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Supporting Information

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Supporting Information

[Pyridine–SO_3H]$ZnCl_3$; A multi-purpose catalyst for A_3 coupling synthesis of propargylamines under mild condition

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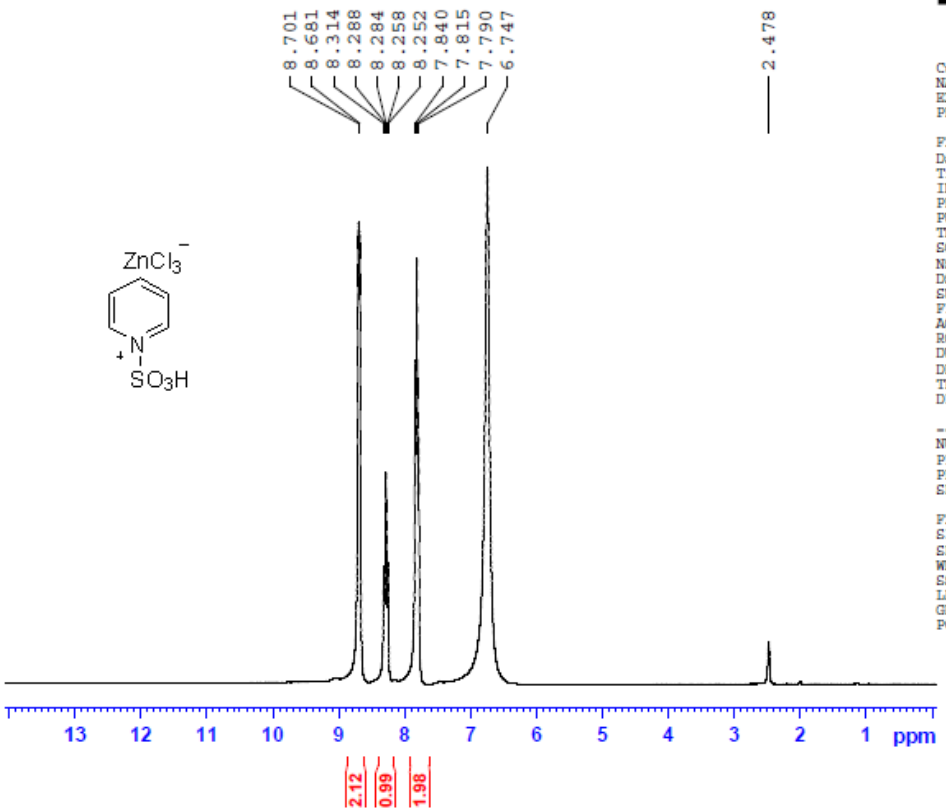
Mohammad-Rezaei-pyridin-ZnCl2-cat



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EXPNO                        71
PROCNO                        1

F2 - Acquisition Parameters
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PROBHD    5 mm Multinucl
PULPROG                      zg
TD                        16384
SOLVENT                    DMSO
NS                           20
DS                            0
SWH                    6265.664 Hz
FIDRES                 0.382426 Hz
AQ                     1.3074932 sec
RG                           32
DW                       79.800 usec
DE                        6.00 usec
TE                       300.0 K
D1                    2.00000000 sec

======== CHANNEL f1 ========
NUC1                         1H
P1                        9.00 usec
PL1                       3.00 dB
SFO1                250.1320010 MHz

F2 - Processing parameters
SI                        32768
SF                  250.1300000 MHz
WDW                          EM
SSB                           0
LB                        0.60 Hz
GB                            0
PC                        1.00
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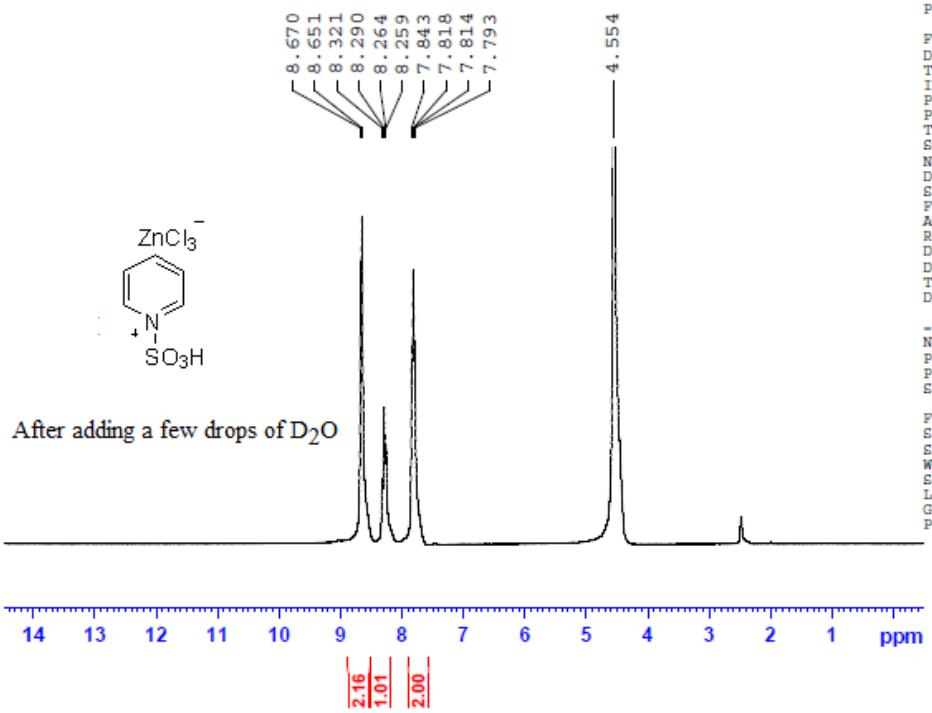
Mohammad-Rezaei-pyridin-ZnCl2-cat-D2O



BRUKER

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EXPNO                       73
PROCNO                       1

F2 - Acquisition Parameters
Date_               20180808
Time                    9.27
INSTRUM                spect
PROBHD    5 mm Multinucl
PULPROG                   zg
TD                     16384
SOLVENT                DMSO
NS                       20
DS                        0
SWH                6265.664 Hz
FIDRES            0.382426 Hz
AQ                1.3074932 sec
RG                       32
DW                   79.800 usec
DE                    6.00 usec
TE                   300.0 K
D1               2.00000000 sec

======== CHANNEL f1 ========
NUC1                     1H
P1                    9.00 usec
PL1                   3.00 dB
SFO1           250.1320010 MHz

F2 - Processing parameters
SI                       32768
SF             250.1300000 MHz
WDW                      EM
SSB                       0
LB                    0.00 Hz
GB                        0
PC                    1.00
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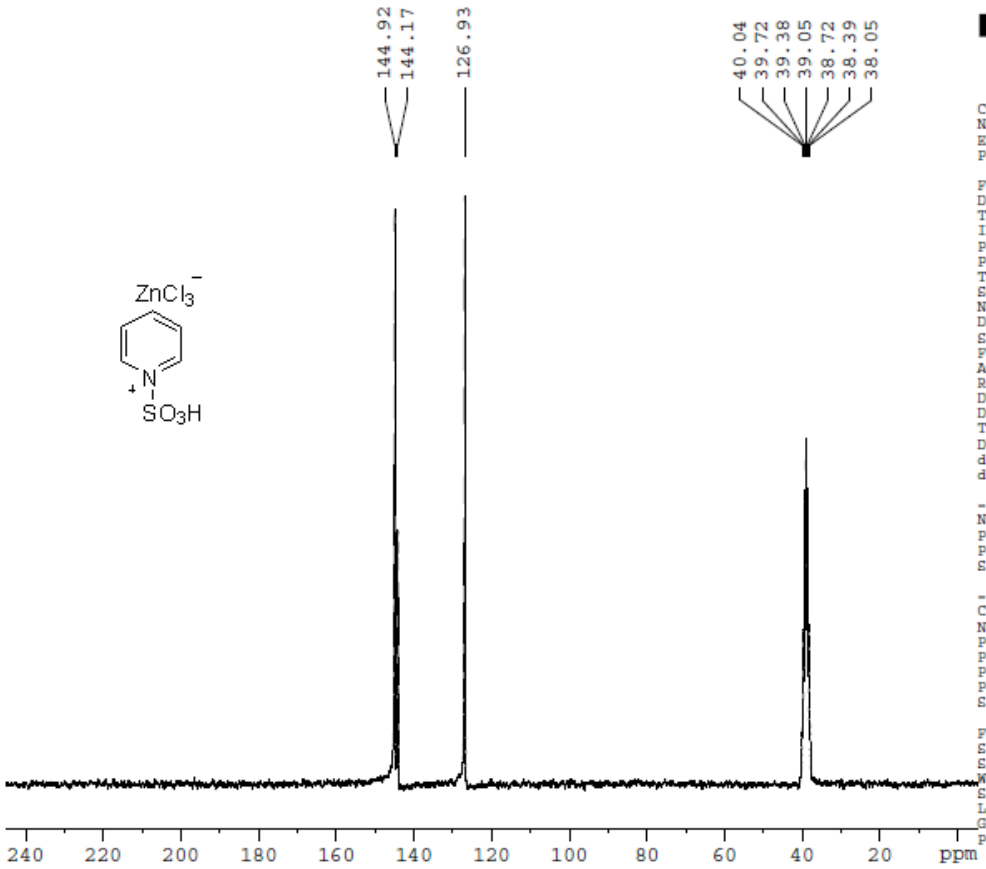
Rezaei-cat-pyridine-ZnCl2



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PROCNO                        1

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Time                      10.19
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PULPROG                   zgpg
TD                       65536
SOLVENT                   DMSO
NS                        1000
DS                           0
SWH                  15723.271 Hz
FIDRES                0.239918 Hz
AQ                    2.0840948 sec
RG                       1625.5
DW                       31.800 usec
DE                        6.00 usec
TE                       300.0 K
D1                   2.00000000 sec
d11                  0.03000000 sec
d12                  0.00002000 sec

======== CHANNEL f1 ========
NUC1                        13C
P1                        10.00 usec
PL1                        0.00 dB
SFO1                62.9027864 MHz

======== CHANNEL f2 ========
CPDPRG2                 waltz16
NUC2                        1H
PCPD2                     80.00 usec
PL2                        3.00 dB
PL12                      21.50 dB
PL13                      23.00 dB
SFO2               250.1310005 MHz

F2 - Processing parameters
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SF                  62.8952390 MHz
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SSB                            0
LB                         6.00 Hz
GB                             0
PC                          1.40
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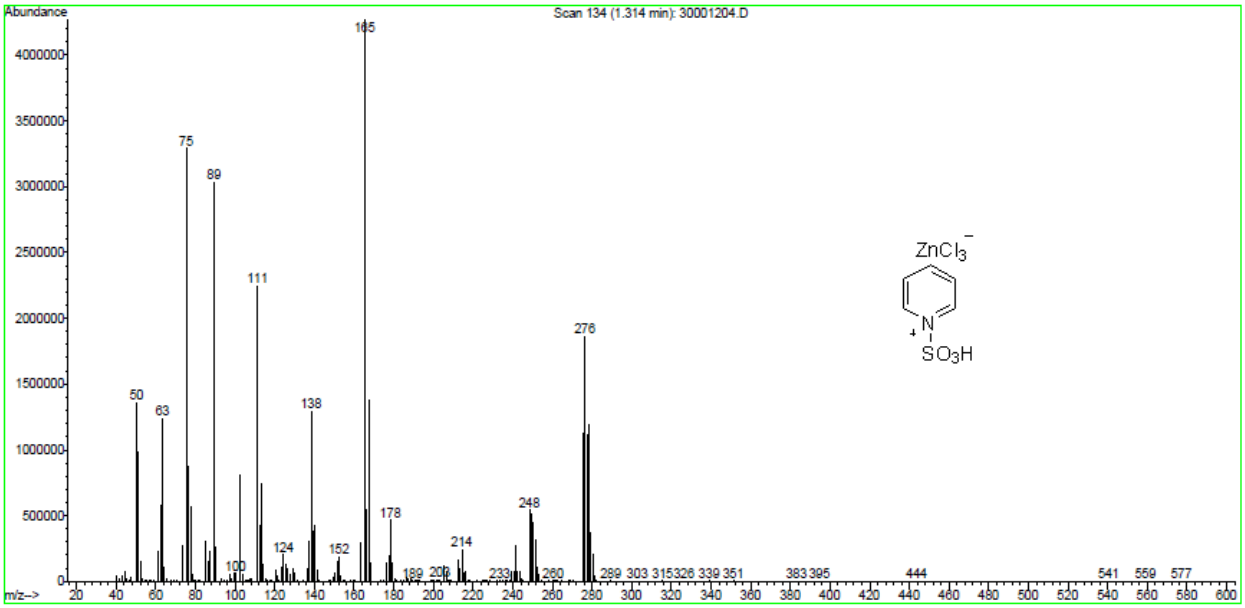
Abundance
Scan 134 (1.314 min): 30001204.D
m/z-->
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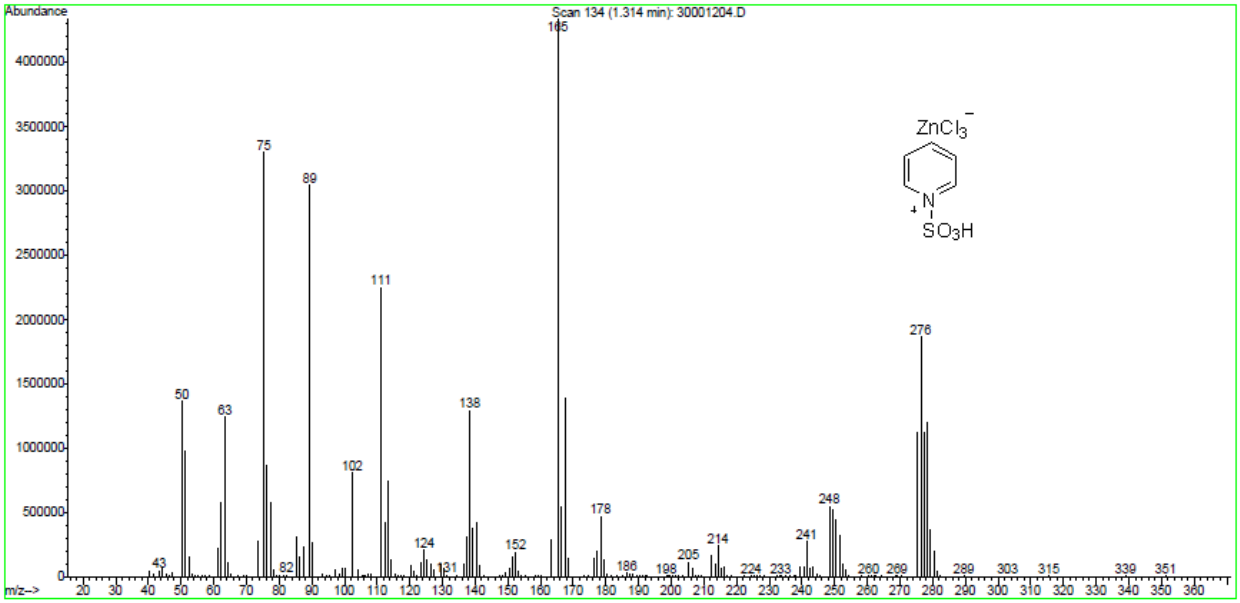
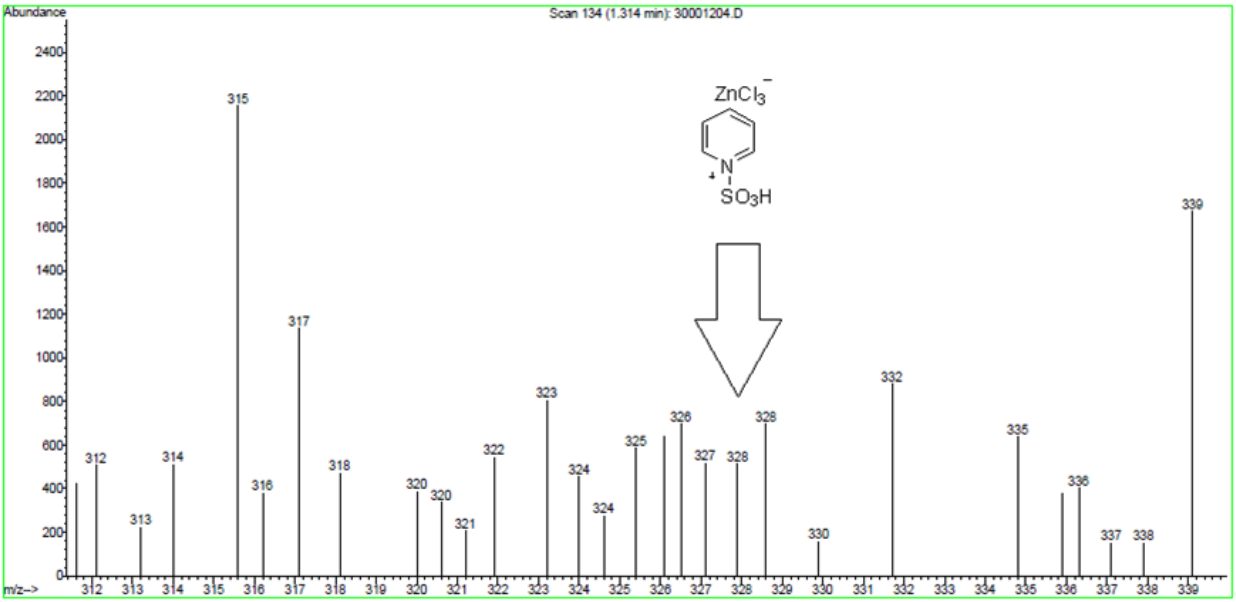
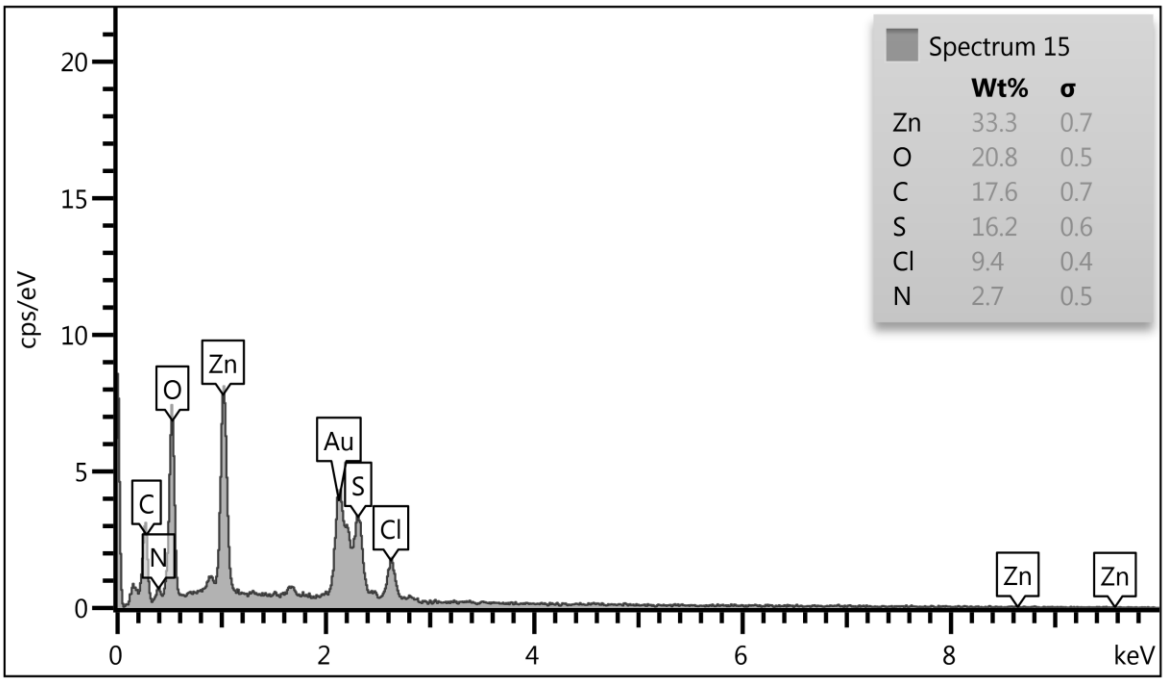
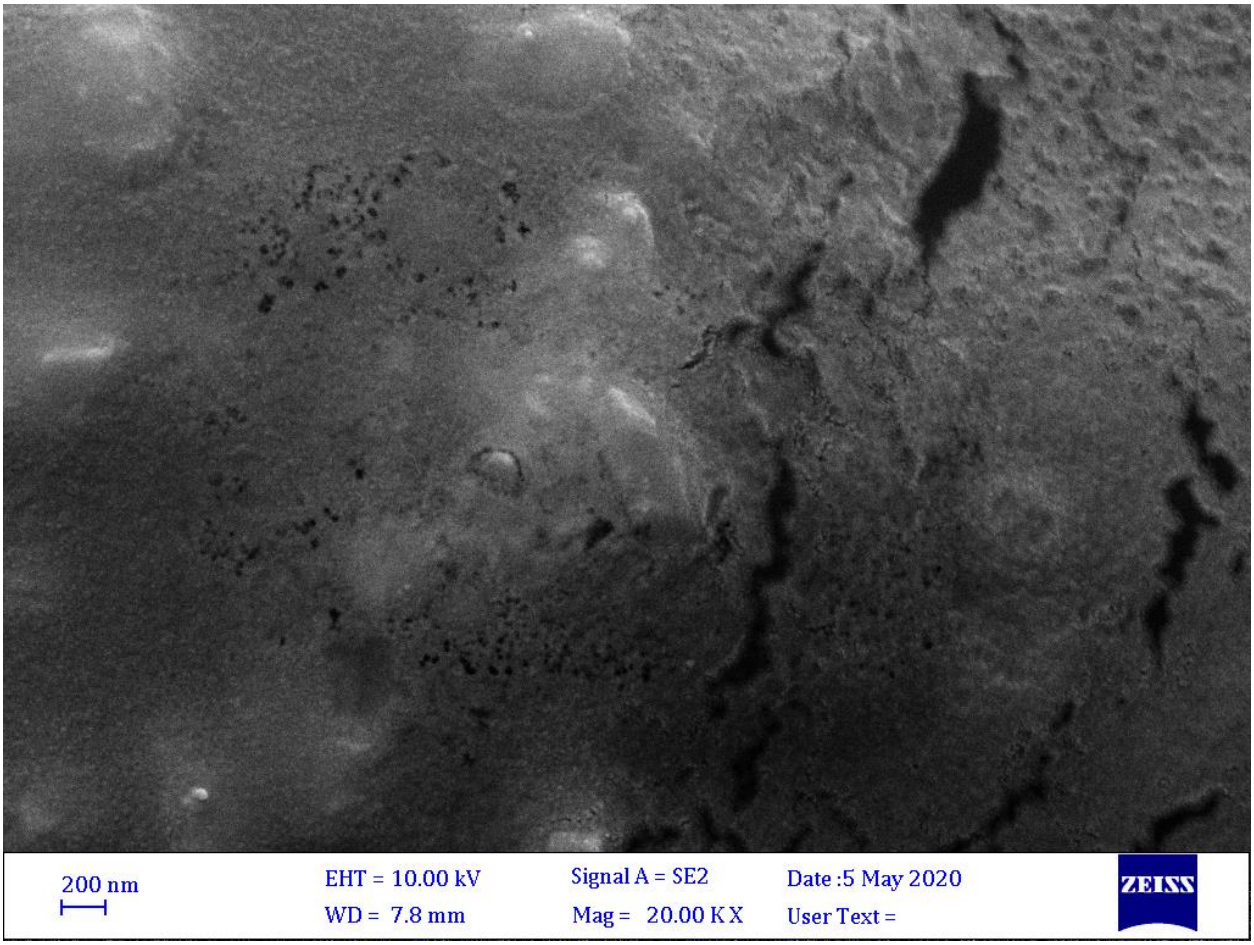
N
SO3H

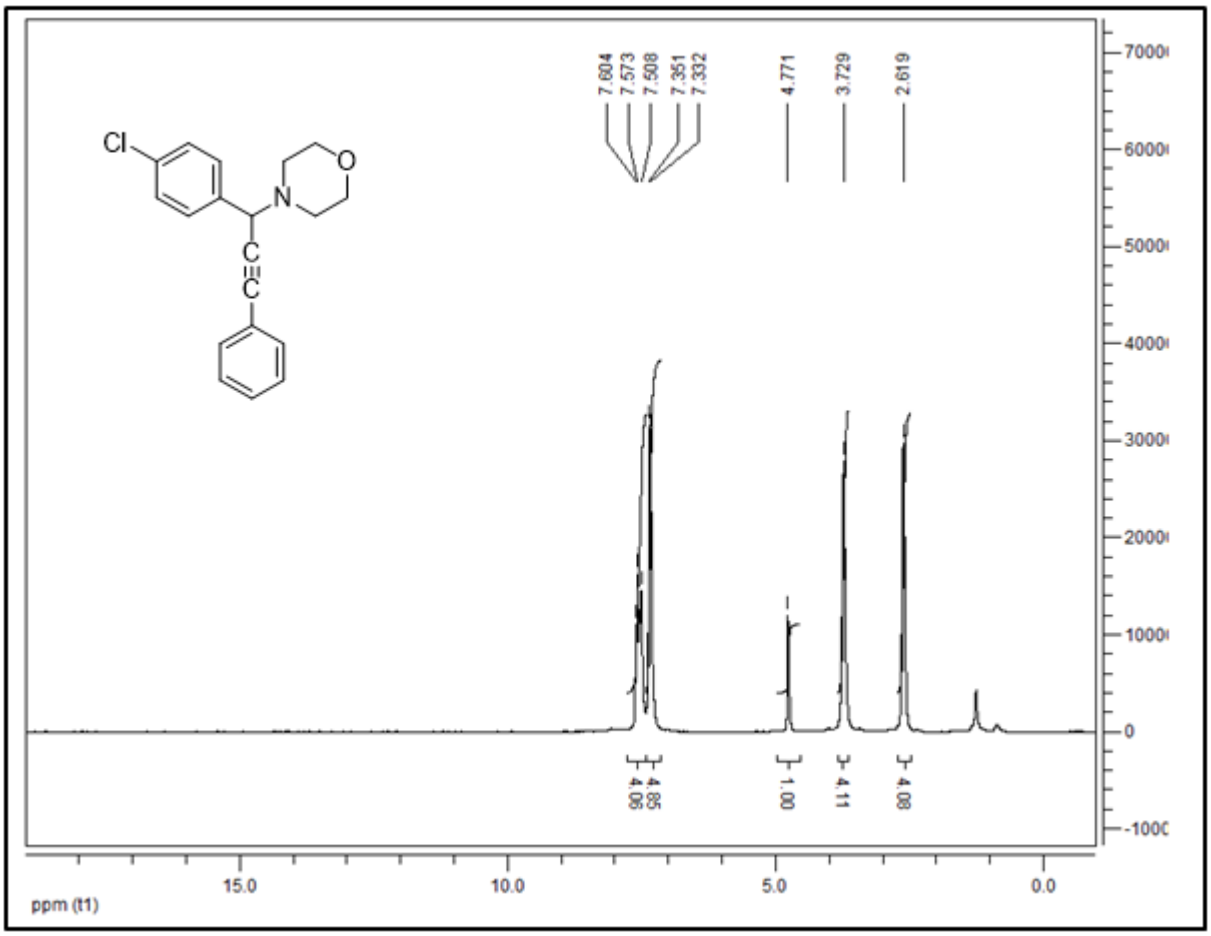

Abundance
Scan 134 (1.314 min): 30001204.D
m/z-->
ZnCl3
N
SO3H


Abundance
Scan 134 (1.314 min): 30001204.D
m/z-->
ZnCl3−
N+
SO3H

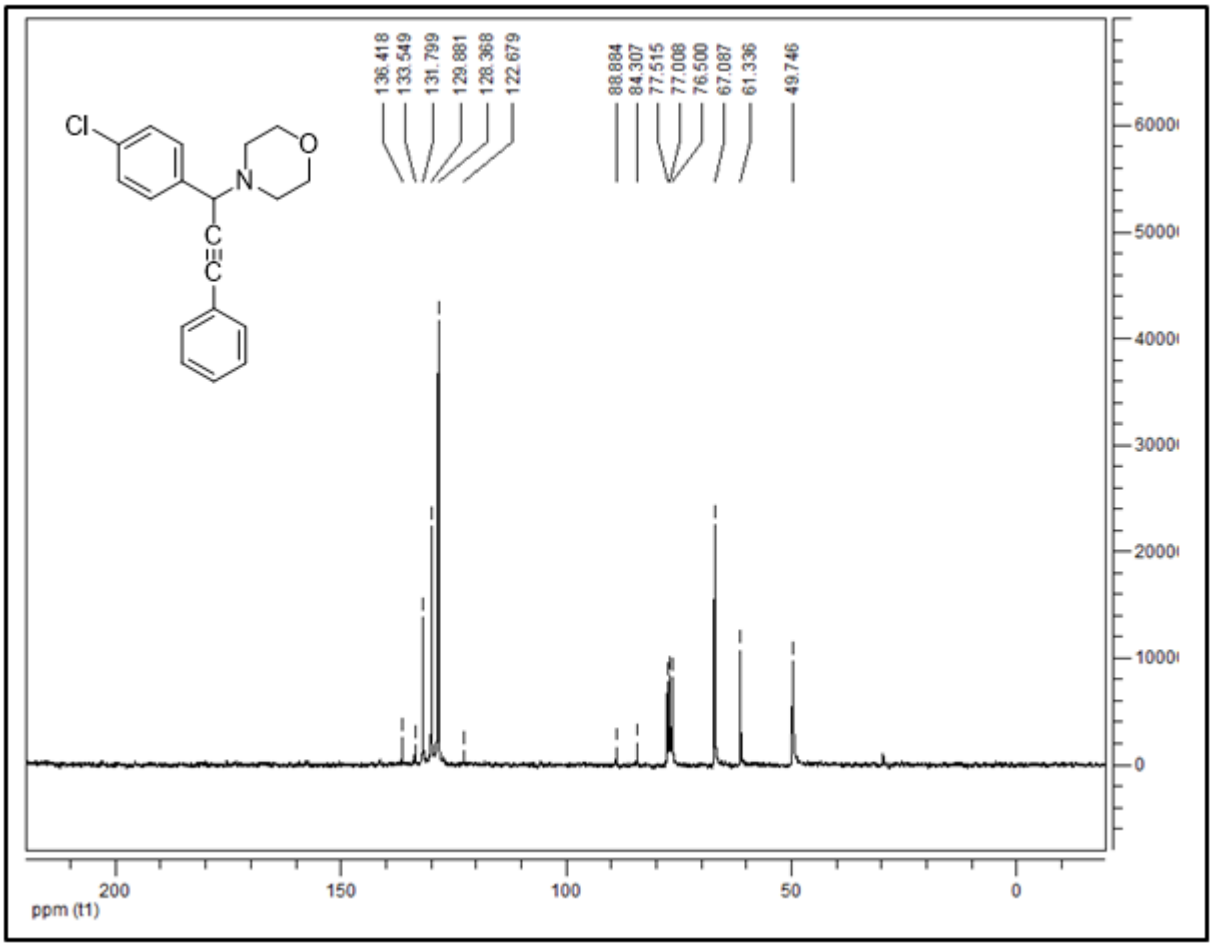

Spectrum 15
Wt% σ
Zn 33.3 0.7
O 20.8 0.5
C 17.6 0.7
S 16.2 0.6
Cl 9.4 0.4
N 2.7 0.5
cps/eV
keV
C
O
N
Zn
Au
S
Cl
Zn
Zn


200 nm
EHT = 10.00 kV
WD = 7.8 mm
Signal A = SE2
Mag = 20.00 K X
Date :5 May 2020
User Text =
ZEISS

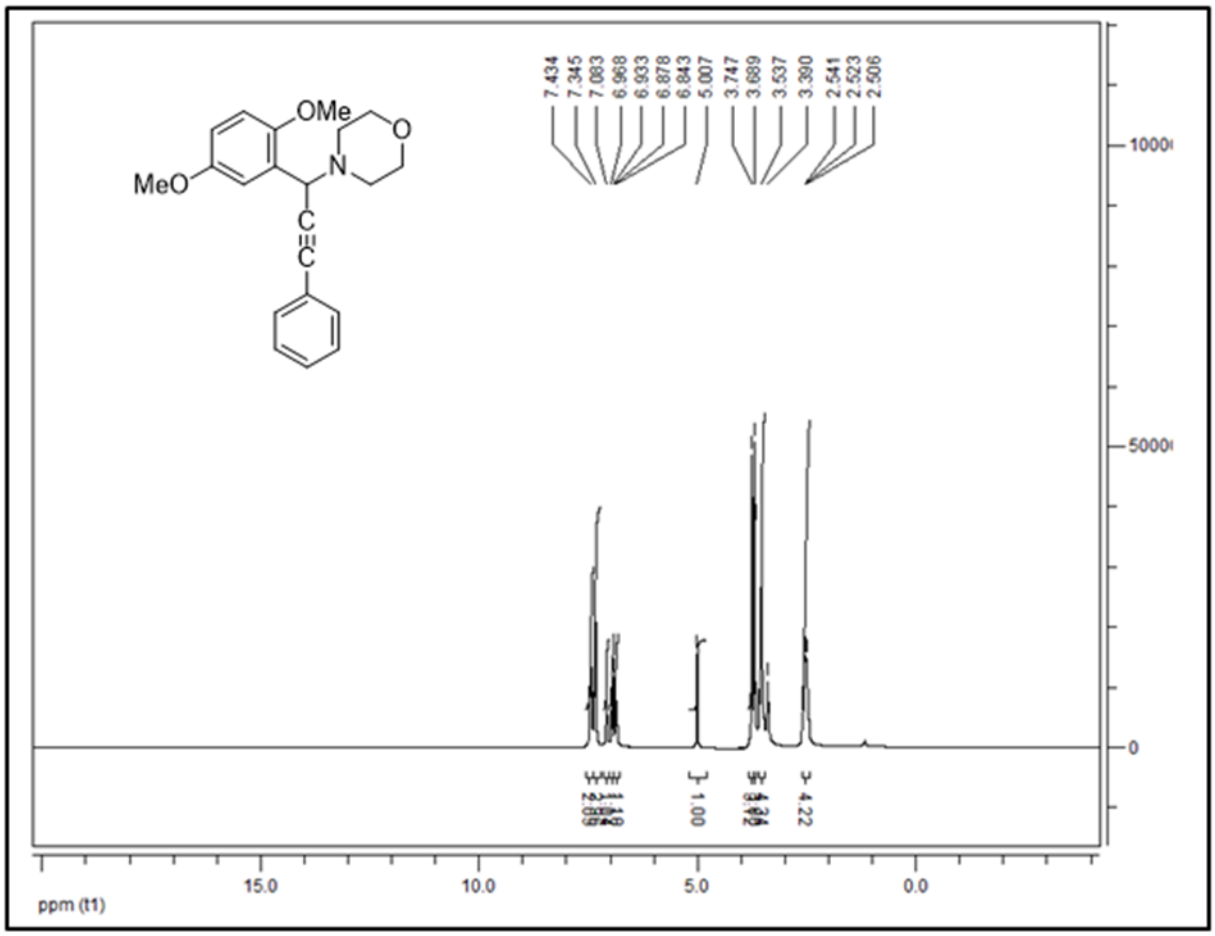
^{1}H NMR (250 MHz, DMSO-d_6):



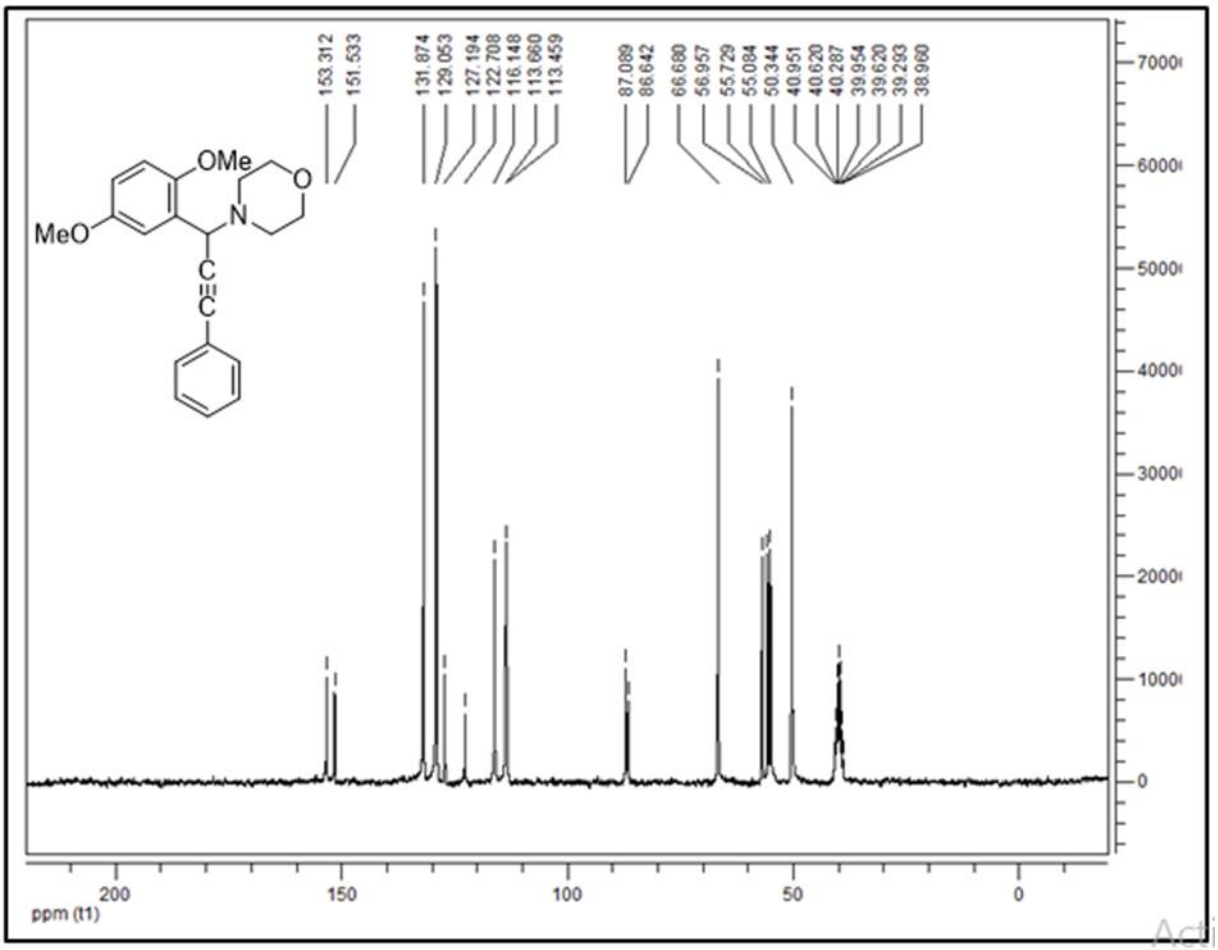
^{13}CNMR (62.5 MHz; DMSO-d_6)



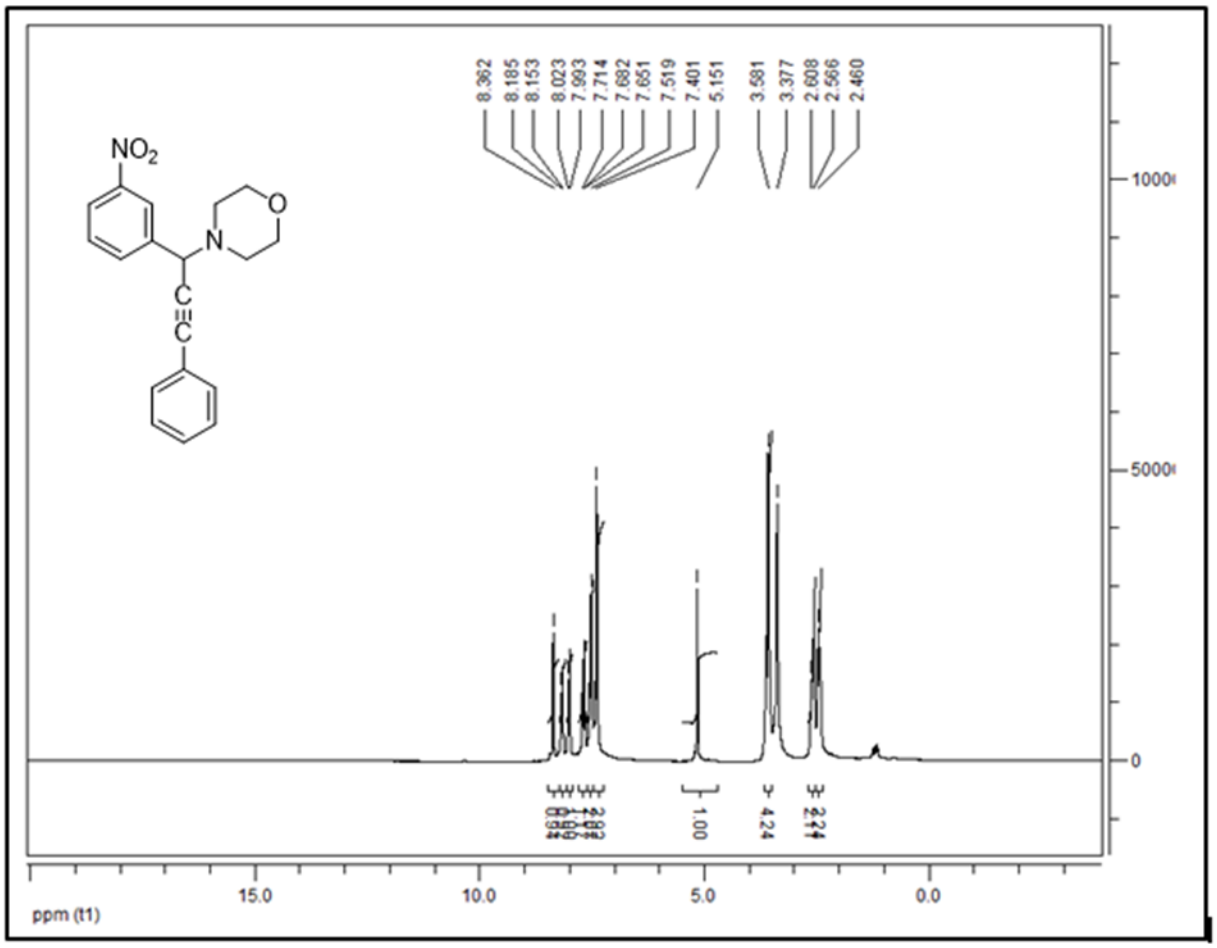
^{1}H NMR (250 MHz, DMSO-d_6):



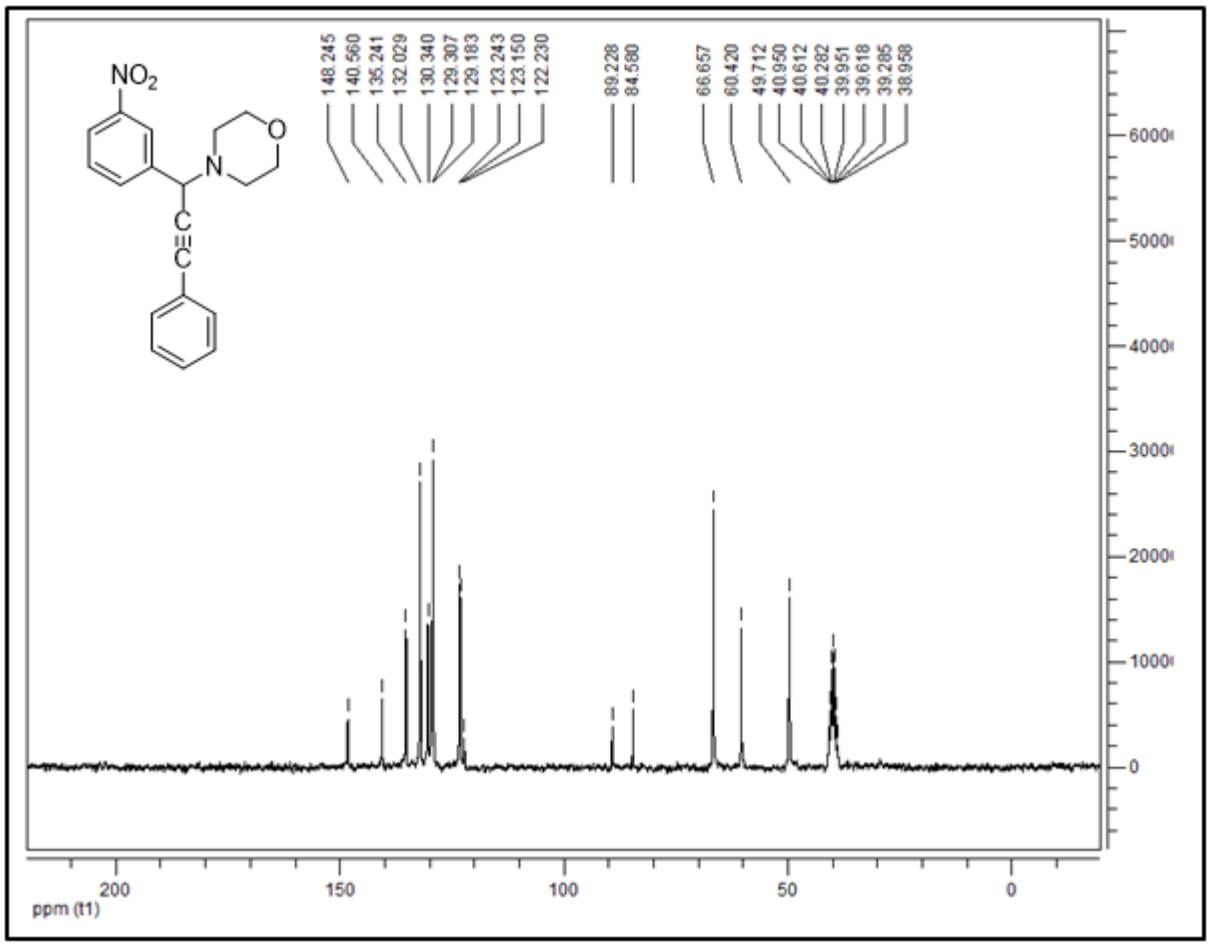
^{13}CNMR (62.5 MHz; DMSO-d_6)



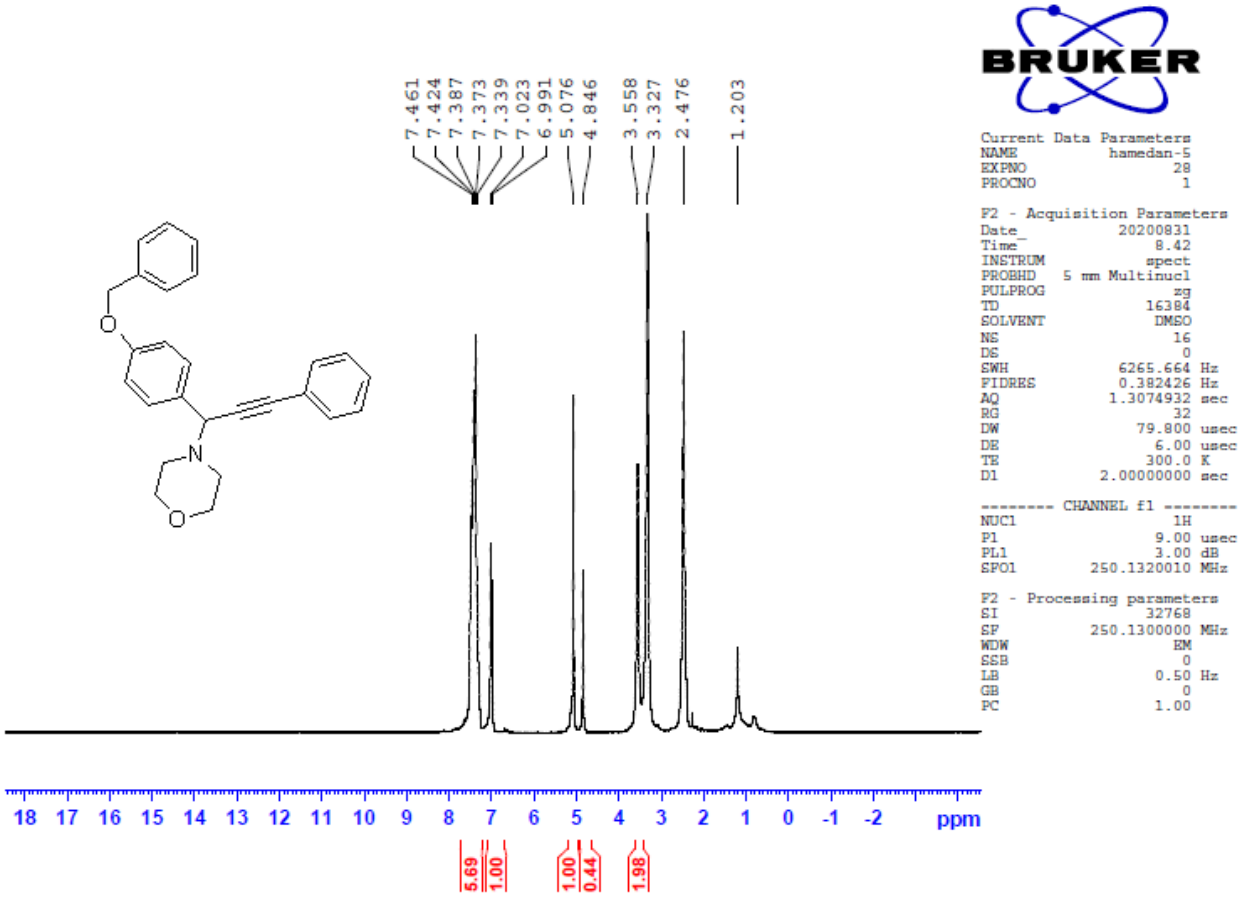
^{1}H NMR (250 MHz, DMSO-d_6):



^{13}CNMR (62.5 MHz; DMSO-d_6)



^{1}H NMR (250 MHz, DMSO-d_6):



BRUKER

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PROCNO                        1

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PULPROG                     zg
TD                       16384
SOLVENT                   DMSO
NS                           16
DS                            0
SWH                   6265.664 Hz
FIDRES                0.382426 Hz
AQ                    1.3074932 sec
RG                           32
DW                      79.800 usec
DE                       6.00 usec
TE                      300.0 K
D1                    2.00000000 sec

======== CHANNEL f1 ========
NUC1                         1H
P1                       9.00 usec
PL1                      3.00 dB
SFO1                250.1320010 MHz

F2 - Processing parameters
SI                       32768
SF                  250.1300000 MHz
WDW                         EM
SSB                           0
LB                       0.50 Hz
GB                            0
PC                         1.00
```