Supporting information

for

Copper(II)-Catalyzed Domino Synthesis of Indolo[3,2-*c*]quinolinones via Selective Carbonyl Migration

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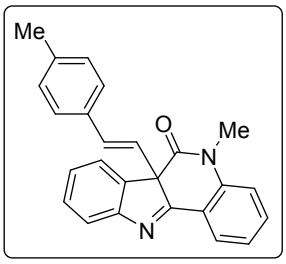
1. General information

All reactions were carried out in oven-dried reaction tubes. Reactions were monitored by thin-layer chromatography (TLC) using Merck silica gel 60 F_{254} precoated plates (0.25 mm) and visualized by UV fluorescence quenching using appropriate mixture of ethyl acetate and hexanes. Silica gel (particle size: 100-200 mesh) was purchased from Avra Synthesis Pvt. Ltd and used for column chromatography using hexanes and ethyl acetate mixture as eluent. All the reactions were carried out in temperature controlled IKA magnetic stirrers. ^{1}H and ^{13}C NMR spectra were recorded on a Bruker 400 MHz and 500 MHz (100 MHz and 125 MHz for ^{13}C) instrument. ^{1}H NMR spectra were reported relative to residual $CDCl_3$ (δ 7.26 ppm) or residual TMS. ^{13}C NMR were reported relative to $CDCl_3$ (δ 77.16 ppm). Chemical shifts were reported in parts per million and multiplicities are as indicated: s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet), and br (broad). Coupling constants, *J*, are reported in Hertz. Melting points were recorded on a Guna capillary melting point apparatus and are uncorrected. Infrared spectra were recorded on a FTIR 4000 Series Spectrometer using dry KBr pellet. The wave numbers of recorded IR signals are quoted in cm^{-1}. High resolution mass spectra (HRMS) were recorded on Waters Q-Tof Micro mass spectrometer. Solvents used for extraction and column chromatography were laboratory grade and used as received. Reaction solvents used were obtained from Fischer Scientific, India Pvt. Ltd. $Cu(OTf)_2$ was obtained from Alfa-Aesar and used directly as received. 2-Aminobenzophenone derivatives were purchased from SRL India.

2. Experimental data

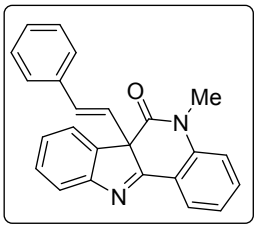
2.1. General procedure for the synthesis of indolo[3,2-*c*]quinolinones 5

Under open atmosphere, 2'-aminochalcone **1** (0.3 mmol), copper triflate (0.03 mmol) and $CHCl_3$ (1.5 mL) were successively added to oven dried reaction tube. The reaction tube was then immersed in a 60 ºC pre-heated oil bath. Then, 3-diazooxindole **2** (0.45 mmol) was dissolved in 1.5 mL of $CHCl_3$ and added to the reaction *via* a syringe pump (1.5 mL/h). The reaction was continued at 60 ºC with stirring till complete conversion of **1**. The reaction progression was monitored by TLC. After completion of the reaction, the solvent was removed under vacuum and the crude mixture was purified using silica gel column chromatography eluting with 1:6 ethylacetate:hexanes to afford indolo[3,2-*c*]quinolinones products **5a-aa**.

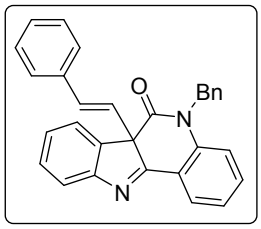


(*E*)-5-Methyl-6a-(4-methylstyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5a): 99 mg, 91% yield; Off white solid; mp 161-163 ºC; R_f 0.32 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 2.25 (s, 3H), 3.49 (s, 3H), 5.96 (d, *J* = 15.8 Hz, 1H), 6.38 (d, *J* = 15.8 Hz, 1H), 7.00 (d, *J* = 8.0 Hz, 2H), 7.05 (d, *J* = 8.0 Hz, 2H), 7.18 (d, *J* = 8.4 Hz, 1H), 7.23-7.29 (m, 1H), 7.35 (td, *J* = 7.6, 1.0 Hz, 1H), 7.46 (td, *J* = 7.6,

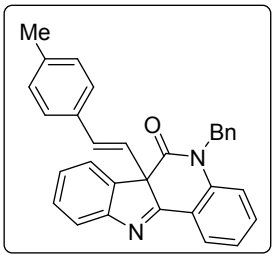
1.4 Hz, 1H), 7.50-7.57 (m, 1H), 7.72 (d, J = 7.6 Hz, 1H), 7.93 (dd, J = 7.4,0.6 Hz, 1H), 8.10 (dd, J = 7.6,1.4 Hz, 1H);^{13}C NMR ($CDCl_3$, 100 MHz) δ 21.2, 30.5, 67.3, 115.7, 120.6, 121.4, 123.8, 124.6, 125.9, 126.1, 126.5, 126.6, 129.2, 129.3, 131.3, 132.9, 133.0, 136.7, 138.3, 142.0, 155.5, 167.4, 174.7; FTIR (KBr) 3051, 2926 1683, 1603, 1268 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{25}H_{21}N_2O$: 365.1654; found: 365.1630.



(*E*)-5-Methyl-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5b): 95 mg, 90% yield; Off white solid; mp 156-158 °C; R_f 0.32 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 3.49 (s, 3H), 6.01 (d, J = 15.8 Hz, 1H), 6.42 (d, J = 15.8 Hz, 1H), 7.12-7.22 (m, 6H), 7.24-7.30 (m, 1H), 7.32-7.39 (m, 1H), 7.46 (td, J = 7.6, 1.2 Hz, 1H), 7.50-7.57 (m, 1H), 7.73 (d, J = 7.6 Hz, 1H), 7.94 (d, J = 6.8 Hz, 1H), 8.11 (dd, J = 7.6, 1.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 30.5, 67.3, 115.7, 120.6, 121.4, 123.9, 125.6, 125.9, 126.1, 126.5, 126.6, 128.3, 128.6, 129.3, 131.4, 132.9, 135.8, 136.6, 141.9, 155.5, 167.3, 174.5; FTIR (KBr) 3056, 2972, 1684, 1602, 1267 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{24}H_{19}N_2O$: 351.1497; found: 351.1484.

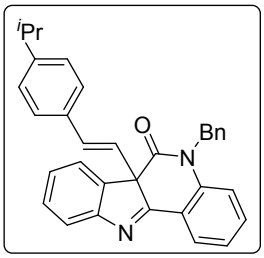


(*E*)-5-Benzyl-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5c): 119 mg, 93% yield; Off white solid; mp 121-123 °C; R_f 0.50 (20% ethyl acetate in hexanes; ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.89 (d, J = 16.5 Hz, 1H), 5.61 (d, J = 16.5 Hz, 1H), 6.09 (d, J = 16.0 Hz, 1H), 6.52 (d, J = 16.0 Hz, 1H), 7.08 (d, J = 8.0 Hz, 1H), 7.14-7.30 (m, 11H), 7.36 (td, J = 7.5, 0.5 Hz, 1H), 7.37-7.42 (m, 1H), 7.47 (td, J = 7.5, 1.2 Hz, 1H), 7.75 (d, J = 7.5 Hz, 1H), 7.93 (d, J = 7.5 Hz, 1H), 8.12 (dd, J = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.2, 67.3, 116.5, 120.7, 121.5, 124.0, 125.6, 126.1, 126.2, 126.5, 126.6, 126.7, 127.6, 128.4, 128.7, 129.1, 129.4, 132.1, 133.0, 135.8, 136.5 (2C), 141.6, 155.6, 167.8, 174.5; FTIR (KBr) 3054, 2982, 1682, 1603, 1265 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{30}H_{23}N_2O$: 427.1810; found: 427.1813.

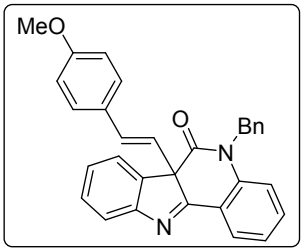


(*E*)-5-Benzyl-6a-(4-methylstyryl)-5,6a-dihydro-6H-indolo[3,2-c]quinolin-6-one (5d): 126 mg, 95% yield; Off white solid; mp 118-120 °C; R_f 0.39 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 2.28 (s, 3H), 4.89 (d, J = 16.5 Hz, 1H), 5.62 (d, J = 16.5 Hz, 1H), 6.05 (d, J = 15.7 Hz, 1H), 6.50 (d, J = 15.7 Hz, 1H), 7.01-7.11 (m, 5H), 7.22 (td, J = 7.5, 1.0 Hz, 1H), 7.25-7.32 (m, 5H), 7.34-7.42 (m, 2H), 7.47 (td, J =

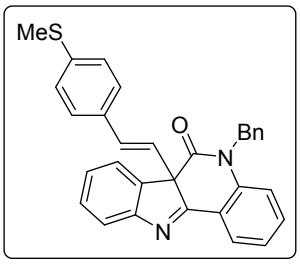
7.5, 1.2 Hz, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.94 (dd, J = 7.5, 0.5 Hz, 1H), 8.13 (dd, J = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 21.3, 47.2, 67.3, 116.5, 120.8, 121.5, 124.0, 124.5, 126.1, 126.2, 126.5, 126.6 (2C), 127.6, 129.1, 129.3, 129.4, 132.0, 132.9, 133.1, 136.5, 136.6, 138.4, 141.6, 155.6, 167.9, 174.6; FTIR (KBr) 3030, 1684, 1603, 1465, 1362, 1189 cm^{-1}; HRMS (m/z): [M+H]$^+$ calcd for $C_{31}H_{25}N_2O$: 441.1966; found: 441.1964.



(*E*)-5-Benzyl-6a-(4-isopropylstyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5e): 129 mg, 92% yield; Off white solid; mp 116-118 °C; R_f 0.50 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 1.18 (d, J = 7.0 Hz, 6H), 2.83 (sep, J = 7.0 Hz, 1H), 4.89 (d, J = 15.6 Hz, 1H), 5.62 (d, J = 15.6 Hz, 1H), 6.04 (d, J = 16.0 Hz, 1H), 6.50 (d, J = 16.0 Hz, 1H), 7.04-7.14 (m, 5H), 7.22 (t, J = 7.6 Hz, 1H), 7.27-7.43 (m, 7H), 7.47 (td, J = 7.8, 1.0 Hz, 1H), 7.75 (d, J =7.6 Hz, 1H), 7.91 (d, J = 7.6 Hz, 1H), 8.11 (dd, J = 7.8, 1.4 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 23.9, 24.0, 34.0, 47.2, 67.3, 116.5, 120.7, 121.5, 124.0, 124.6, 126.0, 126.1, 126.5, 126.6, 126.7, 126.8, 127.6, 129.0, 129.3, 131.9, 132.9, 133.4, 136.5, 136.6, 141.6, 149.5, 155.6, 167.8, 174.7; FTIR (KBr) 3045, 2963, 1684, 1603, 1265 cm^{-1}; HRMS (m/z): [M+H]$^+$ calcd for $C_{33}H_{29}N_2O$: 469.2279; found: 469.2262.

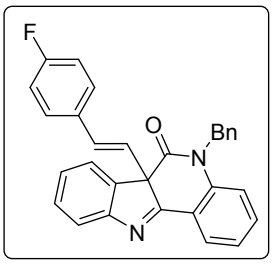


(*E*)-5-Benzyl-6a-(4-methoxystyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5f): 116 mg, 85% yield; Off white solid; mp 165-167 °C; R_f 0.38 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 3.76 (s, 3H), 4.88 (d, J = 16.2 Hz, 1H), 5.62 (d, J = 16.2 Hz, 1H), 5.96 (d, J = 15.8 Hz, 1H), 6.46 (d, J = 15.8 Hz, 1H), 6.76 (d, J = 8.4 Hz, 2H), 7.03-7.16 (m, 3H), 7.19-7.31 (m, 6H), 7.33-7.44 (m, 2H), 7.47 (t, J = 7.4 Hz, 1H), 7.74 (d, J = 7.6 Hz, 1H), 7.93 (d, J = 7.2 Hz, 1H), 8.12 (d, J = 7.2 Hz, 1H);^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.1, 55.4, 67.3, 114.1, 116.5, 120.7, 121.5, 123.2, 124.0, 126.0, 126.1, 126.6 (2C), 127.5, 128.0, 128.5, 129.0, 129.3, 131.5, 132.9, 136.5, 136.7, 141.5, 155.5, 159.9, 167.9, 174.7; FTIR (KBr) 3030, 2962, 1680, 1604, 1248 cm^{-1}; HRMS (m/z): [M+H]$^+$ calcd for $C_{31}H_{25}N_2O_2$: 457.1916; found: 457.1891.

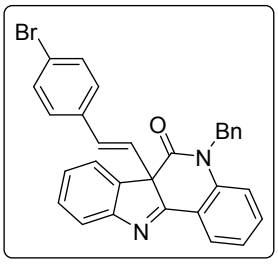


(*E*)-5-Benzyl-6a-(4-(methylthio)styryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5g): 119 mg, 84% yield; Off white solid; mp 91-93 °C; R_f 0.40 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 2.43 (s, 3H), 4.87 (d, J = 16.4 Hz, 1H), 5.62 (d, J = 16.4 Hz, 1H), 6.04 (d, J = 16.0 Hz, 1H), 6.46 (d, J = 16.0

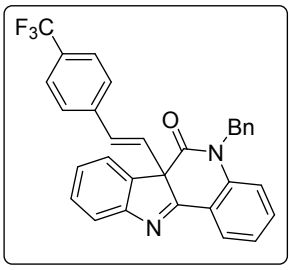
Hz, 1H), 7.04-7.12 (m, 5H), 7.20-7.31 (m, 6H), 7.33-7.44 (m, 2H), 7.48 (t, J = 7.6 Hz, 1H), 7.75 (d, J = 7.6 Hz, 1H), 7.92 (d, J = 7.2 Hz, 1H), 8.12 (d, J = 7.6 Hz, 1H);^{13}C NMR ($CDCl_3$, 100 MHz) δ 15.8, 47.2, 67.3, 116.5, 120.7, 121.5, 124.1, 124.8, 126.0, 126.1, 126.6 (2C), 126.7, 127.1, 127.6, 129.1, 129.4, 131.5, 132.6, 133.0, 136.5 (2C), 139.1, 141.5, 155.6, 167.8, 174.5; FTIR (KBr) 3054, 2985, 1685, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): [M+H]$^+$ calcd for $C_{31}H_{25}N_2OS$: 473.1687; found: 473.1677.



(*E*)-5-Benzyl-6a-(4-fluorostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5h): 113 mg, 85% yield; Off white solid; mp 124-126 °C; R_f 0.35 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.89 (d, J = 16.8 Hz, 1H), 5.62 (d, J = 16.8 Hz, 1H), 6.02 (d, J = 15.6 Hz, 1H), 6.48 (d, J = 15.6 Hz, 1H), 6.92 (t, J = 8.2 Hz, 2H), 7.06-7.18 (m, 3H), 7.20-7.32 (m, 6H), 7.33-7.44 (m, 2H), 7.48 (t, J = 7.8 Hz, 1H), 7.75 (d, J = 7.2 Hz, 1H), 7.93 (d, J = 7.2 Hz, 1H), 8.13 (d, J = 7.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.2, 115.6 (d, J = 22 Hz), 116.5, 120.6, 121.6, 124.1, 125.3, 126.1 (2C), 126.6, 126.7, 127.6, 128.3 (d, J = 8.0 Hz), 129.1, 129.4, 130.9, 131.9 (d, J = 4.0 Hz), 133.0, 136.4, 136.5, 141.5, 155.6, 162.8 (d, J = 247 Hz), 167.7, 174.4; FTIR (KBr) 3055, 2985, 1683, 1604, 1265 cm^{-1}; HRMS (*m*/*z*): [M+H]$^+$ calcd for $C_{30}H_{22}FN_2O$: 445.1716; found: 445.1746.

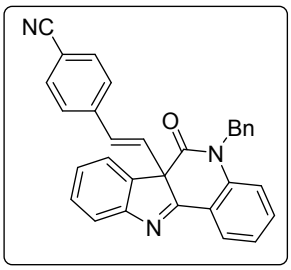


(*E*)-5-Benzyl-6a-(4-bromostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5i): 136 mg, 90% yield; Off white solid; mp 161-163 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.89 (d, J = 16.4 Hz, 1H), 5.61 (d, J = 16.4 Hz, 1H), 6.08 (d, J = 15.8 Hz, 1H), 6.45 (d, J = 15.8 Hz, 1H), 7.02 (d, J = 8.4 Hz, 2H), 7.10 (d, J = 8.4 Hz, 1H), 7.21-7.30 (m, 6H), 7.33-7.45 (m, 4H), 7.48 (td, J = 7.6, 1.2 Hz, 1H), 7.75 (d, J = 7.6 Hz, 1H), 7.92 (d, J = 6.8 Hz, 1H), 8.12 (dd, J = 7.6, 1.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.2, 116.6, 120.6, 121.6, 122.3, 124.1, 126.0, 126.1, 126.3, 126.6, 126.7, 127.6, 128.2, 129.1, 129.5, 131.0, 131.8, 133.1, 134.7, 136.2, 136.4, 141.5, 155.6, 167.6, 174.2; FTIR (KBr) 3051, 2982, 1685, 1603, 1277 cm^{-1}; HRMS (*m*/*z*): [M+H]$^+$ calcd for $C_{30}H_{22}BrN_2O$: 505.0915; found: 505.0929.

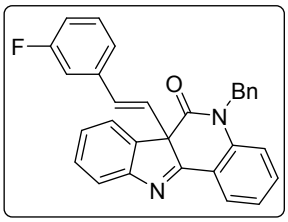


(*E*)-5-Benzyl-6a-(4-(trifluoromethyl)styryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5j): 128 mg, 86% yield; Off white solid; mp 171-173 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.90 (d, J = 16.5 Hz, 1H), 5.62 (d, J =

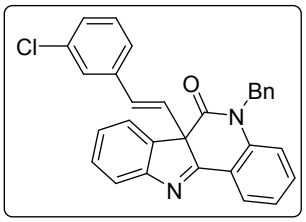
16.5 Hz, 1H), 6.17 (d, J = 16.0 Hz, 1H), 6.54 (d, J = 16.0 Hz, 1H), 7.11 (d, J = 8.5 Hz, 1H), 7.23-7.32 (m, 8H), 7.38 (td, J = 7.5, 1.5 Hz, 1H), 7.40-7.45 (m, 1H), 7.46-7.53 (m, 3H), 7.77 (d, J = 7.5 Hz, 1H), 7.93 (d, J = 7.5 Hz, 1H), 8.13 (dd, J = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.3, 67.2, 116.6, 120.5, 121.7, 124.1 (q, J = 270 Hz), 124.2, 125.6 (q, J = 4 Hz), 126.1, 126.2, 126.6, 126.8, 126.9, 127.7, 128.1, 129.1, 129.6, 130.2 (q, J = 33 Hz), 130.8, 133.2, 136.0, 136.4, 139.2, 141.4, 155.6, 167.4, 174.1; FTIR (KBr) 3055, 2984, 1686, 1605, 1266 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{31}H_{22}F_3N_2O$: 495.1684; found: 495.1690.



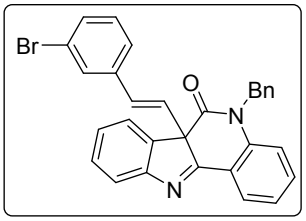
(*E*)-4-(2-(5-Benzyl-6-oxo-5,6-dihydro-6a*H*-indolo[3,2-*c*]quinolin-6a-yl)vinyl)benzonitrile (5k): 112 mg, 83% yield; Off white solid; mp 185-187 °C; R_f 0.36 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.91 (d, J = 16.4 Hz, 1H), 5.60 (d, J = 16.4 Hz, 1H), 6.19 (d, J = 15.8 Hz, 1H), 6.51 (d, J = 15.8 Hz, 1H), 7.12 (d, J = 7.6 Hz, 1H), 7.20-7.31 (m, 8H), 7.35-7.46 (m, 2H), 7.47-7.55 (m, 3H), 7.76 (t, J = 7.6 Hz, 1H), 7.92 (d, J = 7.2 Hz, 1H), 8.13 (dd, J = 7.6, 1.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.1, 111.7, 116.6, 118.7, 120.4, 121.7, 124.2, 126.1 (2C), 126.6, 126.8, 127.2, 127.7, 129.1, 129.4, 130.0, 130.4, 132.5, 133.2, 135.8, 136.3, 140.1, 141.4, 155.7, 167.2, 173.8; FTIR (KBr) 3056, 2930, 2226, 1684, 1603, 1266 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{31}H_{22}N_3O$: 452.1763; found: 452.1784.



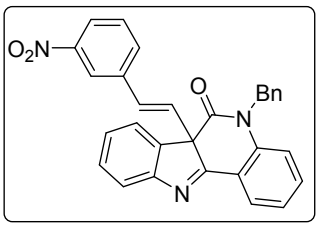
(*E*)-5-Benzyl-6a-(3-fluorostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5l): 123 mg, 92% yield; Off white solid; mp 186-188 °C; R_f 0.44 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.90 (d, J = 16.4 Hz, 1H), 5.61 (d, J = 16.4 Hz, 1H), 6.10 (d, J = 16.0 Hz, 1H), 6.48 (d, J = 16.0 Hz, 1H), 7.11 (d, J = 8.4 Hz, 1H), 7.15-7.32 (m, 10H), 7.37 (td, J = 7.4, 0.8 Hz, 1H), 7.40-7.45 (m, 1H), 7.49 (td, J = 7.6, 1.2 Hz, 1H), 7.76 (d, J = 7.6 Hz, 1H), 7.93 (d, J = 7.2 Hz, 1H), 8.13 (dd, J = 7.6,1.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.1, 113.2 (d, J = 22 Hz), 115.2 (d, J = 21 Hz), 116.6, 120.6, 121.6, 122.6 (d, J = 3 Hz), 124.1, 126.0, 126.1, 126.6, 126.7, 126.9, 127.7, 129.1, 129.5, 130.1 (d, J = 8 Hz), 131.0 (d, J = 2 Hz), 133.1, 136.2, 136.4, 138.0 (d, J = 7 Hz), 141.5, 155.6, 163.0 (d, J = 244 Hz), 167.5, 174.2; FTIR (KBr) 3055, 2987, 1686, 1605, 1265 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{30}H_{22}FN_2O$: 445.1716; found: 445.1716.



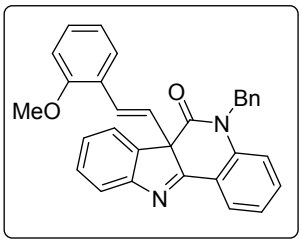
(*E*)-5-Benzyl-6a-(3-chlorostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5m): 124 mg, 90% yield; Off white solid; mp 126-128 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.90 (d, *J* = 16.6 Hz, 1H), 5.61 (d, *J* = 16.6 Hz, 1H), 6.10 (d, *J* = 15.8 Hz, 1H), 6.45 (d, *J* = 15.8 Hz, 1H), 6.98-7.05 (m, 1H), 7.08-7.19 (m, 4H), 7.21-7.32 (m, 6H), 7.34-7.45 (m, 2H), 7.49 (t, *J* = 7.4 Hz, 1H), 7.76 (d, *J* = 7.6 Hz, 1H), 7.92 (d, *J* = 7.6 Hz, 1H), 8.13 (d, *J* = 7.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.2, 116.6, 120.6, 121.6, 124.1, 124.9, 126.1, 126.2, 126.6 (2C), 126.7, 127.1, 127.7, 128.3, 129.1, 129.5, 129.9, 130.8, 133.1, 134.7, 136.1, 136.4, 137.6, 131.5, 155.6, 167.5, 174.1; FTIR (KBr) 3055, 2985, 1689, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{30}H_{22}ClN_2O$: 461.1420; found: 461.1404.



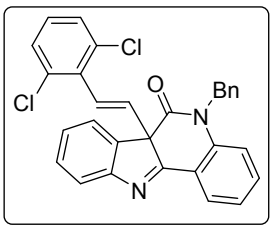
(*E*)-5-Benzyl-6a-(3-bromostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5n): 135 mg, 89% yield; Off white solid; mp 138-140 °C; R_f 0.44 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.90 (d, *J* = 16.2 Hz, 1H), 5.60 (d, *J* = 16.2 Hz, 1H), 6.08 (d, *J* = 15.7 Hz, 1H), 6.43 (d, *J* = 15.7 Hz, 1H), 7.03-7.12 (m, 3H), 7.21-7.33 (m, 8H), 7.36 (t, *J* = 7.5 Hz, 1H), 7.39-7.44 (m, 1H), 7.48 (t, *J* = 8.0 Hz, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.91 (d, *J* = 7.5 Hz, 1H), 8.12 (d, *J* = 7.8 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.2, 67.2, 116.6, 120.6, 121.6, 122.9, 124.1, 125.4, 126.1 (2C), 126.6, 126.7, 127.1, 127.7, 129.1, 129.5 (2C), 130.2, 130.7, 131.2, 133.1, 136.1, 136.4, 137.9, 141.5, 155.6, 167.5, 174.1; FTIR (KBr) 3057, 2984, 1688, 1604, 1266 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{30}H_{22}BrN_2O$: 505.0915; found: 505.0902.



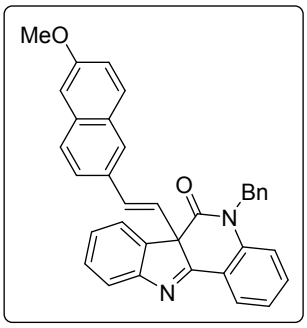
(*E*)-5-Benzyl-6a-(3-nitrostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5o): 111 mg, 78% yield; Off white solid; mp 185-187 °C; R_f 0.36 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.93 (d, *J* = 16.0 Hz, 1H), 5.60 (d, *J* = 16.0 Hz, 1H), 6.21 (d, *J* = 16.0 Hz, 1H), 6.54 (d, *J* = 16.0 Hz, 1H), 7.15 (d, *J* = 8.0 Hz, 1H), 7.24-7.55 (m, 11H), 7.77 (d, *J* = 7.2 Hz, 1H), 7.93 (d, *J* = 6.8 Hz, 1H), 8.00 (s, 1H), 8.03 (d, *J* = 7.6 Hz, 1H), 8.14 (d, *J* = 6.8 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.1, 116.6, 120.4, 121.3, 121.7, 122.9, 124.2, 126.2 (2C), 126.7, 126.8, 127.8, 128.8, 129.1, 129.6, 129.7, 129.9, 132.4, 133.2, 135.8, 136.3, 137.5, 141.4, 148.6, 155.7, 167.3, 173.8; FTIR (KBr) 3056, 2930, 2226, 1684, 1603, 1266 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{30}H_{22}N_3O_3$: 472.1661; found: 472.1653.



(*E*)-5-Benzyl-6a-(2-methoxystyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5p): 118 mg, 86% yield; Off white solid; mp 121-131 °C; R_f 0.41 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 3.70 (s, 3H), 4.85 (d, *J* = 16.4 Hz, 1H), 5.65 (d, *J* = 16.4 Hz, 1H), 6.22 (d, *J* = 16.0 Hz, 1H), 6.72-6.82 (m, 2H), 6.85 (d, *J* = 16.0 Hz, 1H), 7.06 (d, *J* = 8.4 Hz, 1H), 7.13-7.20 (m, 2H), 7.21-7.32 (m, 6H), 7.33-7.41 (m, 2H), 7.43-7.51 (m, 1H), 7.75 (d, *J* = 7.6 Hz, 1H), 7.96 (d, *J* = 7.2 Hz, 1H), 8.12 (d, *J* = 7.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 55.5, 67.7, 111.0, 116.5, 120.6, 120.9, 121.4, 123.9, 124.8, 125.9, 126.0, 126.1, 126.4, 126.5, 127.2, 127.3, 127.4, 129.0, 129.2, 129.4, 132.8, 136.5, 136.8, 141.6, 155.5, 157.0, 167.9, 174.8; FTIR (KBr) 3054, 2984, 1685, 1602, 1259 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{31}H_{25}N_2O_2$: 457.1916; found: 457.1907.

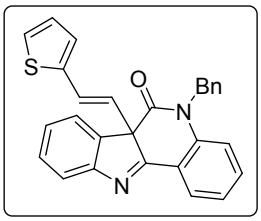


(*E*)-5-Benzyl-6a-(2,6-dichlorostyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5q): 126 mg, 85% yield; Off white solid; mp 123-125 °C; R_f 0.50 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.96 (d, *J* = 16.4 Hz, 1H), 5.54 (d, *J* = 16.4 Hz, 1H), 6.17 (d, *J* = 16.0 Hz, 1H), 6.48 (d, *J* = 15.6 Hz, 1H), 7.02 (t, *J* = 8.2 Hz, 1H), 7.11 (d, *J* = 8.4 Hz, 1H), 7.19 (d, *J* = 8.0 Hz, 2H), 7.22-7.32 (m, 6H), 7.36-7.44 (m, 2H), 7.49 (td, *J* = 7.6, 1.0 Hz, 1H), 7.76 (d, *J* = 7.6 Hz, 1H), 7.99 (d, *J* = 7.2 Hz, 1H), 8.10 (dd, *J* = 7.6,1.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.4, 67.7, 116.6, 121.0, 121.6, 124.1, 125.8, 126.0, 126.2, 126.7 (2C), 127.5, 128.4, 128.8, 129.0, 129.5, 132.9, 133.3, 133.9, 134.5, 135.9, 136.4, 141.6, 155.7, 167.3, 173.9; FTIR (KBr) 3056, 2988, 1686, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+Na]^+$ calcd for $C_{30}H_{20}Cl_2N_2NaO$: 517.0850; found: 517.0827.

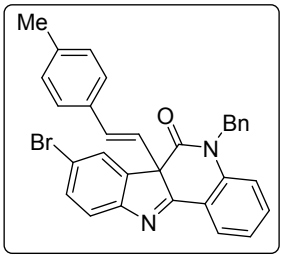


(*E*)-5-Benzyl-6a-(2-(6-methoxynaphthalen-2-yl)vinyl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5r): 120 mg, 79% yield; Off white solid; mp 123-125 °C; R_f 0.38 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 3.89 (s, 3H), 4.90 (d, *J* = 16.5 Hz, 1H), 5.65 (d, *J* = 16.5 Hz, 1H), 6.17 (d, *J* = 16.0 Hz, 1H), 6.65 (d, *J* = 16.0 Hz, 1H), 7.04 (d, *J* = 2.5 Hz, 1H), 7.09 (dd, *J* = 9.0, 2.5 Hz, 2H), 7.22-7.34 (m, 7H), 7.35-7.44 (m, 2H), 7.46-7.52 (m, 2H), 7.58 (d, *J* = 8.5 Hz, 1H), 7.61 (d, *J* = 9.0 Hz, 1H) 7.77 (d, *J* = 7.5 Hz, 1H), 7.97 (dd, *J* = 7.5, 0.5 Hz, 1H), 8.15 (dd, *J* = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.2, 55.4, 67.4, 105.9, 116.5, 119.3, 120.7, 121.5, 123.9, 124.1, 124.6, 126.1, 126.2, 126.6, 126.7, 127.0, 127.2, 127.6,

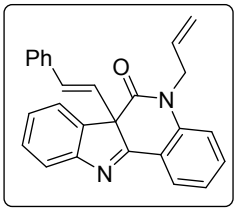
128.9, 129.1, 129.4, 129.6, 131.1, 132.3, 133.0, 134.6, 136.5, 136.6, 141.5, 155.6, 158.2, 167.9, 174.6; FTIR (KBr) 3056, 2986, 1685, 1603, 1265 cm^{-1}; HRMS (*m/z*): $[M+H]^+$ calcd for $C_{35}H_{27}N_2O_2$: 507.2073; found: 507.2060.



(*E*)-5-Benzyl-6a-(2-(thiophen-2-yl)vinyl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5s): 96 mg, 74% yield; Off white solid; mp 178-180 °C; R_f 0.36 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.88 (d, *J* = 16.5 Hz, 1H), 5.62 (d, *J* = 16.5 Hz, 1H), 5.96 (d, *J* = 15.7 Hz, 1H), 6.61 (d, *J* = 15.7 Hz, 1H), 6.81 (d, *J* = 3.5 Hz, 1H), 6.86-6.90 (m, 1H), 7.07-7.13 (m, 2H), 7.20-7.33 (m, 6H), 7.37 (td, *J* = 7.5, 1.0 Hz, 1H), 7.39-7.44 (m, 1H), 7.48 (td, *J* = 7.5, 1.2 Hz, 1H), 7.75 (td, *J* = 7.5, 1. 2 Hz, 1H), 7.93 (d, *J* = 7.0 Hz, 1H), 8.12 (dd, *J* = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.2, 67.1, 116.5, 120.6, 121.6, 124.1, 124.6, 125.3, 125.4, 126.1, 126.2, 126.5, 126.7, 127.0, 127.5, 127.6, 129.1, 129.4, 133.0, 136.3, 136.4, 140.6, 141.5, 155.6, 167.6, 174.2; FTIR (KBr) 3030, 1685, 1602, 1465, 1283 cm^{-1}; HRMS (*m/z*): $[M+H]^+$ calcd for $C_{28}H_{21}N_2OS$: 433.1374; found: 433.1369.

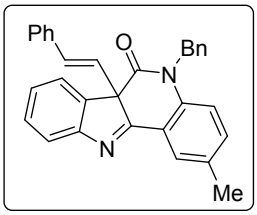


(*E*)-5-Benzyl-8-bromo-6a-(4-methylstyryl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5t): 137 mg, 88% yield; Off white solid; mp 201-203 °C; R_f 0.50 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 2.29 (s, 3H), 4.89 (d, *J* = 16.4 Hz, 1H), 5.60 (d, *J* = 16.4 Hz, 1H), 6.00 (d, *J* = 16.0 Hz, 1H), 6.47 (d, *J* = 16.0 Hz, 1H), 7.01-7.12 (m, 5H), 7.19-7.31 (m, 6H), 7.38-7.45 (m, 1H), 7.59 (d, *J* = 0.8 Hz, 2H), 8.06 (s, 1H), 8.10 (dd, *J* = 7.8, 1.4 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 21.3, 47.2, 67.5, 116.6, 120.3, 120.4, 122.6, 123.7, 124.1, 126.1, 126.5, 126.6, 127.6, 129.1, 129.3, 129.4, 132.4, 132.5, 132.7, 133.2, 136.3, 138.6, 138.7, 141.5, 154.5, 167.3, 175.1; FTIR (KBr) 3034, 2972, 1686, 1602, 1265 cm^{-1}; HRMS (*m/z*): $[M+H]^+$ calcd for $C_{31}H_{24}BrN_2O$: 519.1072; found: 519.1068.

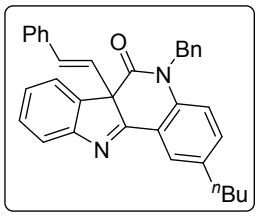


(*E*)-5-Allyl-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5u): 101 mg, 89% yield; Off white solid; mp 167-169 °C; R_f 0.50 (20% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.25-4.39 (m, 1H), 4.94-5.04 (m, 1H), 5.22-5.34 (m, 2H), 5.88-6.00 (m, 1H), 6.03 (d, *J* = 16.0 Hz, 1H), 6.49 (d, *J* = 16.0 Hz, 1H), 7.13-7.28 (m, 7H), 7.35 (td, *J* = 7.4, 1.0 Hz, 1H), 7.43-7.53 (m, 2H), 7.74 (t, *J* = 8.0 Hz, 1H), 7.92 (d, *J* = 7.2 Hz, 1H), 8.11 (dd, *J* = 7.6, 1.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 45.8, 67.2, 116.3, 117.3, 120.7,

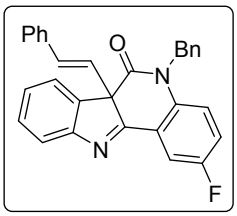
121.5, 123.9, 125.6, 126.0, 126.1, 126.5, 126.6, 128.3, 128.6, 129.3, 131.8, 131.9, 132.9, 135.8, 136.5, 141.3, 155.6, 167.2, 174.6; FTIR (KBr) 3055, 2985, 1684, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{26}H_{21}N_2O$: 377.1654; found: 377.1662.



(*E*)-5-Benzyl-2-methyl-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5v): 124 mg, 94% yield; Off white solid; mp 173-175 °C; R_f 0.55 (20% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 400 MHz) δ 2.37 (s, 3H), 4.89 (d, *J* = 15.8 Hz, 1H), 5.57 (d, *J* = 15.8 Hz, 1H), 6.09 (d, *J* = 15.8 Hz, 1H), 6.52 (d, *J* = 15.8 Hz, 1H), 6.97 (d, *J* = 8.4 Hz, 1H), 7.12-7.31 (m, 11H), 7.35 (t, *J* = 7.2 Hz, 1H), 7.47 (t, *J* = 7.4 Hz, 1H), 7.74 (d, *J* = 7.6 Hz, 1H), 7.93 (s, 2H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 20.5, 47.1, 67.3, 116.5, 120.4, 121.4, 125.7, 126.1, 126.3, 126.5, 126.6, 126.7, 127.5, 128.4, 128.7, 129.0, 129.3, 131.9, 133.7, 133.8, 135.8, 136.5, 136.6, 139.2, 155.6, 167.7, 174.8; FTIR (KBr) 3056, 2978, 1683, 1604, 1281 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{31}H_{25}N_2O$: 441.1966; found: 441.1947.

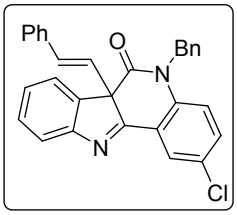


(*E*)-5-Benzyl-2-butyl-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5w): 122 mg, 84% yield; Off white solid; mp 158-160 °C; R_f 0.73 (20% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 400 MHz) δ 0.94 (t, *J* = 7.4 Hz, 3H), 1.31-1.44 (m, 2H), 1.58-1.70 (m, 2H), 2.64 (t, *J* = 7.6 Hz, 2H), 6.85 (d, *J* = 15.8 Hz, 1H), 5.61 (d, *J* = 15.8 Hz, 1H), 6.10 (d, *J* = 15.6 Hz, 1H), 6.52 (d, *J* = 15.6 Hz, 1H), 6.99 (d, *J* = 7.6 Hz, 1H), 7.14-7.31 (m, 11H), 7.36 (t, *J* = 7.4 Hz, 1H), 7.48 (t, *J* = 7.2 Hz, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.88-7.99 (m, 2H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 14.0, 22.5, 33.4, 34.8, 47.2, 67.3, 116.4, 120.5, 121.4, 125.6, 125.8, 126.1, 126.5, 126.6, 126.7, 127.5, 128.4, 128.7, 129.0, 129.3, 131.9, 133.1, 135.9, 136.5, 136.6, 138.9, 139.4, 155.6, 167.7, 174.9; FTIR (KBr) 3055, 2984, 1682, 1610, 1266 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{34}H_{31}N_2O$: 483.2436; found: 483.2453.

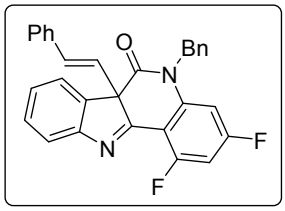


(*E*)-5-Benzyl-2-fluoro-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5x): 112 mg, 84% yield; Off white solid; mp 177-179 °C; R_f 0.60 (20% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 400 MHz) δ 4.87 (d, *J* = 16.6 Hz, 1H), 5.60 (d, *J* = 16.6 Hz, 1H), 6.08 (d, *J* = 16.0 Hz, 1H), 6.53 (d, *J* = 16.0 Hz, 1H), 7.00-7.13 (m, 2H), 7.16-7.32 (m, 10H), 7.38 (t, *J* = 7.4 Hz, 1H), 7.49 (t, *J* = 7.6 Hz, 1H), 7.76 (d, *J* = 7.6 Hz, 1H), 7.79-7.85 (m, 1H), 7.94 (d, *J* = 7.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.4, 67.1, 112.5 (d, *J* =

24.0 Hz), 118.2 (d, J = 8.0 Hz), 119.5 (d, J = 23.0 Hz), 121.8, 122.1 (d, J = 7.0 Hz), 125.1, 126.1, 126.5, 126.7, 127.0, 127.7, 128.5, 128.7, 129.1, 129.5, 132.2, 135.6, 136.2, 136.5, 137.7 (d, J = 2.0 Hz), 155.3, 159.0 (d, J = 245.0 Hz), 167.4, 173,4; FTIR (KBr) 3054, 2986, 1686, 1605, 1270 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{30}H_{22}FN_2O$: 445.1716; found: 445.1704.



(*E*)-5-Benzyl-2-chloro-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5y): 120 mg, 87% yield; Off white solid; mp 188-190 ^oC; R_f 0.65 (20% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 400 MHz) δ 4.89 (d, J = 16.4 Hz, 1H), 5.58 (d, J = 16.4 Hz, 1H), 6.06 (d, J = 16.0 Hz, 1H), 6.52 (d, J = 16.0 Hz, 1H), 7.01 (d, J = 8.8 Hz, 1H), 7.18 (d, J = 7.2 Hz, 2H), 7.21-7.41 (m, 10H), 7.49 (t, J = 7.4 Hz, 1H), 7.76 (d, J = 7.6 Hz, 1H), 7.92 (d, J = 7.6 Hz, 1H), 8.10 (s, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.2, 67.2, 117.9, 121.8, 122.0, 125.0, 125.7, 126.1, 126.5, 126.7, 127.0, 127.8, 128.6, 128.7, 129.2, 129.5, 129.6, 132.3, 132.6, 135.6, 136.0, 136.4, 140.0, 155.3, 167.5, 173.1; FTIR (KBr) 3052, 2998, 1686, 1606, 1259 cm^{-1}; $[M+H]^+$ calcd for $C_{30}H_{22}ClN_2O$: 461.1421; found: 461.1398.

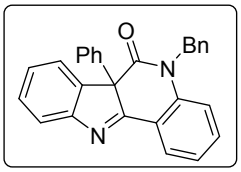


(*E*)-5-Benzyl-1,3-difluoro-6a-styryl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (5aa): 121 mg, 87% yield; Off white solid; mp 180-182 ^oC; R_f 0.55 (20% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 500 MHz) δ 4.86 (d, J = 16.5 Hz, 1H), 5.56 (d, J = 16.5 Hz, 1H), 6.06 (d, J = 15.8 Hz, 1H), 6.55 (d, J = 15.8 Hz, 1H), 6.61-6.77 (m, 2H), 7.19 (d, J = 7.5 Hz, 2H), 7.20-7.34 (m, 8H), 7.38 (t, J = 7.2 Hz, 1H), 7.49 (t, J = 7.6 Hz, 1H), 7.82 (d, J = 7.5 Hz, 1H), 7.90 (d, J = 7.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.7, 67.5, 100.2 (dd, J = 26, 25 Hz), 101.0 (dd, J = 28, 3 Hz), 106.3 (dd, J = 18, 4 Hz), 122.0, 124.5, 126.0, 126.5, 126.7, 127.1, 127.9, 128.7, 128.8, 129.3, 129.6, 132.6, 135.3, 135.4, 135.5, 144.0 (dd, J = 13, 6 Hz), 155.6, 160.8 (dd, J = 258, 15 Hz), 164.9 (dd, J = 251, 15 Hz), 167.3, 168.9 (d, J = 4 Hz); FTIR (KBr) 3056, 2986, 1693, 1604, 1264 cm^{-1}; HRMS (m/z): $[M+H]^+$ calcd for $C_{30}H_{21}F_2N_2O$: 463.1621; found: 463.1607.

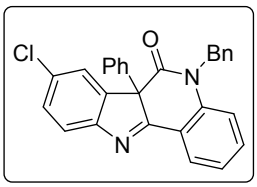
2.2 General procedure for the synthesis of indolo[3,2-*c*]quinolinones 7

Under open atmosphere, 2'-aminobenzophenone **6** (0.3 mmol), copper triflate (0.03 mmol) and $CHCl_3$ (1.5 mL) were successively added to oven dried reaction tube. The reaction tube was then immersed in a 60 ºC pre-heated oil bath. Then the 3-diazooxindole **2** (0.45 mmol)

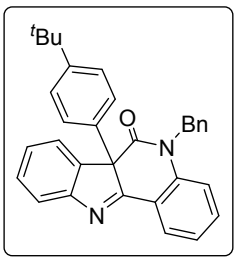
was dissolved in 1.5 mL of $CHCl_3$ and added to the reaction *via* a syringe pump (1.5 mL/h). The reaction was continued at 60 °C with stirring till complete conversion of **6**. The reaction progression was monitored by TLC. After completion of the reaction, the solvent was removed under vacuum and the crude mixture was purified using silica gel column chromatography eluting with 1:4 ethylacetate:hexanes to afford indolo[3,2-*c*]quinolinones products **7a-h**.



5-Benzyl-6a-phenyl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7a): 115 mg, 96% yield; Off white solid; mp 183-185 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.85 (d, *J* = 16.6 Hz, 1H), 5.59 (d, *J* = 16.6 Hz, 1H), 6.91 (d, *J* = 8.4 Hz, 1H), 7.01-7.10 (m, 2H), 7.14-7.26 (m, 10H), 7.29 (t, *J* = 7.8 Hz, 1H), 7.38 (t, *J* = 7.6 Hz, 1H), 7.72 (d, *J* = 8.0 Hz, 1H), 7.78 (d, *J* = 7.2 Hz, 1H), 8.15 (d, *J* = 7.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.3, 69.2, 116.4, 121.3, 121.5, 124.0, 125.7, 125.8, 125.9, 126.4, 126.8, 127.4, 128.4, 128.9, 129.1, 129.4, 132.7, 136.3, 136.5, 139.0, 141.4, 154.8, 168.1, 175.2; FTIR (KBr) 3056, 2993, 1683, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{28}H_{21}N_2O$: 401.1653; found: 401.1642.

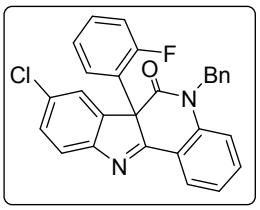


5-Benzyl-8-chloro-6a-phenyl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7b): 117 mg, 90% yield; Off white solid; mp 189-191 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 500 MHz) δ 4.87 (d, *J* = 16.5 Hz, 1H), 5.58 (d, *J* = 16.5 Hz, 1H), 6.94 (d, *J* = 8.0 Hz, 1H), 7.03-7.09 (m, 2H), 7.17-7.27 (m, 9H), 7.30-7.35 (m, 1H), 7.36 (dd, *J* = 8.5, 2.0 Hz, 1H), 7.63 (d, *J* = 8.0 Hz, 1H), 7.74 (d, *J* = 2.0 Hz, 1H), 8.13 (dd, *J* = 7.8, 1.8 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.3, 69.4, 116.5, 121.0, 122.2, 124.2, 125.7, 125.9, 126.3, 126.4, 127.5, 128.7, 128.9, 129.3, 129.6, 132.4, 133.0, 135.8, 136.1, 140.6, 141.3, 153.4, 167.6, 175.6; FTIR (KBr) 3055, 2986, 1684, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{28}H_{20}ClN_2O$: 435.1264; found: 435.1262.

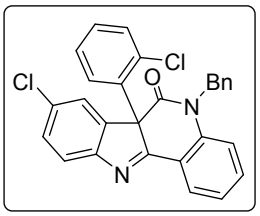


5-Benzyl-6a-(4-(*tert*-butyl)phenyl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7c): 122 mg, 89% yield; Off white solid; mp 194-196 °C; R_f 0.38 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 1.21 (s, 9H), 4.83 (d, *J* = 16.6 Hz, 1H), 5.62 (d, *J* = 16.6 Hz, 1H), 6.90 (d, *J* = 8.4 Hz, 1H), 6.98-7.05 (m, 2H), 7.15-7.27 (m, 9H), 7.30 (t, *J* = 7.8 Hz, 1H), 7.38 (t, *J* = 7.6 Hz, 1H), 7.71 (d, *J* = 8.0 Hz, 1H), 7.83 (d, *J* = 7.2 Hz, 1H), 8.17 (d, *J* = 7.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 31.3, 34.6, 47.0, 68.8, 116.4, 121.3,

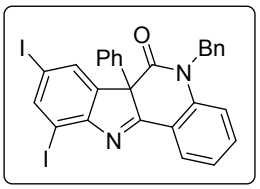
121.4, 123.9, 125.4, 125.7, 125.8, 126.3 (2C), 126.7, 127.4, 128.8, 129.0, 132.7, 133.5, 136.3, 139.0, 141.3, 151.3, 154.8, 168.4, 175.2; FTIR (KBr) 3030, 2936, 1713, 1686, 1591, 1467 cm^{-1}; HRMS (*m*/*z*): $[M+Na]^+$ calcd for $C_{32}H_{28}N_2NaO$: 479.2099; found: 479.2082.



5-Benzyl-8-chloro-6a-(2-fluorophenyl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7d): 110 mg, 81% yield; Off white solid; mp 171-173 °C; R_f 0.36 (15% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 500 MHz) δ 4.95 (d, *J* = 16.8 Hz, 1H), 5.48 (d, *J* = 16.8 Hz, 1H), 6.82-6.89 (m, 1H), 6.97 (d, *J* = 8.0 Hz, 1H), 7.08 (td, *J* = 7.8, 1.2 Hz, 1H), 7.11-7.15 (m, 2H), 7.16-7.29 (m, 5H), 7.31-7.36 (m, 1H), 7.38-7.44 (m, 2H), 7.60 (d, *J* = 2.0 Hz, 1H), 7.66 (d, *J* = 8.0 Hz, 1H), 8.04 (dd, *J* = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 47.8, 66.8, 116.3, 117.0 (d, *J* = 22.5 Hz), 121.5, 122.1, 123.0 (d, *J* = 12.5 Hz), 124.0, 125.1 (d, *J* = 3.75 Hz), 126.3, 126.6, 126.7, 127.6, 128.9, 129.0 (d, *J* = 2.5 Hz), 129.7, 130.5 (d, *J* = 8.75 Hz), 132.5, 132.6, 136.1, 138.2, 141.0, 154.4, 159.7 (d, *J* = 250 Hz), 166.9, 174.5; FTIR (KBr) 3054, 2982, 1685, 1604, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{28}H_{19}ClFN_2O$: 453.1169; found: 453.1159.

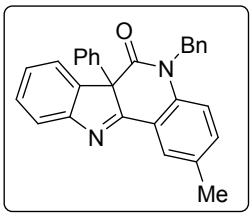


5-Benzyl-8-chloro-6a-(2-chlorophenyl)-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7e): 117 mg, 83% yield; Off white solid; mp 167-169 °C; R_f 0.40 (15% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 500 MHz) δ 4.99 (d, *J* = 16.5 Hz, 1H), 5.40 (d, *J* = 16.5 Hz, 1H), 6.99 (d, *J* = 8.0 Hz, 1H), 7.12-7.22 (m, 6H), 7.26-7.35 (m, 4H), 7.39-7.47 (m, 3H), 7.67 (d, *J* = 8.5 Hz, 1H), 7.99 (dd, *J* = 7.5, 1.5 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 48.2, 70.4, 116.2, 122.1, 122.5, 124.4, 126.6, 127.0, 127.6, 117.7, 128.9, 129.8, 130.0 (2C), 130.2, 131.9, 132.3, 132.6, 132.7, 133.0, 136.0, 137.4, 140.7, 155.2, 167.5, 175.2; FTIR (KBr) 3055, 2984, 1682, 1603, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{28}H_{19}Cl_2N_2O$: 469.0874; found: 469.0873.

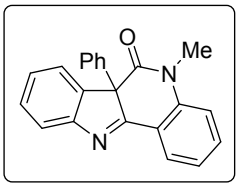


5-Benzyl-8,10-diiodo-6a-phenyl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7f): 149 mg, 76% yield; Off white solid; mp 202-204 °C; R_f 0.53 (15% ethyl acetate in hexanes); ^1H NMR ($CDCl_3$, 400 MHz) δ 4.91 (d, *J* = 16.4 Hz, 1H), 5.49 (d, *J* = 16.4 Hz, 1H), 6.92 (d, *J* = 8.4 Hz, 1H), 6.99-7.09 (m, 2H), 7.15-7.27 (m, 9H), 7.33 (t, *J* = 7.8 Hz, 1H), 8.02 (s, 1H), 8.09 (s, 1H), 8.22 (d, *J* = 7.6 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 47.3, 71.4, 89.5, 92.1, 116.5, 120.7, 124.2, 125.7, 126.4, 126.7, 127.6, 128.9 (2C), 129.7, 133,4, 134.6, 135.4, 135.9, 140.8,

141.2, 146.0, 156.6, 167.4, 176.0; FTIR (KBr) 3051, 2988, 1683, 1605, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+K]^+$ calcd for $C_{28}H_{18}I_2KN_2O$: 690.9145; found: 690.9118.



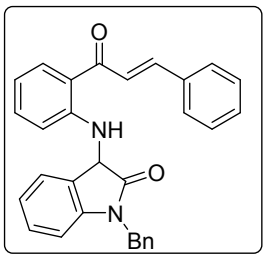
5-Benzyl-2-methyl-6a-phenyl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7g): 121 mg, 97% yield; Off white solid; mp 203-205 °C; R_f 0.40 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ ^{1}H NMR ($CDCl_3$, 500 MHz) δ 2.34 (s, 3H), 4.85 (d, *J* = 16.5 Hz, 1H), 5.55 (d, *J* = 16.5 Hz, 1H), 6.80 (d, *J* = 8.0 Hz, 1H), 7.02-7.07 (m, 2H), 7.09 (dd, *J* = 8.5, 1.5 Hz, 1H), 7.17-7.27 (m, 9H), 7.37 (td, *J* = 7.5, 1.2 Hz, 1H), 7.72 (d, *J* = 8.0 Hz, 1H), 7.78 (dd, *J* = 7.5, 0.5 Hz, 1H), 7.96 (d, *J* = 2.0 Hz, 1H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 20.5, 47.1, 69.1, 116.3, 121.0, 121.4, 125.6, 125.7, 126.1, 126.4, 126.6, 127.3, 128.3, 128.8, 129.0, 129.3, 133.4, 133.7, 136.3, 136.6, 138.9, 139.0, 154.8, 168.0, 175.5; FTIR (KBr) 3056, 2988, 1682, 1604, 1265 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{29}H_{23}N_2O$: 415.1810; found: 415.1806.



5-Methyl-6a-phenyl-5,6a-dihydro-6*H*-indolo[3,2-*c*]quinolin-6-one (7h): 91 mg, 94% yield; Off white solid; mp 153-155 °C; R_f 0.29 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 3.45 (s, 3H), 7.03 (d, *J* = 8.4 Hz, 1H), 7.11-7.27 (m, 7H), 7.37 (t, *J* = 7.6 Hz, 1H), 7.43 (t, *J* = 7.8 Hz, 1H), 7.70 (d, *J* = 8.0 Hz, 1H), 7.75 (d, *J* = 7.6 Hz, 1H), 8.10 (d, *J* = 7.6Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 30.6, 69.2, 115.7, 121.1, 121.4, 123.8, 125.5, 125.8, 125.9, 126.7, 128.2, 129.0, 129.2, 132.7, 136.5, 139.2, 141.8, 154.9, 167.7, 175.5; FTIR (KBr) 3056, 2986, 1710, 1698, 1596, 1494 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{22}H_{17}N_2O$: 325.1340; found: 325.1326.

2.4 Procedure for the synthesis of N-H insertion product 4c

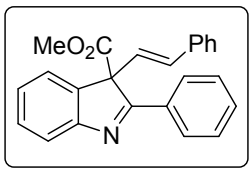
(*E*)-1-(2-aminophenyl)-3-phenylprop-2-en-1-one **1c** (70 mg, 0.3 mmol), $Rh_2(OAc)_4$ (1.3 mg, 0.003 mmol), and CH_2Cl_2 (1.5 mL) were successively added to oven dried reaction tube. The reaction tube was then immersed in a 40 ºC pre-heated oil bath. Then, the 3-diazooxindole **2a** (112 mg, 0.45 mmol) was dissolved in 1.5 mL of CH_2Cl_2 and added to the reaction *via* a syringe pump (1.5 mL/h). The reaction was continued at 40 °C with stirring till complete conversion of **1c**. The reaction progression was monitored by TLC. After 2 h, the reaction mixture was cooled to room temperature. The solvent was removed under vacuum and the crude mixture was purified using silica gel column chromatography eluting with 1:5 ethyl acetate: hexanes (v/v) to afford N-H insertion product **4c**.



1-Benzyl-3-((2-cinnamoylphenyl)amino)indolin-2-one (4c): 78 mg, 58% yield; Yellow solid; mp 128-130 °C; R_f 0.39 (15% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 4.94 (s, 2H), 5.27 (d, *J* = 7.2 Hz, 1H), 6.75 (t, *J* = 7.4 Hz, 1H), 6.80 (d, *J* = 8.0 Hz, 1H), 6.89 (d, *J* = 7.4 Hz, 1H), 7.04 (t, *J* = 7.4 Hz, 1H), 7.21-7.45 (m, 11H), 7.59-7.70 (m, 3H), 7.73 (d, *J* = 15.6 Hz, 1H), 7.95 (d, *J* = 7.6 Hz, 1H), 9.64 (d, *J* = 7.2 Hz, 1H); ^{13}C NMR ($CDCl_3$, 100 MHz) δ 44.2, 55.6, 109.6, 113.4, 116.2, 119.6, 123.2, 123.3, 124.7, 126.4, 127.8, 127.9, 128.4, 128.9, 129.0, 129.5, 130.3, 131.8, 135.2, 135.5, 135.7, 142.9, 143.3, 150.7, 175.3, 192.0; FTIR (KBr) 3071, 3030, 1720, 1610, 1278, 1254 cm^{-1}; HRMS (*m*/*z*): $[M+H]^+$ calcd for $C_{30}H_{25}N_2O_2$: 445.1916; found: 445.1905.

2.5 Procedure for the synthesis of 3*H*-indole 9

Compound **8** (74.3 mg, 0.2 mmol), $Cu(OTf)_2$ (7.2 mg, 0.02 mmol) and $CHCl_3$ (1 mL) were successively added to oven dried reaction tube. The reaction tube was then immersed in a 60 ºC pre-heated oil bath. The reaction was continued at 60 °C with stirring till complete conversion of **8**. The reaction progression was monitored by TLC. After completion of the reaction (12 h), the solvent was removed under vacuum and the crude mixture was purified using silica gel column chromatography eluting with 1:4 ethylacetate: hexanes to afford rearranged product **9**.



Methyl (*E*)-2-phenyl-3-styryl-3*H*-indole-3-carboxylate (9): 54 mg, 76% yield; Off white solid; mp 122-124 °C; R_f 0.46 (10% ethyl acetate in hexanes); ^{1}H NMR ($CDCl_3$, 400 MHz) δ 3.59 (s, 3H), 6.10 (d, *J* = 16.4 Hz, 1H), 7.08 (d, *J* = 16.4 Hz, 1H), 7.17-7.31 (m, 6H), 7.40-7.49 (m, 5H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.99-8.07 (m, 2H); ^{13}C NMR ($CDCl_3$, 125 MHz) δ 53.4, 68.3, 121.6, 122.6, 124.9, 126.7, 126.8, 128.1, 128.6, 128.9, 129.0, 129.4, 131.4, 131.8, 132.2, 136.2, 140.8, 155.4, 171.0, 176.4; FTIR (KBr) 3030, 2952, 1735, 1535, 1446, 1233 cm^{-1}; HRMS (*m*/*z*): $[M+Na]^+$ calcd for $C_{24}H_{19}NO_2Na$: 376.1313; found: 376.1316

2'-Aminochalcones **1** were synthesized according to the previous literature procedure.[1] Compound **8** was prepared according to the reported literature procedure and data was in good agreement.[2]

2.6 General procedure for the preparation of 3-diazooxindoles 2

3-Diazooxindoles **2** were prepared according to literature method with a slight modification.[3] *N*-Protected isatin-tosylhydrazone[4] (10 mmol) was taken in THF (30 mL) at room temperature. 30 mL of 0.66 N of NaOH (20 mmol in 30 mL of H_2O) was added slowly to the reaction over 15 min. The reaction was left to stir at the same temperature till complete consumption of tosylhydrazone. The reaction mixture was neutralized with saturated NH_4Cl solution and extracted with ethyl acetate (3 x 25 mL). The brine wash (1 x 25 mL) was given to the combined organic extractions and dried over anhydrous Na_2SO_4. The solvent was removed under vacuum and the crude mixture was purified using silica gel column chromatography eluting with 1:4 ethylacetate: hexanes (v/v) to afford corresponding 3-diazooxindoles. The data of the prepared diazo compounds are in good agreement with reported compounds.[3]

3. References:

1. K. Chinthapally, N. P. Massaro, H. L. Padgett, I. Sharma, *Chem. Commun.* **2017**, *53*, 12205-12208.
2. C. Jing, D. Xing, W. Hu, *Chem. Commun.* **2014**, *50*, 951-953.
3. C. Zhai, D. Xing, C. Jing, J. Zhou, C. Wang, D. Wang, W. Hu, *Org. Lett.* **2014**, *16*, 2934-2937.
4. D. Arunprasath, B. Devi Bala, G. Sekar, *Org. Lett.* **2017**, *19*, 5280-5283

4. ^{1}H and ^{13}C spectra for all compounds

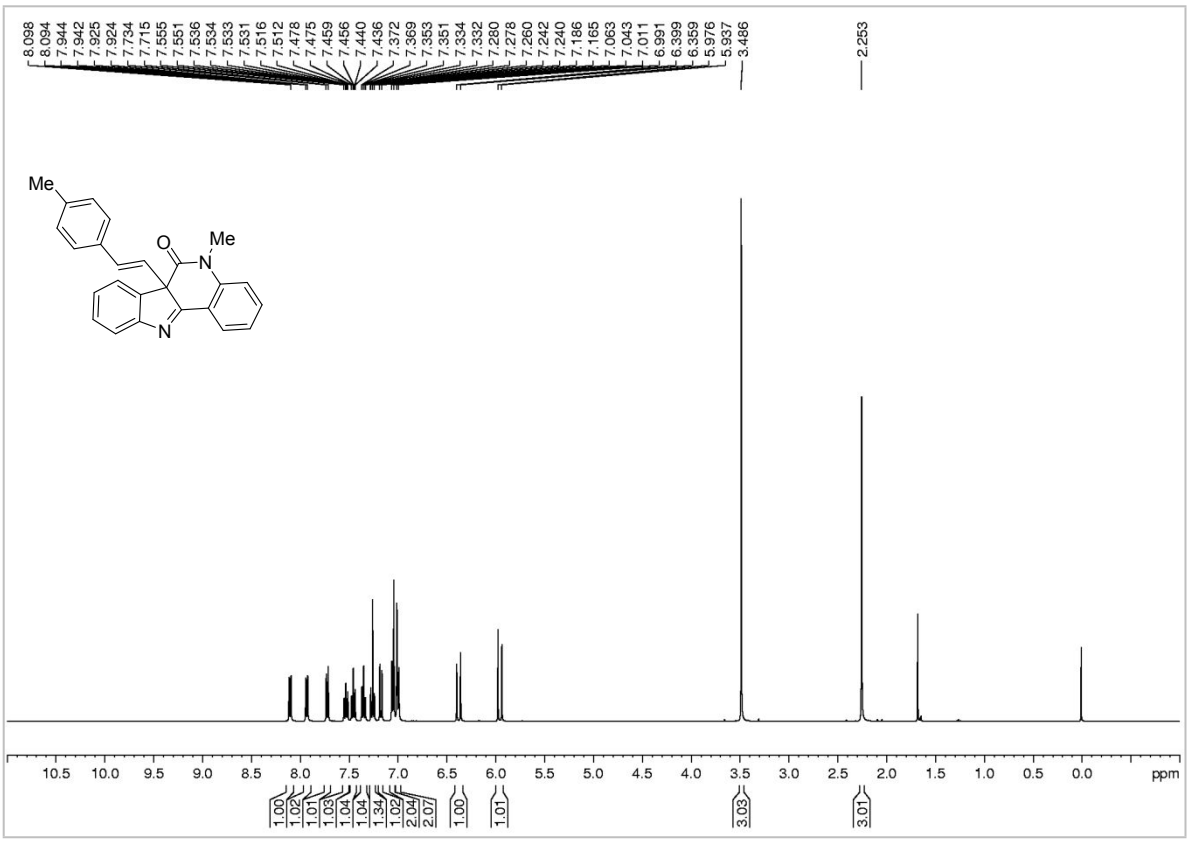


Figure 1. 400 MHz ^{1}H-NMR spectrum of **5a** in $CDCl_3$

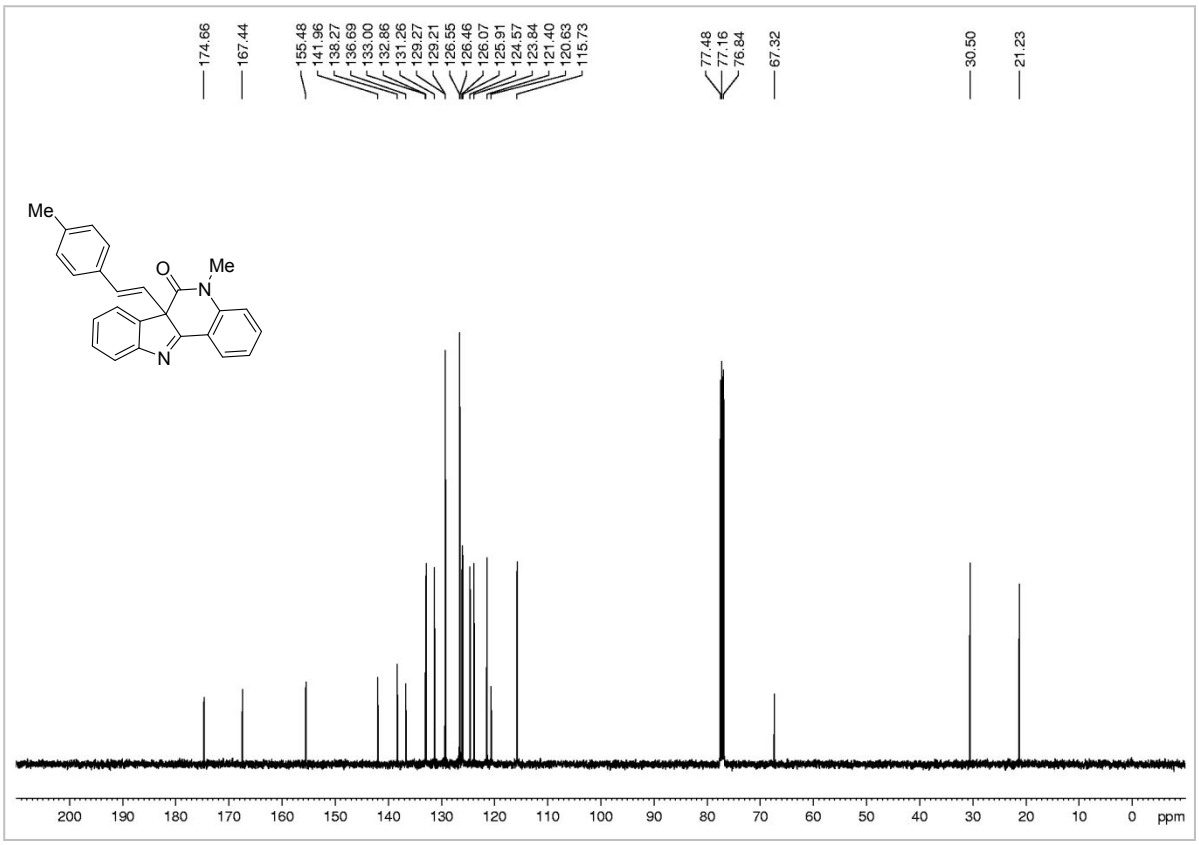


Figure 2. 100 MHz ^{13}C-NMR spectrum of **5a** in $CDCl_3$

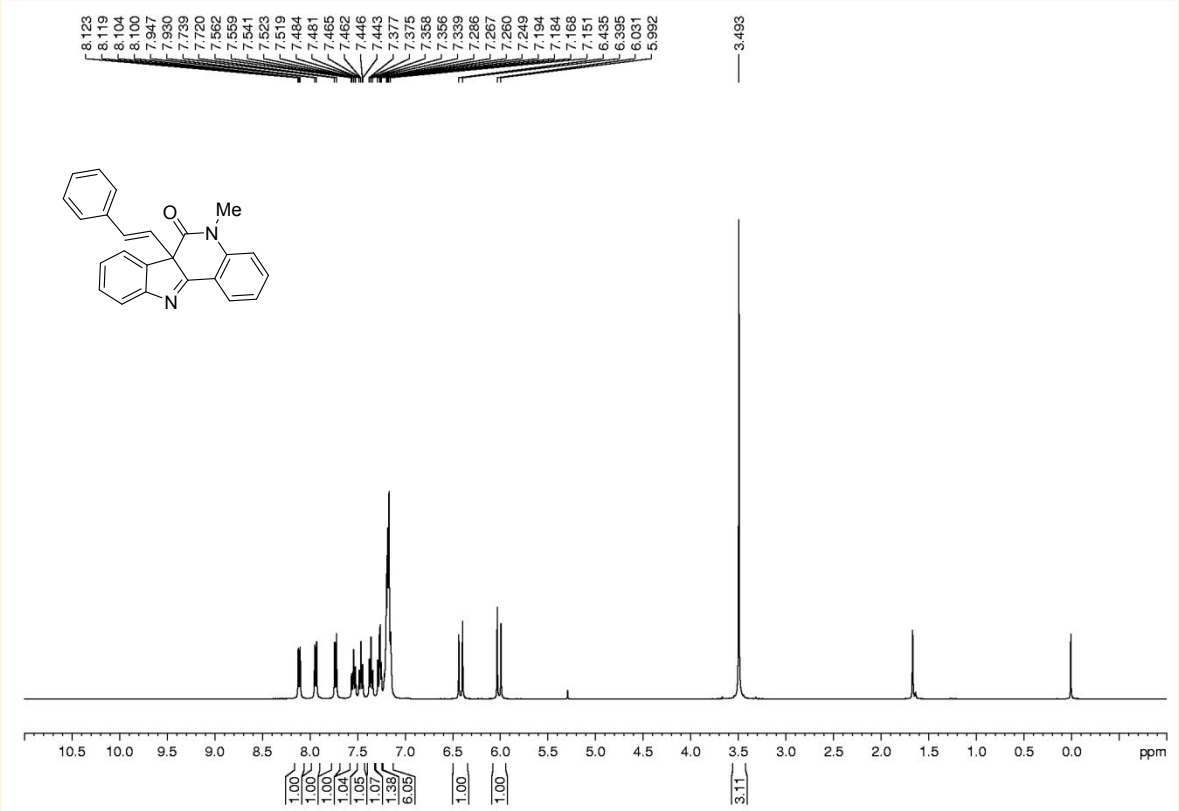


Figure 3. 400 MHz ^{1}H-NMR spectrum of **5b** in $CDCl_3$

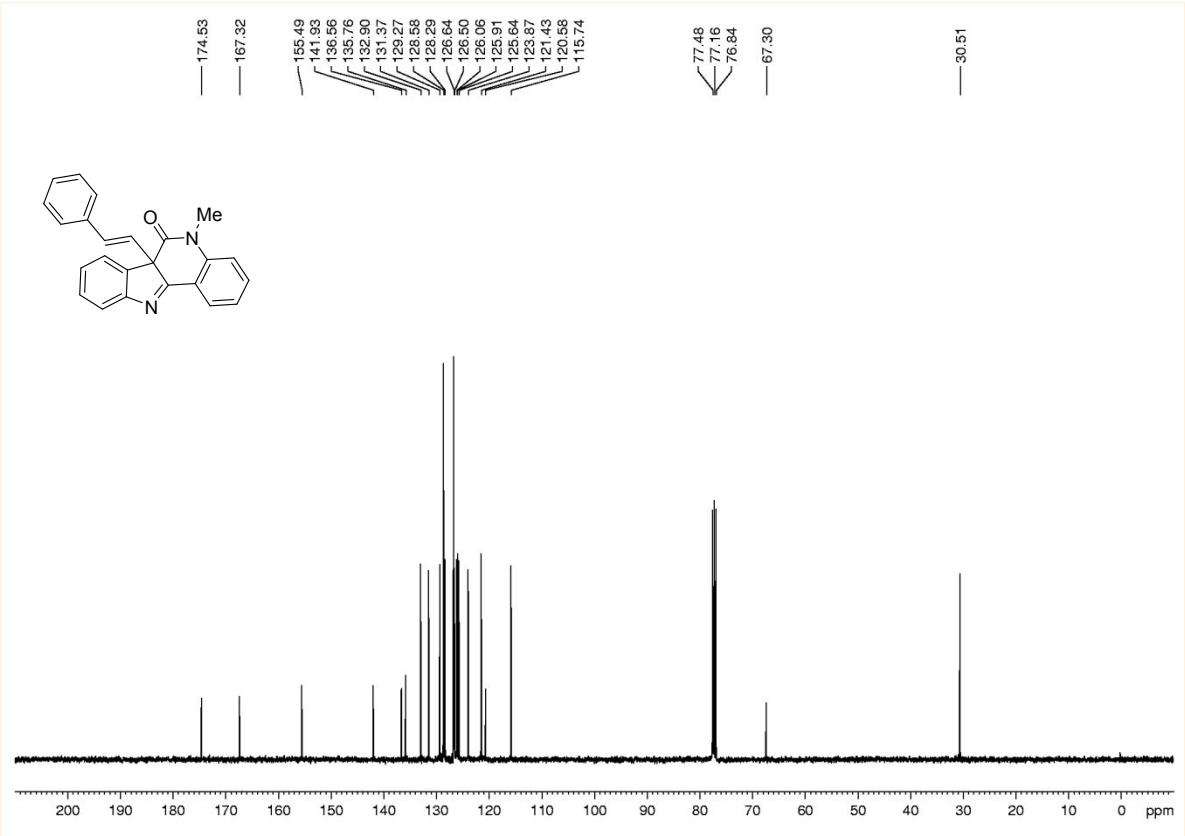


Figure 4. 100 MHz ^{13}C-NMR spectrum of **5b** in $CDCl_3$

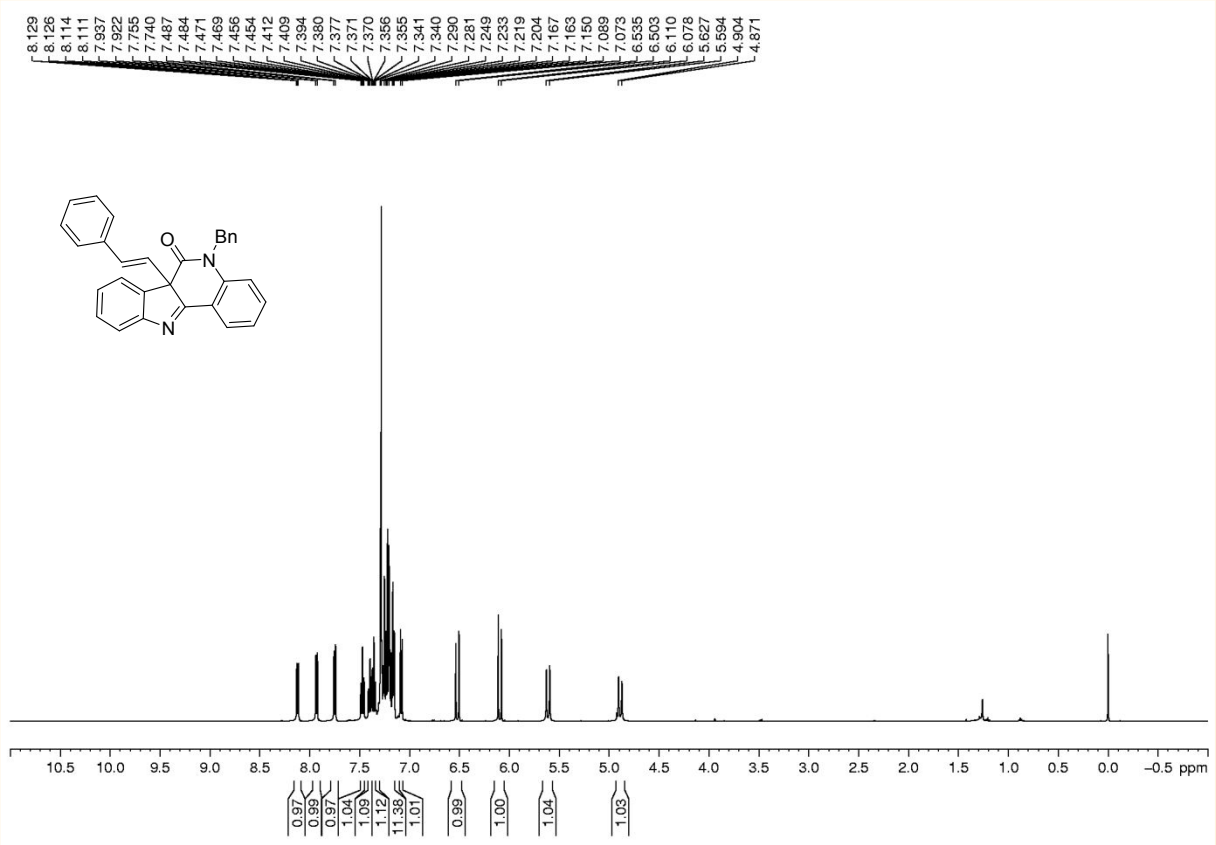


Figure 5. 500 MHz ^{1}H-NMR spectrum of **5c** in $CDCl_3$

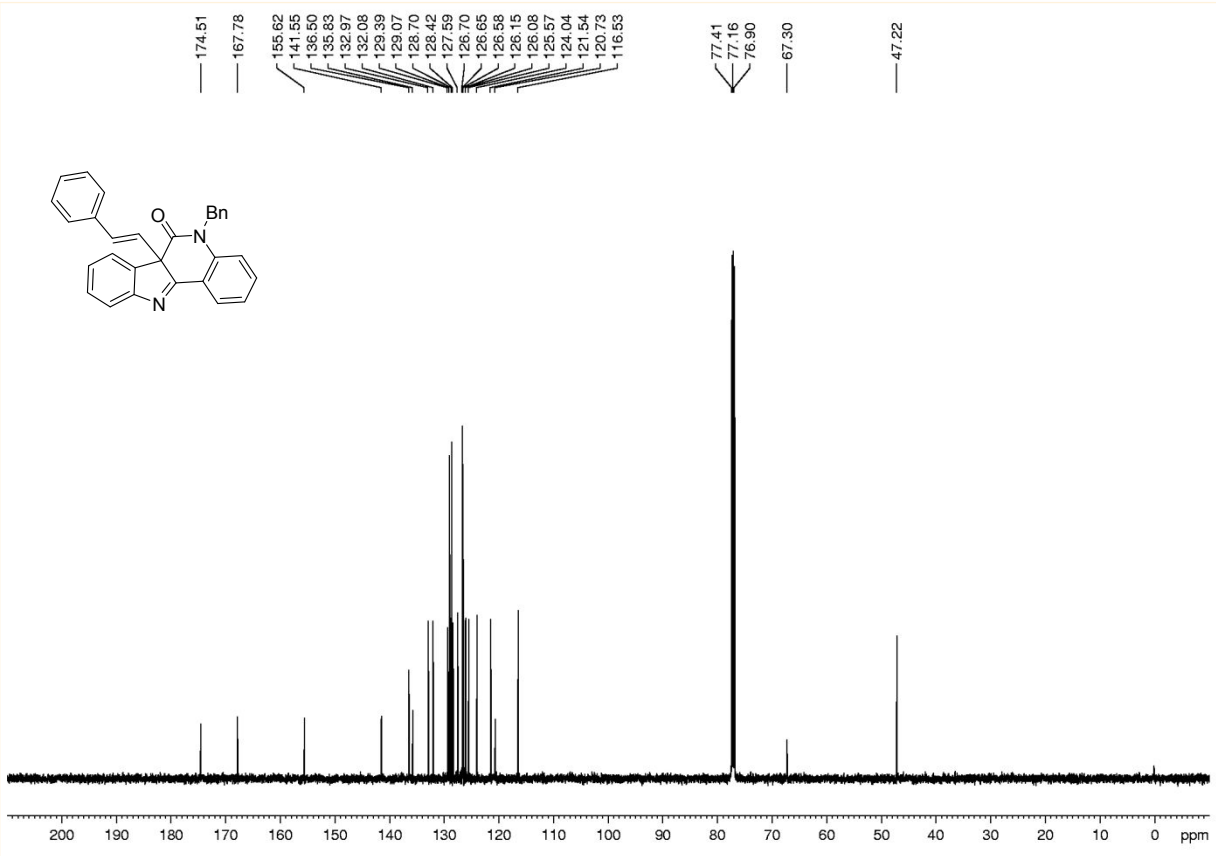


Figure 6. 125 MHz ^{13}C-NMR spectrum of **5c** in $CDCl_3$

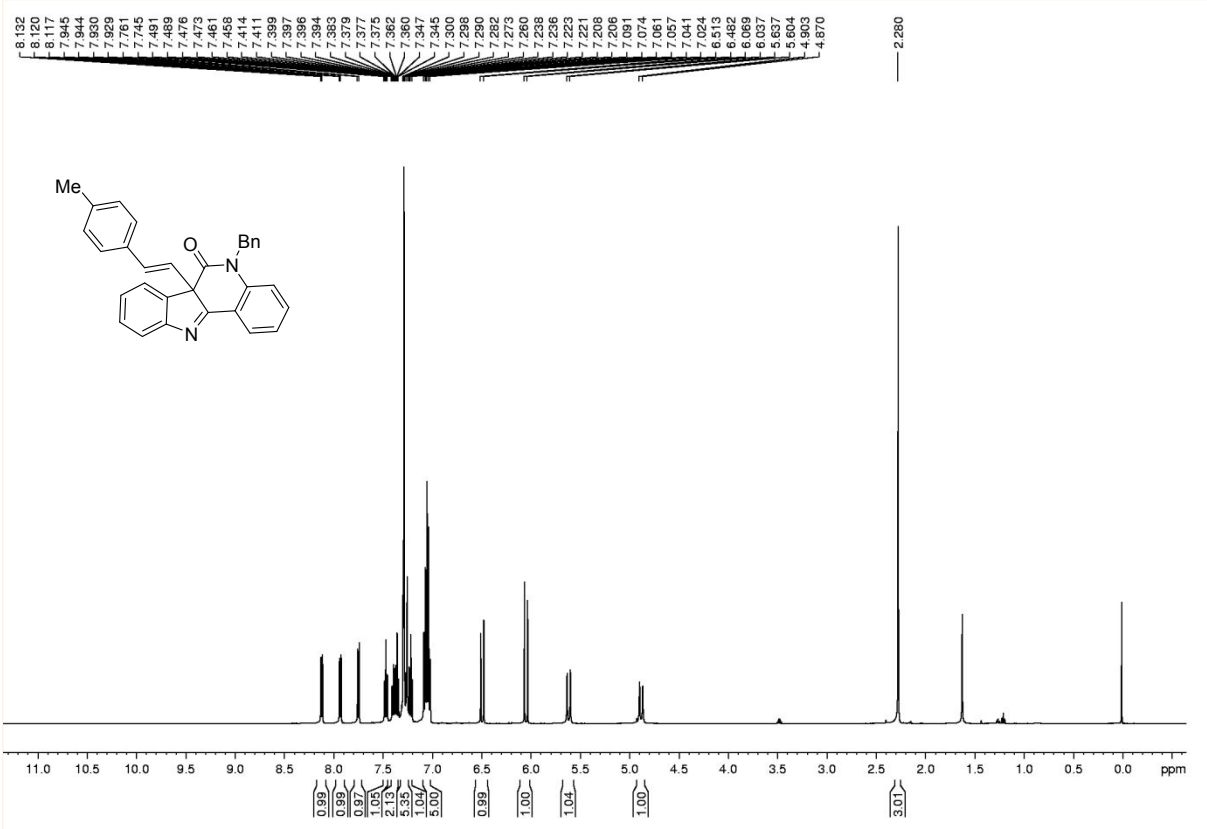


Figure 7. 500 MHz ^{1}H-NMR spectrum of **5d** in $CDCl_3$

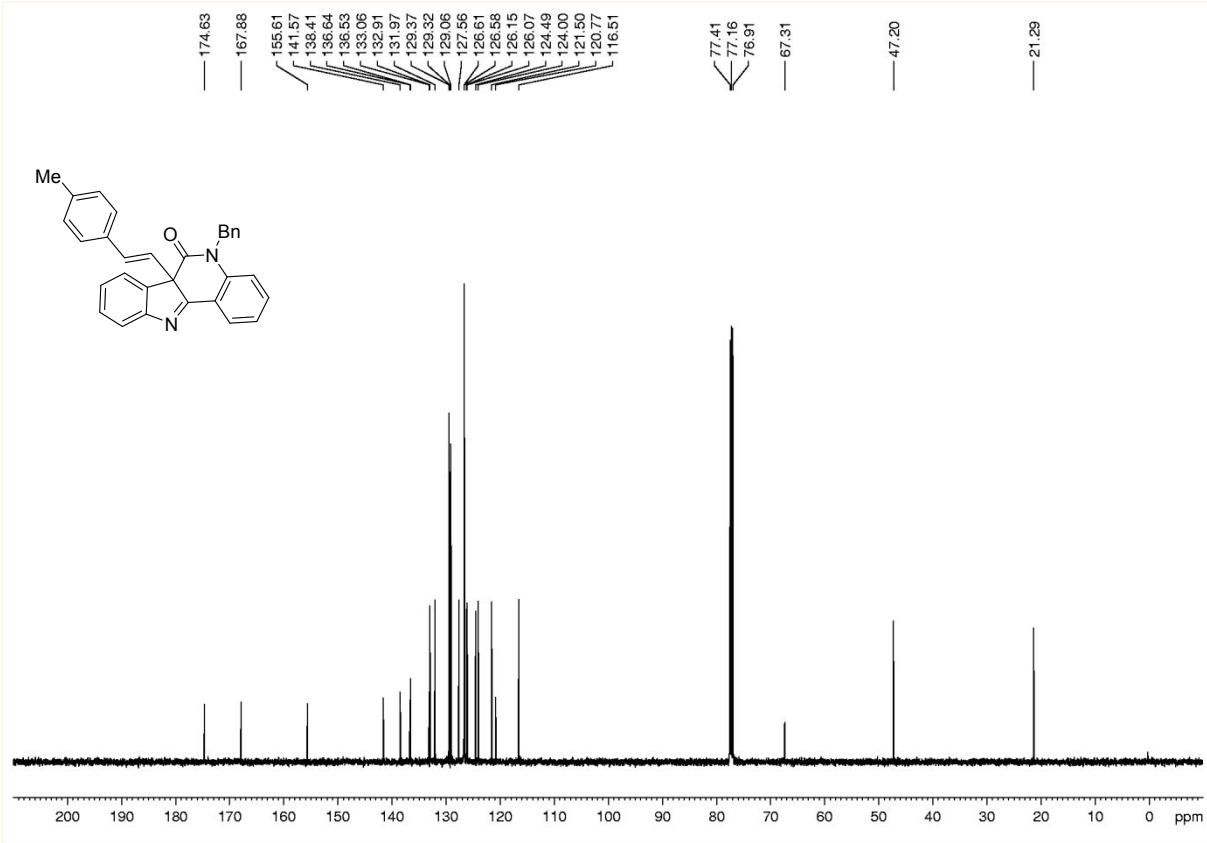


Figure 8. 125 MHz ^{13}C-NMR spectrum of **5d** in $CDCl_3$

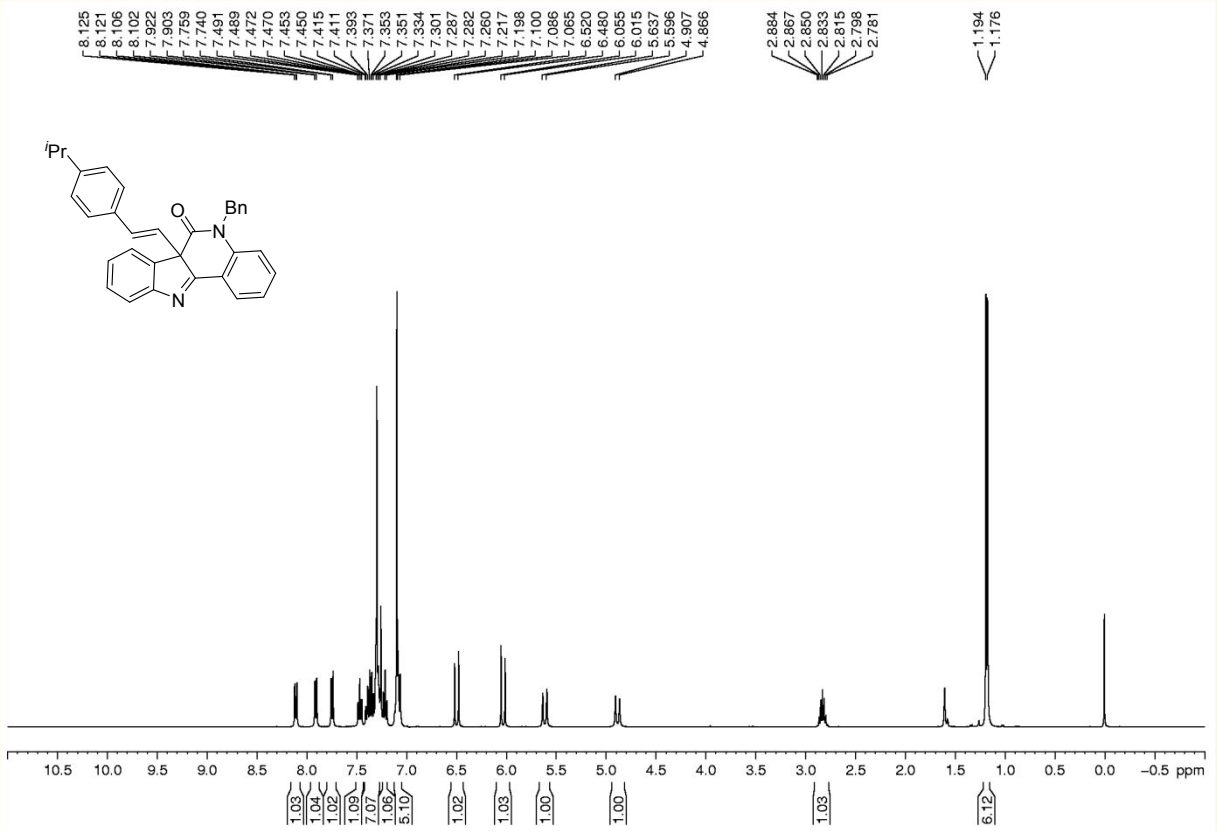


Figure 9. 400 MHz ^{1}H-NMR spectrum of **5e** in $CDCl_3$

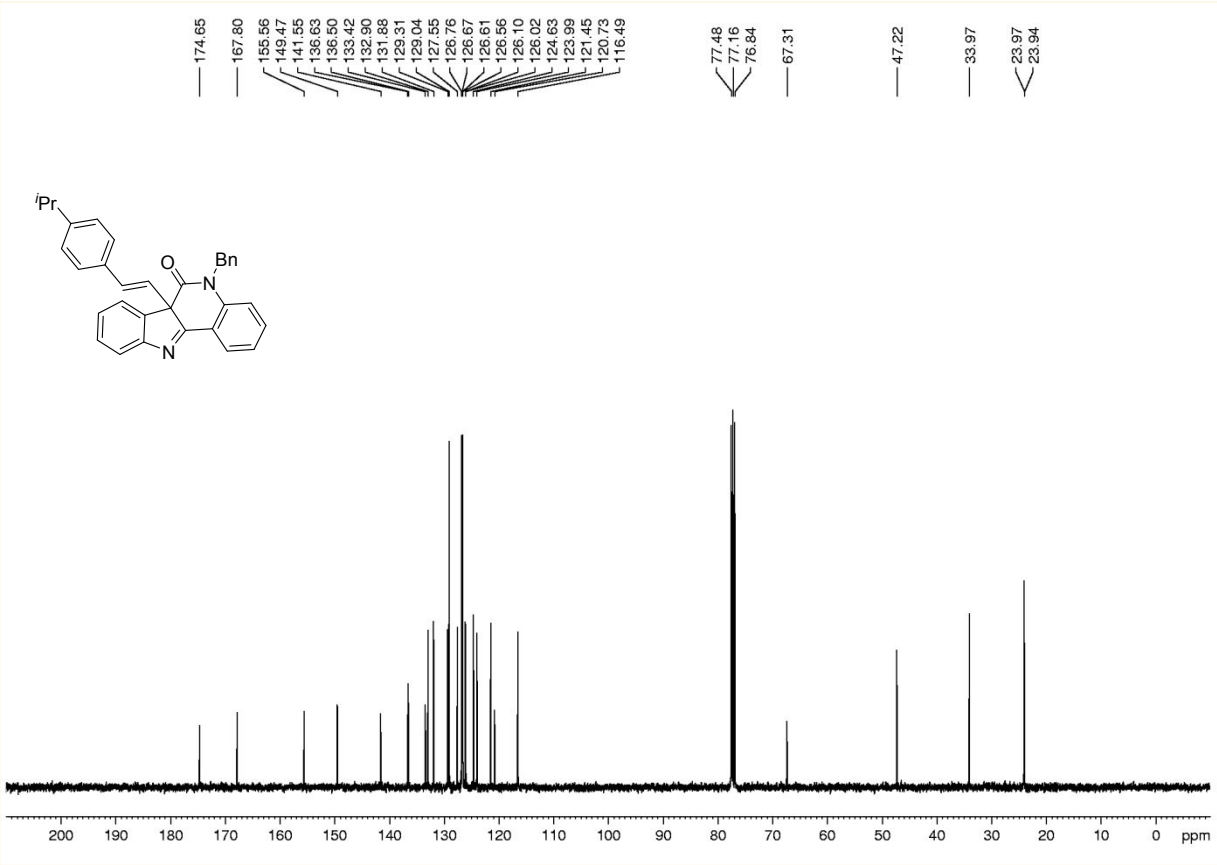


Figure 10. 100 MHz ^{13}C-NMR spectrum of **5e** in $CDCl_3$

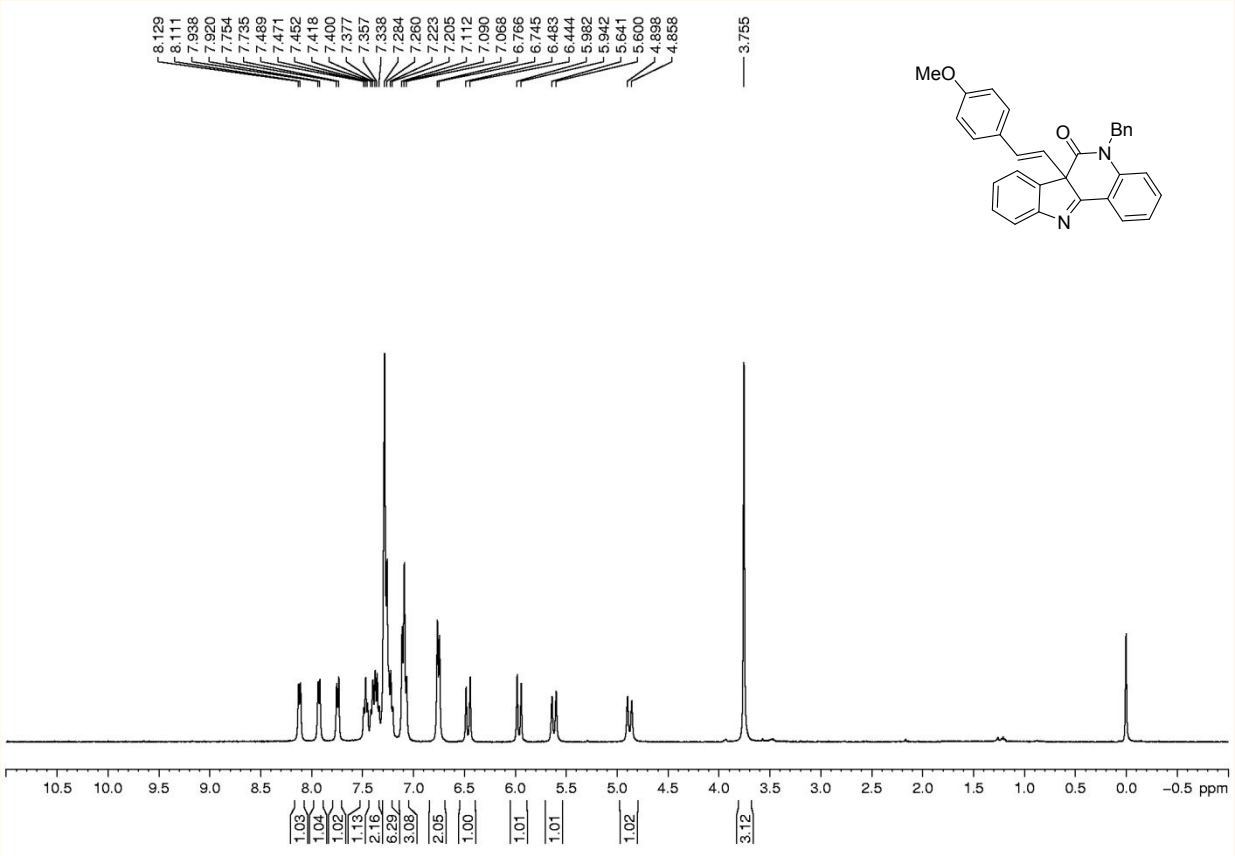


Figure 11. 400 MHz ^{1}H-NMR spectrum of **5f** in $CDCl_3$

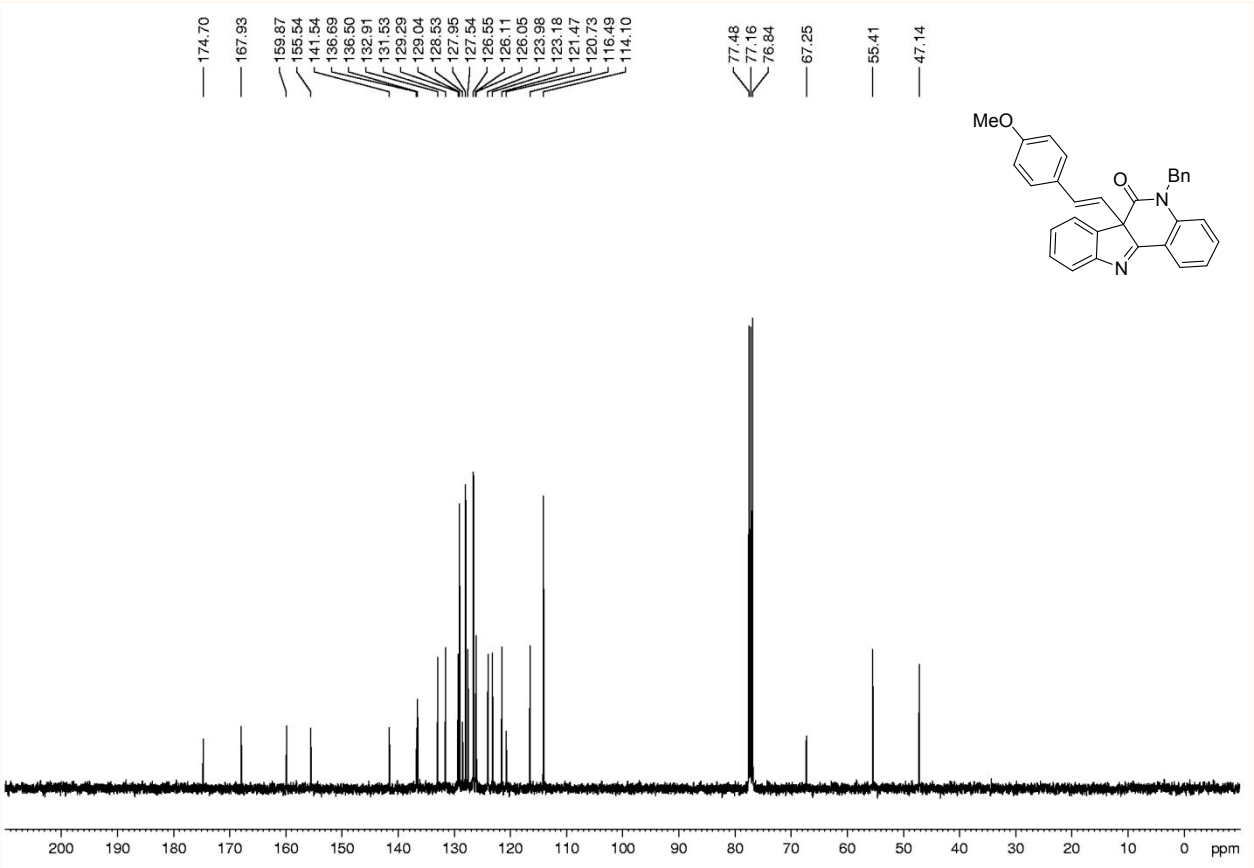


Figure 12. 100 MHz ^{13}C-NMR spectrum of **5f** in $CDCl_3$

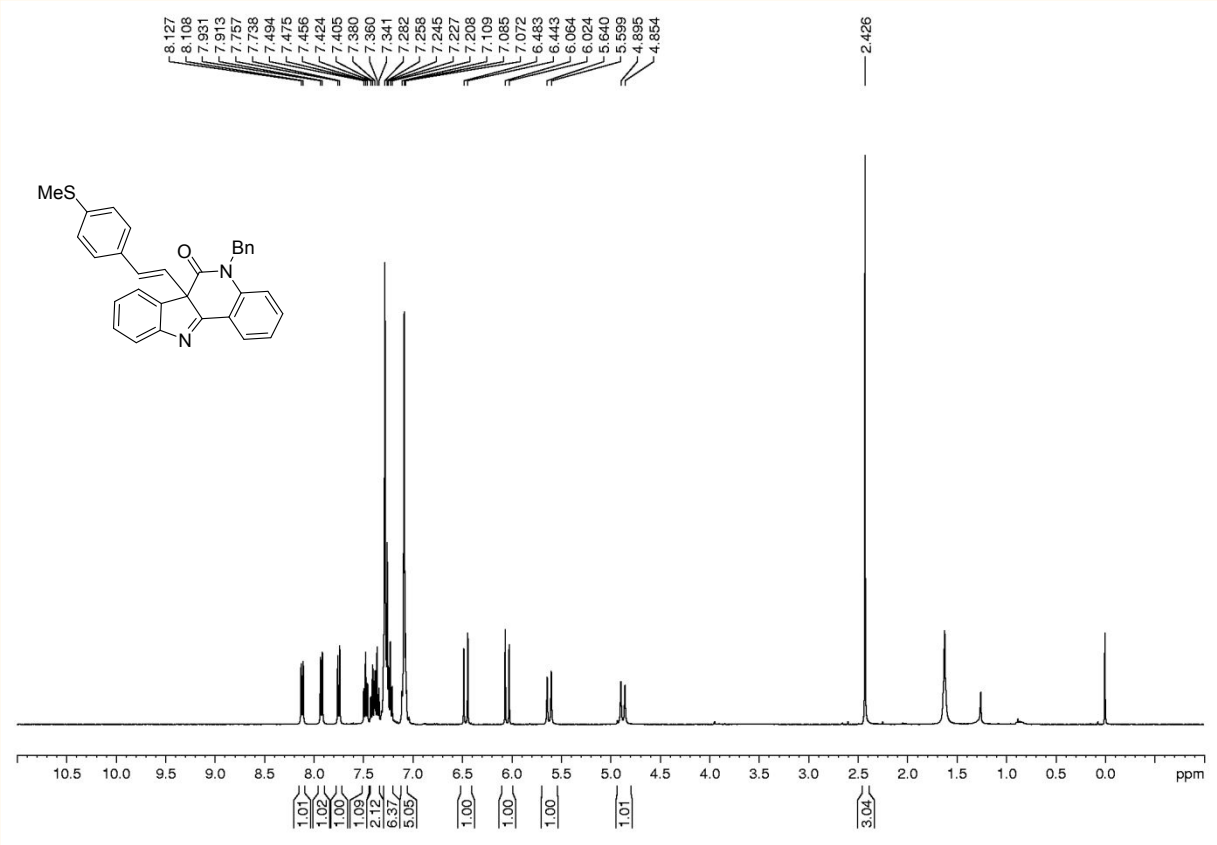


Figure 13. 400 MHz ^{1}H-NMR spectrum of **5g** in $CDCl_3$

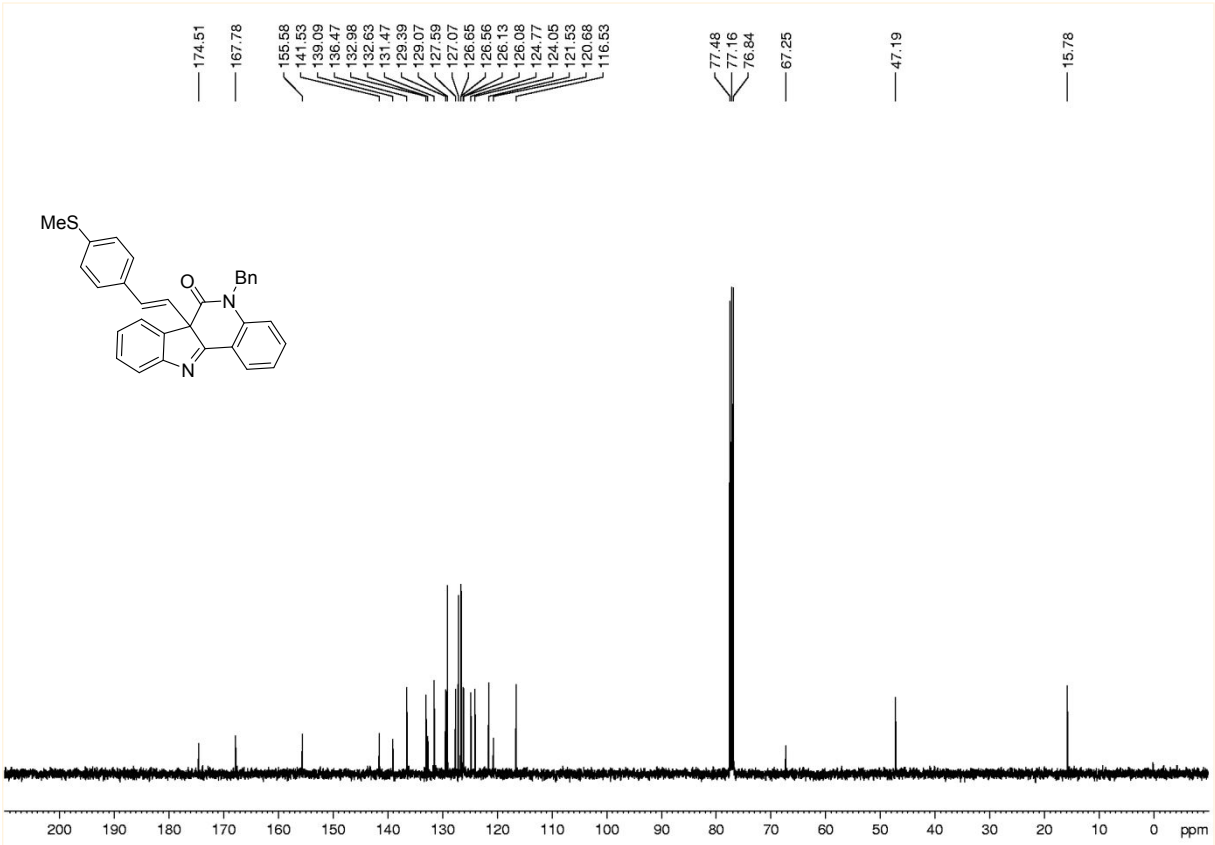


Figure 14. 100 MHz ^{13}C-NMR spectrum of **5g** in $CDCl_3$

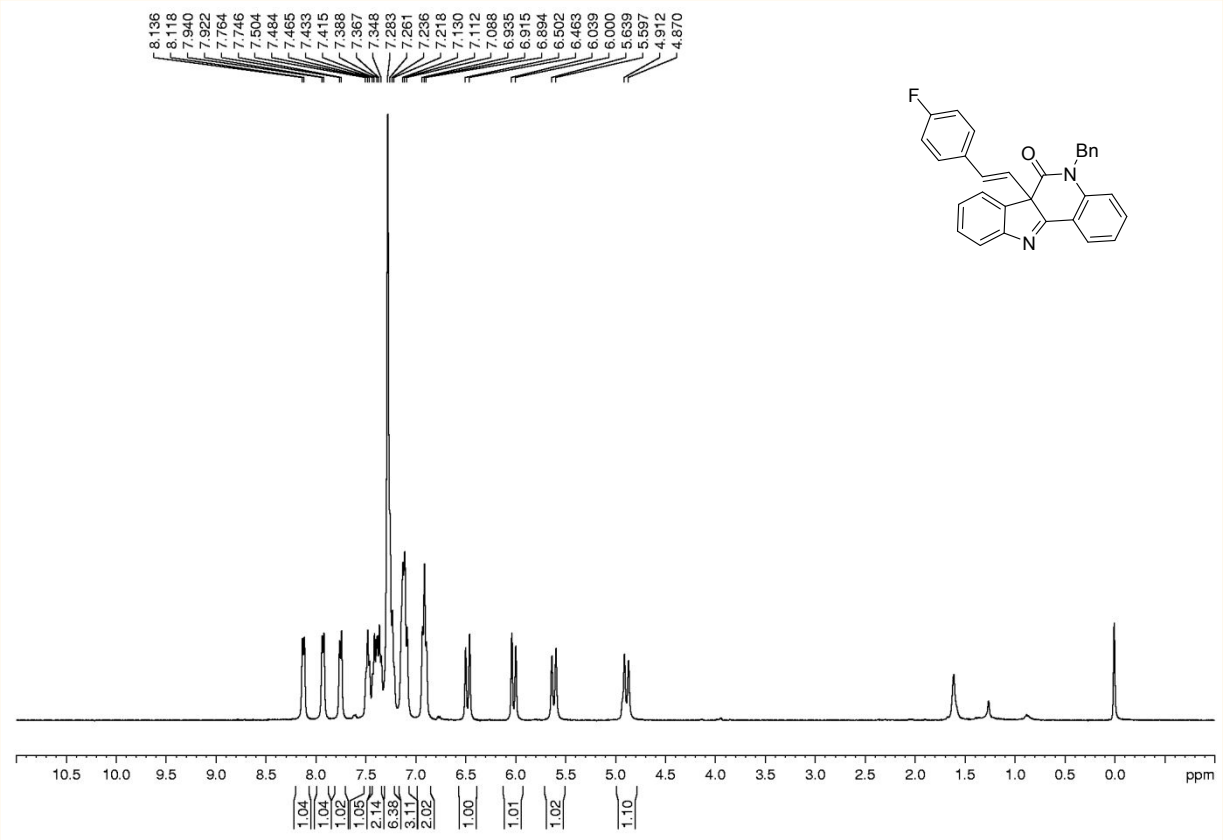


Figure 15. 400 MHz ^{1}H-NMR spectrum of **5h** in $CDCl_3$

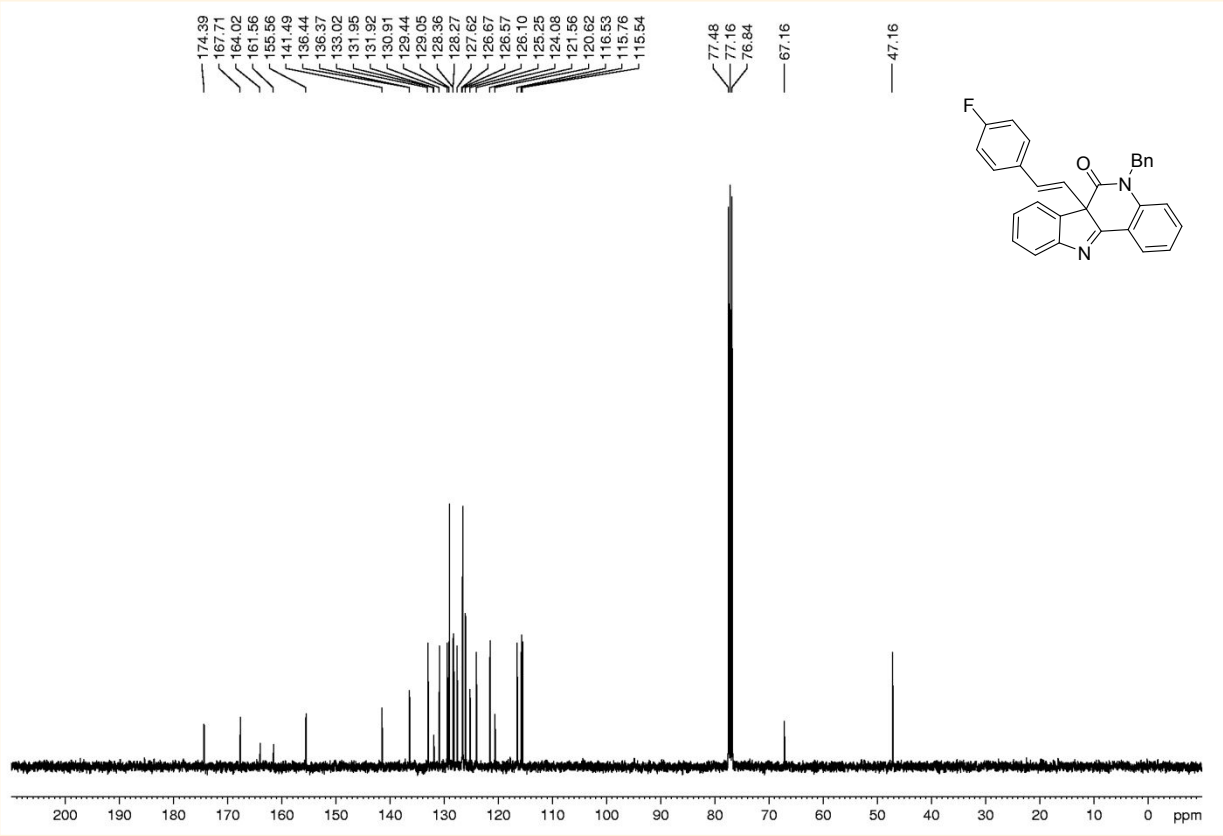


Figure 16. 100 MHz ^{13}C-NMR spectrum of **5h** in $CDCl_3$

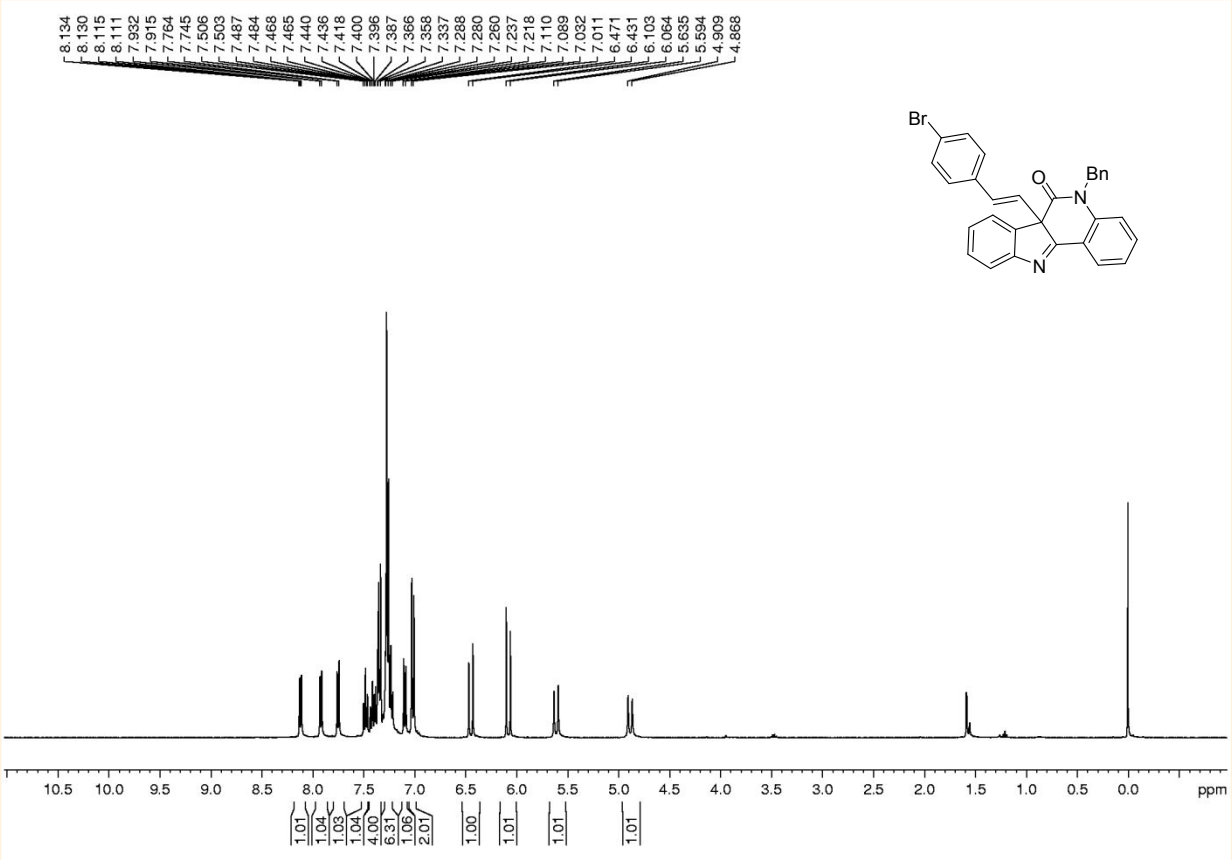


Figure 17. 400 MHz ^{1}H-NMR spectrum of **5i** in $CDCl_3$

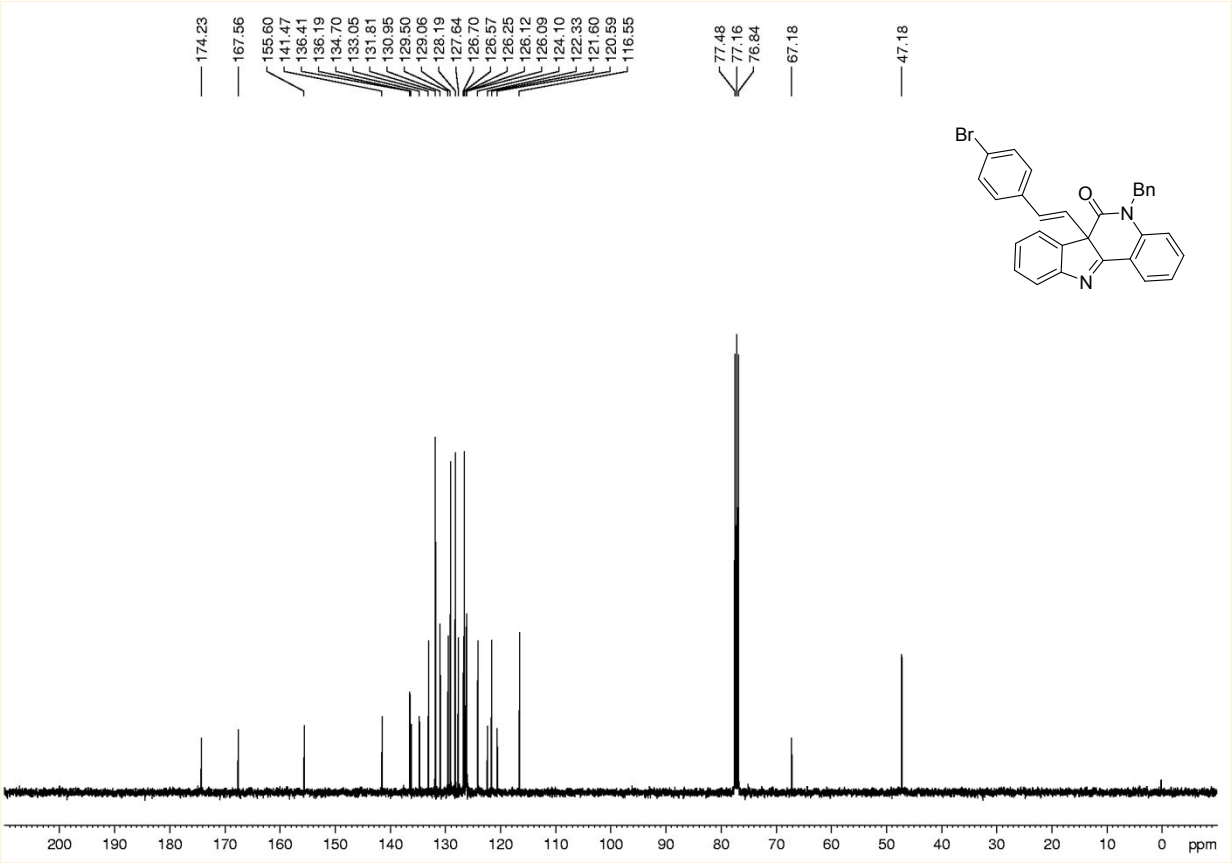


Figure 18. 100 MHz ^{13}C-NMR spectrum of **5i** in $CDCl_3$

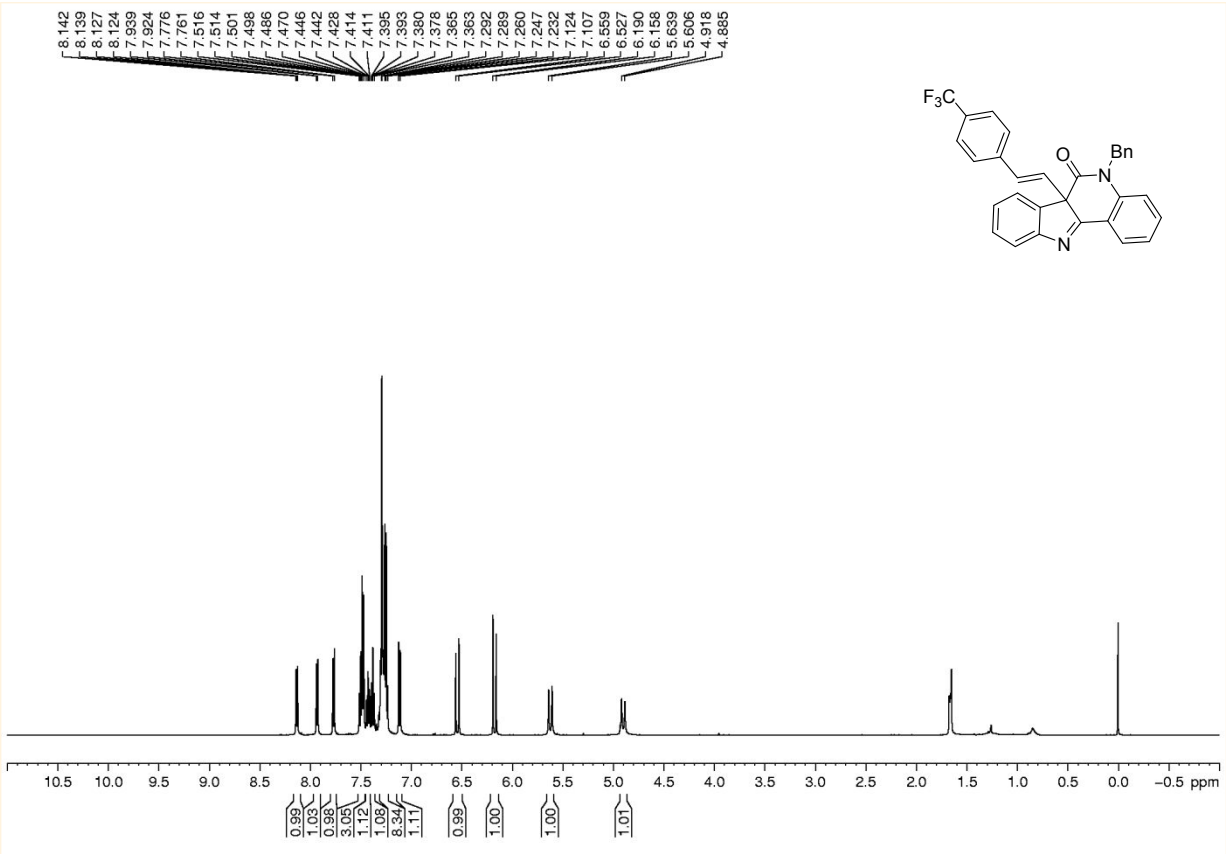


Figure 19. 500 MHz ^{1}H-NMR spectrum of **5j** in $CDCl_3$

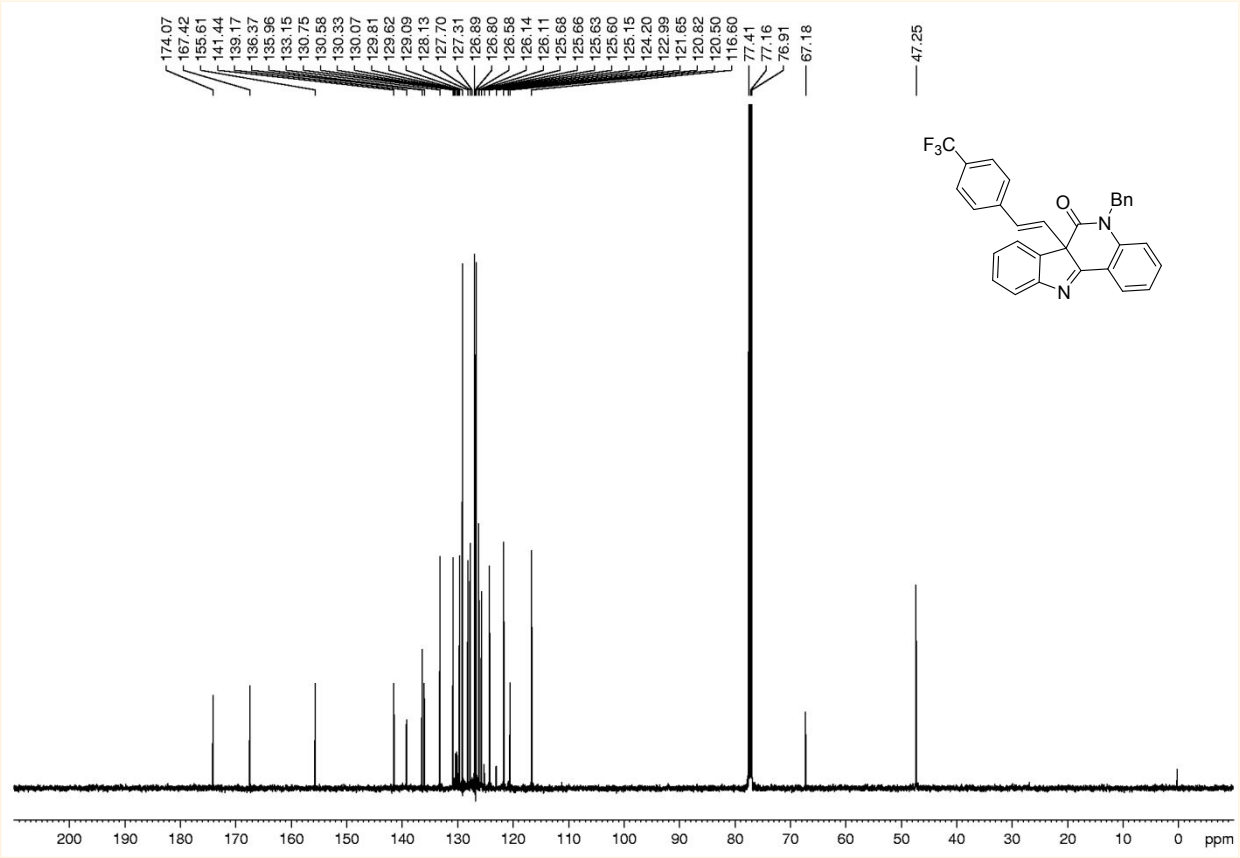


Figure 20. 125 MHz ^{13}C-NMR spectrum of **5j** in $CDCl_3$

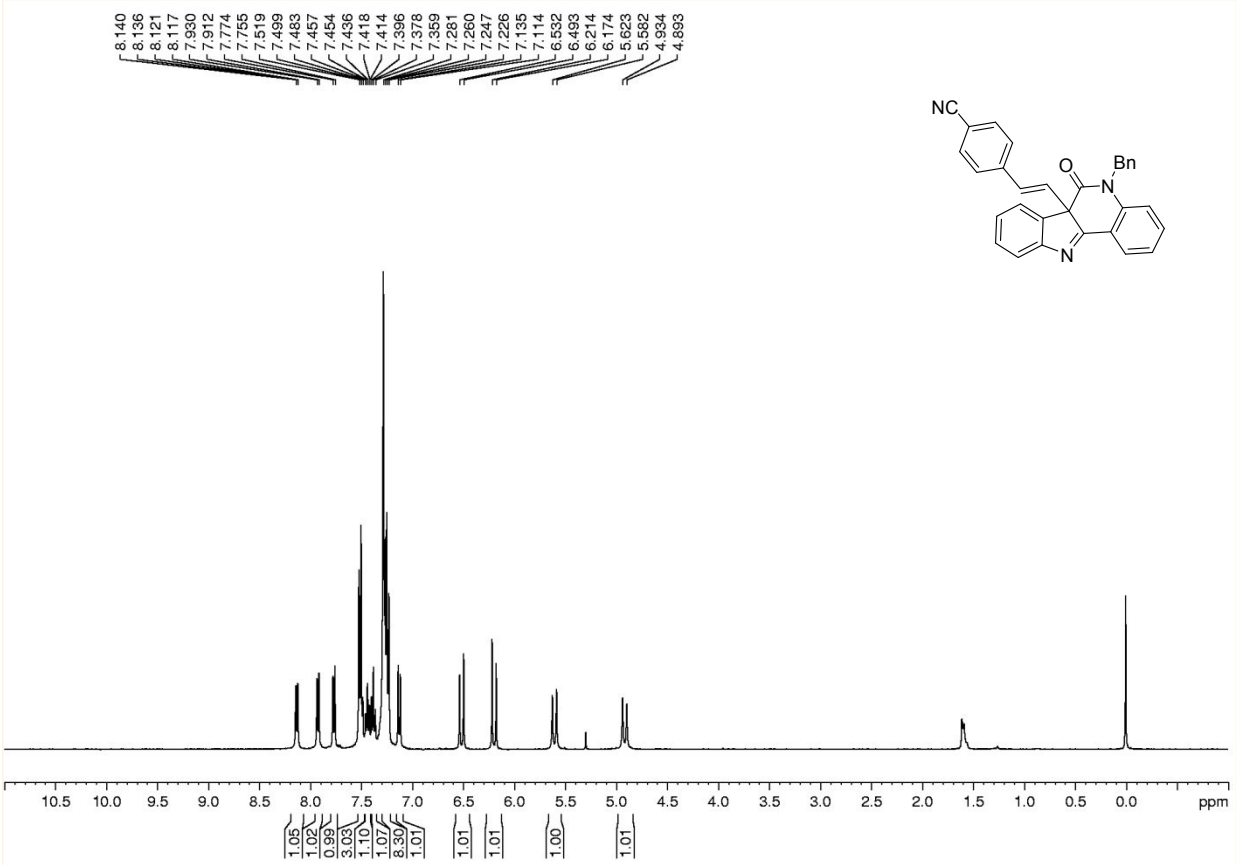


Figure 21. 400 MHz ^{1}H-NMR spectrum of **5k** in $CDCl_3$

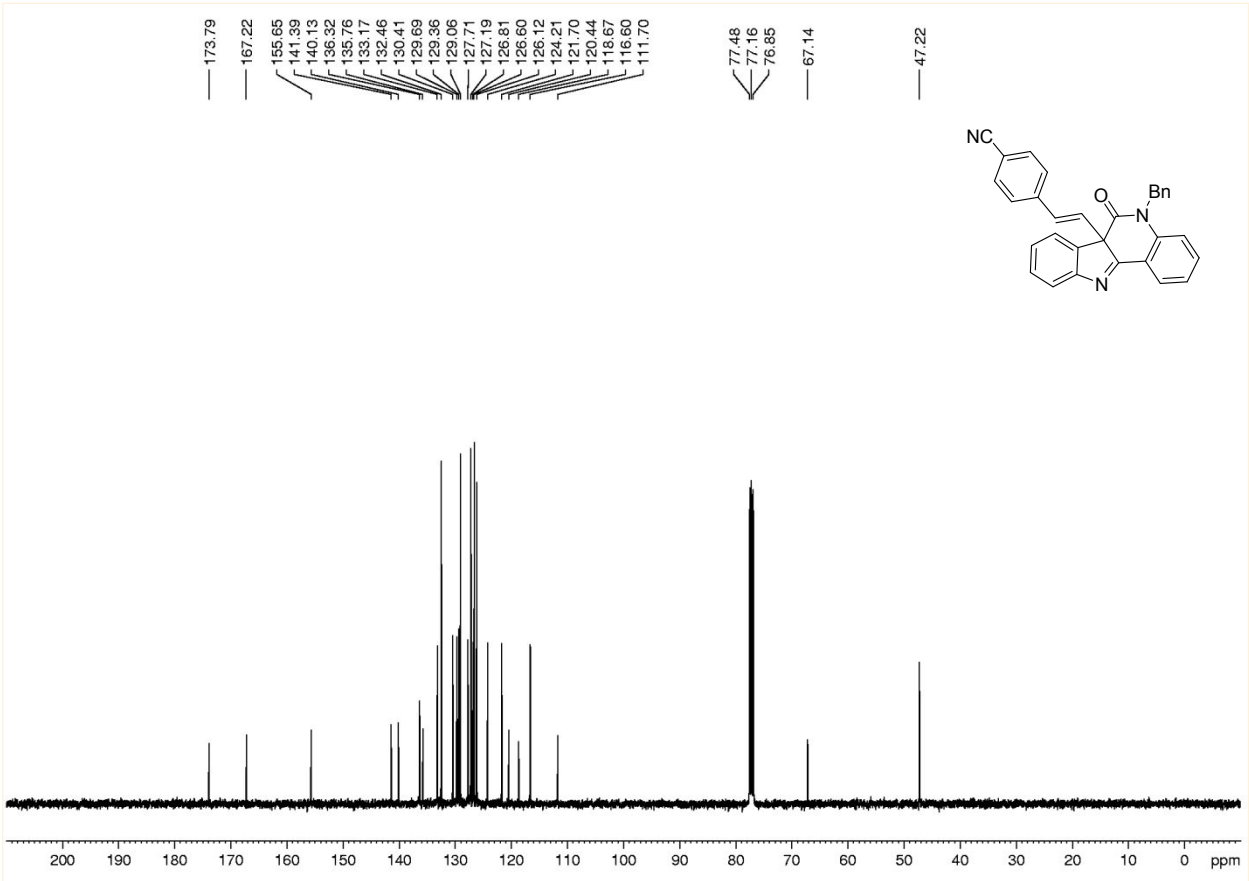


Figure 22. 100 MHz ^{13}C-NMR spectrum of **5k** in $CDCl_3$

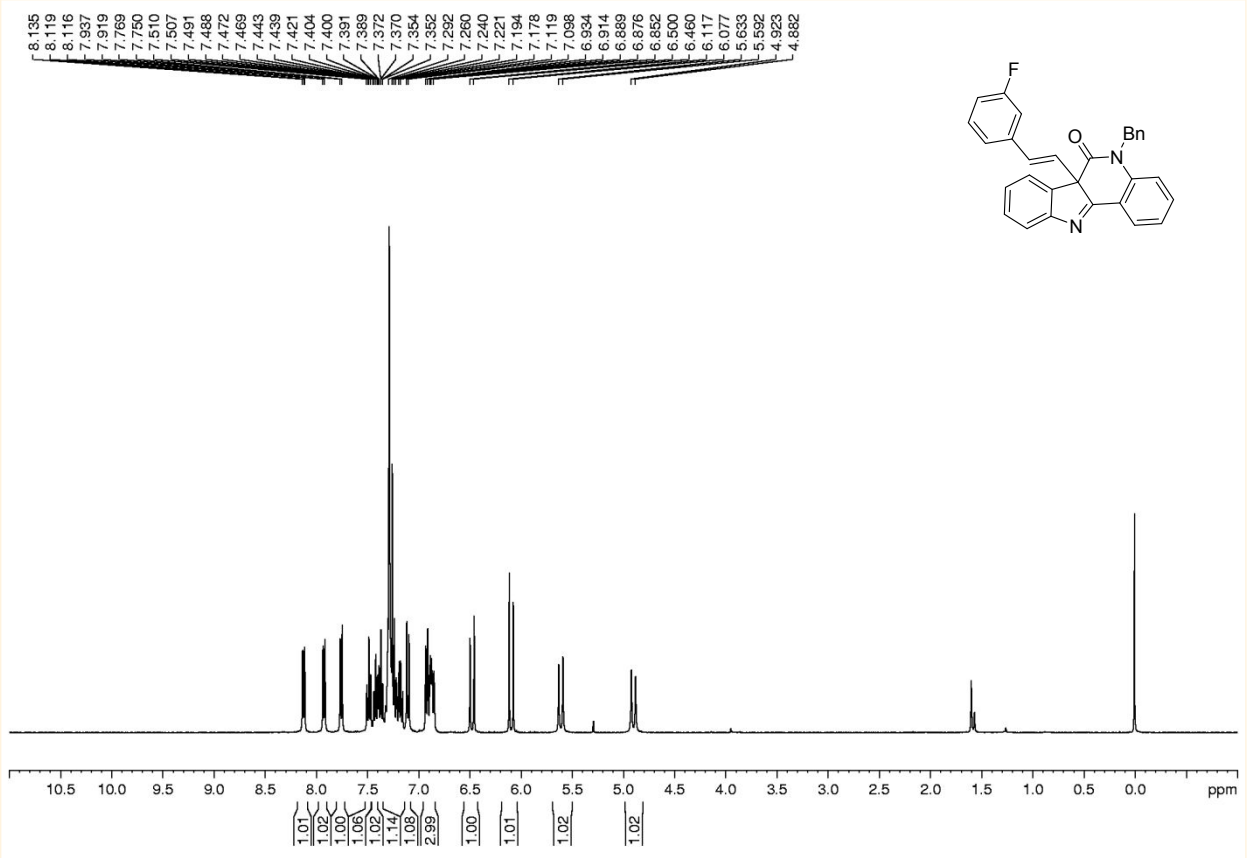


Figure 23. 400 MHz ^{1}H-NMR spectrum of **5l** in $CDCl_3$

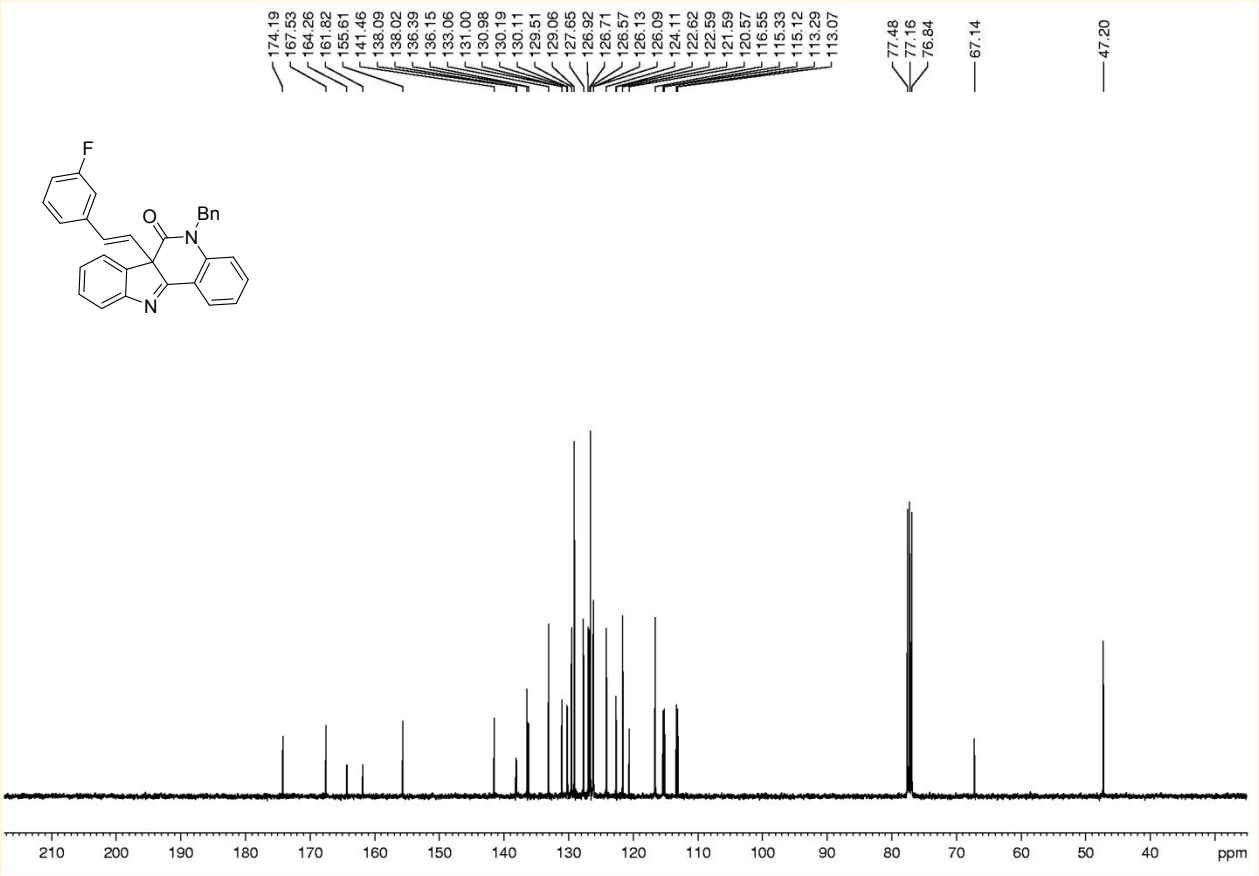


Figure 24. 100 MHz ^{13}C-NMR spectrum of **5l** in $CDCl_3$

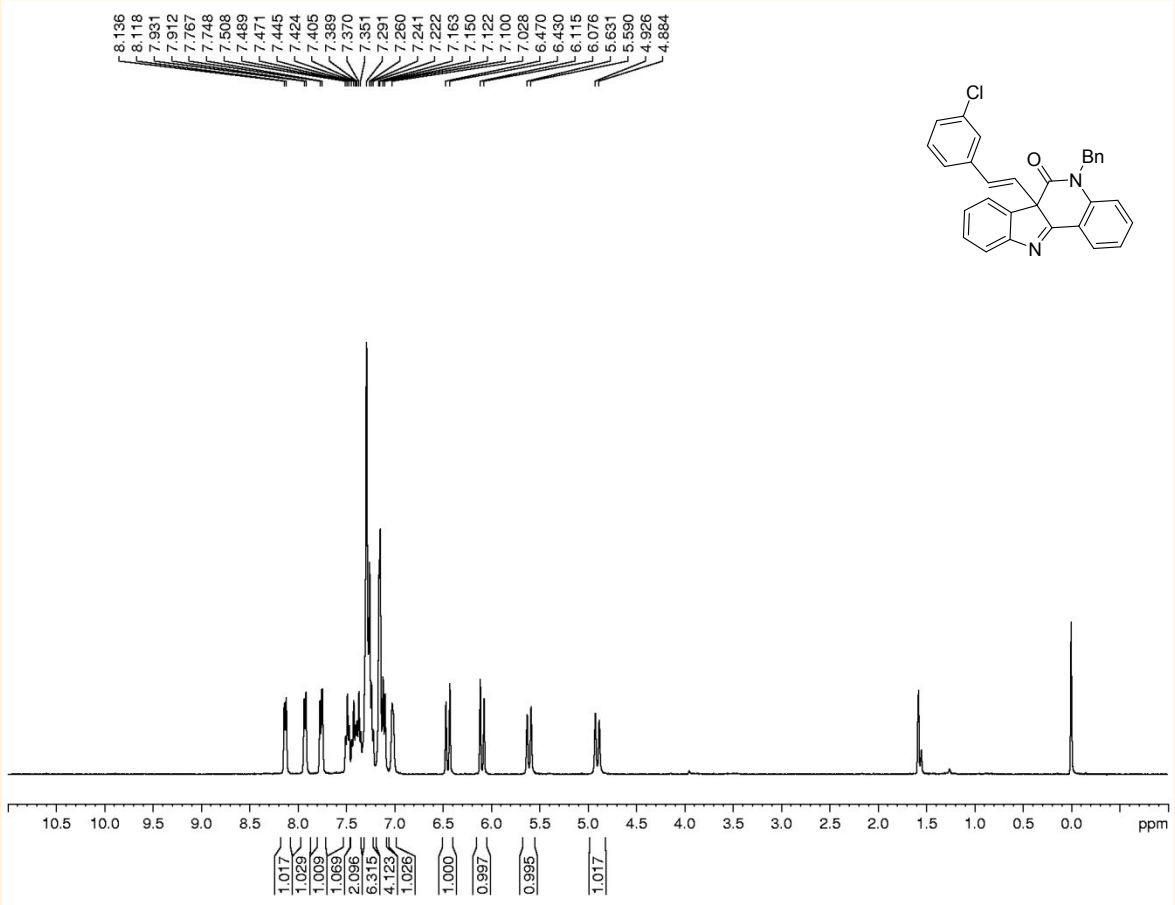


Figure 25. 400 MHz ^{1}H-NMR spectrum of **5m** in $CDCl_3$

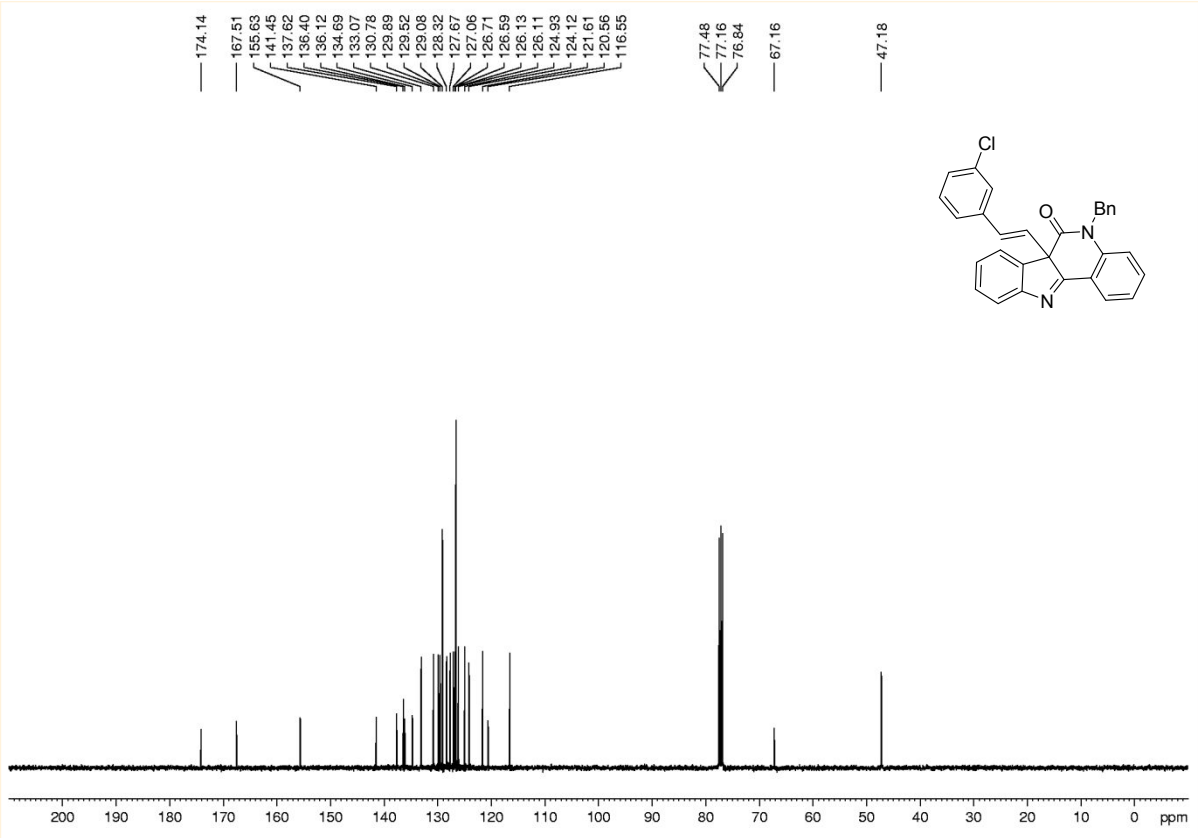


Figure 26. 100 MHz ^{13}C-NMR spectrum of **5m** in $CDCl_3$

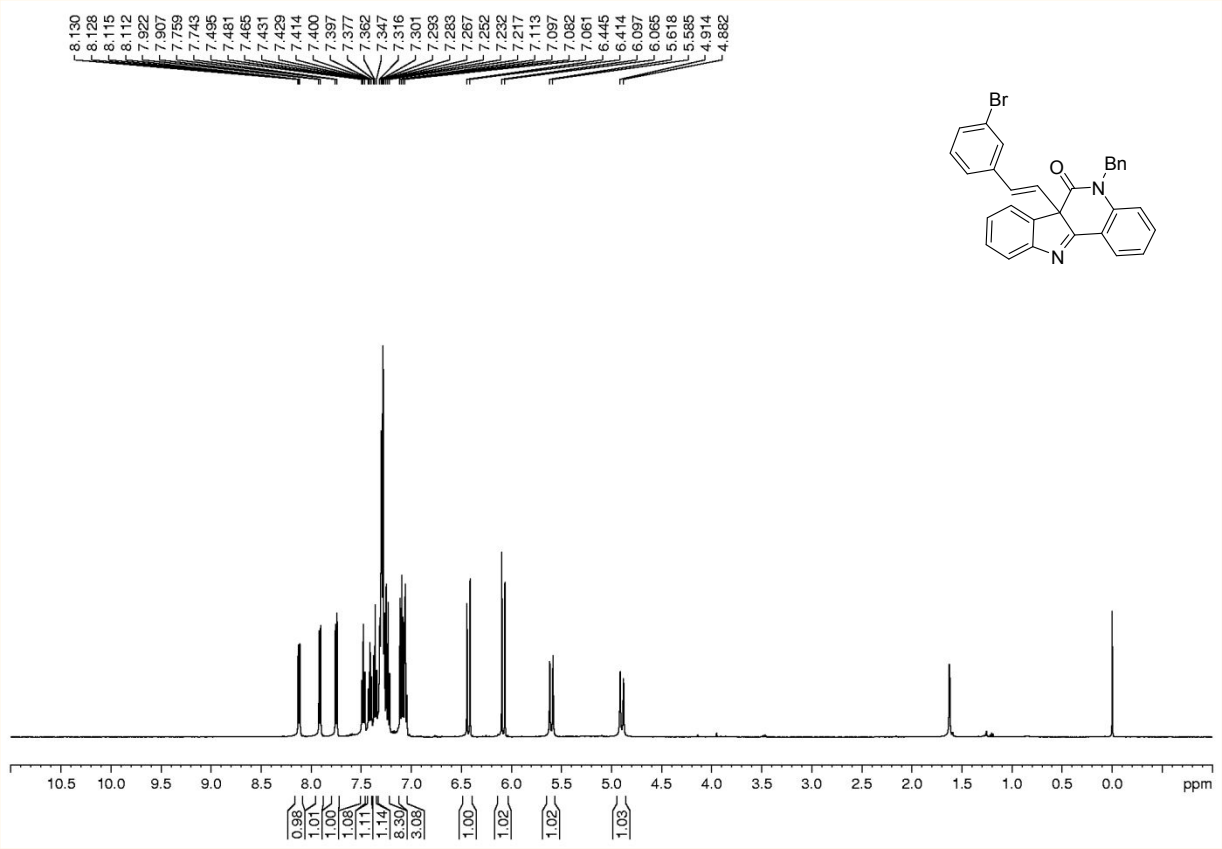


Figure 27. 500 MHz ^{1}H-NMR spectrum of **5n** in $CDCl_3$

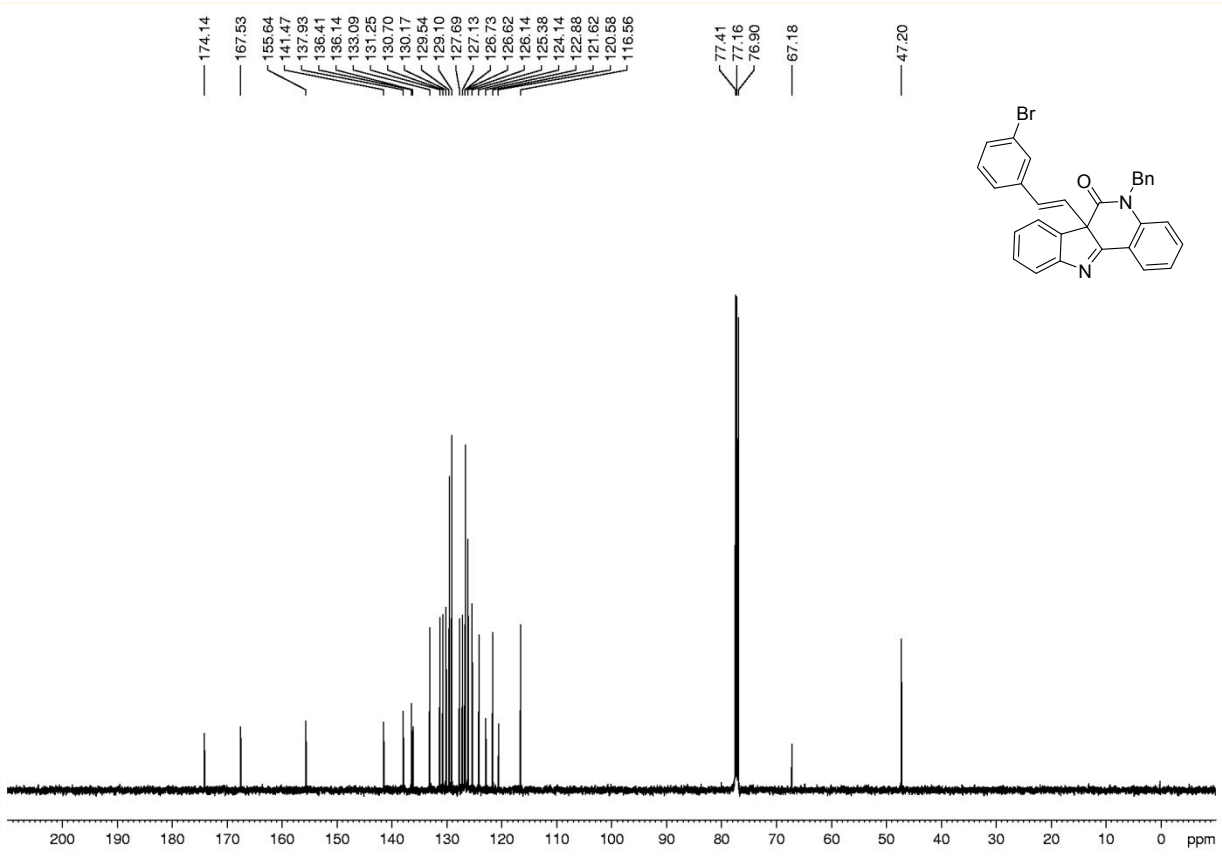


Figure 28. 125 MHz ^{13}C-NMR spectrum of **5n** in $CDCl_3$

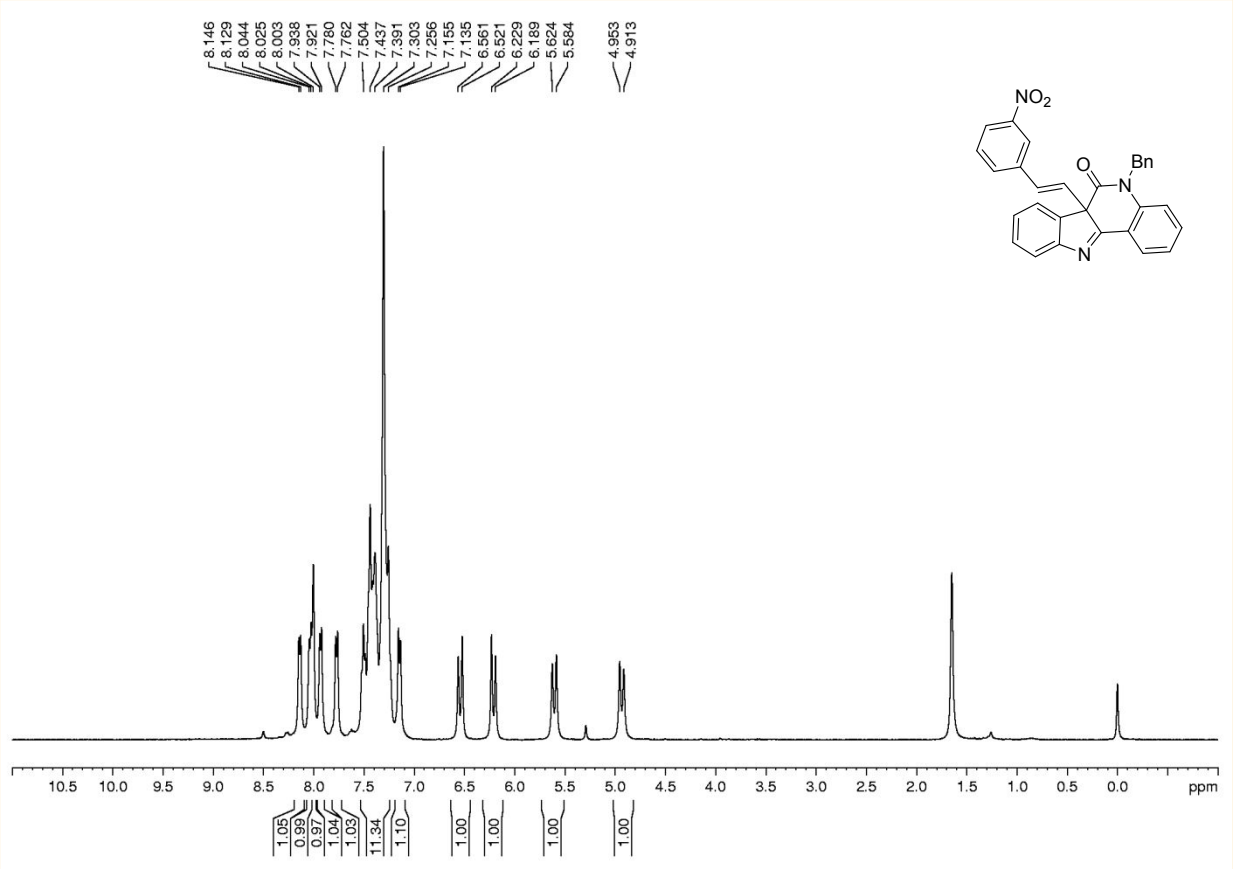


Figure 29. 400 MHz ^{1}H-NMR spectrum of **5o** in $CDCl_3$

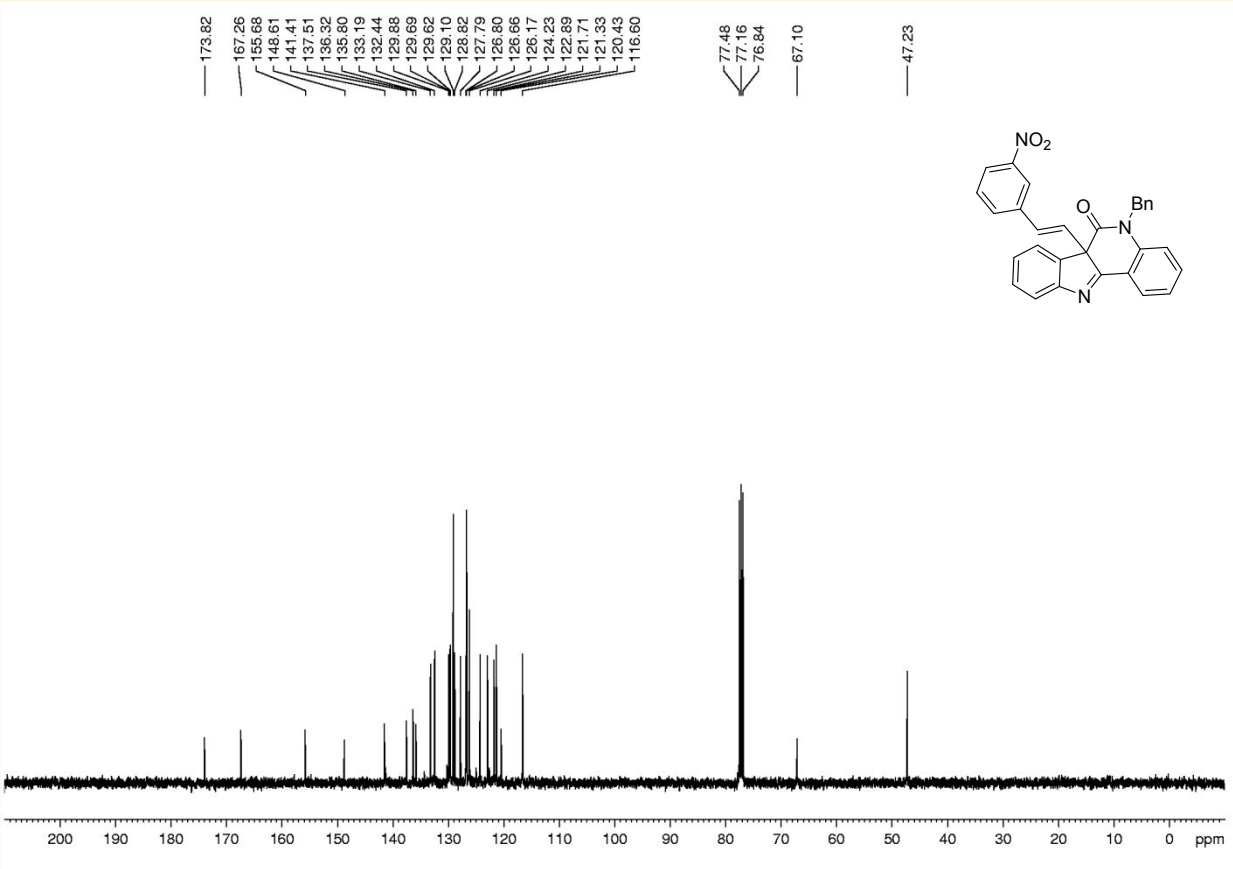


Figure 30. 100 MHz ^{13}C-NMR spectrum of **5o** in $CDCl_3$

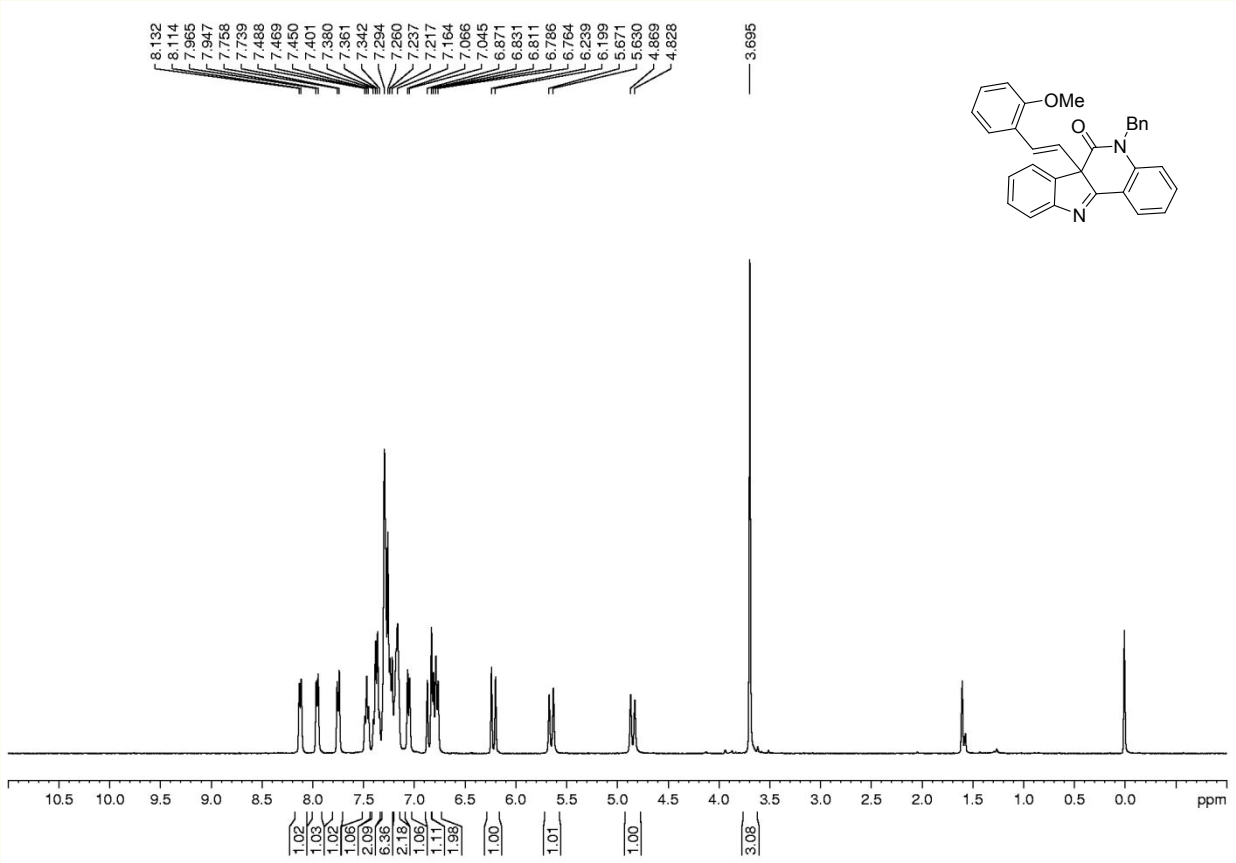


Figure 31. 400 MHz ^{1}H-NMR spectrum of **5p** in $CDCl_3$

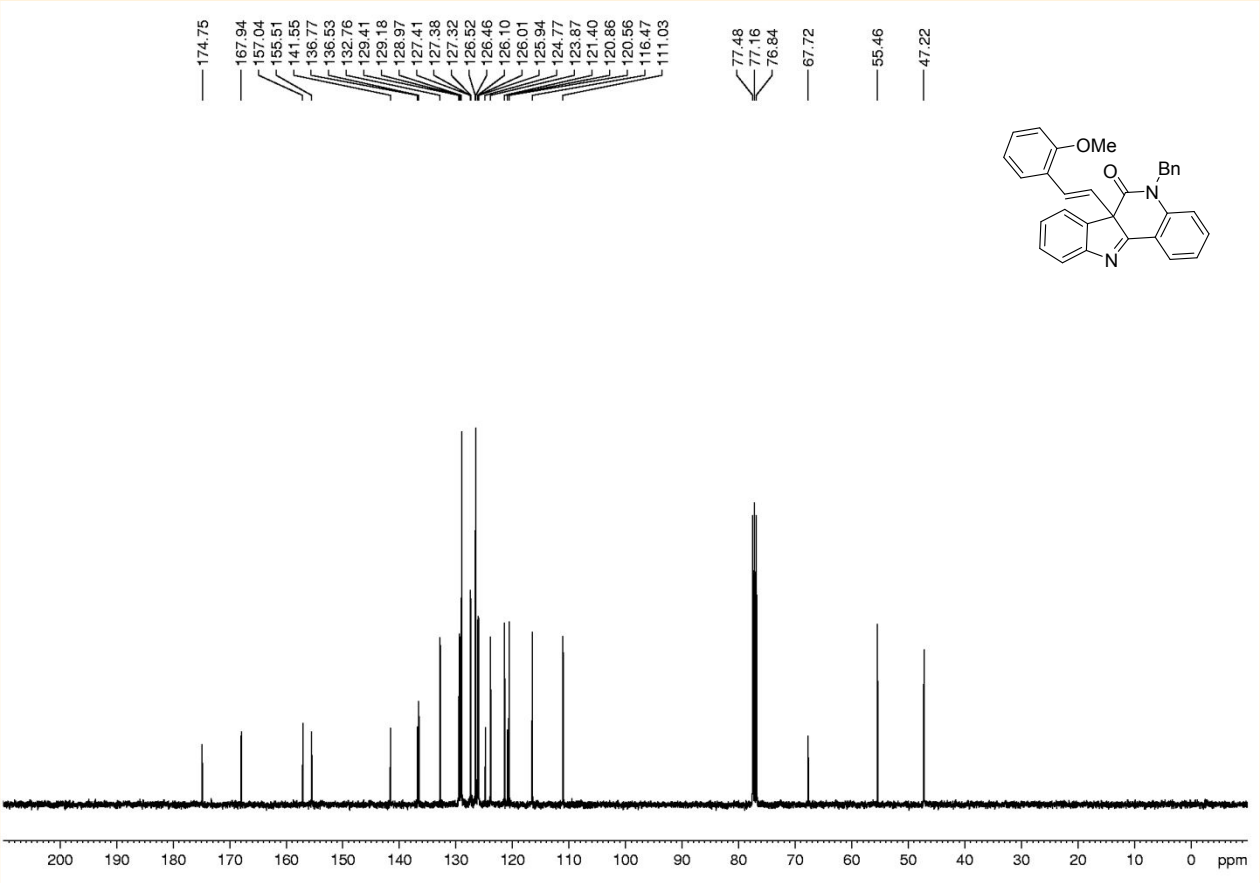


Figure 32. 100 MHz ^{13}C-NMR spectrum of **5p** in $CDCl_3$

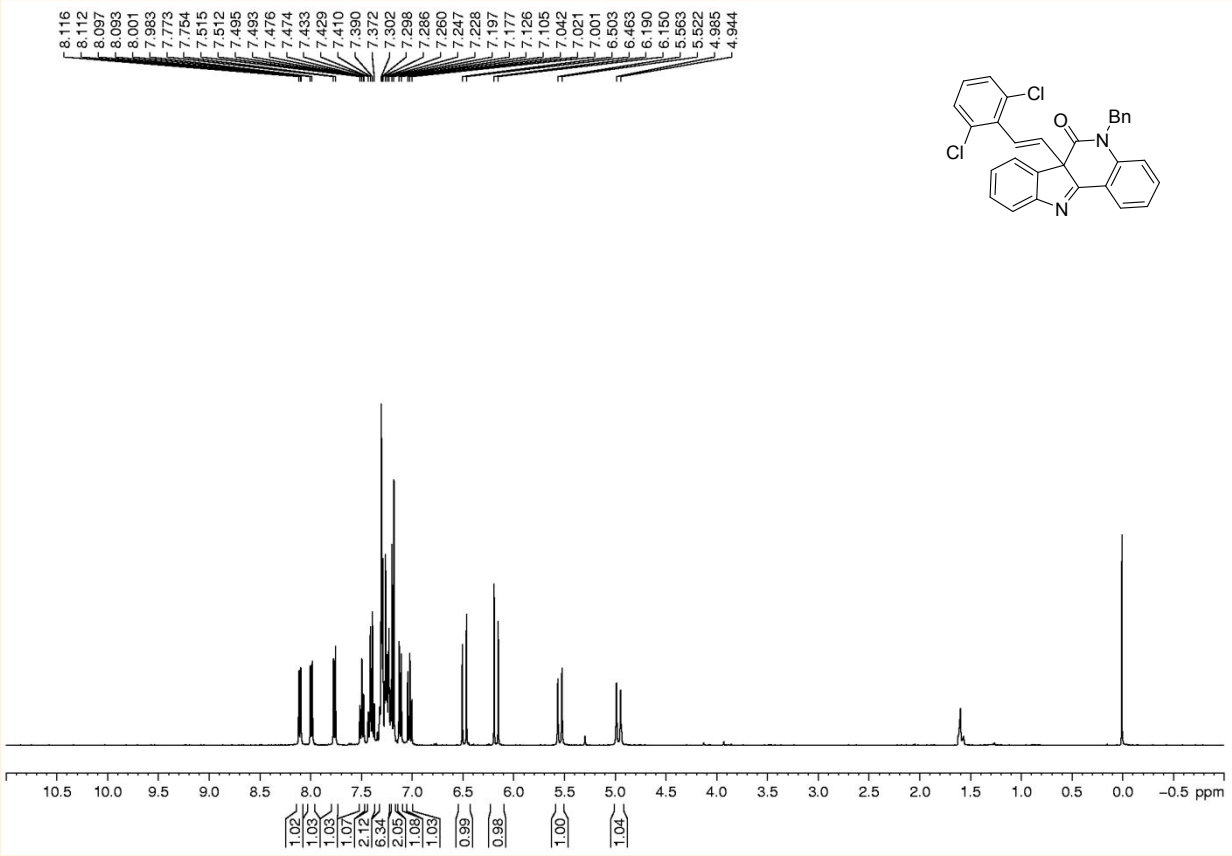


Figure 33. 400 MHz ^{1}H-NMR spectrum of **5q** in $CDCl_3$

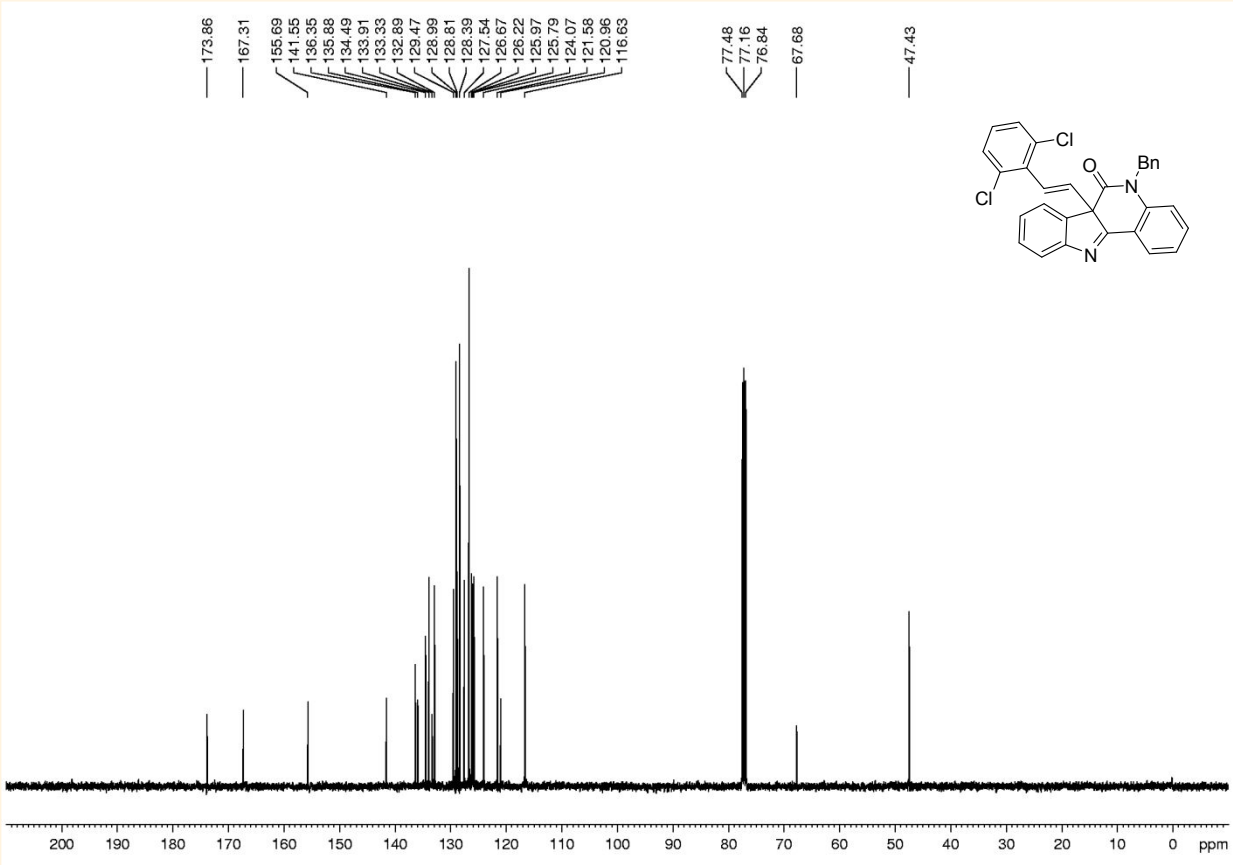


Figure 34. 100 MHz ^{13}C-NMR spectrum of **5q** in $CDCl_3$

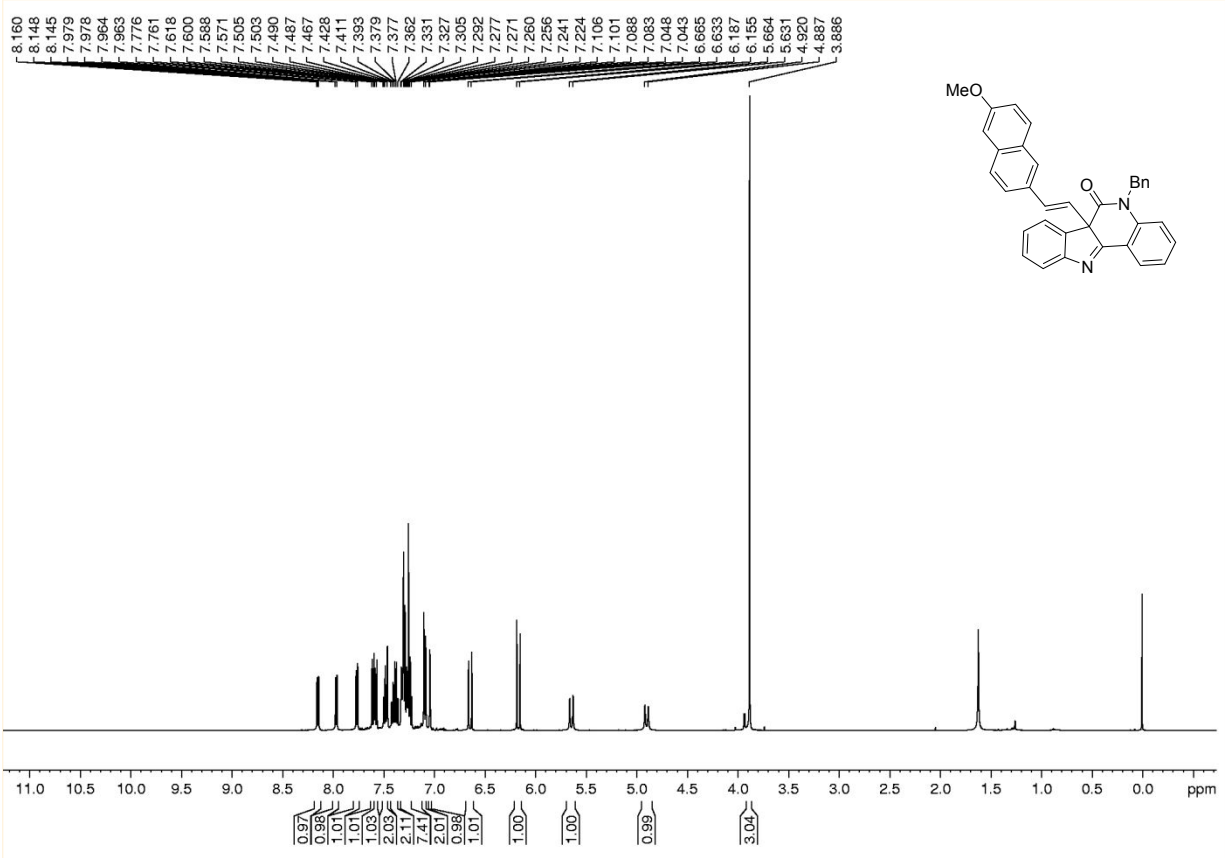


Figure 35. 500 MHz ^{1}H-NMR spectrum of **5r** in $CDCl_3$

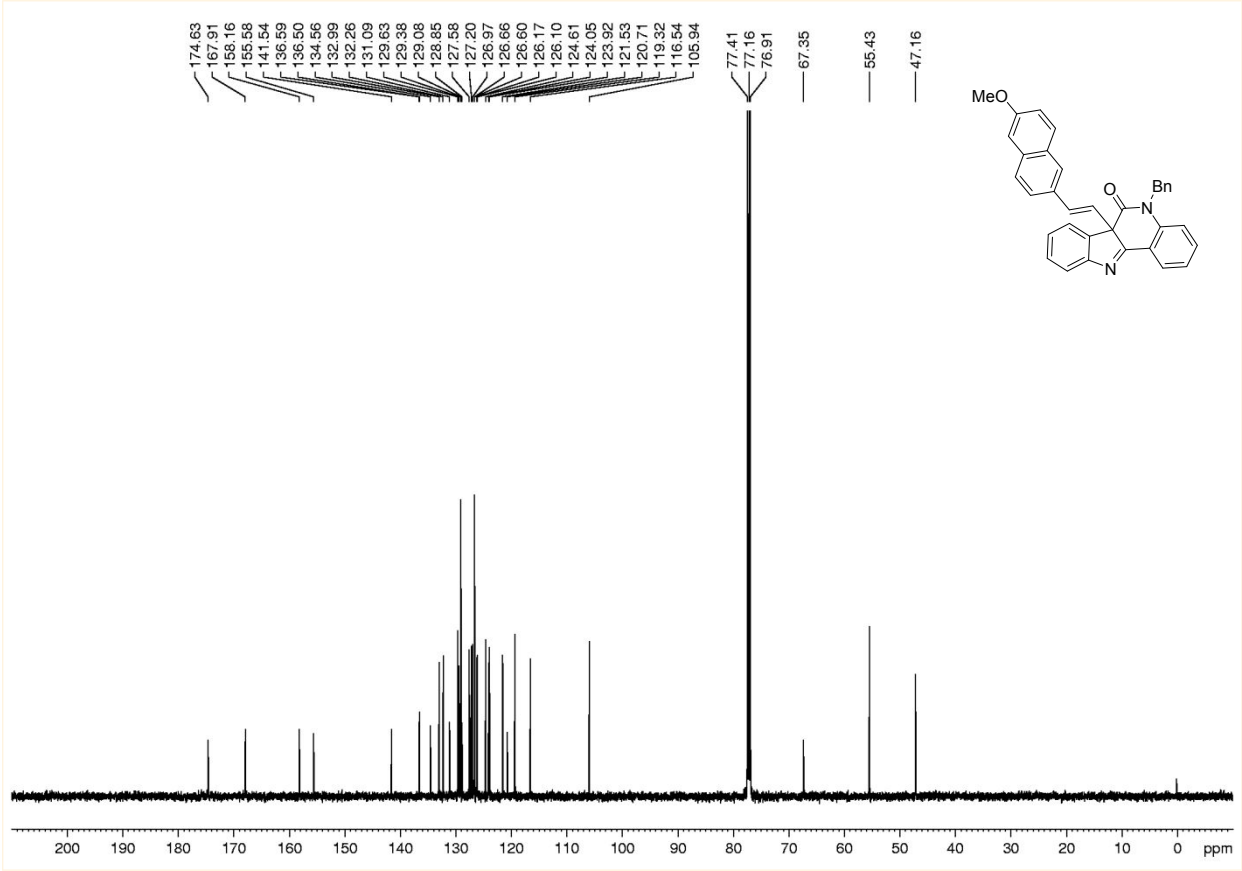


Figure 36. 125 MHz ^{13}C-NMR spectrum of **5r** in $CDCl_3$

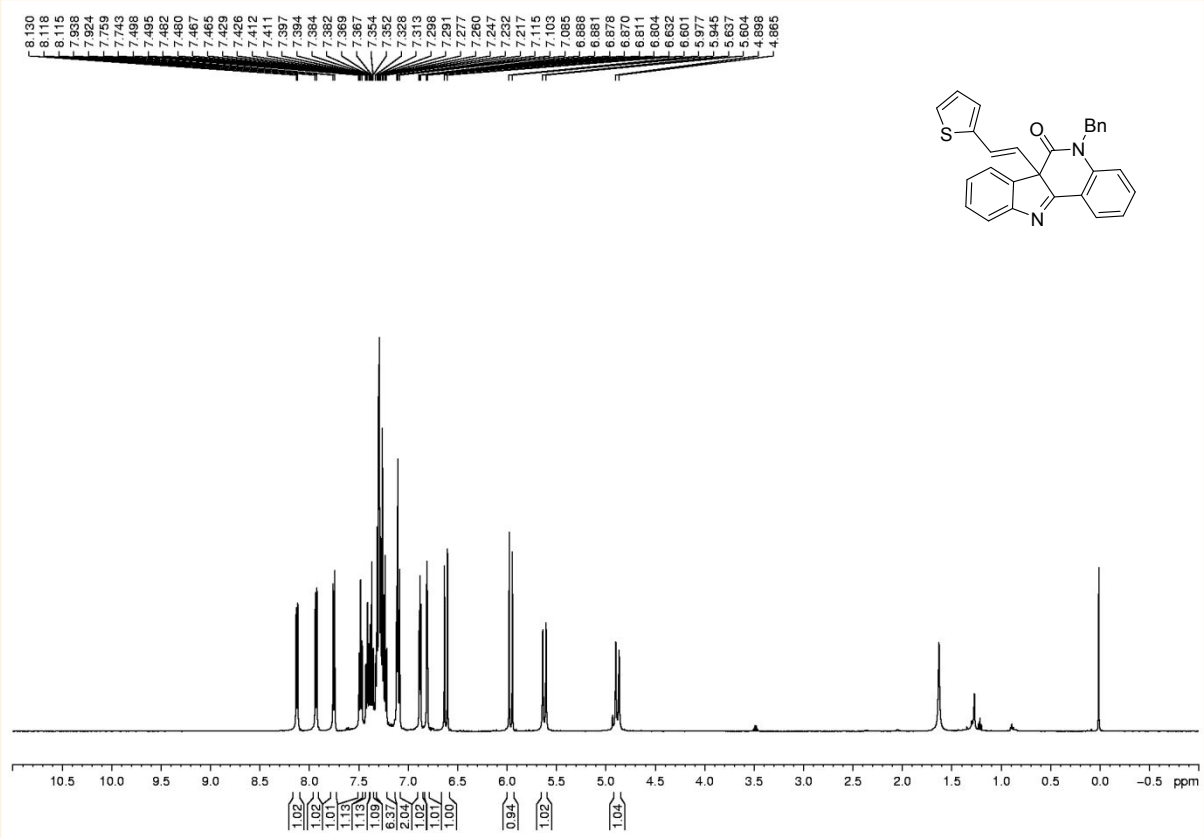


Figure 37. 500 MHz ^{1}H-NMR spectrum of **5s** in $CDCl_3$

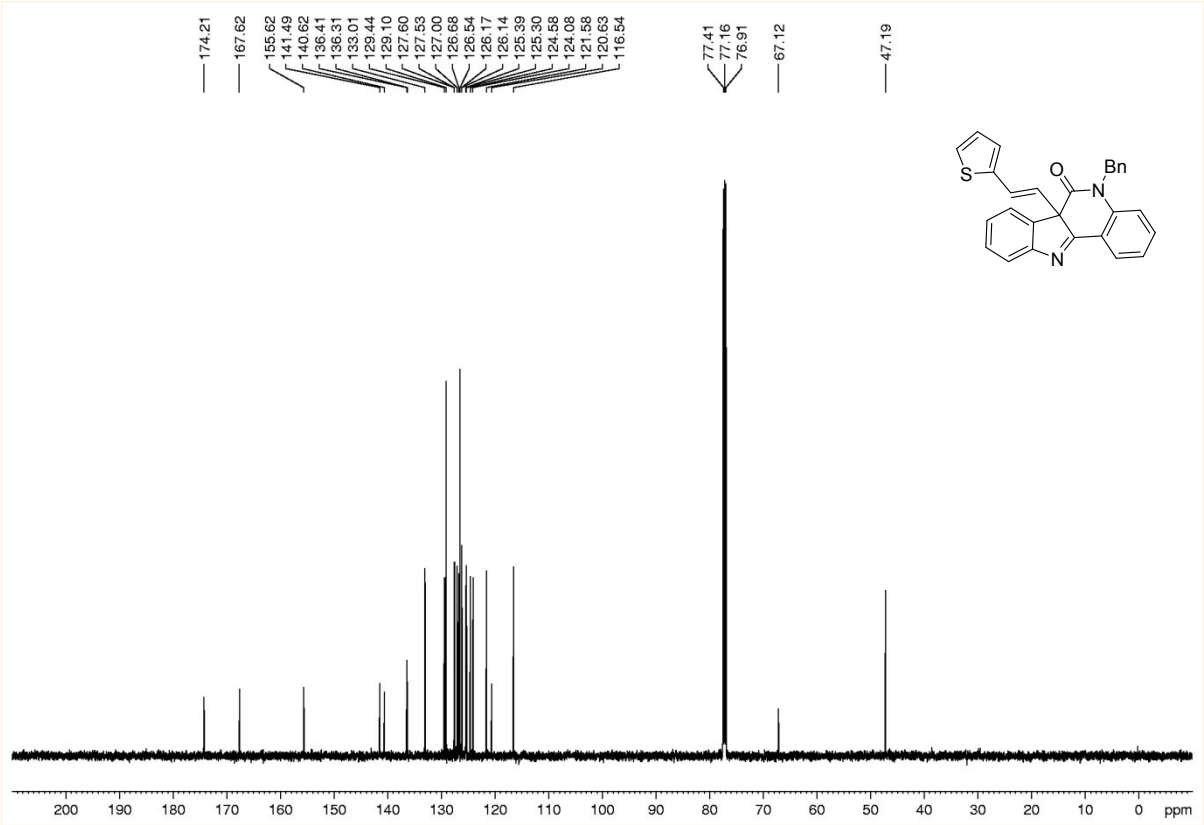


Figure 38. 125 MHz ^{13}C-NMR spectrum of **5s** in $CDCl_3$

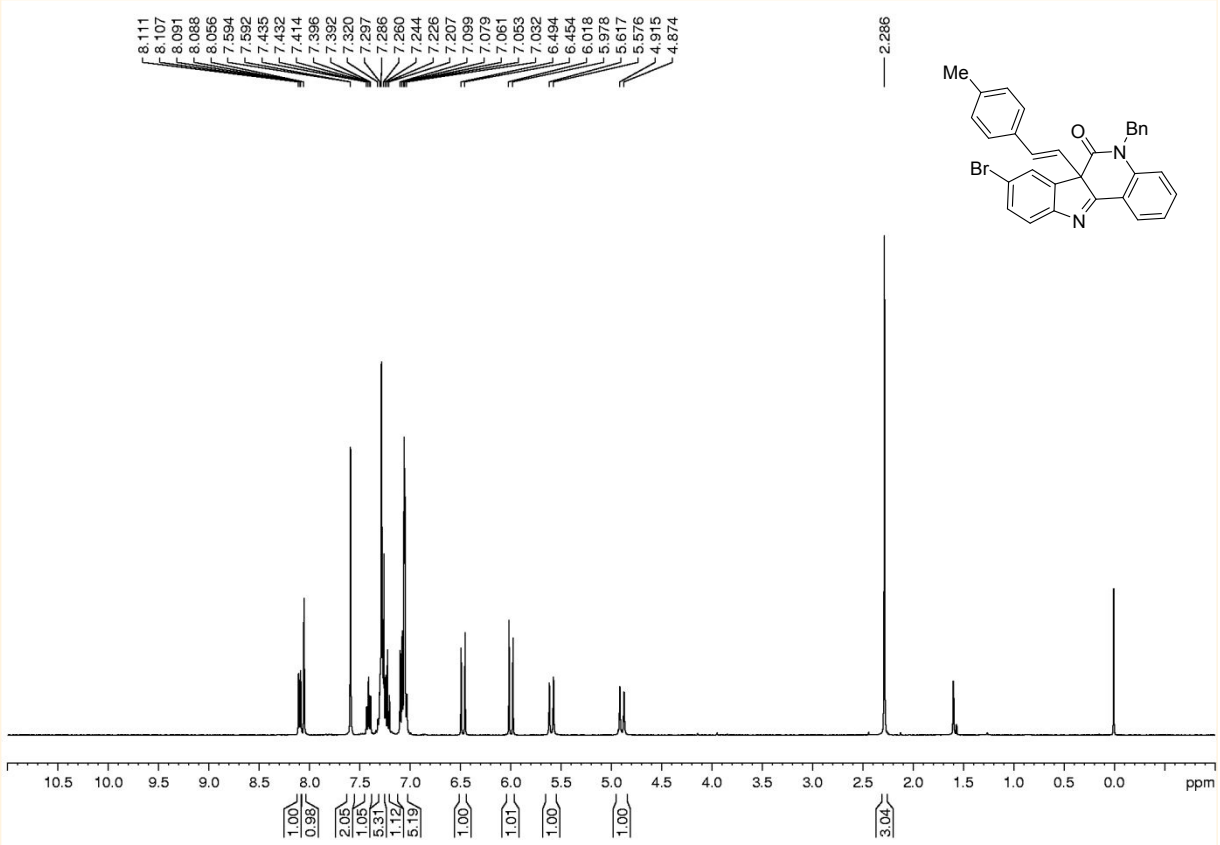


Figure 39. 400 MHz ^{1}H-NMR spectrum of **5t** in $CDCl_3$

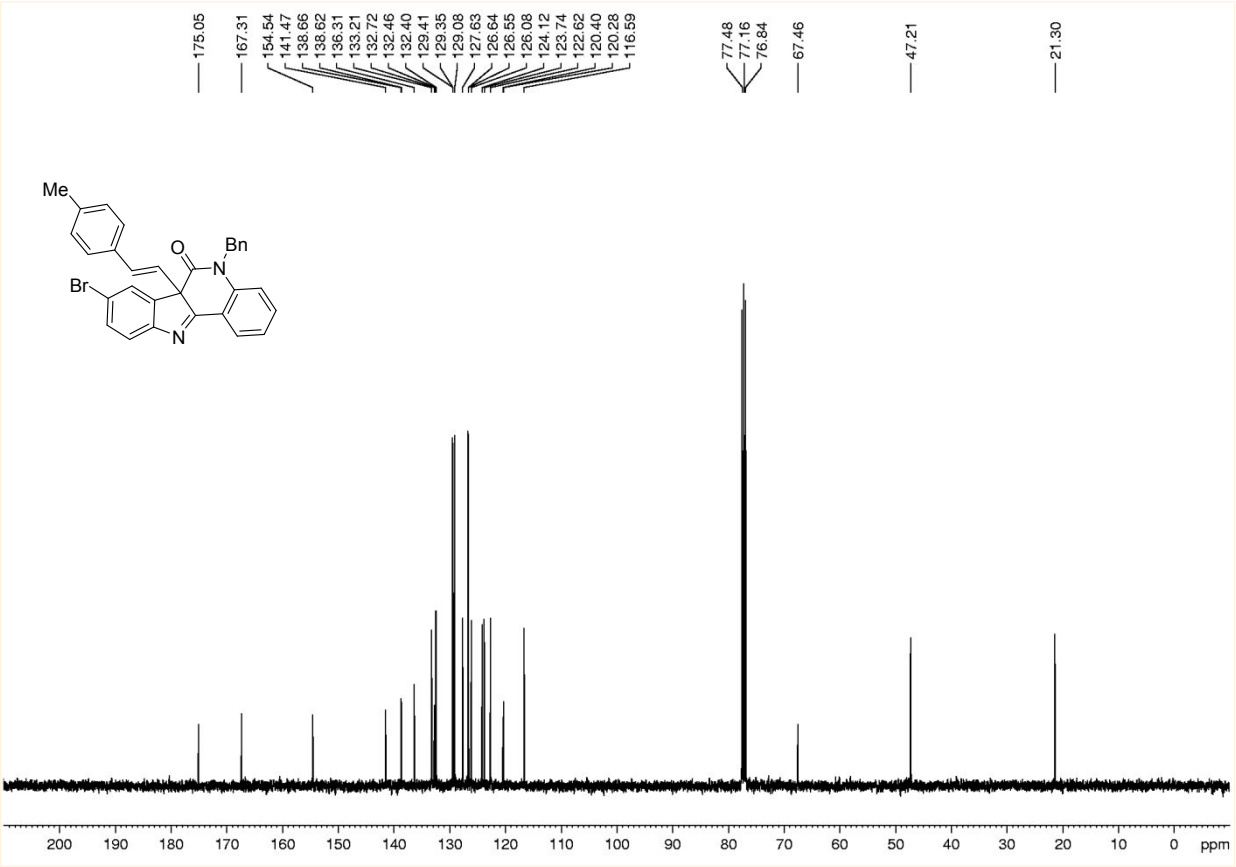


Figure 40. 100 MHz ^{13}C-NMR spectrum of **5t** in $CDCl_3$

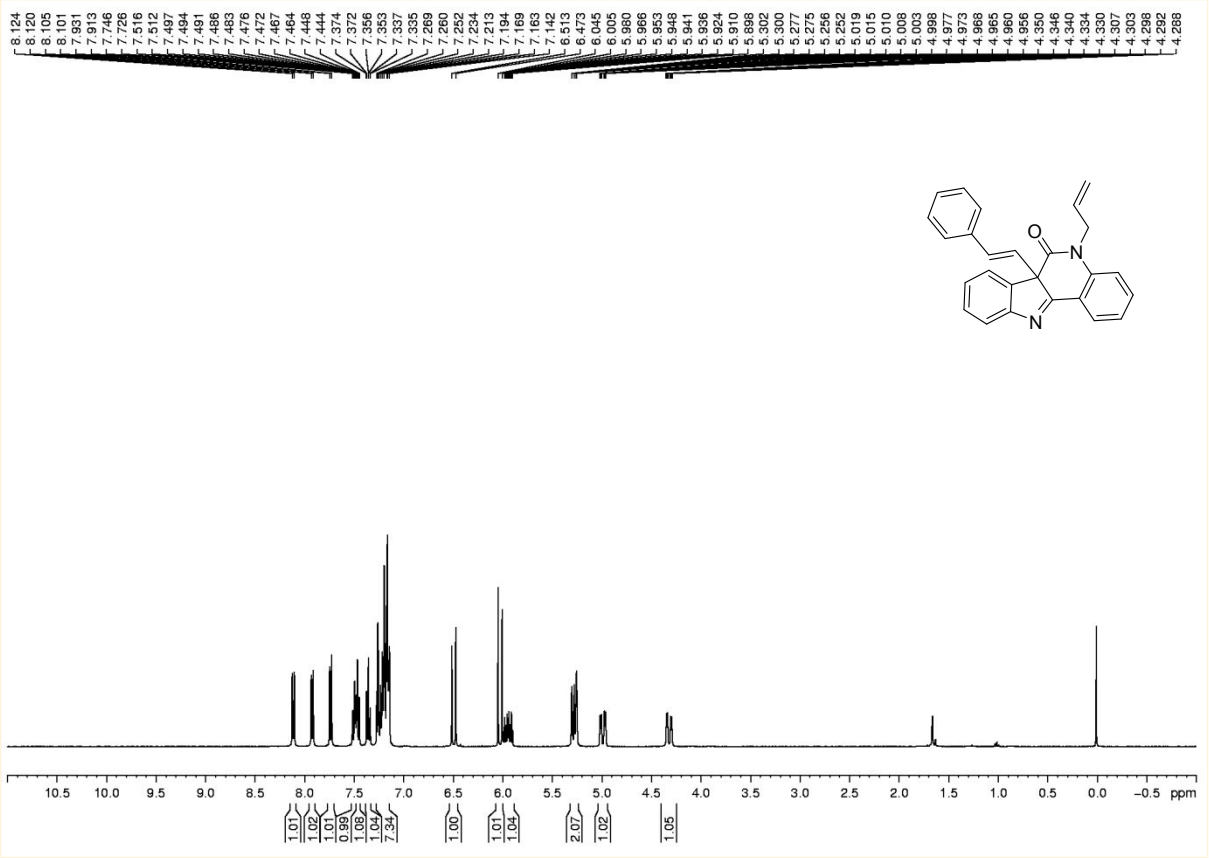


Figure 41. 400 MHz ^{1}H-NMR spectrum of **5u** in $CDCl_3$

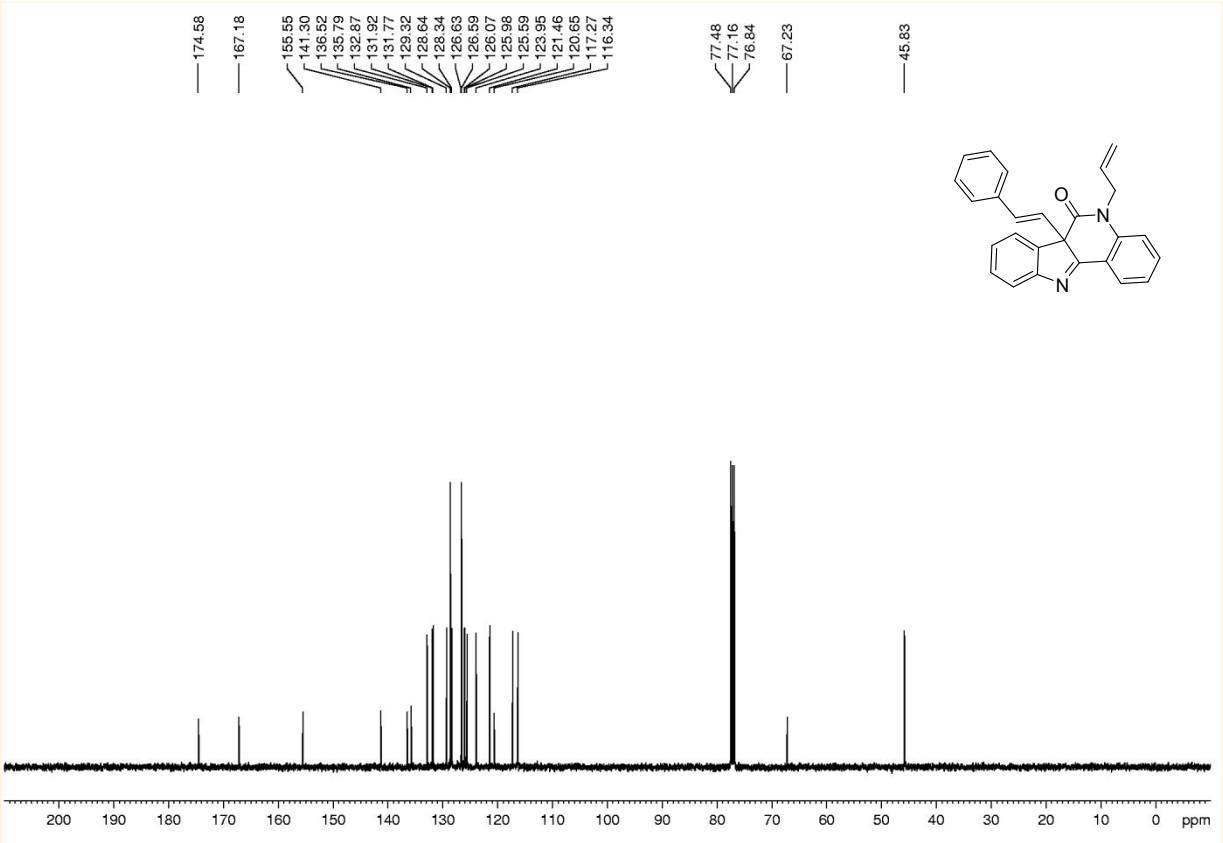


Figure 42. 100 MHz ^{13}C-NMR spectrum of **5u** in $CDCl_3$

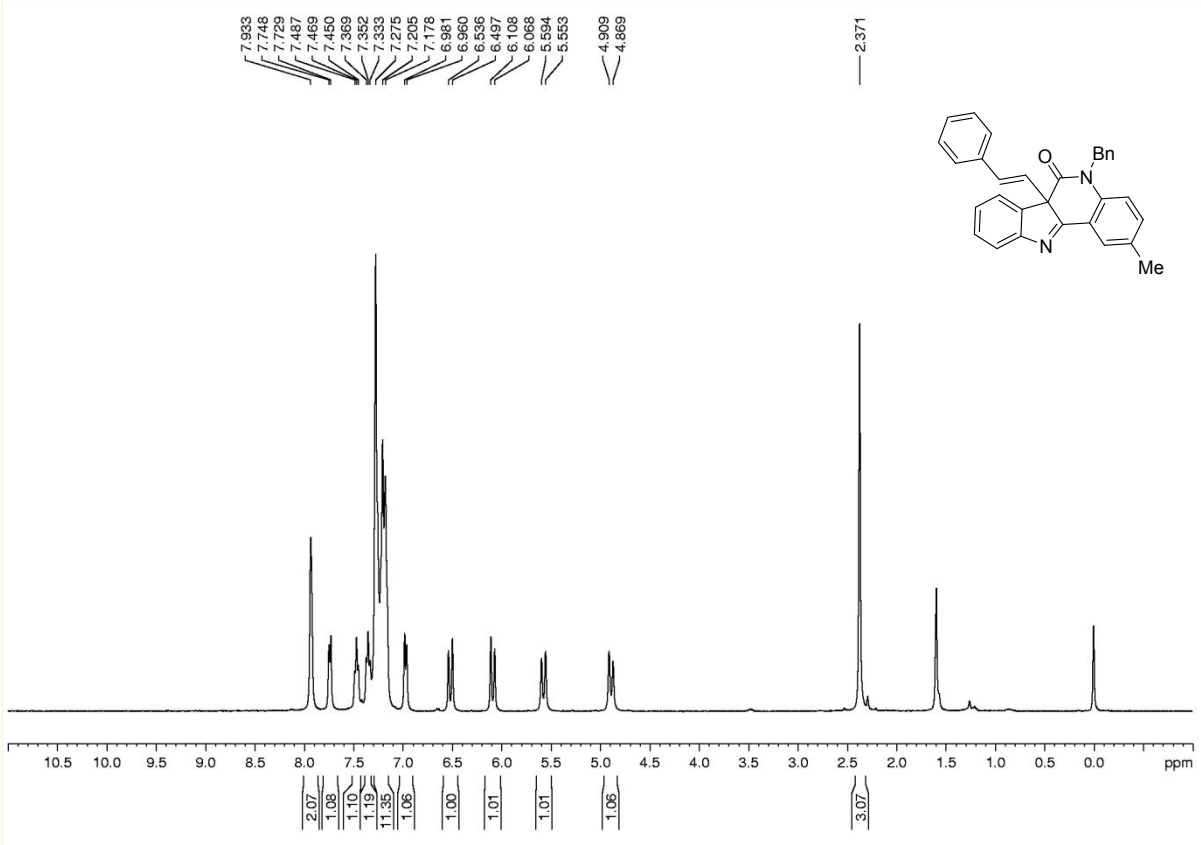


Figure 43. 400 MHz ^{1}H-NMR spectrum of **5v** in $CDCl_3$

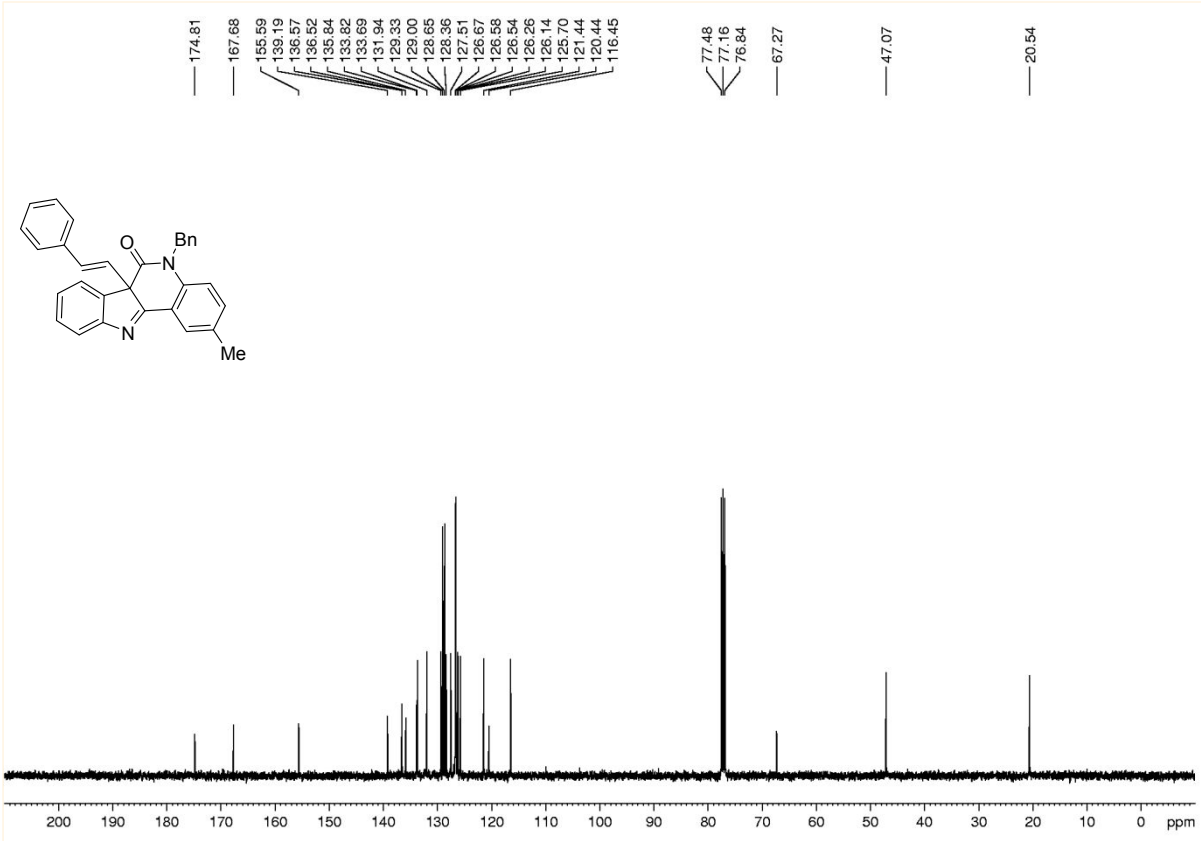


Figure 44. 100 MHz ^{13}C-NMR spectrum of **5v** in $CDCl_3$

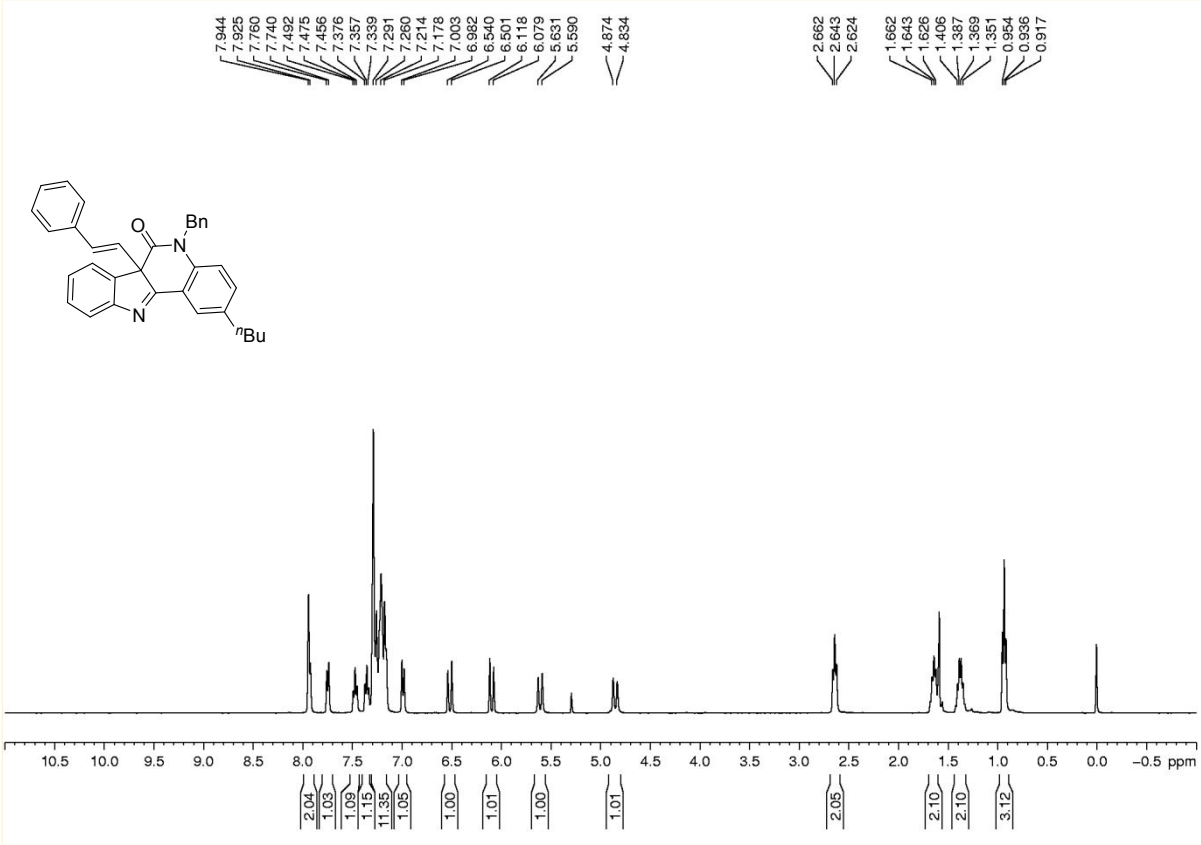


Figure 45. 400 MHz ^{1}H-NMR spectrum of **5w** in $CDCl_3$

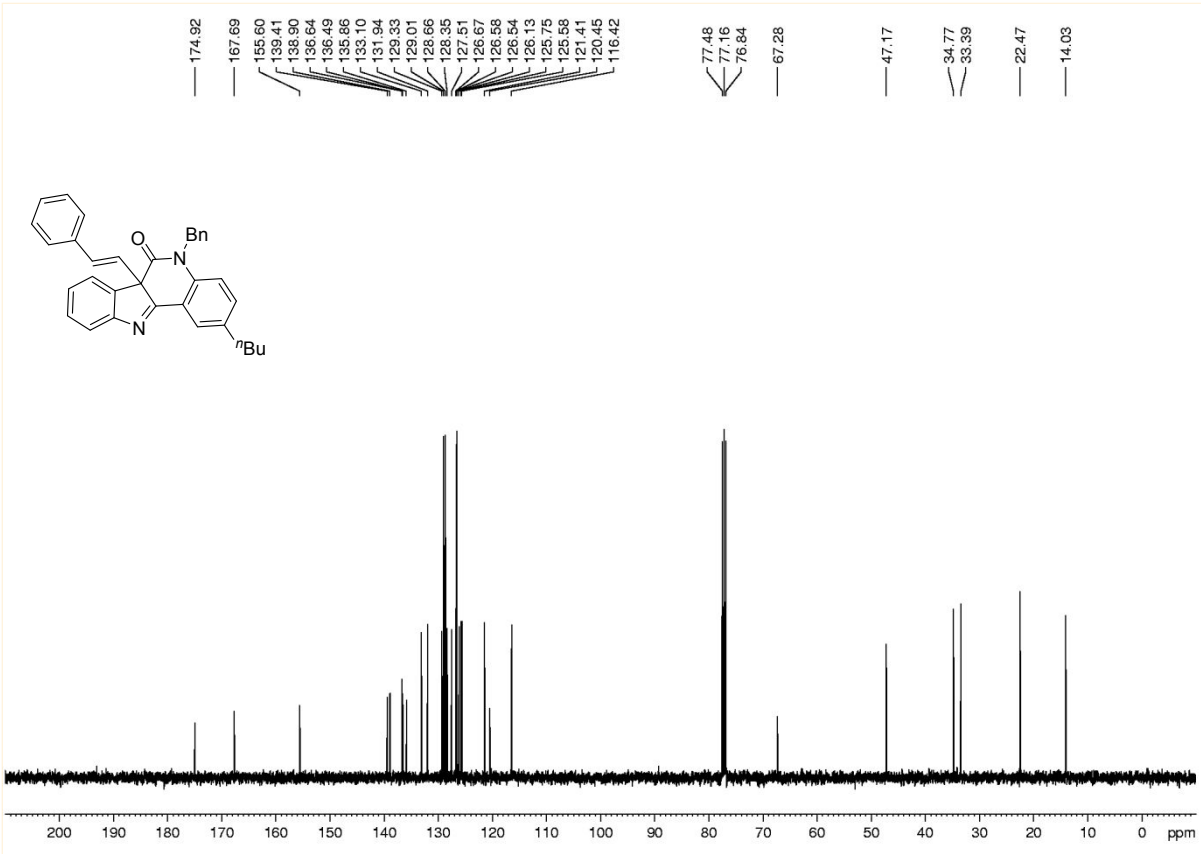


Figure 46. 100 MHz ^{13}C-NMR spectrum of **5w** in $CDCl_3$

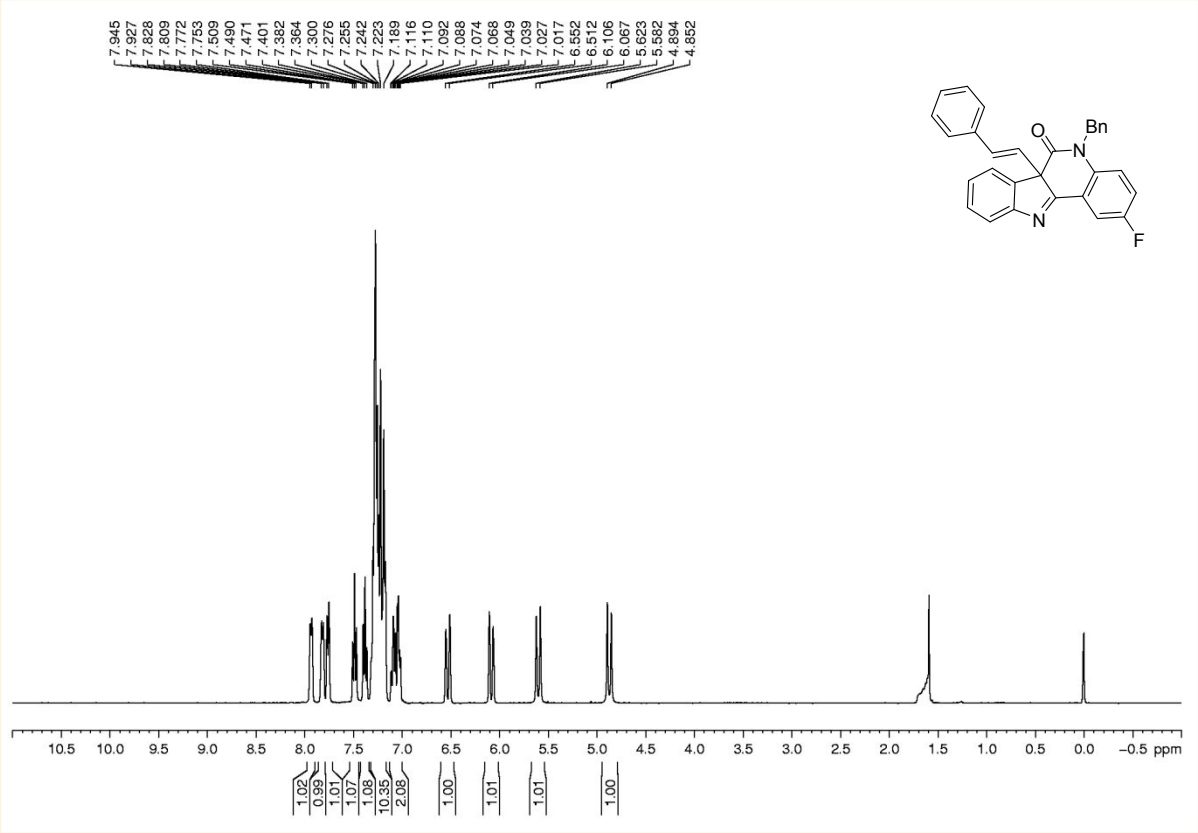


Figure 47. 400 MHz ^{1}H-NMR spectrum of **5x** in $CDCl_3$

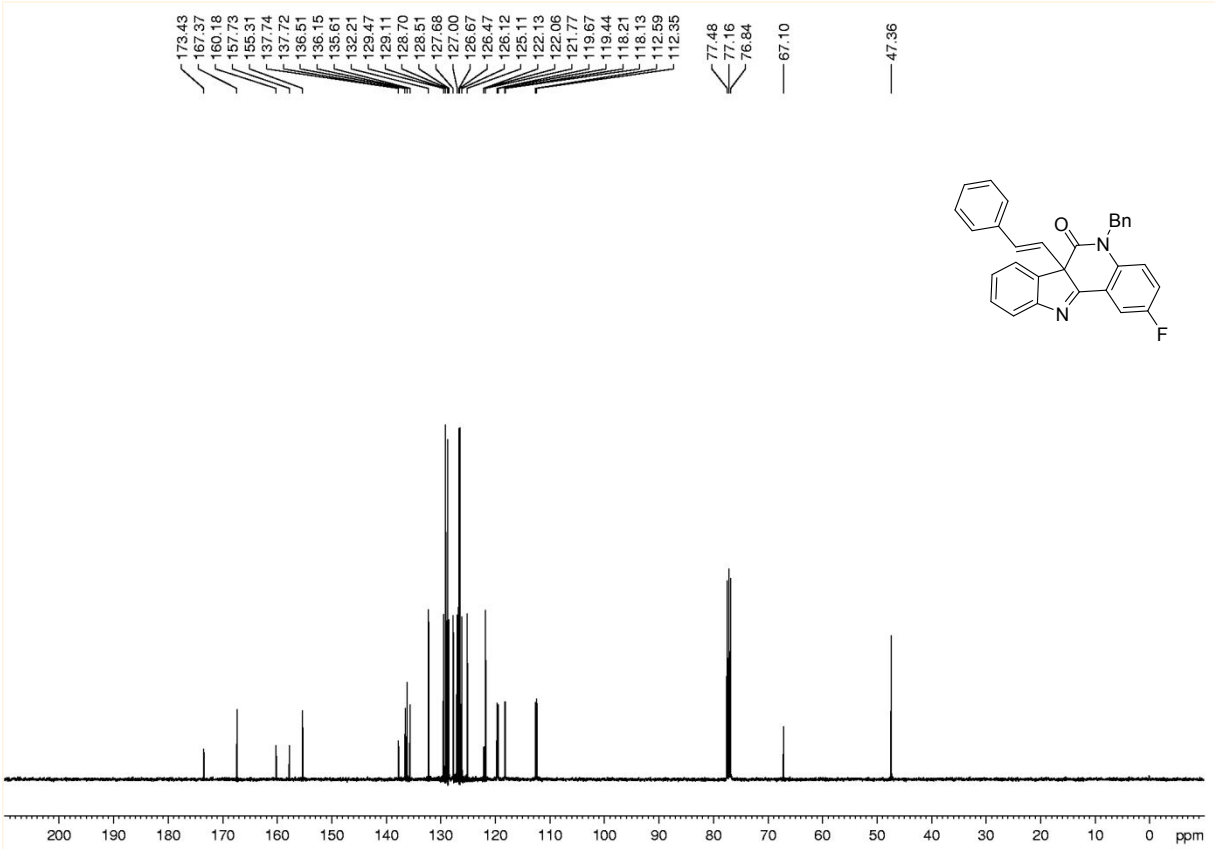


Figure 48. 100 MHz ^{13}C-NMR spectrum of **5x** in $CDCl_3$

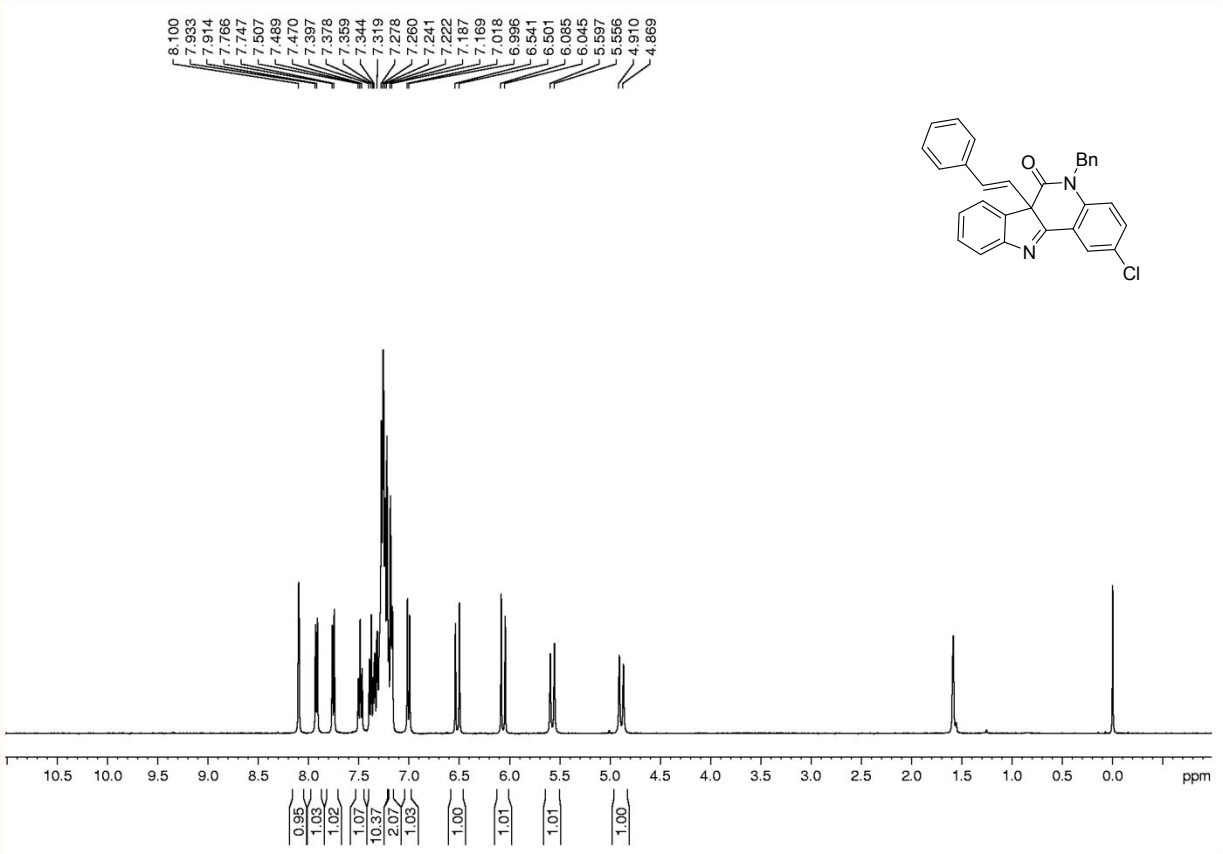


Figure 49. 400 MHz ^{1}H-NMR spectrum of **5y** in $CDCl_3$

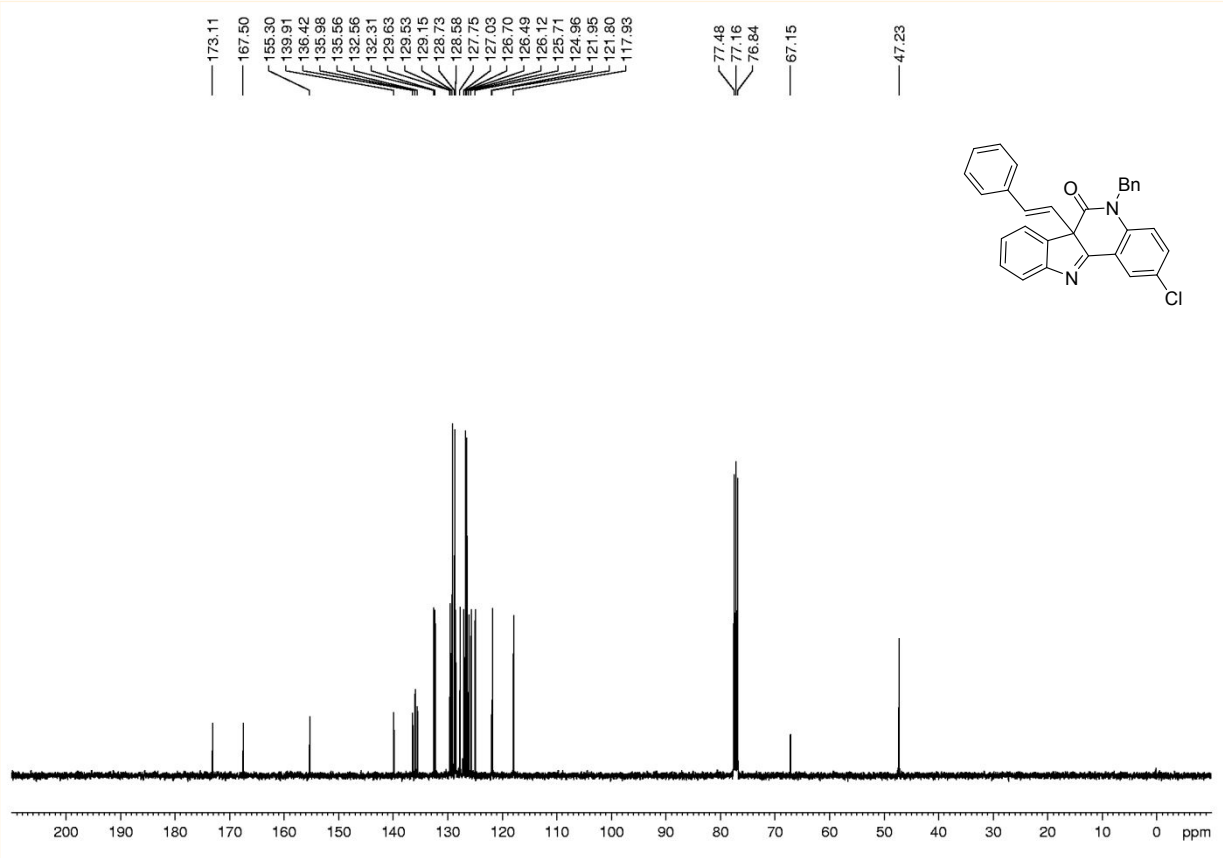


Figure 50. 100 MHz ^{13}C-NMR spectrum of **5y** in $CDCl_3$

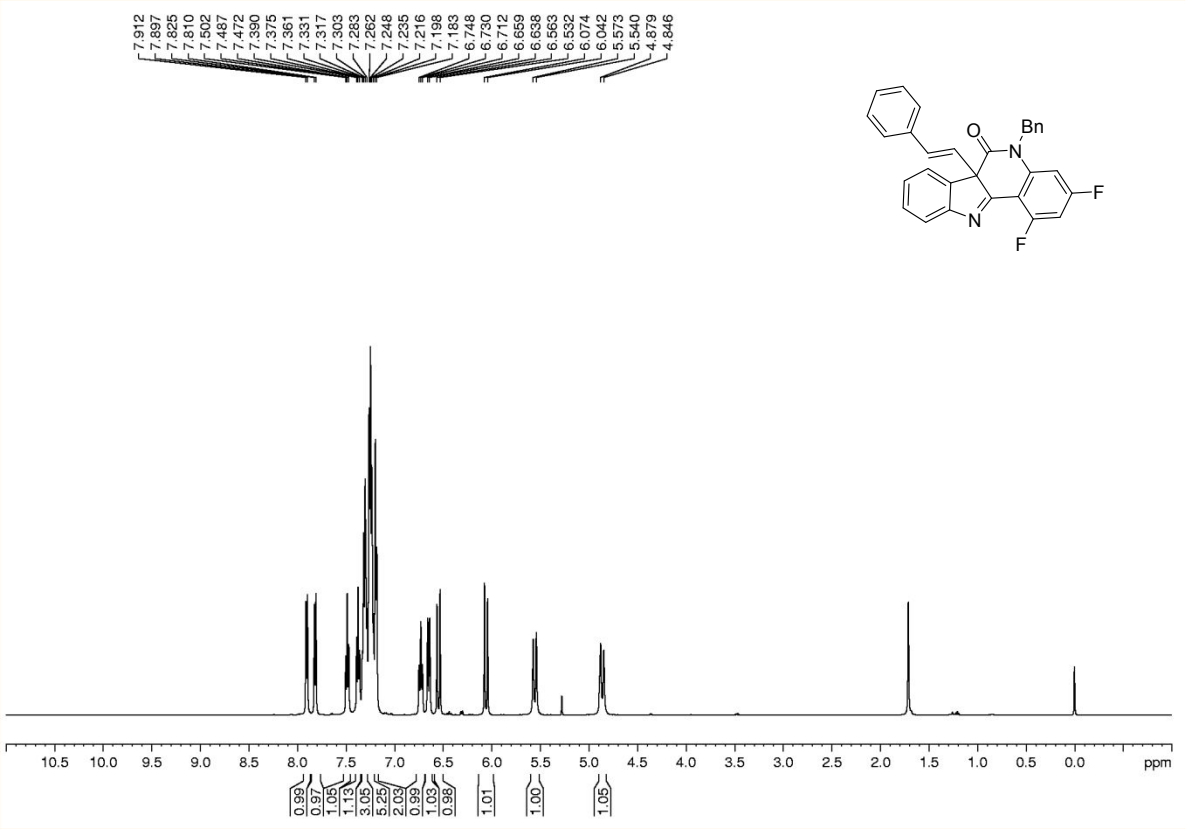


Figure 51. 500 MHz ^{1}H-NMR spectrum of **5aa** in $CDCl_3$

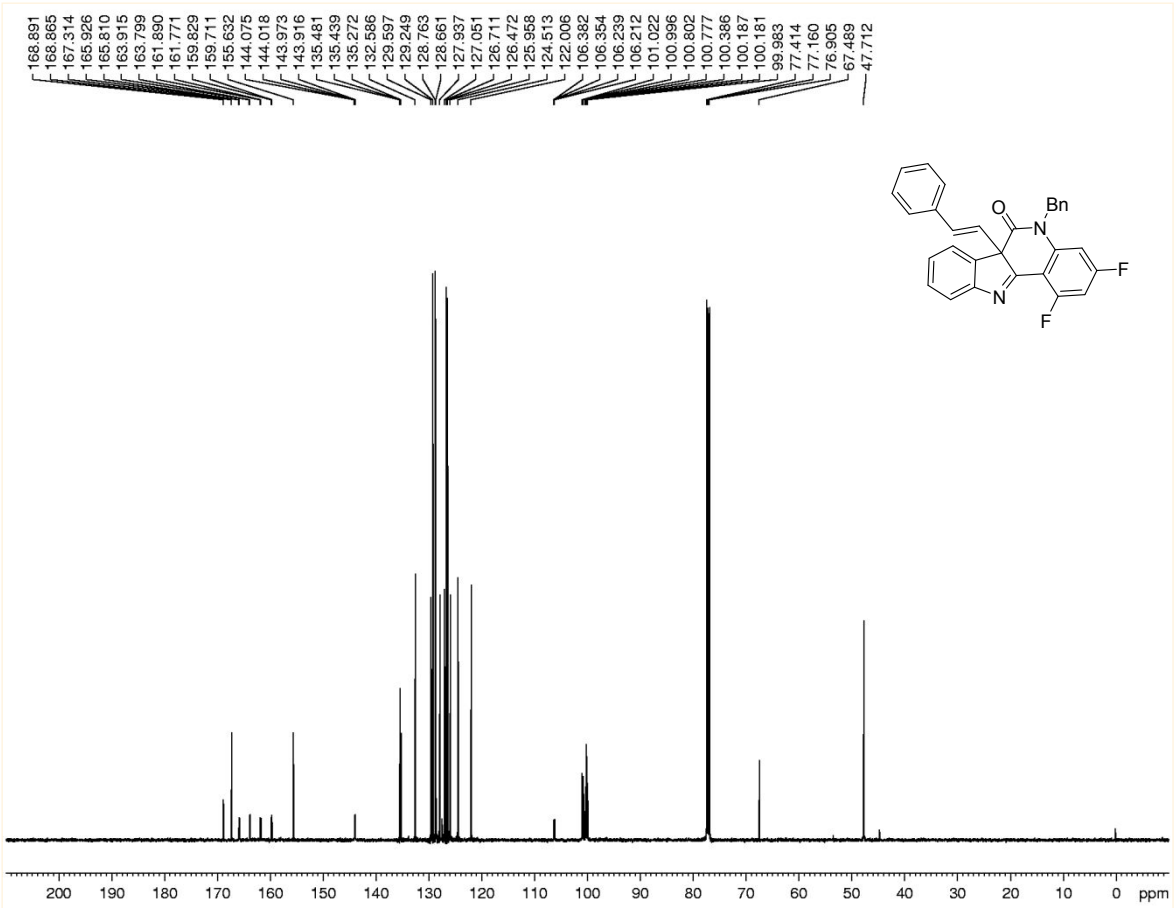


Figure 52. 125 MHz ^{13}C-NMR spectrum of **5aa** in $CDCl_3$

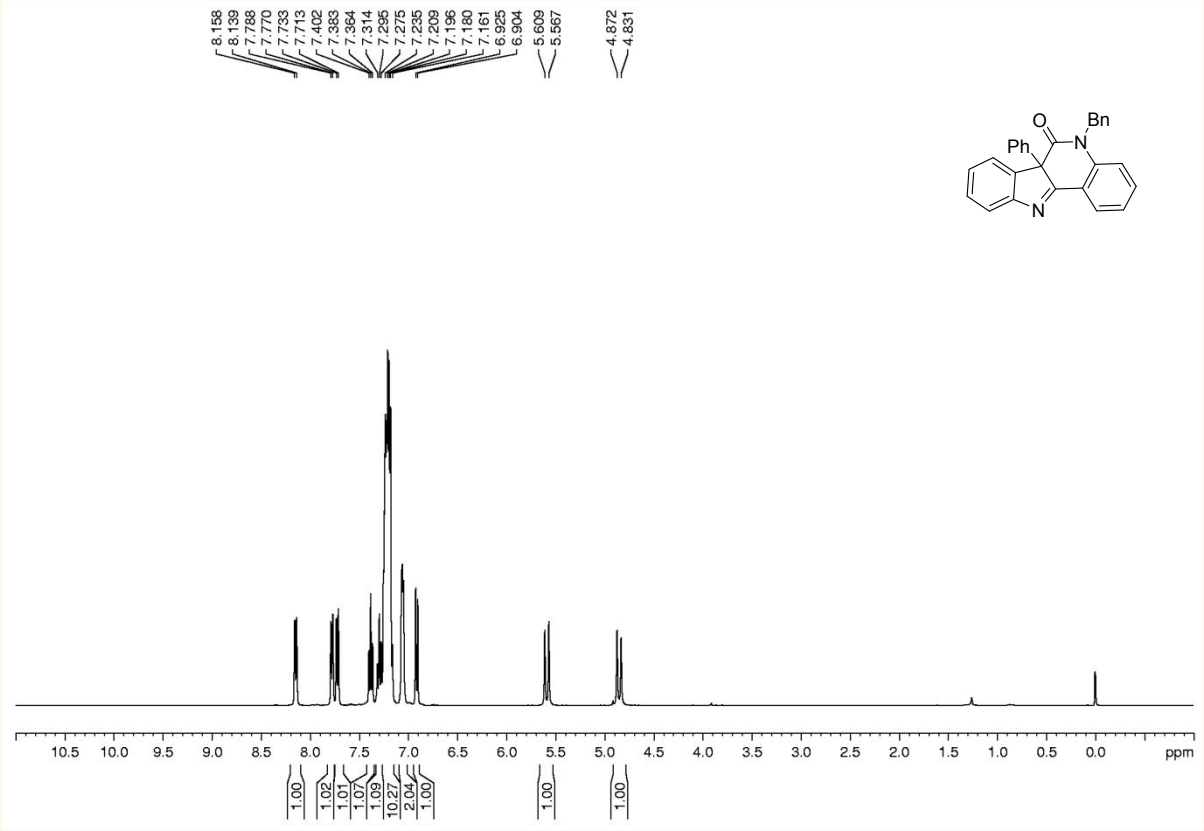


Figure 53. 400 MHz ^{1}H-NMR spectrum of **7a** in $CDCl_3$

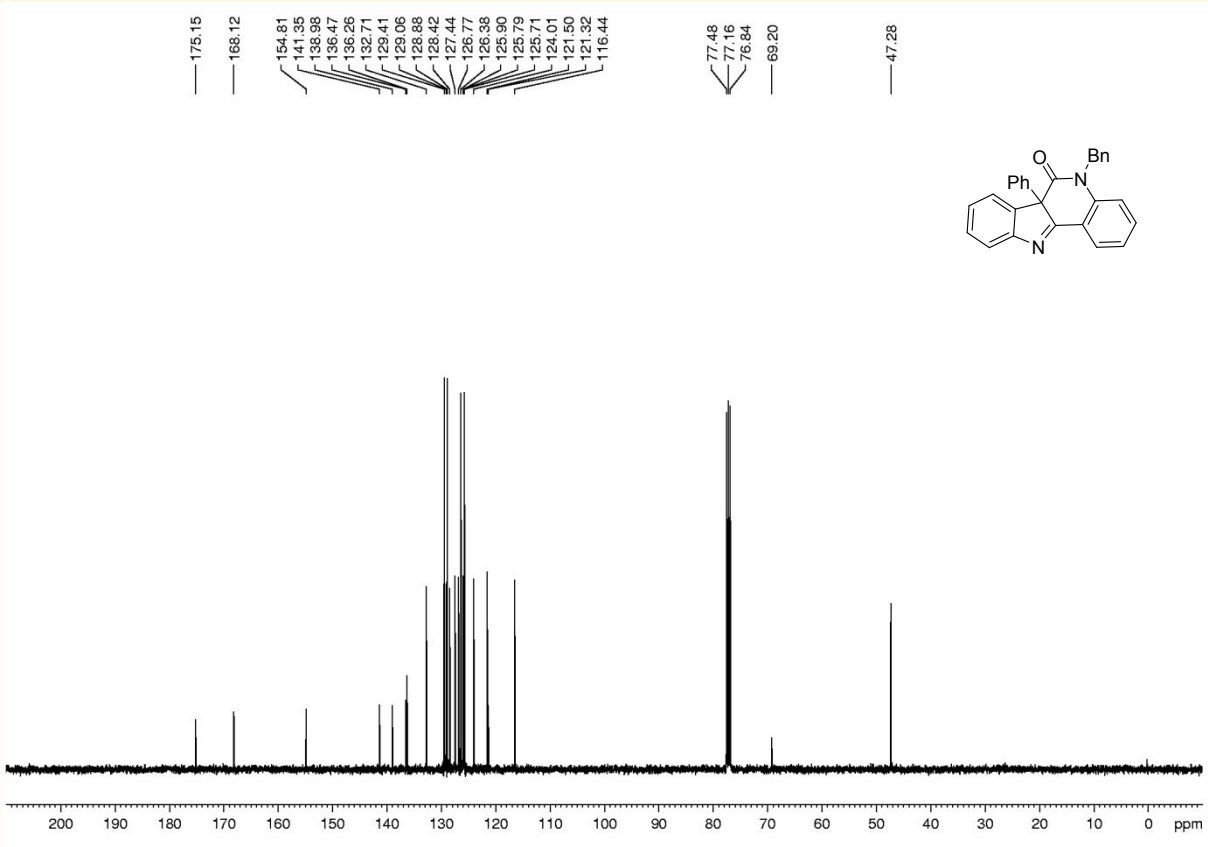


Figure 54. 100 MHz ^{13}C-NMR spectrum of **7a** in $CDCl_3$

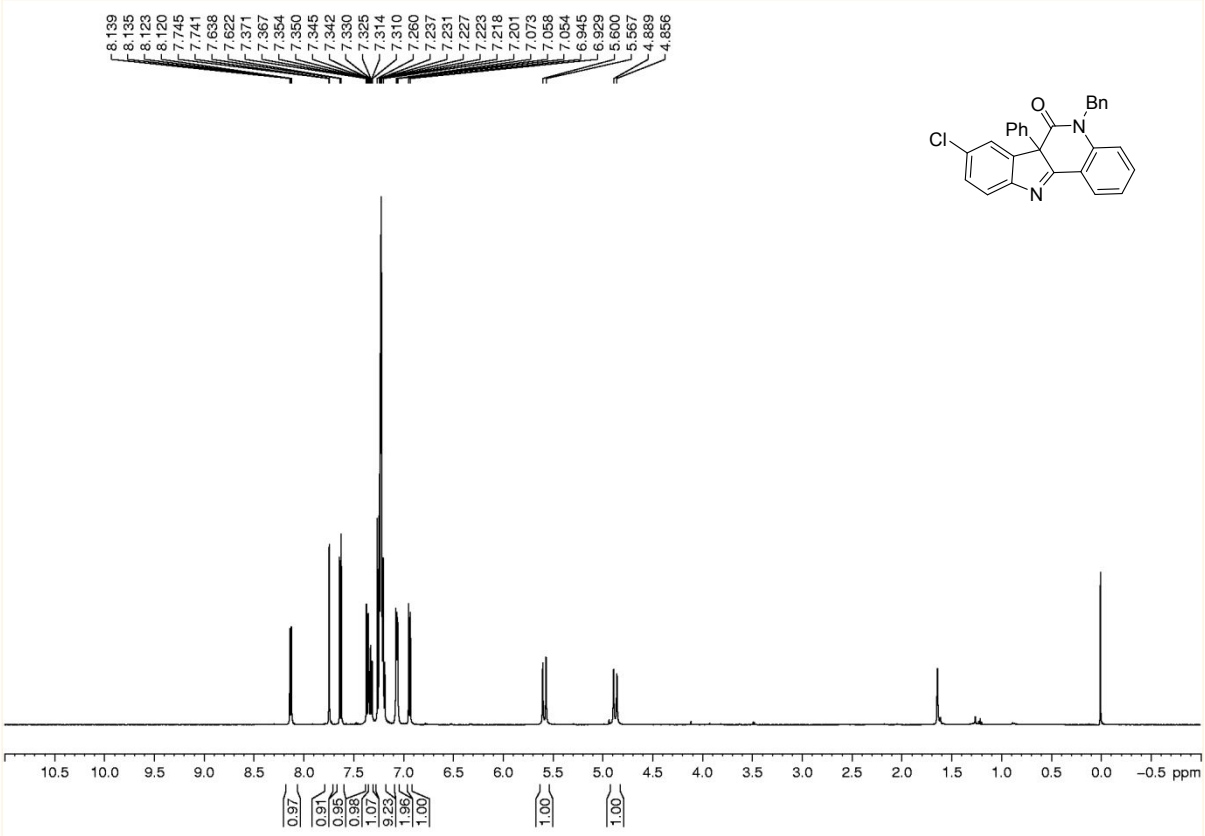


Figure 55. 500 MHz ^{1}H-NMR spectrum of **7b** in $CDCl_3$

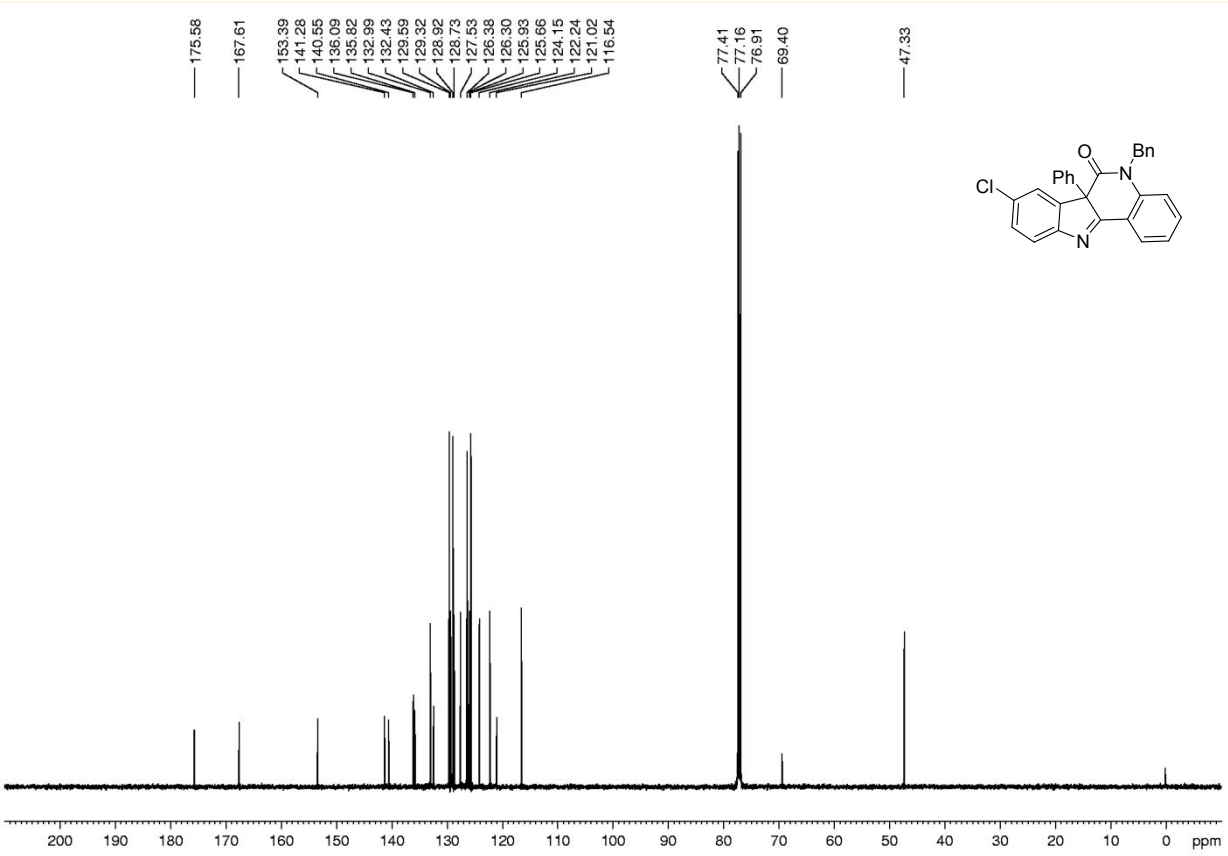


Figure 56. 125 MHz ^{13}C-NMR spectrum of **7b** in $CDCl_3$

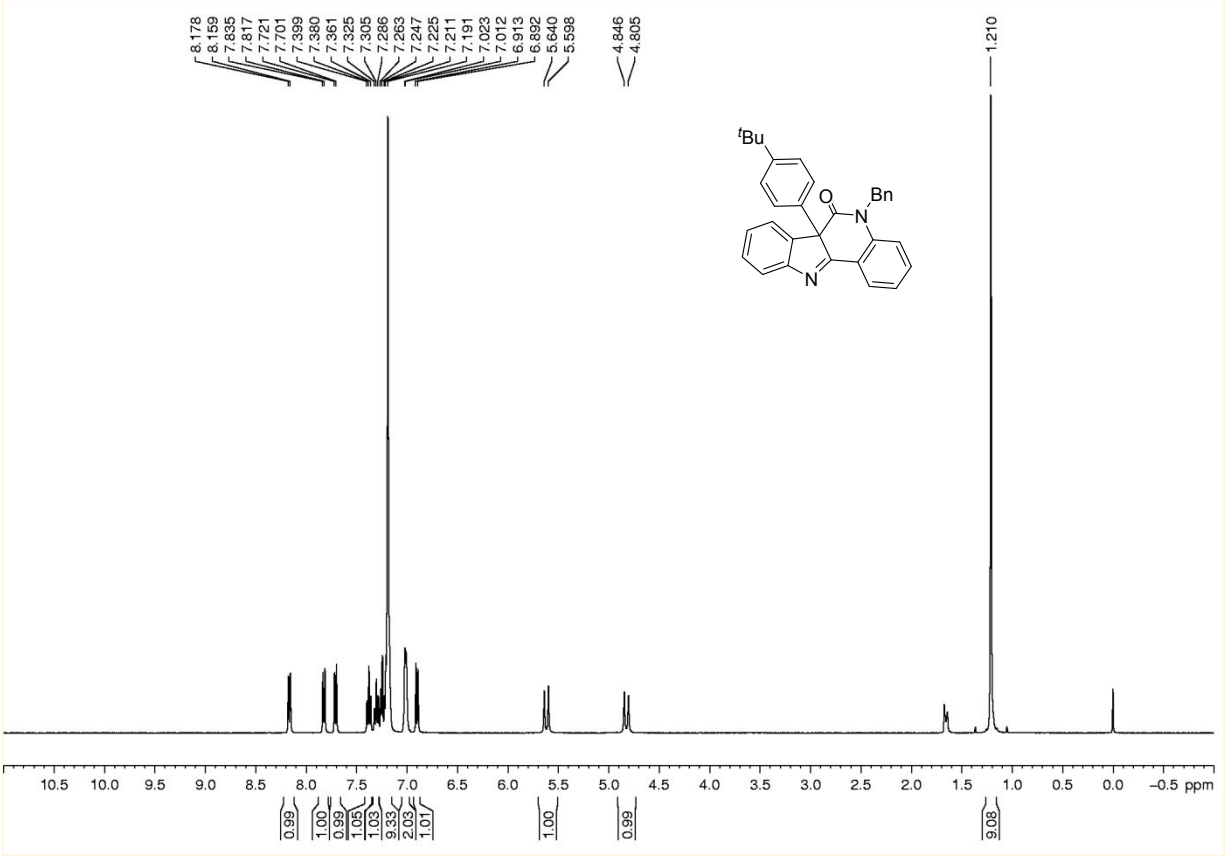


Figure 57. 400 MHz ^{1}H-NMR spectrum of **7c** in $CDCl_3$

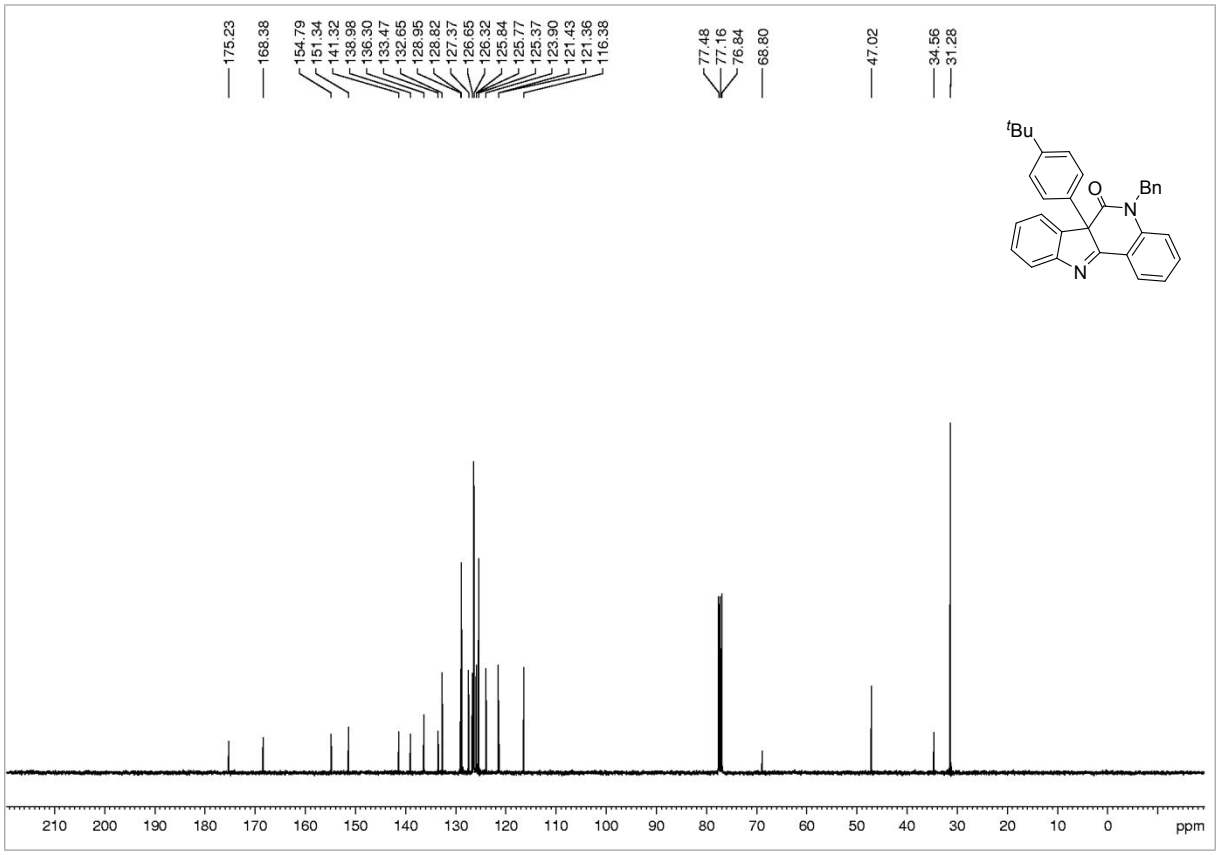


Figure 58. 100 MHz ^{13}C-NMR spectrum of **7c** in $CDCl_3$

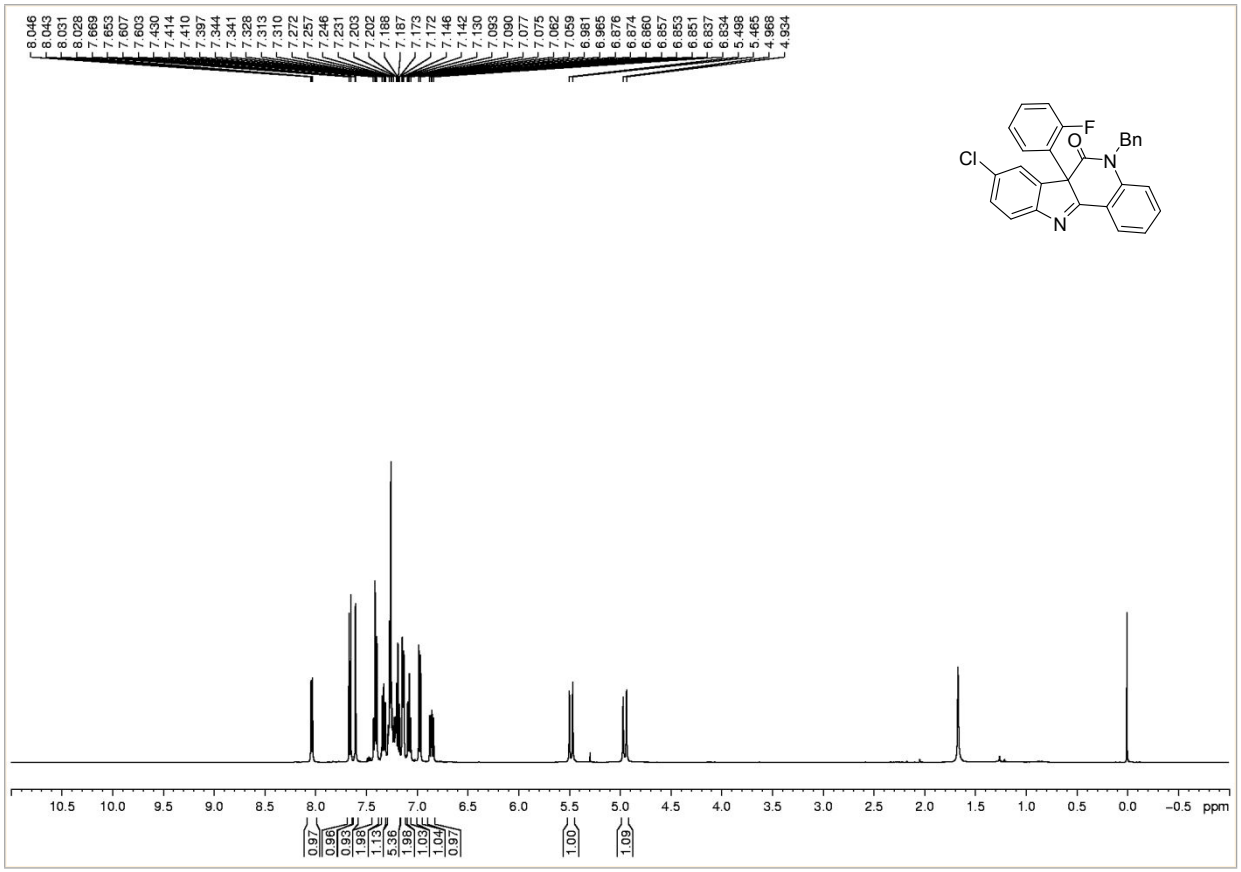


Figure 59. 500 MHz ^{1}H-NMR spectrum of **7d** in $CDCl_3$

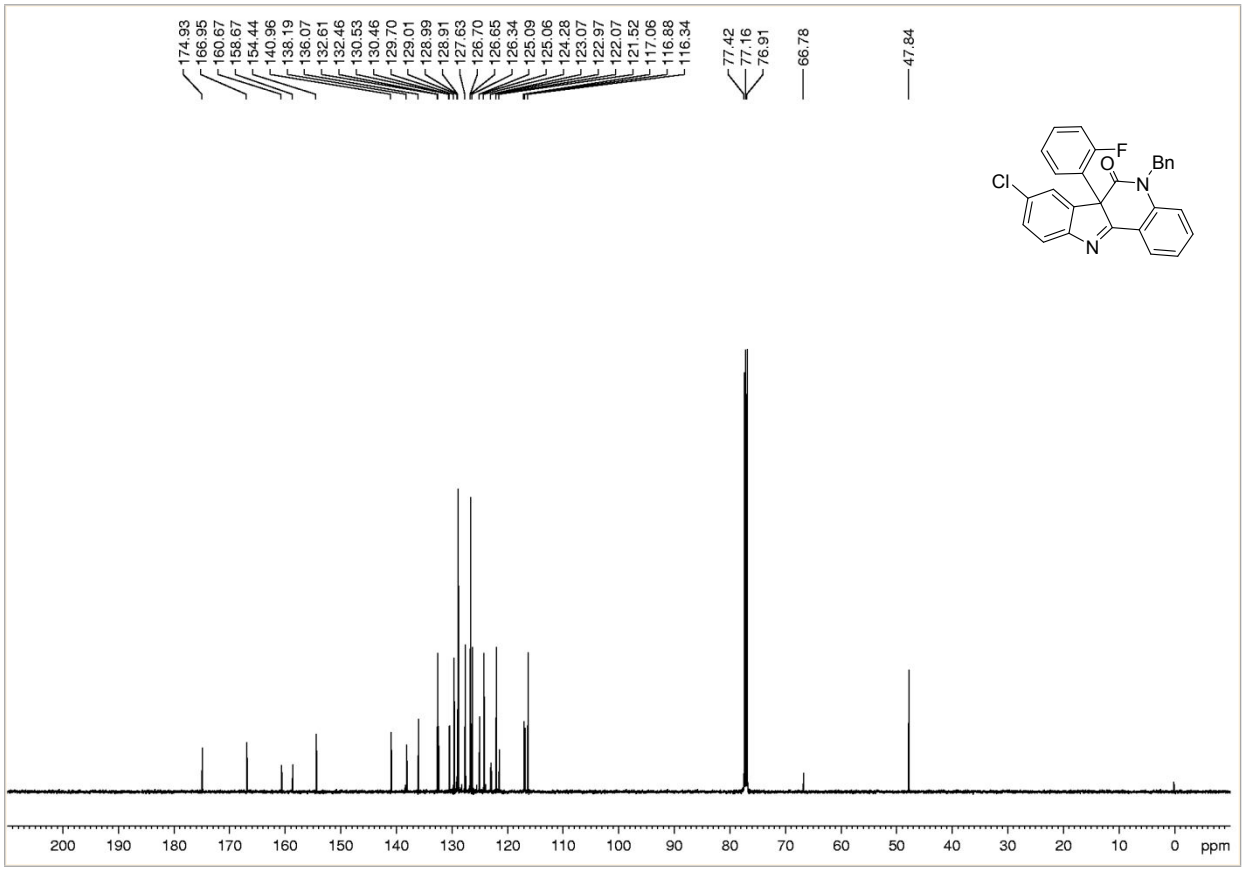


Figure 60. 125 MHz ^{13}C-NMR spectrum of **7d** in $CDCl_3$

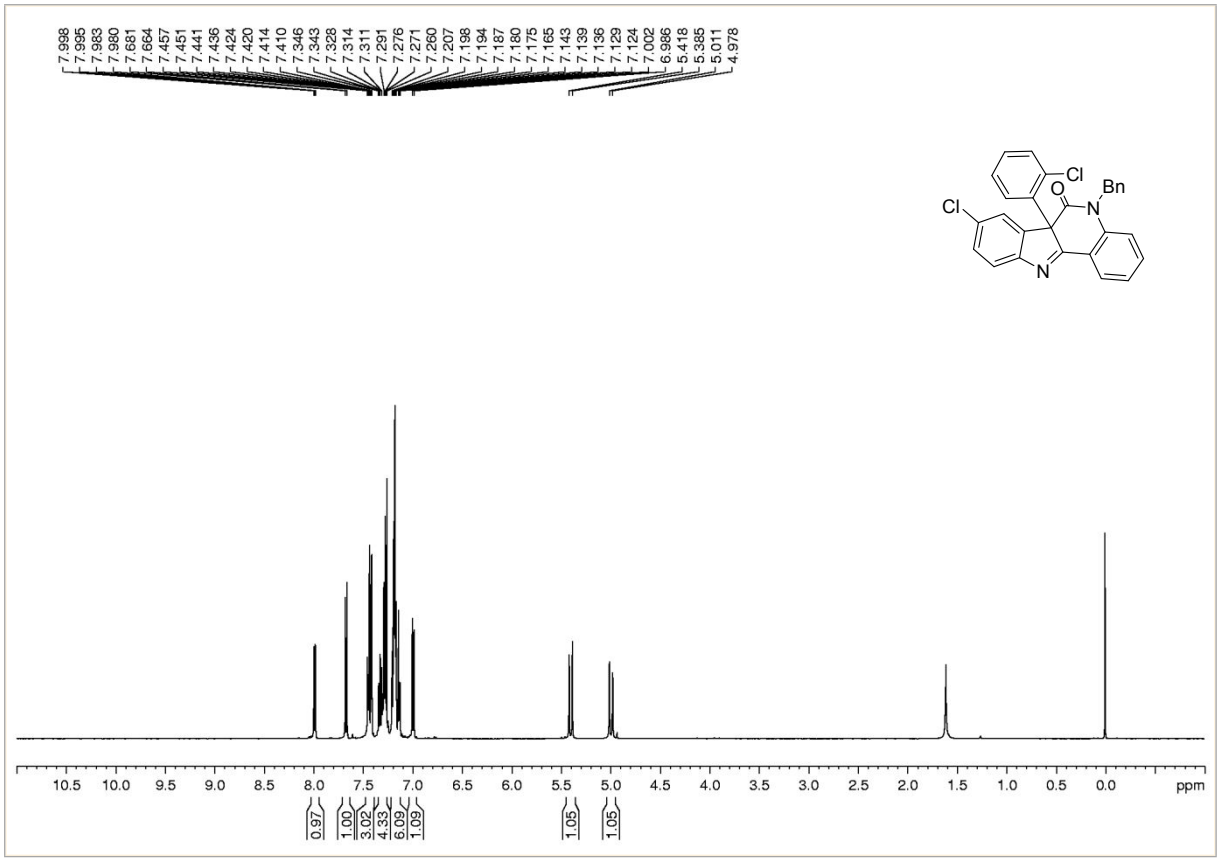


Figure 61. 500 MHz ^{1}H-NMR spectrum of **7e** in $CDCl_3$

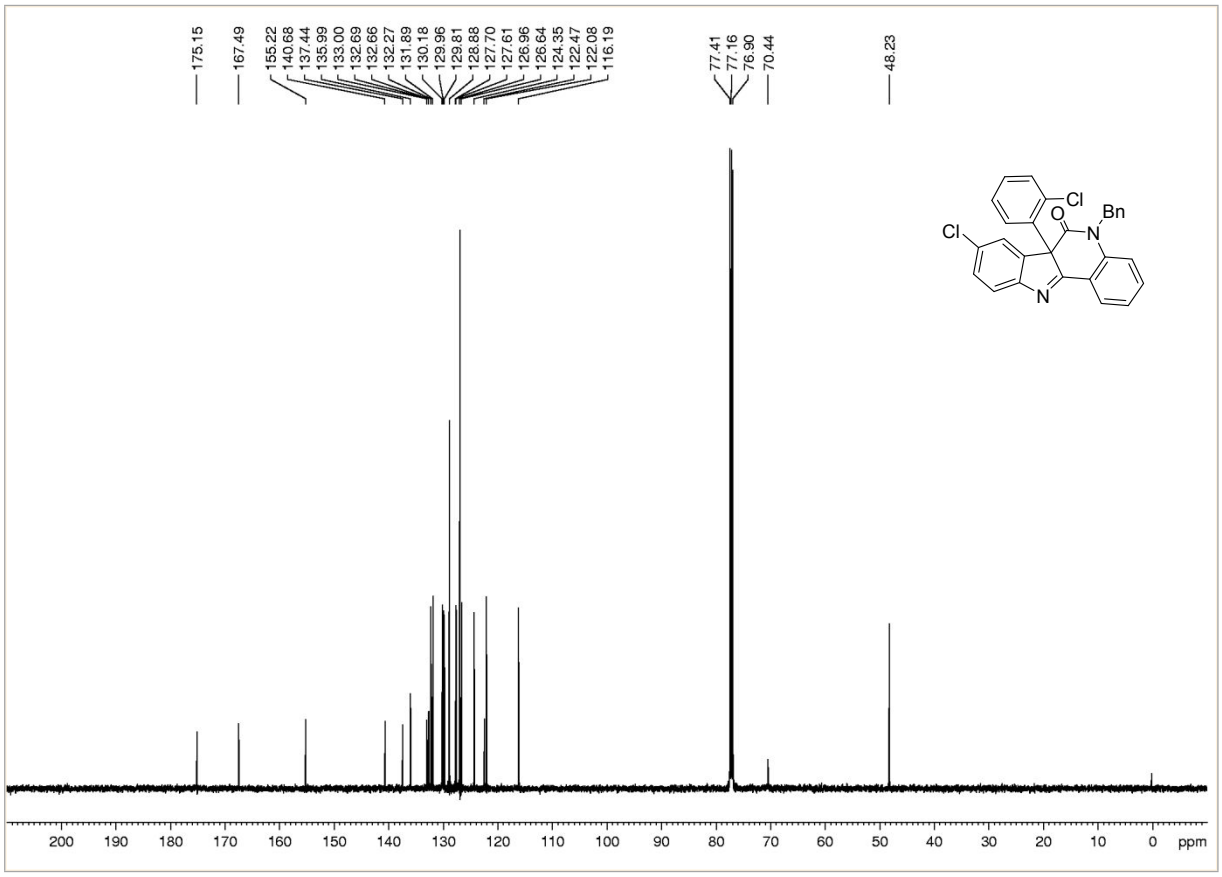


Figure 62. 125 MHz ^{13}C-NMR spectrum of **7e** in $CDCl_3$

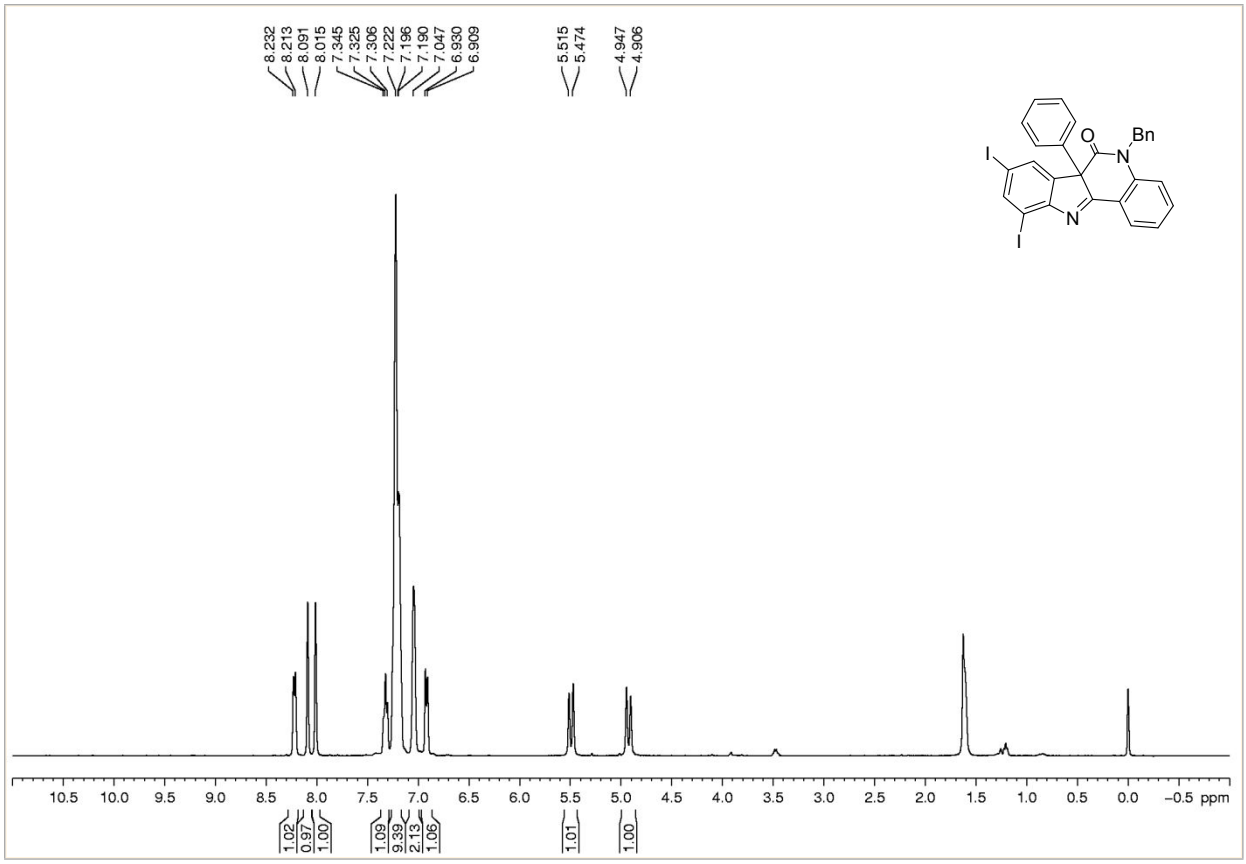


Figure 63. 400 MHz ^{1}H-NMR spectrum of **7f** in $CDCl_3$

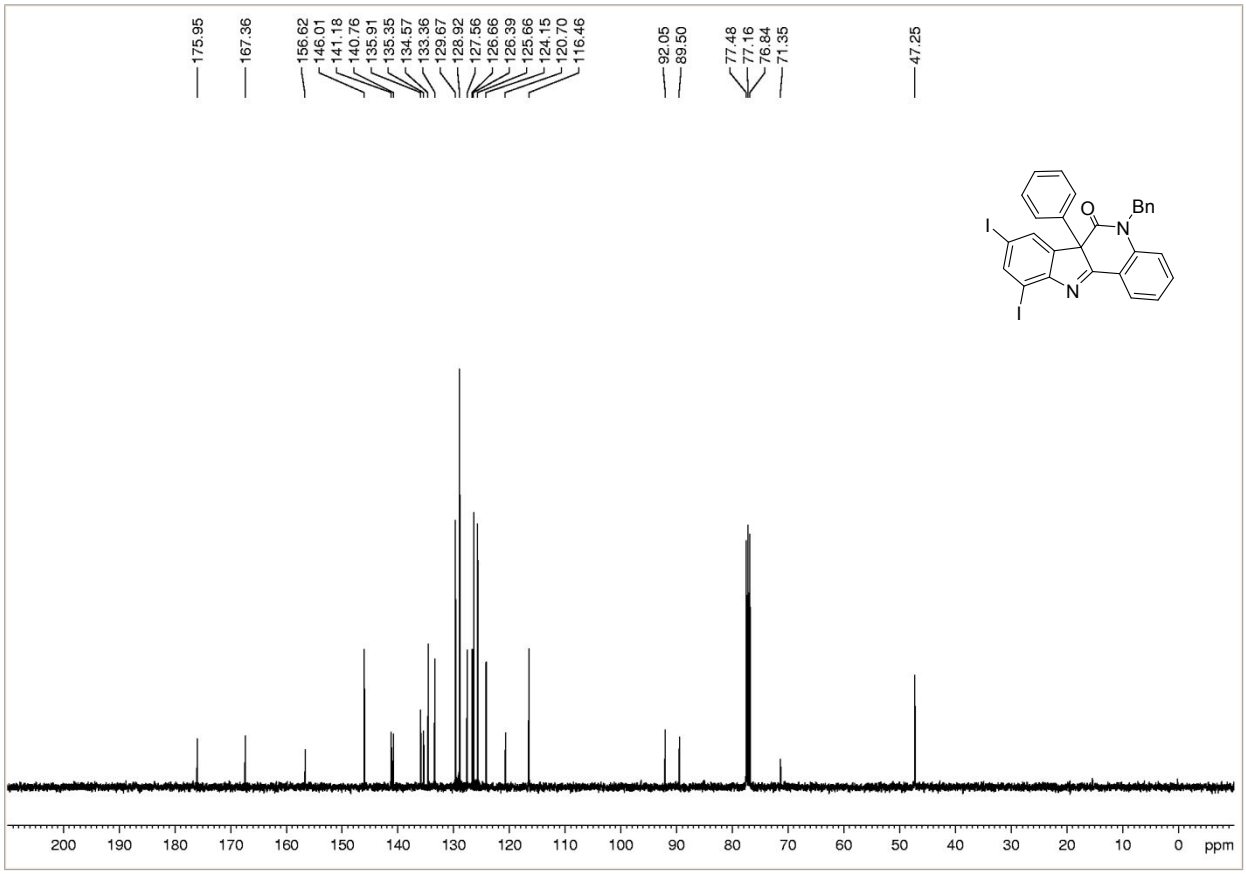


Figure 64. 100 MHz ^{13}C-NMR spectrum of **7f** in $CDCl_3$

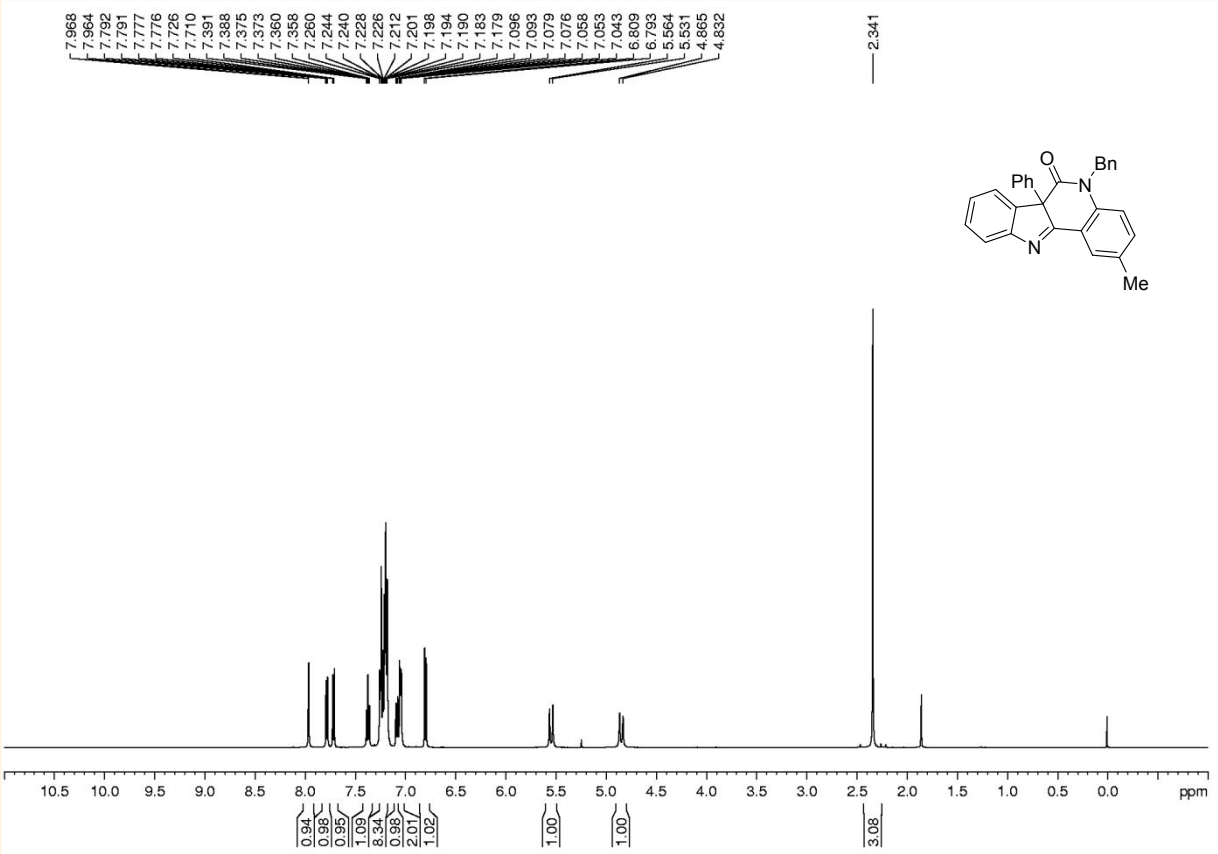


Figure 65. 500 MHz ^{1}H-NMR spectrum of **7g** in $CDCl_3$

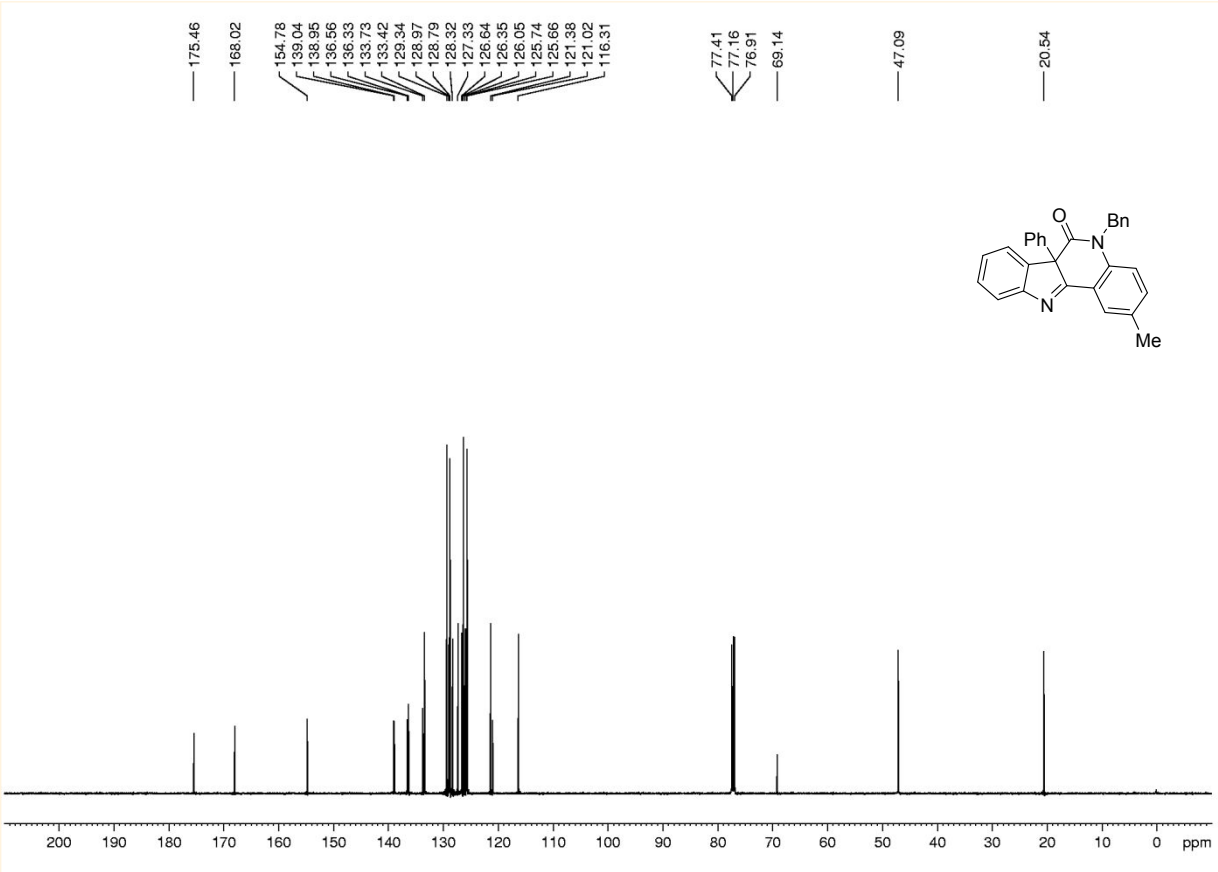


Figure 66. 125 MHz ^{13}C-NMR spectrum of **7g** in $CDCl_3$

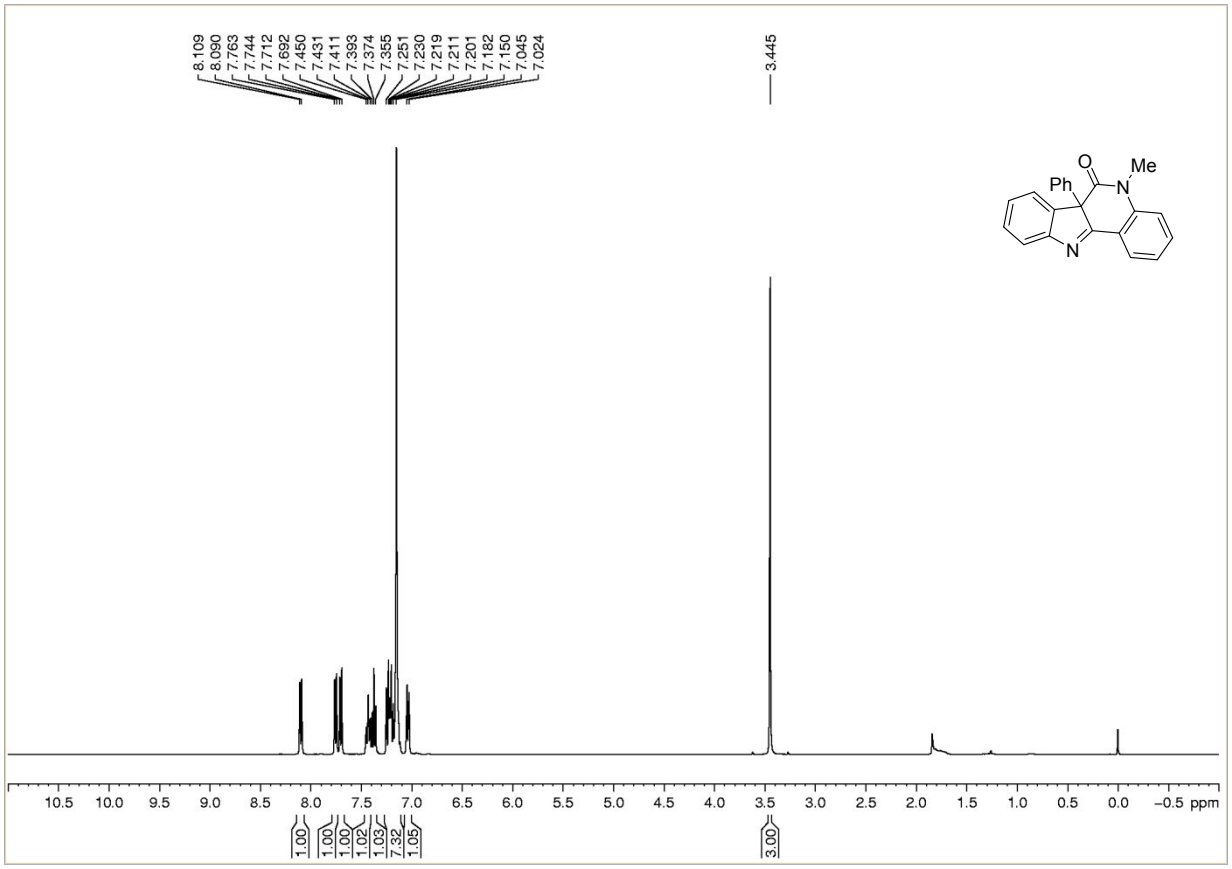


Figure 67. 400 MHz ^{1}H-NMR spectrum of **7h** in $CDCl_3$

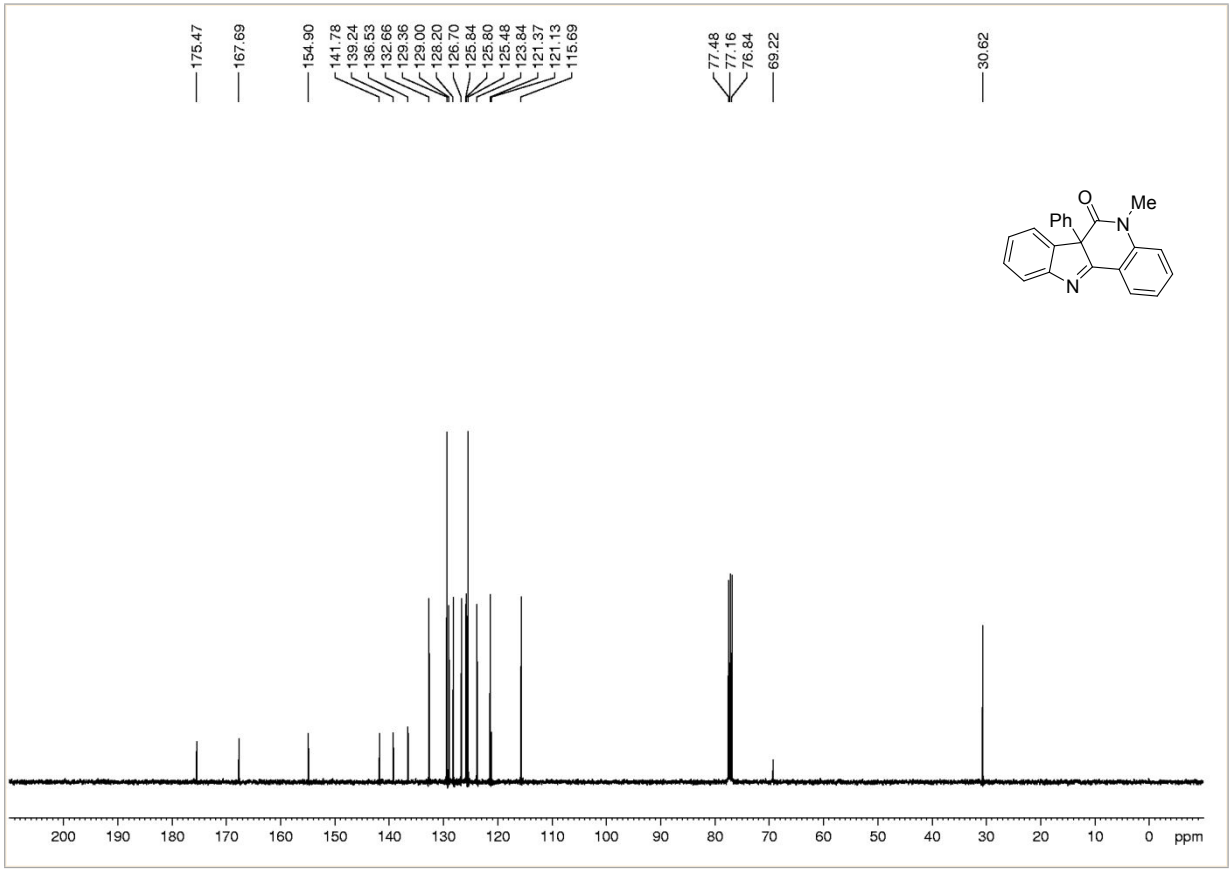


Figure 68. 100 MHz ^{13}C-NMR spectrum of **7h** in $CDCl_3$

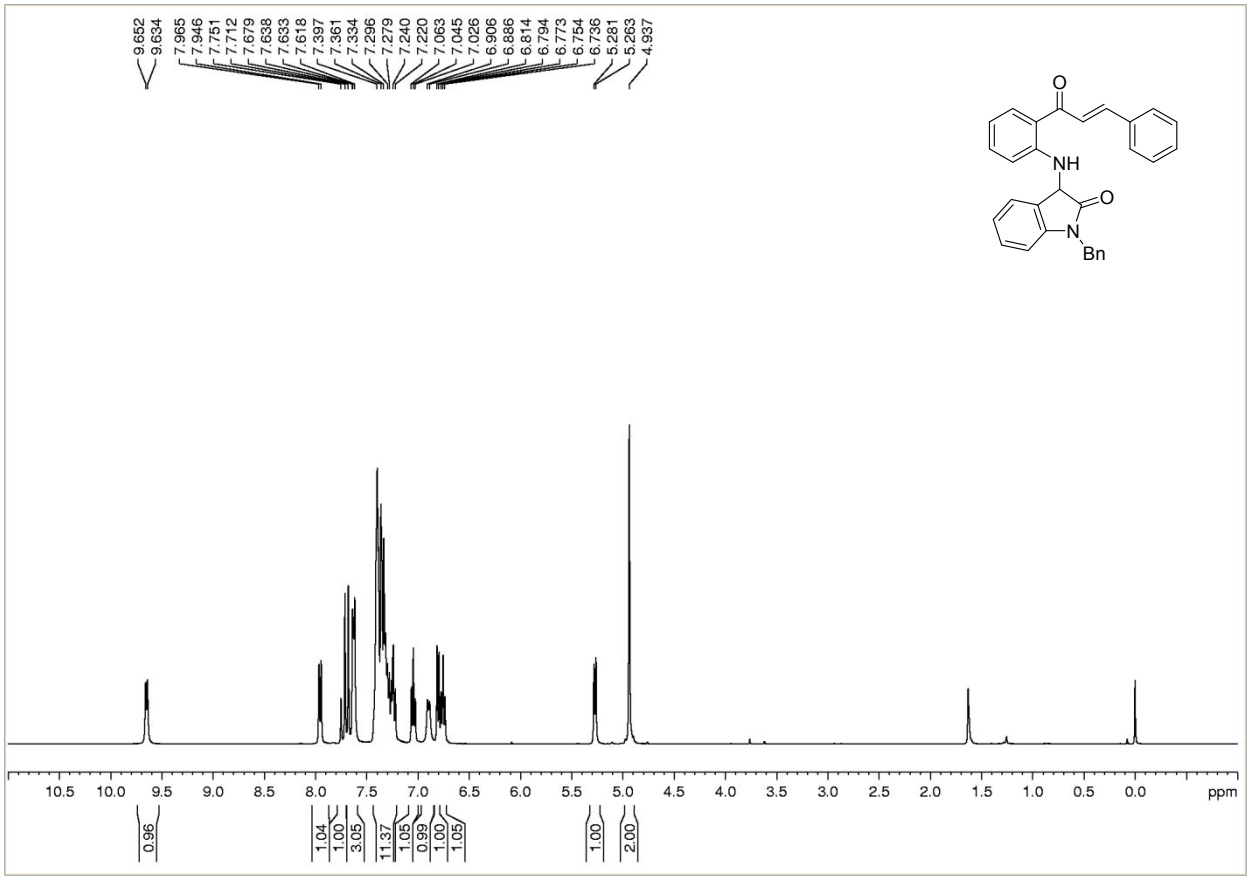


Figure 69. 400 MHz ^{1}H-NMR spectrum of **4c** in $CDCl_3$

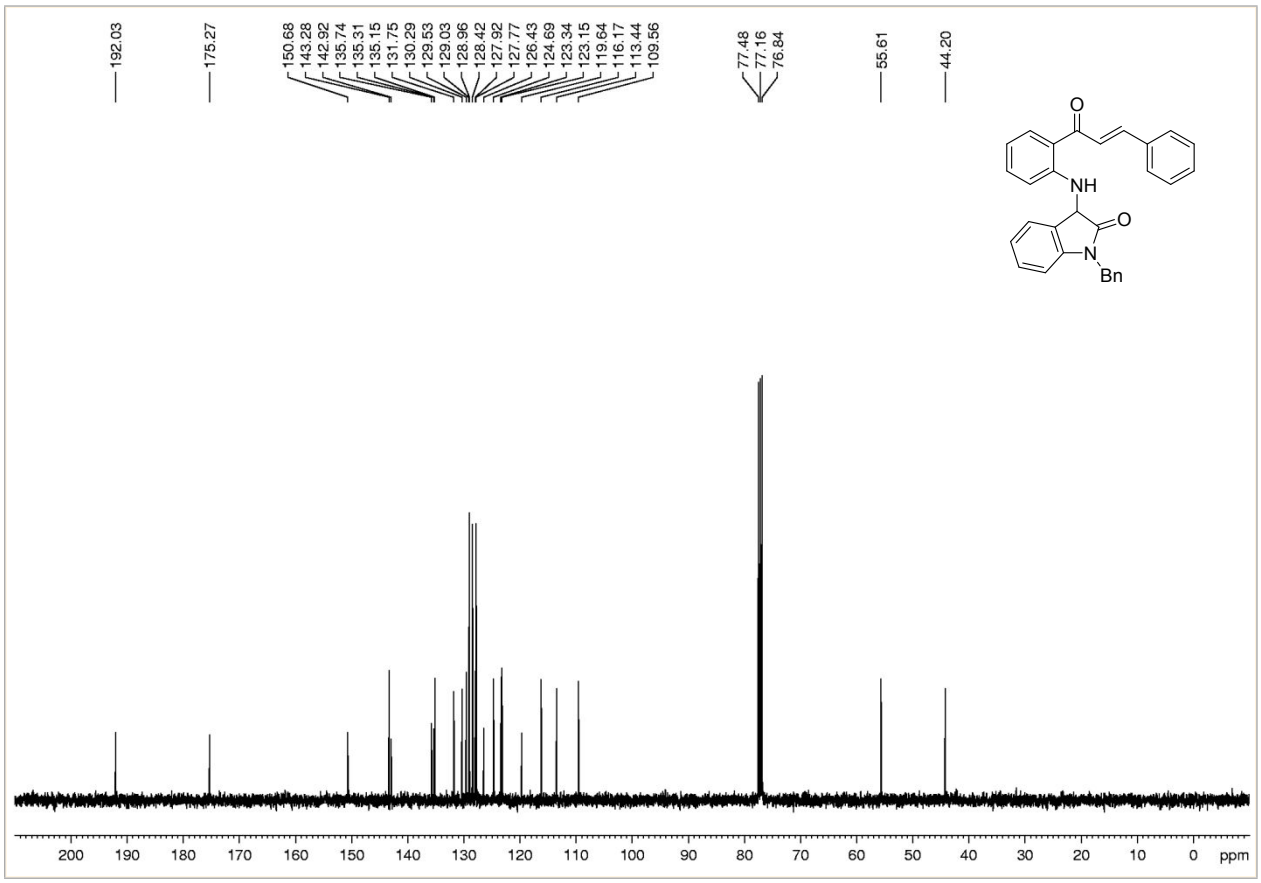


Figure 70. 100 MHz ^{13}C-NMR spectrum of **4c** in $CDCl_3$

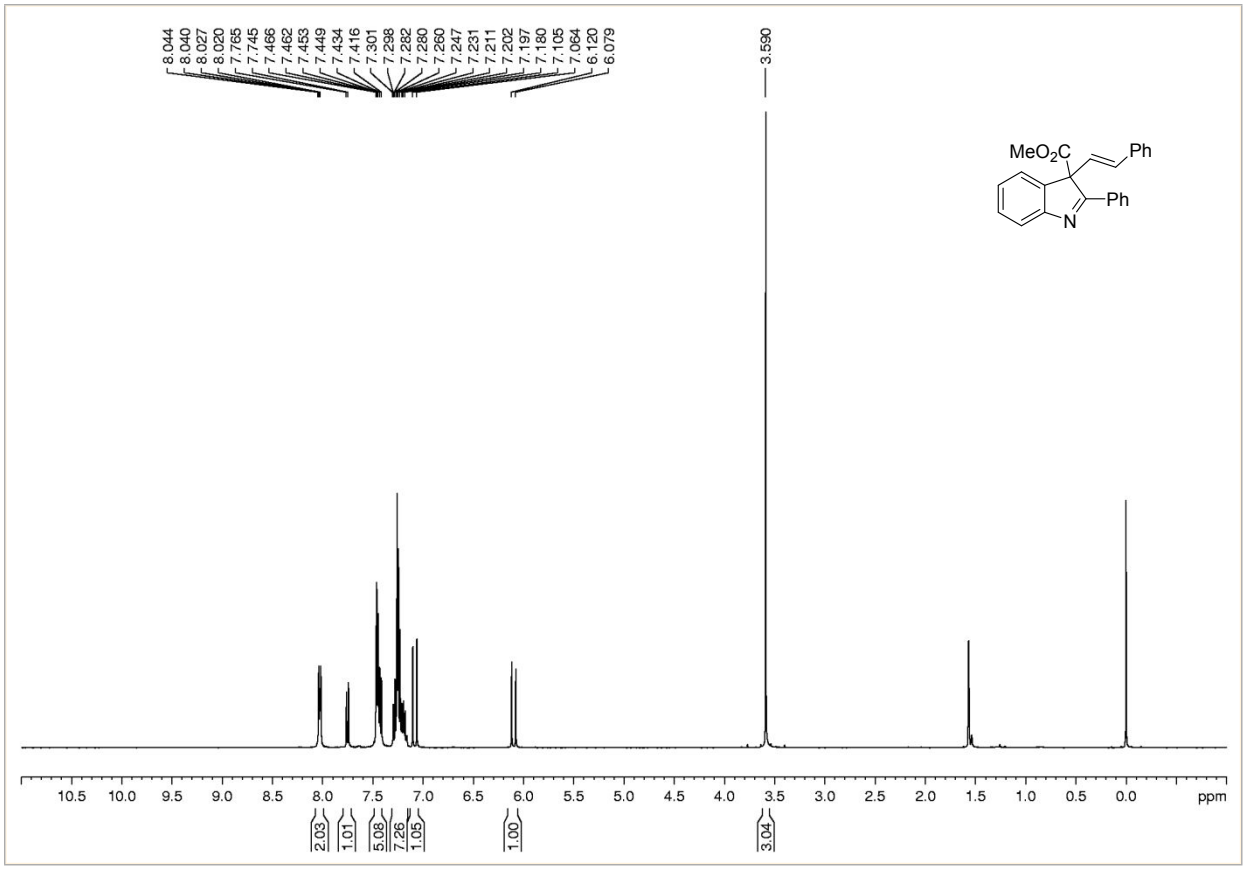


Figure 71. 400 MHz ^{1}H-NMR spectrum of **9** in $CDCl_3$

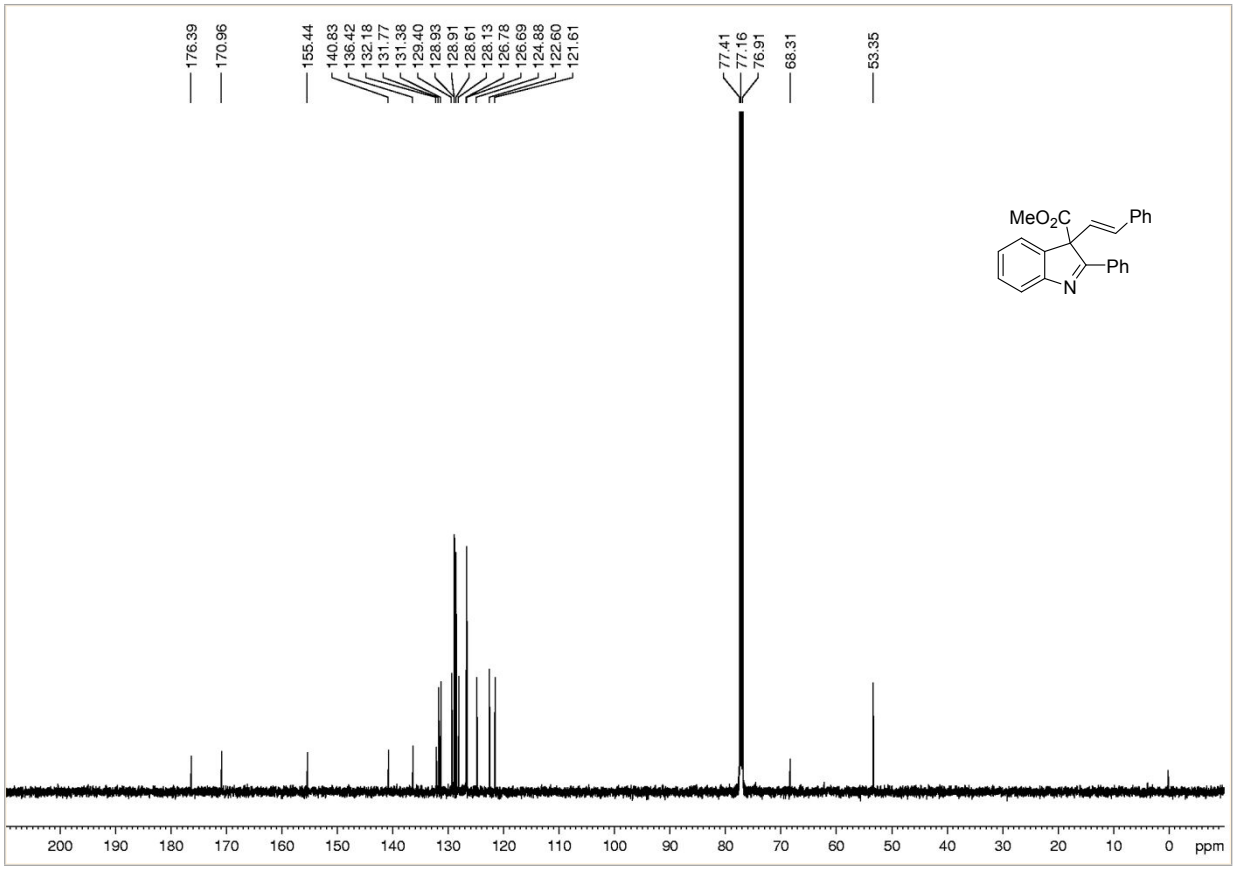


Figure 72. 125 MHz ^{13}C-NMR spectrum of **9** in $CDCl_3$

5. Single crystal XRD data

5a (CCDC No. 1838846)

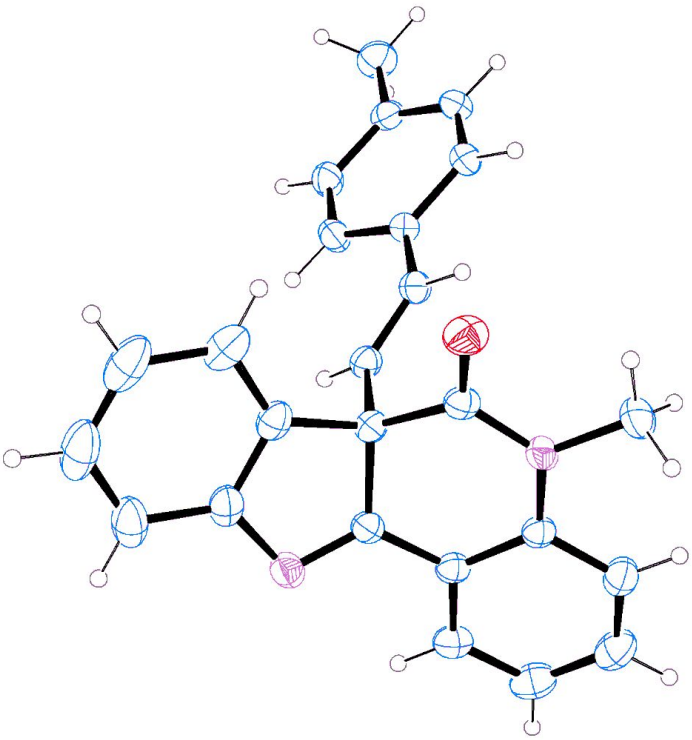


Figure 73. ORTEP diagram of **5a** with 30% probability ellipsoids

Empirical formula	C25 H20 N2 O	
Formula weight	364.43	
Temperature	296(2) K	
Wavelength	0.71073 Å	
Crystal system	Triclinic	
Space group	P-1	
Unit cell dimensions	a = 9.0281(2) Å	a= 105.242(3)°.
	b = 9.7734(2) Å	b= 102.488(4)°.
	c = 12.5957(5) Å	g = 109.400(4)°.
Volume	953.48(6) $Å^3$	
Z	2	
Density (calculated)	1.269 Mg/m^3	
Absorption coefficient	0.078 mm^{-1}	
F(000)	384	
Crystal size	0.150 x 0.100 x 0.100 mm^3	
Theta range for data collection	3.211 to 25.997°.	

Index ranges	-11<=h<=11, -12<=k<=12, -15<=l<=15
Reflections collected	27430
Independent reflections	3708 [R(int) = 0.0265]
Completeness to theta = 25.242°	99.1 %
Absorption correction	Semi-empirical from equivalents
Max. and min. transmission	0.7460 and 0.7088
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	3708 / 0 / 256
Goodness-of-fit on F^2	1.044
Final R indices [I>2sigma(I)]	R1 = 0.0474, wR2 = 0.1136
R indices (all data)	R1 = 0.0611, wR2 = 0.1293
Extinction coefficient	0.093(13)
Largest diff. peak and hole	0.218 and -0.159 e.$Å^{-3}$

7g (CCDC No. 1871970)

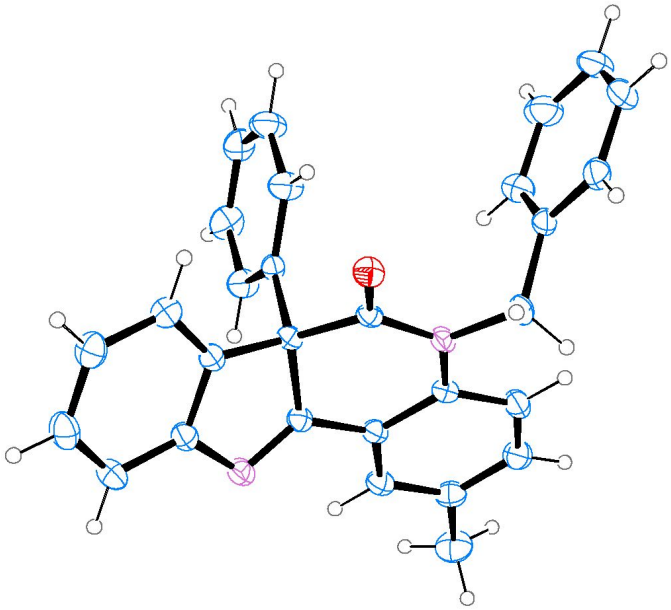


Figure 74. ORTEP diagram of **7g** with 30% probability ellipsoids and excluding one molecule of co-crystallized $CHCl_3$

```
Bond precision:  C-C = 0.0047 A          Wavelength=0.71073

Cell:           a=17.3317(6)    b=9.1603(4)           c=17.4127(7)
                alpha=90        beta=107.9559(16)     gamma=90
Temperature:    296 K

                Calculated                Reported
Volume          2629.86(18)               2629.85(18)
Space group     P 21/n                    P 21/n
Hall group      : -P 2yn                  -P 2yn
Moiety formula  C29 H22 N2 O, C H Cl3     ?
Sum formula     C30 H23 Cl3 N2 O          C30 H23 Cl3 N2 O
Mr              533.85                    533.85
Dx,g cm-3       1.348                     1.348
Z               4                         4
Mu (mm-1)       0.375                     0.375
F000            1104.0                    1104.0
F000'           1106.13
h,k,lmax        20,10,20                  20,10,20
Nref            4637                      4636
Tmin,Tmax       0.906,0.945               0.896,0.946
Tmin'           0.894

Correction method= # Reported T Limits: Tmin=0.896 Tmax=0.946
AbsCorr = MULTI-SCAN

Data completeness= 1.000          Theta(max)= 24.999

R(reflections)= 0.0678( 3649)     wR2(reflections)= 0.1914( 4636)

S = 1.040                 Npar= 327
```