Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.

Supporting Information

Base mediated 7-*exo-dig* intramolecular cyclization of Ugi-Propargyl precursors: Highly efficient and regioselective synthetic approach toward diverse 1, 4-benzoxazepine-5(2H)-ones

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General information: All chemicals and reagents were purchased from commercial sources and were used without further purification. 100-200 mesh silica gel was used for column chromatography,and TLC was performed on Merck-precoated silica gel 60-F254. Melting points were recorded with COMPLAB melting point apparatus and are uncorrected. All the synthesized compounds were fully characterized by ^{1}H, ^{13}CNMR, IR, and further confirmed through ESI-MS, ESI-HRMS analysis. IR spectra were recorded on a Perkin–Elmer FT-IR RXI spectrophotometer and values reported in cm^{-1}. NMR spectra were recorded with 400 MHz spectrometers for ^{1}H NMR, 100 MHz for ^{13}C NMR using $CDCl_3$, DMSO-d_6 as solvent and tetramethylsilane as internal standard. Chemical shifts are reported in parts per million. Multiplicities are reported as follows: singlet (s), doublet (d), triplet (t), multiplet (m), and broad singlet (br s). ESI-MS spectra were obtained on a LCQ Advantage Ion trap mass spectrometer (Finnigan thermo fischer scientific) and High-resolution mass spectra (ESI-HRMS) were recorded on Agilent 6520 ESI-QTOF mass spectrometer. Crystallographic data for the X ray crystal structure analysis of **6d and 6i,** reported in this manuscript have been deposited with the Cambridge Crystallographic Data Center (CCDC) as supplementary publication, CCDC No. 984887 and 984705 respectively.

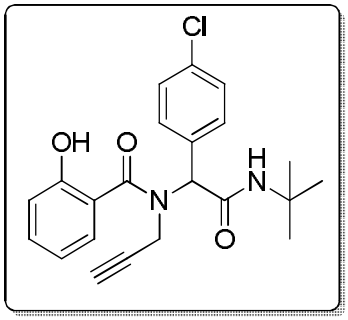
General procedure for the preparation of ugi-propargyl adduct 5(a-t).

A solution of benzaldehyde (1.0 mmol), propargylamine (1.0 mmol), 2 hydroxy benzoic acid (1.0 mmol), isocyanide (1.0 mmol) in MeOH (3mL) was stirred at rt for 18-24 hrs. The reaction mixture was concentrated under reduced pressure and purified by column chromatography on silica gel (eluent: hexane/ EtOAc) to afforded Ugi-Propargyl products **5(a-t)**.

General procedure for the preparation of 1,4-benzoxazepine-5(2H)-one 6(a-t).

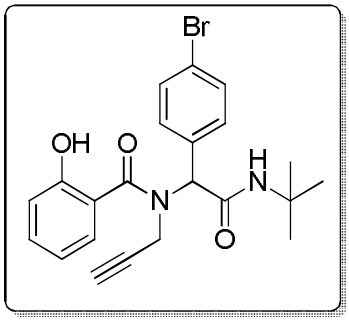
To a solution of **5**(0.5 mmol) in DMF (1.5-2.0 mL) is added K_2CO_3 (2.0 equiv.) and stirred the reaction at 90 °C for 2h. After completion of the reaction as indicated by TLC, the resulting reaction mixture was quenched with water (5 mL), and then extracted three times with EtOAc (20 mL × 3). The combined organic layers were washed with water (20 mL × 3) and brine (20 mL), dried over anhydrous Na_2SO_4 and concentrated in vacuum. The crude thus obtained was purified by column chromatography on silica gel (eluent: hexane/ EtOAc) to afford desired products **6(a-t)**.

***N*-(2-(tert-butylamino)-1-(4-chlorophenyl)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl) benzamide 5a**



White solid; Yield 80%; Mp: 143-144 °C; IR (KBr) ν_{max}: 3365, 3305, 1637, 1216cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.36(br s, 1H), 7.57-7.54(m, 1H), 7.43-7.36(m, 4H), 7.35-7.31(m, 1H), 6.99(dd, 1H, *J*= 0.8 Hz, *J*=8.3 Hz), 6.91-6.87(m, 1H), 5.82(s, 1H), 5.70(s, 1H), 4.22-4.11(m, 2H), 2.10(t, 1H, *J* = 2.4), 1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.4, 168.2, 157.1, 135.0, 132.9, 132.5, 131.4, 129.1, 127.8, 119.4, 118.3, 117.8, 78.9, 72.9, 63.9, 52.1, 38.3, 28.5; HRMS (ESI TOF (+))calcd for [$C_{22}H_{23}ClN_2O_3$ + H^+] 399.1470 found 399.1449.

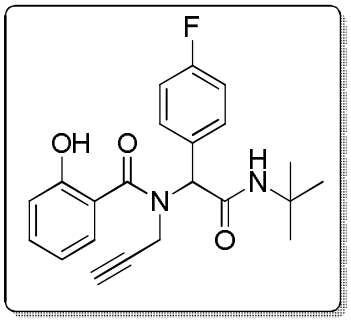
***N*-(1-(4-bromophenyl)-2-(tert-butylamino)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl) benzamide 5b**



White solid; Yield 76% ; Mp: 138-139 °C; IR (KBr) ν_{max}: 3419, 3306, 1630, 1215 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.37(br s, 1H), 7.57-7.53(m, 3H), 7.37(d, 3H, *J* = 7.3 Hz), 7.00(d, 1H, *J* = 8.3 Hz), 6.91-6.88(m, 1H), 5.81(s, 1H), 5.68(s, 1H), 4.23-4.12(m, 2H), 2.10(s, 1H), 1.37(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.5, 168.2, 157.2, 133.1, 132.9, 132.1, 131.7, 127.8, 123.2,

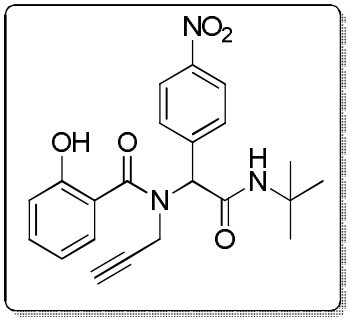
119.4, 118.3, 117.8, 78.9, 72.9, 64.0, 52.2, 38.4, 28.5; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{23}BrN_2O_3$ + H^+] 443.0965 found 443.0946.

***N*-(2-(tert-butylamino)-1-(4-fluorophenyl)-2-oxoethyl)-2-hydroxy-N-(prop-2-yn-1-yl) benzamide 5c**



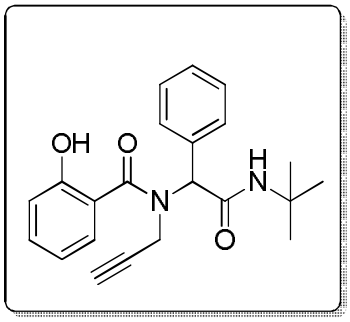
White solid; Yield 73%; Mp: 105-106 °C; IR (KBr) ν_{max}: 3420, 3307, 1631, 1216cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.42(br s, 1H), 7.58(dd, 1H, *J* = 1.1 Hz, *J* = 7.7 Hz), 7.48-7.45(m, 2H), 7.38-7.33(m, 1H), 7.12-7.08(m, 2H),7.01 (dd, 1H, *J* = 0.8 Hz, *J* = 8.3Hz), 6.91-6.87(m, 1H), 5.73(s, 2H), 4.23-4.12(m, 2H), 2.07(t, 1H, *J* = 2.4), 1.37(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.5, 168.5, 164.3, 161.8, 157.2, 132.9, 132.1, 132.0, 129.9, 129.8, 127.8, 119.3, 118.4, 117.9, 116.1, 115.8, 79.0, 72.7, 63.8, 52.2, 38.2, 28.6; ESI-MS: m/z 405 [M+Na]$^+$.

N-(2-(tert-butylamino)-1-(4-nitrophenyl)-2-oxoethyl)-2-hydroxy-N-(prop-2-yn-1-yl) benzamide 5d



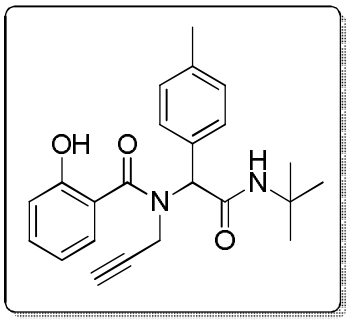
White solid; Yield 72% ; Mp: 172-173 °C; IR (KBr) ν_{max}: 3418, 3306, 1635, 1216 cm^{-1};^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.24(br s, 1H), 8.26-8.24(m, 2H), 7.70(d, 2H, *J* = 8.6 Hz), 7.63 (dd, 1H, *J*= 1.3 Hz, *J* = 7.8 Hz), 7.41-7.37(m, 1H),7.02 (dd, 1H, *J* = 0.7 Hz, *J* = 8.3Hz), 6.94-6.90(m, 1H), 6.02(br s, 1H), 5.73(s, 1H), 4.35-4.18(m, 2H), 2.16(t, 1H, *J* = 2.4), 1.39(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.7, 167.4, 157.6, 147.9, 141.5, 133.4, 130.6, 127.8, 123.8, 119.5, 118.0, 117.6, 78.5, 73.6, 64.0, 52.3, 39.2, 28.5; ESI-MS: m/z 432 $[M+Na]^+$.

***N*-(2-(tert-butylamino)-2-oxo-1-phenylethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl) benzamide 5e**



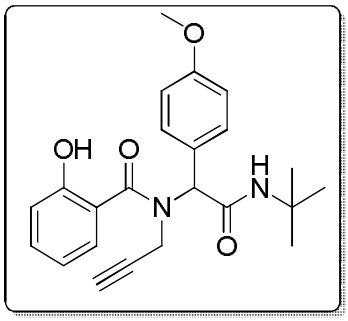
White solid; Yield 88%; Mp: 83-84°C; IR (KBr) ν_{max}: 3419, 3307, 1630, 1159 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.44(br s, 1H), 7.58(d, 1H, *J* = 7.7Hz), 7.48-7.37(m, 5H), 7.35-7.33(m, 1H), 7.01(dd, 1H, *J* = 0.9 Hz, *J* = 8.3 Hz), 6.91-6.87(m, 1H), 5.78(s, 1H), 5.74(br s, 1H),4.21-4.11(m, 2H), 2.05(t, 1H, *J* = 2.4), 1.37(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.4, 168.6, 157.1, 134.0, 132.7, 130.1, 128.9, 127.8, 119.3, 117.8, 79.0, 76.7, 72.4, 64.7, 52.1, 38.0, 28.5; ESI-MS: m/z 365 $[M+H]^+$.

***N*-(2-(tert-butylamino)-2-oxo-1-(p-tolyl)ethyl)-2-hydroxy-N-(prop-2-yn-1-yl)benzamide 5f**



White solid; Yield 72% ; Mp: 77-78°C; IR (KBr) ν_{max}: 3415, 3307, 1631, 1215 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 9.44(br s, 1H), 7.54(d, 1H, *J* = 6.1 Hz), 7.34-7.31(m, 3H), 7.21(d, 2H, *J* = 7.8 Hz), 6.98(d, 1H, *J* = 8.1 Hz), 6.89-6.86(m, 1H), 5.77(s, 1H), 5.74(br s, 1H), 4.11(s, 2H), 2.37(s, 3H), 2.06(t, 1H, *J* = 2.2 Hz), 1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.3, 168.9, 157.1, 138.9, 132.7, 130.8, 130.0, 129.7, 127.8, 119.3, 118.8, 117.8, 79.2, 72.4, 64.7, 52.1, 38.0, 28.6, 21.2; ESI-MS: m/z 379 $[M+H]^+$.

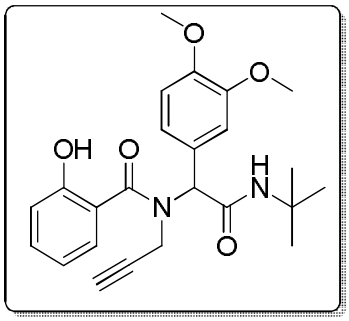
_N_-(2-(tert-butylamino)-1-(4-methoxyphenyl)-2-oxoethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl) benzamide 5g



White solid; Yield 78%; Mp: 155-156°C; IR (KBr) ν_{max}: 3411, 3307, 1630, 1179 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 9.46(br s, 1H), 7.55 (dd, 1H, *J* = 1.1 Hz, *J* =7.7 Hz), 7.39(d, 2H, *J* = 8.7 Hz), 7.36-7.31(m, 1H), 6.99(dd, 1H, *J* = 0.9 Hz, *J* = 8.4 Hz), 6.93-6.91(m, 2H), 6.90-6.86(m, 1H), 5.74(s, 1H), 5.71(s, 1H), 4.12(d, 2H, *J* = 2.4 Hz), 3.83(s, 3H), 2.06(t, 1H, *J* = 2.4 Hz),

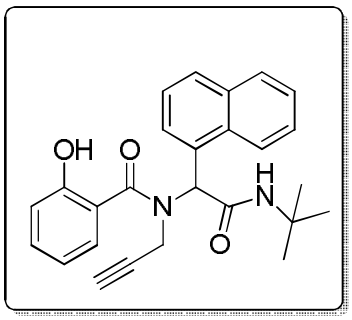
1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.2, 168.9, 160.0, 156.8, 132.6, 131.5, 127.7, 125.8, 119.3, 118.9, 117.7, 114.3, 79.2, 72.3, 64.1, 55.3, 52.0, 37.7, 28.5; HRMS (ESI TOF (+)) calcd for [$C_{23}H_{26}N_2O_4$ + H^+] 395.1965 found 395.1951

_N_-(2-(tert-butylamino)-1-(3,4-dimethoxyphenyl)-2-oxoethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl)benzamide 5h



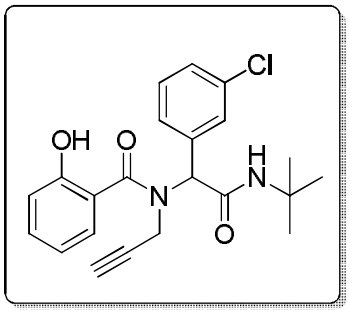
White solid; Yield 68%); Mp: 195-196°C; IR (KBr) ν_{max}: 3415, 3020, 1635, 1260 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.57(br s, 1H), 7.57(d, 1H, *J* = 7.64Hz), 7.37-7.32(m, 1H), 7.00-6.98(m, 3H), 6.90-6.87(m, 2H), 5.75(s, 1H), 5.68(br s, 1H), 4.14-4.13(m, 2H), 3.91(s, 3H), 3.88(s, 3H), 2.07(t, 1H, *J* = 2.3 Hz), 1.37(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.2, 168.8, 156.6, 149.5, 149.1, 132.5, 127.7, 126.0, 122.7, 119.2, 118.9, 117.6, 113.2, 111.1, 79.4, 72.3, 64.2, 55.9, 55.8, 52.0, 37.6, 28.5; ESI-MS: m/z 447 $[M+Na]^+$.

_N_-(2-(tert-butylamino)-1-(naphthalen-1-yl)-2-oxoethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl) benzamide 5i



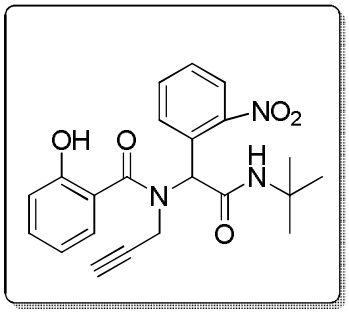
White solid; Yield 82%; Mp: 130-131°C; IR (KBr) ν_{max}: 3417, 3307, 1632, 1217 cm^{1};^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.62(br s, 1H), 7.95-7.88(m, 3H), 7.68(d, 1H, *J* = 7.0 Hz), 7.61-7.50(m, 4H), 7.38-7.33(m, 1H), 7.04(d, 1H, *J* = 8.2 Hz), 6.86-6.82(m, 1H), 6.73(br s, 1H), 5.61(s, 1H), 4.28-4.07(m, 2H), 2.04(s, 1H), 1.41(s, 9H);^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.5, 169.3, 157.5, 133.6, 133.1, 132.9, 130.1, 128.8, 128.1, 127.8, 127.2, 126.2, 125.2, 122.9, 119.1, 118.2, 117.8, 78.8, 71.5, 59.5, 52.2, 37.6, 31.9, 28.6; ESI-MS: m/z 437 $[M+Na]^+$.

***N*-(2-(tert-butylamino)-1-(3-chlorophenyl)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl) benzamide 5j**



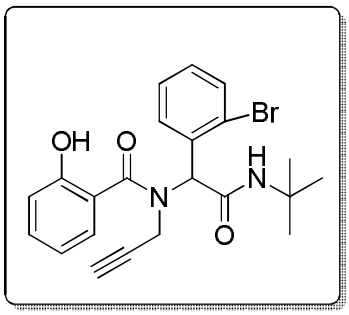
White solid; Yield 84%; Mp: 121-122 °C; IR (KBr) ν_{max}: 3421, 3019, 1647, 1216 cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.36(br s, 1H), 7.60(dd, 1H, *J* = 1.1 Hz, *J* = 7.7 Hz), 7.48(s, 1H), 7.38-7.34(m, 4H), 7.01(dd, 1H, *J* = 0.8 Hz, *J* = 8.3 Hz), 6.92-6.88(m, 1H), 5.82(s, 1H), 5.70(s, 1H), 4.24-4.13(m, 2H), 2.11(t, 1H, *J* = 2.4), 1.38(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.4, 168.0, 157.1, 136.0, 134.7, 132.9, 130.3, 130.1, 129.0, 128.0, 127.8, 119.4, 118.3, 117.8, 78.8, 72.8, 64.0, 52.2, 38.3, 28.5; ESI-MS: m/z 399 $[M+H]^+$.

N-(2-(tert-butylamino)-1-(2-nitrophenyl)-2-oxoethyl)-2-hydroxy-N-(prop-2-yn-1-yl) benzamide 5k



White solid; Yield 70%; Mp: 111-112 °C; IR (KBr) ν_{max}: 3403, 3019, 1631, 1215 cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 8.06(dd, 1H, *J* = 1.2 Hz, *J* = 8.1 Hz), 7.75(dd, 1H, *J* = 1.2 Hz, *J* = 7.8 Hz), 7.70-7.66(m, 1H), 7.59-7.55(m, 2H), 7.39-7.34(m, 1H), 7.02(dd, 1H, *J* = 0.9 Hz, *J* = 8.3 Hz), 6.89-6.86(m, 1H), 6.36(s, 1H), 5.90(br s, 1H), 4.29-4.28(m, 2H), 2.11(t, 1H, *J* = 2.4 Hz), 1.37(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.9, 167.0, 157.5, 150.1, 133.5, 133.2, 130.5, 129.7, 129.4, 127.8, 125.3, 119.4, 117.8, 117.7, 78.5, 72.9, 60.7, 52.2, 38.5, 28.4; ESI-MS: m/z 410 $[M+H]^+$.

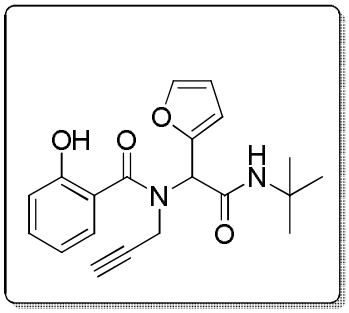
***N*-(1-(2-bromophenyl)-2-(tert-butylamino)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl)benzamide 5l**



White solid; Yield 80%; Mp: 168-169 °C; IR (KBr) ν_{max}: 3389, 1649, 1217, 1146 cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 9.47(br s, 1H), 7.59-7.55(m, 3H), 7.38-7.33(m, 2H), 7.26(s, 1H), 7.0-

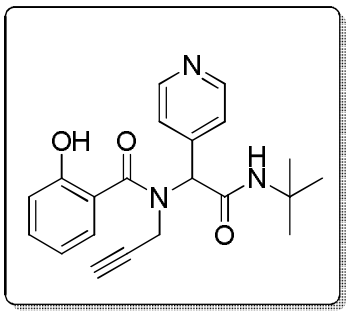
6.98(m, 1H), 6.87-6.84(m, 1H), 6.00(s, 1H), 5.82-5.75(m, 1H), 4.38-4.01(m, 2H), 1.93(s, 1H), 1.39(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.9, 168.3, 158.2, 133.8, 133.2, 133.0, 131.1, 130.6, 127.9, 127.8, 127.4, 118.9, 117.8, 117.6, 78.5, 77.3, 71.8, 63.4, 52.2, 37.6, 28.5; ESI-MS: m/z 443 $[M+H]^+$.

***N*-(2-(tert-butylamino)-1-(furan-2-yl)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl)benzamide 5m**



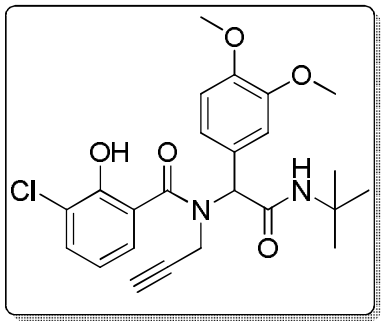
White solid; Yield 86%; Mp: 105-106 °C; IR (KBr) ν_{max}: 3416, 3307, 1630, 1216 cm^1; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.45(br s, 1H), 7.59(s, 1H), 7.48(s, 1H), 7.36-7.33(m, 1H), 6.99(d, 1H, *J* = 6.4 Hz), 6.90-6.87(m, 1H), 6.61(s, 1H), 6.42(s, 1H), 5.92(s, 1H), 5.84(s, 1H), 4.31-4.21(m, 2H), 2.10(s, 1H), 1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.2, 166.4, 157.6, 147.5, 143.3, 133.0, 127.9, 119.2, 117.8, 117.8, 112.6, 111.1, 78.6, 57.4, 52.1, 38.0, 28.5; ESI-MS: m/z 355 $[M+H]^+$.

***N*-(2-(tert-butylamino)-2-oxo-1-(pyridin-4-yl)ethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl) benzamide 5n**



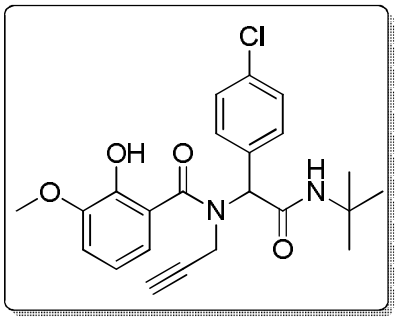
White solid; Yield 84%; Mp: 93-94 °C; IR (KBr) ν_{max}: 3399, 3019, 1632, 1216 cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.64(d, 2H, *J* = 5.1 Hz), 7.587(d, 1H, *J* = 7.4 Hz), 7.44(d, 2H, *J* = 5.6 Hz), 7.38-7.34(m, 1H), 7.00(dd, 1H, *J* = 0.8 Hz, *J* = 8.3 Hz), 6.94-6.90(m, 1H), 6.25(s, 1H), 5.64(s, 1H), 4.32-4.15(m, 2H), 2.19(t, 1H, *J* = 2.4 Hz), 1.38(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.3, 166.9, 156.6, 149.6, 144.1, 132.9, 130.7, 128.0, 124.5, 119.7, 118.9, 117.6, 78.5, 73.5, 63.8, 52.2, 38.8, 28.5; ESI-MS: m/z 366 $[M+H]^+$.

***N*-(2-(tert-butylamino)-1-(3,4-dimethoxyphenyl)-2-oxoethyl)-3-chloro-2-hydroxy-*N*-(prop-2-yn-1-yl)benzamide 5o**



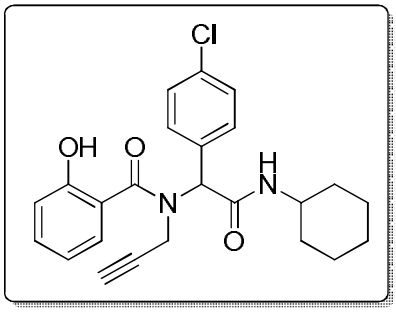
White solid; Yield 88%; Mp: 195-196 °C; IR (KBr) ν_{max}: 3411, 3020, 1650, 1264, 1215, cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.45(br s, 1H), 7.48(s, 1H), 7.27(s, 1H), 6.99(s, 2H), 6.92-6.87(m, 2H), 5.74(s, 1H), 5.65(s, 1H), 4.07(s, 2H), 3.90(s, 3H), 3.87(s, 3H), 2.08(s, 1H), 1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 170.6, 168.9, 154.8, 149.8, 149.3, 132.3, 127.2, 125.6, 124.2, 122.9, 120.6, 119.2, 113.3, 111.2, 78.9, 72.5, 64.2, 55.9, 55.9, 52.3, 37.4, 28.5; ESI-MS: m/z 459 $[M+H]^+$.

***N*-(2-(tert-butylamino)-1-(4-chlorophenyl)-2-oxoethyl)-2-hydroxy-3-methoxy-*N*-(prop-2-yn-1-yl)benzamide 5p**



White solid; Yield 82%; Mp: 65-67 °C; IR (KBr) ν_{max}: 3406, 3020, 1644, 1216, 1073 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ 7.38-7.30(m, 4H), 6.98-6.87(m, 3H), 6.27(s, 1H), 5.81(br s, 1H), 4.14-3.94(m, 2H), 3.90(s, 3H), 2.05(s, 1H), 1.38(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 170.3, 167.7, 147.3, 143.5, 134.5, 132.9, 131.2, 128.8, 120.7, 120.2, 119.7, 112.8, 78.9, 72.6, 63.4, 56.1, 51.9, 37.0, 28.5; ESI-MS: m/z 429 $[M+H]^+$.

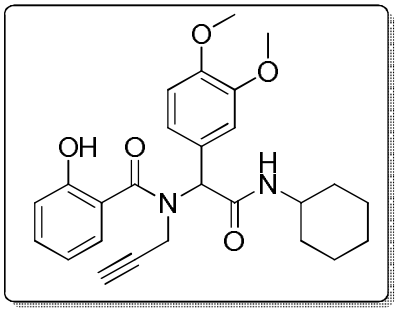
***N*-(1-(4-chlorophenyl)-2-(cyclohexylamino)-2-oxoethyl)-2-hydroxy-*N*-(prop-2-yn-1-yl)benzamide 5q**



White solid; Yield 85% (402 mg); Mp: 77-78 °C; IR (KBr) ν_{max}: 3415, 3021, 1636, 1216 cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 9.34(br s, 1H), 7.53(d, 1H, *J* = 7.3 Hz), 7.42-7.30(m, 5H), 6.97(dd, 1H, *J* = 0.8 Hz, *J* = 8.3 Hz), 6.91-6.87(m, 1H), 6.05(br s, 1H), 5.78(s, 1H), 4.22-4.08(m, 2H),

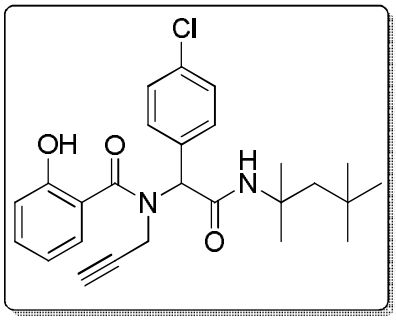
3.87-3.79(m, 1H), 2.11(t, 1H, *J* = 2.3 Hz), 1.92-1.83(m, 2H), 1.69-1.57(m, 3H), 1.38-1.27(m, 2H), 1.19-1.11(m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.4, 168.0, 157.1, 135.0, 132.9, 132.5, 131.4, 129.1, 127.8, 119.4, 118.3, 117.8, 78.8, 72.9, 63.6, 49.0, 38.3, 32.7, 25.3, 24.7, 24.6 ESI-MS: m/z 425 $[M+H]^+$.

_N_-(2-(cyclohexylamino)-1-(3,4-dimethoxyphenyl)-2-oxoethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl)benzamide 5r



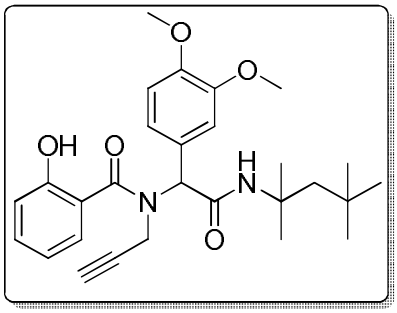
White solid; Yield 88%; Mp: 218-219 °C; IR (KBr) ν_{max}: 3410, 3261, 1650, 1627, 1269 cm^1; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.37(br s, 1H), 7.56(d, 1H *J* = 7.6 Hz), 7.36-7.32(m, 1H), 7.07-6.98(m, 3H), 6.90-6.86(m, 2H), 5.81(s, 1H), 5.79(d, 1H *J* = 7.8 Hz), 4.19-4.08(m, 2H), 3.90-3.87(m, 7H), 2.11(t, 1H, *J* = 2.3 Hz), 1.96-1.92(m, 2H), 1.67-1.59(m, 3H), 1.41-1.32(m, 2H), 1.25-1.19(m,3H); ^{13}C NMR (100 MHz, DMSO-d_6) δ = 167.2, 152.4, 148.0, 147.8, 129.7, 127.2, 123.2, 120.4, 118.5, 115.2, 112.6, 110.8, 80.2, 78.6, 54.9, 54.8, 47.1, 31.6, 31.5, 24.6, 23.9, 23.9 ESI-MS: m/z 473 $[M+Na]^+$.

_N_-(1-(4-chlorophenyl)-2-oxo-2-((2,4,4-trimethylpentan-2-yl)amino)ethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl)benzamide 5s



White solid; Yield 78%; Mp: 118-119 °C; IR (KBr) ν_{max}: 3422, 3019, 1648,1215 cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.40(br s, 1H), 7.50(d, 1H, *J* = 7.7 Hz), 7.44(d, 2H, *J* = 8.4 Hz), 7.36-7.26(m, 3H), 6.95(d, 1H, *J* = 8.3 Hz), 6.88(t, 1H, *J* = 7.5 Hz), 5.98(br s, 1H), 5.68(s, 1H), 4.14(s, 2H), 2.09(t, 1H, *J* = 2.4 Hz), 1.76-1.61(m, 2H), 1.42(s, 3H), 1.39(s, 3H), 0.92(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 172.1, 167.8, 156.6, 134.8, 132.7, 132.6, 131.4, 129.0, 128.8, 127.8, 119.3, 118.7, 117.6, 78.7, 72.9, 64.1, 56.1, 52.2, 38.4, 31.4, 28.7, 28.3; ESI-MS: m/z 455 $[M+H]^{+}$.

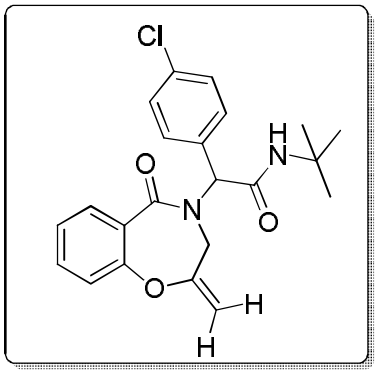
_N_-(1-(3,4-dimethoxyphenyl)-2-oxo-2-((2,4,4-trimethylpentan-2-yl)amino)ethyl)-2-hydroxy-_N_-(prop-2-yn-1-yl)benzamide 5t



White solid; Yield 74%; Mp: 166-167 °C; IR (KBr) ν_{max}: 3409, 3024, 1637, 1215 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 9.49(br s, 1H), 7.56(dd, 1H, *J* = 1.2 Hz, *J* = 7.7 Hz), 7.36-7.32(m, 1H), 7.07-6.98(m, 3H), 6.90-6.86(m, 2H), 5.68(s, 2H), 4.16-4.15(m, 2H), 3.91(s, 3H), 3.88(s, 3H), 2.09(t, 1H, *J* = 2.3 Hz), 1.83(d, 1H, *J* = 14.9 Hz), 1.58(d, 1H, *J* = 14.9 Hz), 1.45(s, 3H), 1.41(s,

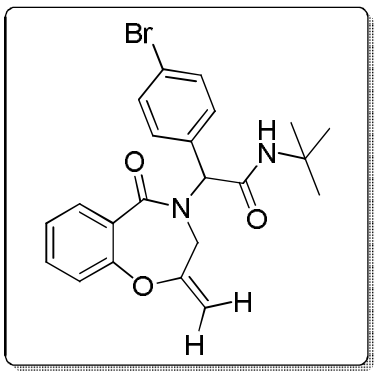
3H), 0.94(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =172.1, 168.4, 156.9, 149.6, 149.2, 132.6, 127.7, 126.1, 122.9, 119.2, 118.8, 117.7, 113.2, 111.1, 79.2, 72.5, 64.7, 56.1, 55.9, 55.8, 52.4, 38.2, 31.5, 31.4, 28.8, 28.4; ESI-MS: m/z 481 $[M+H]^+$.

_N_-(tert-butyl)-2-(4-chlorophenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6a



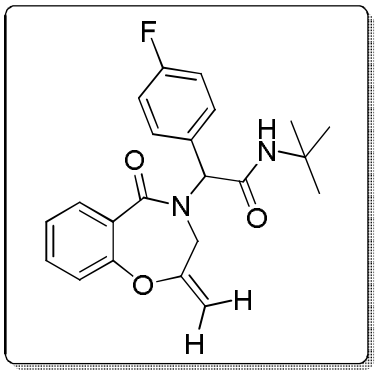
White solid; Yield 92%; Mp: 170-171 °C; IR (KBr) ν_{max}: 3423, 3019, 1637, 1215, cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.85(dd, 1H, *J* = 1.6 Hz, *J* = 7.8 Hz), 7.47-7.43(m, 1H), 7.39-7.33(m, 4H), 7.22-7.18(m, 1H), 7.02(dd, 1H, *J* = 0.8 Hz, *J* = 8.1 Hz), 6.32(s, 1H), 5.95(br s, 1H), 4.28(d, 1H, *J* = 1.4 Hz), 4.03(s, 2H), 3.46(d, 1H, *J* = 1.4 Hz), 1.37(s, 9H), ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.1, 158.2, 152.3, 134.6, 133.4, 133.3, 131.6, 130.8, 128.9, 125.2, 124.1, 120.7, 91.3, 60.1, 51.9, 45.1, 28.6; HRMS (ESI TOF (+)) calcd for $[C_{22}H_{23}ClN_2O_3 + H^+]$ 399.1470 found 399.1469

2-(4-bromophenyl)-_N_-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6b



White solid; Yield 94% ; Mp: 135-136 °C; IR (KBr) ν_{max}: 3423, 3020, 1632, 1215, 1156 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.85(dd, 1H, *J* = 1.6 Hz, *J* = 7.8 Hz), 7.52(d, 2H, *J* = 8.4 Hz), 7.47-7.43(m, 1H),7.32(d, 2H, *J* = 8.4 Hz), 7.22-7.18(m, 1H), 7.03(d, 1H, *J* = 8.1 Hz), 6.29(s, 1H), 5.95(br s, 1H), 4.30(s, 1H), 4.03(s, 2H), 3.50(s, 1H), 1.37(s, 9H), ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.1, 168.0, 158.1, 152.3, 133.8, 133.4, 131.9, 131.6, 131.1, 128.6, 125.2, 124.1, 122.7, 120.8, 91.3, 60.3, 52.0, 45.1, 28.6; HRMS (ESI TOF (+)) calcd for[$C_{22}H_{23}BrN_2O_3$ + H^+] 443.0965 found 443.0965

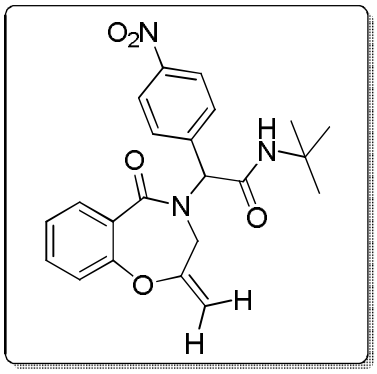
***N*-(tert-butyl)-2-(4-fluorophenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6c**



White solid; Yield 90%; Mp: 205-206 °C; IR (KBr) ν_{max}: 3423, 3322, 1632, 1335, 1219, cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.86(dd, 1H, *J* = 1.7 Hz, *J*= 7.8 Hz), 7.46-7.41(m, 3H), 7.21-7.17(m, 1H), 7.08-7.04(m, 2H), 7.02(dd, 1H, *J* = 1.0 Hz, *J*= 8.1 Hz), 6.33(s, 1H), 5.93(br s, 1H), 4.26(d, 1H, *J* = 1.5 Hz), 4.03(s, 2H), 3.43(d, 1H, *J* = 1.5 Hz), 1.37(s, 9H);^{13}C NMR (100 MHz,

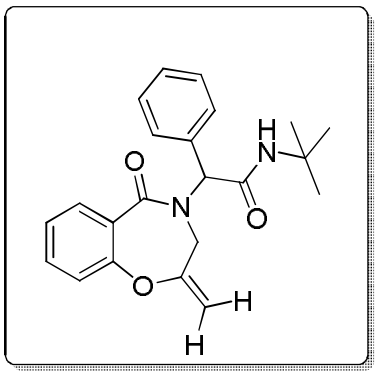
$CDCl_3$) δ = 168.3, 168.0, 164.0, 161.5, 158.3, 152.3, 133.3, 131.7, 131.4, 131.3, 130.6, 125.3, 124.1, 120.7, 115.8, 115.6, 91.1, 60.1, 52.0, 45.0, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{23}FN_2O_3 + H^+$] 383.1765 found 383.1765

***N*-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(4-nitro phenyl)acetamide)acetamide 6d**



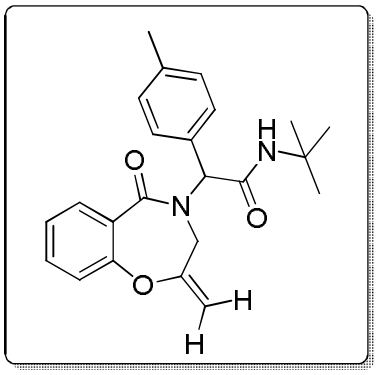
White solid; Yield 80%; Mp: 169-170 °C; IR (KBr) ν_{max}: 3424, 3019, 1648, 1215, 1071cm^1; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.24(d, 2H, *J* = 8.8 Hz), 7.88(dd, 1H, *J* = 1.6 Hz, *J*= 7.8 Hz), 7.64(d, 2H, *J* = 8.4 Hz), 7.51-7.47(m, 1H), 7.24-722(m, 1H), 7.06(dd, 1H, *J* = 0.9 Hz, *J* = 8.2 Hz), 6.38(s, 1H), 6.07(br s, 1H), 4.37(d, 1H, *J* = 1.5 Hz), 4.07(s, 2H), 3.64(d, 1H, *J* = 1.5 Hz), 1.40(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.4, 167.2, 157.9, 152.3, 147.8, 142.0, 133.8, 131.6, 130.1, 124.9, 124.4, 123.7, 121.0, 92.0, 60.2, 52.2, 45.5, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{23}N_3O_5 + H^+$] 410.1710 found 410.1710

***N*-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-phenyl acetamide 6e**



White solid; Yield 86%; Mp: 165-166 °C; IR (KBr) ν_{max}: 3420, 3021, 1637, 1328, 1216cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.88(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz), 7.45-7.36(m, 6H), 7.21-7.17(m, 1H), 7.01(dd, 1H, *J* = 0.8 Hz, *J* = 8.1 Hz), 6.36(s, 1H), 5.84(br s, 1H), 4.21(d, 1H, *J* = 1.4 Hz), 4.03(s, 2H), 3.33(d, 1H, *J* = 1.4 Hz), 1.38(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =168.5, 167.9, 158.2, 152.1, 134.8, 133.1, 131.7, 139.5, 129.5, 128.7, 128.5, 125.3, 123.9, 120.6, 90.7, 60.8, 51.8, 45.0, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{24}N_2O_3$ + H^+] 365.1860 found 365.1862

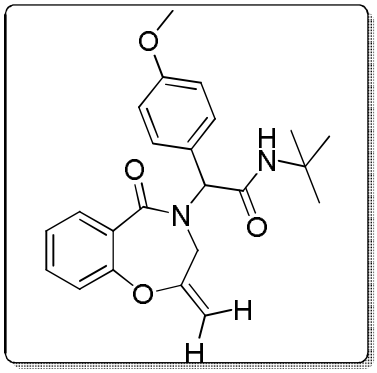
***N*-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(p-tolyl) acetamide 6f**



White solid; Yield 84%; Mp: 82-83 °C; IR (KBr) ν_{max}: 3429, 3019, 1648,1215, 1157 cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.89(dd, 1H, *J* = 1.3 Hz, *J* = 6.3 Hz),7.45-7.41(m, 1H), 7.32(d, 2H,

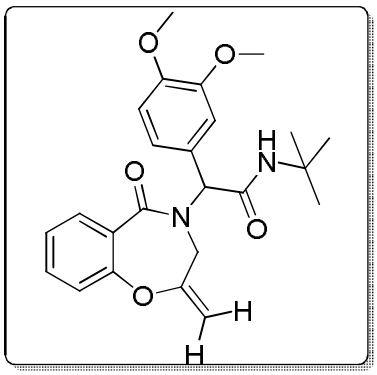
J= 6.4 Hz), 7.21-7.18(m, 3H), 7.00(d, 1H, *J* = 6.5 Hz), 6.28(s, 1H), 5.71(br s, 1H), 4.22(d, 1H, J = 0.7 Hz), 4.05-3.96(m, 2H), 3.33(d, 1H, J = 0.8 Hz), 2.36(s, 3H), 1.38(s, 9H);^{13}C NMR (100 MHz, $CDCl_3$) δ =168.7, 167.9, 158.3, 152.3, 138.5, 133.2, 131.8, 131.6, 129.6, 129.4, 125.4, 124.0, 120.6, 90.8, 60.9, 51.9, 45.0, 28.6, 21.1; HRMS (ESI TOF (+)) calcd for [$C_{23}H_{26}N_2O_3$ + H^+] 379.2016 found 379.2019

N-(tert-butyl)-2-(4-methoxyphenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin -4(5H)-yl)acetamideCompound 6g



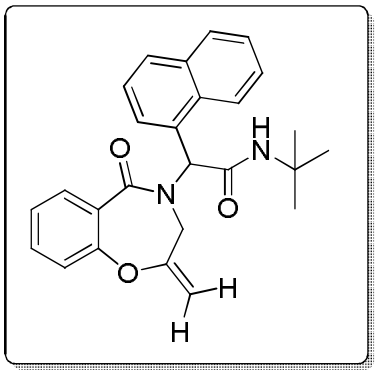
White solid; Yield 90%; Mp: 132-133 °C; IR (KBr) ν_{max}: 3422, 3319, 1631,1334, cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.88(dd, 1H, *J* = 1.6 Hz, *J* = 7.8 Hz), 7.45-7.41(m, 1H), 7.36(d, 2H, *J* = 8.5 Hz), 7.21-7.17(m, 1H), 7.01 (dd, 1H, *J* = 0.8 Hz, *J* = 8.1 Hz), 6.91(d, 2H, *J* = 8.7 Hz), 6.27(s, 1H), 5.76(br s, 1H), 4.23(s, 1H), 4.01(s, 2H), 3.82(s, 3H), 3.39(s, 1H), 1.37(s, 9H), ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.8, 167.8, 159.8, 158.4, 152.2, 133.1, 131.7, 130.9, 126.7, 125.4, 123.9, 120.6, 114.1, 90.8, 60.5, 55.3, 51.8, 44.9, 28.6;HRMS (ESI TOF (+)) calcd for [$C_{23}H_{26}N_2O_4$ + H^+] 395.1965 found 395.1965

***N*-(tert-butyl)-2-(3,4-dimethoxyphenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4] oxazepin-4(5H)-yl)acetamide 6h**



White solid; Yield 92% Mp: 157-158 °C; IR (KBr) ν_{max}: 3323, 3016, 1632, 1261, 1220 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ =7.90(d, 1H, *J* = 7.7 Hz), 7.46-7.42(m, 1H), 7.22-7.18(m, 1H), 7.02(d, 2H, *J* = 8.1 Hz), 6.93(s, 1H), 6.88 (d, 1H, *J* = 8.3 Hz), 6.24(s, 1H), 5.72(br s, 1H), 4.25(s, 1H), 4.03(s, 2H), 3.90(s, 3H), 3.85(s, 3H), 3.38(s, 1H), 1.39(s, 9H), ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.7, 167.9, 158.5, 152.3, 149.3, 149.1, 133.2, 131.7, 126.9, 125.4, 124.0, 121.8, 120.7, 112.9, 110.9, 90.7, 60.9, 55.9, 55.9, 51.8, 45.0, 28.6; HRMS (ESI TOF (+)) calcd for $[C_{24}H_{28}N_2O_5 + H^+]$ 425.2071 found 425.2071

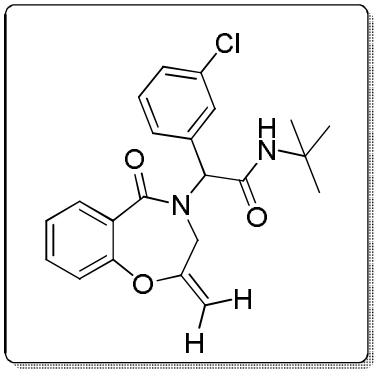
_N_-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(naphthalen-1-yl)acetamide 6i



White solid; Yield 92% ; Mp: 230-231 °C; IR (KBr) ν_{max}: 3422, 3310, 1629, 1335,1217 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ =7.98-7.94(m, 2H),7.92(d, 1H, *J* = 8.1 Hz), 7.88-7.84(m, 1H),

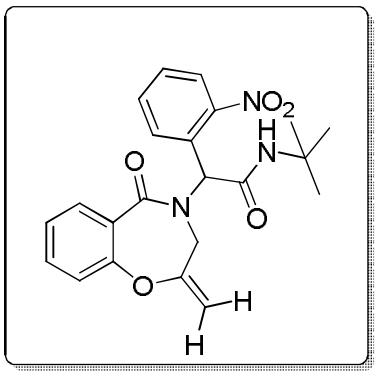
7.68(d, 1H, *J* = 7.0 Hz), 7.53-7.49(m, 3H), 7.43-7.39(m, 1H), 7.23-7.19(m, 1H), 7.00(s, 1H), 6.91-6.89(m, 1H), 5.64(s, 1H), 4.03(s, 2H), 3.63(d, 1H, *J* = 1.5 Hz), 2.64(d, 1H, *J* = 1.5 Hz), 1.42(s, 9H),^{13}C NMR (100 MHz, $CDCl_3$) δ = 169.3, 167.5, 157.7, 152.3, 133.5, 133.1, 132.7, 131.7, 131.1, 129.9, 128.7, 127.4, 127.2, 126.4, 125.3, 124.8, 123.9, 123.1, 120.6, 89.8, 57.9, 52.0, 44.9, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{26}H_{26}N_2O_3$ + H^+] 415.2016 found 415.2016

_N_-(tert-butyl)-2-(3-chlorophenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6j



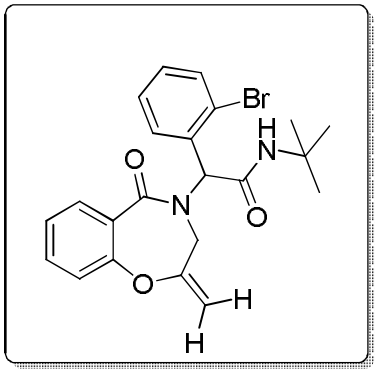
White solid; Yield 88%; Mp: 168-169 °C; IR (KBr) ν_{max}: 3413, 3276, 1626, 1178 cm^1; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.87(dd, 1H, *J*= 1.3Hz, *J*= 6.2Hz), 7.47-7.44(m, 2H), 7.35-7.29(m, 3H), 7.22-7.19(m, 1H), 7.03(dd, 1H, *J* = 0.6 Hz, *J*= 6.5 Hz), 6.31(s, 1H), 5.91(br s, 1H), 4.32(d, 1H, *J* = 1.2 Hz), 4.08-4.01(m, 2H), 3.51(d, 1H, *J* = 1.2 Hz), 1.39(s, 9H);^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.1, 167.9, 158.2, 152.3, 136.8, 134.7, 133.4, 131.7, 130.0, 129.6, 128.7, 127.6, 125.2, 124.1, 120.8, 91.3, 60.3, 52.0, 45.2, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{23}ClN_2O_3$ + H^+] 399.1470 found 399.1458

_N_-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(2-nitrophenyl)acetamide 6k



White solid; Yield 76% Mp: 223-224 °C; IR (KBr) ν_{max}: 3408, 3021, 1641, 1216 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 8.02-7.8(m, 2H), 7.89-7.87(m, 4H), 7.24-7.06(m, 2H), 6.88(s, 1H), 6.04(s, 1H), 4.51(s, 1H), 4.06(s, 2H), 3.89(s, 1H), 1.36(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.2, 166.7, 157.6, 152.3, 149.9, 133.6, 132.9, 131.6, 130.1, 129.7, 129.2, 125.3, 124.9, 124.4, 120.9, 92.3, 59.3, 52.3, 45.6, 28.5; HRMS (ESI TOF (+)) calcd for [$C_{22}H_{23}N_3O_5 + H^+$] 410.1710 found 410.1711

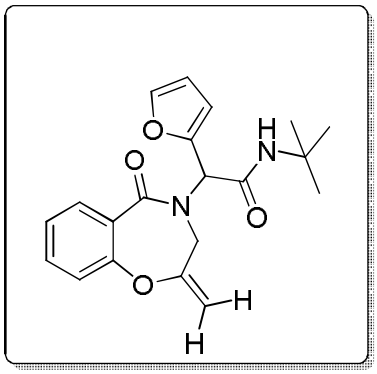
2-(2-bromophenyl)-*N*-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6l



White solid; Yield 90%; Mp: 225-226 °C; IR (KBr) ν_{max}: 3418, 3293, 1722, 1316, cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.93(d, 1H, *J* = 5.8 Hz), 7.62-7.59(m, 2H), 7.45-7.38(m, 2H), 7.21(t, 2H, *J* = 5.6 Hz), 7.01(d, 1H, *J* = 6.3 Hz), 6.36(s, 1H), 5.75(br s, 1H), 4.16(s, 1H), 4.03(dd, 2H, *J* = 13.0 Hz, *J* = 36.7 Hz), 3.08(s, 1H), 1.39(s, 9H);^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.5, 167.4,

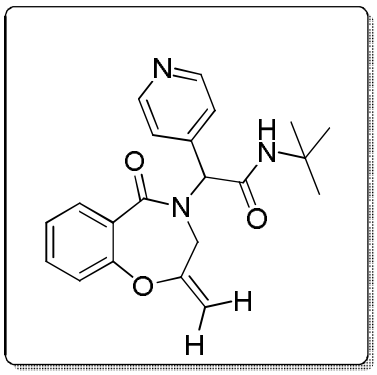
158.2, 152.5, 134.2, 133.5, 133.3, 131.9, 130.7, 130.4, 127.5, 127.4, 125.2, 124.1, 120.8, 90.0, 61.3, 52.0, 45.1, 28.6; HRMS (ESI TOF (+)calcd for [$C_{22}H_{23}BrN_2O_3$ + H^+] 443.0965 found 443.0961

***N*-(tert-butyl)-2-(furan-2-yl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)acetamide 6m**



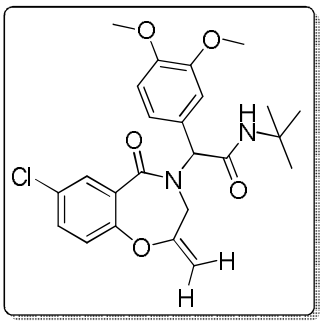
White solid; Yield 86%; Mp: 123-124 °C; IR (KBr) ν_{max}: 3412, 3019, 1633, 1382, 1215, 1069 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.86(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz),.7.47-7.43(m, 2H), 7.22-7.18(m, 1H), 7.03 (dd, 1H, *J* = 0.8 Hz, *J* = 7.4 Hz), 6.65(d, 1H, *J* = 3.3 Hz), 6.40-6.38(m, 1H), 6.34s, 1H), 5.93(br s, 1H), 4.39(d, 1H, *J* = 1.2 Hz), 4.14(dd, 2H, *J* = 16.0 Hz, *J* = 30.2 Hz), 3.71(d, 1H, *J* = 1.3 Hz), 1.35(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =167.8, 166.3, 157.9, 152.4, 148.5, 143.1, 133.4, 131.7, 125.0, 124.1, 120.8, 112.0, 110.5, 91.0, 55.1, 51.9, 44.9, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{20}H_{22}N_2O_4$ + H^+] 355.1652 found 355.1642

***N*-(tert-butyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(pyridin-4-yl)acetamide 6n**



White solid; Yield 78%; Mp: 192-193 °C; IR (KBr) ν_{max}: 3422, 3019, 1682, 1637, 1215, 1071 cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 8.63(br s, 2H), 7.86(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz), 7.50-7.46(m, 1H), 7.35(d, 2H, *J* = 3.9Hz), 7.24-7.20(m, 1H), 7.06(dd, 1H, *J* = 0.9 Hz, *J* = 8.1 Hz), 6.31(s, 1H), 6.16(br s, 1H), 4.38 (d, 1H, *J* = 1.5 Hz), 4.06(s, 2H), 3.67(d, 1H, *J* = 1.5 Hz), 1.39(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.4, 167.1, 157.8, 152.3, 150.1, 143.8, 133.6, 131.5, 124.9, 124.3, 120.9, 91.9, 59.9, 52.1, 45.5, 28.5; HRMS (ESI TOF (+)) calcd for [$C_{21}H_{23}N_3O_3$ + H^+] 366.1812 found 366.1811

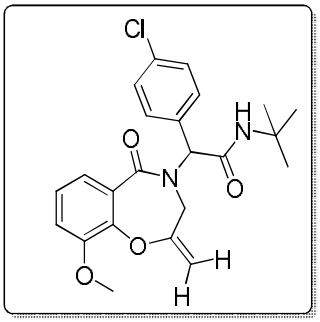
_N_-(tert-butyl)-2-(7-chloro-2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-2-(3,4-dimethoxyphenyl)acetamide 6o



White solid; Yield 87%; Mp: 179-180 °C; IR (KBr) ν_{max}: 3348, 3020, 1635, 1260, 1028` cm^{-1}; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.84(s, 1H), 7.38-7.35(m, 1H), 6.99-6.85(m, 5H), 6.21(s, 1H), 5.78(s, 1H), 4.24(s, 1H), 4.02(d, 1H, *J* = 4.9 Hz), 3.88(s, 3H), 3.83(s, 3H), 3.36(s, 1H), 1.38(s,

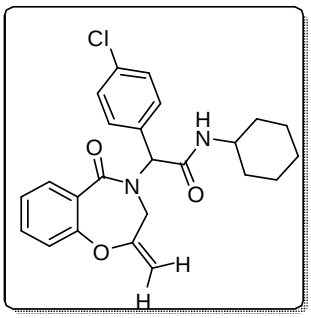
9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ =168.5, 166.5, 158.0, 150.8, 149.4, 149.1, 133.1, 131.3, 129.3, 126.6, 126.5, 122.2, 121.9, 112.9, 110.9, 91.3, 61.0, 56.0, 55.9, 51.9, 44.8, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{24}H_{27}ClN_2O_5$ + H^+] 459.1681found 459.1691

N-(tert-butyl)-2-(4-chlorophenyl)-2-(9-methoxy-2-methylene-5-oxo-2,3-dihydrobenzo [f][1,4]oxazepin-4(5H)-yl)acetamide 6p



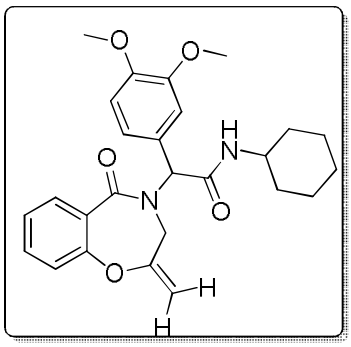
White solid; Yield 83%; Mp: 165-166 °C; IR (KBr) ν_{max}: 3420, 3018, 1633, 1267, 1076 cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.39-7.32(m, 5H), 7.16(t, 1H, *J* = 8.0 Hz), 7.06(dd, 1H, *J* = 1.4 Hz, *J*= 8.0 Hz), 6.31(s, 1H), 5.94(br s, 1H), 4.40(d, 1H, *J* = 1.6 Hz), 4.03(s, 2H), 3.85(s, 3H), 3.56(d, 1H, *J* = 1.6 Hz), 1.37(s, 9H);^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.1, 168.0, 158.3, 150.8, 141.8, 134.5, 133.3, 130.7, 128.8, 126.7, 124.2, 122.5, 115.5, 91.7, 59.9, 56.4, 51.9, 45.2, 28.5; HRMS (ESI TOF (+)) calcd for [$C_{23}H_{25}ClN_2O_4$ + H^+] 429.1576 found 429.1576

2-(4-chlorophenyl)-*N*-cyclohexyl-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4 (5H)-yl)acetamide 6q



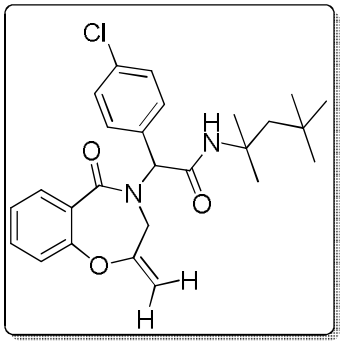
White solid; Yield 91%; Mp: 188-189 °C; IR (KBr) ν_{max} 3316, 3019, 1633, 1216, 1095cm^{-1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.83(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz), 7.47-7.43(m, 1H), 7.38-7.32(m, 4H), 7.21(m, 1H), 7.03 (dd, 1H, *J* = 0.9 Hz, *J* = 8.1 Hz), 6.40(s, 1H), 6.20(d, 1H, J =7.48 Hz), 4.31(d, 1H, *J* = 1.5 Hz), 4.04(s, 2H), 3.86-3.77(m, 1H), 3.53(d, 1H, *J* = 1.5 Hz), 1.93-1.89(m, 2H), 1.70-1.57(m, 3H), 1.36-1.28(m, 2H), 1.15-1.09(m, 3H; ^{13}C NMR (100 MHz, $CDCl_3$) δ =168.1, 167.7, 158.1, 152.2, 134.5, 133.4, 133.2, 131.6, 130.7, 128.8, 125.1, 124.1, 120.8, 91.3, 59.7, 48.6, 45.1, 32.7, 32.6, 25.3, 24.7, 24.6; HRMS (ESI TOF (+)) calcd for [$C_{24}H_{25}ClN_2O_3$ + H^+] 425.1626 found 425.1626

N-cyclohexyl-2-(3,4-dimethoxyphenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4] oxazepin-4(5H)-yl)acetamide 6r



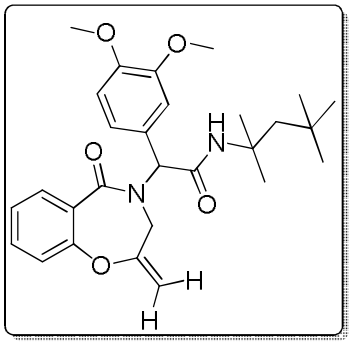
White solid; Yield 88%; Mp: 246-247 °C; IR (KBr) ν_{max}: 3420, 3021, 1633, 1216, cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.88(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz), 7.46-7.42(m, 1H), 7.22-7.18(m, 1H), 7.02-6.99(m, 2H), 6.94(d, 1H, *J* = 2.0Hz), 6.86(d, 1H, *J* = 8.3 Hz), 6.31(s, 1H), 5.87(d, 1H, , *J* = 7.9 Hz), 4.28 (d, 1H, *J* = 1.3 Hz), 4.02(s, 2H), 3.89(s, 3H), 3.87-3.80(m, 4H), 3.45(dd, 1H, *J* = 1.4 Hz), 1.97-1.94(m, 2H), 1.73-1.59(m, 3H), 1.41-1.31(m, 2H), 1.22-1.12(m, 3H);^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.3, 168.0, 158.5, 152.2, 149.2, 149.0, 133.2, 131.6, 126.7, 125.4, 124.0, 121.7, 120.7, 112.8, 110.8, 90.8, 60.5, 55.9, 55.8, 48.5, 45.0, 32.8, 32.6, 25.3, 24.7, 24.6; HRMS (ESI TOF (+)) calcd for [$C_{26}H_{30}N_2O_5$ + H^+] 451.2227 found 451.2227

2-(4-chlorophenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-*N*-(2,4,4-trimethylpentan-2-yl)acetamide 6s



Semisolid; Yield 78%; IR (Neat) ν_{max}: 3433, 3316, 1706, 1232 cm^1; ^1H NMR (400 MHz, $CDCl_3$) δ = 7.85(d, 1H, *J* = 5.8 Hz), 7.45-7.20(m, 6H), 7.03(d, 1H, *J* = 6.2 Hz), 6.27(s, 1H), 6.00(br s, 1H), 4.32(s, 1H), 4.03(s, 2H), 3.53(s, 1H), 1.88(d, 1H, *J* = 11.8 Hz), 1.63(d, 1H, *J* = 11.7 Hz), 1.45(s, 3H), 1.42(s, 3H), 0.96(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.0, 167.6, 158.1, 152.3, 134.5, 133.4, 133.0, 131.6, 130.9, 128.8, 127.0, 125.2, 124.1, 120.8, 91.4, 60.3, 55.9, 51.9, 45.1, 31.6, 31.4, 29.6, 29.0, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{26}H_{31}ClN_2O_3$ + H^+] 455.2096 found 455.2099

2-(3,4-dimethoxyphenyl)-2-(2-methylene-5-oxo-2,3-dihydrobenzo[f][1,4]oxazepin-4(5H)-yl)-*N*-(2,4,4-trimethylpentan-2-yl)acetamide 6t



White solid; Yield 80%; Mp: 90-91 °C; IR (KBr) ν_{max}: 3426, 3318, 1647,1178 cm^{1}; ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.86(dd, 1H, *J* = 1.7 Hz, *J* = 7.8 Hz), 7.45-7.31(m, 1H), 7.21-7.17(m, 1H), 7.04-6.99(m, 2H), 6.95(s, 1H), 6.21(s, 1H), 5.86(br s, 1H), 4.26(d, 1H, *J* = 1.3 Hz), 4.08(dd, 2H, *J* = 16.2 Hz, *J* = 25.5 Hz), 3.88(s, 3H), 3.84(s, 3H), 3.43(d, 1H, *J* = 1.3 Hz), 1.92(d, 1H, *J* = 14.8 Hz), 1.61(d, 1H, *J* = 14.8 Hz), 1.46(s, 3H), 1.42(s, 3H), 0.97(s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ = 168.2, 167.9, 158.5, 152.3, 149.2, 149.0, 133.2, 131.7, 126.7, 125.5, 124.0, 122.0, 120.7, 112.9, 110.9, 90.9, 61.0, 55.9, 55.9, 55.8, 52.1, 45.0, 31.6, 31.4, 29.0, 28.6; HRMS (ESI TOF (+)) calcd for [$C_{28}H_{36}N_2O_5 + H^+$] 481.2697 found 481.2695

Crystallographic data for compound 6d

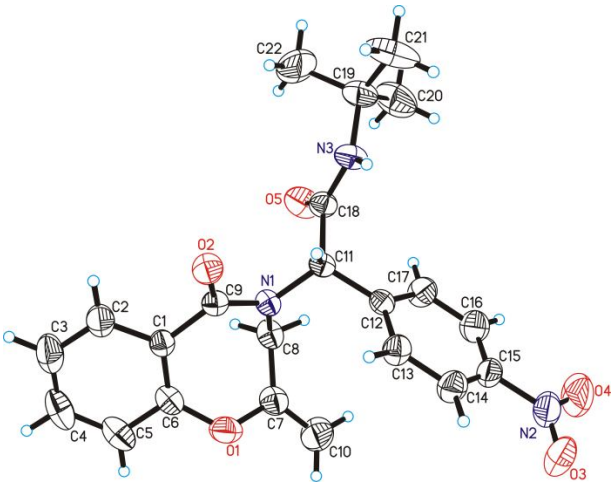


Figure 1 ORTEP diagram drawn with 30% ellipsoid probability for non-H atoms of the crystal structure of compound **6d** determined at 293 K.

Crystallization: Crystals of compound **6d** were grown from the solvent ethyl acetate and hexane by slow evaporation method.

X-Ray Data Collection and Structure Refinement Details of 6d:
A good quality single crystal of size 0.41 x 0.22 x 0.13 mm, was selected under a polarizing microscope and was mounted on a glass fiber for data collection. Single crystal X-ray data for compound **6d** were collected on the Rigaku Kappa 3 circle diffractometer equipped with the AFC12 goniometer and enhanced sensitivity (HG) Saturn724+ CCD detector in the 4x4 bin mode using the monochromated Mo-Kα radiation generated from the microfocus sealed tube MicroMax-003 X-ray generator equipped with specially designed confocal multilayer optics. Data collection was performed using ω-scans of 0.5^{o} steps at 293(2) K. Cell determination, data collection and data reduction was performed using the Rigaku CrystalClear-SM Expert 2.1 b24[1] software. Structure solution and refinement were performed by using SHELX-97[2-3]. Refinement of coordinates and anisotropic thermal parameters of non-hydrogen atoms were carried out by the full-matrix least-squares method. The hydrogen atoms attached to carbon atoms were generated with idealized geometries and isotropically refined using a riding model.

Table 1 Crystal data and structure refinement details for **6d**.

Compound	**6d**
Empirical formula	$C_{22}H_{23}N_3O_5$
Formula weight	409.43
Crystal System	Triclinic
Space group	*P*-1
a (Å)	8.573(6)
b (Å)	11.482(7)
c (Å)	12.279(9)
α (°)	98.521(11)
β (°)	109.560(11)

γ (°)	92.004(7)
V (Å^3)	1121.7(13)
Z	2
D_c (g/cm^3)	1.212
F_{000}	432
μ (mm^{-1})	0.087
θ_{max} (°)	25.36
Total reflections	8860
Unique reflections	4014
Reflections [$I > 2\sigma(I)$]	2170
Parameters	280
R_{int}	0.0301
Goodness-of-fit	1.008
R [$F^2 > 2\sigma(F^2)$]	0.0524
wR (F^2, all data)	0.1648
CCDC No.	984887

Crystallographic data for compound 6i

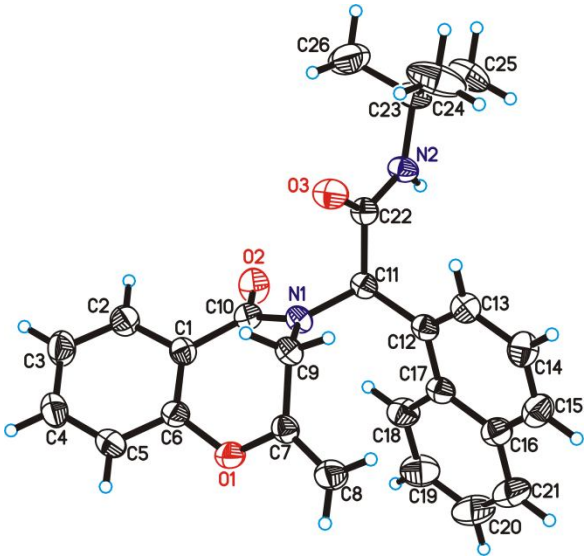


Figure 2 ORTEP diagram drawn with 30% ellipsoid probability for non-H atoms of the crystal structure of compound **6i** determined at 293 K.

Crystallization: Crystals of compound **6i** were grown from the solvent ethyl acetate and hexane by slow evaporation method.

X-Ray Data Collection and Structure Refinement Details of 6i:

A good quality single crystal of size 0.54 x 0.36 x 0.28 mm, was selected under a polarizing microscope and was mounted on a glass fiber for data collection. Single crystal X-ray data for compound **6i** were collected on the Rigaku Kappa 3 circle diffractometer equipped with

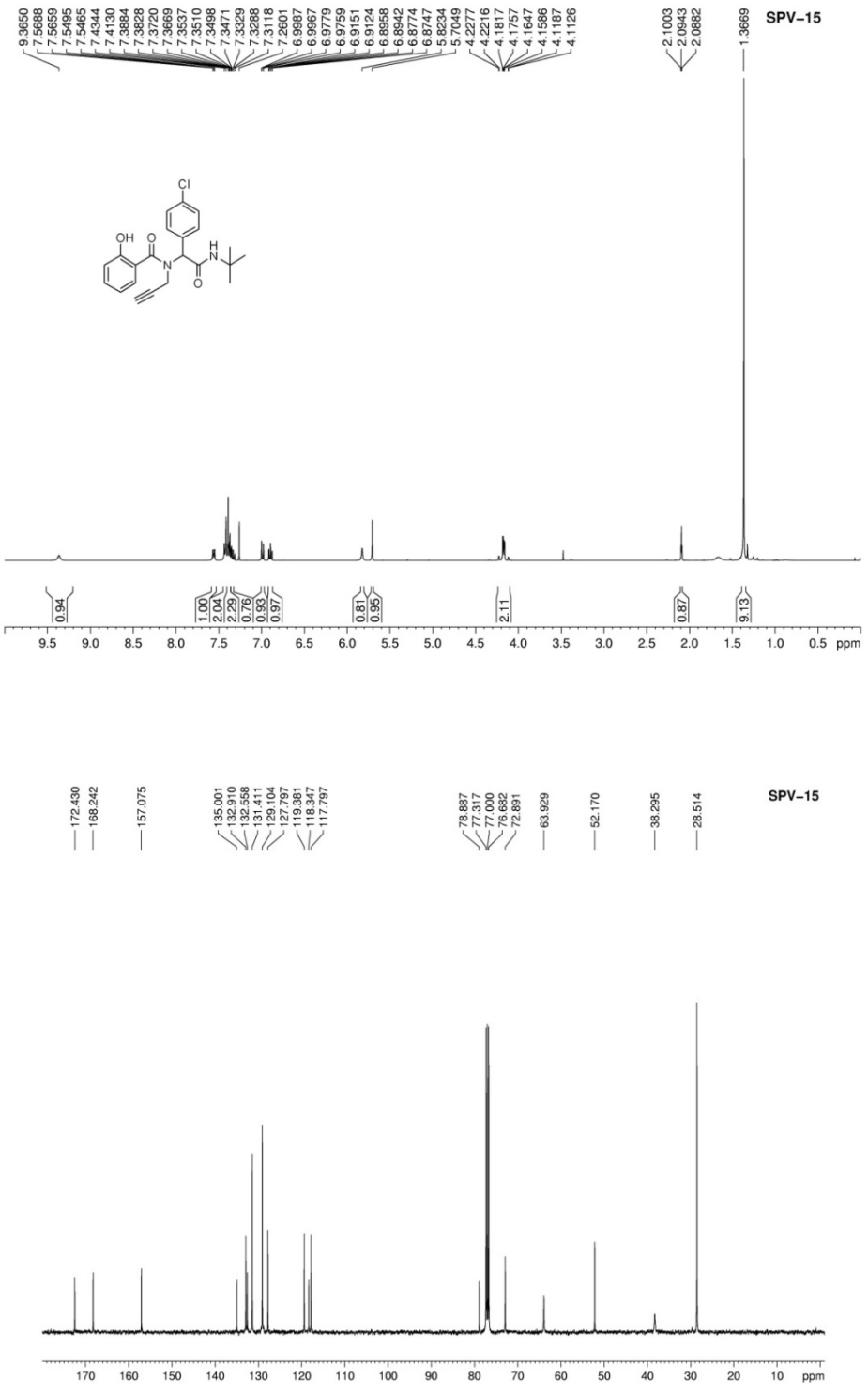
the AFC12 goniometer and enhanced sensitivity (HG) Saturn724+ CCD detector in the 4x4 bin mode using the monochromated Mo-Kα radiation generated from the microfocus sealed tube MicroMax-003 X-ray generator equipped with specially designed confocal multilayer optics. Data collection was performed using ω-scans of 0.5^{o} steps at 293(2) K. Cell determination, data collection and data reduction was performed using the Rigaku CrystalClear-SM Expert 2.1 b24[1] software. Structure solution and refinement were performed by using SHELX-97[2]. Refinement of coordinates and anisotropic thermal parameters of non-hydrogen atoms were carried out by the full-matrix least-squares method. The hydrogen atoms attached to carbon atoms were generated with idealized geometries and isotropically refined using a riding model.

Table 2 Crystal data and structure refinement details for **6i**

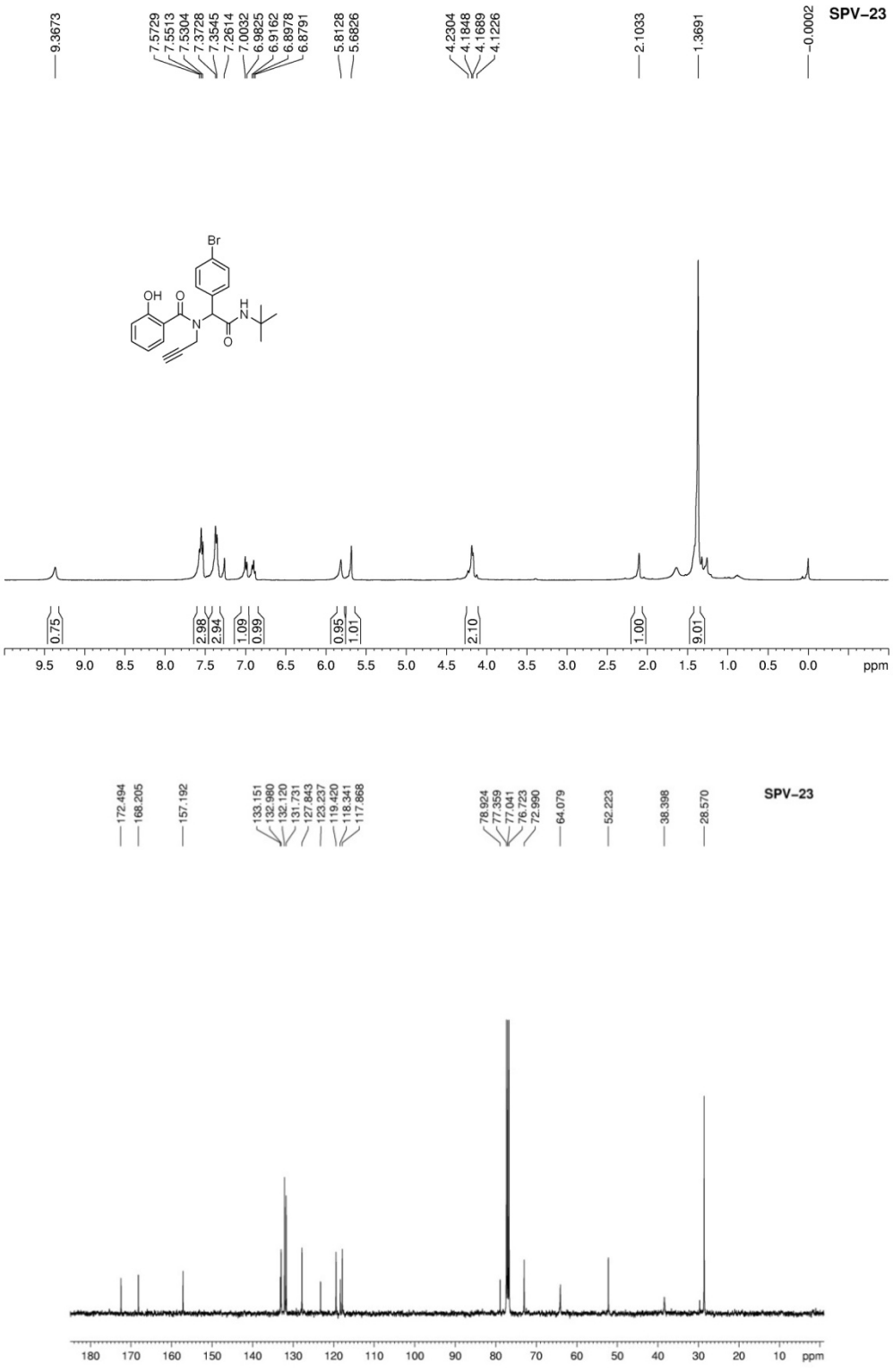
Compound	**6i**
Empirical formula	$C_{26}\ H_{26}\ N_2\ O_3$
Formula weight	414.49
Crystal System	Monoclinic
Space group	*P* 21/*n*
a (Å)	14.280(4)
b (Å)	21.368(5)
c (Å)	15.182(4)
α (°)	90.00
β (°)	98.213(4)
γ (°)	90.00
V (Å^3)	4585(2)
Z	8
D_c (g/cm^3)	1.201
F_{000}	1760
μ (mm^{-1})	0.079
θ_{max} (°)	25.37
Total reflections	35715
Unique reflections	8343
Reflections [$I > 2\sigma(I)$]	6556
Parameters	563
R_{int}	0.0385
Goodness-of-fit	1.101
R [$F^2 > 2\sigma(F^2)$]	0.0629
wR (F^2, all data)	0.1587
CCDC No.	984705

Refrences

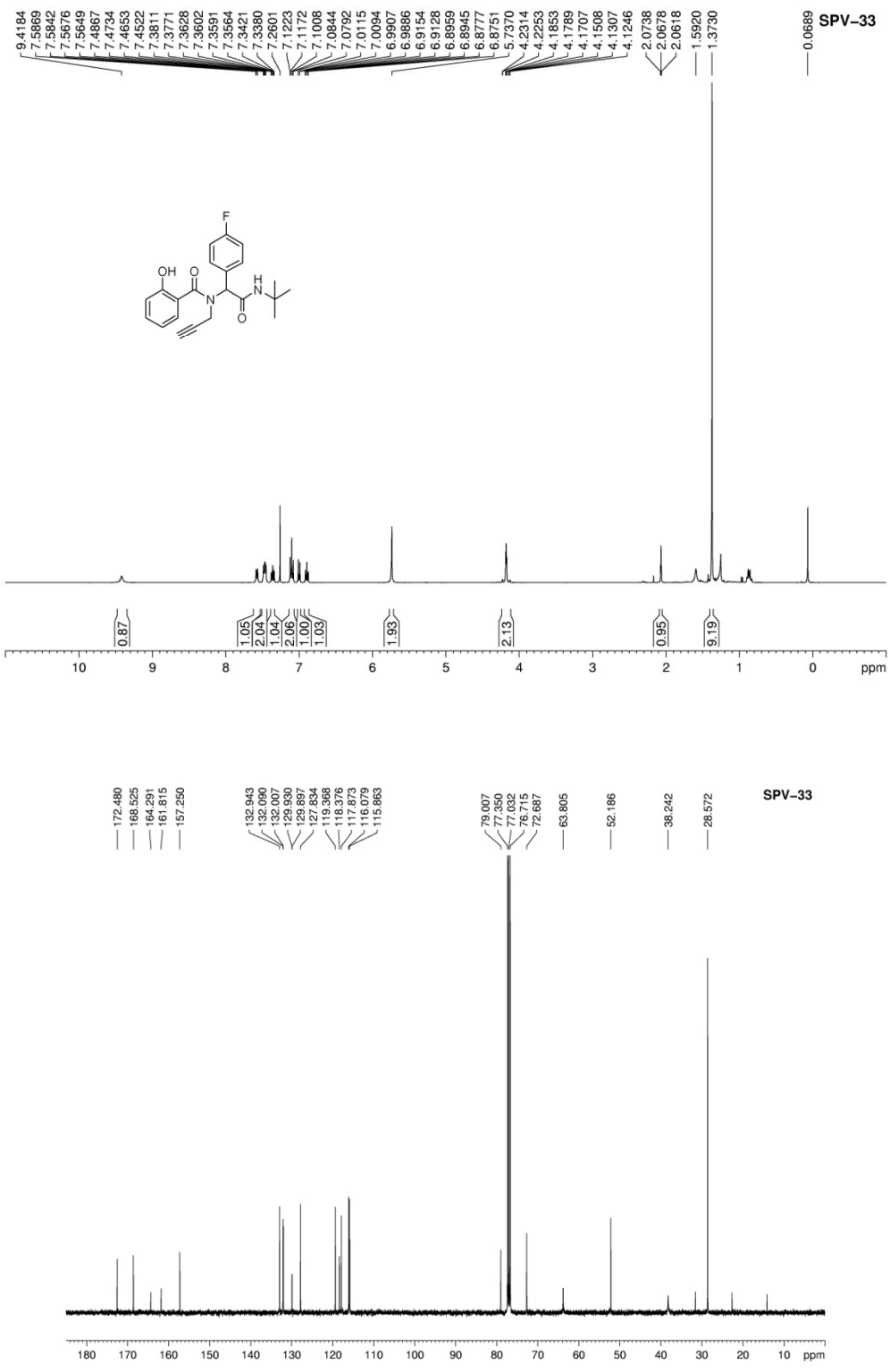
1. CrystalClear 2.1, Rigaku Corporation, Tokyo, Japan
2. Sheldrick, G. M. Acta Crystallogr., Sect. A 2008, 64, 112–122.
3. Farrugia, L. J., Wingx suite for small-molecule single-crystal crystallography. *J. Appl. Crystallogr.*, 1999, **32**, 837–838.



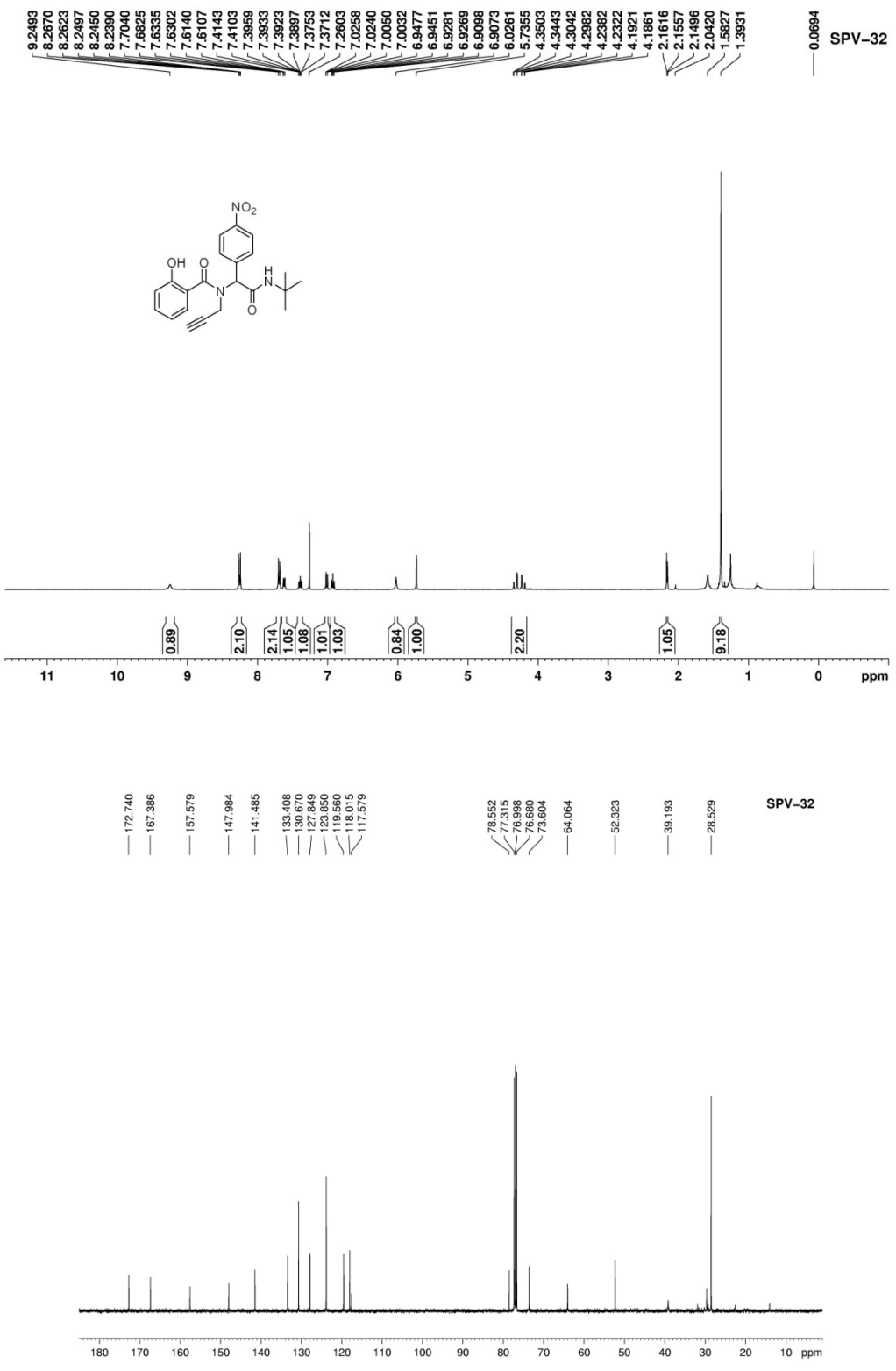
^{1}H and ^{13}C Spectrum of compound **5a**



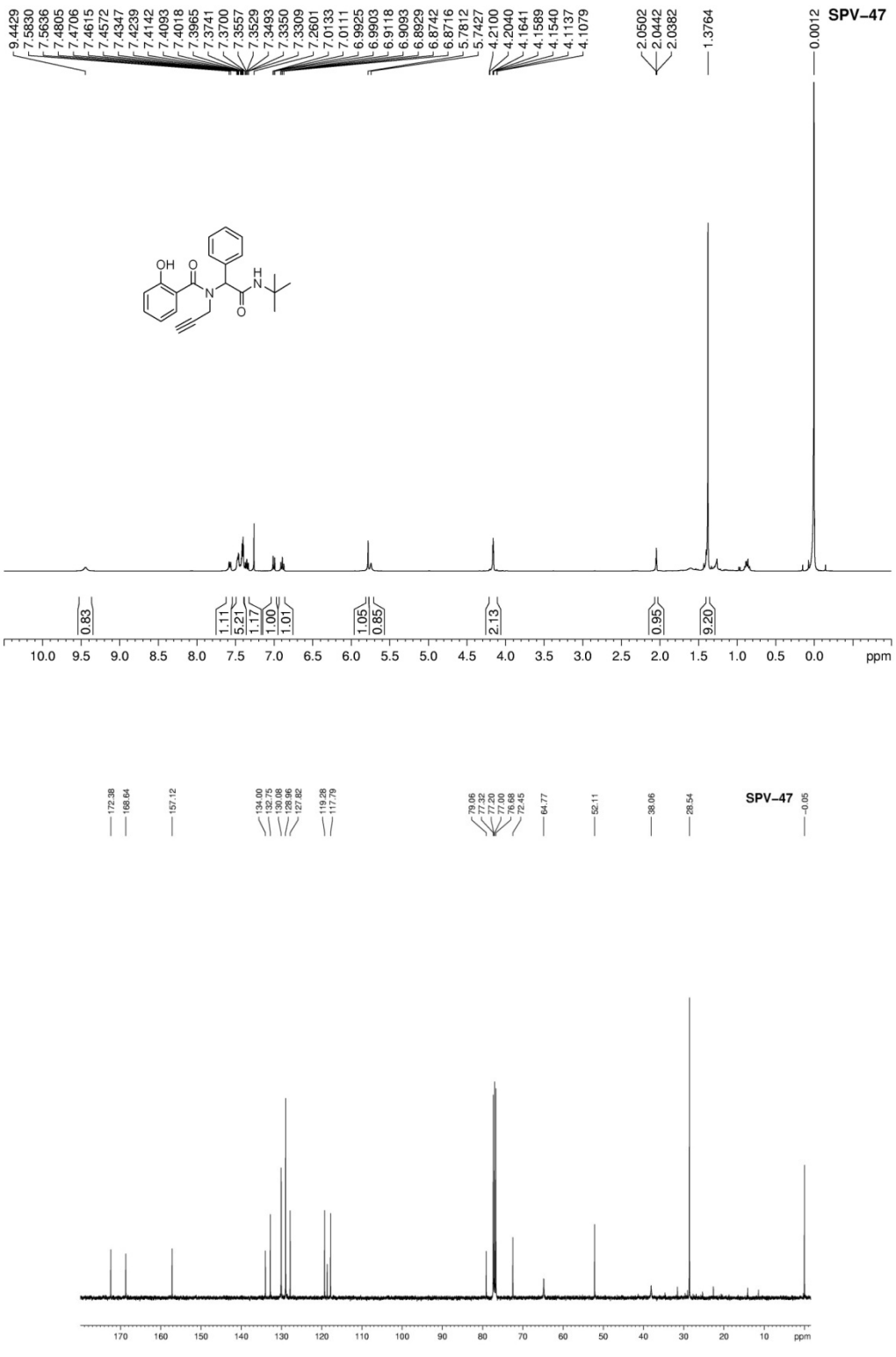
^{1}H and ^{13}C Spectrum of compound **5b**



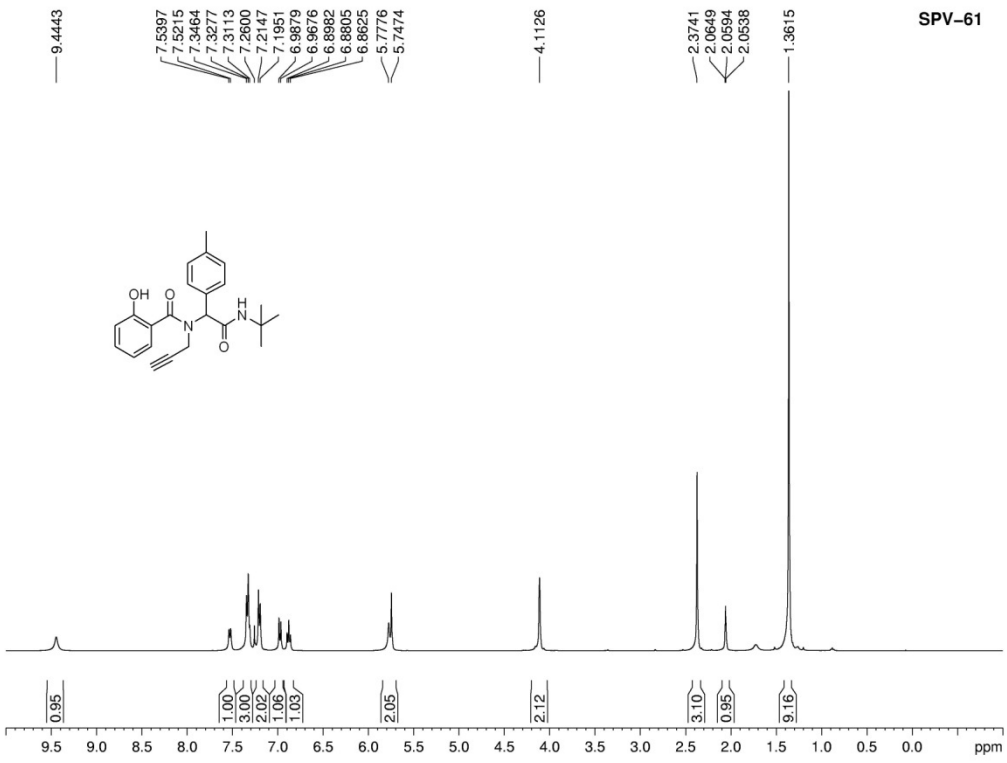
^{1}H and ^{13}C Spectrum of compound **5c**

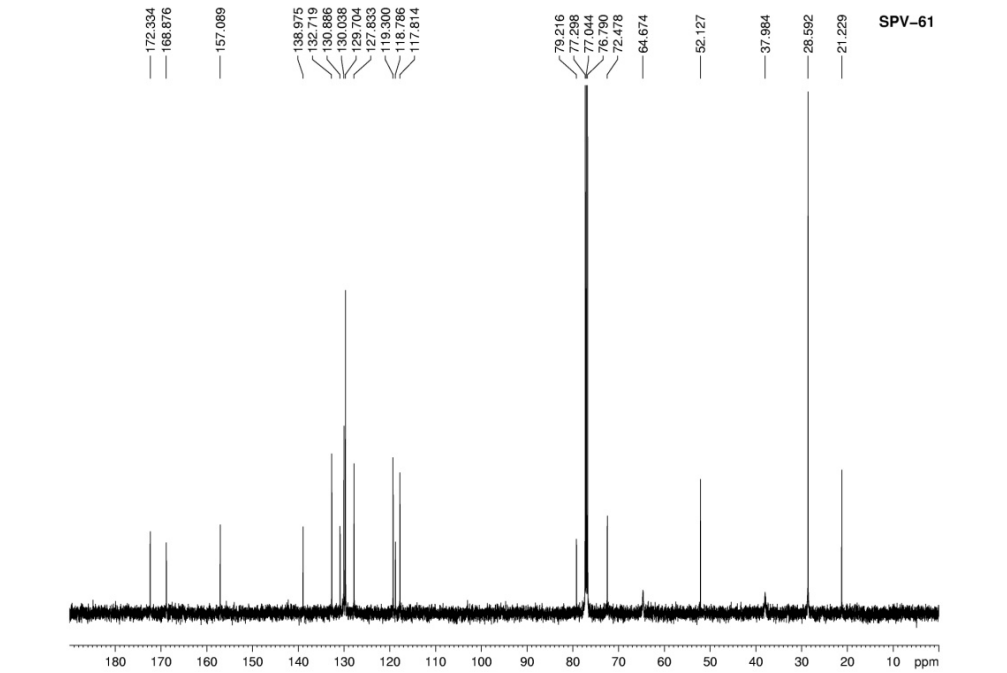


^{1}H and ^{13}C Spectrum of compound **5d**

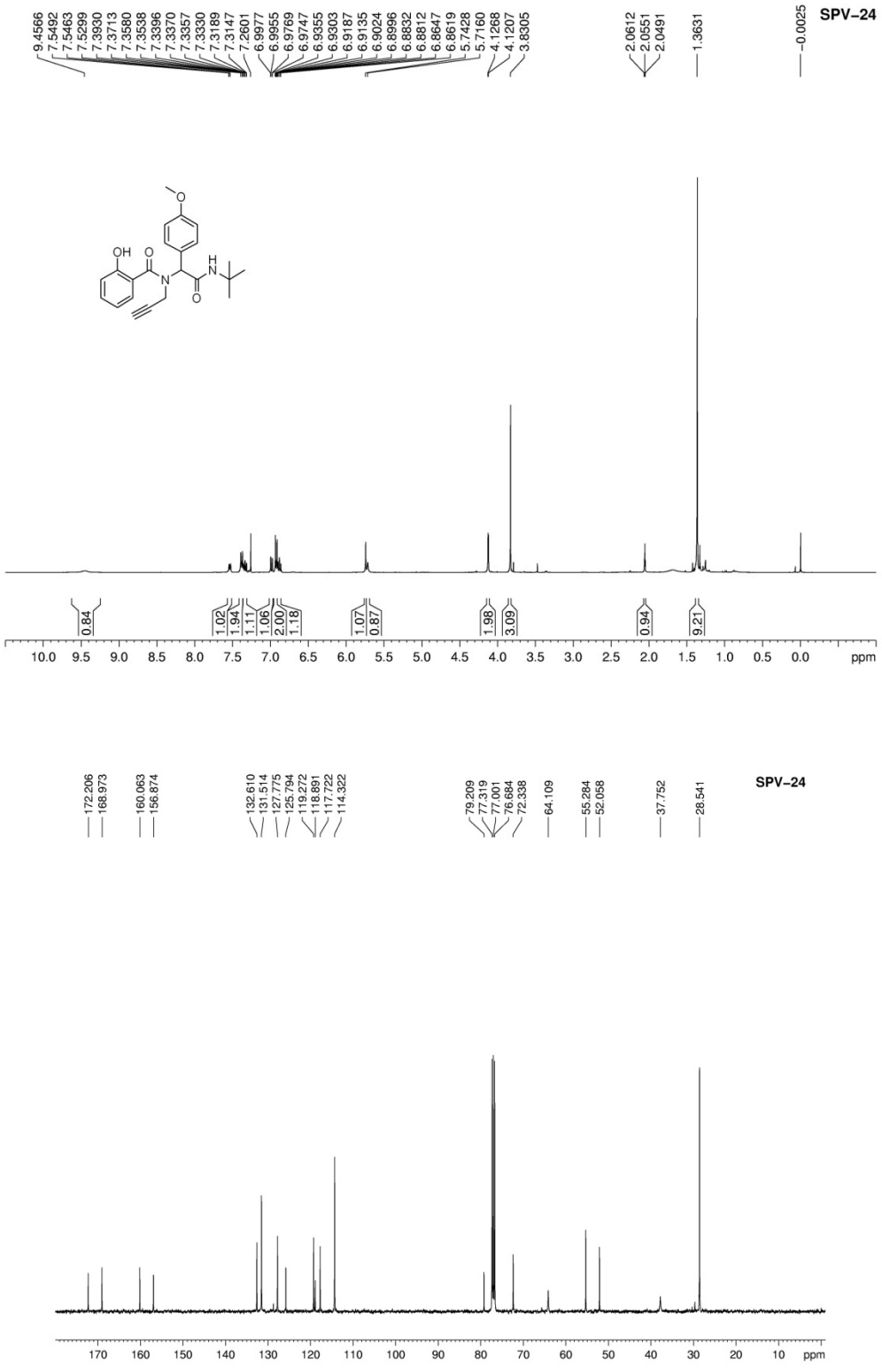


^{1}H and ^{13}C Spectrum of compound **5e**

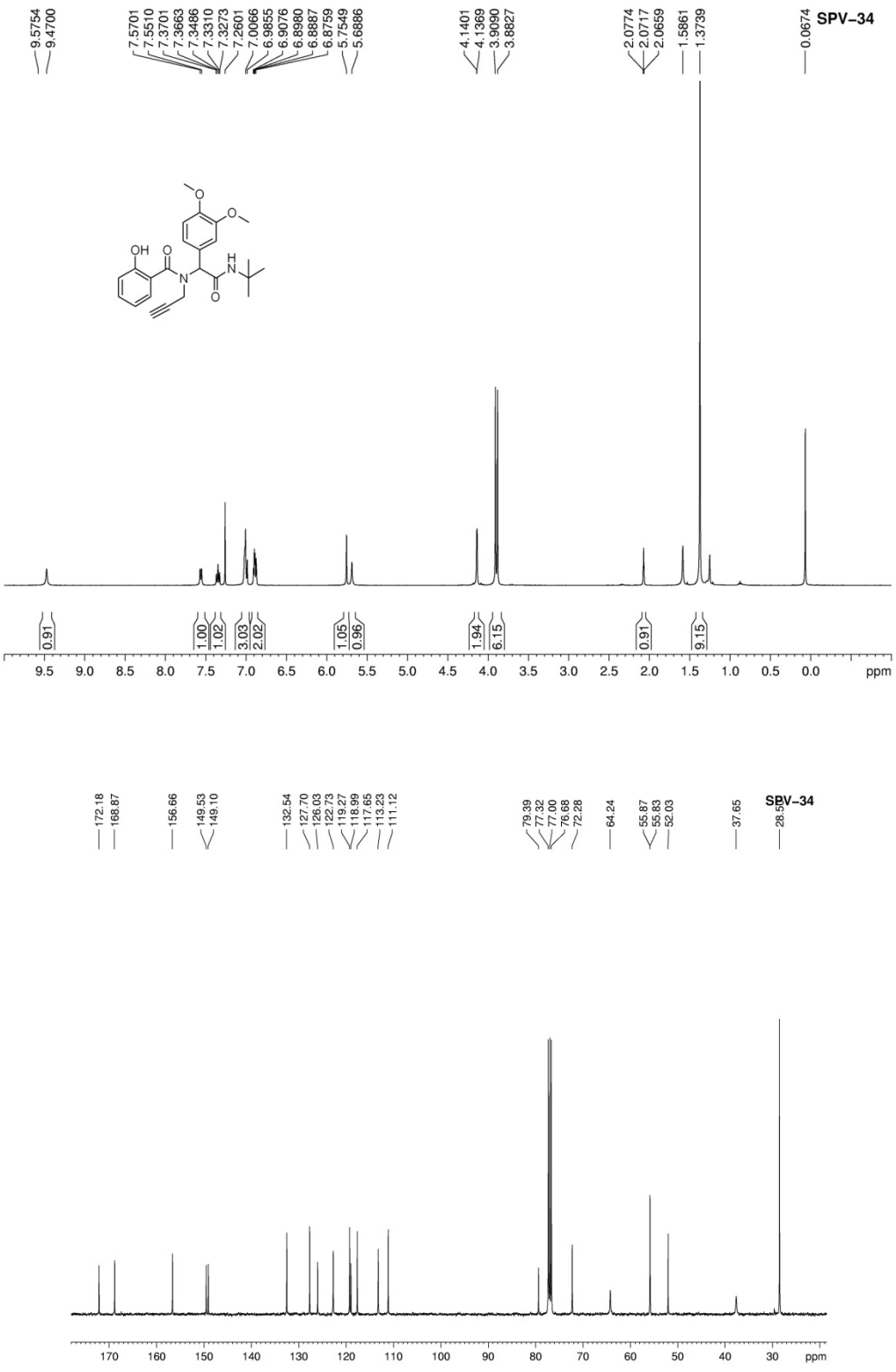




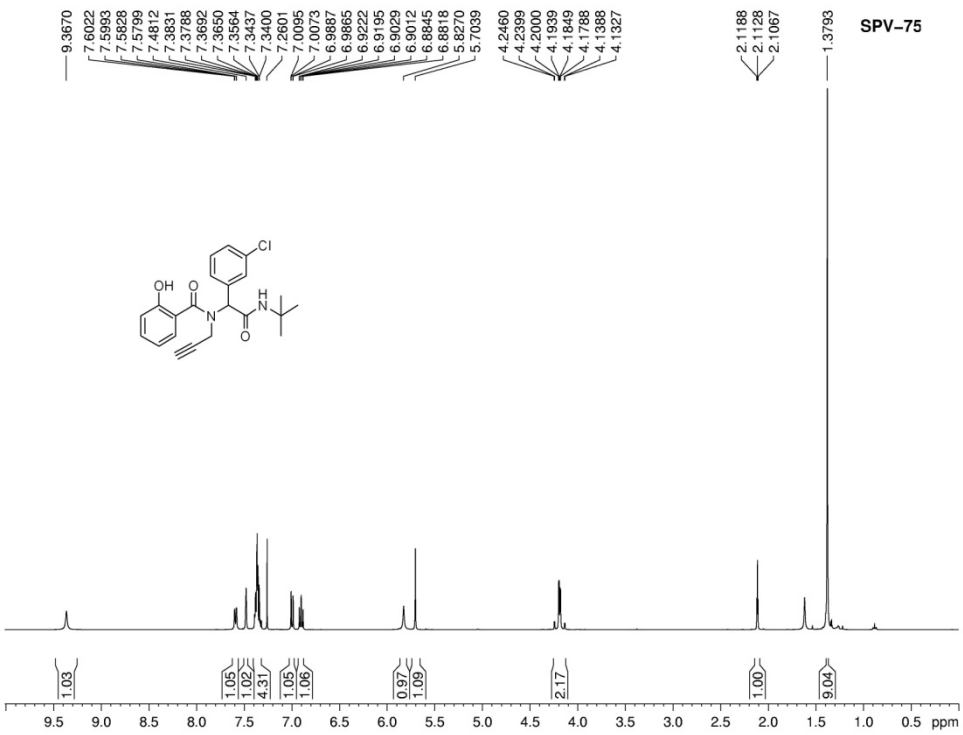
^{1}H and ^{13}C Spectrum of compound **5f**

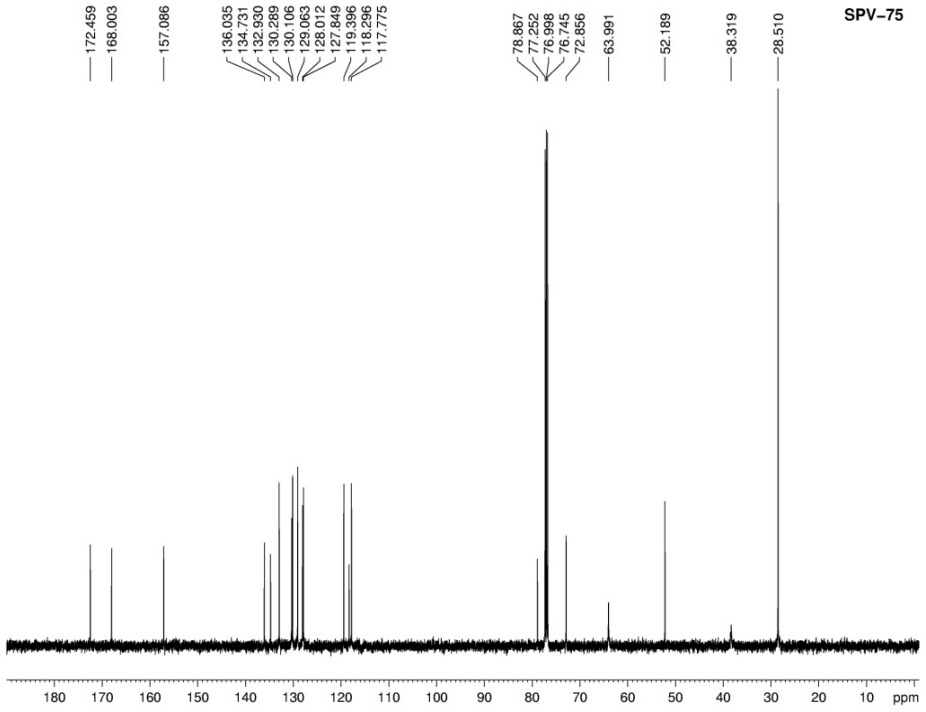


^{1}H and ^{13}C Spectrum of compound **5g**

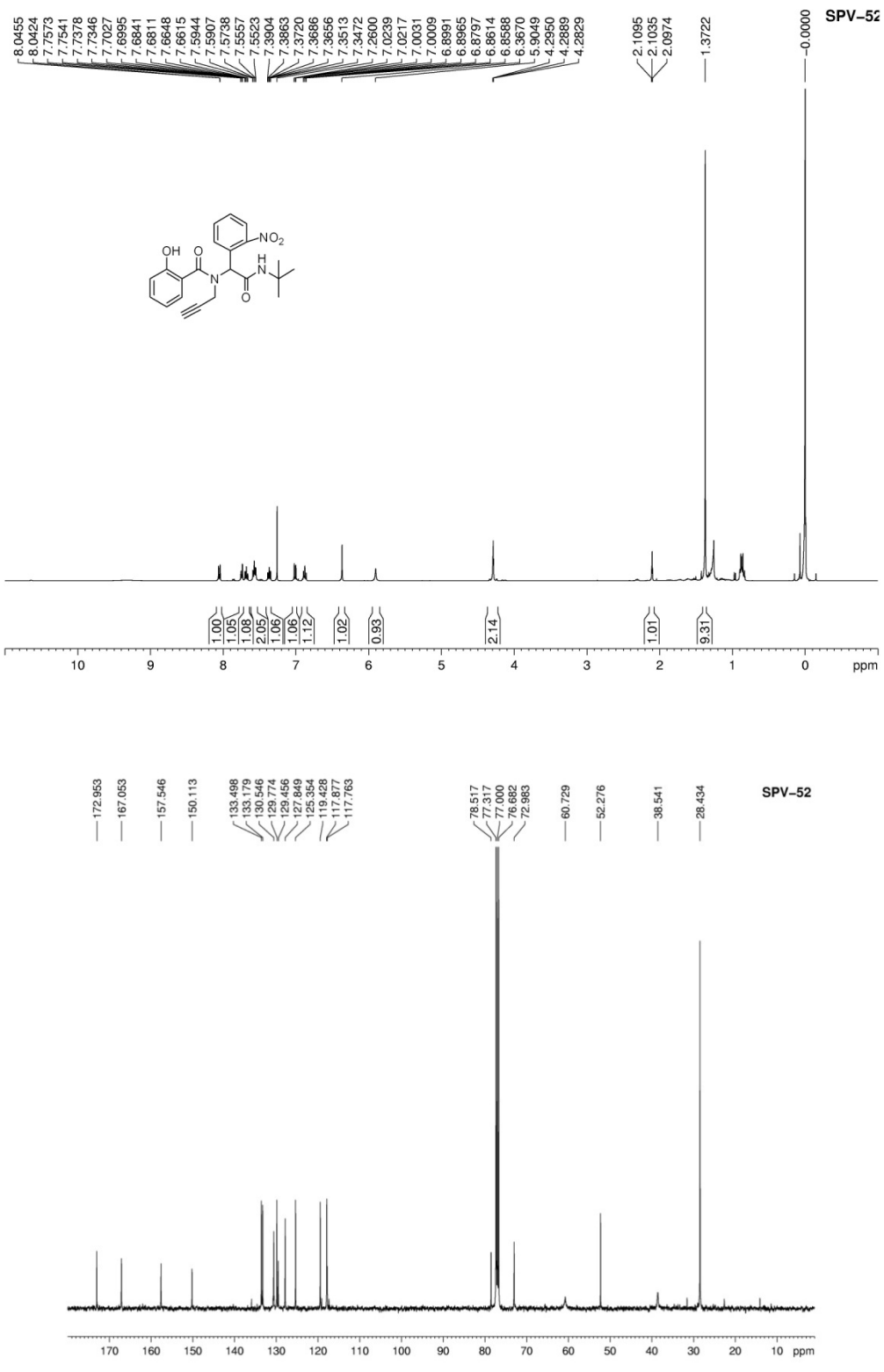


^{1}H and ^{13}C Spectrum of compound **5h**

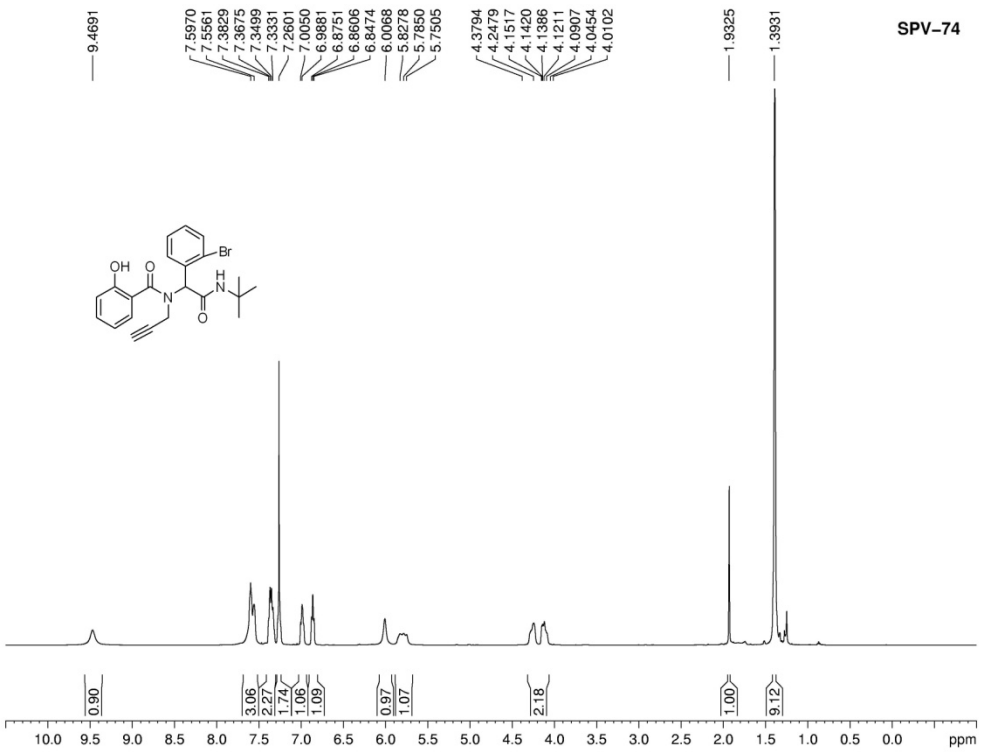


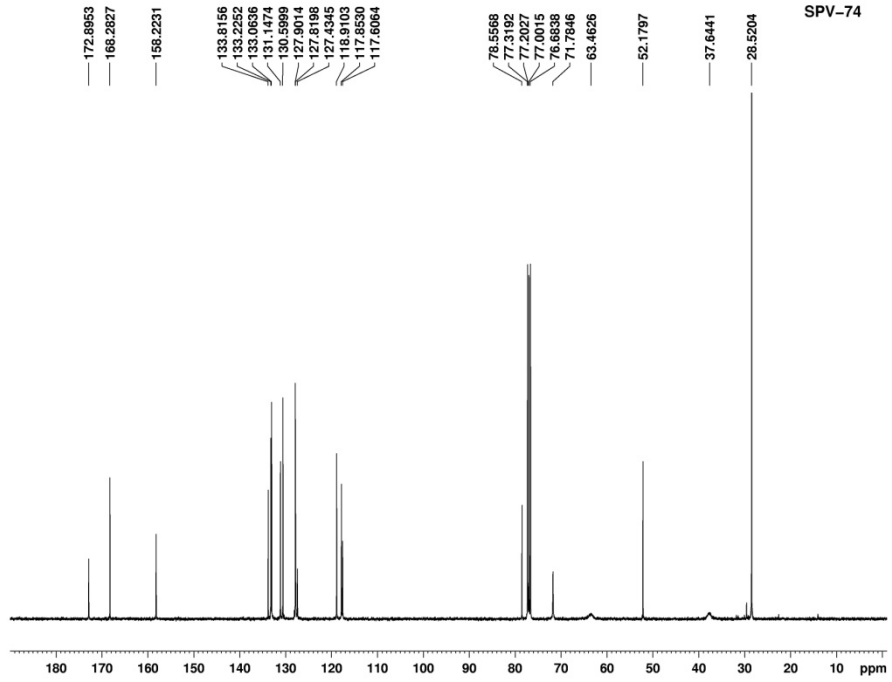


^{1}H and ^{13}C Spectrum of compound **5j**

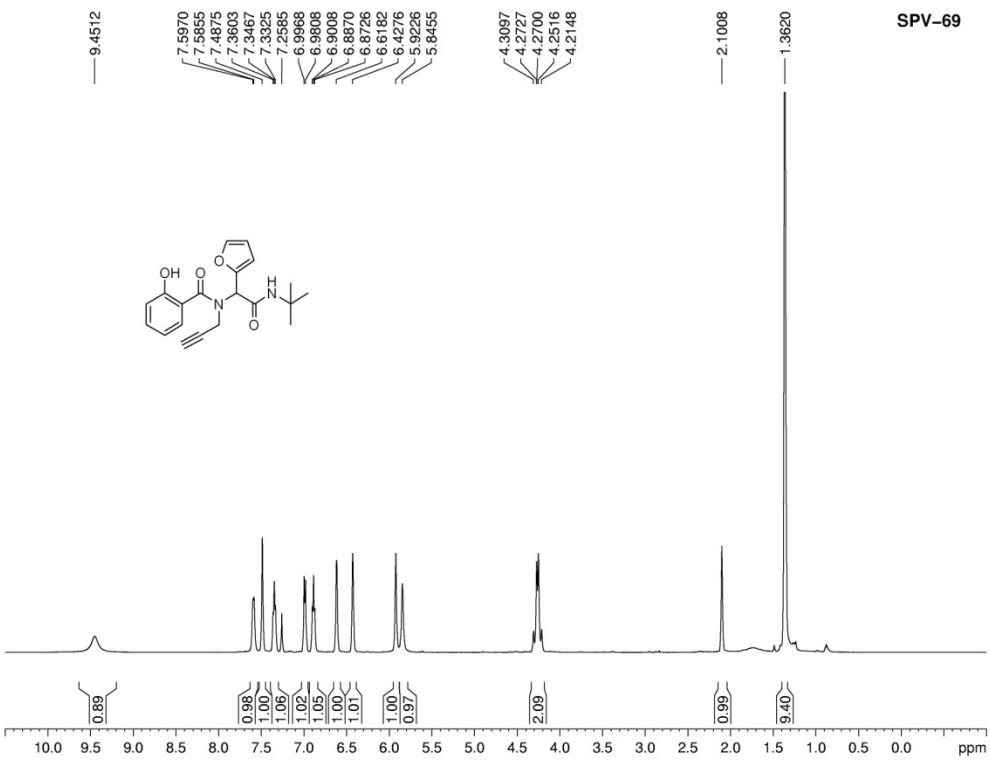


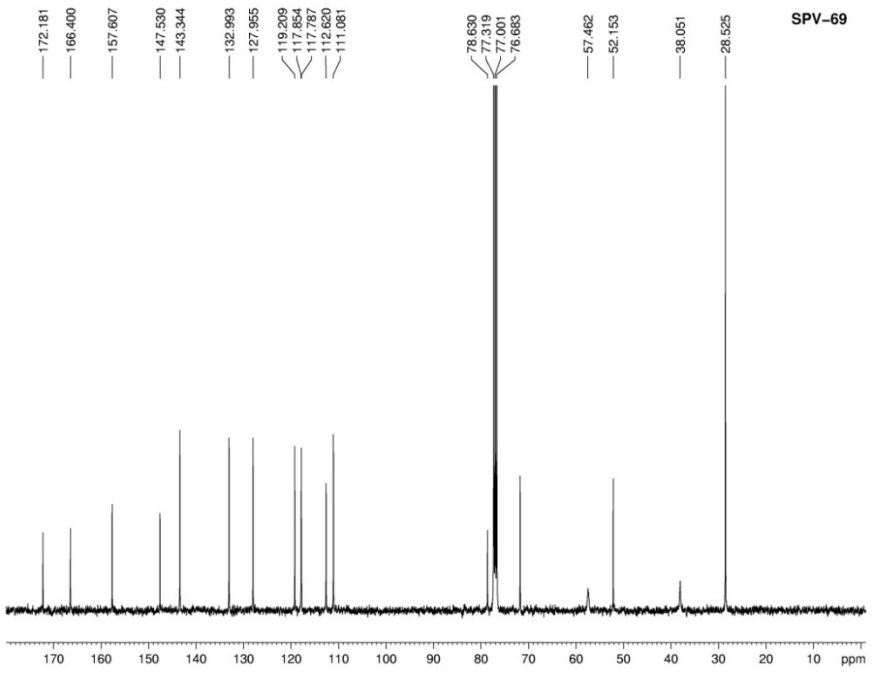
^{1}H and ^{13}C Spectrum of compound **5k**



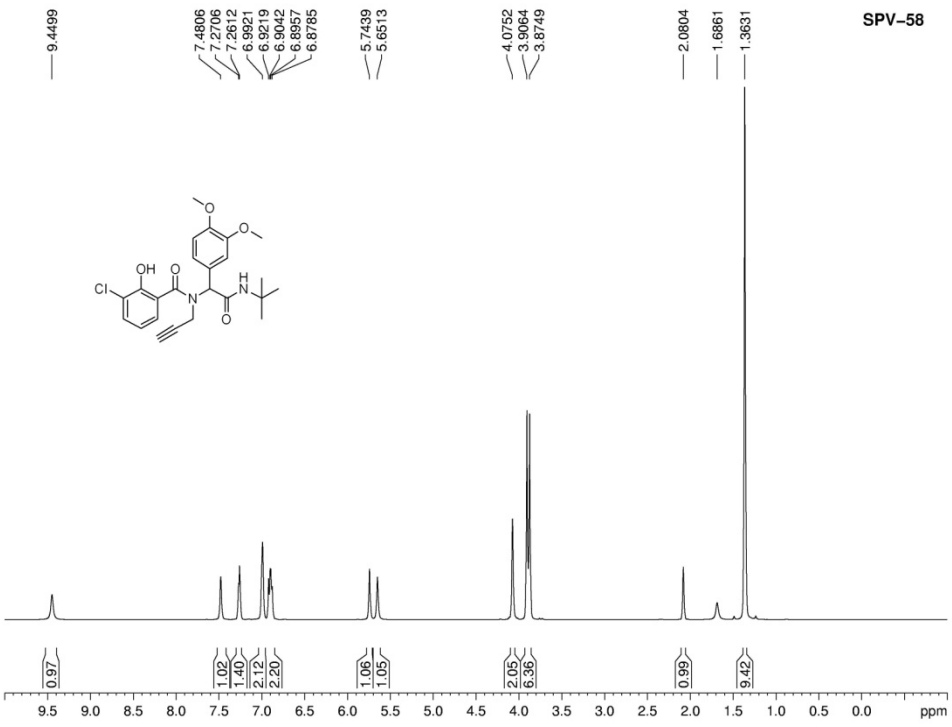


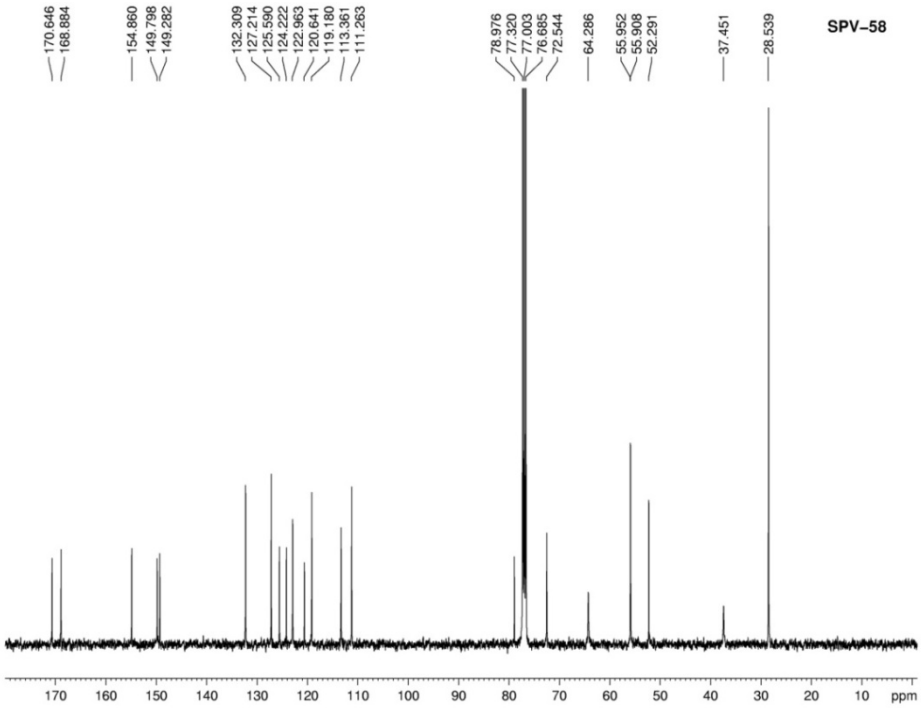
^{1}H and ^{13}C Spectrum of compound **5l**



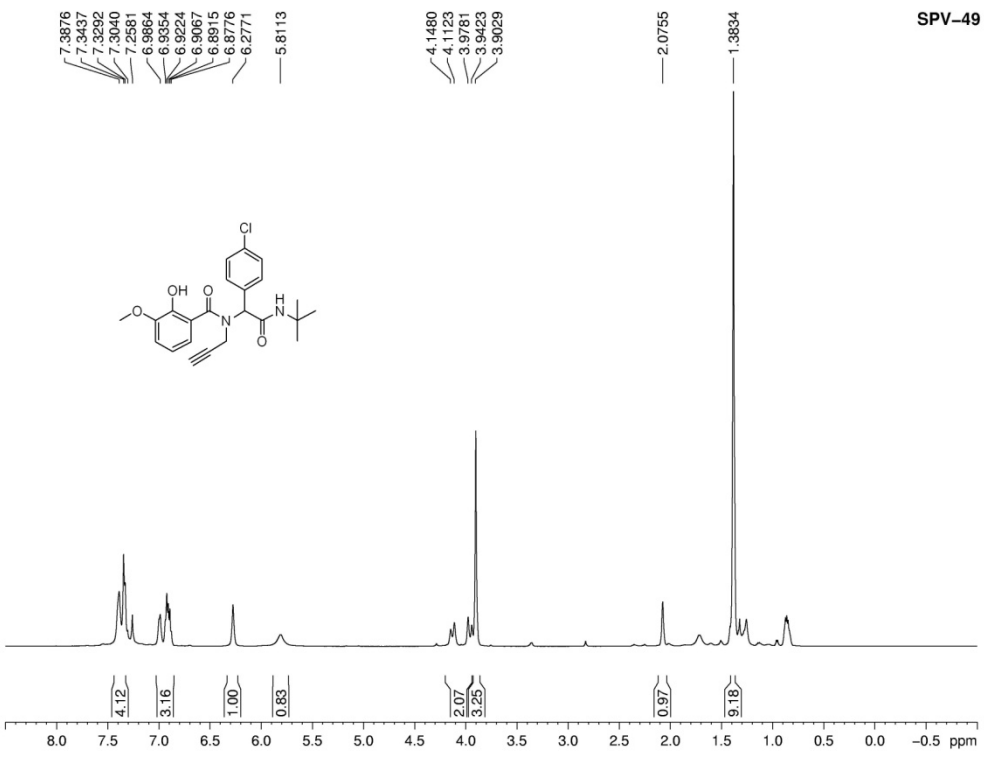


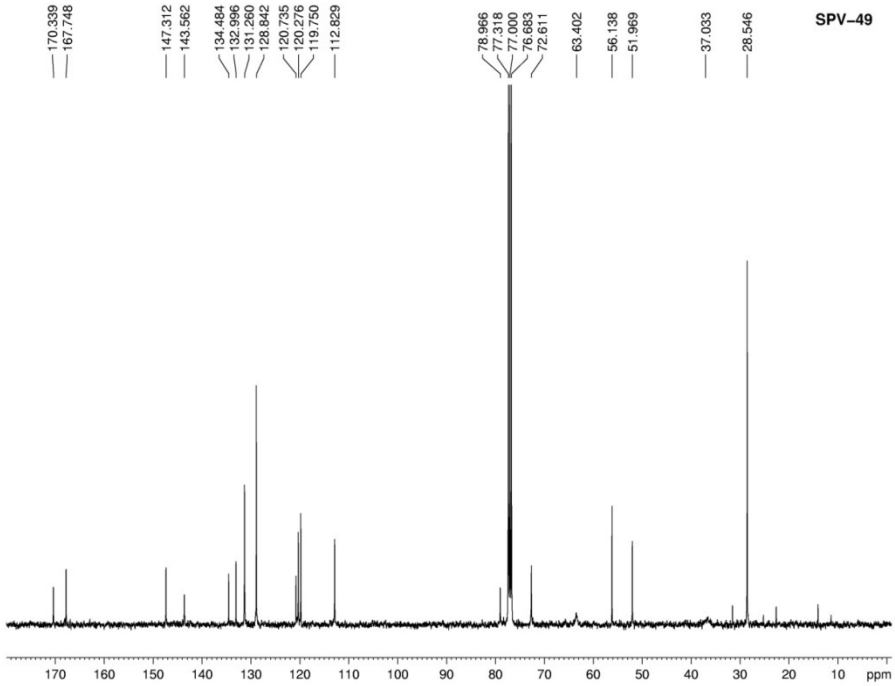
^{1}H and ^{13}C Spectrum of compound **5m**



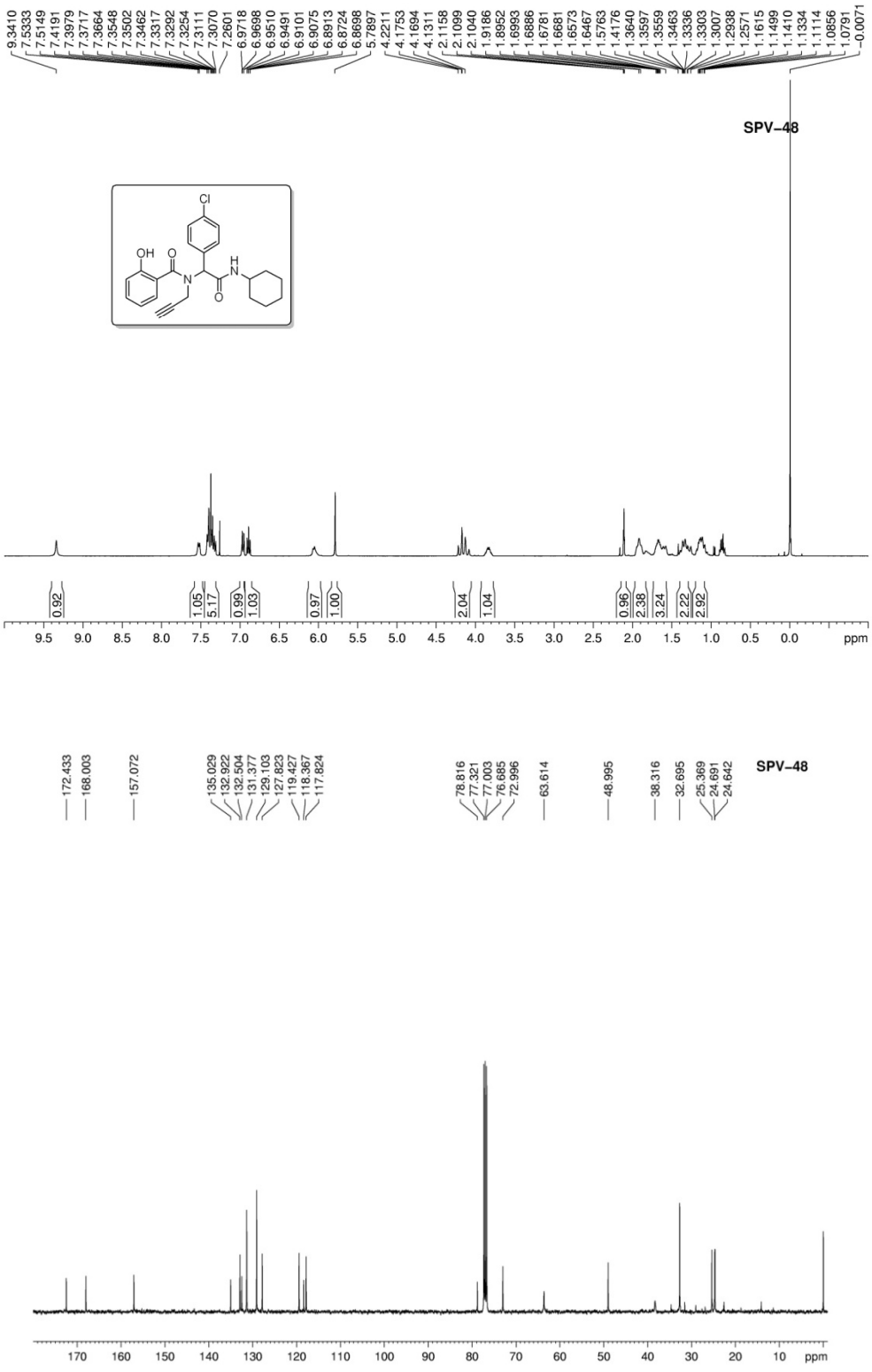


^{1}H and ^{13}C Spectrum of compound **5o**

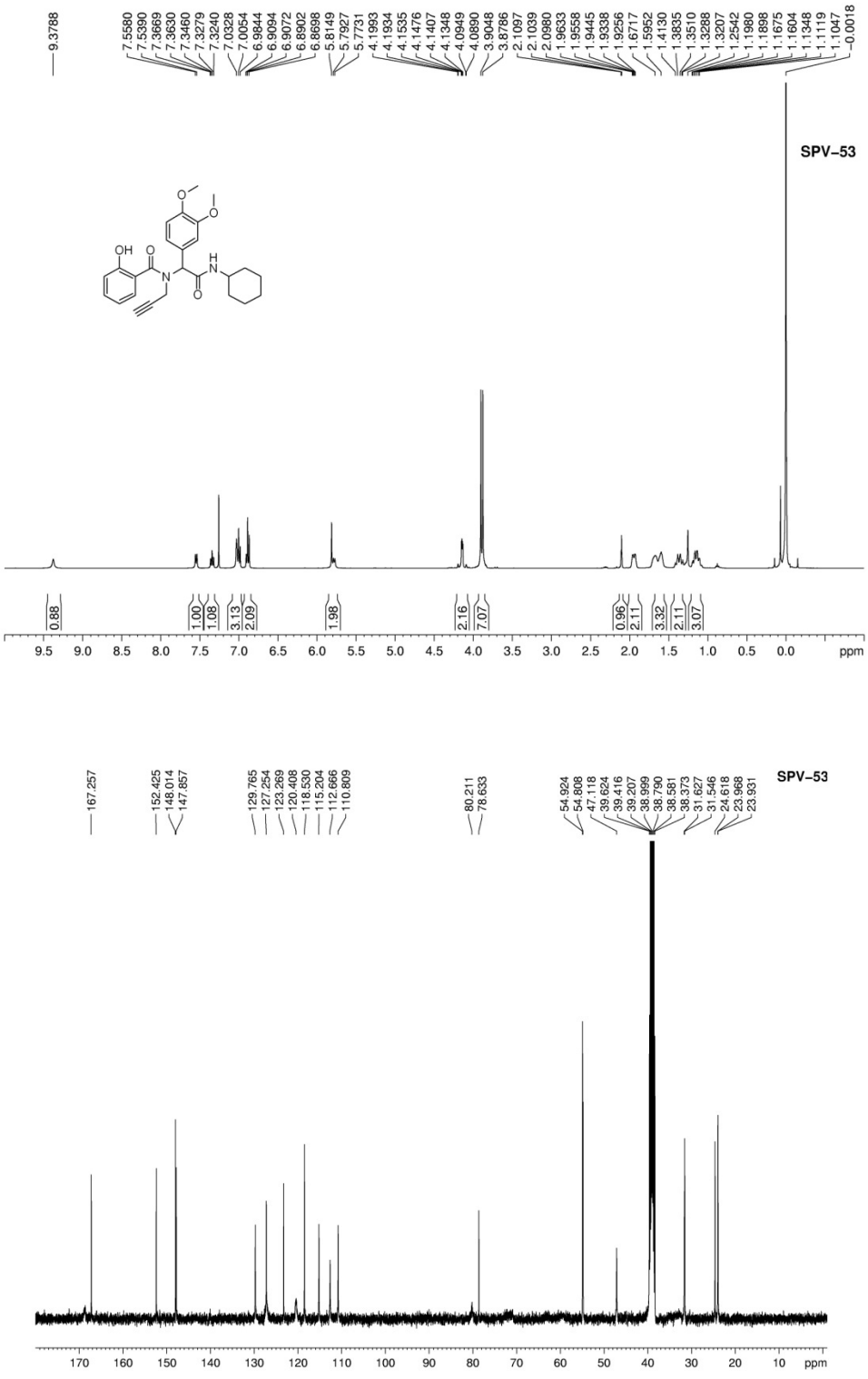




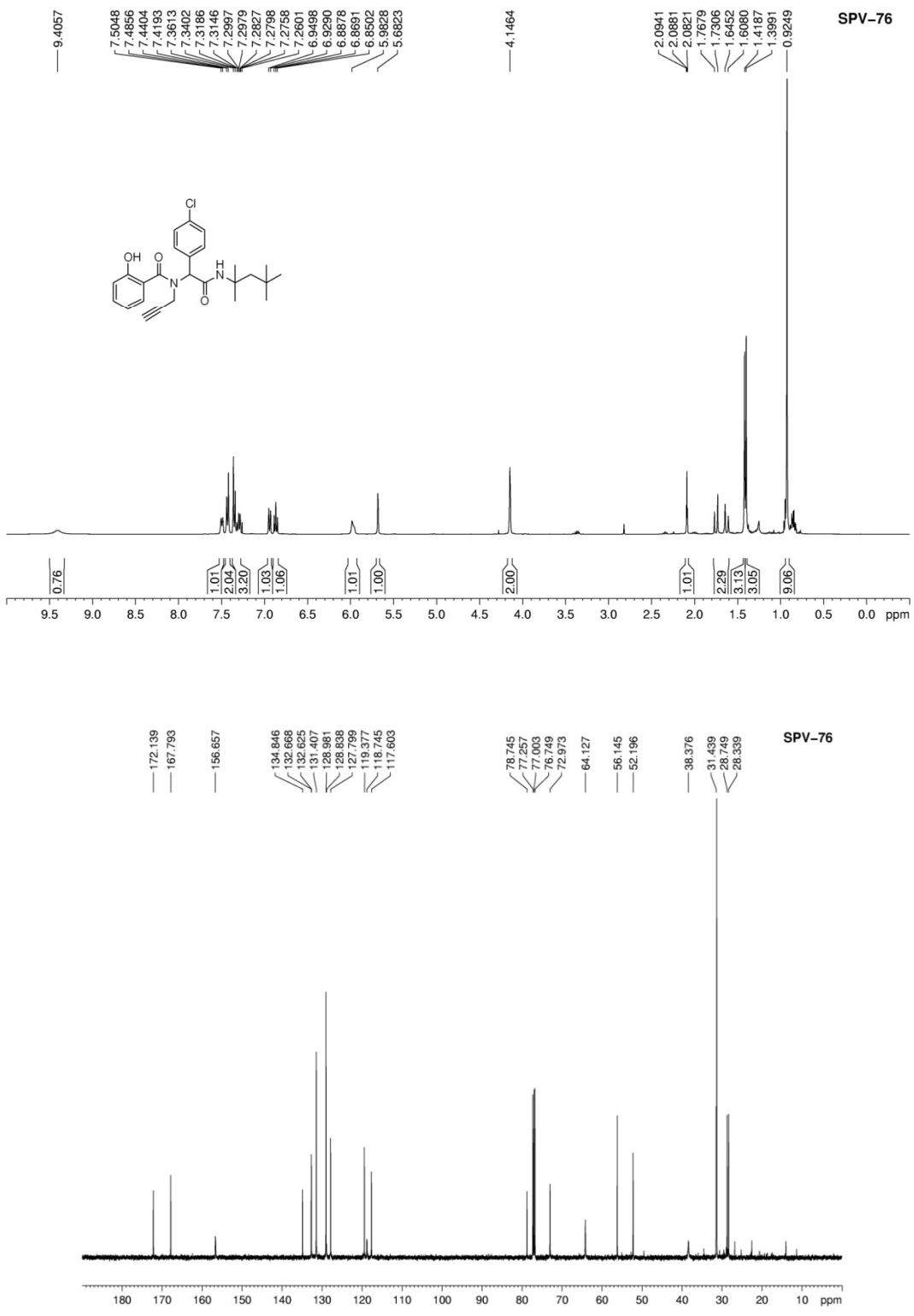
^{1}H and ^{13}C Spectrum of compound **5p**



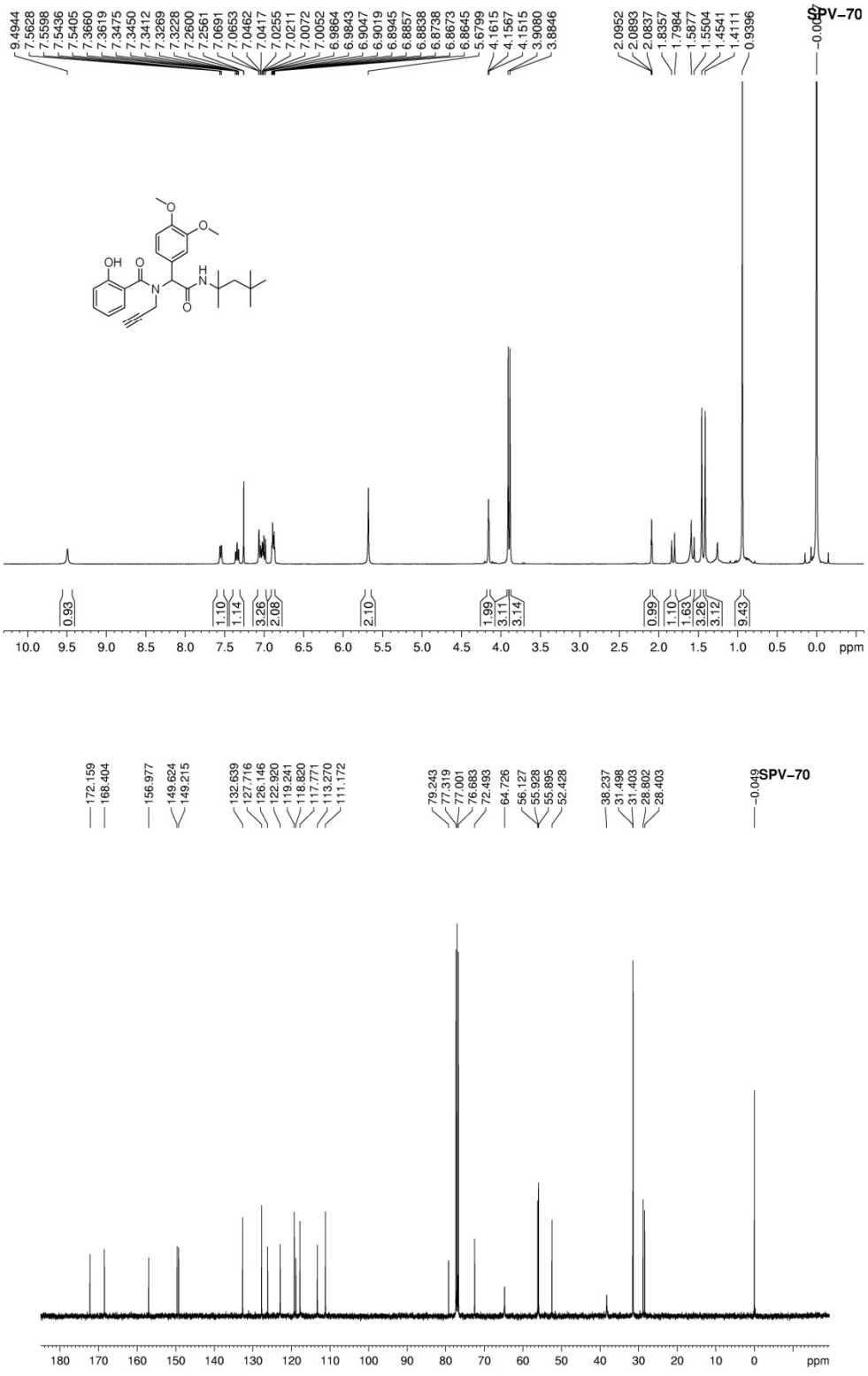
^{1}H and ^{13}C Spectrum of compound **5q**



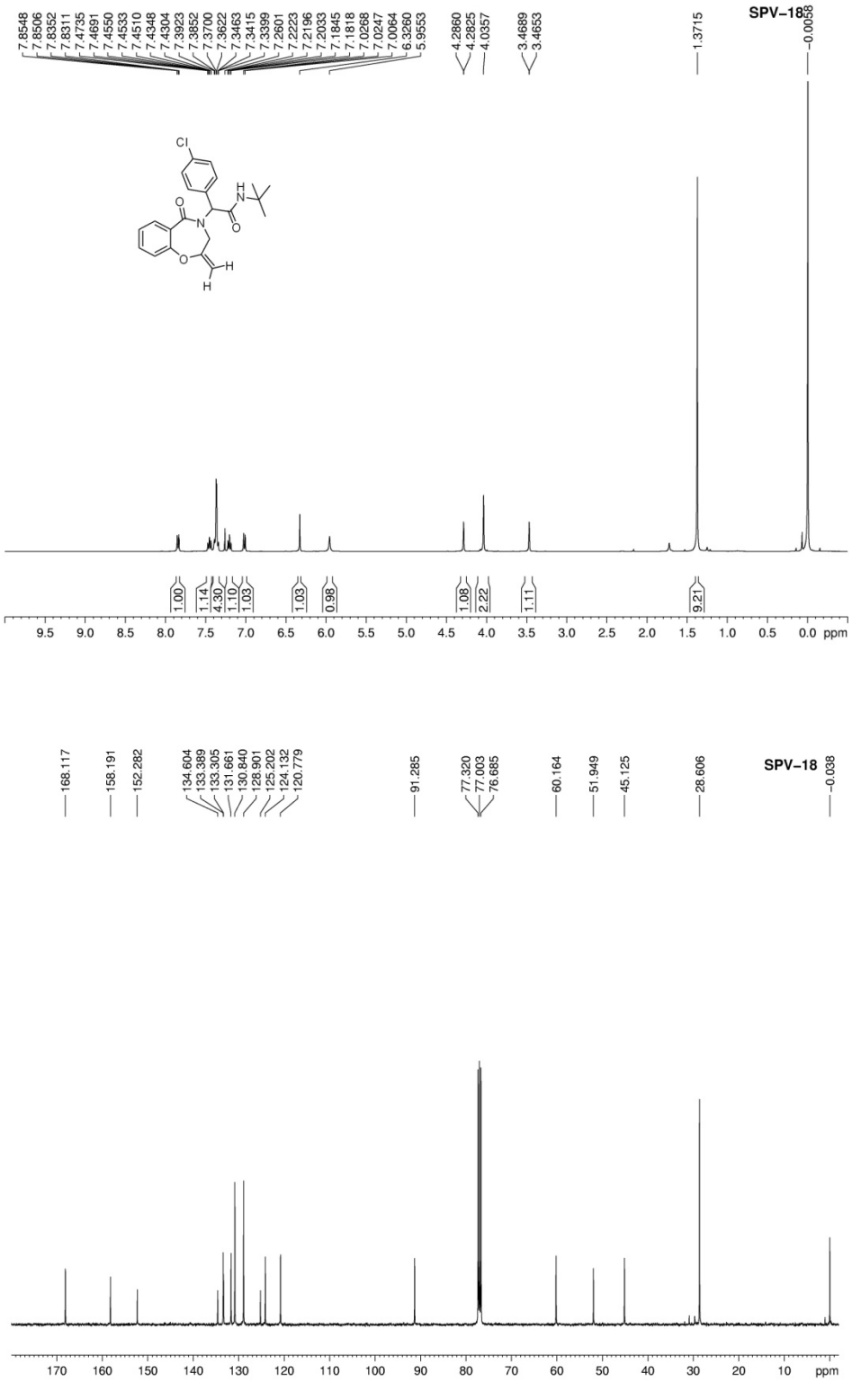
^{1}H and ^{13}C Spectrum of compound **5r**



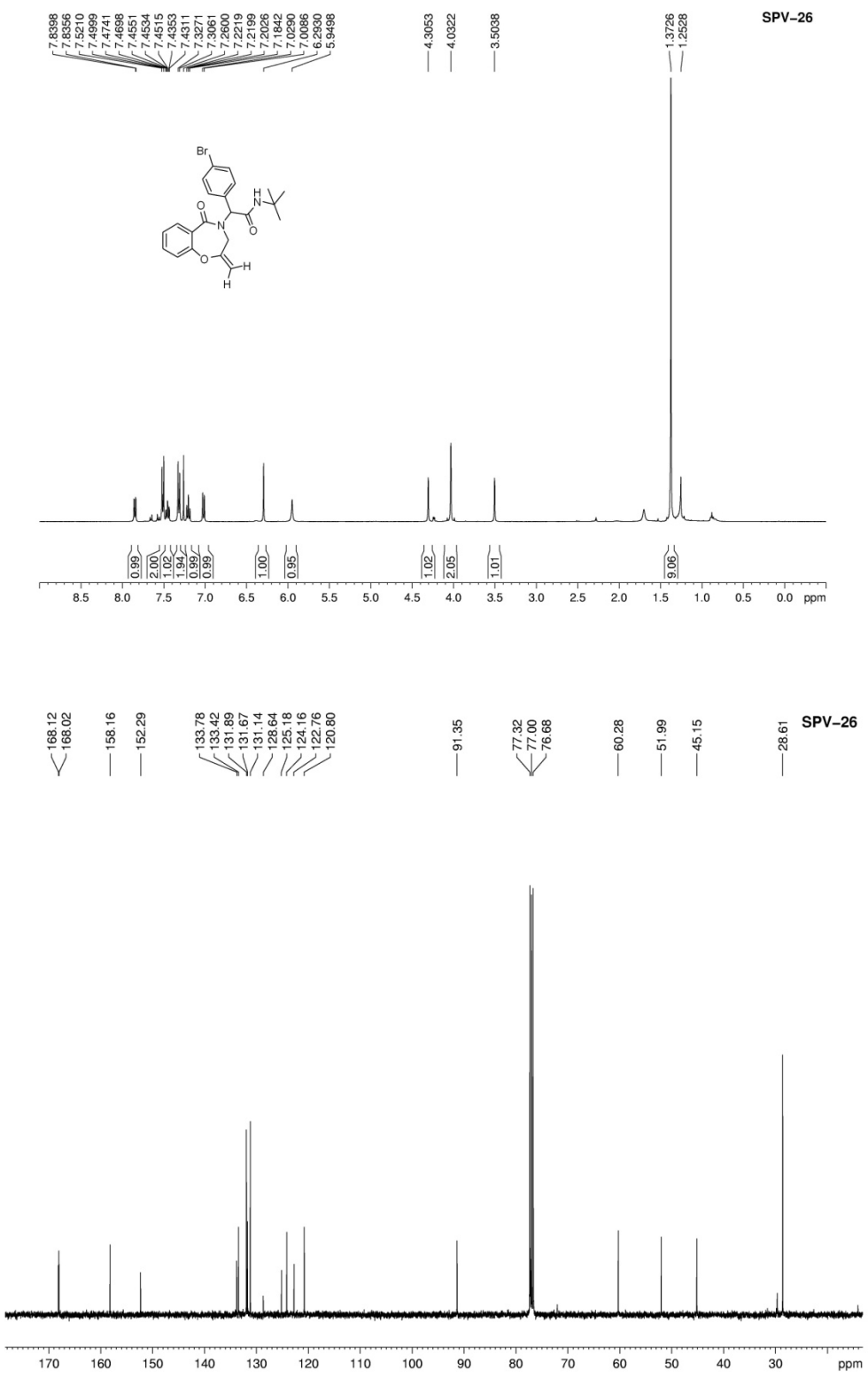
^{1}H and ^{13}C Spectrum of compound **5s**



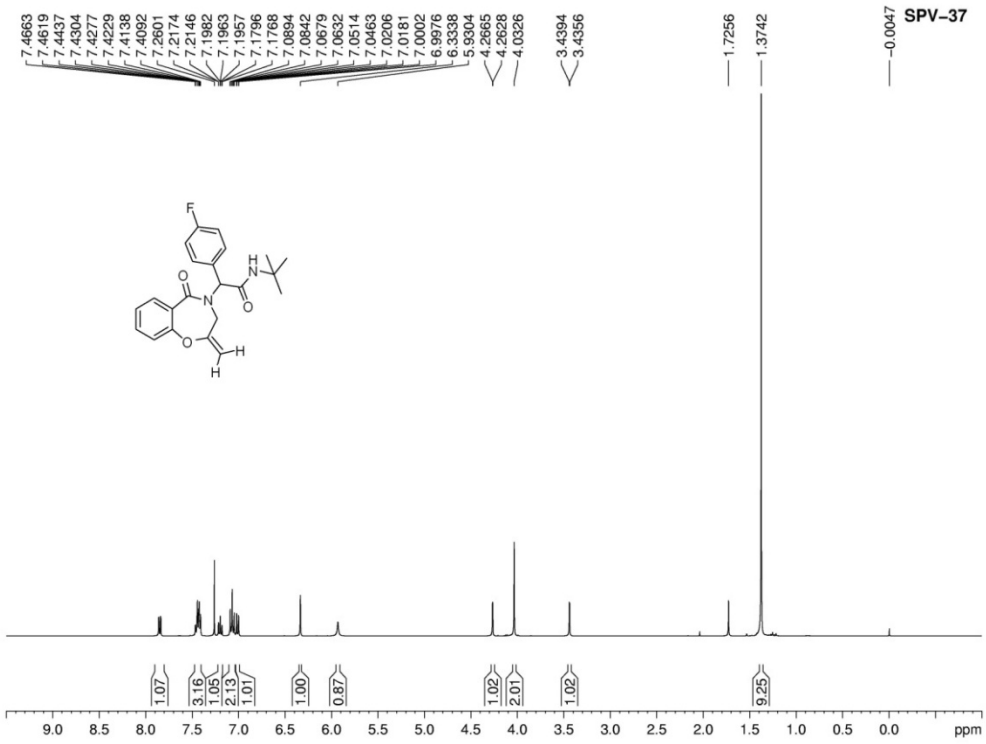
^{1}H and ^{13}C Spectrum of compound **5t**

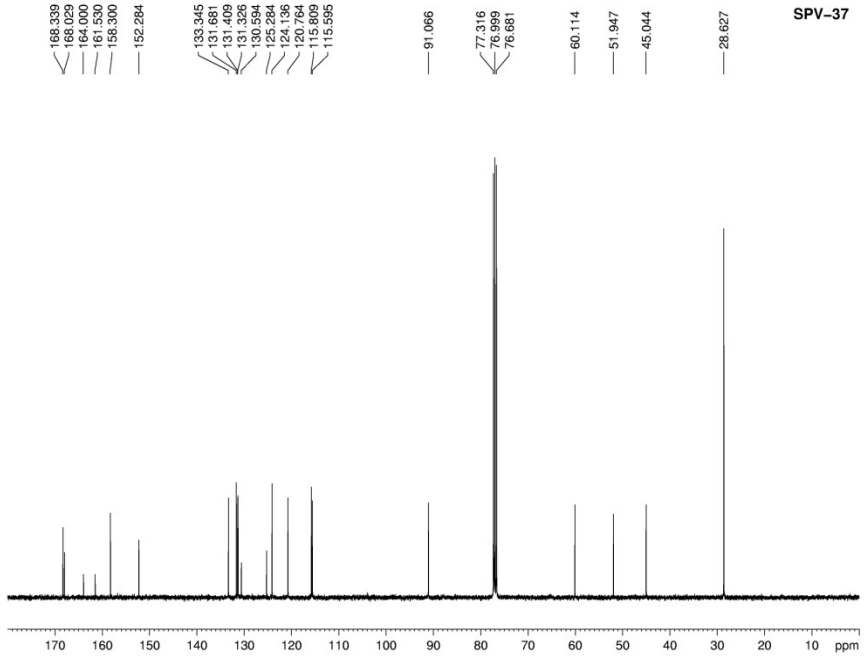


^{1}H and ^{13}C Spectrum of compound **6a**

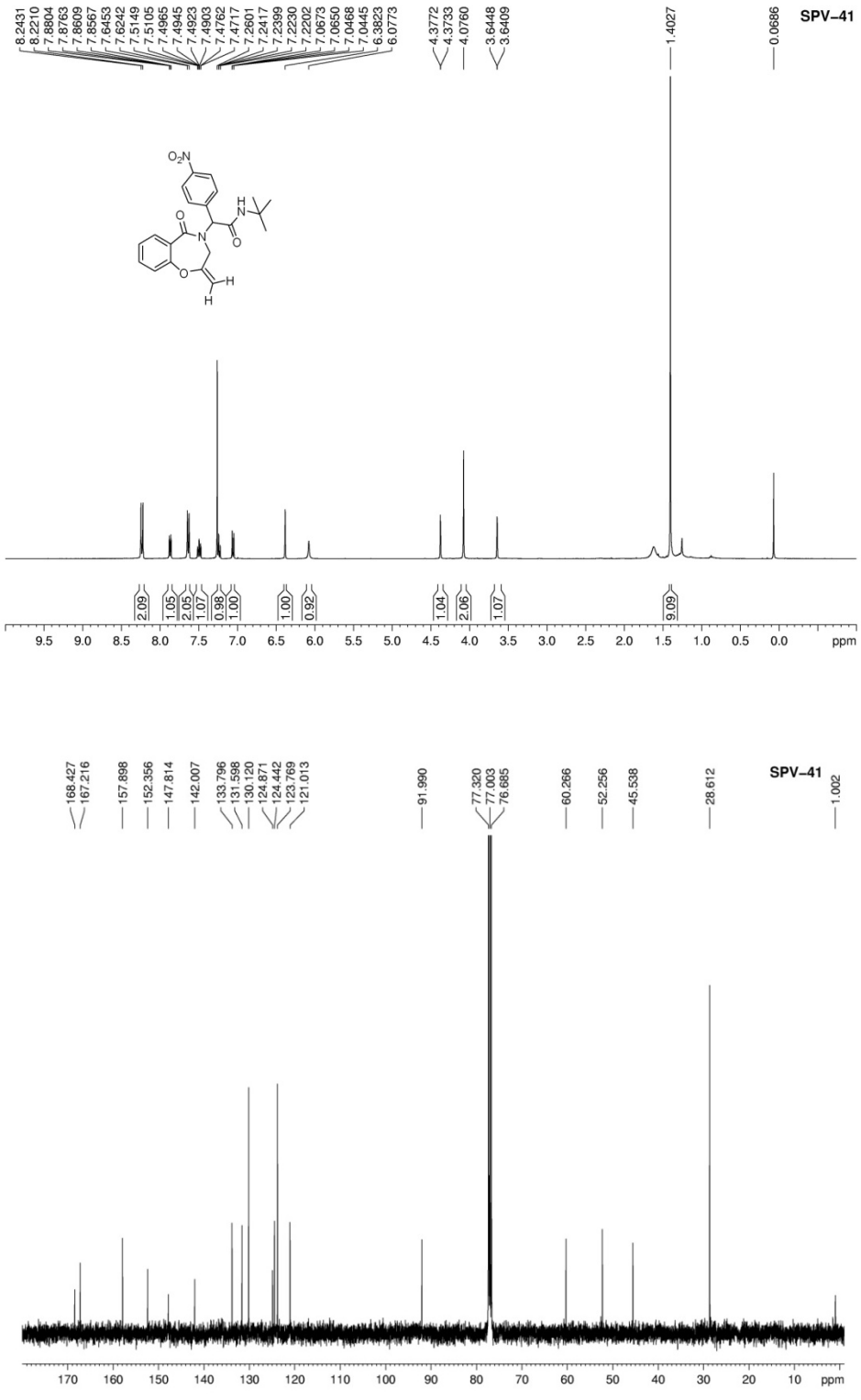


^{1}H and ^{13}C Spectrum of compound **6b**

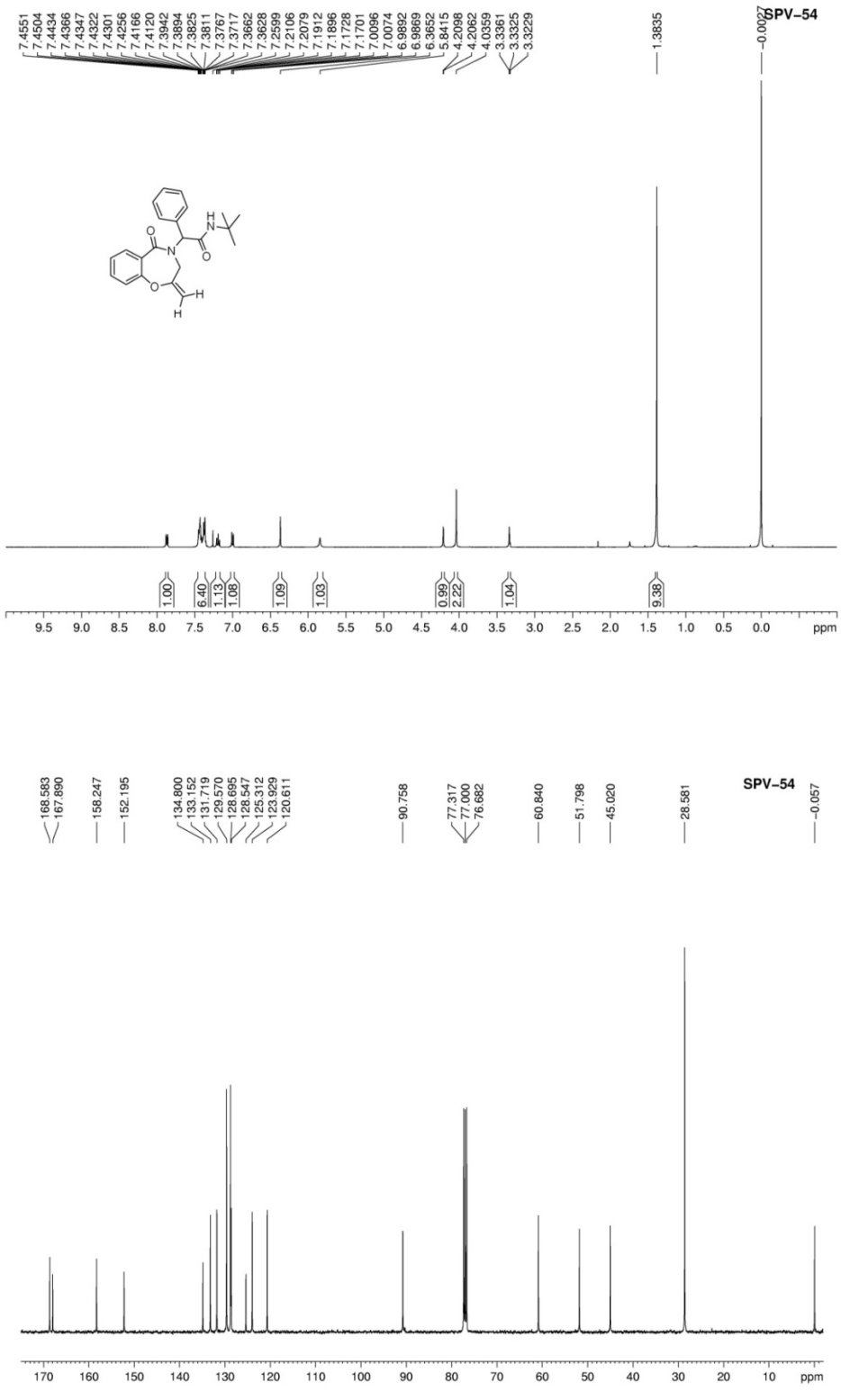




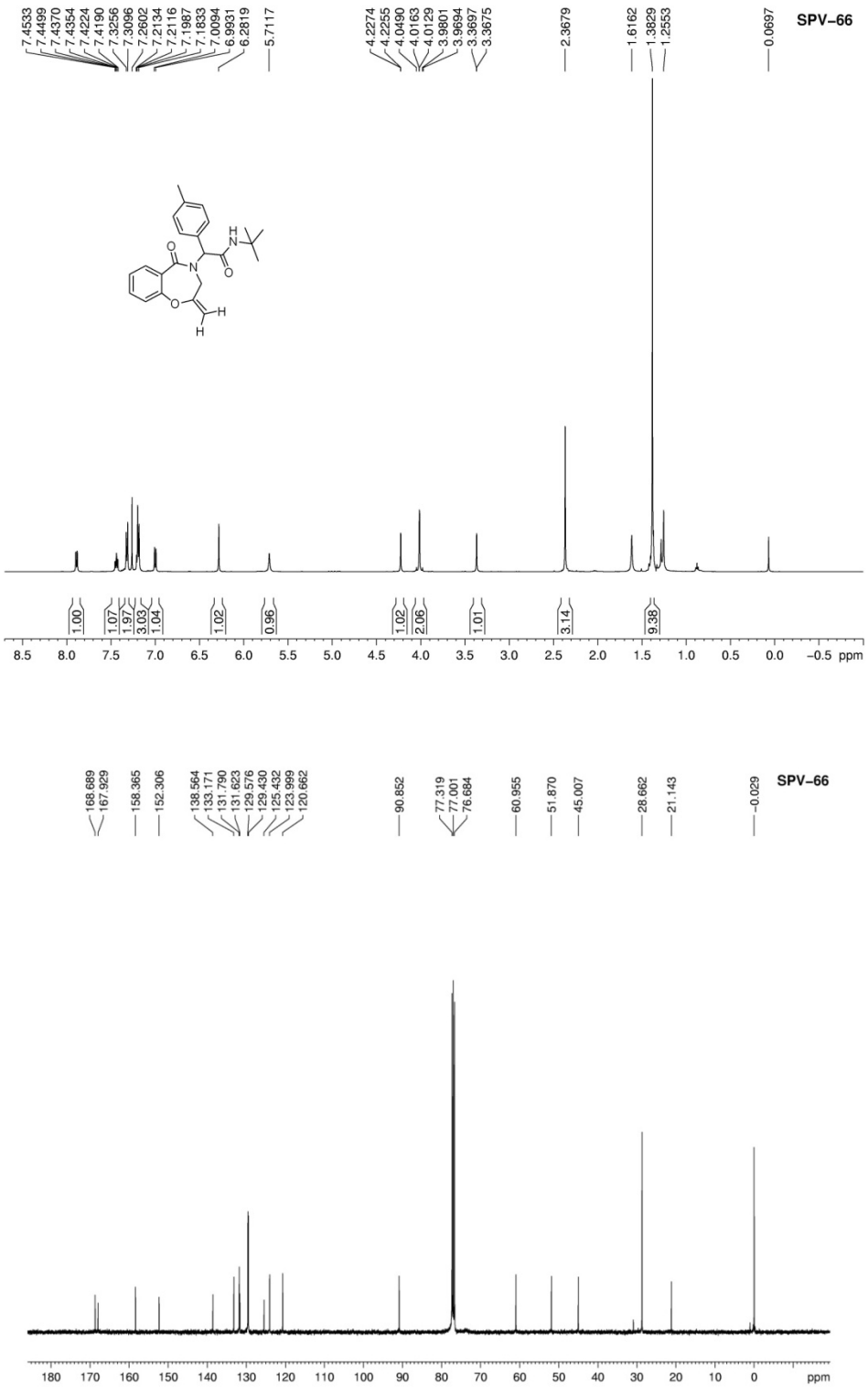
^{1}H and ^{13}C Spectrum of compound **6c**



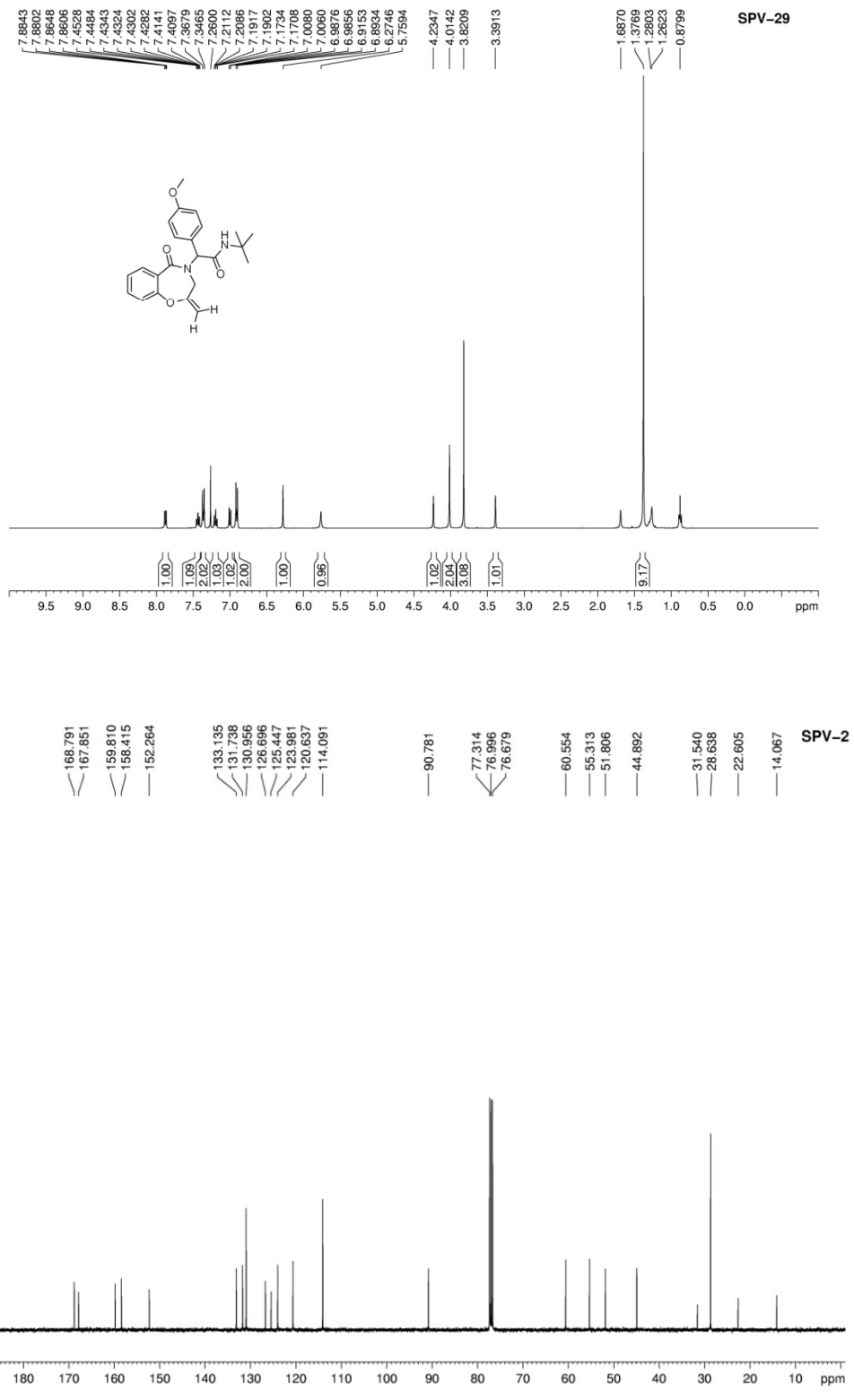
^{1}H and ^{13}C Spectrum of compound **6d**



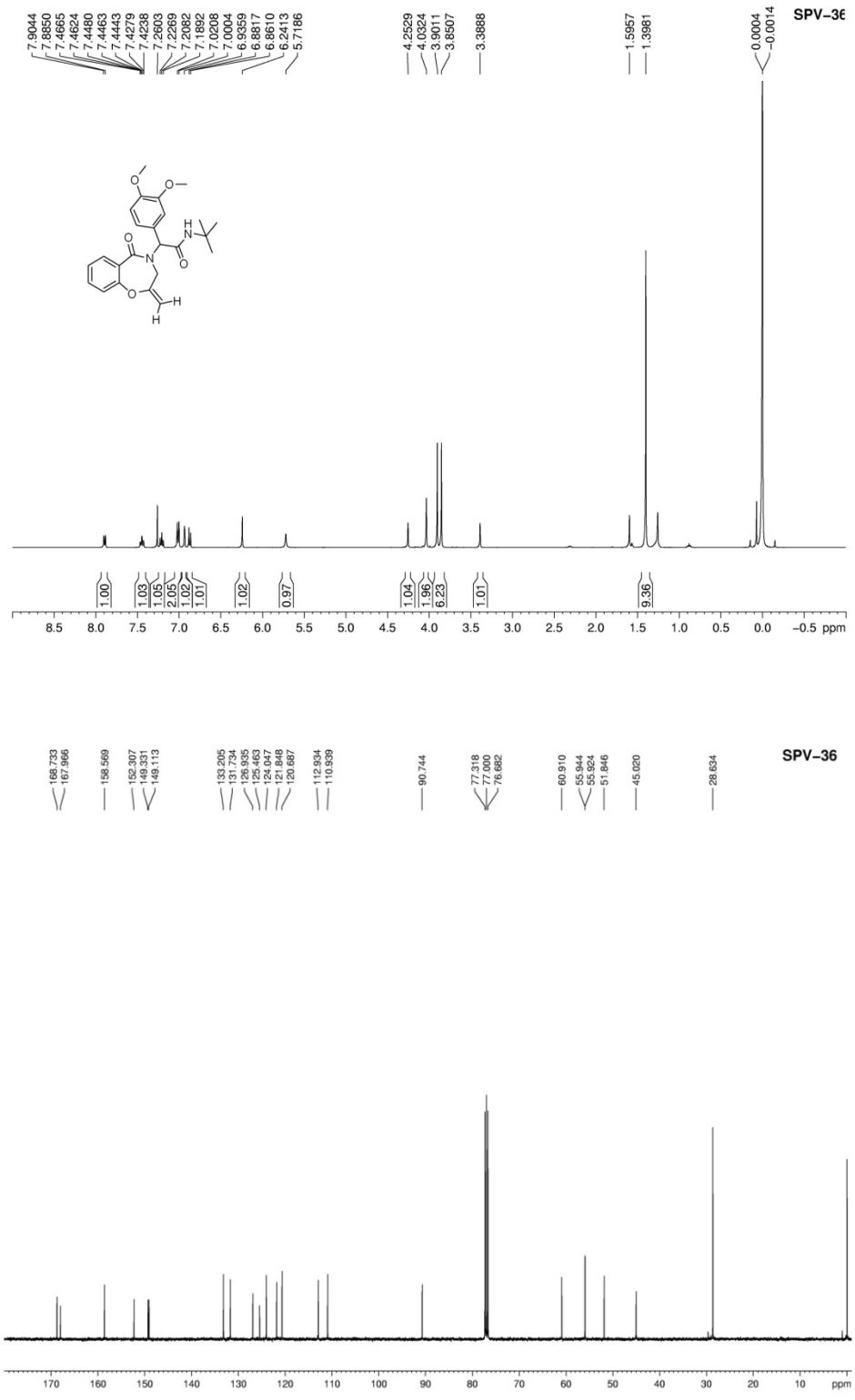
^{1}H and ^{13}C Spectrum of compound **6e**



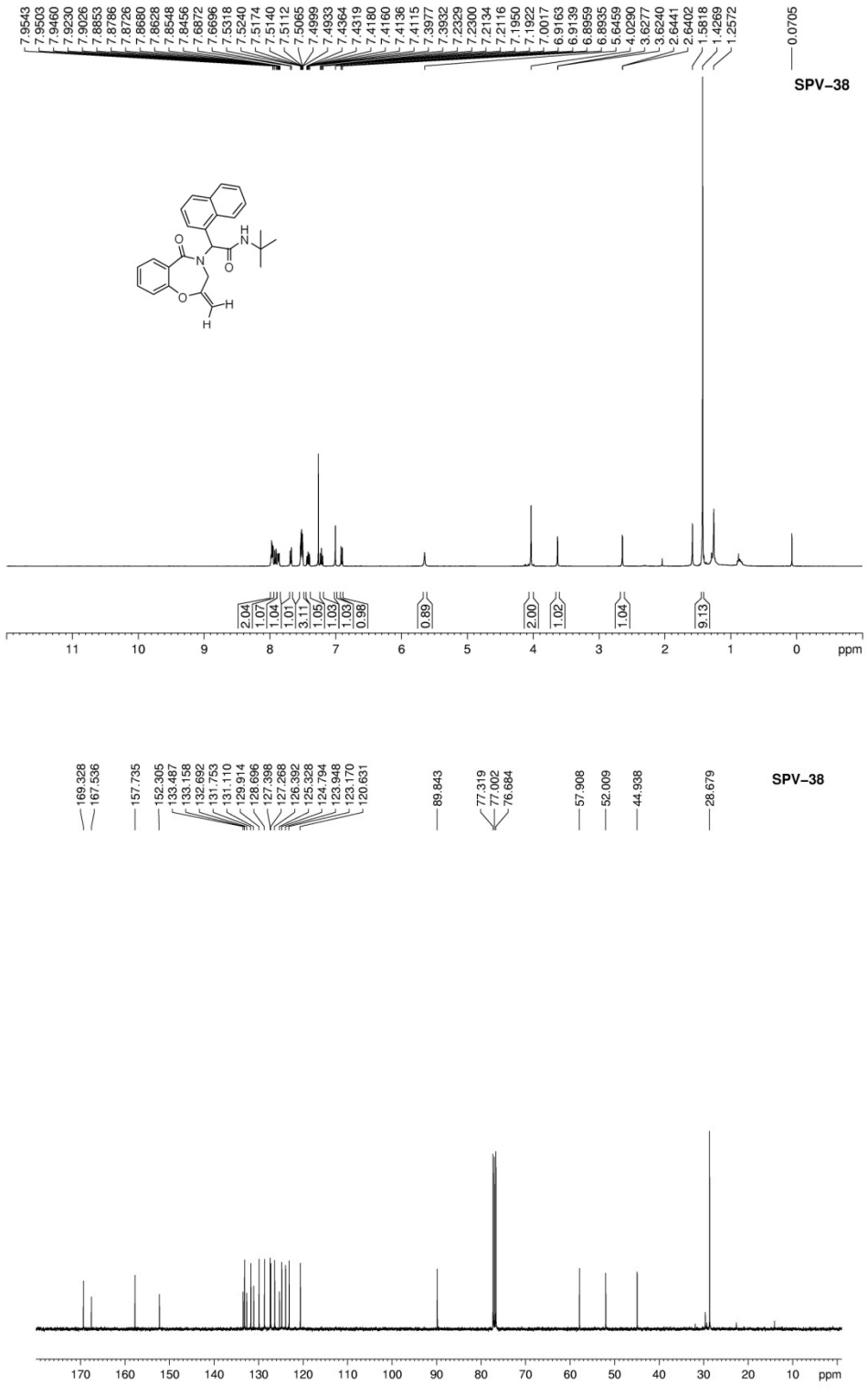
^{1}H and ^{13}C Spectrum of compound **6f**



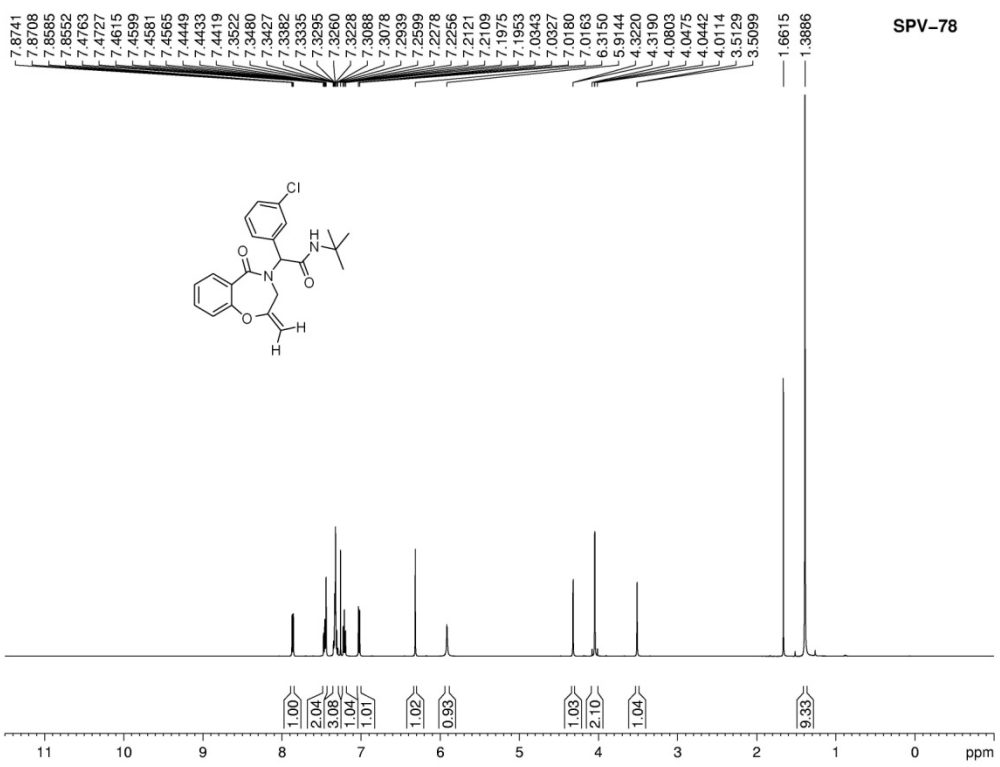
^{1}H and ^{13}C Spectrum of compound **6g**

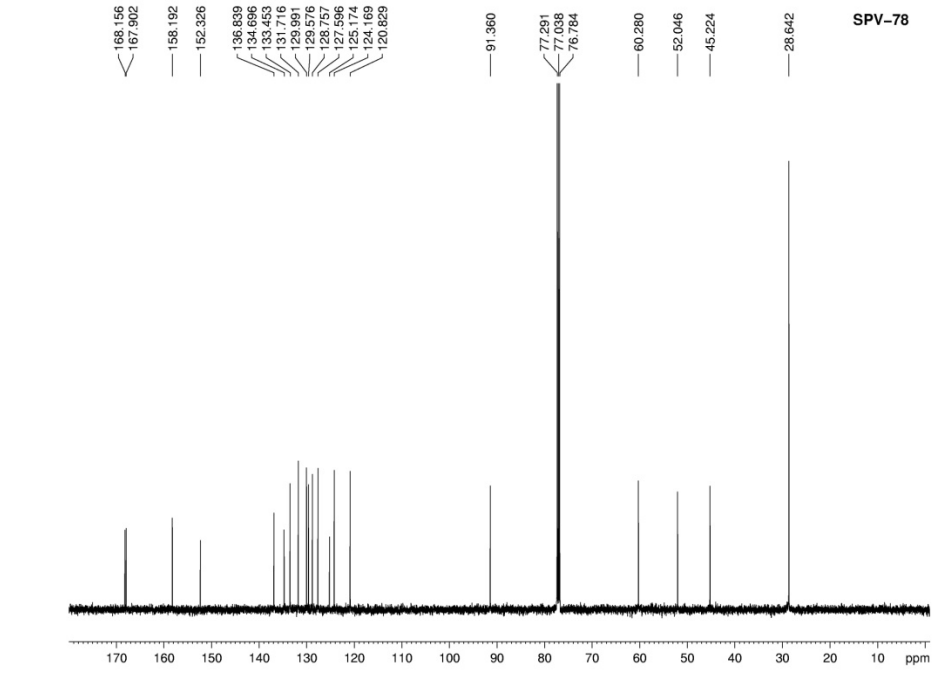


^{1}H and ^{13}C Spectrum of compound **6h**



^{1}H and ^{13}C Spectrum of compound **6i**





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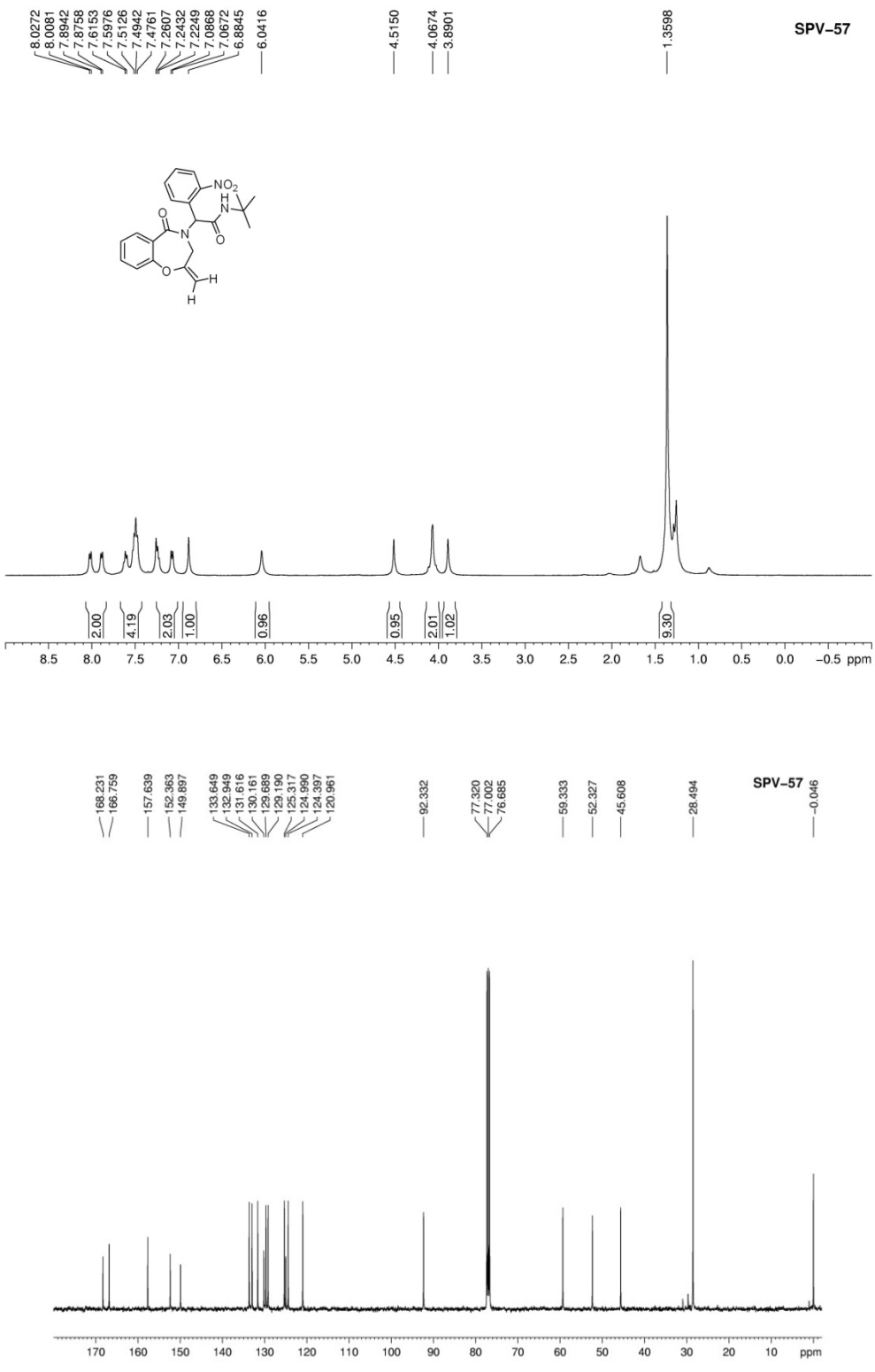
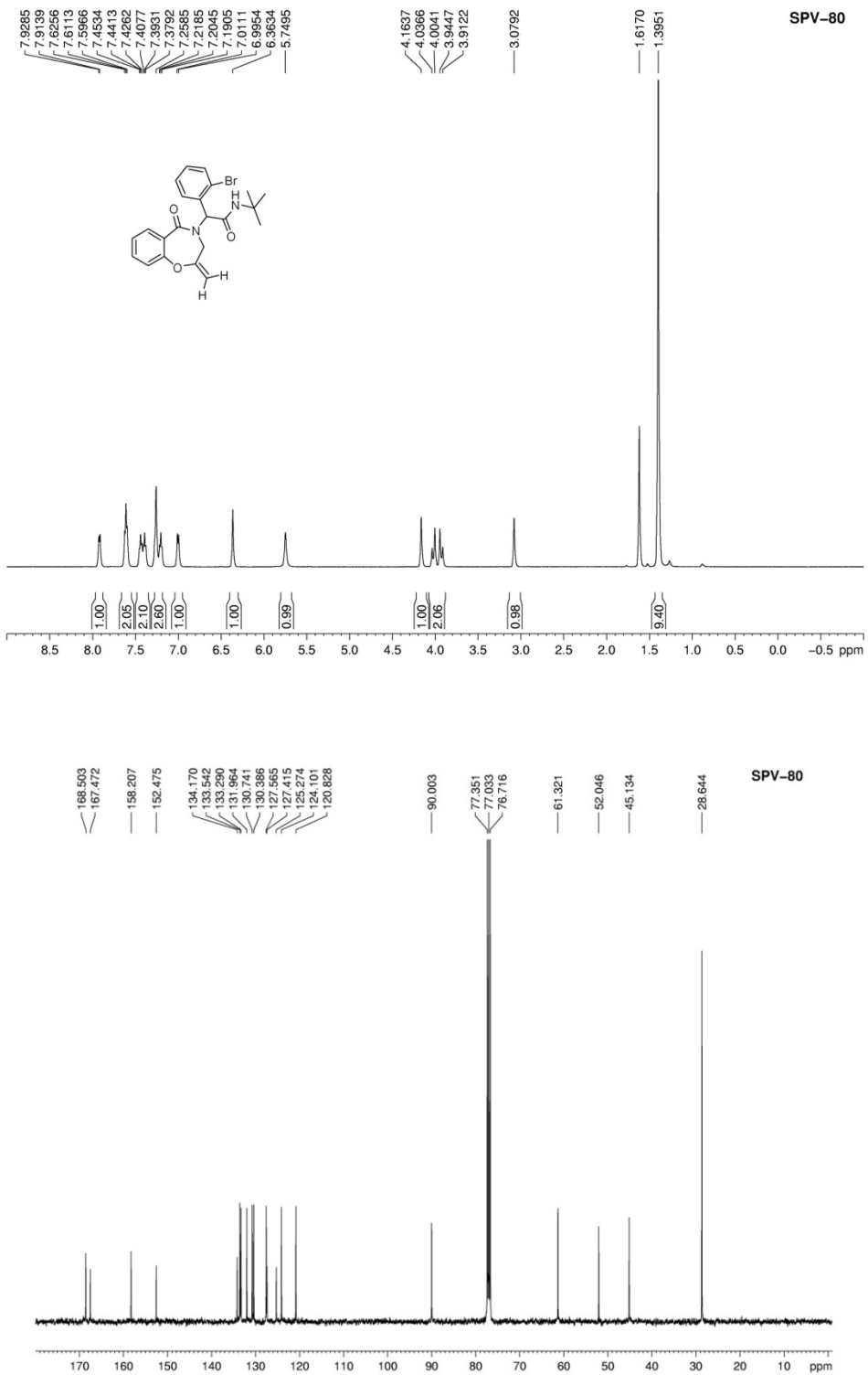
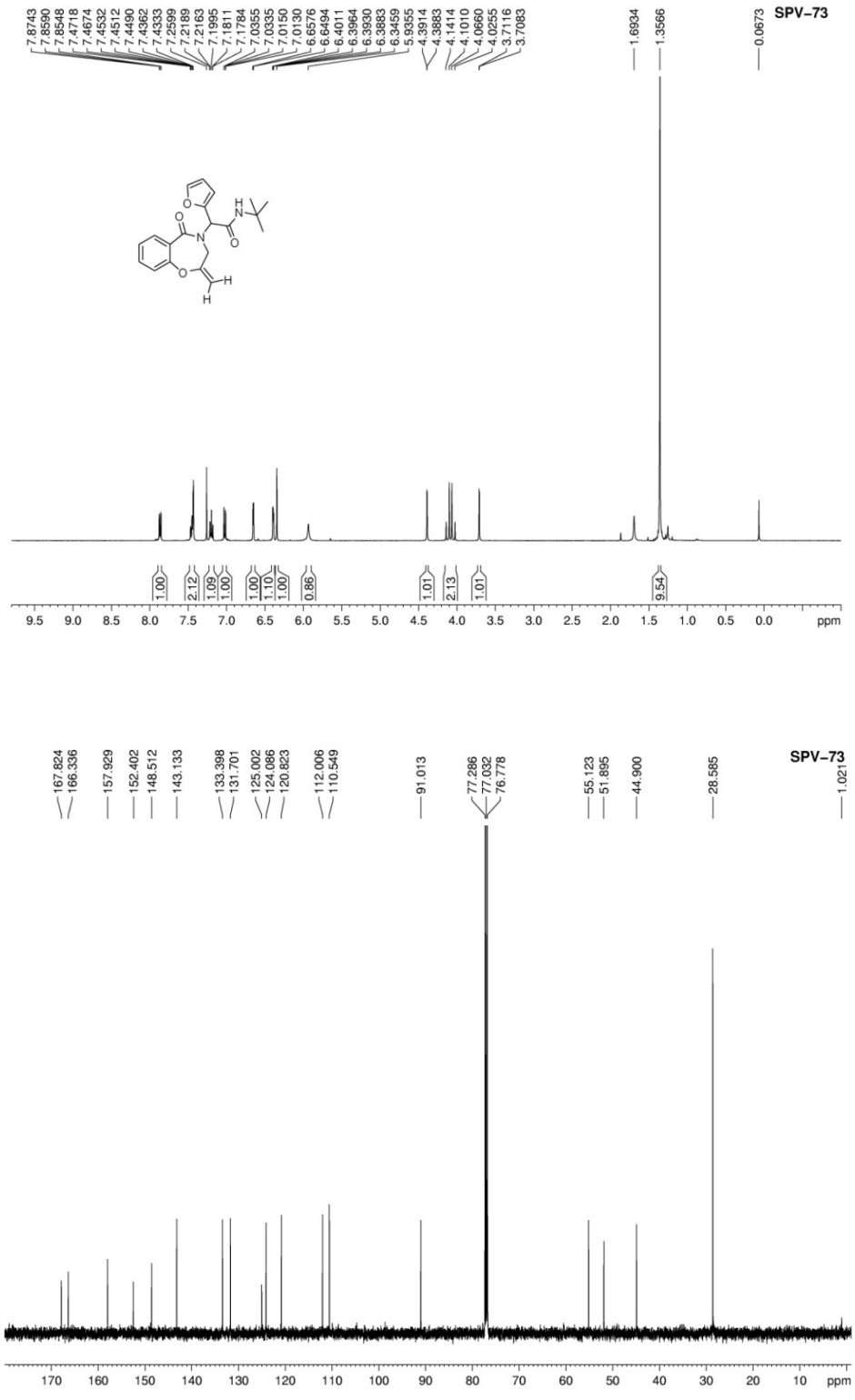


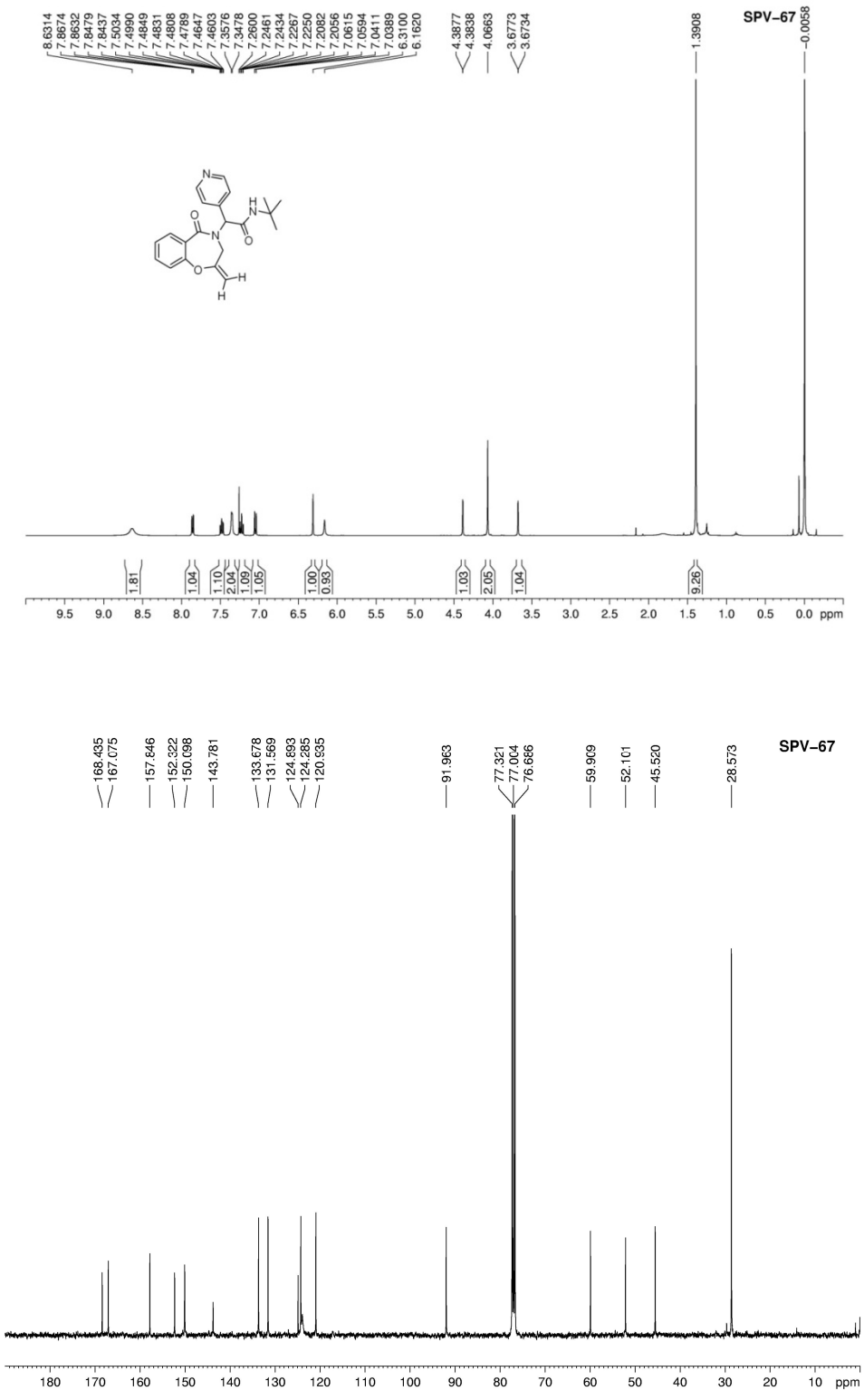
^{1}H and ^{13}C Spectrum of compound **6k**



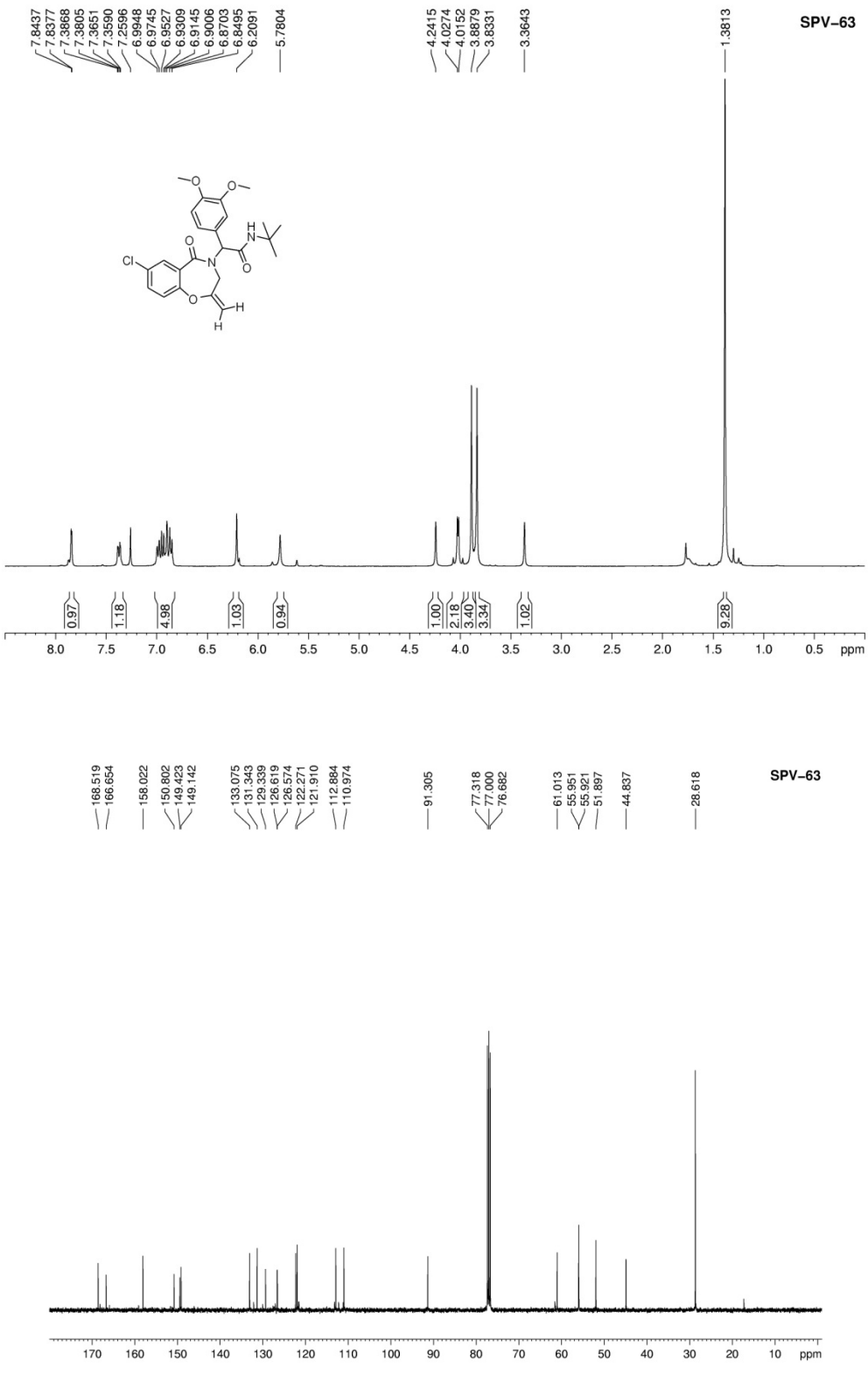
^{1}H and ^{13}C Spectrum of compound **6l**



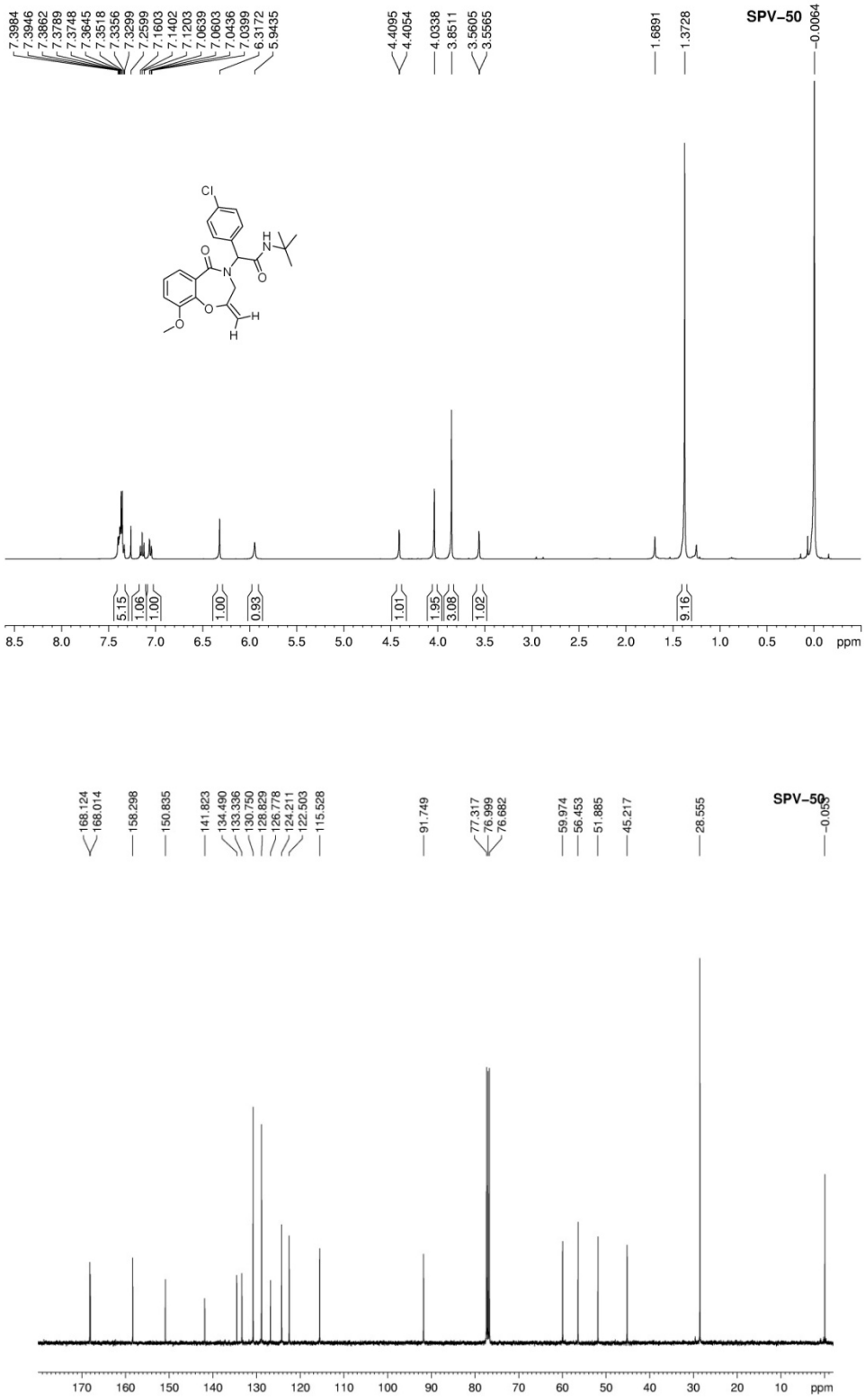
^{1}H and ^{13}C Spectrum of compound **6m**



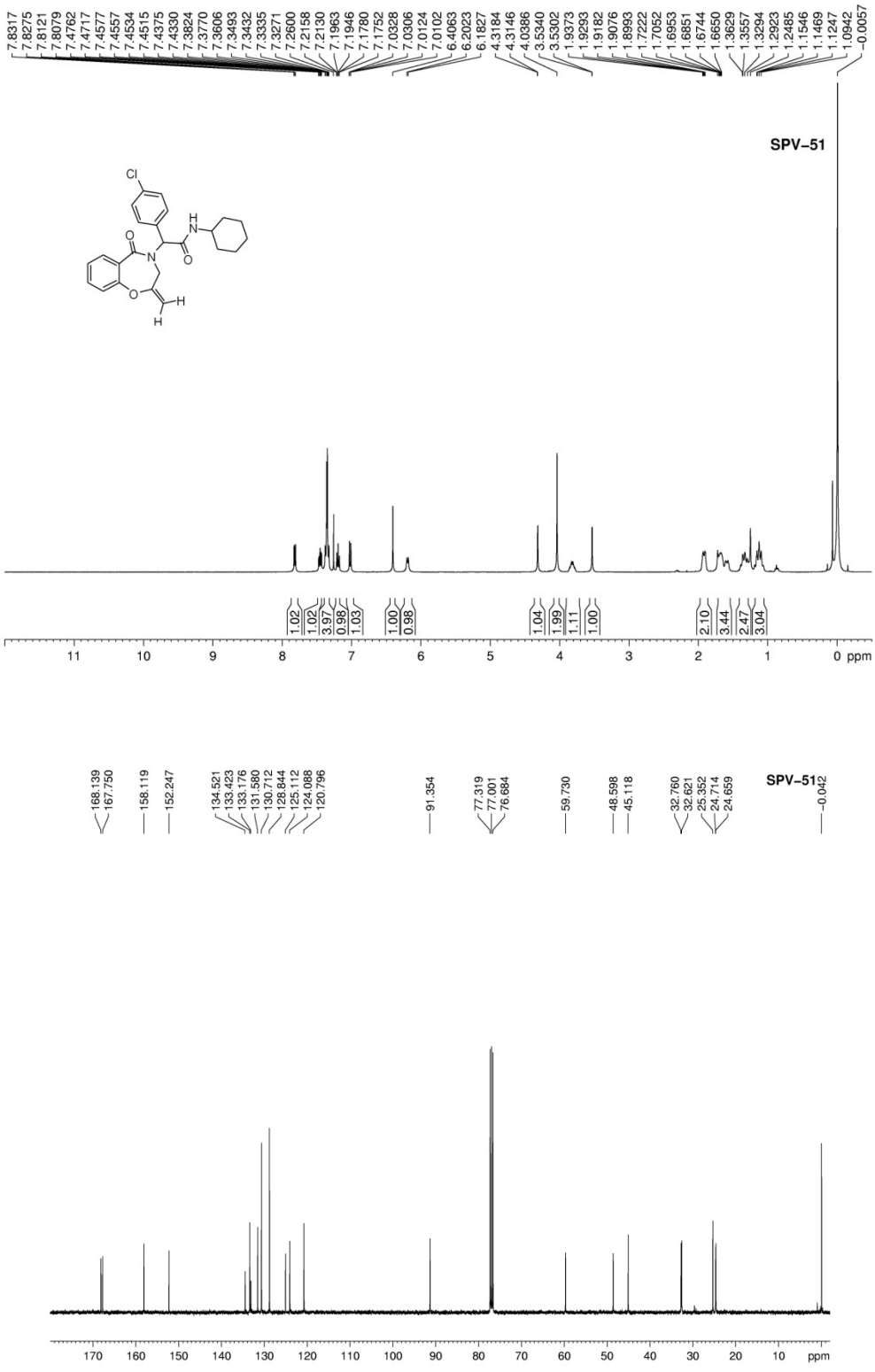
^{1}H and ^{13}C Spectrum of compound **6n**



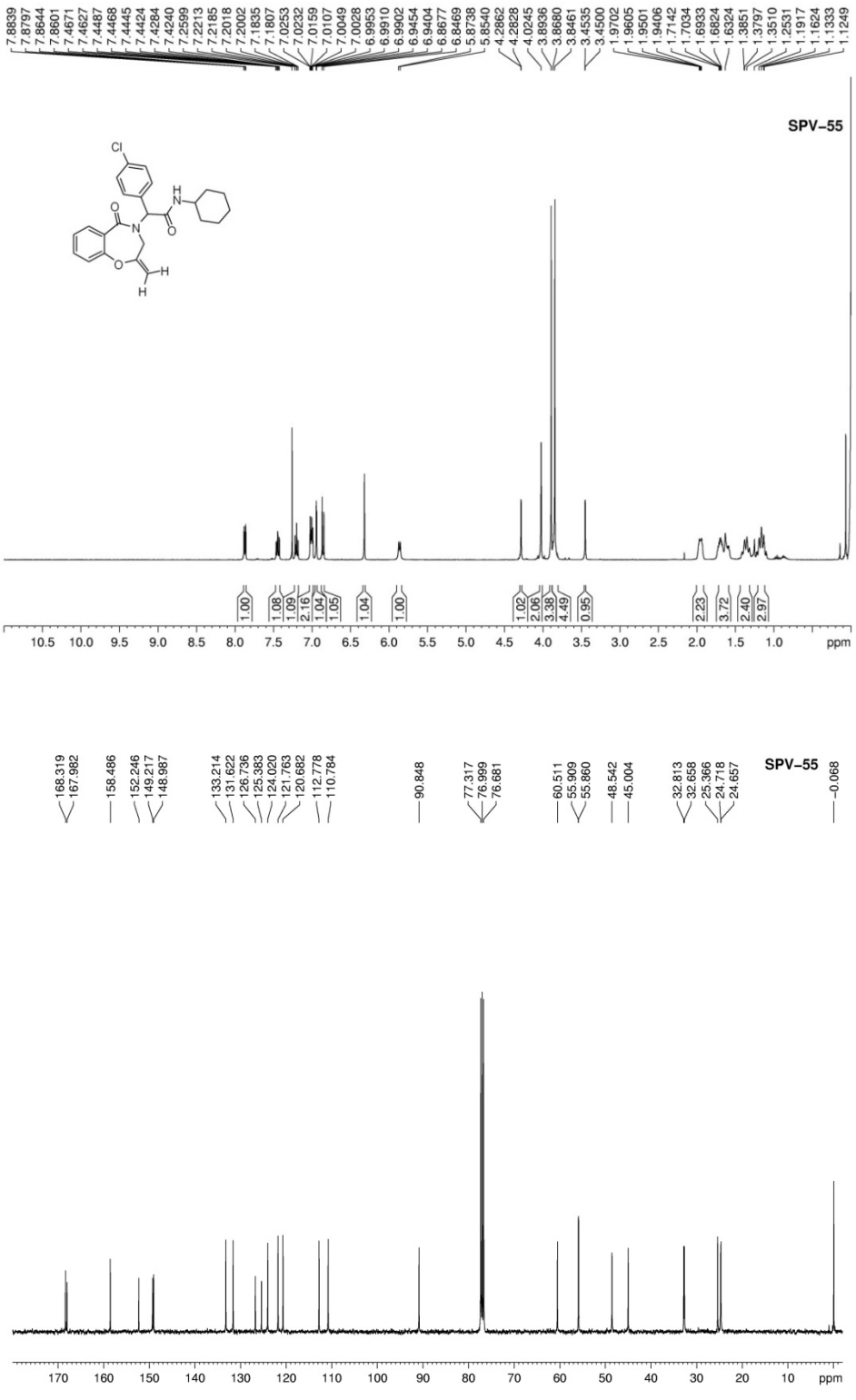
^{1}H and ^{13}C Spectrum of compound **6o**



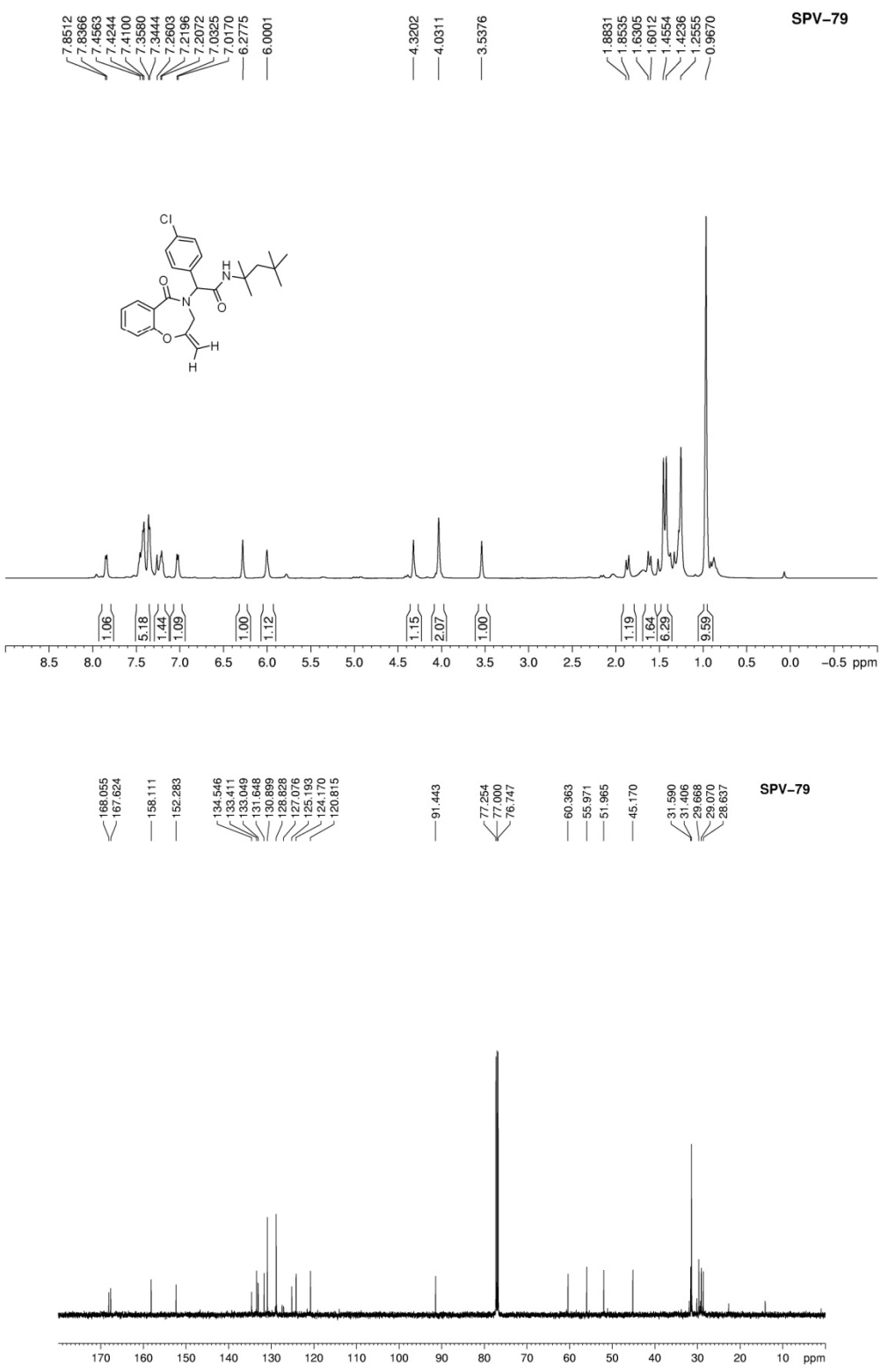
^{1}H and ^{13}C Spectrum of compound **6p**



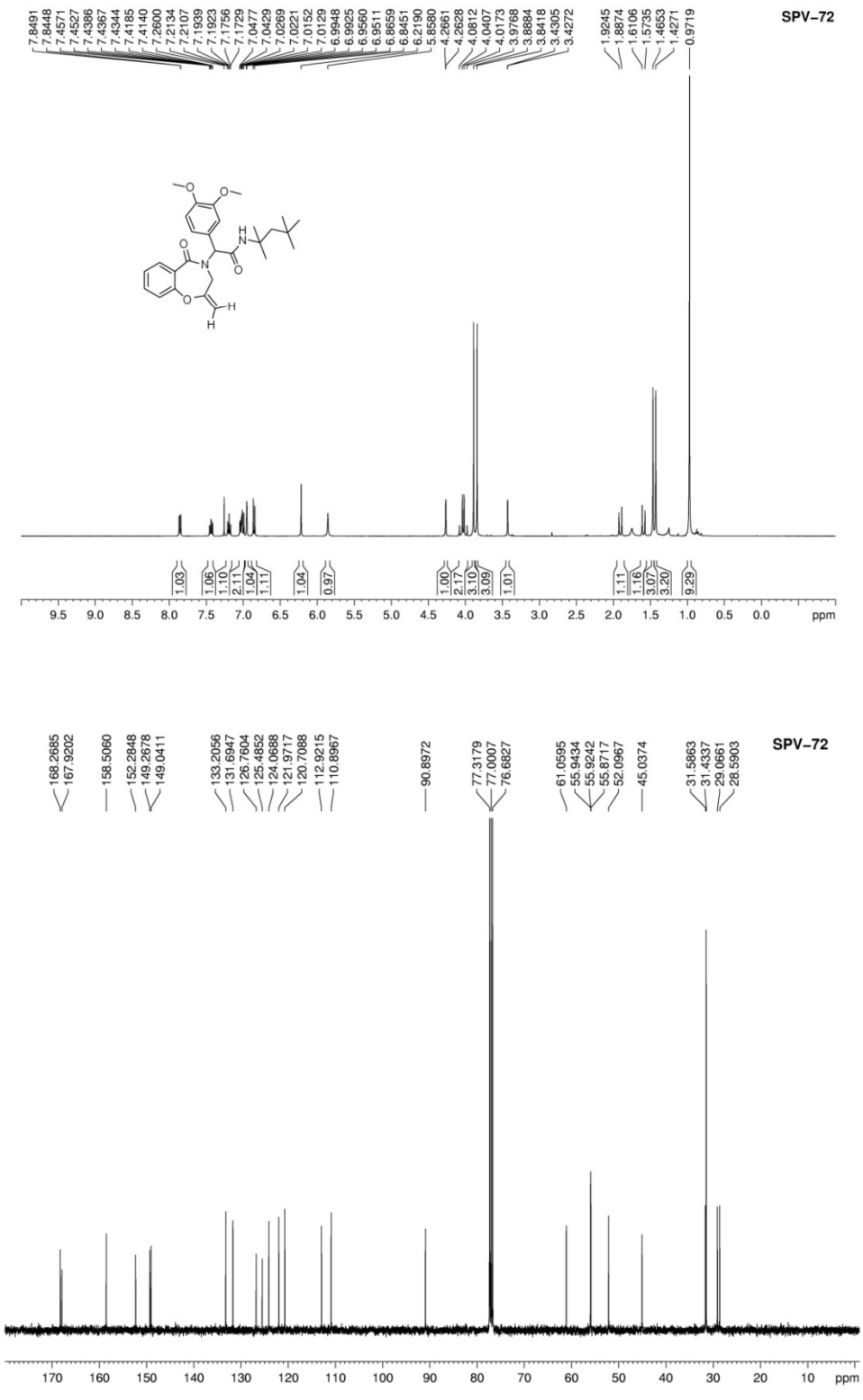
^{1}H and ^{13}C Spectrum of compound **6q**



^{1}H and ^{13}C Spectrum of compound **6r**



^{1}H and ^{13}C Spectrum of compound **6s**



^{1}H and ^{13}C Spectrum of compound **6t**