

Supporting Information

for

An organocatalytic route to 2-heteroarylmethylene decorated *N*-arylpyrroles

Alexandre Jean^{1,2}, Jérôme Blanchet^{*,1}, Jacques Rouden¹, Jacques Maddaluno² and Michaël De Paolis^{*,2}

Address: ¹Laboratoire de Chimie Moléculaire et Thio-organique, ENSICAEN, Université de Caen, CNRS, 6 boulevard du Marechal Juin, 14050 Caen, France and ²Laboratoire des Fonctions Azotées et Oxygénées Complexes de l'IRCOF, CNRS UMR 6014 & FR 3038, Université et INSA de Rouen, Mont Saint-Aignan, France

Email: Jérôme Blanchet - jerome.blanchet@ensicaen.fr; Michaël De Paolis - michael.depaolis@univ-rouen.fr

*Corresponding author

**Physical and spectroscopic data of 5b–j, 9b–e and
¹H and ¹³C spectra of all new compounds**

**Ethyl 3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-5-(pyridin-3-ylmethyl)-
1H-pyrrole-2-carboxylate (5b)**

^1H NMR (300 MHz, CDCl_3) δ = 1.08 (t, 3H, J = 7.1 Hz, OCH_2CH_3), 2.63 (br t, 2H, J = 7.7 Hz), 3.11 (br t, 2H, J = 7.7 Hz), 3.63 (s, 2H), 3.67 (s, 3H), 3.82 (s, 3H), 4.06 (q, 2H, J = 7.1 Hz), 5.90 (s, 1H), 6.85 (d, 2H, J = 8.9 Hz), 6.96 (d, 2H, J = 8.9 Hz), 7.13 (m, 1H), 7.27 (m, 1H), 8.15 (br s, 1H), 8.41 (d, 1H, J = 4.3 Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.7, 160.8, 159.2, 149.9, 147.7, 137.8, 136.0, 134.1, 132.4, 132.0, 128.9 (2*CH), 123.2, 121.1, 113.7 (2*CH), 110.4, 59.5, 55.4, 51.4, 35.1, 30.5, 23.5, 14.0 ppm; IR 2927, 1733, 1690, 1512, 1447, 1368, 1246, 1167, 1079, 1027, 833, 799, 713 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{24}\text{H}_{27}\text{N}_2\text{O}_5$: 423.1920, found: 423.1910; R_f = 0.15 ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 99/1).

**Ethyl 3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-5-(pyridin-4-ylmethyl)-
1H-pyrrole-2-carboxylate (5c)**

^1H NMR (300 MHz, CDCl_3) δ = 1.09 (t, 3H, J = 7.1 Hz, OCH_2CH_3), 2.65 (br t, 2H, J = 7.7 Hz), 3.13 (br t, 2H, J = 7.7 Hz), 3.64 (s, 2H), 3.68 (s, 3H), 3.81 (s, 3H), 4.06 (q, 2H, J = 7.1 Hz), 5.96 (s, 1H), 6.77–6.96 (m, 6H), 8.41 (br d, 2H, J = 4.4 Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.7, 160.8, 159.2, 149.6 (2*CH), 147.8, 136.8, 132.4, 132.0, 128.9 (2*CH), 123.8, 121.3, 113.7 (2*CH), 110.7, 59.5, 55.4, 51.5, 35.1, 32.5, 23.5, 14.0 ppm; IR 2927, 1734, 1695, 1596, 1512, 1444, 1295, 1246, 1153, 1079, 1032, 833 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{24}\text{H}_{27}\text{N}_2\text{O}_5$: 423.1920, found: 423.1905; R_f = 0.25 ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 99/1).

Ethyl 3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-5-(quinolin-2-ylmethyl)-1H-pyrrole-2-carboxylate (5d)

^1H NMR (300 MHz, CDCl_3) δ = 1.09 (t, 3H, J = 7.1 Hz, OCH_2CH_3), 2.63 (br t, 2H, J = 7.9 Hz), 3.11 (br t, 2H, J = 7.9 Hz), 3.64 (s, 3H), 3.77 (s, 3H), 4.07 (q + s, 2H + 2H, J = 7.1 Hz), 5.93 (s, 1H), 6.81 (d, 2H, J = 8.9 Hz), 7.02 (d, 2H, J = 8.9 Hz), 7.11 (d, 1H, J = 8.5 Hz), 7.51 (m, 1H), 7.68 (m, 1H), 7.77 (br d, 1H, J = 8.1 Hz), 7.98 (d, 1H, J = 8.5 Hz), 8.03 (d, 1H, J = 8.5 Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.7 (Cq), 160.9 (Cq), 159.0 (Cq), 158.6 (Cq), 147.5 (Cq), 137.4 (Cq), 136.5 (CH), 132.5 (Cq), 132.1 (Cq), 129.5 (CH), 129.0 (2*CH), 128.8 (CH), 127.4 (CH), 126.7 (Cq), 126.1 (CH), 121.1 (CH), 120.9 (Cq), 113.7 (2*CH), 110.6 (CH), 59.4 (CH_2), 55.3 (CH_3), 51.4 (CH_3), 36.7 (CH_2), 35.0 (CH_2), 23.5 (CH_2), 14.0 (CH_3) ppm; IR 2920, 1733.8, 1688, 1600, 1512, 1245, 1168, 1079, 1033, 832 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{28}\text{H}_{29}\text{N}_2\text{O}_5$: 473.2076, found: 473.2093; R_f = 0.2 ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 99/1).

Ethyl 5-((3-chloropyridin-2-yl)methyl)-3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1H-pyrrole-2-carboxylate (5e)

^1H NMR (300 MHz, CDCl_3) δ = 1.10 (t, 3H, J = 7.1 Hz, OCH_2CH_3), 2.61 (br t, 2H, J = 7.9 Hz), 3.08 (br t, 2H, J = 7.9 Hz), 3.65 (s, 3H), 3.83 (s, 3H), 3.94 (s, 2H), 4.07 (q, 2H, J = 7.1 Hz), 5.70 (s, 1H), 6.87 (d, 2H, J = 8.9 Hz), 7.11 (d, 2H, J = 8.9 Hz), 7.12 (m, 1H), 7.59 (dd, 1H, J = 1.5, 8.1 Hz), 8.42 (dd, 1H, J = 1.5, 4.7 Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.8 (Cq), 160.8 (Cq), 159.0 (Cq), 155.5 (Cq), 147.2 (CH), 136.9 (CH), 136.7 (Cq), 132.4 (Cq), 132.2 (Cq), 131.2 (Cq), 128.8 (2*CH), 122.8 (CH), 120.6 (Cq), 113.6 (2*CH), 109.9 (CH), 59.3 (CH_2), 55.3 (CH_3), 51.4 (CH_3), 35.0 (CH_2), 33.4 (CH_2), 23.7 (CH_2), 13.9 (CH_3) ppm; IR 2952, 1734, 1695, 1512, 1444, 1370, 1296, 1246, 1173, 1081, 1035, 834 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$

C₂₄H₂₆³⁵ClN₂O₅: 457.1530, found: 457.1524; *R*_f = 0.2 (CH₂Cl₂/MeOH: 99/1). NB: py-CH₂ –pyrrol integrate for 1.4H on ¹H spectrum. No deuterium exchange was observed in CD₃OD/D₂O.

Ethyl 3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-5-(pyrazin-2-ylmethyl)-1H-pyrrole-2-carboxylate (5f)

¹H NMR (300 MHz, CDCl₃) δ = 1.09 (t, 3H, *J* = 7.1 Hz, OCH₂CH₃), 2.64 (br t, 2H, *J* = 7.9 Hz), 3.11 (br t, 2H, *J* = 7.9 Hz), 3.67 (s, 3H), 3.81 (s, 3H), 3.87 (s, 2H), 4.06 (q, 2H, *J* = 7.1 Hz), 5.91 (s, 1H), 6.84 (d, 2H, *J* = 8.9 Hz), 6.98 (d, 2H, *J* = 8.9 Hz), 8.10 (br s, 1H), 8.37 (br s, 1H), 8.42 (br s, 1H) ppm; ¹³C NMR (75 MHz, CDCl₃) δ = 173.7 (Cq), 160.8 (Cq), 159.2 (Cq), 154.3 (Cq), 144.5 (CH), 144.0 (CH), 142.4 (CH), 136.1 (Cq), 132.5 (Cq), 132.0 (Cq), 128.9 (2*CH), 121.1 (Cq), 113.7 (2*CH), 110.8 (CH), 59.5 (CH₂), 55.4 (CH₃), 51.5 (CH₃), 35.0 (CH₂), 33.3 (CH₂), 23.5 (CH₂), 14.0 (CH₃) ppm; IR 2939, 1733, 1695, 1512, 1444, 1371, 1246, 1159, 1080, 1018, 834 cm⁻¹; HRMS (ESI⁺) calcd for (M + H)⁺ C₂₃H₂₆N₃O₅: 424.1872, found: 424.1856; *R*_f = 0.15 (CH₂Cl₂/MeOH: 99/1).

Diethyl 5,5'-(pyrazine-2,6-diylbis(methylene))bis(3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1H-pyrrole-2-carboxylate) (5g)

¹H NMR (300 MHz, CDCl₃) δ = 1.09 (t, 6H, *J* = 7.1 Hz, OCH₂CH₃), 2.63 (br t, 4H, *J* = 7.8 Hz), 3.10 (br t, 4H, *J* = 7.8 Hz), 3.67 (s, 6H), 3.77 (s, 4H), 3.80 (s, 6H), 4.06 (q, 4H, *J* = 7.1 Hz), 5.90 (s, 2H), 6.83 (d, 4H, *J* = 8.9 Hz), 6.97 (d, 4H, *J* = 8.8 Hz), 7.96 (s, 2H) ppm; ¹³C NMR (75 MHz, CDCl₃) δ = 173.7, 160.8, 159.0, 158.5, 149.2, 137.7, 136.3, 132.4, 132.2, 128.8 (4*CH), 122.9, 121.3, 120.8, 113.6 (4*CH), 110.5, 59.3, 55.3, 51.4, 35.8, 35.0, 23.5, 13.9 ppm; IR 2939, 1733, 1688, 1512, 1371, 1245, 1161,

1033, 1018, 833, 729 cm^{-1} ; HRMS (ESI⁺) calcd for (M + H)⁺ C₄₂H₄₇N₄O₁₀: 767.3292, found: 767.3320; *R*_f = 0.12 (CH₂Cl₂/MeOH: 99/1).

Ethyl 3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-5-(pyrimidin-2-ylmethyl)-1*H*-pyrrole-2-carboxylate (5h)

¹H NMR (200 MHz, CDCl₃) δ = 1.07 (br t, 3H, *J* = 7.1 Hz, OCH₂CH₃), 2.64 (br t, 2H, *J* = 7.8 Hz), 3.11 (br t, 2H, *J* = 7.8 Hz), 3.65 (s, 3H), 3.78 (s, 3H), 4.06 (m, 4H), 5.96 (s, 1H), 6.79 (d, 2H, *J* = 8.8 Hz), 7.01 (d, 2H, *J* = 8.8 Hz), 7.08 (t, 1H, *J* = 4.9 Hz), 8.57 (d, 2H, *J* = 4.9 Hz) ppm; ¹³C NMR (50 MHz, CDCl₃) δ = 173.8, 168.0, 160.8, 158.9, 157.0 (2*CH), 136.5, 132.4, 132.2, 128.9 (2*CH), 120.8, 118.6, 113.5 (2*CH), 110.4, 59.3, 55.2, 51.4, 37.3, 34.9, 23.6, 13.9 ppm; HRMS (ESI⁺) calcd for (M + H)⁺ C₂₃H₂₆N₃O₅: 424.1872, found: 424.1855; *R*_f = 0.13 (CH₂Cl₂/MeOH: 99/1).

Ethyl 1-(4-(allyloxy)phenyl)-3-(3-methoxy-3-oxopropyl)-5-(pyridin-2-ylmethyl)-1*H*-pyrrole-2-carboxylate (5i)

¹H NMR (400 MHz, CDCl₃) δ = 1.07 (t, 3H, *J* = 7.1 Hz, OCH₂CH₃), 2.65 (br t, 2H, *J* = 7.9 Hz), 3.11 (br t, 2H, *J* = 7.9 Hz), 3.66 (s, 3H), 3.83 (s, 2H), 4.05 (q, 2H, *J* = 7.1 Hz), 4.53 (br dt, 2H, *J* = 1.4, 5.3 Hz), 5.29 (dd, 1H, *J* = 1.4, 10.5 Hz), 5.41 (dd, 1H, *J* = 1.4, 17.2 Hz), 5.92 (s, 1H), 6.04 (m, 1H), 6.84 (d, 2H, *J* = 8.9 Hz), 6.86 (d, 1H, *J* = 7.8 Hz), 6.98 (d, 2H, *J* = 8.9 Hz), 7.07 (m, 1H), 7.50 (td, 1H, *J* = 1.8, 7.8 Hz), 8.44 (d, 1H, *J* = 4.9 Hz) ppm; ¹³C NMR (100 MHz, CDCl₃) δ = 173.8 (Cq), 160.9 (Cq), 158.5 (Cq), 158.1 (Cq), 149.2 (CH), 137.7 (Cq), 136.3 (CH), 133.0 (CH), 132.6 (Cq), 132.4 (Cq), 128.9 (2*CH), 122.9 (CH), 121.4 (CH), 120.9 (Cq), 117.8 (CH₂), 114.4 (2*CH), 110.6 (CH), 68.9 (CH₂), 59.4 (CH₂), 51.5 (CH₃), 35.9 (CH₂), 35.1 (CH₂), 23.6 (CH₂), 14.0 (CH₃) ppm; IR 2982, 2950, 1734, 1695, 1570, 1512, 1435, 1370, 1240, 1169, 1081,

995, 832 cm^{-1} ; HRMS (ESI⁺) calcd for (M + H)⁺ C₂₆H₂₉N₂O₅: 449.2076, found: 449.2075; R_f = 0.22 (CH₂Cl₂/MeOH: 99/1).

Ethyl 1-(4-(benzyloxy)phenyl)-3-(3-methoxy-3-oxopropyl)-5-(quinolin-2-ylmethyl)-1H-pyrrole-2-carboxylate (5j)

¹H NMR (400 MHz, CDCl₃) δ = 1.08 (br t, 3H, J = 7.1 Hz, OCH₂CH₃), 2.65 (br t, 2H, J = 7.8 Hz), 3.13 (br t, 2H, J = 7.8 Hz), 3.66 (s, 3H), 4.04 (s, 2H), 4.07 (q, 2H, J = 7.1 Hz), 5.02 (s, 2H), 5.95 (s, 1H), 6.89 (d, 2H, J = 8.9 Hz), 7.02 (d, 2H, J = 8.9 Hz), 7.09 (d, 1H, J = 8.5 Hz), 7.32–7.45 (m, 5H), 7.50 (m, 1H), 7.67 (m, 1H), 7.76 (br d, 1H, J = 8.5 Hz), 7.96 (br d, 1H, J = 8.5 Hz), 8.00 (br d, 1H, J = 8.5 Hz) ppm; ¹³C NMR (100 MHz, CDCl₃) δ = 173.7, 160.9, 158.7, 158.6, 158.3, 147.7, 137.5, 136.6, 136.3, 132.6, 132.4, 129.4, 129.0, 128.9, 128.5, 128.0, 127.4, 126.7, 126.0, 121.1, 121.0, 114.5, 110.7, 70.1, 59.4, 51.4, 36.8, 35.0, 23.6, 14.0 ppm; IR 2892, 1732, 1694, 1510, 1451, 1368, 1295, 1239, 1166, 1080, 1022, 829, 736, 698 cm^{-1} ; R_f = 0.3 (CH₂Cl₂/MeOH: 99/1).

Ethyl 5-(hydroxy(pyridin-3-yl)methyl)-3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1H-pyrrole-2-carboxylate (9b)

¹H NMR (200 MHz, CDCl₃) δ = 1.08 (br t, 3H, J = 7.1 Hz, OCH₂CH₃), 2.62 (br t, 2H, J = 7.8 Hz), 3.09 (m, 2H), 3.65 (s, 3H), 3.82 (s, 3H), 4.06 (q, 2H, J = 7.1 Hz), 5.48 (s, 1H), 6.04 (s, 1H), 6.84 (m, 2H), 6.91 (dd, 1H, J = 2.4, 8.7 Hz), 7.17 (dd, 1H, J = 1.9, 8.7 Hz), 7.22 (dd, 1H, J = 4.9, 7.7 Hz), 7.57 (d, 1H, J = 7.9 Hz), 8.28 (broad s, 1H), 8.44 (br s, 1H) ppm; ¹³C NMR (50 MHz, CDCl₃) δ = 173.7, 160.8, 159.4, 148.7, 148.0, 140.8, 134.5, 132.1, 131.5, 129.3, 129.0, 123.4, 121.9, 114.0, 113.7, 109.7, 66.8, 59.8, 55.5, 51.6, 35.0, 23.5, 14.0 ppm; IR 3443, 2933, 1733, 1693, 1512, 1440,

1246, 1158, 1082, 1028, 835, 734 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{24}\text{H}_{27}\text{N}_2\text{O}_6$: 439.1869, found: 439.1860; $R_f = 0.3$ ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 95/5).

Ethyl 5-(hydroxy(pyridin-4-yl)methyl)-3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1H-pyrrole-2-carboxylate (9c)

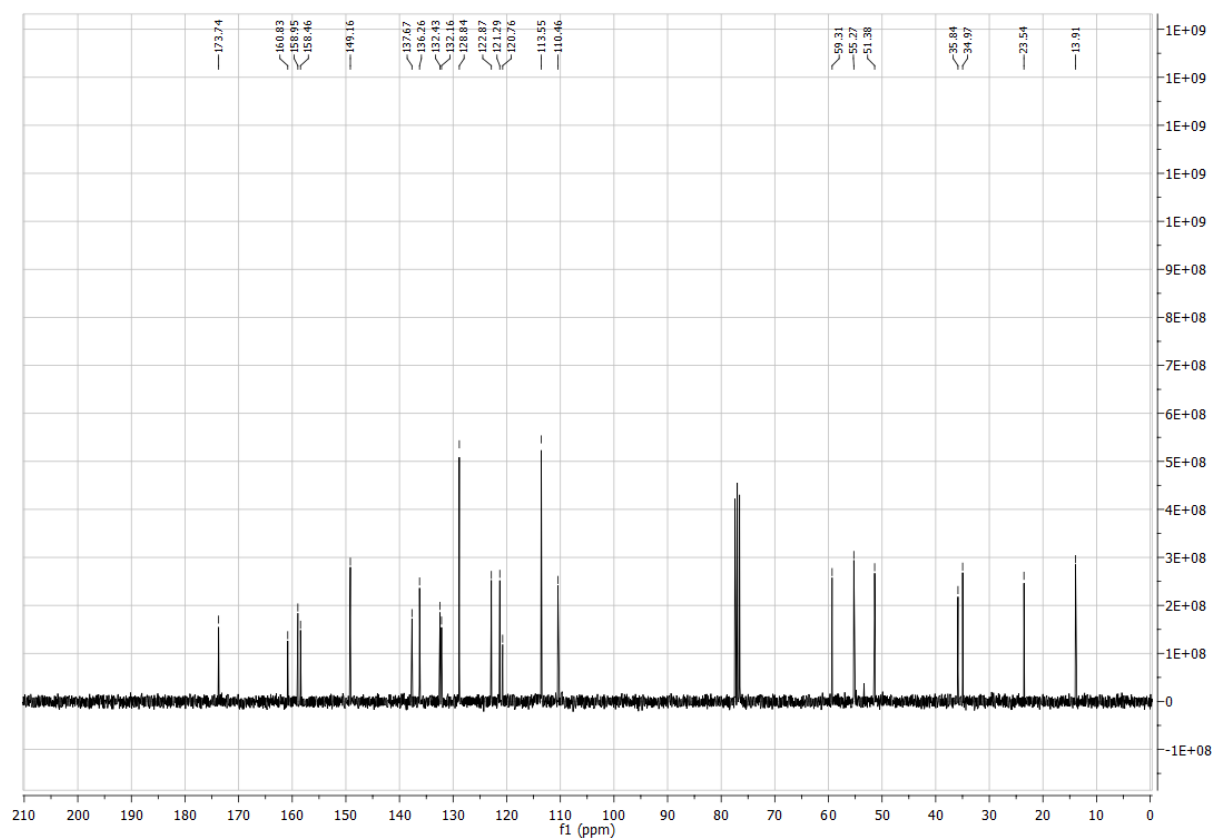
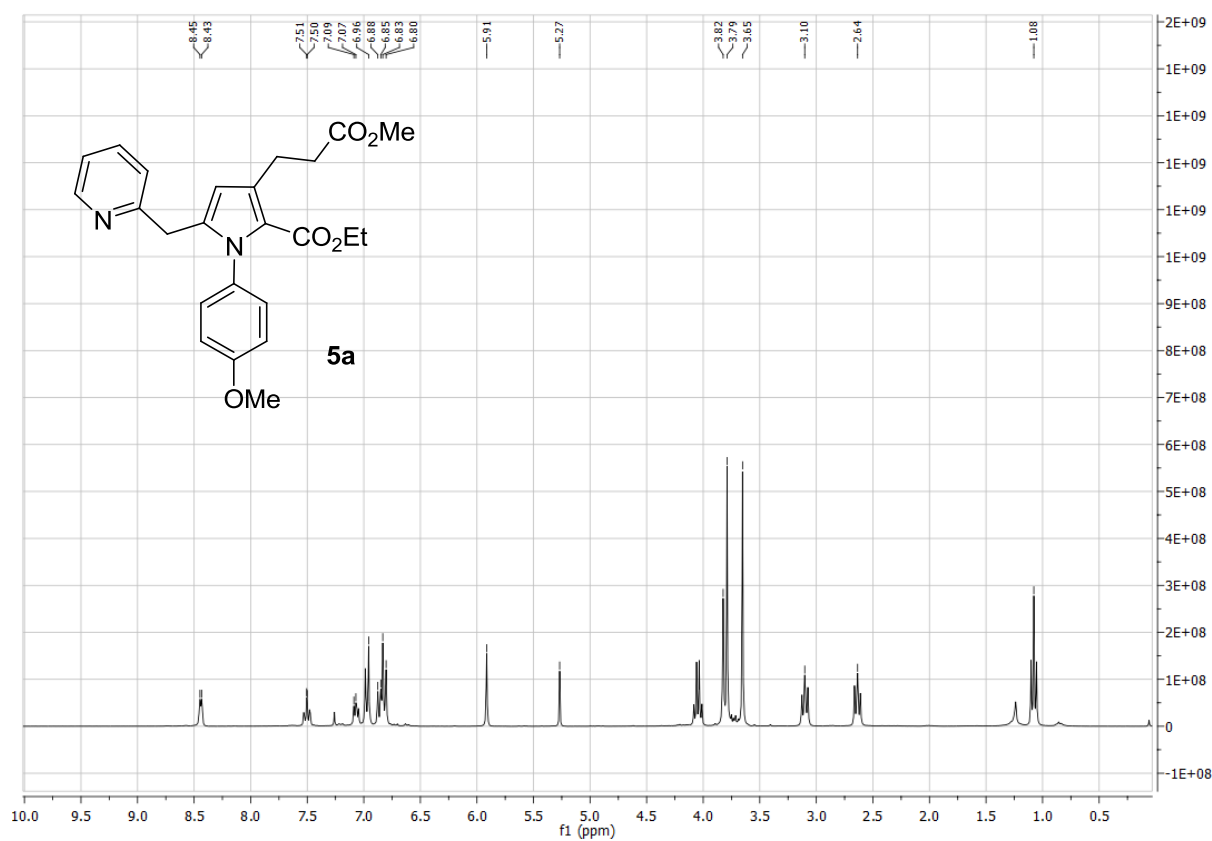
^1H NMR (200 MHz, CDCl_3) δ = 1.10 (br t, 3H, $J = 7.1$ Hz, OCH_2CH_3), 2.61 (br t, 2H, $J = 8.1$ Hz), 3.08 (br t, 2H, $J = 8.1$ Hz), 3.65 (s, 3H), 3.84 (s, 3H), 4.07 (q, 2H, $J = 7.1$ Hz), 5.47 (s, 1H), 5.95 (s, 1H), 6.87 (d, 2H, $J = 8.9$ Hz), 7.03 (m, 1H), 7.09–7.23 (m, 3H), 8.51 (br s, 2H) ppm; ^{13}C NMR (50 MHz, CDCl_3) δ = 173.6, 160.7, 159.4, 151.5, 149.0, 140.1, 132.0, 131.4, 129.3, 129.1, 122.1, 121.6, 113.8, 110.1, 67.2, 59.8, 55.5, 51.5, 34.9, 23.4, 13.9 ppm; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{24}\text{H}_{27}\text{N}_2\text{O}_6$: 439.1869, found: 439.1853; $R_f = 0.17$ ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 99/1).

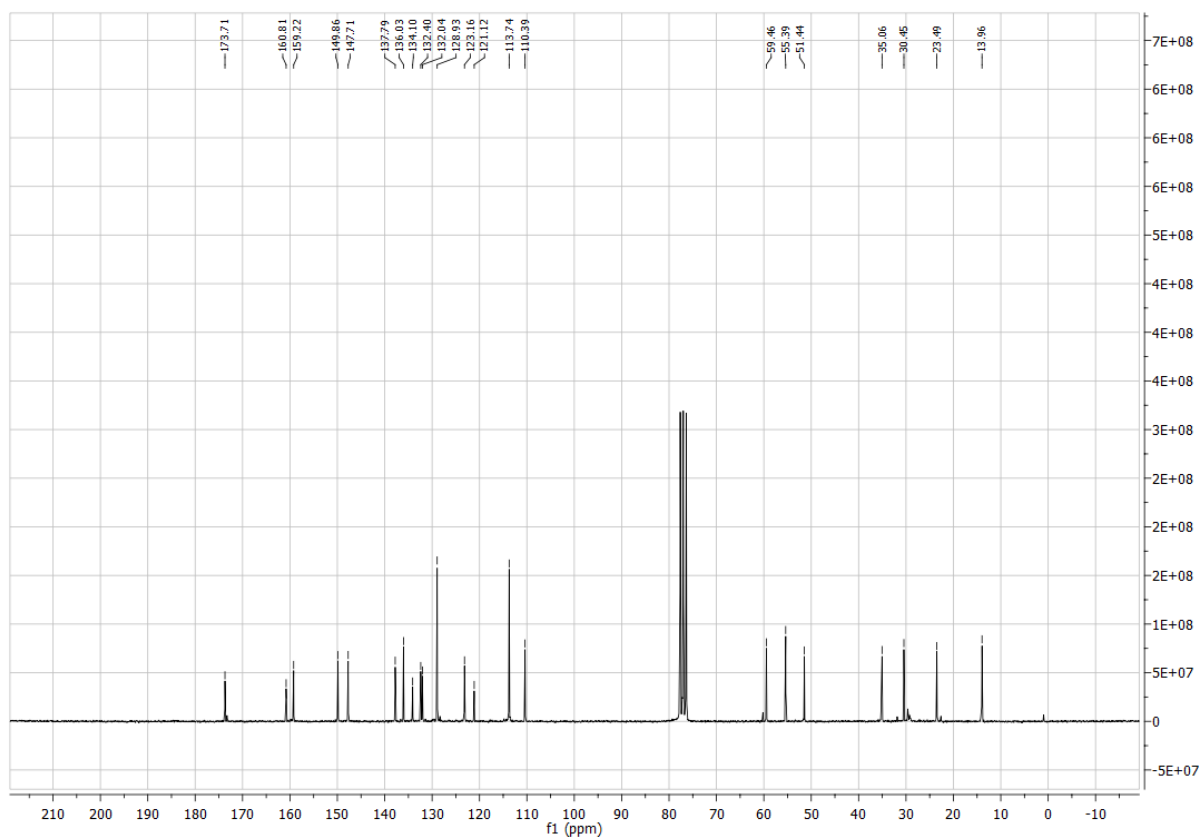
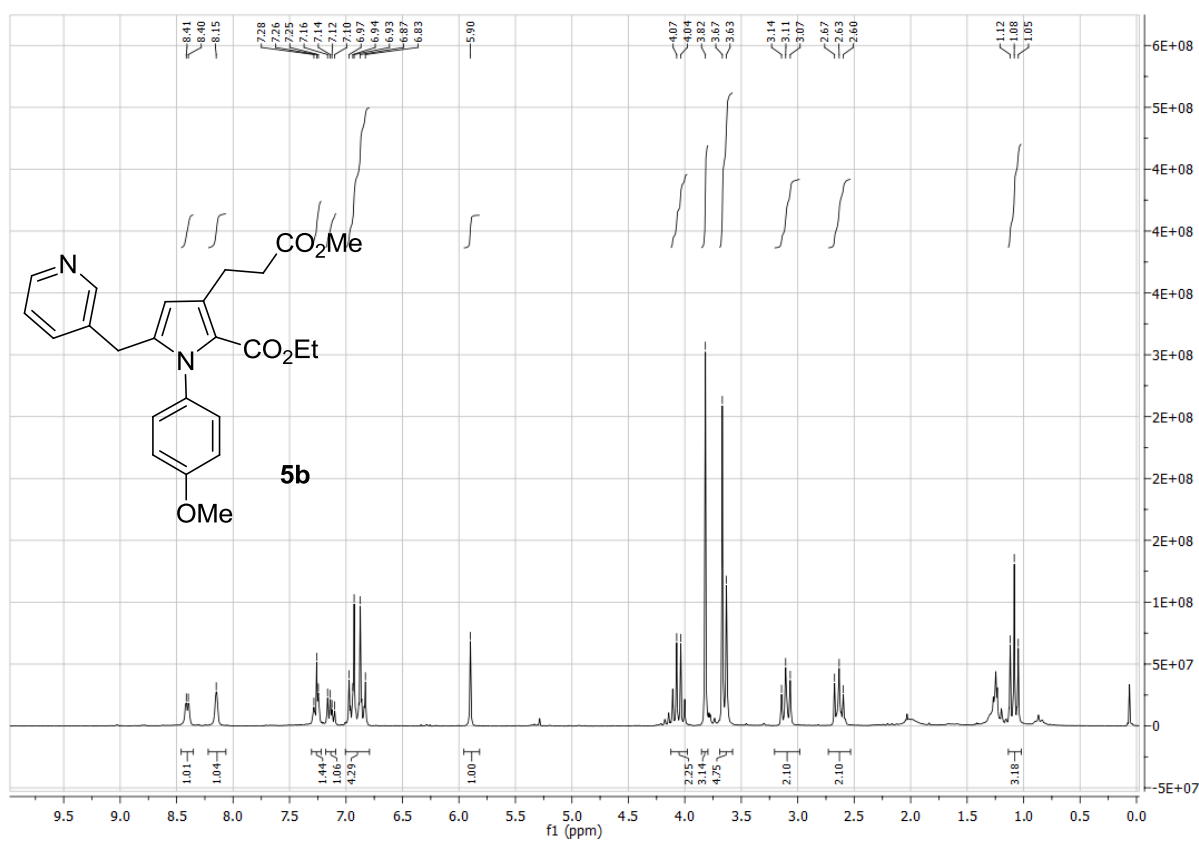
Ethyl 5-(hydroxy(quinolin-2-yl)methyl)-3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1H-pyrrole-2-carboxylate (9d)

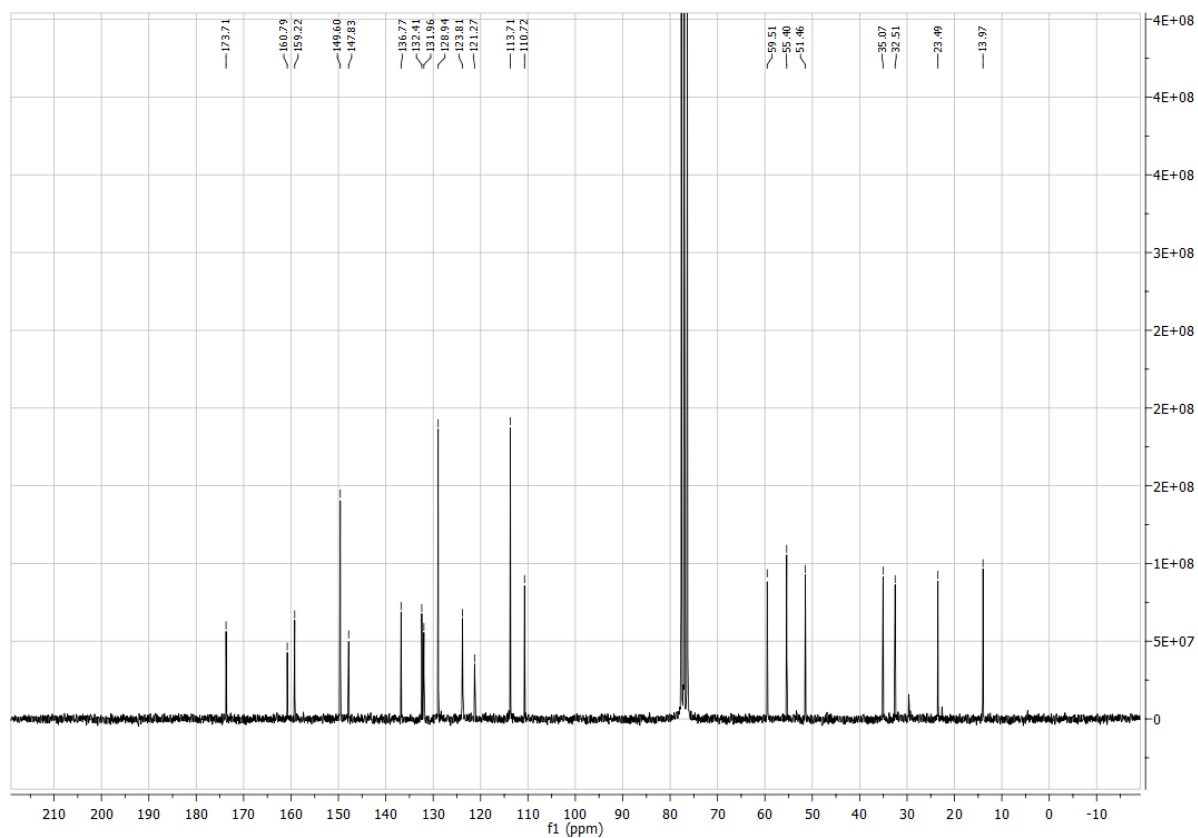
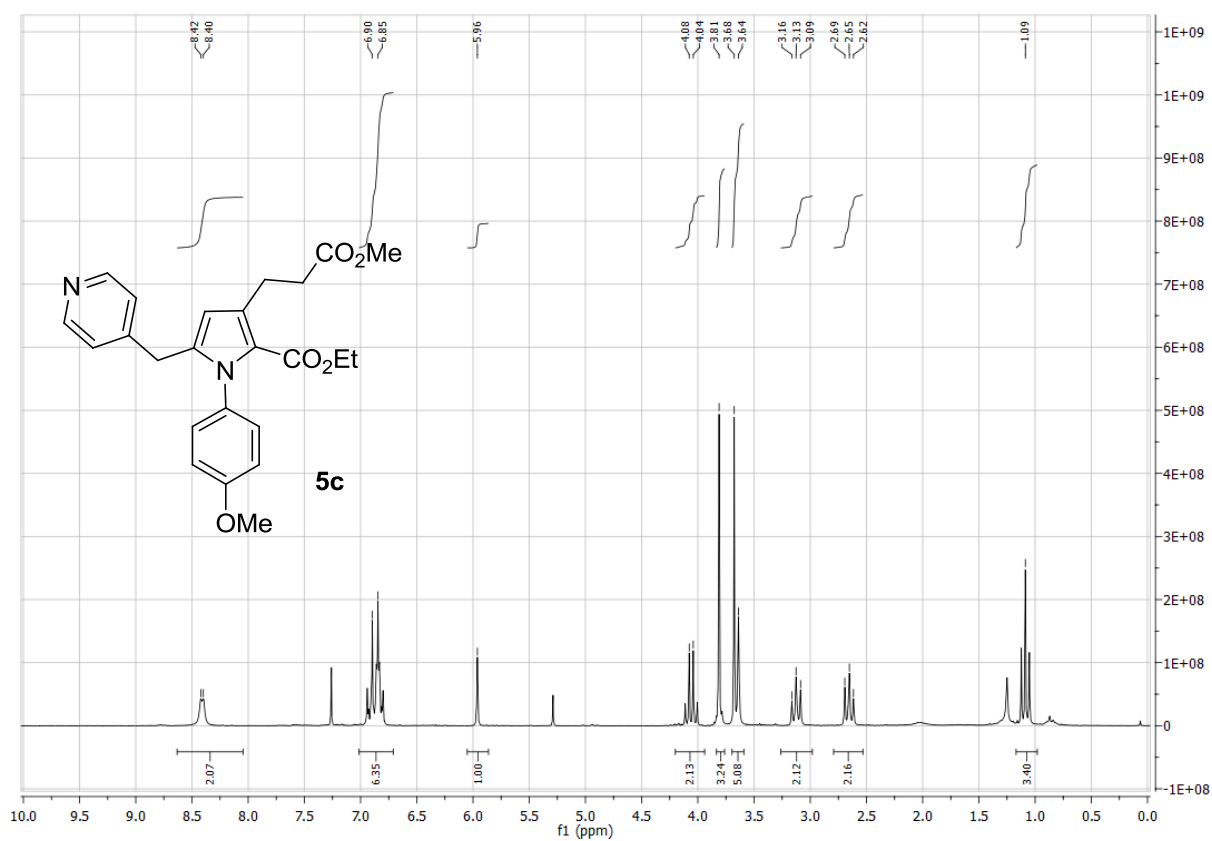
^1H NMR (300 MHz, CDCl_3) δ = 1.08 (br t, 3H, $J = 7.1$ Hz, OCH_2CH_3), 2.60 (br t, 2H, $J = 7.9$ Hz), 3.07 (br t, 2H, $J = 7.9$ Hz), 3.62 (s, 3H), 3.73 (s, 3H), 4.06 (q, 2H, $J = 7.1$ Hz), 5.60 (s, 1H), 5.89 (s, 1H), 6.60 (dd, 1H, $J = 2.5, 8.6$ Hz), 6.91 (dd, 1H, $J = 1.9, 8.2$ Hz), 6.98 (dd, 1H, $J = 2.1, 8.6$ Hz), 7.11 (d, 1H, $J = 8.5$ Hz), 7.27 (dd, 1H, $J = 2.4, 8.4$ Hz), 7.55 (t, 1H, $J = 7.5$ Hz), 7.72 (br t, 1H, $J = 7.6$ Hz), 7.81 (d, 1H, $J = 7.9$ Hz), 7.98 (d, 1H, $J = 8.6$ Hz), 8.06 (d, 1H, $J = 8.6$ Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.7, 160.9, 159.1, 158.4, 145.9, 140.4, 136.7, 132.1, 131.6, 129.8, 129.4, 129.3, 128.7, 127.5, 127.5, 126.7, 121.9, 119.1, 113.8, 112.9, 110.7, 59.6, 55.3, 51.4, 35.0, 23.5, 13.9 ppm; IR 3377, 2946, 1733, 1690, 1512, 1371, 1297, 1245, 1161, 1081, 1031, 832, 728 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} - \text{H})^+$ $\text{C}_{28}\text{H}_{27}\text{N}_2\text{O}_6$: 487.1869, found: 487.1872; $R_f = 0.3$ ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 98/2).

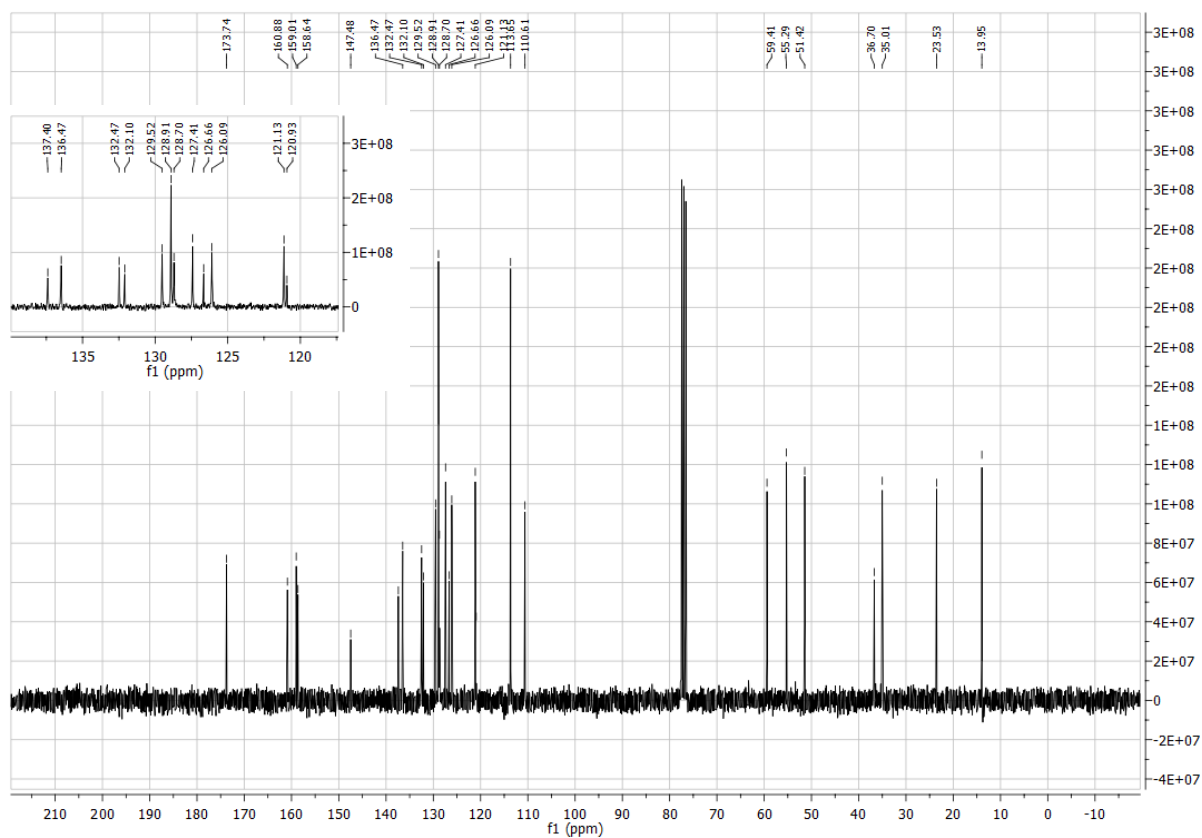
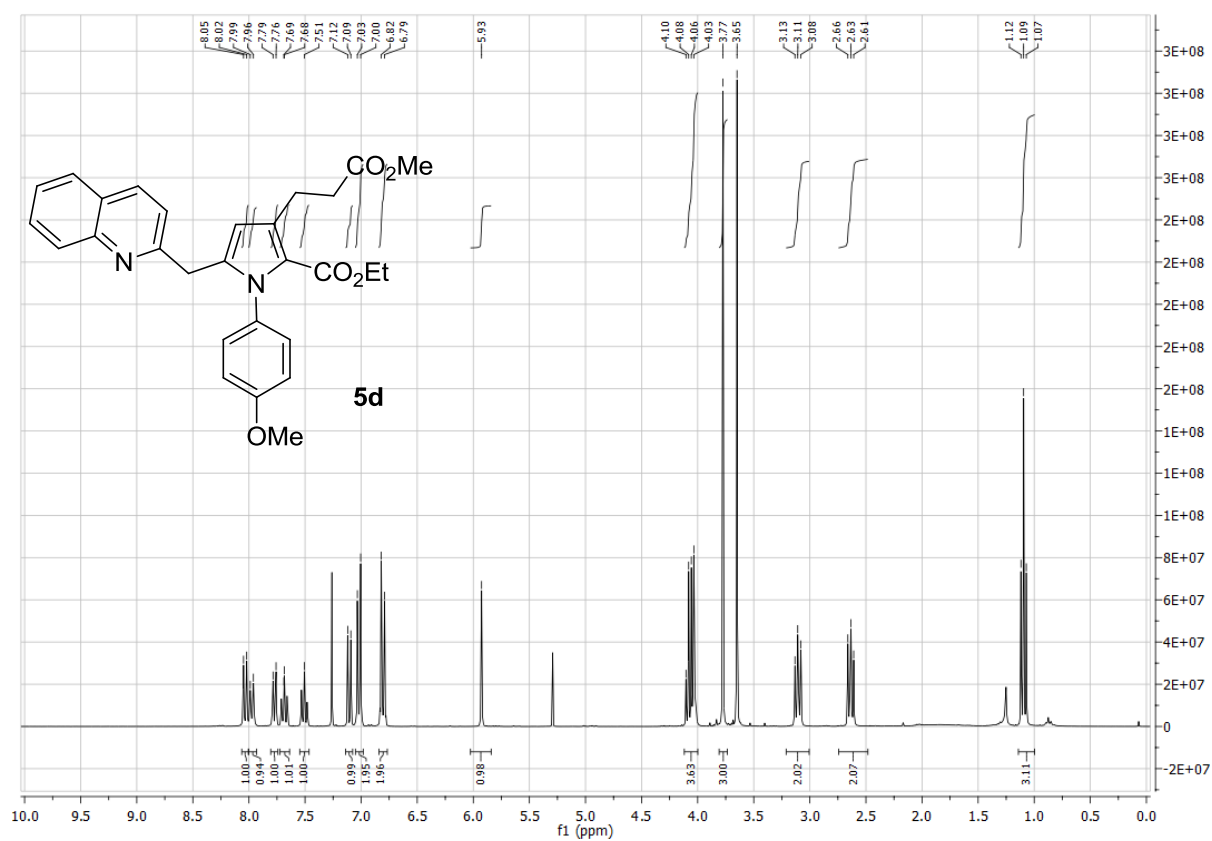
Ethyl 5-((3-chloropyridin-2-yl)(hydroxy)methyl)-3-(3-methoxy-3-oxopropyl)-1-(4-methoxyphenyl)-1*H*-pyrrole-2-carboxylate (9e)

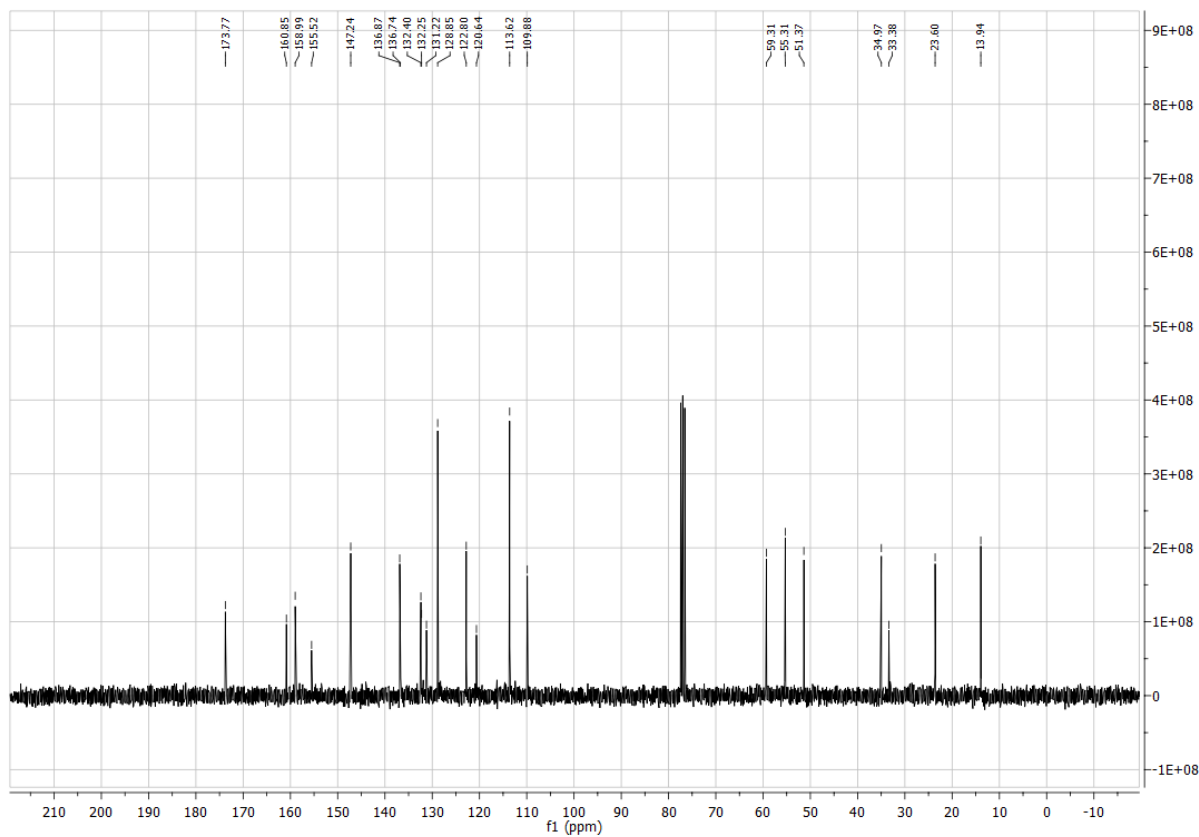
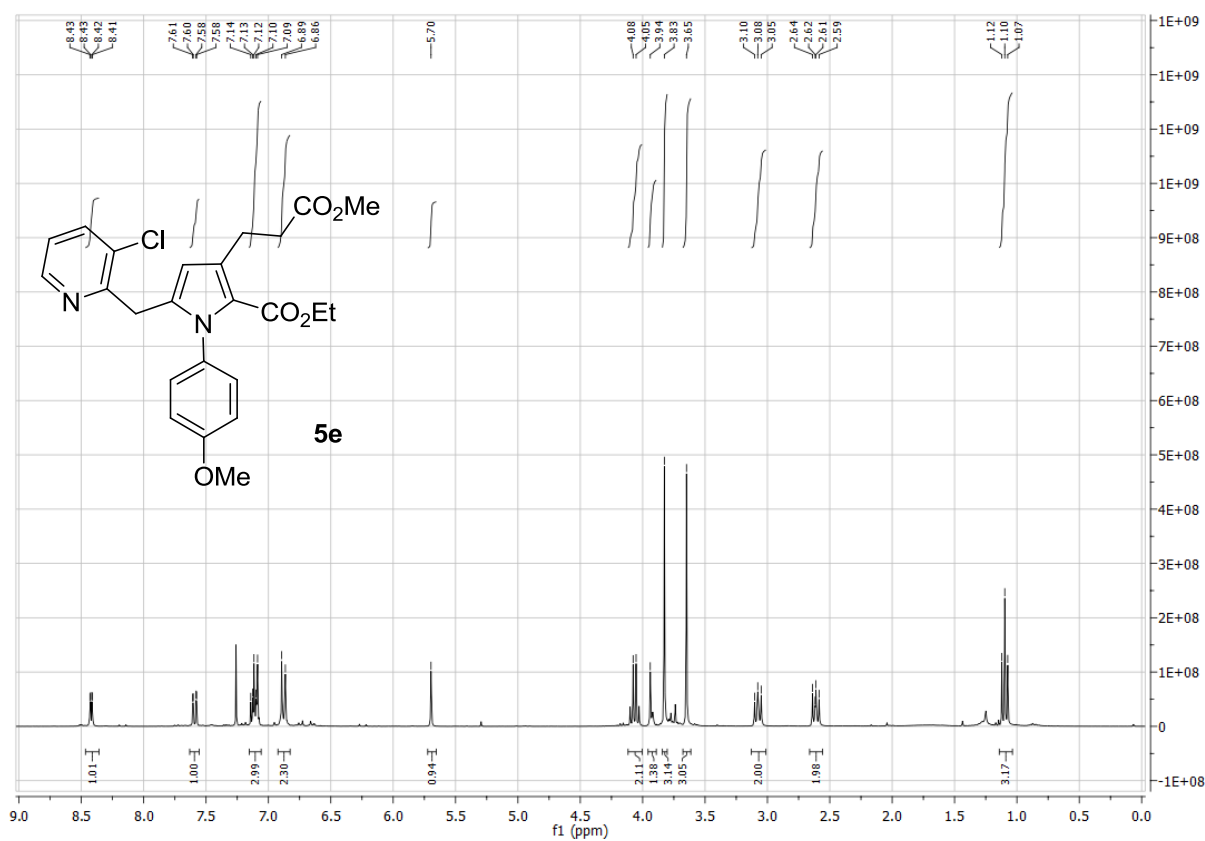
^1H NMR (300 MHz, CDCl_3) δ = 1.10 (t, 3H, J = 7.1 Hz, OCH_2CH_3), 2.56 (t, 2H, J = 7.9 Hz), 3.02 (m, 2H), 3.61 (s, 3H), 3.85 (s, 3H), 4.08 (q, 2H, J = 7.1 Hz), 5.45 (s, 1H), 5.50 (s, 0.56H), 6.96 (d, 2H, J = 8.6 Hz), 7.20–7.31 (m, 2H), 7.38 (m, 1H), 7.65 (dd, 1H, J = 1.3, 8.0 Hz), 8.48 (dd, 1H, J = 1.1, 4.7 Hz) ppm; ^{13}C NMR (75 MHz, CDCl_3) δ = 173.7, 160.9, 159.3, 155.7, 145.7, 139.8, 137.5, 132.0, 131.7, 129.9, 129.6, 129.0, 123.9, 121.5, 113.8, 113.4, 109.1, 64.1, 59.6, 55.4, 51.4, 35.0, 23.6, 14.0 ppm; IR 3436, 2920, 1736, 1700, 1513, 1444, 1370, 1248, 1177, 1083, 834 cm^{-1} ; HRMS (ESI^+) calcd for $(\text{M} + \text{H})^+$ $\text{C}_{24}\text{H}_{26}\text{N}_2\text{O}_6^{35}\text{Cl}$: 473.1479, found: 473.1476; R_f = 0.15 ($\text{CH}_2\text{Cl}_2/\text{MeOH}$: 99/1).

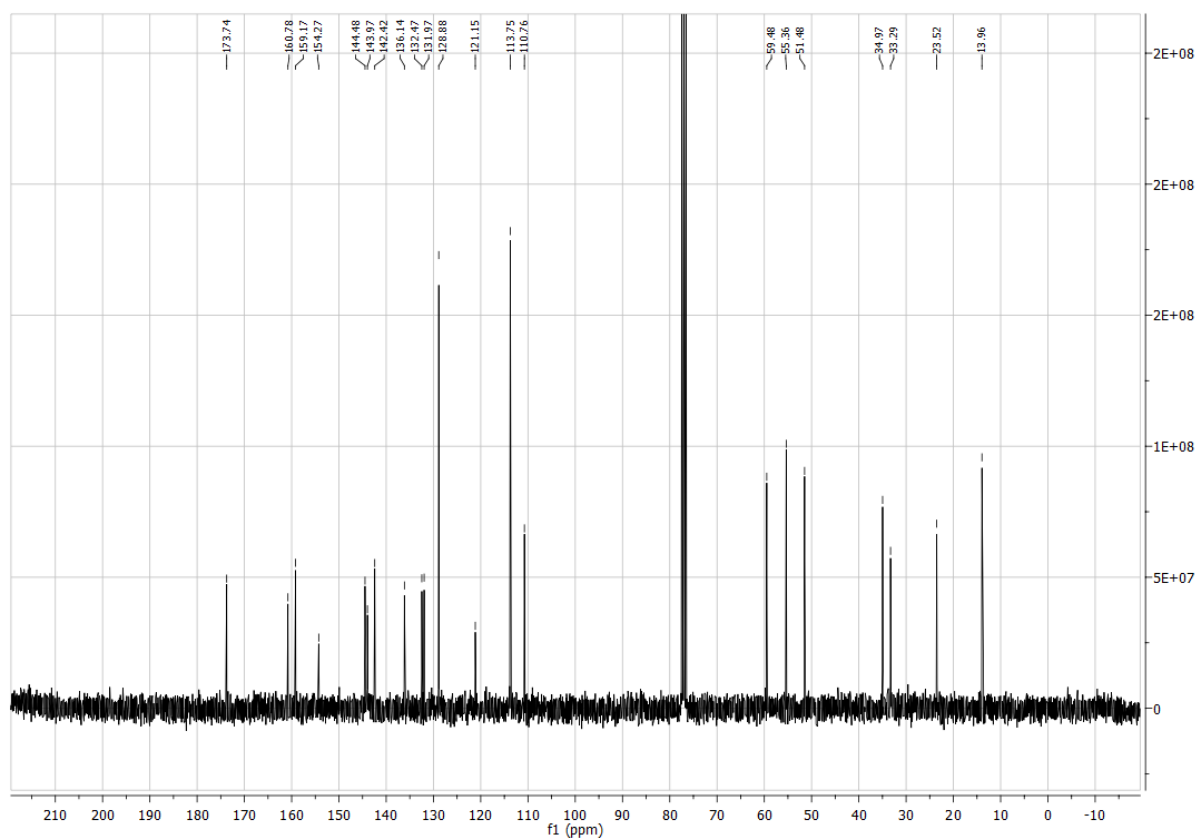
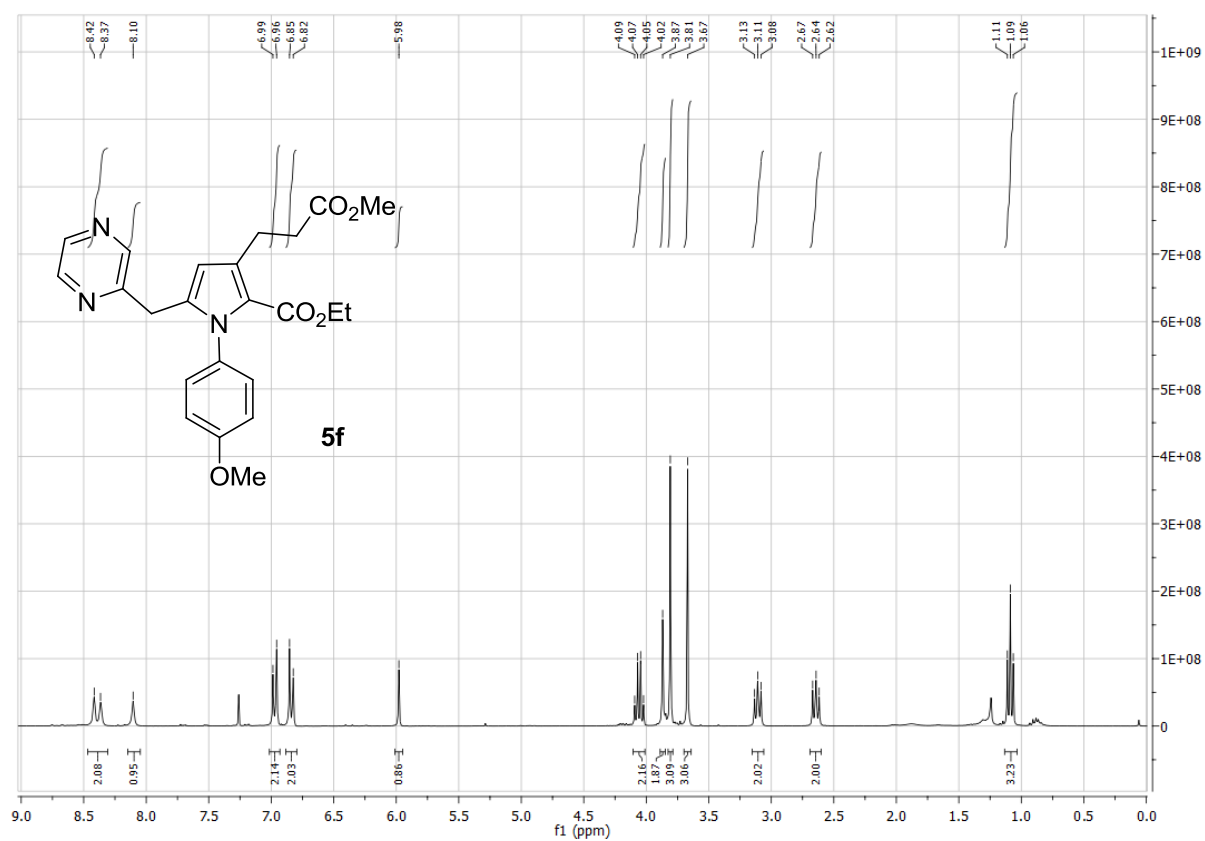


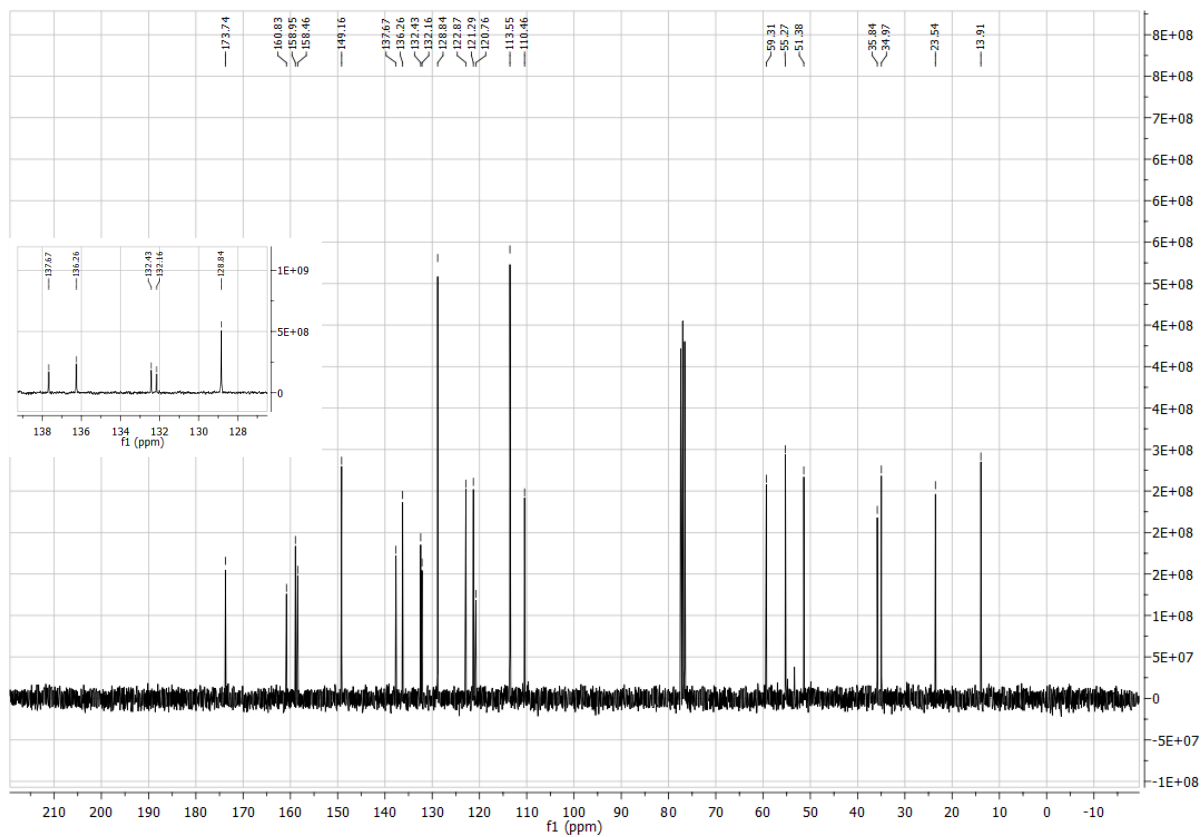
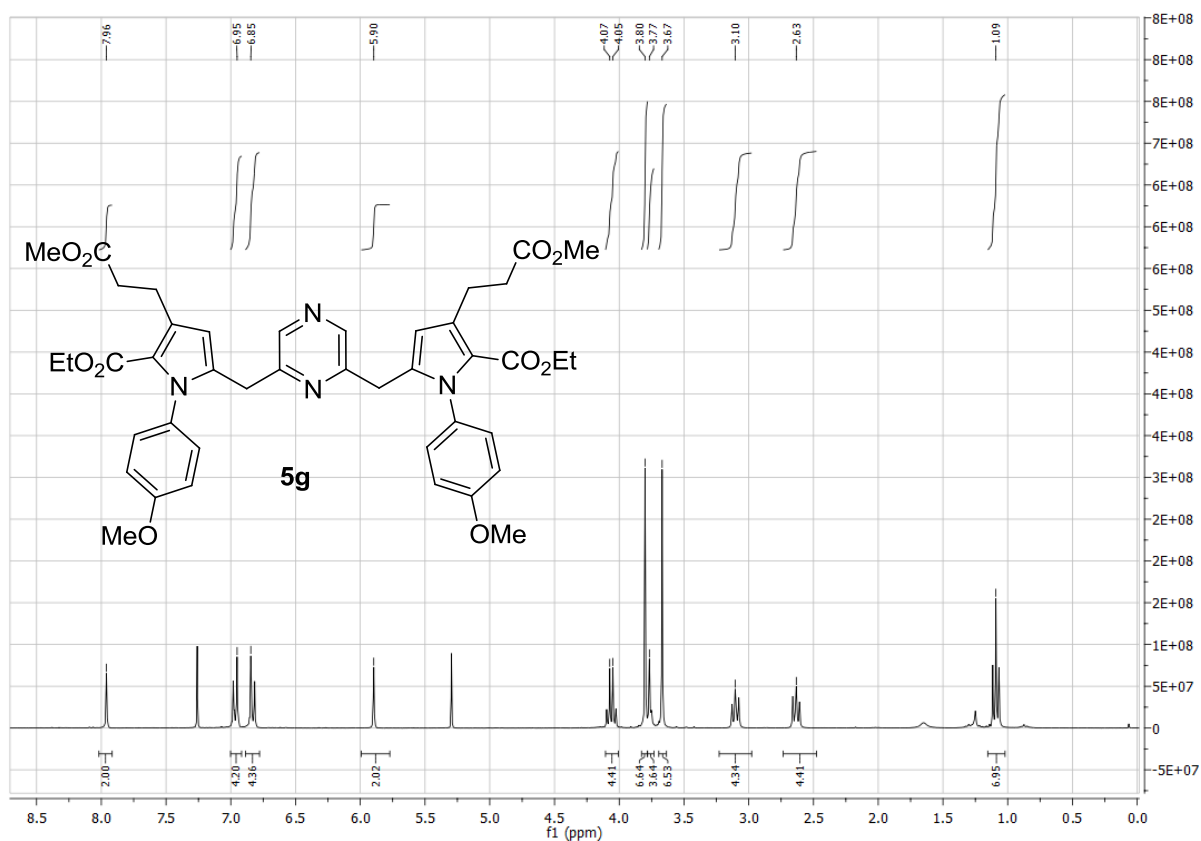


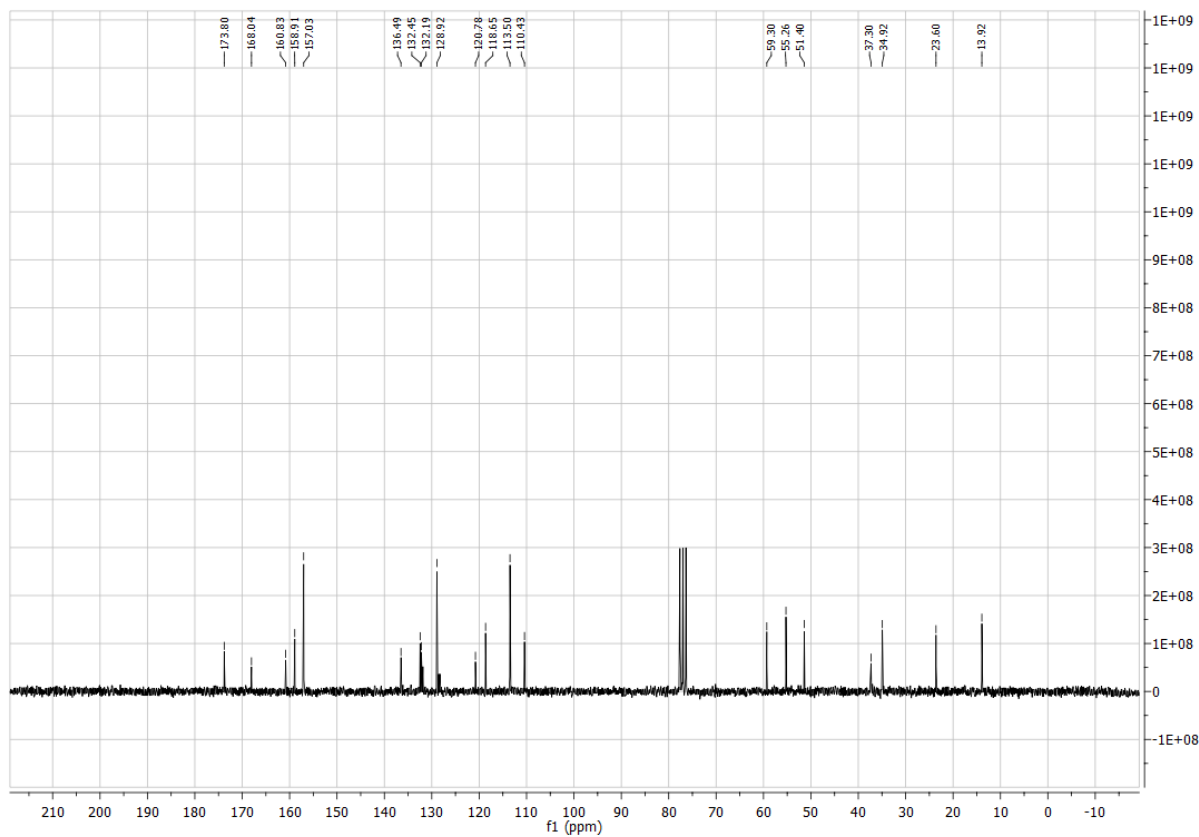
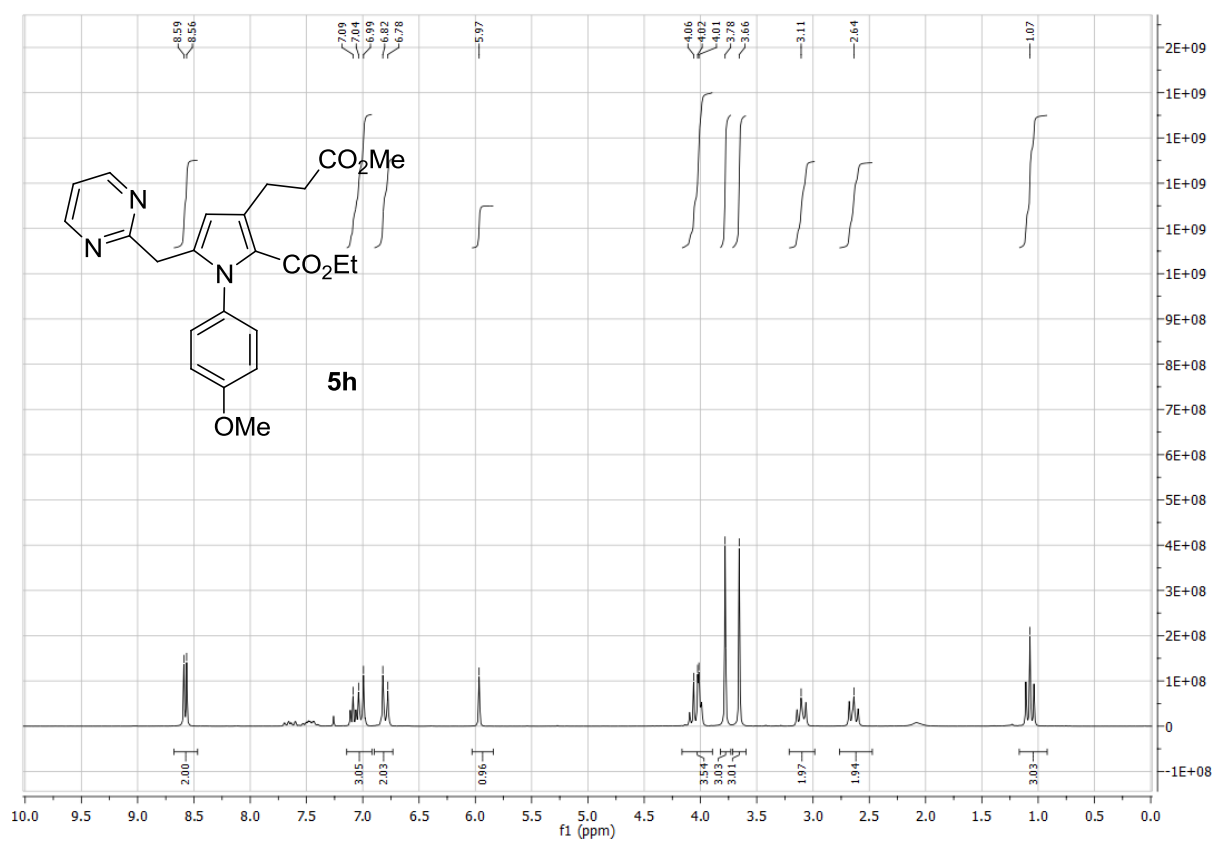


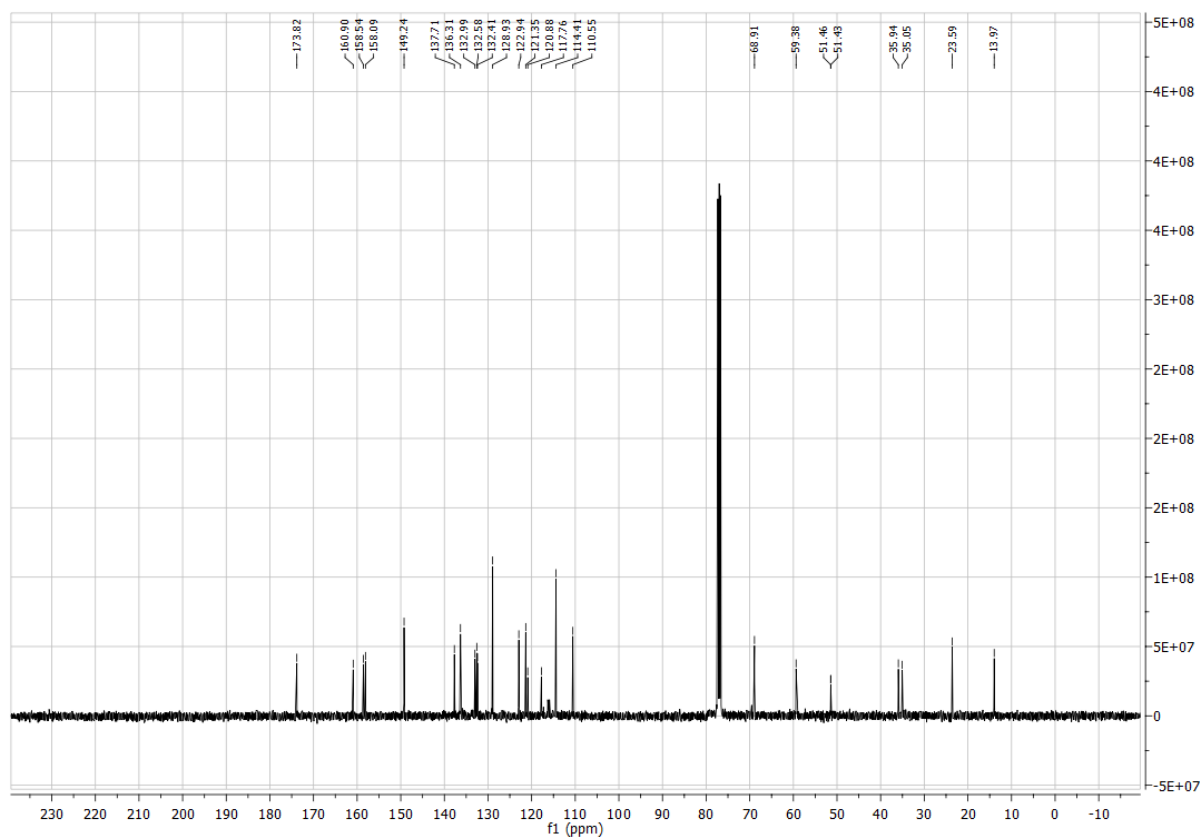
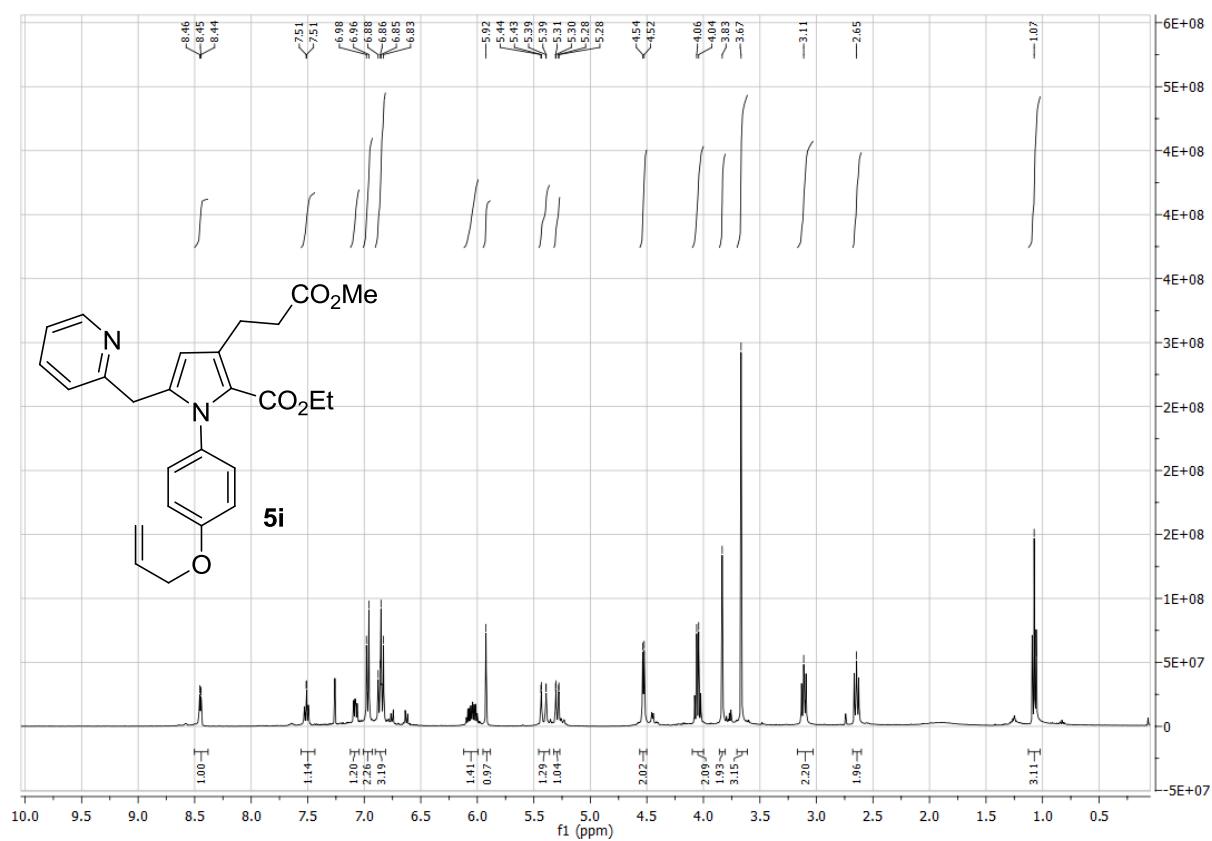


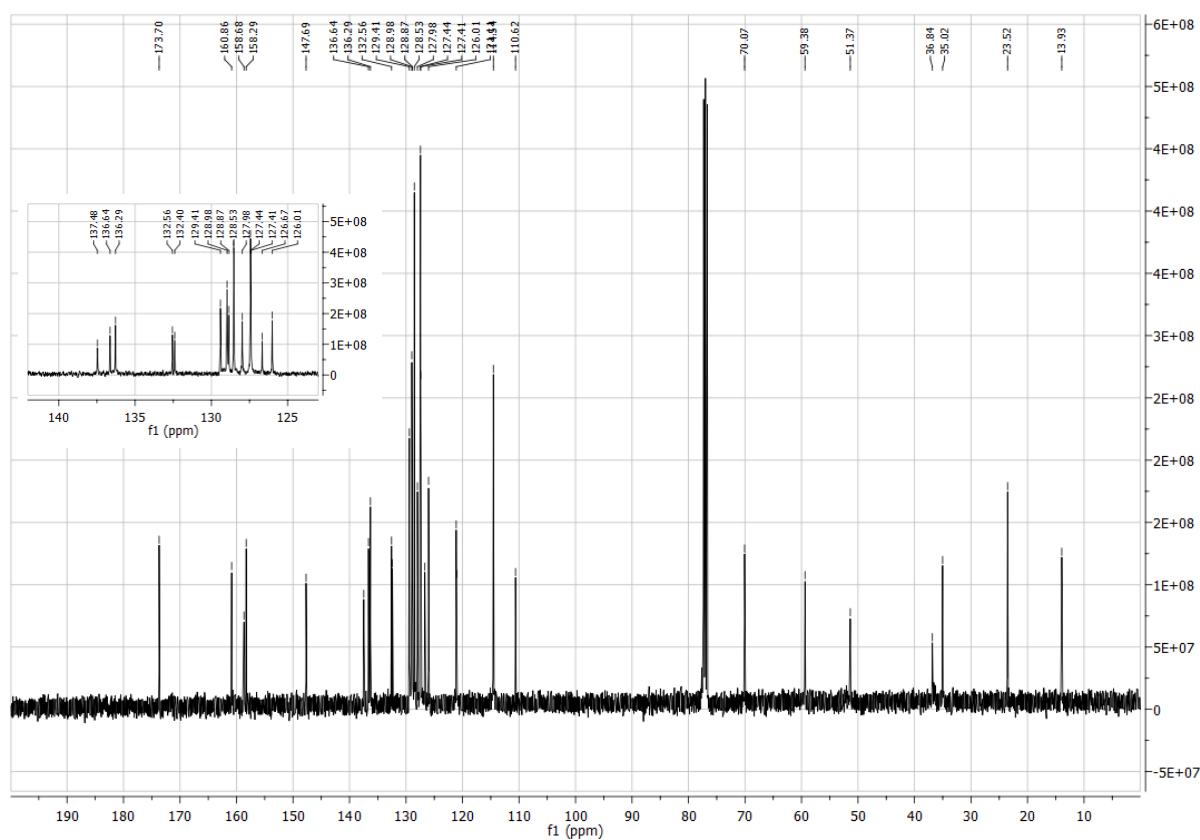
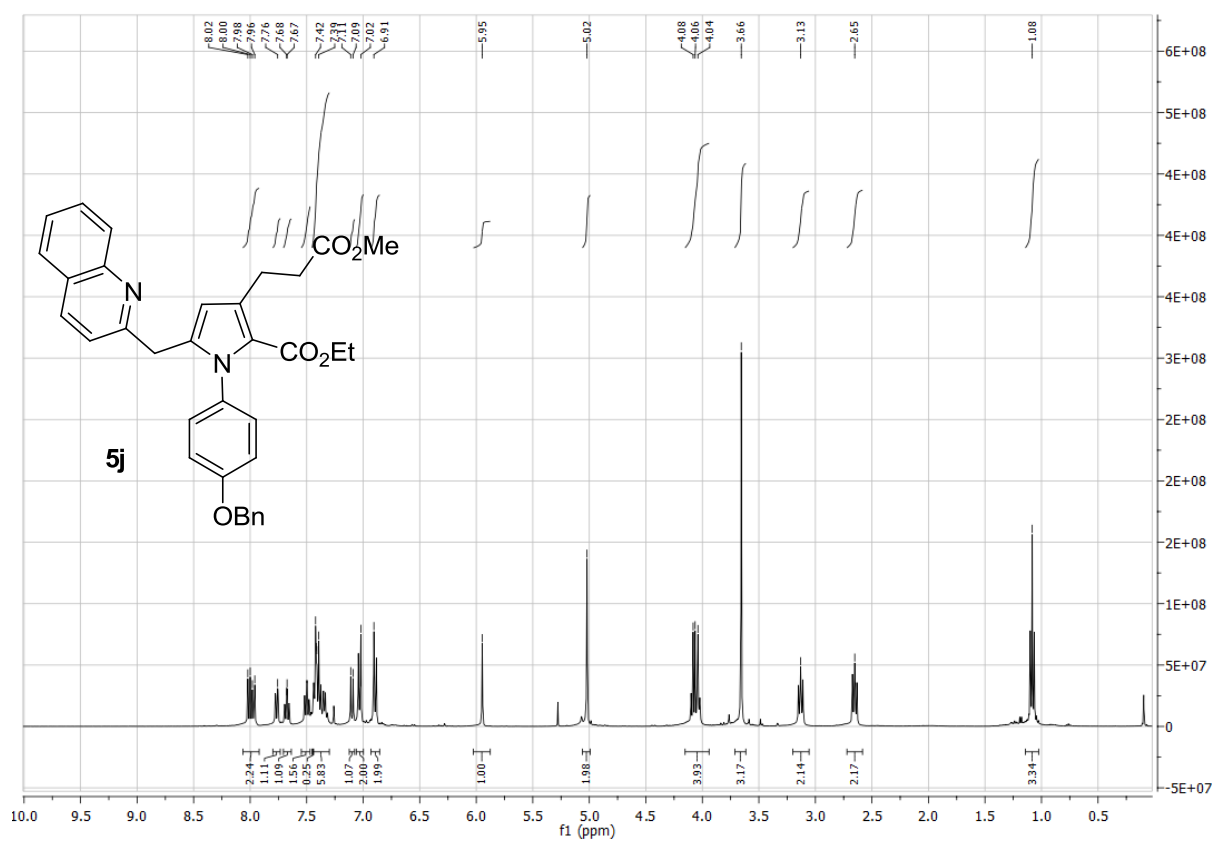


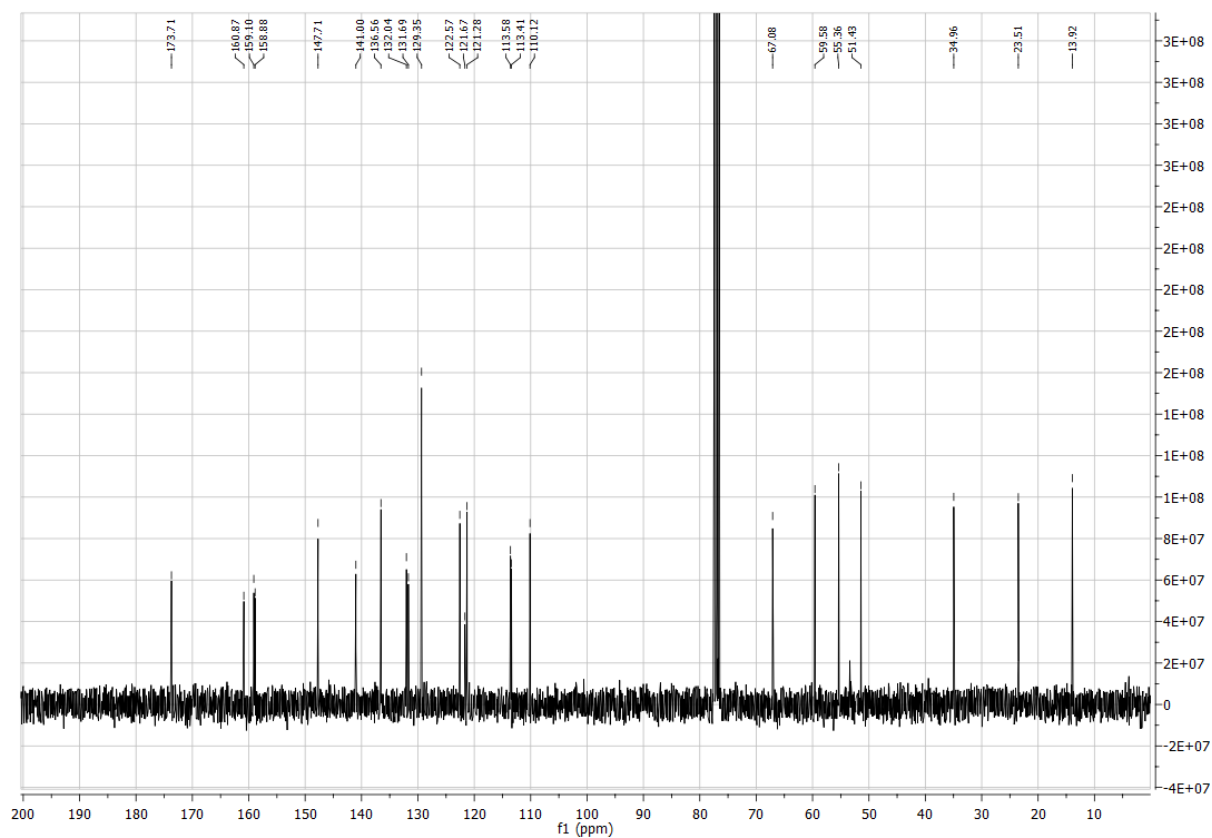
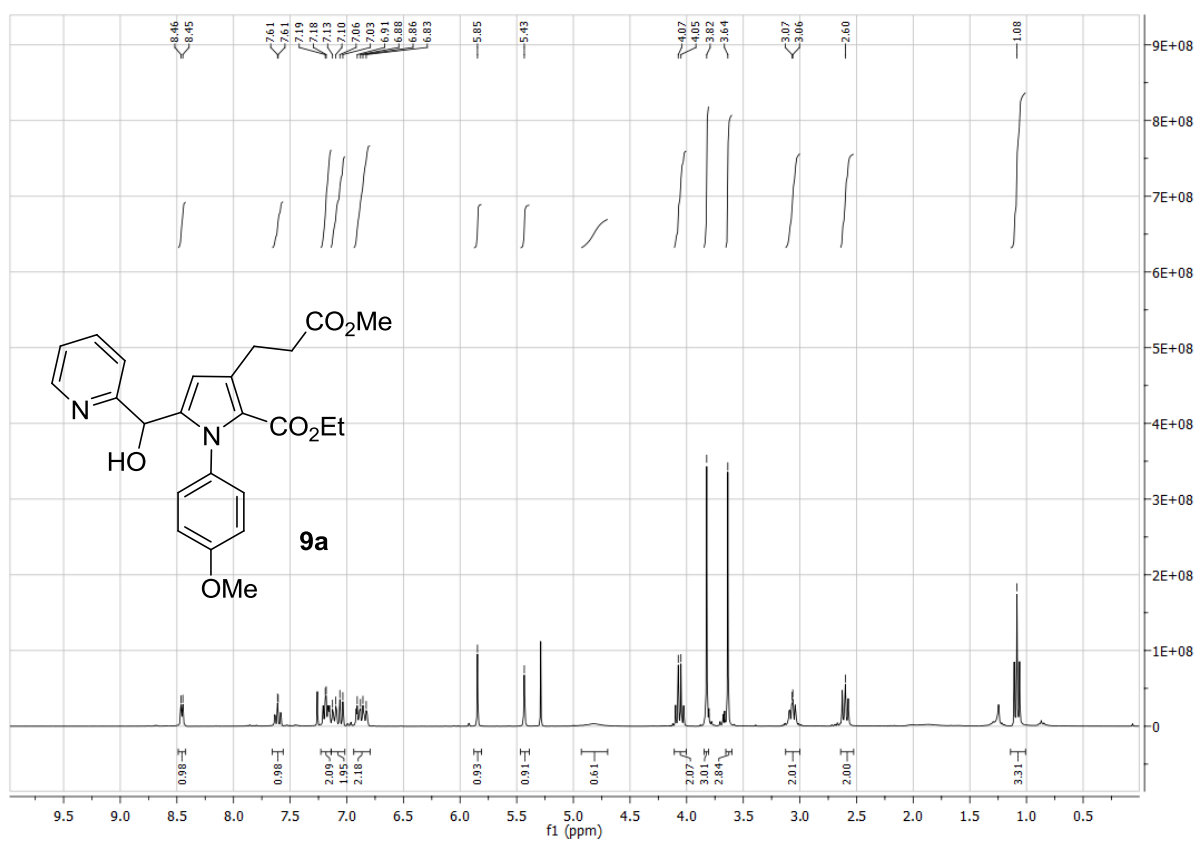


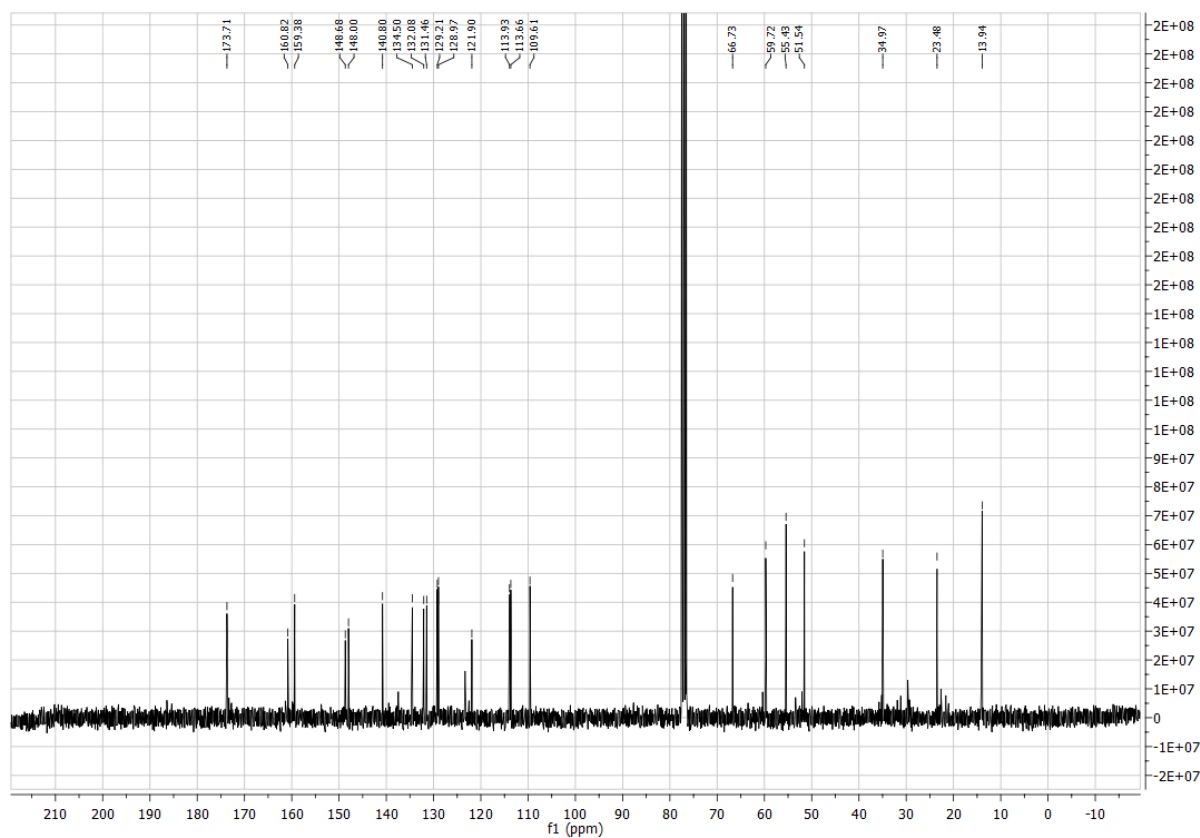
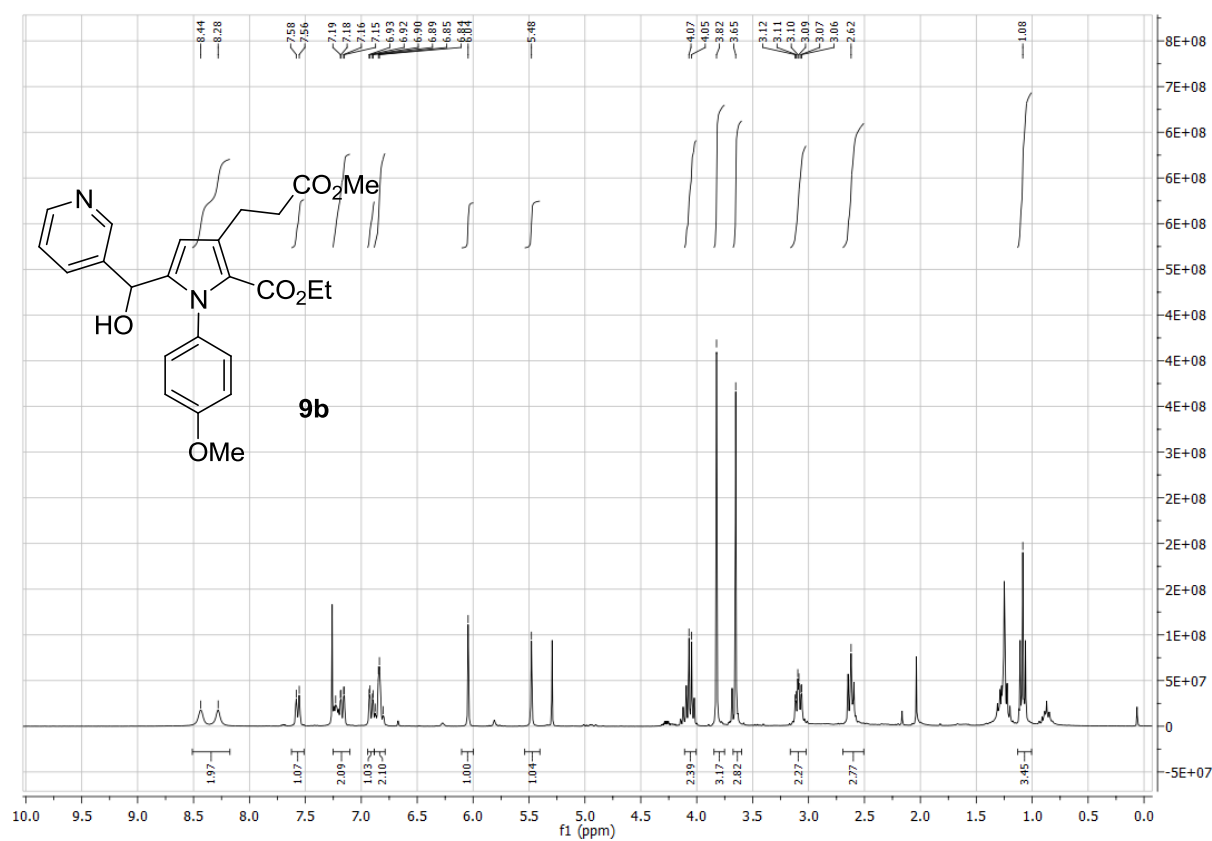


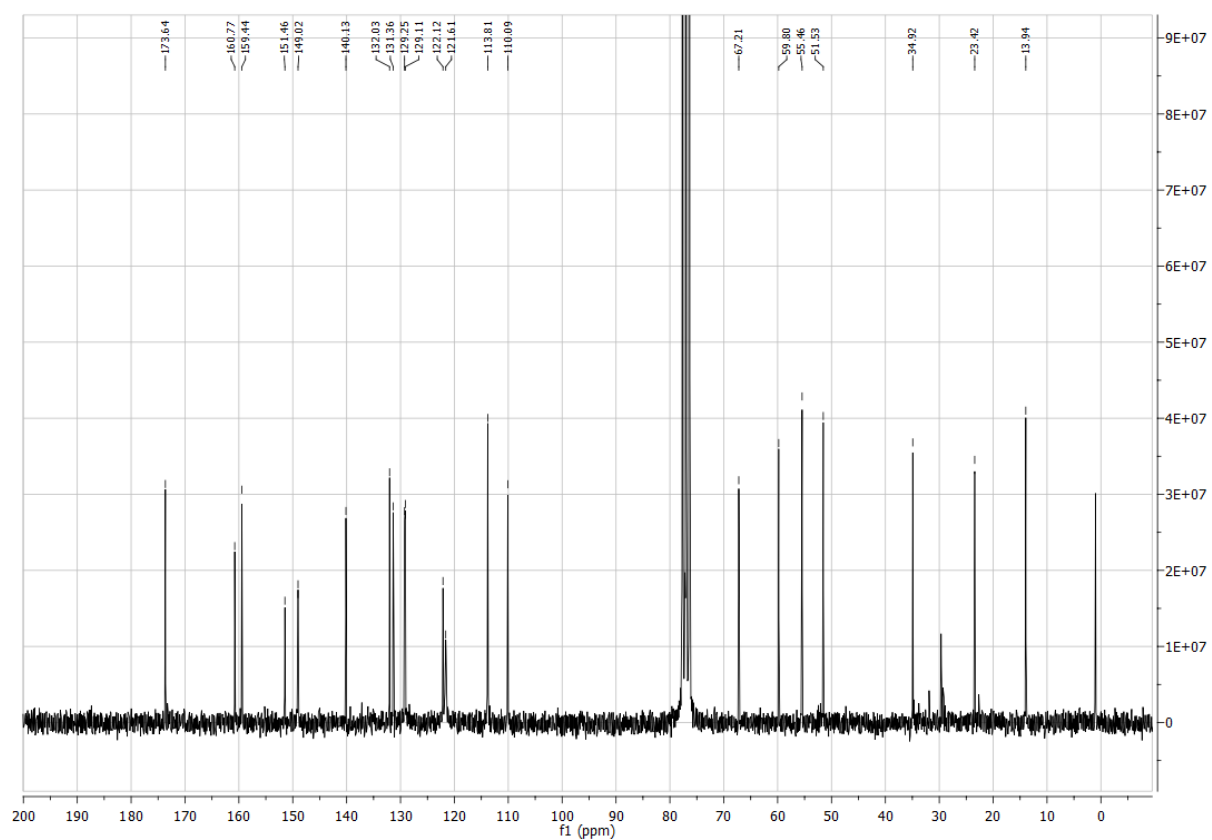
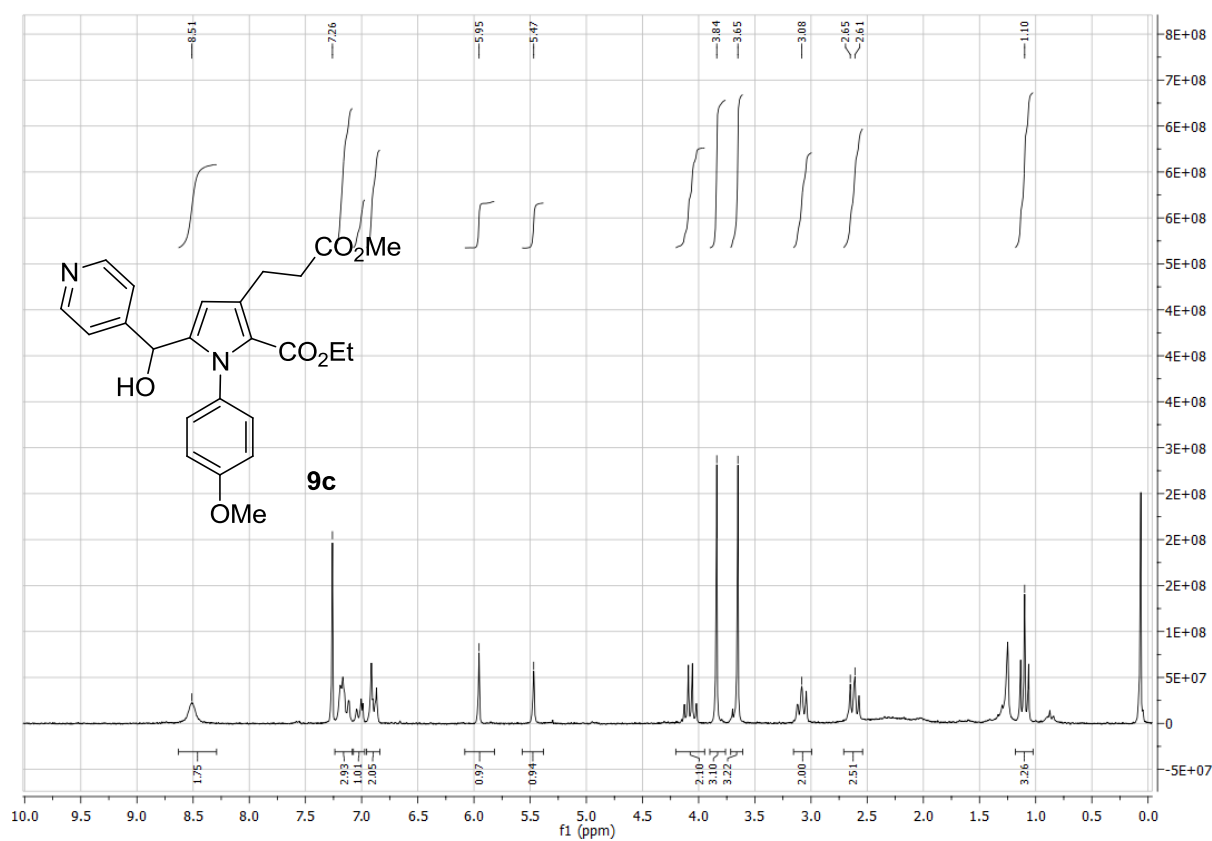


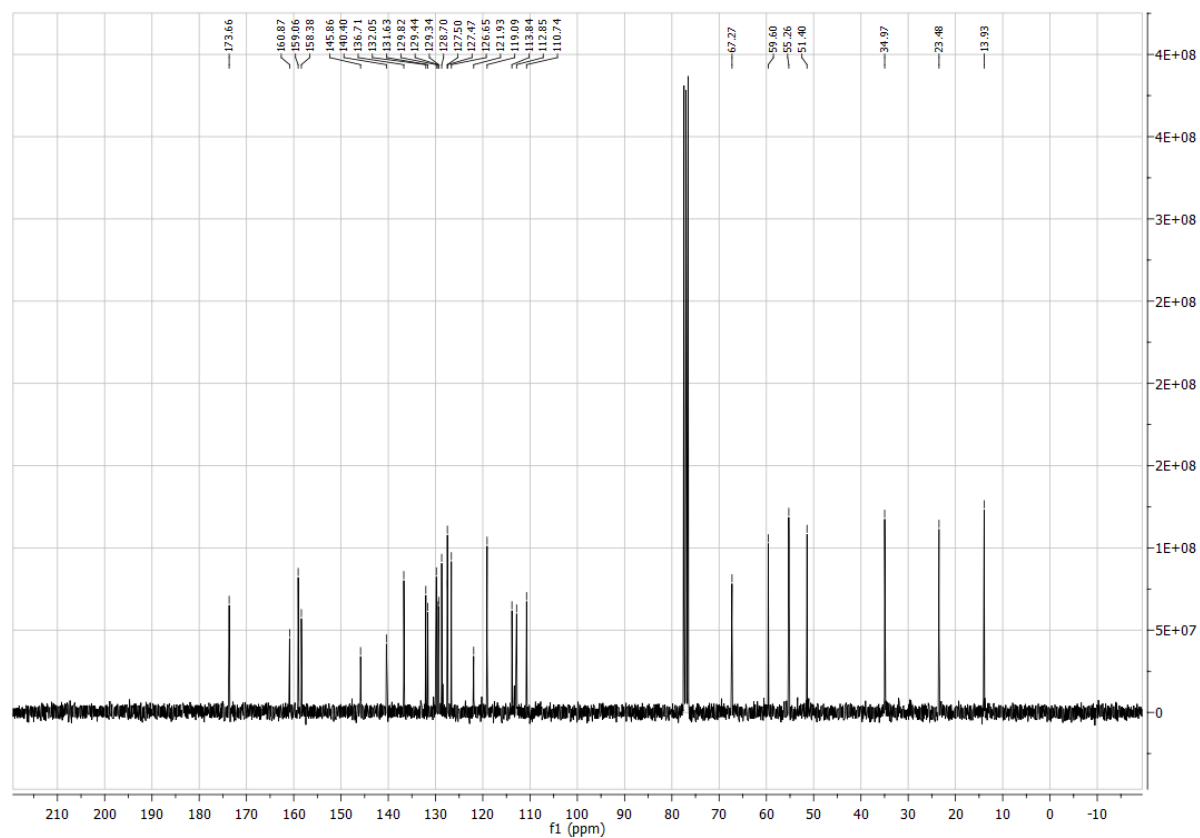
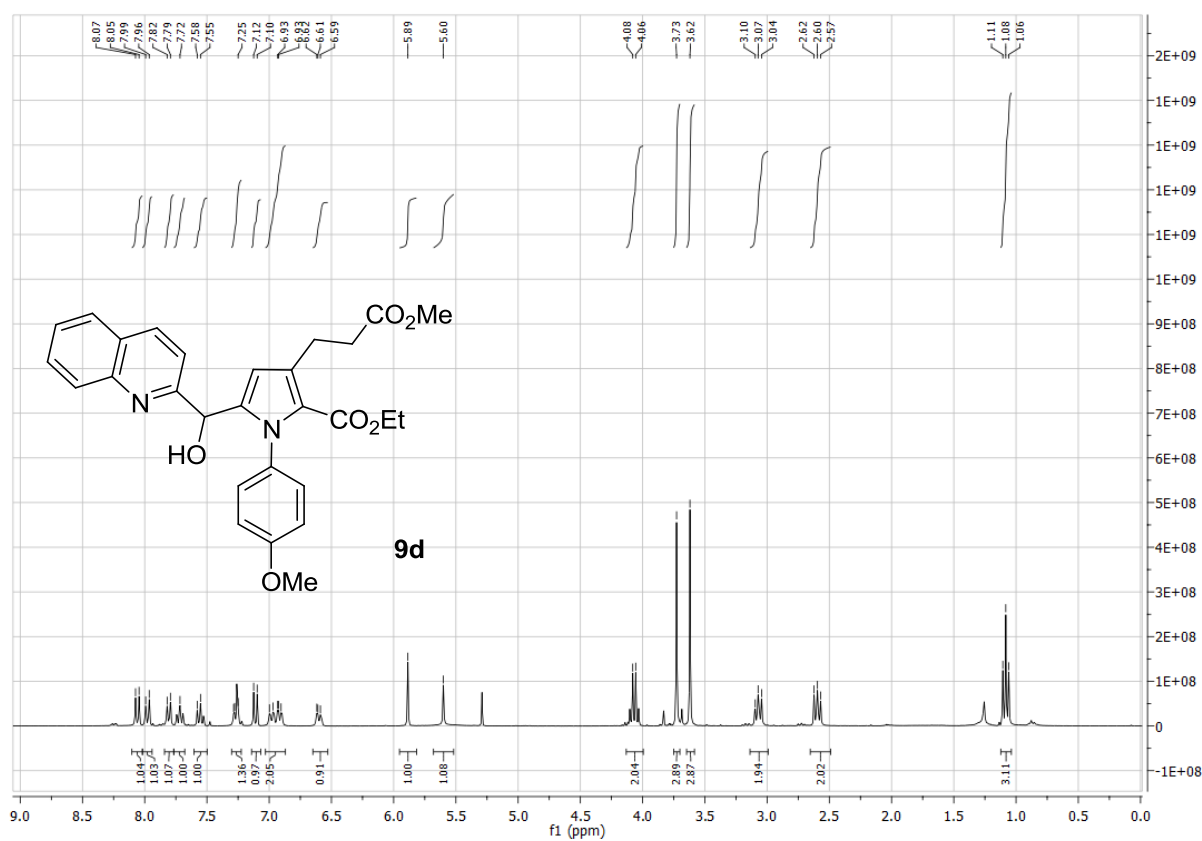


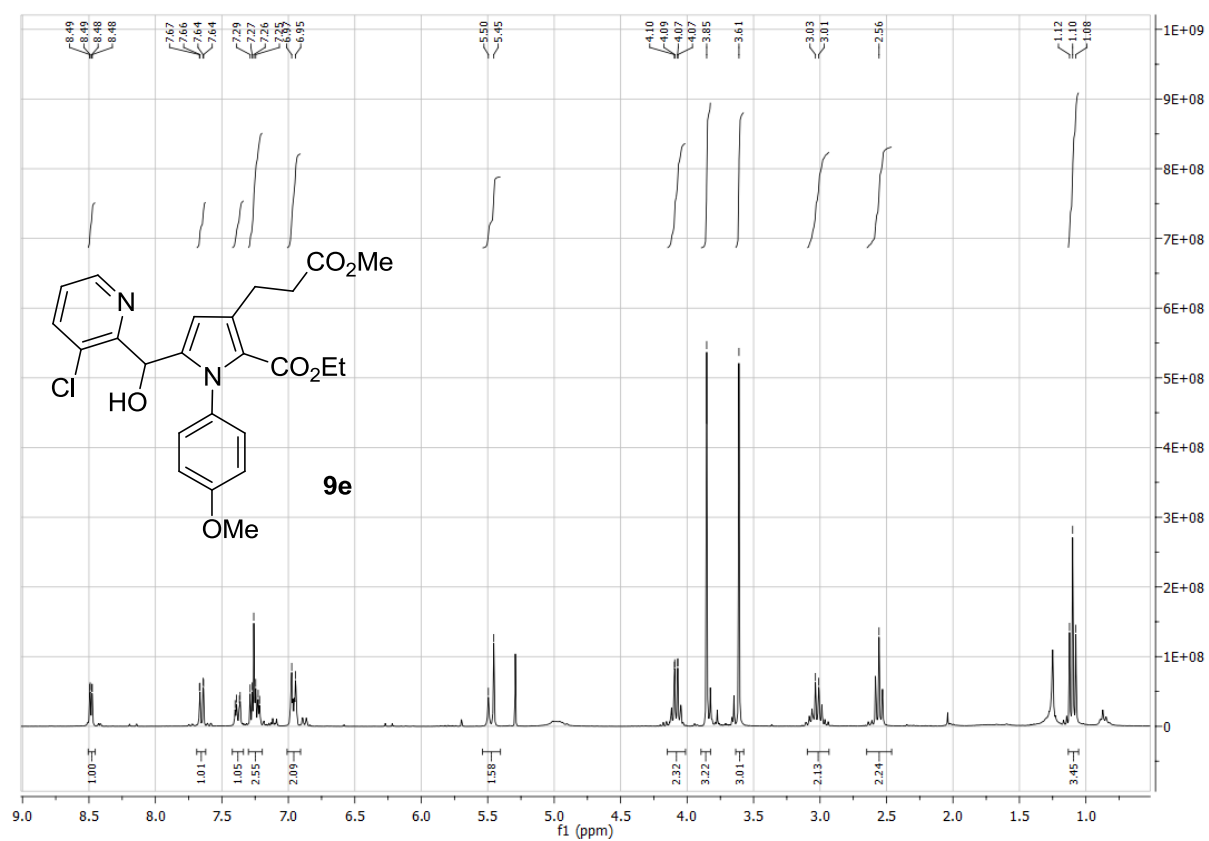


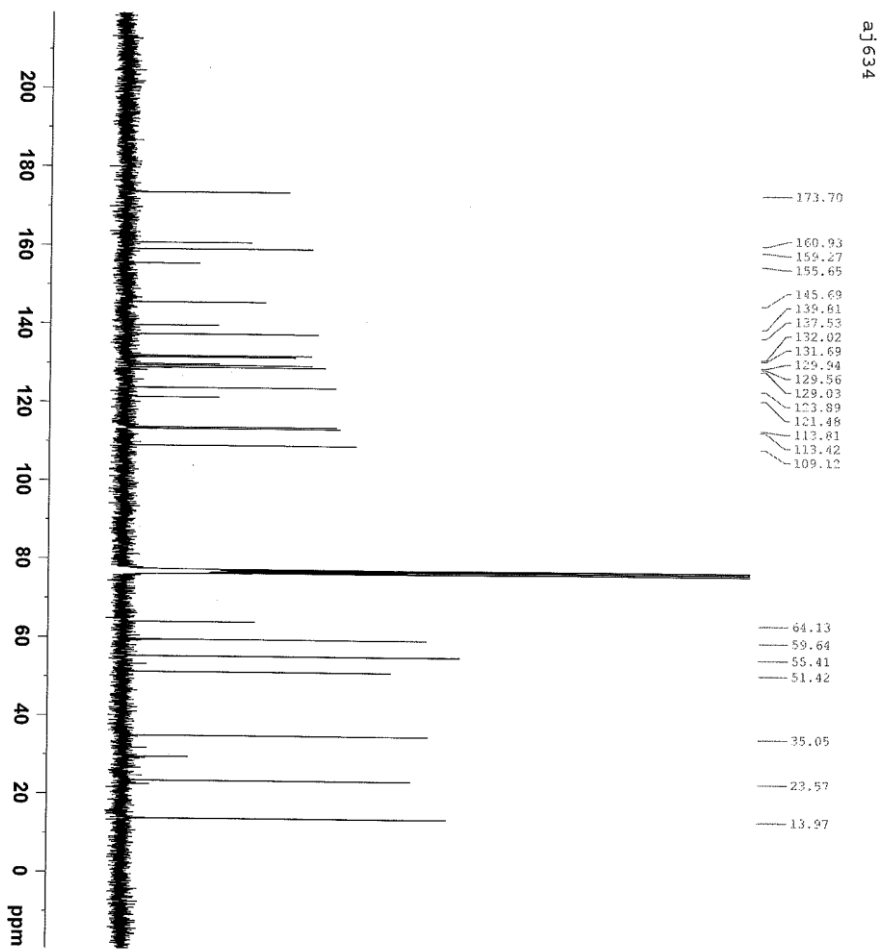












BRUKER

NAME 22 09 2012
EXPNO 380
PROCNO 1
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 12000
DS 4
SWH 18028.846 Hz
FIDRES 0.275098 Hz
AQ 1.8175818 sec
RG 192.42
RG 27.733 usec
DM 26.30 usec
TE 293.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 13C
P1 10.00 usec
SI 32768
SF 75.467516 MHz
SFO 75.467516 MHz
SSB EX
LB 1.00 Hz
GB 0
PC 1.40

