

Supporting Information

Cu-Benzotriazole Catalyzed Electrophilic Cyclization of N-Arylimines: A Methodical Tandem Approach to O-Protected-4-hydroxyquinazolines

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Contents:

Experimental

Spectral data

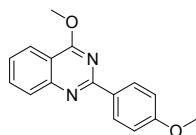
¹H-NMR & ¹³C-NMR

Experimental

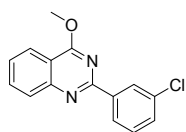
General. All the reactions involving EtOH as solvent were carried out in moisture free environment. Chemicals, solvents were procured from commercial sources and solvents dried by using standard methods. The column chromatography was performed with silica gel of 100-200 mesh size and reactions monitored by analytical TLC on G/GF 254 plates. All ^1H NMR and ^{13}C NMR spectra were recorded on Bruker-Avance DPX FT-NMR 400 (or 500) and 100 (or 125) MHz instruments used TMS as an internal standard for recording chemical shifts (δ ppm) of protons. Mass spectra (ESI-MS and HRMS) were recorded on Agilent 1100 LC-Q-TOF and HRMS-6540-UHD machines. IR spectra were recorded on Perkin-Elmer IR spectrophotometer.

General procedure for Preparation of O-protected-4-hydroxyquinazolines (MPQ & EPQ). Reaction vessel charged with 2-aminobenzonitrile 1 (0.854 mmol) and aldehyde 2 (1.02 mmol) in 4 ml solvent (MeOH or EtOH). To this solution CuI (10 mol%), benzotriazole (20 mol%), potassium carbonate (1.7 mmol) and 4A^o MS powder were successively added and the reaction mass allowed to reflux for 12 to 24 h. The progress of the reaction monitored by TLC, after its completion reaction mixture was cooled to room temperature and excess solvent was removed under reduced pressure. The reaction mass extracted with dichloromethane and dried over anhydrous Na₂SO₄. The crude product was purified by column chromatography on silica gel (100-200 #) using hexane and ethyl acetate (97:3) as eluent to afford the corresponding product.

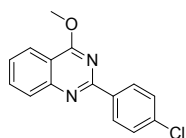
Spectral data of all compounds.



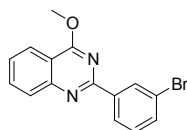
4-Methoxy-2-(4-methoxyphenyl)quinazoline (3a). White solid; yield 78% (175 mg); m.p. 115-117 °C. ^1H NMR (400 MHz, CDCl₃) δ 8.53 (d, J = 8.7 Hz, 2H), 8.07 (d, J = 8.0 Hz, 1H), 7.92 (d, J = 8.4 Hz, 1H), 7.74 (t, J = 7.5 Hz, 1H), 7.41 (t, J = 7.5 Hz, 1H), 6.99 (d, J = 8.7 Hz, 2H), 4.21 (s, 3H), 3.84 (s, 3H); ^{13}C NMR (101 MHz, CDCl₃) δ 166.86, 161.75, 159.81, 151.93, 133.35, 130.88, 130.12, 127.70, 125.90, 123.42, 115.02, 113.73, 55.35, 53.94; IR (CHCl₃) 3066, 2997, 2955, 2935, 2836, 1622, 1605, 1576, 1558, 1516, 1497, 1452 cm⁻¹; ESI-MS: m/z 267 (M + 1)⁺; HRMS: m/z 267.1129 calcd for C₁₆H₁₄N₂O₂ + H⁺ (267.1134).



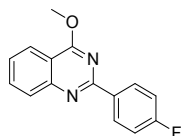
2-(3-Chlorophenyl)-4-methoxyquinazoline (3b). White solid; yield 75% (171 mg); m.p. 111-113 °C. ^1H NMR (400 MHz, CDCl₃) δ 8.57 (s, 1H), 8.47 (d, J = 6.9 Hz, 1H), 8.14 (d, J = 8.1 Hz, 1H), 7.97 (d, J = 8.4 Hz, 1H), 7.81 (t, J = 7.7 Hz, 1H), 7.51 (t, J = 7.6 Hz, 1H), 7.46 – 7.40 (m, 2H), 4.27 (s, 3H); ^{13}C NMR (101 MHz, CDCl₃) δ 167.17, 158.63, 151.66, 140.05, 134.52, 133.61, 130.38, 129.62, 128.52, 128.00, 126.75, 126.56, 123.48, 115.42, 54.19; IR (CHCl₃) 3068, 2941, 1621, 1576, 1558, 1500, 1450 cm⁻¹; ESI-MS: m/z 271 (M + 1)⁺; HRMS: m/z 271.0626 calcd for C₁₅H₁₁ClN₂O + H⁺ (271.0638).



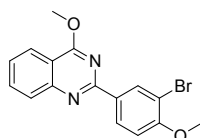
2-(4-Chlorophenyl)-4-methoxyquinazoline (**3c**). White solid; yield 79% (180 mg); m.p. 121-123 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.53 (d, J = 8.4 Hz, 2H), 8.13 (d, J = 8.2 Hz, 1H), 7.95 (d, J = 8.4 Hz, 1H), 7.80 (t, J = 7.7 Hz, 1H), 7.51 (d, J = 7.2 Hz, 1H), 7.48-7.45 (m, 2H), 4.26 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 167.11, 158.98, 151.69, 136.64, 136.63, 133.61, 129.80, 128.61, 127.90, 126.61, 123.49, 115.29, 54.15; IR (CHCl₃) 3117, 3026, 1620, 1575, 1557, 1504, 1487, 1449 cm⁻¹; ESI-MS: m/z 271 (M + 1)⁺; HRMS: m/z 271.0628 calcd for C₁₅H₁₁ClN₂O + H⁺ (271.0638).



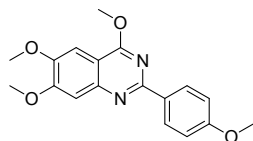
2-(3-Bromophenyl)-4-methoxyquinazoline (**3d**). White solid; yield 83% (220 mg); m.p. 118-120 °C. ¹H NMR (500 MHz, CDCl₃) δ 8.71 (s, 1H), 8.50 (d, J = 7.8 Hz, 1H), 8.12 (d, J = 8.1 Hz, 1H), 7.95 (d, J = 8.4 Hz, 1H), 7.80 (t, J = 8.4 Hz, 1H), 7.59 (d, J = 7.9 Hz, 1H), 7.50 (t, J = 8.0 Hz, 1H), 7.35 (t, J = 7.9 Hz, 1H), 4.25 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 167.13, 158.46, 151.59, 140.23, 133.64, 133.32, 131.42, 129.94, 127.98, 127.02, 126.78, 123.49, 122.71, 115.39, 54.24; IR (CHCl₃) 3146, 3067, 3022, 2942, 1621, 1576, 1554, 1499, 1451 cm⁻¹; ESI-MS: m/z 271 (M + 1)⁺; HRMS: m/z 315.0124 calcd for C₁₅H₁₁BrN₂O + H⁺ (315.0133).



2-(4-Fluorophenyl)-4-methoxyquinazoline (**3e**). White solid; yield 76% (163 mg); m.p. 104-106 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.61 (t, J = 6.3 Hz, 2H), 8.15 (d, J = 8.1 Hz, 1H), 7.96 (d, J = 8.4 Hz, 1H), 7.81 (t, J = 8.3 Hz, 1H), 7.51 (t, J = 7.6 Hz, 1H), 7.18 (t, J = 8.7 Hz, 2H), 4.28 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 166.08, 157.95, 150.64, 135.58, 132.58, 128.75, 127.56, 126.84, 125.57, 122.45, 114.24, 53.11; IR (CHCl₃) 3112, 3025, 2987, 2941, 1619, 1589, 1551, 1472 cm⁻¹; ESI-MS: m/z 255 (M + 1)⁺; HRMS: m/z 255.0923 calcd for C₁₅H₁₁FN₂O + H⁺ (255.0934).

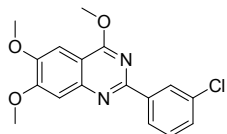


2-(3-Bromo-4-methoxyphenyl)-4-methoxyquinazoline (**3f**). White solid; yield 78% (227 mg); m.p. 130-132 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.78 (d, J = 1.8 Hz, 1H), 8.51 (dd, J = 8.6, 1.6 Hz, 1H), 8.10 (d, J = 8.1 Hz, 1H), 7.94 (d, J = 8.4 Hz, 1H), 7.78 (t, J = 8.2 Hz, 1H), 7.47 (t, J = 7.5 Hz, 1H), 6.98 (d, J = 8.6 Hz, 1H), 4.25 (s, 3H), 3.96 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 167.00, 158.44, 157.71, 151.62, 133.58, 133.48, 132.01, 129.02, 127.66, 126.31, 123.48, 115.10, 111.68, 111.31, 56.38, 54.17; IR (CHCl₃) 3069, 3006, 2924, 2849, 1621, 1597, 1576, 1552, 1505, 1494, 1452 cm⁻¹; ESI-MS: m/z 345 (M + 1)⁺; HRMS: m/z 345.0236 calcd for C₁₆H₁₃BrN₂O₂ + H⁺ (345.0239).

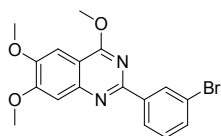


4,6,7-Trimethoxy-2-(4-methoxyphenyl)quinazoline (**3g**). White solid; yield 86% (157 mg); m.p. 190-193 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.49 (d, J = 8.7 Hz, 2H), 7.33 (s, 1H), 7.29 (s, 1H), 7.00 (d, J = 8.7 Hz, 2H), 4.23 (s, 3H),

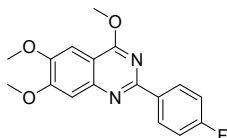
4.03 (s, 3H), 4.00 (s, 3H), 3.88 (s, 3H); ^{13}C NMR (101 MHz, CDCl_3) δ 165.52, 161.39, 158.73, 155.13, 149.14, 149.00, 131.12, 129.66, 113.68, 108.94, 106.91, 101.39, 56.22, 56.13, 55.34, 53.73; IR (CHCl_3) 3077, 2954, 2851, 1621, 1584, 1565, 1515, 1473, 1432, 1405 cm^{-1} ; ESI-MS: m/z 327 ($M + 1$) $^+$; HRMS: m/z 327.1339 calcd for $\text{C}_{18}\text{H}_{18}\text{N}_2\text{O}_4 + \text{H}^+$ (327.1345).



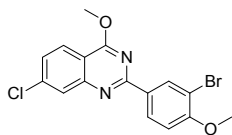
2-(3-Chlorophenyl)-4,6,7-trimethoxyquinazoline (3h). Light brown solid; yield 78% (154 mg); m.p. 141-143 °C. ^1H NMR (400 MHz, CDCl_3) δ 8.52 (s, 1H), 8.41 (d, $J = 5.4$ Hz, 1H), 7.43-7.40 (m, 2H), 7.34 (s, 1H), 7.29 (s, 1H), 4.23 (s, 3H), 4.04 (s, 3H), 4.01 (s, 3H); ^{13}C NMR (101 MHz, CDCl_3) δ 165.67, 157.43, 155.33, 149.63, 148.93, 140.30, 134.45, 129.93, 129.55, 128.14, 126.15, 109.48, 107.08, 101.33, 56.26, 56.18, 53.92; IR (CHCl_3) 3071, 3012, 2956, 2851, 1620, 1594, 1562, 1504, 1474, 1437 cm^{-1} ; ESI-MS: m/z 331 ($M + 1$) $^+$; HRMS: m/z 331.0837 calcd for $\text{C}_{17}\text{H}_{15}\text{ClN}_2\text{O}_3 + \text{H}^+$ (331.0849).



2-(3-Bromophenyl)-4,6,7-trimethoxyquinazoline (3i). White solid; yield 84% (176 mg); m.p. 152-154 °C. ^1H NMR (500 MHz, CDCl_3) δ 8.67 (s, 1H), 8.45 (d, $J = 7.8$ Hz, 1H), 7.57 (d, $J = 7.8$ Hz, 1H), 7.37 – 7.32 (m, 2H), 7.28 (s, 1H), 4.23 (s, 3H), 4.04 (s, 3H), 4.01 (s, 3H); ^{13}C NMR (126 MHz, CDCl_3) δ 165.64, 157.27, 155.28, 149.59, 148.87, 140.49, 132.87, 131.04, 129.87, 126.61, 122.67, 109.47, 107.04, 101.30, 56.30, 56.21, 53.97; IR (CHCl_3) 3095, 3016, 2933, 2851, 1619, 1580, 1557, 1511, 1473, 1437 cm^{-1} ; ESI-MS: m/z 375 ($M + 1$) $^+$; HRMS: m/z 375.0339 calcd for $\text{C}_{17}\text{H}_{15}\text{BrN}_2\text{O}_3 + \text{H}^+$ (375.0344).

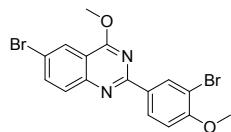


2-(4-Fluorophenyl)-4,6,7-trimethoxyquinazoline (3j). White solid; yield 84% (139 mg); m.p. 216-218 °C. ^1H NMR (500 MHz, CDCl_3) δ 8.54 (dd, $J = 8.6, 5.8$ Hz, 2H), 7.37 (s, 1H), 7.31 (s, 1H), 7.17 (t, $J = 8.7$ Hz, 2H), 4.25 (s, 3H), 4.05 (s, 3H), 4.03 (s, 3H); ^{13}C NMR (126 MHz, CDCl_3) δ 165.70, 163.35, 158.00, 155.29, 149.37, 149.05, 134.55, 130.13, 130.07, 115.36, 115.19, 109.20, 106.99, 101.36, 56.31, 56.21, 53.89; IR (CHCl_3) 3059, 3021, 2994, 2851, 1622, 1582, 1511, 1499, 1452, 1418 cm^{-1} ; ESI-MS: m/z 315 ($M + 1$) $^+$; HRMS: m/z 315.1147 calcd for $\text{C}_{17}\text{H}_{15}\text{FN}_2\text{O}_3 + \text{H}^+$ (315.1145).

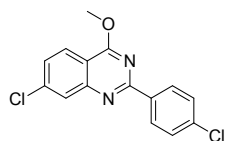


2-(3-Bromo-4-methoxyphenyl)-7-chloro-4-methoxyquinazoline (3k). White solid; yield 86% (193 mg); m.p. 170-172 °C. ^1H NMR (400 MHz, CDCl_3) δ 8.70 (d, $J = 1.8$ Hz, 1H), 8.43 (dd, $J = 8.6, 1.8$ Hz, 1H), 7.97 (d, $J = 8.7$ Hz, 1H), 7.86 (d, $J = 1.5$ Hz, 1H), 7.37 (dd, $J = 8.7, 1.7$ Hz, 1H), 6.94 (d, $J = 8.7$ Hz, 1H), 4.21 (s, 3H), 3.96 (s, 3H); ^{13}C NMR (101 MHz, CDCl_3) δ 166.76, 159.45, 157.92, 152.44, 139.59, 133.54, 131.61, 129.08, 127.00, 126.88,

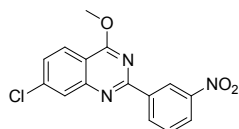
124.85, 113.40, 111.68, 111.25, 56.34, 54.19; IR (CHCl₃) 3065, 3003, 2952, 2852, 1617, 1594, 1556, 1493, 1453, 1403 cm⁻¹; ESI-MS: m/z 379 (M + 1)⁺; HRMS: m/z 378.9843 calcd for C₁₆H₁₂BrClN₂O₂ + H⁺ (378.9849).



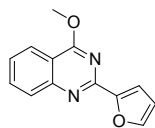
6-Bromo-2-(3-bromo-4-methoxyphenyl)-4-methoxyquinazoline (3l). White solid; yield 78% (173 mg); m.p. 166-168 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.68 (d, J = 2.0 Hz, 1H), 8.39 (dd, J = 8.6, 2.0 Hz, 1H), 8.16 (d, J = 2.1 Hz, 1H), 7.79 (dd, J = 8.9, 2.2 Hz, 1H), 7.71 (d, J = 8.9 Hz, 1H), 6.92 (d, J = 8.7 Hz, 1H), 4.19 (s, 3H), 3.96 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 165.88, 158.62, 157.84, 150.32, 136.81, 133.44, 131.58, 129.41, 128.98, 125.95, 119.48, 116.09, 111.70, 111.24, 56.35, 54.27; IR (CHCl₃) 3138, 3024, 2956, 2850, 1617, 1597, 1550, 1505, 1487, 1454, 1416 cm⁻¹; ESI-MS: m/z 423 (M + 1)⁺; HRMS: m/z 422.9334 calcd for C₁₆H₁₂Br₂N₂O₂ + H⁺ (422.9344).



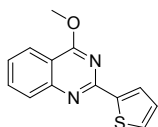
7-Chloro-2-(4-chlorophenyl)-4-methoxyquinazoline (3m). White solid; yield 78% (158 mg); m.p. 182-184 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.49 (d, J = 8.6 Hz, 2H), 8.04 (d, J = 8.7 Hz, 1H), 7.93 (d, J = 1.7 Hz, 1H), 7.45 (d, J = 8.4 Hz, 2H), 7.43 (d, J = 1.9 Hz, 1H), 4.25 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 167.00, 160.08, 152.47, 139.77, 137.02, 136.20, 129.89, 128.65, 127.46, 127.10, 124.94, 113.64, 54.28; IR (CHCl₃) 2995, 2954, 2920, 2851, 1619, 1578, 1557, 1497, 1452, 1428 cm⁻¹; ESI-MS: m/z 305 (M + 1)⁺; HRMS: m/z 305.0244 calcd for C₁₅H₁₀Cl₂N₂O + H⁺ (305.0248).



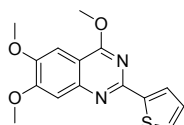
2-(3-Nitrophenyl)-7-chloro-4-methoxyquinazoline (3n). Light yellow solid; yield 80% (152 mg); m.p. 178-180 °C. ¹H NMR (500 MHz, CDCl₃) δ 9.40 (s, 1H), 8.92 (d, J = 7.8 Hz, 1H), 8.35 (ddd, J = 8.1, 2.2, 1.0 Hz, 1H), 8.12 (d, J = 8.7 Hz, 1H), 8.01 (d, J = 1.9 Hz, 1H), 7.69 (t, J = 8.0 Hz, 1H), 7.52 (dd, J = 8.7, 2.0 Hz, 1H), 4.32 (s, 4H); ¹³C NMR (126 MHz, CDCl₃) δ 166.82, 158.20, 151.76, 148.14, 139.61, 139.04, 133.73, 128.90, 127.61, 126.76, 124.73, 124.54, 123.02, 113.42, 54.08; IR (CHCl₃) 2923, 2853, 1737, 1612, 1577, 1531, 1497, 1450 cm⁻¹; ESI-MS: m/z 316 (M + 1)⁺; HRMS: 316.0487 m/z calcd for C₁₅H₁₀ClN₃O₃ + H⁺ (316.0489).



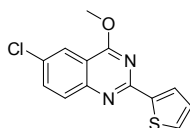
2-(Furan-2-yl)-4-methoxyquinazoline (3o). Light yellow solid; yield 77% (147 mg); m.p. 85-87 °C. ¹H NMR (500 MHz, CDCl₃) δ 8.02 (d, J = 8.1 Hz, 1H), 7.99 (d, J = 8.4 Hz, 1H), 7.74 (t, J = 7.7 Hz, 1H), 7.65 (d, J = 0.8 Hz, 1H), 7.41 (t, J = 7.6 Hz, 1H), 7.33 (d, J = 3.3 Hz, 1H), 6.54 (dd, J = 3.3, 1.7 Hz, 1H), 4.14 (s, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 166.91, 152.95, 152.51, 151.27, 145.05, 133.64, 127.67, 126.32, 123.38, 115.18, 113.86, 111.96, 54.07; IR (CHCl₃) 3115, 3068, 2996, 2950, 1621, 1593, 1575, 1557, 1487, 1455, 1375 cm⁻¹; ESI-MS: m/z 227 (M + 1)⁺; HRMS: m/z 227.0815 calcd for C₁₃H₁₀N₂O₂ + H⁺ (227.0821).



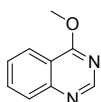
4-Methoxy-2-(thiophen-2-yl)quinazoline (3p). Yellow liquid; yield 85% (174 mg). ^1H NMR (400 MHz, CDCl_3) δ 8.08 (dd, $J = 4.3, 3.3$ Hz, 2H), 7.90 (d, $J = 8.4$ Hz, 1H), 7.79 – 7.73 (m, 1H), 7.47 (d, $J = 4.9$ Hz, 1H), 7.43 (d, $J = 7.1$ Hz, 1H), 7.17 – 7.13 (m, 1H), 4.22 (s, 4H); ^{13}C NMR (126 MHz, CDCl_3) δ 166.87, 156.80, 151.66, 144.15, 133.64, 129.62, 128.97, 128.10, 127.52, 126.16, 123.53, 115.16, 54.21; IR (CHCl_3) 3104, 2937, 1619, 1575, 1563, 1497, 1456, 1425, 1376 cm^{-1} ; ESI-MS: m/z 243 ($M + 1$) $^+$; HRMS: m/z 243.0590 calcd for $\text{C}_{13}\text{H}_{10}\text{N}_2\text{OS} + \text{H}^+$ (243.0592).



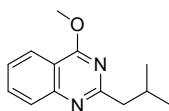
4,6,7-trimethoxy-2-(thiophen-2-yl)quinazoline (3q). White solid; yield 81% (mg); m.p. $^{\circ}\text{C}$. ^1H NMR (400 MHz, CDCl_3) δ 8.01 (d, $J = 3.6$ Hz, 1H), 7.43 (d, $J = 5.0$ Hz, 1H), 7.28 (s, 1H), 7.23 (s, 1H), 7.14 (dd, $J = 4.8, 3.8$ Hz, 1H), 4.18 (s, 3H), 4.01 (s, 3H), 3.98 (s, 3H); ^{13}C NMR (126 MHz, CDCl_3) δ 165.35, 155.64, 155.18, 149.06, 148.80, 144.38, 128.79, 128.06, 127.98, 109.06, 106.73, 101.45, 56.28, 56.13, 53.92; IR (CHCl_3) 3099, 3011, 2955, 2926, 2852, 2834, 1620, 1579, 1503, 1473, 1437, 1412 cm^{-1} ; ESI-MS: m/z ($M + 1$) $^+$; HRMS: m/z 303.0801 calcd for $\text{C}_{15}\text{H}_{14}\text{N}_2\text{O}_3\text{S} + \text{H}^+$ (303.0803).



6-Chloro-4-methoxy-2-(thiophen-2-yl)quinazoline (3r). White solid; yield 78% (149 mg); m.p. 125-127 $^{\circ}\text{C}$. ^1H NMR (400 MHz, CDCl_3) δ 8.10 – 8.01 (m, 2H), 7.82 (d, $J = 8.9$ Hz, 1H), 7.69 (d, $J = 8.9$ Hz, 1H), 7.48 (d, $J = 4.8$ Hz, 1H), 7.16 (d, $J = 3.6$ Hz, 1H), 4.22 (s, 4H); ^{13}C NMR (126 MHz, CDCl_3) δ 166.04, 157.00, 150.09, 143.69, 134.42, 131.57, 129.97, 129.28, 129.11, 128.16, 122.80, 115.74, 54.42; IR (CHCl_3) 3086, 2955, 1617, 1571, 1535, 1489, 1454, 1439, 1406 cm^{-1} ; ESI-MS: m/z 277 ($M + 1$) $^+$; HRMS: m/z 277.0203 calcd for $\text{C}_{13}\text{H}_9\text{ClN}_2\text{OS} + \text{H}^+$ (277.0202).

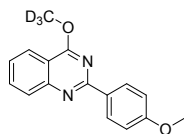


4-Methoxyquinazoline (3s). Colorless liquid; yield 80% (108 mg). ^1H NMR (400 MHz, CDCl_3) δ 8.82 (s, 1H), 8.17 (d, $J = 8.2$ Hz, 1H), 7.94 (d, $J = 8.4$ Hz, 1H), 7.83 (t, $J = 8.4$ Hz, 1H), 7.57 (t, $J = 7.6$ Hz, 1H), 4.19 (s, 4H); ^{13}C NMR (126 MHz, CDCl_3) δ 167.11, 154.37, 150.81, 133.58, 127.67, 127.09, 123.50, 116.65, 54.34; IR (CHCl_3) 3065, 2995, 2924, 2853, 1619, 1574, 1534, 1499, 1464, 1447 cm^{-1} ; ESI-MS: m/z ($M + 1$) $^+$; HRMS: 161.0725 m/z calcd for $\text{C}_9\text{H}_8\text{N}_2\text{O} + \text{H}^+$ (161.0715).

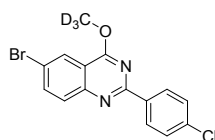


2-Isobutyl-4-methoxyquinazoline (3t).¹ Yellow liquid; yield 81% (131 mg). ^1H NMR (500 MHz, CDCl_3) δ 8.11 (d, $J = 8.2$ Hz, 1H), 7.87 (d, $J = 8.4$ Hz, 1H), 7.77 (t, $J = 7.0$ Hz, 1H), 7.47 (t, $J = 7.1$ Hz, 1H), 4.15 (s, 3H), 2.83 (d, $J = 7.3$ Hz, 2H), 2.38 (td, $J = 13.7, 6.9$ Hz, 1H), 1.00 (d, $J = 6.7$ Hz, 7H); ^{13}C NMR (126 MHz, CDCl_3) δ 166.73, 166.50,

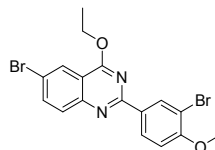
151.24, 133.25, 127.13, 125.98, 123.31, 114.74, 53.97, 48.76, 28.28, 22.60; IR (CHCl₃) 3065, 2959, 2932, 2871, 1620, 1581, 1562, 1496, 1453, 1373 cm⁻¹; ESI-MS: m/z (M + 1)⁺; HRMS: m/z 217.1338 calcd for C₁₃H₁₆N₂O + H⁺ (217.1341).



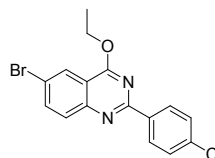
4-(Deuterated methoxy)-2-(4-methoxyphenyl)quinazoline (3u). White solid; yield 75% (170 mg); m.p. 95-97 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.55 (d, J = 8.9 Hz, 2H), 8.11 (d, J = 8.1 Hz, 1H), 7.94 (d, J = 8.4 Hz, 1H), 7.77 (t, J = 7.0 Hz, 1H), 7.45 (t, J = 8.0 Hz, 1H), 7.01 (d, J = 8.9 Hz, 2H), 3.88 (s, 3H); ¹³C NMR (101 MHz, CDCl₃) δ 166.90, 161.75, 159.85, 151.94, 133.36, 130.90, 130.10, 127.71, 125.92, 123.43, 115.04, 113.74, 55.37; ESI-MS: m/z 270 (M + 1)⁺; HRMS: m/z 270.1315 calcd for C₁₆H₁₁D₃N₂O₂ + H⁺ (270.1319).



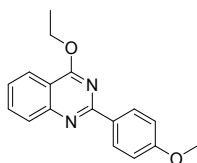
6-(Deuterated bromo)-2-(4-chlorophenyl)-4-methoxyquinazoline (3v). White solid; yield 72% (165 mg); m.p. 184-186 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.51 (d, J = 8.6 Hz, 2H), 8.29 (d, J = 1.9 Hz, 1H), 7.81-7.89 (m, 2H), 7.46 (d, J = 8.6 Hz, 2H); ¹³C NMR (126 MHz, CDCl₃) δ 165.12, 158.26, 149.32, 136.00, 135.89, 135.16, 128.76, 128.59, 127.63, 125.03, 118.92, 115.32; ESI-MS: m/z 270 (M + 1)⁺; HRMS: m/z 270.1322 calcd for C₁₅H₁₃ClN₂O + H⁺ (270.1319). ESI-MS: m/z 352 (M + 1)⁺; HRMS: m/z 351.9933 calcd for C₁₅H₇D₃BrClN₂O + H⁺ (351.9924).



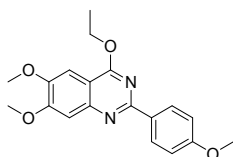
6-Bromo-2-(3-bromo-4-methoxyphenyl)-4-ethoxyquinazoline (3w). White solid; yield 81% (154 mg); m.p. 159-161 °C. ¹H NMR (400 MHz, CDCl₃) δ 8.75 (d, J = 2.0 Hz, 1H), 8.49 (dd, J = 8.7, 2.0 Hz, 1H), 8.29 (d, J = 1.9 Hz, 1H), 7.86 (dd, J = 8.9, 2.2 Hz, 1H), 7.80 (d, J = 8.9 Hz, 1H), 7.00 (d, J = 8.7 Hz, 1H), 4.75 (q, J = 7.1 Hz, 2H), 3.98 (s, 3H), 1.57 (t, J = 7.1 Hz, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 164.69, 157.88, 156.84, 149.46, 135.87, 132.49, 130.77, 128.45, 128.00, 125.09, 118.45, 115.30, 110.73, 110.31, 62.25, 55.36, 13.33; IR (CHCl₃) 3368, 2972, 2851, 1625, 1596, 1568, 1548, 1504, 1413. 1346 cm⁻¹; ESI-MS: m/z 436 (M + 1)⁺; HRMS: m/z 436.9508 calcd for C₁₇H₁₄Br₂N₂O₂ + H⁺ (436.9500).



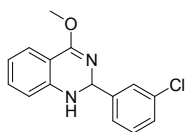
6-Bromo-2-(4-chlorophenyl)-4-ethoxyquinazoline (3x). White solid; yield 78% (131 mg); m.p. 210-212 °C. ¹H NMR (500 MHz, CDCl₃) δ 8.50 (d, J = 8.5 Hz, 1H), 8.31 (d, J = 1.7 Hz, 1H), 7.88 (dd, J = 8.9, 2.0 Hz, 1H), 7.82 (d, J = 8.9 Hz, 1H), 7.47 (d, J = 8.5 Hz, 1H), 4.76 (q, J = 7.1 Hz, 2H), 1.57 (t, J = 7.1 Hz, 3H); ¹³C NMR (126 MHz, CDCl₃) δ 164.50, 158.08, 149.13, 135.66, 135.57, 135.01, 128.49, 128.32, 127.36, 124.82, 118.54, 115.17, 62.00, 13.05; IR (CHCl₃) 3435, 2920, 2850, 1657, 1569, 1496, 1411, 1338, 1305 cm⁻¹; ESI-MS: m/z 362 (M + 1)⁺; HRMS: m/z 362.9904 calcd for C₁₆H₁₂BrClN₂O + H⁺ (362.9900).



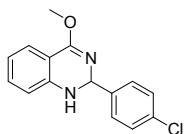
4-Ethoxy-2-(4-methoxyphenyl)quinazoline (3y). Yellow liquid; yield 78% (173 mg). $^1\text{H NMR}$ (500 MHz, CDCl_3) δ 8.54 (d, $J = 9.0$ Hz, 1H), 8.15 (d, $J = 8.1$ Hz, 1H), 7.94 (d, $J = 8.3$ Hz, 1H), 7.78 (t, $J = 8.4$ Hz, 1H), 7.47 (t, $J = 8.1$ Hz, 1H), 7.02 (d, $J = 9.0$ Hz, 1H), 4.76 (q, $J = 7.1$ Hz, 1H), 3.89 (s, 2H), 1.57 (t, $J = 7.1$ Hz, 2H); $^{13}\text{C NMR}$ (126 MHz, CDCl_3) δ 165.50, 160.63, 158.86, 150.91, 132.29, 129.91, 129.02, 126.61, 124.80, 122.48, 114.08, 112.68, 61.68, 54.35, 13.40; IR (CHCl_3) 3400, 2926, 2851, 1620, 1605, 1575, 1557, 1516, 1496, 1454, 1422, 1381 cm^{-1} ; ESI-MS: m/z 281 ($M + 1$) $^+$; HRMS: 281.1284 m/z calcd for $\text{C}_{17}\text{H}_{16}\text{N}_2\text{O}_2 + \text{H}^+$ (281.1290).



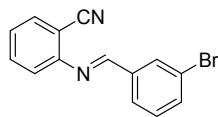
4-Ethoxy-6,7-dimethoxy-2-(4-methoxyphenyl)quinazoline (3z). Light yellow solid; yield 78% (141 mg); m.p. 152-154 $^{\circ}\text{C}$. $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 8.48 (d, $J = 8.9$ Hz, 1H), 7.36 (s, 1H), 7.30 (s, 1H), 7.01 (d, $J = 8.9$ Hz, 1H), 4.74 (q, $J = 7.1$ Hz, 1H), 4.05 (s, 2H), 4.03 (s, 2H), 3.89 (s, 2H), 1.56 (t, $J = 7.1$ Hz, 2H); $^{13}\text{C NMR}$ (126 MHz, CDCl_3) δ 164.18, 160.30, 157.75, 154.04, 148.15, 147.89, 130.14, 128.59, 112.64, 108.00, 105.87, 100.42, 61.46, 55.22, 55.15, 54.32, 13.56; IR (CHCl_3) 3400, 3074, 2958, 2934, 2835, 1621, 1579, 1563, 1515, 1502, 1480, 1465, 1425 cm^{-1} ; ESI-MS: m/z 341 ($M + 1$) $^+$; HRMS: m/z 341.1505 calcd for $\text{C}_{19}\text{H}_{20}\text{N}_2\text{O}_4 + \text{H}^+$ (341.1501).



2-(3-Chlorophenyl)-4-methoxy-1,2-dihydroquinazoline (4b). White solid; yield 78% (mg). $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.52 (d, $J = 7.9$ Hz, 2H), 7.41 – 7.36 (m, 1H), 7.29 (d, $J = 5.1$ Hz, 2H), 7.21 (t, $J = 8.3$ Hz, 1H), 6.73 (t, $J = 7.5$ Hz, 1H), 6.53 (d, $J = 8.0$ Hz, 1H), 5.98 (s, 1H), 4.11 (s, 1H), 3.85 (s, 3H). IR (CHCl_3) 3436, 2955, 2923, 2852, 1621, 1578, 1558, 1502, 1451 cm^{-1} ; ESI-MS: 273 m/z ($M + 1$) $^+$; HRMS: m/z 273.0792 calcd for $\text{C}_{15}\text{H}_{13}\text{ClN}_2\text{O} + \text{H}^+$ (273.0795).



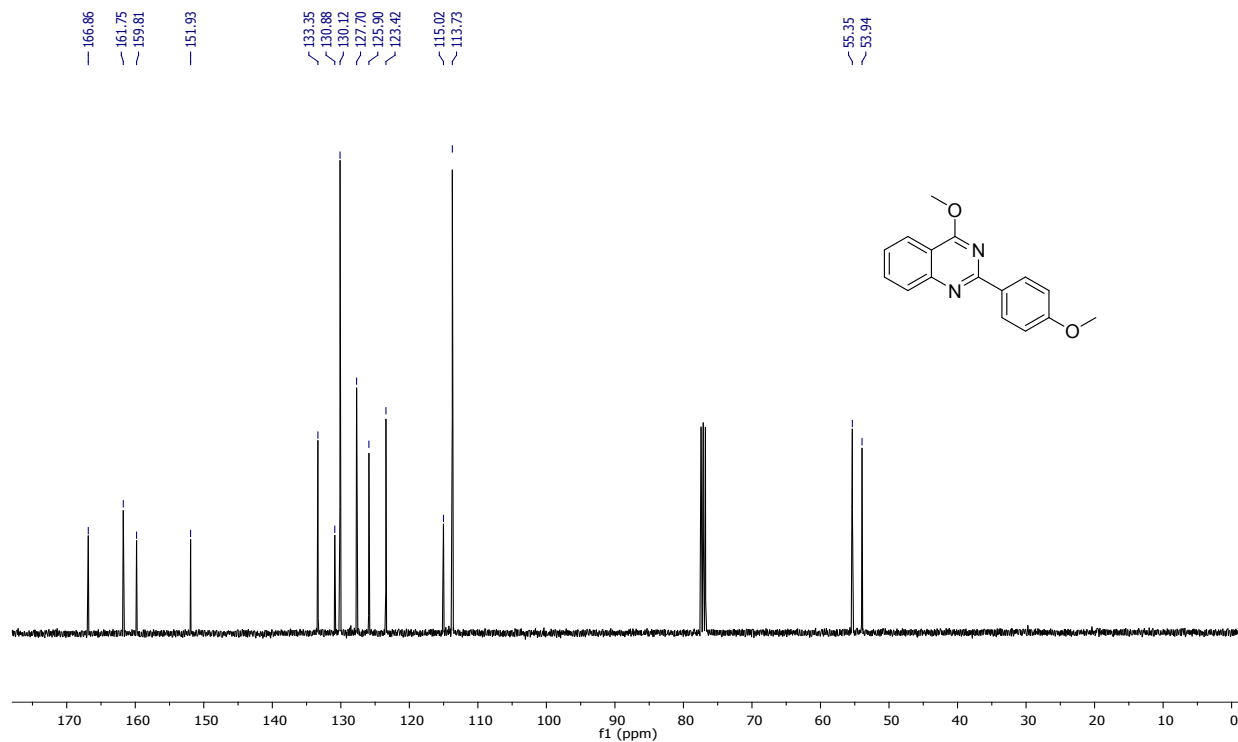
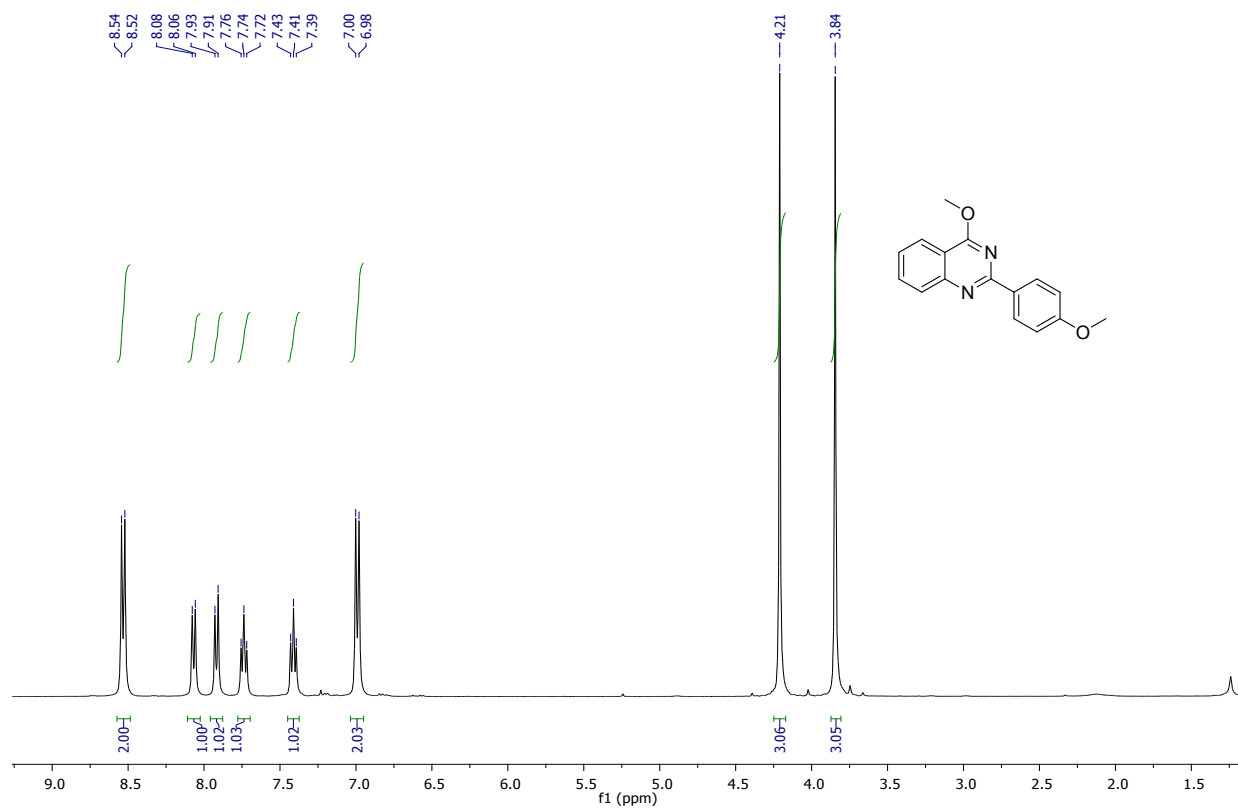
2-(4-Chlorophenyl)-4-methoxy-1,2-dihydroquinazoline (4c). White solid; yield 78% (mg). $^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.52 (d, $J = 7.0$ Hz, 1H), 7.47 (d, $J = 8.4$ Hz, 2H), 7.35 (d, $J = 8.4$ Hz, 2H), 7.22 (t, $J = 7.7$ Hz, 1H), 6.74 (t, $J = 7.5$ Hz, 1H), 6.54 (d, $J = 8.0$ Hz, 1H), 6.00 (s, 1H), 4.08 (s, 1H), 3.84 (s, 3H). IR (CHCl_3) 3442, 2990, 2915, 2850, 1632, 1585, 1540, 1495, 1450 cm^{-1} ; ESI-MS: m/z 273 ($M + 1$) $^+$; HRMS: m/z 273.0791 calcd for $\text{C}_{15}\text{H}_{13}\text{ClN}_2\text{O} + \text{H}^+$ (273.0795).



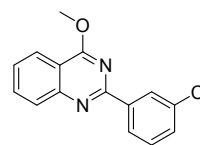
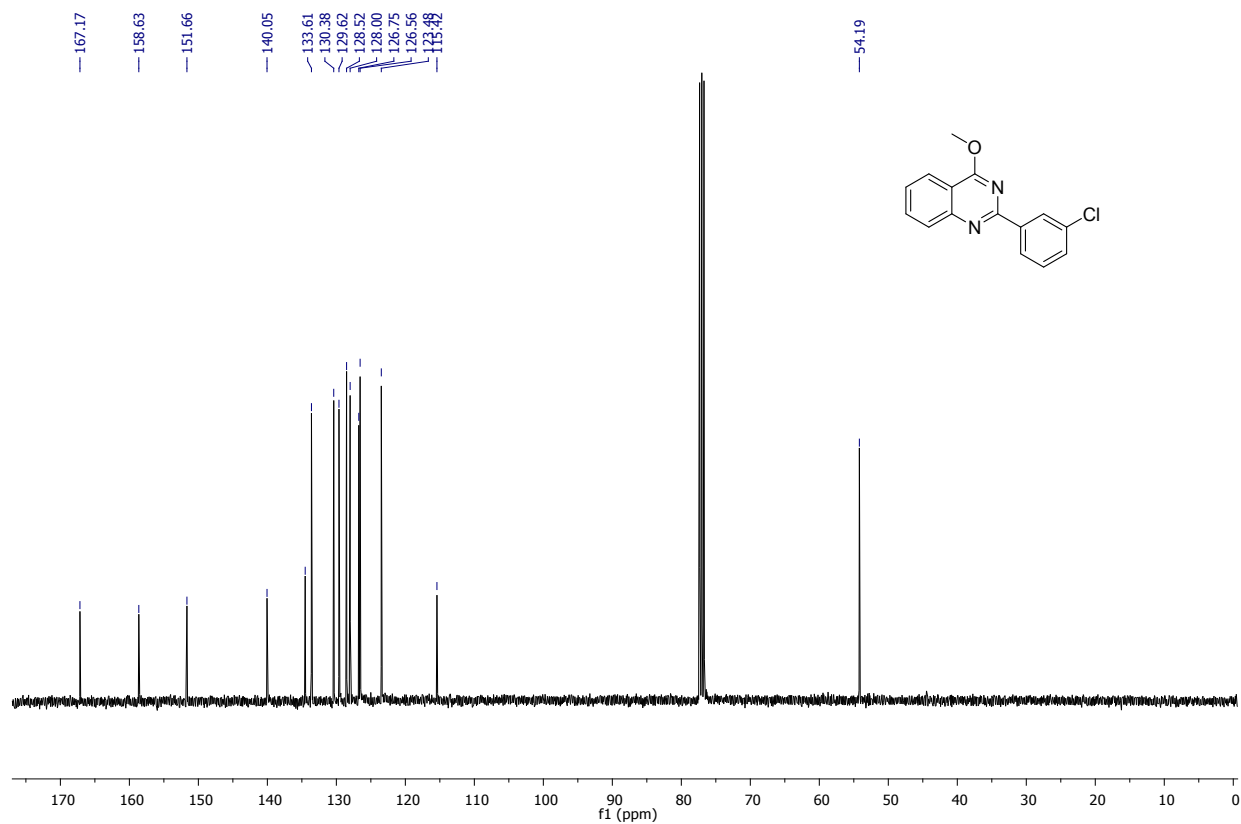
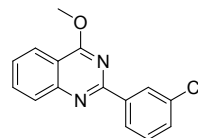
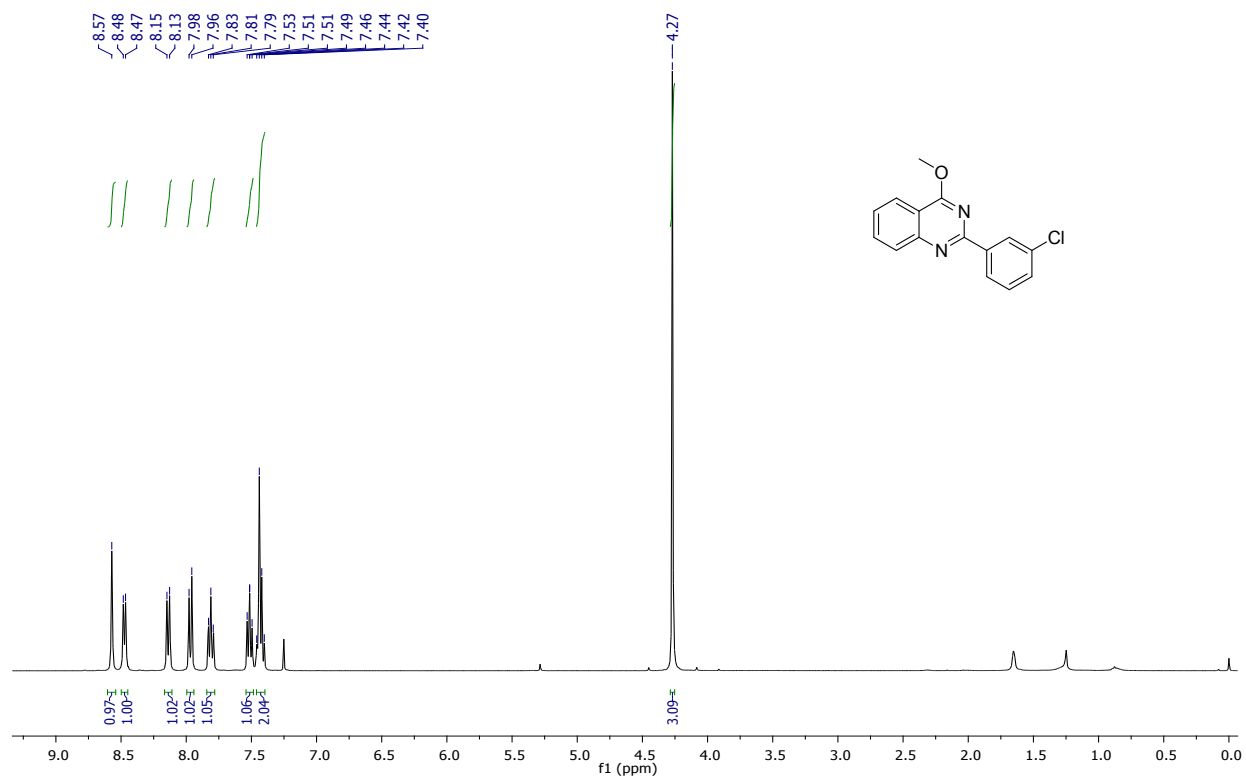
2-((3-Bromobenzylidene)amino)benzonitrile (**5**). Yellowish semi solid; ^1H NMR (400 MHz, CDCl_3) δ 8.40 (s, 1H), 8.10 (s, 1H), 7.85 (d, $J = 7.7$ Hz, 1H), 7.68-7.57 (m, 3H), 7.37-7.27 (m, 2H), 7.16 (d, $J = 8.1$ Hz, 1H); ^{13}C NMR (126 MHz, CDCl_3) δ 161.48, 153.98, 137.24, 135.20, 133.85, 133.35, 131.89, 130.43, 128.22, 126.23, 123.12, 119.11, 117.20, 107.29; IR (CHCl_3) 3372, 3063, 2921, 2853, 2226, 1698, 1696, 1590, 1564, 1482, 1445 cm^{-1} ; ESI-MS: m/z 285 ($M + 1$) $^+$; HRMS: m/z 285.0027 calcd for $\text{C}_{15}\text{H}_{13}\text{ClN}_2\text{O} + \text{H}^+$ (285.0028).

H¹ & C¹³ spectra of all compounds.

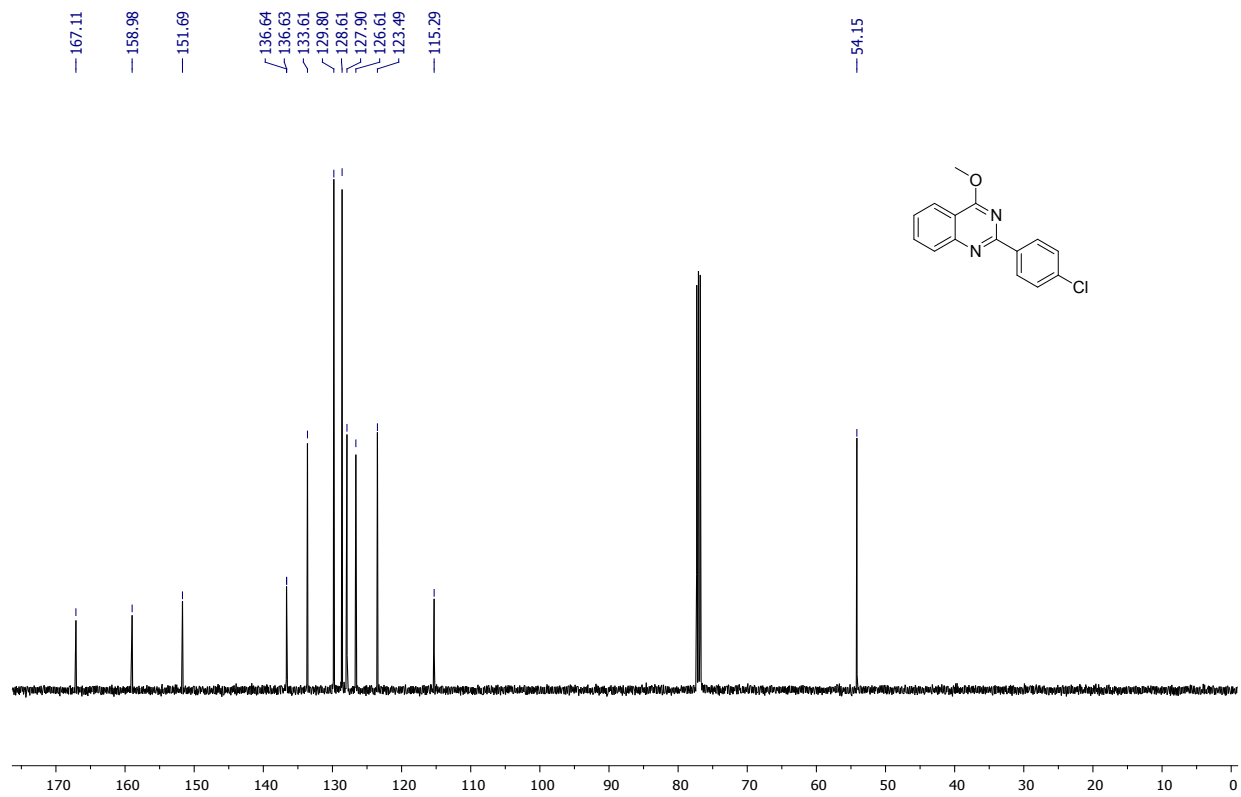
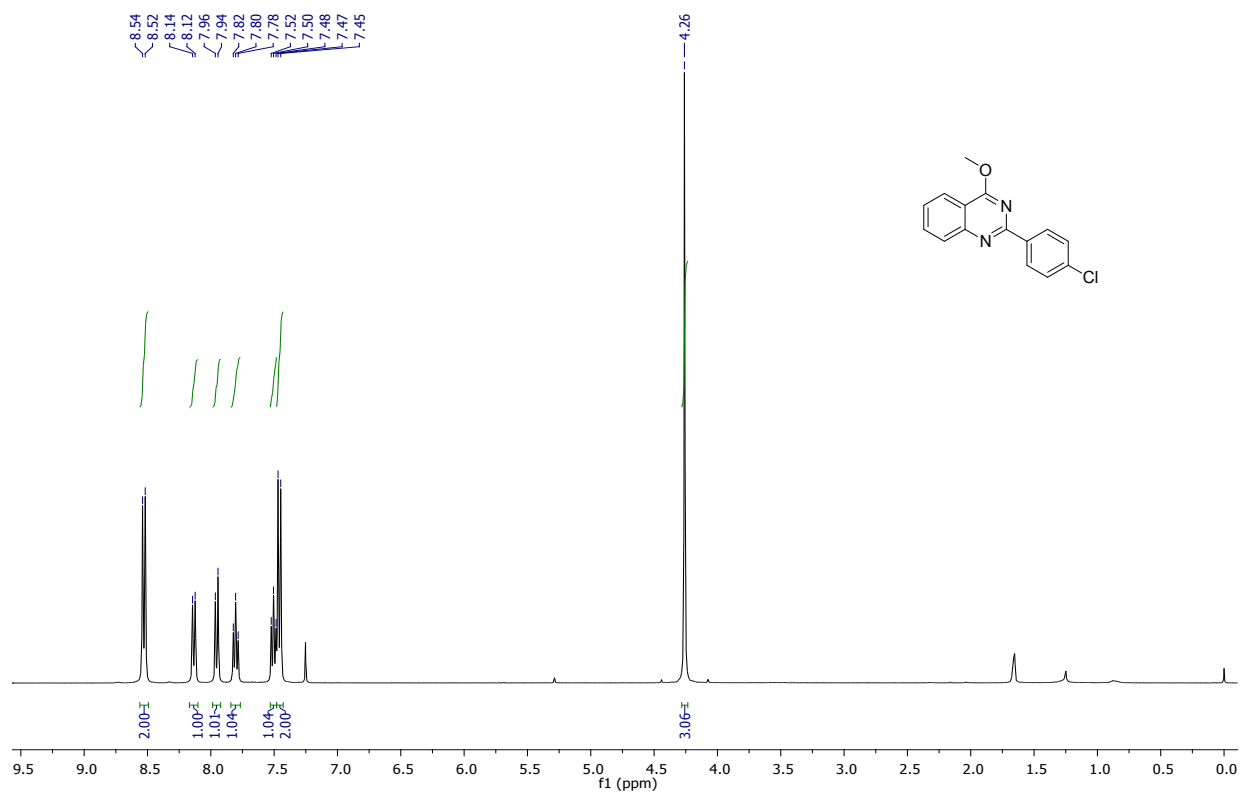
3a. 4-methoxy-2-(4-methoxyphenyl)quinazoline



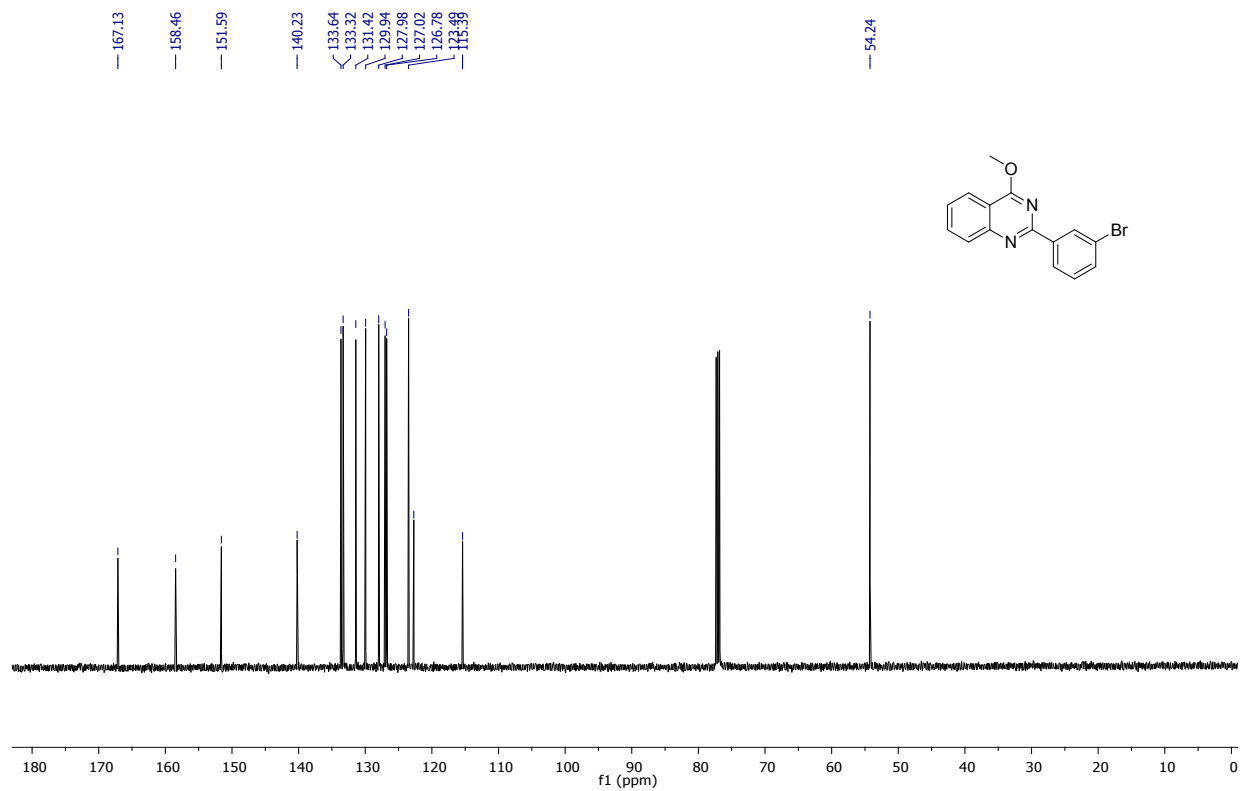
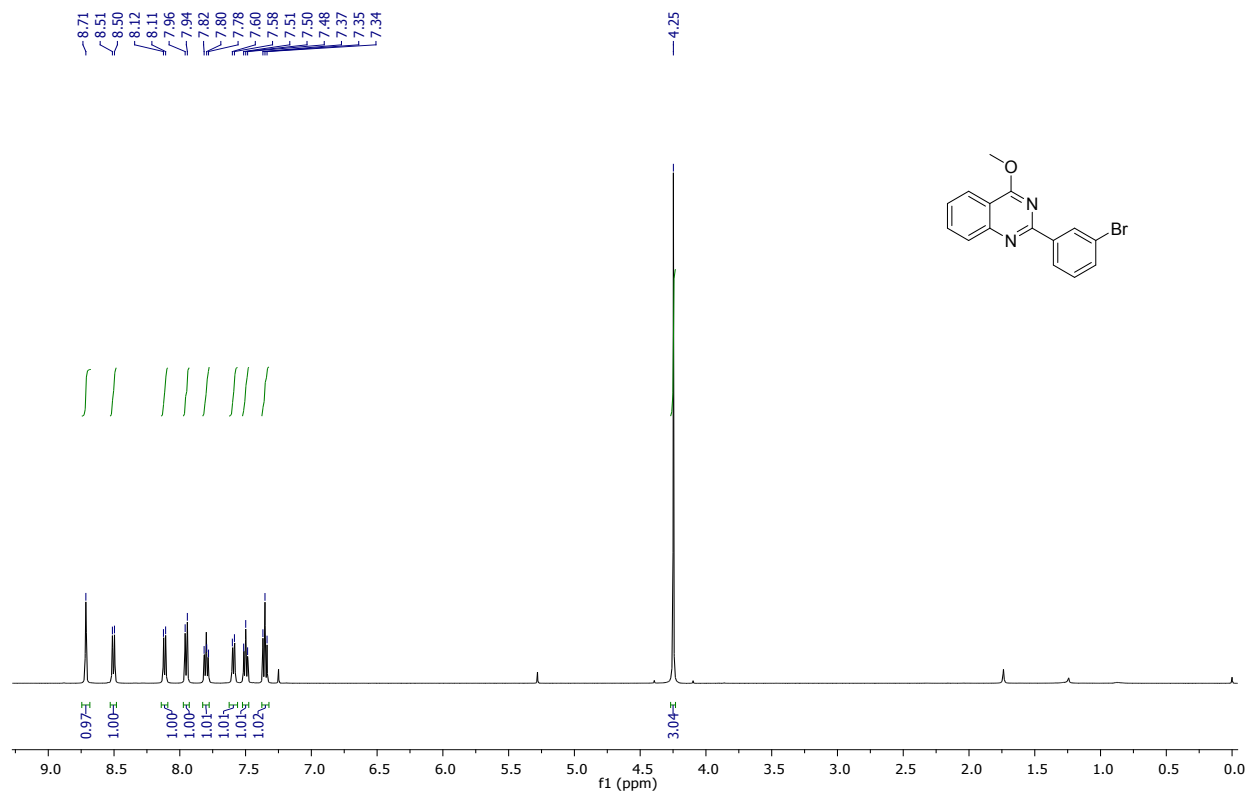
3b. 2-(3-chlorophenyl)-4-methoxyquinazoline



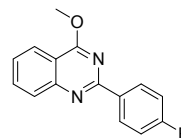
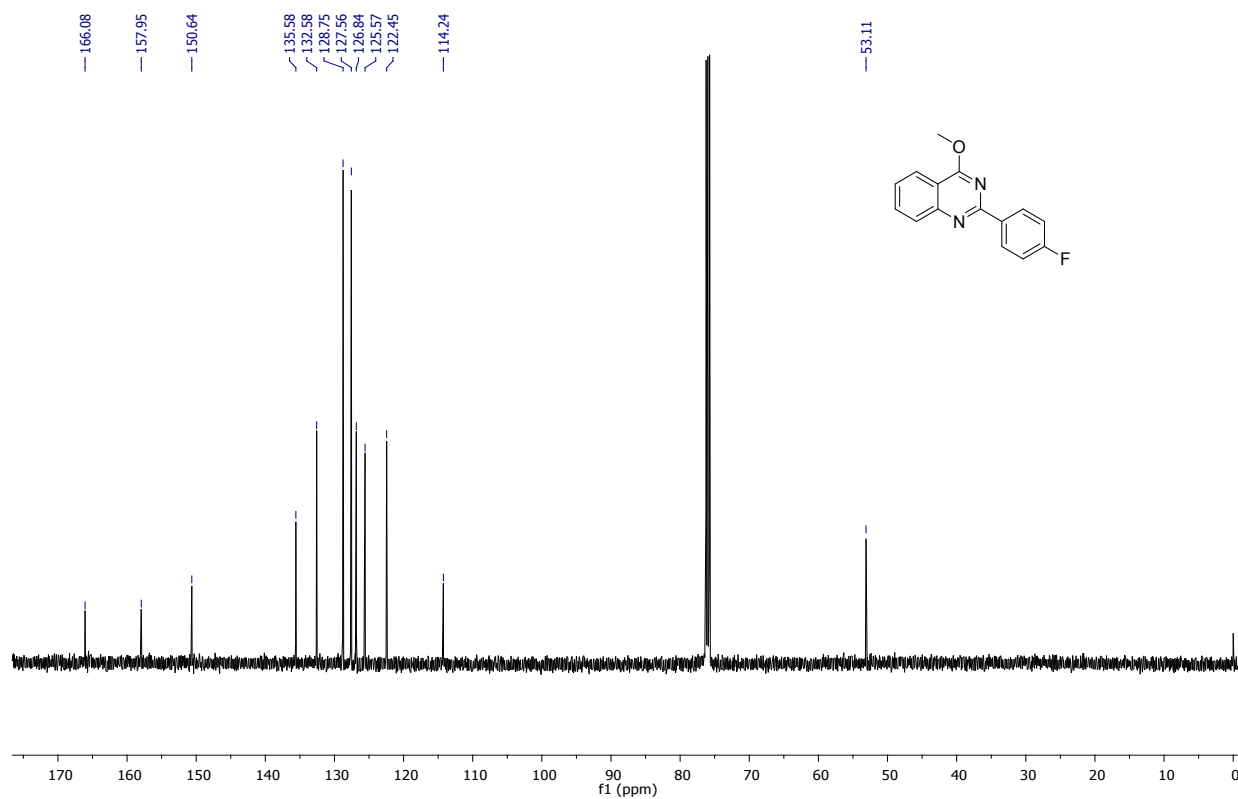
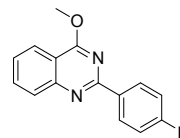
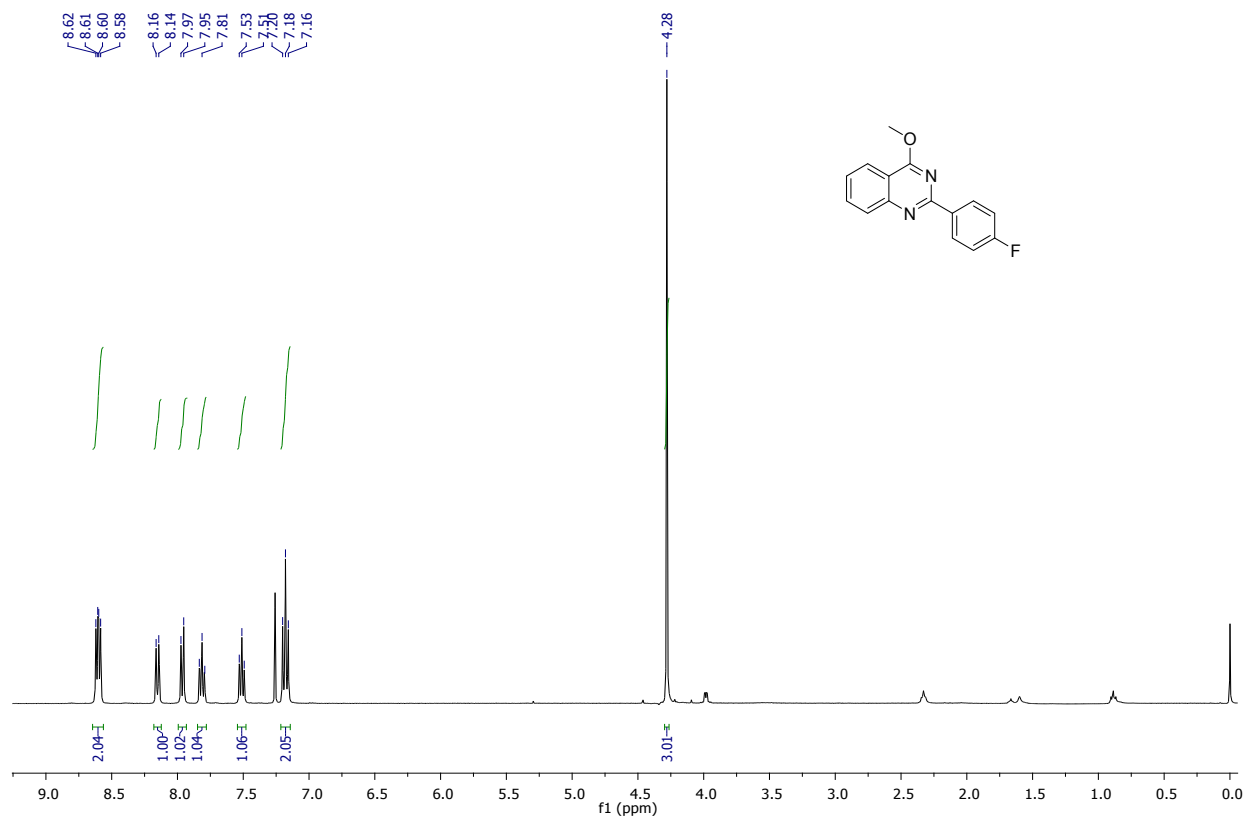
3c. 2-(4-chlorophenyl)-4-methoxyquinazoline



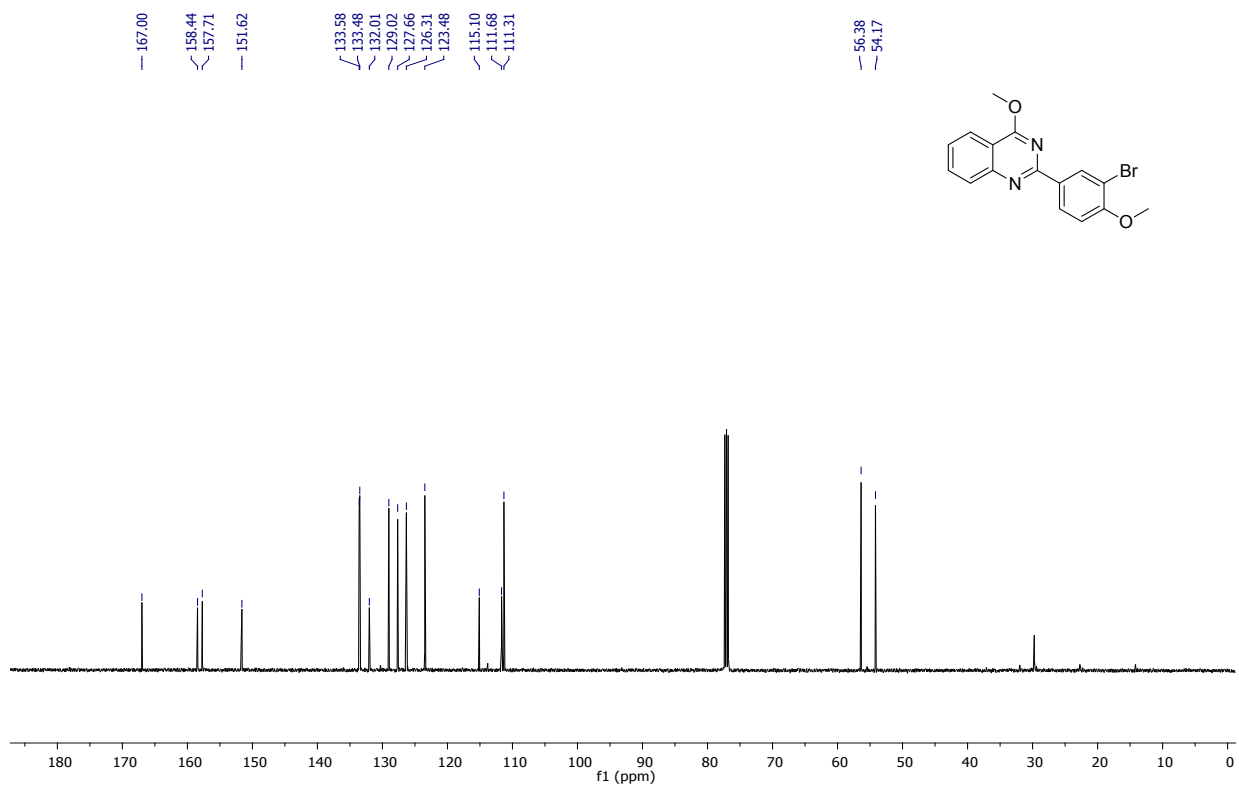
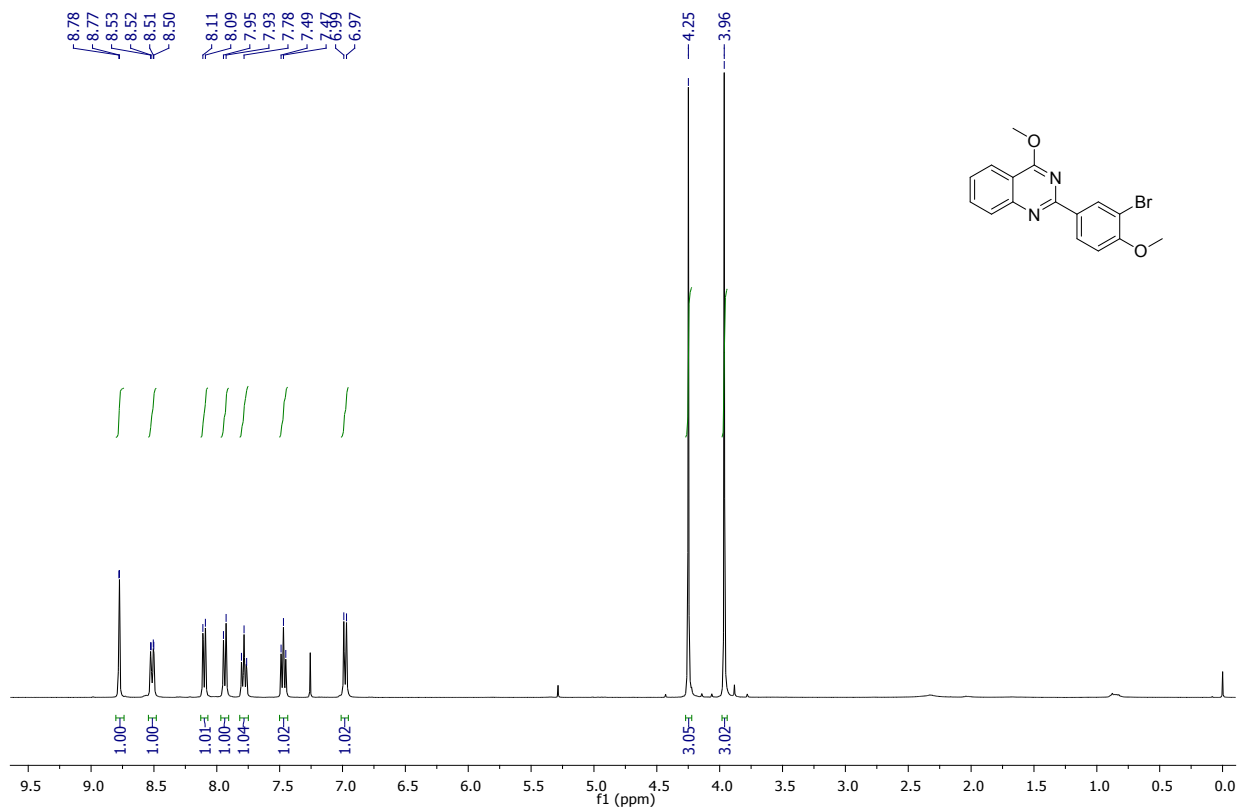
3d. 2-(3-bromophenyl)-4-methoxyquinazoline



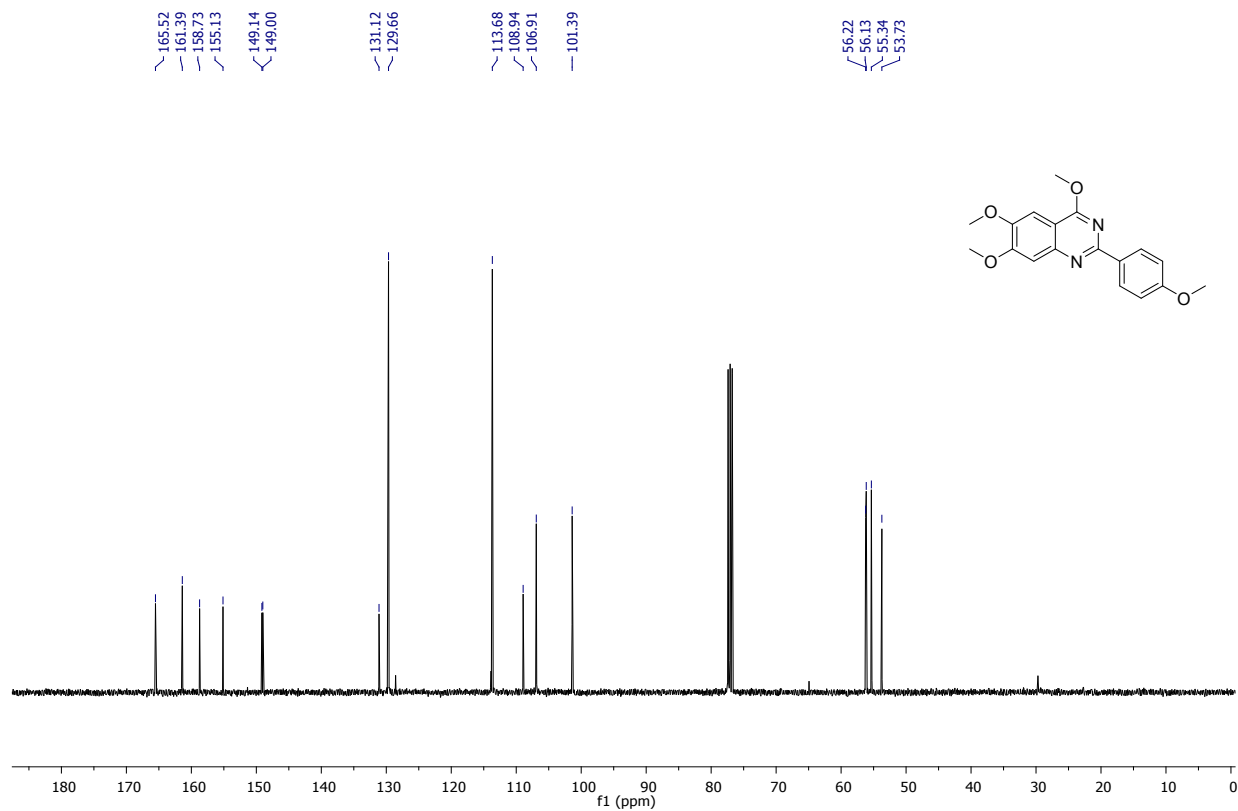
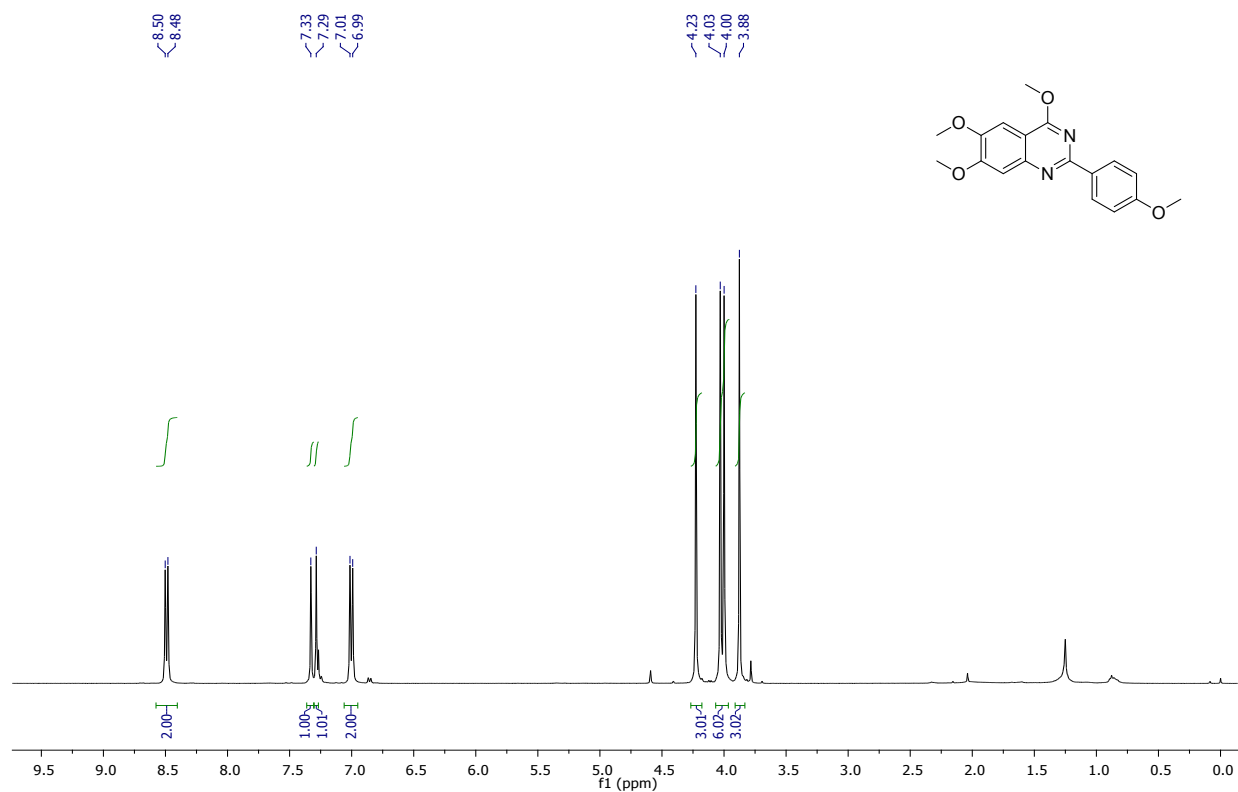
3e. 2-(4-fluorophenyl)-4-methoxyquinazoline



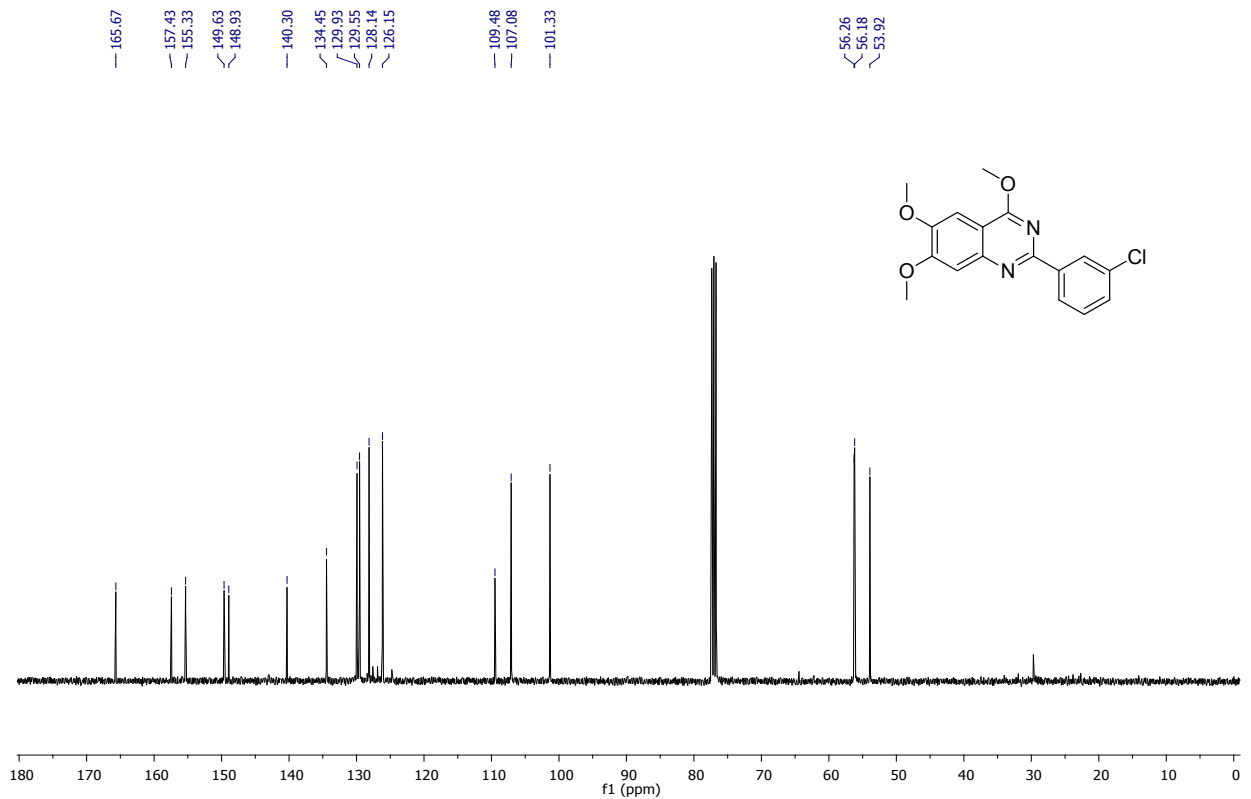
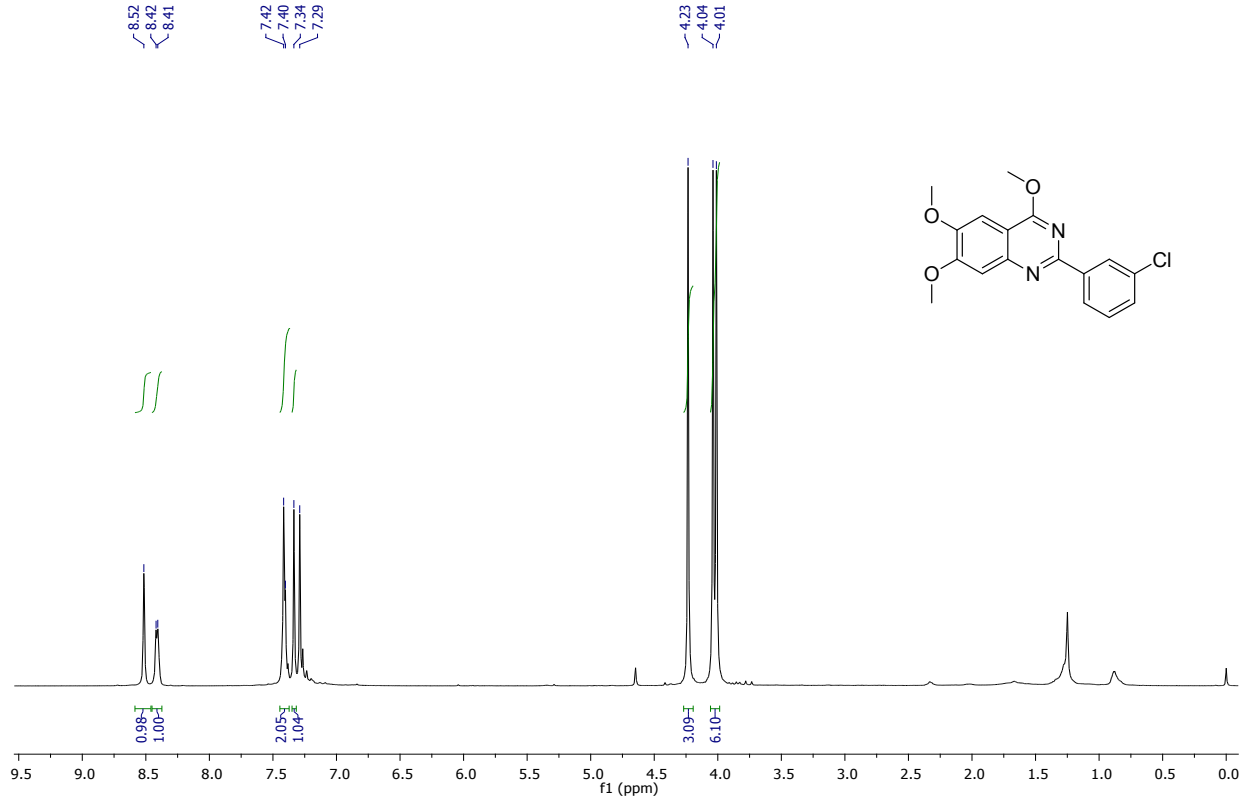
3f. 2-(3-bromo-4-methoxyphenyl)-4-methoxyquinazoline



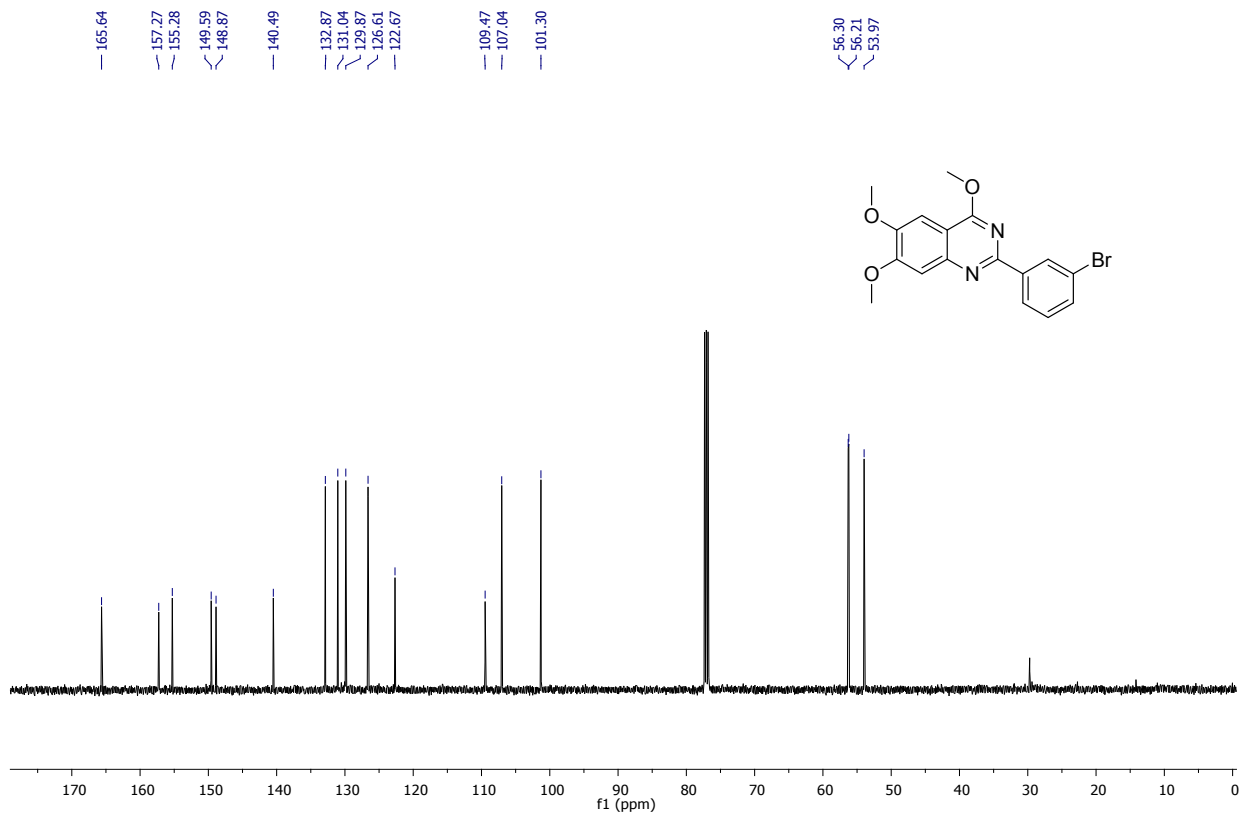
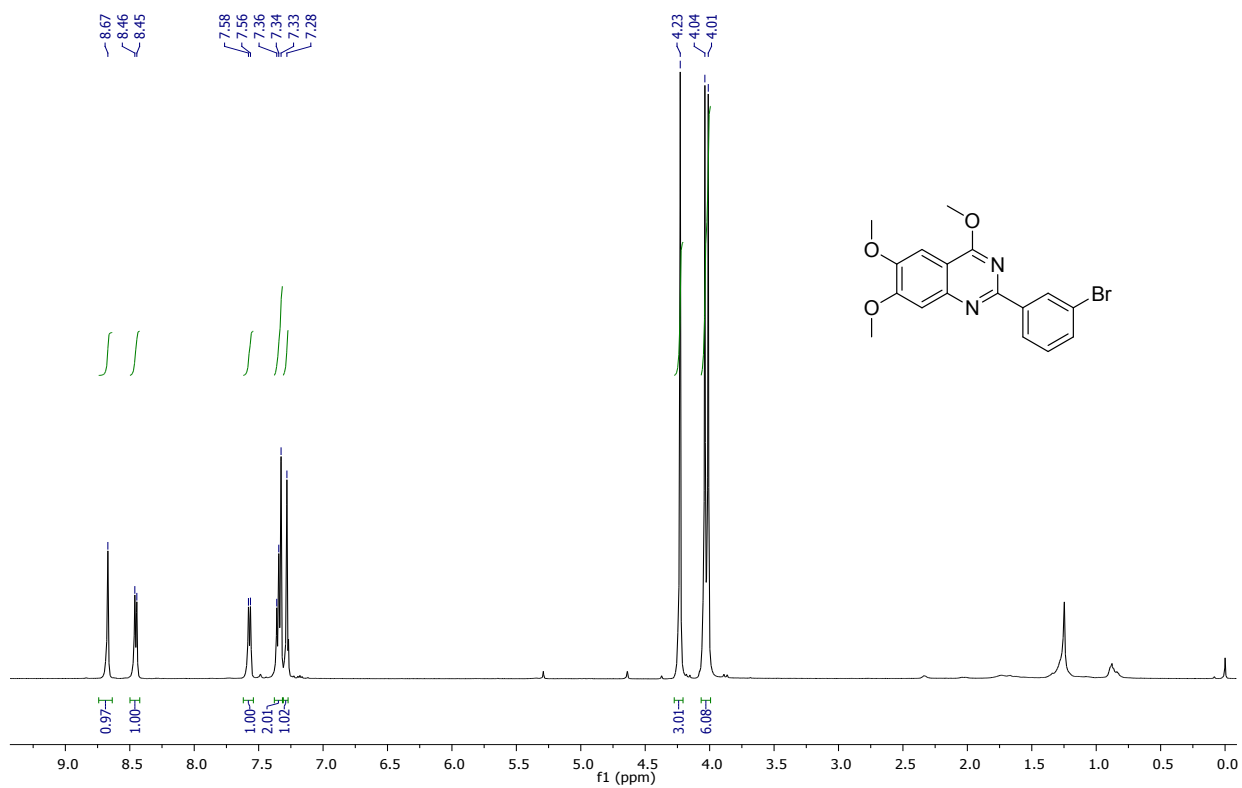
3g. 4,6,7-trimethoxy-2-(4-methoxyphenyl)quinazoline



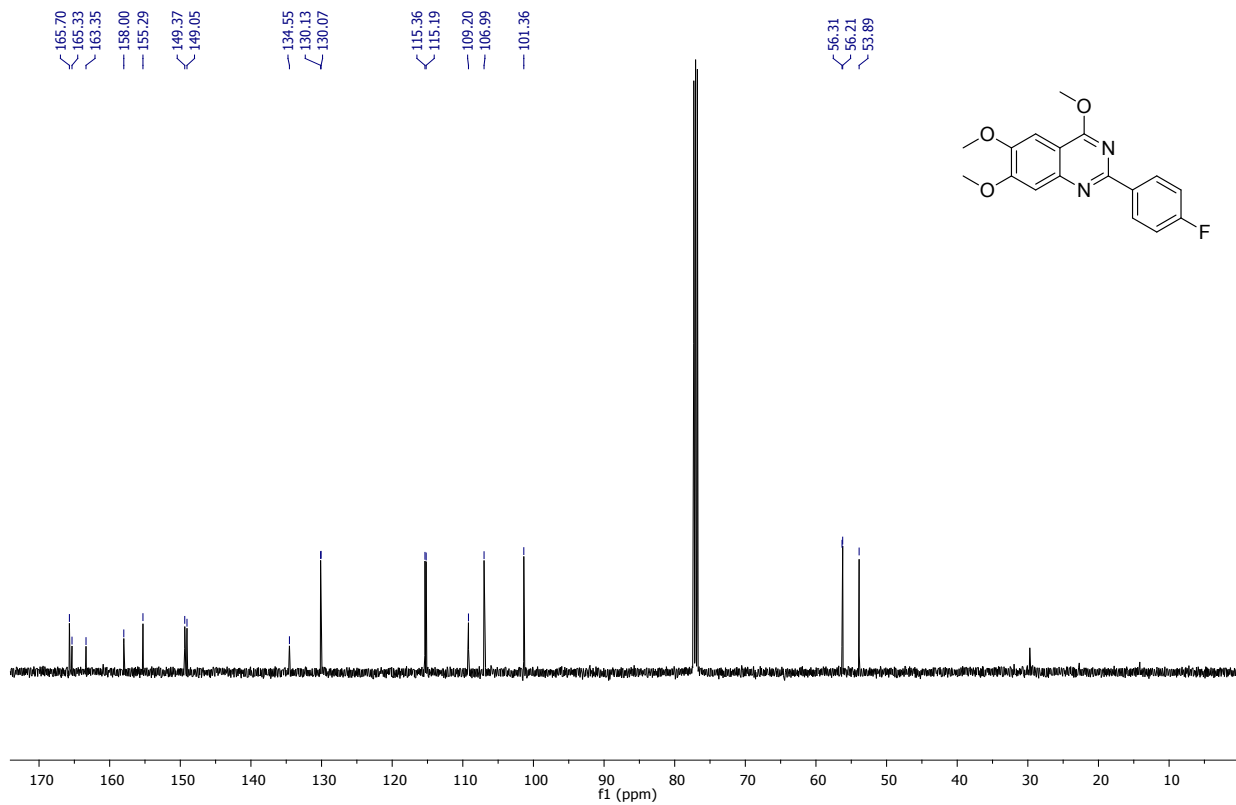
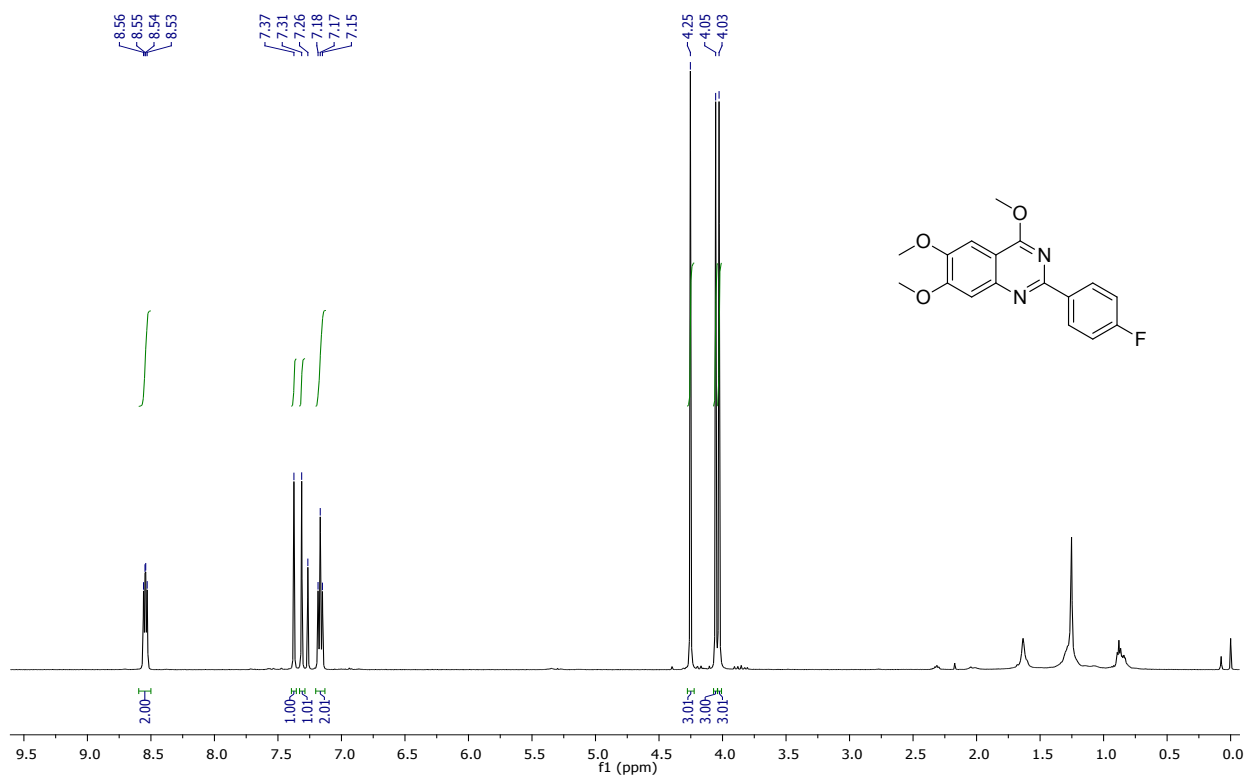
3h. 2-(3-chlorophenyl)-4,6,7-trimethoxyquinazoline



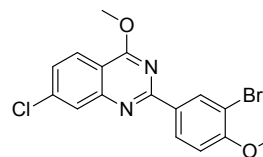
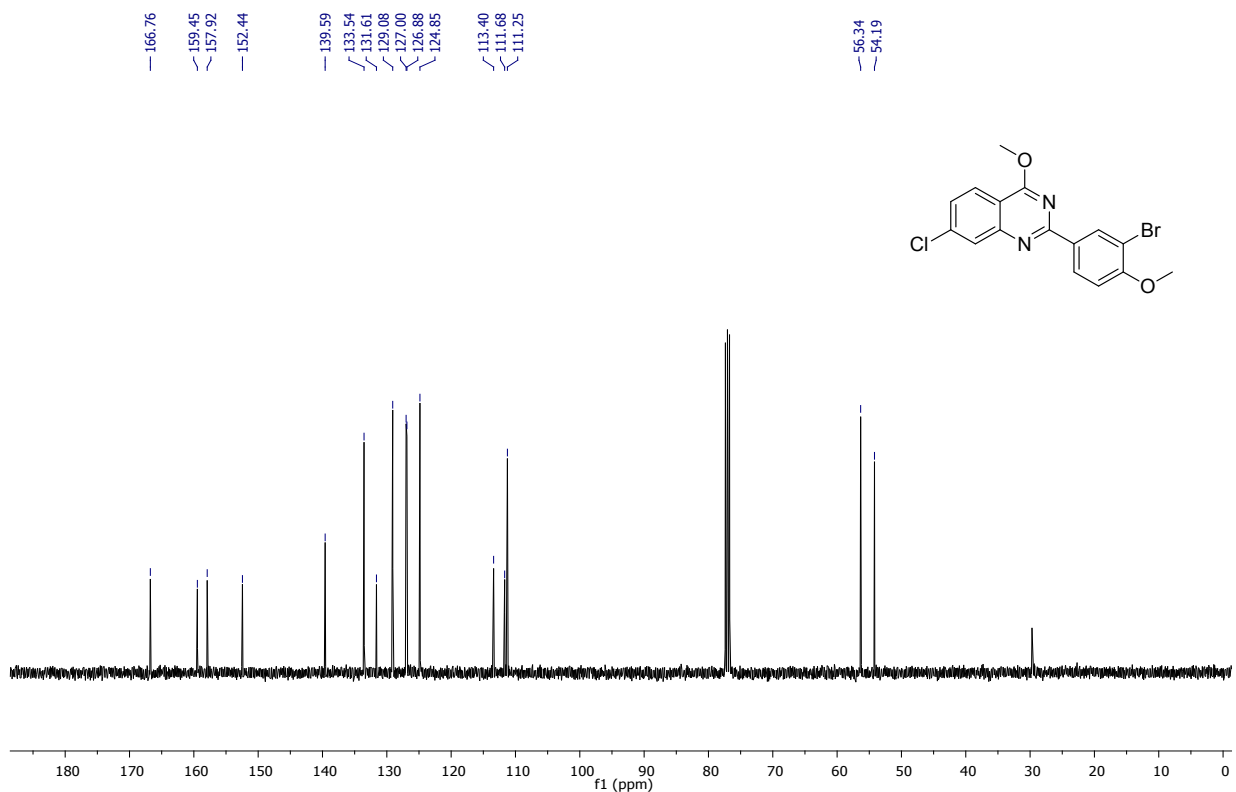
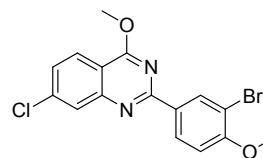
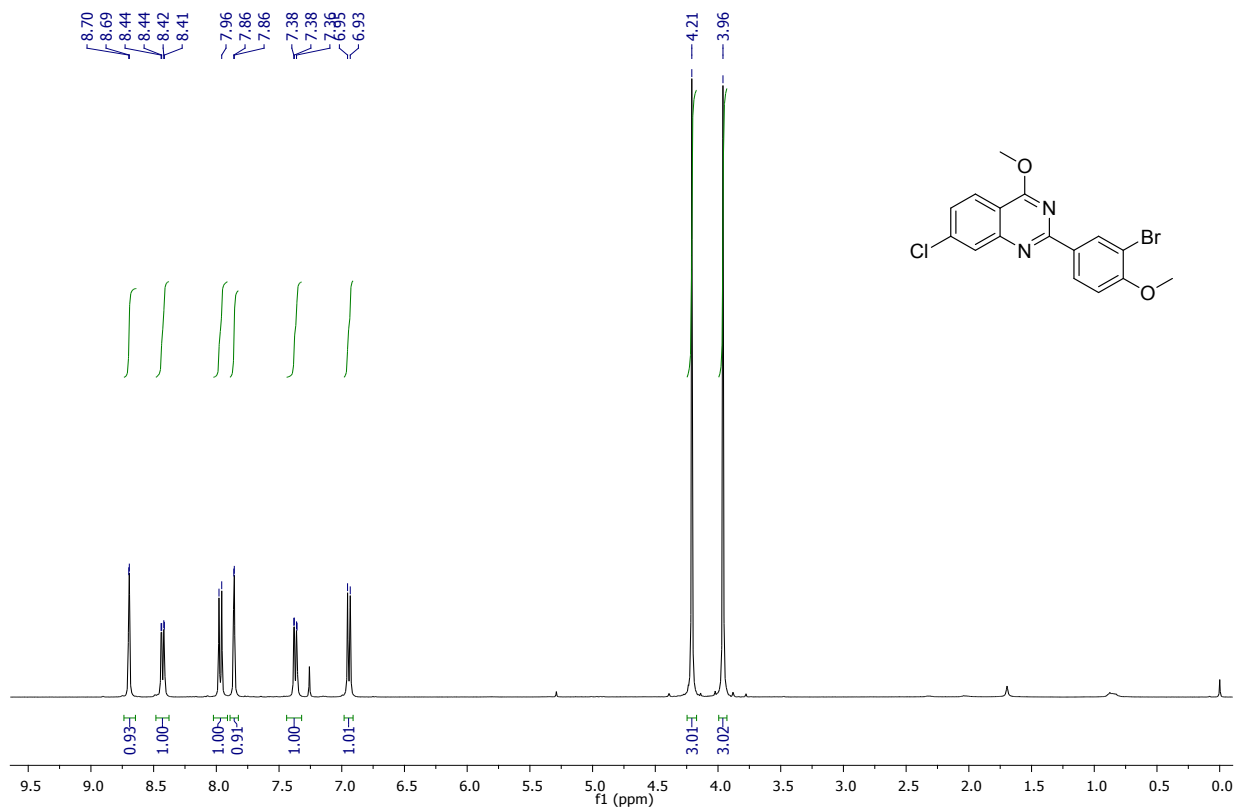
3i. 2-(3-bromophenyl)-4,6,7-trimethoxyquinazoline



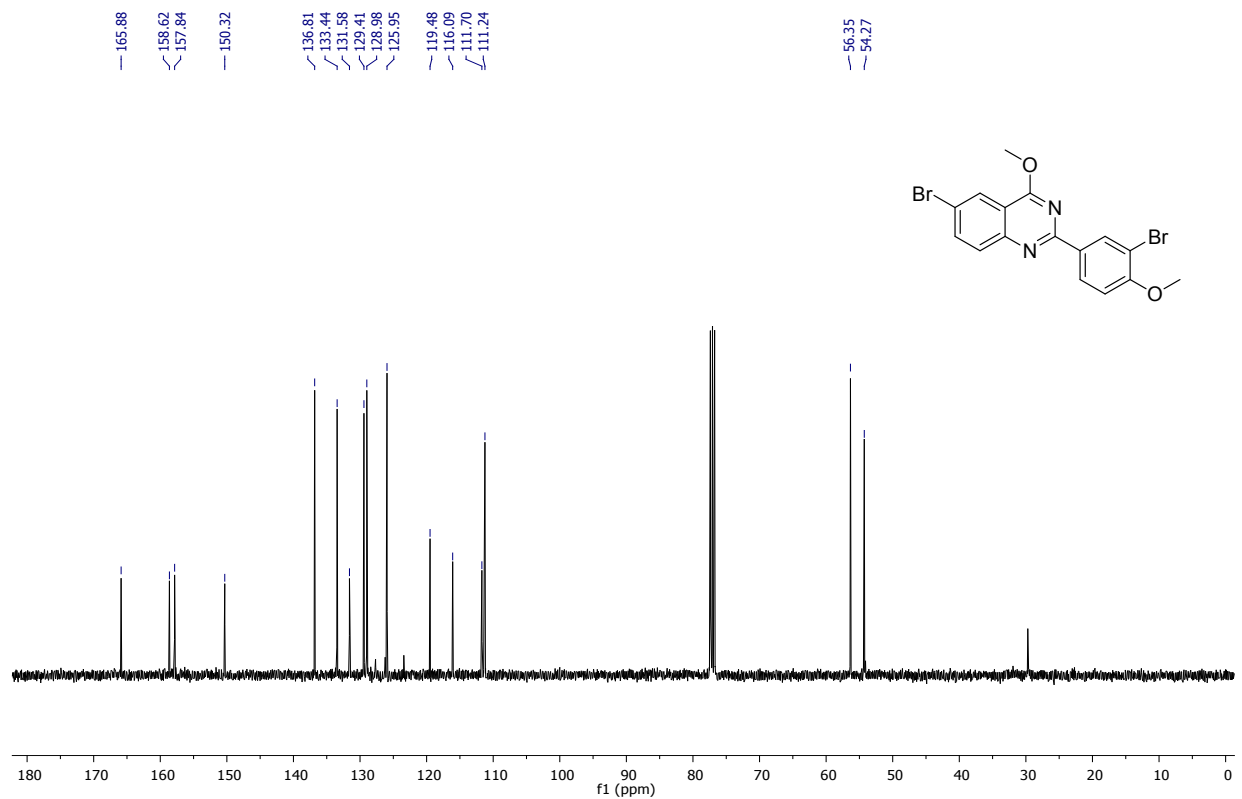
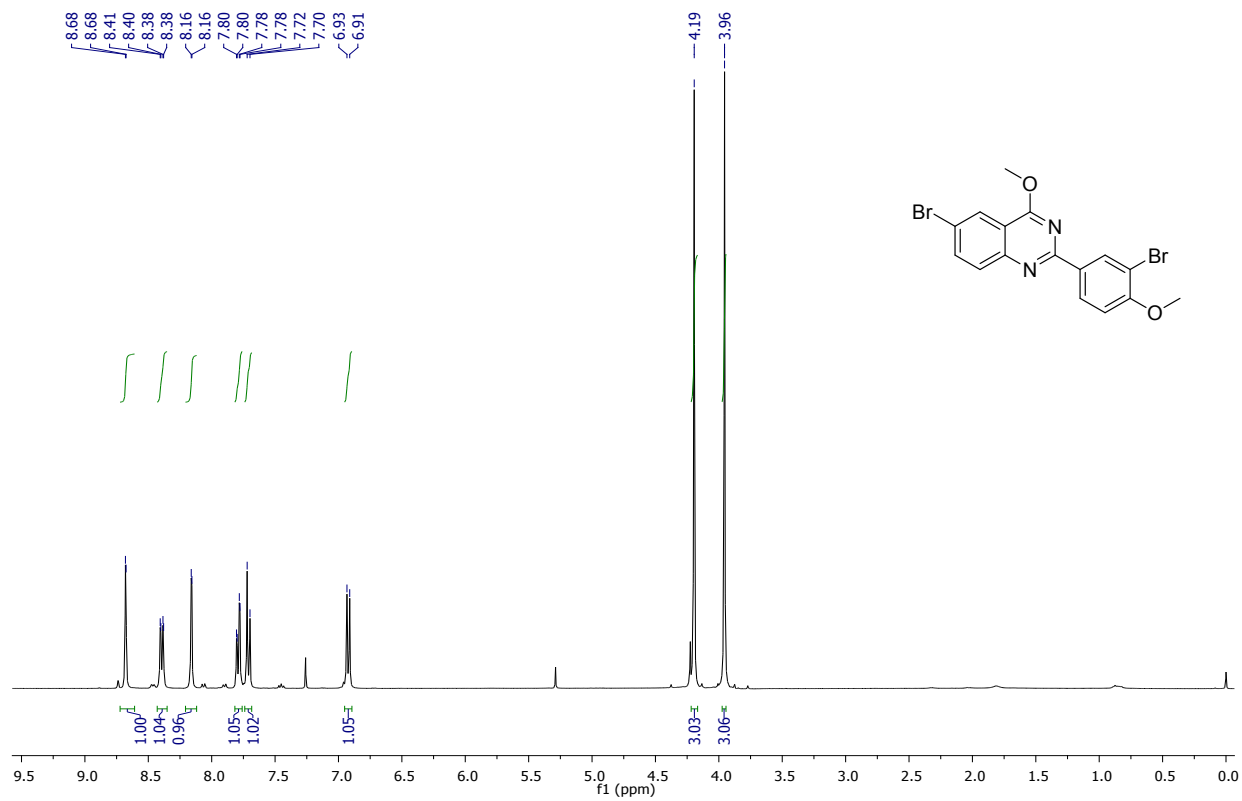
3j. 2-(4-fluorophenyl)-4,6,7-trimethoxyquinazoline



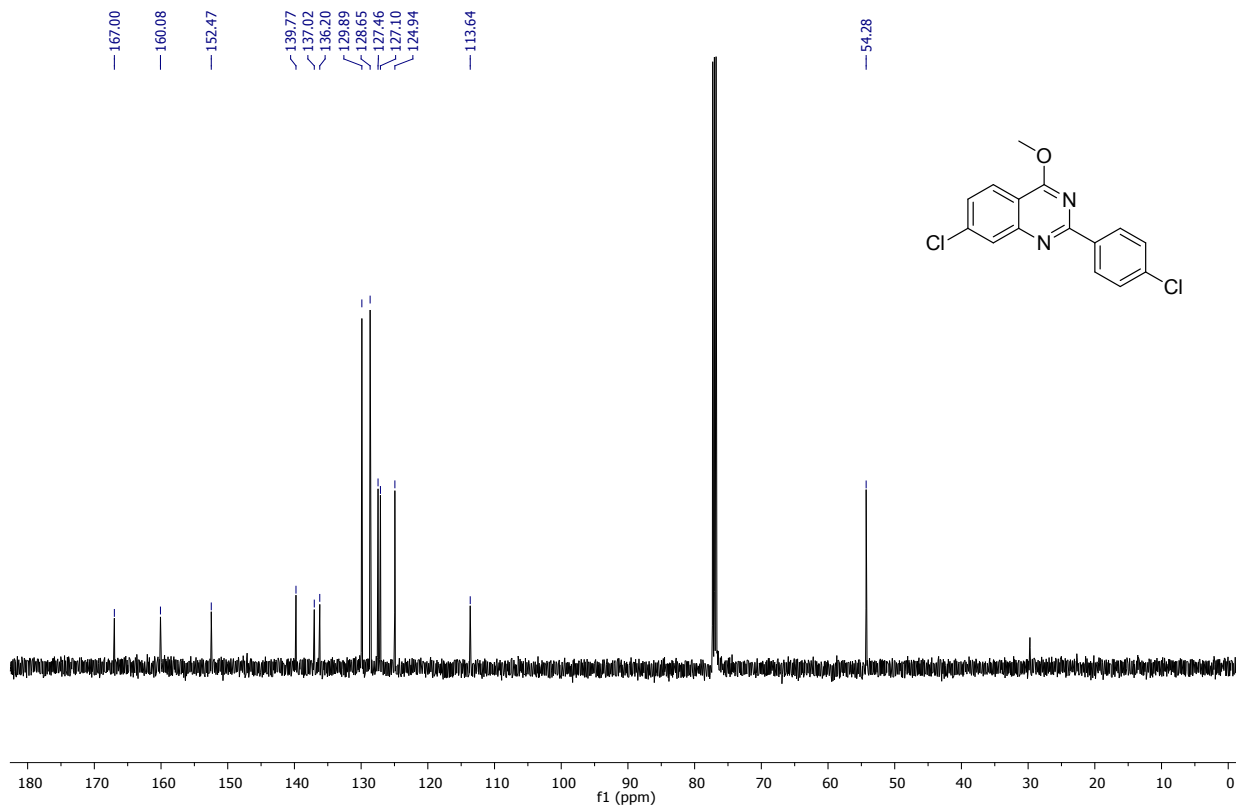
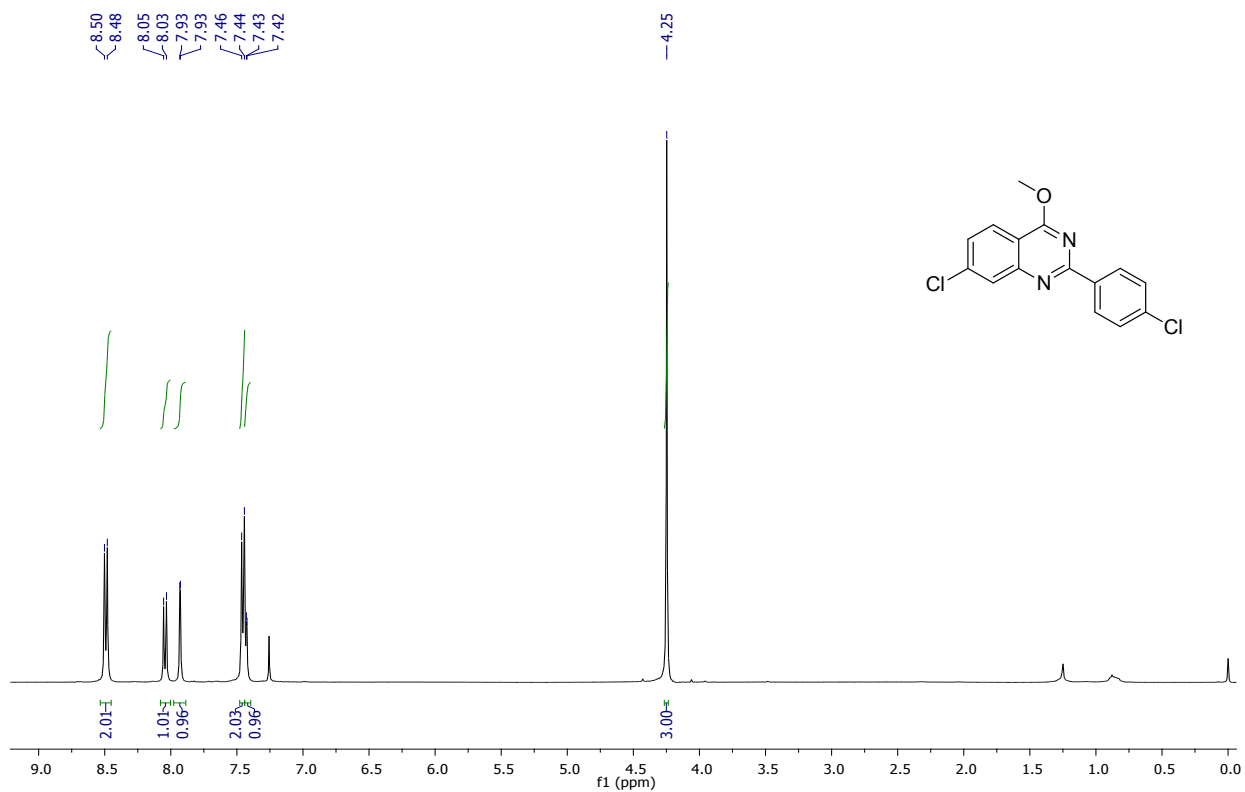
3k. 2-(3-bromo-4-methoxyphenyl)-7-chloro-4-methoxyquinazoline



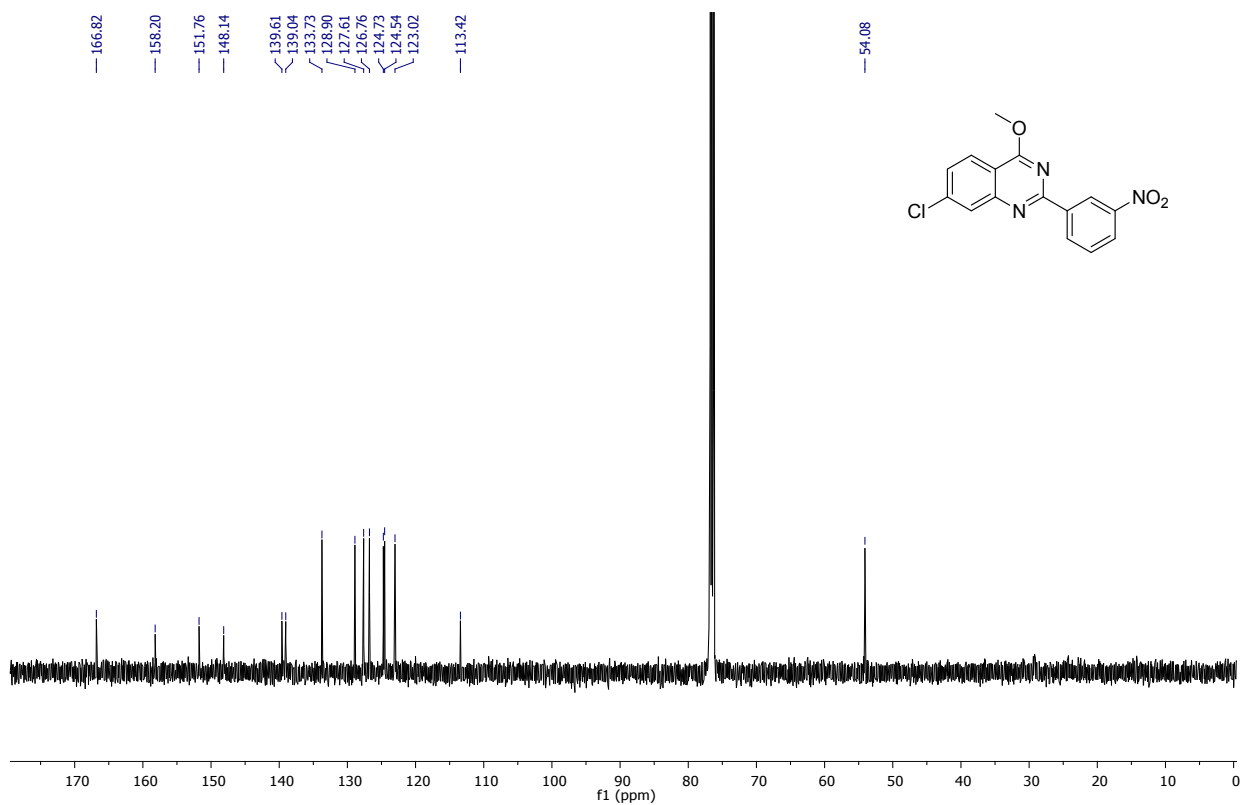
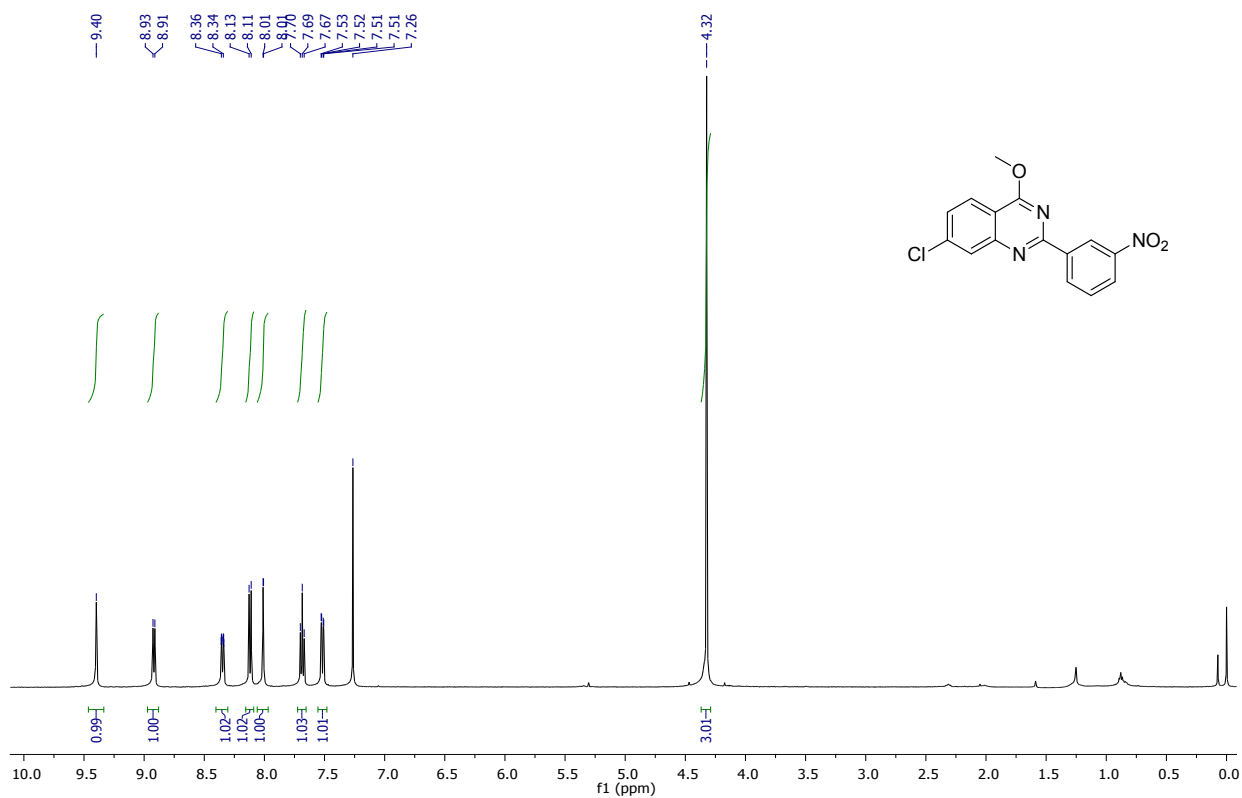
3l. 6-bromo-2-(3-bromo-4-methoxyphenyl)-4-methoxyquinazoline



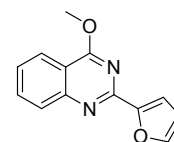
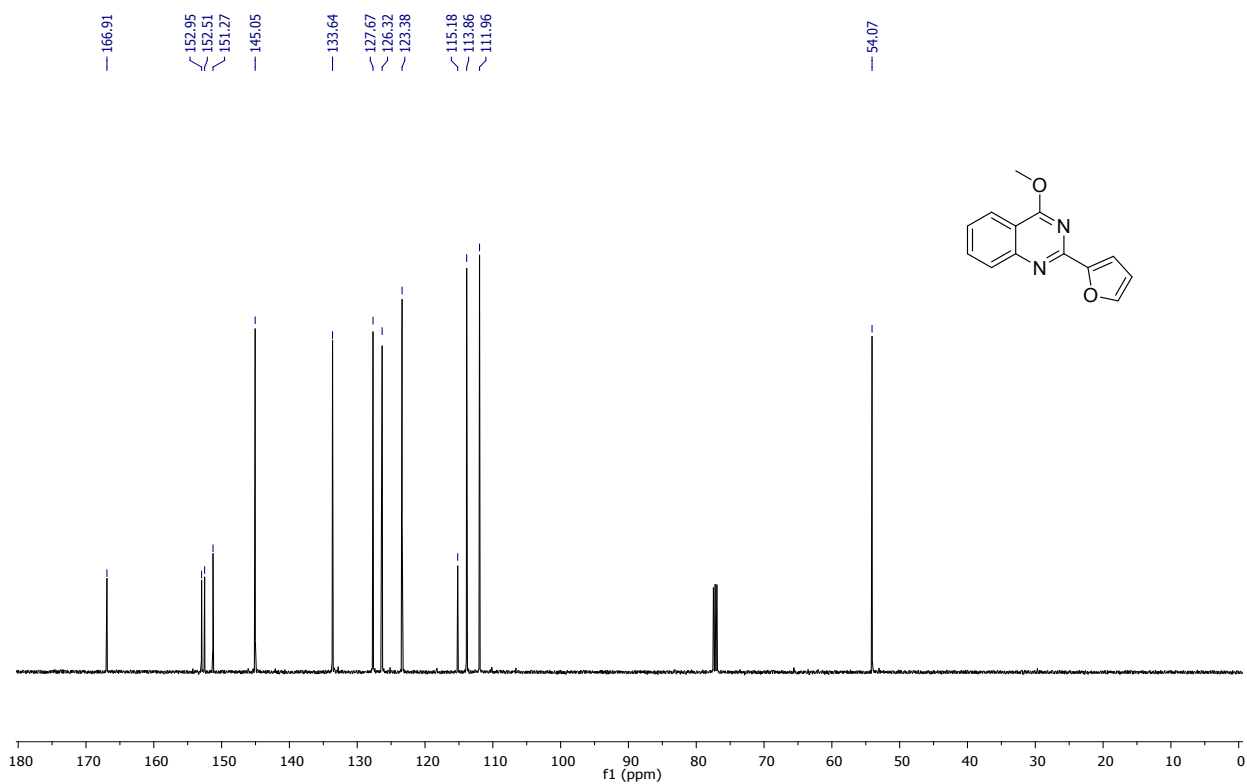
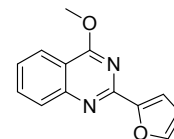
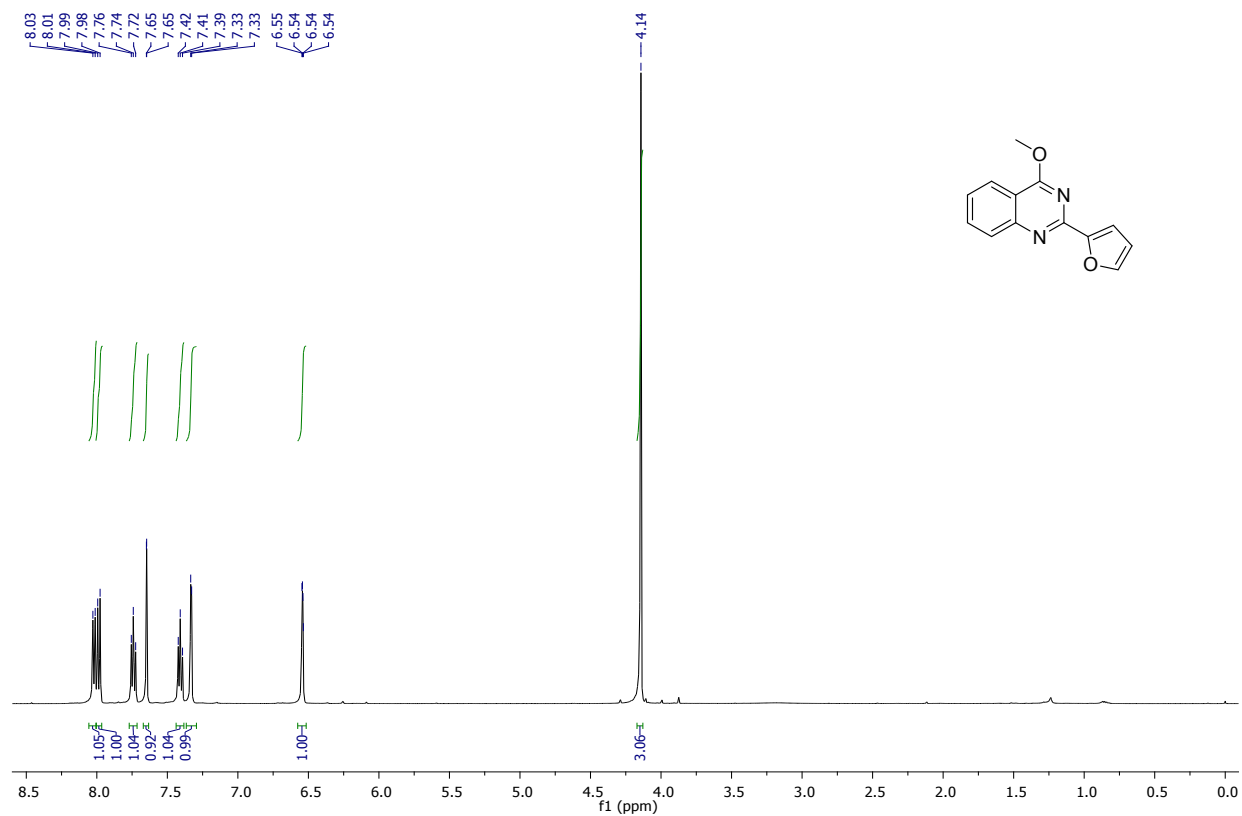
3m. 7-chloro-2-(4-chlorophenyl)-4-methoxyquinazoline



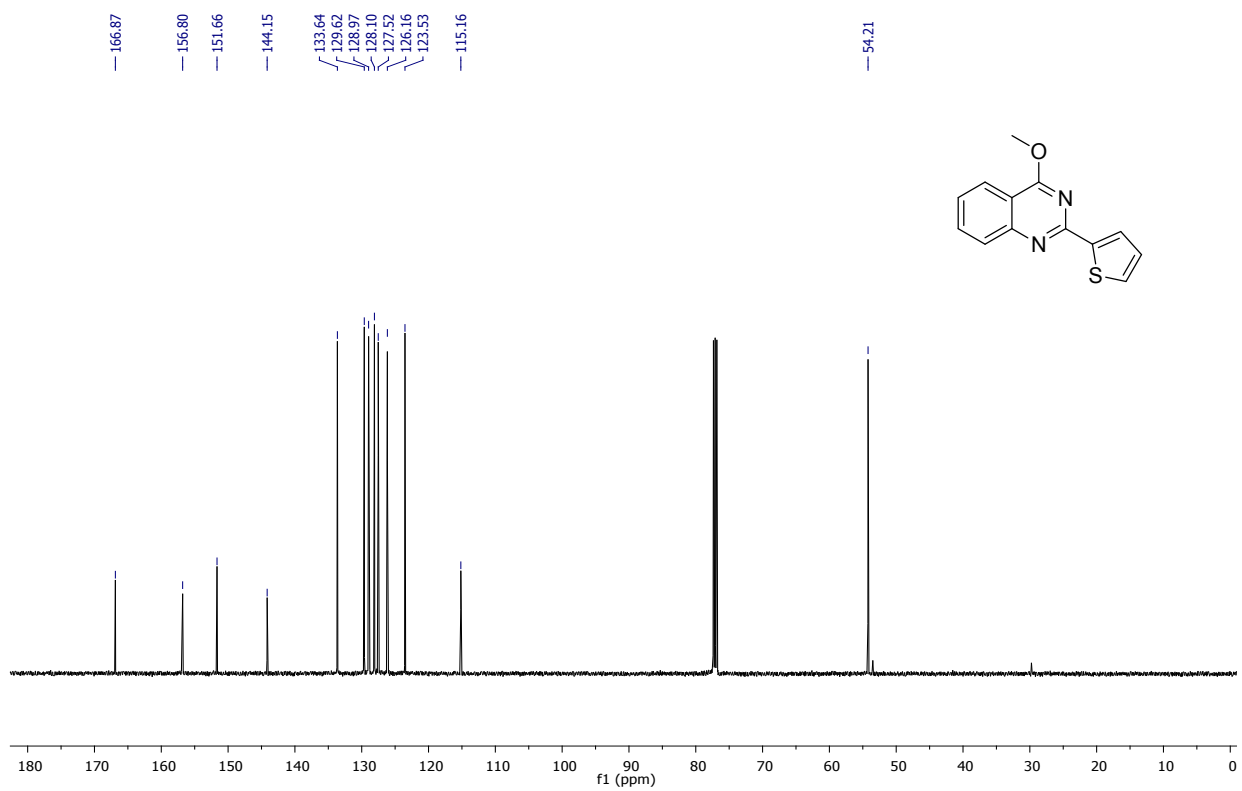
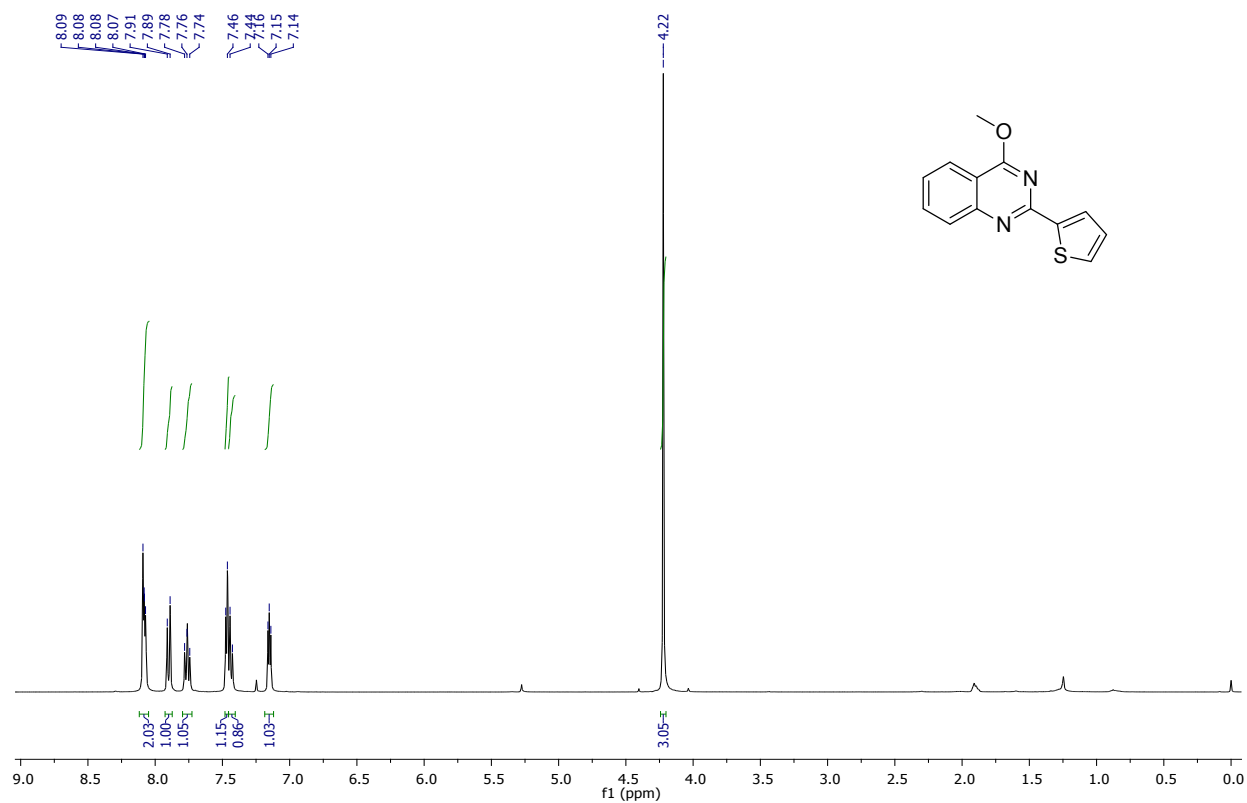
3n. 2-(3-nitrophenyl)-7-chloro-4-methoxyquinazoline



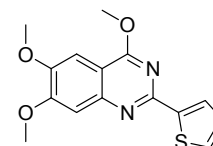
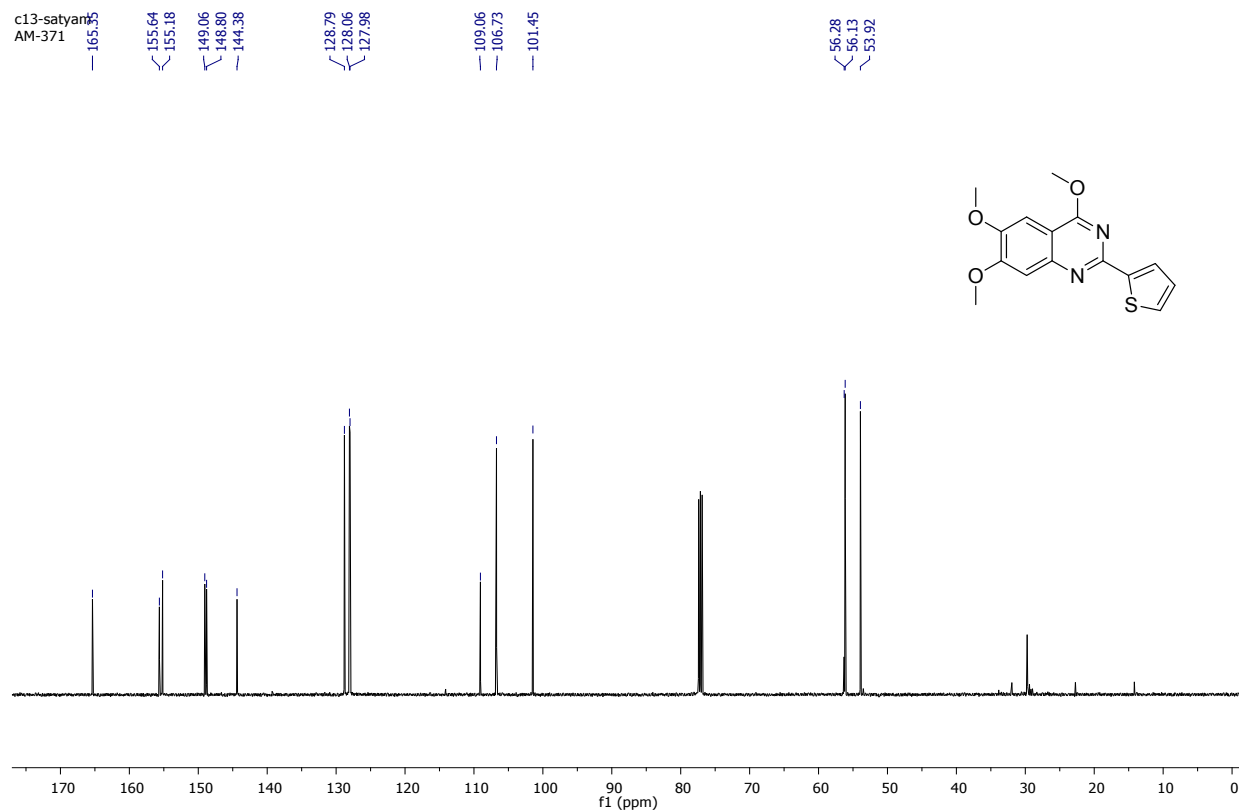
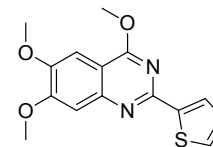
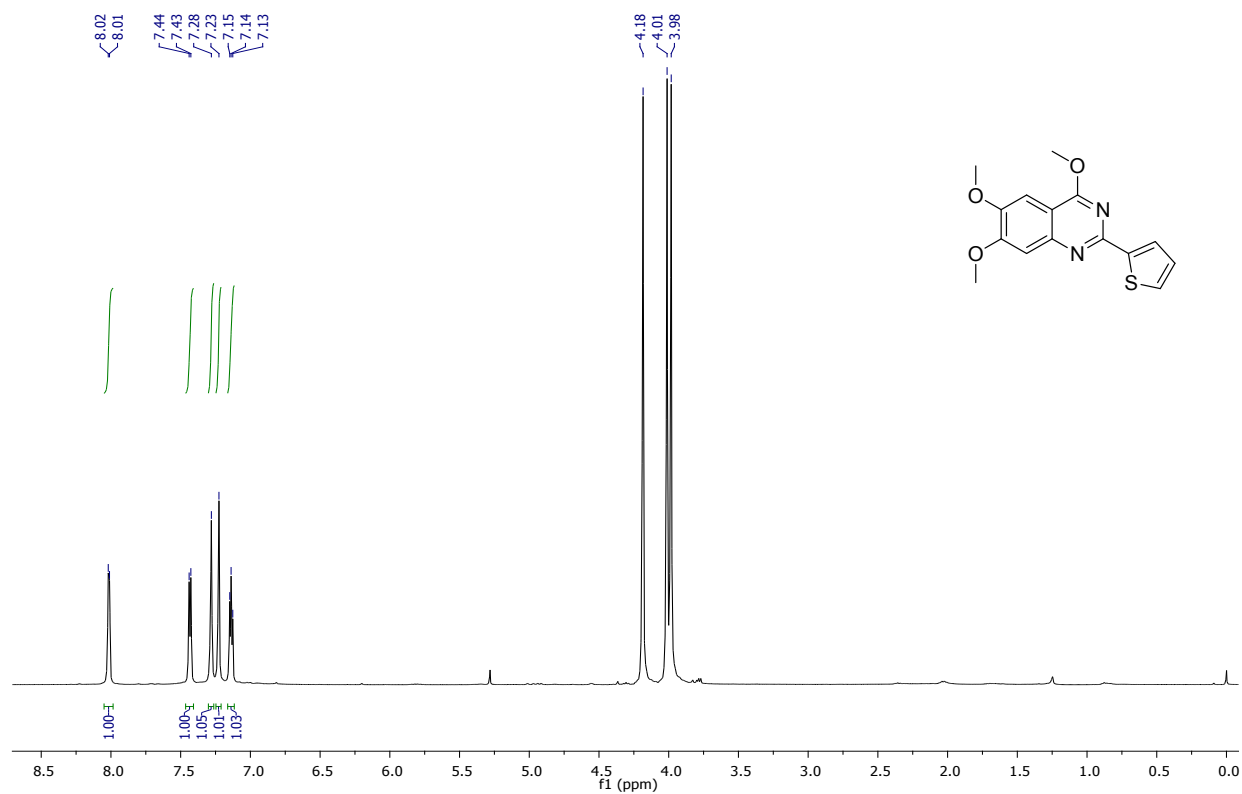
3o. 2-(furan-2-yl)-4-methoxyquinazoline



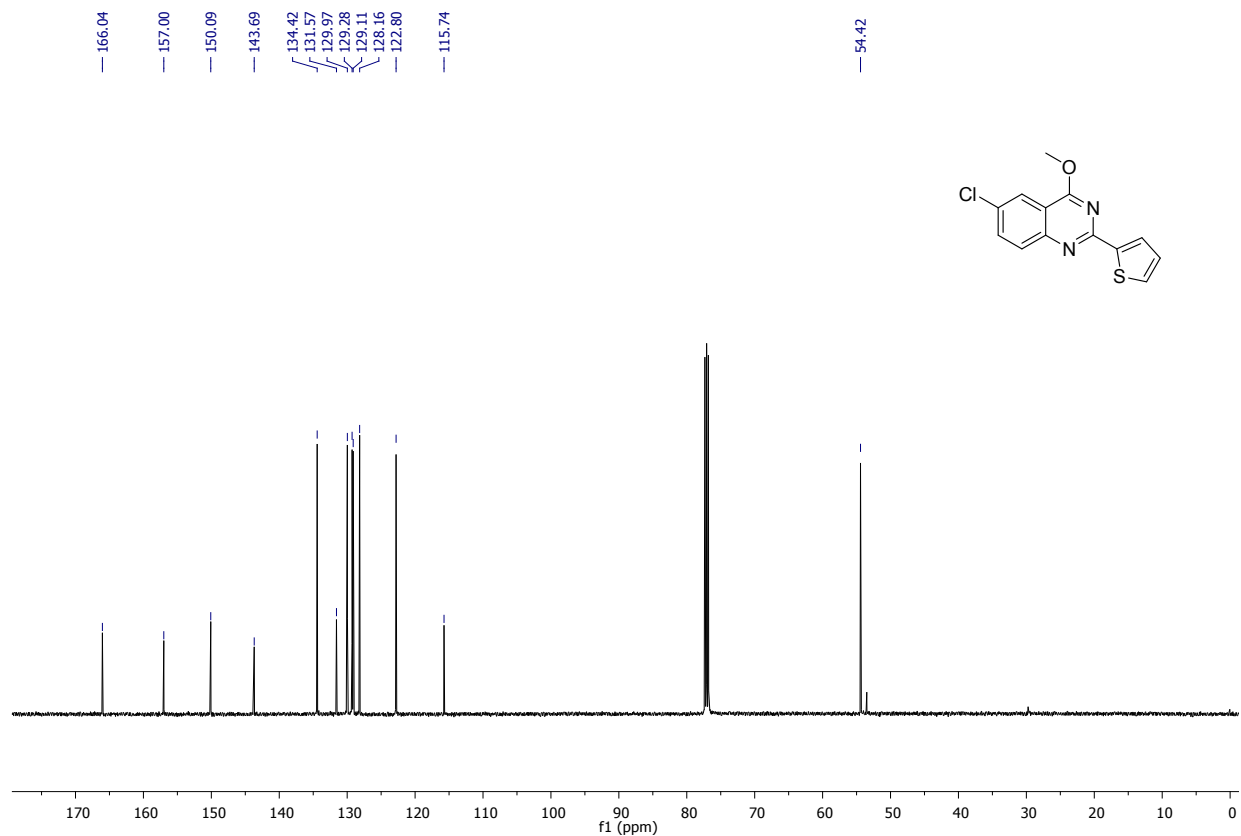
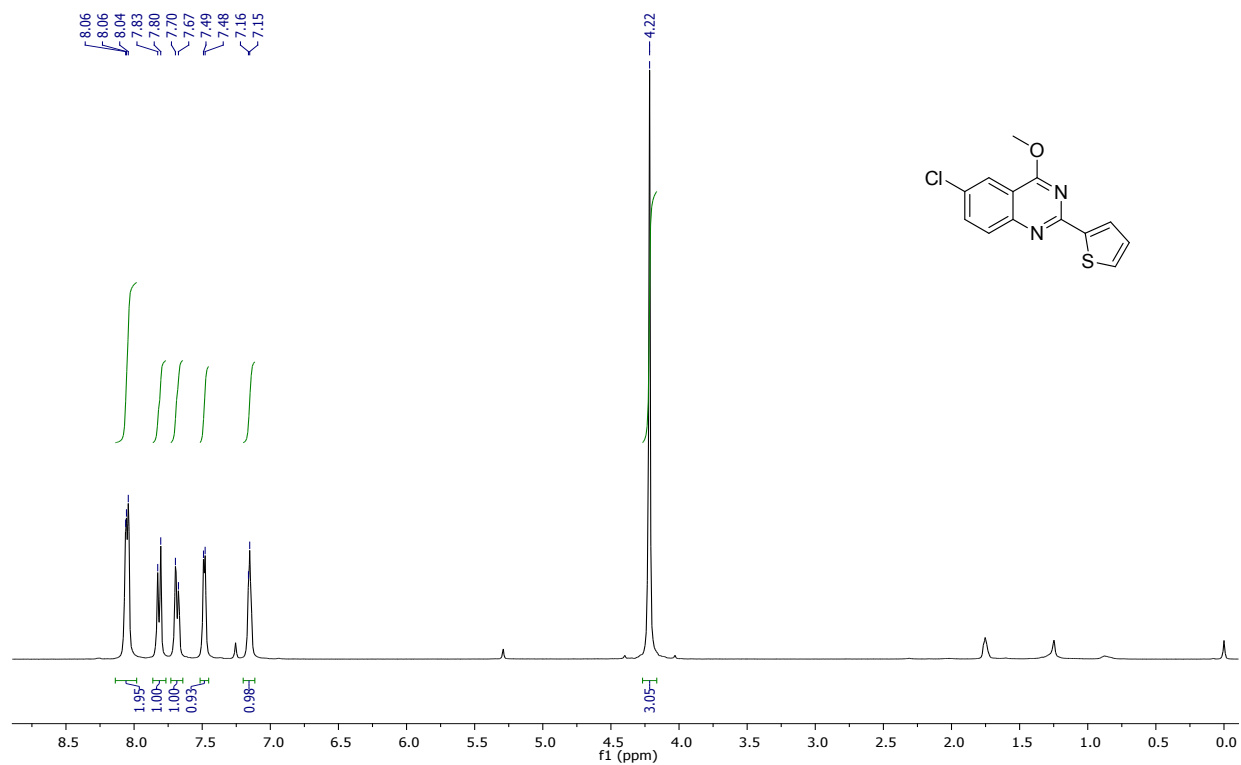
3p. 4-methoxy-2-(thiophen-2-yl)quinazoline



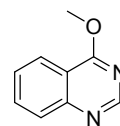
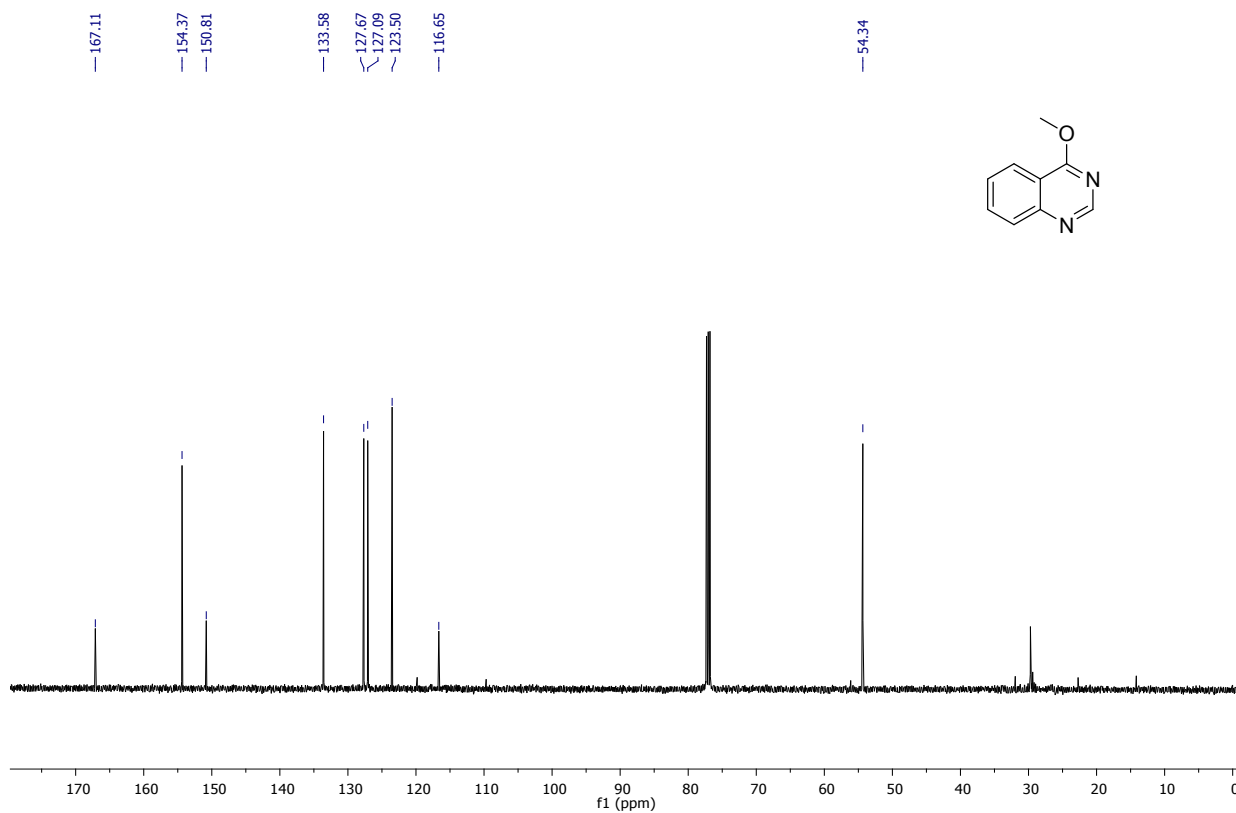
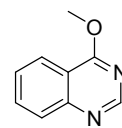
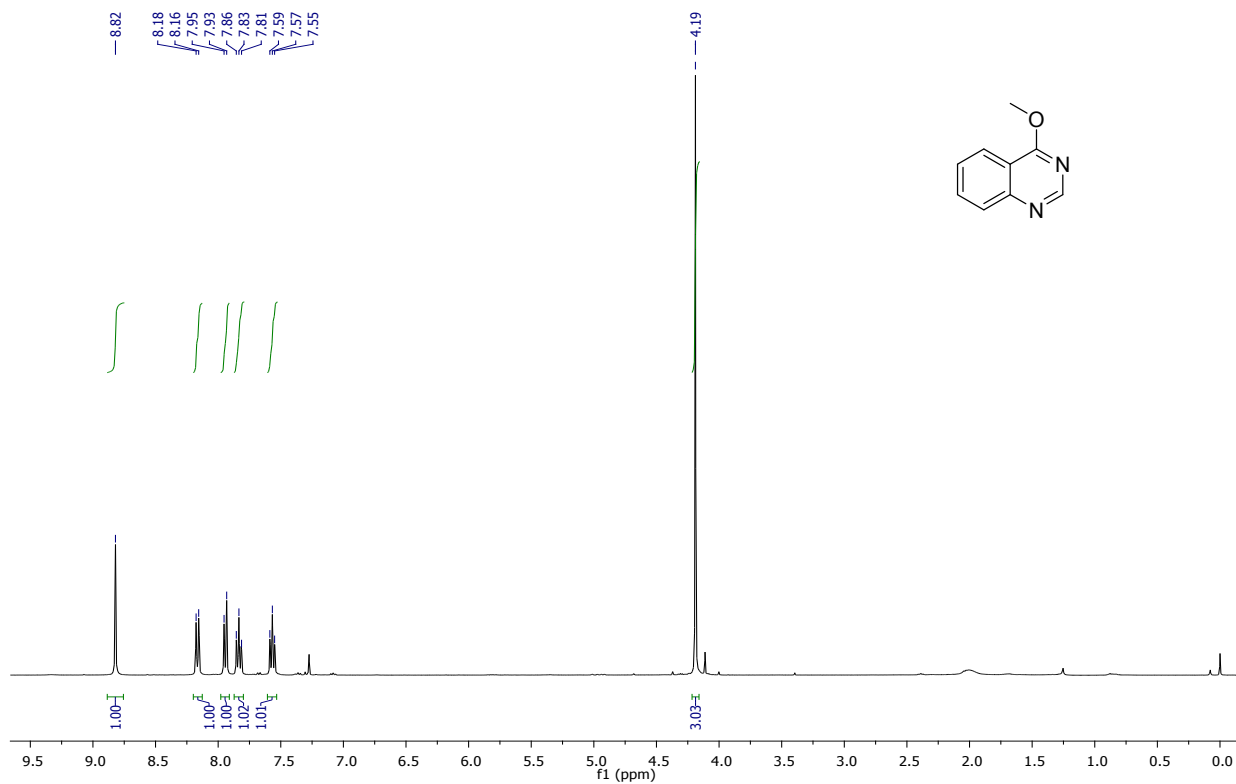
3q. 4,6,7-trimethoxy-2-(thiophen-2-yl)quinazoline



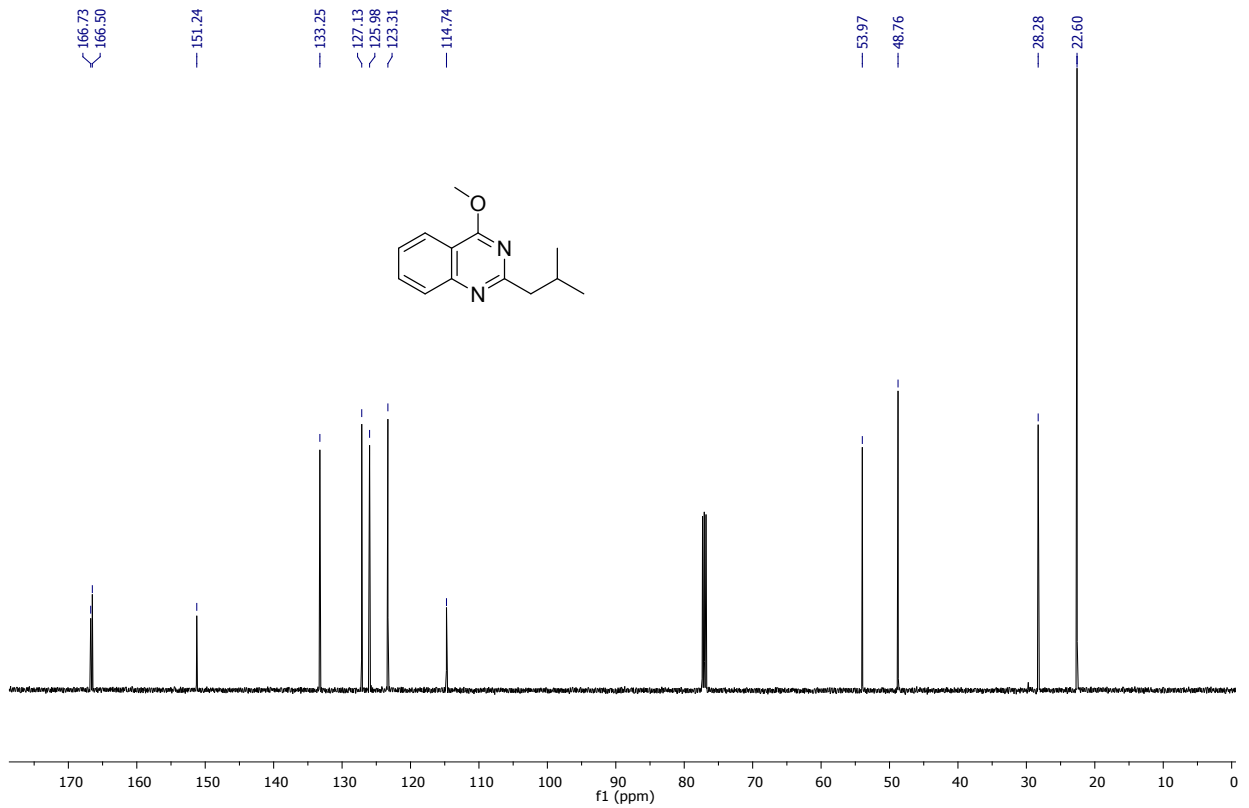
3r. 6-chloro-4-methoxy-2-(thiophen-2-yl)quinazoline



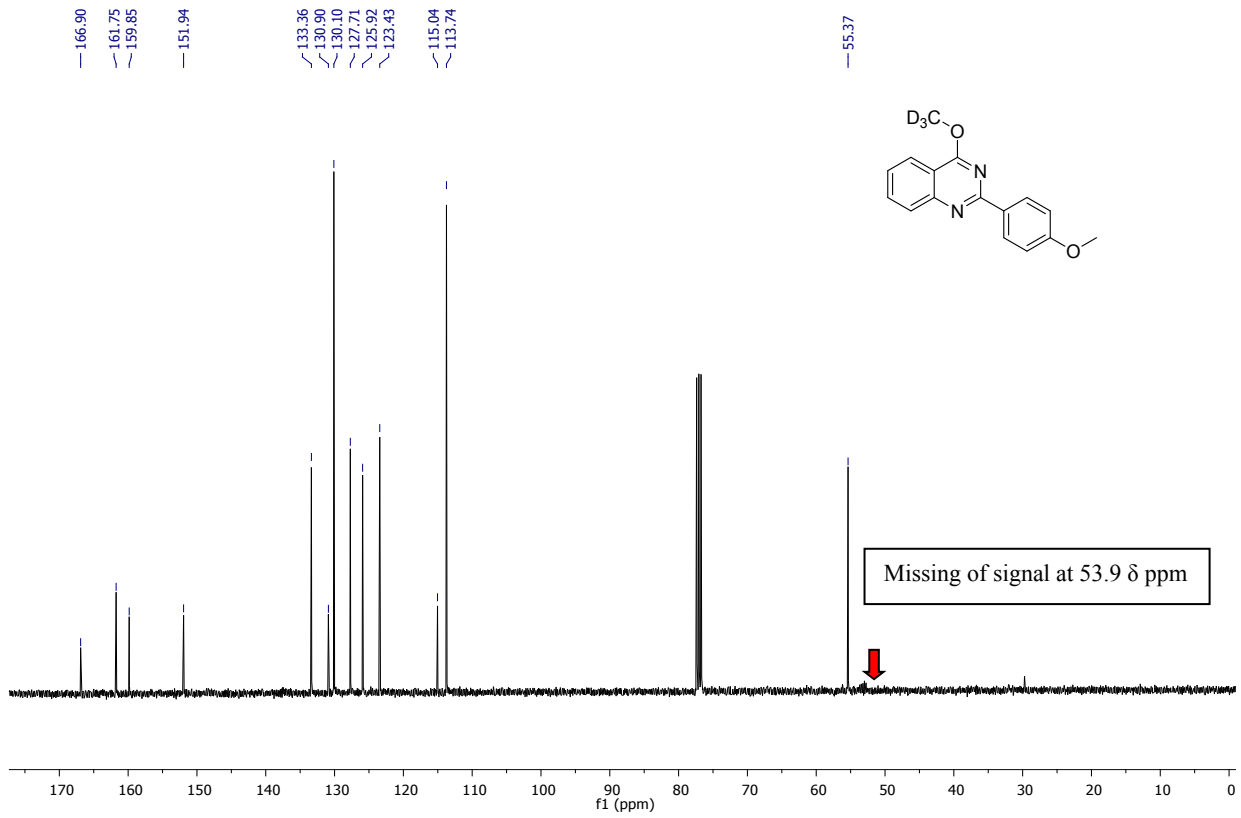
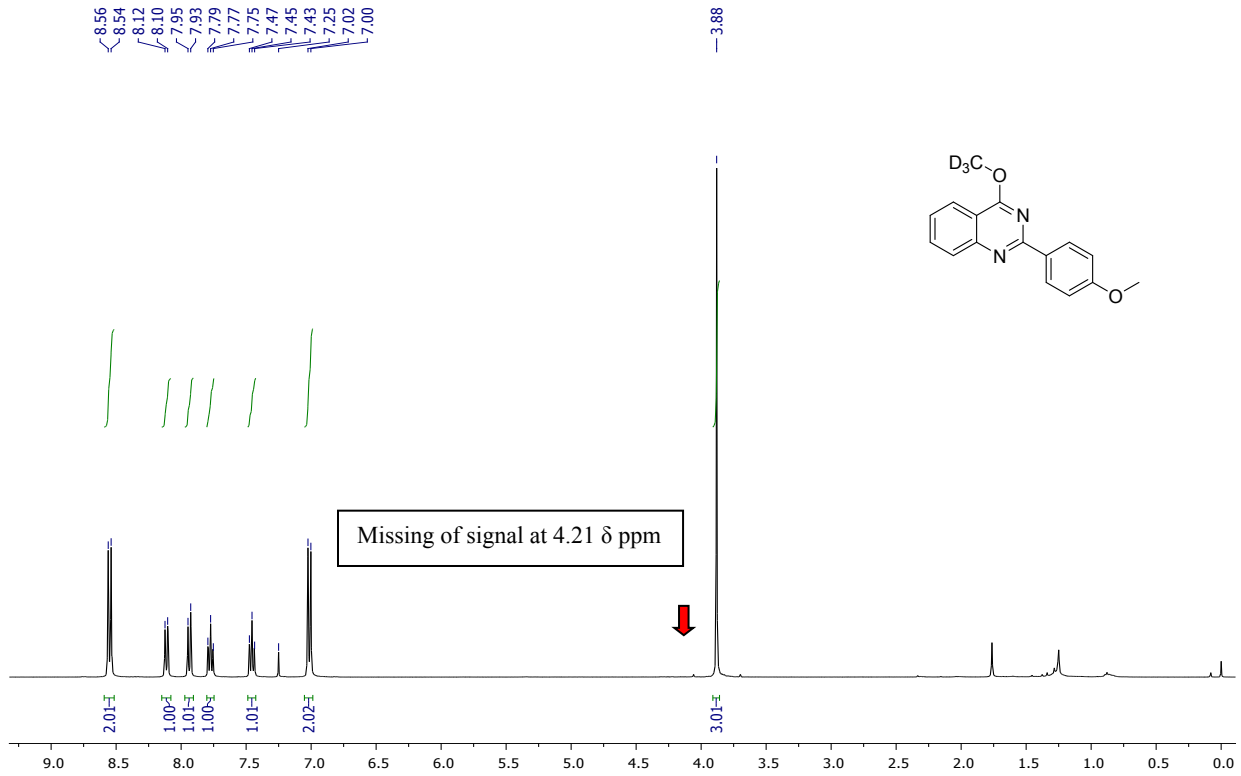
3s. 4-methoxyquinazoline¹



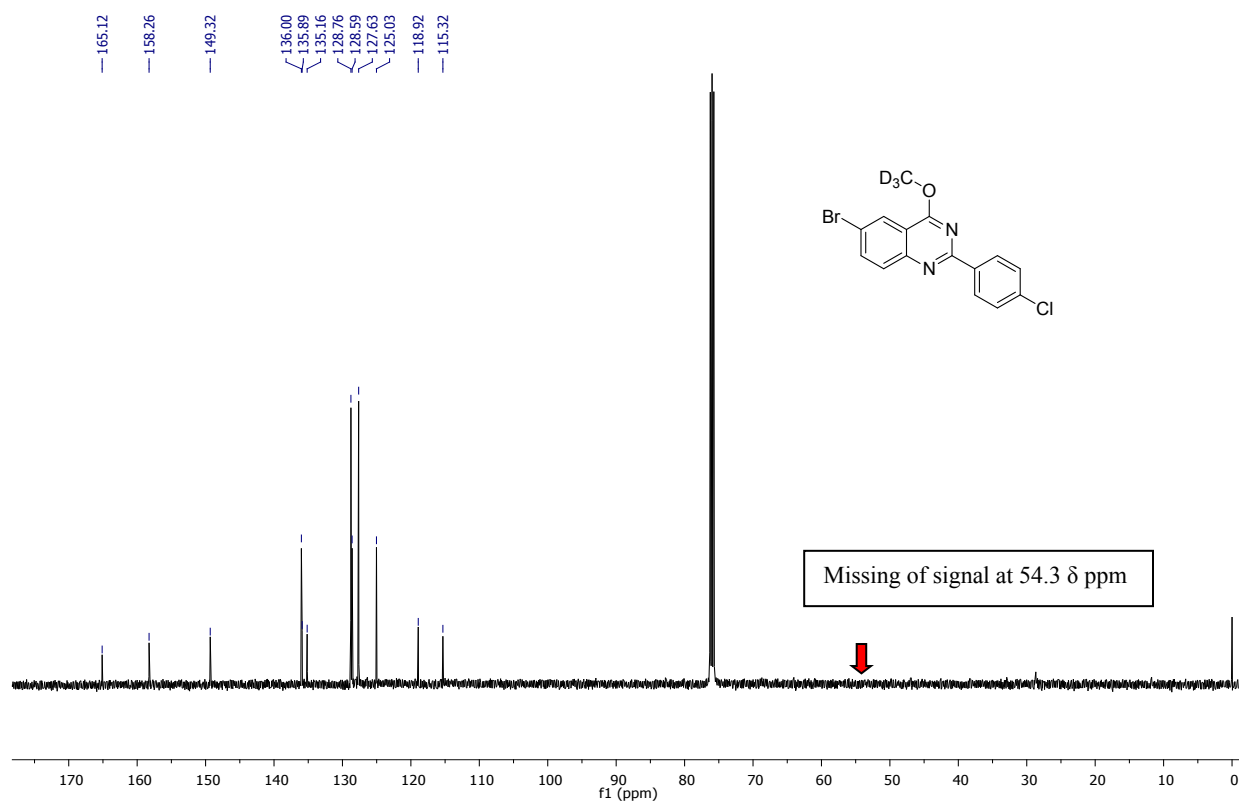
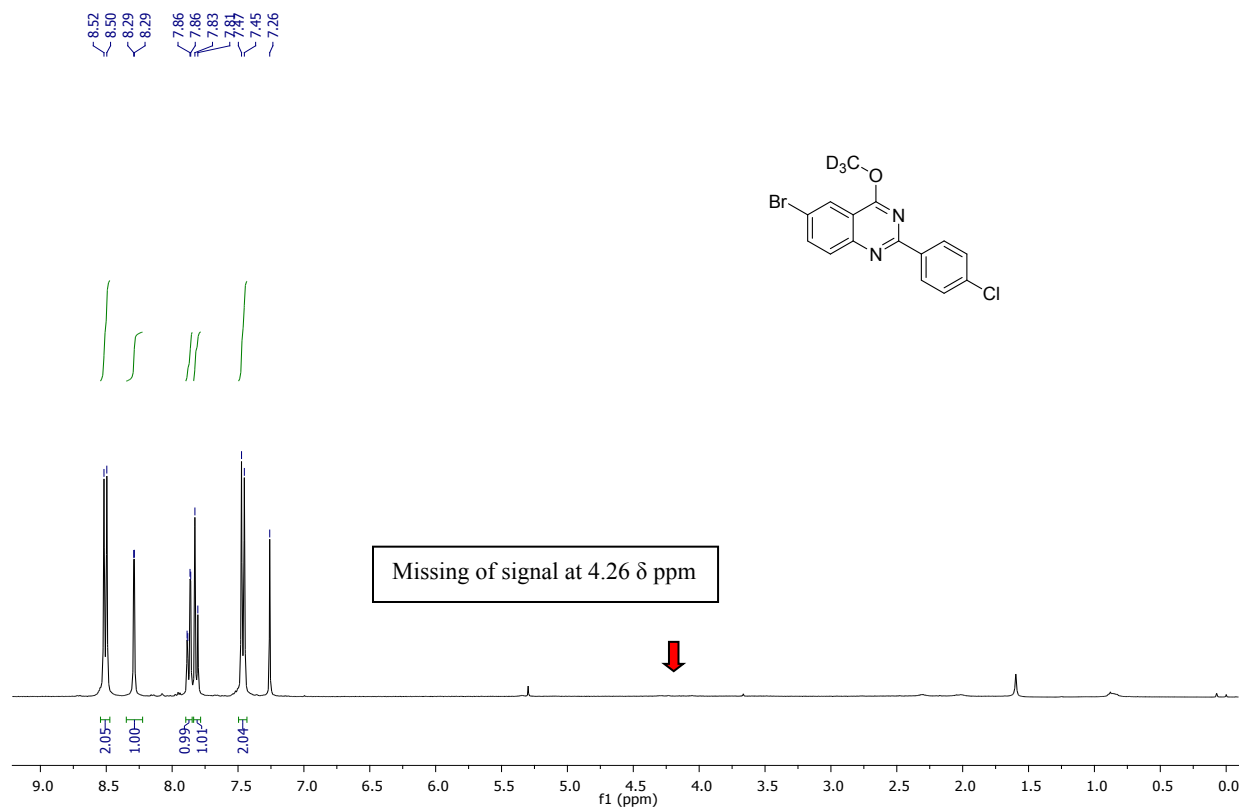
3t. 2-isobutyl-4-methoxyquinazoline



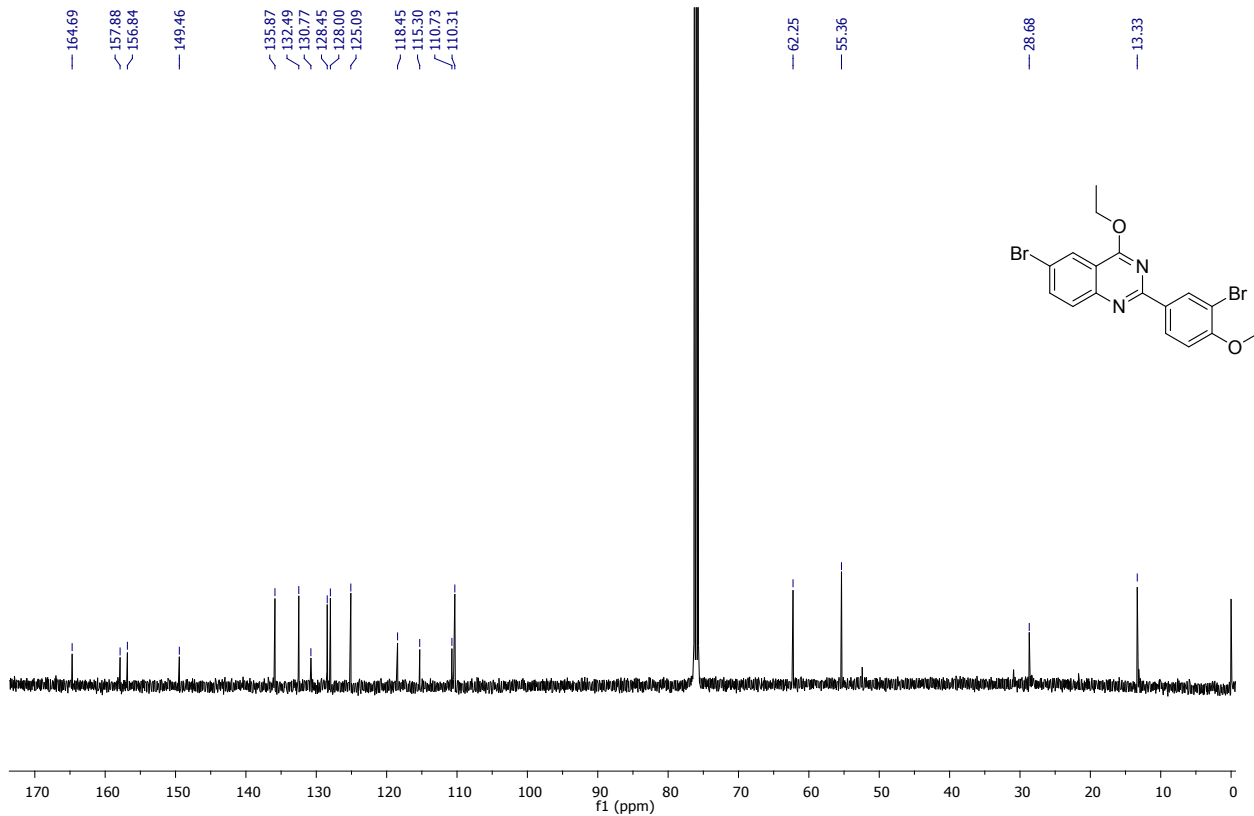
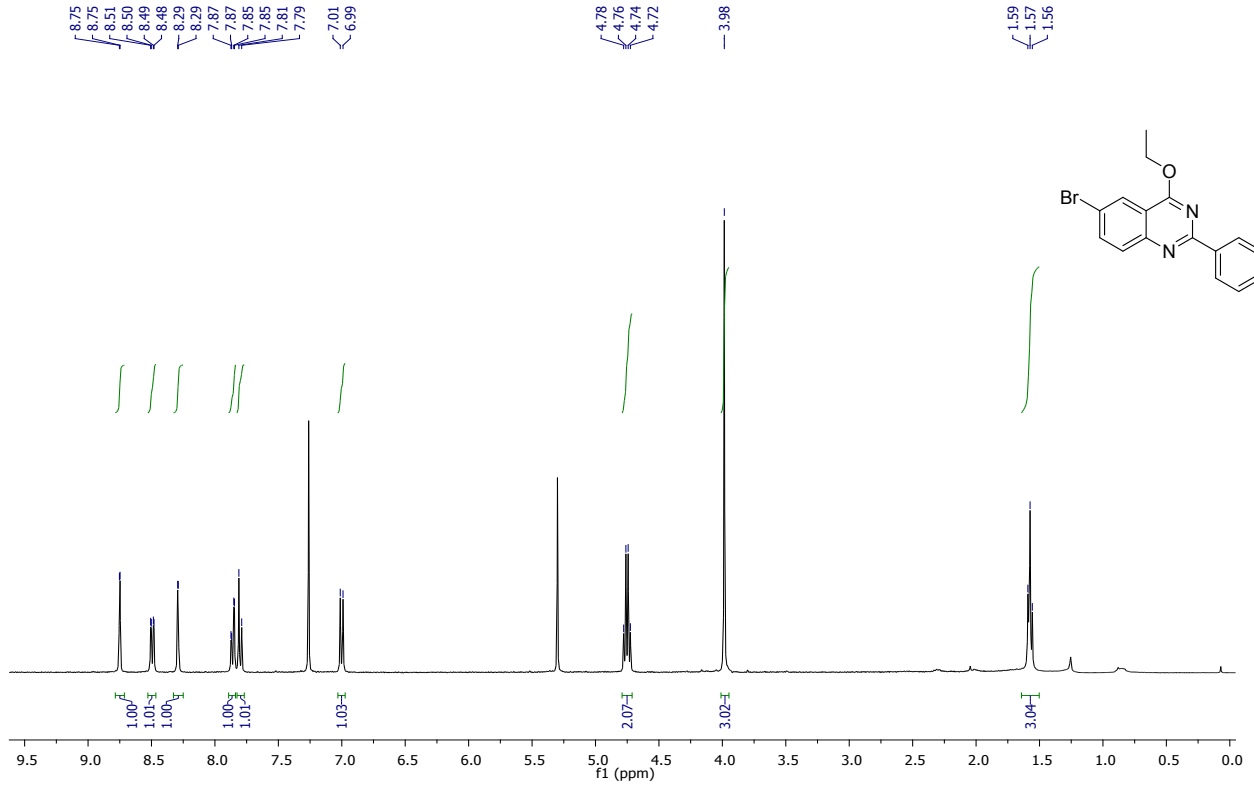
3u. 4-(Deuterated methoxy)-2-(4-methoxyphenyl)quinazoline



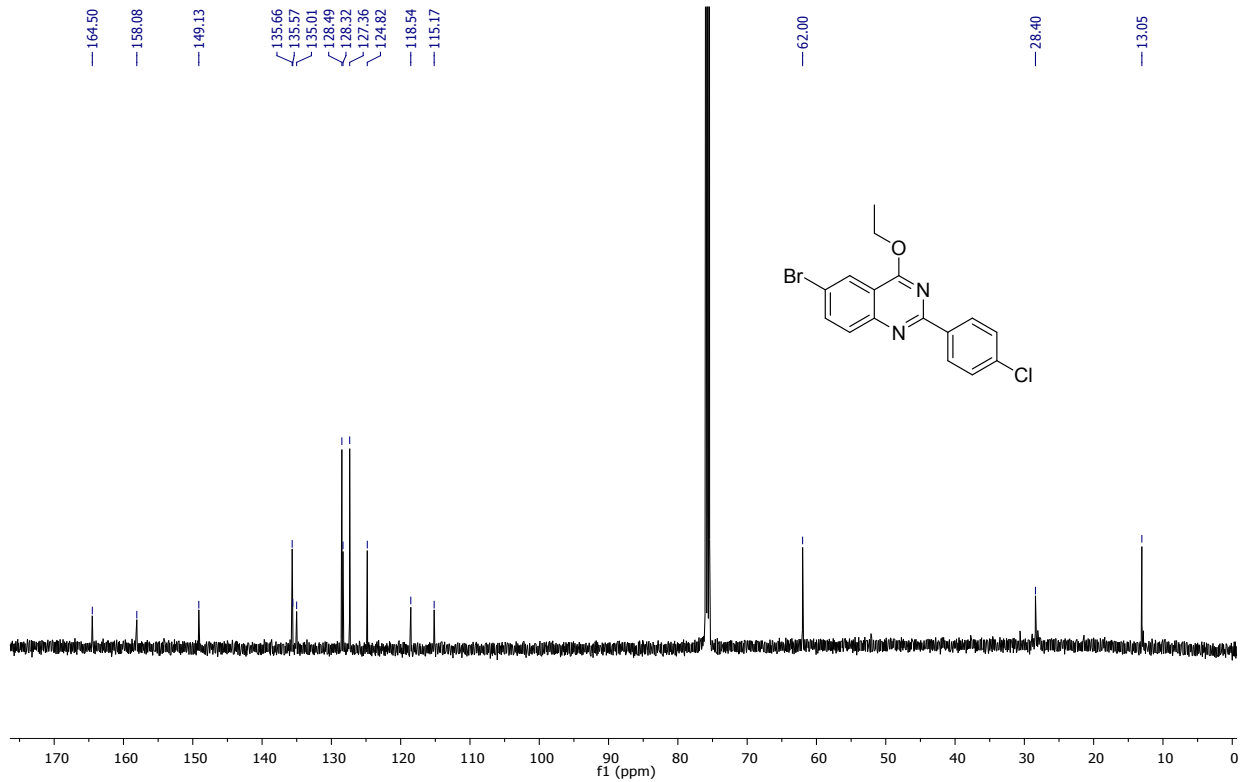
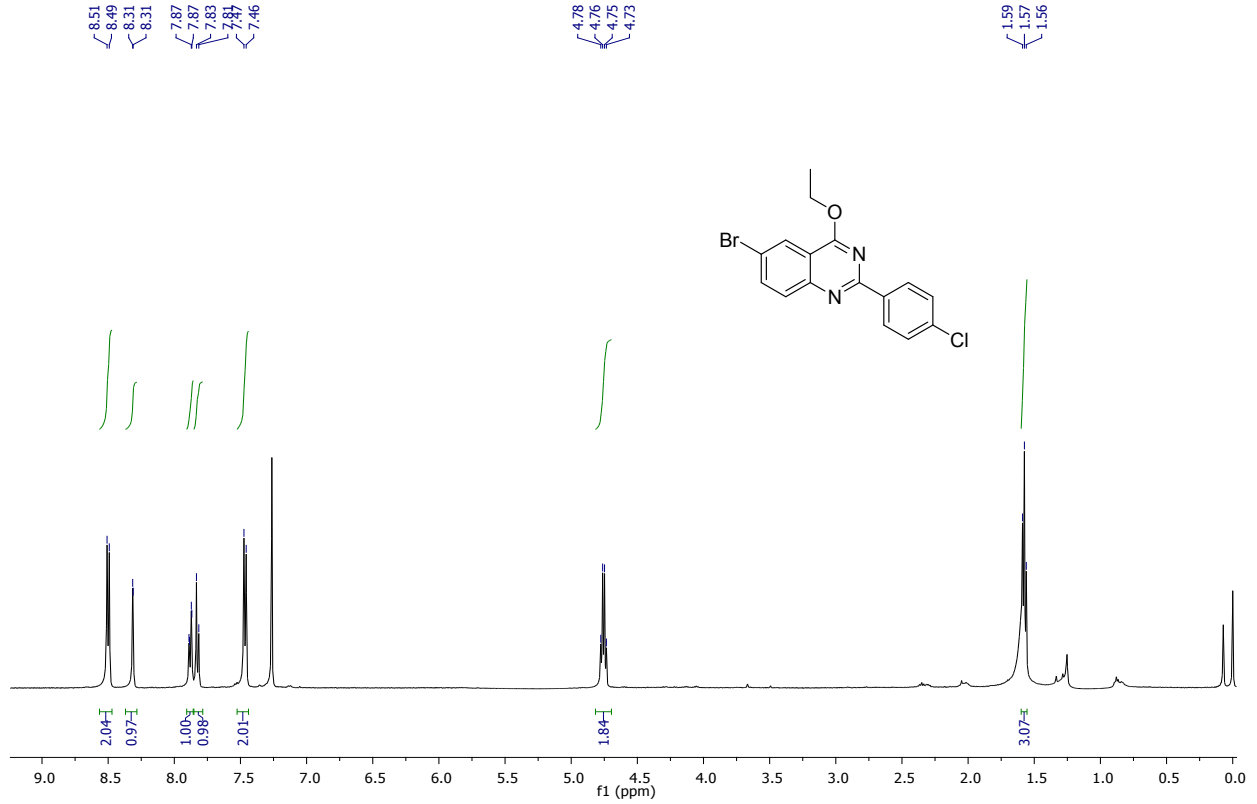
3v. 6-(Deuterated bromo)-2-(4-chlorophenyl)-4-methoxyquinazoline



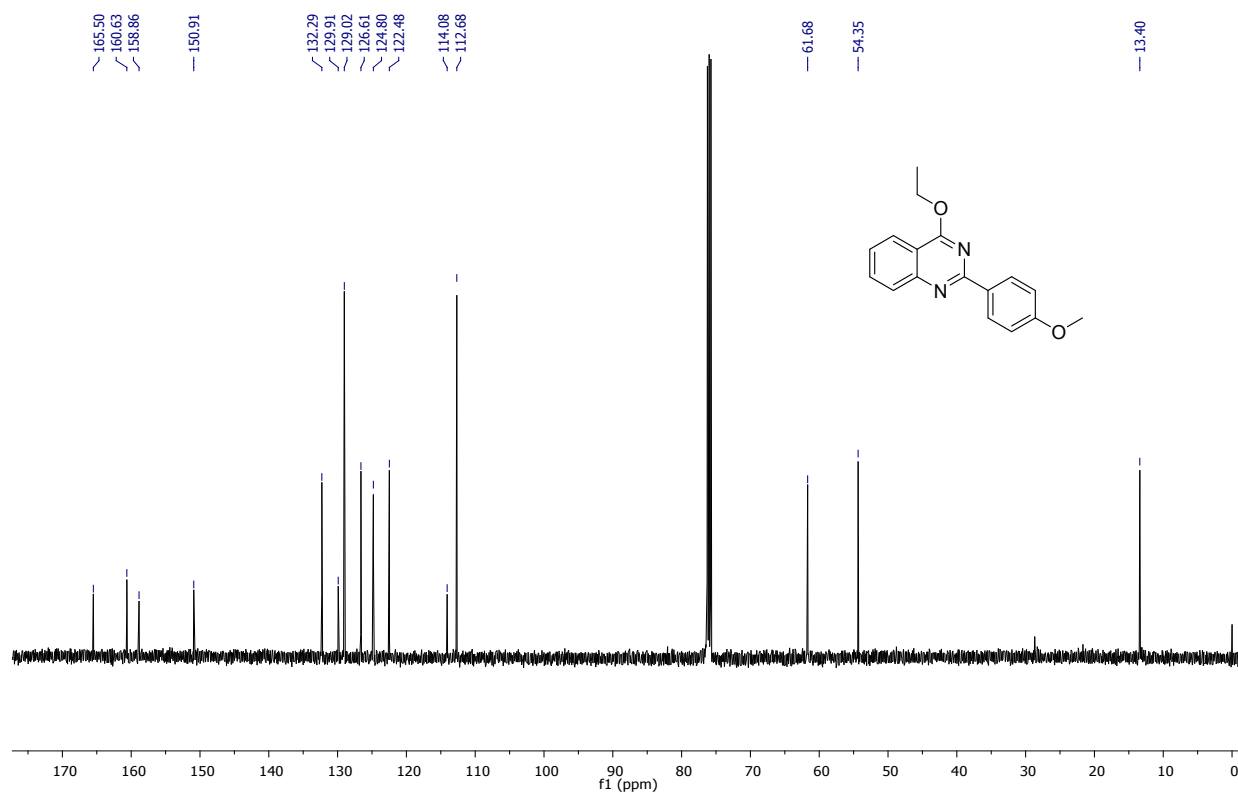
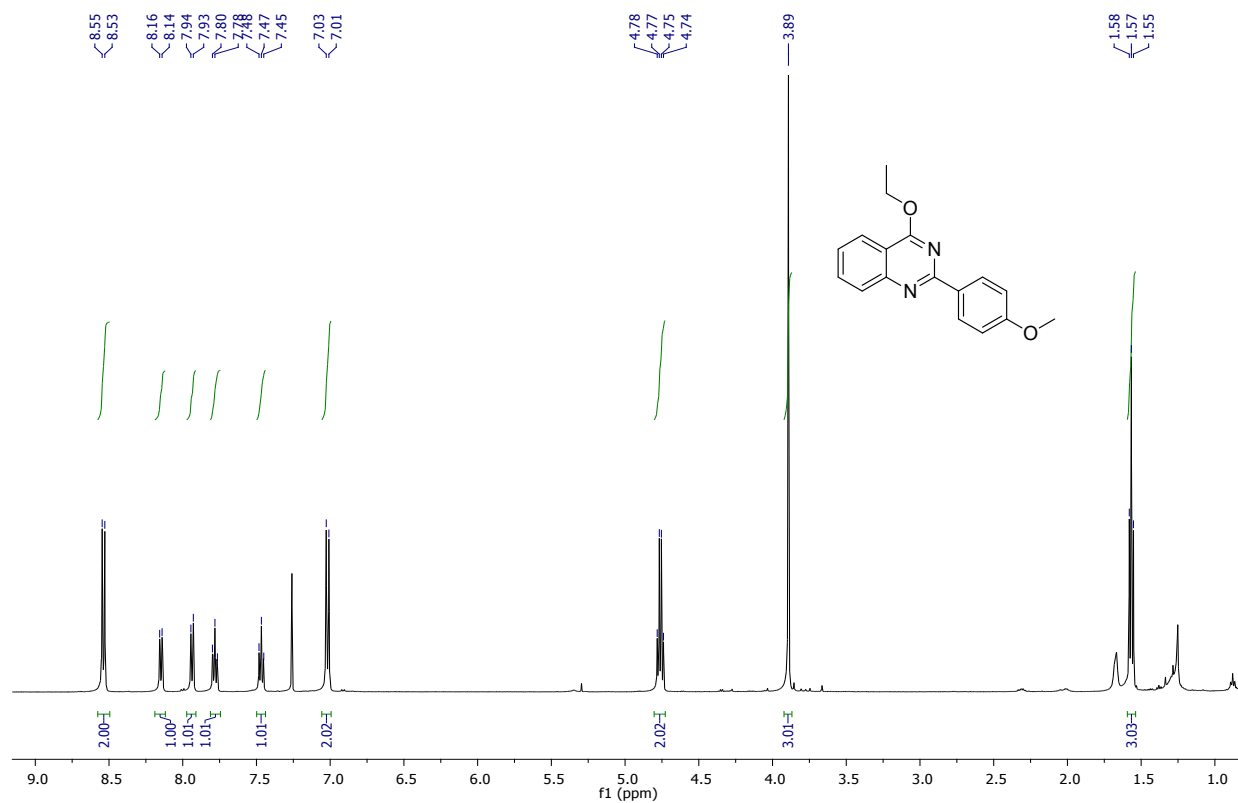
3w. 6-bromo-2-(3-bromo-4-methoxyphenyl)-4-ethoxyquinazoline



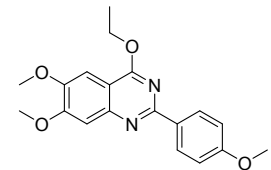
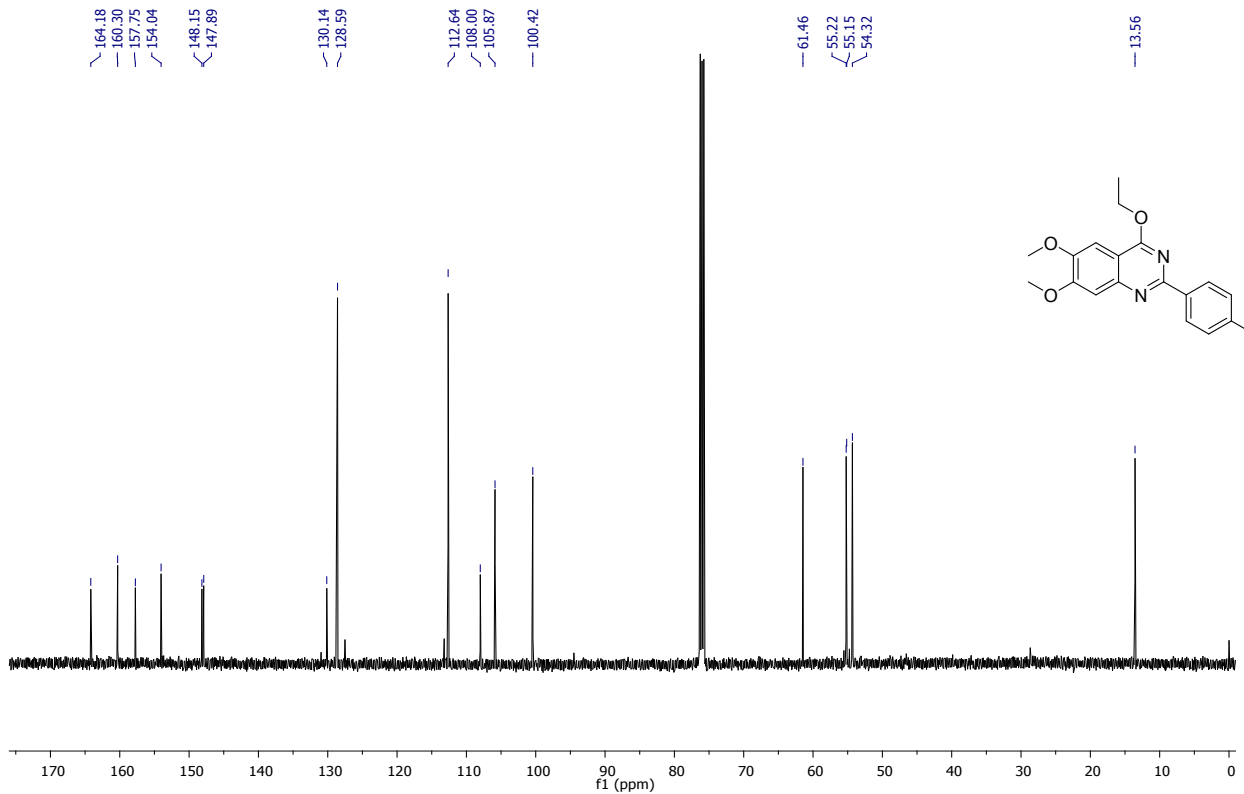
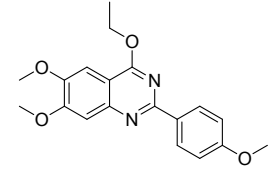
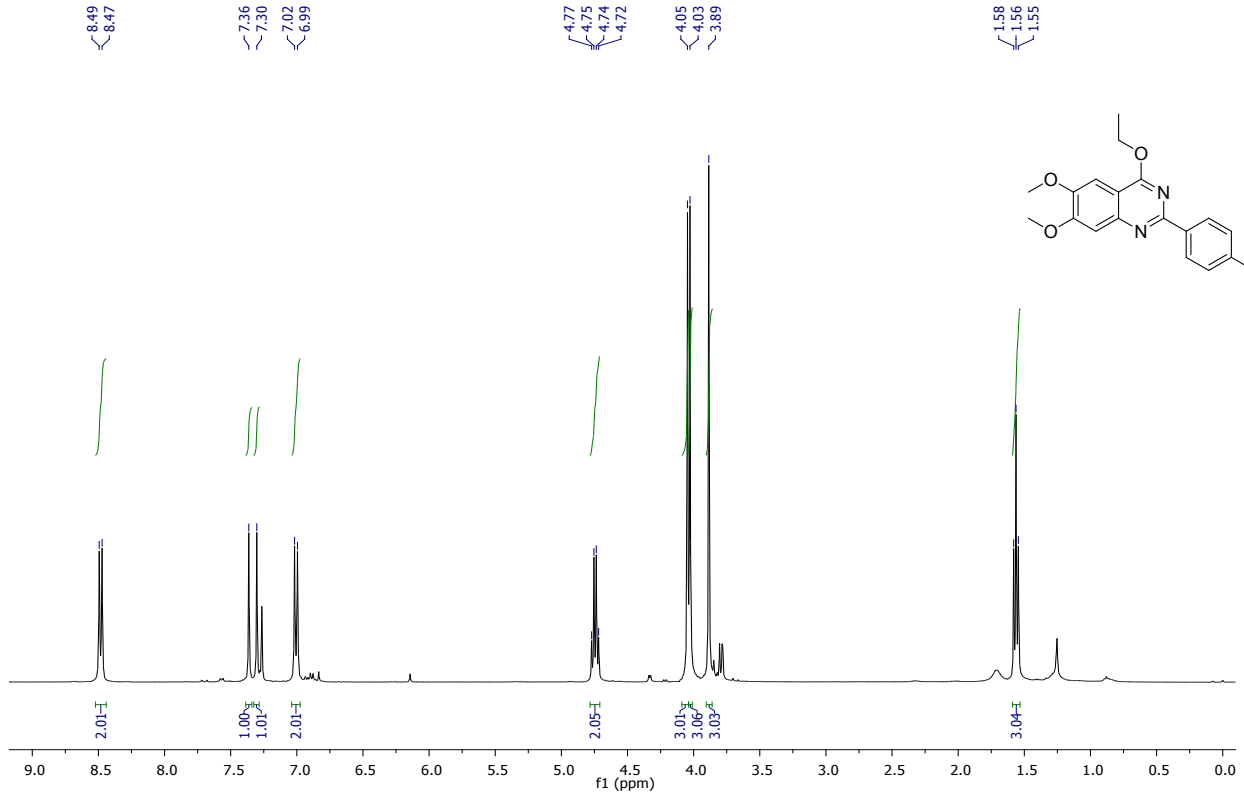
3x. 6-bromo-2-(4-chlorophenyl)-4-ethoxyquinazoline



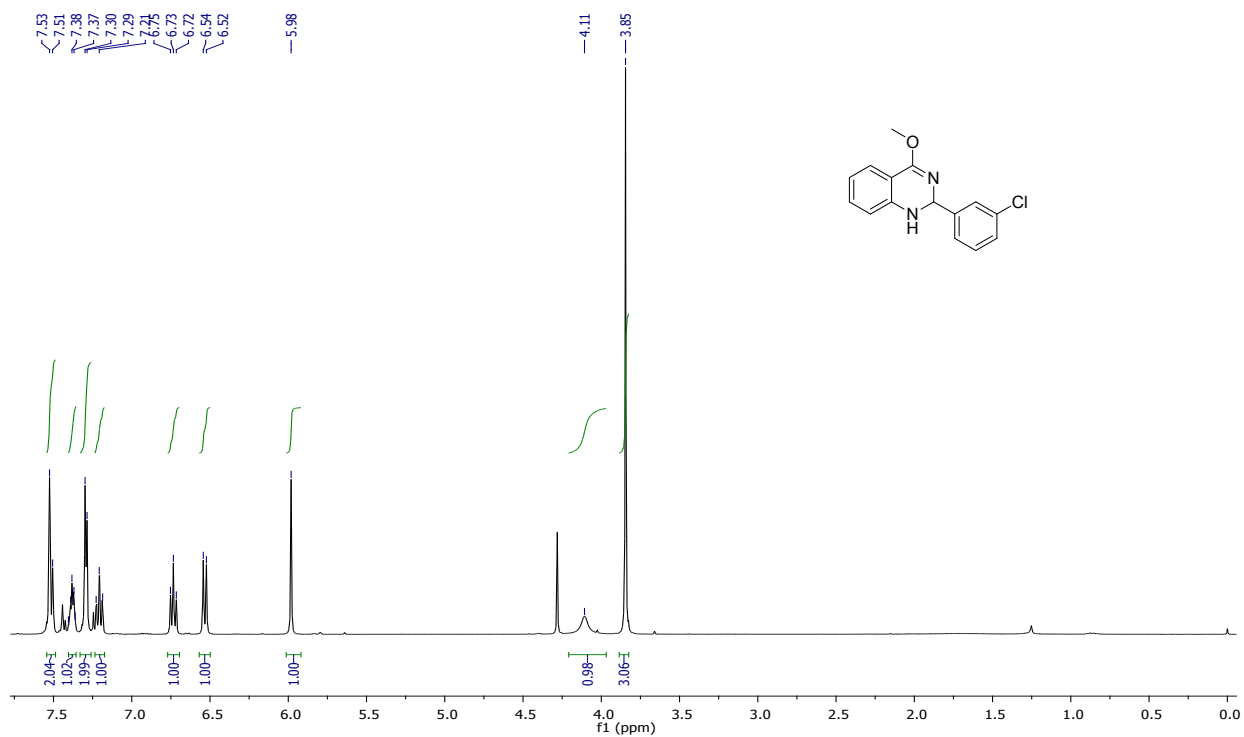
3y. 4-ethoxy-2-(4-methoxyphenyl)quinazoline



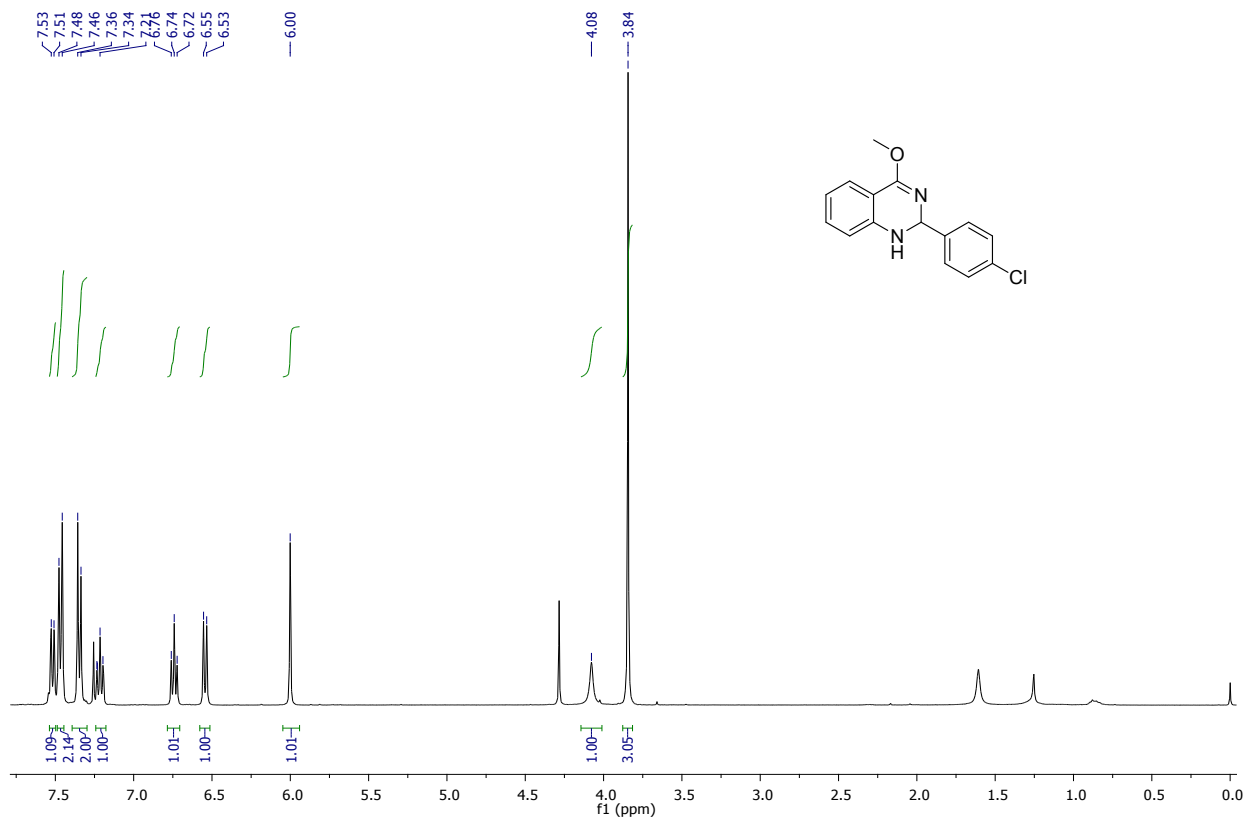
3z. 4-ethoxy-6,7-dimethoxy-2-(4-methoxyphenyl)quinazoline



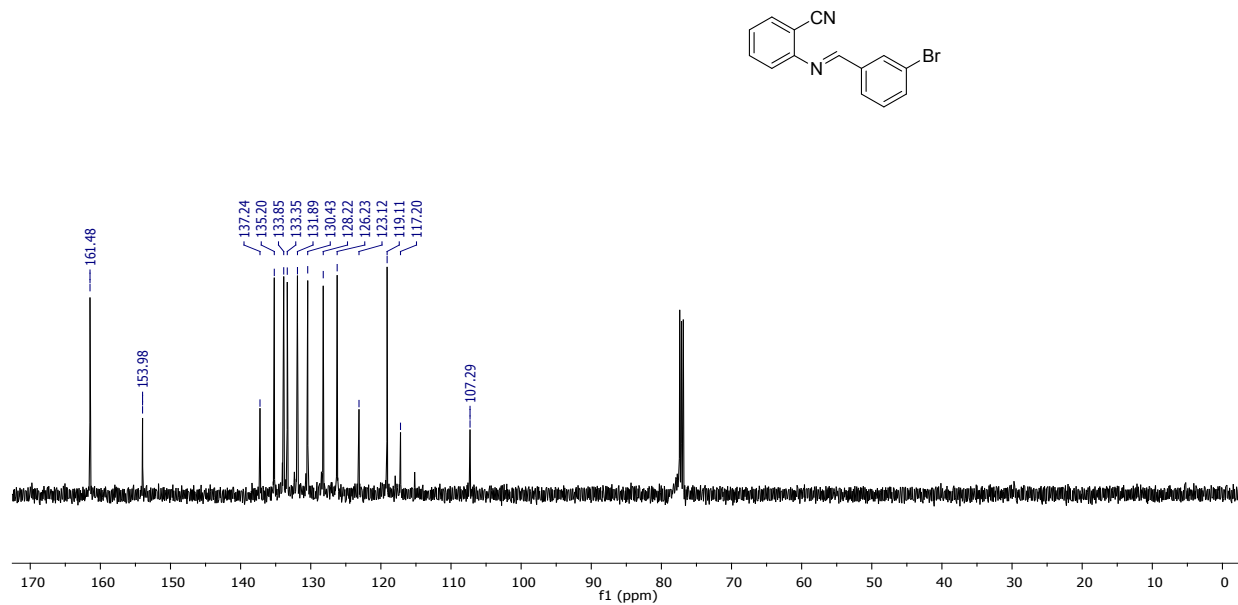
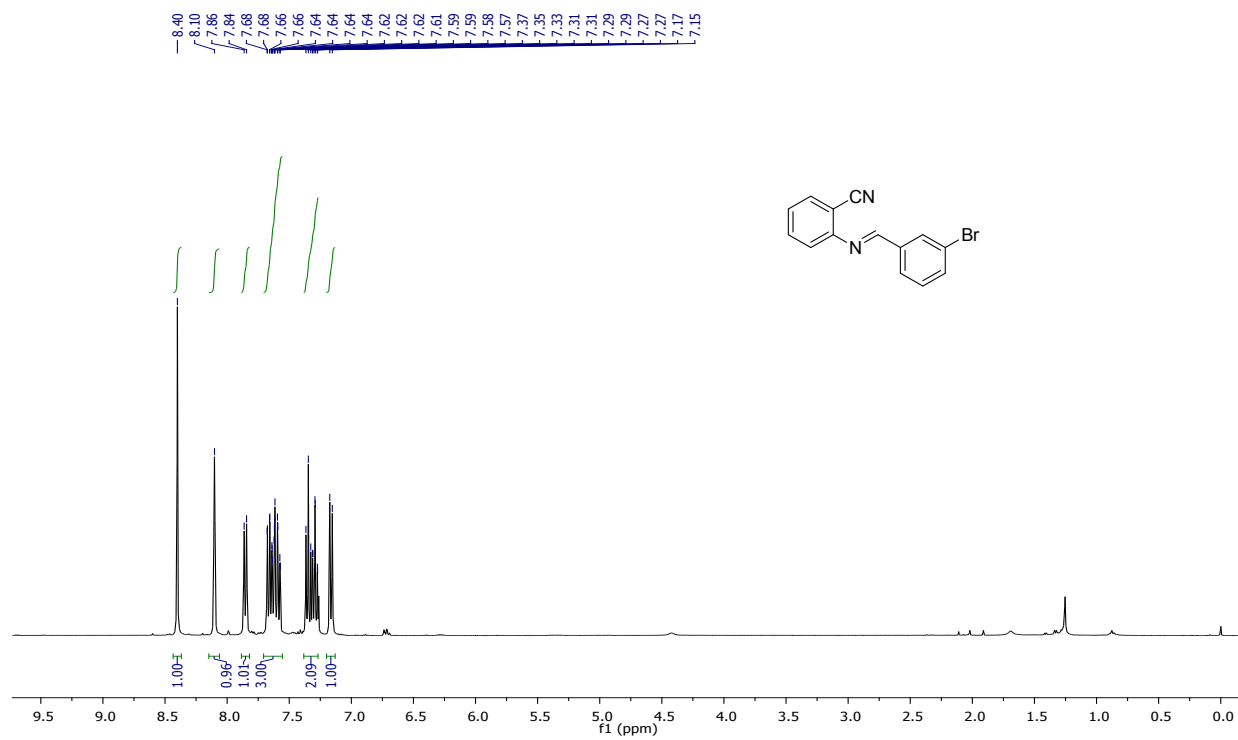
4b. 2-(3-chlorophenyl)-4-methoxy-1,2-dihydroquinazoline



4c. 2-(4-chlorophenyl)-4-methoxy-1,2-dihydroquinazoline



5. 2-((3-Bromobenzylidene)amino)benzonitrile.



References:

1. Kokatla, H. P.; Lakshman, M. K. *Org. Lett.* **2010**, 12, 4478.