Supporting Information

List of the Contents:

1. General experiment

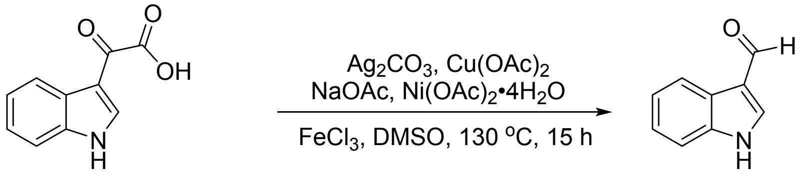
All commercially available reagents and solvent were obtained from the commercial providers and used without further purification Nuclear Magnetic Resonance spectra were recorded on Bruker Avance 300 and Bruker ARX 400 spectrometers. All ^1H NMR experiments were reported in δ units, parts per million (ppm), and were measured relative to residual chloroform (7.26 ppm) or DMSO (2.5 ppm) in the deuterated solvent. All ^{13}C NMR spectra were reported in ppm relative to DMSO-d^6 (39.9 ppm), CD_3OD (48.0 ppm) and all were obtained with ^1H decoupling. Data for ^1H NMR are recorded as follows: chemical shift (δ, ppm), multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet or unresolved, br = broad singlet, coupling constant(s) in Hz, integration). Data for ^{13}C NMR are reported in terms of chemical shift (δ, ppm). Electron impact (EI) mass spectra were recorded on AMD 402 mass spectrometer (70 eV). High resolution mass spectra (HR-MS) were recorded on Agilent 6210. The data were given as mass units per charge (m/z). Gas chromatography analysis was performed on an Agilent HP-5890 instrument with a FID detector and HP-5 capillary column (polydimethylsiloxane with 5% phenyl groups, 30 m, 0.32 mm i.d., 0.25 μm film thickness) using argon as carrier gas. The products were isolated from the reaction mixture by column chromatography on silica gel 60, 0.063-0.2 mm, 70-230 mesh (Merck). To detect CO gas we used Micro III CO sensor device (0-500 ppm) which was produce by GFG Company. 300 mL Autoclave of the 4560 series was ordered from Parr Instruments®.

2. General procedure

In a 25 mL tube, a mixture of indoles 1 (0.2 mmol, 1 equiv.), glyoxylic acid monohydrate 2a (0.4 mmol, 2 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) were added under air atmosphere, then the tube was sealed and stirred at 130 ^oC for 15 hours. Then the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (3×10 mL). The solvent was then evaporated under vacuum. The crude products were purified by using column chromatography on silica gel (pentane/ethyl acetate) to give the pure products.

3. Control Experiments and other substrates Experiments

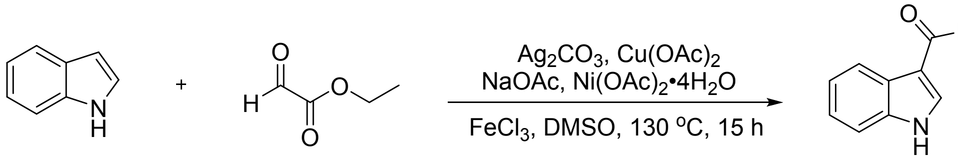
a)



1n **3a**

10% GC yield

b)



1a **2b** **3a**

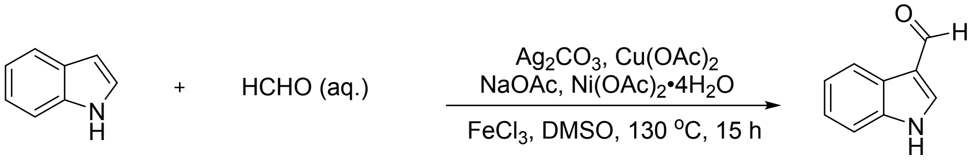
22% GC yield

c)

none

1a **2c**

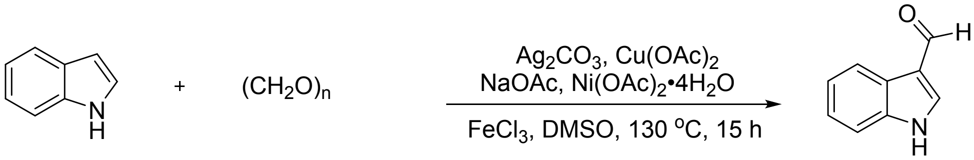
d)



1a **2d** **3a**

3% GC yield

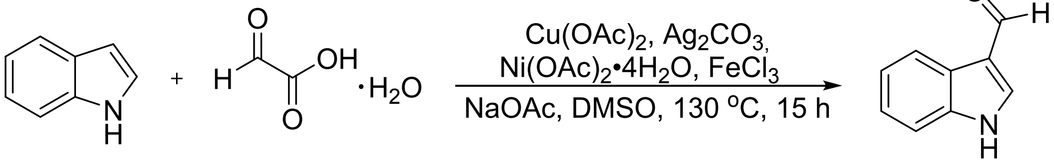
e)



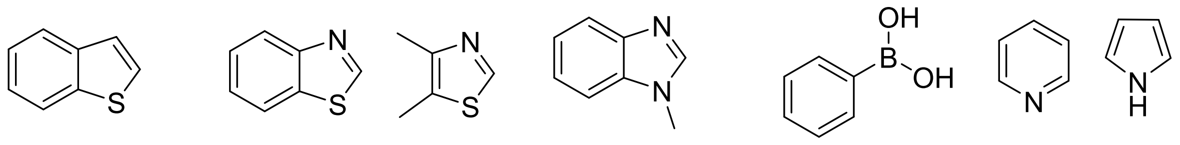
1a **2e** **3a**

6% GC yield

Using these substrates to replace **1a** did not give any products.



1a **2a** **3a**



a) In a 25 mL sealed tube, a mixture of 3-indoleglyoxylic acid **1n** (0.2 mmol, 1 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) was stirred at 130 ^oC under air. After 15 hours, the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (10 mL). The product **3a** was detected by GC, GC-MS and TLC. Yields were determined by GC using n-hexadecane as the internal standard.

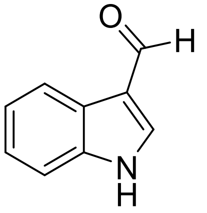
b) In a 25 mL sealed tube, a mixture of indole **1a** (0.2 mmol, 1 equiv.), ethyl glyoxalate **2b** (0.4 mmol, 2 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) was stirred at 130 ^oC under air. After 15 hours, the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (10 mL). The product **3a** was detected by GC, GC-MS and TLC. Yields were determined by GC using n-hexadecane as the internal standard.

c) In a 25 mL sealed tube, a mixture of indole **1a** (0.2 mmol, 1 equiv.), methyl formate **2c** (0.4 mmol, 2 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) was stirred at 130 ^oC under air. After 15 hours, the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (10 mL). The product was detected by GC, GC-MS and TLC.

d) In a 25 mL sealed tube, a mixture of indole **1a** (0.2 mmol, 1 equiv.), formaldehyde (37 wt. % in H_2O) **2d** (0.4 mmol, 2 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) was stirred at 130 ^oC under air. After 15 hours, the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (10 mL). The product **3a** was detected by GC, GC-MS and TLC. Yields were determined by GC using n-hexadecane as the internal standard.

e) In a 25 mL sealed tube, a mixture of indole **1a** (0.2 mmol, 1 equiv.), paraformaldehyde **2e** (0.4 mmol, 2 equiv.), $Ni(OAc)_2{\cdot}4H_2O$ (0.02 mmol, 10 mol%), $FeCl_3$ (0.08 mmol, 40 mol%), Ag_2CO_3 (0.4 mmol, 2 equiv.), $Cu(OAc)_2$ (0.2 mmol, 1 equiv.), and NaOAc (0.4 mmol, 2 equiv.) in DMSO (1 mL) was stirred at 130 ^oC under air. After 15 hours, the mixture was cooled to room temperature. The residue was diluted with H_2O solution (10 mL) and extracted with EtOAc (10 mL). The product **3a** was detected by GC, GC-MS and TLC. Yields were determined by GC using n-hexadecane as the internal standard.

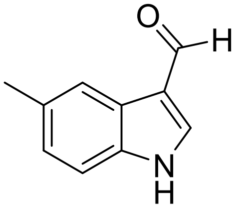
4. Spectroscopic and analytical data of products



1*H*-Indole-3-carbaldehyde[1] **(3a):** White solid.

^{1}H NMR (400 MHz, DMSO-d^{6}) δ 12.14 (s, 1H), 9.94 (s, 1H), 8.29 (s, 1H), 8.10 (d, J = 8.0 Hz, 1H), 7.60 – 7.47 (m, 1H), 7.29 – 7.20 (m, 2H).

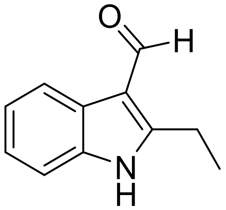
^{13}C NMR (101 MHz, DMSO-d^{6}) δ 185.41, 138.93, 137.50, 124.57, 123.91, 122.58, 121.27, 118.61, 112.87.



5-Methyl-1*H*-indole-3-carbaldehyde[2] **(3b):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^{6}) δ 12.03 (s, 1H), 9.91 (s, 1H), 8.22 (s, 1H), 7.91 (dq, J = 1.7, 0.8 Hz, 1H), 7.40 (dd, J = 8.3, 0.7 Hz, 1H), 7.21 – 6.93 (m, 1H), 2.41 (s, 3H).

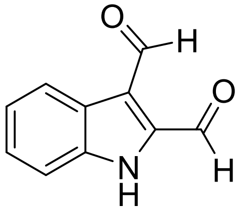
^{13}C NMR (75 MHz, DMSO-d^{6}) δ 185.28, 138.85, 135.82, 131.50, 125.36, 124.86, 121.04, 118.30, 112.49, 21.68.



2-Ethyl-1*H*-indole-3-carbaldehyde (3d): Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^{6}) δ 11.98 (s, 1H), 10.09 (s, 1H), 8.22 – 7.96 (m, 1H), 7.44 – 7.39 (m, 1H), 7.23 – 7.13 (m, 2H), 3.10 (q, J = 7.6 Hz, 2H), 1.34 (t, J = 7.6 Hz, 3H).

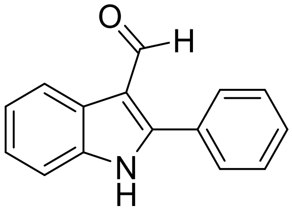
^{13}C NMR (75 MHz, DMSO-d^{6}) δ 184.52, 154.31, 135.88, 126.01, 123.13, 122.32, 120.61, 113.14, 111.97, 19.36, 15.06.



1*H*-Indole-2,3-dicarbaldehyde (3e): Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 12.90 (s, 1H), 10.67 (s, 1H), 10.50 (s, 1H), 8.25 (ddt, J = 8.1, 1.3, 0.7 Hz, 1H), 7.59 (dt, J = 8.3, 1.0 Hz, 1H), 7.46 (ddd, J = 8.3, 7.0, 1.3 Hz, 1H), 7.39 – 7.32 (m, 1H).

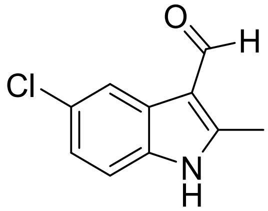
^{13}C NMR (75 MHz, DMSO-d^6) δ 187.07, 184.22, 139.46, 137.31, 127.55, 125.01, 124.25, 123.24, 120.66, 113.95.



2-Phenyl-1*H*-indole-3-carbaldehyde[2] **(3f):** White solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 12.42 (s, 1H), 9.99 (s, 1H), 8.32 – 8.15 (m, 1H), 7.86 – 7.75 (m, 2H), 7.68 – 7.56 (m, 3H), 7.54 – 7.50 (m, 1H), 7.33 – 7.22 (m, 2H).

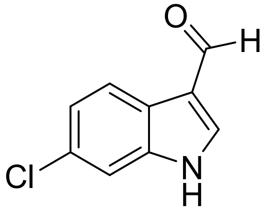
^{13}C NMR (75 MHz, DMSO-d^6) δ 185.97, 149.55, 136.38, 130.36, 130.29, 130.25, 129.44, 126.24, 124.18, 122.91, 121.54, 113.95, 112.48.



5-Chloro-2-methyl-1*H*-indole-3-carbaldehyde (3h): Red solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 12.17 (s, 1H), 10.04 (s, 1H), 8.12 – 7.91 (m, 1H), 7.41 (dd, J = 8.5, 0.6 Hz, 1H), 7.20 (dd, J = 8.6, 2.2 Hz, 1H), 2.69 (s, 3H).

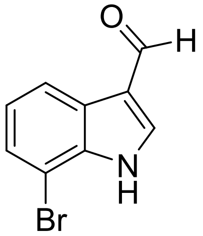
^{13}C NMR (75 MHz, DMSO-d^6) δ 184.92, 150.25, 134.33, 127.23, 126.95, 122.99, 119.56, 113.70, 113.45, 12.02.



6-Chloro-1*H*-indole-3-carbaldehyde[4] **(3i):** White solid.

^{1}H NMR (300 MHz, DMSO-d^{6}) δ 12.22 (s, 1H), 9.94 (s, 1H), 8.34 (s, 1H), 8.08 (ddd, J = 8.5, 0.3 Hz, 1H), 7.58 (dd, J = 1.9, 0.6 Hz, 1H), 7.25 (dd, J = 8.4, 1.9 Hz, 1H).

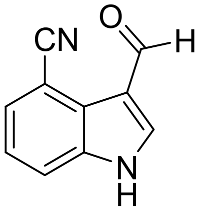
^{13}C NMR (75 MHz, DMSO-d^{6}) δ 185.56, 139.74, 137.96, 128.37, 123.33, 122.90, 122.54, 118.42, 112.68.



7-Bromo-1*H*-indole-3-carbaldehyde[2] **(3j):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^{6}) δ 12.40 (s, 1H), 9.98 (s, 1H), 8.38 (m, 1H), 8.11 (dd, J = 7.9, 0.9 Hz, 1H), 7.50 (d, J = 7.5, 1H), 7.17 (d, J = 7.8 Hz, 1H).

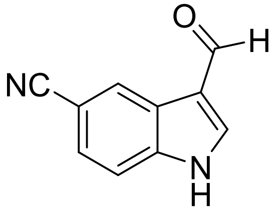
^{13}C NMR (75 MHz, DMSO-d^{6}) δ 185.89, 139.62, 135.92, 126.60, 126.24, 124.15, 120.72, 119.35, 105.29.



3-Formyl-1*H*-indole-4-carbonitrile[5] **(3k):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^{6}) δ 12.75 (s, 1H), 10.20 (s, 1H), 8.51 (s, 1H), 7.89 (dd, J = 8.2, 1.0 Hz, 1H), 7.73 (dd, J = 7.5, 1.0 Hz, 1H), 7.42 (dd, J = 8.2, 7.5 Hz, 1H).

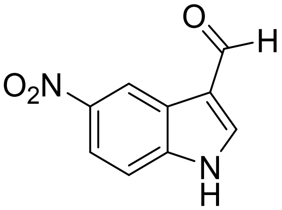
^{13}C NMR (75 MHz, DMSO-d^{6}) δ 184.20, 138.88, 137.98, 129.47, 124.28, 123.73, 119.61, 118.67, 117.71, 102.60.



3-Formyl-1*H*-indole-5-carbonitrile[3] **(3l):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 12.58 (s, 1H), 10.00 (s, 1H), 8.51 (s, 1H), 8.46 (dd, J = 1.6, 0.8 Hz, 1H), 7.73 – 7.62 (m, 2H).

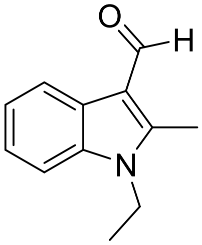
^{13}C NMR (75 MHz, DMSO-d^6) δ 185.87, 140.74, 139.28, 126.88, 126.16, 124.42, 120.38, 118.46, 114.43, 104.85.



5-Nitro-1*H*-indole-3-carbaldehyde[3] **(3m):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 12.69 (s, 1H), 10.02 (s, 1H), 8.93 (dt, J = 2.4, 0.4 Hz, 1H), 8.56 (s, 1H), 8.14 (dd, J = 9.0, 2.4 Hz, 1H), 7.70 (dd, J = 9.0, 0.6 Hz, 1H).

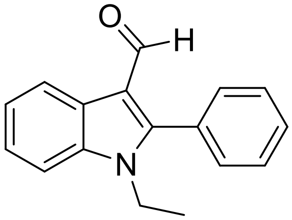
^{13}C NMR (75 MHz, DMSO-d^6) δ 185.99, 143.32, 141.91, 140.59, 123.97, 119.52, 119.25, 117.52, 113.68.



1-Ethyl-3-formyl-2-methylindole[3] **(3c):** Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 10.10 (s, 1H), 8.18 – 8.03 (m, 1H), 7.60 – 7.55 (m, 1H), 7.28 – 7.18 (m, 2H), 4.27 (q, J = 7.2 Hz, 2H), 2.73 (s, 3H), 1.32 – 1.27 (m, 3H).

^{13}C NMR (75 MHz, DMSO-d^6) δ 184.70, 148.90, 136.18, 125.63, 123.18, 122.69, 120.60, 113.96, 110.62, 38.12, 15.02, 10.23.



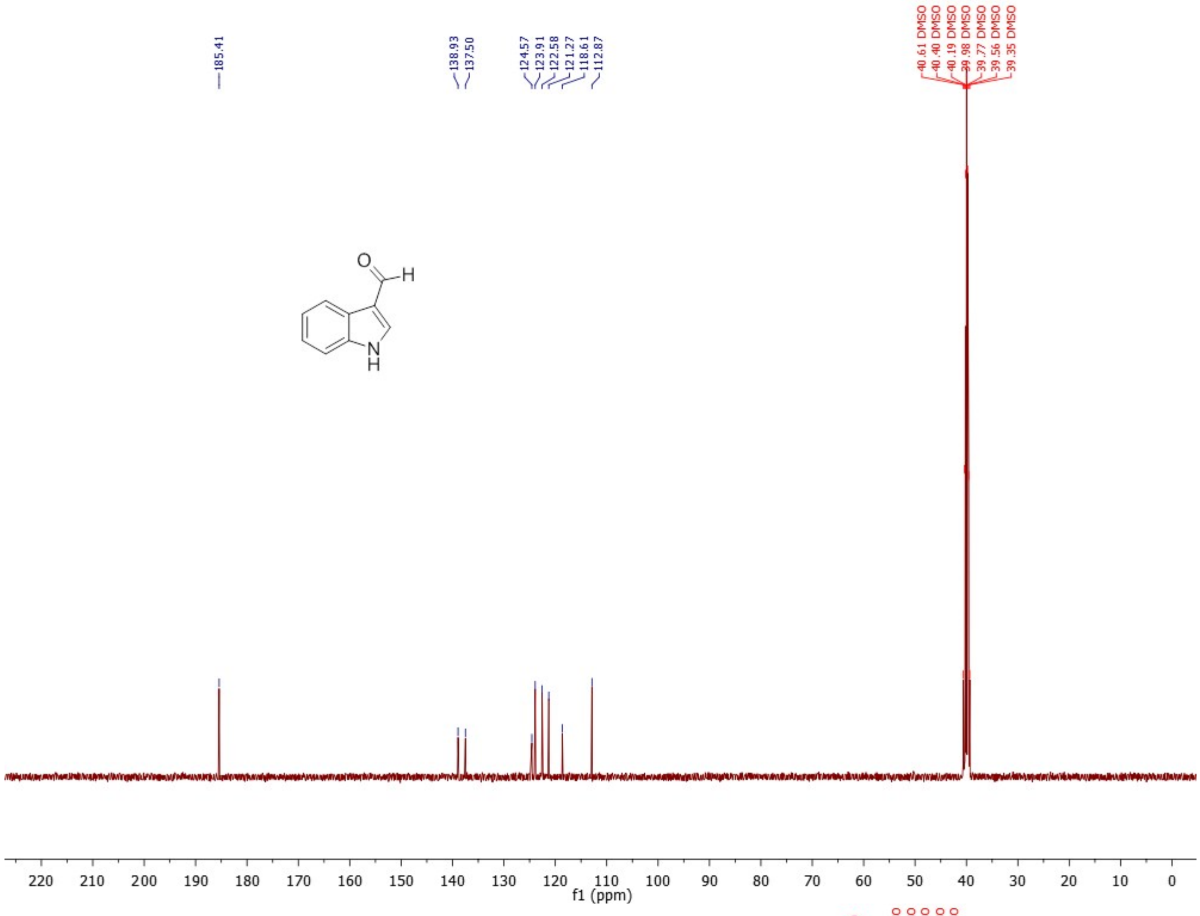
1-Ethyl-2-phenyl-1*H*-indole-3-carbaldehyde (3g): Yellow solid.

^{1}H NMR (300 MHz, DMSO-d^6) δ 9.55 (s, 1H), 8.27 – 8.17 (m, 1H), 7.75 – 7.69 (m, 1H), 7.67 – 7.62 (m, 5H), 7.41 – 7.30 (m, 2H), 4.16 (q, J = 7.1 Hz, 2H), 1.22 (d, J = 7.2 Hz, 3H).

^{13}C NMR (101 MHz, DMSO-d^6) δ 185.57, 151.42, 136.30, 131.17, 130.39, 129.20, 128.73, 125.19, 124.28, 123.38, 121.49, 115.34, 111.61, 39.15, 15.36.

5. Reference

(1) S. McGrath, M. Tortorici, L. Drouin, S. Solanki, L. Vidler, I. Westwood, P. Gimeson, R. Van Montfort, S. Hoelder, *Chem. Eur. J.* **2017**, *23*, 9577-9584.
(2) Q. –D. Wang, J. –M. Yang, D. Fang, J. Ren, B. –B. Zeng, *Tetrahedron Lett.* **2017**, *58*, 2877-2880.
(3) L. Zhang, C. Peng, D. Zhao, Y. Wang, H. –J. Fu, Q. Shen, J. –X. Li, *Chem. Commun.* **2012**, *48*, 5928–5930.
(4) B. Zhang, B. Liu, J. Chen, J. Wang, M. Liu, *Tetrahedron Lett.* **2014**, *55*, 5618-5621.
(5) J. Zheng, L. Deng, M. Chen, X. Xiao, S. Xiao, C. Guo, G. Xiao, L. Bai, W. Ye, D. Zhang, H. Chen, *Eur. J. Med. Chem.* **2013**, *65*, 158-167.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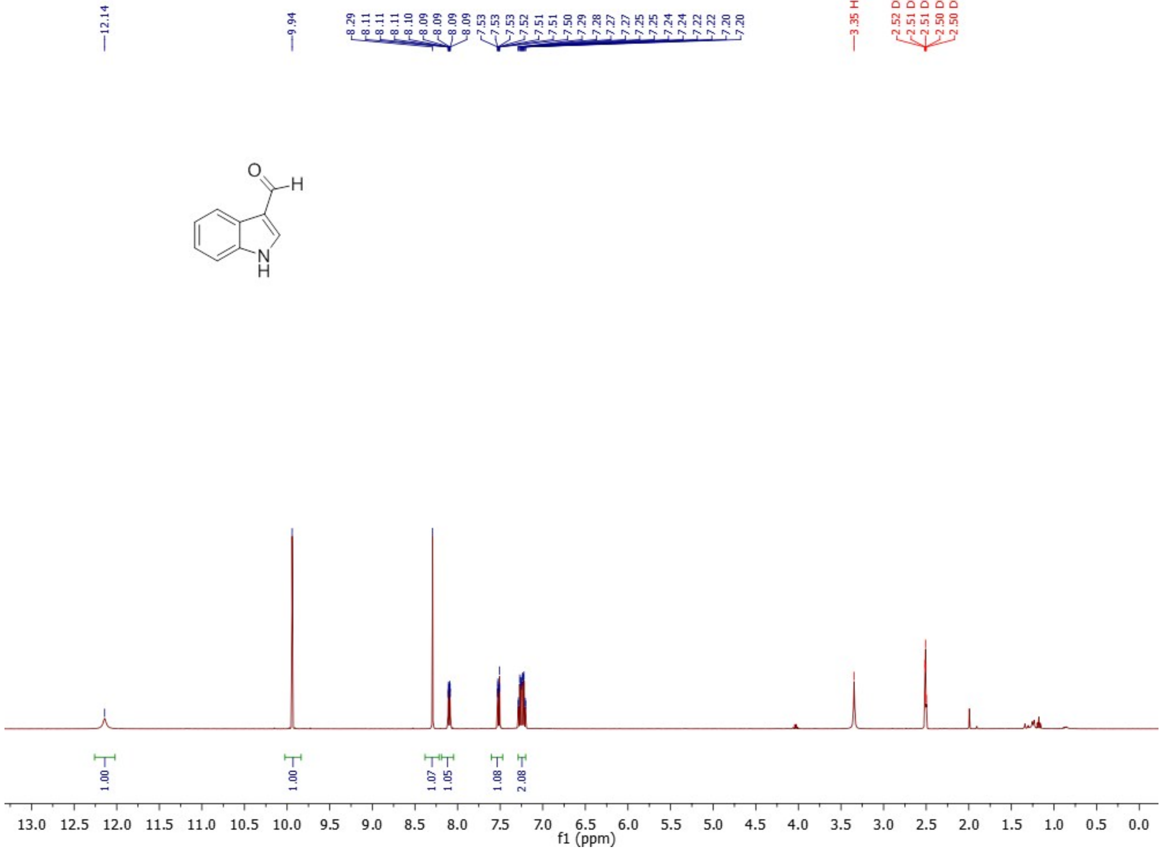
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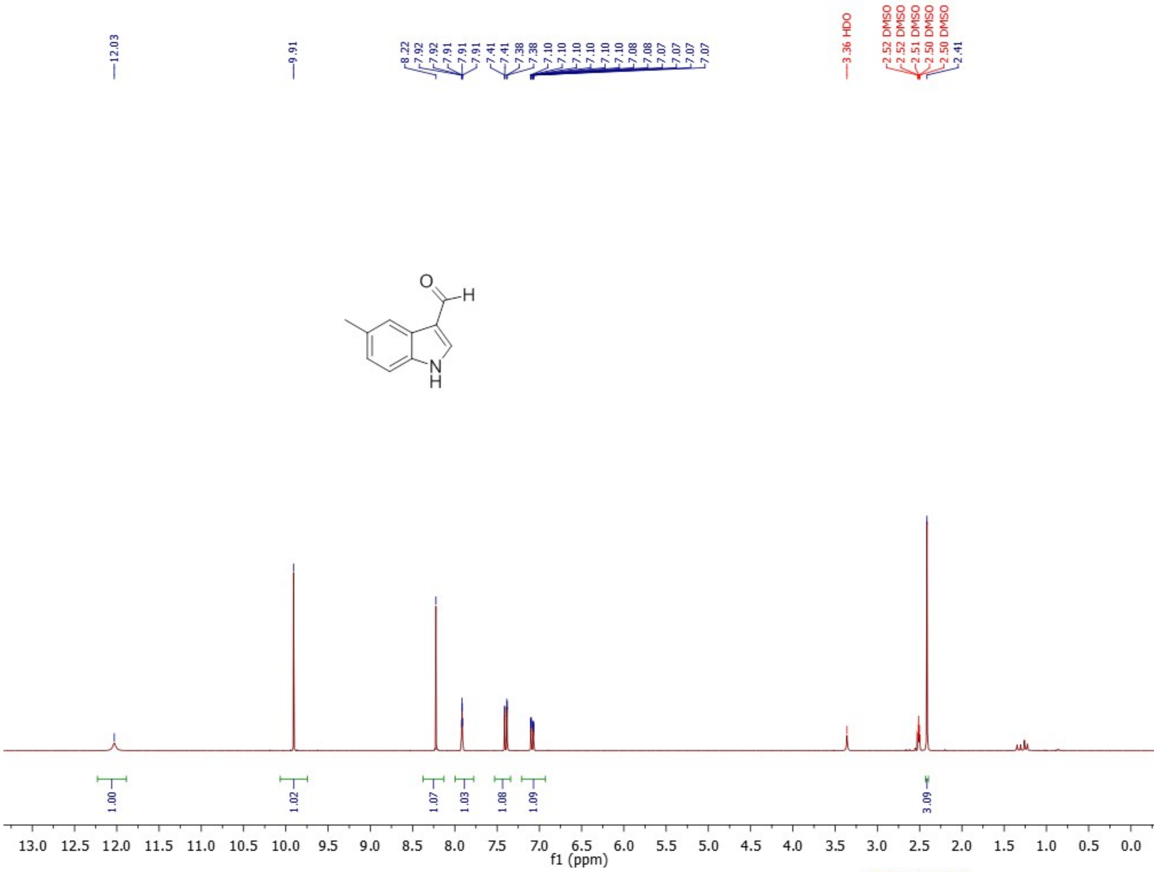
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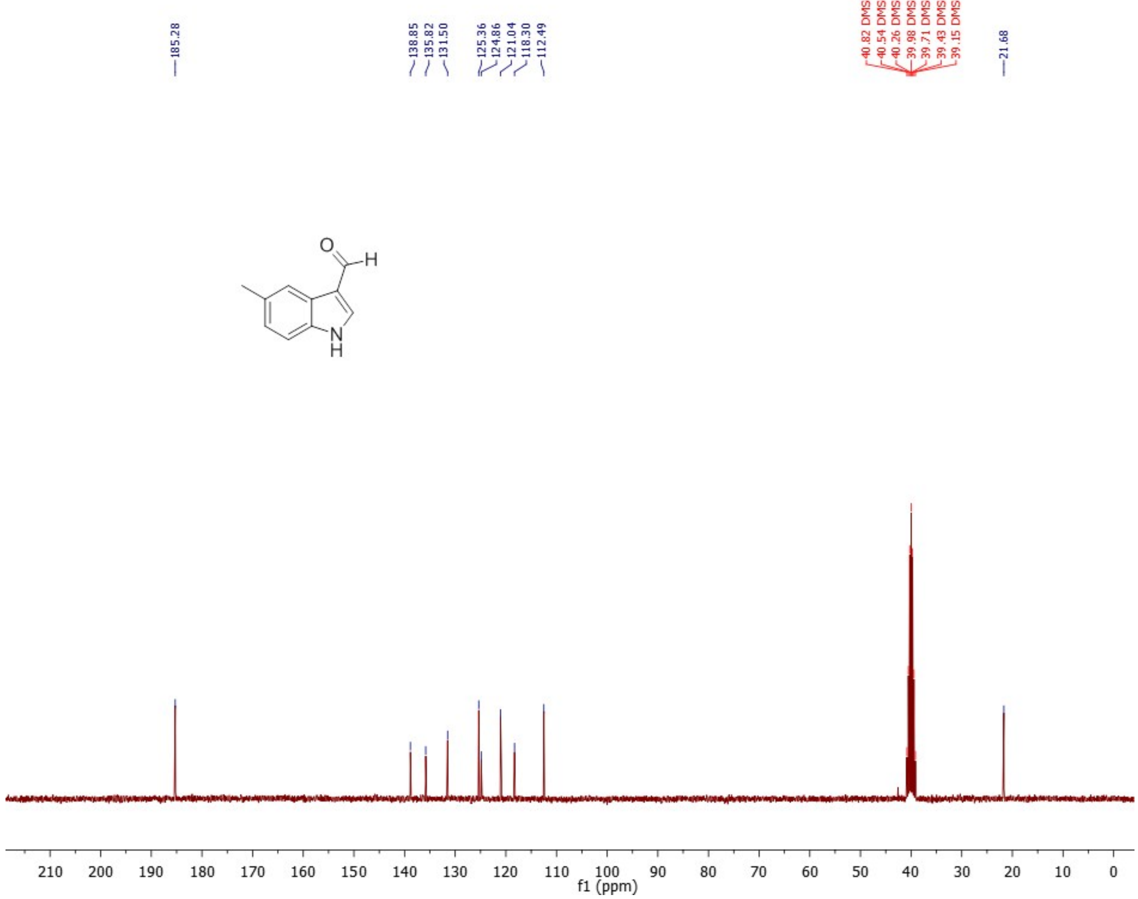
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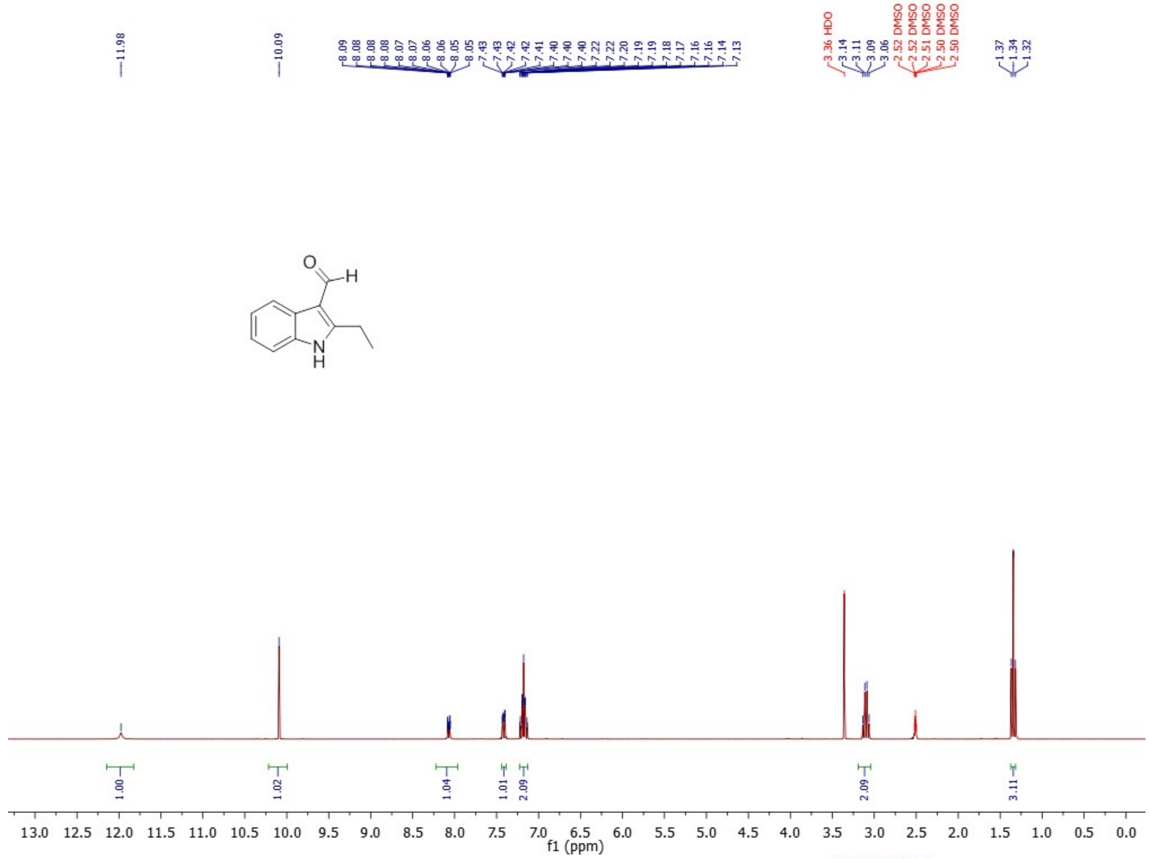
f1 (ppm)



11.98
10.09
8.09
8.08
8.08
8.07
8.06
8.06
8.05
8.05
7.43
7.42
7.42
7.41
7.40
7.40
7.40
7.22
7.20
7.19
7.19
7.18
7.17
7.16
7.14
7.13
3.36 HDO
3.14
3.11
3.09
3.06
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
1.37
1.34
1.32
O
H
N
H
1.00
1.02
1.04
1.01
2.09
2.09
3.11
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
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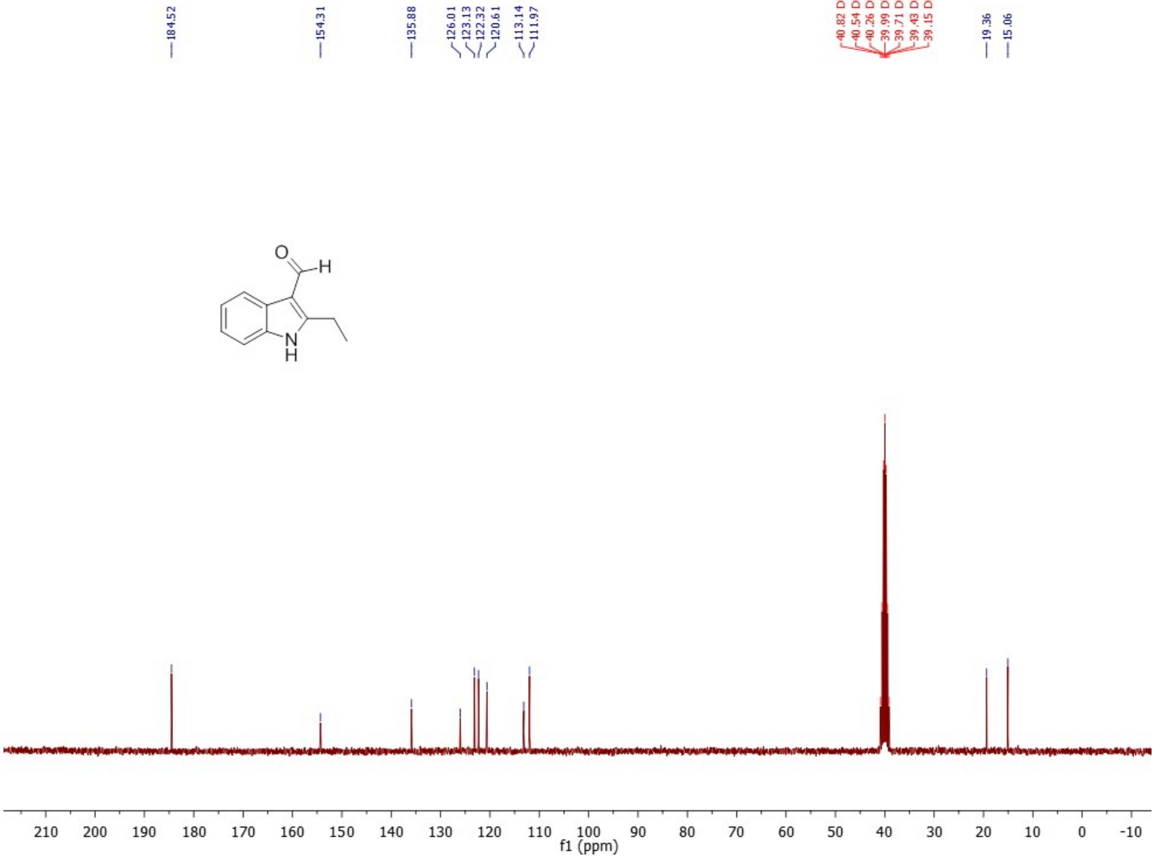

184.52
154.31
135.88
126.01
123.13
122.32
120.61
113.14
111.97
40.82 DMSO
40.54 DMSO
40.26 DMSO
39.99 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
19.36
15.06
O
H
N
H
210
200
190
180
170
160
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140
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120
110
100
90
80
70
60
50
40
30
20
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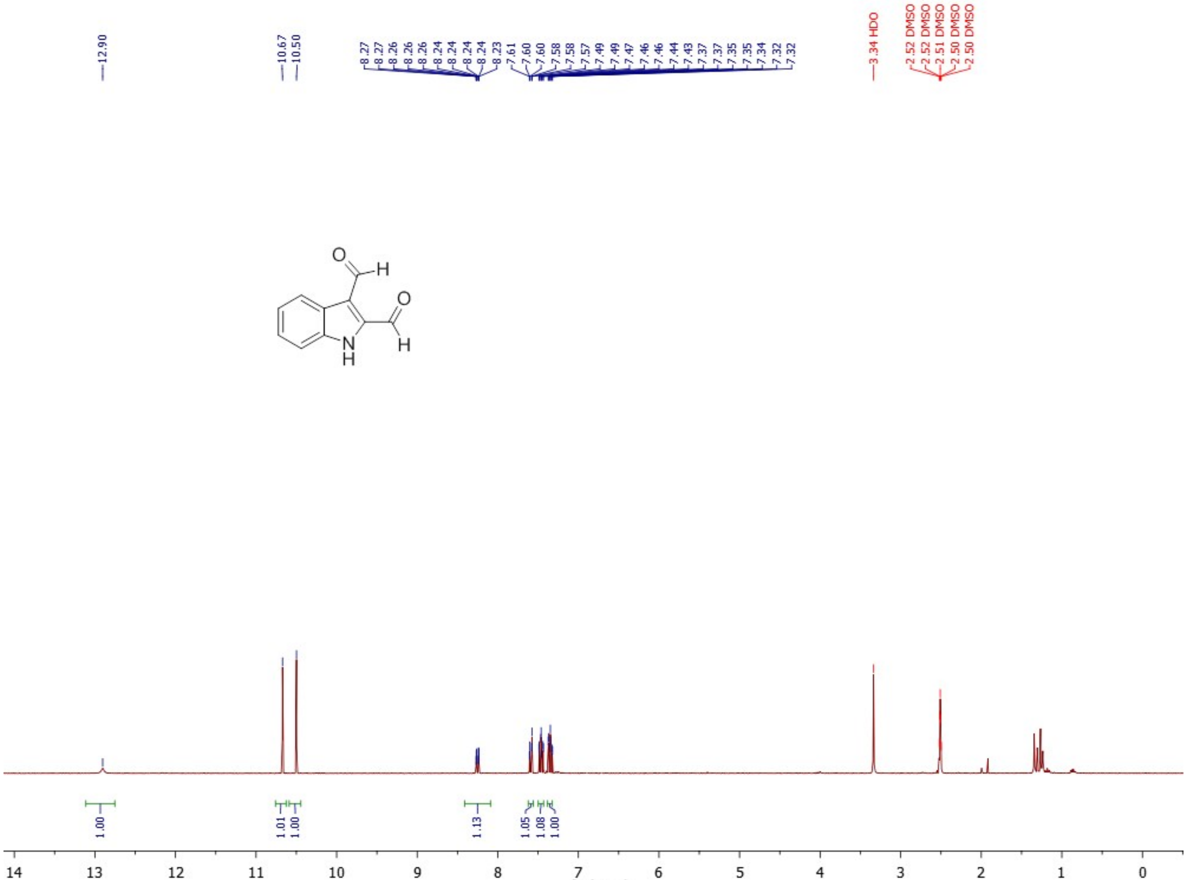
f1 (ppm)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8.23
7.61
7.60
7.58
7.58
7.57
7.49
7.47
7.46
7.46
7.44
7.43
7.37
7.37
7.35
7.34
7.32
7.32
3.34 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
O
H
O
H
N
H
1.00
1.01
1.00
1.13
1.05
1.08
1.00
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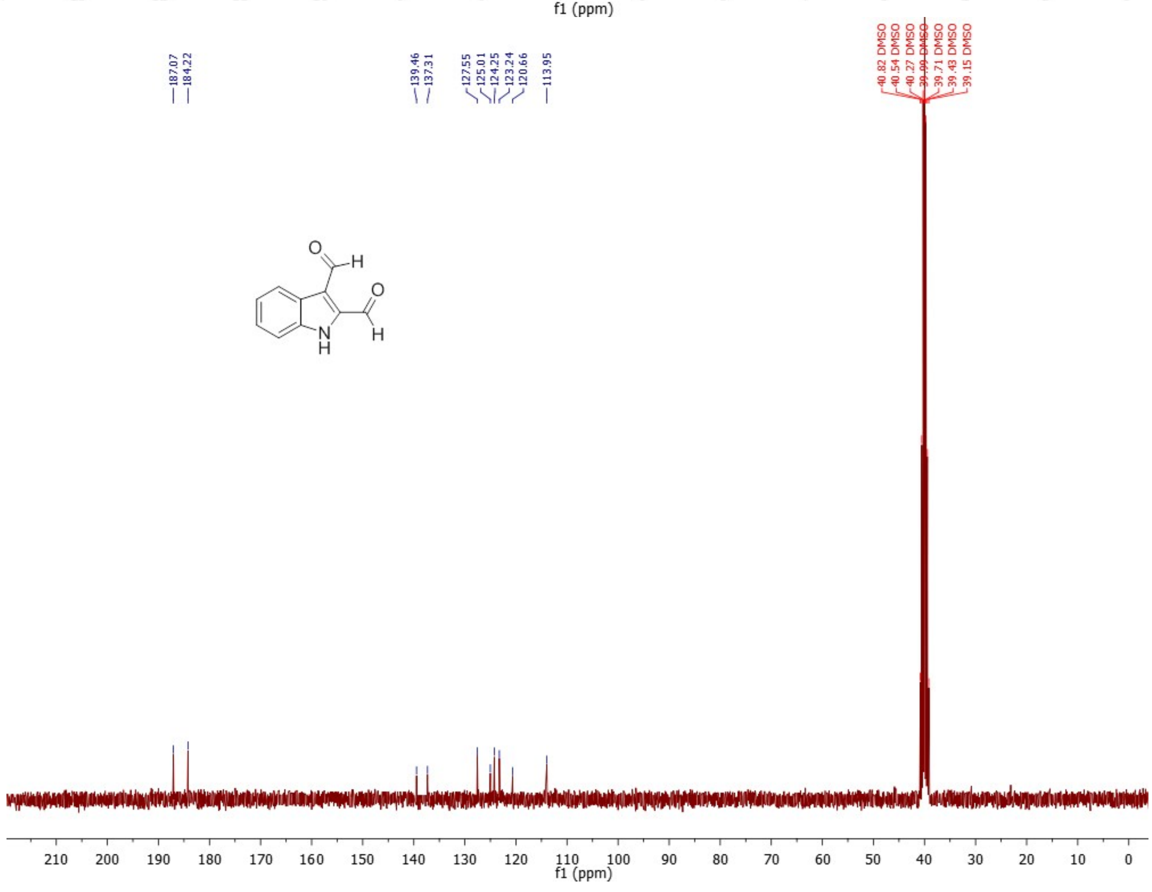
13
12
11
10
9
8
7
6
5
4
3
2
1
0
f1 (ppm)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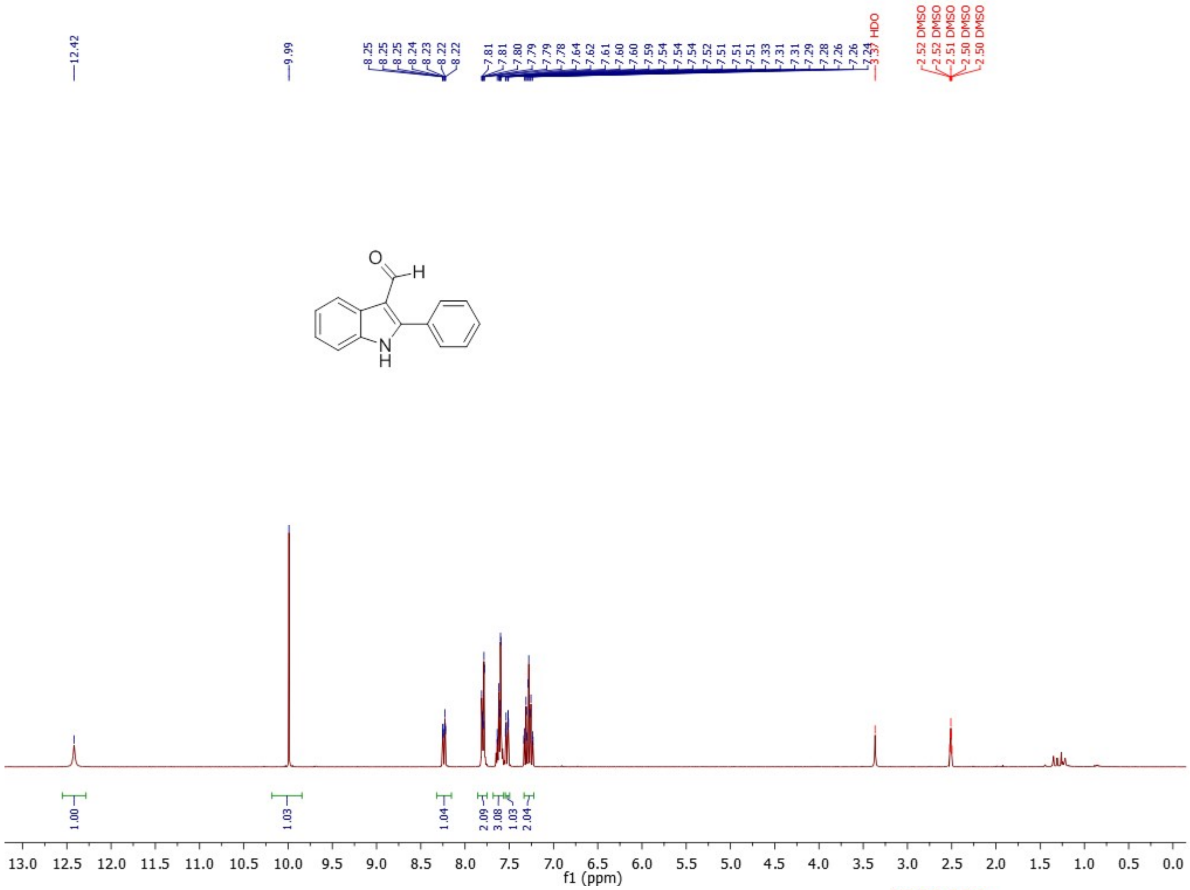
127.55
125.01
124.25
123.24
120.66
113.95
40.82 DMSO
40.54 DMSO
40.27 DMSO
39.99 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
O
H
O
H
N
H
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)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8.23
8.22
8.22
7.81
7.81
7.80
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7.79
7.78
7.64
7.62
7.61
7.60
7.60
7.59
7.54
7.54
7.54
7.52
7.51
7.51
7.51
7.33
7.31
7.31
7.29
7.28
7.26
7.26
7.24
3.37 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
O
H
N
H
1.00
1.03
1.04
2.09
3.08
1.03
2.04
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
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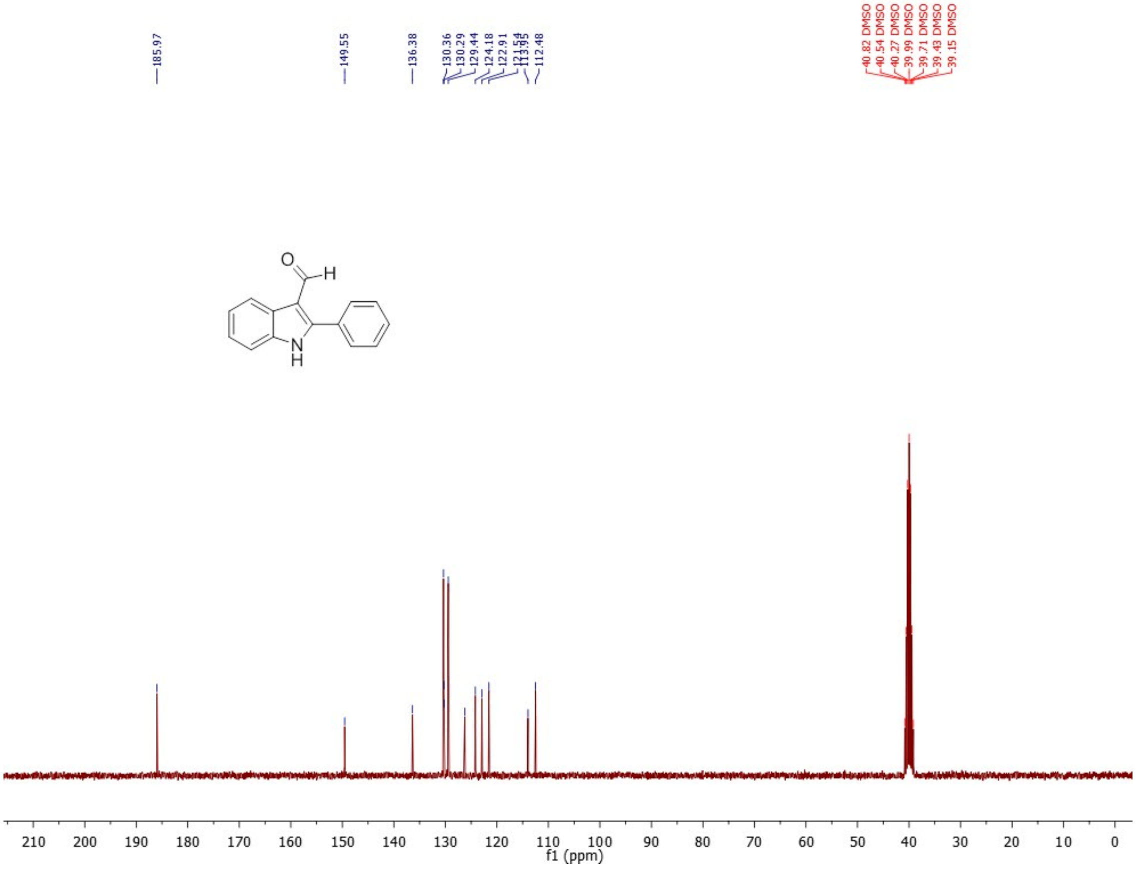
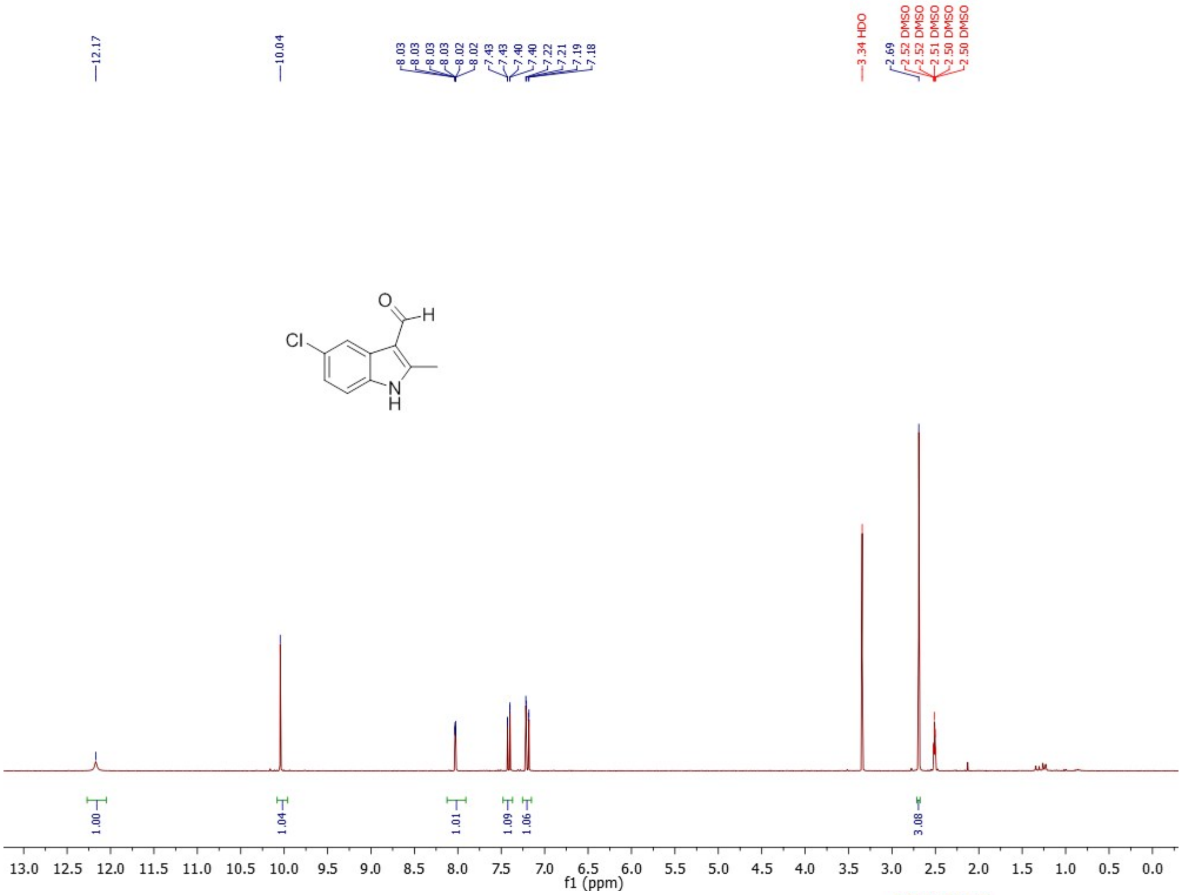
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


185.97
149.55
136.38
130.36
130.29
129.44
124.18
122.91
121.54
113.95
112.48
40.82 DMSO
40.54 DMSO
40.27 DMSO
39.99 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
O
H
N
H
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)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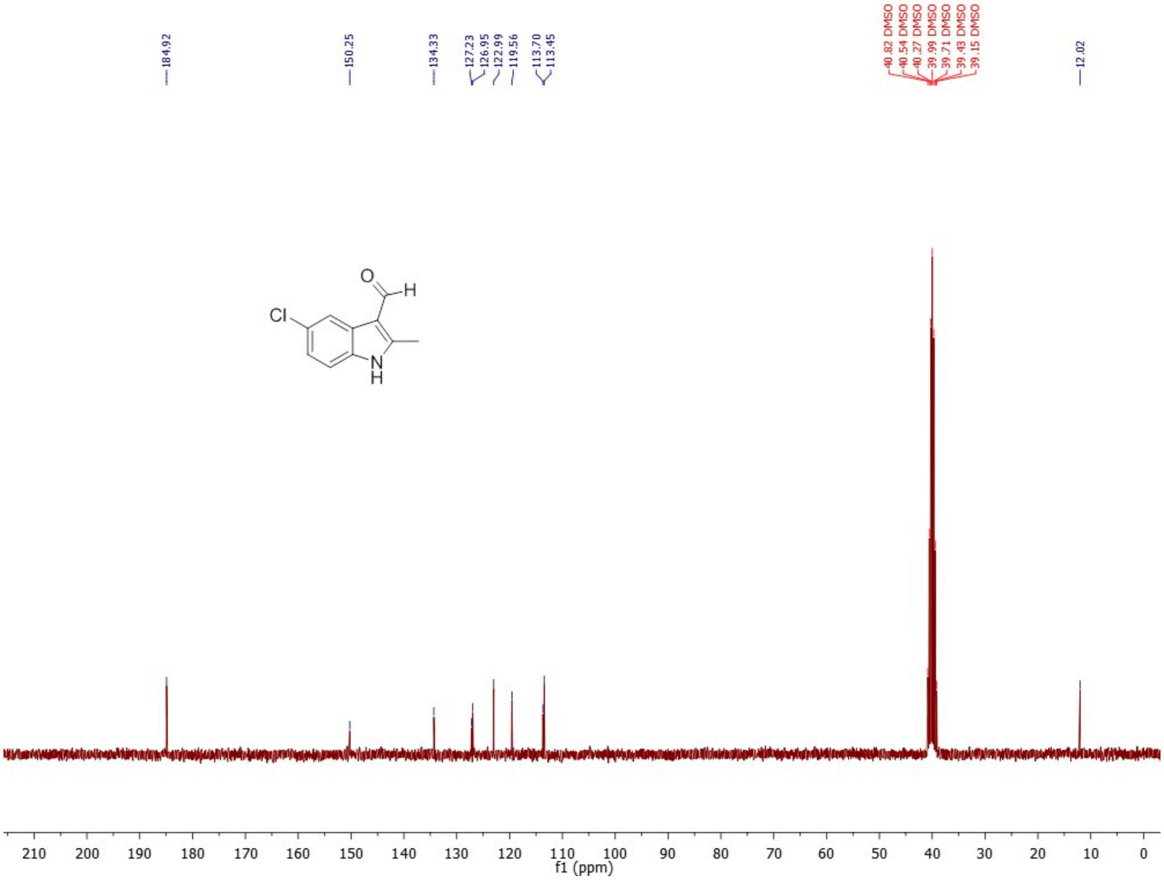
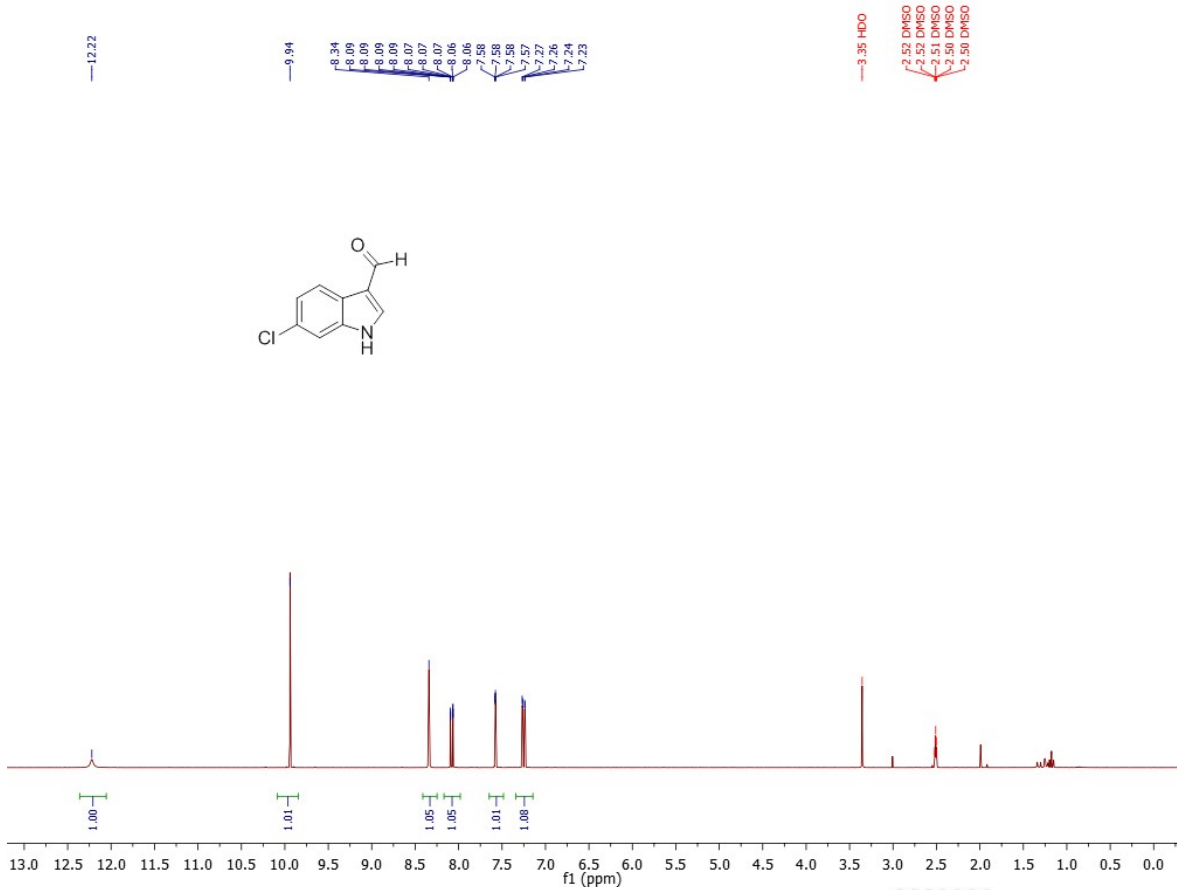
10.04
8.03
8.03
8.03
8.03
8.02
8.02
7.43
7.43
7.40
7.40
7.22
7.21
7.19
7.18
3.34 HDO
2.69
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
Cl
O
H
N
H
1.00
1.04
1.01
1.09
1.06
3.08
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


184.92
150.25
134.33
127.23
126.95
122.99
119.56
113.70
113.45
40.82 DMSO
40.54 DMSO
40.27 DMSO
39.99 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
12.02
Cl
O
H
N
H
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)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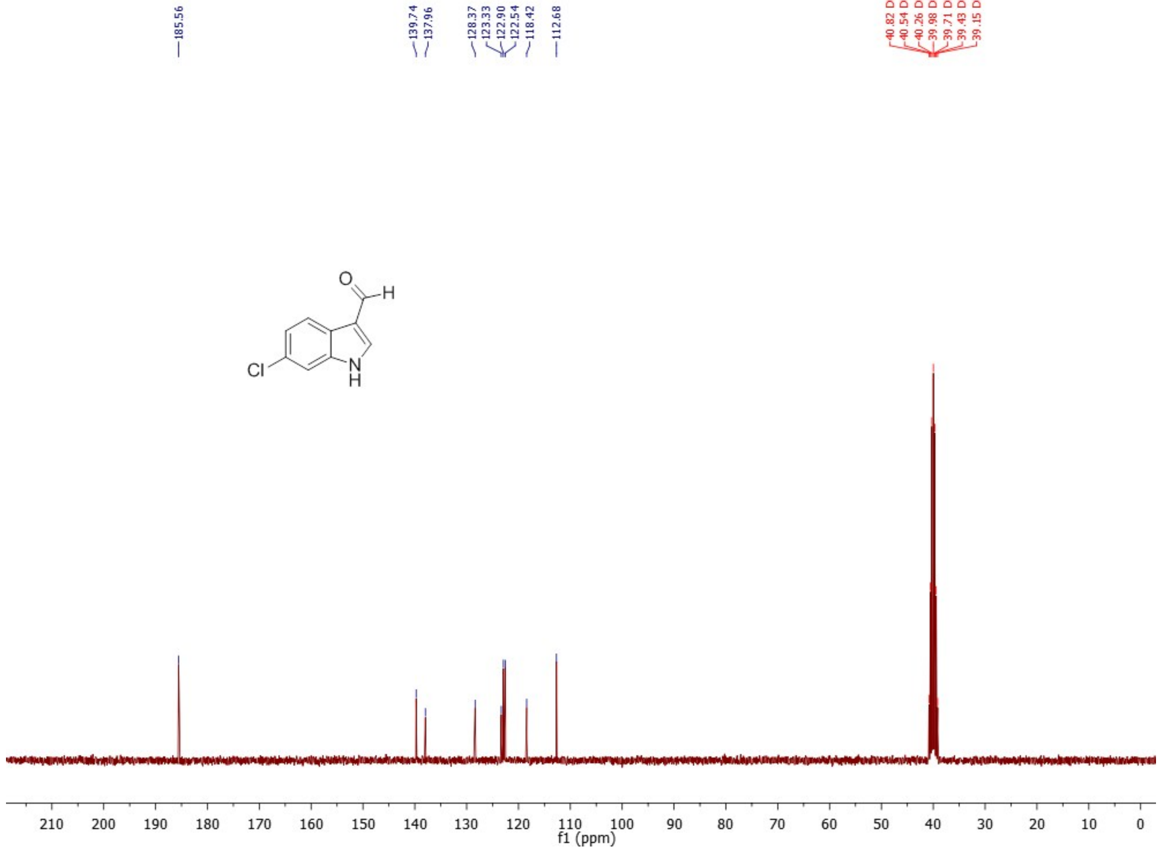
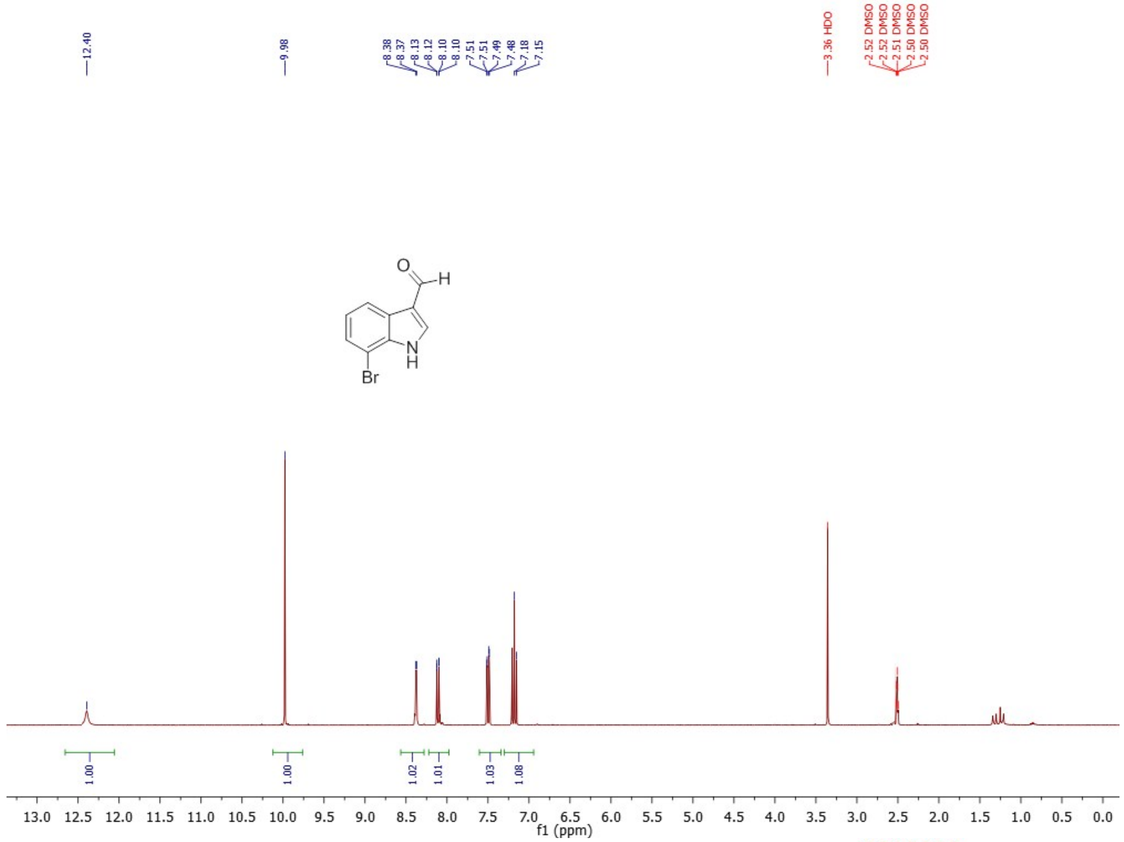
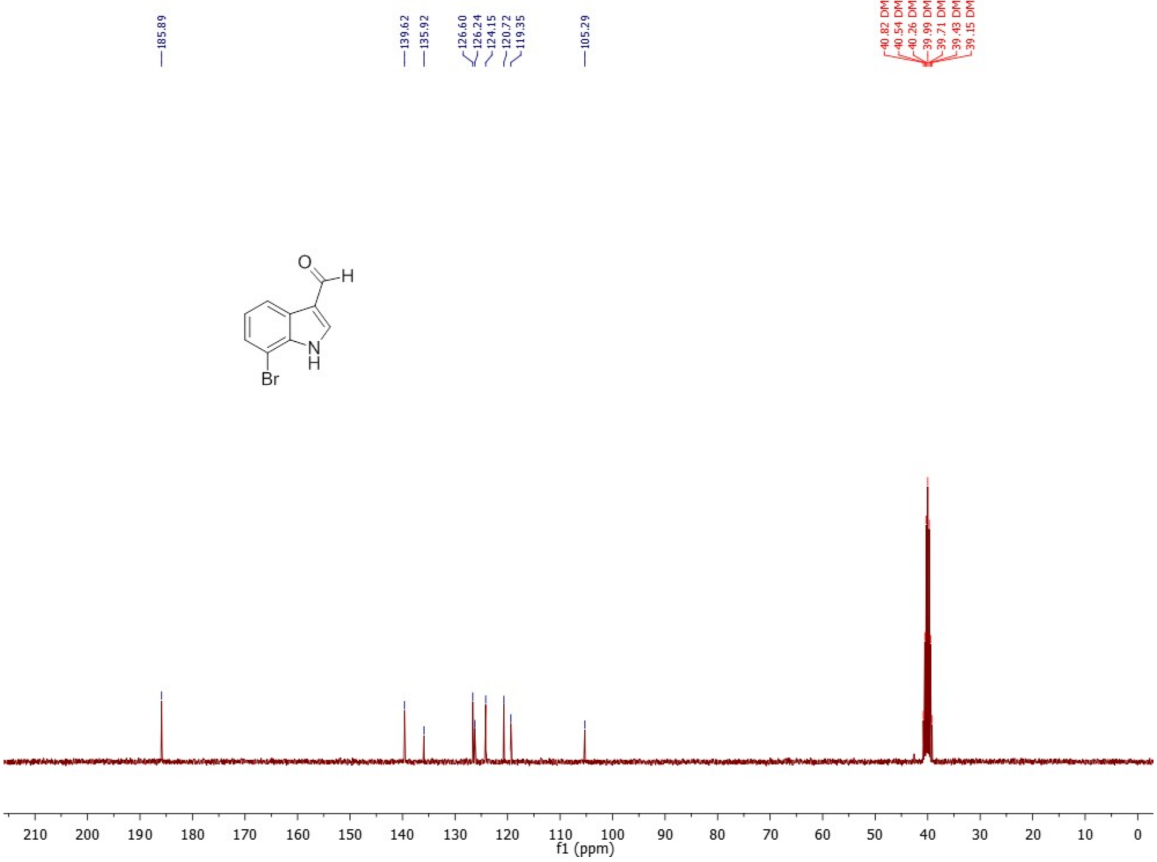
9.94
8.34
8.09
8.09
8.09
8.09
8.07
8.07
8.06
8.06
7.58
7.58
7.58
7.57
7.27
7.26
7.24
7.23
3.35 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
O
H
Cl
N
H
1.00
1.01
1.05
1.05
1.01
1.08
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

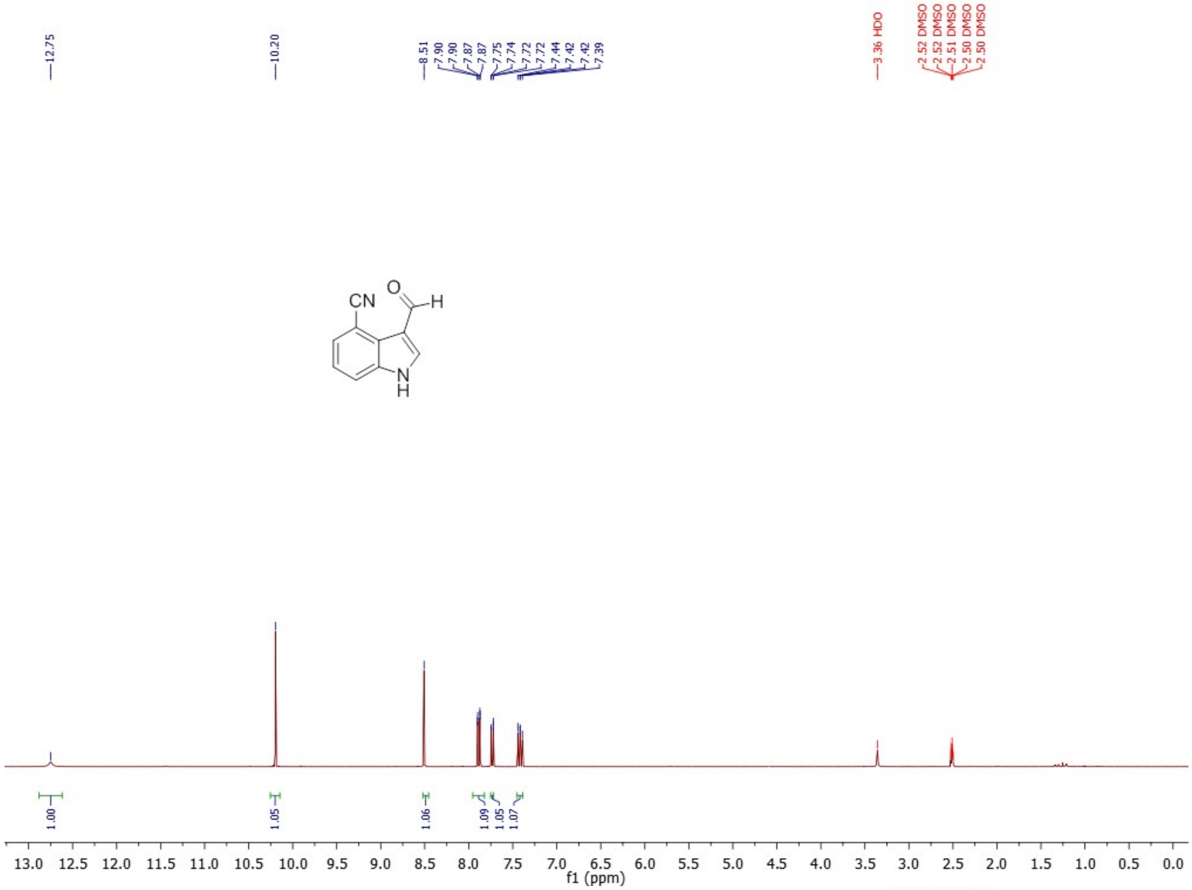

185.56
139.74
137.96
128.37
123.33
122.90
122.54
118.42
112.68
40.82 DMSO
40.54 DMSO
40.26 DMSO
39.98 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
O
H
Cl
N
H
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)



12.40
9.98
8.38
8.37
8.13
8.12
8.10
8.10
7.51
7.51
7.49
7.48
7.18
7.15
3.36 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
O
H
N
H
Br
1.00
1.00
1.02
1.01
1.03
1.08
13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)



185.89
139.62
135.92
126.60
126.24
124.15
120.72
119.35
105.29
40.82 DMSO
40.54 DMSO
40.26 DMSO
39.99 DMSO
39.71 DMSO
39.43 DMSO
39.15 DMSO
O
H
N
H
Br
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)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7.90
7.90
7.87
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7.75
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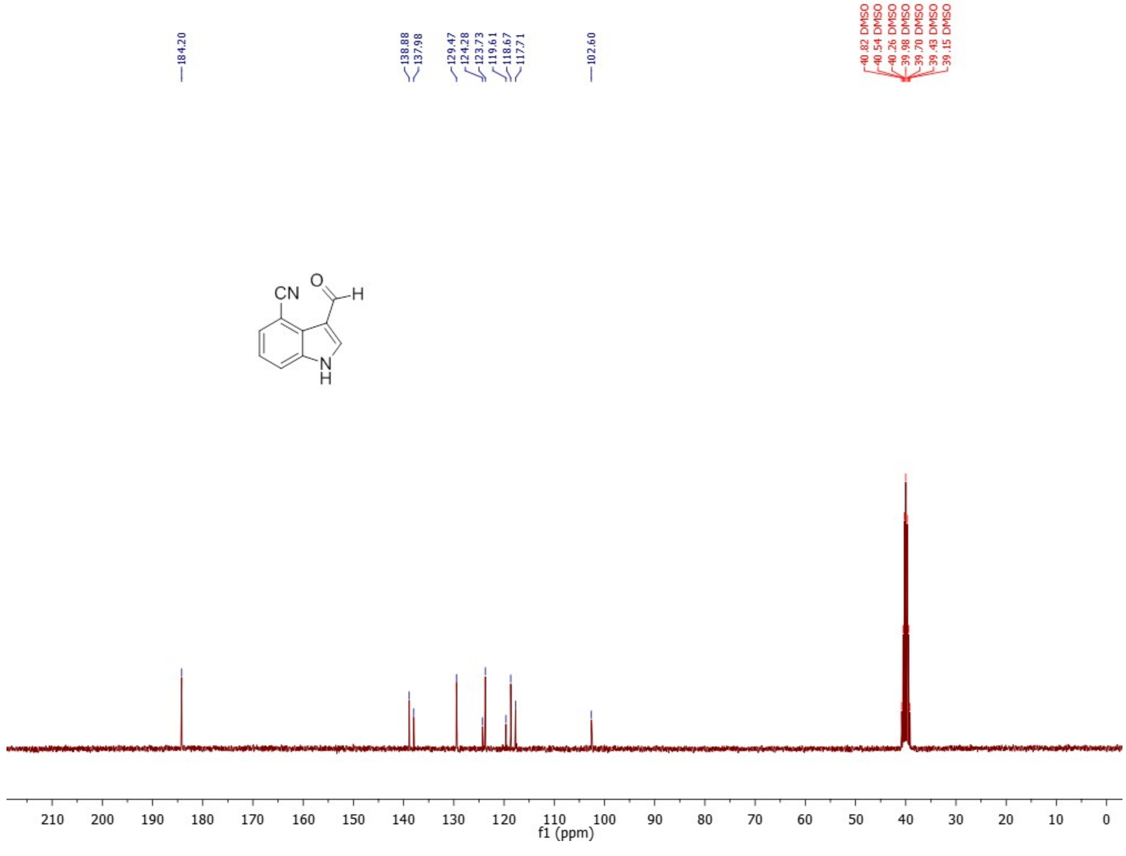
7.72
7.72
7.44
7.42
7.42
7.39
3.36 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
CN
O
H
N
H
1.00
1.05
1.06
1.09
1.05
1.07
13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)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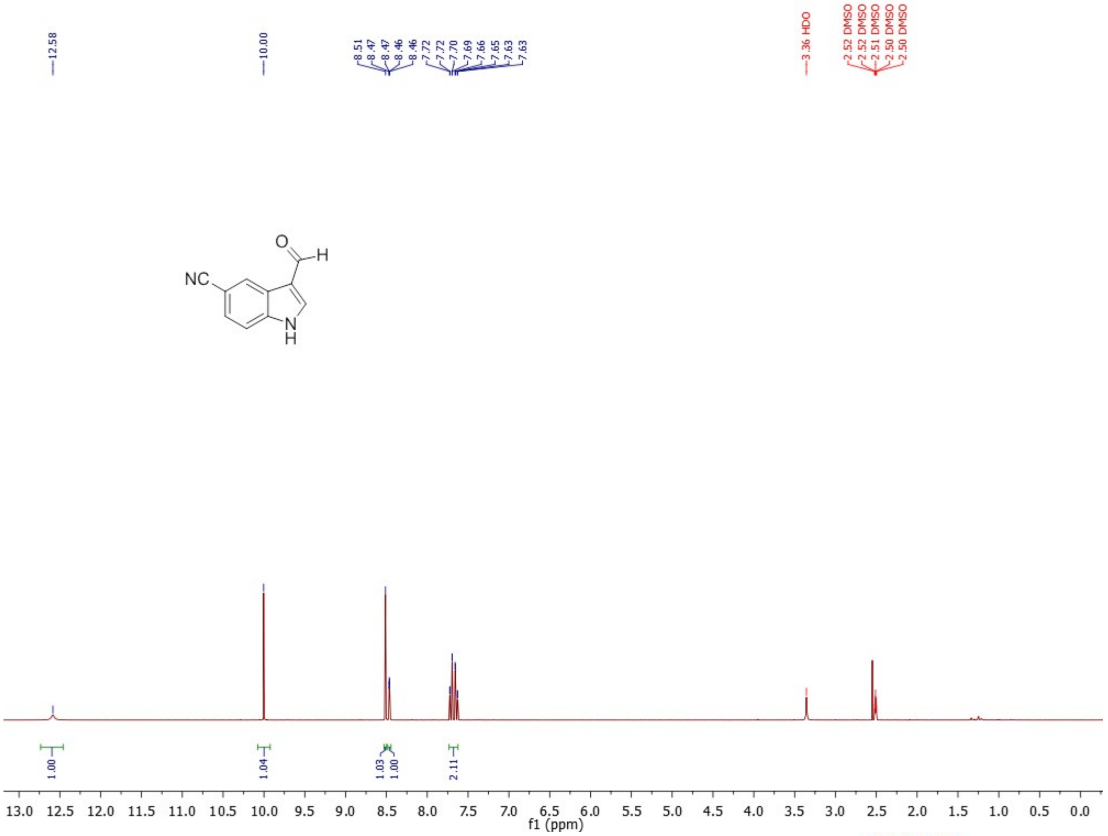
137.98
129.47
124.28
123.73
119.61
118.67
117.71
102.60
40.82 DMSO
40.54 DMSO
40.26 DMSO
39.98 DMSO
39.70 DMSO
39.43 DMSO
39.15 DMSO
CN
O
H
N
H
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)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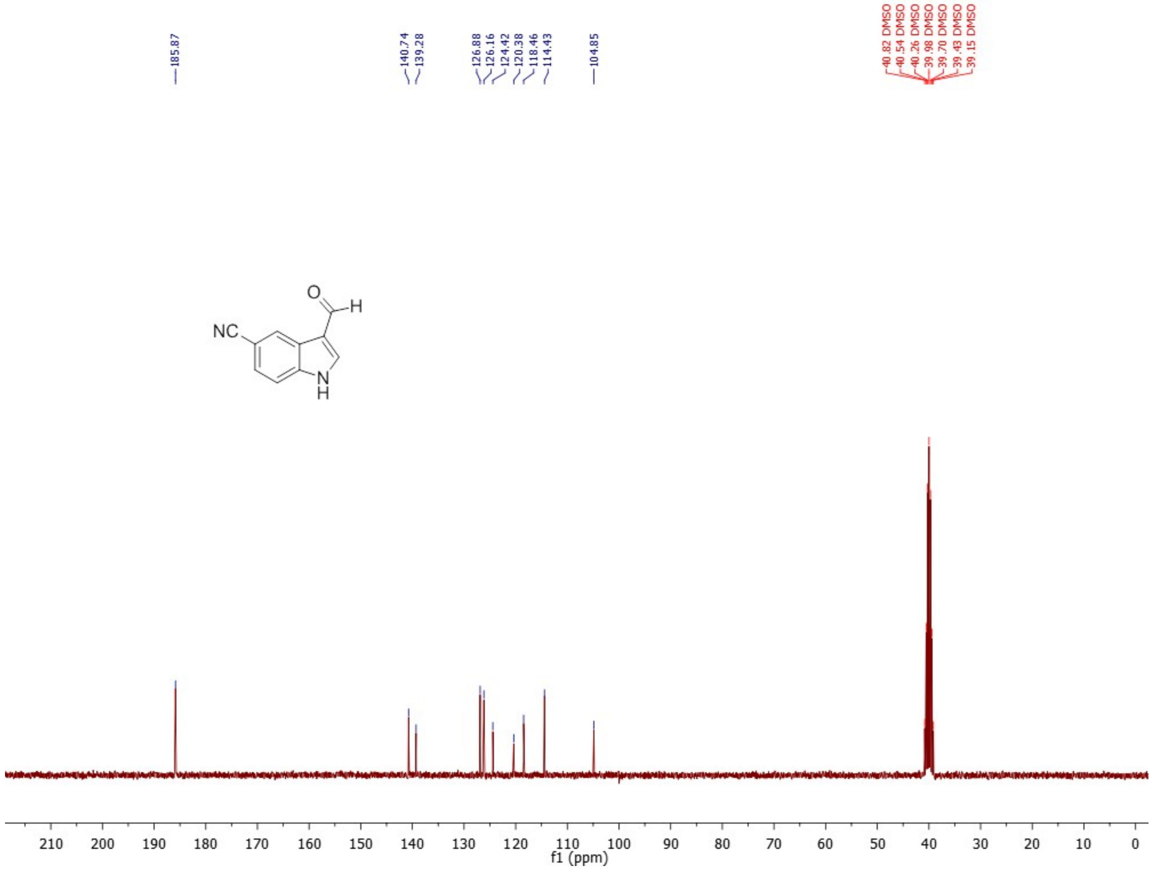
10.00
8.51
8.47
8.47
8.46
8.46
7.72
7.72
7.70
7.69
7.66
7.65
7.63
7.63
3.36 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
NC
O
H
N
H
1.00
1.04
1.03
1.00
2.11
13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)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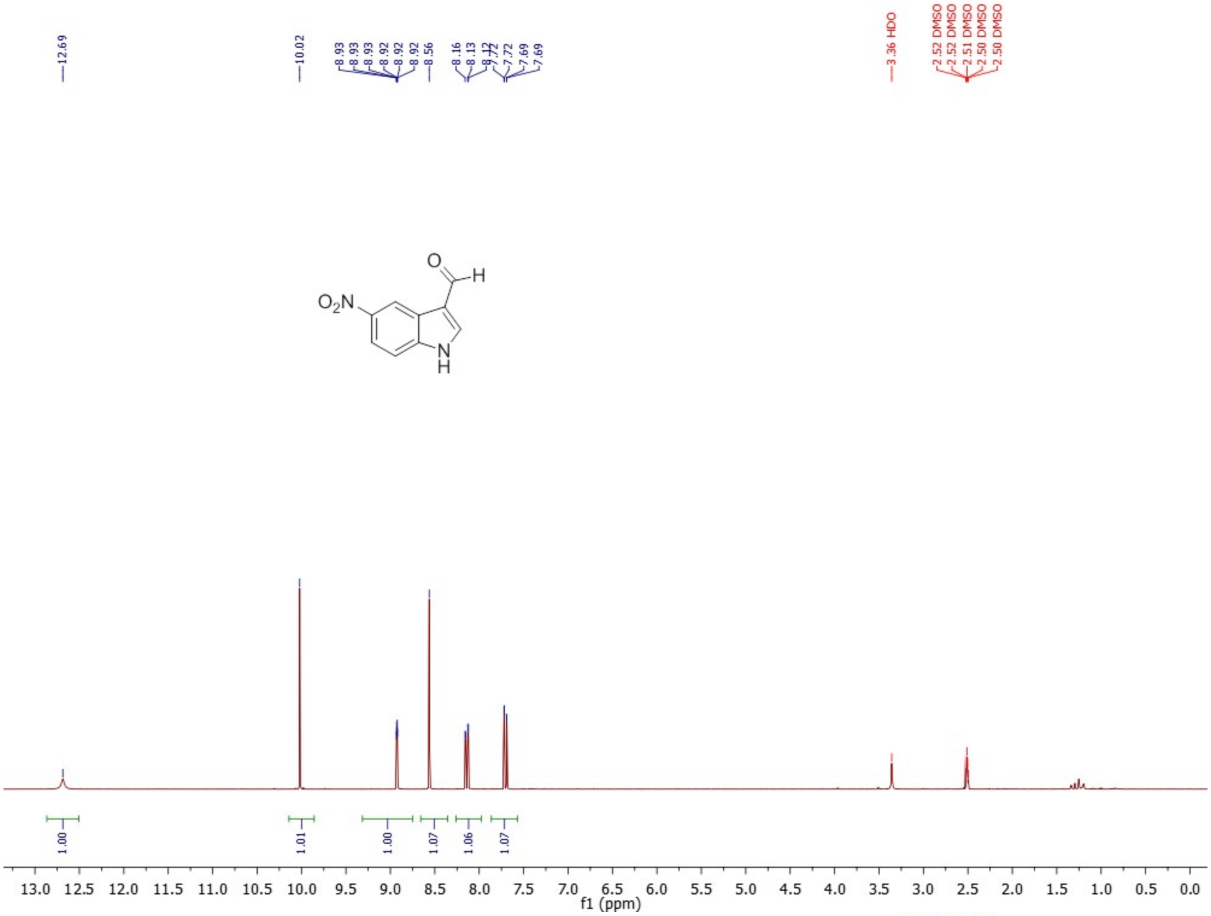
126.88
126.16
124.42
120.38
118.46
114.43
104.85
40.82 DMSO
40.54 DMSO
40.26 DMSO
39.98 DMSO
39.70 DMSO
39.43 DMSO
39.15 DMSO
NC
O
H
N
H
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)



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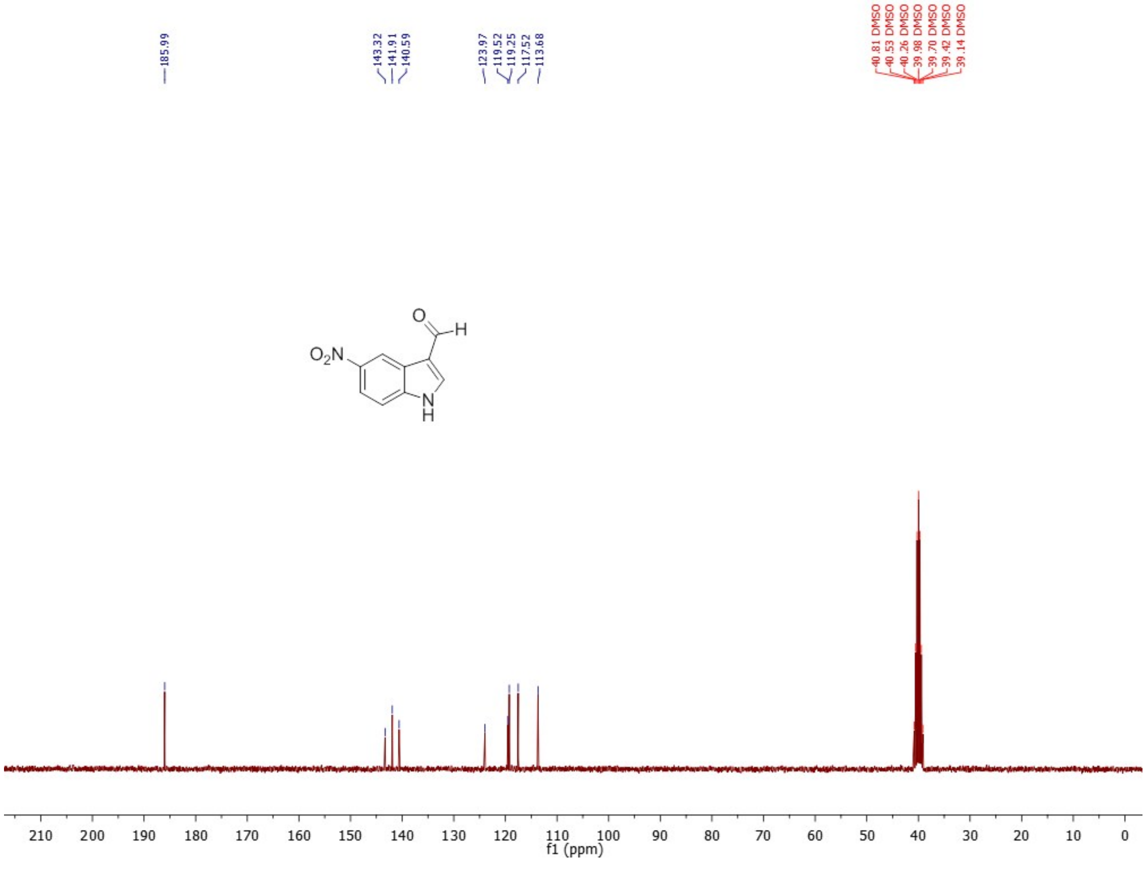
10.02
8.93
8.93
8.93
8.92
8.92
8.92
8.56
8.16
8.13
8.12
7.72
7.69
7.69
3.36 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
O
H
O2N
N
H
1.00
1.01
1.00
1.07
1.06
1.07
13.0 12.5 12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)



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143.32
141.91
140.59
123.97
119.52
119.25
117.52
113.68
40.81 DMSO
40.53 DMSO
40.26 DMSO
39.98 DMSO
39.70 DMSO
39.42 DMSO
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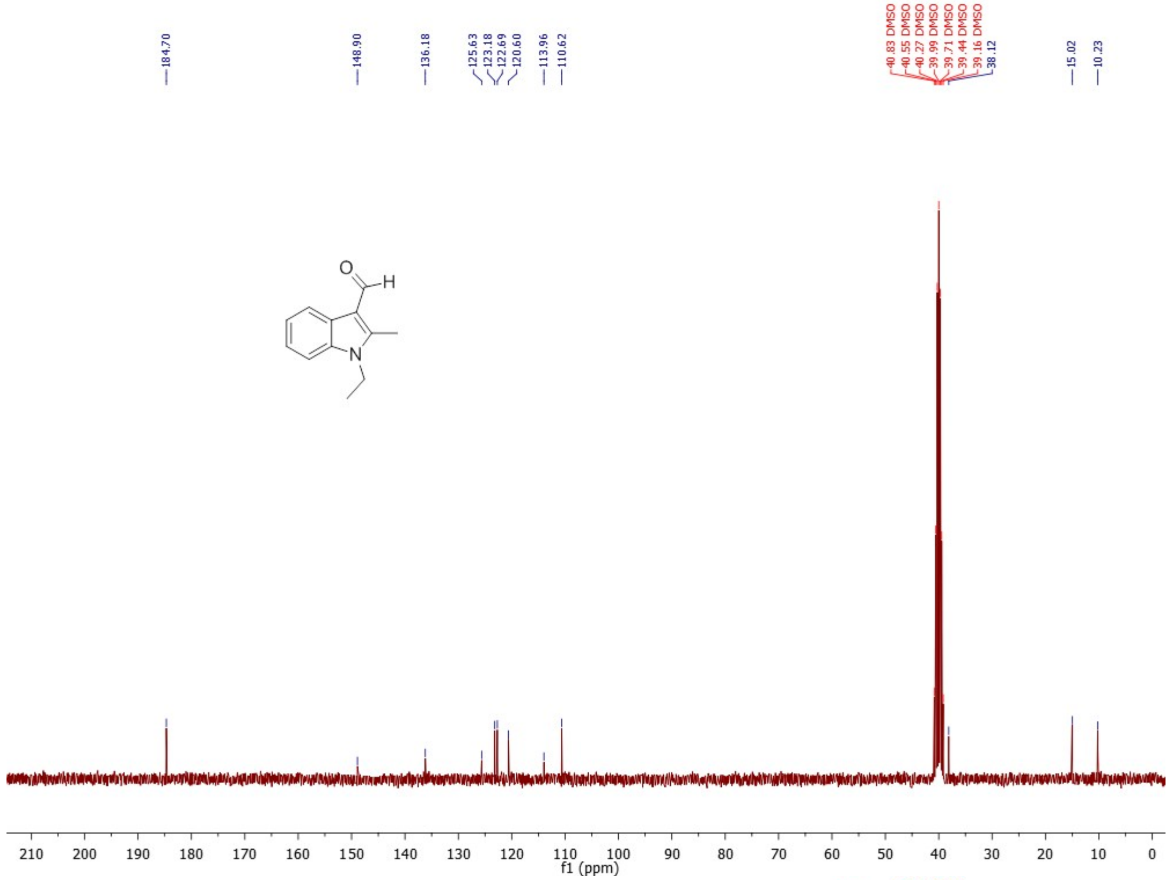
O
H
O2N
N
H
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)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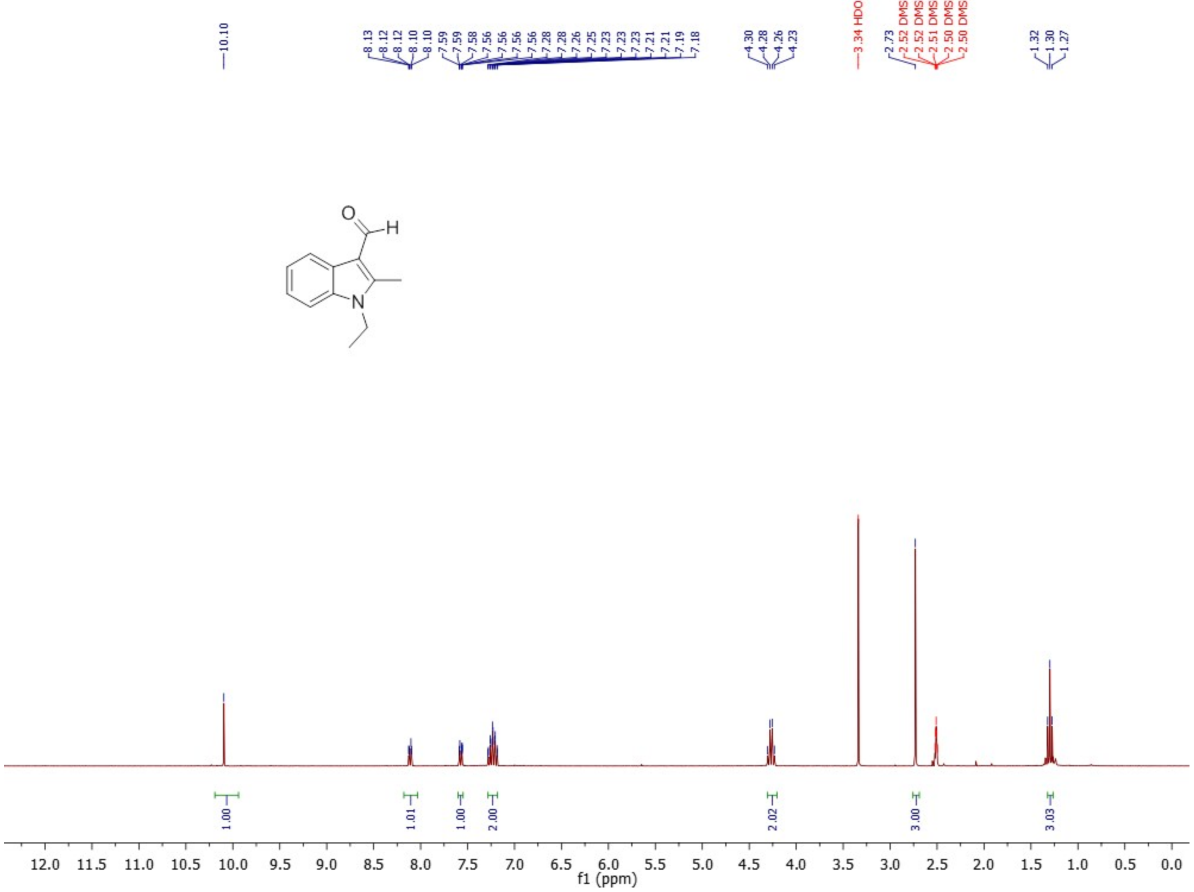
148.90
136.18
125.63
123.18
122.69
120.60
113.96
110.62
40.83 DMSO
40.55 DMSO
40.27 DMSO
39.99 DMSO
39.71 DMSO
39.44 DMSO
39.16 DMSO
38.12
15.02
10.23
O
H
N
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)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8.12
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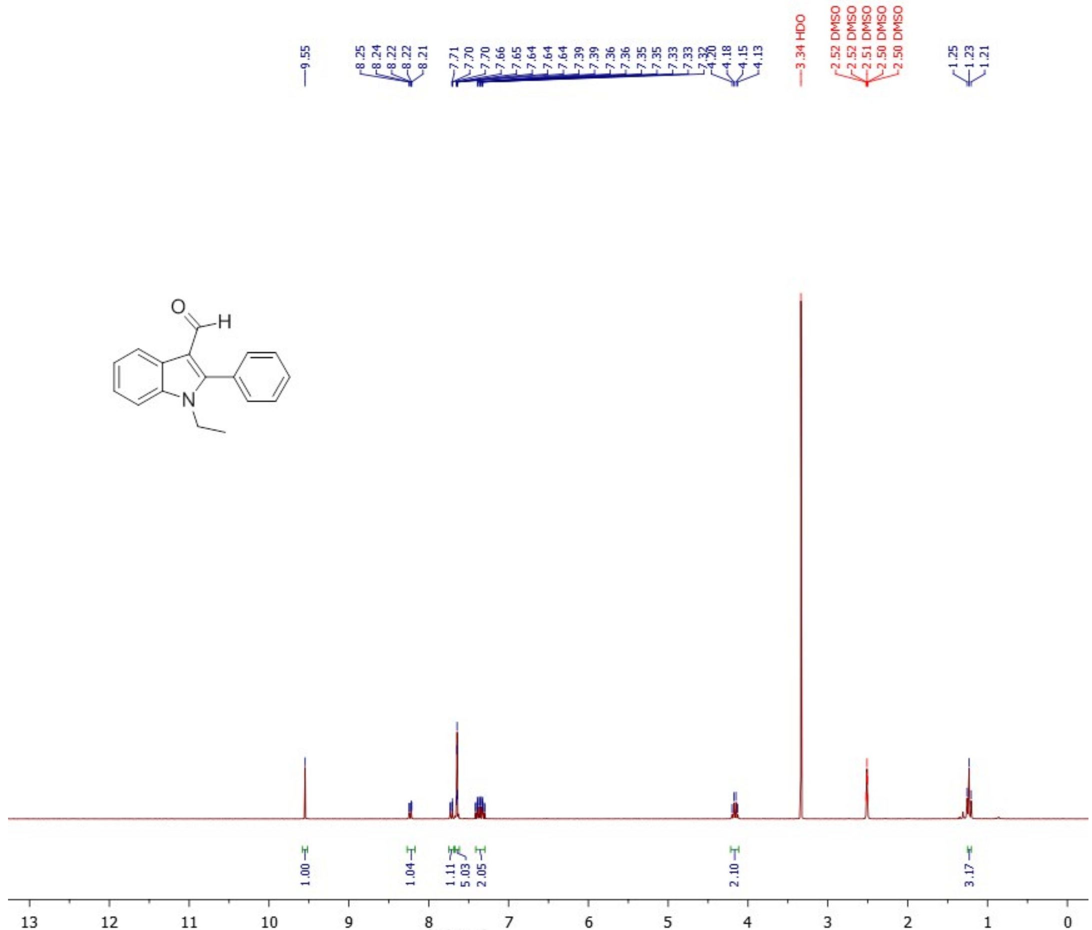
7.59
7.58
7.56
7.56
7.56
7.56
7.28
7.28
7.26
7.25
7.23
7.23
7.23
7.21
7.21
7.19
7.18
4.30
4.28
4.26
4.23
3.34 HDO
2.73
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
1.32
1.30
1.27
O
H
N
1.00
1.01
1.00
2.00
2.02
3.00
3.03
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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8.22
8.22
8.21
7.71
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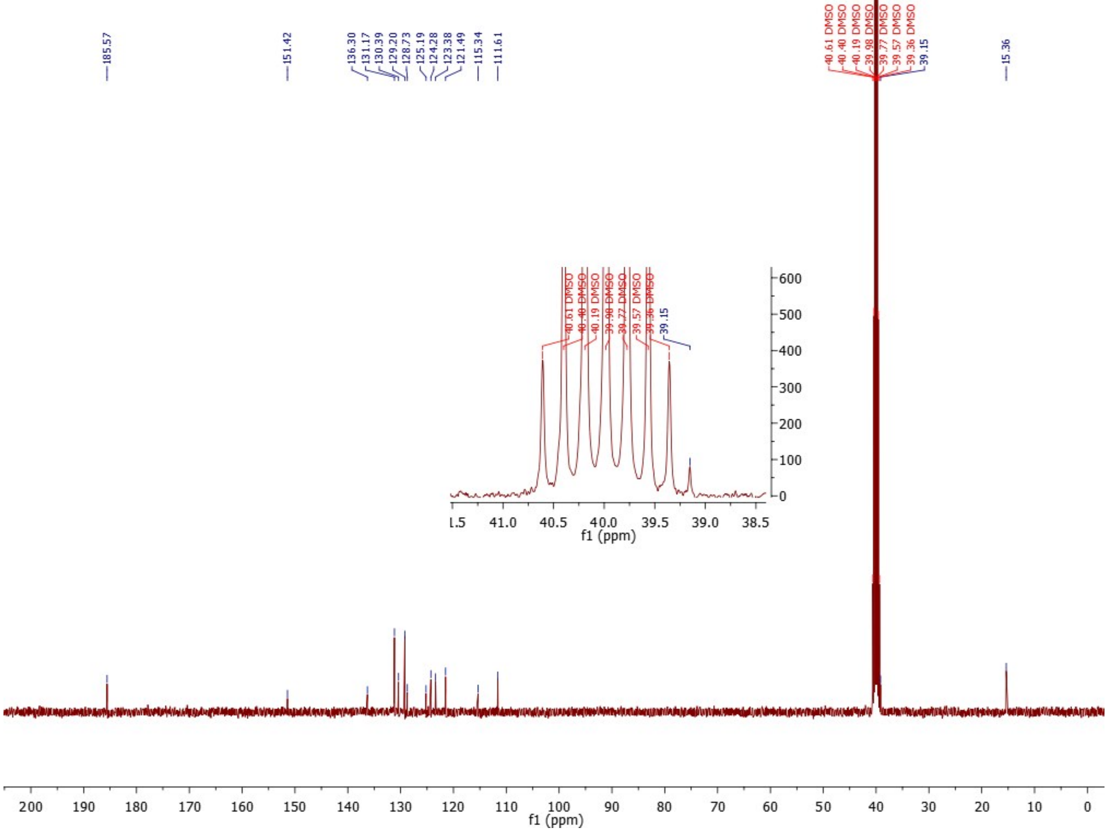
7.70
7.66
7.65
7.64
7.64
7.64
7.39
7.39
7.36
7.36
7.35
7.35
7.33
7.33
7.32
4.20
4.18
4.15
4.13
3.34 HDO
2.52 DMSO
2.52 DMSO
2.51 DMSO
2.50 DMSO
2.50 DMSO
1.25
1.23
1.21
O
H
N
1.00
1.04
1.11
5.03
2.05
2.10
3.17
13
12
11
10
9
8
7
6
5
4
3
2
1
0
f1 (ppm)


185.57
151.42
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131.17
130.39
129.20
128.73
125.19
124.28
123.38
121.49
115.34
111.61
40.61 DMSO
40.40 DMSO
40.19 DMSO
39.98 DMSO
39.77 DMSO
39.57 DMSO
39.36 DMSO
39.15
15.36
600
500
400
300
200
100
0
1.5
41.0
40.5
40.0
39.5
39.0
38.5
f1 (ppm)
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)