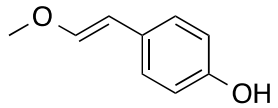
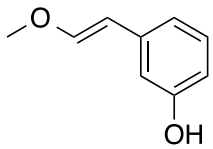
General Information:
All reagents were obtained from Sigma-Aldrich and used as received. Solvents were freshly distilled (DCM was distilled over CaH_2, toluene was distilled over sodium/benzophenone). All reactions were performed with oven-dried glassware under dry N_2 atmosphere. Thin layer chromatography (TLC) was performed using aluminium sheets precoated with silica gel $60F_{254}$ (Macherey-Nagel) and visualized using 254 nm UV light. ^1H and ^{13}C NMR spectra were recorded on a Bruker AV 600 spectrometer using $CDCl_3$ or methanol-d_4 as solvents. Chemical shifts (δ) are reported in ppm and coupling constants (J) are expressed in Hertz (Hz).

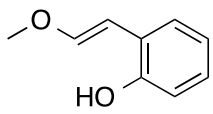
General procedure for preparation of enol ethers:
Methoxymethyltriphenylphosphine chloride (1.2 eq) was dissolved in THF under N_2 (1 mM) and cooled to 0˚C in an ice bath. LiHMDS (1.3 eq, 1M solution in THF) was added dropwise. The reaction was allowed to stir for 20 minutes at 0˚C to allow for imine formation. The benzaldehyde (1.0 eq) was dissolved in THF (1 mM) and added dropwise to the ylide solution. The reaction was allowed to warm to room temperature over 2 hours, then quenched by the addition of a saturated NH_4Cl solution. The reaction mixture was extracted with DCM, and the organic layers were combined and concentrated under reduced pressure. The crude product was purified by silica gel chromatography using a hexane:EtOAc (9:1) gradient elution to afford the desired product.



4-(2-methoxyethenyl)-phenol (3a): colourless oil (>95%)
Major isomer (2:1)
^1H NMR (600 MHz, $CDCl_3$): δ 3.75 (3H, s), 5.16 (1H, d, J = 7.0 Hz), 6.05 (1H, d, J = 7.0 Hz), 6.75 (2H, d, J = 8.7 Hz), 7.46 (2H, d, J = 8.7 Hz)
Minor Isomer
^1H NMR (600 MHz, $CDCl_3$): δ 3.66 (3H, s), 5.77 (1H, d, J = 13.0 Hz), 6.74 (1H, d, J = 8.6 Hz), 6.92 (2H, d, J = 13.0 Hz), 7.11 (2H, d, J = 8.5 Hz)

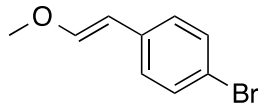


3-(2-methoxyethenyl)-phenol (3b): colourless oil (74%); filtered through a silica plug and used without further purification.

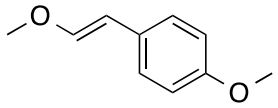


2-(2-methoxyethenyl)-phenol (3c): colourless oil (33%); ^1H NMR (600 MHz, $CDCl_3$): δ 3.84 (3H, s), 5.39 (1H, d, J = 7.1 Hz), 6.06 (1H, d, J = 7.2 Hz), 6.84 (1H, td, J = 1.2, 7.5

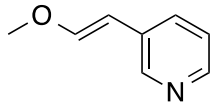
Hz), 6.91 (1H, dd, J = 1.2, 8.1 Hz), 7.09 (1H, dd, J = 1.6, 7.7 Hz), 7.15 (1H, ddd, J = 1.7, 7.2, 8.1 Hz), 7.60 (1H, broad s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 60.8, 105.4, 117.9, 120.2, 121.6, 128.9, 131.1, 143.5, 153.8.



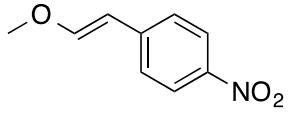
1-bromo-4-(2-methoxyethenyl)-benzene (3d): colourless oil (>95%)
Major isomer (7:2)
^{1}H NMR (600 MHz, $CDCl_3$): δ 3.68 (3H, s), 5.74 (1H, d, J = 13.0 Hz), 7.04 (1H, d, J = 13.0 Hz), 7.09 (2H, d, J = 8.4 Hz), 7.37 (2H, d, J = 8.5 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 56.7, 104.2, 119.3, 126.7, 131.7, 135.5
Minor Isomer
^{1}H NMR (600 MHz, $CDCl_3$): δ 3.79 (3H, s), 5.16 (1H, d, J = 7.0 Hz), 6.16 (1H, d, J = 7.0 Hz), 7.39 (2H, d, J = 8.7 Hz), 7.44 (2H, d, J = 8.6 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 60.9, 104.7, 119.1, 129.8, 131.3, 135.0
High resolution MS: m/z calc. for $C_9H_{10}BrO^+$: 211.9837, found 211.9826.



1-methoxy-4-(2-methoxyethenyl)-benzene (3e): colourless oil (70%); filtered through a silica plug and used without further purification.
High resolution MS: m/z calc. for $C_{10}H_{12}O_2^+$: 164.0837, found 164.0828.

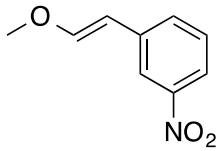


3-(2-methoxyethenyl)-pyridine (3f): colourless oil (92%)
Major Isomer
^{1}H NMR (600 MHz, $CDCl_3$): δ 3.71 (3H, s), 5.75 (1H, d, J = 13.1 Hz), 7.07 (1H, s, J = 13.1 Hz), 7.17 (1H, dd, J = 0.5, 4.8, 7.9 Hz), 7.52-7.53 (1H, m), 8.36 (1H, dd, J = 1.6, 4.8 Hz), 8.47 (1H, d, J = 2.2 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 56.8, 77.2, 101.5, 123.6, 131.7, 132.4, 146.9, 147.1, 150.3
Minor Isomer
^{1}H NMR (600 MHz, $CDCl_3$): δ 3.81 (3H, s), 5.20 (1H, d, J = 6.9 Hz), 6.26 (1H, d, J = 6.9 Hz), 7.19-7.21 (1H, m), 7.98 (1H, d, J = 8.0 Hz), 8.35-8.35 (1H, m), 8.67 (1H, s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 60.8, 101.9, 123.1, 131.9, 134.9, 146.3, 149.1, 149.8
High resolution MS: m/z calc. for $C_8H_{10}NO^+$: 135.0684, found 135.0672.



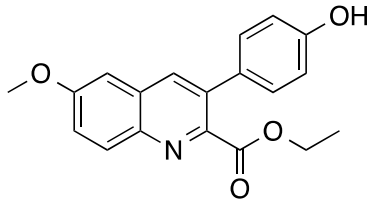
1-(2-methoxyethenyl)-4-nitrobenzene (3g): yellow oil (28%)
Major isomer

^{1}H NMR (600 MHz, $CDCl_3$): δ 3.87 (3H, s), 5.29 (1H, d, J = 7.0 Hz), 6.34 (1H, d, J = 7.0 Hz), 7.67 (2H, d, J = 7.9 Hz), 8.10-8.13 (2H, m); ^{13}C NMR (150 MHz, $CDCl_3$): δ 57.1, 104.1, 125.1, 128.5, 143.0, 145.5, 152.6
Minor Isomer
^{1}H NMR (600 MHz, $CDCl_3$): δ 3.75 (3H, s), 5.84 (1H, d, J = 13.0 Hz), 7.23 (1H, d, J = 13.0 Hz), 7.32 (2H, d, J = 8.8 Hz), 8.10-8.13 (2H, m); ^{13}C NMR (150 MHz, $CDCl_3$): δ 61.5, 103.8, 123.8, 124.3, 143.9, 145.2, 151.7
High resolution MS: m/z calc. for $C_9H_{10}NO_3^+$: 179.0582, found 179.0572.

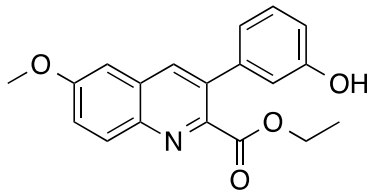


1-(2-methoxyethenyl)-3-nitrobenzene (3h): yellow oil (43%); filtered through a silica plug and used without further purification.
High resolution MS: m/z calc. for $C_9H_{10}NO_3^+$: 179.0582, found 179.0567.

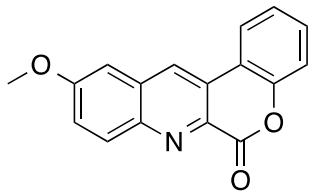
General procedure for the preparation of quinolines: Aniline (1.2 eq) and ethyl glyoxalate (1.2 eq) were dissolved in DCM (0.5 mM) under N_2 and allowed to stir for 20 minutes to allow for imine formation. Enol ether (1.0 eq) was dissolved in DCM (0.5 mM) and added to the reaction mixture. The reaction was cooled to 0˚C in an ice bath, then TFA (1.05 eq) was added dropwise. The reaction was monitored by TLC. Upon completion (generally 5-15 minutes from addition of TFA), the reaction was quenched by the addition of a saturated $NaHCO_3$ solution. The product was then extracted using DCM and concentrated under reduced pressure. The crude product was purified using silica gel chromatography with a hexane/EtOAc (9:1 – 1:1) solvent gradient to afford the desired product.



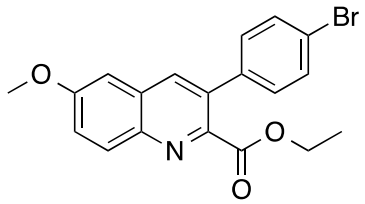
Ethyl-3-(4-hydroxyphenyl)-6-methoxyquinoline-2-carboxylate (4a): pale yellow oil (82%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.17 (3H, t, J = 7.2 Hz), 3.95 (3H, s), 4.27 (2H, q, J = 7.2 Hz), 6.91 (2H, dt, J = 3.0, 8.4 Hz), 7.09 (1H, d, J = 2.8 Hz), 7.30 (2H, dt, J = 3.0 Hz, 8.4 Hz), 7.39 (1H, dd, J = 2.8, 9.2 Hz), 8.05 (1H, s), 8.12 (1H, d, J = 9.3 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 55.7, 62.0, 104.7, 115.7, 123.4, 129.9, 130.0, 130.7, 131.0, 134.0, 136.1, 142.2, 148.0, 156.2, 159.2, 167.6; High resolution MS: m/z calc. for $C_{19}H_{18}NO_4^+$: 324.1236, found 324.1236.



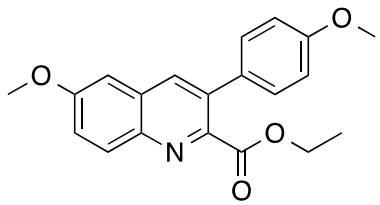
Ethyl-3-(3-hydroxyphenyl)-6-methoxyquinoline-2-carboxylate (4b): pale yellow oil (67%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.13 (3H, t, J = 7.1 Hz), 3.96 (3H, s), 4.26 (2H, q, J = 7.2 Hz), 6.89 (1H, ddd, J = 0.9, 2.5, 8.1 Hz), 6.94 (1H, t, J = 2.0 Hz), 6.98 (1H, ddd, J = 0.9, 1.56, 7.6 Hz), 7.10 (1H, d, J = 2,8 Hz), 7.3 (1H, t, J = 7.9 Hz), 7.43 (1H, dd, J = 2.9, 9.3 Hz), 8.09 (1H, s), 8.18 (1H, d, J = 9.3 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 13.9, 55.8, 62.0, 104.8, 115.1, 115.7, 121.1, 123.5, 129.7, 129.9, 131.4, 134.0, 136.1, 140.4, 142.6, 156.0, 159.3, 167.5; High resolution MS: m/z calc. for $C_{19}H_{18}NO_4^+$: 324.1236, found 324.1234.



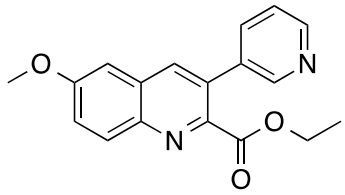
Ethyl-3-(2-hydroxyphenyl)-6-methoxyquinoline-2-carboxylate (4c): white solid (66%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 4.024 (3H, s), 7.22 (1H, d, J = 2.8 Hz), 7.40-7.43 (2H, m), 7.50 (1H, dd, J = 2.8, 9.3 Hz), 7.54 (1H, ddd, J = 1.4, 7.1, 8.4 Hz), 8.17 (1H, dd, J = 1.5, 7.9 Hz), 8.78 (1H, s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 56.0, 104.1, 107.2, 107.6, 110.0, 118.2, 123.1, 125.0, 125.5, 127.7, 131.1, 131.9, 132.8, 132.9, 136.4, 145.6, 150.8; High resolution MS: m/z calc. for $C_{17}H_{12}NO_3^+$: 278.0817, found 278.0805.



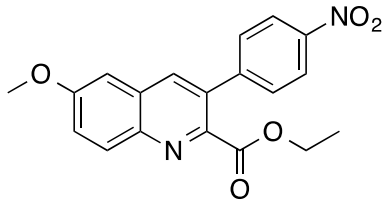
Ethyl-3-(4-bromophenyl)-6-methoxyquinoline-2-carboxylate (4d): pale yellow oil (76%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.16 (3H, t, J = 7.1 Hz), 3.96 (3H, s), 4.27 (2H, q, J = 7.1 Hz), 7.31 (2H, dt, J = 2.4, 9.0 Hz), 7.43 (1H, dd, J = 2.8, 9.2 Hz), 7.58 (2H, dt, J = 2.3, 9.0 Hz), 8.04 (1H, s), 8.14 (1H, d, J = 9.2 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 55.9, 62.2, 104.8, 122.5, 124.0, 129.8, 130.3, 131.3, 131.8, 133.3, 136.5, 137.8, 142.3, 147.1, 159.6, 166.7; High resolution MS: m/z calc. for C19H17BrNO_3^+: 386.0392, found 386.0397.



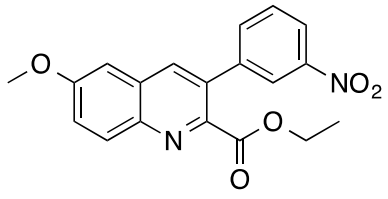
Ethyl-3-(4-methoxyphenyl)-6-methoxyquinoline-2-carboxylate (4e): pale yellow oil (75%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.16 (3H, t, J = 7.1 Hz), 3.87 (3H, s), 3.95 (3H, s), 4.28 (2H, q, J = 7.1 Hz), 6.99 (2H, dt, J = 2.4, 9.0 Hz), 7.09 (1H, d, J = 2.8 Hz), 7.37 (2H, dt, J = 2.4, 8.4 Hz), 7.40 (1H, dd, J = 2.8, 9.2 Hz), 8.06 (1H, s), 8.14 (1H, d, J = 9.3 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 55.5, 55.8, 61.9, 104.7, 114.1, 123.2, 126.8, 131.2, 131.4, 133.9, 135.9, 142.2, 148.2, 159.2, 159.6, 167.6; High resolution MS: m/z calc. for $C_{20}H_{20}NO_4^+$: 338.1392, found 338.1379.



Ethyl-3-(3-pyridinyl)-6-methoxyquinoline-2-carboxylate (4f): white solid (58%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.17 (3H, t, J = 7.1 Hz), 3.97 (3H, s), 4.29 (2H, q, J = 7.1Hz), 7.13 (1H, d, J = 2.8 Hz), 7.41 (1H, dd, J = 4.9, 7.8 Hz), 7.46 (1H, dd, J = 2.8, 9.3 Hz), 7.78 (1H, dt, J = 2.0, 7.8 Hz), 8.07 (1H, s), 8.17 (1H, d, J = 9.2 Hz), 8.68 (1H, dd, J = 1.6, 4.9 Hz), 8.70 (1H, d, J = 2.3 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 55.9, 62.1, 104.7, 123.3, 124.1, 129.7, 131.0, 135.3, 136.4, 136.8, 143.1, 146.8, 148.7, 148.9, 166.6; High resolution MS: m/z calc. for $C_{18}H_{17}N_2O_3^+$: 309.1239, found 309.1231.

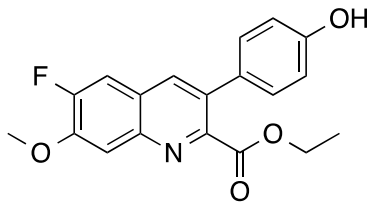


Ethyl-3-(4-nitrophenyl)-6-methoxyquinoline-2-carboxylate (4g): pale yellow oil (47%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.19 (3H, t, J = 7.1 Hz), 3.97 (3H, s), 4.29 (2H, q, J = 7.1 Hz), 7.13 (1H, d, J = 2.8 Hz), 7.481 1H, dd, J = 2.8 Hz, 9.3 Hz), 7. 60 (2H, dt, J = 2.4, 9.0 Hz), 8.08 (1H, s), 8.18 (1H, d, J = 9.3 Hz), 8.33 (2H, dt, J = 2.4, 9.6 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.1, 55.9, 62.2, 104.8, 114.8, 123.7, 124.4, 129.6, 129.6, 131.7, 132.7, 136.5, 146.3, 147.6, 159.9, 166.5; High resolution MS: m/z calc. for $C_{19}H_{17}N_2O_5^+$: 353.1137, found 353.1146.

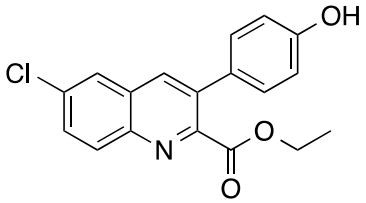


Ethyl-3-(3-nitrophenyl)-6-methoxyquinoline-2-carboxylate (4h): pale yellow oil (61%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.20 (3H, t, J = 7.1 Hz), 3.97 (3H, s), 4.30 (2H, q, J = 7.1 Hz), 7.13 (1H, d, J = 2.7 Hz), 7.47 (1H, dd, J = 2.8, 9.3 Hz), 7.63 (1H, t, J = 7.9 Hz), 7.75 (1H, ddd, J = 1.0, 1.7, 7.6 Hz), 8.10 (1H, s), 8.17 (1H, d, J = 9.3 Hz), 8.29 (1H, ddd, J = 1.0, 2.2, 8.2 Hz), 8.33 (1H, t, J = 1.9 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.1, 55.9, 62.2, 104.8, 122.8, 123.7, 124.2, 129.4, 129.7, 131.7, 132.4, 134.8, 136.7, 140.9,

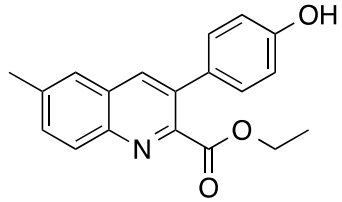
143.1, 146.5, 148.4, 159.8, 166.5; High resolution MS: m/z calc. for $C_{19}H_{17}N_2O_5^+$: 353.1137, found 353.1137.



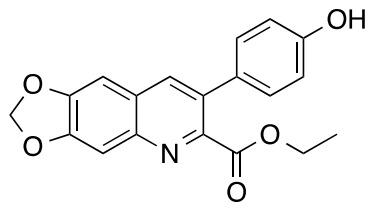
Ethyl-3-(4-hydroxyphenyl)-6-fluoro-7-methoxyquinoline-2-carboxylate (4i): pale yellow oil (69%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.17 (3H, t, J = 7.1 Hz), 4.03 (3H, s), 4.28 (2H, q, J = 7.1 Hz), 6.91 (2H, d, J = 8.6 Hz), 7.30 (2H, d, J = 8.6 Hz), 7.46 (1H, d, J = 10.9 Hz), 7.64 (1H, d, J = 8.1 Hz), 8.04 (1H, s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 56.5, 62.1, 110.0, 111.1, 111.2, 115.7, 123.7, 130.0, 130.7, 132.2, 136.5, 144.3, 150.0, 152.8, 155.9, 167.4; High resolution MS: m/z calc. for $C_{19}H_{17}FNO_4^+$: 342.1142, found 342.1128.



Ethyl-3-(4-hydroxyphenyl)-6-chloroquinoline-2-carboxylate (4j): pale yellow oil (56%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.17 (3H, t, J = 7.2 Hz), 4.29 (2H, q, J = 7.2 Hz), 6.93 (2H, d, J = 8.6 Hz), 7.32 (2H, d, J = 8.6 Hz), 7.69 (1H, dd, J = 2.3, 9.0 Hz), 7.85 (1H, d, J = 2.3 Hz), 8.09 (1H, s), 8.18 (1H, d, J = 9.0 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 62.3, 115.8, 126.3, 129.1, 130.0, 130.2, 131.3, 134.3, 134.4, 136.4, 144.3, 151.0, 156.2, 167.1; High resolution MS: m/z calc. for $C_{18}H_{14}ClNO_3^+$: 328.0740, found 328.0747.

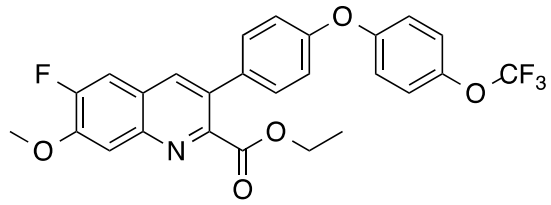


Ethyl-3-(4-hydroxyphenyl)-6-methyquinoline-2-carboxylate (4k): pale yellow oil (65%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.17 (3H, t, J = 7.2 Hz), 2.57 (3H, s), 4.28 (2H, q, J = 7.2 Hz), 6.91 (2H, d, J = 8.6 Hz), 7.12 (2H, d, J = 8.6 Hz), 7.59 (1H, dd, J = 1.8, 8.7 Hz), 7.62 (1H, s), 8.09 (1H, s), 8.14 (1H, d, J = 8.7 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 21.9, 62.2, 115.8, 126.5, 128.7, 129.1, 130.0, 131.4, 132.8, 133.5, 137.0, 138.7, 149.6, 156.3, 167.5; High resolution MS: m/z calc. for $C_{19}H_{18}NO_3^+$: 338.1287, found 338.1277.

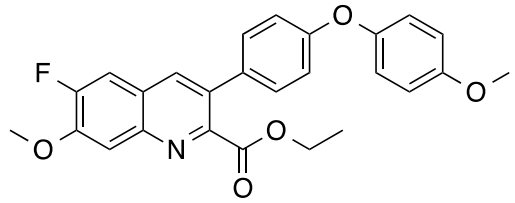


Ethyl-3-(4-hydroxyphenyl)-[1,3]dioxolo-6,7-quinoline-2-carboxylate (4k): pale yellow oil (84%)**;** ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.16 (3H, t, J = 7.1 Hz), 4.27 (2H, q, J = 7.1 Hz), 6.15 (2H, s), 6.90 (2H, d, J = 8.6 Hz), 7.08 (1H, s), 7.27 (2H, d, J = 8.6 Hz), 7.57 (1H, s), 8.0 (1H, s)); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 62.2, 102.4, 102.5, 105.3, 110.0, 115.7, 126.4, 130.0, 130.4, 132.3, 137.0, 137.0, 137.0, 149.7, 151.9, 156.1; High resolution MS: m/z calc. for $C_{19}H_{16}NO_5^+$: 338.1028, found 338.1024.

General procedure for Chan-Lam coupling: Aryl quinoline **4a** or **4i** (1 eq) was dissolved in dry DCM (0.1 mM) to which was added crushed molecular sieves (4A), $CuOAc_2$ (1 eq), TEA (5 eq), and an aryl boronic acid (3 eq). The reaction was stirred under air at room temperature for two days. The crude reaction mixture was then concentrated and purified by silica gel chromatography using a Hexane:EtOAc 3:1 gradient for elution. This afforded the pure product as a colourless oil.

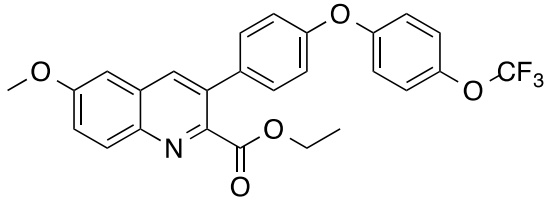


Ethyl-6-Fluoro-7-methoxy-3-(4-(4-(trifluoromethoxy)phenoxy)phenyl)quinoline-2-carboxylate (5a): colourless oil (80%);^{1}H NMR (600 MHz, $CDCl_3$): δ 1.22 (3H, t, J = 7.1 Hz), 4.08 (3H, s), 4.34 (2H, q, J = 7.1 Hz), 7.10 (2H, d, J = 9.1 Hz), 7.12 (2H, d, J = 8.7 Hz), 7.25 (2H, dd, J = 0.7, 9.0 Hz), 7.44 (2H, d, J = 8.7 Hz), 7.51 (1H, d, J = 10.8 Hz), 7.71 (1H, d, J = 8.0 Hz), 8.11 (1H, s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.1, 56.6, 62.2, 110.0, 111.2 (d, J = 19 Hz), 119.0, 120.1, 120.7 (q, J = 255 Hz), 122.9, 123.6 (d, J = 9 Hz), 130.3, 131.9, 133.7, 136.7 (d, J = 6 Hz), 144.7 (d, J = 73 Hz), 149.7, 151.8, 152.9, 154.6, 155.5, 157.1, 167.0; High resolution MS: m/z calc. for $C_{26}H_{20}F_5NO_5^+$: 502.1278, found 502.1287.

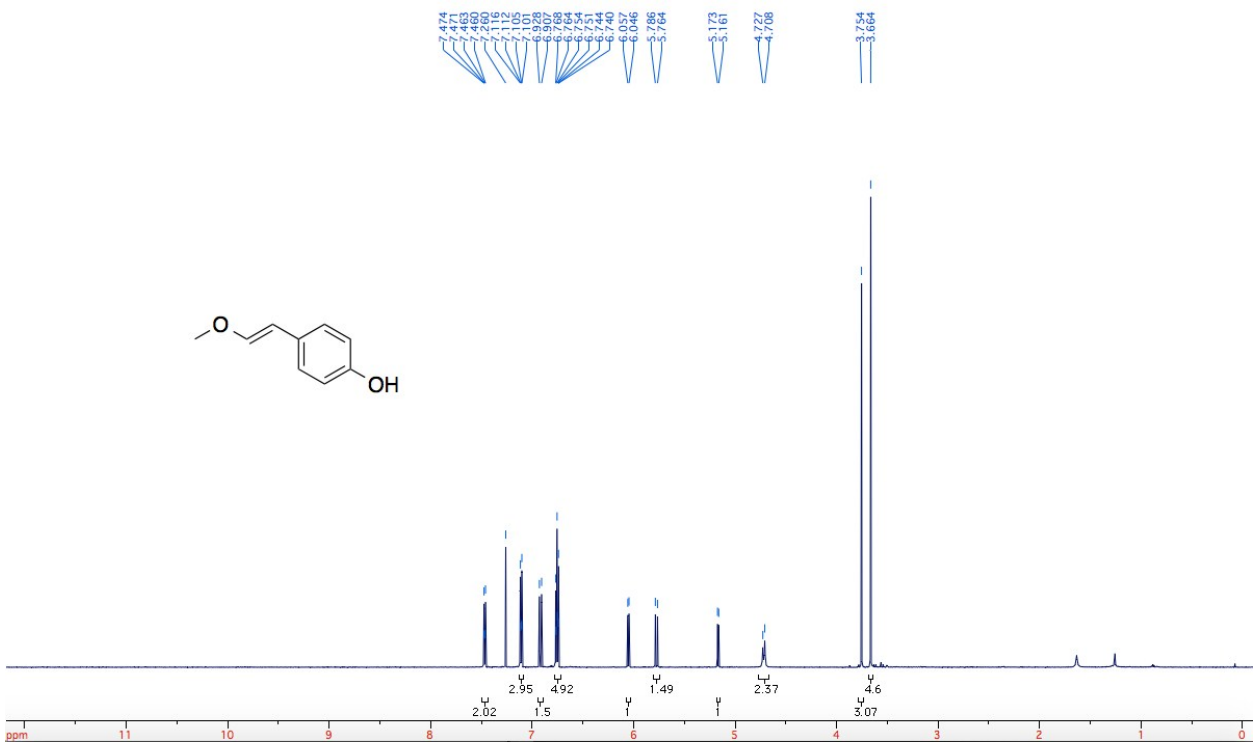


Ethyl-6-Fluoro-7-methoxy-3-(4-(4-(methoxy)phenoxy)phenyl)quinoline-2-carboxylate (5b): yellow oil (70%); ^{1}H NMR (600 MHz, $CDCl_3$): δ 1.20 (3H, t, J = 7.1 Hz), 3.83 (3H, s), 4.05 (3H, s), 4.31 (2H, q, J = 7.1 Hz), 6.92 (2H, d, J = 9.1 Hz), 7.01 (2H, d, J = 8.8 Hz), 7.03 (2H, d, J = 9.1 Hz), 7.35 (2H, d, J = 8.8 Hz), 7.48 (1H, d, J = 10.6 Hz), 7.73 (1H, d, J = 8.05), 8.09 (1H, s); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.0, 55.8, 56.6, 62.2, 109.7, 111.2 (d, J = 20 Hz), 115.1, 117.5, 121.3, 123.7 (d, J = 9 Hz), 130.0,

132.1 (d, J = 4 Hz), 136.9, 144.0, 149.5, 149.7, 151.8 (d, J = 14 Hz), 152.9, 154.6, 156.4, 159.0, 166.9; High resolution MS: m/z calc. for $C_{26}H_{23}FNO_5^+$: 448.1560, found 448.1562.



Ethyl-6-Methoxy-3-(4-(4-(trifluoromethoxy)phenoxy)phenyl)quinoline-2-carboxylate (5c): yellow oil (53%);^{1}H NMR (600 MHz, $CDCl_3$): δ 1.21 (3H, t, J = 7.1 Hz), 3.97 (3H, s), 4.31 (2H, q, J = 7.14 Hz), 7.07-7.12 (5H, m), 7.22 (2H, dd, J = 0.7, 9.0 Hz), 7.42-7.45 (3H, m), 8.10 (1H, s), 8.20 (1H, d, J = 9.2 Hz); ^{13}C NMR (150 MHz, $CDCl_3$): δ 14.1, 55.8, 62.1, 104.8, 118.9, 120.2, 120.7 (q, J = 255 Hz), 122.8, 123.8, 129.9, 130.3 (d, J = 4.35) 131.1, 133.6, 134.0, 136.6, 142.1, 144.9, 147.5, 155.5, 157.1, 159.5, 166.9; High resolution MS: m/z calc. for $C_{26}H_{21}F_3NO_5^+$: 484.1372, found 484.1384.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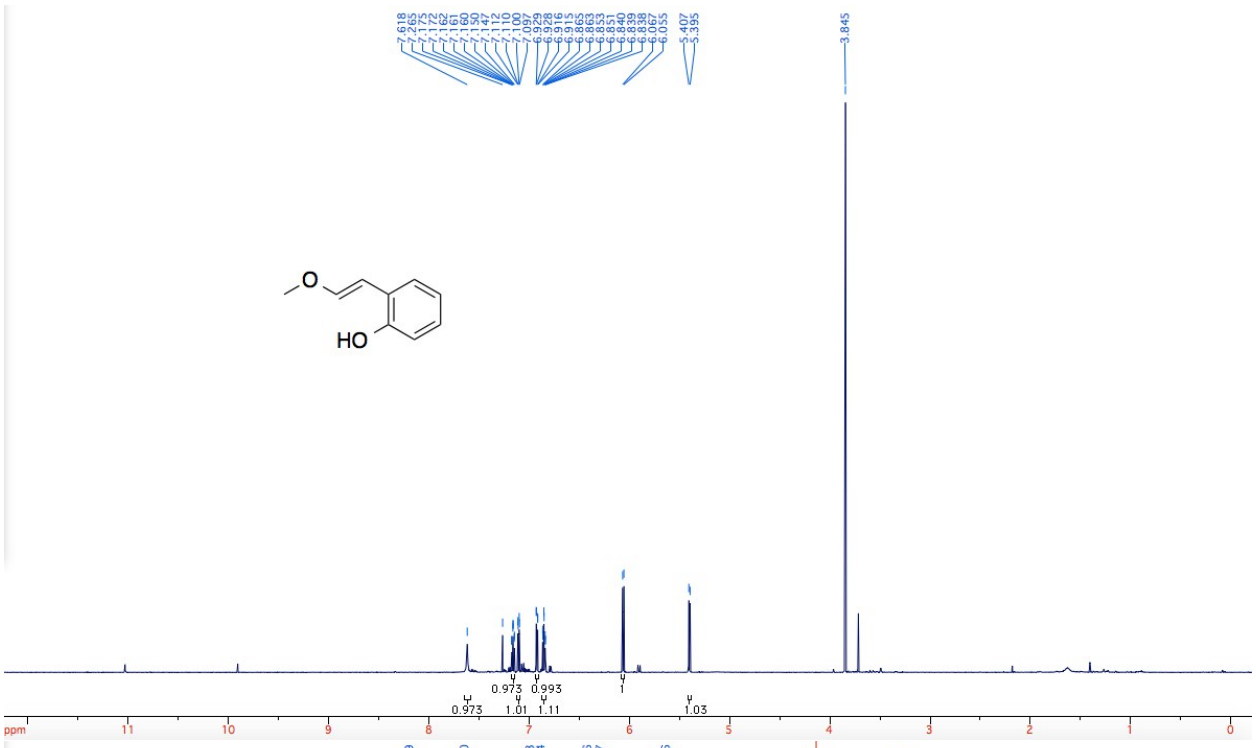
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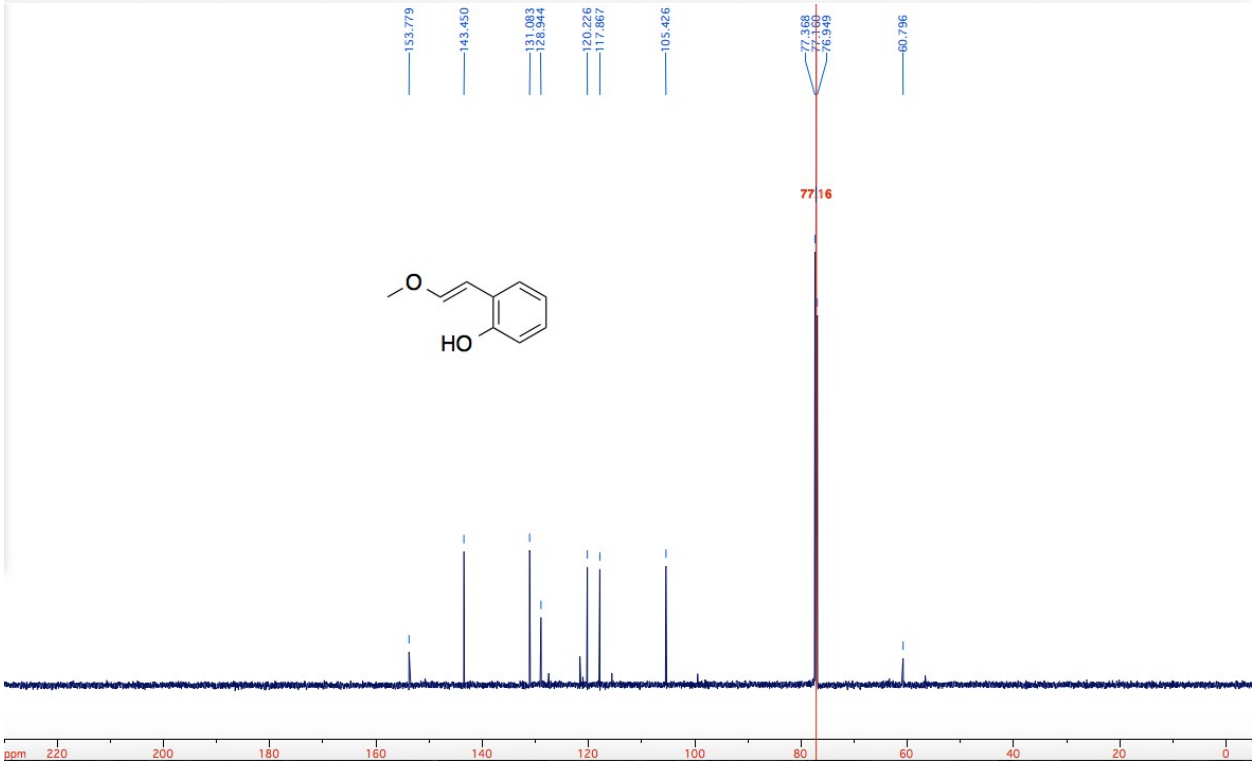
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HO
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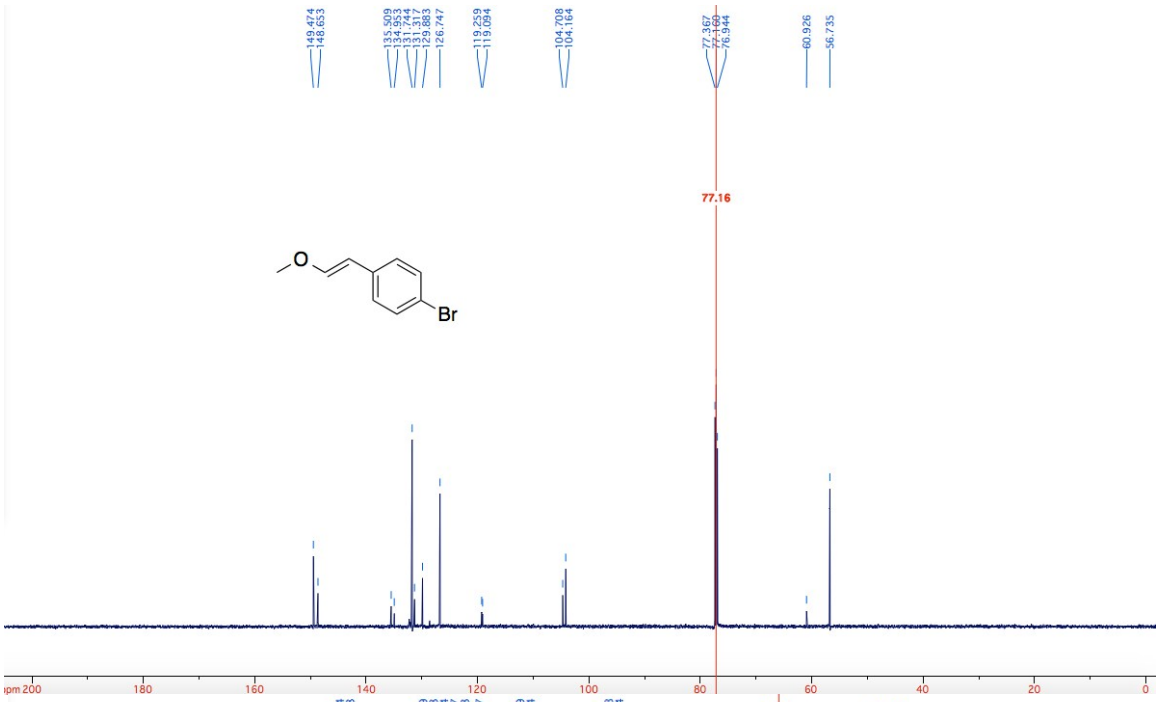
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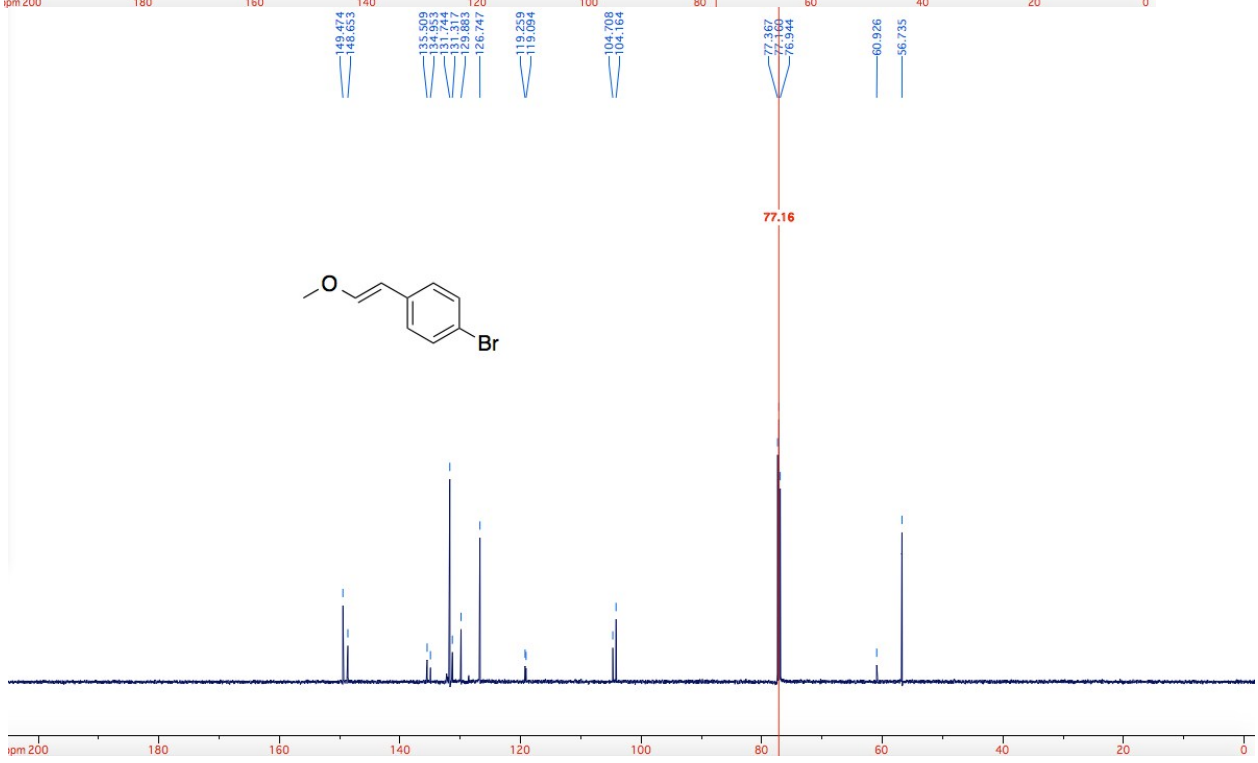
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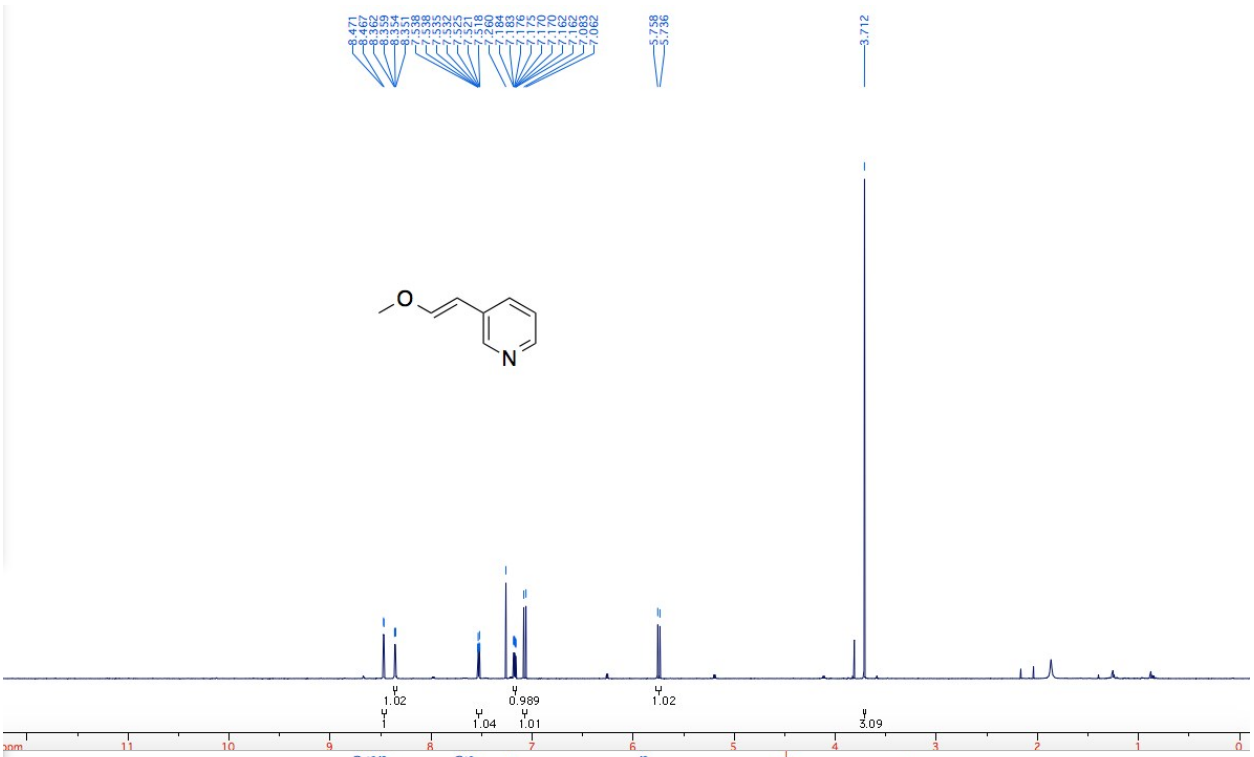
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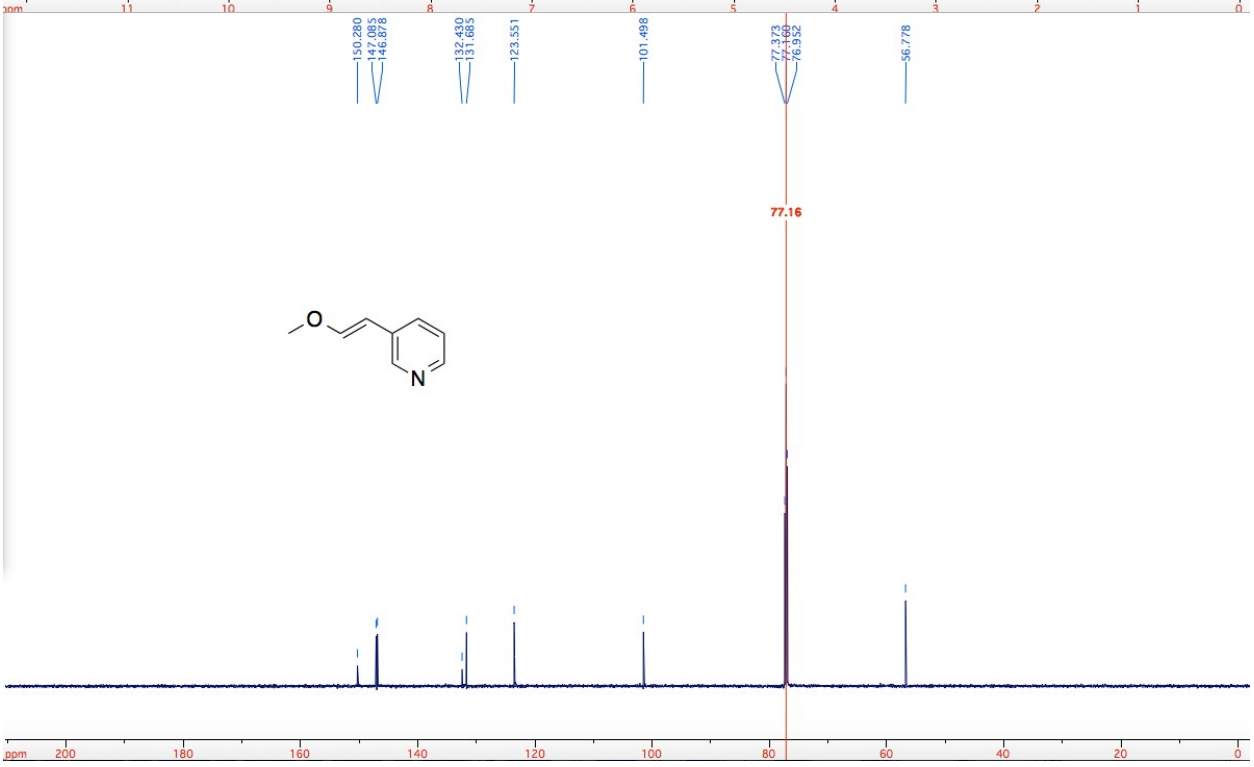
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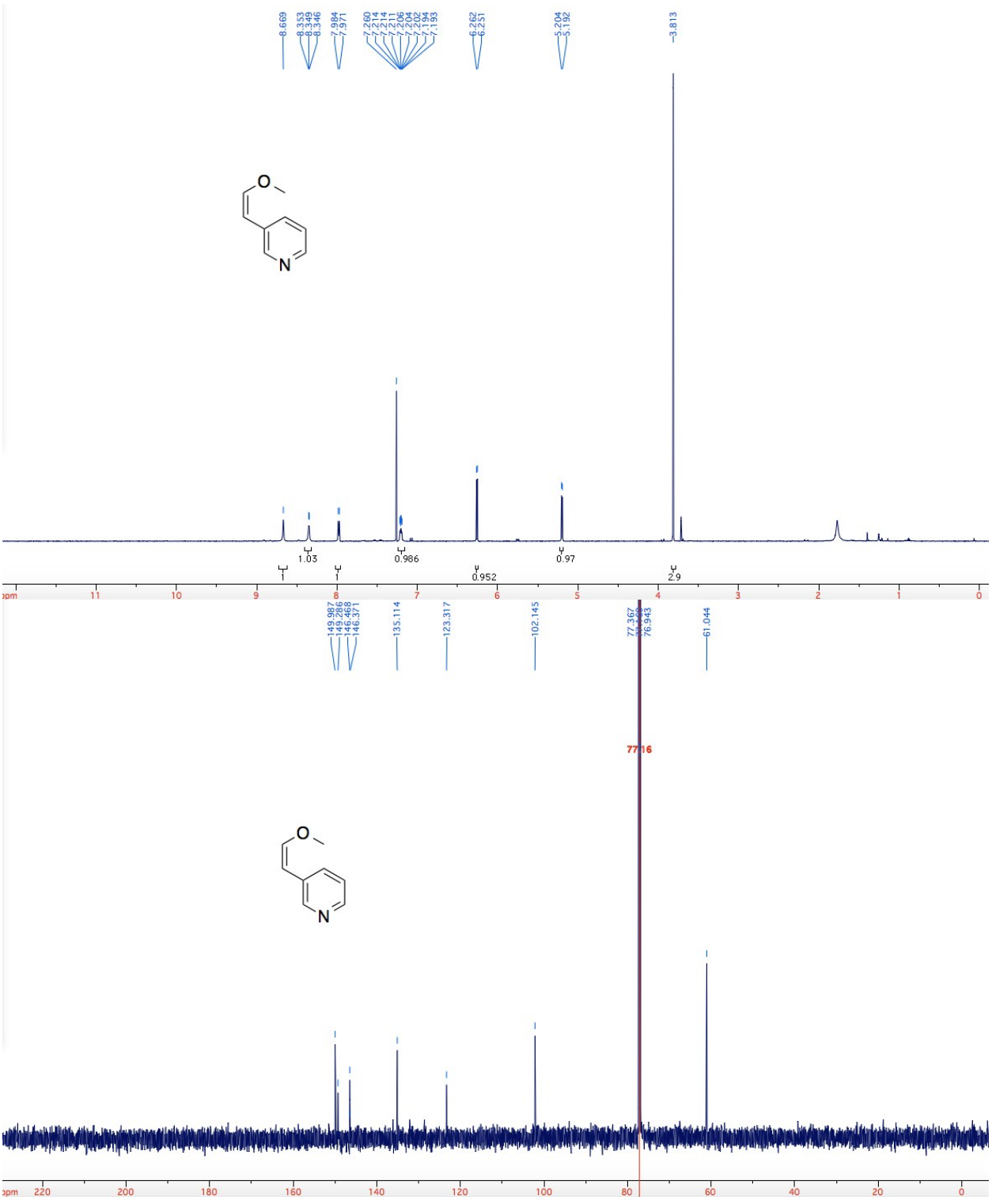
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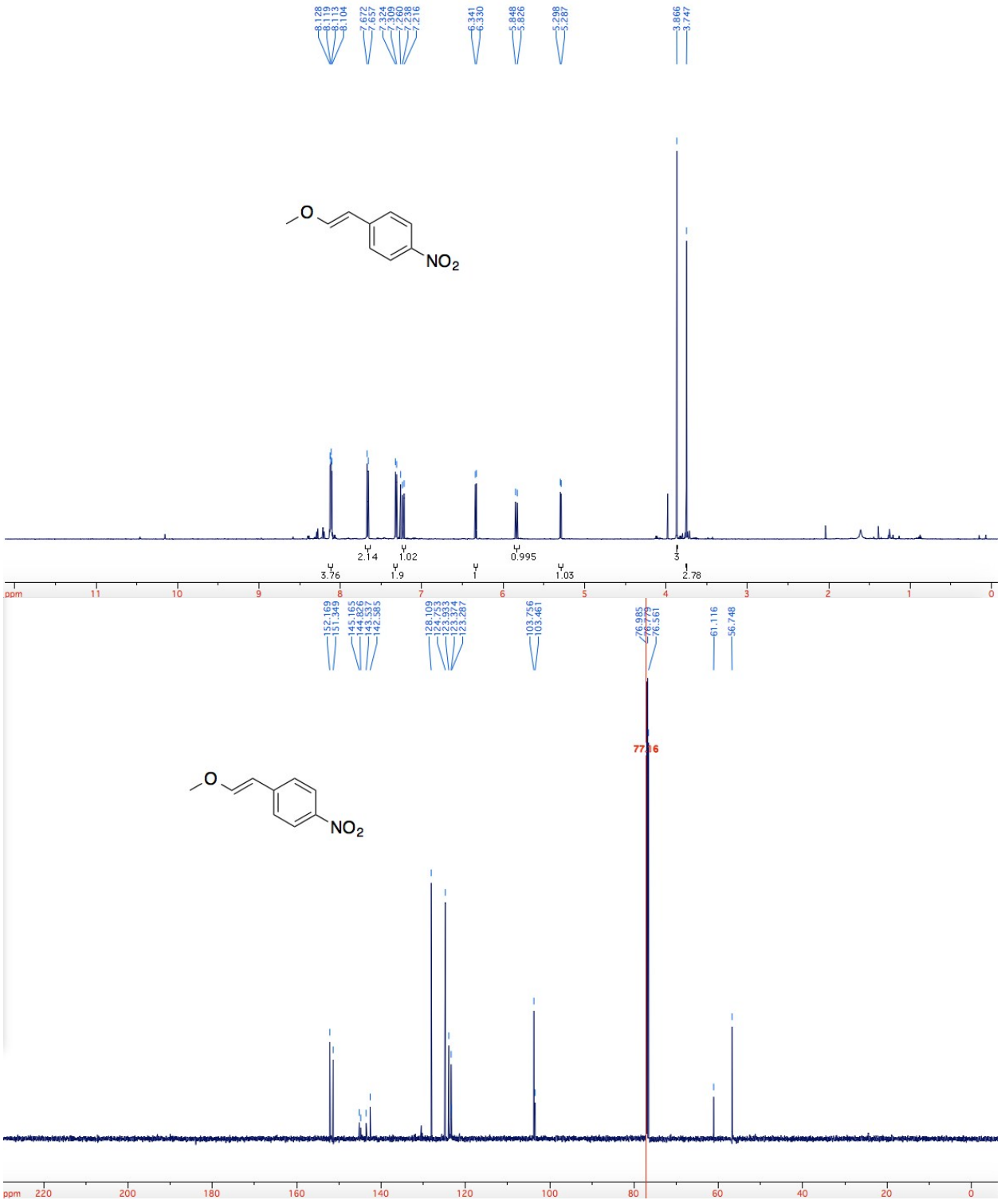
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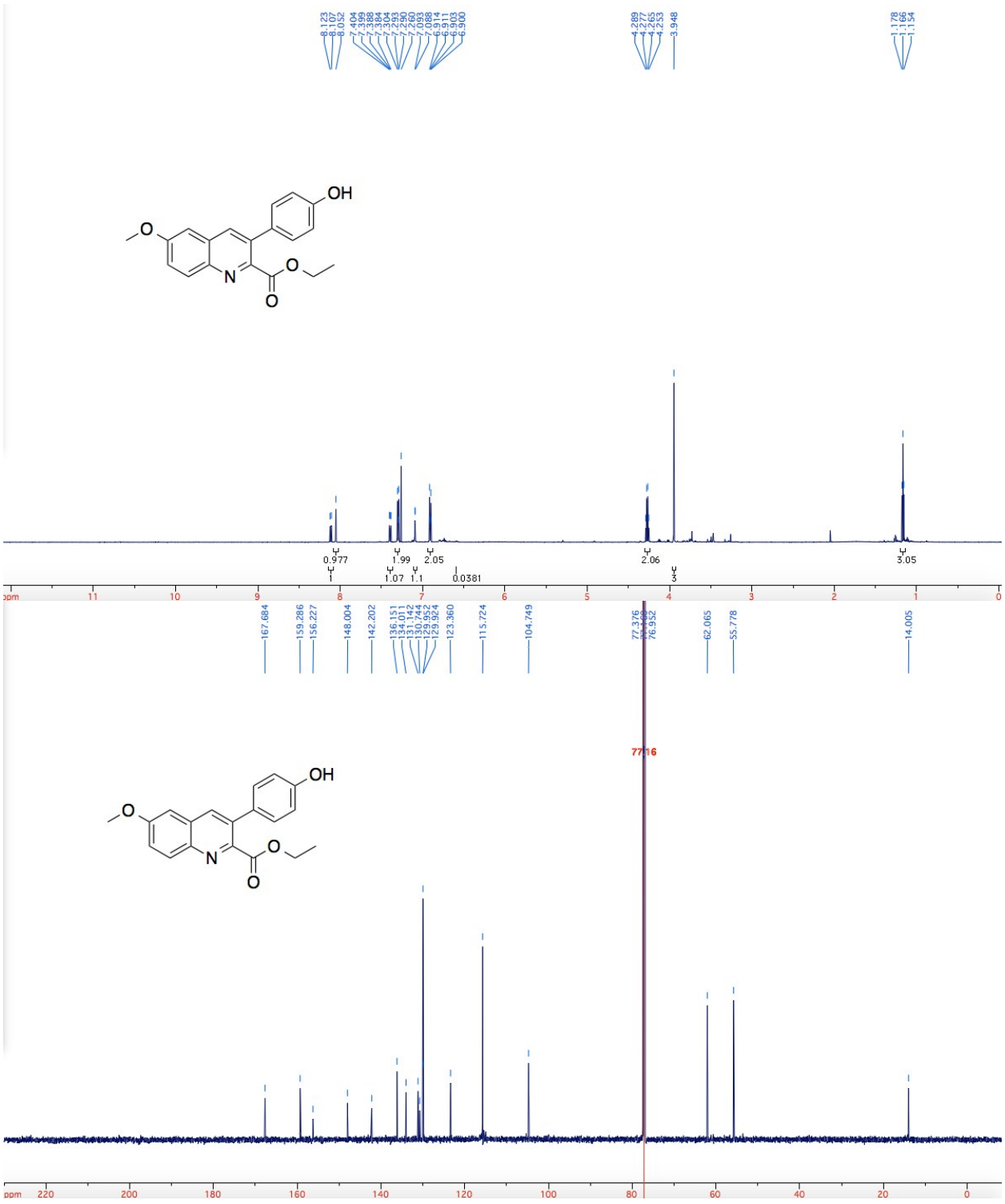
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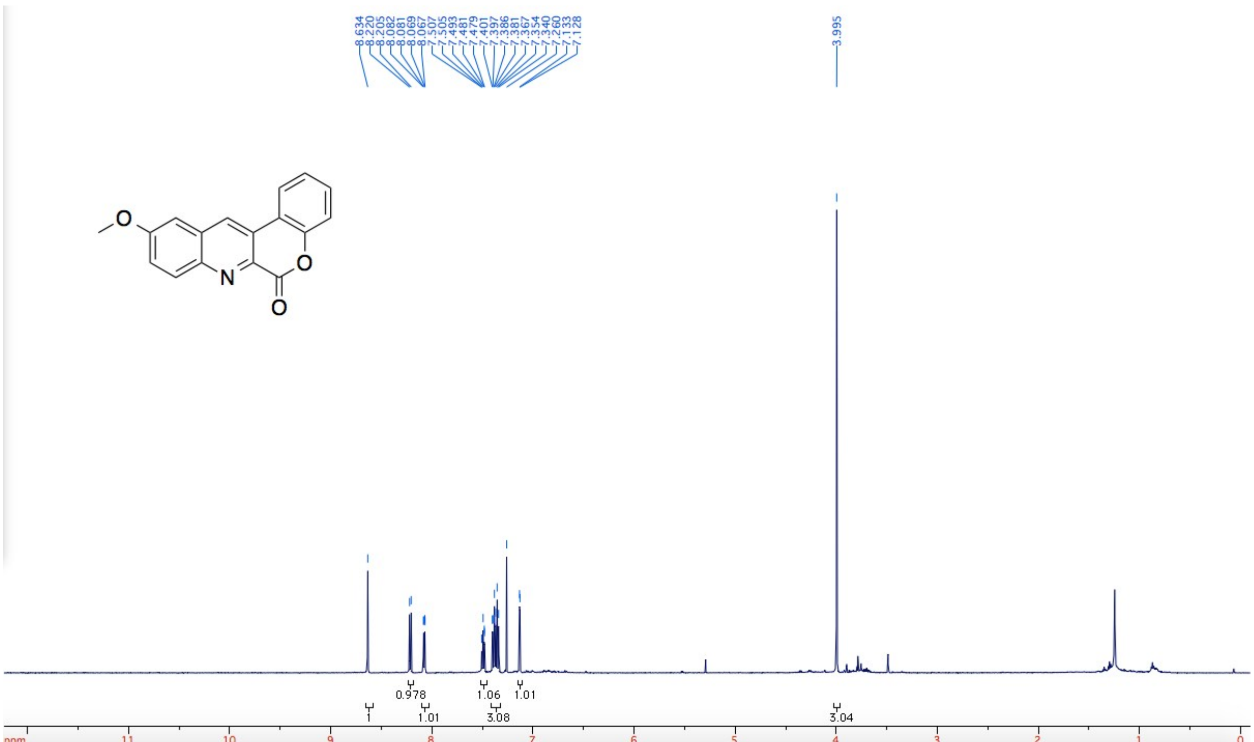
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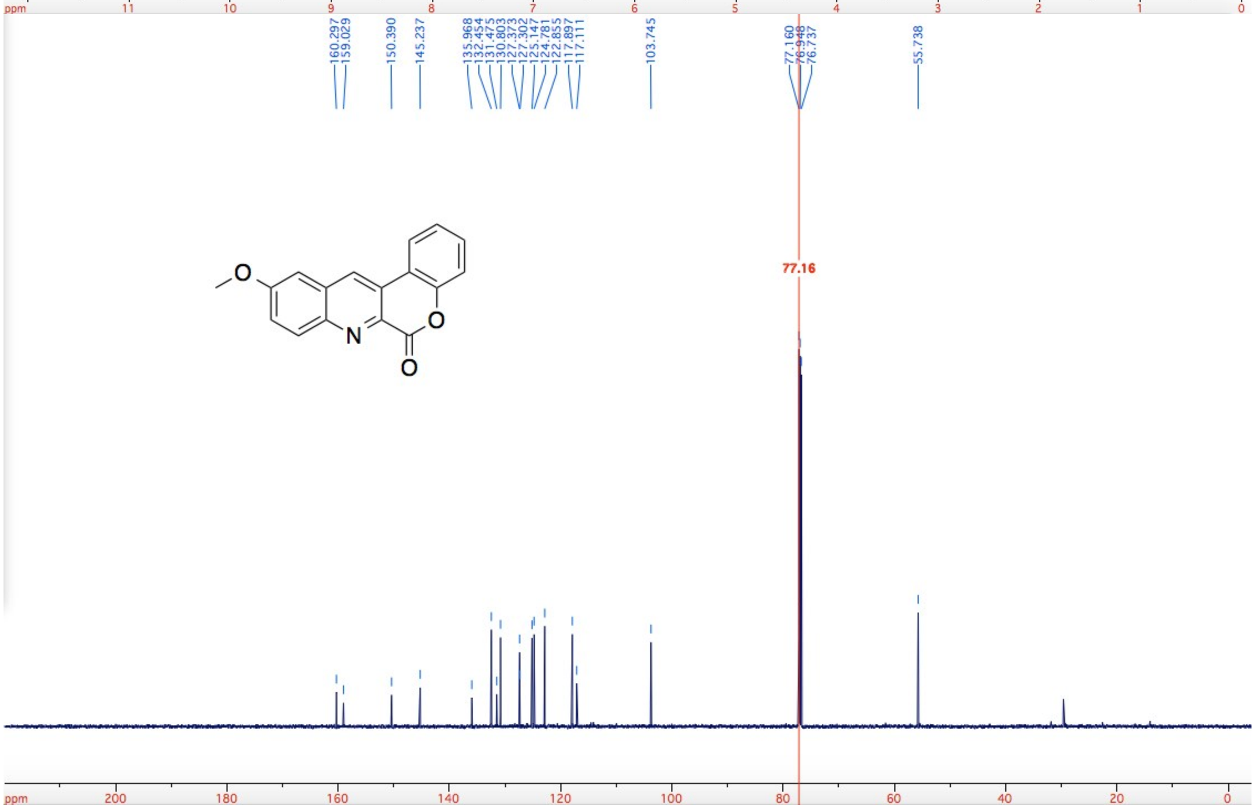
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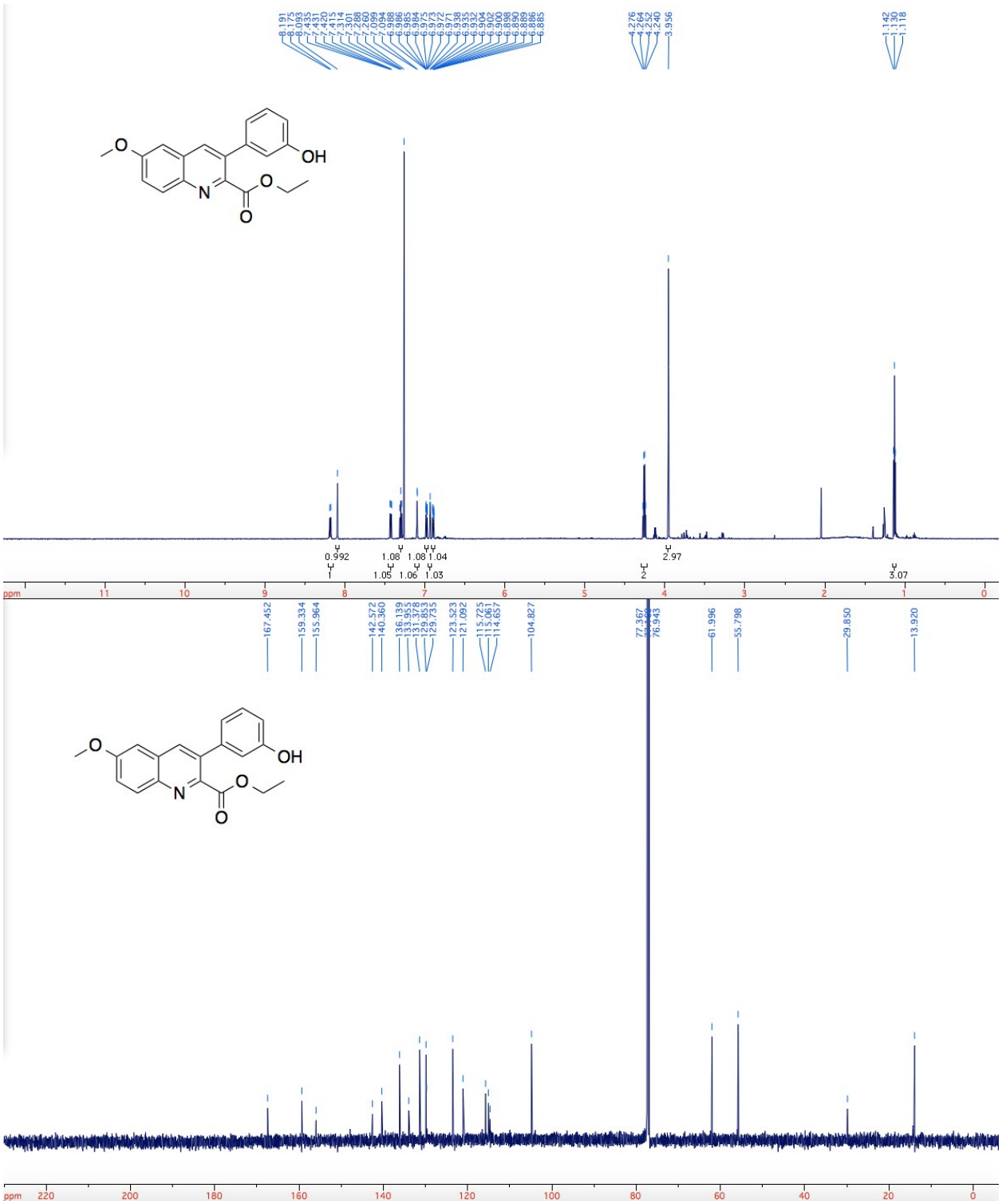
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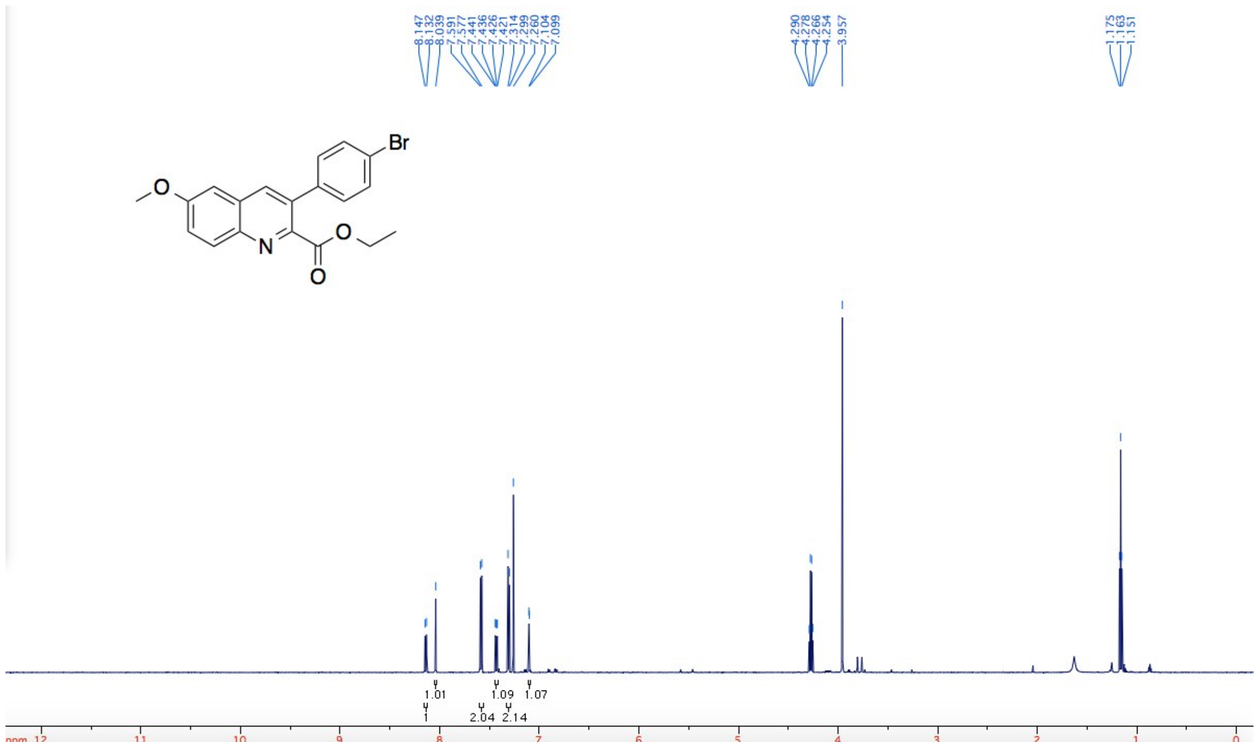
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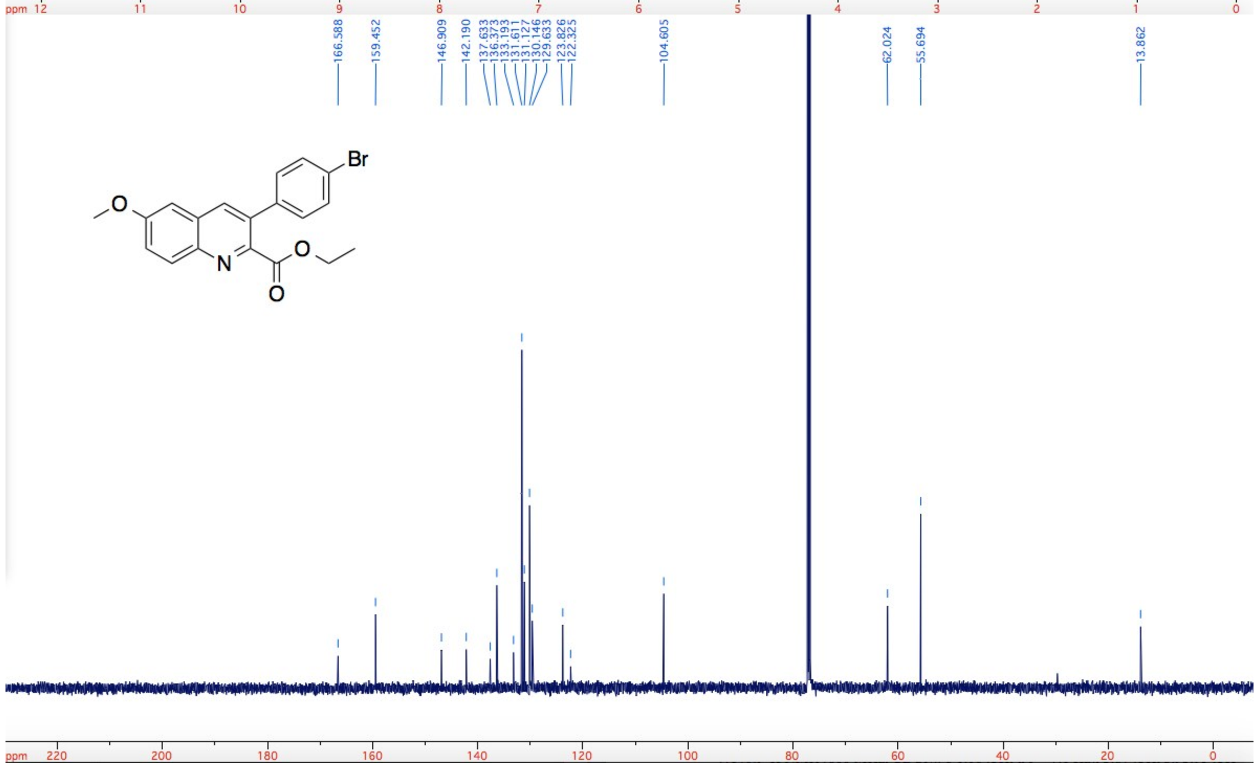
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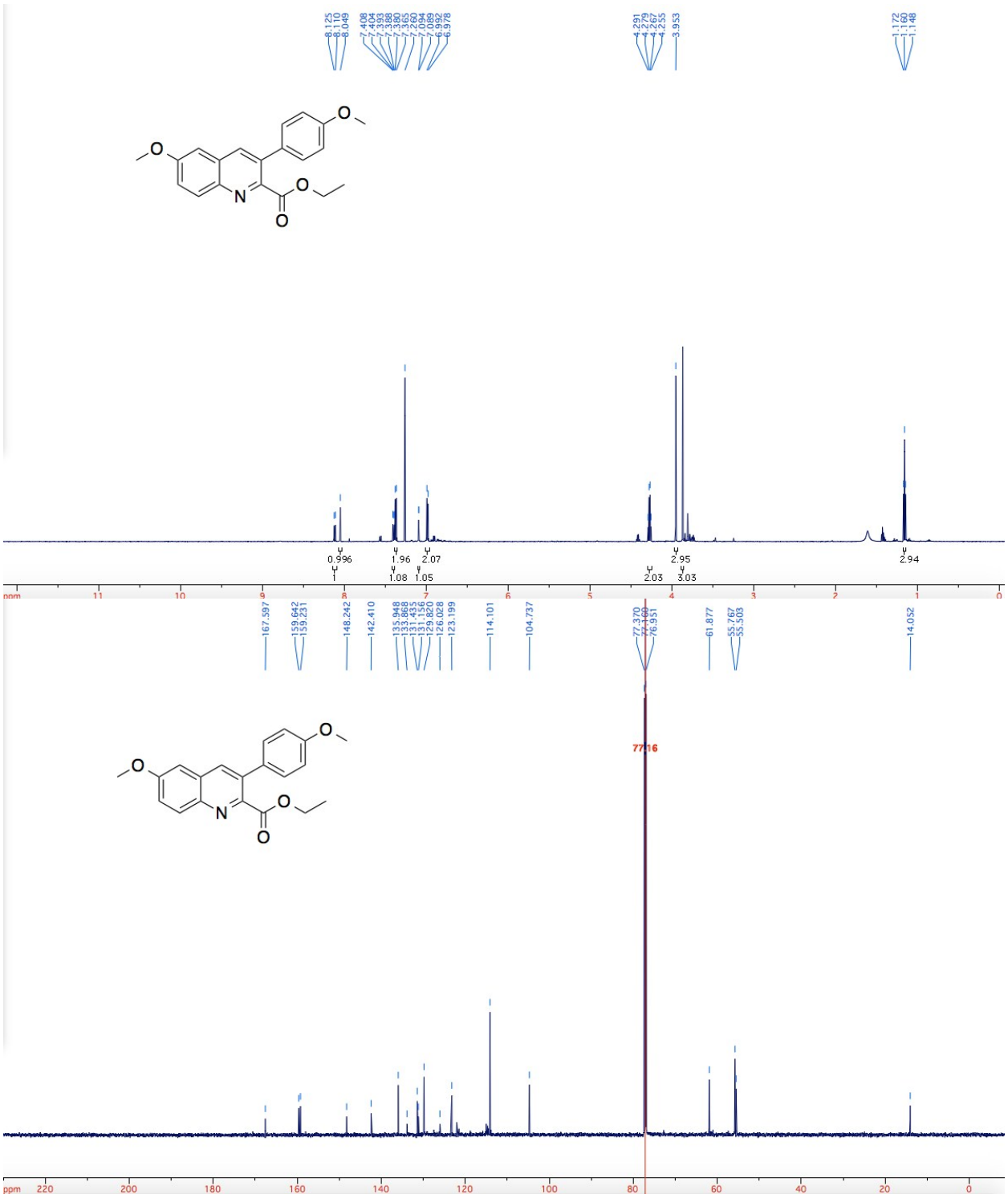
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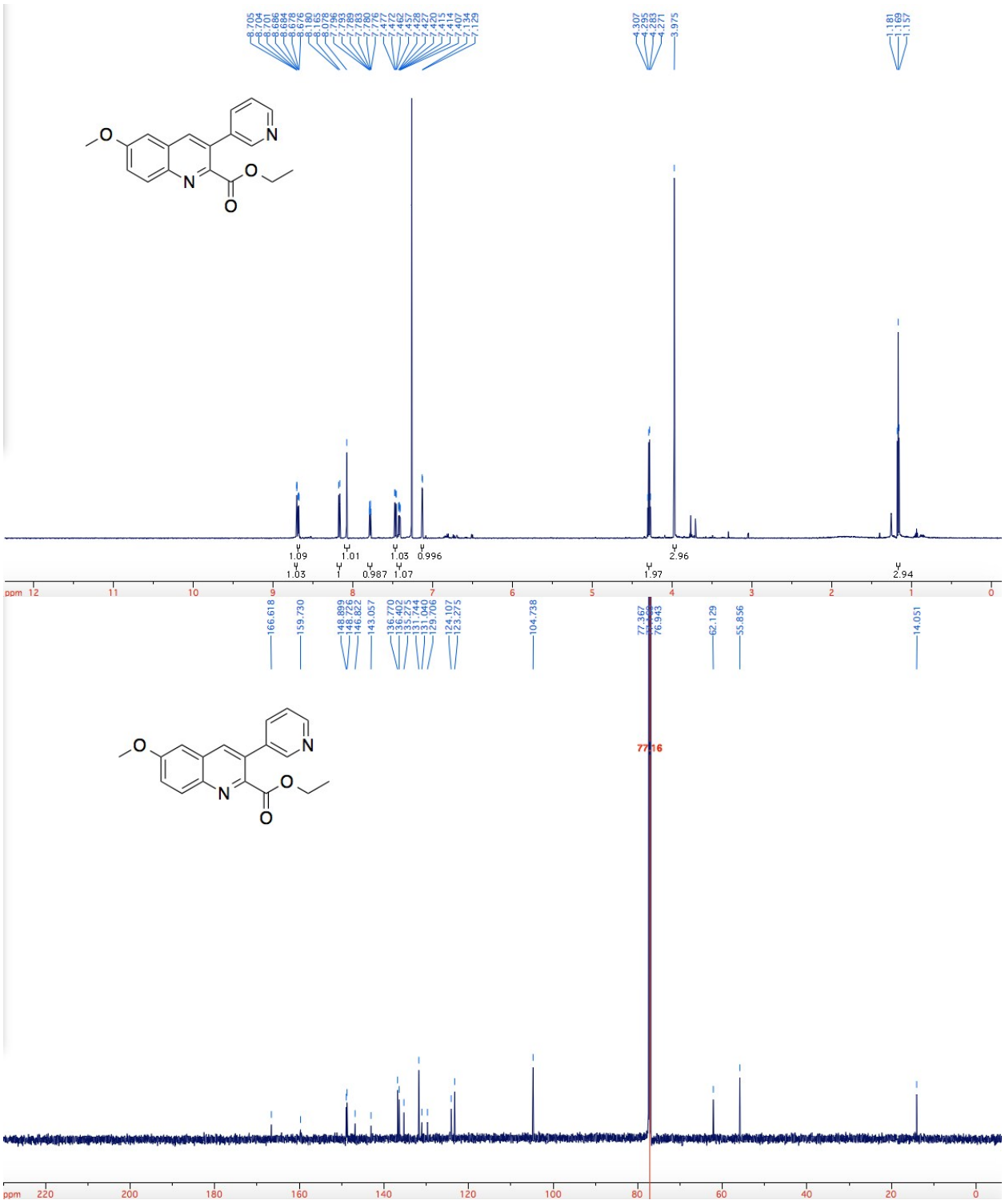
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1.181
1.169
1.157
1.09
1.03
1.01
1
1.03
0.987
1.07
0.996
2.96
1.97
2.94
ppm
166.618
159.730
148.899
148.622
146.622
143.057
136.770
136.402
135.275
134.744
131.040
129.706
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123.275
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76.943
62.129
55.856
14.051
77116
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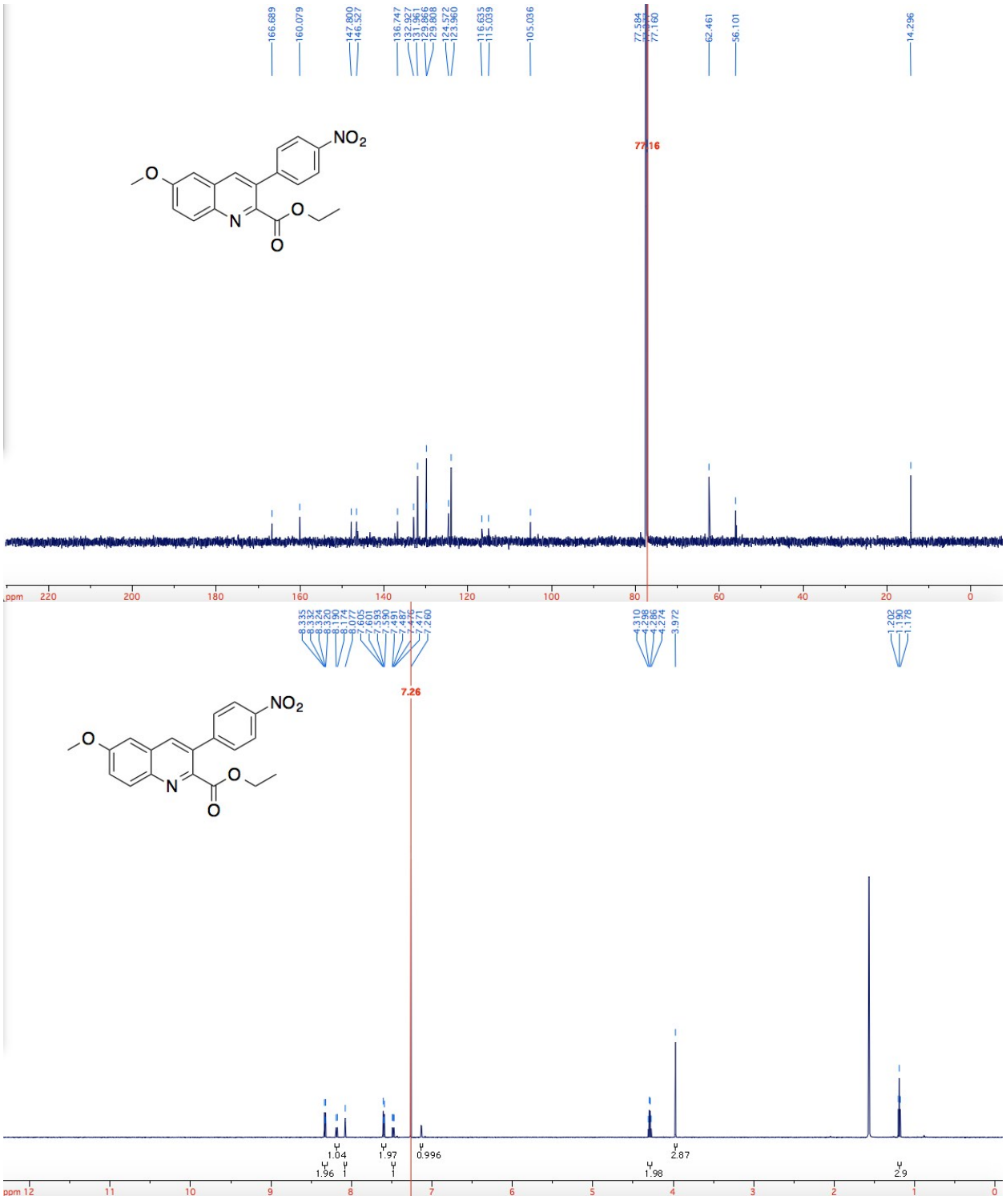
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146.527
136.747
132.927
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129.886
129.808
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116.635
115.039
105.036
77.584
77.160
62.461
56.101
14.296
77.16
NO2
O
N
O
O
ppm
220
200
180
160
140
120
100
80
60
40
20
0
8.335
8.332
8.324
8.320
8.190
8.174
8.077
8.075
7.601
7.593
7.590
7.487
7.487
7.476
7.471
7.260
4.310
4.298
4.286
4.274
3.972
1.202
1.190
1.178
7.26
NO2
O
N
O
O
1.04
1.96
1
1.97
1
0.996
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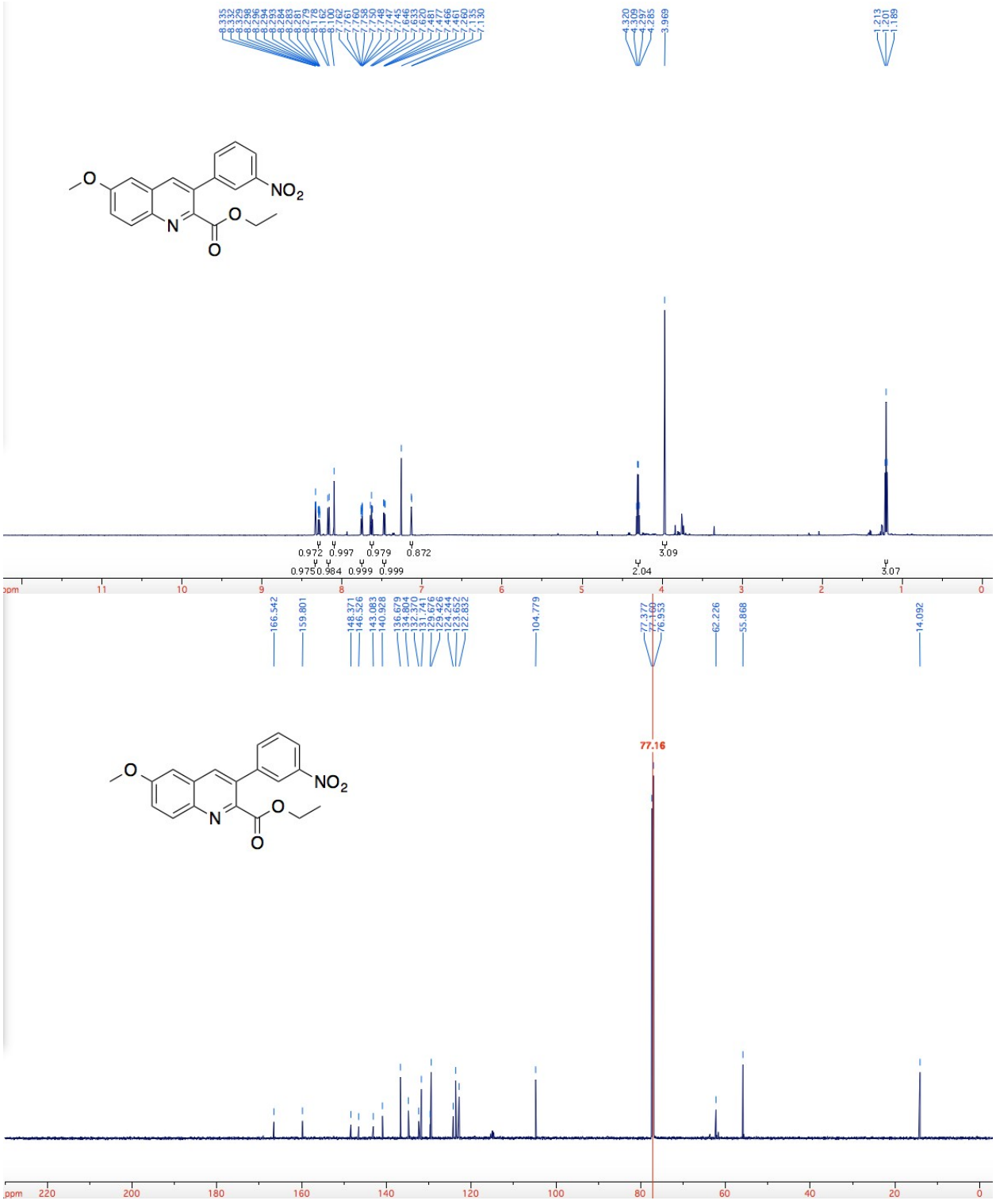
2.87
2.9
ppm
12
11
10
9
8
7
6
5
4
3
2
1
0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8.332
8.329
8.298
8.296
8.294
8.293
8.284
8.283
8.281
8.279
8.178
8.176
8.100
7.762
7.761
7.760
7.758
7.750
7.748
7.747
7.745
7.646
7.633
7.630
7.481
7.477
7.466
7.461
7.260
7.135
7.130
4.320
4.309
4.297
4.285
3.969
1.213
1.201
1.189
NO2
O
N
O
O
0.972
0.997
0.979
0.872
0.975
0.984
0.999
0.999
3.09
2.04
3.07
ppm
166.542
159.801
148.371
146.326
143.083
140.928
136.679
134.804
132.370
131.141
129.676
129.426
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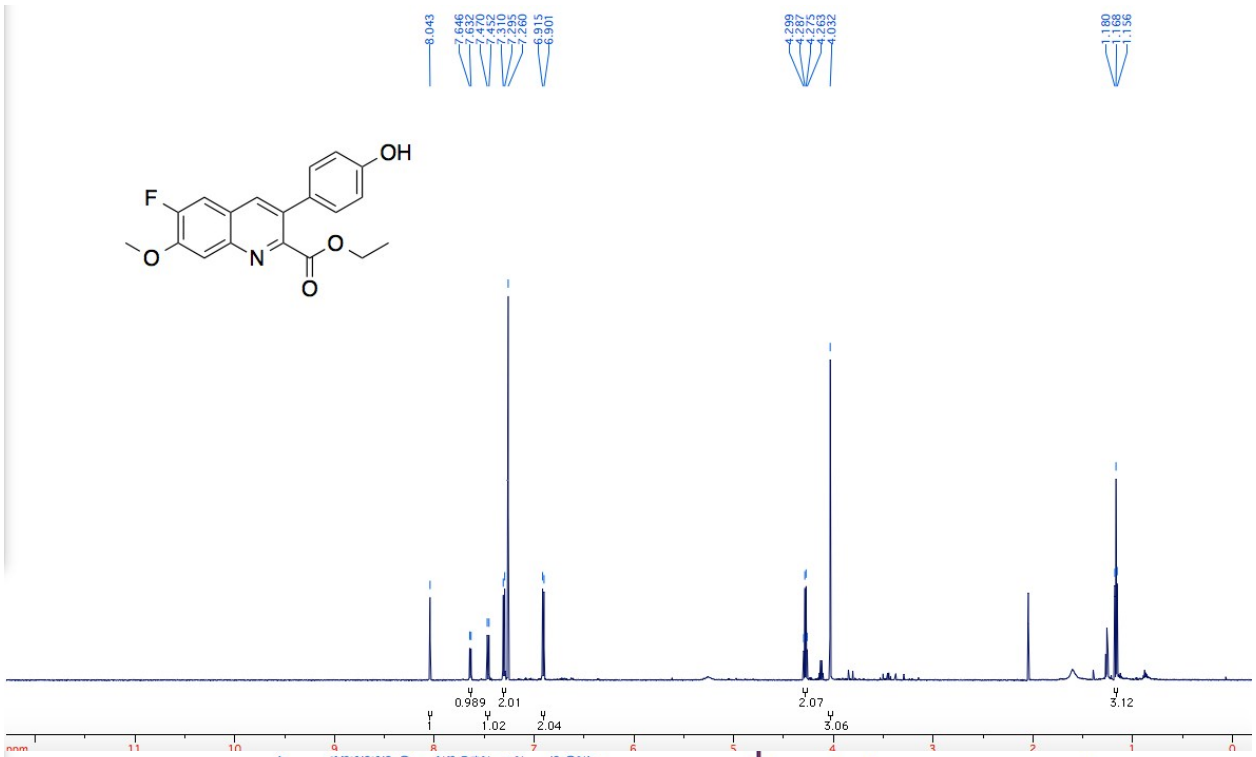
122.832
104.779
77.377
77.160
76.953
62.226
55.868
14.092
77.16
ppm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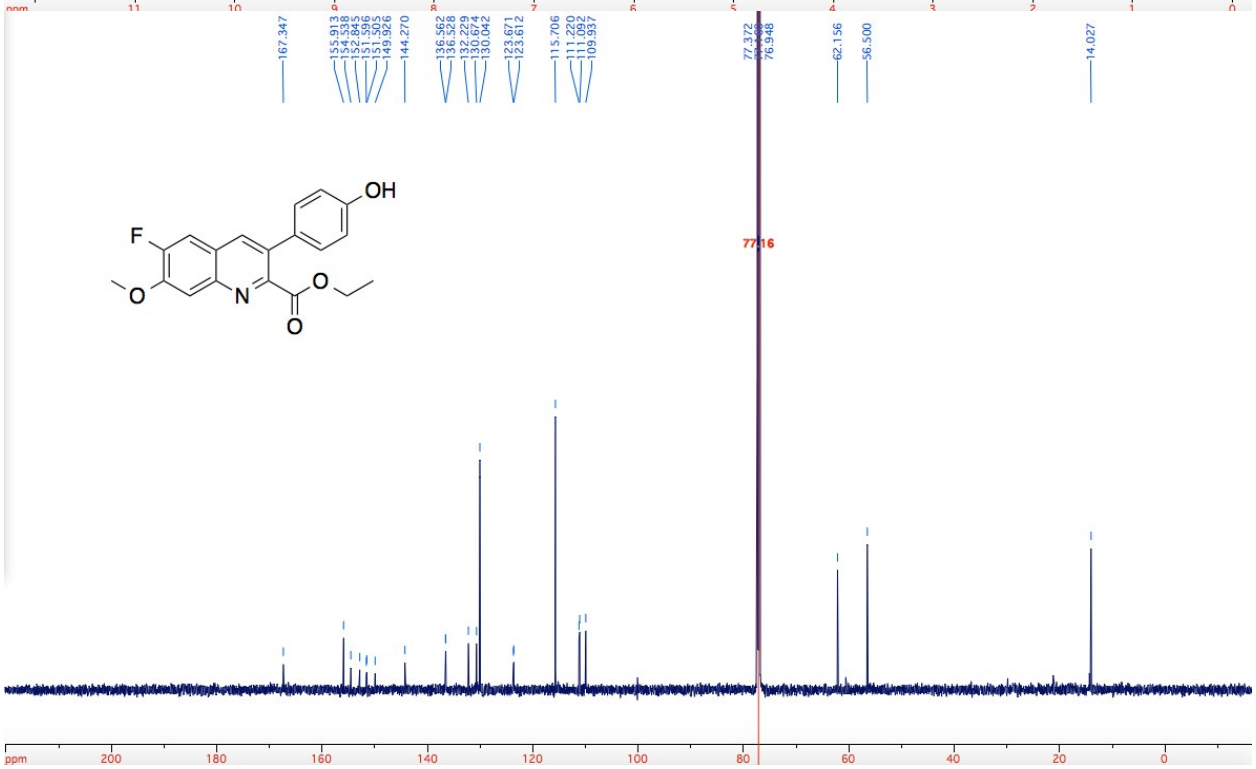
7.646
7.632
7.470
7.462
7.310
7.295
7.260
6.915
6.901
4.299
4.277
4.275
4.263
4.032
1.180
1.168
1.156
OH
F
O
N
O
O
0.989
2.01
1.02
2.04
2.07
3.06
3.12
ppm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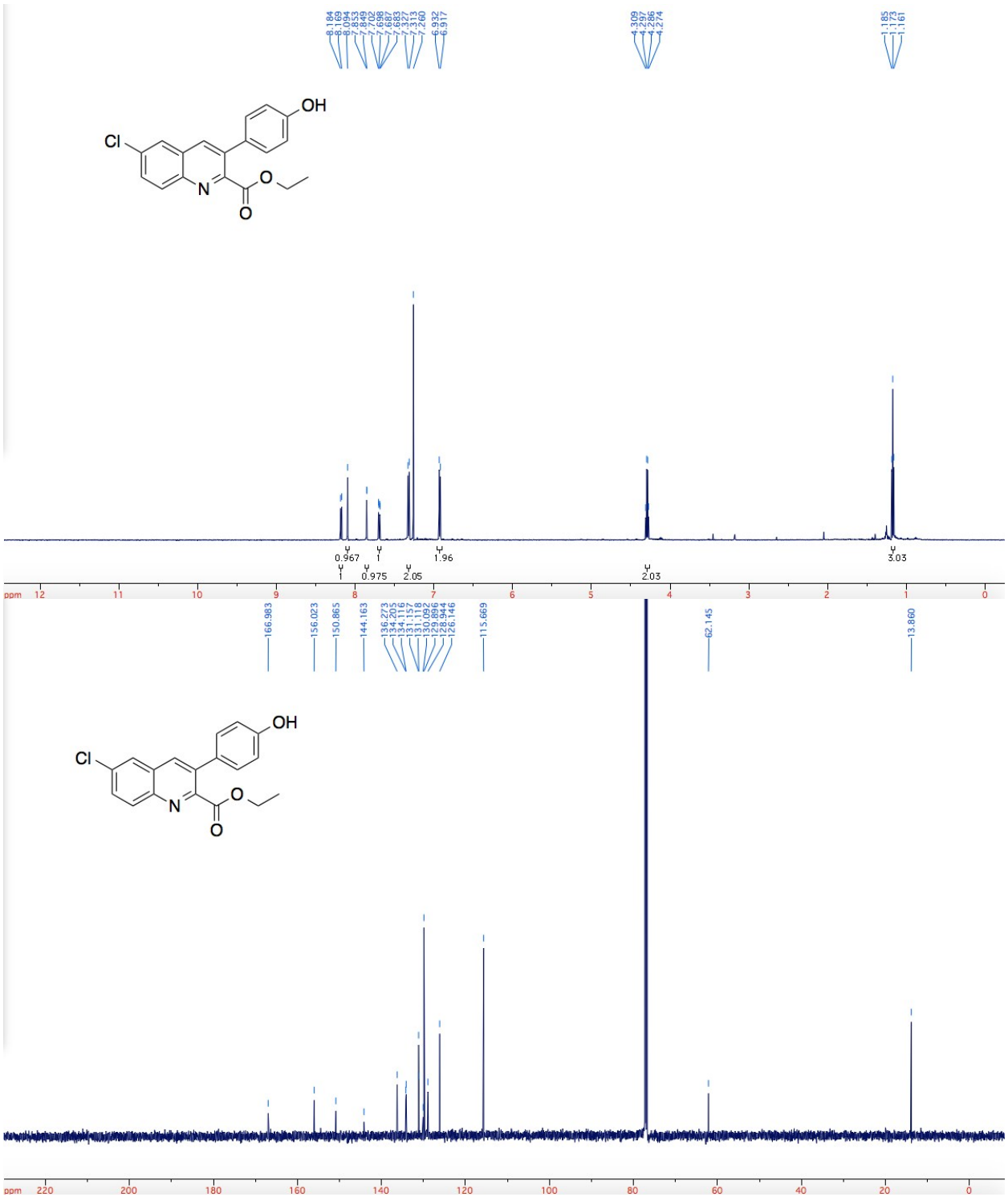
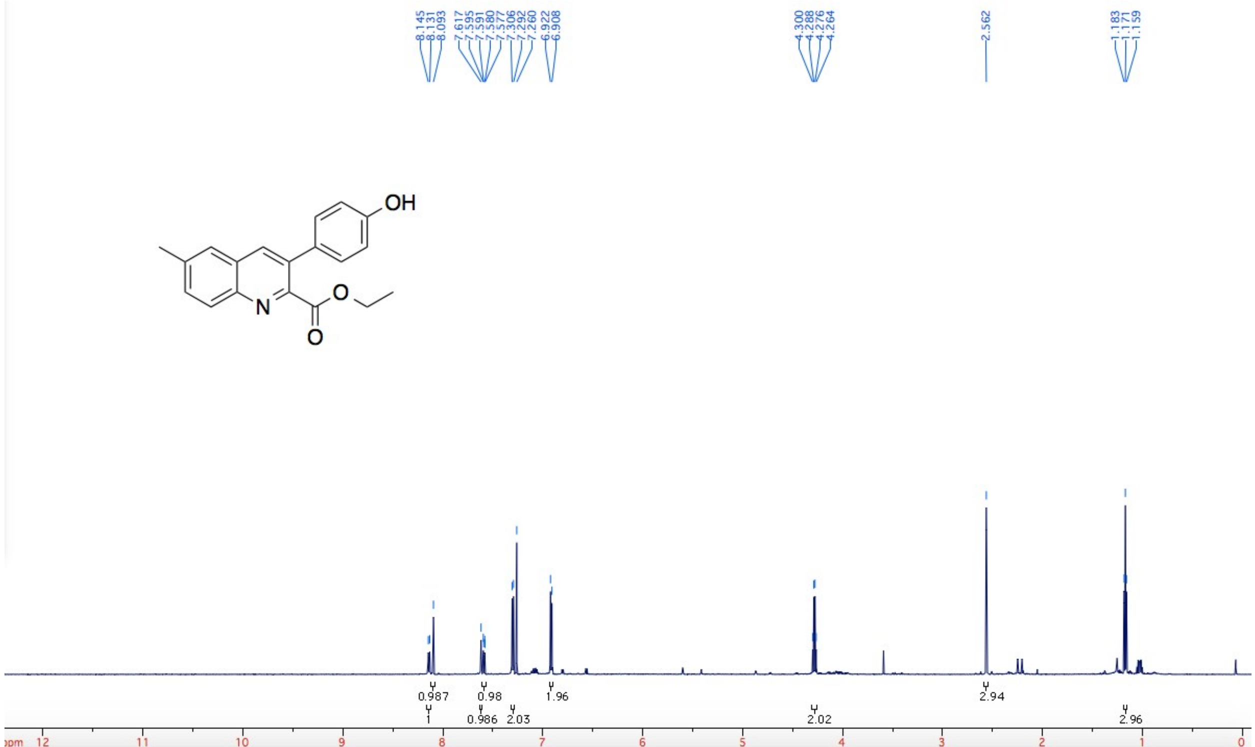
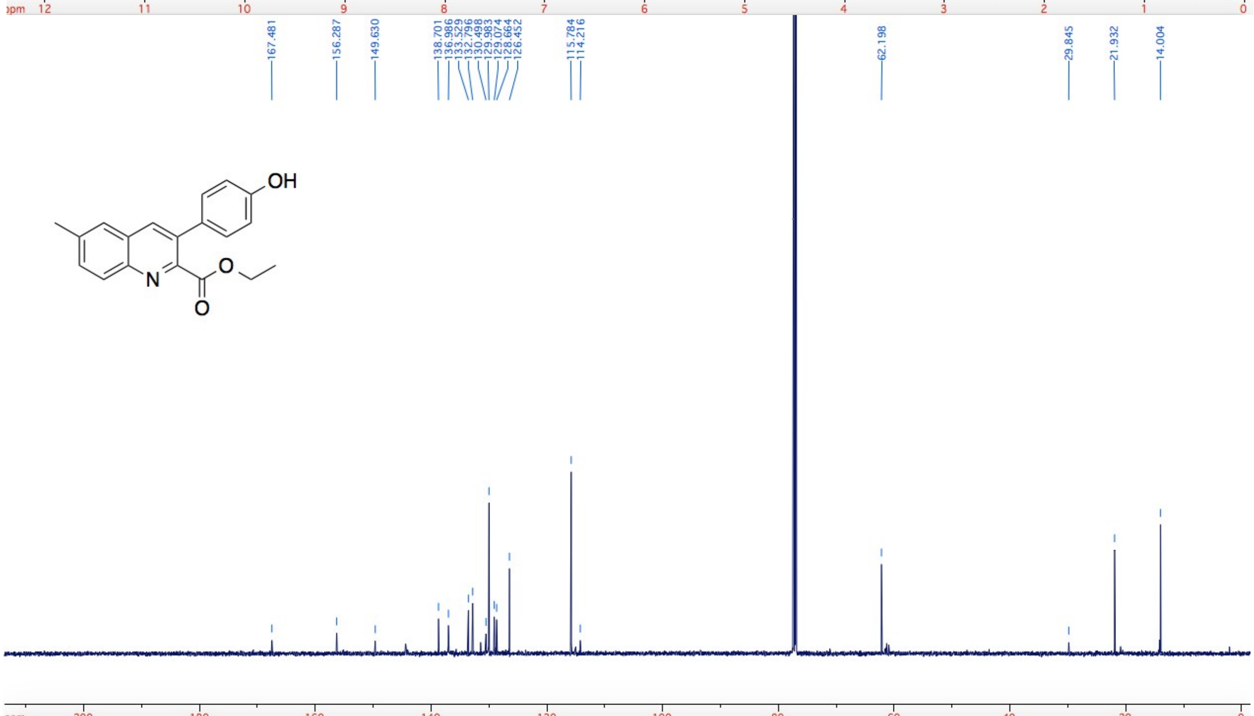
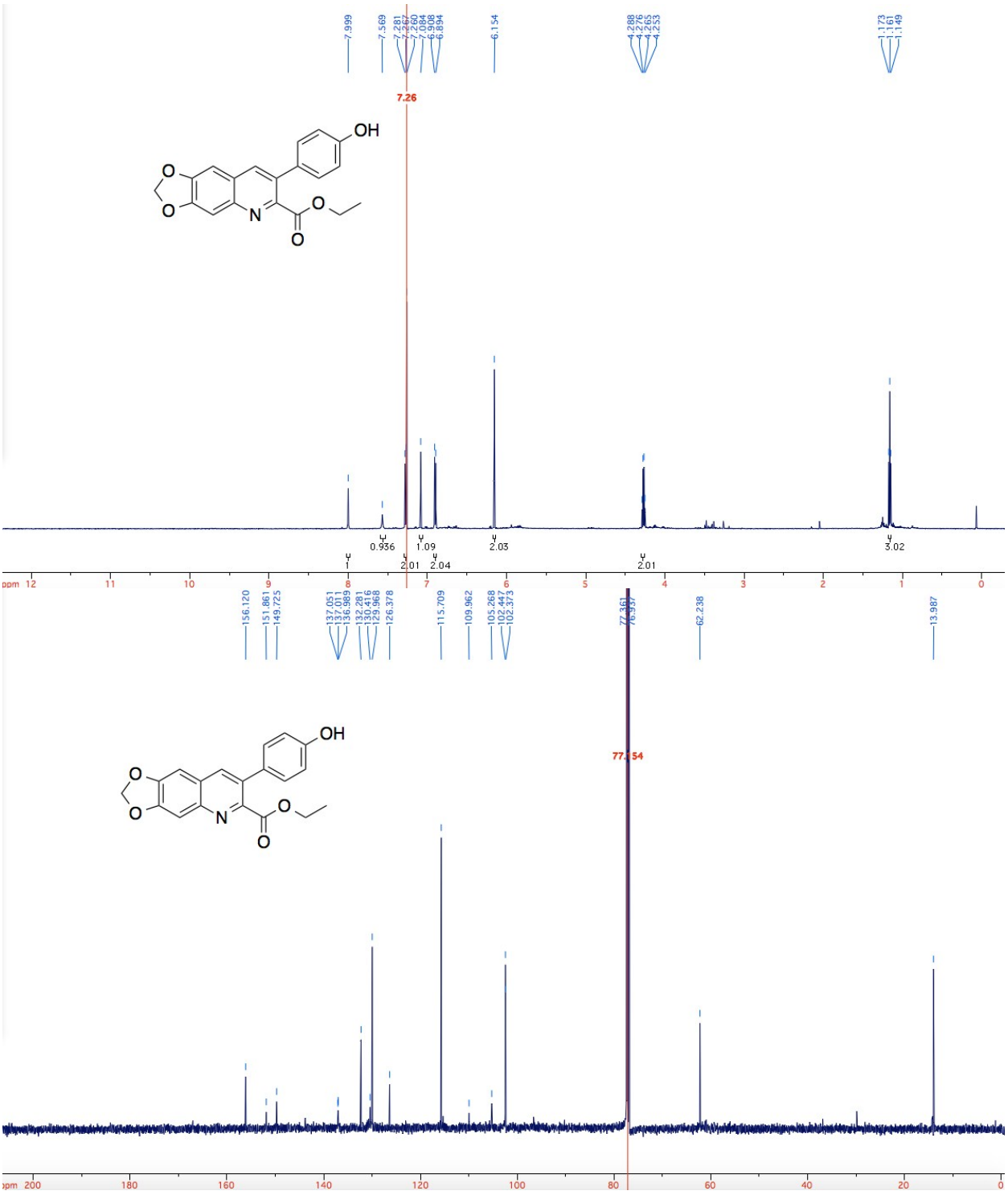
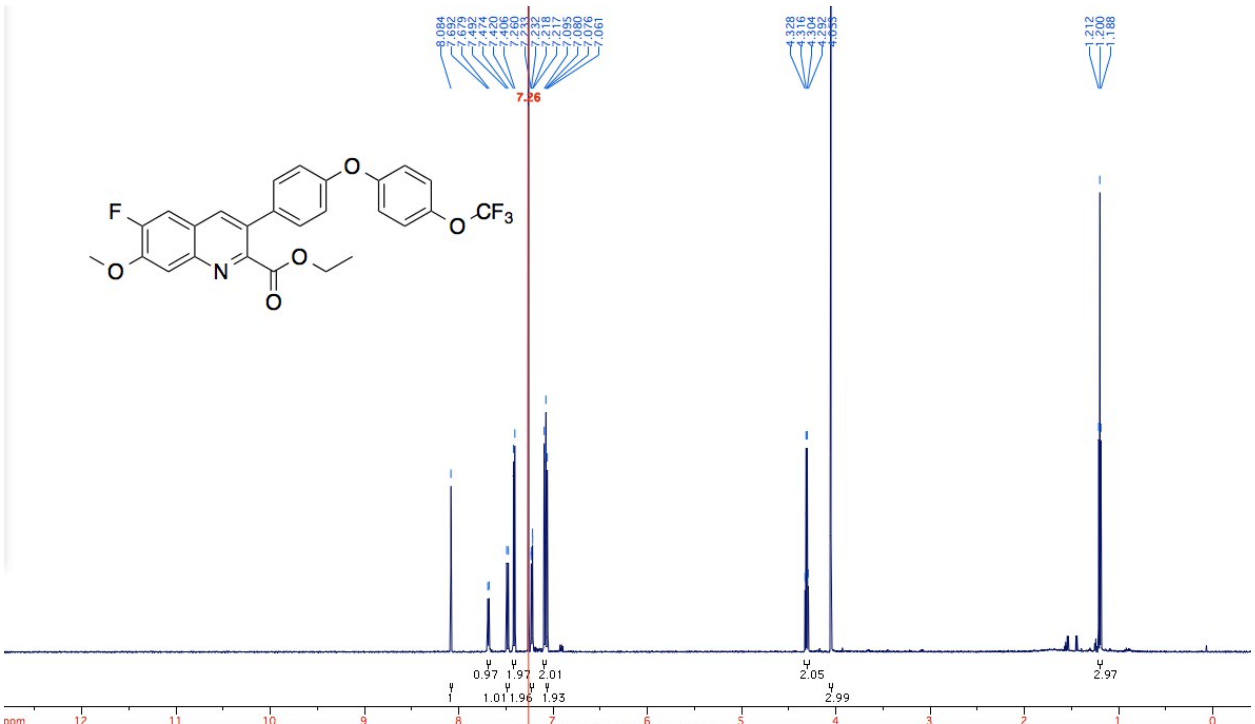
155.913
154.538
152.845
151.996
151.305
149.926
144.270
136.562
136.528
132.229
130.674
130.042
123.671
123.612
115.706
111.220
111.092
109.937
77.372
77.160
76.948
62.156
56.500
14.027
77.16
OH
F
O
N
O
O
ppm
200
180
160
140
120
100
80
60
40
20
0

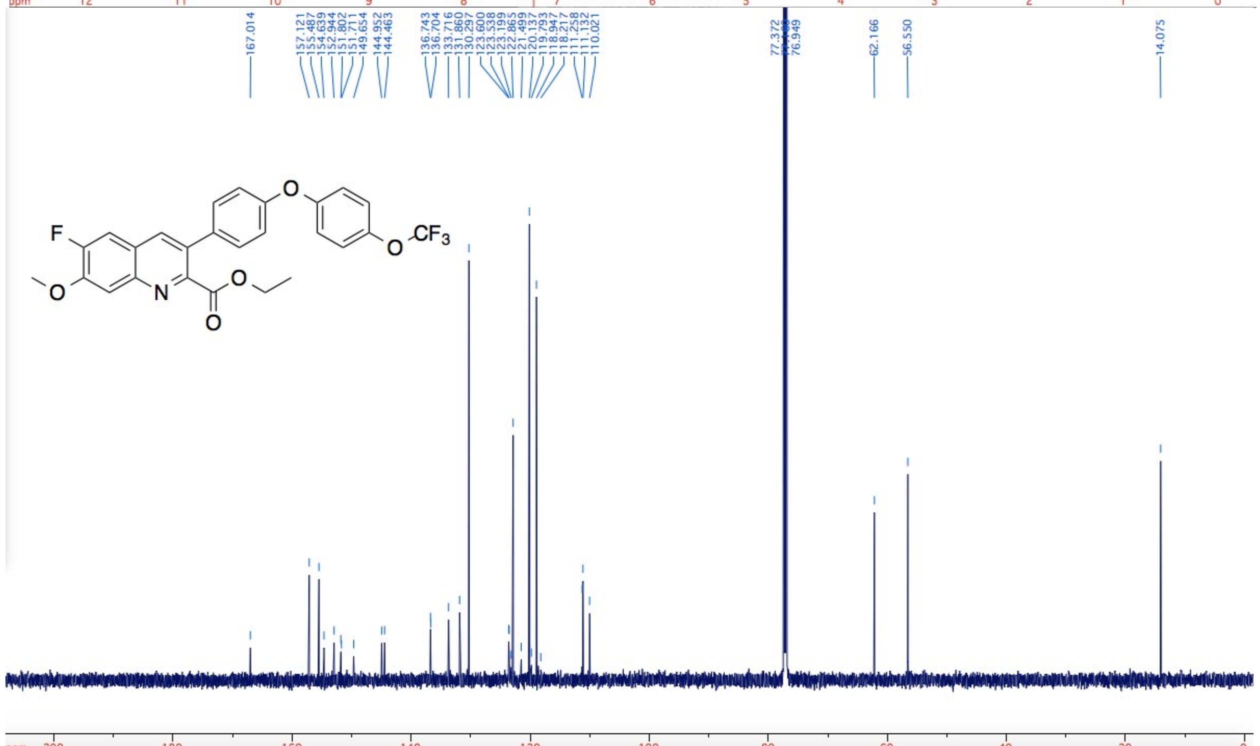

8.184
8.169
8.094
7.853
7.849
7.702
7.698
7.687
7.683
7.337
7.313
7.260
6.932
6.917
4.309
4.297
4.286
4.274
1.185
1.173
1.161
OH
Cl
N
O
O
0.967
1
0.975
2.05
1.96
2.03
3.03
ppm
166.983
156.023
150.865
144.163
136.273
134.205
134.116
131.157
131.118
130.092
129.896
128.944
126.146
115.669
62.145
13.860
OH
Cl
N
O
O
ppm

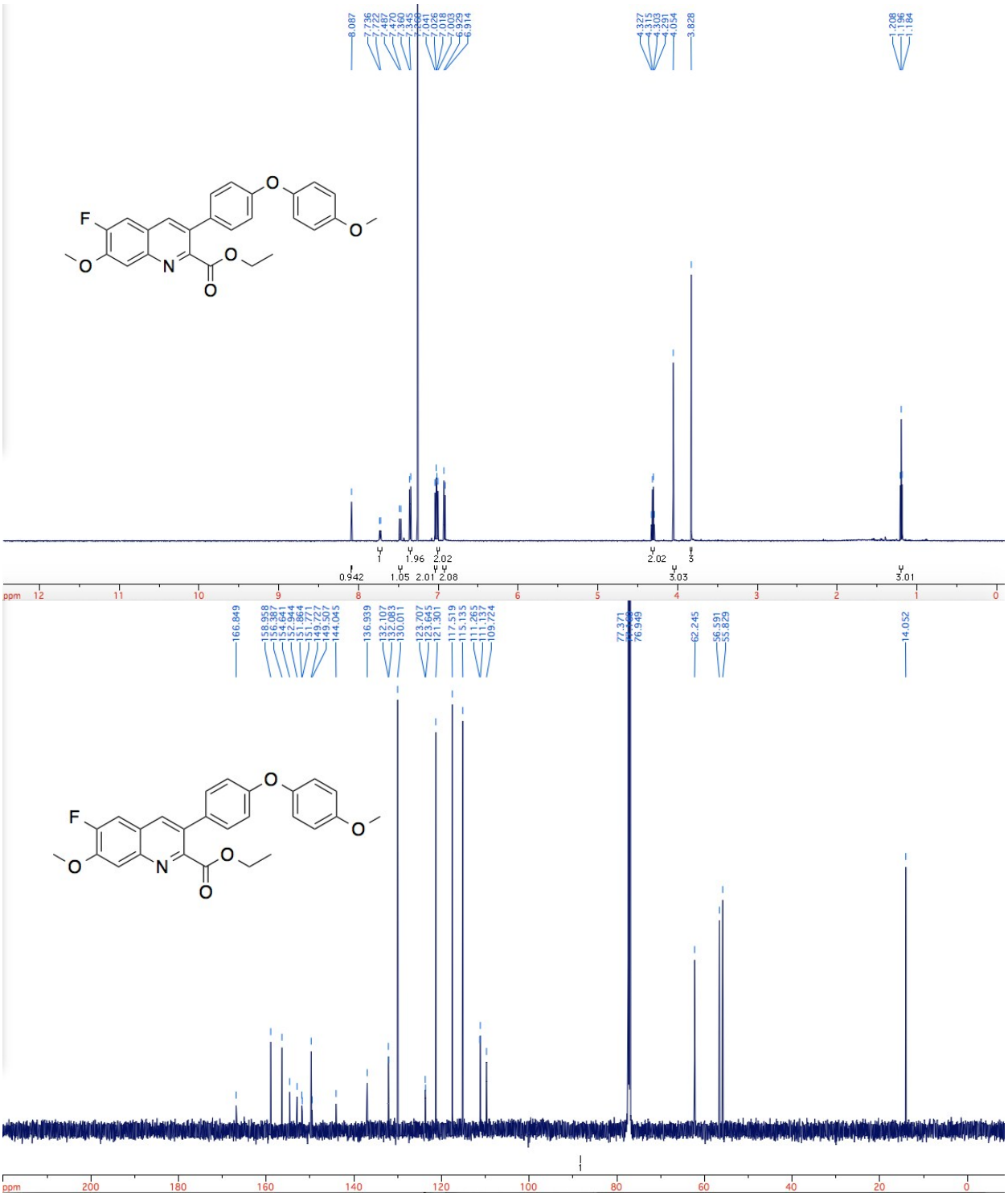

8.145
8.131
8.093
7.617
7.595
7.591
7.580
7.577
7.306
7.292
7.260
6.922
6.908
4.300
4.288
4.276
4.264
2.562
1.183
1.171
1.159
OH
N
O
O
0.987
0.98
1.96
2.94
1
0.986
2.03
2.02
2.96
ppm 12 11 10 9 8 7 6 5 4 3 2 1 0


167.481
156.287
149.630
138.701
136.986
133.529
132.796
130.498
129.983
129.074
128.664
126.452
115.784
114.216
62.198
29.845
21.932
14.004
OH
N
O
O
ppm 200 180 160 140 120 100 80 60 40 20 0


7.999
7.569
7.281
7.267
7.260
7.084
6.908
6.894
6.154
4.288
4.276
4.260
4.253
1.173
1.161
1.149
7.26
OH
O
O
N
O
O
0.936
1.09
2.03
3.02
1
2.01
2.04
2.01
ppm 12
11
10
9
8
7
6
5
4
3
2
1
0
156.120
151.861
149.725
137.051
137.011
136.989
132.281
130.416
129.968
126.378
115.709
109.962
105.268
102.447
102.373
77.361
76.937
62.238
13.987
77.154
OH
O
O
N
O
O
ppm 200
180
160
140
120
100
80
60
40
20
0


8.084 7.692 7.679 7.492 7.474 7.420 7.406 7.260 7.233 7.232 7.218 7.217 7.095 7.080 7.076 7.061
4.328 4.316 4.304 4.292 4.053
1.212 1.200 1.188
7.26
F
O
N
O
O
O
CF3
0.97 1.97 2.01
1 1.01 1.96 1.93
2.05
2.99
2.97
ppm 12 11 10 9 8 7 6 5 4 3 2 1 0


167.014
157.121 155.487 154.639 152.944 151.802 151.711 149.654 144.952 144.463
136.743 136.704 133.716 131.860 130.297 123.600 123.538 123.199 122.865 121.499 120.137 119.793 118.947 118.217 111.258 111.132 110.021
77.372 76.949
62.166
56.550
14.075
F
O
N
O
O
O
CF3
ppm 200 180 160 140 120 100 80 60 40 20 0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7.736
7.722
7.487
7.470
7.460
7.345
7.026
7.021
7.018
7.003
6.999
6.974
6.914
4.327
4.315
4.303
4.291
4.054
3.828
1.208
1.196
1.184
F
O
O
N
O
O
O
1
1.96
2.02
2.02
3
0.942
1.05
2.01
2.08
3.03
3.01
ppm
166.849
158.958
156.387
154.641
152.844
151.964
151.771
149.727
149.507
144.045
136.939
132.107
132.083
130.011
123.707
123.645
121.301
117.519
115.135
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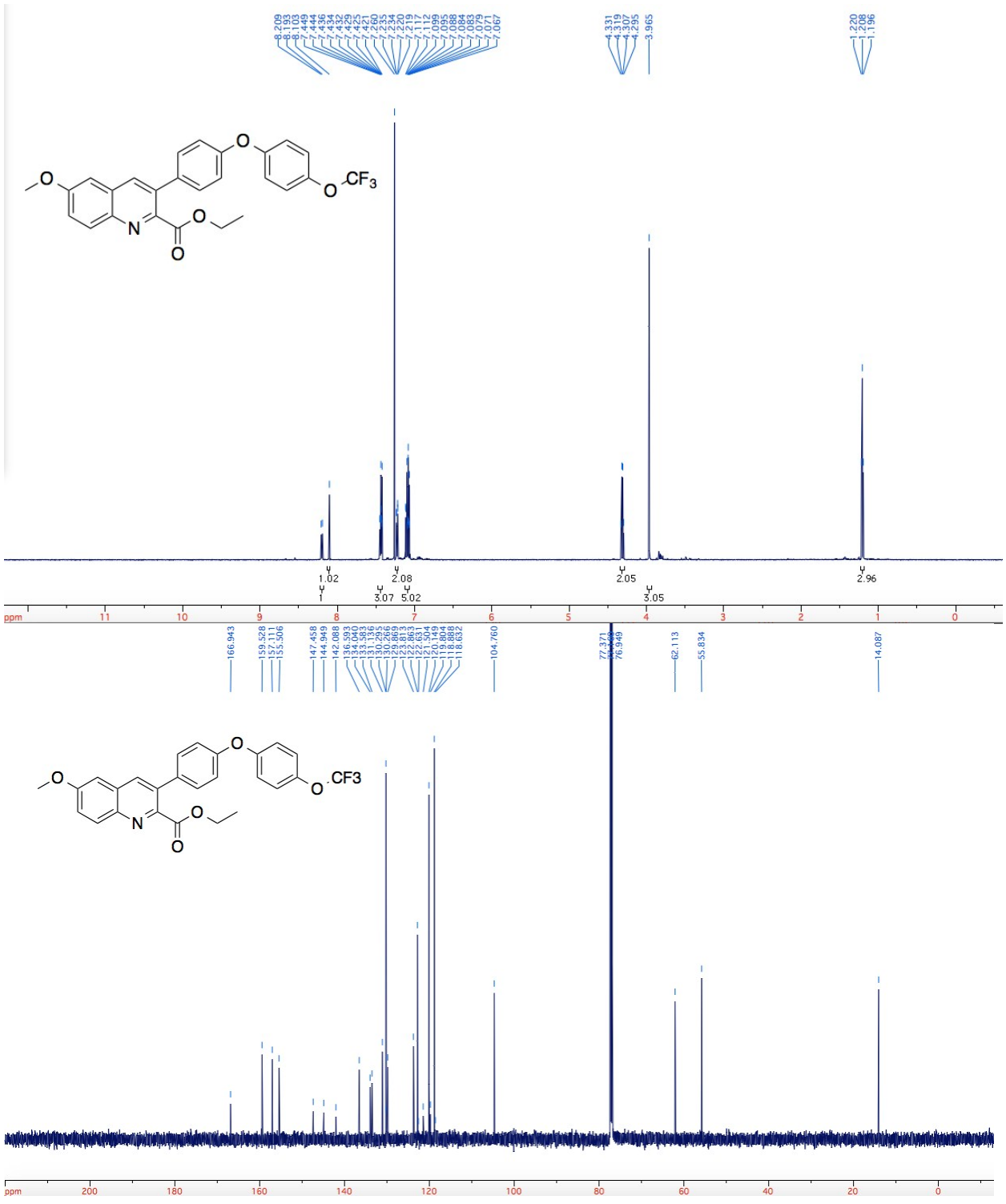
109.724
77.371
77.159
76.948
62.245
56.591
55.829
14.052
ppm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8.103
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7.436
7.434
7.432
7.429
7.425
7.421
7.260
7.235
7.234
7.230
7.219
7.117
7.112
7.099
7.095
7.088
7.084
7.083
7.073
7.071
7.067
4.331
4.319
4.307
4.295
3.965
1.220
1.208
1.196
O
O
CF3
O
N
O
O
1.02
2.08
2.05
2.96
1
3.07
5.02
3.05
ppm
11
10
9
8
7
6
5
4
3
2
1
0
166.943
159.528
157.111
155.506
147.458
144.949
142.088
135.533
134.040
133.583
131.156
130.295
130.266
129.869
129.833
122.863
122.631
121.504
120.149
119.804
118.888
118.632
104.760
77.371
77.268
76.949
62.113
55.834
14.087
O
O
CF3
O
N
O
O
ppm
200
180
160
140
120
100
80
60
40
20
0