

## *Supporting information*

### **Organocatalytic Enantioselective Friedel-Crafts Reactions of 1-Naphthols with Aldimines**

Guixia Liu,<sup>†</sup> Shilei Zhang,<sup>†</sup> Hao Li,<sup>‡</sup> Tangzhi Zhang,<sup>†</sup> and Wei Wang<sup>†,‡\*</sup>

<sup>†</sup>*Department of Chemistry and Chemical Biology, University of New Mexico, Albuquerque, NM 87131-0001*

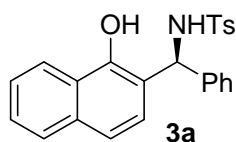
<sup>‡</sup>*Shanghai Institute of Materia Medica, Chinese Academy of Sciences, 555 Zuchongzhi Road, Shanghai 201203, China*

**General.** Commercial reagents were used as received, unless otherwise stated. Merck 60 silica gel was used for chromatography, and Whatman silica gel plates with fluorescence F<sub>254</sub> were used for thin-layer chromatography (TLC) analysis. <sup>1</sup>H and <sup>13</sup>C NMR spectra were recorded on Bruker Avance 500, and tetramethylsilane (TMS) was used as a reference. Data for <sup>1</sup>H are reported as follows: chemical shift (ppm), and multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet). Data for <sup>13</sup>C NMR are reported as ppm.

### General Procedure for Asymmetric Friedel-Crafts Reaction of Naphthol with Imines

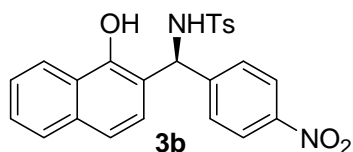
To a vial containing imine (0.2 mmol), naphthol (1.0 mmol) and 1.0 mL of anhydrous toluene was added catalyst (0.02 mmol). The reaction mixture was stirred at 0 °C. After the reaction was completed as monitored by TLC, the reaction mixture was purified by silica gel chromatography, eluting with EtOAc/hexane (1/5) to provide the desired product.

#### N-((1-Hydroxynaphthalen-2-yl)(phenyl)methyl)-4-methylbenzenesulfonamide (Table 2, entry 1)



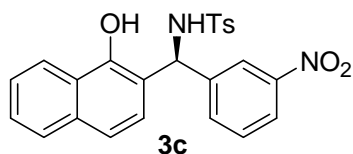
According to the general procedure, the title compound was synthesized in 80% yield. <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.05-8.04 (m, 1H), 7.72-7.71 (m, 1H), 7.54-7.45 (m, 4H), 7.26-7.18 (m, 5H), 6.95-6.73 (m, 4H), 5.91 (d, *J* = 7.0 Hz, 1H), 5.46 (d, *J* = 7.5 Hz, 1H), 2.17 (s, 3H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 149.4, 143.6, 139.0, 136.1, 134.1, 129.2, 128.7, 127.8, 127.5, 127.1, 127.0, 126.5, 126.2, 125.5, 125.2, 121.3, 120.6, 119.5, 58.6, 21.1; HR-MS: calcd (*M* + Na<sup>+</sup>) for C<sub>24</sub>H<sub>21</sub>NO<sub>3</sub>S, 426.1140; found 426.1150; elemental analysis for C<sub>24</sub>H<sub>21</sub>NO<sub>3</sub>S: calcd C 71.44, H 5.25 N 3.47; found C 71.51, H 5.31, N 3.38; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min, λ = 235 nm): *t*<sub>minor</sub> = 22.48 min, *t*<sub>major</sub> = 31.29 min, ee = 94%; [α]<sub>D</sub><sup>22</sup> = -38.8 (*c* = 1.0 in CH<sub>2</sub>Cl<sub>2</sub>).

#### N-((1-Hydroxynaphthalen-2-yl)(4-nitrophenyl)methyl)-4-methylbenzenesulfonamide (Table 2, entry 2)



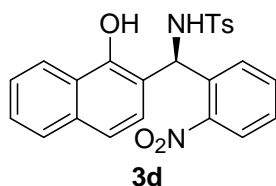
According to the general procedure, the title compound was synthesized in 88% yield. <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>): δ 8.00 (d, *J* = 8.5 Hz, 2H), 7.93-7.92 (m, 1H), 7.75-7.73 (m, 1H), 7.51-7.48 (m, 4H), 7.37 (d, *J* = 8.5 Hz, 2H), 7.27 (d, *J* = 9.0 Hz, 1H), 6.90 (d, *J* = 8.5 Hz, 2H), 6.86 (d, *J* = 8.5 Hz, 1H), 5.97 (s, 1H), 2.14 (s, 3H); <sup>13</sup>C NMR (125 MHz, CDCl<sub>3</sub>): δ 148.7, 147.1, 143.9, 136.2, 134.2, 129.3, 128.0, 127.8, 126.9, 126.1, 125.8, 124.6, 123.5, 121.3, 120.2, 119.3, 57.8, 21.2; HR-MS: calcd (*M* + Na<sup>+</sup>) for C<sub>24</sub>H<sub>20</sub>N<sub>2</sub>O<sub>5</sub>S, 471.0991; found 471.0003; elemental analysis for C<sub>24</sub>H<sub>20</sub>N<sub>2</sub>O<sub>5</sub>S: calcd C 64.27, H 4.49, N 6.25; found C 64.08, H 4.43, N 6.31; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min, λ = 254 nm): *t*<sub>minor</sub> = 34.29 min, *t*<sub>major</sub> = 50.04 min, ee = 95%; [α]<sub>D</sub><sup>22</sup> = -73.4 (*c* = 1.0 in CH<sub>2</sub>Cl<sub>2</sub>).

***N*-((1-Hydroxynaphthalen-2-yl)(3-nitrophenyl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 3)



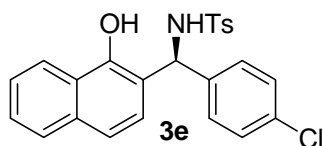
According to the general procedure, the title compound was synthesized in 91% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.04 (s, 1H), 7.94 (d,  $J = 7.0$  Hz, 1H), 7.75 (d,  $J = 8.0$  Hz, 1H), 7.61-7.28 (m, 7H), 6.95 (d,  $J = 8.0$  Hz, 2H), 6.89 (d,  $J = 8.0$  Hz, 1H), 6.44 (s, 1H), 6.01 (d,  $J = 8.5$  Hz, 1H), 5.88 (d,  $J = 8.5$  Hz, 1H), 2.16 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  148.8, 148.3, 143.8, 142.0, 136.3, 134.3, 133.3, 129.4, 129.3, 128.0, 127.0, 126.9, 126.1, 125.7, 124.7, 122.5, 121.9, 121.4, 120.3, 119.3, 57.6, 21.2; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{24}\text{H}_{20}\text{N}_2\text{O}_5\text{S}$ , 471.0991; found 471.0994; elemental analysis for  $\text{C}_{24}\text{H}_{20}\text{N}_2\text{O}_5\text{S}$ : calcd C 64.27, H 4.49, N 6.25; found C 64.38, H 4.42, N 6.19; HPLC (Chiralpak OD-H, *i*-PrOH/hexane = 15/85, flow rate = 0.6 mL/min,  $\lambda = 254$  nm):  $t_{\text{minor}} = 25.57$  min,  $t_{\text{major}} = 32.85$  min, ee = 94%;  $[\alpha]_{\text{D}}^{22} = -44.6$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-((1-Hydroxynaphthalen-2-yl)(2-nitrophenyl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 4)



According to the general procedure, the title compound was synthesized in 89% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.15-8.14 (m, 1H), 7.75-7.73 (m, 1H), 7.82-7.68 (m, 3H), 7.58-7.36 (m, 6H), 7.26-7.19 (m, 1H), 7.04 (d,  $J = 7.5$  Hz, 2H), 6.91 (s, 1H), 6.71 (d,  $J = 8.5$  Hz, 1H), 6.66 (d,  $J = 7.0$  Hz, 1H), 5.84 (s, 1H), 2.28 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.8, 148.0, 144.0, 135.8, 134.3, 133.3, 129.9, 129.7, 129.6, 128.7, 127.5, 127.2, 126.9, 126.4, 125.7, 125.1, 124.4, 121.8, 120.5, 118.0, 53.5, 21.4; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{24}\text{H}_{20}\text{N}_2\text{O}_5\text{S}$ , 471.0991; found 471.0982; elemental analysis for  $\text{C}_{24}\text{H}_{20}\text{N}_2\text{O}_5\text{S}$ : calcd C 64.27, H 4.49, N 6.25; found C 64.34, H 4.54, N 6.22  $[\alpha]_{\text{D}}^{22} = -57.0$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

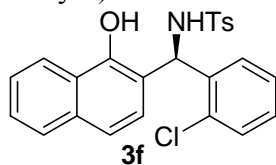
***N*-((4-Chlorophenyl)(1-hydroxynaphthalen-2-yl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 5)



According to the general procedure, the title compound was synthesized in 66% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.02-7.80 (m, 1H), 7.72-7.70 (m, 1H), 7.48-7.44 (m, 4H), 7.25 (d,  $J = 8.5$  Hz, 1H), 7.17-7.10 (m, 4H), 6.89 (d,  $J = 8.0$  Hz, 2H), 6.85 (d,  $J = 8.5$  Hz, 1H), 6.71 (s, 1H), 5.89 (d,  $J = 8.5$  Hz, 1H), 5.80-5.79 (m, 1H), 2.15 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.1, 143.7, 137.8, 136.2, 134.2, 133.5, 129.2, 128.6, 128.5, 127.7, 127.0, 126.6, 125.9, 125.8, 125.0, 120.9, 120.8, 119.5, 57.9, 21.2; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{24}\text{H}_{20}\text{ClNO}_3\text{S}$ , 460.0750; found 460.0745;

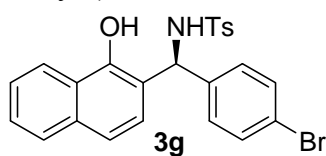
elemental analysis for  $C_{24}H_{20}ClNO_3S$ : calcd C 65.82, H 4.60, N 3.20; found C 65.94, H 4.58, N 3.31; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 16.31 min,  $t_{\text{major}}$  = 22.02 min, ee = 93%;  $[\alpha]_D^{22}$  = -27.6 ( $c$  = 1.0 in  $CH_2Cl_2$ ).

***N*-((2-Chlorophenyl)(1-hydroxynaphthalen-2-yl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 6)



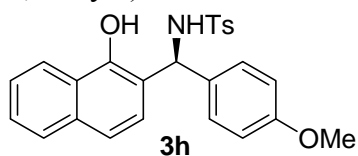
According to the general procedure, the title compound was synthesized in 79% yield.  $^1H$  NMR (500 MHz,  $CDCl_3$ ):  $\delta$  8.23-8.21 (m, 1H), 7.72-7.70 (m, 1H), 7.57 (d,  $J$  = 8.0 Hz, 2H), 7.49-7.47 (m, 2H), 7.30-7.15 (m, 2H), 7.02 (d,  $J$  = 8.0 Hz, 2H), 6.73 (d,  $J$  = 8.5 Hz, 1H), 6.20 (d,  $J$  = 7.0 Hz, 1H), 5.40 (d,  $J$  = 7.0 Hz, 1H), 2.26 (s, 3H);  $^{13}C$  NMR (125 MHz,  $CDCl_3$ ):  $\delta$  150.6, 144.0, 135.5, 135.4, 134.3, 133.0, 130.1, 129.1, 127.4, 127.0, 126.8, 125.5, 125.4, 125.1, 122.1, 120.1, 117.0, 56.2, 21.4; HR-MS: calcd ( $M + Na^+$ ) for  $C_{24}H_{20}ClNO_3S$ , 460.0750; found 460.0753; elemental analysis for  $C_{24}H_{20}ClNO_3S$ : calcd C 65.82, H 4.60, N 3.20; found C 65.91, H 4.64, N 3.15; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 40.26 min,  $t_{\text{major}}$  = 26.40 min, ee = 96%;  $[\alpha]_D^{22}$  = -63.0 ( $c$  = 1.0 in  $CH_2Cl_2$ ).

***N*-((4-Bromophenyl)(1-hydroxynaphthalen-2-yl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 7)



According to the general procedure, the title compound was synthesized in 81% yield.  $^1H$  NMR (500 MHz,  $CDCl_3$ ):  $\delta$  8.01-7.99 (m, 1H), 7.70-7.69 (m, 1H), 7.44 (d,  $J$  = 8.5 Hz, 4H), 7.27 (d,  $J$  = 8.5 Hz, 2H), 7.21 (d,  $J$  = 8.5 Hz, 1H), 7.04 (d,  $J$  = 8.0 Hz, 2H), 6.84 (d,  $J$  = 7.0 Hz, 4H), 6.02 (s, 1H), 5.86 (s, 1H), 2.12 (s, 3H);  $^{13}C$  NMR (125 MHz,  $CDCl_3$ ):  $\delta$  149.0, 143.6, 138.3, 136.1, 134.1, 131.5, 129.1, 128.8, 127.7, 126.9, 126.5, 126.0, 125.7, 124.9, 121.5, 120.9, 120.8, 119.4, 57.9, 21.2; HR-MS: calcd ( $M + Na^+$ ) for  $C_{24}H_{20}BrNO_3S$ , 504.0245; found 504.0244; elemental analysis for  $C_{24}H_{20}BrNO_3S$ : calcd C 59.76, H 4.18, N 2.90; found C 59.94, H 4.39, N 2.84; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 17.23 min,  $t_{\text{major}}$  = 24.22 min, ee = 93%;  $[\alpha]_D^{22}$  = -27.0 ( $c$  = 1.0 in  $CH_2Cl_2$ ).

***N*-((1-Hydroxynaphthalen-2-yl)(4-methoxyphenyl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 8)

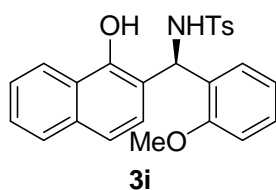


According to the general procedure, the title compound was synthesized in 62% yield.  $^1H$  NMR (500 MHz,  $CDCl_3$ ):  $\delta$  8.05-8.03 (m, 1H), 7.72-7.71 (m, 1H), 7.53-7.45 (m, 4H), 7.26-7.25 (m, 1H),



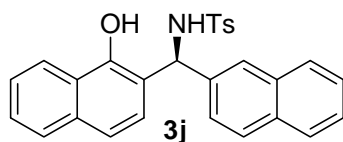
7.10 (d,  $J = 8.5$  Hz, 2H), 6.96-6.92 (m, 3H), 6.76 (d,  $J = 9.0$  Hz, 3H), 5.84 (d,  $J = 6.5$  Hz, 1H), 5.34 (d,  $J = 6.5$  Hz, 1H), 3.75 (s, 3H), 2.18 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  159.2, 149.4, 143.6, 136.1, 134.1, 130.9, 129.1, 128.4, 127.5, 127.2, 126.4, 126.2, 125.5, 125.2, 121.3, 120.5, 119.4, 114.1, 58.5, 55.3, 21.2; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{25}\text{H}_{23}\text{NO}_4\text{S}$ , 456.1245; found 456.1239; elemental analysis for  $\text{C}_{25}\text{H}_{23}\text{NO}_4\text{S}$ : calcd C 69.26, H 5.35, N 3.23; found C 69.01, H 5.21, N 3.11; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda = 254$  nm):  $t_{\text{minor}} = 34.29$  min,  $t_{\text{major}} = 50.04$  min, ee = 95%;  $[\alpha]_{\text{D}}^{22} = -73.4$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-((1-Hydroxynaphthalen-2-yl)(2-methoxyphenyl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 9)



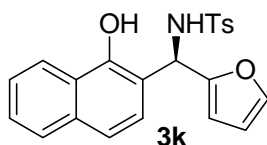
According to the general procedure, the title compound was synthesized in 76% yield.  $^1\text{H}$  NMR (500 MHz, DMSO):  $\delta$  9.22 (s, 1H), 8.23 (d,  $J = 9.0$  Hz, 1H), 8.12-8.10 (m, 1H), 7.77-7.75 (m, 1H), 7.52 (d,  $J = 8.0$  Hz, 2H), 7.46 (d,  $J = 8.5$  Hz, 1H), 7.42-7.40 (m, 2H), 7.30 (d,  $J = 8.5$  Hz, 1H), 7.15-7.09 (m, 4H), 6.80 (d,  $J = 8.0$  Hz, 1H), 6.75 (d,  $J = 7.5$  Hz, 1H), 6.46 (d,  $J = 8.5$  Hz, 1H), 3.36 (s, 3H), 2.22 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz, DMSO):  $\delta$  156.0, 148.5, 141.7, 138.8, 133.2, 129.4, 128.7, 128.4, 128.1, 121.4, 126.3, 126.1, 125.5, 124.8, 124.6, 123.2, 121.8, 119.7, 118.7, 110.6, 55.1, 49.6, 20.8; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{25}\text{H}_{23}\text{NO}_4\text{S}$ , 456.1245; found 456.1249; elemental analysis for  $\text{C}_{25}\text{H}_{23}\text{NO}_4\text{S}$ : calcd C 69.26, H 5.35, N 3.23; found C 70.02, H 5.49, N 3.04;  $[\alpha]_{\text{D}}^{22} = -76.4$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-((1-Hydroxynaphthalen-2-yl)(naphthalen-2-yl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 10)



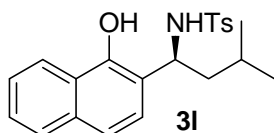
According to the general procedure, the title compound was synthesized in 77% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CD}_3\text{Cl}$ ):  $\delta$  8.09-8.07 (m, 1H), 7.76-7.72 (m, 4H), 7.71-7.43 (m, 7H), 7.27-7.22 (m, 2H), 6.90-6.80 (m, 4H), 6.09 (d,  $J = 7.5$  Hz, 1H), 5.65 (d,  $J = 7.5$  Hz, 1H), 2.54 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.6, 143.6, 136.1, 134.2, 133.0, 132.7, 129.1, 128.6, 128.0, 127.6, 127.1, 126.6, 126.4, 126.3, 126.1, 125.8, 125.6, 125.2, 125.0, 121.4, 120.6, 119.4, 58.6, 21.2; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{28}\text{H}_{23}\text{NO}_3\text{S}$ , 476.1296; found 476.1291; elemental analysis for  $\text{C}_{28}\text{H}_{23}\text{NO}_3\text{S}$ : calcd C 74.15, H 5.11, N 3.09; found C 74.92, H 5.03, N 3.20; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda = 254$  nm):  $t_{\text{minor}} = 23.81$  min,  $t_{\text{major}} = 32.42$  min, ee = 94%;  $[\alpha]_{\text{D}}^{22} = -42.6$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-(Furan-2-yl(1-hydroxynaphthalen-2-yl)methyl)-4-methylbenzenesulfonamide** (Table 2, entry 11)



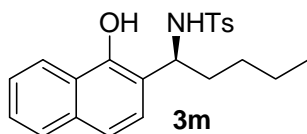
According to the general procedure, the title compound was synthesized in 92% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.09 (m, 1H), 7.72 (m, 1H), 7.62 (d,  $J = 4.8$  Hz, 2H), 7.47-7.45 (m, 2H), 7.31-7.28 (m, 2H), 6.99-6.93 (m, 4H), 6.22 (m, 1H), 6.03 (m, 1H), 5.89 (d,  $J = 4.0$  Hz, 1H), 5.44 (d,  $J = 4.0$  Hz, 1H), 2.20 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  143.7, 142.8, 134.5, 129.2, 127.4, 126.7, 125.7, 125.4, 121.8, 120.4, 116.9, 110.5, 108.6, 53.5, 29.7, 25.3, 21.3; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{22}\text{H}_{19}\text{NO}_4\text{S}$ , 416.0932; found 416.0927; elemental analysis for  $\text{C}_{22}\text{H}_{19}\text{NO}_4\text{S}$ : calcd C 67.16, H 4.87, N 3.56; found C 66.89, H 4.77, N 3.44; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda = 254$  nm):  $t_{\text{minor}} = 31.15$  min,  $t_{\text{major}} = 34.96$  min, ee = 93%;  $[\alpha]_{\text{D}}^{22} = -41.1$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-(1-(1-Hydroxynaphthalen-2-yl)-3-methylbutyl)-4-methylbenzenesulfonamide** (Table 2, entry 12)



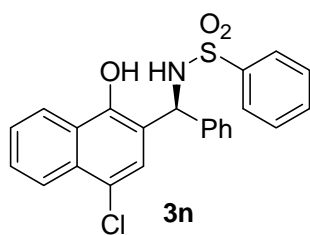
According to the general procedure, the title compound was synthesized in 63% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.97 (m, 1H), 7.69 (m, 1H), 7.47-7.42 (m, 4H), 7.25 (s, 1H), 7.02 (d,  $J = 4.8$  Hz, 1H), 6.85 (d,  $J = 4.8$  Hz, 1H), 6.70 (m, 1H), 5.23 (d,  $J = 4.0$  Hz, 1H), 4.72 (m, 1H), 2.08 (s, 3H), 1.77-1.43 (s, 3), 0.88 (d,  $J = 11.2$  Hz, 3H), 0.83 (d,  $J = 11.2$  Hz, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.0, 143.3, 136.6, 133.9, 128.9, 127.5, 126.9, 126.2, 125.3, 125.2, 121.0, 120.6, 119.9, 53.6, 44.0, 24.7, 22.4, 22.1, 21.1; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{22}\text{H}_{25}\text{NO}_3\text{S}$  406.1453; found 406.1454; elemental analysis for  $\text{C}_{22}\text{H}_{25}\text{NO}_3\text{S}$ : calcd C 68.90, H 6.57, N 3.65; found C 69.16, H 6.45, N 3.61; HPLC (Chiralpak OJ-H, *i*-PrOH/hexane = 13/87, flow rate = 0.45 mL/min,  $\lambda = 254$  nm):  $t_{\text{majorr}} = 18.07$  min,  $t_{\text{minor}} = 26.98$  min, ee = 90%;  $[\alpha]_{\text{D}}^{22} = -40.0$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-(1-(1-Hydroxynaphthalen-2-yl)pentyl)-4-methylbenzenesulfonamide** (Table 2, entry 13)



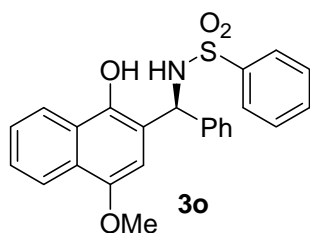
According to the general procedure, the title compound was synthesized in 87% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.98 (m, 1H), 7.69 (m, 1H), 7.48 (d,  $J = 4.8$  Hz, 2H), 7.42 (m, 2H), 7.25 (m, 1H), 7.01 (d,  $J = 5.0$  Hz, 1H), 6.85 (d,  $J = 4.6$  Hz, 2H), 6.80 (s, 1H), 5.44 (m, 1H), 4.60 (m, 1H), 2.07 (s, 3H), 1.82 (m, 2H), 1.25 (m, 4H), 1.08 (m, 1H), 0.75 (t,  $J = 4.0$  Hz, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.0, 143.3, 136.5, 133.8, 128.9, 127.4, 126.9, 126.1, 125.4, 125.3, 125.2, 121.1, 120.5, 119.9, 55.7, 34.8, 28.3, 22.1, 21.1, 13.7; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{22}\text{H}_{25}\text{NO}_3\text{S}$ , 406.1453; found 406.1451; elemental analysis for  $\text{C}_{22}\text{H}_{25}\text{NO}_3\text{S}$ : calcd C 68.90, H 6.57, N 3.65; found C 69.12, H 6.63, N 3.58; HPLC (Chiralpak OJ-H, *i*-PrOH/hexane = 11/89, flow rate = 0.4 mL/min,  $\lambda = 254$  nm):  $t_{\text{majorr}} = 28.17$  min,  $t_{\text{minor}} = 37.55$  min, ee = 92%;  $[\alpha]_{\text{D}}^{22} = -38.2$  ( $c = 1.0$  in  $\text{CH}_2\text{Cl}_2$ ).

***N*-((4-Chloro-1-hydroxynaphthalen-2-yl)(phenyl)methyl)benzenesulfonamide** (Table 2, entry 14)



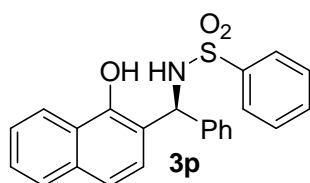
According to the general procedure, the title compound was synthesized in 100% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.12 (d,  $J$  = 8.5 Hz, 1H), 8.08 (d,  $J$  = 8.0 Hz, 1H), 7.64-7.49 (m, 4H), 7.29-7.14 (m, 8H), 6.97 (s, 1H), 6.94 (s, 1H), 5.91 (d,  $J$  = 8.0 Hz, 1H), 5.85-5.77 (m, 1H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  148.7, 139.0, 138.1, 132.7, 130.9, 128.8, 128.7, 128.0, 127.6, 127.0, 126.9, 126.3, 125.7, 124.3, 123.5, 122.0, 120.1, 57.9; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{23}\text{H}_{18}\text{ClNO}_3\text{S}$ , 446.0594; found 446.0599; elemental analysis for  $\text{C}_{23}\text{H}_{18}\text{ClNO}_3\text{S}$ : calcd C 65.17, H 4.28, N 3.30; found C 65.49, H 4.41, N 3.19; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 19.60 min,  $t_{\text{major}}$  = 37.16 min, ee = 94%;  $[\alpha]_{\text{D}}^{22}$  = -65.4 ( $c$  = 1.0 in  $\text{CH}_2\text{Cl}_2$ ).

***N*-((1-Hydroxy-4-methoxynaphthalen-2-yl)(phenyl)methyl)benzenesulfonamide** (Table 2, entry 15)



According to the general procedure, the title compound was synthesized in 97% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  8.09 (s, 2H), 7.95 (s, 1H), 7.62 (d,  $J$  = 7.5 Hz, 2H), 7.46 (s, 2H), 7.25-7.23 (m, 6H), 7.11-7.09 (m, 2H), 6.21 (s, 1H), 5.92 (s, 2H), 5.84 (s, 1H), 3.71 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  149.8, 142.5, 139.6, 139.2, 132.4, 128.6, 128.5, 127.8, 126.9, 126.3, 125.9, 121.9, 120.9, 120.0, 103.8, 58.5, 55.5; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{24}\text{H}_{21}\text{NO}_4\text{S}$ , 442.1089; found 442.1094; C, H, N analysis for  $\text{C}_{24}\text{H}_{21}\text{NO}_4\text{S}$ : calcd C 68.72, H 5.05, N 3.34; found C 68.95, H 4.96, N 3.55; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 20.76 min,  $t_{\text{major}}$  = 44.58 min, ee = 95%;  $[\alpha]_{\text{D}}^{22}$  = -45.2 ( $c$  = 1.0 in  $\text{CH}_2\text{Cl}_2$ ).

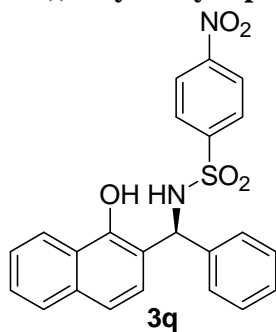
***N*-((1-Hydroxynaphthalen-2-yl)(phenyl)methyl)benzenesulfonamide** (Table 2, entry 16)



According to the general procedure, the title compound was synthesized in 83% yield.  $^1\text{H}$  NMR (500 MHz, DMSO):  $\delta$  9.49-9.48 (m, 1H), 8.76-8.75 (m, 1H), 8.14 (s, 1H), 7.74-7.64 (m, 3H), 7.43-7.13 (m, 12H), 6.33-6.31 (m, 1H);  $^{13}\text{C}$  NMR (125 MHz, DMSO):  $\delta$  148.2, 141.9, 141.3, 133.2, 131.7, 128.4, 127.9, 127.4, 126.8, 126.6, 126.2, 125.7, 125.2, 124.9, 123.1, 122.0, 119.5, 54.2;

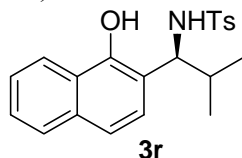
HR-MS: calcd ( $M + Na^+$ ) for  $C_{23}H_{19}NO_3S$ , 412.0983; found 412.0985; elemental analysis for  $C_{23}H_{19}NO_3S$ : calcd C 70.93, H 4.92, N 3.60; found C 70.14, H 4.99, N 3.58; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 22.87 min,  $t_{\text{major}}$  = 38.6 min, ee = 94%;  $[\alpha]_D^{22}$  = -40.1 ( $c$  = 1.0 in  $CH_2Cl_2$ ).

***N*-((1-Hydroxynaphthalen-2-yl)(phenyl)methyl)-4-nitrobenzenesulfonamide (Table 2, entry 17)**



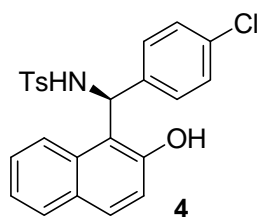
According to the general procedure, the title compound was synthesized in 94% yield.  $^1H$  NMR (300 MHz,  $CDCl_3:CD_3OD$  = 10:1):  $\delta$  7.82-7.78 (m, 1H), 7.69-7.56 (m, 5H), 7.34-7.30 (m, 2H), 7.29-7.23 (m, 2H), 7.20-7.12 (m, 4H), 6.94-6.92 (m, 1H), 5.94 (s, 1H);  $^{13}C$  NMR (75 MHz,  $CDCl_3:CD_3OD$  = 10:1):  $\delta$  149.1, 148.7, 145.7, 139.6, 133.9, 128.2, 127.7, 127.5, 127.3, 126.9, 126.5, 126.3, 125.4, 125.0, 122.9, 120.6, 120.3, 120.1, 58.3; HR-MS: calcd ( $M + Na^+$ ) for  $C_{23}H_{18}N_2O_5S$ , 457.0834; found 457.0832; elemental analysis for  $C_{23}H_{18}N_2O_5S$ : calcd C 63.58, H 4.18, N 6.45; found C 63.78, H 4.27, N 6.33; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 30/70, flow rate = 0.6 mL/min,  $\lambda$  = 210 nm):  $t_{\text{minor}}$  = 26.38 min,  $t_{\text{major}}$  = 47.13 min, ee = 85%.

***N*-(1-(1-Hydroxynaphthalen-2-yl)-2-methylpropyl)-4-methylbenzenesulfonamide (Table 2, entry 18)**



According to the general procedure, the title compound was synthesized in 55% yield.  $^1H$  NMR (300 MHz, acetone- $d_6$ ):  $\delta$  8.20 (s, 1H), 8.13 (d,  $J$  = 8.1 Hz, 1H), 7.72 (d,  $J$  = 7.5 Hz, 1H), 7.47-7.38 (m, 4H), 7.21 (m, 2H), 6.79 (d,  $J$  = 7.8 Hz, 2H), 6.71 (d,  $J$  = 9.6 Hz, 1H), 4.67 (t,  $J$  = 9.3 Hz, 1H), 2.11 (m, 1H), 1.96 (s, 3H), 1.06 (d,  $J$  = 6.6 Hz, 3H), 0.76 (d,  $J$  = 6.9 Hz, 3H);  $^{13}C$  NMR (75 MHz, acetone- $d_6$ ):  $\delta$  149.5, 142.7, 139.4, 134.5, 129.3, 128.3, 127.3, 126.4, 126.3, 125.9, 125.7, 122.8, 122.0, 120.7, 59.7, 34.3, 20.9, 19.9, 19.8; HR-MS: calcd ( $M + Na^+$ ) for  $C_{21}H_{23}NO_3S$ , 392.1296; found 392.1291; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 14.59 min,  $t_{\text{major}}$  = 18.29 min, ee = 85%.

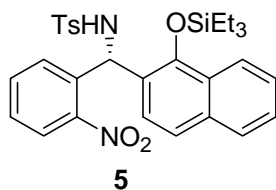
***N*-((4-Chlorophenyl)(2-hydroxynaphthalen-1-yl)methyl)-4-methylbenzenesulfonamide (4)**



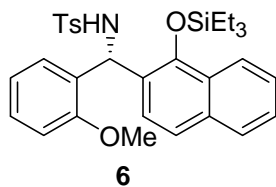
According to the general procedure, the title compound was synthesized in 92% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CDCl}_3$ ):  $\delta$  7.67-7.63 (m, 2H), 7.50 (d,  $J$  = 9.0 Hz, 1H), 7.38 (t,  $J$  = 7.5 Hz, 1H), 7.31-7.25 (m, 3H), 7.22 (d,  $J$  = 8.5 Hz, 2H), 7.14 (d,  $J$  = 8.5 Hz, 2H), 6.89-6.81 (m, 3H), 6.60 (d,  $J$  = 8.0 Hz, 2H), 6.32 (d,  $J$  = 10.5 Hz, 1H), 2.06 (s, 3H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CDCl}_3$ ):  $\delta$  150.9, 142.9, 138.7, 136.0, 133.1, 132.2, 129.9, 128.9, 128.7, 128.4, 128.3, 128.2, 127.3, 126.5, 123.5, 121.7, 117.9, 117.2, 53.8, 21.2; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{25}\text{H}_{24}\text{ClNO}_3\text{S}$ , 476.1063; found 476.1066; elemental analysis for  $\text{C}_{25}\text{H}_{24}\text{ClNO}_3\text{S}$ : calcd C 66.14, H 5.53, N 3.09; found C 66.02, H 5.37, N 3.17; HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 40/60, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 10.09 min,  $t_{\text{major}}$  = 14.75 min, ee = 62%.

### General procedure for the derivation of the Friedel-Crafts products.

At 0 °C, to a vial containing the product (0.06 mmol) and 1.1 mL of anhydrous  $\text{CH}_2\text{Cl}_2$  was added 2,6-lutidine (17.5  $\mu\text{L}$ , 0.15 mmol) and TESOTf (16.4  $\mu\text{L}$ , 0.072 mmol). The reaction solution was stirred at 0 °C for 0.5 h before 0.1 mL of methanol and 3 mL of brine was added. The mixture was extracted with  $\text{CH}_2\text{Cl}_2$ . The combined extracts were dried over  $\text{MgSO}_4$ , filtered and concentrated in vacuo. The resulting residue was then purified by silica gel chromatography, eluting with EtOAc/hexane (1/7) to provide the corresponding derivative.



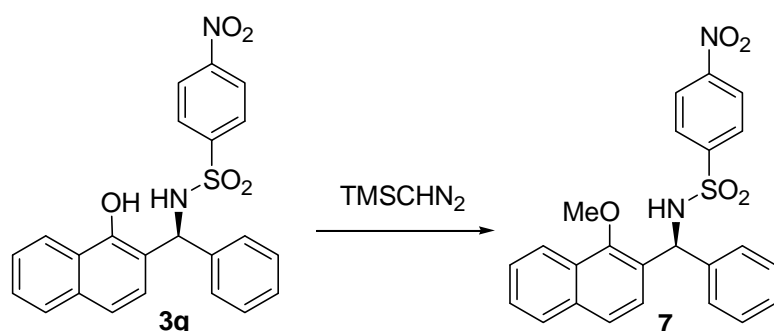
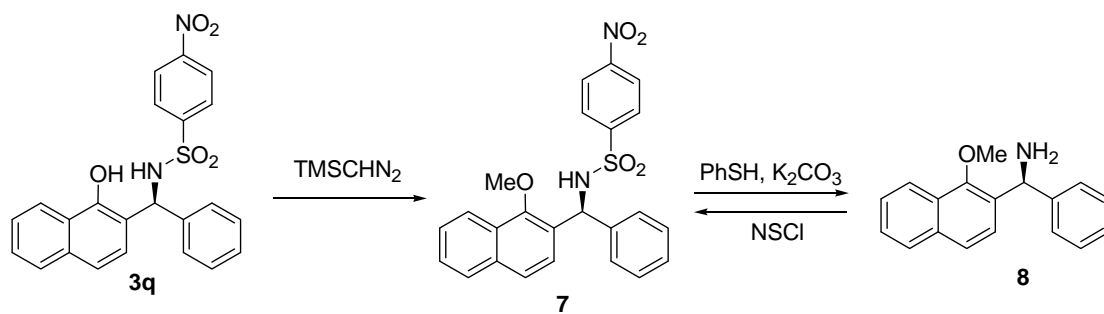
The title compound was obtained in 92% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CD}_3\text{Cl}$ ):  $\delta$  7.96-7.94 (m, 1H), 7.77-7.70 (m, 2H), 7.48-7.43 (m, 4H), 7.37-7.26 (m, 4H), 7.05 (d,  $J$  = 8.5 Hz, 1H), 6.94 (d,  $J$  = 8.0 Hz, 2H), 6.72 (d,  $J$  = 7.5 Hz, 1H), 5.48 (d,  $J$  = 7.5 Hz, 1H), 2.21 (s, 3H), 0.90 (t,  $J$  = 7.5 Hz, 9H), 0.81-0.79 (m, 6H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CD}_3\text{Cl}$ ):  $\delta$  149.8, 149.4, 143.0, 137.5, 134.5, 134.2, 132.1, 131.1, 129.0, 128.6, 127.8, 127.7, 127.1, 126.4, 125.3, 124.7, 122.9, 122.6, 121.5, 53.4, 21.3, 6.8, 5.7; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{30}\text{H}_{34}\text{N}_2\text{O}_5\text{SSi}$ , 585.1855; found 585.1859; HPLC (Chiralpak OD-H, *i*-PrOH/hexane = 5/95, flow rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 32.99 min,  $t_{\text{major}}$  = 20.39 min, ee = 91%;  $[\alpha]_{\text{D}}^{22}$  = -76.4 ( $c$  = 1.0 in  $\text{CH}_2\text{Cl}_2$ ).



The title compound was obtained in 90% yield.  $^1\text{H}$  NMR (500 MHz,  $\text{CD}_3\text{Cl}$ ):  $\delta$  7.99-7.97 (m, 1H), 7.76-7.74 (m, 1H), 7.67 (t,  $J$  = 8.0 Hz, 3H), 7.43-7.39 (m, 3H), 7.15-7.14 (m, 1H), 7.05 (d,  $J$  = 8.0 Hz, 2H), 6.89 (d,  $J$  = 6.5 Hz, 1H), 6.75-6.68 (m, 2H), 6.23 (d,  $J$  = 6.0 Hz, 1H), 5.33 (d,  $J$  = 5.5 Hz, 1H), 3.67 (s, 3H), 2.30 (s, 3H), 0.97-0.89 (m, 9H), 0.73-0.72 (m, 6H);  $^{13}\text{C}$  NMR (125 MHz,  $\text{CD}_3\text{Cl}$ ):  $\delta$  156.7, 148.9, 142.7, 137.4, 134.2, 129.6, 129.1, 128.9, 127.9, 127.8, 127.6, 127.5, 126.4, 125.8, 124.9, 124.6, 122.9, 121.0, 120.3, 110.5, 54.9, 52.5, 21.3, 6.7, 5.5; HR-MS: calcd ( $\text{M} + \text{Na}^+$ ) for  $\text{C}_{31}\text{H}_{37}\text{NO}_4\text{SSi}$ , 570.2110; found 570.2111; HPLC (Chiralpak OD-H, *i*-PrOH/hexane = 5/95, flow

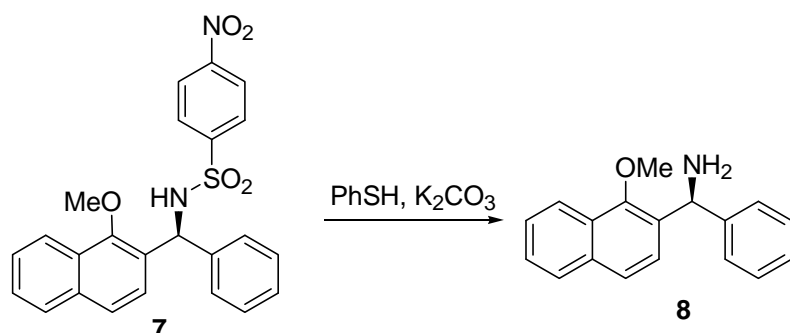
rate = 0.6 mL/min,  $\lambda$  = 254 nm):  $t_{\text{minor}}$  = 22.95 min,  $t_{\text{major}}$  = 15.58 min, ee = 80%;  $[\alpha]_{\text{D}}^{22}$  = -89.6 ( $c$  = 1.0 in  $\text{CH}_2\text{Cl}_2$ ).

### Procedures for the deprotection of sulfonamide group



#### (*S*)-*N*-((1-Methoxynaphthalen-2-yl)(phenyl)methyl)-4-nitrobenzenesulfonamide (**7**)

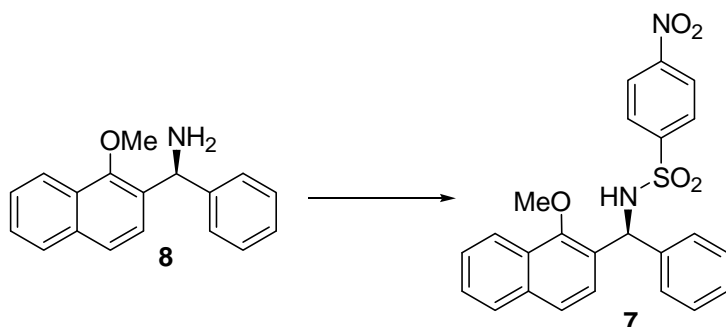
To a solution of compound **3q** (43.5 mg, 0.1 mmol) in MeOH (2 mL) and  $\text{CH}_2\text{Cl}_2$  (2 mL),  $\text{TMSCHN}_2$  (2N solution in hexane, 0.5 mL, 1.0 mmol) was added in 5 portions within 30 min at rt. The reaction mixture was then stirred at rt for another 30 min. The solvent was removed under reduced pressure. The residue was purified through chromatography and got the desired product **7** 38 mg, 85% yield.  $^1\text{H}$  NMR (300 MHz,  $\text{CDCl}_3:\text{CD}_3\text{OD}$  = 10:1):  $\delta$  7.81-7.64 (m, 6H), 7.47-7.41 (m, 3H), 7.35-7.11 (m, 5H), 7.12 (d,  $J$  = 8.4 Hz, 1H), 6.27 (d,  $J$  = 9.6 Hz, 1H), 6.04 (d,  $J$  = 9.6 Hz, 1H), 3.52 (s, 3H);  $^{13}\text{C}$  NMR (75 MHz,  $\text{CDCl}_3:\text{CD}_3\text{OD}$  = 10:1):  $\delta$  153.1, 148.9, 145.7, 139.9, 134.6, 128.6, 128.0, 127.9, 127.8, 127.5, 126.9, 126.8, 126.6, 126.1, 124.5, 123.2, 121.7, 62.4, 57.9;



#### (*S*)-((1-Methoxynaphthalen-2-yl)(phenyl)methyl)ethanamine (**8**)

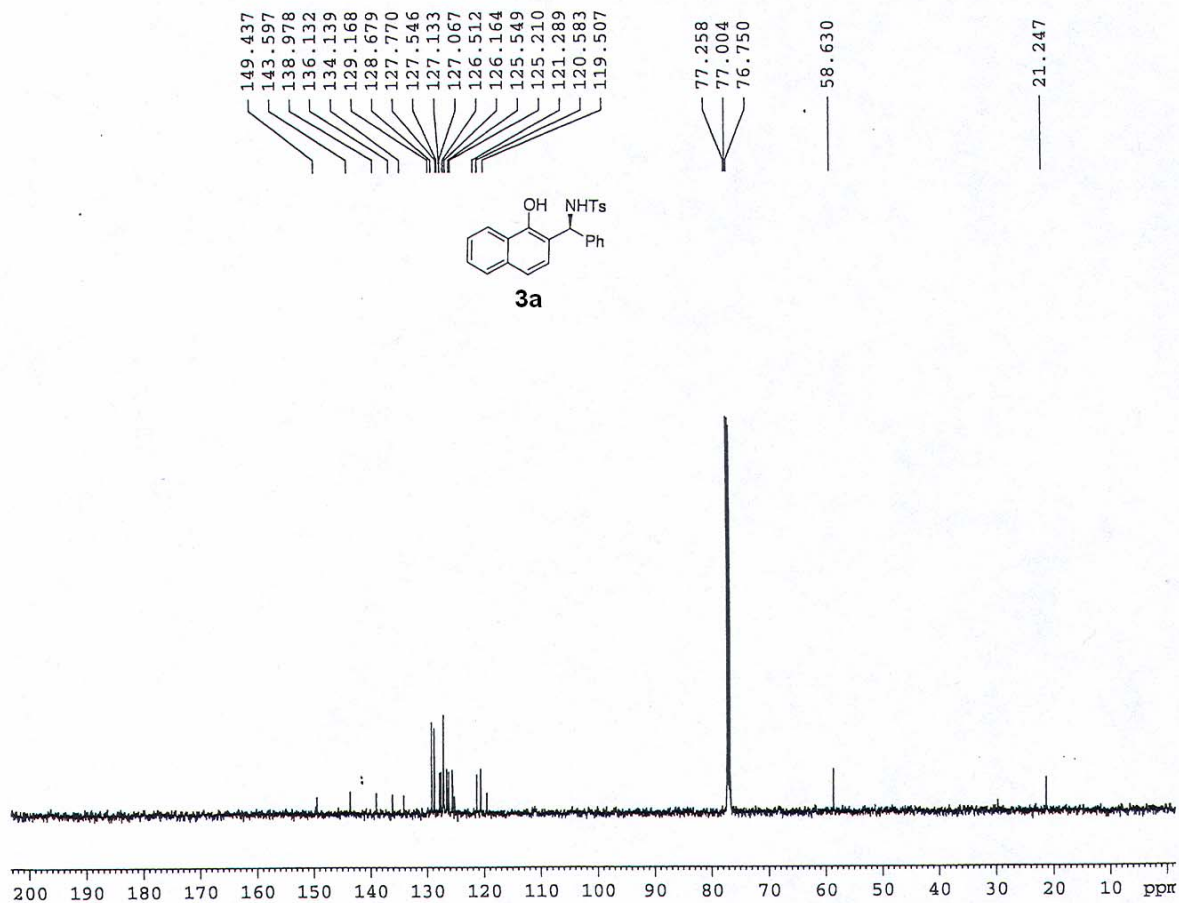
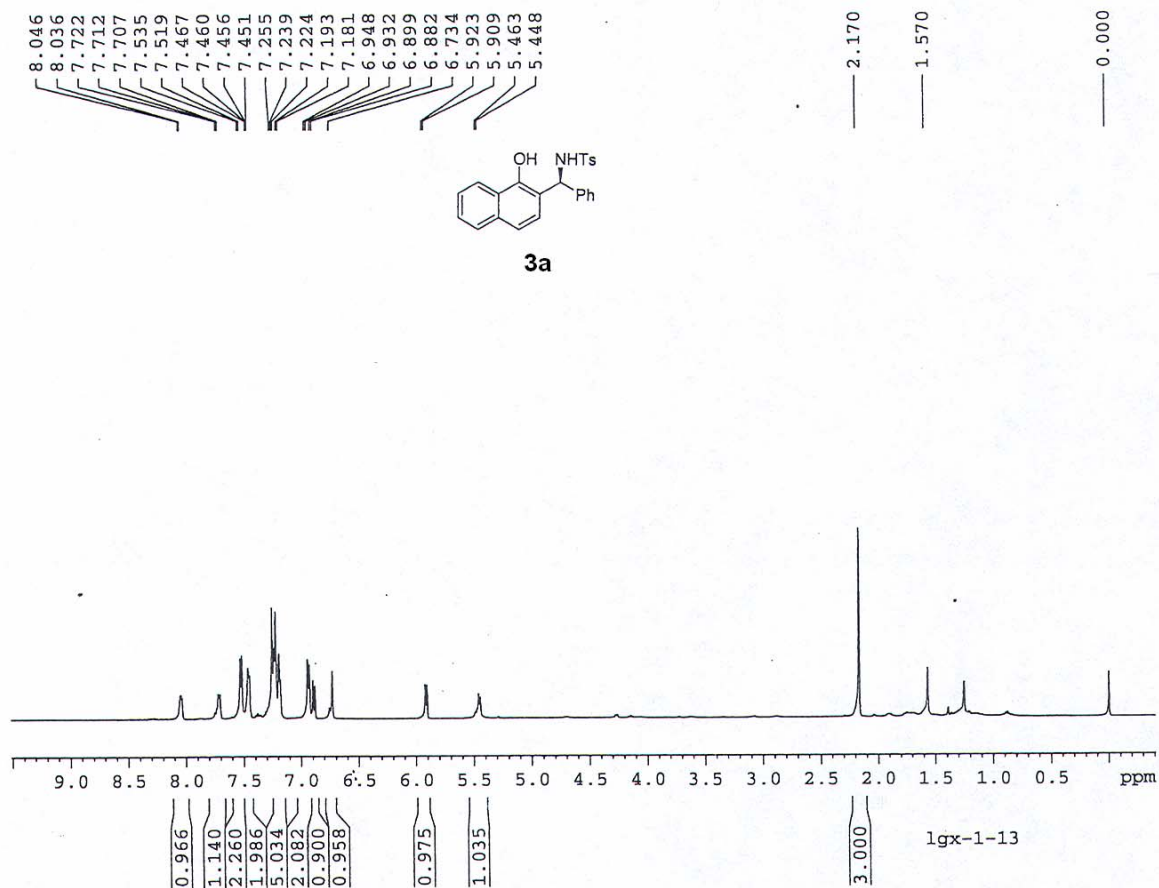
$\text{PhSH}$  (148 mg, 1.34 mmol) was added to a solution of compound **7** (30 mg, 0.067 mmol) and  $\text{K}_2\text{CO}_3$  (185 mg, 1.34 mmol) in DMF (0.5 mL) and  $\text{CH}_3\text{CN}$  (0.5 mL). The mixture was stirred at 50 °C for 30 min. Water (10 mL) was added and extracted with EtOAc (5 mL  $\times$  2). The combined organic layer was back extracted with 0.5 N HCl (3 mL) and then the aqueous layer was basified with NaOH

and extracted with EtOAc. The combined EtOAc layer was dried over Na<sub>2</sub>SO<sub>4</sub> and the solvent was removed. The crude product (13 mg) was pure enough in 74% yield. <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>:CD<sub>3</sub>OD = 10:1): δ 8.00 (d, *J* = 8.1 Hz, 1H), 7.82 (d, *J* = 8.7 Hz, 1H), 7.61 (d, *J* = 8.4 Hz, 1H), 7.54-7.45 (m, 5H), 7.47-7.41 (m, 3H), 7.34-7.15 (m, 3H), 5.84 (s, 1H), 3.89 (s, 3H); <sup>13</sup>C NMR (75 MHz, CDCl<sub>3</sub>:CD<sub>3</sub>OD = 10:1): δ 152.9, 134.3, 128.4, 128.1, 127.8, 126.9, 126.8, 126.0, 125.4, 124.6, 122.3, 62.6, 52.9;

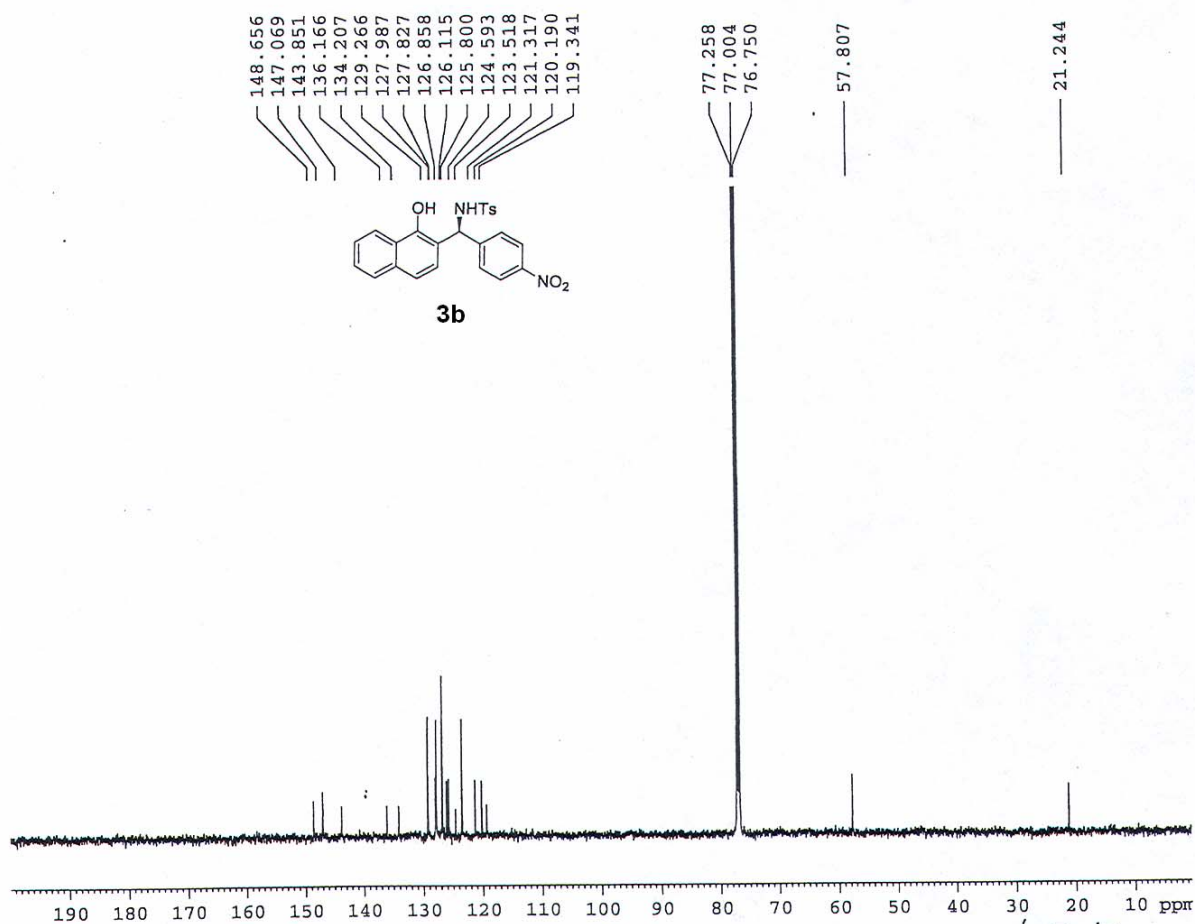
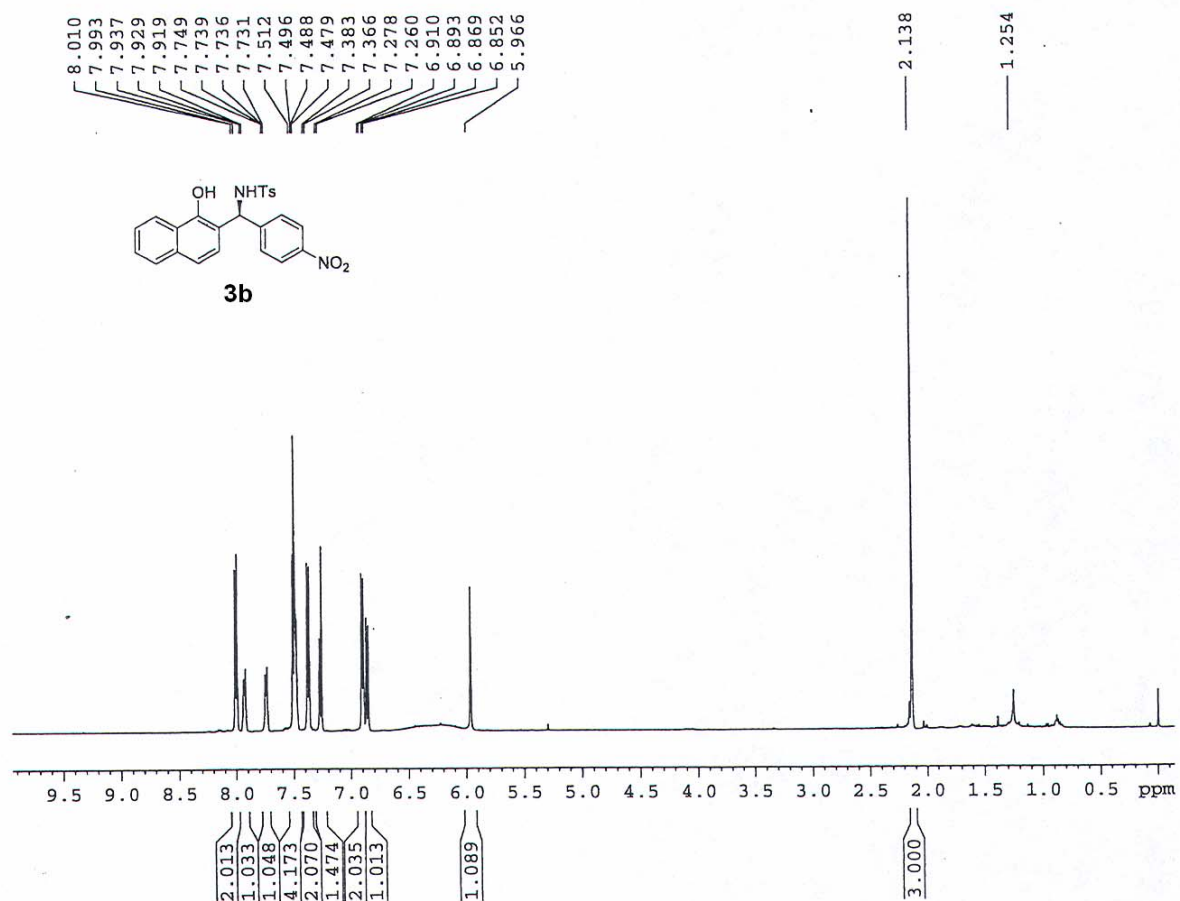


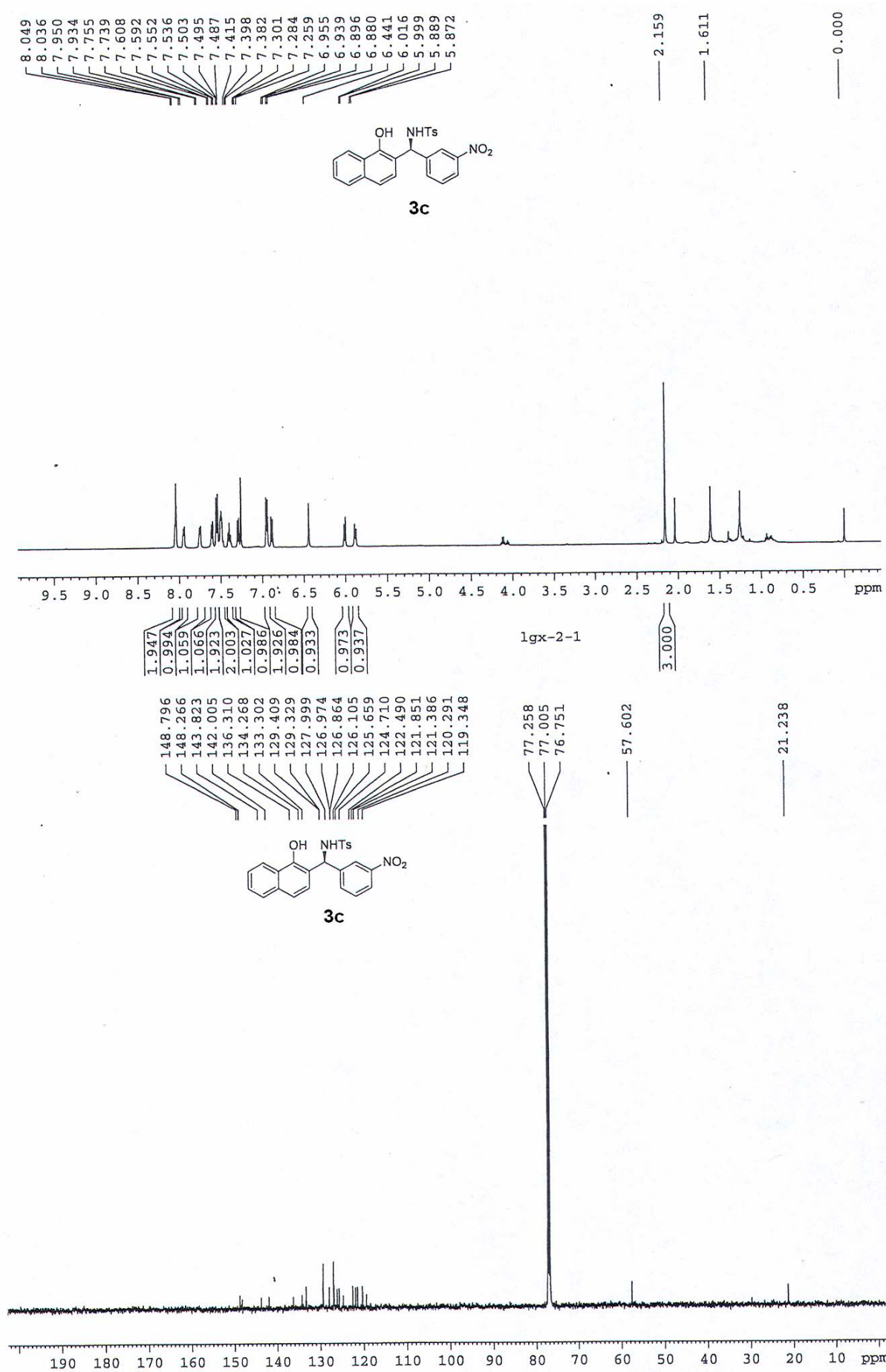
**(S)-N-((1-Methoxynaphthalen-2-yl)(phenyl)methyl)-4-nitrobenzenesulfonamide (7)** (Converted to **7** for chiral HPLC analysis)

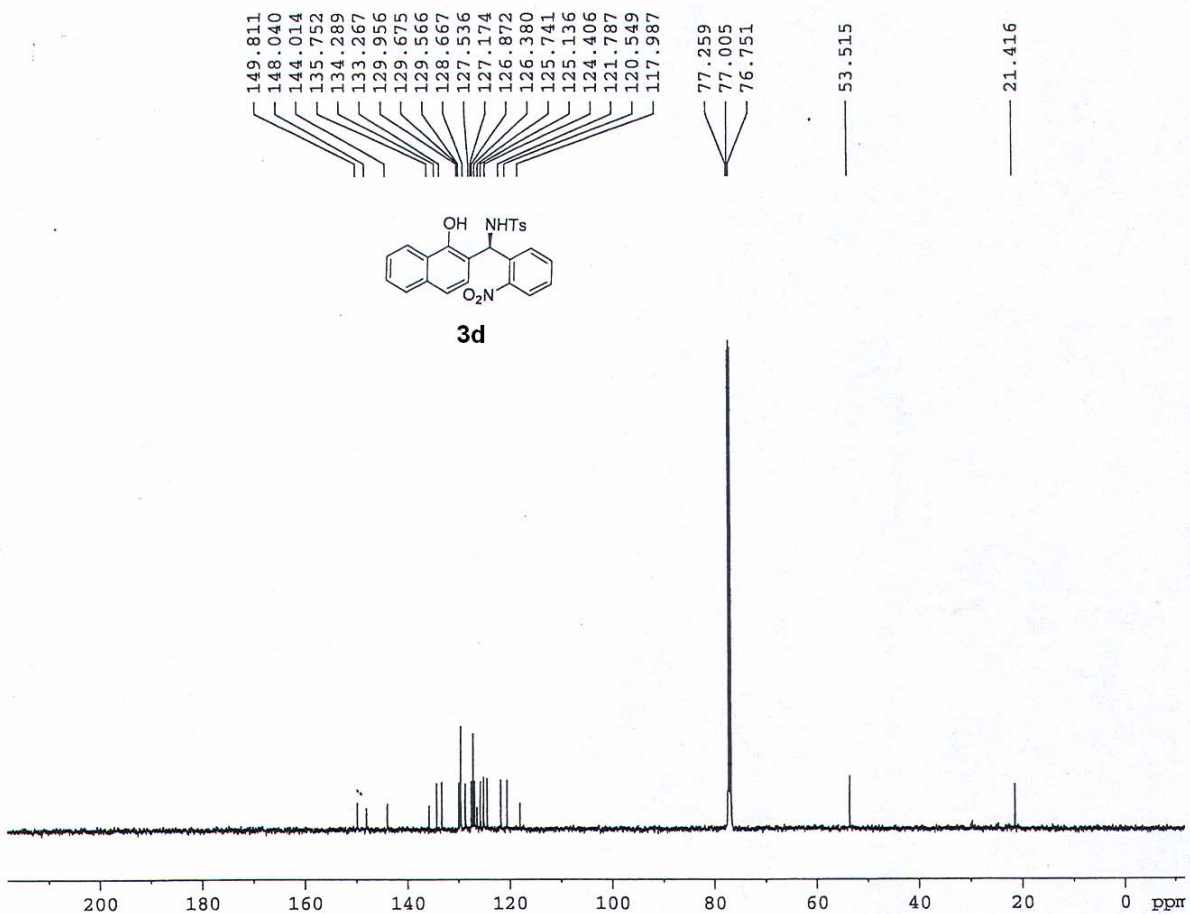
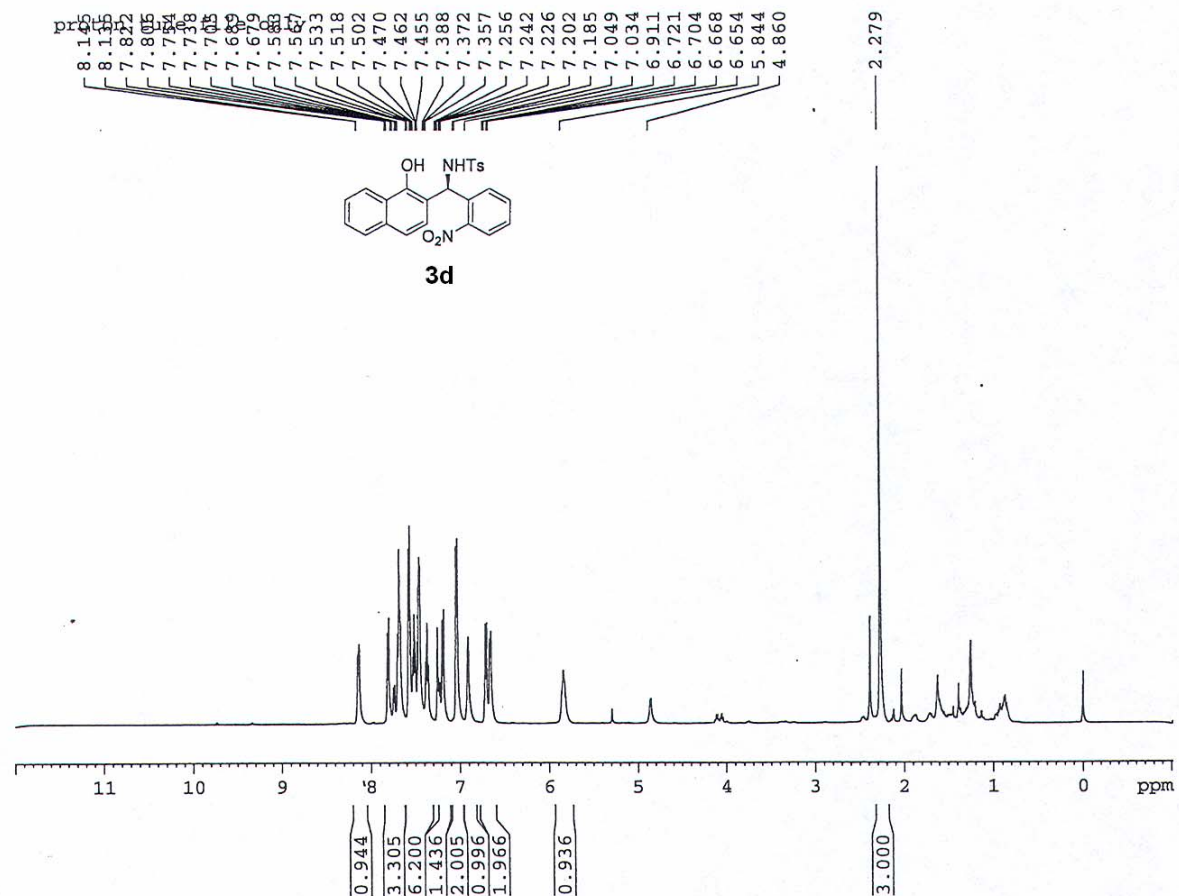
*p*-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>Cl (16.8 mg, 0.076 mmol) was added to a solution of compound **8** (10 mg, 0.038 mmol) and Et<sub>3</sub>N (11.5 mg, 0.11 mmol) in CH<sub>2</sub>Cl<sub>2</sub> (0.4 mL) at 0 °C. The reaction mixture was stirred at the same temperature for 3 h. Direct chromatography gave the desired product 15 mg, 88% yield. HPLC (Chiralpak AS-H, *i*-PrOH/hexane = 30/70, flow rate = 0.6 mL/min, λ = 210 nm): *t*<sub>minor</sub> = 30.06 min, *t*<sub>major</sub> = 39.88 min, ee = 85%.

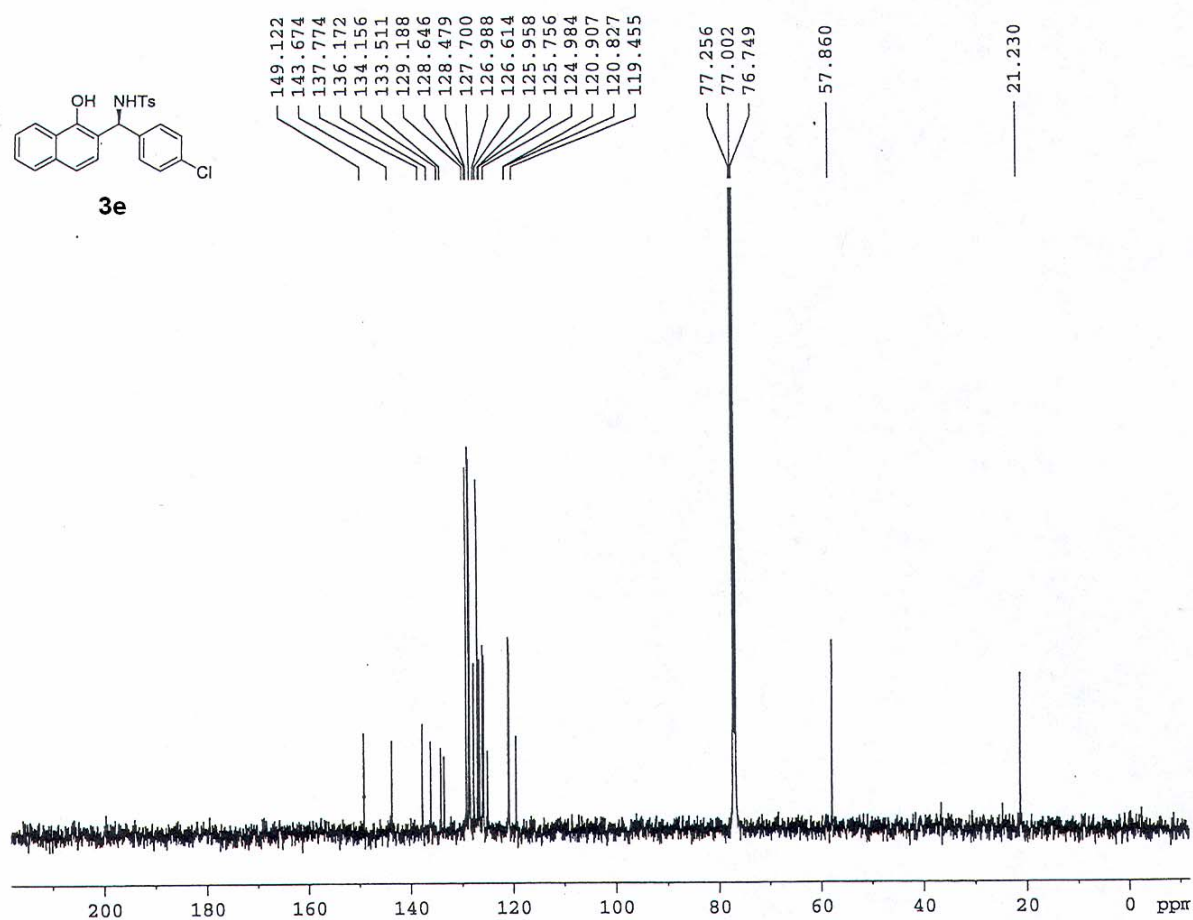
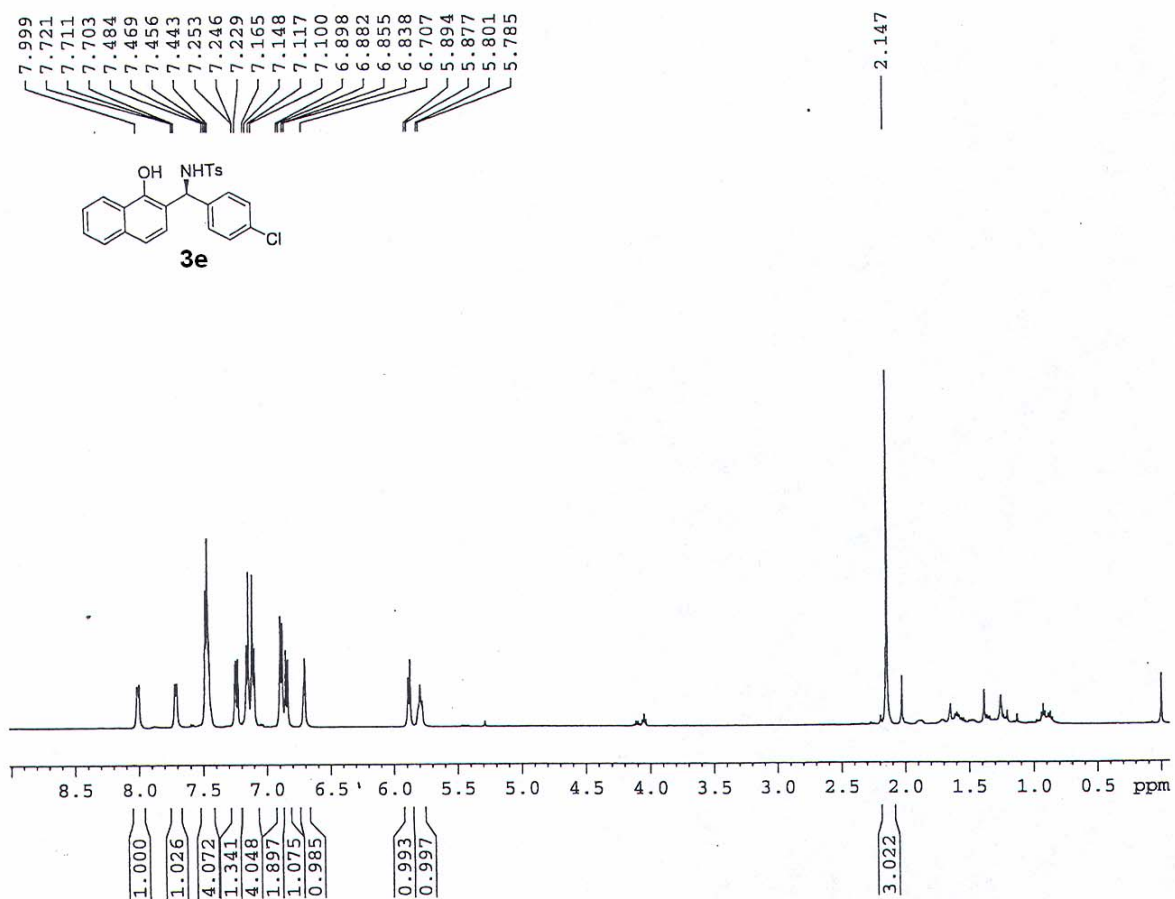


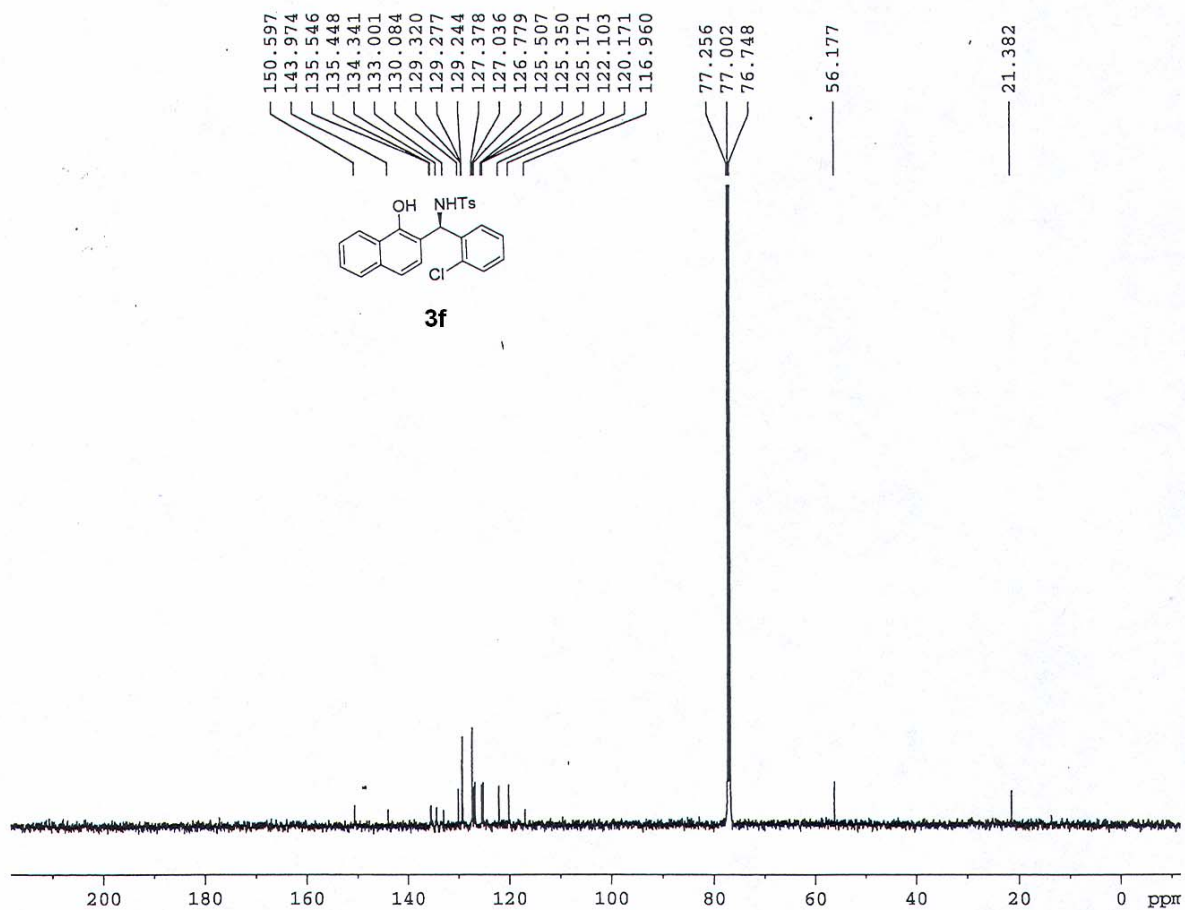
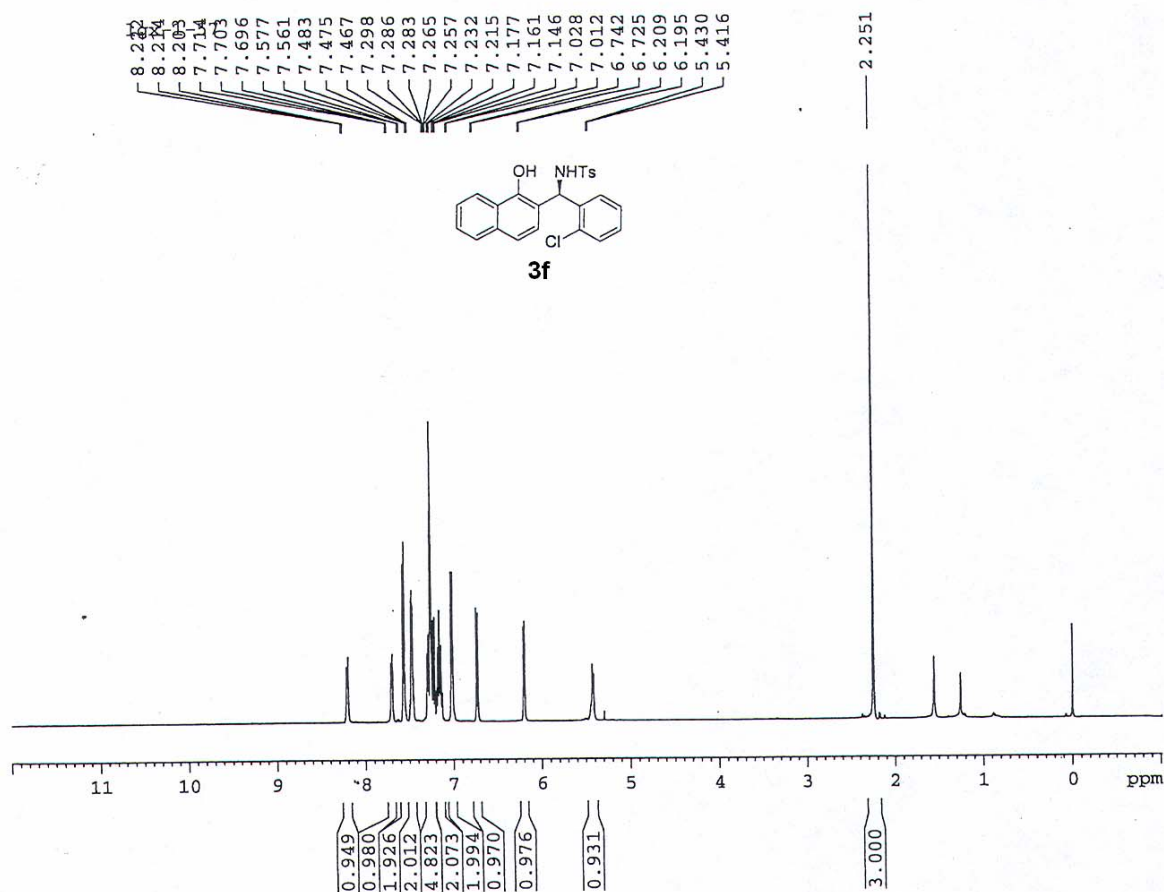




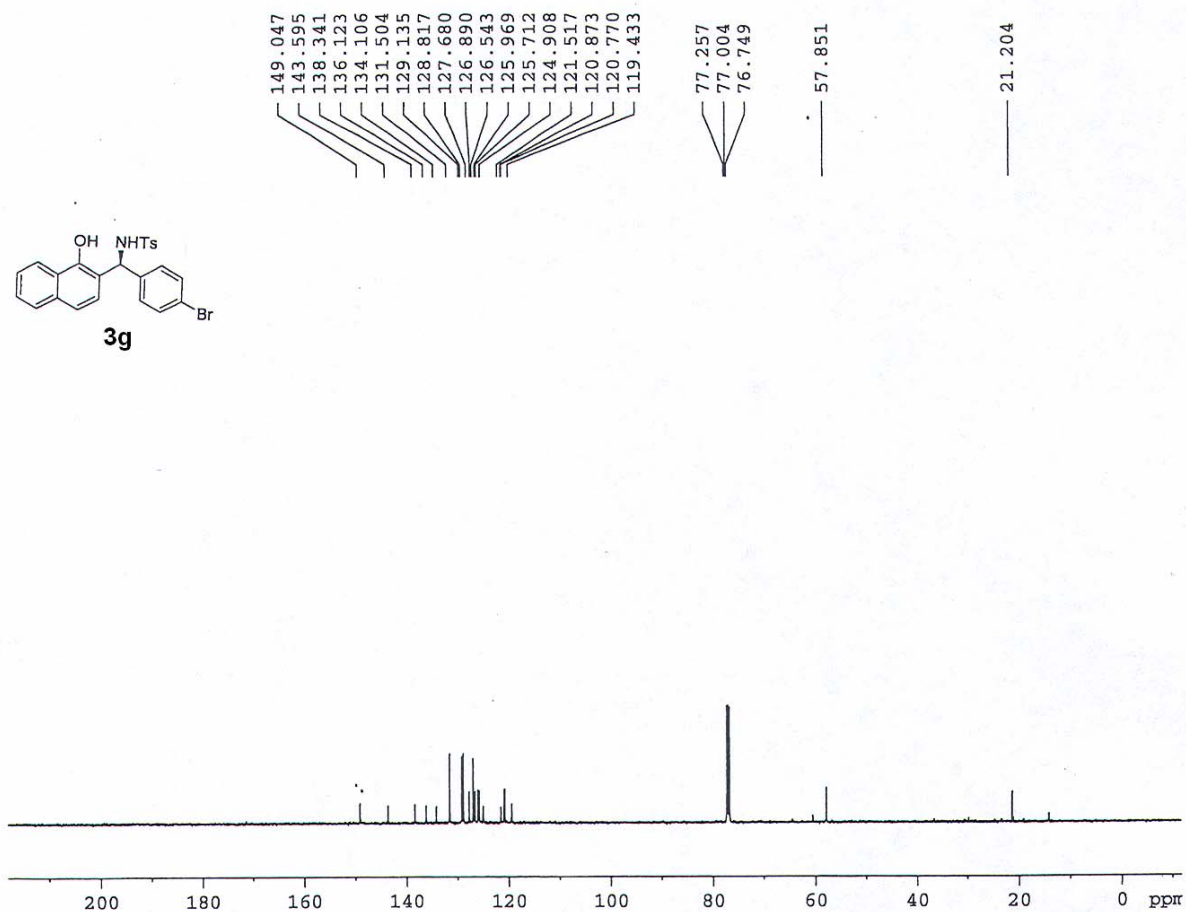
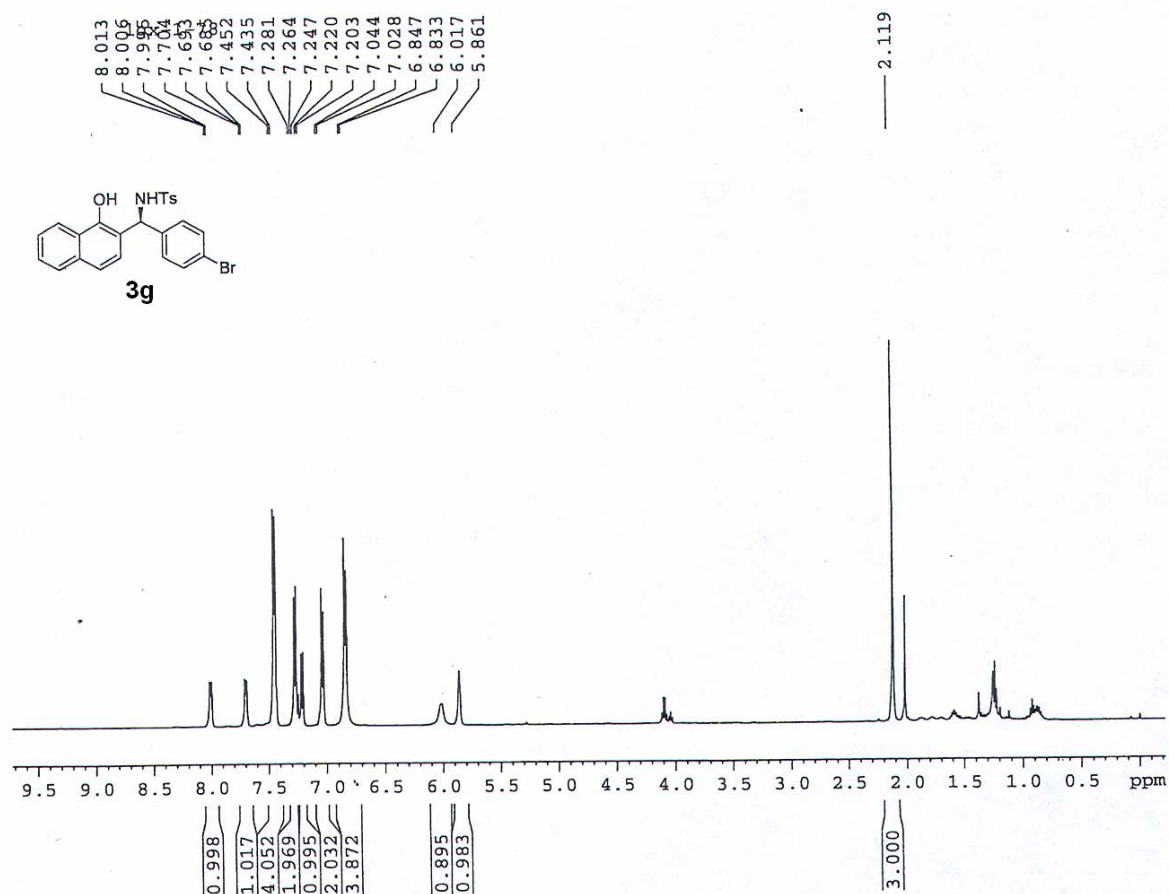


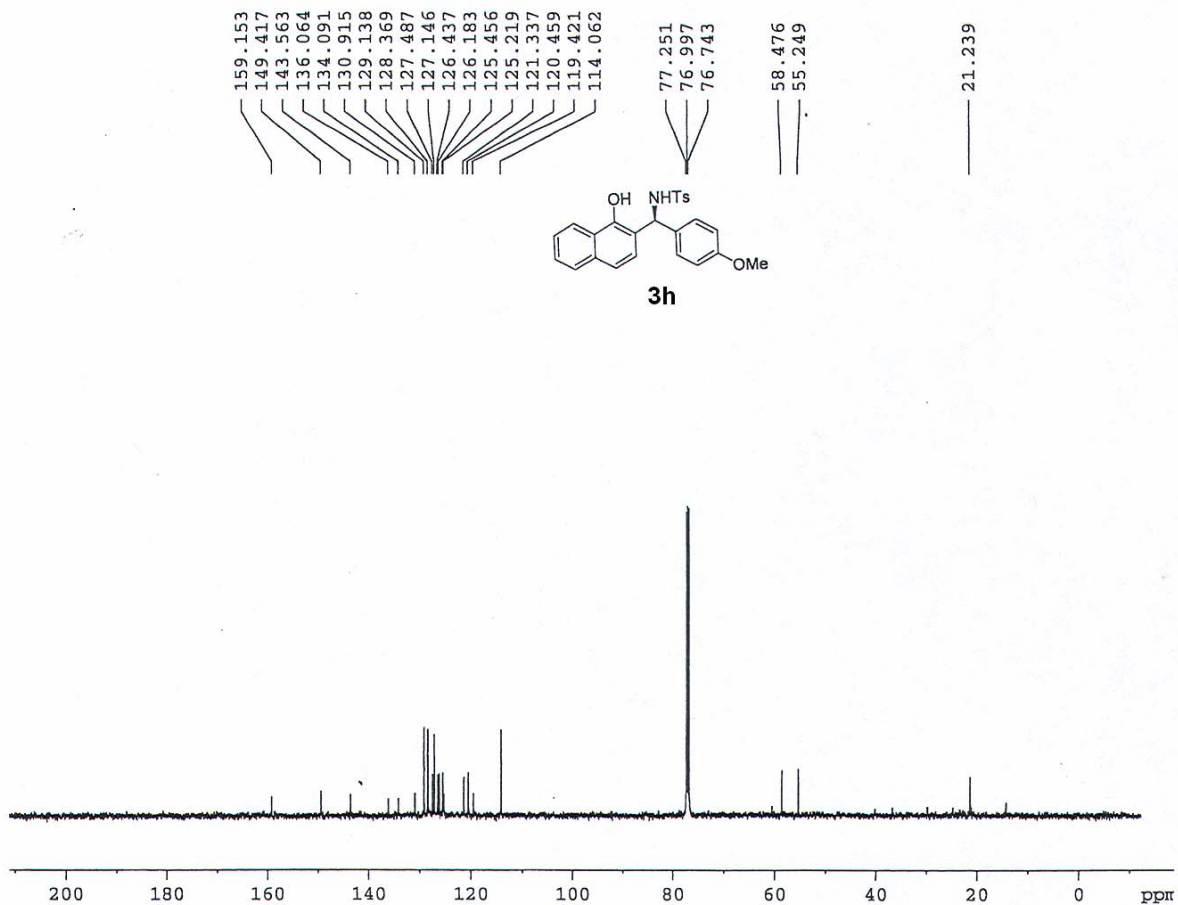
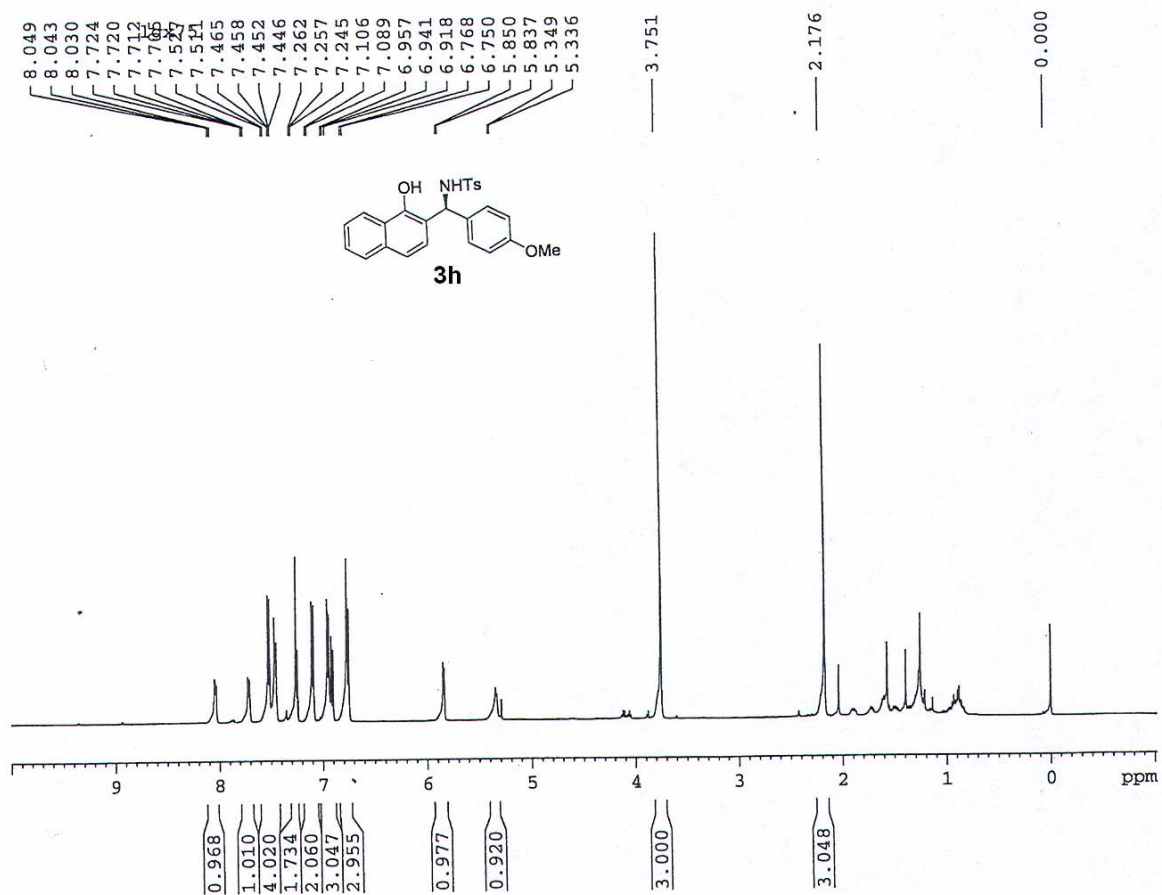


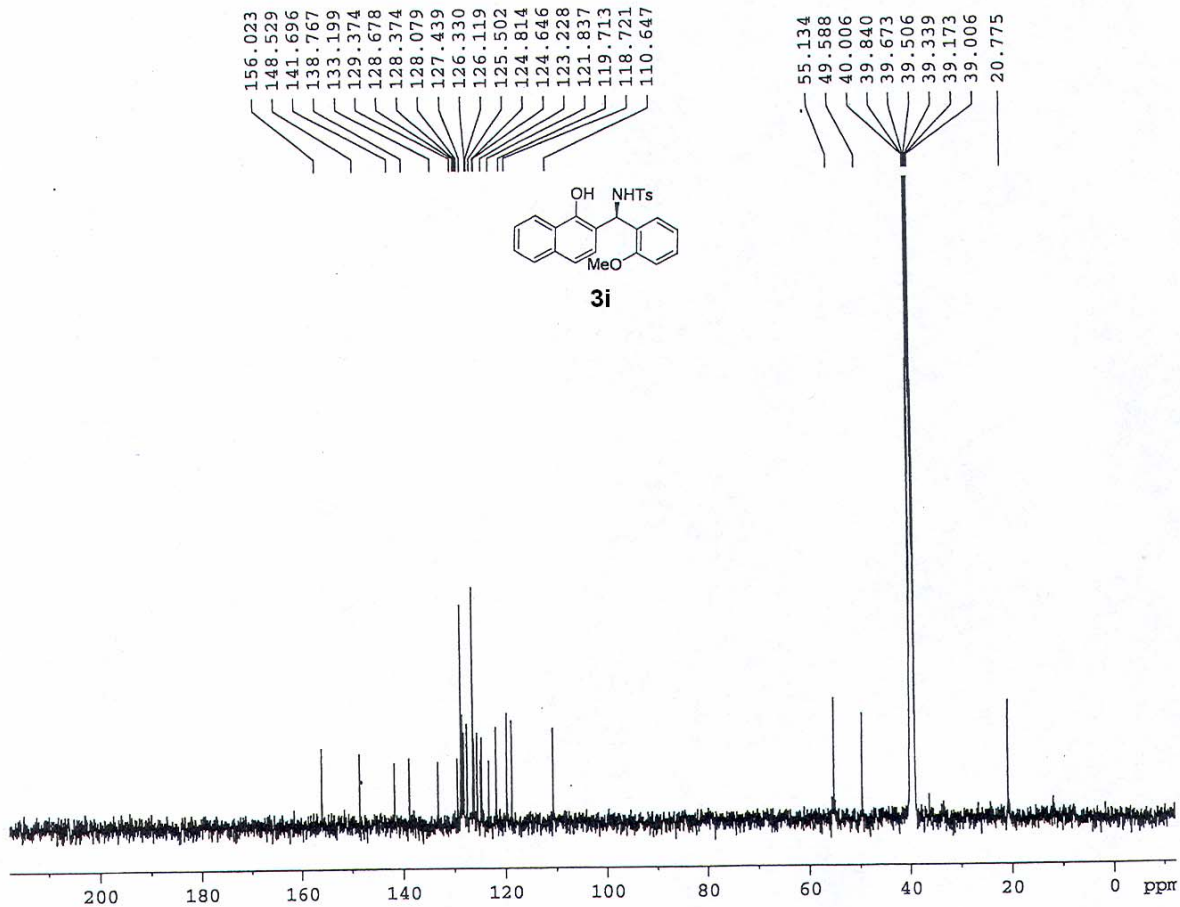
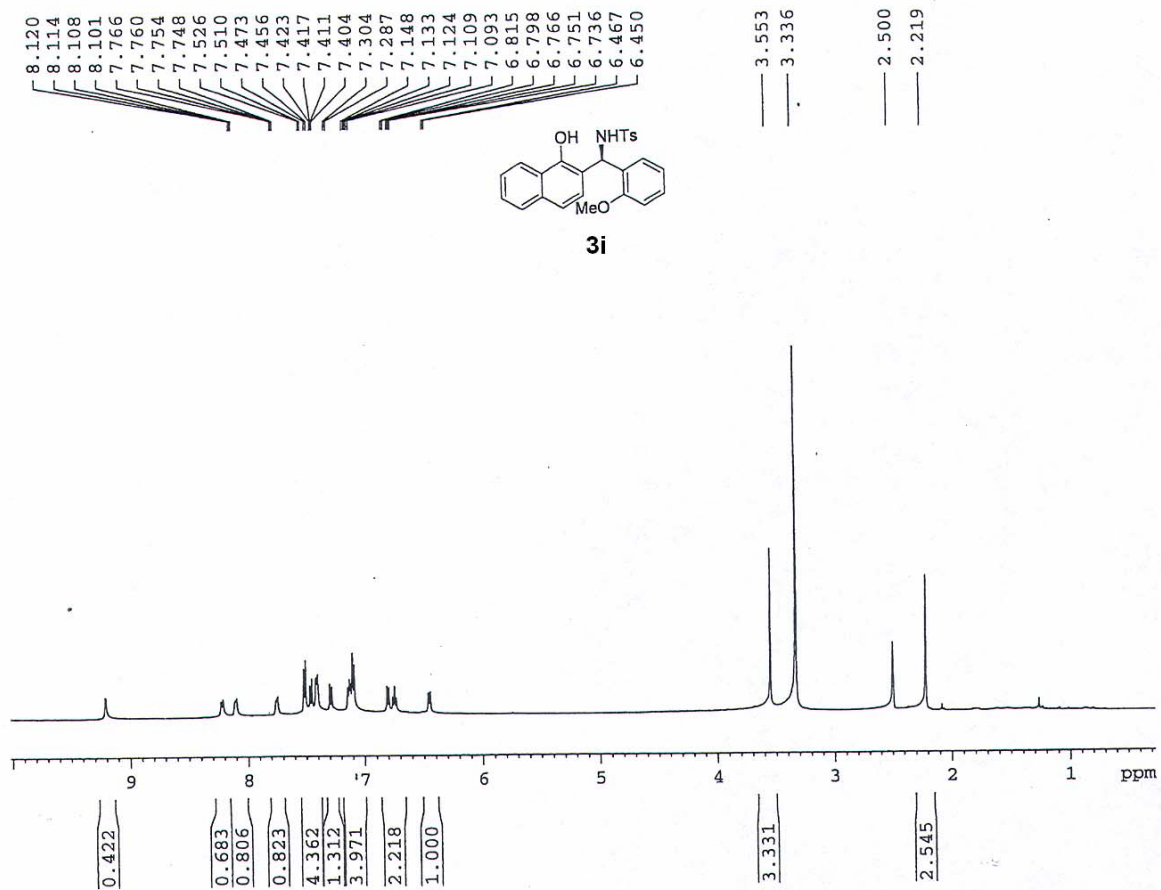




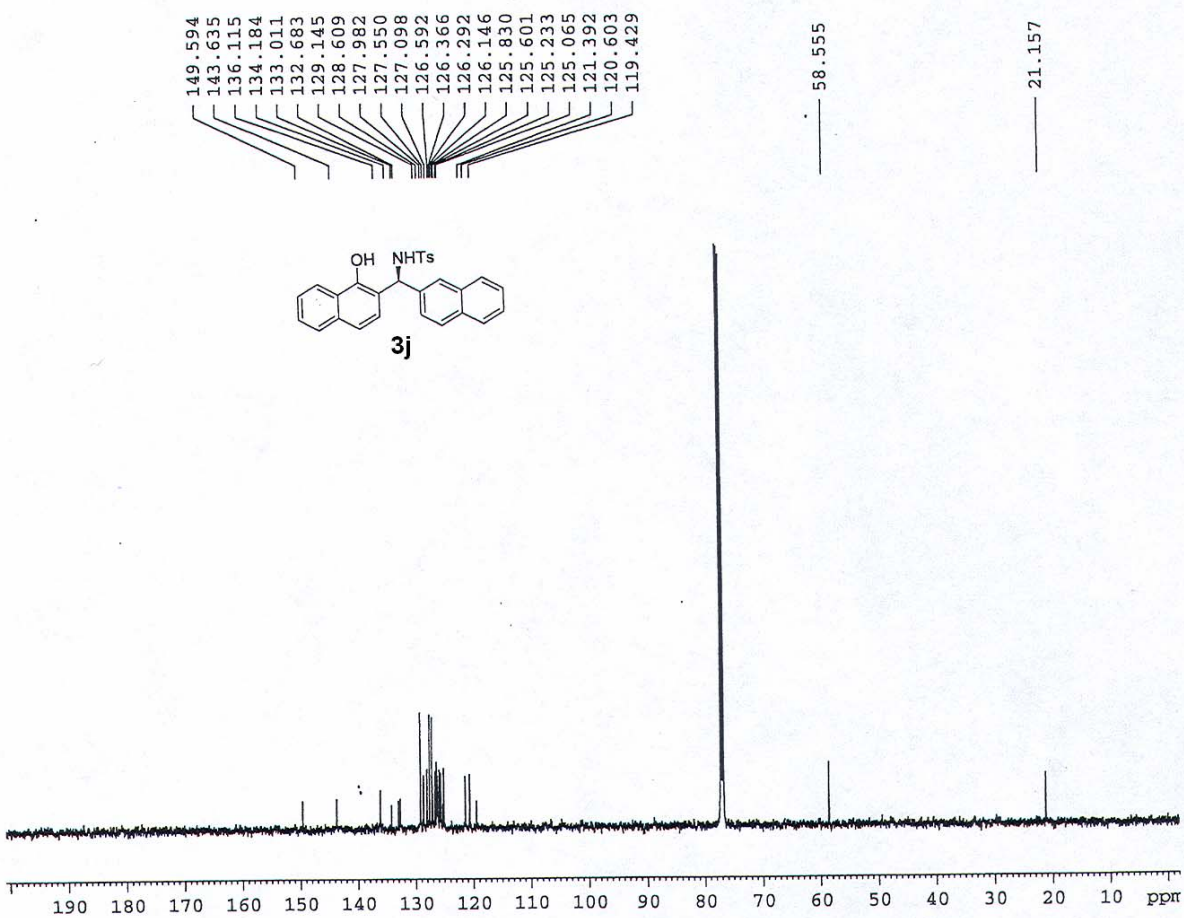
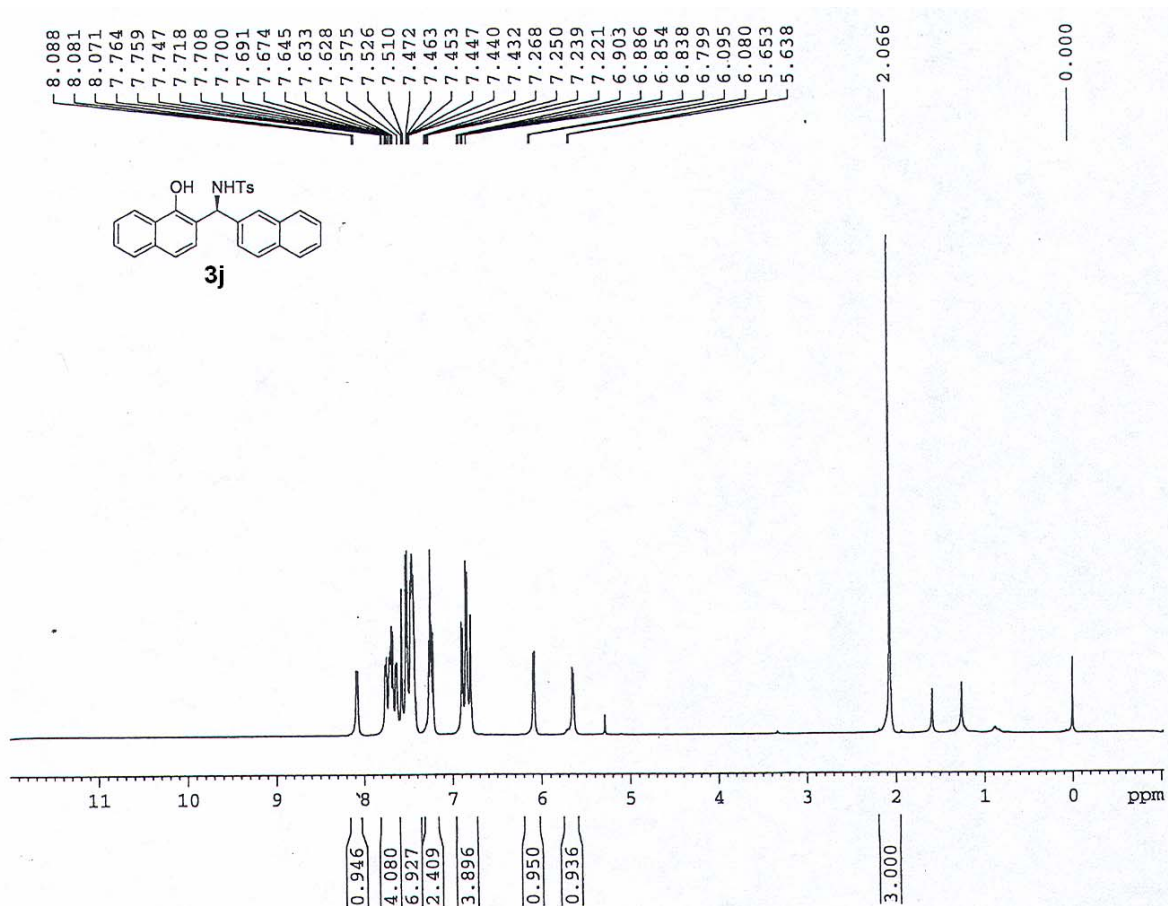


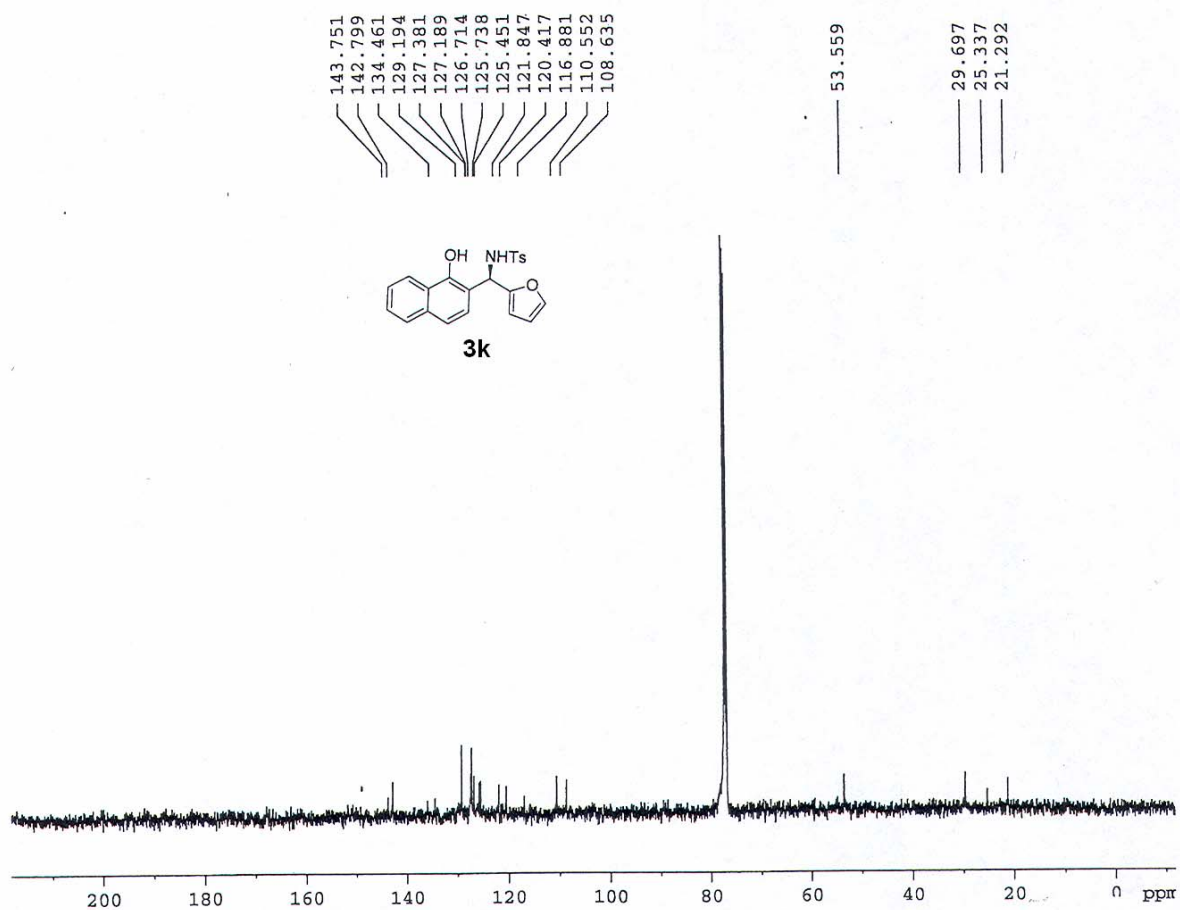
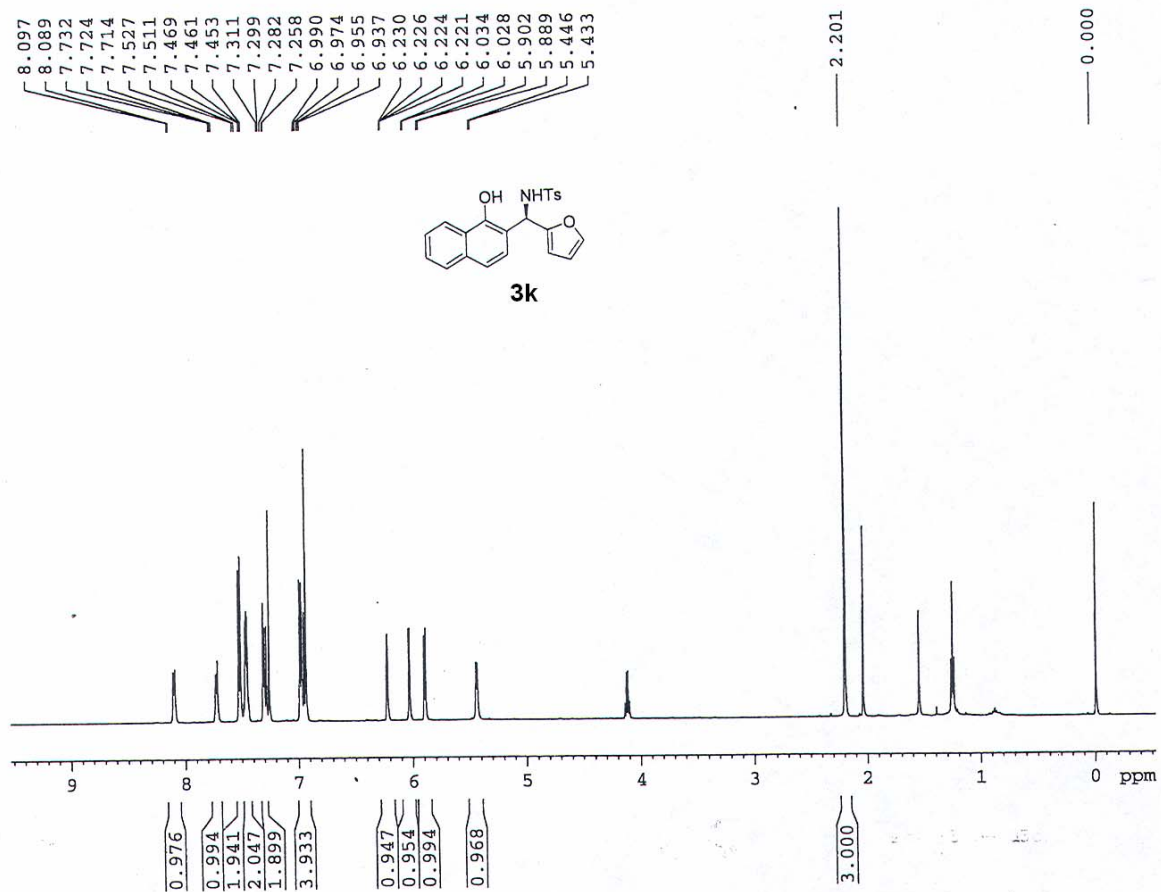


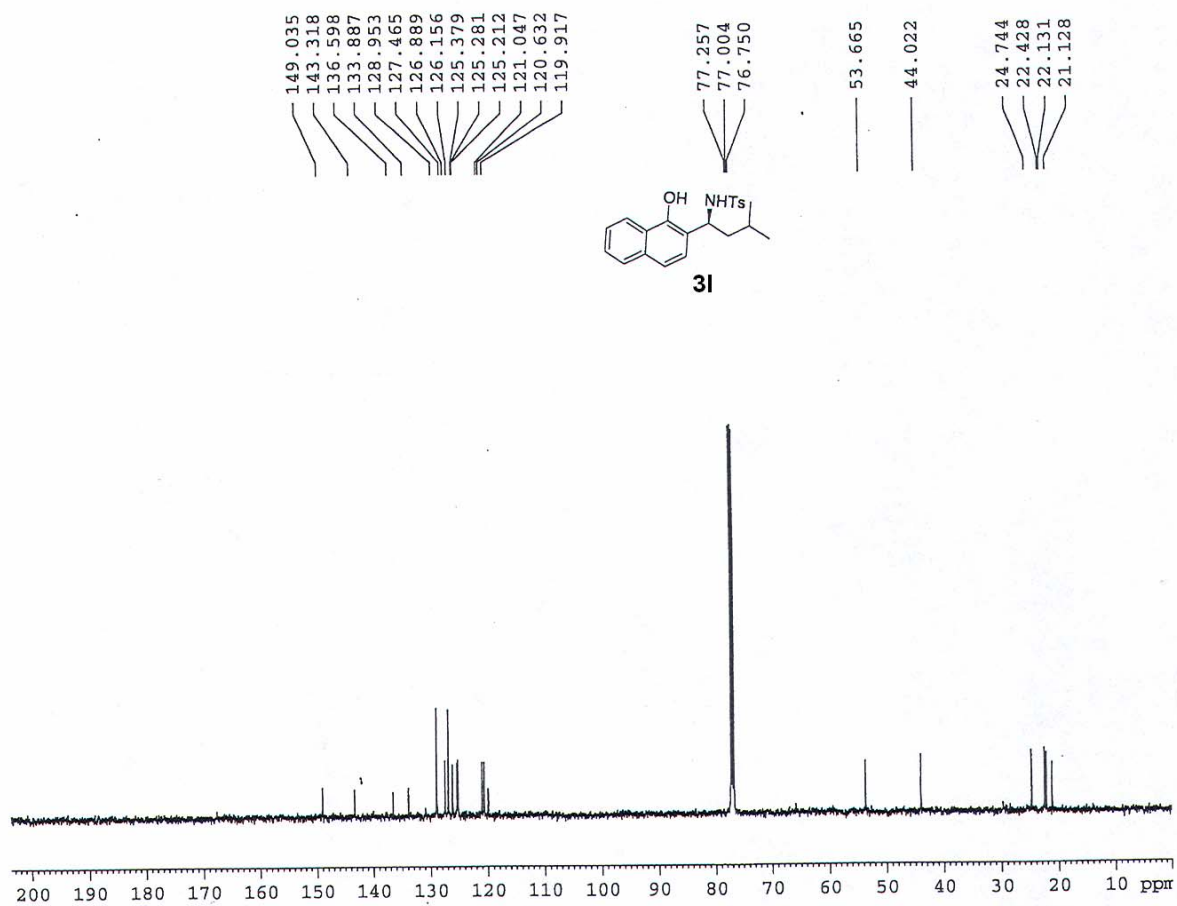
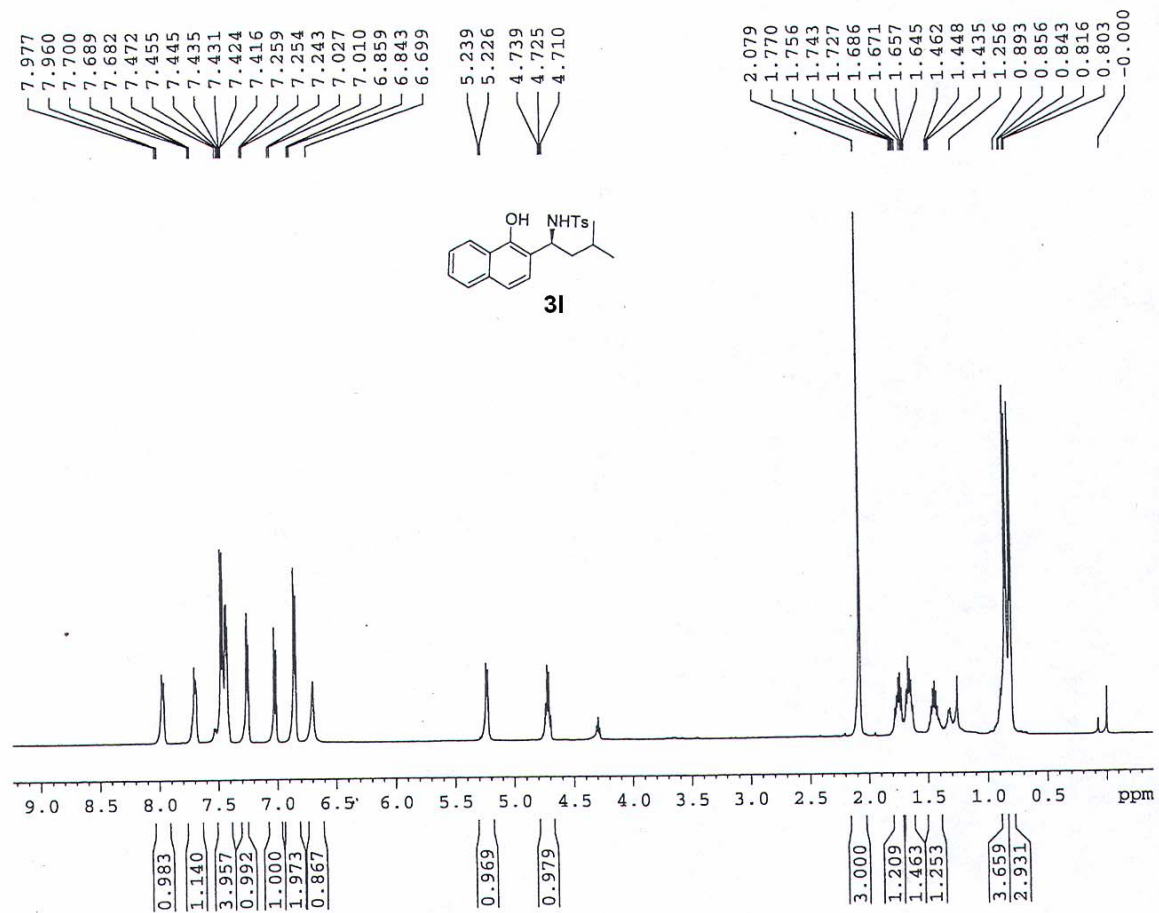


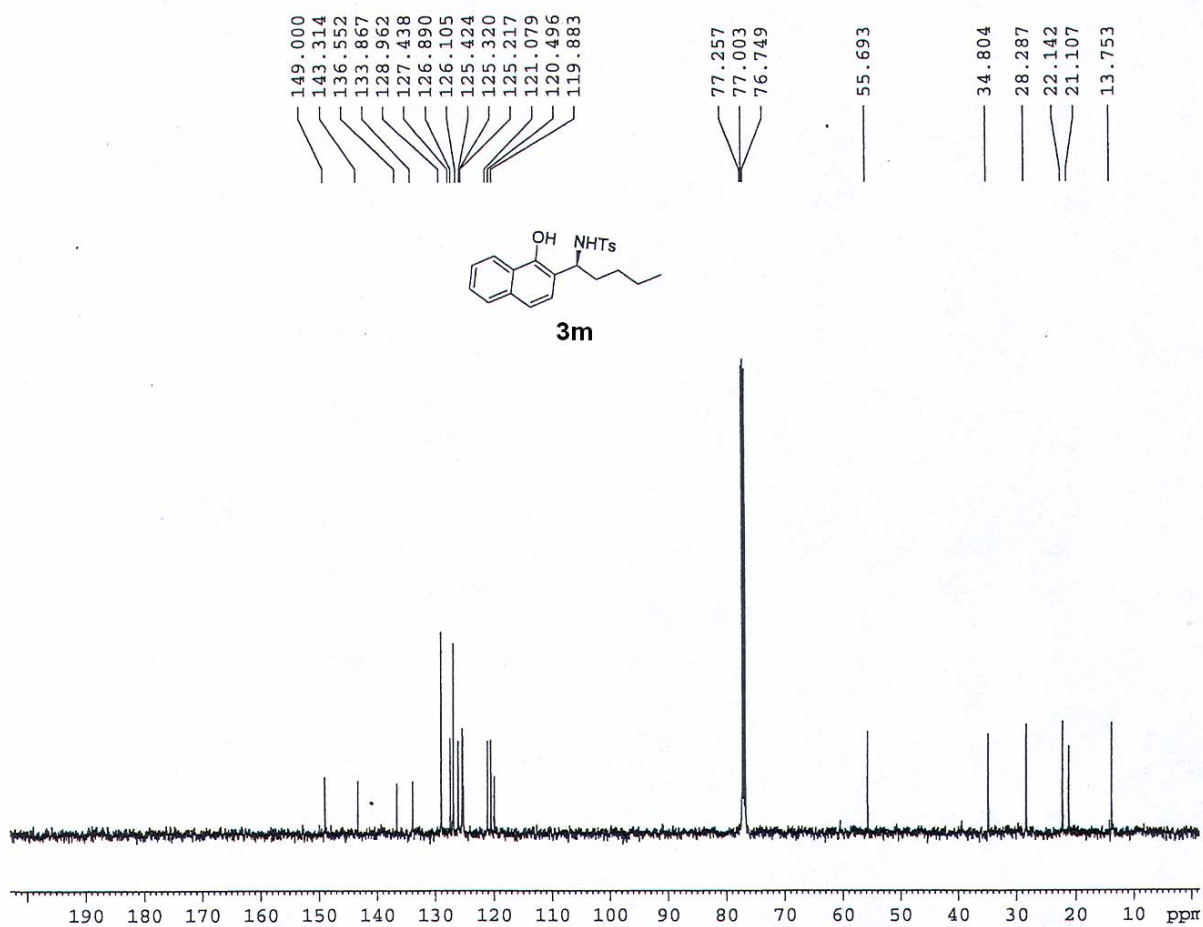
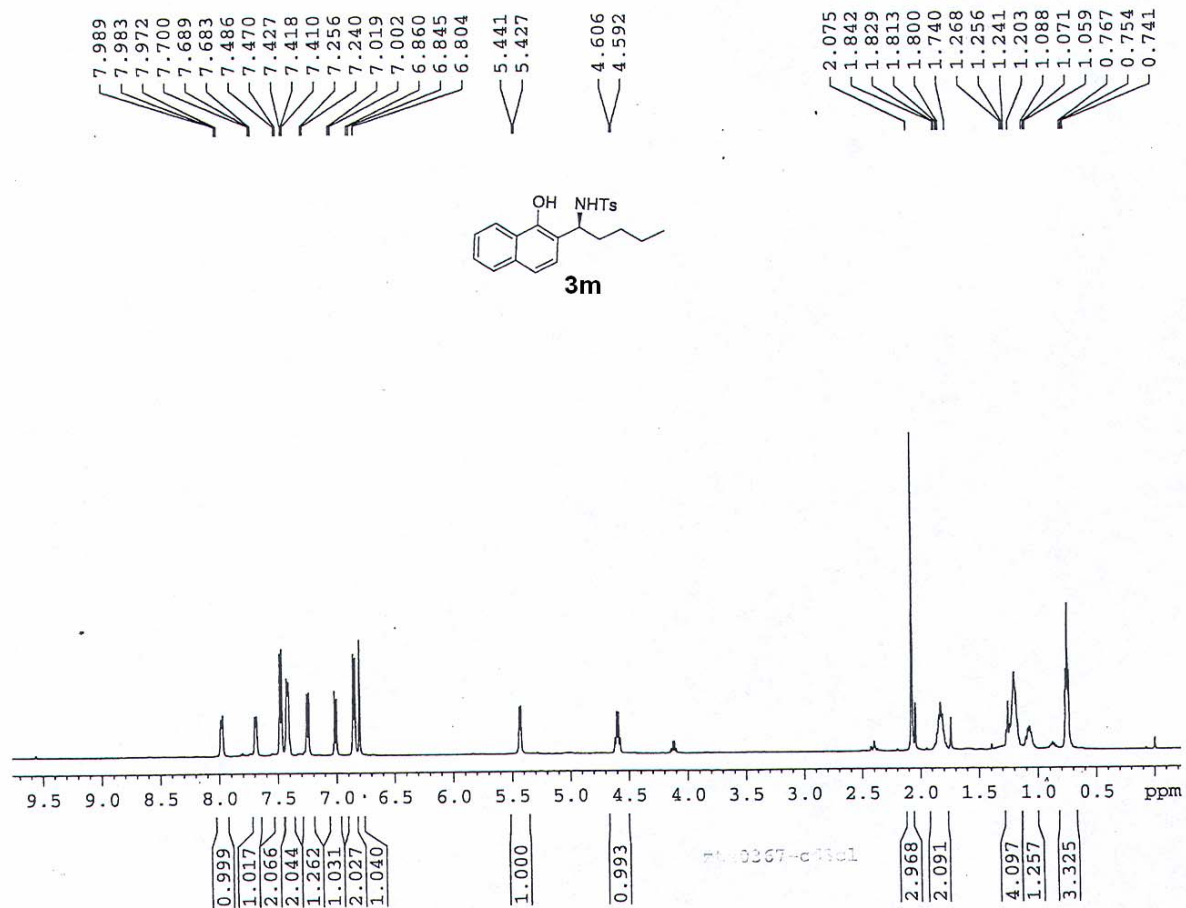




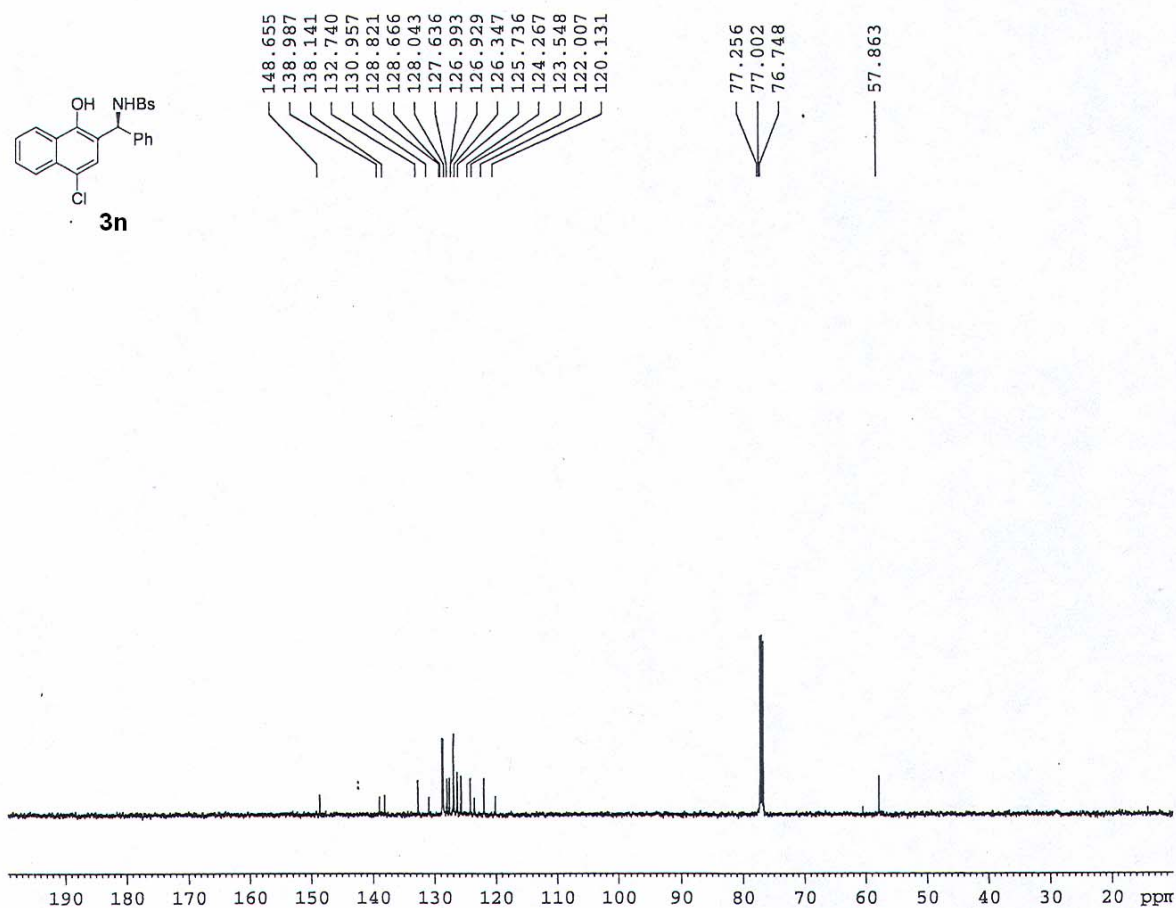
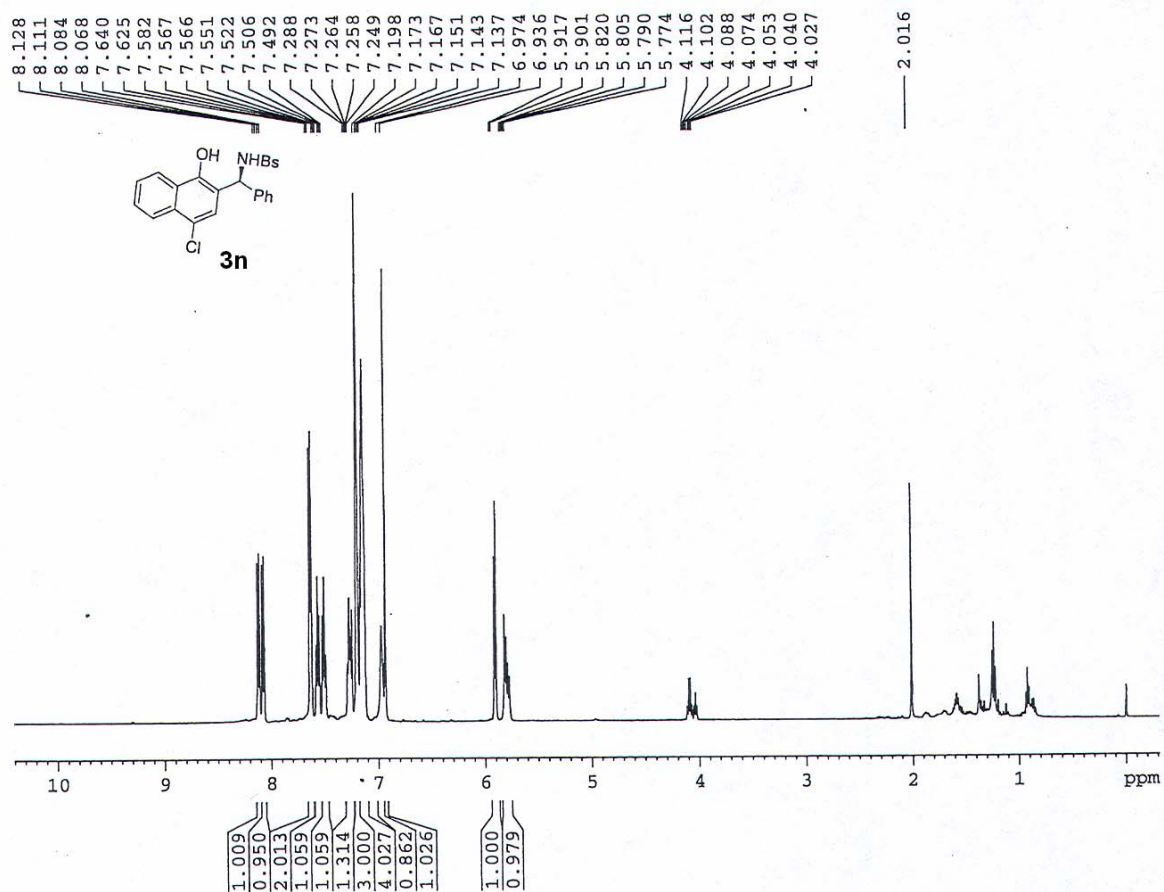


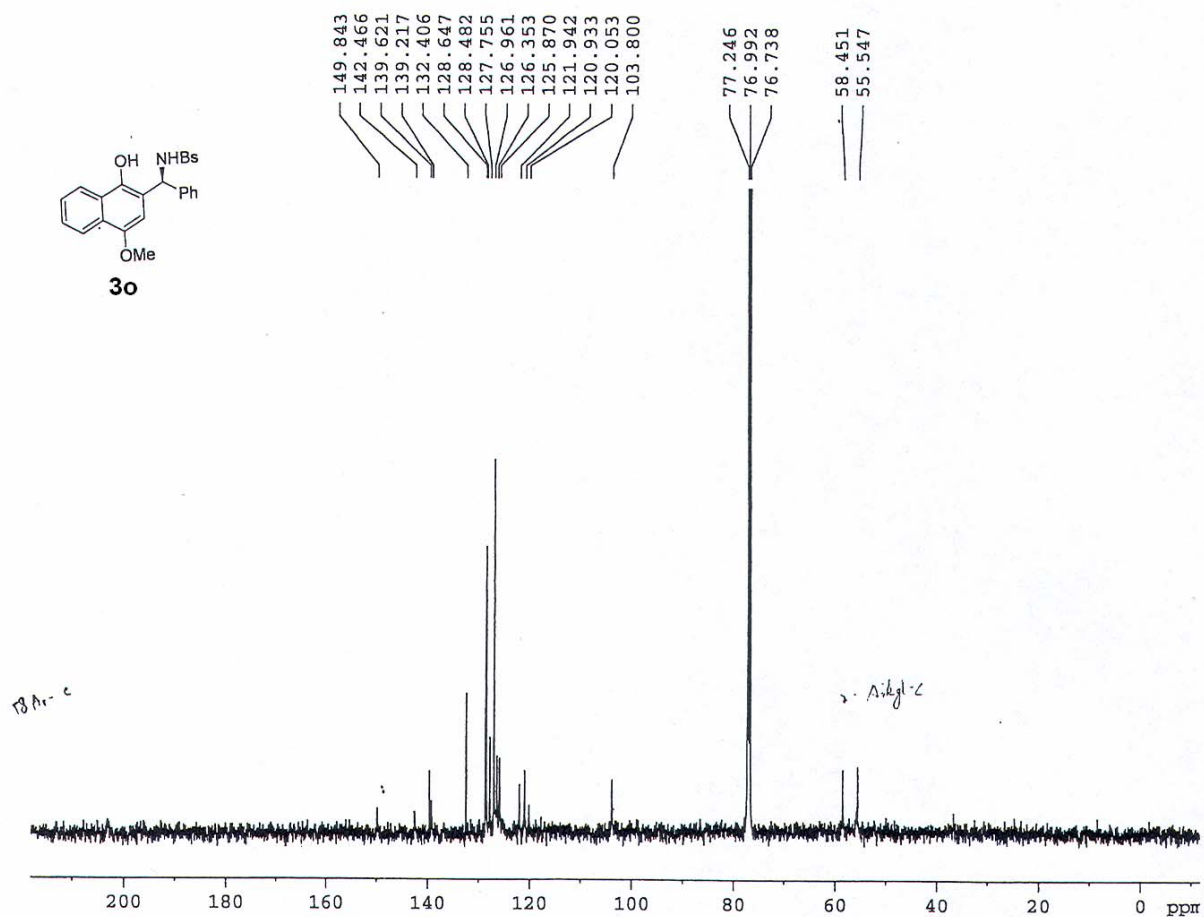
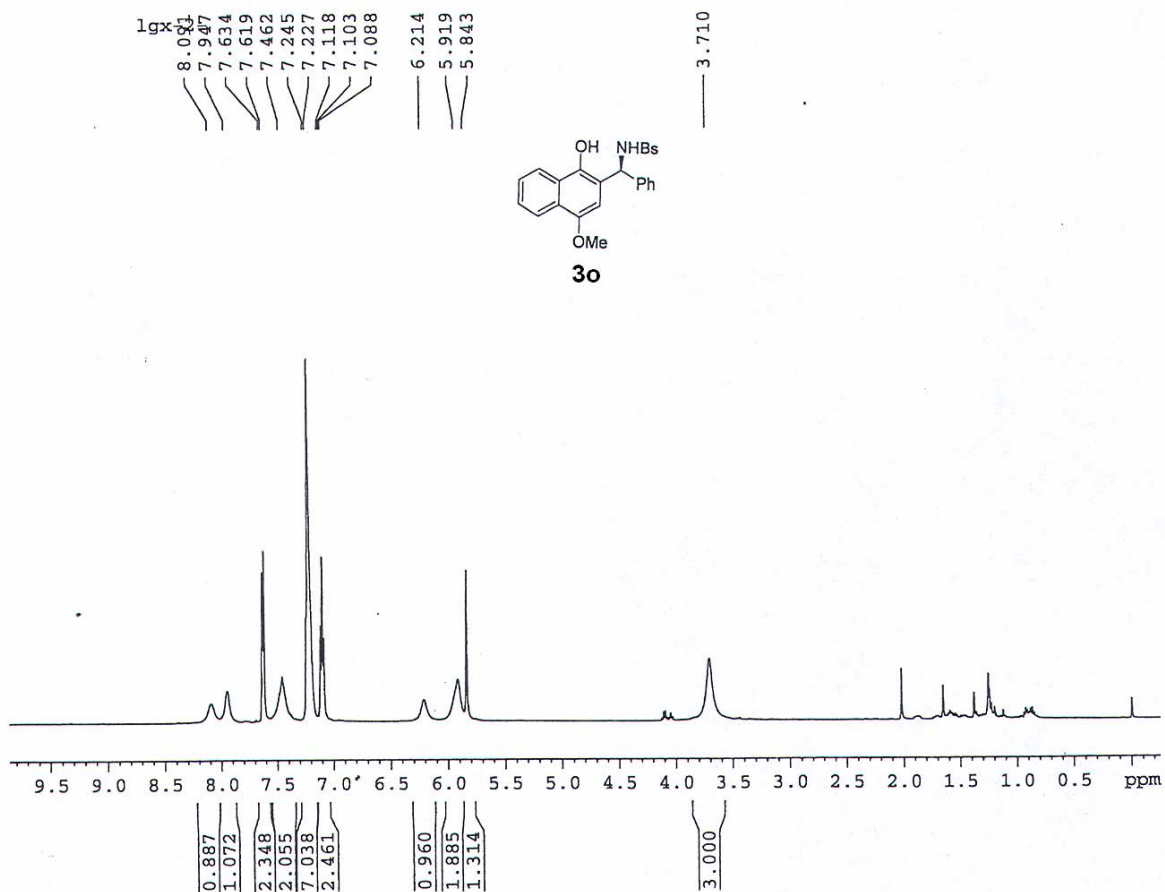


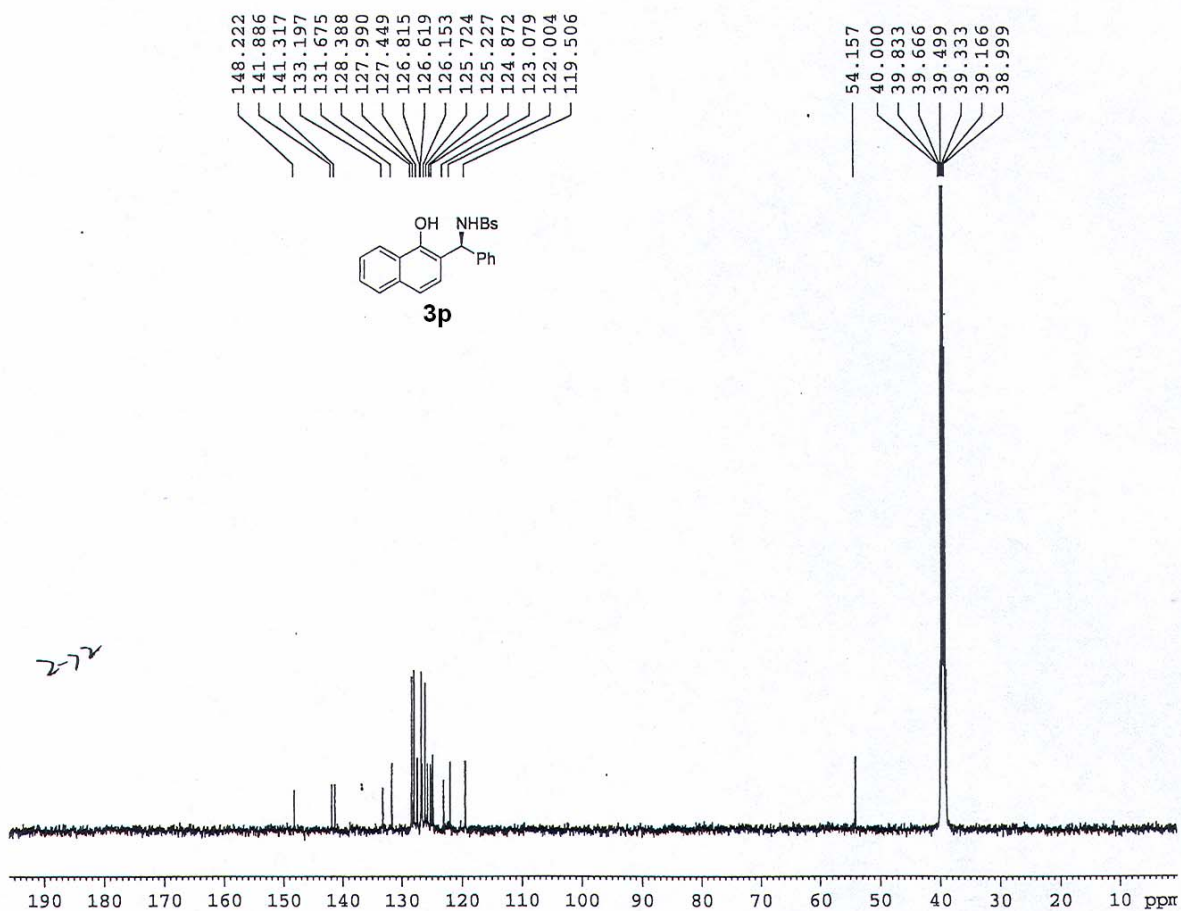
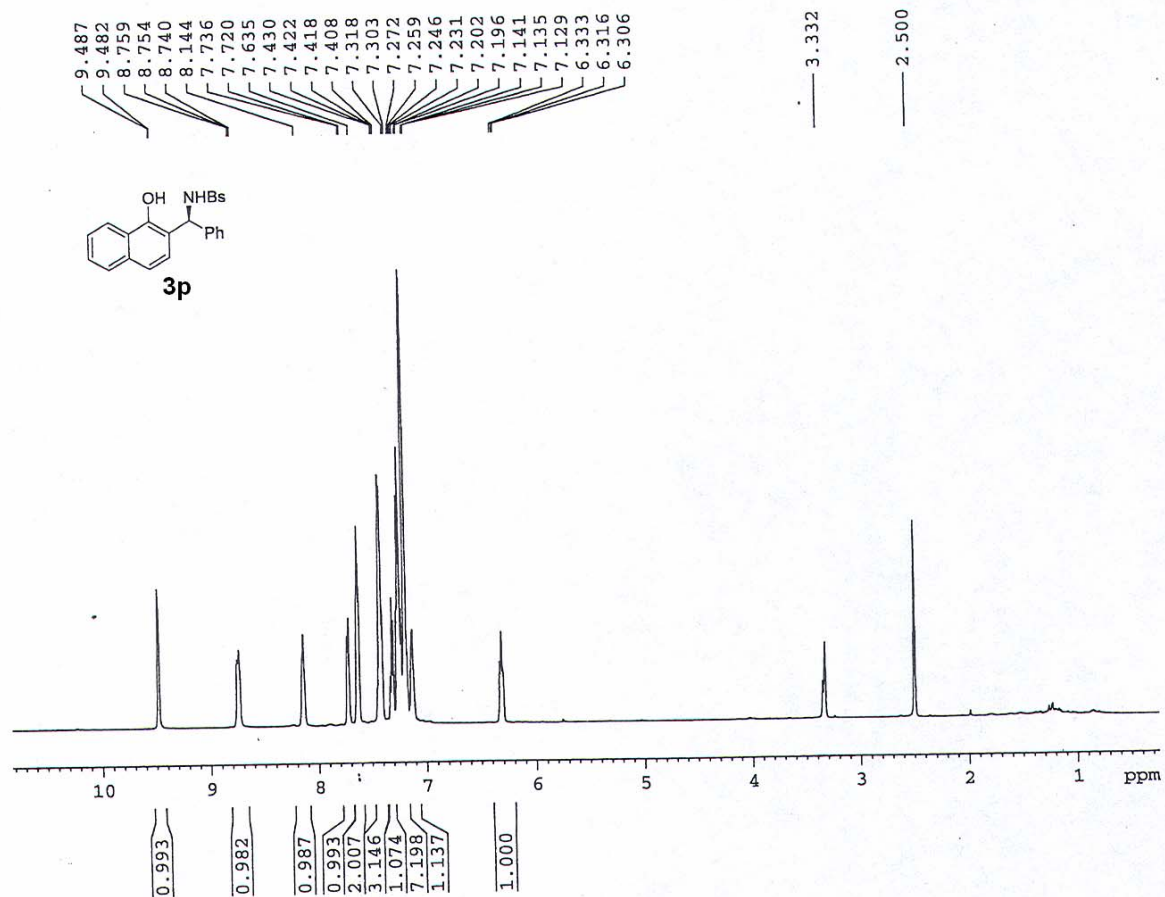




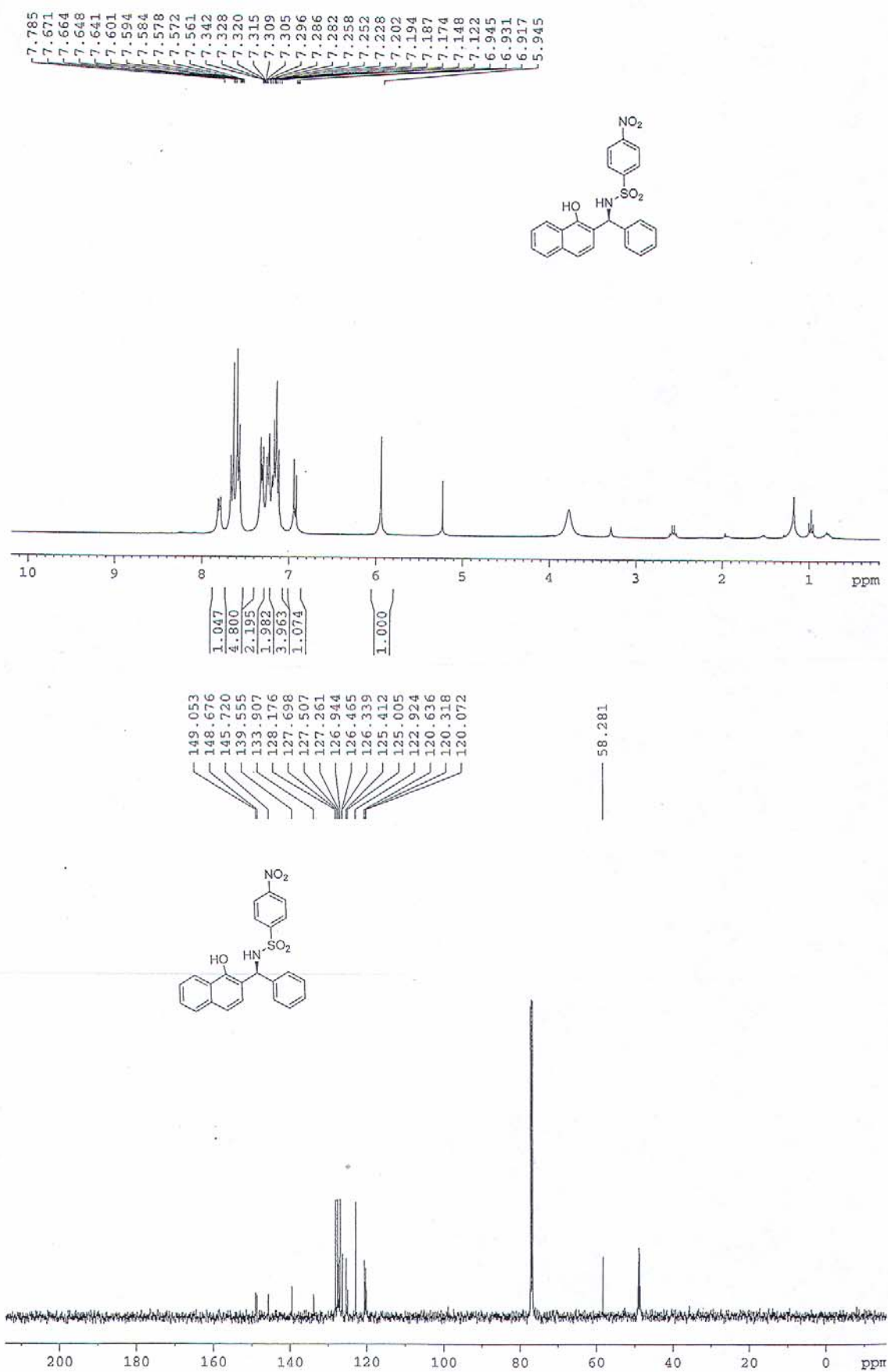




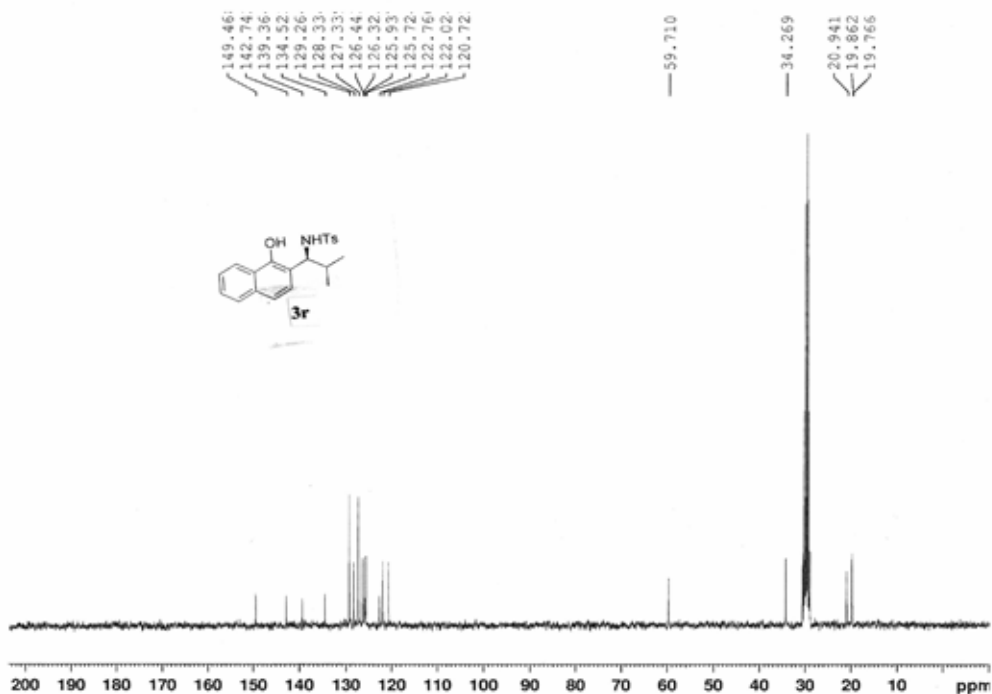
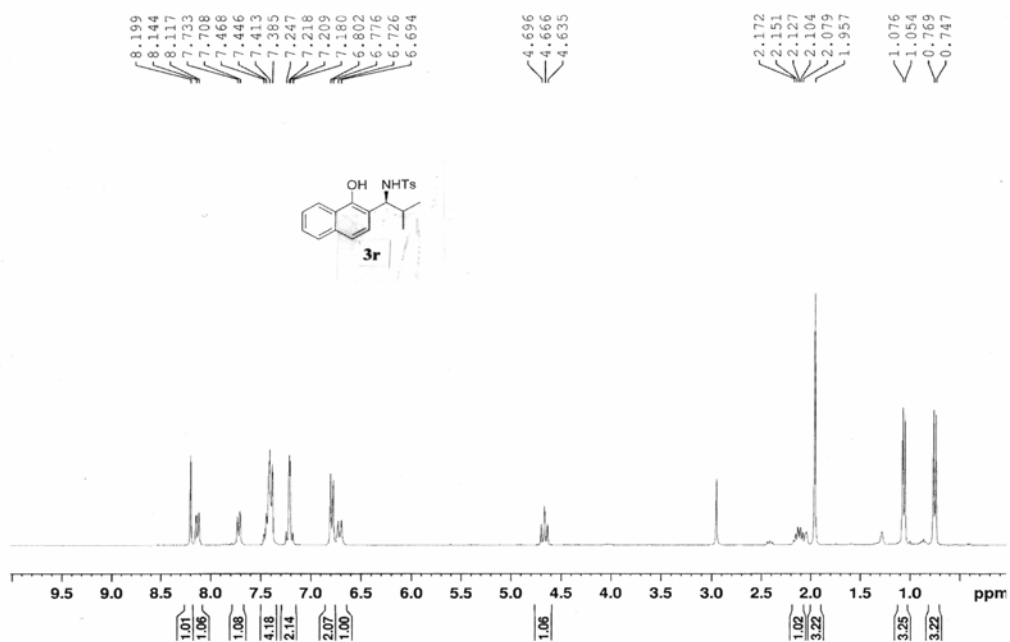




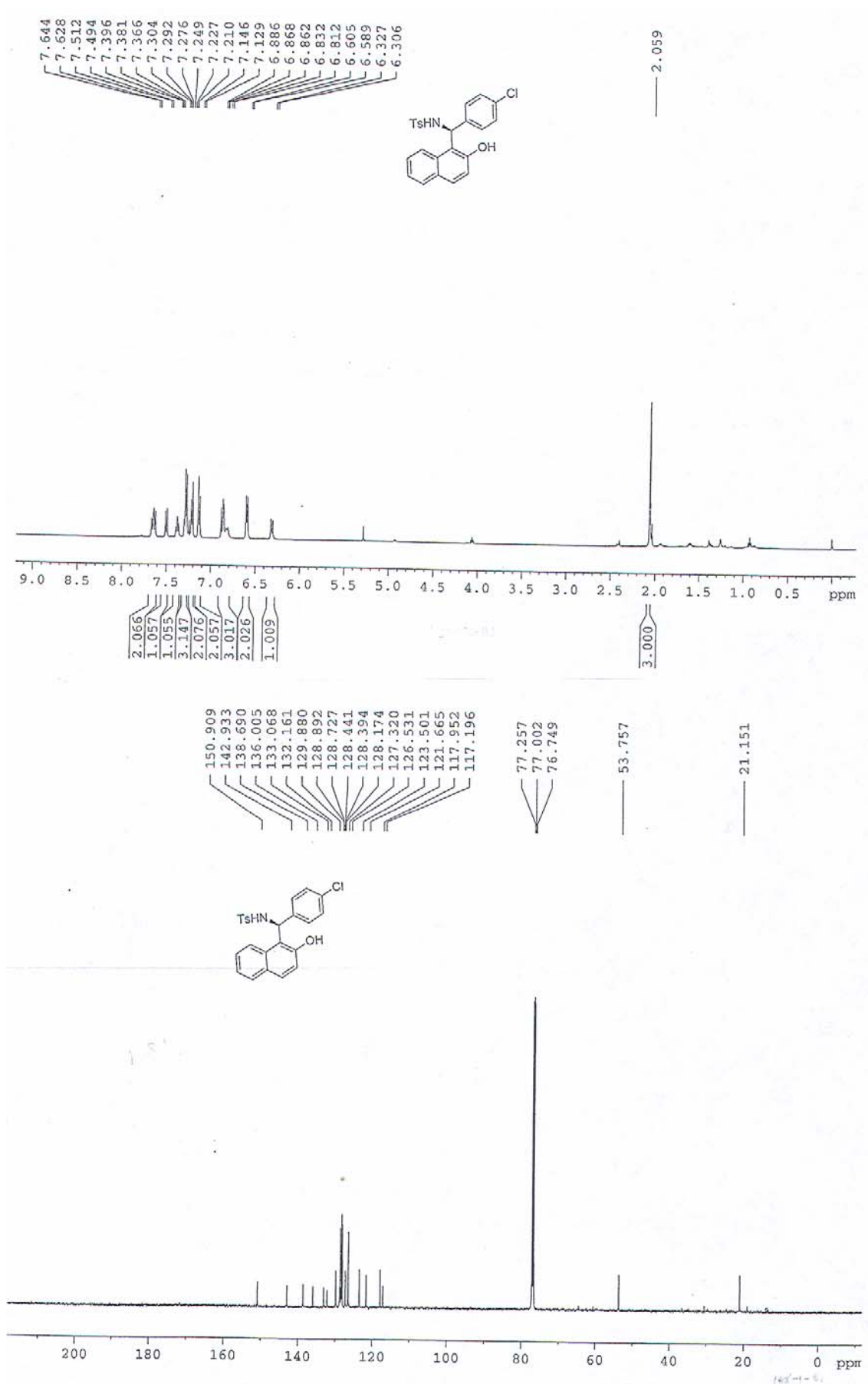
# Compound 3q



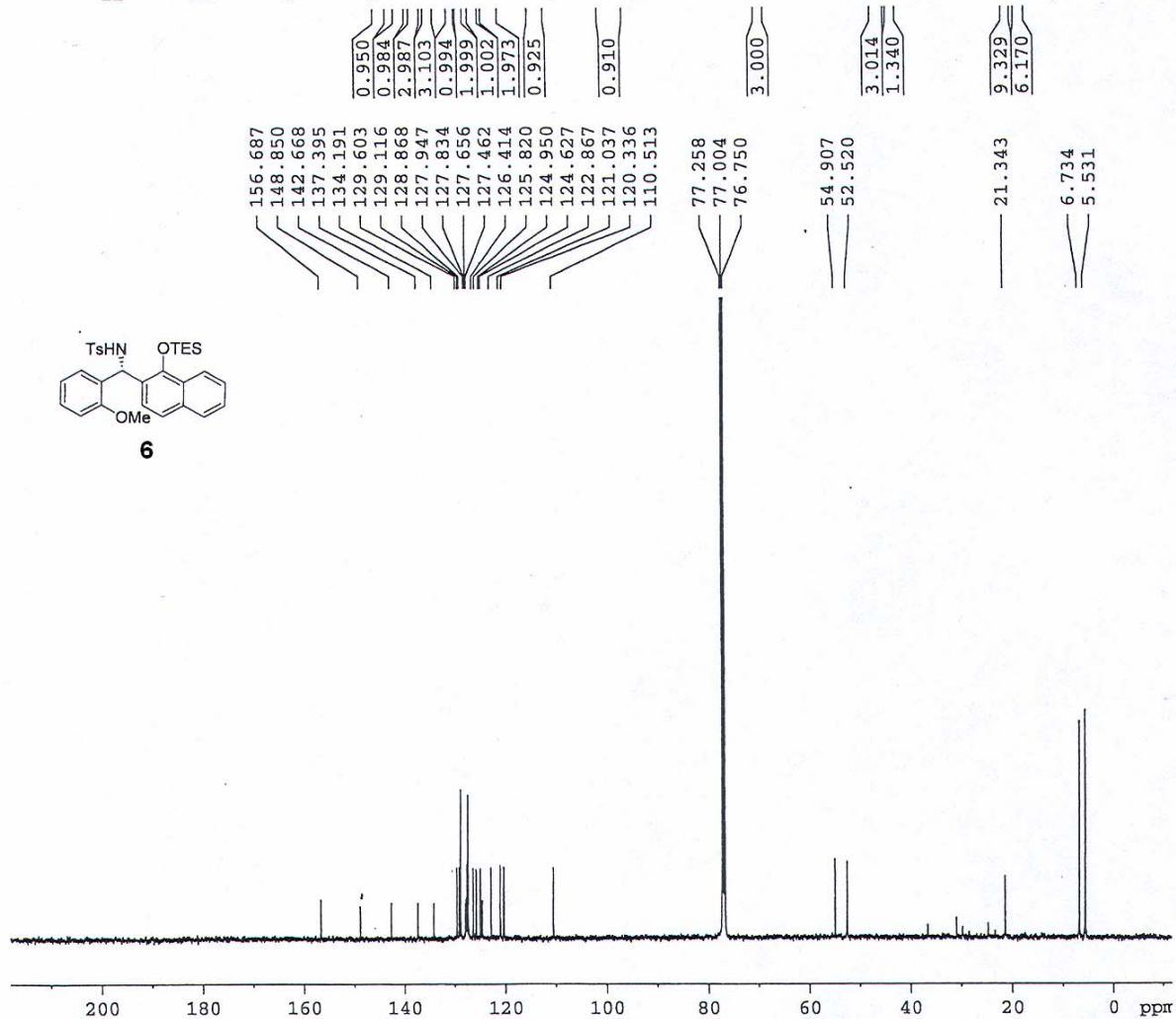
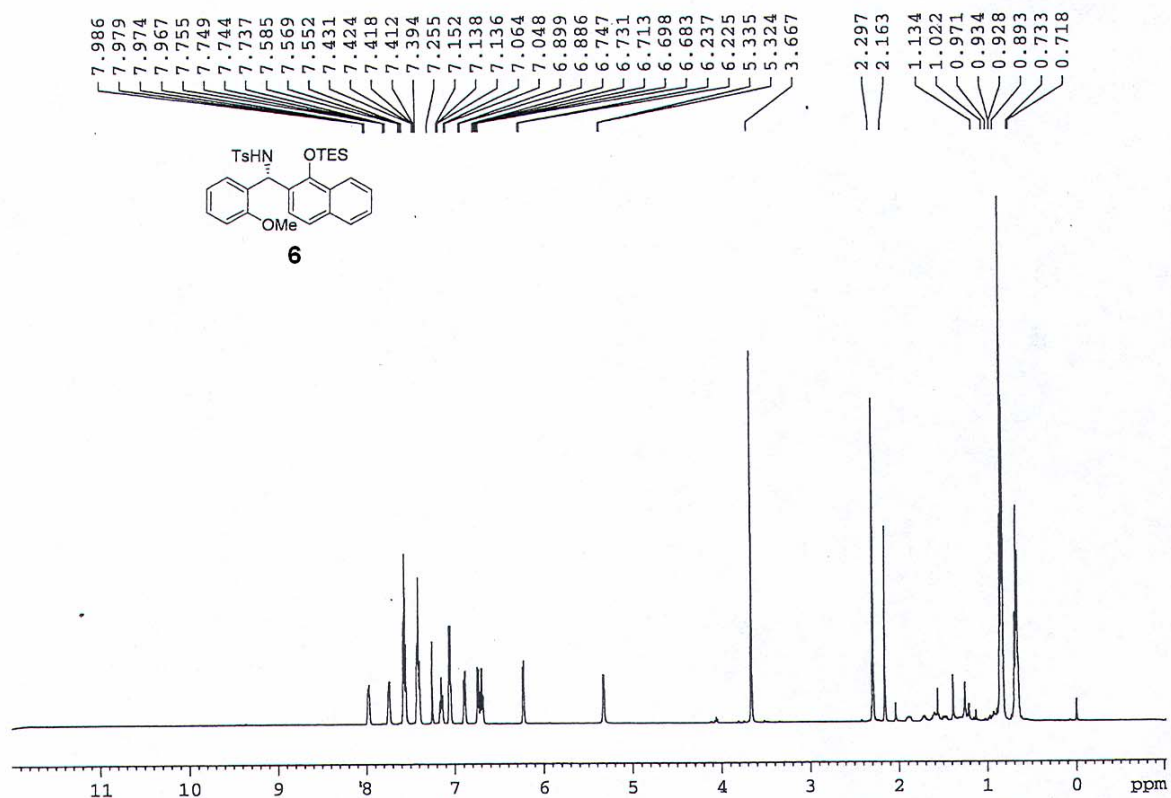


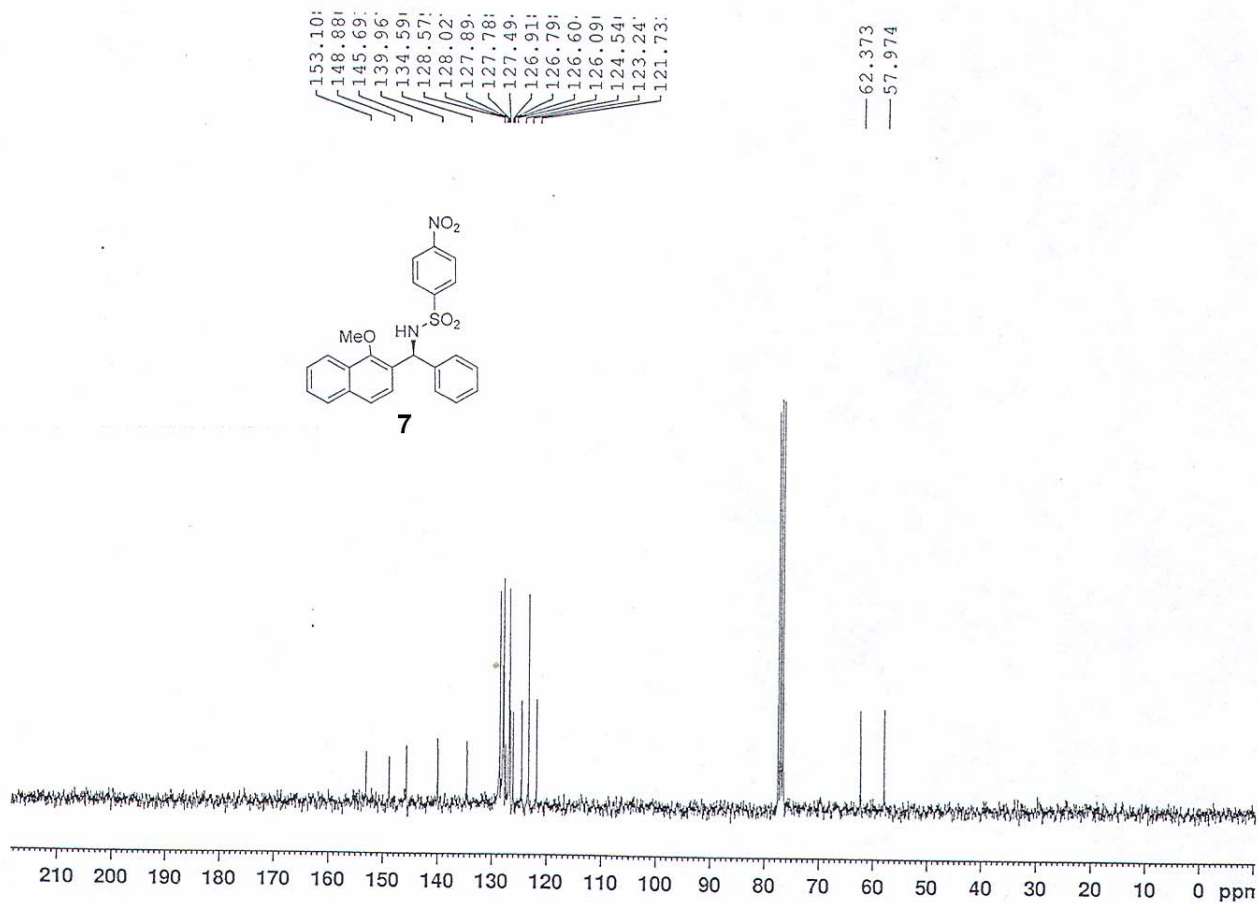
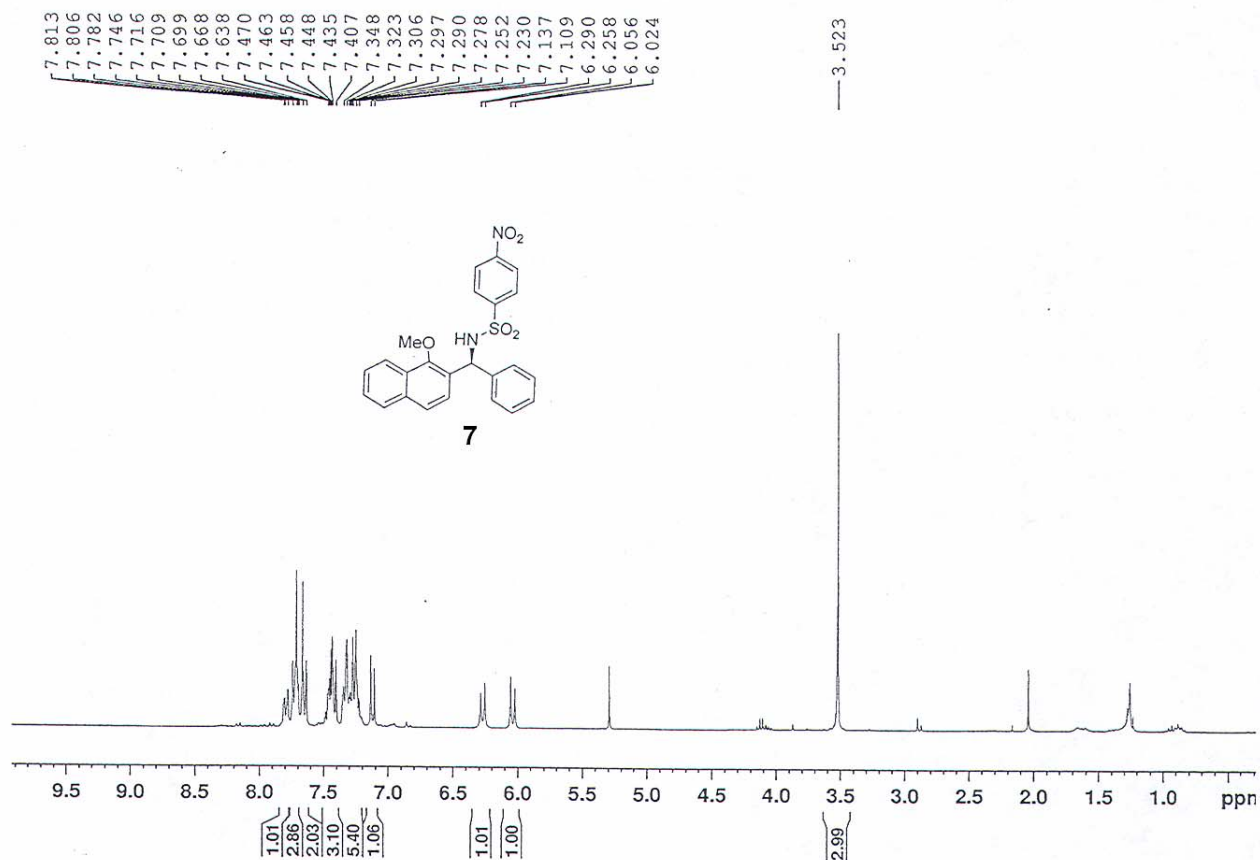


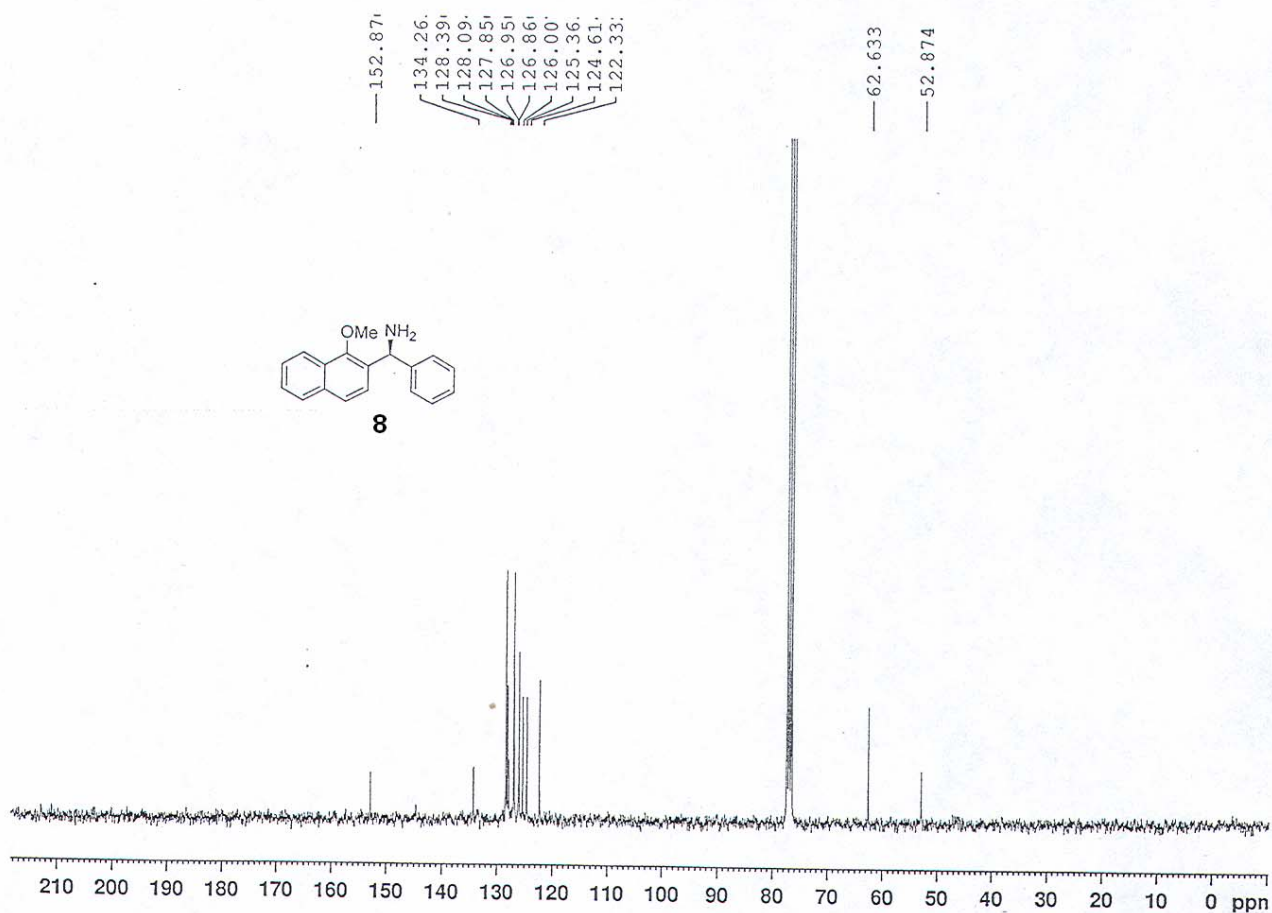
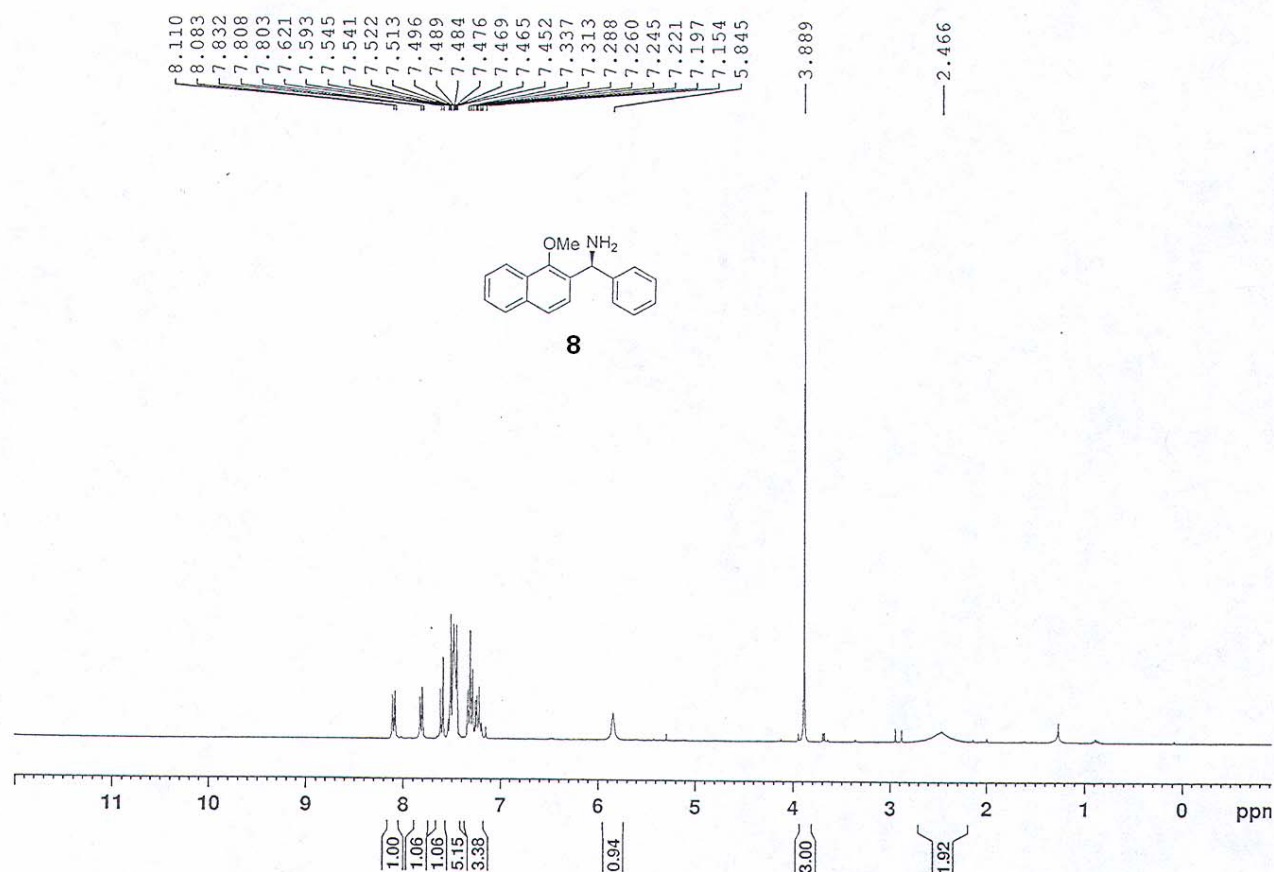
# Compound 4







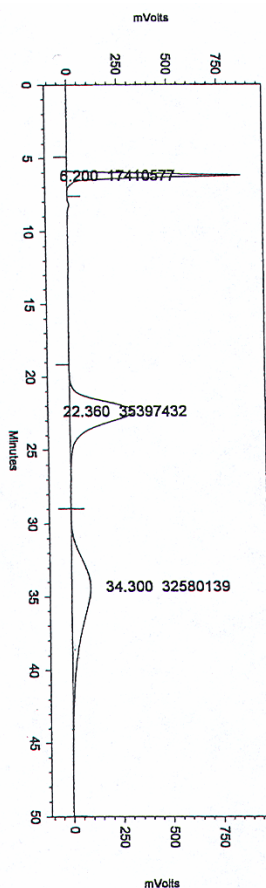
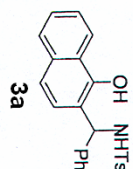






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Method Name: C:\EZStart\Projects\WeiWang\aa04.met  
Data File: C:\EZStart\Projects\WeiWang\19x1-15-1.dat  
Date Acquired: 11/15/2007 10:59:26 AM Date Printed: 08/20/2008 01:47:46 PM  
Sample ID: 19x1-15

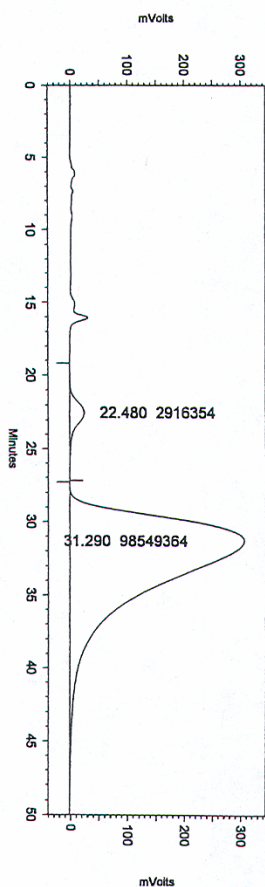
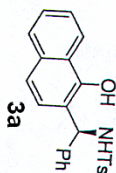


SPD-10AVP  
Ch1-235nm Results

PK #	RT	Area	Area %
2	22.360	35397432	41.455
3	34.300	32580139	38.155
Totals		67977571	79.610

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Method Name: C:\EZStart\Projects\WeiWang\11.met  
Data File: C:\EZStart\Projects\WeiWang\19x1-35-3.dat  
Date Acquired: 11/29/2007 12:52:47 PM Date Printed: 08/20/2008 01:43:35 PM  
Sample ID: 19x1-35

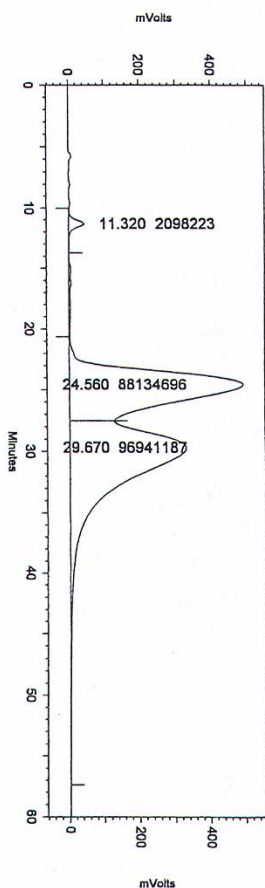
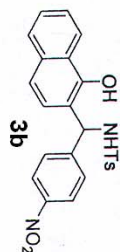


SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	22.480	2916354	2.874
2	31.290	98549364	97.126
Totals		101465718	100.000

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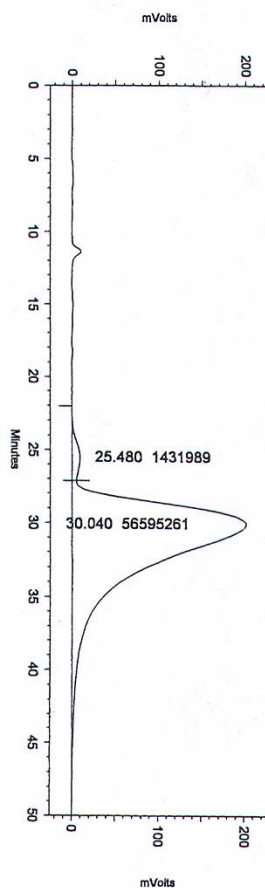
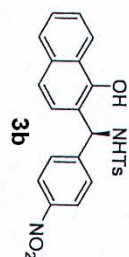
Method Name: C:\EZStart\Projects\WeiWang\aa07.met  
Data File: C:\EZStart\Projects\WeiWang\lgx1-37-1.dat  
Date Acquired: 11/30/2007 3:01:37 PM Date Printed: 11/30/2007 04:27:32 PM  
Sample ID: 1gx1-37



SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
2	24.560	88134696	47.087	
3	29.670	96941187	51.792	
Totals		185075883	98.879	

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Method Name: C:\EZStart\Projects\WeiWang\aa07.met  
Data File: C:\EZStart\Projects\WeiWang\lgx1-50-1.dat  
Date Acquired: 11/30/2007 4:30:39 PM Date Printed: 11/30/2007 05:24:29 PM  
Sample ID: 1gx1-50

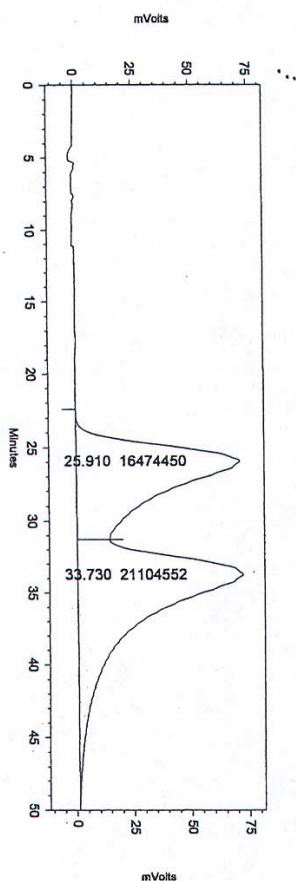
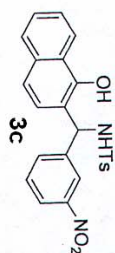


SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
1	25.480	1431989	2.468	
2	30.040	56595261	97.532	
Totals		58027250	100.000	



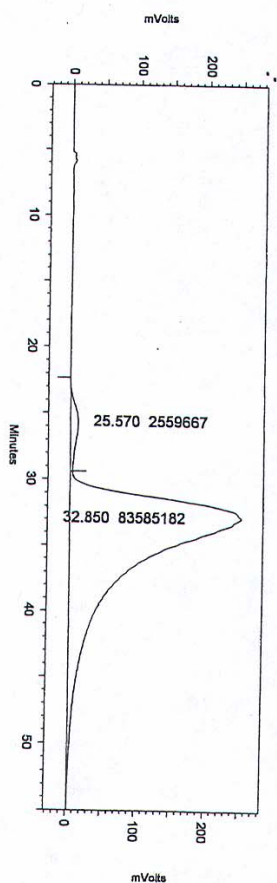
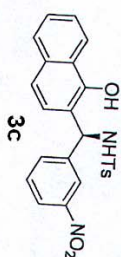
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Department of Chemistry

Method Name: C:\EzStart\Projects\WeiWang\1s1368.met  
Data File: C:\EzStart\Projects\WeiWang\1gx1-91-5.dat  
Date Acquired: 1/18/2008 11:28:55 AM Date Printed: 08/20/2008 01:51:39 PM  
Sample ID: 1gx1-91



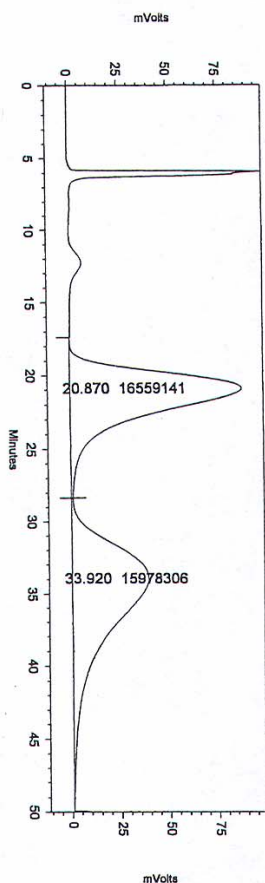
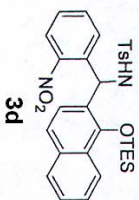
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Method Name: C:\EzStart\Projects\WeiWang\1s1368.met  
Data File: C:\EzStart\Projects\WeiWang\1gx2-1-1.dat  
Date Acquired: 1/18/2008 2:10:36 PM Date Printed: 08/20/2008 01:52:23 PM  
Sample ID: 1gx2-1



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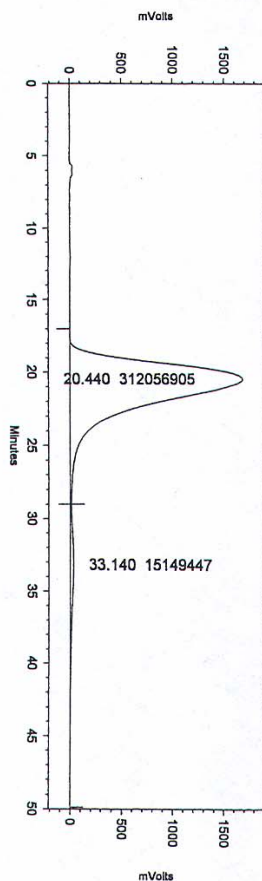
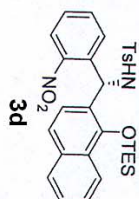
Method Name: C:\MSStart\Projects\WeiWang\z1s1632.met  
Data File: C:\MSStart\Projects\WeiWang\lgx1-831-7.dat  
Date Acquired: 1/28/2008 12:56:52 PM Date Printed: 01/28/2008 01:51:38 PM  
Sample ID: lgx1-831



SPD-10A VP Ch1-254nm Results			
PK #	RT	Area	Area %
1	20.870	16559141	50.893
2	33.920	15978306	49.107
Totals		32537447	100.000

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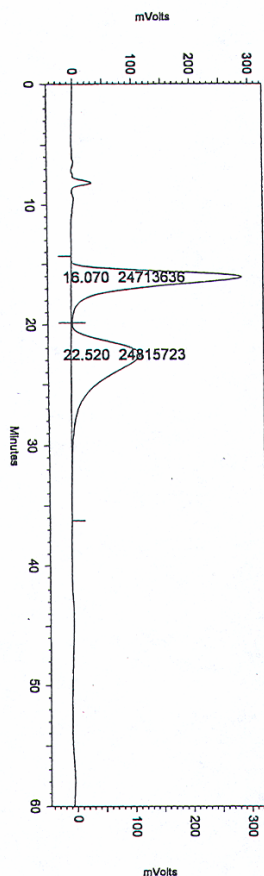
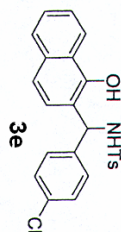
Method Name: C:\MSStart\Projects\WeiWang\z1s1632.met  
Data File: C:\MSStart\Projects\WeiWang\lgx1-861-2.dat  
Date Acquired: 1/28/2008 10:46:44 AM Date Printed: 01/28/2008 11:37:31 AM  
Sample ID: lgx1-861



SPD-10A VP Ch1-235nm Results			
PK #	RT	Area	Area %
1	20.440	312056905	95.370
2	33.140	15149447	4.630
Totals		327206352	100.000

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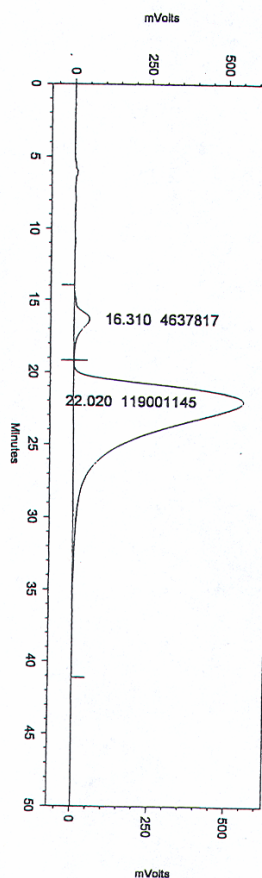
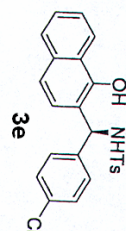
Method Name: C:\EZStart\Projects\WeiWang\11.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-39-1.dat  
Date Acquired: 11/29/2007 10:43:25 AM Date Printed: 11/29/2007 11:50:20 AM  
Sample ID: 1gx1-39



SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
1	16.070	24713636	49.897	
2	22.520	24815723	50.103	
Totals		49529359	100.000	

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Method Name: C:\EZStart\Projects\WeiWang\11.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-40-1.dat  
Date Acquired: 11/29/2007 11:55:41 AM Date Printed: 11/29/2007 12:47:00 PM  
Sample ID: 1gx1-40

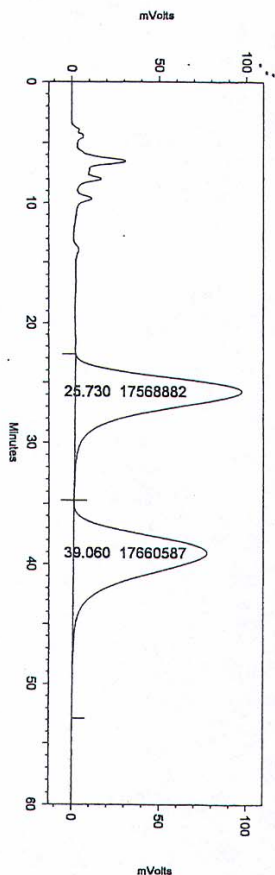
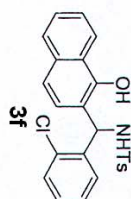


SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
1	16.310	4637817	3.751	
2	22.020	119001145	96.249	
Totals		123638962	100.000	



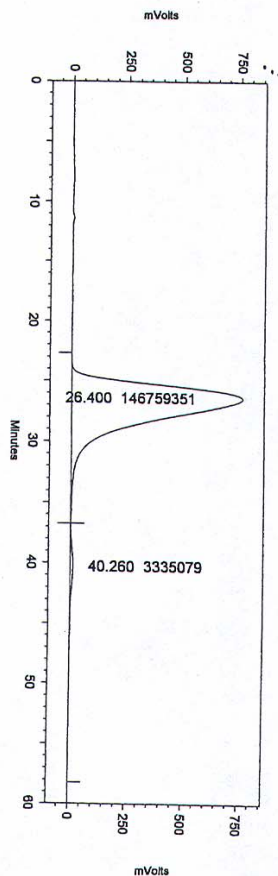
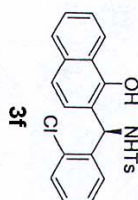
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Method Name: C:\EZStart\Projects\WeiWang\aa09.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-54-1.dat  
Date Acquired: 12/7/2007 3:02:12 PM Date Printed: 12/07/2007 04:15:40 PM  
Sample ID: 1gx1-54



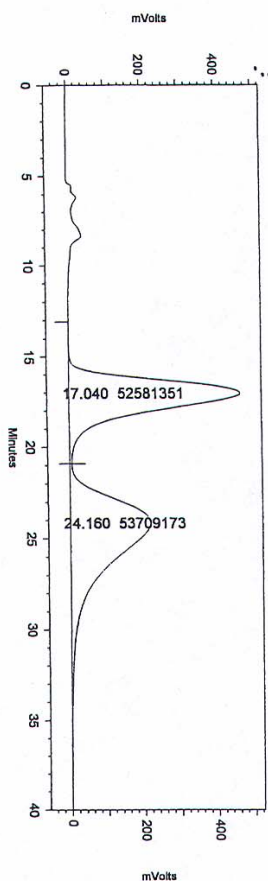
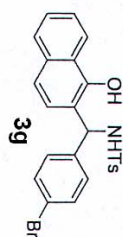
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Method Name: C:\EZStart\Projects\WeiWang\aa09.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-57-2.dat  
Date Acquired: 12/7/2007 5:23:00 PM Date Printed: 12/07/2007 09:10:04 PM  
Sample ID: 1gx1-57



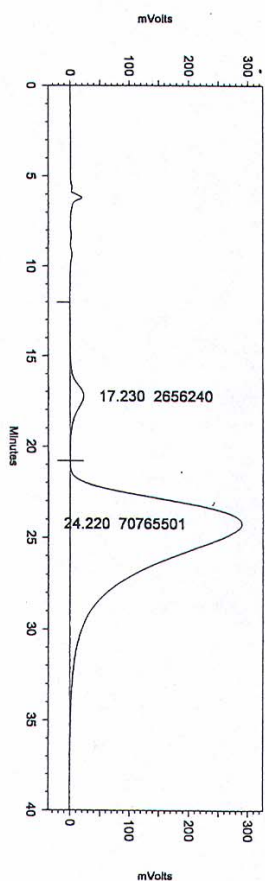
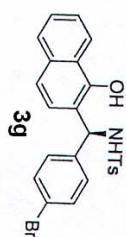
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Method Name: C:\EZStart\Projects\WeiWang\aa01.met  
Data File: C:\EZStart\Projects\WeiWang\19x1-78-2.dat  
Date Acquired: 1/2/2008 11:16:53 AM Date Printed: 01/02/2008 11:59:01 AM  
Sample ID: 19x1-78



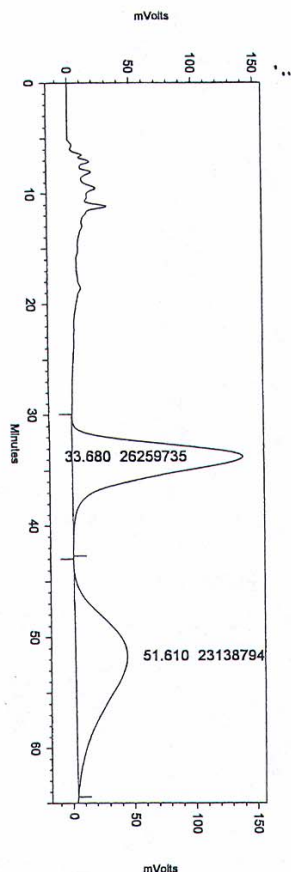
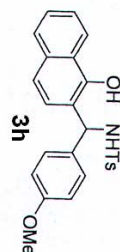
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Method Name: C:\EZStart\Projects\WeiWang\aa01.met  
Data File: C:\EZStart\Projects\WeiWang\19x1-87-1.dat  
Date Acquired: 1/2/2008 12:01:09 PM Date Printed: 01/02/2008 12:42:17 PM  
Sample ID: 19x1-87



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Method Name: C:\EZStart\Projects\WeiWang\1s1560.met  
Data File: C:\EZStart\Projects\WeiWang\1gxl-73-2.dat  
Date Acquired: 12/18/2007 10:30:42 AM Date Printed: 12/18/2007 11:38:31 AM  
Sample ID: 1gxl-73



SPD-10Avp  
Ch1-254nm Results

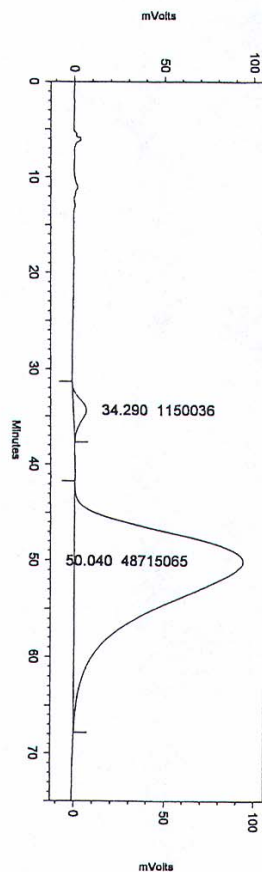
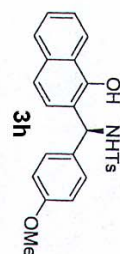
PK #	RT	Area	Area %
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1	33.680	26259735	53.159
2	51.610	23138794	46.841

Totals		49398529	100.000
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Method Name: C:\EZStart\Projects\WeiWang\1s1560.met  
Data File: C:\EZStart\Projects\WeiWang\1gxl-75-2.dat  
Date Acquired: 12/18/2007 11:45:27 AM Date Printed: 12/18/2007 01:04:11 PM  
Sample ID: 1gxl-75



SPD-10Avp  
Ch1-254nm Results

PK #	RT	Area	Area %
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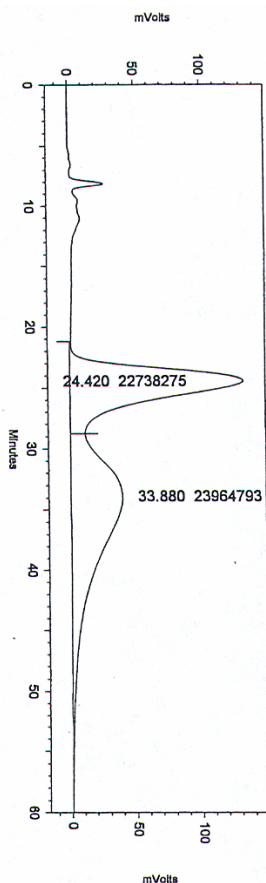
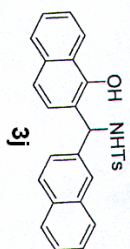
1	34.290	1150036	2.306
2	50.040	48715065	97.694

Totals		49865101	100.000
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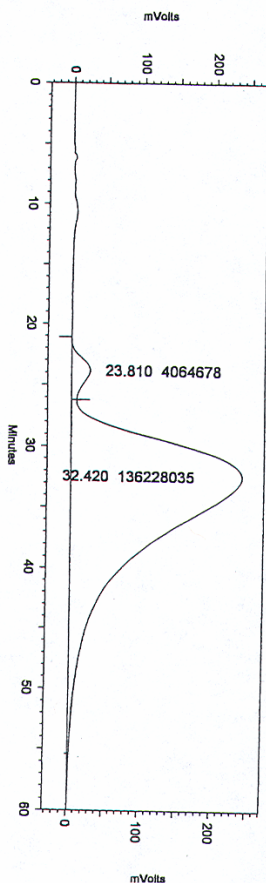
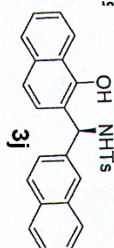
University Of New Mexico  
Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\aa09.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-55-2.dat  
Date Acquired: 12/8/2007 11:52:20 AM Date Printed: 12/10/2007 11:02:46 AM  
Sample ID: 1gx1-56



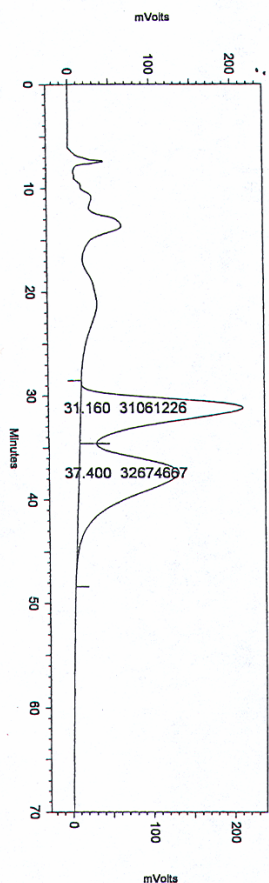
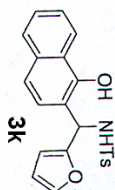
University Of New Mexico  
Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\ff55.met  
Data File: C:\EZStart\Projects\WeiWang\1gx1-59-1.dat  
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Sample ID: 1gx1-55



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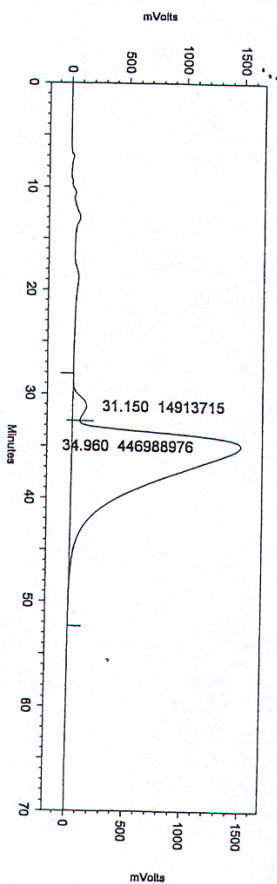
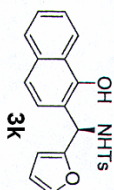
Method Name: C:\EZStart\Projects\WeiWang\zt1s1867.met  
Data File: C:\EZStart\Projects\WeiWang\zt0357a-ash-2.dat  
Date Acquired: 6/25/2008 4:39:19 PM Date Printed: 06/25/2008 05:55:35 PM  
Sample ID: zt0357a



SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
1	31.160	31061226	48.734	
2	37.400	32674667	51.266	
Totals		63735893	100.000	

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Method Name: C:\EZStart\Projects\WeiWang\zt1s1867.met  
Data File: C:\EZStart\Projects\WeiWang\zt0357b-ash-1.dat  
Date Acquired: 6/25/2008 5:57:08 PM Date Printed: 06/26/2008 11:07:05 AM  
Sample ID: zt0357b

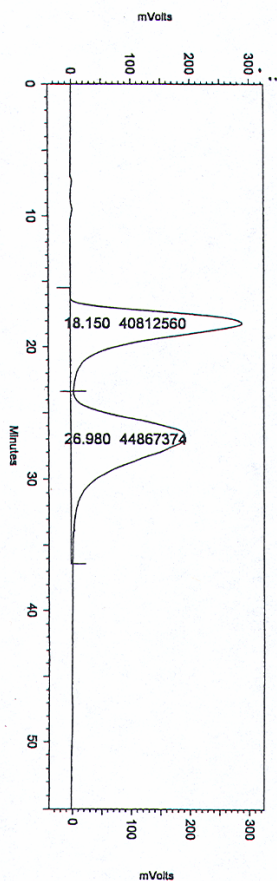
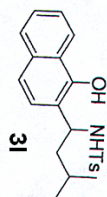


SPD-10AVP Ch1-254nm Results				
PK #	RT	Area	Area %	
1	31.150	14913715	3.229	
2	34.960	446988976	96.771	
Totals		461902691	100.000	



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Method Name: C:\EZStart\Projects\WeiWang\ztz0373.met  
Data File: C:\EZStart\Projects\WeiWang\ztz0373-oj-1.dat  
Date Acquired: 7/3/2008 3:50:24 PM Date Printed: 07/03/2008 04:50:57 PM  
Sample ID: ztz0373



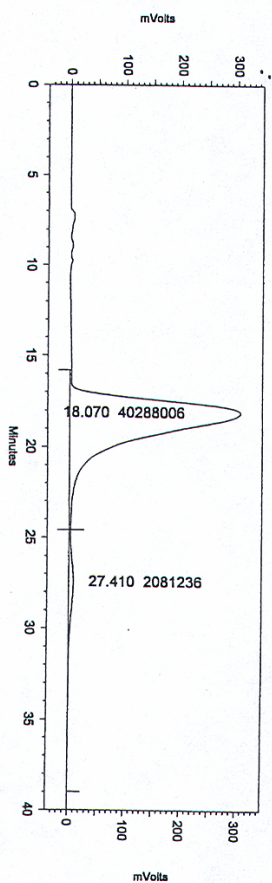
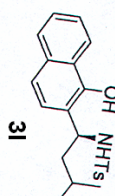
SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	18.150	40812560	47.634
2	26.980	44867374	52.366

Totals	85679934	100.000
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Method Name: C:\EZStart\Projects\WeiWang\ztz0327.met  
Data File: C:\EZStart\Projects\WeiWang\ztz0327-oj.dat  
Date Acquired: 7/3/2008 4:52:43 PM Date Printed: 07/03/2008 05:42:24 PM  
Sample ID: ztz0327



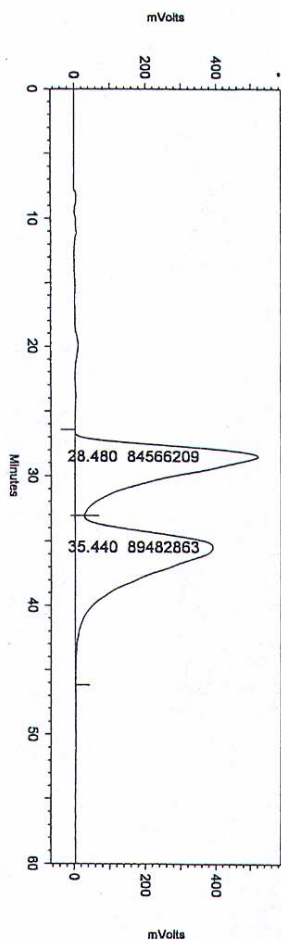
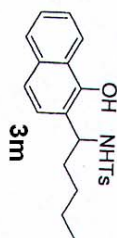
SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	18.070	40288006	95.088
2	27.410	2081236	4.912

Totals	42369242	100.000
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Method Name: C:\EZStart\Projects\WeiWang\zt1867.met  
Data File: C:\EZStart\Projects\WeiWang\zt20367-oj-4.dat  
Date Acquired: 7/4/2008 9:53:56 AM Date Printed: 07/04/2008 10:55:52 AM  
Sample ID: zt20367

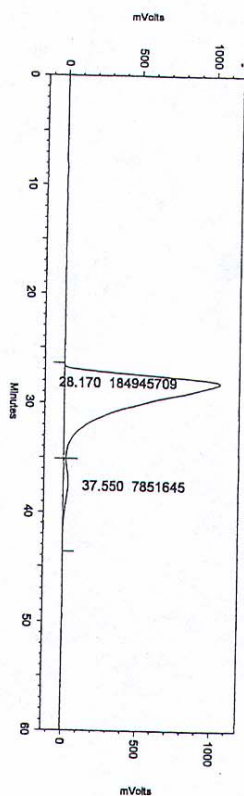
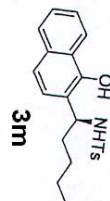


SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	28.480	84566209	48.588
2	35.440	89482863	51.412

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Method Name: C:\EZStart\Projects\WeiWang\zt1867.met  
Data File: C:\EZStart\Projects\WeiWang\zt20368-oj-1.dat  
Date Acquired: 7/4/2008 10:58:41 AM Date Printed: 07/04/2008 12:04:34 PM  
Sample ID: zt20368

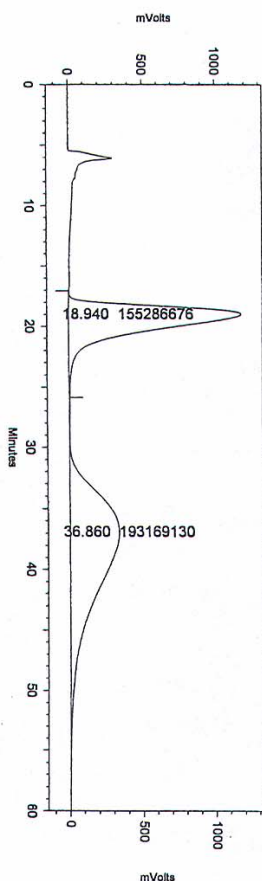
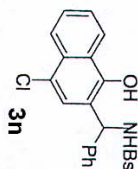


SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	28.170	184945709	95.928
2	37.550	7851645	4.072

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Method Name: C:\EZStart\Projects\WeiWang\aa07.met  
Data File: C:\EZStart\Projects\WeiWang\lgx2-8-1.dat  
Date Acquired: 1/14/2008 12:13:37 PM Date Printed: 01/14/2008 01:16:18 PM  
Sample ID: 1gx2-8

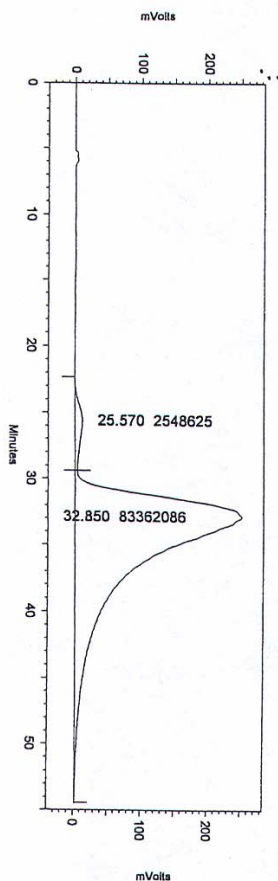
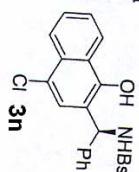


SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	18.940	155286676	44.564
2	36.860	193169130	55.436
Totals		348455806	100.000

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Method Name: C:\EZStart\Projects\WeiWang\z1a1368.met  
Data File: C:\EZStart\Projects\WeiWang\lgx2-1-1.dat  
Date Acquired: 1/18/2008 2:10:36 PM Date Printed: 01/18/2008 03:05:09 PM  
Sample ID: 1gx2-1



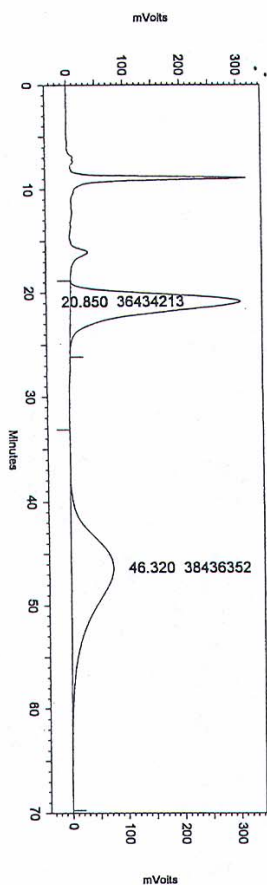
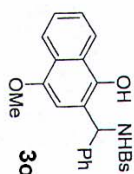
SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	25.570	2548625	2.967
2	32.850	83362086	97.033
Totals		85910711	100.000



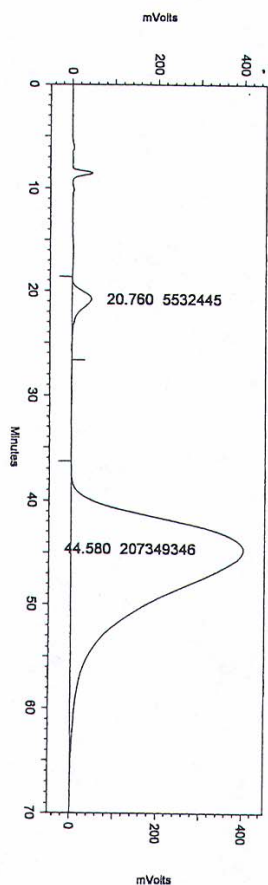
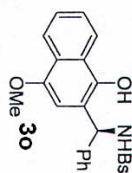
University of New Mexico  
Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\aa07.met  
Data File: C:\EZStart\Projects\WeiWang\lgx2-9-1.dat  
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Sample ID: lgx2-9



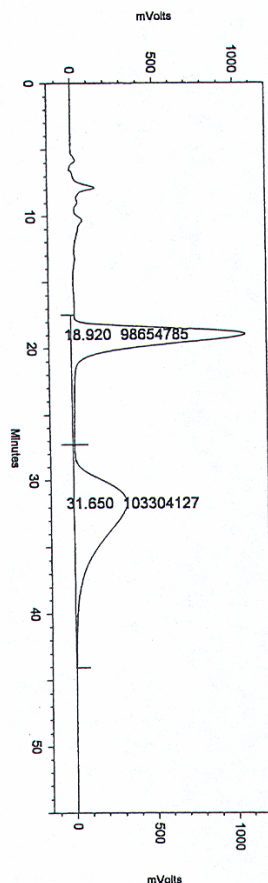
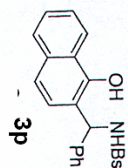
University of New Mexico  
Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\aa004.met  
Data File: C:\EZStart\Projects\WeiWang\lgx2-12-1.dat  
Date Acquired: 1/15/2008 2:57:54 PM Date Printed: 01/15/2008 04:10:40 PM  
Sample ID: lgx2-12



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Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\ffl.met  
Data File: C:\EZStart\Projects\WeiWang\lgx1-72-1.dat  
Date Acquired: 12/15/2007 3:42:40 PM Date Printed: 12/15/2007 04:39:22 PM  
Sample ID: lgx1-72



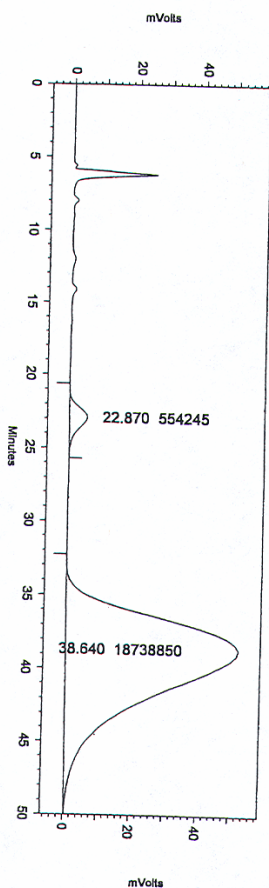
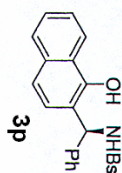
SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	18.920	98654785	48.849
2	31.650	103304127	51.151

Totals		201958912	100.000
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Department of Chemistry

Method Name: C:\EZStart\Projects\WeiWang\aa01.met  
Data File: C:\EZStart\Projects\WeiWang\lgx1-76-2.dat  
Date Acquired: 12/31/2007 4:41:05 PM Date Printed: 01/01/2008 03:17:29 PM  
Sample ID: lgx1-76



SPD-10AVP  
Ch1-254nm Results

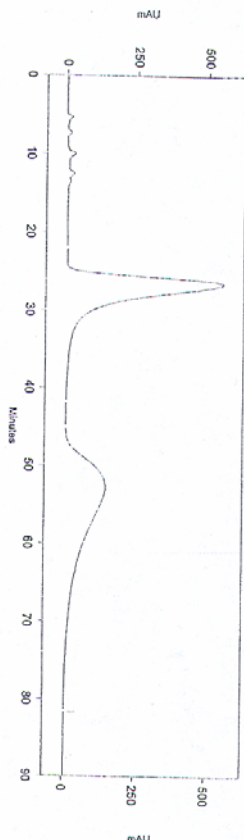
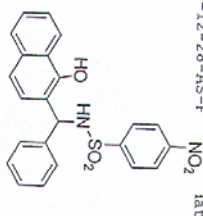
PK #	RT	Area	Area %
1	22.870	554245	2.873
2	38.640	18738850	97.127

Totals		19293095	100.000
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# Compound 3q

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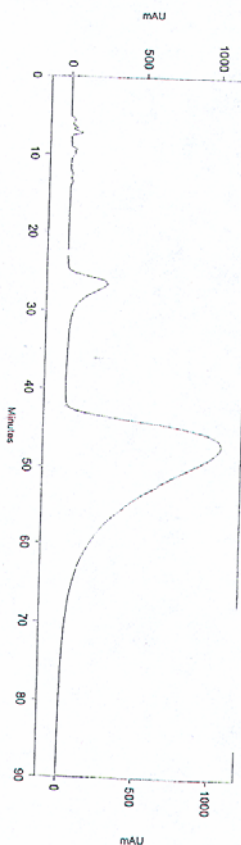
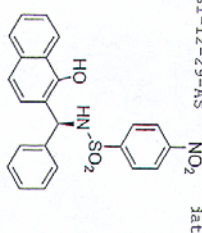
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Data File: C:\EzStart\Projects\Default\Data\zsh\zsl-12-28-AS-t  
Data Acquired: 10/31/2010 6:44:08 PM  
Date Printed: 10/31/2010 10:43:38 PM  
Sample ID: zsl-12-28



SPD-20A Ch2-210nm Results				
PK #	Retention Time	Area	Area Percent	
1	26.458	10588593	51.606	
2	52.683	9929474	48.394	
Totals		20518067	100.000	

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Method Name: C:\EzStart\Projects\Default\Method\123.met  
Data File: C:\EzStart\Projects\Default\Data\zsh\zsl-12-29-AS  
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Date Printed: 10/31/2010 10:44:51 PM  
Sample ID: zsl-12-29



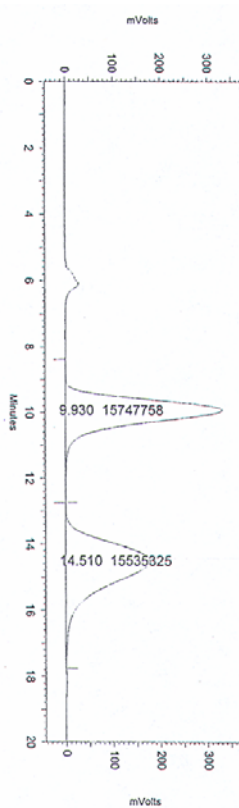
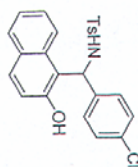
SPD-20A Ch2-210nm Results				
PK #	Retention Time	Area	Area Percent	
1	26.383	54505419	7.284	
2	47.133	693805357	92.716	
Totals		748310776	100.000	



# Compound 4

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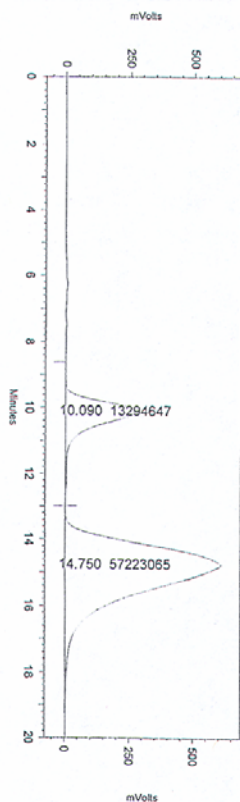
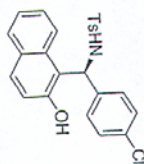
Method Name: C:\EZStart\Projects\WeiWang\lgxl-81b-1.dat  
Data File: C:\EZStart\Projects\WeiWang\lgxl-81b-1.dat  
Date Acquired: 12/24/2007 11:30:02 AM Date Printed: 12/24/2007 11:56:05 AM  
Sample ID: 19xl-81b



SPD-10AVP Chl-254nm Results			
PK #	RT	Area	Area %
1	9.930	15747758	50.340

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Method Name: C:\EZStart\Projects\WeiWang\lgxl-53-1.dat  
Data File: C:\EZStart\Projects\WeiWang\lgxl-53-1.dat  
Date Acquired: 12/5/2007 11:19:11 AM Date Printed: 12/05/2007 11:41:07 AM  
Sample ID: 19xl-53

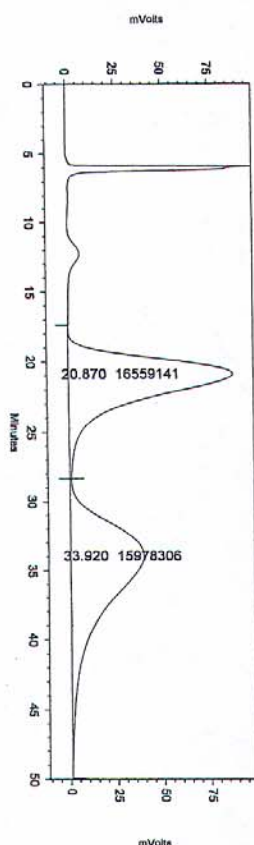
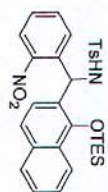


SPD-10AVP Chl-254nm Results			
PK #	RT	Area	Area %
1	10.090	13294647	18.853
2	14.750	57223065	81.147
Totals		70517712	100.000

# Compound 5

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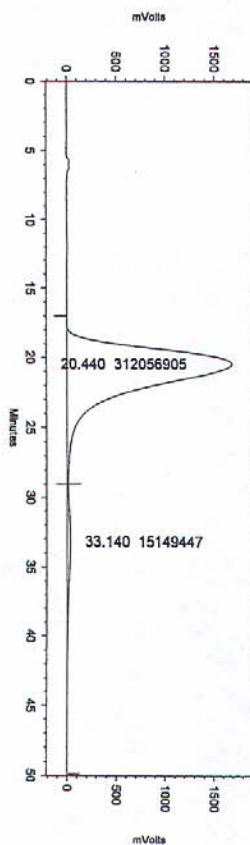
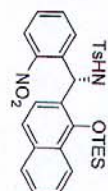
Method Name: C:\XZStart\Projects\WeiWang\z1s1632.met  
Data File: C:\XZStart\Projects\WeiWang\lgx1-83-7.dat  
Date Acquired: 1/28/2008 12:56:52 PM Date Printed: 01/28/2008 01:51:38 PM  
Sample ID: lgx1-83'



SPD-10AVP Ch1-254nm Results			
Pk #	RT	Area	Area %
1	20.870	16559141	50.893
2	33.920	15978306	49.107
Totals		32537447	100.000

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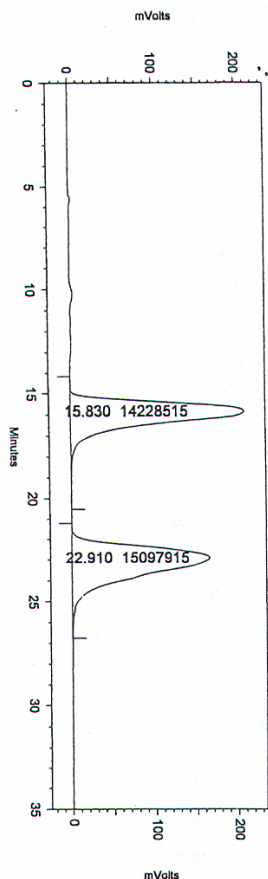
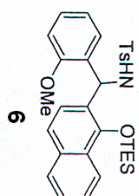
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Data File: C:\XZStart\Projects\WeiWang\lgx1-86'-2.dat  
Date Acquired: 1/28/2008 10:46:44 AM Date Printed: 01/28/2008 11:37:31 AM  
Sample ID: lgx1-86'



SPD-10AVP Ch1-255nm Results			
Pk #	RT	Area	Area %
1	20.440	312056905	95.370
2	33.140	15149447	4.630
Totals		327206352	100.000

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Method Name: C:\EZStart\Projects\WeiWang\01w.met  
Data File: C:\EZStart\Projects\WeiWang\1gx2-22-5.dat  
Date Acquired: 1/24/2008 4:25:24 PM Date Printed: 01/24/2008 05:01:12 PM  
Sample ID: 1gx2-22



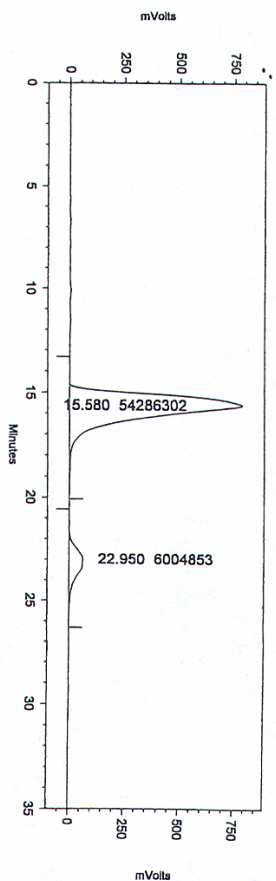
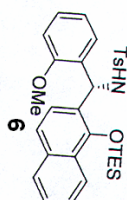
SPD-10AVP  
Ch1-254nm Results

PK #	RT	Area	Area %
1	15.830	14228515	48.518
2	22.910	15097915	51.482

Totals	29326430	100.000
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Method Name: C:\EZStart\Projects\WeiWang\01w.met  
Data File: C:\EZStart\Projects\WeiWang\1gx2-28-1.dat  
Date Acquired: 1/24/2008 5:03:24 PM Date Printed: 01/25/2008 10:27:24 AM  
Sample ID: 1gx2-28



SPD-10AVP  
Ch1-254nm Results

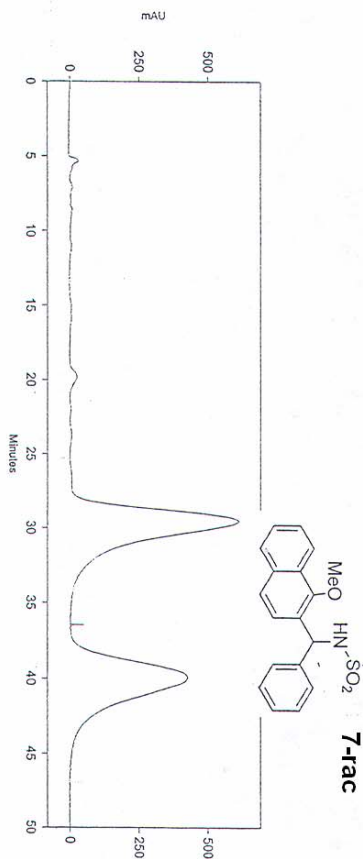
PK #	RT	Area	Area %
1	5.580	54286302	50.040
2	22.950	6004853	9.960

Totals	60291155	100.000
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Method Name: C:\EZStart\Projects\Default\Method\srthwrthwt.met  
 Data File: C:\EZStart\Projects\Default\Data\zsh\zsl-13-7-AS-H-70%-1.dat  
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 Date Printed: 12/26/2010 4:38:05 AM  
 Sample ID: zsl-13-7



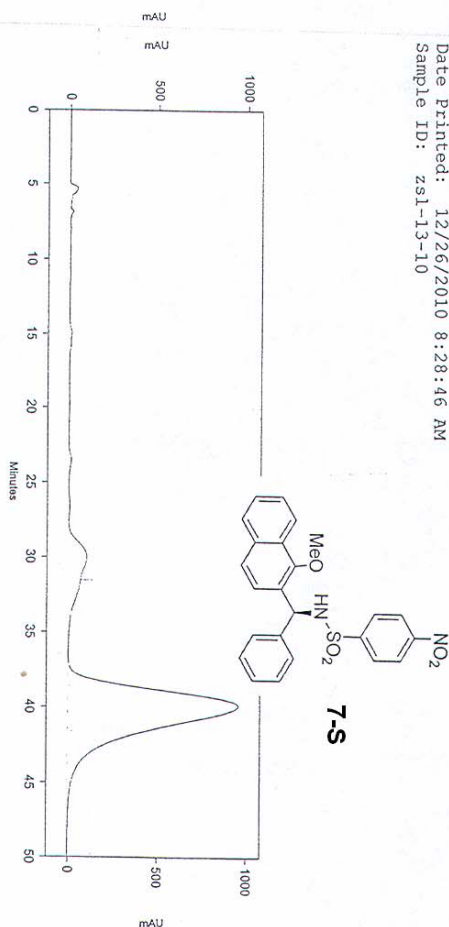
SPD-20A  
Ch2-210nm Results

PK #	Retention Time	Area	Area Percent
1	29.517	85800275	53.398
2	39.892	74881267	46.602
Totals		160681542	100.000

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Method Name: C:\EZStart\Projects\Default\Method\srthwrthwt.met  
 Data File: C:\EZStart\Projects\Default\Data\zsh\zsl-13-10-AS-H-70%-2.dat  
 Data Acquired: 12/26/2010 7:29:45 AM  
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 Sample ID: zsl-13-10



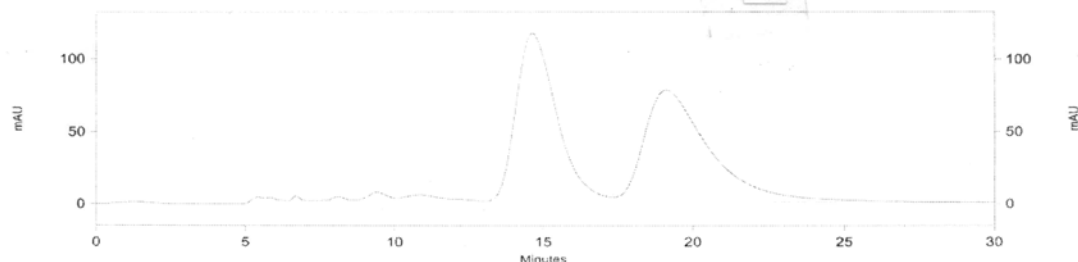
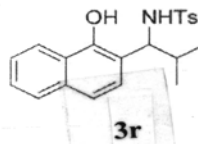
SPD-20A  
Ch2-210nm Results

PK #	Retention Time	Area	Area Percent
1	30.058	14027217	7.602
2	39.883	170485519	92.398
Totals		184512736	100.000



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Method Name: C:\EZStart\Projects\Default\Method\123.met  
 Data File: C:\EZStart\Projects\Default\Data\zsh\zsl-13-12-AS-H-60%-1.dat  
 Data Acquired: 12/29/2010 8:19:37 PM  
 Date Printed: 12/29/2010 9:42:12 PM  
 Sample ID: zsl-13-12



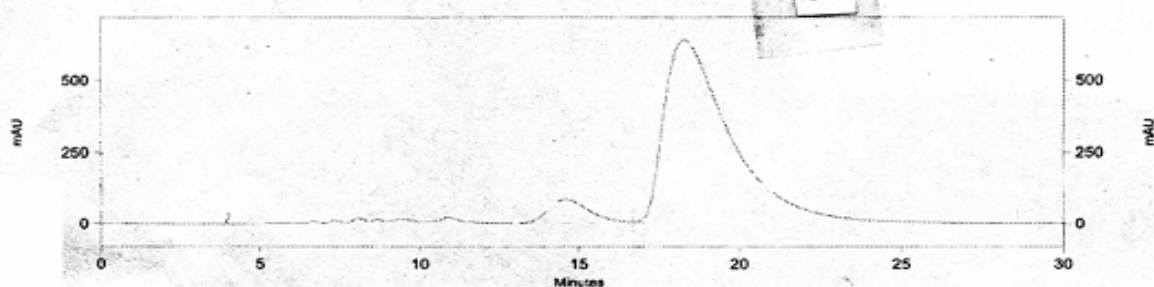
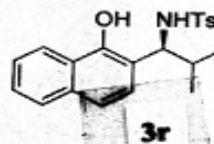
SPD-20A

Ch1-254nm Results

Pk #	Retention Time	Area	Area Percent
1	14.625	10986455	48.153
2	19.133	11829075	51.847
Totals		22815530	100.000

**University of New Mexico**  
**Department of Chemistry & Chemical Biology**

Method Name: C:\EZStart\Projects\Default\Method\srthwrthwrt.met  
 Data File: C:\EZStart\Projects\Default\Data\zsh\zsl-13-13-AS-H-60%-1.dat  
 Data Acquired: 12/29/2010 9:01:10 PM  
 Date Printed: 12/29/2010 9:39:50 PM  
 Sample ID: zsl-13-13



SPD-20A

Ch1-254nm Results

Pk #	Retention Time	Area	Area Percent
1	14.592	7685302	7.624
2	18.292	93113453	92.376
Totals		100798755	100.000