

Step economic, efficient, ZnS nanoparticle catalyzed synthesis of spirooxindole derivatives in aqueous medium via Knoevenagel condensation followed by Michael addition

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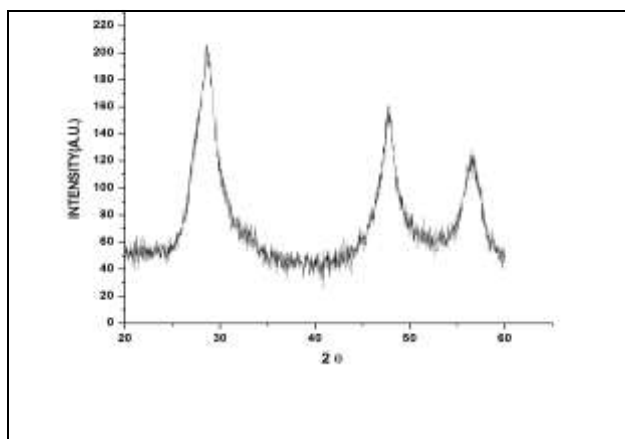


Fig.2: XRD patterns of ZnS nanoparticles

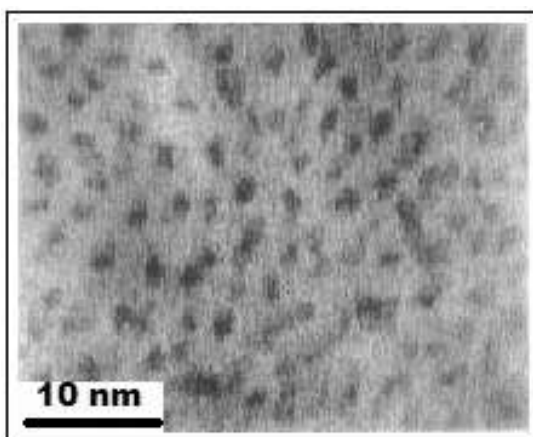


Fig.3a: TEM image of ZnS nanoparticles

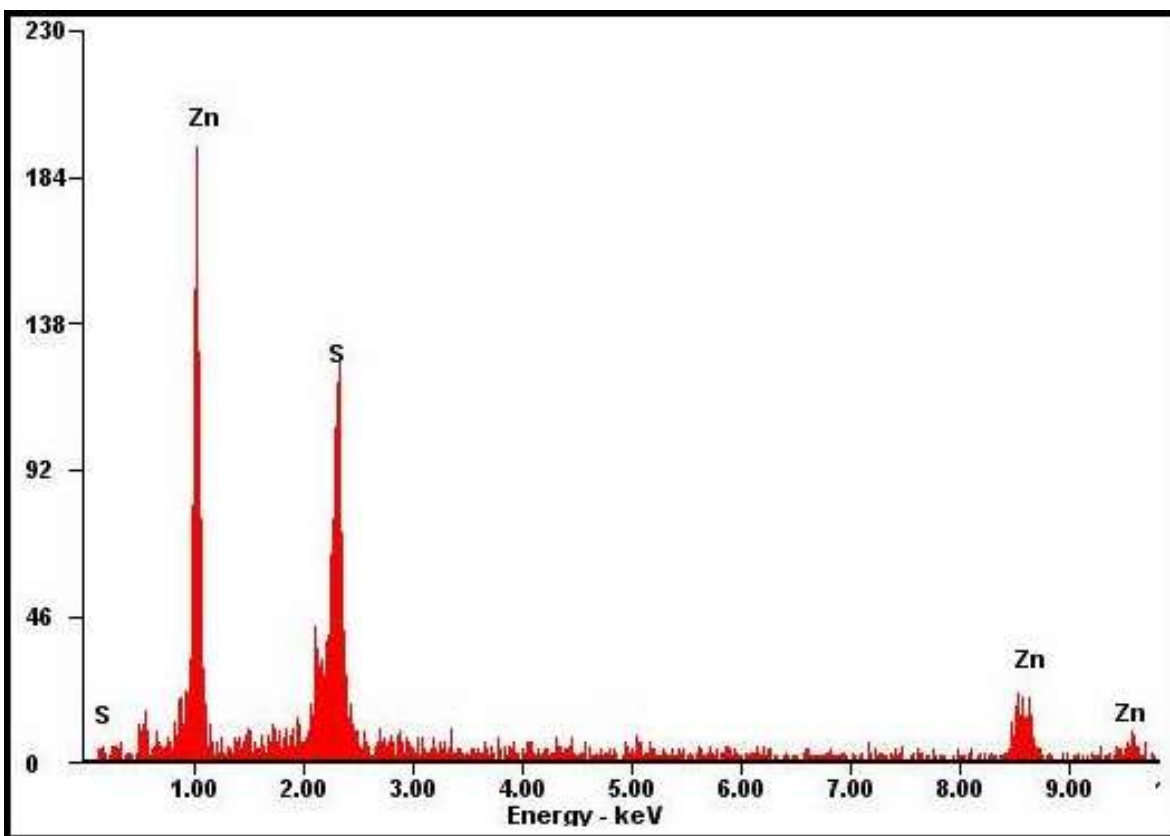
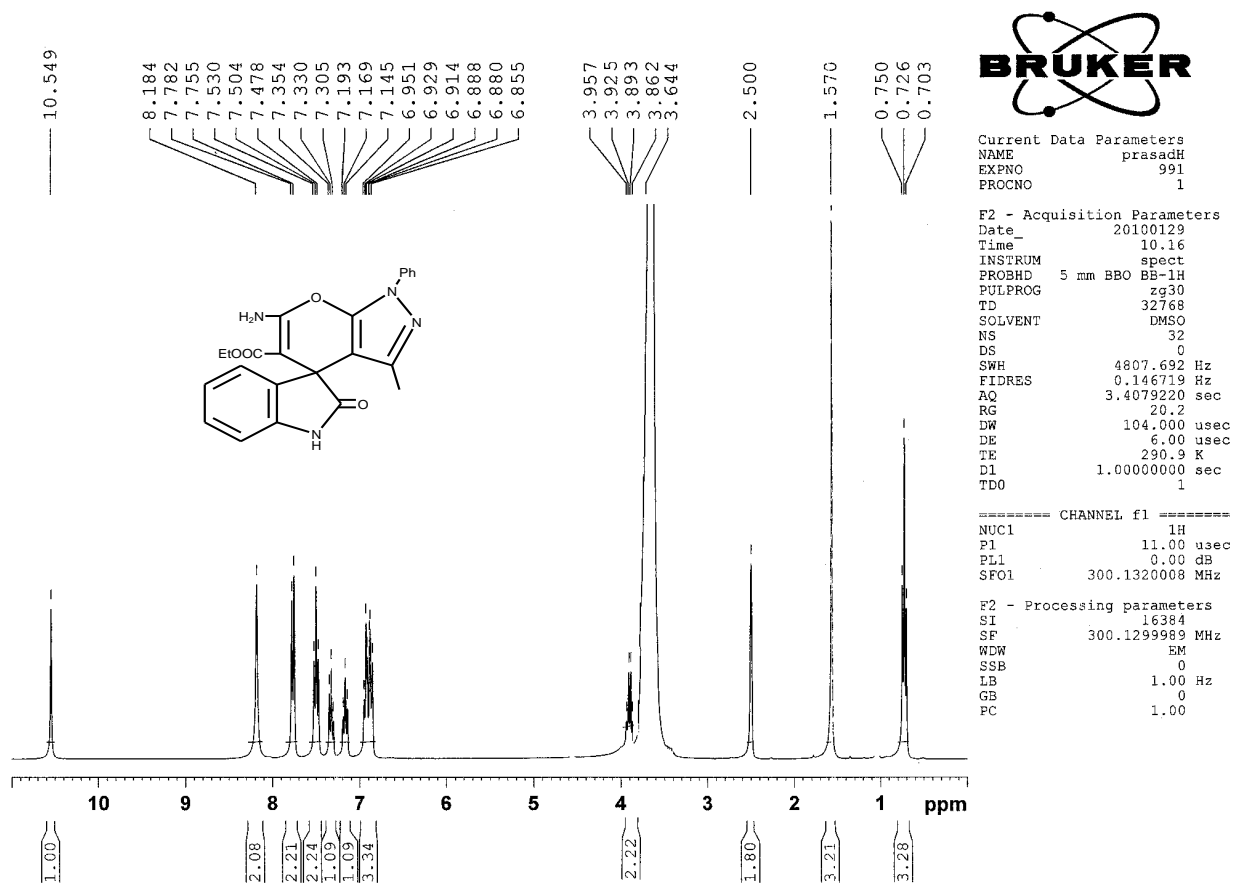
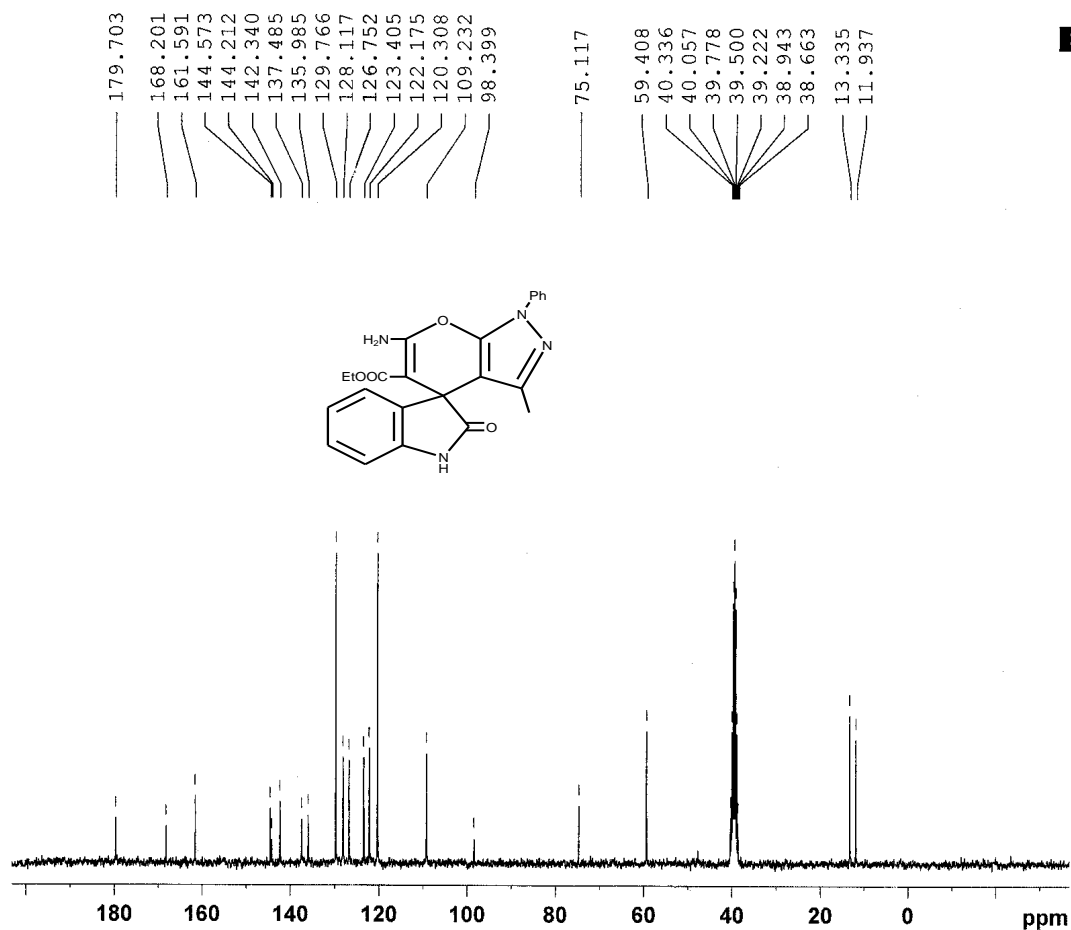


Fig. 5: EDAX pattern of ZnS nanoparticles



¹H NMR Spectrum of compound 5a



Current Data Parameters
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 EXPNO 267
 PROCNO 1

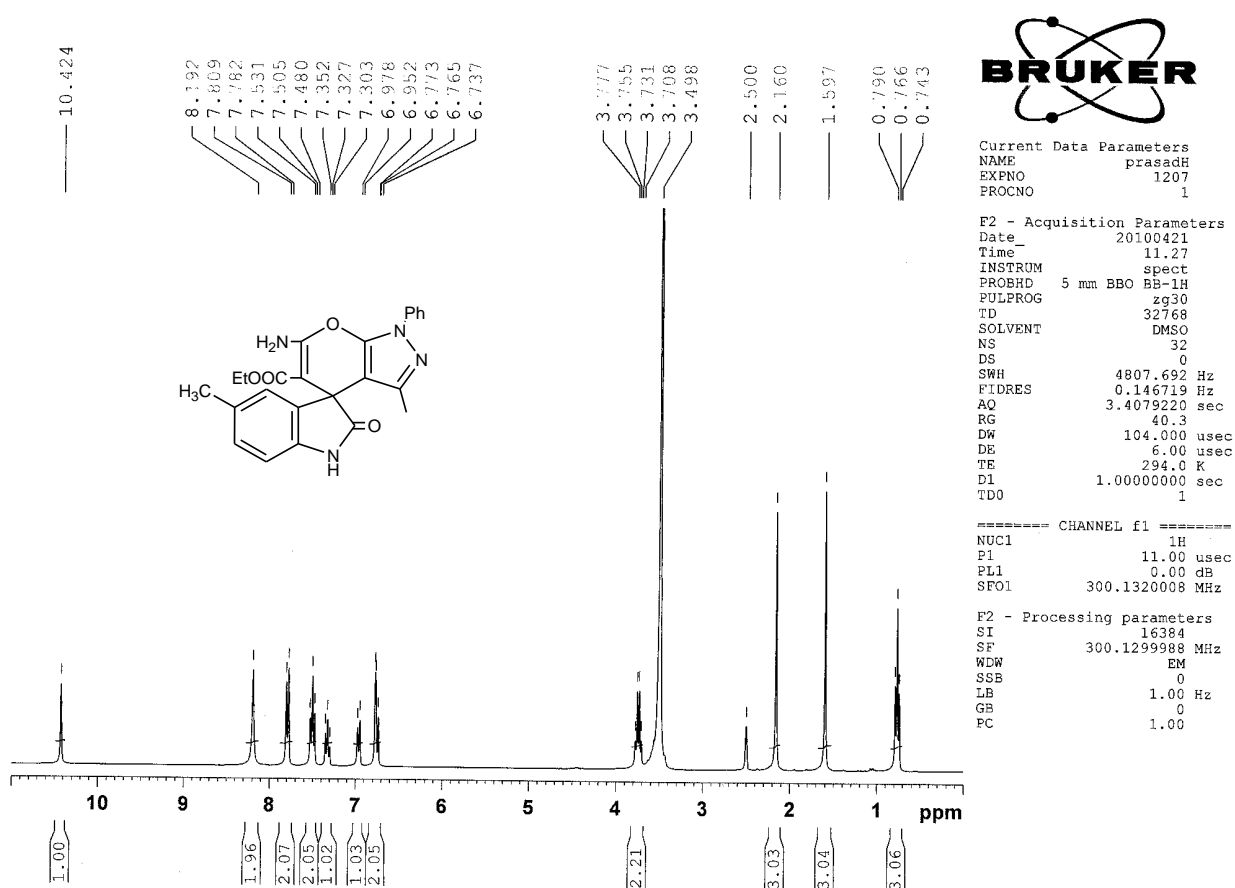
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 SOLVENT DMSO
 NS 630
 DS 4
 SWH 18115.941 Hz
 FIDRES 0.552855 Hz
 AQ 0.9044468 sec
 RG 90.5
 DW 27.600 usec
 DE 6.00 usec
 TE 290.7 K
 D1 1.00000000 sec
 d11 0.03000000 sec
 DELTA 0.89999998 sec
 TDO 1

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 P1 9.20 usec
 PL1 -1.00 dB
 SFO1 75.4740505 MHz

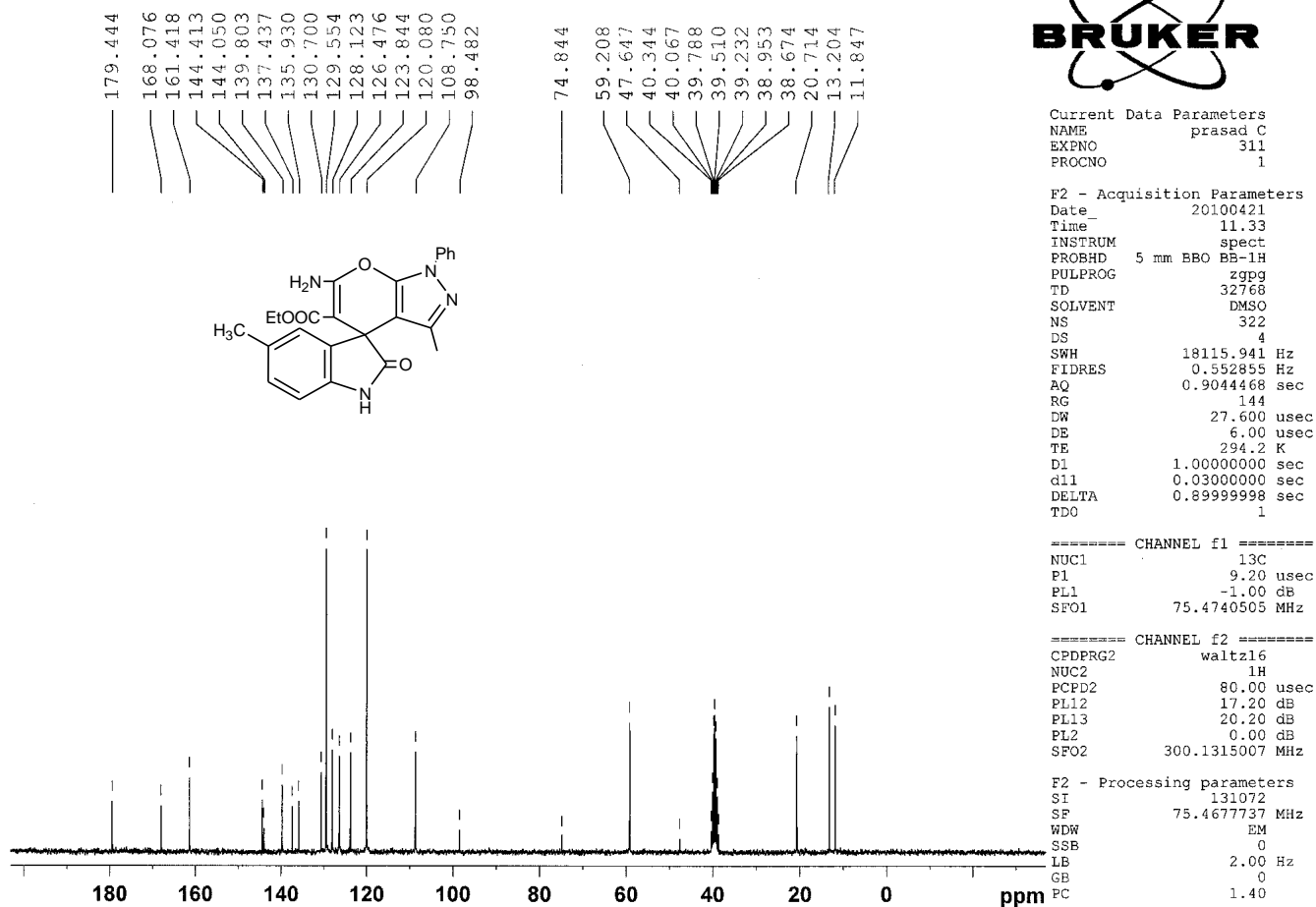
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 PL2 0.00 dB
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F2 - Processing parameters
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 SSB 0
 LB 3.00 Hz
 GB 0
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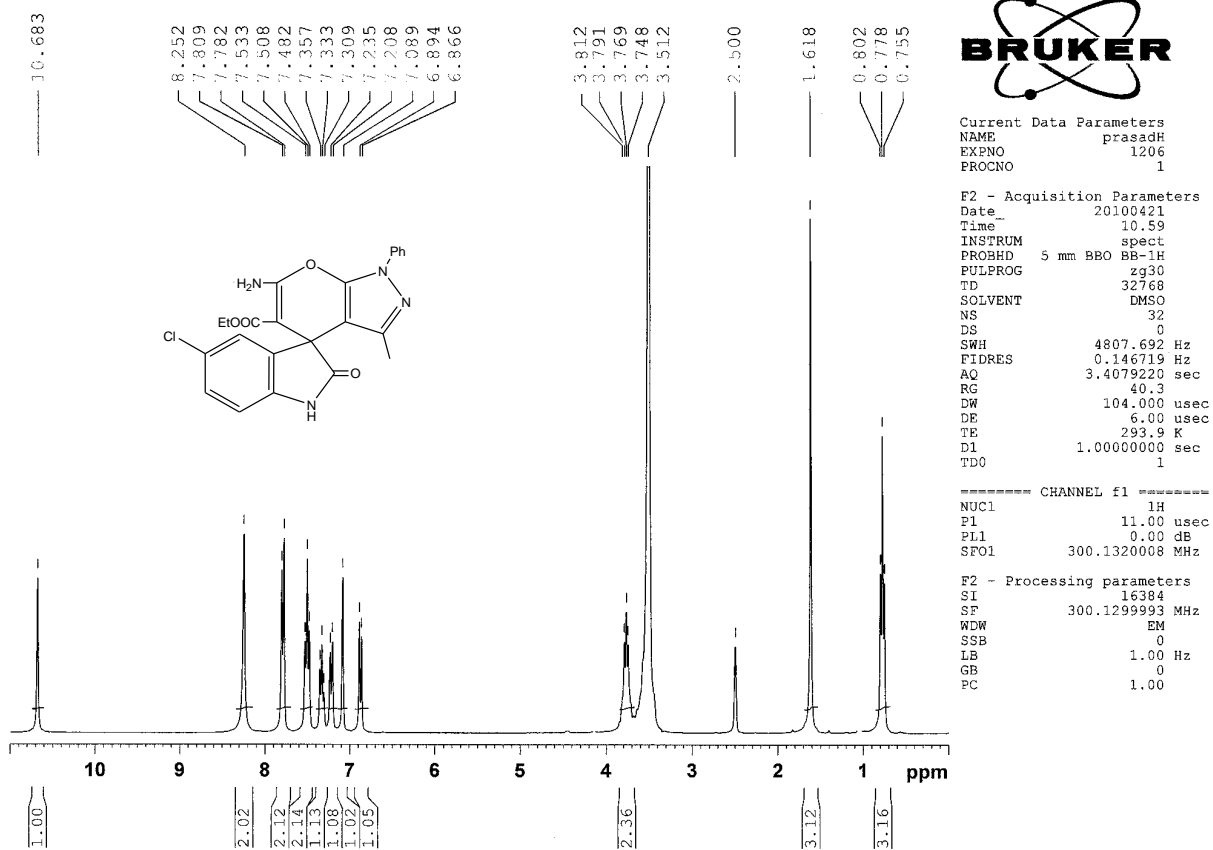
¹³C NMR Spectrum of compound 5a



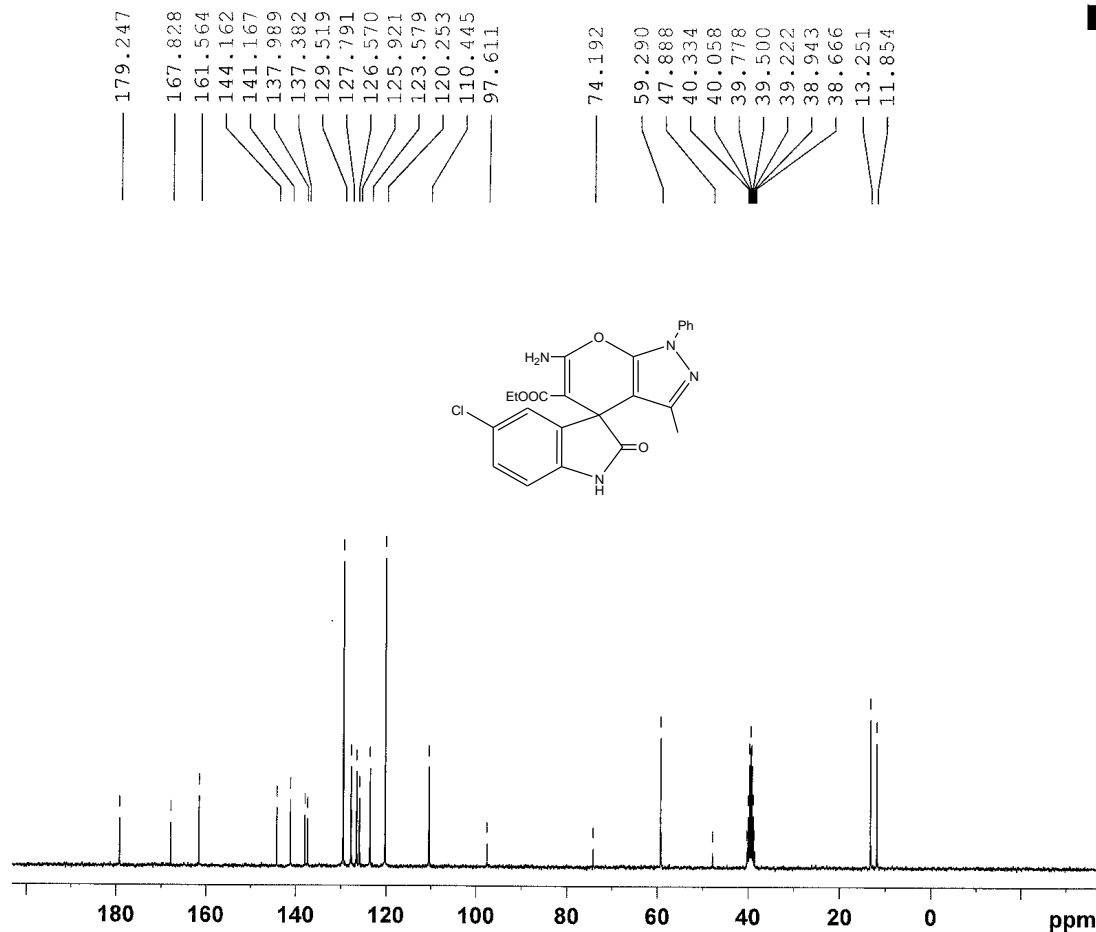
¹H NMR Spectrum of compound **5b**



¹³C NMR Spectrum of compound 5b



¹H NMR Spectrum of compound 5c



Current Data Parameters
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PROCNO 1

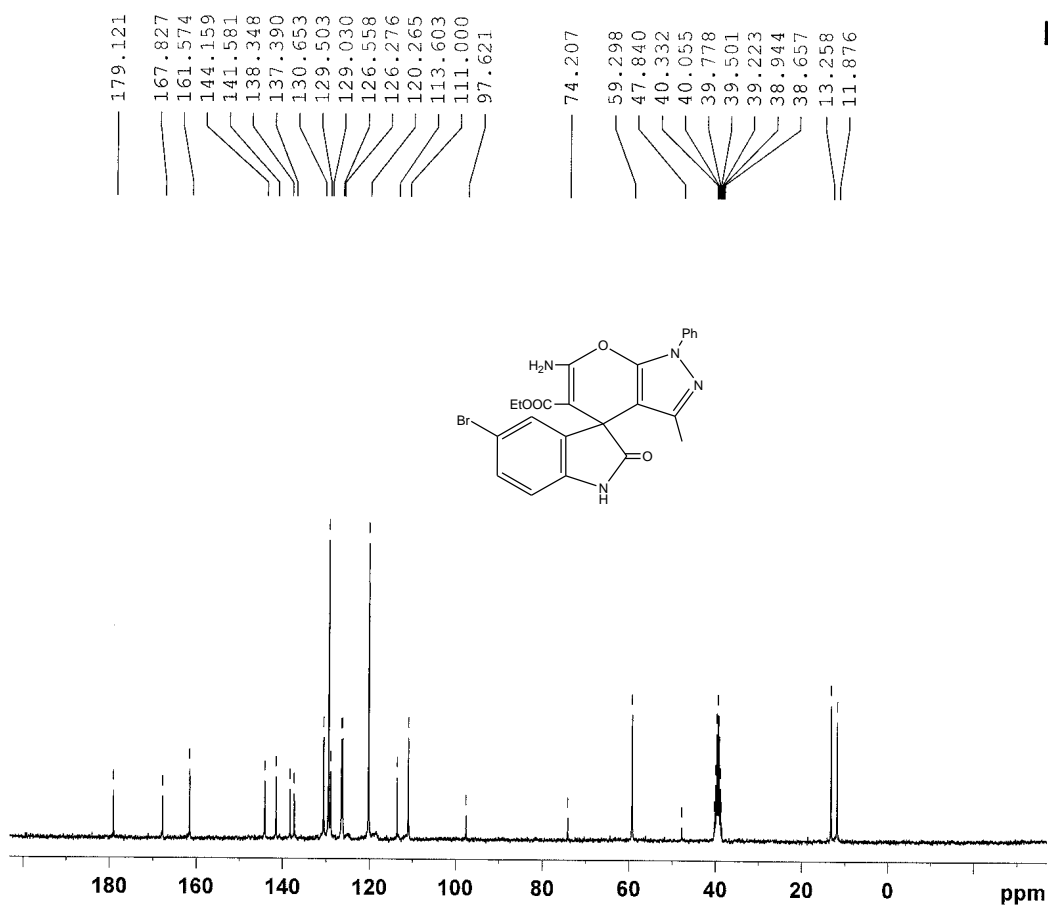
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TD 32768
SOLVENT DMSO
NS 553
DS 4
SWH 18115.941 Hz
FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 144
DW 27.600 usec
DE 6.00 usec
TE 293.9 K
D1 1.0000000 sec
d11 0.0300000 sec
DELTA 0.89999998 sec
TDO 1

===== CHANNEL f1 =====
NUC1 13C
P1 9.20 usec
PL1 -1.00 dB
SFO1 75.4740505 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL12 17.20 dB
PL13 20.20 dB
PL2 0.00 dB
SFO2 300.1315007 MHz

F2 - Processing parameters
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SF 75.4677742 MHz
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¹³C NMR Spectrum of compound 5c



Current Data Parameters
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EXPNO 312
PROCNO 1

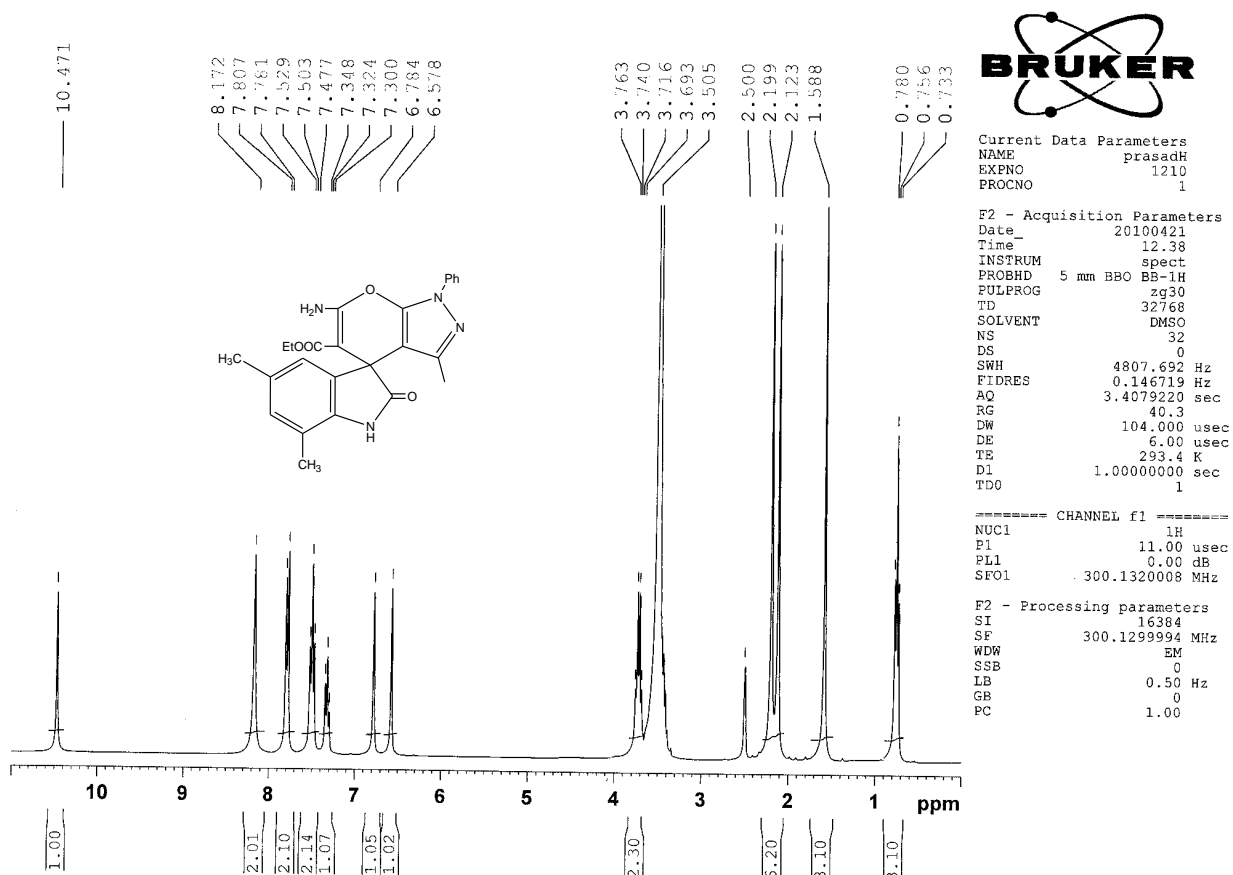
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FIDRES 0.552855 Hz
AQ 0.9044468 sec
RG 144
DW 27.600 usec
DE 6.00 usec
TE 293.9 K
D1 1.0000000 sec
d11 0.0300000 sec
DELTA 0.89999998 sec
TD0 1

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PL1 -1.00 dB
SFO1 75.4740505 MHz

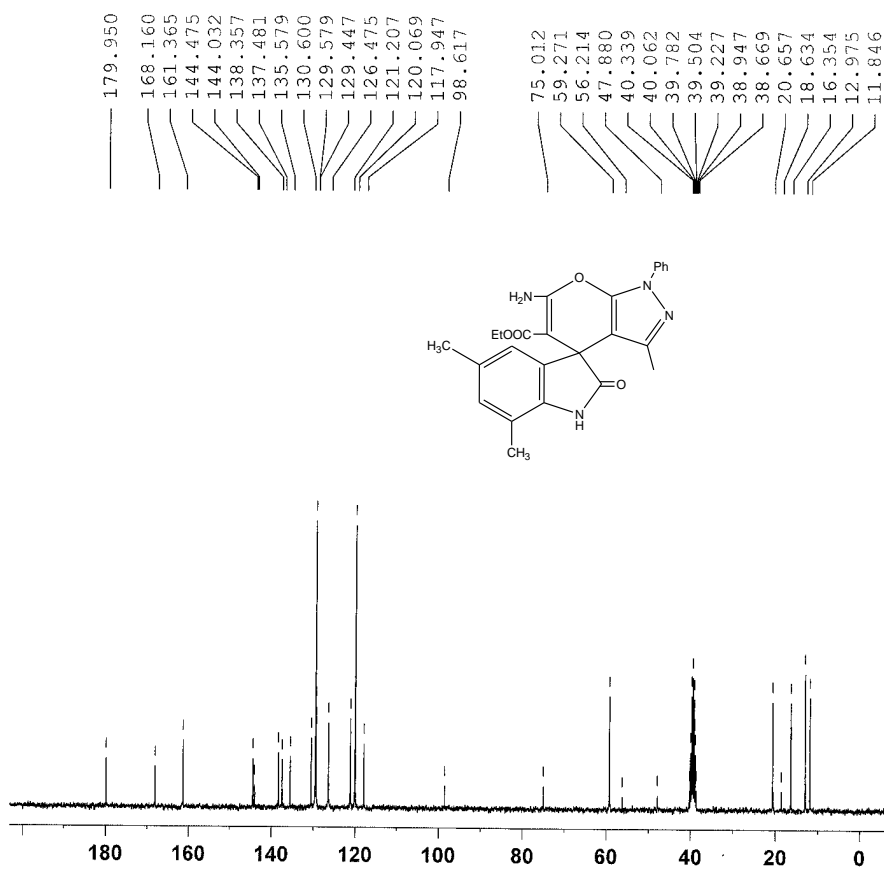
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F2 - Processing parameters
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SF 75.4677754 MHz
WDW EM
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¹³C NMR Spectrum of compound 5d



¹H NMR Spectrum of compound **5f**



Current Data Parameters
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 PROCNO 1

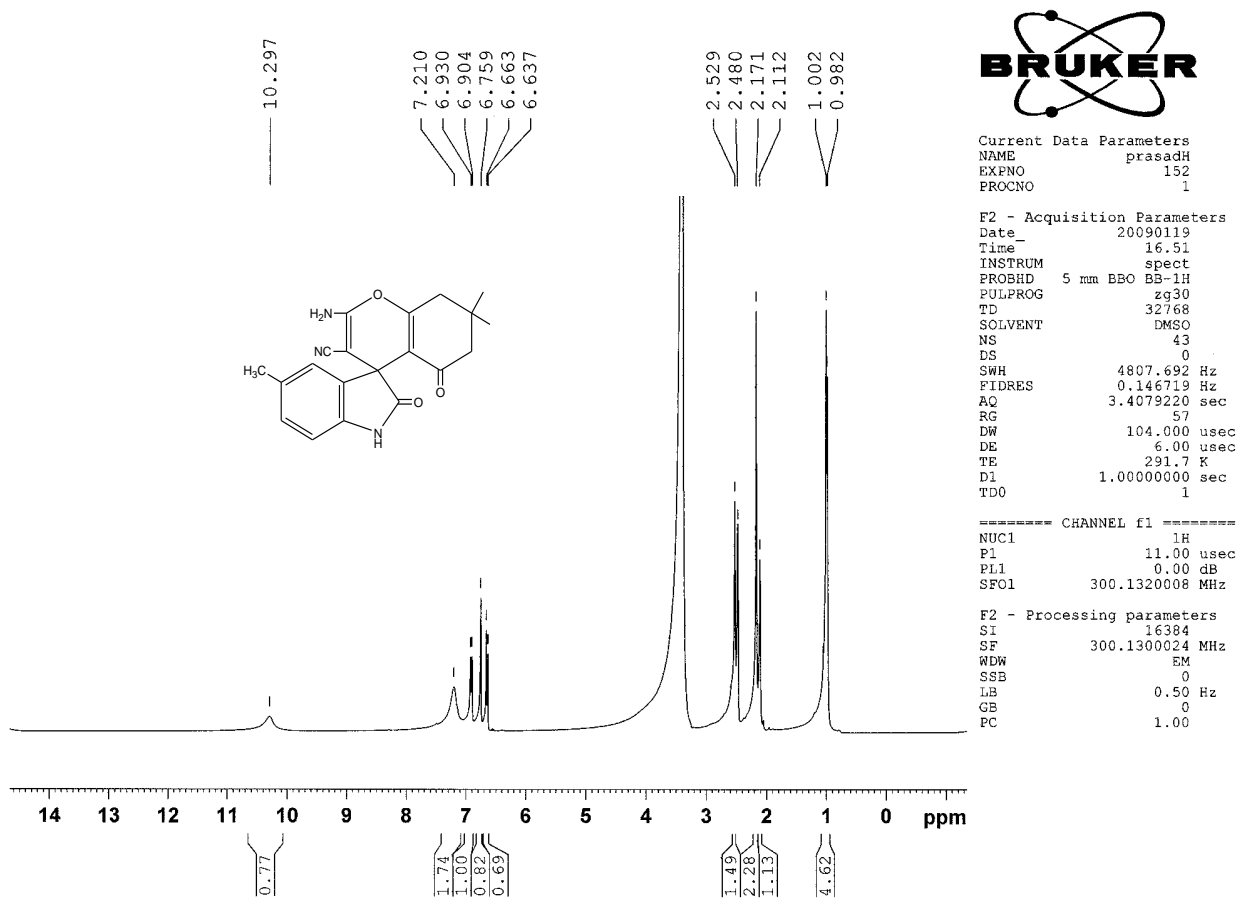
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 SOLVENT DMSO
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 DS 4
 SWH 18115.941 Hz
 FIDRES 0.552855 Hz
 AQ 0.9044468 sec
 RG 144
 DW 27.600 usec
 DE 6.00 usec
 TE 293.7 K
 D1 1.00000000 sec
 d11 0.03000000 sec
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===== CHANNEL f1 =====
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 PL1 -1.00 dB
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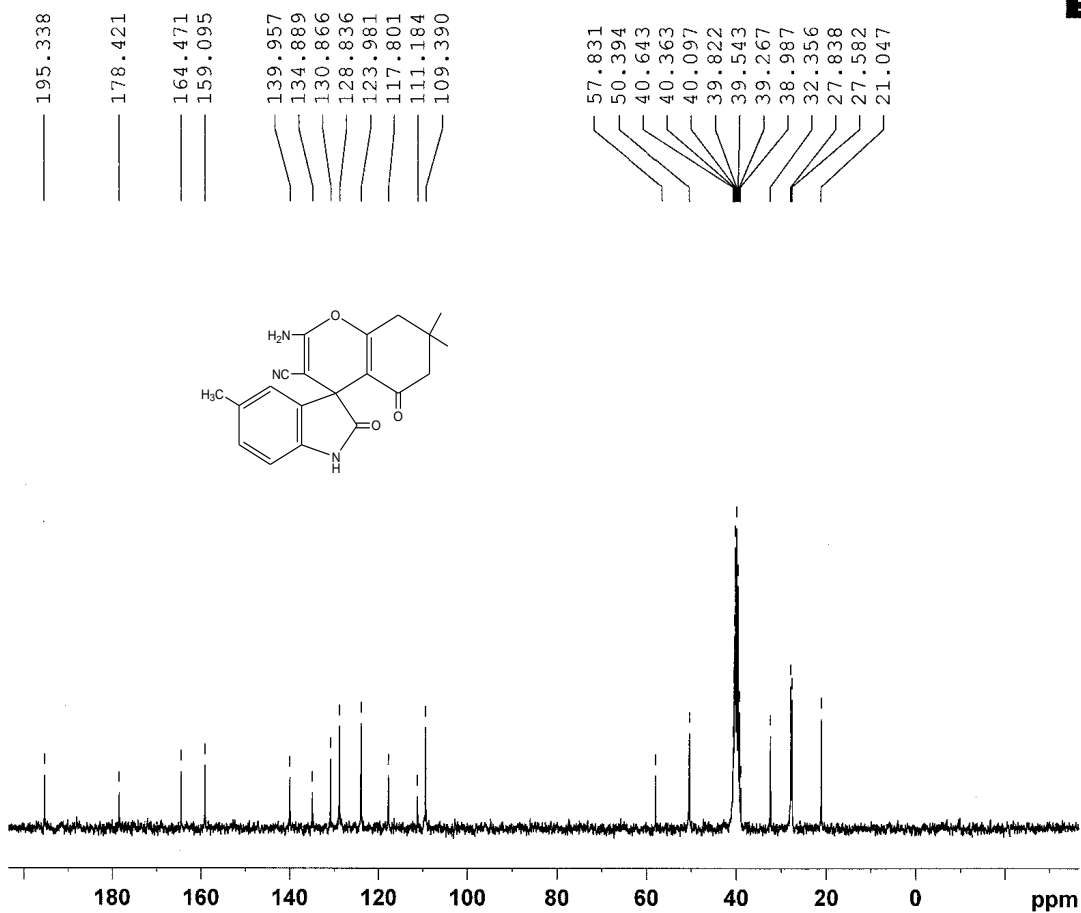
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 SFO2 300.1315007 MHz

F2 - Processing parameters
 SI 131072
 SF 75.4677718 MHz
 WDW EM
 SSB 0
 LB 2.00 Hz
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^{13}C NMR Spectrum of compound **5f**



^1H NMR Spectrum of compound **7h**



Current Data Parameters
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 EXPNO 78
 PROCNO 1

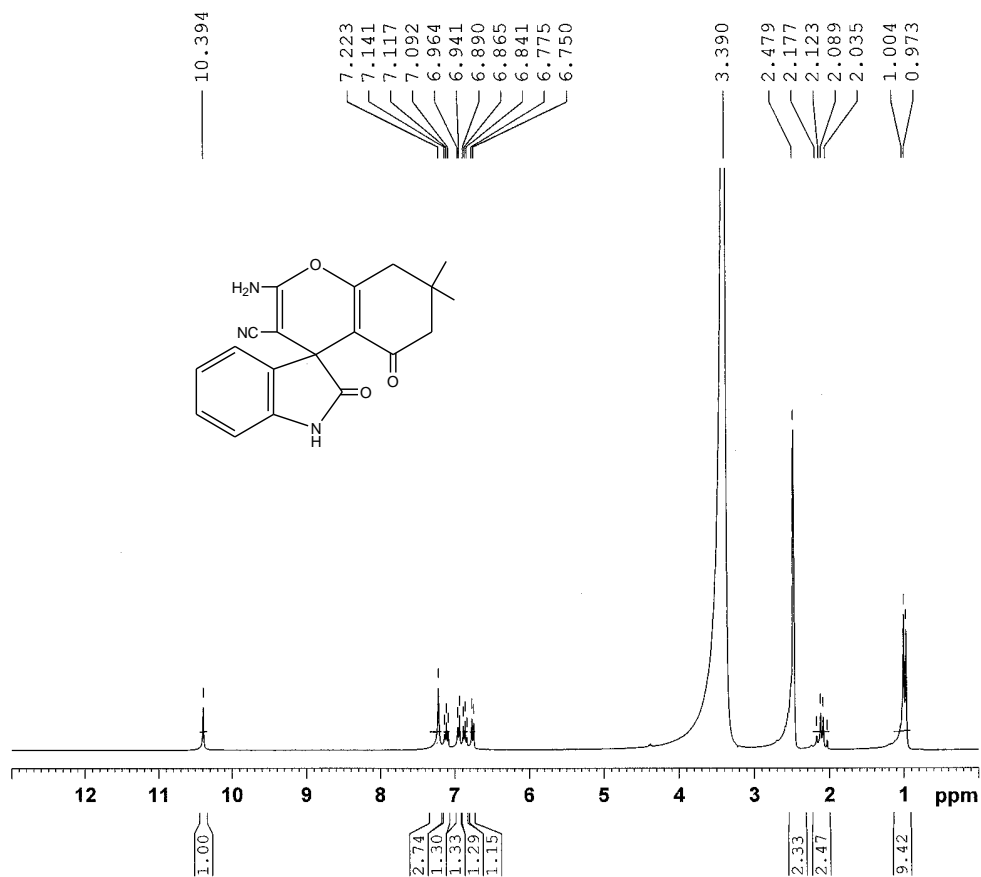
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 SOLVENT DMSO
 NS 1037
 DS 4
 SWH 18115.941 Hz
 FIDRES 0.552855 Hz
 AQ 0.9044468 sec
 RG 203
 DW 27.600 usec
 DE 6.00 usec
 TE 292.6 K
 D1 1.00000000 sec
 d11 0.03000000 sec
 DELTA 0.89999998 sec
 TDO 1

===== CHANNEL f1 =====
 NUC1 13C
 P1 9.20 usec
 PL1 -1.00 dB
 SFO1 75.4740505 MHz

===== CHANNEL f2 =====
 CPDPRG2 waltz16
 NUC2 1H
 FCPD2 80.00 usec
 PL12 17.20 dB
 PL13 20.20 dB
 PL2 0.00 dB
 SFO2 300.1315007 MHz

F2 - Processing parameters
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¹³C NMR Spectrum of compound 7h



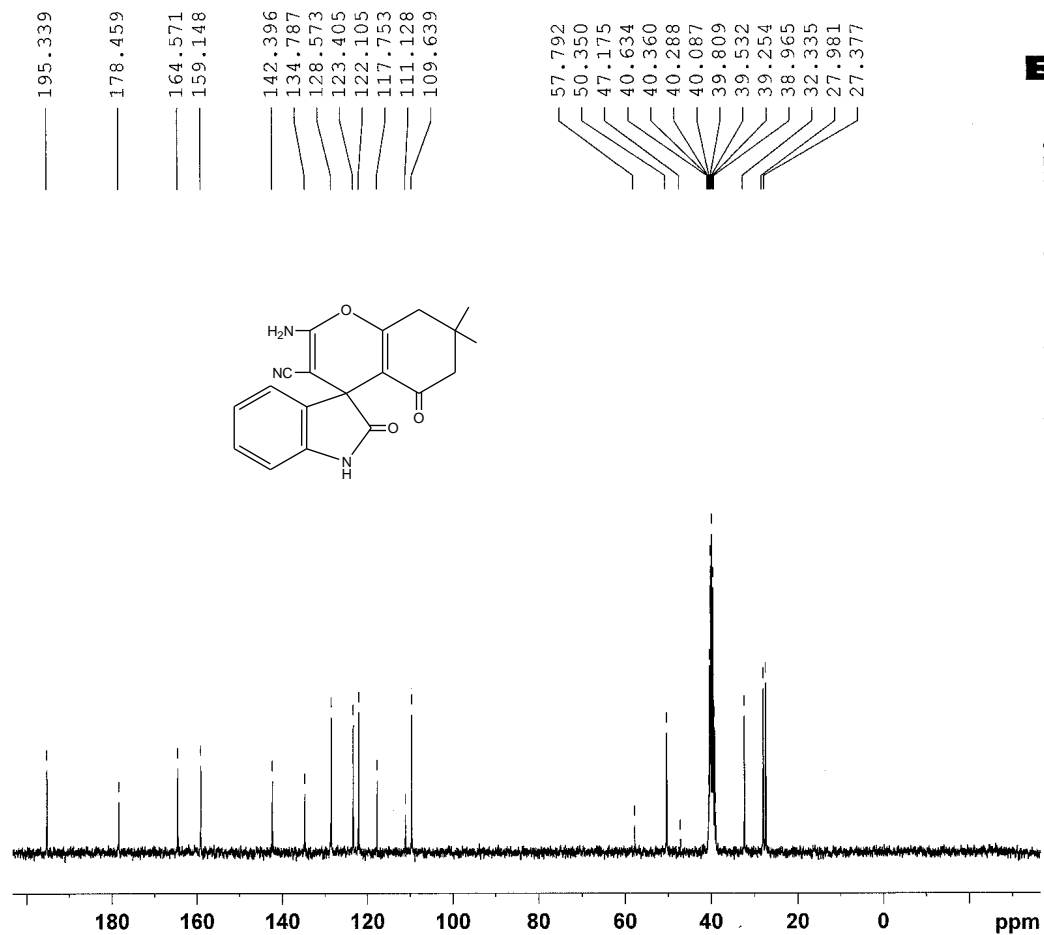
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 PROCNO 1

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 PULPROG zg30
 TD 32768
 SOLVENT DMSO
 NS 100
 DS 0
 SWH 4807.692 Hz
 FIDRES 0.146719 Hz
 AQ 3.4079220 sec
 RG 128
 DW 104.000 usec
 DE 6.00 usec
 TE 291.6 K
 D1 1.0000000 sec
 TD0 1

===== CHANNEL f1 =====
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 P1 11.00 usec
 PL1 0.00 dB
 SFO1 300.1320008 MHz

F2 - Processing parameters
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 SF 300.1300024 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.00

¹H NMR Spectrum of compound 7g



Current Data Parameters
NAME prasad C
EXPNO 79
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090120
Time 12.19
INSTRUM spect
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PULPROG zgpg
TD 32768
SOLVENT DMSO
NS 1048
DS 4
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FIDRES 0.552855 Hz
AQ 0.9044468 sec
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d11 0.03000000 sec
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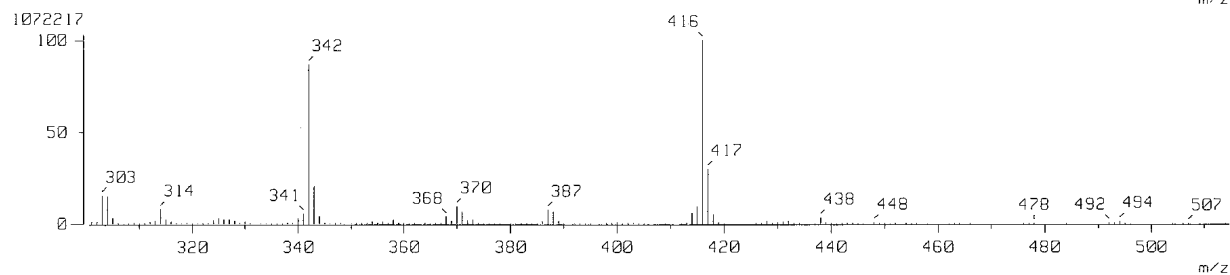
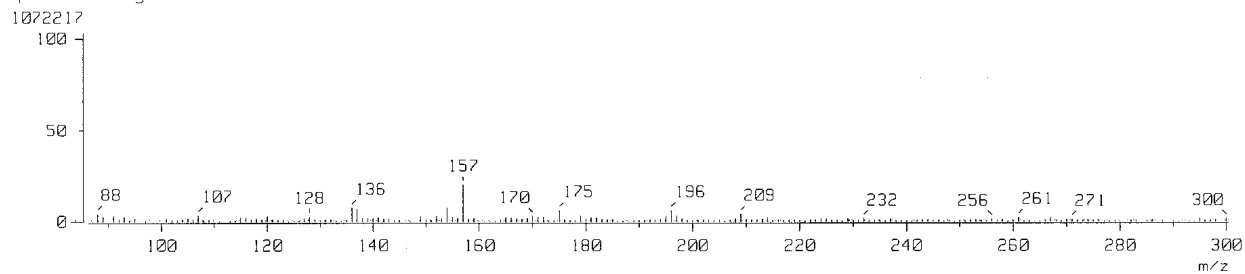
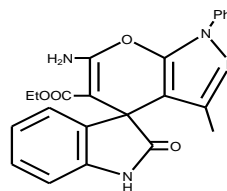
===== CHANNEL f1 =====
NUC1 13C
P1 9.20 usec
PL1 -1.00 dB
SFO1 75.4740505 MHz

===== CHANNEL f2 =====
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL12 17.20 dB
PL13 20.20 dB
PL2 0.00 dB
SFO2 300.1315007 MHz

F2 - Processing parameters
SI 131072
SF 75.4677536 MHz
WDW EM
SSB 0
LB 2.00 Hz
GB 0
PC 1.40

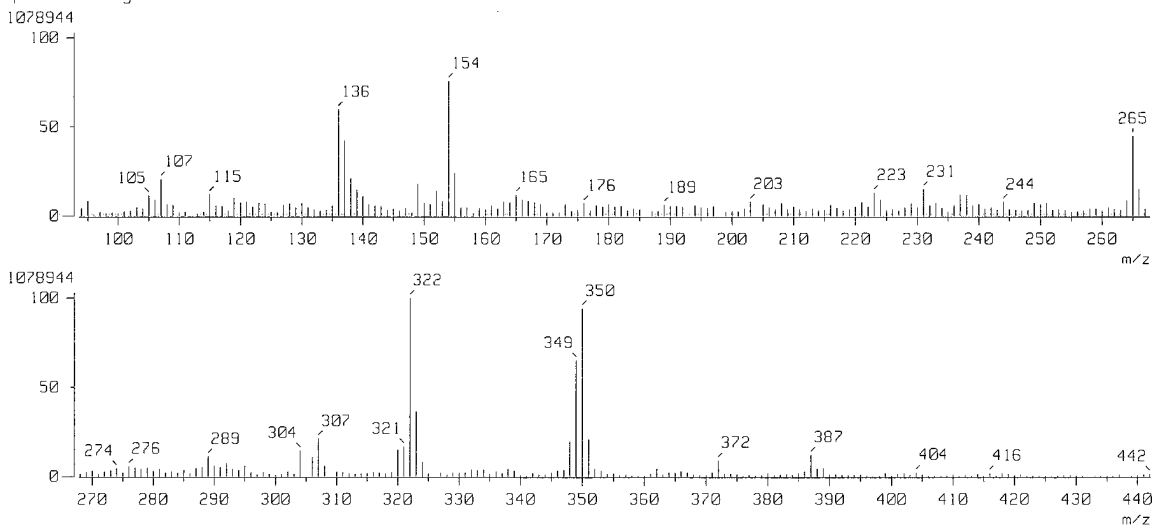
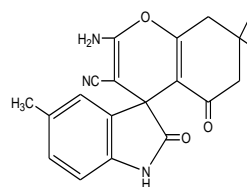
^{13}C NMR Spectrum of compound **7g**

[Mass Spectrum]
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Sample: A-1 DR ANSHU DANDIA RAJ UNIV JAIPUR #3941
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Inlet : Direct Ion Mode : FAB+
Spectrum Type : Normal Ion [MF-Linear]
RT : 0.12 min Scan# : 2
BP : m/z 416.0000 Int. : 99.08
Output m/z range : 86.2747 to 514.6563 Cut Level : 0.00 %



Mass spectrum of compound **5a**

[Mass Spectrum]
Data : 8E05SEPT059
Sample: A-1 DR ANSHU DANDIA RAJ UNIV JAIPUR #3139
Note : -
Inlet : Direct Ion Mode : FAB+
Spectrum Type : Normal Ion [MF-Linear]
RT : 0.37 min Scan# : 4
BP : m/z 322.0000 Int. : 100.00
Output m/z range : 93.5878 to 442.1178 Cut Level : 0.00 %



Mass spectrum of compound 7h