

Electronic supplementary information for

I₂-TBHP-catalyzed one-pot highly efficient synthesis of 4,3-fused 1,2,4-triazoles from *N*-tosylhydrazones and aromatic *N*-heterocycles via intermolecular formal 1,3-dipolar cycloaddition

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Table of contents

The ¹ H and ¹³ C NMR spectra of compounds 6a-x , 11-m & 1s	S2-S55
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¹H and ¹³C NMR Spectra of compounds 6a-x, 1l-m & 1s:

NUCLEUS : H1
FRQ (MHz) : 399.64
AT (sec) : 2.27
SW (ppm) : 18.08
RD (sec) : 1.00
DW (usec) : 6.40
Scans : 32
Solvent : dms0
Data Points : 32768
LB (Hz) : 2.00
TEMP (K) : 303.15
EXP : zgpg1
DATE : Jan 22 2016
System : VNMR8_400

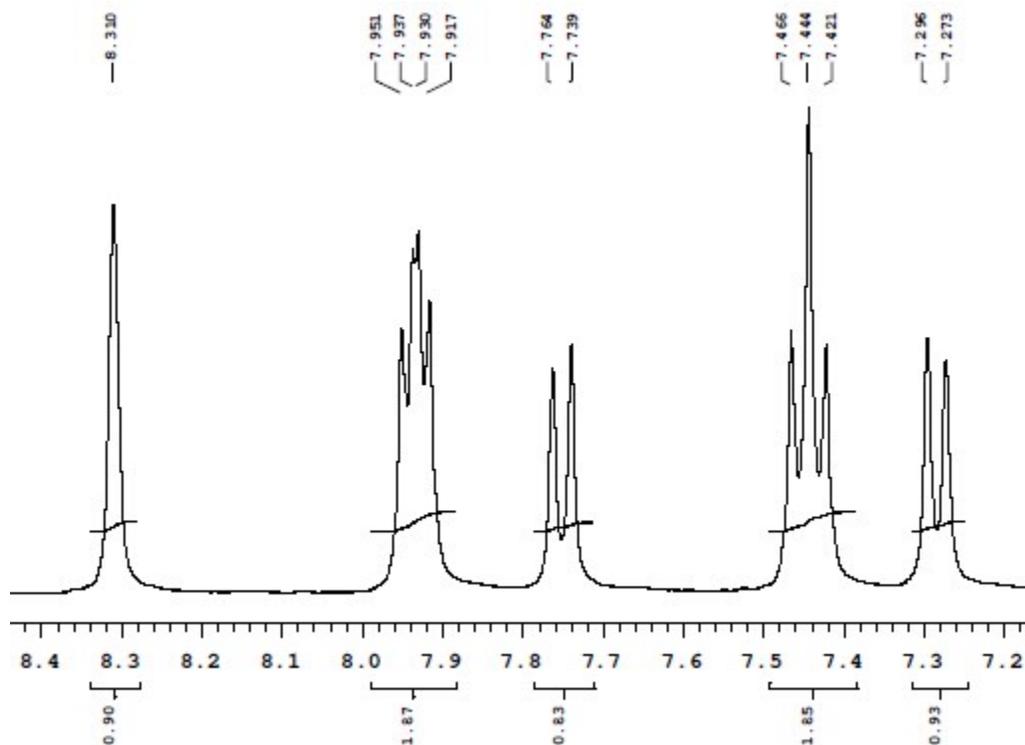
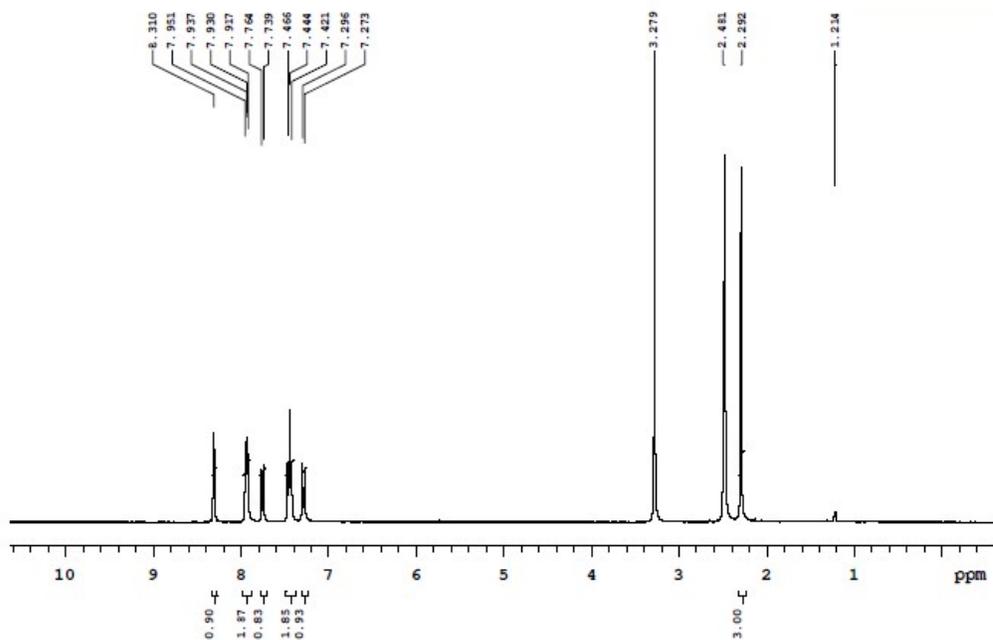
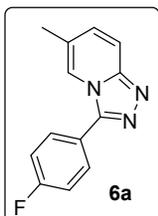


Figure S53. ¹H NMR Spectra & its expansion for compound **6a** in DMSO-*d*₆

NUCLEUS : C13
 FRQ (MHz) : 100.50
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 SW (ppm) : 253.84
 RD (sec) : 1.00
 PW (usec) : 5.05
 Scans : 6400
 Solvent : dmsc
 Data Points : 65536
 LB (Hz) : 4.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Jan 23 2016
 System : VNMR5_400

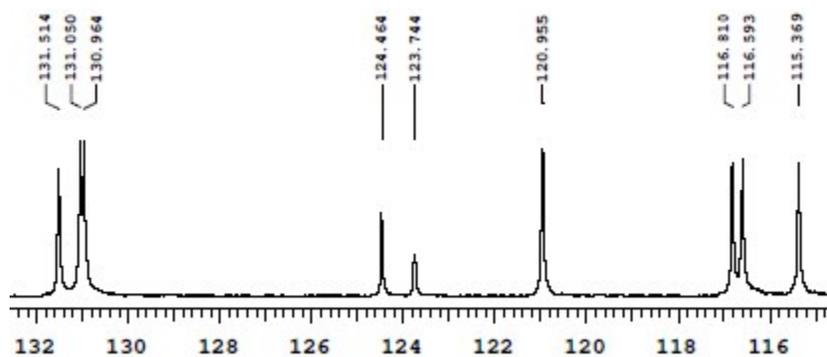
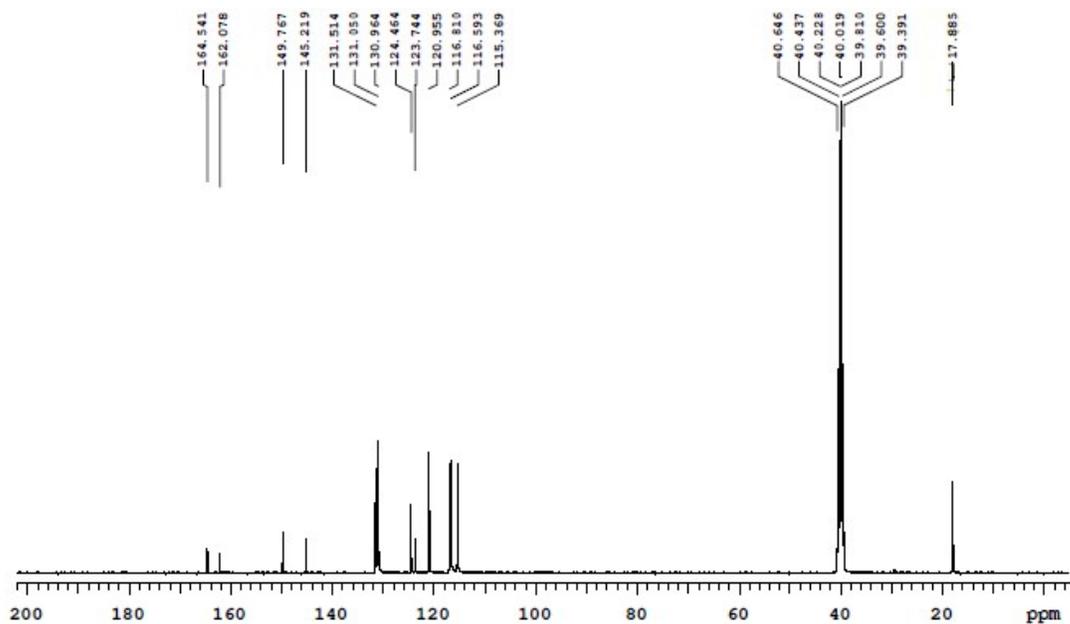
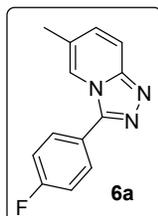


Figure S54. ^{13}C NMR Spectra & its expansion for compound **6a** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.60
 Scans : 64
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 LB (Hz) : 1.00
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 EXP : s2pul
 DATE : Jan 21 2016
 System : VNMR5_400

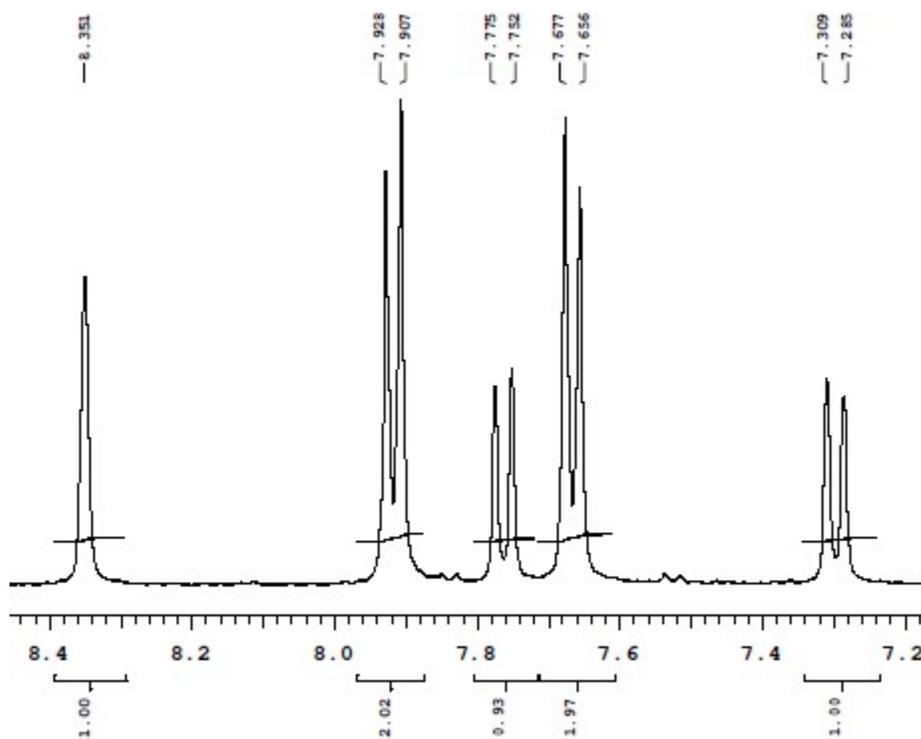
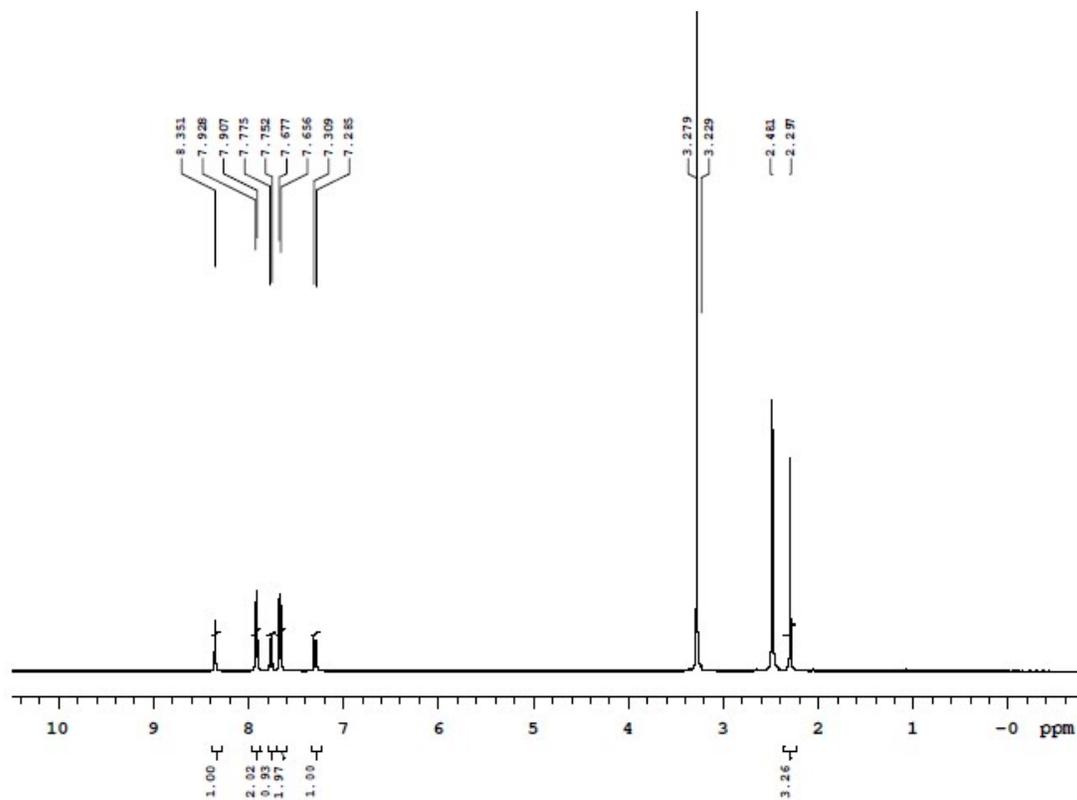
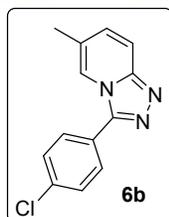


Figure S55. ^1H NMR Spectra & its expansion for compound **6b** in $\text{DMSO-}d_6$

NUCLEUS : C13
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 DATE : Jan 21 2016
 System : VNMR_400

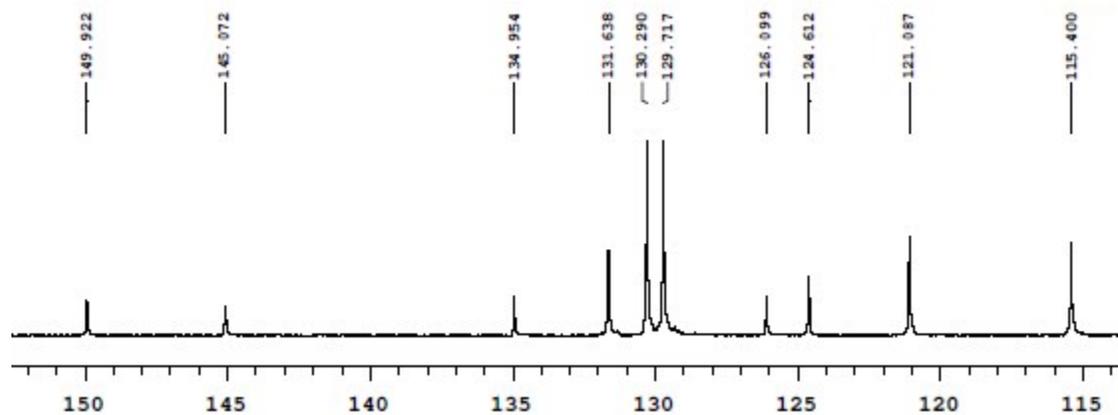
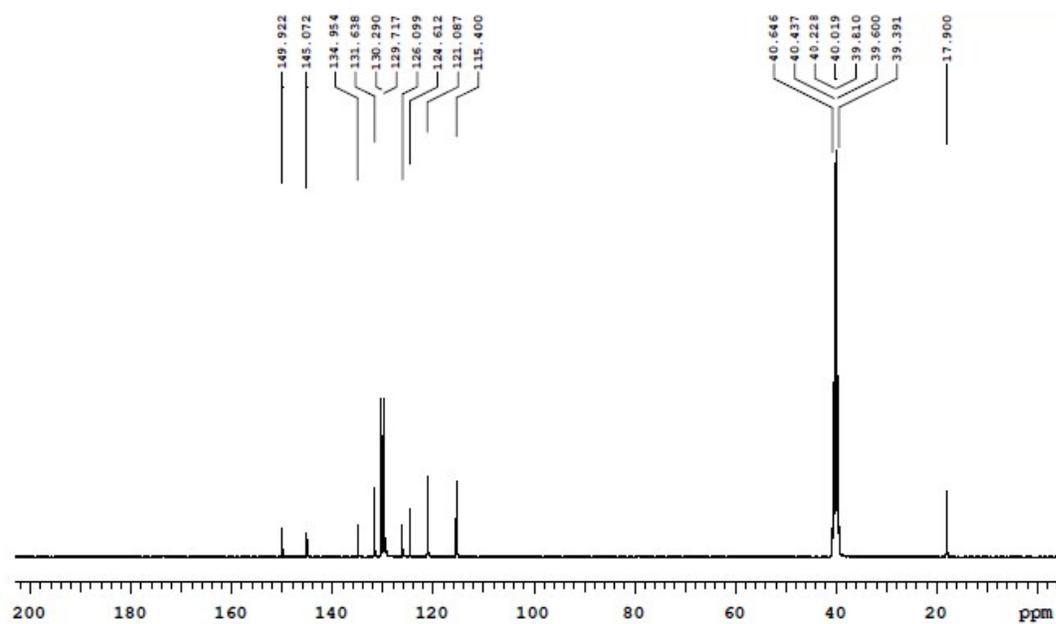
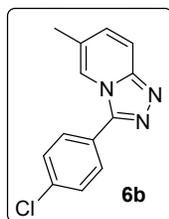


Figure S56. ^{13}C NMR Spectra & its expansion for compound **6b** in $\text{DMSO-}d_6$

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 SW (ppm) : 18.08
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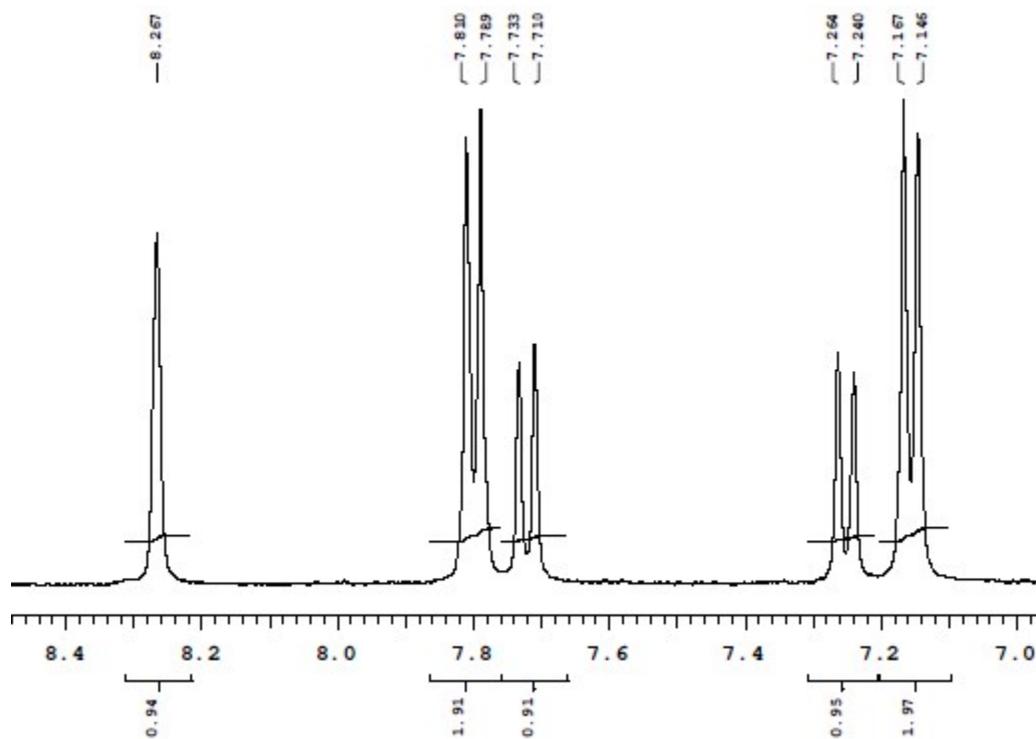
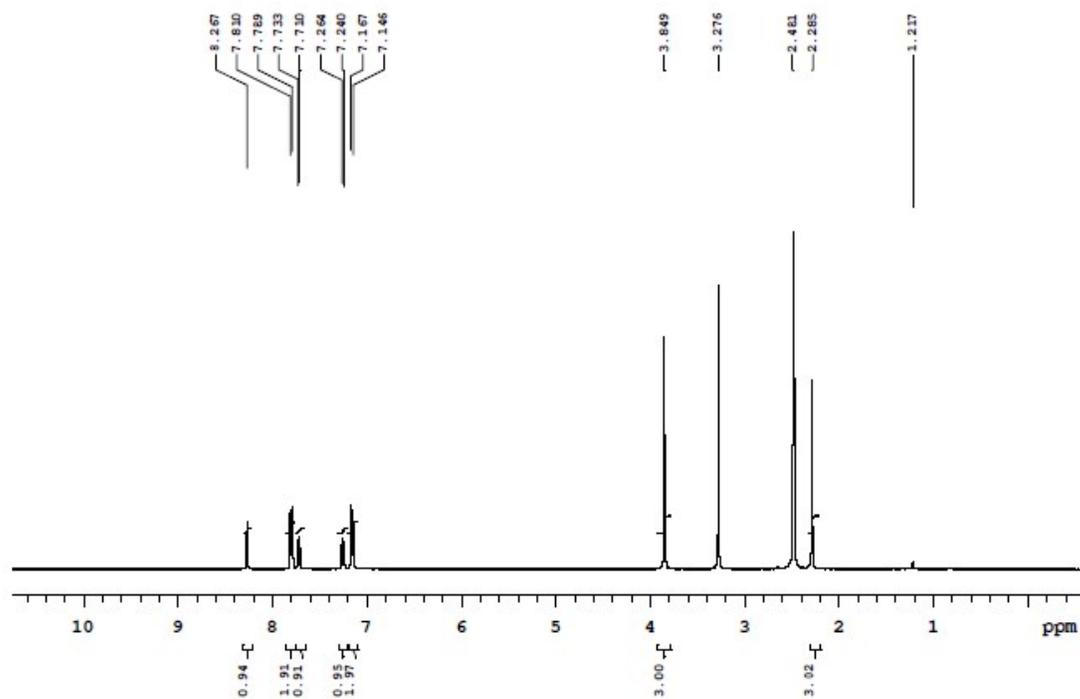
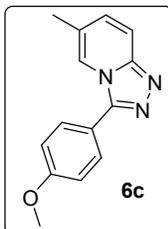


Figure S57. ^1H NMR Spectra & its expansion for compound **6c** in $\text{DMSO-}d_6$

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 RD (sec) : 1.00
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 DATE : Jan 23 2016
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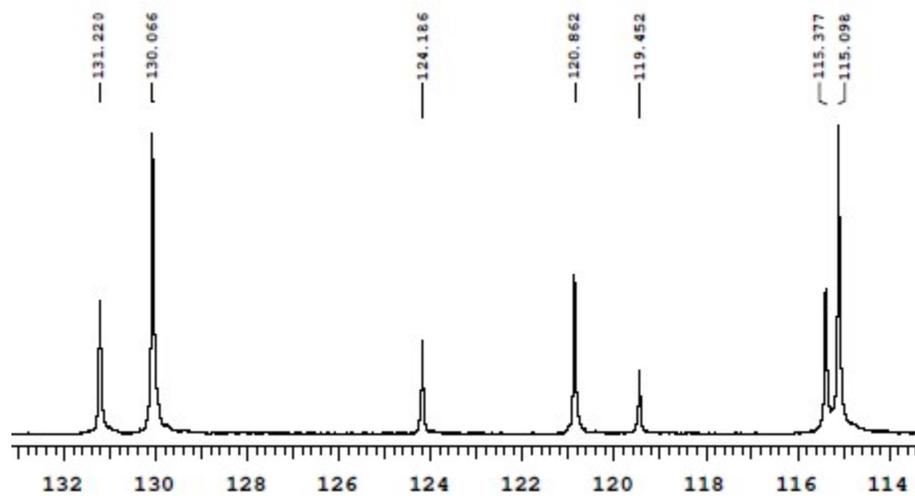
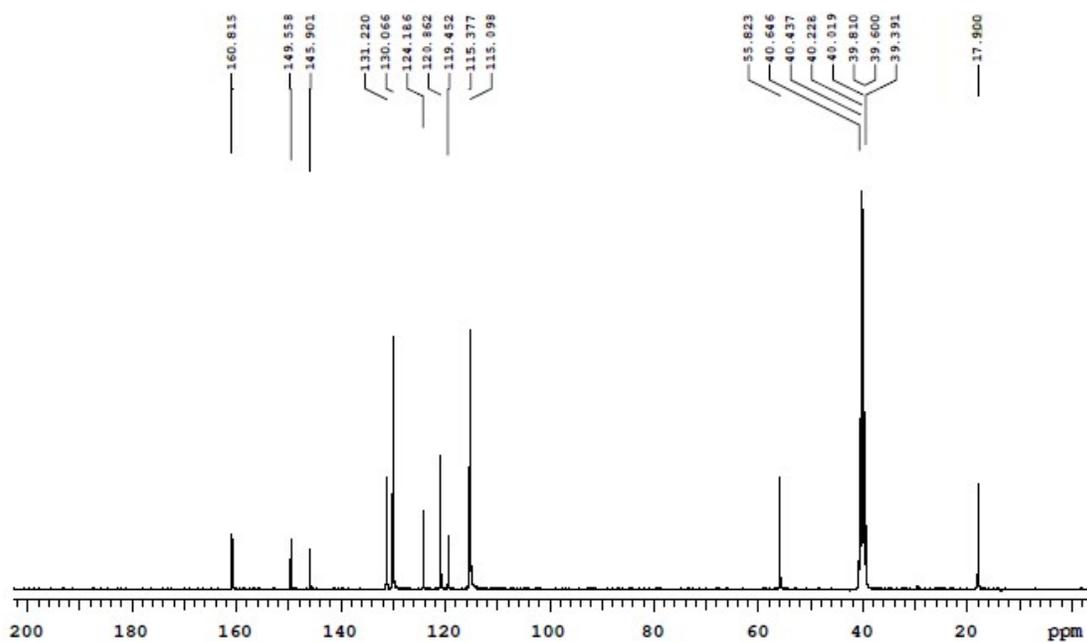
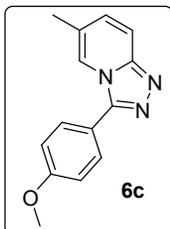


Figure S58. ^{13}C NMR Spectra & its expansion for compound **6c** in $\text{DMSO-}d_6$

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 SW (ppm) : 18.08
 RD (sec) : 1.00
 FWH (usec) : 6.60
 Scans : 64
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 DATE : Jan 20 2016
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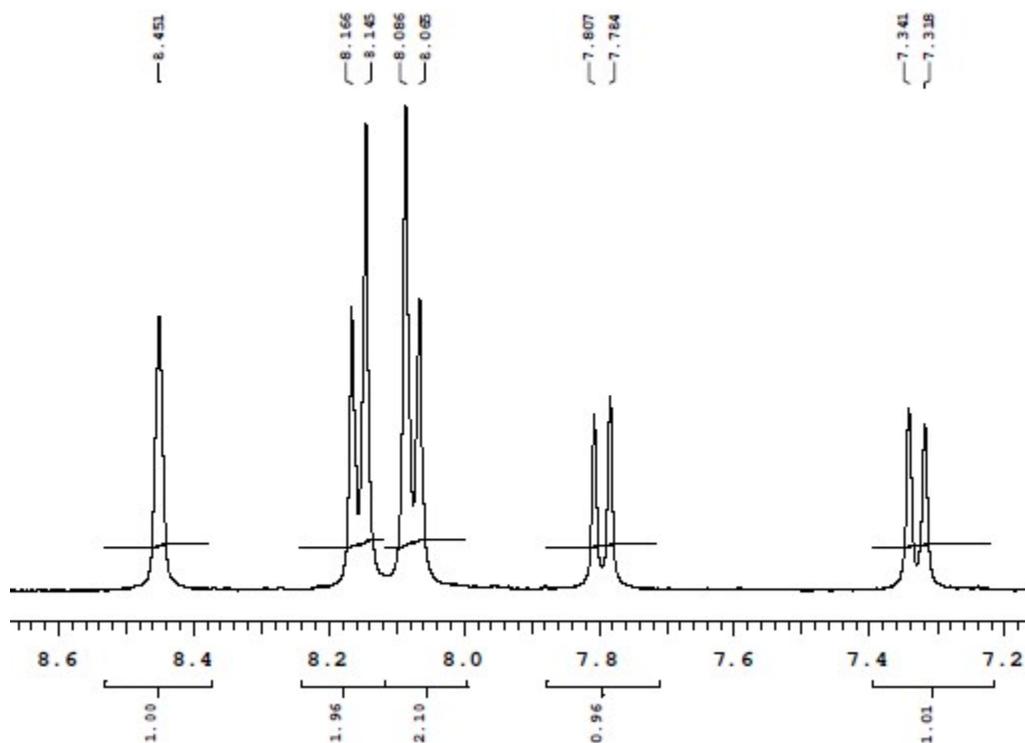
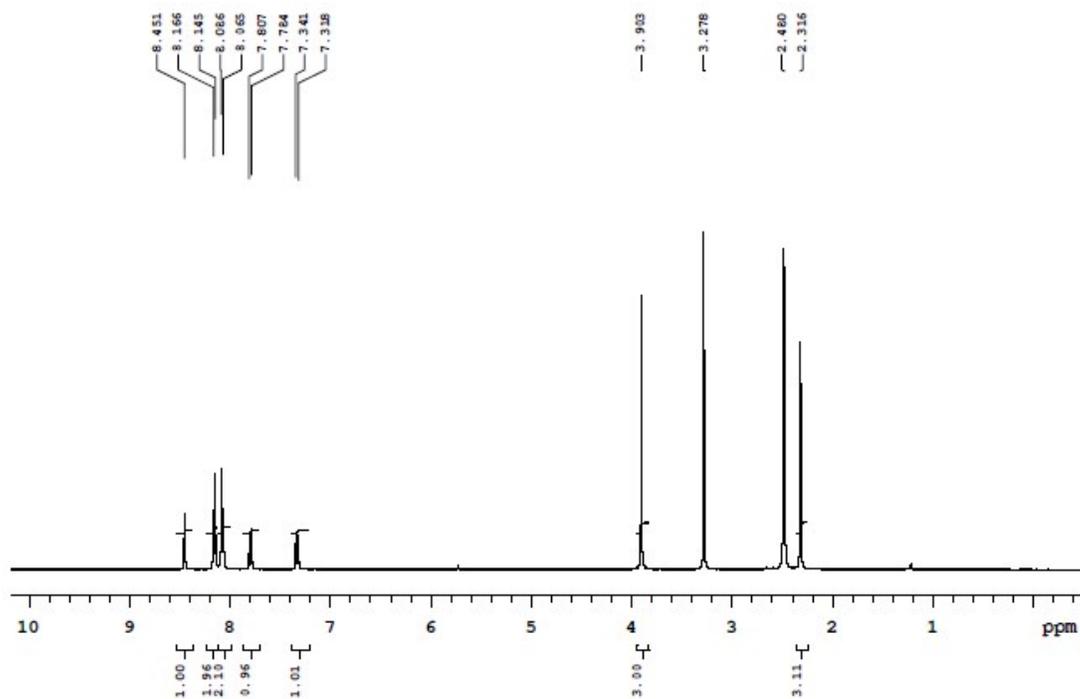
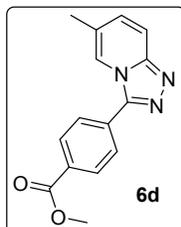


Figure S59. ^1H NMR Spectra & its expansion for compound **6d** in $\text{DMSO-}d_6$

NUCLEUS : C13
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 DW (usec) : 5.05
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 TEMP (K) : 303.15
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 DATE : Jan 21 2016
 System : VNMR5_400

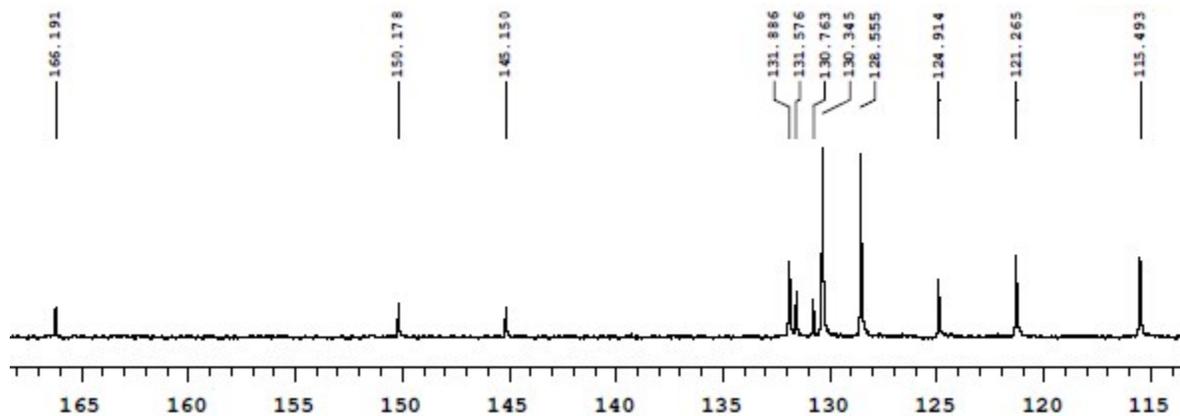
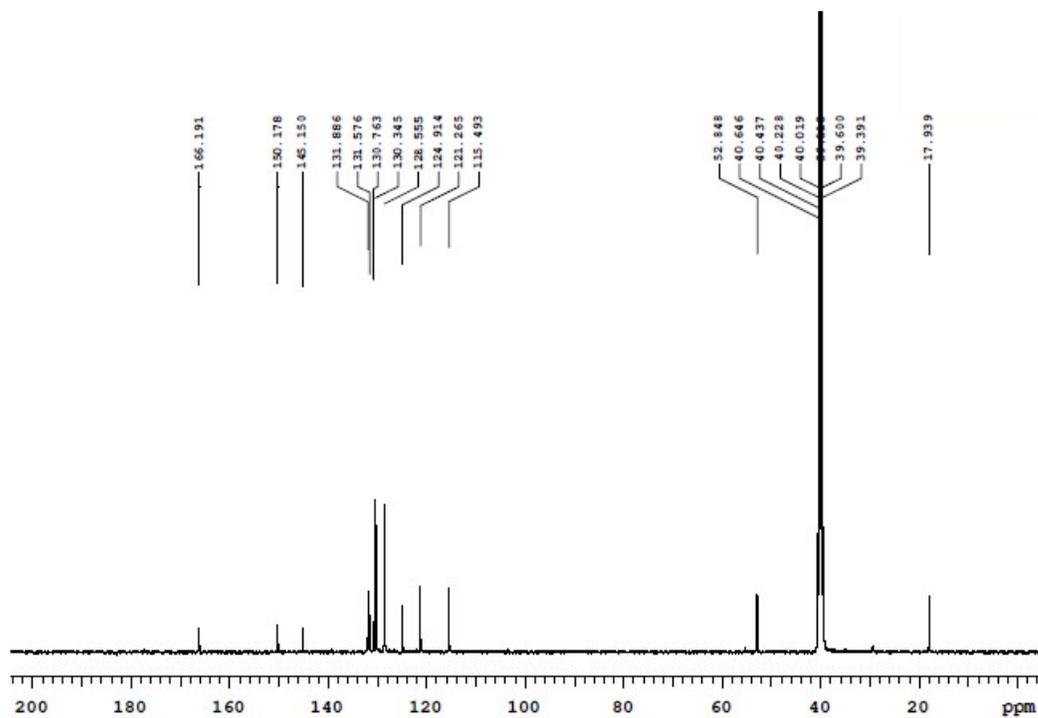
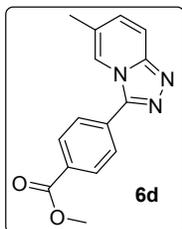


Figure S60. ^{13}C NMR Spectra & its expansion for compound **6d** in $\text{DMSO-}d_6$

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 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.60
 Scans : 64
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 LB (Hz) : 1.00
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 EXP : s2pul
 DATE : Feb 10 2016
 System : VNMRS_400

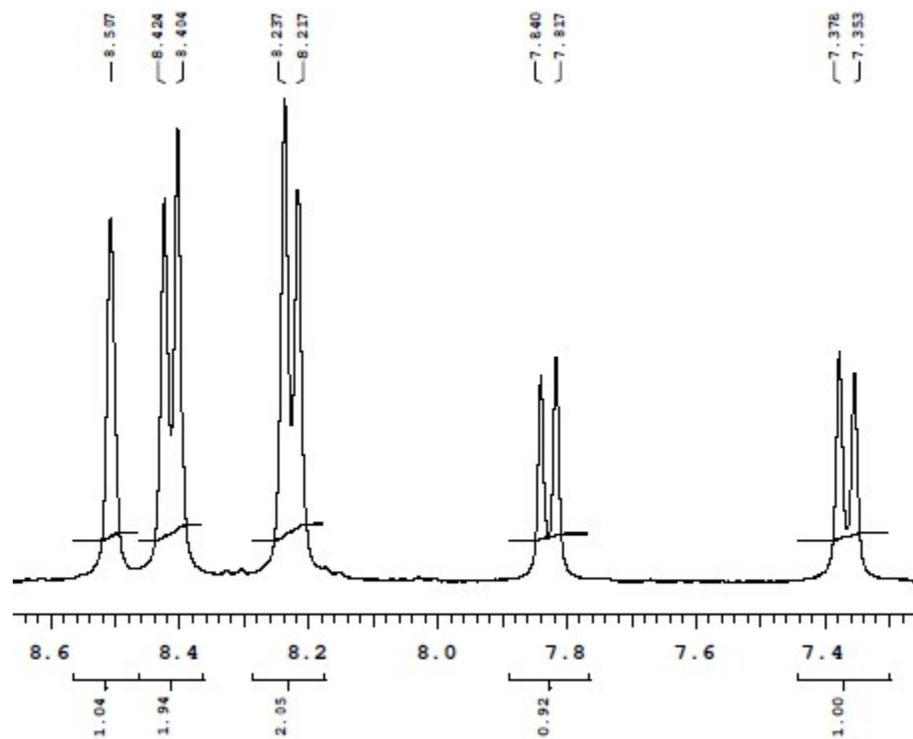
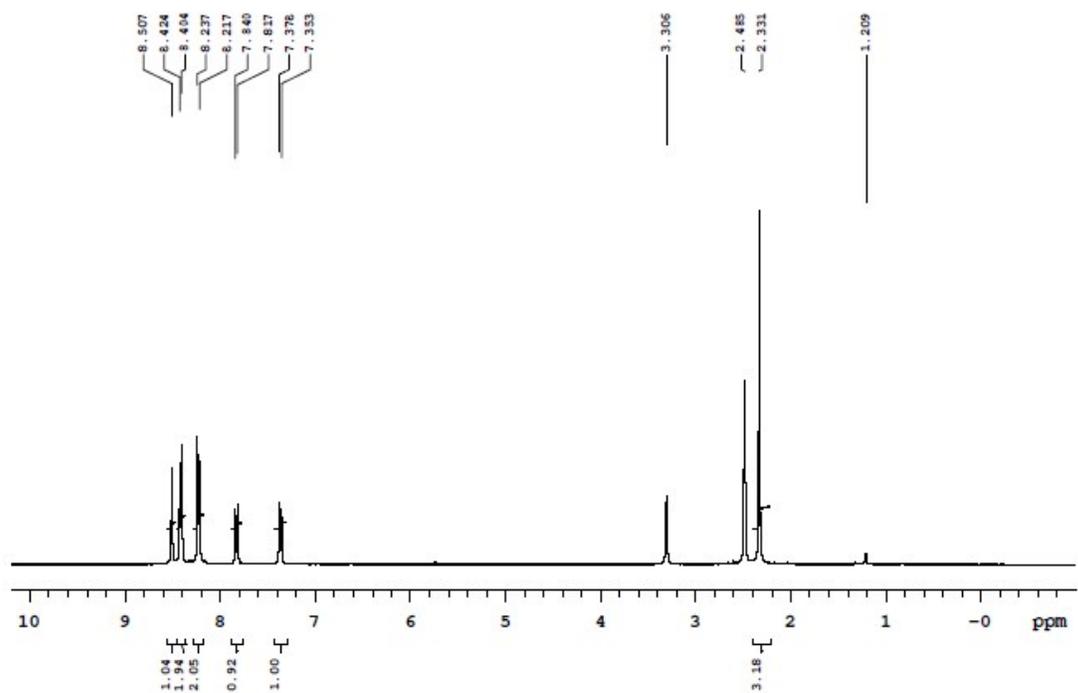
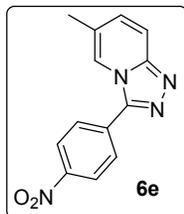


Figure S61. ^1H NMR Spectra & its expansion for compound **6e** in $\text{DMSO-}d_6$

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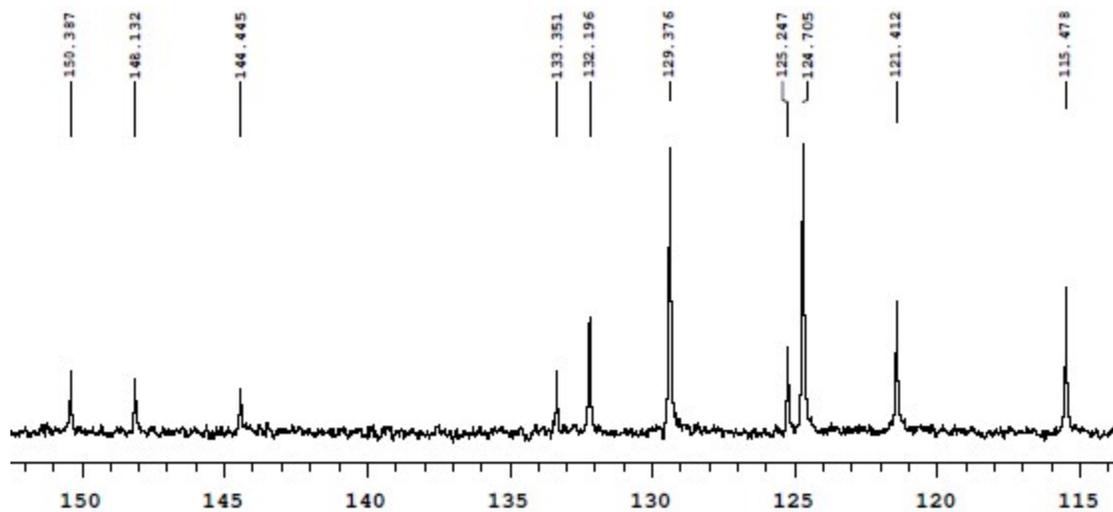
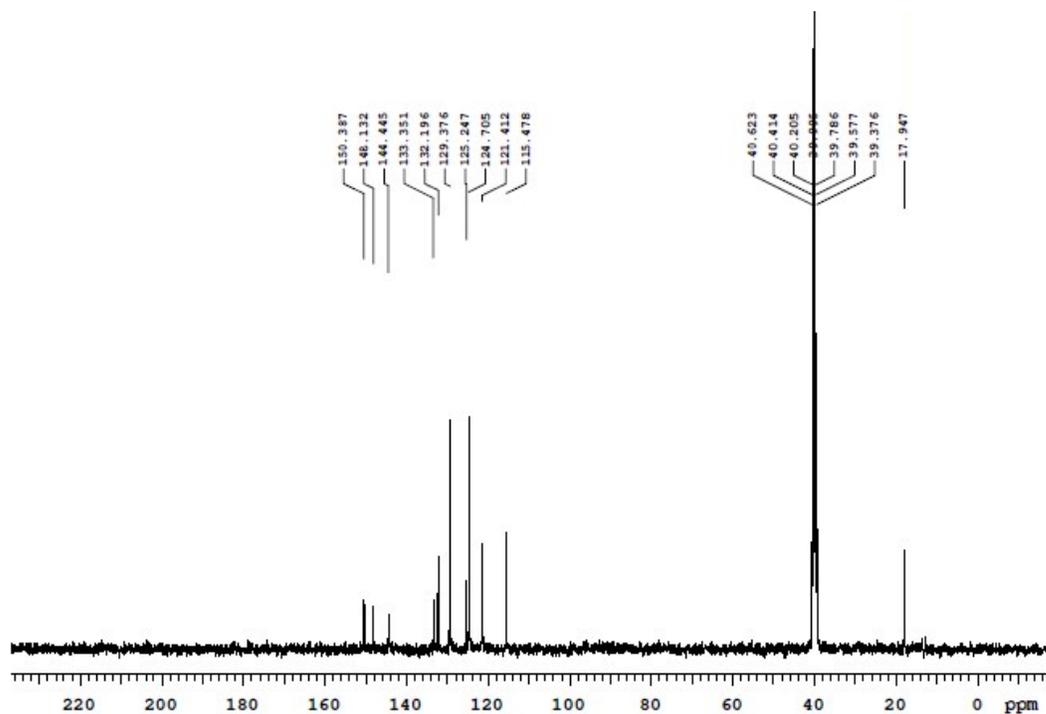
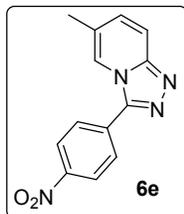


Figure S62. ^{13}C NMR Spectra & its expansion for compound **6e** in $\text{DMSO-}d_6$

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 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FWH (usec) : 6.60
 Scans : 64
 Solvent : dms0
 Data Points : 32768
 LS (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pu1
 DATE : Feb 9 2016
 System : VNMRB_400

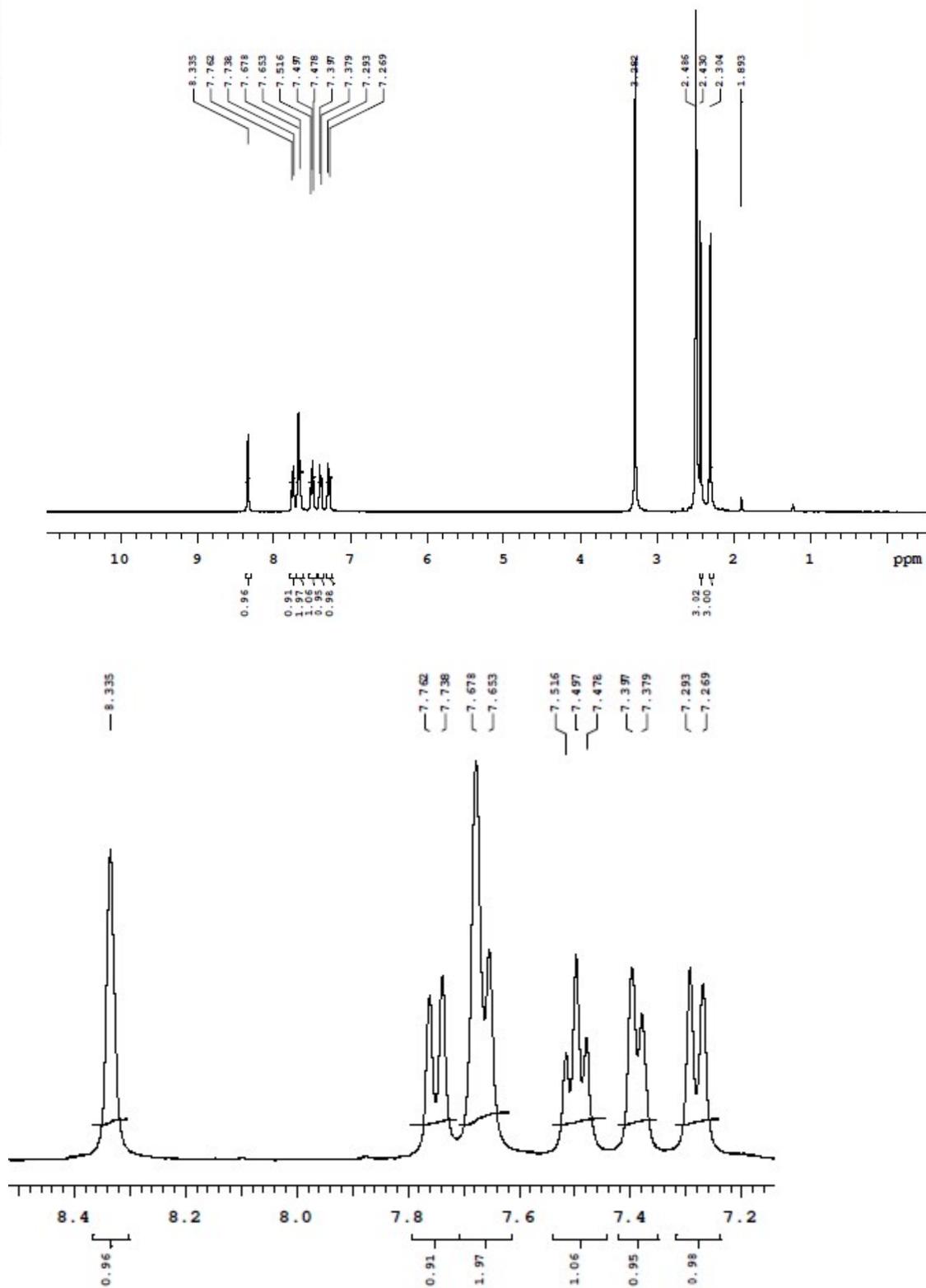
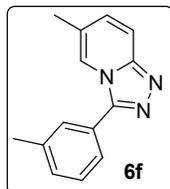


Figure S63. ^1H NMR Spectra & its expansion for compound **6f** in $\text{DMSO-}d_6$

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 SW (ppm) : 253.84
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 FWH (usec) : 5.05
 Scans : 1000
 Solvent : dms0
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
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 DATE : Feb 10 2016
 System : VNMR5_400

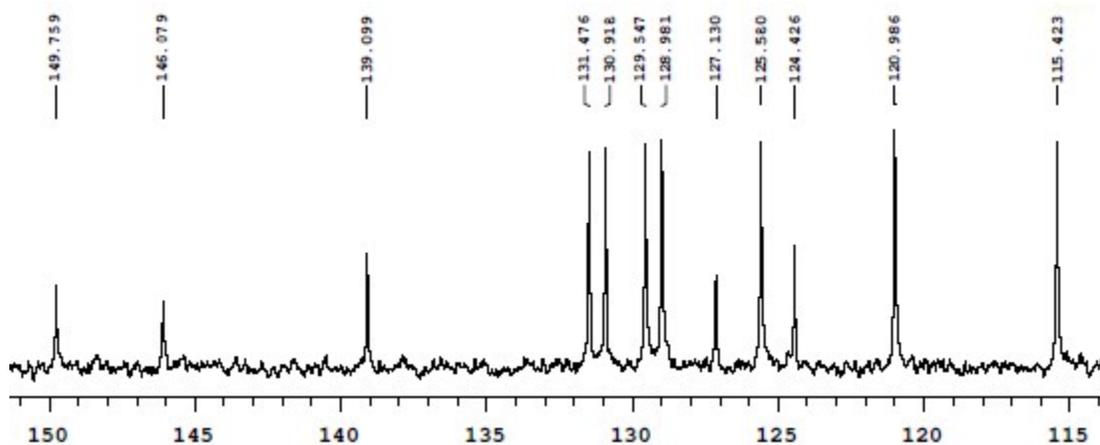
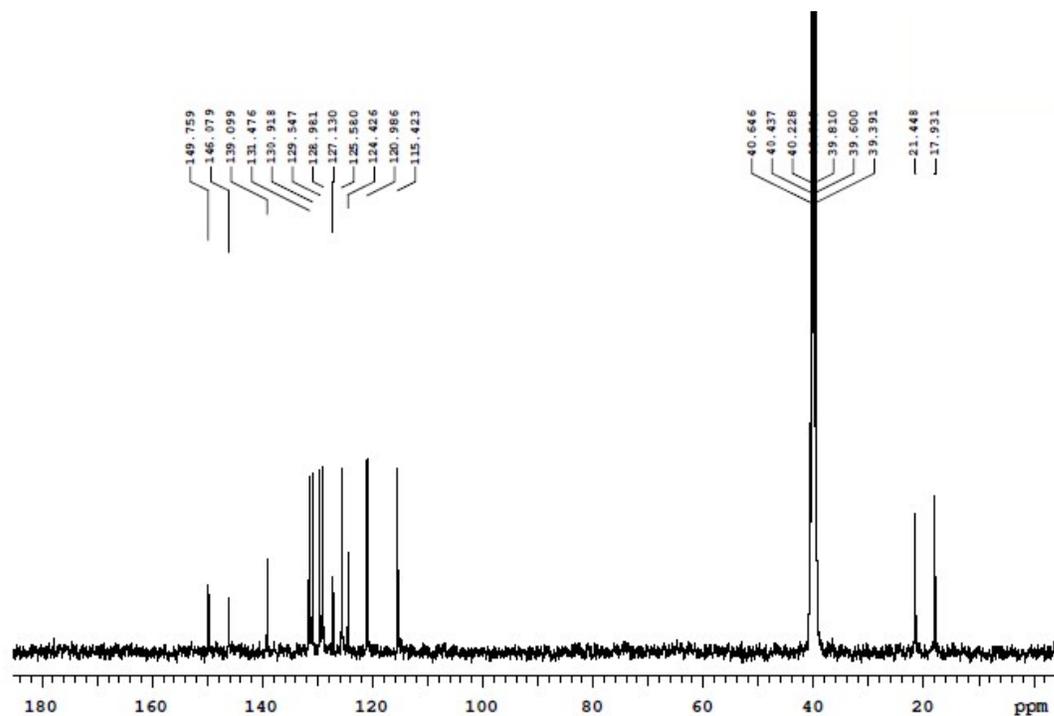
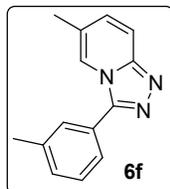


Figure S64. ^{13}C NMR Spectra & its expansion for compound **6f** in $\text{DMSO-}d_6$

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 SW (ppm) : 18.08
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 DW (usec) : 6.60
 Scans : 64
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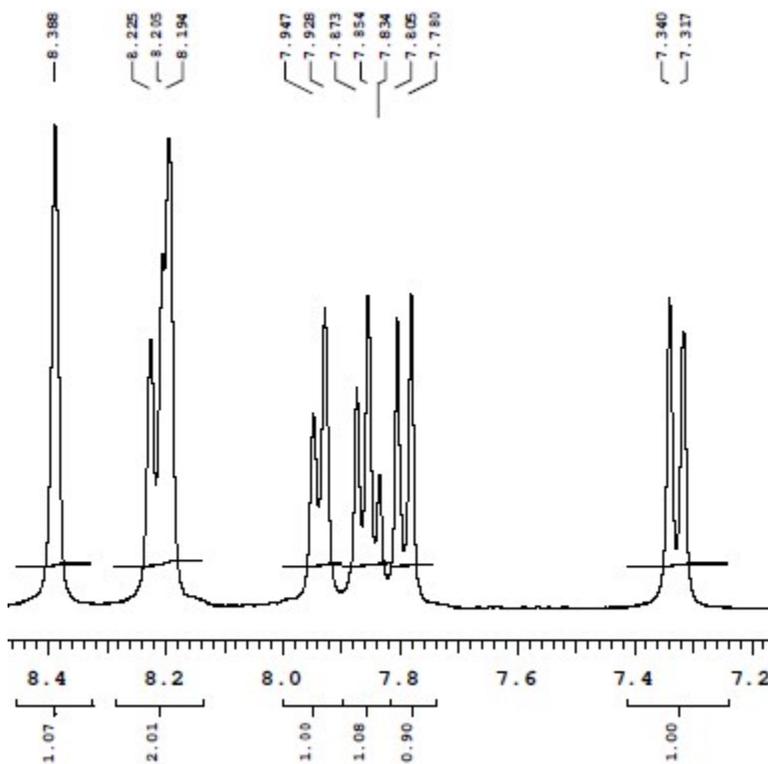
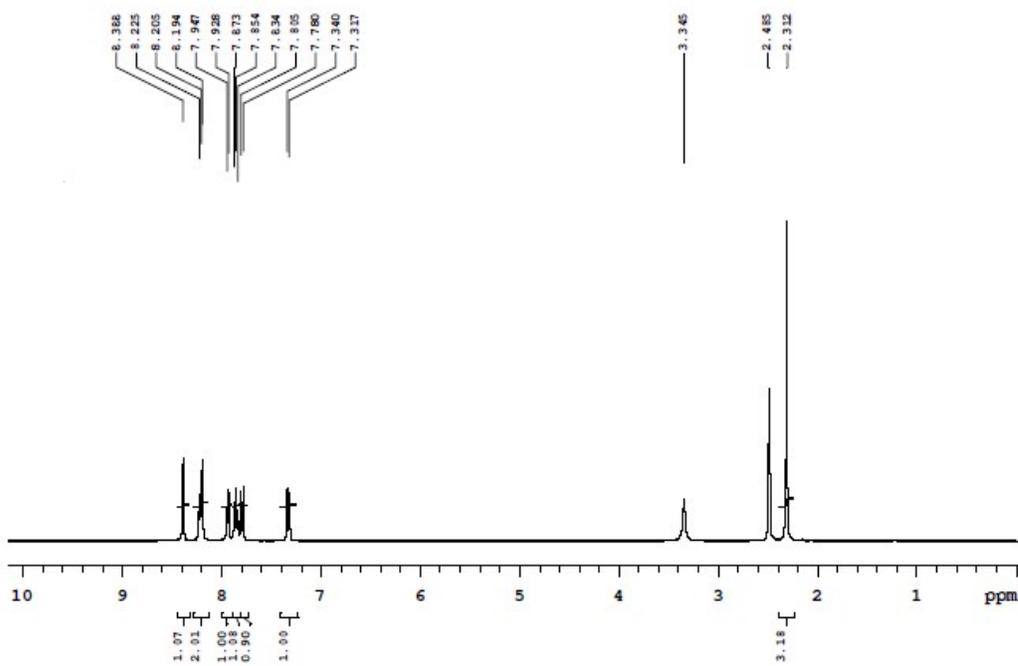
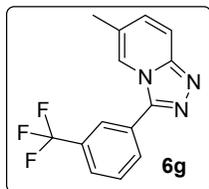


Figure S65. ^1H NMR Spectra & its expansion for compound **6g** in $\text{DMSO-}d_6$

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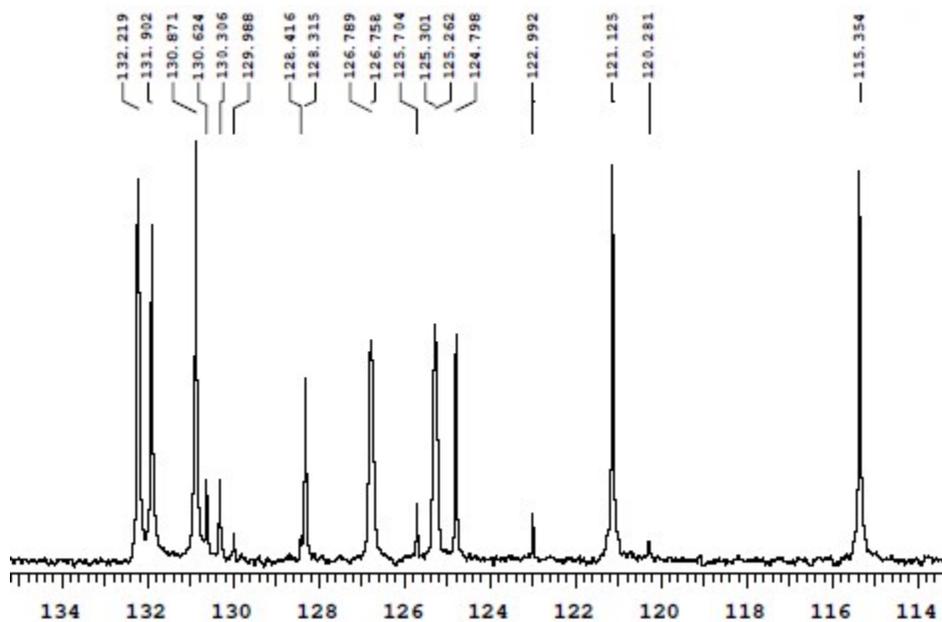
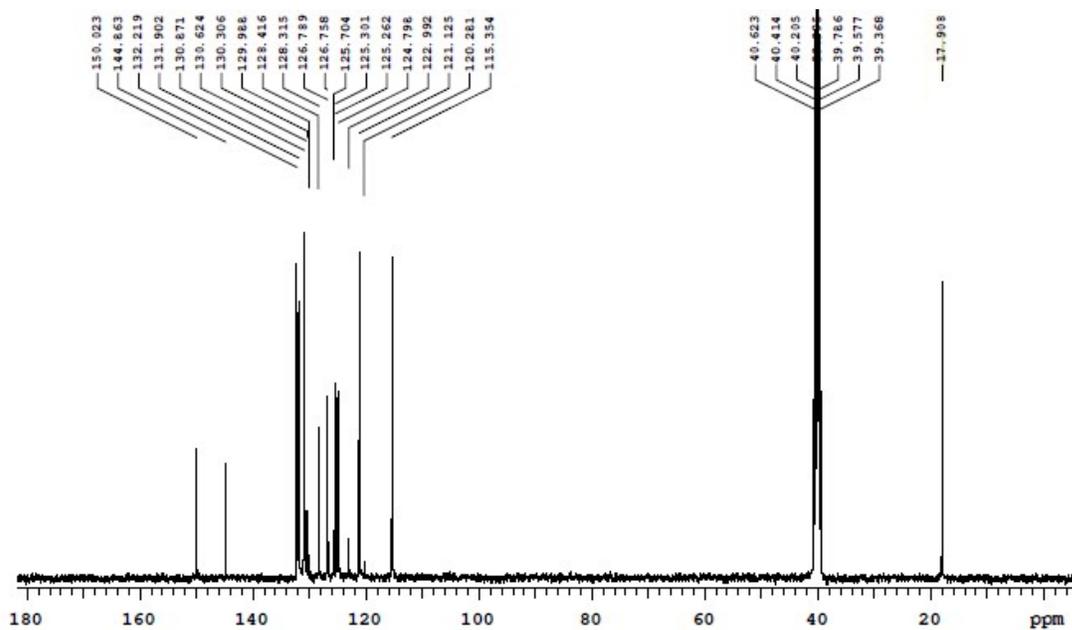
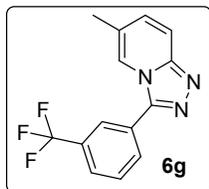


Figure S66. ^{13}C NMR Spectra & its expansion for compound **6g** in $\text{DMSO-}d_6$

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 SW (ppm) : 18.08
 RD (sec) : 1.00
 FWH (usec) : 6.60
 Scans : 64
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 Data Points : 32768
 LB (Hz) : 1.00
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 DATE : Feb 10 2016
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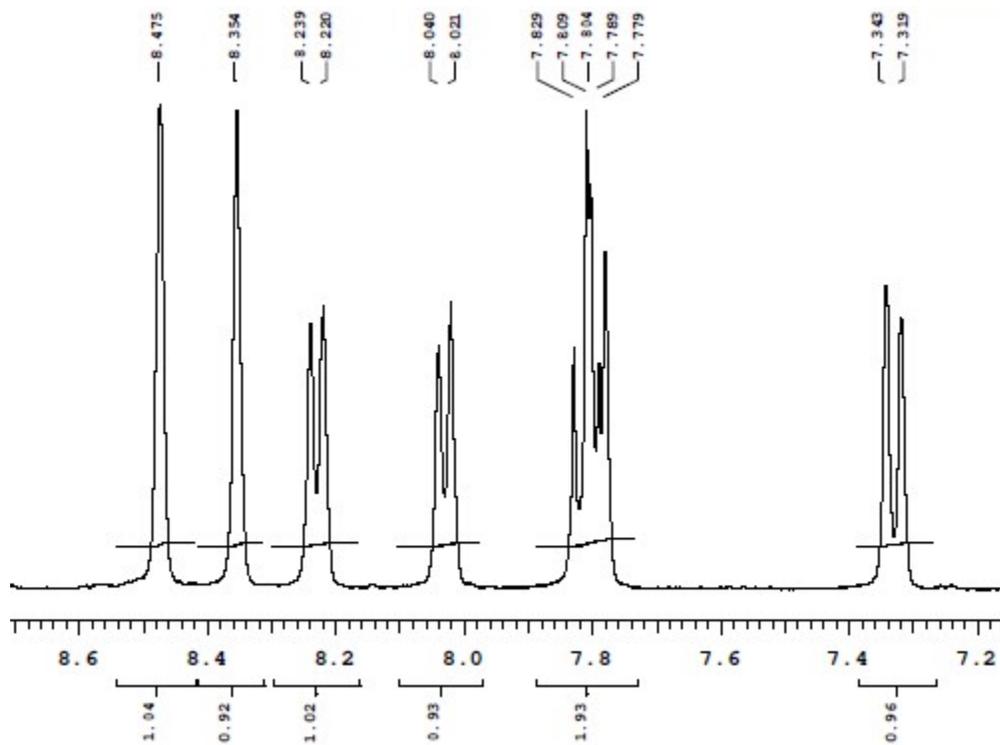
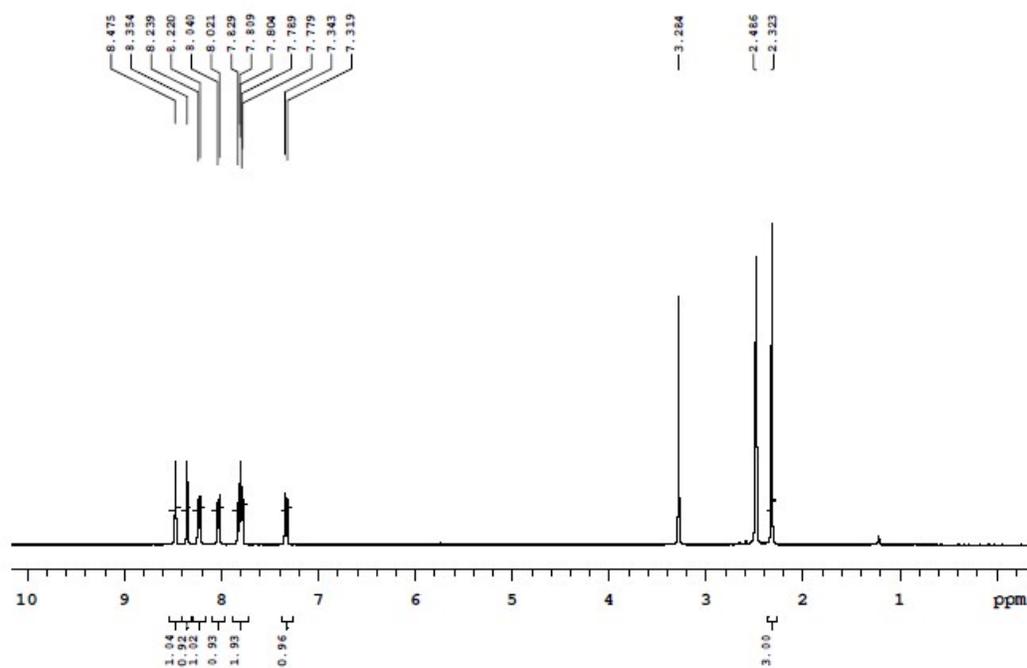
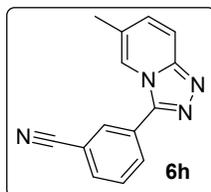


Figure S67. ^1H NMR Spectra & its expansion for compound **6h** in $\text{DMSO-}d_6$

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 SW (ppm) : 253.84
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 PW (usec) : 5.05
 Scans : 1000
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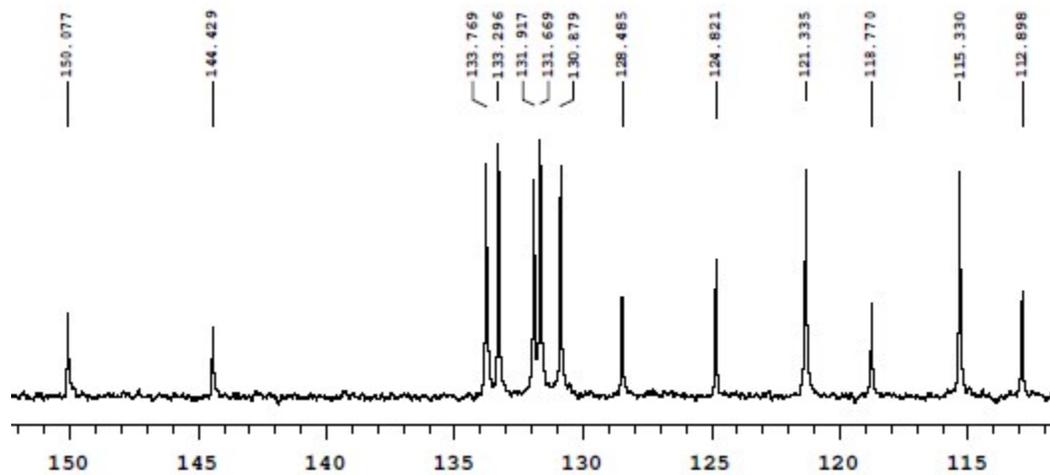
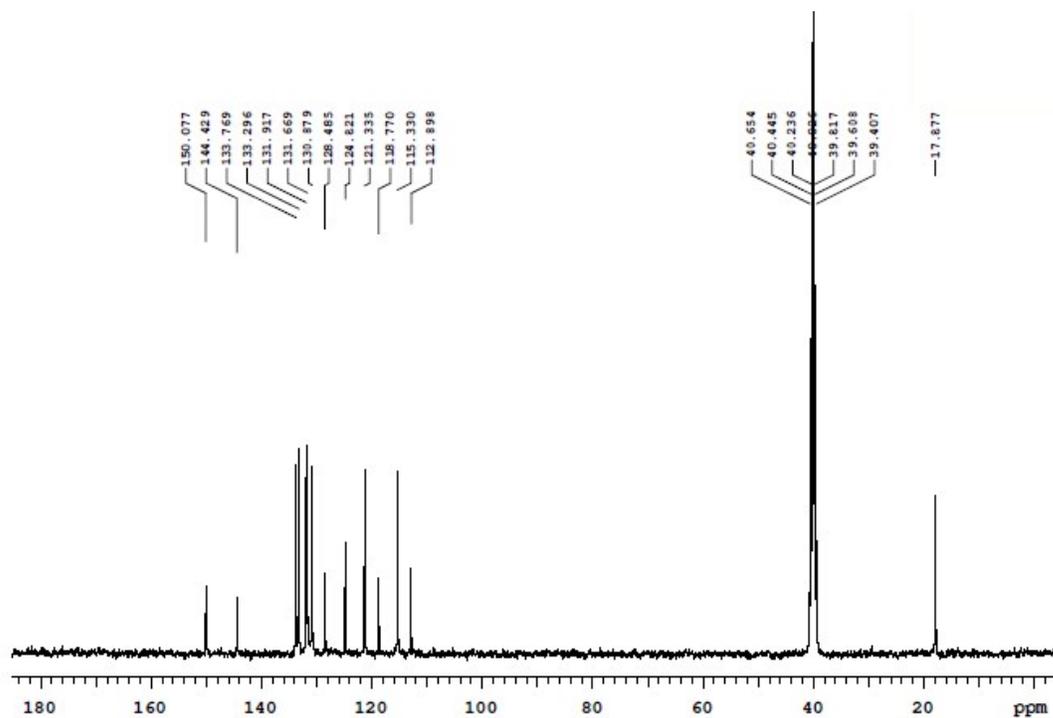
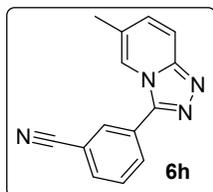


Figure S68. ^{13}C NMR Spectra & its expansion for compound **6h** in $\text{DMSO-}d_6$

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 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.60
 Scans : 64
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 9 2016
 System : VNMR5_400

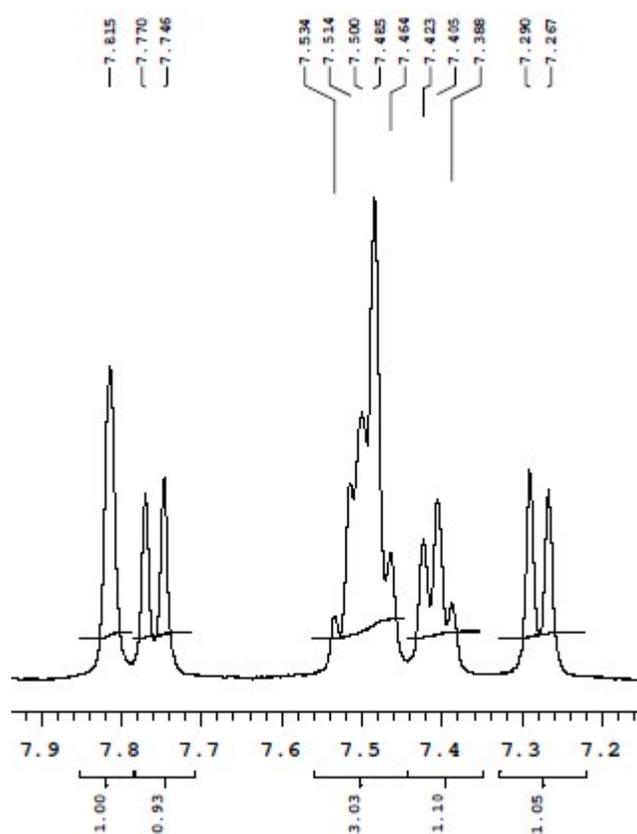
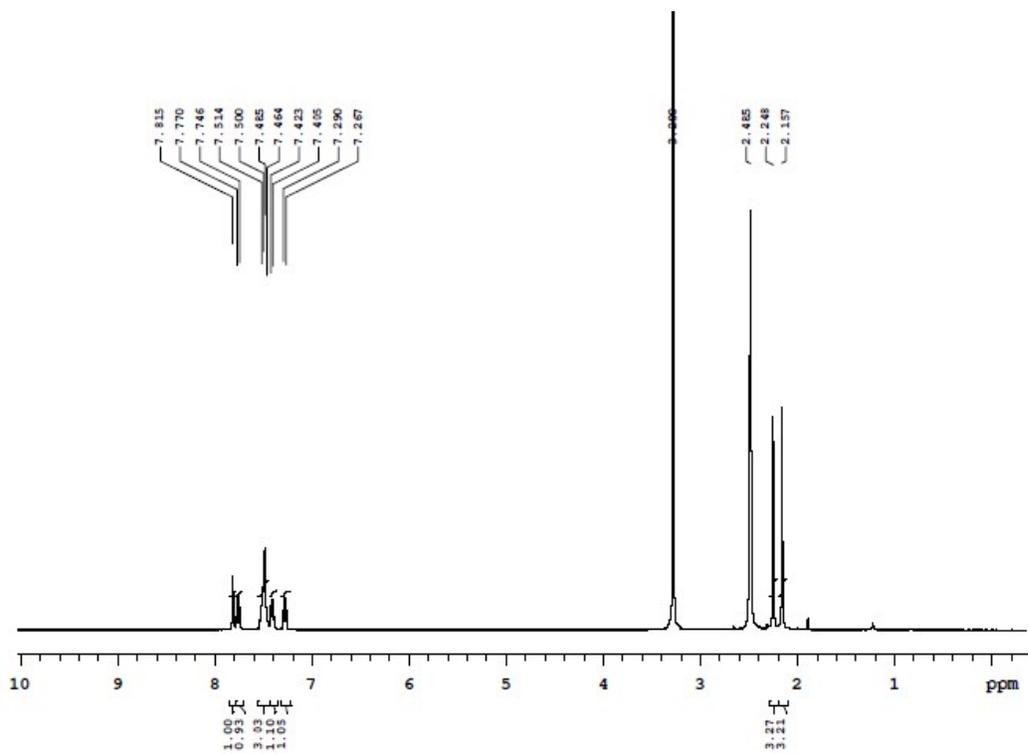
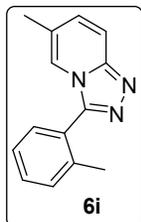


Figure S69. ^1H NMR Spectra & its expansion for compound **6i** in $\text{DMSO-}d_6$

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 FRQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 FWH (usec) : 5.05
 Scans : 1000
 Solvent : dmsc
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 10 2016
 System : VNMR5_400

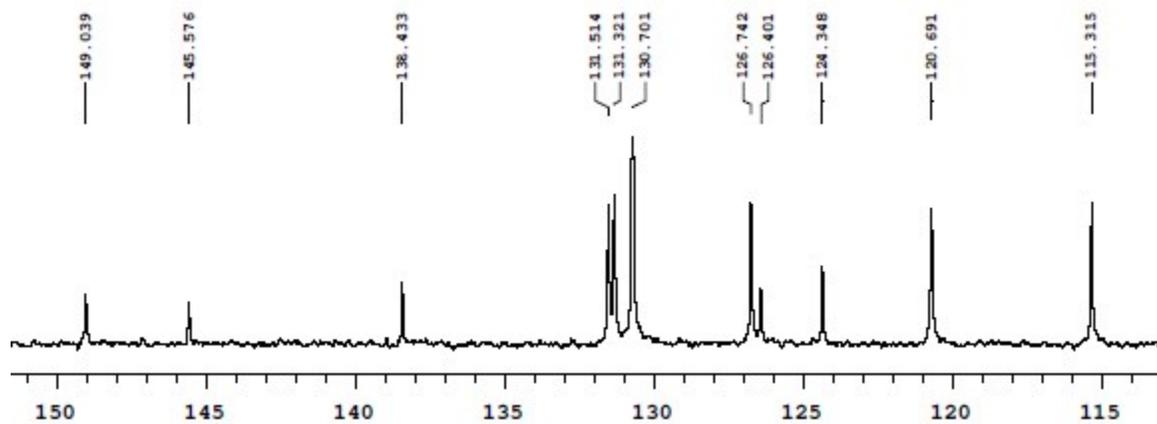
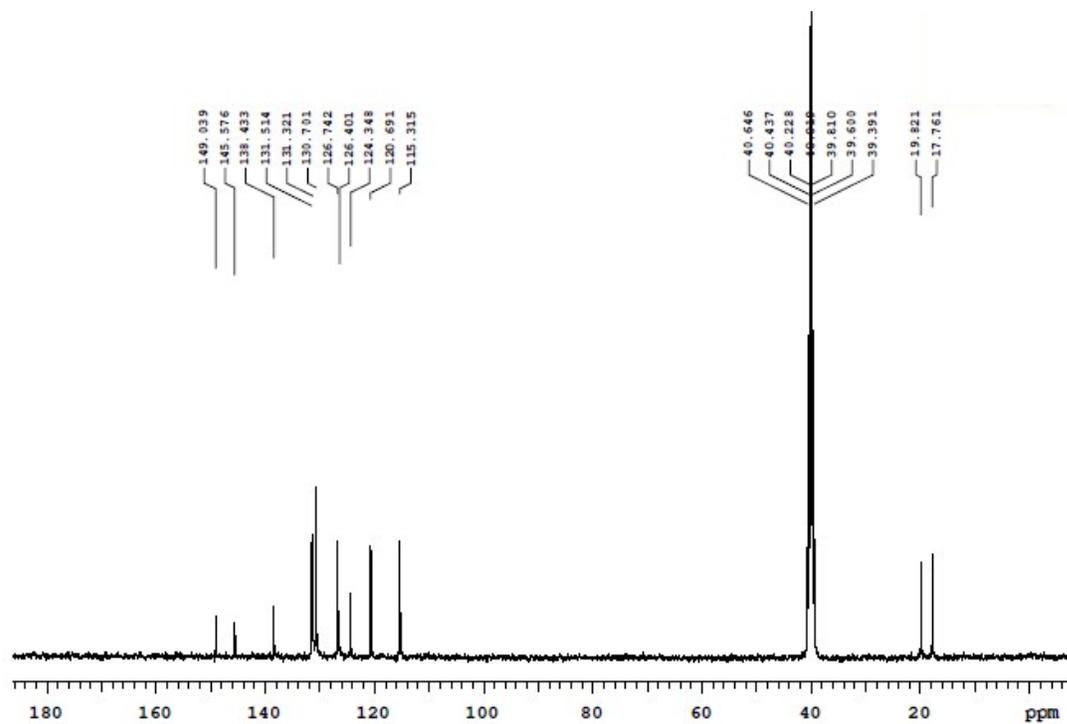
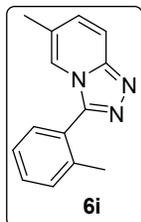


Figure S70. ^{13}C NMR Spectra & its expansion for compound **6i** in $\text{DMSO-}d_6$

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 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.60
 Scans : 64
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 9 2016
 System : VNMR5_400

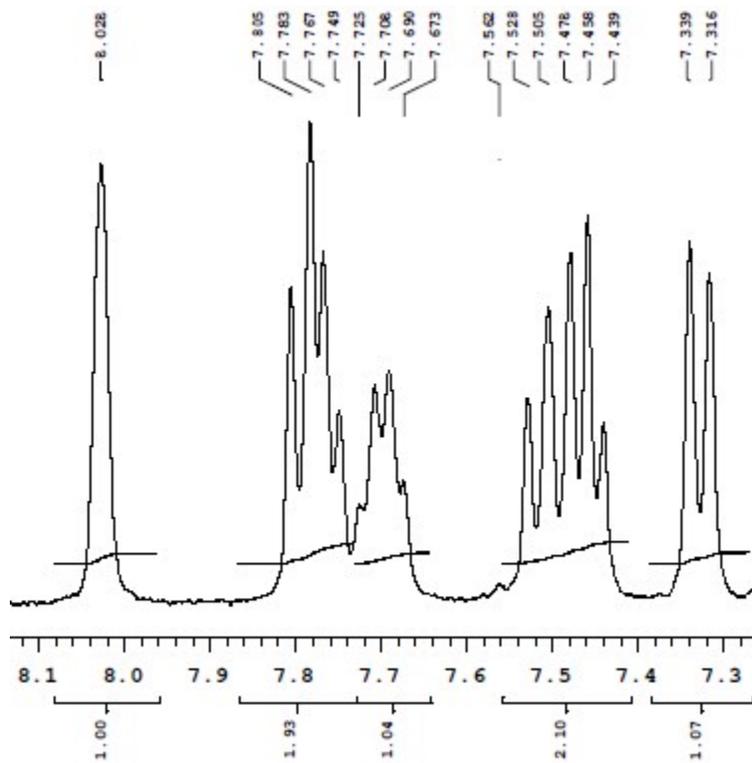
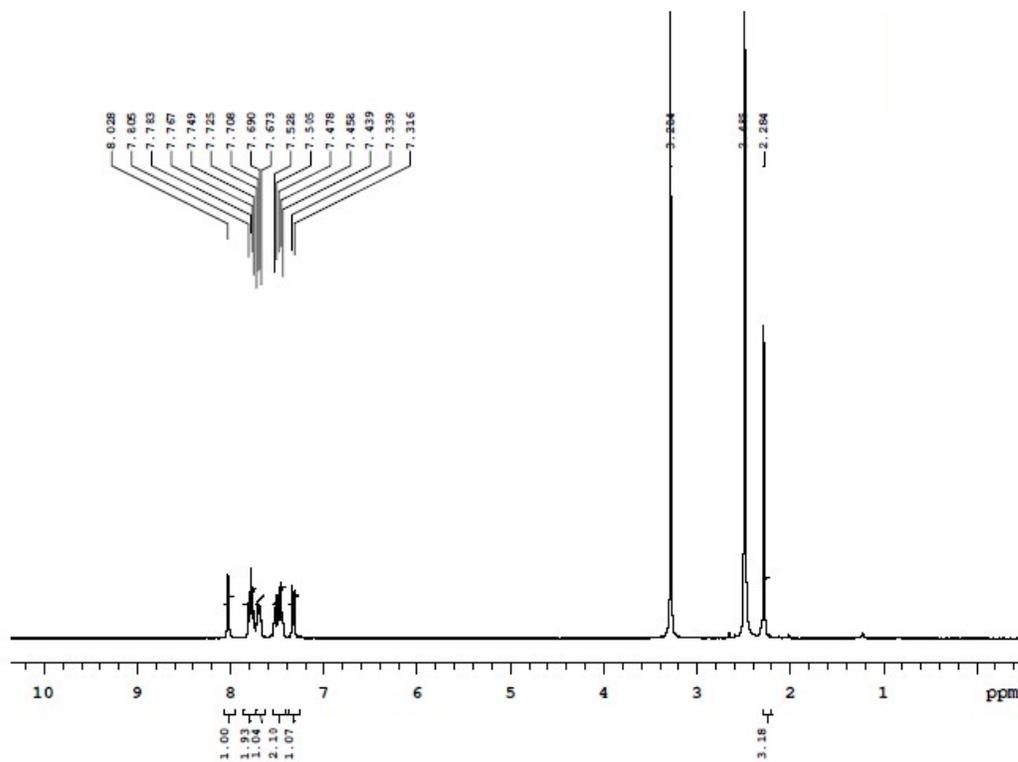
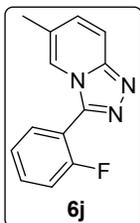


Figure S71. ^1H NMR Spectra & its expansion for compound **6j** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 PW (usec) : 5.05
 Scans : 1000
 Solvent : dms0
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : s2p01
 DATE : Feb 11 2016
 System : VNMRS_400

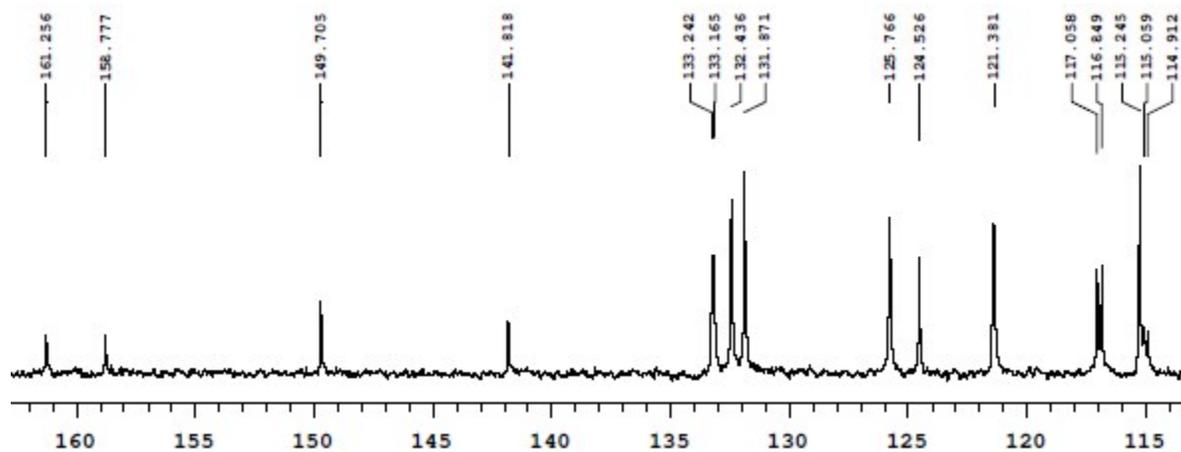
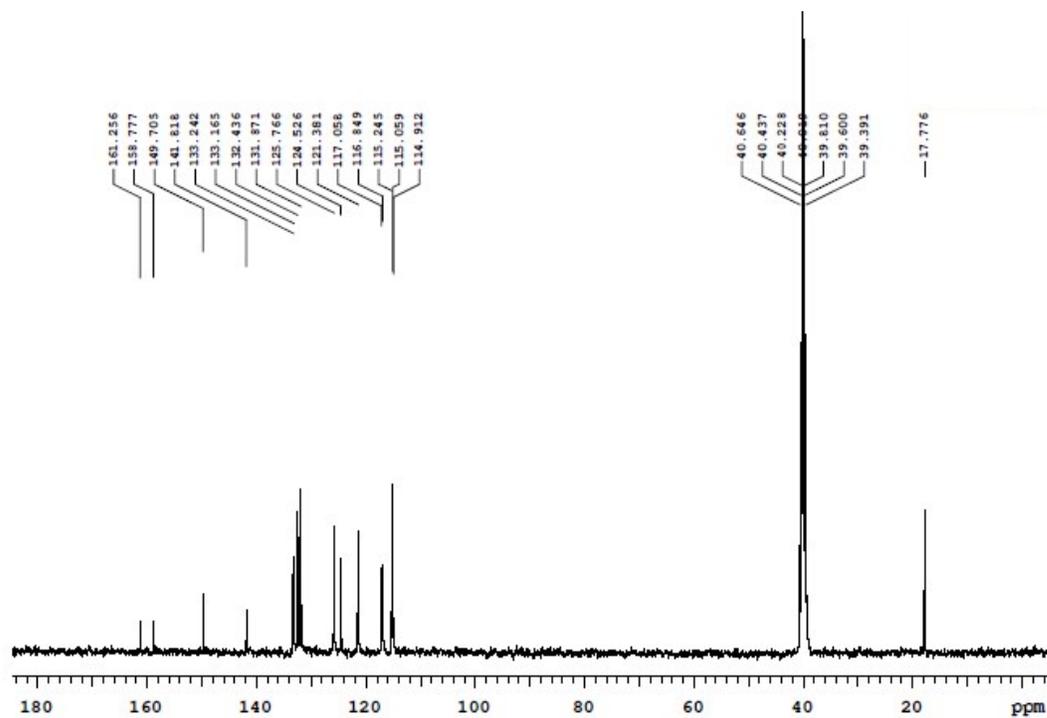
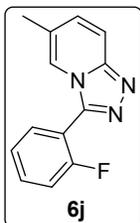


Figure S72. ^{13}C NMR Spectra & its expansion for compound **6j** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.40
 Scans : 32
 Solvent : dmsc
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : sfpul
 DATE : Feb 3 2016
 System : VNMR5_400

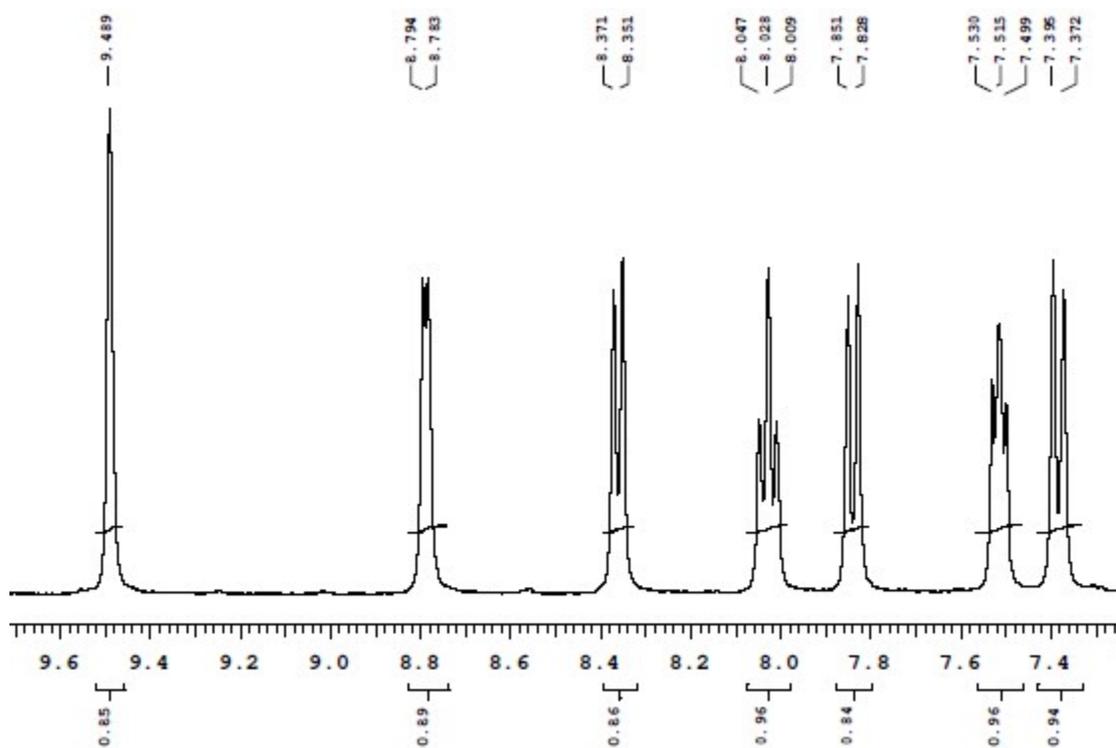
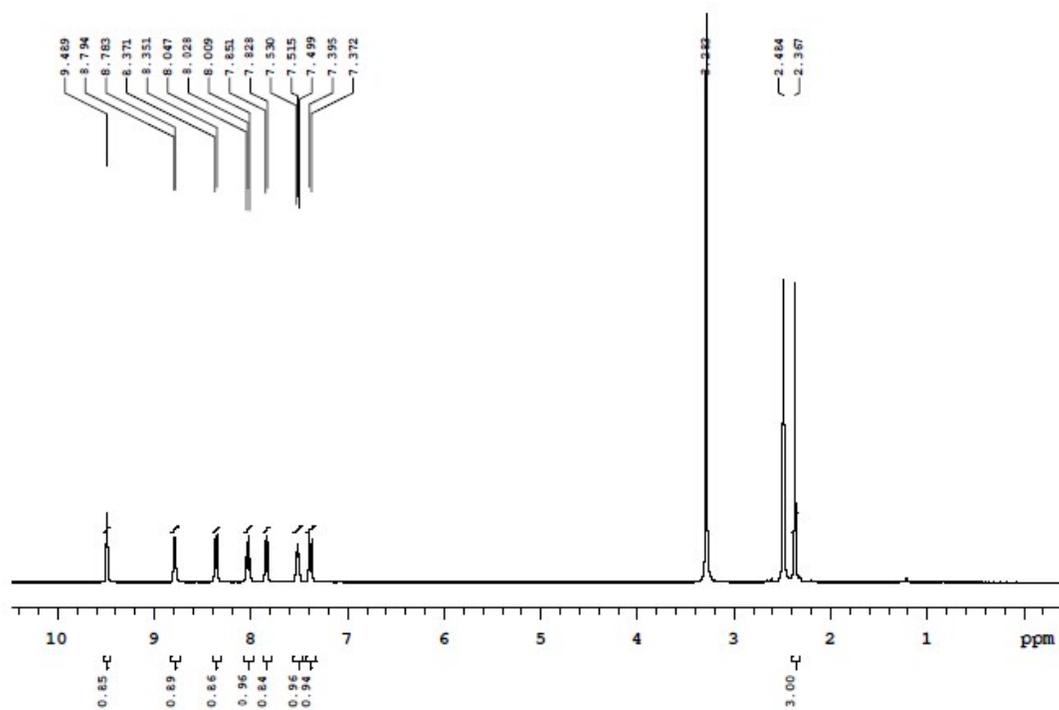
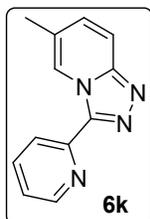


Figure S73. ^1H NMR Spectra & its expansion for compound **6k** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FRQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 PW (usec) : 5.05
 Scans : 1000
 Solvent : DMSO
 Data Points : 65536
 LB (Hz) : 4.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 9 2016
 System : VNMR_400

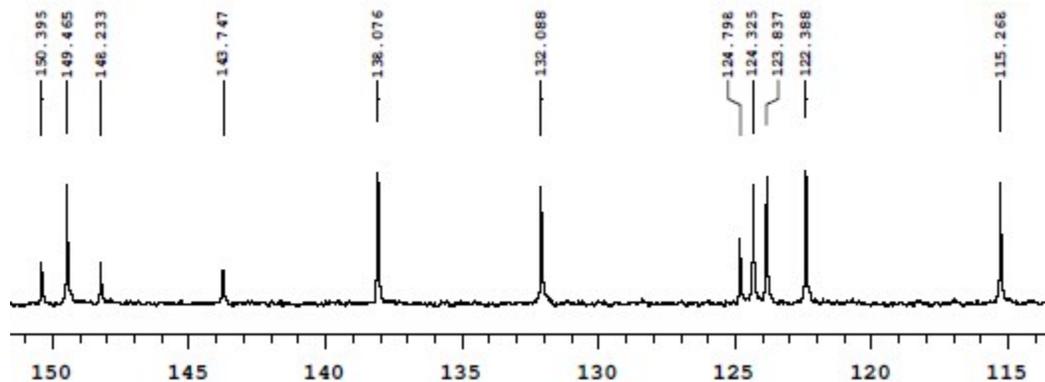
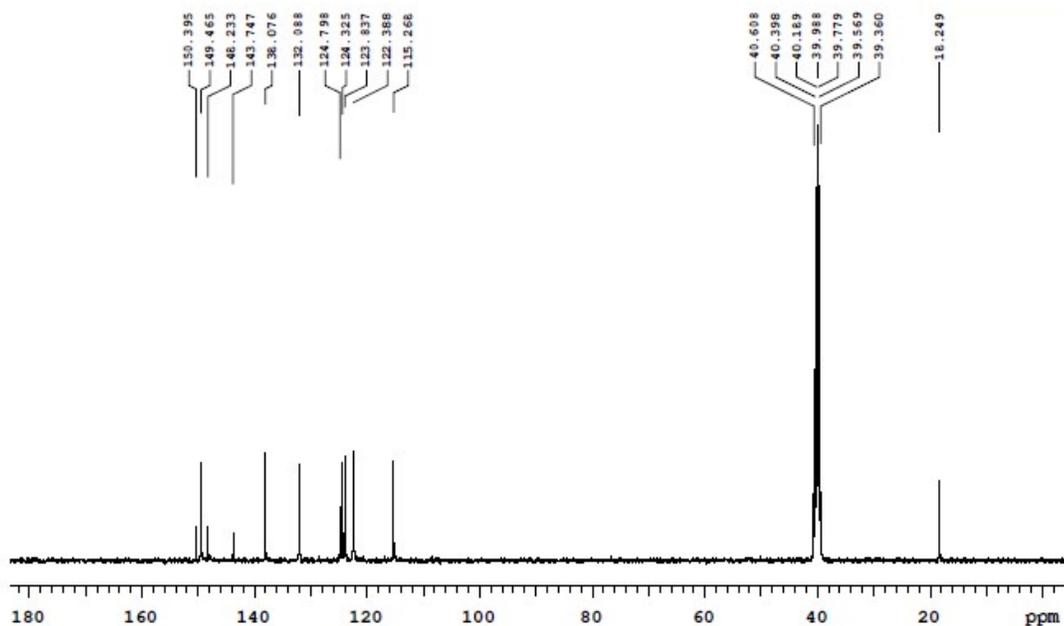
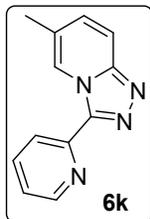


Figure S74. ^{13}C NMR Spectra & its expansion for compound **6k** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.40
 Scans : 32
 Solvent : dmsc
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 3 2016
 System : VNM6S_400

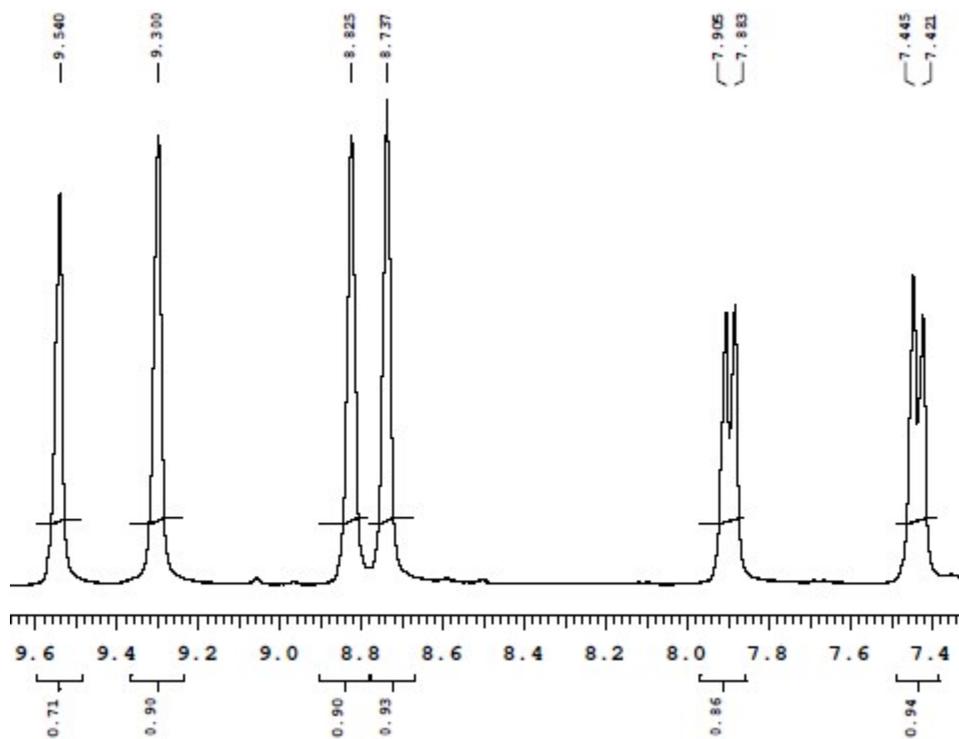
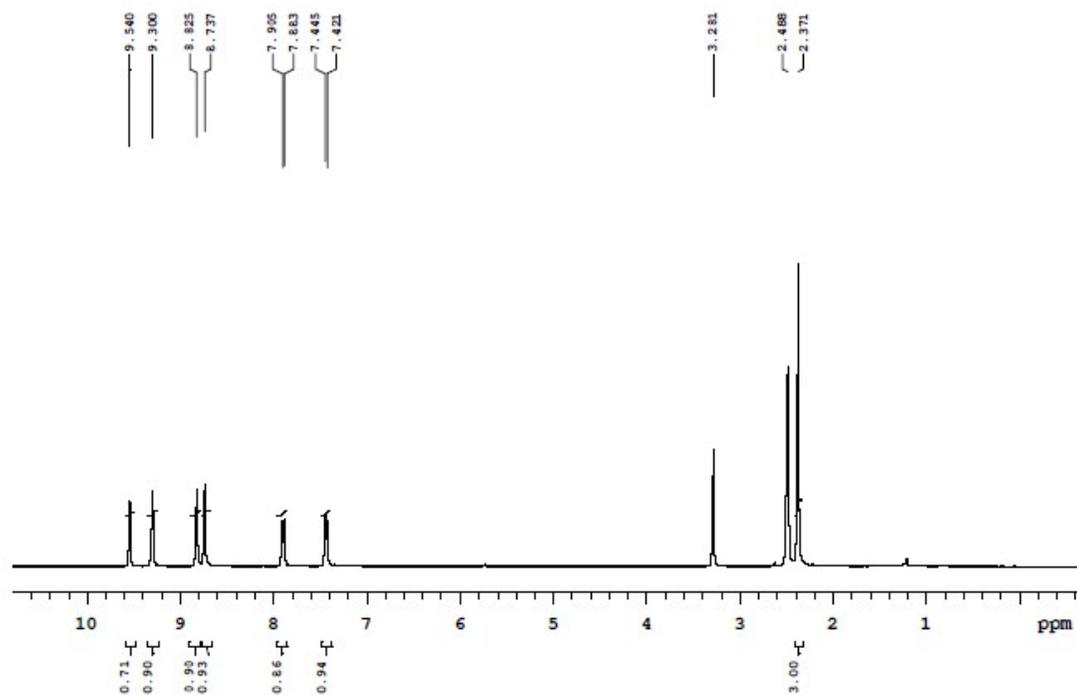
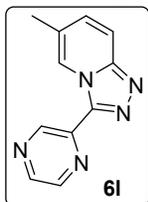


Figure S75. ^1H NMR Spectra & its expansion for compound **6l** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 PW (usec) : 5.05
 Scans : 1000
 Solvent : dmsd
 Data Points : 65536
 LB (Hz) : 4.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 9 2016
 System : VNMR5_400

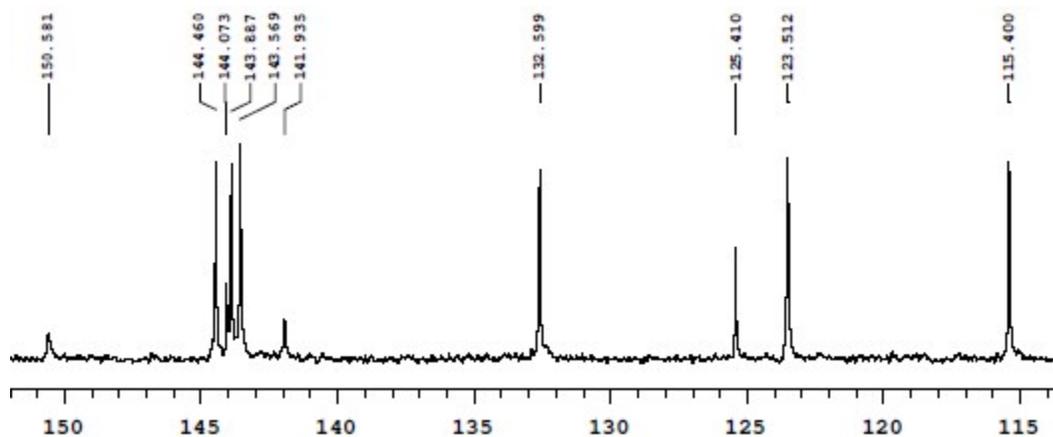
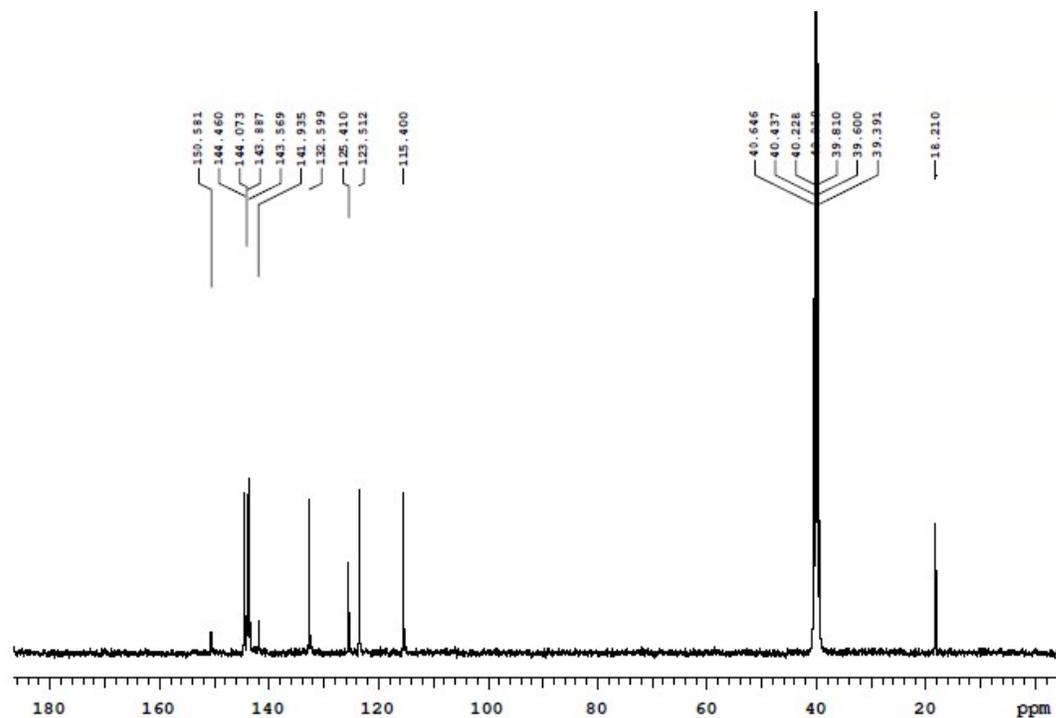
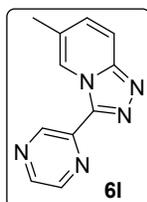


Figure S76. ^{13}C NMR Spectra & its expansion for compound **6l** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FWH (usec) : 6.40
 Scans : 32
 Solvent : dmsc
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 3 2016
 System : VNMR5_400

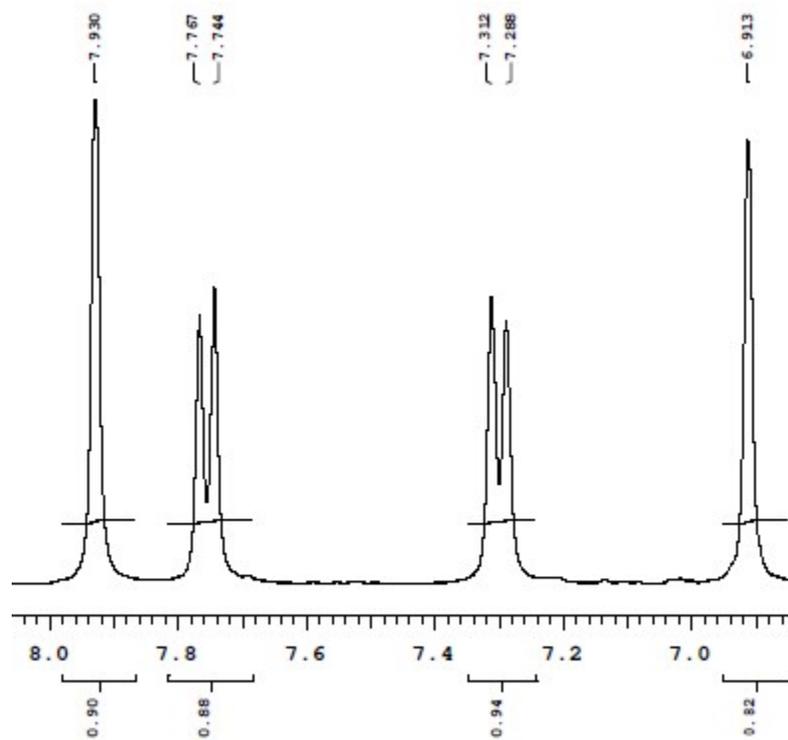
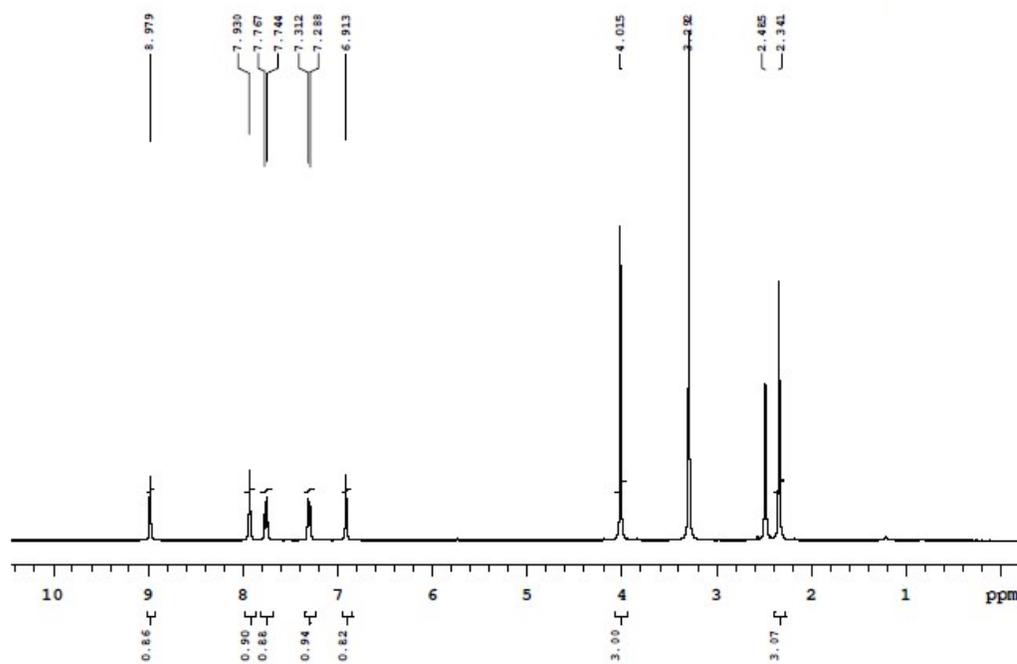
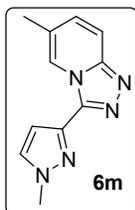


Figure S77. ^1H NMR Spectra & its expansion for compound **6m** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FRQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 DW (usec) : 5.05
 Scans : 1000
 Solvent : dmsd
 Data Points : 65536
 LB (Hz) : 4.00
 TEMP (K) : 303.15
 EXP : sfpul
 DATE : Feb 9 2016
 System : VNMR5_400

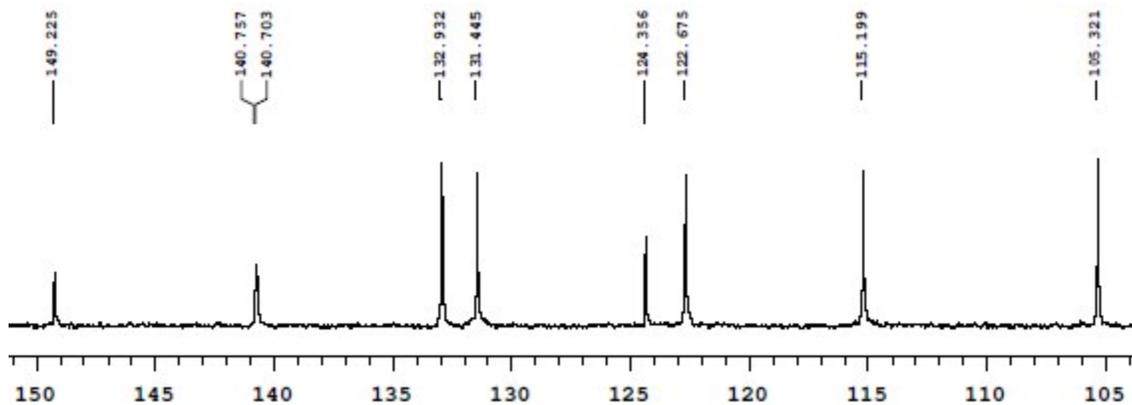
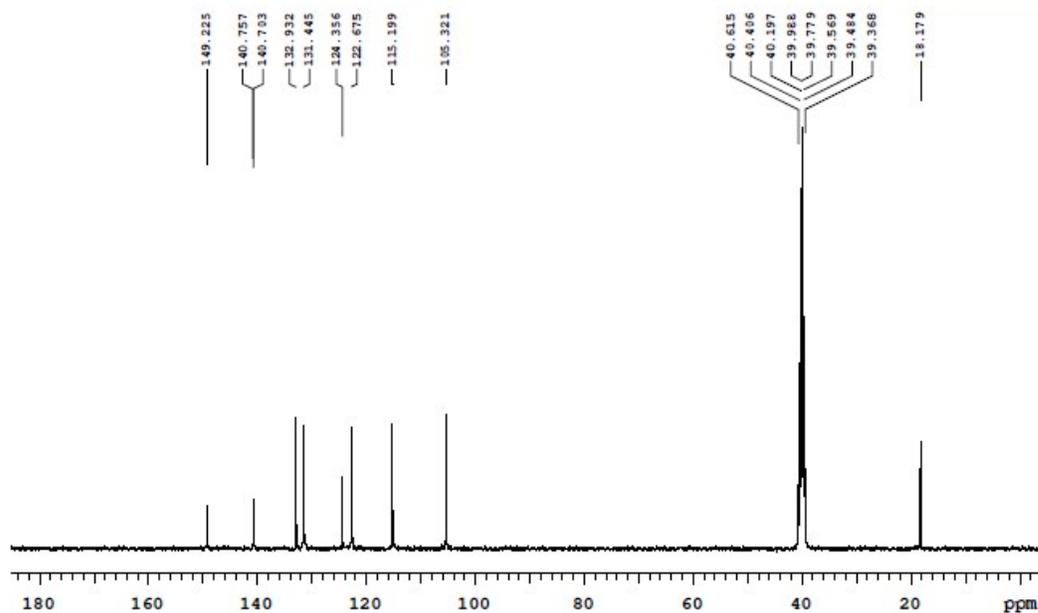
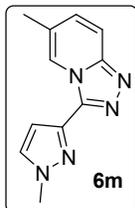


Figure S78. ^{13}C NMR Spectra & its expansion for compound **6m** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.40
 Scans : 32
 Solvent : dmsd
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2p11
 DATE : Feb 3 2016
 System : VNMR_400

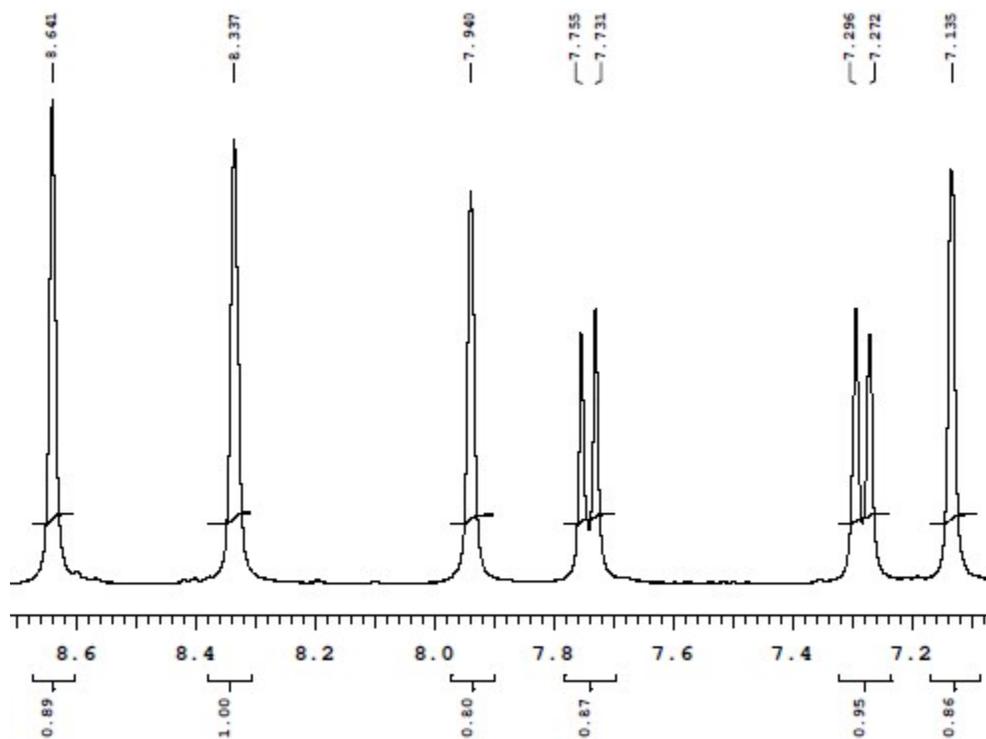
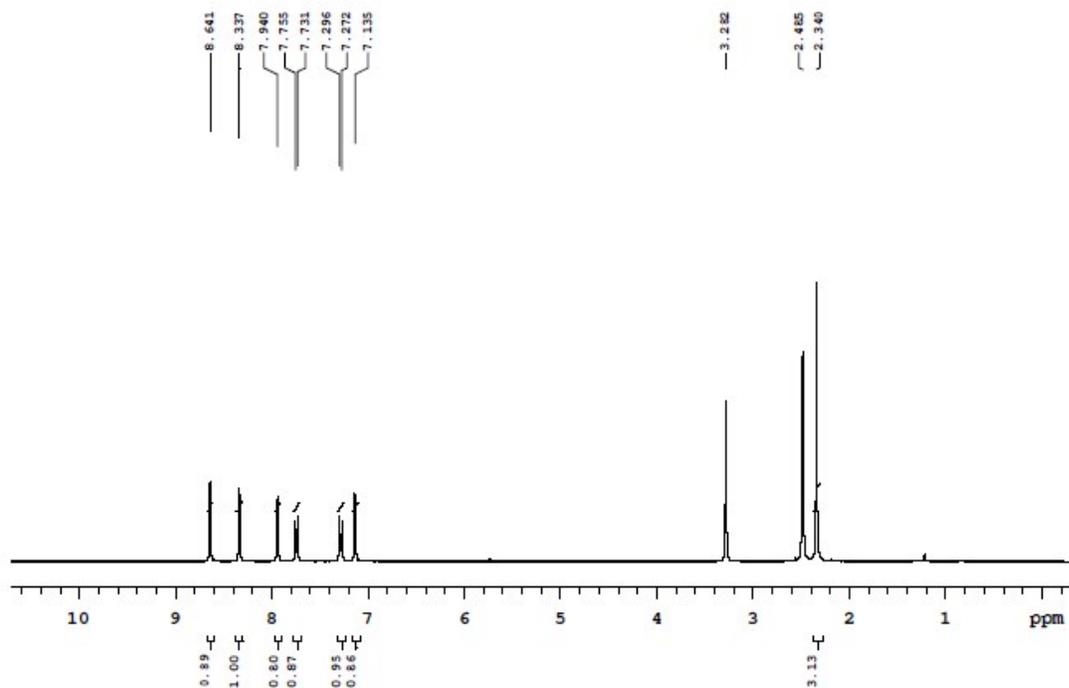
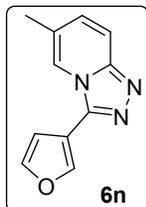


Figure S79. ^1H NMR Spectra & its expansion for compound **6n** in $\text{DMSO-}d_6$

NUCLEUS : C13
FREQ (MHz) : 100.50
AQ (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
DW (usec) : 5.05
Scans : 1000
Solvent : dms0
Data Points : 65536
LB (Hz) : 4.00
TEMP (K) : 303.15
EXP : gpcpul
DATE : Feb 9 2016
System : VNMR8_400

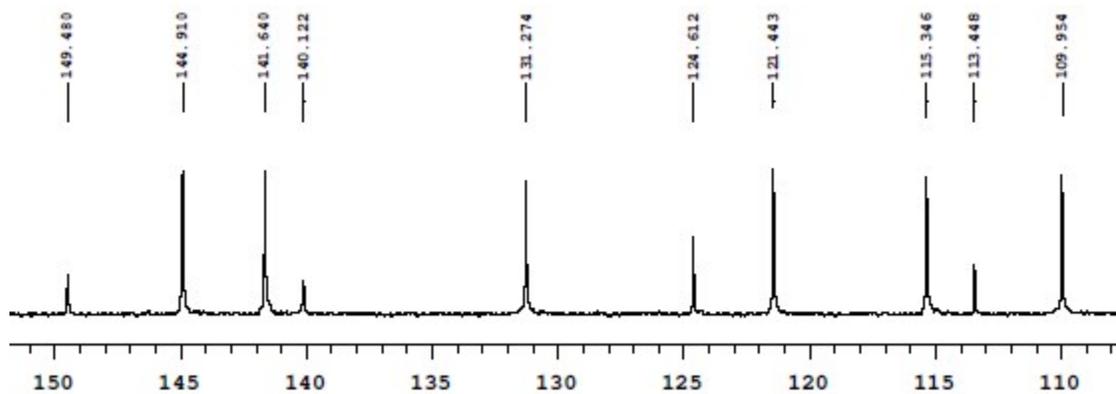
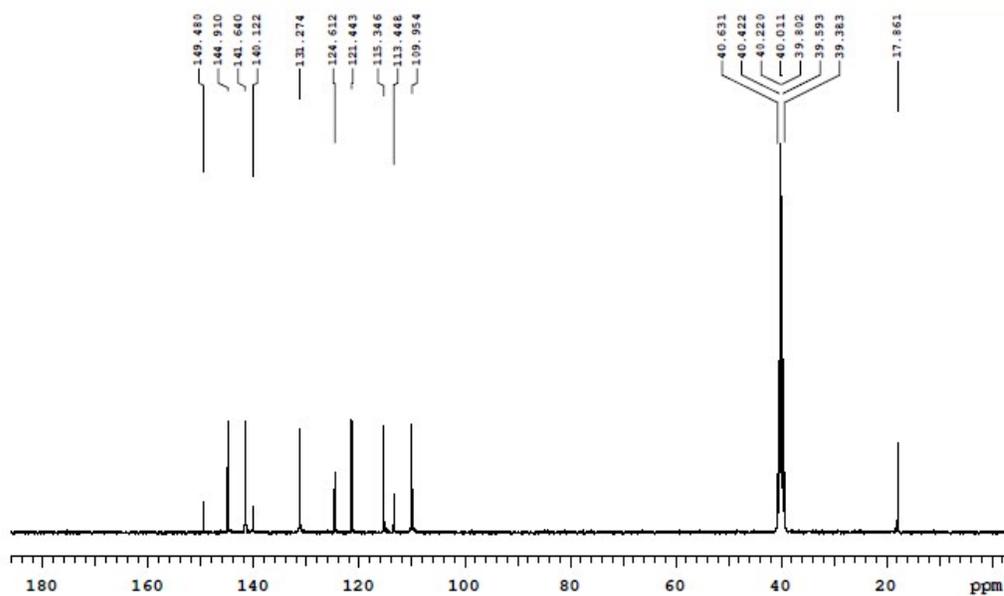
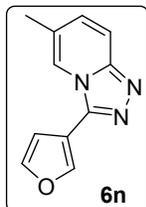


Figure S80. ^{13}C NMR Spectra & its expansion for compound **6n** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FWH (usec) : 6.40
 Scans : 32
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 2 2016
 System : VNMR5_400

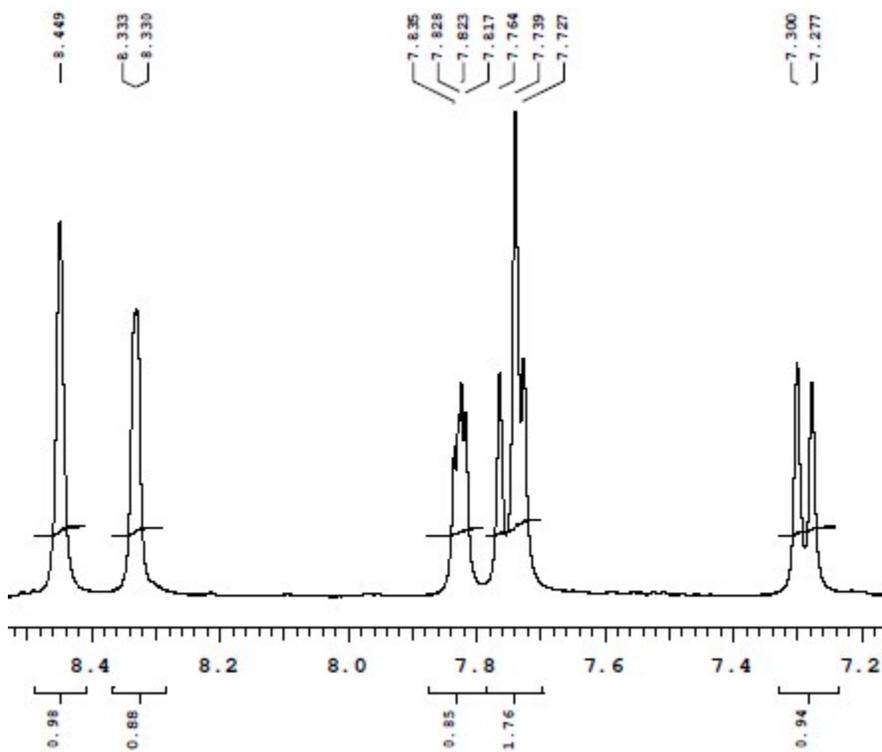
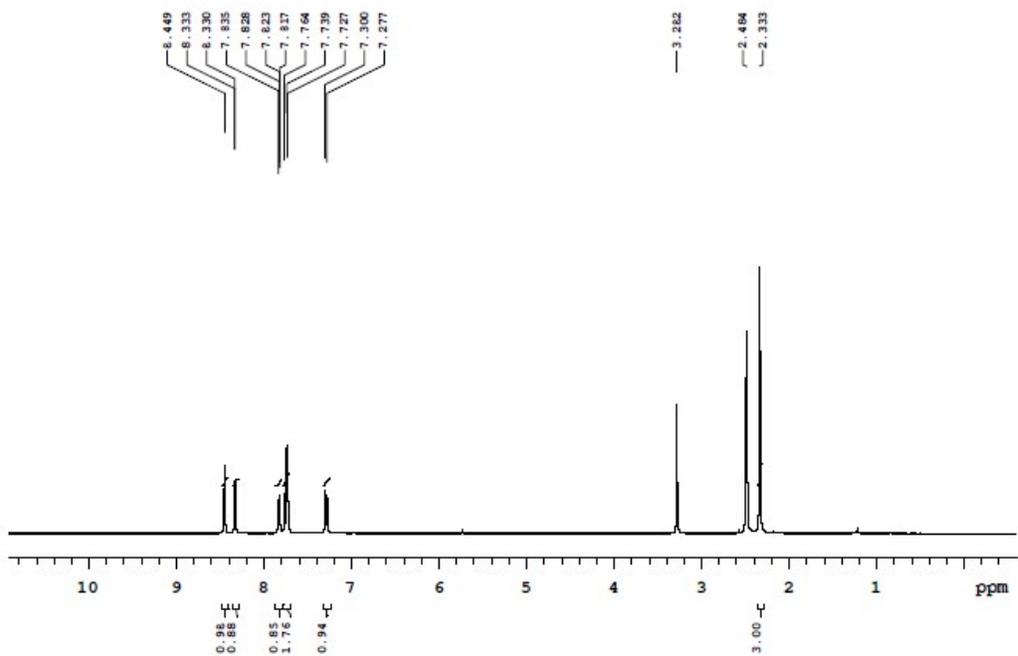
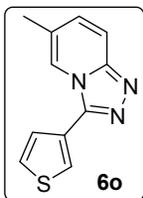


Figure S81. ^1H NMR Spectra & its expansion for compound **60** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FRQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RE (sec) : 1.00
 DW (usec) : 5.05
 Scans : 1000
 Solvent : dmsc
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : #2pul
 DATE : Feb 3 2016
 System : VNMRB_400

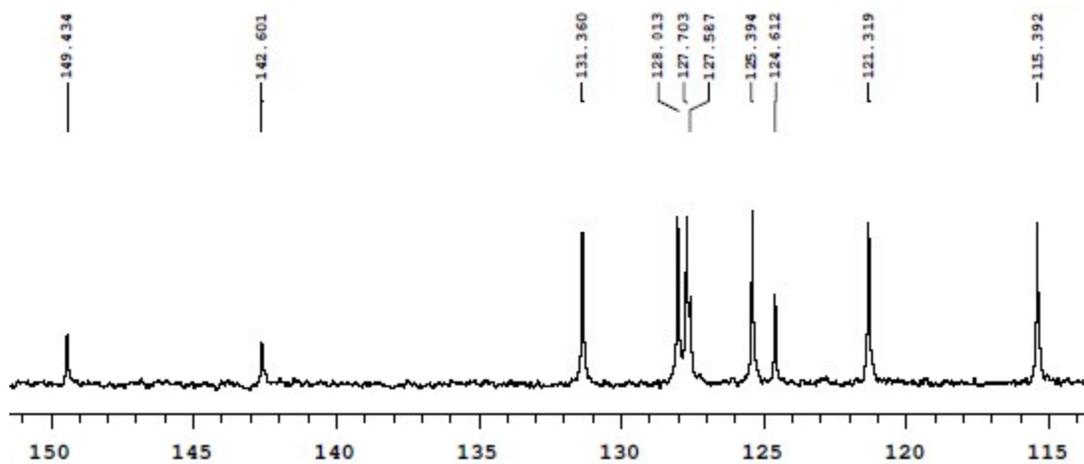
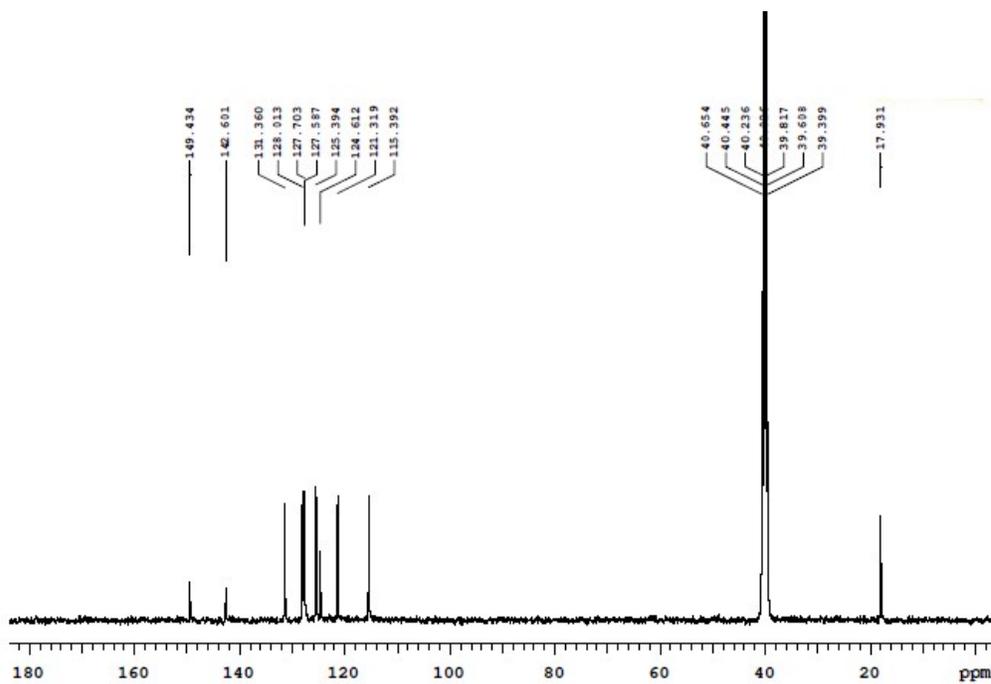
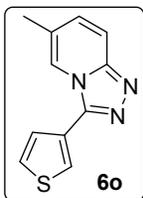


Figure S82. ^{13}C NMR Spectra & its expansion for compound **6o** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.40
 Scans : 32
 Solvent : DMSO
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2p01
 DATE : Feb 2 2016
 System : VNMRS_400

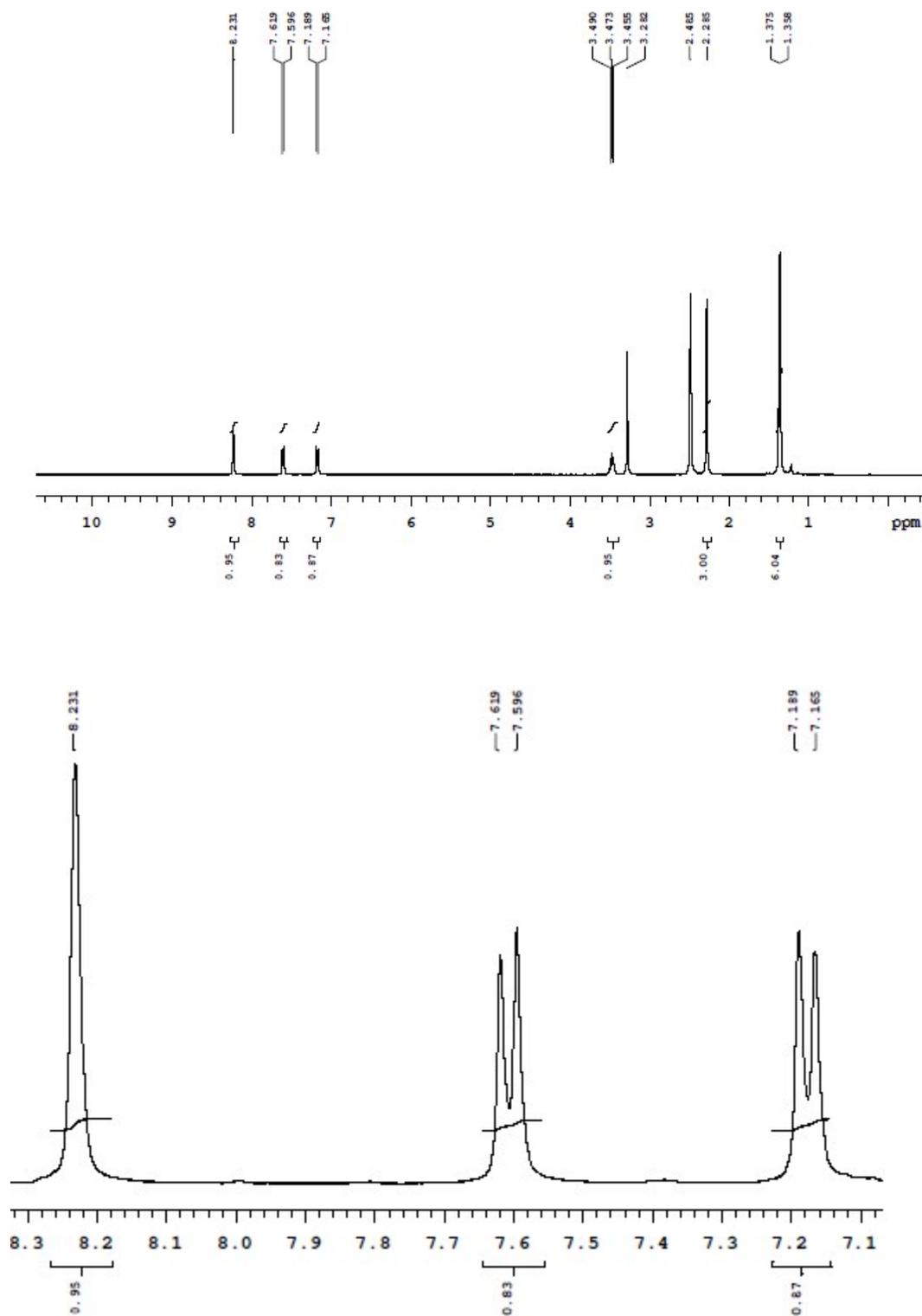
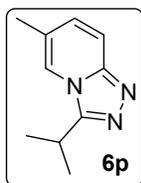


Figure S83. ^1H NMR Spectra & its expansion for compound **6p** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 DW (usec) : 5.05
 Scans : 1000
 Solvent : DMSO
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 3 2016
 System : VNMR5_400

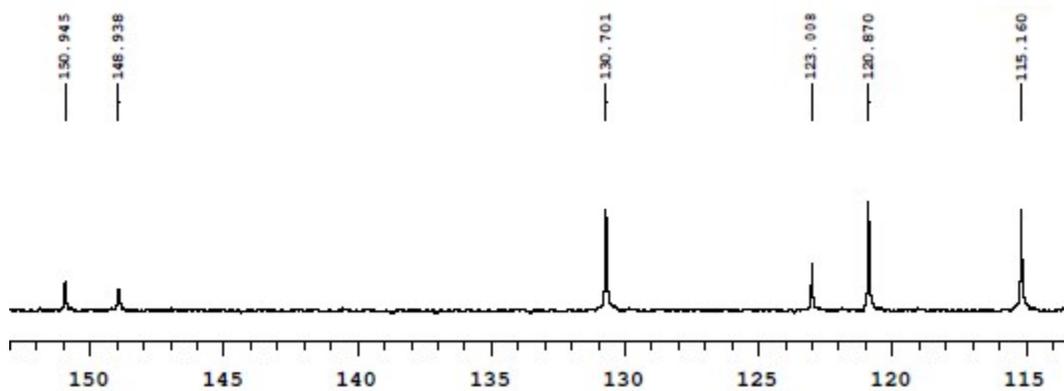
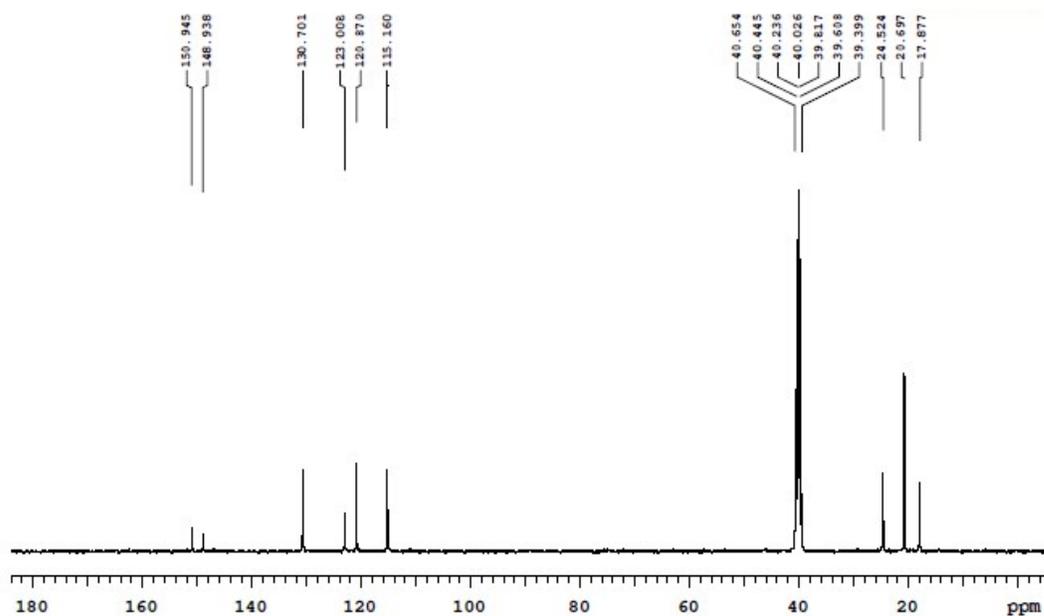
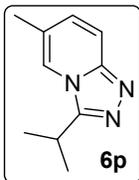


Figure S84. ^{13}C NMR Spectra & its expansion for compound **6p** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RE (sec) : 1.00
 PW (usec) : 6.40
 Scans : 32
 Solvent : dmsd
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 2 2016
 System : VNMR5_400

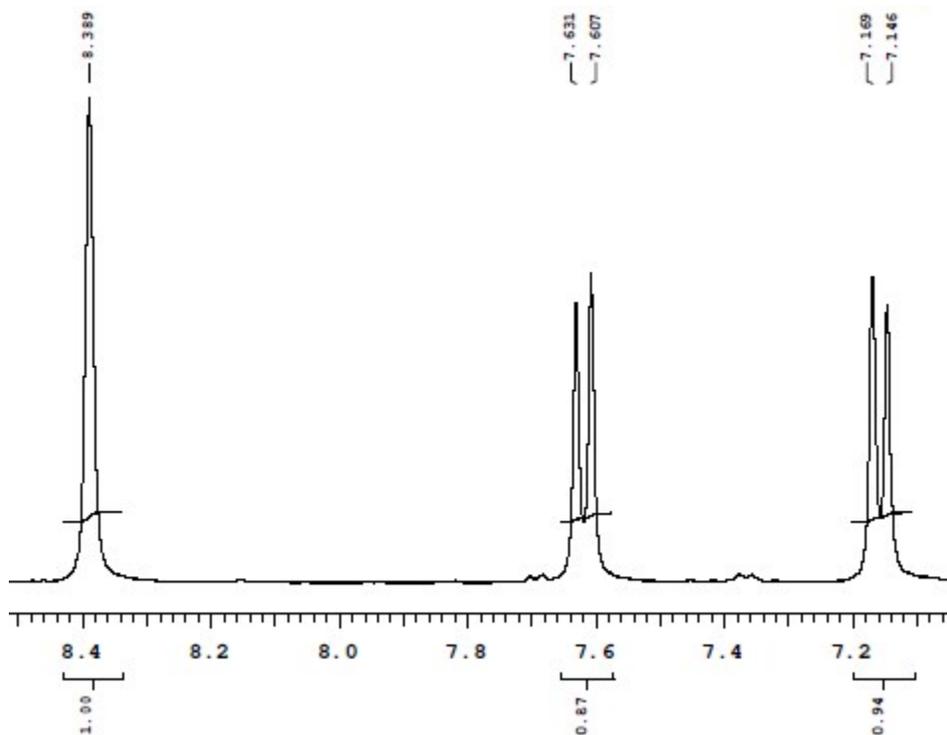
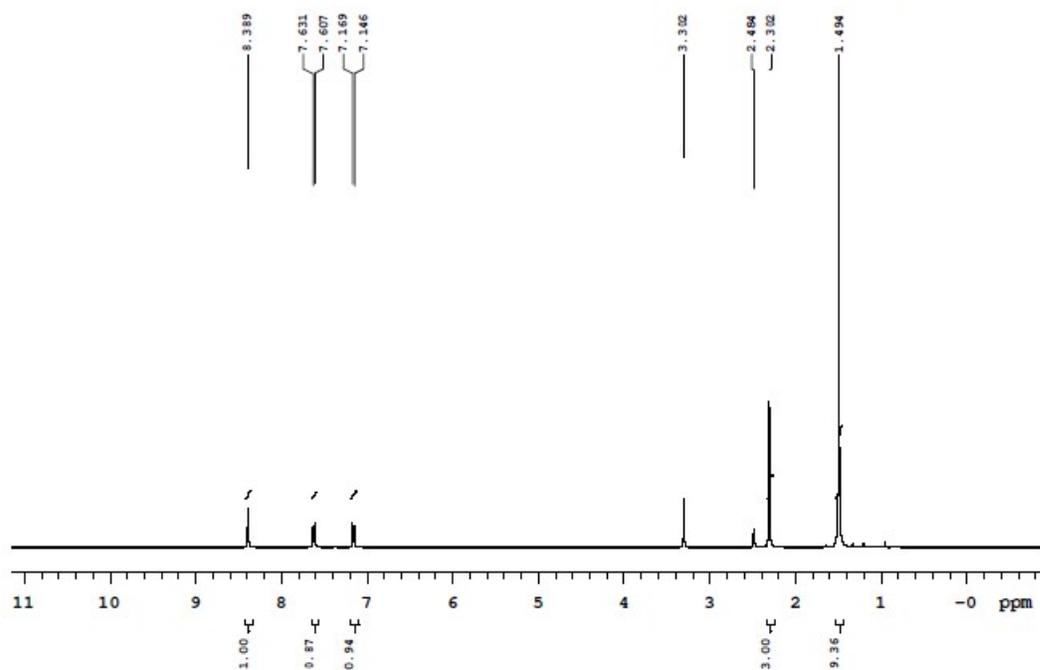
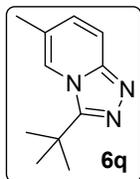


Figure S85. ^1H NMR Spectra & its expansion for compound **6q** in $\text{DMSO-}d_6$

NUCLEUS : C13
FRQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
PW (usec) : 5.05
Scans : 1000
Solvent : dmsc
Data Points : 65536
LB (Hz) : 3.00
TEMP (K) : 303.15
EXP : s2pul
DATE : Feb 2 2016
System : VNMR_400

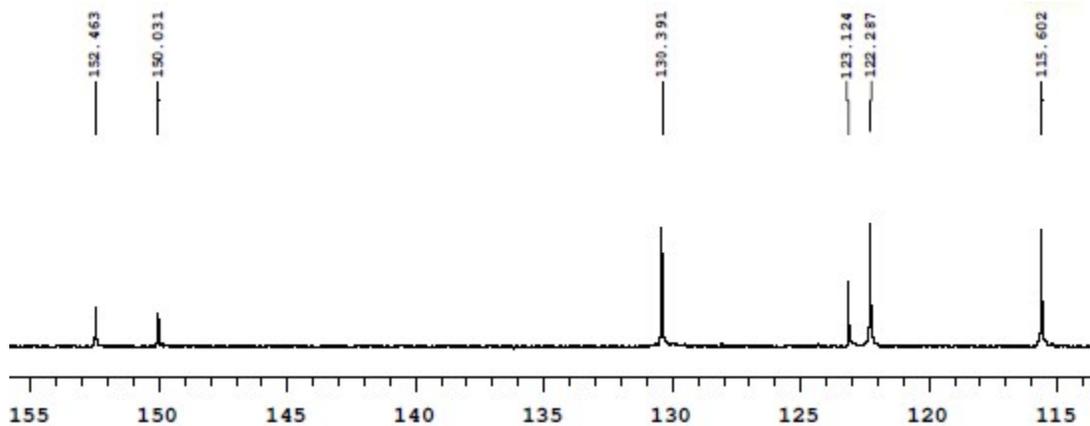
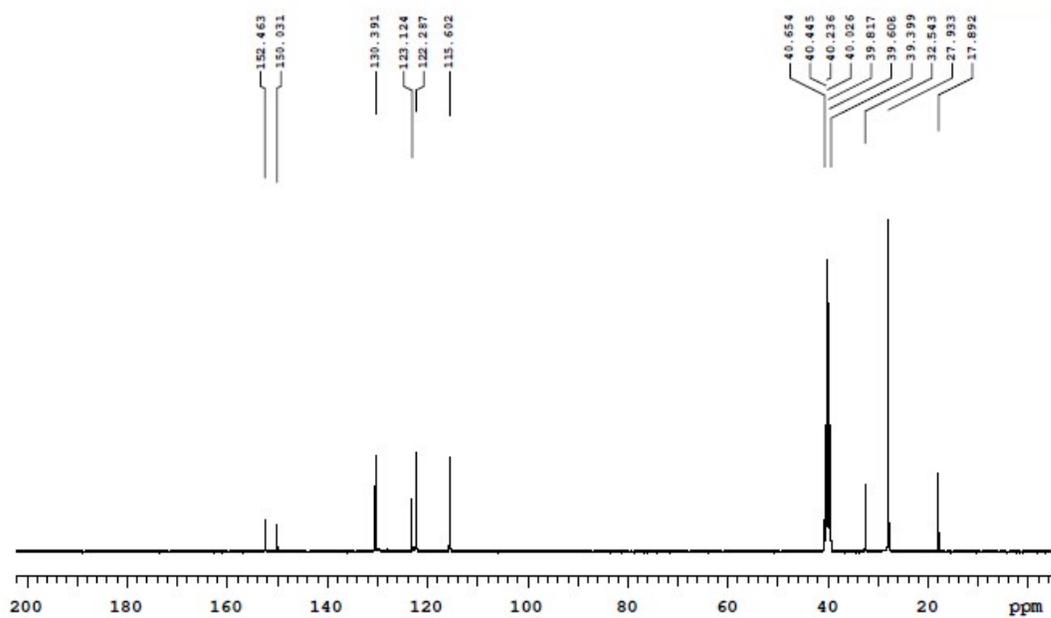
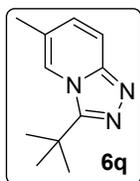


Figure S86. ^{13}C NMR Spectra & its expansion for compound **6q** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.60
 Scans : 64
 Solvent : dmsc
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pal
 DATE : Feb 1 2016
 System : VNMR_400

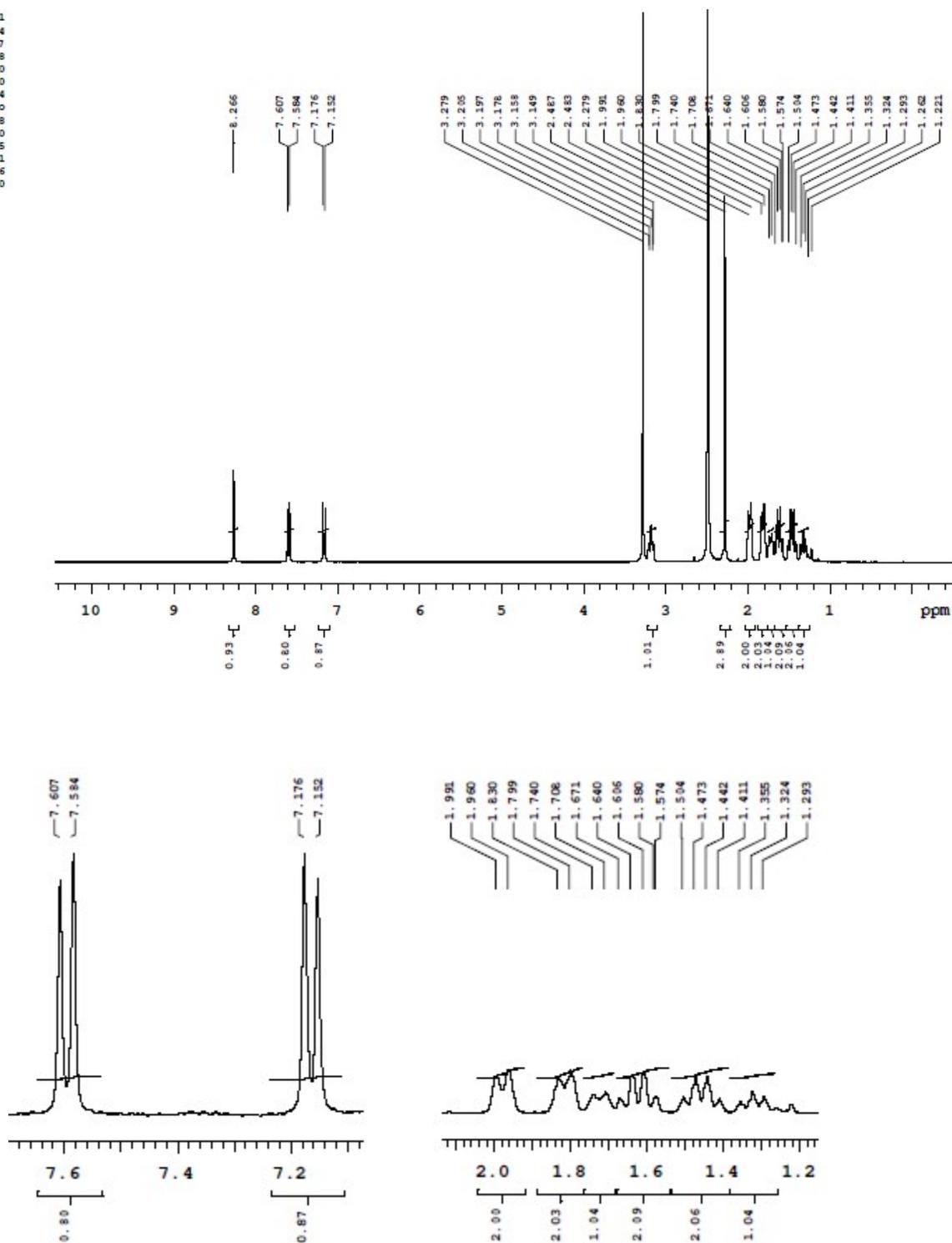
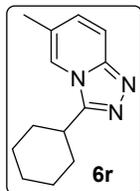


Figure S87. ^1H NMR Spectra & its expansion for compound **6r** in $\text{DMSO-}d_6$

NUCLEUS : C13
FRQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
PW (usec) : 5.05
Scans : 1000
Solvent : dms0
Data Points : 65536
LB (Hz) : 5.00
TEMP (K) : 303.15
EXP : s2pul
DATE : Feb 3 2016
System : VNMR5_400

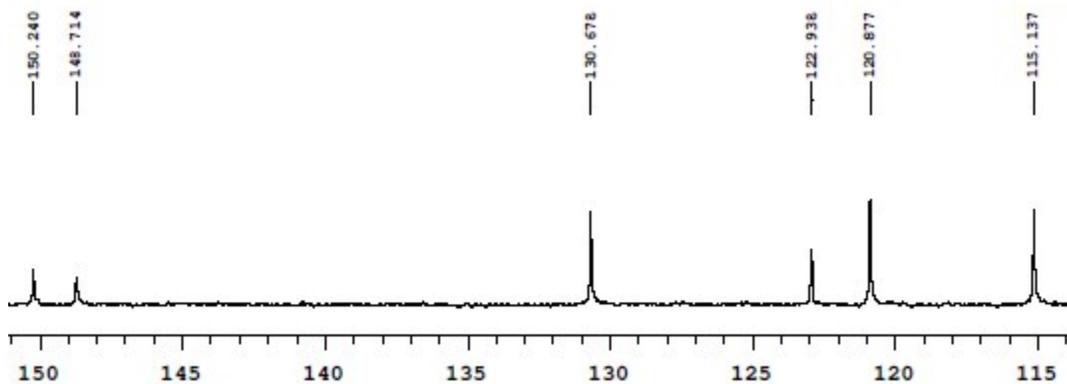
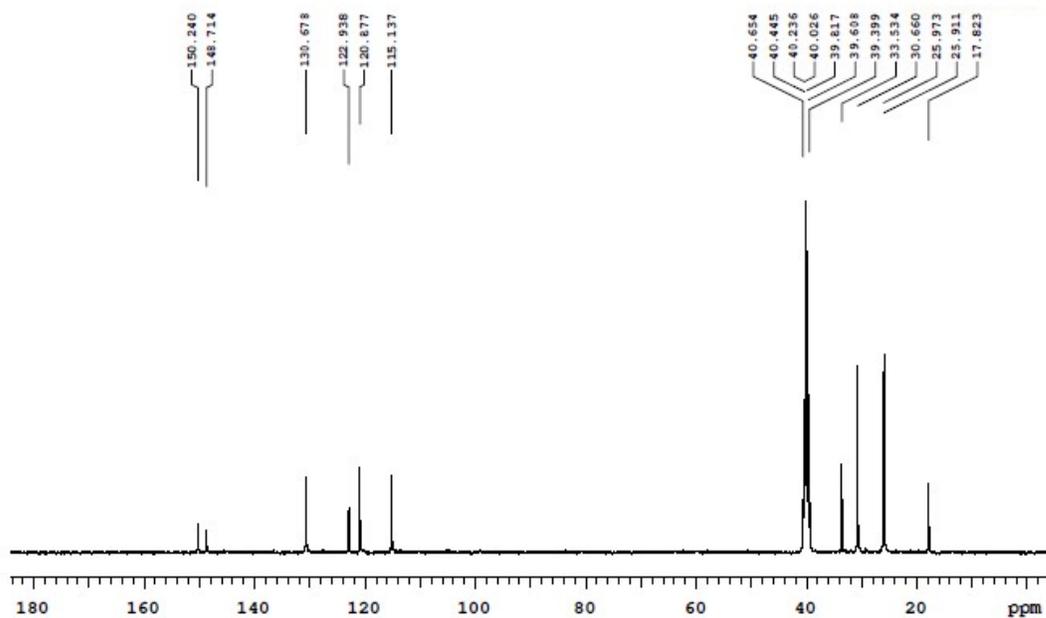
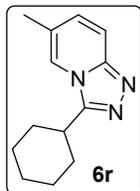


Figure S88. ^{13}C NMR Spectra & its expansion for compound **6r** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 10.08
 RD (sec) : 1.00
 DW (usec) : 6.60
 Scans : 64
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 1.00
 TEM (K) : 303.15
 EXP : s2pul
 DATE : Feb 16 2016
 System : VNMR5_400

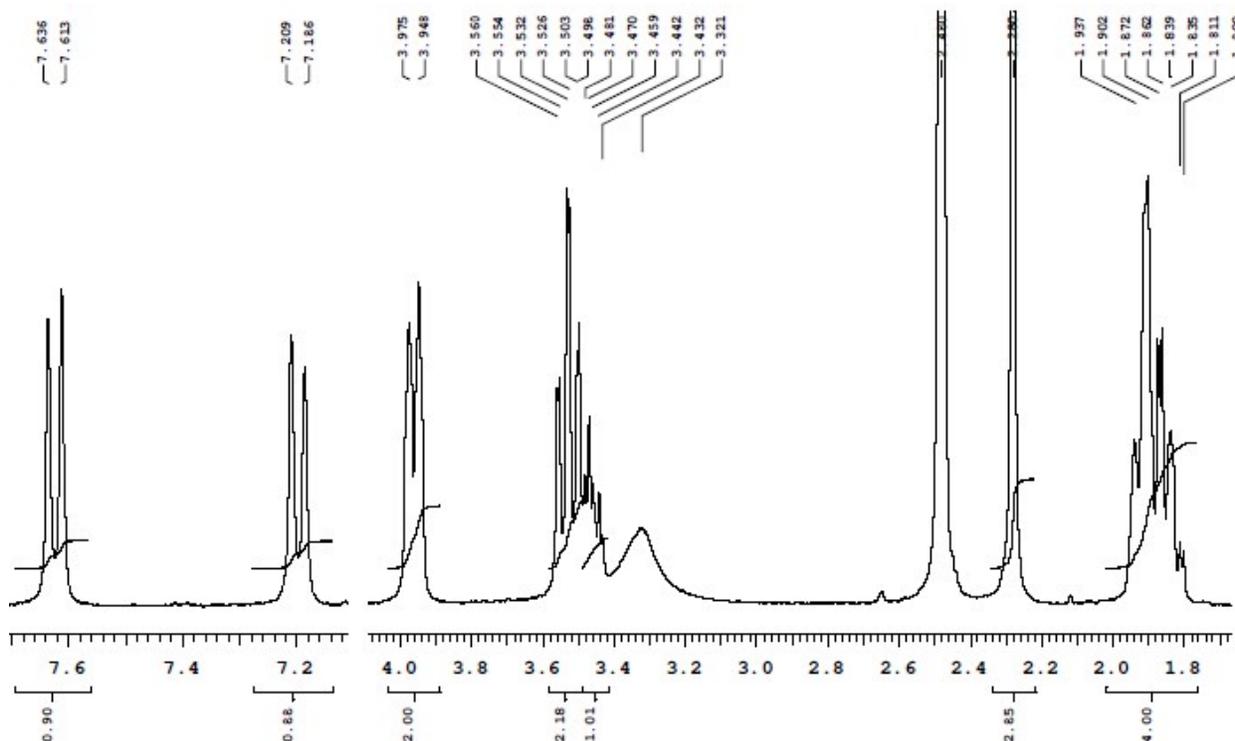
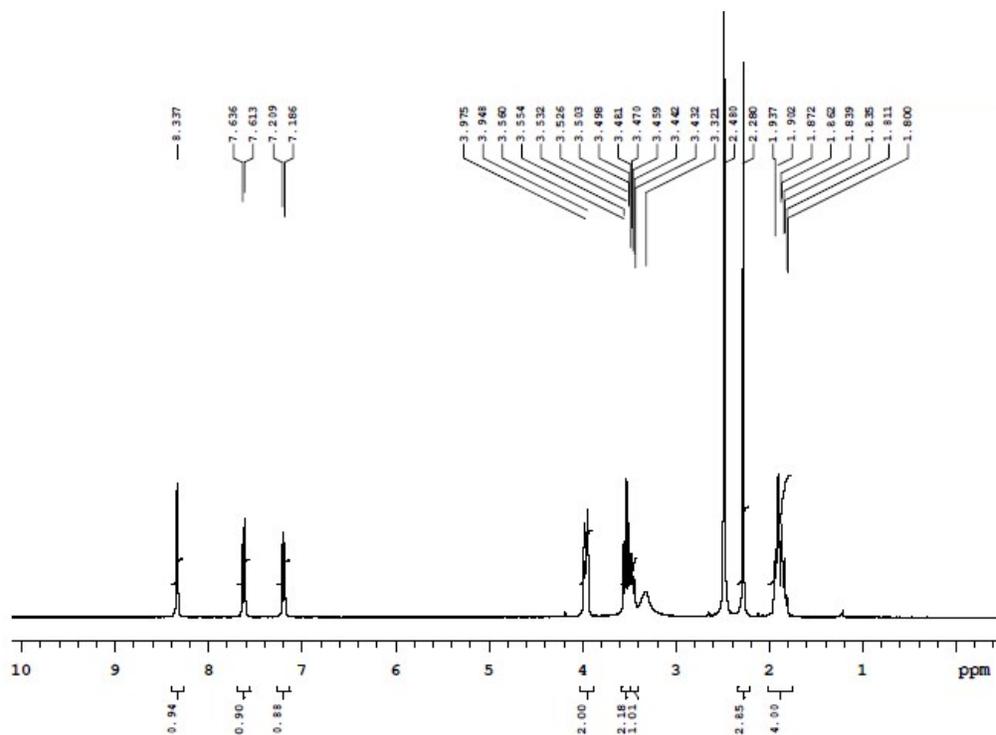
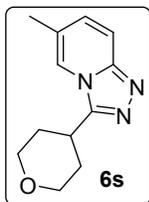


Figure S89. ^1H NMR Spectra & its expansion for compound **6s** in $\text{DMSO-}d_6$

NUCLEUS : C13
FREQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
FID (usec) : 5.05
Scans : 2000
Solvent : dmsd
Data Points : 65536
LB (Hz) : 5.00
TEMP (K) : 303.15
EXP : s2pol
DATE : Feb 19 2016
System : VNMR8_400

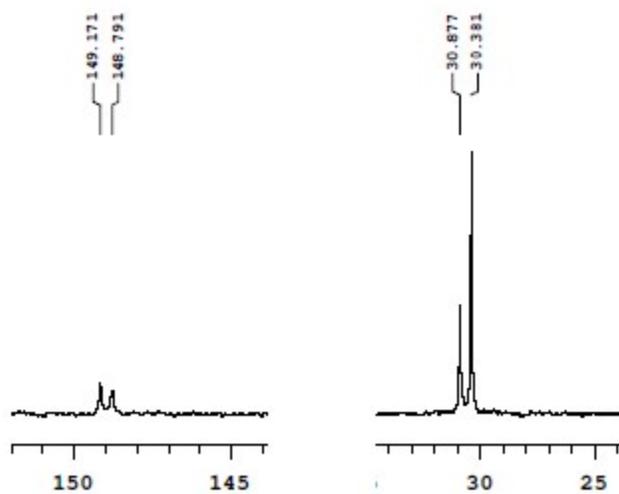
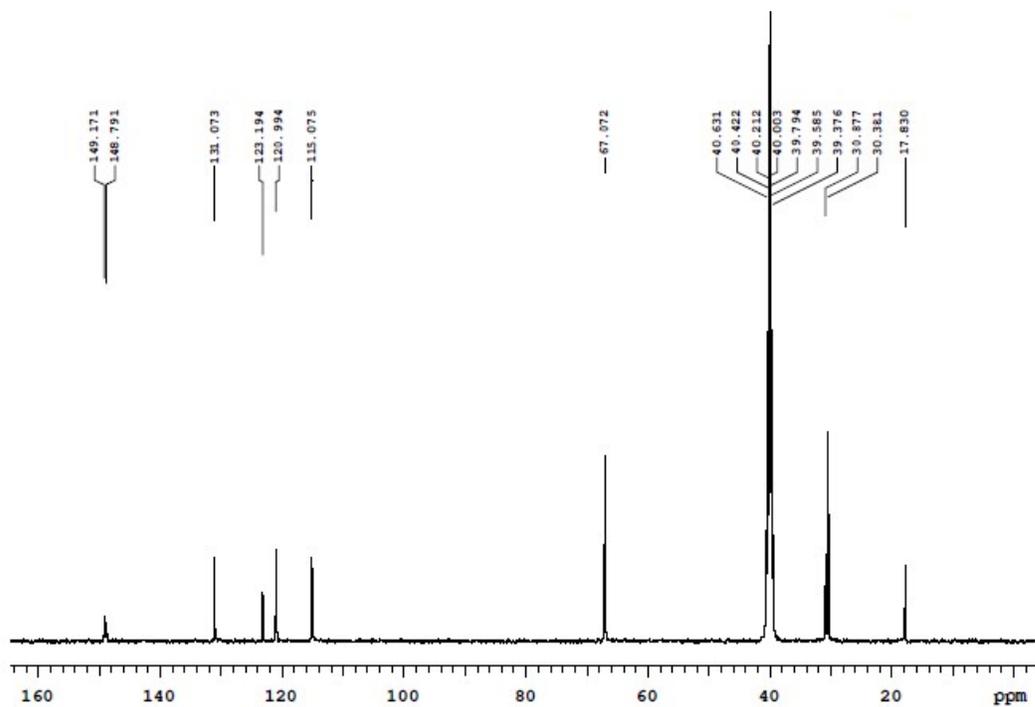
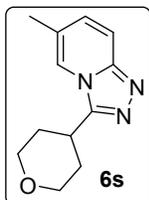


Figure S90. ^{13}C NMR Spectra & its expansion for compound **6s** in DMSO- d_6

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.60
 Scans : 64
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pu1
 DATE : Feb 17 2016
 System : VNMR5_400

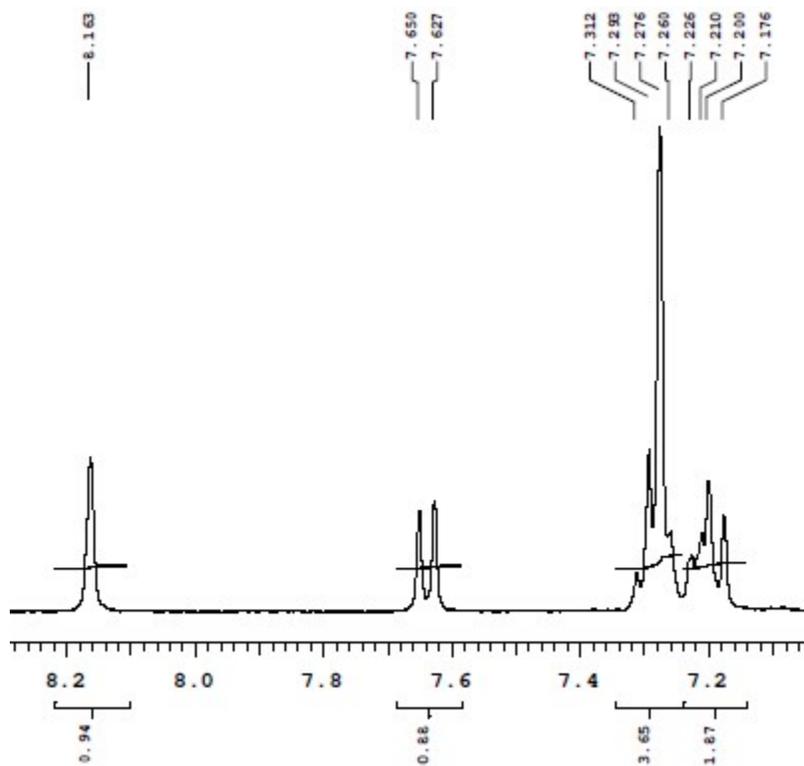
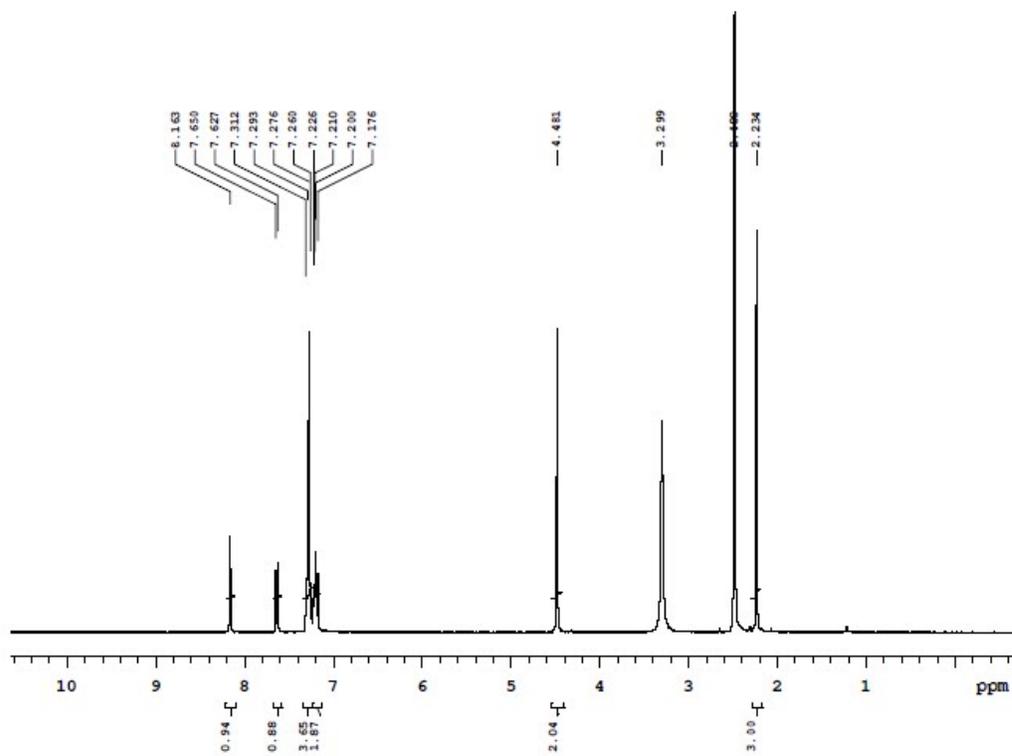
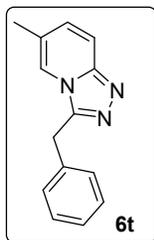


Figure S91. ^1H NMR Spectra & its expansion for compound **6t** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 FWH (usec) : 5.05
 Scans : 2400
 Solvent : dmsd
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 17 2016
 System : VNMR5_400

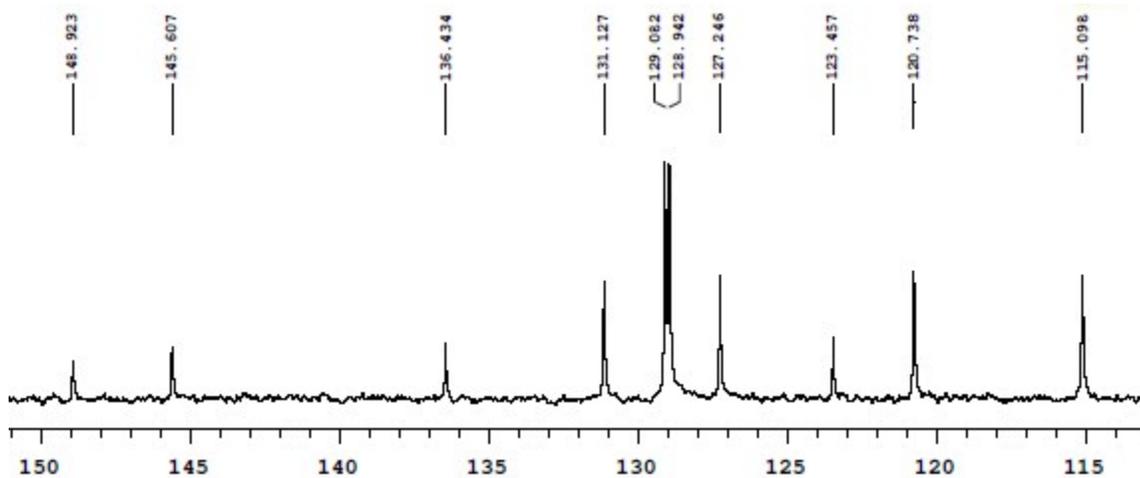
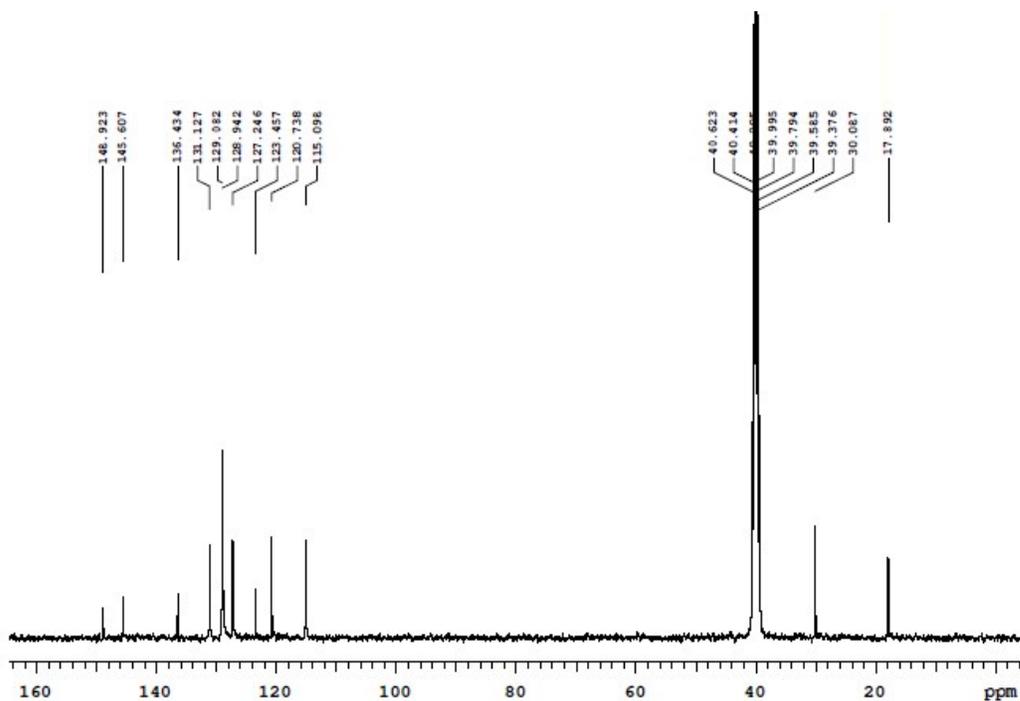
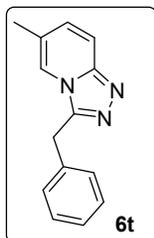


Figure S92. ^{13}C NMR Spectra & its expansion for compound **6t** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.40
 Scans : 32
 Solvent : dms0
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pu1
 DATE : Feb 3 2016
 System : VNMR8_400

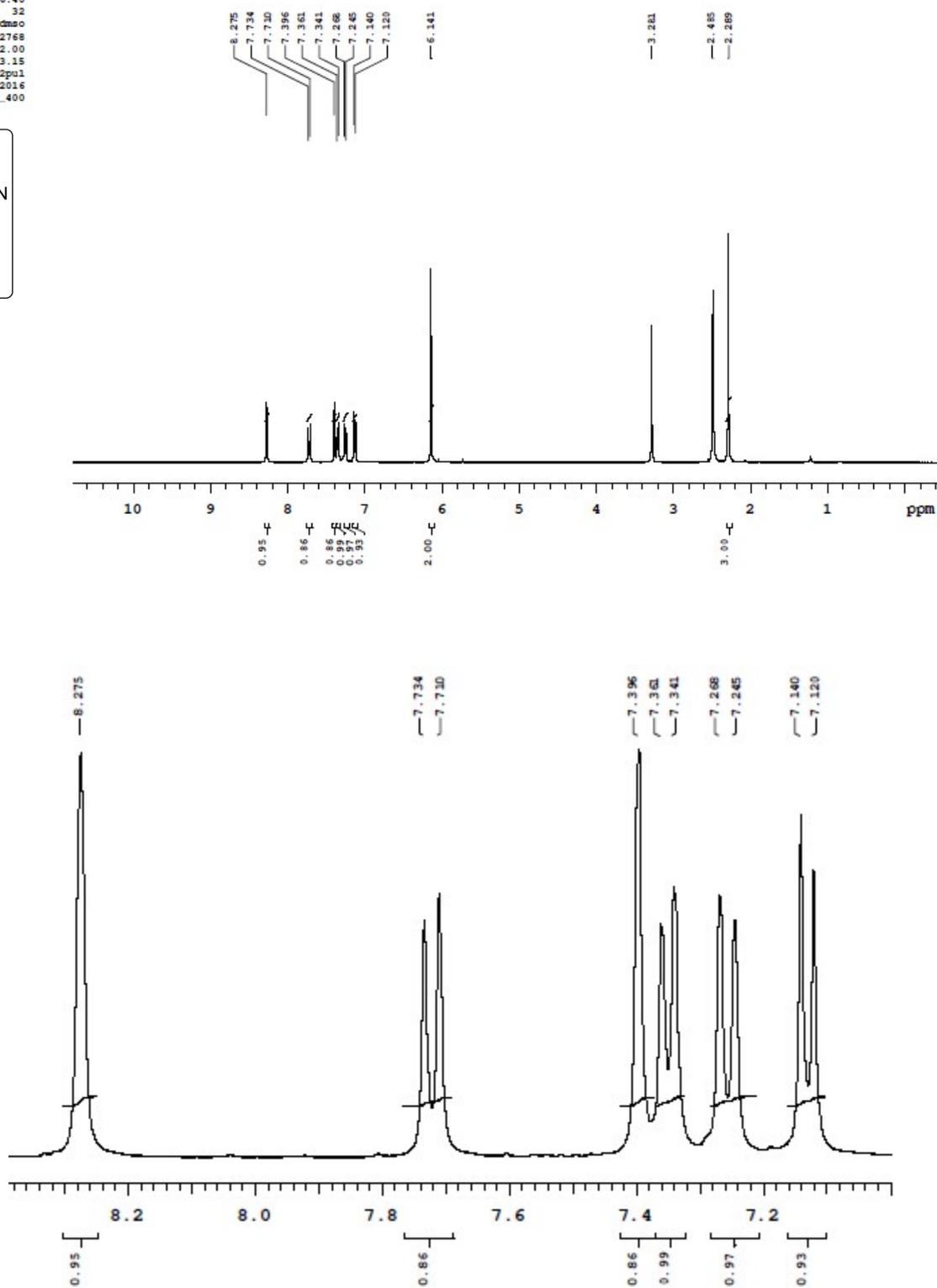
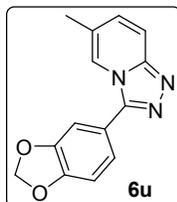


Figure S93. ^1H NMR Spectra & its expansion for compound **6u** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 FWH (usec) : 5.05
 Scans : 1000
 Solvent : dms0
 Data Points : 65536
 LB (Hz) : 5.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 9 2016
 System : VNMRS_400

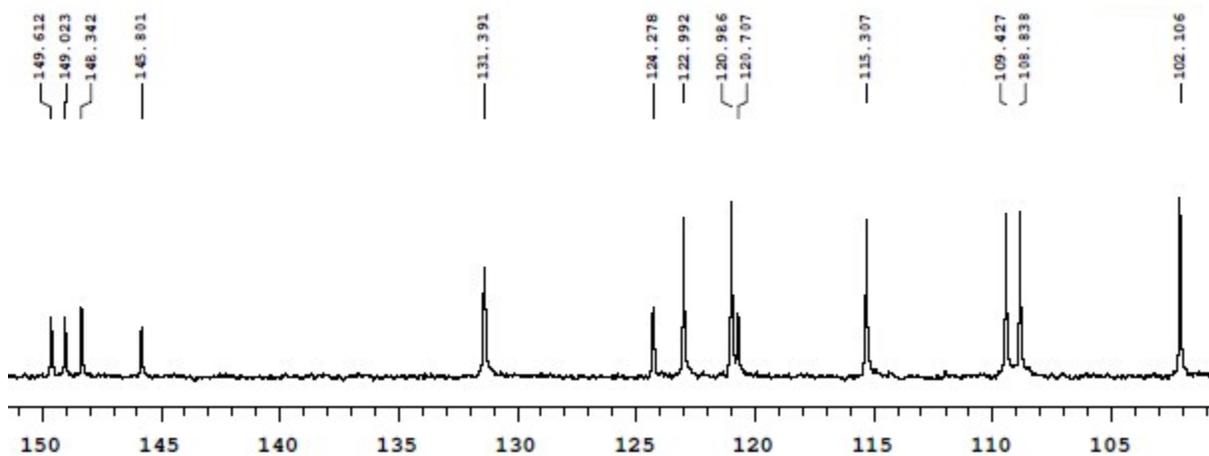
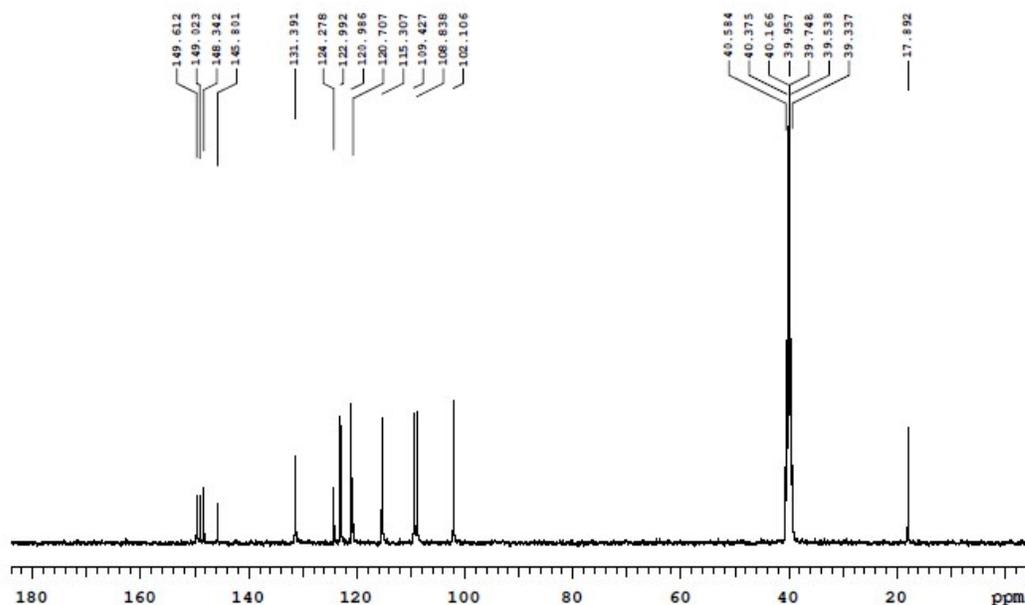
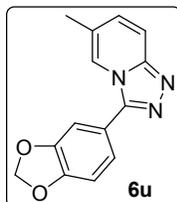


Figure S94. ^{13}C NMR Spectra & its expansion for compound **6u** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.63
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FW (usec) : 6.40
 Scans : 64
 Solvent : cdcl3
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : szpul
 DATE : May 16 2016
 System : VNMR5_400

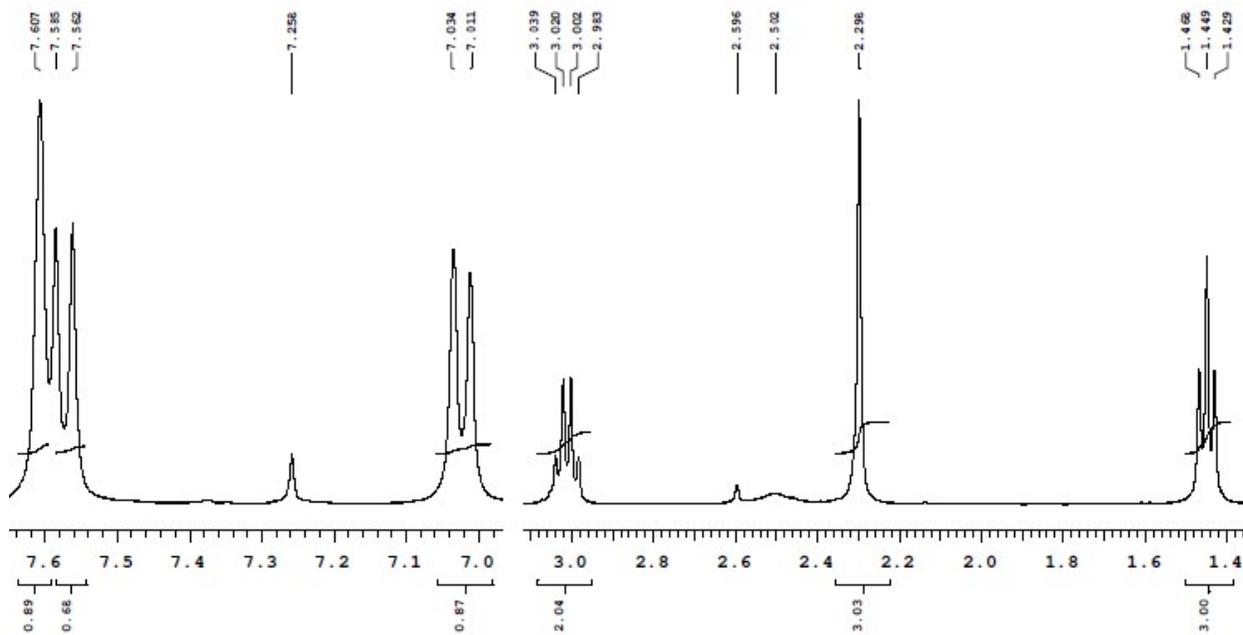
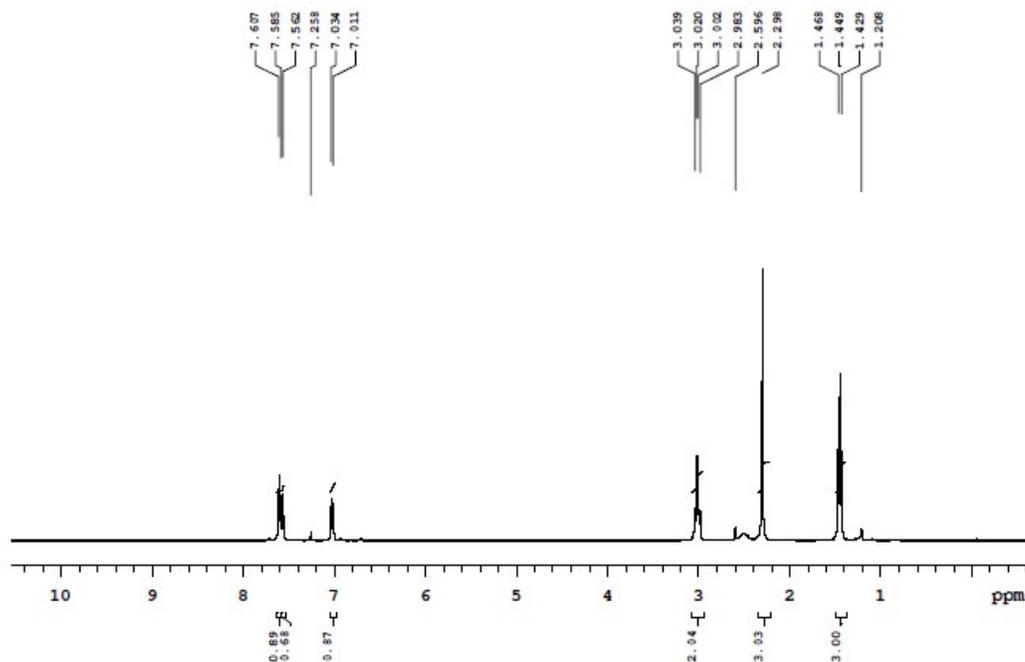
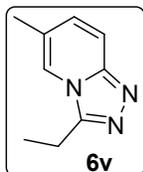


Figure S95. ^1H NMR Spectra & its expansion for compound **6v** in CDCl_3

NUCLEUS : C13
FRQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
PW (usec) : 5.05
Scans : 3000
Solvent : cdd13
Data Points : 65536
LS (Hz) : 4.00
TEMP (K) : 303.15
EXP : s2pu1
DATE : May 16 2016
System : VNMR5_400

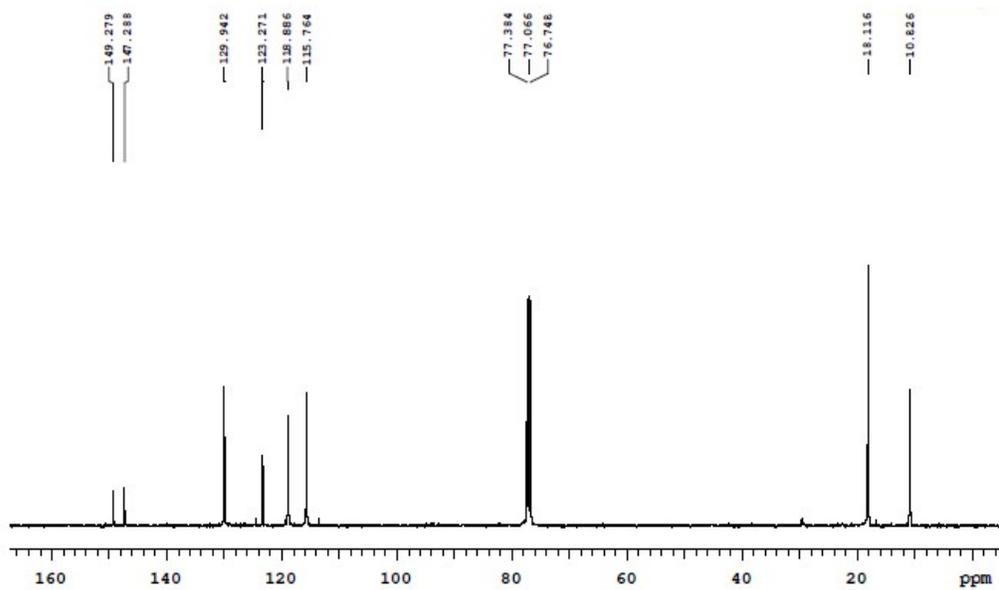
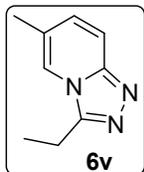


Figure S96. ^{13}C NMR Spectra for compound **6v** in CDCl_3

NUCLEUS : H1
 FRQ (MHz) : 399.63
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.40
 Scans : 64
 Solvent : cdcl3
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : May 16 2016
 System : VNMR5_400

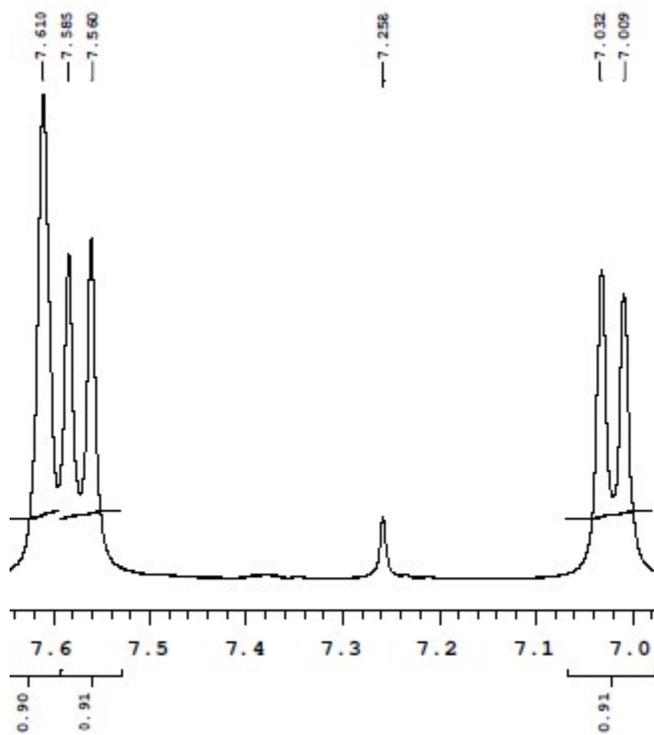
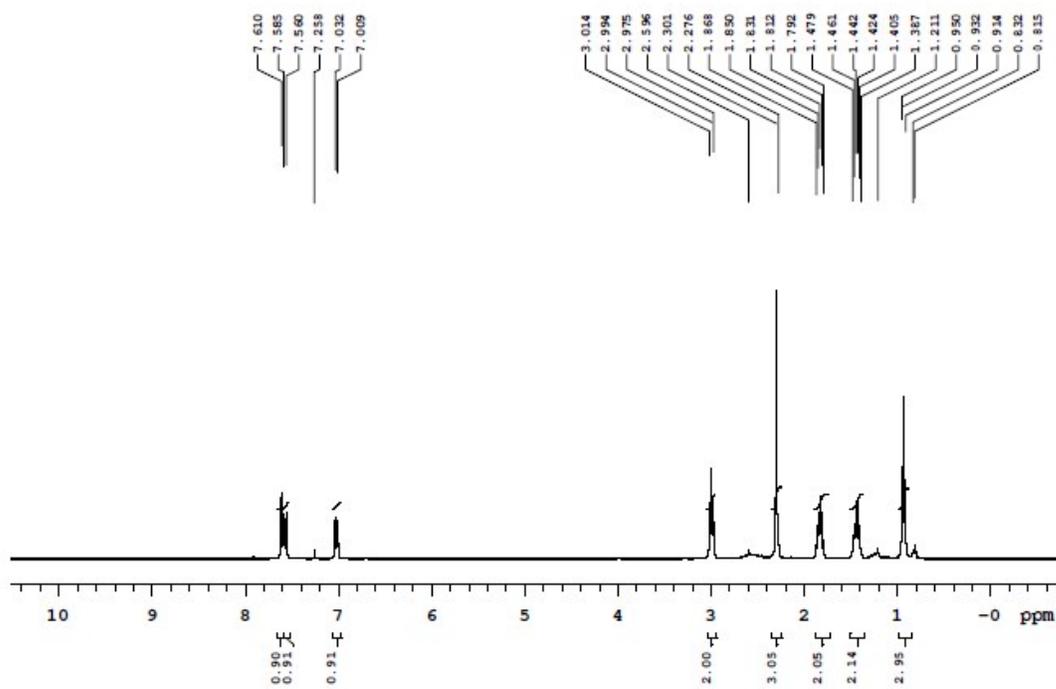
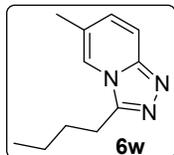


Figure S97. ^1H NMR Spectra & its expansion for compound **6w** in CDCl_3

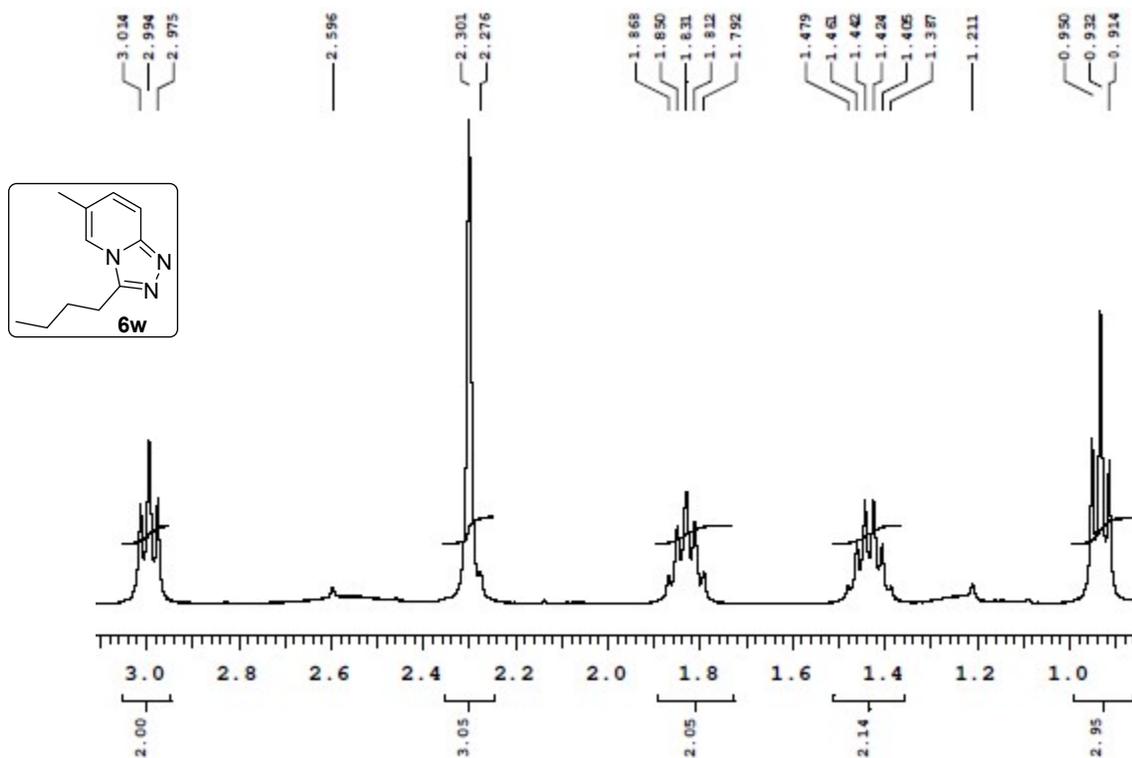


Figure S98. ¹H NMR Spectra expansion for compound **6w** in CDCl₃

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 FWH (usec) : 5.05
 Scans : 3000
 Solvent : cdcl3
 Data Points : 65536
 LB (Hz) : 4.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : May 16 2016
 System : VNMR5_400

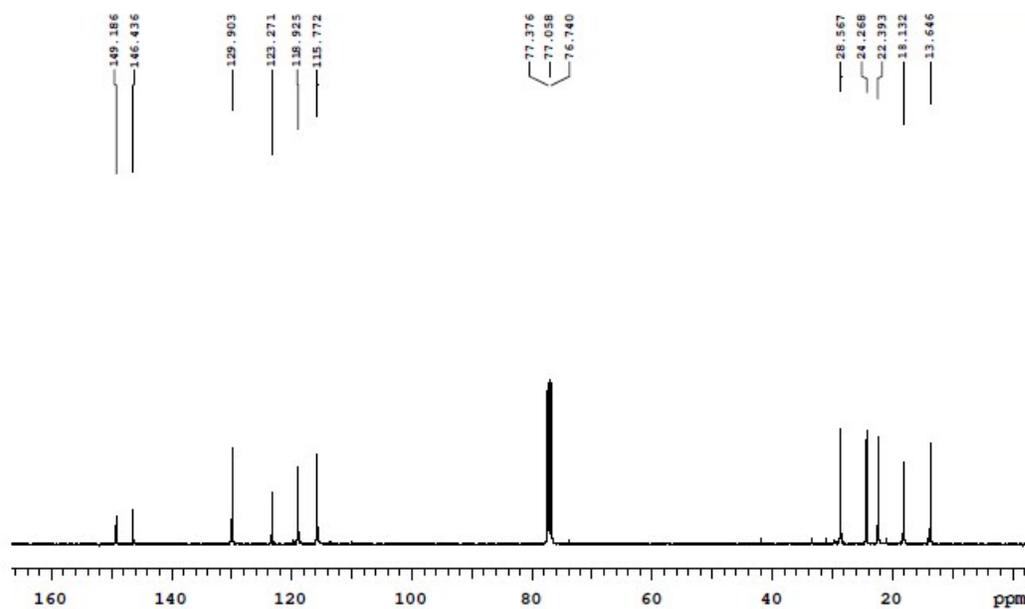
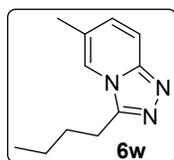


Figure S99. ¹³C NMR Spectra for compound **6w** in CDCl₃

NUCLEUS : H1
 FREQ (MHz) : 399.63
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 DW (usec) : 6.40
 Scans : 64
 Solvent : cdcl3
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : May 12 2016
 System : VNMRB_400

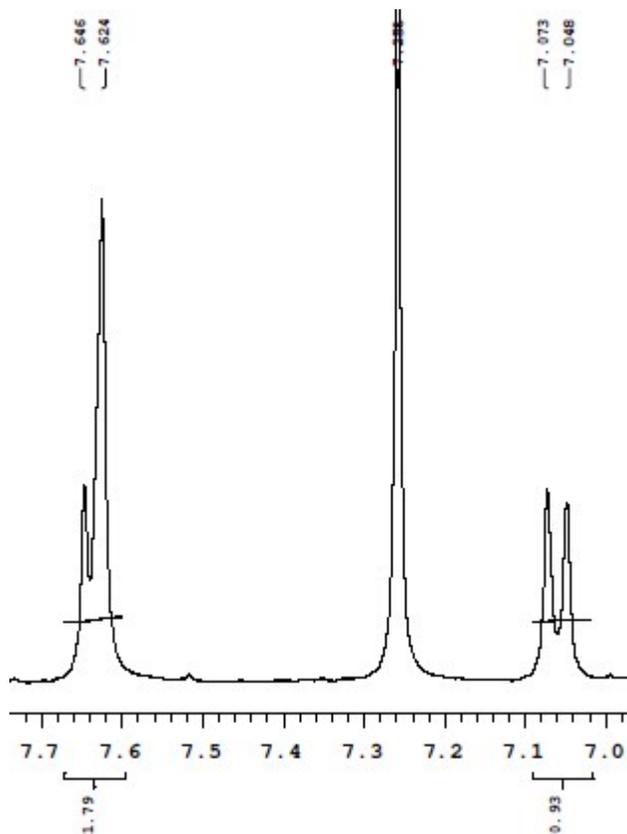
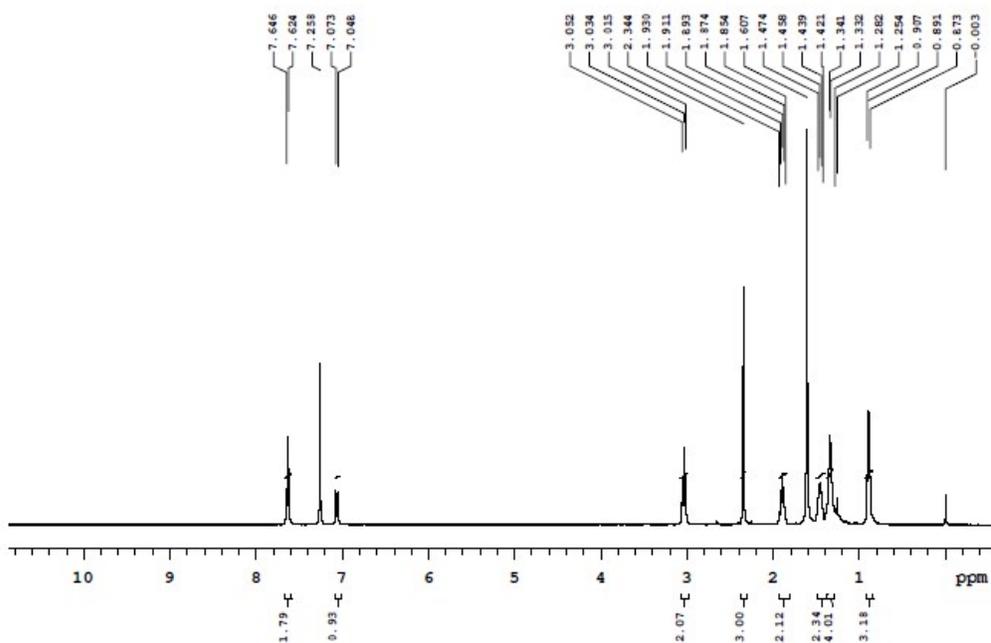
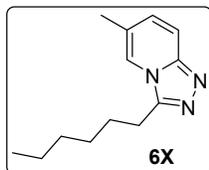


Figure S100. ^1H NMR Spectra & its expansion for compound **6x** in CDCl_3

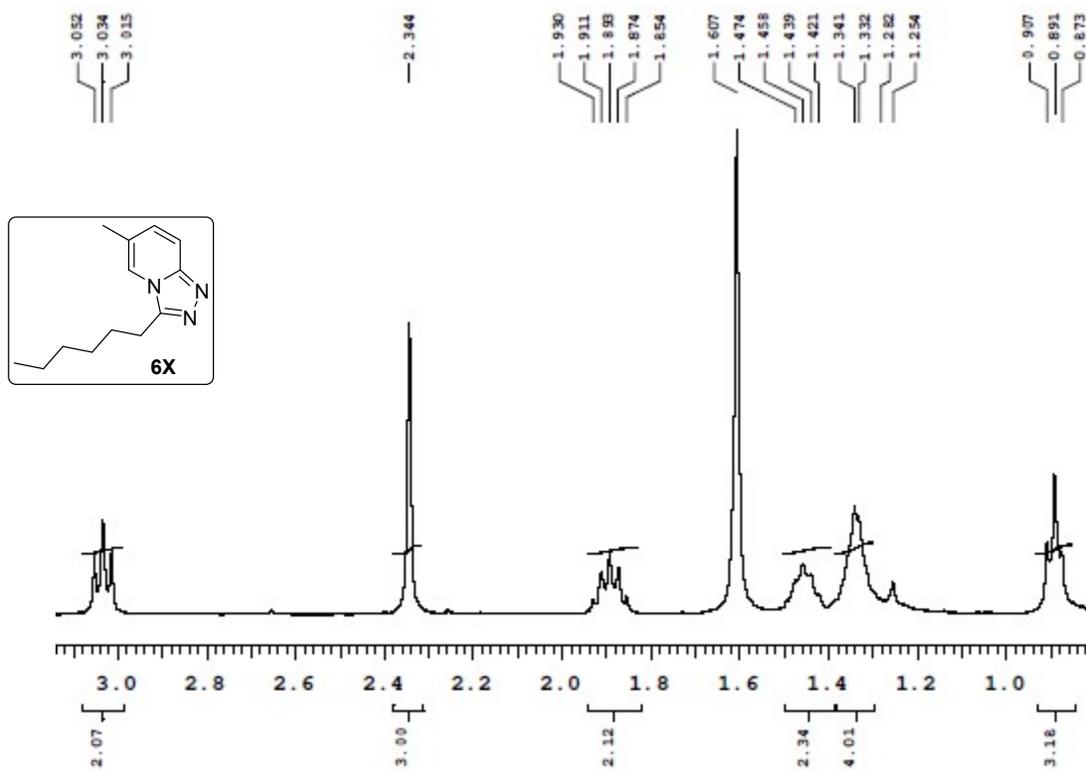


Figure S101. ¹H NMR Spectra expansion for compound 6x in CDCl₃

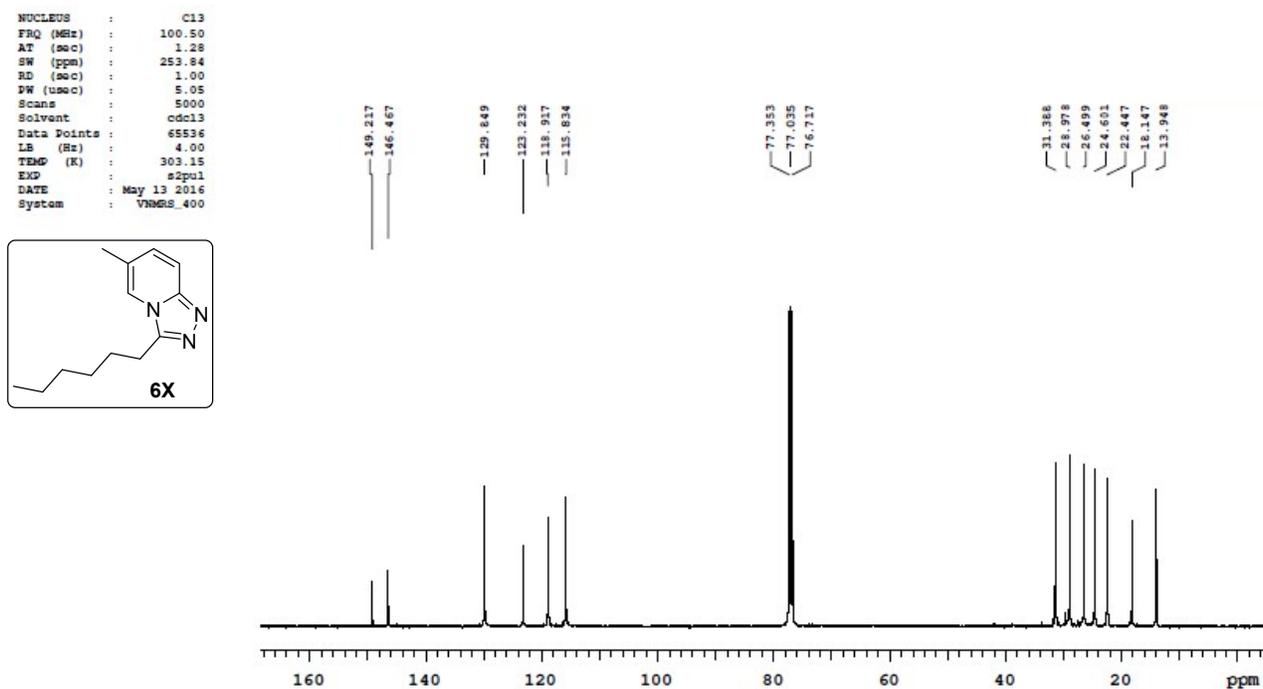


Figure S102. ¹³C NMR Spectra for compound 6x in CDCl₃

NUCLEUS : H1
 FRQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FW (usec) : 6.60
 Scans : 64
 Solvent : dmsc
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Jan 5 2016
 System : VNMR5_400

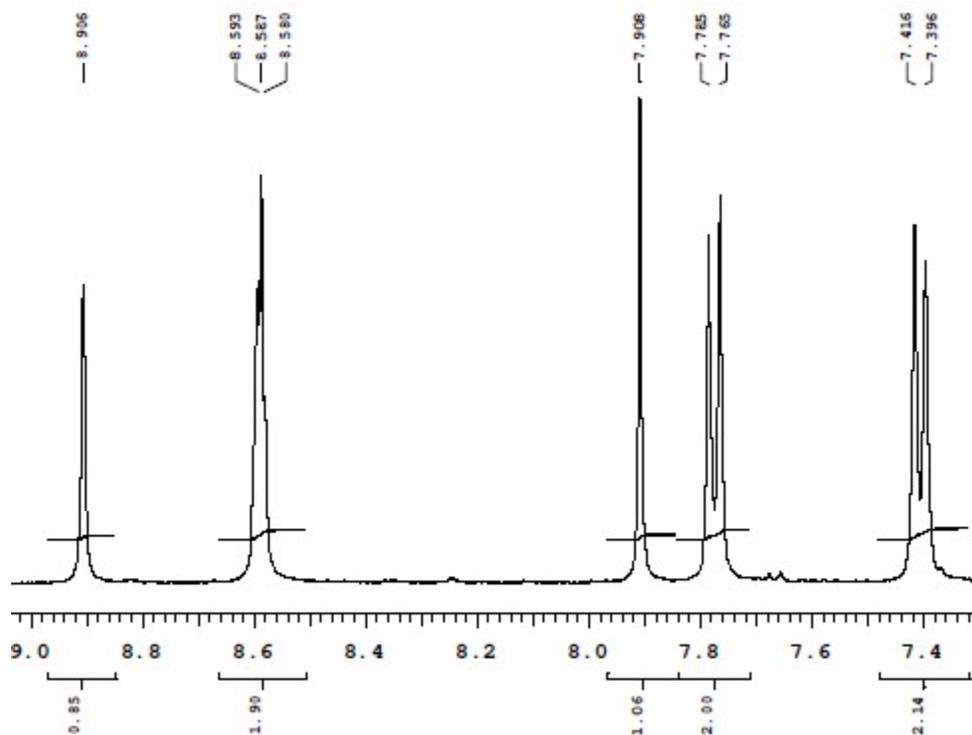
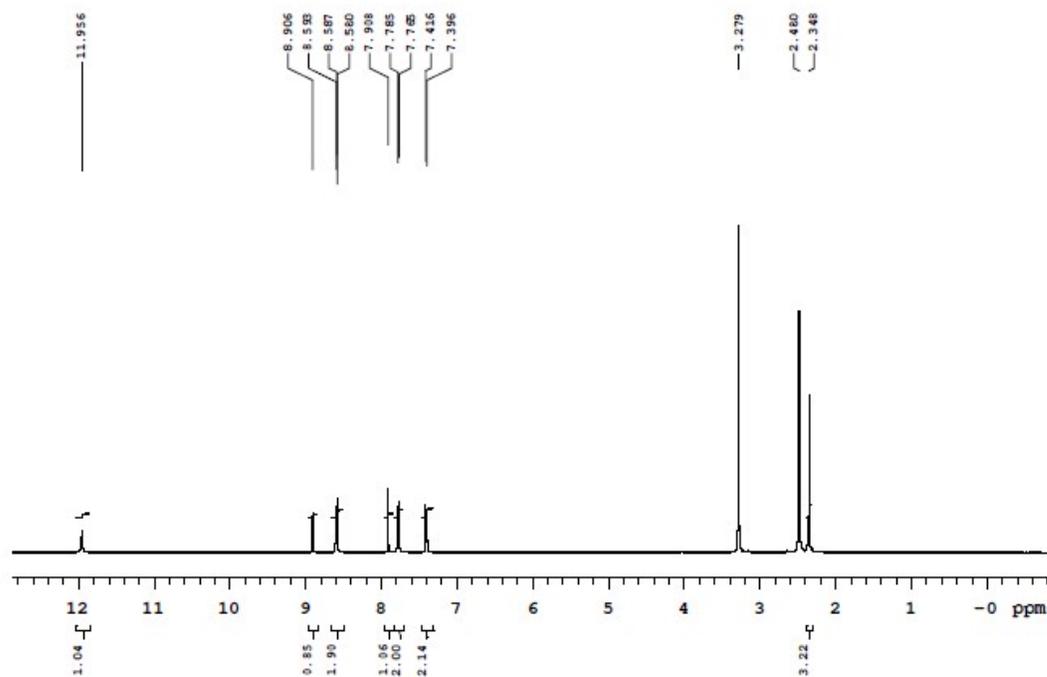
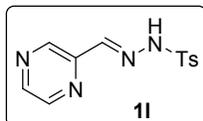


Figure S103. ^1H NMR Spectra & its expansion for compound **11** in $\text{DMSO-}d_6$

NUCLEUS : C13
 FREQ (MHz) : 100.50
 AT (sec) : 1.28
 SW (ppm) : 253.84
 RD (sec) : 1.00
 PW (usec) : 5.05
 Scans : 1600
 Solvent : dmsc
 Data Points : 65536
 LS (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Jan 8 2016
 System : VNMR5_400

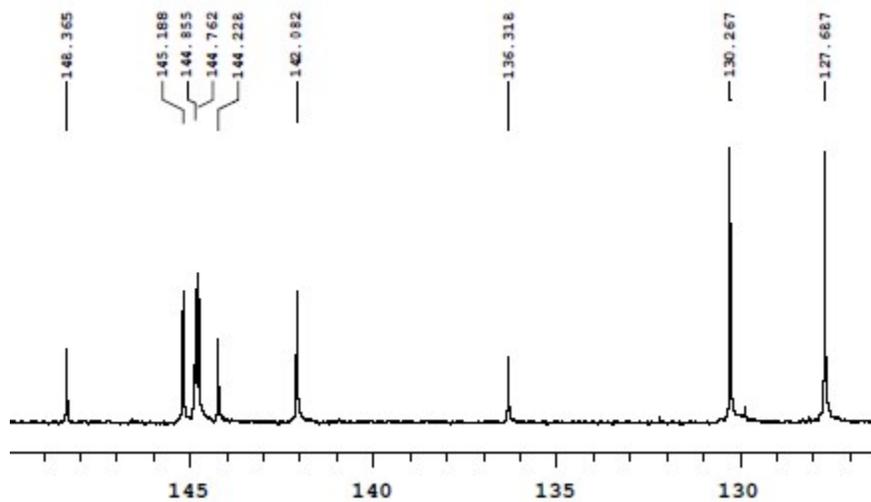
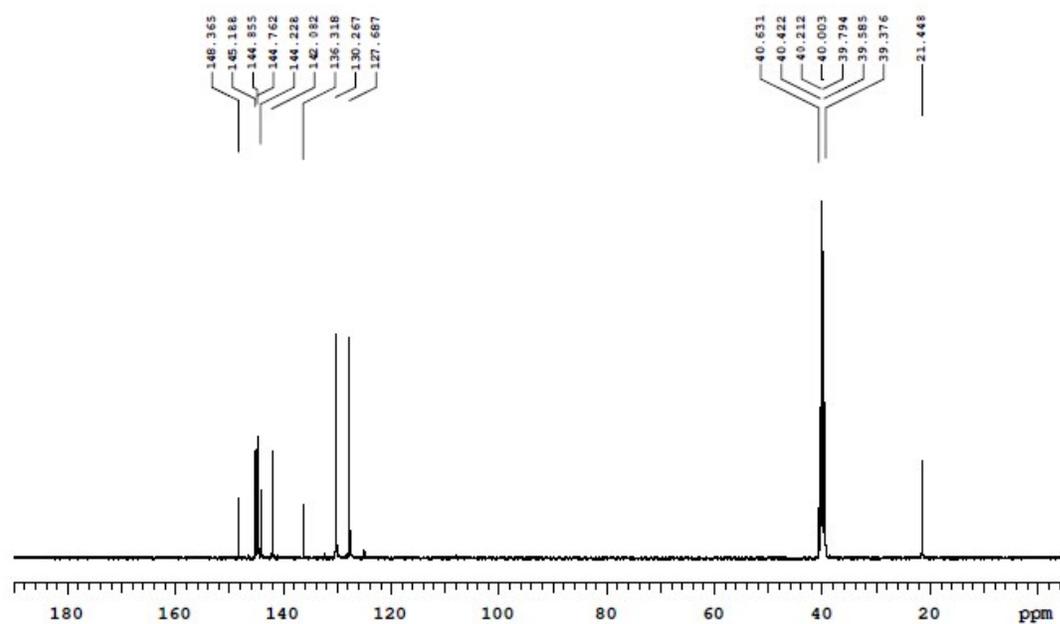
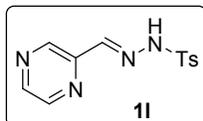


Figure S104. ^{13}C NMR Spectra & its expansion for compound **11** in $\text{DMSO-}d_6$

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 FID (sec) : 6.60
 Scans : 64
 Solvent : DMSO
 Data Points : 32768
 LB (Hz) : 2.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Jan 11 2016
 System : VNMR5_400

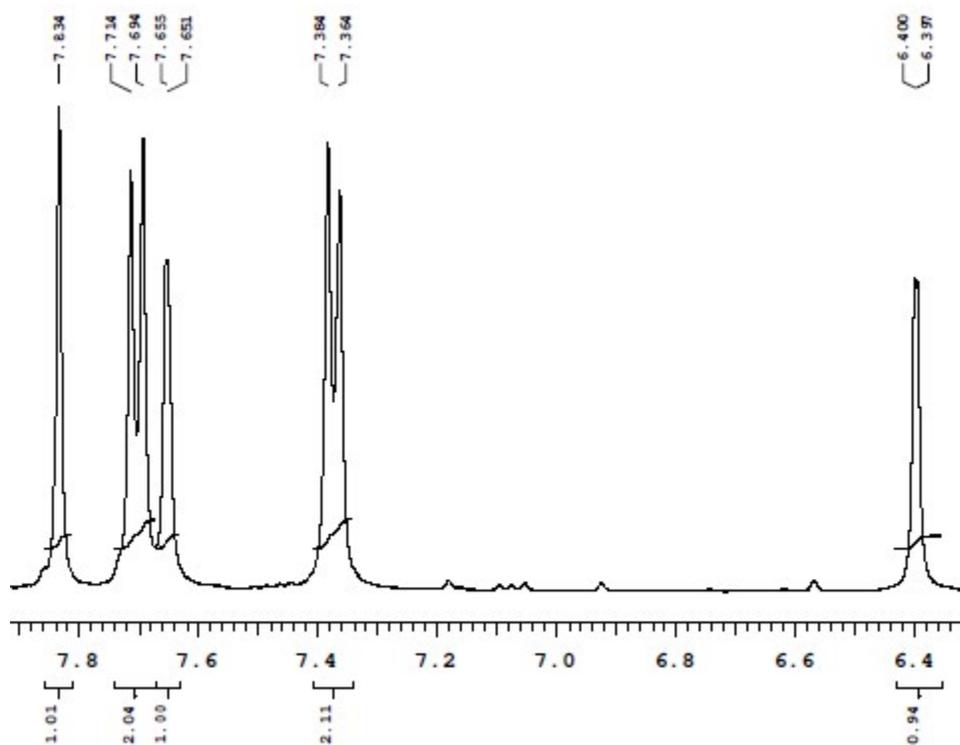
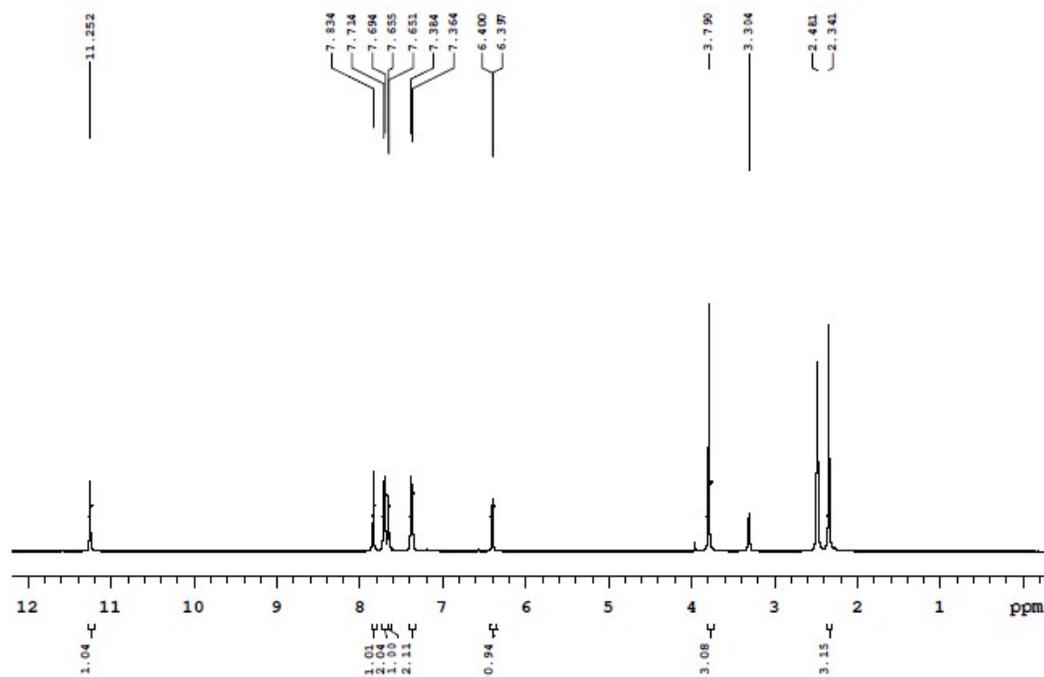
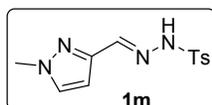


Figure S105. ^1H NMR Spectra & its expansion for compound **1m** in $\text{DMSO-}d_6$

NUCLEUS : C13
FRQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
PW (usec) : 5.05
Scans : 1000
Solvent : dms0
Data Points : 65536
LB (Hz) : 3.00
TEMP (K) : 303.15
EXP : szpol
DATE : Jan 13 2016
System : VNMR5_400

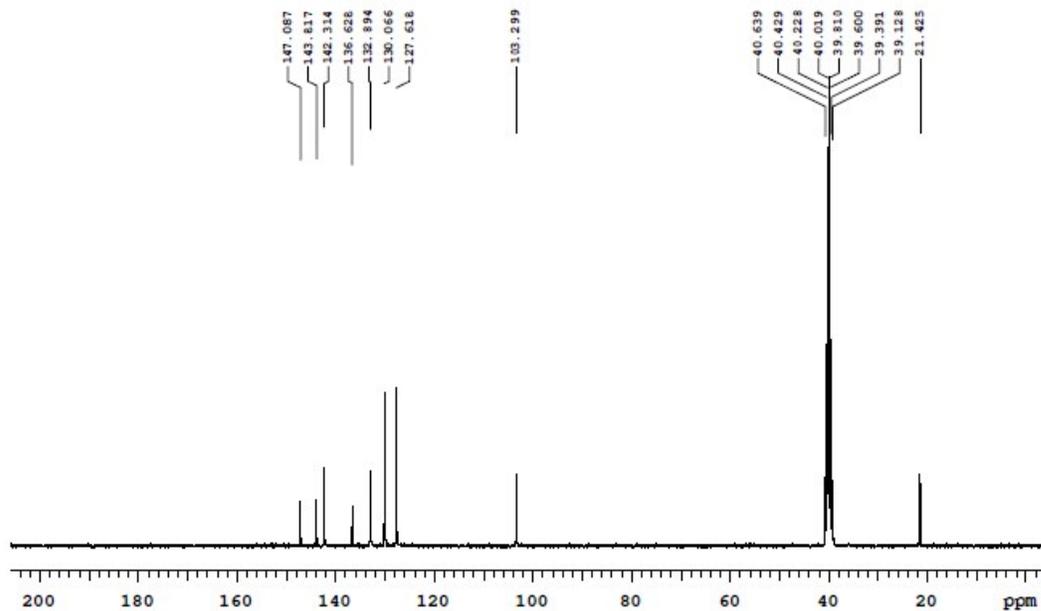
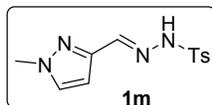


Figure S106. ¹³C NMR Spectra for compound **1m** in DMSO-*d*₆

NUCLEUS : H1
 FREQ (MHz) : 399.64
 AT (sec) : 2.27
 SW (ppm) : 18.08
 RD (sec) : 1.00
 PW (usec) : 6.60
 Scans : 64
 Solvent : dmsd
 Data Points : 32768
 LB (Hz) : 1.00
 TEMP (K) : 303.15
 EXP : s2pul
 DATE : Feb 16 2016
 System : VNMR5_400

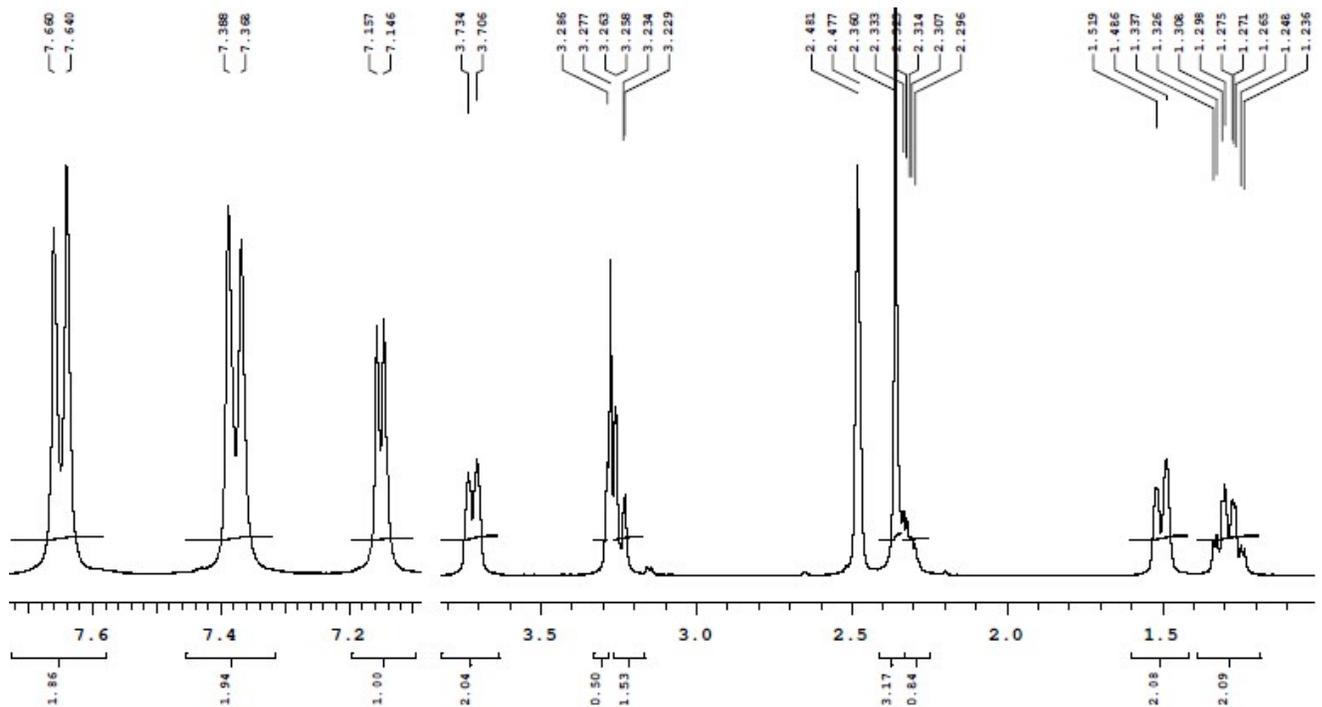
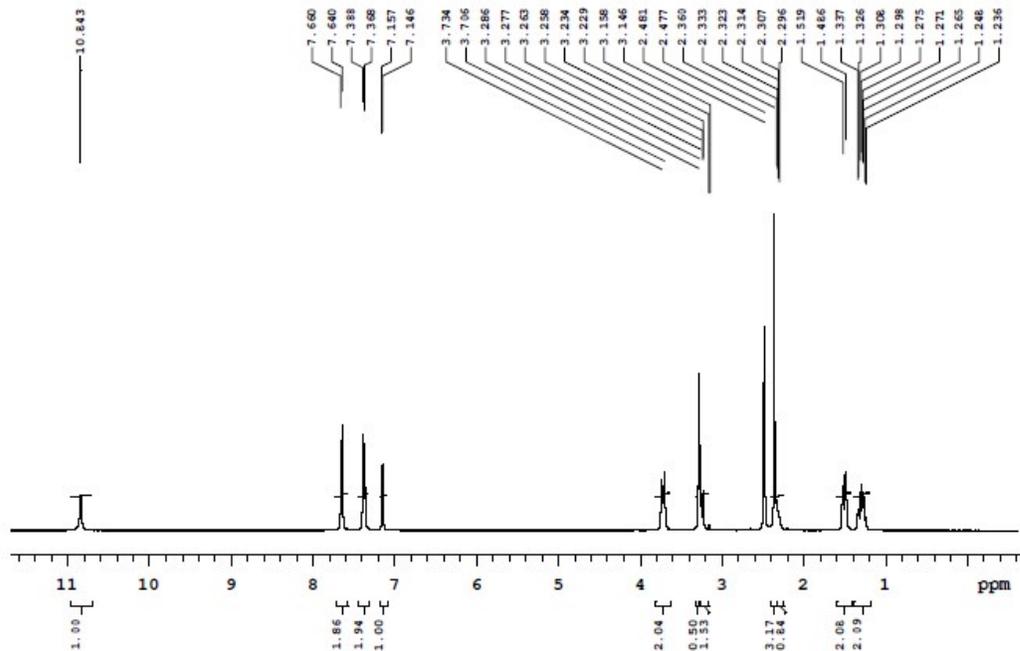
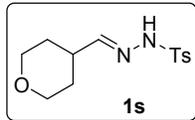


Figure S107. ^1H NMR Spectra & its expansion for compound **1s** in $\text{DMSO-}d_6$

NUCLEUS : C13
FREQ (MHz) : 100.50
AT (sec) : 1.28
SW (ppm) : 253.84
RD (sec) : 1.00
PW (usec) : 5.05
Scans : 1000
Solvent : dms0
Data Points : 65536
LB (Hz) : 3.00
TEMP (K) : 303.15
EXP : s2pu1
DATE : Feb 17 2016
System : VNMR_400

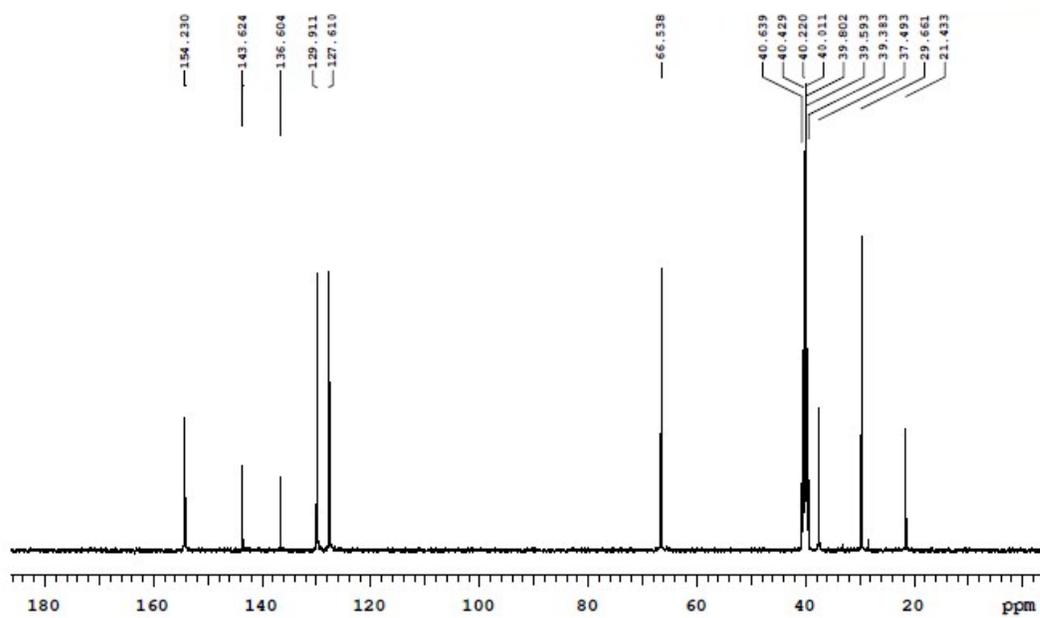
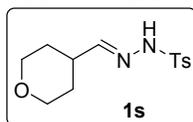


Figure S108. ^{13}C NMR Spectra for compound **1s** in $\text{DMSO-}d_6$