Supporting Information

Synthesis of oxazolidine-2,4-diones by tandem phosphorus-mediated carboxylative condensation/cyclization reaction using atmospheric carbon dioxide

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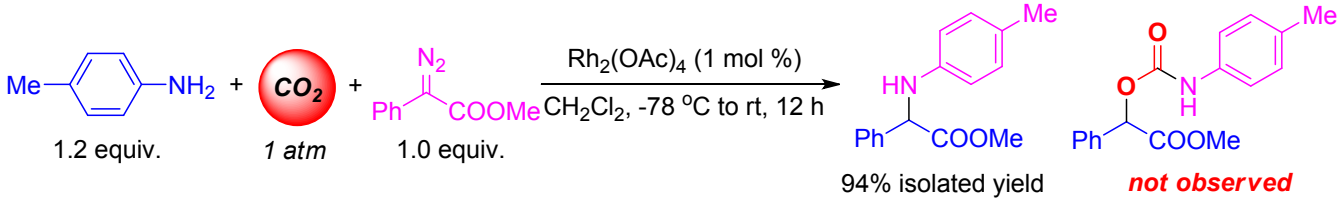
1. General Methods

Unless otherwise statement, all manipulations were performed using standard Schlenk techniques under a dry nitrogen or carbon dioxide atmosphere. DMF, DMAc and DMSO were distilled from CaH_2 at 60 °C under reduced pressure and stored over 4A molecular sieves. Column chromatography was performed on silica gel (200-300 mesh). Thin layer chromatography was performed on 0.20 mm GF254 plates. Visualization was accomplished with UV light (254 nm), cerium ammonium molybdate, and potassium permanganate.

NMR spectra were recorded on a Bruker AvanceII 400M type (^1H NMR, 400 MHz; ^{13}C NMR, 100 MHz) spectrometer in $CDCl_3$ at ambient temperature and chemical shifts are expressed in parts per million (δ, ppm). Proton chemical shifts are referenced to 7.26 ppm ($CHCl_3$) and carbon chemical shifts are referenced to 77.0 ppm ($CDCl_3$). Data reporting uses the following abbreviations: s, singlet; d, doublet; t, triplet; m, multiplet; hept, heptet, and *J*, coupling constant in Hz. High resolution mass spectra (HRMS) were recorded on a Q-TOF mass spectrometry (Micromass, Wythenshawe, UK) equipped with Z-spray ionization source. Infrared spectra (IR) were measured using a Nicolet NEXUS FT-IR spectrophotometer.

Unless otherwise indicated, commercially available starting materials were purchased from Energy Chemical. α-Ketoesters[1] were synthesized according to literature procedures.

2. $Rh_2(OAc)_4$ Catalyzed Reaction of 4-Toluidine, CO_2 and Methyl 2-Diazo-2-phenylacetate



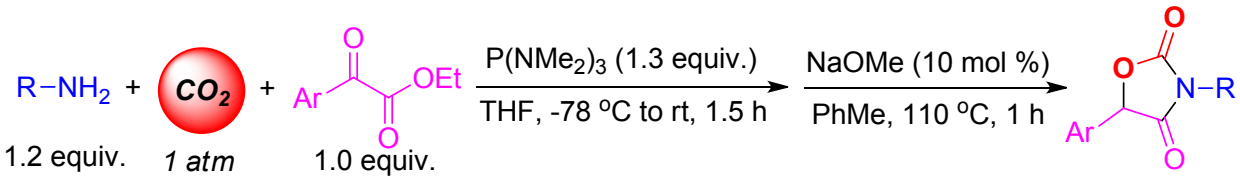
4-Toluidine (139 mg, 1.3 mmol), methyl 2-diazo-2-phenylacetate (190 mg, 1.08 mmol), and CH_2Cl_2 (5 mL) were added to a flame-dried 50 mL Schlenk tube in a glove box. After removal from the glove box, the reaction vessel was cooled to -78 °C and purged with atmospheric carbon dioxide three times. $Rh_2(OAc)_2$ (5 mg, 0.011 mmol) was then added. After the resulting solution was stirred at -78 °C for 30 min, the reaction system was allowed to warm to room temperature and stirred overnight under atmospheric carbon dioxide. CH_2Cl_2 was removed under vacuum, the resulting residue was purified by column chromatography on silica gel (Hexane:EtOAc, 5:1) to afford the non-carboxylative product (260

[1] H.-L. Wu, P.-Y. Wu, Y.-Y. Shen, B.-J. Uang, *J. Org. Chem.* **2008**, *73*, 6445.

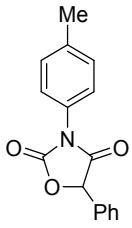
mg, 94% isolated yield). **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.57 (d, *J* = 7.2 Hz, 2H), 7.42-7.35 (m, 3H), 7.01 (d, *J* = 8.3 Hz, 2H), 6.56 (d, *J* = 8.4 Hz, 2H), 5.14 (s, 1H), 4.91 (s, 1H), 3.78 (s, 3H), 2.27 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 172.52, 143.74, 137.82, 129.81, 128.93, 128.33, 127.35, 127.33, 113.59, 61.06, 52.80, 20.46. **IR** (neat, cm^{-1}) ν 3409, 3025, 2949, 1732, 1619, 1524, 1455, 1434, 1319, 1256, 1176, 1002, 938, 805, 728, 698. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{17}NO_2Na$ $[M+Na]^+$: 278.1157, found: 278.1165.

The carboxylative product was not observed.

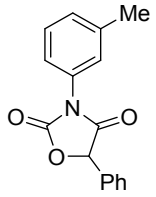
3. General Procedure for Tandem Phosphorus-Mediated Condensation/Cyclization Reaction



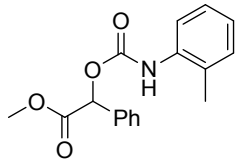
Primary amine (1.2 mmol), $P(NMe_2)_3$ (1.3 mmol), and THF (10 mL) were added to a flame-dried 50 mL Schlenk tube in a glove box. After removal from the glove box, the reaction vessel was cooled to -78 °C and purged with atmospheric carbon dioxide three times. α-Ketoester (1.0 mmol) was then added via syringe. After the resulting solution was stirred at -78 °C for 30 min, the reaction system was allowed to warm to room temperature over 1 h under atmospheric carbon dioxide. THF was removed under vacuum, then NaOMe (0.1 mmol) and toluene (5 mL) was added to the Schlenk tube in the glove box. The reaction tube was sealed and the mixture was stirred at 110 °C for 1 h. The reaction mixture was allowed to cool to ambient temperature and concentrated under vacuum. Ethyl acetate (50 mL) was added and the resulting solution was washed with 2% NaCl (5 x 30 mL) and brine, dried over anhydrous sodium sulfate. After removal of the solvent, the resulting residue was purified by column chromatography on silica gel (Hexane:EtOAc) to afford the desired product.



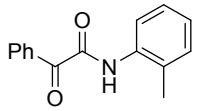
3-(*p*-Tolyl)-5-phenyloxazolidine-2,4-dione (5a). 72% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.53-7.45 (m, 5H), 7.33-7.28 (m, 4H), 5.89 (s, 1H), 2.40 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.14, 154.12, 139.28, 131.55, 130.04, 129.92, 129.21, 128.06, 126.07, 125.50, 79.92, 21.24. **IR** (neat, cm^{-1}) ν 3052, 2955, 1824, 1745, 1443, 1340, 1208, 1107, 996, 777, 725, 669. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{13}NO_3Na$ $[M+Na]^+$: 290.0793, found: 290.0781.



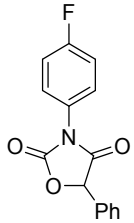
3-(*m*-Tolyl)-5-phenyloxazolidine-2,4-dione (5b). 70% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.51-7.46 (m, 5H), 7.38 (t, *J* = 7.7 Hz, 1H), 7.26-7.24 (m, 3H), 5.86 (s, 1H), 2.40 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.16, 154.07, 139.52, 131.60, 130.61, 129.85, 129.14, 126.27, 126.10, 122.80, 79.93, 21.26. **IR** (neat, cm^{-1}) ν 3032, 2923, 2845, 1816, 1747, 1610, 1591, 1493, 1454, 1398, 1241, 1180, 1157, 1064, 1028, 776, 757, 695. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{13}NO_3Na$ $[M+Na]^+$: 290.0793, found: 290.0774



Methyl 2-(2-methylphenyl)aminocarbonyloxy-phenylacetate (4c). 81% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.76 (bs, 1H), 7.50-7.48 (m, 2H), 7.39-7.38 (m, 3H), 7.22-7.00 (m, 4H), 6.02 (s, 1H), 3.72 (s, 3H), 2.24 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 169.81, 152.81, 135.35, 133.97, 130.47, 129.35, 128.87, 127.77, 126.92, 124.72, 118.61, 114.96, 75.02, 52.65, 17.68. **IR** (neat, cm^{-1}) ν 3343, 3033, 2954, 2925, 1739, 1590, 1530, 1456, 1212, 1068, 755, 733, 696. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{17}NO_4Na$ $[M+Na]^+$: 322.1055, found: 322.1059.

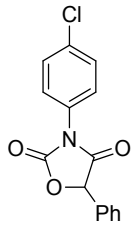


α-Oxo-*N*-(2-methylphenyl)benzeneacetamide (6c). **^{1}H NMR** (400 MHz, $CDCl_3$) δ 8.95 (s, 1H), 8.48-8.45 (m, 2H), 8.14 (d, *J* = 7.6 Hz, 1H), 7.71-7.67 (m, 1H), 7.57-7.53 (m, 2H), 7.31-7.15 (m, 3H), 2.40 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 187.56, 158.85, 134.65, 133.16, 131.52, 130.69, 128.68, 128.59, 126.98, 125.68, 121.70, 17.60. **IR** (neat, cm^{-1}) ν 3385, 3059, 2923, 1668, 1589, 1526, 1453, 1276, 1169, 743, 686. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_{13}NO_2Na$ $[M+Na]^+$: 262.0844, found: 262.0834.

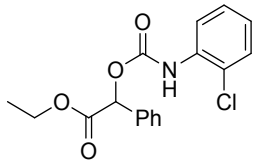


3-(4-Fluorophenyl)-5-phenyloxazolidine-2,4-dione (5d). 57% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ7.51-7.43 (m, 7H), 7.20-7.16 (m, 2H), 5.90 (s, 1H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.02, 163.63, 161.15, 153.90, 131.40, 130.05, 129.29, 127.64, 126.12, 116.50, 80.06. **IR** (neat, cm^{-1})

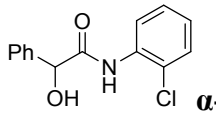
ν3062, 2928, 1811, 1744, 1514, 1428, 1196, 1176, 841, 789, 756, 700. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_9NO_2F$ [M-H]$^-$: 270.0566, found: 270.0557.



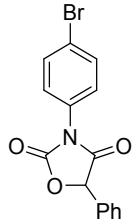
3-(4-Chlorophenyl)-5-phenyloxazolidine-2,4-dione (5e). 61% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.48-7.38 (m, 9H), 5.86 (s, 1H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 169.82, 153.63, 134.79, 131.29, 130.03, 129.56, 129.25, 126.80, 126.11, 80.03. **IR** (neat, cm^{-1}) ν 2945, 2919, 1809, 1746, 1496, 1427, 1408, 1301, 1180, 1093, 1066, 1011, 800, 774, 707, 699. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_9NO_3Cl$ [M-H]$^-$: 286.0271, found: 286.0281.



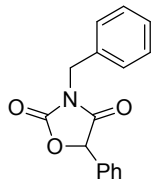
Ethyl 2-(2-chlorophenyl)aminocarbonyloxy-phenylacetate (4f). 80% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 8.16 (d, *J* = 7.4 Hz, 1H), 7.53-7.51 (m, 2H), 7.44-7.22 (m, 6H), 7.03-6.99 (m, 1H), 6.00 (s, 1H), 4.31-4.15 (m, 2H), 1.24 (t, *J* = 7.1 Hz, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 169.03, 152.13, 134.34, 133.82, 129.39, 129.15, 128.87, 127.79, 127.62, 124.18, 122.41, 120.19, 75.36, 61.84, 14.04. **IR** (neat, cm^{-1}) ν 3416, 3036, 2959, 2926, 1747, 1597, 1529, 1442, 1207, 1181,1049, 750, 696. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{16}NO_4ClNa$ [M+Na]$^+$: 356.0666, found: 356.0659.



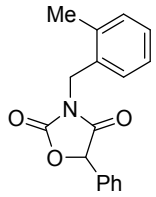
α-Hydroxy-*N*-(2-chlorophenyl)benzeneacetamide (6f). **^{1}H NMR** (400 MHz, $CDCl_3$) δ 9.00 (s, 1H), 8.32 (dd, *J* = 8.3, 1.4 Hz, 1H), 7.50-7.48 (m, 2H), 7.42-7.37 (m, 4H), 7.28-7.23 (m, 1H), 7.06 (td, *J* = 7.9, 1.5 Hz, 1H), 5.16 (d, *J* = 3.4 Hz, 1H), 3.98 (d, *J* = 3.4 Hz, 1H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.41, 138.79, 133.93, 129.09, 128.94, 128.87, 127.73, 126.78, 125.05, 123.31, 121.30, 74.91. **IR** (neat, cm^{-1}) ν 3344, 3064, 2922, 1675, 1594, 1529, 1443, 1303, 1189, 1060, 751, 732, 695. **HRMS** (ESI, *m*/*z*) calcd for $C_{14}H_{11}NO_2Cl$ [M-H]$^-$: 260.0478, found: 260.0472.



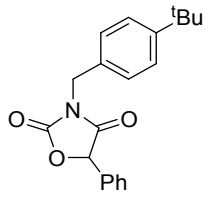
3-(4-Bromophenyl)-5-phenyloxazolidine-2,4-dione (5g). 45% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.62 (d, *J* = 8.9 Hz, 2H), 7.49-7.46 (m, 5H), 7.37 (d, *J* = 8.9 Hz, 2H), 5.89 (s, 1H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 169.76, 153.56, 132.62, 131.29, 130.11, 129.86, 129.31, 127.04, 126.11, 122.92, 80.05. **IR** (neat, cm^{-1}) ν2920, 1807, 1743, 1494, 1427, 1173, 1067, 1011, 745, 698. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_9NO_3Br$ $[M-H]^-$: 329.9766, found: 329.9778.



3-Benzyl-5-phenyloxazolidine-2,4-dione (5h). 53% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ7.42-7.32 (m, 10H), 5.73 (s, 1H), 4.77-4.68 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.94, 155.07, 134.62, 131.55, 129.81, 129.12, 128.92, 128.78, 128.53, 126.09, 80.29, 44.00. **IR** (neat, cm^{-1}) ν 3047, 2950, 1821, 1747, 1442, 1340, 1160, 1008, 761, 724, 697. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{13}NO_3Na$ $[M+Na]^+$: 290.0793, found: 290.0781.

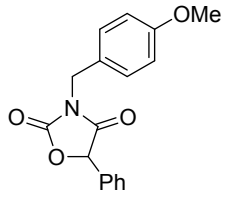


3-(2-Methylbenzyl)-5-phenyloxazolidine-2,4-dione (5i). 62% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.45-7.39 (m, 5H), 7.33 (d, *J* = 7.3 Hz, 1H), 7.25-7.16 (m, 3H), 5.74 (s, 1H), 4.76 (m, 2H), 2.45 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.10, 155.19, 136.48, 132.52, 131.61, 130.75, 129.82, 129.15, 128.89, 128.46, 126.38, 126.04, 80.24, 41.48, 19.40. **IR** (neat, cm^{-1}) ν 3033, 2925, 1821, 1743, 1496, 1435, 1409, 1345, 1159, 1118, 1026, 760, 744, 725, 704. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{14}NO_3$ $[M-H]^-$: 280.0974, found: 280.0979.

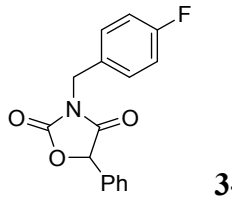


3-(4-*tert*-Butylbenzyl)-5-phenyloxazolidine-2,4-dione (5j). 37% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.41-7.36 (m, 9H), 5.68 (s, 1H), 4.72-4.64 (m, 2H), 1.30 (s, 9H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.96, 155.12, 151.56, 131.63, 131.60, 129.77, 129.10, 128.58, 126.08, 125.84, 80.23,

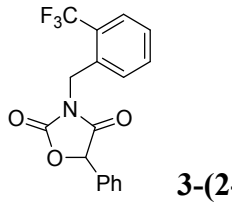
43.70, 34.62, 31.30. **IR** (neat, cm^{-1}) ν 2962, 1820, 1742, 1436, 1407, 1343, 1156, 1097, 1025, 764, 697. **HRMS** (ESI, *m*/*z*) calcd for $C_{20}H_{20}NO_3$ [M-H]$^-$: 322.1443, found: 322.1436.



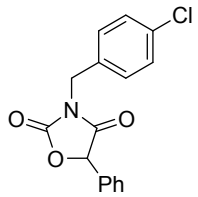
3-(4-Methoxybenzyl)-5-phenyloxazolidine-2,4-dione (5k). 24% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.42-7.34 (m, 7H), 6.86 (d, *J* = 8.7 Hz, 2H), 5.70 (s, 1H), 4.70-4.62 (m, 2H), 3.79 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.01, 159.79, 155.16, 131.62, 130.42, 129.84, 129.16, 126.87, 126.13, 114.27, 80.29, 55.36, 43.59. **IR** (neat, cm^{-1}) ν 2927, 1815, 1736, 1613, 1512, 1434, 1407, 1344, 1247, 1157, 813, 768, 749, 627. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{15}NO_4Na$ [M+Na]$^+$: 320.0899, found: 320.0891.



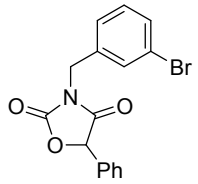
3-(4-Fluoroxybenzyl)-5-phenyloxazolidine-2,4-dione (5l). 65% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.42-7.32 (m, 7H), 7.05-7.00 (m, 2H), 5.72 (s, 1H), 4.74-4.63 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.96, 162.49, 155.05, 131.48, 130.97, 130.52, 130.00, 129.27, 126.11, 115.99, 80.43, 43.42. **IR** (neat, cm^{-1}) ν2962, 2924, 1826, 1731, 1444, 1412, 1261, 1017, 800, 700. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{11}FNO_3$ [M-Na]$^-$: 284.0723, found: 284.0716.



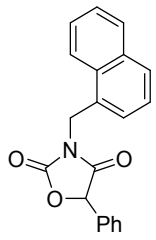
3-(2-Trifluoromethylbenzyl)-5-phenyloxazolidine-2,4-dione (5m). 73% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.68 (d, *J* = 7.8 Hz, 1H), 7.44-7.37 (m, 7H), 7.25 (d, *J* = 7.5 Hz, 1H), 5.85 (s, 1H), 5.03-4.94 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.93, 154.90, 132.45, 132.33, 131.39, 129.93, 129.22, 128.17, 127.74, 126.52, 126.46, 125.98, 122.77, 80.45, 40.44. **IR** (neat, cm^{-1}) ν 3047, 2950, 1821, 1747, 1442, 1340, 1160, 1008, 761, 724, 697. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{11}NO_3F_3$ [M-H]$^-$: 334.0691, found: 334.0702.



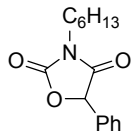
3-(4-Chlorobenzyl)-5-phenyloxazolidine-2,4-dione (5n). 59% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.43-7.30 (m, 9H), 5.73 (s, 1H), 4.72-4.63 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.88, 154.95, 134.65, 133.06, 131.41, 130.35, 129.96, 129.23, 129.18, 126.07, 80.42, 43.37. **IR** (neat, cm^{-1}) ν 2927, 1822, 1733, 1437, 1325, 1157, 1000, 927, 769, 757, 698. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{12}NO_3ClNa$ $[M+Na]^+$: 324.0403, found: 324.0402.



3-(3-Bromobenzyl)-5-phenyloxazolidine-2,4-dione (5o). 61% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.55 (d, *J* = 1.5 Hz, 1H), 7.46-7.32 (m, 7H), 7.20 (t, *J* = 7.8 Hz, 1H), 5.73 (s, 1H), 4.70-4.62 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.79, 154.85, 136.65, 131.71, 131.66, 131.35, 130.50, 129.89, 129.16, 127.39, 126.05, 122.82, 80.39, 43.25. **IR** (neat, cm^{-1}) ν 2912, 1810, 1733, 1443, 1402, 1318, 1156, 1004, 943, 765, 700. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{12}NO_3BrNa$ $[M+Na]^+$: 367.9898, found: 367.9877.

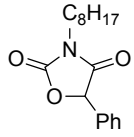


3-(1-Naphthalenemethyl)-5-phenyloxazolidine-2,4-dione (5p). 53% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 8.25 (d, *J* = 8.5 Hz, 1H), 7.88-7.79 (m, 2H), 7.63-7.32 (m, 10H), 5.69 (s, 1H), 5.23-5.14 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.09, 155.05, 133.86, 131.44, 131.16, 129.82, 129.47, 129.10, 128.89, 128.71, 128.60, 127.50, 126.91, 126.09, 125.27, 123.23, 80.18, 41.99. **IR** (neat, cm^{-1}) ν 2955, 2923, 1820, 1739, 1437, 1408, 1344, 1153, 1084, 1026, 780, 763, 700. **HRMS** (ESI, *m*/*z*) calcd for $C_{20}H_{14}NO_3$ $[M-H]^-$: 316.0974, found: 316.0982.

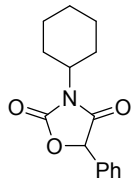


3-Hexyl-5-phenyloxazolidine-2,4-dione (5q). 68% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.37-7.31 (m, 5H), 5.63 (s, 1H), 3.54-3.45 (m, 2H), 1.62-1.57 (m, 2H), 1.27-1.20 (m, 6H), 0.80 (t, *J* = 7.0 Hz, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.30, 155.37, 131.84, 129.76, 129.13, 126.04, 80.09, 40.49, 31.20, 27.51, 26.20, 22.45, 13.94. **IR** (neat, cm^{-1}) ν 2954, 2935, 2915, 2856, 1802, 1736, 1458,

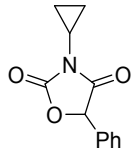
1340, 1129, 1107, 922, 763, 698. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_{19}NO_3Na$ $[M+Na]^+$: 284.1263, found: 284.1268.



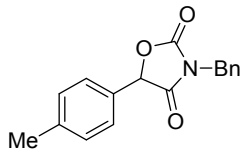
3-Octyl-5-phenyloxazolidine-2,4-dione (5r). 62% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.47-7.37 (m, 5H), 5.71 (s, 1H), 3.63-3.52 (m, 2H), 1.70-1.62 (m, 2H), 1.35-1.21 (m, 10H), 0.87 (t, *J* = 6.9 Hz, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.28, 155.37, 131.67, 129.78, 129.12, 125.96, 80.06, 40.49, 31.69, 29.02, 27.54, 26.52, 22.61, 14.08. **IR** (neat, cm^{-1}) ν 3050, 2955, 2917, 2853, 1802, 1739, 1496, 1458, 1346, 1209, 1130, 1006, 773, 763, 698. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{23}NO_3Na$ $[M+Na]^+$: 312.1576, found: 312.1561.



3-Cyclohexyl-5-phenyloxazolidine-2,4-dione (5s). 58% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.44-7.36 (m, 5H), 5.61 (s, 1H), 3.97-3.88 (m, 1H), 2.17-2.02 (m, 2H), 1.85-1.64 (m, 5H), 1.33-1.14 (m, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.30, 154.90, 132.00, 129.69, 129.08, 126.02, 79.23, 53.10, 29.03, 28.89, 25.62, 24.81. **IR** (neat, cm^{-1}) ν 3035, 2934, 2858, 1813, 1736, 1454, 1406, 1385, 1348, 1185, 1142, 1052, 764, 732, 703. **HRMS** (ESI, *m*/*z*) calcd for $C_{15}H_{16}NO_3$ $[M-H]^-$: 258.1130, found: 258.1136.

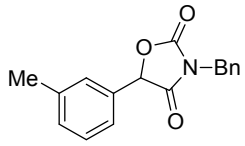


3-Cyclopropyl-5-phenyloxazolidine-2,4-dione (5t). 43% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.41 (s, 5H), 5.64 (s, 1H), 2.72 (s, 1H), 1.01 (s, 4H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.62, 155.14, 131.65, 129.72, 129.08, 125.89, 79.25, 22.91, 5.02, 4.94. **IR** (neat, cm^{-1}) ν 2956, 2922, 2850, 2360, 2341, 1814, 1742, 1454, 1419, 1197, 1157, 1026, 930, 879, 756, 704, 690. **HRMS** (ESI, *m*/*z*) calcd for $C_{12}H_{11}NO_3Na$ $[M+Na]^+$: 240.0637, found: 240.0645.

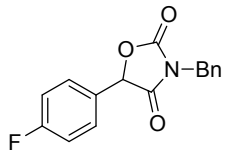


3-Benzyl-5-(4-methylphenyl)oxazolidine-2,4-dione (5u). 55% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.43-7.41 (m, 2H), 7.37-7.33 (m, 3H), 7.25-7.20 (m, 4H), 5.68 (s, 1H), 4.76-4.68 (m, 2H), 2.36 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.15, 155.15, 139.98, 134.74, 129.82, 128.92, 128.79, 128.66, 128.52, 126.22, 80.46, 43.99, 21.26. **IR** (neat, cm^{-1}) ν2919, 2852, 1806, 1739, 1517,

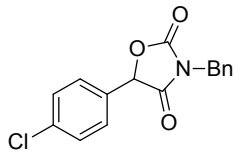
1407, 1174, 1064, 995, 819, 757. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{15}NO_3Na$ [M+Na]$^+$: 304.0950, found: 304.0930.



3-Benzyl-5-(3-methylphenyl)oxazolidine-2,4-dione (5v). 46% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.45-7.16 (m, 9H), 5.66 (s, 1H), 4.76-4.69 (m, 2H), 2.36 (s, 3H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 171.04, 155.12, 139.03, 134.71, 131.54, 130.59, 129.00, 128.89, 128.78, 128.50, 126.71, 123.28, 80.42, 43.97, 21.33. **IR** (neat, cm^{-1}) ν 3033, 2924, 1818, 1732, 1438, 1409, 1341, 1158, 1104, 1012, 941, 791, 761, 695. **HRMS** (ESI, *m*/*z*) calcd for $C_{17}H_{15}NO_3Na$ [M+H]$^+$: 304.0950, found: 304.0930.

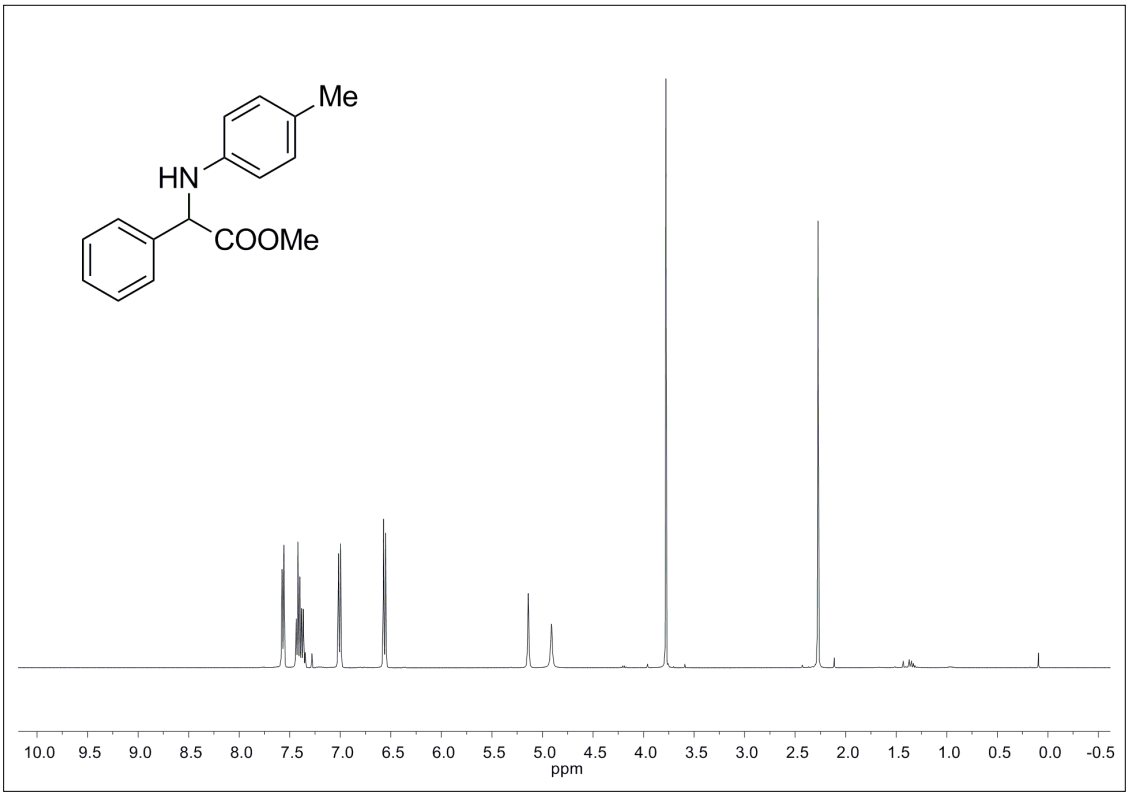


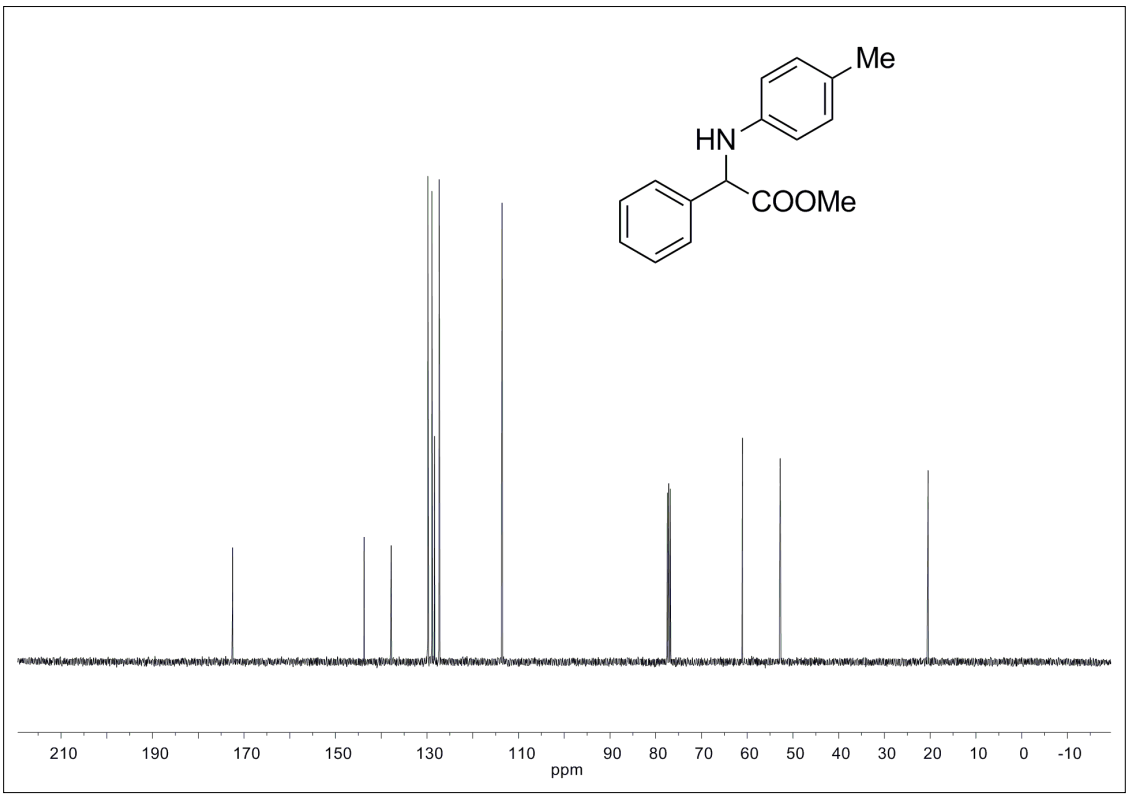
3-Benzyl-5-(4-fluorophenyl)oxazolidine-2,4-dione (5x). 67% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.42-7.32 (m, 6H), 7.20-7.18 (m, 1H), 7.13-7.09 (m, 2H), 5.69 (s, 1H), 4.74-4.67 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.41, 162.93, 154.78, 134.49, 133.78, 130.86, 128.96, 128.80, 128.62, 121.59, 116.87, 116.70, 113.20, 79.27, 44.13. **IR** (neat, cm^{-1}) ν 3054, 2950, 2927, 1820, 1746, 1595, 1491, 1442, 1340, 1160, 1015, 927, 879, 795, 731, 695. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{12}FNO_3Na$ [M+Na]$^+$: 308.0699, found: 308.0689.

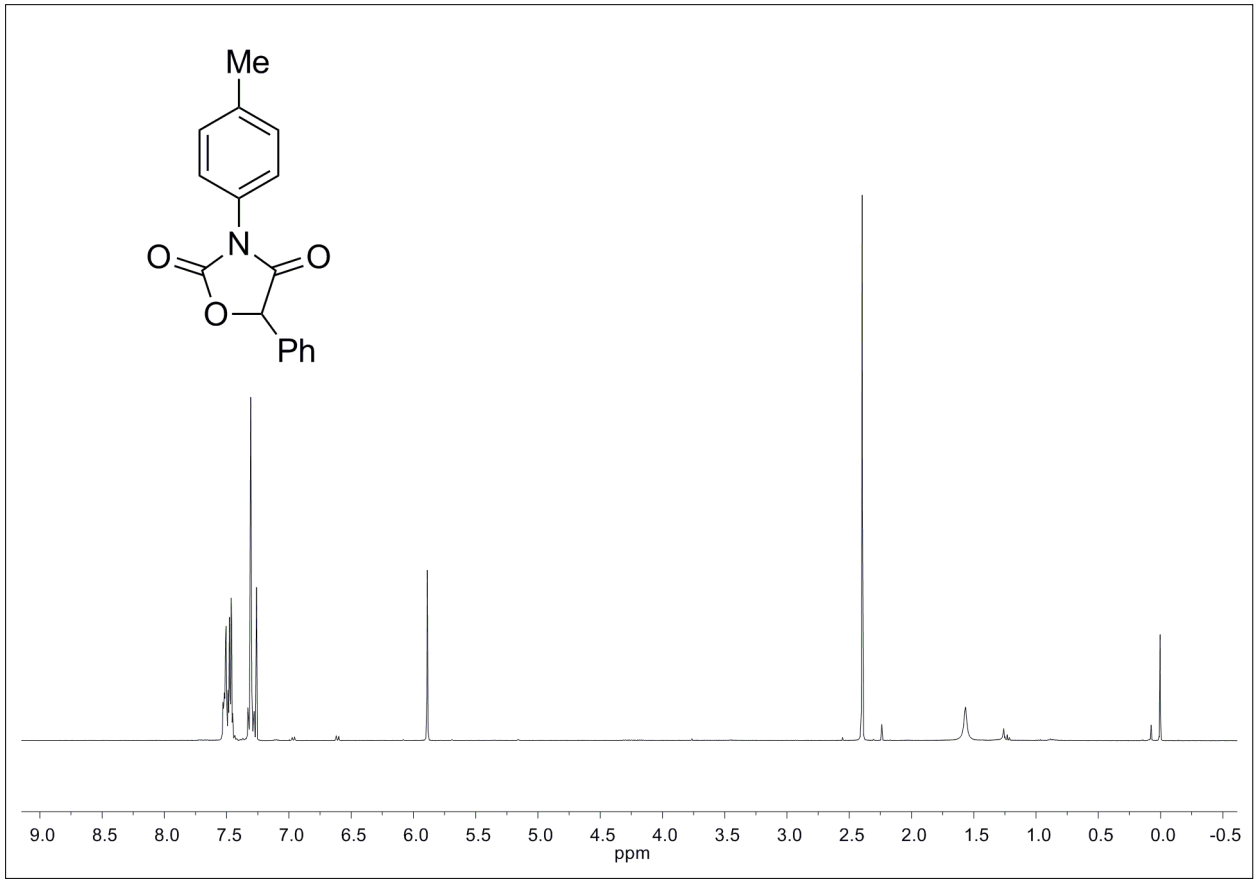


3-Benzyl-5-(4-chlorophenyl)oxazolidine-2,4-dione (5y). 70% yield. **^{1}H NMR** (400 MHz, $CDCl_3$) δ 7.41-7.31 (m, 9H), 5.68 (s, 1H), 4.75-4.67 (m, 2H). **^{13}C NMR** (100 MHz, $CDCl_3$) δ 170.61, 154.85, 136.07, 134.54, 130.07, 129.48, 129.06, 128.89, 128.73, 127.42, 79.52, 44.24. **IR** (neat, cm^{-1}) ν 2950, 2920, 1820, 1740, 1444, 1415, 1339, 1165, 1007, 836, 761, 735. **HRMS** (ESI, *m*/*z*) calcd for $C_{16}H_{12}NO_3ClNa$ [M+Na]$^+$: 324.0403, found: 324.0412.

4. ^{1}H NMR and ^{13}C NMR Spectra of New Compounds



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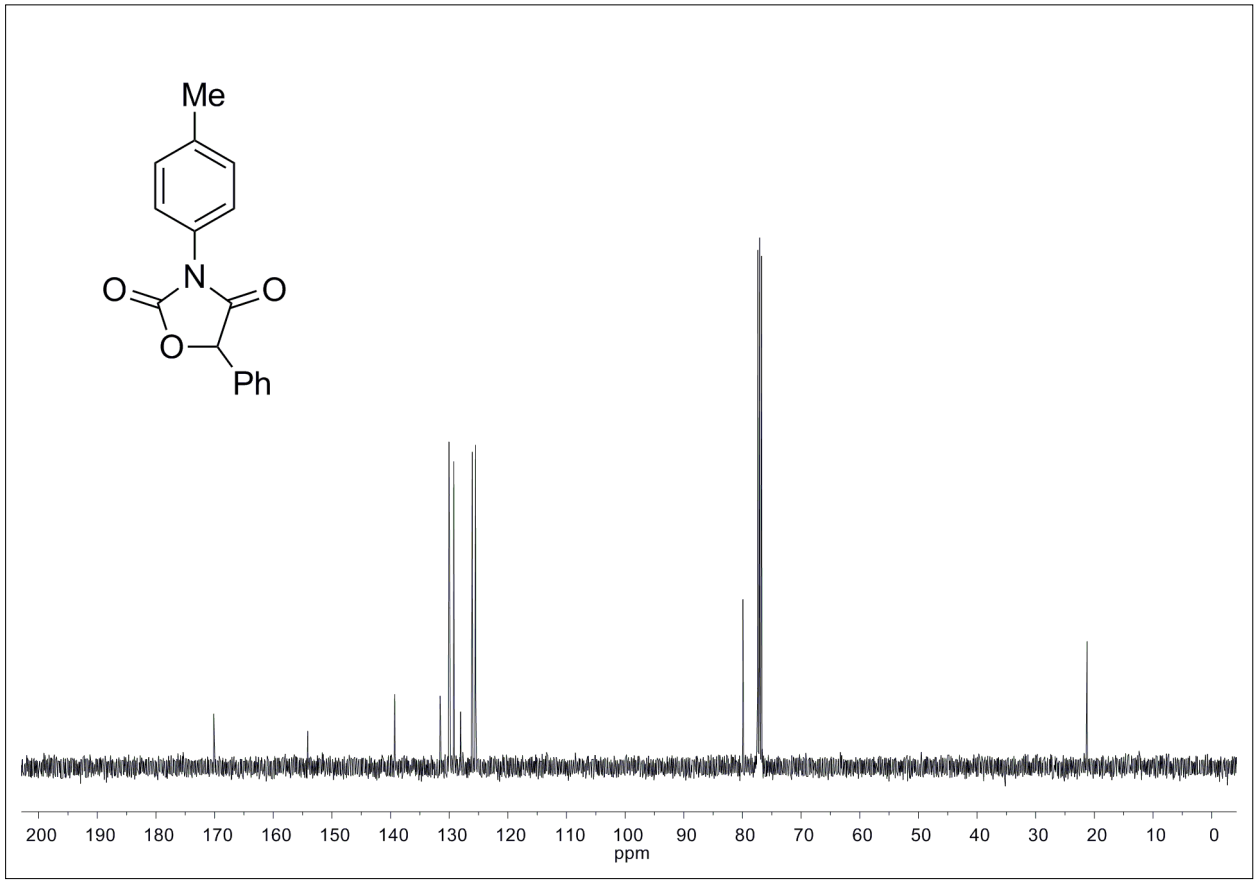
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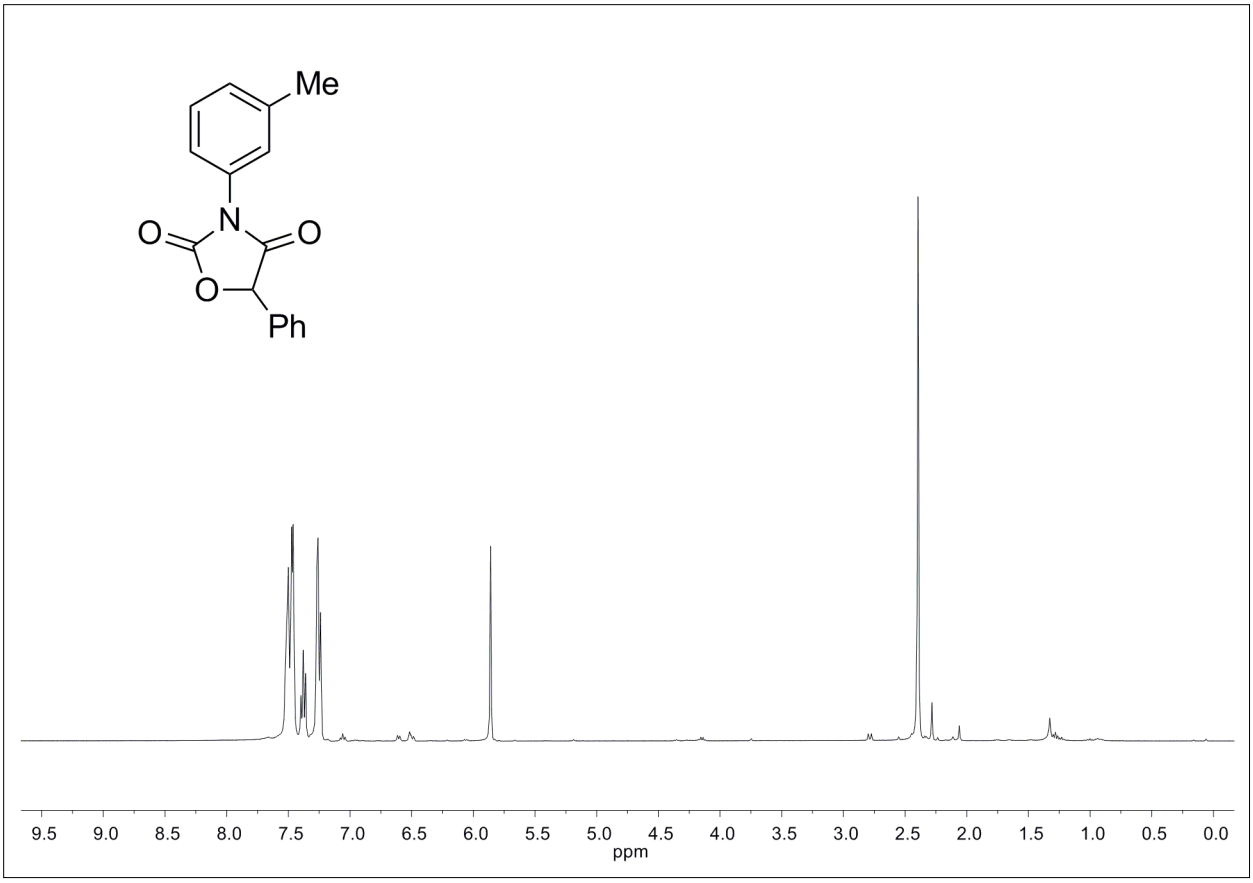
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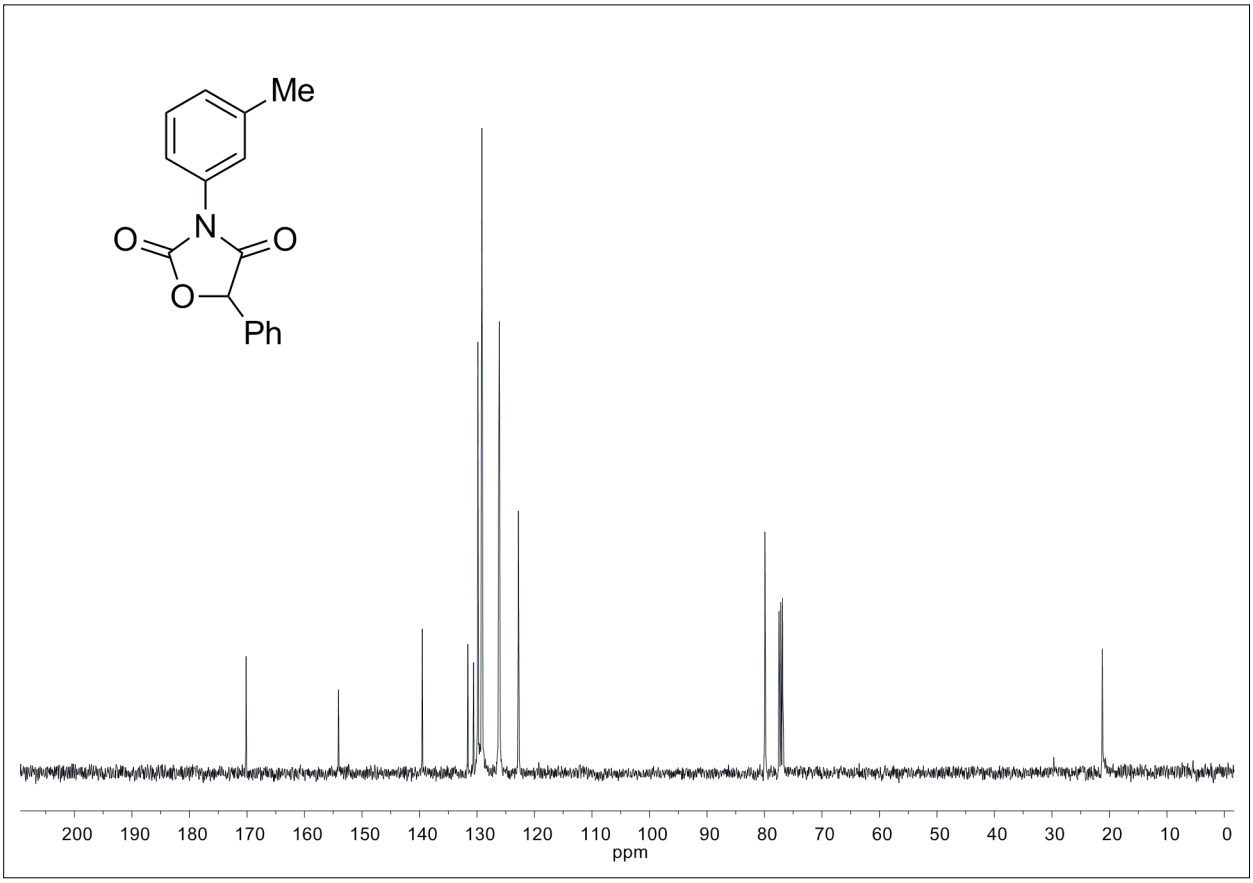
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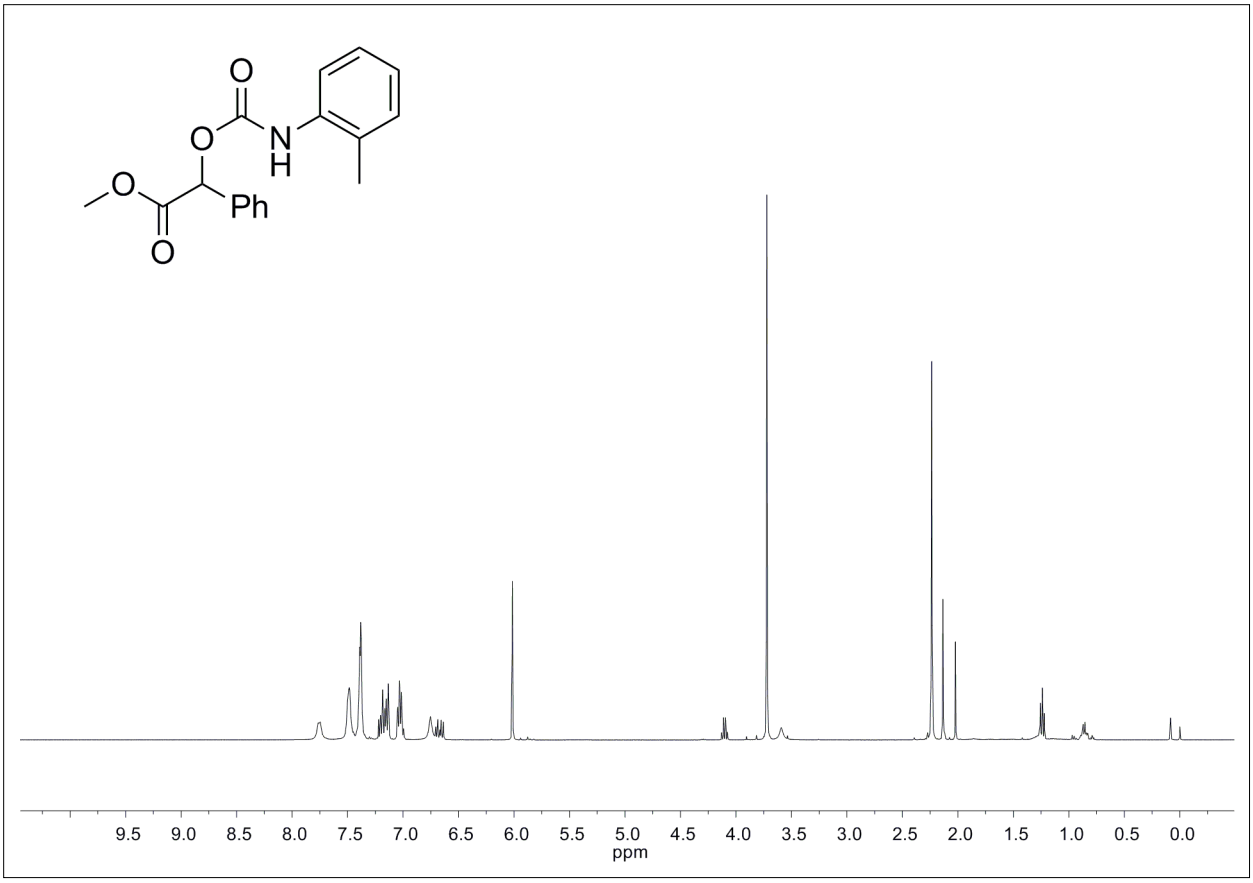
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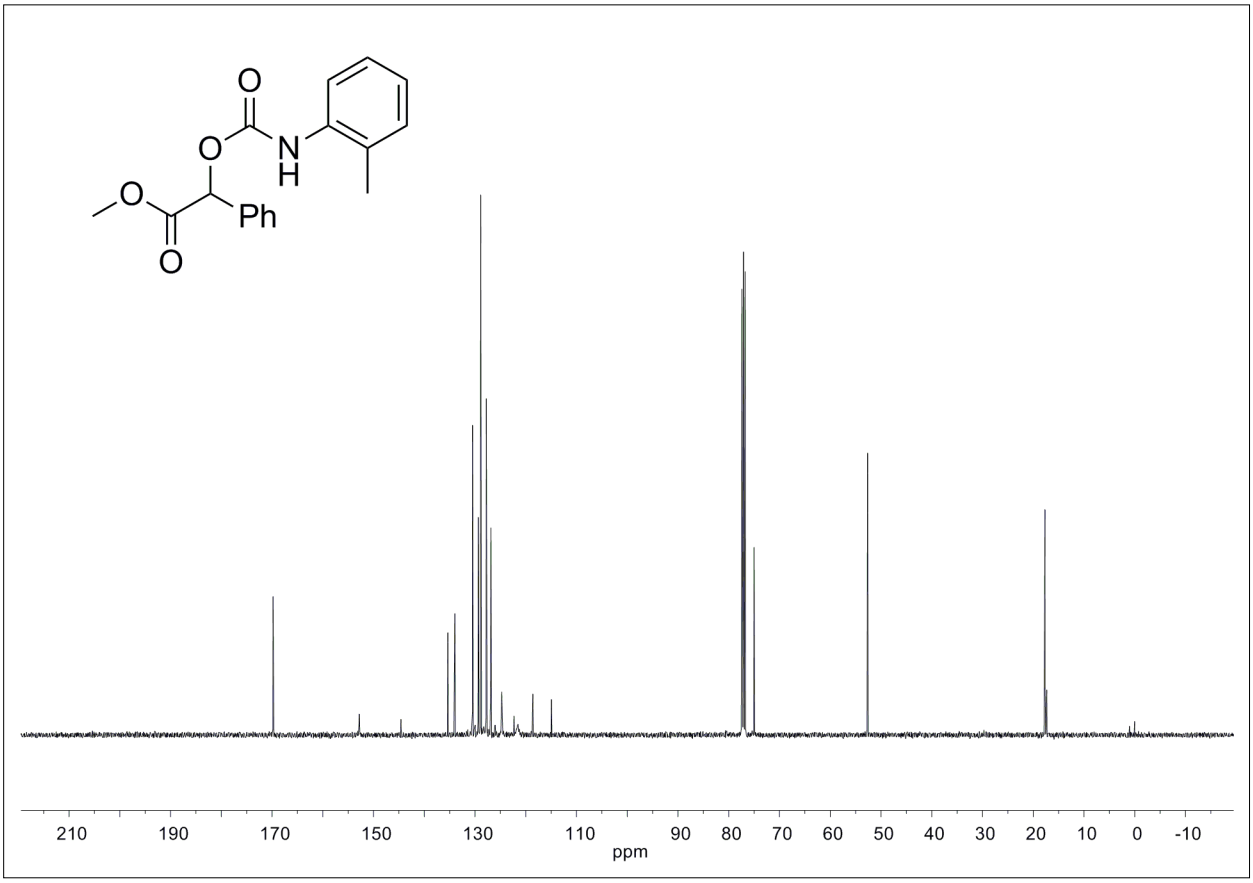
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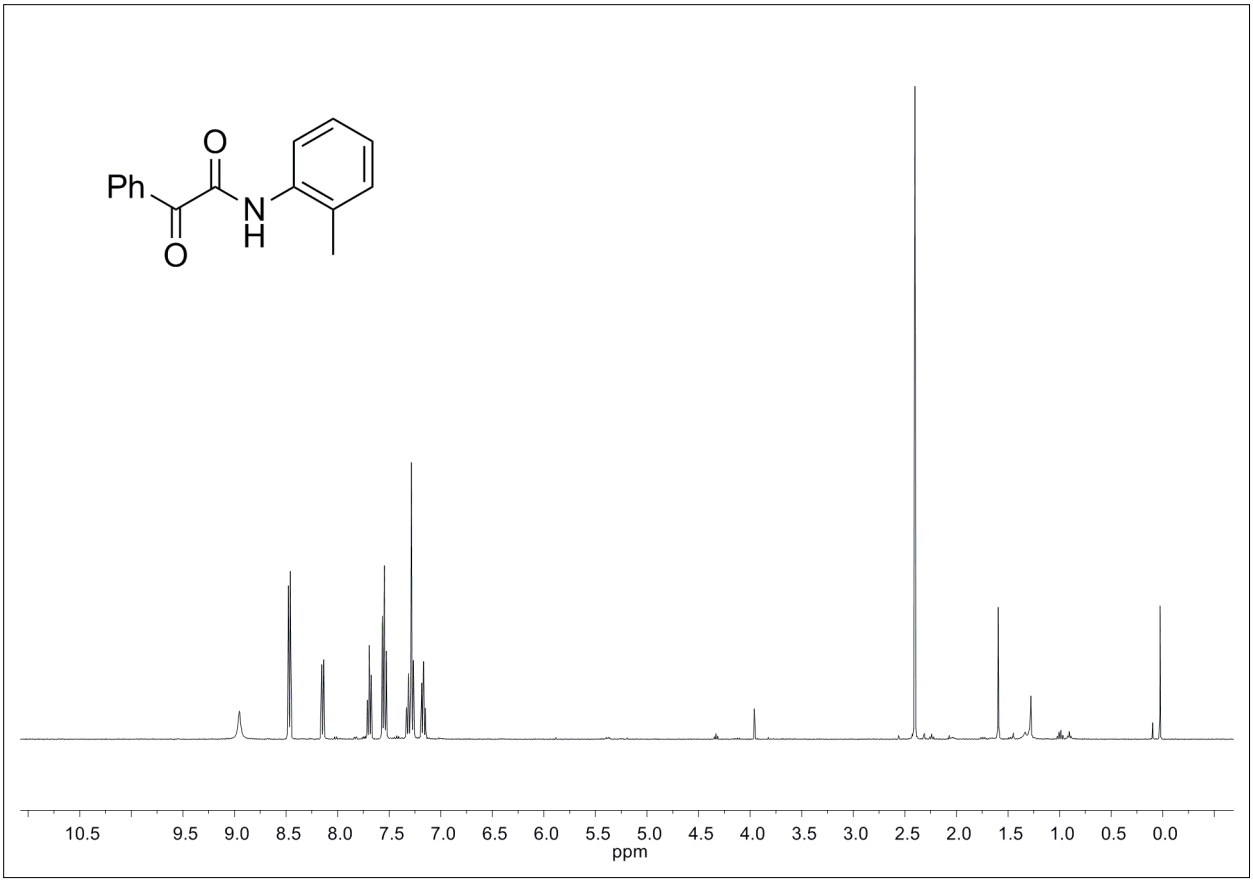
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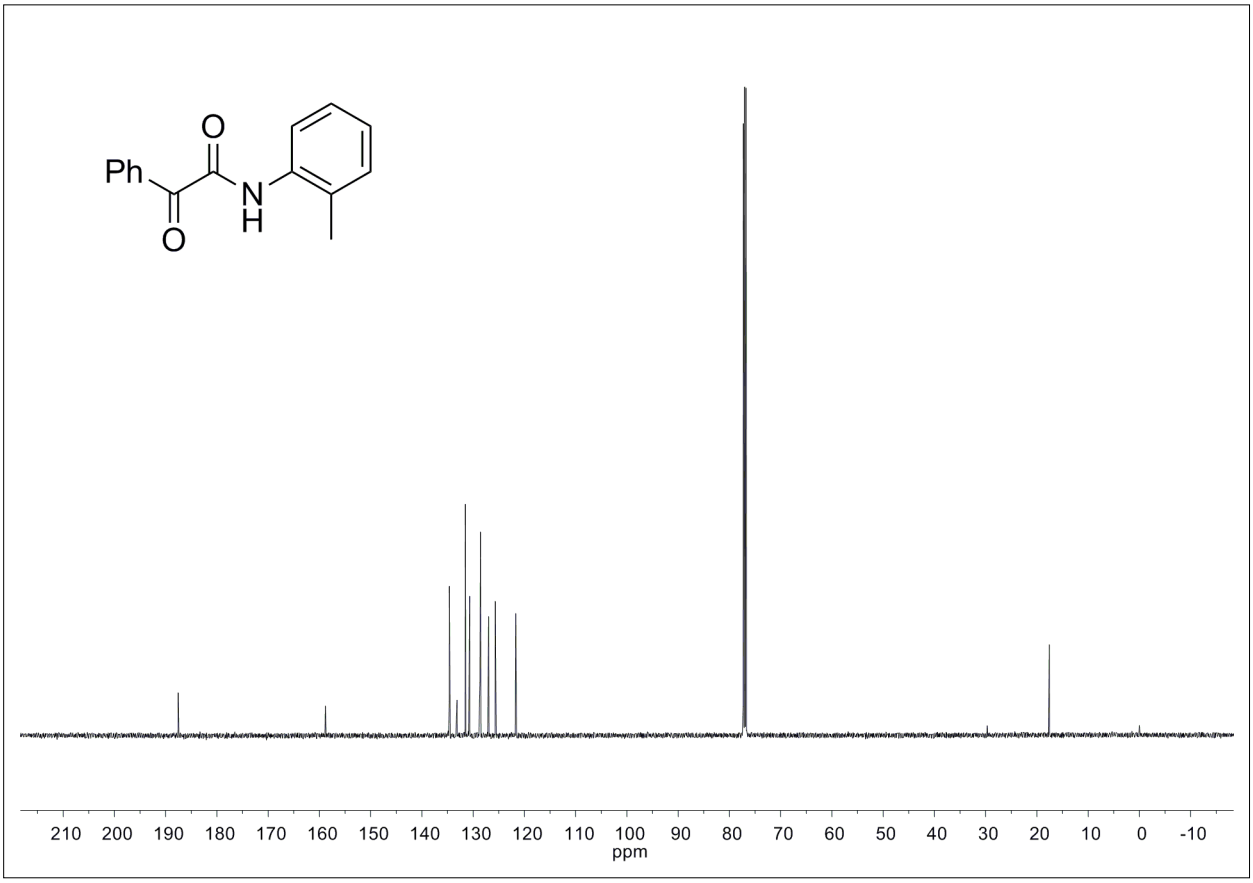
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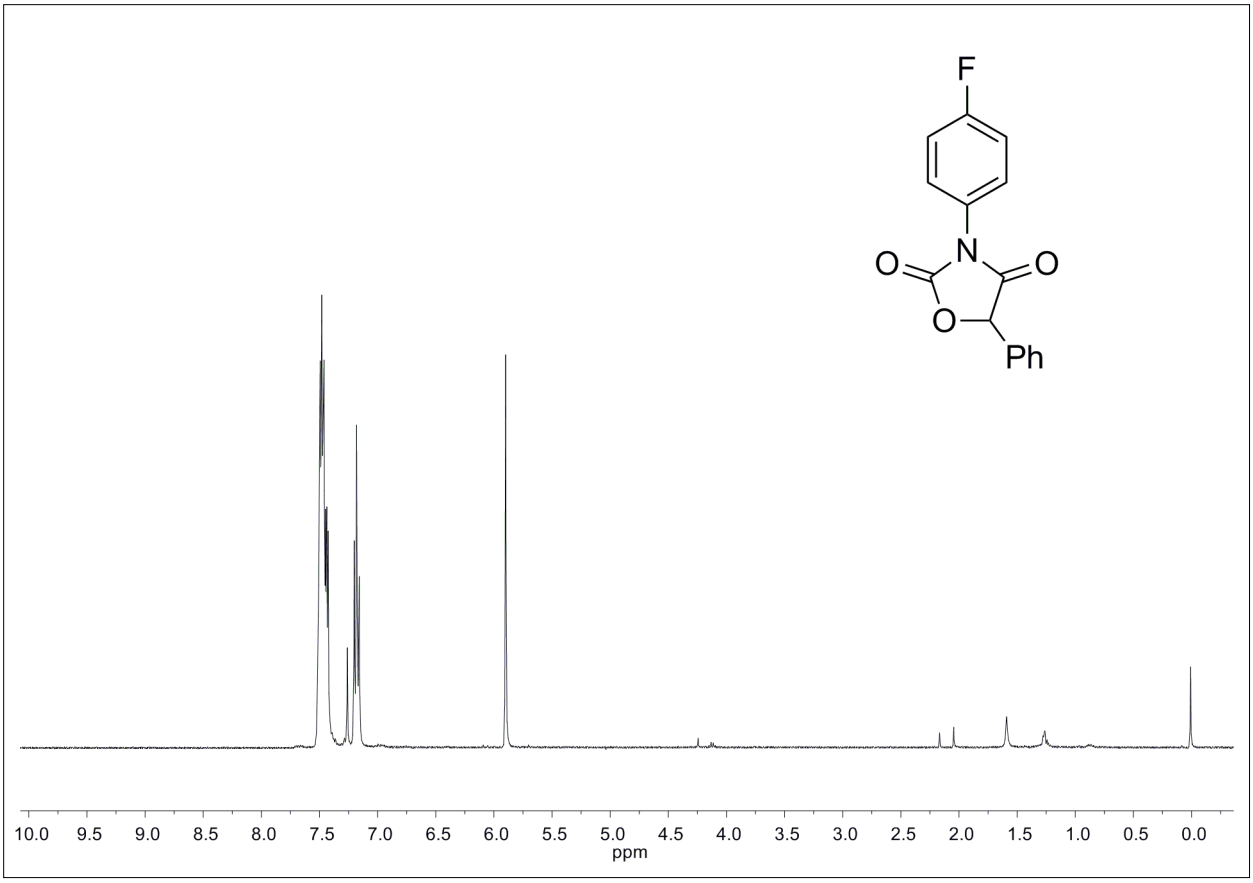
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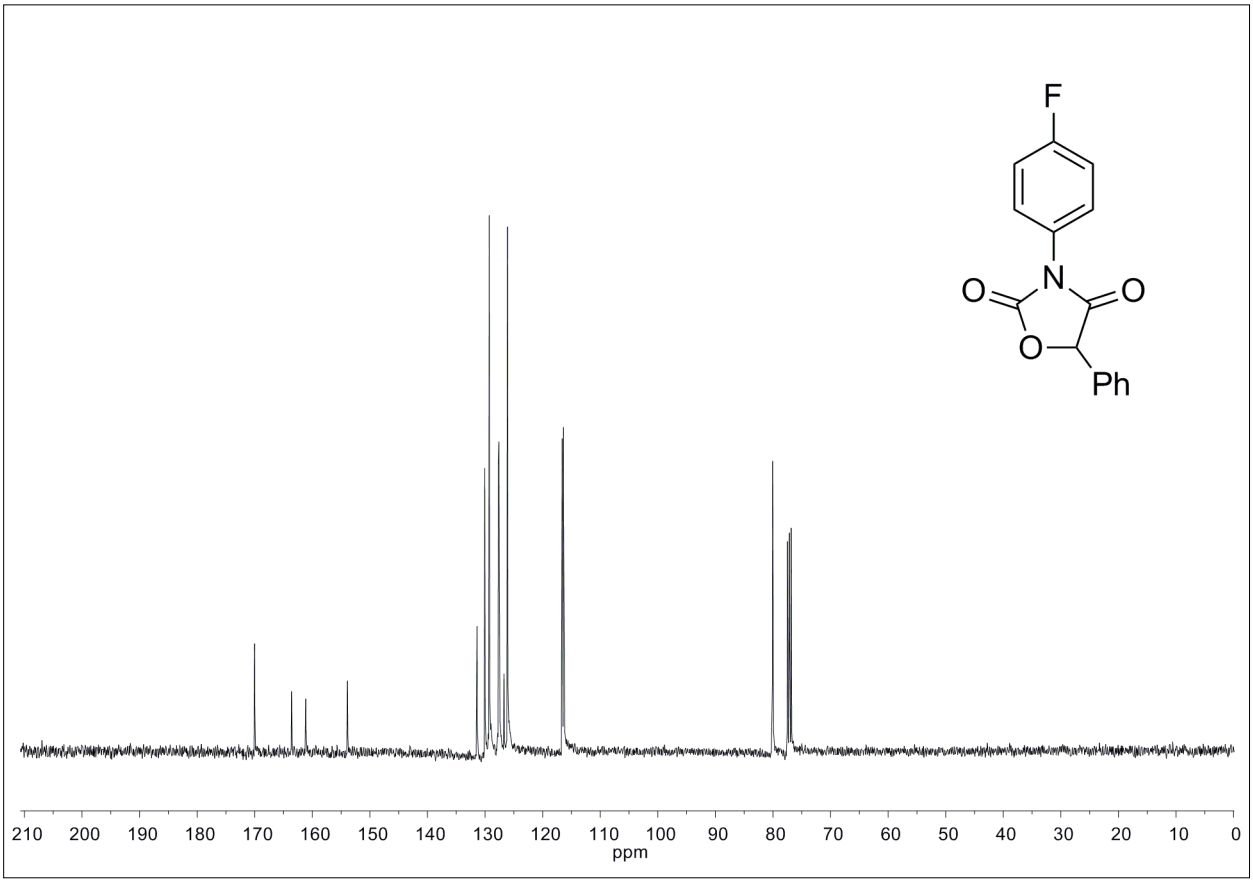
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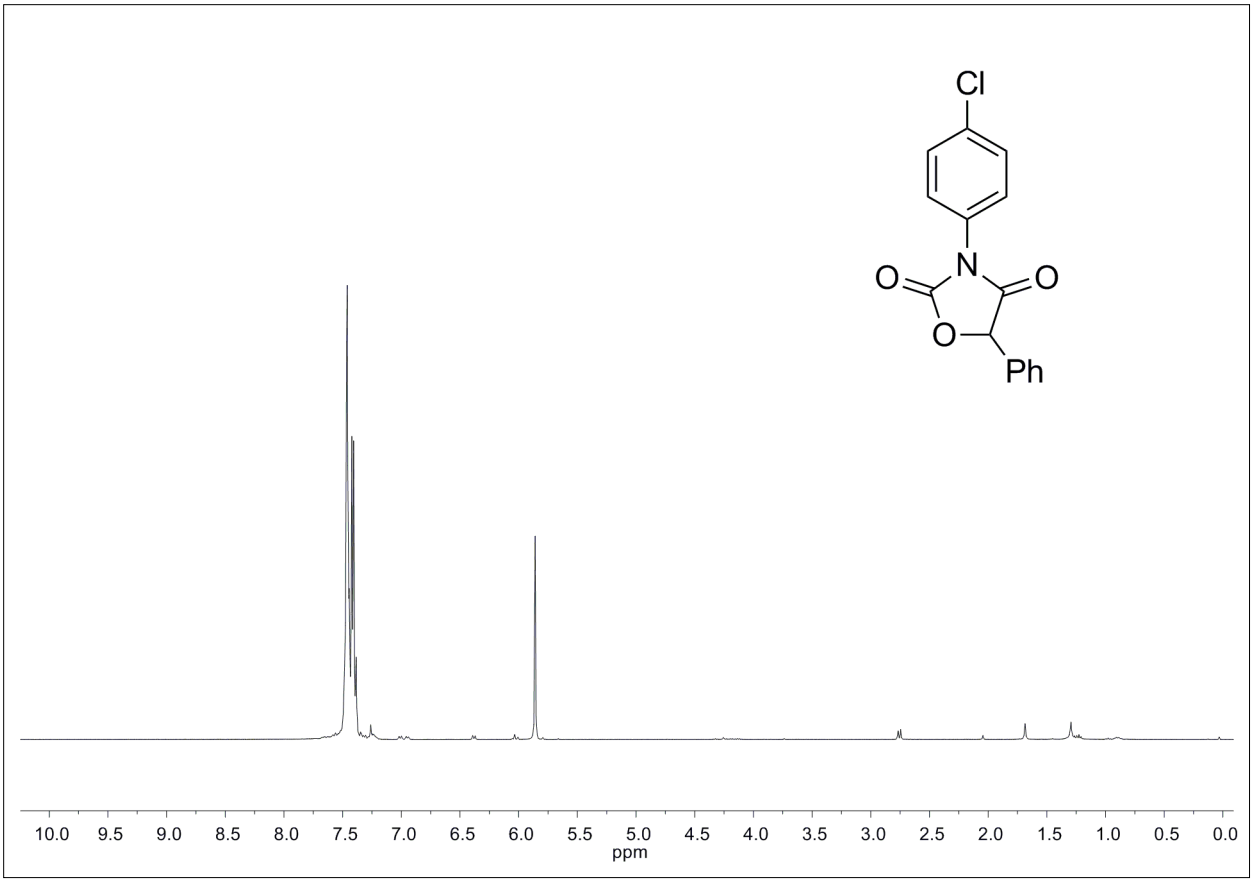
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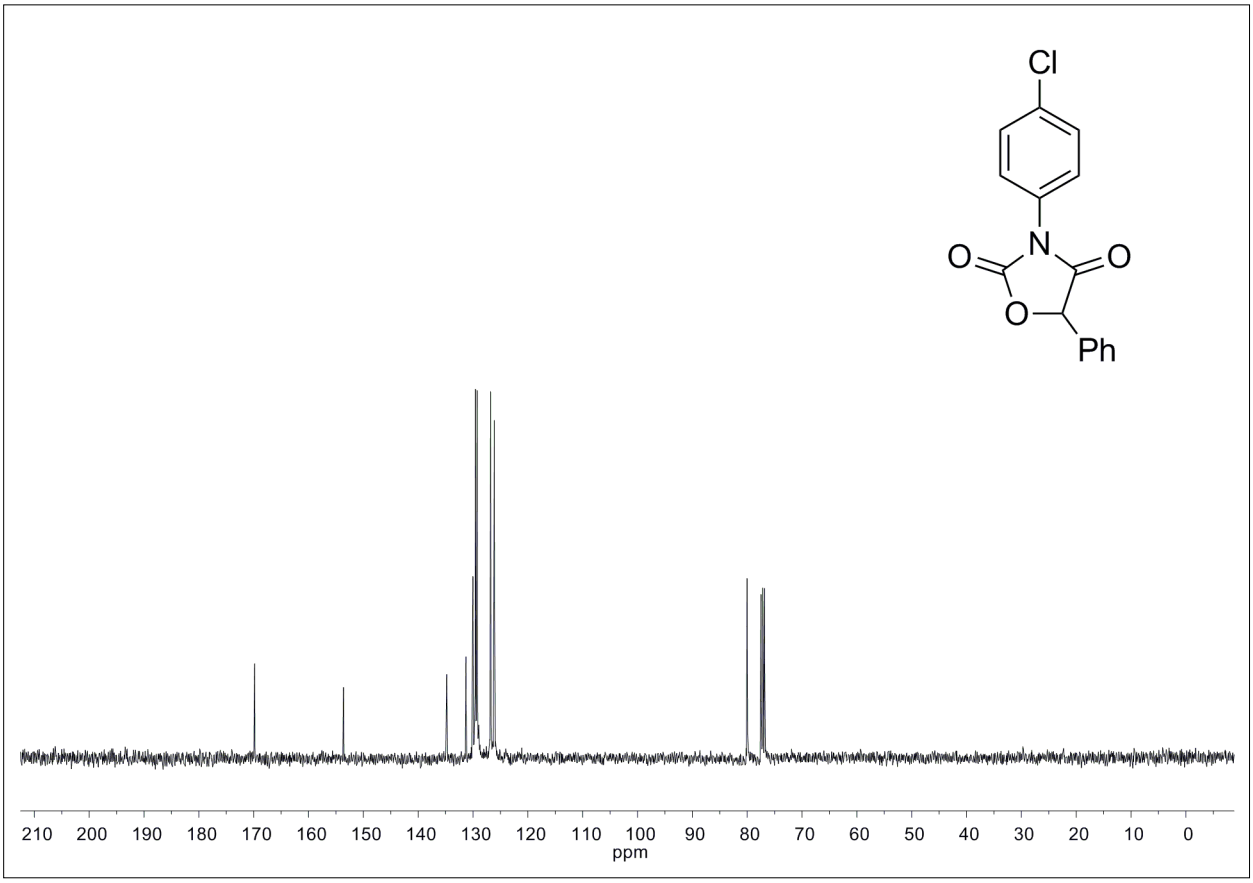
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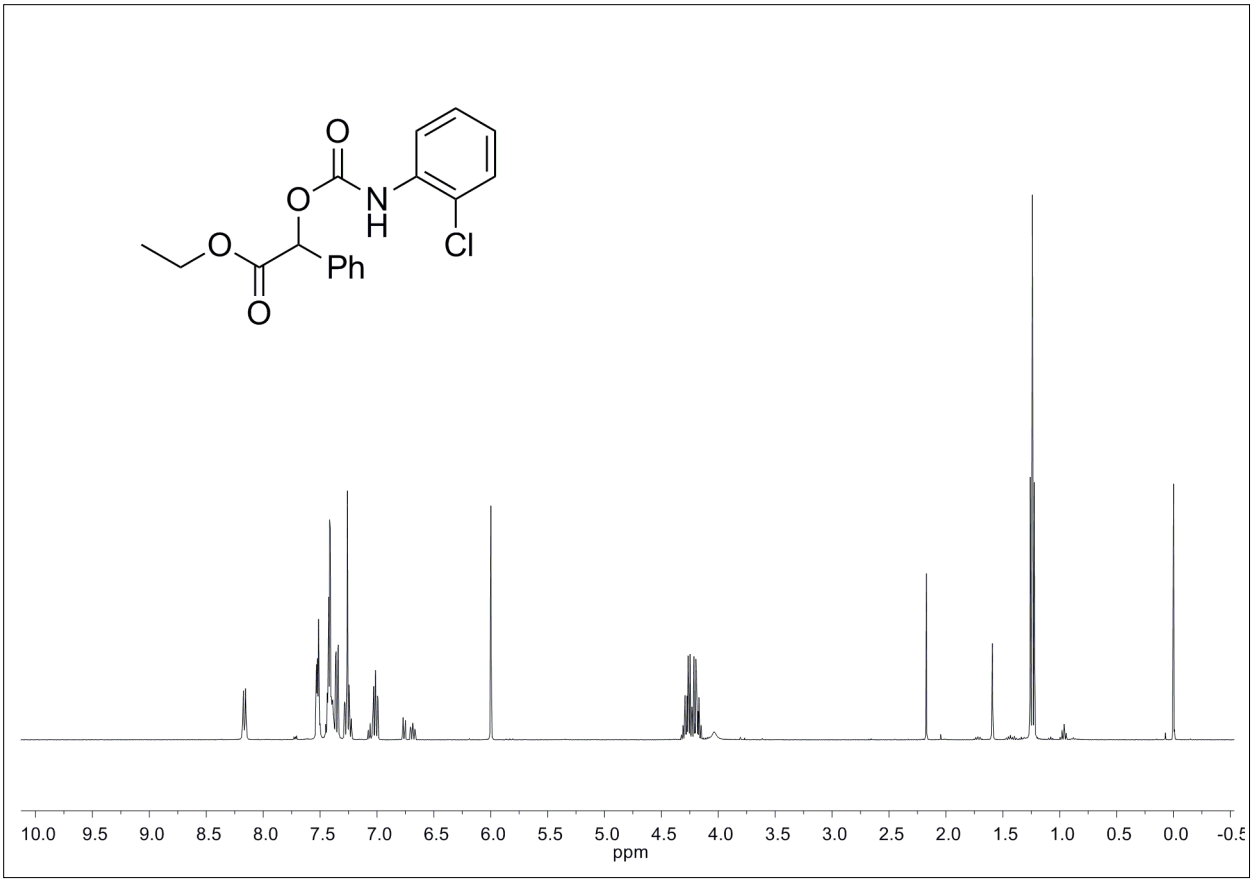
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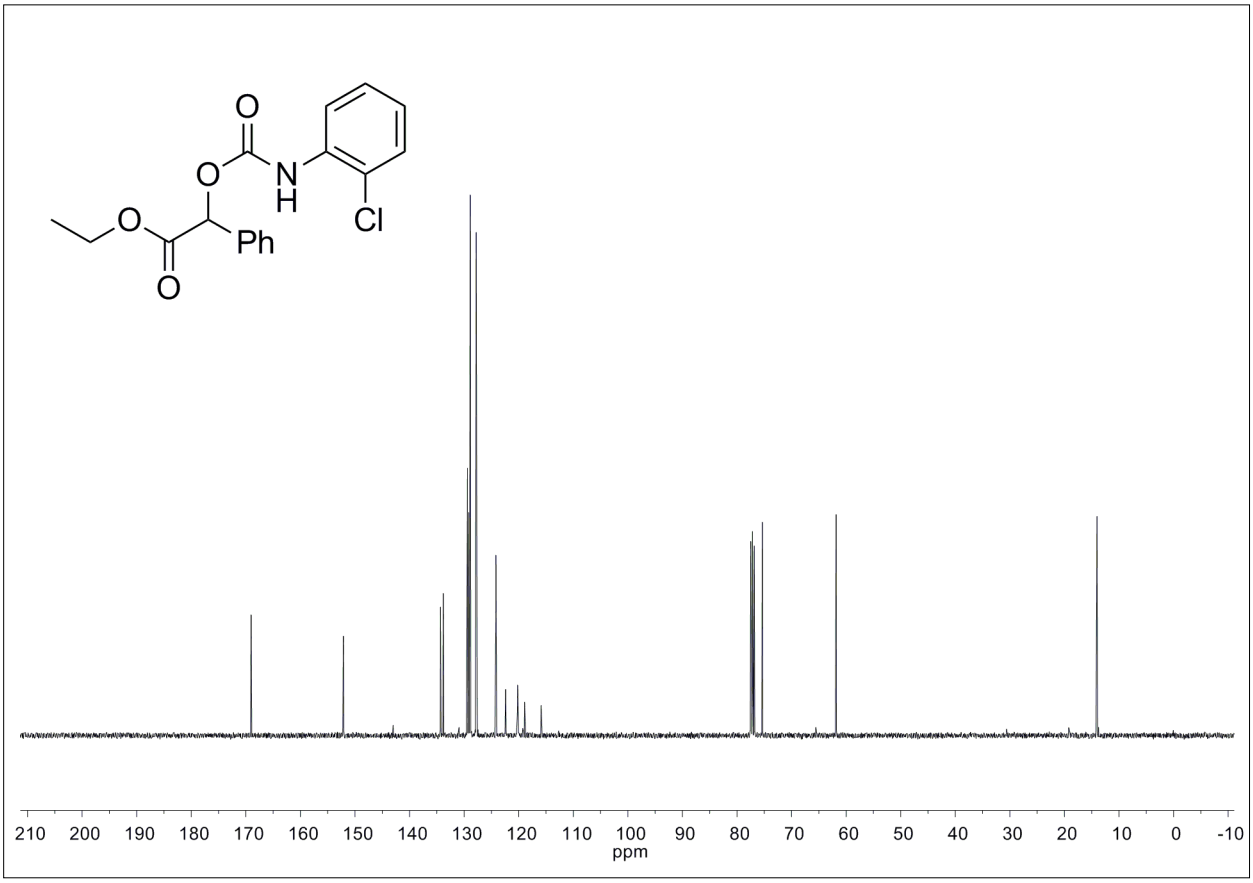
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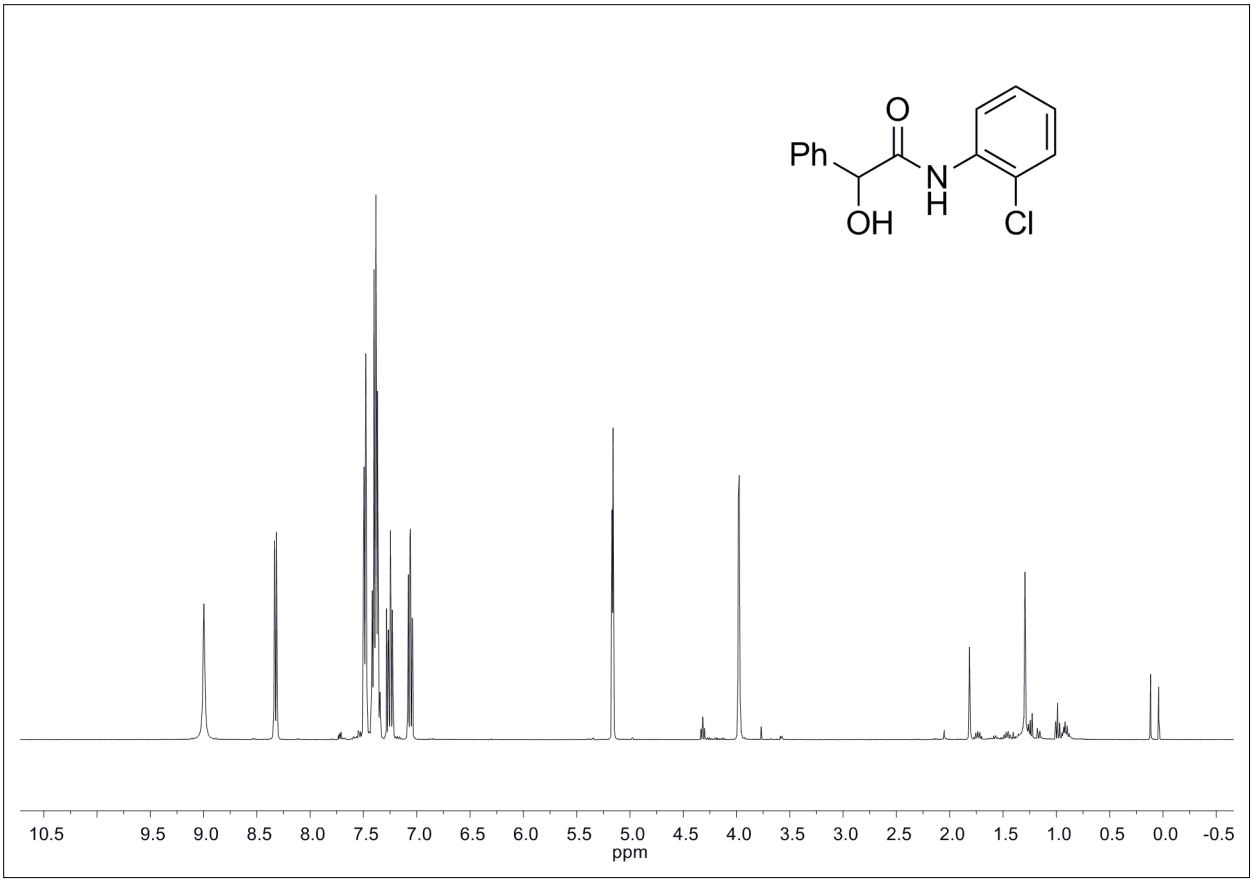
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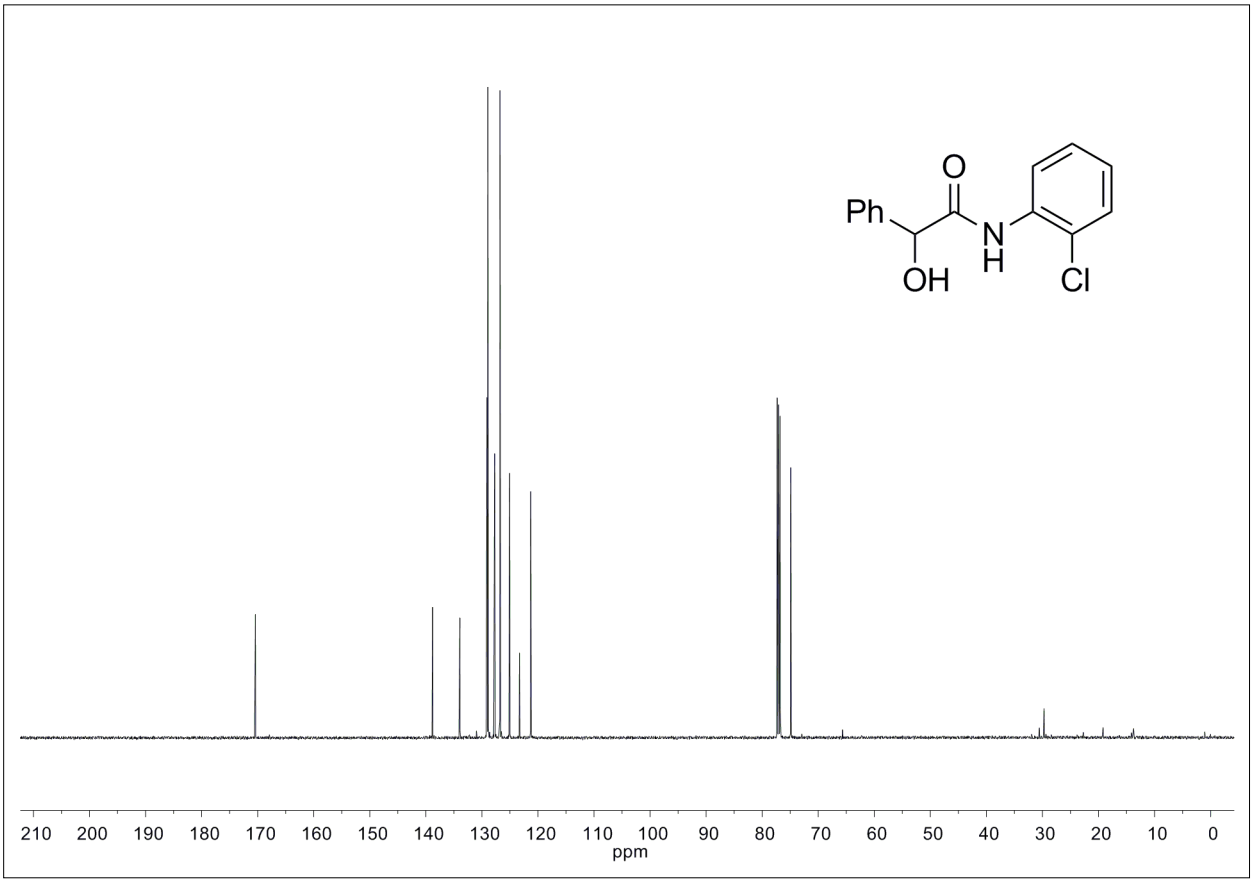
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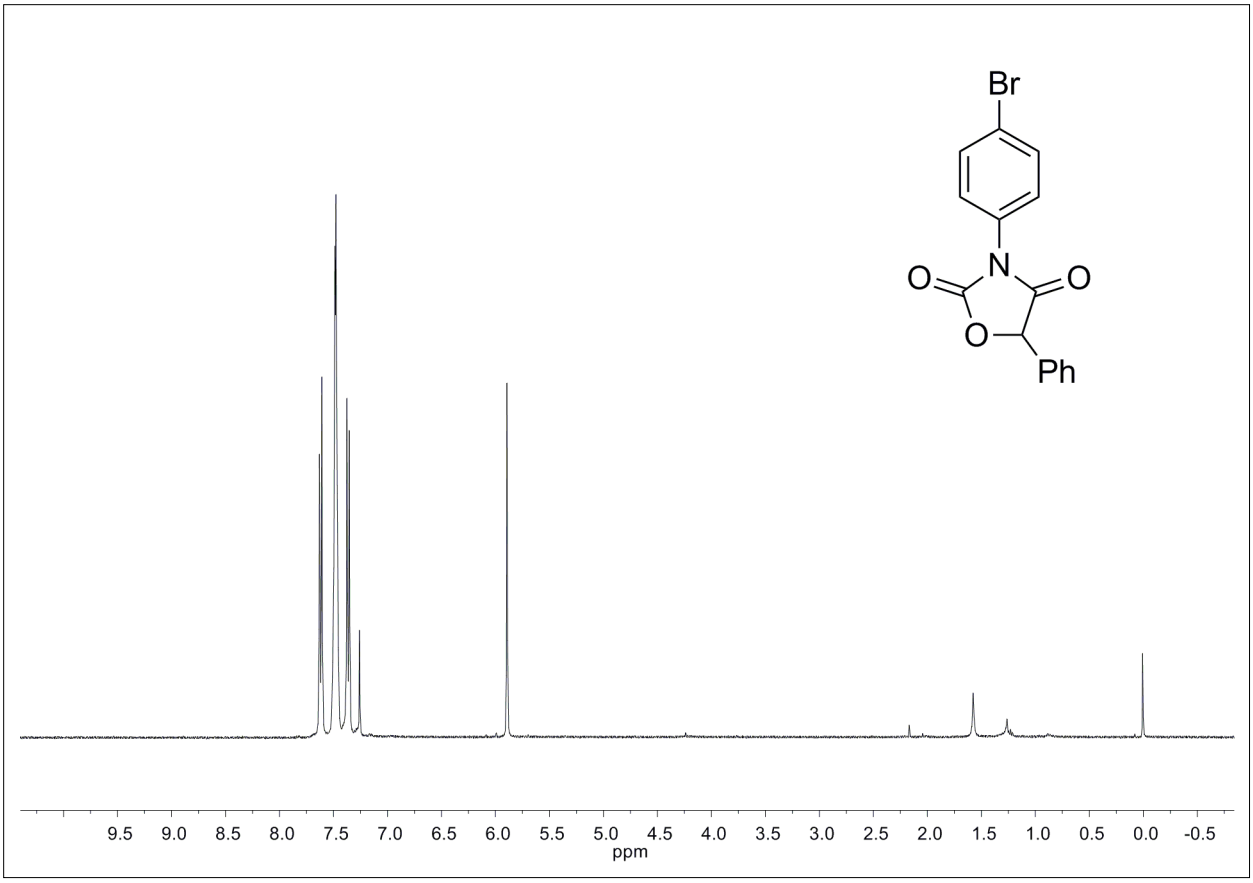
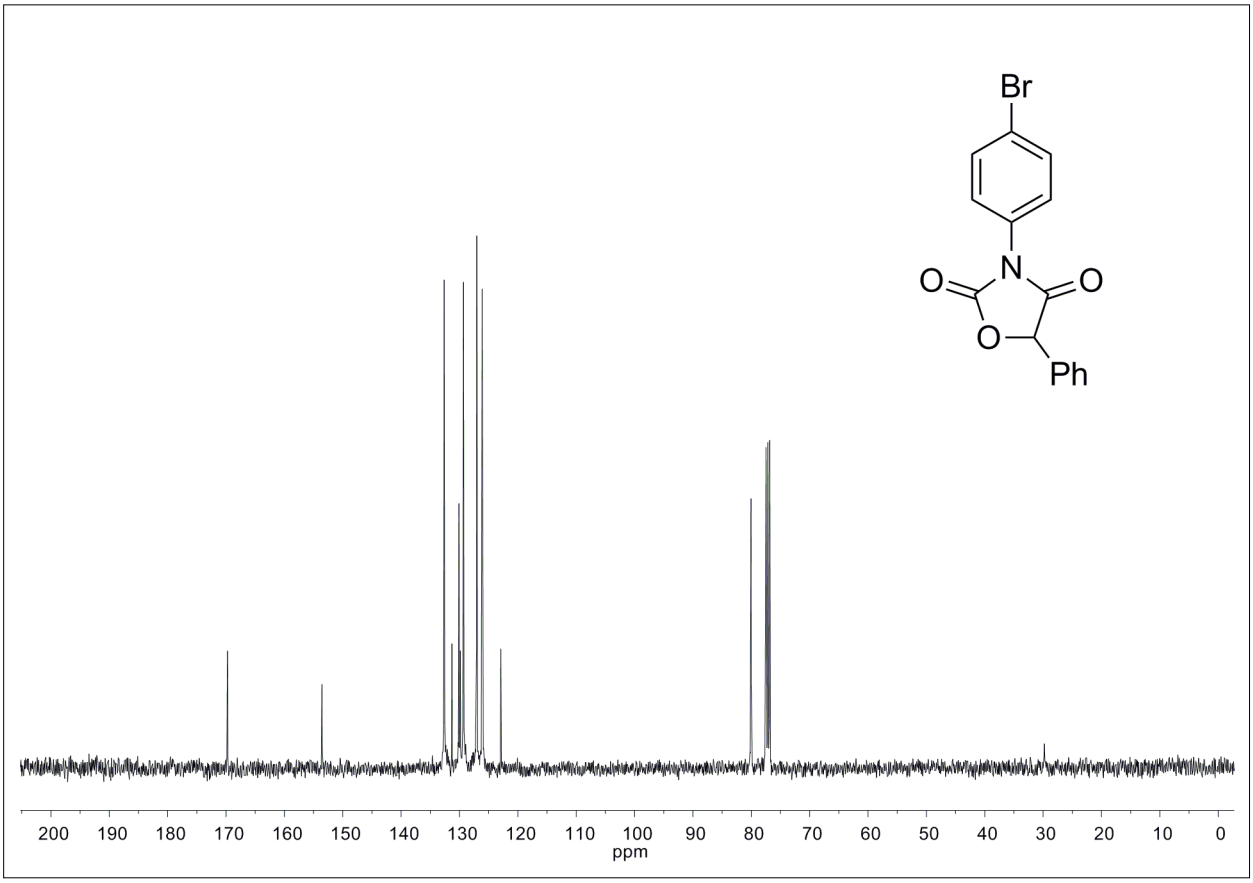

Br
N
O
O
O
Ph
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
ppm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O
Ph
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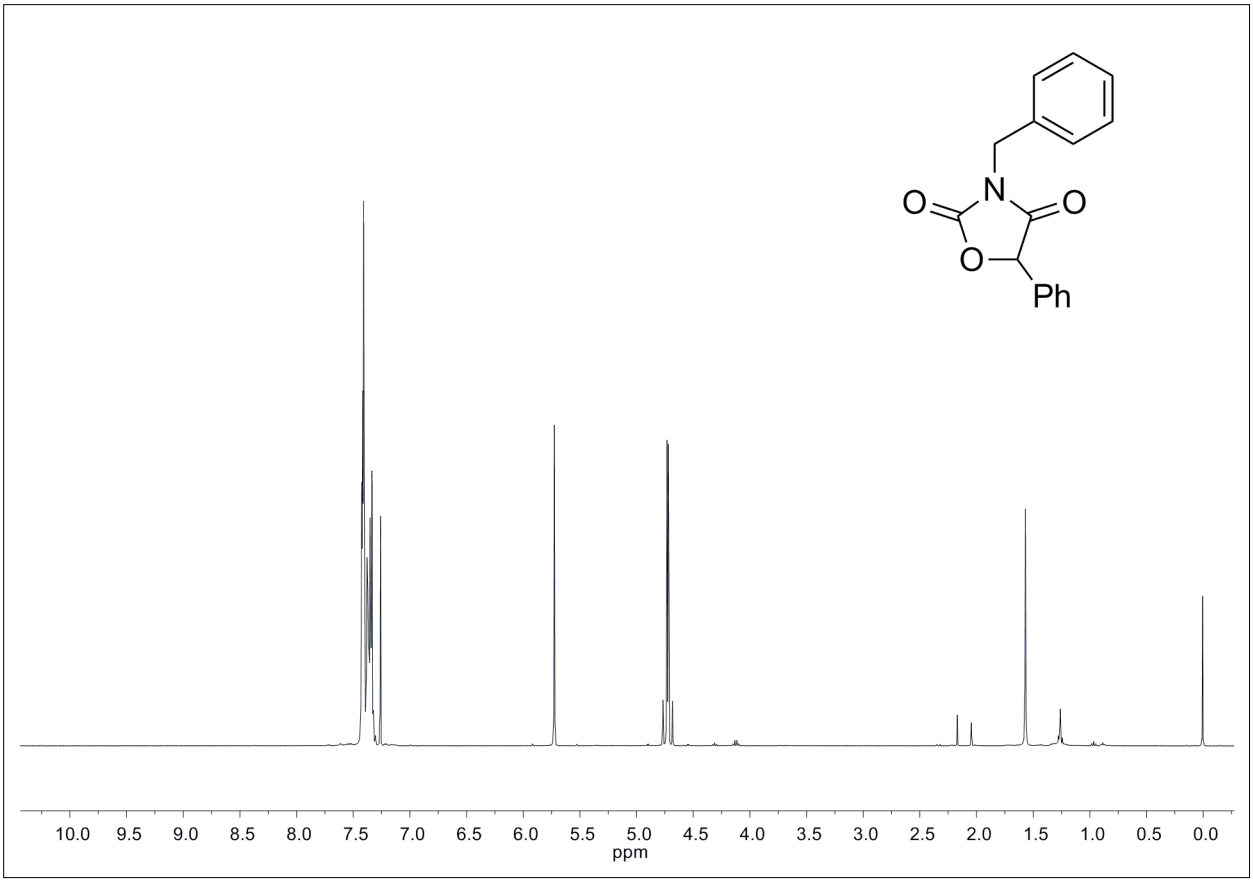
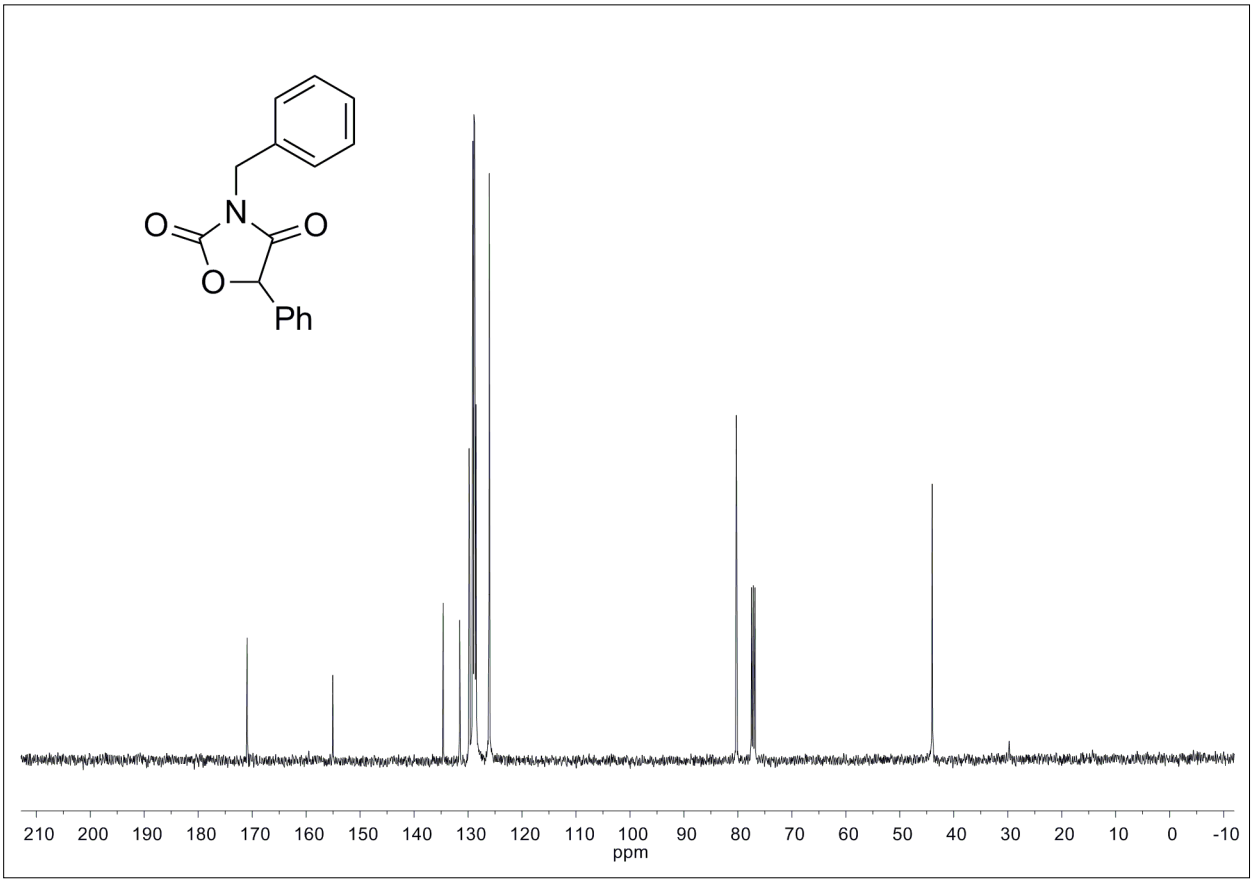

O
N
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm


O
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O
O
Ph
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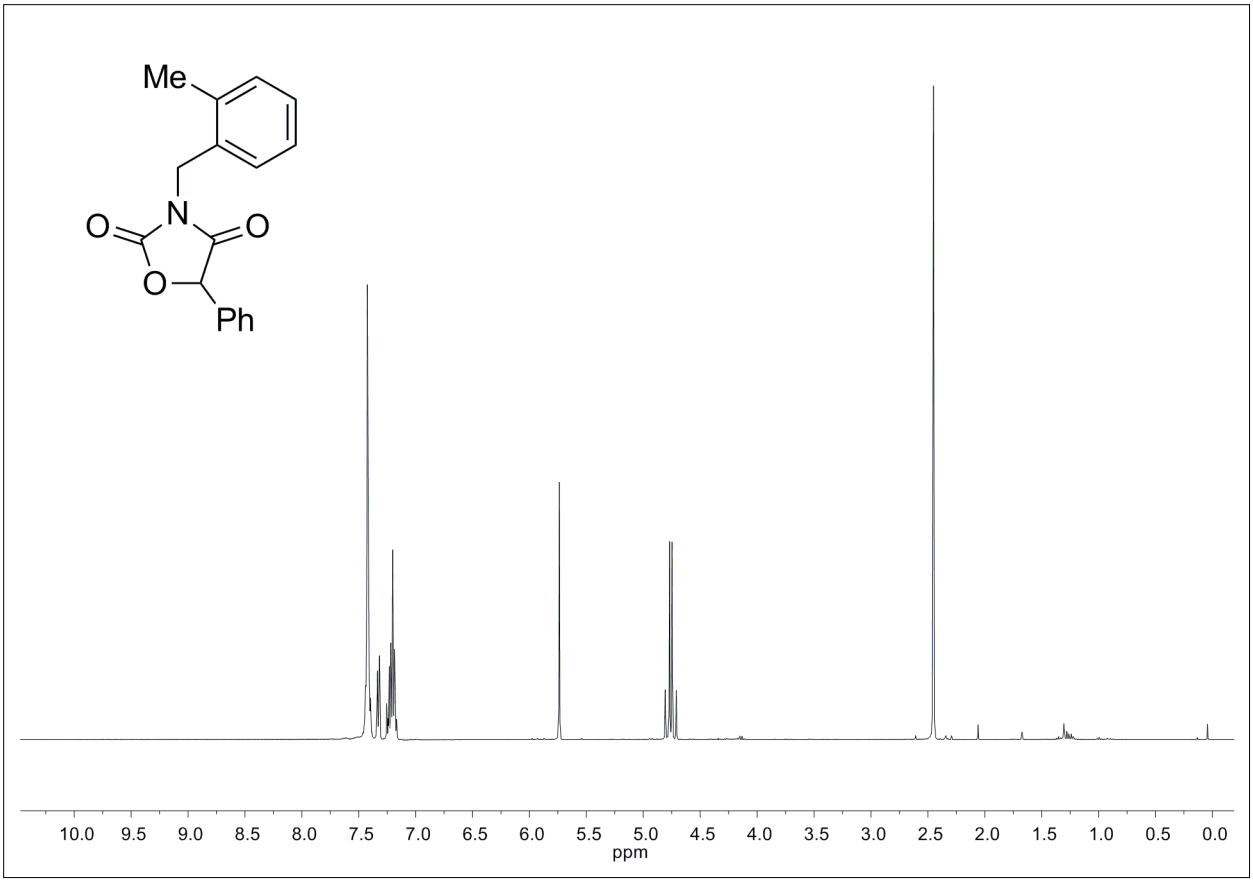
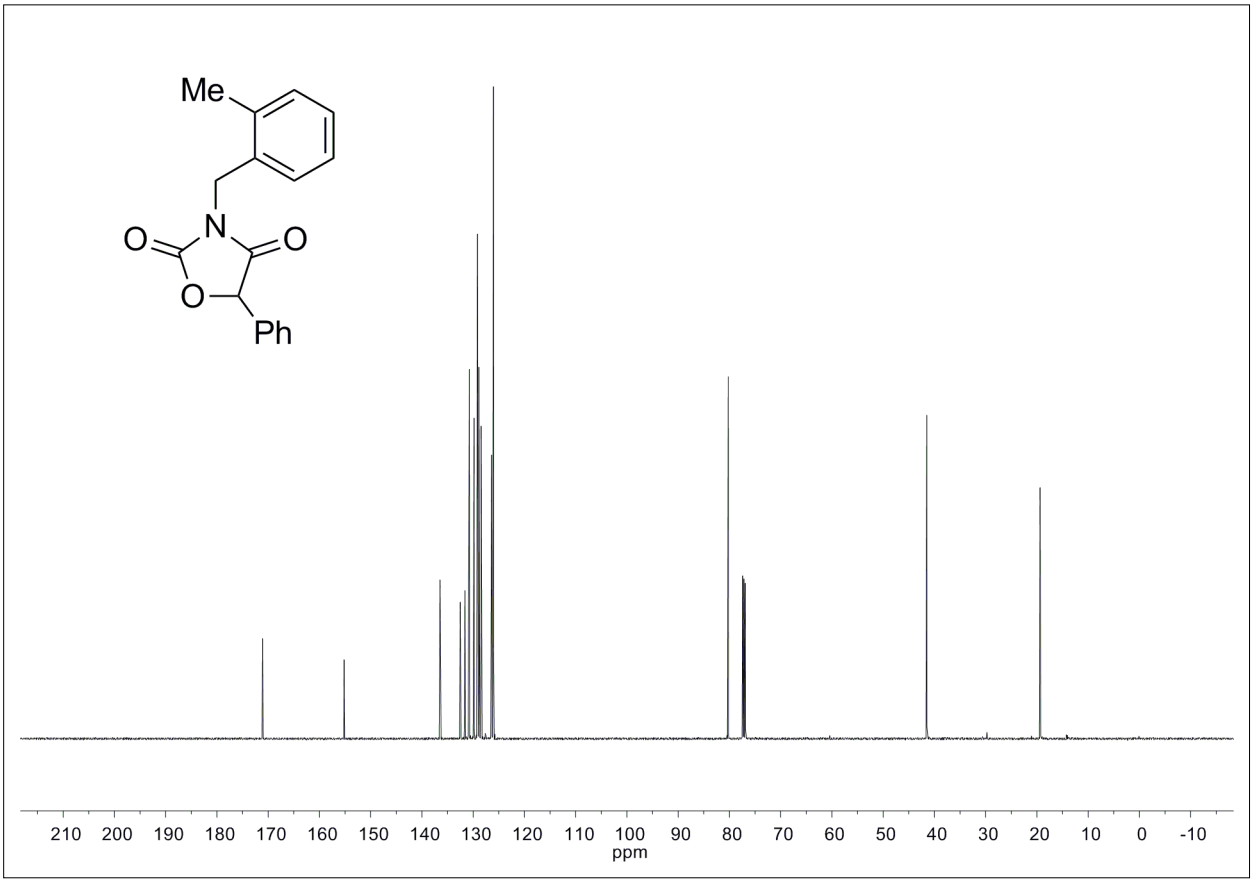
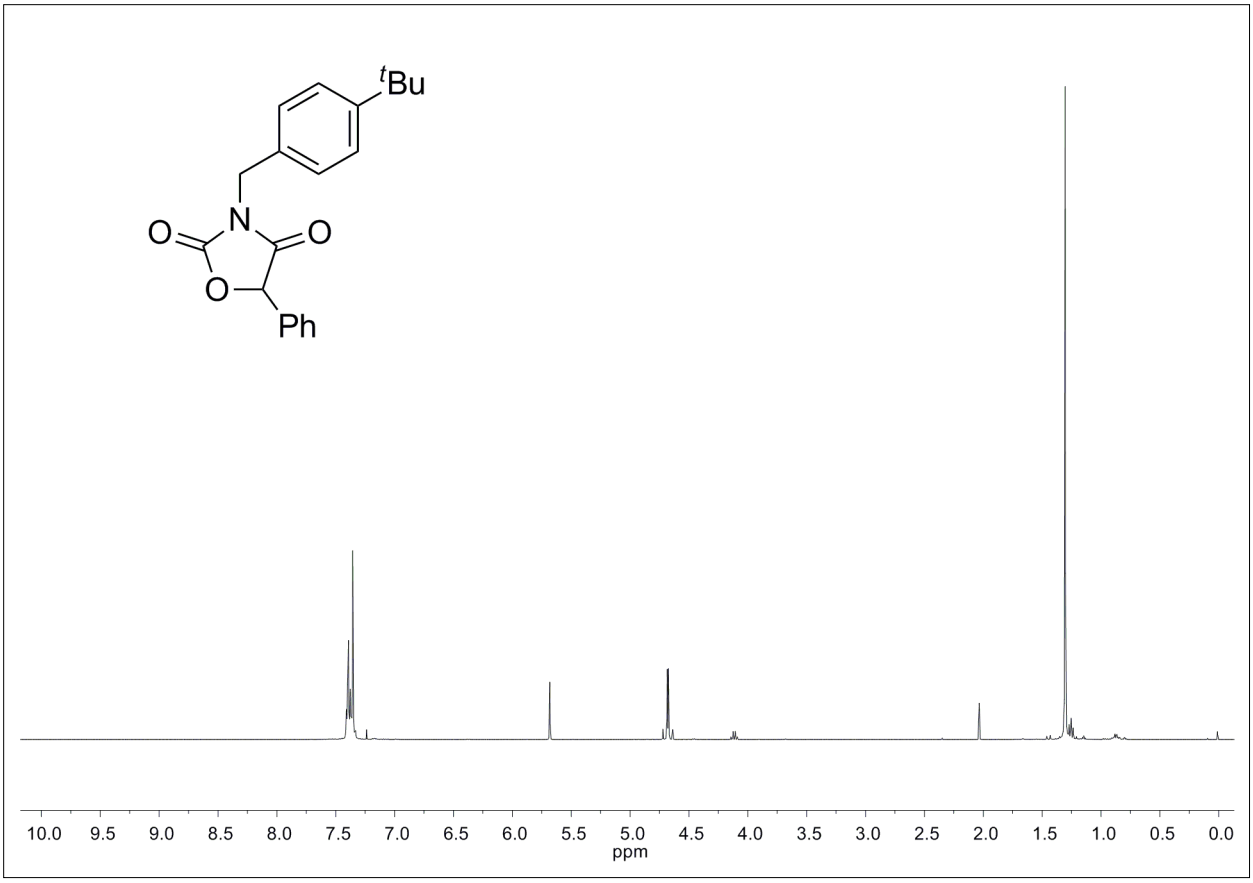
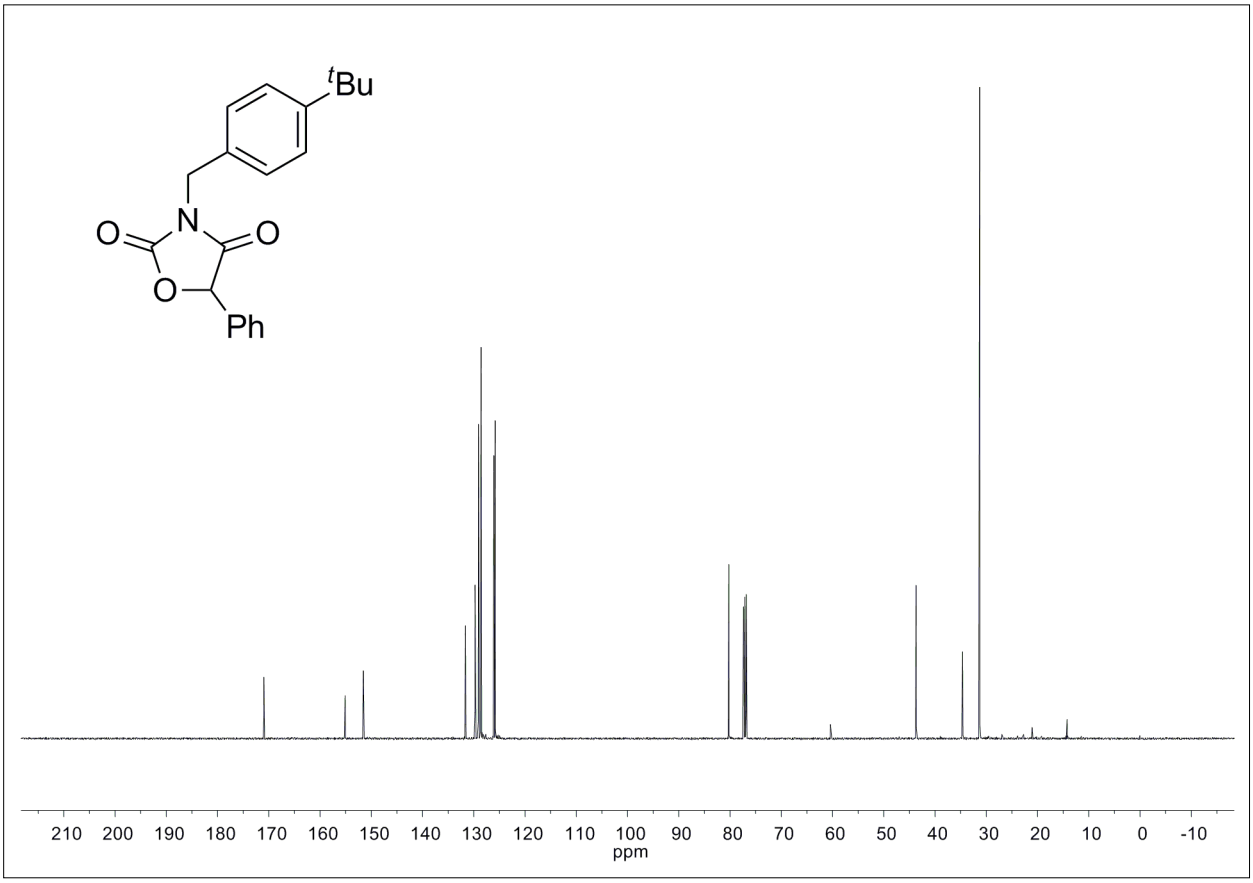
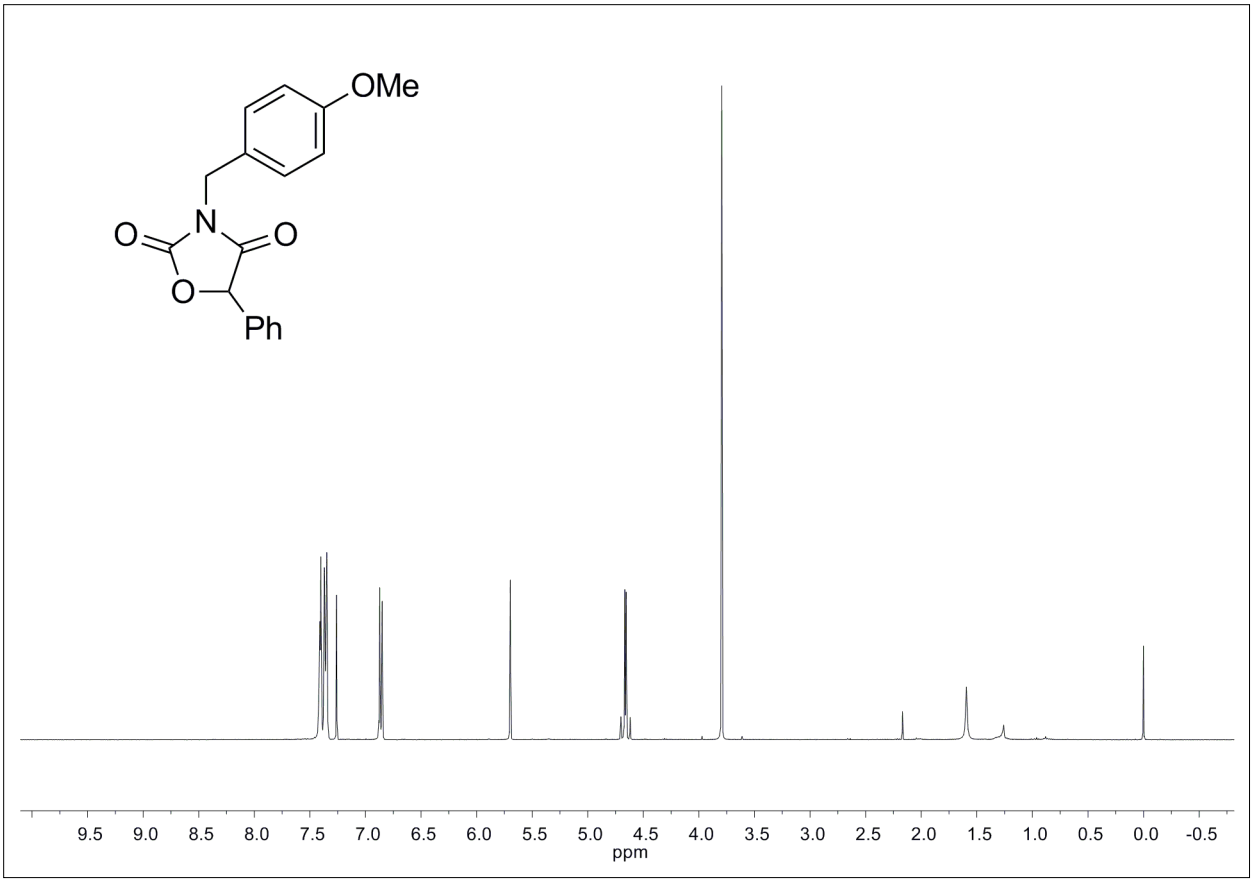
ppm

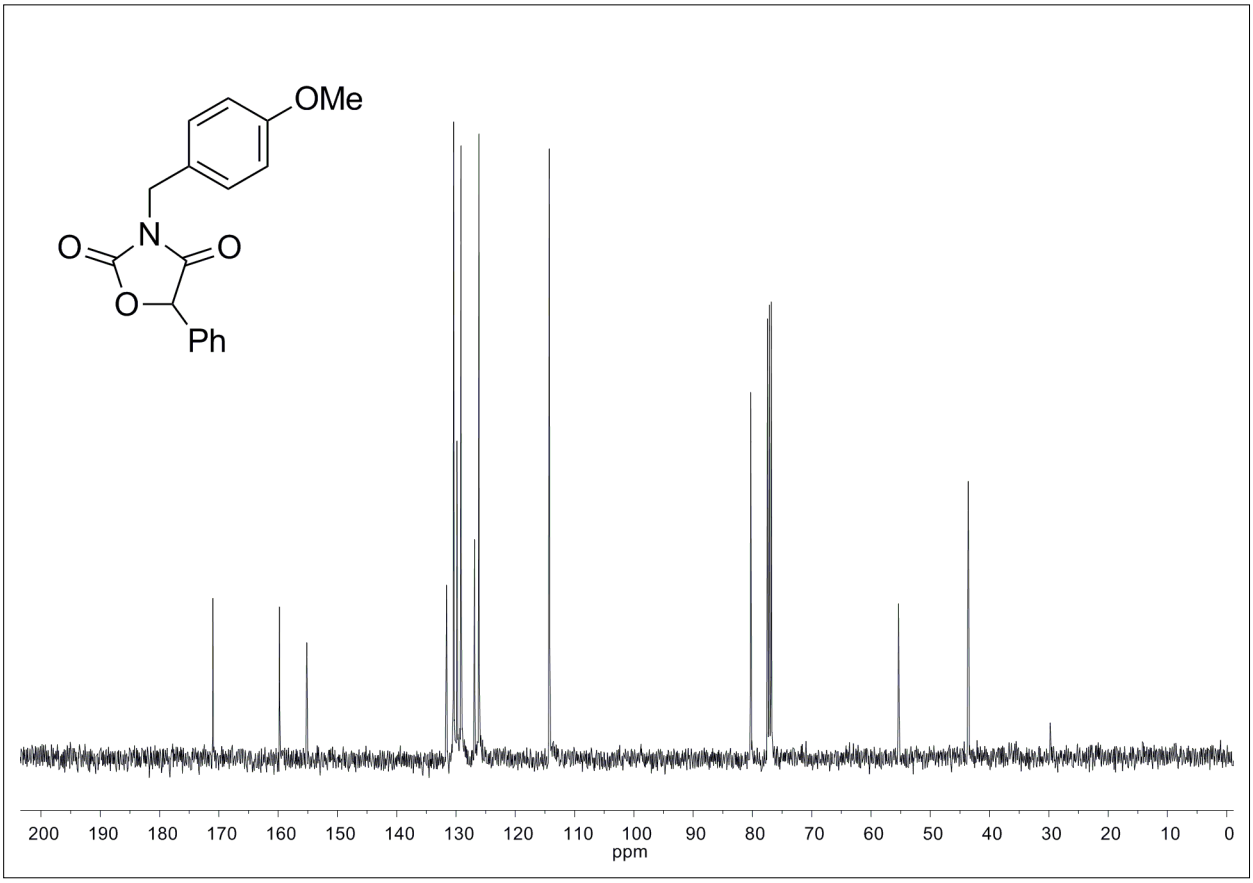

Me
N
O
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm

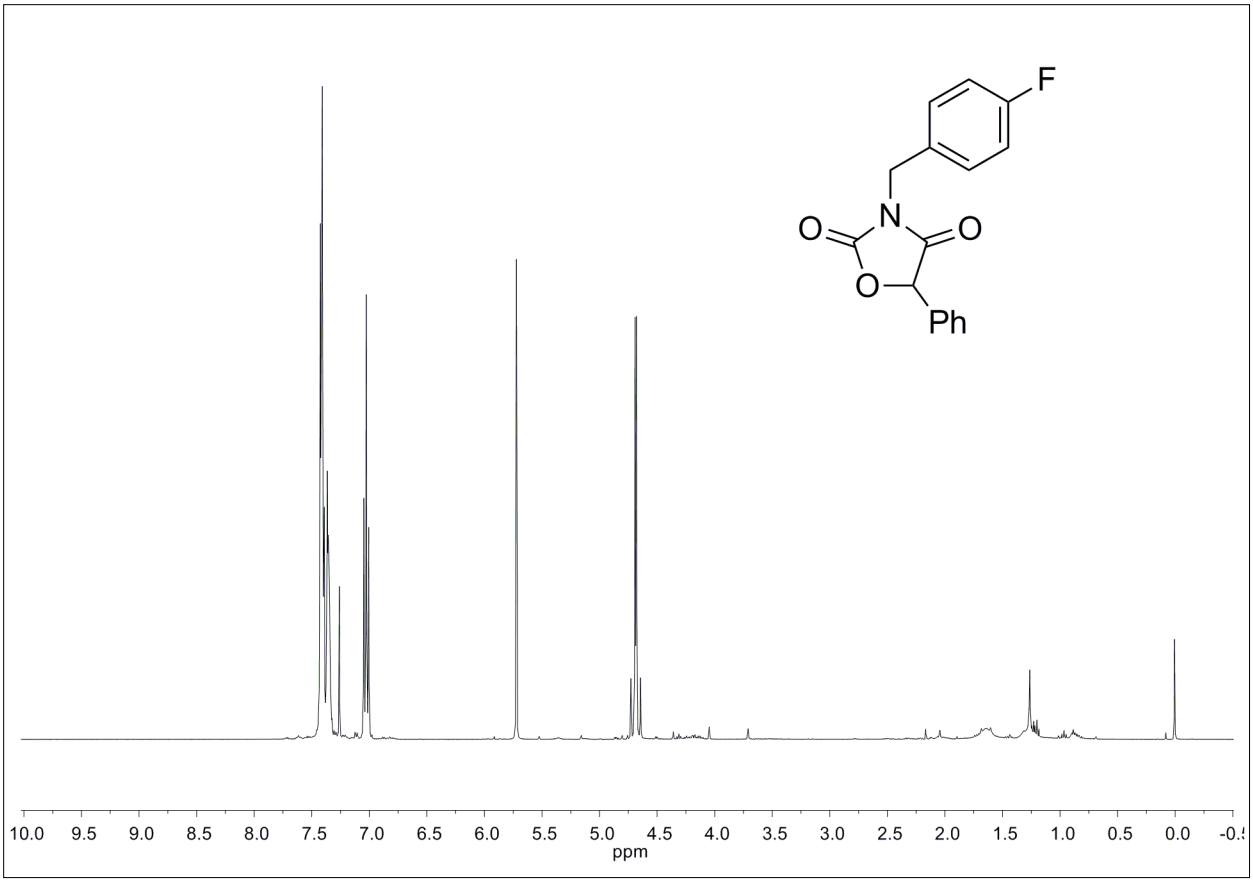

Me
N
O
O
O
Ph
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
ppm

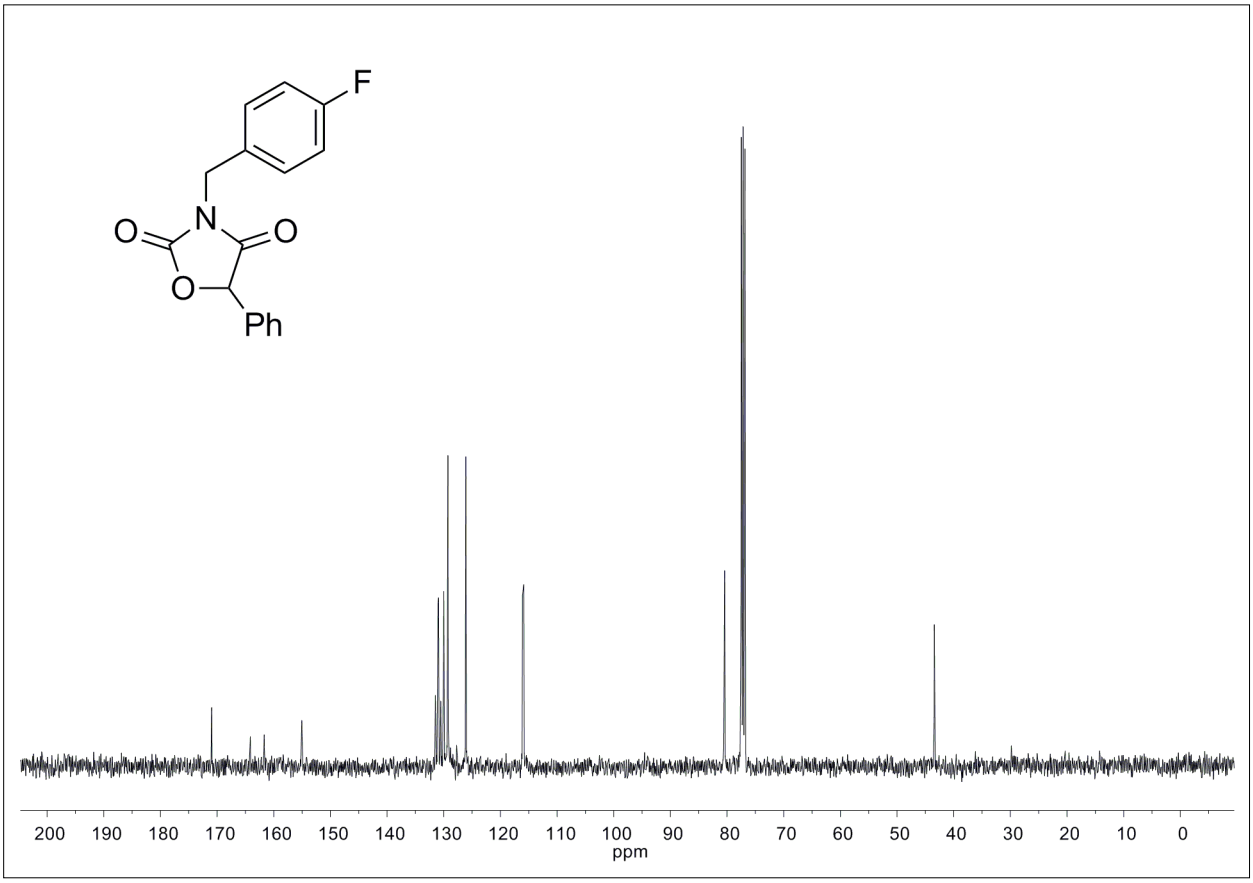

tBu
N
O
O
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm

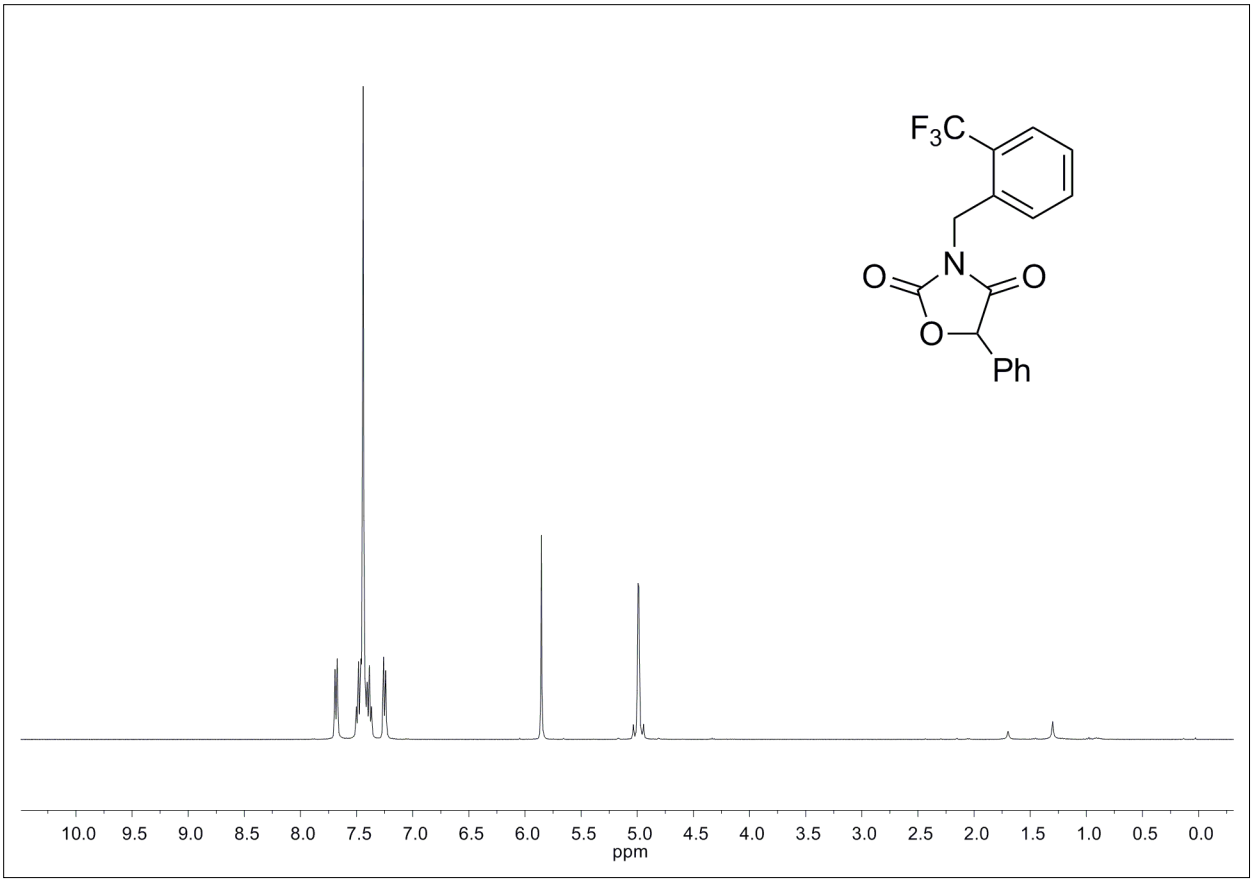

tBu
N
O
O
O
O
Ph
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
ppm

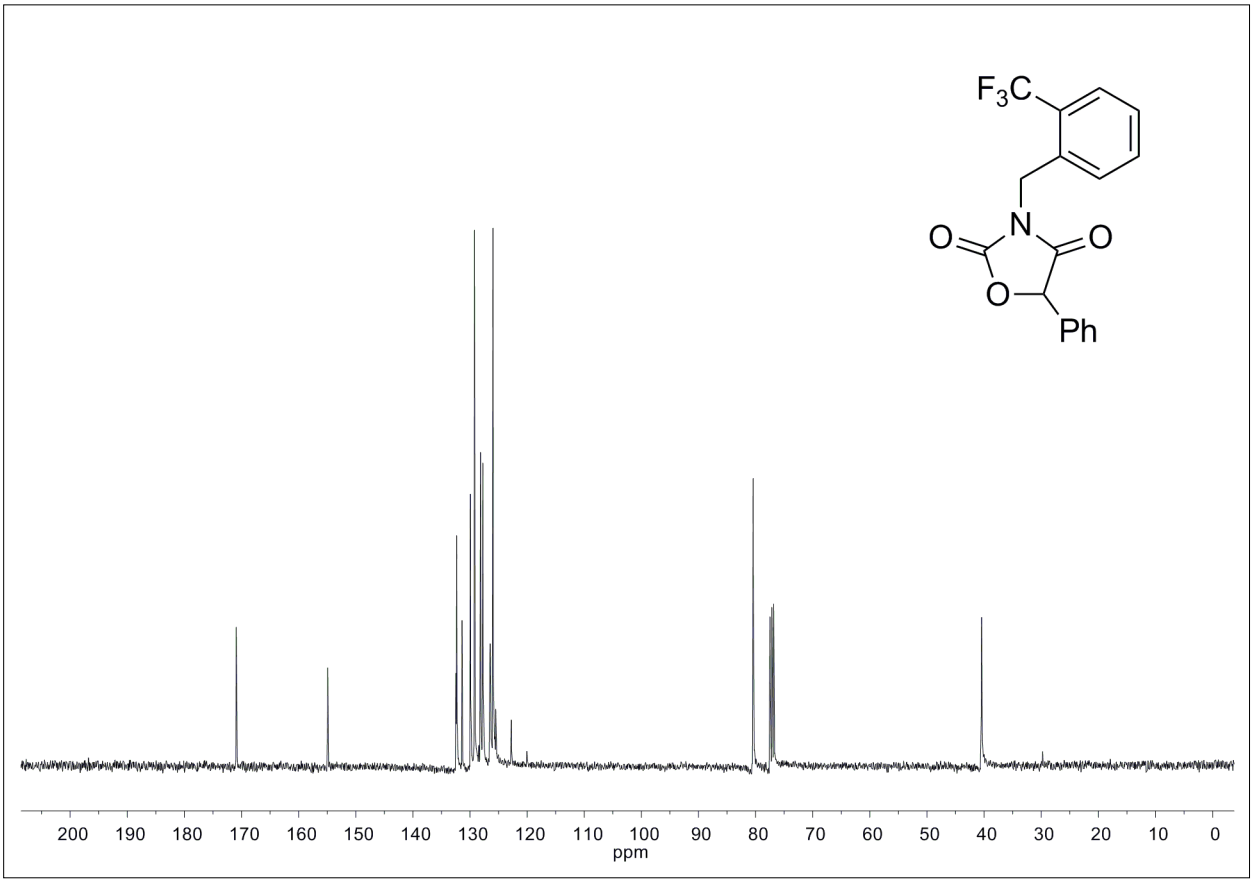

OMe
N
O
O
O
Ph
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
ppm

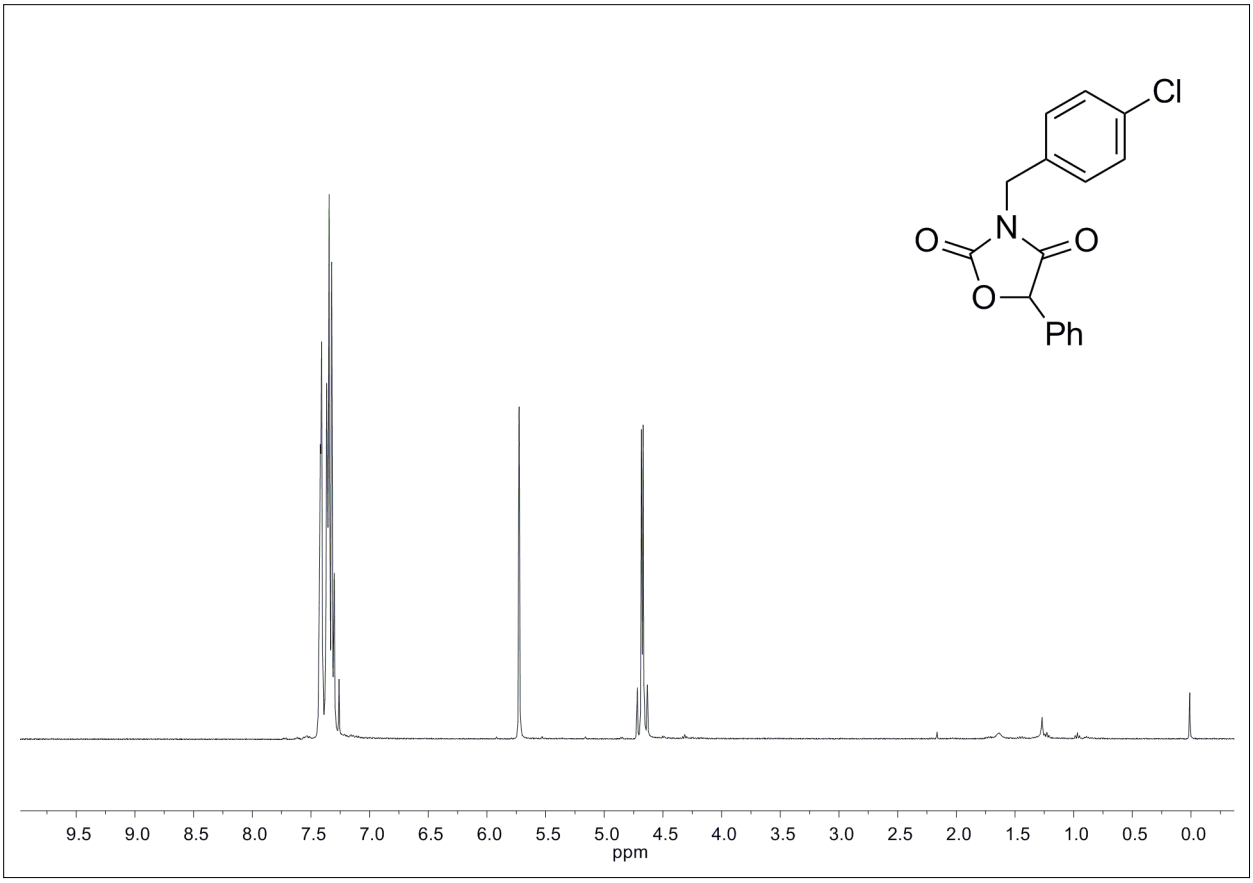

OMe
N
O
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm

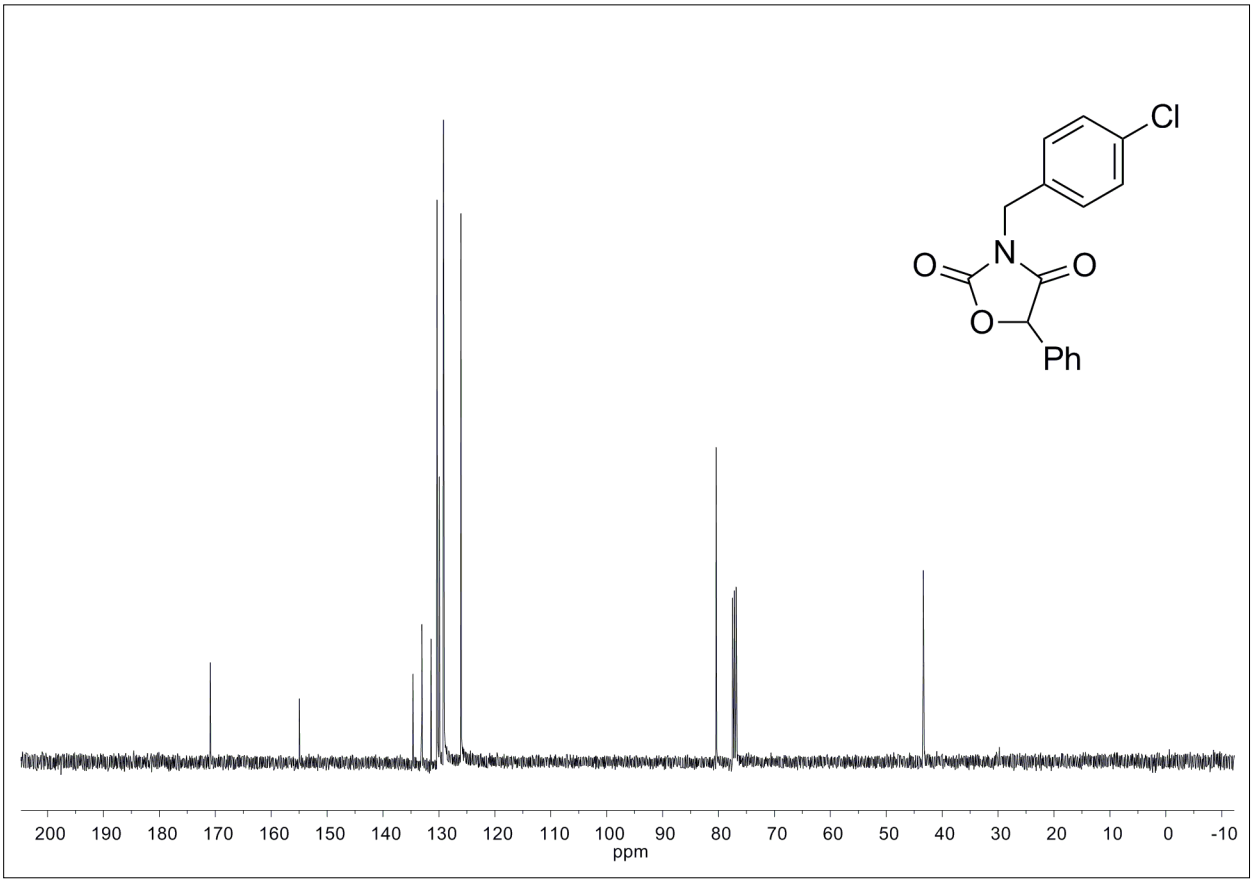

F
N
O
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm

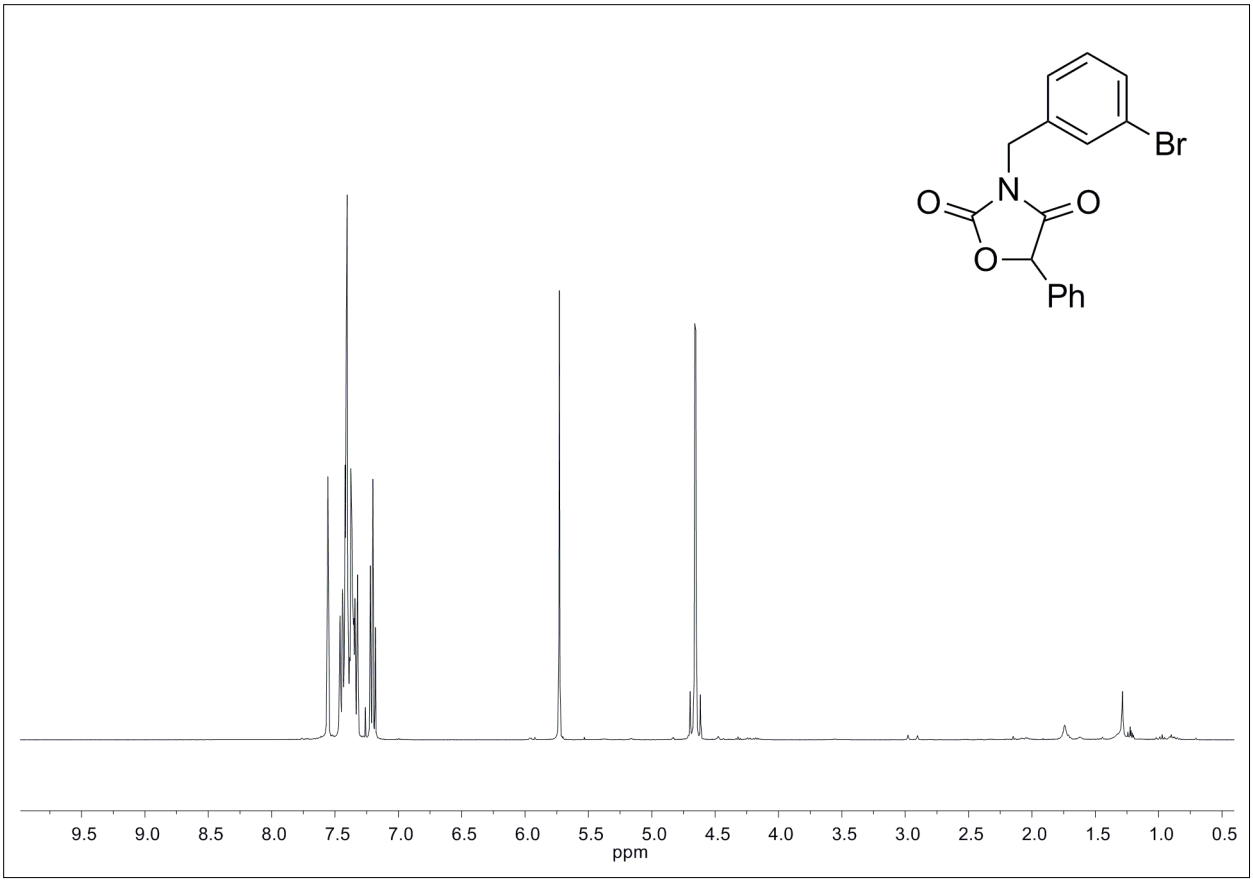

F
N
O
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm

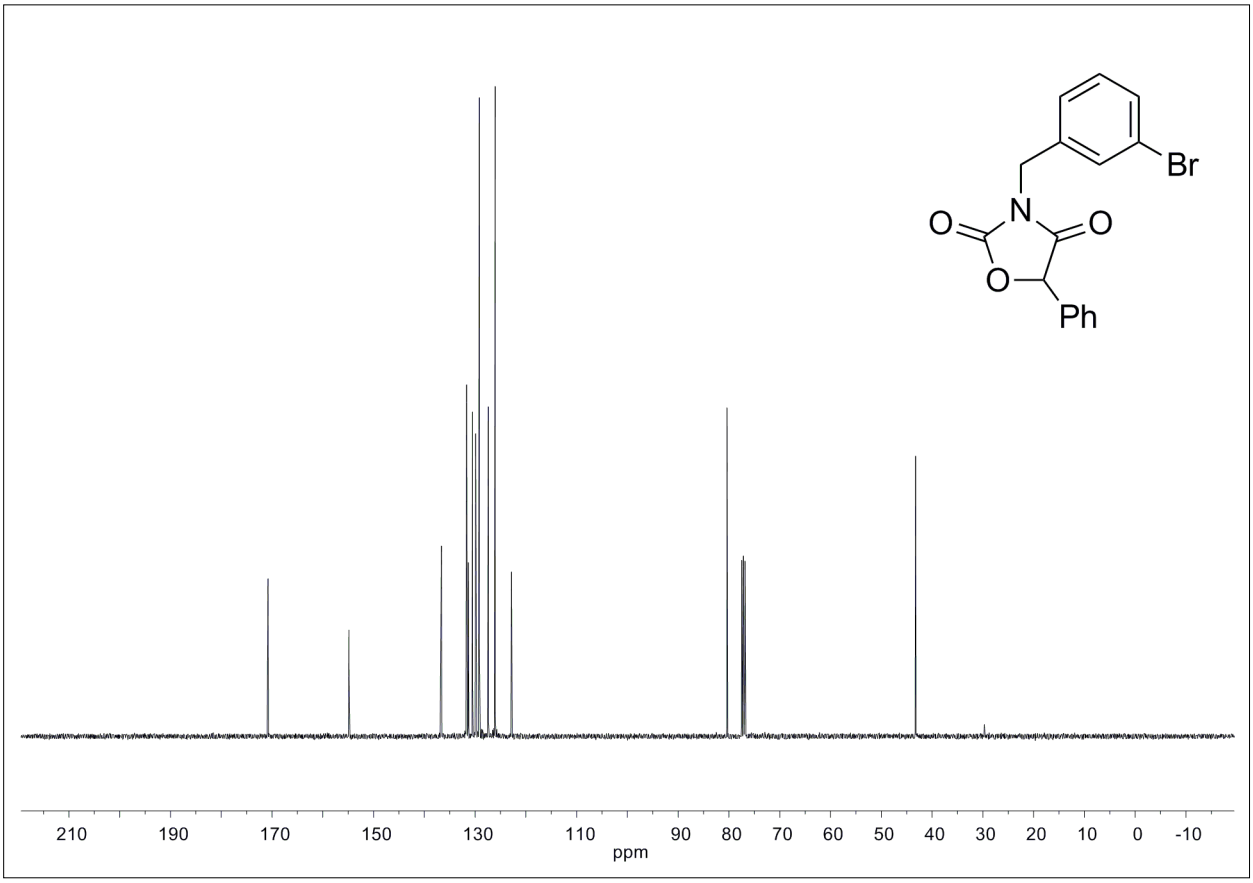

F3C
N
O
O
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm

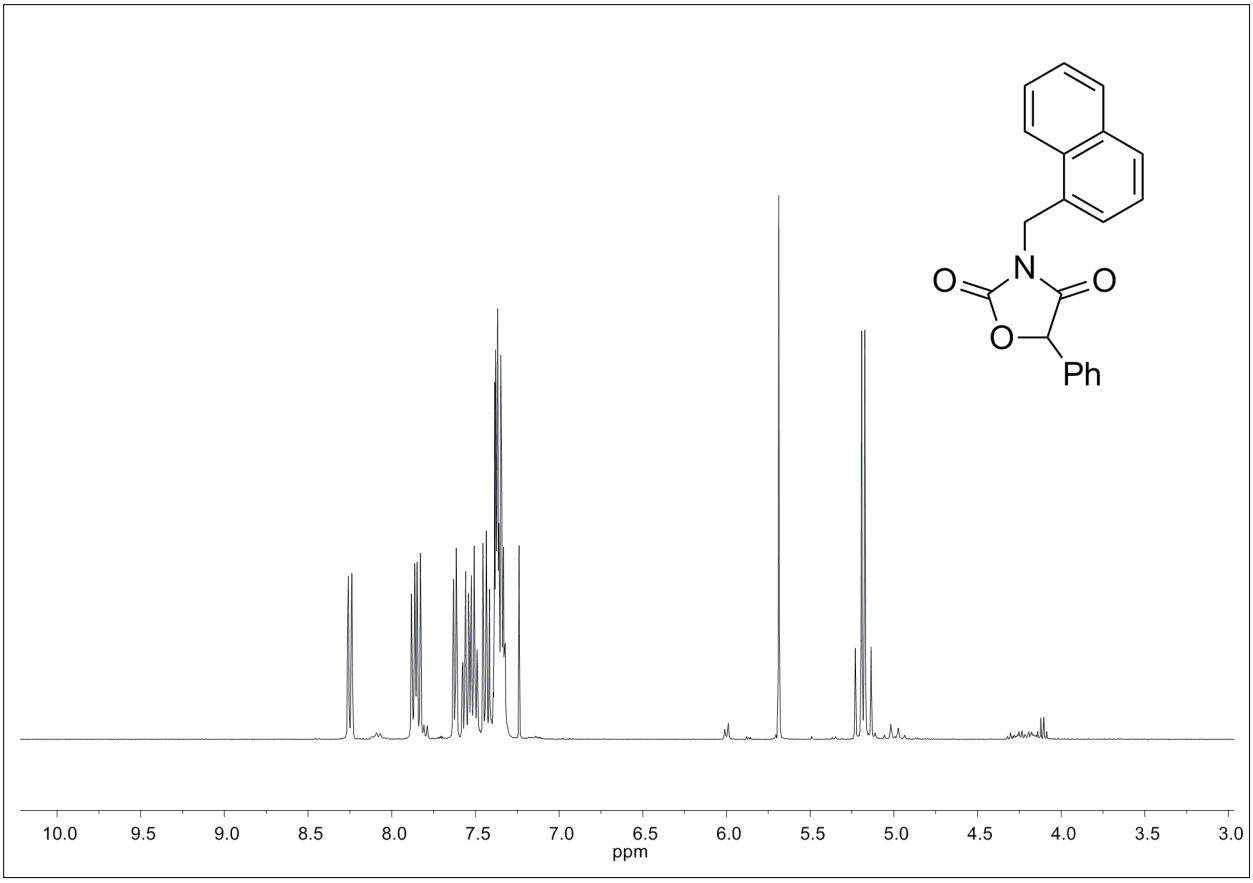

F3C
N
O
O
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm

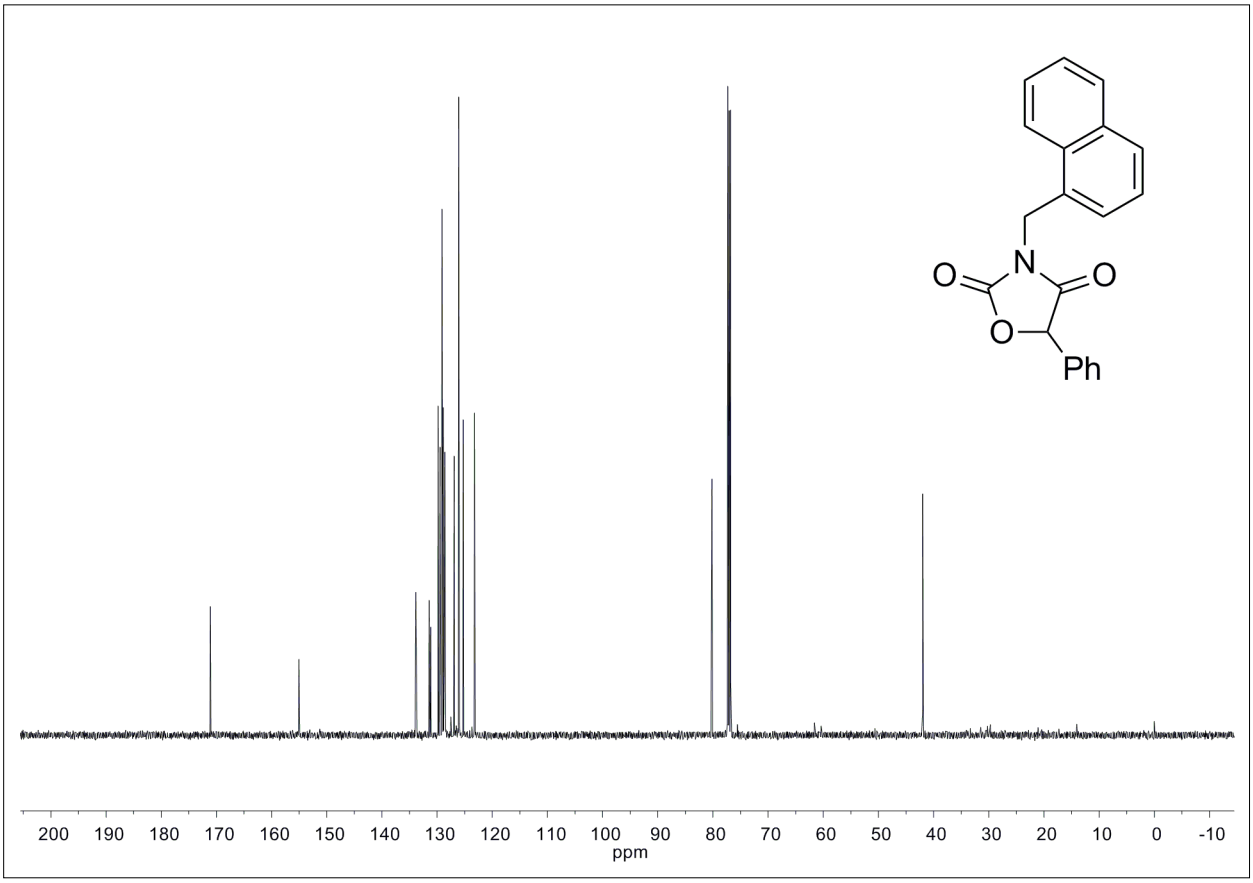

Cl
N
O
O
O
Ph
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm

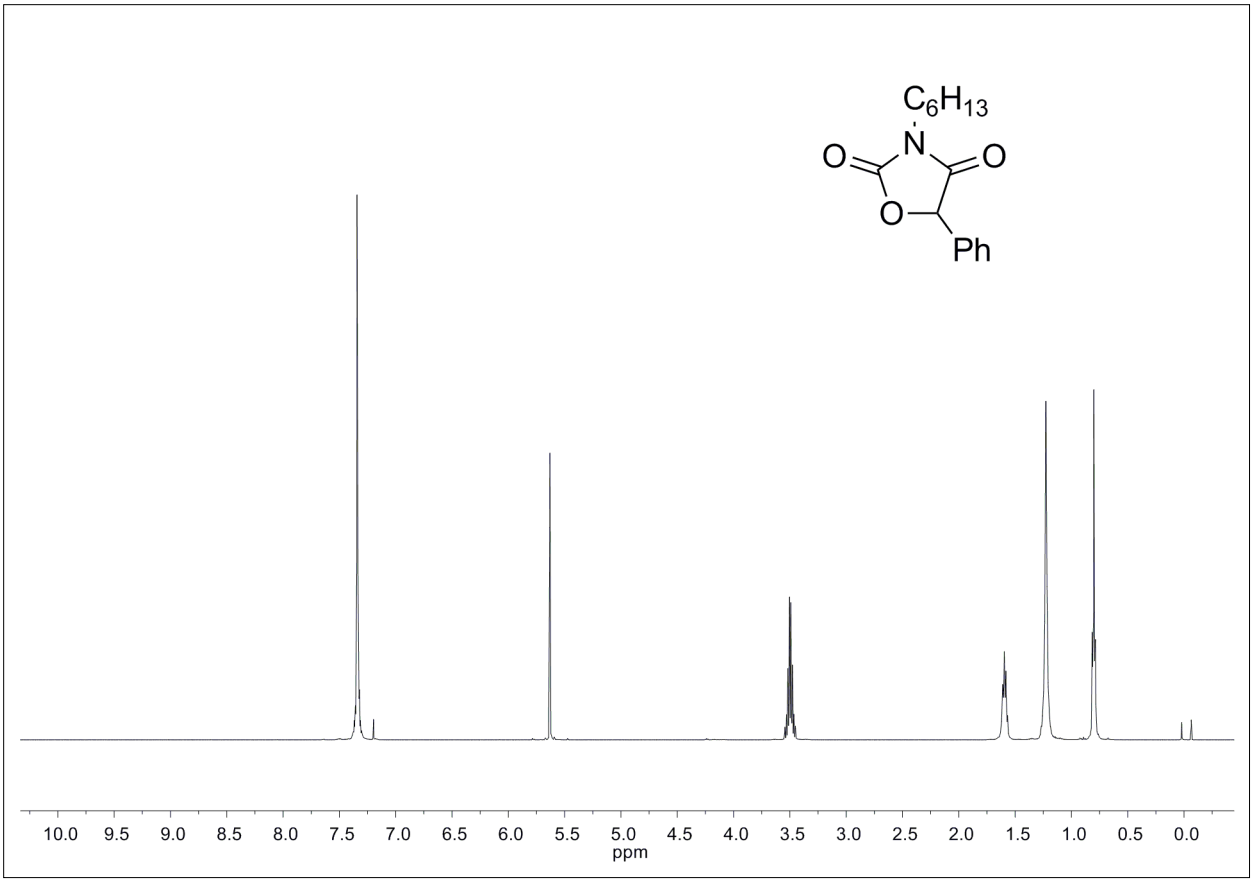

Cl
N
O
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
ppm

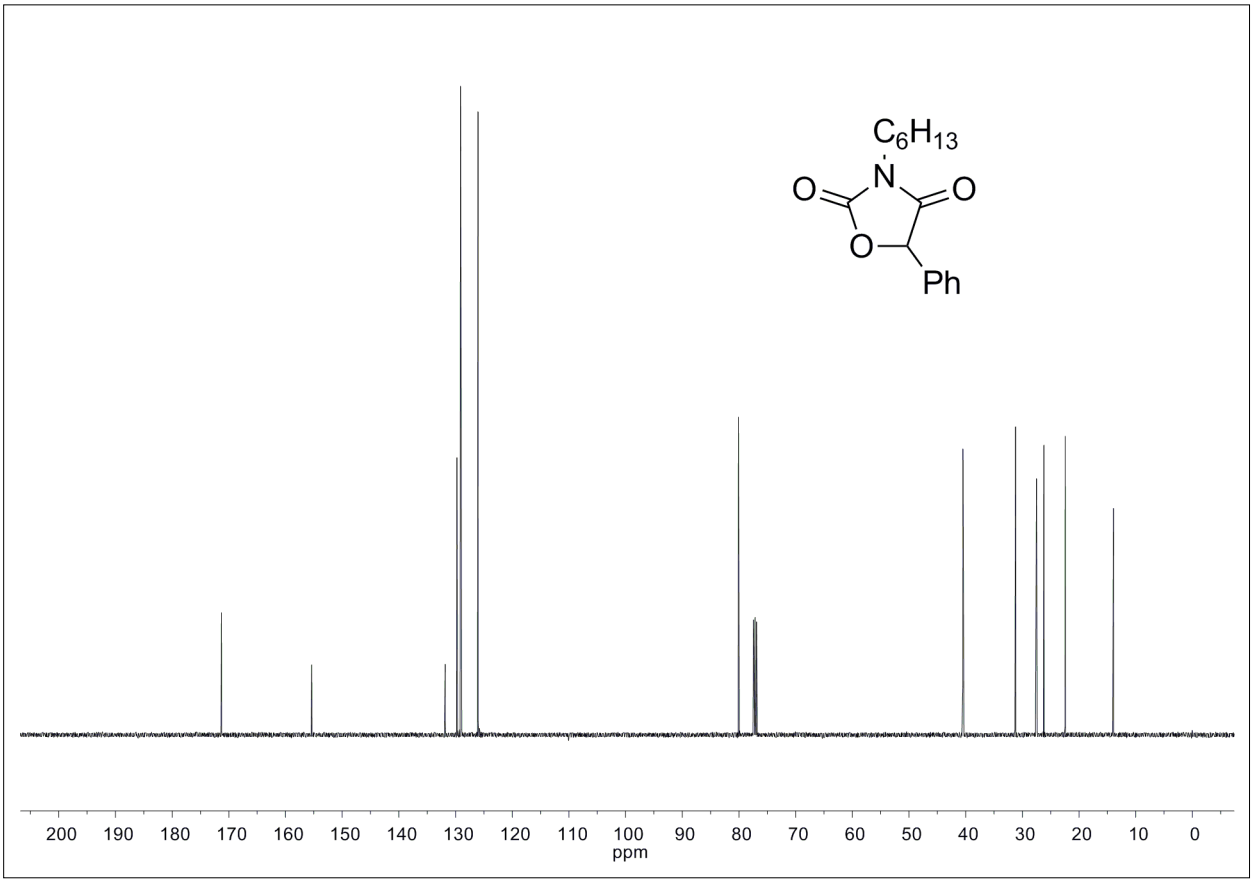

Br
N
O
O
O
Ph
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
ppm

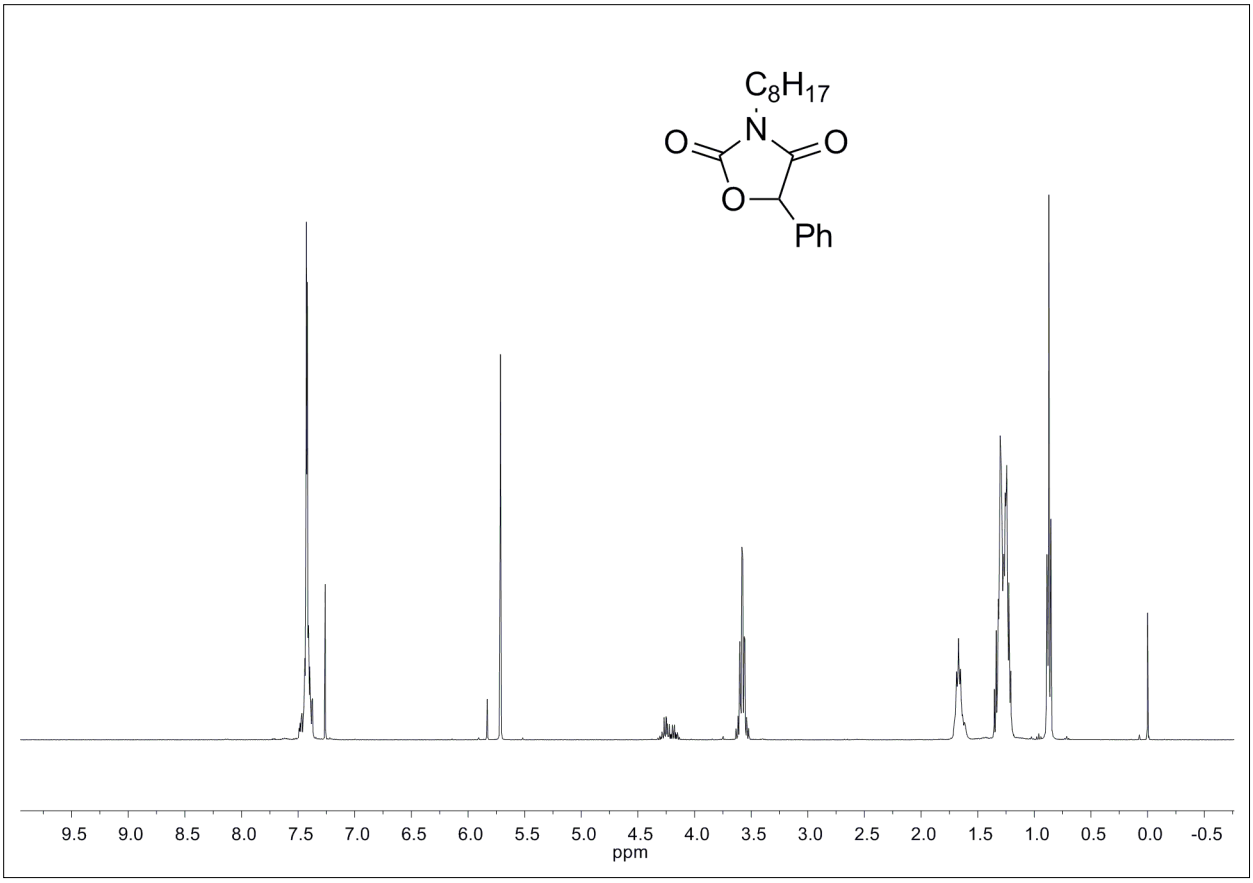

Br
N
O
O
O
Ph
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
ppm


O
N
O
O
Ph
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
ppm


O
N
O
O
Ph
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
ppm


C6H13
N
O
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm


C6H13
N
O
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm


C8H17
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O
O
O
Ph
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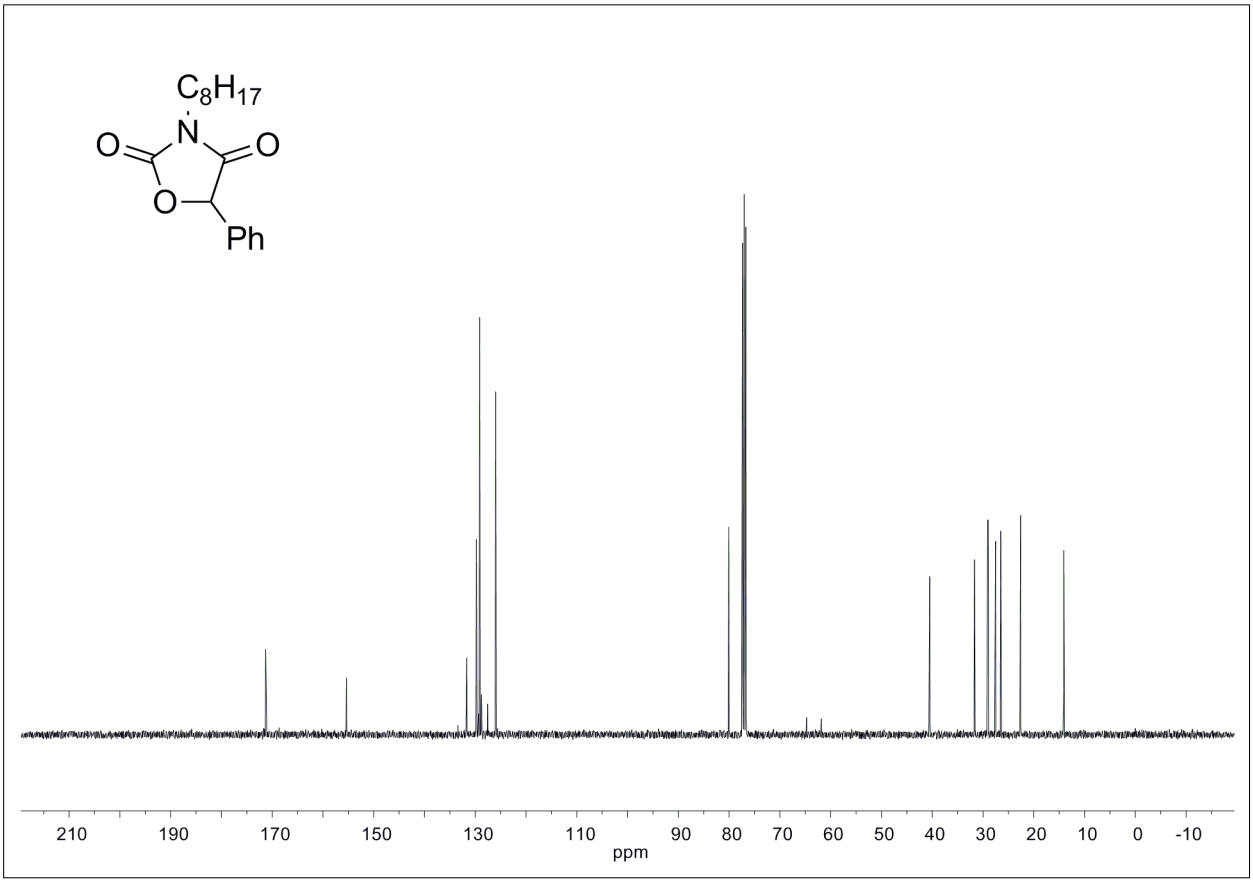
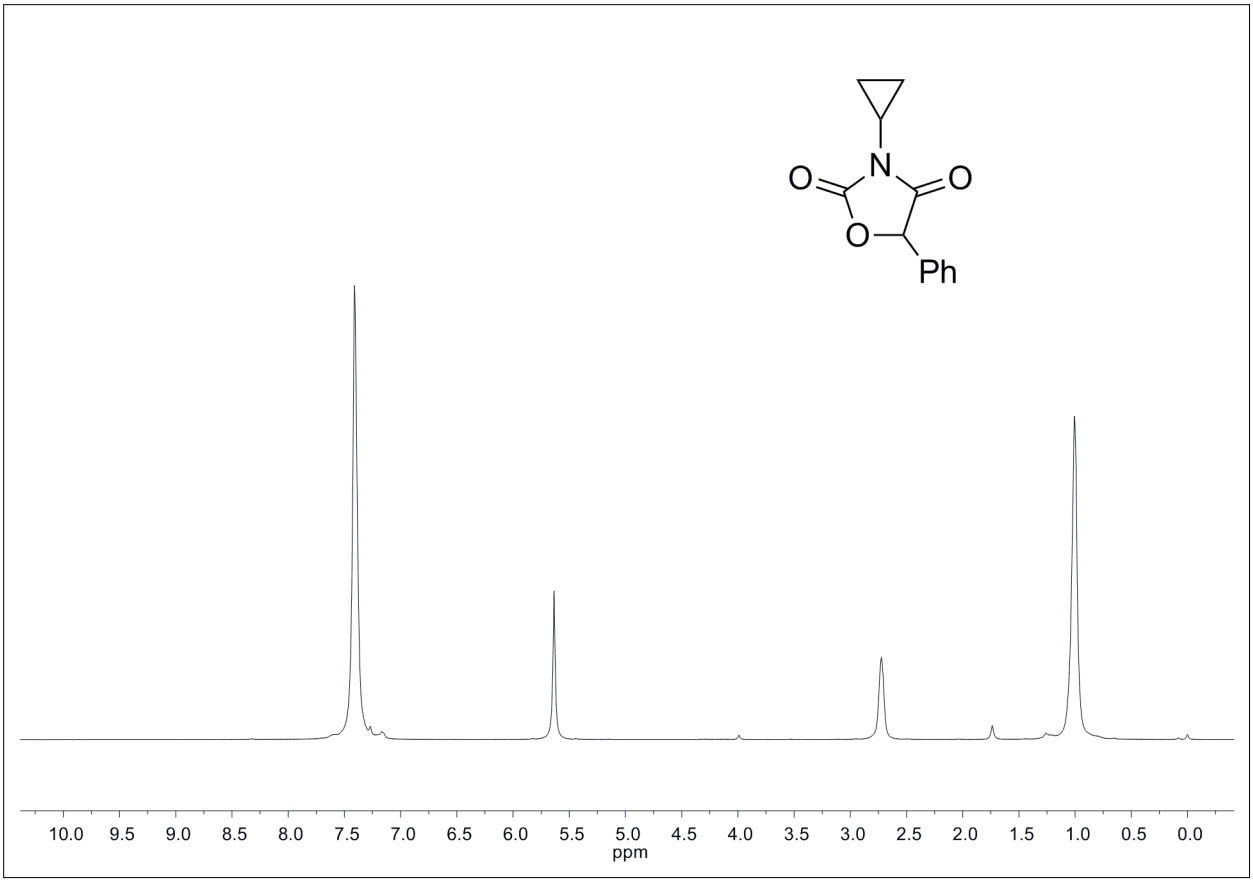
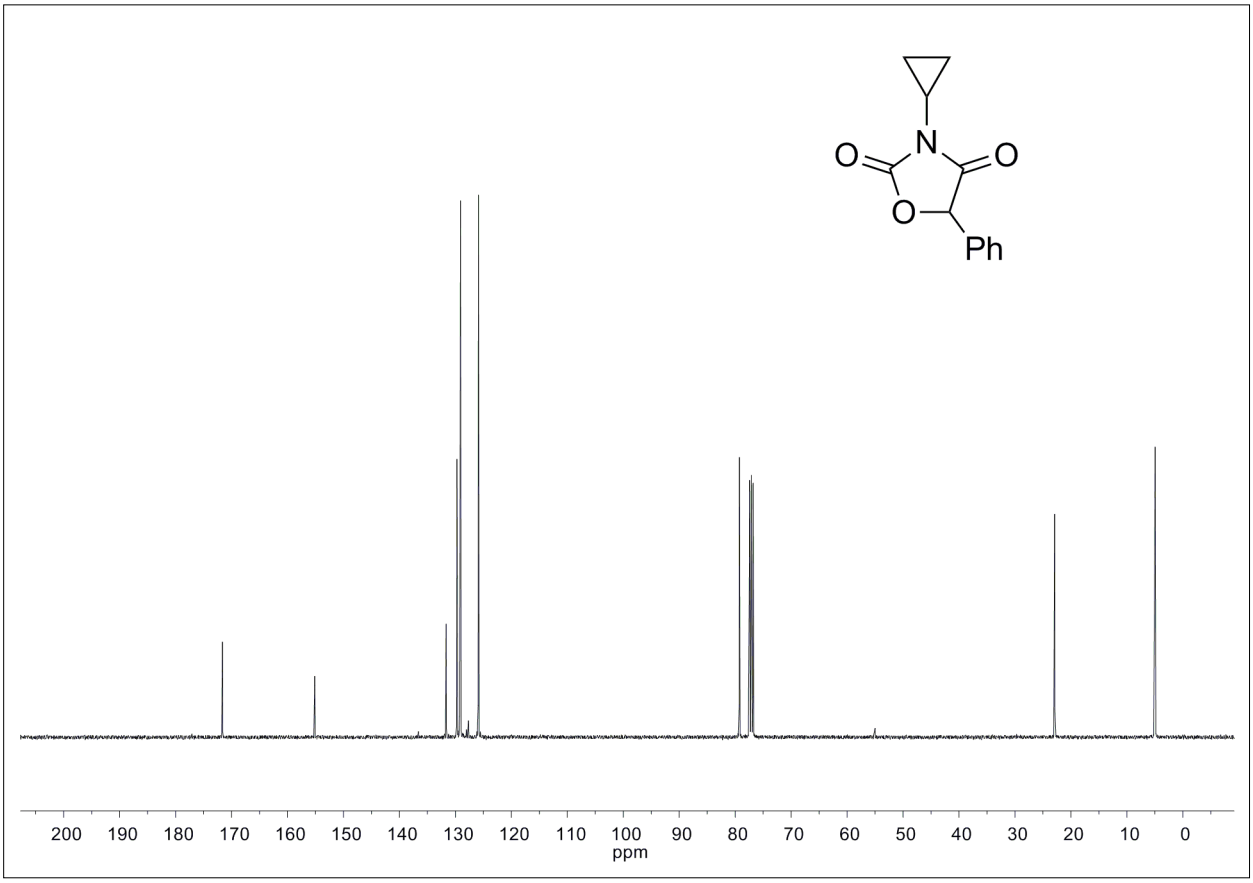
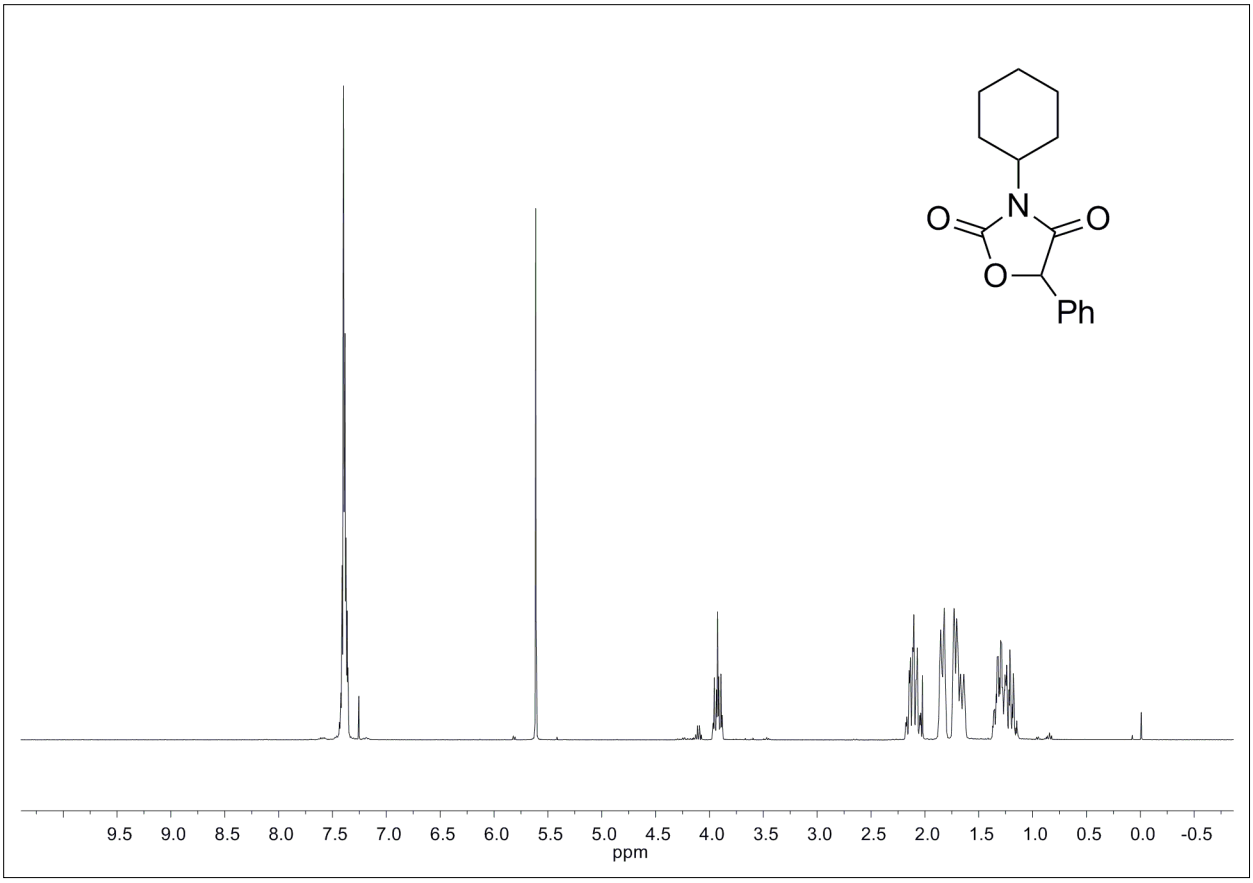
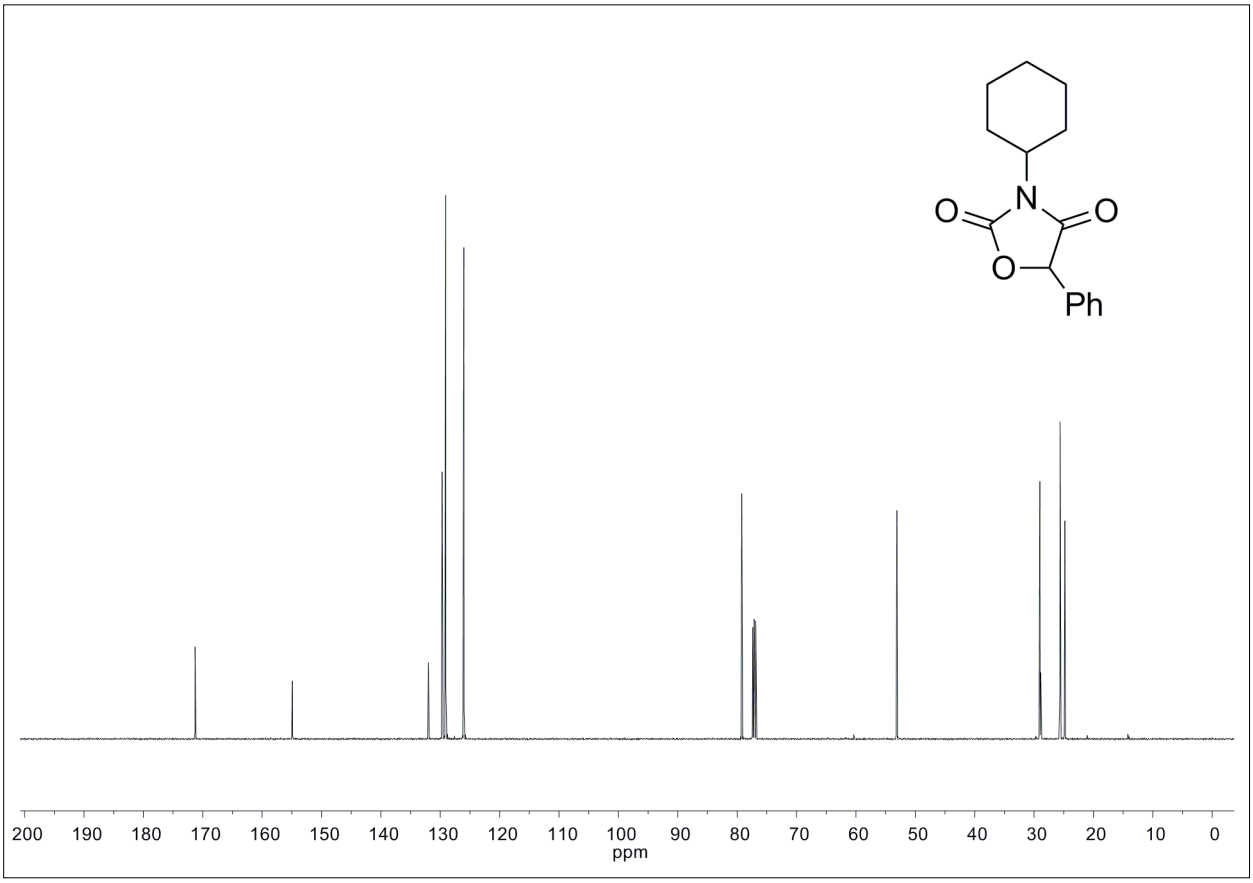
ppm


C8H17
N
O
O
O
Ph
210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -10
ppm


O
N
O
O
Ph
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
ppm


O
N
O
O
Ph
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm


N
O
O
O
Ph
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
ppm


N
O
O
O
Ph
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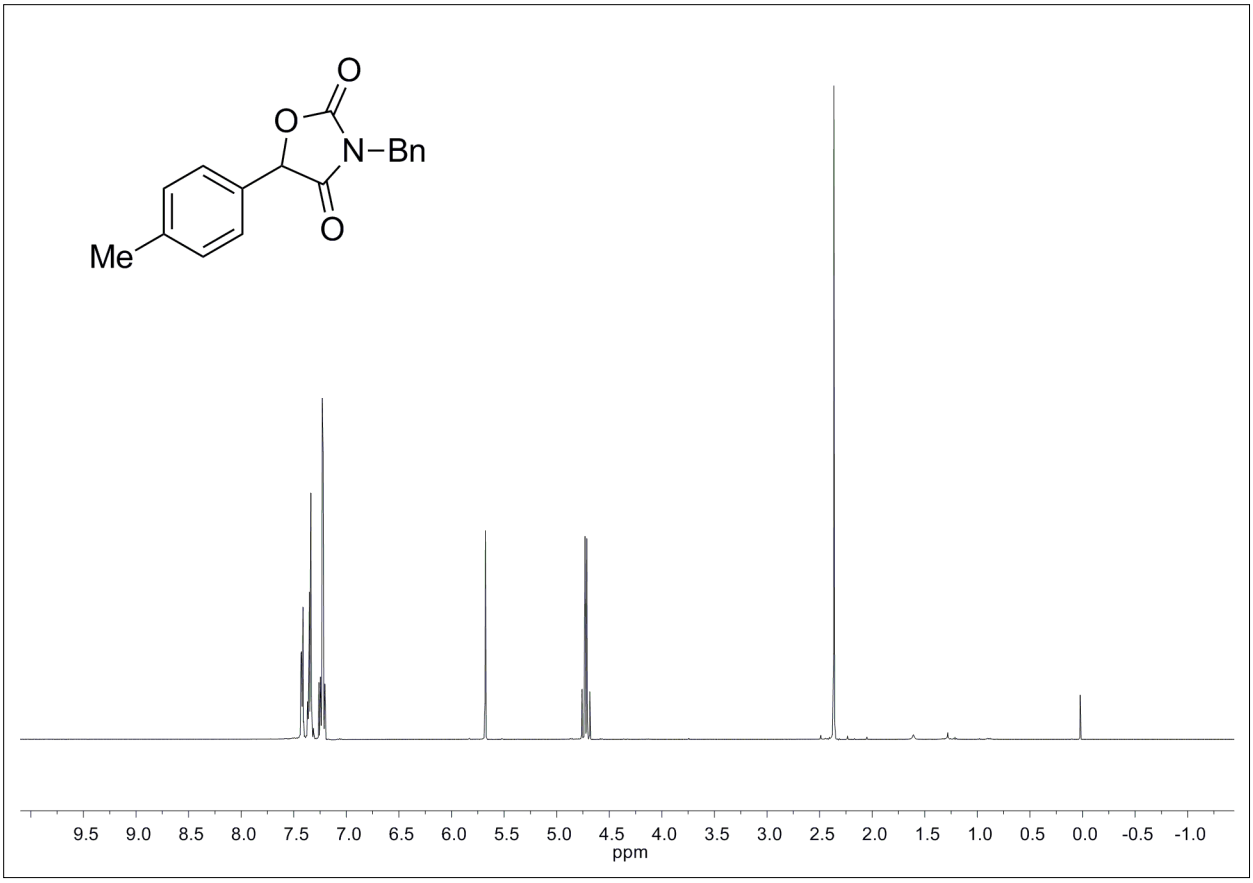
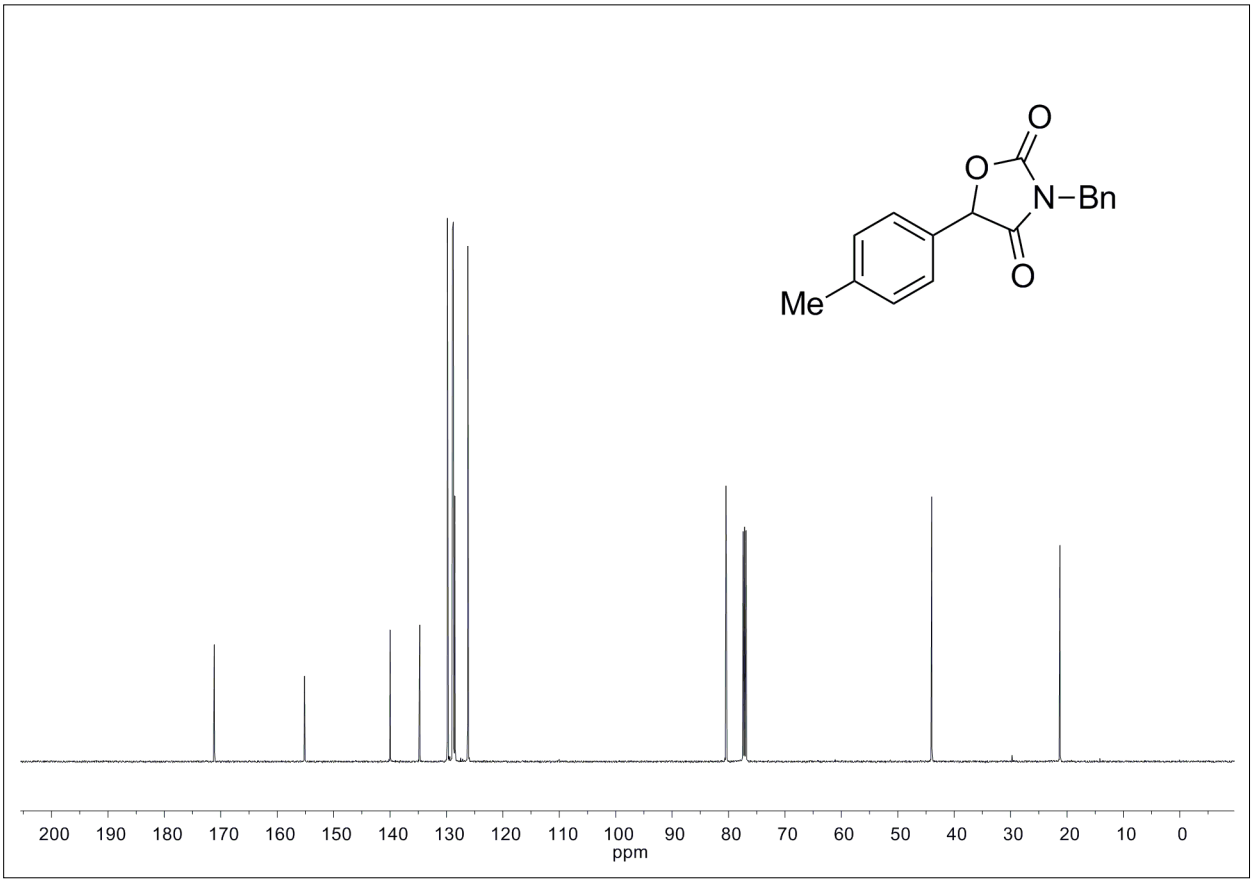
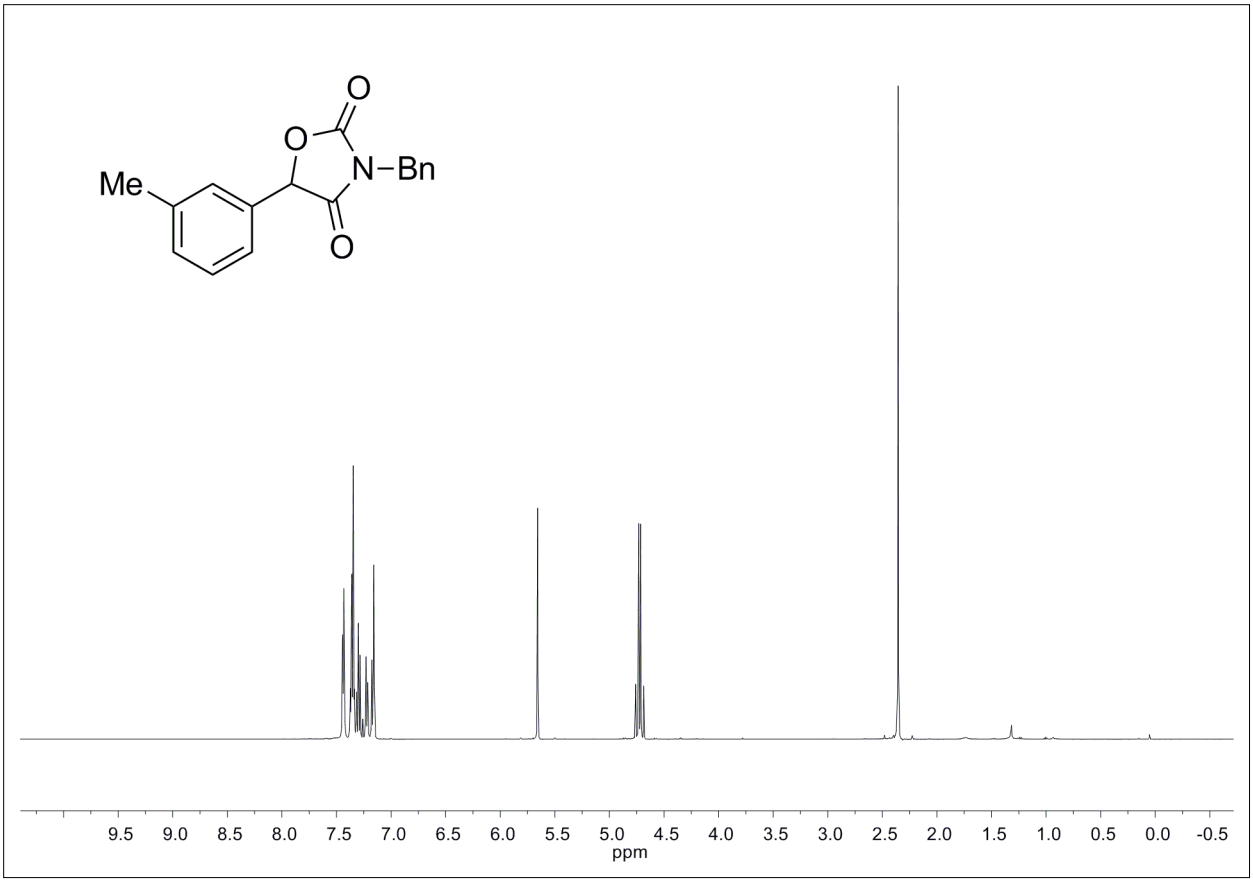
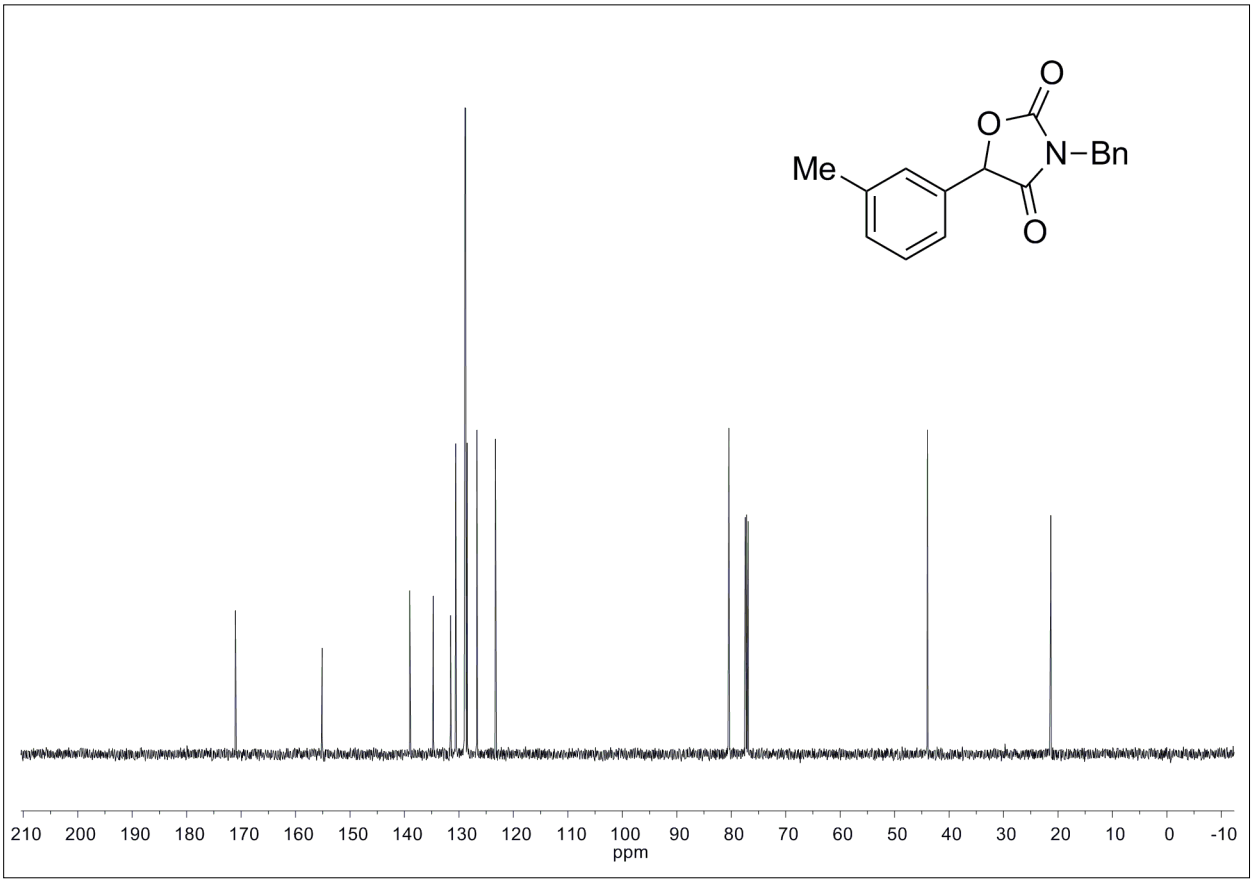
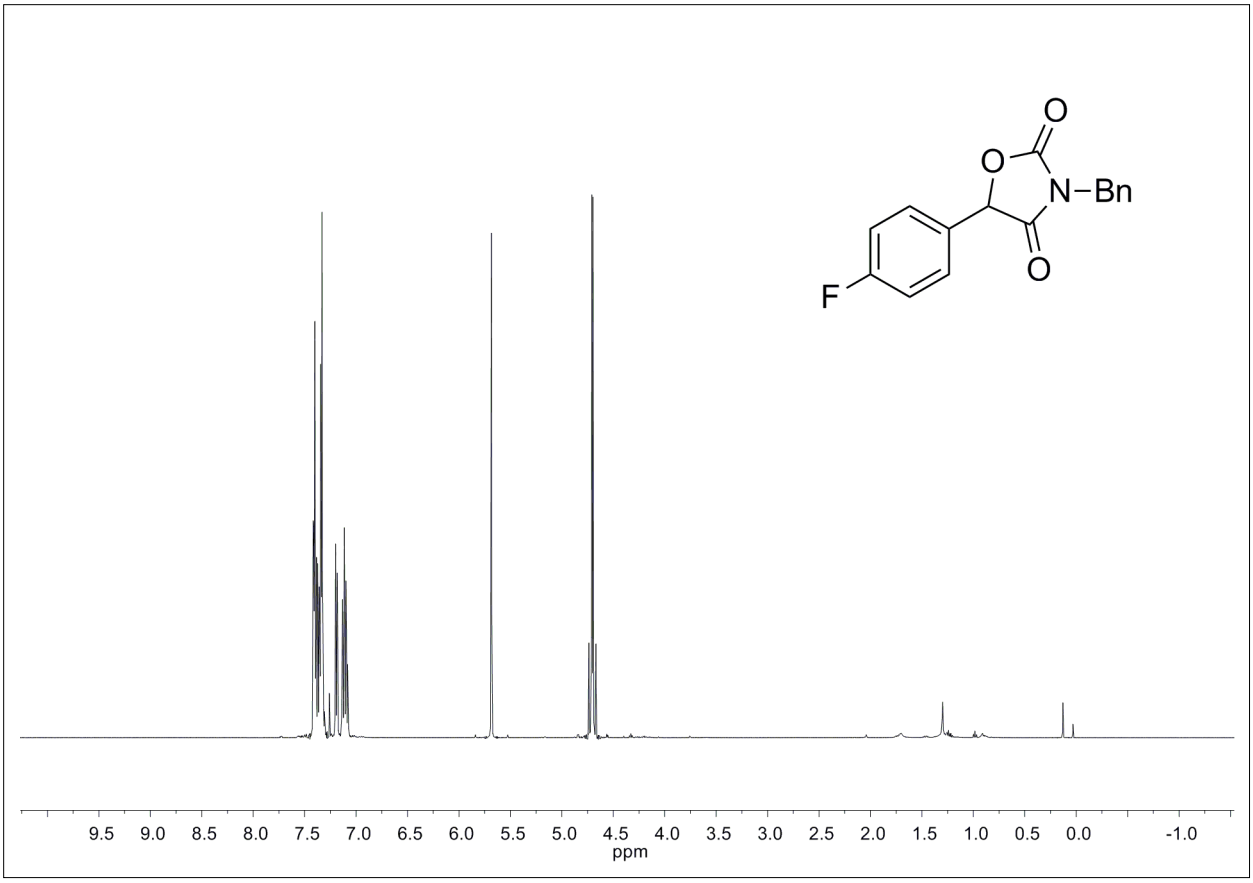
ppm

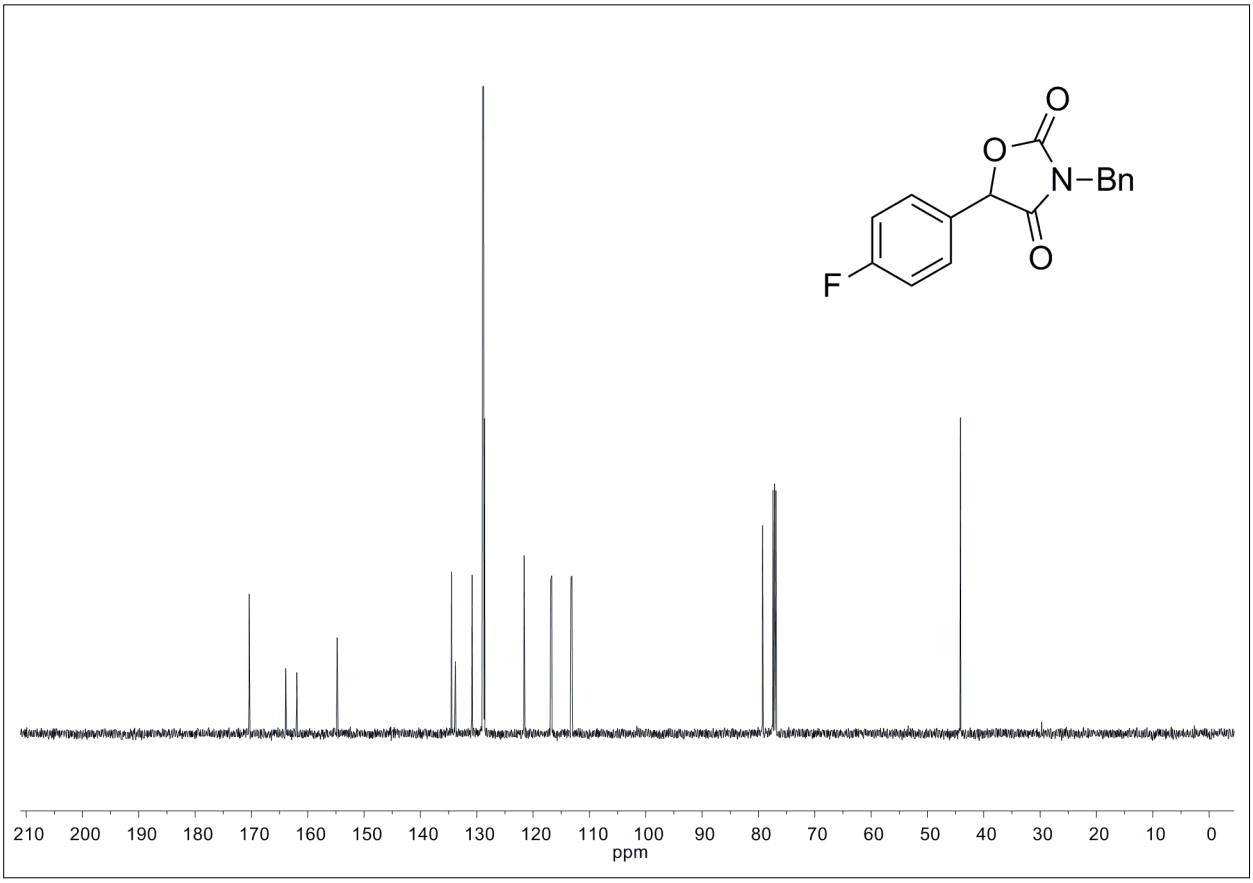

O
O
N−Bn
O
Me
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1.0
ppm

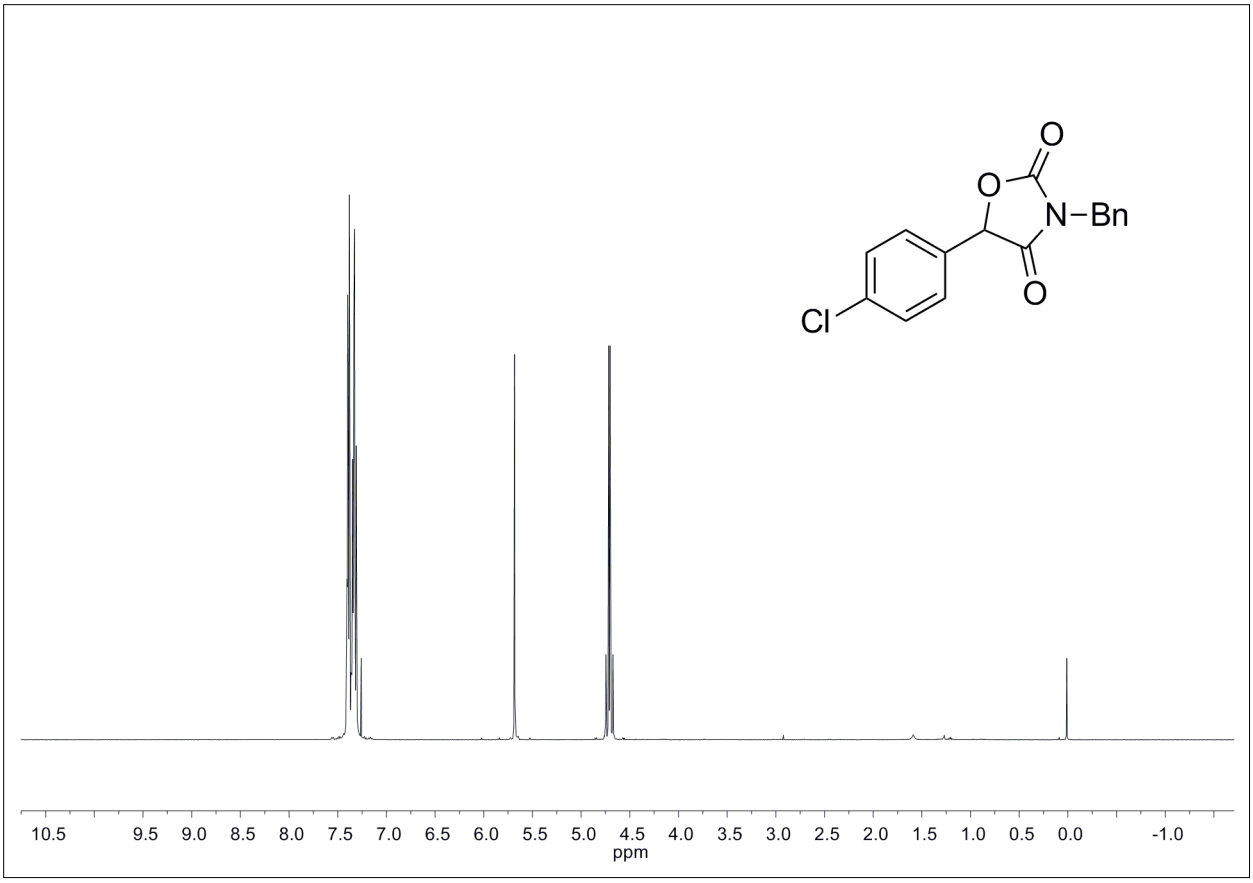

O
O
N−Bn
O
Me
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm

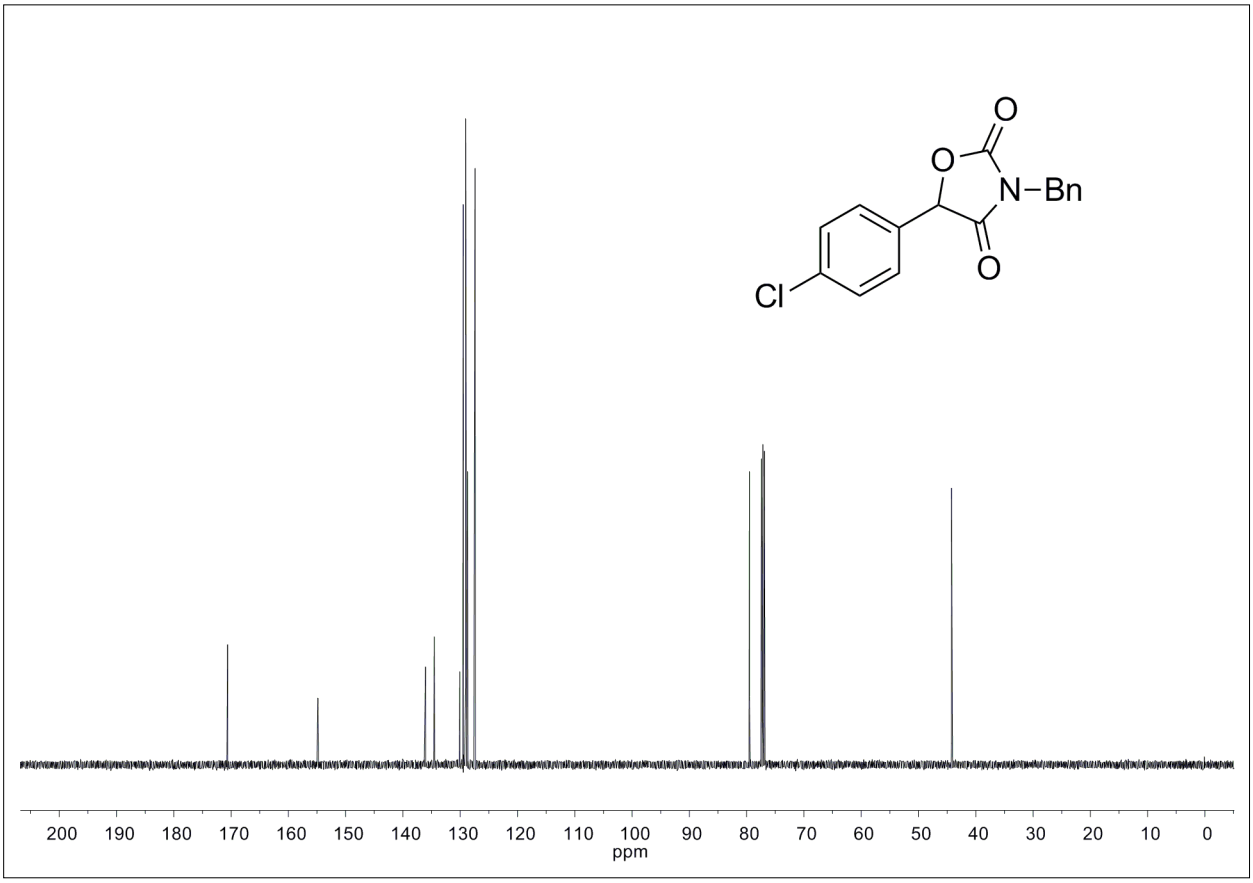

O
O
N−Bn
Me
O
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
ppm


O
O
N−Bn
Me
O
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
ppm


O
O
N–Bn
O
F
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -1.0
ppm


O
O
N–Bn
O
F
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
ppm


O
O
N−Bn
O
Cl
10.5
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-1.0
ppm


O
O
N−Bn
O
Cl
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
ppm