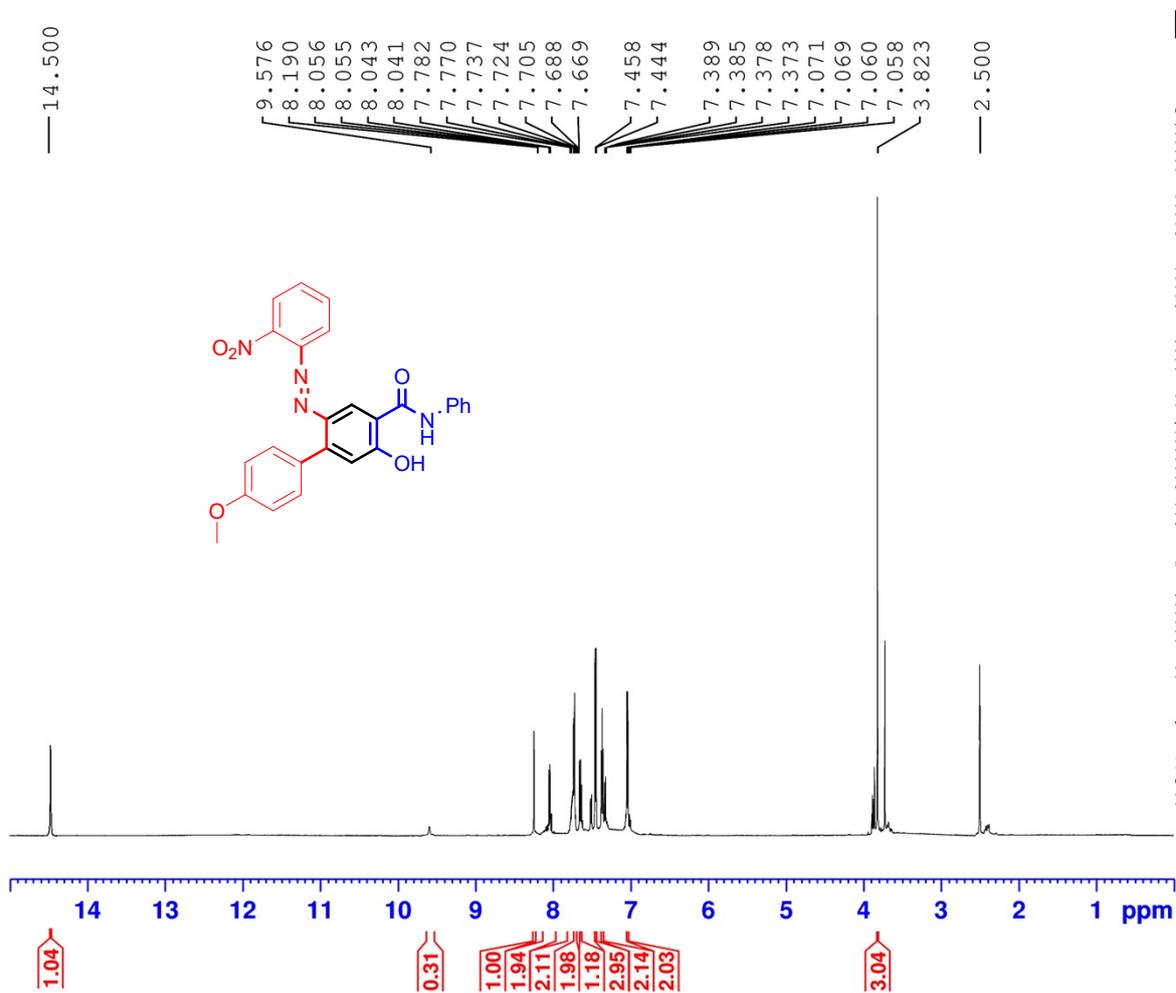


**2-(4-Bromophenylazo)-5-hydroxy-4'-methoxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3k)**



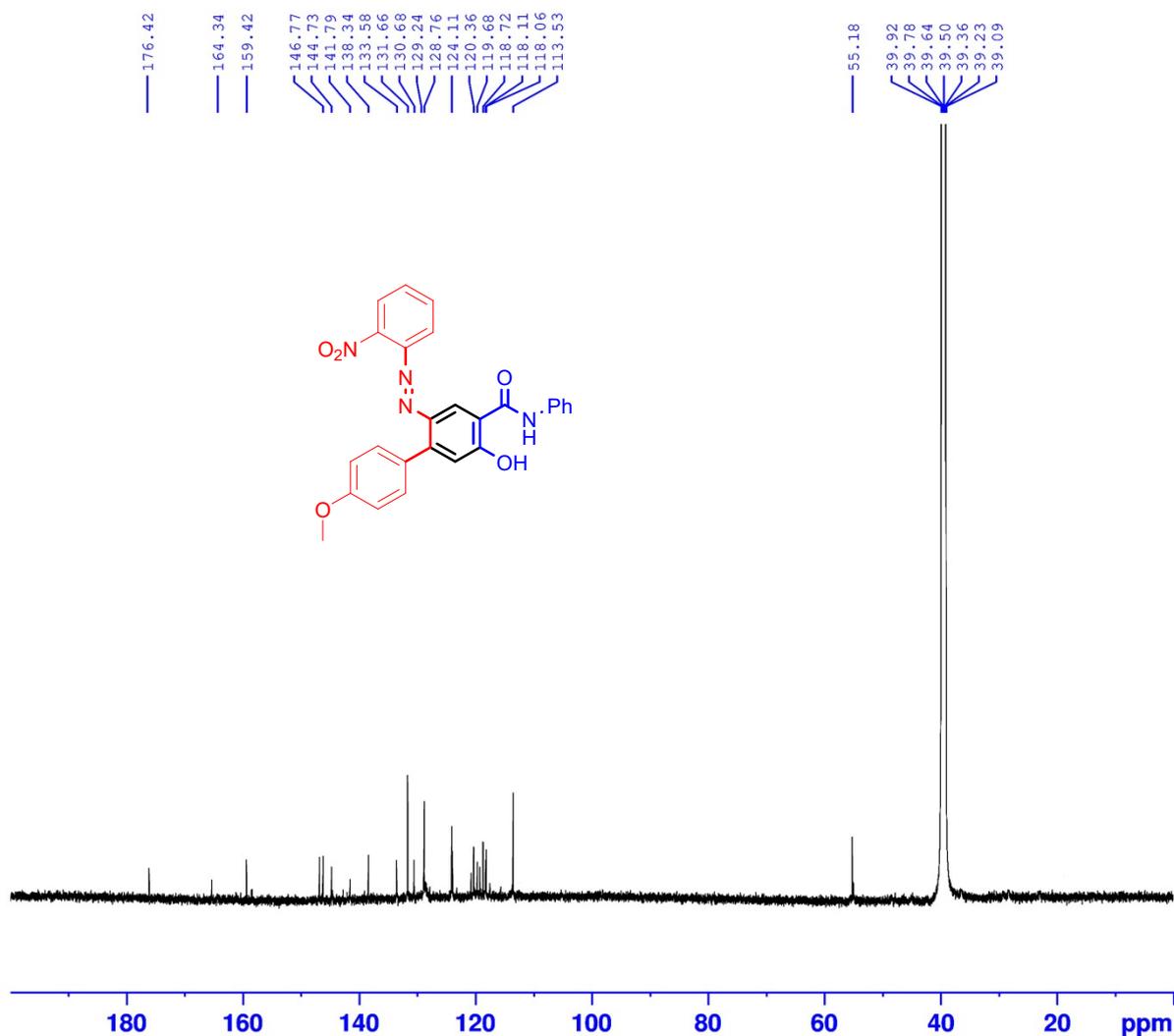
<sup>13</sup>C NMR spectrum of compound 3k

**5-Hydroxy-4'-methoxy-2-(2-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(31)**



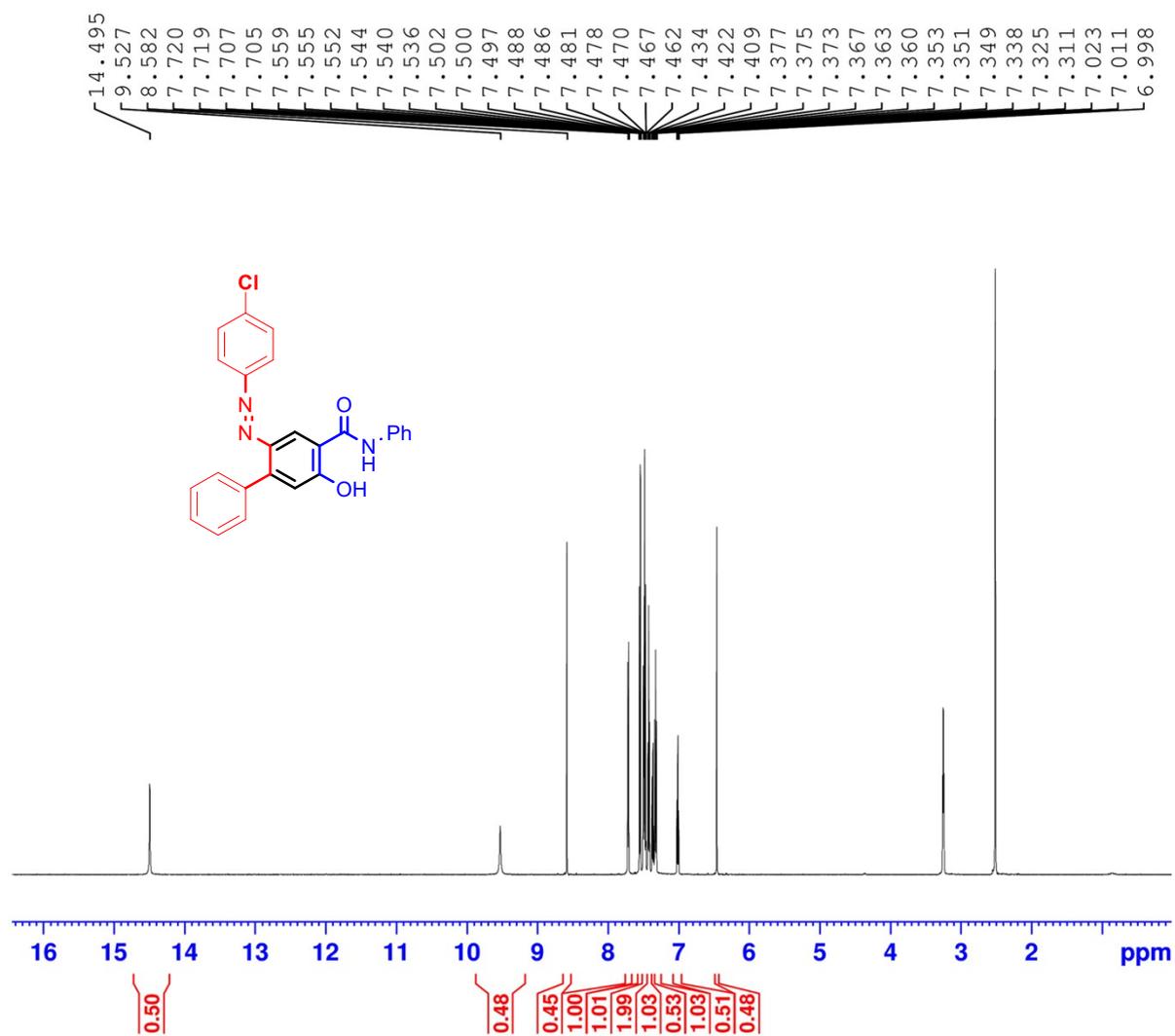
**<sup>1</sup>H NMR spectrum of compound 31**

**5-Hydroxy-4'-methoxy-2-(2-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide  
(31)**



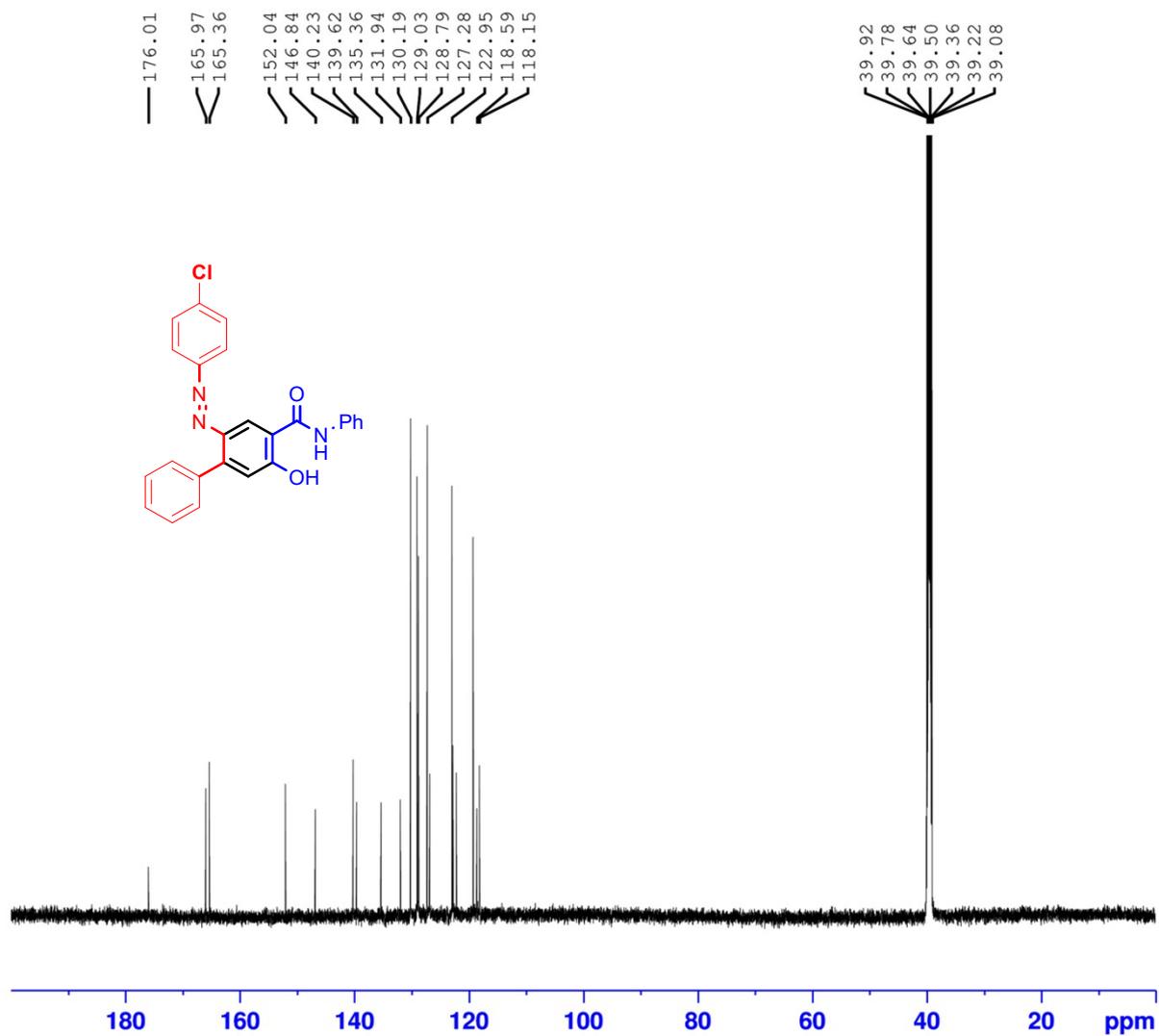
<sup>13</sup>C NMR spectrum of compound 31

## 2-(4-Chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3m)



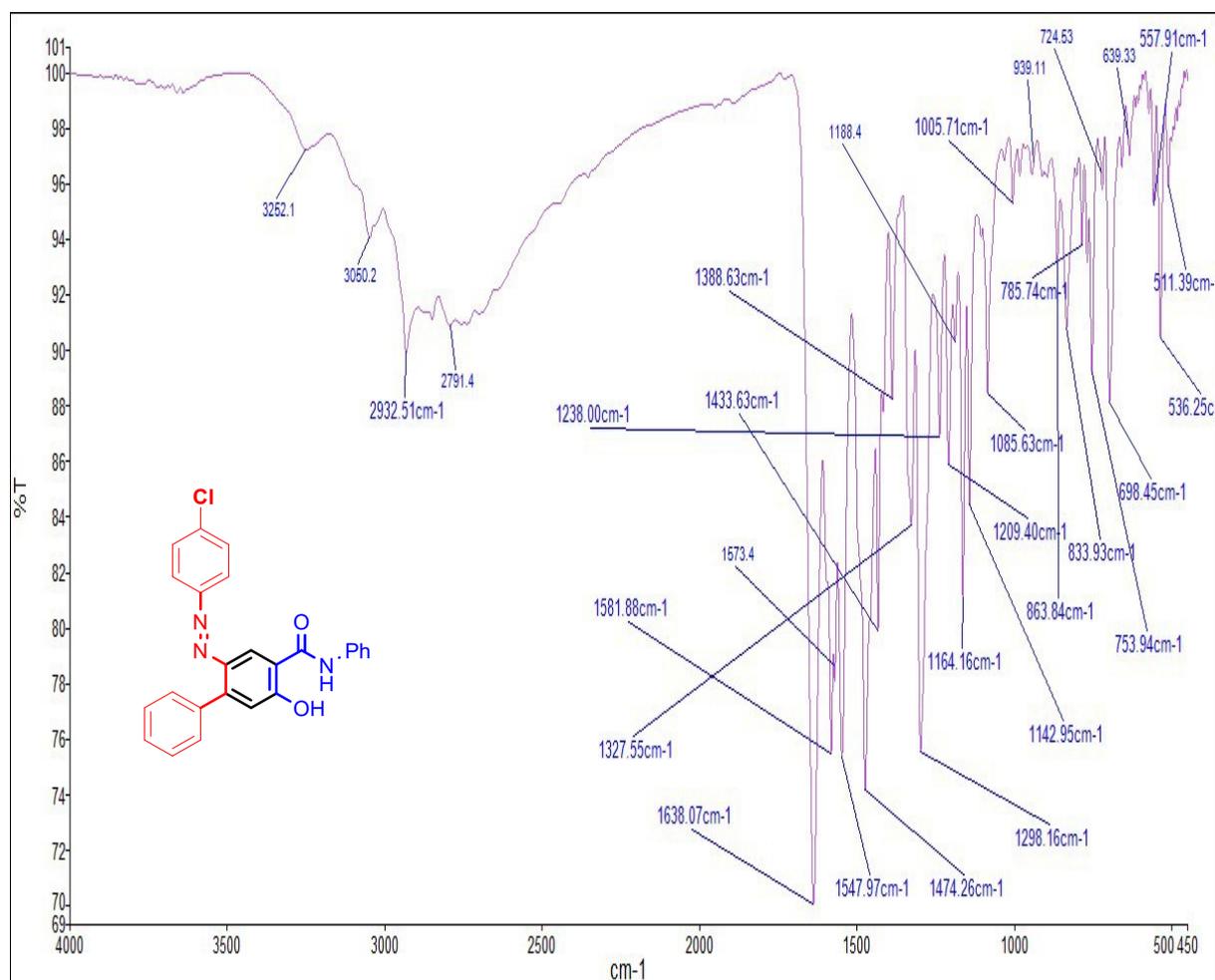
<sup>1</sup>H NMR spectrum of compound 3m

**2-(4-Chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3m)**



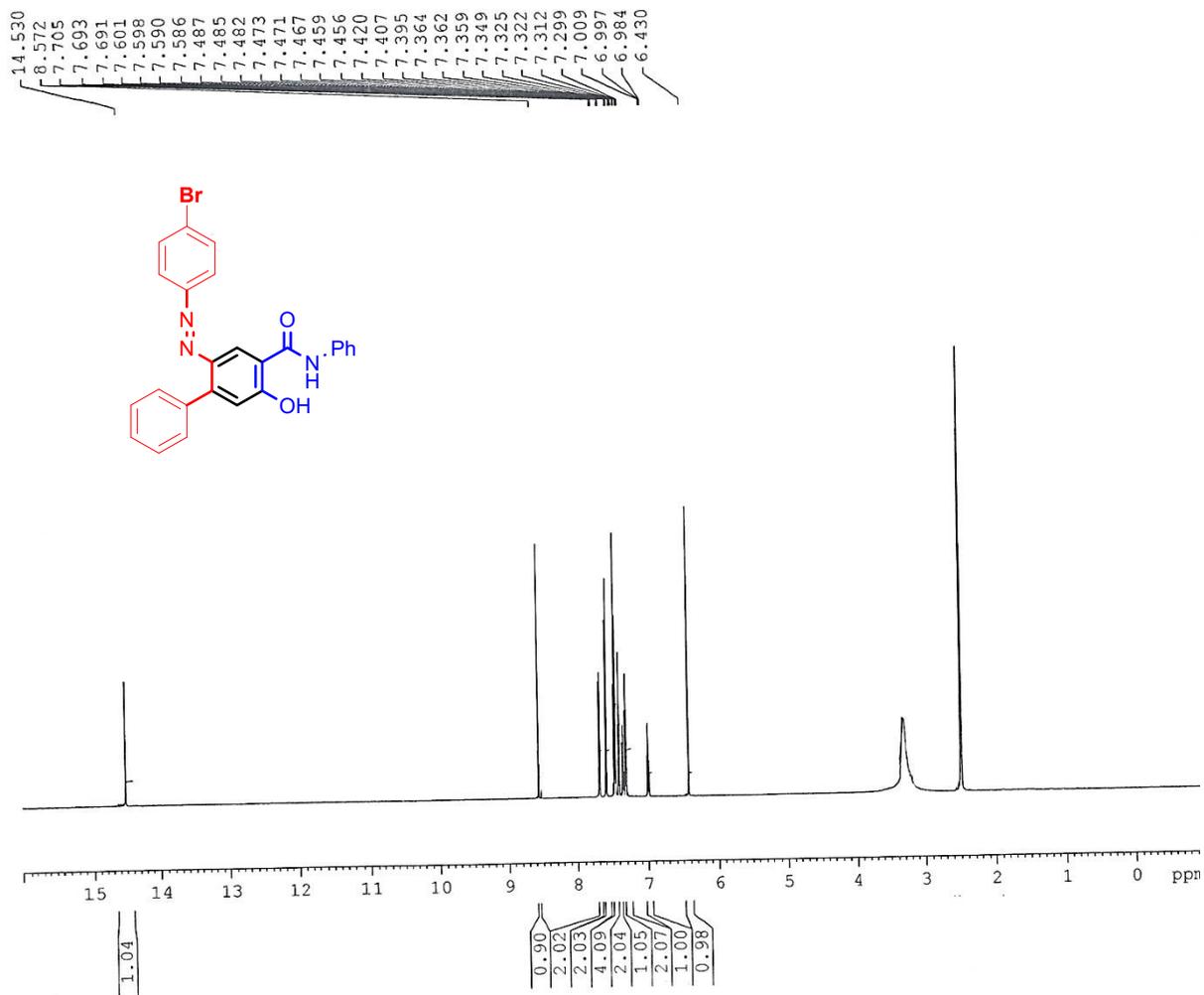
**<sup>13</sup>C NMR spectrum of compound 3m**

## 2-(4-Chlorophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3m)



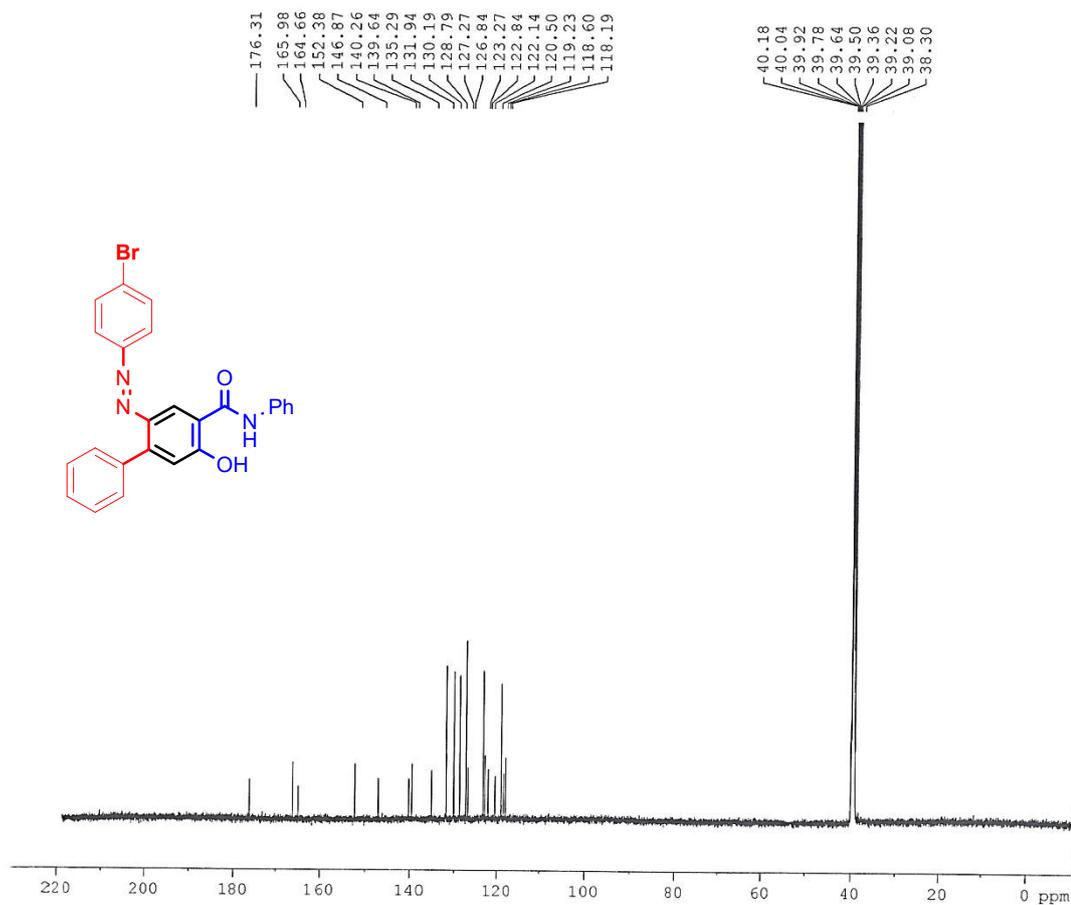
FT-IR spectrum of compound 3m

## 2-(4-Bromophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3n)



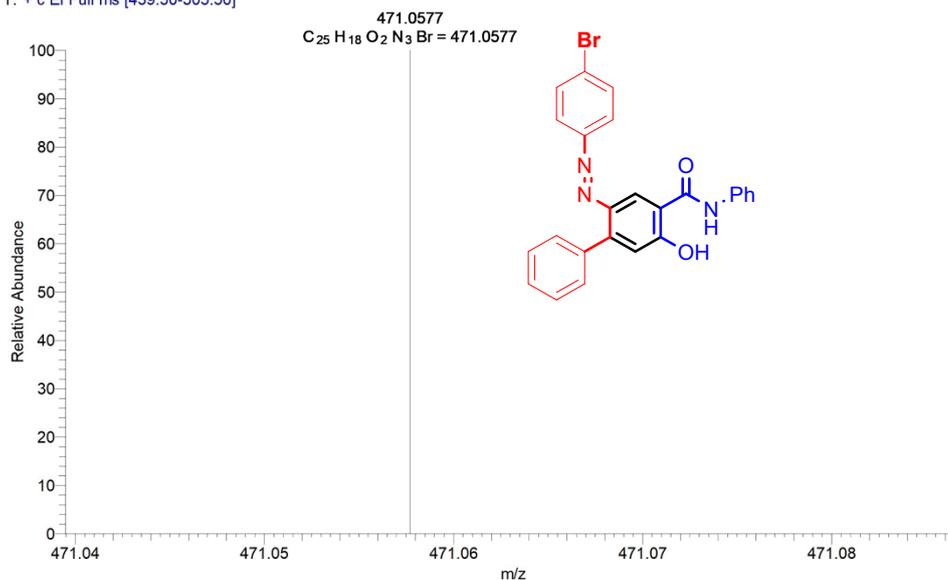
<sup>1</sup>H NMR spectrum of compound 3n

## 2-(4-Bromophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3n)



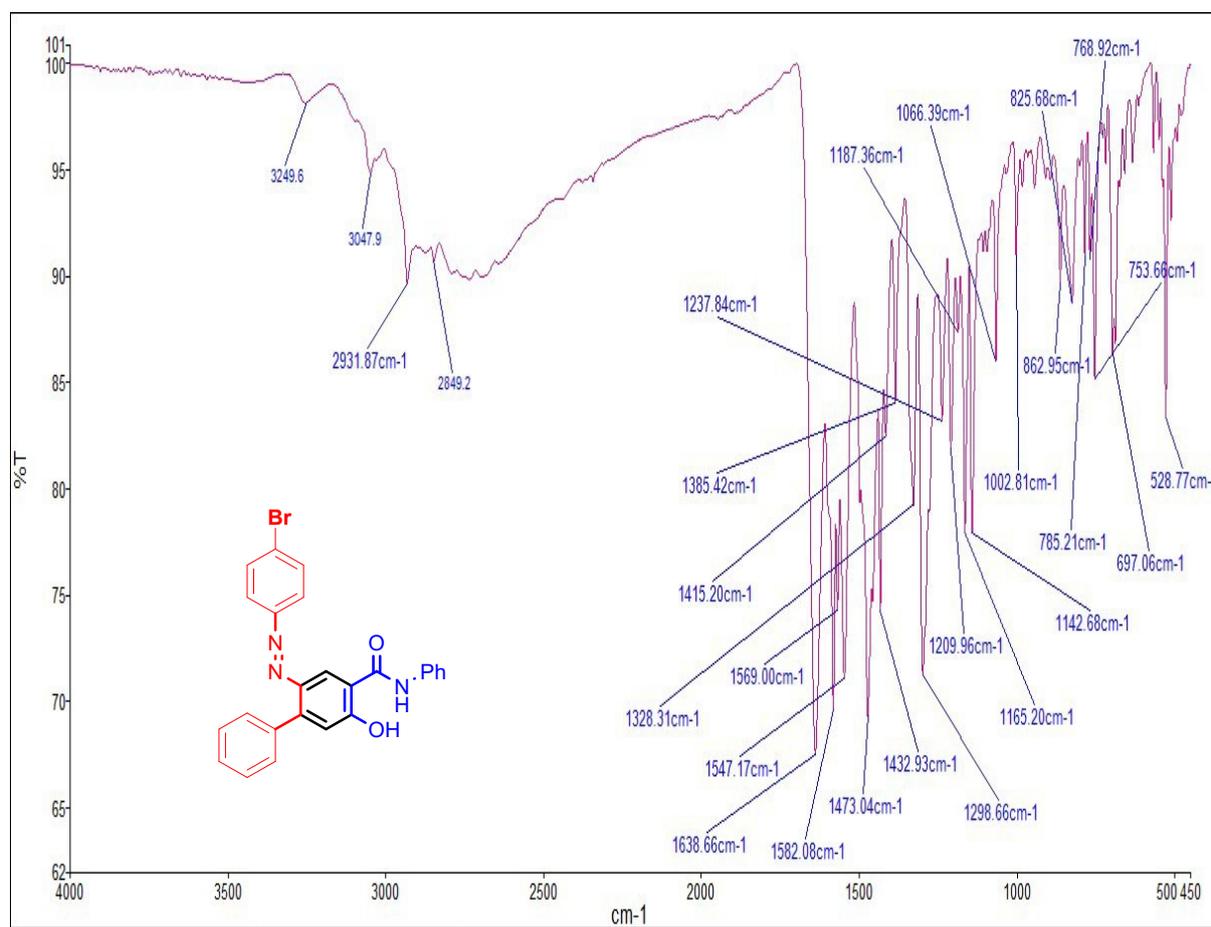
<sup>13</sup>C NMR spectrum of compound 3n

HRMS-12DH-cmass2 #299 RT: 9.73 AV: 1 NL: 2.74E5  
T: + c EI Full ms [439.50-505.50]



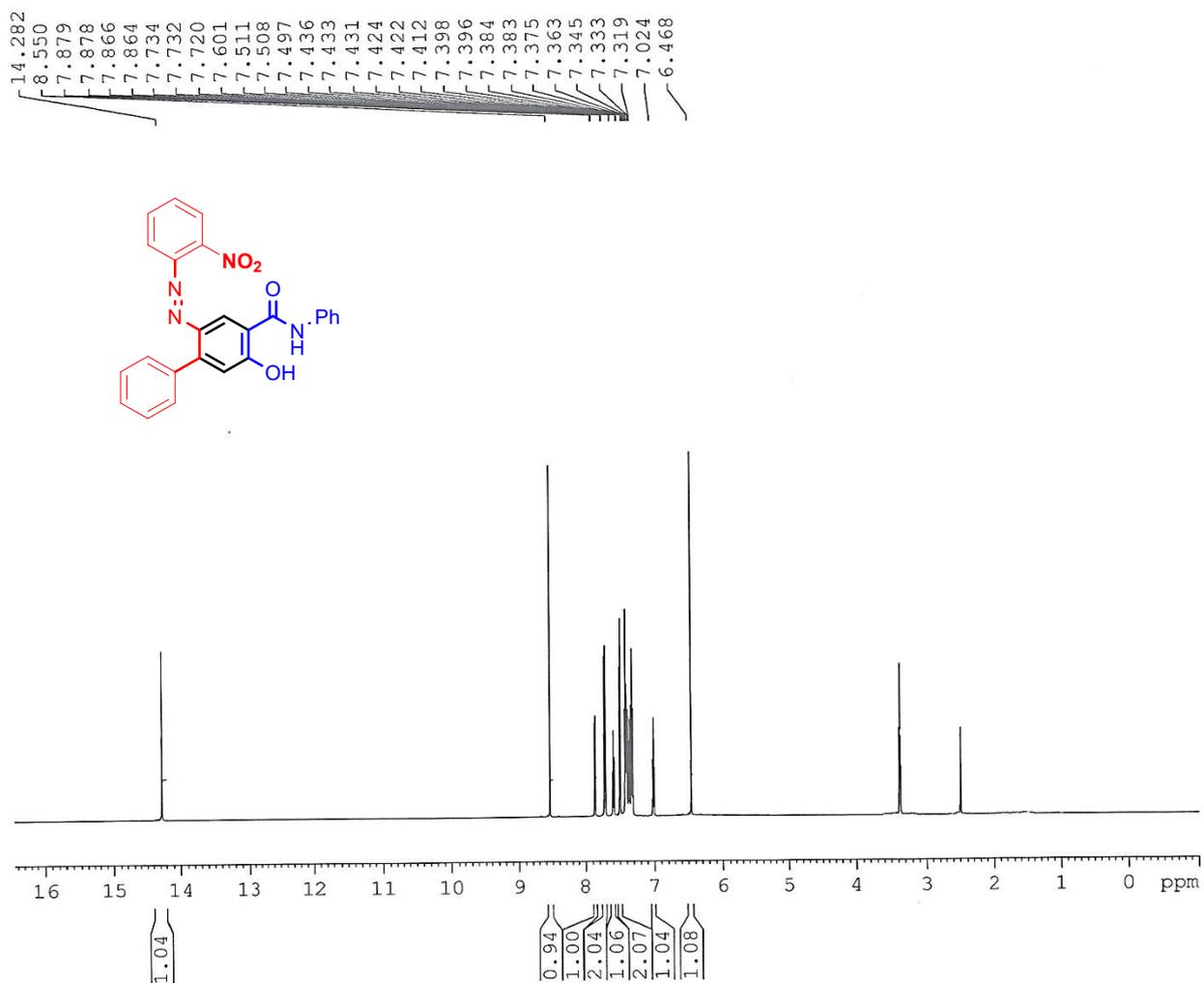
HRMS spectrum of compound 3n

## 2-(4-Bromophenylazo)-5-hydroxy-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3n)



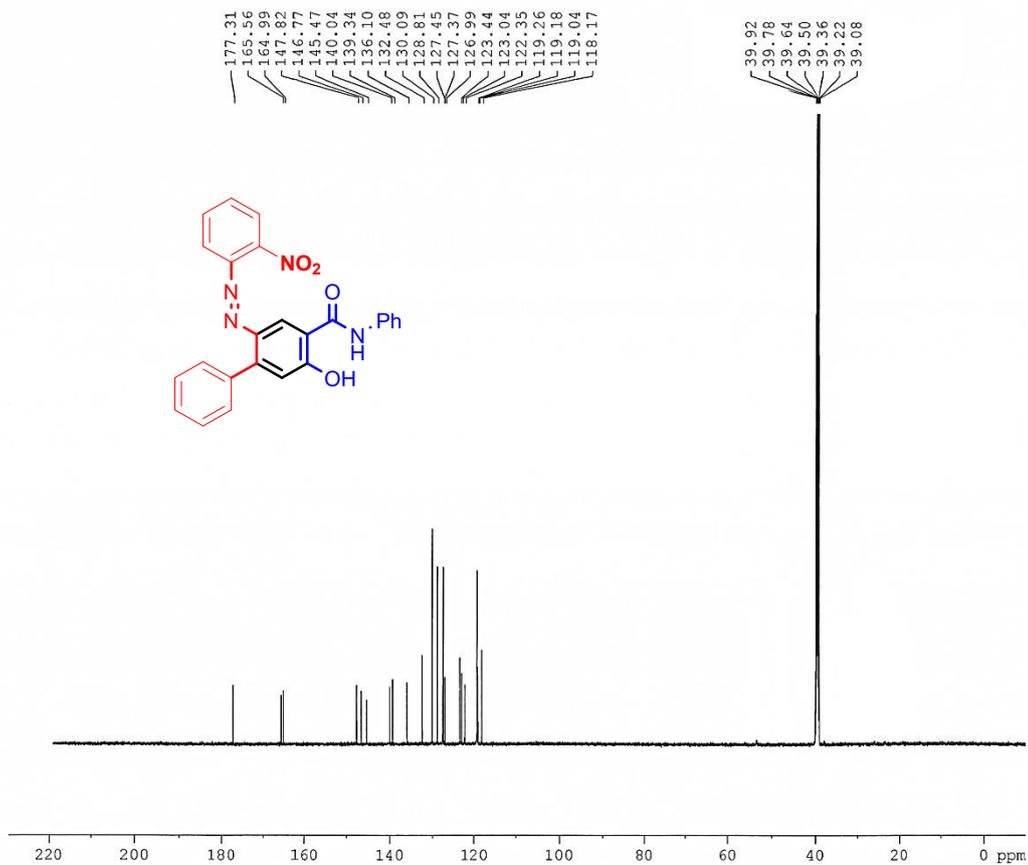
FT-IR spectrum of compound 3n

### 5-Hydroxy-2-(2-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3o)



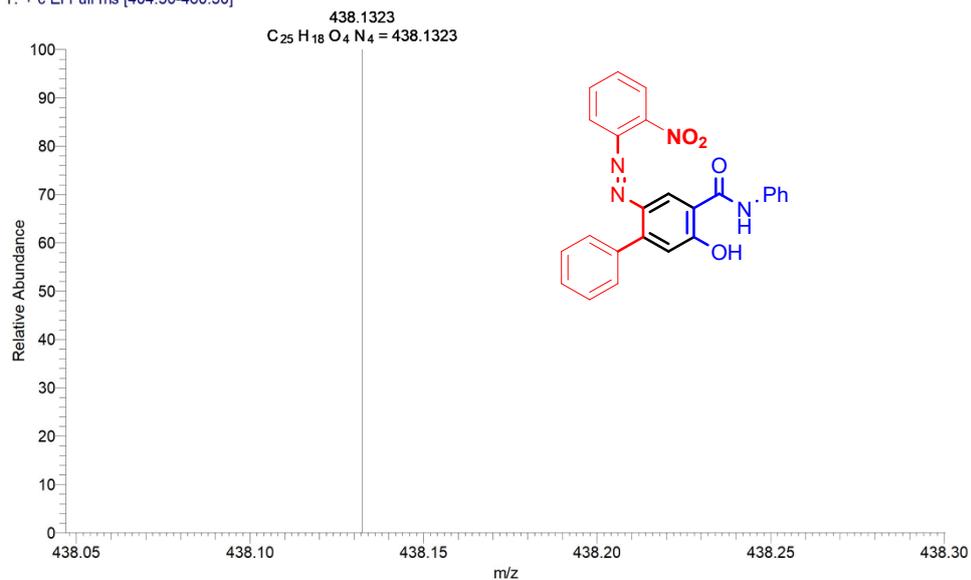
<sup>1</sup>H NMR spectrum of compound 3o

# 5-Hydroxy-2-(2-nitrophenylazo)-N-phenyl-[1,1'-biphenyl]-4-carboxamide (3o)



<sup>13</sup>C NMR spectrum of compound 3o

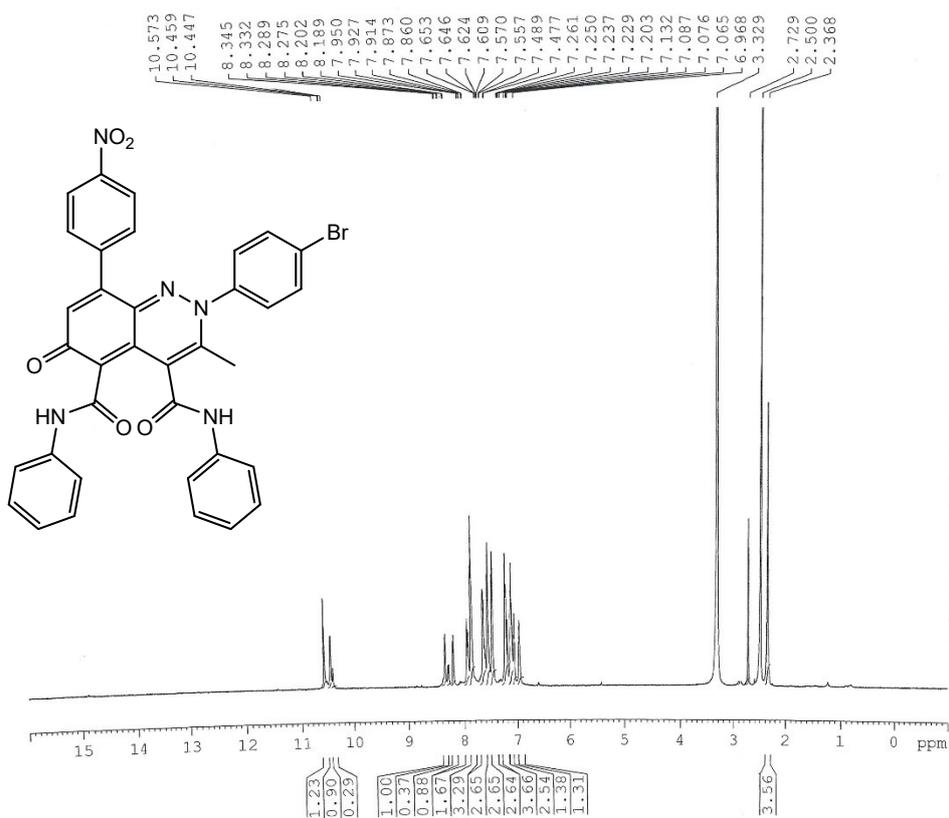
HRMS-10DH r-mass1 #273 RT: 8.24 AV: 1 NL: 7.32E4  
T: + c EI Full ms [404.50-460.50]



HRMS spectrum of compound 3o

**2-(4-Bromophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4a)**

<sup>1</sup>H spectra Dr.Hamad 104HW in DMSO



Current Data Parameters  
NAME 104HW  
EXPNO 1  
PROCNO 1

F2 - Acquisition Parameters  
Date\_ 20170621  
Time 11.57  
INSTRUM spect  
PROBHD 5 mm PABBO BB-  
PULPROG zg30  
TD 65536  
SOLVENT DMSO  
NS 16  
DS 2  
SWH 12335.526 Hz  
FIDRES 0.188225 Hz  
AQ 2.6563926 sec  
RG 203  
DW 40.533 usec  
DE 20.00 usec  
TE 298.0 K  
D1 1.00000000 sec  
TDO 1

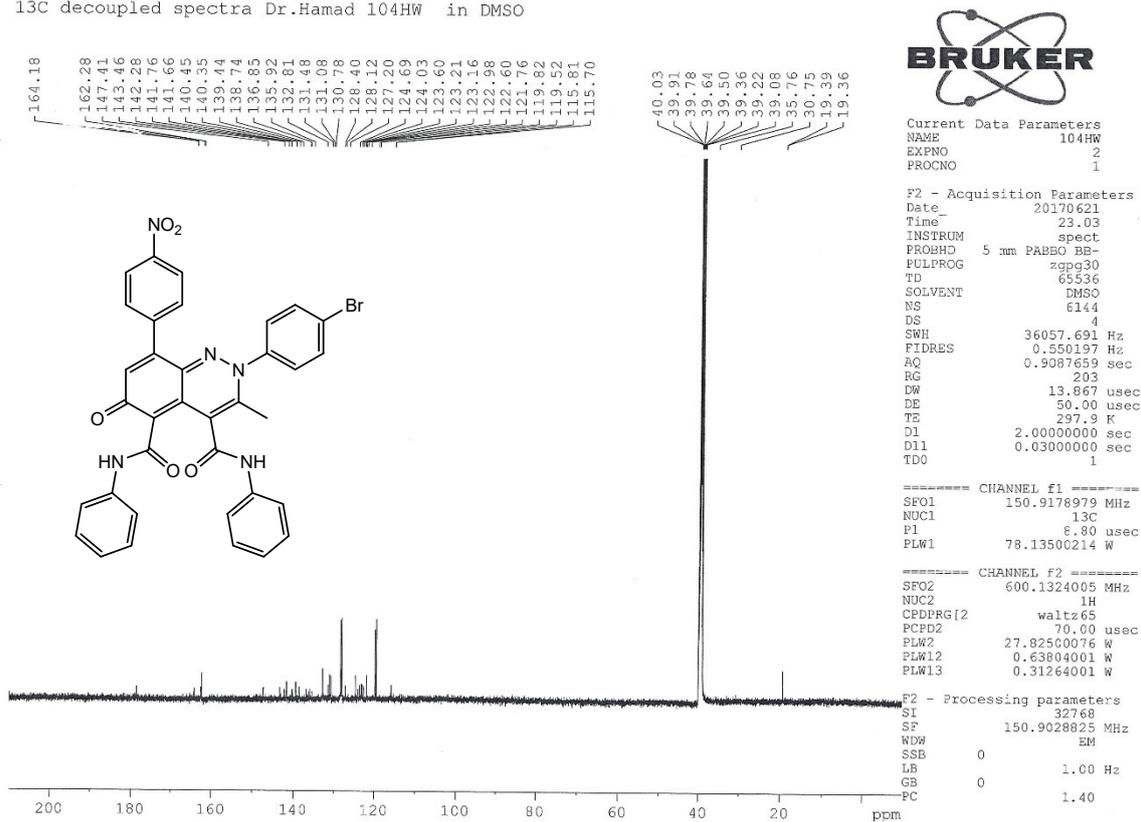
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SFO1 600.1337060 MHz  
NUC1 1H  
P1 10.60 usec  
PLW1 27.82500076 W

F2 - Processing parameters  
SI 32768  
SF 600.1300000 MHz  
WDB EM  
SSB 0  
LB 0.30 Hz  
GB 0  
PC 1.00

**<sup>1</sup>H NMR spectrum of compound 4a**

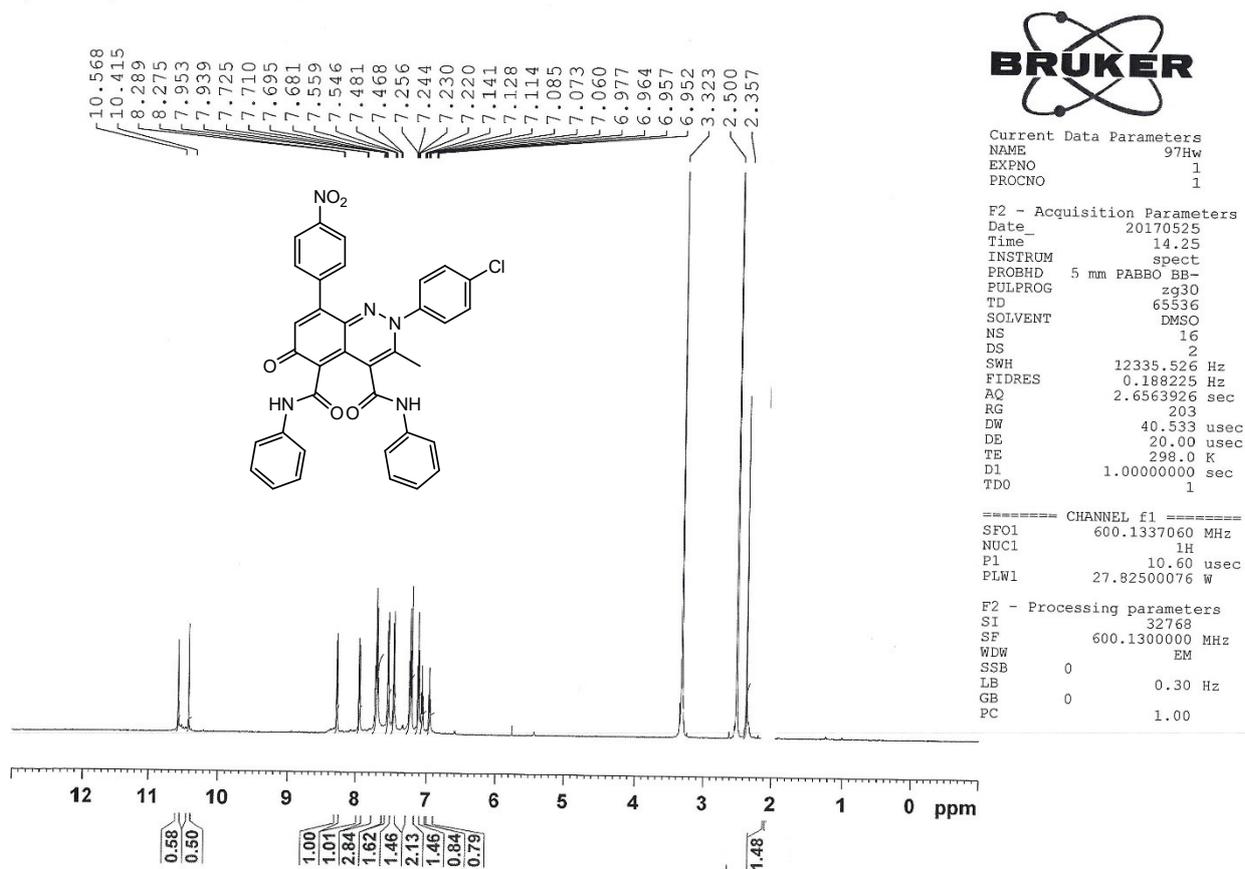
**2-(4-Bromophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4a)**

<sup>13</sup>C decoupled spectra Dr.Hamad 104HW in DMSO



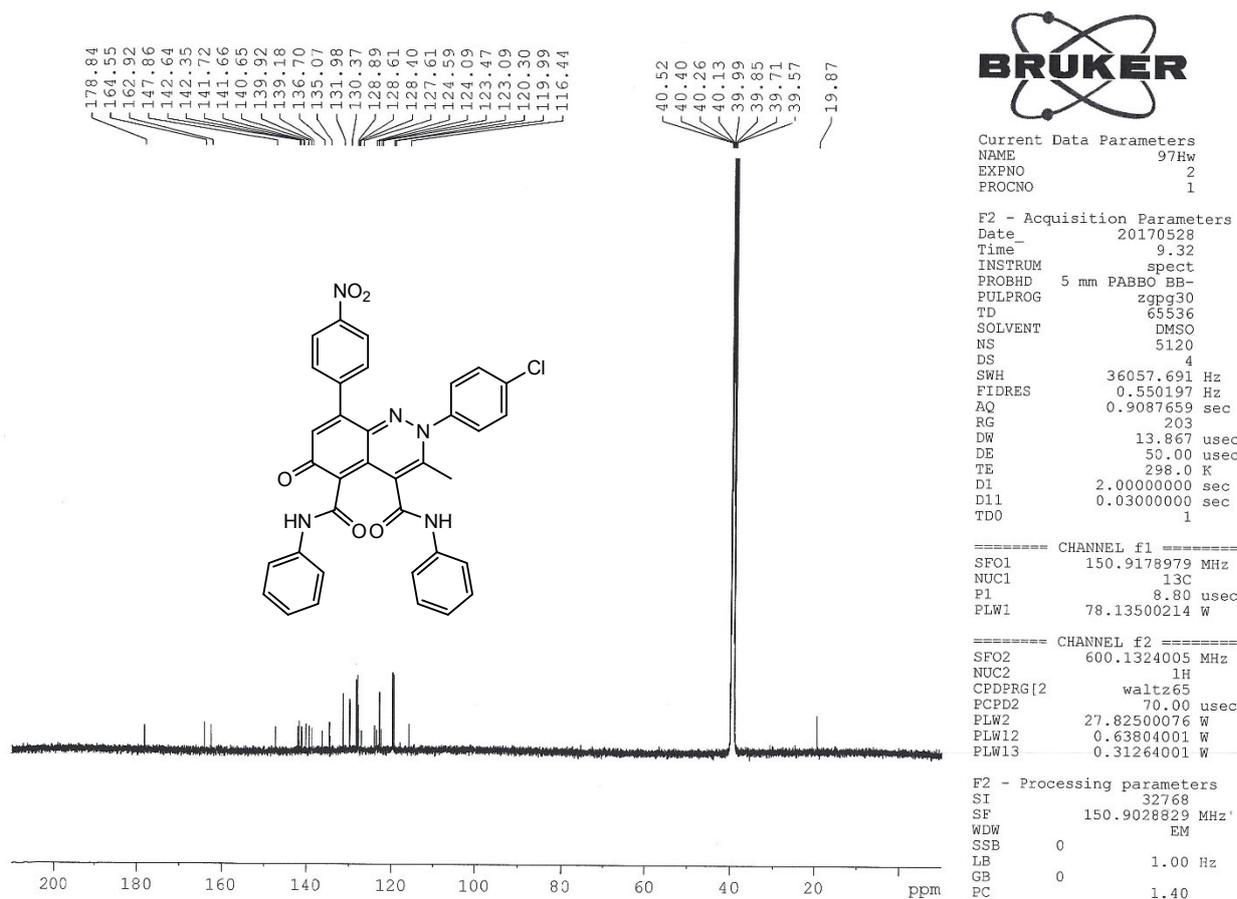
**<sup>13</sup>C NMR spectrum of compound 4a**

**2-(4-Chlorophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4b)**



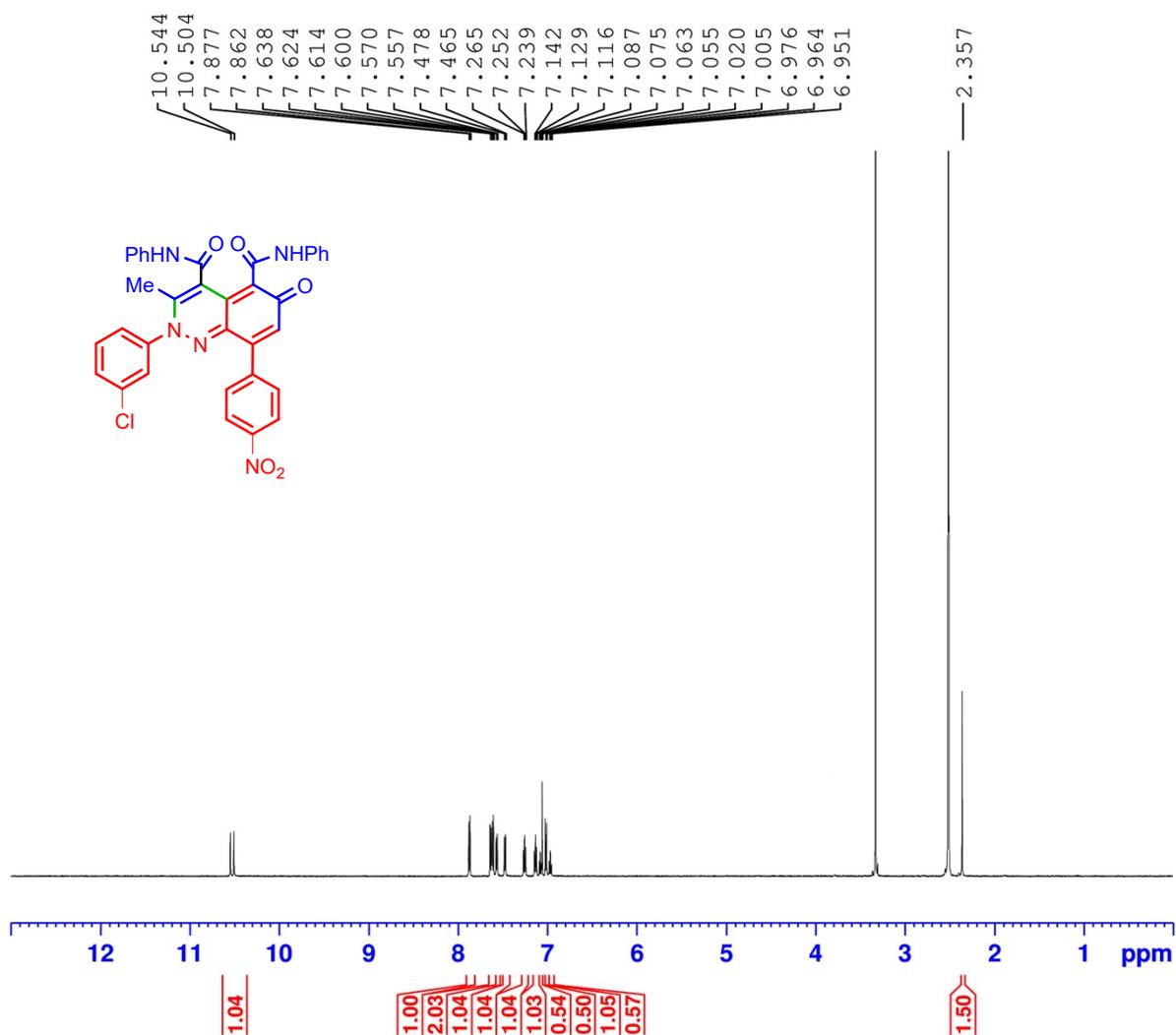
**<sup>1</sup>H NMR spectrum of compound 4b**

2-(4-Chlorophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4b)



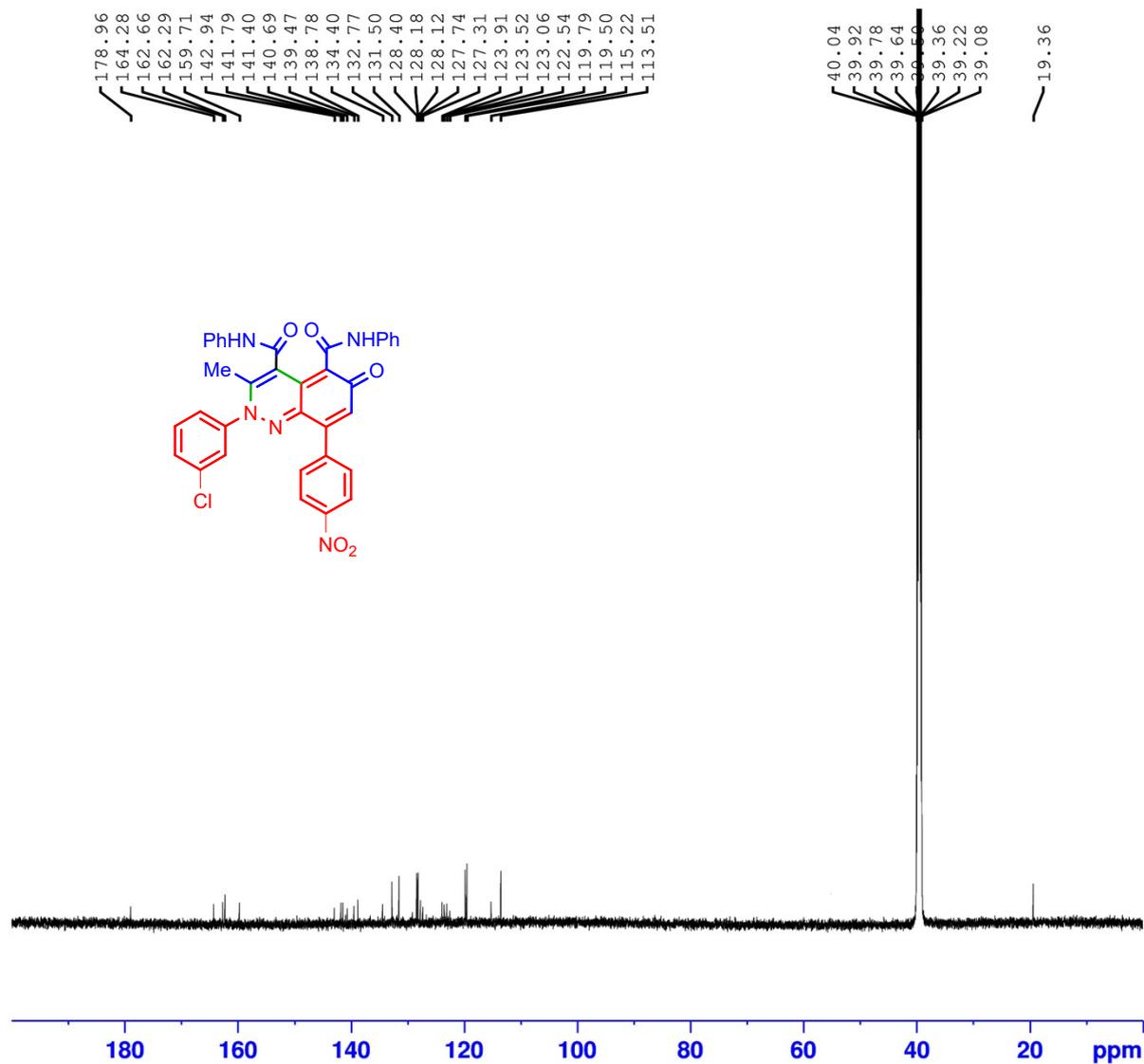
<sup>13</sup>C NMR spectrum of compound 4b

**2-(3-Chlorophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4c)**



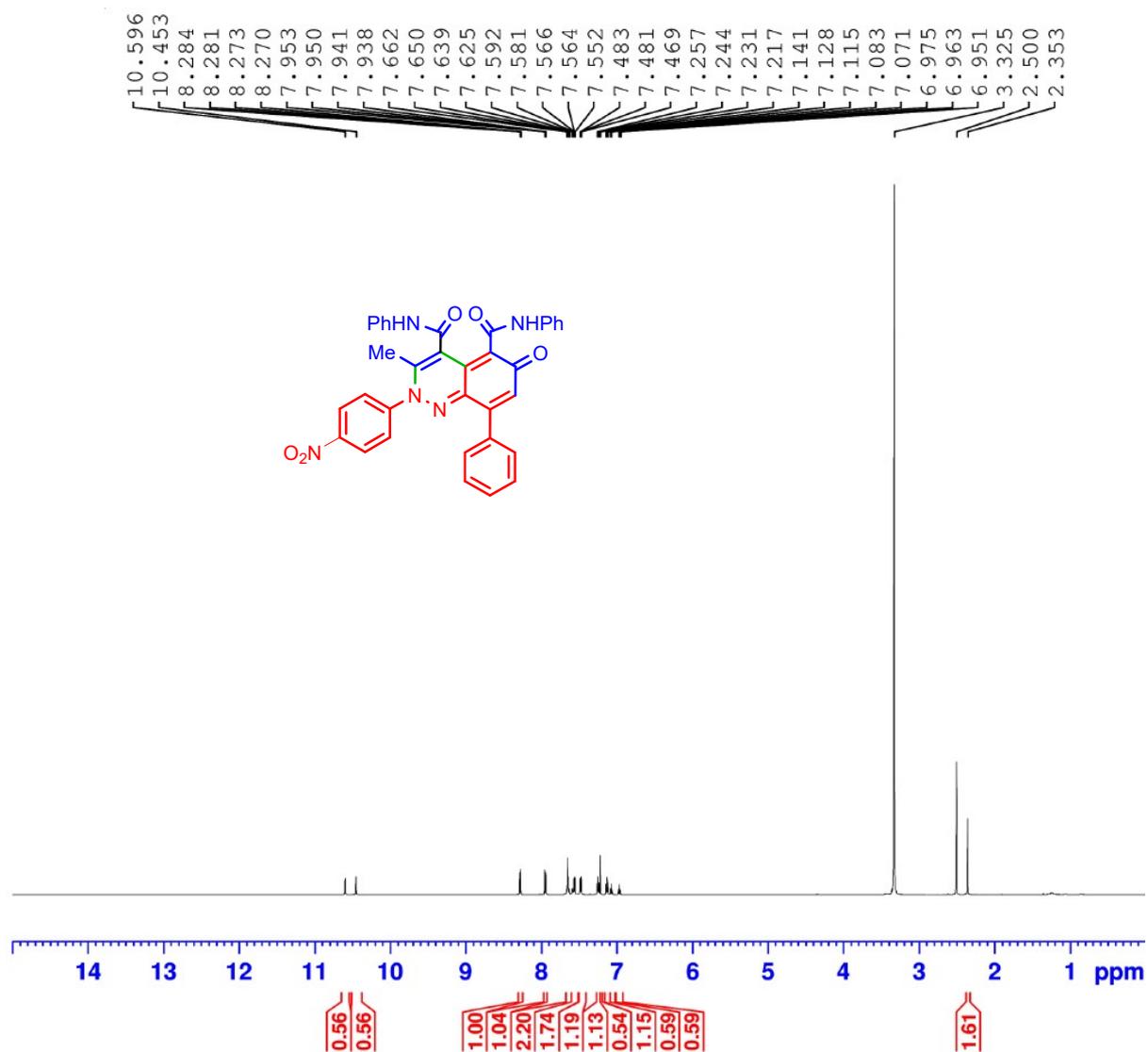
**<sup>1</sup>H NMR spectrum of compound 4c**

**2-(3-Chlorophenyl)-3-methyl-8-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4c)**

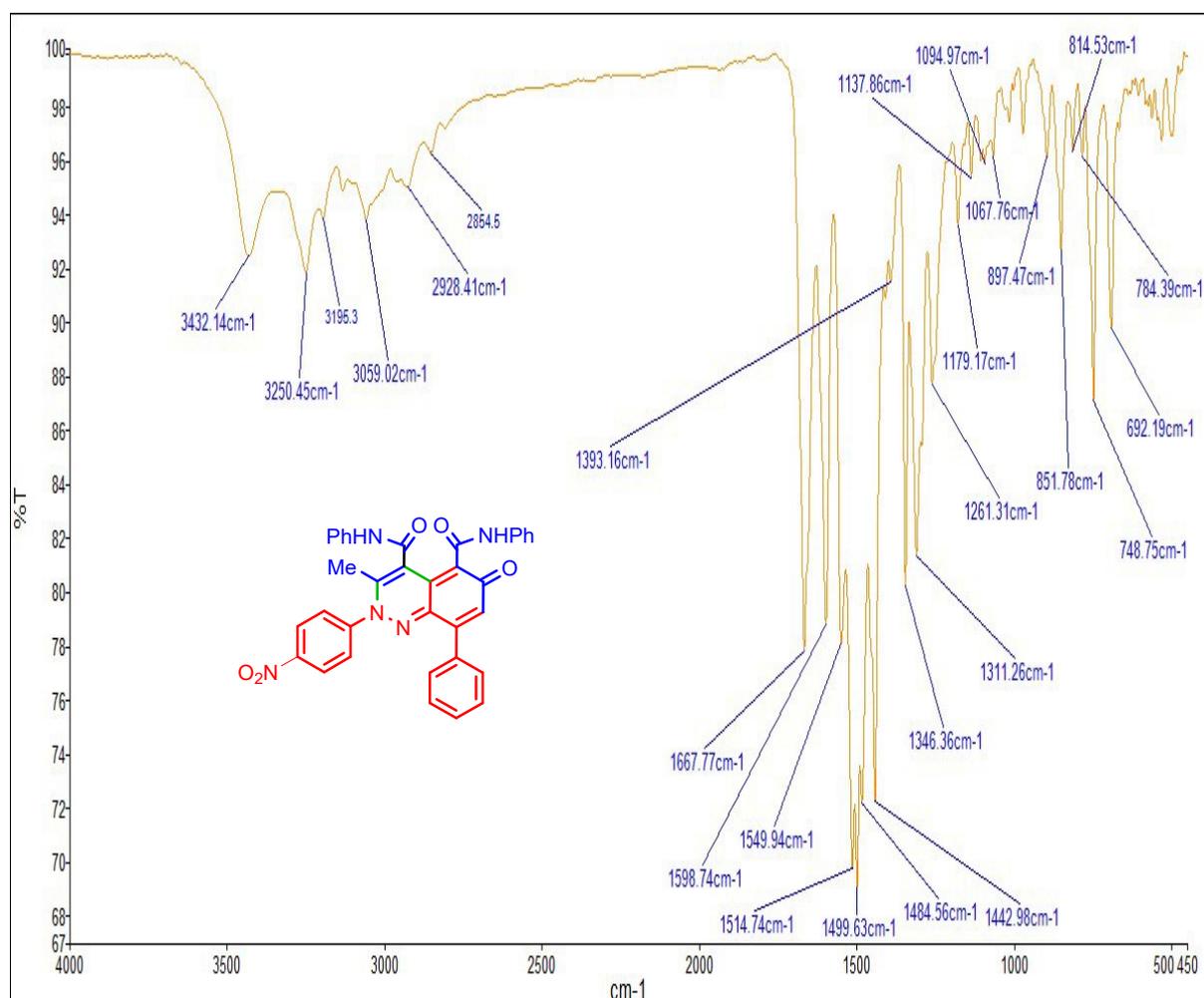


<sup>13</sup>C NMR spectrum of compound 4c

**3-methyl-2-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4d)**

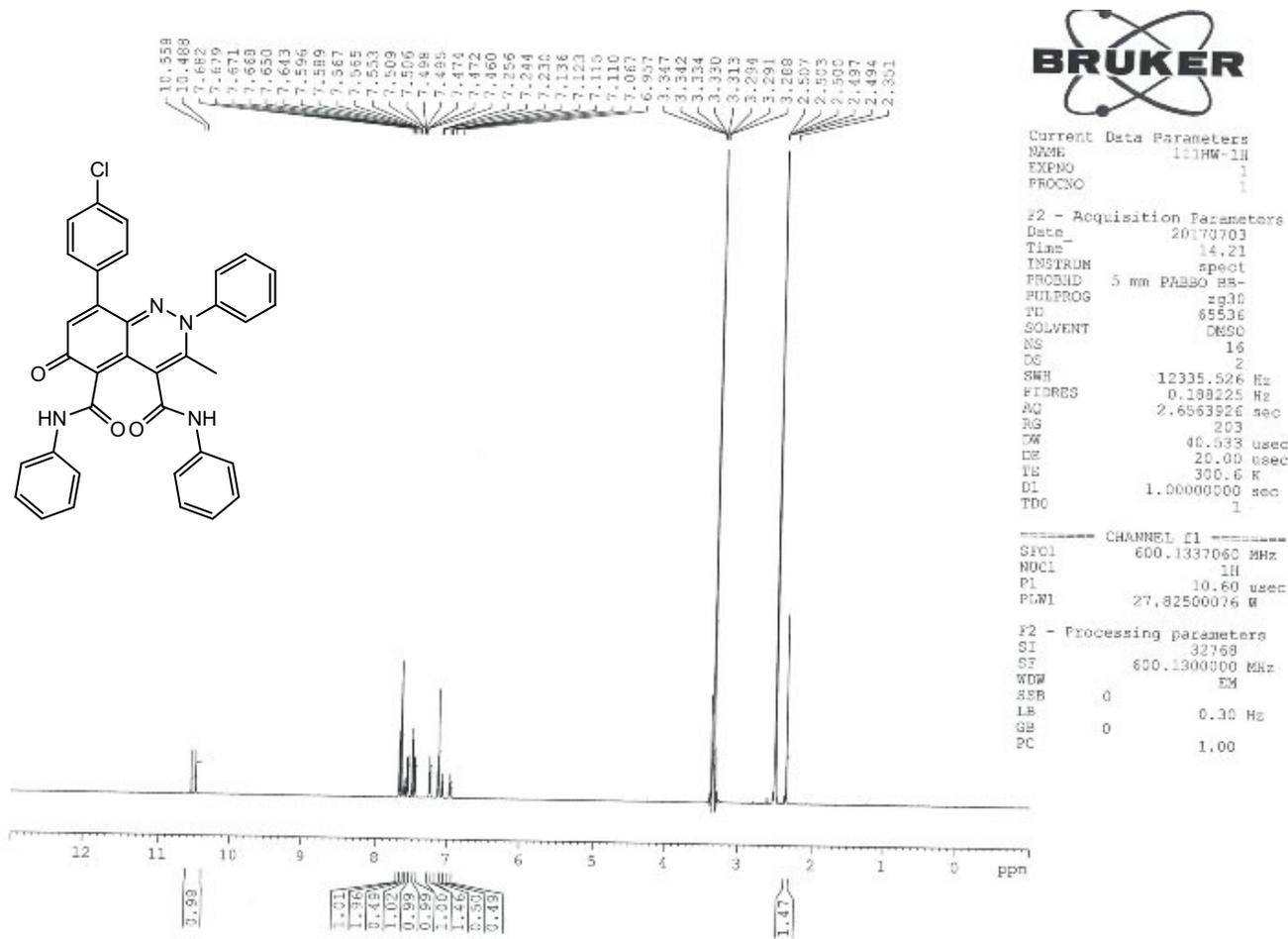


**3-methyl-2-(4-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4d)**



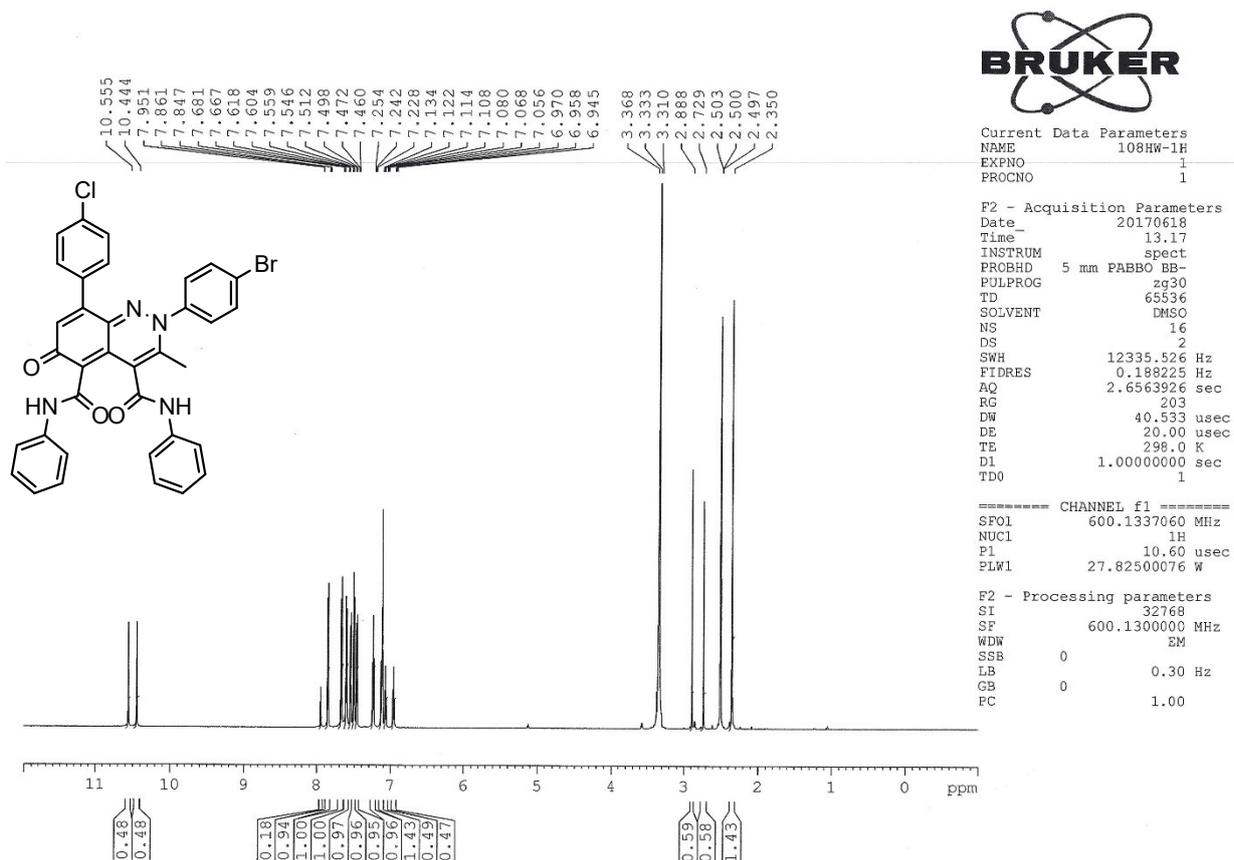
**FT-IR spectrum of compound 4d**

8-(4-Chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,2-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4e)



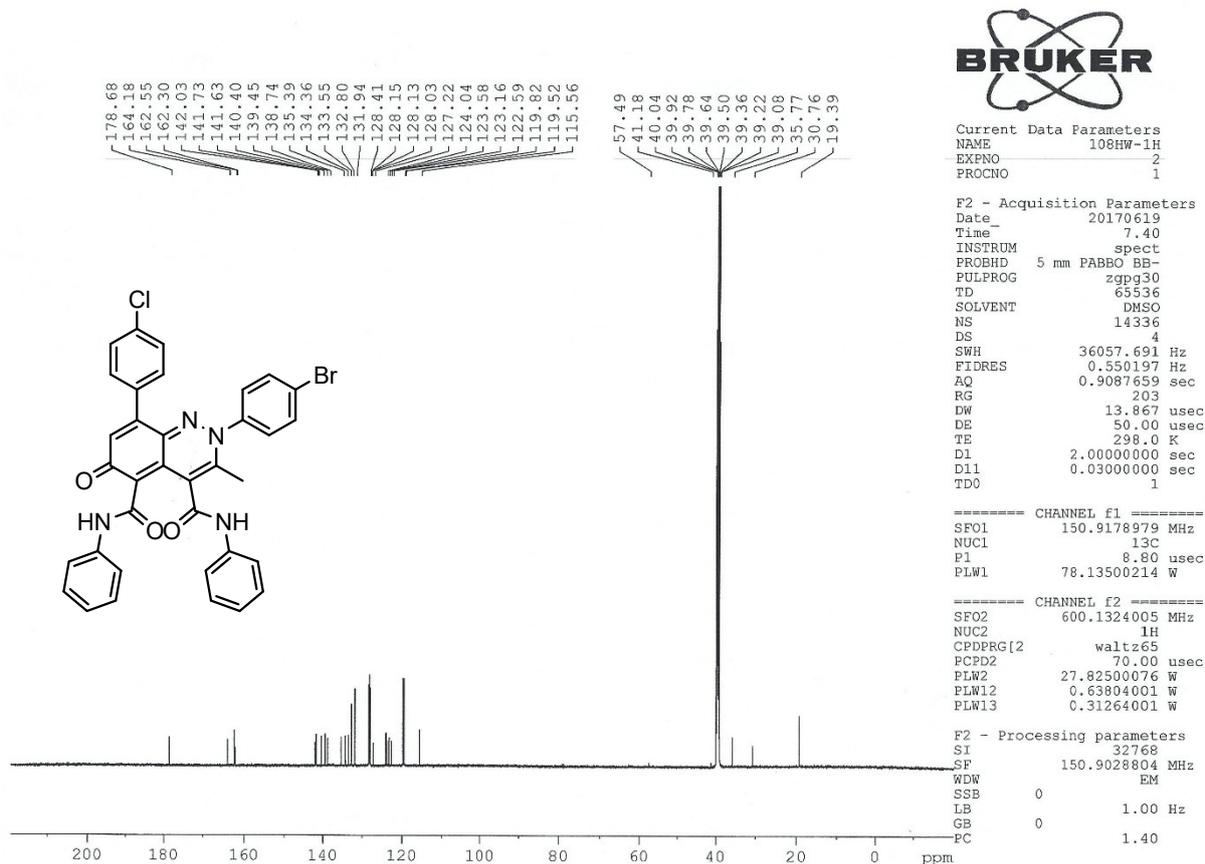
<sup>1</sup>H NMR spectrum of compound 4e

**2-(4-Bromophenyl)-8-(4-chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4f)**



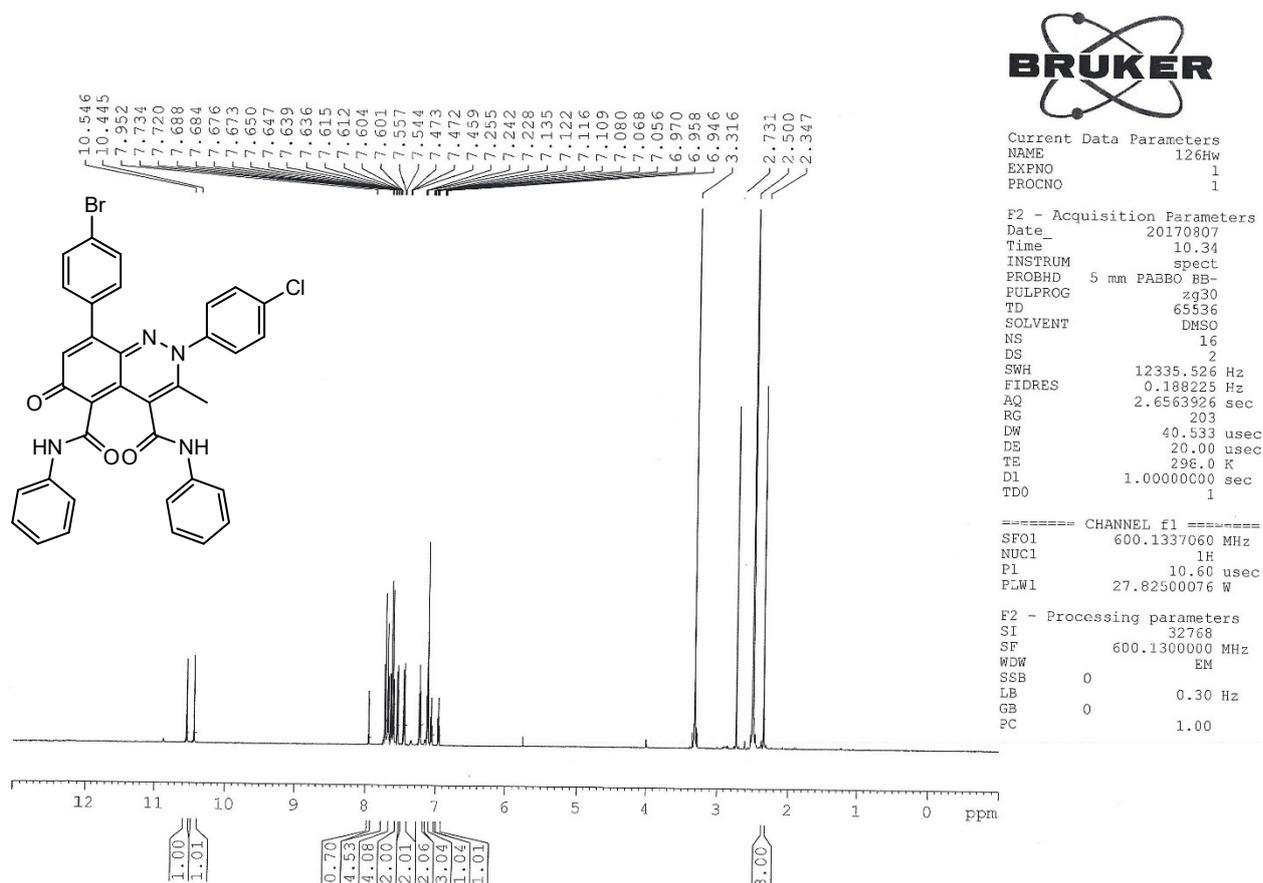
**<sup>1</sup>H NMR spectrum of compound 4f**

**2-(4-Bromophenyl)-8-(4-chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4f)**



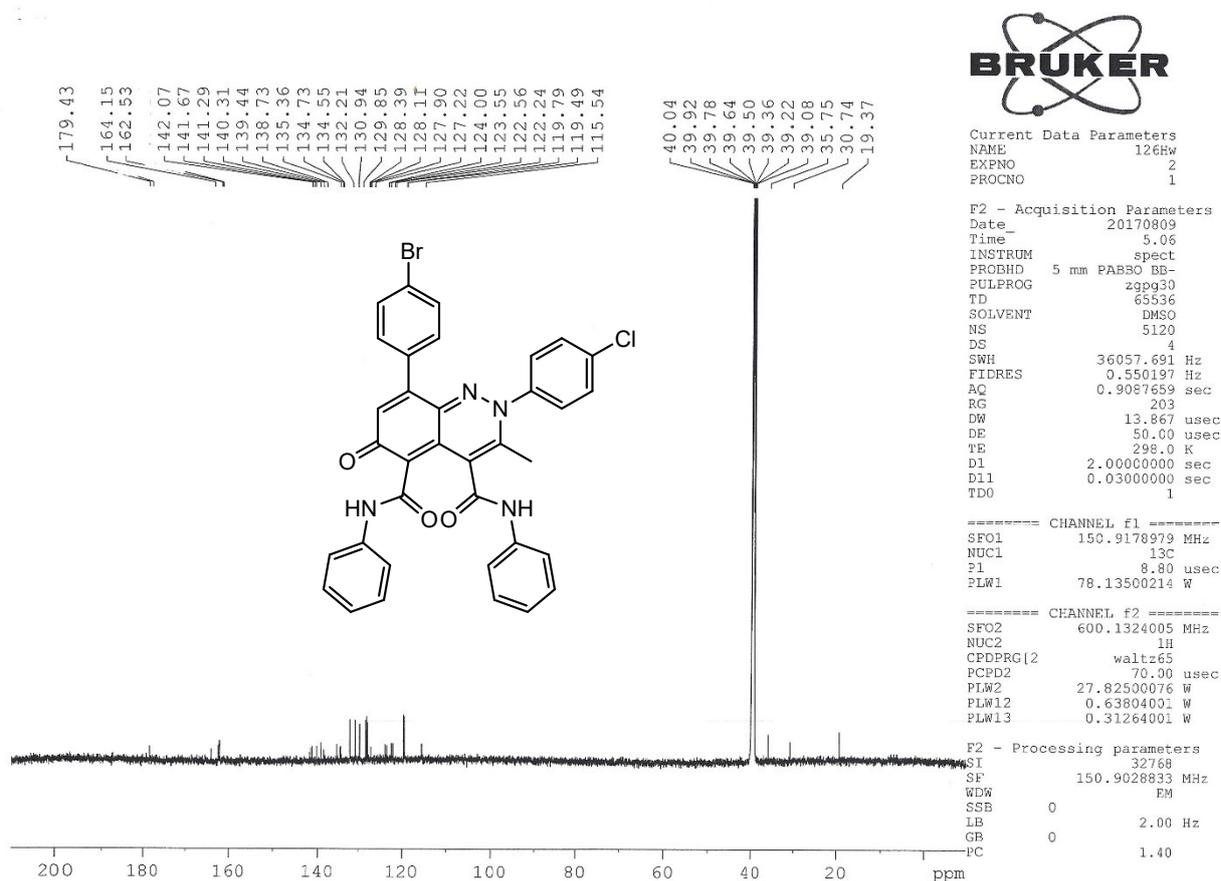
**<sup>13</sup>C NMR spectrum of compound 4f**

**8-(4-Bromophenyl)-2-(4-chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4g)**



**<sup>1</sup>H NMR spectrum of compound 4g**

**8-(4-Bromophenyl)-2-(4-chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4g)**



**<sup>13</sup>C NMR spectrum of compound 4g**

**2,8-Di(4-bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4h)**

<sup>1</sup>H spectra Dr.Hamad 129HW in DMSO

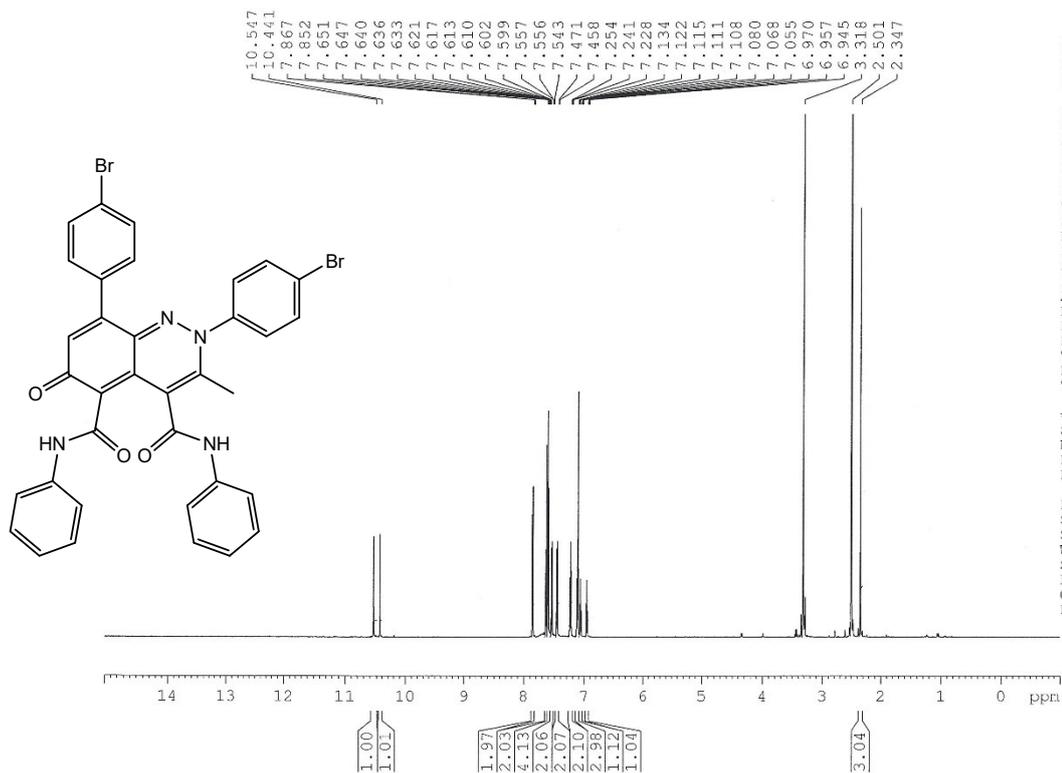


Current Data Parameters  
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 PROCNO 1

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 PULPROG zg30  
 TD 65536  
 SOLVENT DMSO  
 NS 16  
 DS 2  
 SWH 12335.526 Hz  
 FIDRES 0.188225 Hz  
 AQ 2.6563926 sec  
 RG 203  
 DW 40.533 usec  
 DE 20.00 usec  
 TE 298.0 K  
 D1 1.0000000 sec  
 TDC 1

===== CHANNEL f1 =====  
 SFO1 600.1337060 MHz  
 NUC1 1H  
 P1 10.60 usec  
 PLW1 27.82500076 W

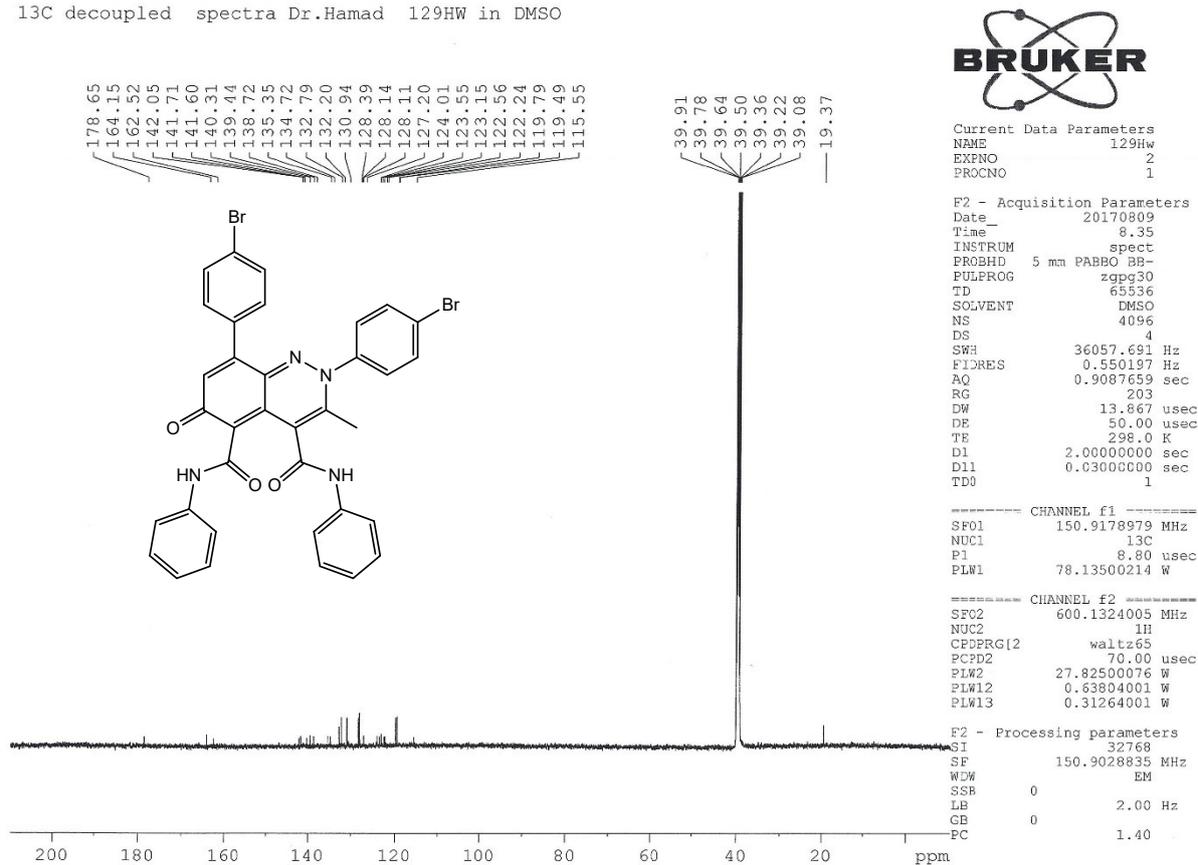
F2 - Processing parameters  
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 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00



**<sup>1</sup>H NMR spectrum of compound 4h**

**2,8-Di(4-bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4h)**

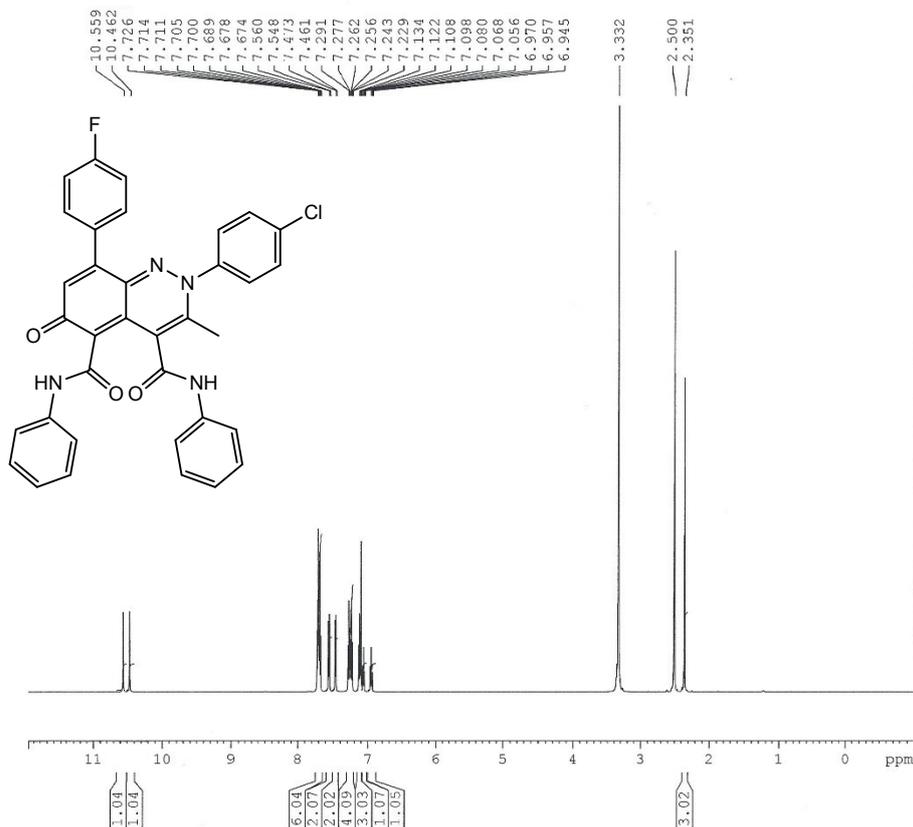
<sup>13</sup>C decoupled spectra Dr.Hamad 129HW in DMSO



**<sup>13</sup>C NMR spectrum of compound 4h**

**2-(4-Chlorophenyl)-8-(4-fluorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4i)**

1H spectra Dr.Hamad 138 HW in DMSO



Current Data Parameters  
 NAME 138HW  
 EXPNO 1  
 PROCNO 1

F2 - Acquisition Parameters  
 Date\_ 20171022  
 Time\_ 12.20  
 INSTRUM spect  
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 PULPROG zg30  
 TD 65536  
 SOLVENT DMSO  
 NS 16  
 DS 2  
 SWH 12335.526 Hz  
 FIDRES 0.188225 Hz  
 AQ 2.6563926 sec  
 RG 203  
 DW 40.533 usec  
 DE 20.00 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1

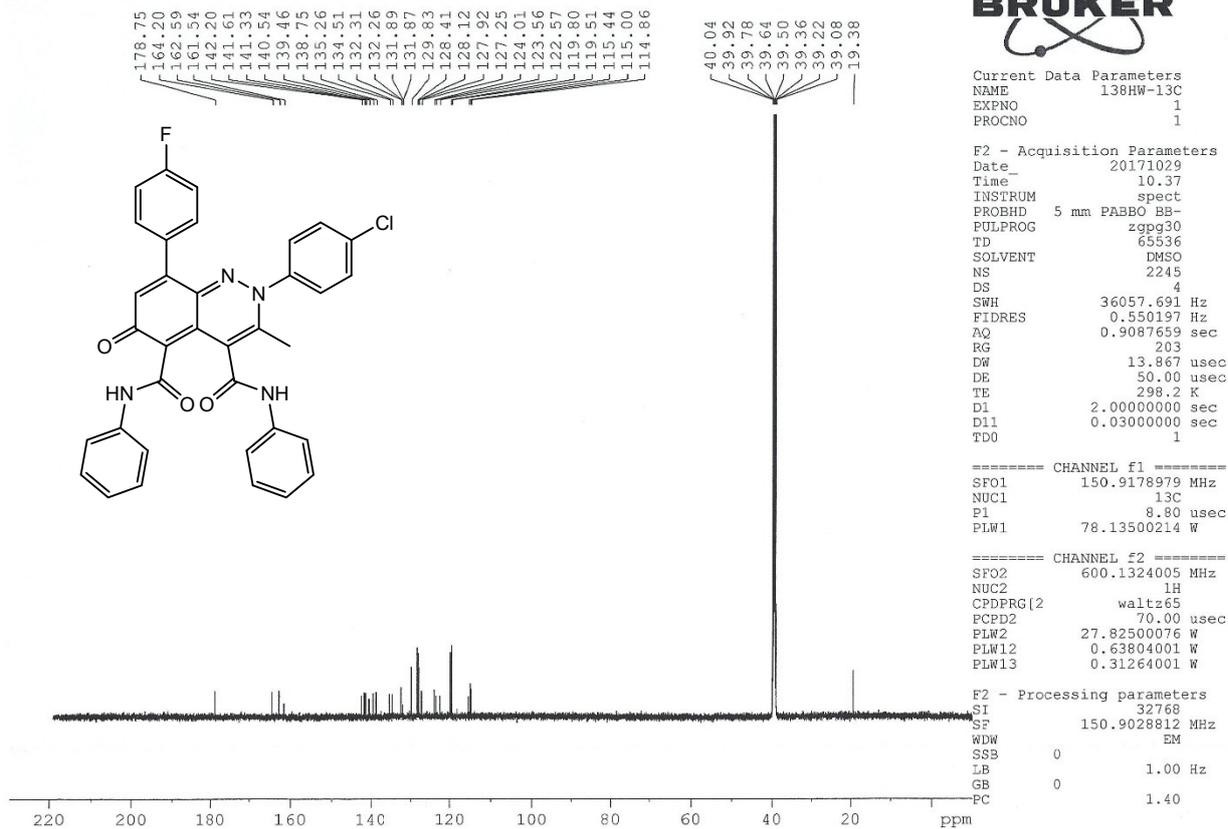
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 NUC1 1H  
 P1 10.60 usec  
 PLW1 27.82500076 W

F2 - Processing parameters  
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 SF 600.1300000 MHz  
 WDW EM  
 LB 0 0.30 Hz  
 GB 0  
 PC 1.00

**<sup>1</sup>H NMR spectrum of compound 4i**

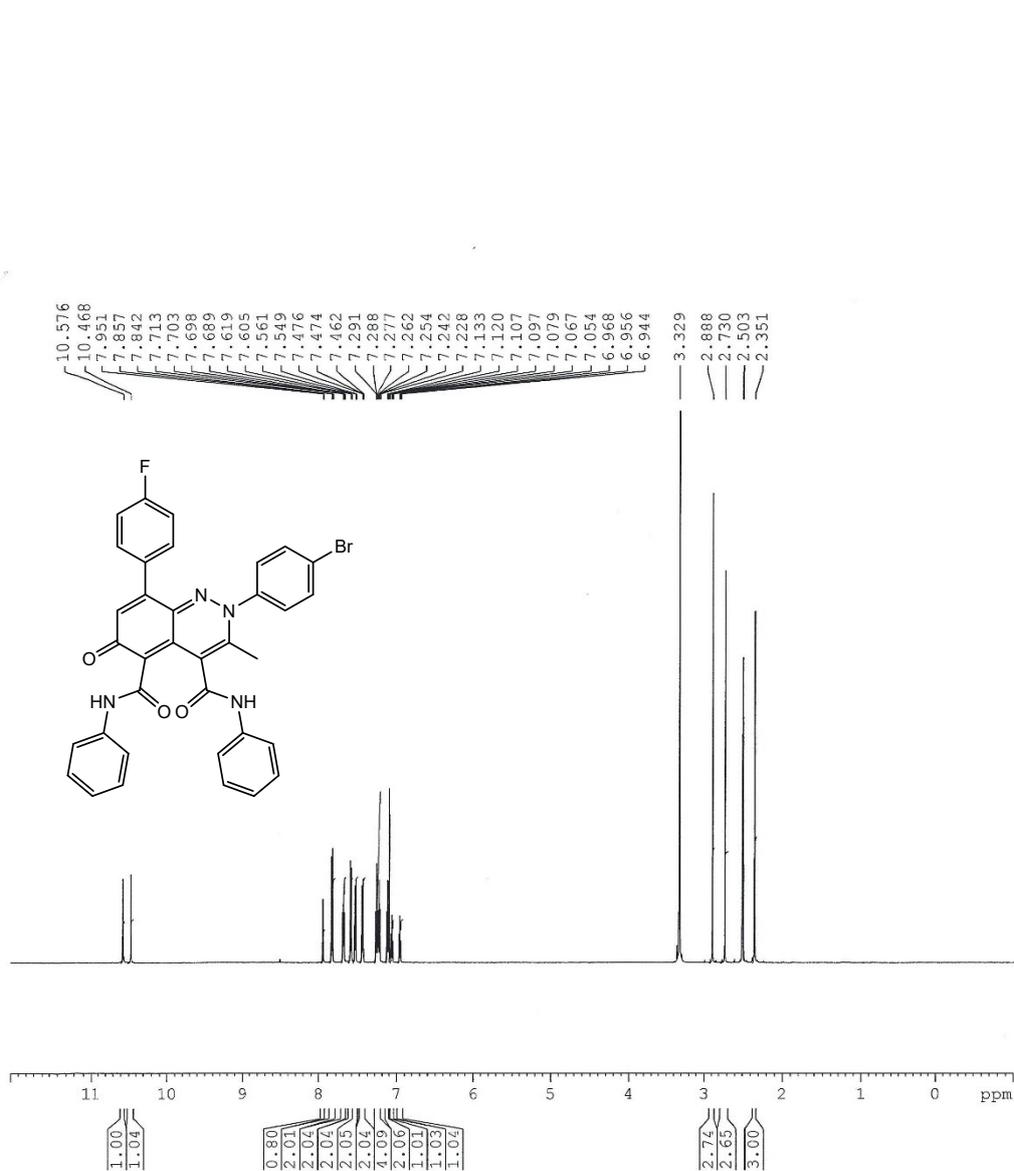
**2-(4-Chlorophenyl)-8-(4-fluorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4i)**

<sup>13</sup>C decoupled spectrum Dr.Hamad 138 Hw in DMSO



**<sup>13</sup>C NMR spectrum of compound 4i**

**2-(4-Bromophenyl)-8-(4-fluorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4j)**



Current Data Parameters  
 NAME 136HW-1H  
 EXPNO 1  
 PROCNO 1

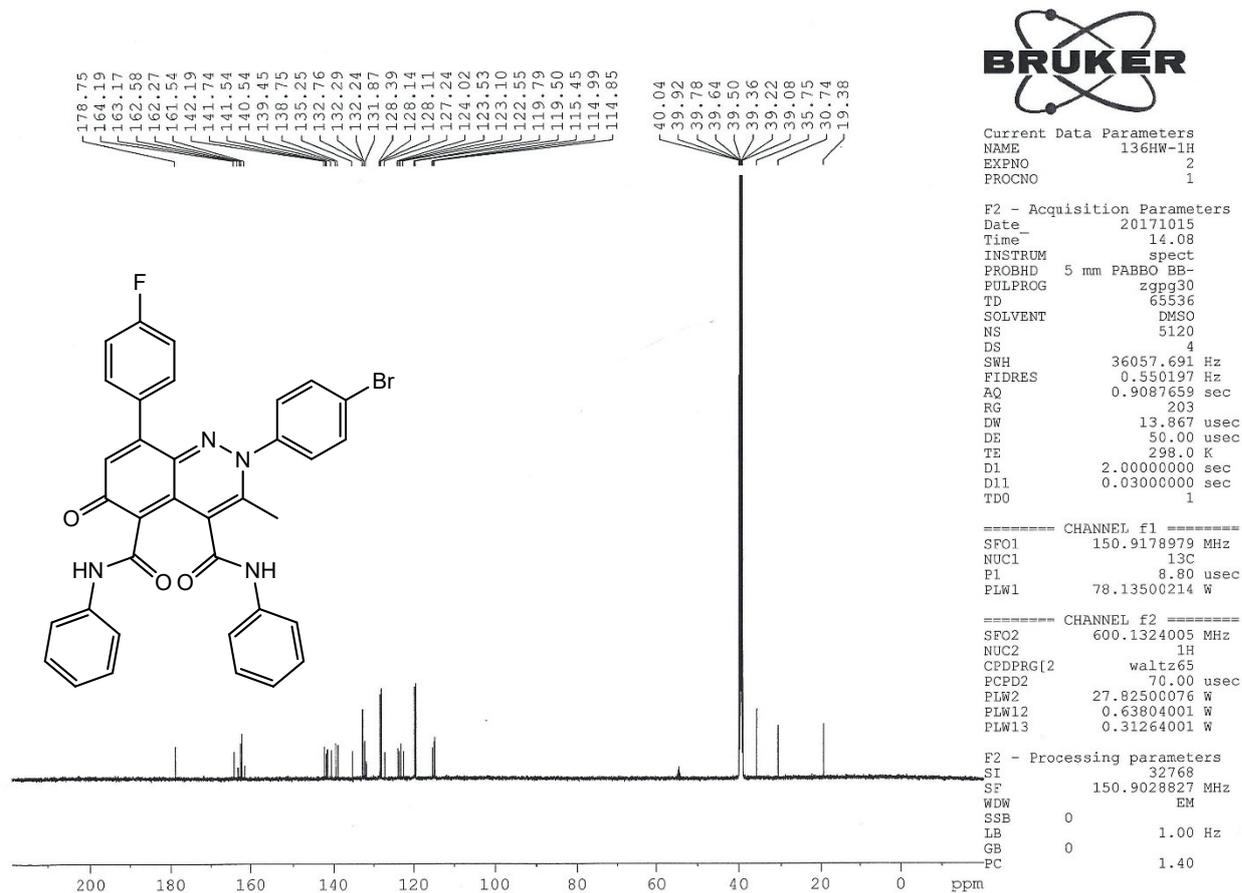
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 PULPROG zg30  
 TD 65536  
 SOLVENT DMSO  
 NS 16  
 DS 2  
 SWH 12335.526 Hz  
 FIDRES 0.188225 Hz  
 AQ 2.6563926 sec  
 RG 203  
 DW 40.533 usec  
 DE 20.00 usec  
 TE 298.0 K  
 D1 1.00000000 sec  
 TD0 1

===== CHANNEL f1 =====  
 SFO1 600.1337060 MHz  
 NUC1 1H  
 P1 10.60 usec  
 PLW1 27.82500076 W

F2 - Processing parameters  
 SI 32768  
 SF 600.1300000 MHz  
 WDW EM  
 SSB 0  
 LB 0.30 Hz  
 GB 0  
 PC 1.00

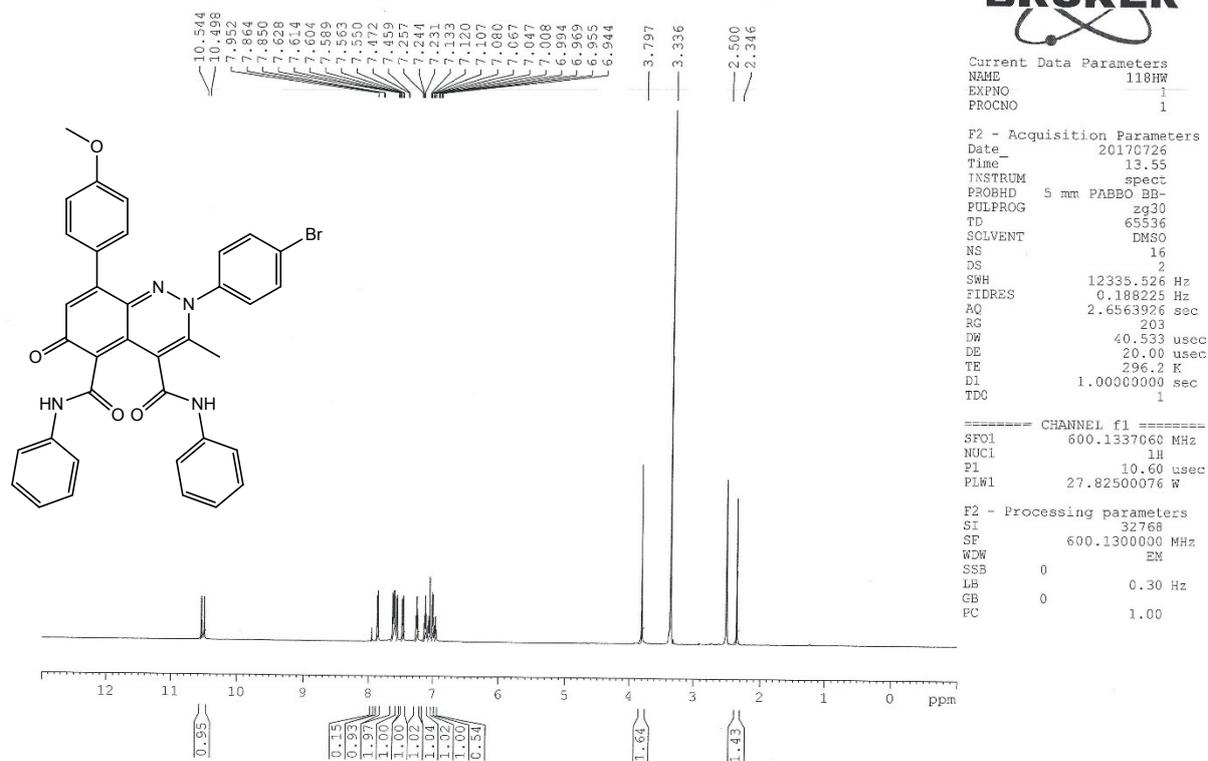
**<sup>1</sup>H NMR spectrum of compound 4j**

**2-(4-Bromophenyl)-8-(4-fluorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4j)**



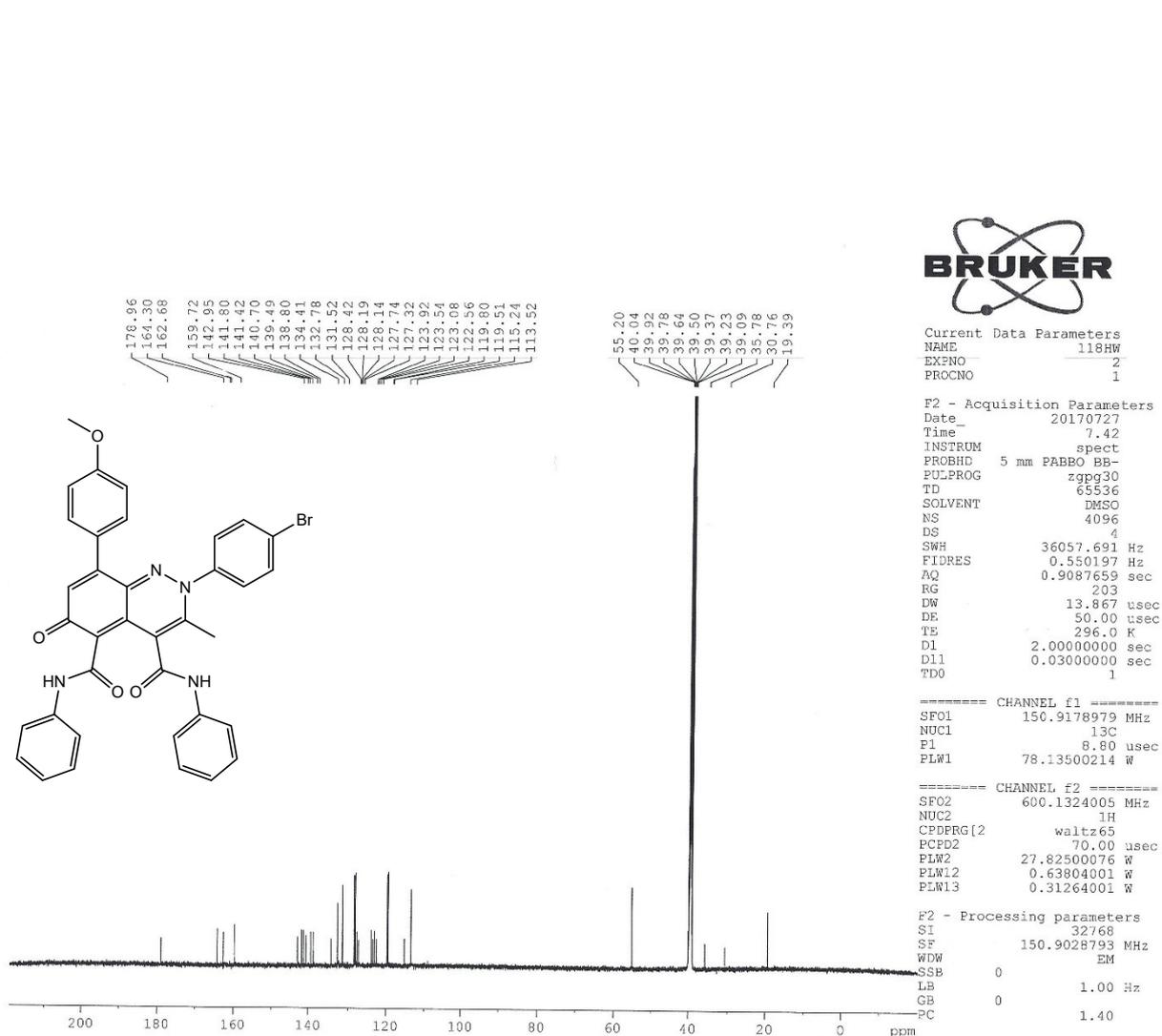
**<sup>13</sup>C NMR spectrum of compound 4j**

**8-(4-Anisyl)-2-(4-bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4k)**



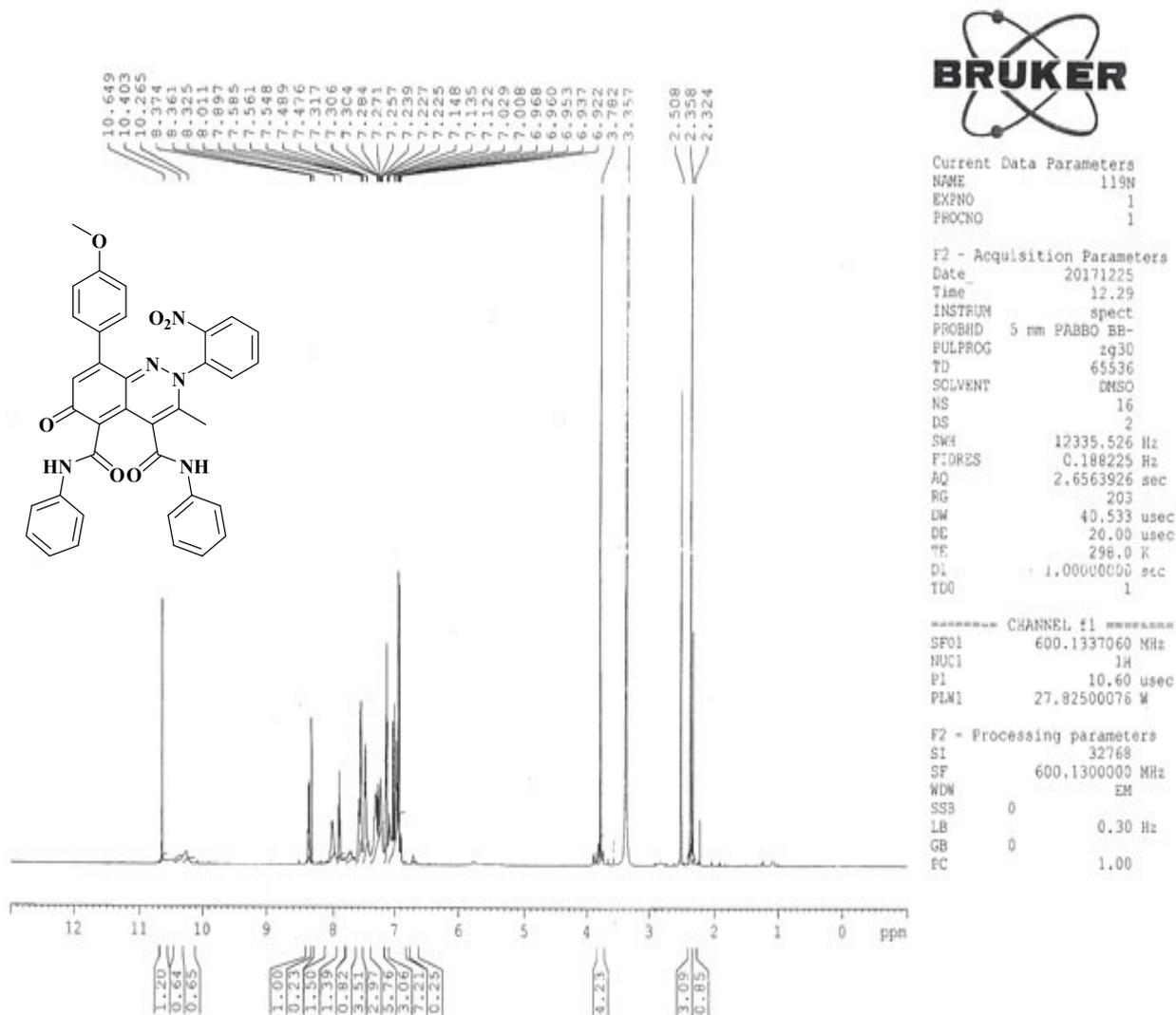
**<sup>1</sup>H NMR spectrum of compound 4k**

**8-(4-Anisyl)-2-(4-bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4k)**



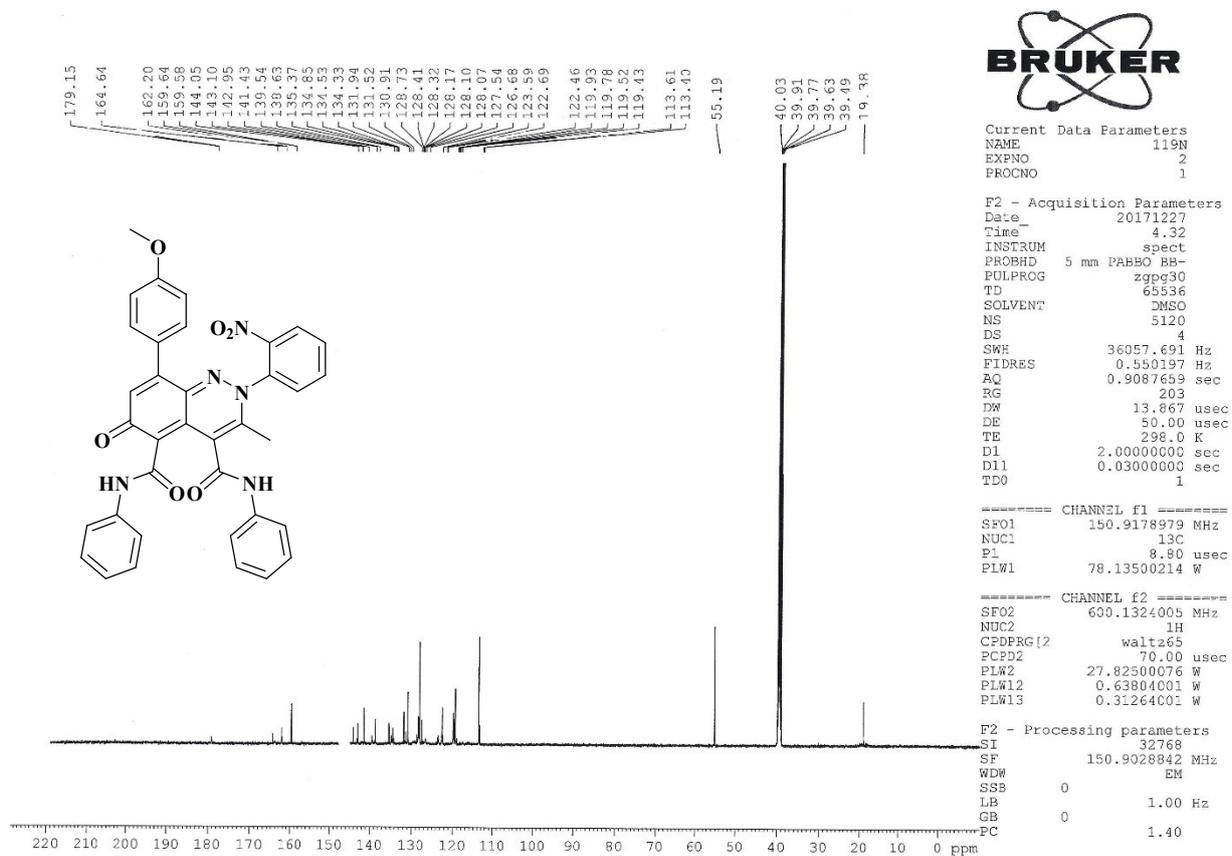
**<sup>13</sup>C NMR spectrum of compound 4k**

**8-(4-Anisyl)-3-methyl-2-(2-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4l)**



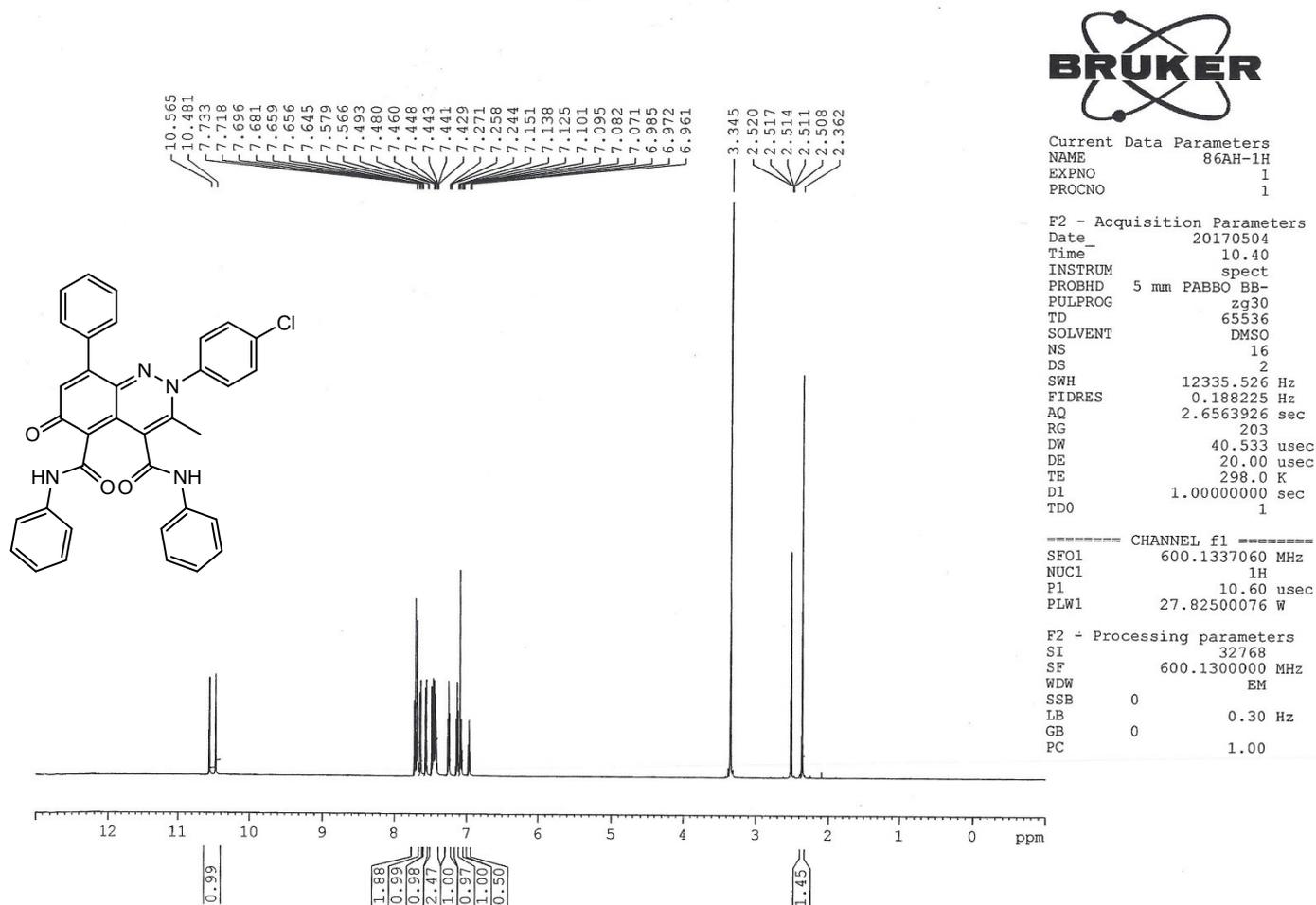
**<sup>1</sup>H NMR spectrum of compound 4l**

**8-(4-Anisyl)-3-methyl-2-(2-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>-diphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4l)**



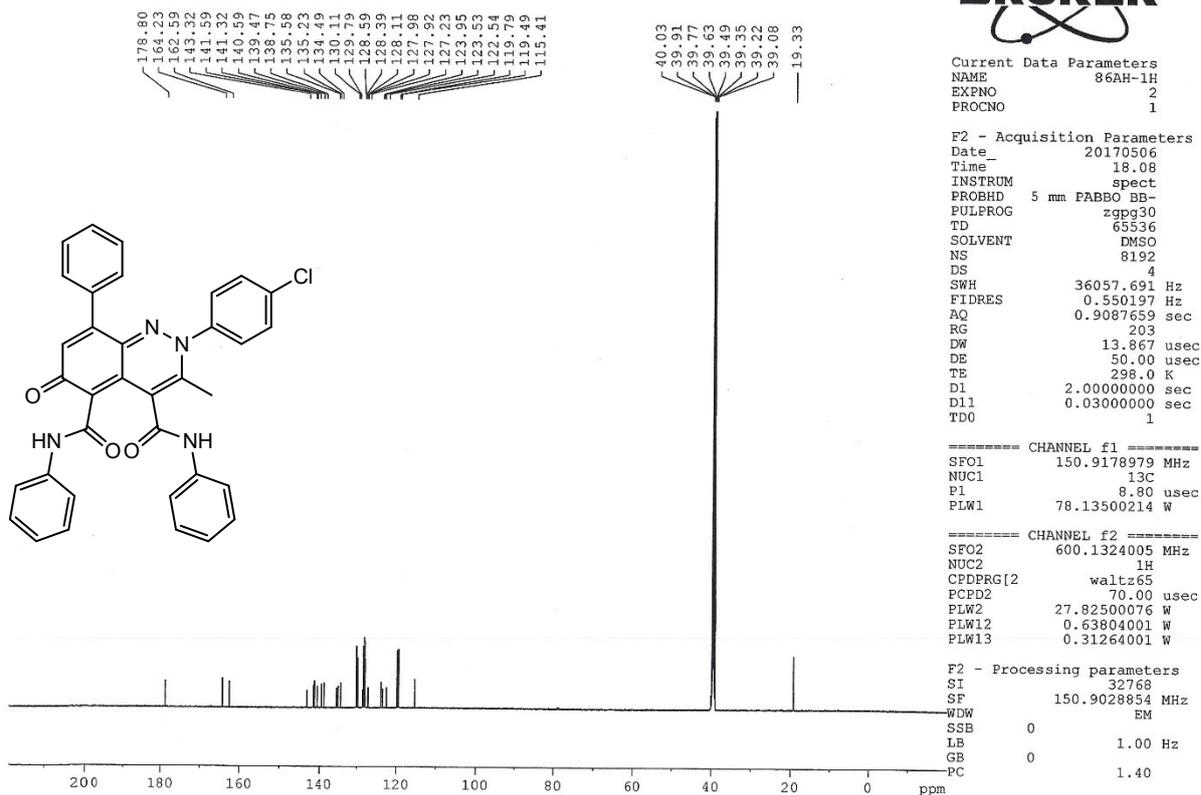
**<sup>13</sup>C NMR spectrum of compound 4l**

**2-(4-Chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4m)**



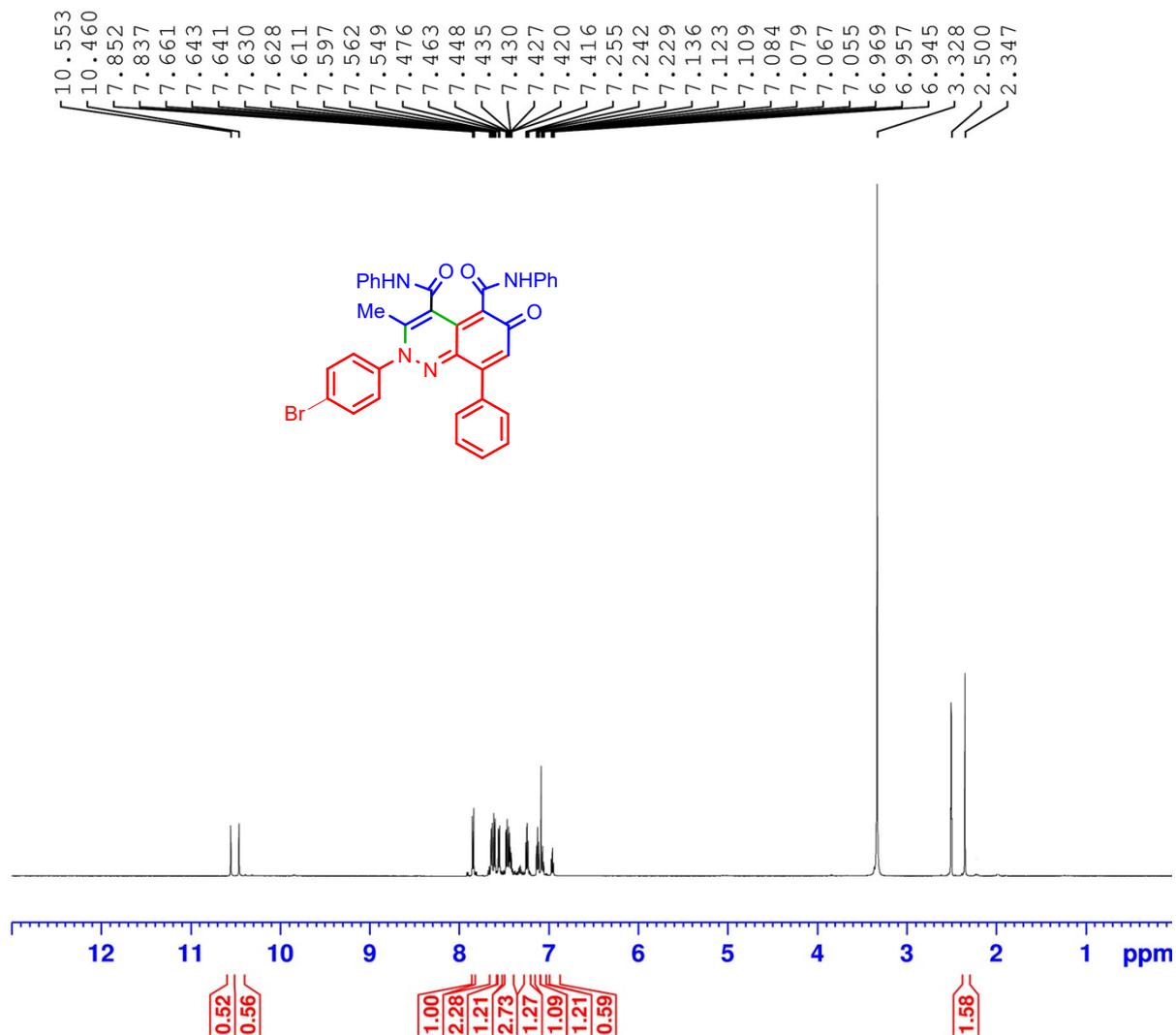
**<sup>1</sup>H NMR spectrum of compound 4m**

**2-(4-Chlorophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4m)**



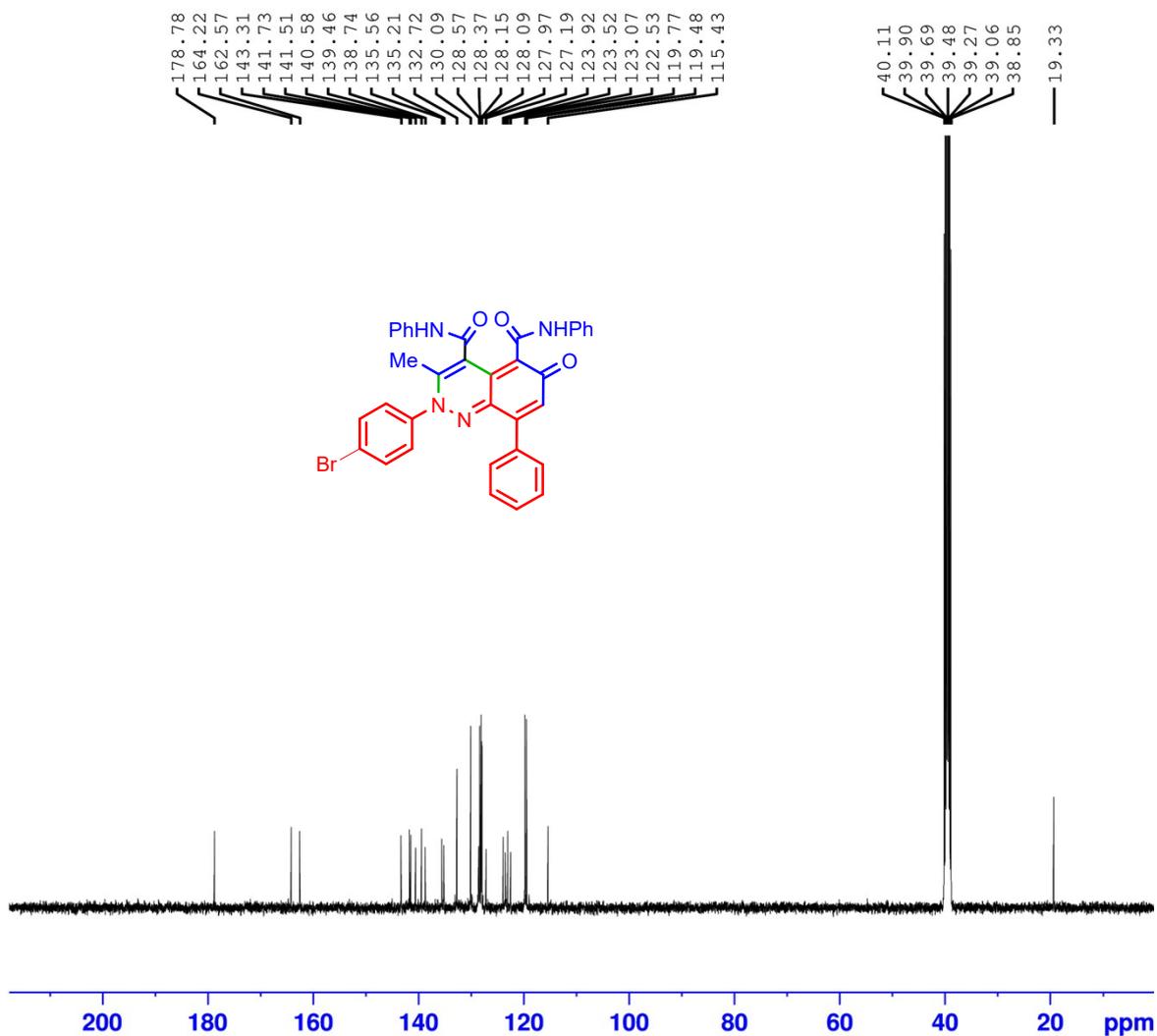
**<sup>13</sup>C NMR spectrum of compound 4m**

**2-(4-Bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4n)**



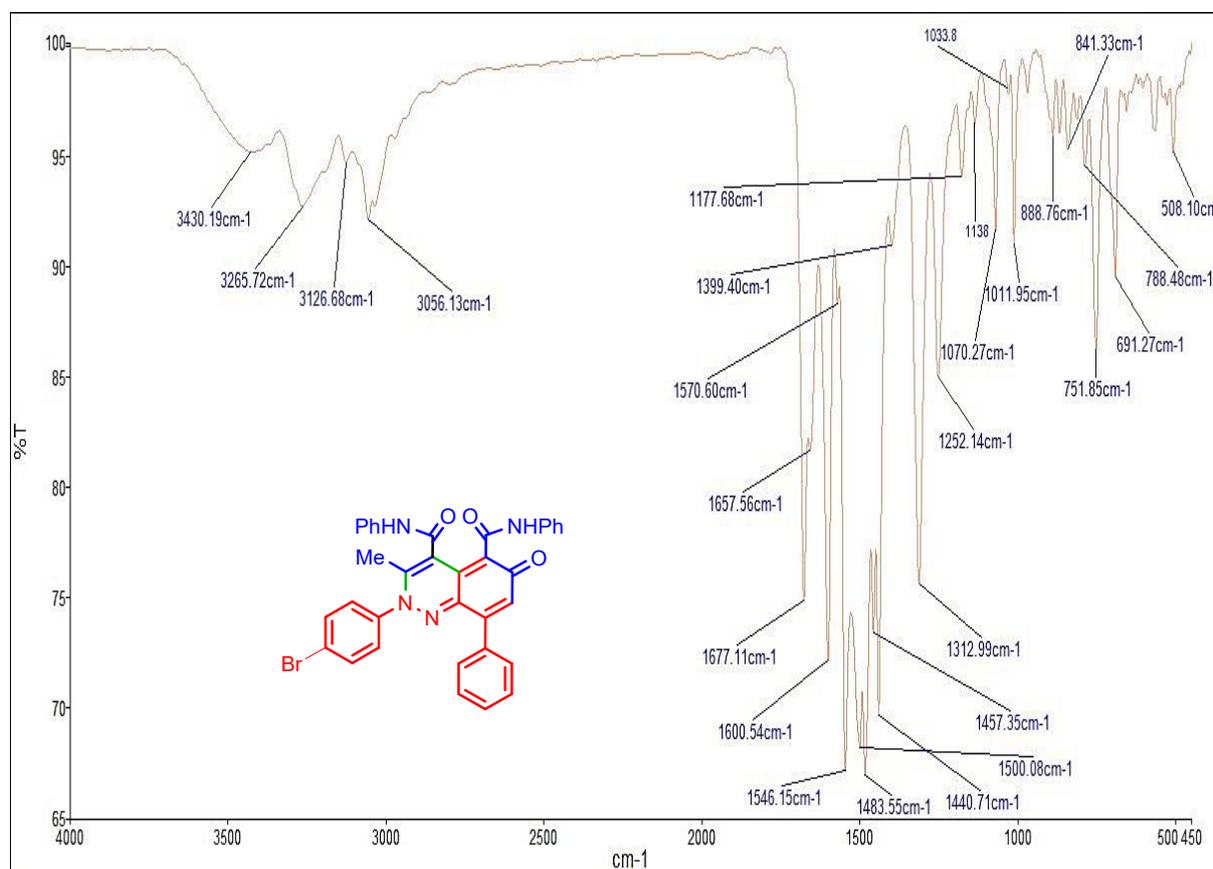
**<sup>1</sup>H NMR spectrum of compound 4n**

**2-(4-Bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4n)**



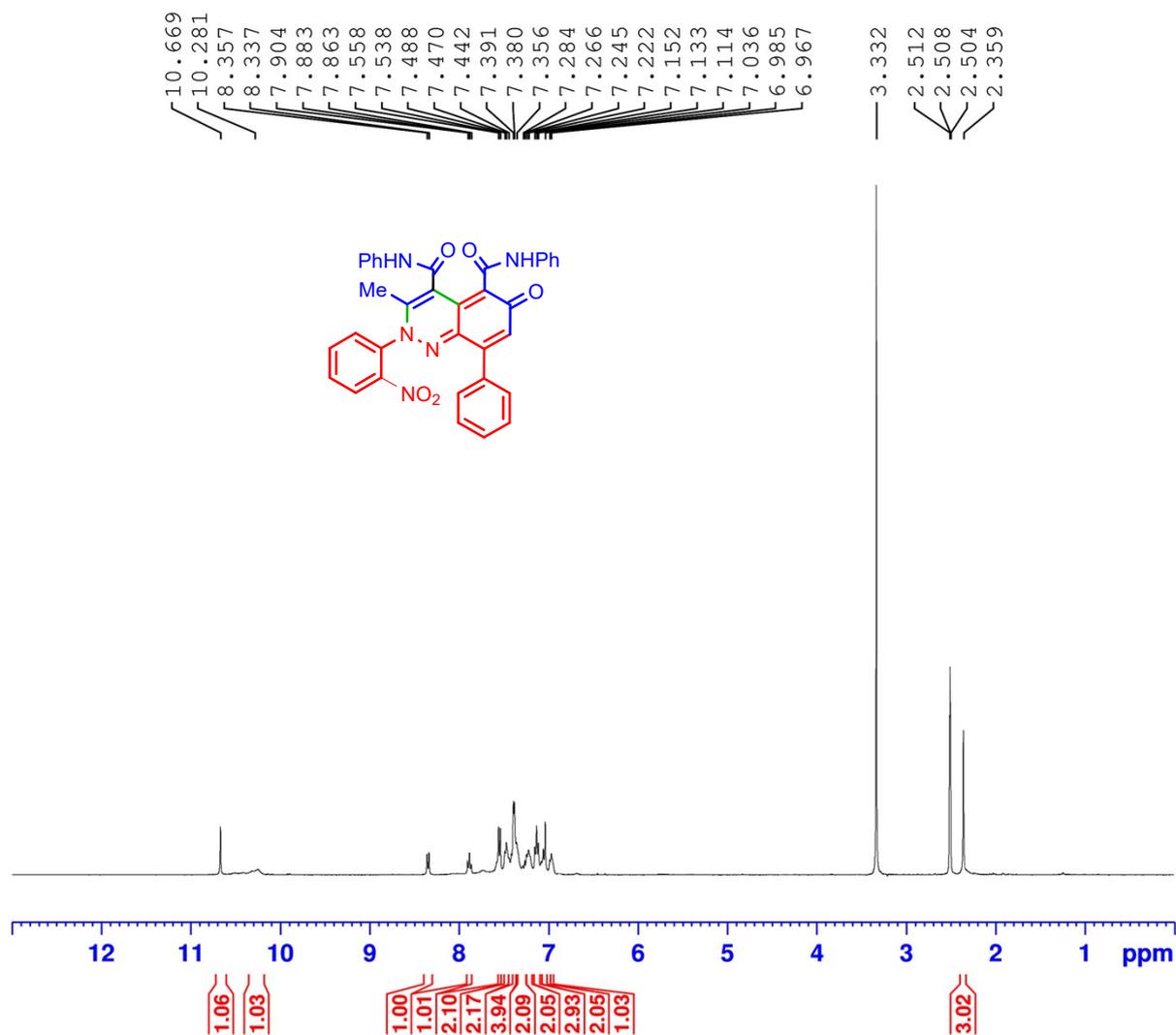
**<sup>13</sup>C NMR spectrum of compound 4n**

**2-(4-Bromophenyl)-3-methyl-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4n)**

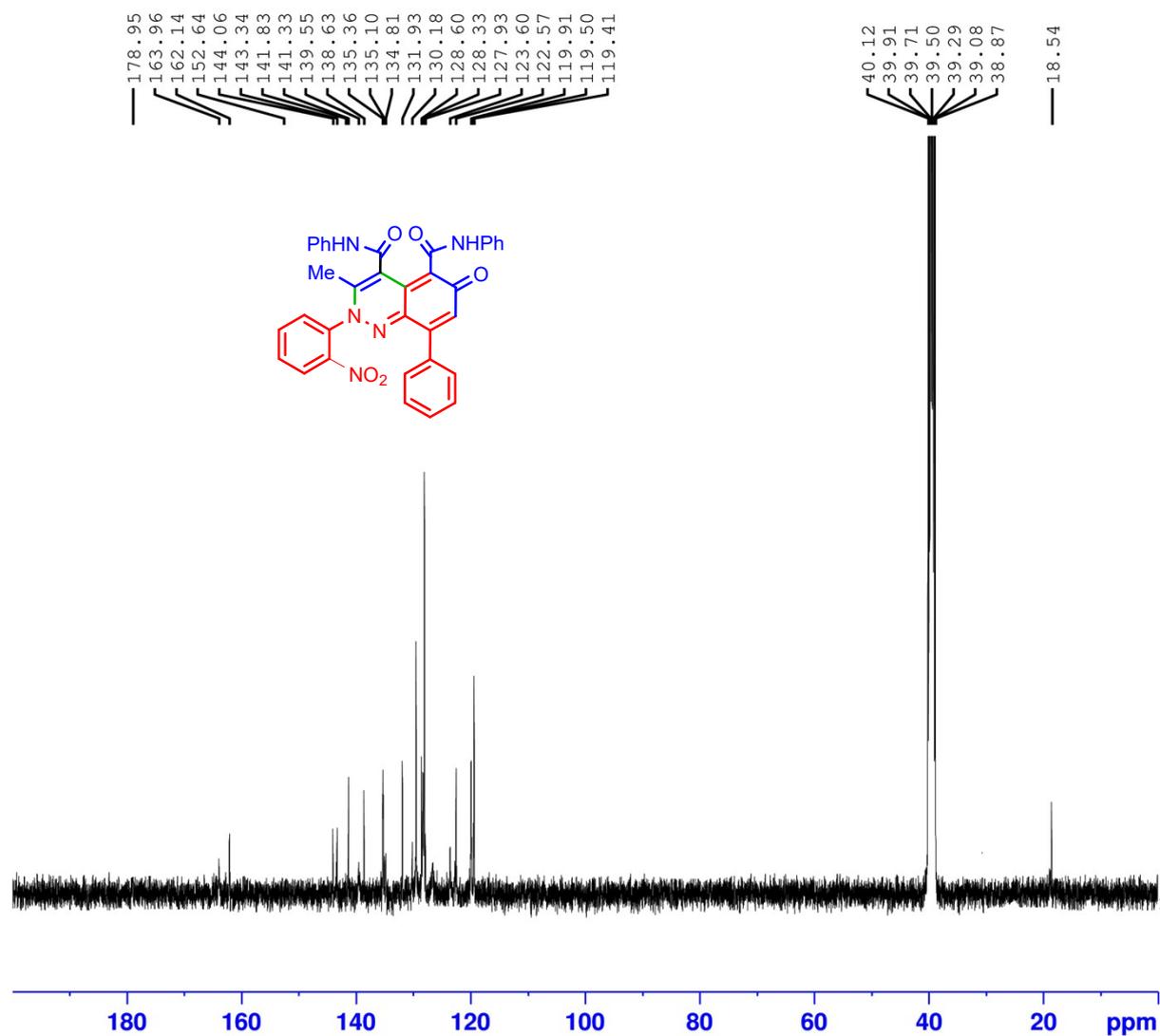


**FT-IR spectrum of compound 4d**

**3-Methyl-2-(2-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4o)**

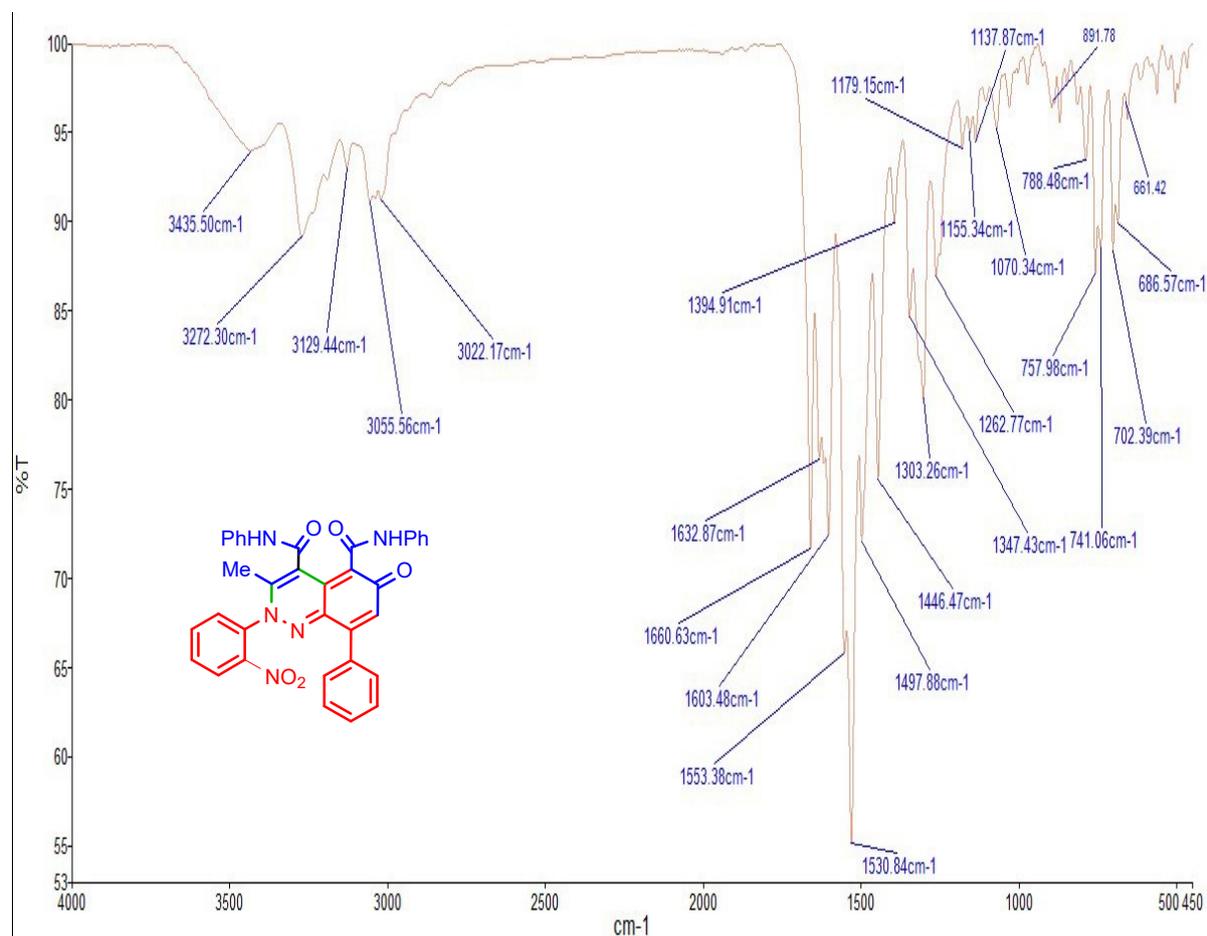


**3-Methyl-2-(2-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4o)**



<sup>13</sup>C NMR spectrum of compound 4o

**3-Methyl-2-(2-nitrophenyl)-6-oxo-*N*<sup>4</sup>,*N*<sup>5</sup>,8-triphenyl-2,6-dihydrocinnoline-4,5-dicarboxamide (4o)**



**FT-IR spectrum of compound 4o**