

Supporting Information

Photoexcited nitroarenes for alkylation of quinoxalin-2(1*H*)-ones

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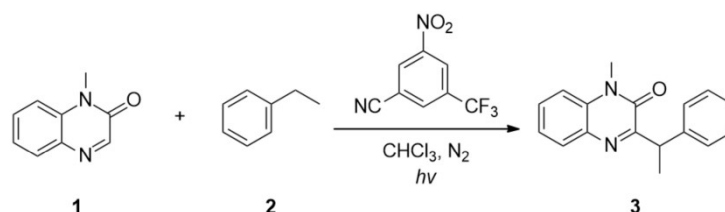
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General Information

Reagents were purchased from commercial sources and were used as received. ^1H and ^{13}C Nuclear Magnetic Resonance (NMR) spectra were recorded on Bruker Avance 500 Ultrashield NMR spectrometers. Chemical shifts (δ) were given in parts per million (ppm) and were measured downfield from internal tetramethylsilane. High-resolution mass spectrometry (HRMS) data were obtained on an FTICR-MS instrument (Ionspec 7.0 T). Conversion was monitored by thin layer chromatography (TLC). Flash column chromatography was performed over silica gel (100-200 mesh). The synthesis of the substrate refers to the published literature.^{S1}

General experimental procedure for the synthesis of products except 3f, 3h and 3o.

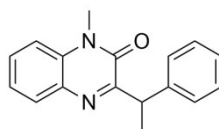


To a 10 mL glass vial was added quinoxalin-2(1H)-one **1** (0.2 mmol, 1.0 equiv), ethylbenzene **2** (0.4 mmol, 2 equiv), substituted nitrobenzene (0.3 mmol, 1.5 equiv) and 4 mL of CHCl_3 . The reaction mixture was degassed by bubbling with nitrogen for 30 s with an outlet needle and the vial was sealed and the mixture was stirred under the irradiation with purple LEDs (395 nm) for 12 h at room temperature. After the reaction was complete, solvent was removed under reduced pressure, the mixture was subjected to flash column chromatography (PE/EtOAc = 5:1) to furnish the corresponding product **3**.

General experimental procedure for the synthesis of products 3f, 3h and 3o.

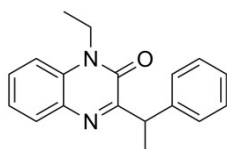
To a 10 mL glass vial was added quinoxalin-2(1H)-one **1** (0.2 mmol, 1.0 equiv), ethylbenzene **2** (0.4 mmol, 2 equiv), substituted nitrobenzene (0.3 mmol, 1.5 equiv), TFA (0.2 mmol, 1.0 equiv), and 4 mL of CHCl_3 . The reaction mixture was degassed by bubbling with nitrogen for 30 s with an outlet needle and the vial was sealed and the mixture was stirred under the irradiation with purple LEDs (395 nm) for 12 h at room temperature. After the reaction was complete, solvent was removed under reduced pressure, the mixture was subjected to flash column chromatography (PE/EtOAc = 5:1) to furnish the corresponding product **3**.

1-methyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (**3a**)



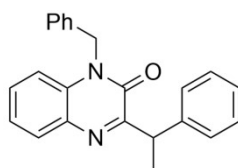
White solid (40.1 mg, 76%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (dd, J = 8.0, 1.2 Hz, 1H), 7.54 – 7.47 (m, 1H), 7.46 – 7.39 (m, 2H), 7.37 – 7.31 (m, 1H), 7.26 (dt, J = 8.3, 7.6 Hz, 3H), 7.17 (t, J = 7.4 Hz, 1H), 4.82 (q, J = 7.1 Hz, 1H), 3.61 (s, 3H), 1.68 (d, J = 7.1 Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 161.9, 154.4, 143.1, 133.1, 132.7, 130.1, 129.7, 128.3, 128.1, 126.5, 123.4, 113.4, 41.8, 29.0, 19.6. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{16}\text{N}_2\text{NaO}$ [$\text{M} + \text{Na}$] $^+$ 287.1155; found 287.1160.

1-ethyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (**3b**)



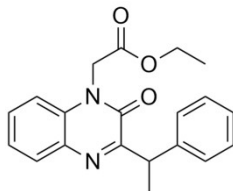
White solid (37.8 mg, 68%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.49 (ddd, $J = 8.6, 7.3, 1.5$ Hz, 1H), 7.47 – 7.39 (m, 2H), 7.34 – 7.30 (m, 1H), 7.29 – 7.23 (m, 3H), 7.21 – 7.14 (m, 1H), 4.84 (q, $J = 7.1$ Hz, 1H), 4.35 – 4.12 (m, 2H), 1.68 (d, $J = 7.2$ Hz, 3H), 1.30 (t, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 161.9, 153.9, 143.2, 133.0, 132.0, 130.4, 129.6, 128.3, 128.1, 126.4, 123.2, 113.3, 41.6, 37.3, 19.7, 12.4. HRMS (ESI): calcd. for $\text{C}_{18}\text{H}_{19}\text{N}_2\text{O}$ $[\text{M} + \text{H}]^+$ 279.1492; found 279.1494.

1-benzyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (3c)



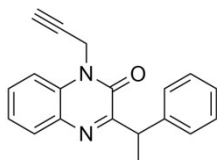
Yellow oil (30.6 mg, 45%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (dd, $J = 8.0, 1.5$ Hz, 1H), 7.48 – 7.43 (m, 2H), 7.39 – 7.35 (m, 1H), 7.31 – 7.24 (m, 5H), 7.23 – 7.10 (m, 5H), 5.53 (d, $J = 15.7$ Hz, 1H), 5.29 (d, $J = 15.7$ Hz, 1H), 4.89 (q, $J = 7.1$ Hz, 1H), 1.72 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 162.0, 154.5, 143.2, 135.3, 133.0, 132.4, 130.2, 129.7, 128.8, 128.4, 128.1, 127.6, 126.8, 126.5, 123.5, 114.3, 45.9, 41.9, 19.7. HRMS (ESI): calcd. for $\text{C}_{23}\text{H}_{20}\text{N}_2\text{NaO}$ $[\text{M} + \text{Na}]^+$ 363.1468; found 363.1473.

ethyl 2-(2-oxo-3-(1-phenylethyl)quinoxalin-1(2H)-yl)acetate (3d)



White solid (47.7 mg, 71%). ^1H NMR (500 MHz, CDCl_3) δ 7.93 (dd, $J = 8.0, 1.3$ Hz, 1H), 7.49 – 7.44 (m, 1H), 7.43 – 7.39 (m, 2H), 7.36 – 7.31 (m, 1H), 7.26 (t, $J = 7.8$ Hz, 2H), 7.19 – 7.14 (m, 1H), 7.02 (d, $J = 8.3$ Hz, 1H), 5.06 (d, $J = 17.3$ Hz, 1H), 4.80 (dd, $J = 12.2, 5.1$ Hz, 2H), 4.24 – 4.13 (m, 2H), 1.69 (d, $J = 7.1$ Hz, 3H), 1.21 (t, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 167.1, 161.7, 154.0, 143.0, 132.8, 132.2, 130.4, 129.8, 128.3, 128.0, 126.5, 123.7, 112.9, 61.9, 43.6, 41.9, 19.6, 14.0. HRMS (ESI): calcd. for $\text{C}_{20}\text{H}_{21}\text{N}_2\text{O}_3$ $[\text{M} + \text{H}]^+$ 337.1547; found 337.1552.

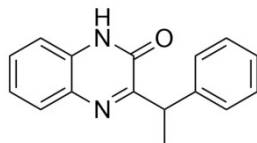
3-(1-phenylethyl)-1-(prop-2-yn-1-yl)quinoxalin-2(1H)-one (3e)



White solid (32.5 mg, 39%). ^1H NMR (500 MHz, CDCl_3) δ 7.93 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.58 – 7.52 (m, 1H), 7.49 – 7.39 (m, 3H), 7.39 – 7.35 (m, 1H), 7.28 (dd, $J = 11.1, 5.4$ Hz, 2H), 7.22 – 7.15 (m, 1H), 5.09 (dd, $J = 17.4, 2.5$ Hz, 1H), 4.93 – 4.69 (m, 2H), 2.24 (t, $J = 2.5$ Hz, 1H), 1.68 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 161.8, 153.4, 142.9, 132.9, 131.5, 130.3, 129.8, 128.4,

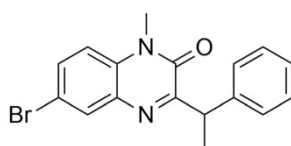
128.1, 126.5, 123.8, 114.0, 76.8, 73.1, 41.8, 31.5, 19.7. HRMS (ESI): calcd. for C₁₉H₁₇N₂O [M + H]⁺ 289.1335; found 289.1337.

2-(1-phenylethyl)quinoxalin-2(1H)-one (3f)



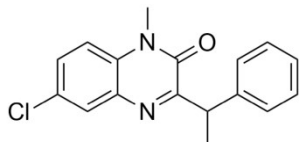
White solid (31 mg, 62%). ¹H NMR (500 MHz, CDCl₃) δ 11.61 (s, 1H), 7.89 (d, *J* = 8.0 Hz, 1H), 7.58 – 7.37 (m, 3H), 7.32 (t, *J* = 7.6 Hz, 1H), 7.28 – 7.23 (m, 2H), 7.21 – 7.06 (m, 2H), 4.82 (q, *J* = 7.1 Hz, 1H), 1.71 (d, *J* = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃) δ 162.4, 155.8, 143.0, 132.8, 130.8, 129.7, 129.2, 128.3, 128.1, 126.5, 123.9, 115.3, 41.3, 19.4. HRMS (ESI): calcd. for C₁₆H₁₅N₂O [M + H]⁺ 251.1179; found 251.1185.

6-bromo-1-methyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (3g)



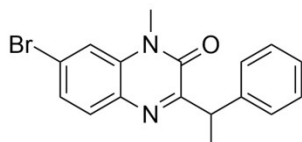
White solid (48 mg, 70%). ¹H NMR (500 MHz, CDCl₃) δ 8.08 (d, *J* = 2.3 Hz, 1H), 7.59 (dd, *J* = 8.9, 2.3 Hz, 1H), 7.48 – 7.37 (m, 2H), 7.30 – 7.25 (m, 2H), 7.21 – 7.16 (m, 1H), 7.12 (d, *J* = 8.9 Hz, 1H), 4.81 (d, *J* = 7.1 Hz, 1H), 3.59 (s, 3H), 1.66 (d, *J* = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃) δ 163.3, 154.1, 142.7, 133.5, 132.5, 132.4, 132.2, 128.4, 128.1, 126.6, 116.0, 114.9, 41.9, 29.2, 19.5. HRMS (ESI): calcd. for C₁₇H₁₅BrN₂NaO [M + Na]⁺ 365.0260; found 365.0265.

6-chloro-1-methyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (3h)



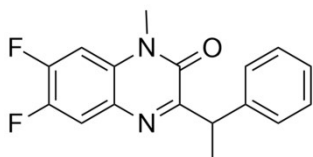
White solid (38.9 mg, 65%). ¹H NMR (500 MHz, CDCl₃) δ 7.93 (s, 1H), 7.51 – 7.36 (m, 3H), 7.31 – 7.25 (m, 2H), 7.22 – 7.12 (m, 2H), 4.82 (q, *J* = 7.0 Hz, 1H), 3.60 (s, 3H), 1.66 (d, *J* = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃) δ 163.3, 154.1, 142.7, 133.2, 131.8, 129.6, 129.5, 128.7, 128.4, 128.1, 126.6, 114.6, 41.9, 29.2, 19.5. HRMS (ESI): calcd. for C₁₇H₁₆ClN₂O [M + H]⁺ 299.0946; found 299.0951.

7-bromo-1-methyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (3i)



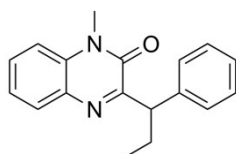
White solid (49.9 mg, 73%). ¹H NMR (500 MHz, CDCl₃) δ 7.75 (d, *J* = 8.5 Hz, 1H), 7.45 – 7.36 (m, 4H), 7.30 – 7.24 (m, 2H), 7.20 – 7.12 (m, 1H), 4.78 (q, *J* = 7.1 Hz, 1H), 3.57 (s, 3H), 1.66 (d, *J* = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃) δ 162.3, 154.0, 142.8, 134.1, 131.5, 131.3, 128.4, 128.1, 126.6, 126.6, 123.6, 116.5, 41.9, 29.2, 19.5. HRMS (ESI): calcd. for C₁₇H₁₅BrN₂NaO [M + Na]⁺ 365.0260; found 365.0265.

6,7-difluoro-1-methyl-3-(1-phenylethyl)quinoxalin-2(1H)-one (3j)



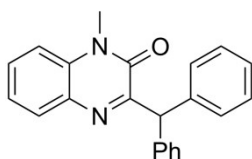
White solid (25.8 mg, 43%). ^1H NMR (500 MHz, CDCl_3) δ 7.73 (dd, $J = 10.2, 8.3$ Hz, 1H), 7.40 (d, $J = 7.6$ Hz, 2H), 7.30 – 7.25 (m, 2H), 7.18 (t, $J = 7.3$ Hz, 1H), 7.05 (dd, $J = 11.3, 7.1$ Hz, 1H), 4.79 (q, $J = 7.1$ Hz, 1H), 3.57 (s, 3H), 1.65 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 162.51 (d, $J = 3.4$ Hz), 154.0, 151.1 (dd, $J = 252.6, 14.4$ Hz), 146.5 (dd, $J = 246.5, 13.8$ Hz), 142.6, 130.2 (d, $J = 8.4$ Hz), 128.9 (dd, $J = 9.2, 2.8$ Hz), 128.4, 128.1, 126.6, 117.7 (dd, $J = 17.9, 1.9$ Hz), 102.0 (d, $J = 23.0$ Hz), 41.8, 29.6, 19.5. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{15}\text{F}_2\text{N}_2\text{O}$ $[\text{M} + \text{H}]^+$ 301.1147; found 301.1152.

1-methyl-3-(1-phenylpropyl)quinoxalin-2(1H)-one (3k)



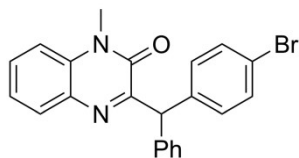
White solid (28.4 mg, 51%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (d, $J = 8.0$ Hz, 1H), 7.59 – 7.39 (m, 3H), 7.34 (t, $J = 7.6$ Hz, 1H), 7.29 – 7.24 (m, 3H), 7.17 (t, $J = 7.3$ Hz, 1H), 4.58 (t, $J = 7.6$ Hz, 1H), 3.62 (s, 3H), 2.44 – 2.24 (m, 1H), 2.16 – 2.05 (m, 1H), 0.92 (t, $J = 7.3$ Hz, 3H). ^{13}C NMR (126 MHz, CDCl_3) δ 161.3, 154.6, 141.6, 133.0, 132.8, 130.1, 129.6, 128.7, 128.2, 126.5, 123.4, 113.4, 49.1, 29.1, 27.1, 12.4. HRMS (ESI): calcd. for $\text{C}_{18}\text{H}_{19}\text{N}_2\text{O}$ $[\text{M} + \text{H}]^+$ 279.1492; found 279.1492.

2-benzhydryl-1-methylquinoxalin-2(1H)-one (3l)



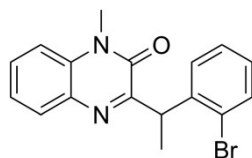
White solid (43.7 mg, 67%). ^1H NMR (500 MHz, CDCl_3) δ 7.84 (dd, $J = 8.0, 1.3$ Hz, 1H), 7.55 – 7.50 (m, 1H), 7.43 – 7.37 (m, 4H), 7.33 – 7.26 (m, 6H), 7.25 – 7.12 (m, 2H), 6.29 (s, 1H), 3.68 (s, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 160.7, 154.6, 141.0, 133.0, 132.6, 130.5, 130.0, 129.5, 128.3, 126.6, 123.4, 113.5, 52.4, 29.3. HRMS (ESI): calcd. for $\text{C}_{22}\text{H}_{18}\text{N}_2\text{NaO}$ $[\text{M} + \text{Na}]^+$ 349.1311; found 349.1316.

3-((4-bromophenyl)(phenyl)methyl)-1-methylquinoxalin-2(1H)-one (3m)



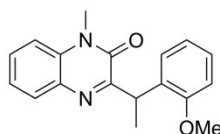
Yellow oil (51.8 mg, 64%). ^1H NMR (500 MHz, CDCl_3) δ 7.82 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.56 – 7.49 (m, 1H), 7.43 – 7.39 (m, 2H), 7.38 – 7.34 (m, 2H), 7.33 – 7.25 (m, 6H), 7.25 – 7.20 (m, 1H), 6.22 (s, 1H), 3.66 (s, 3H). ^{13}C NMR (126 MHz, CDCl_3) δ 160.1, 154.5, 140.4, 140.1, 133.0, 132.5, 131.3, 131.2, 130.4, 130.3, 129.3, 128.4, 126.9, 123.6, 120.7, 113.6, 51.8, 29.3. HRMS (ESI): calcd. for $\text{C}_{22}\text{H}_{17}\text{BrN}_2\text{NaO}$ $[\text{M} + \text{Na}]^+$ 427.0416; found 427.0421.

3-(1-(2-bromophenyl)ethyl)-1-methylquinoxalin-2(1H)-one (3n)



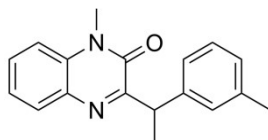
White solid (32.2 mg, 47%). ^1H NMR (500 MHz, CDCl_3) δ 7.90 (dd, $J = 8.0, 1.2$ Hz, 1H), 7.62 – 7.48 (m, 2H), 7.38 – 7.27 (m, 2H), 7.20 – 7.12 (m, 2H), 7.08 – 7.00 (m, 1H), 5.22 (q, $J = 7.0$ Hz, 1H), 3.64 (s, 3H), 1.61 (d, $J = 7.0$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 161.6, 154.3, 142.9, 133.2, 133.0, 132.6, 130.2, 129.9, 128.1, 127.9, 127.3, 125.0, 123.4, 113.5, 41.6, 29.1, 18.7. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{15}\text{BrN}_2\text{NaO}$ [$\text{M} + \text{Na}$] $^+$ 365.0260; found 365.0265.

3-(1-(2-methoxyphenyl)ethyl)-1-methylquinoxalin-2(1H)-one (3o)



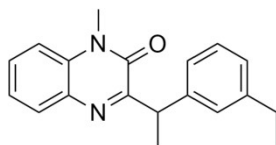
White solid (25.3 mg, 43%). ^1H NMR (500 MHz, CDCl_3) δ 7.89 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.55 – 7.44 (m, 1H), 7.36 – 7.30 (m, 1H), 7.26 (d, $J = 8.4$ Hz, 1H), 7.17 (td, $J = 8.2, 1.7$ Hz, 1H), 7.12 (dd, $J = 7.6, 1.5$ Hz, 1H), 6.94 – 6.79 (m, 2H), 5.22 (q, $J = 7.0$ Hz, 1H), 3.86 (s, 3H), 3.63 (s, 3H), 1.59 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 162.8, 156.9, 154.3, 133.2, 132.7, 132.2, 130.0, 129.5, 127.4, 127.3, 123.3, 120.4, 113.4, 110.9, 55.8, 34.9, 29.0, 18.6. HRMS (ESI): calcd. for $\text{C}_{18}\text{H}_{19}\text{N}_2\text{O}_2$ [$\text{M} + \text{H}$] $^+$ 295.1441; found 295.1446.

1-methyl-3-(1-(*m*-tolyl)ethyl)quinoxalin-2(1H)-one (3p)



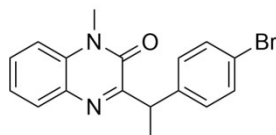
White solid (21.1 mg, 38%). ^1H NMR (500 MHz, CDCl_3) δ 7.93 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.51 (ddd, $J = 8.6, 7.4, 1.5$ Hz, 1H), 7.38 – 7.31 (m, 1H), 7.27 – 7.21 (m, 3H), 7.16 (t, $J = 7.8$ Hz, 1H), 6.99 (d, $J = 7.4$ Hz, 1H), 4.78 (q, $J = 7.1$ Hz, 1H), 3.62 (s, 3H), 2.30 (s, 3H), 1.66 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (126 MHz, CDCl_3) δ 161.9, 154.4, 143.1, 137.8, 133.1, 132.7, 130.1, 129.6, 128.8, 128.2, 127.3, 125.1, 123.3, 113.4, 41.8, 29.0, 21.4, 19.7. HRMS (ESI): calcd. for $\text{C}_{18}\text{H}_{19}\text{N}_2\text{O}$ [$\text{M} + \text{H}$] $^+$ 279.1492; found 279.1494.

3-(1-(3-ethylphenyl)ethyl)-1-methylquinoxalin-2(1H)-one (3q)



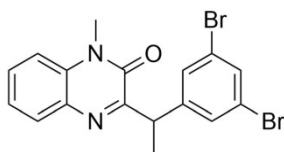
Yellow oil (21 mg, 36%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.53 – 7.46 (m, 1H), 7.36 – 7.32 (m, 1H), 7.28 – 7.23 (m, 3H), 7.18 (t, $J = 7.5$ Hz, 1H), 7.02 (d, $J = 7.5$ Hz, 1H), 4.81 (q, $J = 7.1$ Hz, 1H), 3.62 (s, 3H), 2.60 (q, $J = 7.6$ Hz, 2H), 1.67 (d, $J = 7.1$ Hz, 3H), 1.20 (t, $J = 7.6$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 162.0, 154.4, 144.2, 143.1, 133.0, 132.7, 130.1, 129.6, 128.2, 127.8, 126.0, 125.3, 123.4, 113.4, 41.8, 29.1, 28.8, 19.8, 15.4. HRMS (ESI): calcd. for $\text{C}_{19}\text{H}_{21}\text{N}_2\text{O}$ [$\text{M} + \text{H}$] $^+$ 293.1648; found 293.1653.

3-(1-(4-bromophenyl)ethyl)-1-methylquinoxalin-2(1H)-one (3r)



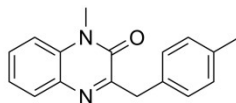
White solid (43.9 mg, 64%). ^1H NMR (500 MHz, CDCl_3) δ 7.90 (dd, $J = 8.0, 1.2$ Hz, 1H), 7.55 – 7.48 (m, 1H), 7.41 – 7.28 (m, 5H), 7.26 – 7.23 (m, 1H), 4.77 (q, $J = 7.1$ Hz, 1H), 3.61 (s, 3H), 1.65 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 161.2, 154.3, 142.1, 133.0, 132.6, 131.4, 130.1, 129.9, 127.1, 123.5, 120.4, 113.5, 41.4, 29.1, 19.5. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{15}\text{BrN}_2\text{NaO}$ [$\text{M} + \text{Na}$] $^+$ 365.0260; found 365.0265.

2-(1-(3,5-dibromophenyl)ethyl)-1-methylquinoxalin-2(1H)-one (3s)



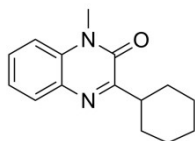
White solid (42.2 mg, 50%). ^1H NMR (500 MHz, CDCl_3) δ 7.92 (d, $J = 8.0$ Hz, 1H), 7.52 (dt, $J = 9.8, 8.1$ Hz, 4H), 7.37 (t, $J = 7.6$ Hz, 1H), 7.32 – 7.26 (m, 1H), 4.73 (q, $J = 7.1$ Hz, 1H), 3.65 (s, 3H), 1.64 (d, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 160.4, 154.2, 147.1, 133.1, 132.6, 132.2, 130.3, 130.2, 130.0, 123.6, 122.7, 113.6, 41.4, 29.2, 19.5. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{14}\text{Br}_2\text{N}_2\text{NaO}$ [$\text{M} + \text{Na}$] $^+$ 442.9365; found 442.9370.

1-methyl-3-(4-methylbenzyl)quinoxalin-2(1H)-one (3t)



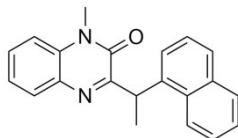
Yellow oil (15.8 mg, 30%). ^1H NMR (500 MHz, CDCl_3) δ 7.75 (dt, $J = 43.9, 21.9$ Hz, 1H), 7.46 – 7.40 (m, 1H), 7.32 – 7.20 (m, 3H), 7.17 (d, $J = 7.6$ Hz, 1H), 7.04 – 6.99 (m, 2H), 4.14 (s, 2H), 3.57 (s, 3H), 2.21 (s, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 159.5, 154.7, 136.1, 133.9, 133.3, 132.8, 129.9, 129.8, 129.4, 129.1, 123.5, 113.5, 40.4, 29.0, 21.0. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{16}\text{N}_2\text{NaO}$ [$\text{M} + \text{Na}$] $^+$ 287.1155; found 287.1160.

3-cyclohexyl-1-methylquinoxalin-2(1H)-one (3u)



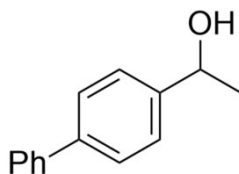
White solid (13.1 mg, 27%). ^1H NMR (500 MHz, CDCl_3) δ 7.84 (dd, $J = 8.0, 1.2$ Hz, 1H), 7.54 – 7.47 (m, 1H), 7.36 – 7.27 (m, 2H), 3.70 (s, 3H), 3.34 (tt, $J = 11.6, 3.3$ Hz, 1H), 1.96 (d, $J = 11.6$ Hz, 2H), 1.90 – 1.84 (m, 2H), 1.77 (d, $J = 12.9$ Hz, 1H), 1.62 – 1.59 (m, 1H), 1.57 – 1.52 (m, 1H), 1.52 – 1.43 (m, 2H), 1.36 – 1.29 (m, 1H). ^{13}C NMR (126 MHz, CDCl_3) δ 164.3, 154.5, 132.9, 132.8, 129.8, 129.3, 123.3, 113.4, 40.8, 30.5, 29.0, 26.3, 26.1. HRMS (ESI): calcd. for $\text{C}_{15}\text{H}_{19}\text{N}_2\text{O}$ [$\text{M} + \text{H}$] $^+$ 243.1492; found 243.1494.

1-methyl-3-(1-(naphthalen-1-yl)ethyl)quinoxalin-2(1H)-one (3v)



White solid (26.4 mg, 42%). ^1H NMR (500 MHz, CDCl_3) δ 8.43 (d, $J = 8.5$ Hz, 1H), 7.91 (dd, $J = 8.0, 1.4$ Hz, 1H), 7.83 (d, $J = 8.1$ Hz, 1H), 7.69 (d, $J = 8.0$ Hz, 1H), 7.55 (ddd, $J = 8.4, 6.8, 1.3$ Hz, 1H), 7.52 – 7.43 (m, 2H), 7.42 – 7.26 (m, 3H), 7.25 – 7.19 (m, 1H), 5.65 (q, $J = 7.0$ Hz, 1H), 3.59 (s, 3H), 1.78 (d, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3) δ 162.4, 154.5, 139.9, 134.1, 133.1, 132.7, 131.7, 130.1, 129.7, 128.8, 127.1, 126.2, 125.4, 125.3, 124.4, 123.7, 123.4, 113.5, 37.1, 29.1, 19.6. HRMS (ESI): calcd. for $\text{C}_{17}\text{H}_{14}\text{Br}_2\text{N}_2\text{NaO}$ $[\text{M} + \text{Na}]^+$ 442.9365; found 442.9370.

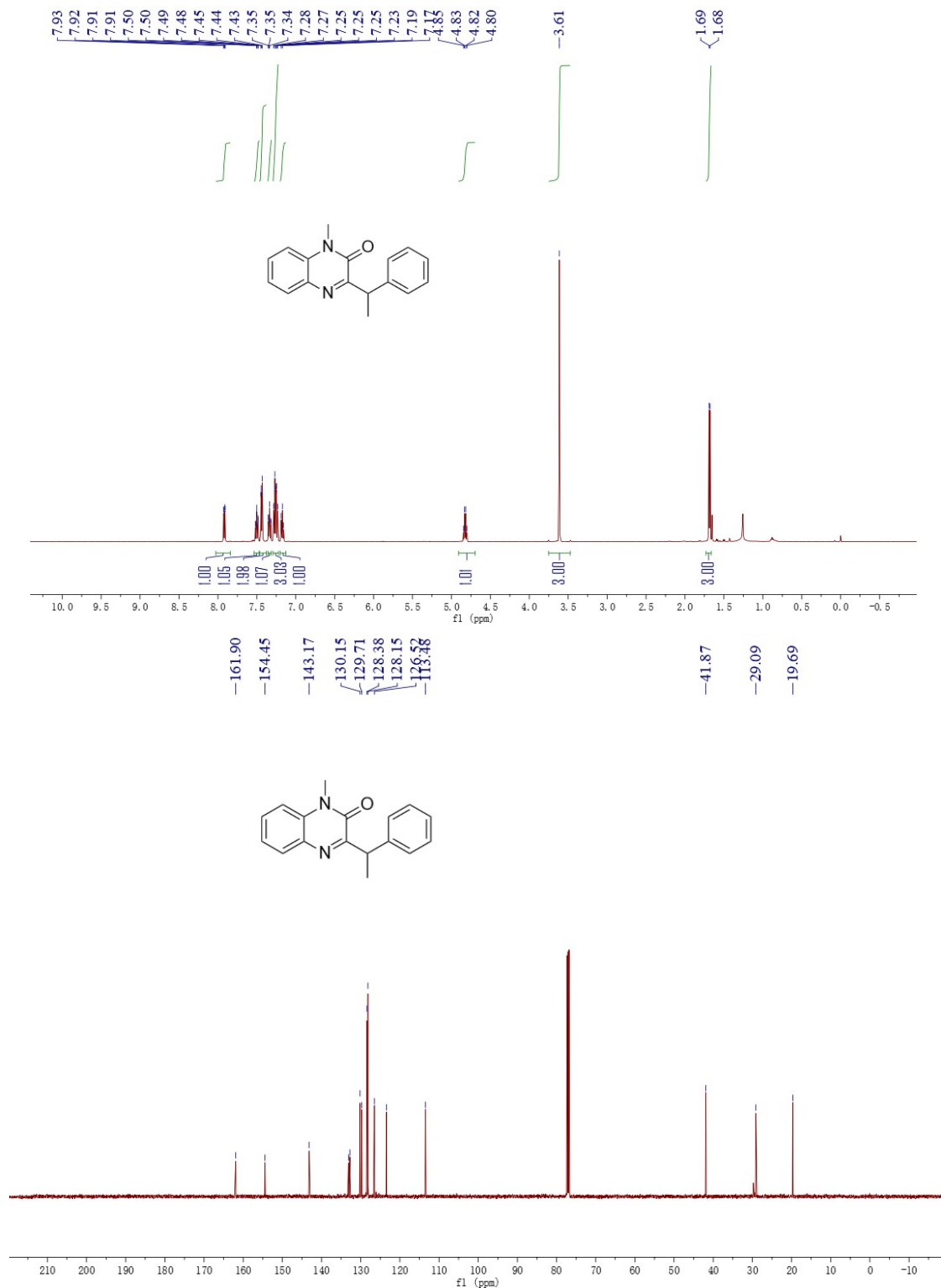
1-([1,1'-biphenyl]-4-yl)ethanol (5)



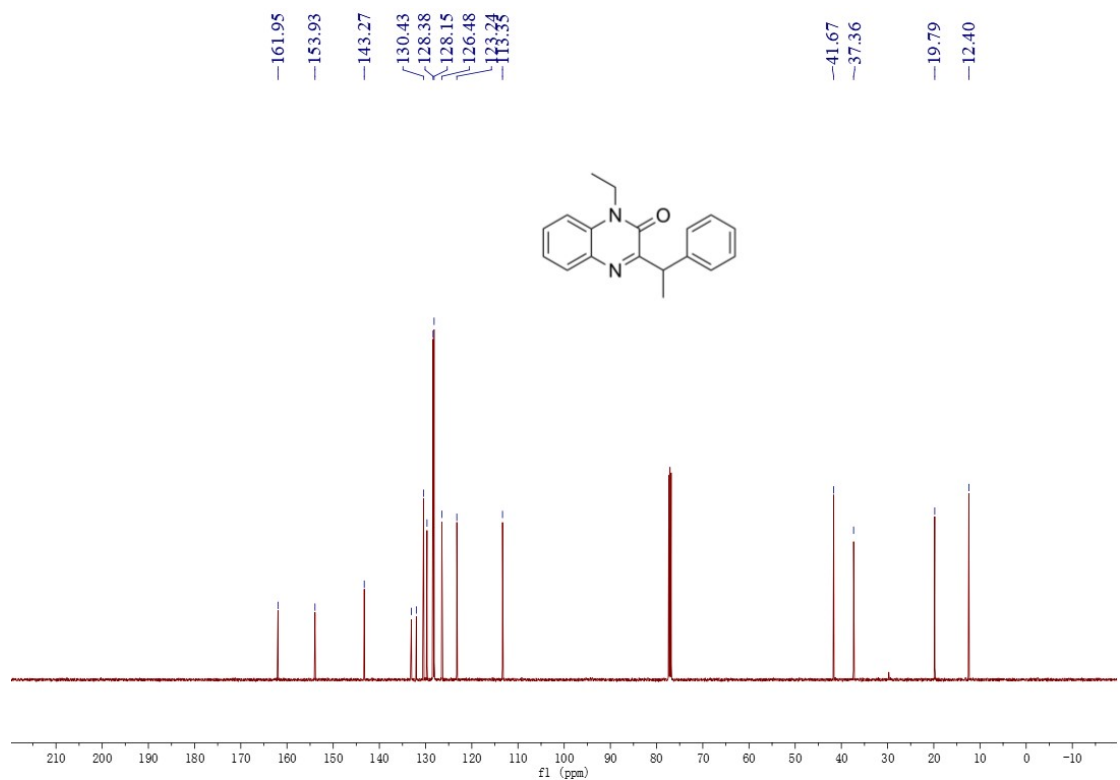
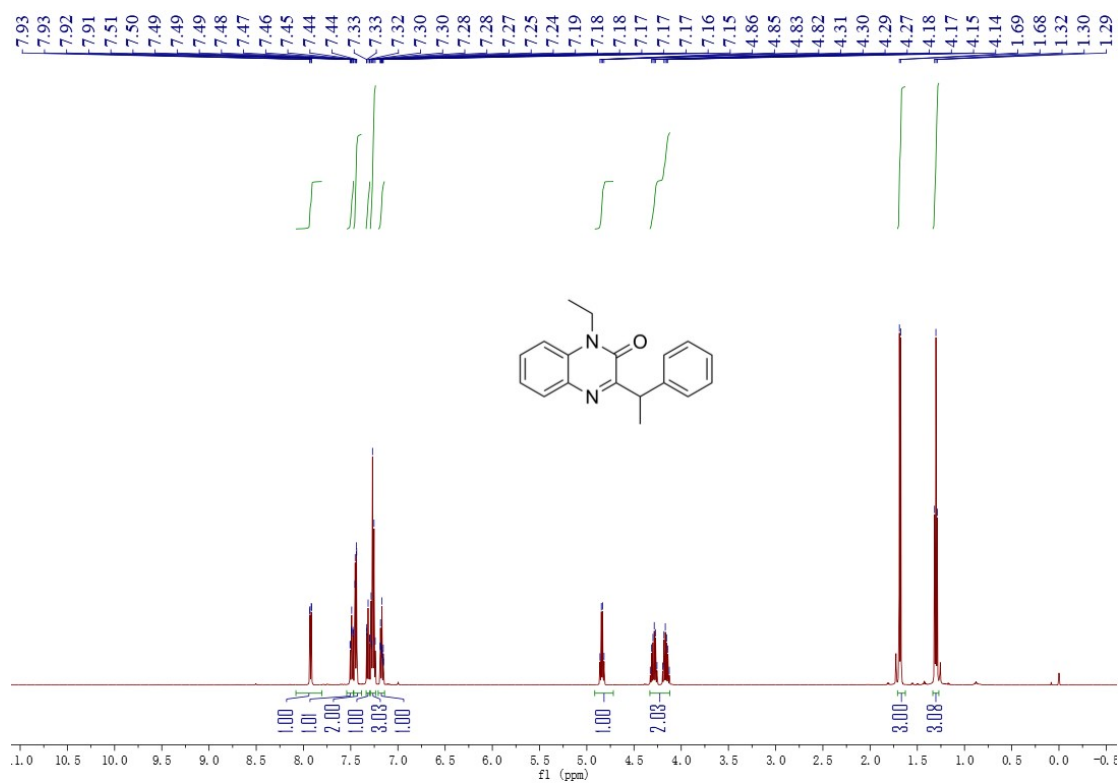
White solid (69.3 mg, 70%). ^1H NMR (500 MHz, CDCl_3) δ 7.63 – 7.54 (m, 4H), 7.49 – 7.38 (m, 4H), 7.37 – 7.31 (m, 1H), 4.94 (q, $J = 6.4$ Hz, 1H), 1.93 (s, 1H), 1.53 (d, $J = 6.5$ Hz, 3H).

NMR spectra of products

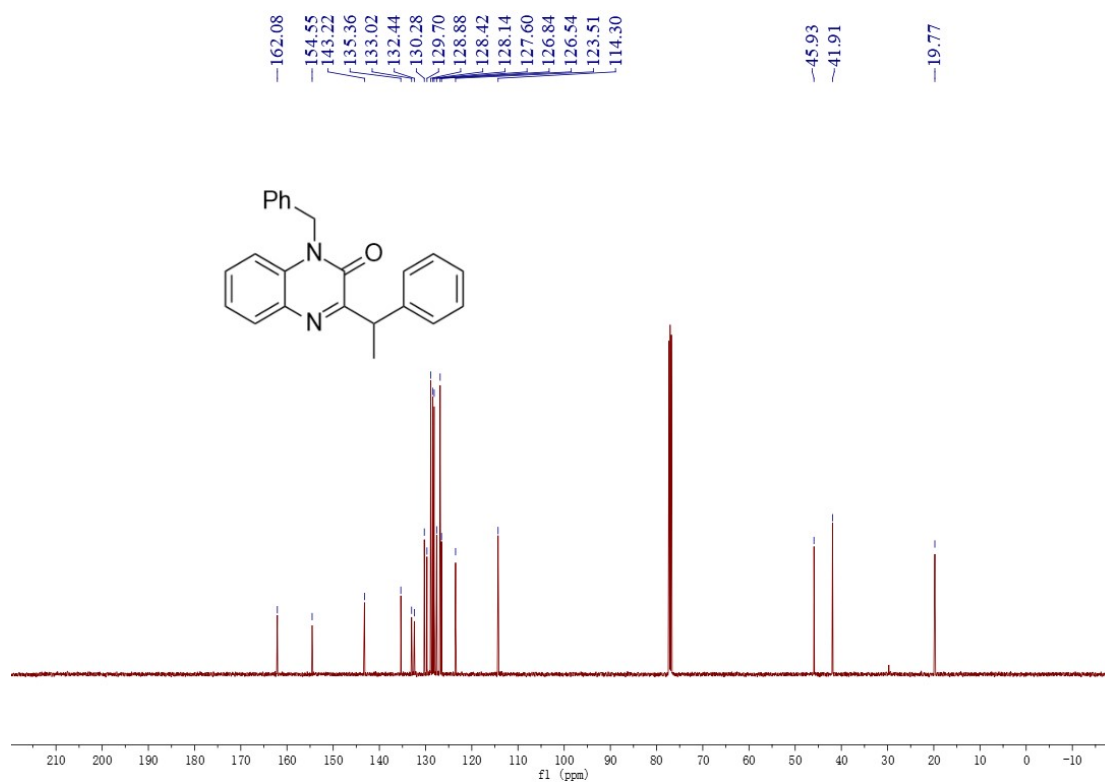
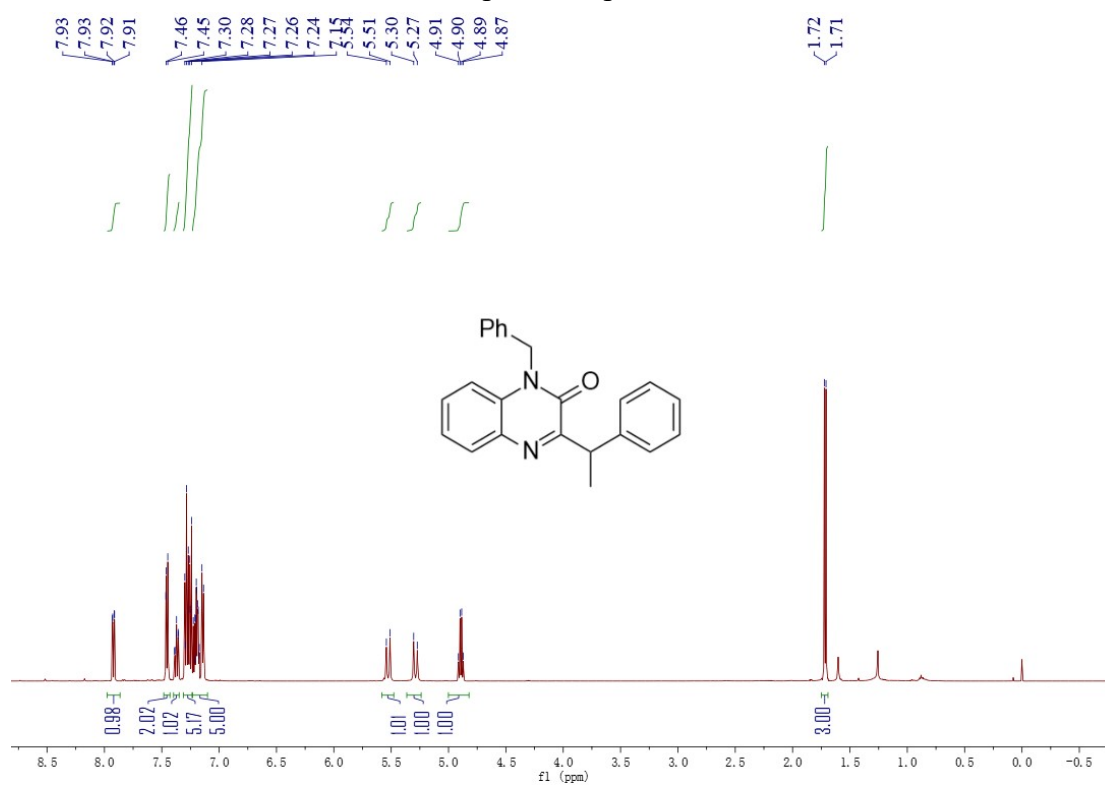
NMR spectra of product 3a



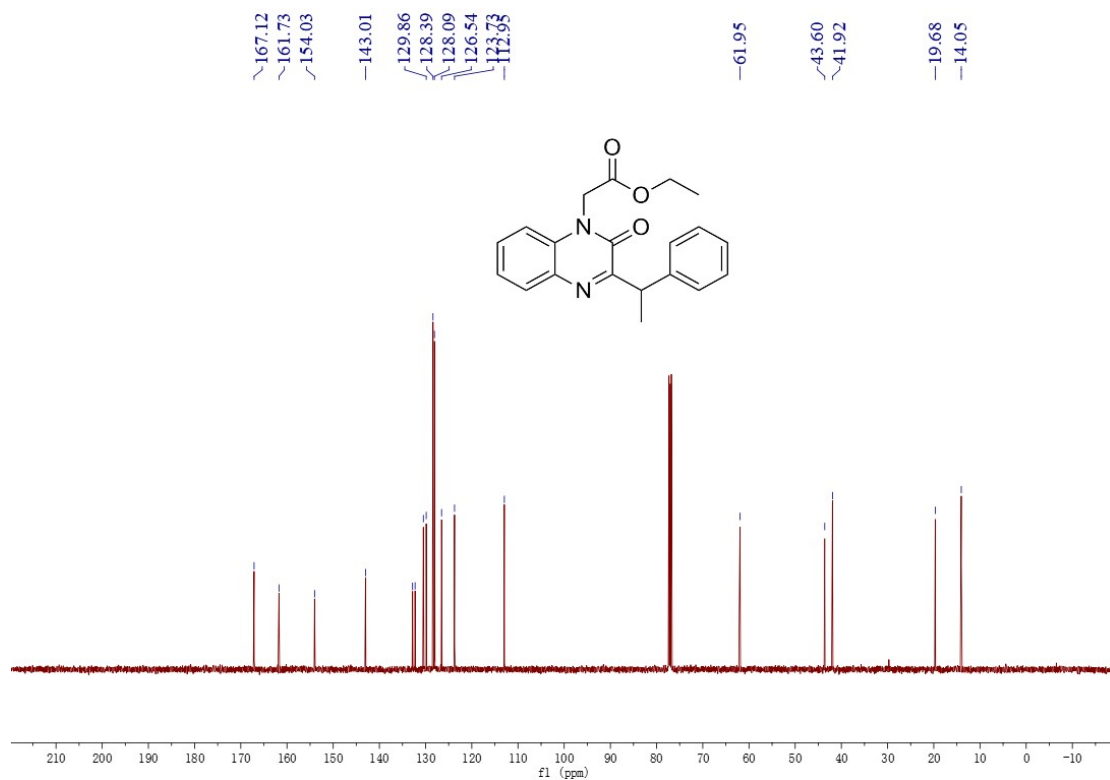
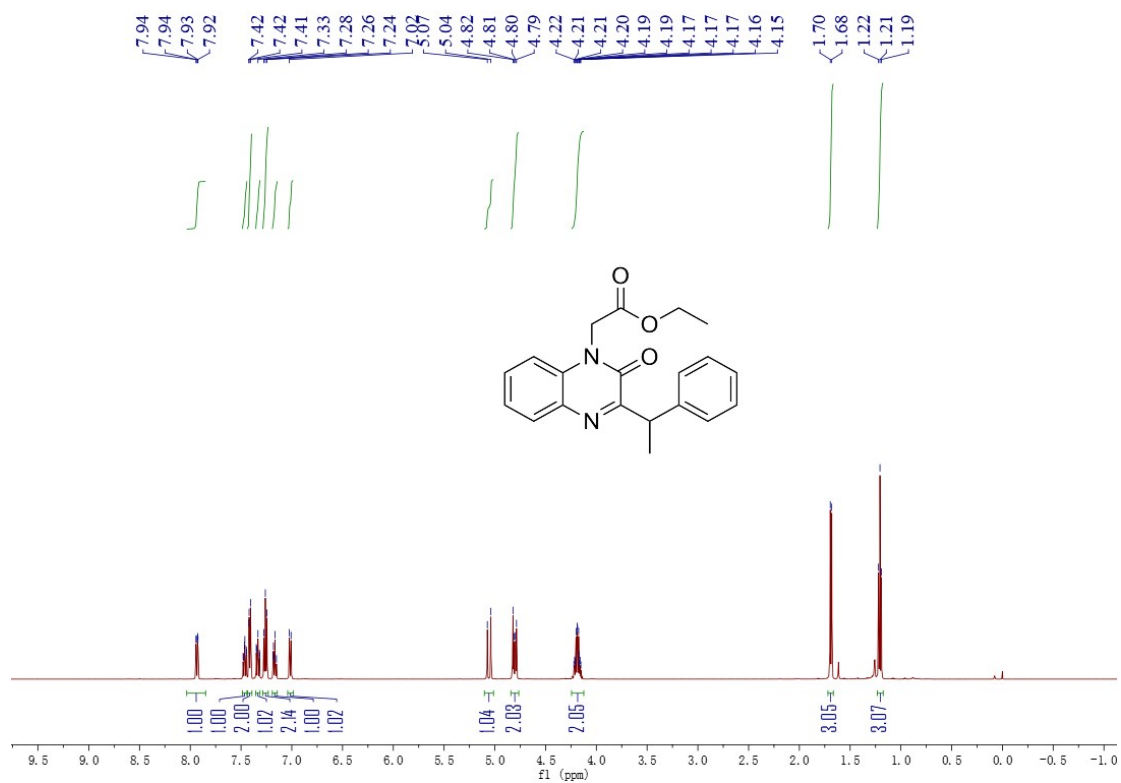
NMR spectra of product 3b



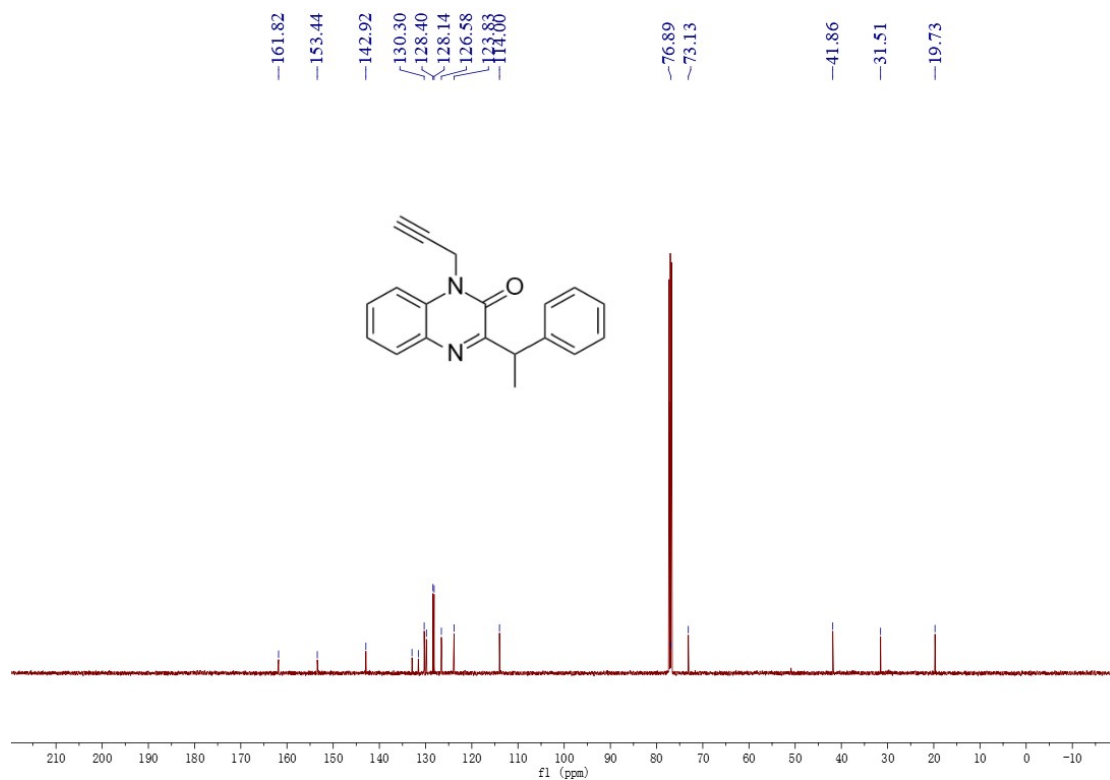
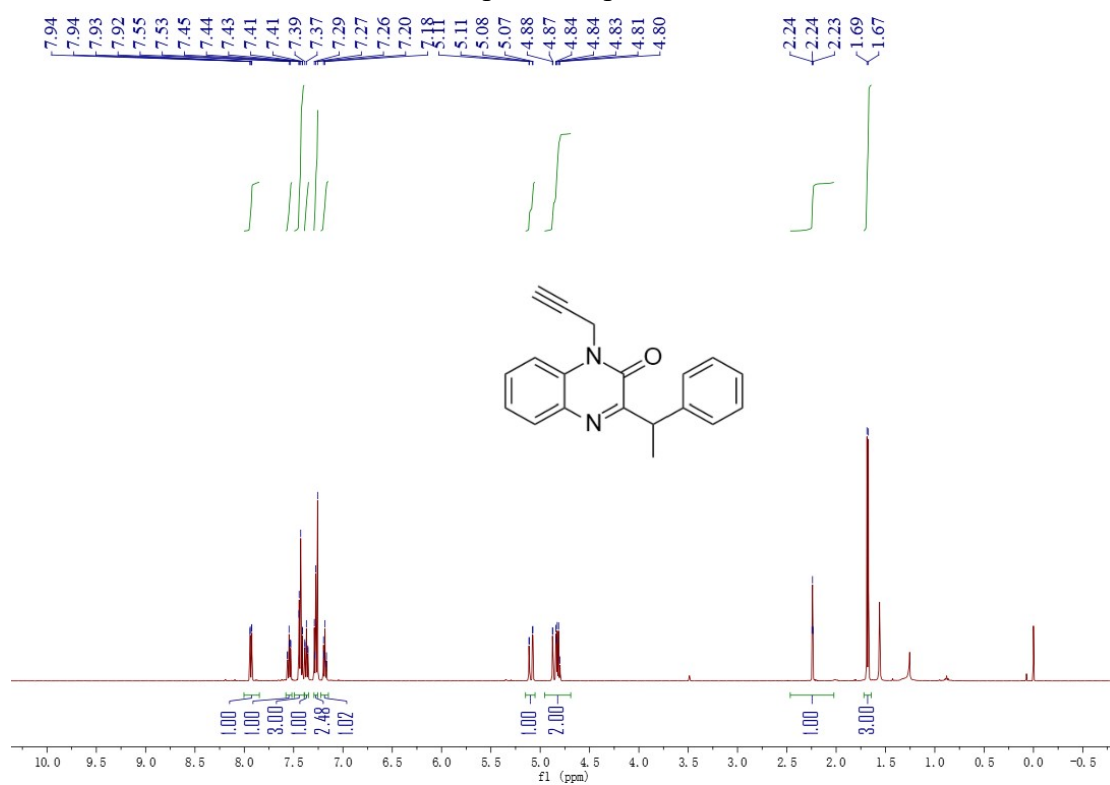
NMR spectra of product 3c



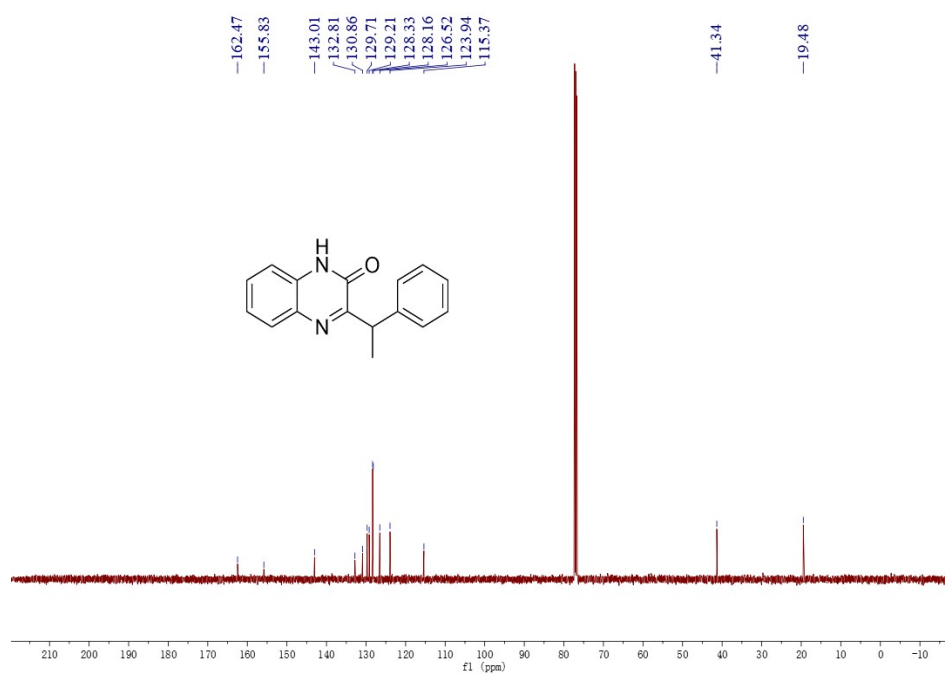
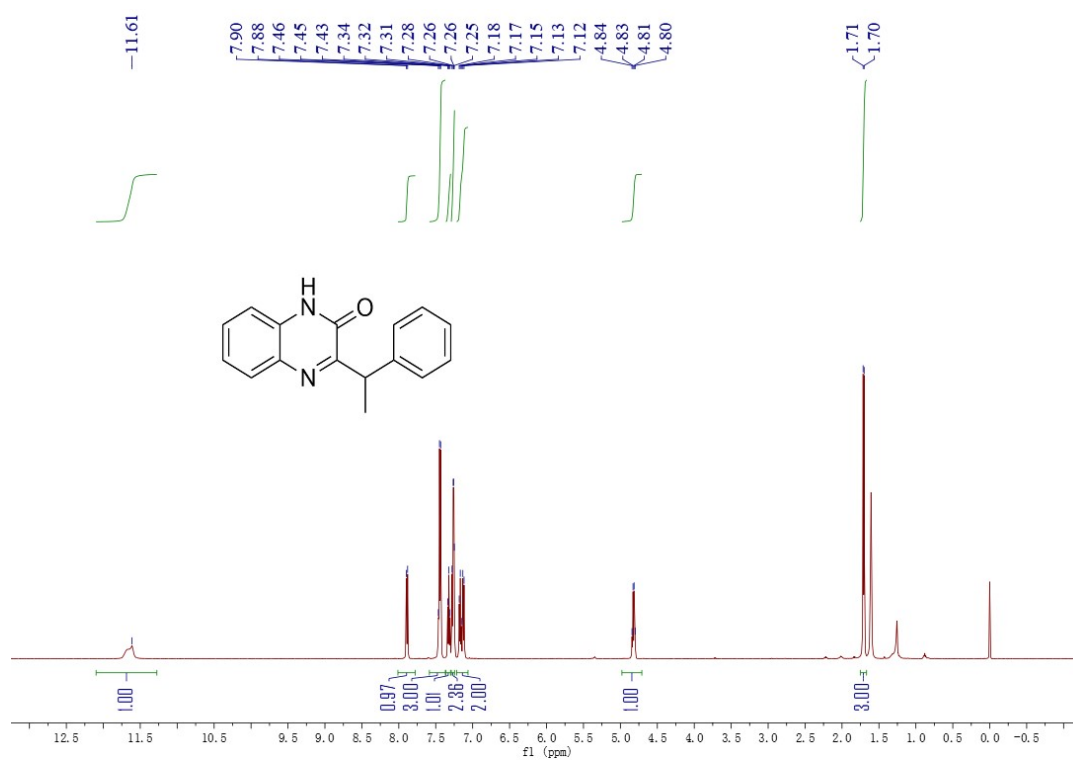
NMR spectra of product 3d



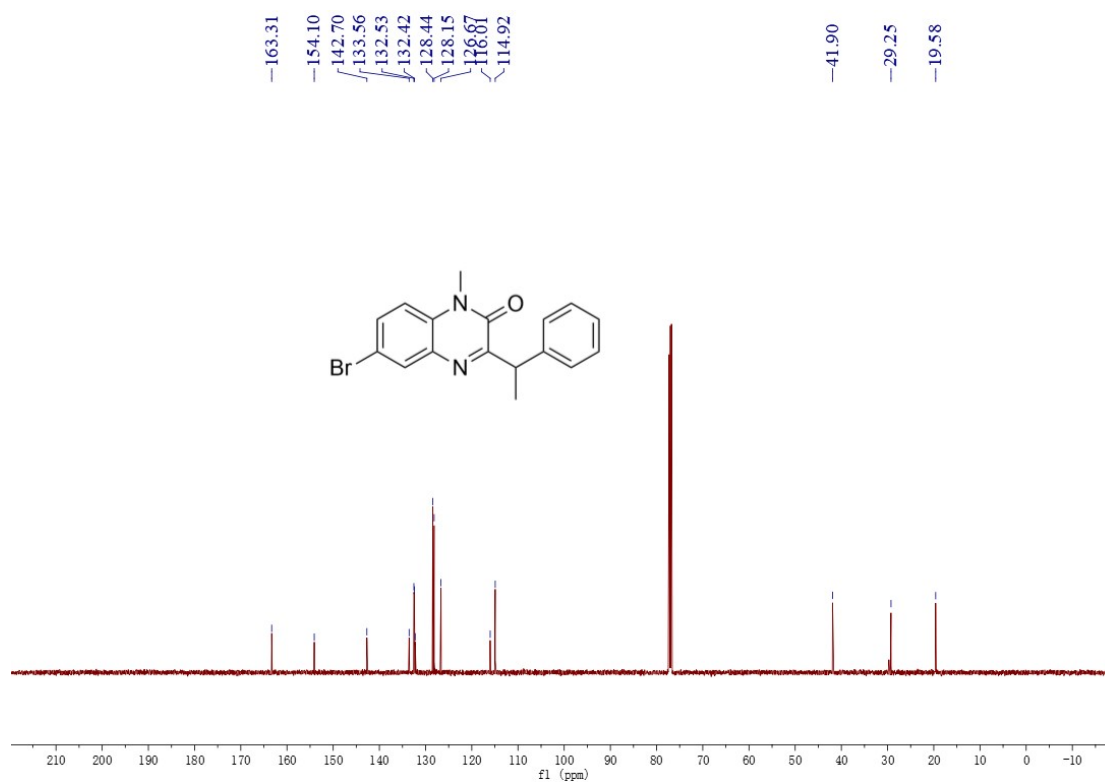
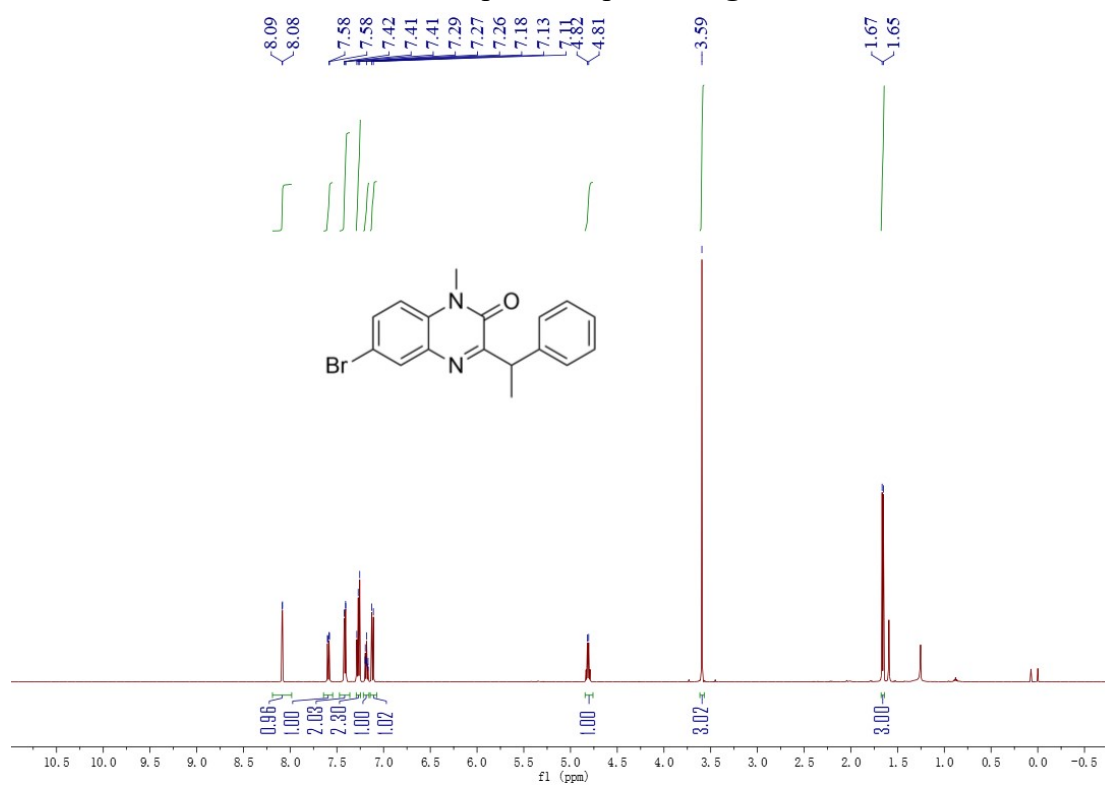
NMR spectra of product 3e



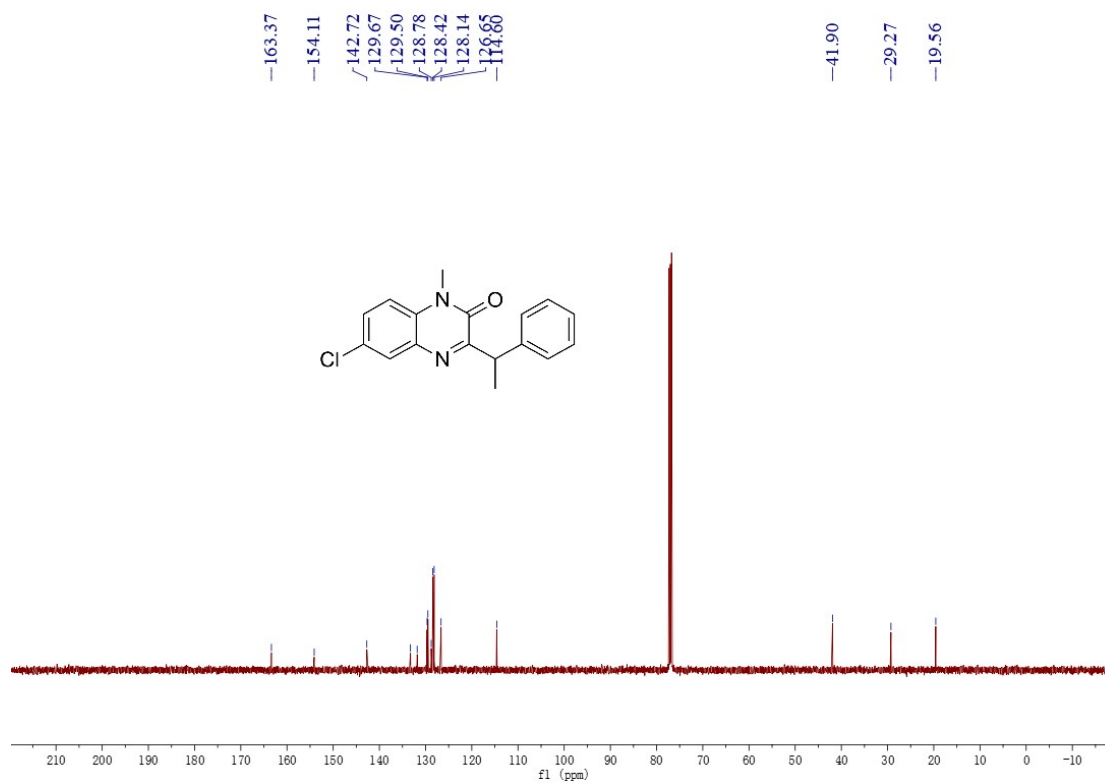
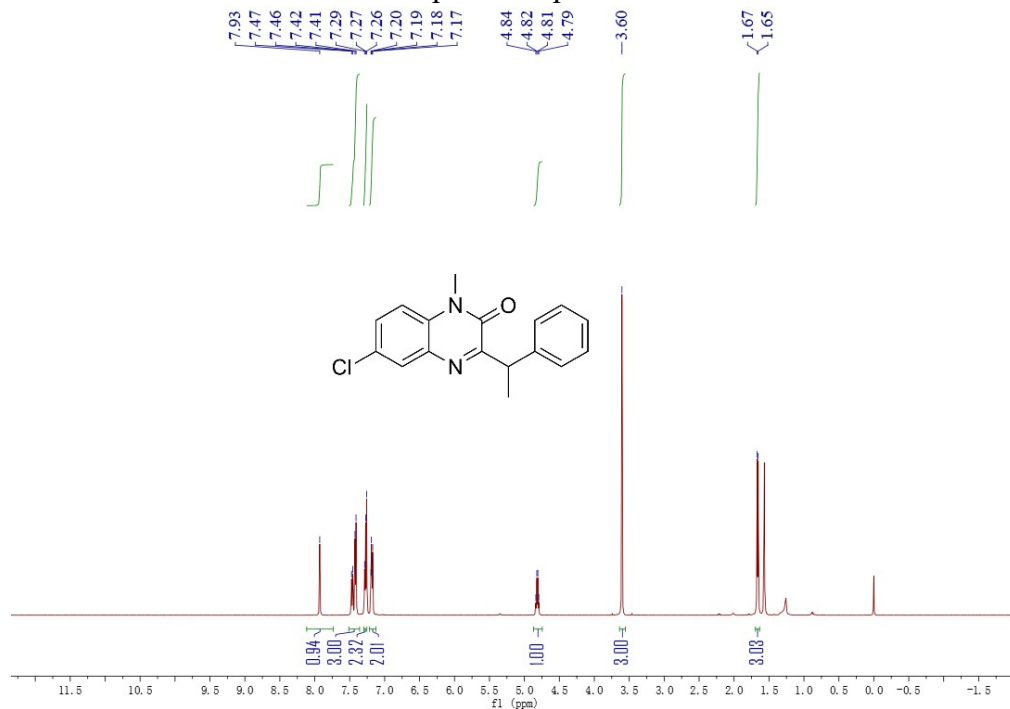
NMR spectra of product **3f**



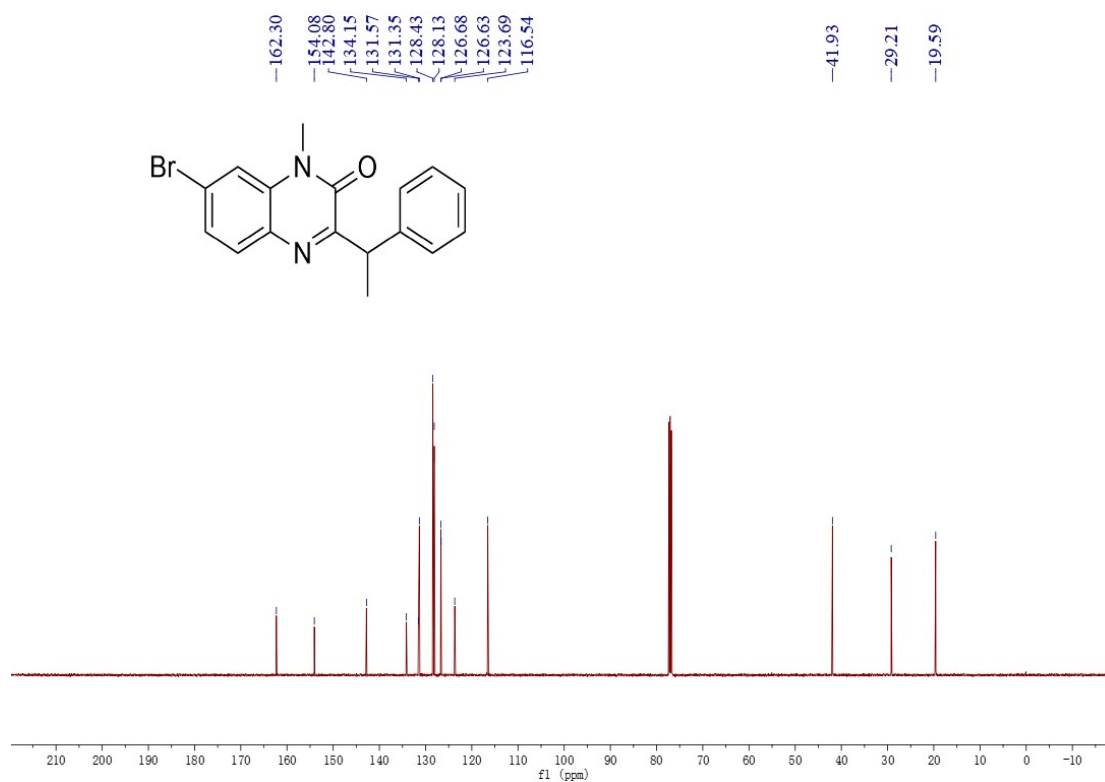
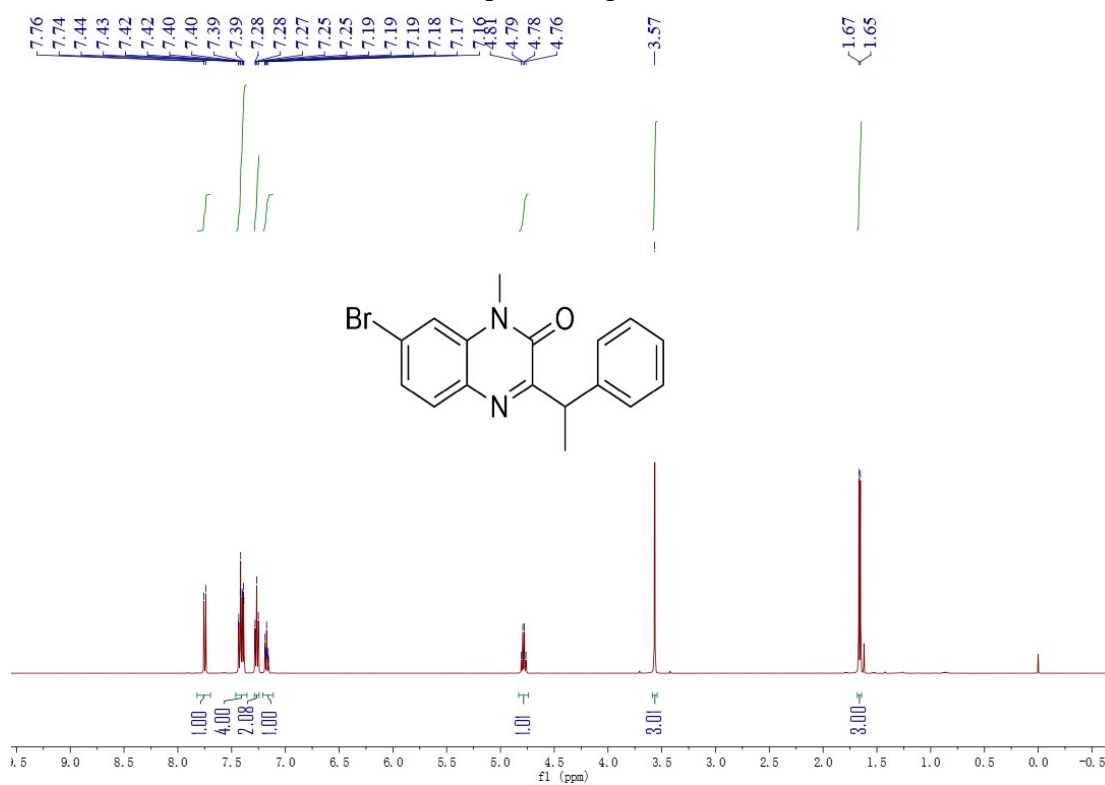
NMR spectra of product **3g**



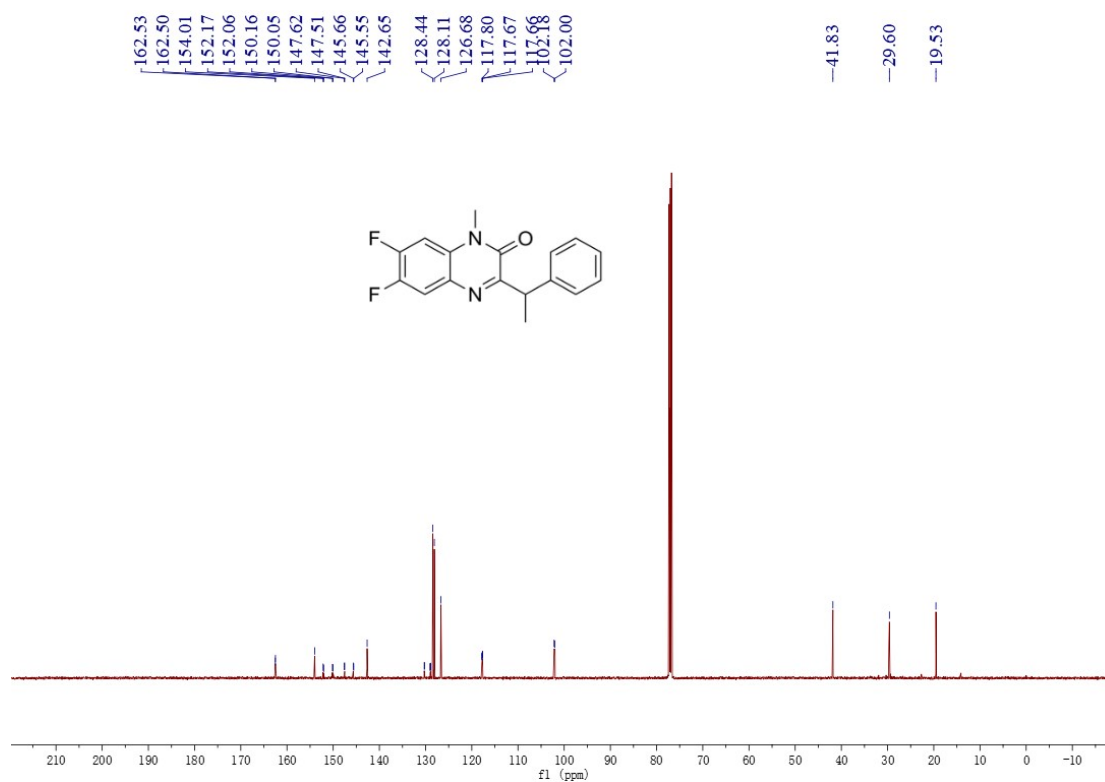
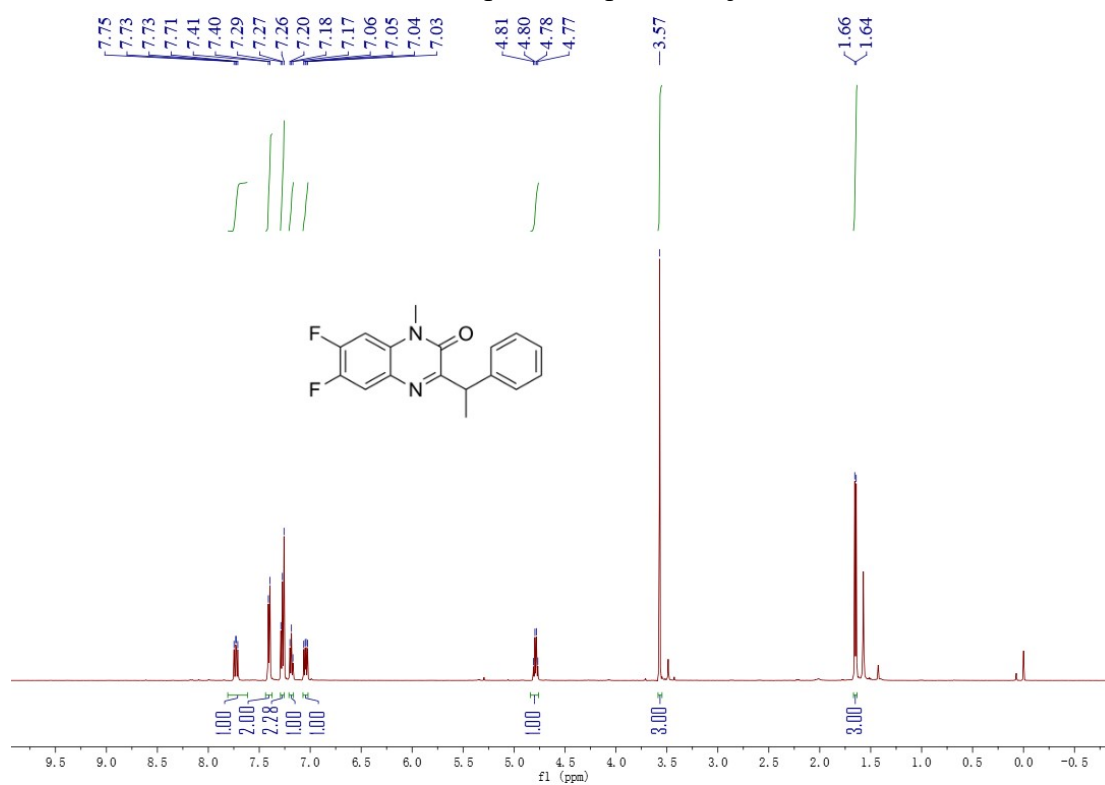
NMR spectra of product 3h



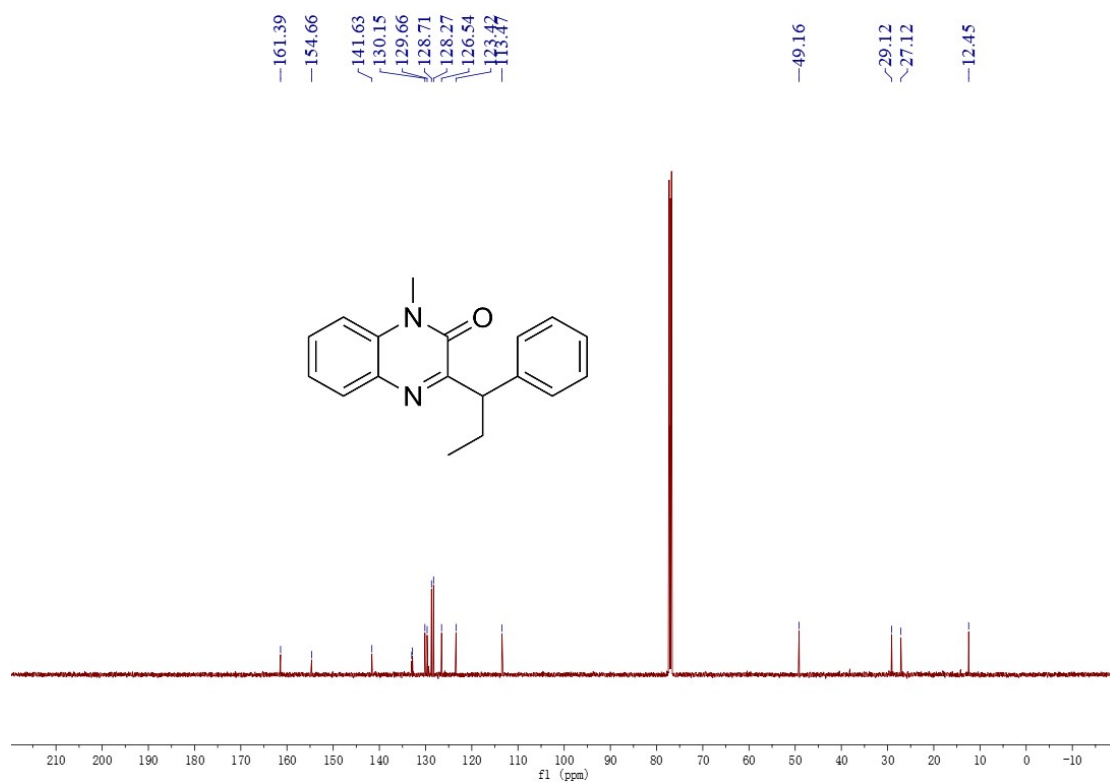
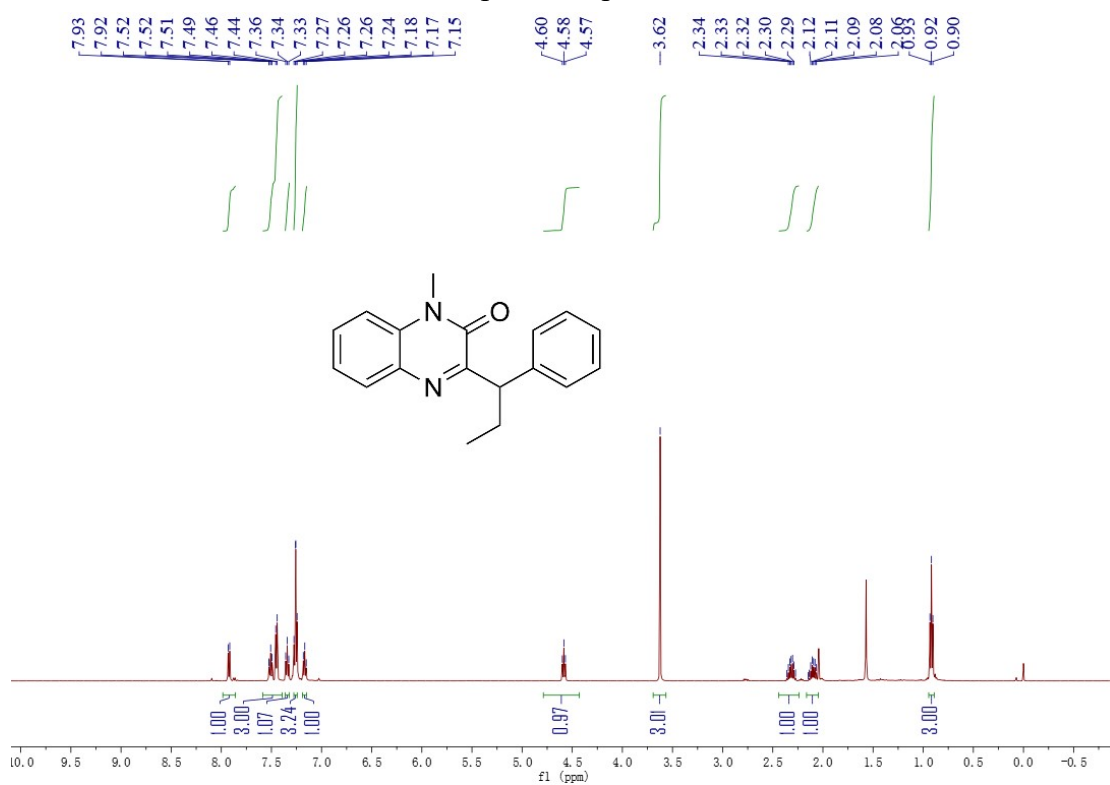
NMR spectra of product **3i**



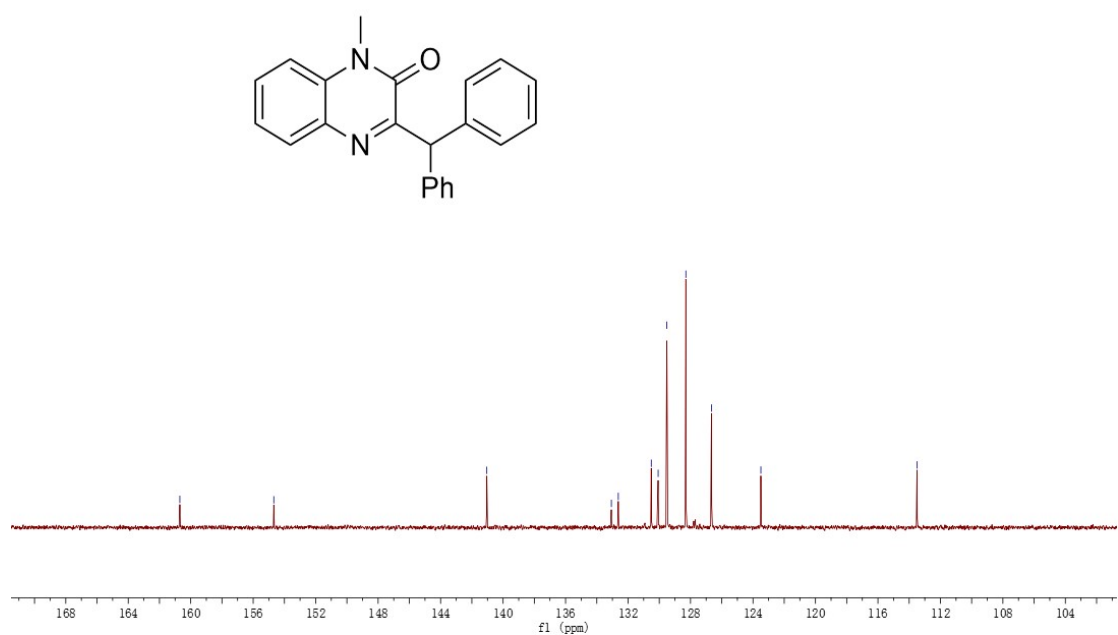
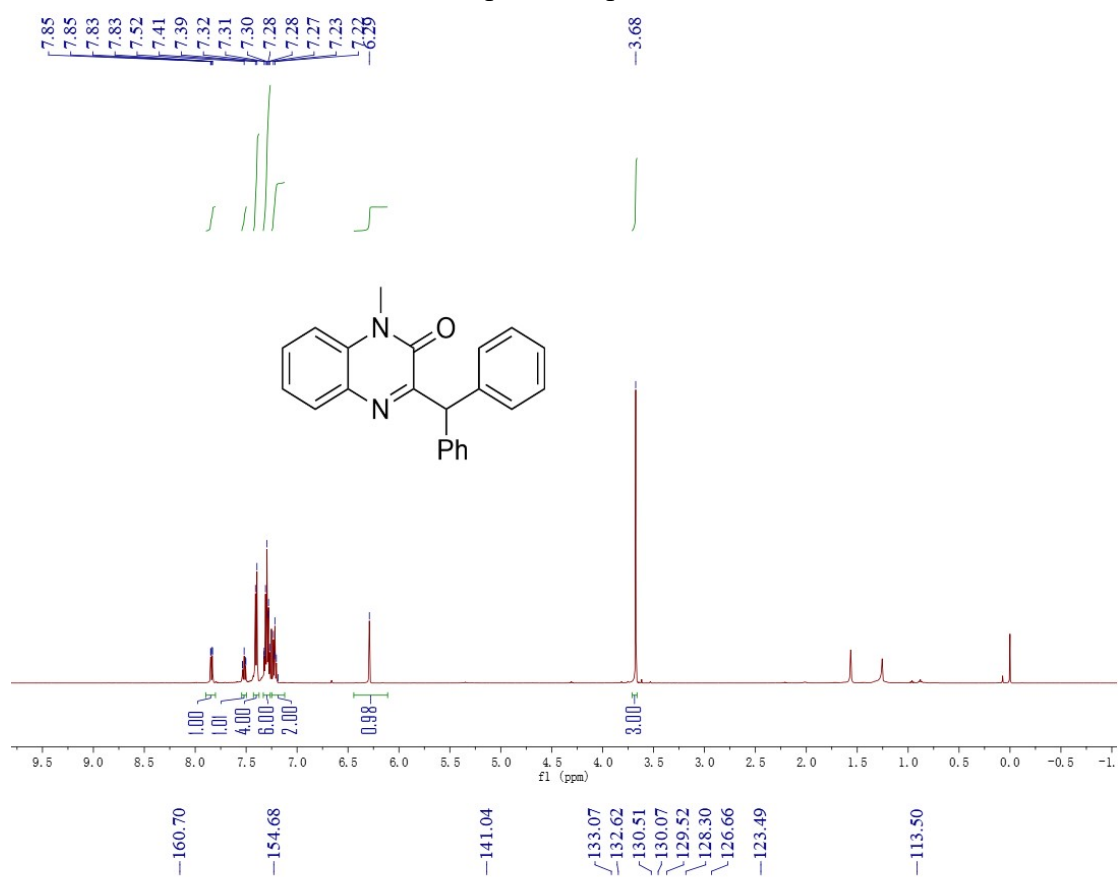
NMR spectra of product **3j**



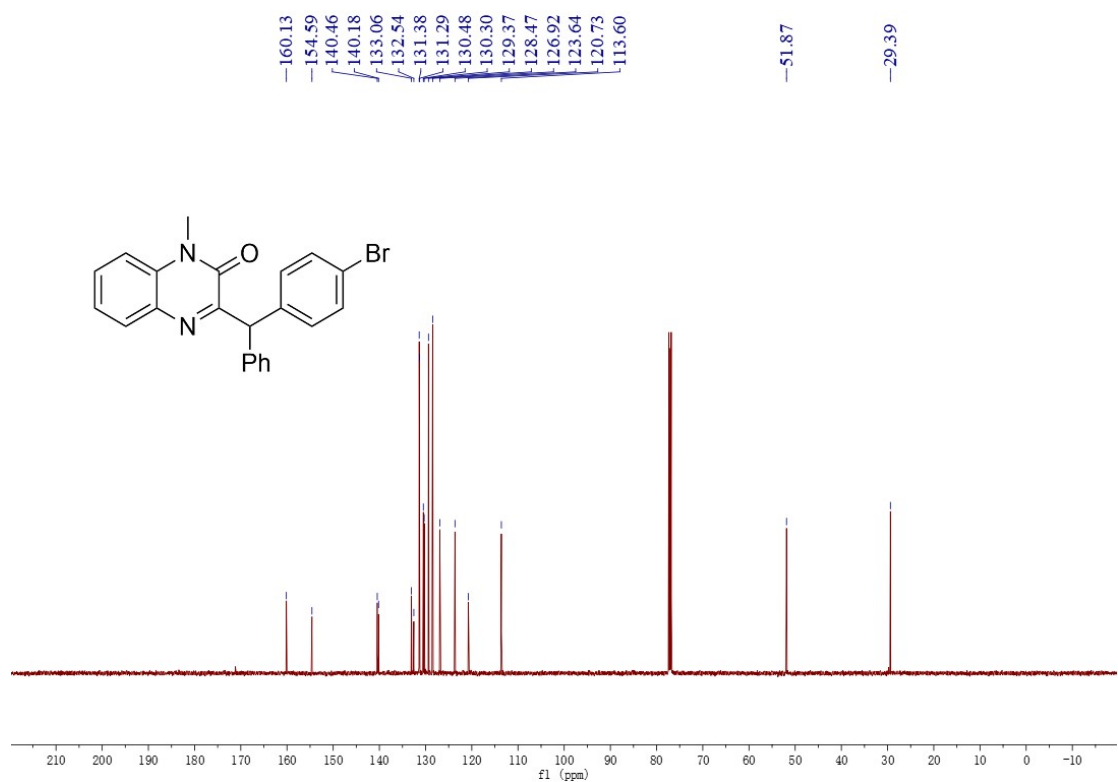
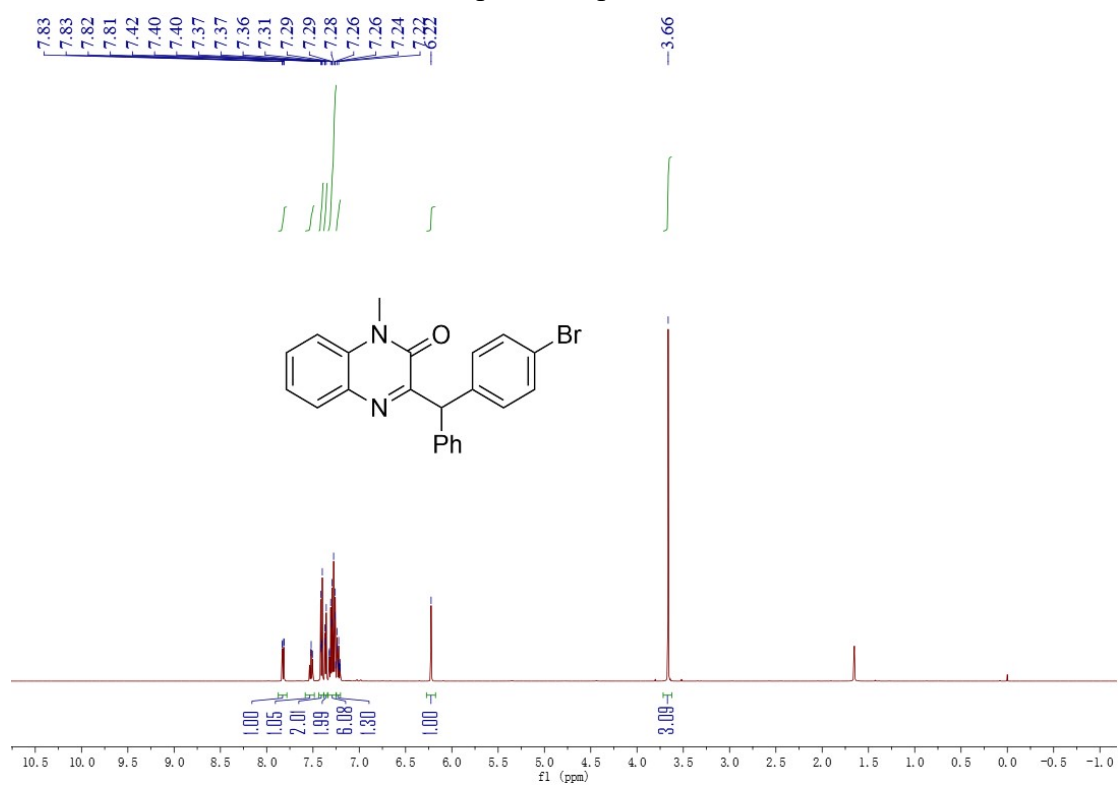
NMR spectra of product 3k



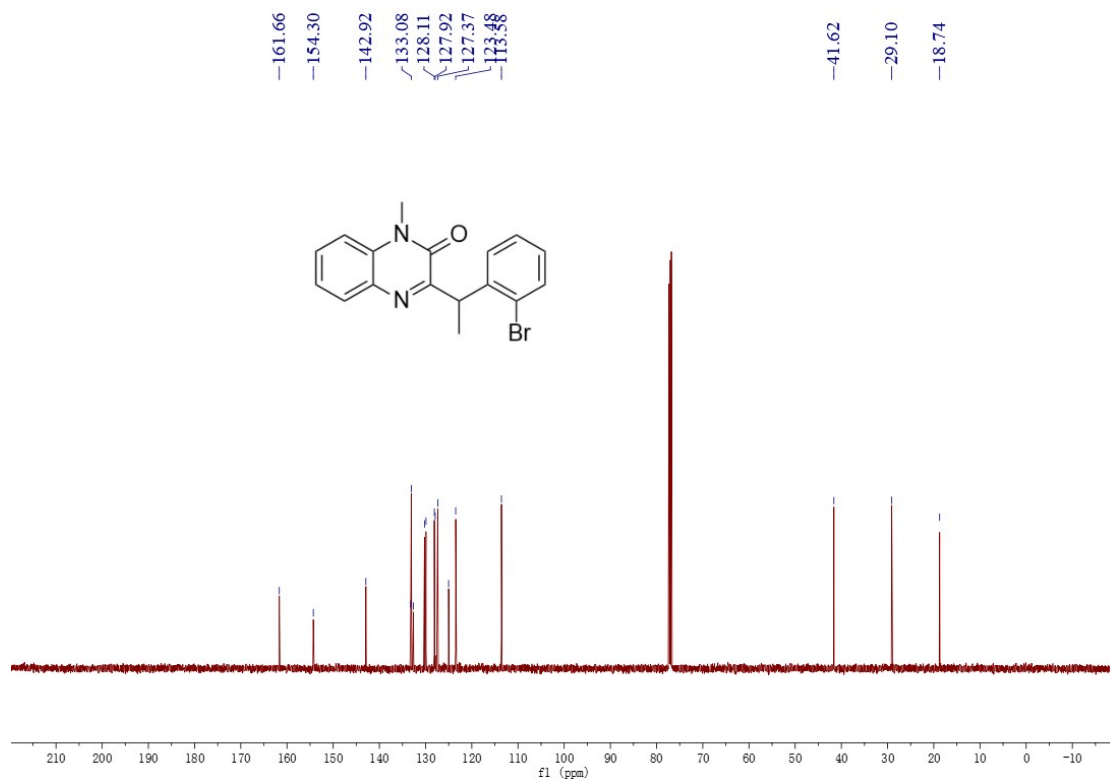
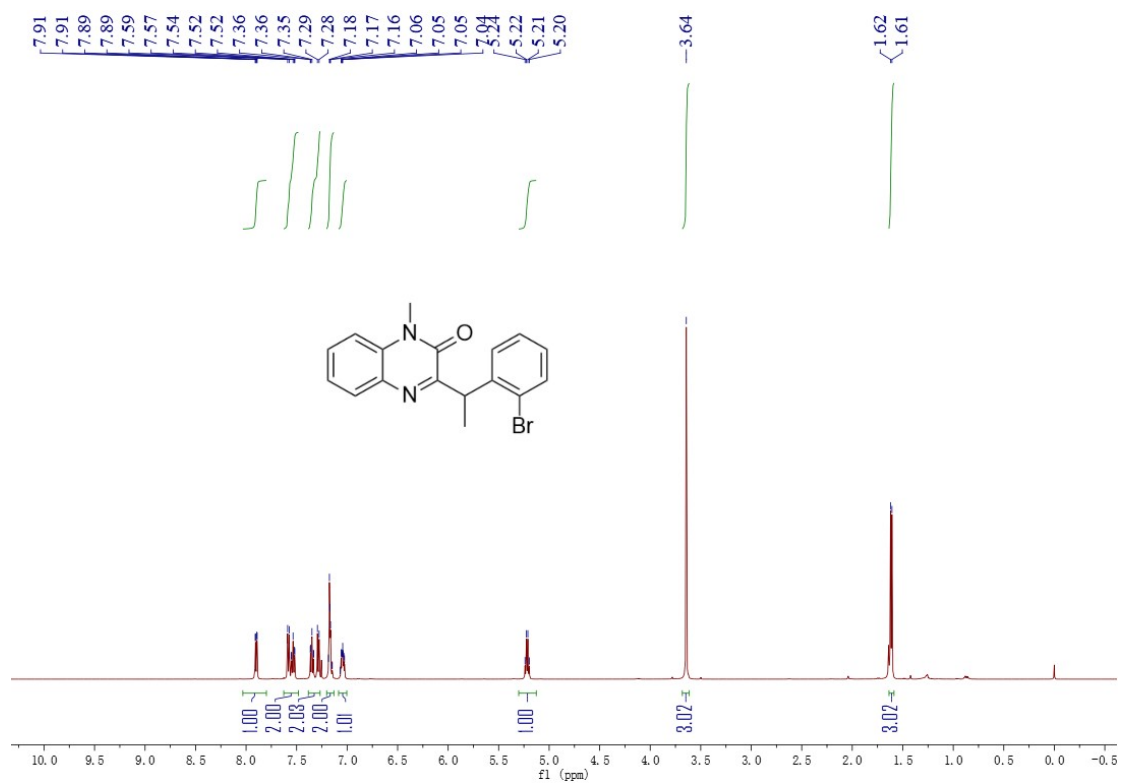
NMR spectra of product **31**



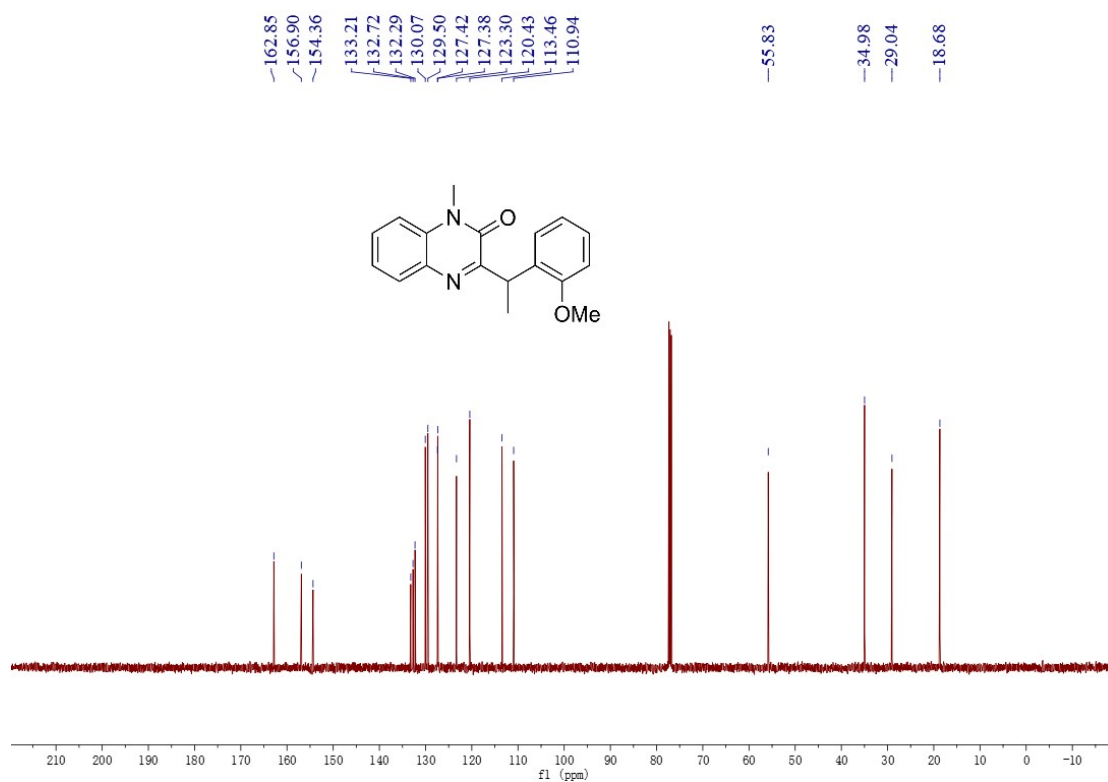
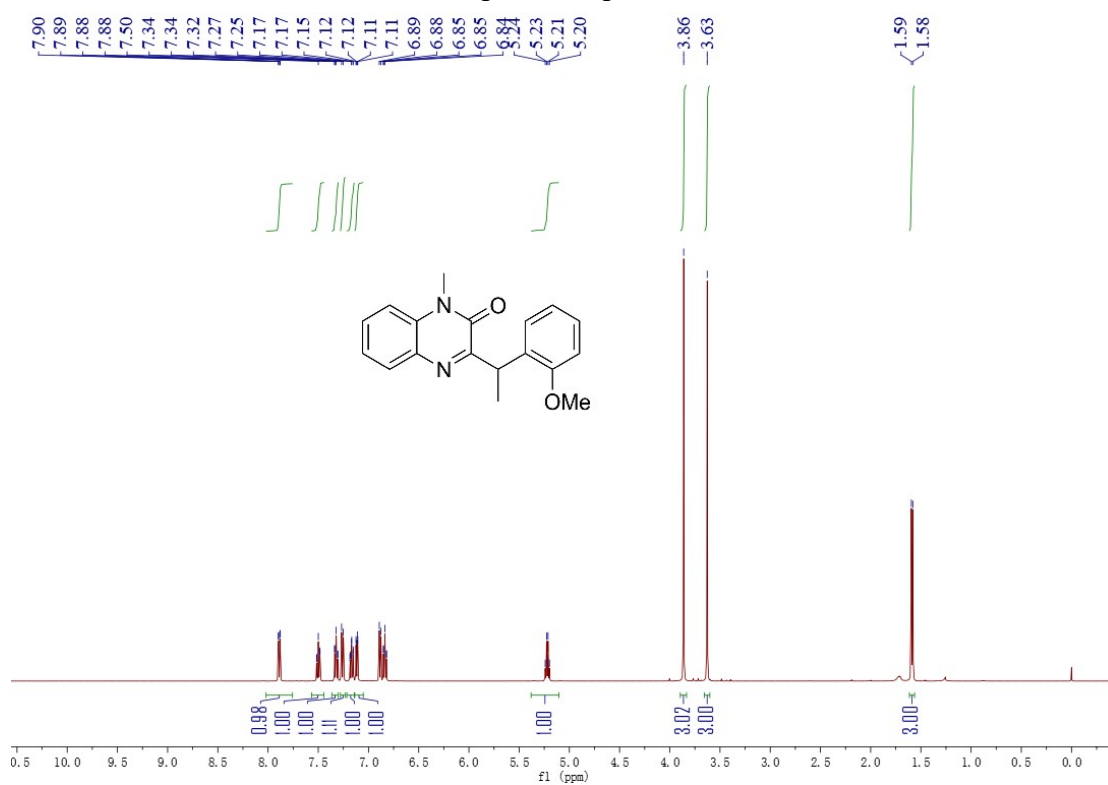
NMR spectra of product **3m**



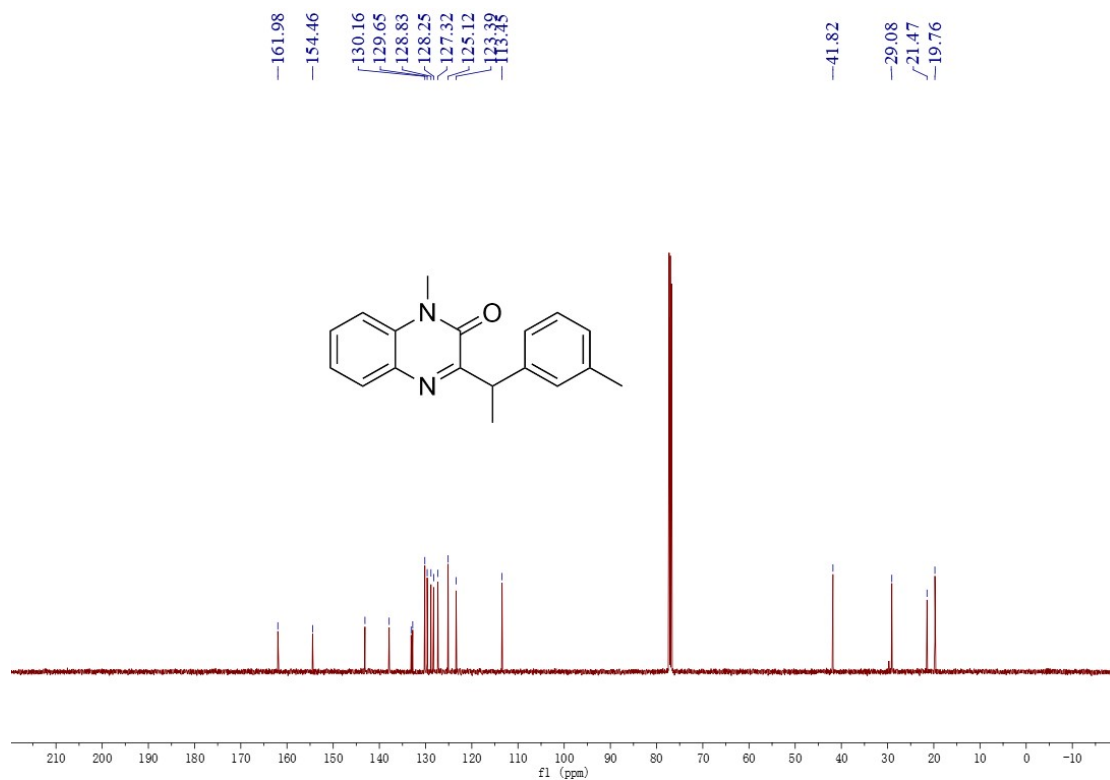
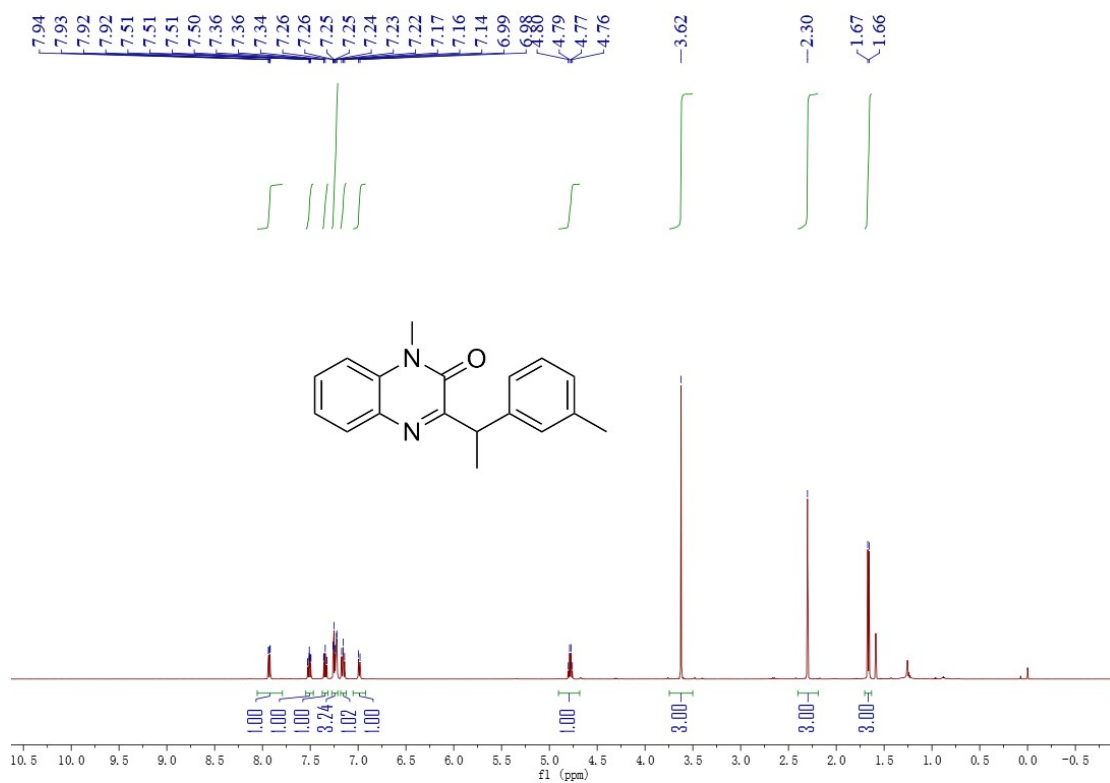
NMR spectra of product 3n



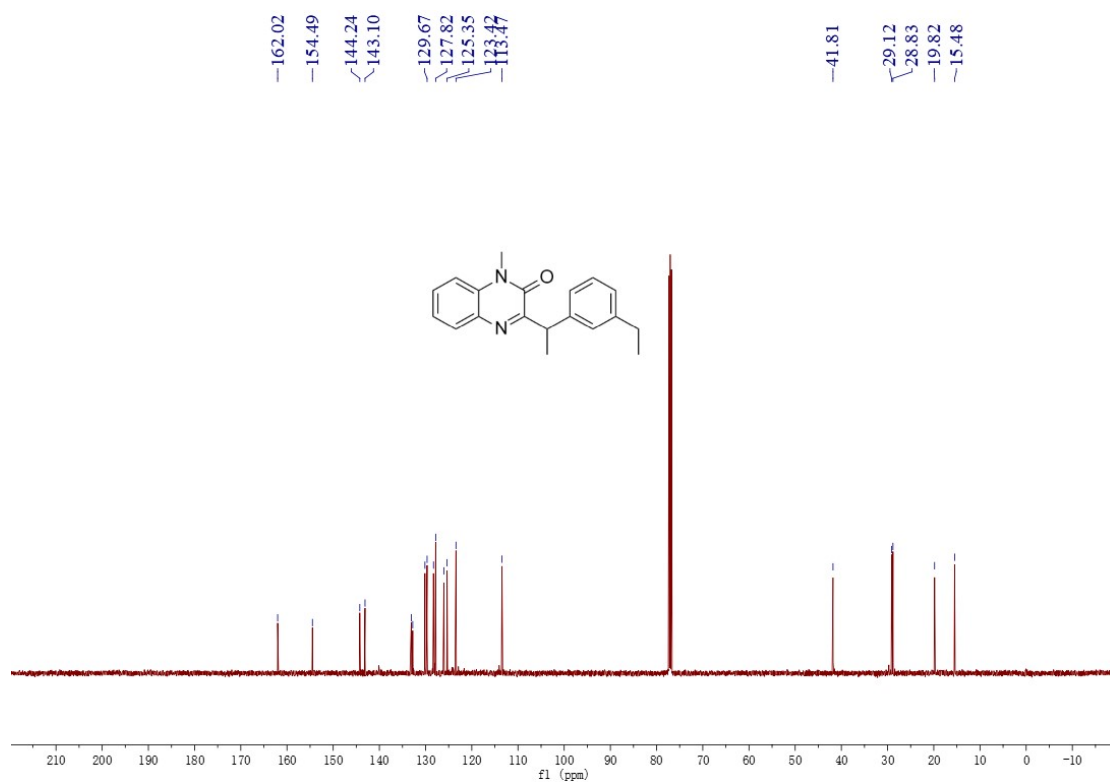
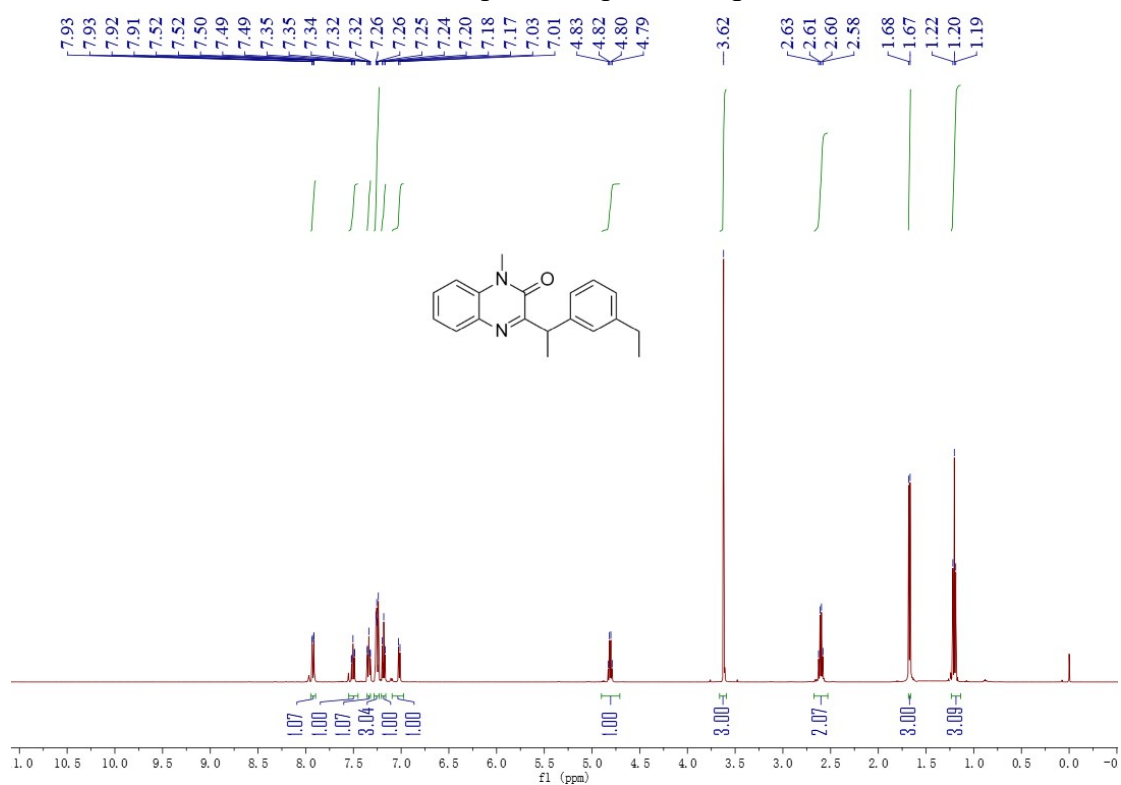
NMR spectra of product **3o**



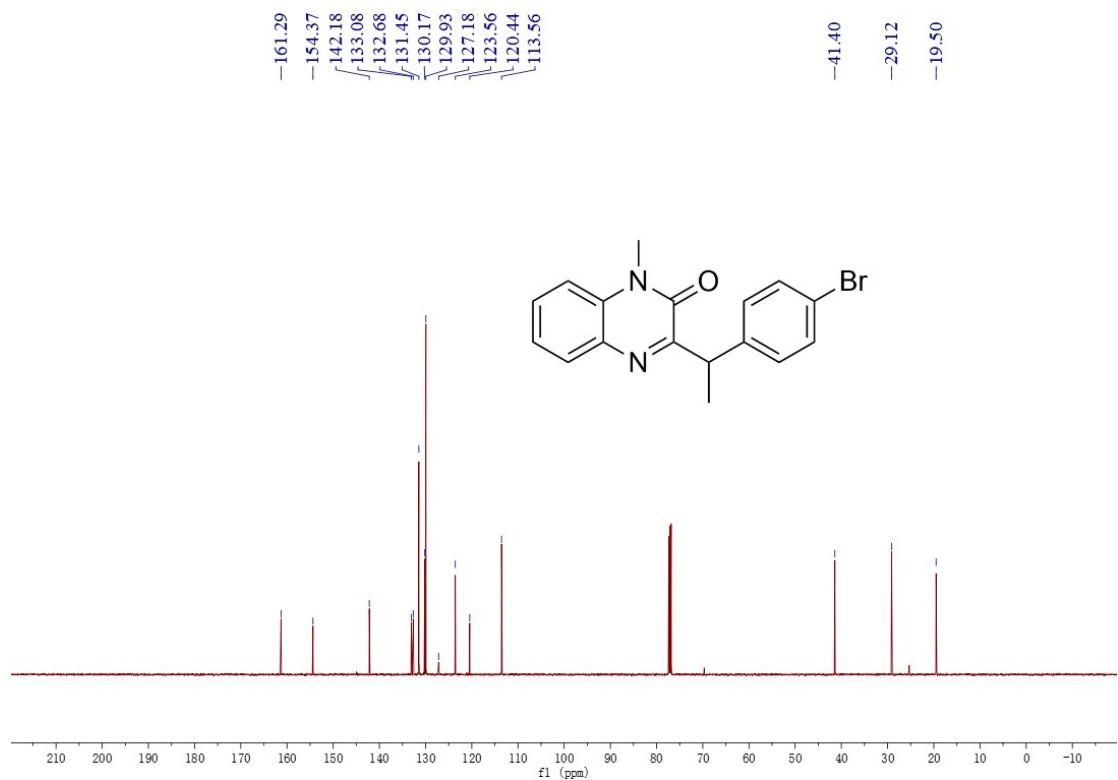
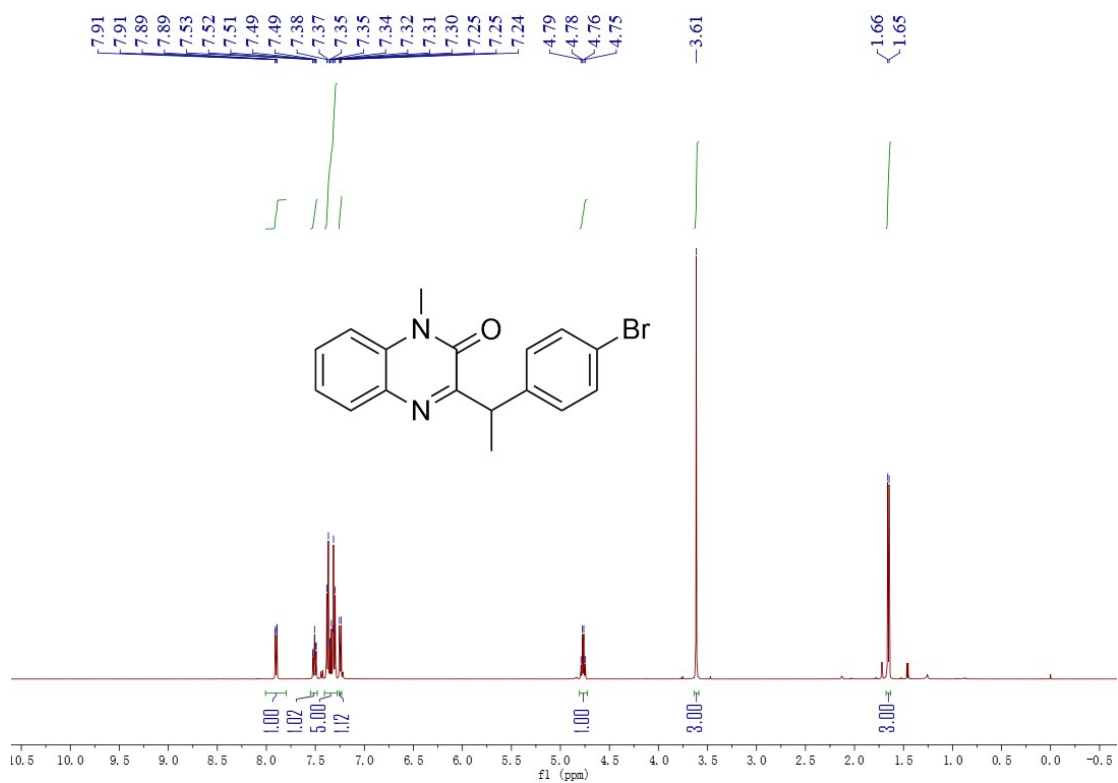
NMR spectra of product 3p



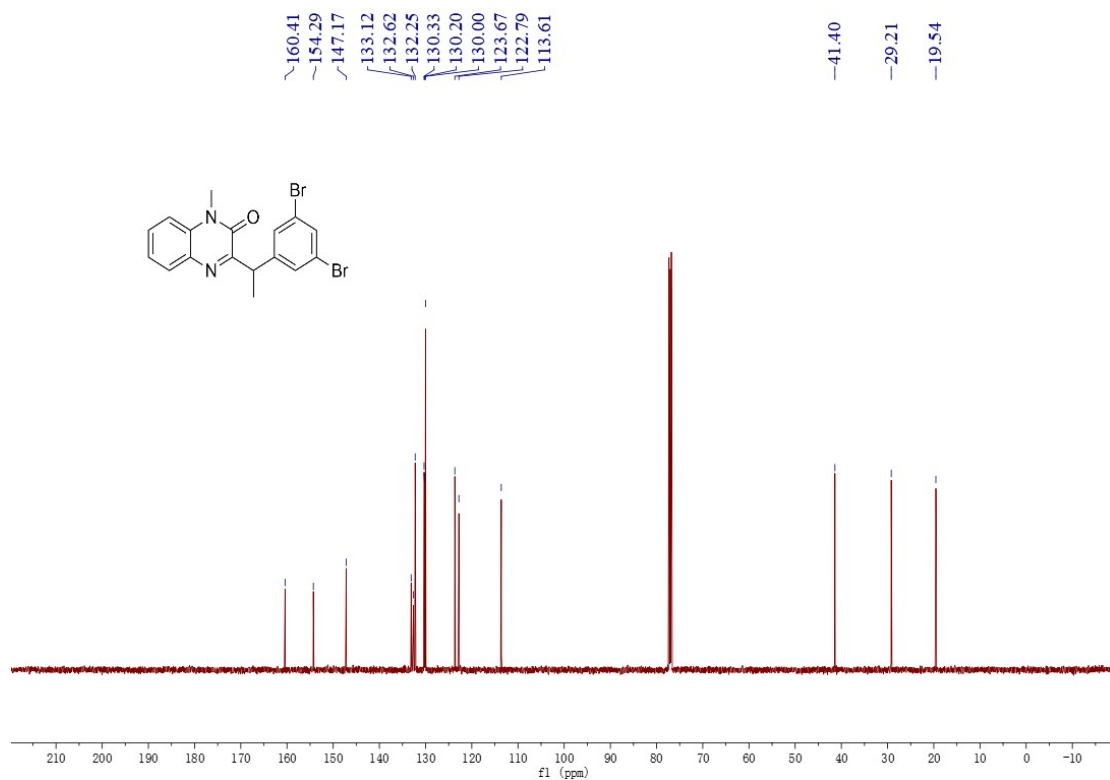
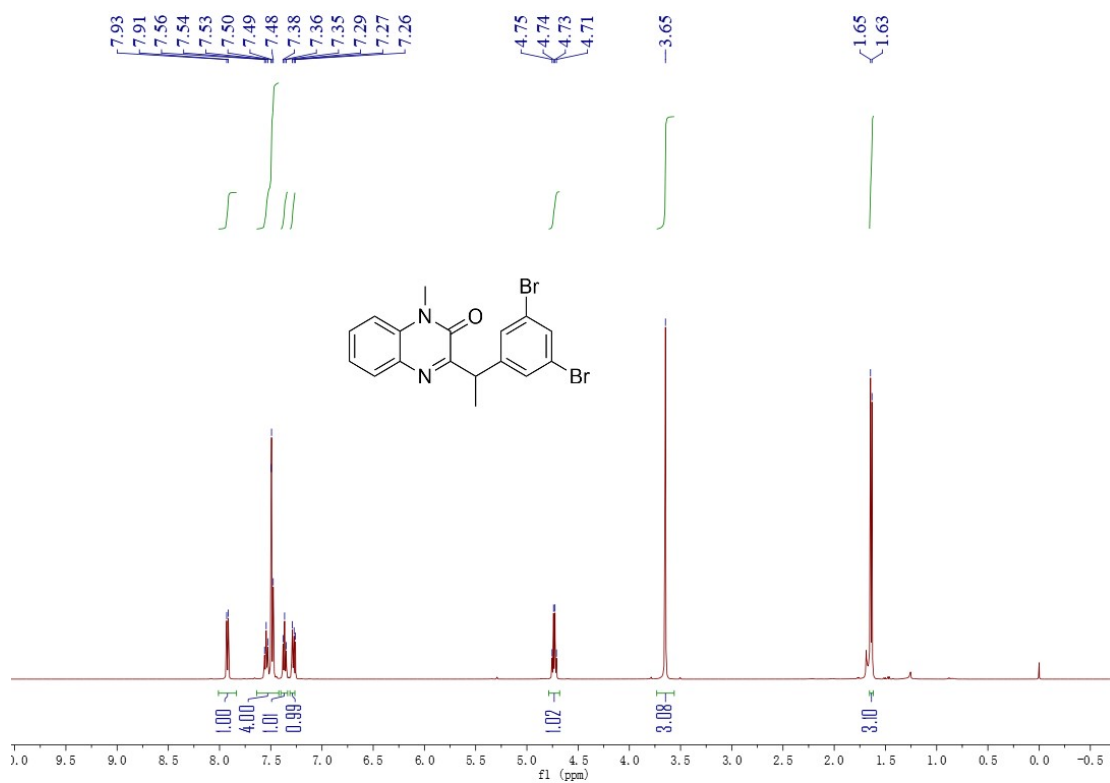
NMR spectra of product 3q



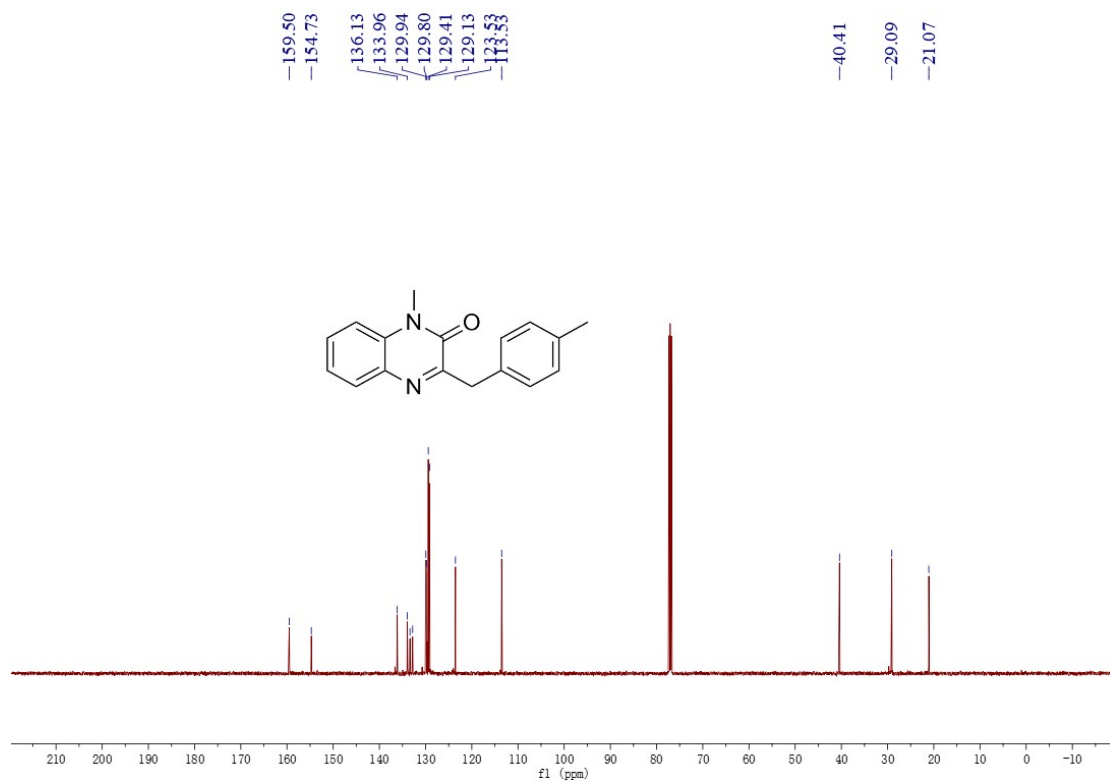
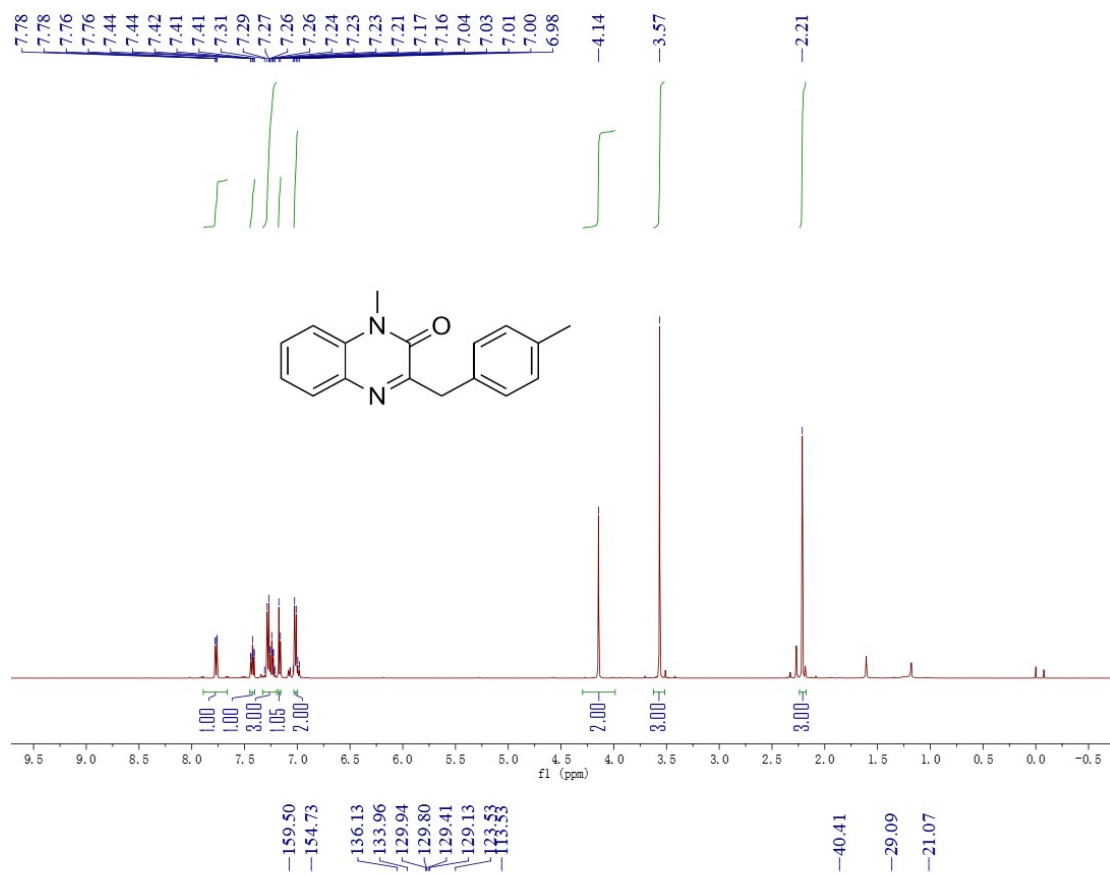
NMR spectra of product 3r



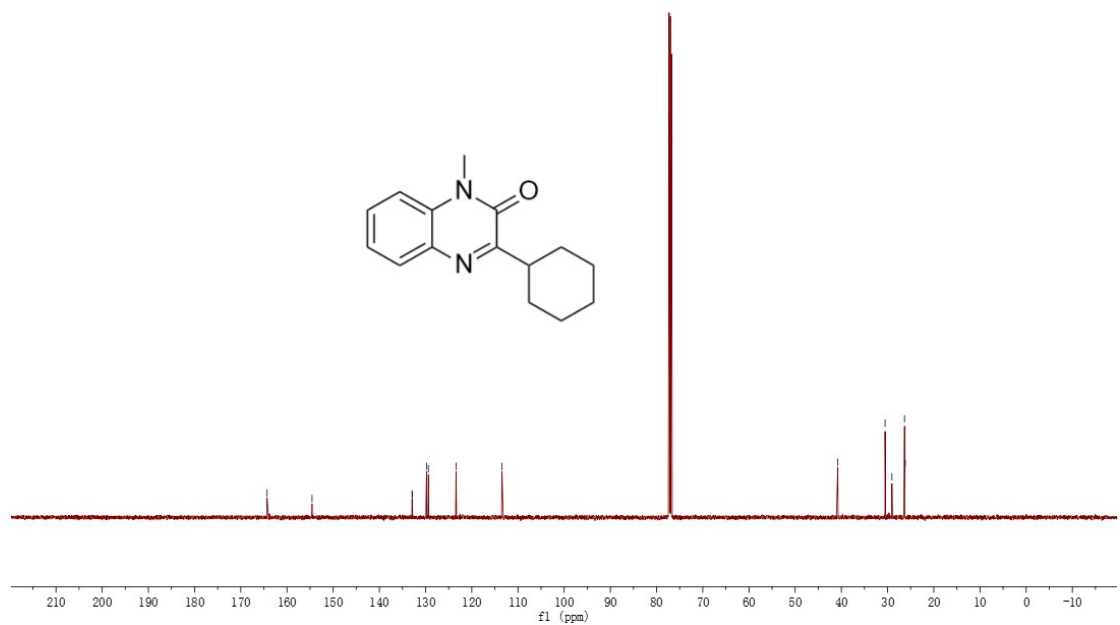
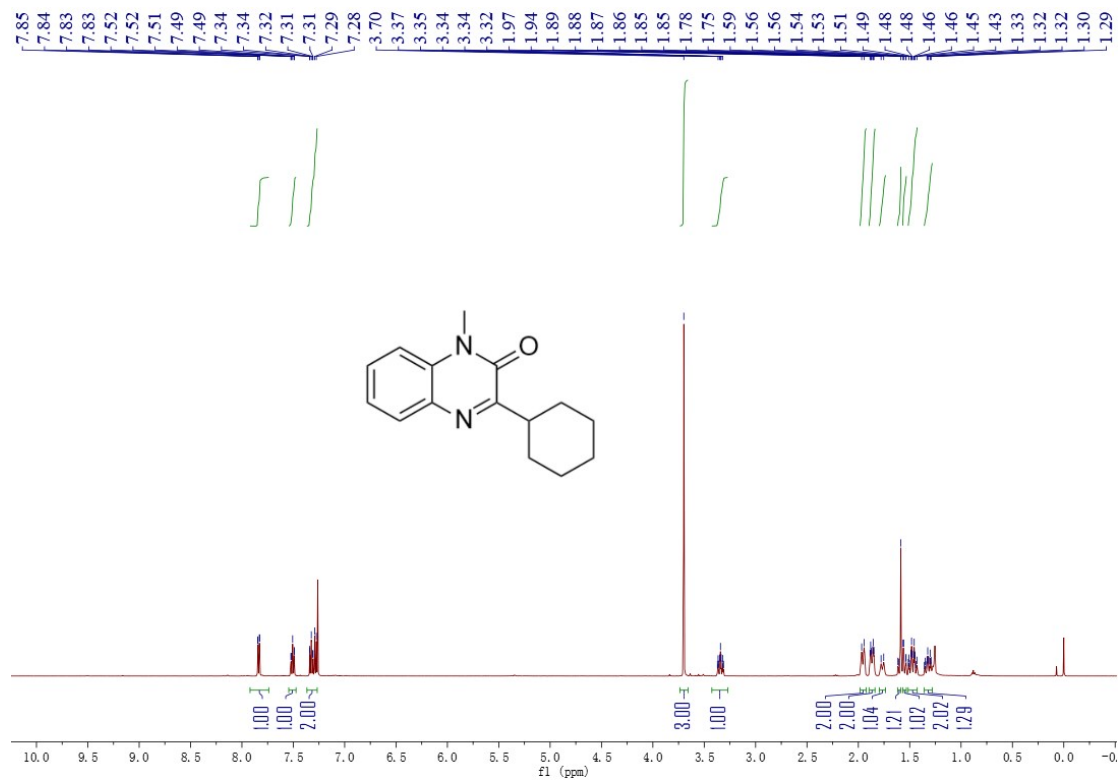
NMR spectra of product 3s



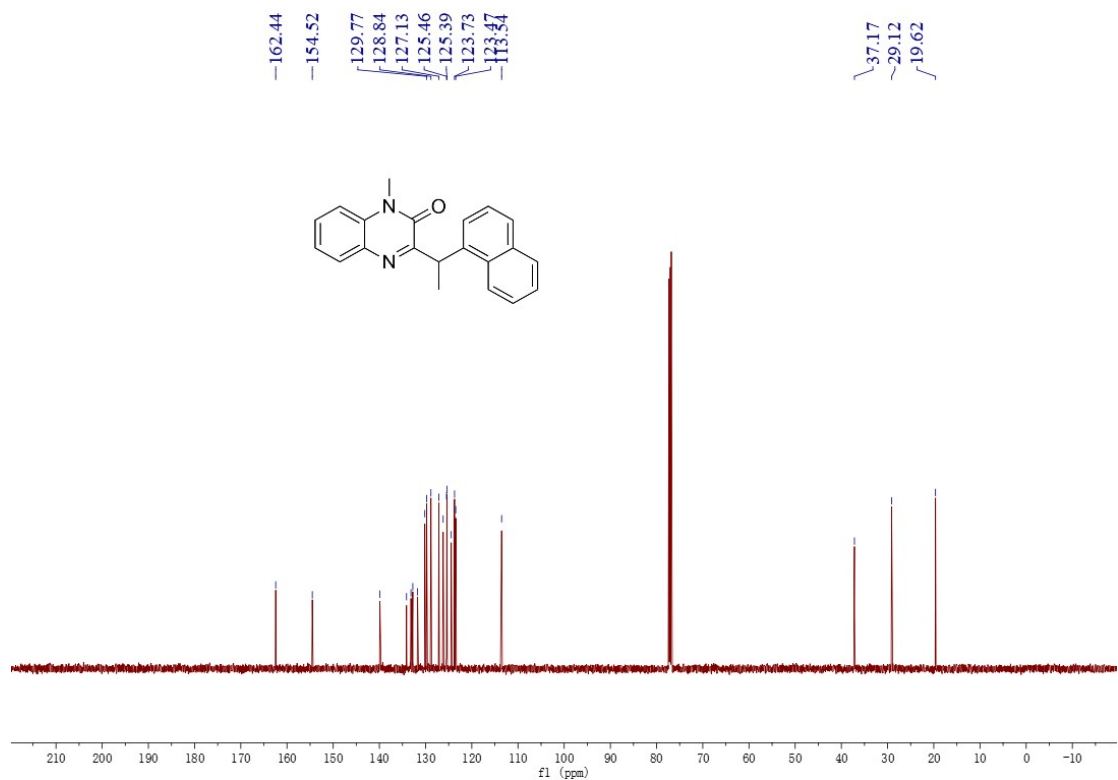
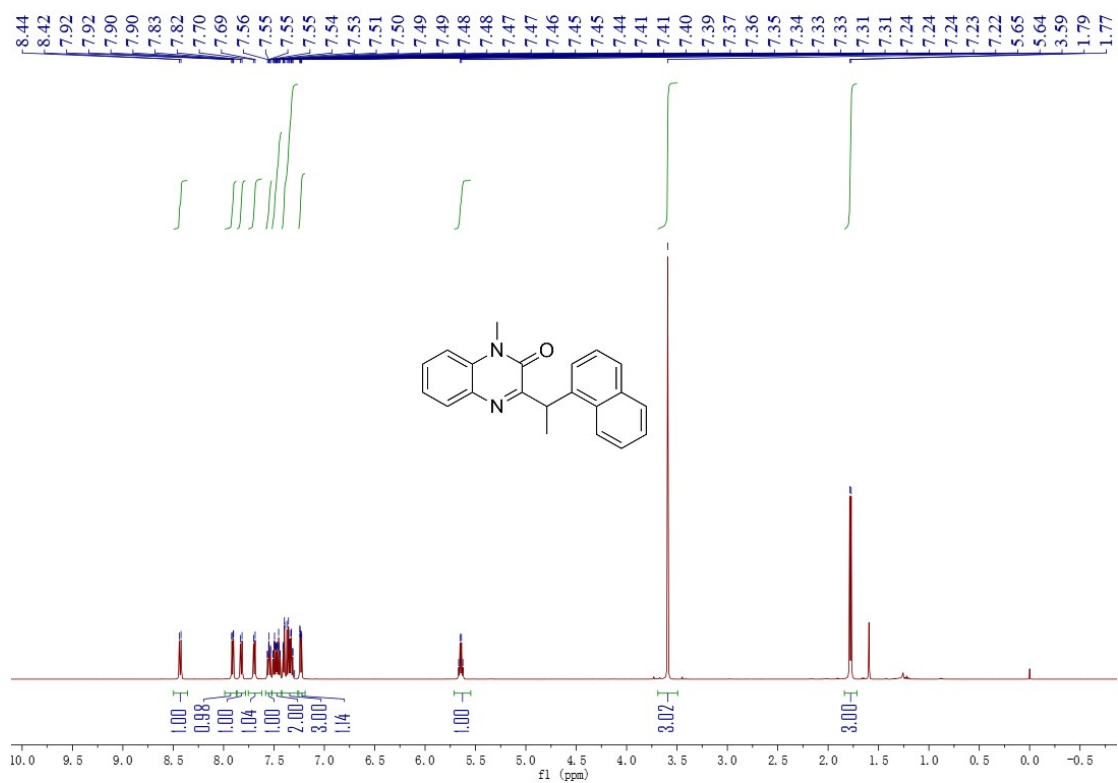
NMR spectra of product 3t



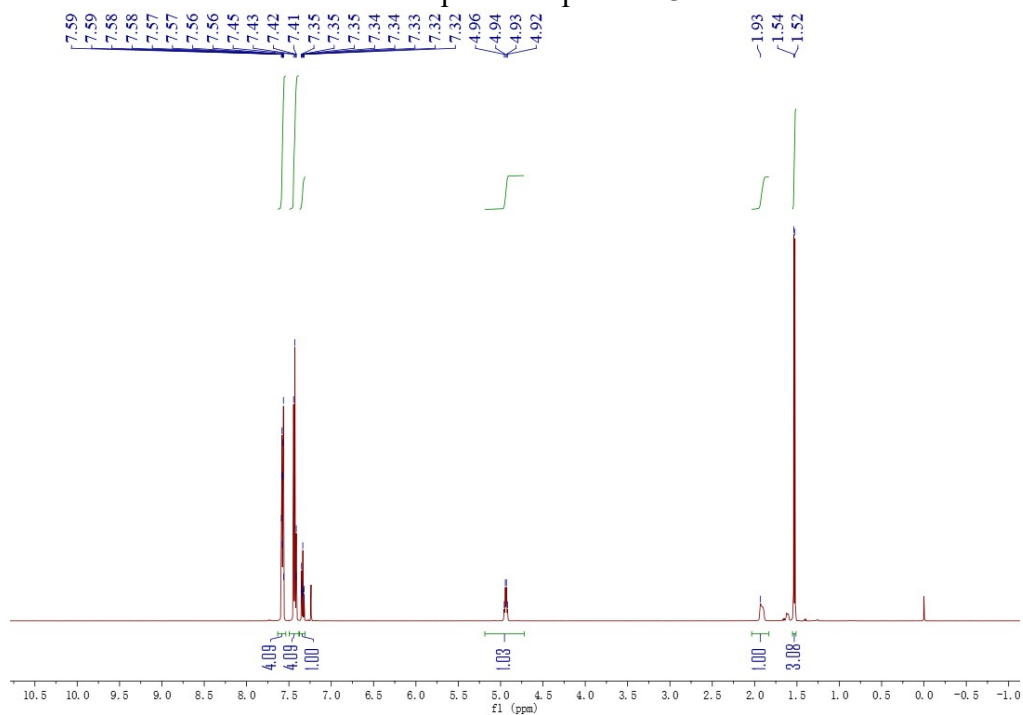
NMR spectra of product **3u**



NMR spectra of product 3v



NMR spectra of product 5



References

[S1] K.-K. Niu, J. Cui, R.-Z. Dong, S. Yu, H. Liu and L.-B. Xing, *Chem. Commun.*, **2024**, *60*, 2409–2412.