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Supporting Information

Highly Efficient Cyclization of *o*-Iodobenzoates with Aldehydes Catalyzed by Cobalt Bidentate Phosphine Complexes: a Novel Entry to Chiral Phthalides

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Supporting Information

Spectral data of compounds **3d-g**, **3k-r** and **4c-e** and copy of ^{1}H and ^{13}C NMR spectra of all compounds are listed bellow.

3-(4-Methoxyphenyl)-3*H*-1-isobenzofuranone (3d): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.78 (s, 3 H; OCH_3), 6.35 (s, 1 H; CH), 6.87 (d, ^{3}J(H,H) = 8.8 Hz, 2 H; HC=), 7.15 (t, ^{3}J(H,H) = 8.8 Hz, 2 H; HC=), 7.29 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.53 (t, ^{3}J(H,H) = 7.2 Hz, 1H; HC=), 7.63 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.93 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.48 (C=O), 160.37 (C), 149.71 (C), 134.18 (CH), 129.24 (CH), 128.73(CH), 128.24 (C), 125.88 (C), 125.51 (CH), 122.88 (CH), 114.27 (CH), 82.67 (CH), 55.27 (CH_3); HRMS (m/z) calcd for $C_{15}H_{12}O_2$ 240.0786 found 240.0790.

3-(3-Methoxyphenyl)-3*H*-1-isobenzofuranone (3e): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.73 (s, 3 H; OCH_3), 6.34 (s, 1 H; CH), 6.76 (s, 1 H; HC=), 6.88-6.84 (m, 2 H; aromatic H), 7.26 (t, ***J*** = 7.2 Hz, 1 H; HC=), 7.32 (d, ***J*** = 7.6 Hz, 1 H; HC=), 7.51 (t, ***J*** = 7.2 Hz, 1 H; HC=), 7.62 (t, ***J*** = 7.6 Hz, 1 H; HC=), 7.91 (d, ***J*** = 7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.42 (C=O), 159.91 (C), 149.51 (C), 137.85 (C), 134.26 (CH), 129.98(CH), 129.28 (CH), 125.51 (CH), 125.34 (C), 122.76 (CH), 118.99 (CH), 114.52 (CH), 112.32 (CH), 82.42 (CH), 55.21 (CH_3); HRMS (m/z) calcd for $C_{15}H_{12}O_2$ 240.0786 found 240.0783.

3-(4-Chlorophenyl)-3*H*-isobenzofuran-1-one (3f): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.37 (s, 1 H; CH), 7.21 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.31 (d, ^{3}J(H,H) = 7.6 Hz, 2 H; HC=), 7.35 (d, ^{3}J(H,H) = 7.6 Hz, 2 H; HC=), 7.57 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.66 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.97 (d,

^{3}J(H,H) = 7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.44 (C=O), 149.44 (C), 135.55 (C), 135.21 (C), 134.69 (CH), 129.81 (CH), 129.46 (C), 128.58 (C), 126.02 (CH), 125.76 (C), 112.98 (CH), 82.08 (CH); HRMS (m/z) calcd for $C_{14}H_9ClO_2$ 244.0291 found 244.0286.

3-(4-Trifluoromethylphenyl)-3*H*-isobenzofuran-1-one (3g): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.43 (s, 1 H; CH), 7.32 (d, ^{3}J(H,H) = 7.6 Hz, 2 H; HC=), 7.41 (d, ^{3}J(H,H) = 8.0 Hz, 2 H; HC=), 7.57 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.68-7.63 (m, 2 H; aromatic H), 7.97 (d, J = 7.2 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.06 (C=O), 148.89 (C), 140.47 (C), 134.53 (CH), 131.01 (C), 129.65(CH), 127.04 (CH), 125.91 (CH), 125.75 (CH), 125.04 (C), 122.65 (CH), 81.44 (CH); HRMS (m/z) calcd for $C_{15}H_9F_3O_2$ 278.0555 found 278.0564.

3-Naphthalen-1-yl-3H-isobenzofuran-1-one (3k): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.14 (s, 1 H; CH), 7.16 (d, ^{3}J(H,H) = 6.5 Hz, 1 H; HC=), 7.29 (t, ^{3}J(H,H) = 7.0 Hz, 1 H; HC=), 7.33 (d, ^{3}J(H,H) = 8.0 Hz, 1 H; HC=), 7.48 (t, ^{3}J(H,H) = 7.5 Hz, 2 H; HC=), 7.54 (t, ^{3}J(H,H) = 8.0 Hz, 2 H; HC=), 7.78 (d, ^{3}J(H,H) = 8.0 Hz, 1 H; HC=), 7.83 (d, ^{3}J(H,H) = 7.0 Hz, 1 H; HC=), 7.91 (d, ^{3}J(H,H) = 7.5 Hz, 1 H; HC=), 8.13 (d, ^{3}J(H,H) = 8.5 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.50 (C=O), 149.21 (C), 134.11 (CH), 133.91 (C), 131.84 (C), 131.23 (C), 129.66 (CH), 129.43 (CH), 129.01(CH), 126.98 (CH), 126.18 (CH), 126.01 (C), 125.90 (CH), 125.20 (CH), 124.46 (CH), 123.15 (CH), 122.89 (CH), 79.59 (CH); HRMS (m/z) calcd for $C_{18}H_{12}O_2$ 260.0837 found 260.0836.

3-Benzofuran-2-yl-3H-isobenzofuran-1-one (3l): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.56 (s, 1 H; CH), 6.78 (s, 1 H; HC=), 7.22 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.30 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.42 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.53 (d,

^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.55 (d, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.61 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.71 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.99 (d, ^{3}J(H,H) = 8.0 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 169.71 (C=O), 155.47 (C), 151.18 (C), 134.29 (CH), 146.24 (C), 134.38 (CH), 129.94 (CH), 127.31 (C), 126.01 (CH), 125.91 (C), 123.19 (CH), 123.02 (CH), 121.52 (CH), 111.54 (CH), 116.74 (CH), 75.81 (CH); HRMS (m/z) calcd for $C_{16}H_{10}O_3$ 250.0630 found 250.0630.

3-(Pyridin-4-yl)isobenzofuran-1(3H)-one (3m): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.43(s, 1 H; CH), 7.30 (d, ^{3}J(H,H) = 8.0Hz, 2 H; HC=), 7.50 (d, ^{3}J(H,H) = 8.0Hz, 1 H; HC=), 7.58 (t, ^{3}J(H,H) = 8.0Hz, 1 H; HC=), 7.68 (t, ^{3}J(H,H) = 7.6Hz, 1 H; HC=), 7.97 (d, ^{3}J(H,H) = 7.6Hz, 1 H; HC=), 8.65 (d, ^{3}J(H,H) = 7.6Hz, 2 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 169.94 (C=O), 150.66 (CH), 148.61 (C), 148.48 (CH), 134.64 (CH), 134.55 (CH), 132.45 (C), 129.82 (CH), 125.96 (CH), 125.53 (C), 123.96 (CH), 122.74 (CH), 81.14 (CH); HRMS (m/z) calcd for $C_{13}H_9NO_2$ 211.0633 found 211.0629.

3-Hexyl-3*H*-isobenzofuran-1-one (3n): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.85 (t, ^{3}J(H,H) = 5.2 Hz, 3 H; CH_3), 1.29-1.23 (m, 2 H; alkyl H), 1.38-1.30 (m, 4 H; alkly H), 1.49-1.40 (m, 2 H; alkyl H), 1.69-1.72 (m, 1 H; alkyl H), 2.04-1.95 (m, 1 H, alkyl H), 5.45 (dd, ^{3}J(H,H) = 8.0 Hz, ^{3}J(H,H) = 4.0 Hz, 1 H; CH), 7.41 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.50 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.65 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.88 (d, ^{3}J(H,H) =7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.68 (C=O), 150.13 (C), 133.89 (CH), 128.99 (CH), 126.15 (C), 125.69 (CH), 121.68 (CH), 81.44 (CH), 34.74 (CH_2), 31.56 (CH_2), 28.97 (CH_2), 24.75 (CH_2), 22.49 (CH_2), 14.00 (CH_3); HRMS (m/z) calcd for $C_{14}H_{18}O_2$ 218.1307 found 218.1302.

3-Propyl-3*H*-isobenzofuran-1-one (3o): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 0.92 (t, ^{3}J(H,H) = 7.6 Hz, 3 H; CH_3), 1.56-1.35 (m, 2 H; alkyl H), 1.77-1.68 (m, 1 H; alkyl H), 2.01-1.95 (m, 1 H; alkyl H), 5.46 (dd, ^{3}J(H,H) = 8.0 Hz, ^{3}J(H,H) = 4.0 Hz, 1 H; CH), 7.41 (d, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.50 (t, ^{3}J(H,H) = 7.2 Hz, 1 H; HC=), 7.65 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.87 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.86 (C=O), 150.36 (C), 133.11 (CH), 129.21 (CH), 126.39 (C), 125.91 (CH), 121.91 (CH), 81.47 (CH), 34.07 (CH_2), 18.44 (CH_2), 13.99 (CH_3); HRMS (m/z) calcd for $C_{11}H_{12}O_2$ 176.0837 found 176.0845.

3-Benzyl-3H-isobenzofuran-1-one (3p): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 3.16 (dd, ^{3}J(H,H) = 14.4 Hz, ^{3}J(H,H) = 6.4 Hz, 1 H; one of CH_2), 3.28 (dd, ^{3}J(H,H) = 14.4 Hz, ^{3}J(H,H) = 6.4 Hz, 1 H; one of CH_2), 5.70(t, ^{3}J(H,H) = 6.4 Hz, 1 H; CH), 7.17 (d, ^{3}J(H,H) = 7.6 Hz, 1 H;HC=), 7.25-7.21 (m, 2 H; HC=), 7.31-7.25 (m, 3 H; HC=), 7.49 (t, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=), 7.60 (td, ^{3}J(H,H) = 7.6 Hz, ^{3}J(H,H) = 1.2 Hz, 1 H; HC=), 7.84 (d, ^{3}J(H,H) = 7.6 Hz, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.13 (C=O), 149.07 (C), 134.96 (C), 133.63 (CH), 129.63 (CH), 129.11 (CH), 128.47 (CH), 127.08 (CH), 126.23 (C), 125.62 (CH), 122.23 (CH), 81.12 (CH), 40.80 (CH_2); HRMS (m/z) calcd for $C_{15}H_{12}O_2$ 224.0837 found 224.0834.

7-Phenyl-5,7-dihydro[1,3]dioxolo[4,5-*f*]isobenzofuran-5-one (3q): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.07 (d, ^{2}J(H,H) = 0.8 Hz, 1 H; CH_2), 6.09 (d, ^{2}J(H,H) = 1.2 Hz, 1 H), 6.23 (s, 1 H; CH), 6.64 (s, 1 H; HC=), 7.27-7.23 (m, 3 H; aromatic H), 7.38-7.34 (m, 3 H; aromatic H); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.07 (C=O), 153.85 (C), 149.43 (C), 146.44 (C), 136.40 (C), 129.30 (CH), 128.96 (CH), 126.88 (CH), 119.22 (C),

104.08 (CH), 102.68 (CH), 102.49 (CH_2), 82.04 (CH); HRMS (m/z) calcd for $C_{15}H_{10}O_4$ 254.0579 found 254.0576.

7-(4-Methylphenyl)-5,7-dihydro[1,3]dioxolo[4,5-*f*]isobenzofuran-5-one (**3r**): ^{1}H NMR (400 MHz, $CDCl_3$): δ = 2.35(s, 3 H; CH_3), 6.08(s, 1 H; one of CH_2), 6.10(s, 1 H; one of CH_2), 6.21(s, 1 H; CH), 6.63(s, 1 H; HC=), 7.13(d, ^3J(H,H) = 8.0 Hz, 2 H; HC=), 7.18(d, ^3J(H,H) = 8.0 Hz, 2 H; HC=), 7.23 (s, 1 H; HC=); ^{13}C NMR (100 MHz, $CDCl_3$): δ = 170.31 (C=O), 154.05 (C), 149.64 (C), 146.83 (C), 139.56 (C), 133.68 (C), 129.86 (CH), 127.18 (CH), 119.63 (C), 104.27 (CH), 102.88 (CH), 102.76 (CH_2), 82.30 (CH), 21.42 (CH_3) ; HRMS (m/z) calcd for $C_{16}H_{12}O_4$ 268.0736 found 268.0734.

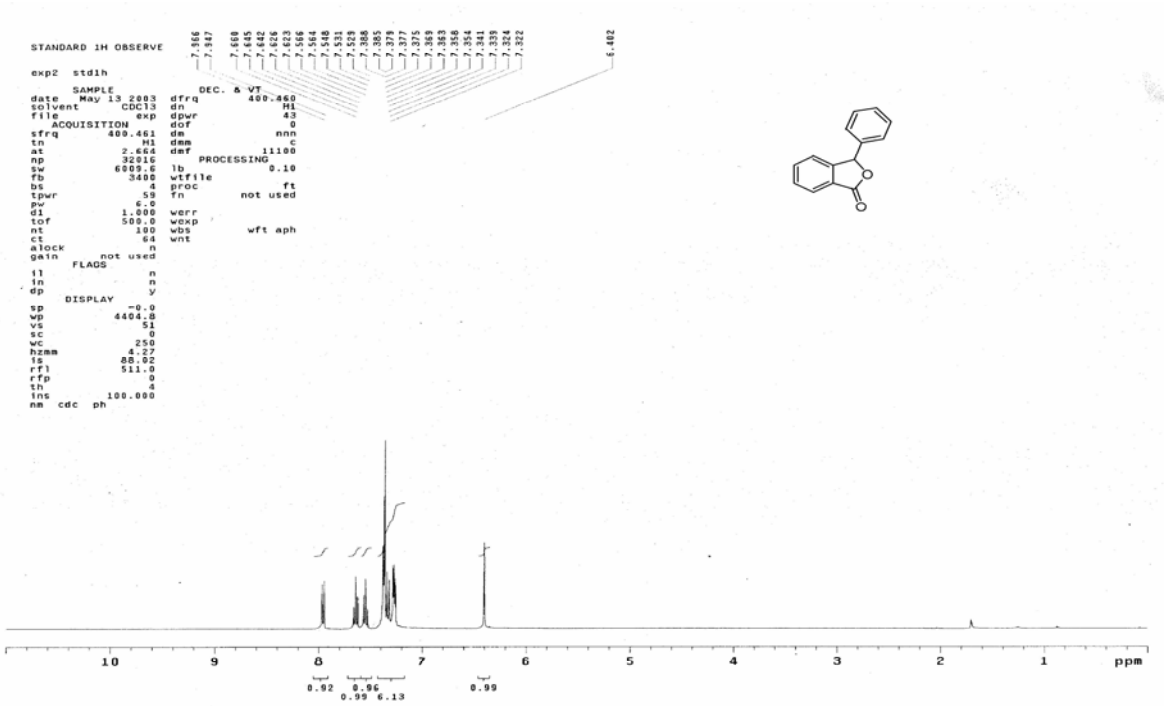
(*S*)-3-(4-*tert*-Butylphenyl)isobenzofuran-1(3H)-one (**4c**): $[\alpha]_D^{27}$ +7.8 (*c* 1.00, CH_2Cl_2) for 91% *ee*; ^{1}H NMR (400 MHz, $CDCl_3$): δ = 1.28 (s, 9 H; $C(CH_3)_3$), 6.38 (s, 1 H; CH), 7.18 (d, ^3J(H,H) = 8.4 Hz, 2 H; HC=), 7.33 (d, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.37 (d, ^3J(H,H) = 8.4 Hz, 2 H; HC=), 7.53 (t, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.63 (t, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.94 (d, ^3J(H,H) = 7.6 Hz, 1 H; HC=). Compound **4c** was isolated in 85% and ee ratio of 91% was determined using HPLC analysis on a chiral OD-H column, detected at 254 nm. Retention times in *n*-hexane:*i*-PrOH (95:5) were 10.1 min (major) and 11.0 min (minor) (1.0 mL/min).

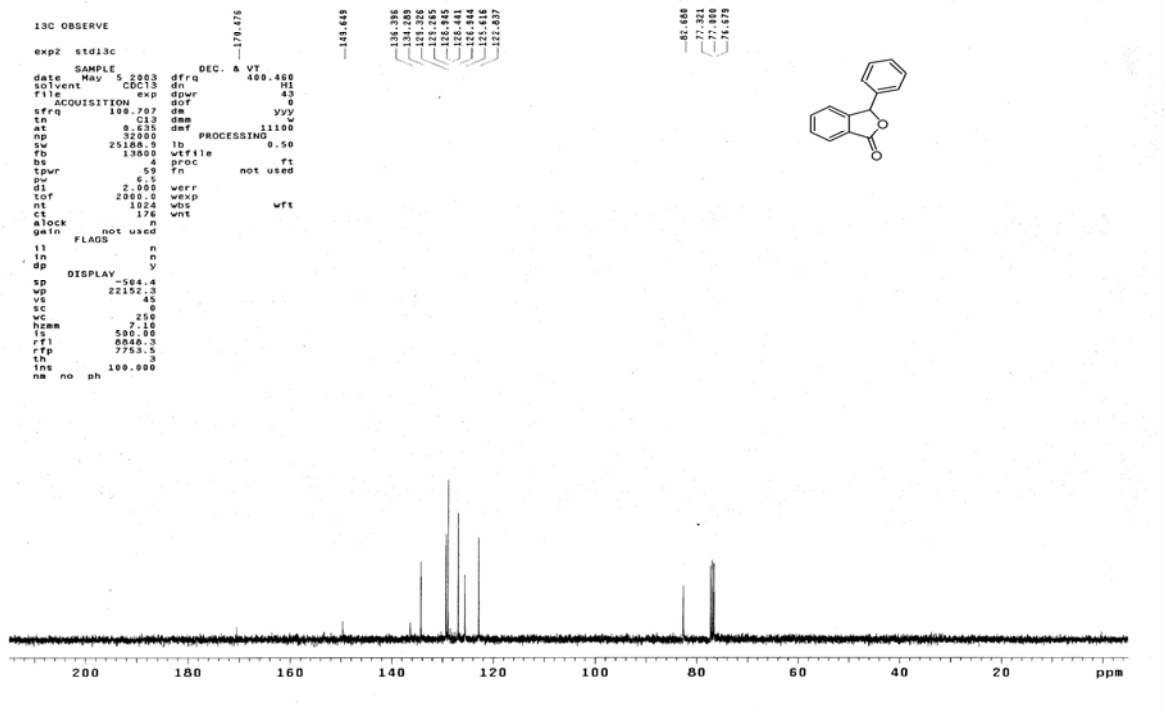
(*S*)-3-(4-Chlorophenyl)isobenzofuran-1(3H)-one (**4d**): $[\alpha]_D^{27}$ +23.5 (*c* 1.00, CH_2Cl_2) for 98% *ee*; ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.36 (s, 1 H; CH), 7.20 (d, ^3J(H,H) = 8.4 Hz, 2 H; HC=), 7.35-7.29 (m, 3 H; aromatic H), 7.55 (t, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.65 (t, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.95 (d, ^3J(H,H) = 8.0 Hz, 1 H; HC=). Compound **4d** was isolated in 83% and ee ratio of 98% was determined using HPLC analysis on a chiral OD-H column, detected at 254 nm. Retention times in

n-hexane:*i*-PrOH (9:1) were 10.8 min (major) and 12.5 min (minor) (1.0 mL/min).

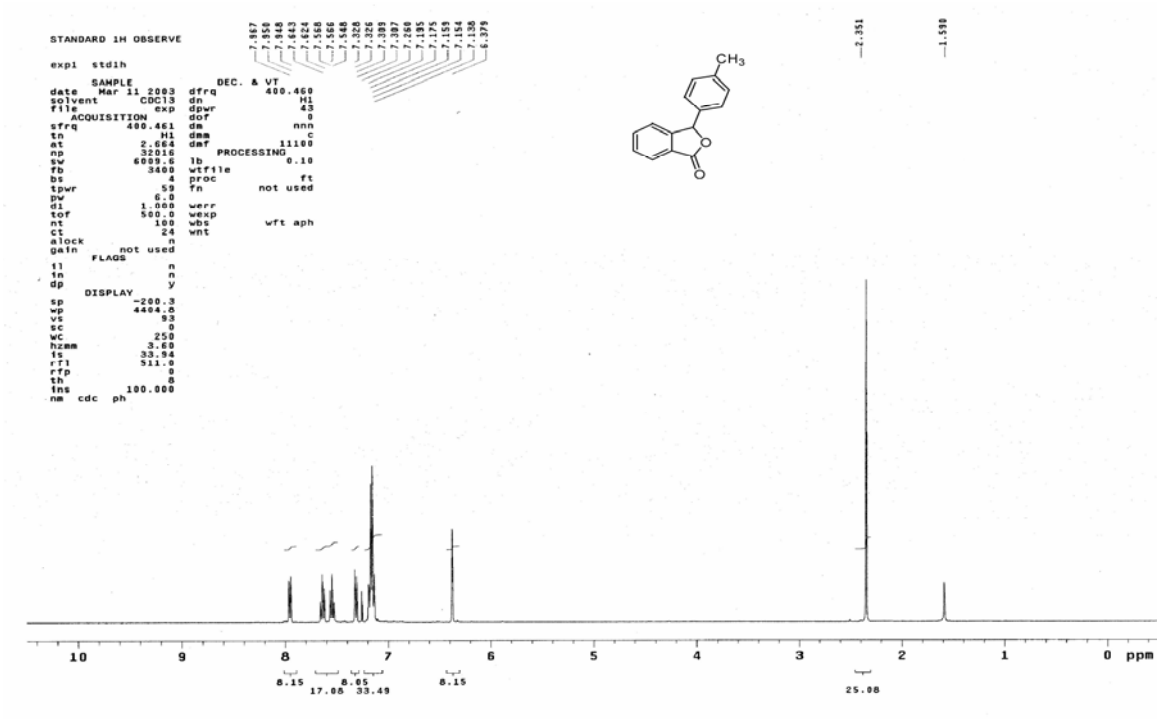
(*S*)-3-(4-(Trifluoromethyl)phenyl)isobenzofuran-1(3*H*)-one (**4e**): $[\alpha]_D^{27}$ +34.0 (*c* 0.50, CH_2Cl_2) for 70% *ee*; ^{1}H NMR (400 MHz, $CDCl_3$): δ = 6.43 (s, 1 H; CH), 7.32 (d, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.42 (d, ^3J(H,H) = 8.0 Hz, 2 H; HC=), 7.57 (t, ^3J(H,H) = 7.6 Hz, 1 H; HC=), 7.68-7.63 (m, 3 H; aromatic H), 7.97 (d, ^3J(H,H) = 7.2 Hz, 1 H; HC=). Compound **4e** was isolated in 81% and ee ratio of 70% was determined using HPLC analysis on a chiral OD-H column, detected at 254 nm. Retention times in *n*-hexane:*i*-PrOH (95:5) were 14.9 min (major) and 16.4 min (minor) (1.0 mL/min).

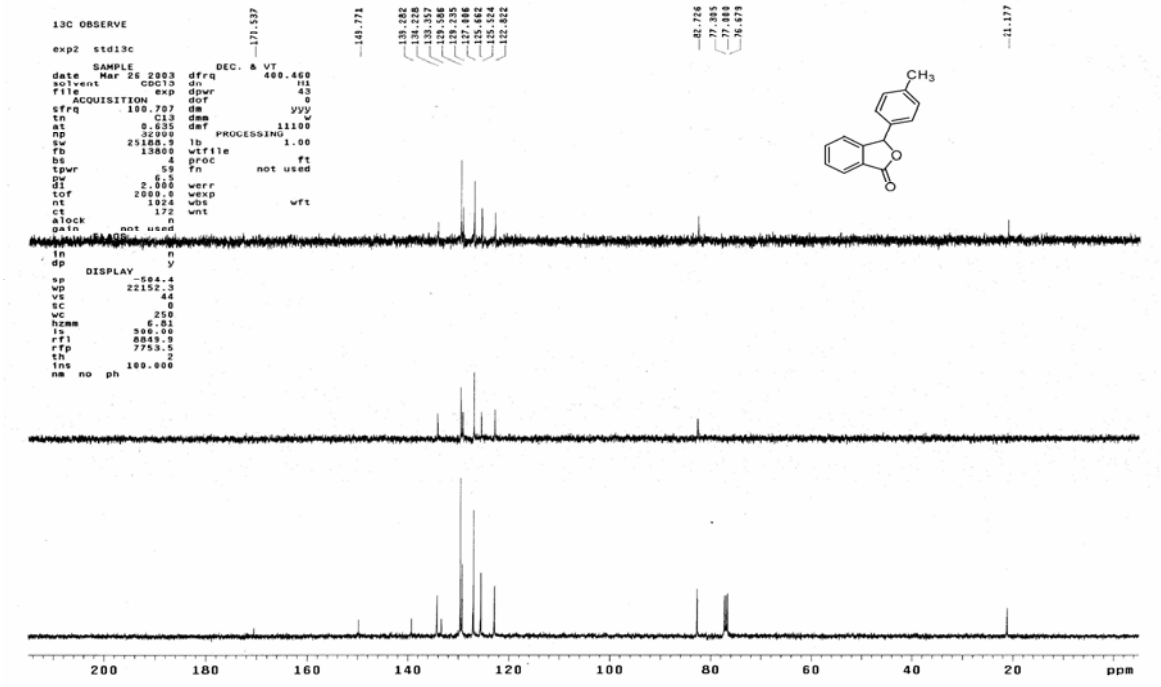
^{1}H and ^{13}C NMR spectra of compound **3a.**





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





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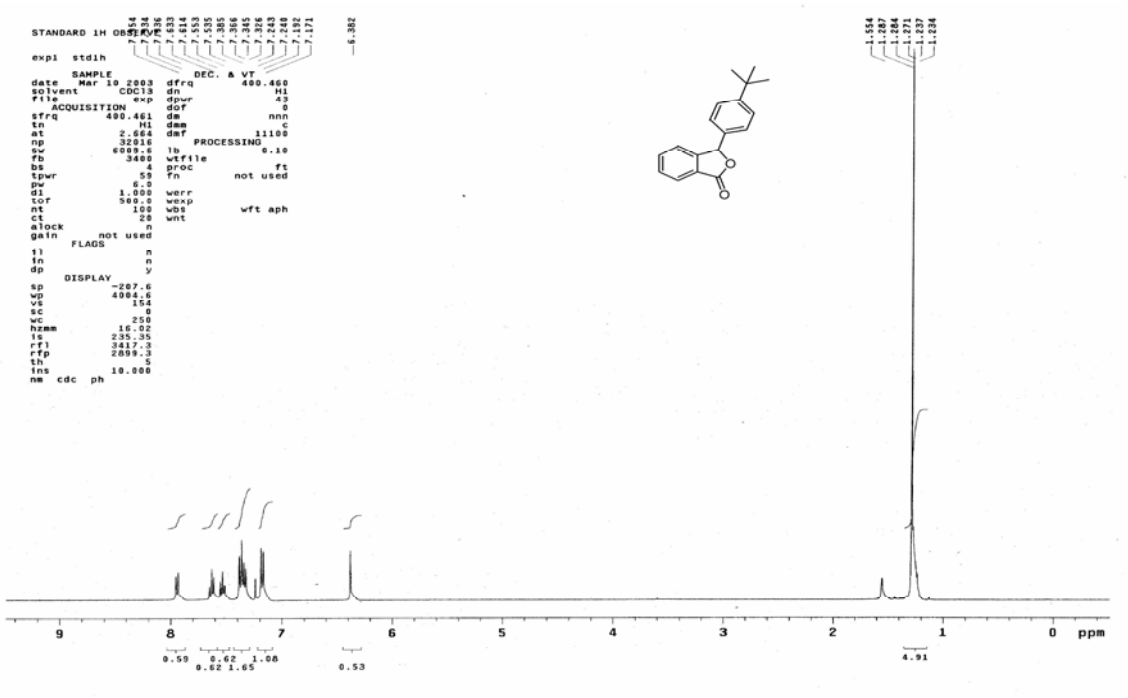
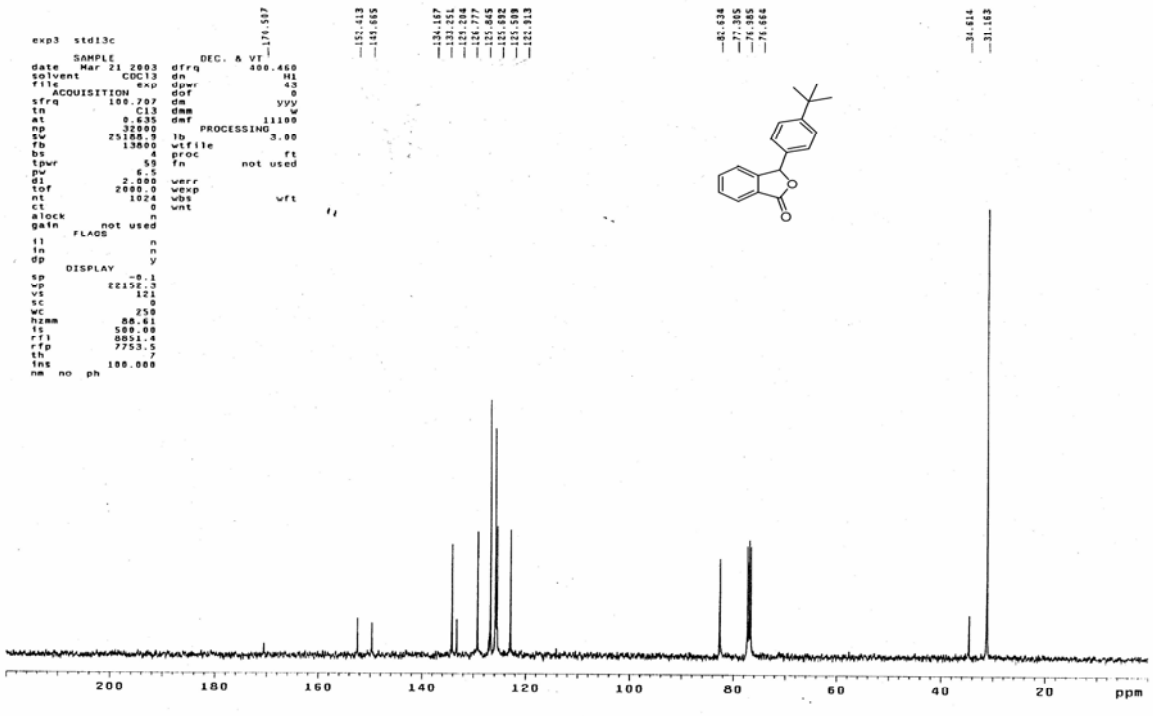
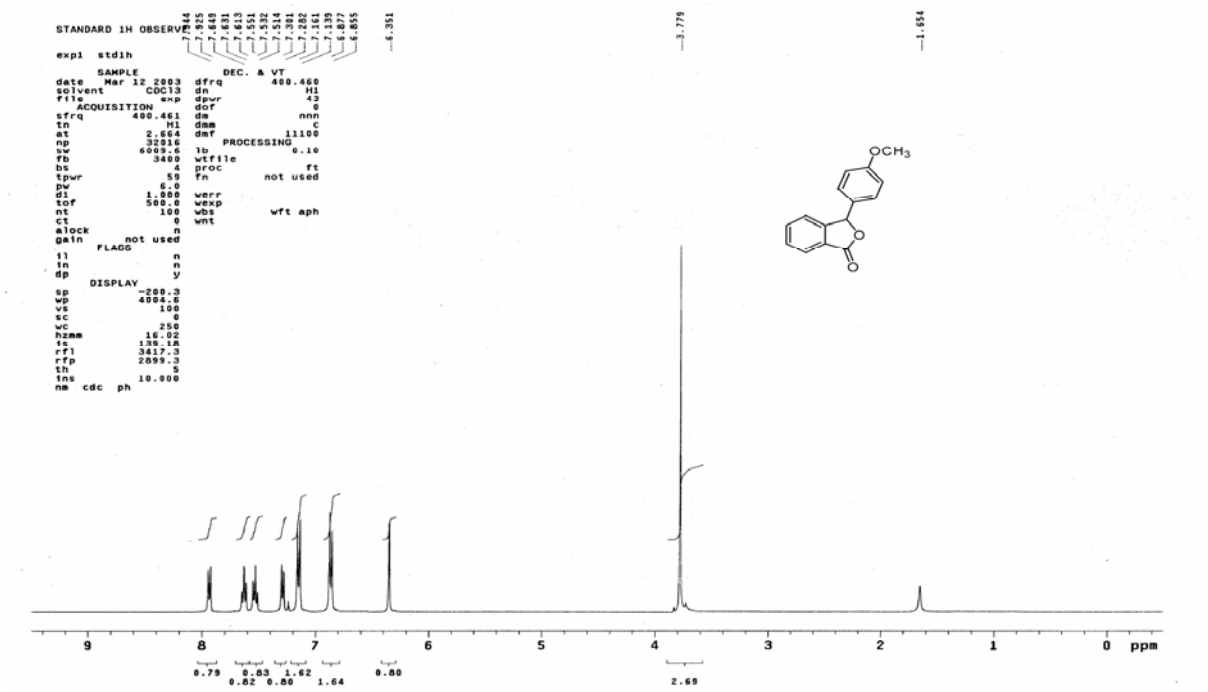
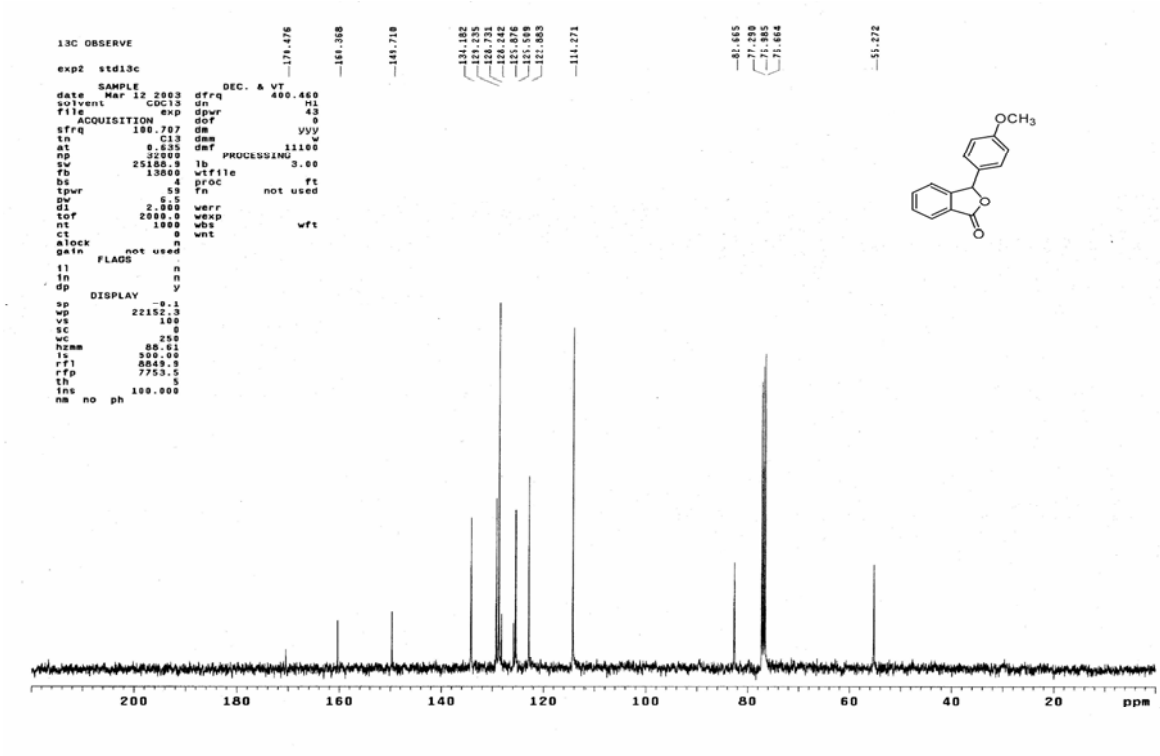




^{1}H and ^{13}C NMR spectra of compound **3d**.

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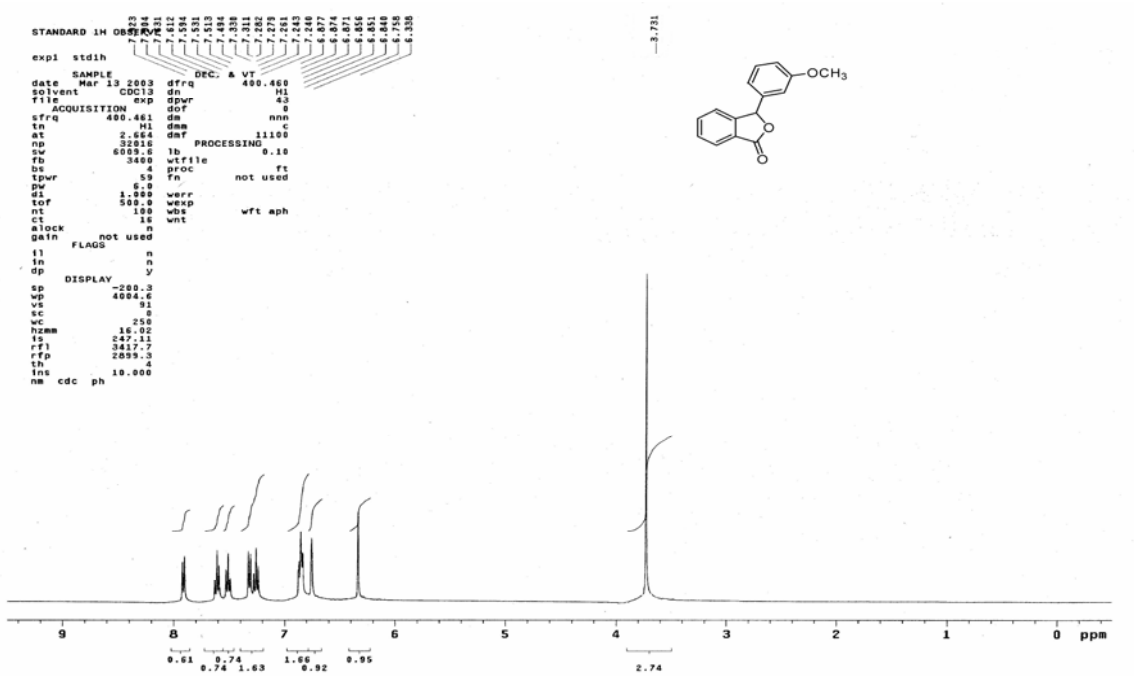
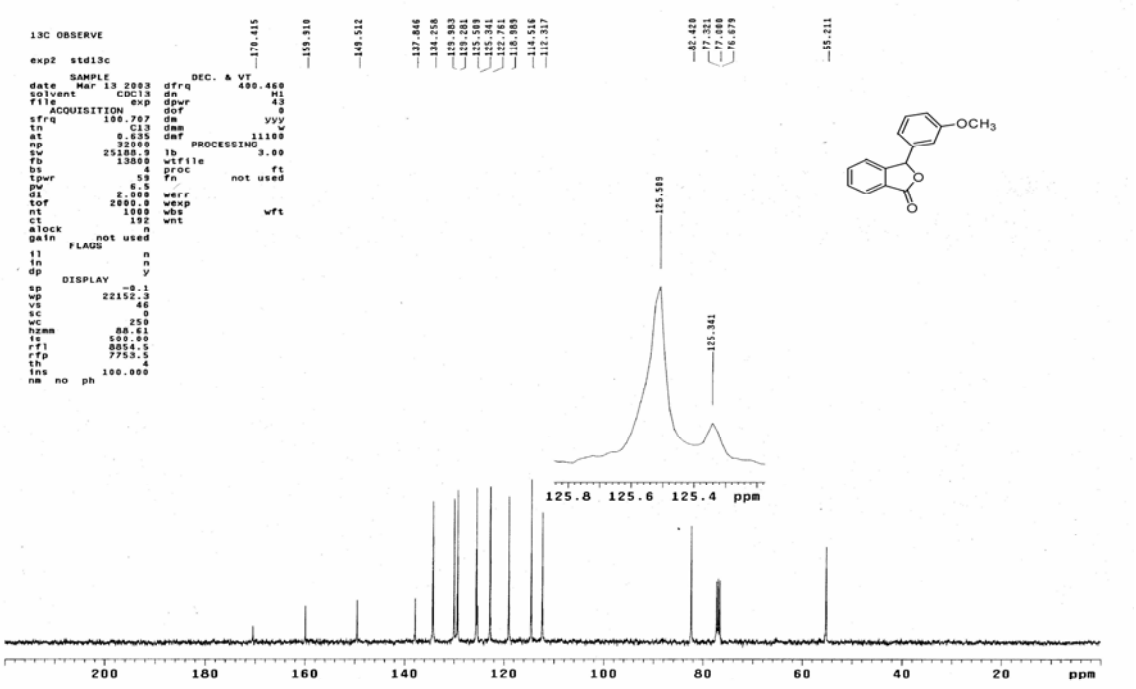
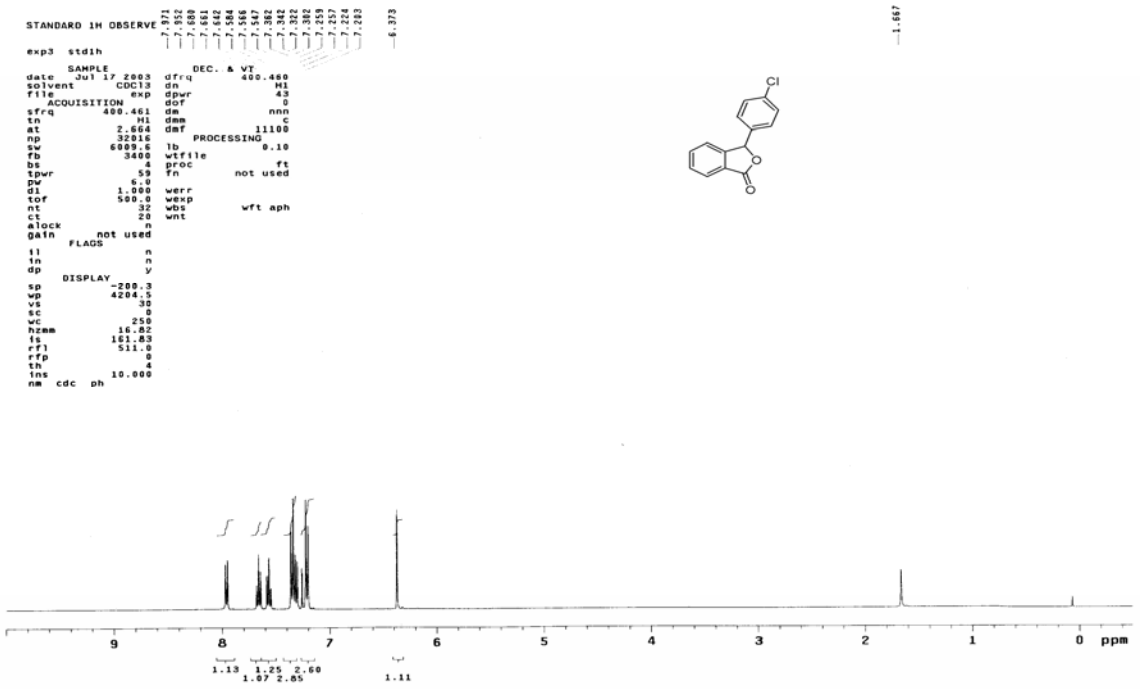
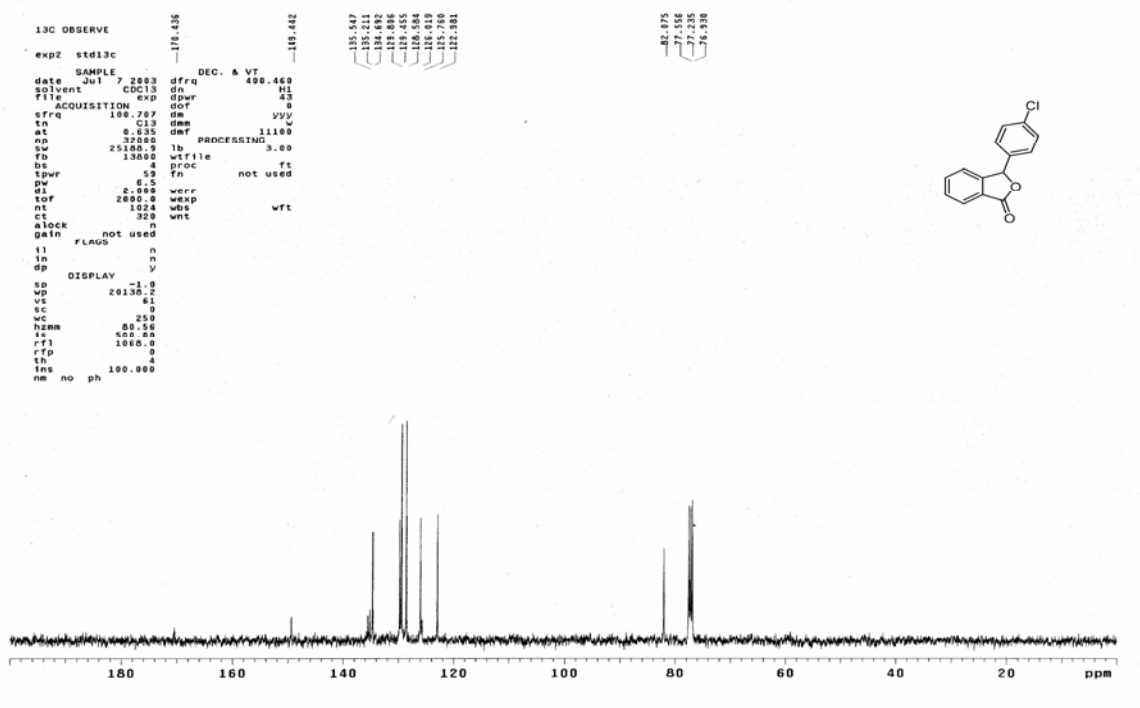
^{1}H and ^{13}C NMR spectra of compound **3e.**



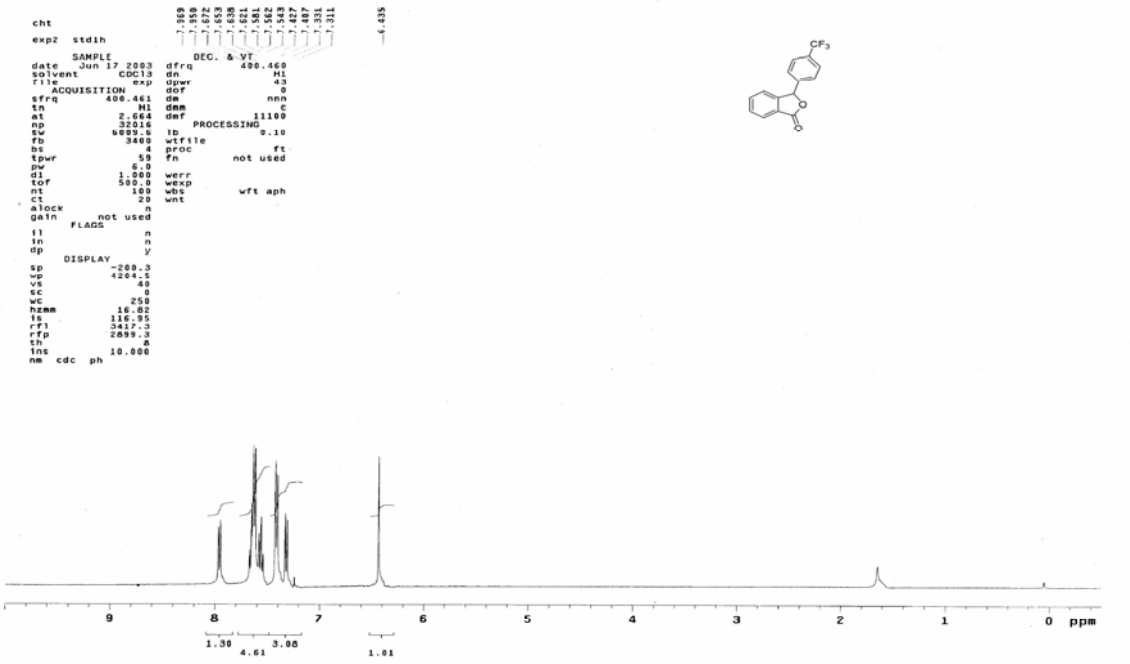


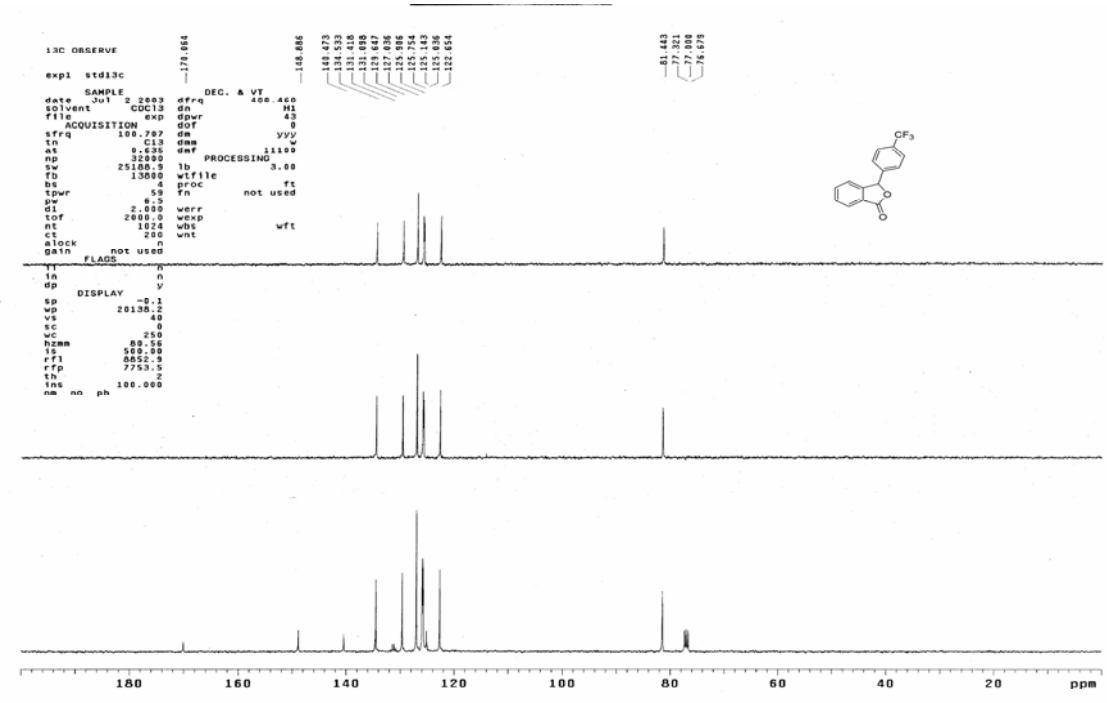
^{1}H and ^{13}C NMR spectra of compound **3f.**



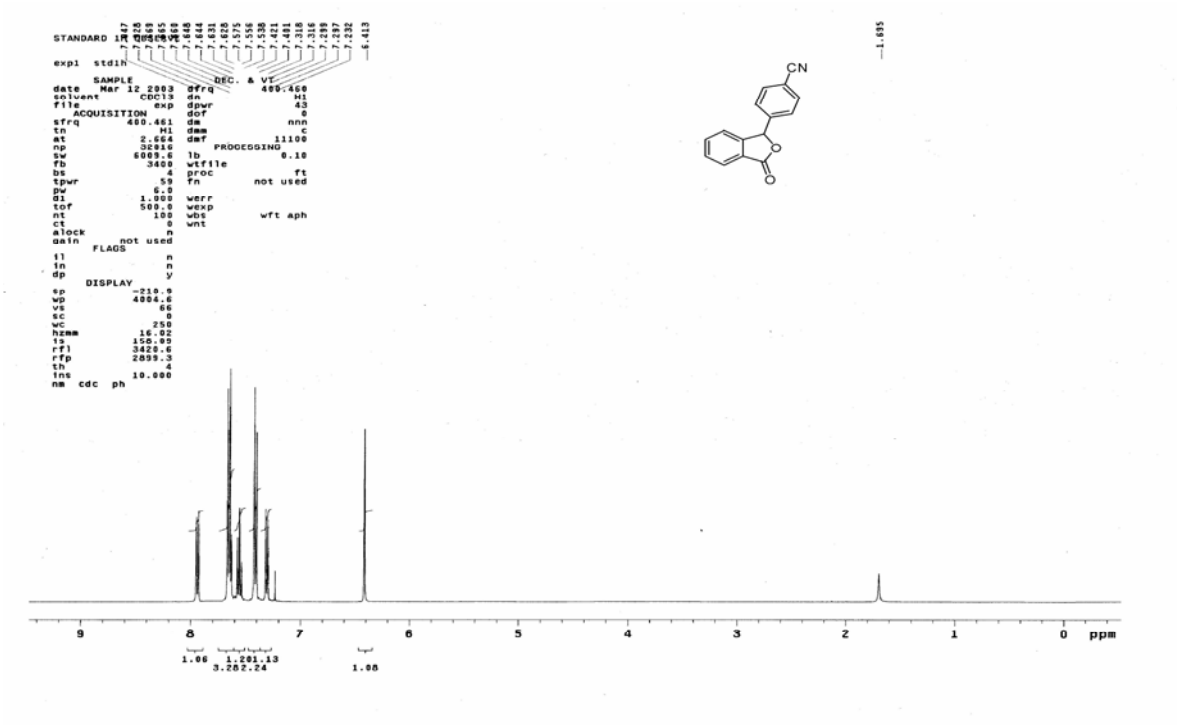


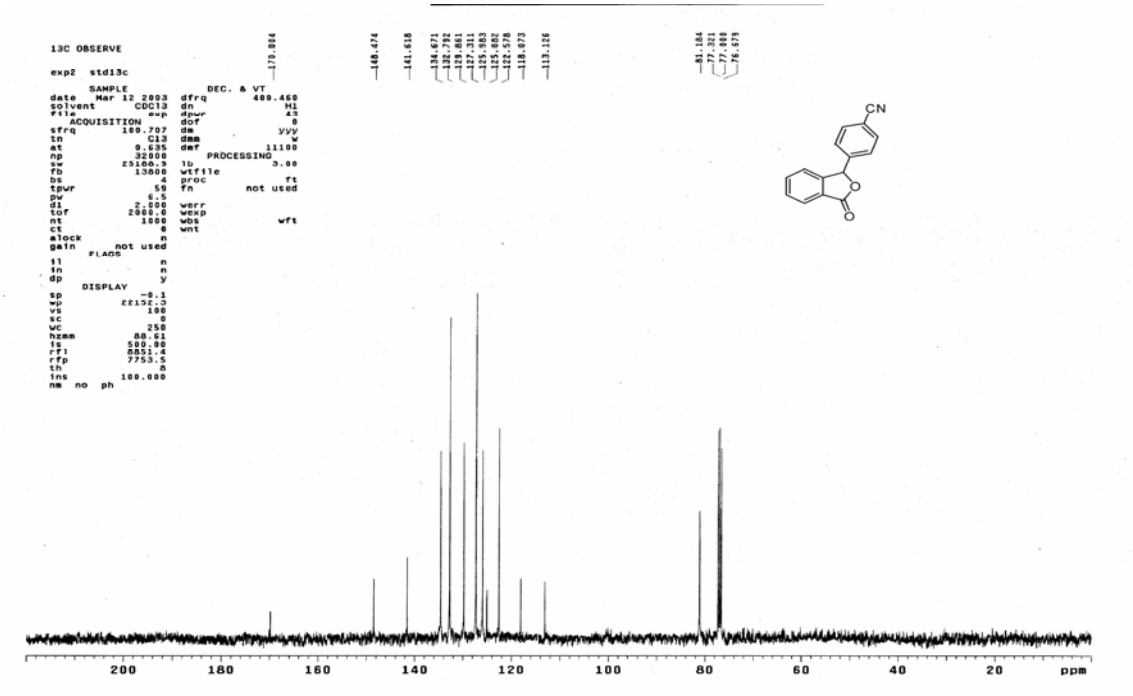
^{1}H and ^{13}C NMR spectra of compound **3g.**



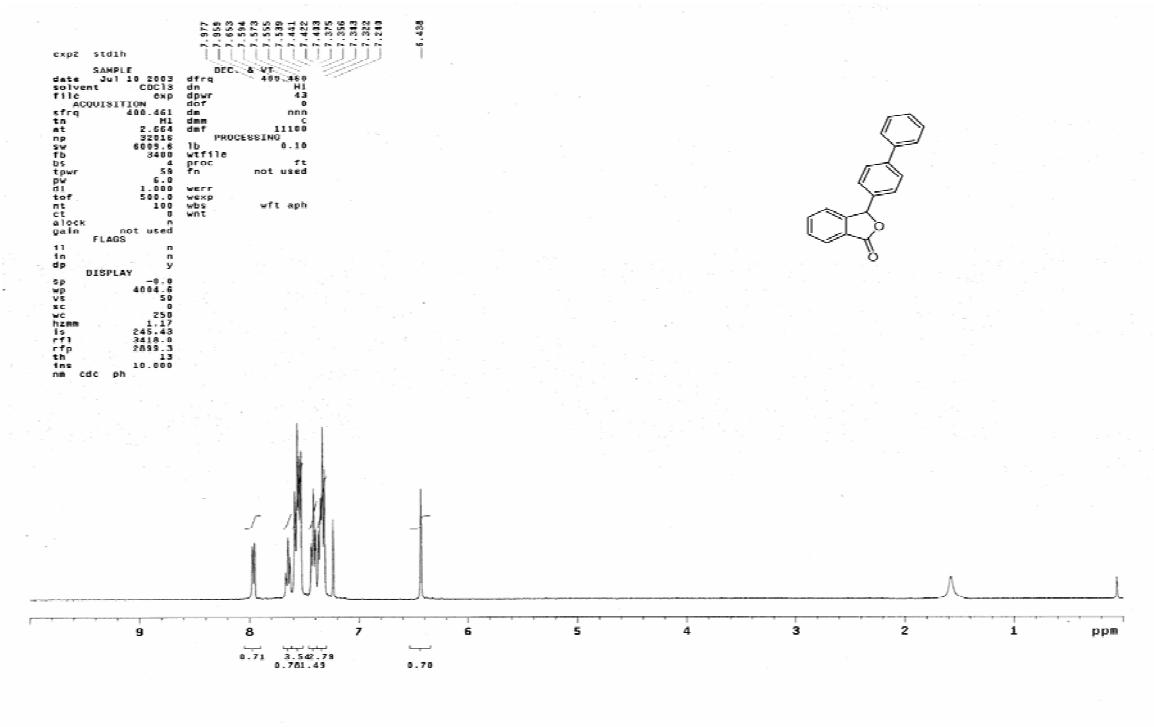


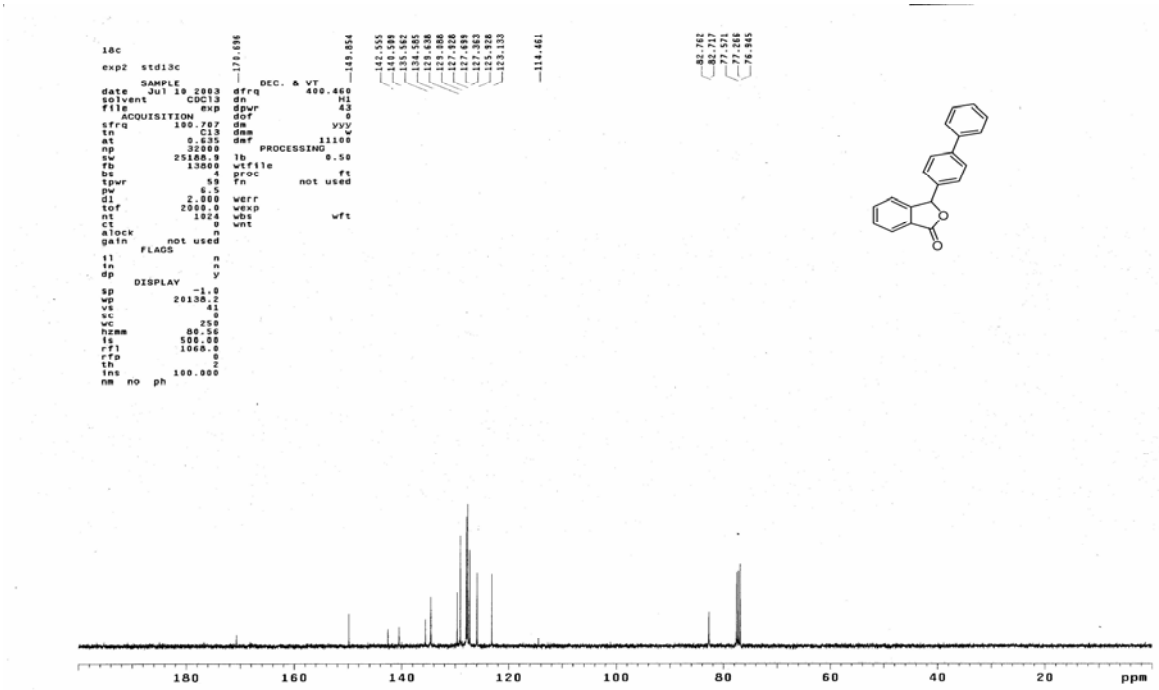
^{1}H and ^{13}C NMR spectra of compound **3h.**





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

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gl 2.000
tof 2000.0
nt 1024
ct 0
alock n
gain not used
FLAGS
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in n
dp y
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ins 100.000
nm no ph
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140.599
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134.585
129.638
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127.385
125.928
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114.461
82.762
82.717
77.571
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76.945
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wtfile
proc ft
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60
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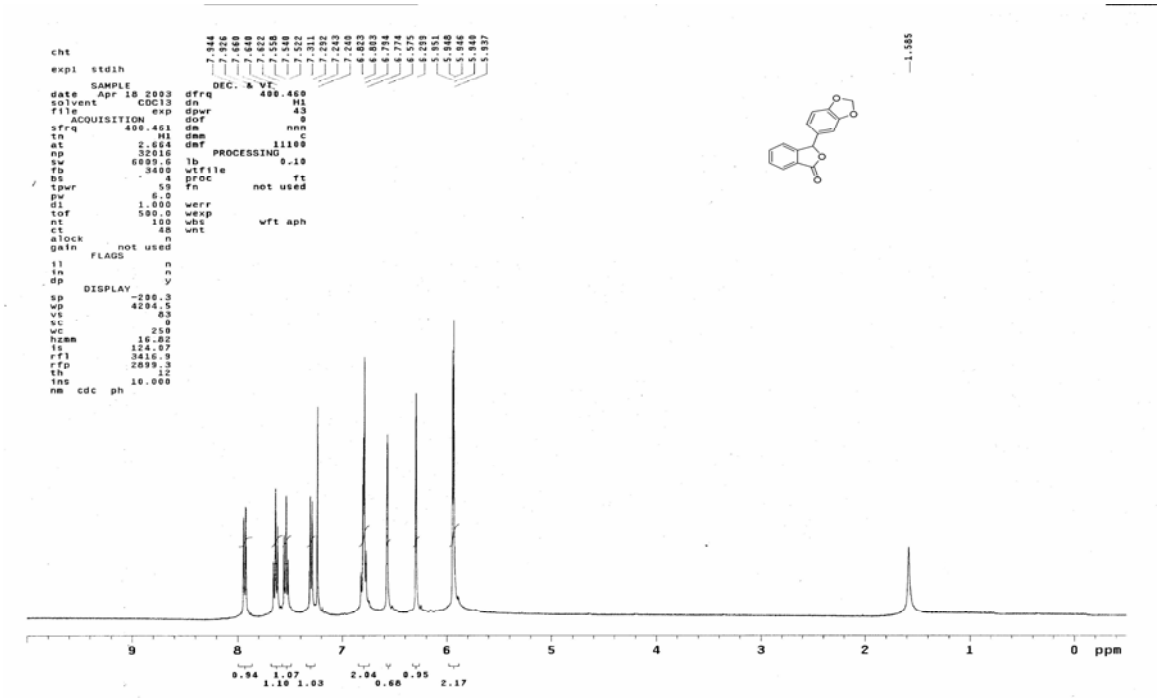
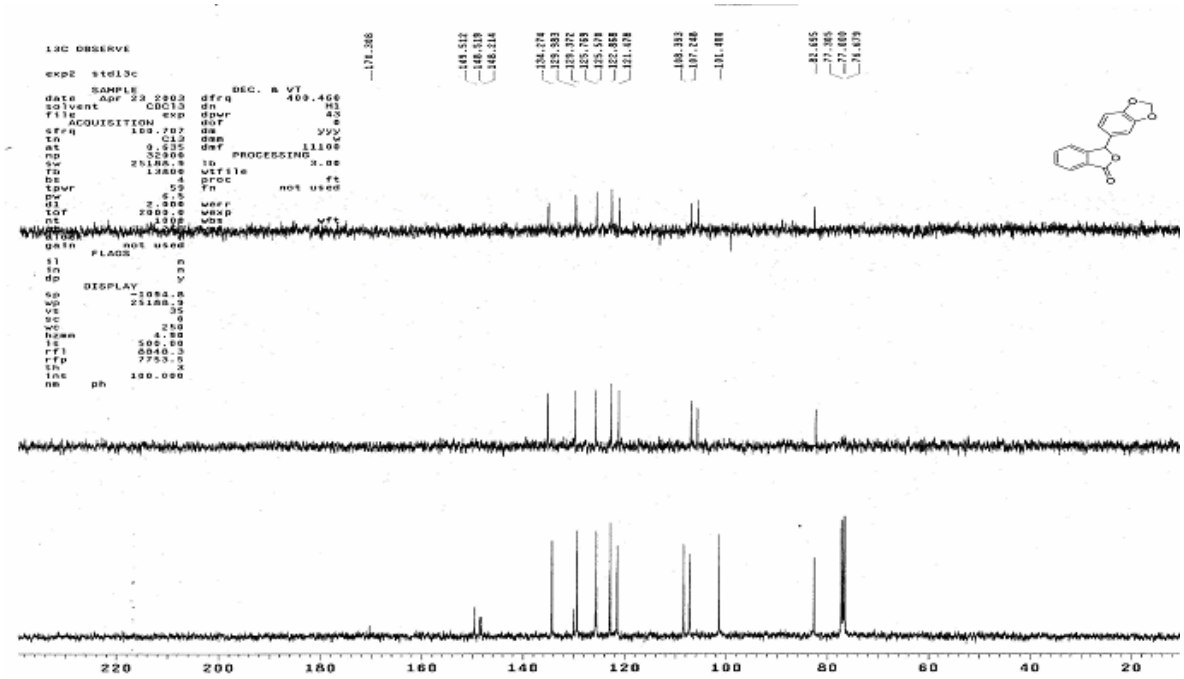
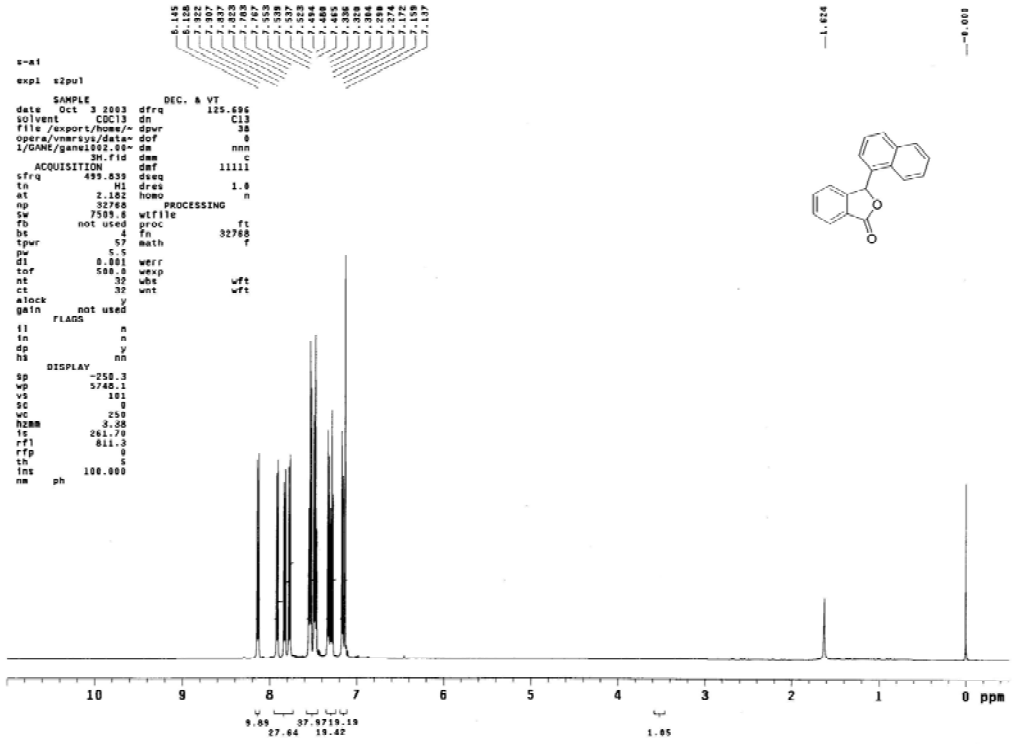
20
ppm

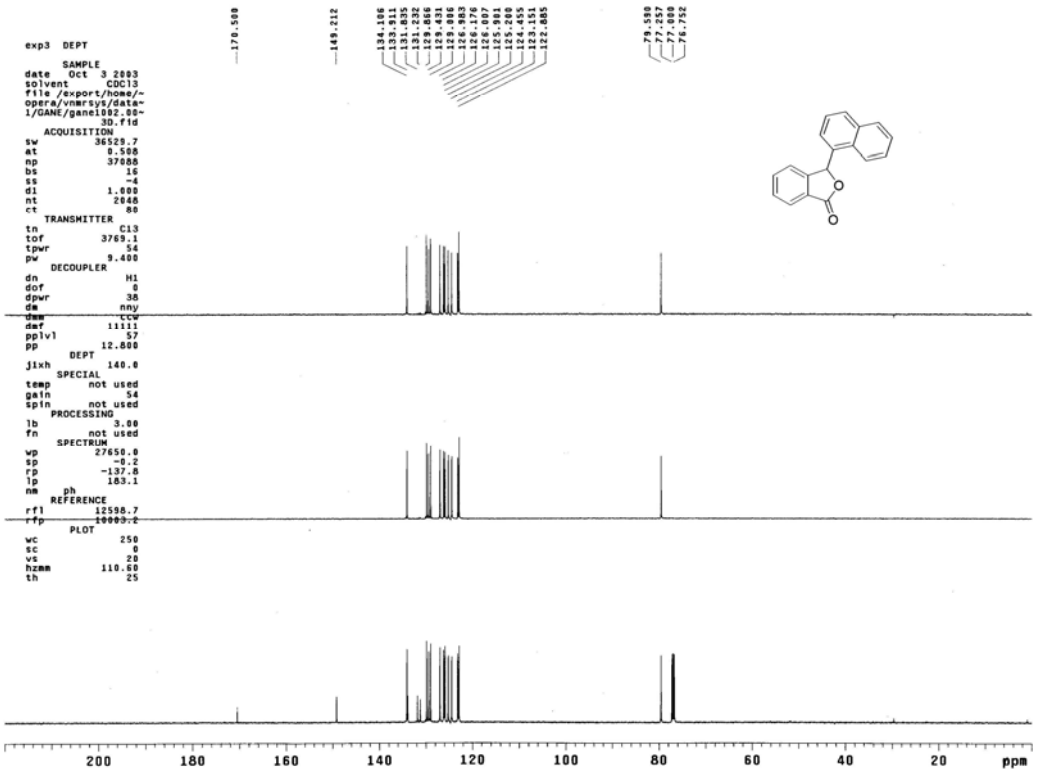
^{1}H and ^{13}C NMR spectra of compound **3j.**



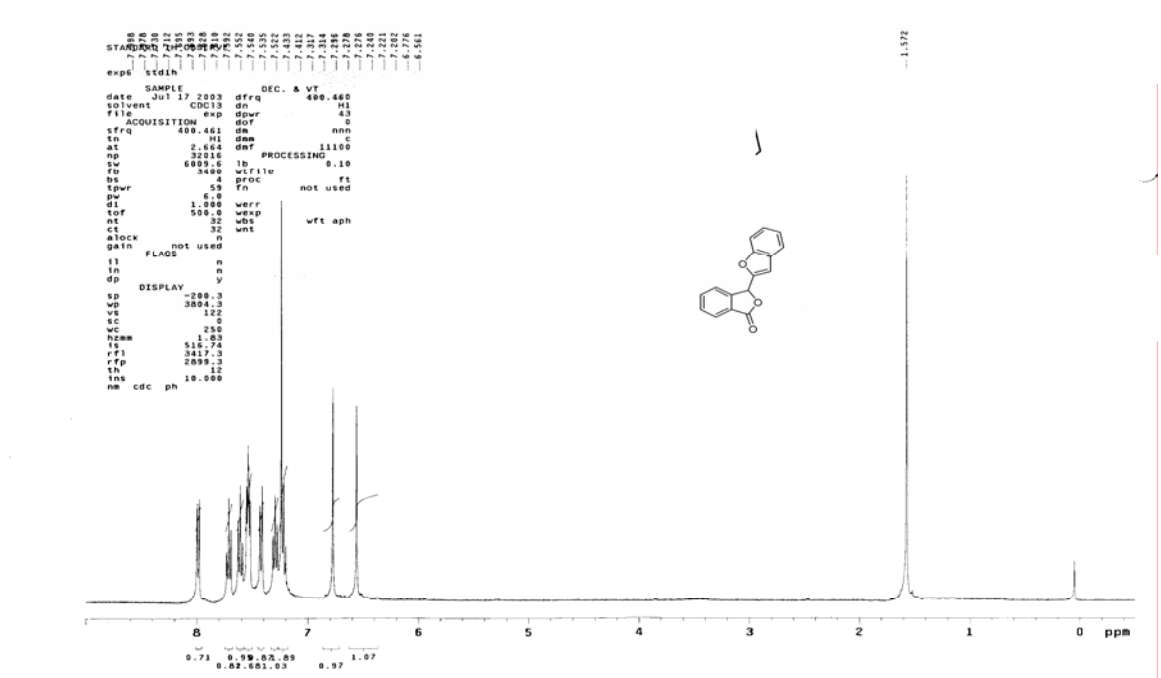


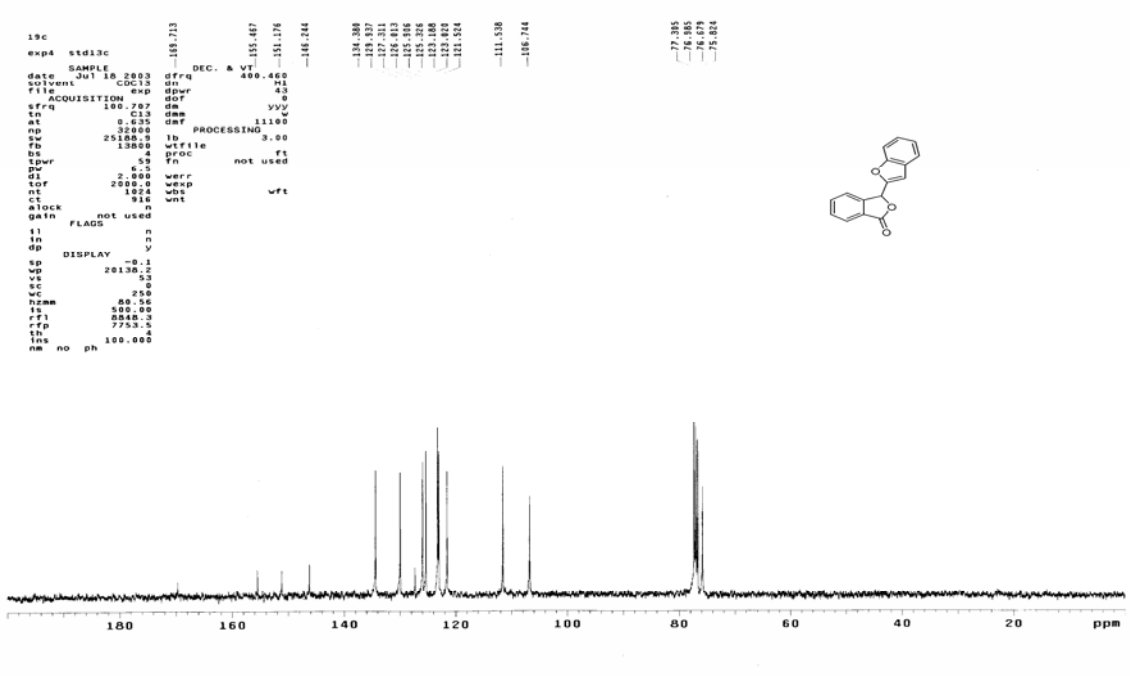
^{1}H and ^{13}C NMR spectra of compound **3k.**





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

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gain not used
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155.467
151.176
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134.388
129.537
127.311
126.815
125.506
125.326
123.188
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111.538
106.744
77.385
76.985
76.679
75.824
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dmf 11100
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wtfile
proc ft
fn not used
werr
wexp
wbs wft
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160
140
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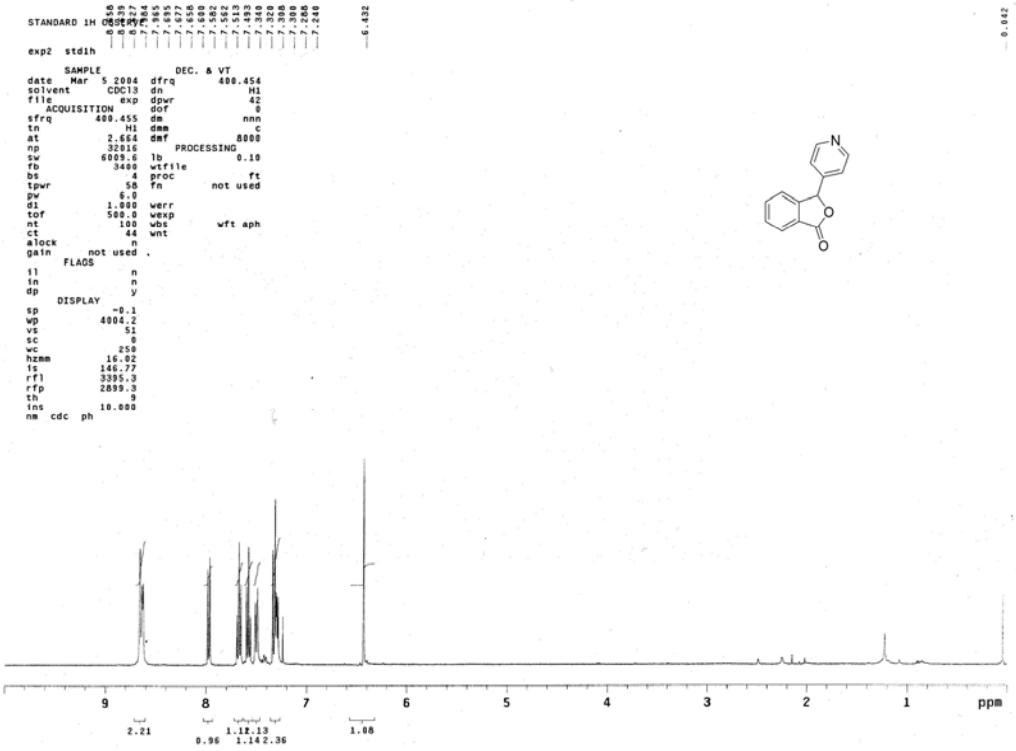
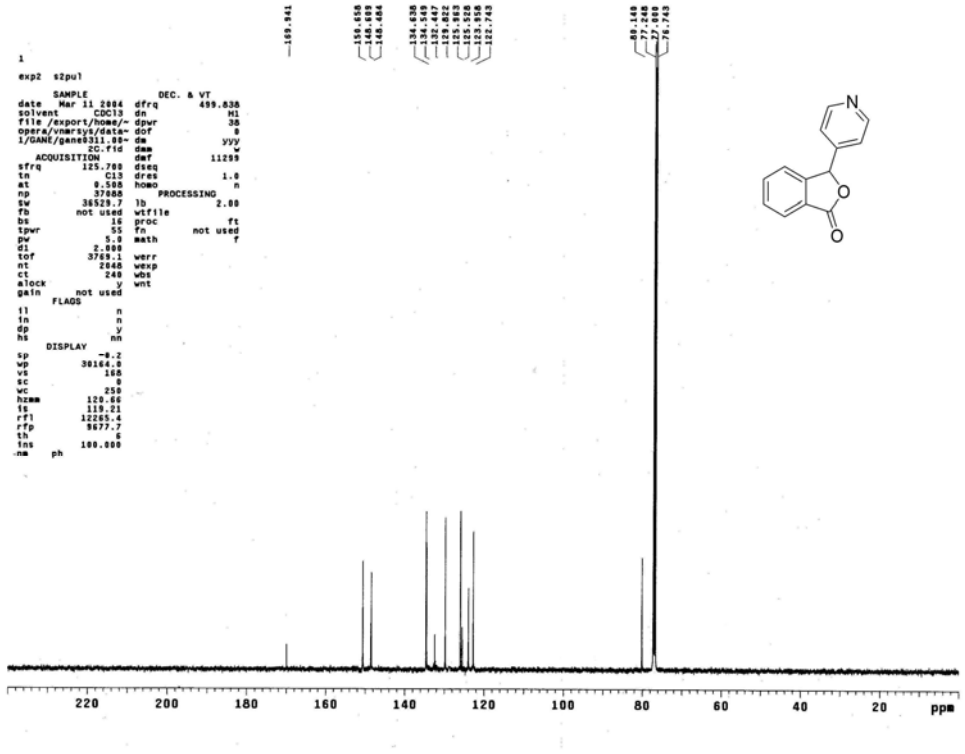
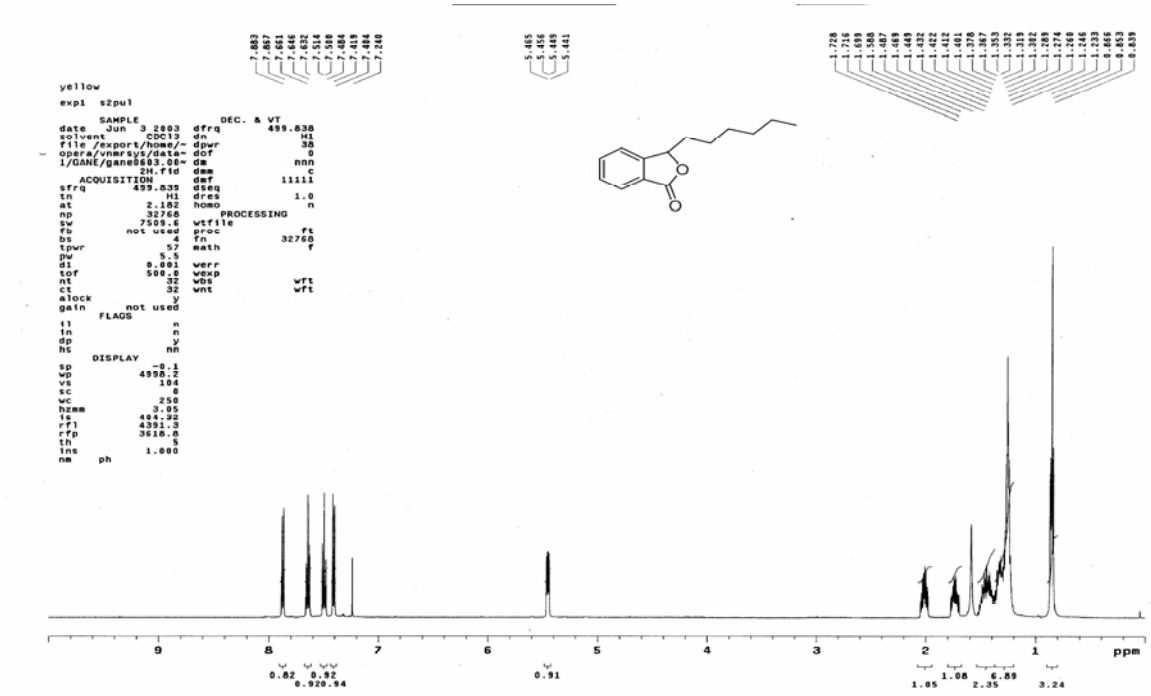
100
80
60
40
20
ppm

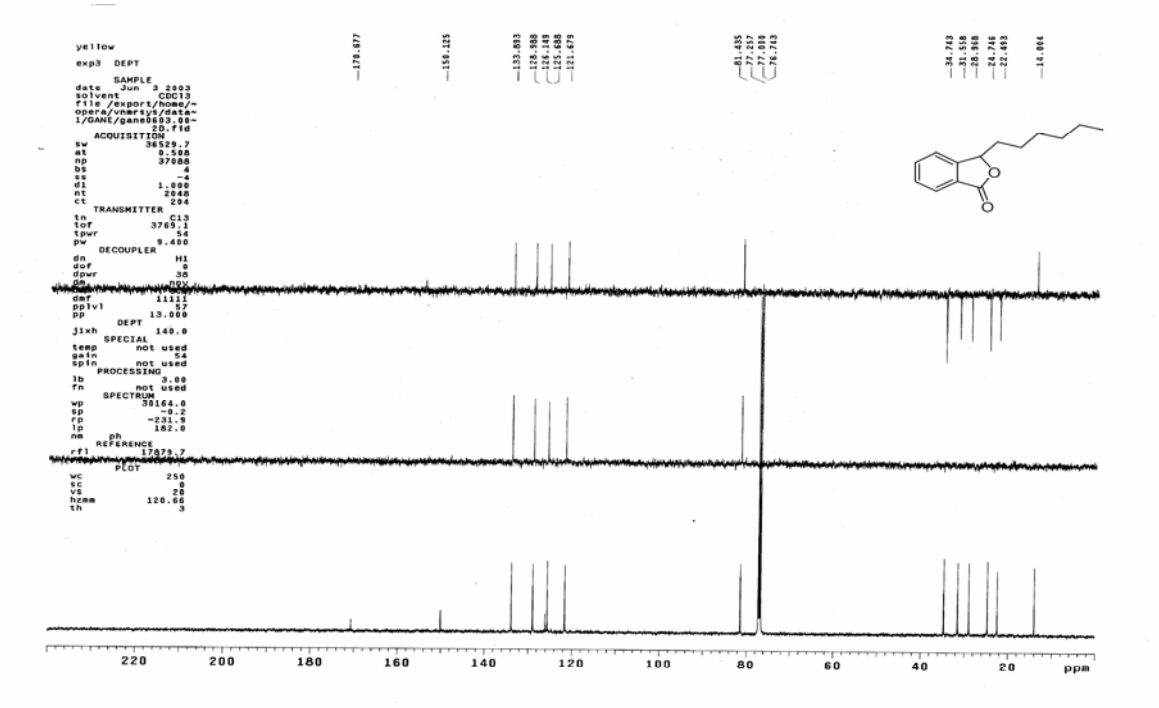
^{1}H and ^{13}C NMR spectra of compound **3m.**





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

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tof 3765.1
tpwr 54
pw 9.480
DECOUPLER
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dof 0
dpwr 38
dmr 11111
pplvl 57
pp 13.000
DEPT
J1xh 140.0
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gain 54
spin not used
PROCESSING
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fn not used
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rp -231.9
lp 162.0
nm ph
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126.185
125.688
121.679
81.435
77.257
77.000
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34.743
31.558
28.968
24.746
22.693
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220
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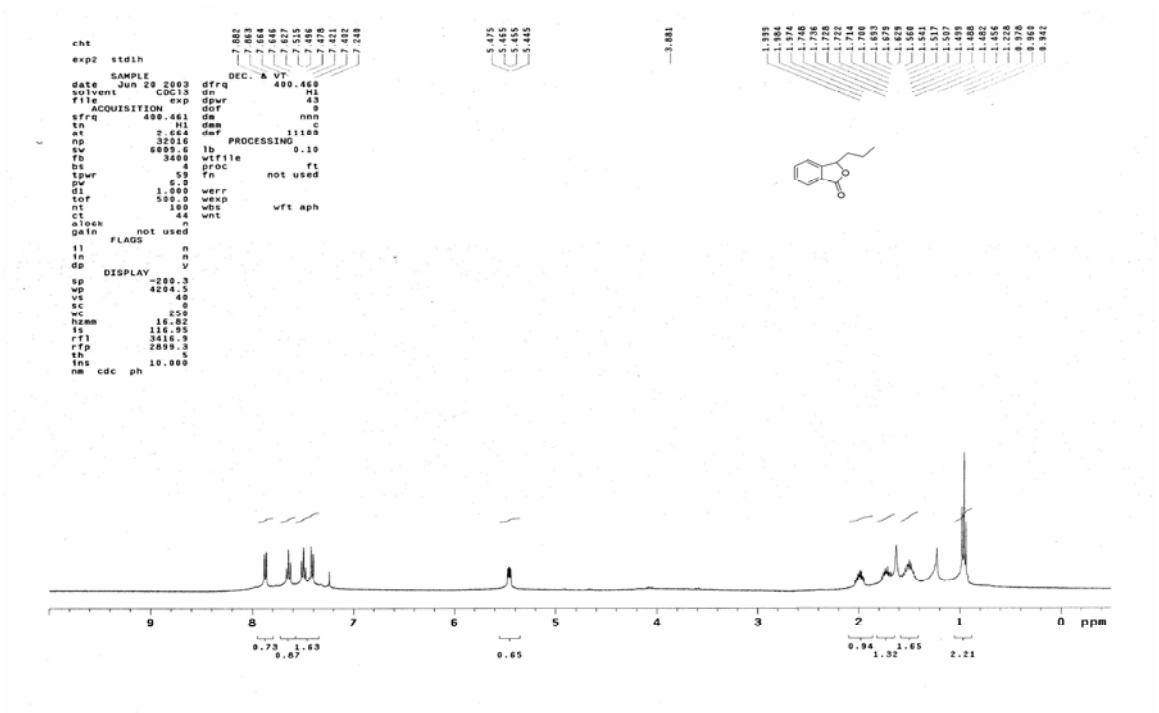
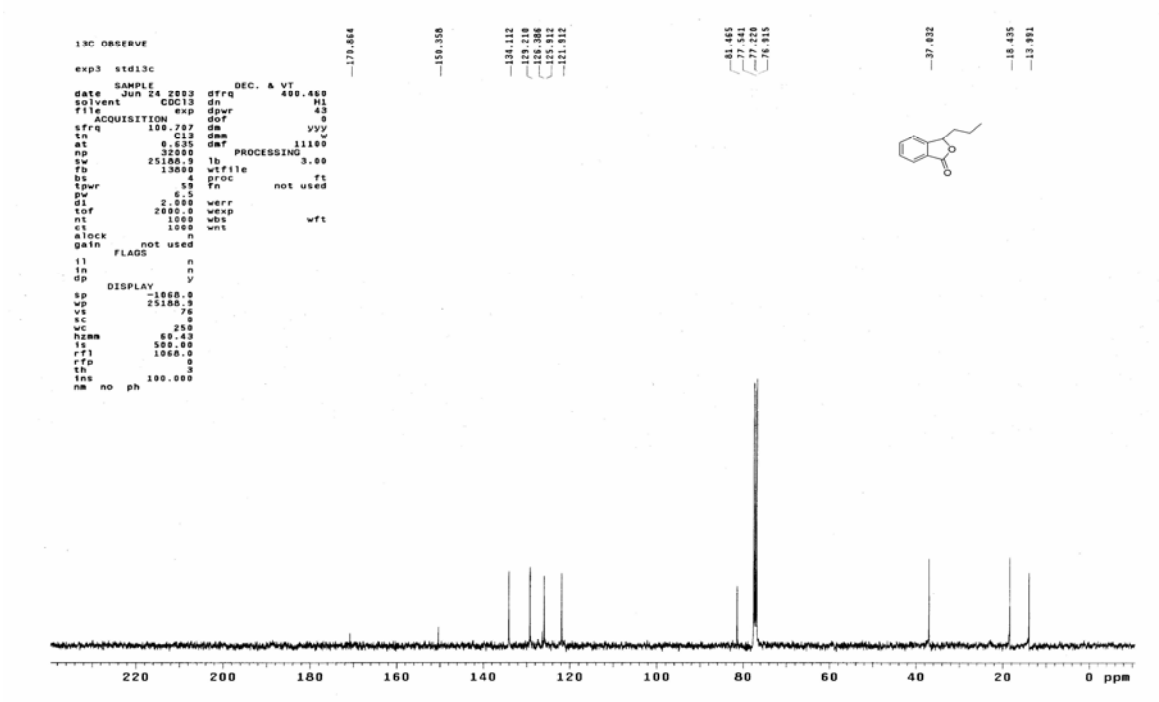
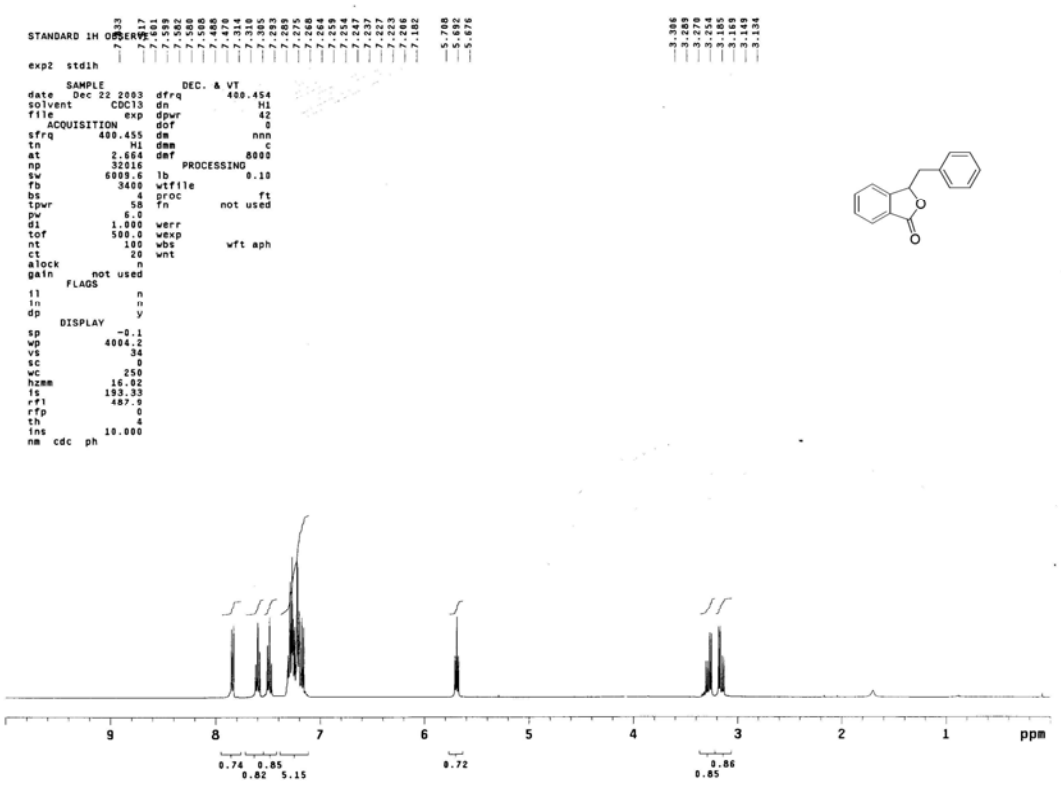
80
60
40
20
ppm

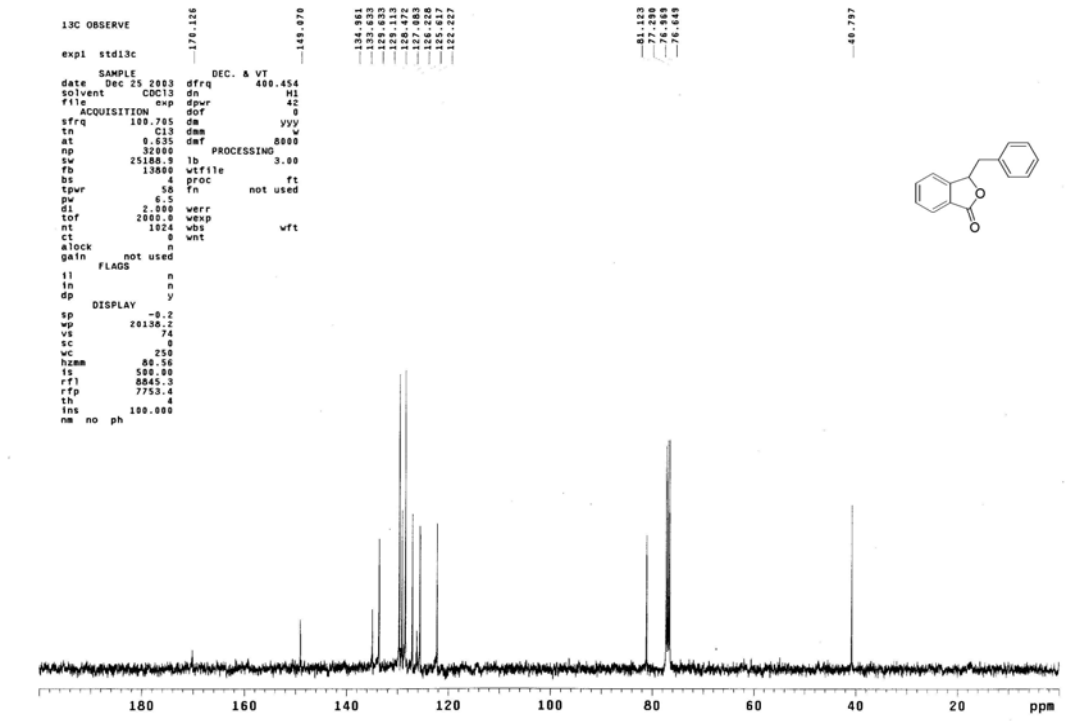
^{1}H and ^{13}C NMR spectra of compound **3o.**



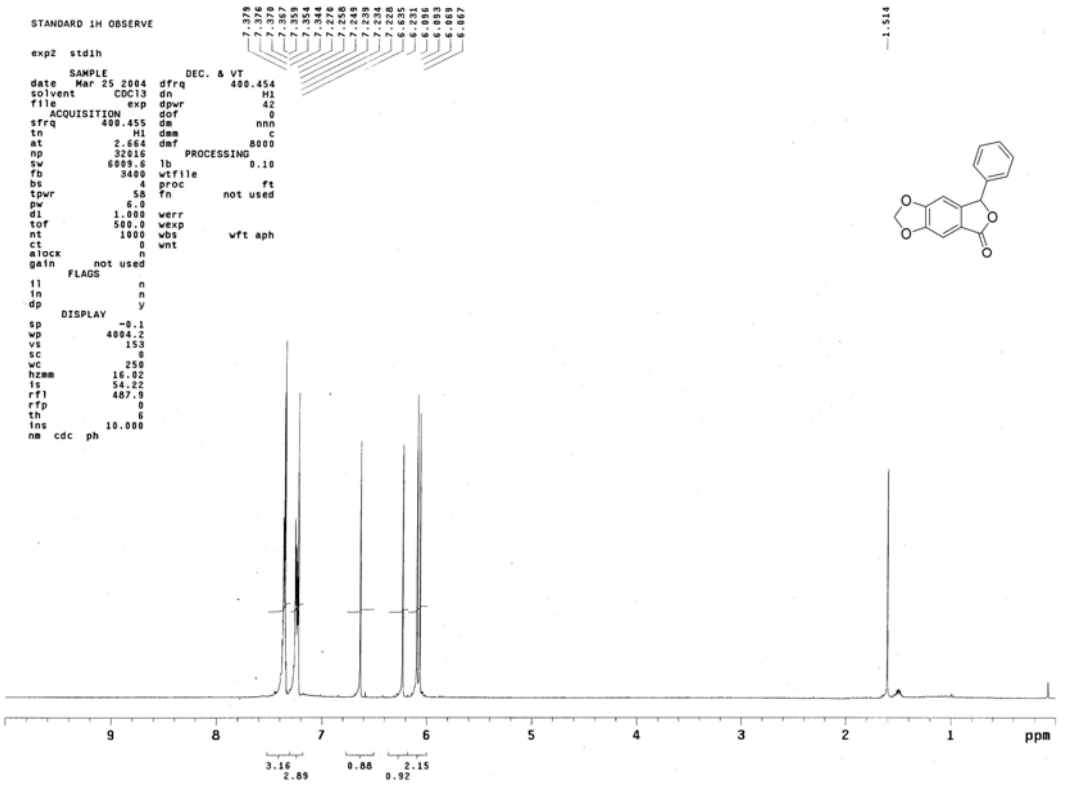


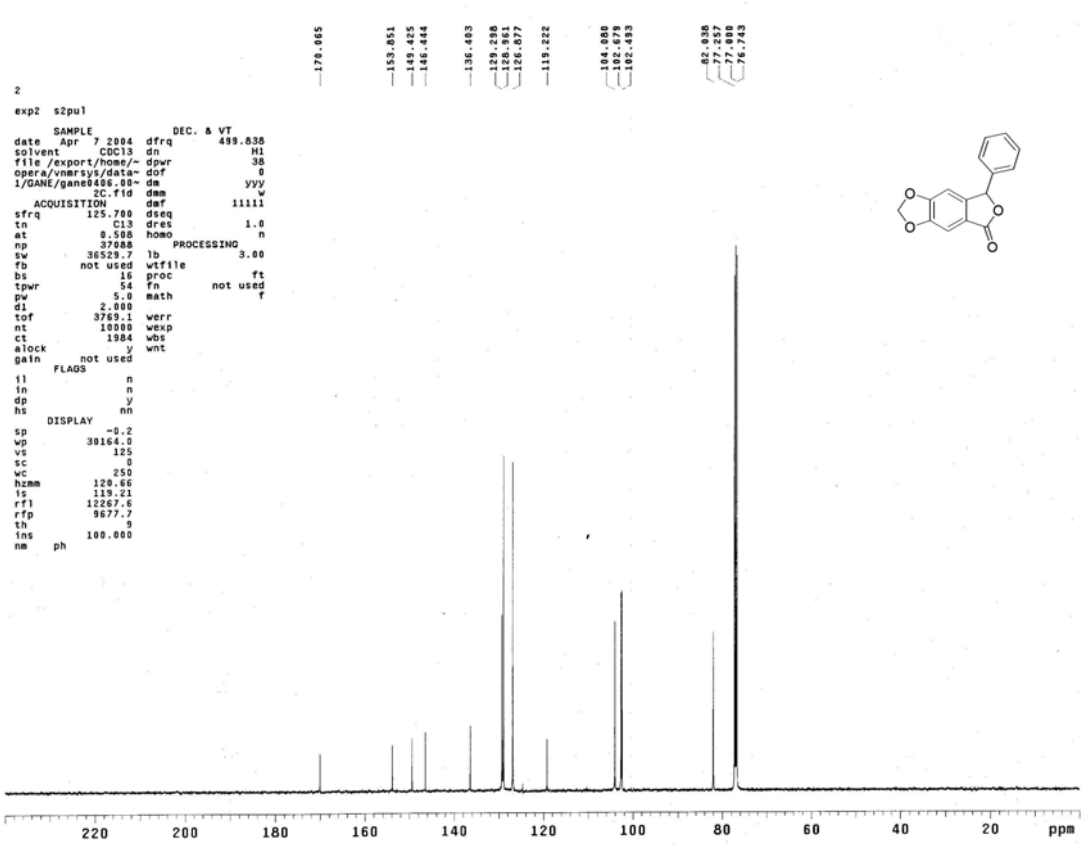
^{1}H and ^{13}C NMR spectra of compound **3p.**



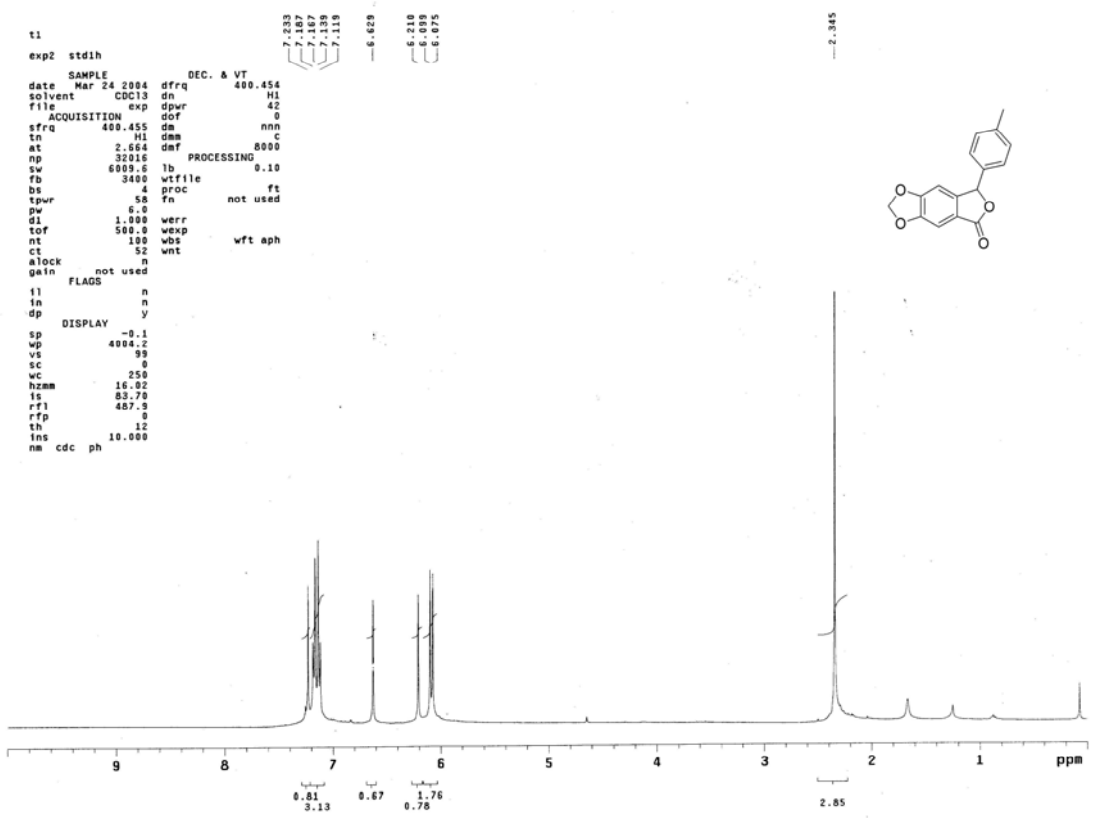


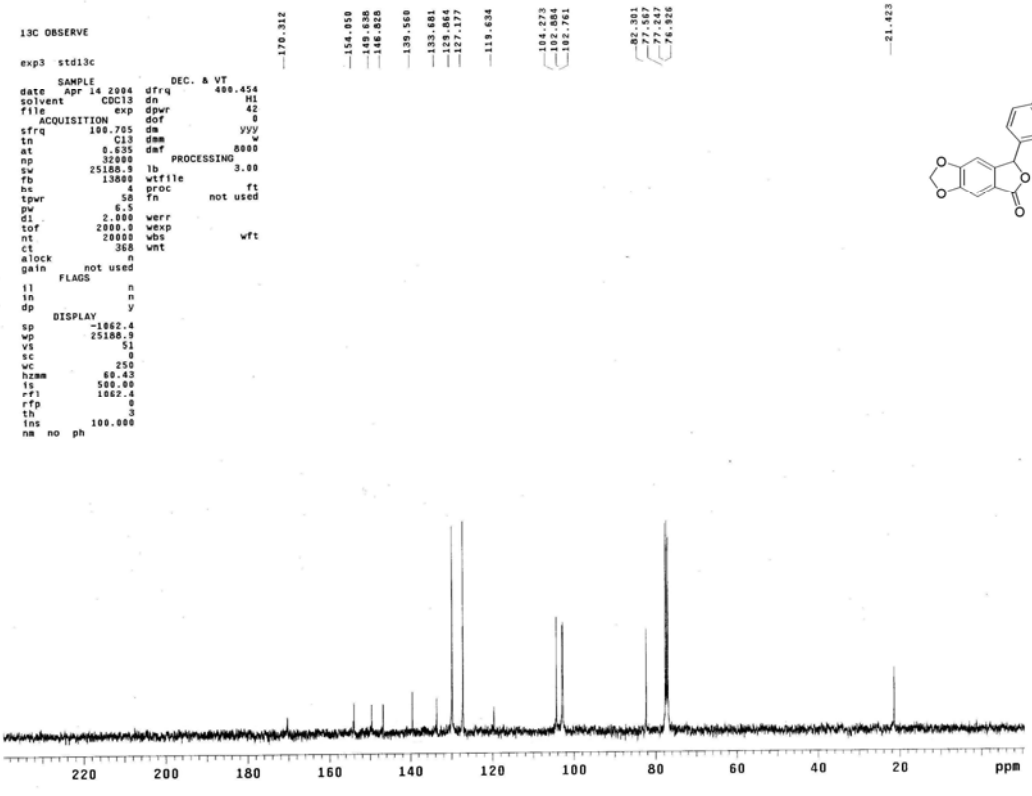
^{1}H and ^{13}C NMR spectra of compound **3q**.



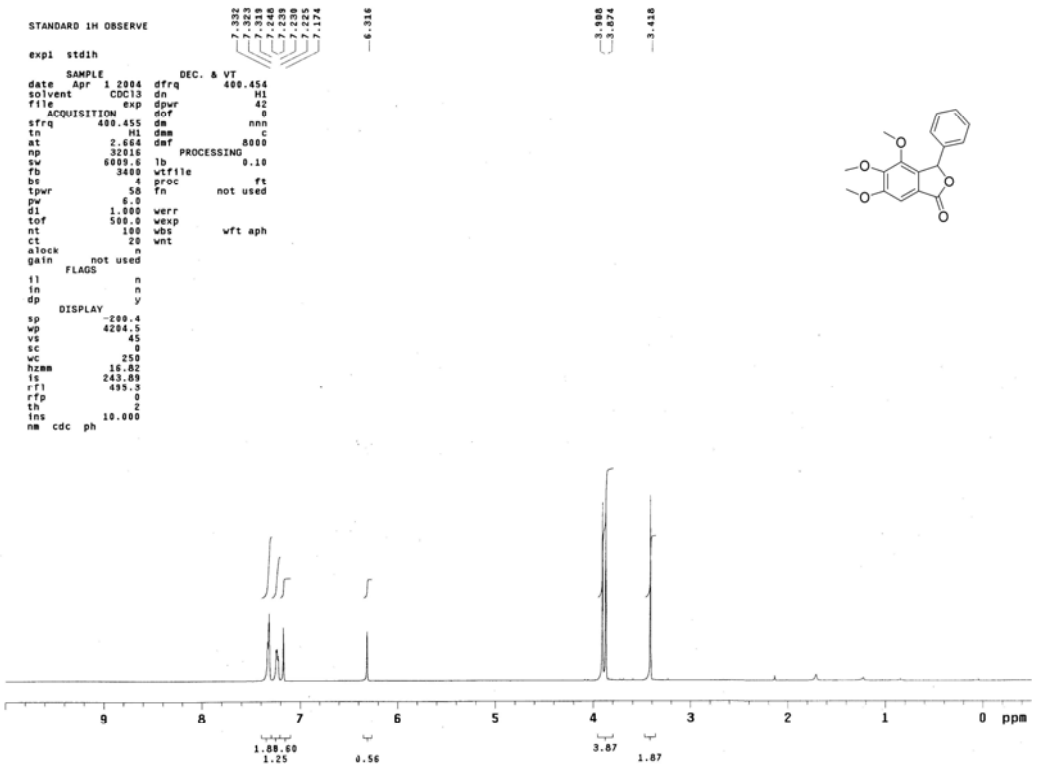


^{1}H and ^{13}C NMR spectra of compound **3r**.





^{1}H and ^{13}C NMR spectra of compound **3s.**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pw 6.0
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gain not used
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in n
dp y
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ins 10.000
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proc ft
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werr
wexp
wbs wft aph
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7.319
7.246
7.239
7.230
7.225
7.174
6.316
3.908
3.874
3.418
9
8
7
6
5
4
3
2
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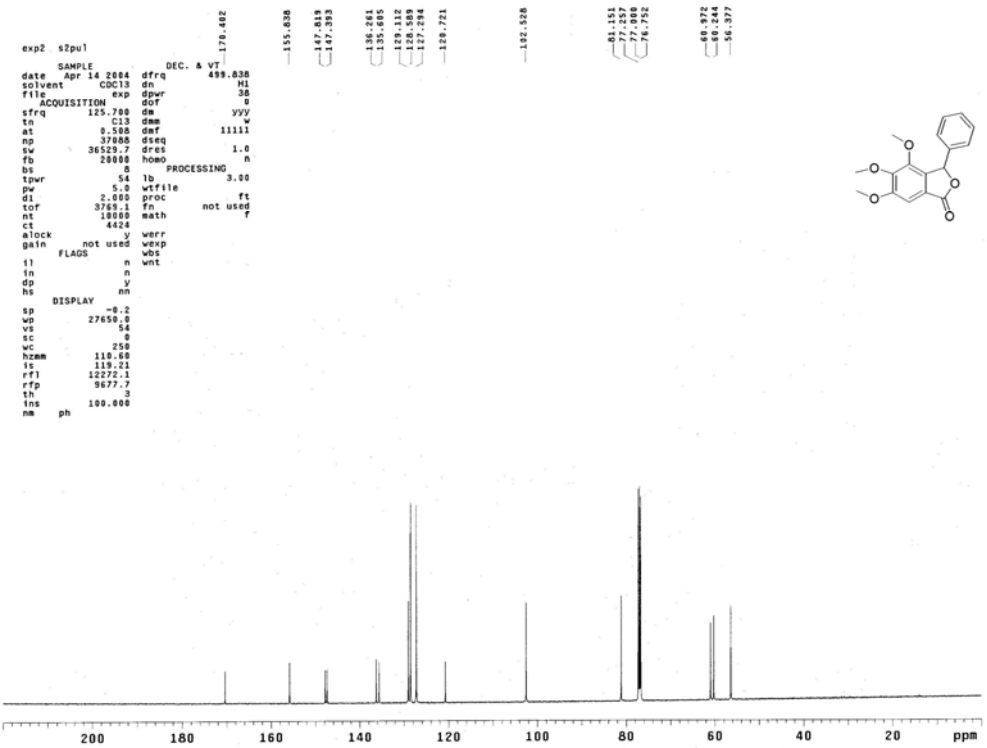
0.56
3.87
1.87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tof 3769.1
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alock y
gain not used
FLAGS
il n
in n
dp y
hs nn
DISPLAY
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rfp 9677.7
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ins 100.000
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dmm w
dmf 11111
dseq
dres 1.0
homo n
PROCESSING
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wtfile
proc ft
fn not used
math f
wexp
wbs
wnt
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147.393
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135.605
129.112
128.589
127.294
120.721
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81.151
77.257
77.000
76.752
60.972
60.244
56.377
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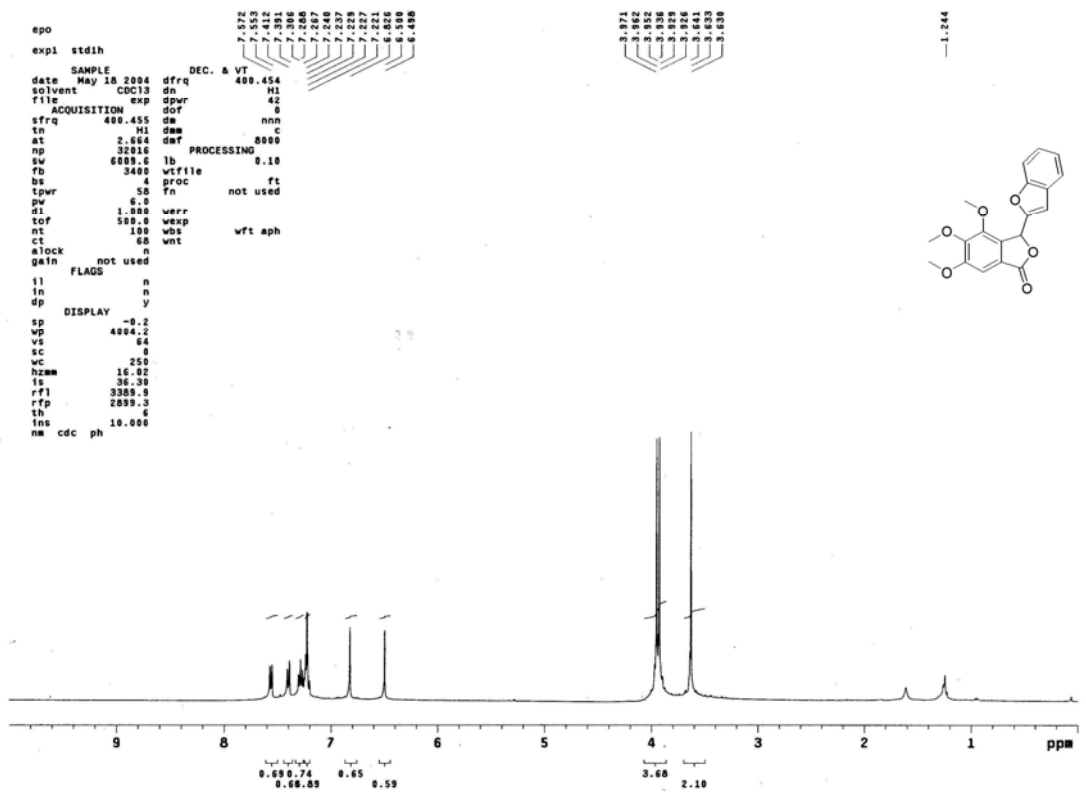
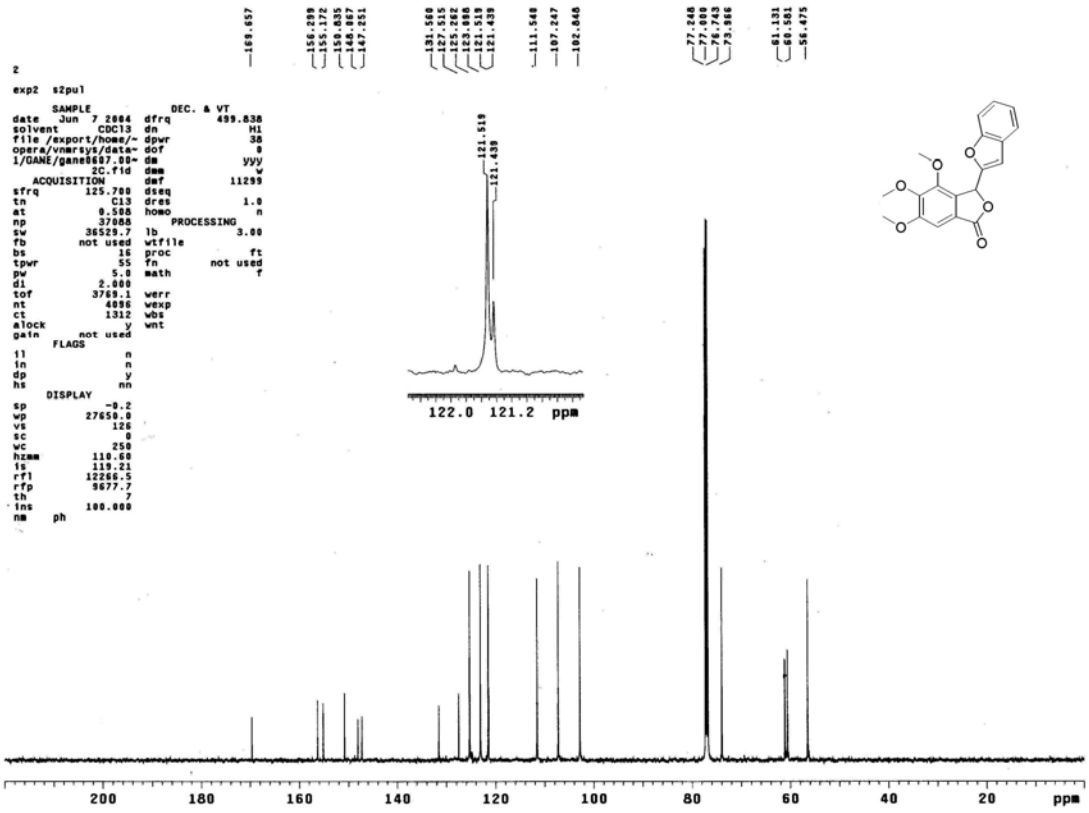
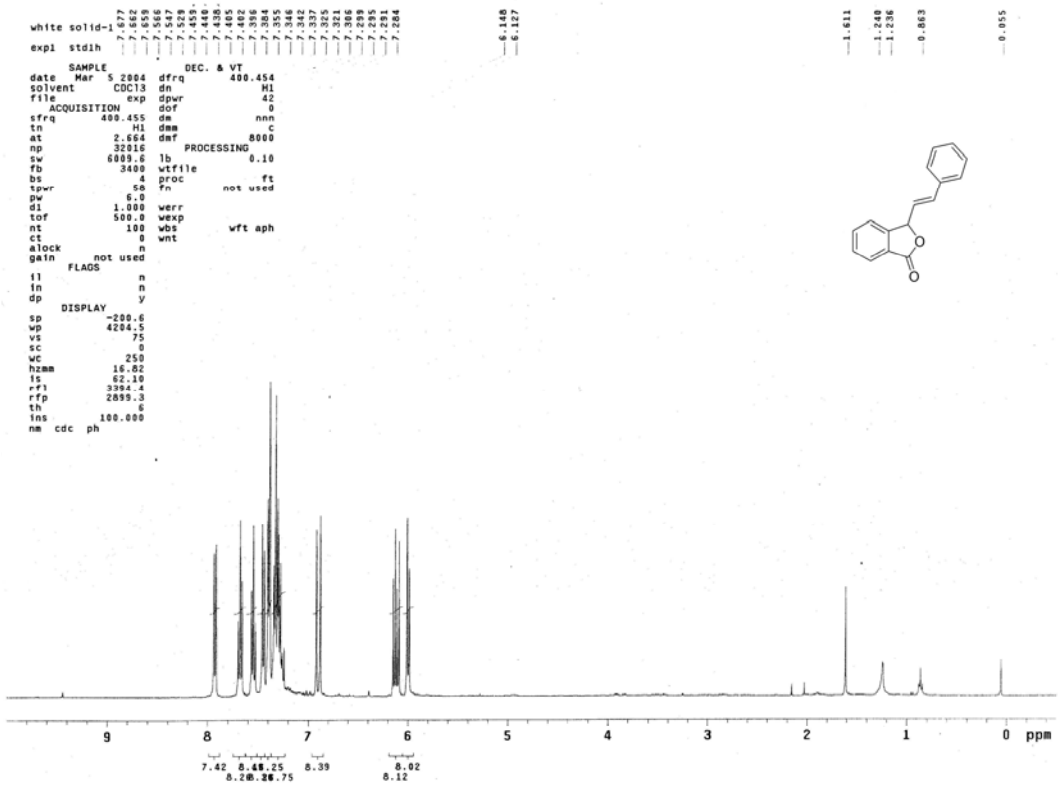
160
140
120
100
80
60
40
20
ppm

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





^{1}H and ^{13}C NMR spectra of compound **3u**.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nt 100
ct 0
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gain not used
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in n
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7.566
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7.453
7.440
7.438
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7.402
7.396
7.384
7.355
7.346
7.342
7.337
7.325
7.321
7.306
7.299
7.295
7.291
7.284
6.148
6.127
1.611
1.240
1.236
0.863
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8
7
6
5
4
3
2
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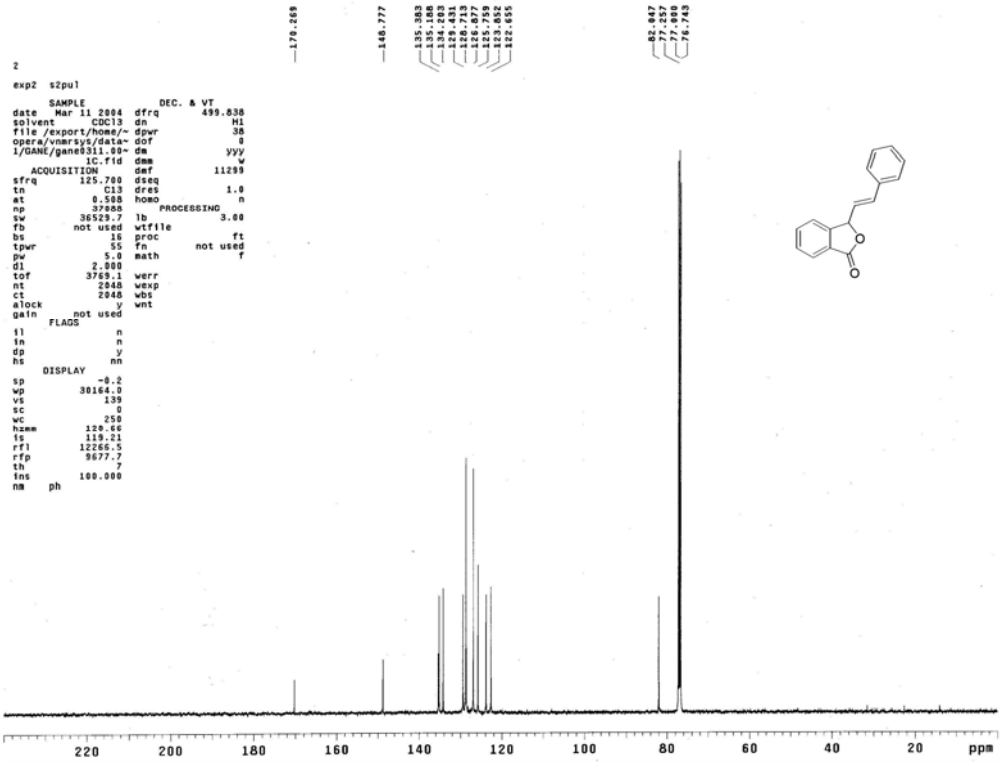
7.42
8.25
8.39
8.02
8.12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fb not used
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tpwr 55
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tof 3769.1
nt 2048
ct 2048
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gain not used
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dp y
hs nn
DISPLAY
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rfp 9677.7
th 7
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nm ph
DEC. & VT
dfrq 499.838
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dof 0
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dmm w
dmf 11299
dseq
dres 1.8
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PROCESSING
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wtfile
proc ft
fn not used
math f
wexp
wbs
wnt
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135.188
134.203
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128.733
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125.759
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122.655
82.647
77.257
77.000
76.748
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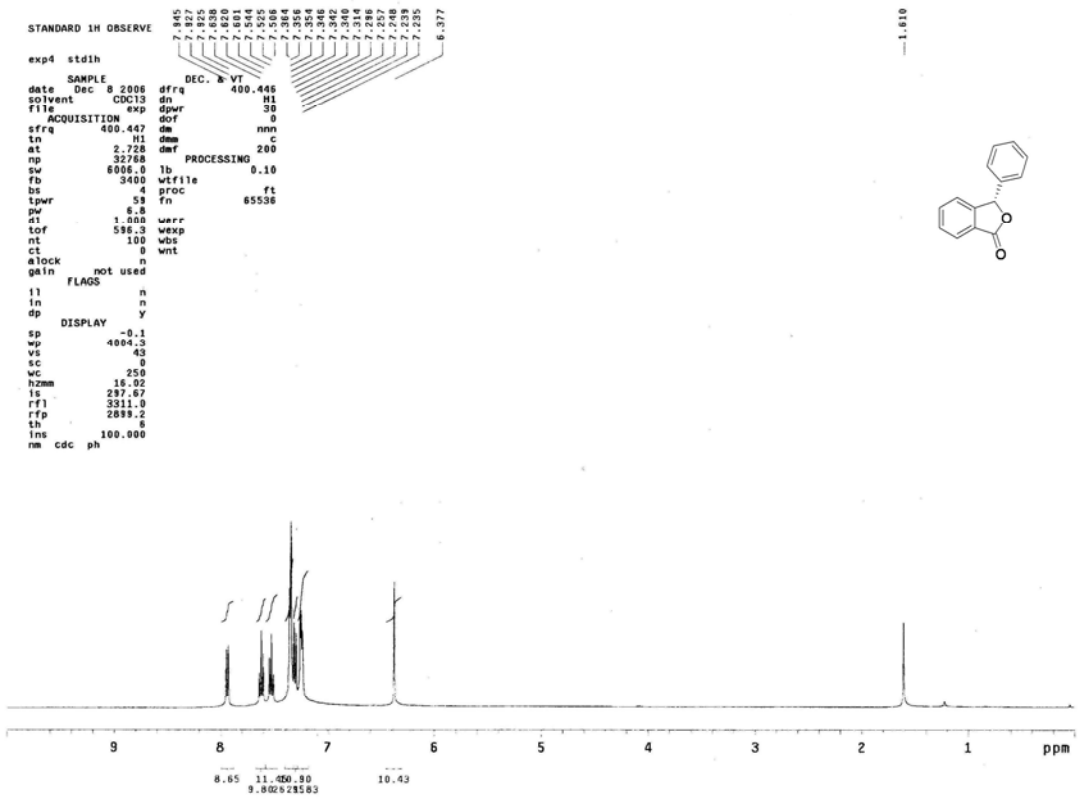
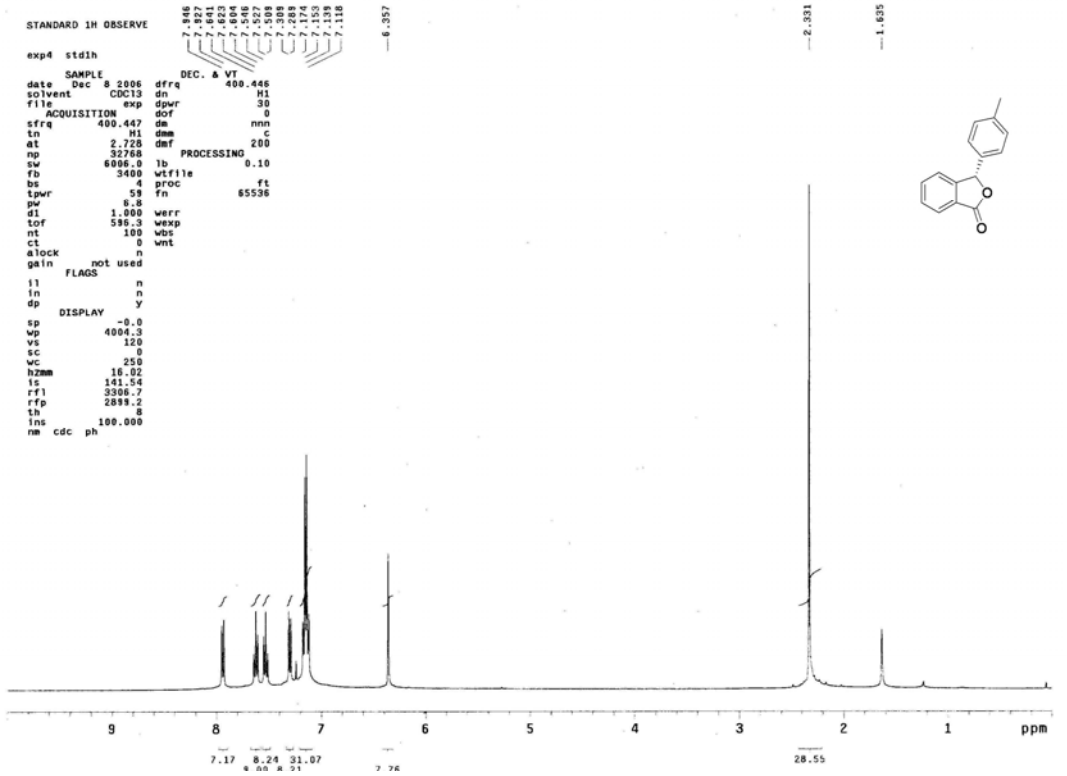
200
180
160
140
120
100
80
60
40
20
ppm

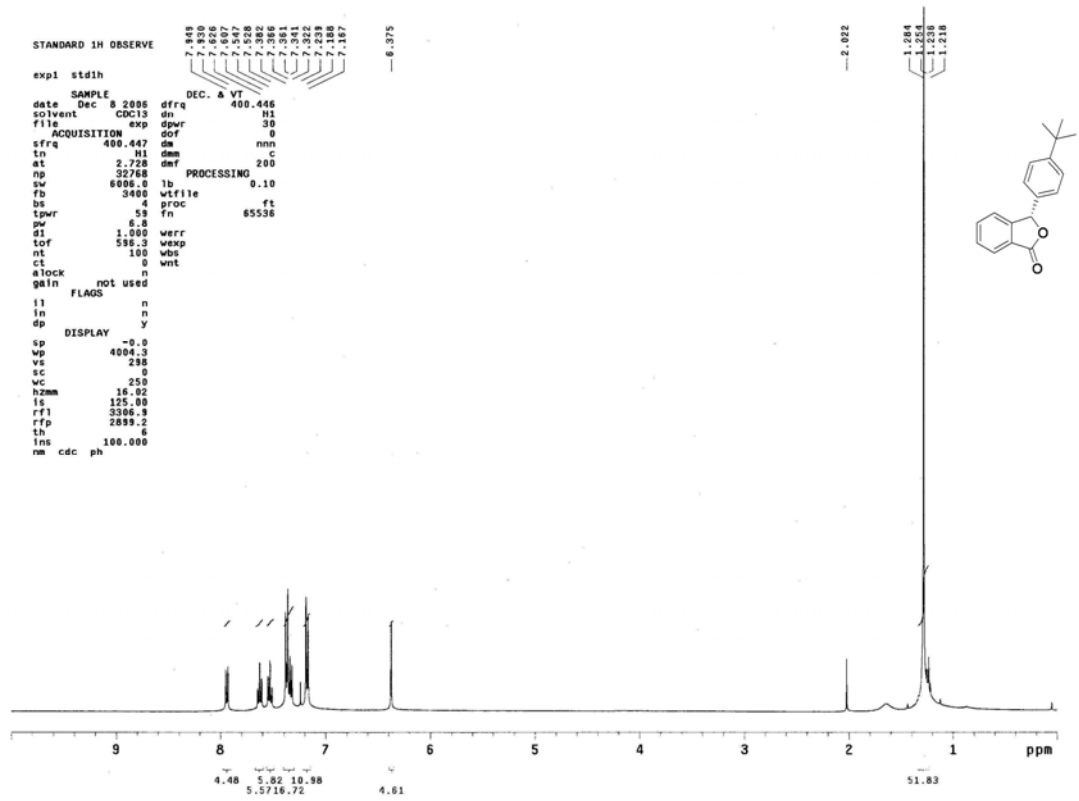
^{1}H NMR spectrum of compound **4a**.



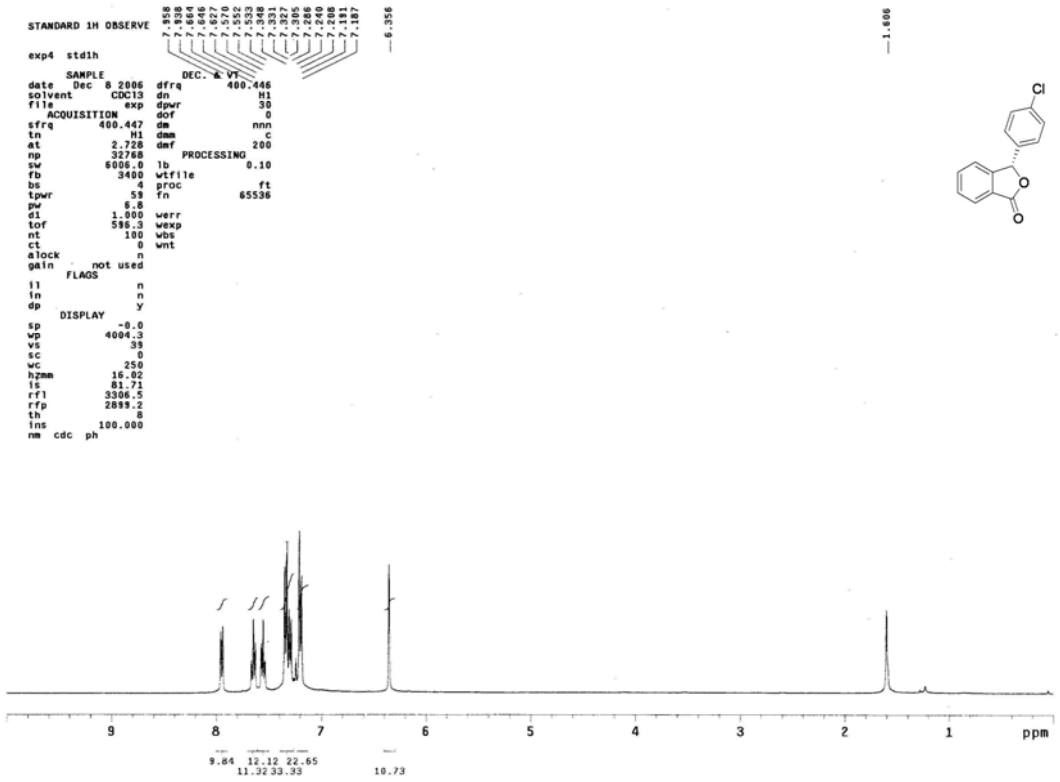
^{1}H NMR spectrum of compound **4b**.



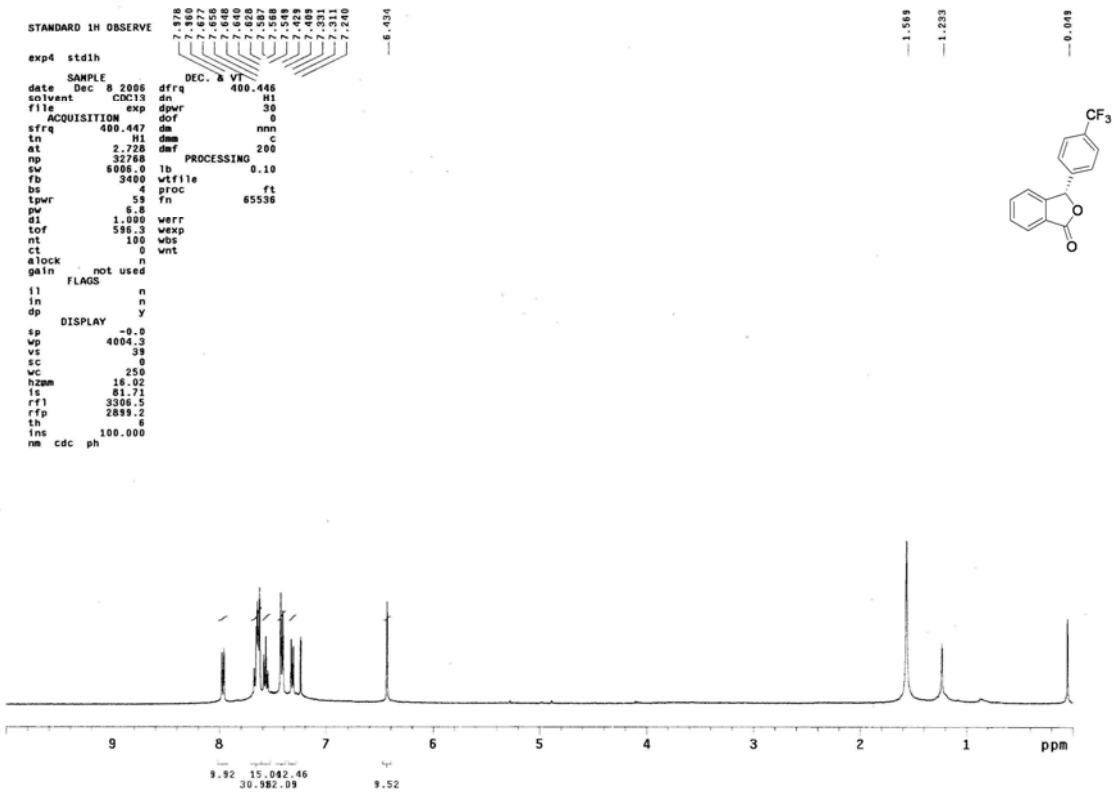
^{1}H NMR spectrum of compound **4c.**



^{1}H NMR spectrum of compound **4d.**



^{1}H NMR spectrum of compound **4e.**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nt 100
ct 0
alock n
gain not used
FLAGS
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in n
dp y
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wp 4004.3
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sc 0
wc 250
hzmm 16.02
is 81.71
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rfp 2899.2
th 6
ins 100.000
nm cdc ph
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7.960
7.677
7.655
7.648
7.640
7.628
7.587
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7.548
7.469
7.403
7.331
7.311
7.240
6.434
1.569
1.233
0.049
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werr
wexp
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30.98
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9.52