

Fe/S-Catalyzed Synthesis of 2-Benzoylbenzoxazoles and 2-Quinolylbenzoxazoles via Redox Condensation of *o*-Nitrophenols with Acetophenones and Methylquinolines

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General information

Reagents were obtained from commercial supplier and used without further purification. Analytical thin layer chromatography (TLC) was purchased from Merck KGaA (silica gel 60 F254). Visualization of the chromatogram was performed by UV light (254 nm) or phosphomolybdic acid or vanilline stains. Flash column chromatography was carried out using kieselgel 35-70 μm particle sized silica gel (230-400 mesh). NMR Chemical shifts are reported in (δ) ppm relative to tetramethylsilane (TMS) with the residual solvent as internal reference (CDCl_3 , δ 7.26 ppm for ^1H). Data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet), coupling constants (Hz) and integration.

General procedure

Synthesis of 2-benzoylbenzoxazoles **3**

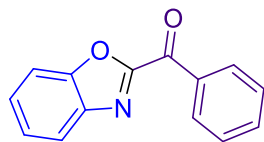
A mixture of 2-nitrophenol **1** (1 mmol), acetophenone (1.2 mmol), elemental sulfur (1 mmol, 32 mg), $\text{FeCl}_2 \cdot 4\text{H}_2\text{O}$ (10 mg, 0.05 mmol, 5 mol %), DIPEA (129 mg, 1 mmol) and pyridine (79 mg, 1 mmol) was stirred and heated under an argon atmosphere in a 7-mL test tube closed with a rubber septum at 80-100 $^\circ\text{C}$ (see Schemes 3-4 for detailed) for 16 h. The crude mixture was purified by column chromatography on silica gel (*n*-hexane:EtOAc) or (CH_2Cl_2 :MeOH 1:0 to 200:1) to afford the product **3**.

Synthesis of 2-quinolylbenzoxazoles **5**

A mixture of 2-nitrophenol **1** (1 mmol), methylquinoline analogues **4** (1.2 mmol), elemental sulfur (1 mmol, 32 mg), $\text{FeCl}_2 \cdot 4\text{H}_2\text{O}$ (10 mg, 0.05 mmol, 5 mol %) and DIPEA (129 mg, 1 mmol) was stirred and heated under an argon atmosphere in a 7-mL test tube closed with a rubber septum at 80-100 $^\circ\text{C}$ for 16 h. The crude mixture was purified by column chromatography on silica gel (CH_2Cl_2 :MeOH 1:0 to 200:1) to afford the product **5**.

Characterization of products 3 and 5

Benzoxazol-2-yl(phenyl)methanone (3aa)¹

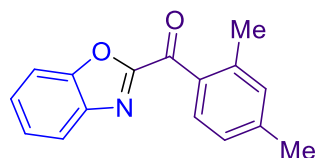


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (161 mg, 72%).

¹H NMR (500 MHz, CDCl₃) δ 8.56-8.54 (m, 2H), 7.95 (d, J = 8.0 Hz, 1H), 7.73-7.68 (m, 2H), 7.59-7.54 (m, 3H), 7.50-7.46 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 180.6, 157.2, 150.5, 140.8, 135.1, 134.3, 131.0, 128.7, 128.5, 125.8, 122.4, 111.9.

Benzoxazol-2-yl(2,4-dimethylphenyl)methanone (3ab)



Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (138 mg, 55%).

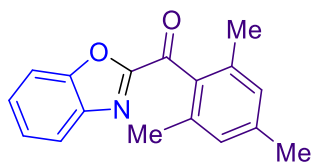
¹H NMR (500 MHz, CDCl₃) δ 8.02-8.00 (m, 1H), 7.91-7.90 (m, 1H), 7.71-7.69 (m, 1H), 7.55-7.52 (m, 1H), 7.47-7.44 (m, 1H), 7.18-7.17 (m, 2H), 2.54 (s, 3H), 2.41 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 183.3, 158.1, 150.7, 143.5, 140.8, 140.1, 132.7, 132.2, 132.0, 128.3, 126.3, 125.6, 122.4, 111.9, 21.6, 20.8.

HRMS (ESI+) calcd for C₁₆H₁₄NO₂ [M + H]⁺ 252.1025. Found 252.1033.

¹ L. A. Nguyen, Q. A. Ngo, P. Retailleau and T. B. Nguyen, *Adv. Synth. Catal.*, 2021, **8**, 2098.

Benzoxazol-2-yl(mesityl)methanone (3ac)¹

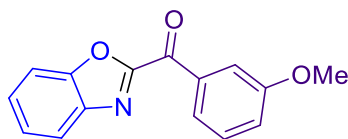


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (154 mg, 58%).

¹H NMR (500 MHz, CDCl₃) δ 7.89 (d, J = 8.1 Hz, 1H), 7.69 (d, J = 8.3 Hz, 1H), 7.55 (t, J = 7,8 Hz, 1H), 7.44 (t, J = 7,5 Hz, 1H), 6.95 (s, 2H), 2.34 (s, 3H), 2.21 (s, 6H).

¹³C NMR (125 MHz, CDCl₃) δ 188.6, 158.1, 150.9, 141.0, 140.4, 135.3, 134.7, 128.9, 128.8, 125.8, 122.8, 112.0, 21.4, 19.6.

Benzoxazol-2-yl(3-methoxyphenyl)methanone (3ad)¹

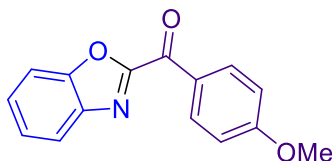


Purification of the crude mixture by column chromatography (CH₂Cl₂) afforded the product as pale yellow solid (139 mg, 55%).

¹H NMR (500 MHz, CDCl₃) δ 8.24-8.22 (m, 1H), 8.02-8.01 (m, 1H), 7.95 (d, J = 7.9 Hz, 1H), 7.72 (d, J = 8.2 Hz, 1H), 7.58-7.55 (m, 1H), 7.50-7.47 (m, 2H), 7.24 (dd, J = 8.2 Hz, 2.6 Hz, 1H), 3.92 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 180.3, 159.8, 157.2, 150.5, 140.8, 136.2, 129.7, 128.5, 125.8, 124.0, 122.5, 121.1, 114.8, 111.9, 55.6.

Benzoxazol-2-yl(4-methoxyphenyl)methanone (3ae)¹

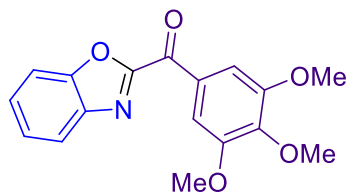


Purification of the crude mixture by column chromatography (CH₂Cl₂) afforded the product as pale yellow solid (134 mg, 53%).

¹H NMR (500 MHz, CDCl₃) δ 8.63-8.60 (m, 2H), 7.94 (d, J = 7.8 Hz, 1H), 7.71 (d, J = 7.8 Hz, 1H), 7.56-7.53 (m, 1H), 7.49-7.45 (m, 1H), 7.06-7.03 (m, 2H), 3.93 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 178.8, 164.7, 157.5, 150.4, 140.8, 133.6, 128.2, 128.0, 125.6, 122.2, 114.0, 111.9, 55.7.

Benzoxazol-2-yl(3,4,5-trimethoxyphenyl)methanone (3af)²

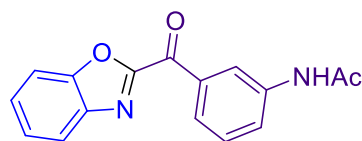


Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as pale yellow solid (213 mg, 68%).

^1H NMR (500 MHz, CDCl_3) δ 7.90 (s, 2H), 7.89 (d, J = 8.2 Hz, 1H), 7.66 (d, J = 8.2 Hz, 1H), 7.52-7.48 (m, 1H), 7.44-7.41 (m, 1H), 3.95 (s, 3H), 3.94 (s, 6H).

^{13}C NMR (125 MHz, CDCl_3) δ 178.8, 157.2, 152.9, 150.3, 144.0, 140.7, 129.8, 128.3, 125.6, 122.3, 111.8, 108.8, 61.0, 56.4.

***N*-(3-(benzoxazole-2-carbonyl)phenyl)acetamide (3ag)**



Purification of the crude mixture by column chromatography (heptane:EtOAc 4:1) afforded the product as pale yellow solid (160 mg, 57%).

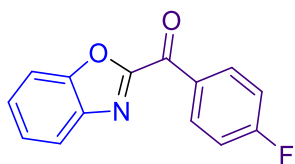
^1H NMR (500 MHz, CDCl_3) δ 8.45 (s, 1H), 8.33 (d, J = 7.7 Hz, 1H), 8.13 (d, J = 7.7 Hz, 1H), 7.96, 7.95 (d, J = 8.0 Hz, 1H), 7.71 (d, J = 8.3 Hz, 1H), 7.58-7.53 (m, 2H), 7.50-7.47 (m, 2H), 2.24 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 179.9, 168.5, 157.0, 150.5, 140.7, 138.4, 135.6, 129.6, 128.6, 126.9, 125.8, 122.5, 121.6, 111.9, 24.7 (one signal missing due to overlap).

HRMS (ESI⁺) calcd for $\text{C}_{16}\text{H}_{13}\text{N}_2\text{O}_3$ $[\text{M} + \text{H}]^+$ 281.0927. Found 281.0929.

² J. Chen, C. M. Li, J. Wang, S. Ahn, Wang, Lu, Z. Y. J. T. Dalton, D. D. Miller and L. Wei, *Bioorg. Med. Chem.*, 2011, **19**, 4782.

Benzoxazol-2-yl(4-fluorophenyl)methanone (3ah)³

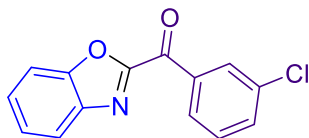


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (149 mg, 62%).

¹H NMR (600 MHz, CDCl₃) δ 8.68-8.66 (m, 2H), 7.96-7.94 (m, 1H), 7.73-7.71 (m, 1H), 7.58-7.55 (m, 1H), 7.50-7.48 (m, 1H), 7.25-7.23 (m, 2H).

¹³C NMR (150 MHz, CDCl₃) δ 178.8, 167.5, 165.8, 157.0, 150.4, 140.7, 134.0 (d, J = 9.4 Hz), 131.4 (d, J = 3.3 Hz), 128.6, 125.8, 122.4, 115.9 (d, J = 22.3 Hz), 111.9.

Benzoxazol-2-yl(3-chlorophenyl)methanone (3ai)⁴



Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (157 mg, 61%).

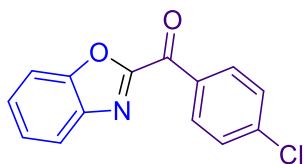
¹H NMR (500 MHz, CDCl₃) δ 8.58-8.57 (m, 1H), 8.51-8.49 (m, 1H), 7.98-7.96 (m, 1H), 7.73-7.72 (m, 1H), 7.67-7.65 (m, 1H), 7.60-7.56 (m, 1H), 7.54-7.48 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 179.2, 156.7, 150.5, 140.7, 136.5, 134.9, 134.2, 130.9, 130.0, 129.2, 128.8, 125.9, 122.6, 111.9.

³ S. Karthik and T. Gandhi, *Org. Lett.*, 2017, **19**, 5486.

⁴ K. Yang, X. Chen, Y. Wang, W. Li, A. A. Kadi, H. K. Fun, H. Sun, Y. Zhang, G. Li and H. Lu, *J. Org. Chem.*, 2015, **21**, 11065.

Benzoxazol-2-yl(4-chlorophenyl)methanone (3aj)⁴



Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (137 mg, 53%).

¹H NMR (500 MHz, CDCl₃) δ 8.58-8.55 (m, 2H), 7.95 (d, J = 8.1 Hz, 1H), 7.72 (d, J = 8.1 Hz, 1H), 7.59-7.54 (m, 3H), 7.51-7.48 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 179.2, 156.9, 150.5, 141.1, 140.7, 133.3, 132.5, 129.0, 128.7, 125.9, 122.5, 111.9.

Benzoxazol-2-yl(3-bromophenyl)methanone (3ak)¹

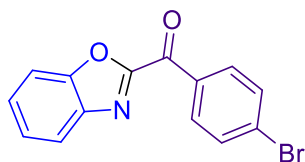


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (166 mg, 55%).

¹H NMR (500 MHz, CDCl₃) δ 8.72-8.71 (m, 1H), 8.57-8.54 (m, 1H), 7.97 (d, J = 8.1 Hz, 1H), 7.83-7.81 (m, 1H), 7.73 (d, J = 8.1 Hz, 1H), 7.60-7.56 (m, 1H), 7.52- 7.45 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 179.1, 156.7, 150.5, 140.7, 137.1, 136.7, 133.8, 130.2, 129.7, 128.8, 125.9, 122.9, 122.6, 111.9.

Benzoxazol-2-yl(4-bromophenyl)methanone (3al)⁴

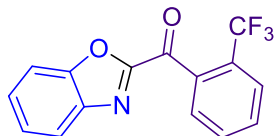


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (190 mg, 63%).

¹H NMR (500 MHz, CDCl₃) δ 8.49-8.46 (m, 2H), 7.96-7.94 (m, 1H), 7.73-7.71 (m, 3H), 7.59-7.56 (m, 1H), 7.51-7.48 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 179.4, 156.9, 150.5, 140.7, 133.8, 132.5, 132.0, 130.0, 128.7, 125.9, 122.5, 111.9.

Benzoxazol-2-yl(2-(trifluoromethyl)phenyl)methanone (3am)¹



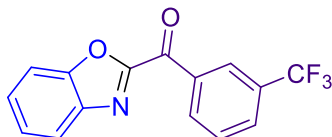
Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (183 mg, 63%).

^1H NMR (500 MHz, CDCl_3) δ 7.87-7.85 (m, 1H), 7.83-7.81 (m, 1H), 7.79-7.77 (m, 1H), 7.72-7.67 (m, 3H), 7.56-7.53 (m, 1H), 7.45-7.42 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 182.6, 157.3, 151.0, 140.8, 135.5, 131.6, 131.5, 130.1, 129.5, 129.1, 127.1 (q, $J = 5.2$ Hz), 126.0, 123.5 (q, $J = 272.9$ Hz), 122.7, 112.0.

HRMS (ESI+) calcd for $\text{C}_{15}\text{H}_9\text{F}_3\text{NO}_2$ $[\text{M} + \text{H}]^+$ 292.0561 Found 292.0552.

Benzoxazol-2-yl(3-(trifluoromethyl)phenyl)methanone (3an)¹

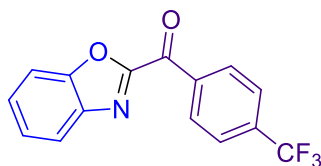


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (189 mg, 65%).

^1H NMR (500 MHz, CDCl_3) δ 8.85 (s, 1H), 8.80 (d, $J = 7.9$ Hz, 1H), 7.94-7.91 (m, 2H), 7.71-7.68 (m, 2H), 7.57-7.54 (m, 1H), 7.48-7.45 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 178.9, 156.6, 150.5, 140.7, 135.5, 134.2, 131.3 (q, $J = 33.3$ Hz), 130.5, 129.2, 128.8, 127.9 (q, $J = 3.7$ Hz), 125.9, 123.7 (q, $J = 270.7$ Hz), 122.6, 111.9.

Benzoxazol-2-yl(4-(trifluoromethyl)phenyl)methanone (3ao)⁵



Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (198 mg, 68%).

¹H NMR (500 MHz, CDCl₃) δ 8.68 (d, J = 8.2 Hz, 2H), 7.95 (d, J = 8.1 Hz, 1H), 7.83 (d, J = 8.2 Hz, 2H), 7.72 (d, J = 8.1 Hz, 1H), 7.60-7.57 (m, 1H), 7.51-7.48 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 179.5, 156.7, 150.5, 140.7, 137.7, 135.3 (q, J = 32.9 Hz), 128.9, 126.0 (q, J = 272.3 Hz), 125.6 (q, J = 3.8 Hz), 123.6, 122.6, 112.0.

3-(Benzoxazole-2-carbonyl)benzonitrile (3ap)¹

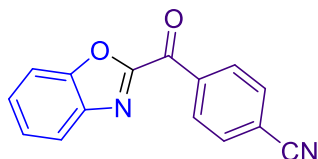


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (161 mg, 65%).

¹H NMR (500 MHz, CDCl₃) δ 8.97 (s, 1H), 8.78-8.77 (m, 1H), 7.95-7.93 (m, 2H), 7.72-7.68 (m, 2H), 7.59-7.56 (m, 1H), 7.51-7.48 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 178.0, 156.3, 150.4, 140.5, 136.9, 135.7, 134.8, 134.8, 129.6, 129.1, 126.1, 122.6, 117.9, 113.2, 111.9.

4-(Benzoxazole-2-carbonyl)benzonitrile (3aq)¹



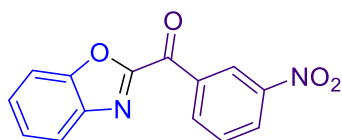
Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (154 mg, 62%).

⁵ J. Jiang, H. Zou, Q. Dong, R. Wang, L. Lu, Y. Zhu and W. He, *J. Org. Chem.*, 2016, **81**, 51.

^1H NMR (500 MHz, CDCl_3) δ 8.71-8.69 (m, 2H), 7.96 (d, $J = 8.0$ Hz, 1H), 7.89-7.86 (m, 2H), 7.73 (d, $J = 8.3$ Hz, 1H), 7.62-7.59 (m, 1H), 7.53-7.50 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 179.0, 156.5, 150.5, 140.6, 138.0, 132.3, 131.4, 129.2, 126.2, 122.6, 117.9, 117.3, 112.0.

Benzoxazol-2-yl(3-nitrophenyl)methanone (3ar)¹

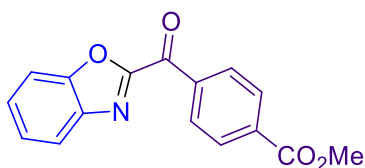


Purification of the crude mixture by column chromatography (CH_2Cl_2) afforded the product as pale yellow solid (145 mg, 54%).

^1H NMR (500 MHz, CDCl_3) δ 9.51-9.50 (m, 1H), 8.94-8.92 (m, 1H), 8.54-8.52 (m, 1H), 7.99 (d, $J = 8.2$ Hz, 1H), 7.79 (t, $J = 7.9$ Hz, 1H), 7.74 (d, $J = 8.3$ Hz, 1H), 7.62-7.59 (m, 1H), 7.54-7.51 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 178.1, 156.4, 150.6, 148.4, 140.6, 136.4, 136.2, 129.9, 129.2, 128.3, 126.2, 126.1, 122.7, 112.0.

Methyl 4-(benzoxazole-2-carbonyl)benzoate (3as)¹

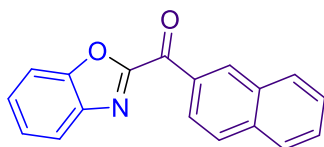


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (166 mg, 59%).

^1H NMR (500 MHz, CDCl_3) δ 8.64-8.61 (m, 2H), 8.24-8.21 (m, 2H), 7.98-7.96 (m, 1H), 7.74-7.72 (m, 1H), 7.60-7.57 (m, 1H), 7.52-7.49 (m, 1H), 3.98 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 180.0, 166.2, 156.9, 150.5, 140.8, 138.3, 134.8, 131.0, 129.7, 128.8, 126.0, 122.6, 112.0, 52.6.

Benzoxazol-2-yl(naphthalen-2-yl)methanone (3at)¹

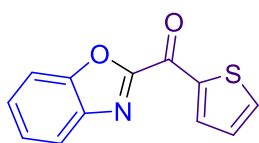


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (169 mg, 62%).

^1H NMR (500 MHz, CDCl_3) δ 9.33 (s, 1H), 8.45-8.43 (m, 1H), 8.09 (d, J = 8.1 Hz, 1H), 7.99 (t, J = 9.4 Hz, 2H), 7.97, 7.91 (d, J = 8.1 Hz, 1H), 7.74(d, J = 8.2 Hz, 1H), 7.67-7.64 (m, 1H), 7.61-7.55 (m, 2H), 7.52-7.48 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 180.3, 157.3, 150.5, 140.9, 136.1, 134.3, 132.4, 132.3, 130.3, 129.3, 128.5, 128.4, 127.9, 126.9, 125.8, 125.4, 122.5, 111.9.

Benzoxazol-2-yl(thiophen-2-yl)methanone (3au)¹

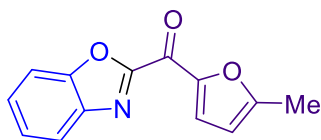


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (149 mg, 65%).

^1H NMR (500 MHz, CDCl_3) δ 8.75-8.74 (m, 1H), 7.95-7.93 (m, 1H), 7.85-7.84 (m, 1H), 7.71-7.70 (m, 1H), 7.56-7.53 (m, 1H), 7.49-7.46 (m, 1H), 7.27-7.26 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 172.2, 156.9, 150.6, 140.7, 140.6, 137.6, 137.0, 128.7, 128.4, 125.8, 122.3, 111.9.

Benzoxazol-2-yl(5-methylfuran-2-yl)methanone (3av)



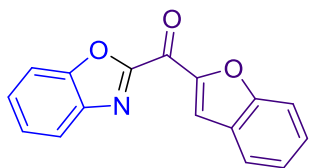
Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (153 mg, 67%).

^1H NMR (500 MHz, CDCl_3) δ 8.24 (d, J = 3.4 Hz, 1H), 7.89 (d, J = 8.0 Hz, 1H), 7.68 (d, J = 8.0 Hz, 1H), 7.53-7.50 (m, 1H), 7.47-7.44 (m, 1H), 6.33 (d, J = 3.4 Hz, 1H), 2.49 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 166.3, 161.4, 156.8, 150.6, 149.5, 140.8, 128.1, 127.3, 125.7, 122.1, 111.8, 110.2, 14.3.

HRMS (ESI+) calcd for $\text{C}_{13}\text{H}_{10}\text{NO}_3$ $[\text{M} + \text{H}]^+$ 228.0661. Found 228.0657.

Benzoxazol-2-yl(benzofuran-2-yl)methanone (3aw)¹

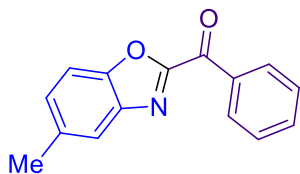


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (174 mg, 66%).

¹H NMR (500 MHz, CDCl₃) δ 8.73 (s, 1H), 7.98 (d, *J* = 7.9 Hz, 1H), 7.84 (d, *J* = 7.9 Hz, 1H), 7.74 (d, *J* = 8.3 Hz, 1H), 7.68 (d, *J* = 8.3 Hz, 1H), 7.59-7.55 (m, 2H), 7.53-7.50 (m, 1H), 7.39-7.36 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 168.9, 156.7, 156.6, 150.7, 150.3, 140.7, 129.7, 128.6, 127.2, 126.0, 124.4, 124.2, 122.4, 121.1, 112.7, 112.0.

(5-Methylbenzoxazol-2-yl)(phenyl)methanone (3ba)¹

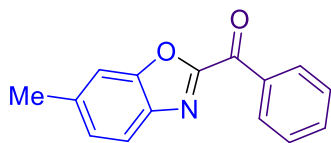


Purification of the crude mixture by column chromatography (n-hexane:EtOAc 97:3) afforded the product as pale yellow solid (123 mg, 52%).

¹H NMR (500 MHz, CDCl₃) δ 8.55-8.53 (m, 2H), 7.72-7.67 (m, 2H), 7.59-7.55 (m, 2H), 7.37-7.35 (m, 1H), 2.52 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 180.7, 157.3, 148.8, 141.0, 135.8, 135.1, 134.2, 131.0, 129.9, 128.6, 122.0, 111.2, 21.6.

(6-Methylbenzoxazol-2-yl)(phenyl)methanone (3ca)¹

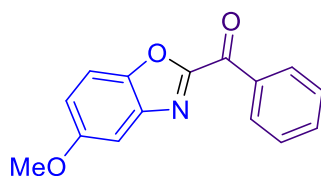


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (178 mg, 75%).

^1H NMR (500 MHz, CDCl_3) δ 8.55-8.53 (m, 2H), 7.81 (d, J = 8.2 Hz, 1H), 7.70-7.67 (m, 1H), 7.59-7.55 (m, 2H), 7.51 (s, 1H), 7.30 (d, J = 8.2 Hz, 1H), 2.56 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 180.6, 156.9, 150.8, 139.6, 138.7, 135.2, 134.2, 131.0, 128.6, 127.4, 121.8, 111.8, 22.2.

(5-Methoxybenzoxazol-2-yl)(phenyl)methanone (3da)⁵

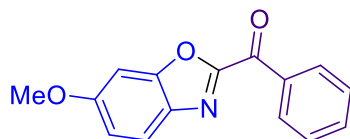


Purification of the crude mixture by column chromatography (CH_2Cl_2) afforded the product as pale yellow solid (139 mg, 55%).

^1H NMR (600 MHz, CDCl_3) δ 8.54-8.52 (m, 2H), 7.69-7.66 (m, 1H), 7.59-7.55 (m, 3H), 7.36-7.35 (m, 1H), 7.17-7.15 (m, 1H), 3.89 (s, 3H).

^{13}C NMR (150 MHz, CDCl_3) δ 180.4, 158.2, 157.9, 145.2, 141.7, 135.1, 134.2, 131.0, 128.6, 118.5, 112.2, 103.6, 56.0.

(6-Methoxybenzoxazol-2-yl)(phenyl)methanone (3ea)¹

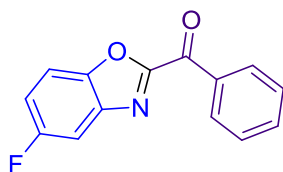


Purification of the crude mixture by column chromatography (CH_2Cl_2) afforded the product as pale yellow solid (175 mg, 69%).

^1H NMR (500 MHz, CDCl_3) δ 8.52-8.51 (m, 2H), 7.76 (d, J = 8.9 Hz, 1H), 7.65-7.62 (m, 1H), 7.54-7.51 (m, 2H), 7.12-7.11 (m, 1H), 7.03 (dd, J = 8.9 Hz, 2.1 Hz, 1H), 3.87 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 180.0, 161.0, 156.7, 151.8, 135.2, 134.6, 134.0, 130.9, 128.5, 122.6, 115.6, 95.1, 56.0.

(5-Fluorobenzoxazol-2-yl)(phenyl)methanone (3fa)^{Error! Bookmark not defined.}

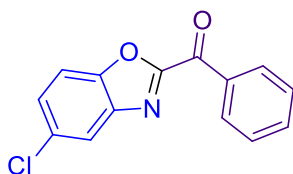


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (128 mg, 53%).

¹H NMR (500 MHz, CDCl₃) δ 8.54-8.52 (m, 2H), 7.71-7.65 (m, 2H), 7.62-7.56 (m, 3H), 7.32-7.28 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 180.2, 161.5, 159.2 (d, J = 129.6 Hz), 146.8, 141.5 (d, J = 13.0 Hz), 134.8, 134.5, 131.0, 128.7, 116.7 (d, J = 26.5 Hz), 112.5 (d, J = 10.0 Hz), 108.3 (d, J = 25.2 Hz).

(5-Chlorobenzoxazol-2-yl)(phenyl)methanone (3ga)¹

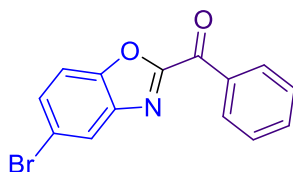


Purification of the crude mixture by column chromatography (n-hexane:EtOAc 97:3) afforded the product as pale yellow solid (141 mg, 55%).

¹H NMR (500 MHz, CDCl₃) δ 8.54-8.53 (m, 2H), 7.94-7.93 (m, 1H), 7.72-7.69 (m, 1H), 7.66-7.64 (m, 1H), 7.59-7.57 (m, 2H), 7.54-7.52 (m, 1H).

¹³C NMR (125 MHz, CDCl₃) δ 180.2, 158.1, 149.0, 141.8, 134.8, 134.6, 131.3, 131.0, 128.9, 128.7, 122.1, 112.7.

(5-Bromobenzoxazol-2-yl)(phenyl)methanone (3ha)⁶

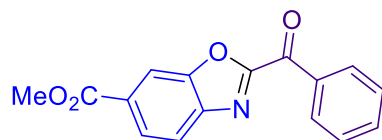


Purification of the crude mixture by column chromatography (heptane:EtOAc 97:3) afforded the product as pale yellow solid (175 mg, 58%).

⁶ X. Chen, X. Cui, F. Yang and Y. Wu, *Org. Lett.*, 2015, **17**, 1445.

^1H NMR (500 MHz, CDCl_3) δ 8.53-8.51 (m, 2H), 8.08-8.07 (m, 1H), 7.70-7.64 (m, 2H), 7.59-7.55 (m, 3H).
 ^{13}C NMR (125 MHz, CDCl_3) δ 180.1, 157.9, 149.4, 142.2, 134.8, 134.5, 131.5, 131.0, 128.7, 125.2, 118.5, 113.1.

Methyl 2-benzoylbenzoxazole-6-carboxylate (3ia)



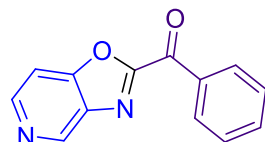
Purification of the crude mixture by column chromatography (CH_2Cl_2) afforded the product as pale yellow solid (205 mg, 73%).

^1H NMR (500 MHz, CDCl_3) δ 8.54-8.52 (m, 2H), 8.36 (s, 1H), 8.17 (dd, J = 8.5 Hz, 1.5 Hz, 1H), 7.96 (d, J = 8.4 Hz, 1H), 7.71-7.67 (m, 1H), 7.58-7.55 (m, 2H), 3.97 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 180.1, 166.1, 158.9, 150.0, 144.2, 134.7, 134.6, 131.0, 130.2, 128.7, 127.1, 122.1, 113.6, 52.6.

HRMS (ESI+) calcd for $\text{C}_{16}\text{H}_{12}\text{NO}_4$ $[\text{M} + \text{H}]^+$ 282.0767. Found 282.0780.

Oxazolo[4,5-c]pyridin-2-yl(phenyl)methanone (3ja)



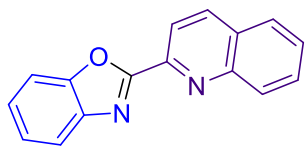
Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as pale yellow solid (117 mg, 52%).

^1H NMR (600 MHz, CDCl_3) δ 9.31 (s, 1H), 8.75 (d, J = 5.6 Hz, 1H), 8.56-8.54 (m, 2H), 7.73-7.68 (m, 2H), 7.60-7.57 (m, 2H).

^{13}C NMR (150 MHz, CDCl_3) δ 177.3, 154.7, 152.7, 145.3, 143.1, 135.8, 132.3, 131.9, 128.5, 126.3, 104.9.

HRMS (ESI+) calcd for $\text{C}_{13}\text{H}_9\text{N}_2\text{O}_2$ $[\text{M} + \text{H}]^+$ 225.0664. Found 225.0672.

2-(Quinolin-2-yl)benzoxazole (5aa)⁶

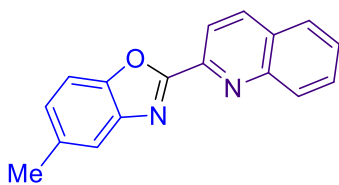


Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (180 mg, 73%).

¹H NMR (500 MHz, CDCl₃) δ 8.46 (d, J = 8.5 Hz, 1H), 8.35 (t, J = 9.1 Hz, 2H), 7.89-7.87 (m, 2H), 7.80 (t, J = 7.7 Hz, 1H), 7.73 (d, J = 7.7 Hz, 1H), 7.63 (t, J = 7.4 Hz, 1H), 7.45-7.40 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 161.7, 151.3, 148.1, 145.9, 141.9, 137.3, 130.4, 130.3, 128.8, 128.1, 127.7, 126.3, 125.0, 120.8, 120.3, 111.5.

5-Methyl-2-(quinolin-2-yl)benzoxazole (5ba)⁷

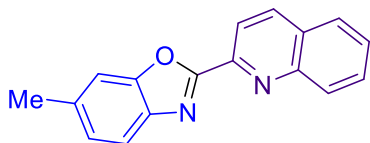


Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (185 mg, 71%).

¹H NMR (500 MHz, CDCl₃) δ 8.35 (d, J = 8.5 Hz, 1H), 8.30 (d, J = 8.5 Hz, 1H), 8.21 (d, J = 8.5 Hz, 1H), 7.77 (d, J = 7.9 Hz, 1H), 7.72 (t, J = 7.6 Hz, 1H), 7.58 (s, 1H), 7.54-7.52 (m, 2H), 7.17 (d, J = 8.2 Hz, 1H), 2.44 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 161.7, 149.5, 148.0, 146.0, 142.1, 137.1, 134.8, 130.3, 130.2, 128.6, 127.9, 127.6, 127.5, 120.6, 120.2, 110.8, 21.5.

6-Methyl-2-(quinolin-2-yl)benzoxazole (5ca)



⁷ Q. Zhou, S. Liu, M. Ma, H. Z. Cui, X. Hong, S. Huang, J. F. Zhang and X. F. Hou, *Synthesis*, 2018, **50**, 1315.

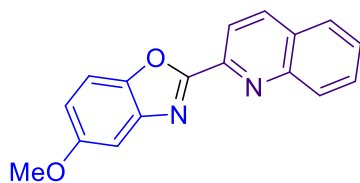
Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (179 mg, 69%).

¹H NMR (500 MHz, CDCl₃) δ 8.34 (d, J = 8.5 Hz, 1H), 8.29 (d, J = 8.5 Hz, 1H), 8.20 (d, J = 8.5 Hz, 1H), 7.76 (d, J = 8.2 Hz, 1H), 7.73-7.70 (m, 1H), 7.67 (d, J = 7.9 Hz, 1H), 7.53-7.50 (m, 1H), 7.44 (s, 1H), 7.15 (d, J = 8.2 Hz, 1H), 2.46 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 161.1, 151.6, 148.0, 146.0, 139.7, 137.1, 136.9, 130.3, 130.2, 128.6, 127.9, 127.6, 126.4, 120.2, 120.1, 111.4, 21.9.

HRMS (ESI+) calcd for C₁₇H₁₃N₂O [M + H]⁺ 261.1028. Found 261.1033.

5-Methoxy-2-(quinolin-2-yl)benzoxazole (5da)



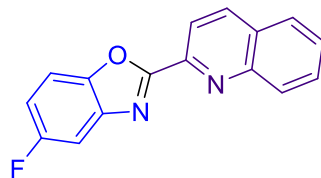
Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (207 mg, 75%).

¹H NMR (500 MHz, CDCl₃) δ 8.43 (d, J = 8.4 Hz, 1H), 8.33 (t, J = 8.4 Hz, 2H), 7.88-7.87 (m, 1H), 7.81-7.78 (m, 1H), 7.64-7.59 (m, 2H), 7.33 (d, J = 2.6 Hz, 1H), 7.05, 7.04, 7.03 (dd, J = 9.1 Hz, 2.6 Hz, 1H), 3.89 (s, 3H).

¹³C NMR (125 MHz, CDCl₃) δ 162.4, 157.7, 148.1, 146.1, 146.0, 142.7, 137.2, 130.4, 130.3, 128.7, 128.1, 127.7, 120.2, 115.4, 111.6, 103.2, 56.0.

HRMS (ESI+) calcd for C₁₇H₁₃N₂O₂ [M + H]⁺ 277.0978. Found 277.0981.

5-Fluoro-2-(quinolin-2-yl)benzoxazole (5fa)



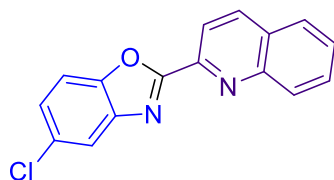
Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (164 mg, 62%).

^1H NMR (500 MHz, CDCl_3) δ 8.31-8.26 (m, 2H), 8.22-8.20 (m, 1H), 7.77-7.70 (m, 2H), 7.57-7.52 (m, 2H), 7.47-7.45 (m, 1H), 7.10-7.06 (m, 1H).

^{13}C NMR (125 MHz, CDCl_3) δ 163.2, 160.3 (d, $J = 241.2$ Hz), 148.0, 147.5, 145.4, 142.6 (d, $J = 14.0$ Hz), 137.2, 130.4, 130.2, 128.7, 128.2, 127.6, 120.2, 114.0 (d, $J = 26.7$ Hz), 111.7 (d, $J = 10.1$ Hz), 106.9 (d, $J = 25.5$ Hz).

HRMS (ESI+) calcd for $\text{C}_{16}\text{H}_{10}\text{FN}_2\text{O}$ $[\text{M} + \text{H}]^+$ 265.0777. Found 265.0770.

5-Chloro-2-(quinolin-2-yl)benzoxazole (5ga)^{Error! Bookmark not defined.}

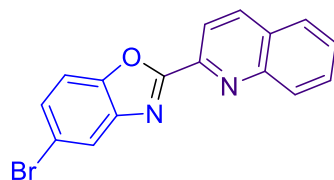


Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as pale yellow solid (193 mg, 69%).

^1H NMR (500 MHz, CDCl_3) δ 8.43, 8.42, 8.35, 8.33, 7.90, 7.89, 7.88, 7.84, 7.83, 7.82, 7.81, 7.80, 7.79, 7.66, 7.65, 7.64, 7.63, 7.41, 7.39.

^{13}C NMR (125 MHz, CDCl_3) δ 162.9, 149.9, 148.1, 145.5, 143.0, 137.4, 130.6, 130.3, 128.8, 128.3, 127.7, 126.6, 120.7, 120.3, 112.2 (one signal missing due to overlap).

5-Bromo-2-(quinolin-2-yl)benzoxazole (5ha)⁸



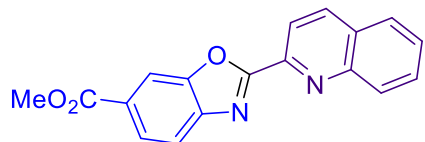
Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as pale yellow solid (211 mg, 65%).

^1H NMR (500 MHz, CDCl_3) δ 8.33 (d, $J = 8.6$ Hz, 1H), 8.28 (d, $J = 8.5$ Hz, 1H), 8.24 (d, $J = 8.6$ Hz, 1H), 7.92 (s, 1H), 7.80 (d, $J = 8.2$ Hz, 1H), 7.75 (t, $J = 7.7$ Hz, 1H), 7.57 (t, $J = 7.3$ Hz, 1H), 7.56, 7.52 (d, $J = 8.5$ Hz, 1H), 7.47 (d, $J = 8.5$ Hz, 1H).

⁸ S. De, R. C. Shreya, R. J. Gajanan, K. Selva, M. Prasanth, N. Ramesh, M. Ashaparna, M. Anbalagan, B. Subhasis, P. Priyankar and S. K. A Kumar, *New J. Chem.* 2019, **43**, 3291.

^{13}C NMR (125 MHz, CDCl_3) δ 162.6, 150.2, 148.0, 145.3, 143.4, 137.3, 130.5, 130.3, 129.3, 128.8, 128.3, 127.7, 123.7, 120.3, 117.8, 112.6.

Methyl 2-(quinolin-2-yl)benzoxazole-6-carboxylate (5ia)



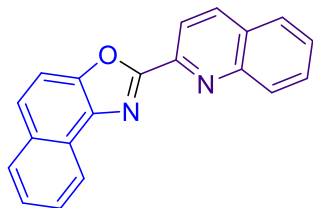
Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as pale yellow solid (225 mg, 74%).

^1H NMR (500 MHz, CDCl_3) δ 8.36 (d, J = 8.5 Hz, 1H), 8.31-8.29 (m, 2H), 8.26 (d, J = 8.5 Hz, 1H), 8.09-8.07 (m, 1H), 7.83-7.80 (m, 2H), 7.77-7.74 (m, 1H), 7.59-7.56 (m, 1H), 3.93 (s, 3H).

^{13}C NMR (125 MHz, CDCl_3) δ 166.4, 163.9, 150.9, 148.1, 145.6, 145.3, 137.3, 130.5, 130.4, 128.8, 128.4, 128.2, 127.7, 126.6, 120.4 (2C), 113.0, 52.4.

HRMS (ESI+) calcd for $\text{C}_{18}\text{H}_{13}\text{N}_2\text{O}_3$ $[\text{M} + \text{H}]^+$ 305.0927. Found 305.0936.

2-(Quinolin-2-yl)naphtho[1,2-d]oxazole (5ka)⁹



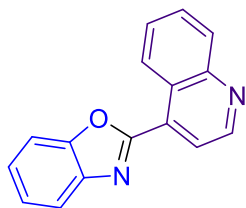
Purification of the crude mixture by column chromatography (CH_2Cl_2 :MeOH 1:0 to 200:1) afforded the product as a brown solid (83 mg, 28%).

^1H NMR (500 MHz, CDCl_3) δ 8.42-8.39 (m, 2H), 8.35-8.33 (m, 1H), 8.26-8.25 (m, 1H), 7.94-7.93 (m, 1H), 7.89-7.87 (m, 1H), 7.81-7.74 (m, 3H), 7.63-7.60 (m, 1H), 7.57-7.51 (m, 2H).

^{13}C NMR (125 MHz, CDCl_3) δ 161.1, 148.1, 147.3, 145.9, 138.6, 137.2, 132.3, 130.3, 130.2, 128.7, 128.5, 127.9, 127.6, 126.9, 126.2, 126.0, 120.9, 120.5, 120.0, 118.9.

⁹ P. Z. Renzo, V. Silvana, G. Yasser, Z. T. Gerald, L. Else, N. Sant and L. Z. Antonio, *Photochem. Photobiol.*, 2018, **94**, 1092.

2-(Quinolin-4-yl)benzoxazole (5ab)¹⁰

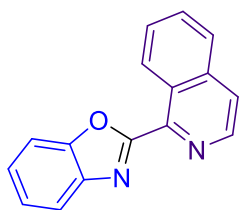


Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (185 mg, 75%).

¹H NMR (500 MHz, CDCl₃) δ 9.46 (d, J = 8.5 Hz, 1H), 9.05 (d, J = 4.3 Hz, 1H), 8.21-8.18 (m, 2H), 7.90-7.88 (m, 1H), 7.81-7.78 (m, 1H), 7.74-7.71 (m, 1H), 7.65-7.63 (m, 1H), 7.45-7.39 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 160.5, 150.2, 149.7, 149.1, 142.0, 131.1, 130.1, 129.9, 128.3, 126.4 (2C), 125.0, 124.6, 121.4, 120.9, 110.8.

2-(Isoquinolin-1-yl)benzoxazole (5ac)¹¹



Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (135 mg, 55%).

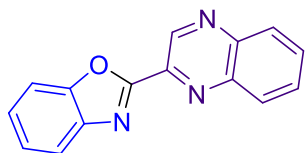
¹H NMR (500 MHz, CDCl₃) δ 9.68 (d, J = 7.9 Hz, 1H), 8.74 (d, J = 5.4 Hz, 1H), 7.92-7.86 (m, 2H), 7.79-7.71 (m, 4H), 7.45-7.39 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 160.8, 150.4, 144.8, 142.2, 142.0, 137.0, 130.6, 129.0, 127.4, 127.2, 127.1, 126.4, 124.9, 123.5, 120.9, 111.3.

¹⁰ F. Gao, B. S. Kim and P. J. Walsh, *Chem. Commun.*, 2014, **50**, 10661.

¹¹ X. Chen, X. Cui, F. Yang and Y. Wu, *Org. Lett.*, 2015, **17**, 1445.

2-(Quinoxalin-2-yl)benzoxazole (5ad)^{Error! Bookmark not defined.}

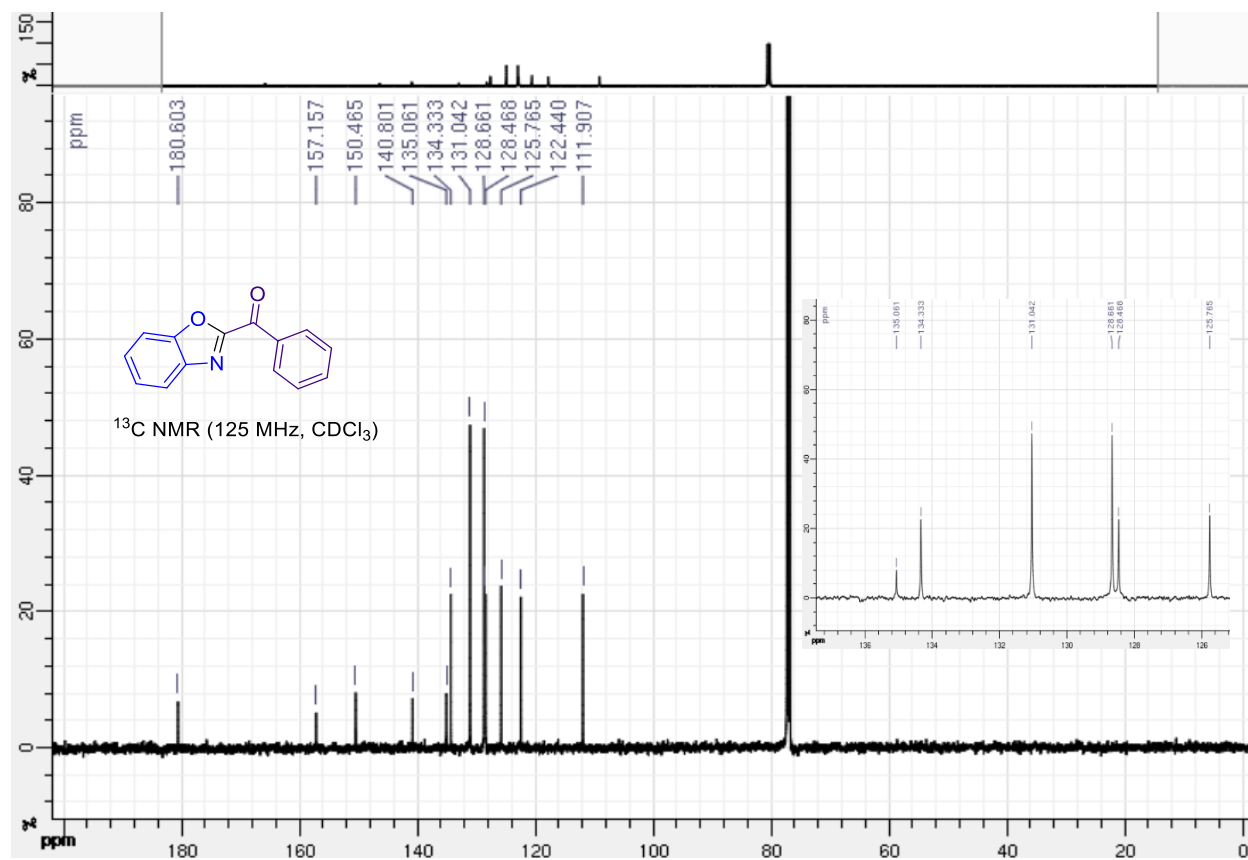
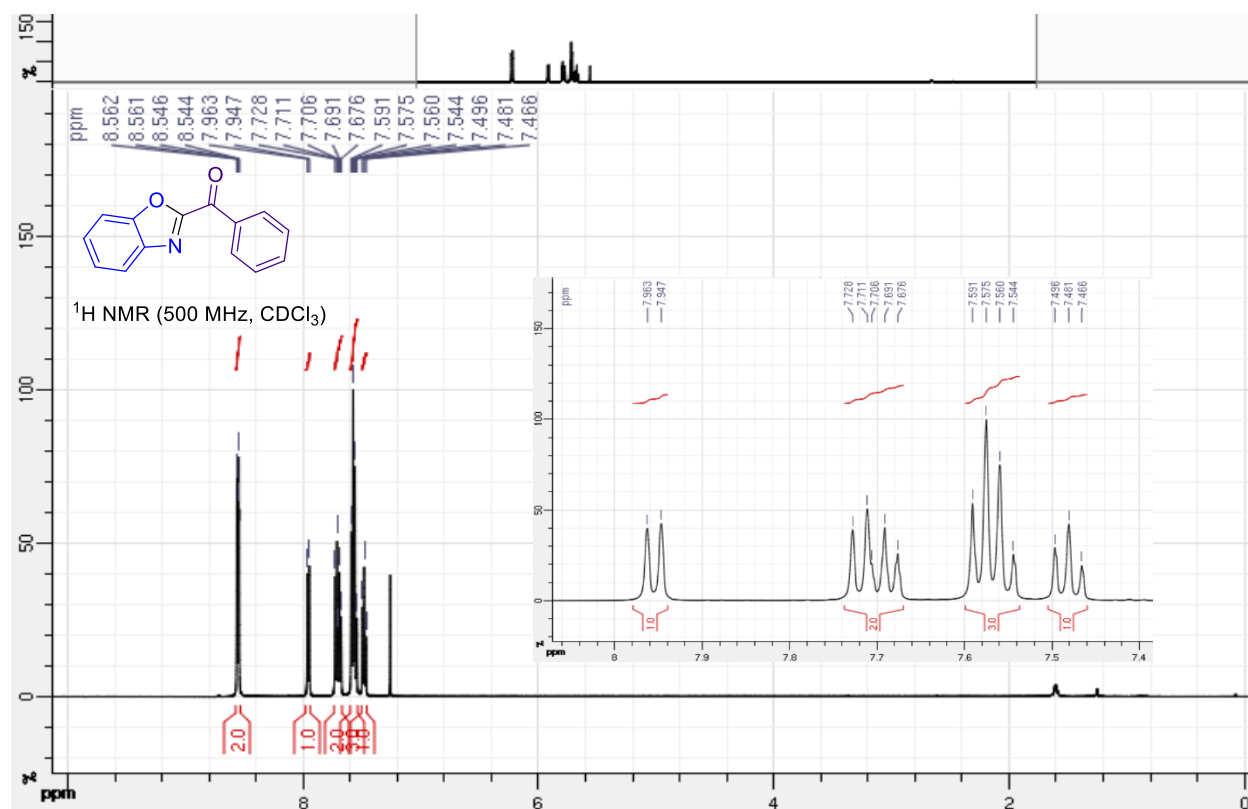


Purification of the crude mixture by column chromatography (CH₂Cl₂:MeOH 1:0 to 200:1) afforded the product as pale yellow solid (86 mg, 35%).

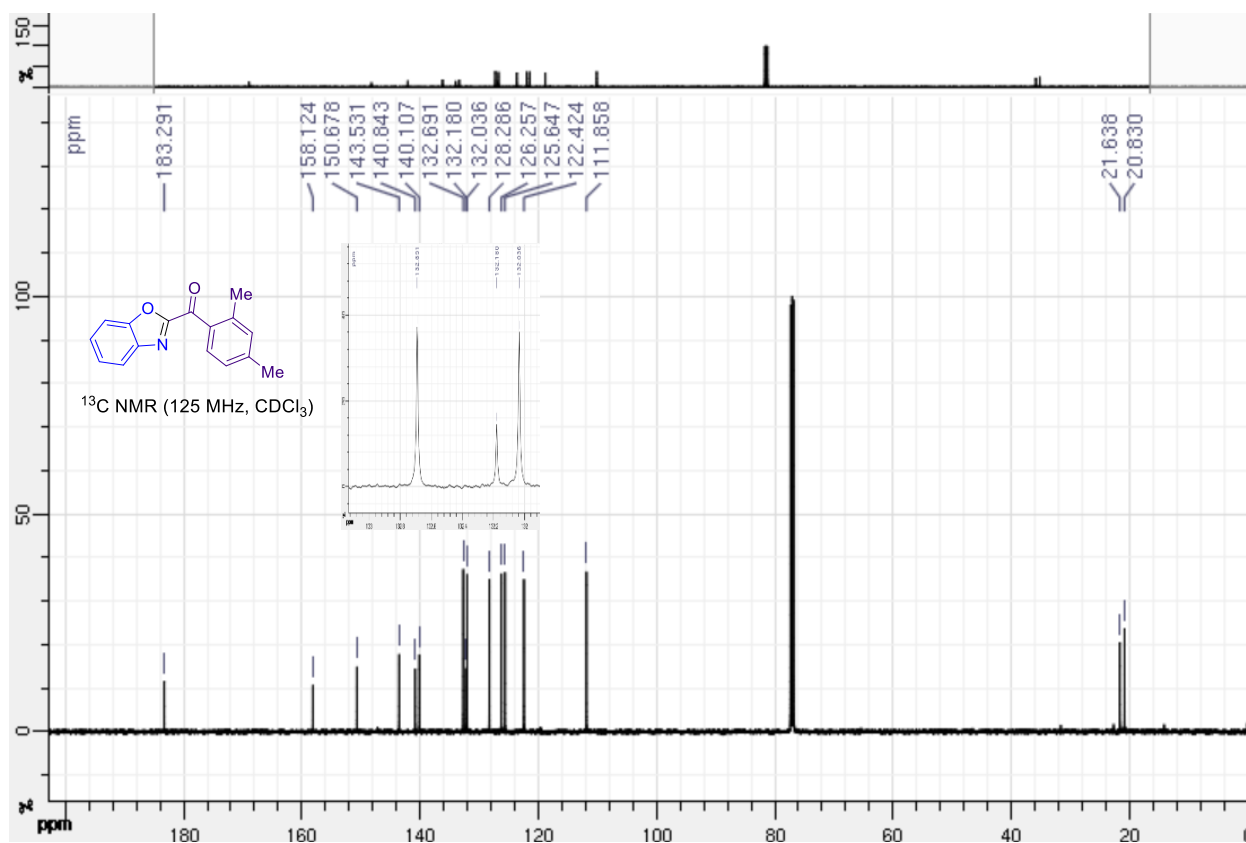
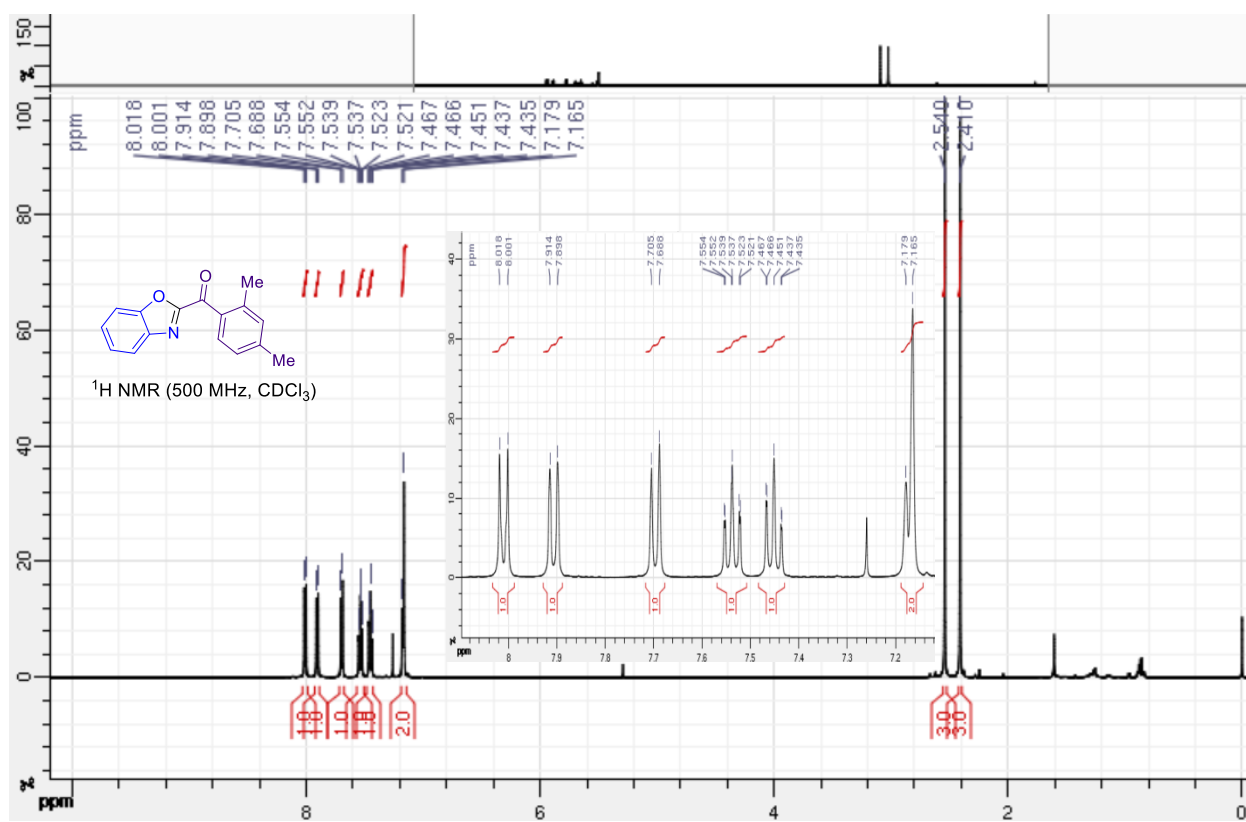
¹H NMR (500 MHz, CDCl₃) δ 9.72 (s, 1H), 8.24-8.20 (m, 1H), 8.09-8.07 (m, 1H), 7.81-7.80 (m, 1H), 7.77-7.73 (m, 2H), 7.64-7.62 (m, 1H), 7.39-7.32 (m, 2H).

¹³C NMR (125 MHz, CDCl₃) δ 159.7, 151.1, 144.3, 142.9, 141.7, 141.6, 140.8, 131.5, 131.0, 130.1, 129.4, 126.8, 125.3, 121.0, 111.4.

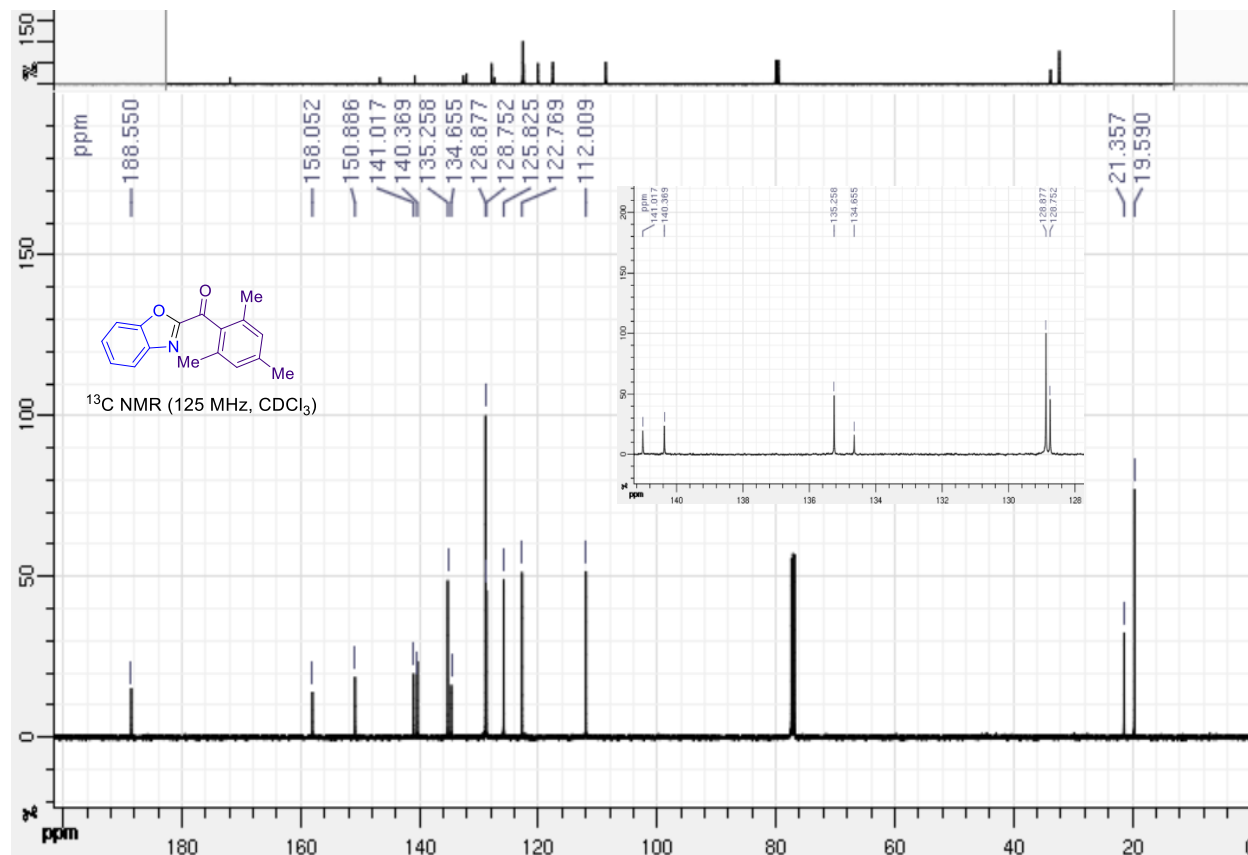
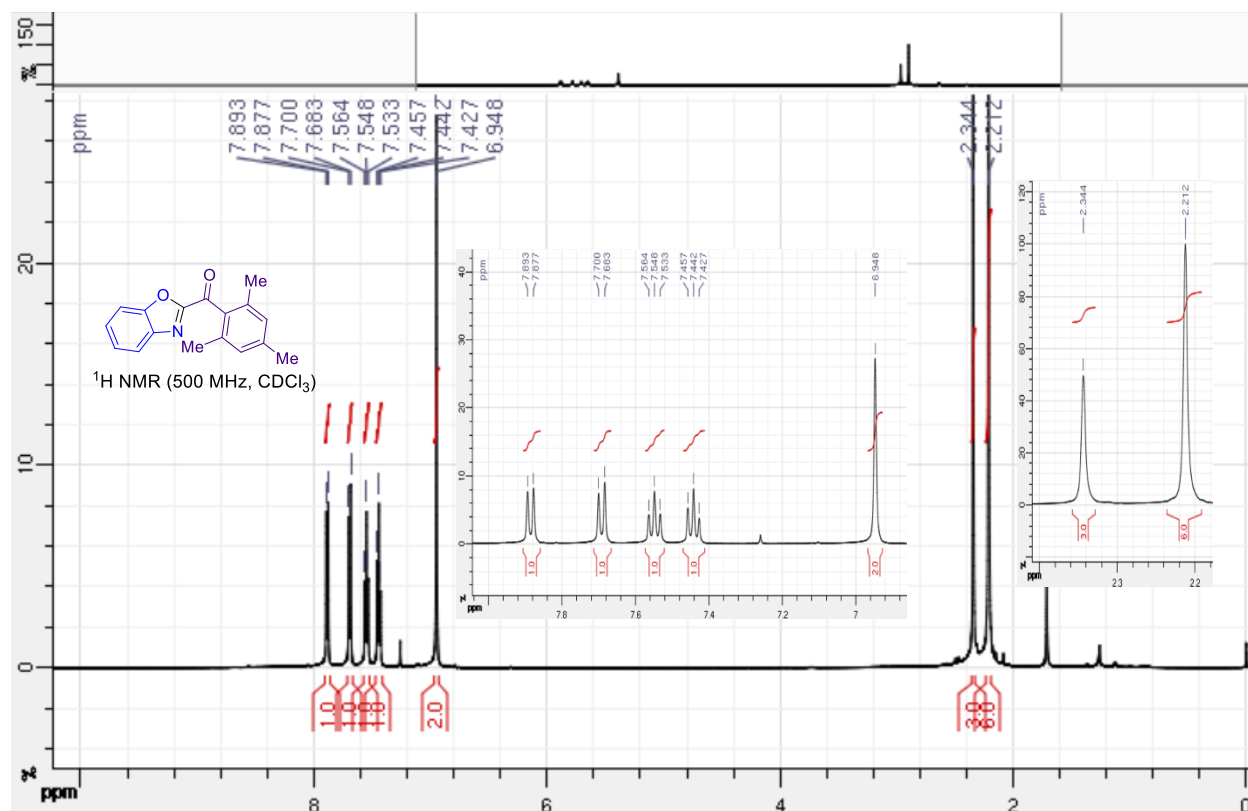
Benzoxazol-2-yl(phenyl)methanone (3aa)



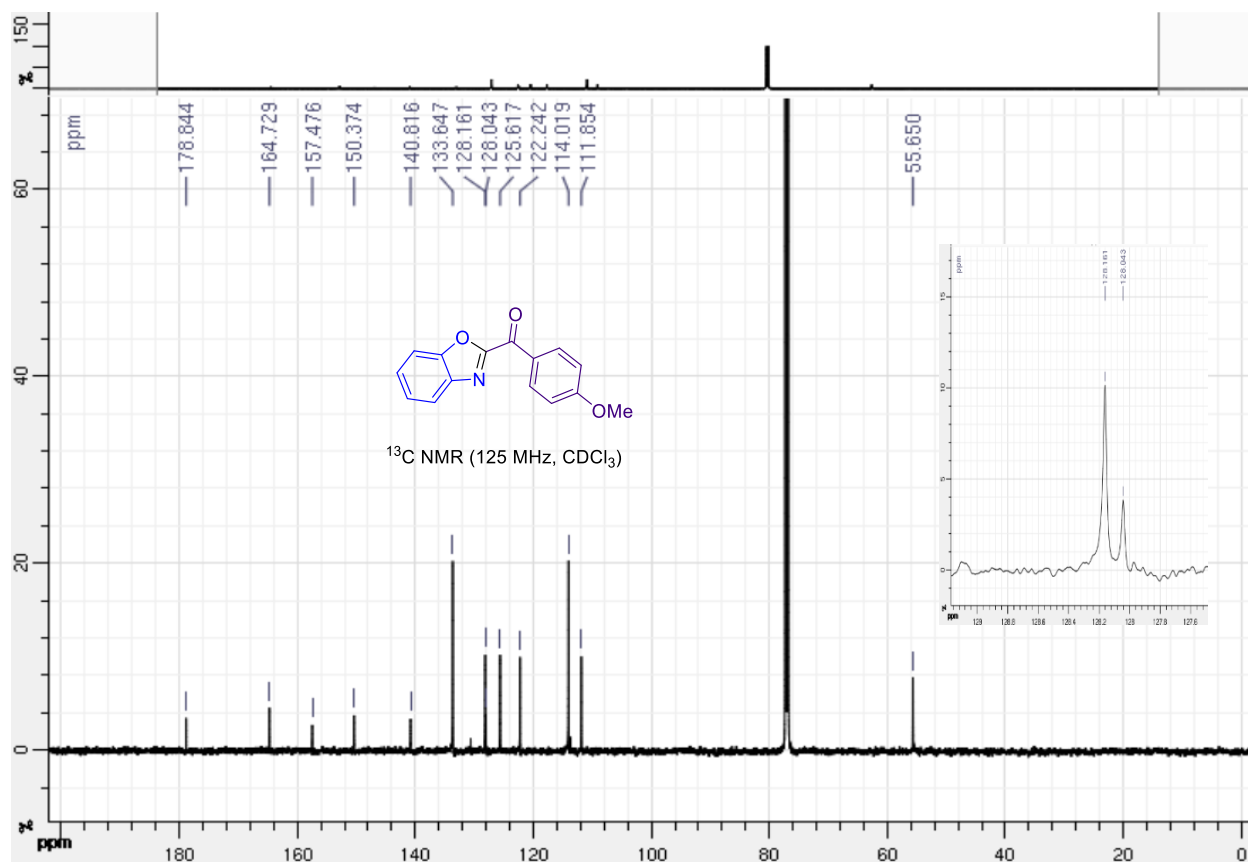
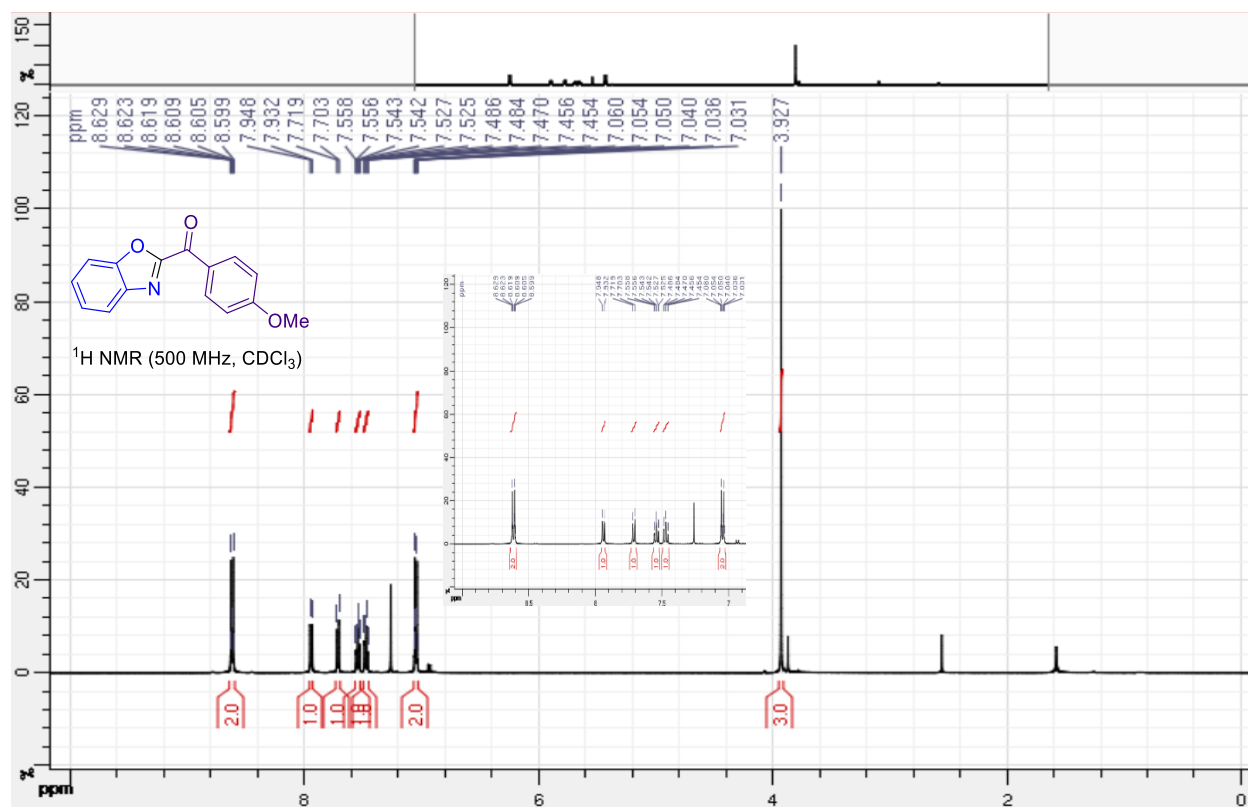
Benzoxazol-2-yl(2,4-dimethylphenyl)methanone (3ab)



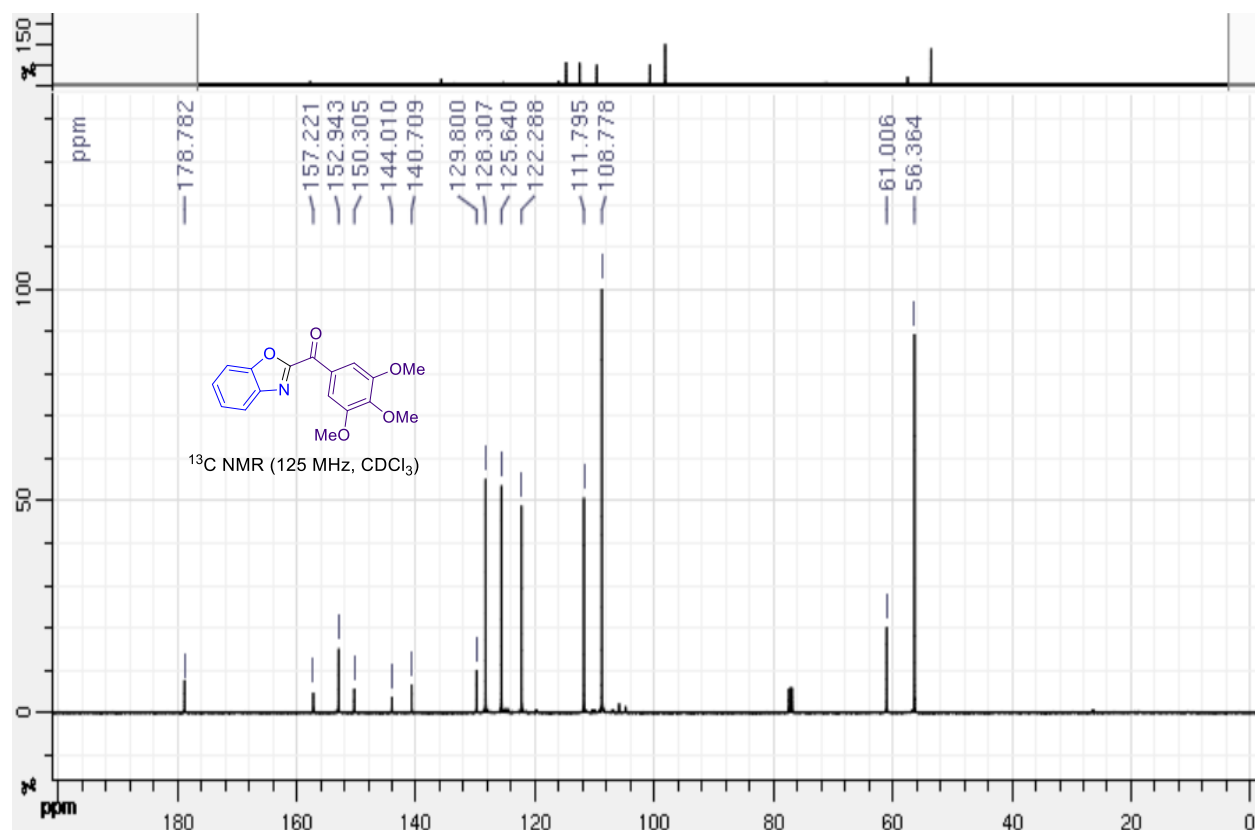
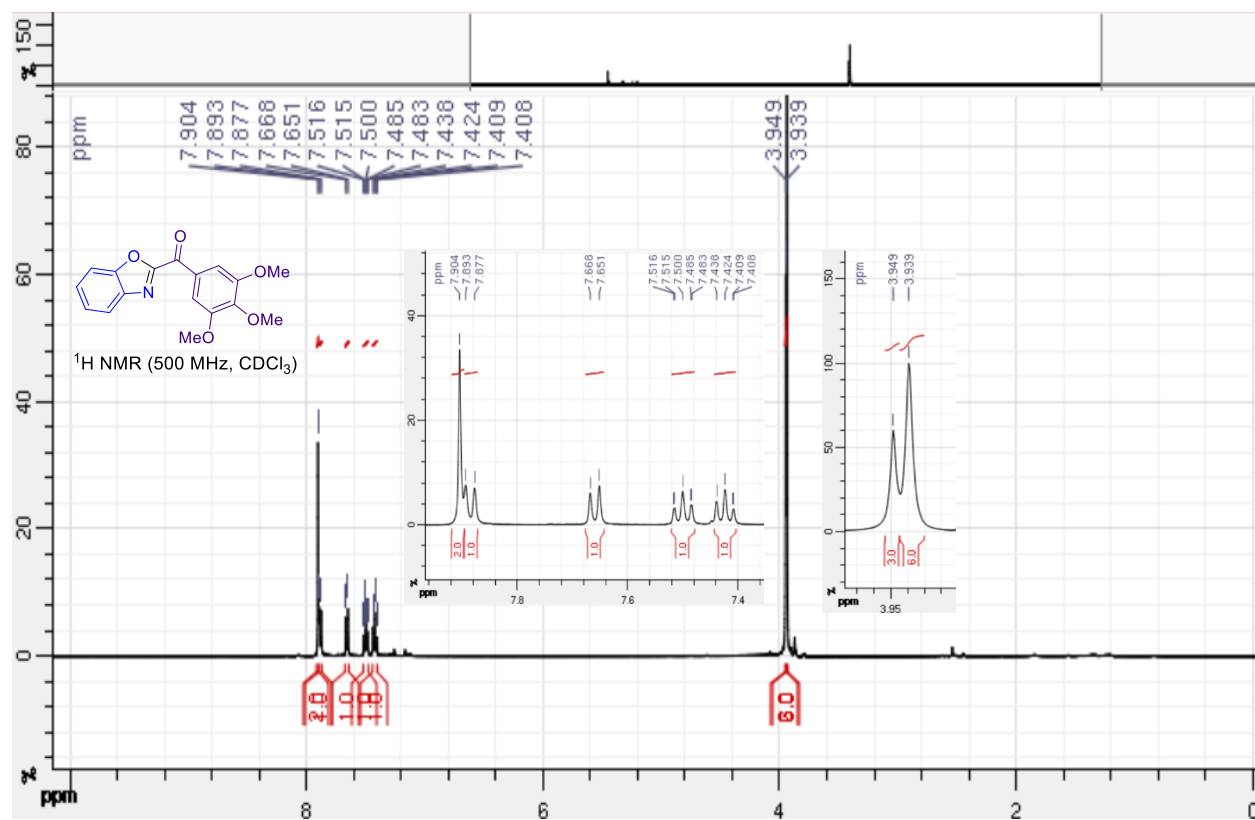
Benzoxazol-2-yl(mesityl)methanone (3ac)

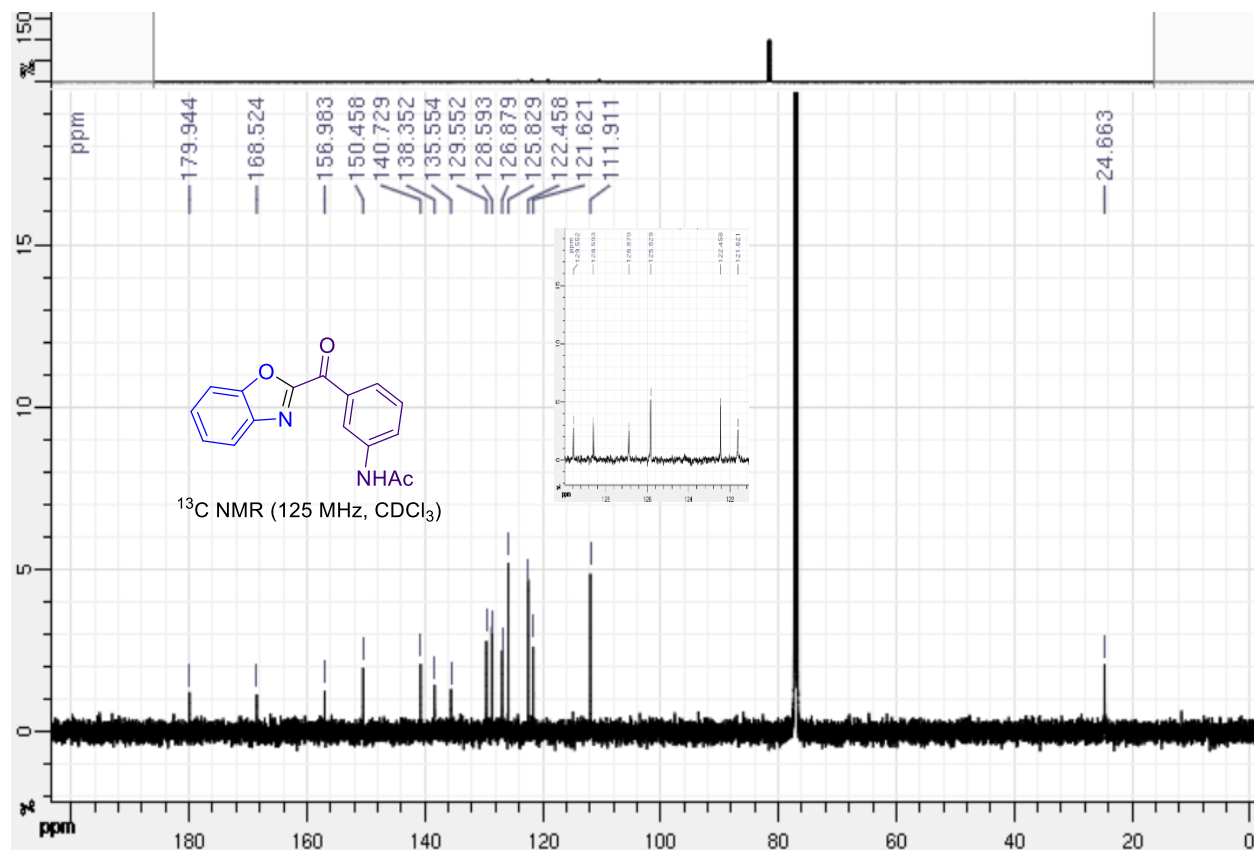


Benzoxazol-2-yl(4-methoxyphenyl)methanone (3ae)

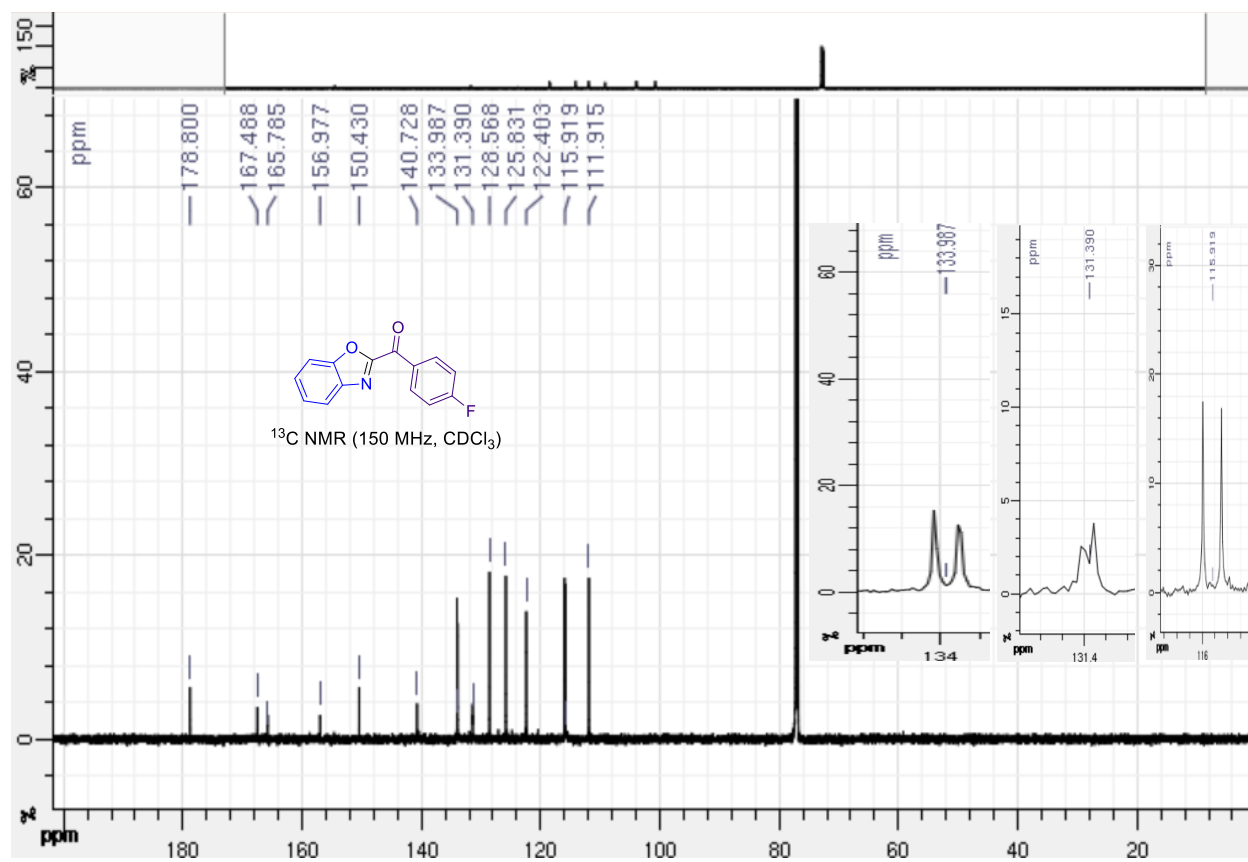
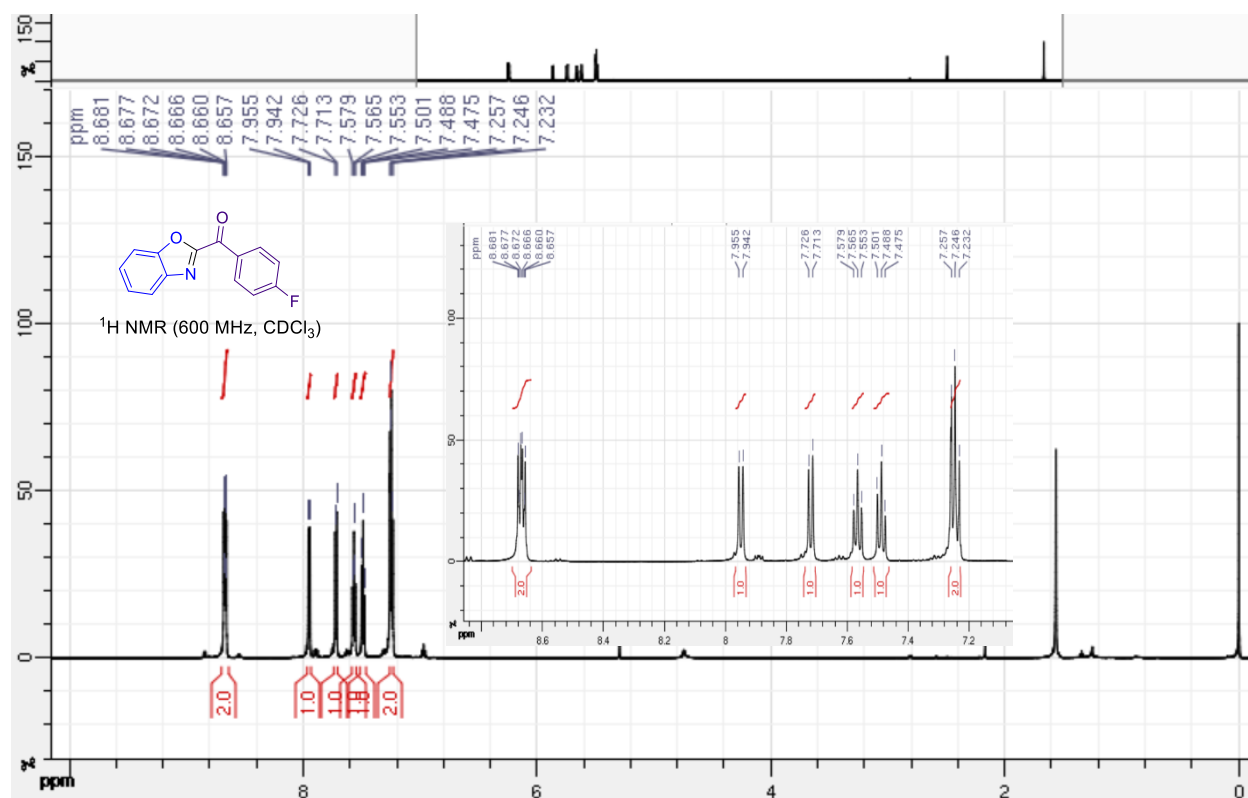


Benzoxazol-2-yl(3,4,5-trimethoxyphenyl)methanone (3af)

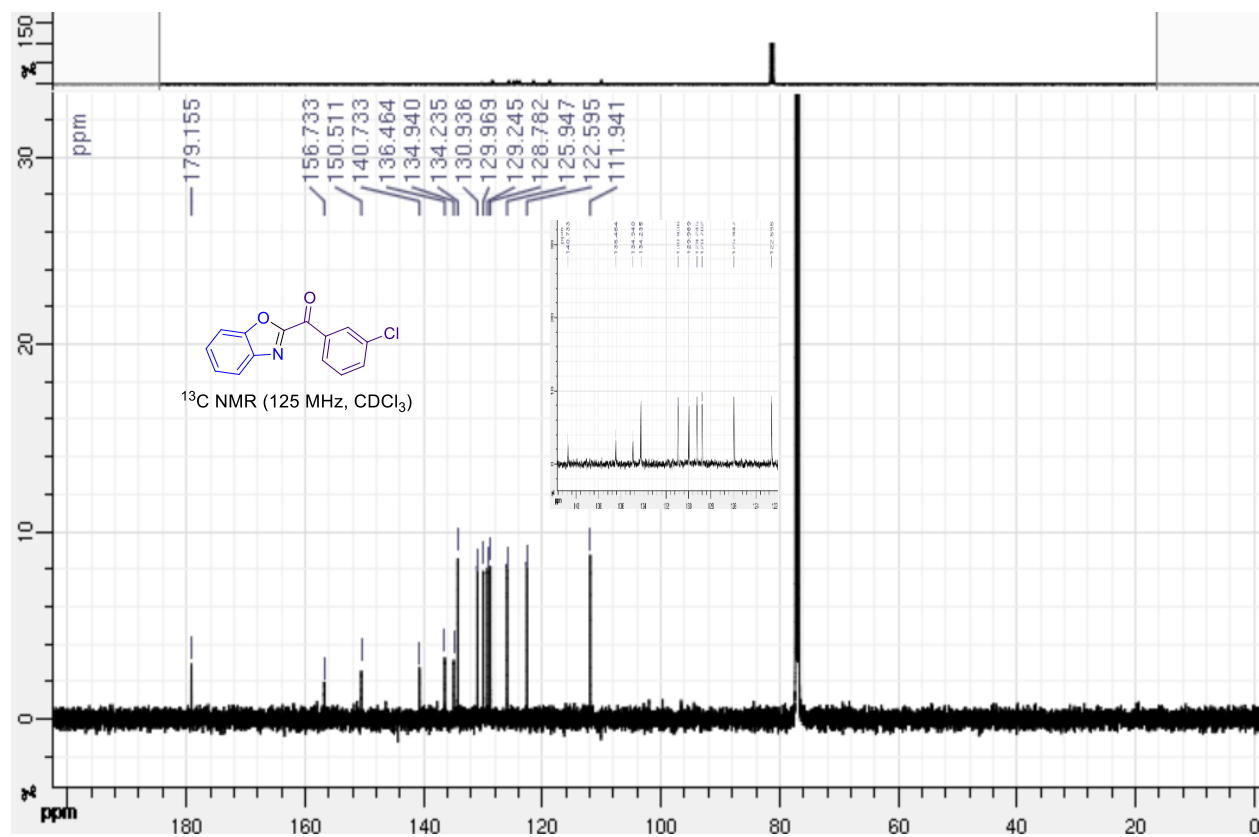
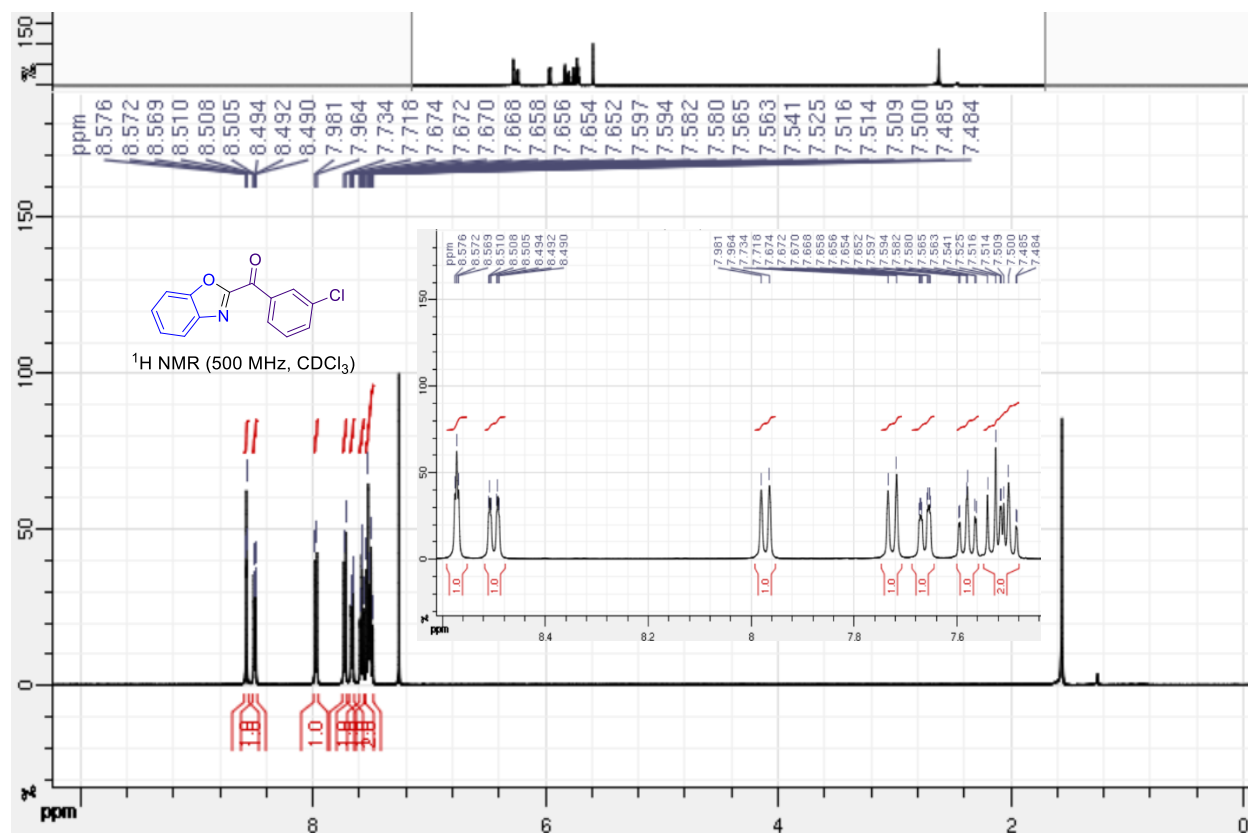


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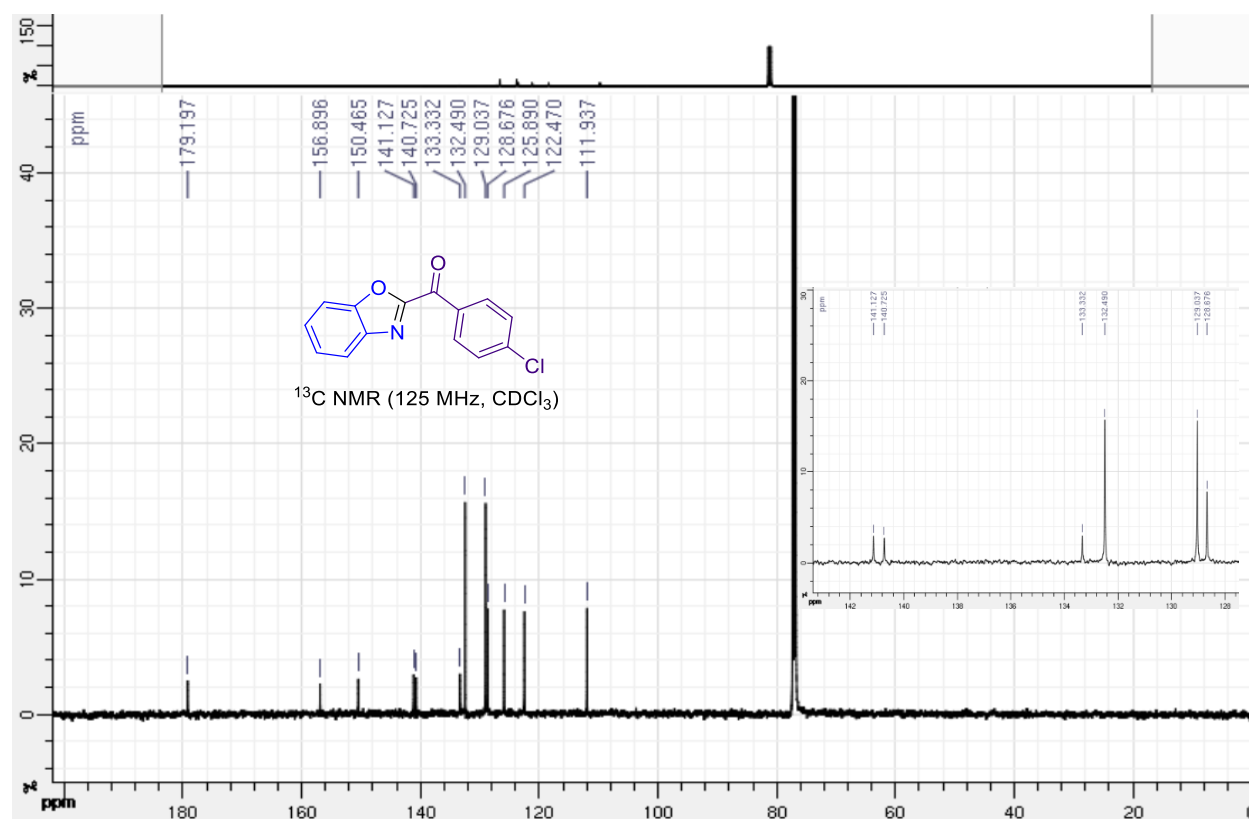
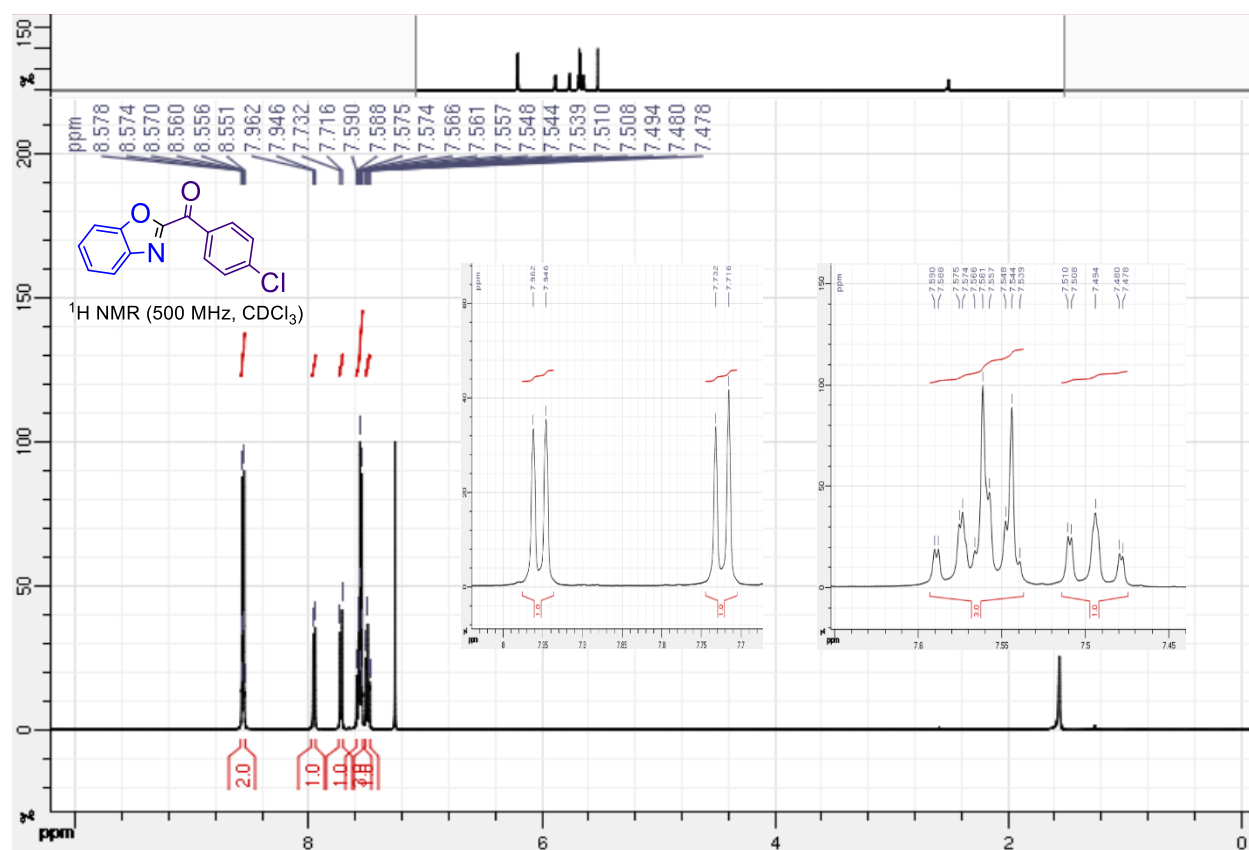
Benzoxazol-2-yl(4-fluorophenyl)methanone (3ah)



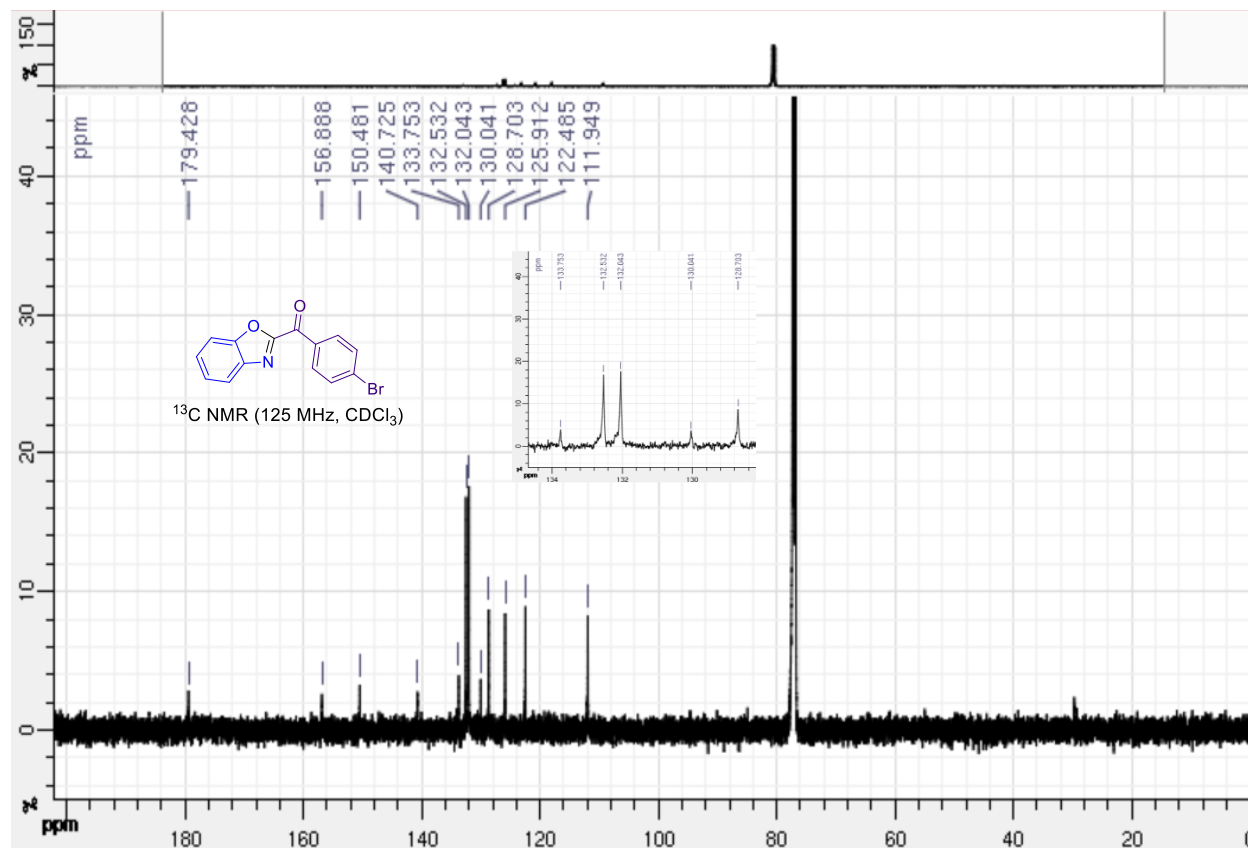
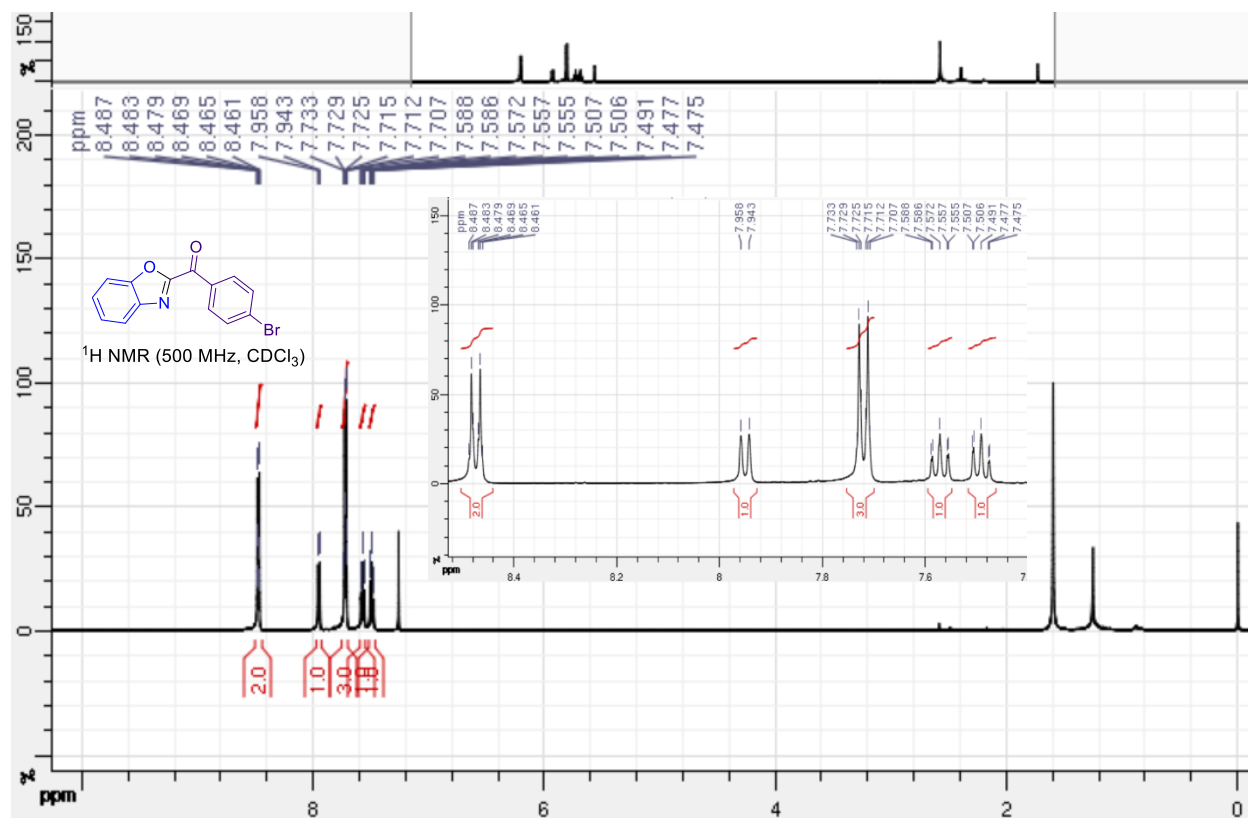
Benzoxazol-2-yl(3-chlorophenyl)methanone (3ai)



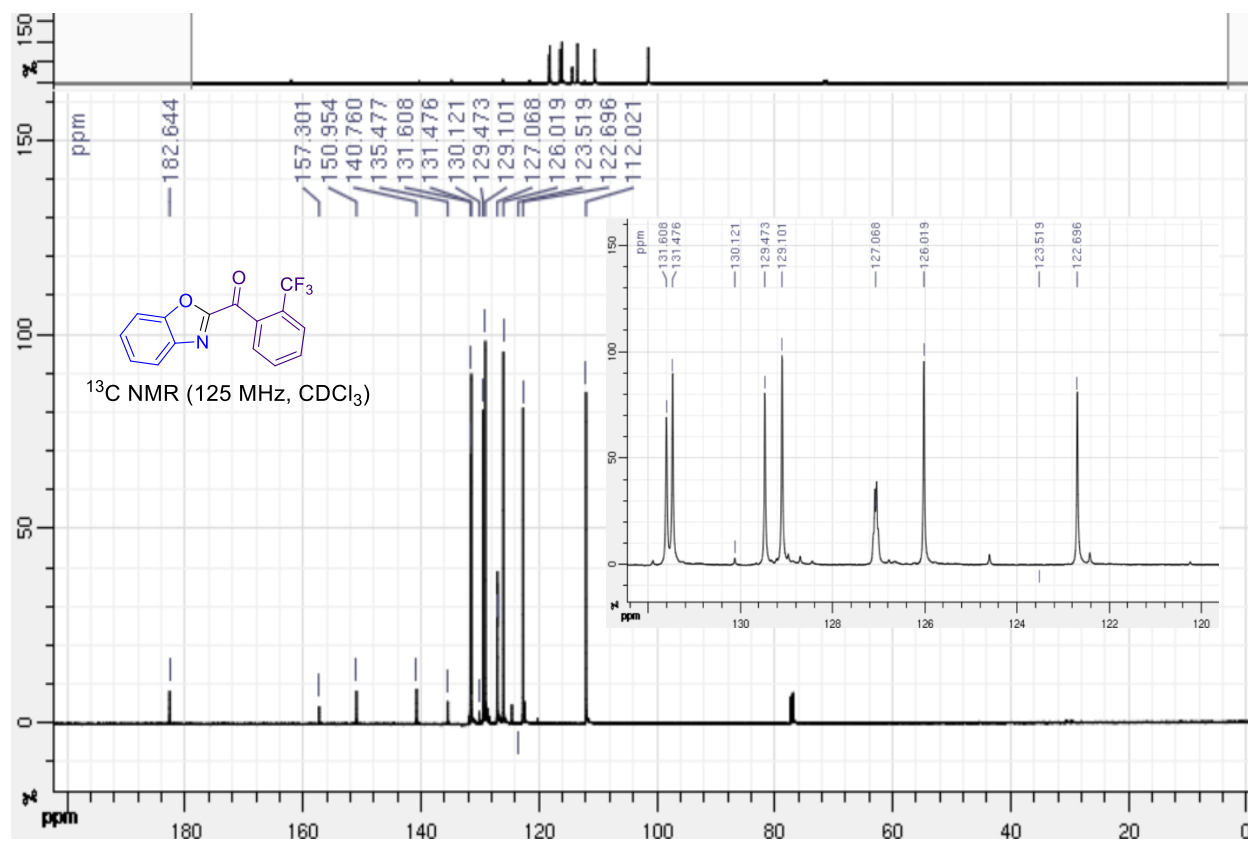
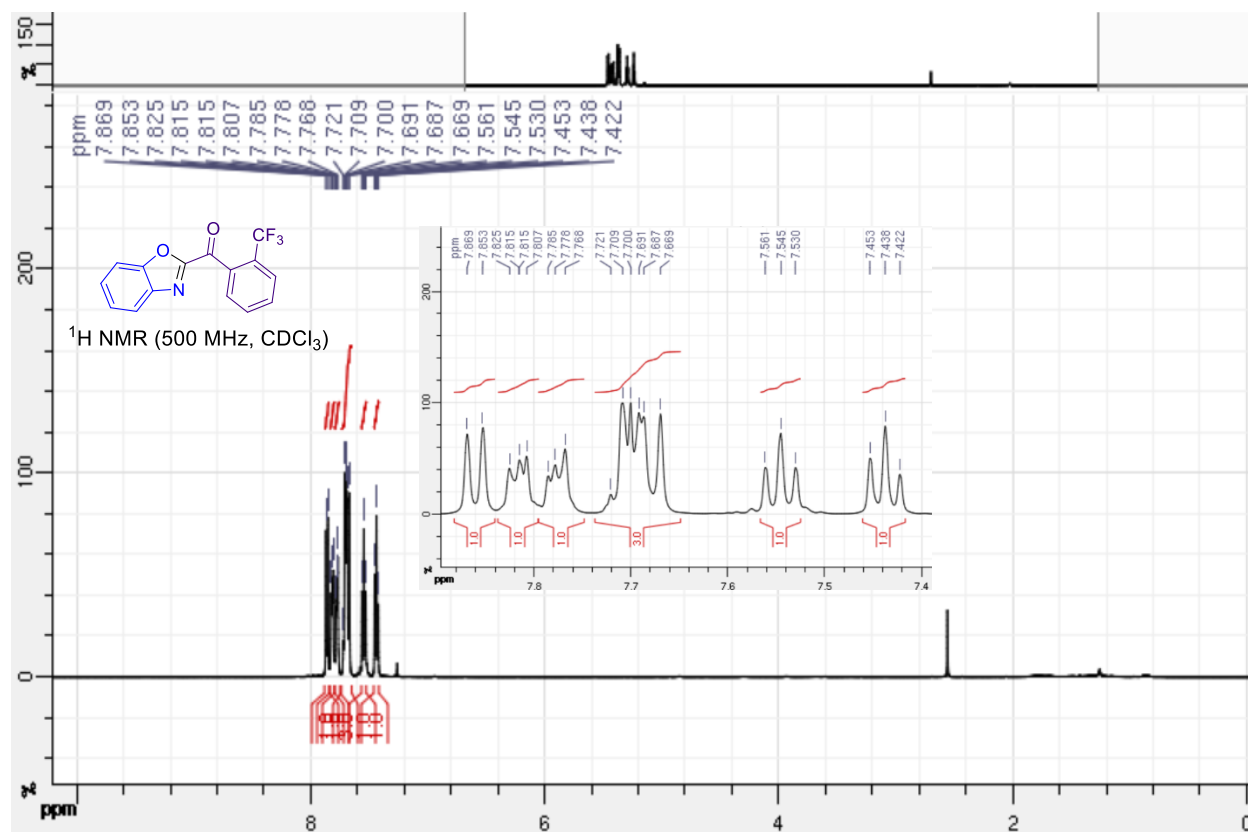
Benzoxazol-2-yl(4-chlorophenyl)methanone (3aj)



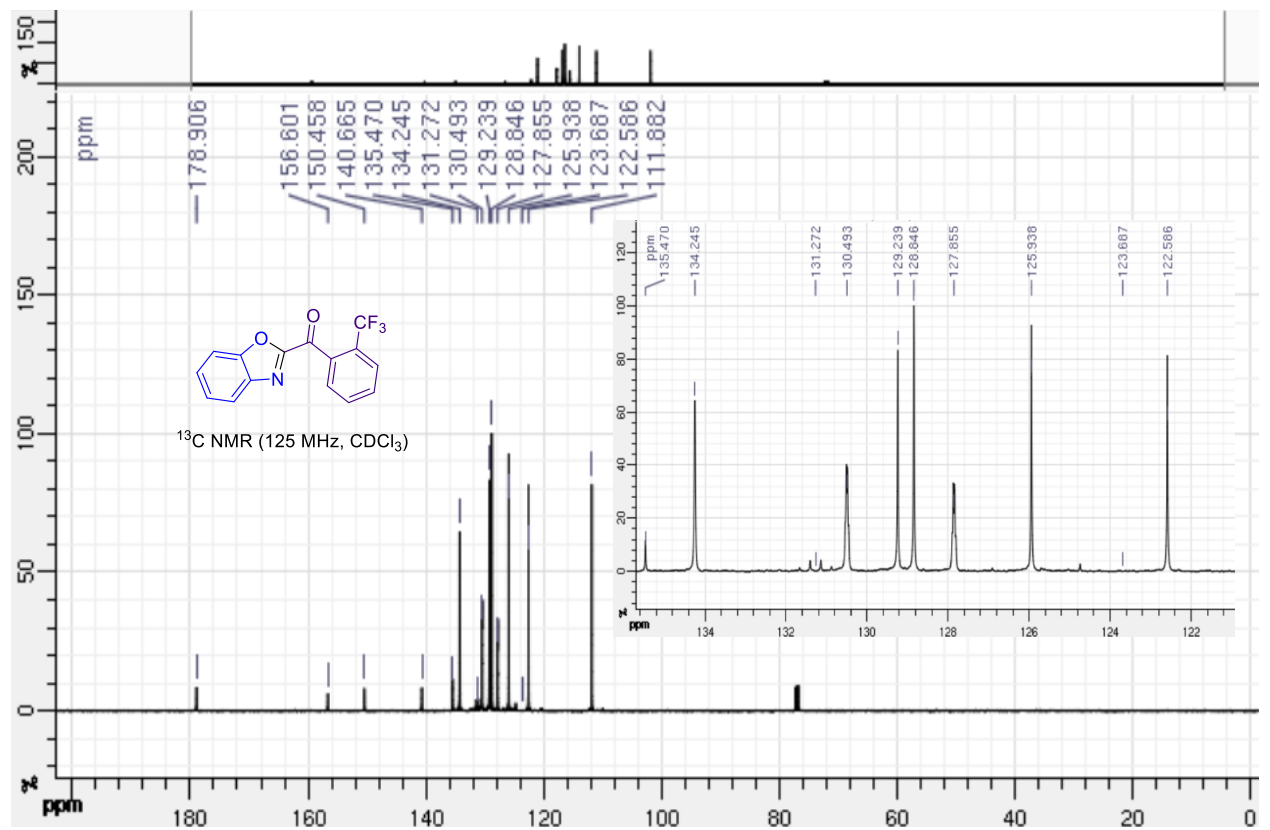
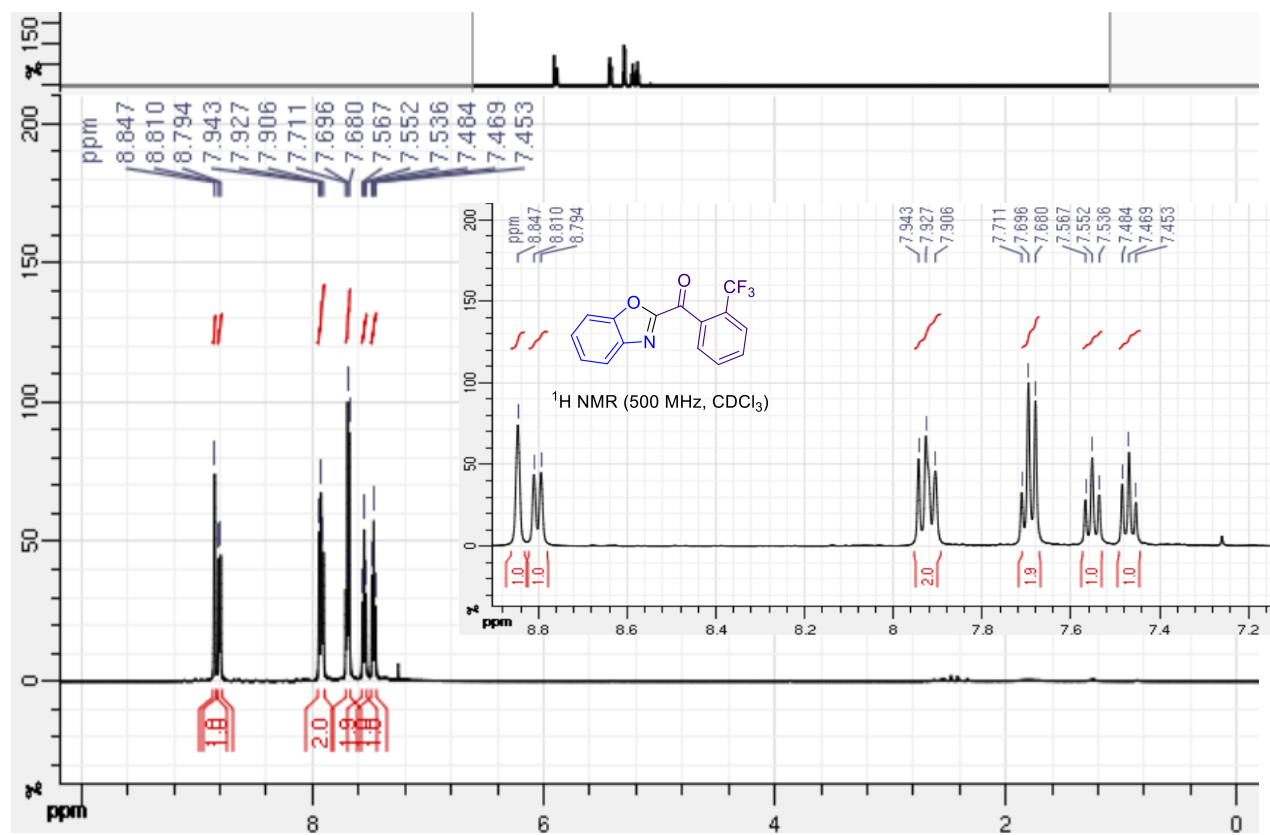
Benzoxazol-2-yl(4-bromophenyl)methanone (3al)



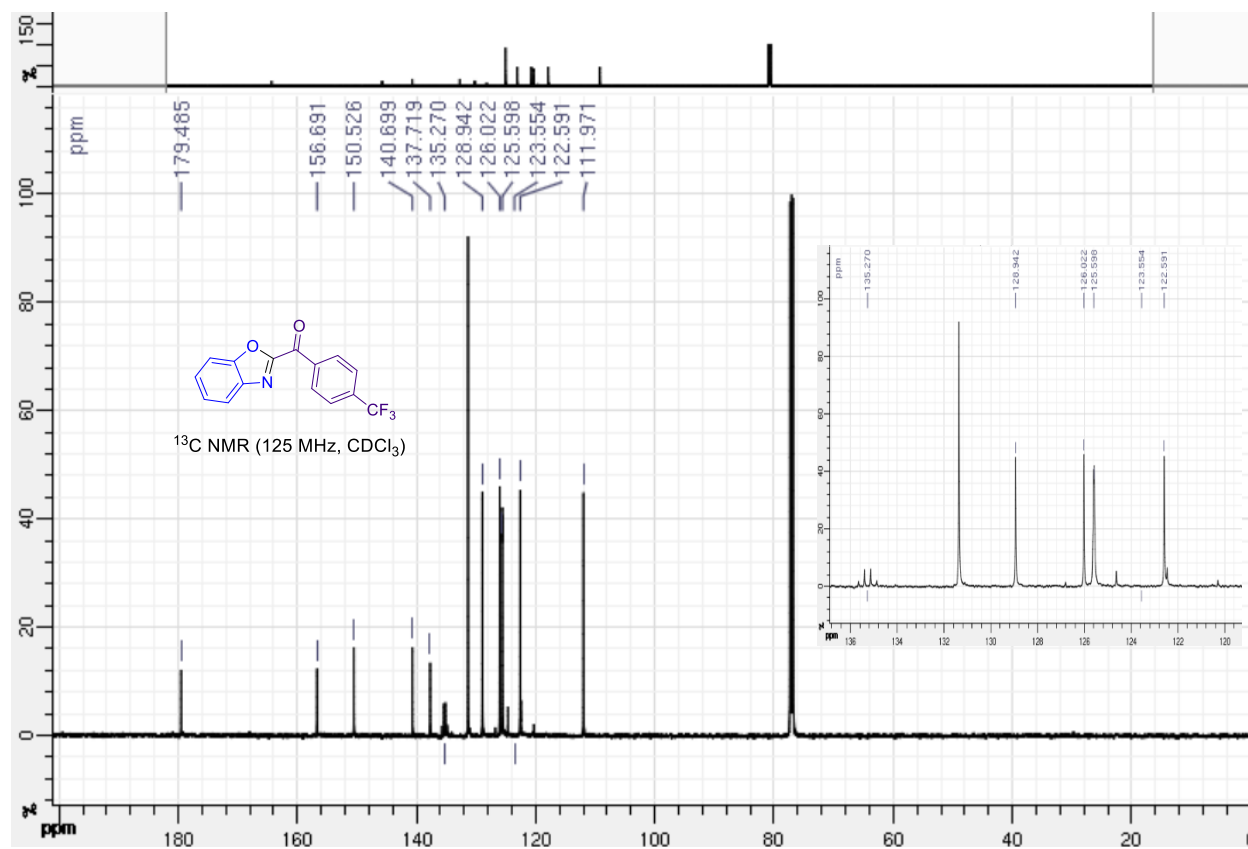
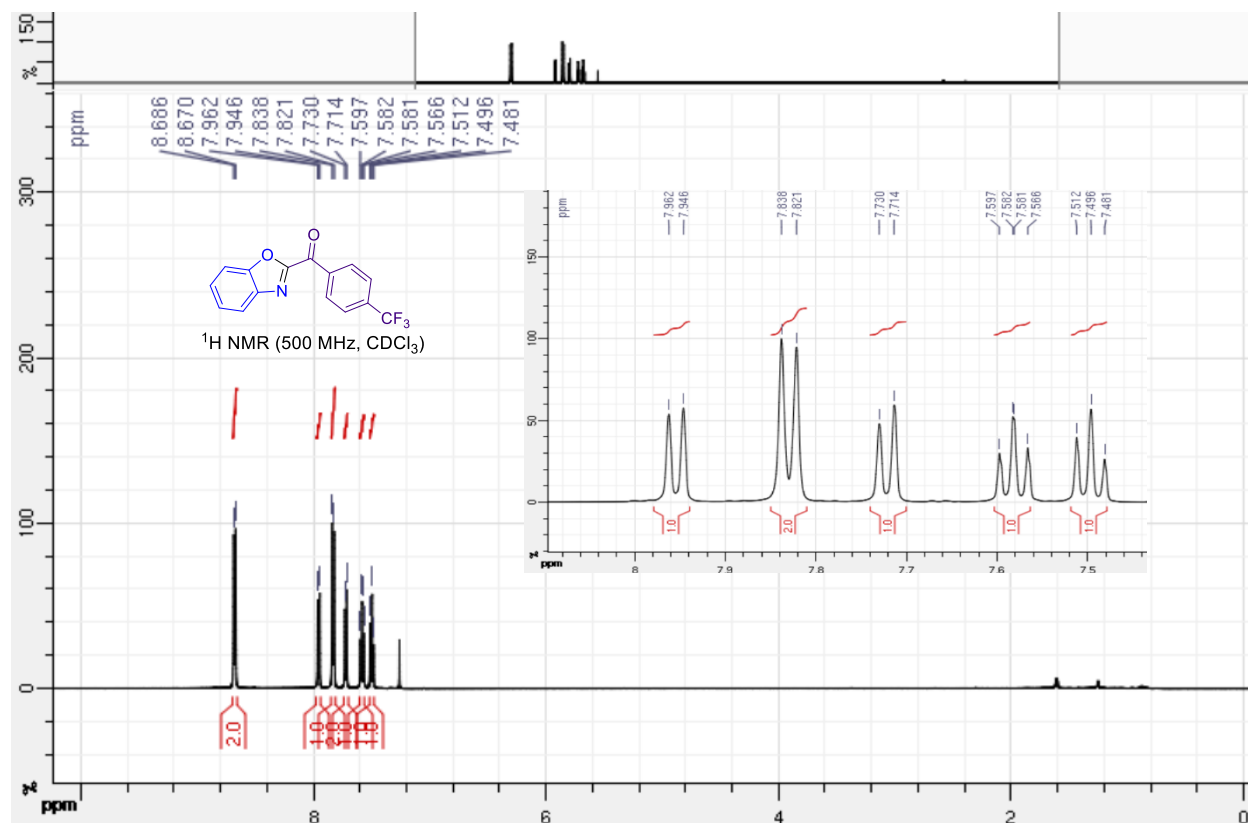
Benzoxazol-2-yl(2-(trifluoromethyl)phenyl)methanone (3am)



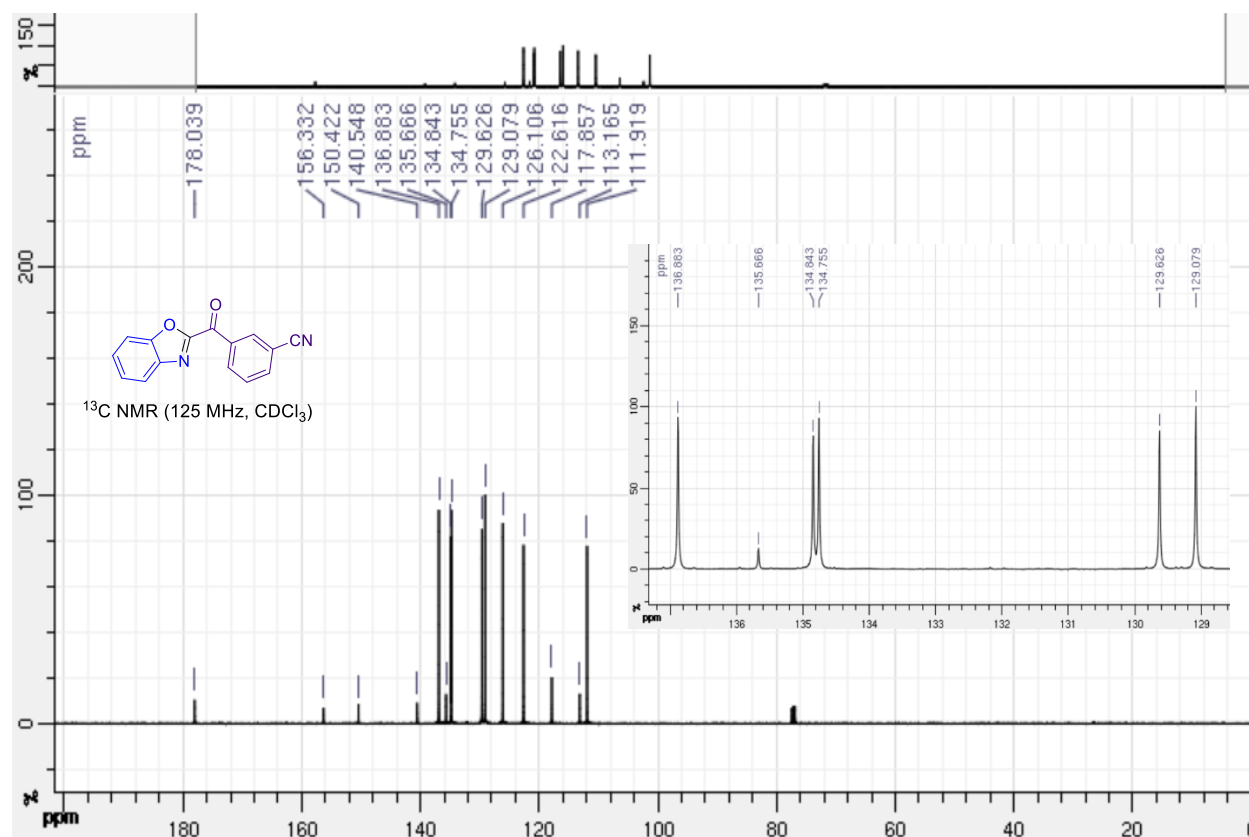
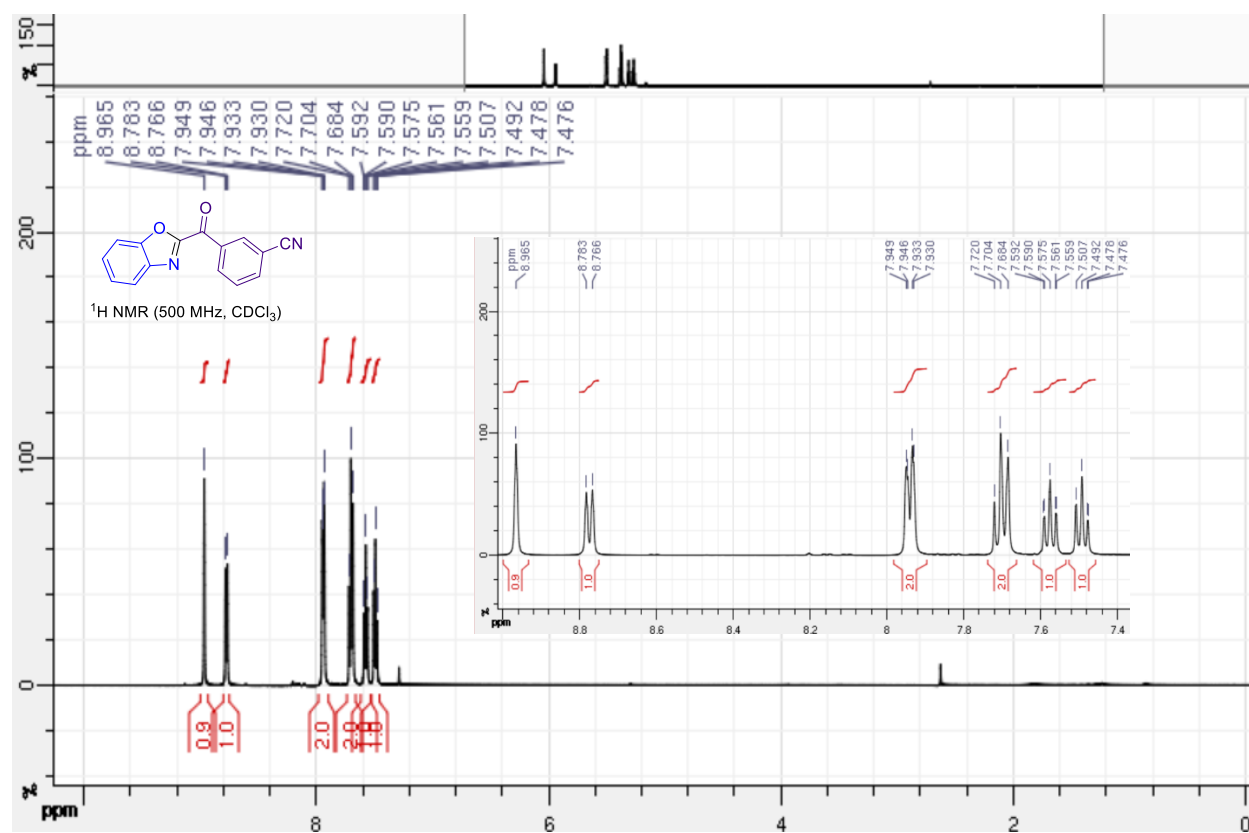
Benzoxazol-2-yl(3-(trifluoromethyl)phenyl)methanone (3an)



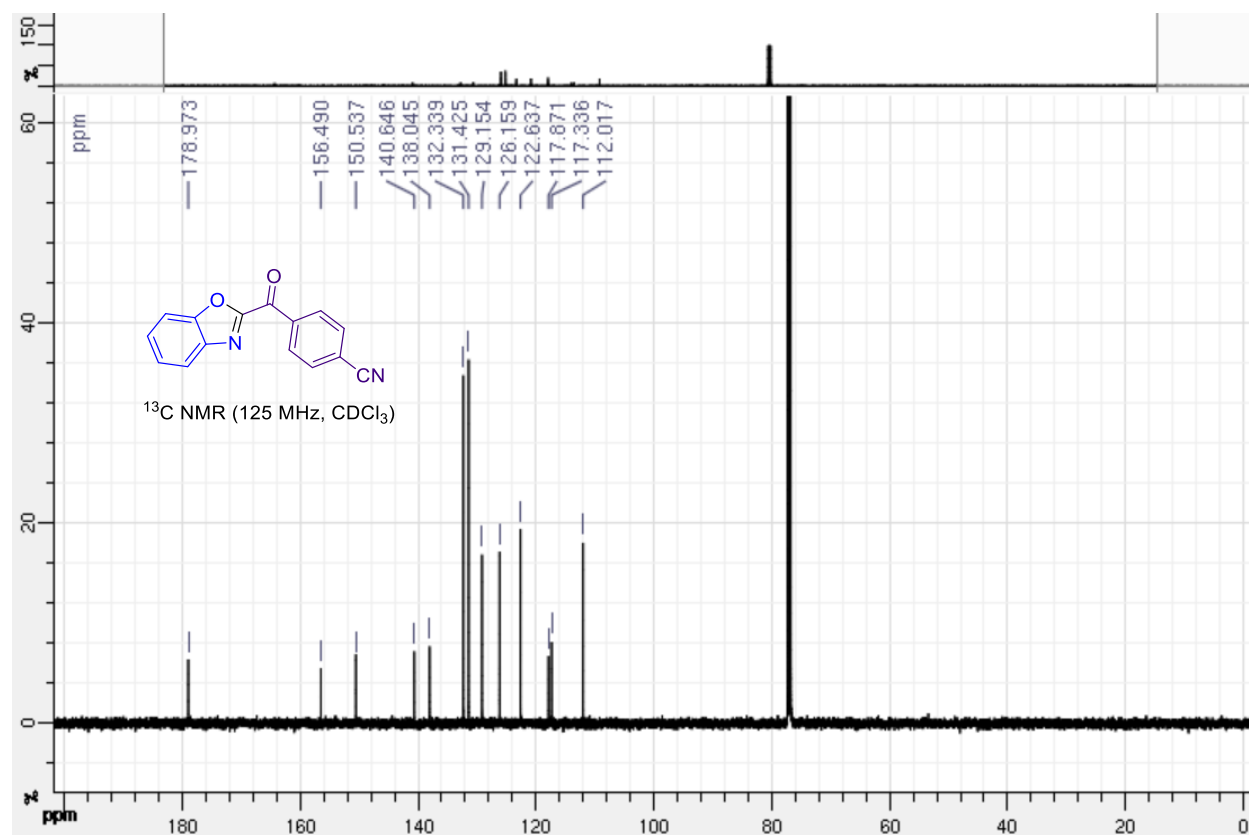
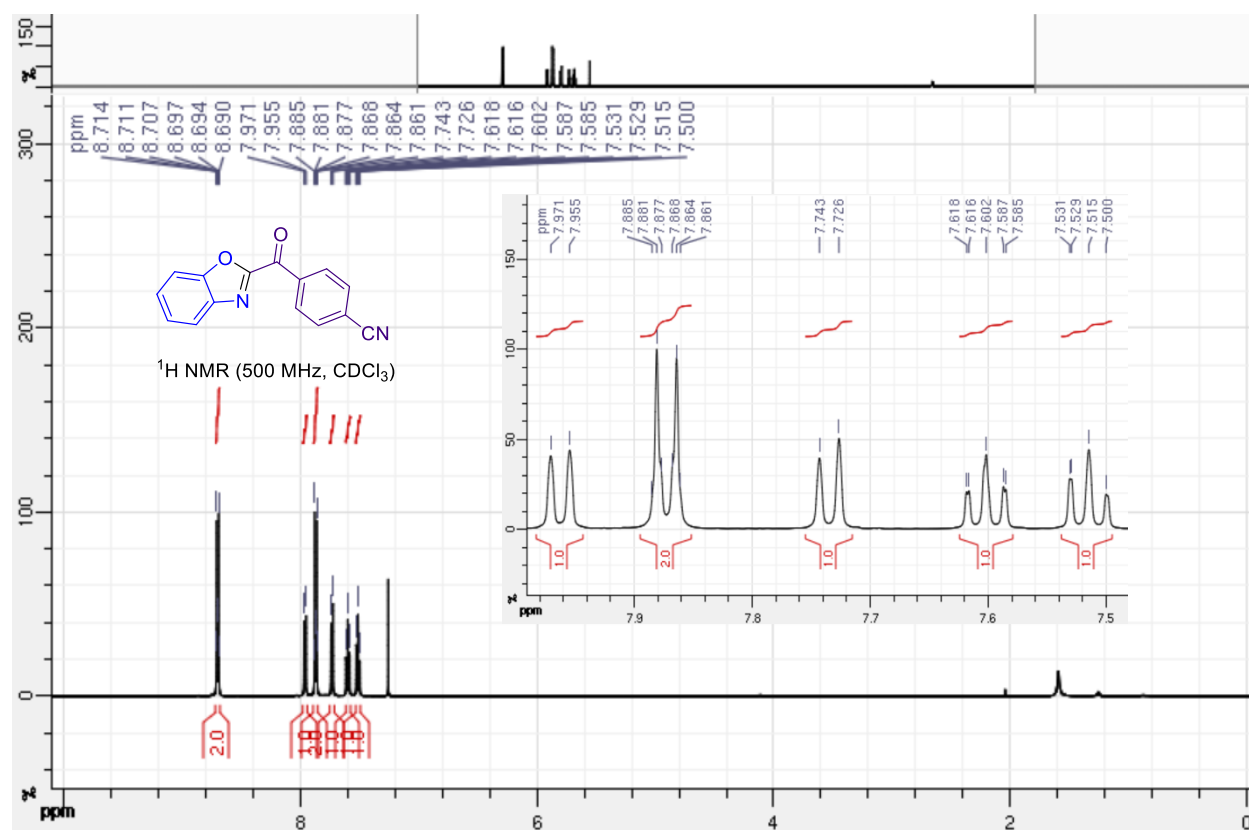
Benzoxazol-2-yl(4-(trifluoromethyl)phenyl)methanone (3ao)



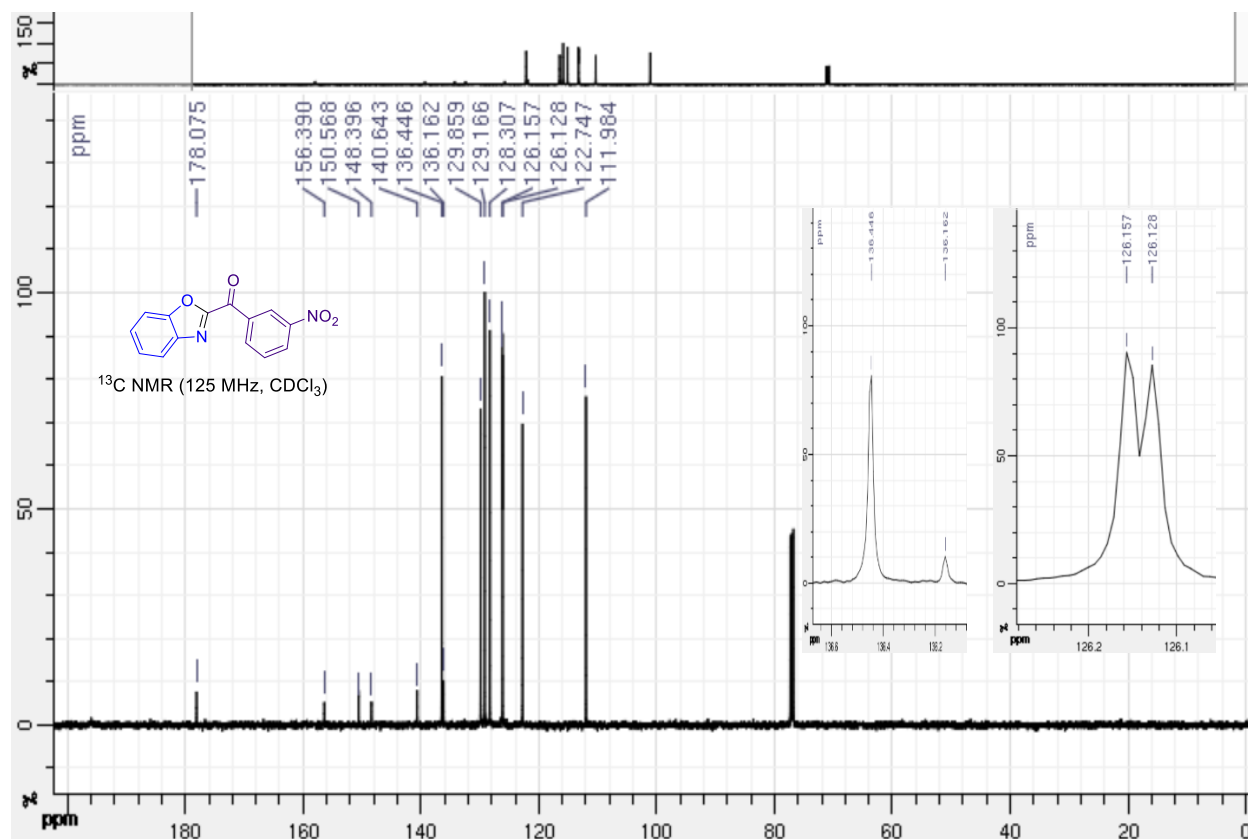
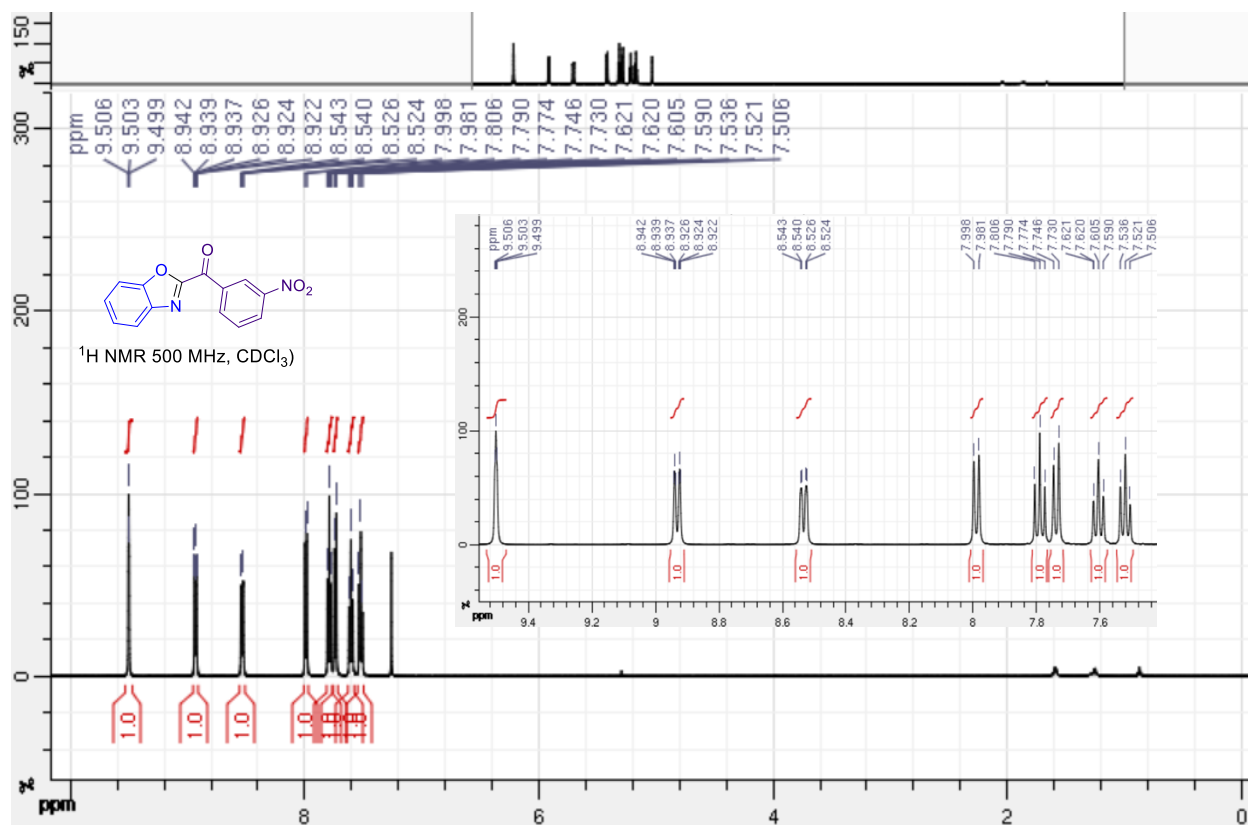
3-(Benzoxazole-2-carbonyl)benzonitrile (3ap)



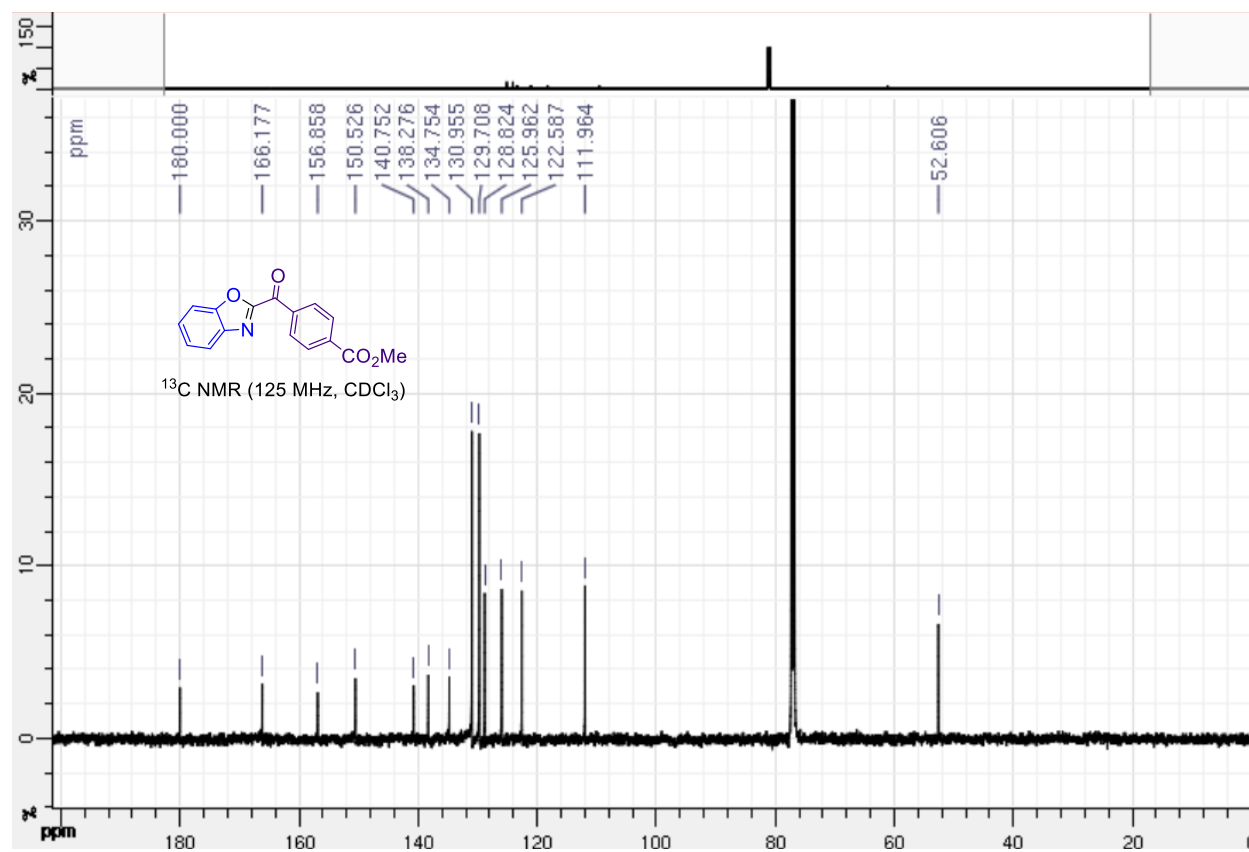
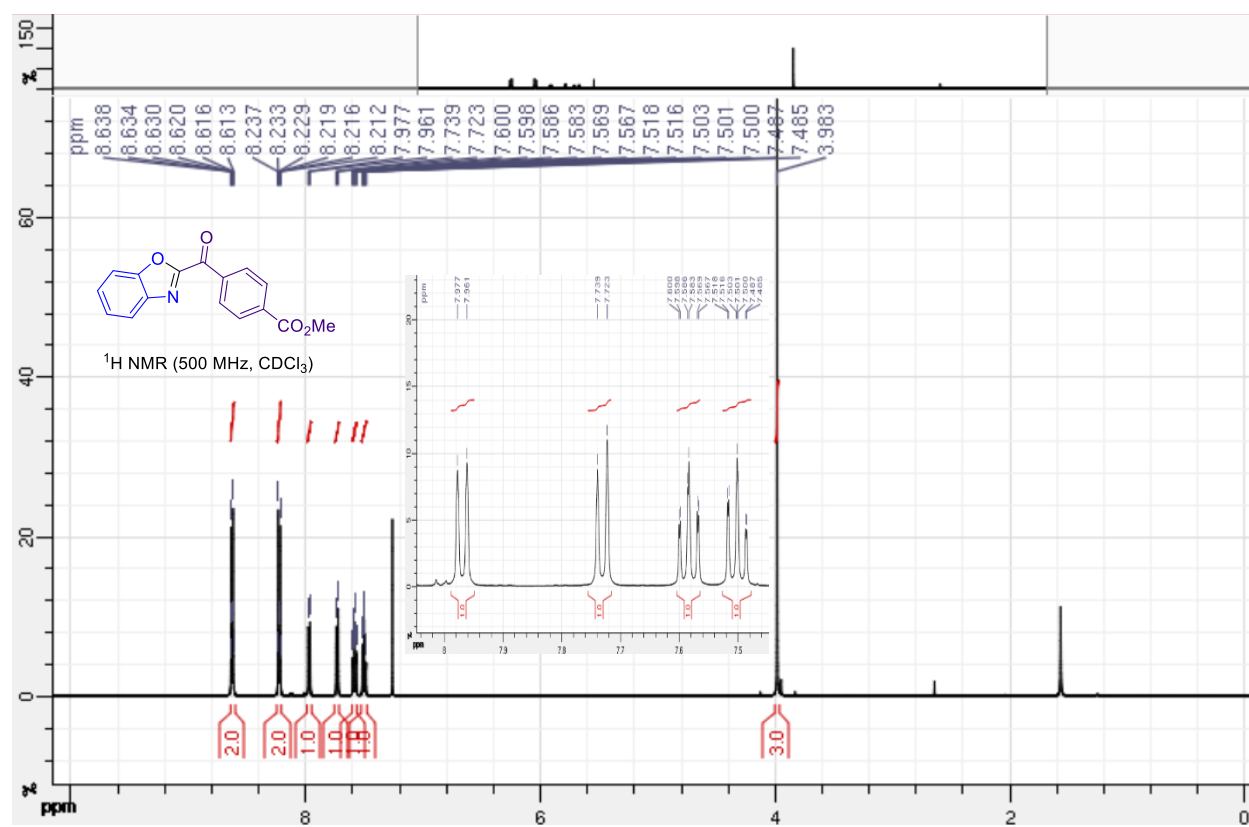
4-(Benzoxazole-2-carbonyl)benzonitrile (3aq)



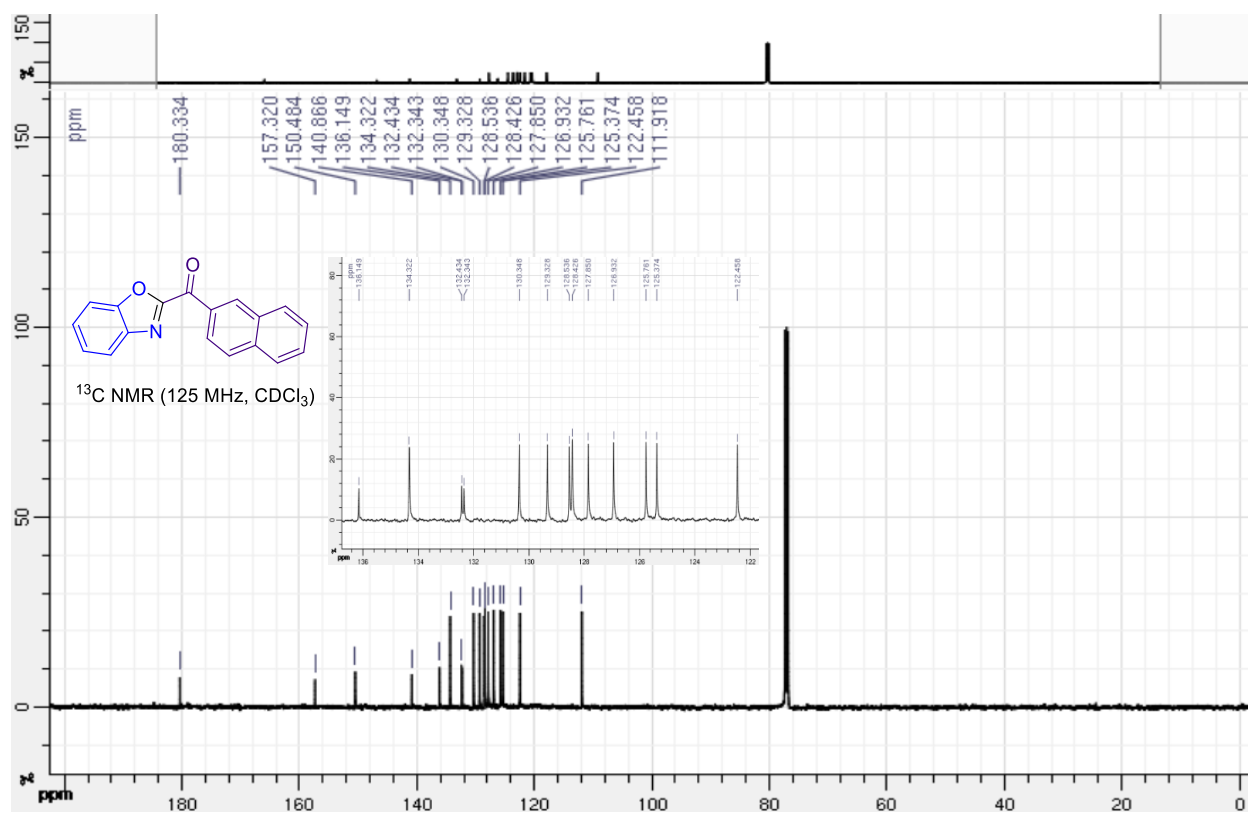
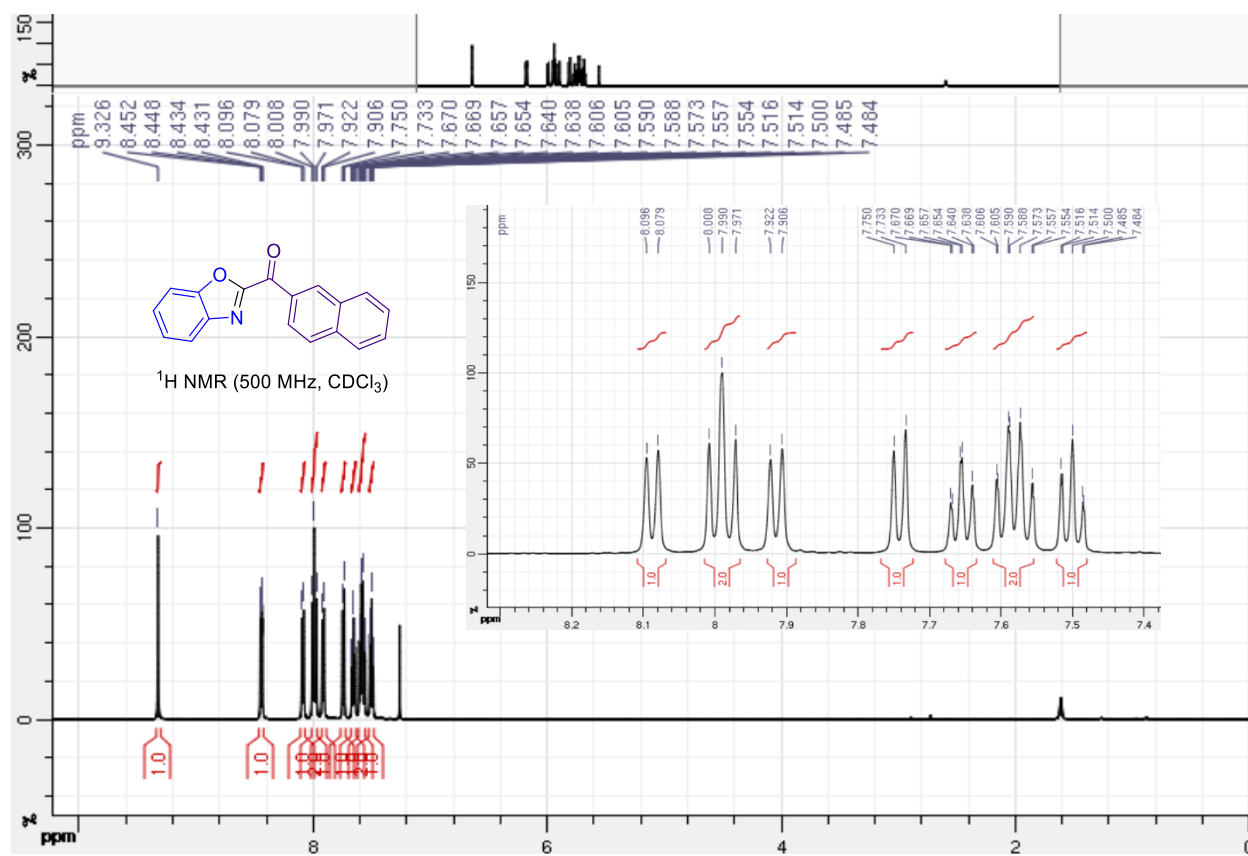
Benzoxazol-2-yl(3-nitrophenyl)methanone (3ar)



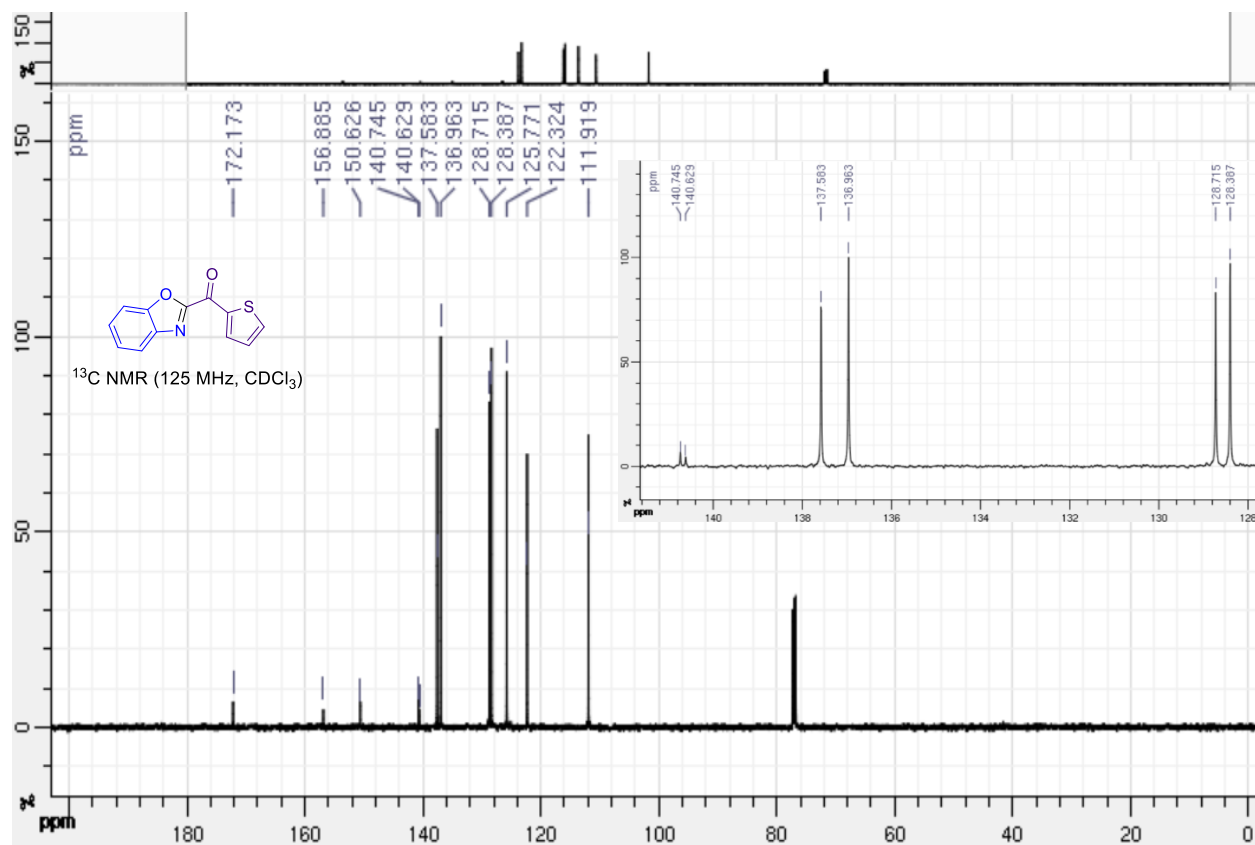
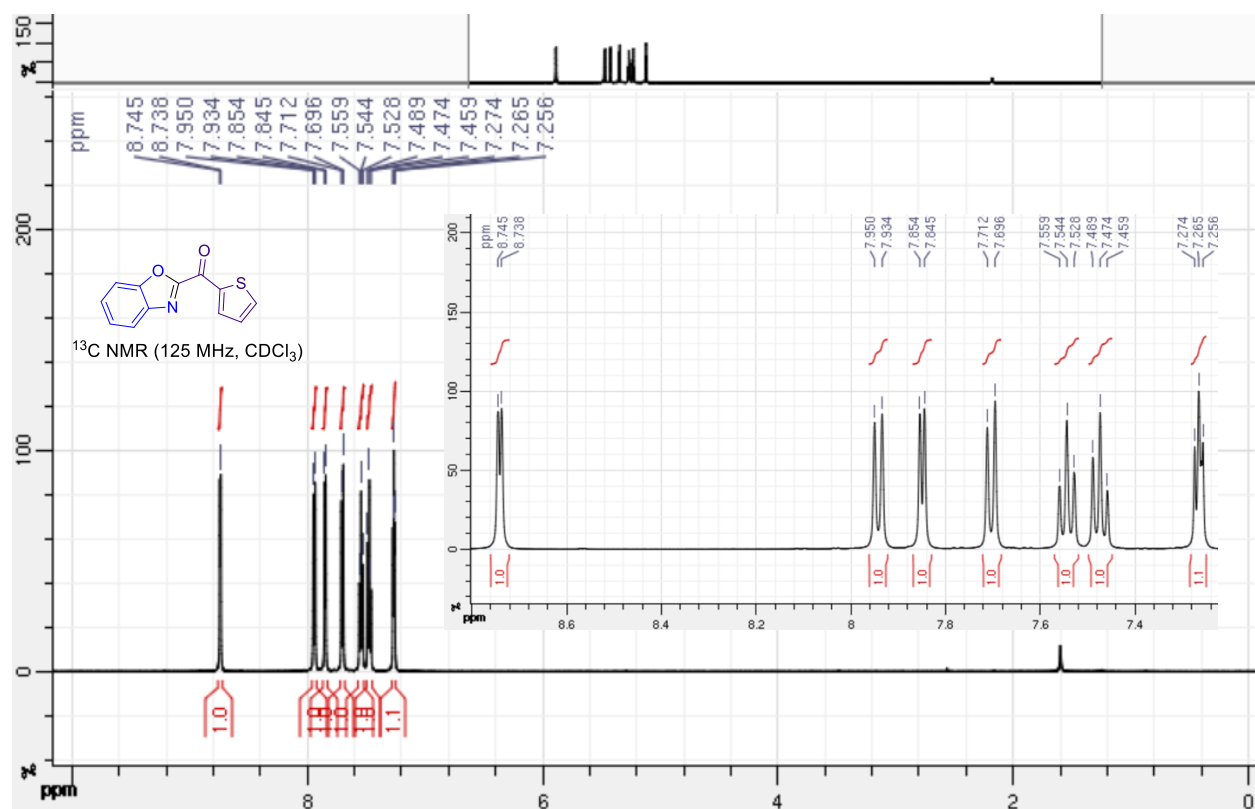
Methyl 4-(benzoxazole-2-carbonyl)benzoate (3as)



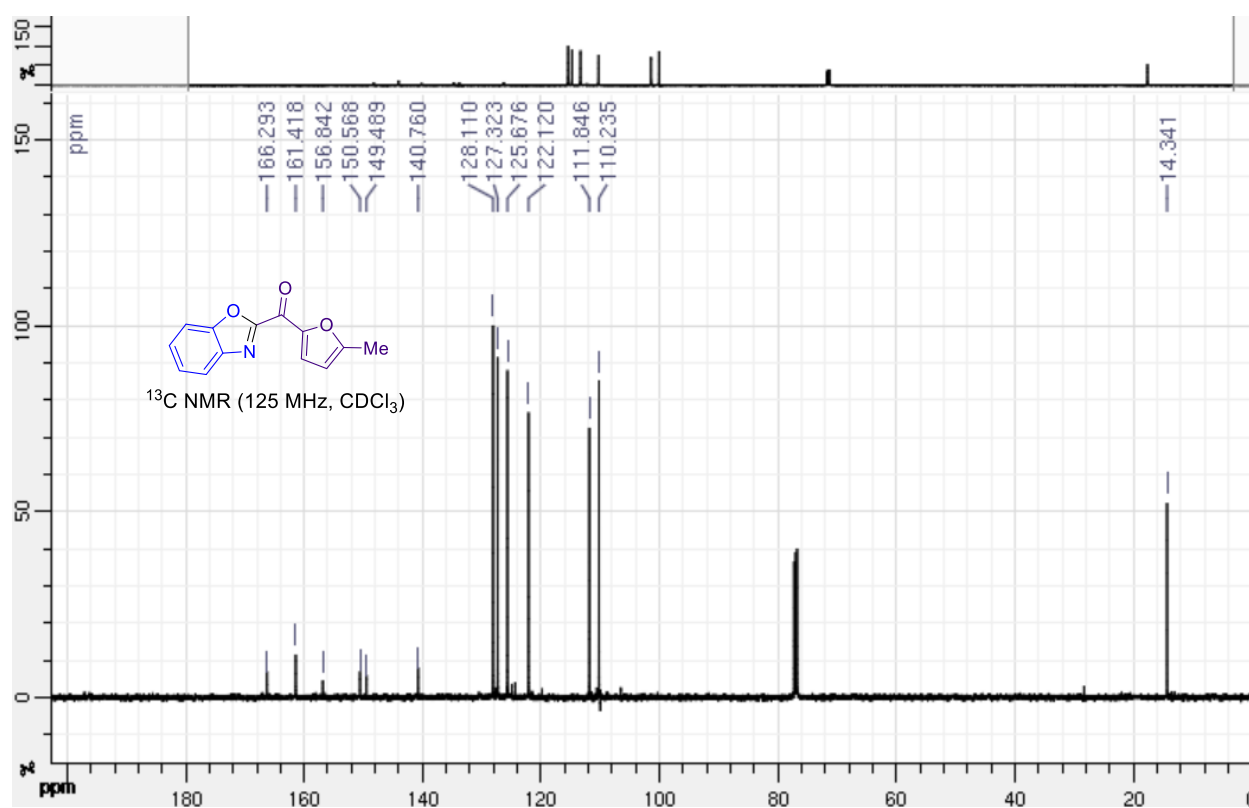
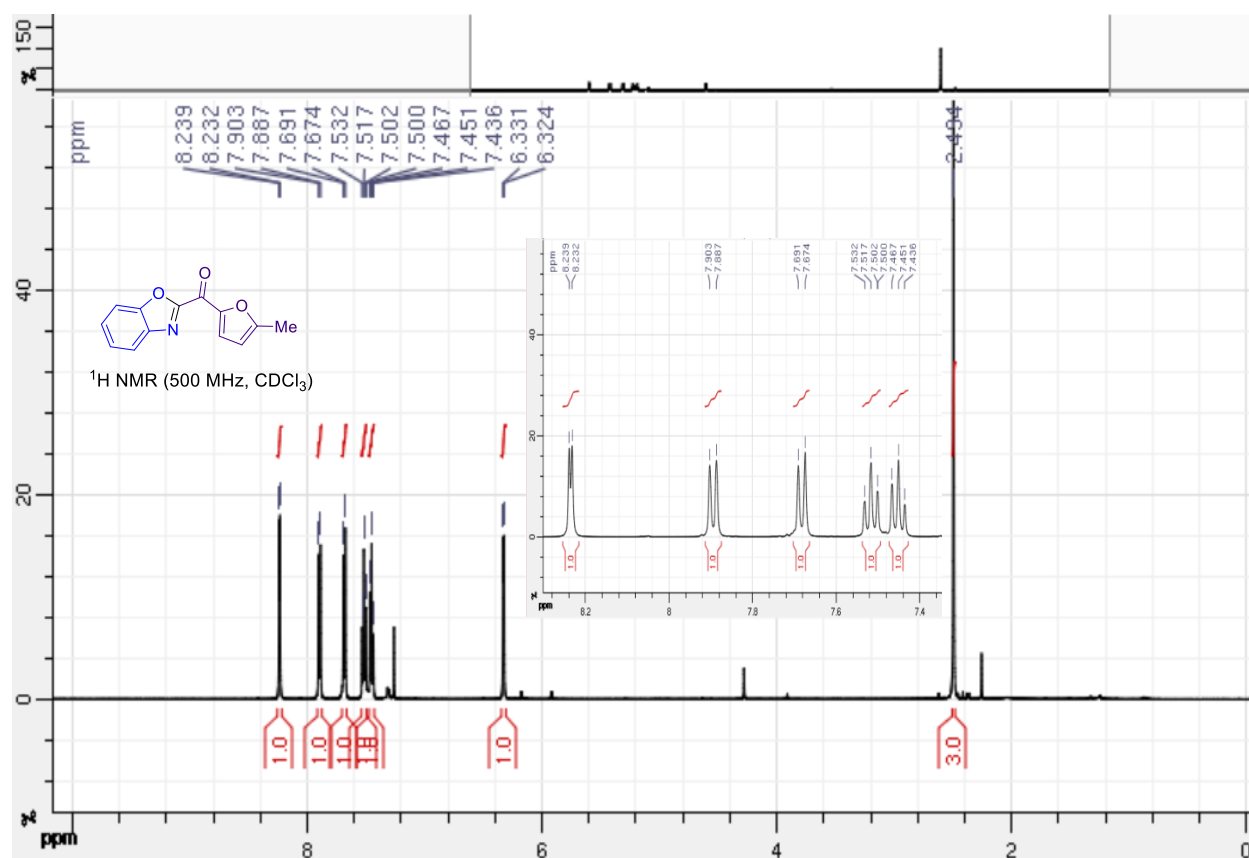
Benzoxazol-2-yl(naphthalen-2-yl)methanone (3at)



Benzoxazol-2-yl(thiophen-2-yl)methanone (3au)



Benzoxazol-2-yl(5-methylfuran-2-yl)methanone (3av)



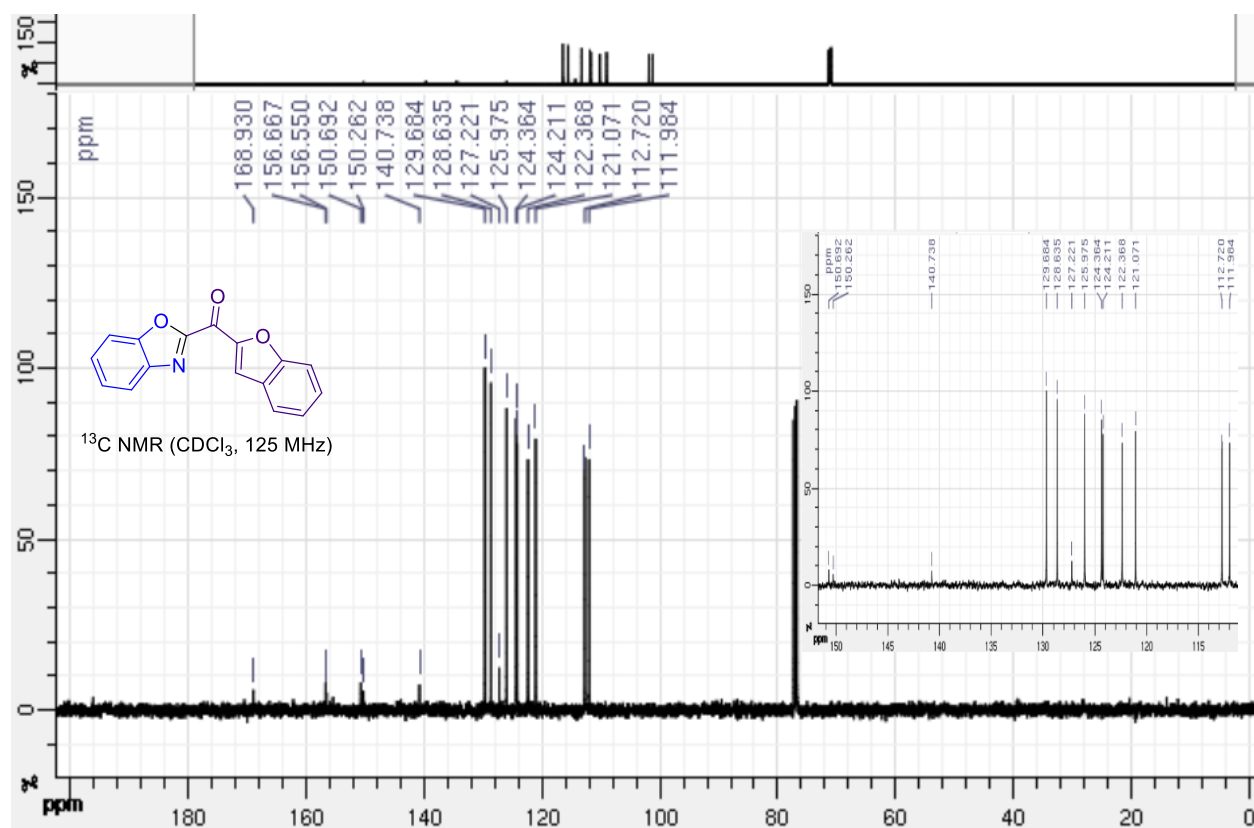
N#Cc1ccccc1-c2cc3ccccc3oc2C(=O)N4C=CC=CC=C4

¹H NMR (CDCl₃, 500 MHz)

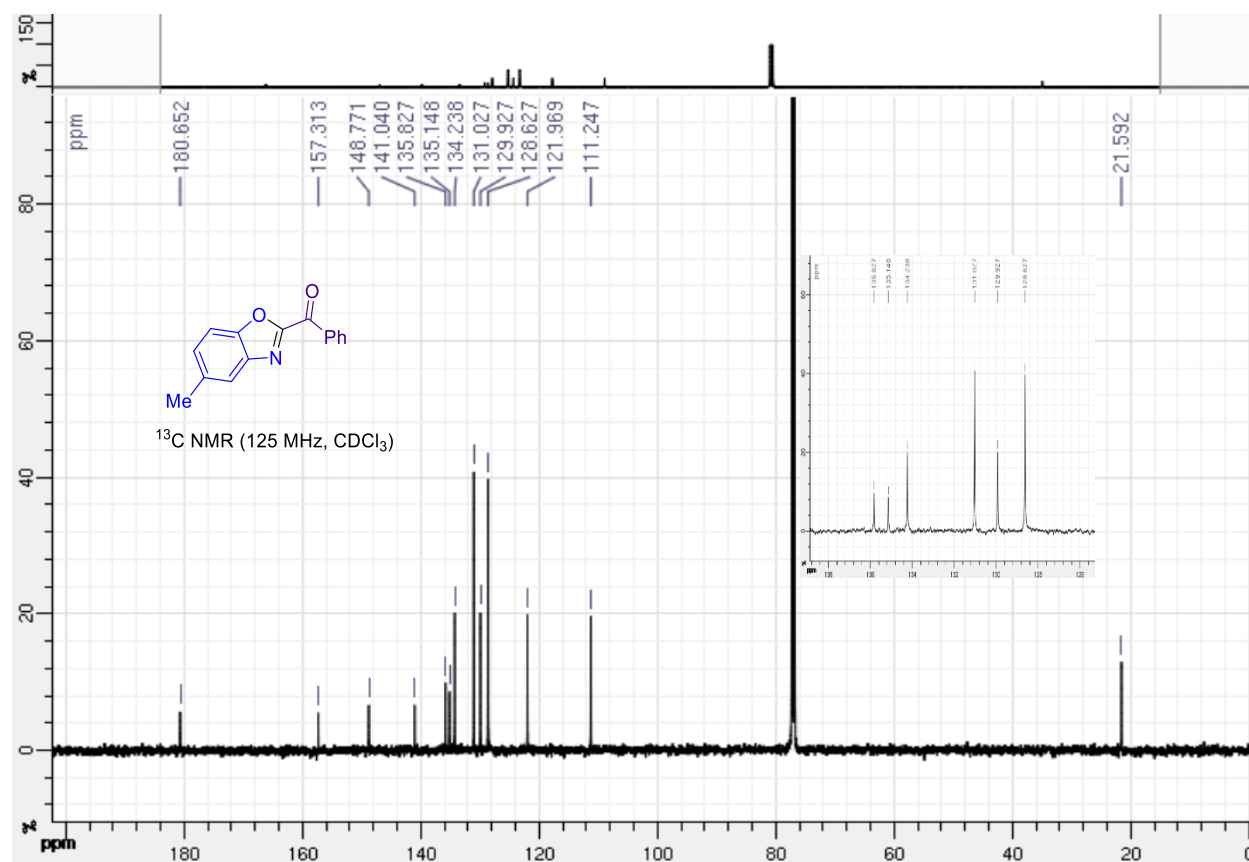
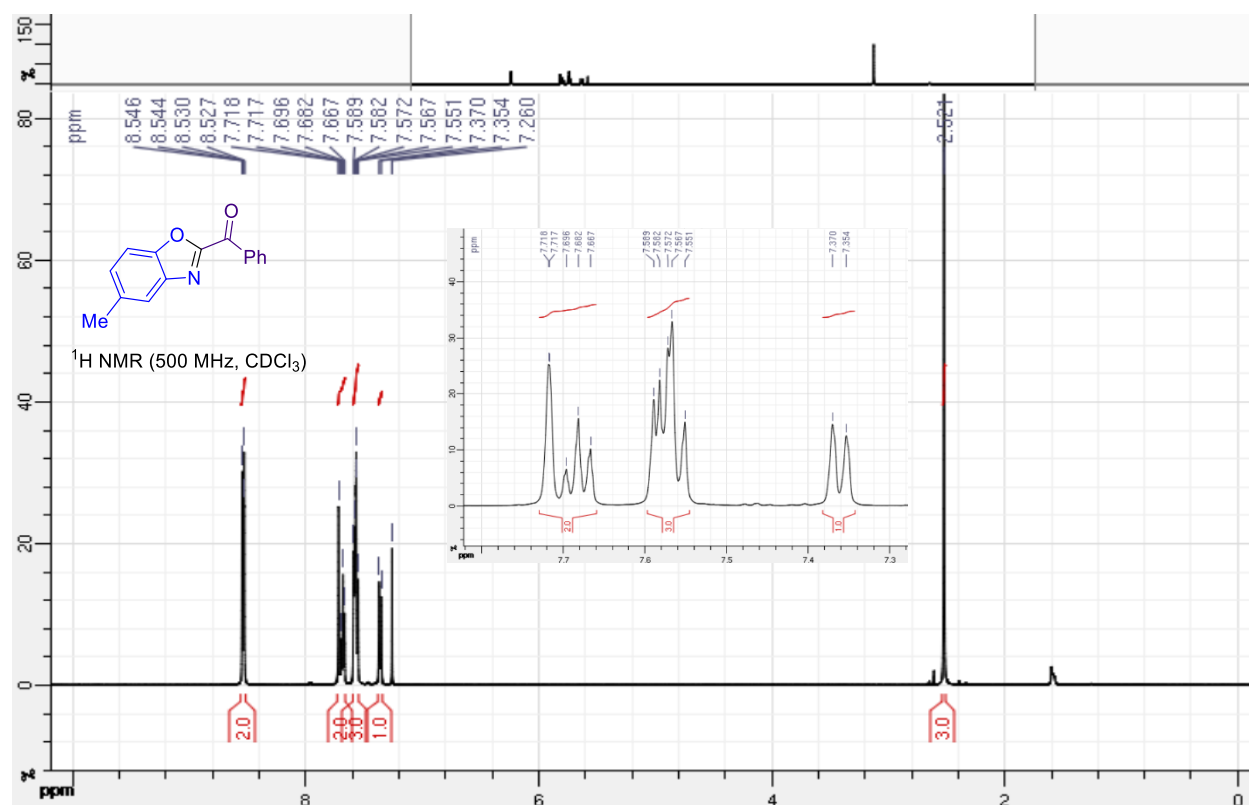
Chemical structure: 2-(benzofuran-2-yl)-1H-benzotriazole-3-carboxamide

Peak list (ppm): 8.730, 7.984, 7.968, 7.849, 7.834, 7.744, 7.727, 7.691, 7.674, 7.594, 7.591, 7.577, 7.563, 7.547, 7.546, 7.525, 7.524, 7.510, 7.495, 7.392, 7.377, 7.363

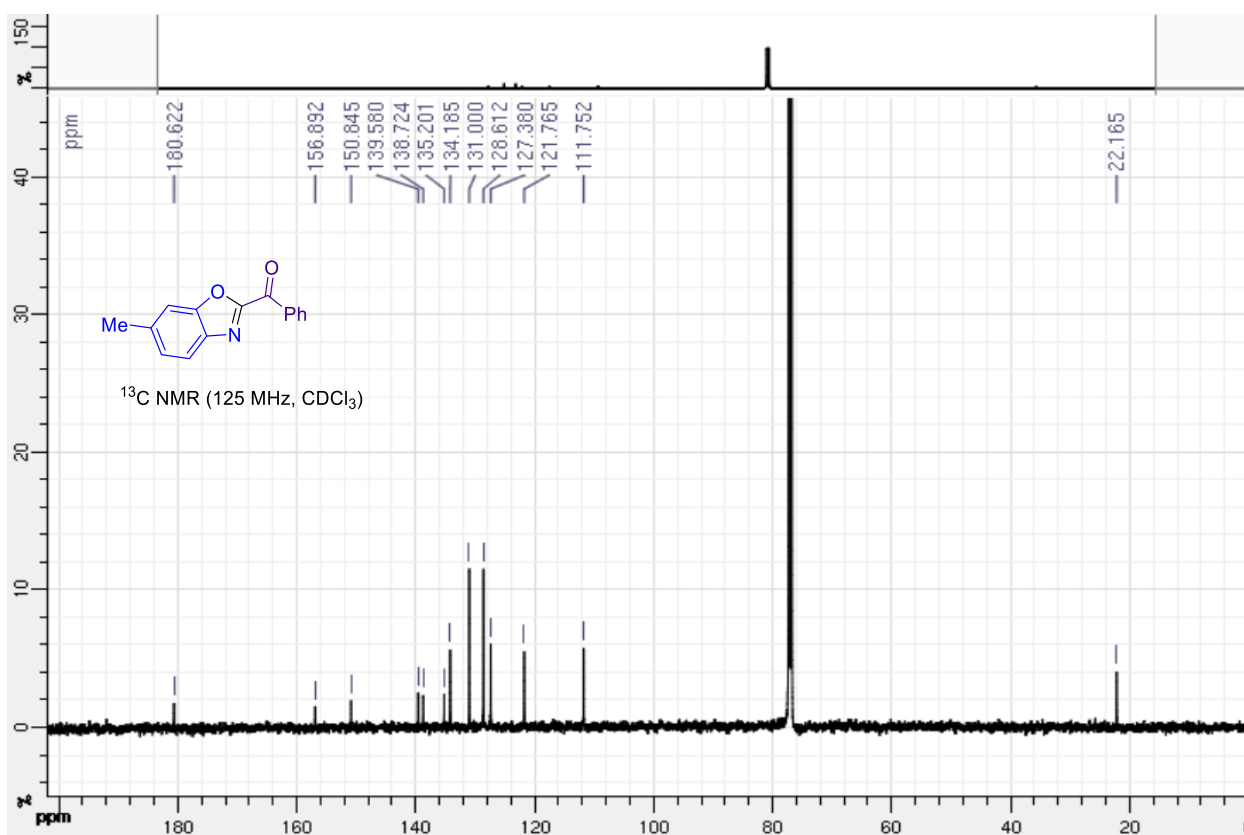
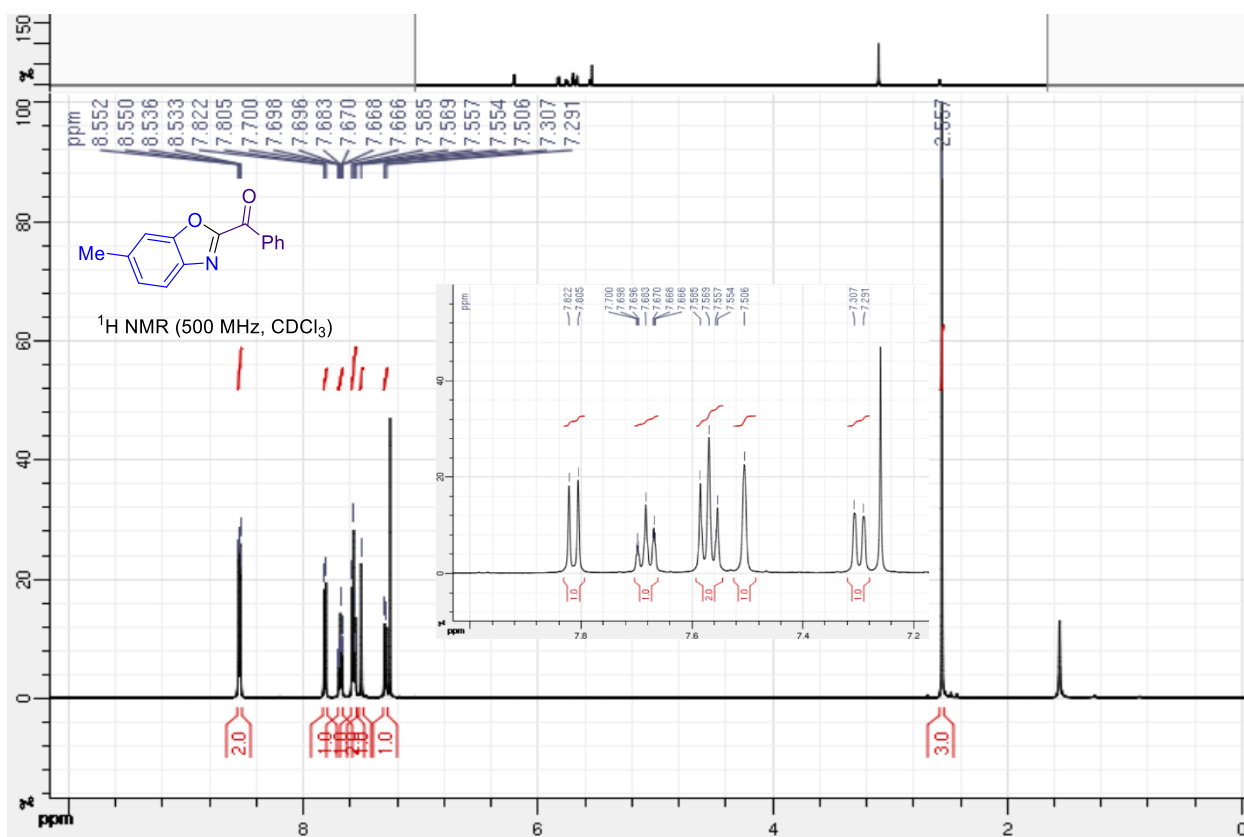
Integration values: 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 2.0, 1.0, 1.0



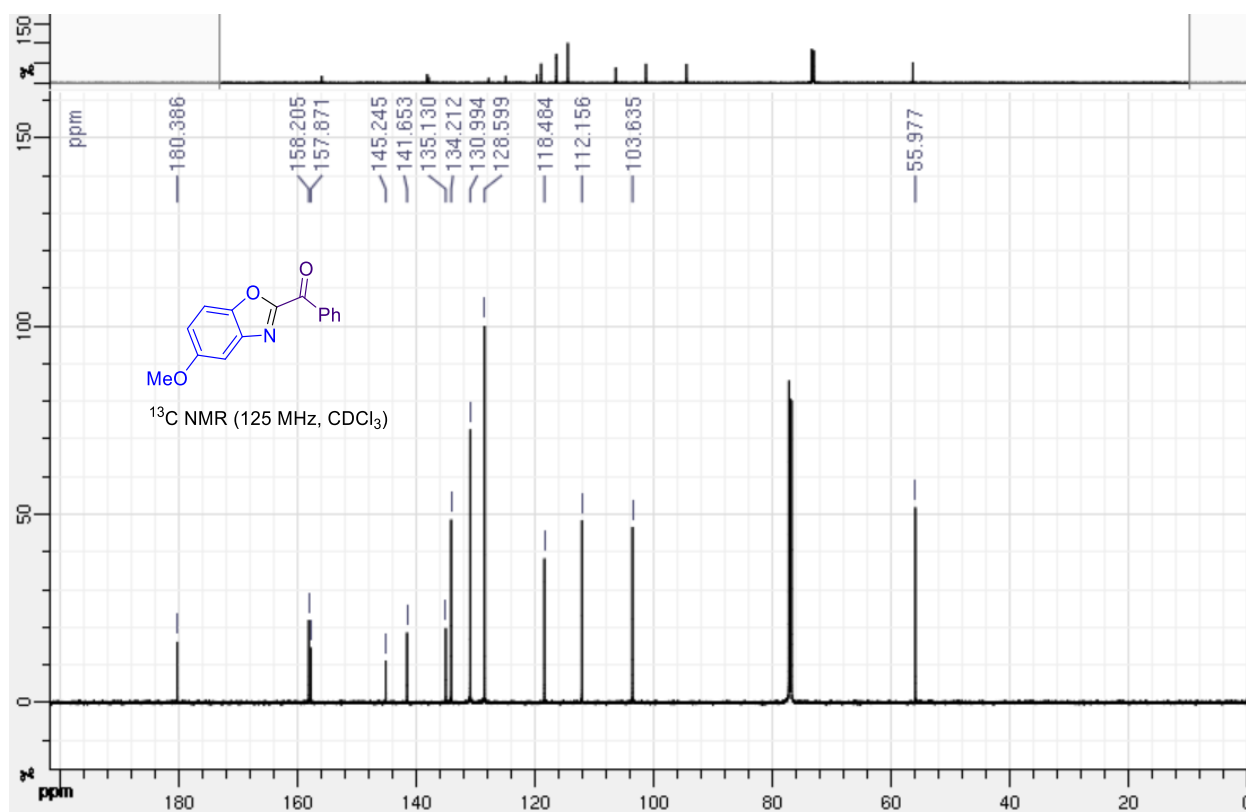
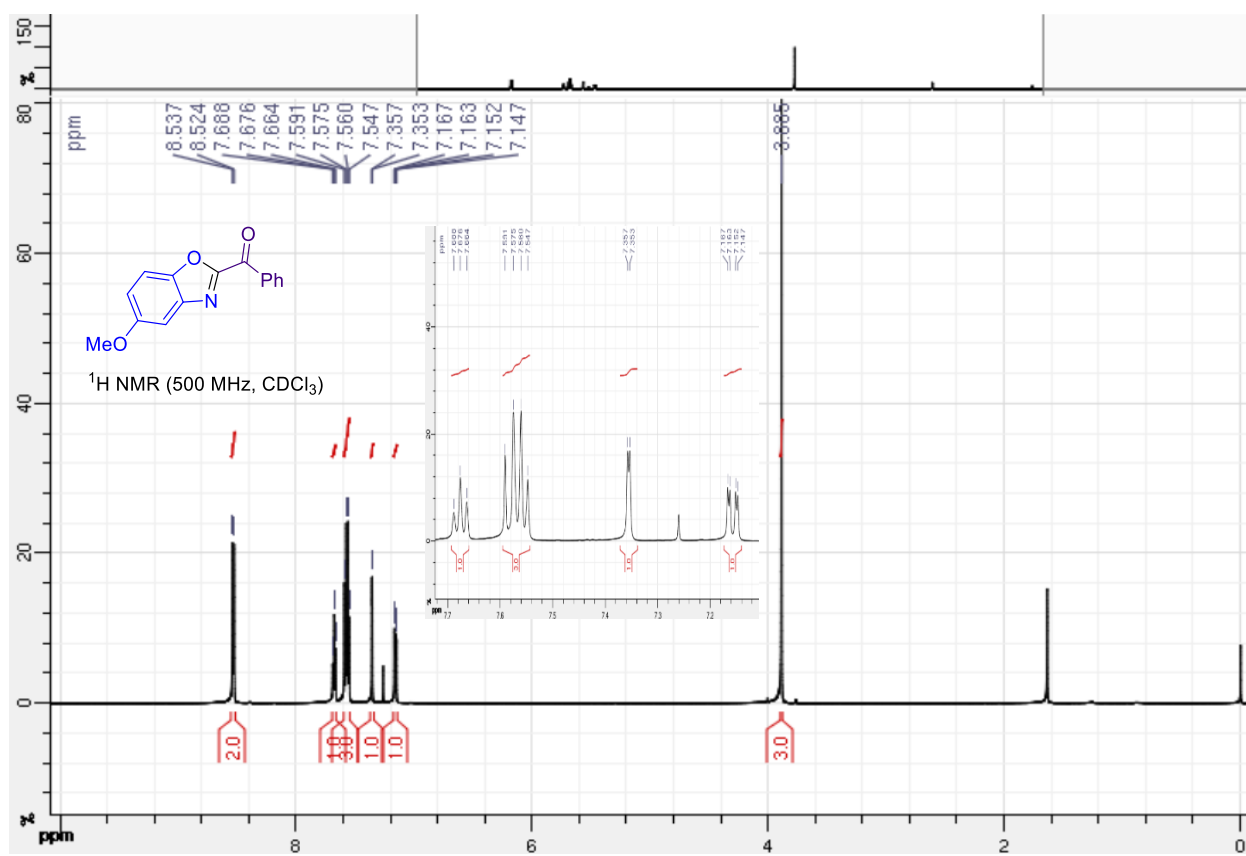
(5-methylbenzoxazol-2-yl)(phenyl)methanone (3ba)



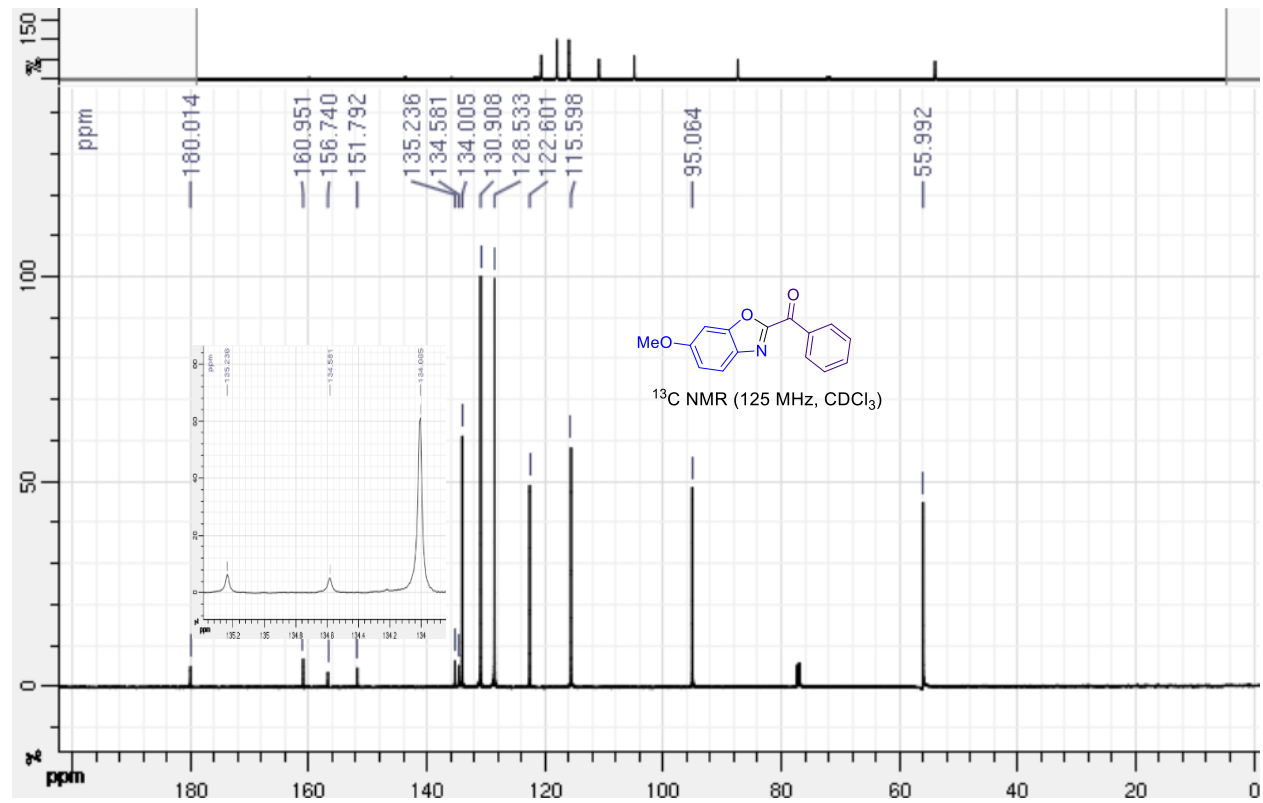
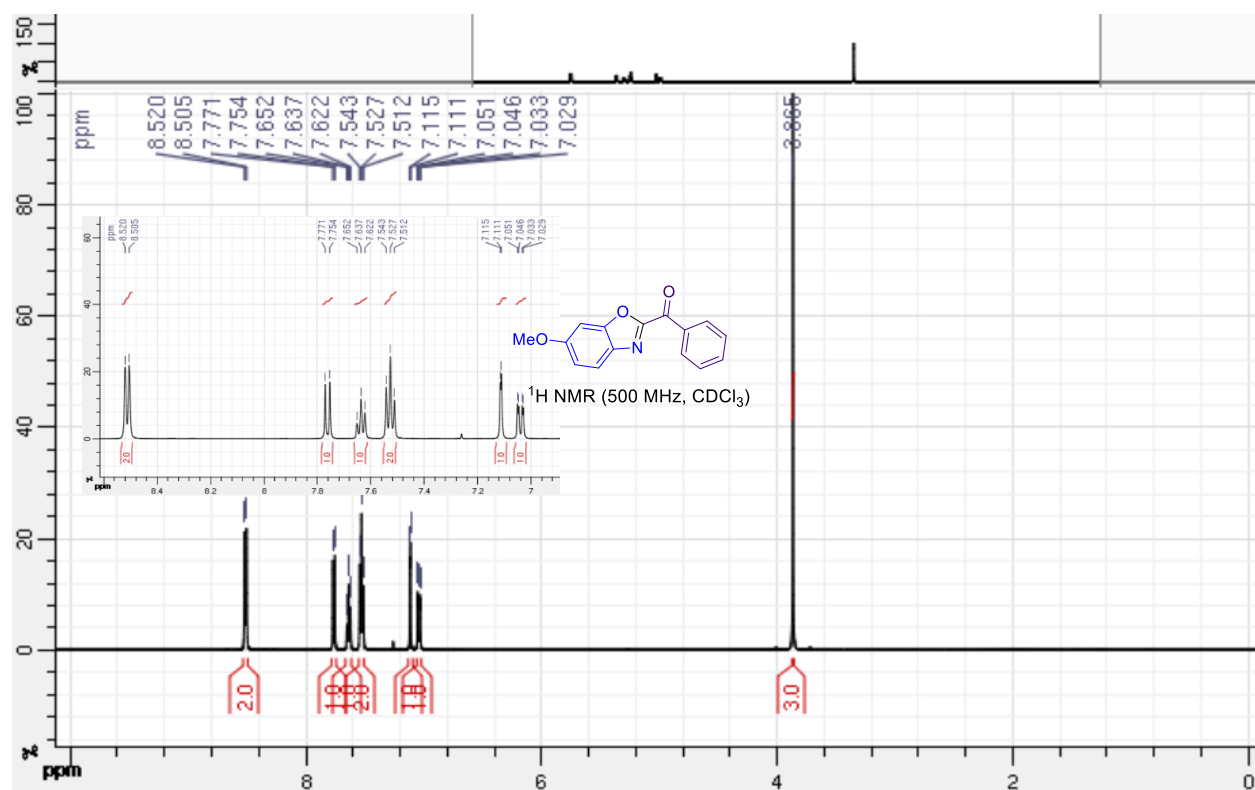
(6-Methylbenzoxazol-2-yl)(phenyl)methanone (3ca)



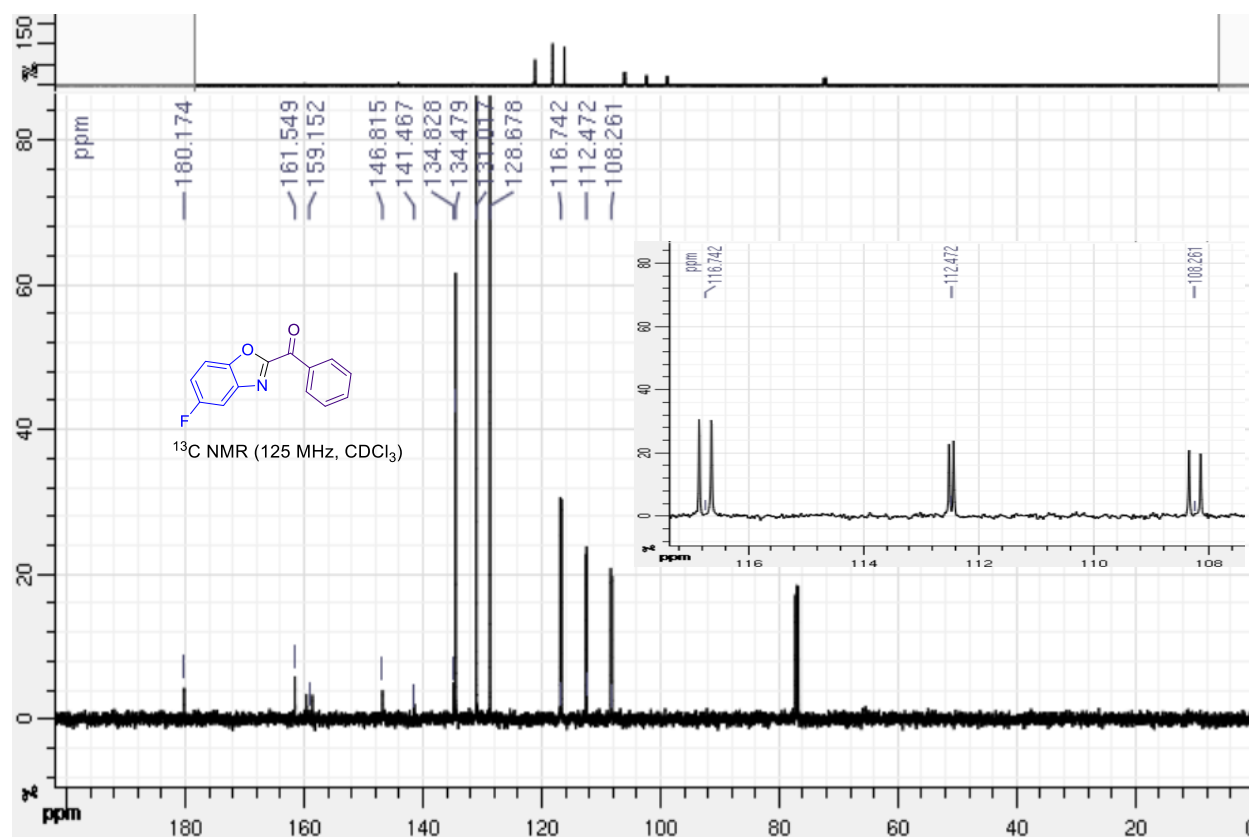
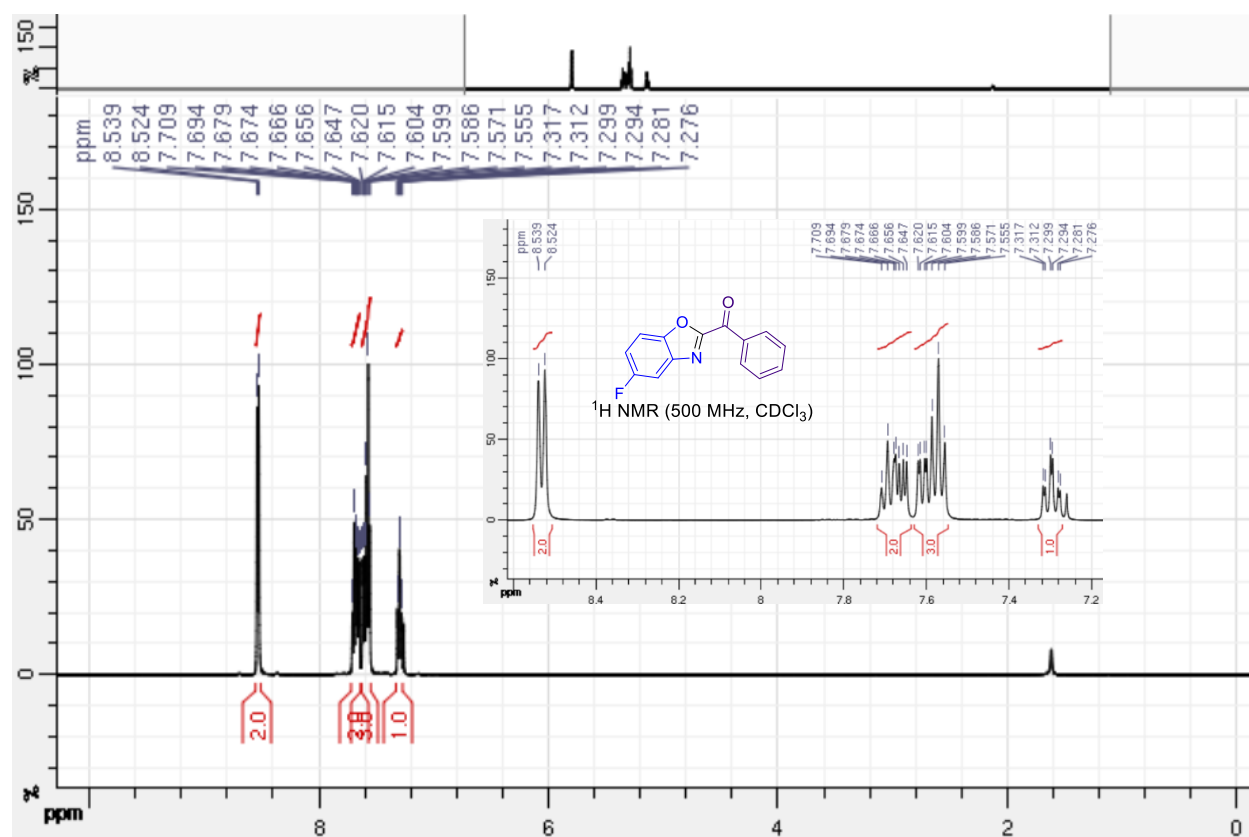
(5-Methoxybenzoxazol-2-yl)(phenyl)methanone (3da)



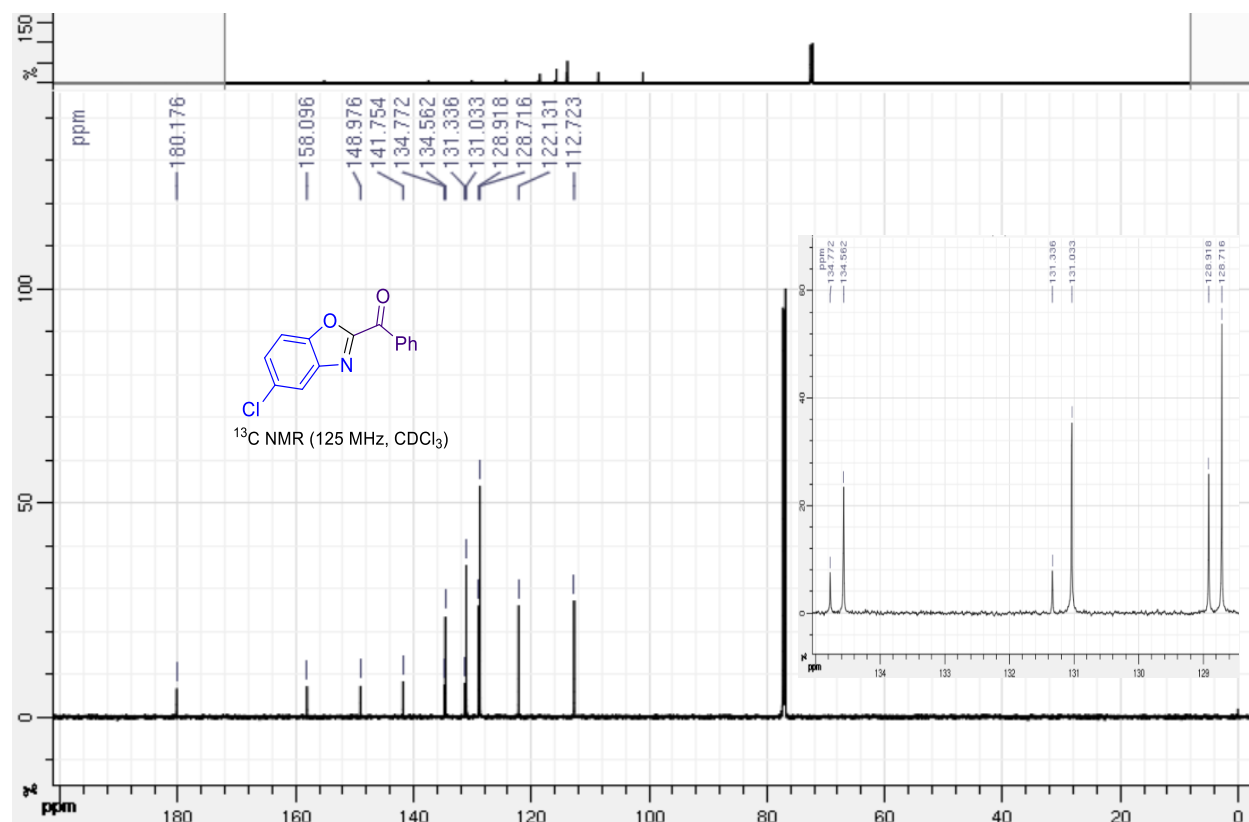
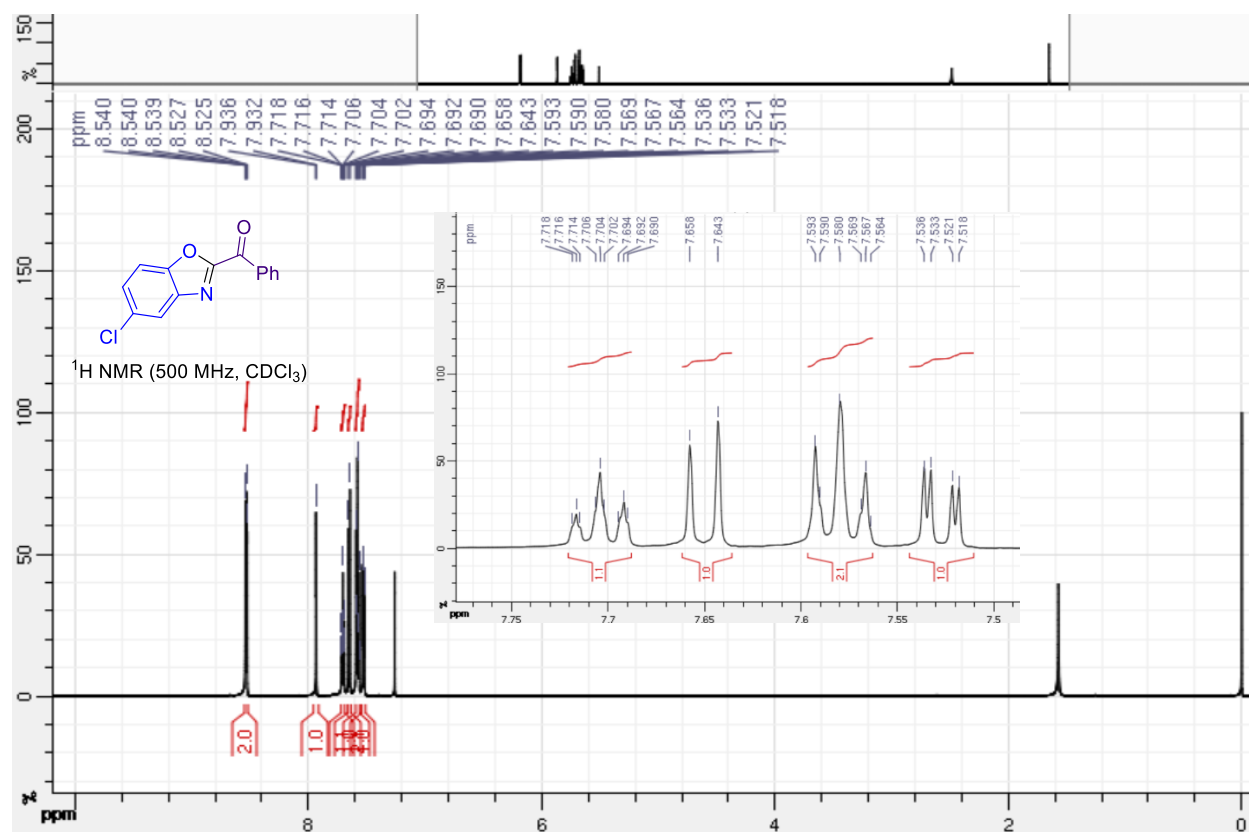
(6-Methoxybenzoxazol-2-yl)(phenyl)methanone (3ea)



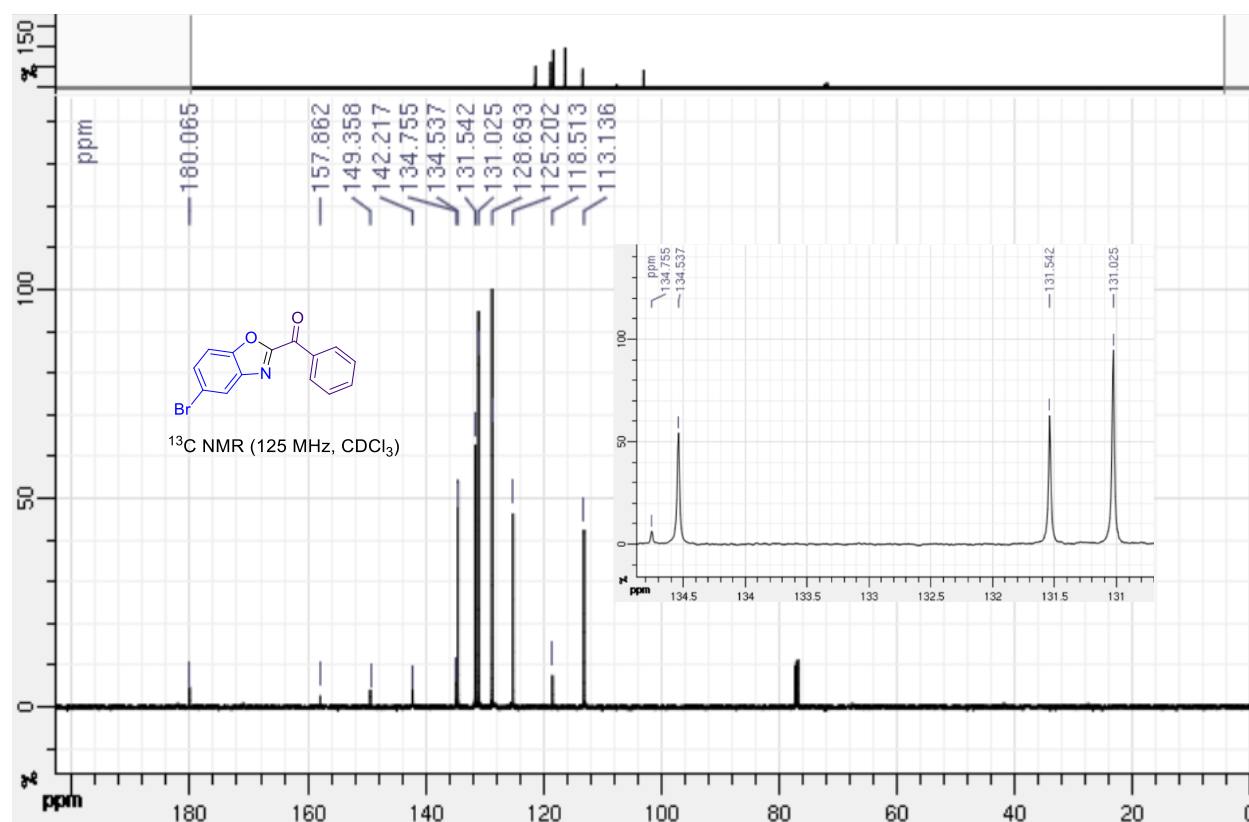
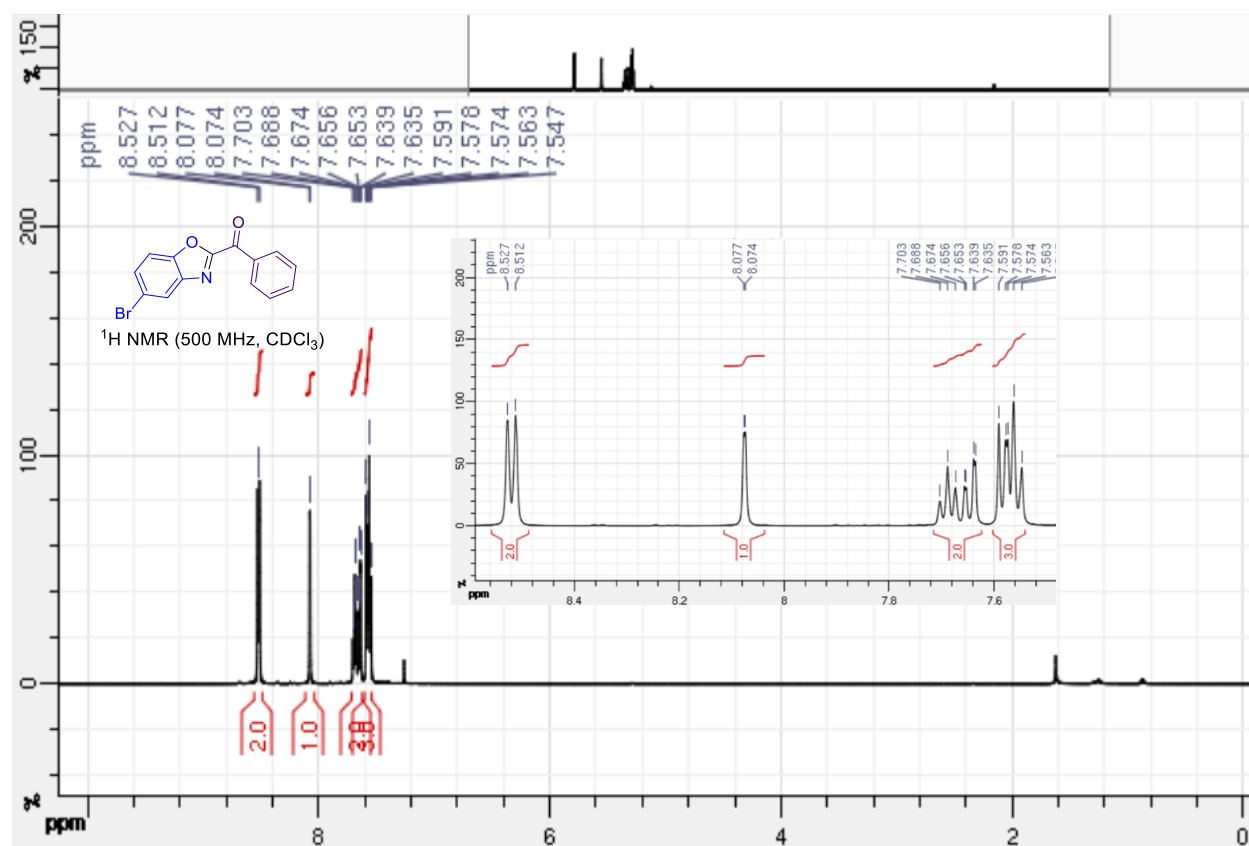
5-Fluorobenzoxazol-2-yl)(phenyl)methanone (3fa)



(5-Chlorobenzoxazol-2-yl)(phenyl)methanone (3ga)



(5-Bromobenzoxazol-2-yl)(phenyl)methanone (3ha)



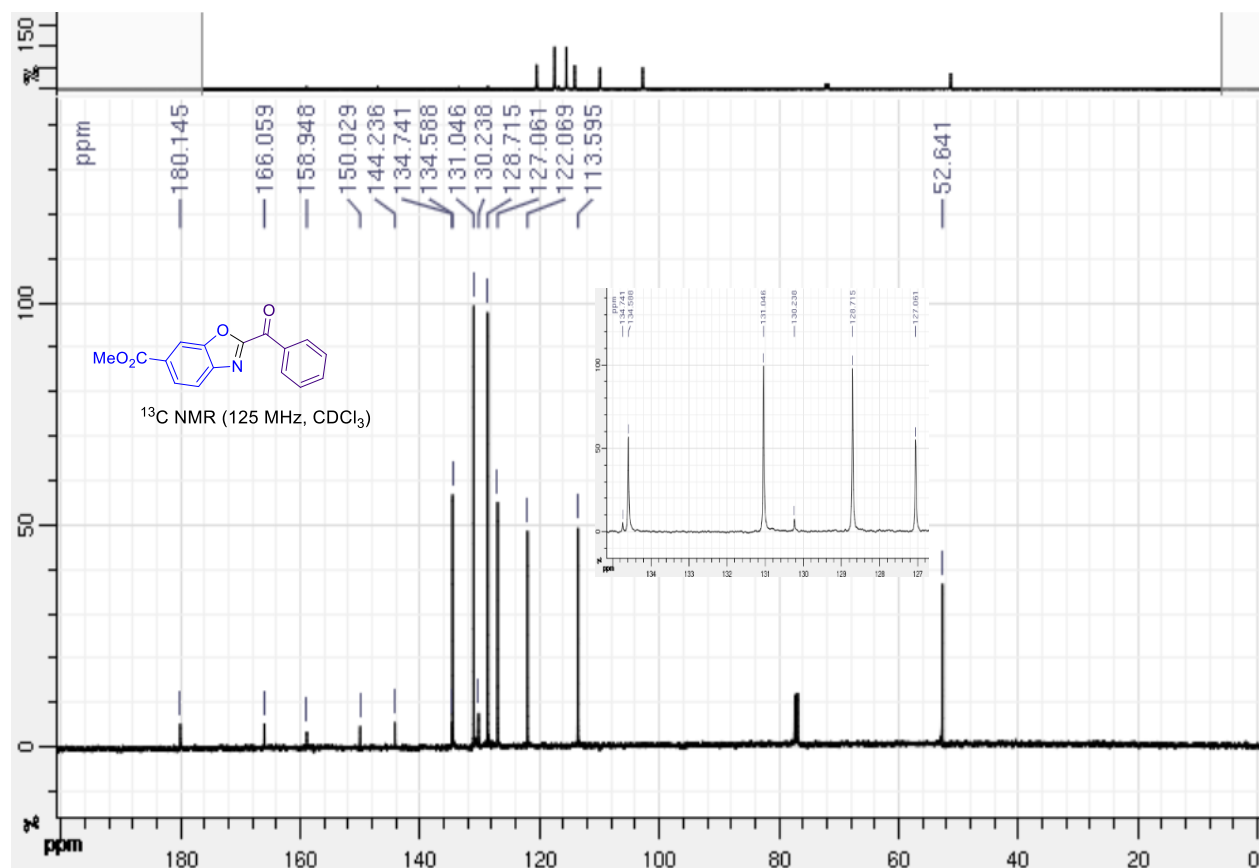
COc1ccc2nc(C(=O)c3ccccc3)cc2

¹H NMR (500 MHz, CDCl₃)

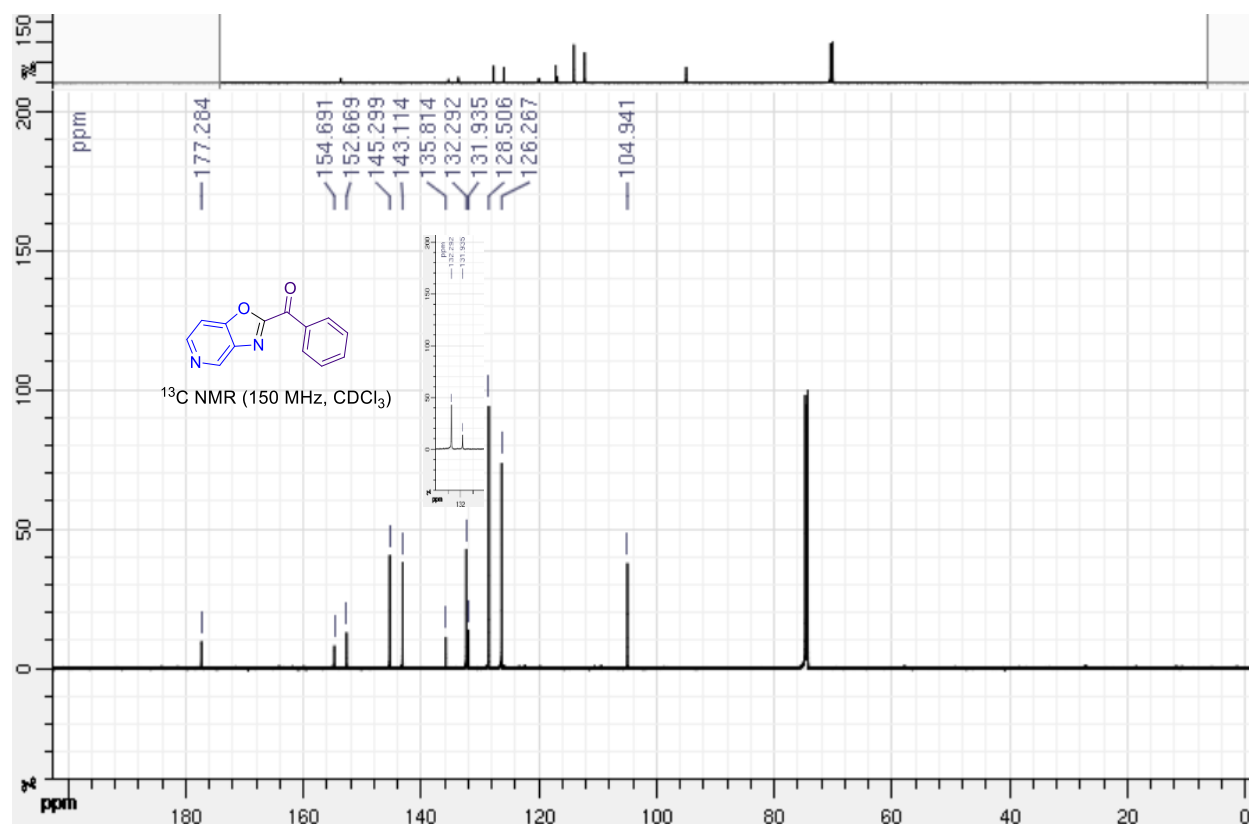
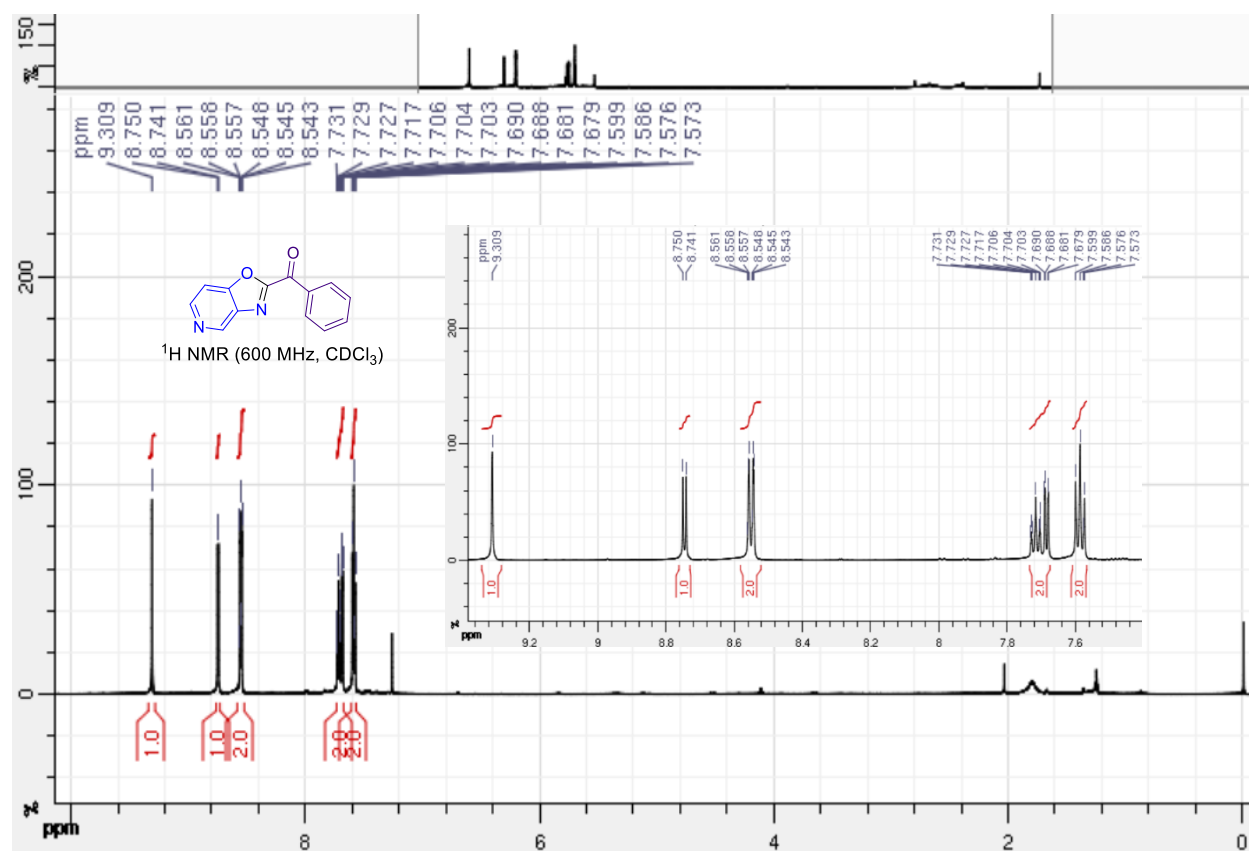
Chemical structure: 4-methoxy-2-phenyl-1H-benzotriazole

Peak list (ppm): 8.537, 8.522, 8.520, 8.360, 8.182, 8.180, 8.166, 8.163, 7.972, 7.955, 7.705, 7.703, 7.701, 7.688, 7.676, 7.674, 7.671, 7.578, 7.562, 7.547, 3.974

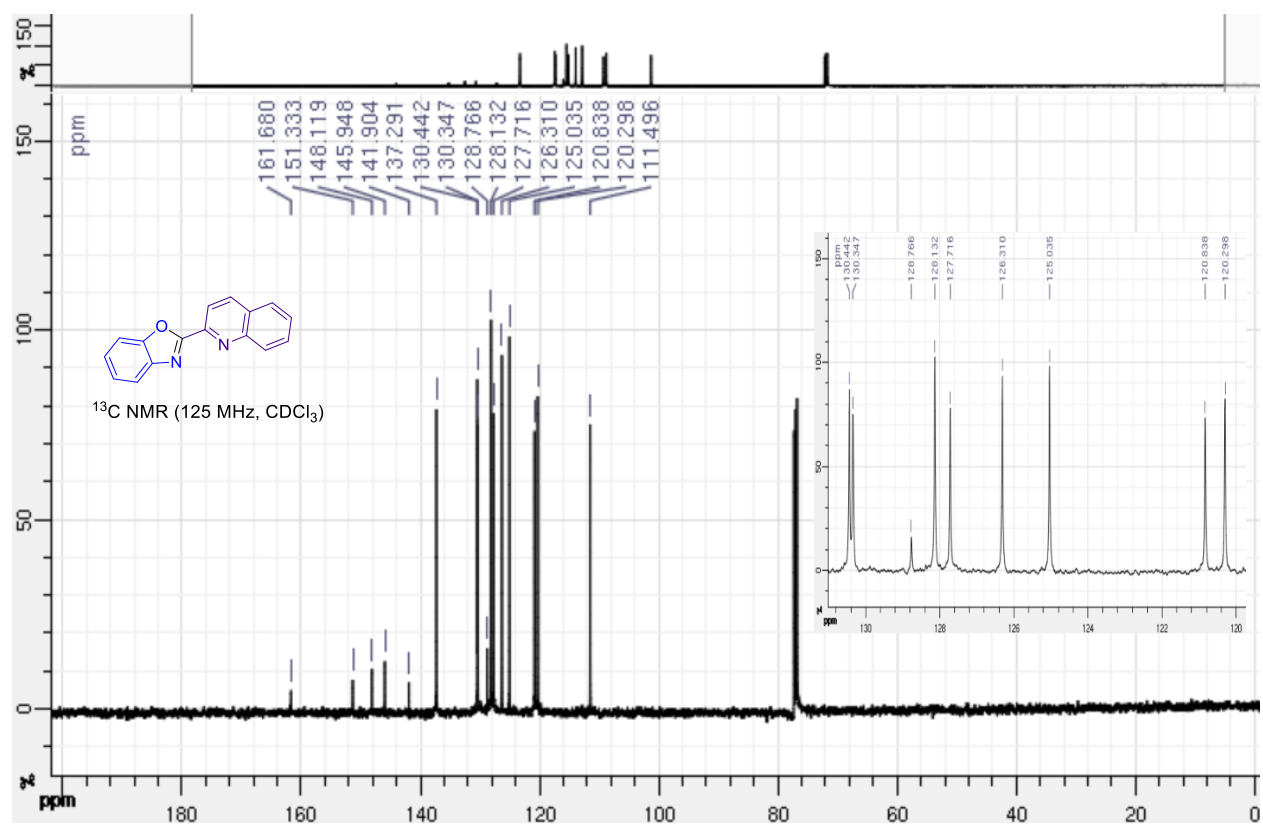
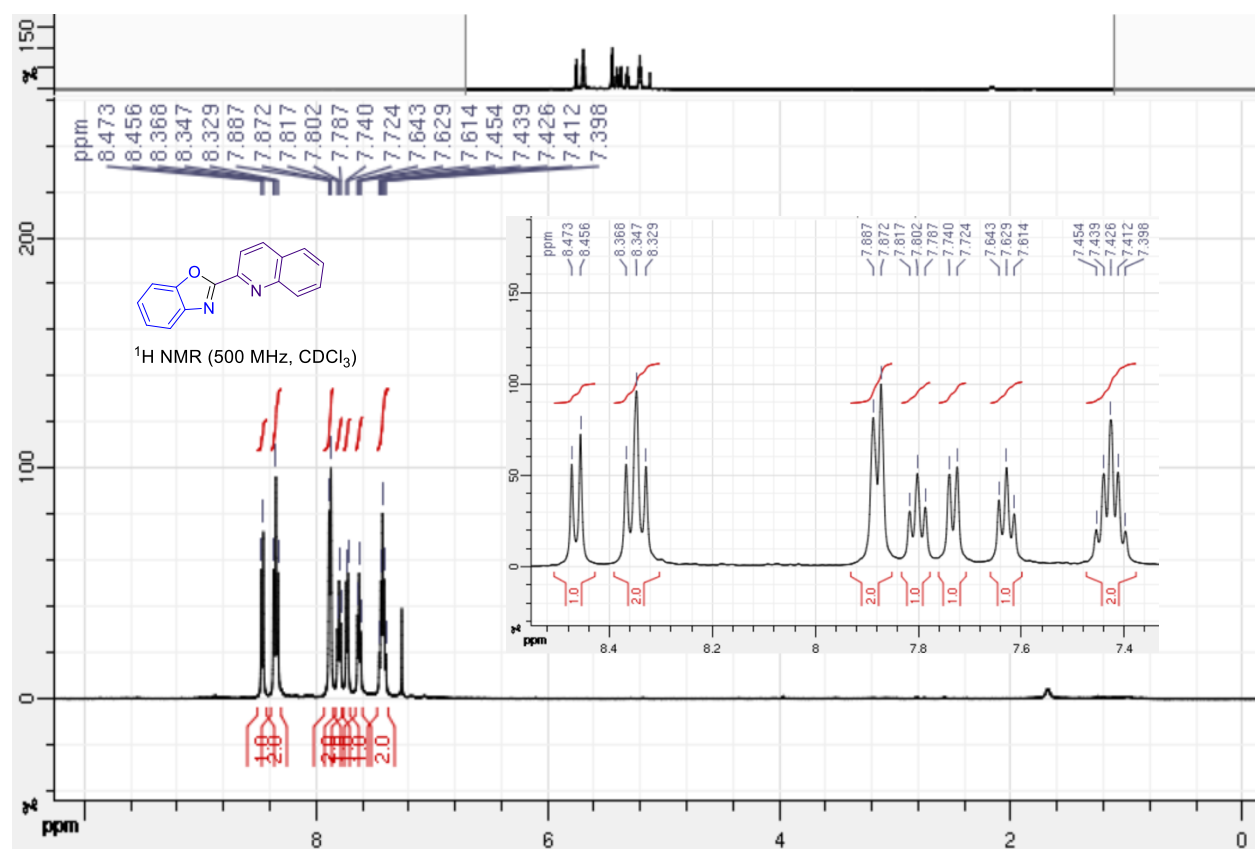
Integration values (from left to right): 2.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 3.0



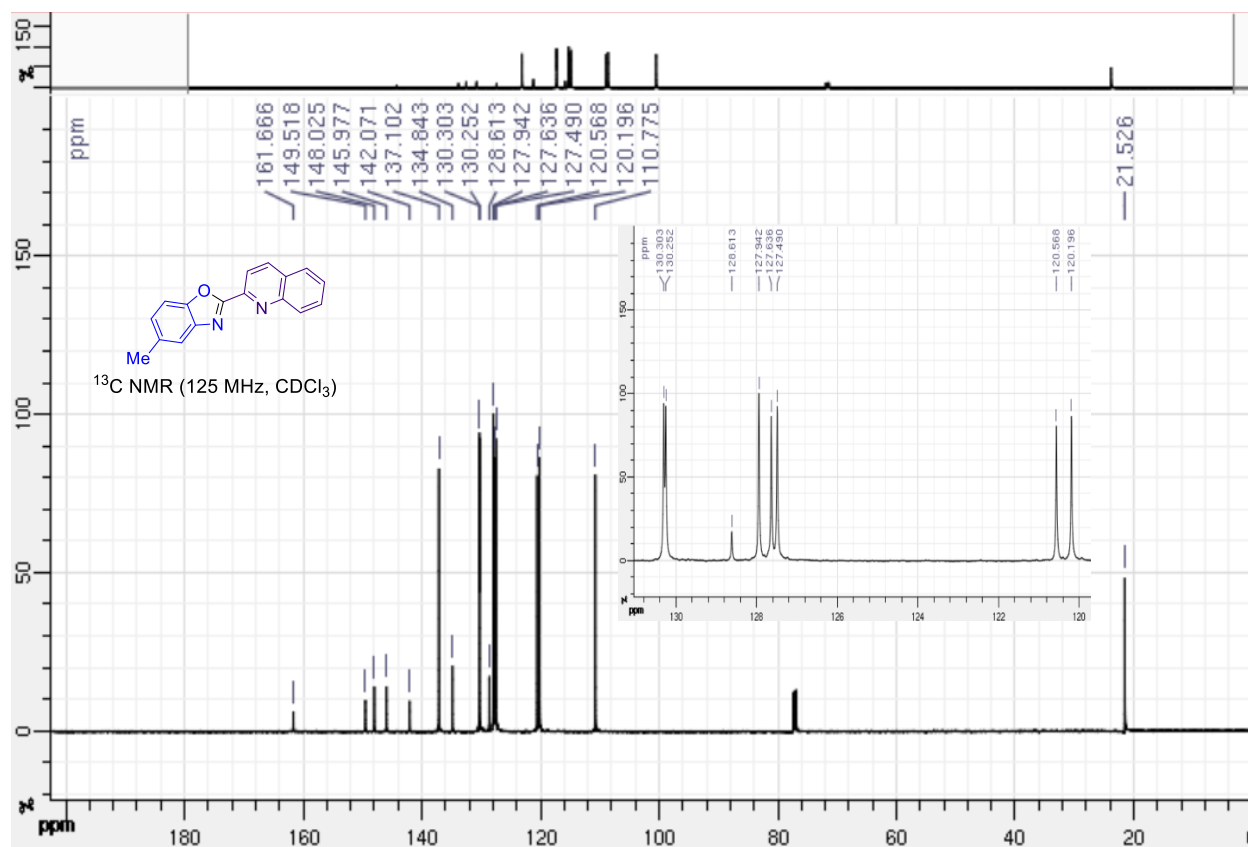
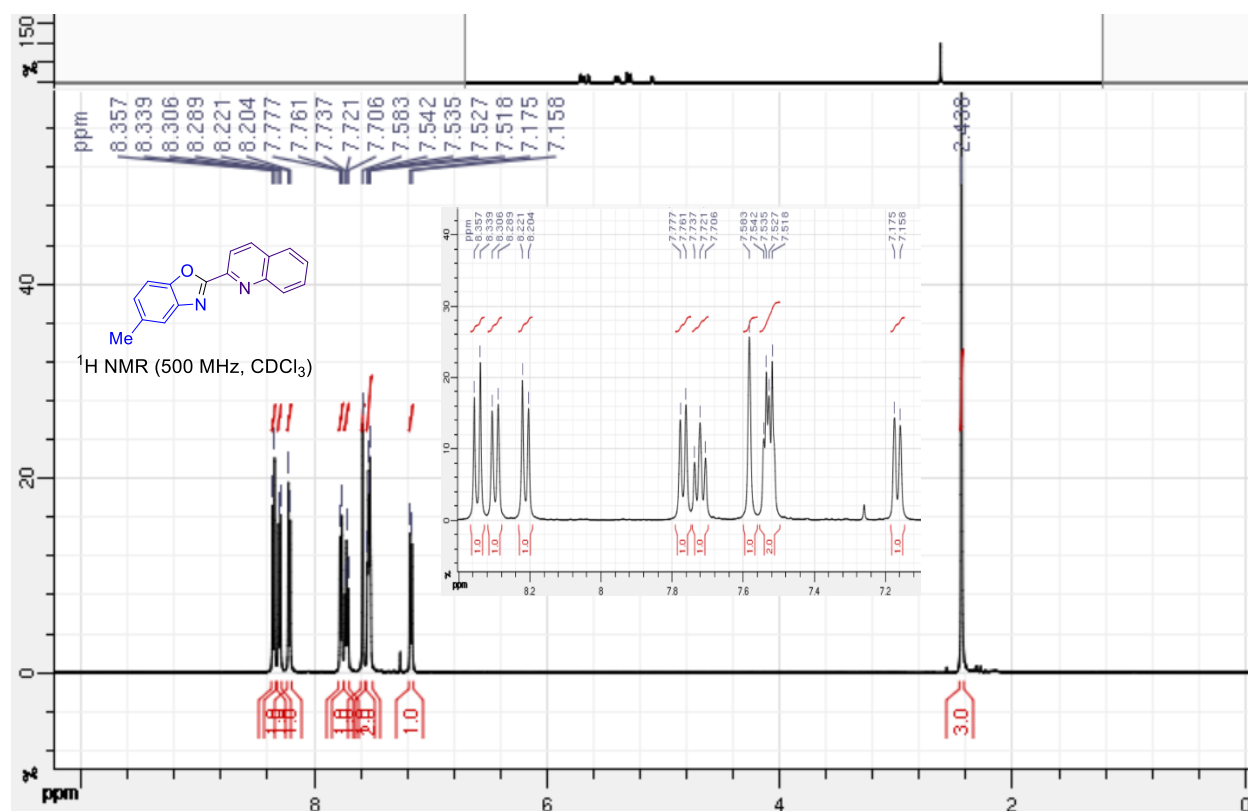
Oxazolo[4,5-c]pyridin-2-yl(phenyl)methanone (3ja)



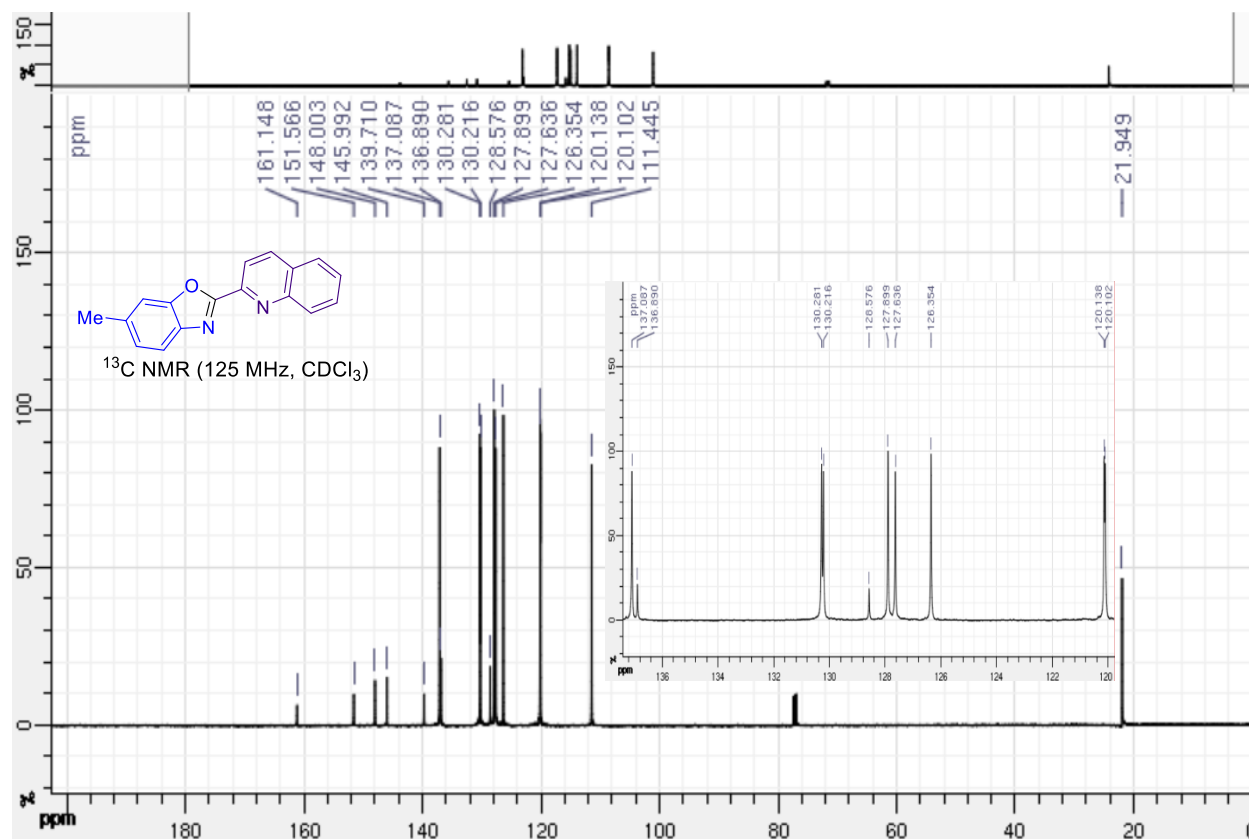
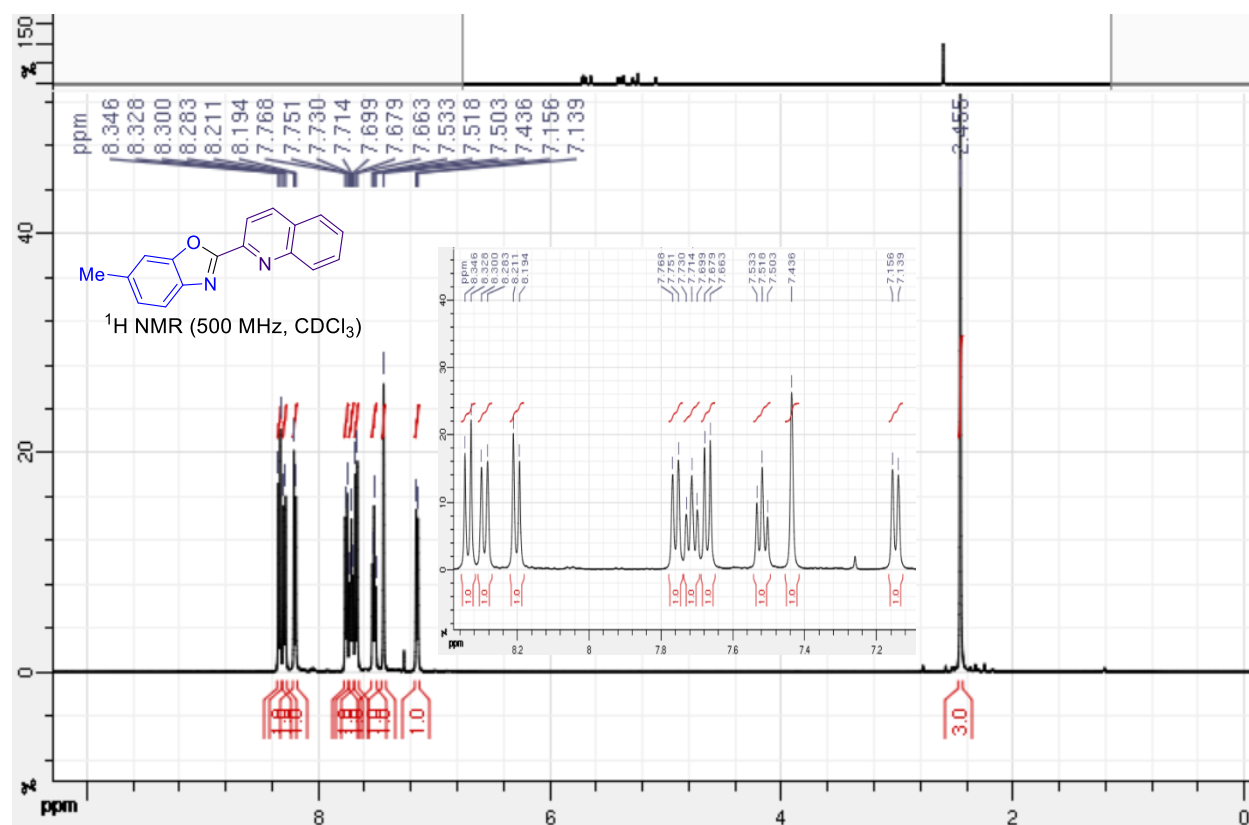
2-(Quinolin-2-yl)benzoxazole (5aa)



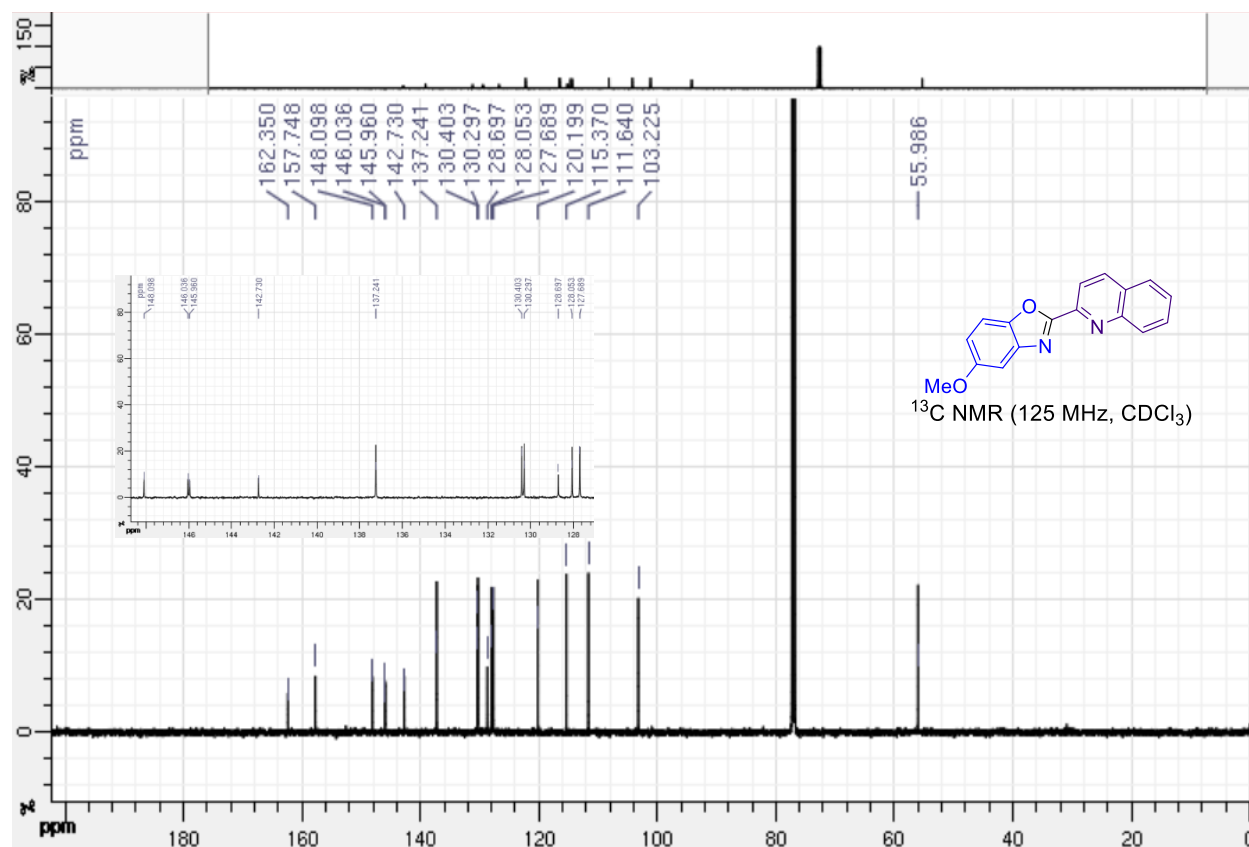
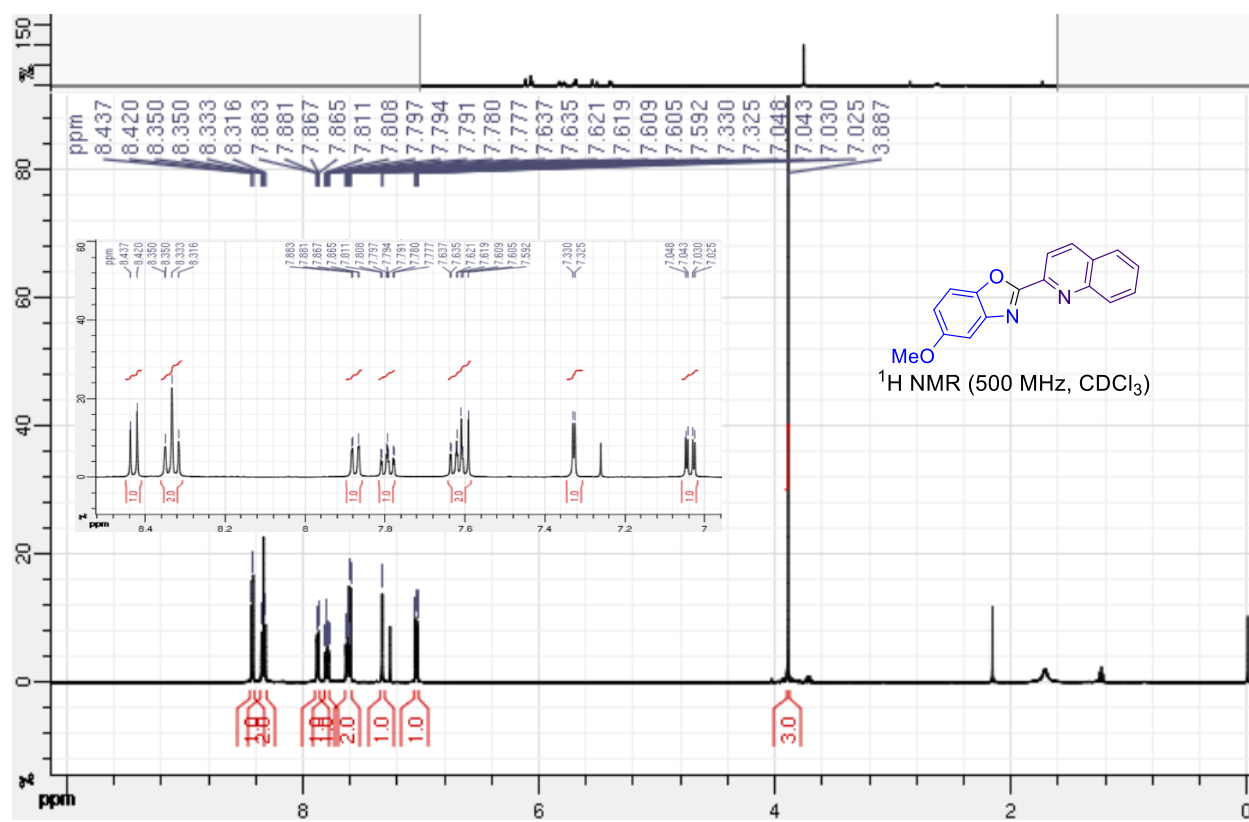
5-Methyl-2-(quinolin-2-yl)benzoxazole (5ba)



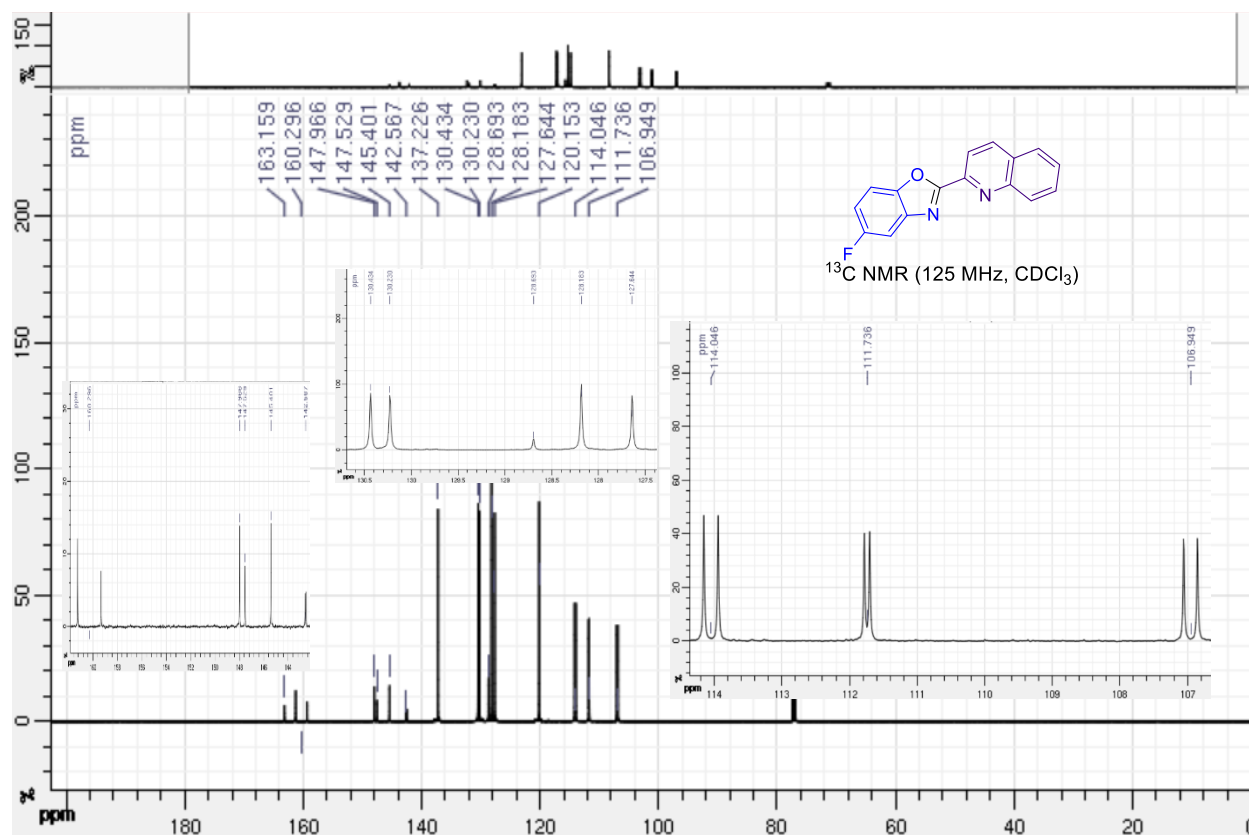
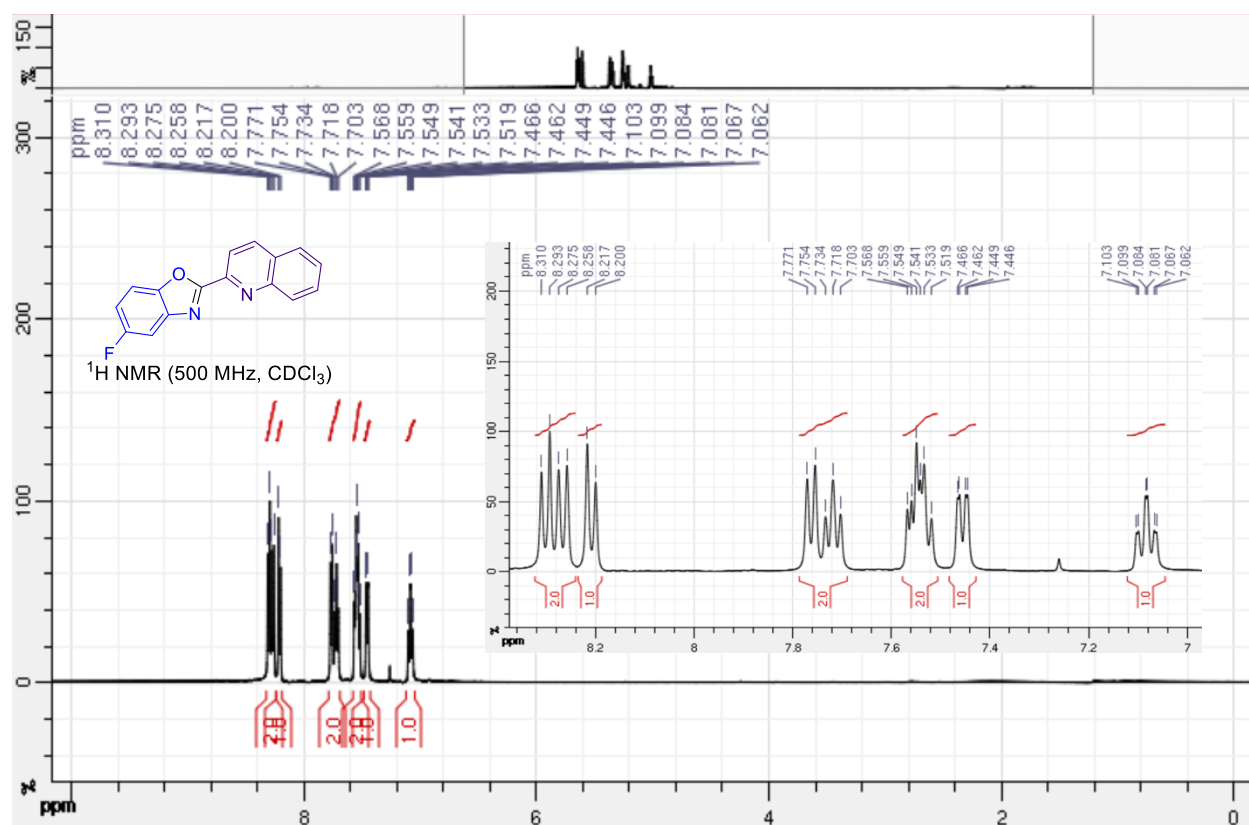
6-methyl-2-(quinolin-2-yl)benzoxazole (5ca)



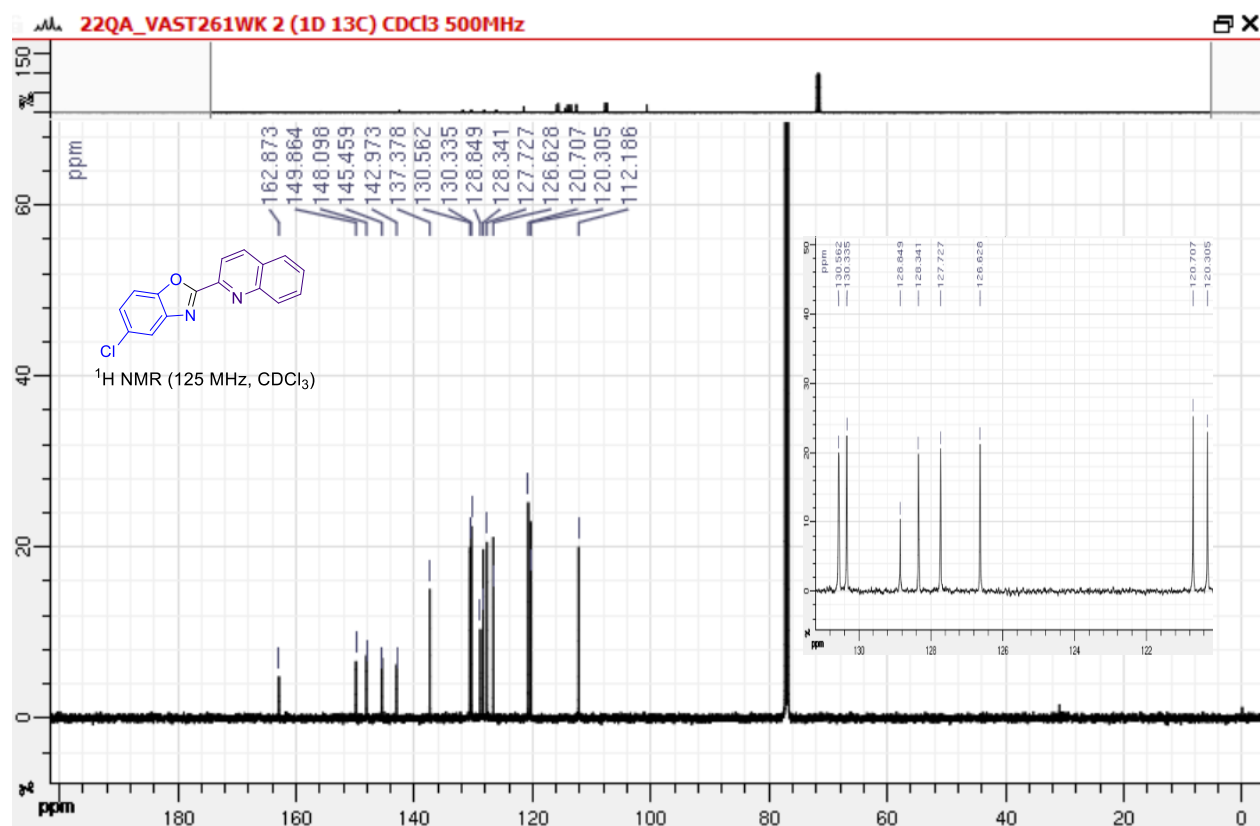
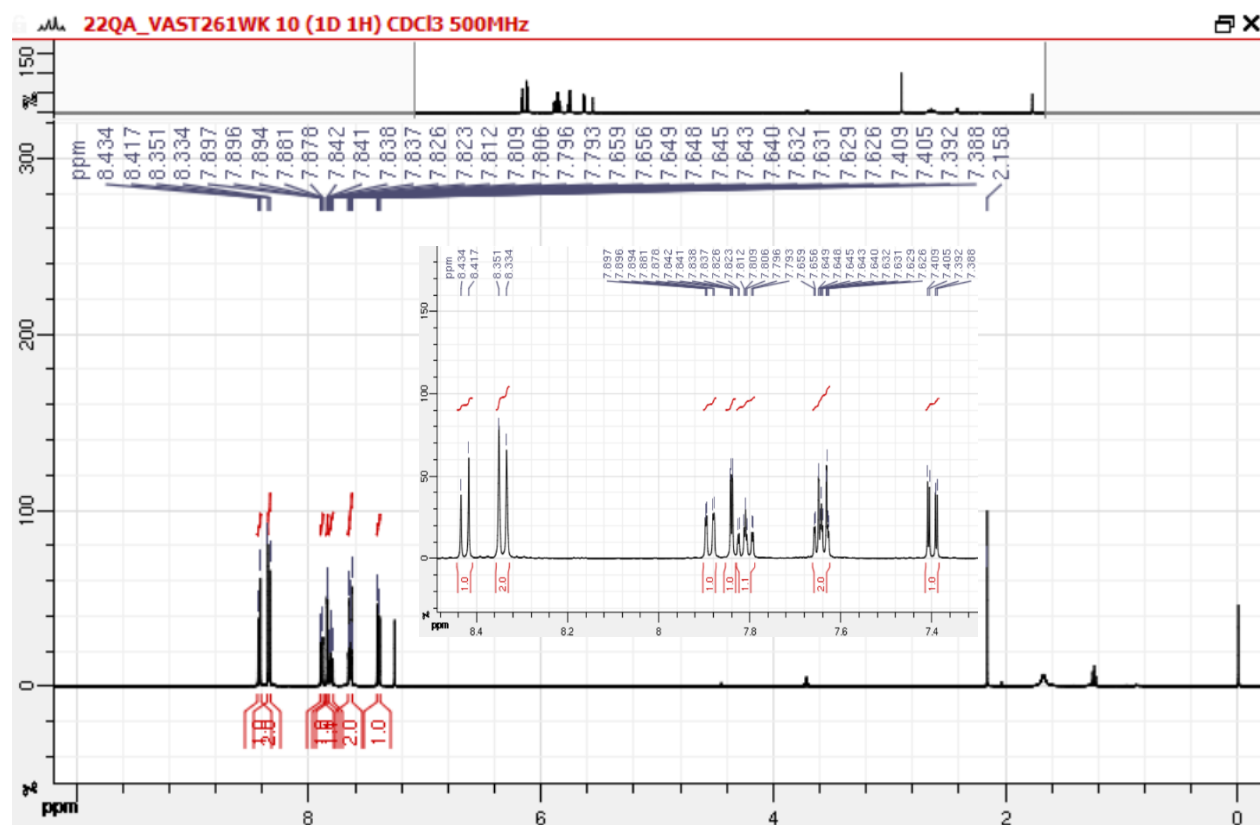
5-Methoxy-2-(quinolin-2-yl)benzoxazole (5da)

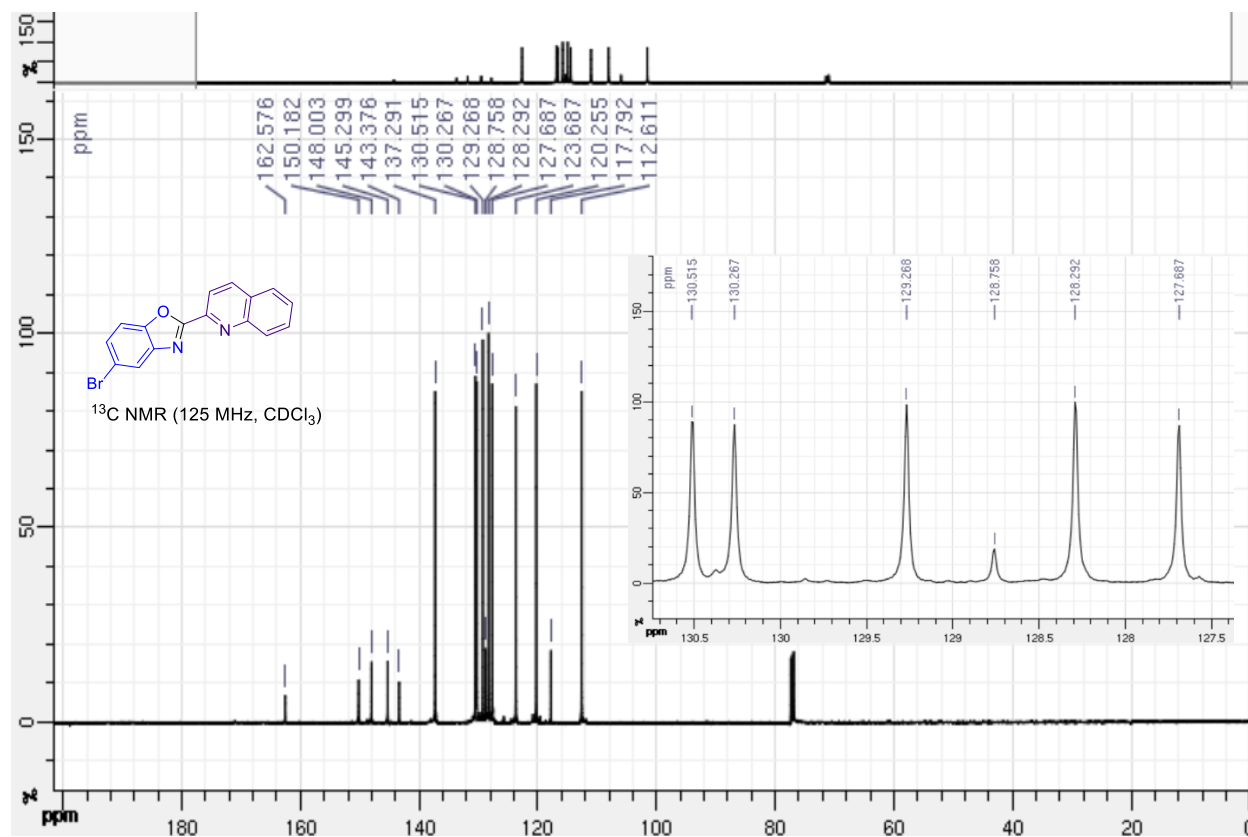


5-Fluoro-2-(quinolin-2-yl)benzoxazole (5fa)

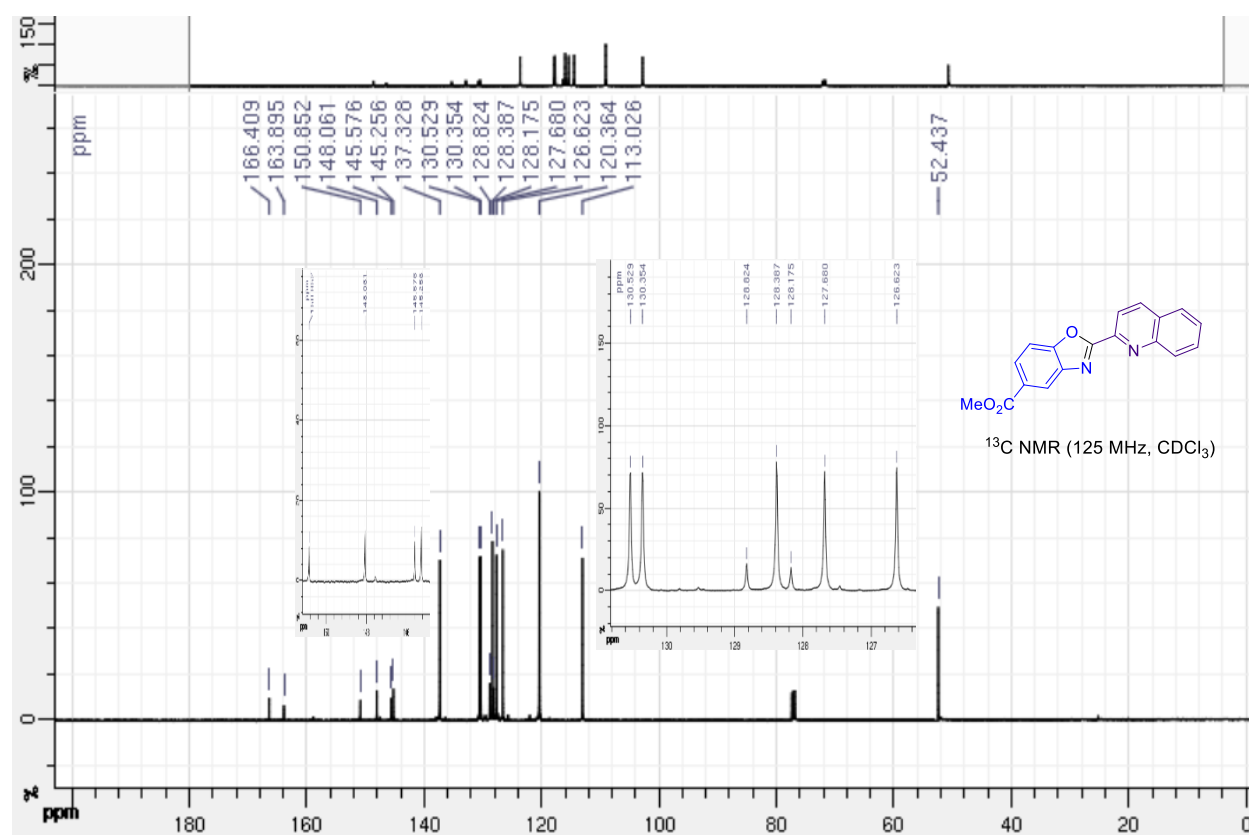
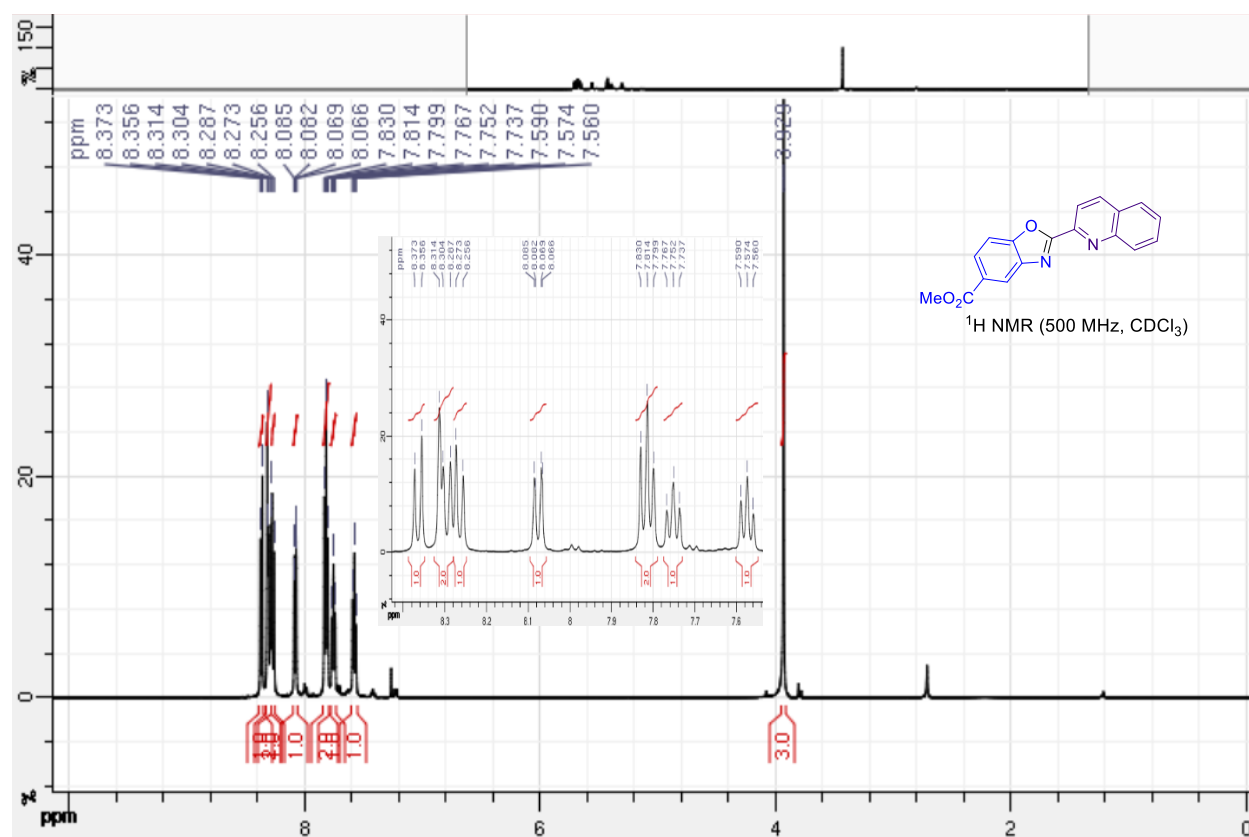


5-chloro-2-(quinolin-2-yl)benzoxazole (5ga)

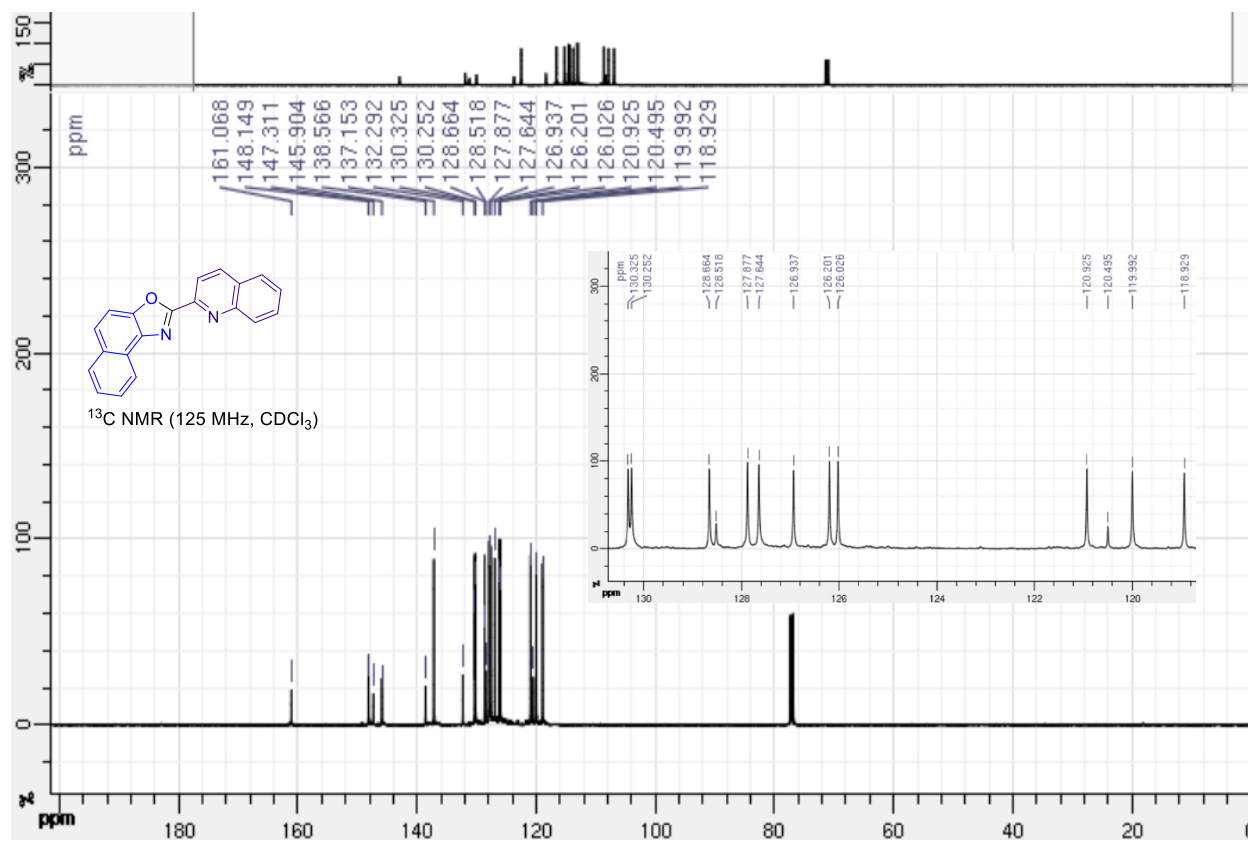
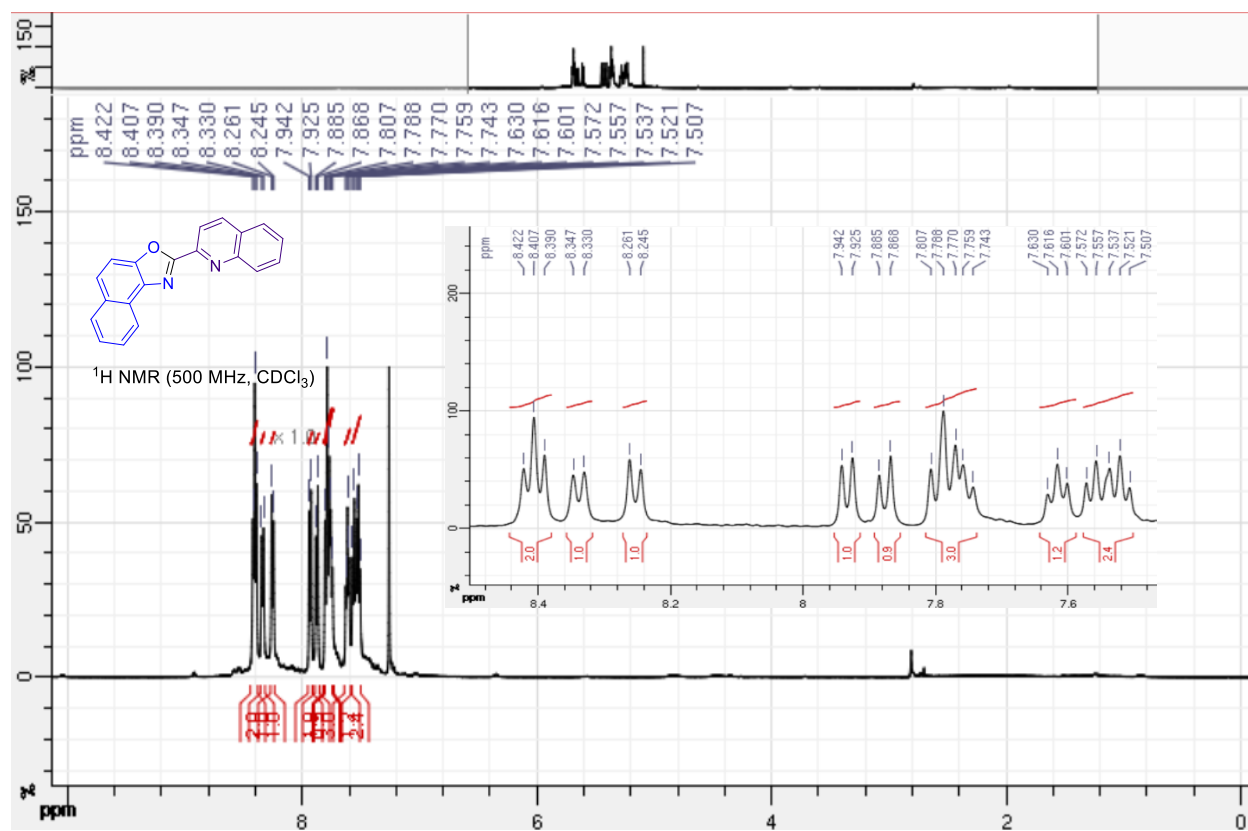


[illegible]

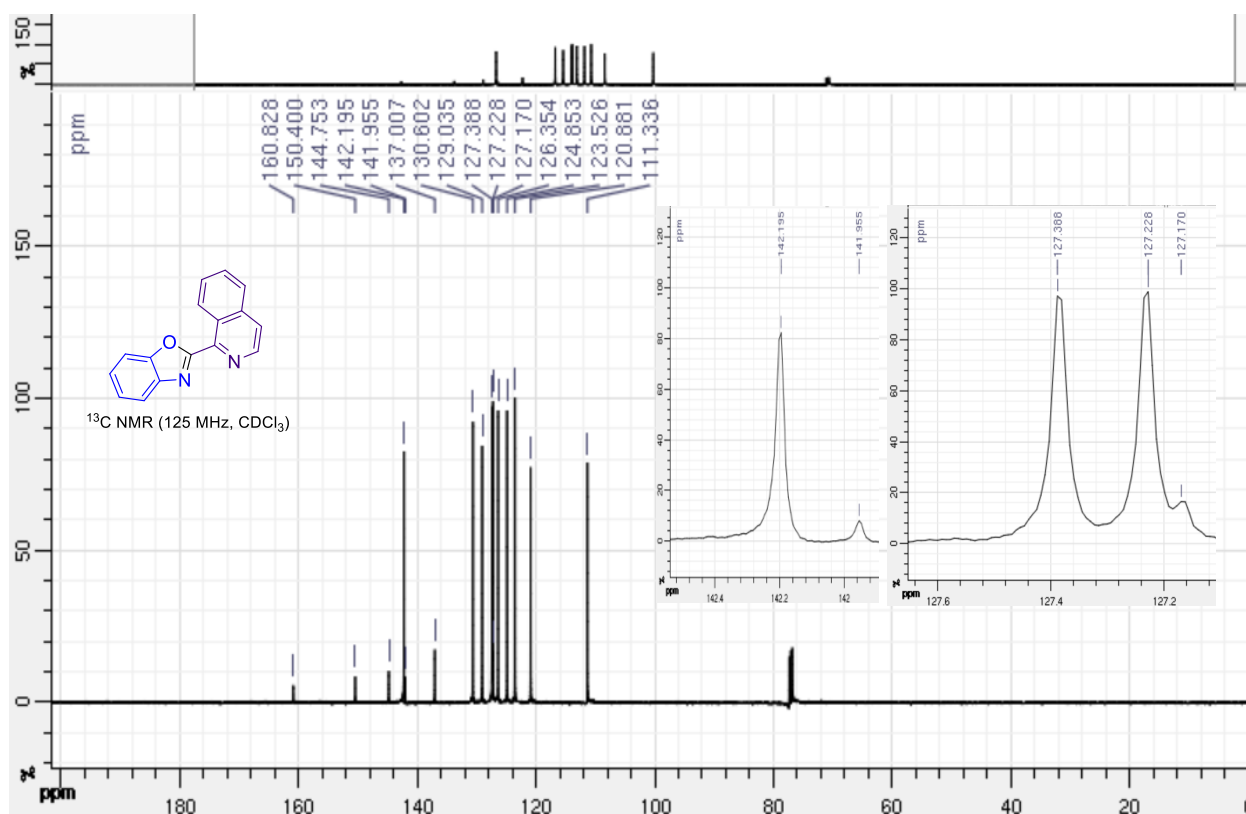
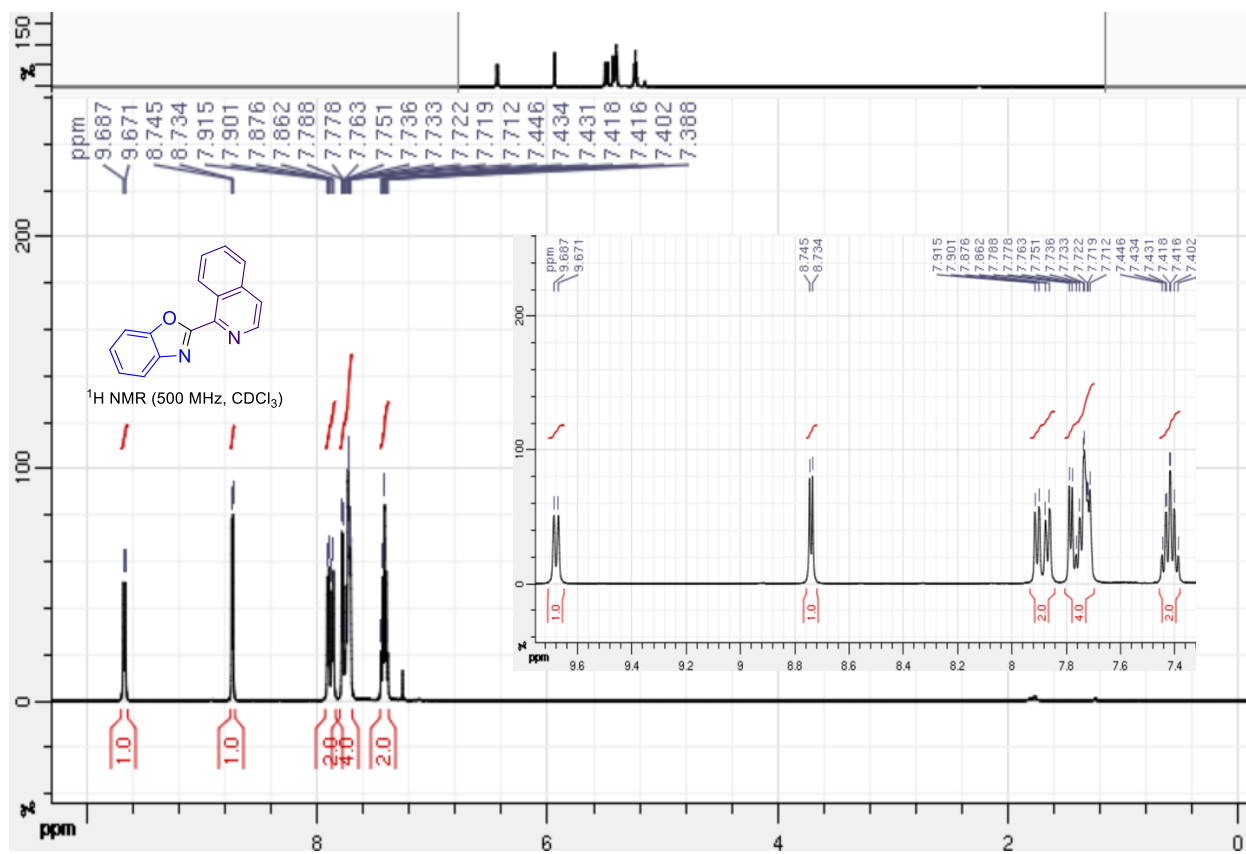
Methyl 2-(quinolin-2-yl)benzoxazole-5-carboxylate (5ia)



2-(Quinolin-2-yl)naphtho[1,2-d]oxazole (5ka)



2-(isoquinolin-1-yl)benzoxazole (5ac)



2-(Quinoxalin-2-yl)benzoxazole (5ad)

