Supporting Information

Photoactive bimetallic framework for direct aminoformylation of nitroarenes

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1. Synthesis of g-C_3N_4 and AgPd@g-C_3N_4 catalyst

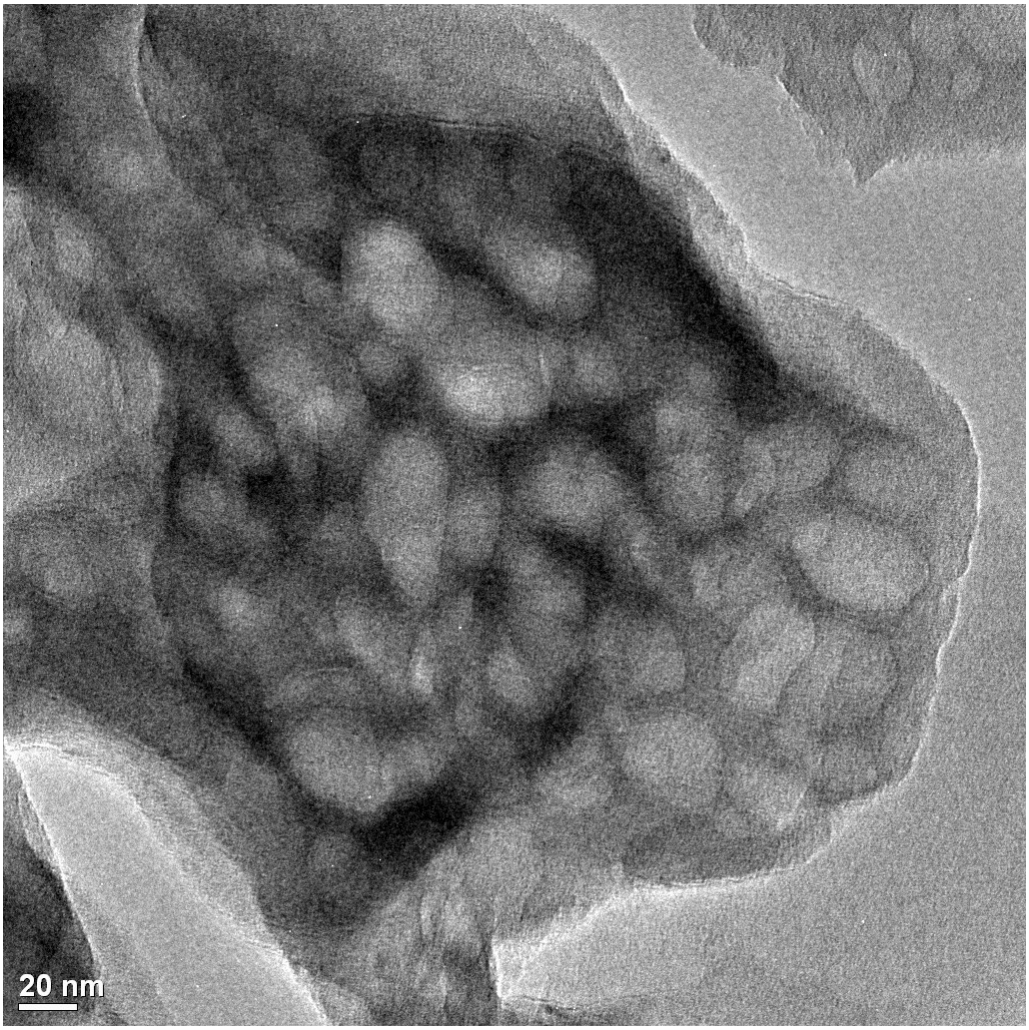
a) Synthesis of g-C_3N_4:

The pure urea obtained from Aldrich was calcinated at 500 ^oC in a closed furnace. A pale yellow solid of pure graphitic carbon nitride (g-C_3N_4) was obtained and used directly as a heterogeneous support in the synthesis of AgPd@g-C_3N_4 catalyst.

b) Synthesis of AgPd@g-C_3N_4 catalyst:

Graphitic carbon nitride, g-C_3N_4 (1000 mg) was dispersed in 500 mL of water using sonication. The aqueous solution of $AgNO_3$ was added in the aqueous suspension of g-C_3N_4. After 10 min, the aqueous solution of $Pd(NO_3)_2$ was added and the reaction mixture was stirred for 12 h. The reaction temperature was raised to 50 ^oC and excess of sodium borohydride ($NaBH_4$) was added in portions to reduce the Ag and Pd salts. The reaction mixture turned black after addition of $NaBH_4$. The stirring of reaction mixture was continued for another 12 hours. The catalyst was filtered off, washed with methanol and dried under vacuum at 50 ^oC. The isolated AgPd@g-C_3N_4 catalyst was than characterized using TEM, SEM, XRD, XPS and ICP-AES analysis.

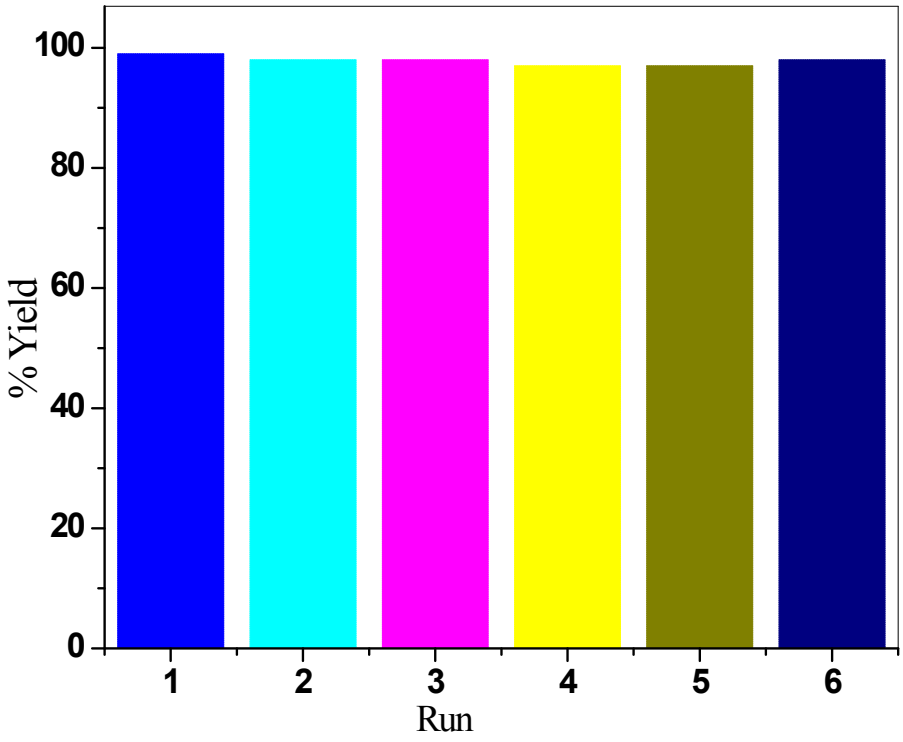
3. TEM image of g-C_3N_4 support



S1 TEM image of g-C_3N_4 support

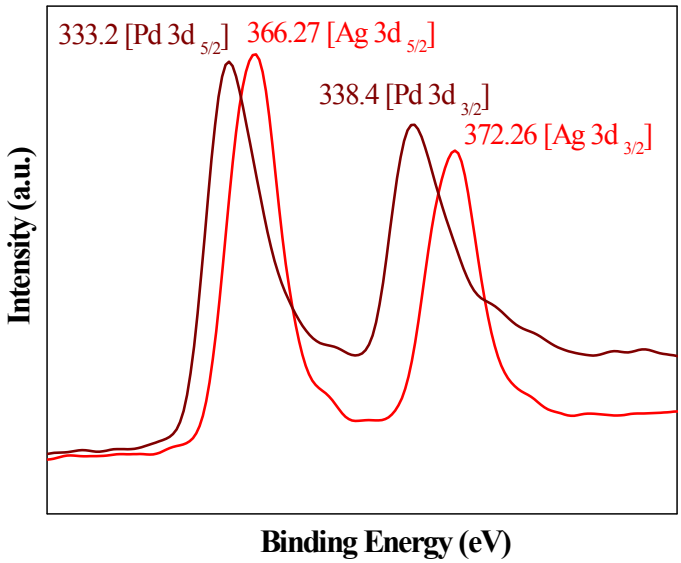
3. Recycling of catalyst:

After the completion of each reaction, the AgPd@g-C_3N_4 catalyst was recovered using centrifuge, washed with water followed by acetone: methanol (1:1) mixture and dried under vacuum and used for the fresh set of reactants. It was observed that the catalyst remains active even after sixth cycle and could be reused several times without losing activity.



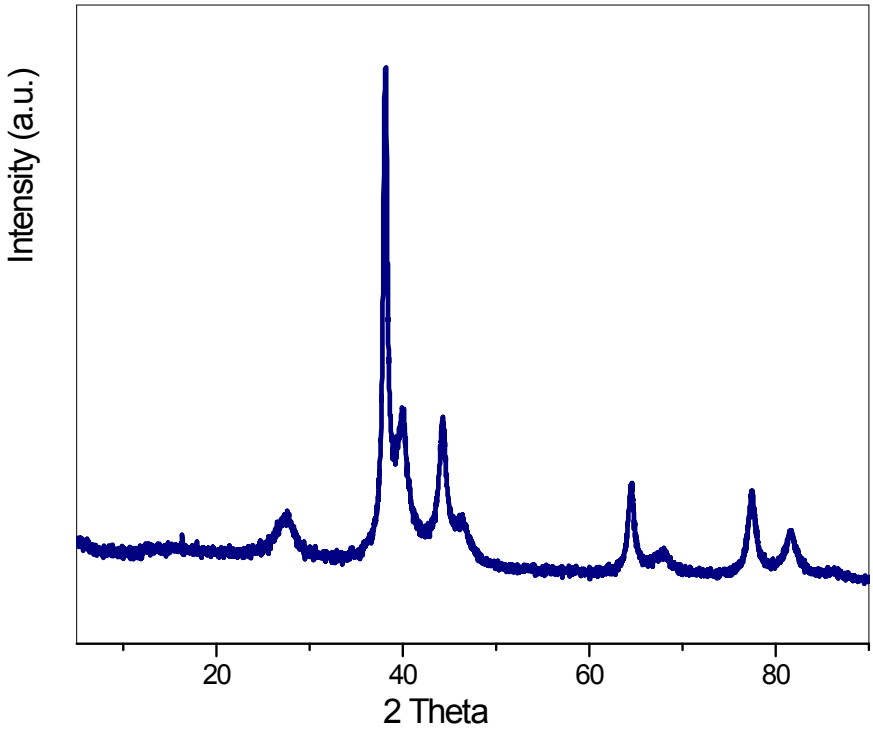
S2 Recycling of AgPd@g-C_3N_4 catalyst

5. XPS spectra of recycled AgPd@g-C_3N_4 catalyst



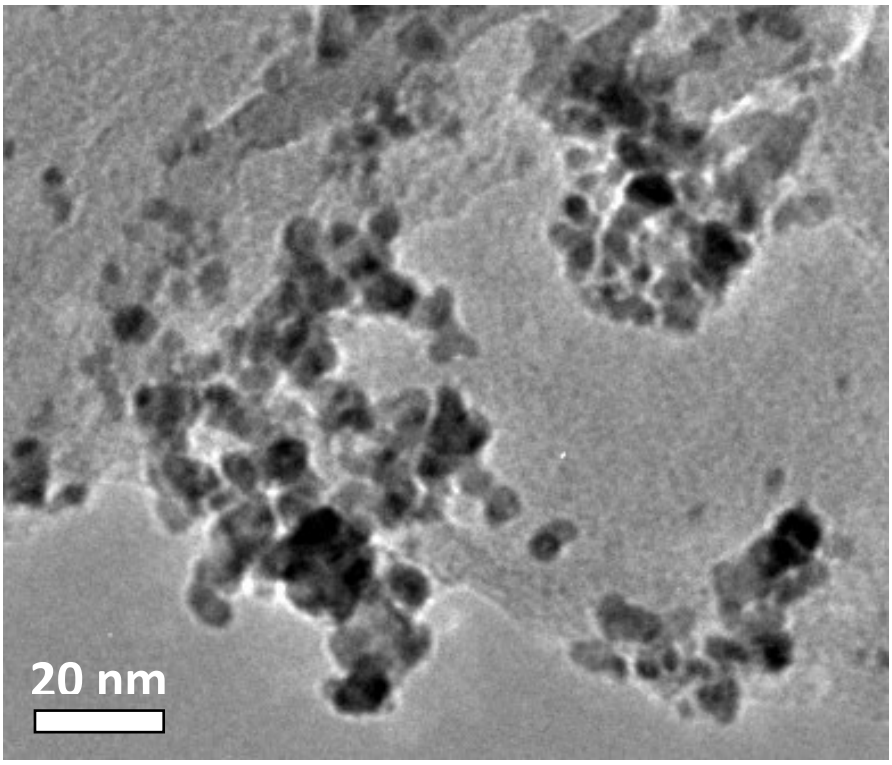
S3 XPS spectra of recycled AgPd@g-C_3N_4 catalyst

6. XRD spectra of recycled AgPd@g-C_3N_4 catalyst



S4 XRD spectra of recycled AgPd@g-C_3N_4 catalyst

7. TEM spectra of recycled AgPd@g-C_3N_4 catalyst



S5 TEM spectra of recycled AgPd@g-C_3N_4 catalyst

GC-MASS Spectra of the product

Table 2, Entry 1

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Operator   : kt
Acquired   : 10 Nov 2015  12:25 pm using AcqMethod SAMPLES- 20 MIN_20151015_A.M
Instrument :    Instrument #1
Sample Name: ns 90tyr
Misc Info  :
Vial Number: 15
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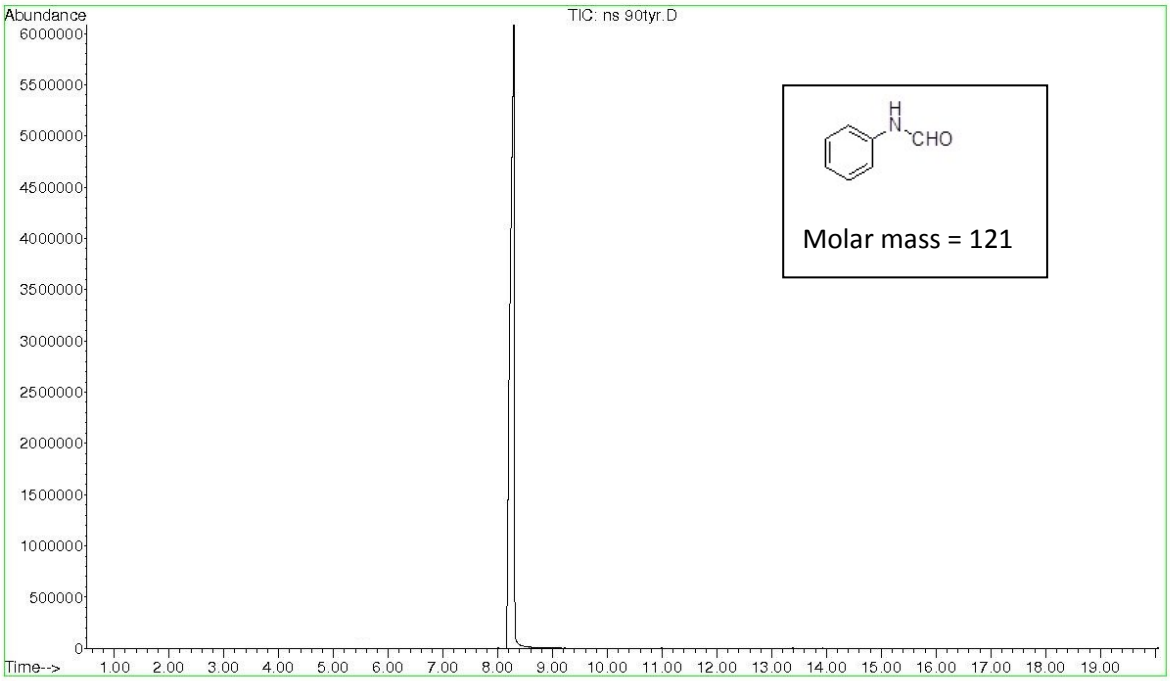

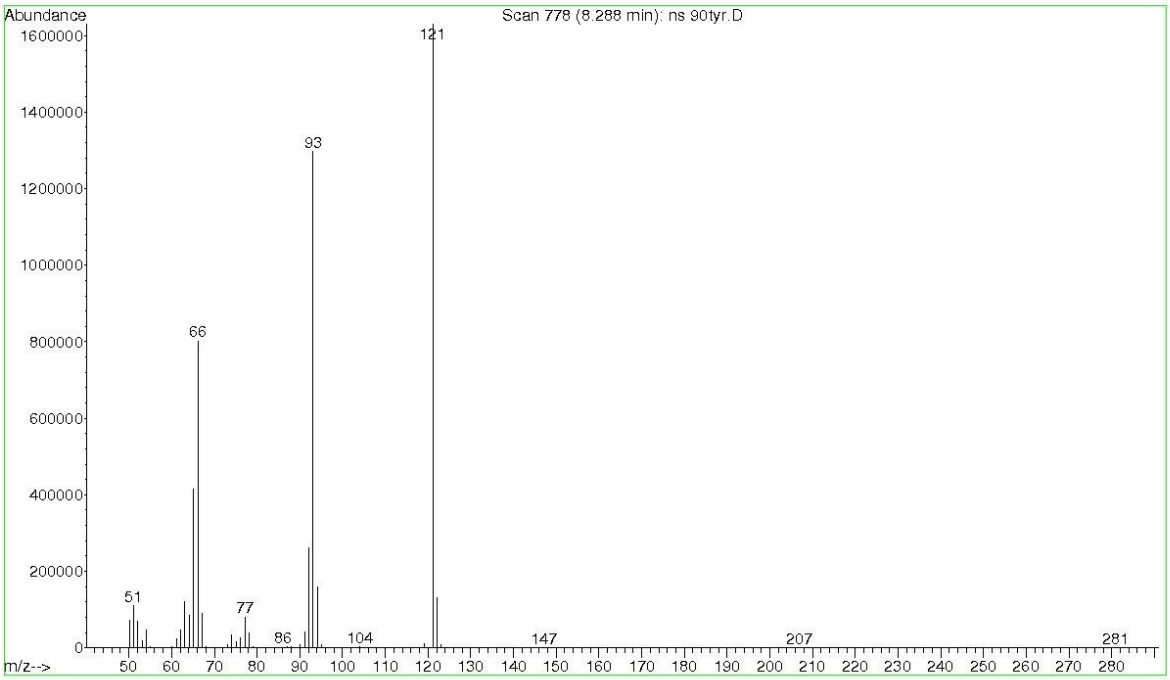

Table 2, Entry 2

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File       :C:\Sanny\Data\NS 139 RT.D
Operator   : kt
Acquired   : 12 Nov 2015  12:10 pm using AcqMethod SAMPLES- 20 MIN_20151015_A.M
Instrument :    Instrument #1
Sample Name: NS 139 RT
Misc Info  :
Vial Number: 16
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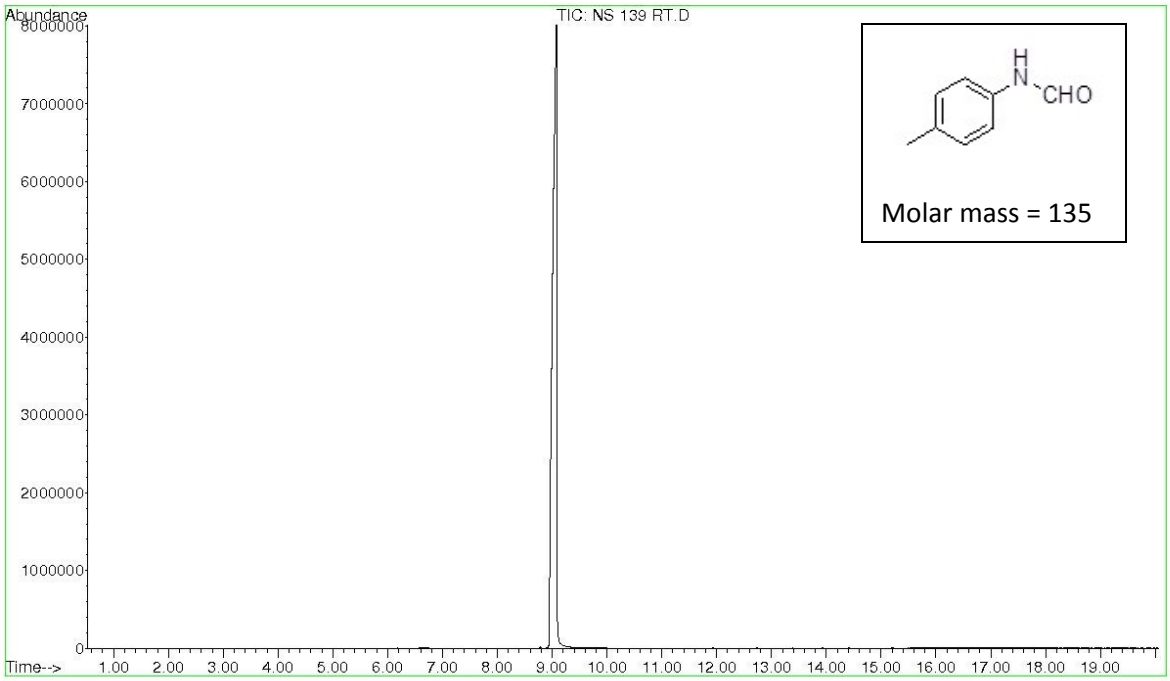

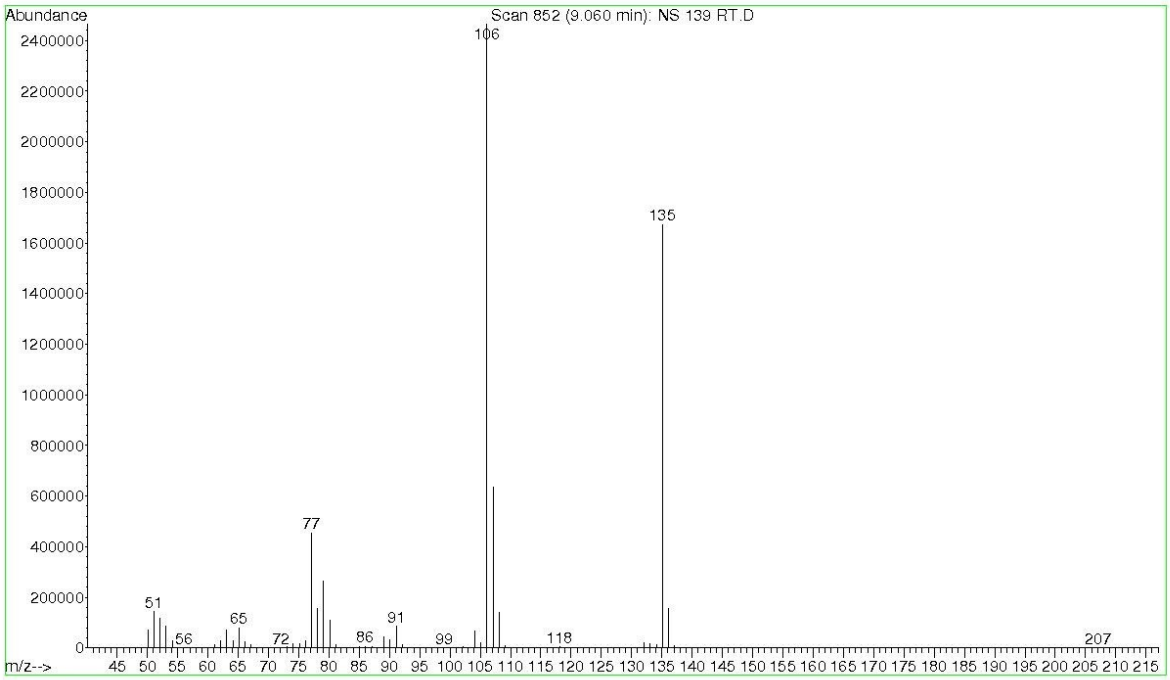

Table 2, Entry 4

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Instrument :    Instrument #1
Sample Name: NS93
Misc Info  :
Vial Number: 7
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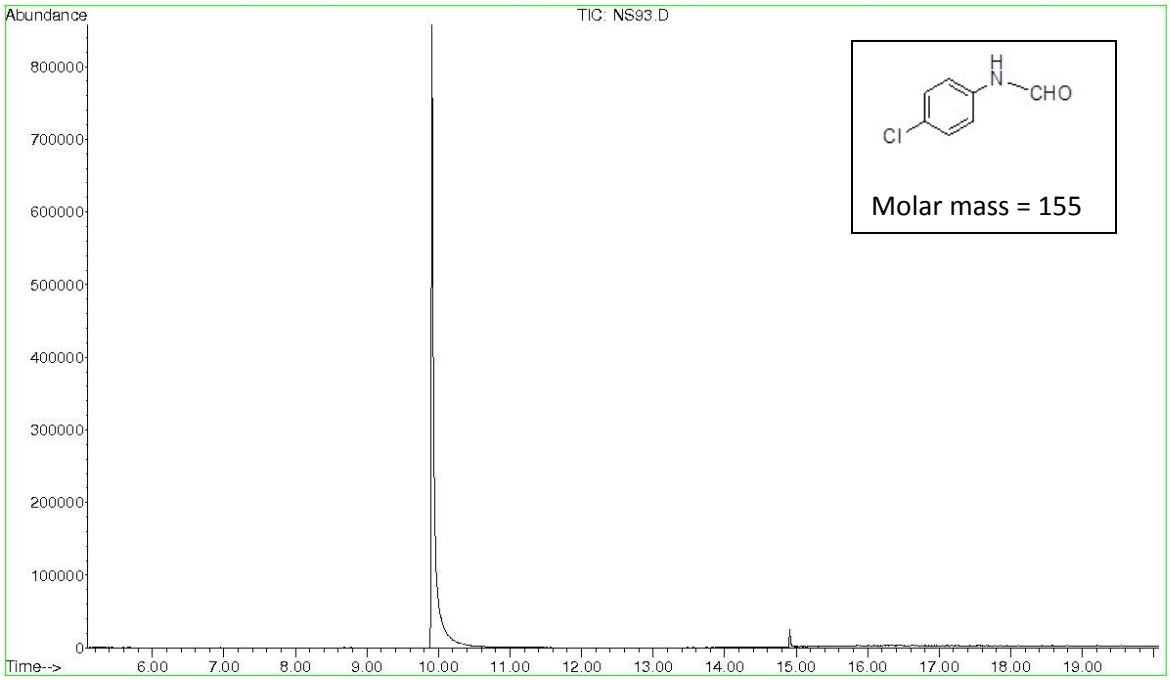

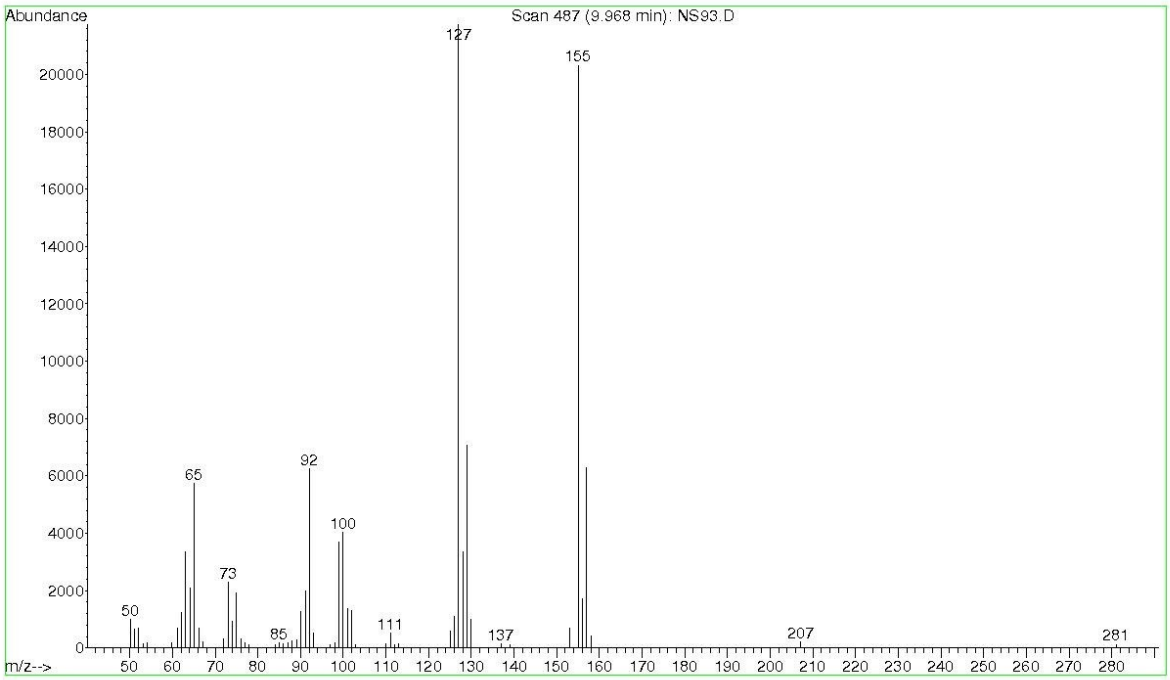

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Instrument :    Instrument #1
Sample Name: NS 97 HJT
Misc Info  :
Vial Number: 8
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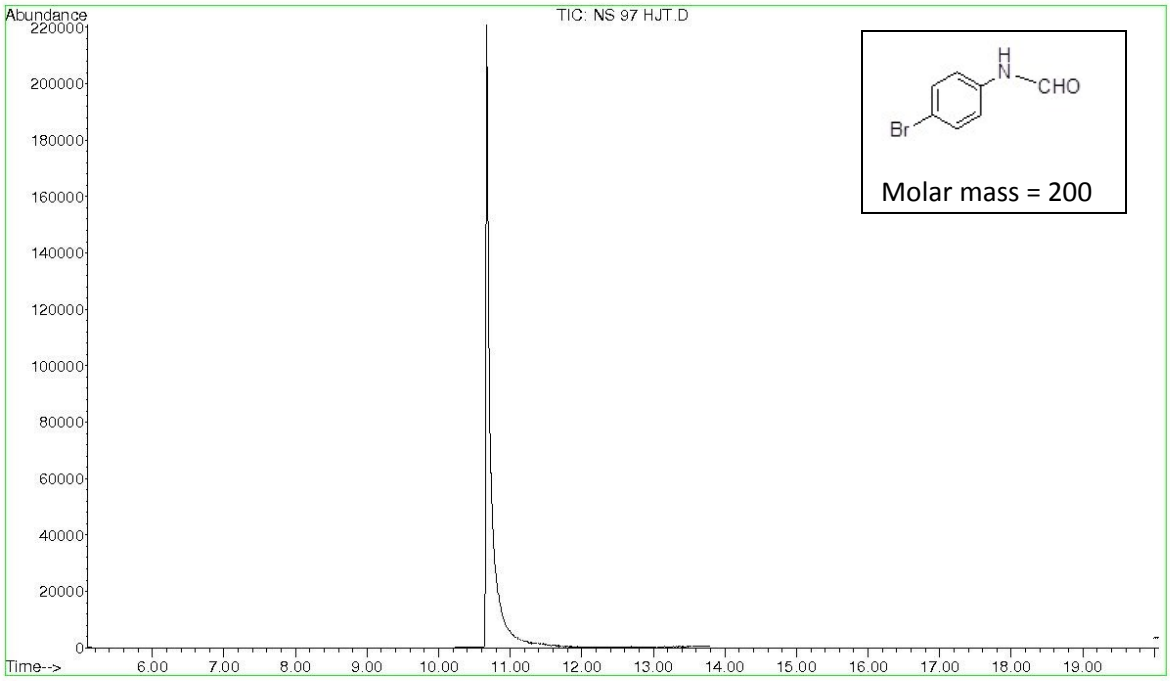

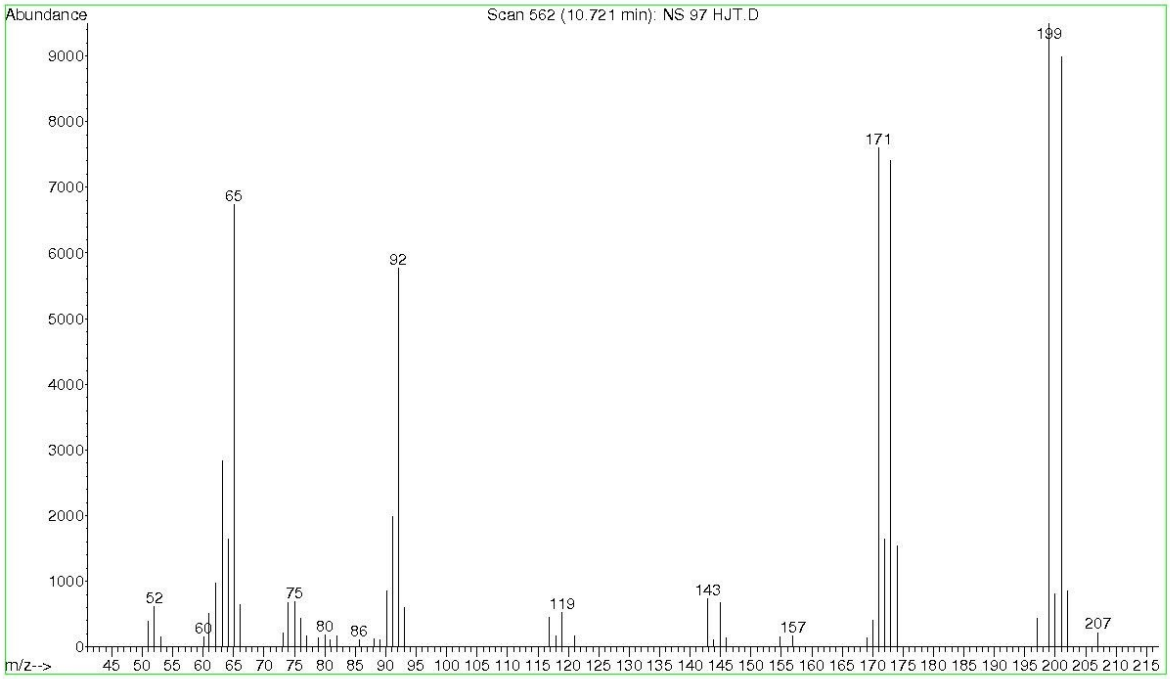

Table 2, Entry 6

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File       :C:\Sanny\Data\NS 95GY.D
Operator   : kt
Acquired   : 10 Nov 2015   4:29 pm using AcqMethod SAMPLES- 20 MIN_20151015_A.M
Instrument :    Instrument #1
Sample Name: NS 95GY
Misc Info  :
Vial Number: 17
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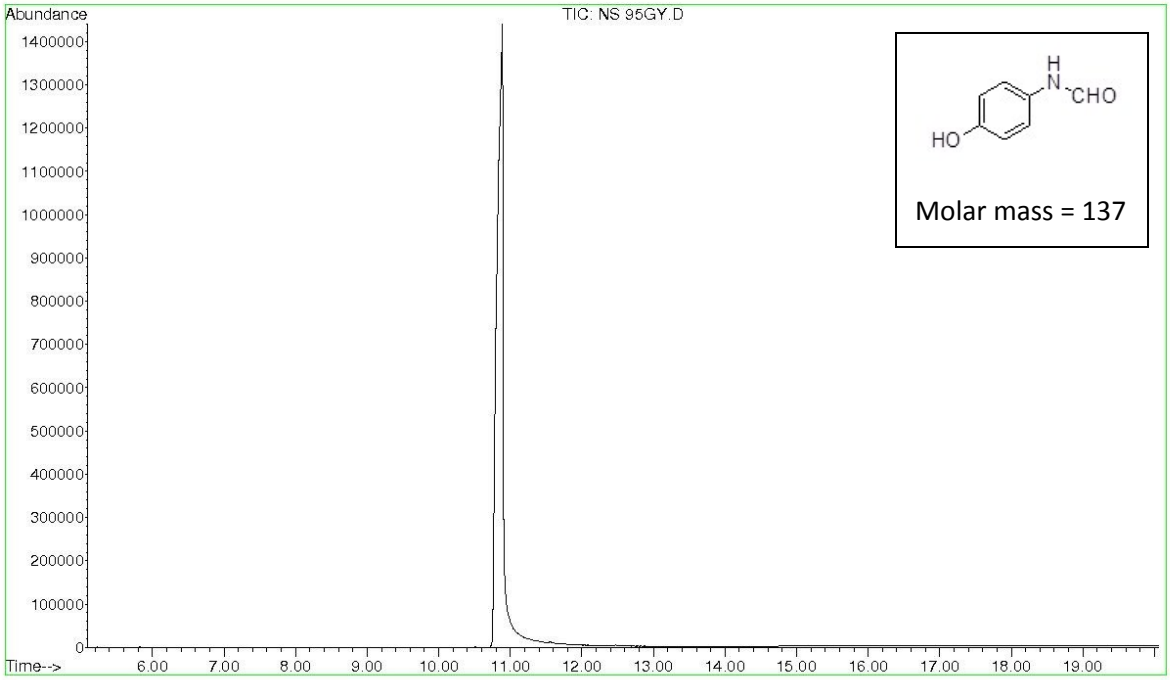

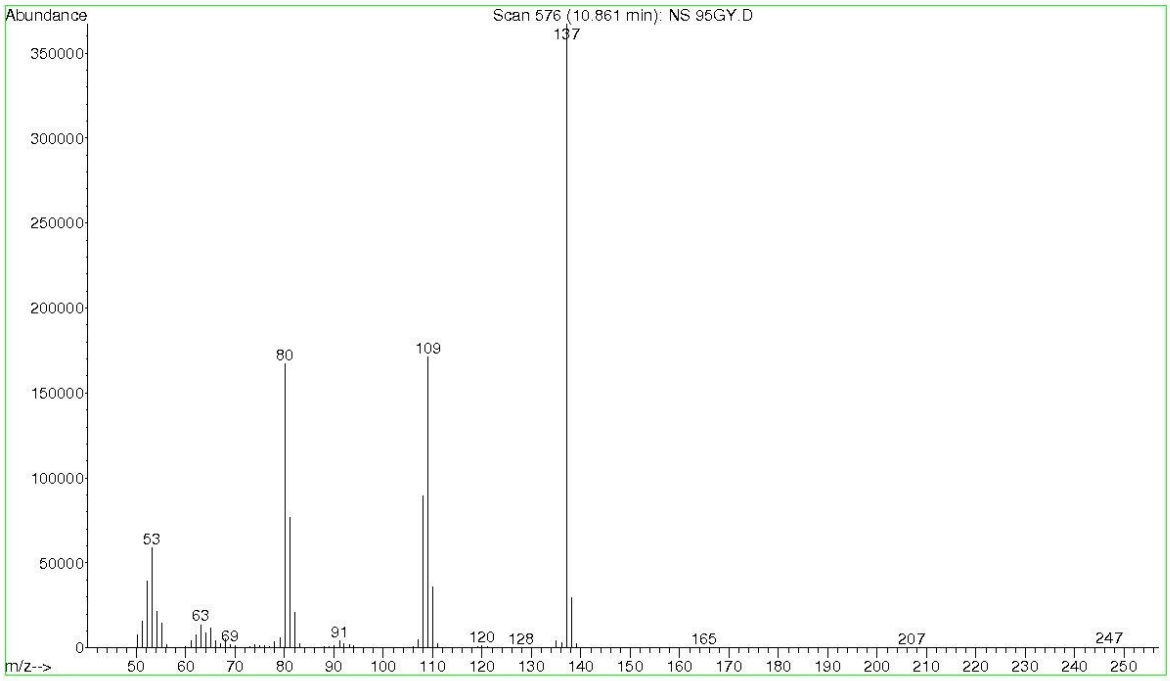

Table 2, Entry 7

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File       :C:\Sanny\Data\NS 94GY.D
Operator   : kt
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Instrument :    Instrument #1
Sample Name: NS 94GY
Misc Info  :
Vial Number: 18
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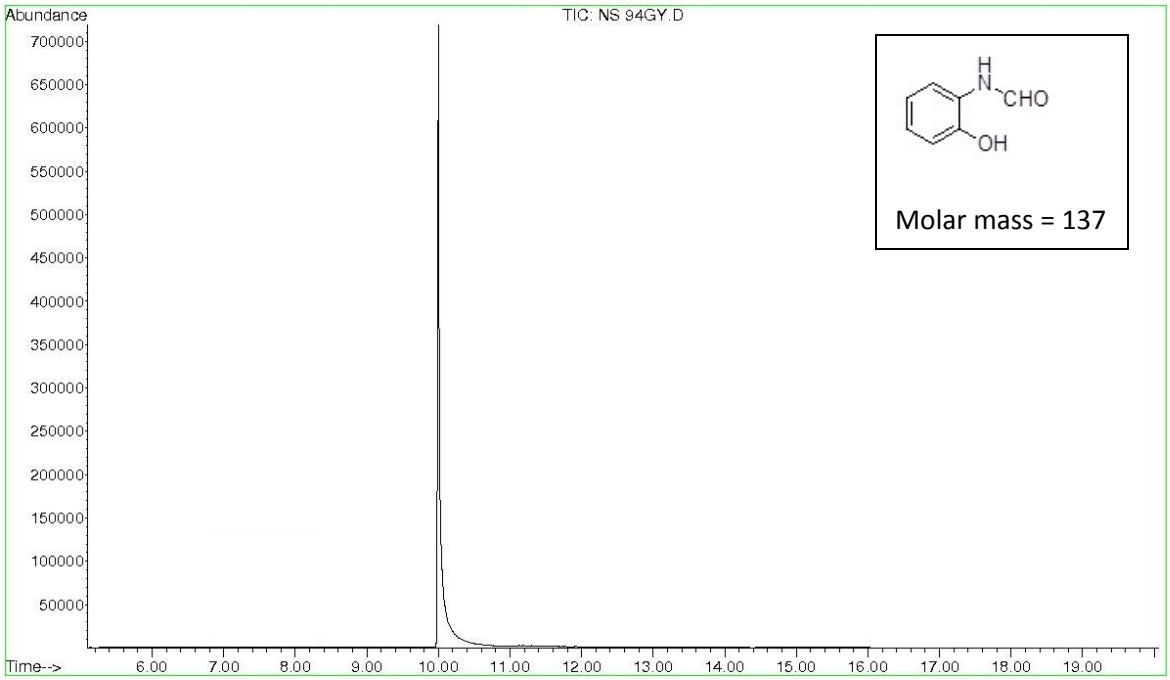

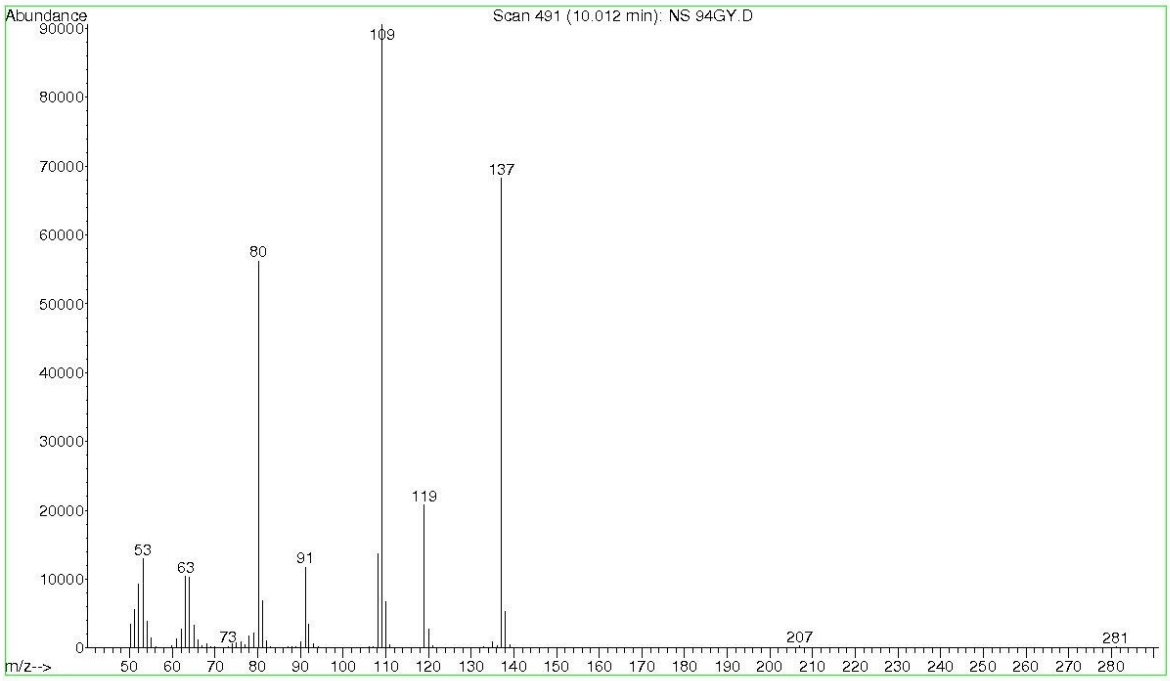

Table 2, Entry8

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Operator   : kt
Acquired   : 12 Nov 2015   5:18 pm using AcqMethod SAMPLES- 20 MIN_20151015_A.M
Instrument :    Instrument #1
Sample Name: NS92FGT
Misc Info  :
Vial Number: 10
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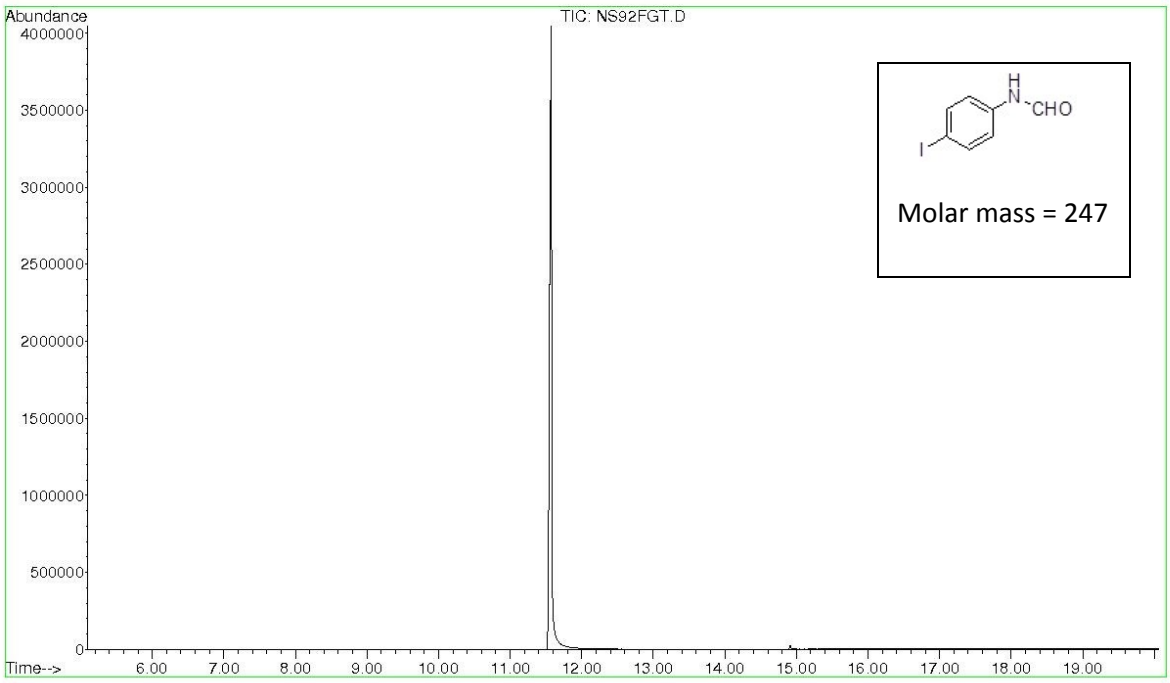

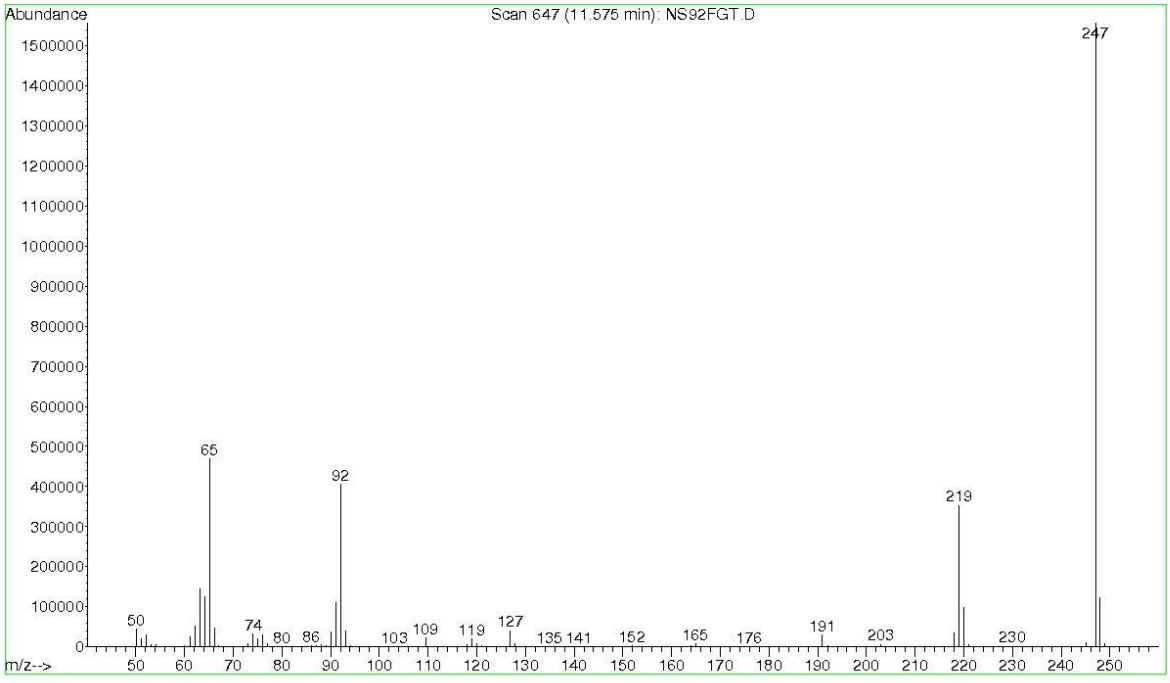

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Instrument :    Instrument #1
Sample Name: NS 151
Misc Info  :
Vial Number: 18
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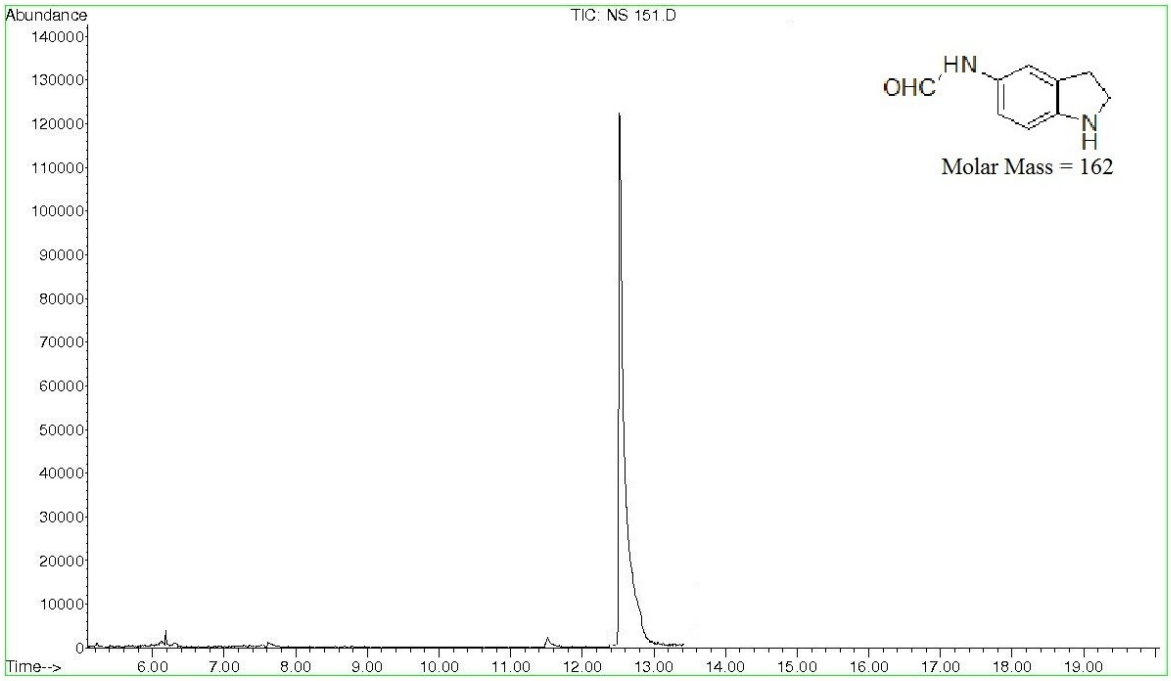


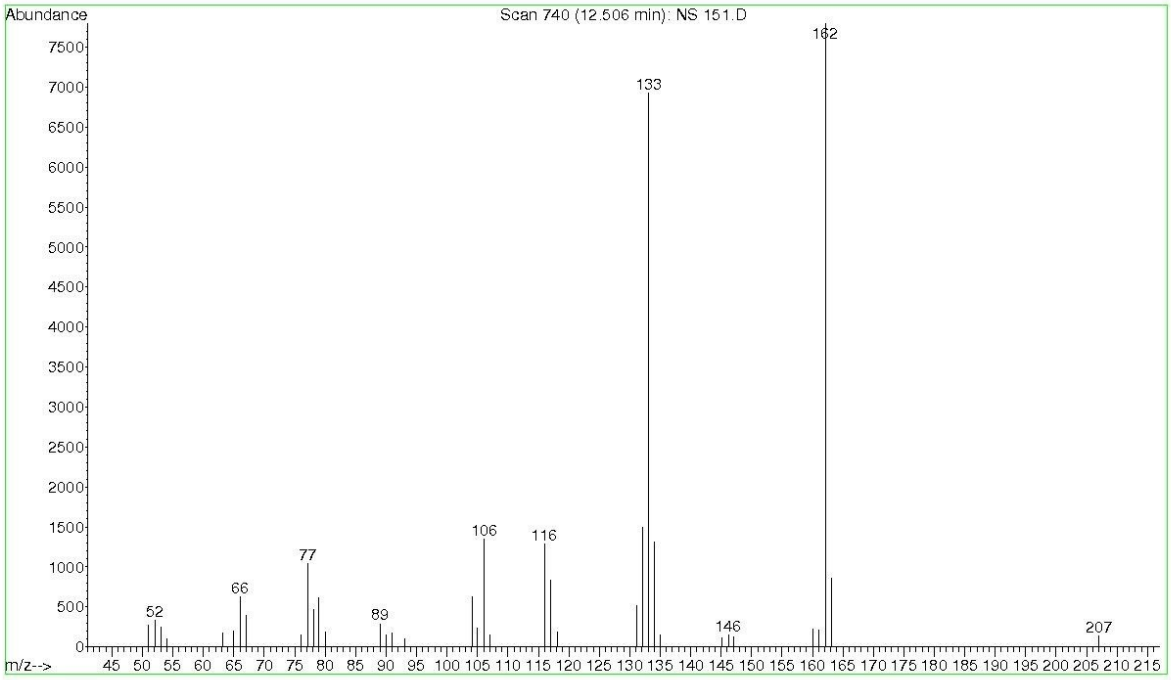
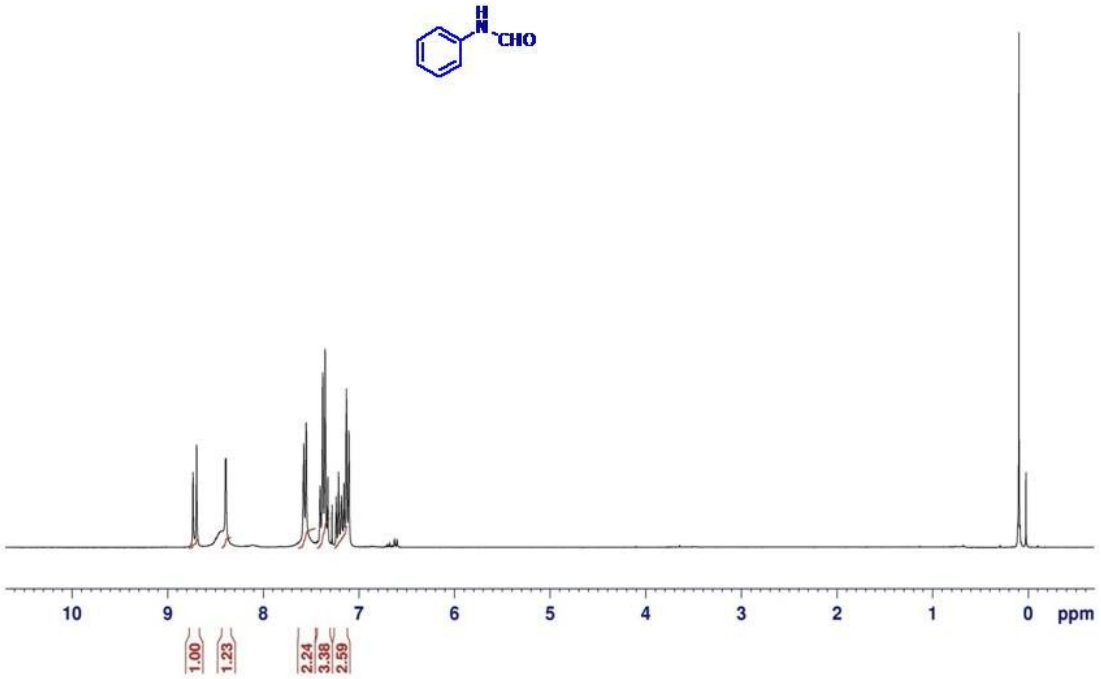


Table 2, Entry 1



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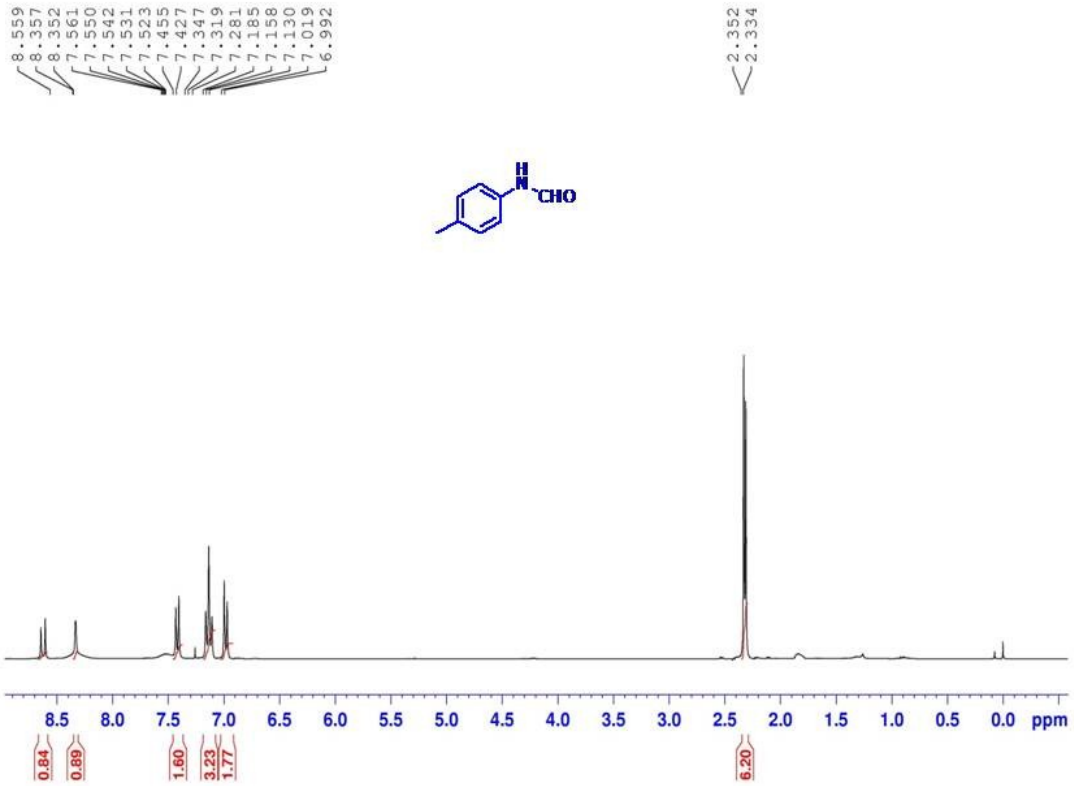

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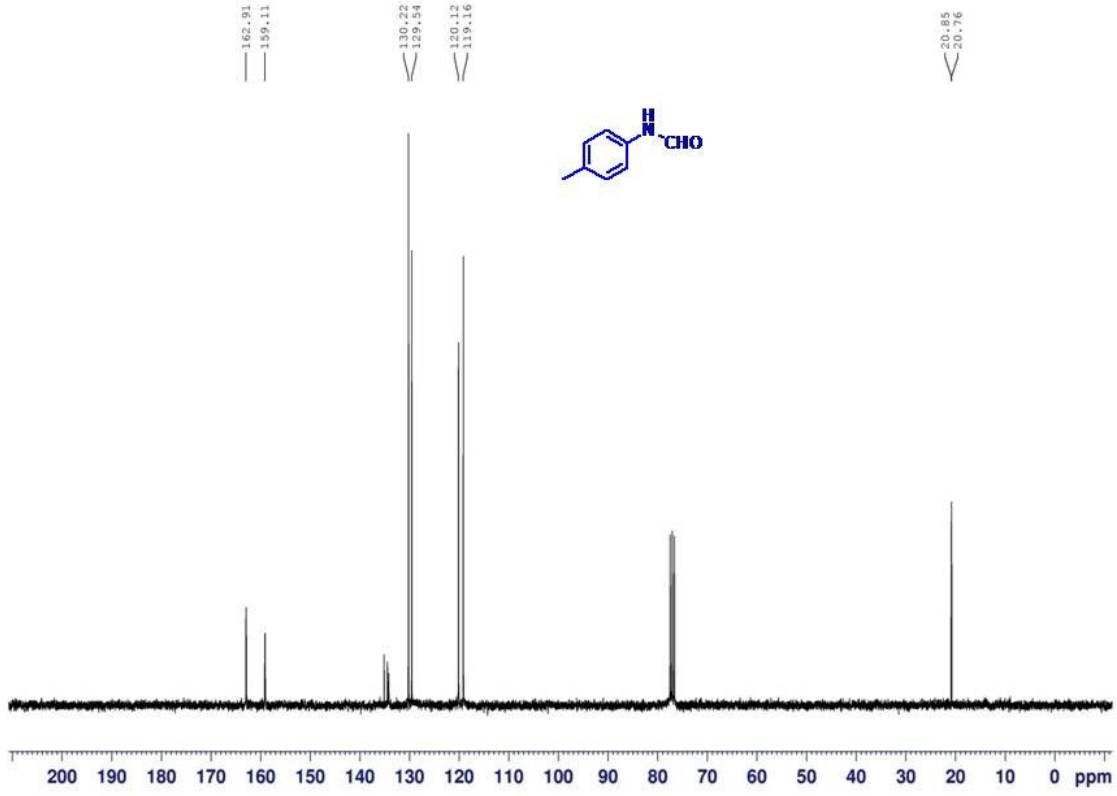

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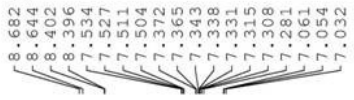

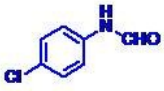

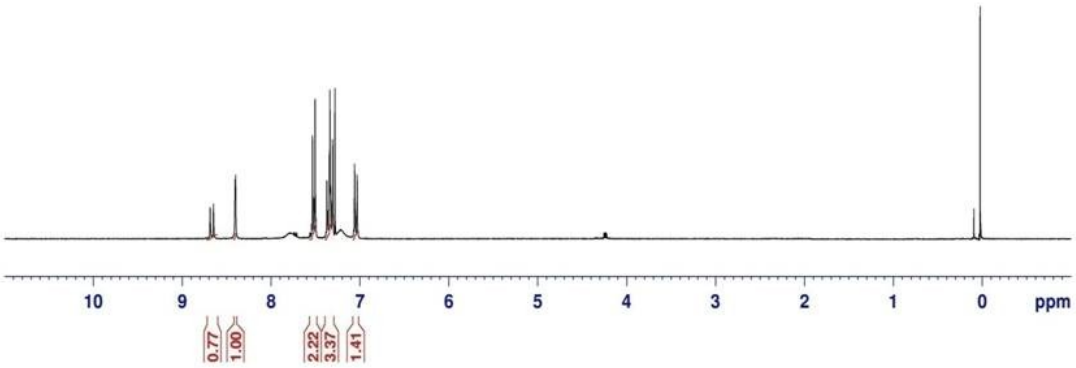

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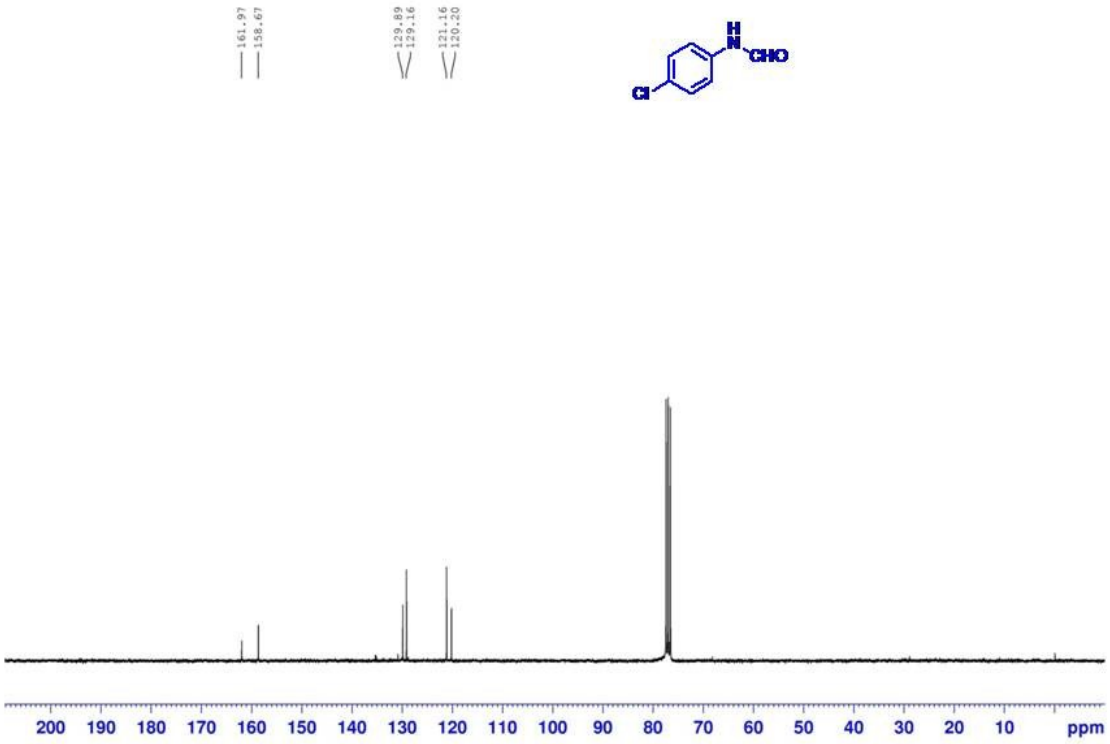

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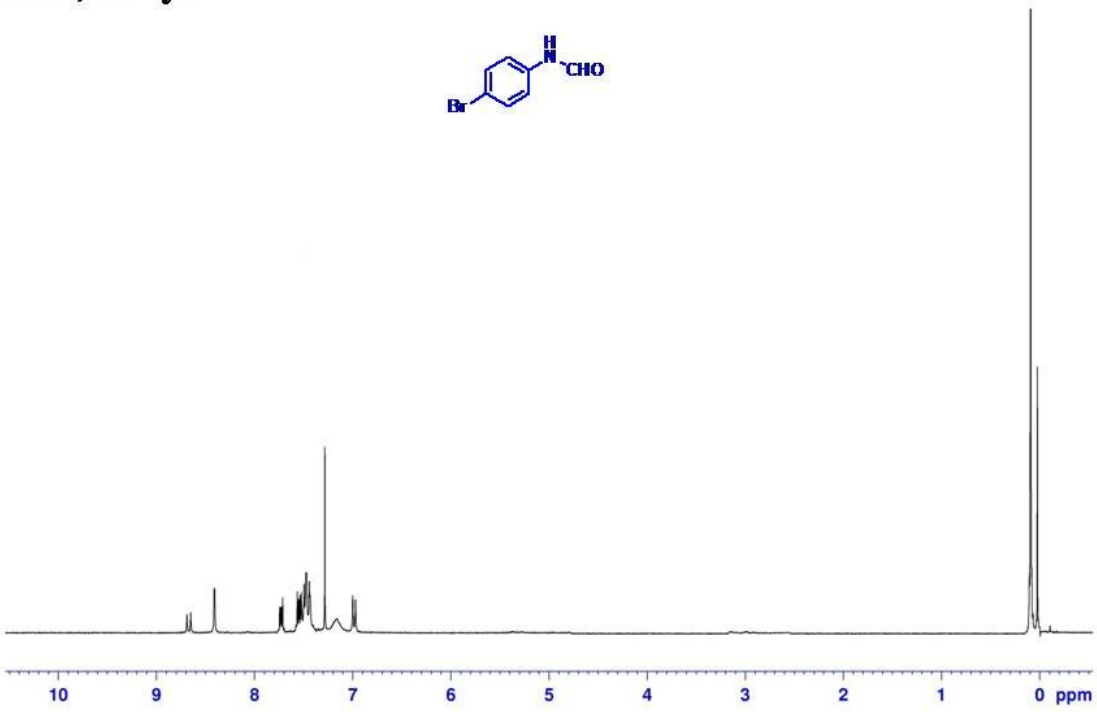

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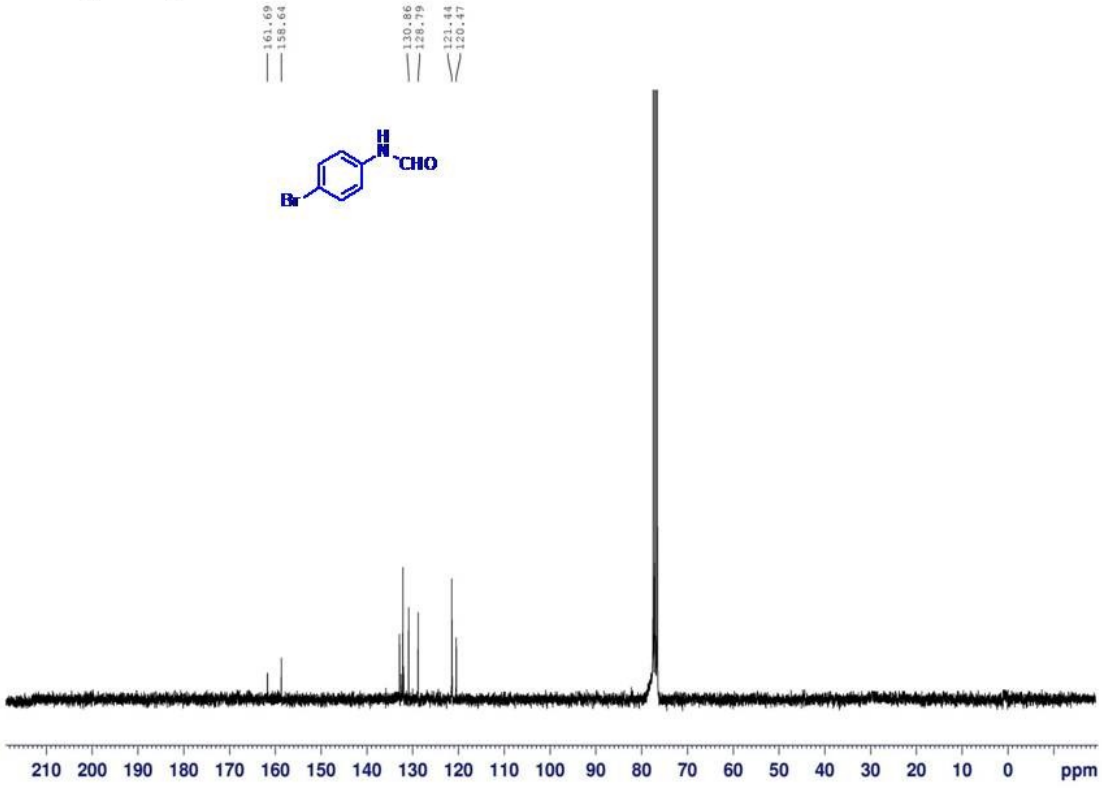

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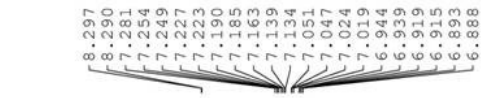

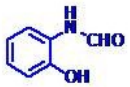


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PROCNO                   1
Date_             20151112
Time                 12.14
INSTRUM              spect
PROBHD   5 mm BBO BB-1H
PULPROG                 zg
TD                   32768
SOLVENT              CDCl3
NS                      16
DS                       2
SWH               6188.119 Hz
FIDRES           0.188846 Hz
AQ               2.6477852 sec
RG                     181
DW                  80.800 usec
DE                    6.50 usec
TE                   303.0 K
D1             1.00000000 sec
TD0                      1

======== CHANNEL f1 ========
NUC1                    1H
P1                   13.00 usec
PL1                   3.20 dB
PL1W         12.02264404 W
SFO1         300.1318534 MHz
SI                   32768
SF           300.1300000 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
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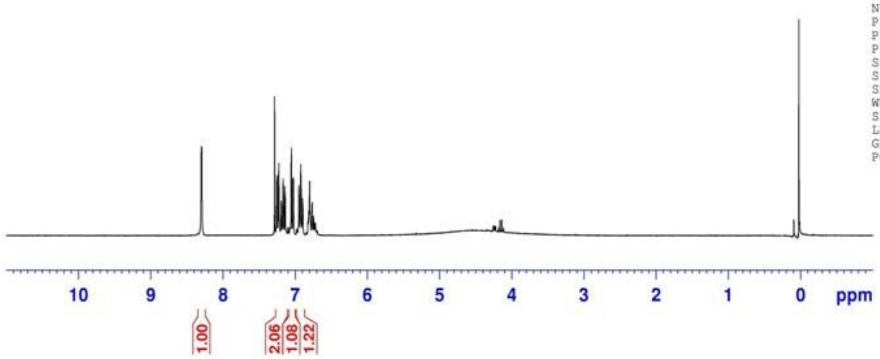

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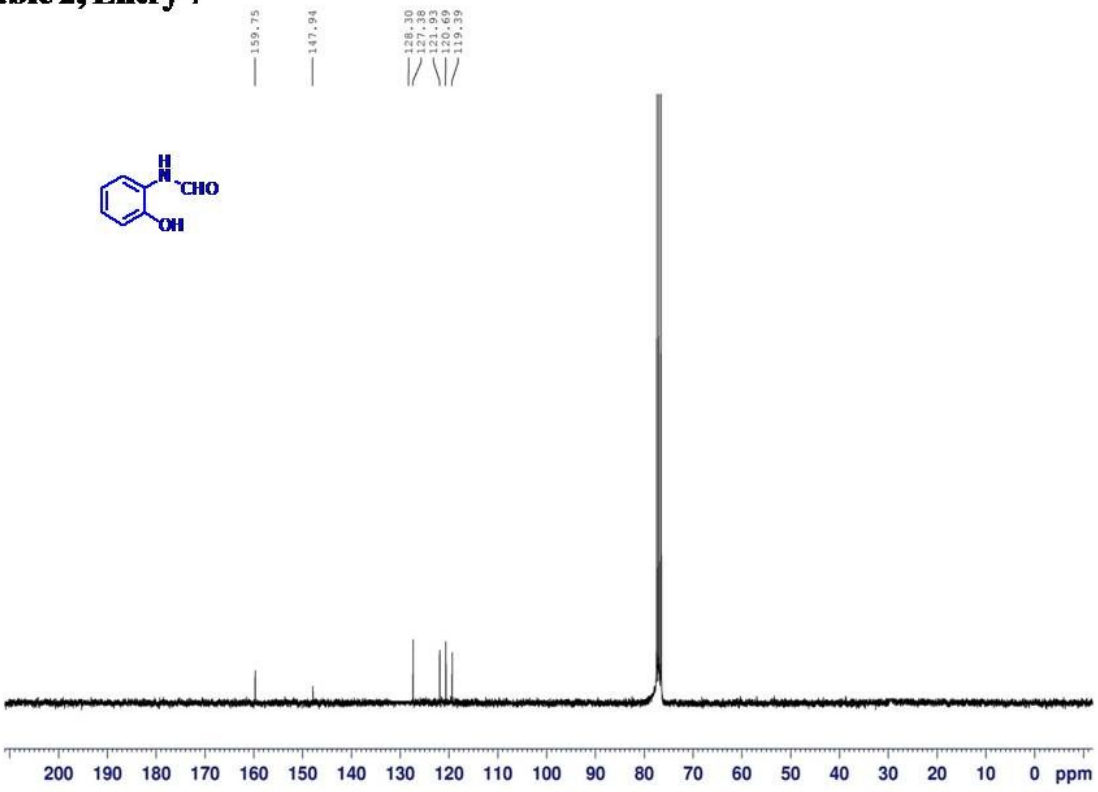

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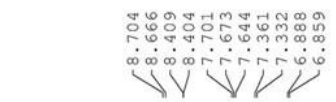
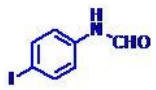
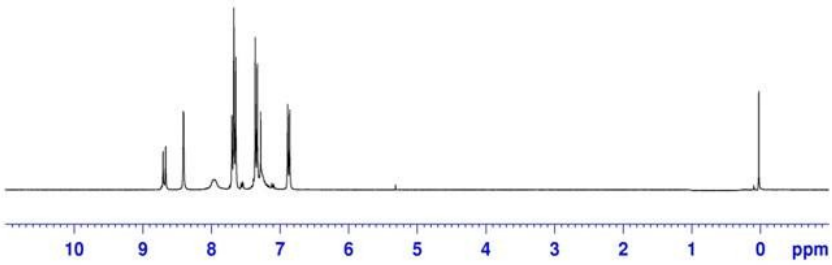


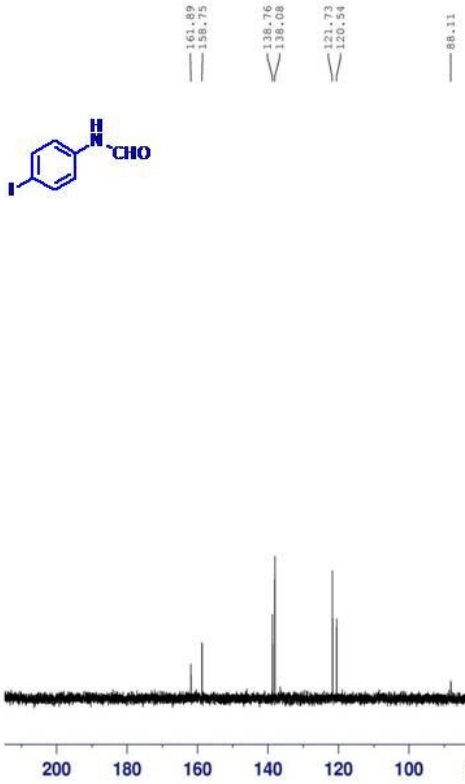




BRUKER

NAME	NS 92
EXPNO	1
PROCNO	1
Date_	20151113
Time	14.19
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zg
TD	32768
SOLVENT	CDCl3
NS	16
DS	2
SWH	6188.119 Hz
FIDRES	0.188846 Hz
AQ	2.6477852 sec
RG	181
DW	80.800 usec
DE	6.50 usec
TE	303.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	1H
P1	13.00 usec
PL1	3.20 dB
PL1W	12.02264404 W
SFO1	300.1318534 MHz
SI	32768
SF	300.1300000 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

Table 2, Entry 8



BRUKER

NAME	
NS	92
EXPNO	2
PROCNO	1
Date_	20151113
Time	15.19
INSTRUM	spect
PROBHD	5 mm BBO BB-1H
PULPROG	zgig
TD	32768
SOLVENT	CDCl3
NS	1024
DS	4
SWH	17985.611 Hz
FIDRES	0.548877 Hz
AQ	0.9110282 sec
RG	8192
DW	27.800 usec
DE	6.50 usec
TE	303.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
NUC1	13C
P1	10.00 usec
PL1	1.80 dB
PL1W	49.78760910 W
SFO1	75.4752953 MHz
======== CHANNEL f2 ========	
CPDPRG2	waltz16
NUC2	1H
PCPD2	80.00 usec
PL2	3.20 dB
PL12	18.98 dB
PL2W	12.02264404 W
PL12W	0.31768745 W
SFO2	300.1312005 MHz
SI	32768
SF	75.4677490 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40