

Supporting Information

Iodine-catalyzed regioselective thiolation of imidazo[1,2-*a*]pyridines using sulfonyl hydrazides as a thiol surrogate

Avik Kumar Bagdi,^a Shubhanjan Mitra,^a Monoranjan Ghosh ^a and Alakananda Hajra*^a

^a*Department of Chemistry, Visva-Bharati, Santiniketan-731235, India*

E-mail: alakananda.hajra@visva-bharati.ac.in

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General: ^1H NMR spectra were determined on a Bruker 400 (400 MHz) spectrometer as solutions in CDCl_3 . Chemical shifts are expressed in parts per million (δ) and are referenced to tetramethylsilane (TMS) as internal standard and the signals were reported as s (singlet), d (doublet), t (triplet), m (multiplet) and coupling constants J were given in Hz. ^{13}C NMR spectra were recorded at 100 MHz in CDCl_3 solution. All reactions were carried out in open air conditions. TLC was done on silica gel coated glass slide (Merck, Silica gel G for TLC). Silica gel (60-120 mesh, SRL, India) was used for column chromatography. Petroleum ether refers to the fraction boiling in the range of 60-80 $^\circ\text{C}$ unless otherwise mentioned. All solvents were dried and distilled before use. Solvents, reagents and chemicals were purchased from Aldrich. All the imidazopyridines were synthesized by following reported methodology.¹

1. Typical procedure for the synthesis of 2-phenyl-3-*p*-tolylsulfanyl-imidazo[1,2-*a*]pyridine (3aa):

To a solution of 2-phenyl-imidazo[1,2-*a*]pyridine **1a** (97 mg, 0.5 mmol) in ethanol (0.1 mL), *p*-toluene sulfonylhydrazide **2a** (110 mg, 0.6 mmol) and I_2 (20 mol-%) was added. The mixture was stirred at 70 $^\circ\text{C}$ for 10 h (TLC). After completion, the reaction mixture was cooled to room temperature and ethanol was evaporated. Subsequently, the mixture was extracted with dichloromethane (5 mL) followed by washing with brine (3 mL). The combined organic phases were dried over anhydrous Na_2SO_4 . The crude product was concentrated in vacuo and was purified by column chromatography on silica gel using petroleum ether/ethylacetate (15:1 to 10:1) as eluent.

2. Typical procedure for the synthesis of 6-phenyl-5-(*p*-tolylthio)imidazo[2,1-*b*]thiazole (5aa):

A mixture of 2-phenyl-imidazo[1,2-*a*]thiazole **4a** (100 mg, 0.5 mmol) and *p*-toluene sulfonylhydrazide **2a** (110 mg, 0.6 mmol) was stirred in presence of I_2 (20 mol%) in ethanol (0.1 mL) at 70 $^\circ\text{C}$ for 10h (TLC). After completion, the reaction mixture was cooled to room temperature and extracted with dichloromethane (5 mL) followed by washing with brine (3 mL) and dried over Na_2SO_4 . After evaporation of solvent the crude product was purified by column chromatography on silica gel using petroleum ether/ethylacetate as eluent.

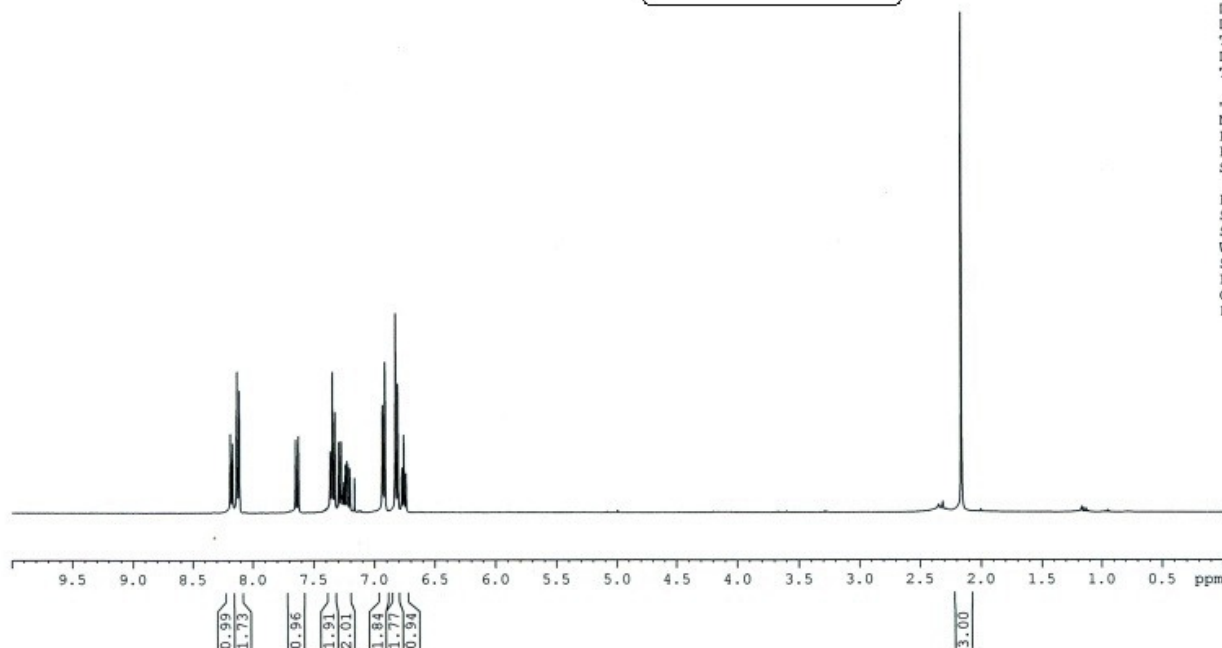
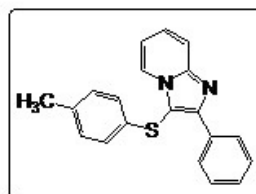
3. Typical procedure for the synthesis of 2-Phenyl-3-*p*-tolylsulfanyl-benzo[*d*]imidazo[2,1-*b*]thiazole (7aa):

A mixture of 2-phenyl-benzo[*d*]imidazo[2,1-*b*]thiazole **6a** (125 mg, 0.5 mmol) and *p*-toluene sulfonylhydrazide **2a** (110 mg, 0.6 mmol) was stirred in presence of I₂ (20 mol%) in ethanol (0.1 mL) at 70 °C for 10h (TLC). After completion, the reaction mixture was cooled to room temperature and extracted with dichloromethane (5 mL) followed by washing with brine (3 mL) and dried over Na₂SO₄. After evaporation of solvent the crude product was purified by column chromatography on silica gel using petroleum ether/ethylacetate as eluent.

^1H and ^{13}C NMR spectra

8.187
8.175
8.173
8.170
8.139
8.135
8.117
8.115
7.650
7.648
7.628
7.625
7.569
7.566
7.548
7.529
7.524
7.500
7.296
7.278
7.260
7.244
7.230
7.226
7.207
7.204
7.168
6.936
6.916
6.830
6.825
6.813
6.809
6.777
6.775
6.760
6.758
6.743
6.741

2.163

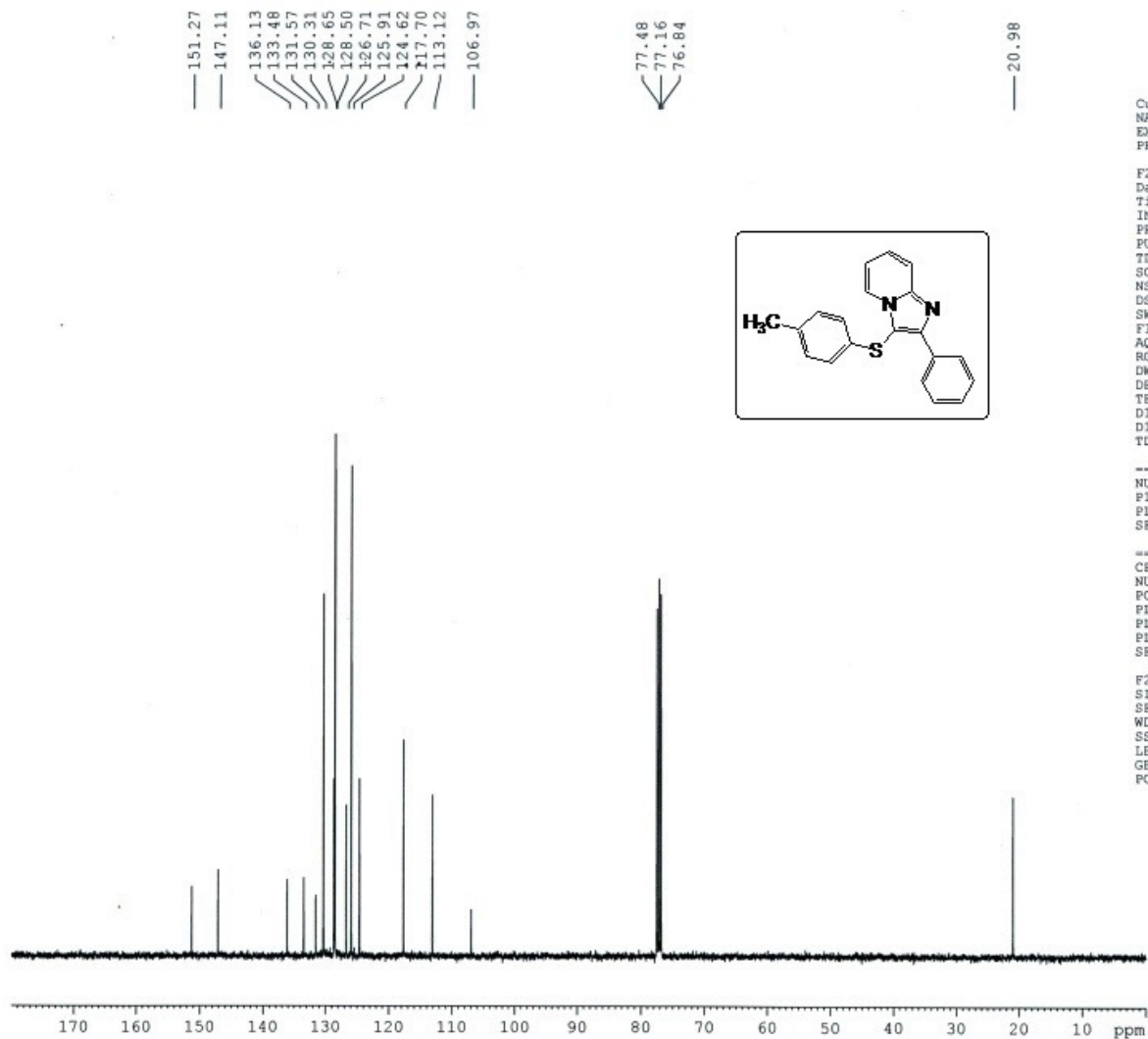


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RG 62.69
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TE 296.5 K
D1 1.00000000 sec
TD0 1

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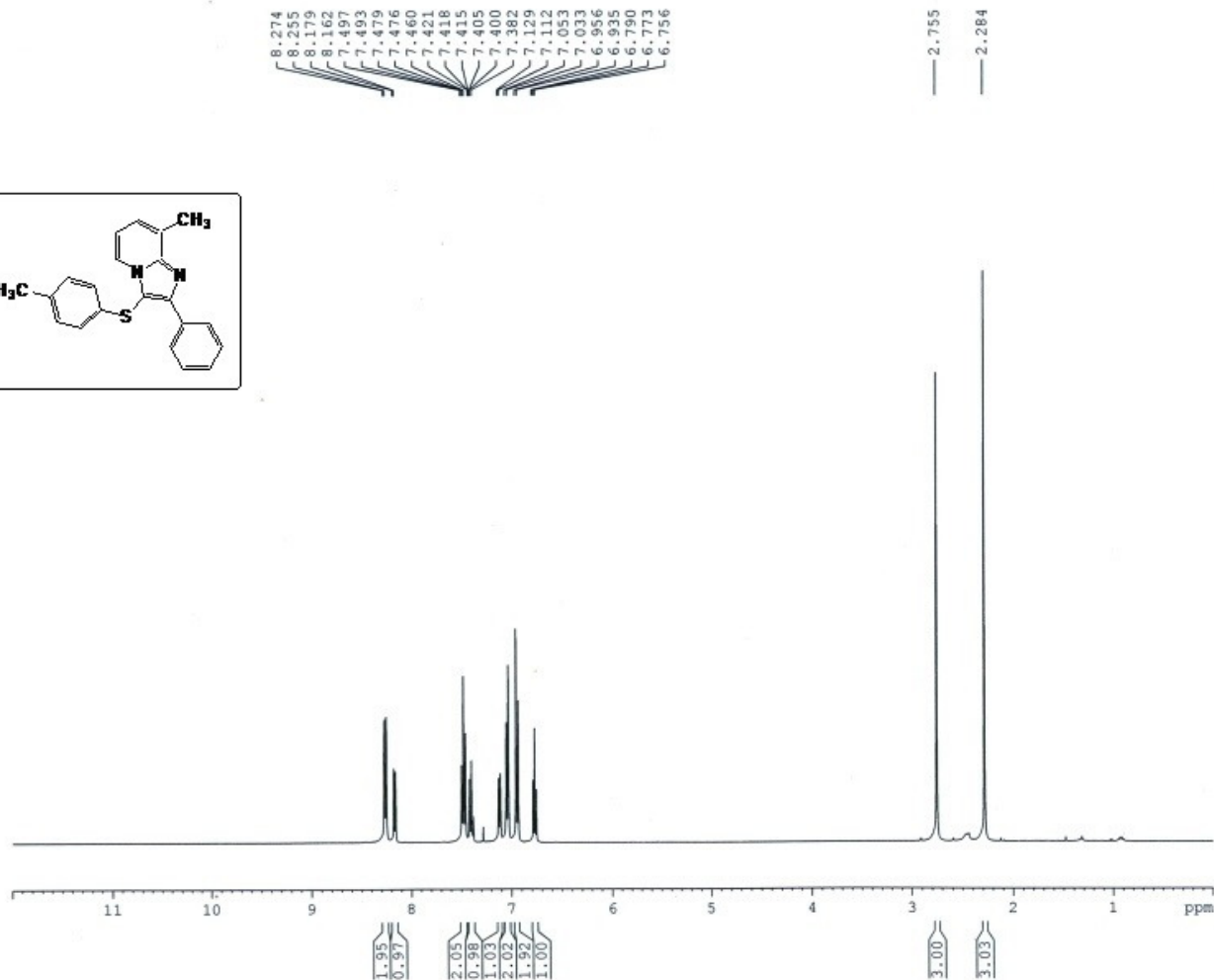
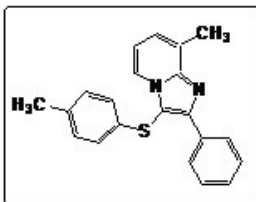
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 TE 297.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
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 NUC2 1H
 PCPD2 80.00 usec
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 PLW12 0.40792999 W
 PLW13 0.26107001 W
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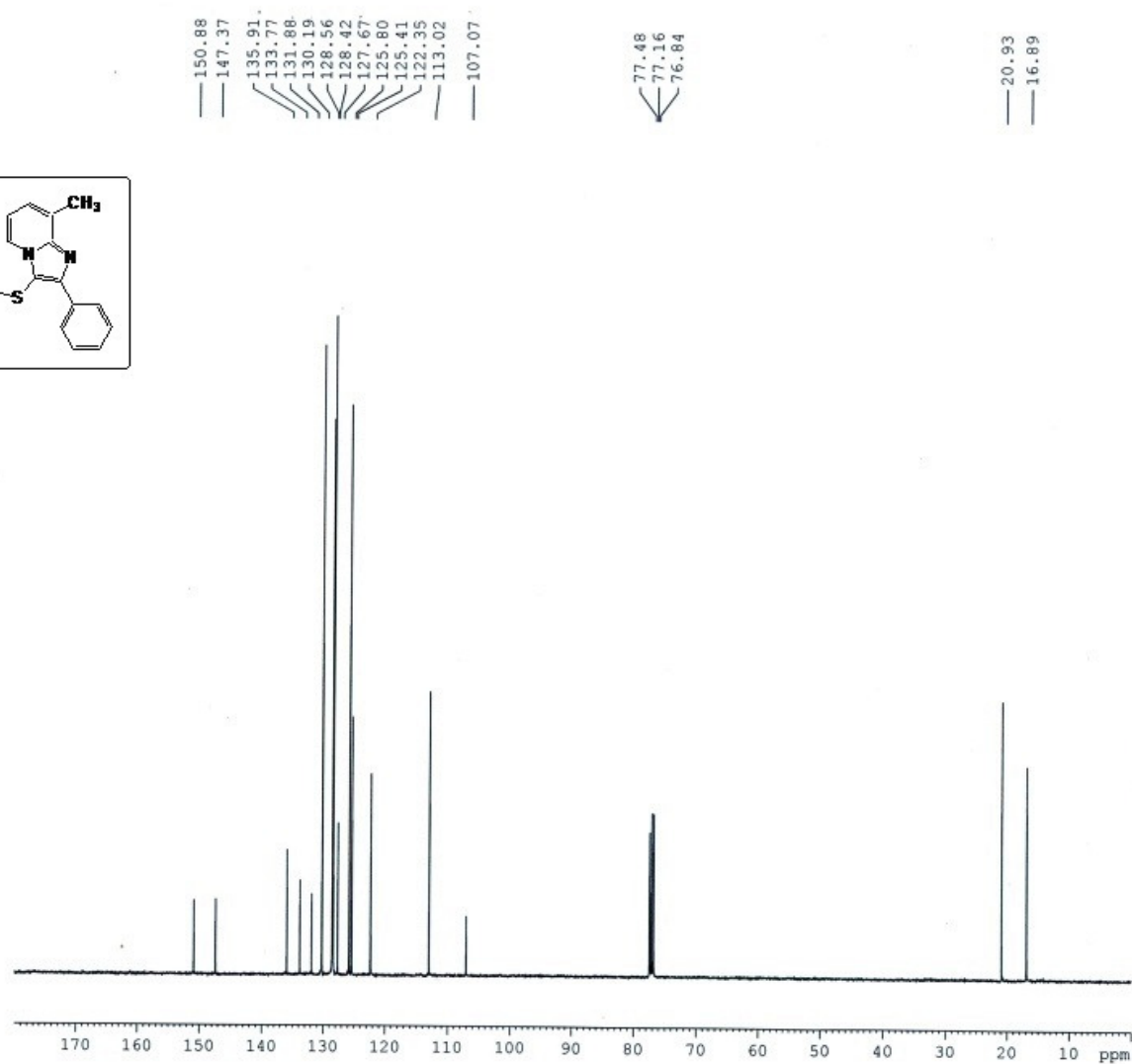
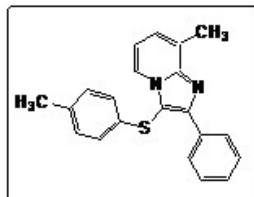


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D1 1.00000000 sec
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===== CHANNEL f1 =====
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P1 14.75 usec
PLW1 11.99499989 W
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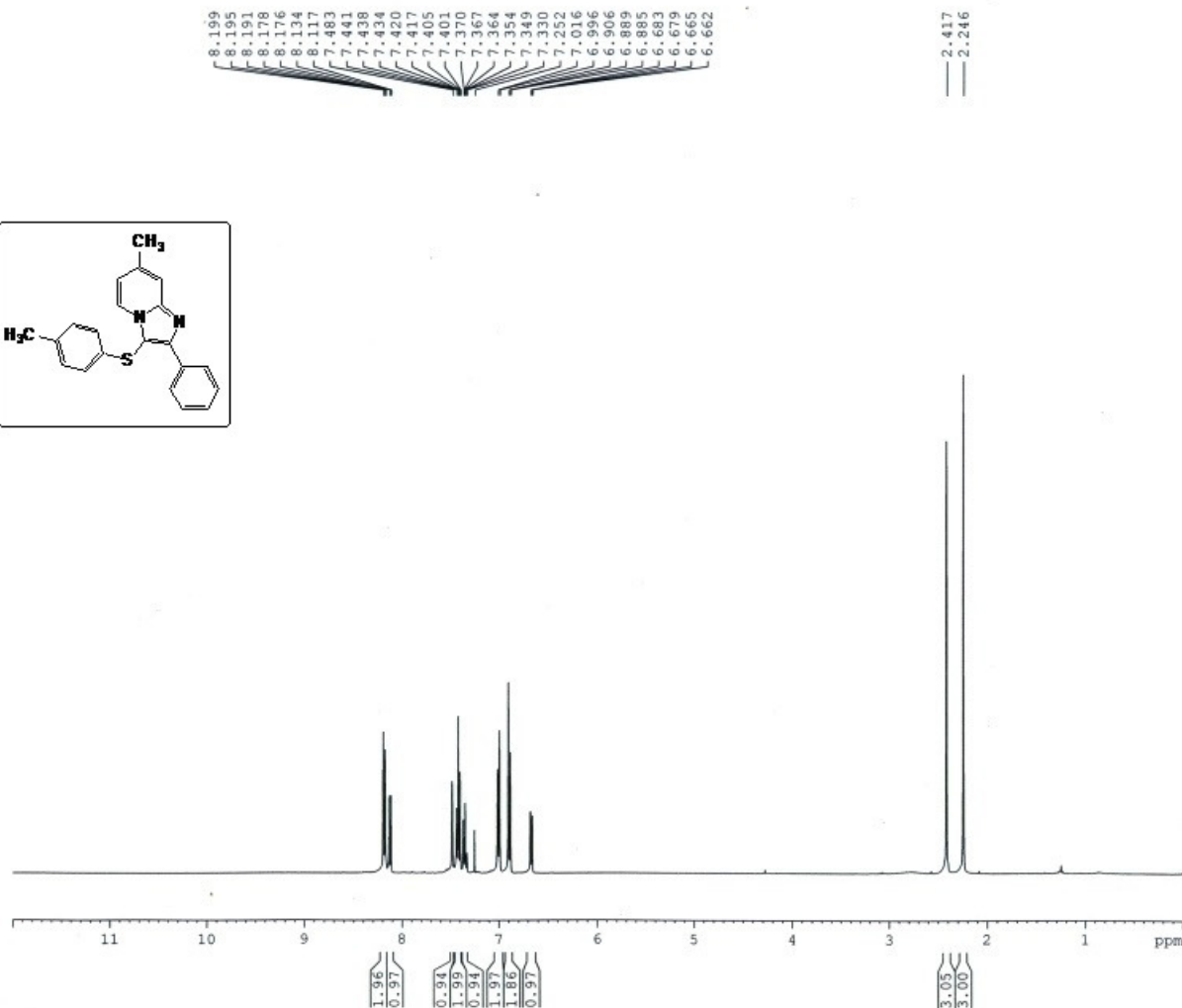
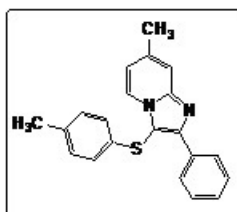
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FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 32.25
DW 20.800 usec
DE 6.50 usec
TE 296.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

===== CHANNEL f2 =====
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NUC2 1H
PCPD2 80.00 usec
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PLW12 0.40792999 W
PLW13 0.26107001 W
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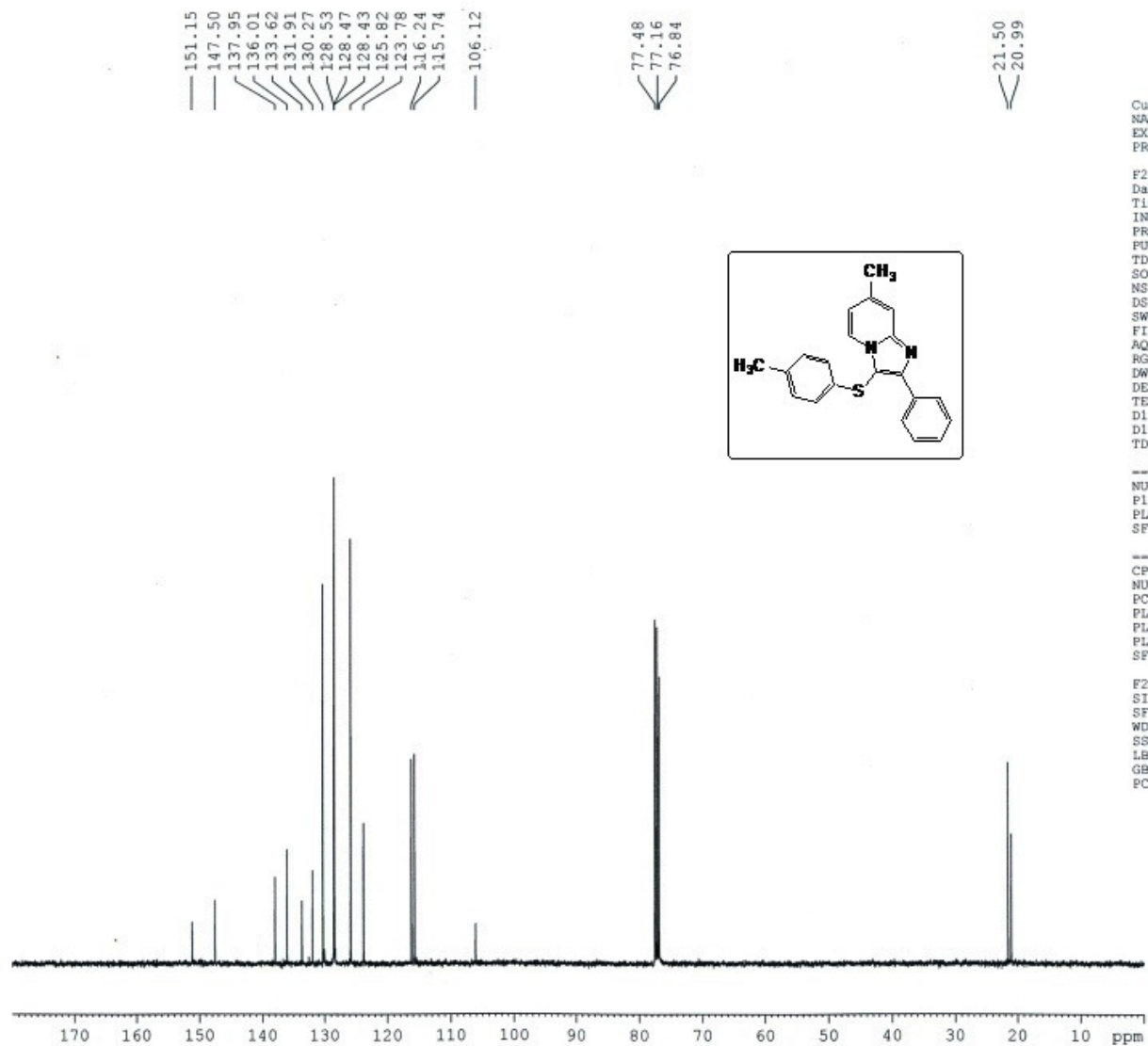


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 TE 296.8 K
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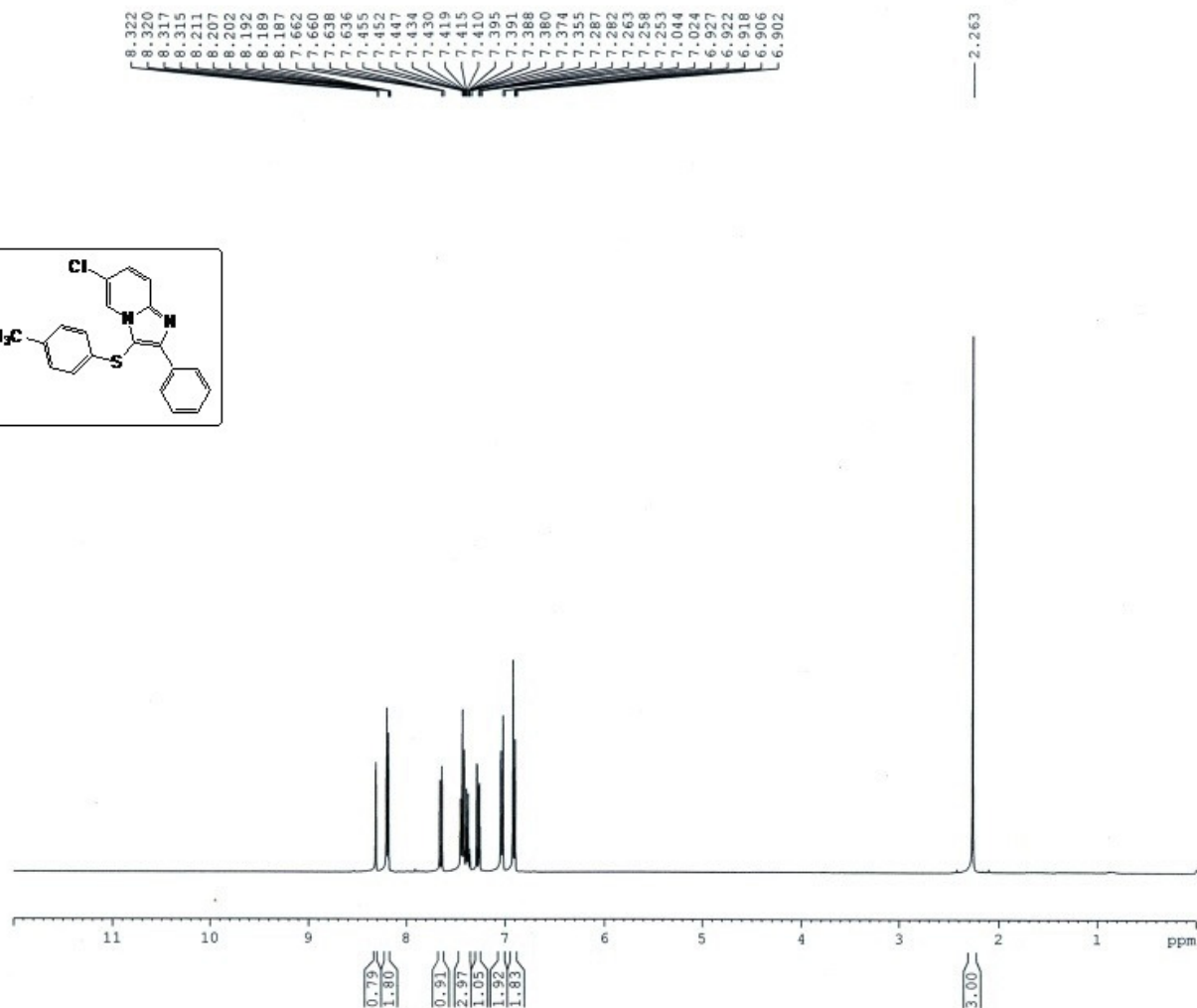
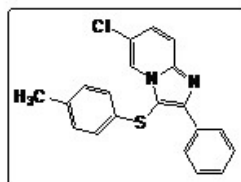
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AQ 0.6816244 sec
RG 87.66
DW 20.800 usec
DE 6.50 usec
TE 297.6 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
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P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

----- CHANNEL f2 -----
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NUC2 1H
PCPD2 80.00 usec
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PLW12 0.40792999 W
PLW13 0.26107001 W
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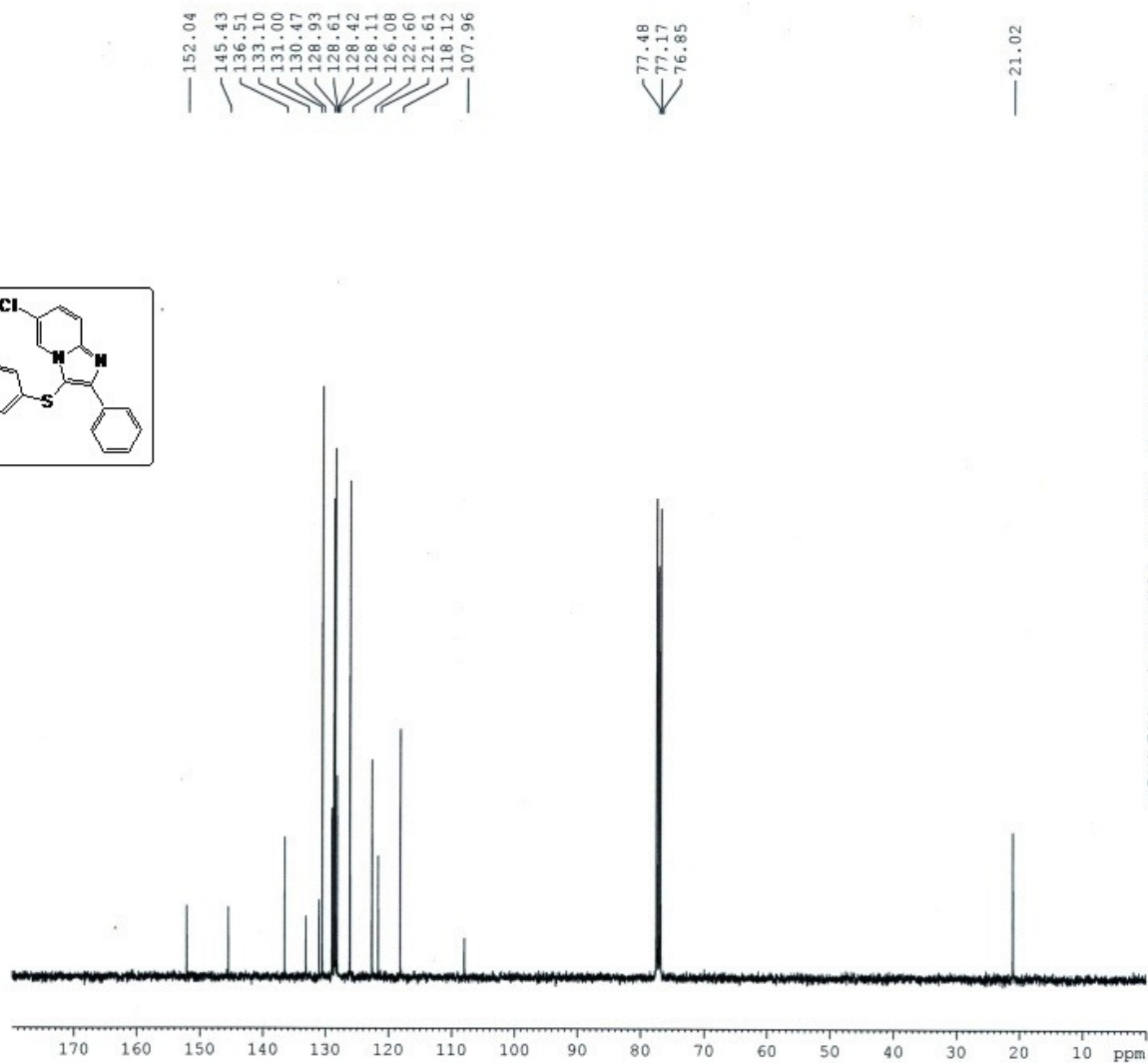
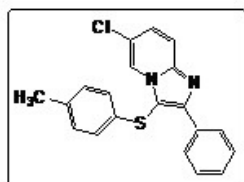


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SOLVENT CDCl3
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SWH 8223.685 Hz
FIDRES 0.250967 Hz
AQ 1.9923444 sec
RG 87.66
DW 60.800 usec
DE 6.50 usec
TE 296.8 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 14.75 usec
PLW1 11.99499989 W
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F2 - Processing parameters
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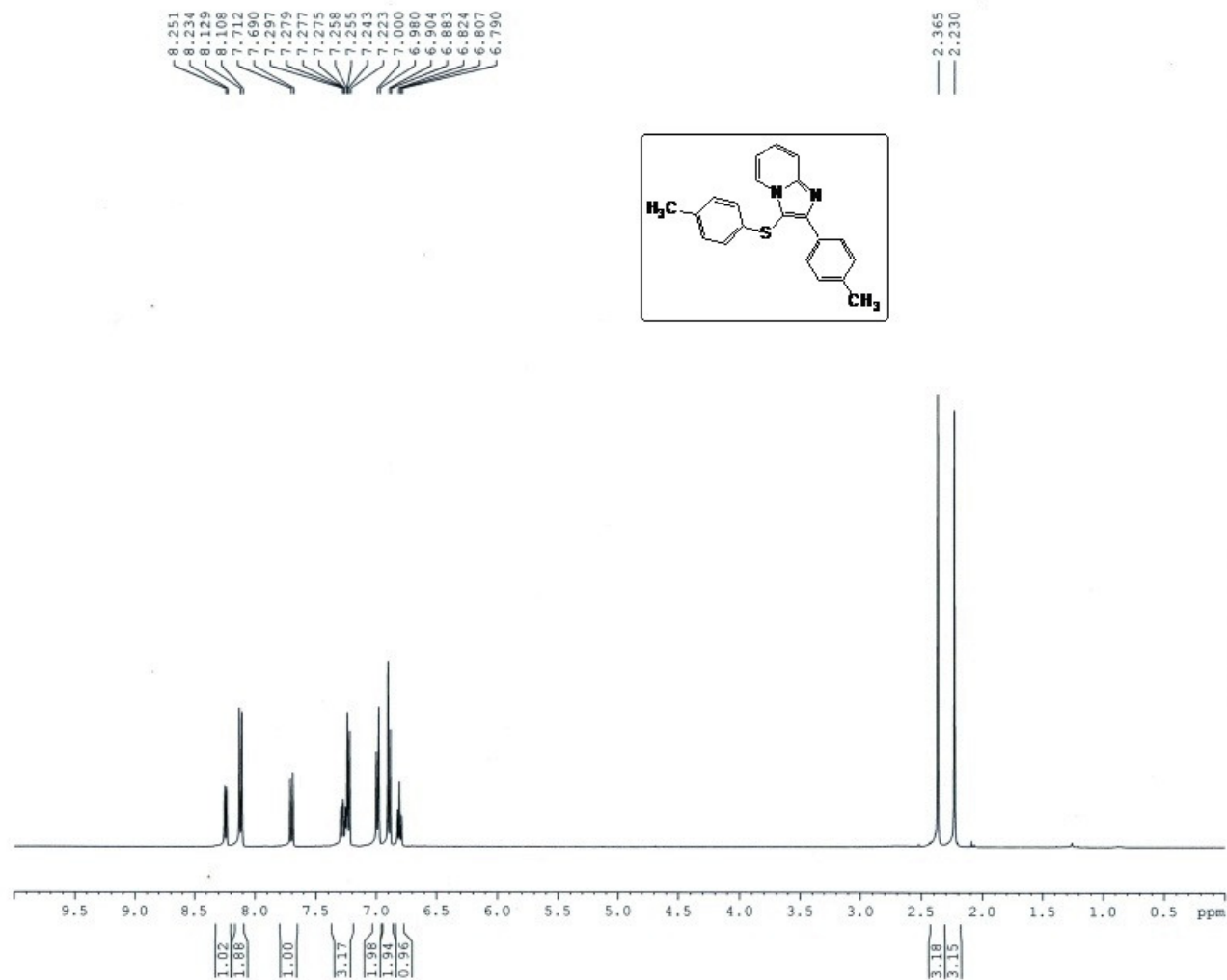
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SOLVENT CDCl3
NS 320
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FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 87.66
DW 20.800 usec
DE 6.50 usec
TE 297.5 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
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P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
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PLW12 0.40792999 W
PLW13 0.26107001 W
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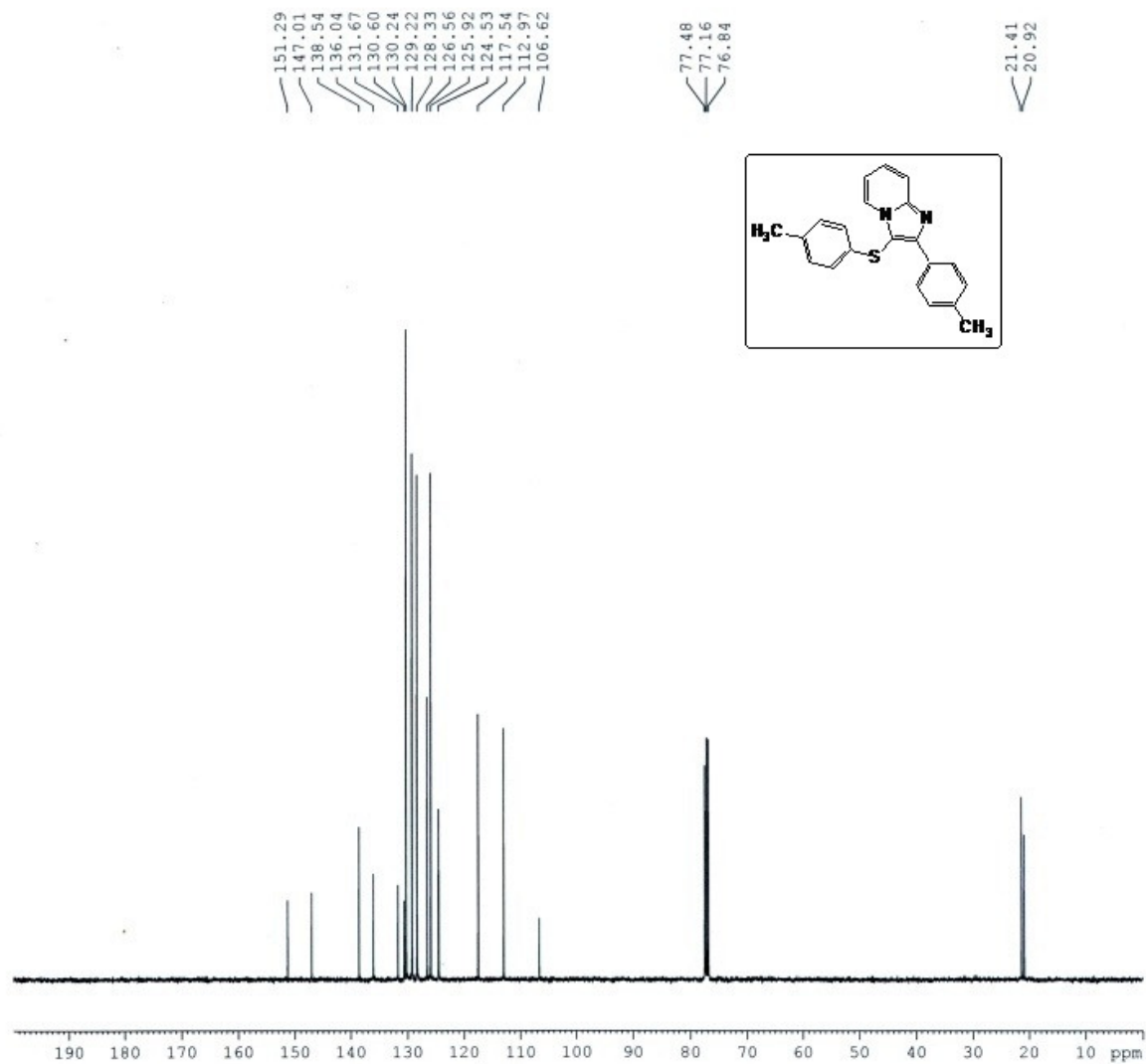


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 RG 47.25
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 TE 300.9 K
 D1 1.00000000 sec
 TDO 1

----- CHANNEL f1 -----
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 P1 14.75 usec
 PLW1 11.99499989 W
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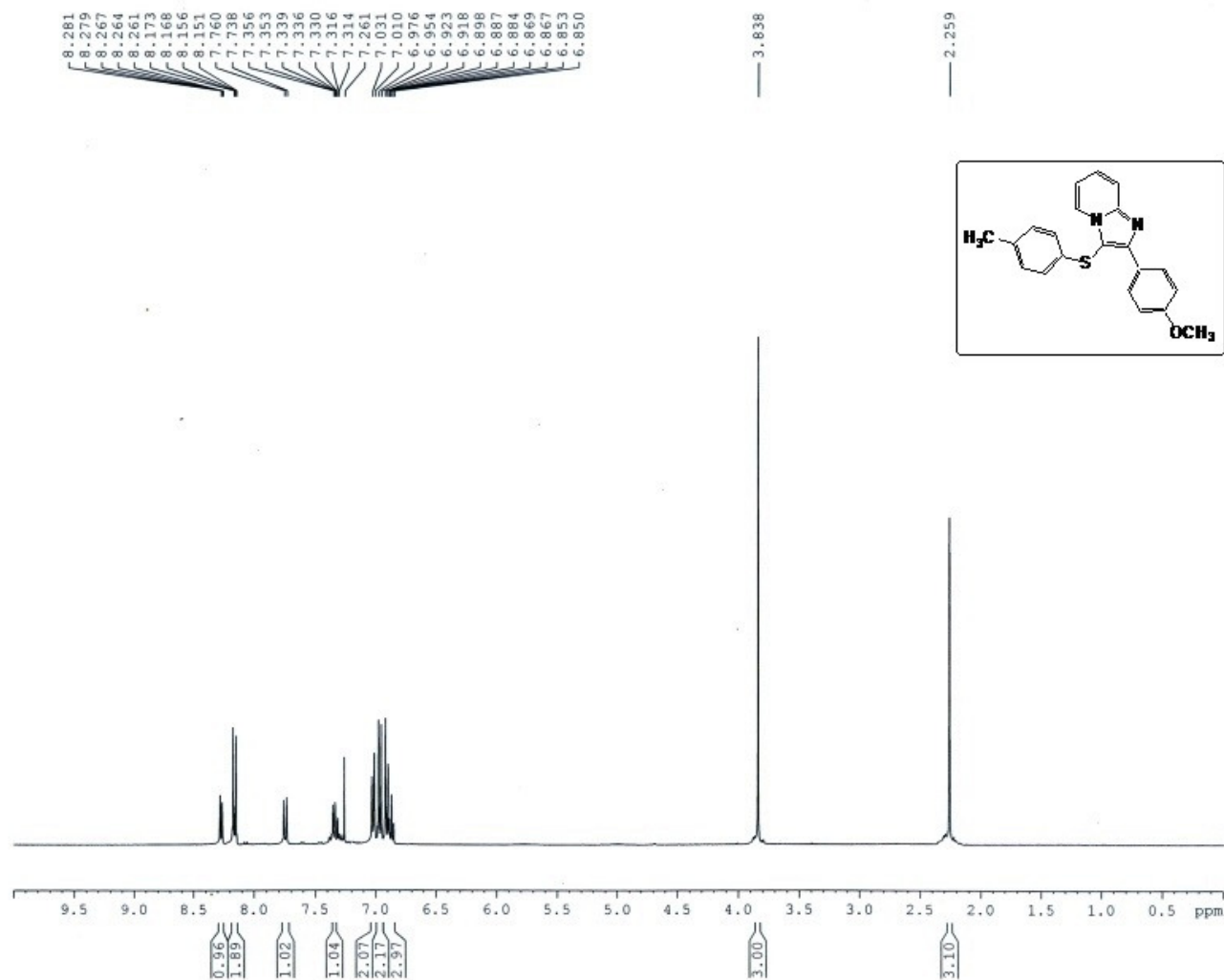
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SOLVENT CDCl3
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FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 87.66
DW 20.800 usec
DE 6.50 usec
TE 303.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TDO 1

===== CHANNEL f1 =====
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

===== CHANNEL f2 =====
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NUC2 1H
PCPD2 80.00 usec
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PLW12 0.40792999 W
PLW13 0.26107001 W
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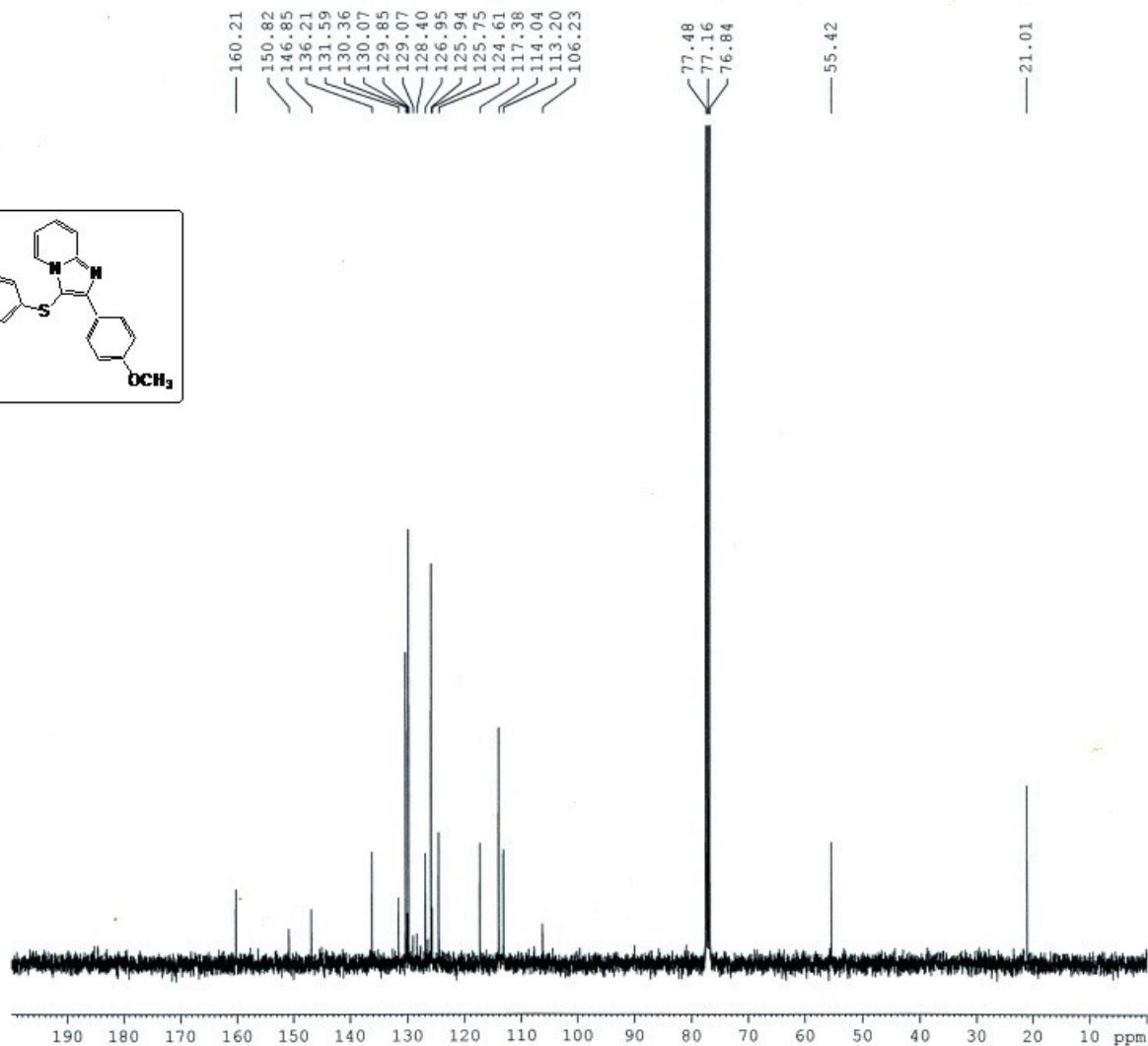
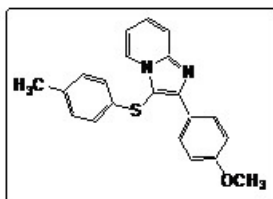


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===== CHANNEL f1 =====
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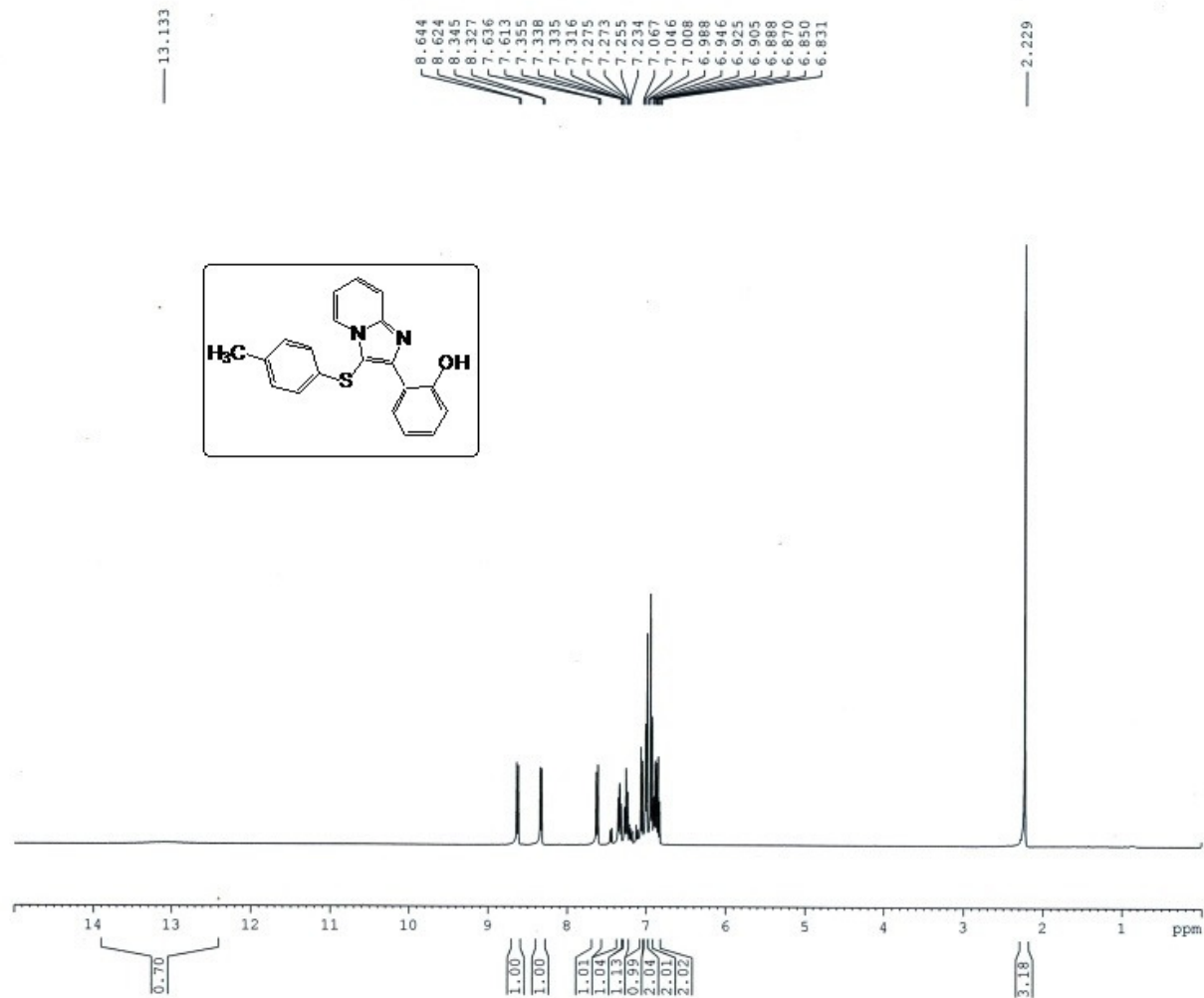
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 RG 87.66
 DW 20.800 usec
 DE 6.50 usec
 TE 299.1 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
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 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
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 PLW12 0.40792999 W
 PLW13 0.26107001 W
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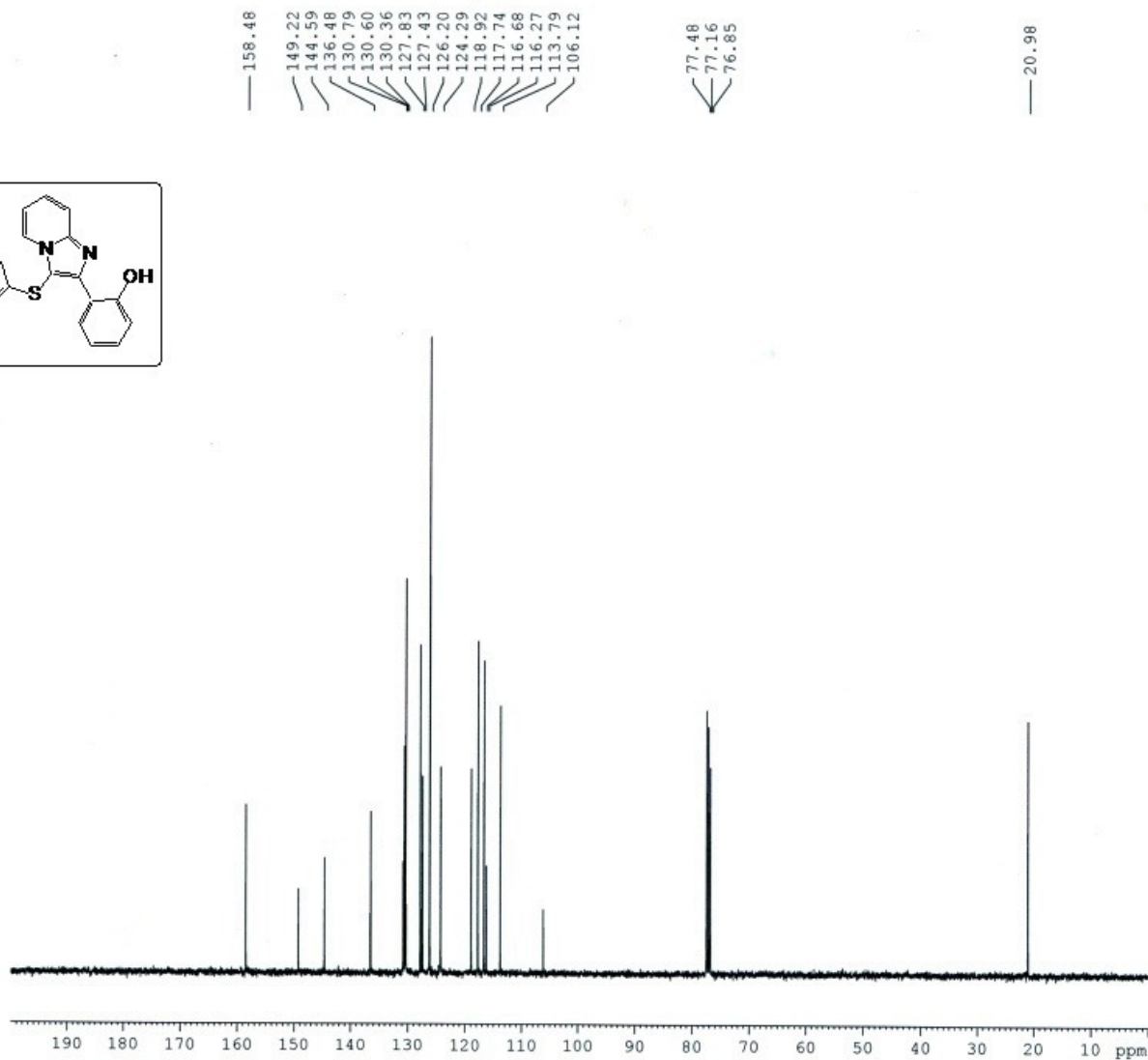
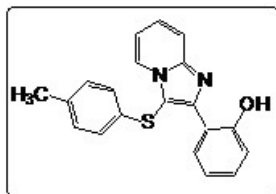


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 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 40.87
 DW 60.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 1.00000000 sec
 TDO 1

----- CHANNEL f1 -----
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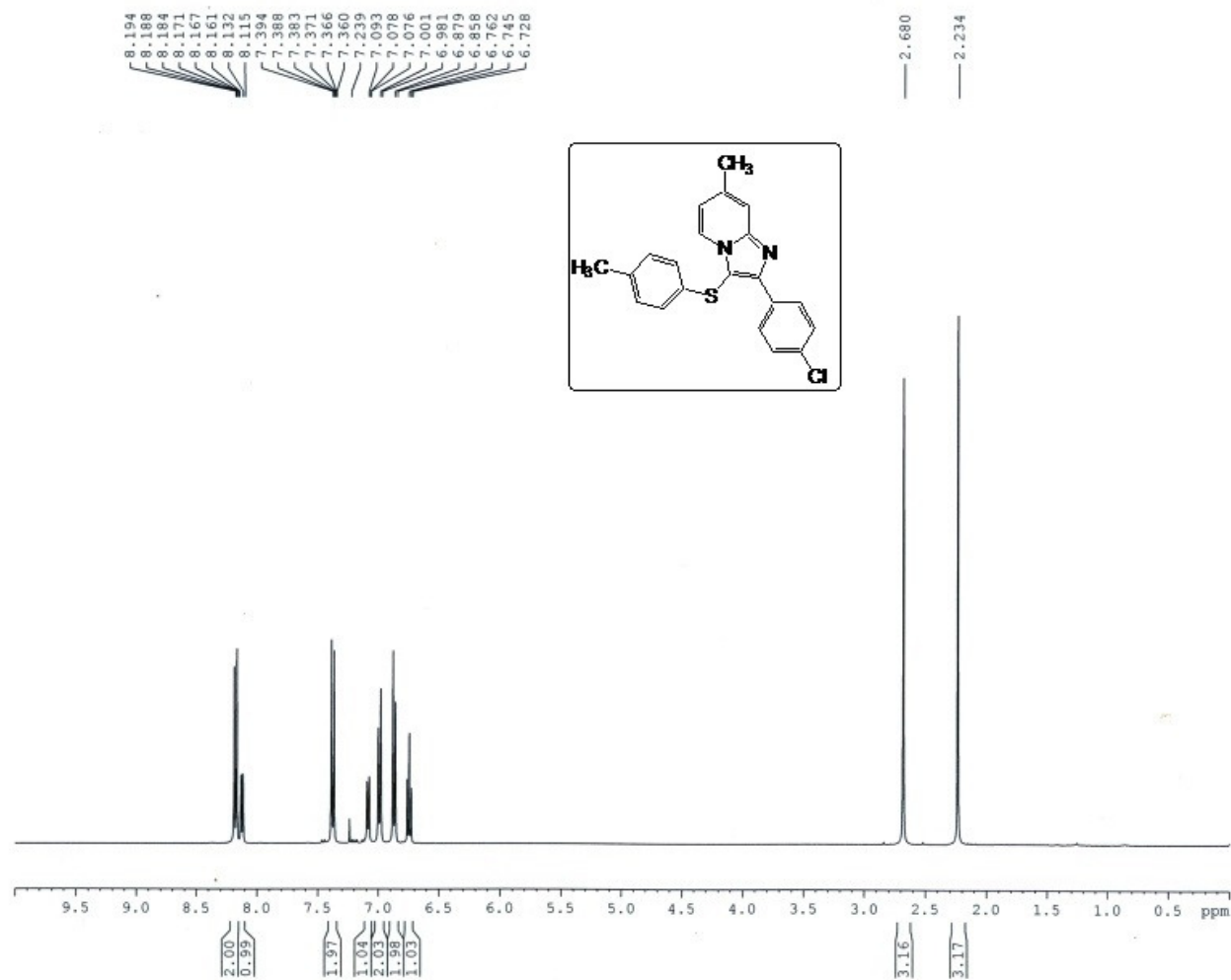
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FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 40.87
CW 20.800 usec
DE 6.50 usec
TE 296.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TDO 1

----- CHANNEL f1 -----
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

----- CHANNEL f2 -----
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NUC2 1H
PCPD2 80.00 usec
PLW2 12.00000000 W
PLW12 0.40792999 W
PLW13 0.26107001 W
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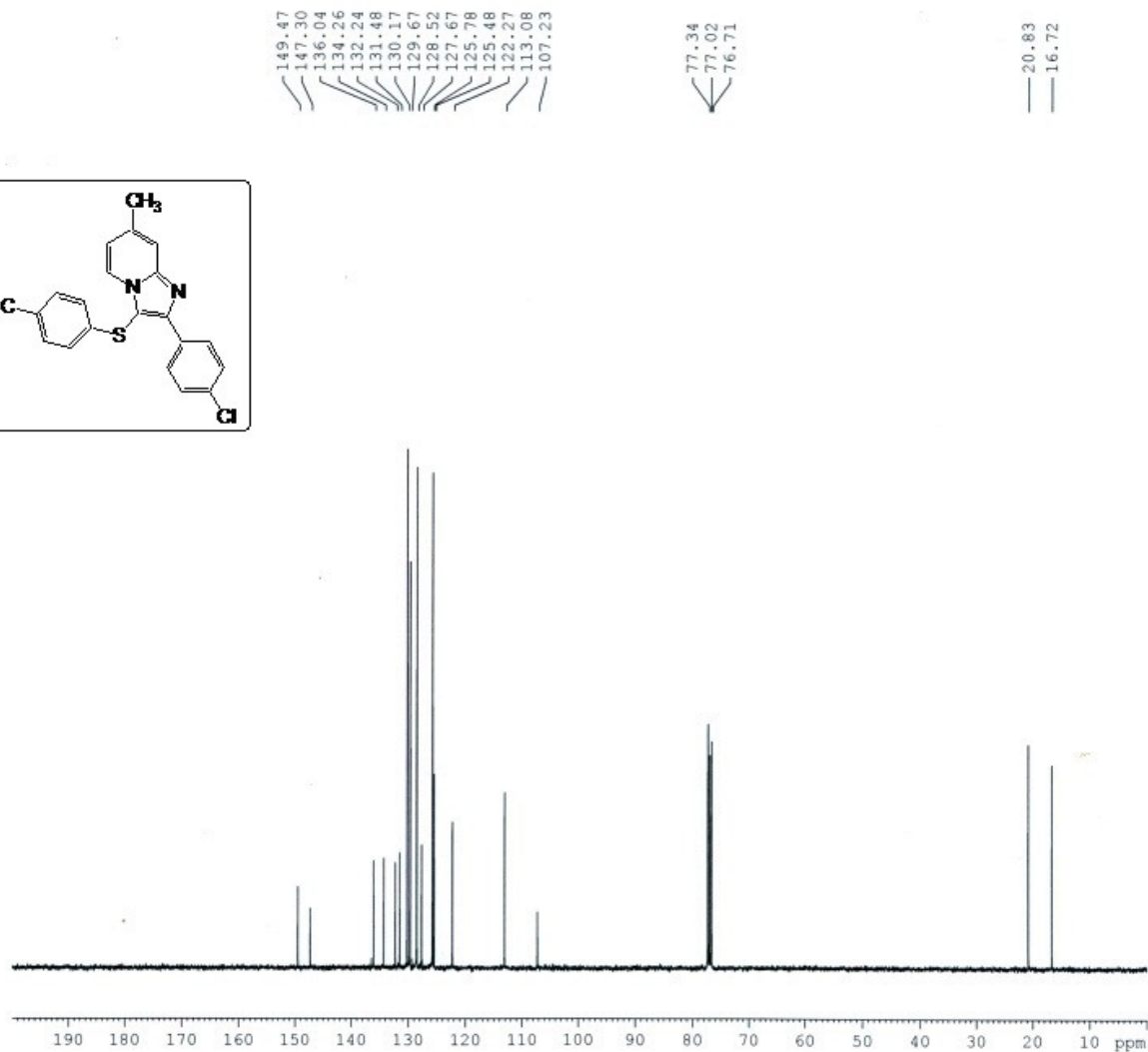
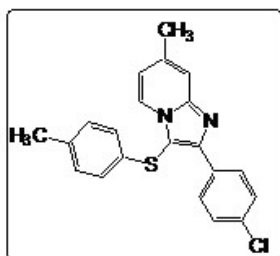


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 AQ 1.9923444 sec
 RG 54.07
 DW 60.800 usec
 DE 6.50 usec
 TE 300.6 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
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BRUKER

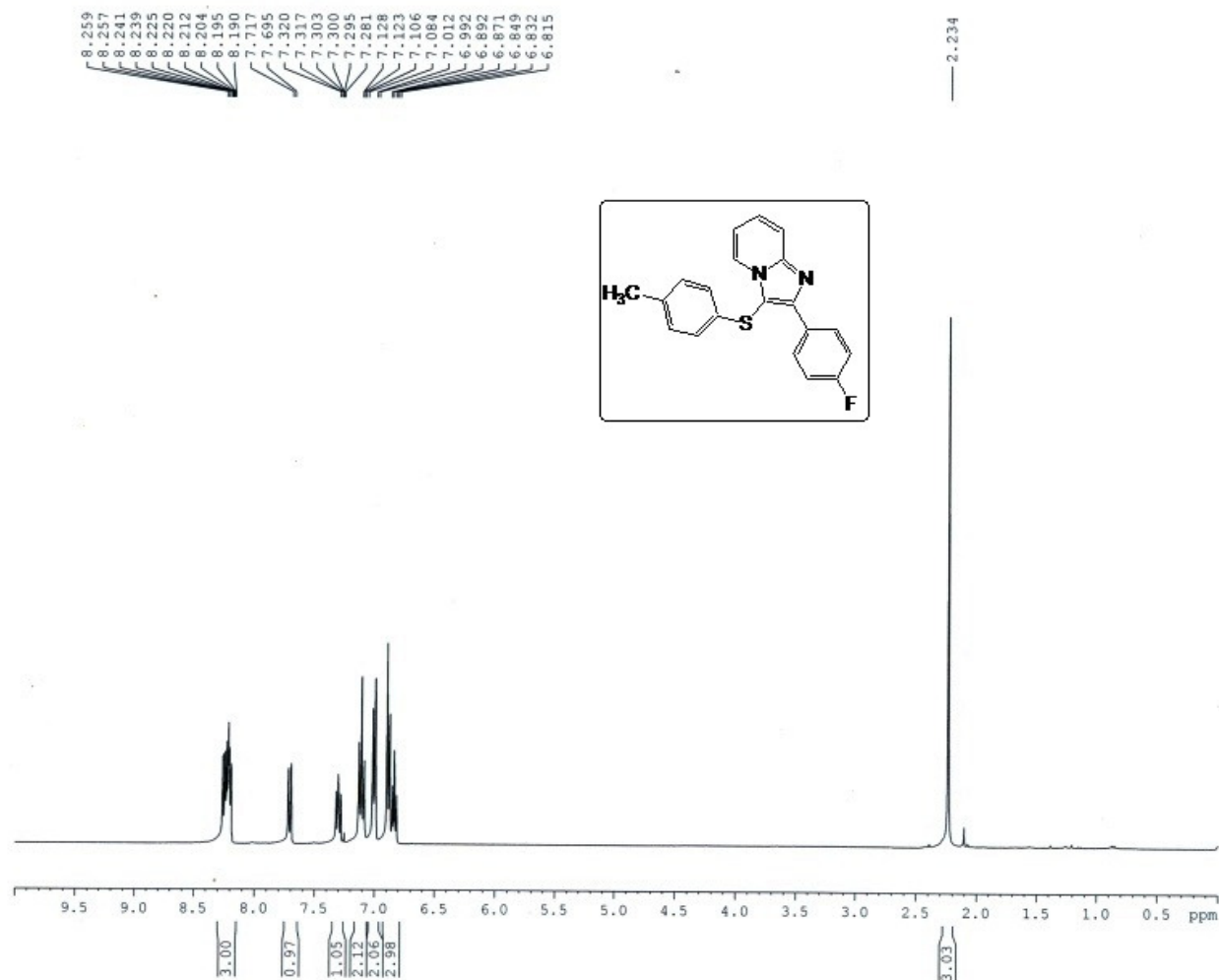
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SOLVENT CDCl3
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DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 47.25
DW 20.800 usec
DE 6.50 usec
TE 301.3 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
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P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PLW2 12.00000000 W
PLW12 0.40792999 W
PLW13 0.26107001 W
SFO2 400.1516006 MHz

F2 - Processing parameters
SI 16384
SF 100.6178026 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

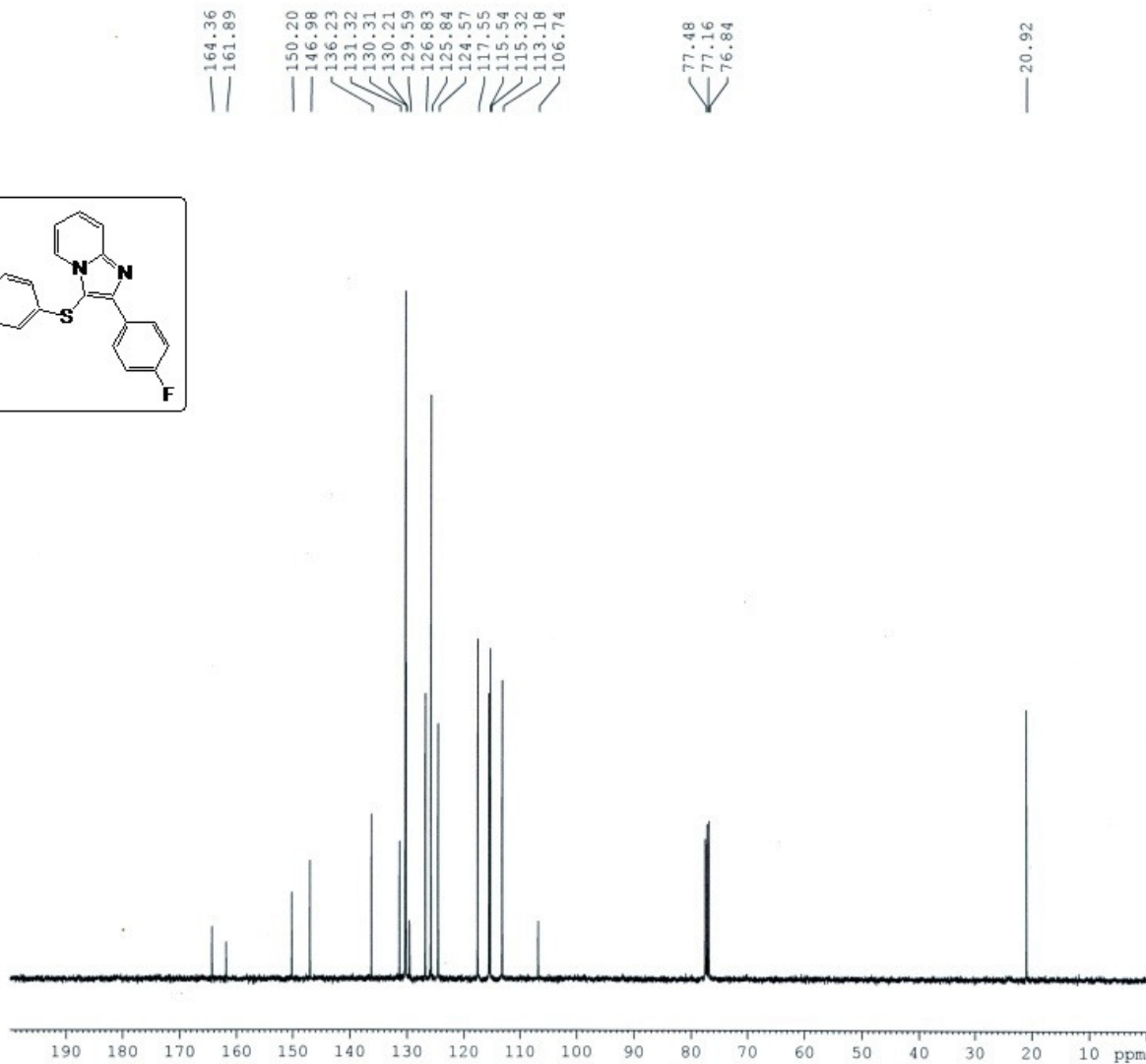
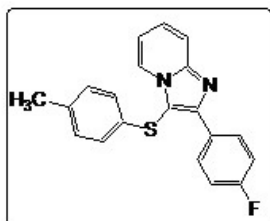


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 949
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141010
 Time 20.44
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 24
 DS 2
 SWH 8223.685 KHz
 FIDRES 0.250967 KHz
 AQ 1.9923444 sec
 RG 32.25
 DW 60.800 usec
 DE 6.50 usec
 TE 296.1 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500112 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



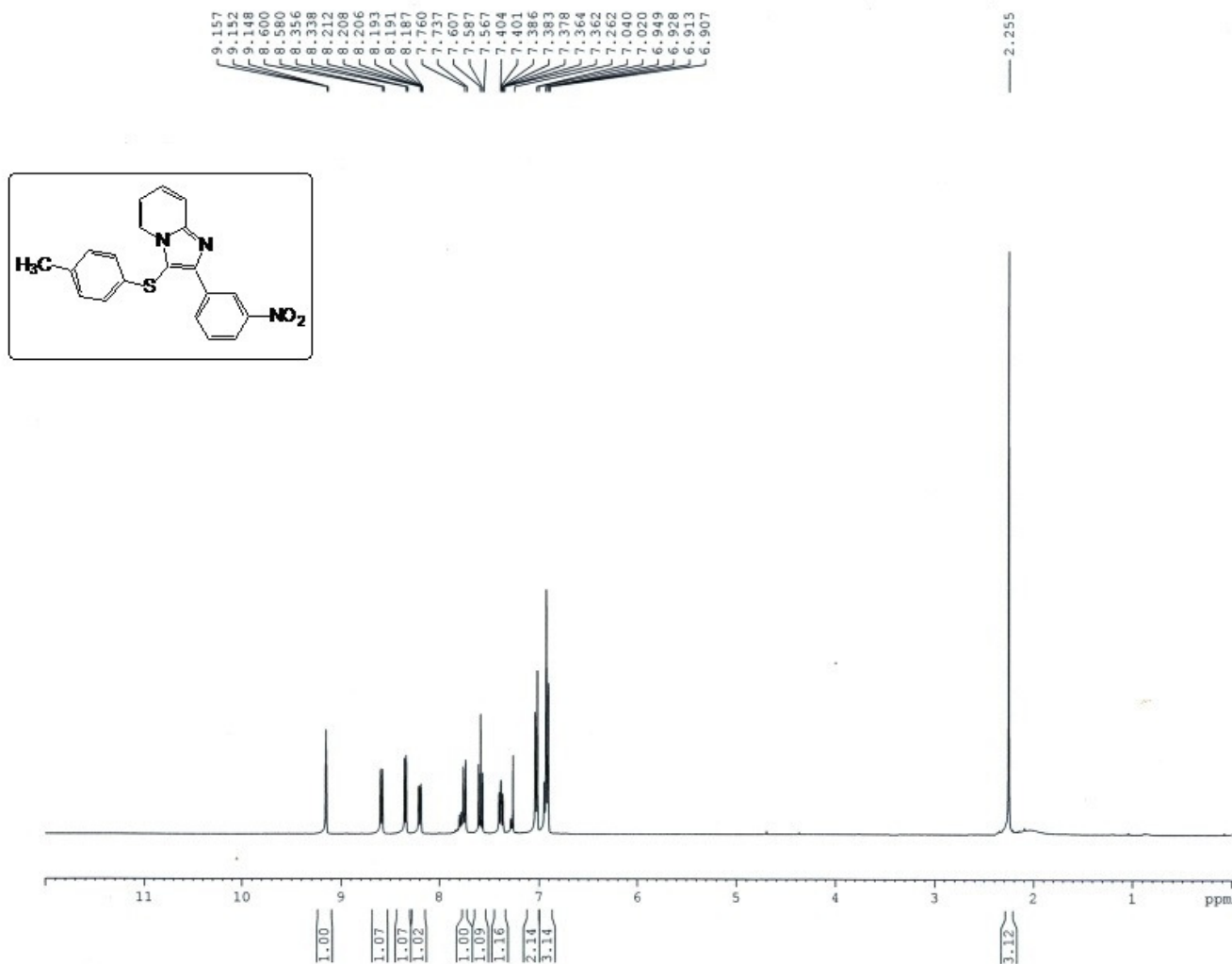
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 954
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141011
 Time 12.14
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDC13
 NS 220
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 32.25
 DW 20.800 usec
 DE 6.50 usec
 TE 298.9 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177939 MHz
 WDM EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

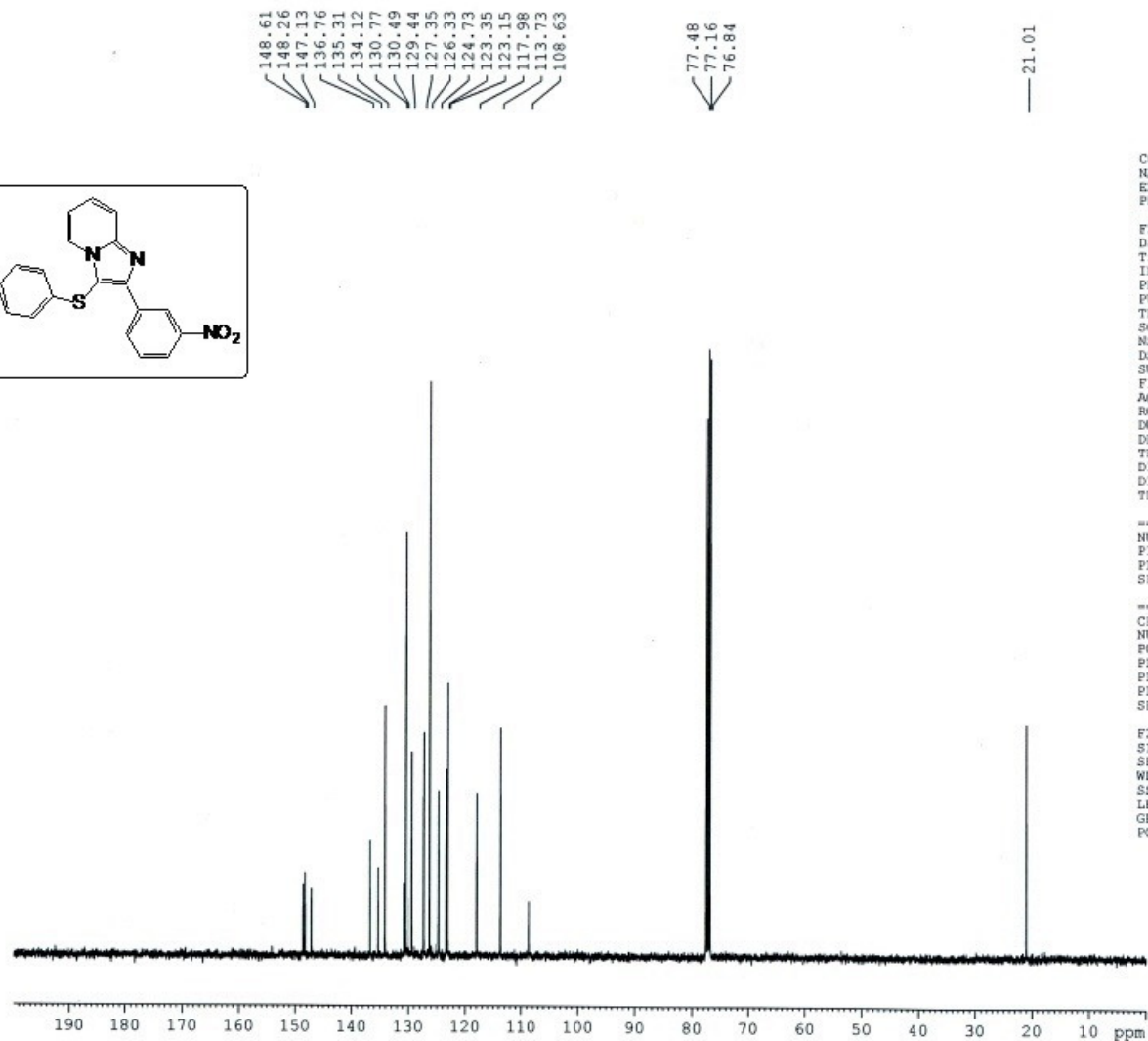
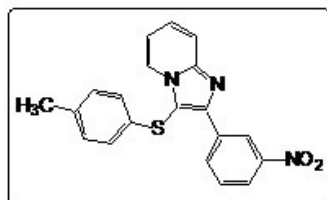


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 873
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140909
 Time 11.52
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl₃
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 87.66
 DW 60.800 usec
 DE 6.50 usec
 TE 300.8 K
 D1 1.00000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 ¹H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500076 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



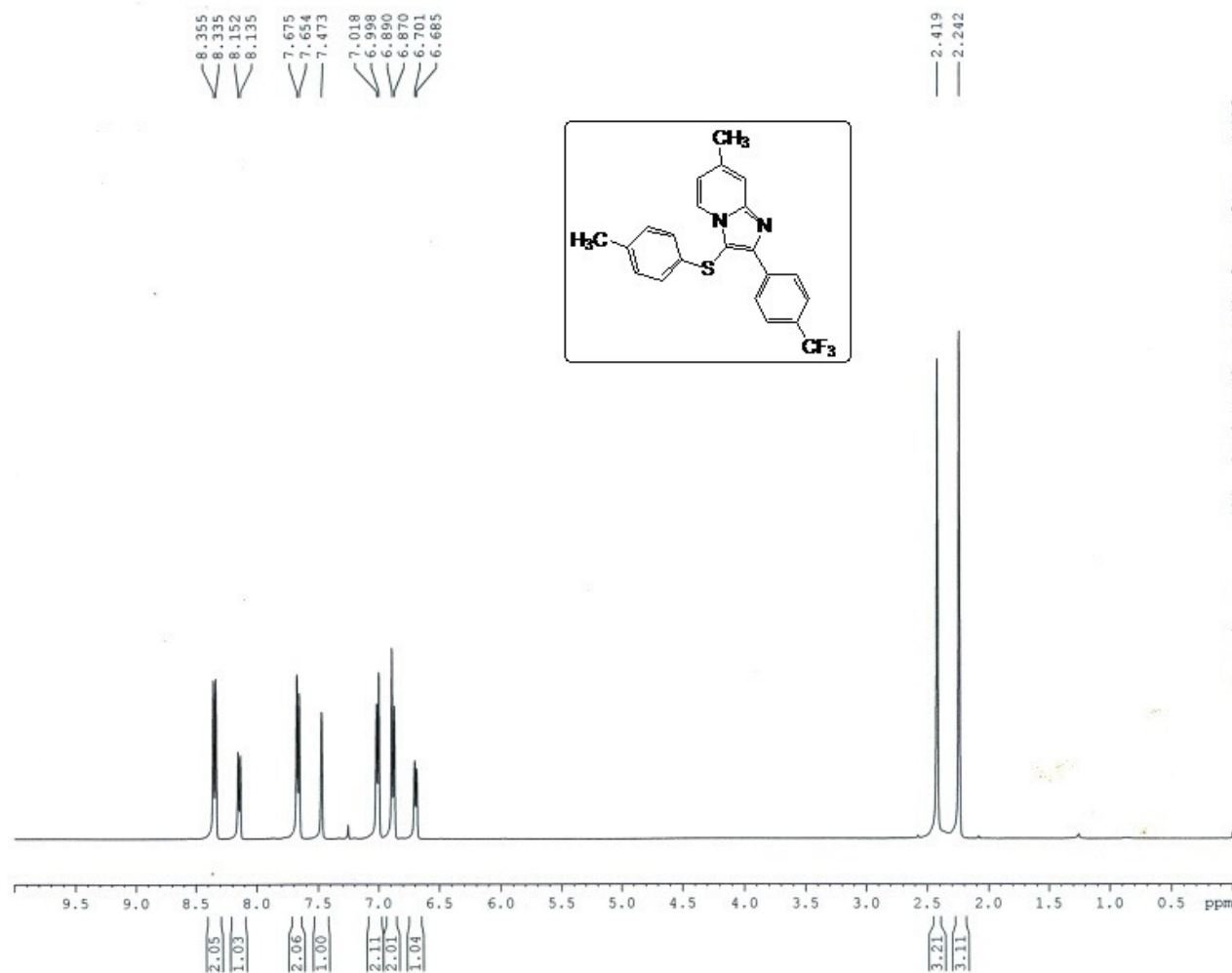
Current Data Parameters
NAME Dr. A RAJRA 2014
EXPNO 899
PROCNO 1

F2 - Acquisition Parameters
Date_ 20140913
Time 16.25
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 512
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 87.66
DW 20.800 usec
DE 6.50 usec
TE 300.7 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 13C
P1 8.90 usec
PLW1 54.00000000 W
SFO1 100.6278588 MHz

----- CHANNEL f2 -----
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PLW2 12.00000000 W
PLW12 0.40792999 W
PLW13 0.26107001 W
SFO2 400.1516006 MHz

F2 - Processing parameters
SI 16384
SF 100.6177865 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

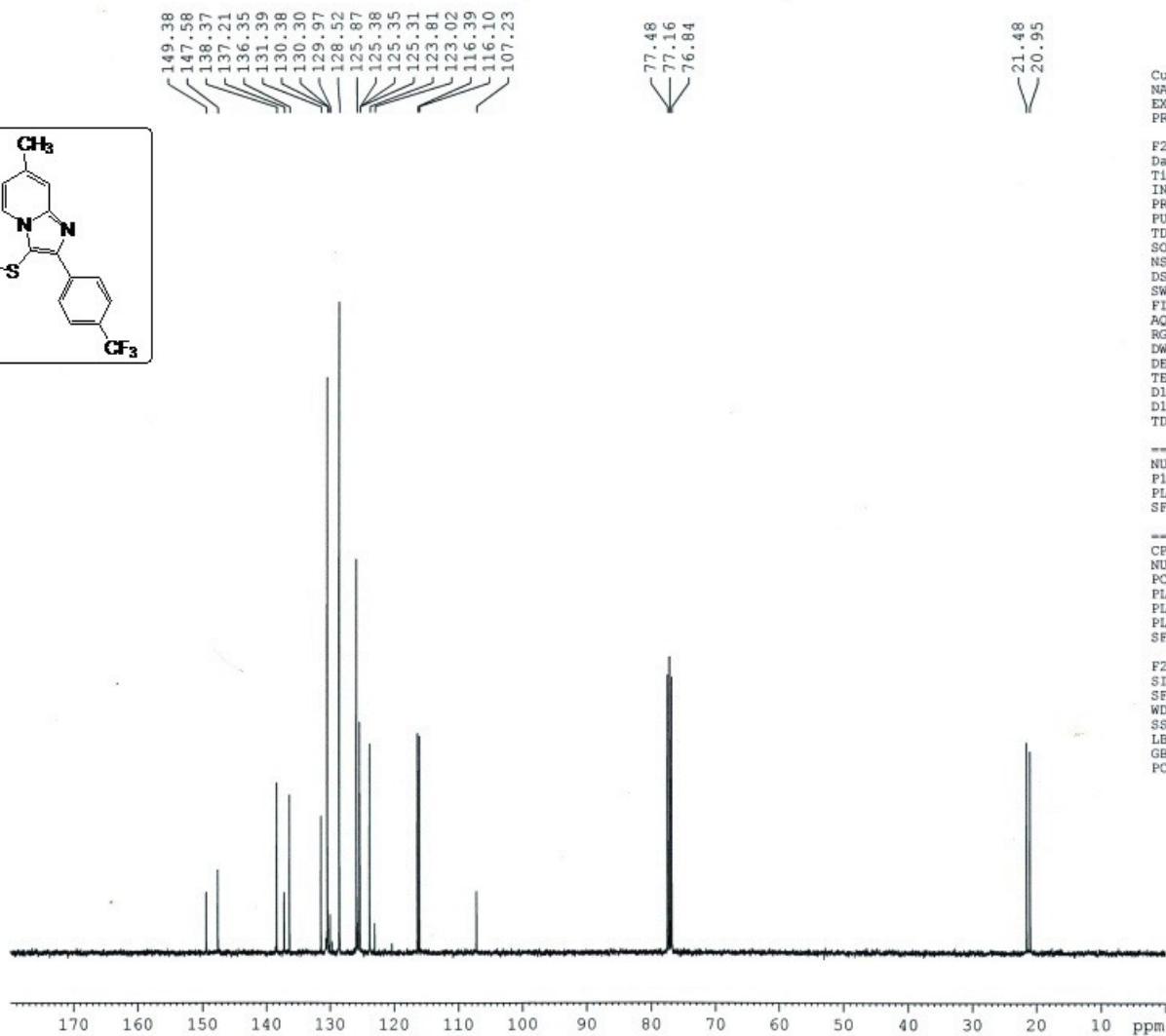
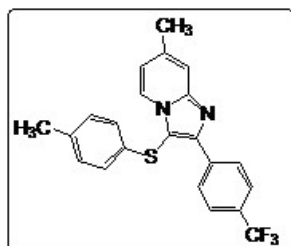


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 944
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140927
 Time 20.19
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 32
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 47.25
 DW 60.800 usec
 DE 6.50 usec
 TE 297.9 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500113 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



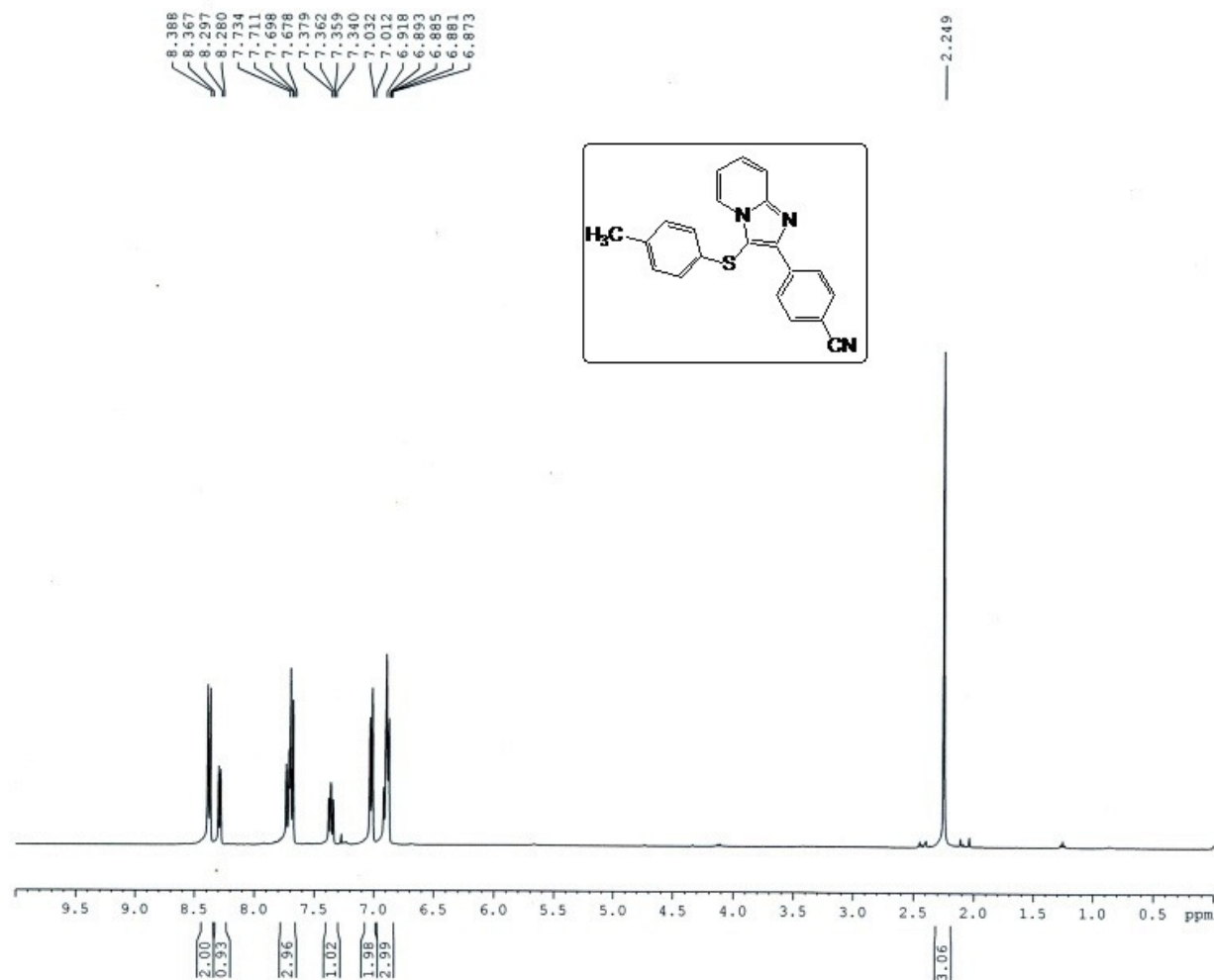
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 945
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140927
 Time 20.37
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 320
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 47.25
 DW 20.800 usec
 DE 6.50 usec
 TE 298.8 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177881 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

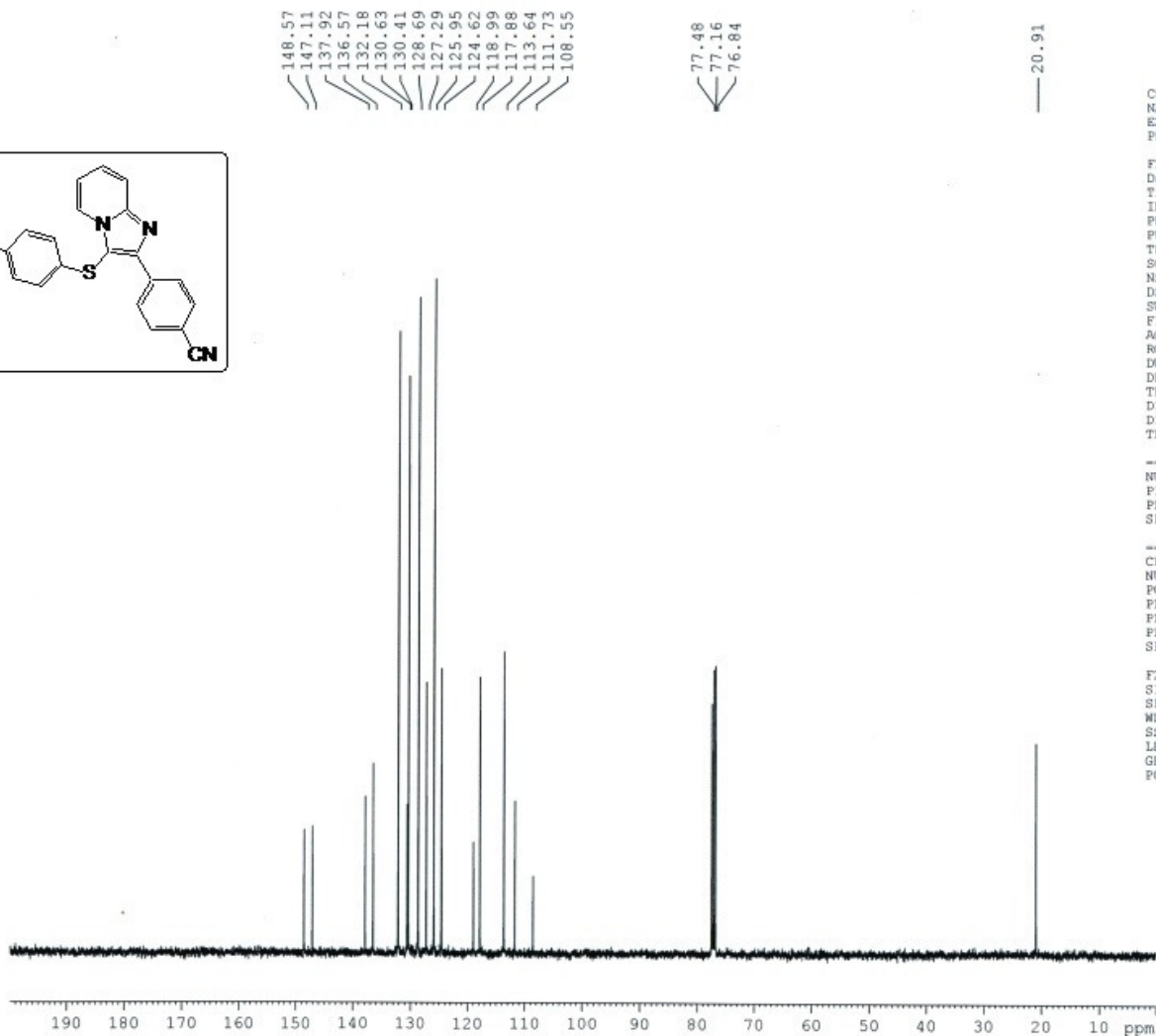
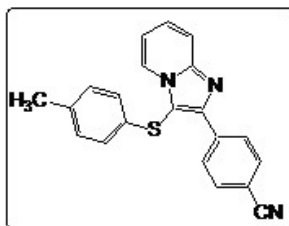


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 950
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141010
 Time_ 20.47
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDC13
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 37.83
 DW 60.800 usec
 DE 6.50 usec
 TE 296.1 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SF01 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500037 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



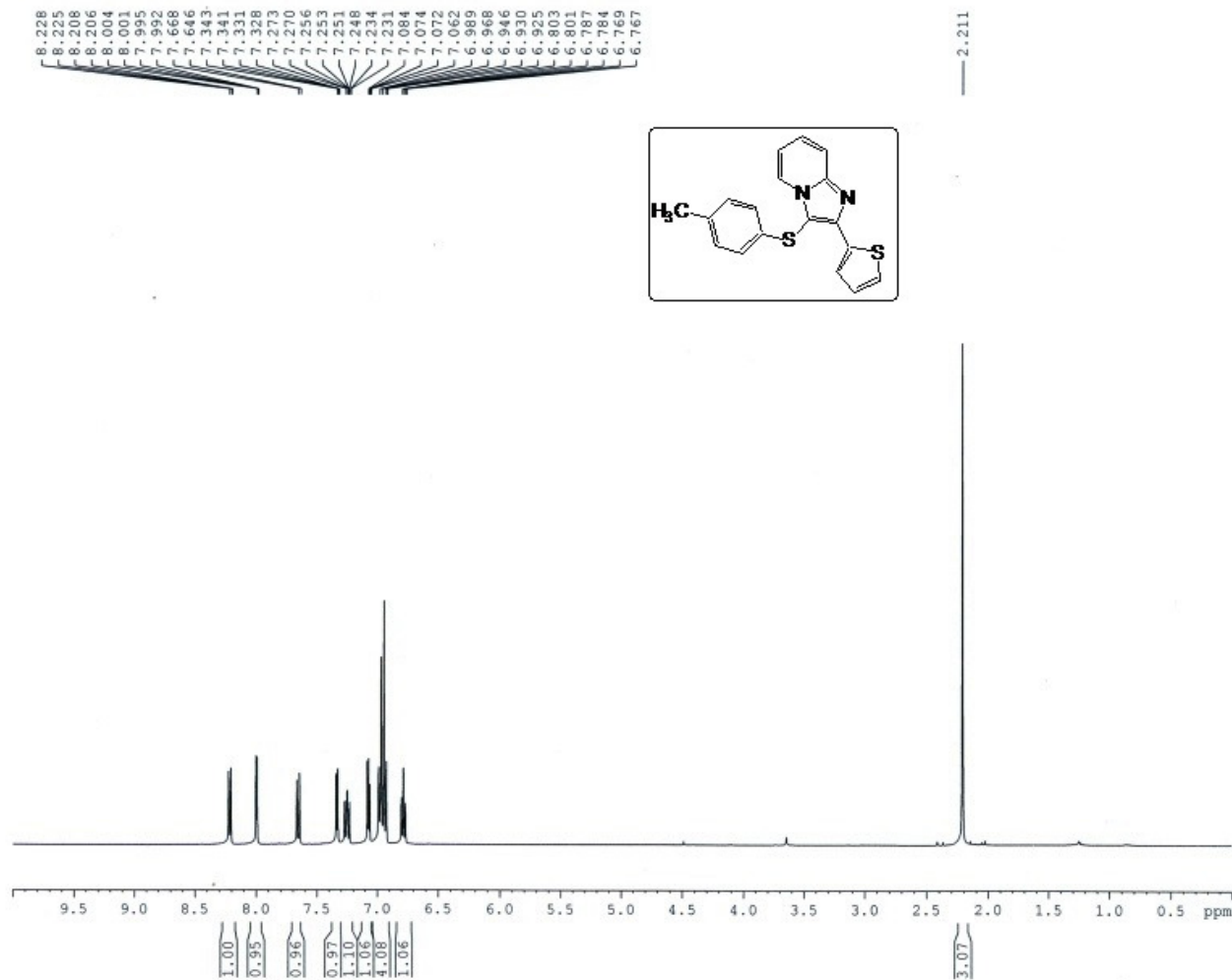
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 952
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141011
 Time_ 11.43
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 160
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 37.83
 DW 20.800 usec
 DE 6.50 usec
 TE 298.6 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177968 MHz
 MEW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

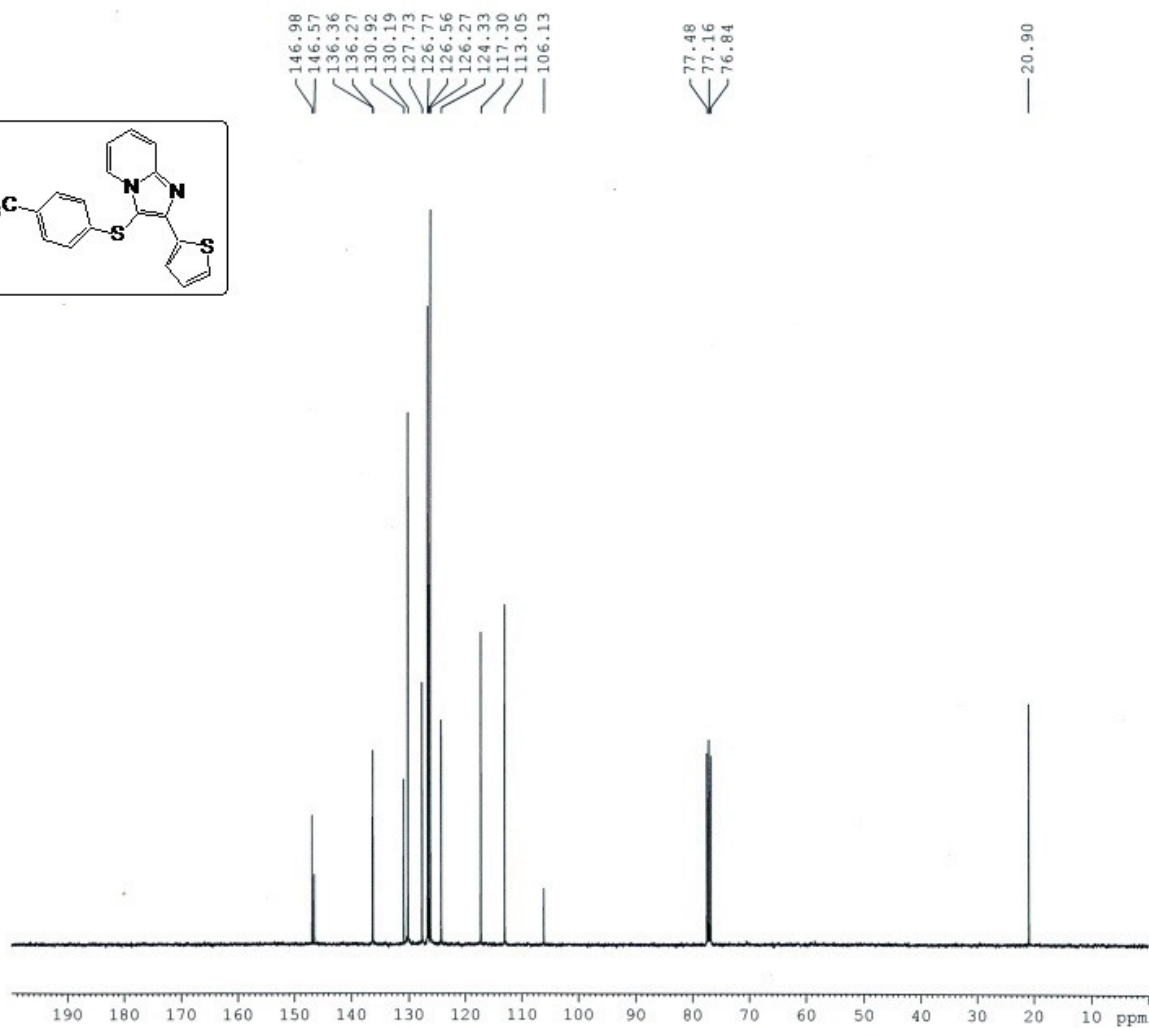
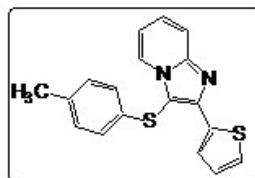


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 951
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141010
 Time 20.50
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDC13
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 32.25
 DW 60.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500136 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



Current Data Parameters
NAME Dr. A HAJRA 2014
EXPNO 959
PROCNO 1

F2 - Acquisition Parameters
Date_ 20141012
Time 11.04
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 32768
SOLVENT CDCl3
NS 400
DS 2
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 0.6816244 sec
RG 32.25
DM 20.800 usec
DE 6.50 usec
TE 299.0 K
D1 2.0000000 sec
D11 0.0300000 sec
TD0 1

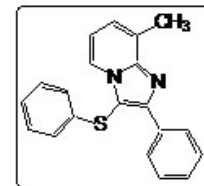
===== CHANNEL f1 =====
NUC1 13C
P1 8.90 usec
PLW1 54.0000000 W
SFO1 100.6278588 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PLW2 12.0000000 W
PLW12 0.40792999 W
PLW13 0.24107001 W
SFO2 400.1516006 MHz

F2 - Processing parameters
SI 16384
SF 100.6177998 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

8.204
8.199
8.186
8.086
8.069
7.422
7.420
7.417
7.403
7.399
7.383
7.345
7.342
7.339
7.329
7.324
7.318
7.305
7.187
7.164
7.160
7.146
7.144
7.130
7.127
7.083
7.069
7.064
7.059
7.049
7.047
7.035
7.032
7.029
6.971
6.968
6.963
6.950
6.948
6.902
6.684
6.667

2.686

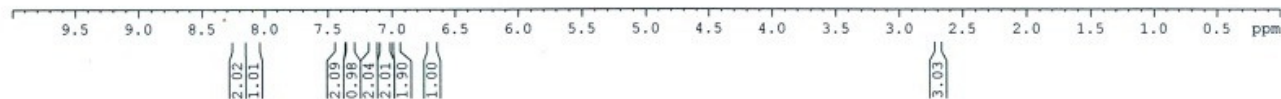


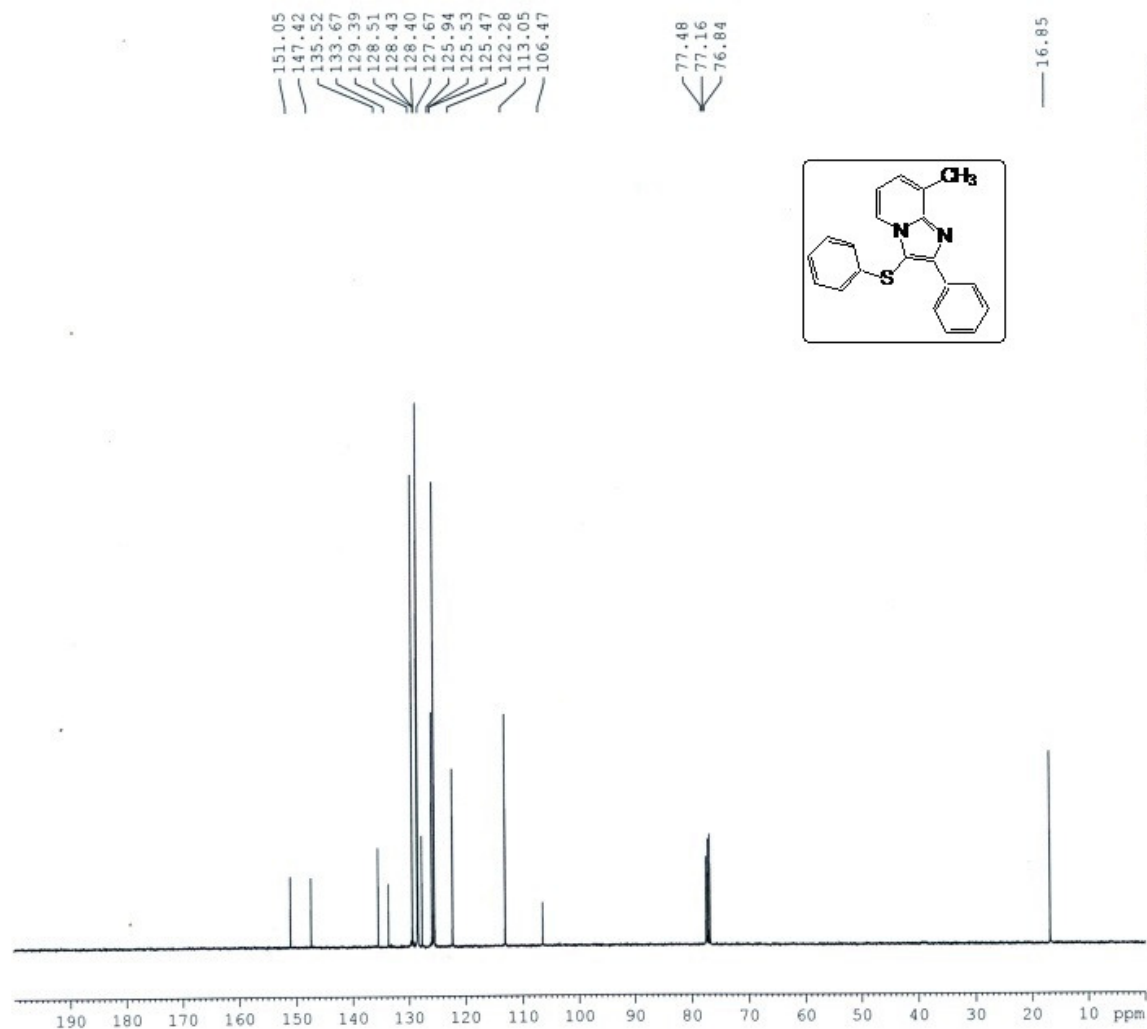
Current Data Parameters
NAME Dr. A HAJRA 2014
EXPNO 1018
PROCNO 1

F2 - Acquisition Parameters
Date 20141026
Time 19.25
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 28
DS 2
SWH 8223.685 Hz
FIDRES 0.250967 Hz
AQ 1.9923444 sec
RG 30.11
DW 60.800 usec
DE 6.50 usec
TE 295.9 K
D1 1.00000000 sec
TD0 1

----- CHANNEL f1 -----
NUC1 1H
P1 14.75 usec
PLW1 11.99499989 W
SFO1 400.1524711 MHz

F2 - Processing parameters
SI 16384
SF 400.1500322 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





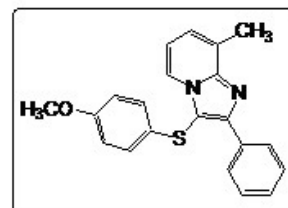
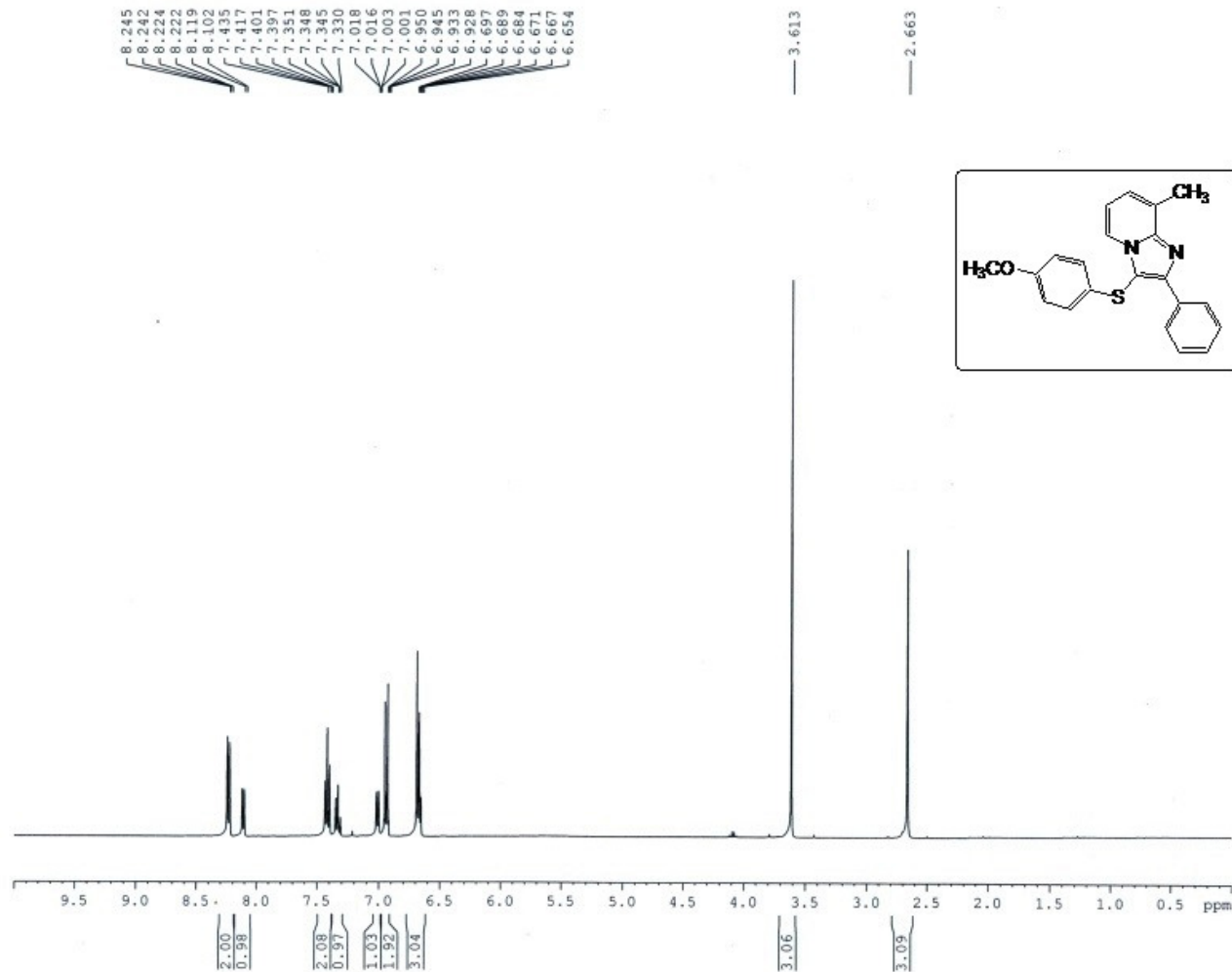
Current Data Parameters
 NAME Dr. A. HAJRA 2014
 EXPNO 1023
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141026
 Time 20.15
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 200
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 30.11
 DM 20.800 usec
 DE 6.50 usec
 TE 296.5 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 FCD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6178026 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

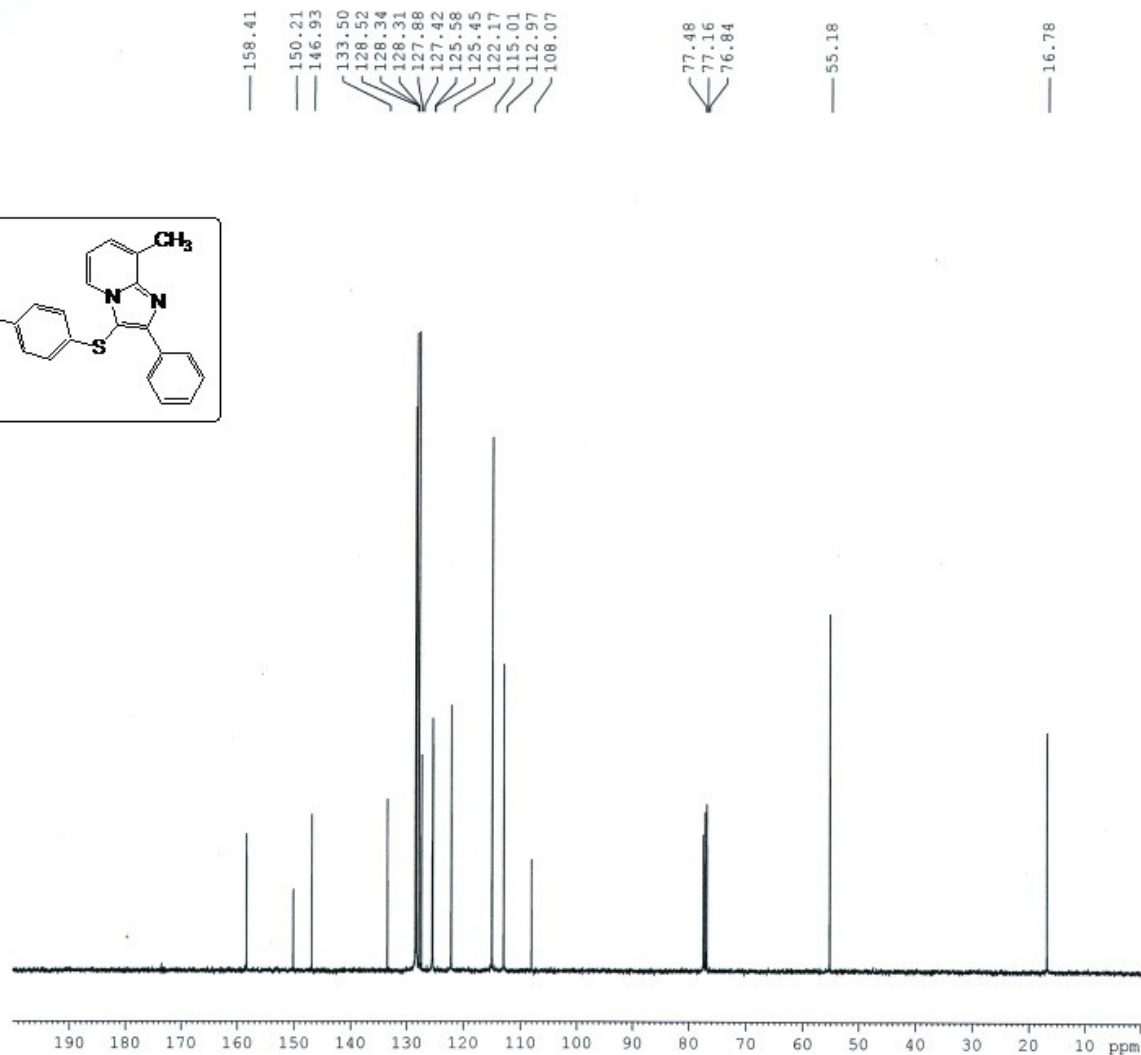
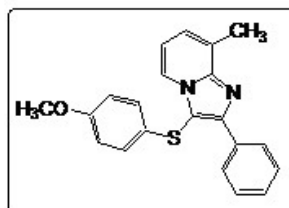


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 1020
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141026
 Time 19.43
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 20
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 12.92
 DW 60.800 usec
 DE 6.50 usec
 TE 295.7 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500272 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



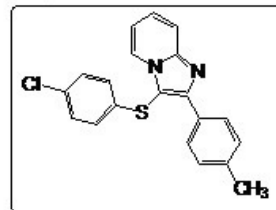
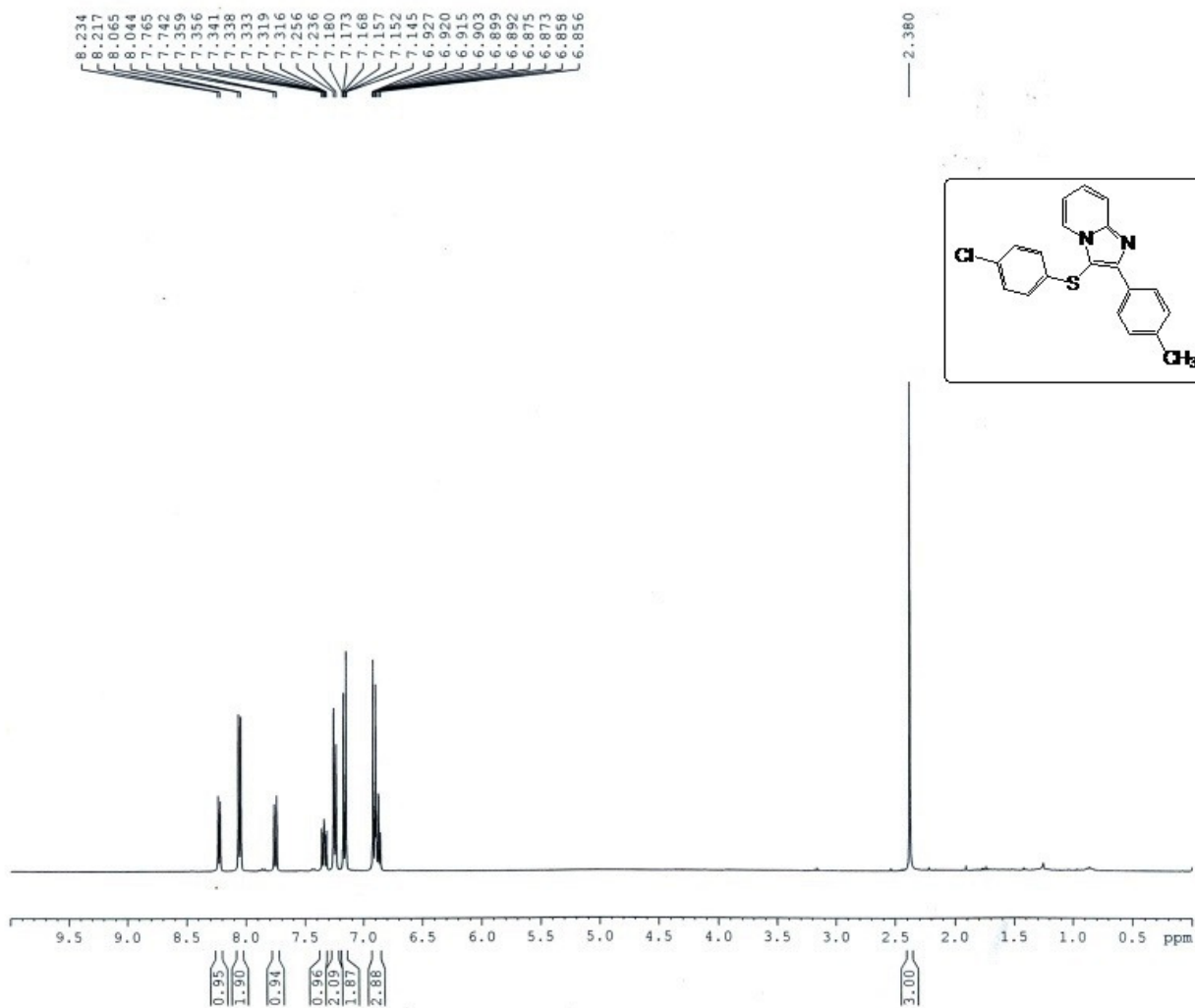
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 1021
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141026
 Time 19.52
 INSTRUM spect
 PROBRD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 120
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 12.92
 DM 20.800 usec
 DE 6.50 usec
 TE 296.6 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

***** CHANNEL f1 *****
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278988 MHz

***** CHANNEL f2 *****
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6178100 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

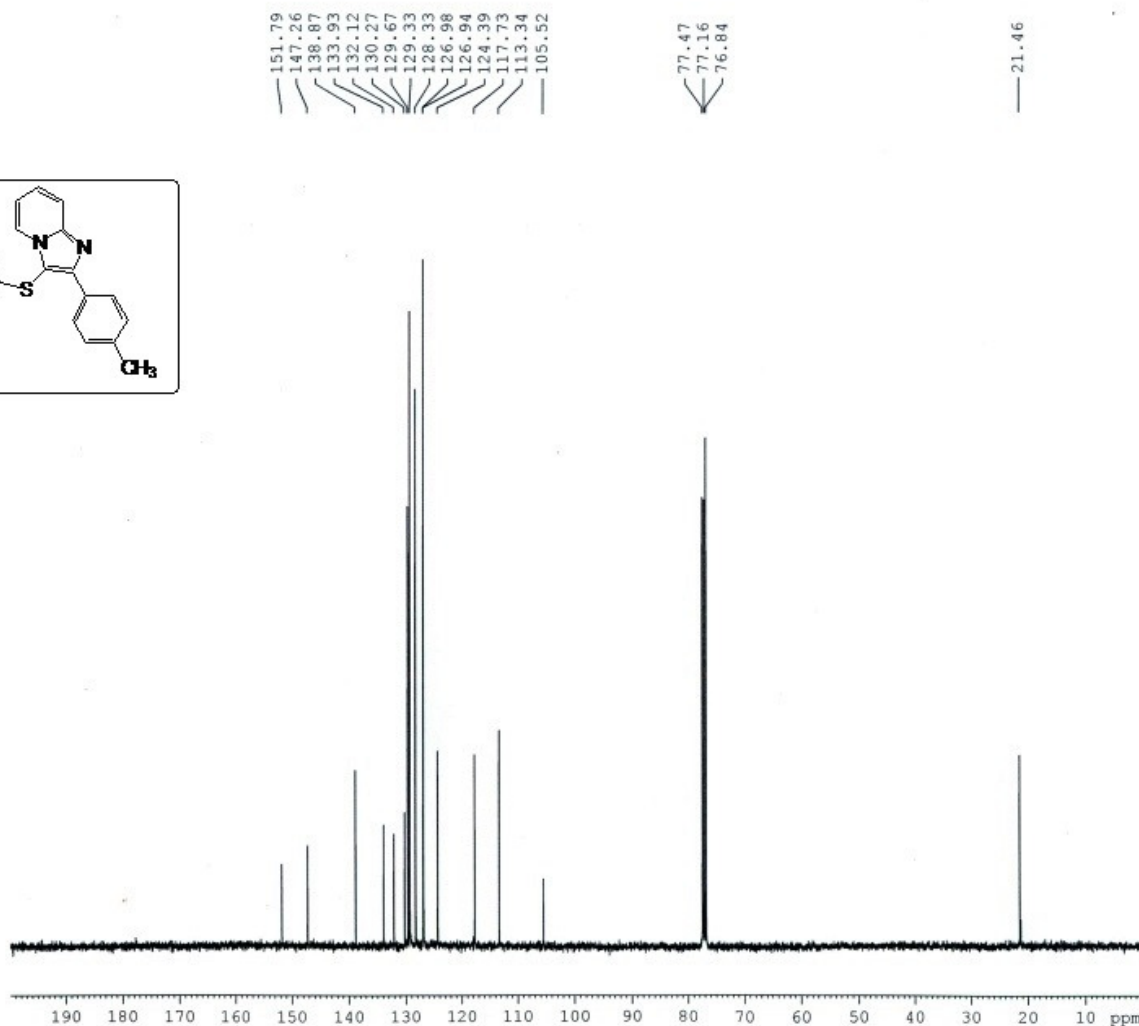
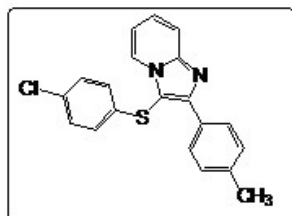


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 981
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141015
 Time_ 20.18
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 87.66
 DW 60.800 usec
 DE 6.50 usec
 TE 298.1 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500101 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



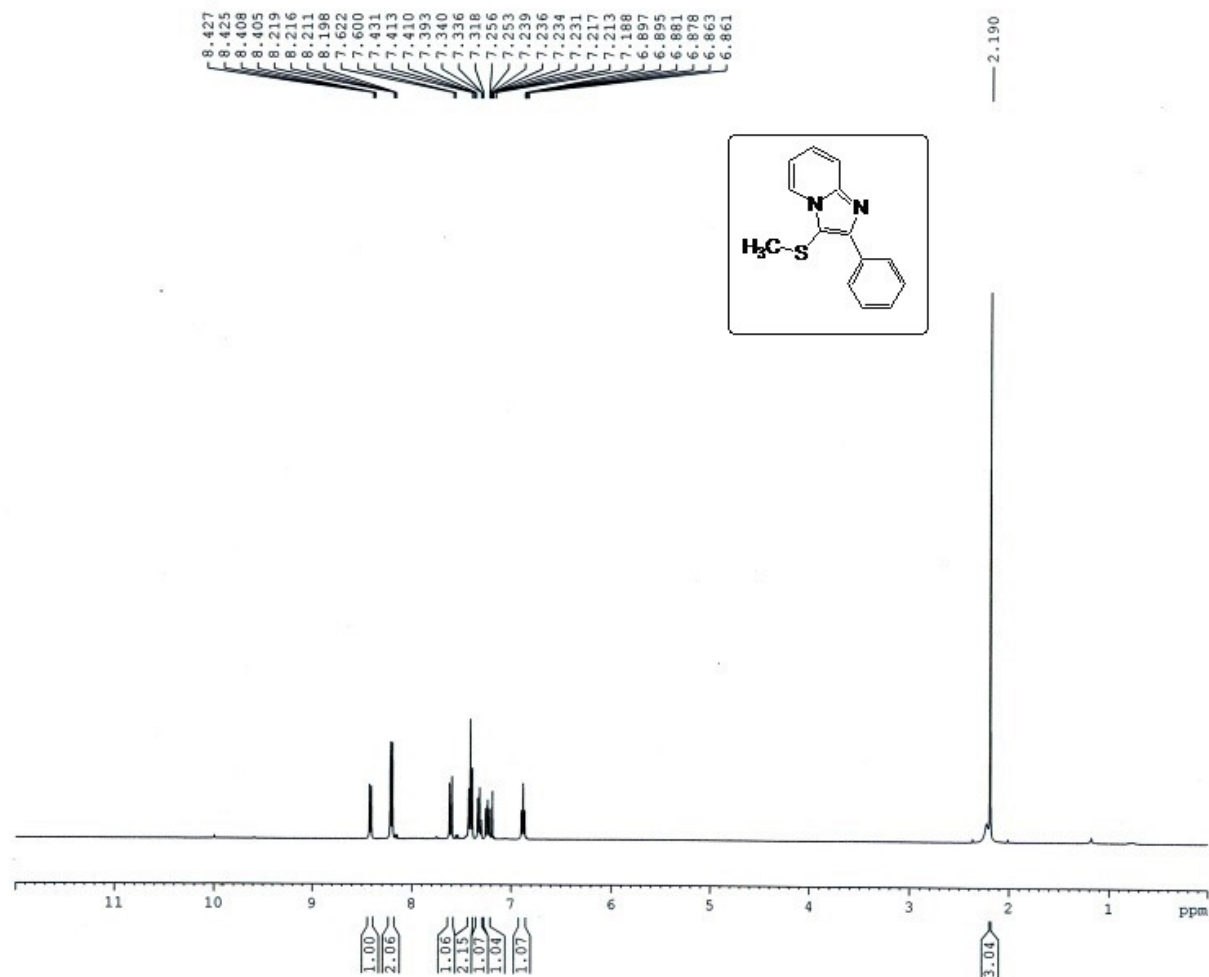
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 982
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141015
 Time_ 20.39
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 400
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 87.66
 DW 20.800 usec
 DE 6.50 usec
 TE 299.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 FCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177880 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

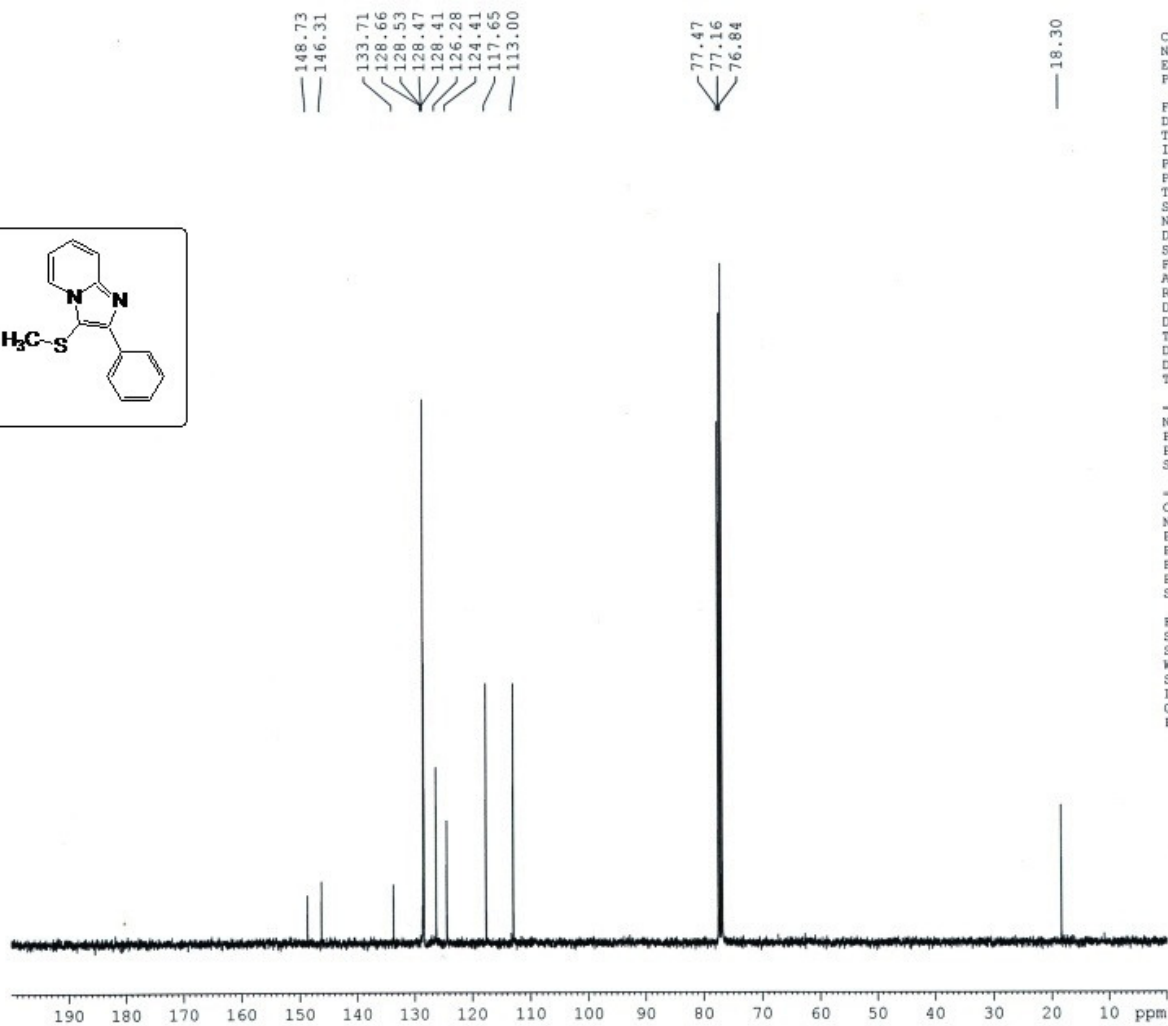
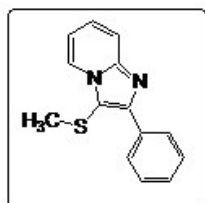


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 738
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140816
 Time 20.35
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDC13
 NS 32
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 87.66
 DW 60.800 usec
 DE 6.50 usec
 TE 296.2 K
 D1 1.00000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500377 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



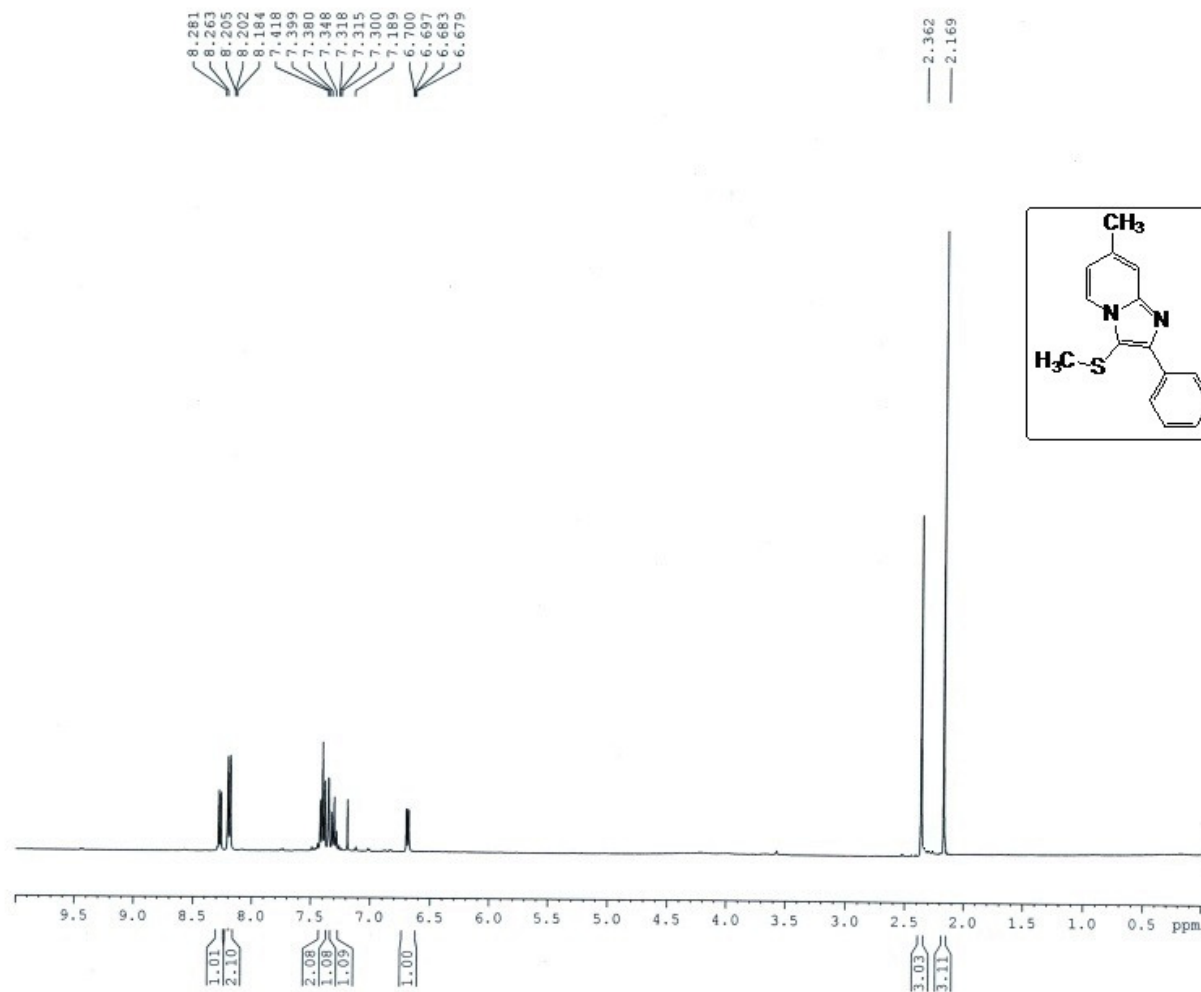
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 739
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140816
 Time 21.05
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 512
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 87.66
 DW 20.800 usec
 DE 6.50 usec
 TE 297.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177865 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

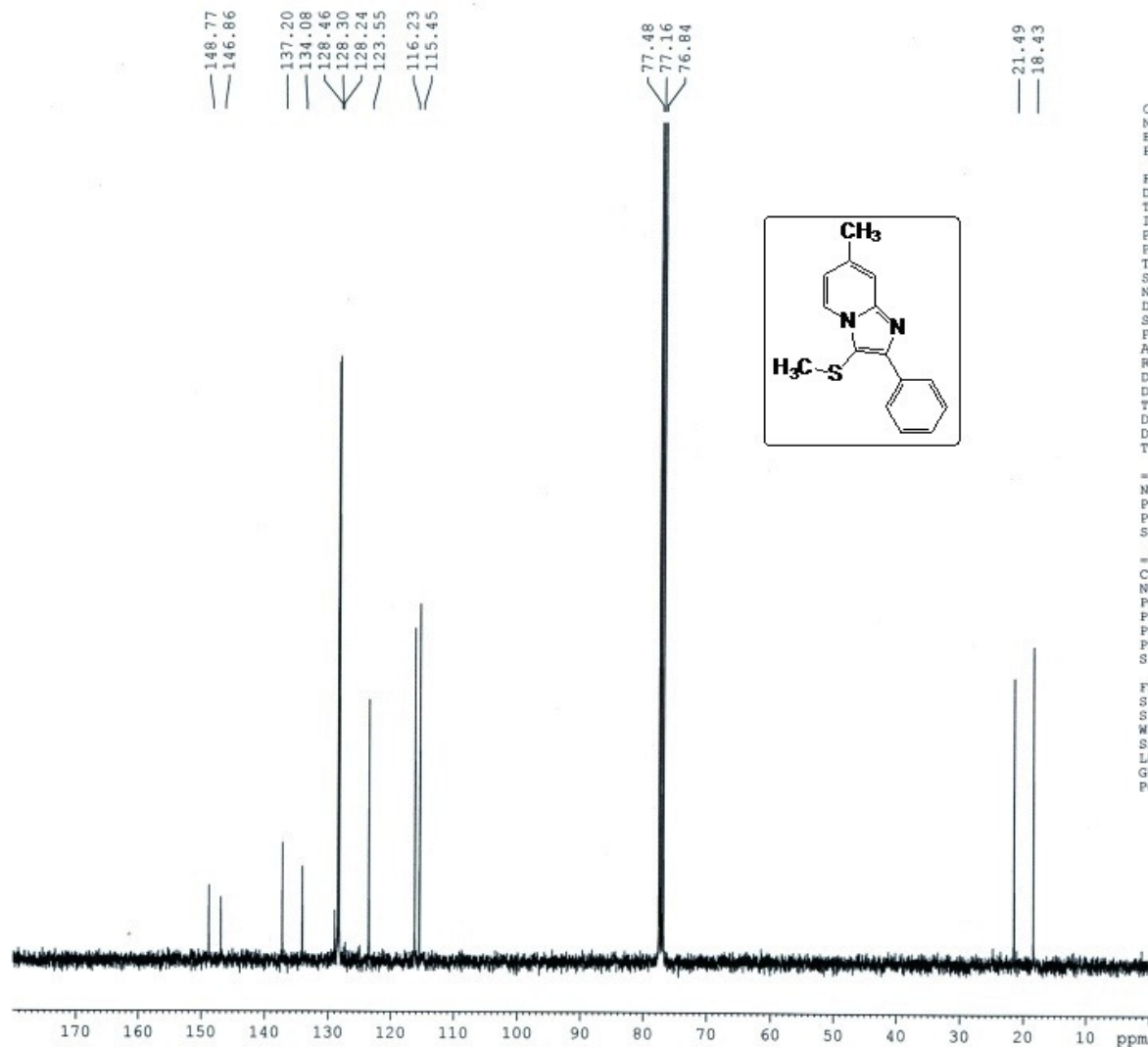


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 688
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140805
 Time_ 17.43
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 32
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 87.66
 DW 60.800 usec
 DE 6.50 usec
 TE 295.1 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500374 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



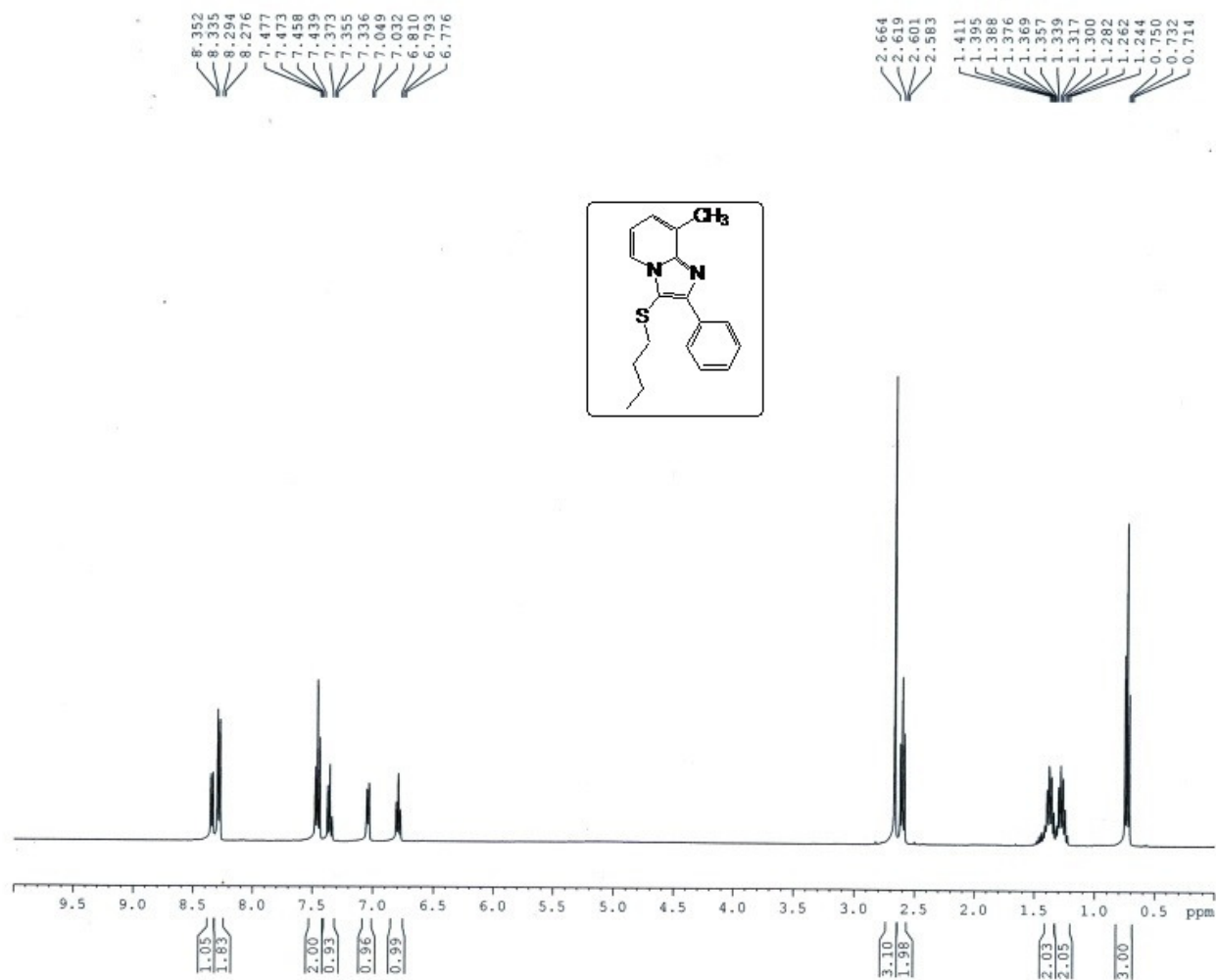
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 689
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20140805
 Time 18.13
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl₃
 NS 512
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 87.66
 DW 20.800 usec
 DE 6.50 usec
 TE 296.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177866 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

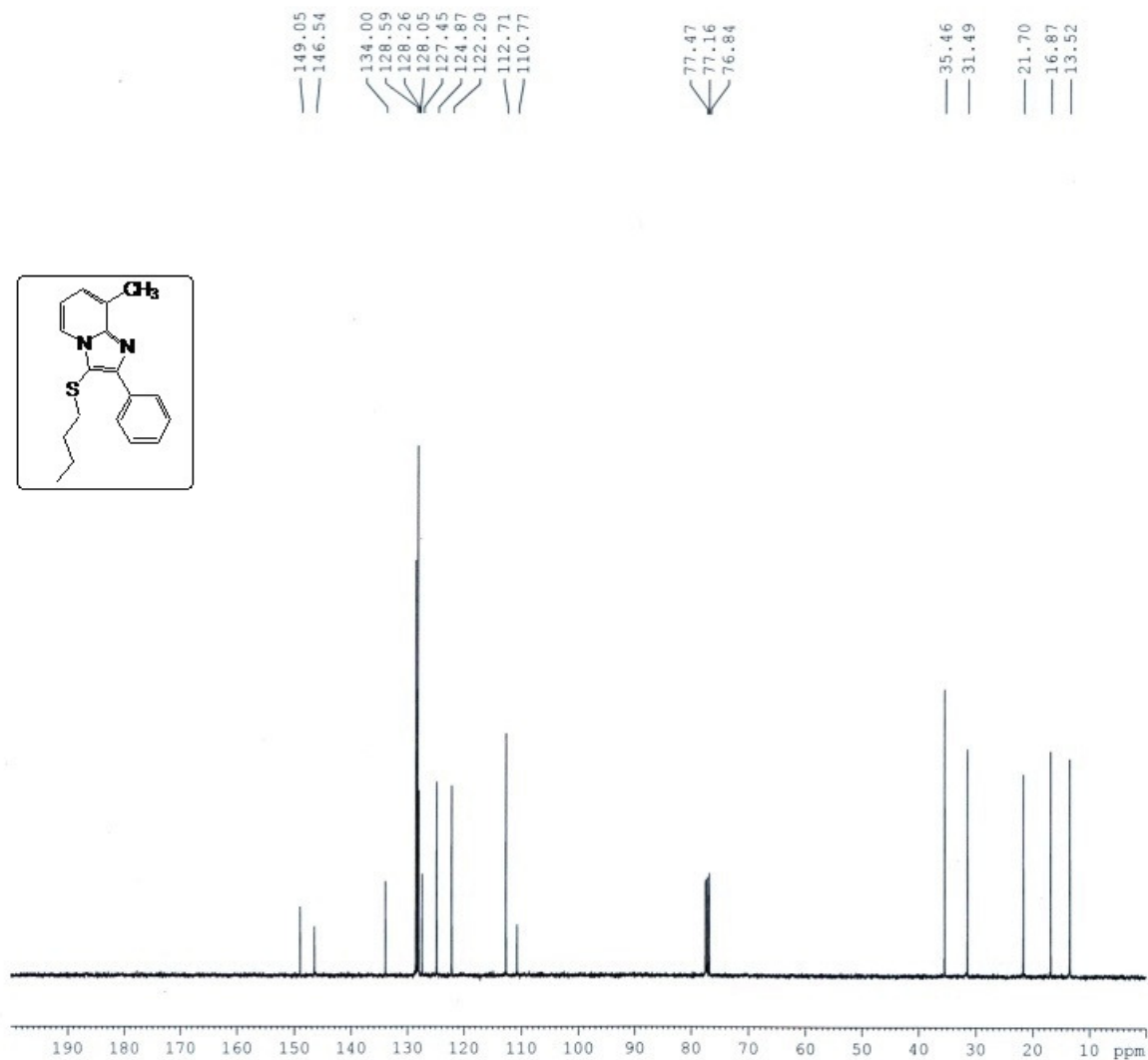
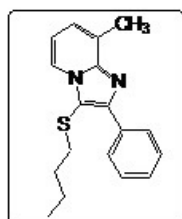


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 1019
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141026
 Time 19.34
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDC13
 NS 28
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 23.55
 DW 60.800 usec
 DE 6.50 usec
 TE 295.8 K
 D1 1.00000000 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500124 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



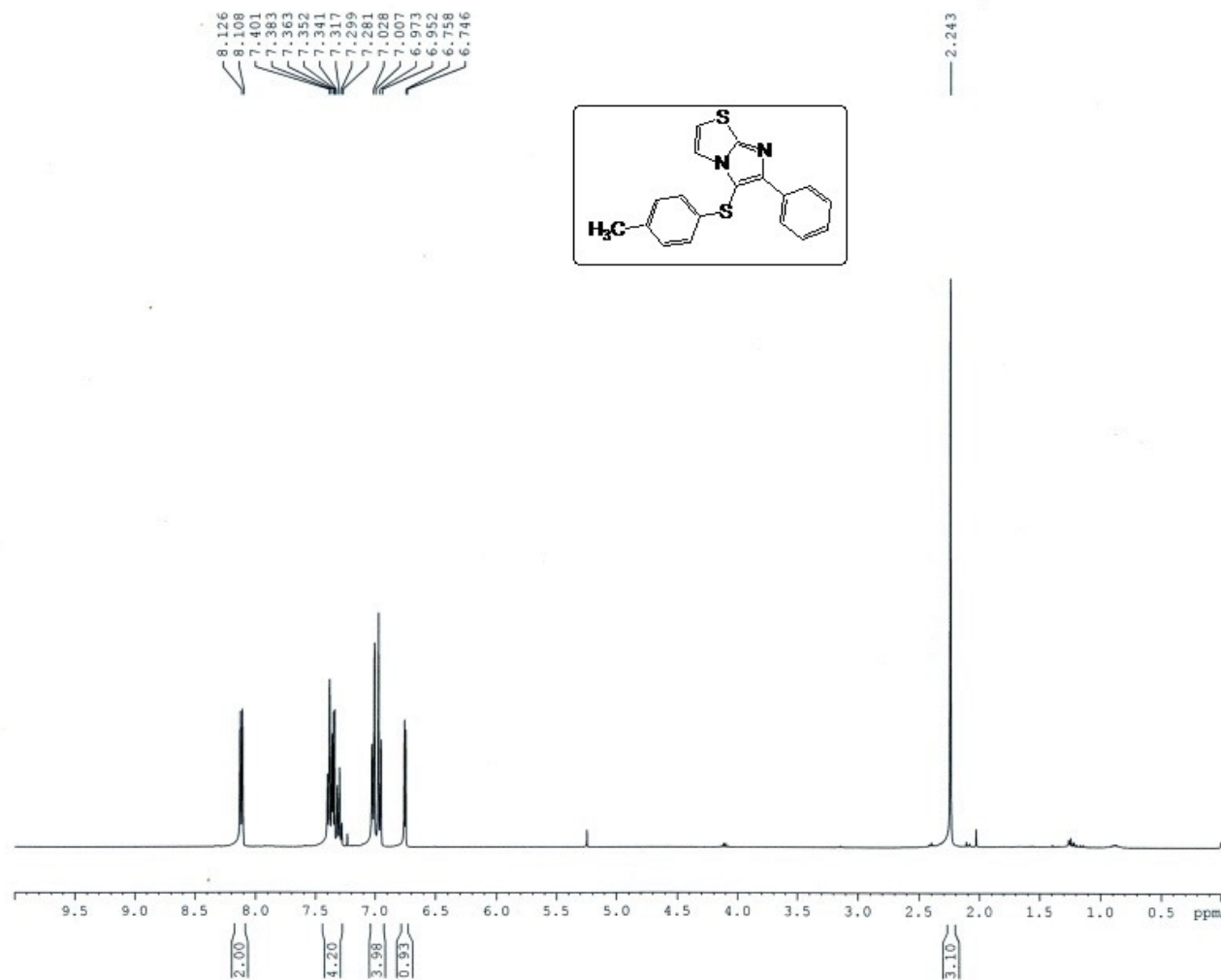
Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 1022
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141026
 Time_ 20.01
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 100
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 23.55
 DW 20.800 usec
 DE 6.50 usec
 TE 296.6 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TDO 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177983 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

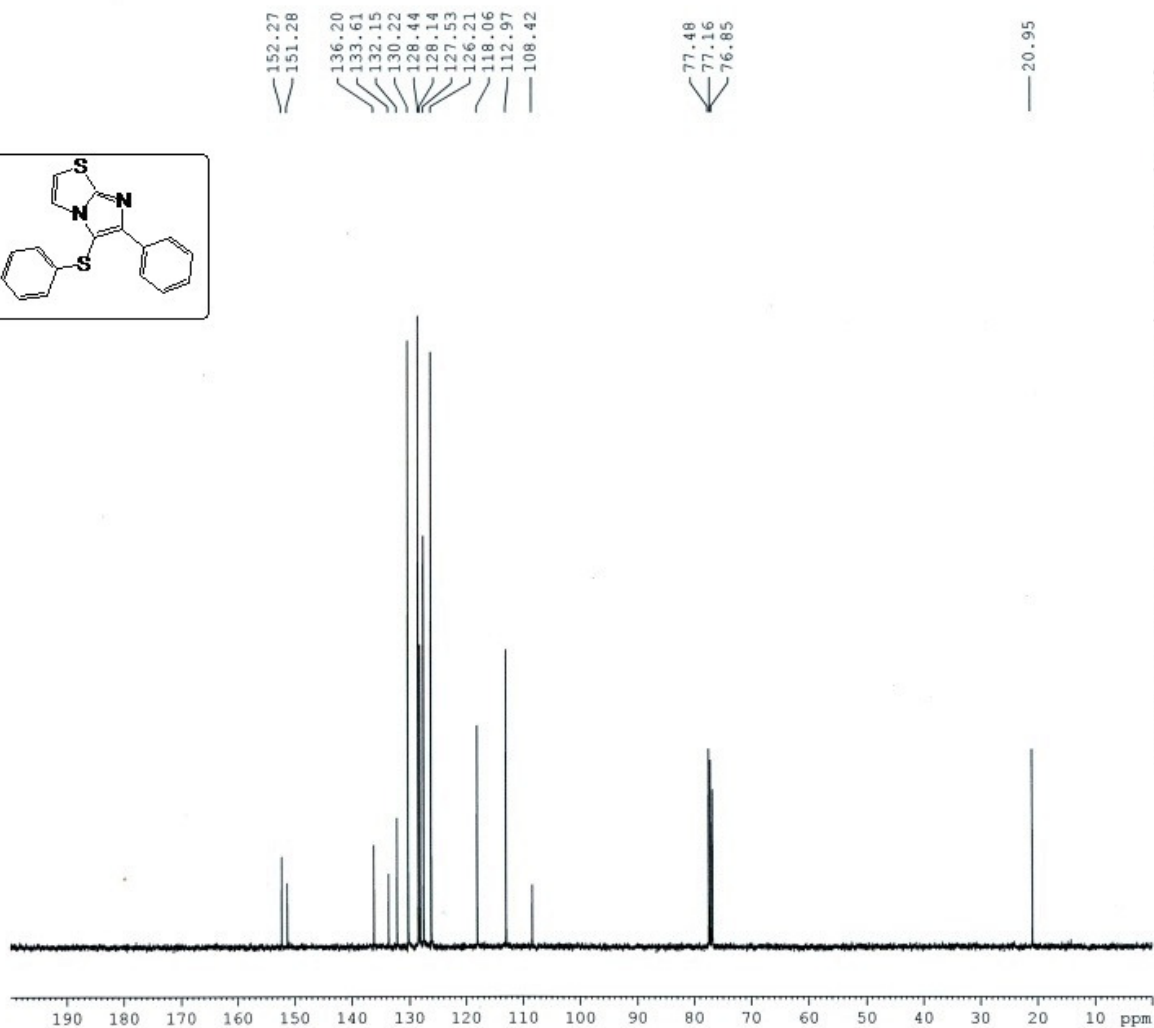
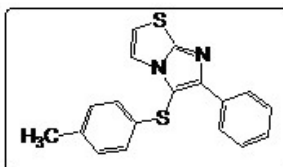


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 948
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141010
 Time_ 20.41
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 37.83
 DW 60.800 usec
 DE 6.50 usec
 TE 296.1 K
 D1 1.00000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500192 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



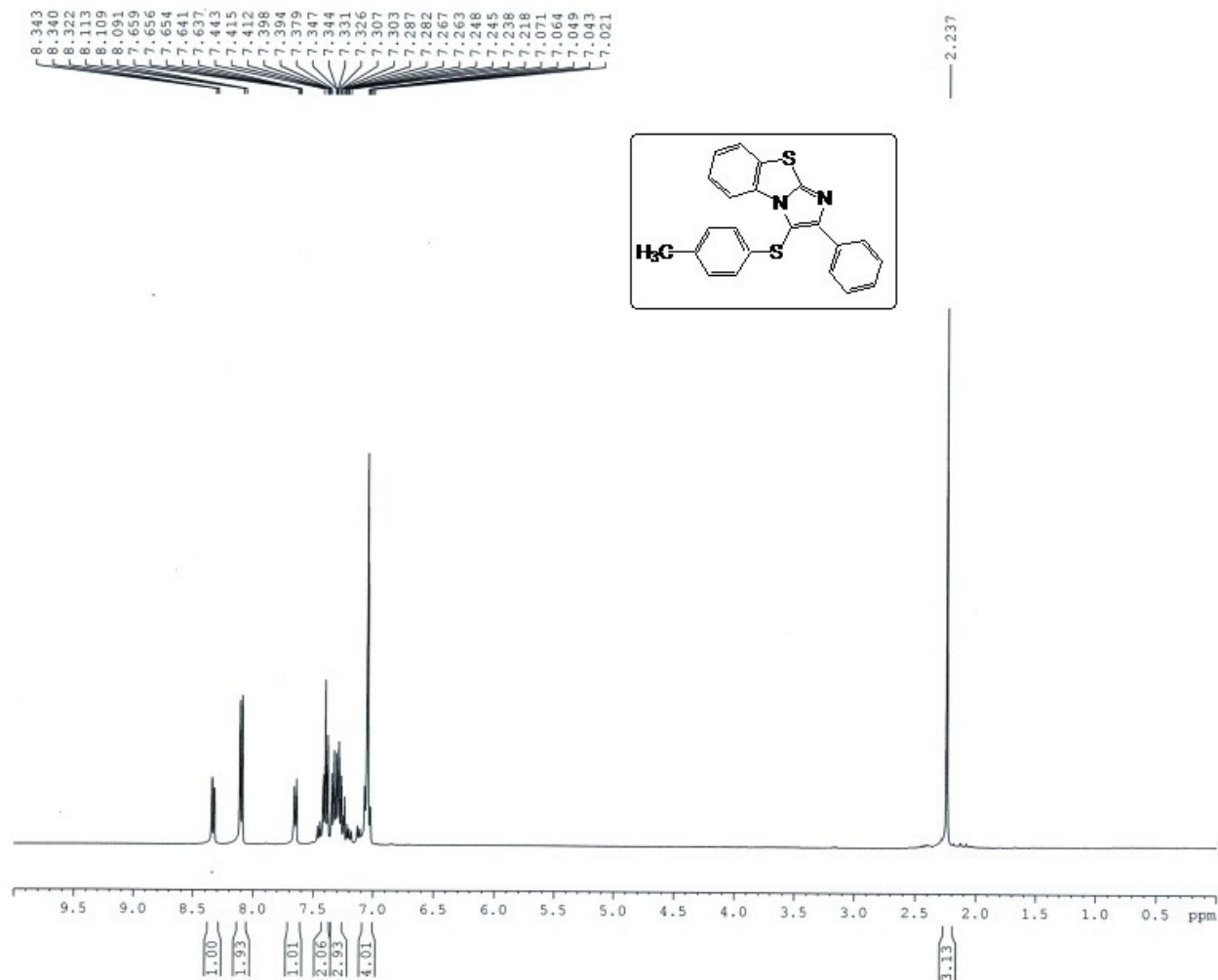
Current Data Parameters
 NAME Dr. A RAJRA 2014
 EXPNO 960
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141012
 Time 12.29
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 160
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 37.83
 DW 20.800 usec
 DE 6.50 usec
 TE 299.5 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40752999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177954 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

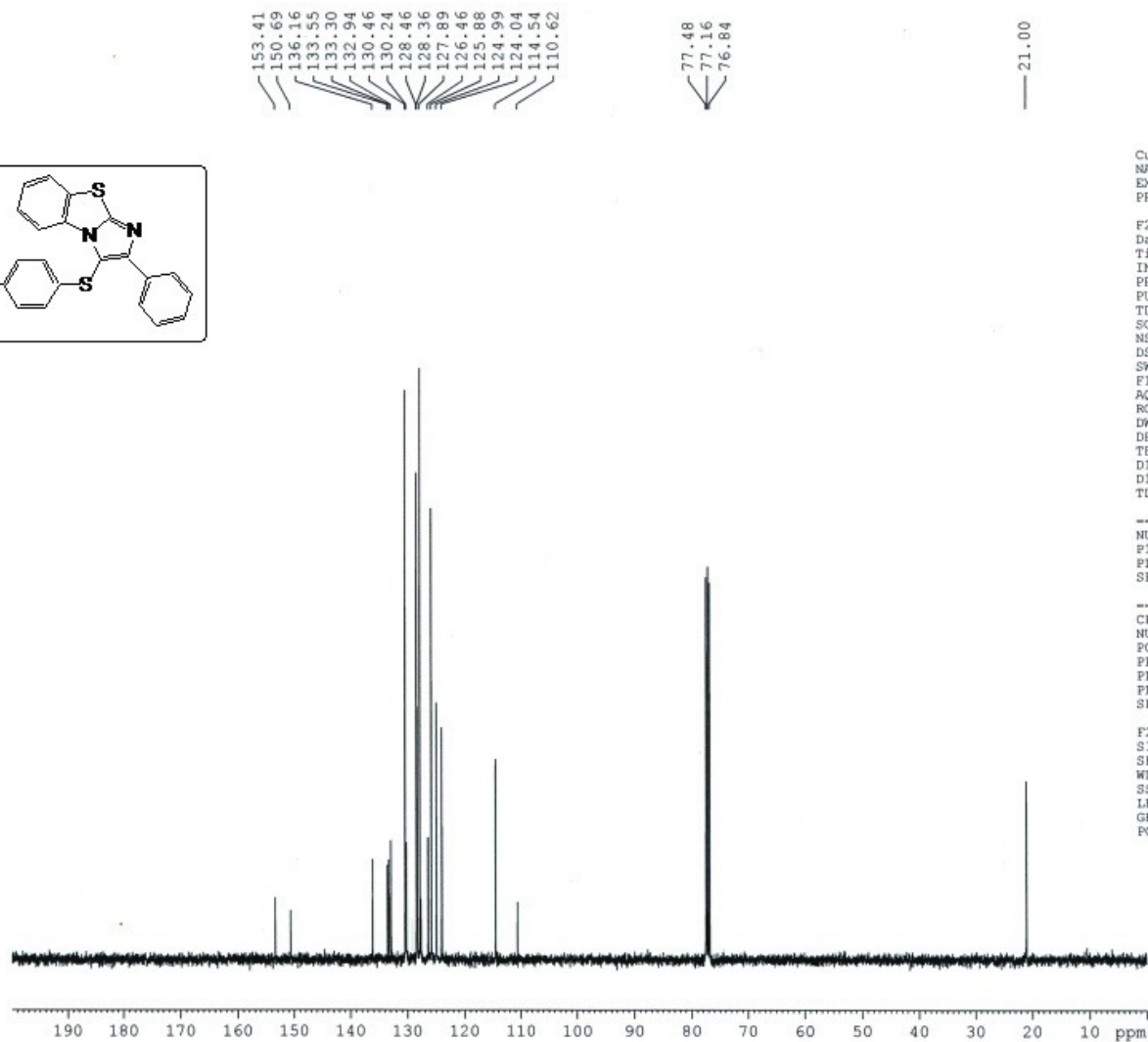
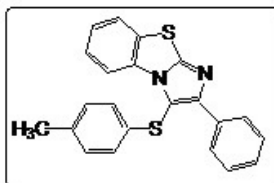


Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 947
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141010
 Time 20.38
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zg30
 TD 32768
 SOLVENT CDCl3
 NS 24
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.250967 Hz
 AQ 1.9923444 sec
 RG 47.25
 DW 60.800 usec
 DE 6.50 usec
 TE 296.2 K
 D1 1.00000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 1H
 P1 14.75 usec
 PLW1 11.99499989 W
 SFO1 400.1524711 MHz

F2 - Processing parameters
 SI 16384
 SF 400.1500172 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



Current Data Parameters
 NAME Dr. A HAJRA 2014
 EXPNO 953
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20141011
 Time_ 11.56
 INSTRUM spect
 PROBHD 5 mm PABBO BB/
 PULPROG zgpg30
 TD 32768
 SOLVENT CDCl3
 NS 240
 DS 2
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 0.6816244 sec
 RG 47.25
 DW 20.800 usec
 DE 6.50 usec
 TE 298.7 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

----- CHANNEL f1 -----
 NUC1 13C
 P1 8.90 usec
 PLW1 54.00000000 W
 SFO1 100.6278588 MHz

----- CHANNEL f2 -----
 CPDPRG2 waltz16
 NUC2 1H
 PCPD2 80.00 usec
 PLW2 12.00000000 W
 PLW12 0.40792999 W
 PLW13 0.26107001 W
 SFO2 400.1516006 MHz

F2 - Processing parameters
 SI 16384
 SF 100.6177895 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40