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Supporting Information

Platinum-Catalyzed Multi-step Reaction of Indoles with Alkynyl Alcohols

Sivakolundu Bhuvaneswari, Masilamani Jeganmohan and Chien-Hong Cheng*[a]

[a] Department of Chemistry, National Tsing Hua University, Hsinchu 30013, Taiwan

E-mail: chcheng@mx.nthu.edu.tw

Experimental procedure for the addition reaction of N-methyl indole (1a) with cyclic enol ether 6: A 25 ml round-bottomed flask containing $PtCl_2$ (0.050 mmol, 5.0 mol %) was evacuated and purged with nitrogen gas three times. Freshly distilled THF (3.0 ml), N-methyl indole (**1a**) (1.00 mmol) and 2,3-dihydro-5-methylfuran (**6**) (3.0 mmol) were sequentially added to the system and the reaction mixture was stirred at room temperature for 2 h. The mixture was filtered through a short Celite and silica gel pad and washed with dichloromethane several times. The filtrate was concentrated and the residue was purified on a silica gel column using hexanes-ethyl acetate as eluent to afford the cyclization product **3a**. Product **3s** was synthesized according to this procedure by using 2,3-dihydro-5-methylfuran (**6**) (1.2 mmol) or N-methyl indole (**1a**) (1.00 mmol) and **3a** (1.0 mmol) for 6 h or N-methyl indole (**1a**) (2.0 mmol) and pent-3-yn-1-ol (**2a**) (1.0 mmol) for 6 h. Product **3t** was also synthesized according to this procedure by using N-methyl indole (**1a**) (1.00 mmol) and **11** (1.2 mmol) for 3 h.

Experimental procedure for the addition reaction of N-methyl indole (1a) with 3-tetrahydro-2-(pent-3-ynyloxy)-2*H*-pyran (10b): A 25 ml round-bottomed flask containing $PtCl_2$ (0.050 mmol, 5.0 mol %) was evacuated and purged with nitrogen gas three times. Freshly distilled THF (3.0 ml), N-methyl indole (**1a**) (2.00 mmol) and 3-tetrahydro-2-(pent-3-ynyloxy)-2*H*-pyran (**10b**) were sequentially added to the system and the reaction mixture was stirred at room temperature for 2 h. The mixture was filtered through a short Celite and silica gel pad and washed with dichloromethane several times. The filtrate was concentrated and the residue was purified on a silica gel

column using hexanes-ethyl acetate as eluent to afford the cyclization products **3a** and **3t**.

Spectral data of compounds **3d-h**, **3k-m**, **3q**, and **3s-t** and copies of ^{1}H and ^{13}C NMR spectra of all compounds are listed bellow.

3-(Tetrahydro-2-methylfuran-2-yl)-7-methoxy-1-methyl-1*H*-indole (**3d**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.27 (d, *J* = 8.0 Hz, 1 H; HC=), 6.97 (t, *J* = 8.0 Hz, 1 H; HC=), 6.84 (s, 1 H; HC=), 6.61 (d, *J* = 7.6 Hz, 1 H; HC=), 4.02-3.96 (m, 5 H; O-CH_2, O-CH_3), 3.92 (s, 3 H; N-CH_3), 2.41-2.39 (m, 1 H; CH_2), 2.04-2.00 (m, 3 H; CH_2), 1.67 (s, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 148.11 (C), 127.85 (C), 127.63 (C), 126.62 (CH), 121.68 (C), 119.50 (CH), 113.43 (CH), 102.37 (CH), 82.00 (C), 67.45 (CH_2), 55.62 (O-CH_3), 38.64 (CH_2), 36.65 (N-CH_3), 28.90 (CH_3), 26.32 (CH_2); HRMS (m/z) calcd for $C_{15}H_{19}O_2N$ 245.1416 found 245.1410.

5-Bromo-3-(tetrahydro-2-methylfuran-2-yl)-1-methyl-1*H*-indole (**3e**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.84 (d, *J* = 1.6 Hz, 1 H; HC=), 7.28 (d, *J* = 8.8 Hz, 1 H; HC=), 7.13 (d, *J* = 8.4 Hz, 1 H; HC=), 6.95 (s, 1 H; HC=), 4.02-3.93 (m, 2 H; O-CH_2), 3.71 (s, 3 H; N-CH_3), 2.35-2.28 (m, 1 H; CH_2), 2.07-1.93 (m, 3 H; CH_2), 1.64 (s, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 136.27 (C), 127.02 (C), 126.84 (CH), 124.12 (CH), 122.85 (CH), 121.22 (C), 112.22 (C), 110.69 (CH), 81.42 (C), 67.18 (CH_2), 38.48 (CH_2), 32.74 (N-CH_3), 28.59 (CH_3), 25.98 (CH_2); HRMS (m/z) calcd for $C_{14}H_{16}ON$ 293.0415 found 293.0409.

3-(Tetrahydro-2-methylfuran-2-yl)-5-iodo-1-methyl-1*H*-indole (**3f**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.01 (d, *J* = 1.2 Hz, 1 H; HC=), 7.42 (d, *J* = 8.4 Hz, 1 H; HC=), 7.02 (d, *J* = 8.4 Hz, 1 H; HC=), 6.89 (s, 1 H; HC=), 4.00-3.89 (m, 2 H; O-CH_2),

3.67 (s, 3 H; N-CH_3), 2.32-2.63 (m, 1 H; CH_2), 2.03-1.90 (m, 3 H; CH_2), 1.62 (s, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 136.69 (C), 129.61 (CH), 129.13 (CH), 127.93 (C), 125.95 (CH), 121.13 (CH), 111.29 (CH), 82.50 (C), 81.44 (C), 67.20 (CH_2), 38.52 (CH_2), 32.69 (N-CH_3), 28.66 (CH_3), 25.99 (CH_2); HRMS (m/z) calcd for $C_{14}H_{16}ONI$ 341.0277 found 341.0277.

3-(Tetrahydro-2-methylfuran-2-yl)-1-methyl-5-nitro-1*H*-indole (**3g**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.65 (d, *J* = 2.0 Hz, 1 H; HC=), 8.06 (d, *J* = 9.2 Hz, 1 H; HC=), 7.26 (d, *J* = 9.2 Hz, 1 H; HC=), 7.08 (s, 1 H; HC=), 4.02-3.92 (m, 2 H; O-CH_2), 3.78 (s, 3 H; N-CH_3), 2.33-2.28 (m, 1 H; CH_2), 2.12-1.91 (m, 3 H; CH_2), 1.64 (s, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 141.03 (C), 140.36 (C), 128.19 (CH), 124.87 (C), 124.66 (C), 117.82 (CH), 117.13 (CH), 109.12 (C), 81.24 (C), 67.35 (CH_2), 38.79 (CH_2), 33.79 (N-CH_3), 28.74 (CH_3), 26.01 (CH_2); HRMS (m/z) calcd for $C_{14}H_{16}O_3N_2$ 260.1161 found 260.1167.

3-(Tetrahydro-2-methylfuran-2-yl)-1,2-dimethyl-1*H*-indole (**3h**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.68 (d, *J* = 8.0 Hz, 1 H; HC=), 7.22 (d, *J* = 8.0 Hz, 1 H; HC=), 7.13 (t, *J* = 7.2 Hz, 1 H; HC=), 7.04 (t, *J* = 8.0 Hz, 1 H; HC=), 4.04-3.90 (m, 2 H; O-CH_2), 3.75 (s, 3 H; N-CH_3), 2.59 (s, 3 H; CH_3), 2.57-2.50 (m, 1 H; CH_2), 2.22-2.17 (m, 1 H; CH_2), 2.08-1.87 (m, 2 H; CH_2), 1.64 (s, 3 H, CH_3); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 136.99 (C), 132.03 (C), 126.07 (C), 120.50 (CH), 120.21 (CH), 118.90 (CH), 117.26 (C), 108.81 (CH), 83.69 (C), 67.03 (CH_2), 39.71 (CH_2), 31.84 (N-CH_3), 29.50 (CH_3), 29.32 (CH_3), 26.01 (CH_2); HRMS (m/z) calcd for $C_{15}H_{19}ON$ 229.1467 found 229.1468.

3-(Tetrahydro-2-phenylfuran-2-yl)-1-methyl-1*H*-indole (**3k**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.57 (d, *J* = 8.0 Hz, 1 H; HC=),

7.52-7.50 (m, 2 H; HC=), 7.31-7.14 (m, 5 H; HC=), 7.00 (t, *J* = 8.0 Hz, 1 H; HC=), 6.84 (s, 1 H; HC=), 4.11-4.07 (m, 2 H; O-CH_2), 3.82 (s, 3 H; N-CH_3), 2.78-2.71 (m, 1 H; CH_2), 2.59-2.43 (m, 1 H; CH_2), 2.09-1.92 (m, 2 H; CH_2); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 146.46 (C), 137.72 (C), 127.87 (CH), 126.72 (CH), 126.49 (CH), 126.05 (CH), 125.88 (C), 121.51 (CH), 121.08 (CH), 119.89 (C), 119.04 (CH), 109.11 (CH), 85.43 (C), 67.37 (CH_2), 38.65 (CH_2), 32.65 (N-CH_3), 25.80 (CH_2); HRMS (m/z) calcd for $C_{19}H_{19}ON$ 277.1467 found 277.1470.

(*E*)-4-(1-methyl-1*H*-indol-3-yl)-4-phenylbut-3-en-1-ol and (*Z*)-4-(1-methyl-1*H*-indol-3-yl)-4-phenylbut-3-en-1-ol (**3k'**): ^{1}H NMR of *E* isomer (400 MHz, $CDCl_3$): δ = 7.37-7.32 (m, 3 H; HC=), 7.25-7.18 (m, 5 H; HC=), 7.08 (s, 1 H; HC=), 6.98 (t, *J* = 8.0 Hz, 1 H; HC=), 6.11 (t, *J* = 7.2 Hz, 1 H; HC=), 3.82 (s, 3 H; N-CH_3), 3.69 (t, *J* = 7.2 Hz, 2 H; O-CH_2), 2.53 (q, *J* = 6.8, 14.6 Hz, 2 H; CH_2); ^{1}H NMR of *Z* isomer (400 MHz, $CDCl_3$): δ = 7.61 (d, *J* = 8.0 Hz, 1 H; HC=), 7.39-7.26 (m, 6 H; HC=), 7.21 (t, *J* = 7.2 Hz, 1 H; HC=), 7.01 (t, *J* = 6.8 Hz, 1 H; HC=), 6.65 (s, 1 H; HC=), 6.18 (t, *J* = 7.2 Hz, 1 H; HC=), 3.72 (t, *J* = 7.2 Hz, 2 H; O-CH_2), 3.68 (s, 3 H; N-CH_3), 2.53 (q, *J* = 6.8, 15.0 Hz, 2 H; CH_2); HRMS (m/z) calcd for $C_{19}H_{19}ON$ 277.1467 found 277.1470.

3-(Tetrahydro-2-(thiophen-2-yl)furan-2-yl)-1-methyl-1*H*-indole (**3l**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.61 (d, *J* = 8.0 Hz, 1 H; HC=), 7.32 (t, *J* = 7.6 Hz, 1 H; HC=), 7.22 (d, *J*) = 8.0 Hz, 1 H; HC=), 7.05 (t, *J* = 8.0 Hz, 1 H; HC=), 6.98 (s, 1 H; HC=), 6.94-6.91 (m, 3 H; HC=), 4.17-4.10 (m, 2 H; O-CH_2), 3.72 (s, 3 H; N-CH_3), 2.77-2.72 (m, 1 H; CH_2), 2.66-2.62 (m, 1 H; CH_2), 2.15-2.09 (m, 2 H; CH_2); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 151.82 (C), 137.65 (C), 127.08 (C), 126.60 (CH), 126.33 (CH), 125.71 (C), 124.76 (CH), 124.23 (CH),

121.52 (CH), 120.82 (CH), 119.63 (CH), 109.21 (CH), 83.52 (C), 67.06 (CH_2), 40.08 (CH_2), 32.66 (N-CH_3), 26.05 (CH_2); HRMS (m/z) calcd for $C_{17}H_{17}ONS$ 283.1031 found 283.1036.

4-(1-Methyl-1*H*-indol-3-yl)-4-(thiophen-2-yl)but-3-en-1-ol (**3l'**): ^1H NMR of *E* isomer (400 MHz, $CDCl_3$): δ = 7.31-7.29 (m, 2 H; HC=), 7.25 (t, *J* = 8.0 Hz, 1 H; HC=), 7.11-7.03 (m, 3 H; HC=), 6.87 (m, 1 H; HC=), 6.11 (t, *J* = 7.2 Hz, 1 H; HC=), 6.79 (m, 1 H; =CH), 6.21 (t, *J* = 8.0 Hz, 1 H; HC=), 3.82 (s, 3 H, N-CH_3), 3.67 (t, *J* = 6.4 Hz, 2 H; O-CH_2), 2.41 (q, *J* = 6.8, 14.0 Hz, 2 H; CH_2); HRMS (m/z) calcd for $C_{17}H_{17}ONS$ 283.1031 found 283.1036.

3-(2-Ethyl-tetrahydro-5-methylfuran-2-yl)-1-methyl-1*H*-indole (**3m**) (1:1 diastereoisomer): ^1H NMR (500 MHz, $CDCl_3$): δ = 7.67 (d, *J* = 8.0 Hz, 1 H; HC=), 7.62 (d, *J* = 8.5 Hz, 1 H; HC=), 7.26 (d, *J* = 8.0 Hz, 2 H; HC=), 7.18 (t, *J* = 7.0 Hz, 2 H; HC=), 7.05 (t, *J* = 8.0 Hz, 2 H; HC=), 6.98 (s, 1 H; HC=), 6.93 (s, 1 H; HC=), 4.21-4.11 (m, 2 H; O-CH_2), 3.72 (s, 6 H; N-CH_3), 2.33-2.30 (m, 2 H; CH_2), 2.16-2.00 (m, 2 H; CH_2), 1.99-1.93 (m, 6 H; CH_2), 1.57-1.50 (m, 2 H; CH_2), 1.24 (t, *J* = 9.0 Hz, 4 H; CH_2), 0.80 (m, 6 H; CH_3); ^{13}C NMR (125 MHz, $CDCl_3$): δ = 137.70 (C), 126.53 (CH), 125.95 (CH), 125.71 (C), 121.63 (C), 121.17 (CH), 121.06 (CH), 119.07 (CH), 120.73 (C), 120.62 (CH), 120.31 (CH), 118.56 (CH), 118.47 (CH), 109.19 (CH), 83.35 (C), 85.21 (C), 75.11 (CH), 74.13 (CH), 37.70 (CH_2), 36.52 (CH_2), 34.87 (CH_2), 34.06 (CH_2), 33.70 (CH_2), 33.48 (CH_2), 32.64 (N-CH_3), 21.73 (CH_3), 21.66 (CH_3), 9.14 (CH_3), 9.06 (CH_3); HRMS (m/z) calcd for $C_{16}H_{21}ON$ 243.1623 found 243.1624.

6-Di(1*H*-indol-3-yl)heptan-1-ol (**3q**): IR (cm^{-1}): 3556.09 (OH), 3301.54 (NH); ^1H NMR (400 MHz, $CDCl_3$): δ = 7.93 (N-H), 7.34 (d, *J* = 8.0 Hz, 2 H; HC=), 7.34 (d, *J* = 8.0 Hz, 2 H;

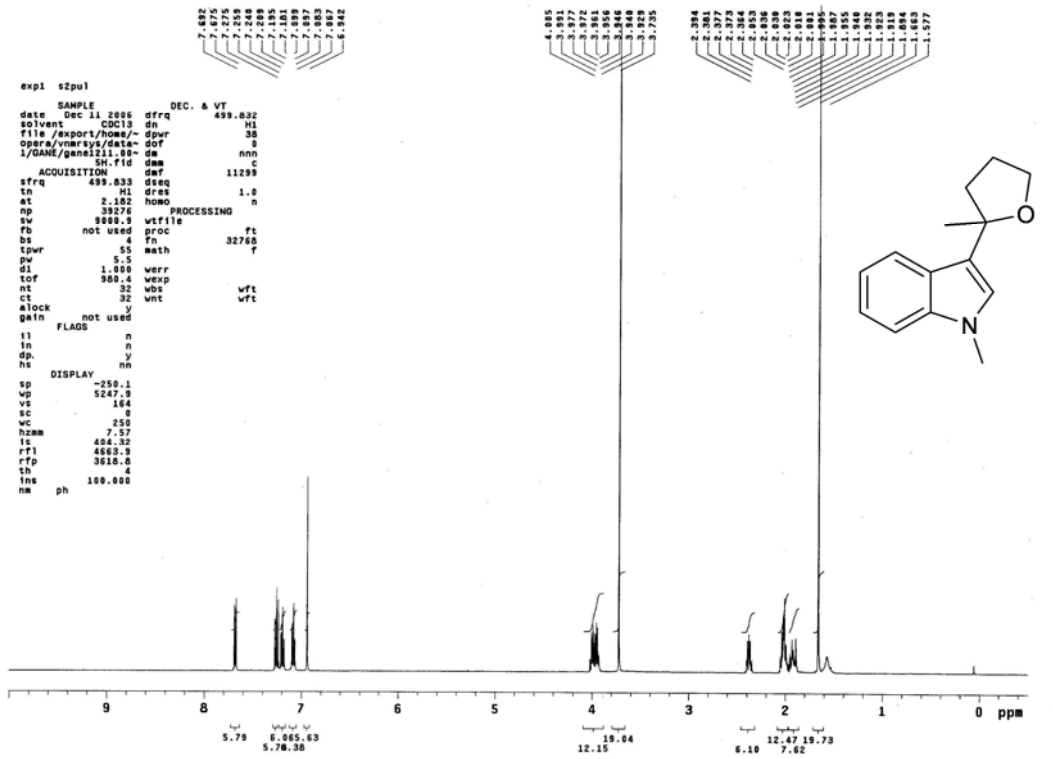
HC=), 7.27 (d, *J* = 8.0 Hz, 2 H; HC=), 7.06-7.03 (m, 4 H; HC=), 6.85-6.81 (m, 2 H; HC=), 3.48 (t, *J* = 6.4 Hz, 2 H; OCH_2), 2.34 (t, *J* = 7.6 Hz, 2 H; CH_2), 1.81 (s, 3 H, CH_3), 1.46-1.14 (m, 6 H; CH_2); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 136.98 (C), 126.36 (C), 124.31 (C), 121.28 (CH), 121.11 (CH), 121.10 (CH), 118.54 (CH), 110.94 (CH), 62.96 (CH_2), 40.29 (CH_2), 38.37 (C), 32.59 (CH_2), 26.92 (CH_3), 26.23 (CH_2), 24.24 (CH_2); HRMS (m/z) calcd for $C_{23}H_{26}ON_2$ 346.2045 found 346.2053.

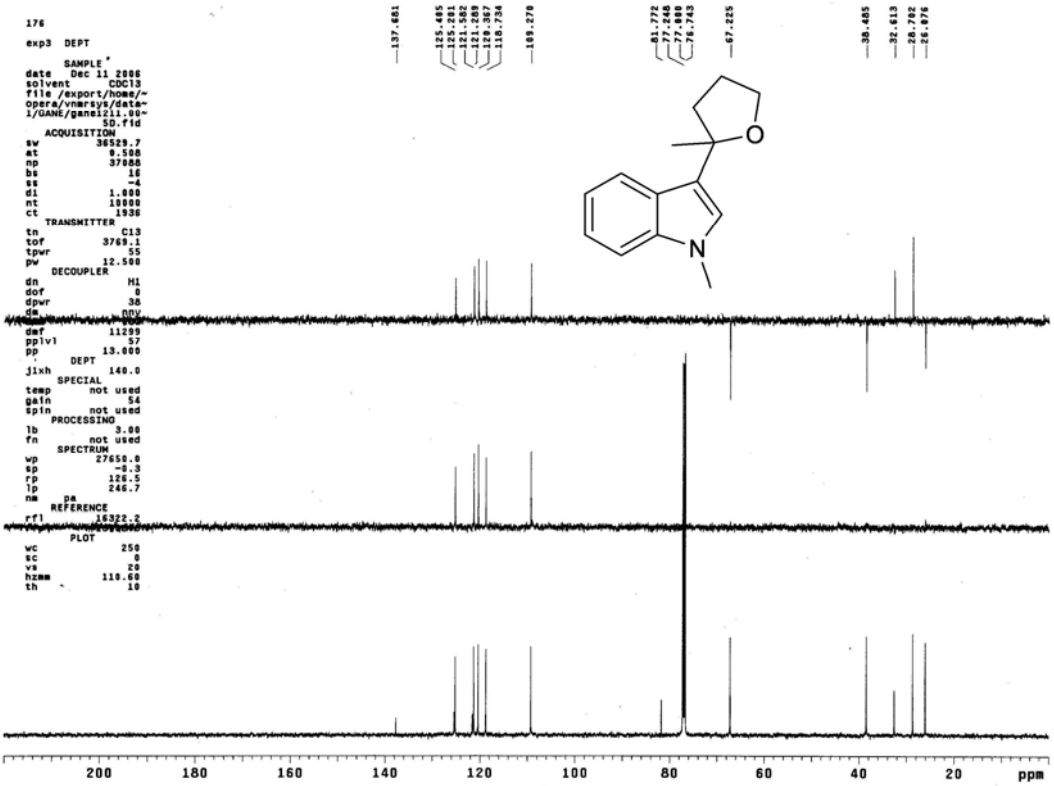
4,4-Bis(1-methyl-1*H*-indol-3-yl)pentan-1-ol (**3s**): IR (cm^{-1}): 3470.25 (OH); ^1H NMR (400 MHz, $CDCl_3$): δ = 7.38 (d, *J* = 8.0 Hz, 2 H; HC=), 7.25 (d, *J* = 8.0 Hz, 2 H; HC=), 7.11 (t, *J* = 7.2 Hz, 2 H; HC=), 6.92 (s, 2 H; HC=), 6.86 (t, *J* = 7.2 Hz, 2 H; HC=), 3.73 (s, 3 H; N-CH_3), 3.75 (s, 3 H; N-CH_3), 3.54 (t, *J* = 6.8 Hz, 2 H; OCH_2), 2.43 – 2.39 (m, 2 H; CH_2), 1.84 (s, 3 H, CH_3), 1.46-1.42 (m, 2 H; CH_2); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 137.64 (C), 126.69 (C), 126.14 (CH), 122.50 (C), 121.30 (CH), 120.86 (CH), 118.03 (CH), 108.99 (CH), 63.62 (CH_2), 38.15 (CH_2), 36.64 (C), 32.66 (N-CH_3), 28.24 (CH_2), 27.34 (CH_3); HRMS (m/z) calcd for $C_{23}H_{26}ON_2$ 346. 2045 found 346.2050.

1-Methyl-3-(1-(1-methyl-1*H*-indol-3-yl)-5-(tetrahydro-2H-pyran-2-yloxy)pentyl)-1*H*-indole (**3t**): ^1H NMR (400 MHz, $CDCl_3$): δ = 7.61 (d, *J* = 8.0 Hz, 2 H; HC=), 7.26 (d, *J* = 8.0 Hz, 2 H; HC=), 7.19 (t, *J* = 8.0 Hz, 2 H; HC=), 7.04 (t, *J* = 8.0 Hz, 2 H; HC=), 6.85 (s, 2 H; HC=), 4.50-4.46 (m, 2 H; O-CH_2), 3.80 (m, 8 H; N-CH_3, O-CH_2), 3.46-3.33 (m, 2 H; O-CH_2), 2.26-2.20 (q, *J* = 7.6 Hz, 2 H; CH_2), 1.82-1.51 (m, 10 H; CH_2); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 137.17 (C), 127.45 (C), 126.15 (CH), 121.18 (CH), 119.67 (CH), 118.97 (C), 118.34 (CH), 109.02 (CH), 98.77(CH), 67.49 (CH_2), 62.28

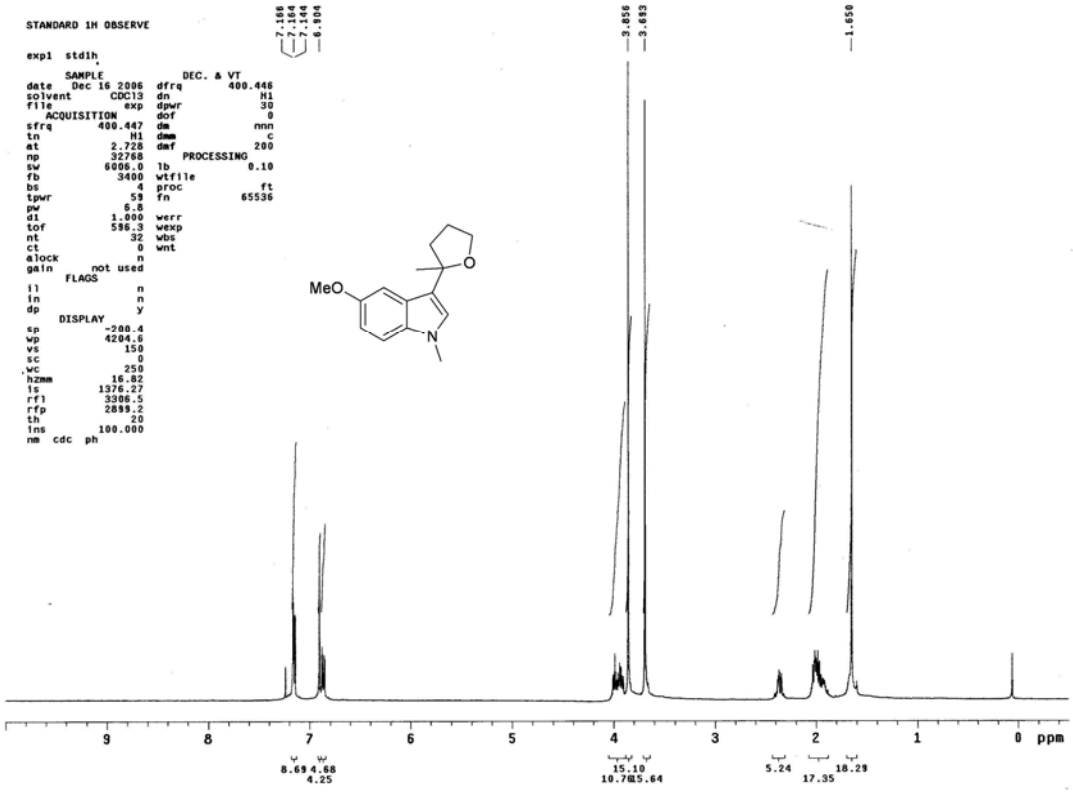
(CH_2), 36.12 (CH_2), 33.72 (C-H), 32.59 (N-CH_3), 30.70 (CH_2), 29.76 (CH_2), 25.44 (CH_2), 24.85 (CH_2), 19.63 (CH_2); HRMS (m/z) calcd for $C_{28}H_{34}O_2N_2$ 430.2620 found 430.2629.

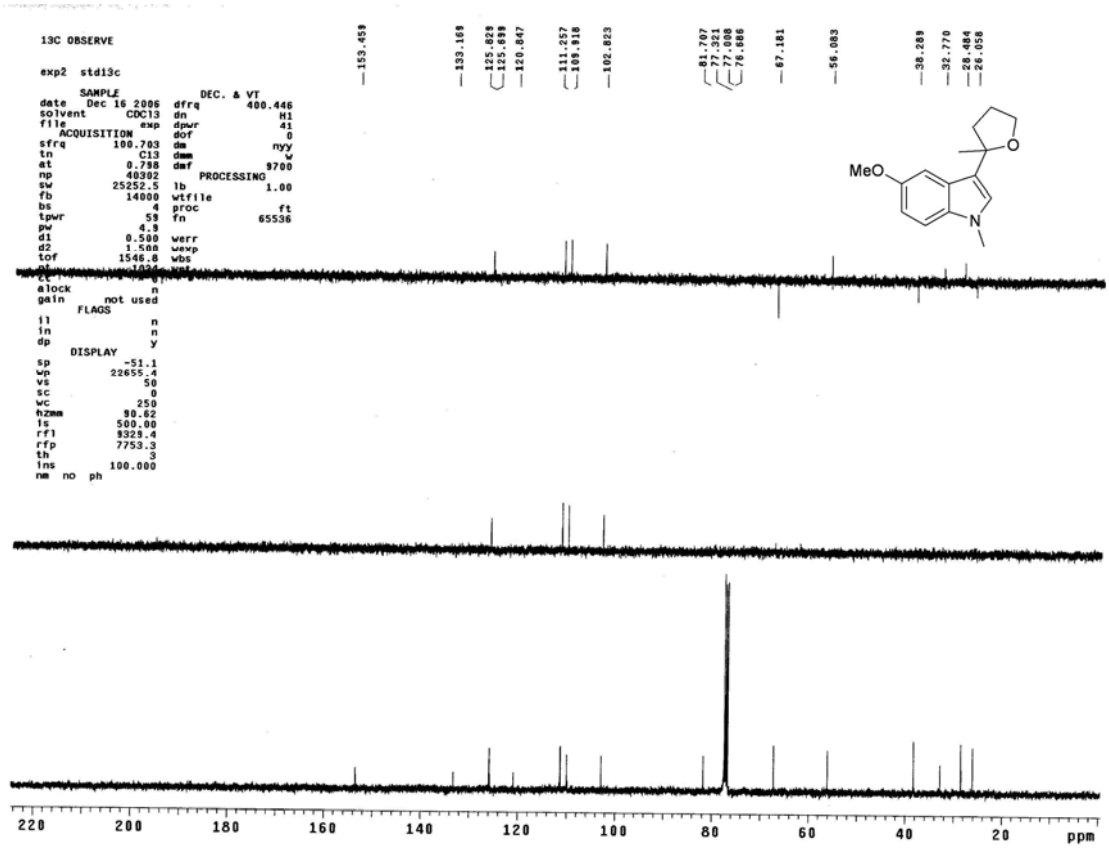
^{1}H and ^{13}C NMR spectra of compound **3a**.





^{1}H and ^{13}C NMR spectra of compound **3b**.

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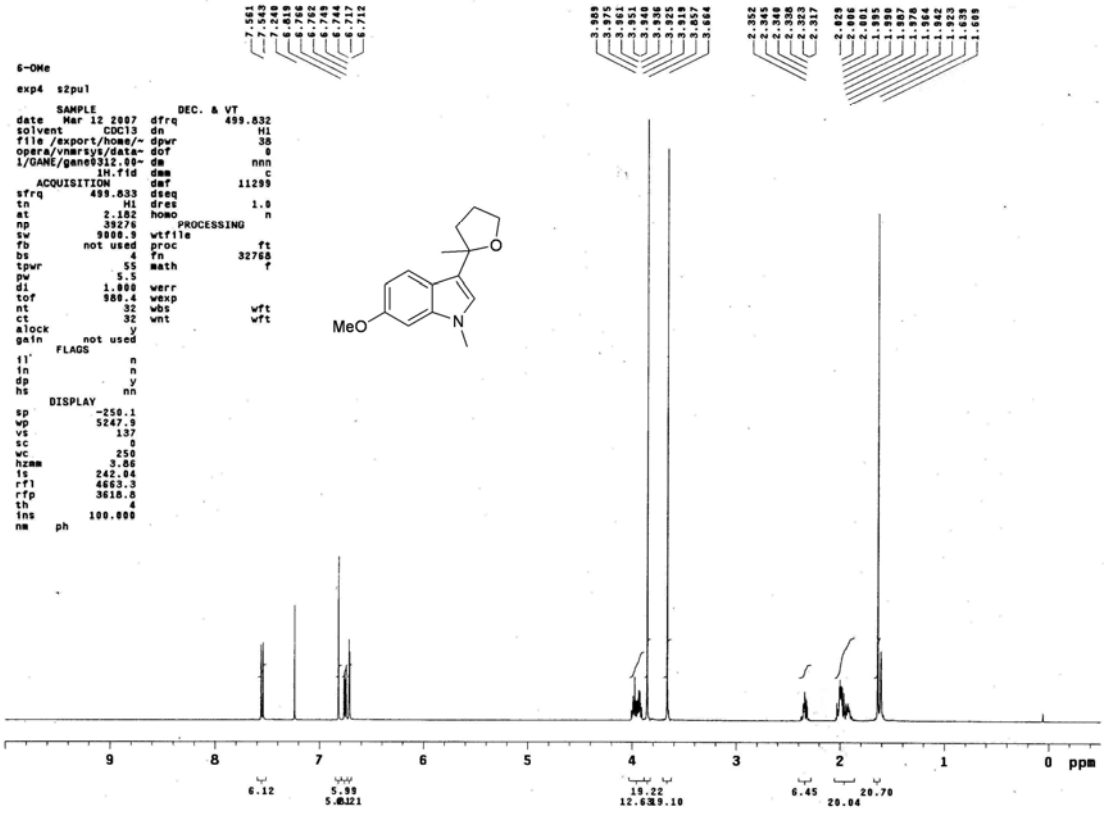
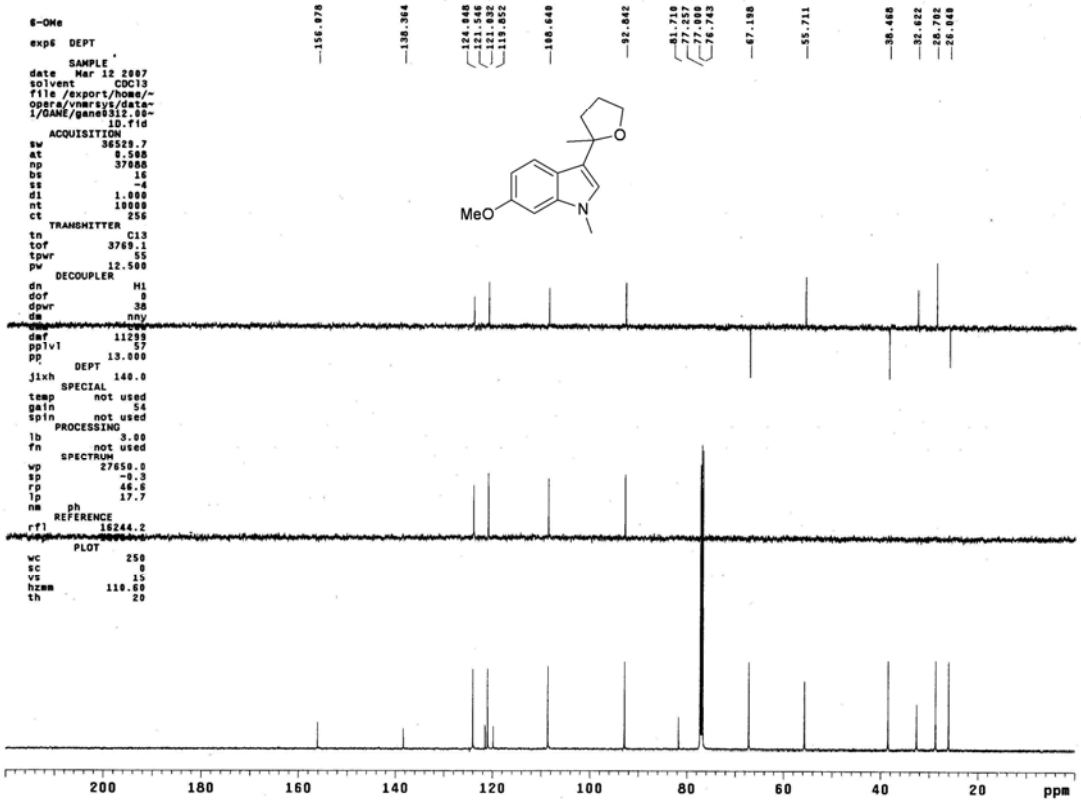
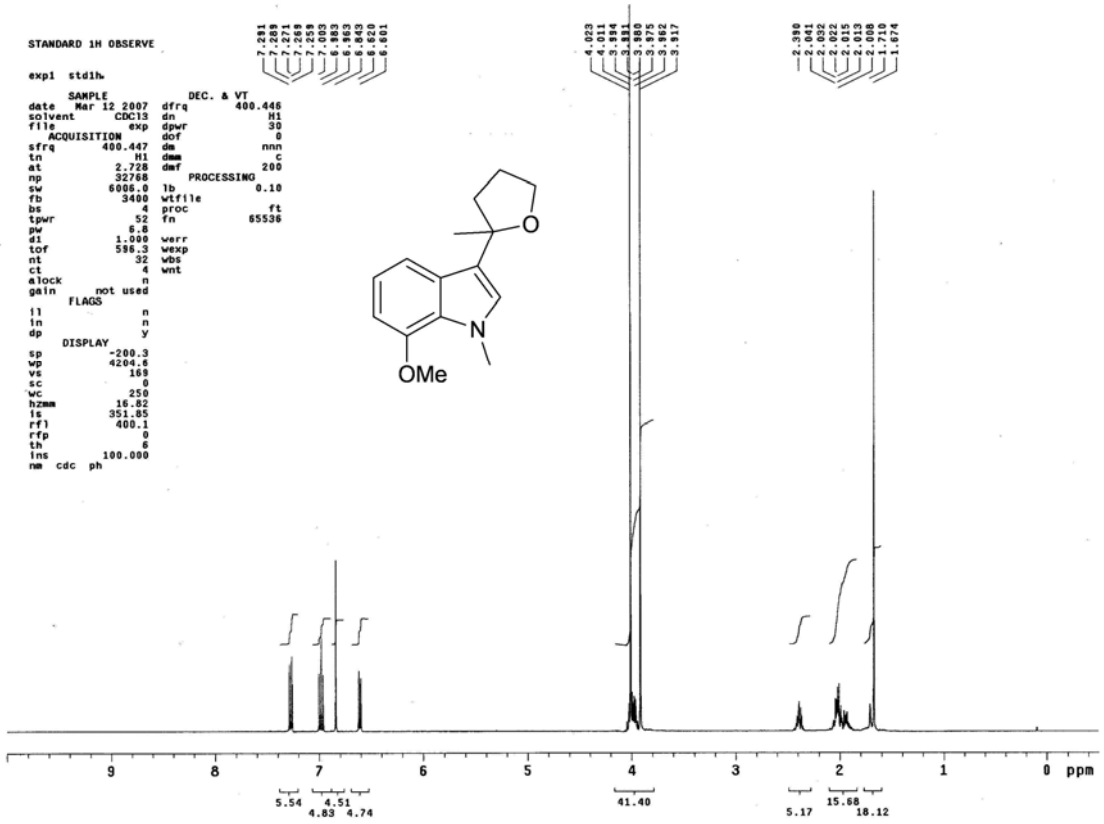
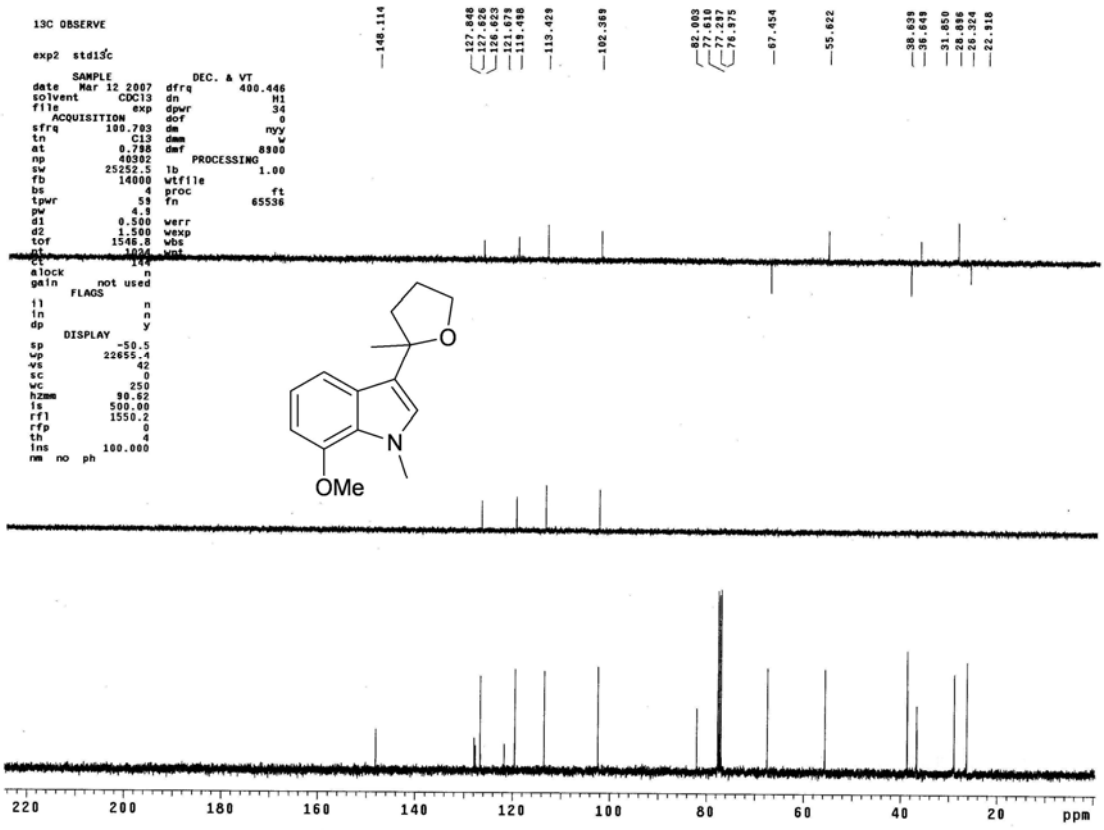
^{1}H and ^{13}C NMR spectra of compound **3c**.





^{1}H and ^{13}C NMR spectra of compound **3d**.

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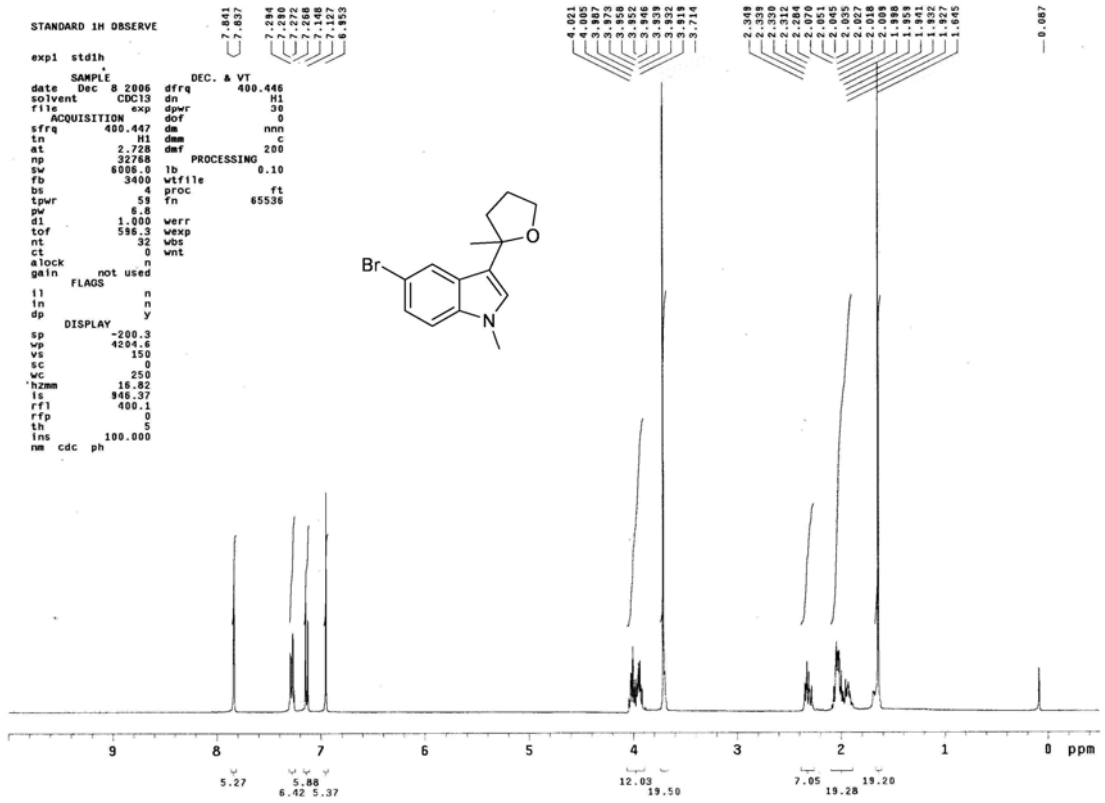
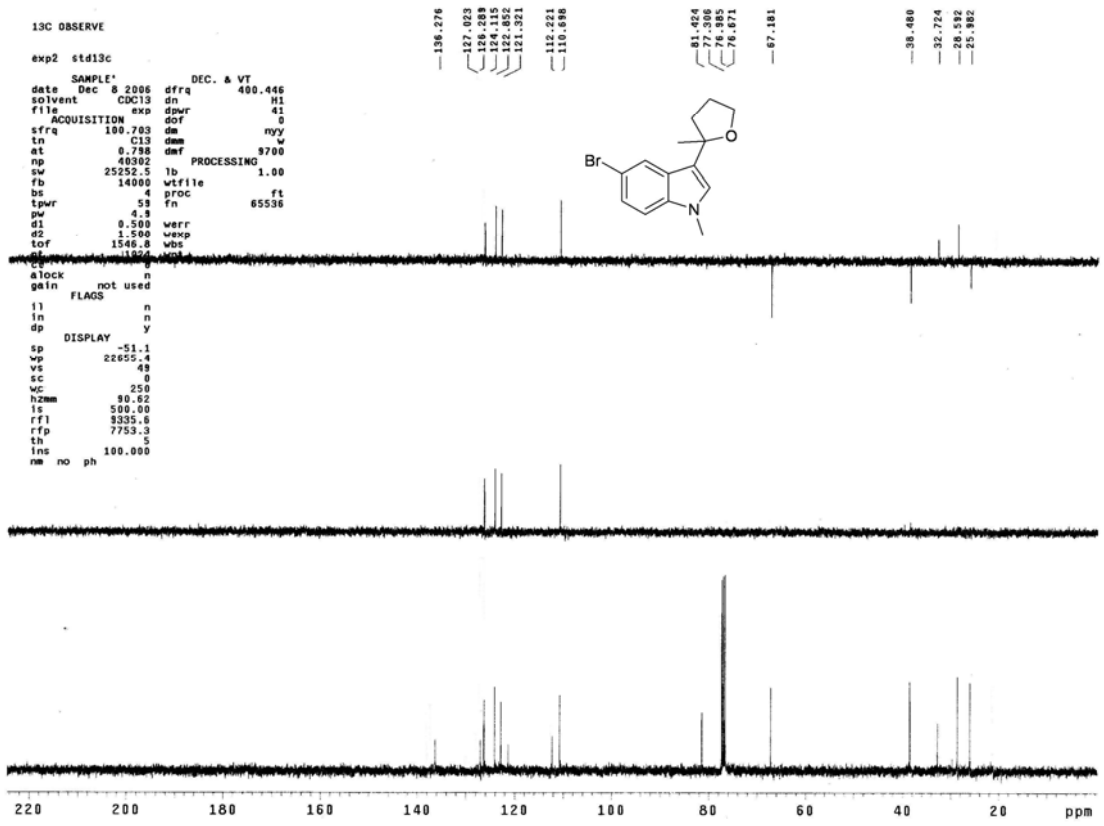
^{1}H and ^{13}C NMR spectra of compound **3e**.

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date Dec 8 2006
solvent CDCl3
file exp
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tn C13
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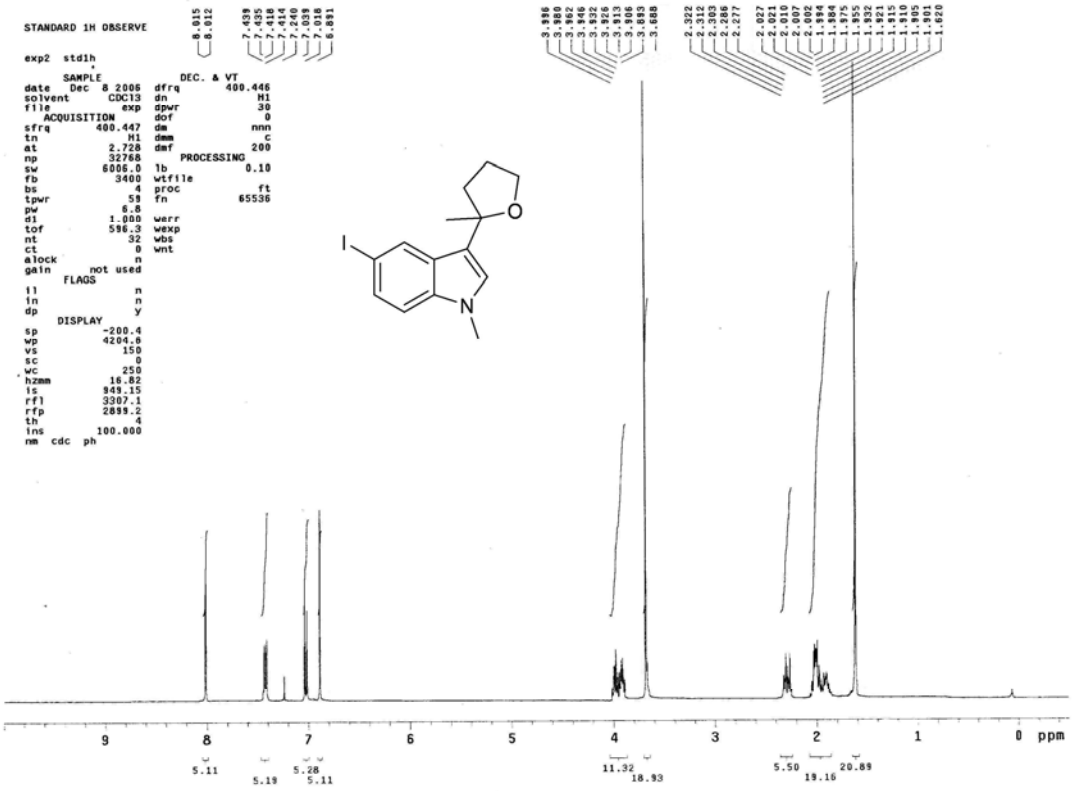
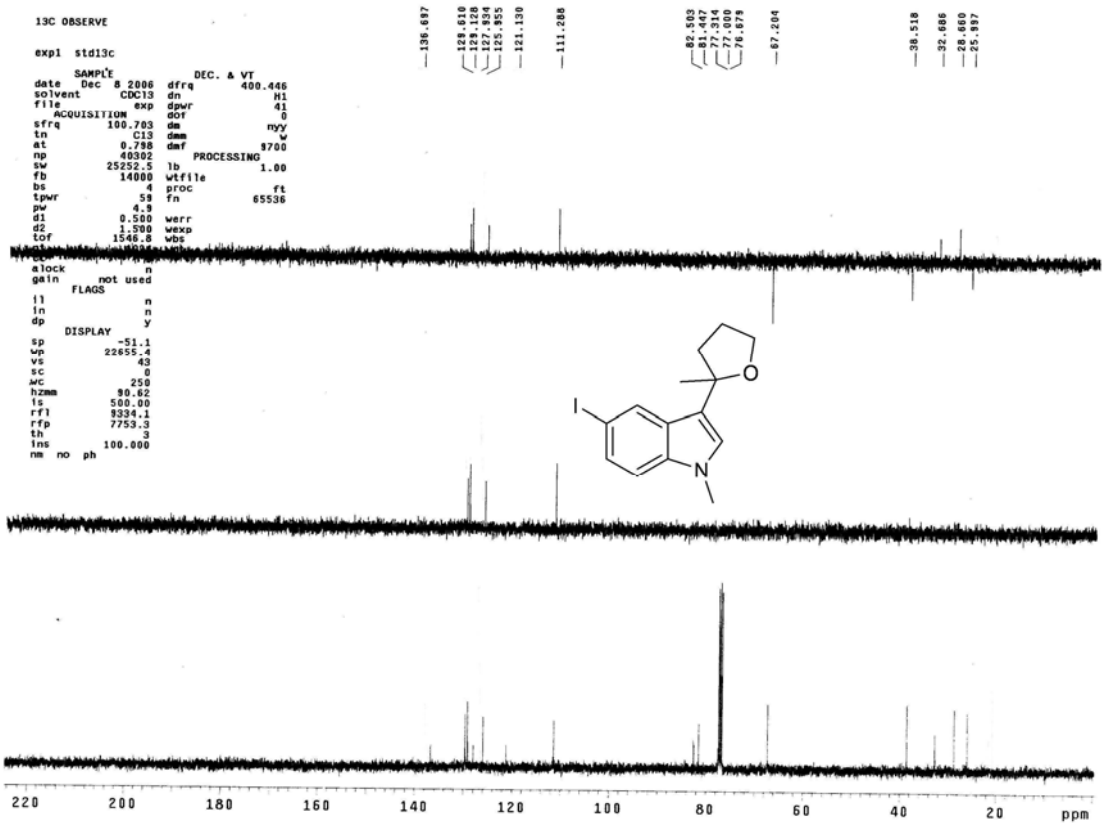
np 40302
sw 25252.5
fb 14000
bs 4
tpwr 55
pw 4.9
d1 0.500
d2 1.500
tof 1546.8
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -51.1
wp 22655.4
vs 49
sc 0
wc 250
hzmm 90.62
is 500.00
rfl 9335.6
rfp 7753.3
th 5
ins 100.000
nm no ph
DEC. & VT
dfrq 400.446
dn H1
dpwr 41
dof 0
dm nyy
dmm w
dmf 9700
PROCESSING
lb 1.00
wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
136.276
127.023
126.289
124.115
122.852
121.321
112.221
110.698
81.424
77.306
76.985
76.671
67.181
38.480
32.724
28.592
25.982
Br
O
N
220
200
180
160
140
120
100
80
60
40
20
ppm

^{1}H and ^{13}C NMR spectra of compound **3f**.




13C OBSERVE
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date Dec 8 2006
solvent CDCl3
file exp
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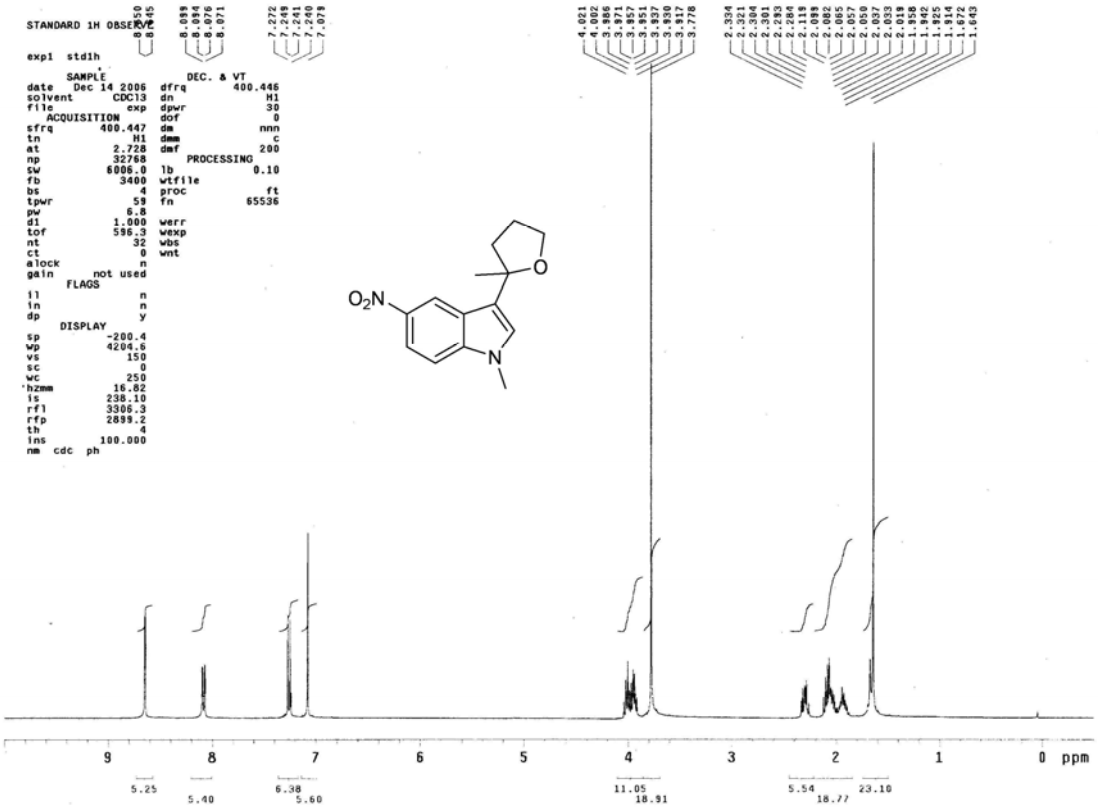
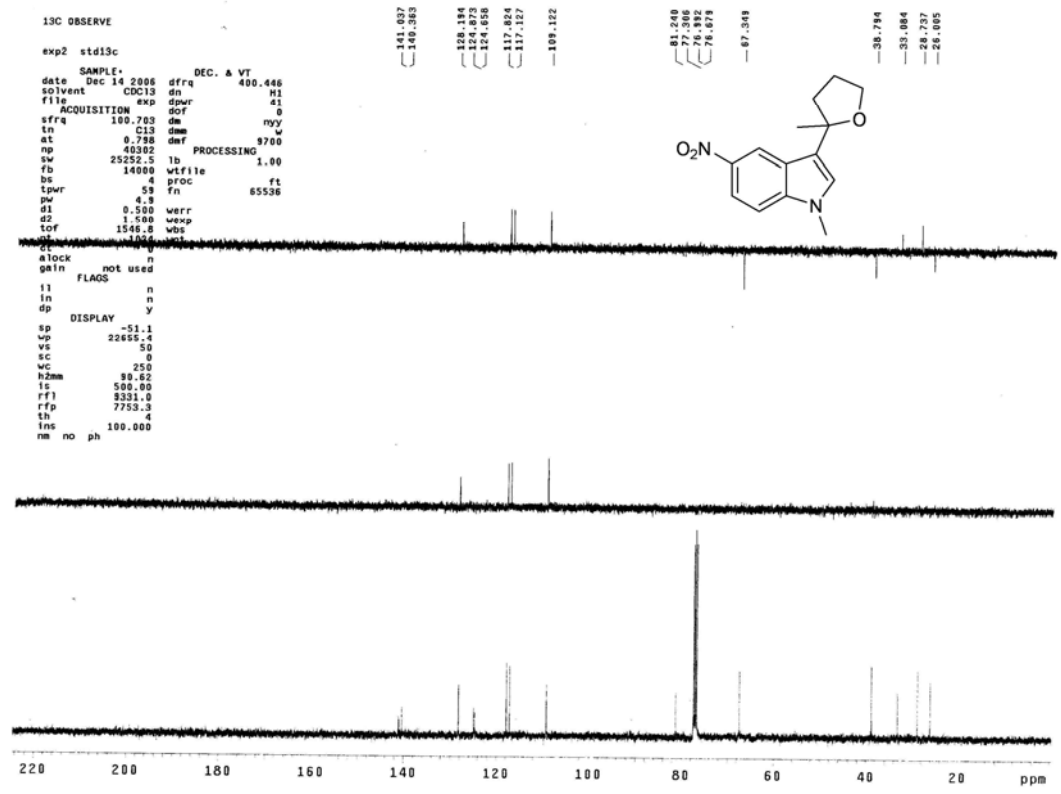
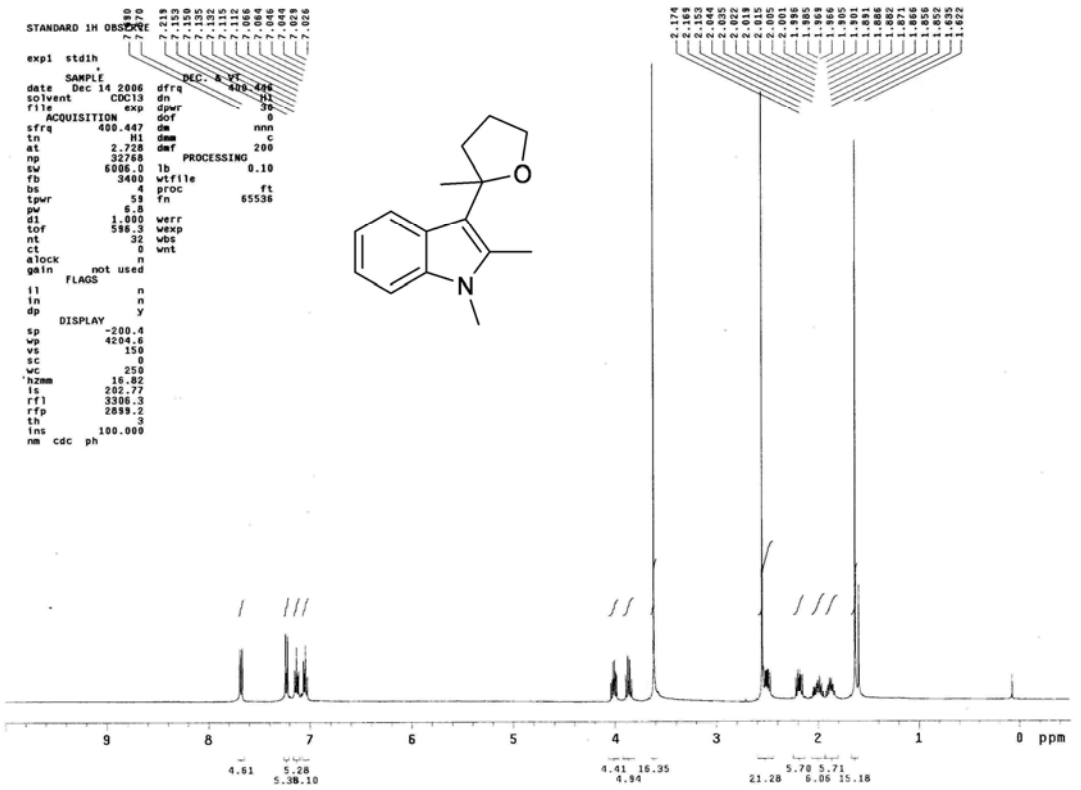
tn C13
at 0.798
np 40302
sw 25252.5
fb 14000
bs 4
tpwr 58
pw 4.8
d1 0.500
d2 1.500
tof 1546.8
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -51.1
wp 22655.4
vs 43
sc 0
wc 250
hzmm 90.62
is 500.00
rf1 9334.1
rfp 7753.3
th 3
ins 100.000
nm no ph
DEC. & VT
dfrq 400.446
dn H1
dpwr 41
dof 0
dm nyy
dmm w
dmf 8700
PROCESSING
lb 1.00
wtfile
proc ft
fn 65536
werr
wexp
wbs
136.697
128.610
128.128
127.934
125.955
121.130
111.208
82.503
81.447
77.314
77.000
76.679
67.204
38.518
32.686
28.660
25.997
I
O
N
220
200
180
160
140
120
100
80
60
40
20
ppm

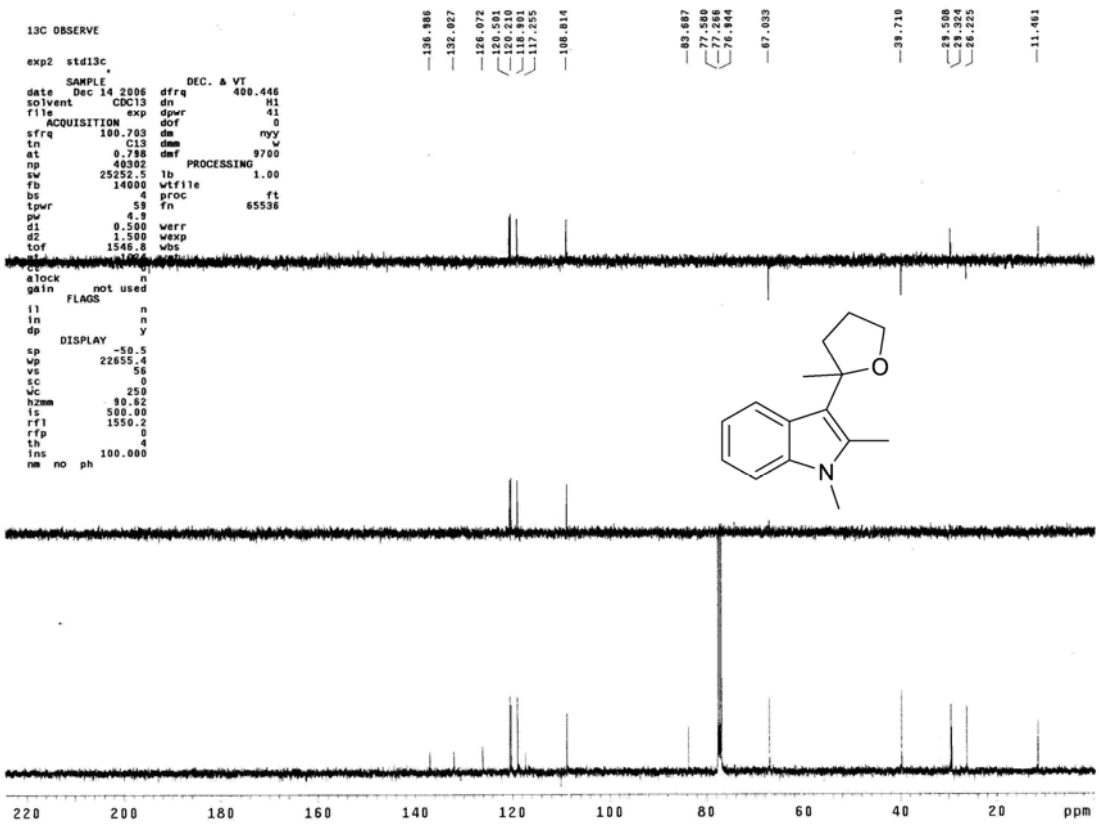
^{1}H and ^{13}C NMR spectra of compound **3g**.



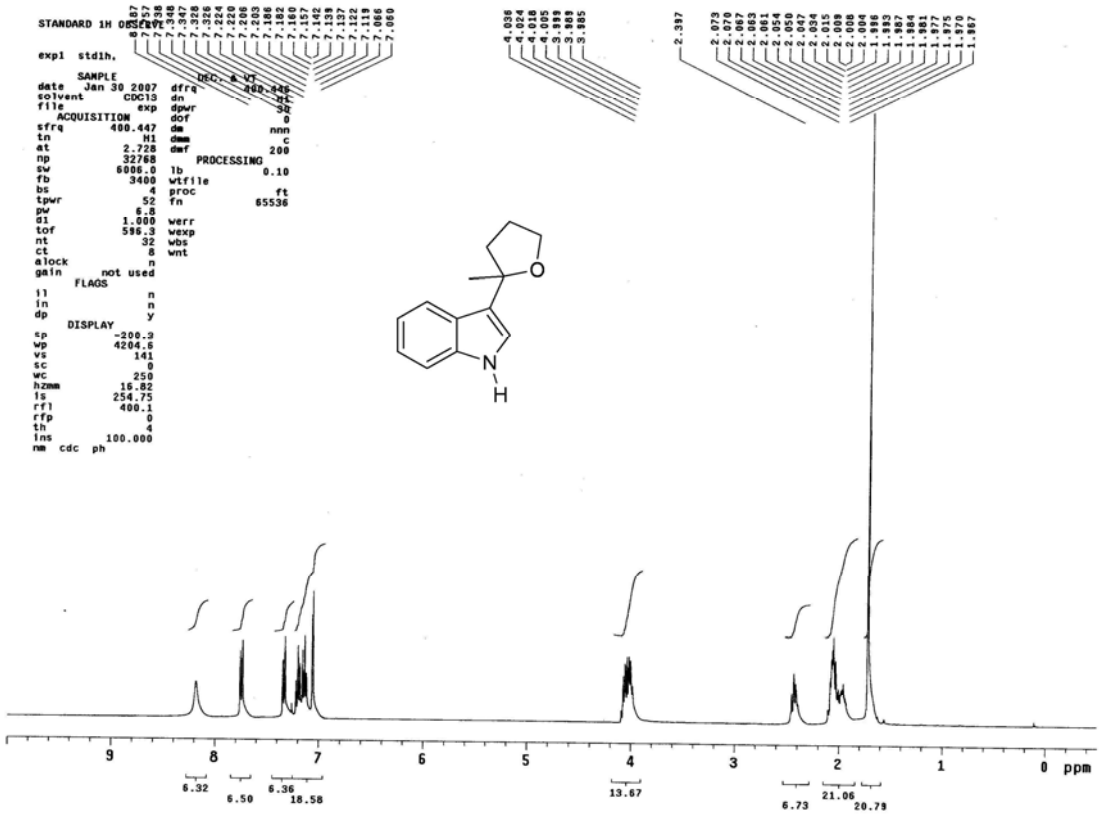


^{1}H and ^{13}C NMR spectra of compound **3h**.





^{1}H and ^{13}C NMR spectra of compound **3i**.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SAMPLE
date Jan 30 2007
solvent CDCl3
file exp
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at 2.728
np 32768
sw 6006.0
fb 3400
bs 4
tpwr 52
pw 6.8
d1 1.000
tof 596.3
nt 32
ct 8
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -200.3
wp 4204.6
vs 141
sc 0
wc 250
hzmm 16.82
is 254.75
rfl 400.1
rfp 0
th 4
ins 100.000
nm cdc ph
DEC. & VT
dfrq 400.445
dn H1
dpwr 52
dof 0
dm nnn
dmm c
dmf 200
PROCESSING
lb 0.10
wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
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7.357
7.338
7.328
7.326
7.224
7.220
7.206
7.203
7.186
7.182
7.160
7.157
7.142
7.139
7.137
7.122
7.118
7.068
7.060
4.038
4.024
4.018
4.005
3.999
3.989
3.985
2.397
2.073
2.070
2.067
2.063
2.061
2.054
2.050
2.047
2.034
2.015
2.009
2.008
2.004
1.986
1.983
1.977
1.964
1.961
1.977
1.975
1.970
1.967
O
N
H
9
8
7
6
5
4
3
2
1
0 ppm
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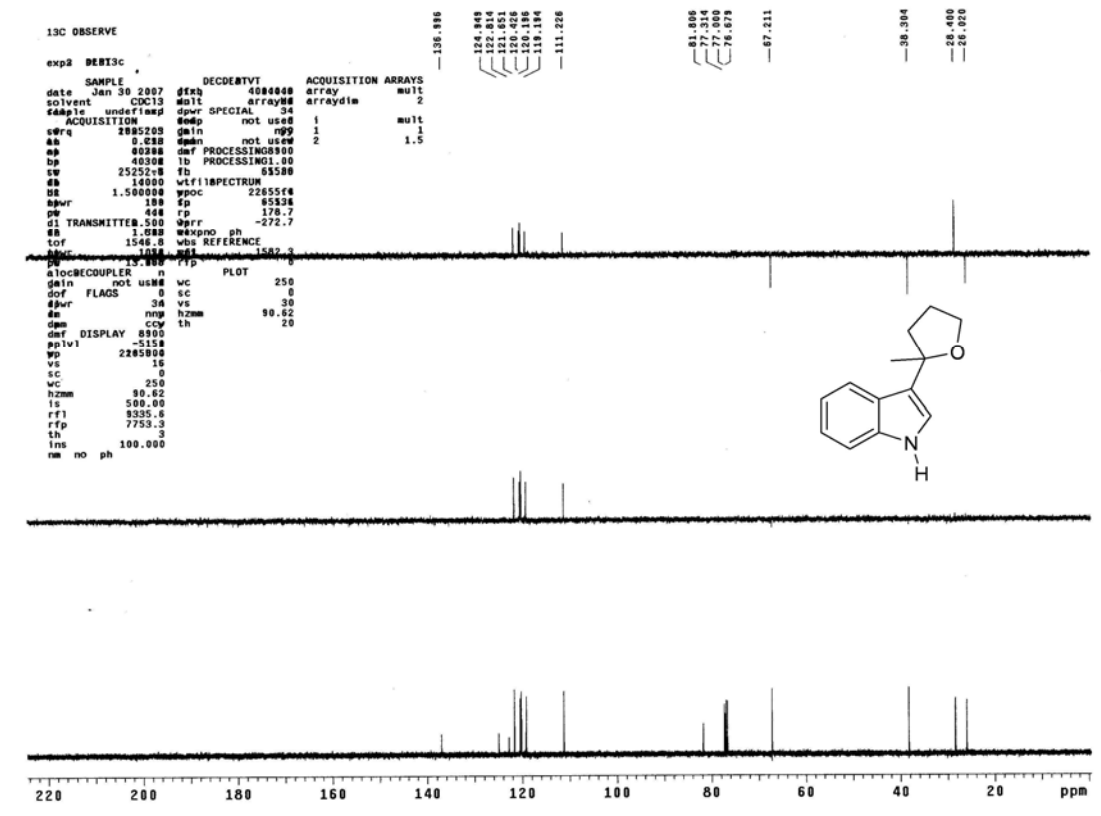
6.50
6.36
18.58
13.67
6.73
21.06
20.79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date Jan 30 2007
solvent CDCl3
sample undefined
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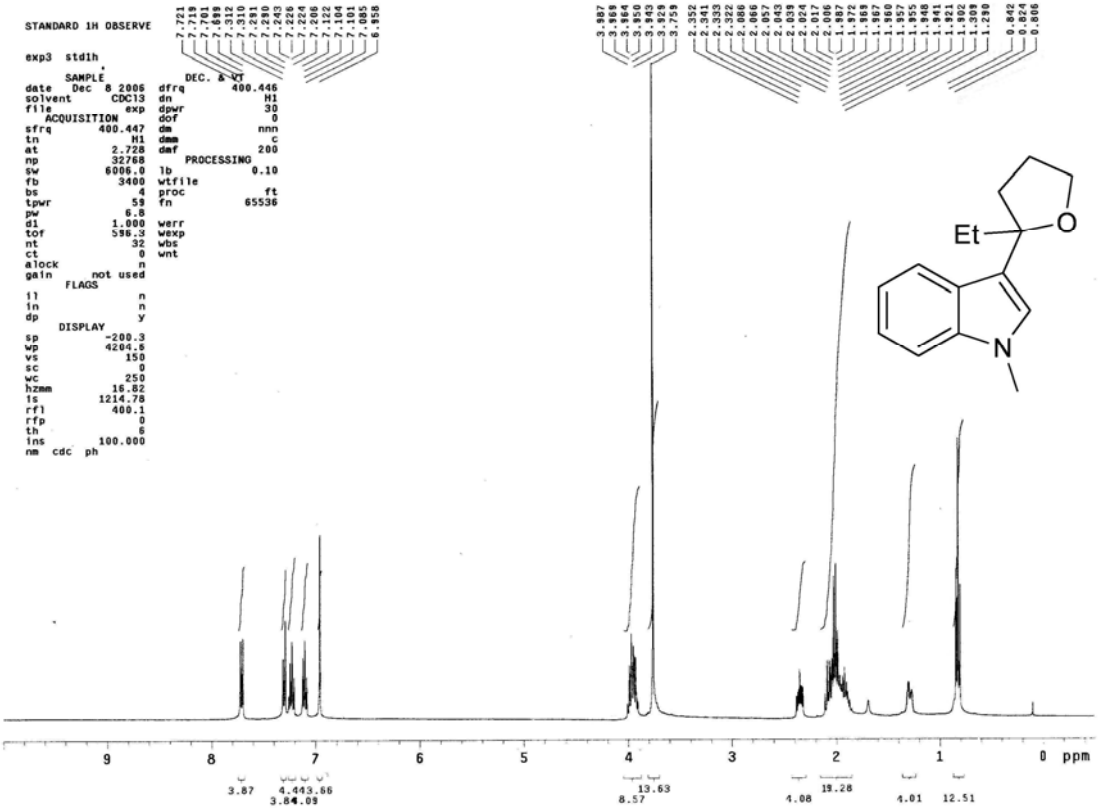
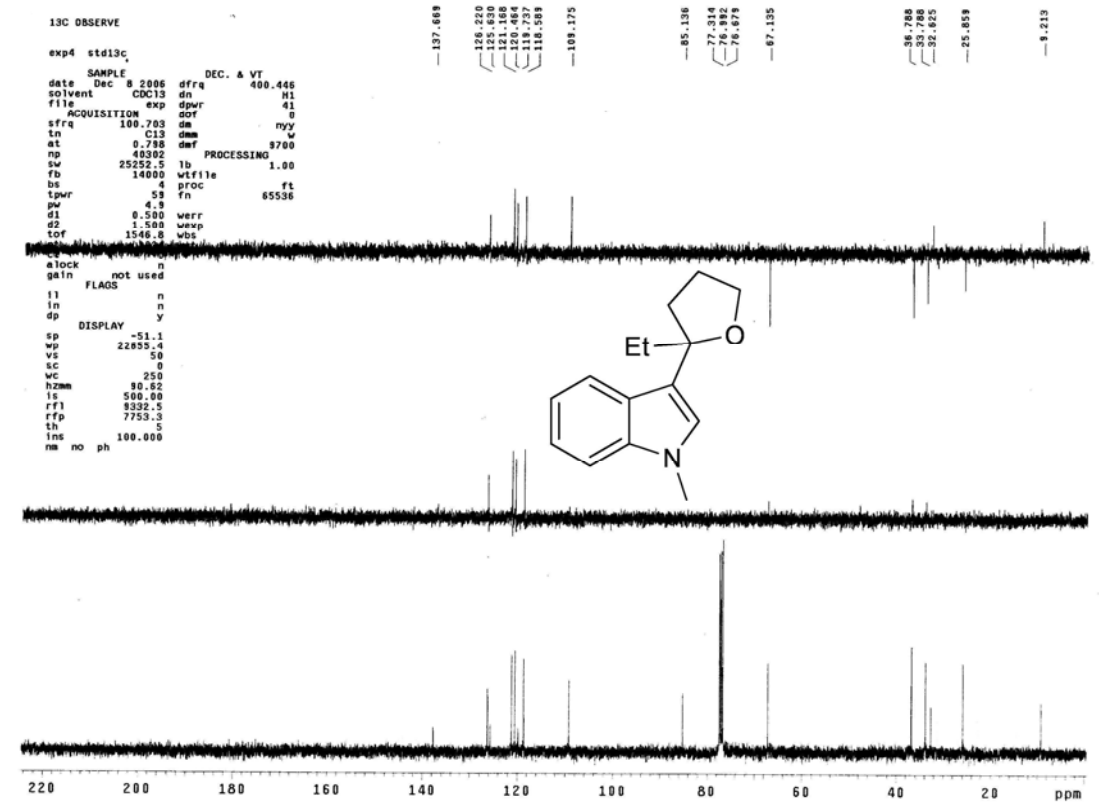
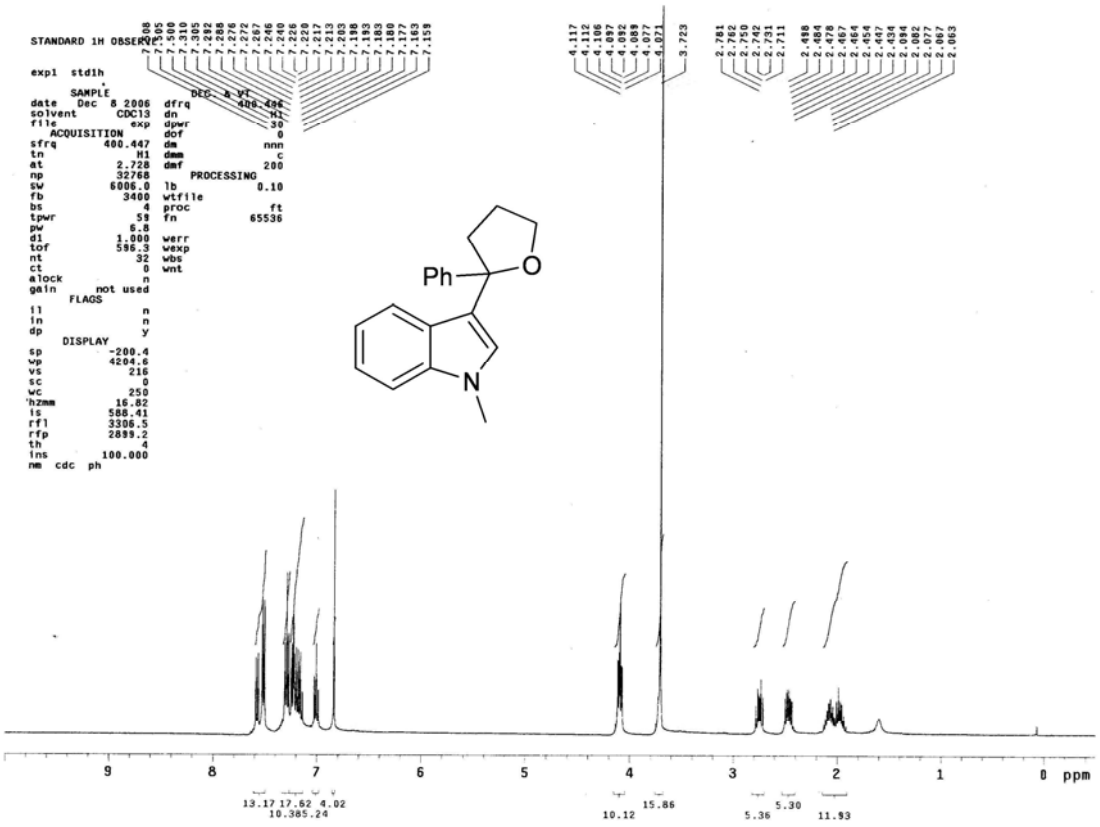
aq 0.8192
bp 4030.9
sw 25252.5
fb 14000
bs 1.500000
dpwr 100
pw 4.8
d1 TRANSMITTER 1.500
dl 1.000
tof 1546.8
dpwr2 1000
pw2 13.800
alock DECOUPLER n
gain not used
dof FLAGS 0
dpwr 34
dm nnp
dmm ccw
dmf DISPLAY 8900
ppiwl -5158
wp 22655.0
vs 16
sc 0
wc 250
hzmm 90.62
is 500.00
rfl 9335.6
rfp 7753.3
th 3
ins 100.000
nm no ph
DECOUPLER TVT
dfrq 40.040
dmf 8900
dpwr SPECIAL 34
dm not used
gain n99
dmm not used
dmf PROCESSING8900
lb PROCESSING1.00
fb 65580
wtfile SPECTRUM
wpoc 22655.0
fp 65536
rp 178.7
vp -272.7
wexpno ph
wbs REFERENCE
wnt 1582.3
rfp 0
PLOT
wc 250
sc 0
vs 30
hzmm 90.62
th 20
ACQUISITION ARRAYS
array mult
arraydim 2
i mult
1 1
2 1.5
136.996
124.949
122.814
121.651
120.426
120.196
119.194
111.226
81.606
77.314
77.000
76.678
67.211
38.304
28.400
26.020
O
N
H
220
200
180
160
140
120
100
80
60
40
20
ppm

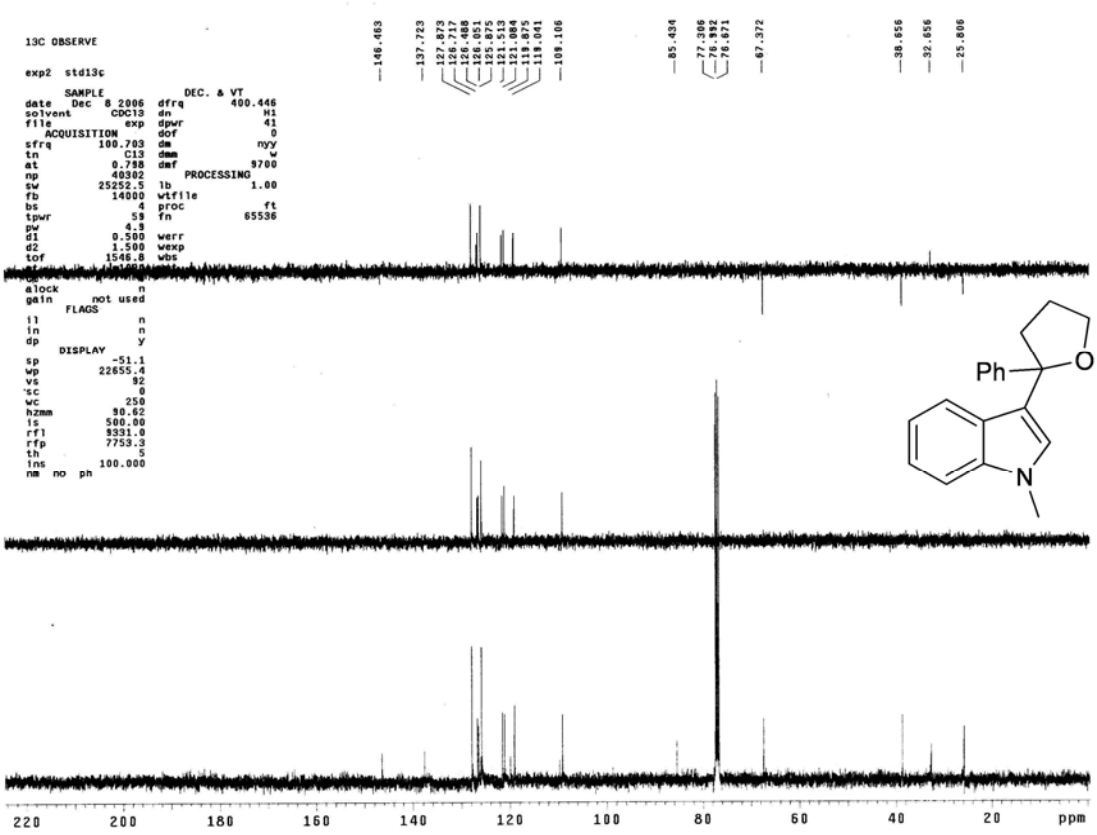
^{1}H and ^{13}C NMR spectra of compound **3j**.



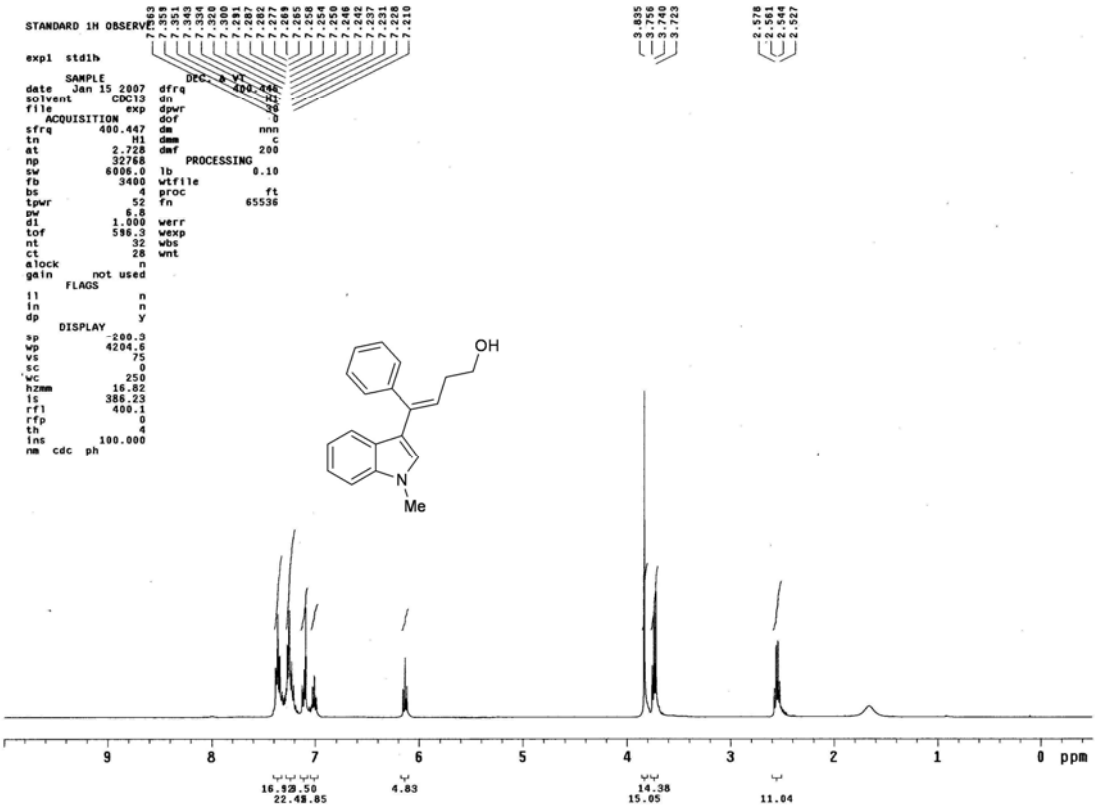


^{1}H and ^{13}C NMR spectra of compound **3k**.





^{1}H NMR spectra of E and Z form of compounds **3k’.**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date Jan 15 2007
solvent CDCl3
file exp
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tn H1
at 2.728
np 32768
sw 6006.0
fb 3400
bs 4
tpwr 52
pw 6.8
d1 1.000
tof 596.3
nt 32
ct 28
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -200.3
wp 4204.6
vs 75
sc 0
wc 250
hzmm 16.82
is 386.23
rfl 400.1
rfp 0
th 4
ins 100.000
nm cdc ph
DEC. & VT
dfrq 400.448
dn H1
dpwr 30
dof 0
dm nnn
dmm c
dmf 200
PROCESSING
lb 0.10
wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
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7.359
7.351
7.343
7.334
7.320
7.309
7.291
7.287
7.282
7.277
7.269
7.265
7.258
7.254
7.250
7.246
7.242
7.237
7.231
7.228
7.210
3.835
3.756
3.740
3.723
2.578
2.561
2.544
2.527
OH
N
Me
9
8
7
6
5
4
3
2
1
0 ppm
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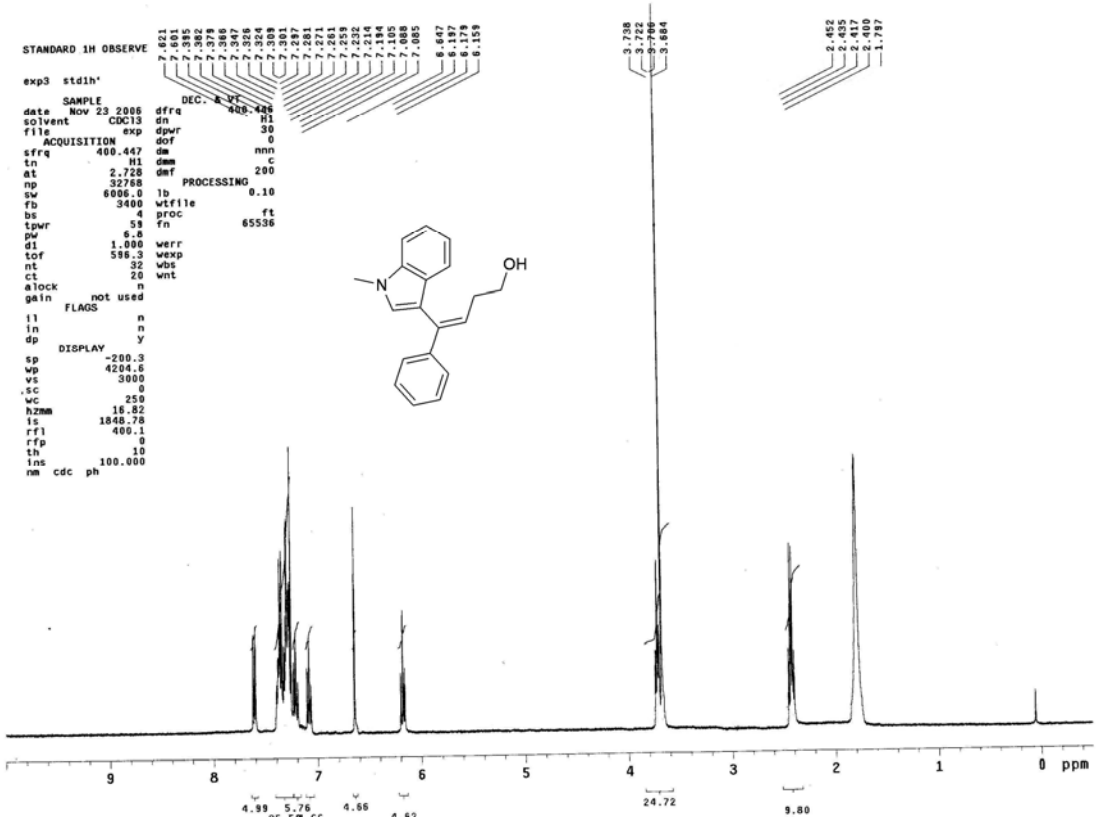
23.50
22.41
8.85
4.83
14.38
15.05
11.04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date Nov 23 2006
solvent CDCl3
file exp
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at 2.728
np 32768
sw 6006.0
fb 3400
bs 4
tpwr 59
pw 6.8
d1 1.000
tof 596.3
nt 32
ct 20
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -200.3
wp 4204.6
vs 3000
sc 0
wc 250
hzmm 16.82
is 1848.78
rfl 400.1
rfp 0
th 10
ins 100.000
nm cdc ph
DEC. & VT
dfrq 400.446
dn H1
dpwr 30
dof 0
dm nnn
dmm c
dmf 200
PROCESSING
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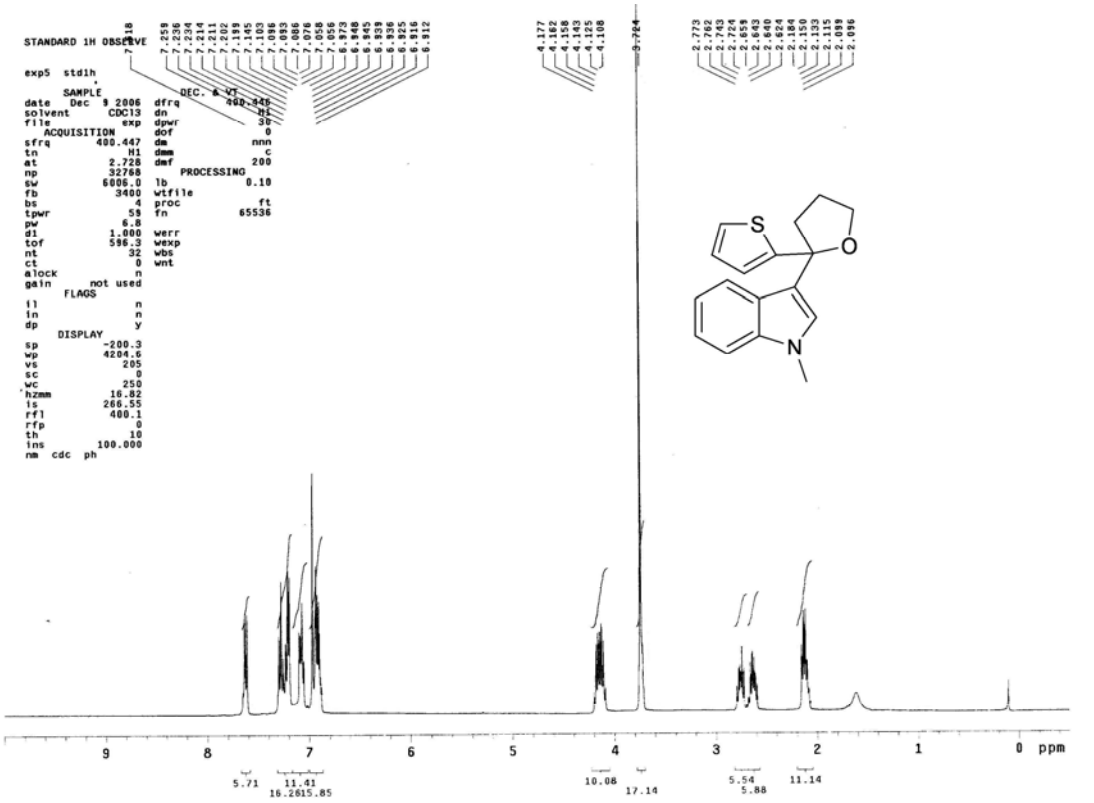
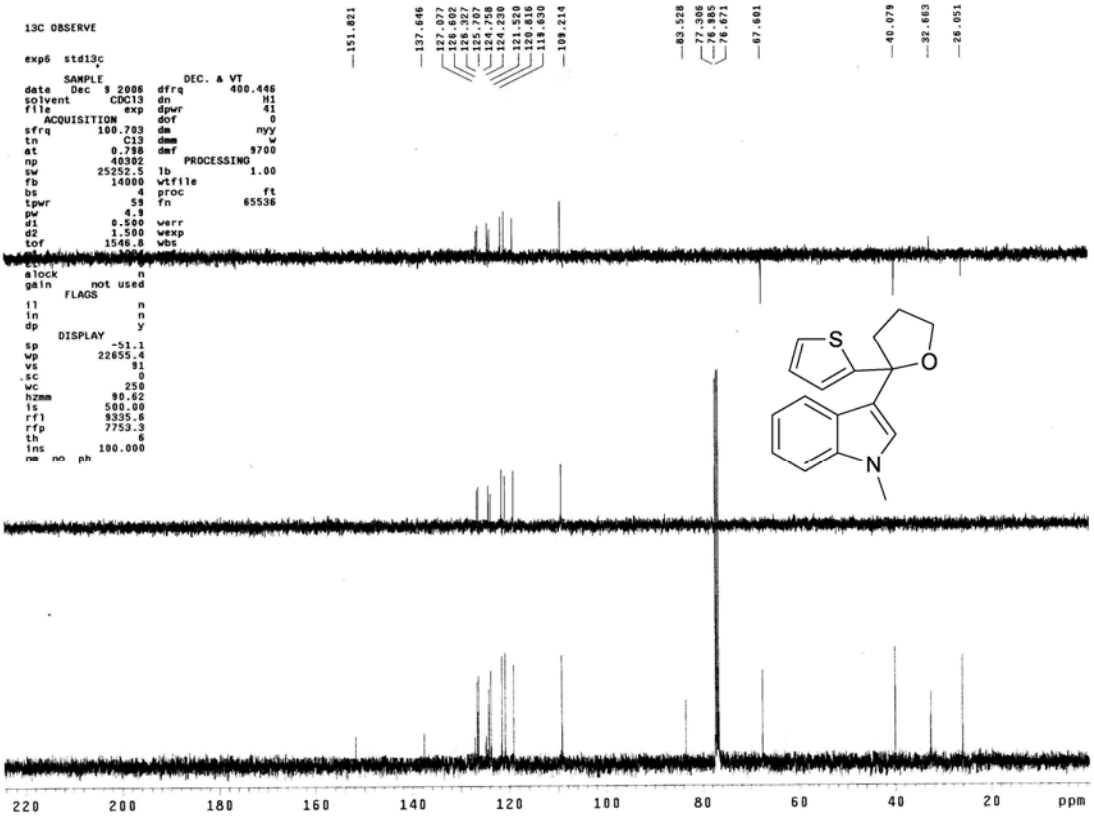
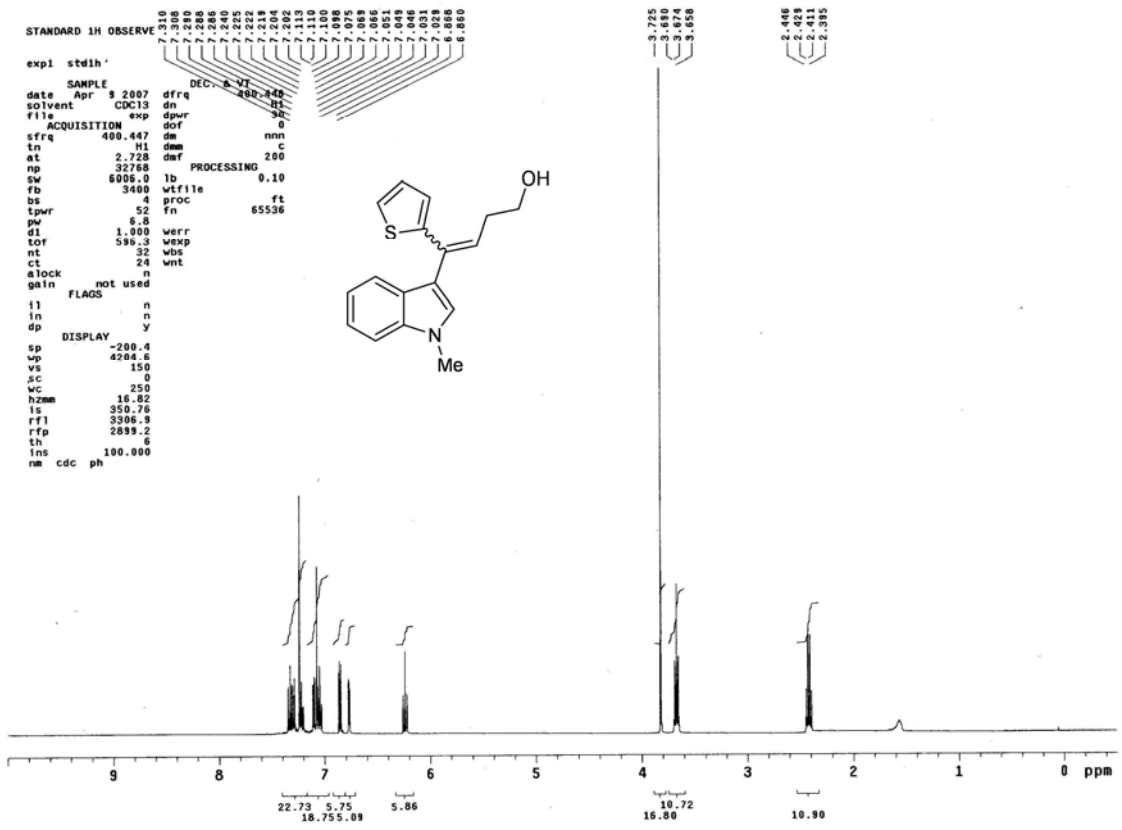
wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
7.621
7.601
7.395
7.382
7.373
7.366
7.347
7.326
7.309
7.301
7.287
7.281
7.271
7.261
7.259
7.232
7.214
7.184
7.105
7.088
7.085
6.647
6.197
6.179
6.159
3.738
3.722
3.700
3.684
2.452
2.435
2.417
2.400
1.797
OH
N
9
8
7
6
5
4
3
2
1
0 ppm
4.99
5.76
4.66
24.72
9.80

^{1}H and ^{13}C NMR spectra of compound **3l**.

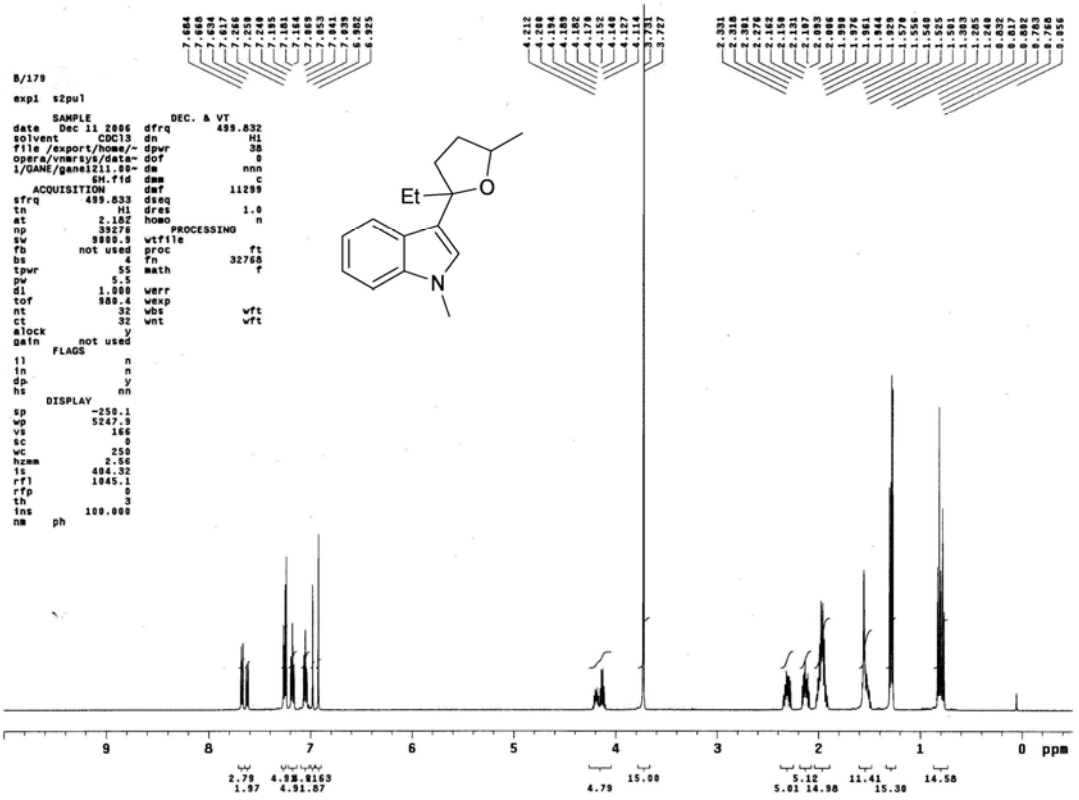


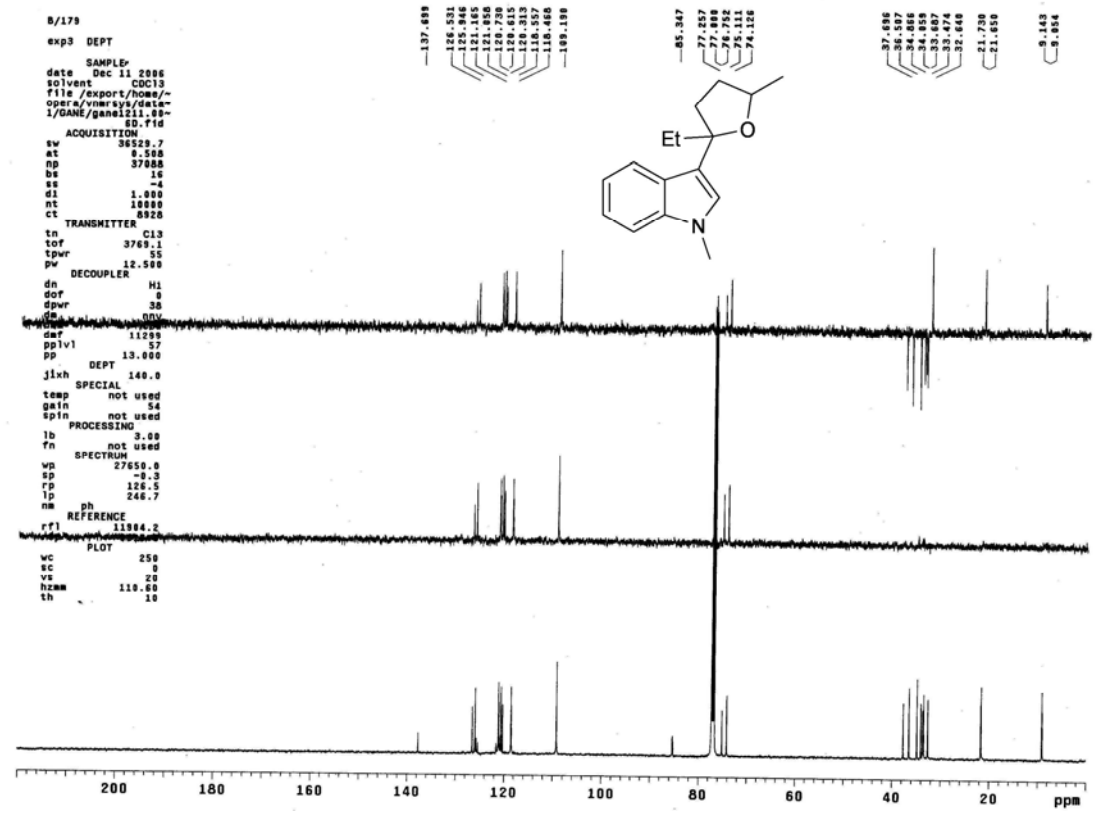


^{1}H NMR spectra of compound **3l’.**

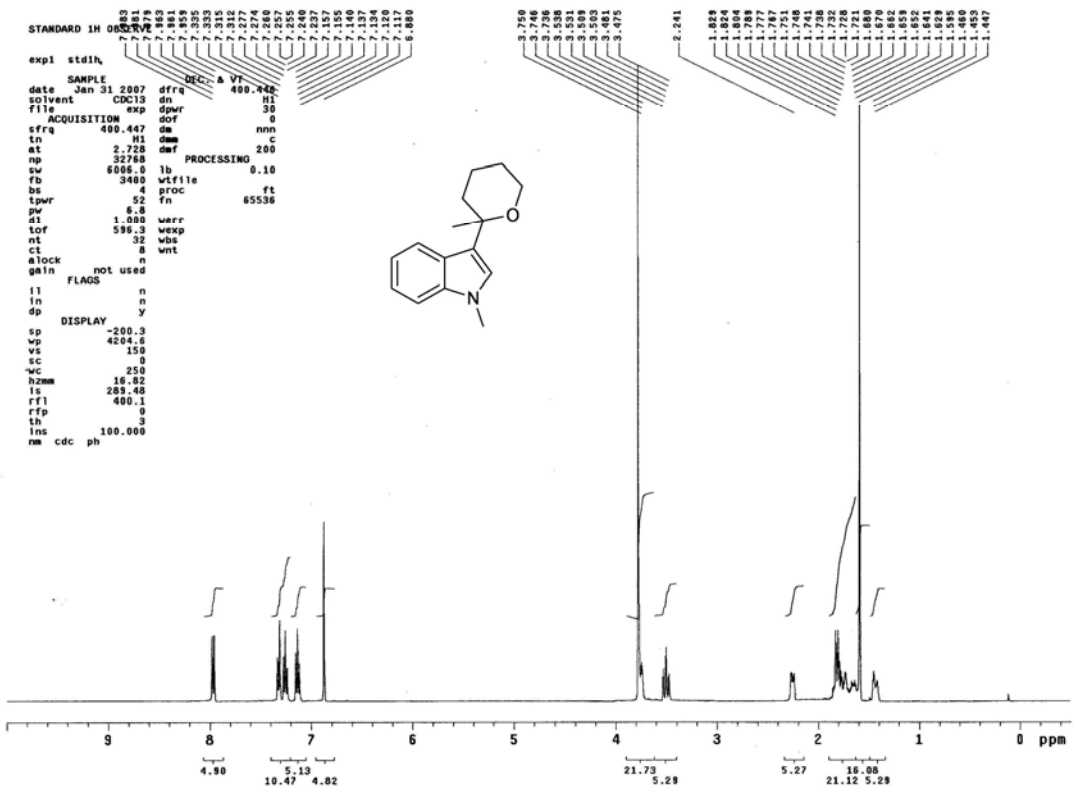


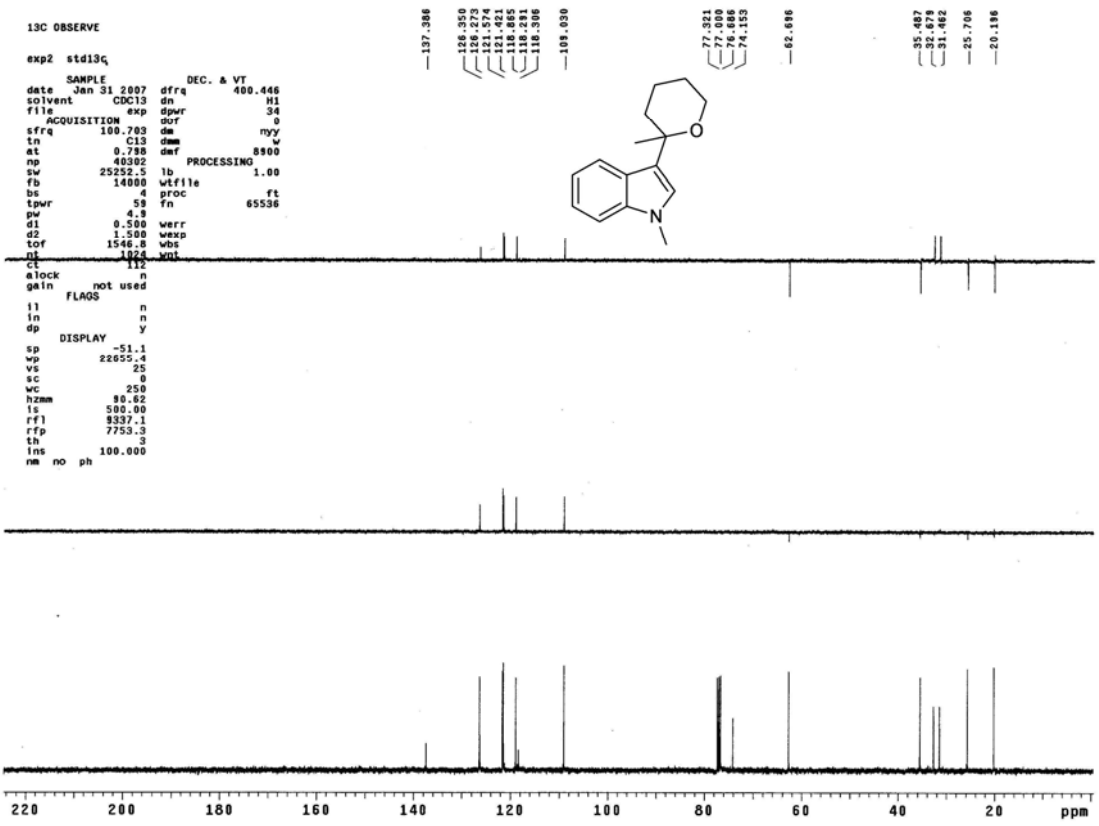
^{1}H and ^{13}C NMR spectra of compound **3m**.



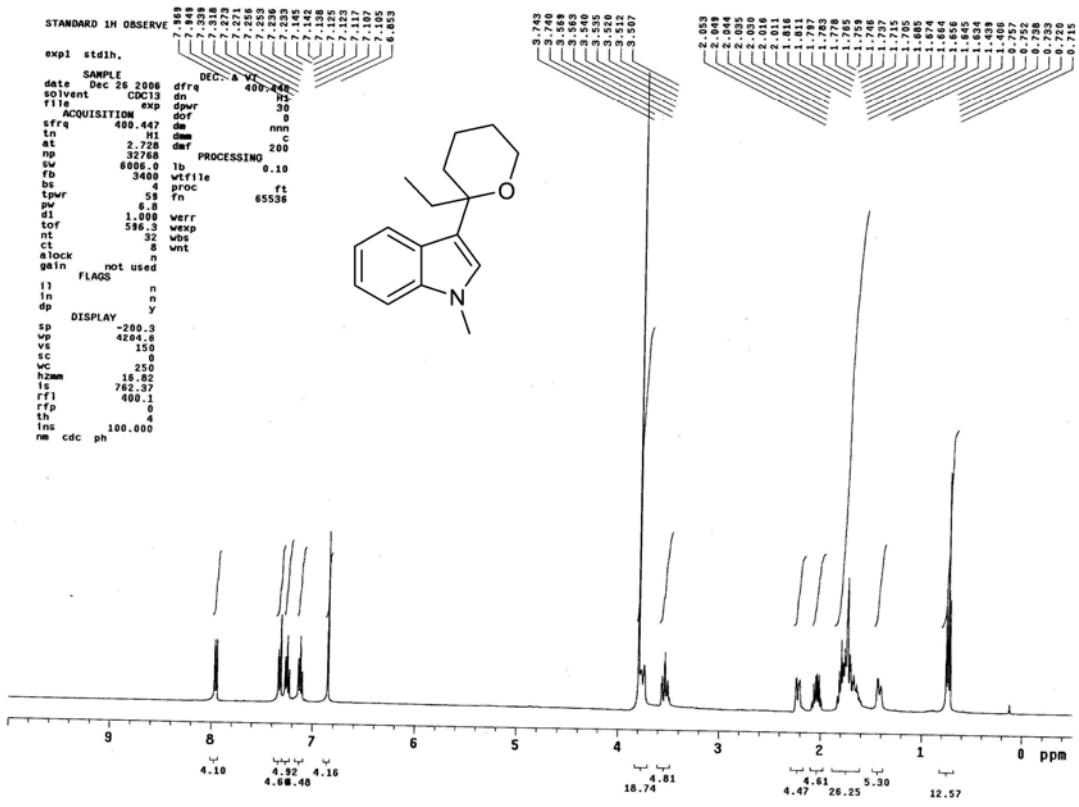


^{1}H and ^{13}C NMR spectra of compound **3n**.





^{1}H and ^{13}C NMR spectra of compound **3o**.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date Dec 26 2006
solvent CDCl3
file exp
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np 32768
sw 6006.0
fb 3400
bs 4
tpwr 59
pw 6.8
d1 1.000
tof 596.3
nt 32
ct 8
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -200.3
wp 4204.6
vs 150
sc 0
wc 250
hzmm 16.82
is 762.37
rfl 400.1
rfp 0
th 4
ins 100.000
nm cdc ph
DEC. & VT
dfrq 400.448
dn H1
dpwr 30
dof 0
dm nnn
dmm c
dmf 200
PROCESSING
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wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
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7.349
7.339
7.318
7.273
7.271
7.255
7.253
7.236
7.233
7.145
7.142
7.138
7.125
7.123
7.117
7.107
7.105
6.853
3.743
3.740
3.569
3.565
3.540
3.535
3.520
3.512
3.507
2.053
2.049
2.044
2.035
2.030
2.016
2.011
1.816
1.811
1.787
1.783
1.778
1.765
1.759
1.748
1.737
1.715
1.705
1.685
1.674
1.664
1.656
1.645
1.634
1.439
1.406
0.757
0.752
0.738
0.733
0.720
0.715
O
N
9
8
7
6
5
4
3
2
1
0 ppm
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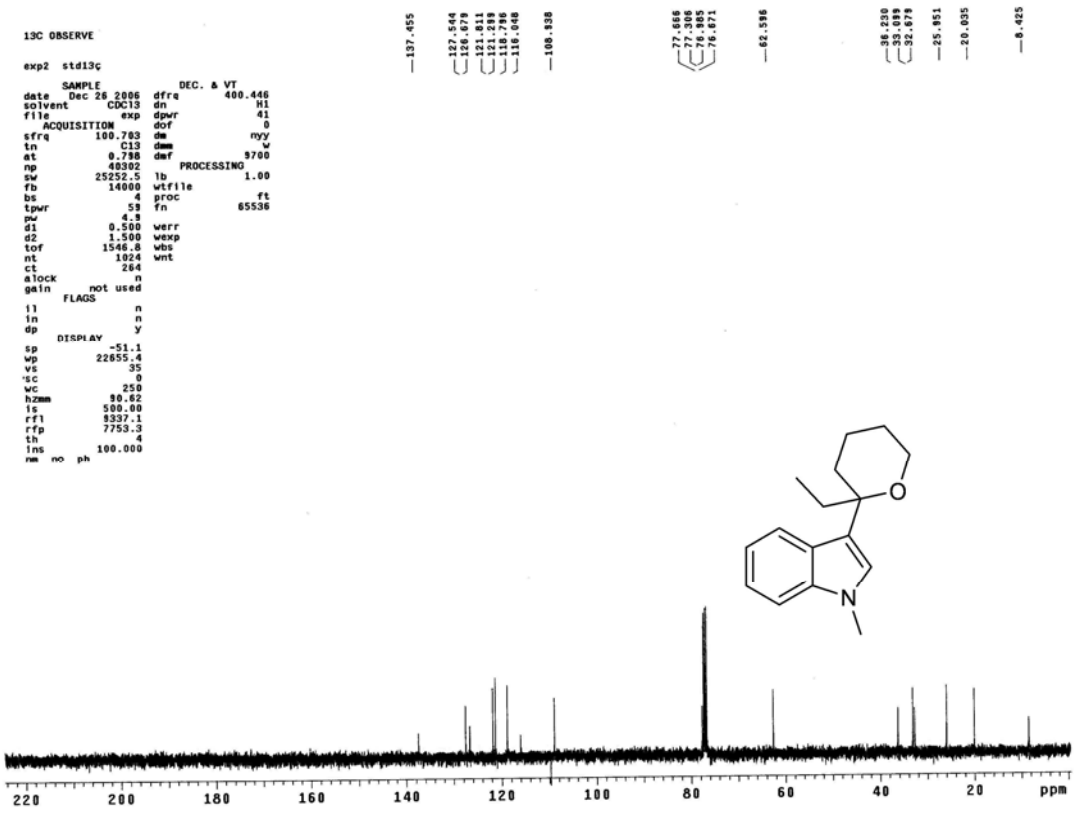
4.81
4.47
4.61
26.25
5.30
12.57


13C OBSERVE
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SAMPLE
date Dec 26 2006
solvent CDCl3
file exp
ACQUISITION
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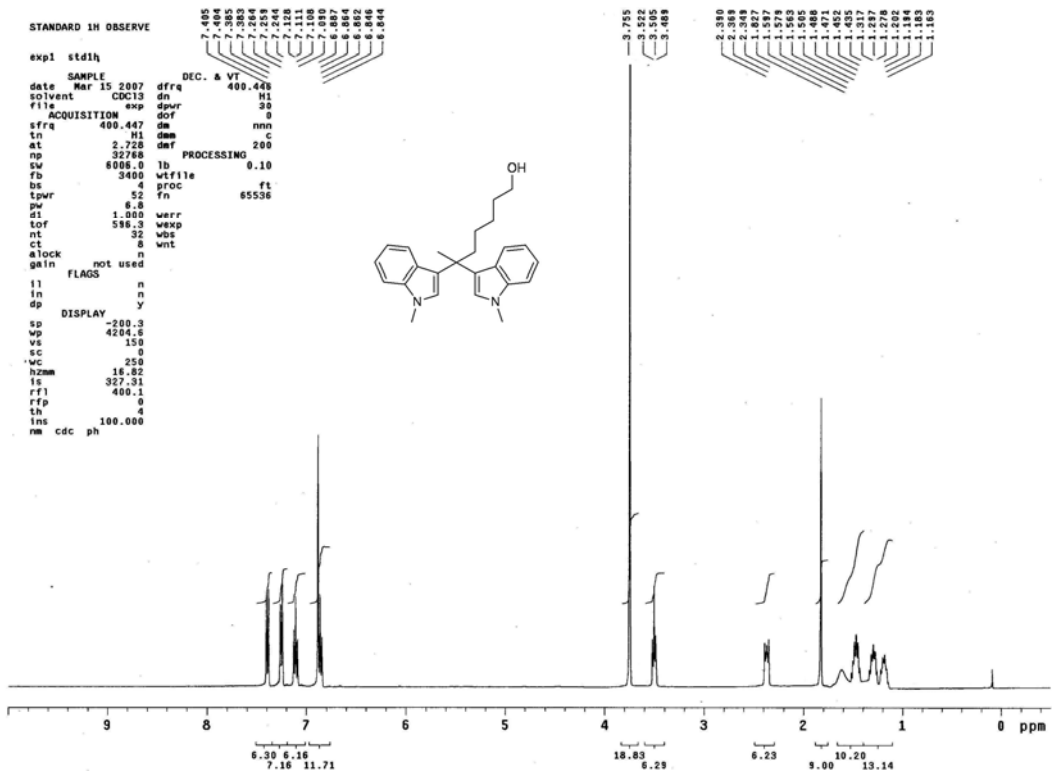
tn C13
at 0.798
np 40302
sw 25252.5
fb 14000
bs 4
tpwr 59
pw 4.5
d1 0.500
d2 1.500
tof 1546.8
nt 1024
ct 264
alock n
gain not used
FLAGS
il n
in n
dp y
DISPLAY
sp -51.1
wp 22655.4
vs 35
sc 0
wc 250
hzmm 90.62
is 500.00
rfl 9337.1
rfp 7753.3
th 4
ins 100.000
nm no ph
DEC. & VT
dfrq 400.446
dn H1
dpwr 41
dof 0
dm nyy
dmm w
dmf 9700
PROCESSING
lb 1.00
wtfile
proc ft
fn 65536
werr
wexp
wbs
wnt
137.455
127.544
126.679
121.911
121.018
118.786
110.048
108.938
77.666
77.366
76.985
76.671
62.596
36.230
33.089
32.679
25.951
20.035
8.425
O
N
220
200
180
160
140
120
100
80
60
40
20
ppm

^{1}H and ^{13}C NMR spectra of compound **3p**.



13C OBSERVE

exp2 std13c

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file	exp	dpwr	34
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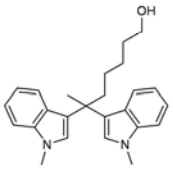
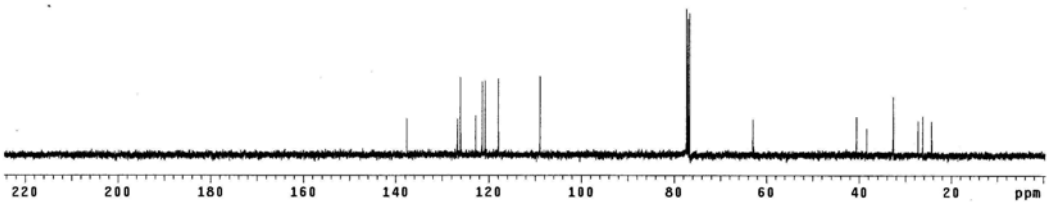
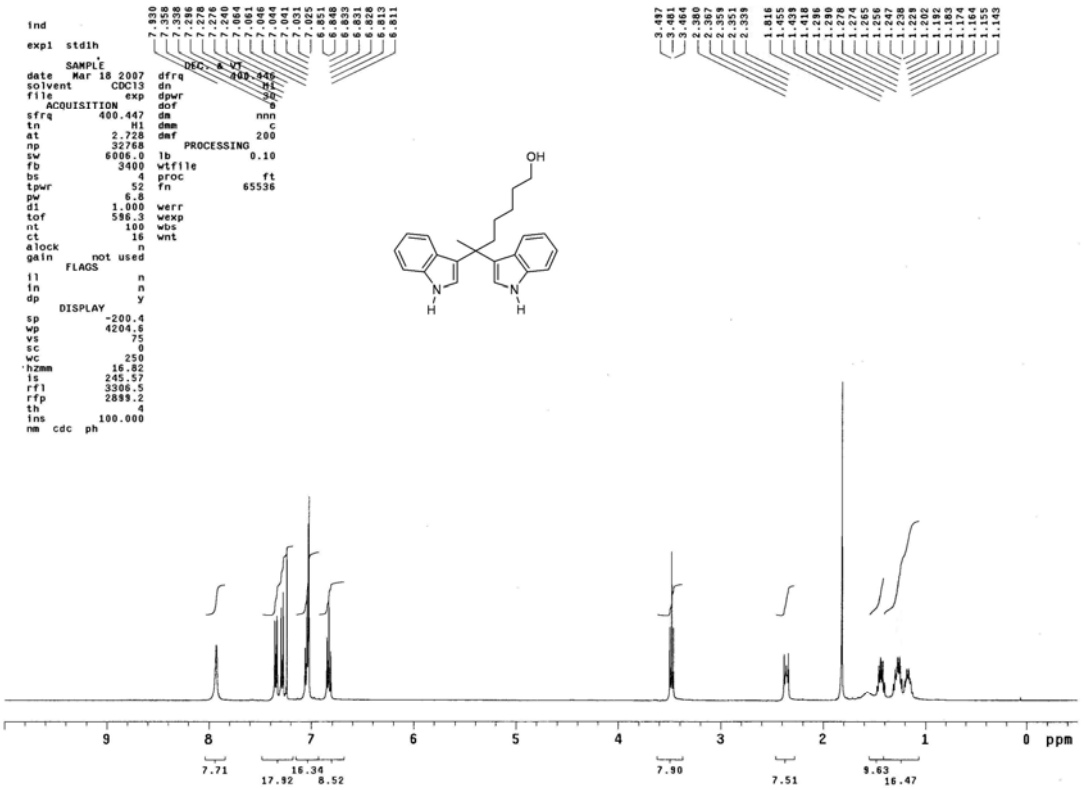
tn	C13	dmm	w
at	0.798	dmf	8900
np	40302	PROCESSING	
sw	25252.5	lb	1.00
fb	14000	wtfile	
bs	4	proc	ft
tpwr	59	fn	65536
pw	4.9		
d1	0.500	werr	
d2	1.500	wexp	
tof	1546.8	wbs	
nt	1024	wnt	
ct	176		
alock	n		
gain	not used		
FLAGS			
il	n		
in	n		
dp	y		
DISPLAY			
sp	-51.1		
wp	22655.4		
vs	35		
sc	0		
wc	250		
hzmm	80.62		
ls	500.00		
rfl	9333.3		
rfp	7753.3		
th	4		
ins	100.000		
nm no ph			

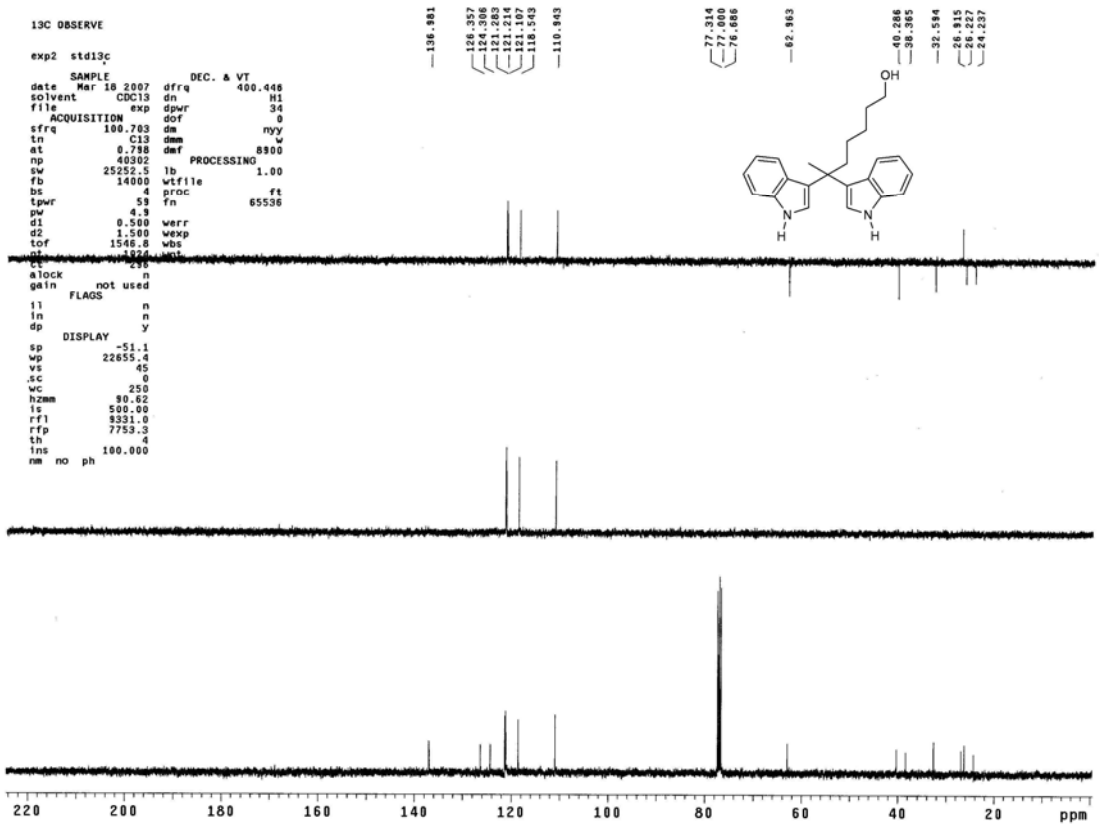
137.608
126.740
126.074
122.837
121.383
120.763
117.416
108.938
77.314
77.000
76.679
62.956
40.592
38.373
32.648
32.371
27.552
26.234
24.283



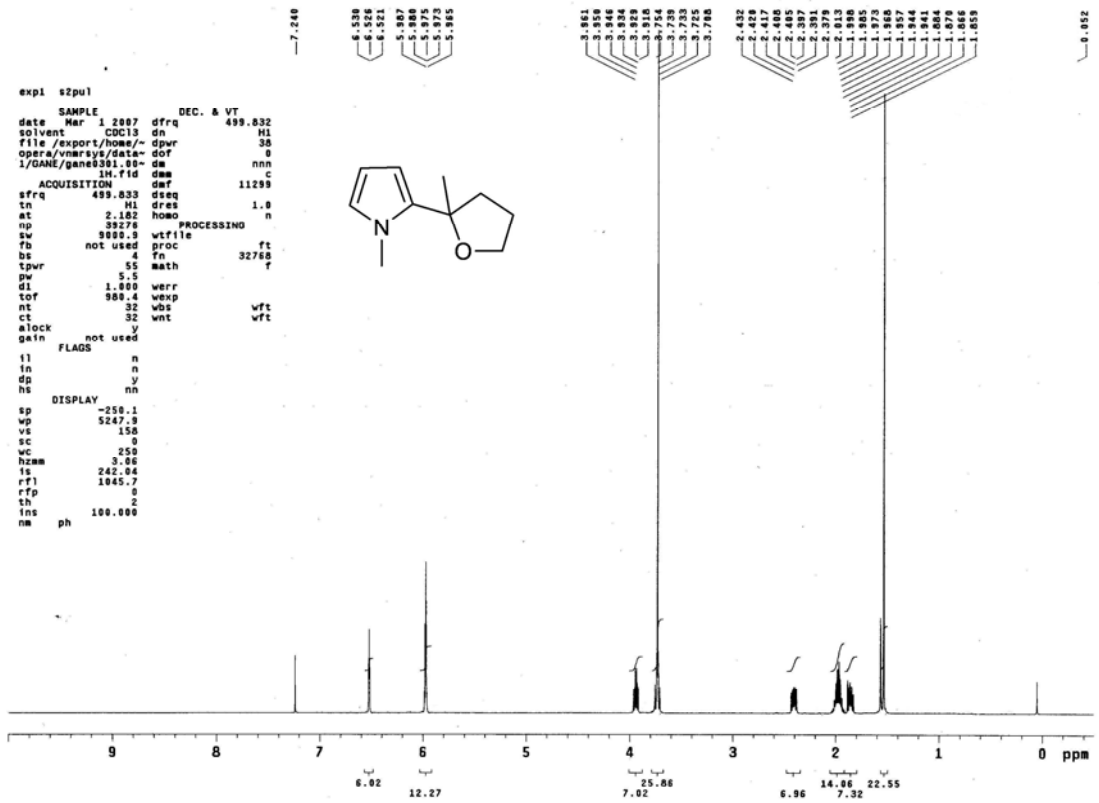


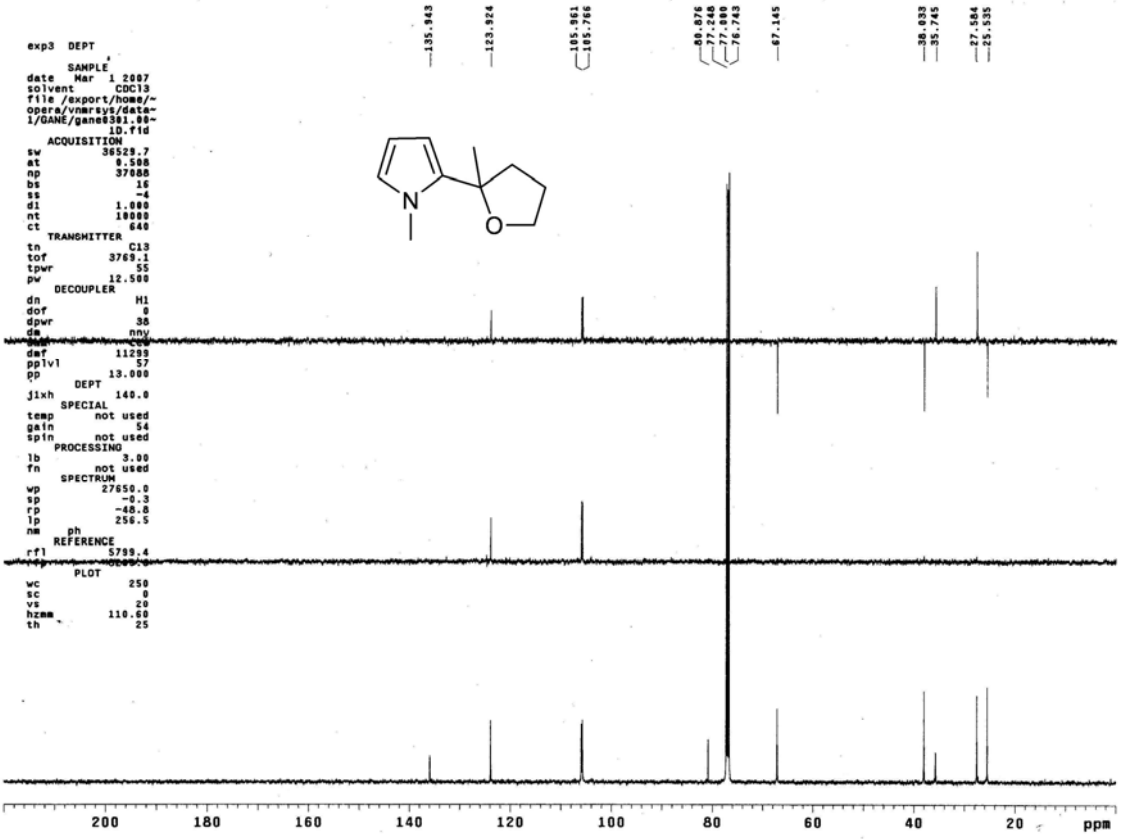
^{1}H and ^{13}C NMR spectra of compound **3q**.





^{1}H and ^{13}C NMR spectra of compound **3r**.


exp1 s2pul
SAMPLE
date Mar 1 2007
solvent CDCl3
file /export/home/~
opera/vnmrsys/data~
1/GANE/gane0301.00~
1H.fid
ACQUISITION
sfrq 499.833
tn H1
at 2.182
np 39276
sw 9000.9
fb not used
bs 4
tpwr 55
pw 5.5
d1 1.000
tof 980.4
nt 32
ct 32
alock y
gain not used
FLAGS
il n
in n
dp y
hs nn
DISPLAY
sp -250.1
wp 5247.9
vs 158
sc 0
wc 250
hzmm 3.06
is 242.84
rfl 1045.7
rfp 0
th 2
ins 100.000
nm ph
DEC. & VT
dfrq 499.832
dn H1
dpwr 38
dof 0
dm nnn
dmm c
dmf 11299
dseq
dres 1.0
homo n
PROCESSING
wtfile
proc ft
fn 32768
math f
werr
wexp
wbs wft
wnt wft
7.240
6.530
6.526
6.521
5.987
5.980
5.975
5.973
5.965
3.961
3.956
3.946
3.934
3.928
3.916
3.754
3.739
3.733
3.725
3.708
2.432
2.429
2.417
2.408
2.405
2.397
2.391
2.379
2.013
1.998
1.985
1.973
1.968
1.957
1.944
1.941
1.884
1.879
1.866
1.859
0.052
9
8
7
6
5
4
3
2
1
0 ppm
6.02
12.27
7.02
25.86
6.96
14.06
7.32
22.55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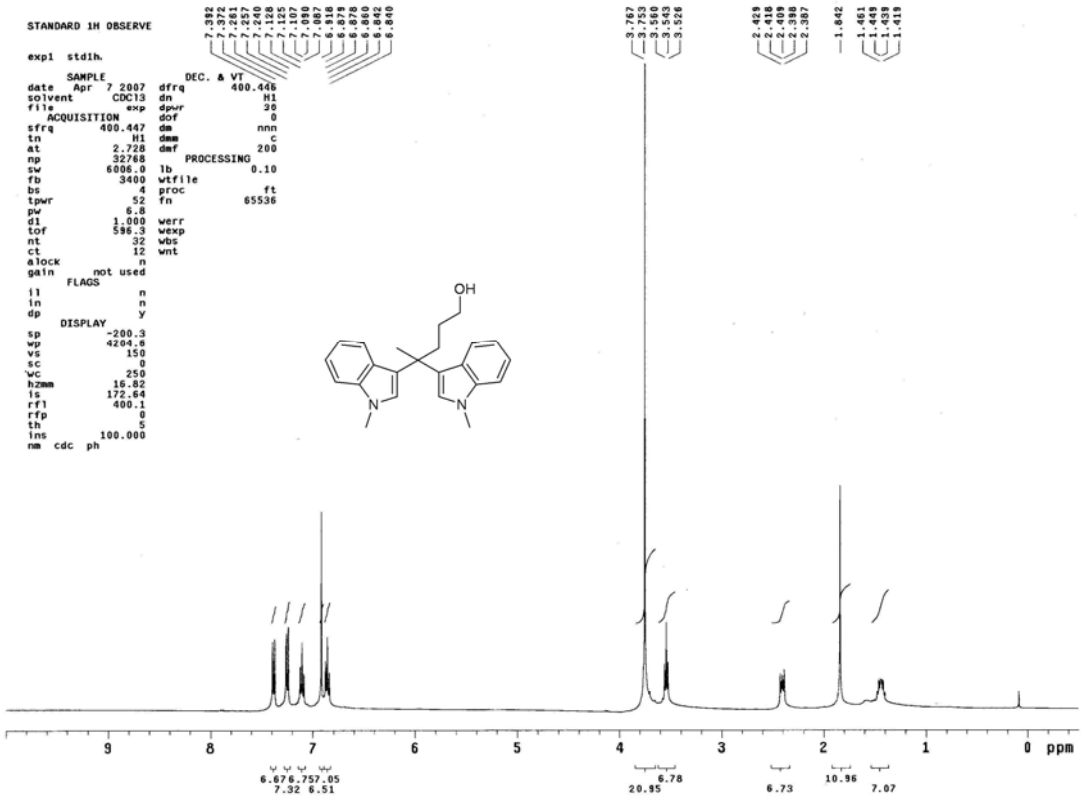
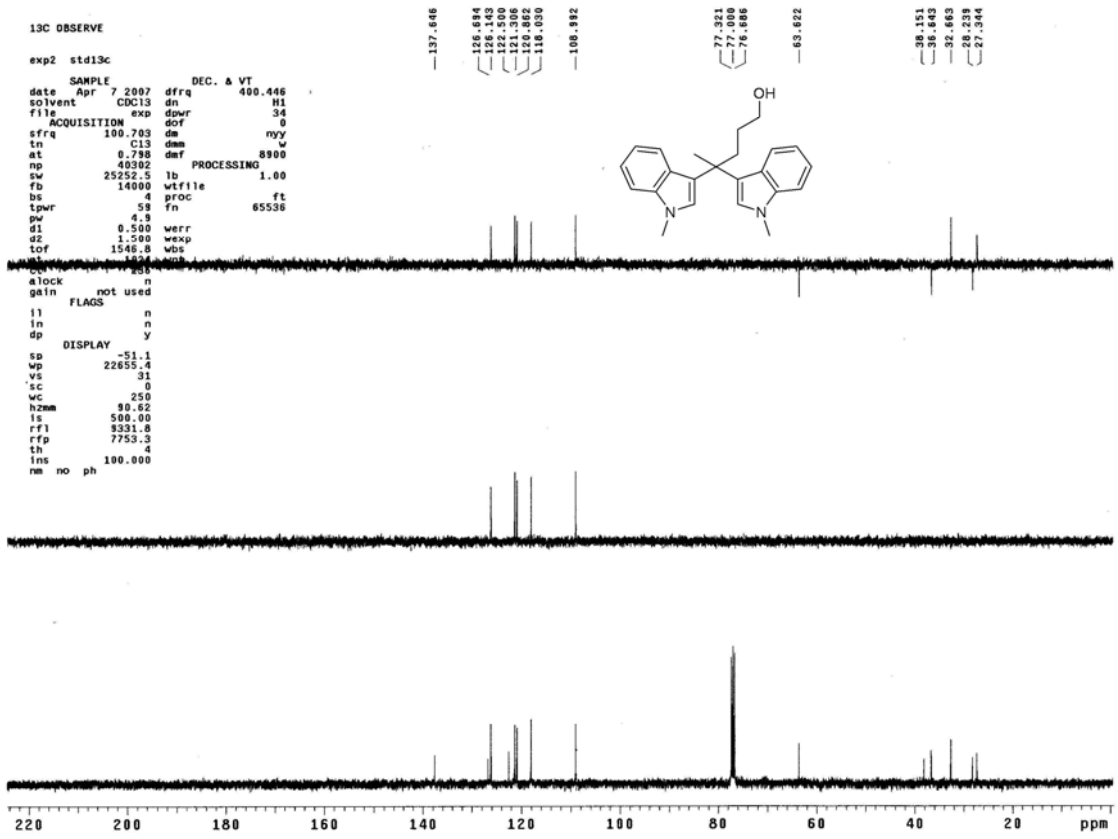
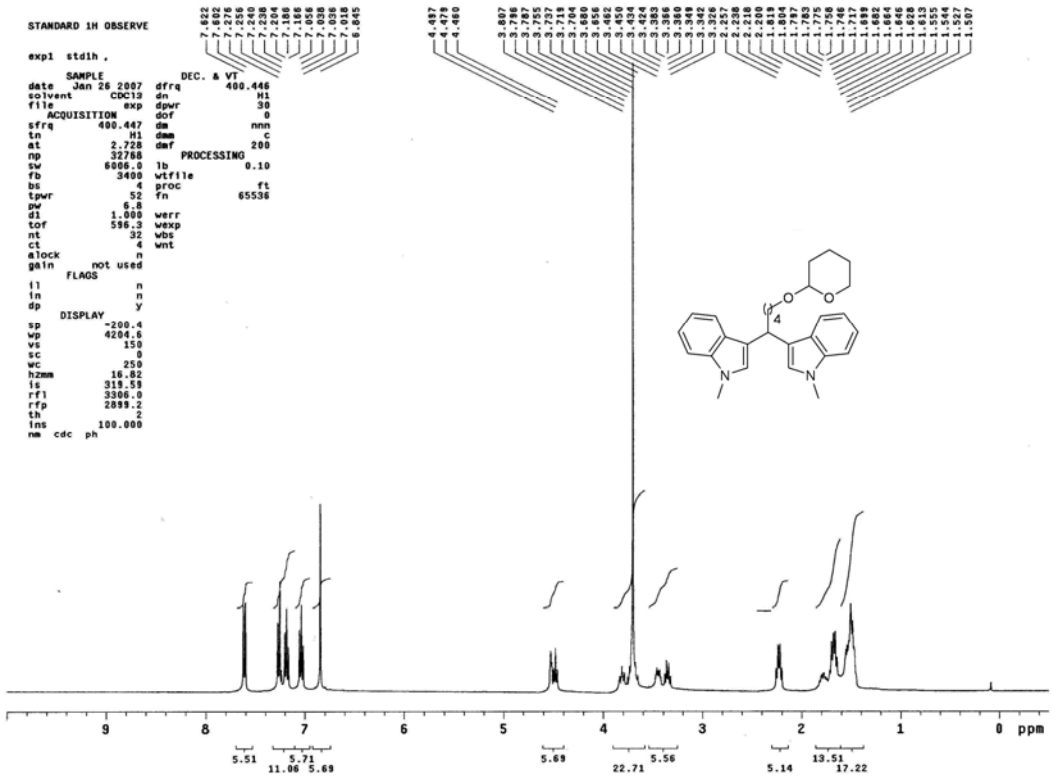
date Mar 1 2007
solvent CDCl3
file /export/home/~
opera/vnmrsys/data~
1/GANE/gane0301.00~
1D.fid
ACQUISITION
sw 36529.7
at 0.508
np 37088
bs 16
ss -4
d1 1.000
nt 19080
ct 640
TRANSMITTER
tn C13
tof 3769.1
tpwr 55
pw 12.500
DECOUPLER
dn H1
dof 0
dpwr 38
dm nny
dmf 11299
pplvl 57
pp 13.000
DEPT
jlxh 140.0
SPECIAL
temp not used
gain 54
spin not used
PROCESSING
lb 3.00
fn not used
SPECTRUM
wp 27650.0
sp -0.3
rp -48.8
lp 256.5
nm ph
REFERENCE
rfl 5789.4
PLOT
wc 250
sc 0
vs 20
hzmm 110.60
th 25
135.943
123.924
105.961
105.766
80.076
77.246
77.000
76.748
67.145
38.033
35.745
27.584
25.535
200
180
160
140
120
100
80
60
40
20 ppm

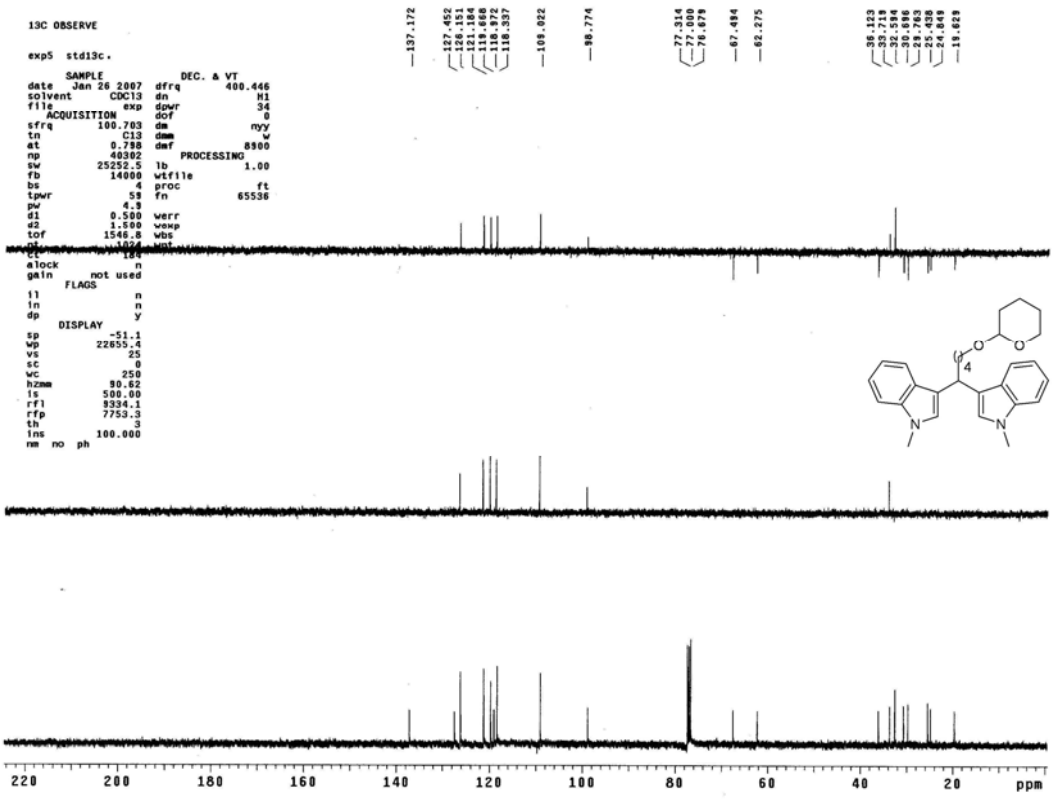
^{1}H and ^{13}C NMR spectra of compound **3s**.





^{1}H and ^{13}C NMR spectra of compound **3t**.





13C OBSERVE

exp5 std13c.

SAMPLE		DEC. & VT	
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file	exp	dpwr	34
ACQUISITION		dof	0
sfrq	100.703	dm	nyy
tn	C13	dmm	w
at	0.798	dmf	8500
np	40302	PROCESSING	
sw	25252.5	lb	1.00
fb	14000	wtfile	
bs	4	proc	ft
tpwr	59	fn	65536
pw	4.9		
d1	0.500	werr	
d2	1.500	wexp	
tof	1546.8	wbs	
[illegible]	[illegible]	wnt	
ct	184		
alock	n		
gain	not used		
FLAGS			
il	n		
in	n		
dp	y		
DISPLAY			
sp	-51.1		
wp	22655.4		
vs	25		
sc	0		
wc	250		
hzmm	90.62		
is	500.00		
rfl	9334.1		
rfp	7753.3		
th	3		
ins	100.000		
nm no ph			