Electronic Supplementary Material (ESI) for ChemComm.

Support Information

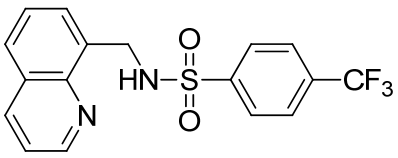
Contents

Experimental Section:

General Considerations: All the reactions were carried out under argon atmosphere using standard Schlenk technique. ^{1}H NMR (400 M Hz), ^{19}F (376 M Hz), and ^{13}C NMR (100 M Hz) were recorded on Bruker AV400 NMR spectrometer with $CDCl_3$ as solvent. Chemical shifts of ^{1}H, ^{19}F, and ^{13}C NMR spectra are reported in parts per million (ppm). The residual solvent signals were used as references and the chemical shifts converted to the TMS scale ($CDCl_3$: δ H = 7.26 ppm, δ C = 77.00 ppm), (DMSO: δ H = 2.50 ppm, δ C = 39.43 ppm). All coupling constants (J values) were reported in Hertz (Hz). Multiplicities are reported as follows: singlet (s), doublet (d), doublet of doublets (dd), doublet of doublet of doublets (ddd), doublet of triplets (dt), triplet (t), triplet of doublets (td), quartet (q), and multiplet (m). Column chromatography was performed on silica gel 200-300 mesh. Analytical thin-layer chromatography (TLC) was performed on pre-coated, glass-backed silica gel plates. Visualization of the developed chromatogram was performed by UV absorbance (254 nm). HRMS were done on Varian 7.0 T FTICR-mass spectrometer. [(*p*-Cymene)$RuCl_2$]$_2$ was prepared following a literature procedure.[1] Unless otherwise noted below, all other compounds have been reported in the literature or are commercially available from Alfa Aesar China (Beijing) Chemical Co. Ltd. without any further purification. The substrates **3b-3p**, **3a-D$_3$**[2-10] and **2a-2i**[11] were prepared according to the literatures.

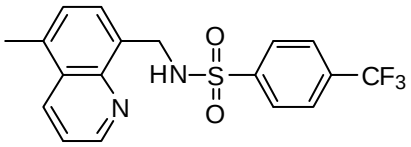
General Procedure: Ru(II)-catalyzed C-H Amidation of 8-Methyl-quinolines

A mixture of the substituted 8-methylquinoline (**1**) (0.6 mmol, 2.0 equiv), the sulfonyl azide (**2**) (if solid) (0.30 mmol, 1.0 equiv), [(*p*-cymene)$RuCl_2$]$_2$ (9.2 mg, 0.015 mmol, 5.0 mol%), $Zn(OAc)_2{\cdot}2H_2O$ (33.0 mg, 50 mol%) and $AgSbF_6$ (20.6 mg, 0.06 mmol, 20.0 mol%) were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added (followed immediately by the sulfonyl azide if it is a liquid), and the mixture was stirred at 80 °C for 12 h under Ar atmosphere. Afterward, it was transferred to a round-bottom flask. Silica was added to the flask, and volatiles were evaporated under reduced pressure. The purification was performed by flash column chromatography on silica gel (EtOAc / petroleum ether = 1:6 to 1:3).



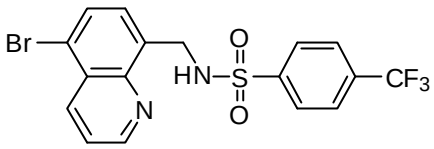
*N-(quinolin-8-ylmethyl)-4-(trifluoromethyl)benzenesulfonamide (**3aa**)*[10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.82 (1H, d, *J* = 2.6 Hz), 8.05 (1H, m), 7.62 (1H, d, *J* = 8.0 Hz), 7.56 (2H, d, *J* = 8.1 Hz), 7.49-7.39 (2H, m), 7.36-7.30 (1H, m), 7.28 (1H, s), 6.89 (1H, br s), 4.75 (2H, d, *J* = 6.4 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 149.4, 145.9, 143.8, 136.7, 133.6, 133.3, 133.0, 132.8, 132.7, 129.6, 128.3, 127.0, 126.8, 126.2(q), 125.9, 124.9(q, *C*F_3), 124.4, 121.7, 121.3, 46.6; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* −63.4 (s).



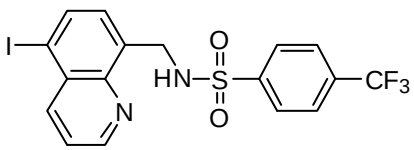
*N-((5-Methylquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ba**)* [10]

^{1}H NMR (DMSO, 400 MHz) δ 8.84 (1H, dd, *J* = 4.1, 1.5 Hz), 8.41 (1H, t, *J* = 6.2 Hz), 8.37 (1H, d, *J* = 8.5 Hz), 7.83 (2H, d, *J* = 8.4 Hz), 7.75 (2H, d, *J* = 8.4 Hz), 7.58-7.51 (2H, m), 7.32 (1H, d, *J* = 7.2 Hz), 4.65 (2H, d, *J* = 6.2 Hz), 2.57 (3H, s); ^{13}C NMR (DMSO, 101 MHz) *δ* 149.1, 145.2, 144.6, 134.1, 132.7, 132.4, 132.1, 131.7, 131.4, 131.1, 128.0, 127.1, 126.7, 126.1, 125.7(q), 124.7, 122.0, 121.0, 42.4, 17.9; ^{19}F NMR (DMSO, 376 MHz) *δ* −61.6 (s).



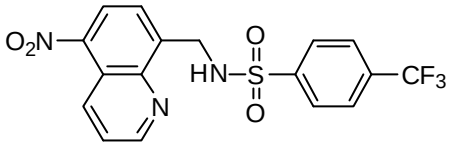
*N-((5-Bromoquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ca**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.82 (1H, dd, *J* = 4.2, 1.4 Hz), 8.44 (1H, dd, *J* = 8.5, 0.9 Hz), 7.62 (1H, d, *J* = 7.6 Hz), 7.56 (2H, d, *J* = 8.2 Hz), 7.51 (1H, dd, *J* = 8.5, 4.2 Hz), 7.36-7.30 (3H, m), 6.65 (1H, t, *J* = 6.0 Hz), 4.70 (2H, d, *J* = 6.6 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.1, 146.5, 143.9, 136.3, 133.6, 133.4, 133.3, 130.0, 129.6, 127.6, 126.9, 125.1(q), 124.4, 122.4, 122.2, 121.7, 46.1; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* −63.1 (s).



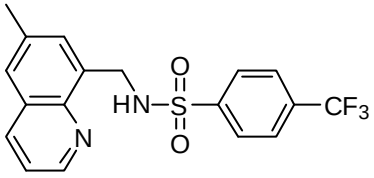
*N-((5-Iodoquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3da**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.77 (1H, s), 8.26 (1H, d, *J* = 8.4 Hz), 7.91 (1H, d, *J* = 7.4 Hz), 7.56 (2H, d, *J* = 8.1 Hz), 7.50-7.44 (1H, m), 7.32 (2H, d, *J* = 8.2 Hz), 7.20 (1H, d, *J* = 7.5 Hz), 6.66 (1H, br s), 4.69 (2H, d, *J* = 6.5 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.2, 146.3, 143.8, 141.2, 137.0, 134.3, 133.6, 133.3, 130.7, 130.1, 126.9, 125.1(q), 124.4, 122.9, 121.7, 98.6, 46.1; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* −62.9 (s).



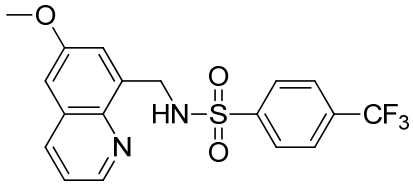
*N-((5-Nitroquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ea**)* [10]

^{1}H NMR (DMSO, 400 MHz) δ 9.00 (1H, dd, *J* = 4.1, 1.5 Hz), 8.78 (1H, dd, *J* = 8.8, 1.4 Hz), 8.71 (1H, t, *J* = 6.3 Hz), 8.39 (1H, d, *J* = 8.0 Hz), 7.92-7.86 (3H, m), 7.83-7.77 (3H, m), 4.78 (2H, d, *J* = 6.2 Hz); ^{13}C NMR (DMSO, 101 MHz) *δ* 150.9, 144.4, 144.4, 144.3, 142.6, 132.1, 131.7, 131.7, 127.2, 126.7, 126.0(q), 124.7, 124.2, 124.1, 122.0, 119.7, 42.4; ^{19}F NMR ($CDCl_3$, 376 MHz): −63.3 (s).



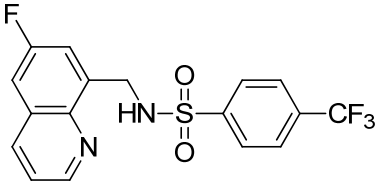
*N-((6-Methylquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3fa**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.75 (1H, s), 7.95 (1H, d, *J* = 7.3 Hz), 7.58 (1H, d, *J* = 7.0 Hz), 7.36-7.21 (5H, m), 6.93 (1H, br s), 4.72 (2H, d, *J* = 6.5 Hz), 2.41 (3H, s); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 148.5, 144.6, 144.0, 136.0, 135.9, 133.7, 133.4, 133.0, 132.7, 132.4, 131.9, 128.4, 127.0, 126.8, 124.9(q), 124.4, 121.7, 121.3, 119.0, 46.5, 21.1; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* −63.4 (s).



*N-((6-methoxyquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ga**)*

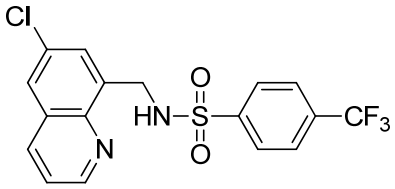
White solid, mp 97-99 °C. ^{1}H NMR (400 MHz, DMSO) δ 8.76 (d, *J* = 3.5 Hz, 1H), 8.20 (d, *J* = 8.0 Hz, 1H), 7.88 – 7.78 (m, 4H), 7.70 (d, *J* = 8.1 Hz, 2H), 7.39 (d, *J* = 9.2 Hz, 1H), 7.34 (dd, *J* = 8.0, 4.0 Hz, 1H), 4.69 (d, *J* = 5.2 Hz, 2H), 3.82 (s, 3H); ^{13}C NMR (101 MHz, DMSO) δ 157.6, 150.4, 146.4, 144.7, 136.1, 129.4, 127.3, 125.5, 122.6, 119.0, 117.7, 113.7, 56.1, 40.2, 39.9, 39.7, 39.5, 39.3, 39.1, 38.9, 36.0; ^{19}F NMR (376 MHz, $CDCl_3$) δ -63.4; HRMS (ESI) calcd for $C_{18}H_{15}F_3N_2O_3S$ $[M+H]^+$ 397.0828, found 397.0833.



*N-((6-fluoroquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ha**)* [10]

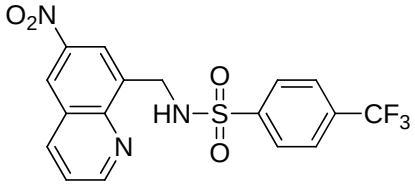
^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.78 (1H, dd, *J* = 4.2, 1.5 Hz), 8.00 (1H, dd, *J* = 8.3, 1.0 Hz), 7.61 (2H, d, *J* = 8.2 Hz), 7.42 (1H, dd, *J* = 8.3, 4.2 Hz), 7.34 (2H, d, *J* = 8.3 Hz), 7.28-7.24 (1H, m), 7.22 (1H, dd, *J* = 8.5, 2.7 Hz), 6.75 (1H, t, *J* = 5.6 Hz), 4.72 (2H, d, *J* = 6.6 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ*

160.6, 158.1, 148.7, 143.9, 143.1, 136.2, 136.2, 136.1, 134.0, 133.7, 133.3, 133.0, 129.2, 129.1, 127.0, 125.2(q), 124.4, 122.1, 121.7, 120.1, 119.8, 119.0, 110.8, 110.6, 46.0; ^{19}F NMR ($CDCl_3$, 376 MHz) δ −63.40 (s), −112.9 (s).



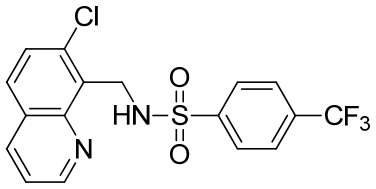
*N-((6-chloroquinolin-8-yl)methyl)-4-(trifluoromethyl)benzene sulfonamide (**3ia**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.85 (1H, dd, *J* = 4.3, 1.6 Hz), 8.04 (1H, dd, *J* = 8.2, 1.2 Hz), 7.59 (2H, d, *J* = 8.2 Hz), 7.51 (1H, d, *J* = 8.8 Hz), 7.43 (1H, dd, *J* = 8.3, 4.3 Hz), 7.32 (1H, d, J = 8.8 Hz), 7.25 (2H, d, J = 8.0 Hz), 7.02 (1H, t, *J* = 5.7 Hz), 5.0 (2H, d, *J* = 6.5 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) δ 149.6, 144.2, 143.8, 135.8, 134.9, 133.9, 133.6, 133.3, 132.9, 131.7, 130.4, 128.9, 127.0, 126.5, 125.1(q), 124.3, 122.2, 121.6, 45.8; ^{19}F NMR ($CDCl_3$, 376 MHz) δ −63.4 (s).



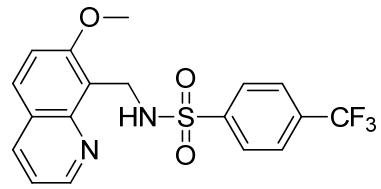
*N-((6-nitroquinolin-8-yl)methyl)-4-(trifluoromethyl)benzene sulfonamide (**3ja**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 9.05 (1H, dd, *J* = 4.2, 1.6 Hz), 8.63 (1H, d, *J* = 2.4 Hz), 8.35 (1H, dd, *J* = 8.3, 1.2 Hz), 8.28 (1H, d, *J* = 2.4 Hz), 7.73 (2H, d, *J* = 8.2 Hz), 7.5 (1H, dd, *J* = 8.3, 4.2 Hz), 7.44 (2H, d, *J* = 8.3 Hz), 6.60 (1H, br s), 4.81 (2H, d, *J* = 3.8 Hz); ^{13}C NMR (DMSO, 101 MHz) δ 153.3, 146.8, 144.5, 144.3, 138.7, 137.6, 132.1, 131.8, 127.2, 126.7, 126.1, 126.0, 124.6, 124.1, 123.3, 121.9, 120.6, 41.7; ^{19}F NMR ($CDCl_3$, 376 MHz) δ −63.35 (s).



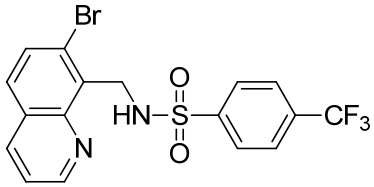
*N-((7-chloroquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenes ulfonamide (**3ka**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.85 (1H, dd, *J* = 4.3, 1.7 Hz), 8.04 (1H, dd, *J* = 8.3, 1.5 Hz), 7.60 (2H, d, *J* = 8.2 Hz), 7.51 (1H, d, *J* = 8.0 Hz), 7.43 (1H, dd, *J* = 8.3, 4.3 Hz), 7.32 (1H, d, *J* = 8.8 Hz), 7.26 (2H, d, *J* = 8.2 Hz), 6.99 (1H, t, *J* = 6.3 Hz), 4.99 (2H, d, *J* = 6.6 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) δ 150.1, 146.4, 143.7, 136.9, 134.8, 133.8, 133.5, 133.1, 132.8, 130.3, 128.7, 128.0, 126.8, 126.8, 125.0(q), 124.4, 121.6, 121.4, 42.1; ^{19}F NMR ($CDCl_3$, 376 MHz) δ −63.4 (s).



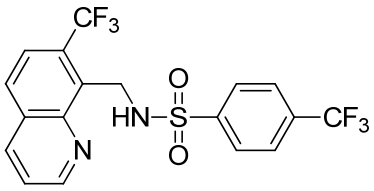
*N-((7-methoxyquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3la**)*

White solid, mp 105-107 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.81 (d, J = 3.2 Hz, 1H), 8.03 (d, J = 6.4 Hz, 1H), 7.63 (d, J = 7.7 Hz, 3H), 7.29 (d, J = 7.9 Hz, 3H), 7.12 (d, J = 9.0 Hz, 1H), 7.05 (s, 1H), 4.87 (d, J = 4.6 Hz, 2H), 3.92 (s, 3H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 149.9, 144.0, 133.5, 133.0, 129.2, 127.1, 124.9, 124.9, 124.8, 124.8, 124.4, 123.3, 121.7, 119.0, 118.0, 113.5, 56.3, 37.9; ^{19}F NMR (376 MHz, $CDCl_3$) δ -63.3; HRMS (ESI) calcd for $C_{18}H_{15}F_3N_2O_3S$ $[M+H]^+$ 397.0828, found 397.0834.



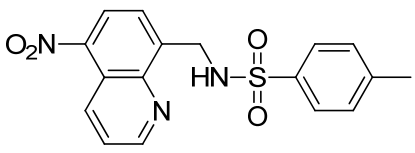
*N-((7-bromoquinolin-8-yl)methyl)-4-(trifluoromethyl)benzenesulfonamide (**3ma**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.82 (1H, dd, *J* = 4.2, 1.7 Hz), 7.95 (1H, dd, *J* = 8.3, 1.6 Hz), 7.75 (1H, d, *J* = 2.1 Hz), 7.57 (2H, d, *J* = 8.2 Hz), 7.51 (1H, d, *J* = 2.0 Hz), 7.43 (1H, dd, *J* = 8.3, 4.3 Hz), 7.33 (2H, d, *J* = 8.3 Hz), 6.65 (1H, t, *J* = 6.5 Hz), 4.71 (2H, d, *J* = 6.7 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.1, 146.4, 143.7, 136.9, 133.8, 133.5, 133.1, 132.8, 132.4, 130.9, 128.8, 127.3, 127.0, 126.8, 126.2(q), 125.5, 124.9(q, *C*F_3), 124.4, 121.6, 121.6, 45.1; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* –63.4 (s).



*4-(Trifluoromethyl)-N-((7-(trifluoromethyl)quinolin-8-yl)methyl)benzenesulfonamide (**3na**)* [10]

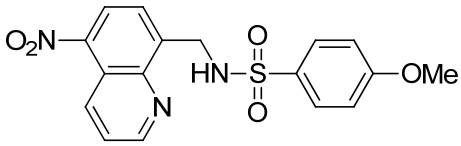
^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.94 (1H, dd, *J* = 4.2, 1.7 Hz), 8.17 (1H, dd, *J* = 8.4, 1.5 Hz), 7.77 (1H, d, *J* = 8.8 Hz), 7.68 (3H, d, *J* = 8.6 Hz), 7.57 (1H, dd, *J* = 8.3, 4.2 Hz), 7.38 (2H, d, *J* = 8.3 Hz), 7.14 (1H, br s), 4.97 (2H, br s); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.6, 146.1, 143.7, 137.0, 129.6, 128.7, 127.1, 125.2(q), 125.0, 124.4, 123.0, 122.5, 122.5, 122.4, 122.4, 77.3, 77.0, 76.7, 41.5, 41.5; ^{19}F NMR ($CDCl_3$, 376 MHz) *δ* –57.2 (s), –63.3 (s).



*4-Methyl-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamide (**3eb**)* [10]

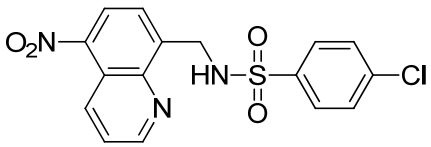
^{1}H NMR ($CDCl_3$, 400 MHz) δ 8.97-8.92 (2H, m), 8.17 (1H, d, *J* = 7.8 Hz), 7.69-7.61 (2H, m), 7.44 (2H, d, *J* = 8.2 Hz), 6.98 (2H, d, *J* = 8.1 Hz), 6.33 (1H, br s), 4.76 (2H, s), 2.28 (3H, s); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.5, 145.7, 145.1, 143.2, 141.6, 137.1, 132.6, 129.0, 127.6, 126.6, 124.0, 123.9,

121.0, 45.7, 21.3.



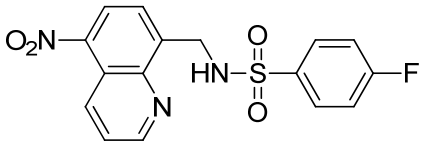
*4-Methoxy-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamide (**3ec**)* [10]

^{1}H NMR (DMSO, 400 MHz) δ 9.02 (1H, d, *J* = 4.0 Hz), 8.84 (1H, d, *J* = 8.8 Hz), 8.44 (1H, d, *J* = 8.0 Hz), 8.27 (1H, t, *J* = 6.4 Hz), 7.94 (1H, d, *J* = 8.0 Hz), 7.82 (1H, dd, *J* = 8.1, 4.1 Hz), 7.69 (2H, d, *J* = 8.8 Hz), 7.02 (1H, d, *J* = 8.8 Hz), 4.67 (2H, d, *J* = 6.3 Hz), 3.81 (3H, s); ^{13}C NMR (DMSO, 101 MHz) *δ* 149.2, 149.0, 146.2, 145.2, 134.3, 132.8, 132.4, 128.1, 127.8, 126.7, 126.2, 123.9, 121.1, 42.4, 18.0.



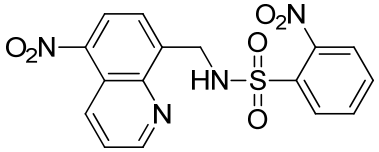
*4-Chloro-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamide (**3ed**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 9.01-8.94 (2H, m), 8.23 (1H, d, *J* = 7.9 Hz), 7.71-7.65 (2H, m), 7.57-7.53 (2H, m), 7.22-7.18 (2H, m), 6.38 (1H, br s), 4.76 (2H, s); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.6, 145.8, 145.3, 141.3, 138.8, 138.6, 132.7, 128.7, 128.1, 127.6, 124.0, 121.1, 45.7.



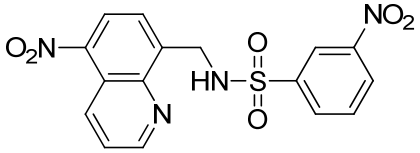
*4-Fluoro-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamide (**3ee**)*

White solid, mp 113-115 °C; ^{1}H NMR (400 MHz, DMSO) δ 8.99 (s, 1H), 8.80 (d, J = 8.7 Hz, 1H), 8.41 (d, J = 7.7 Hz, 2H), 7.92 (d, J = 7.5 Hz, 1H), 7.88 – 7.70 (m, 3H), 7.40 (s, 1H), 7.32 (m, 1H), 4.73 (d, J = 4.8 Hz, 2H); ^{13}C NMR (101 MHz, DMSO) δ 165.3, 162.8, 150.9, 144.5, 144.3, 143.0, 136.9, 131.7, 129.5, 129.4, 128.5, 128.5, 126.3, 124.2, 119.8, 116.2, 116.0, 42.4, 40.1, 39.9, 39.7, 39.5, 39.3, 39.1, 38.9; ^{19}F NMR (376 MHz, DMSO) δ -106.8; HRMS (ESI) calcd for $C_{16}H_{12}FN_3O_4S$ $[M+H]^+$ 362.0605, found 362.0609.



*2-Nitro-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamide (**3ef**)*

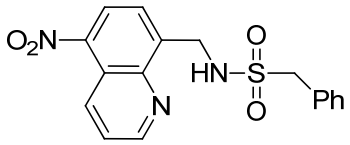
White solid, mp 138-140 °C; ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.96 (d, *J* = 3.8 Hz, 1H), 8.87 (d, *J* = 8.8 Hz, 1H), 8.20 (d, *J* = 7.8 Hz, 1H), 7.88 (d, *J* = 7.3 Hz, 1H), 7.76 (d, *J* = 7.8 Hz, 1H), 7.65 – 7.58 (m, 2H), 7.56 – 7.45 (m, 2H), 7.19 (s, 1H), 4.94 (d, *J* = 4.7 Hz, 2H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 150.9, 145.9, 145.5, 141.4, 134.3, 133.2, 132.5, 132.4, 130.5, 127.8, 125.0, 124.1, 123.8, 120.9, 77.3, 77.0, 76.7, 46.1; HRMS (ESI) calcd for $C_{16}H_{12}N_4O_6S$ $[M+H]^+$ 389.0550, found 389.0550.



3-Nitro-N-((5-nitroquinolin-8-yl)methyl)benzenesulfonamid

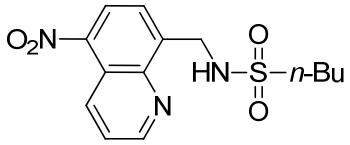
*e (**3eg**)*

White solid, mp 166-168 °C; ^{1}H NMR (400 MHz, DMSO) δ 8.98 (s, 1H), 8.75 (s, 2H), 8.33 (d, J = 17.6 Hz, 3H), 8.07 (d, J = 6.6 Hz, 1H), 7.89 (d, J = 7.4 Hz, 1H), 7.83 – 7.63 (m, 2H), 4.81 (d, J = 4.3 Hz, 2H); ^{13}C NMR (101 MHz, DMSO) δ 151.0, 147.4, 144.5, 142.4, 142.2, 132.3, 131.6, 130.8, 127.0, 126.7, 124.2, 124.0, 121.1, 119.7, 42.4, 40.1, 39.9, 39.7, 39.5, 39.3, 39.1, 38.9; HRMS (ESI) calcd for $C_{16}H_{12}N_4O_6S$ $[M+H]^+$ 389.0550, found 389.0544.



*N-((5-nitroquinolin-8-yl)methyl)-1-phenylmethanesulfonamide (**3eh**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 9.05 (1H, dd, *J* = 8.8, 1.6 Hz), 8.92 (1H, dd, *J* = 4.2, 1.6 Hz), 8.31 (1H, d, *J* = 7.9 Hz), 7.71-7.65 (2H, m), 7.35-7.21 (5H, m), 5.91 (1H, br s), 4.69 (2H, s), 4.24 (2H, s); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.7, 146.1, 145.2, 142.6, 132.6, 130.7, 130.5, 129.0, 128.8, 128.6, 128.6, 127.1, 124.5, 124.0, 121.2, 59.4, 45.5.

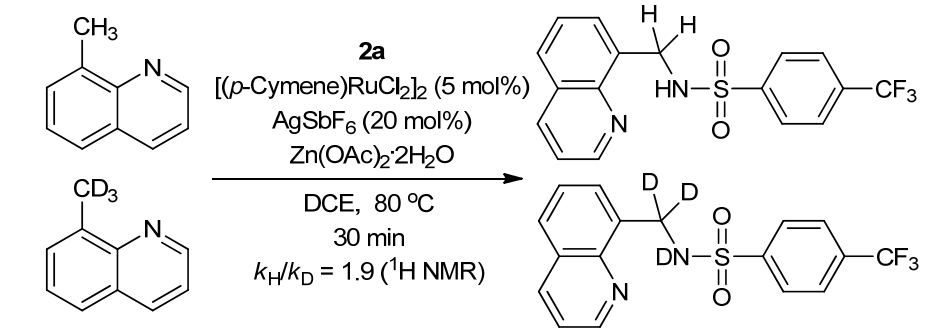


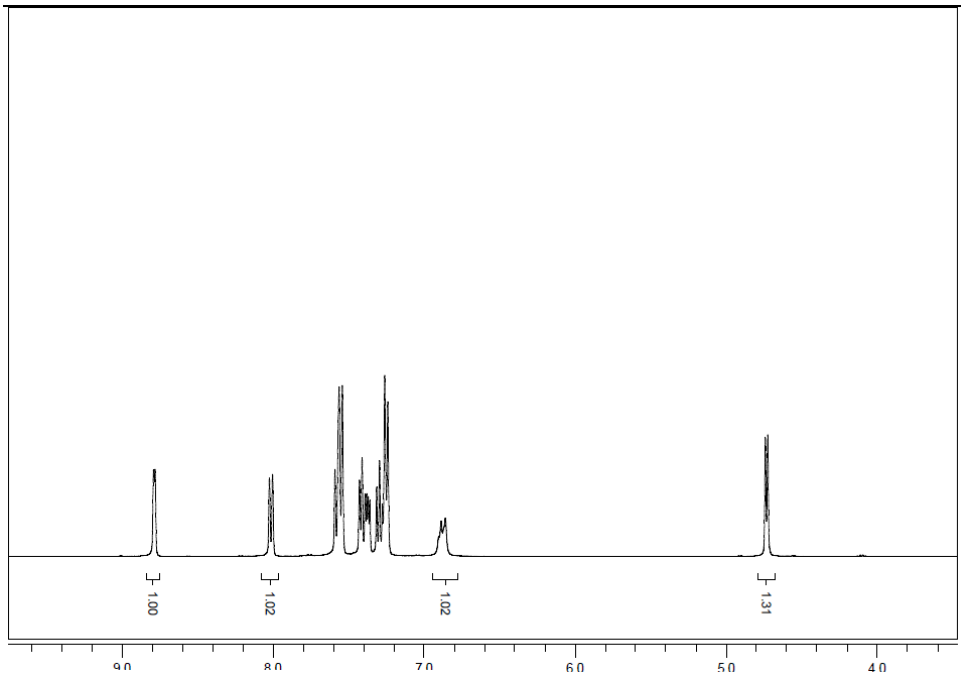
*N-((5-nitroquinolin-8-yl)methyl)butane-1-sulfonamide (**3ei**)* [10]

^{1}H NMR ($CDCl_3$, 400 MHz) δ 9.08 (1H, dd, *J* = 8.8, 1.6 Hz), 9.03 (1H, dd, *J* = 4.2, 1.6 Hz), 8.37 (1H, d, *J* = 7.9 Hz), 7.86 (1H, d, *J* = 7.9 Hz), 7.73 (1H, dd, *J* = 8.8, 4.2 Hz), 5.91 (1H, br s), 4.87 (2H, s), 2.97-2.92 (2H, m), 1.71-1.63 (2H, m), 1.36-1.27 (2H, m), 0.83 (3H, t, *J* = 7.3 Hz); ^{13}C NMR ($CDCl_3$, 101 MHz) *δ* 150.8, 146.1, 145.2, 142.8, 132.8, 127.2, 124.5, 124.1, 121.2, 53.0, 45.1, 25.5, 21.4, 13.5.

Mechanism Research:

KIE experiments:



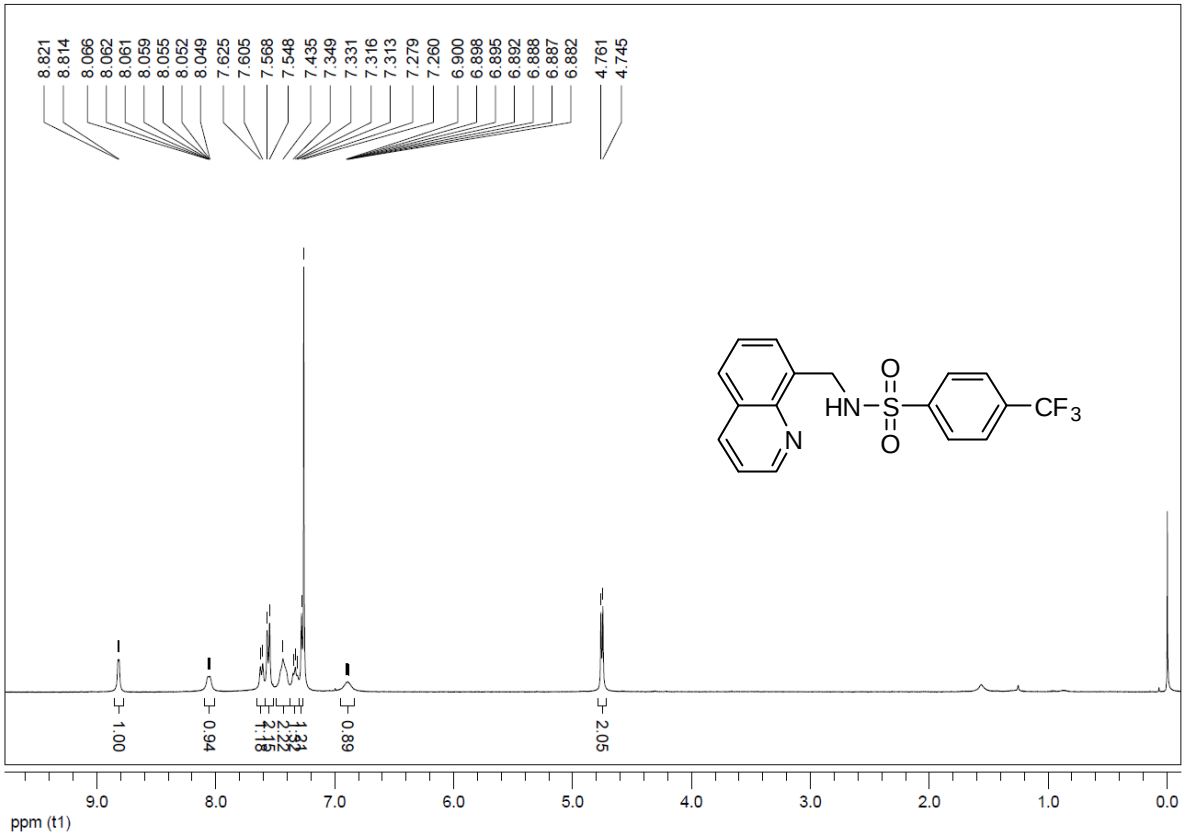


^{1}H NMR of the KIE reaction products.

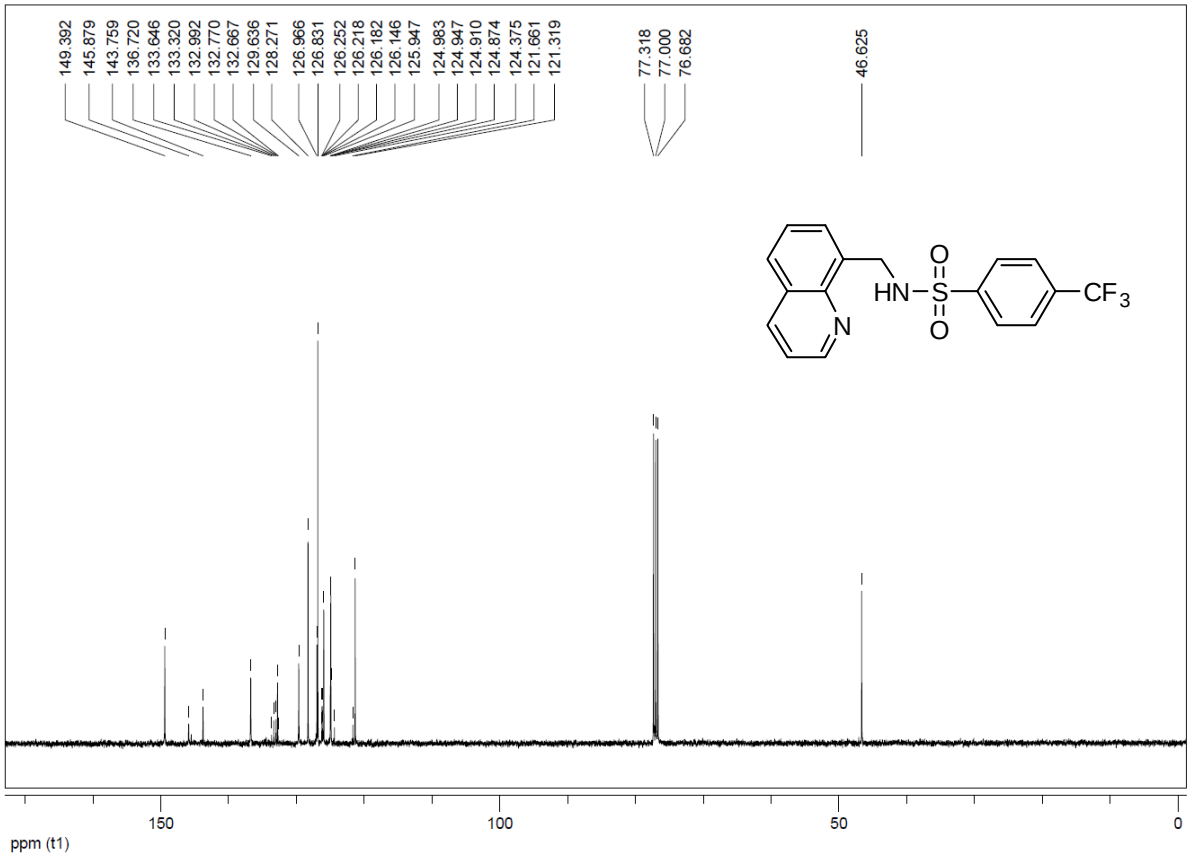
General procedure for the KIE experiments:

A mixture of 4-(trifluoromethyl)benzenesulfonyl azide (0.3 mmol, 1.0 equiv), [(*p*-cymene)$RuCl_2$]$_2$ (9.2 mg, 0.015 mmol, 5.0 mol %), $Zn(OAc)_2{\cdot}2H_2O$ (33.0 mg, 50 mol%) and $AgSbF_6$ (20.6 mg, 20.0 mol %) were weighed in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added followed immediately by 8-methylquinoline (0.6 mmol, 2 equiv), or 8-methylquinoline-d_3 (0.6 mmol, 2 equiv), and the mixture was stirred at 80 °C for 30 min under Ar atmosphere. Afterward, the two independent reactions were poured into the same round flask, the solvent was evaporated under reduced pressure, and the residue was absorbed to small amounts of silica. The purification was performed by flash column chromatography on silica gel (EtOAc/petroleum ether = 1:6).

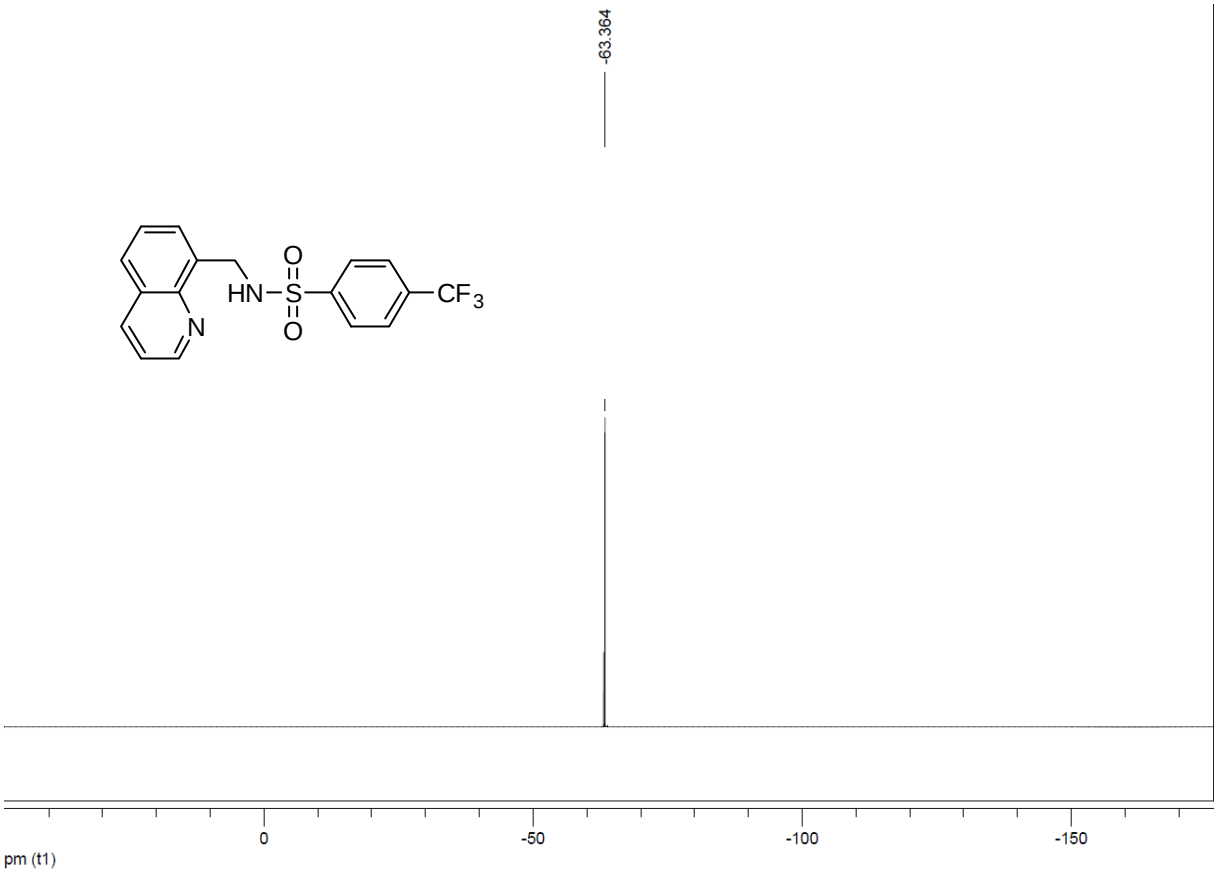
^{1}H NMR Spectra of **3aa**



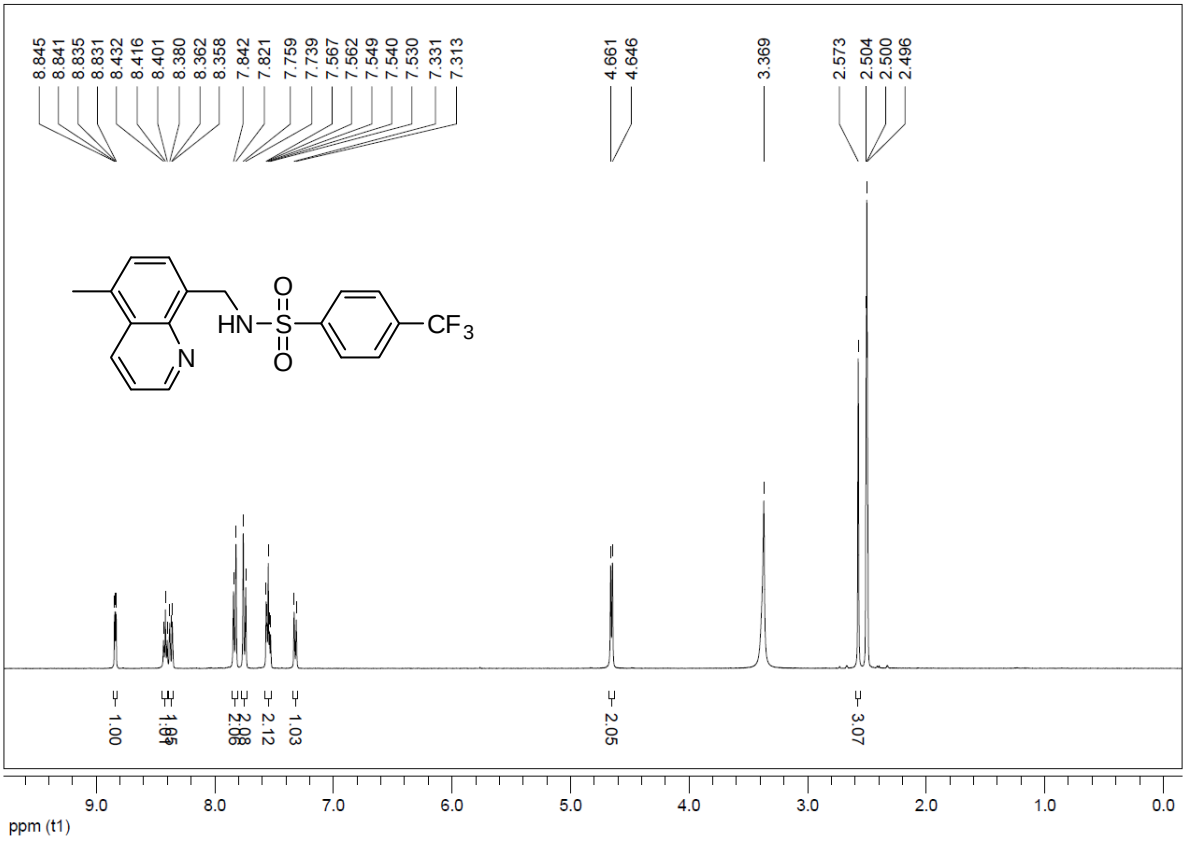
^{13}C NMR Spectra of **3aa**



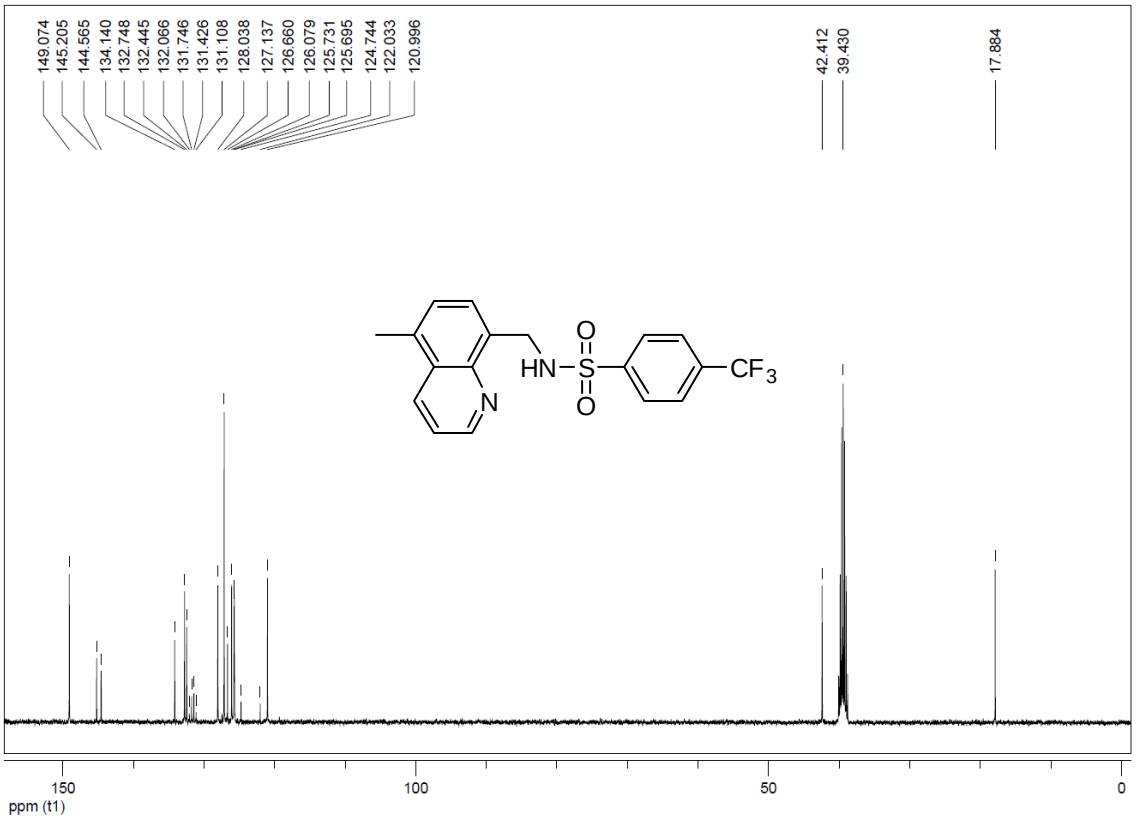
^{19}F NMR Spectra of **3aa**



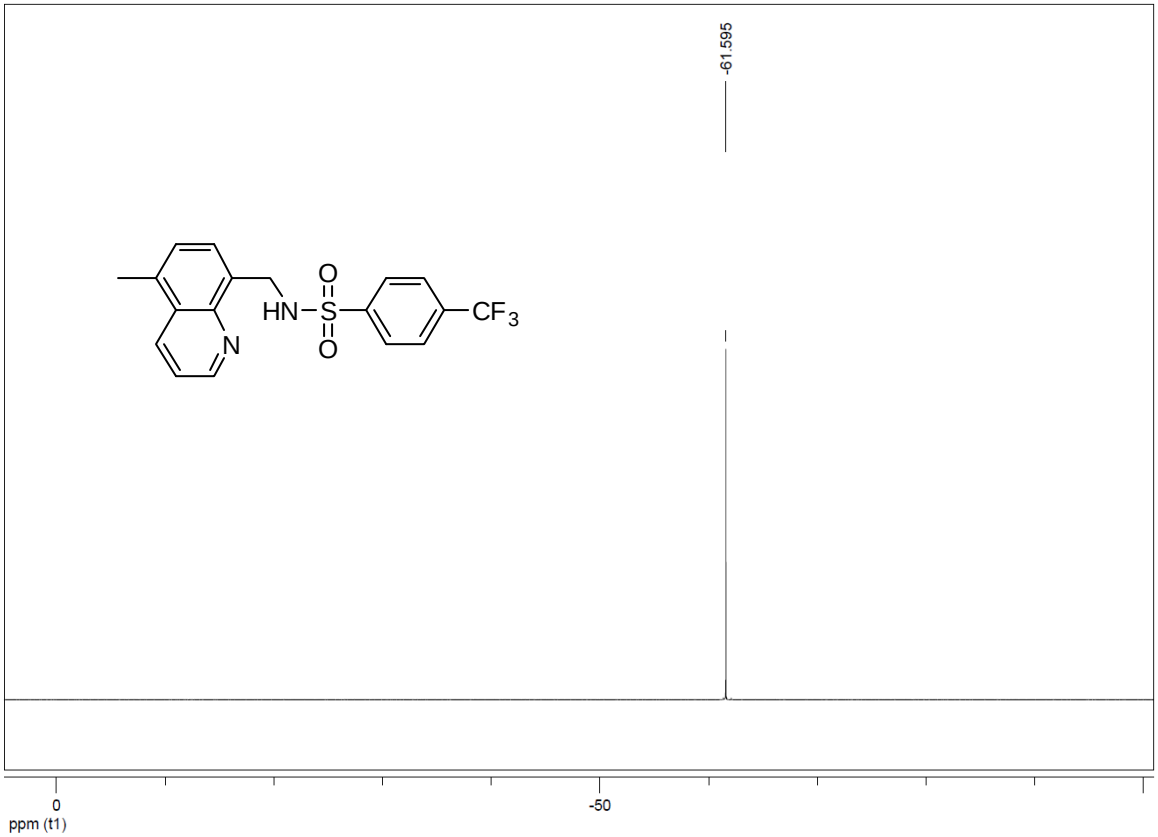
^{1}H NMR Spectra of **3ba**



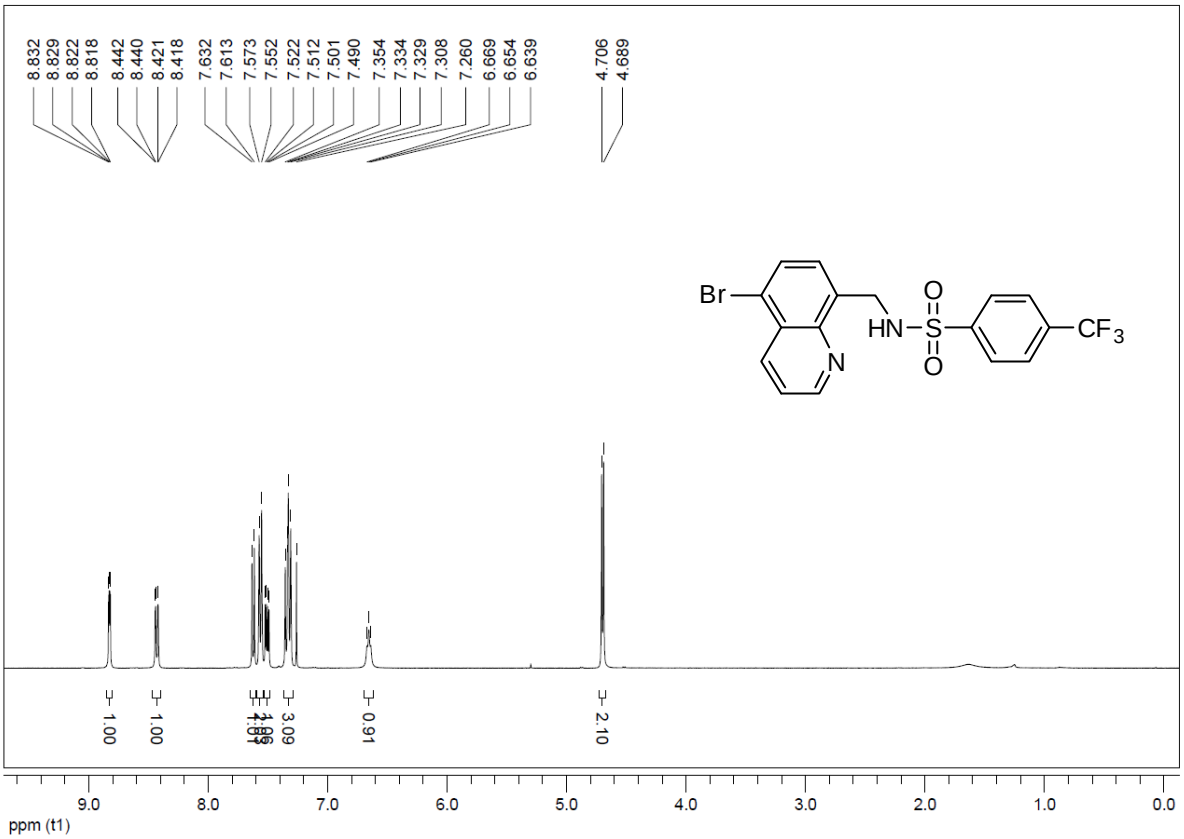
^{13}C NMR Spectra of **3ba**



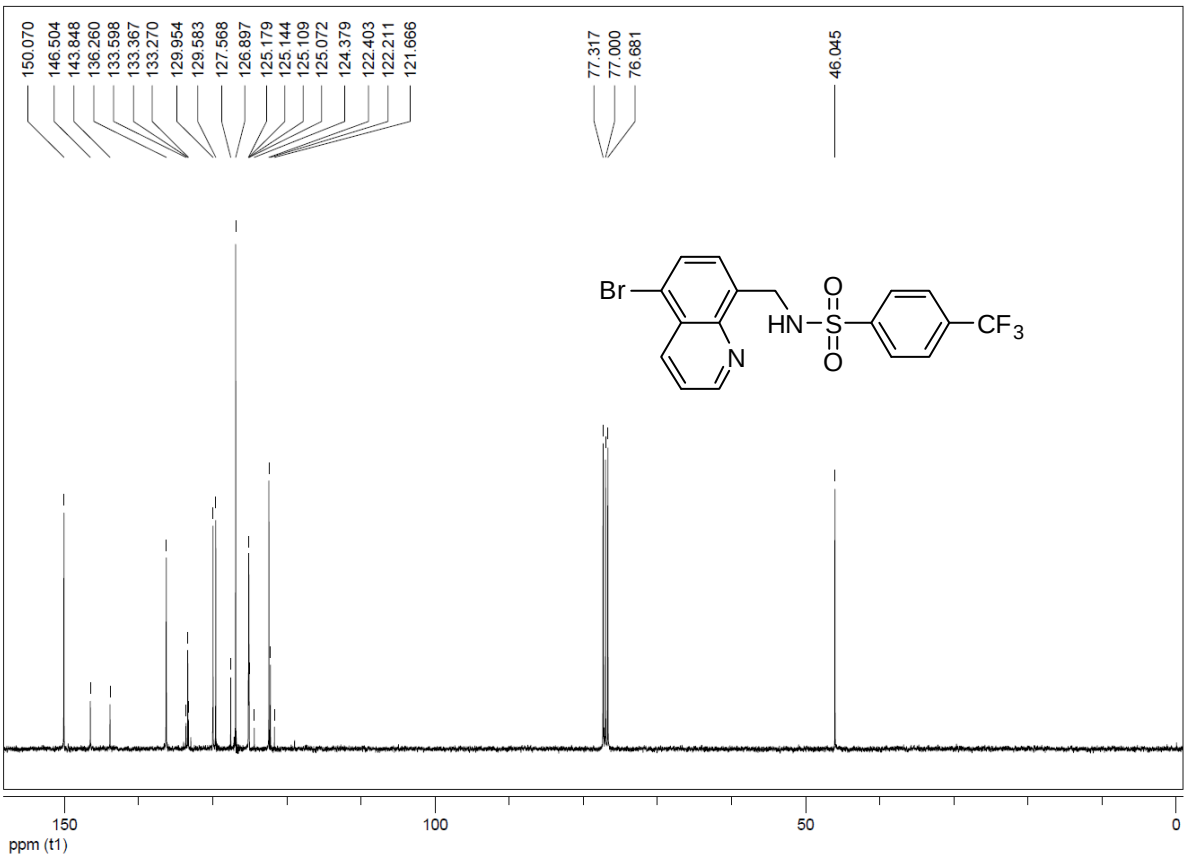
^{19}F NMR Spectra of **3ba**



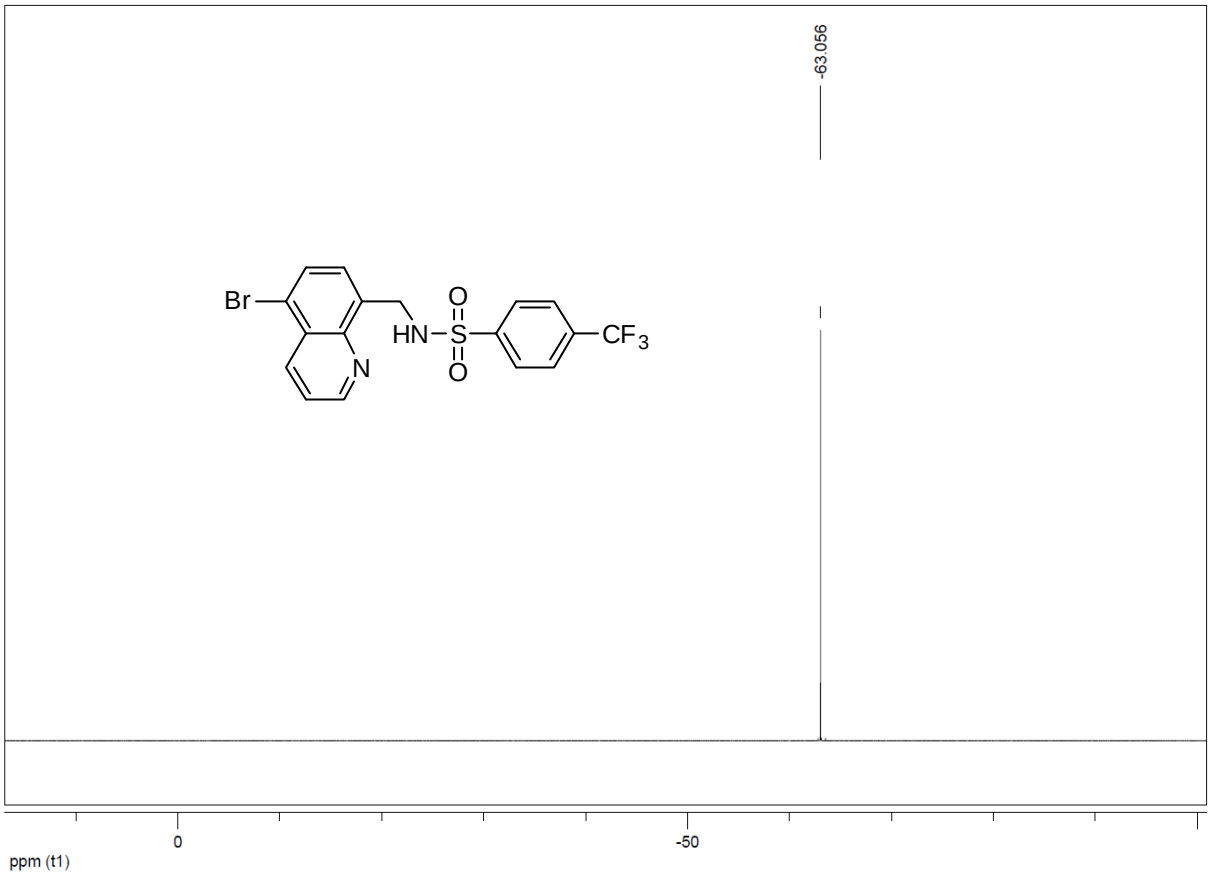
^{1}H NMR Spectra of **3ca**



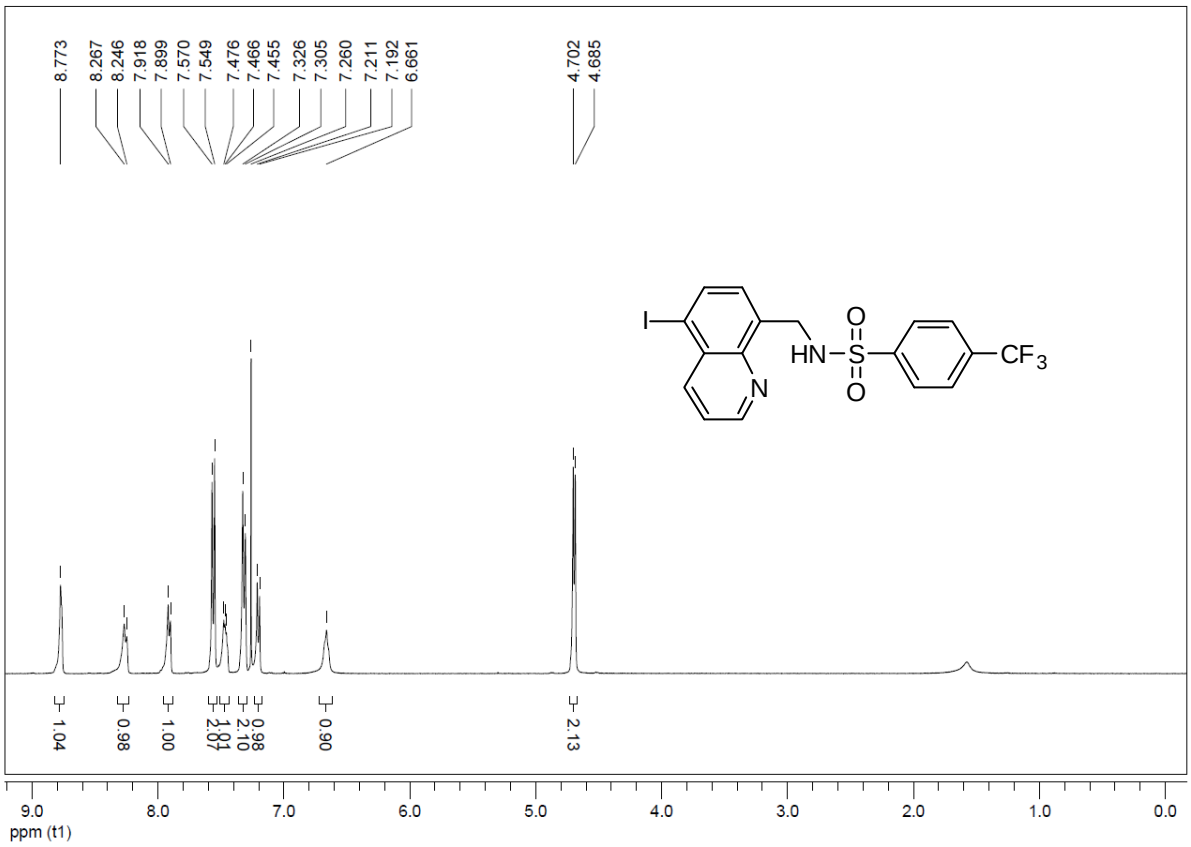
^{13}C NMR Spectra of **3ca**



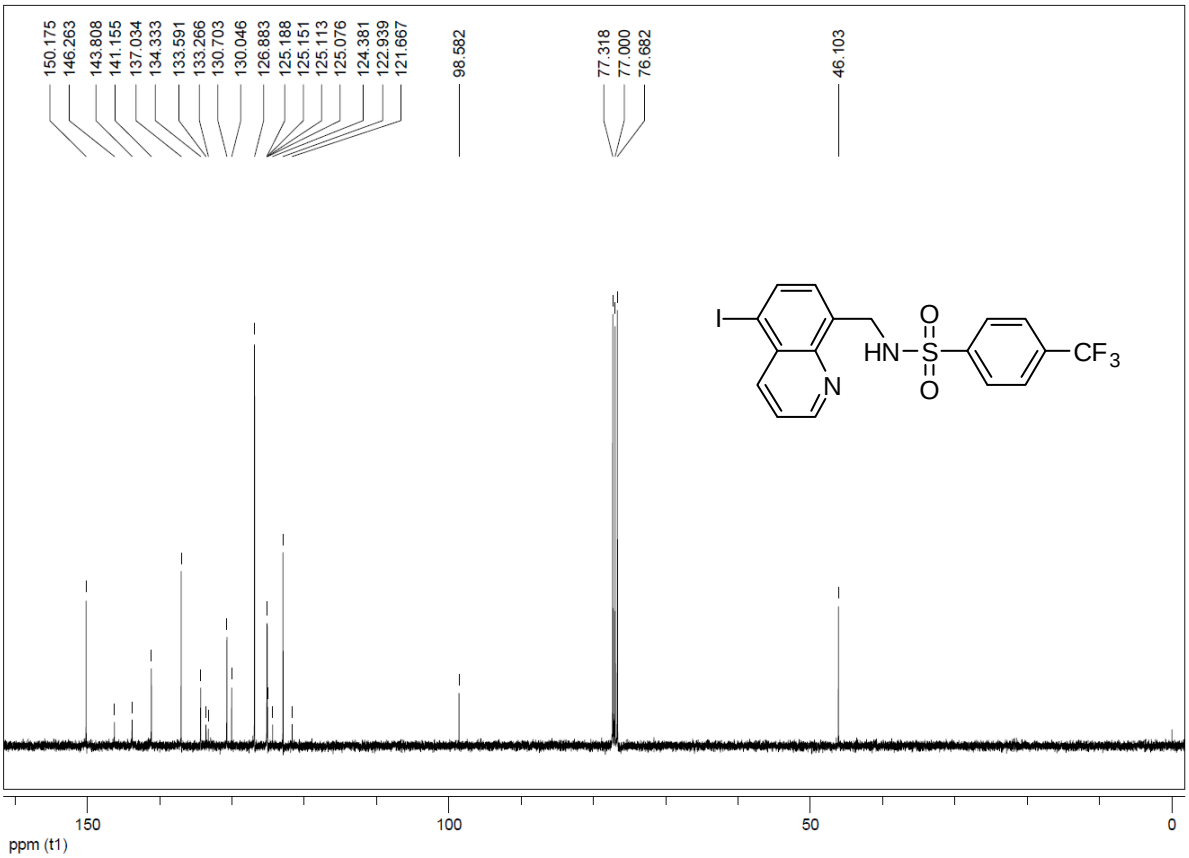
^{19}F NMR Spectra of **3ca**



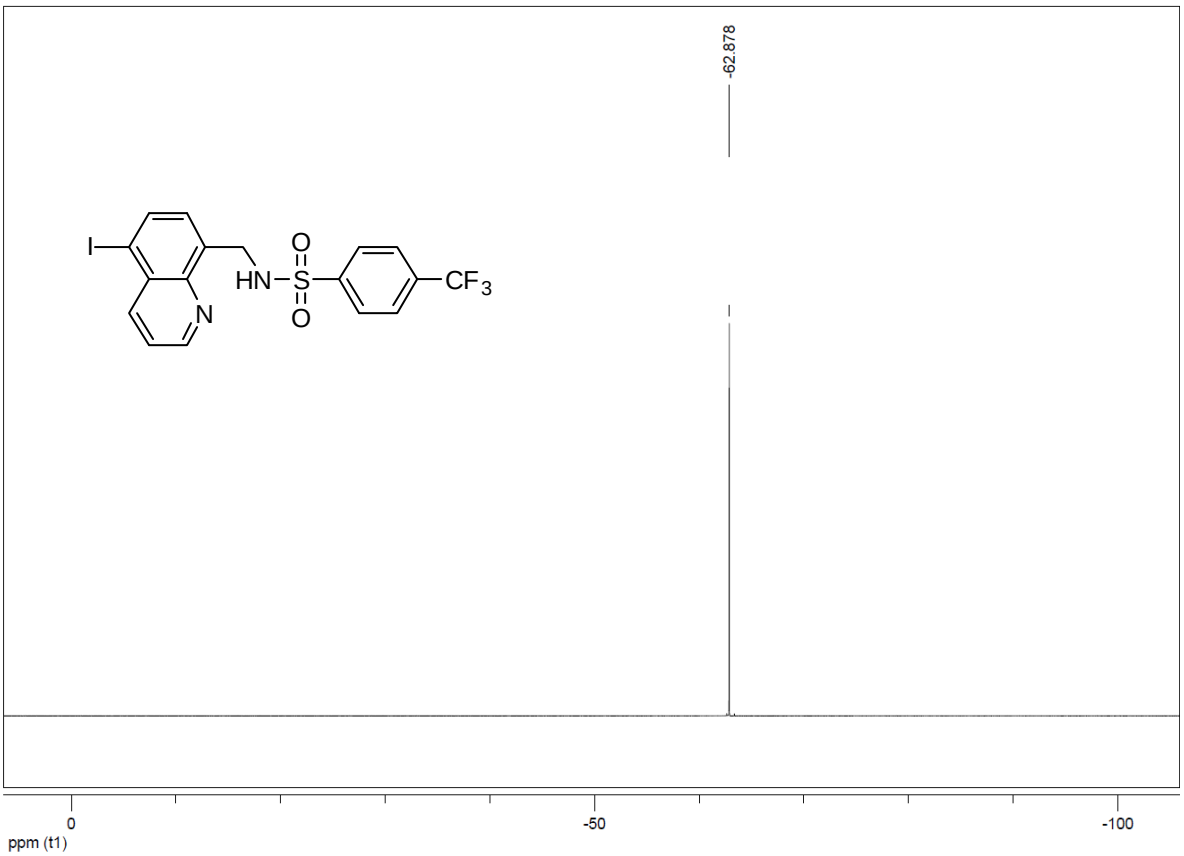
^{1}H NMR Spectra of **3da**



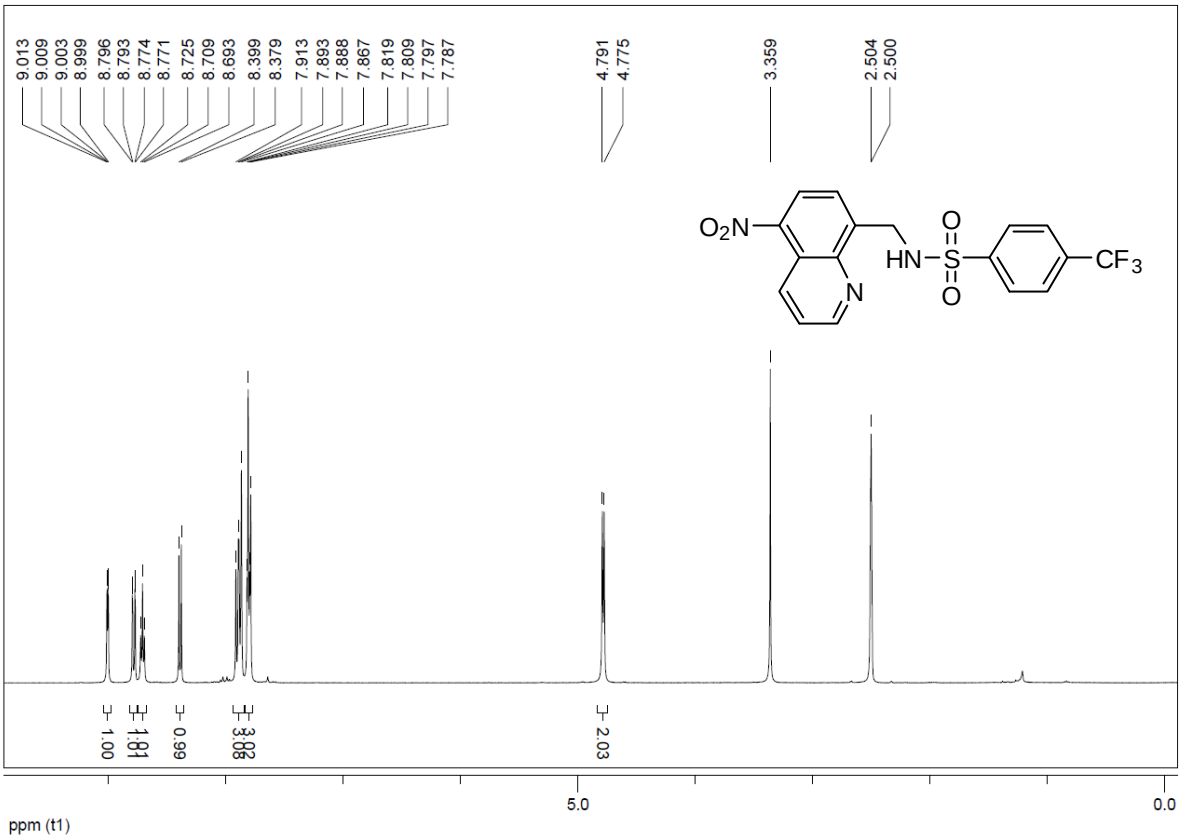
^{13}C NMR Spectra of **3da**



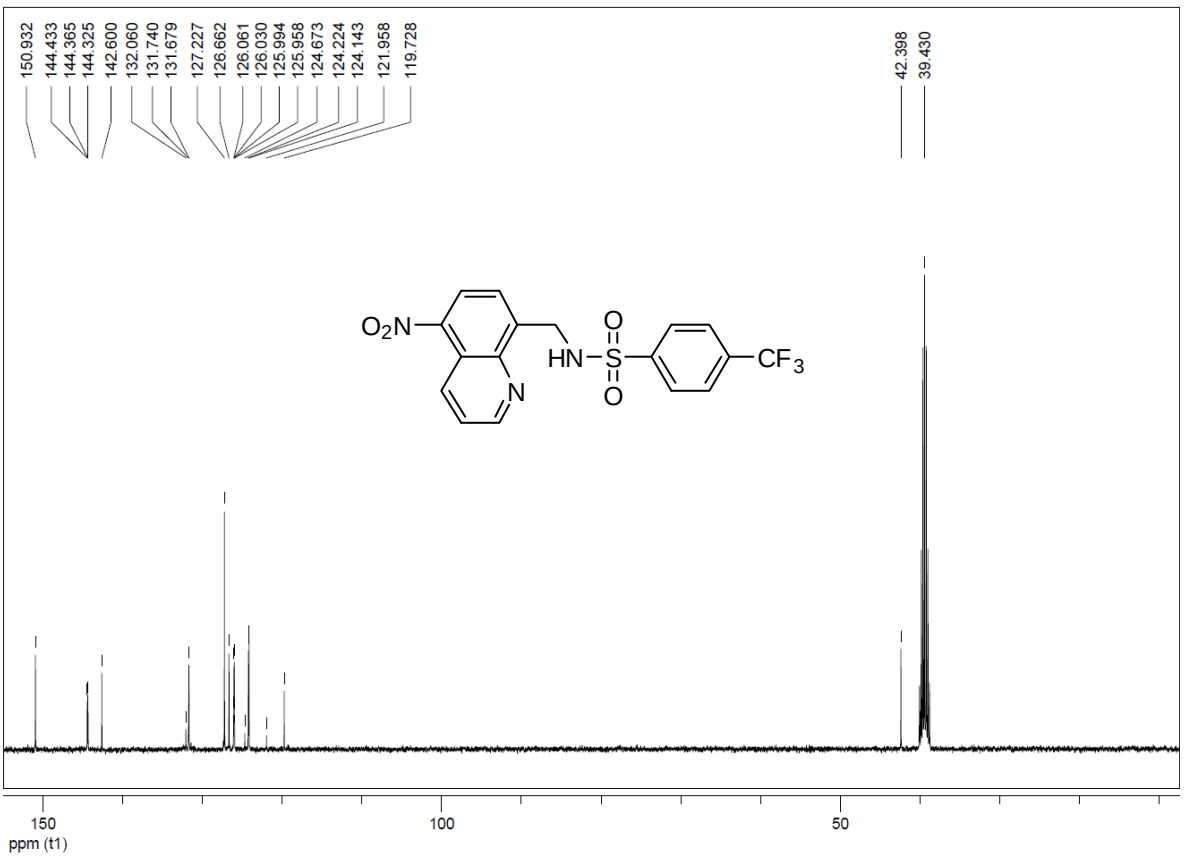
^{19}F NMR Spectra of **3da**



^{1}H NMR Spectra of **3ea**

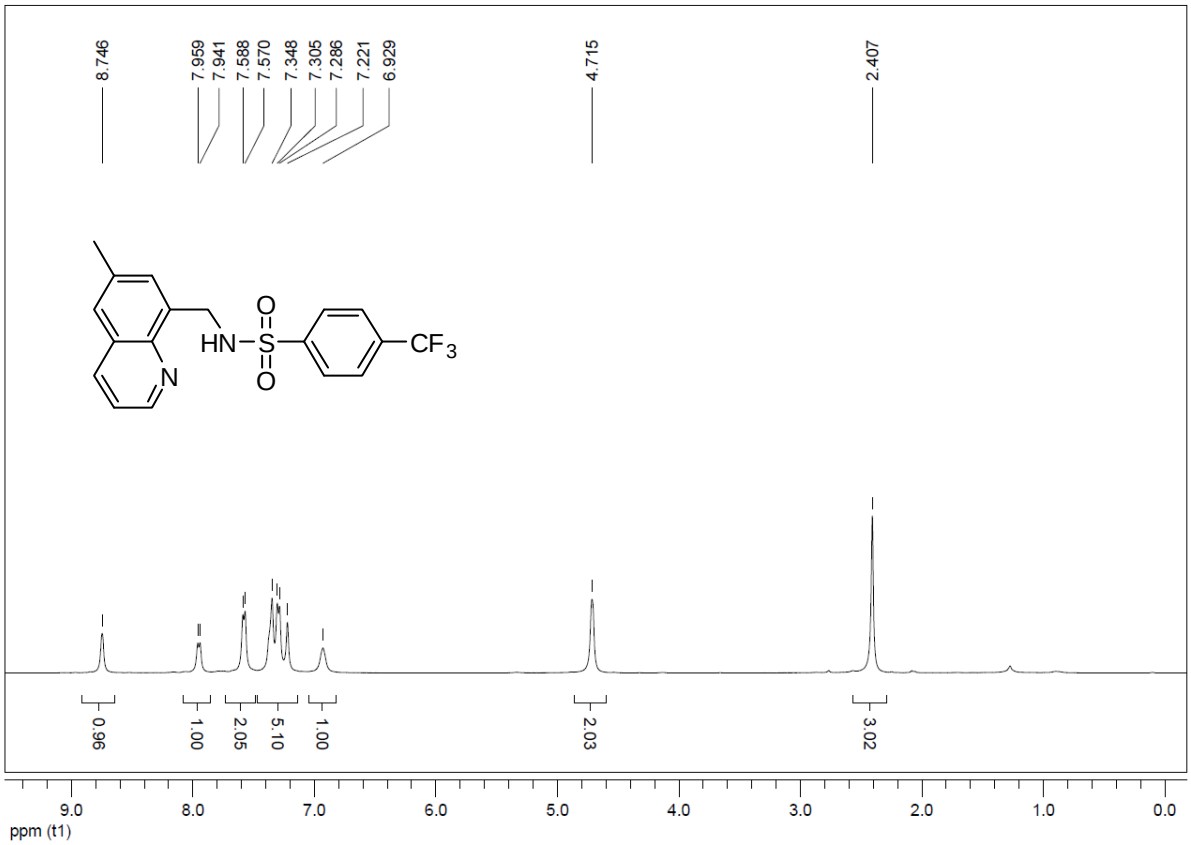


^{13}C NMR Spectra of **3ea**

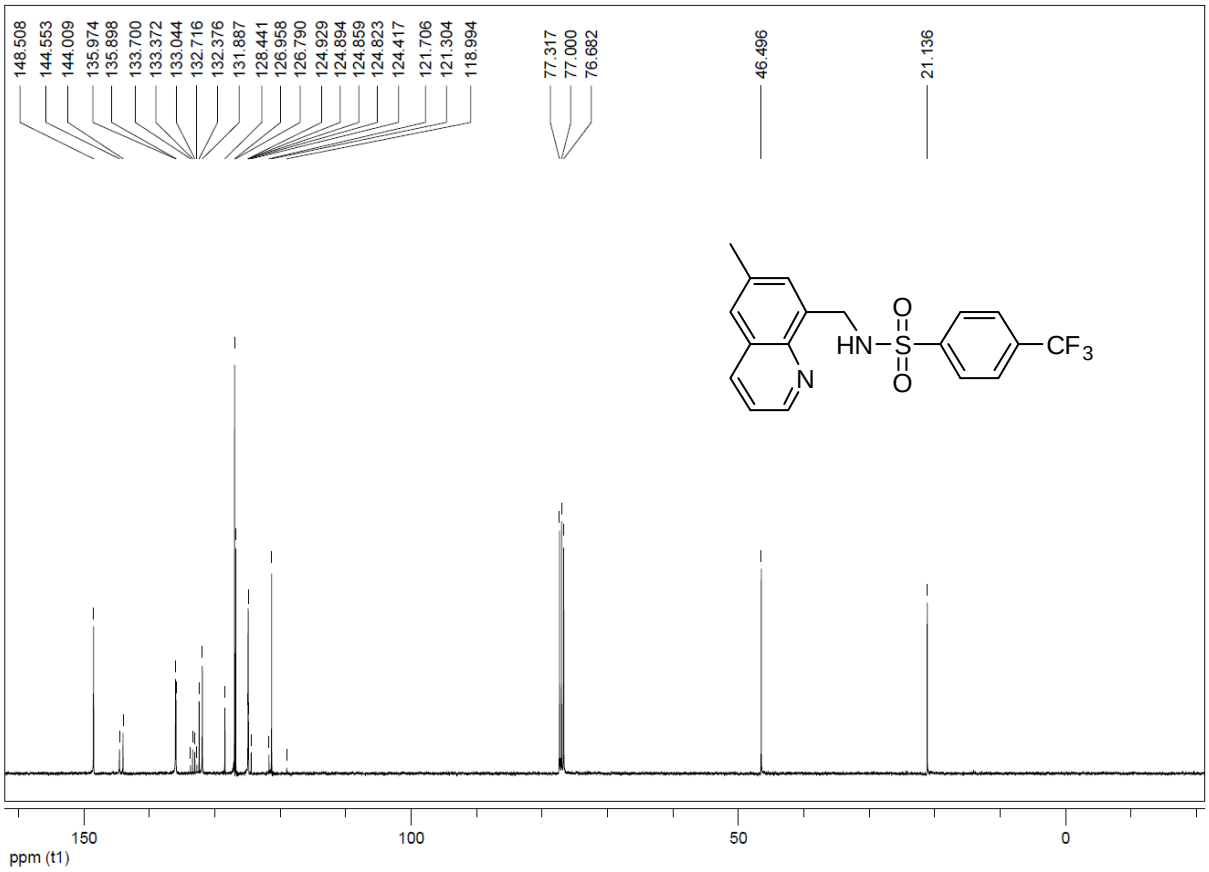


^{19}F NMR Spectra of **3ea**

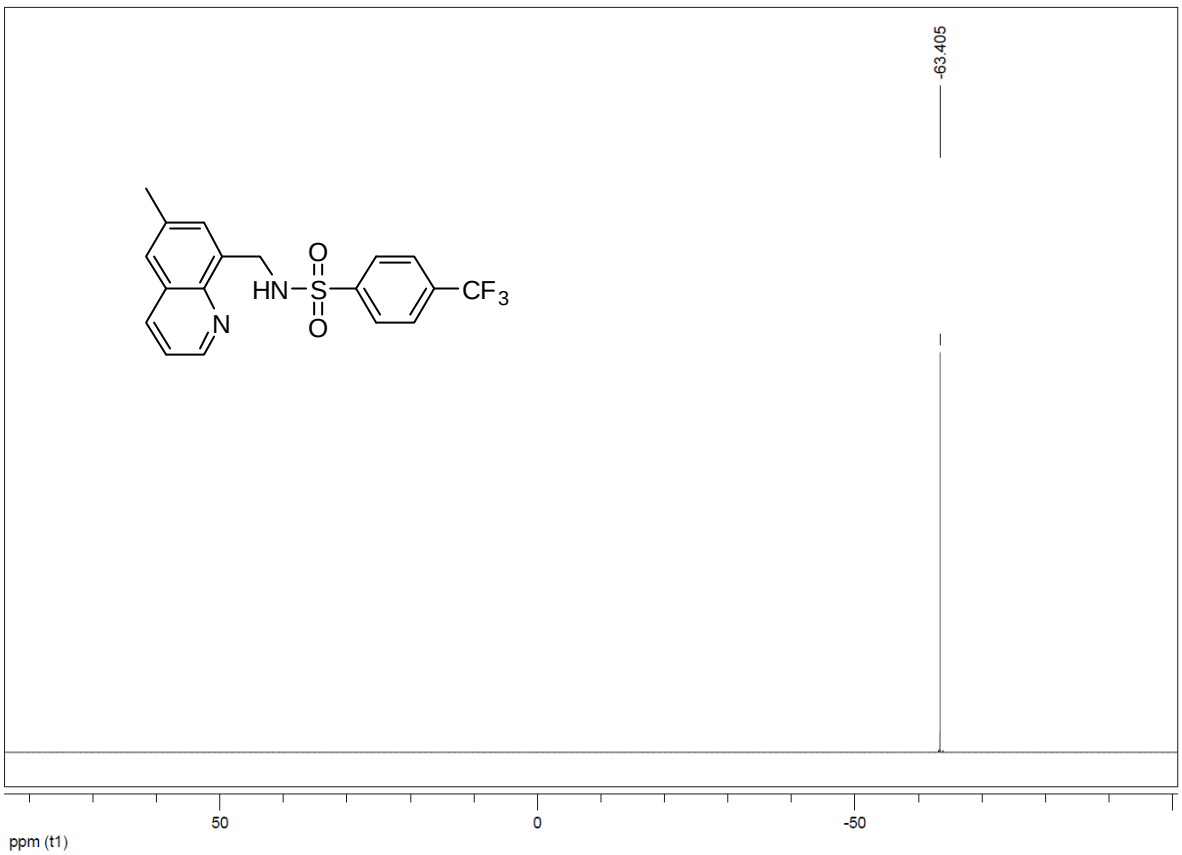
^{1}H NMR Spectra of **3fa**



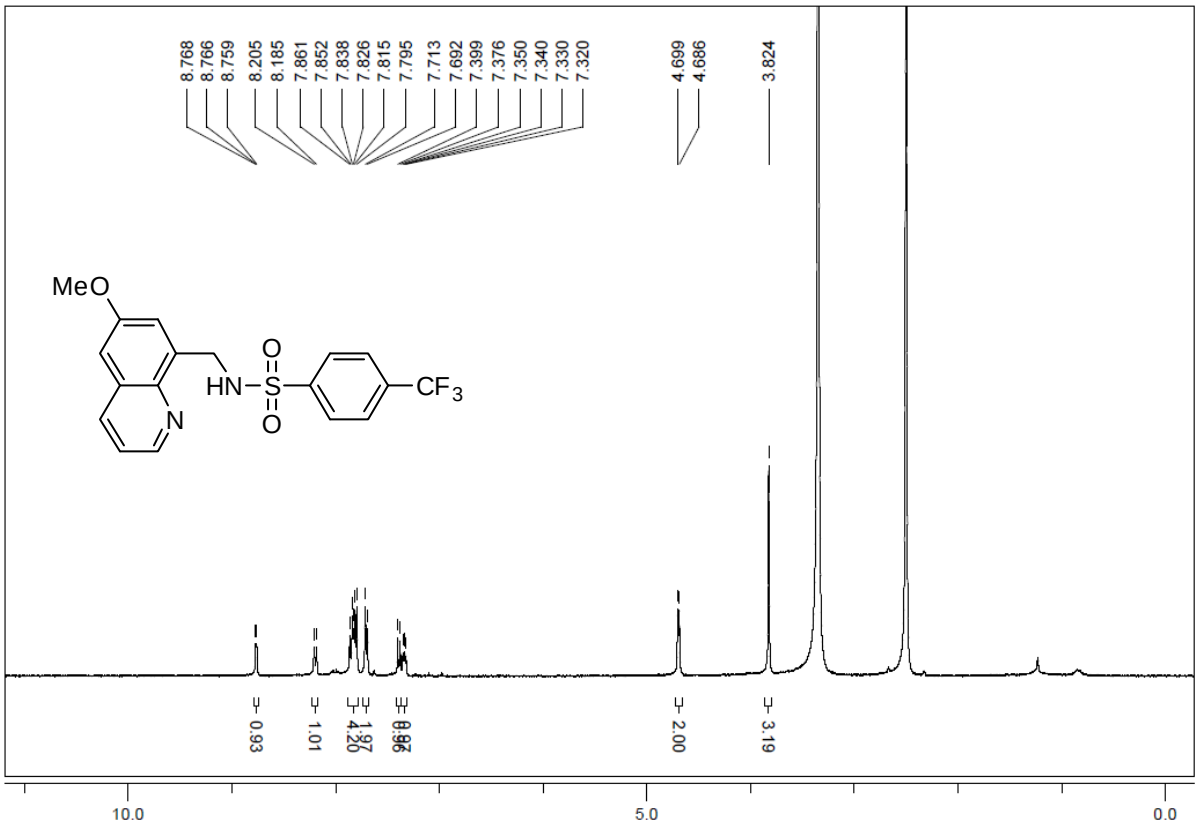
^{13}C NMR Spectra of **3fa**



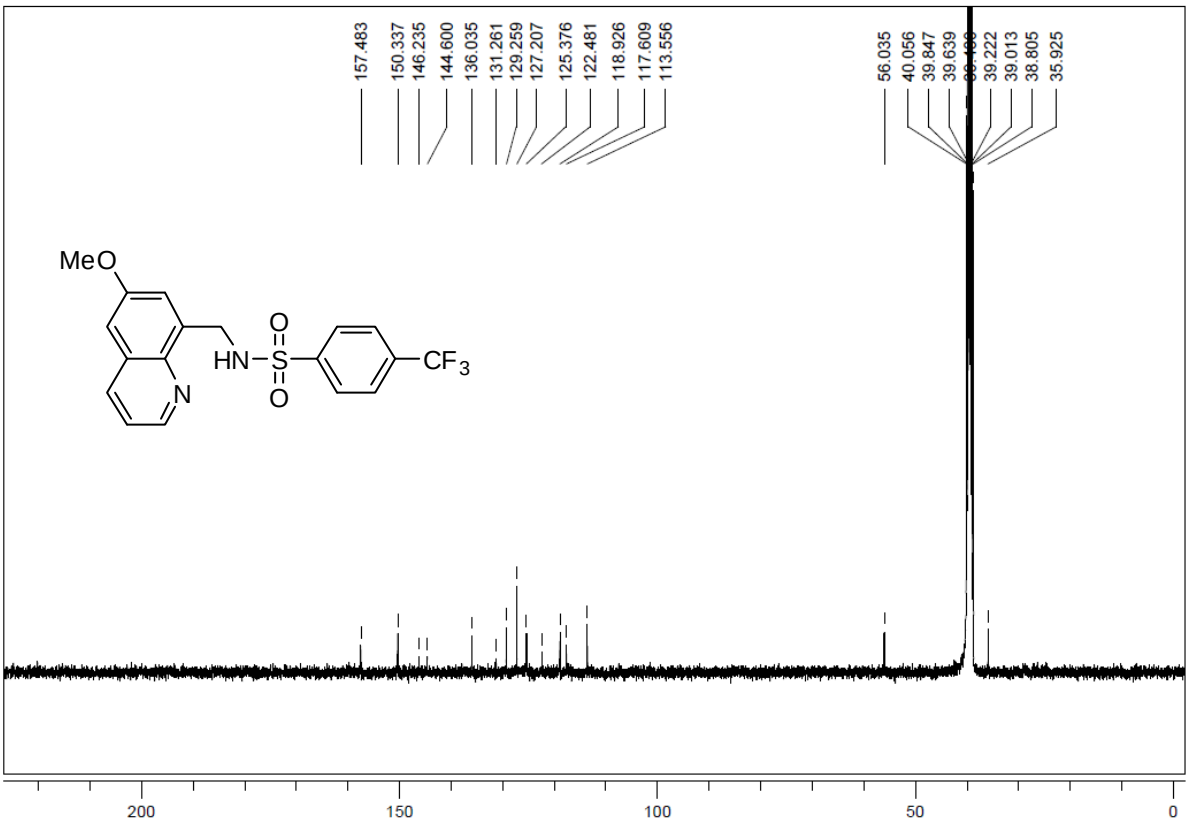
^{19}F NMR Spectra of **3fa**



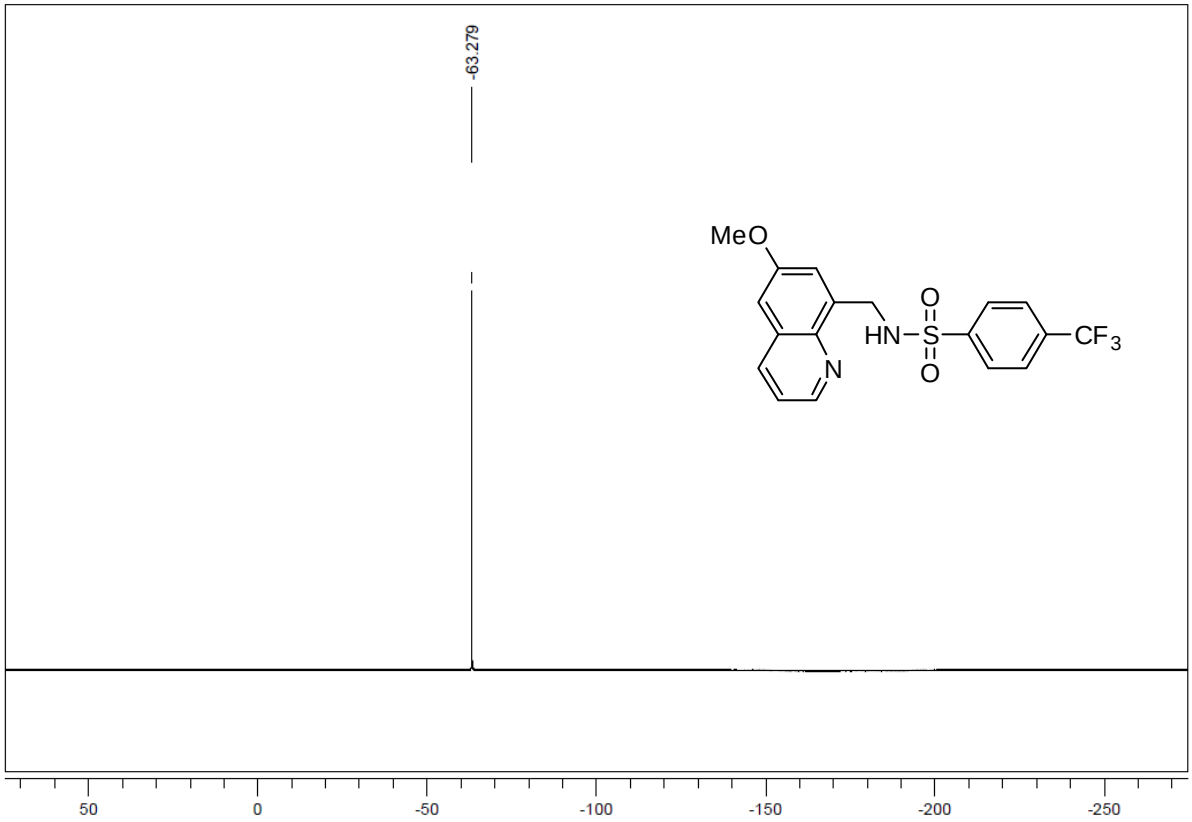
^{1}H NMR Spectra of **3ga**



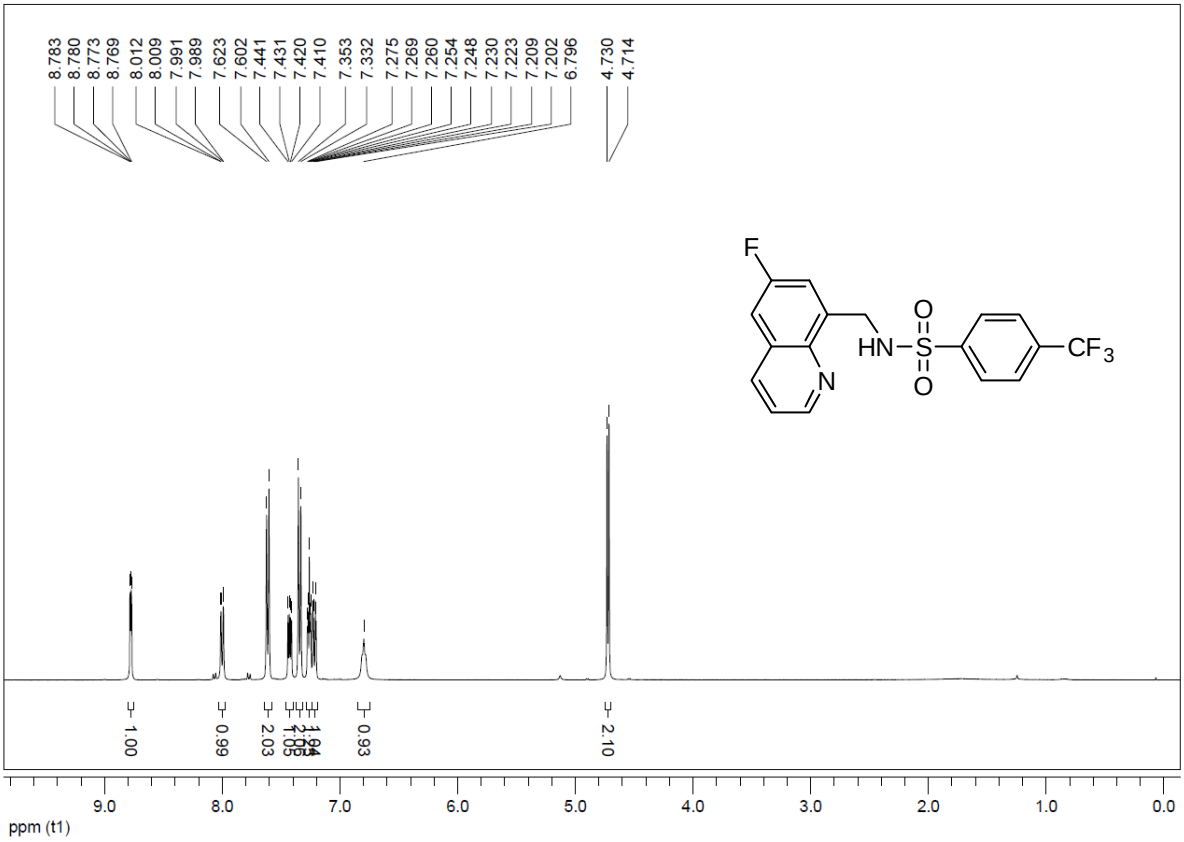
^{13}C NMR Spectra of **3ga**



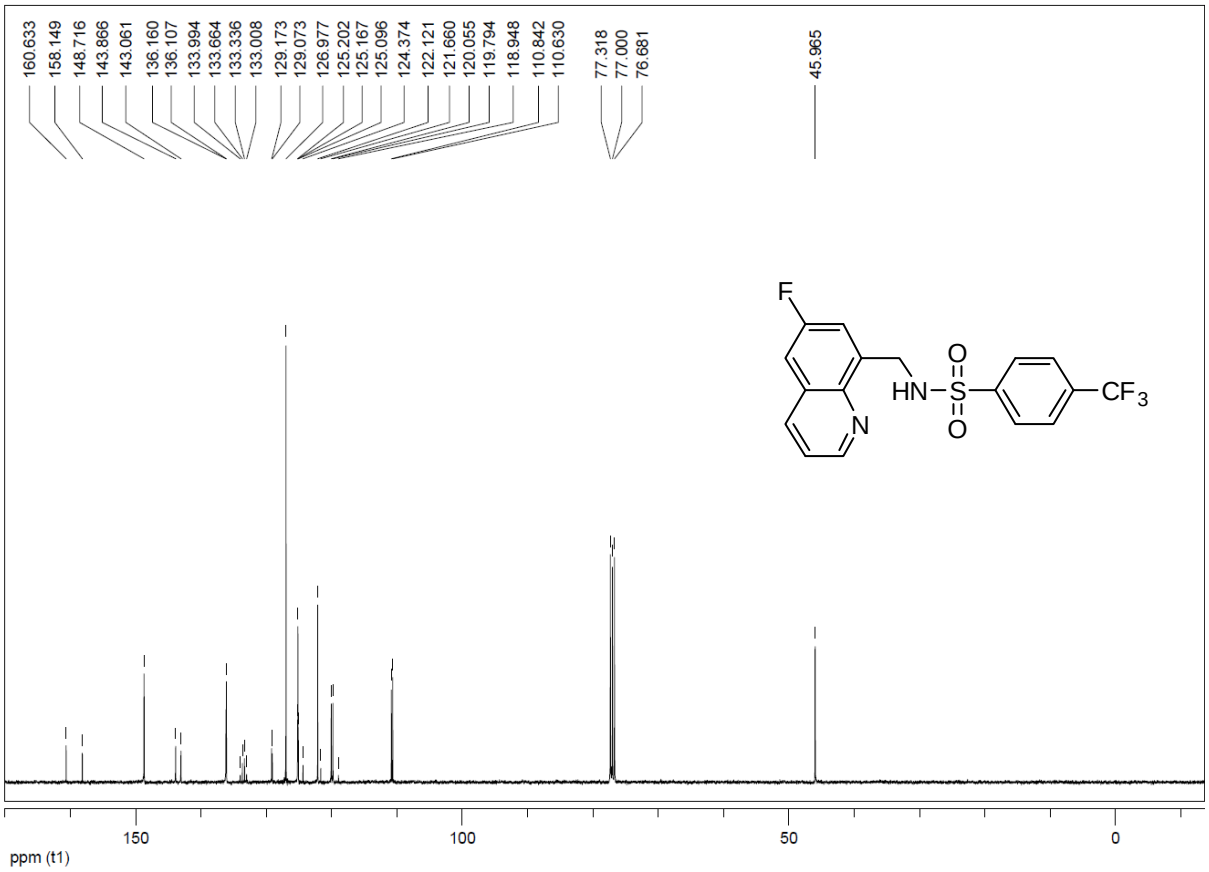
^{19}F NMR Spectra of **3ga**



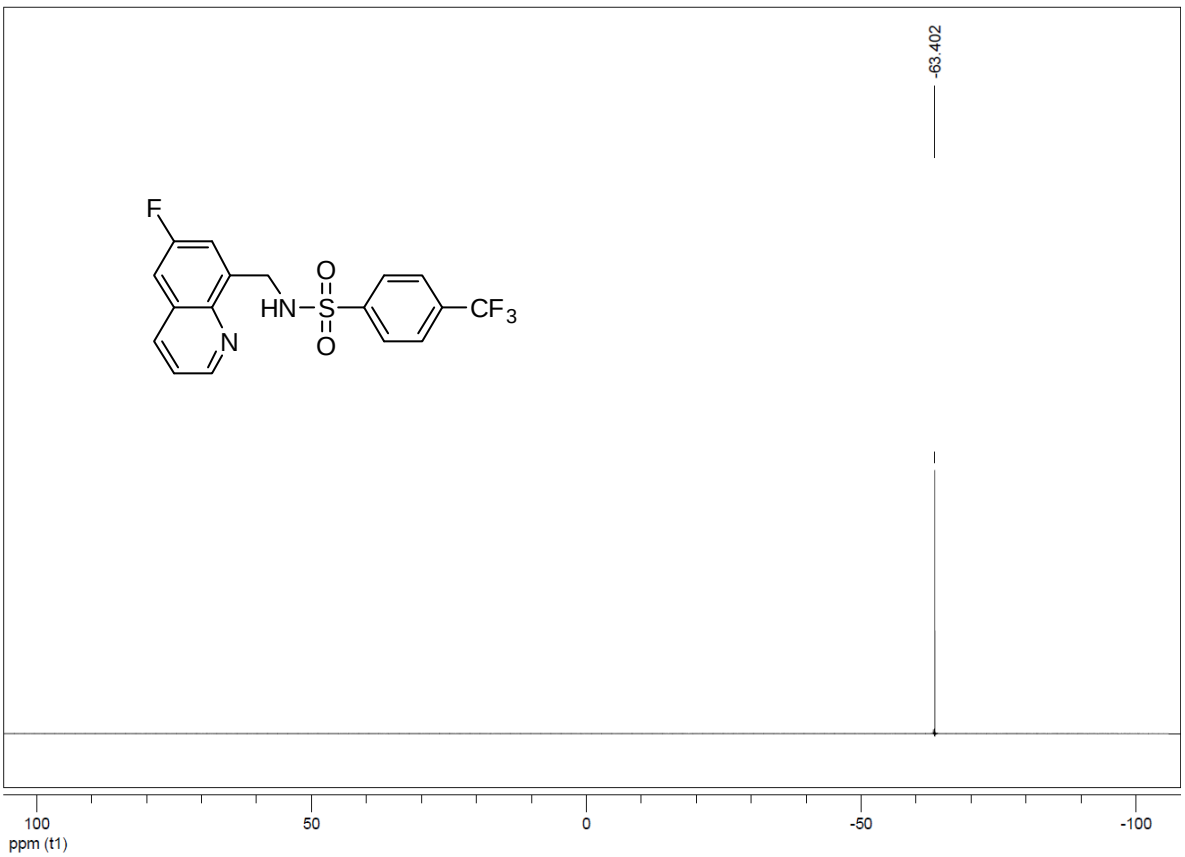
^{1}H NMR Spectra of **3ha**



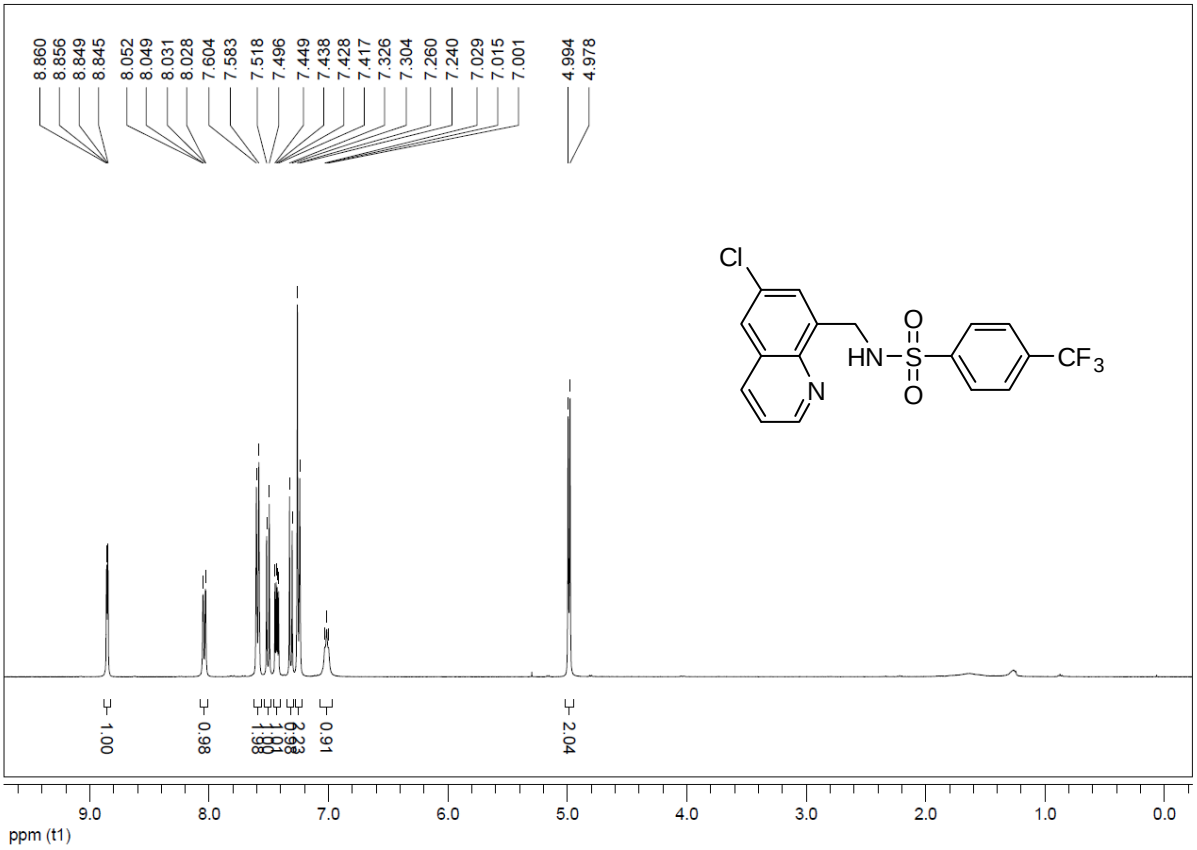
^{13}C NMR Spectra of **3ha**



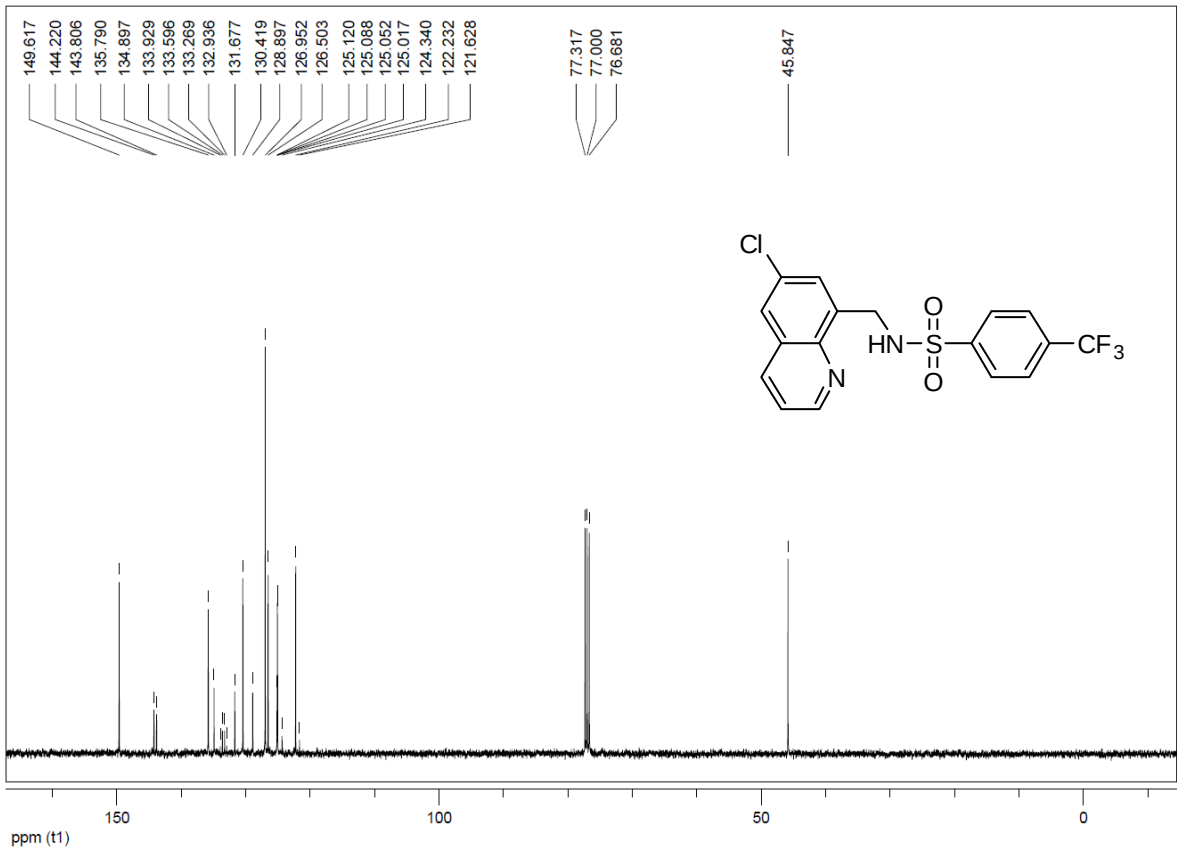
^{19}F NMR Spectra of **3ha**



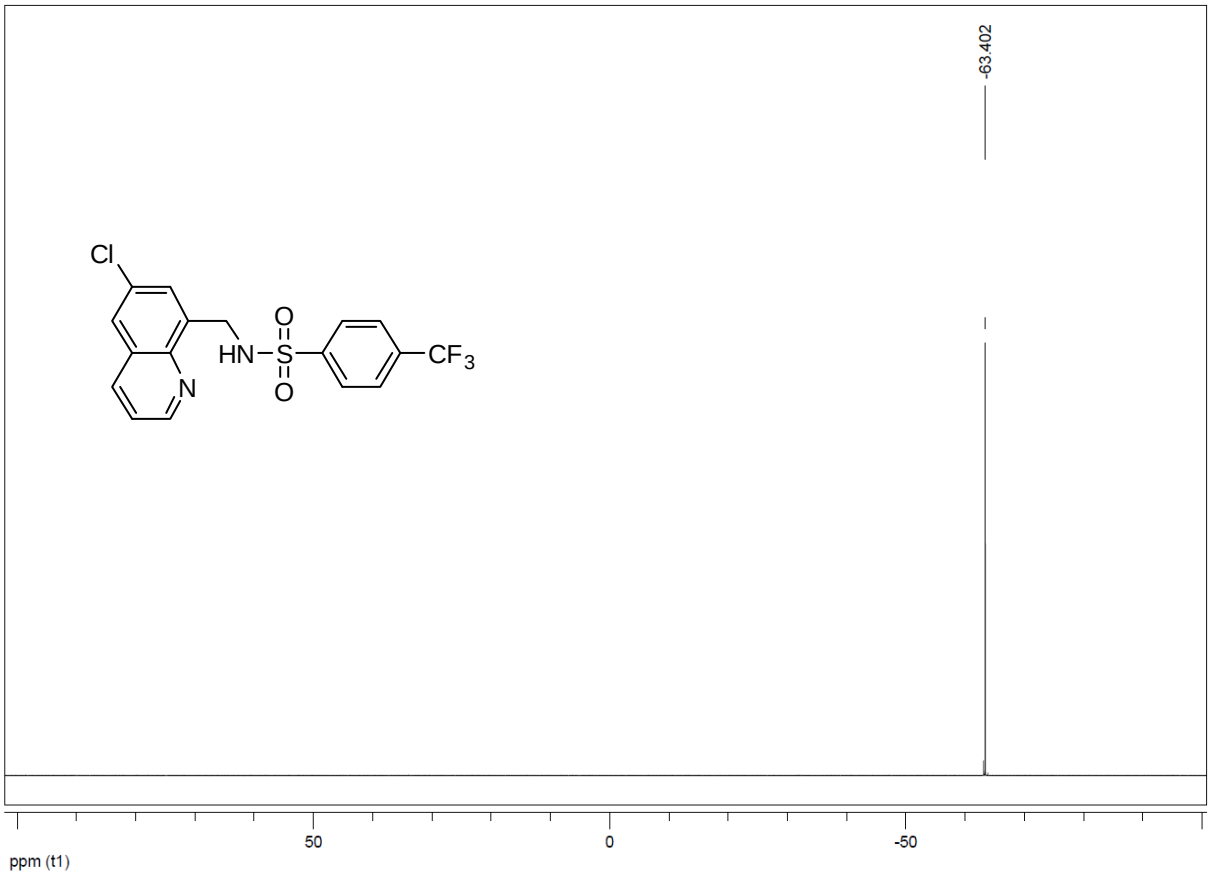
^{1}H NMR Spectra of **3ia**



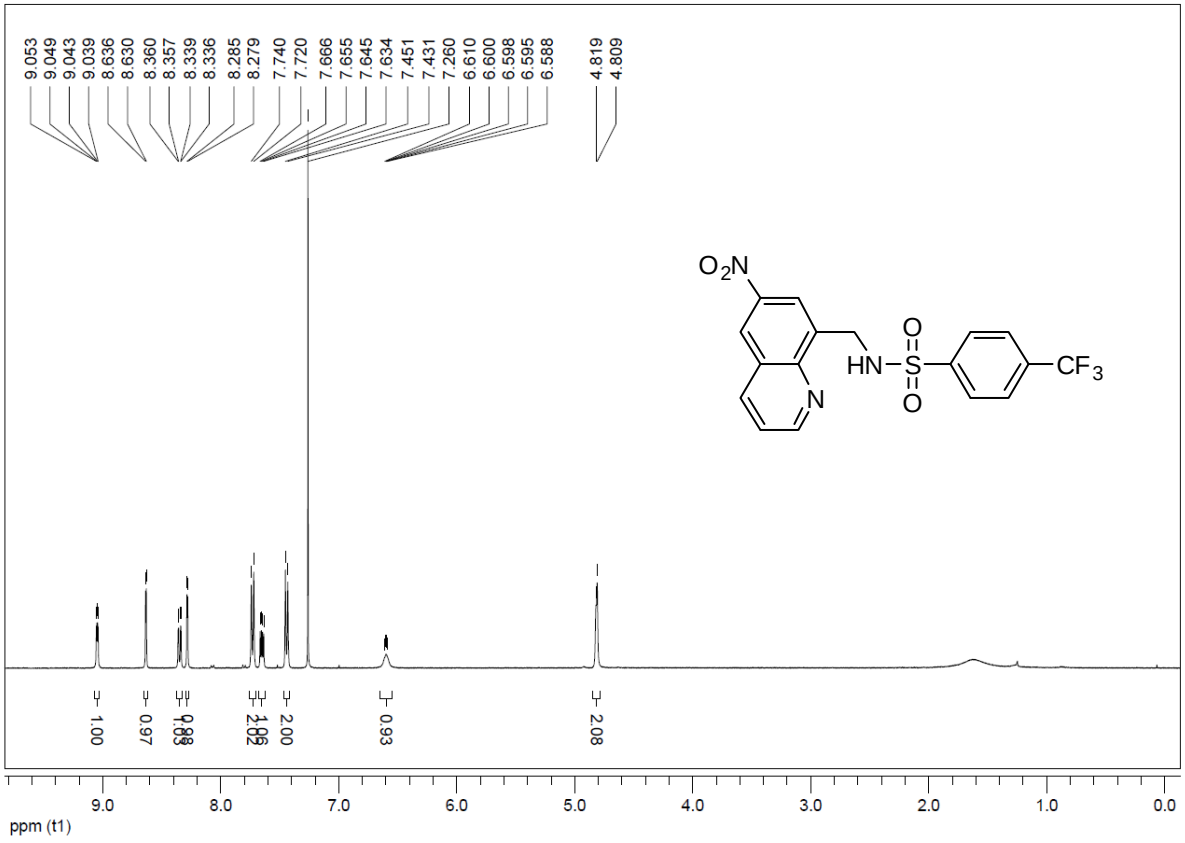
^{13}C NMR Spectra of **3ia**



^{19}F NMR Spectra of **3ia**



^{1}H NMR Spectra of **3ja**



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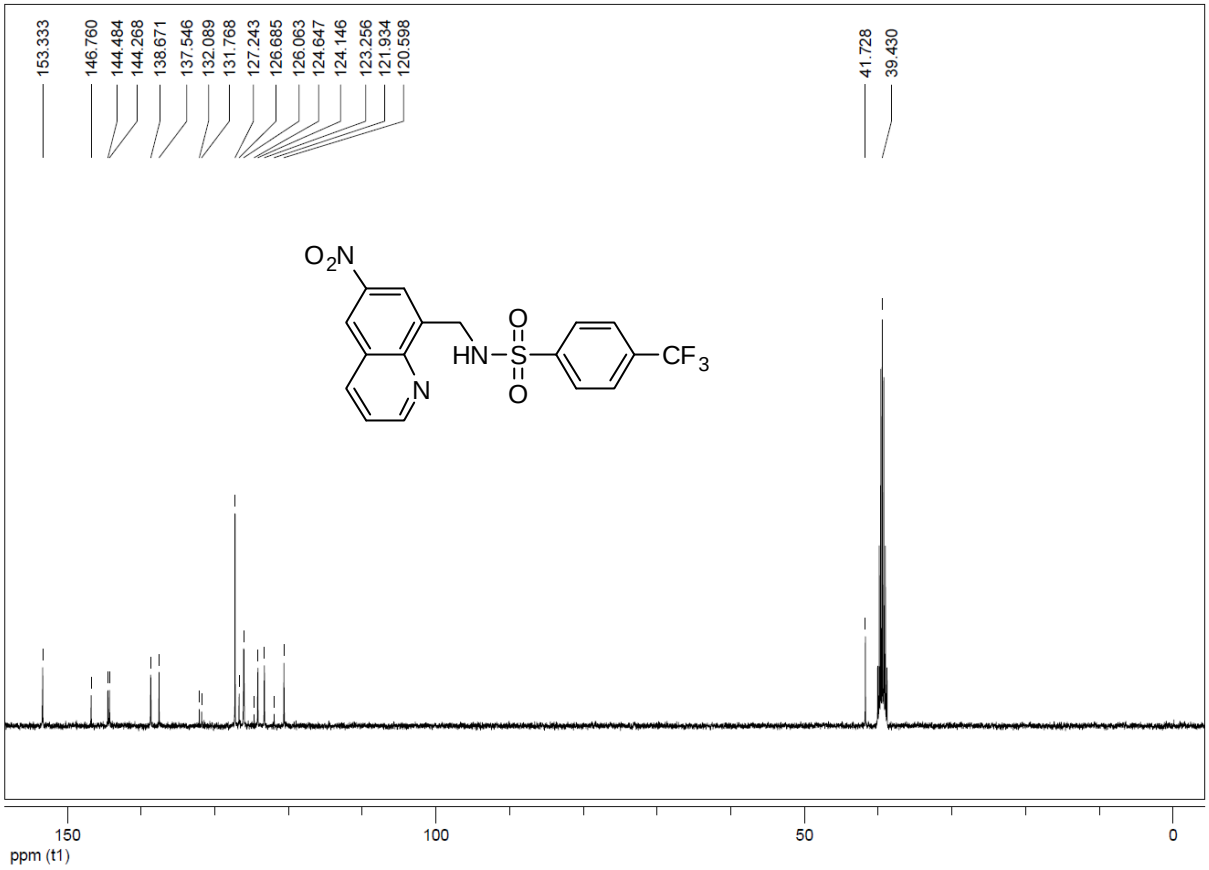
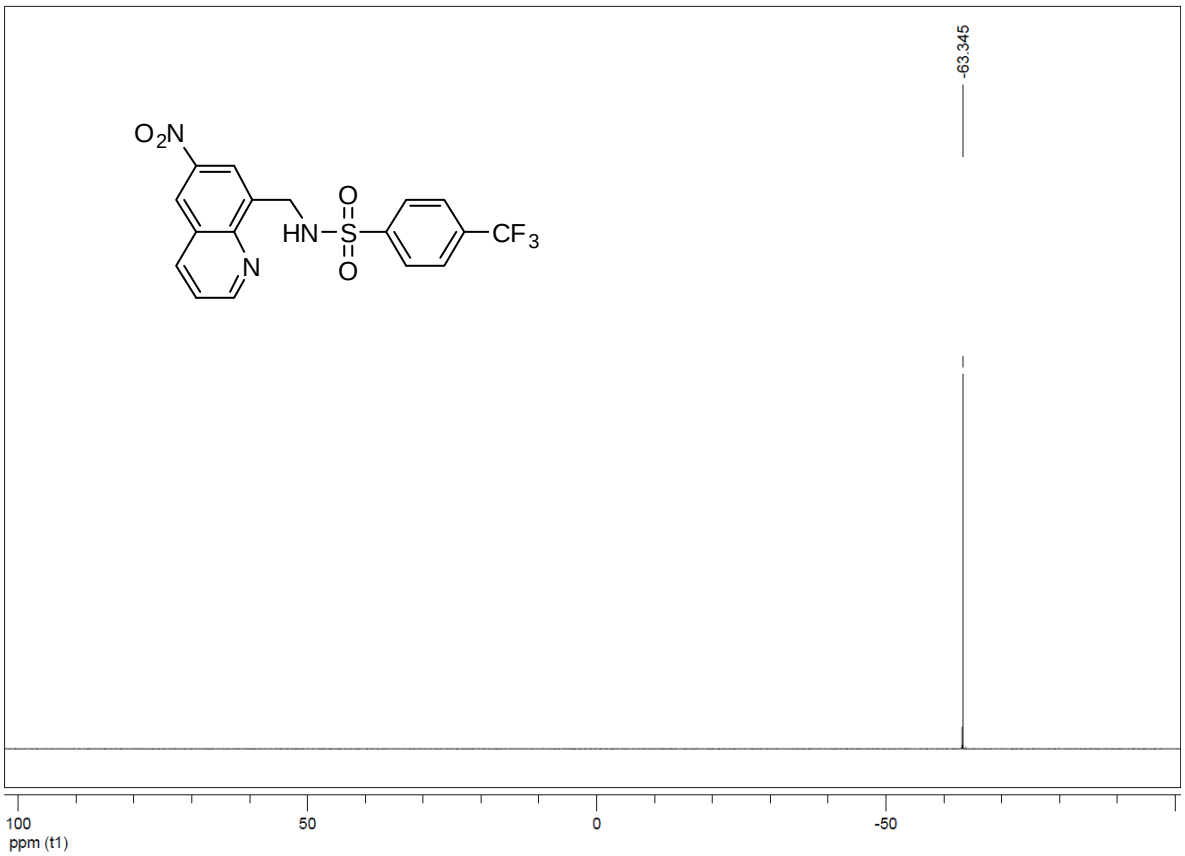
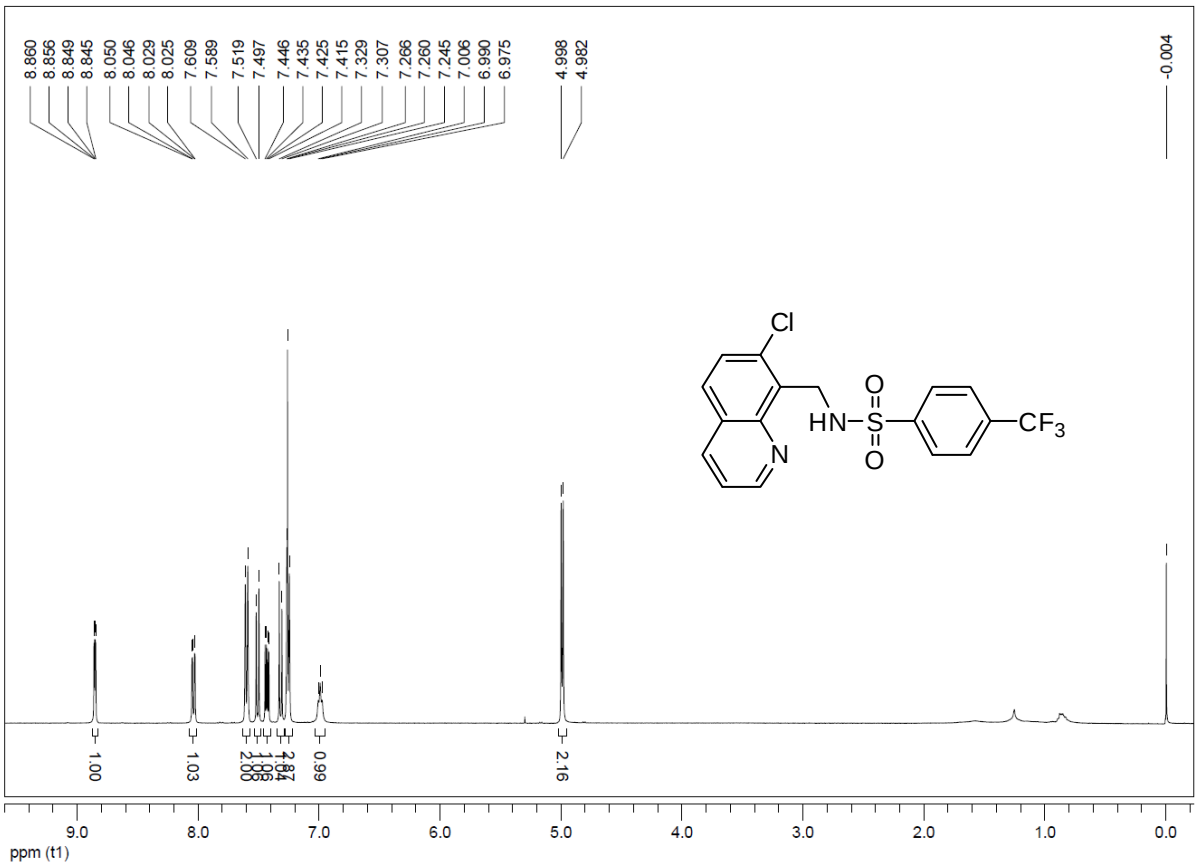


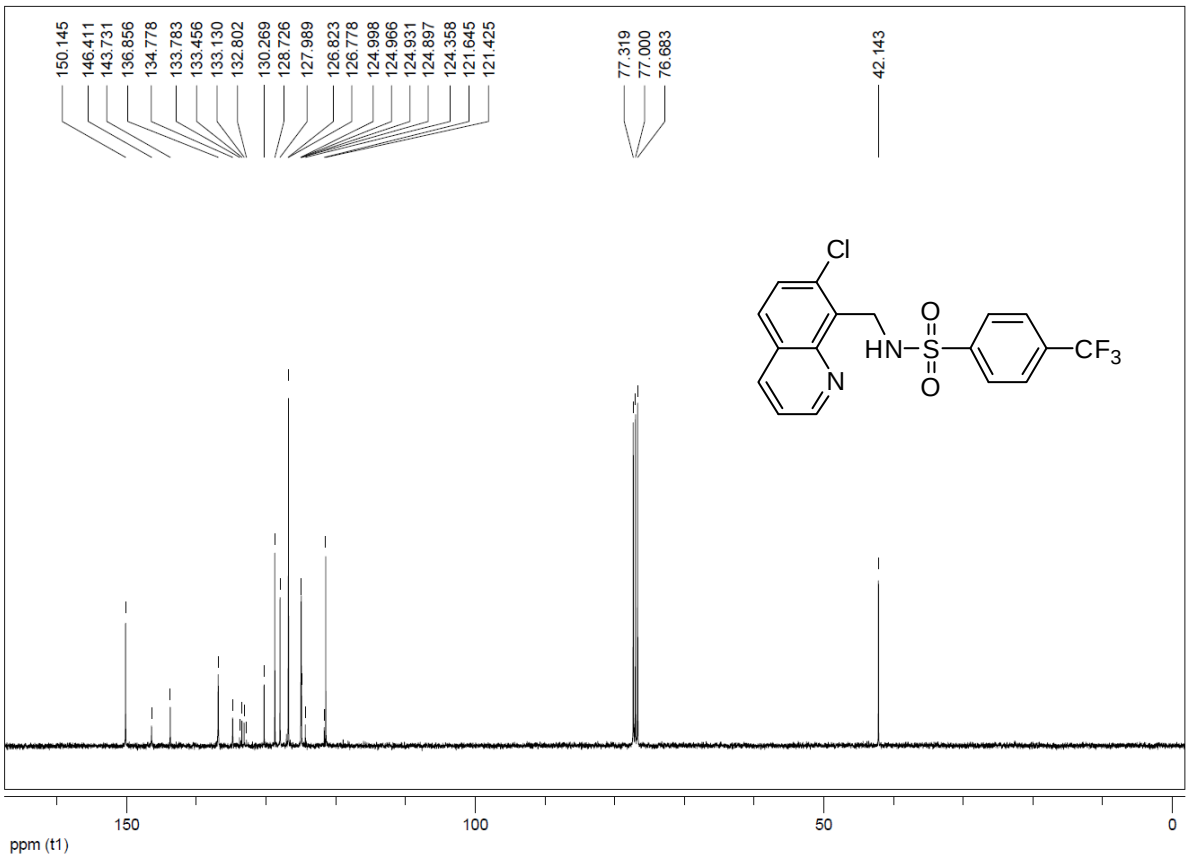
^{19}F NMR Spectra of **3ja**



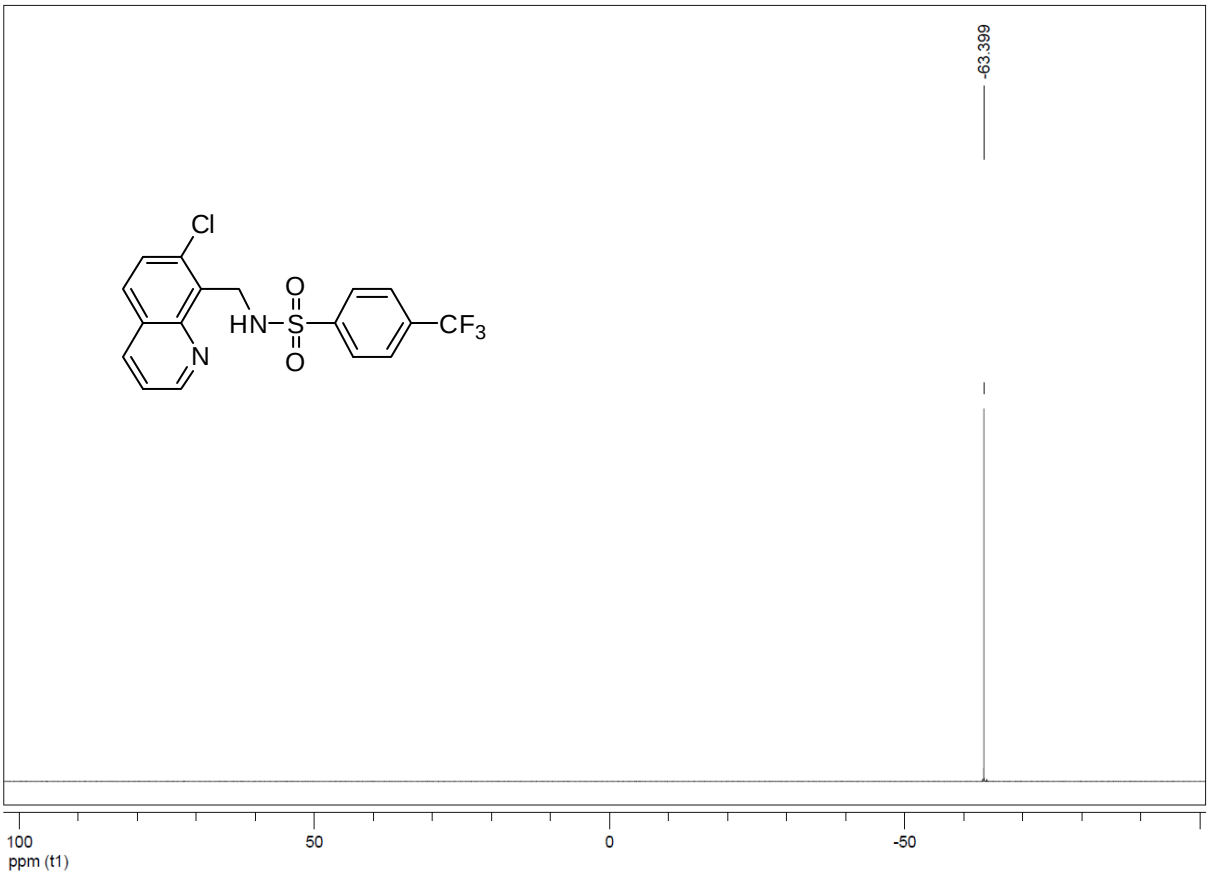
^{1}H NMR Spectra of **3ka**



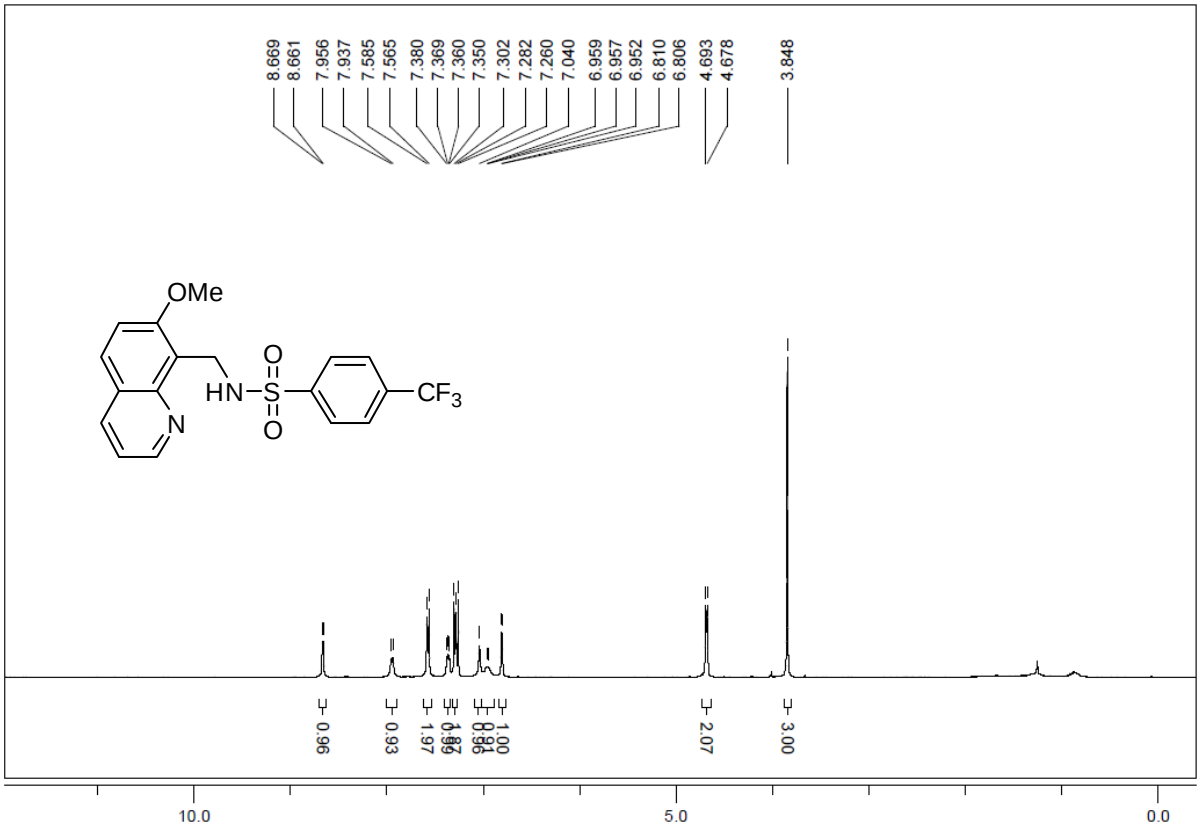
^{13}C NMR Spectra of **3ka**



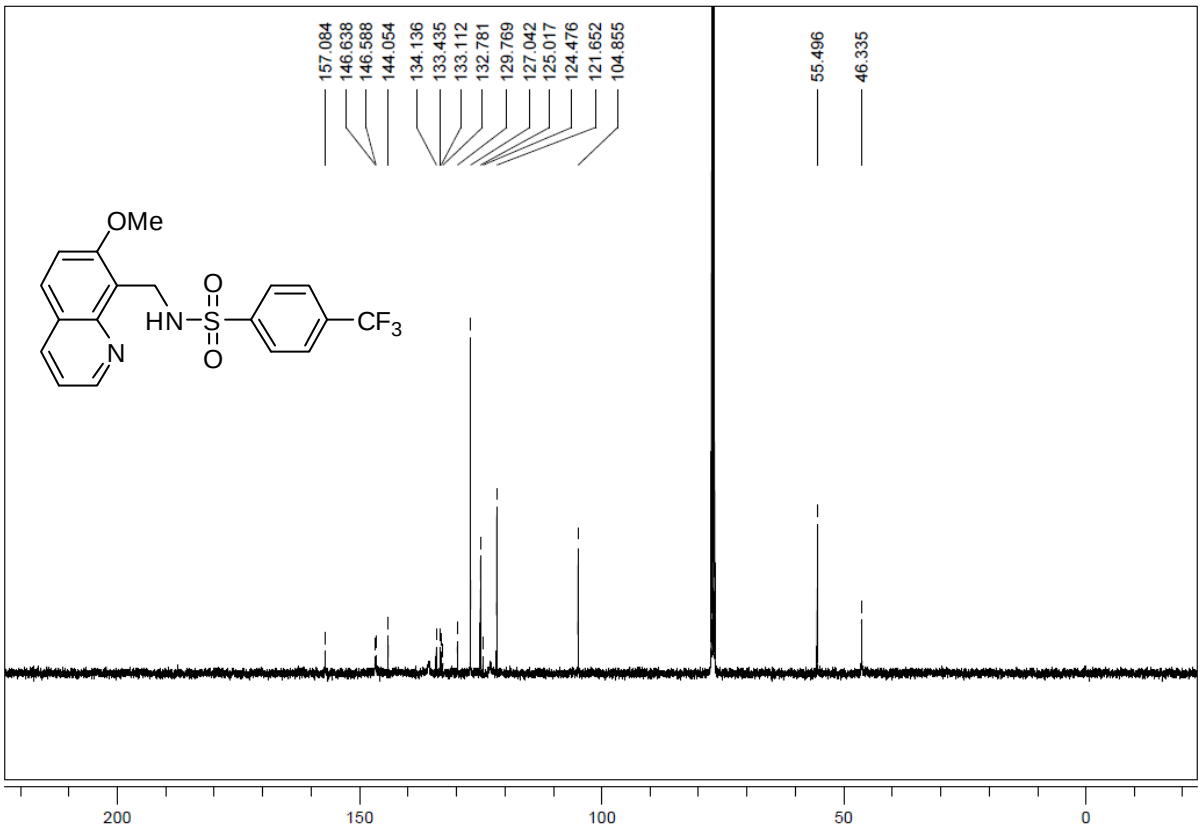
^{19}F NMR Spectra of **3ka**



^{1}H NMR Spectra of **3la**



^{13}C NMR Spectra of **3la**



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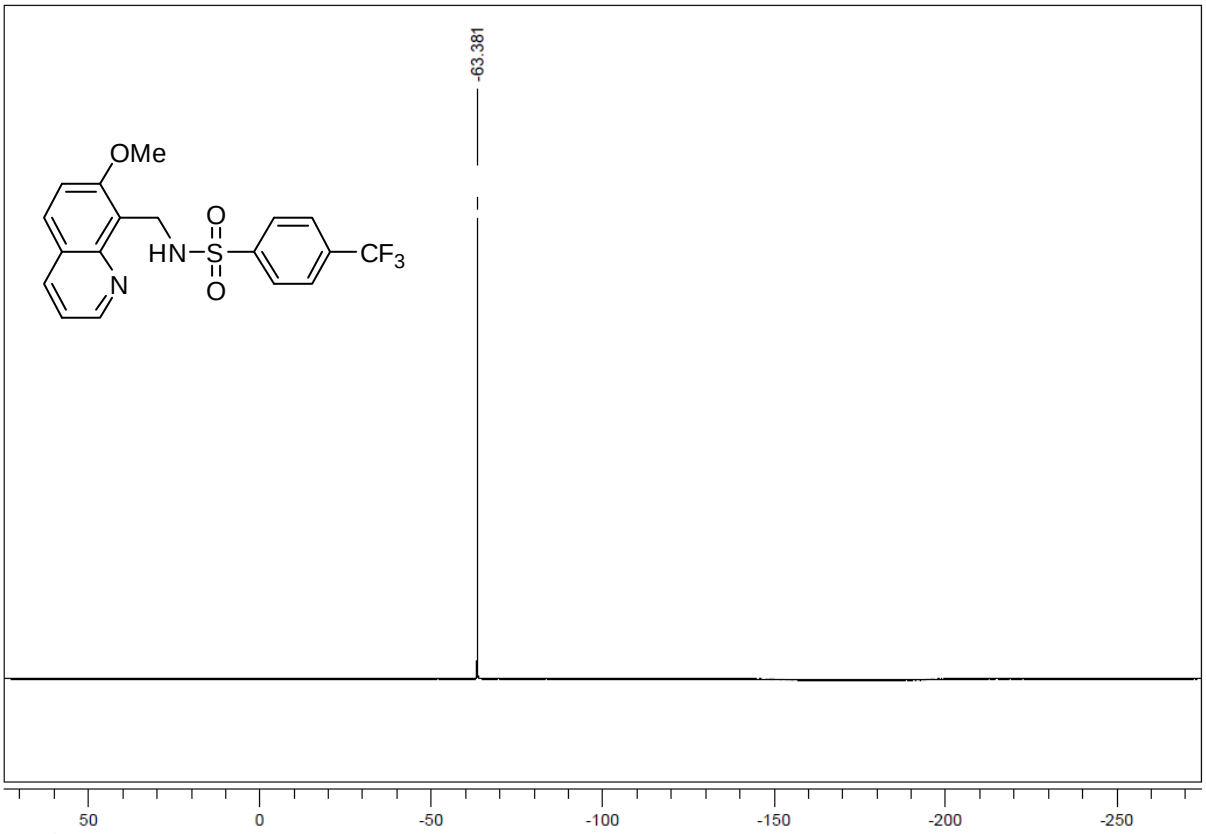
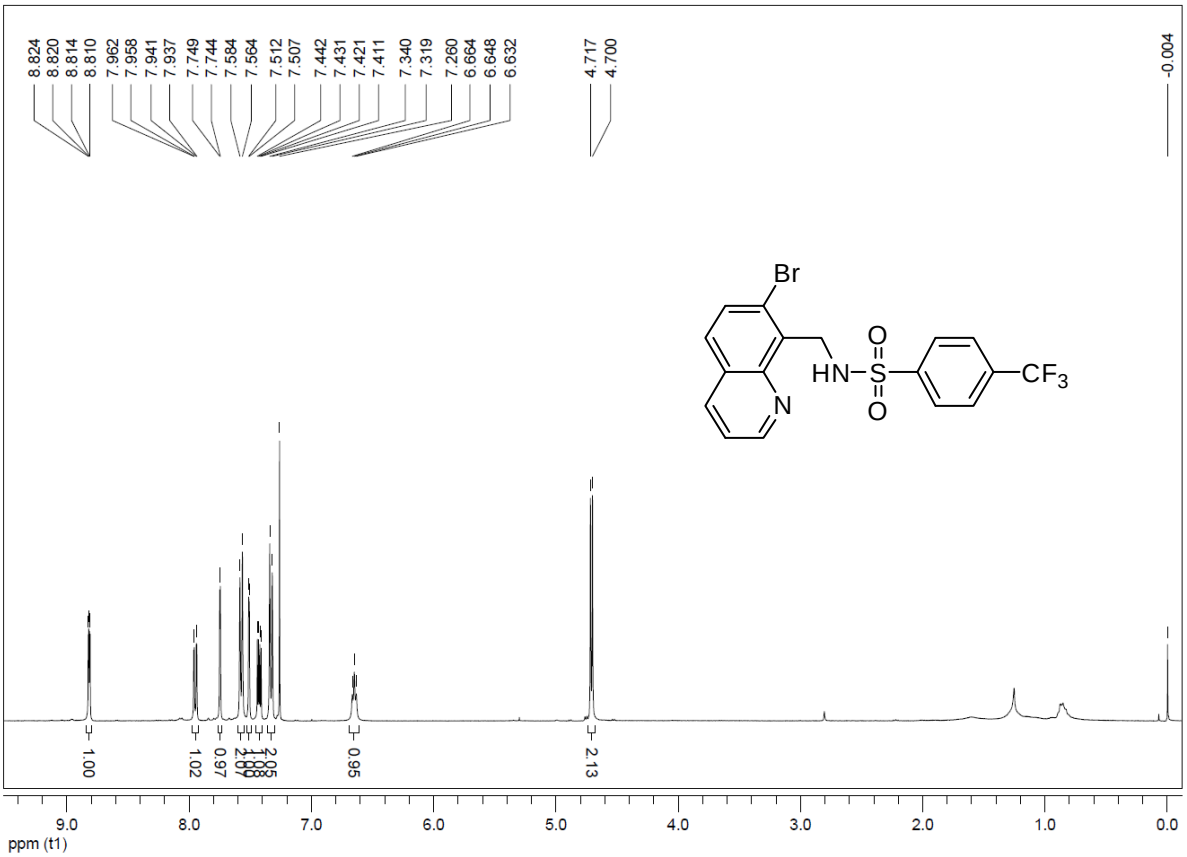
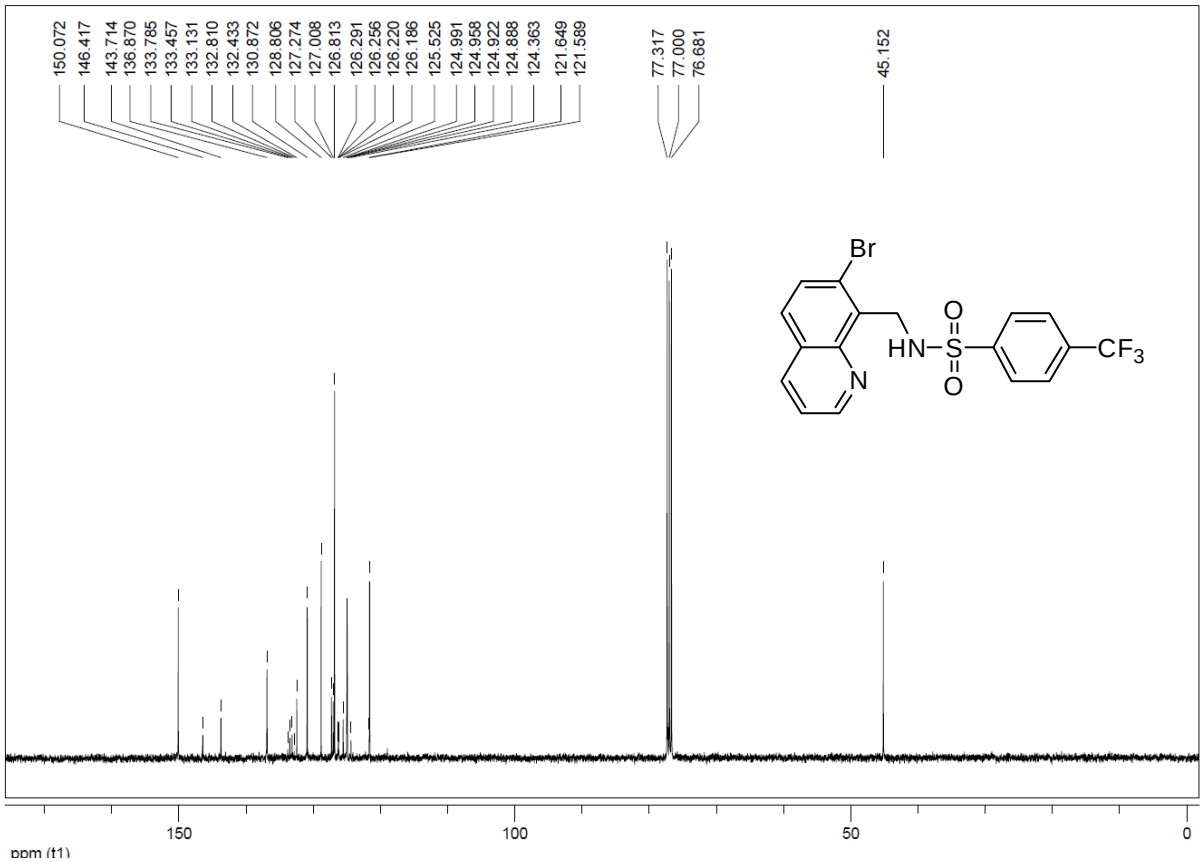


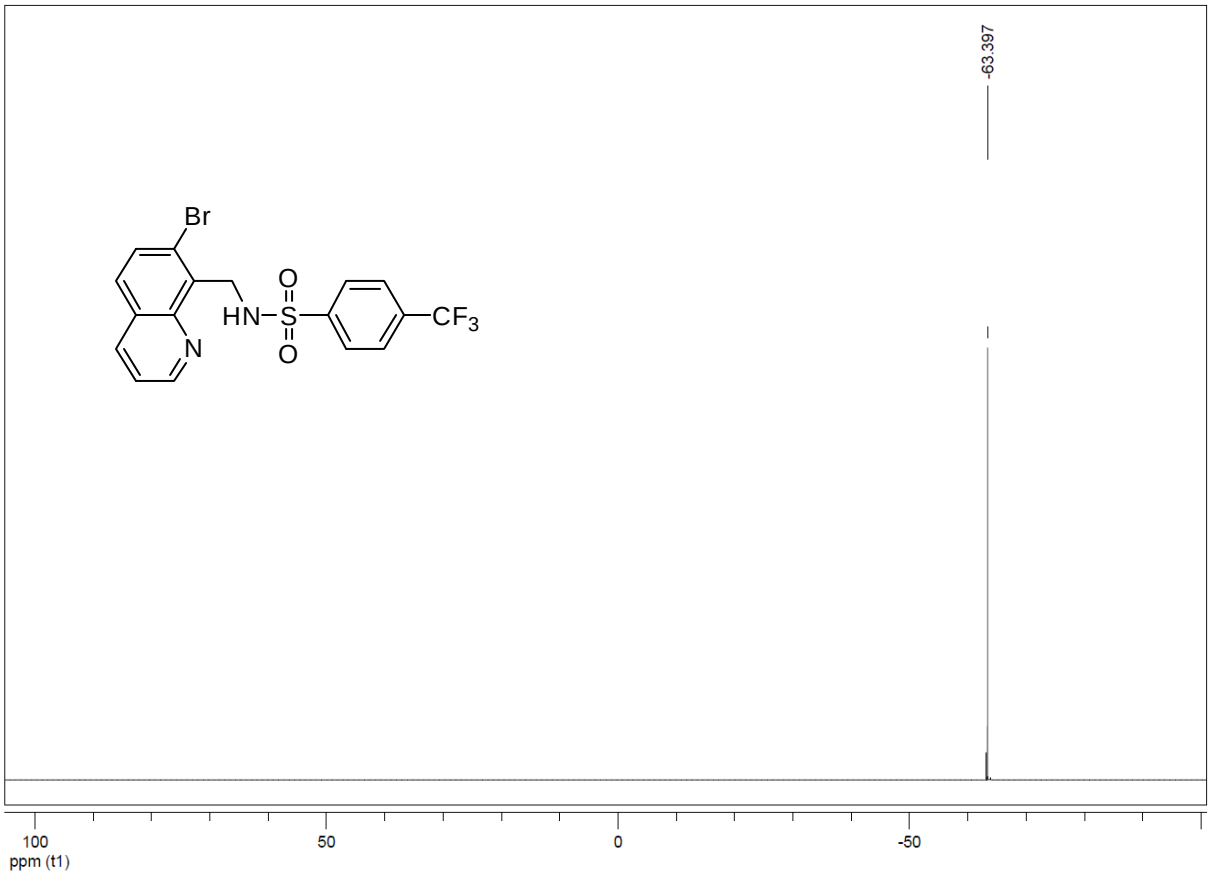
^{1}H NMR Spectra of **3ma**



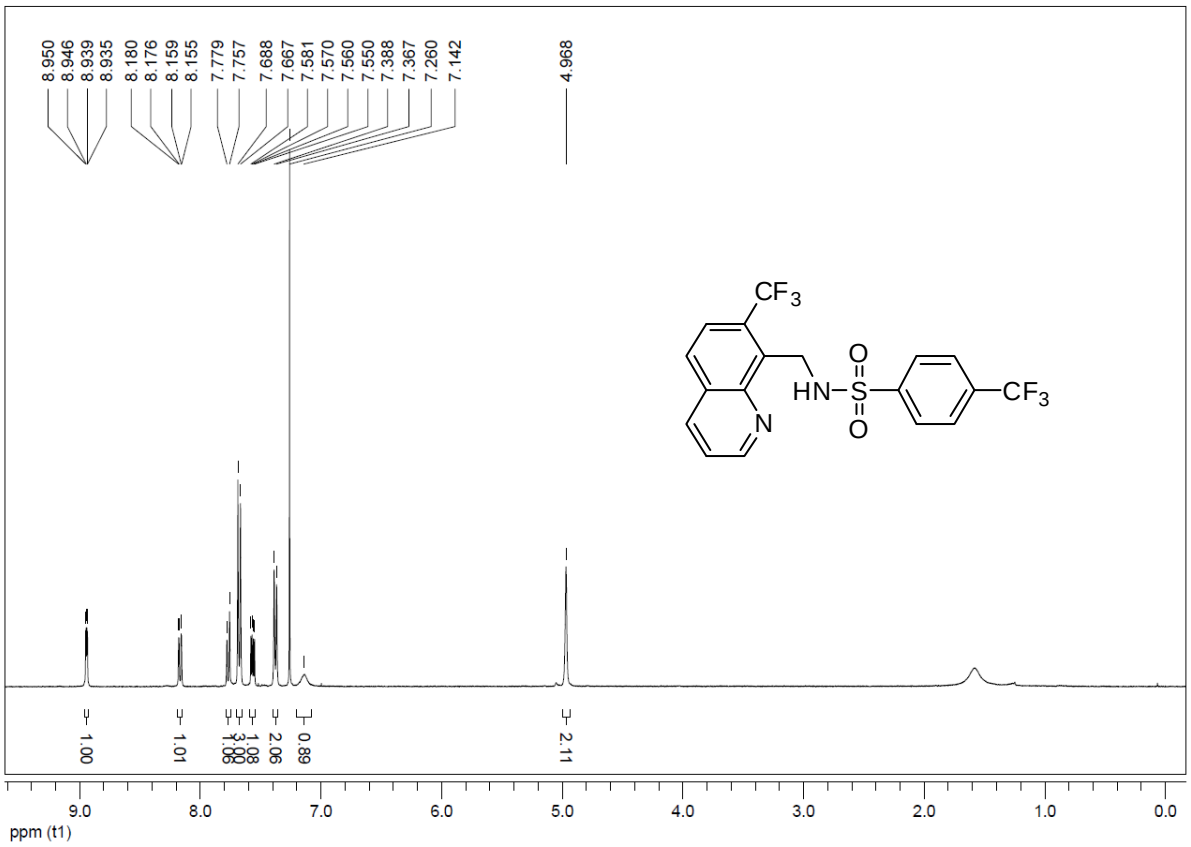
^{13}C NMR Spectra of **3ma**



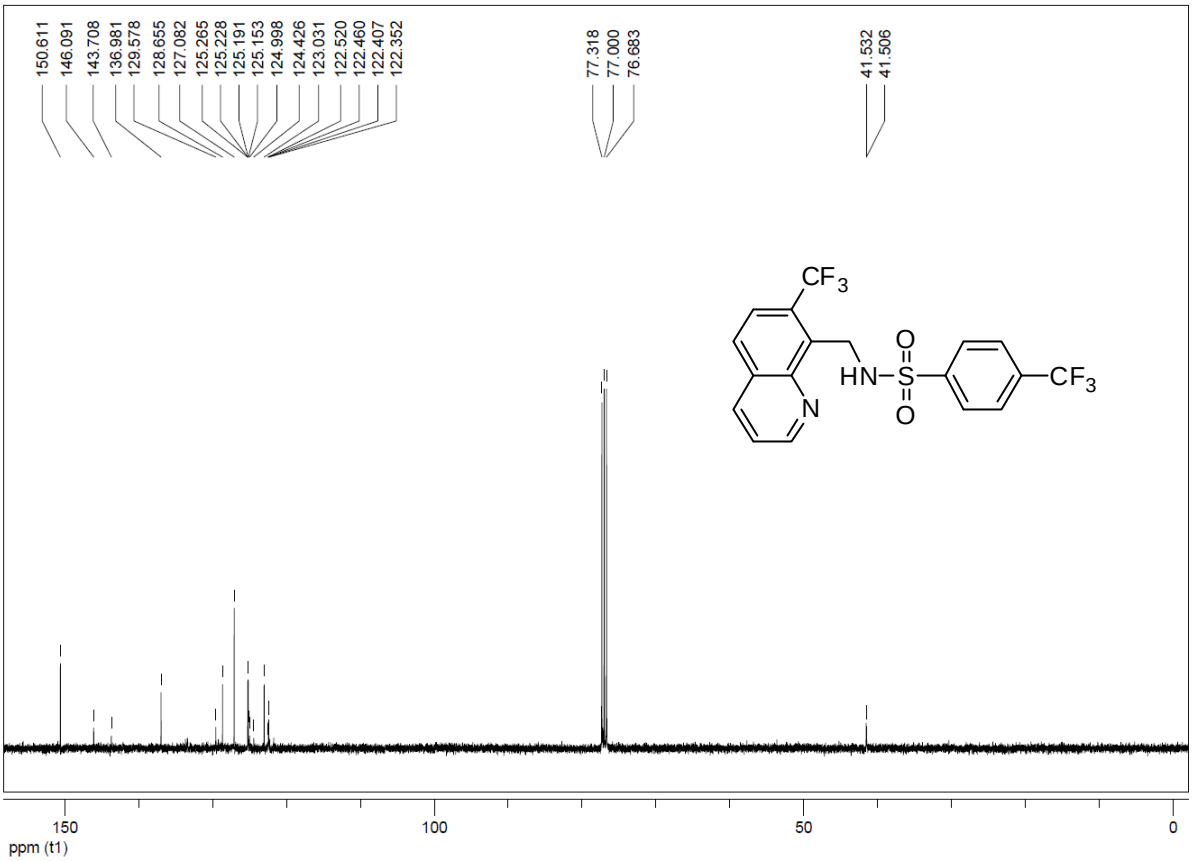
^{19}F NMR Spectra of **3ma**



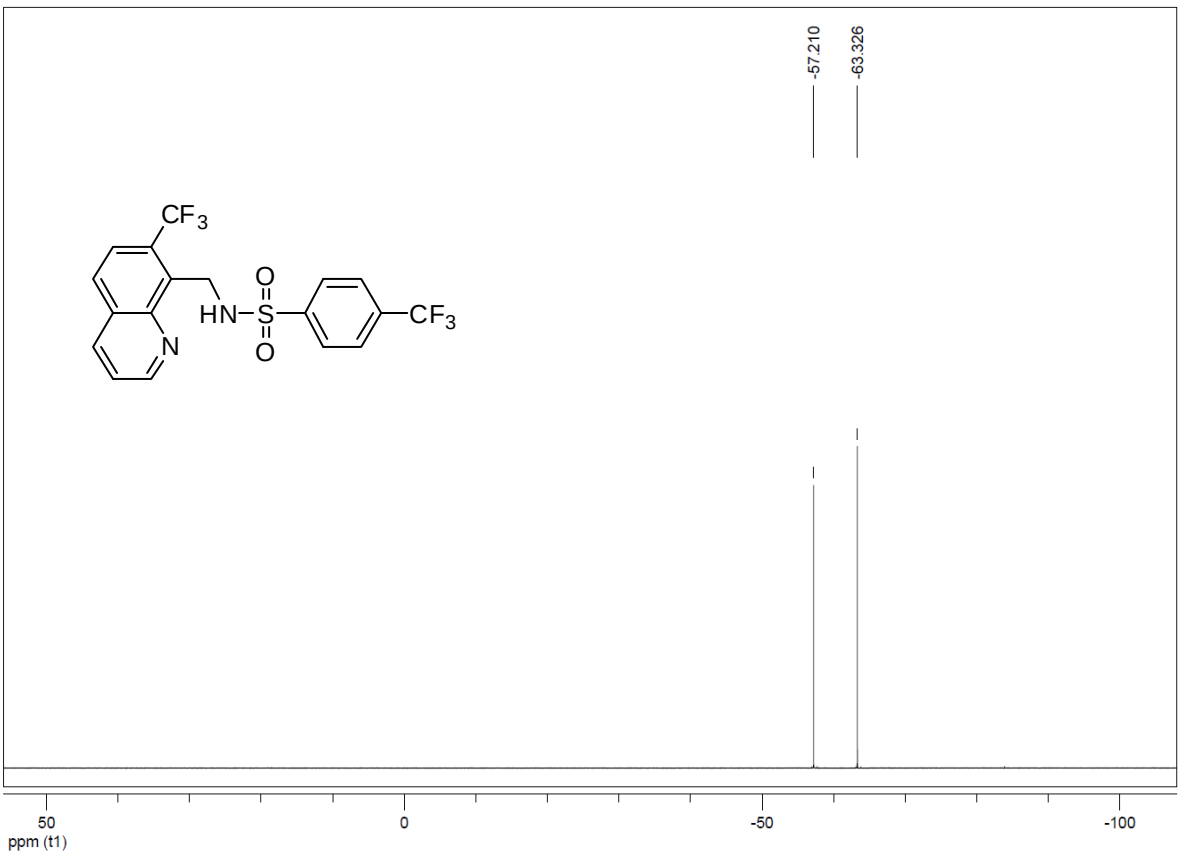
^{1}H NMR Spectra of **3na**



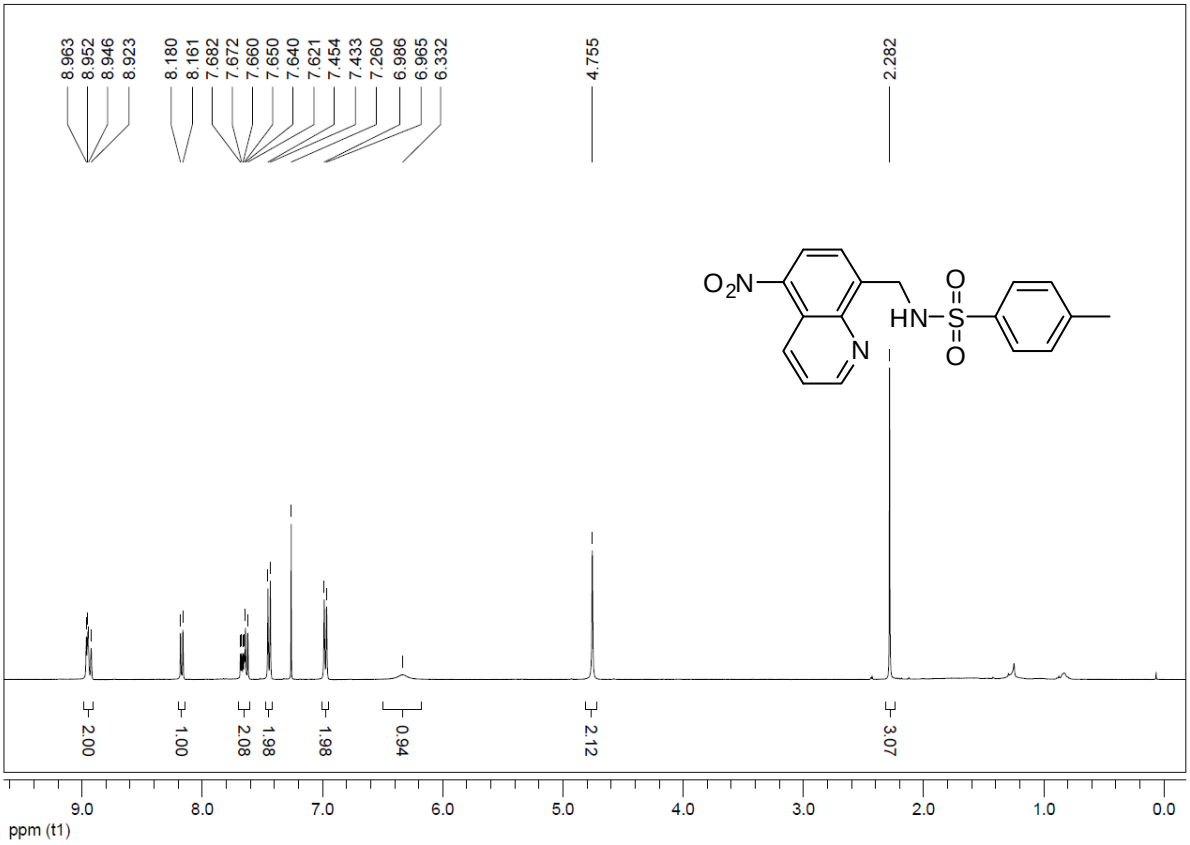
^{13}C NMR Spectra of **3na**



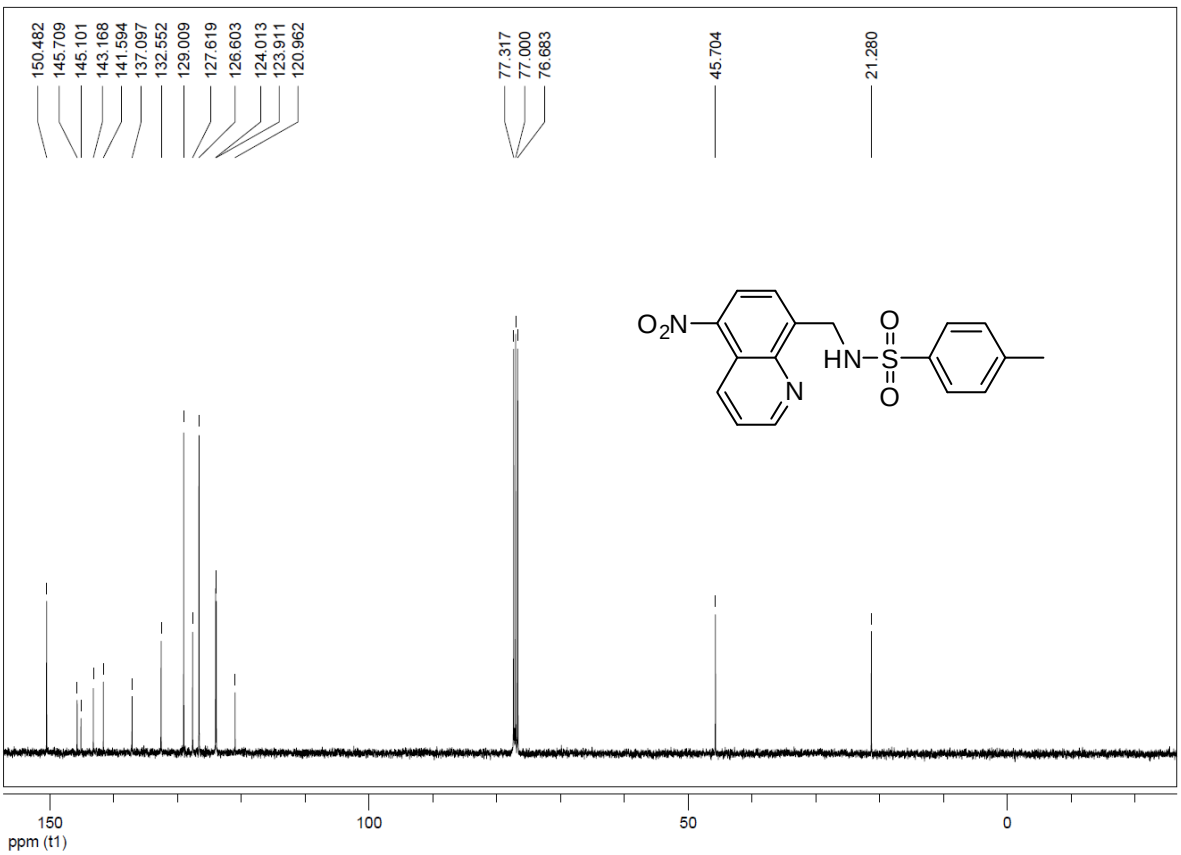
^{19}F NMR Spectra of **3na**



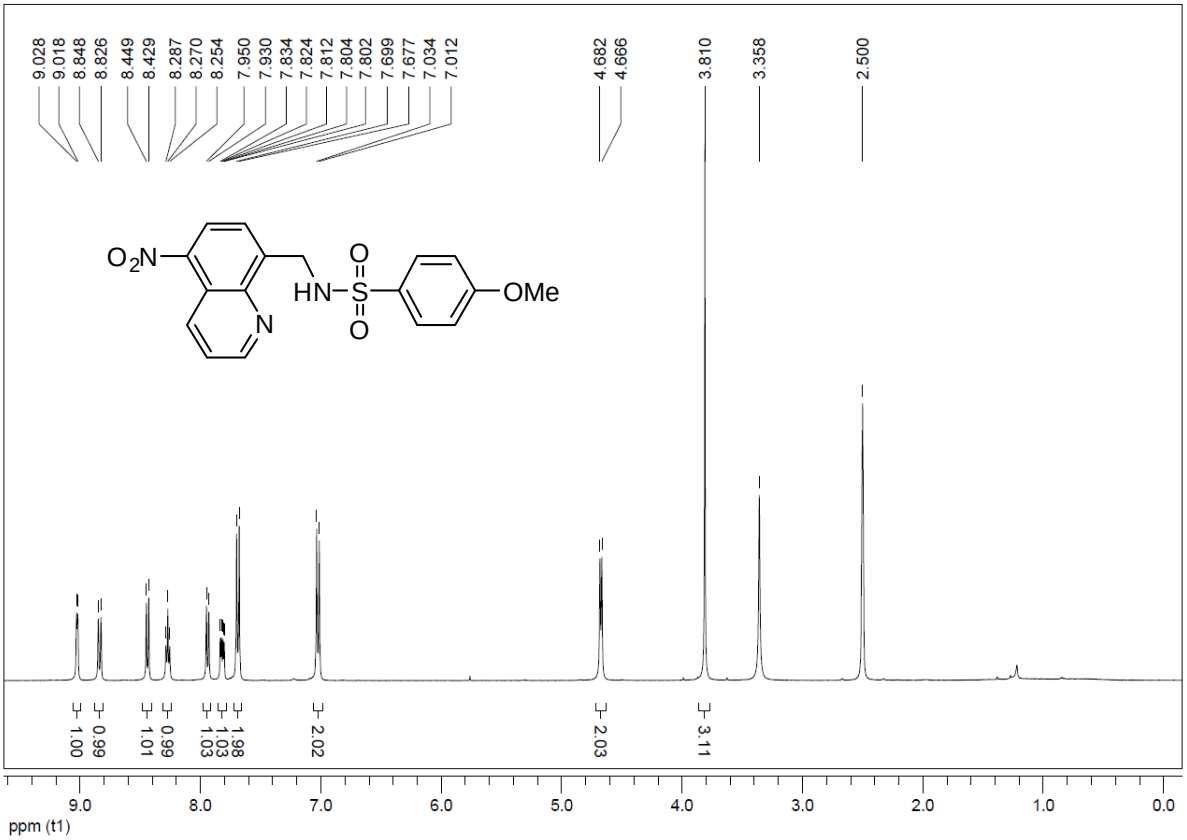
^{1}H NMR Spectra of **3eb**



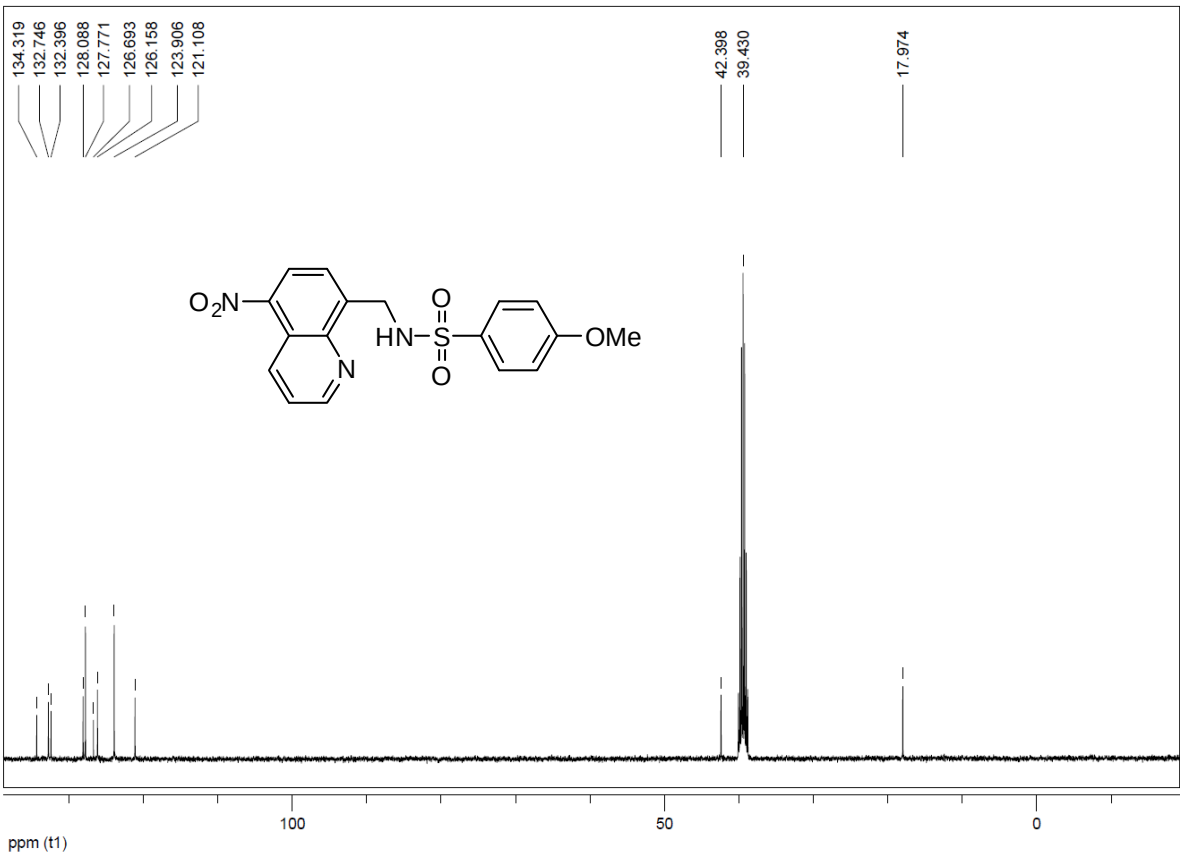
^{13}C NMR Spectra of **3eb**



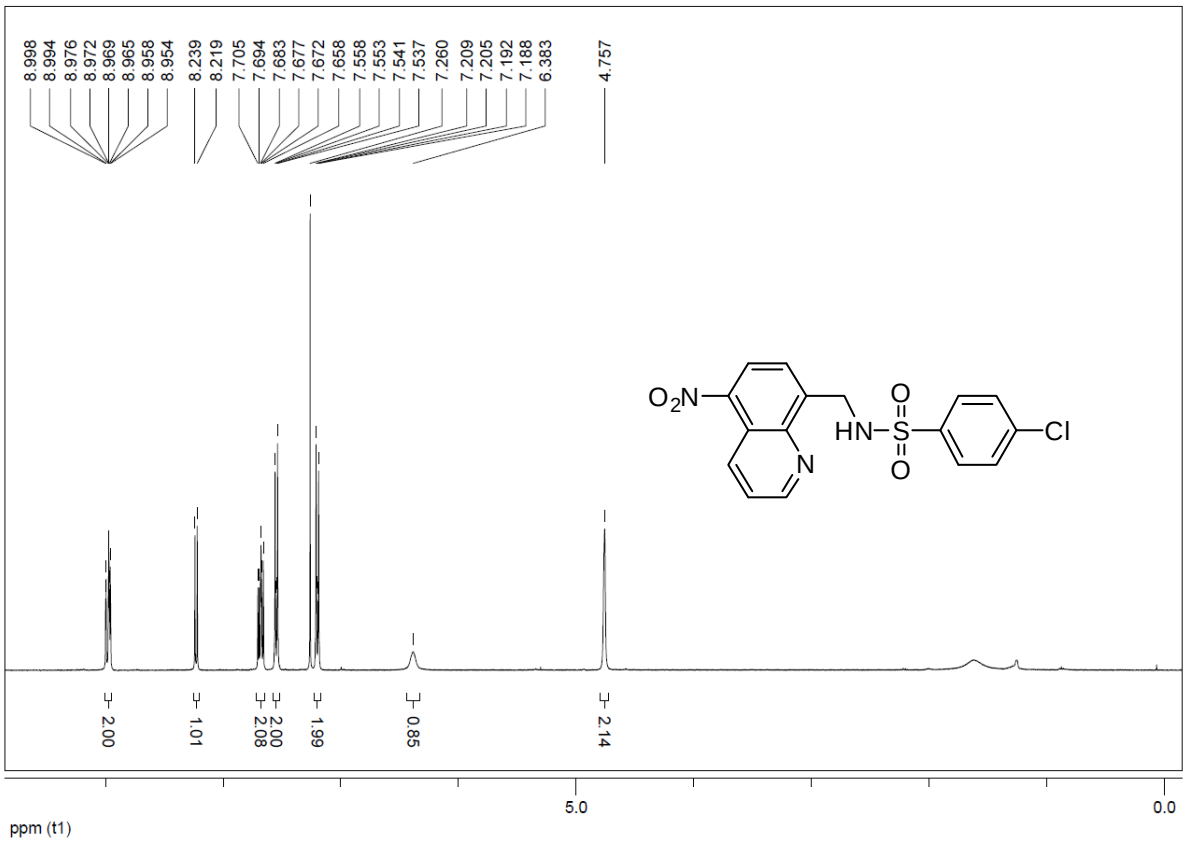
^{1}H NMR Spectra of **3ec**



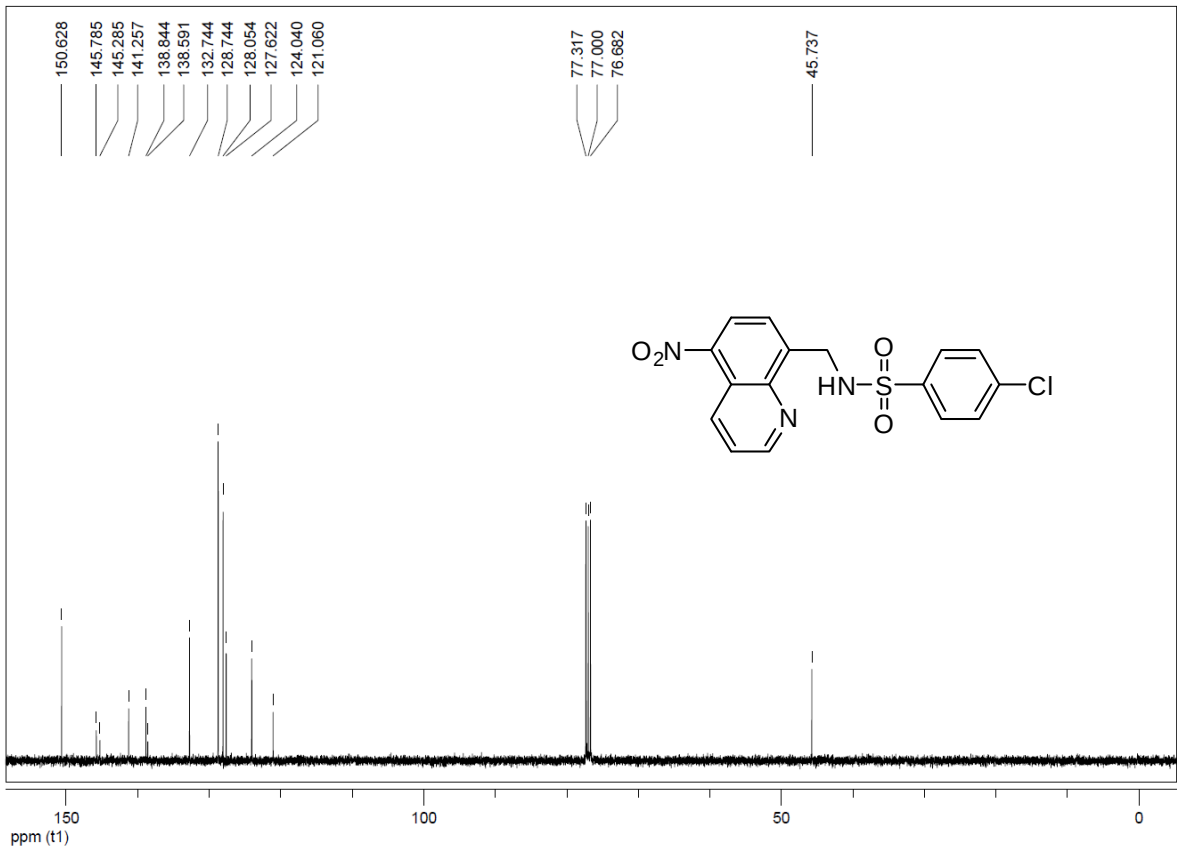
^{13}C NMR Spectra of **3ec**



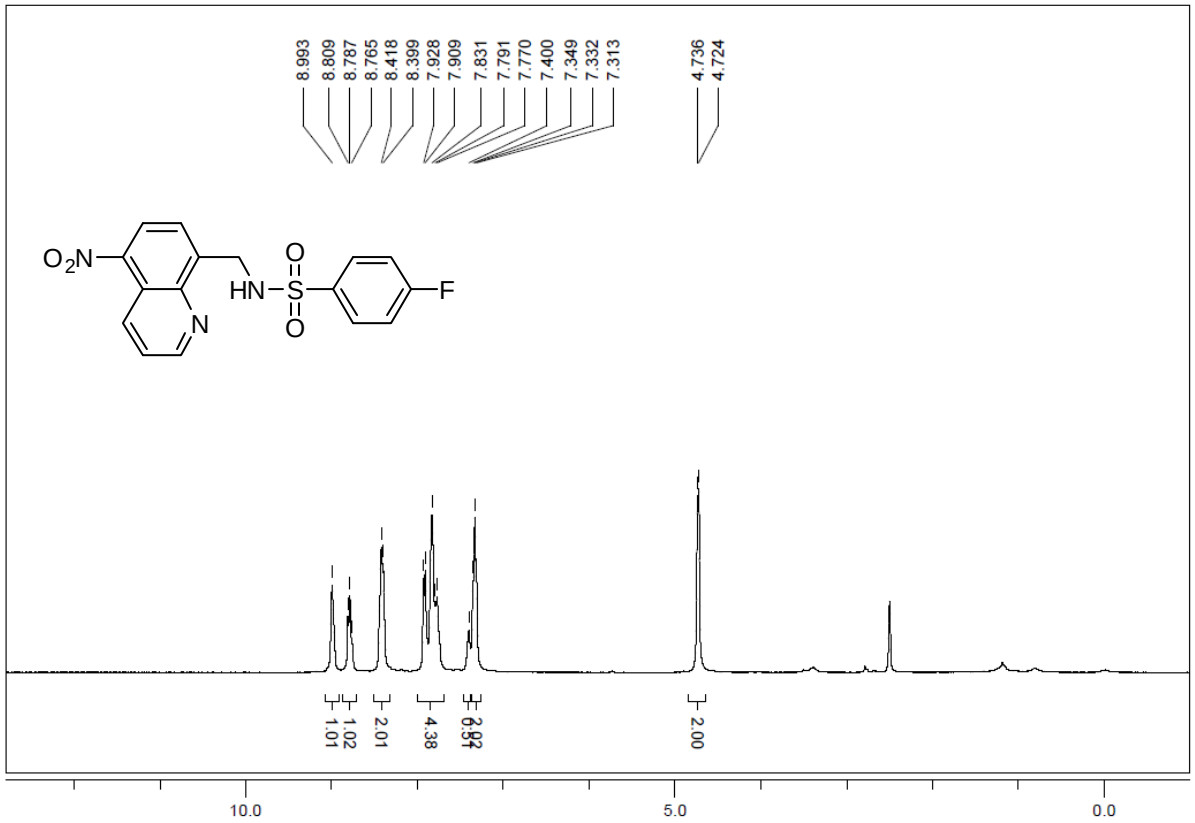
^{1}H NMR Spectra of **3ed**



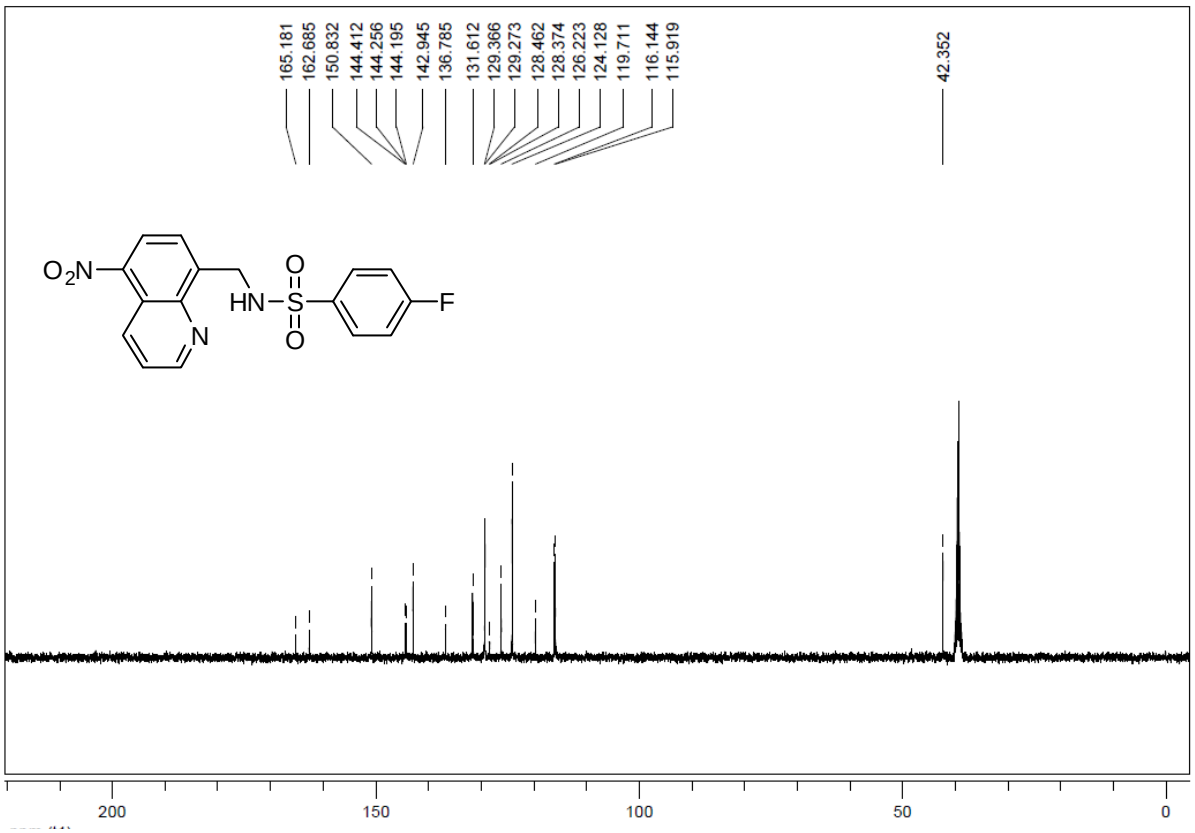
^{13}C NMR Spectra of **3ed**



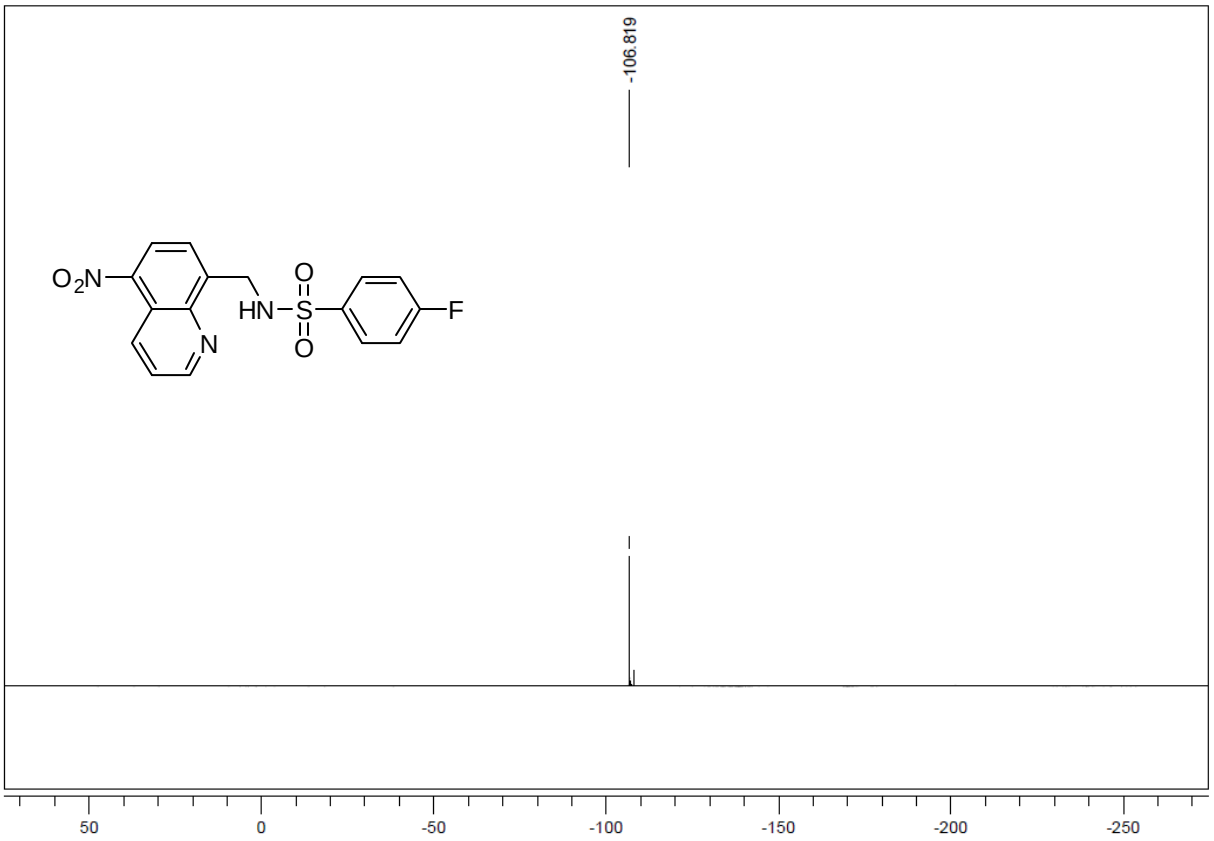
^{1}H NMR Spectra of **3ee**



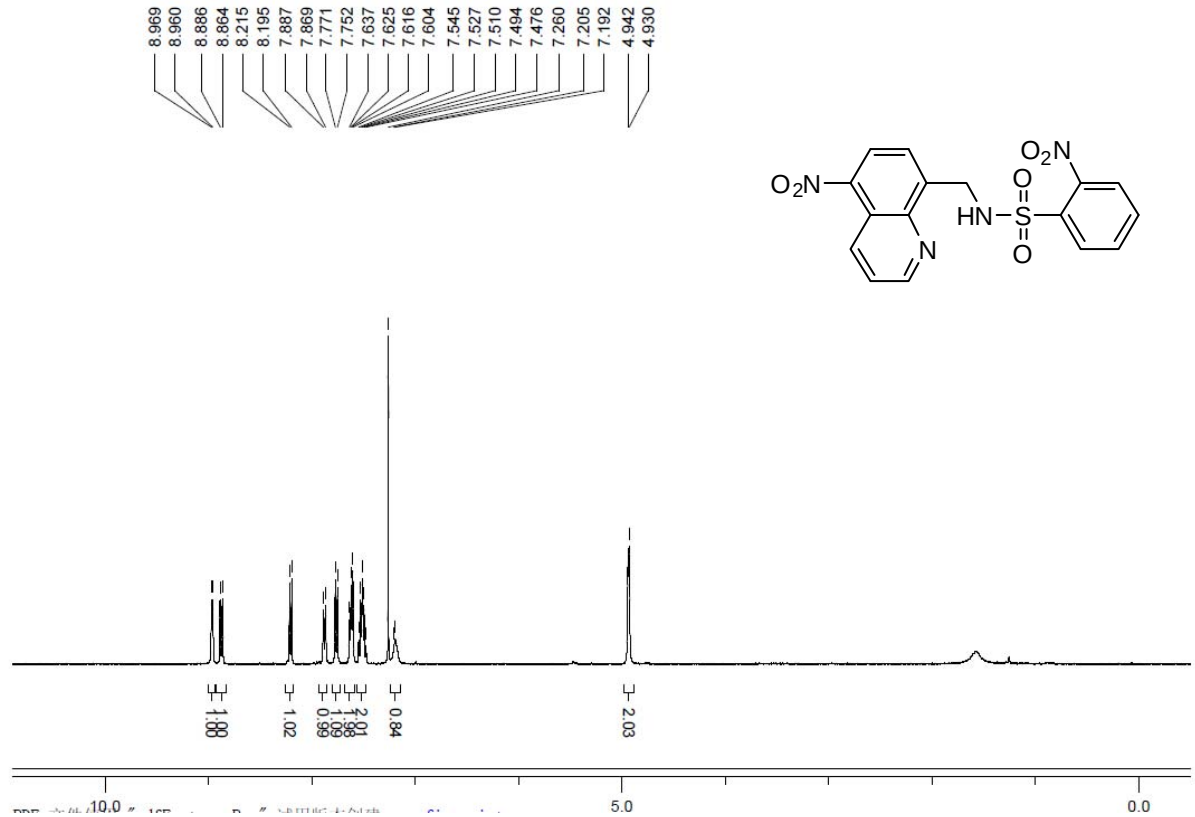
^{13}C NMR Spectra of **3ee**



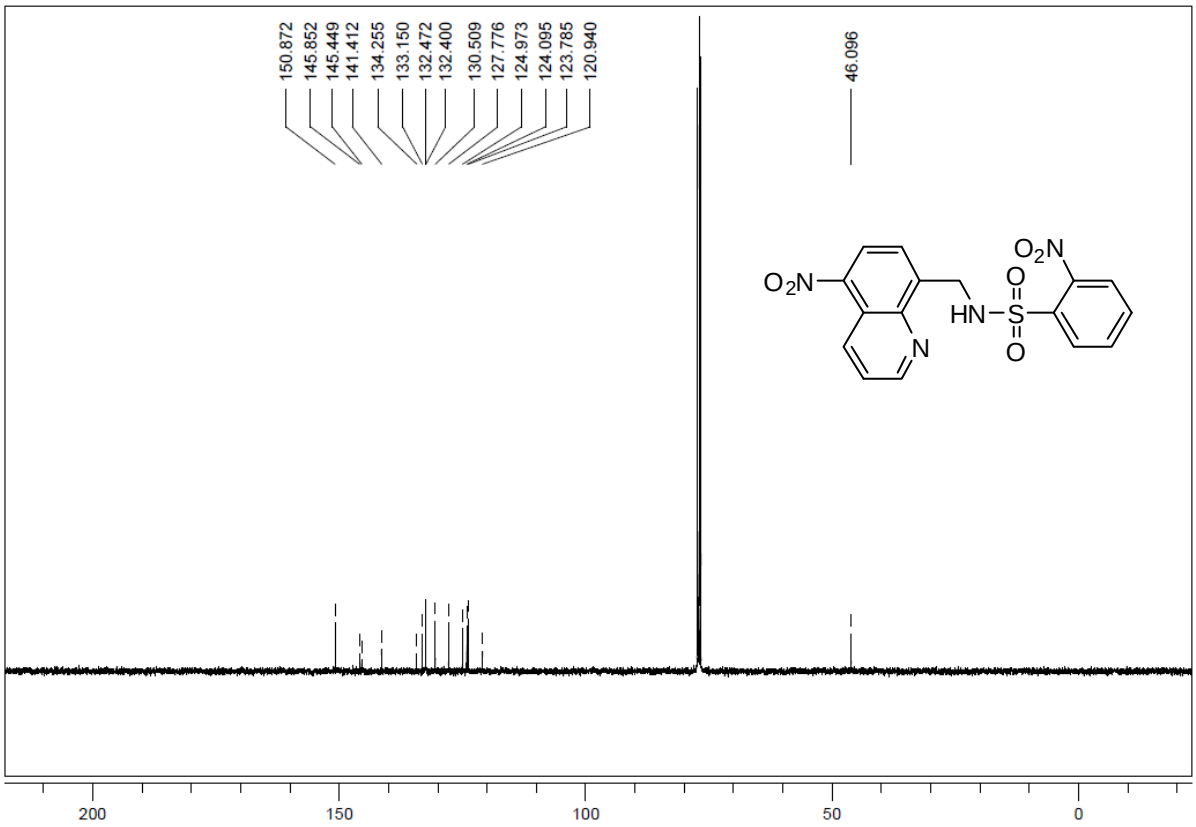
^{19}F NMR Spectra of **3ee**



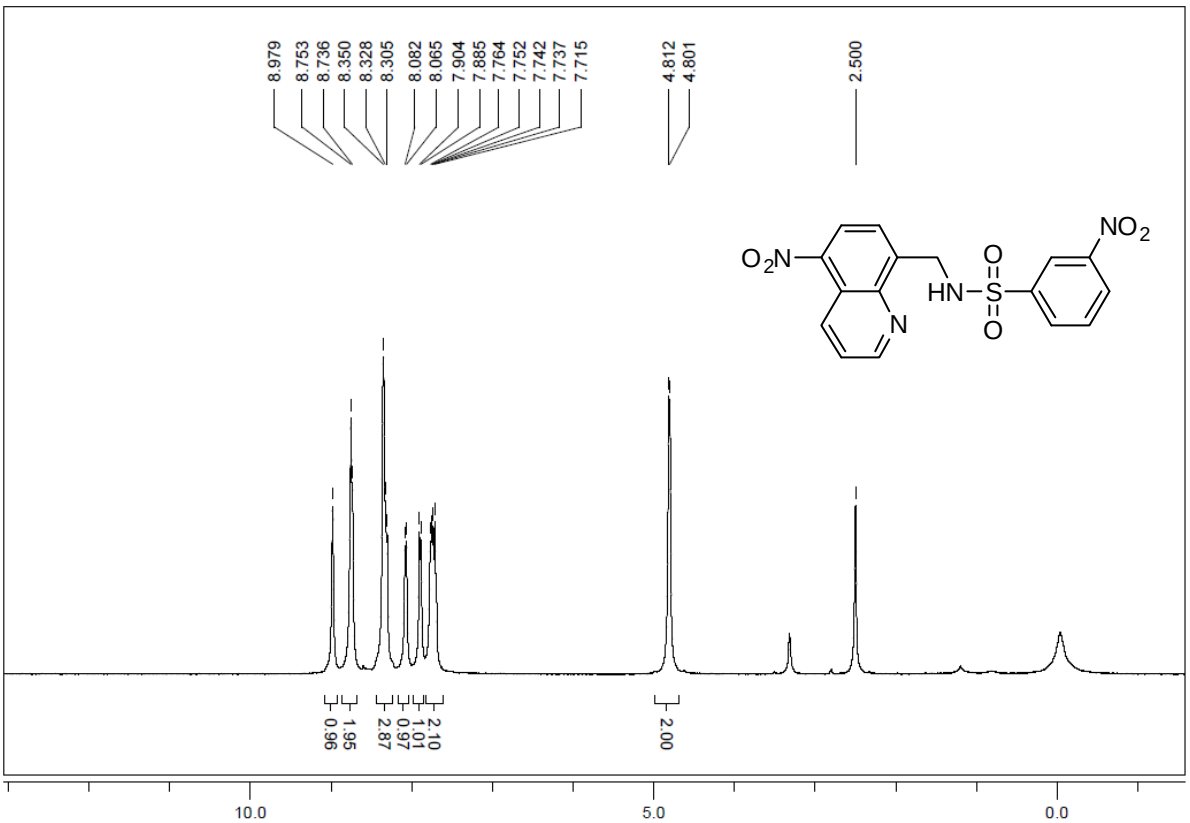
^{1}H NMR Spectra of **3ef**



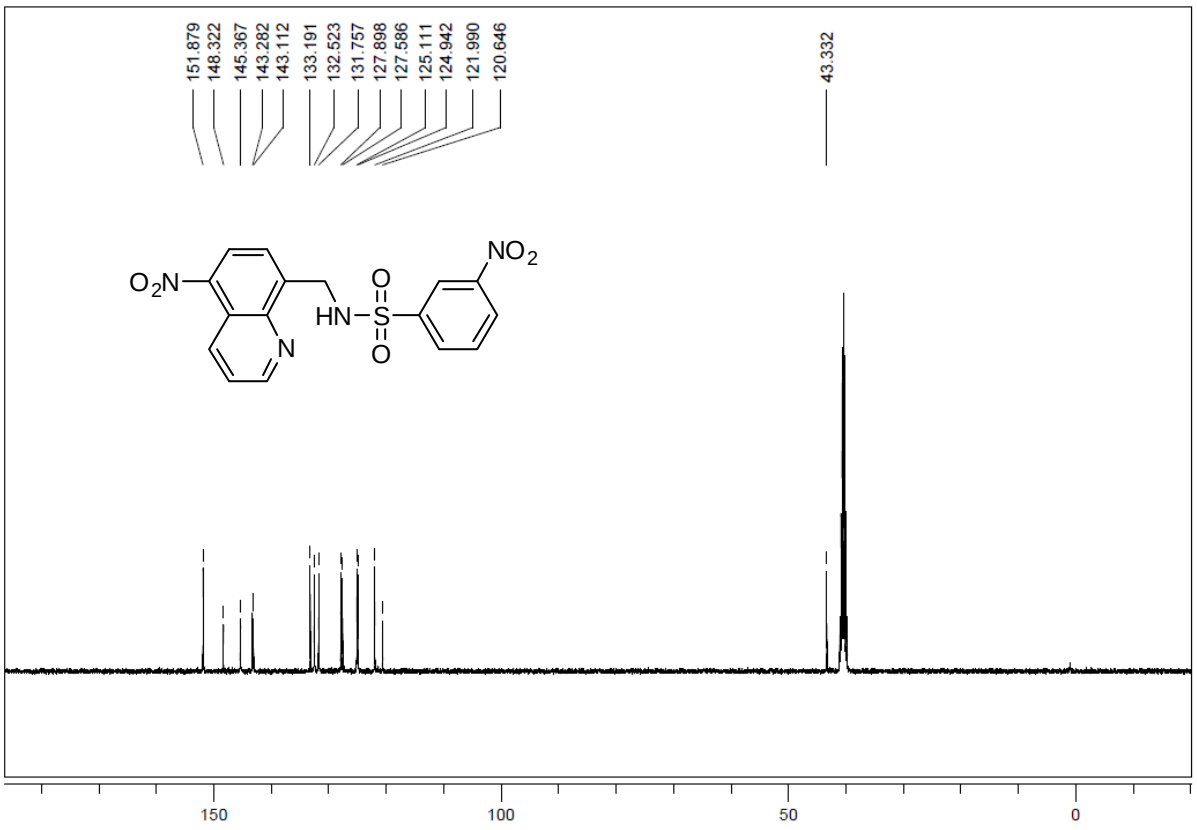
^{13}C NMR Spectra of **3ef**



^{1}H NMR Spectra of **3eg**



^{13}C NMR Spectra of **3eg**



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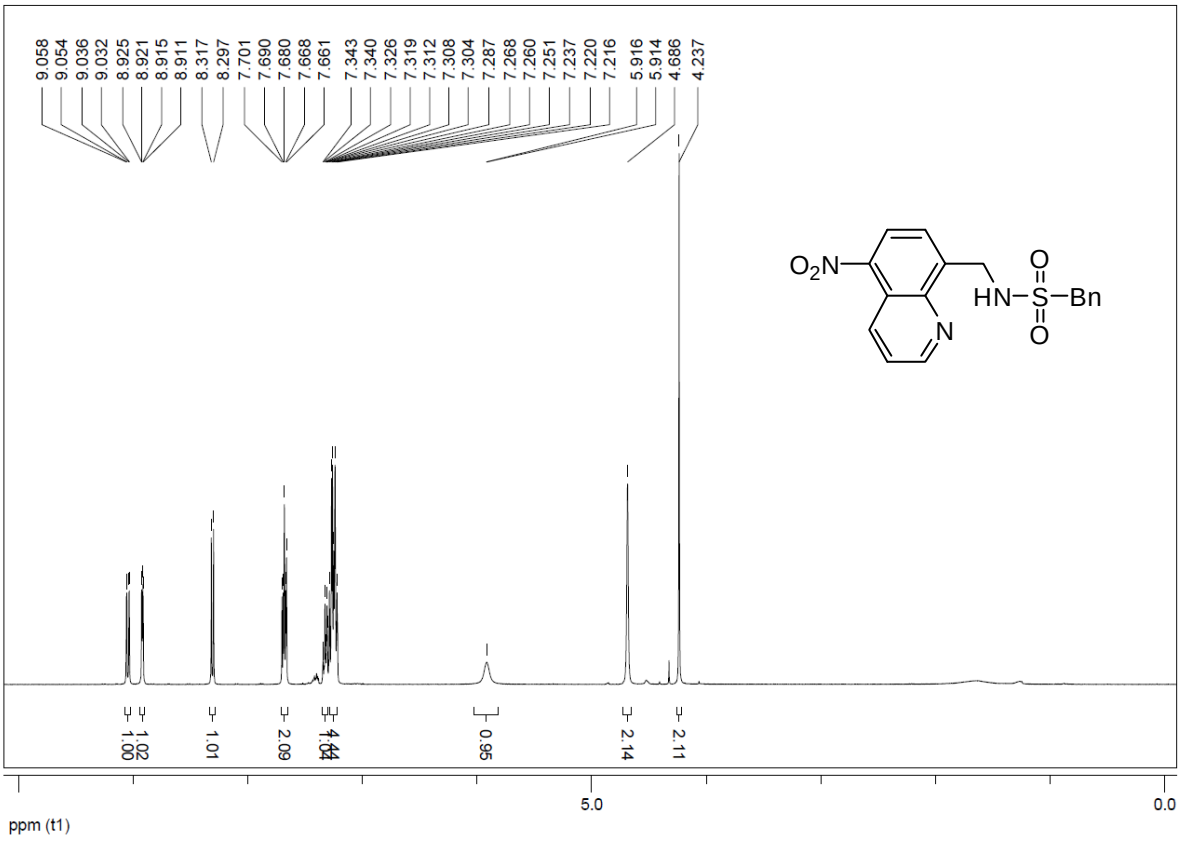

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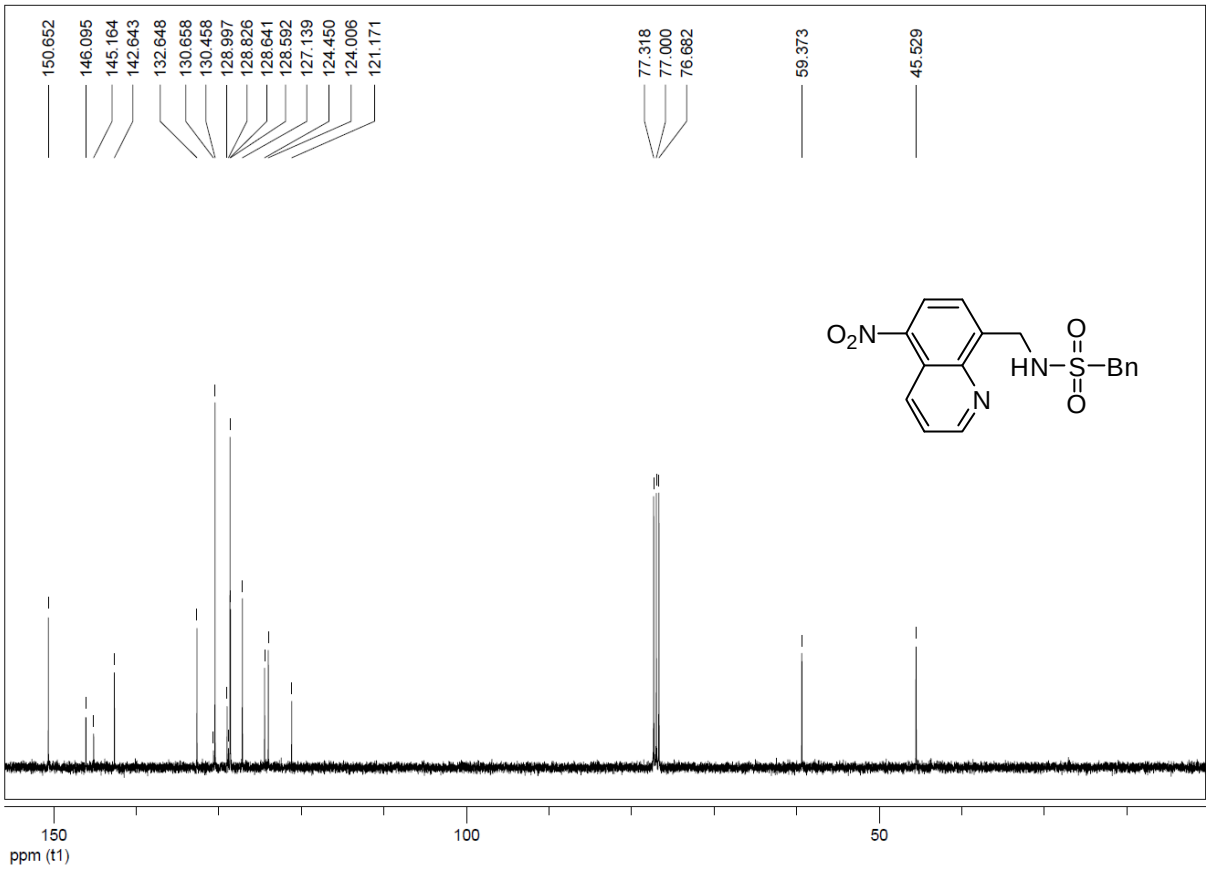
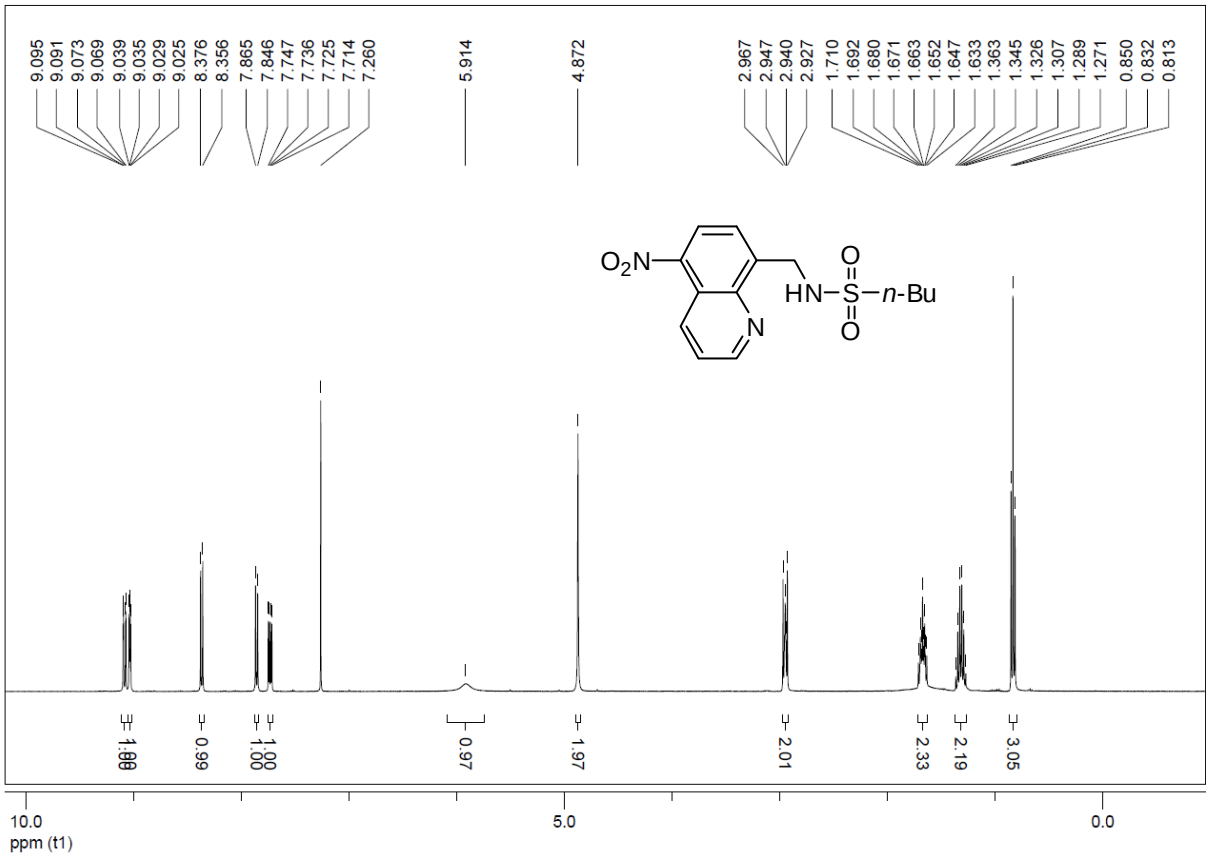
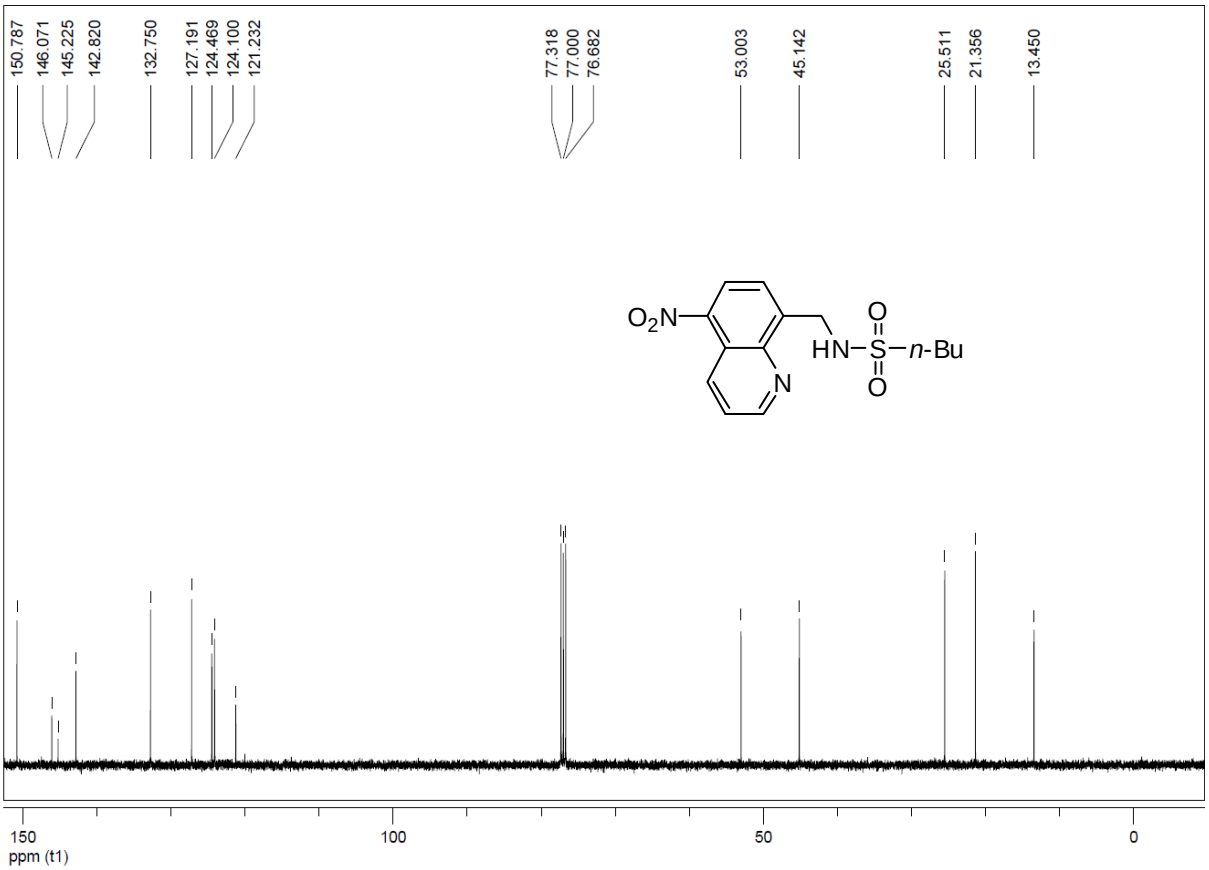


^{1}H NMR Spectra of **3ei**



^{13}C NMR Spectra of **3ei**



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