Supporting Information

Reductive Cross-Coupling of 3-Bromo-2,1-Borazaronaphthalenes with Alkyl Iodides

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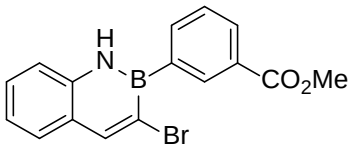
EXPERIMENTAL

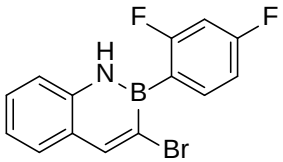
General Considerations. All cross-coupling reactions were carried out under an Ar atmosphere. All solids used in the cross-couplings were weighed out open to air. ^{1}H and ^{13}C NMR spectra were recorded at 500 and 125.8 MHz, respectively. ^{11}B NMR spectra were recorded at 128.4 MHz. Melting points (°C) were determined using a Thomas-Hoover capillary melting point apparatus and are uncorrected. HRMS data was obtained using a TOF mass spectrometer by ES+ or CI, as specified.

Spectral Information on 2,1-Borazaronaphthalenes:

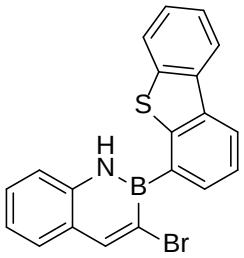
2,1-Borazaronaphthalenes were synthesized[1] and brominated[2] according to the literature.



3-Bromo-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene. The title compound was obtained as an off-white solid in 62% yield (2 mmol scale, 424 mg). mp 105-107 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.51 (s, 1H), 8.47 (s, 1H), 8.17-8.10 (m, 3H), 7.63 (d, *J* = 7.9 Hz, 1H), 7.56-7.48 (m, 2H), 7.35 (d, *J* = 7.9 Hz, 1H), 7.27-7.26 (m, 1H), 3.95 (s, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 167.6, 147.2, 139.3, 138.3, 134.2, 130.5, 129.7, 129.2, 128.9, 128.0, 125.3, 112.3, 118.4, 52.3; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 35.5; FT-IR (neat): 3352, 1707, 1558, 1427, 1266 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{16}H_{14}BBrNO_2$ $(M+H)^+$ 342.0301, found 342.0305.



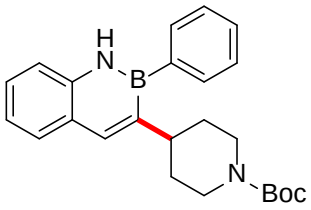
3-Bromo-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene. The title compound was obtained as an off-white solid in 92% yield (0.70 mmol scale, 208 mg). mp 93-95 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.49 (s, 1H), 8.35 (br s, 1H), 7.98-7.94 (m, 1H), 7.63 (d, *J* = 8.1 Hz, 1H), 7.52-7.49 (m, 1H), 7.32 (d, *J* = 8.1 Hz, 1H), 7.28-7.24 (m, 1H), 7.04-6.99 (m, 1H), 6.92-6.86 (m, 1H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 165.6 (dd, *J* = 245, 13 Hz), 165.5 (dd, *J* = 206, 13 Hz), 147.2, 138.7, 137.1 (dd, *J* = 10, 8 Hz), 129.0, 128.7, 124.9, 122.2, 118.2, 111.1 (dd, *J* = 19, 4 Hz), 103.5 (dd, *J* = 29, 24 Hz); ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 31.3; FT-IR (neat): 2922, 1609, 1560, 1427, 1238 cm^{-1}; HRMS (CI+) *m/z* calcd. for $C_{14}H_9BNBrF_2$ $(M)^+$ 318.9979, found 318.9987.



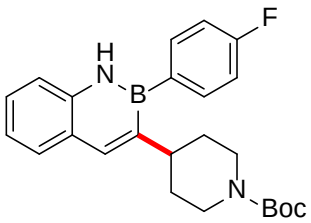
3-Bromo-2-(4-dibenzothienyl)-2,1-borazaronaphthalene. The title compound was obtained as an off-white solid in 87% yield (0.72 mmol scale, 244 mg). mp 106-108 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.56 (s, 1H), 8.52 (br s, 1H), 8.25-8.20 (m, 2H), 7.95 (d, J = 7.1 Hz, 1H), 7.87-7.84 (m, 1H), 7.68-7.65 (m, 1H), 7.61-7.57 (m, 1H), 7.50-7.47 (m, 3H), 7.33-7.29 (m, 2H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 147.2, 143.2, 139.0, 138.7, 135.7, 135.0, 132.6, 129.0, 128.7, 126.6, 125.3, 124.4, 124.3, 120.0, 122.6, 122.3, 121.6, 118.3; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 33.1; FT-IR (neat): 3322, 1616, 1556, 1428 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{20}H_{14}BBrNS$ $(M+H)^+$ 390.0123, found 390.0129.

Procedure for the reductive cross-coupling of alkyl iodides with 3-bromo-2,1-borazaronaphthalenes . An oven-dried Biotage 10 mL microwave vial equipped with a magnetic stirbar was charged with the 3-bromo-2,1-borazaronaphthalene (0.5 mmol), alkyl iodide (0.6 mmol), $NiCl_2$•glyme (0.025 mmol, 5.5 mg), 4,4'-dimethyl-2,2'-bipyridine (0.025 mmol, 4.6 mg), $NaBF_4$ (0.25 mmol, 27.5 mg), and Mn powder (1.0 mmol, 55.0 mg). The vial was sealed with a disposable Teflon septum cap and was evacuated and purged with Ar three times. A 2:1 mixture of cyclohexane/DMA (1.67 mL cyclohexane, 0.83 mL DMA) and 4-ethylpyridine (0.5 mmol, 54 mg) was added via syringe. The reaction was stirred under Ar with conventional heating at 40 °C for 18 h, after which the solution was cooled and diluted with 5 mL of EtOAc. The resulting mixture was filtered through Celite, which

was rinsed with EtOAc (~ 10 mL). The solution was concentrated, and the product was isolated by column chromatography, eluting with a gradient of EtOAc in hexanes (0 to 10% EtOAc).

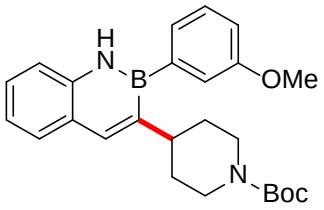


3-(4-(*N*-Boc)-Piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1a). The title compound was obtained as an off-white solid in 78% yield (151 mg). mp 174-174 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.03 (br s, 1H), 7.91 (s, 1H), 7.70-7.65 (m, 3H), 7.50-7.46 (m, 3H), 7.45-7.41 (m, 1H), 7.30-7.27 (m, 1H), 7.26-7.24 (m, 1H), 4.23 (br, 2H), 3.02-2.96 (m, 1H), 2.73 (br, 2H), 1.81 (d, J = 11.7 Hz, 2H), 1.66-1.61 (m, 2H), 1.53 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 139.6, 138.9, 132.3, 129.1, 128.3, 128.0, 127.8, 125.3, 121.3, 117.7, 79.2, 44.2, 39.3, 33.2, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 37.9; FT-IR (neat): 1664, 1431, 1165 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{24}H_{30}BN_2O_2$ $(M+H)^+$ 389.2400, found 389.2399.

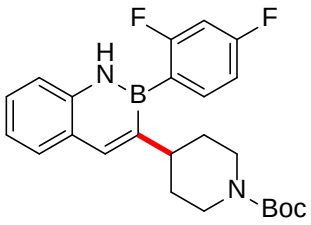


3-(4-(*N*-Boc)-Piperidenyl)-2-(4-fluorophenyl)-2,1-borazaronaphthalene (1b). The title compound was obtained as a white solid in 96% yield (195 mg). mp 169-171 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.00 (br s, 1H), 7.89 (s, 1H), 7.66 (d, J = 7.8 Hz, 1H), 7.63-7.60 (m, 2H), 7.43-7.40 (m, 1H), 7.30 (d, J = 8.1 Hz, 1H), 7.24-7.20 (m, 1H), 7.19-7.15 (m, 2H), 4.17 (br, 2H), 2.94-2.90 (m, 1H), 2.69 (br, 2H), 1.80-1.76 (m, 2H), 1.66-1.62 (m, 2H), 1.50 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 163.2 (d, J = 247 Hz), 154.9, 139.7, 138.8, 134.1 (d, J = 7.6 Hz), 129.1, 127.8, 125.3, 121.4, 117.7, 115.1 (d, J =

20 Hz), 79.2, 44.7, 39.4, 33.1, 28.6; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.2; FT-IR (neat): 3260, 1670, 1420, 1162 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{24}H_{28}BN_2O_2FNa$ $(M+Na)^+$ 429.2126, found 429.2118.

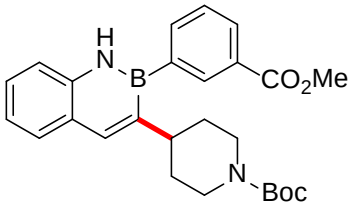


3-(4-(*N*-Boc)-Piperidenyl)-2-(3-methoxyphenyl)-2,1-borazaronaphthalene (1c). The title compound was obtained a white solid in 77% yield (161 mg). mp 93-94 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.02 (br s, 1H), 7.90 (s, 1H), 7.66 (d, J = 7.8 Hz, 1H), 7.43-7.40 (m, 2H), 7.28 (d, J = 8.3 Hz, 1H), 7.24-7.19 (m, 3H), 7.02-6.98 (m, 1H), 4.28 (br, 2H), 3.88 (s, 3H), 3.02-2.96 (m, 1H), 2.73 (br, 2H), 1.82-1.79 (m, 2H), 1.62-1.60 (m, 2H), 1.51 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 159.1, 154.9, 139.6, 138.8, 129.2, 129.1, 127.8, 125.3, 124.6, 121.3, 117.8, 117.7, 113.5, 79.2, 55.1, 45.0, 39.3, 33.2, 28.5 ; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 35.4; FT-IR (neat): 1674, 1569, 1422, 1168 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{25}H_{32}BN_2O_3$ $(M+H)^+$ 419.2506, found 419.2518.

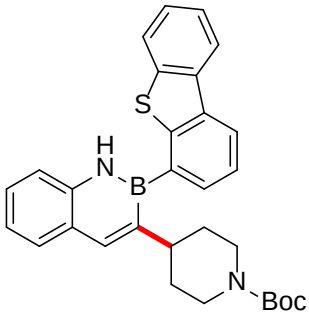


3-(4-(*N*-Boc)-Piperidenyl)-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene (1d). The title compound was obtained as a white solid in 80% yield (170 mg). mp 170-172 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.17 (br s, 1H), 7.91 (s, 1H), 7.67 (d, J = 7.8 Hz, 1H), 7.45-7.40 (m, 2H), 7.30 (d, J = 8.1 Hz, 1H), 7.25-7.22 (m, 1H), 7.00-6.97 (m, 1H), 6.90-6.87 (m, 1H), 4.18 (br, 2H), 2.73-2.61 (m, 3H), 1.76-1.73 (m, 2H), 1.58-1.55 (m, 2H), 1.49 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 164.8 (dd, J = 256, 13 Hz), 163.6 (dd, J = 256, 13 Hz), 154.8, 139.9, 138.6, 134.9 (dd, J = 1, 10 Hz), 129.1, 127.8, 125.4, 121.5,

117.8, 111.3 (dd, J = 20, 4 Hz), 103.5 (dd, J = 29, 5 Hz), 79.2, 44.3, 39.8, 33.1, 28.4.; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 33.4; FT-IR (neat): 3276, 1668, 1436, 1167 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{24}H_{27}BF_2N_2O_2Na$ $(M+Na)^+$ 447.2031, found 447.2045.

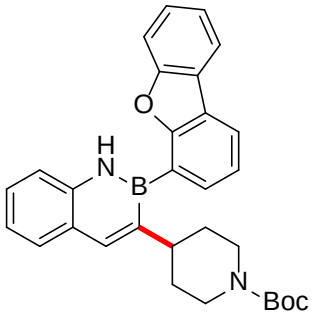


3-(4-(*N*-Boc)-Piperidenyl)-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene (1e). The title compound was obtained as a white solid in 74% yield (165 mg). mp 172-174 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.32 (br s, 1H), 8.21 (s, 1H), 8.08 (d, J = 7.6 Hz, 1H), 7.89 (s, 1H), 7.82 (d, J = 6.8 Hz, 1H), 7.65 (d, J = 7.6 Hz, 1H), 7.52-7.50 (m, 1H), 7.42-7.39 (m, 1H), 7.34-7.31 (m, 1H), 7.23-7.20 (m, 1H), 4.18 (br, 2H), 3.93 (s, 3H), 2.90-2.87 (m, 1H), 2.65 (br, 2H), 1.77-1.74 (m, 2H), 1.58-1.55 (m, 2H), 1.48 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 167.4, 154.8, 139.8, 138.8, 136.8, 136.8, 133.4, 129.6, 129.3, 129.1, 127.9, 127.9, 125.3, 121.4, 117.8, 79.2, 52.1, 44.5, 39.4, 33.1, 28.4; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 35.0; FT-IR (neat): 3324, 1707, 1682, 1427, 1231, 1167 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{26}H_{31}BN_2O_4Na$ $(M+Na)^+$ 469.2275, found 469.2273.

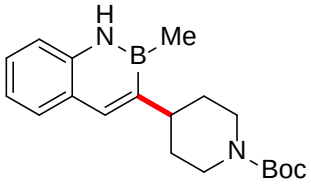


3-(4-(*N*-Boc)-Piperidenyl)-2-(4-dibenzothienyl)-2,1-borazaronaphthalene (1f). The title compound was obtained as an off-white solid in 74% yield (183 mg). mp 107-109°C; ^{1}H NMR (500

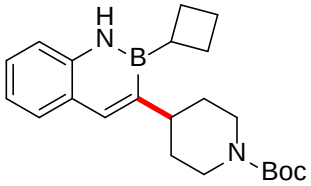
MHz, $CDCl_3$): δ 8.31 (br s, 1H), 8.21 (d, *J* = 7.6 Hz, 2H), 7.99 (s, 1H), 7.82 (d, *J* = 7.6 Hz, 1H), 7.71 (d, *J* = 7.6 Hz, 1H), 7.59-7.53 (m, 2H), 7.50-7.41 (m, 3H), 7.29-7.25 (m, 2H), 4.11 (br, 2H), 2.88-2.83 (m, 1H), 2.59-2.54 (m, 2H), 1.80-1.76 (m, 2H), 1.62-1.59 (m, 2H), 1.45 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 155.1, 143.4, 140.5, 139.7, 138.9, 137.9, 136.0, 134.9, 130.9, 129.4, 128.1, 126.8, 125.8, 124.6, 124.3, 122.9, 121.8, 121.6, 118.2, 79.4, 44.5, 39.9, 33.3, 28.7; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 35.0; FT-IR (neat): 1684, 1424, 1166 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{30}H_{31}BN_2O_2NaS$ $(M+Na)^+$ 517.2097, found 517.2096.



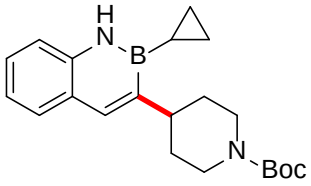
3-(4-(*N*-Boc)-Piperidenyl)-2-(4-dibenzofuranyl)-2,1-borazaronaphthalene (1g). The title compound was obtained as a white solid in 89% yield (213 mg). mp 54-56 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 8.47 (br s, 1H), 8.07-8.00 (m, 3H), 7.74-7.68 (m, 2H), 7.57 (d, *J* = 7.8 Hz, 1H), 7.50-7.43 (m, 3H), 7.41-7.38 (m, 1H), 7.36-7.34 (m, 1H), 7.28-7.25 (m, 1H), 4.19 (br, 2H), 3.02-2.99 (m, 1H), 2.64 (br, 2H), 1.92-1.89 (m, 2H), 1.68-1.65 (m, 2H), 1.49 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 158.8, 155.9, 154.9, 140.0, 138.8, 131.7, 129.1, 127.8, 127.0, 125.5, 124.3, 123.2, 122.7, 122.6, 121.4, 121.0, 120.7, 117.9, 111.5, 79.1, 44.8, 39.7, 33.2, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.4; FT-IR (neat): 1684, 1425, 1186, 1168 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{30}H_{32}BN_2O_3$ $(M+H)^+$ 479.2506, found 479.2509.



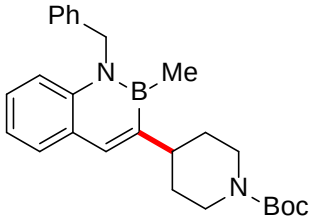
3-(4-(*N*-Boc)-Piperidenyl)-2-methyl-2,1-borazaronaphthalene (1h). The title compound was obtained as a white solid in 62% yield (101 mg). mp 131-133 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.76 (br s, 1H), 7.64 (s, 1H), 7.56 (d, J = 7.8 Hz, 1H), 7.37-7.33 (m, 1H), 7.19 (d, J = 8.1 Hz, 1H), 7.15-7.11 (m, 1H), 4.31 (br, 2H), 2.85 (br, 2H), 2.75-2.71 (m, 1H), 1.82-1.78 (m, 2H), 1.63-1.60 (m, 2H), 1.53 (s, 9H), 0.79 (s, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 139.1, 137.2, 128.9, 127.2, 125.0, 120.6, 117.1, 79.2, 44.5, 40.8, 32.5, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 37.0; FT-IR (neat): 3314, 1672, 1435, 1164 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{19}H_{27}BN_2O_2Na$ $(M+Na)^+$ 349.2063, found 349.2076.



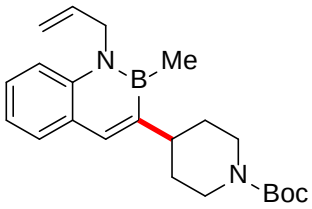
3-(4-(*N*-Boc)-Piperidenyl)-2-cyclobutyl-2,1-borazaronaphthalene (1i). The title compound was obtained as a yellow oil in 37% yield (68 mg). ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.75 (br s, 1H), 7.66 (s, 1H), 7.56 (d, J = 7.6 Hz, 1H), 7.38-7.34 (m, 1H), 7.26 (d, J = 8.3 Hz, 1H), 7.16-7.12 (m, 1H), 4.27 (br, 2H), 2.81 (br, 2H), 2.70-2.64 (m, 2H), 2.29-2.26 (m, 3H), 2.13-2.10 (m, 2H), 2.01-1.99 (m, 1H), 1.77-1.74 (m, 2H), 1.59-1.54 (m, 2H), 1.50 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 138.8, 137.8, 128.8, 127.3, 125.2, 120.7, 117.3, 79.2, 44.8, 39.9, 32.3, 28.4, 25.7, 22.2; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 36.8; FT-IR (neat): 1684, 1674, 1425, 1168 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{22}H_{32}BN_2O_2$ $(M+H)^+$ 367.2557, found 367.2551.



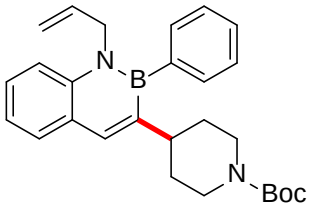
3-(4-(*N*-Boc)-Piperidenyl)-2-cyclopropyl-2,1-borazaronaphthalene (1j). The title compound was obtained as a white solid in 88% yield (155 mg). mp 199-202 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.62 (s, 1H), 7.54 (d, *J* = 7.6 Hz, 1H), 7.33-7.29 (m, 1H), 7.14-7.10 (m, 3H), 4.30 (br, 2H), 2.93-2.86 (m, 3H), 1.94-1.92 (m, 2H), 1.68-1.64 (m, 2H), 1.52 (s, 9H), 0.92-0.89 (m, 2H), 0.56-0.52 (m, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 138.9, 136.9, 128.8, 127.2, 124.9, 120.5, 117.1, 79.2, 44.6, 40.6, 32.6, 28.5, 6.1; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 36.7; FT-IR (neat): 3318, 1670, 1430, 1159, 1122 cm^{-1}; HRMS (CI) *m/z* calcd. for $C_{21}H_{29}BN_2O_2$ $(M)^+$ 352.2322, found 352.2321.



1-Benzyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1k). The title compound was obtained as a light yellow solid in 84% yield (175 mg). mp 47-50 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.72 (s, 1H), 7.63 (d, *J* = 7.8 Hz, 1H), 7.33-7.29 (m, 4H), 7.27-7.24 (m, 1H), 7.17-7.13 (m, 3H), 5.36 (s, 2H), 4.36 (br, 2H), 2.91-2.85 (m, 3H), 1.92-1.88 (m, 2H), 1.68-1.65 (m, 2H), 1.57 (s, 9H), 0.90 (s, 3H).; ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 140.5, 138.4, 137.5, 129.8, 128.7, 127.6, 126.8, 126.3, 125.7, 120.6, 115.6, 79.3, 51.2, 44.8, 40.3, 32.7, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 39.2; FT-IR (neat): 1689, 1424, 1364, 1230, 1168 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{26}H_{33}BN_2O_2Na$ $(M+Na)^+$ 439.2533, found 439.2530.

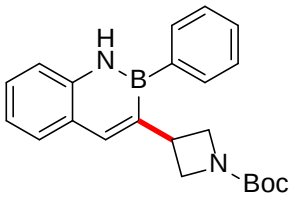


1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1l). The title compound was obtained as an off-white solid in 51% yield (93 mg). mp 146-148 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.62-7.58 (m, 2H), 7.42-7.39 (m, 2H), 7.17-7.15 (m, 1H), 6.08-6.01 (m, 1H), 5.15 (dd, J = 10.5, 1.5 Hz 1H), 4.98 (dd, J = 17.2, 1.3 Hz, 1H), 4.72-4.69 (m, 2H), 4.31 (br, 2H), 2.86-2.79 (m, 3H), 1.83-1.80 (m, 2H), 1.58-1.52 (m, 2H), 1.48 (s, 9H), 0.84 (s, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.9, 140.3, 137.1, 134.3, 129.7, 127.4, 126.1, 120.3, 115.5, 115.0, 79.2, 49.5, 44.5, 40.3, 32.6, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 39.2; FT-IR (neat): 1671, 1426, 1162, 1120cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{22}H_{31}BN_2O_2Na$ $(M+Na)^+$ 389.2376, found 389.2367.

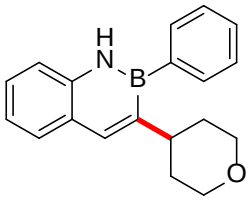


1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1m). The title compound was obtained as a light yellow oil in 90% yield (193 mg). ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.87 (s, 1H), 7.72-7.69 (m, 1H), 7.52-7.42 (m, 7H), 7.28-7.25 (m, 1H), 5.97-5.94 (m, 1H), 5.16 (d, J = 10.3 Hz, 1H), 4.96 (d, J = 17.4 Hz, 1H), 4.65-4.62 (m, 2H), 4.17 (br, 2H), 2.57-2.50 (m, 3H), 1.72-1.70 (m, 2H), 1.56-1.48 (m, 11H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.8, 139.8, 139.3, 135.1, 130.1, 129.9, 127.8, 127.6, 127.3, 127.7, 121.1, 116.2, 115.8, 79.1, 51.1, 44.6, 39.9, 32.9, 28.5; ^{11}B NMR (128.38 MHz,

$CDCl_3$) δ 37.5; FT-IR (neat): 1689, 1427, 1364, 1168 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{27}H_{33}BN_2O_2Na$ $(M+Na)^+$ 451.2533, found 451.2533

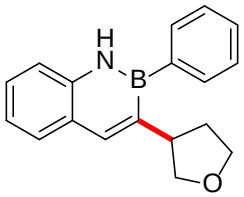


3-(3-(*N*-Boc)-Azetidinyl)-2-phenyl-2,1-borazaronaphthalene (2a). The reaction temperature was 50 °C. The title compound was obtained as an off-white solid in 61% yield (110 mg). mp 46-48 °C; ^1H NMR (500 MHz, $CDCl_3$): δ 8.02 (s, 1H), 7.96 (s, 1H), 7.70-7.67 (m, 1H), 7.57-7.54 (m, 2H), 7.45-7.41 (m, 4H), 7.30-7.26 (m, 1H), 7.25-7.22 (m, 1H), 4.17-4.14 (m, 2H), 4.12-4.08 (m, 1H), 3.95 (br, 2H), 1.46 (s, 9H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 156.5, 139.9, 139.1, 132.2, 129.1, 128.6, 128.2, 128.0, 124.9, 121.4, 117.8, 79.2, 32.2, 28.4, 27.6; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.5; FT-IR (neat): 1682, 1410, 1366, 1150 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{22}H_{26}BN_2O_2$ $(M+H)^+$ 361.2087, found 361.2094.

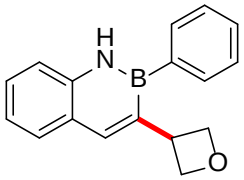


2-Phenyl-3-(4-tetrahydro-2*H*-pyranyl)-2,1-borazaronaphthalene (2b). The title compound was obtained as a light brown oil in 90% yield (130 mg). ^1H NMR (500 MHz, $CDCl_3$): δ 8.01 (br s, 1H), 7.96 (s, 1H), 7.72-7.68 (m, 3H), 7.53-7.43 (m, 4H), 7.32-7.24 (m, 2H), 4.09-4.06 (m, 2H), 3.51-3.46 (m, 2H), 3.14-3.09 (m, 1H), 1.84-1.74 (m, 4H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 139.6, 138.9, 132.2, 129.1, 128.3, 128.0, 127.8, 125.3, 121.3, 117.7, 117.6, 68.6, 38.4, 34.0; ^{11}B NMR (128.38 MHz, $CDCl_3$)

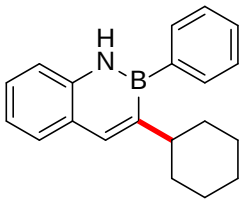
δ 34.5; FT-IR (neat): 1734, 1721, 1242 cm^{-1}; HRMS (CI+) *m/z* calcd. for $C_{19}H_{21}BNO$ $(M+H)^+$ 290.1716, found 290.1730.



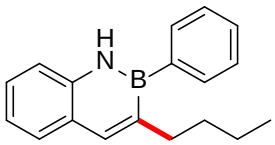
2-Phenyl-3-(3-tetrahydrofuranyl)-2,1-borazaronaphthalene (2c). The title compound was obtained as a light brown oil in 48% yield (66 mg). ^1H NMR (500 MHz, $CDCl_3$): δ 8.03 (s, 1H), 8.00 (s, 1H), 7.70-7.76 (m, 3H), 7.50-7.44 (m, 4H), 7.30-7.24 (m, 2H), 4.09-4.04 (m, 2H), 3.94-3.89 (m, 1H), 3.79-3.68 (m, 2H), 2.31-2.25 (m, 1H), 2.07-2.00 (m, 1H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 140.0, 138.9, 132.4, 129.2, 128.4, 128.0, 127.9, 125.2, 121.3, 117.7, 74.8, 68.2, 42.3, 34.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.5; FT-IR (neat): 1615, 1567, 1429, 1239 cm^{-1}; HRMS (CI+) *m/z* calcd. for $C_{18}H_{19}BNO$ $(M+H)^+$ 276.1560, found 276.1567.



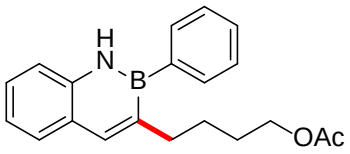
3-(3-Oxetanyl)-2-phenyl-2,1-borazaronaphthalene (2d). The title compound was obtained as an off-white solid in 59% yield (77 mg). mp 117-119 °C; ^1H NMR (500 MHz, $CDCl_3$): δ 8.10 (s, 2H), 7.74 (d, J = 7.8 Hz, 1H), 7.60-7.55 (m, 2H), 7.49-7.44 (m, 4H), 7.32-7.26 (m, 2H), 4.96-4.93 (m, 2H), 4.82-4.79 (m, 2H), 4.65-4.62 (m, 1H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 139.9, 139.1, 132.2, 129.2, 128.6, 128.1, 125.1, 121.5, 117.8, 117.8, 78.6, 38.7; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.0; FT-IR (neat): 3286, 1616, 1574, 1458 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_7H_{16}BNO$ $(M)^+$ 261.1325, found 261.1326.



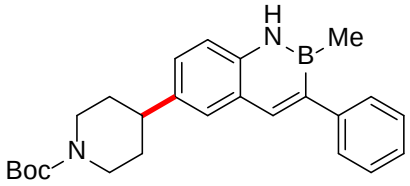
3-Cyclohexyl-2-phenyl-2,1-borazaronaphthalene (2e). The title compound was obtained as a white solid in 62% yield (89 mg). mp 86-87 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.90 (s, 1H), 7.66-7.62 (m, 3H), 7.46-7.42 (m, 3H), 7.38-7.35 (m, 1H), 7.24-7.20 (m, 2H), 7.18-7.15 (m, 1H), 2.83-2.80 (m, 1H), 1.86-1.83 (m, 2H), 1.80-1.76 (m, 2H), 1.72-1.69 (m, 1H), 1.41-1.27 (m, 5H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 139.0, 138.8, 132.5, 129.0, 127.9, 127.4, 125.6, 121.1, 117.7, 117.6, 41.1, 34.6, 27.1, 26.4; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.4; FT-IR (neat): 2927, 1613, 1422 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{20}H_{22}BN$ $(M)^+$ 287.1845, found 287.1845.



3-Butyl-2-phenyl-2,1-borazaronaphthalene (2f). The title compound was obtained as a light brown oil in 70% yield (91 mg). ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.91 (s, 1H), 7.86 (s, 1H), 7.72-7.69 (m, 2H), 7.65-7.62 (m, 1H), 7.48-7.42 (m, 3H), 7.41-7.38 (m, 1H), 7.27-7.23 (m, 1H), 7.22-7.18 (m, 1H), 2.77-2.73 (m, 2H), 1.52-1.48 (m, 2H), 1.37-1.32 (m, 2H), 0.90-0.87 (m, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 141.8, 139.0, 132.5, 128.8, 128.4, 128.0, 127.3, 125.5, 121.1, 117.7, 34.9, 33.5, 22.7, 14.0; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ33.6; FT-IR (neat): 1614, 1566, 1423 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{18}H_{20}BN$ $(M)^+$ 261.1689, found 261.1697.



4-(2-Phenyl-2,1-borazaronaphthyl)butyl acetate (2g). The title compound was obtained as a light brown oil in 91% yield (145 mg). ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.99 (br s, 1H), 7.88 (s, 1H), 7.73-7.70 (m, 2H), 7.67 (d, *J* = 7.8 Hz, 1H), 7.51-7.40 (m, 4H), 7.31-7.28 (m, 1H), 7.24-7.21 (m, 1H), 4.04 (t, *J* = 6.5 Hz, 2H), 2.81 (t, *J* = 7.5 Hz, 2H), 2.03 (s, 3H), 1.67-1.62 (m, 2H), 1.61-1.56 (m, 2H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 171.2, 142.1, 139.1, 132.3, 128.8, 128.4, 128.0, 127.5, 125.3, 121.2, 117.7, 64.4, 34.8, 28.4, 27.3, 21.0; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 34.6; FT-IR (neat): 1734, 1722, 1615, 1241 cm^{-1}; HRMS (CI) *m/z* calcd. for $C_{20}H_{22}BNO_2$ $(M)^+$ 319.1744, found 319.1732.

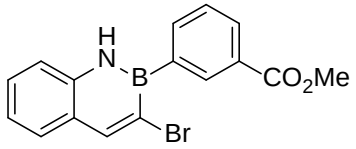


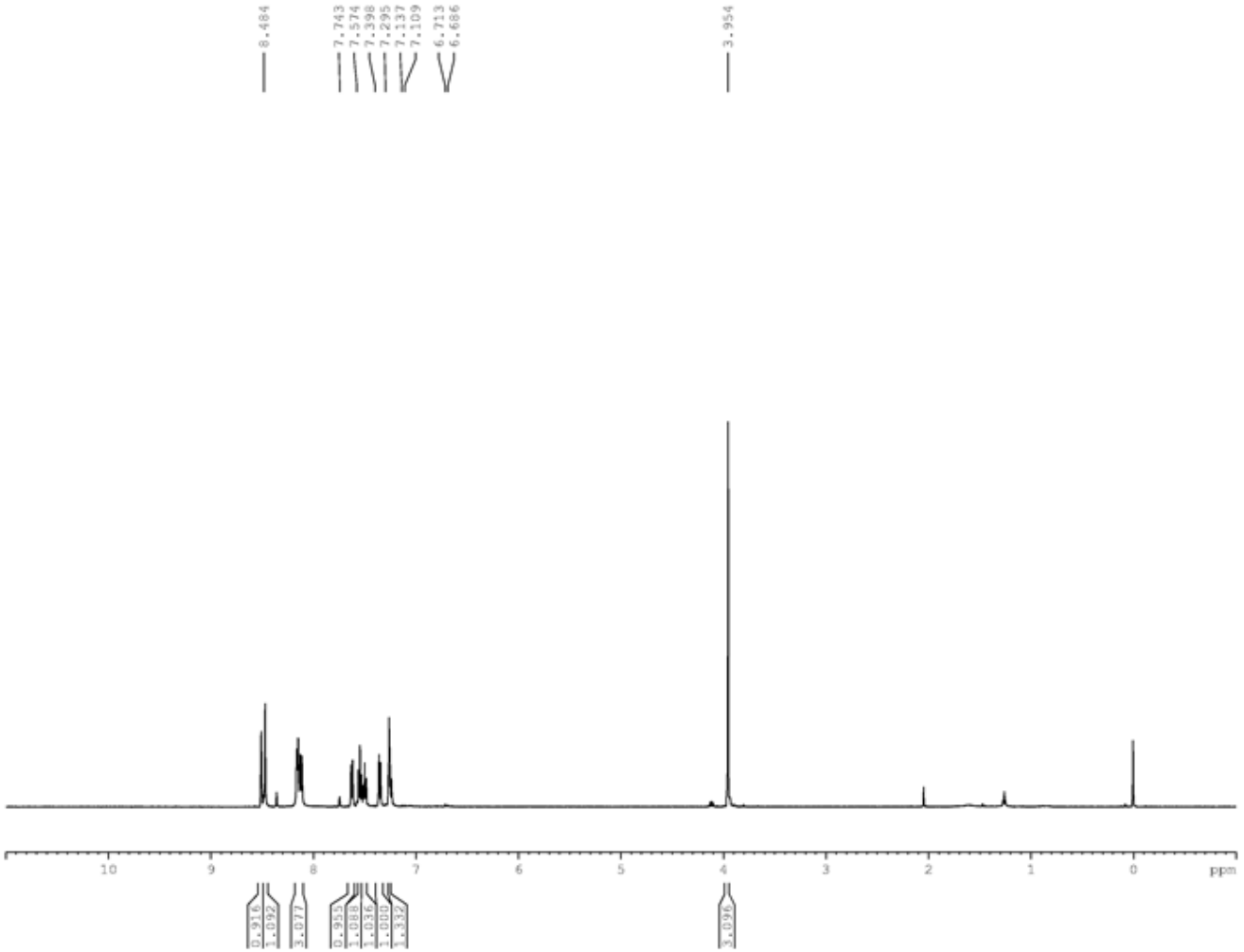
6-(4-(*N*-Boc)-Piperidinyl)-2-methyl-3-phenyl-2,1-borazaronaphthalene (3a). The title compound was obtained as a white solid in 51% yield (102 mg). mp 62-64 °C; ^{1}H NMR (500 MHz, $CDCl_3$): δ 7.86 (br s, 2H), 7.48-7.44 (m, 5H), 7.35-7.32 (m, 1H), 7.29-7.26 (m, 1H), 7.21 (d, *J* = 8.1 Hz, 1H), 4.31 (br, 2H), 2.86 (br, 2H), 2.75-2.72 (m, 1H), 1.91-1.88 (m, 2H), 1.72-1.67 (m, 2H), 1.54 (s, 9H), 0.85 (s, 3H); ^{13}C NMR (125.8 MHz, $CDCl_3$): δ 154.8, 144.8, 141.3, 138.3, 138.2, 128.1, 128.1, 127.0, 126.9, 125.9, 124.9, 117.4, 79.4, 44.7, 42.1, 33.5, 28.5; ^{11}B NMR (128.38 MHz, $CDCl_3$) δ 37.3; FT-IR (neat): 3314, 2932, 1673, 1164 cm^{-1}; HRMS (ES+) *m/z* calcd. for $C_{25}H_{31}BN_2O_2Na$ $(M+Na)^+$ 425.2376, found 425.2377.

References:

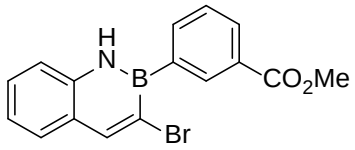
(1) Wisniewski; S. R.; Guenther, C. G.; Argintaru, O. A.; Molander, G. A. *J. Org. Chem.* **2014**, *79*, 365.
(2) Molander, G. A.; Wisniewski, S. R. Manuscript Submitted.

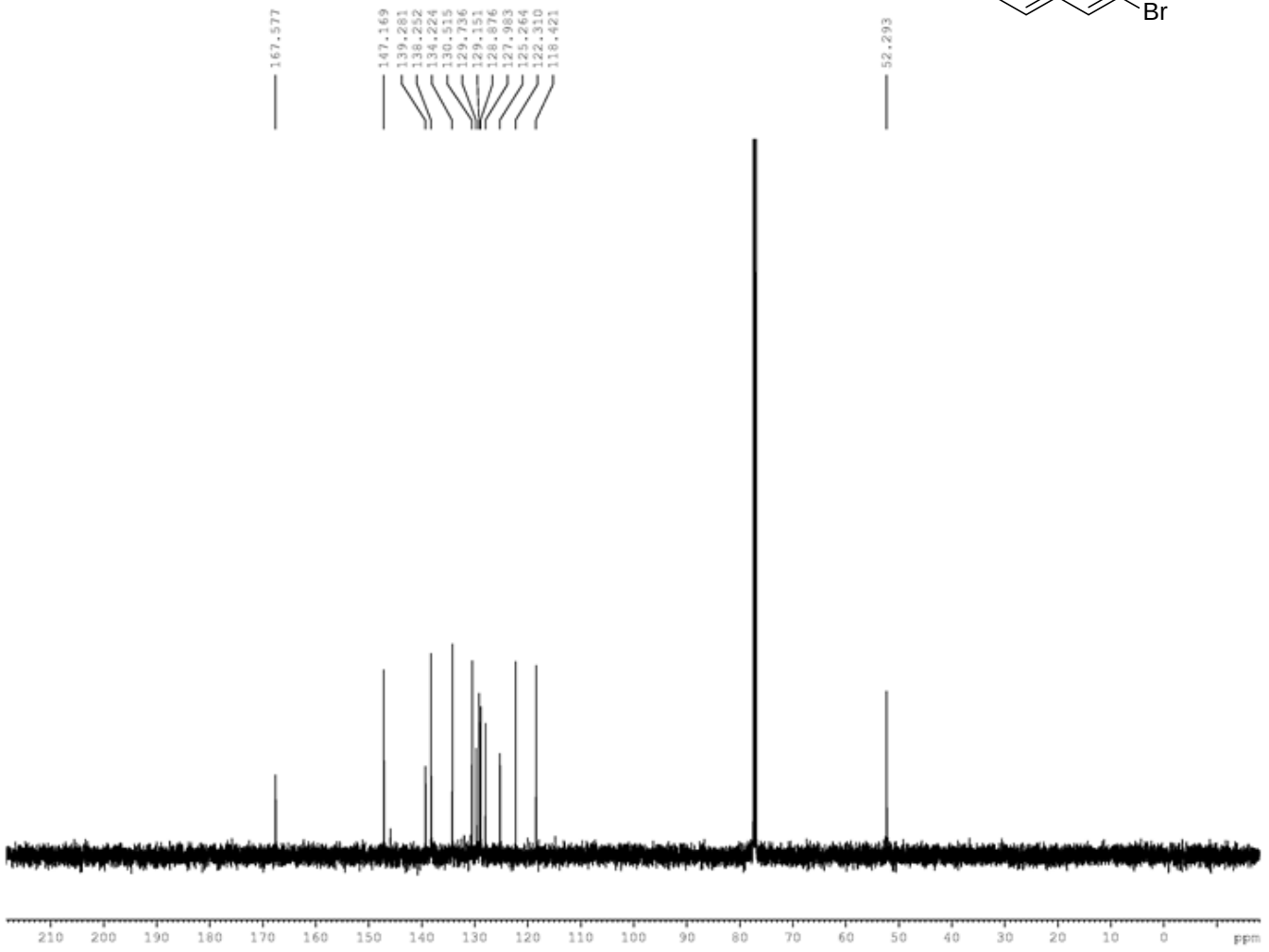
^{1}H NMR (500 MHz, $CDCl_3$) of **3-Bromo-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene**



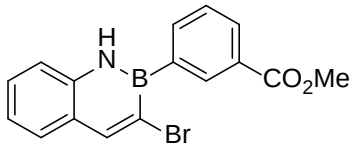


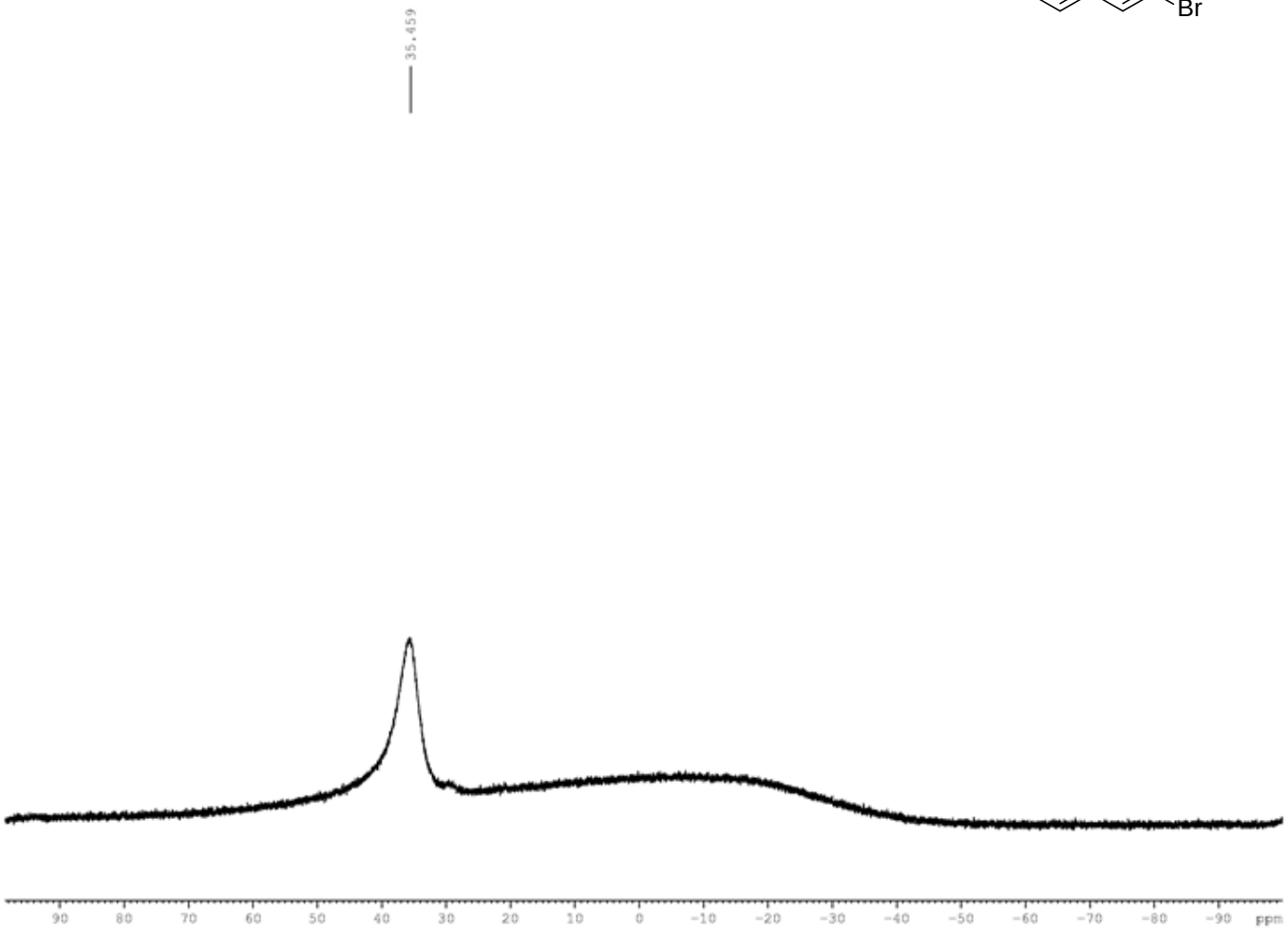
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-Bromo-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene**



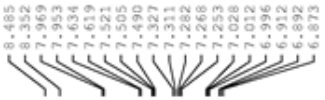


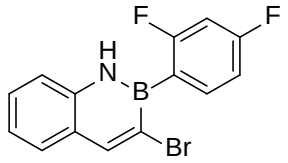
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-Bromo-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene**

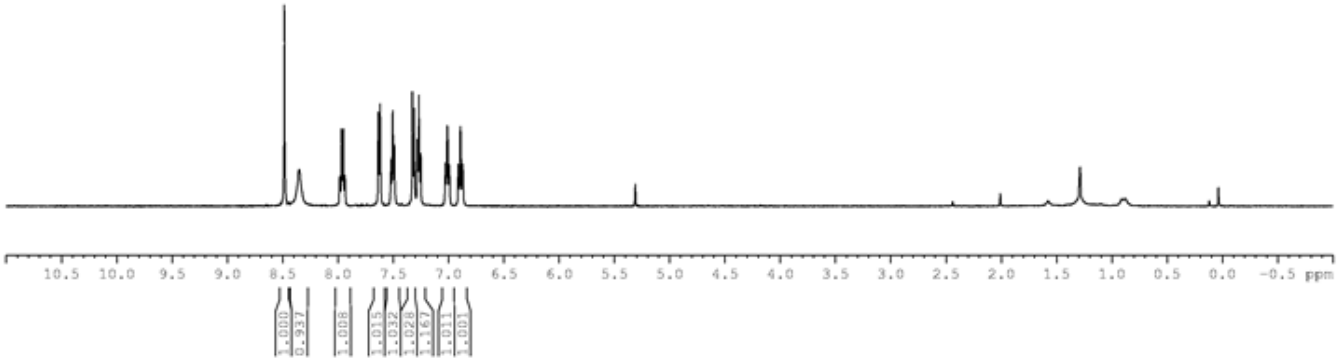




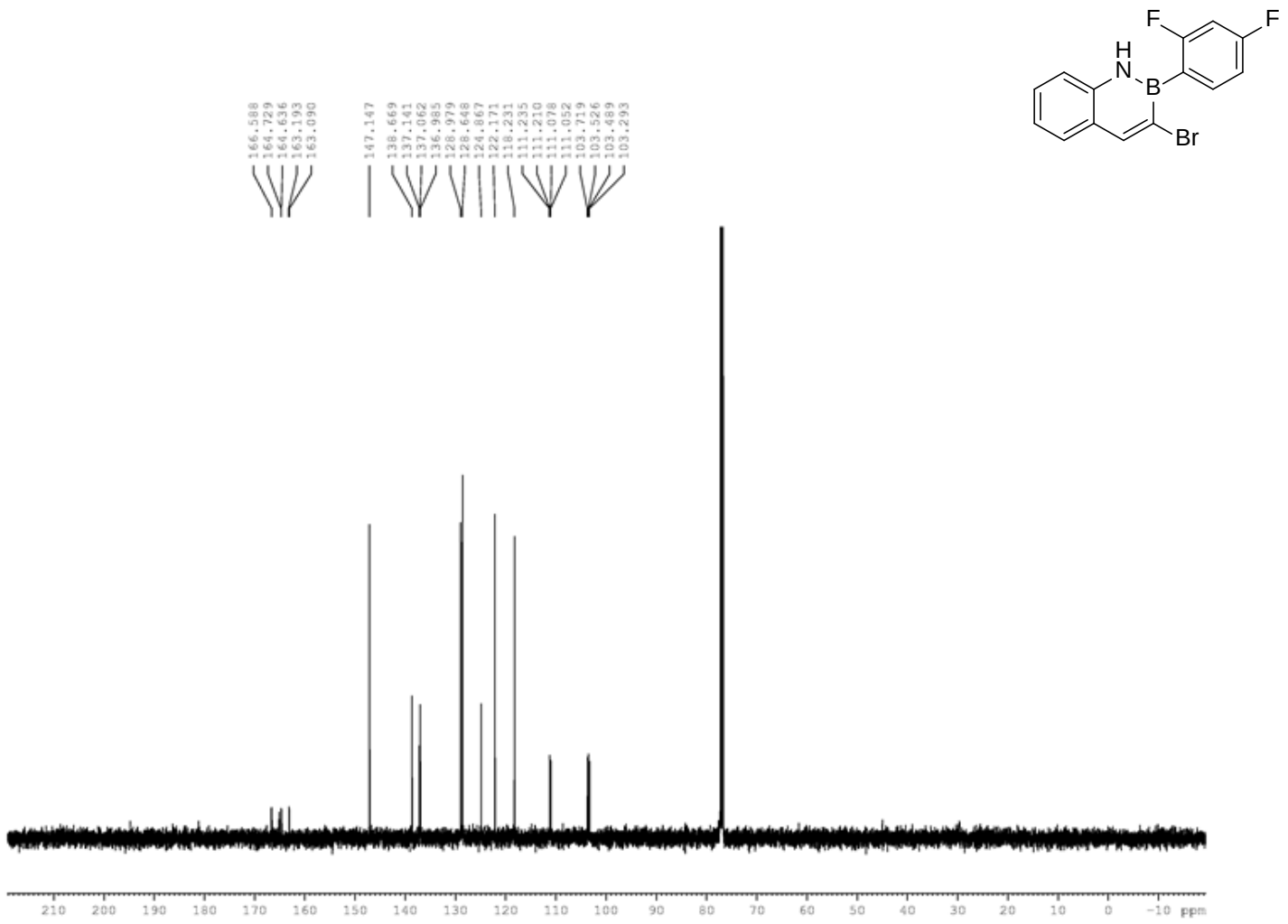
^{1}H NMR (500 MHz, $CDCl_3$) of **3-Bromo-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene**



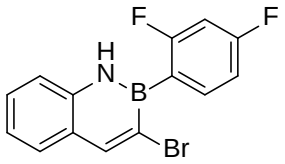


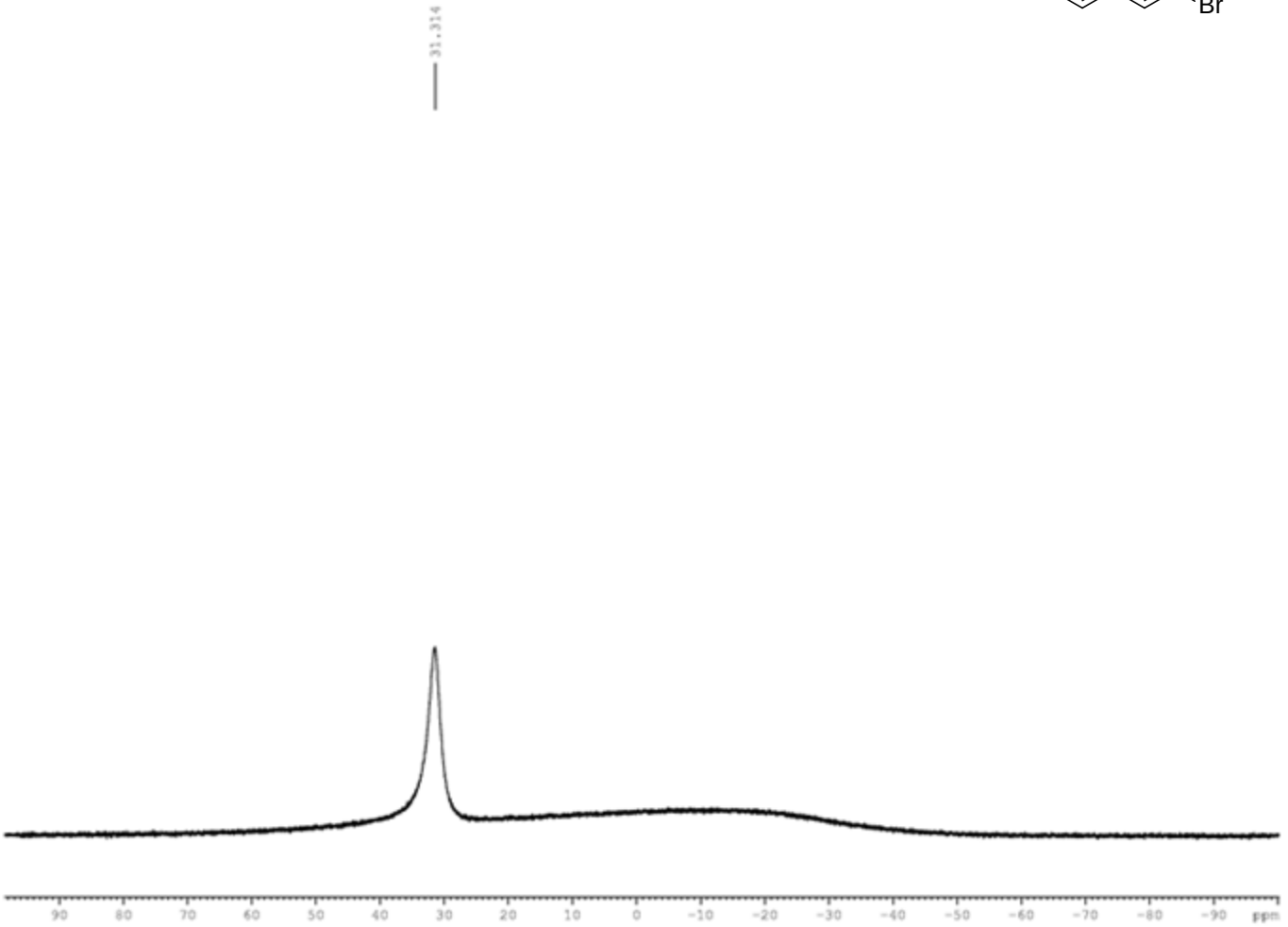


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-Bromo-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene**

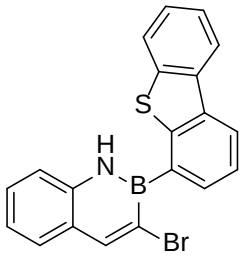


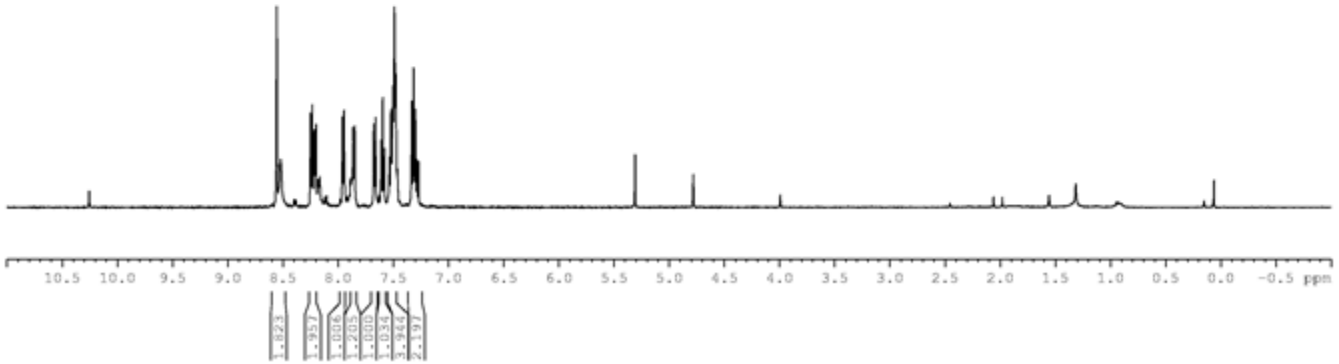
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-Bromo-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene**



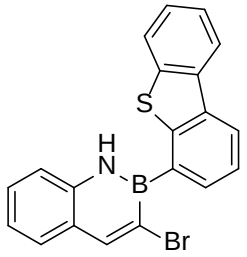


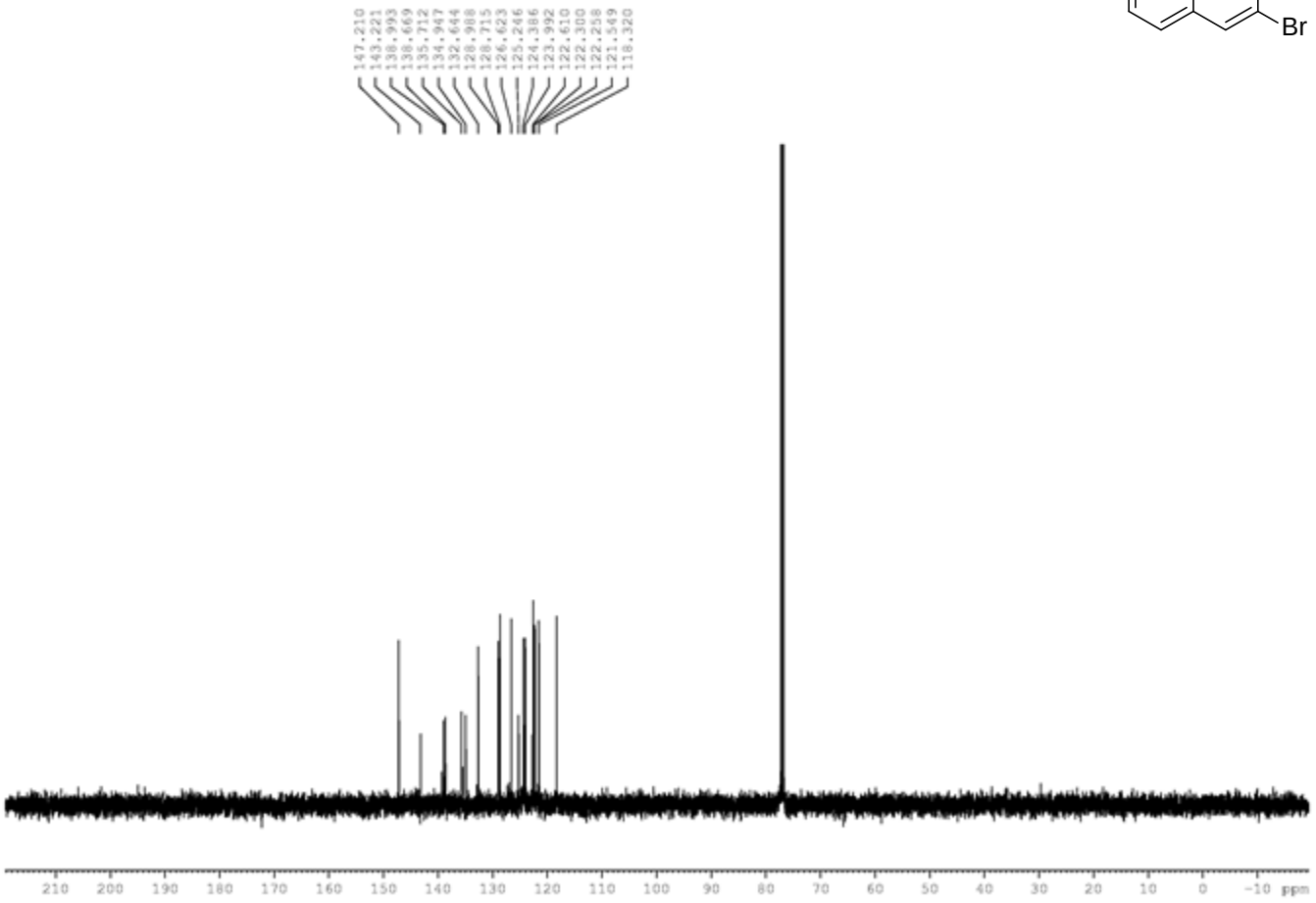
^{1}H NMR (500 MHz, $CDCl_3$) of **3-Bromo-2-(4-dibenzothienyl)-2,1-borazaronaphthalene**



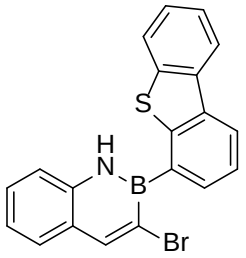


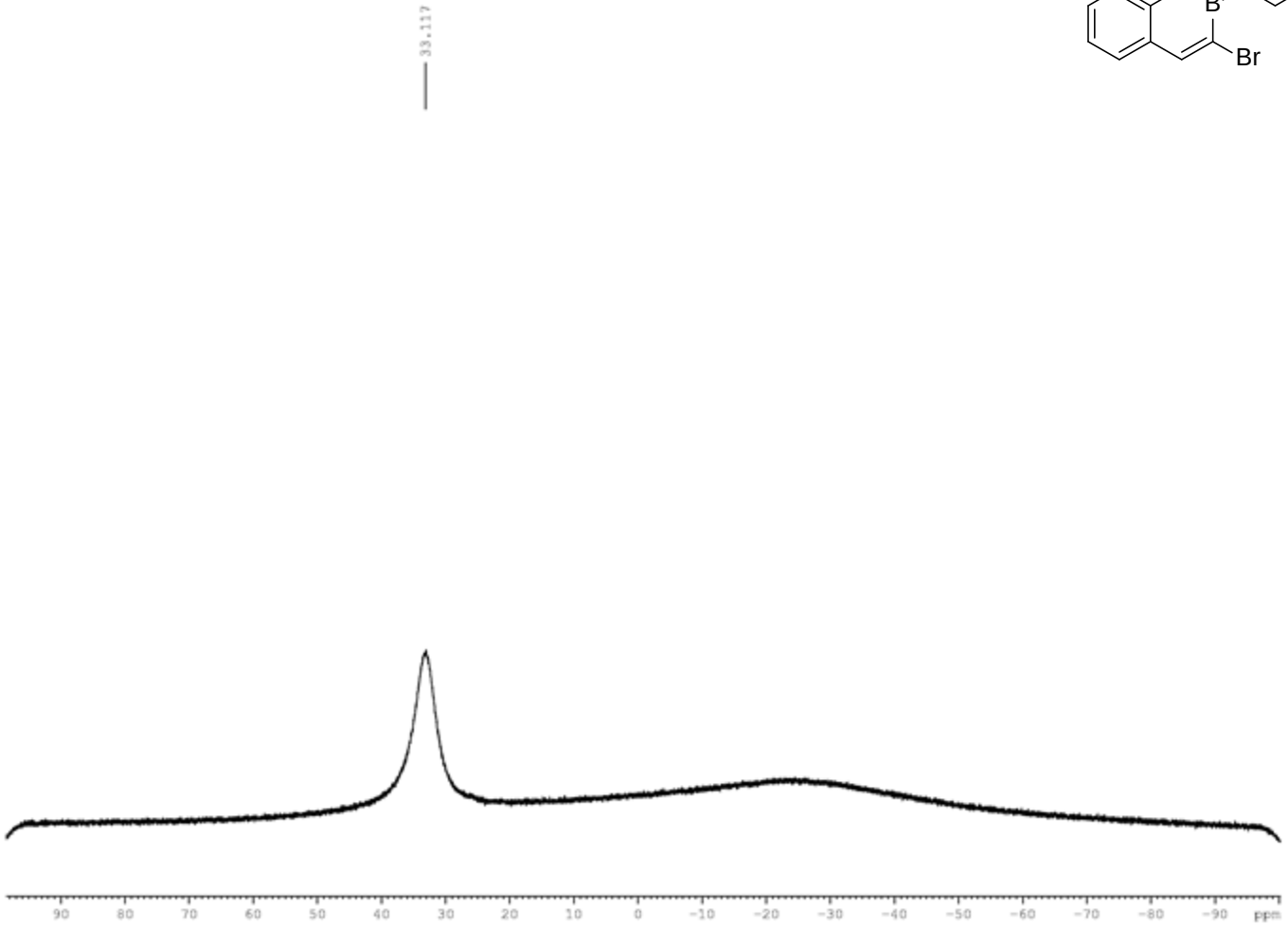
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-Bromo-2-(4-dibenzothienyl)-2,1-borazaronaphthalene**



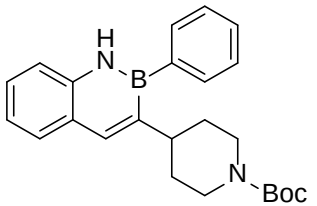


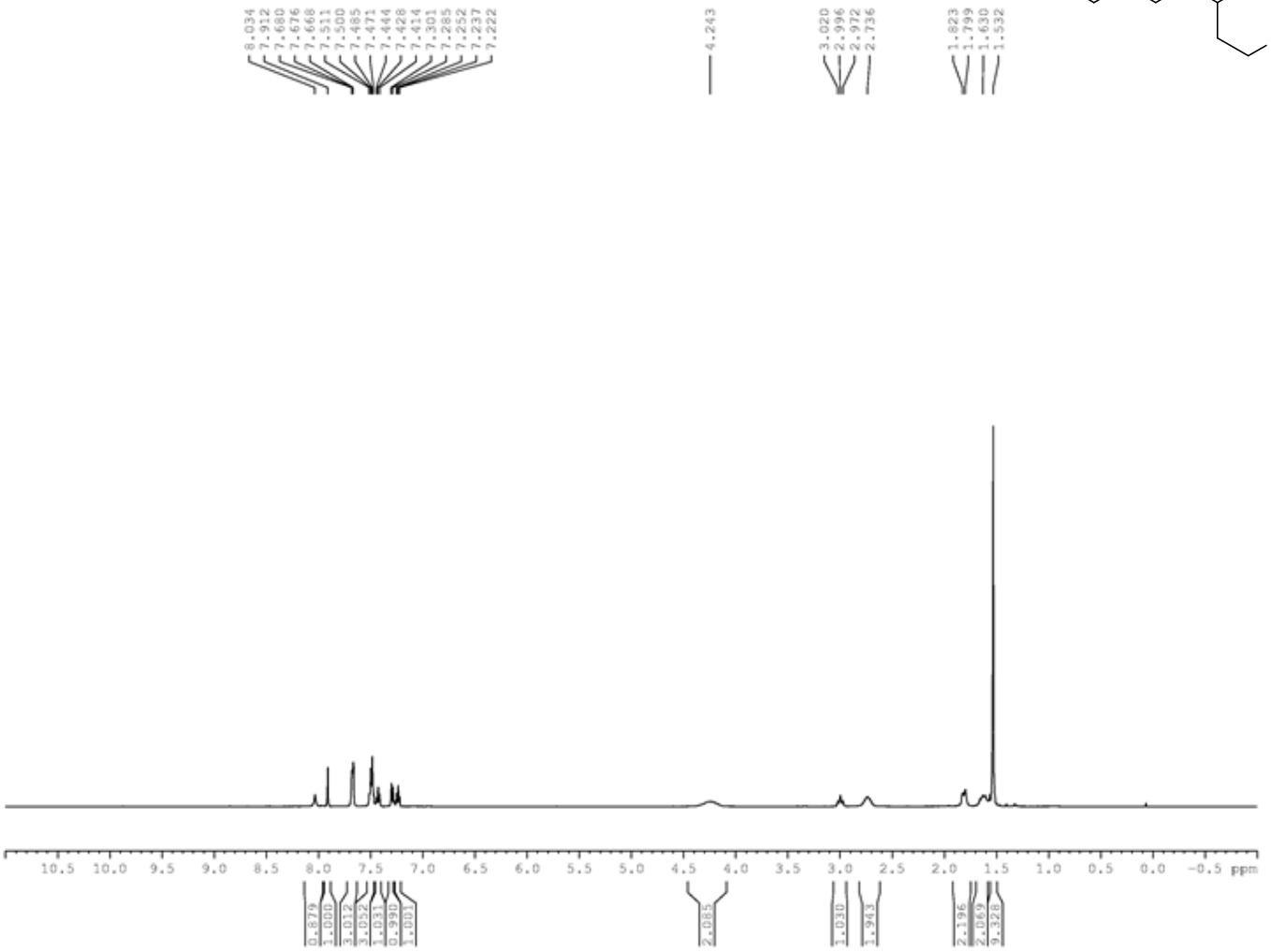
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-Bromo-2-(4-dibenzothienyl)-2,1-borazaronaphthalene**



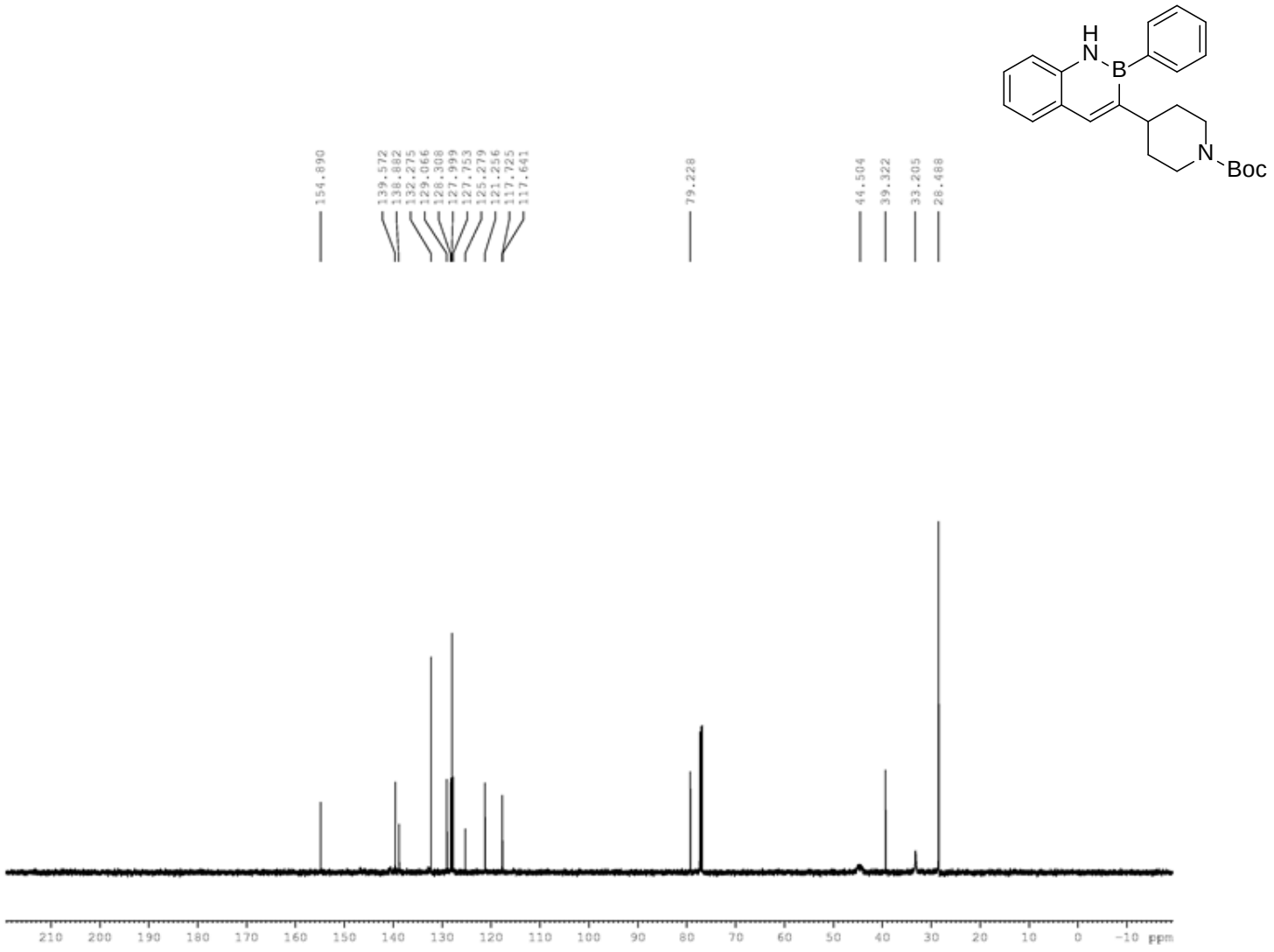


^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1a)**

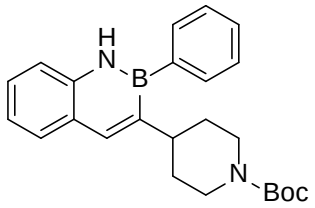


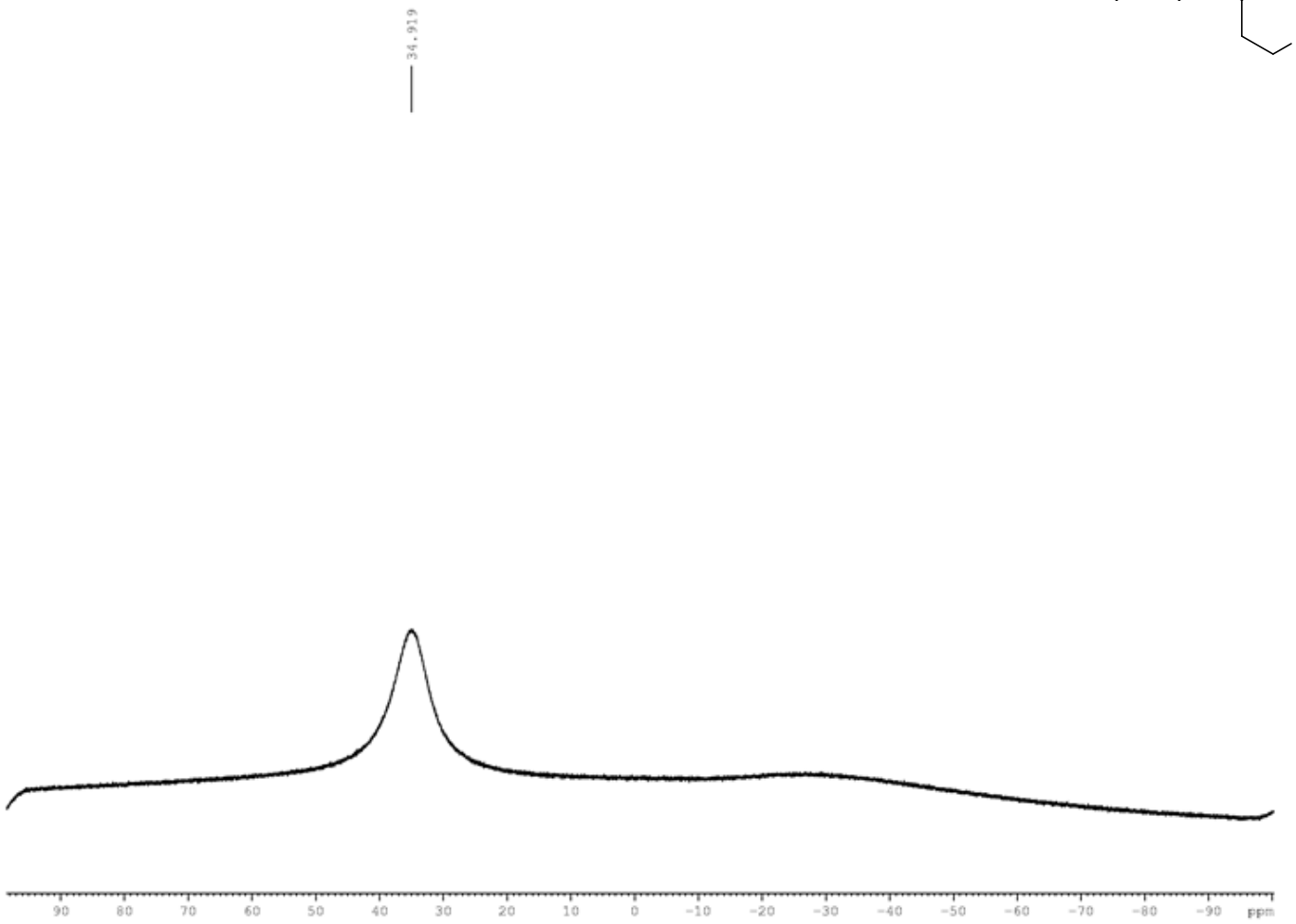


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1a)**

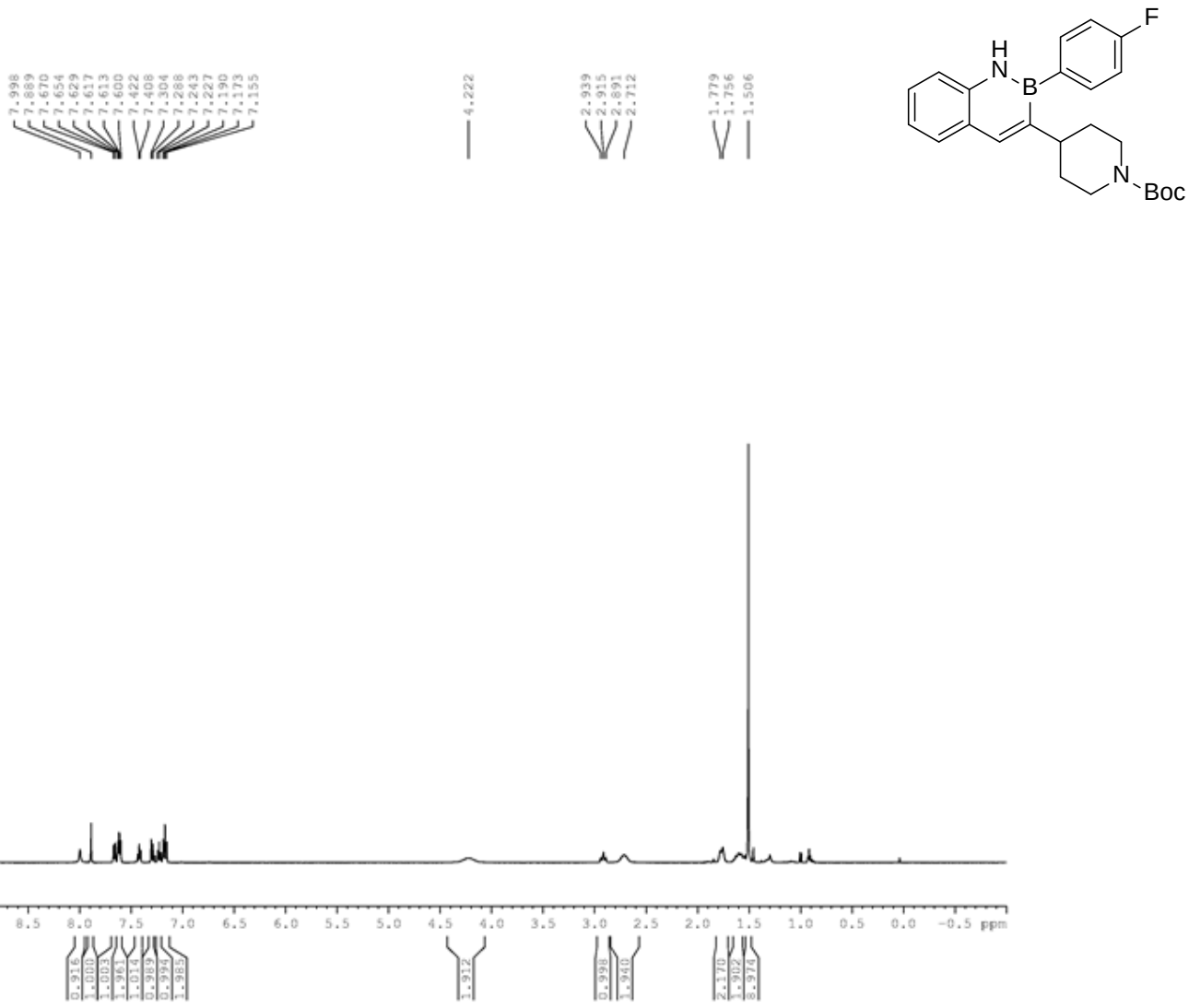


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1a)**

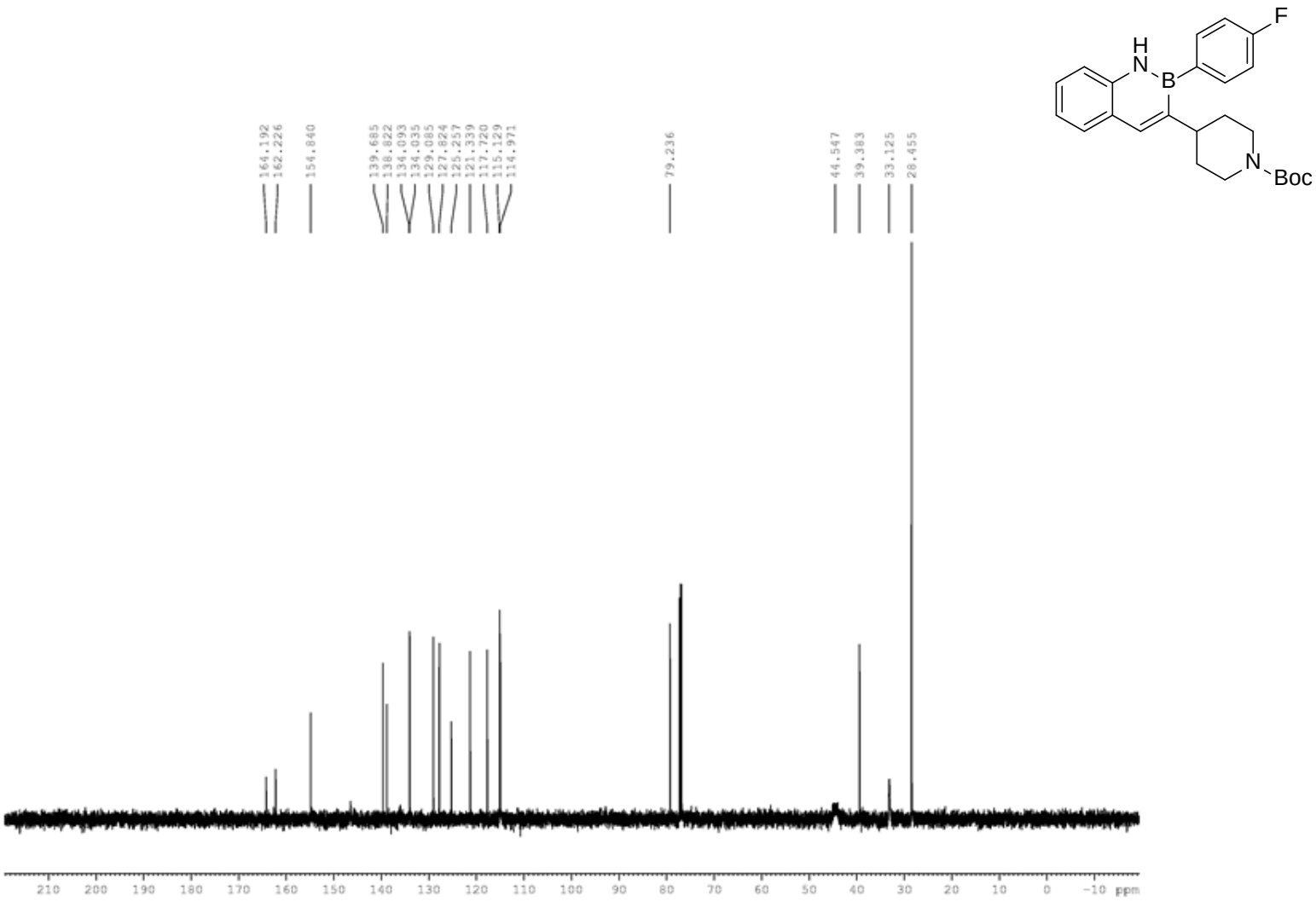




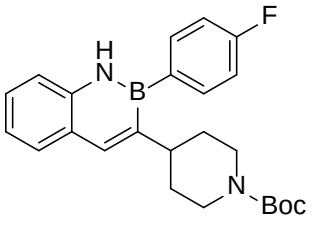
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-fluorophenyl)-2,1-borazaronaphthalene (1b)**

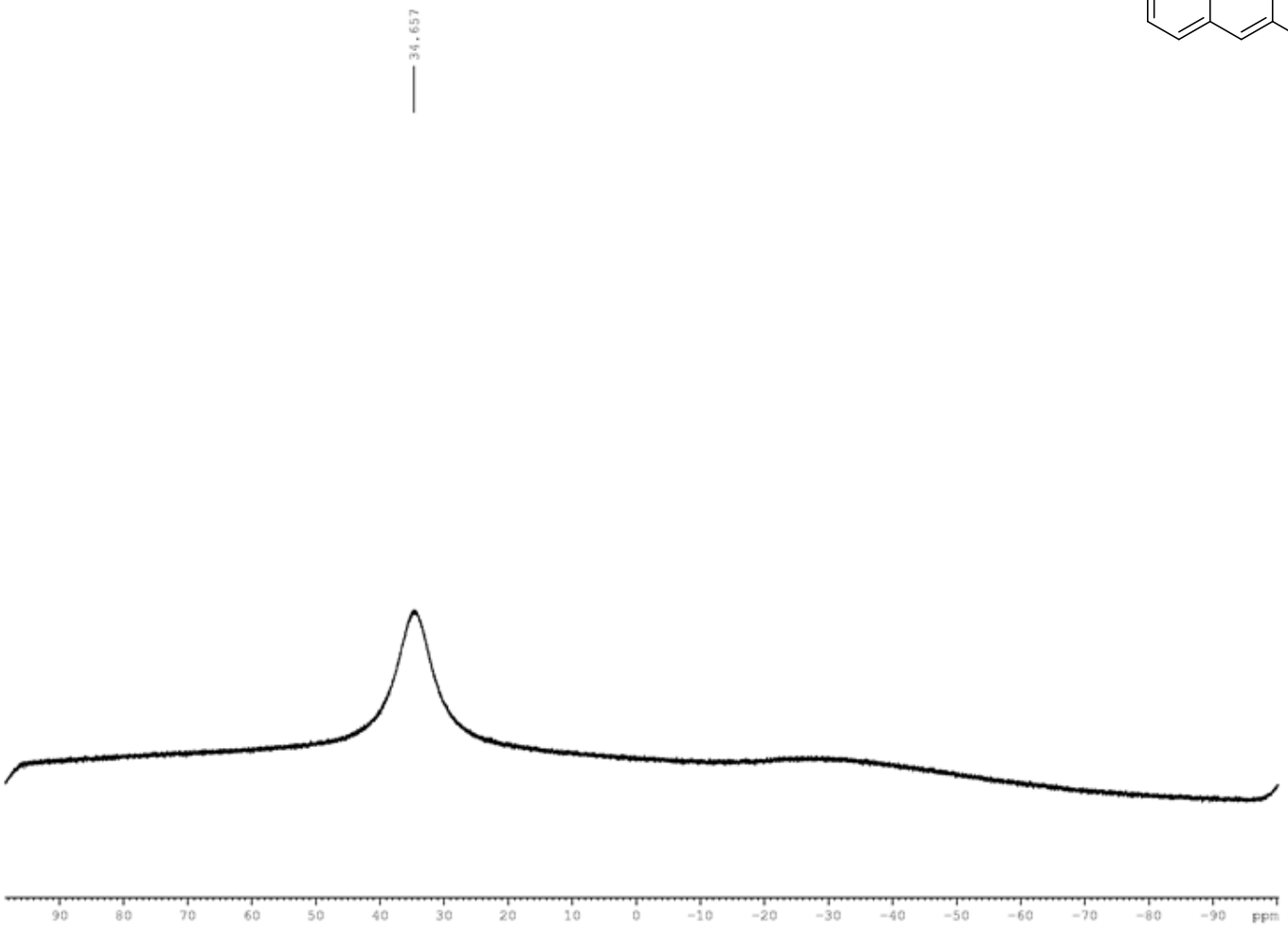


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-fluorophenyl)-2,1-borazaronaphthalene (1b)**

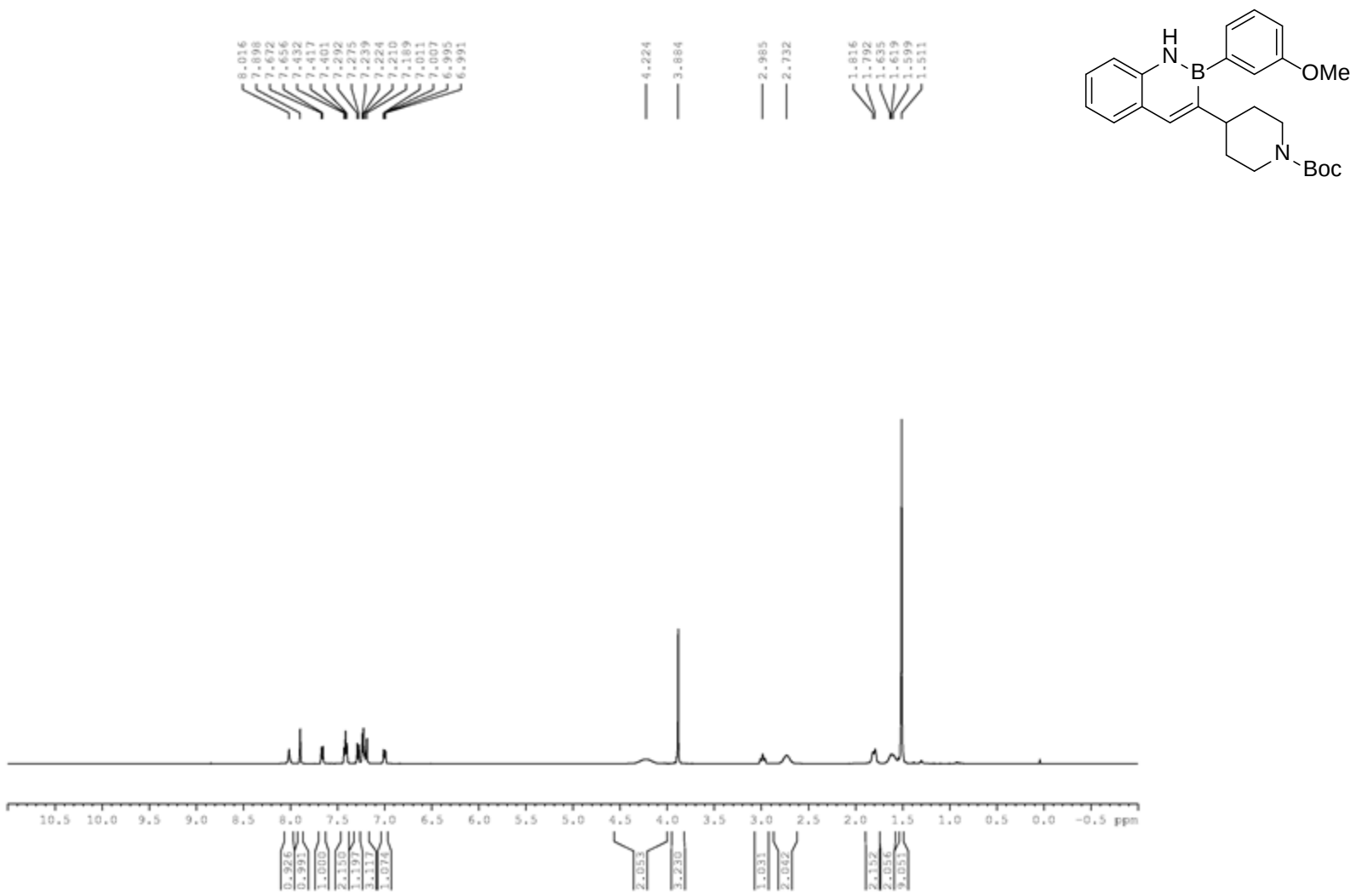


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-fluorophenyl)-2,1-borazaronaphthalene (1b)**

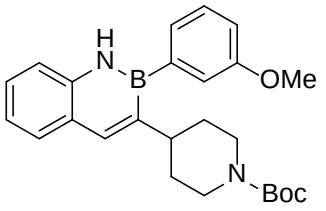


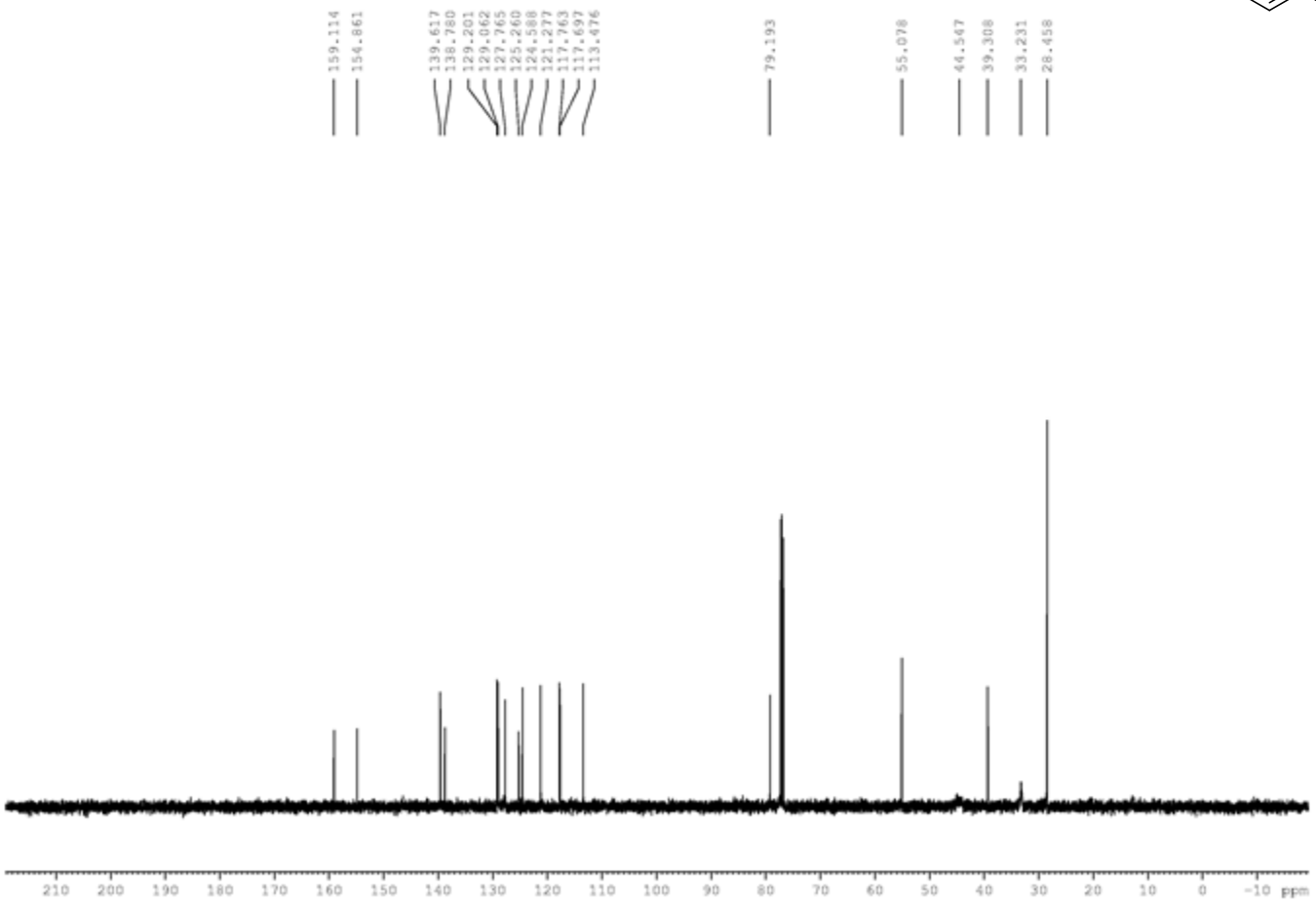


^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-methoxyphenyl)-2,1-borazaronaphthalene (1c)**

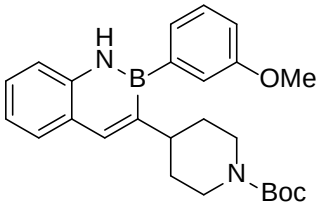


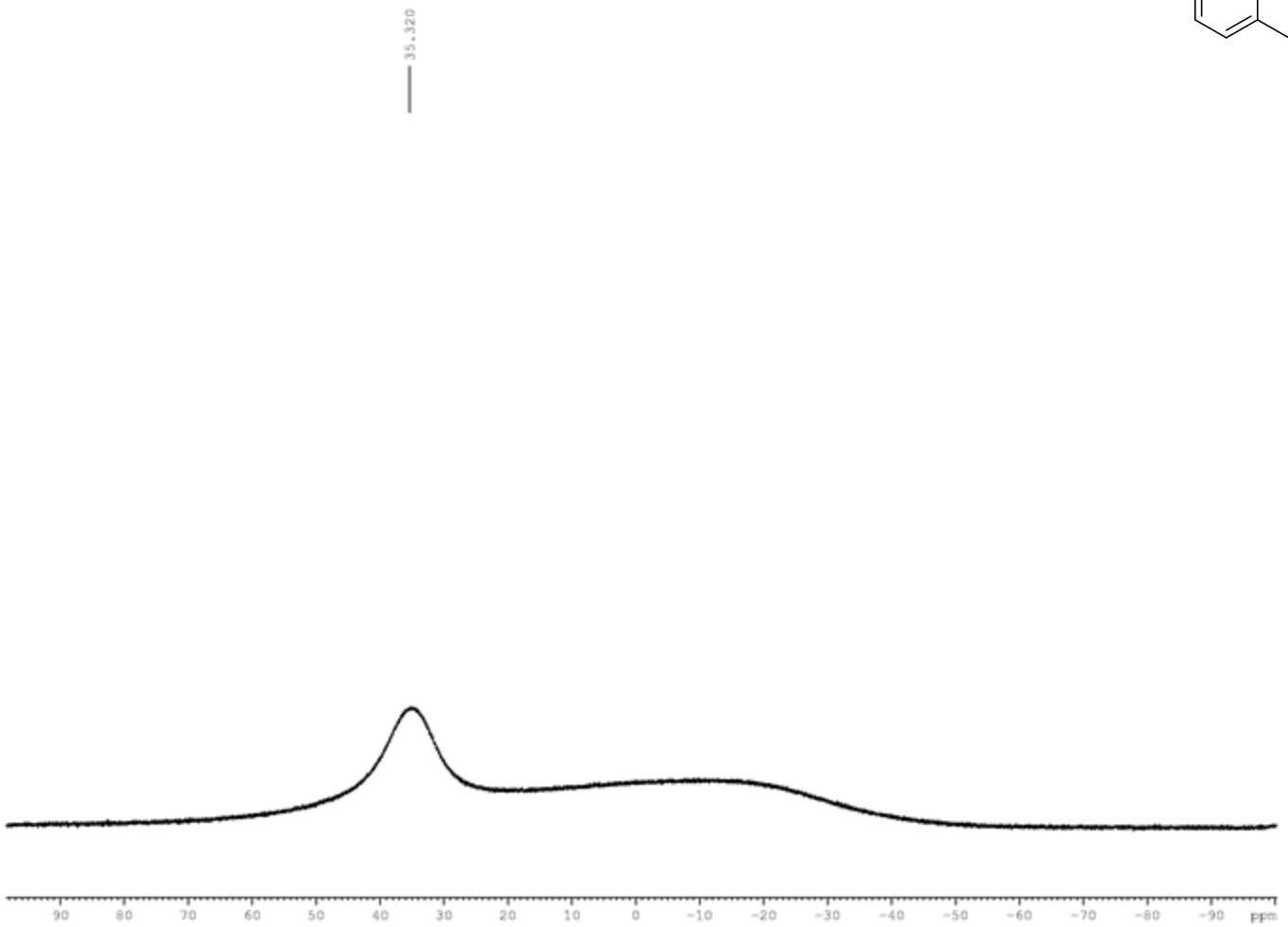
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-methoxyphenyl)-2,1-borazaronaphthalene (1c)**



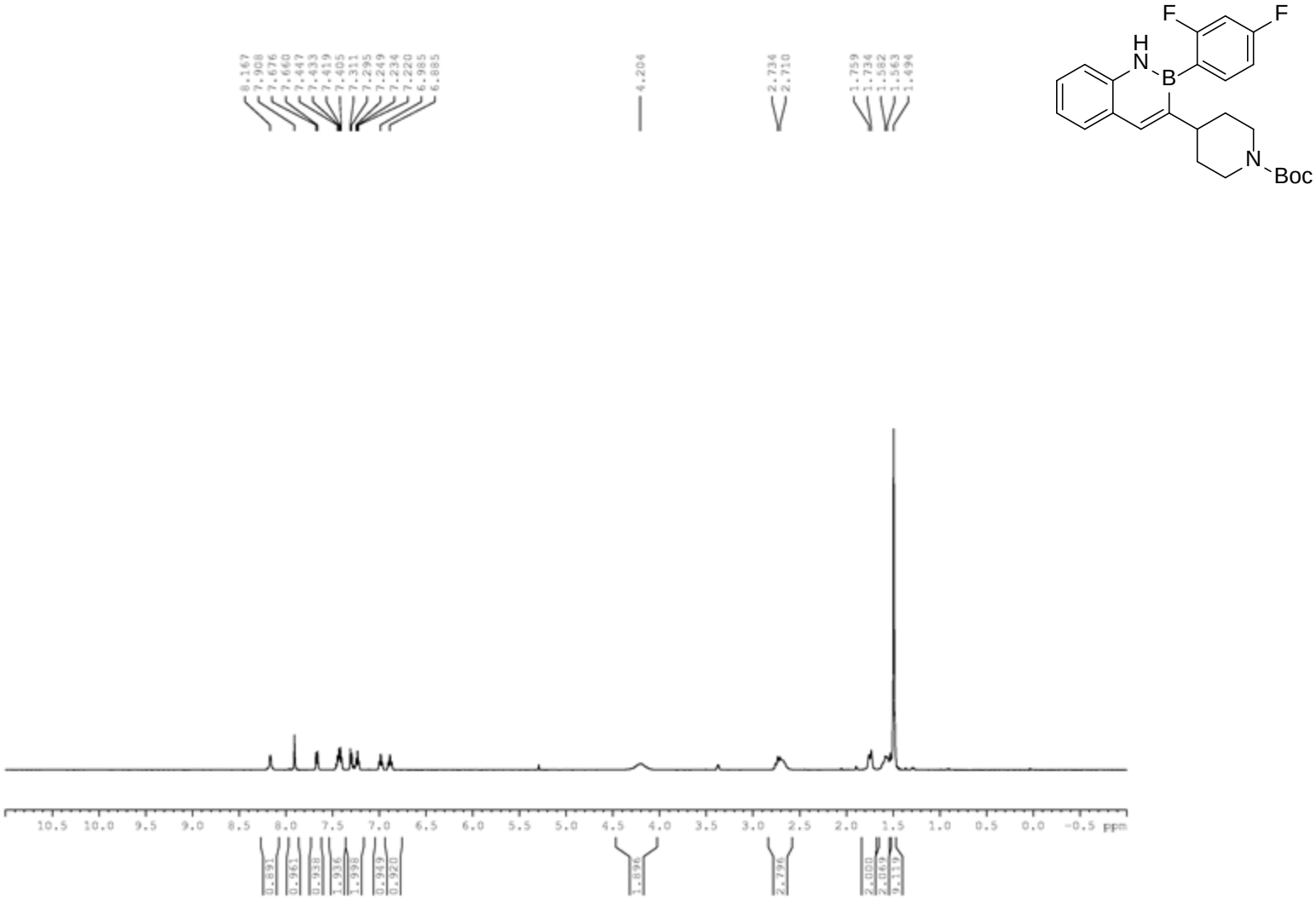


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-methoxyphenyl)-2,1-borazaronaphthalene (1c)**

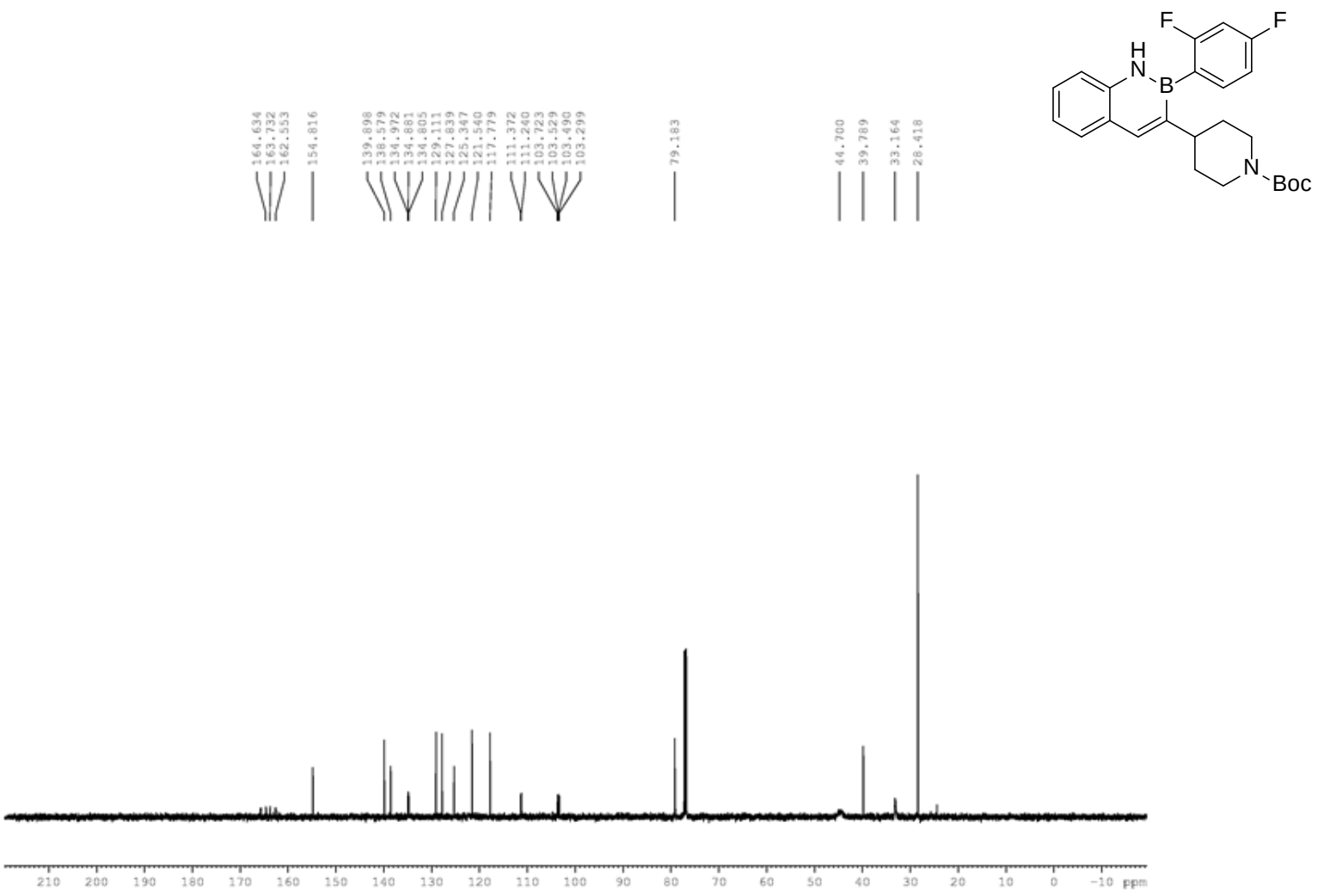




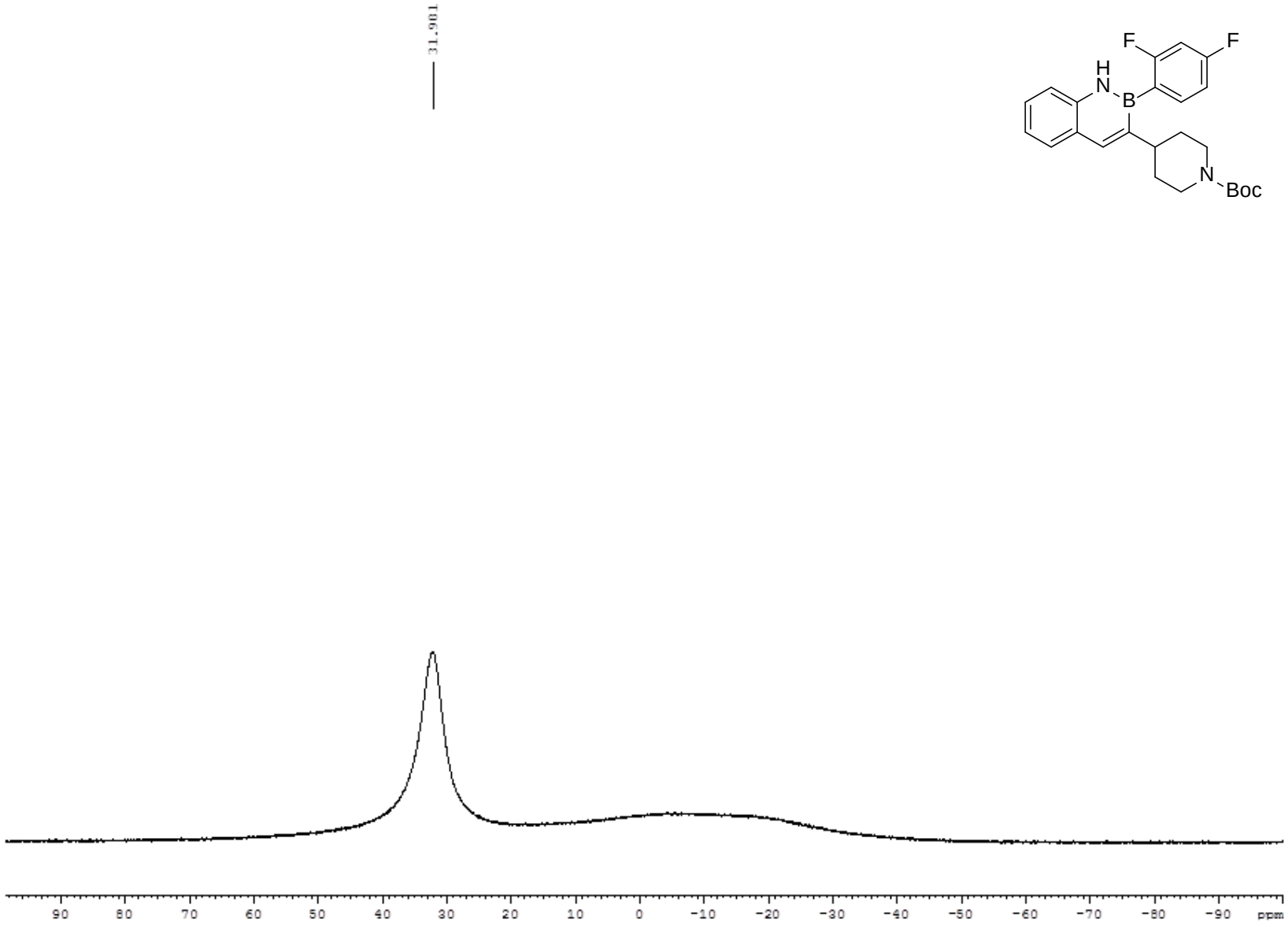
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene (1d)**



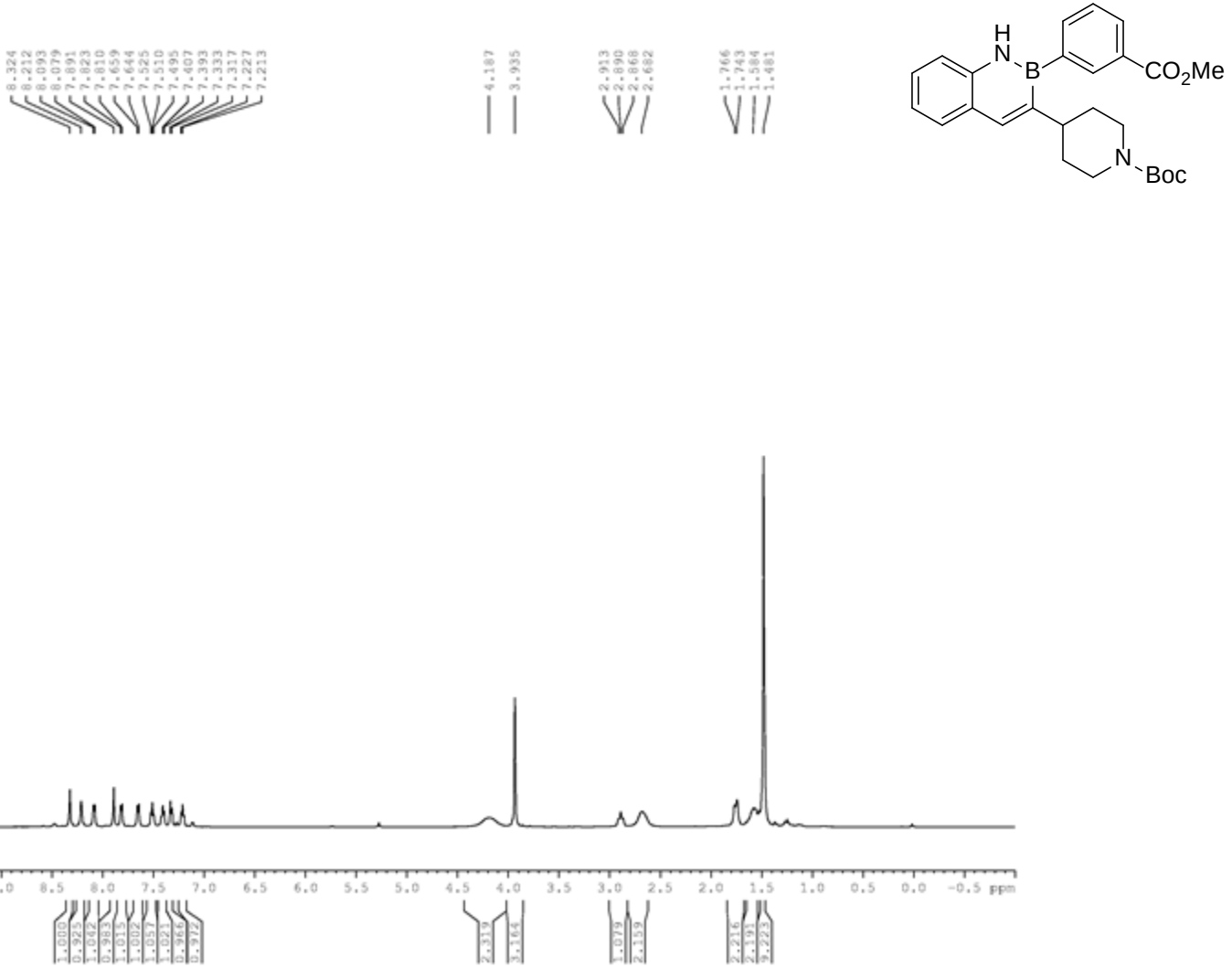
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene (1d)**



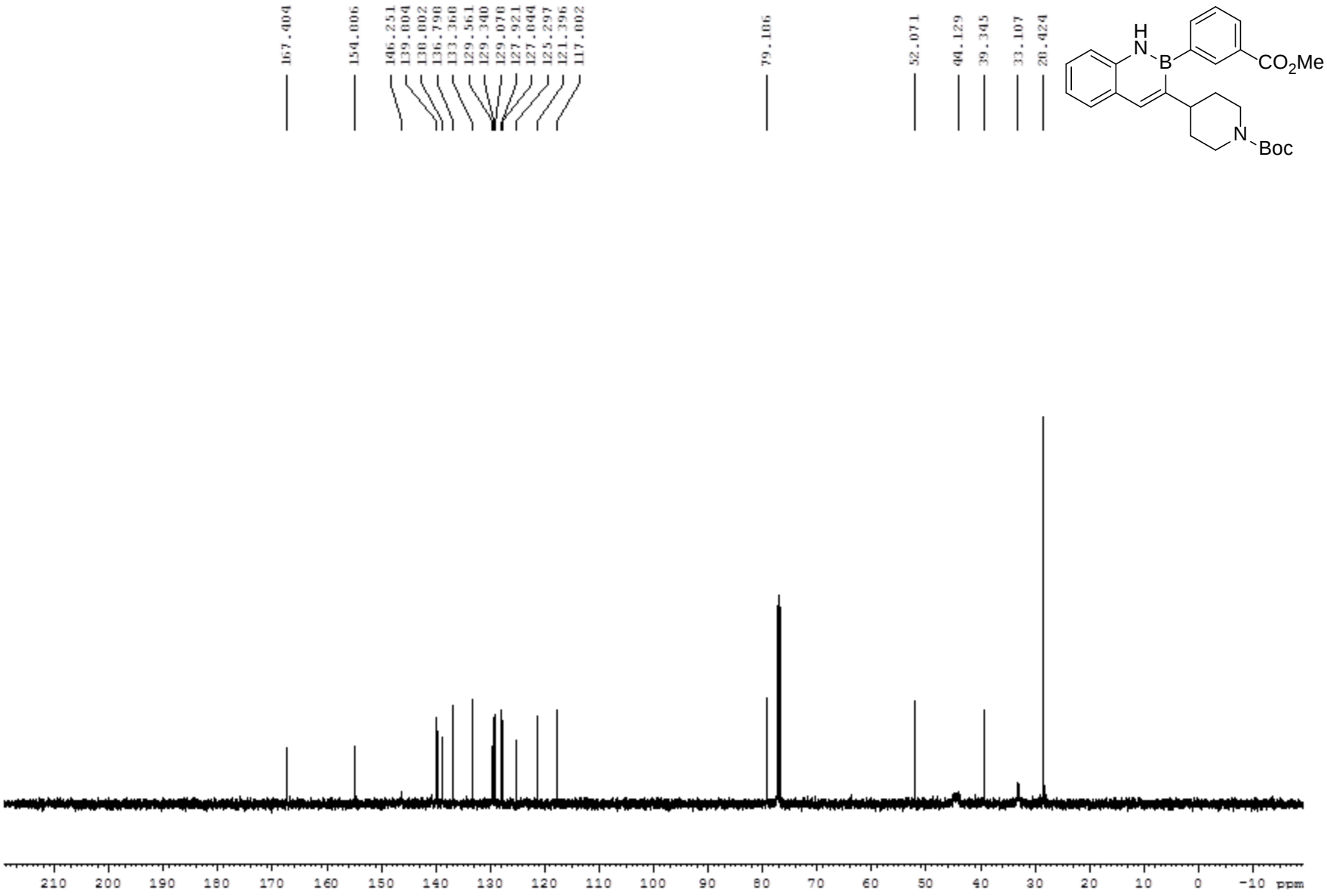
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(2,4-difluorophenyl)-2,1-borazaronaphthalene (1d)**



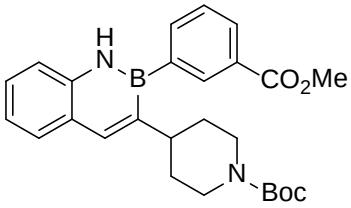
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene (1e)**

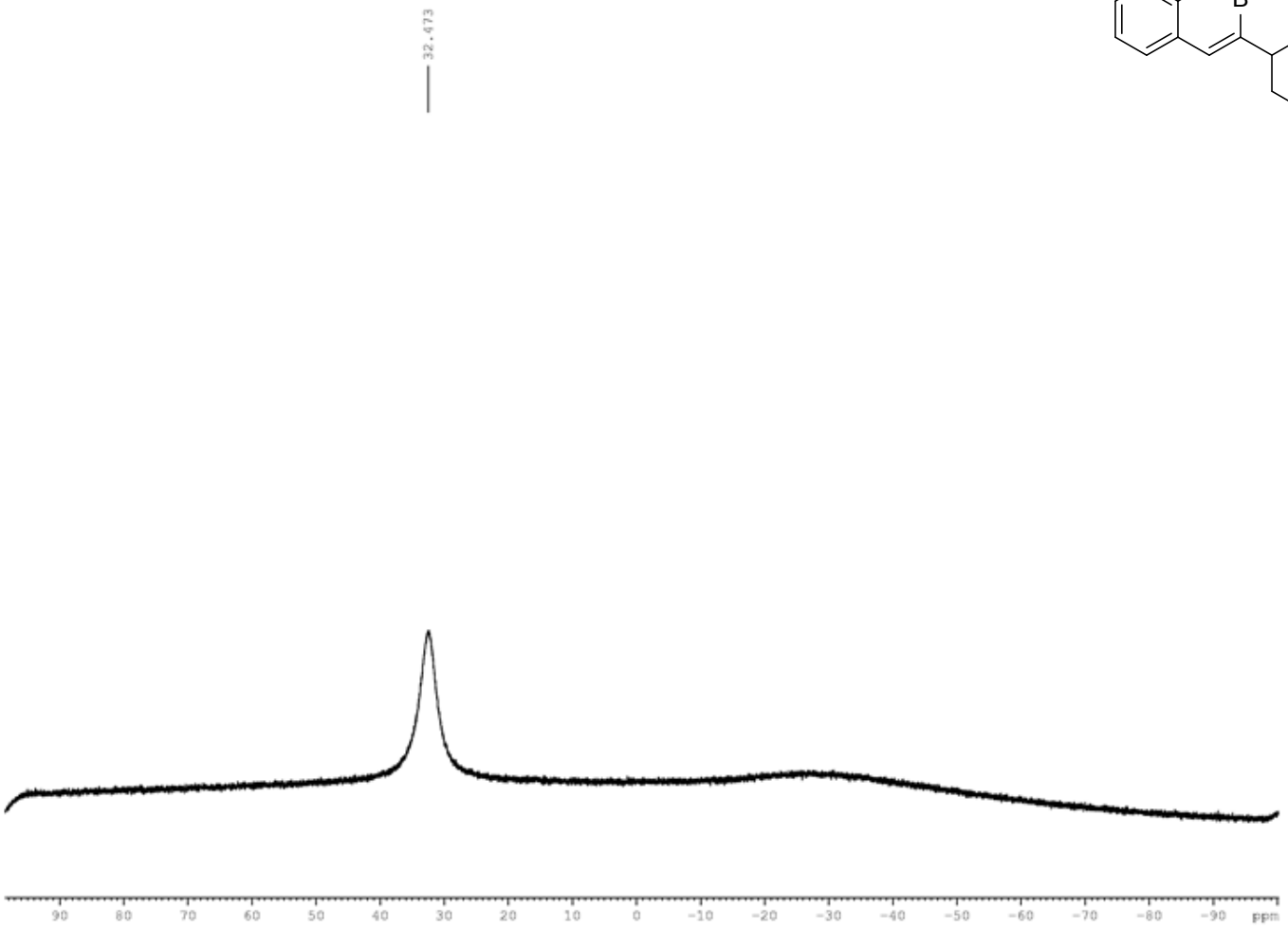


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene (1e)**

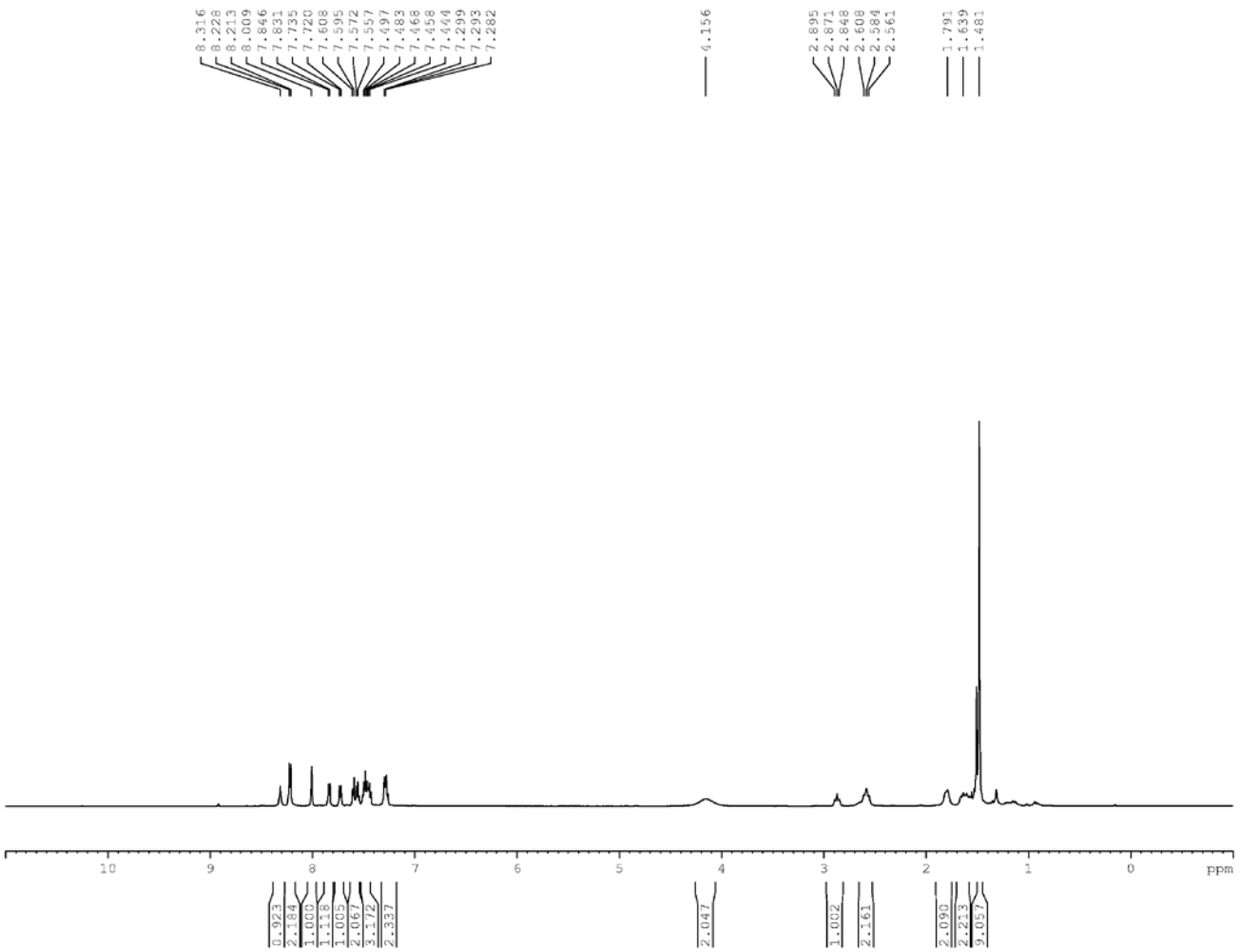


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(3-carbomethoxyphenyl)-2,1-borazaronaphthalene (1e)**

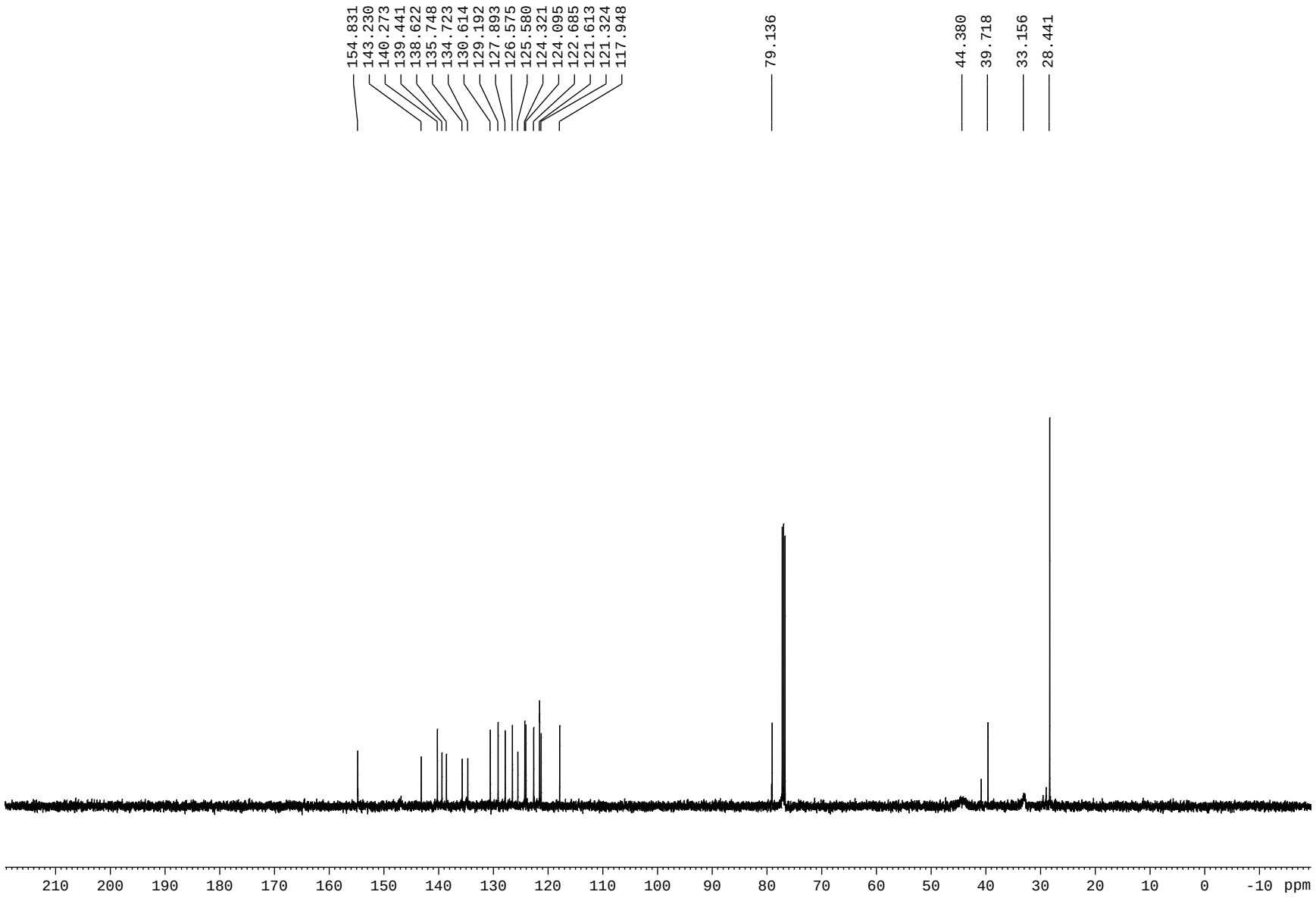




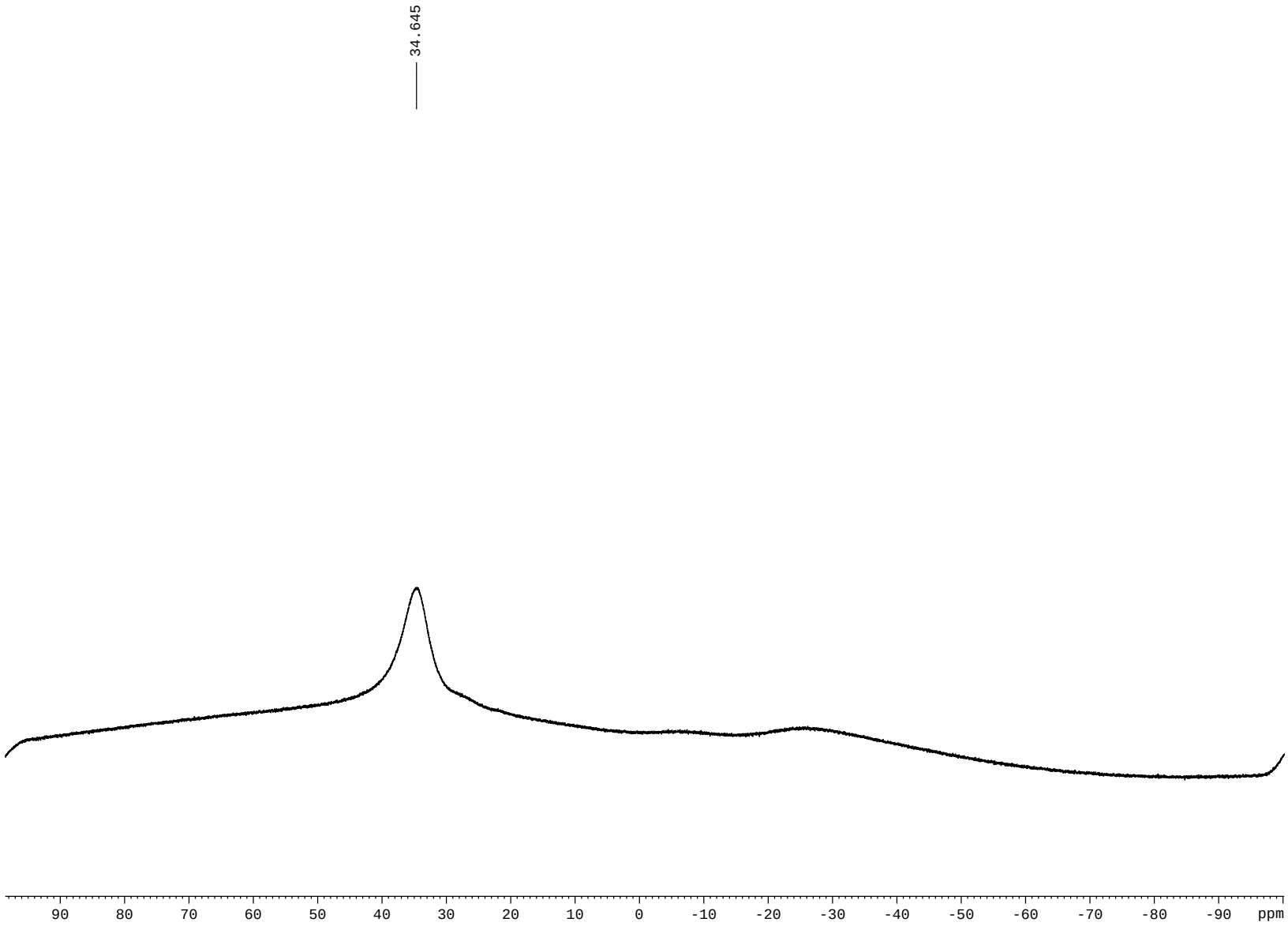
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzothienyl)-2,1-borazaronaphthalene (1f)**



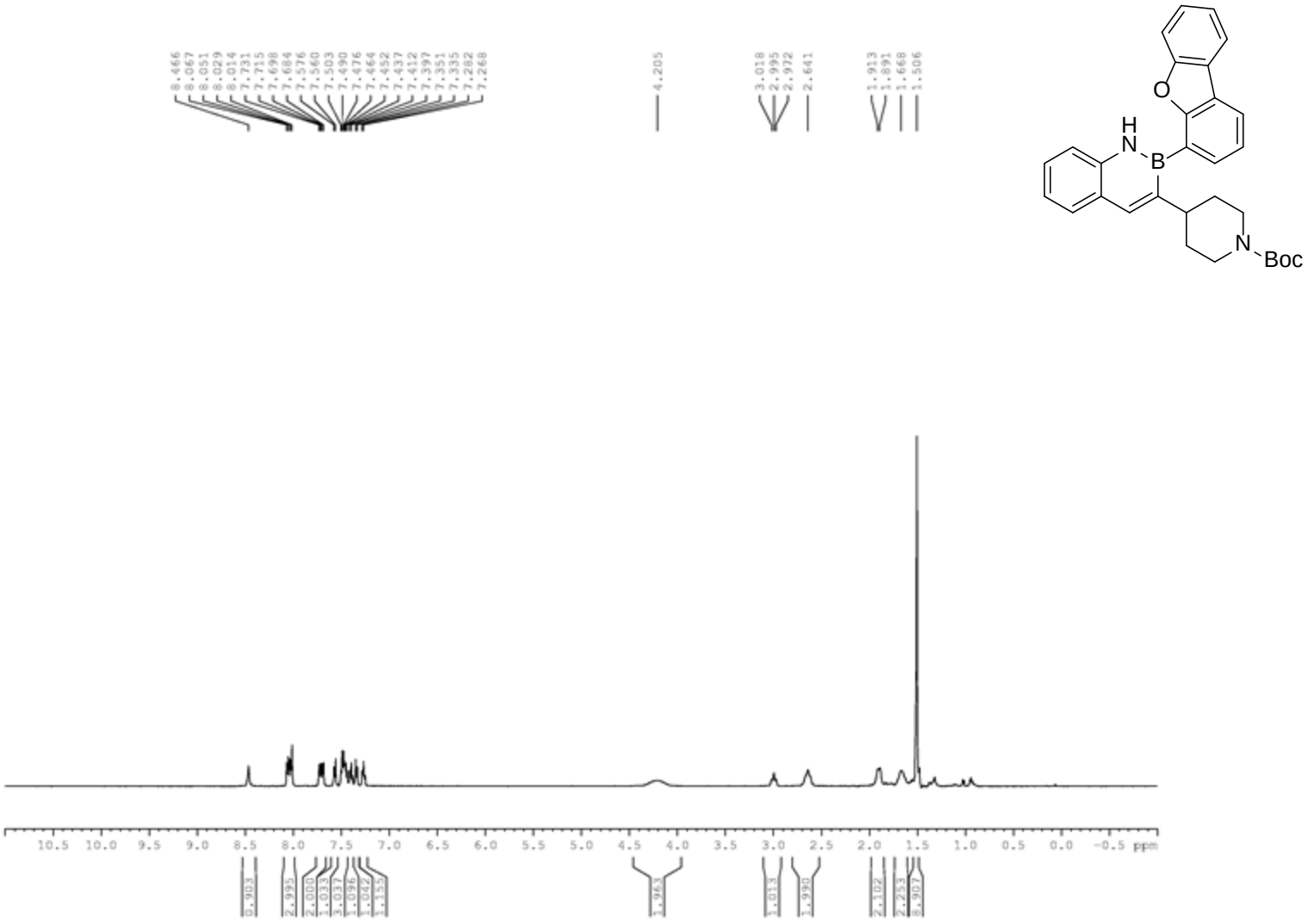
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzothienyl)-2,1-borazaronaphthalene (1f)**



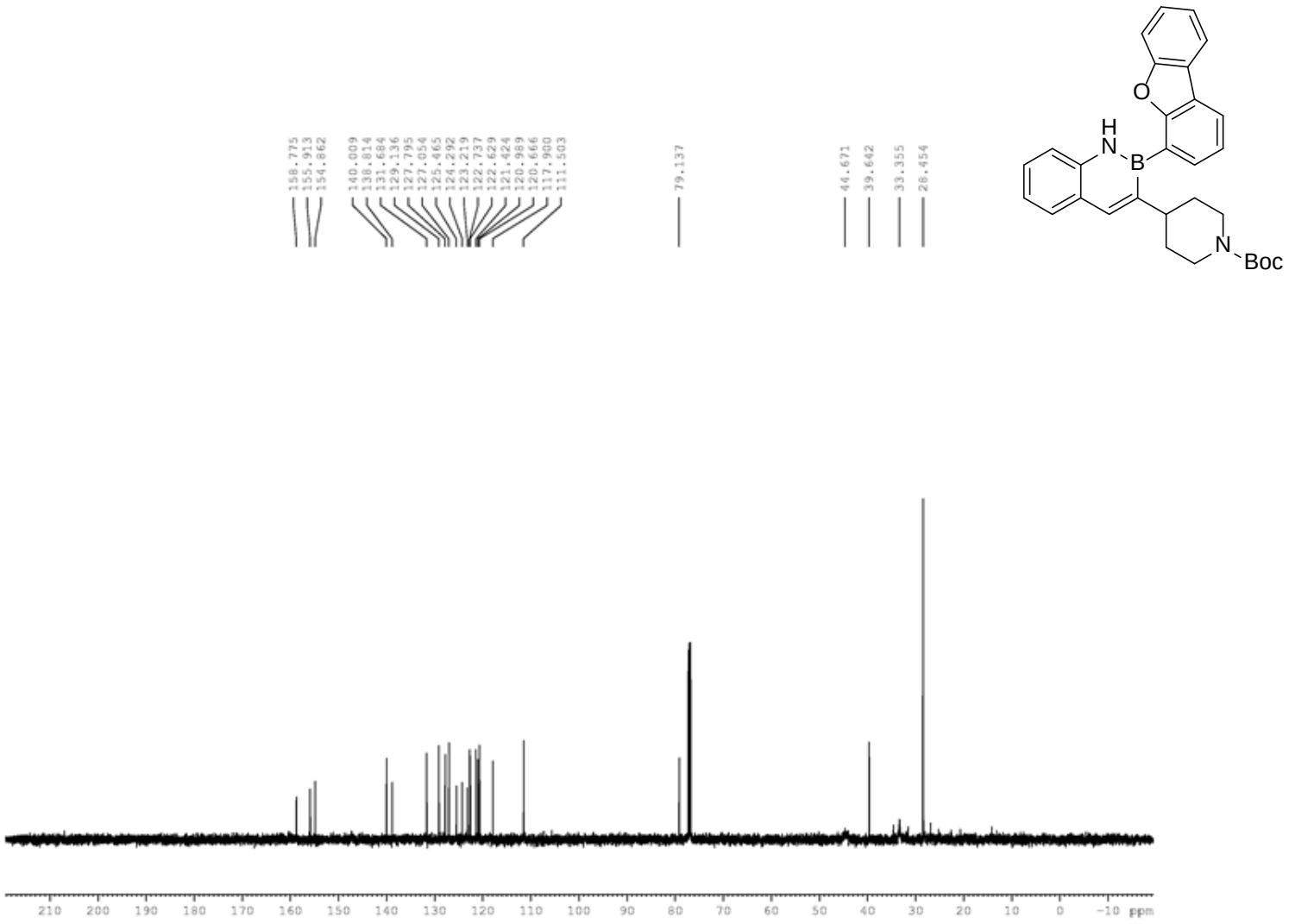
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzothienyl)-2,1-borazaronaphthalene (1f)**



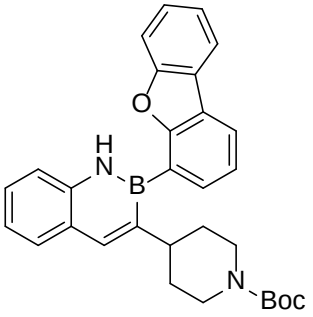
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzofuranyl)-2,1-borazaronaphthalene (1g)**

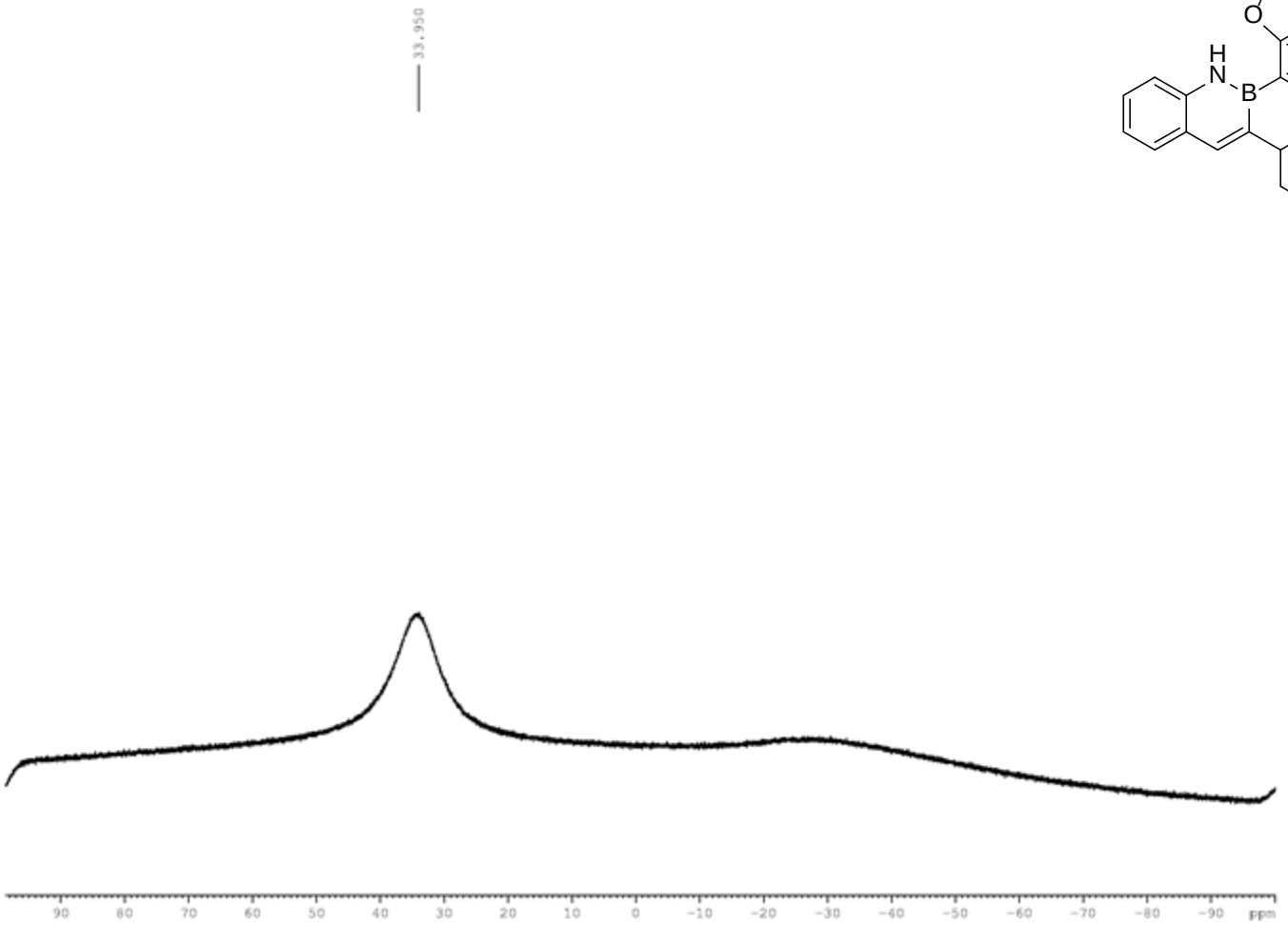


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzofuranyl)-2,1-borazaronaphthalene (1g)**

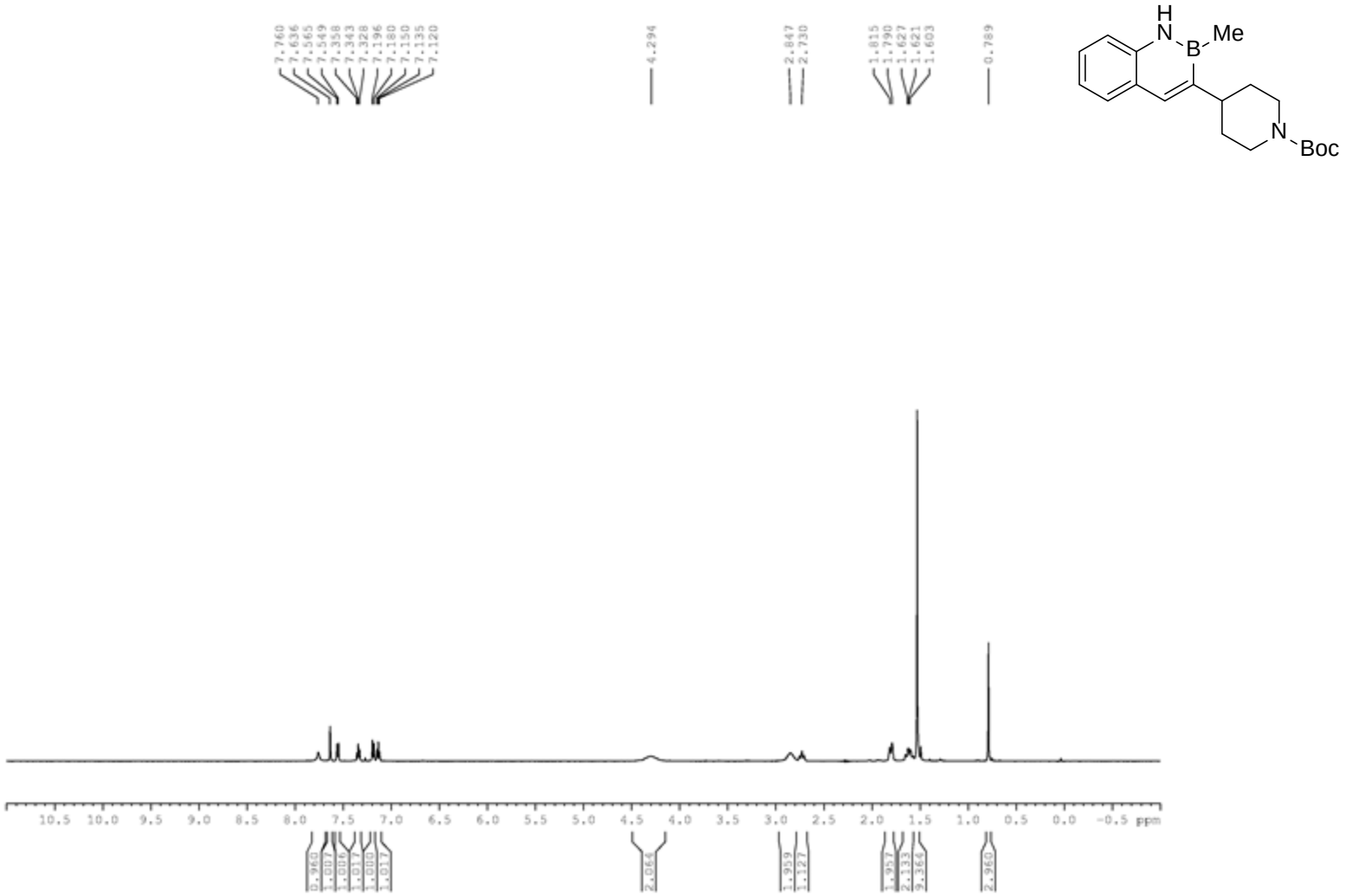


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-(4-dibenzofuranyl)-2,1-borazaronaphthalene (1g)**

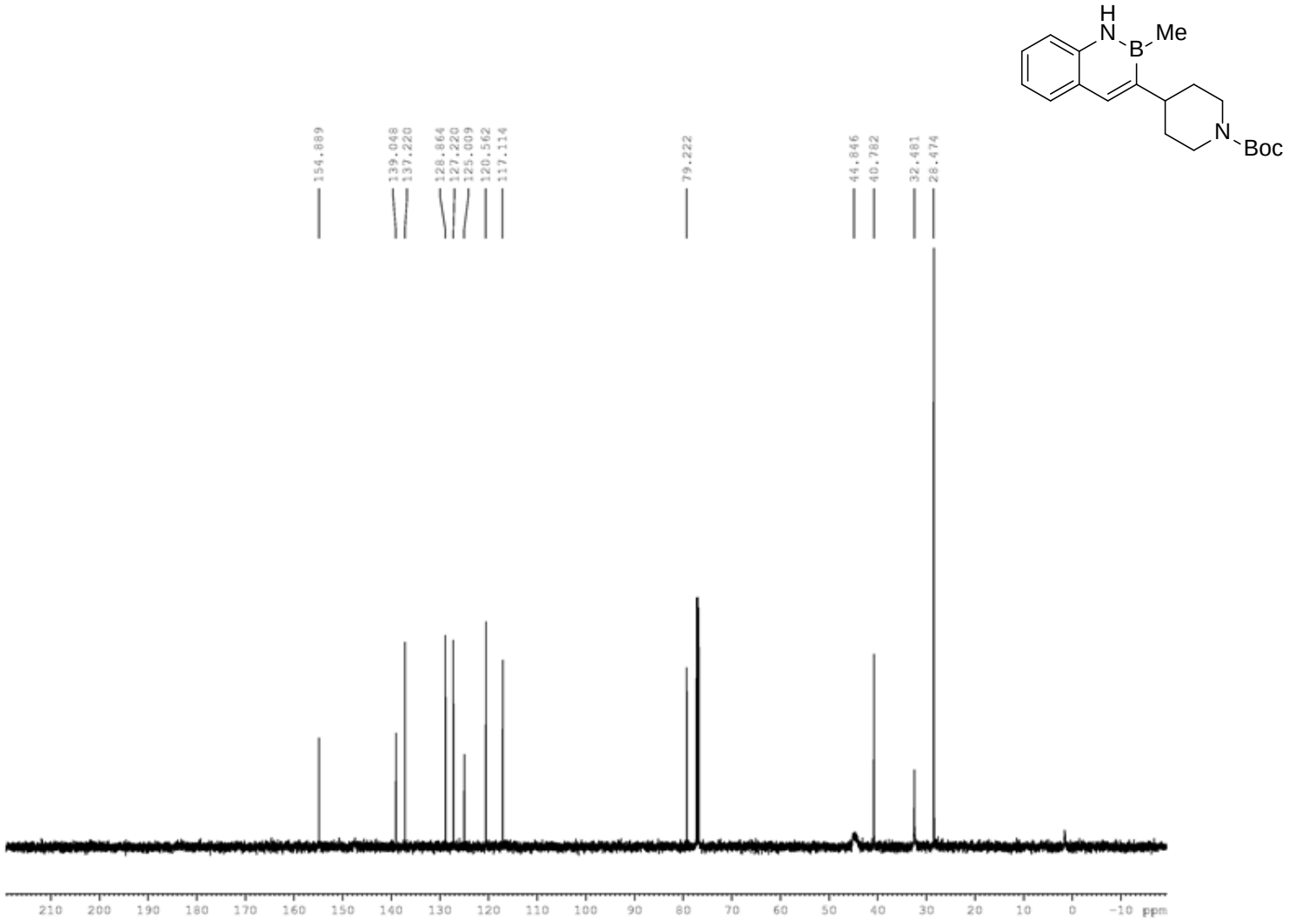




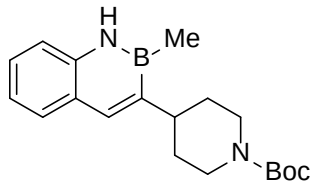
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1h)**

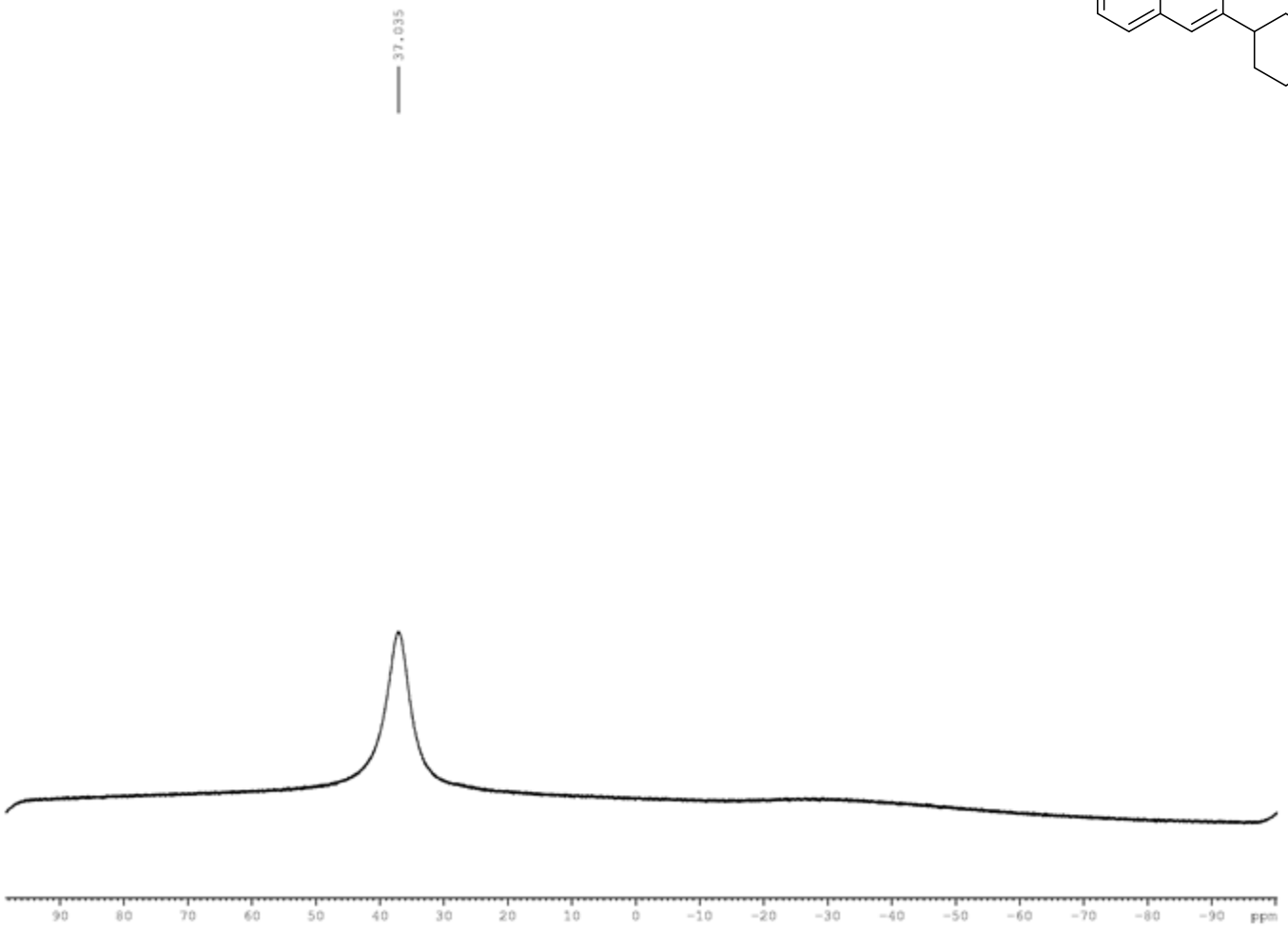


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1h)**

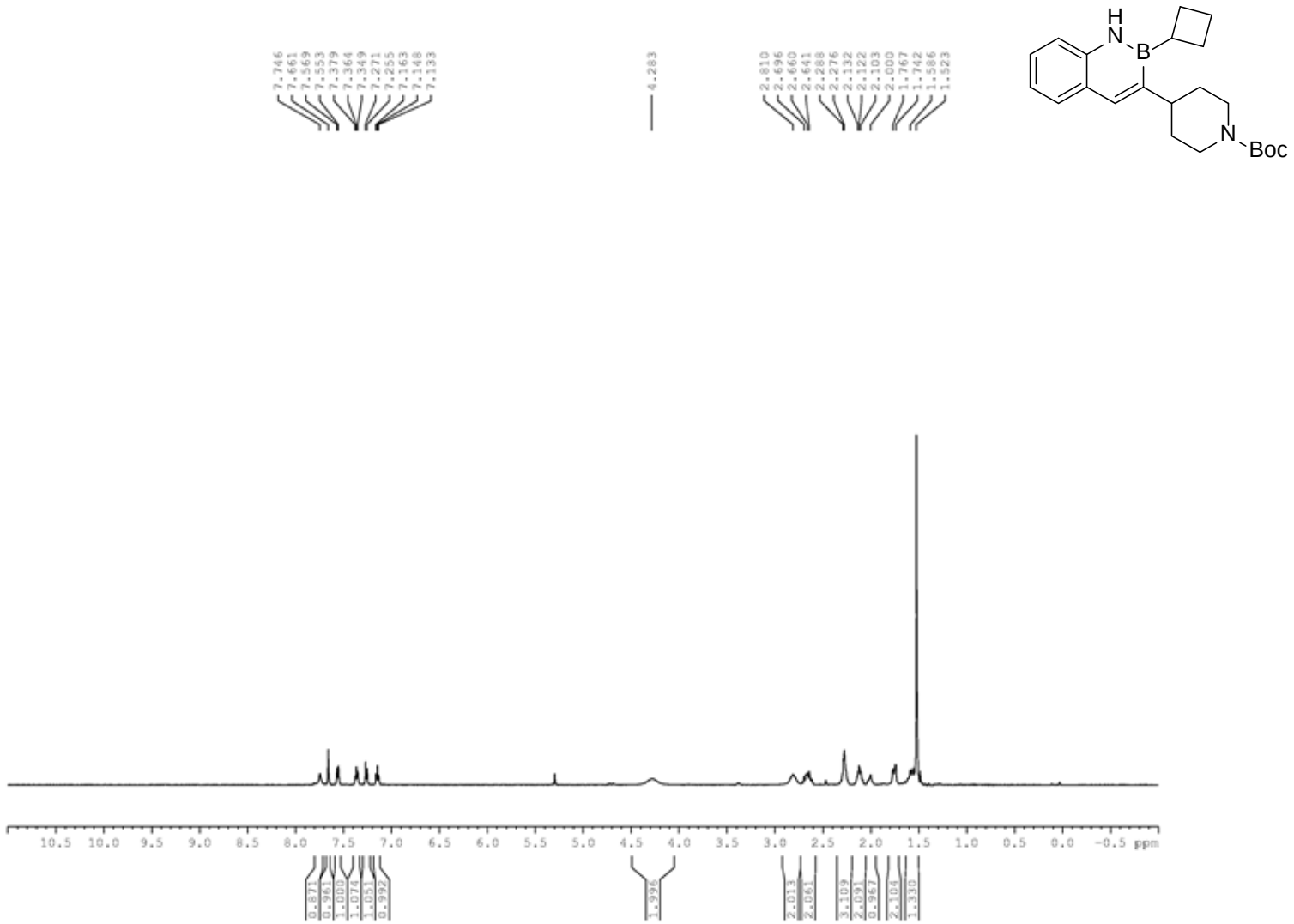


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1h)**

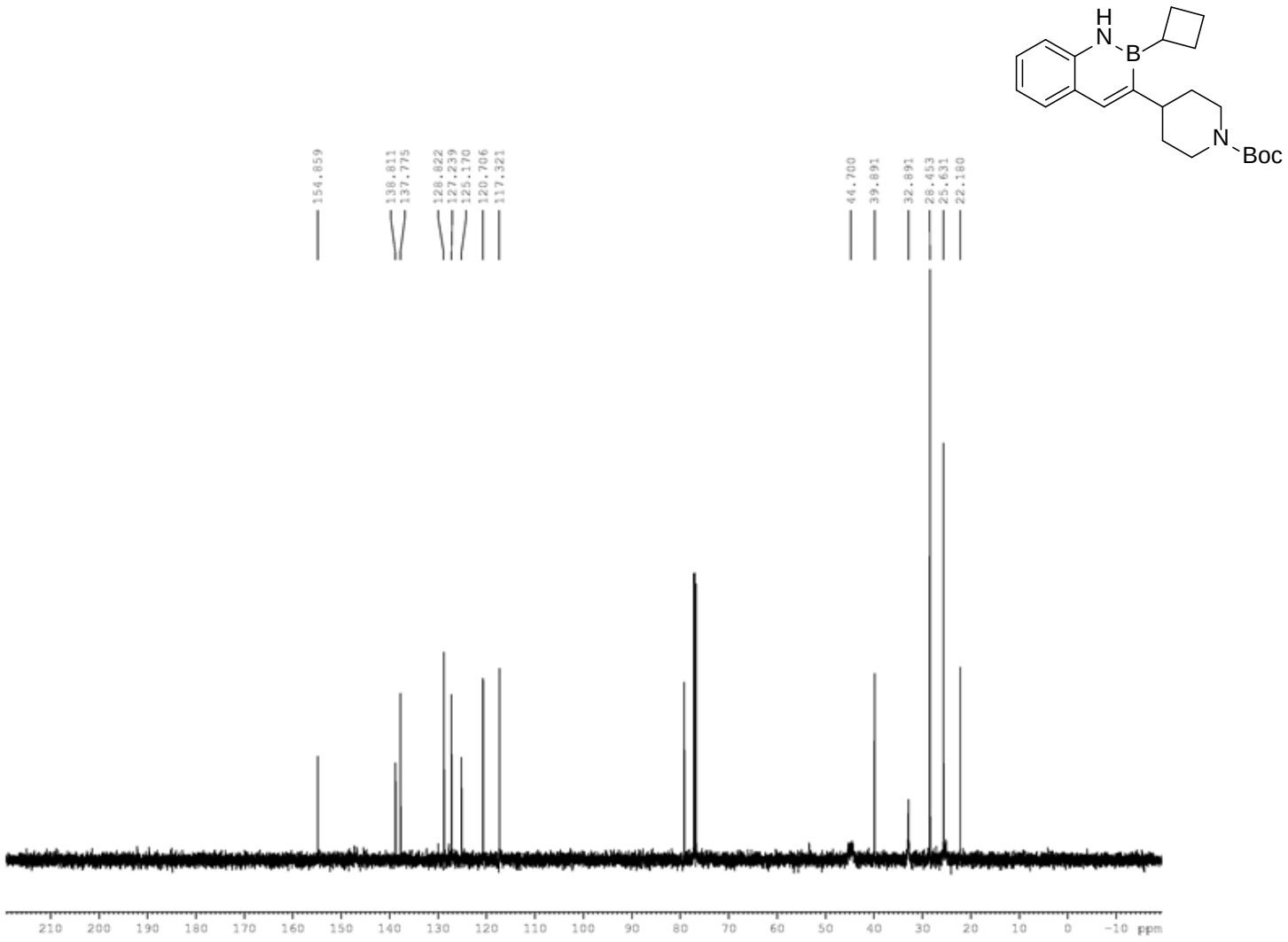




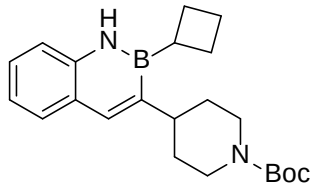
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclobutyl-2,1-borazaronaphthalene (1i)**

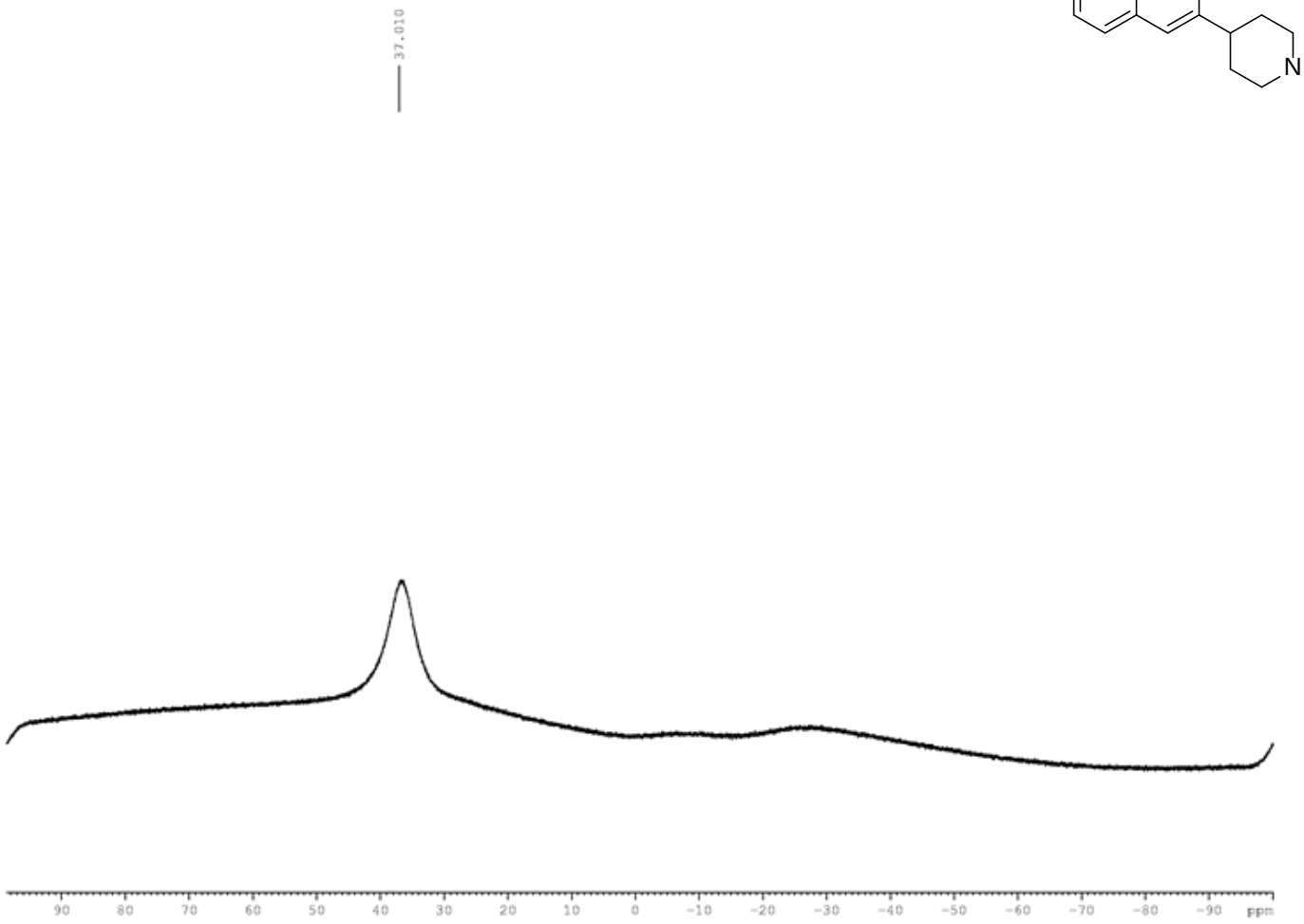


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclobutyl-2,1-borazaronaphthalene (1i)**

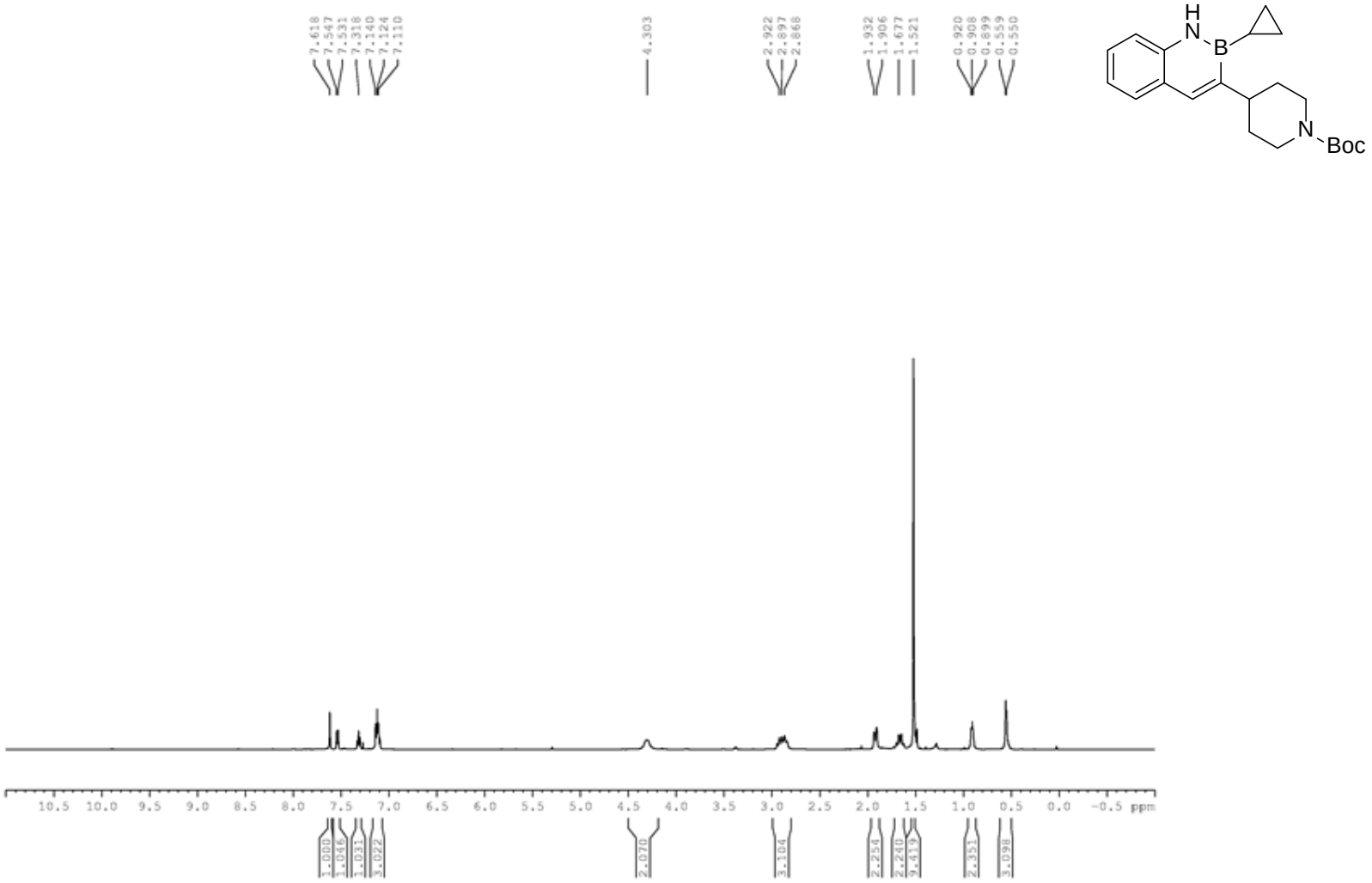


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclobutyl-2,1-borazaronaphthalene (1i)**

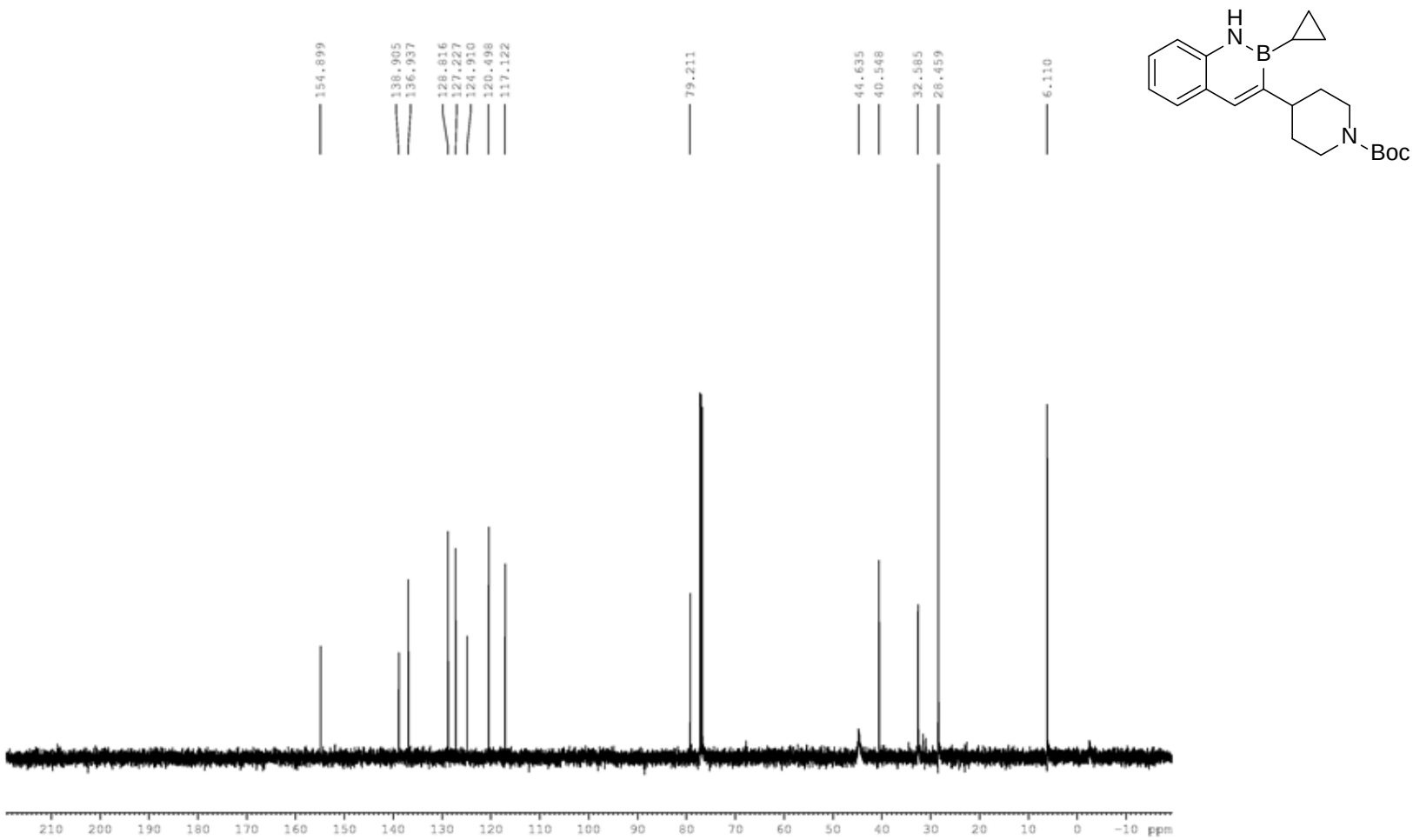




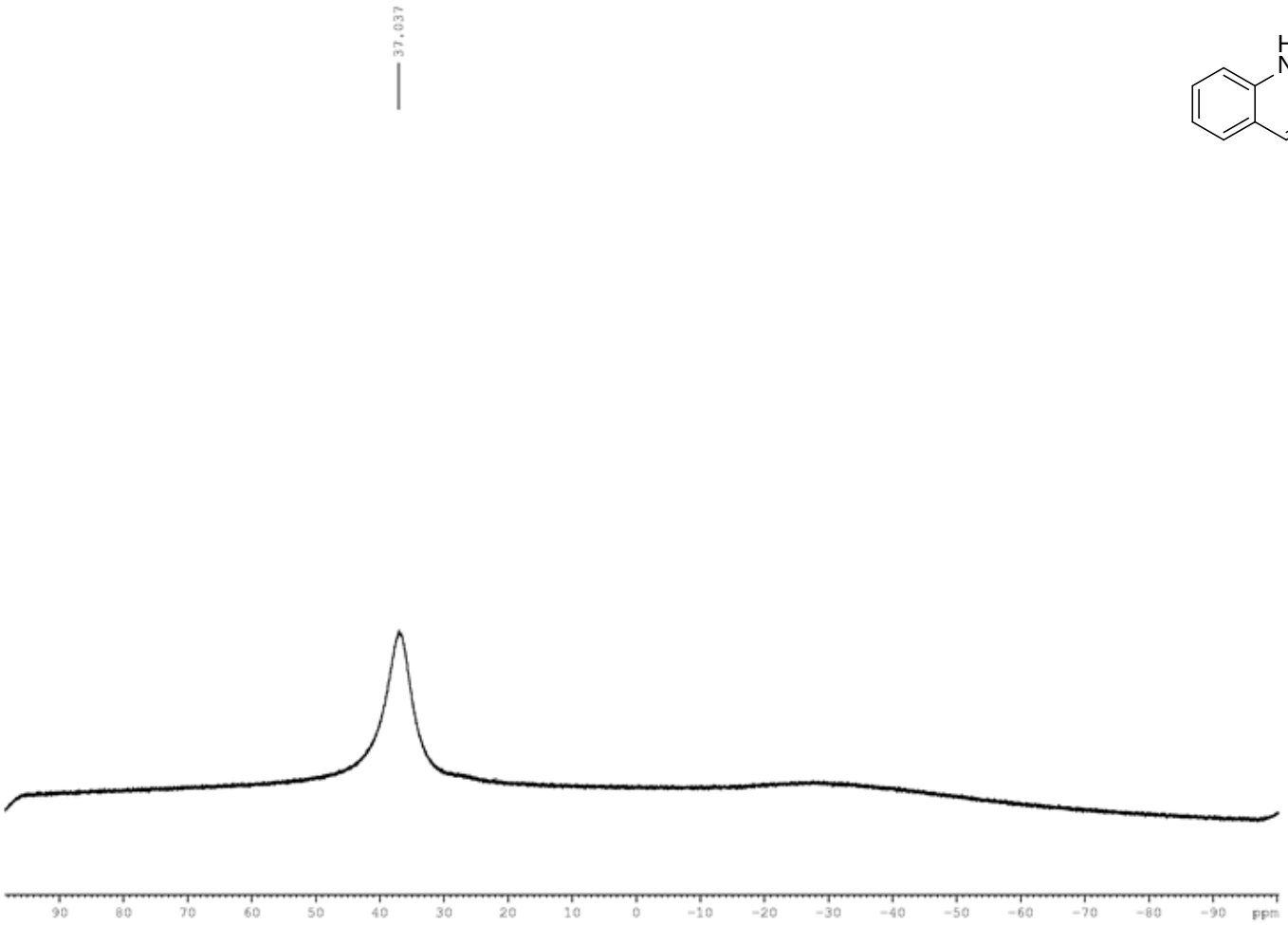
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclopropyl-2,1-borazaronaphthalene (1j)**



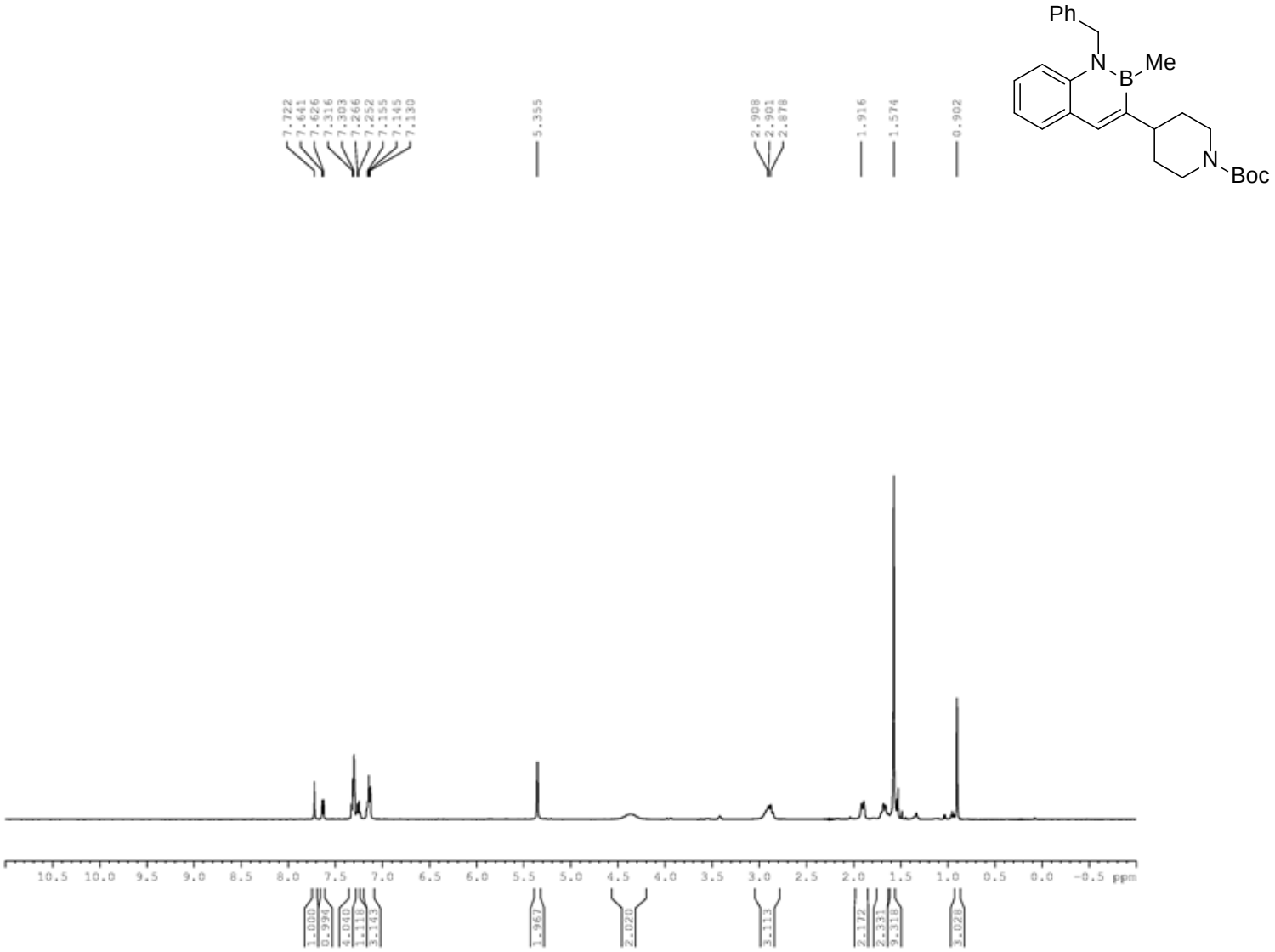
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclopropyl-2,1-borazaronaphthalene (1j)**



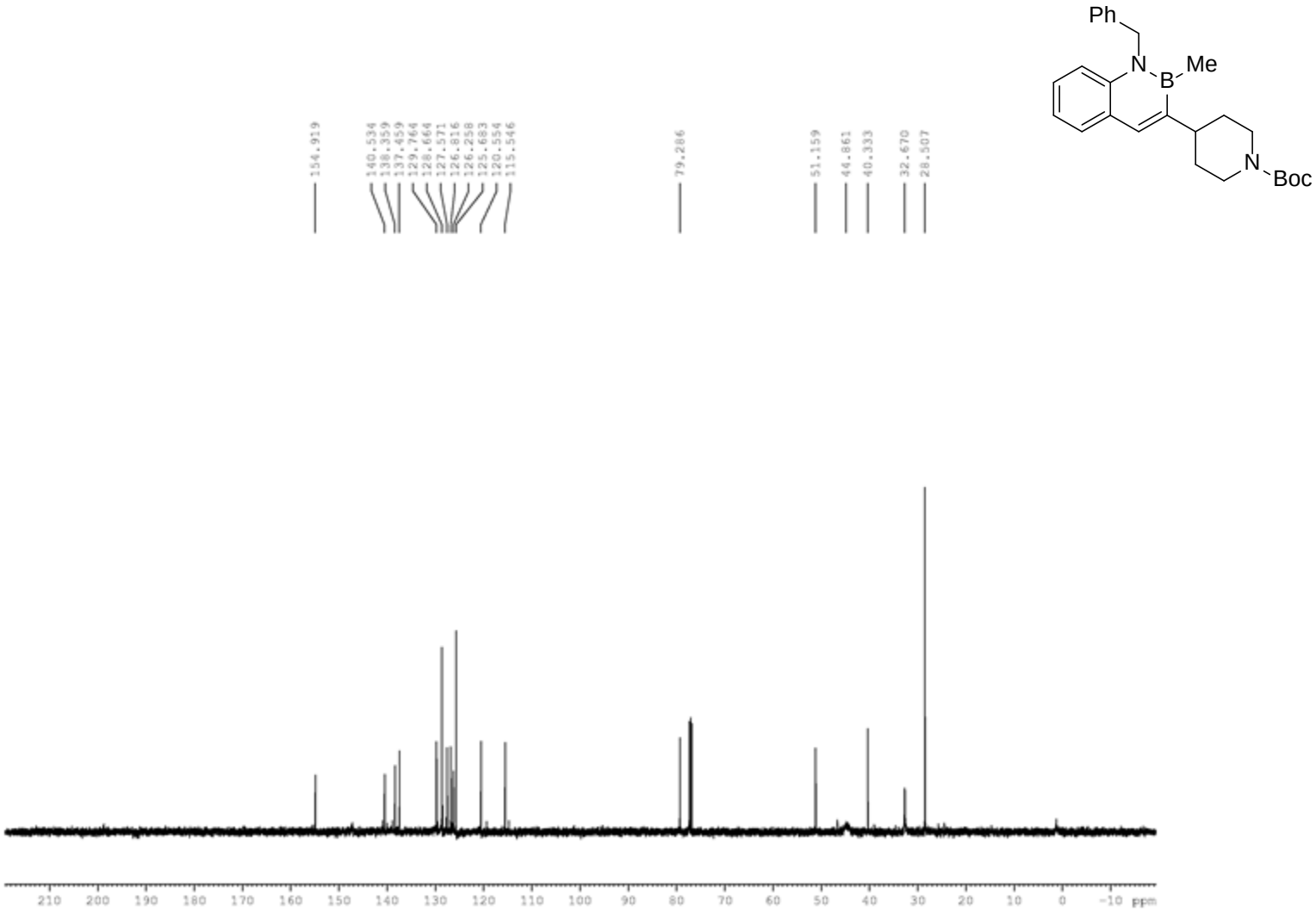
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(4-(*N*-Boc)-piperidenyl)-2-cyclopropyl-2,1-borazaronaphthalene (1j)**



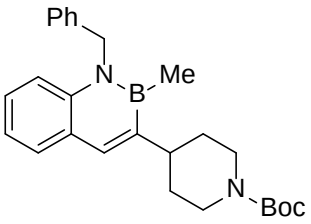
^{1}H NMR (500 MHz, $CDCl_3$) of **1-Benzyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1k)**

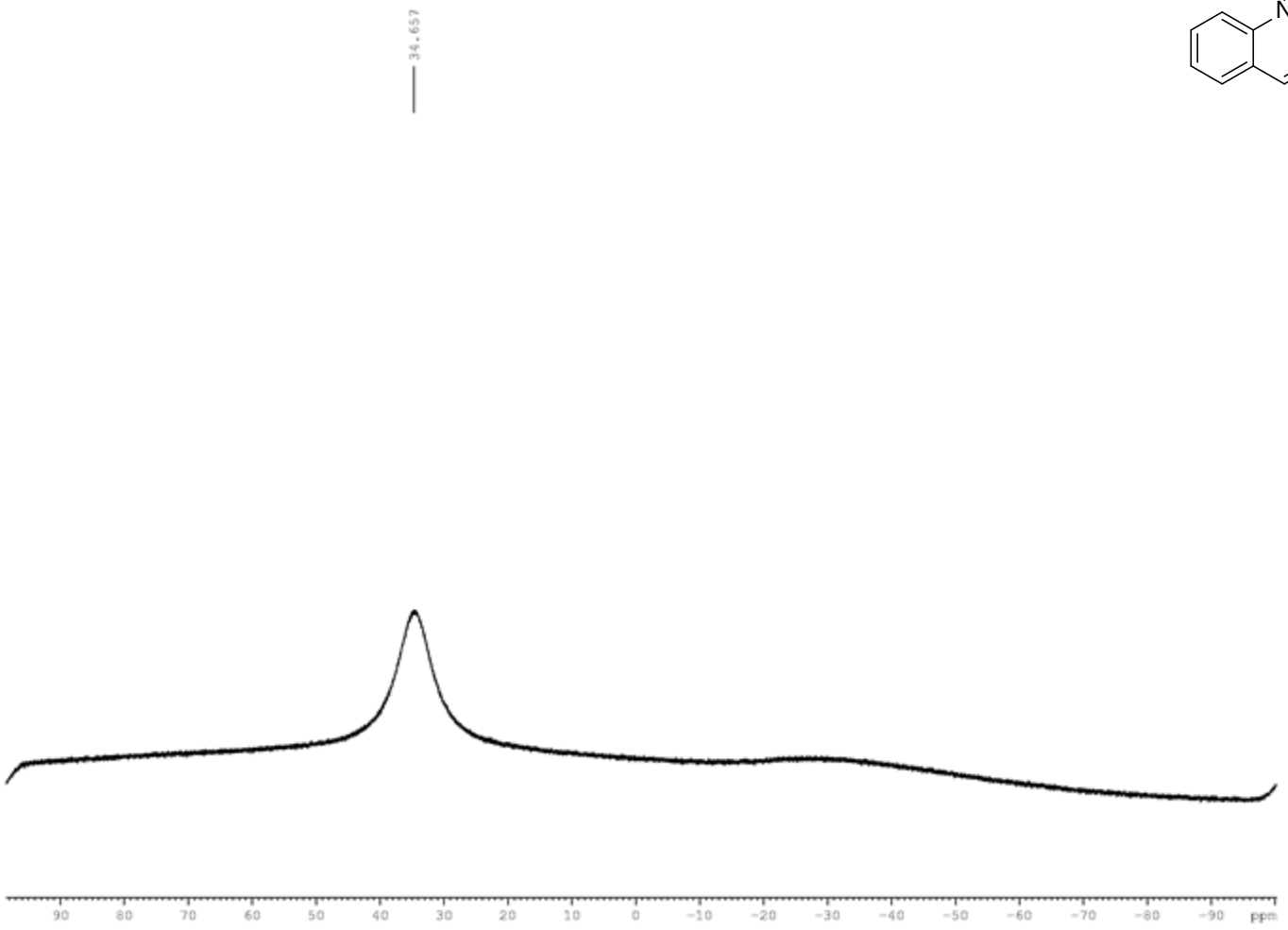


^{13}C NMR (125.8 MHz, $CDCl_3$) of **1-Benzyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1k)**

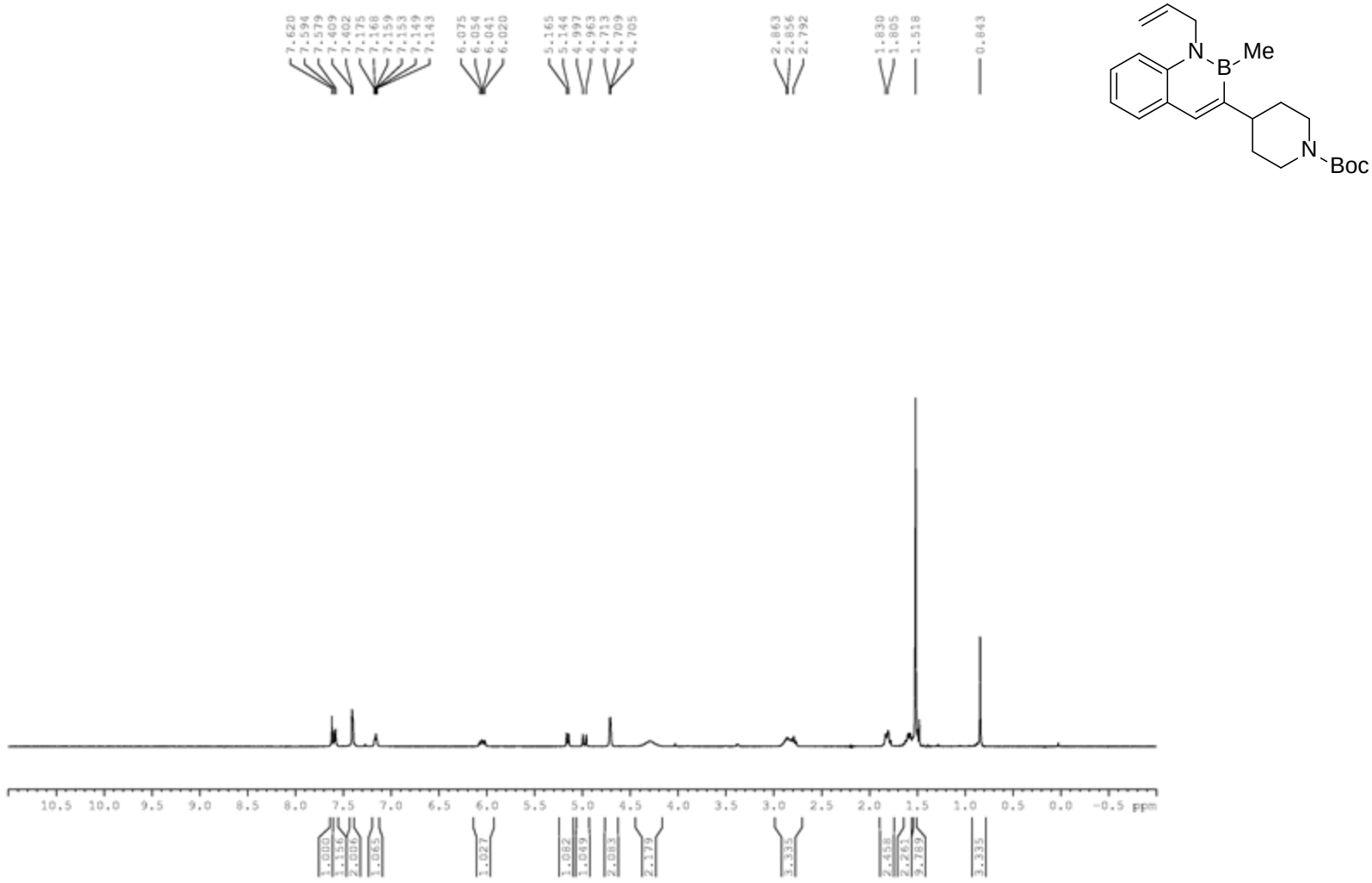


^{11}B NMR (128.38 MHz, $CDCl_3$) of **1-Benzyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1k)**

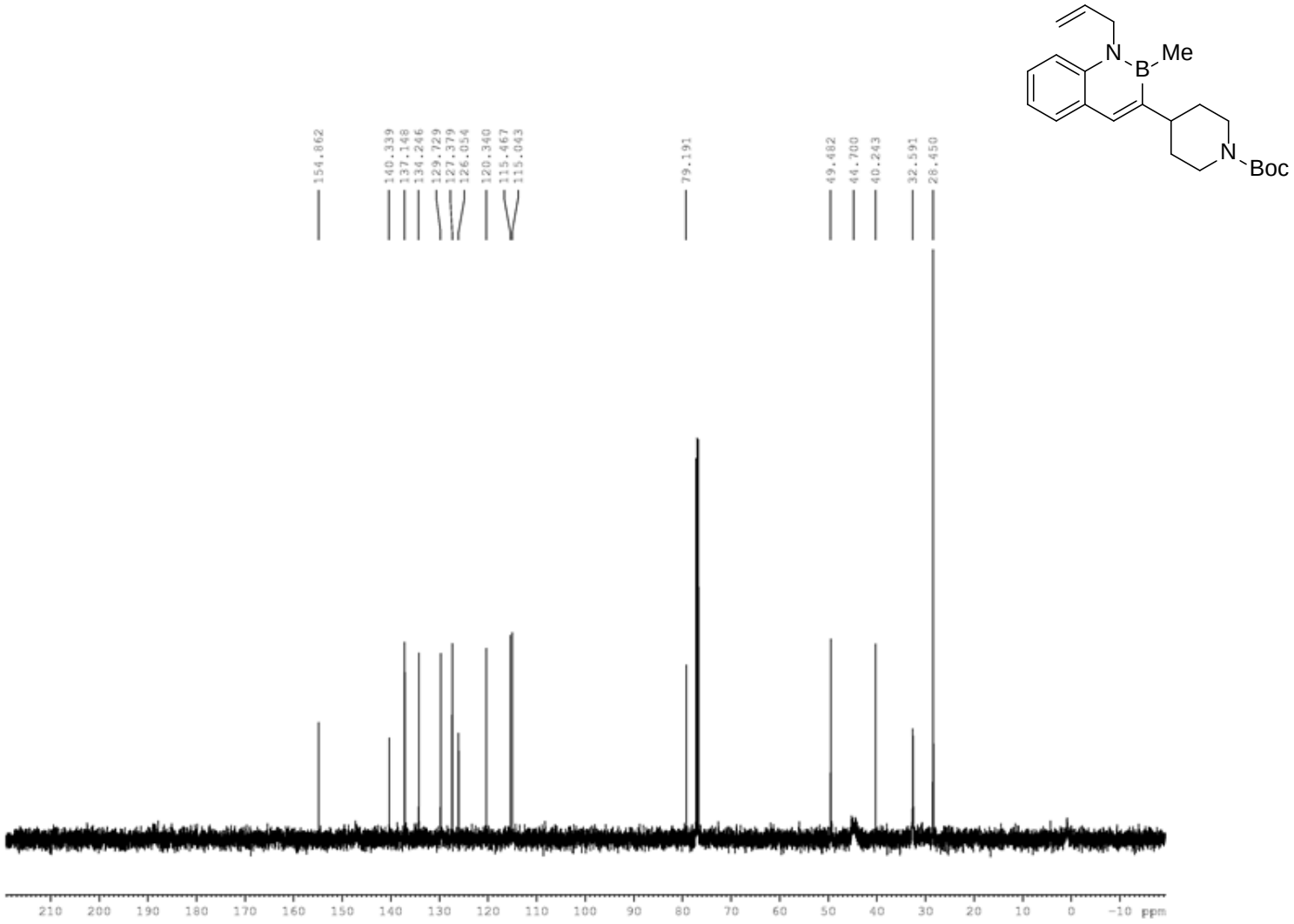




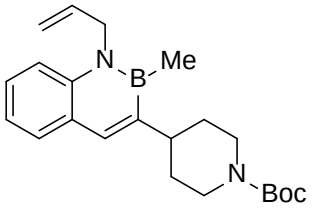
^{1}H NMR (500 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1l)**

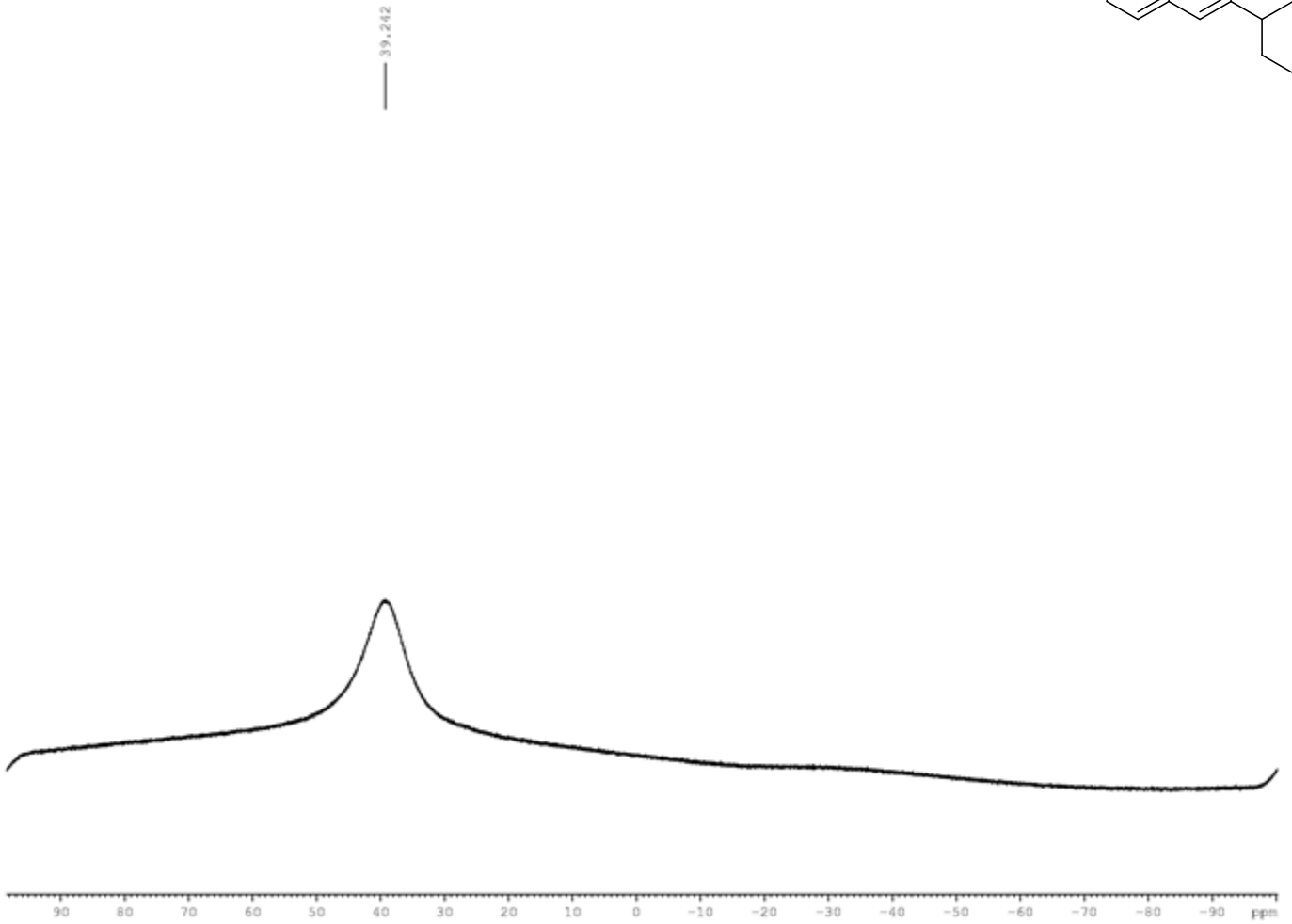


^{13}C NMR (125.8 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1l)**

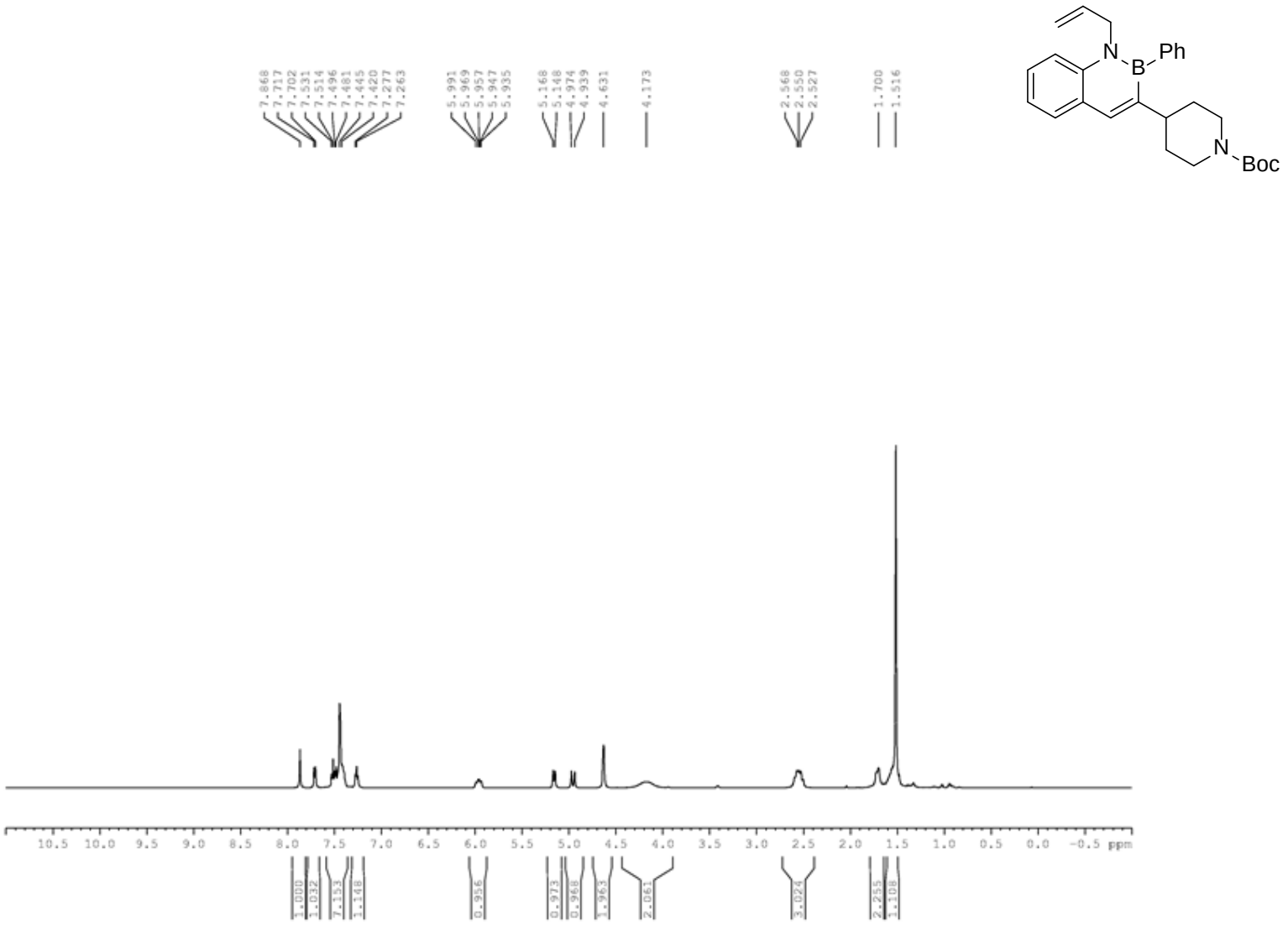


^{11}B NMR (128.38 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-methyl-2,1-borazaronaphthalene (1l)**

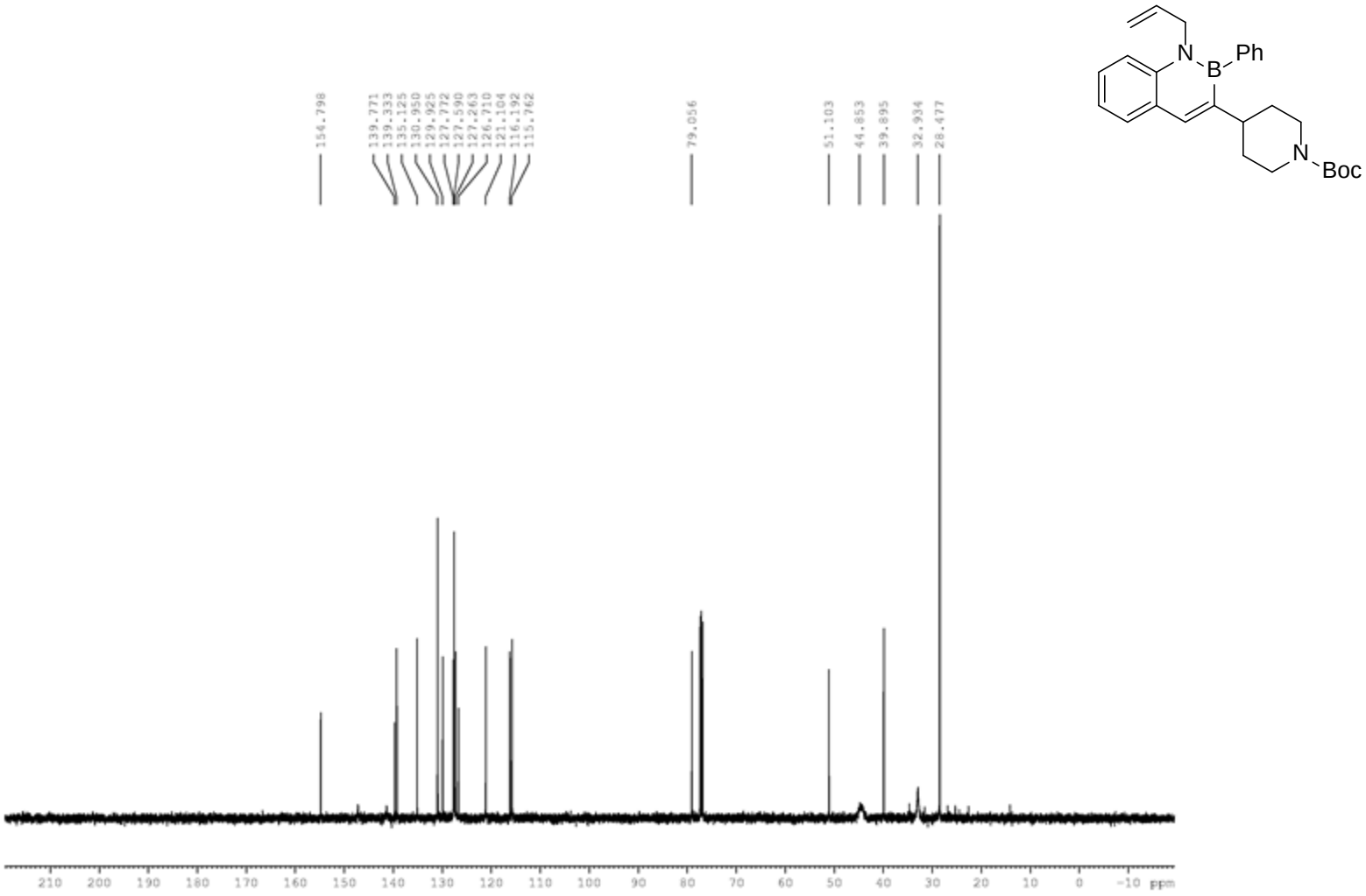




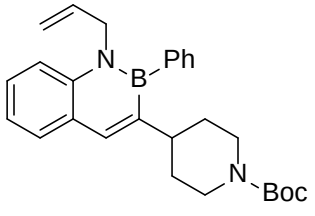
^{1}H NMR (500 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)--piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1m)**

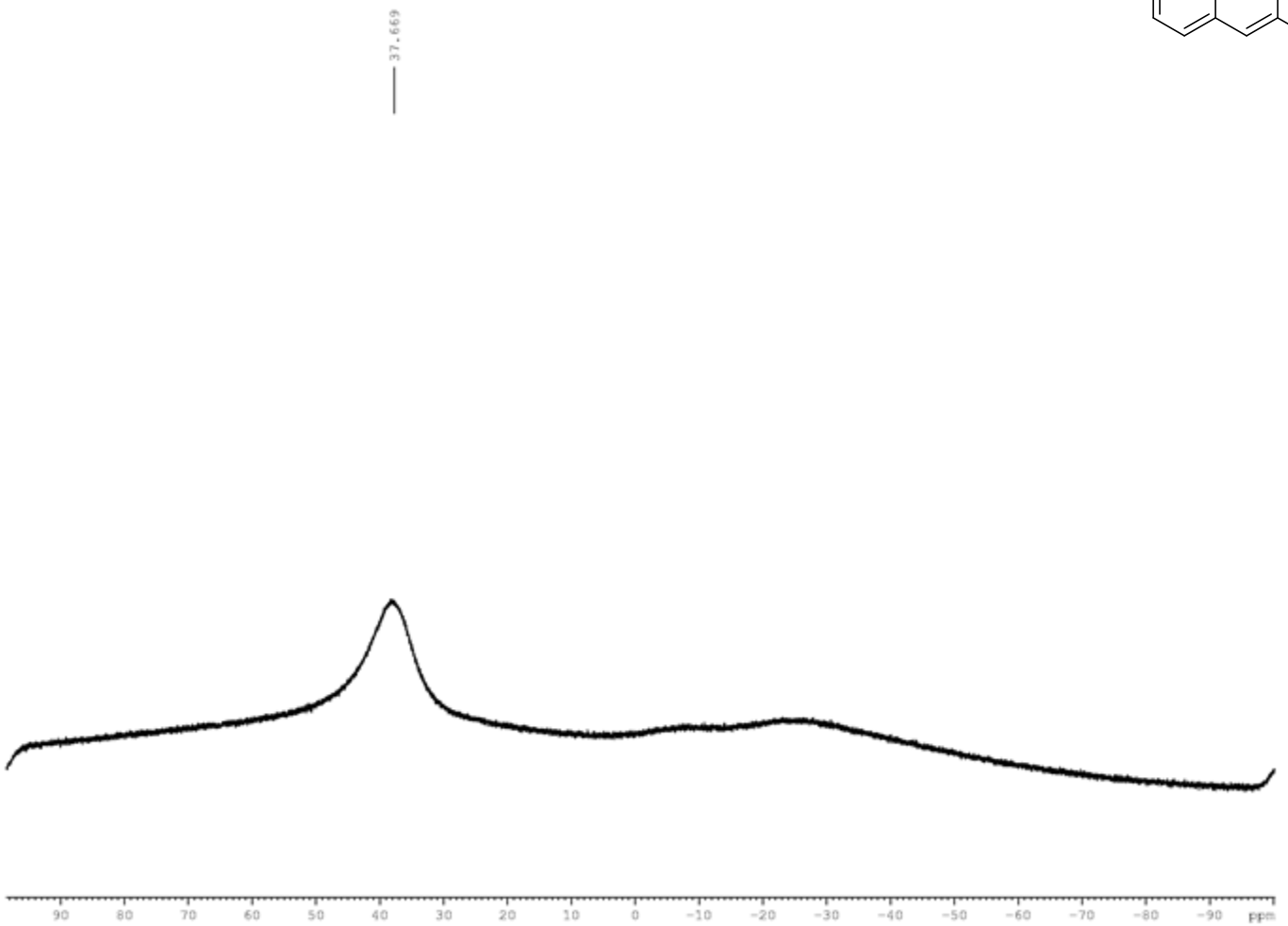


^{13}C NMR (125.8 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1m)**

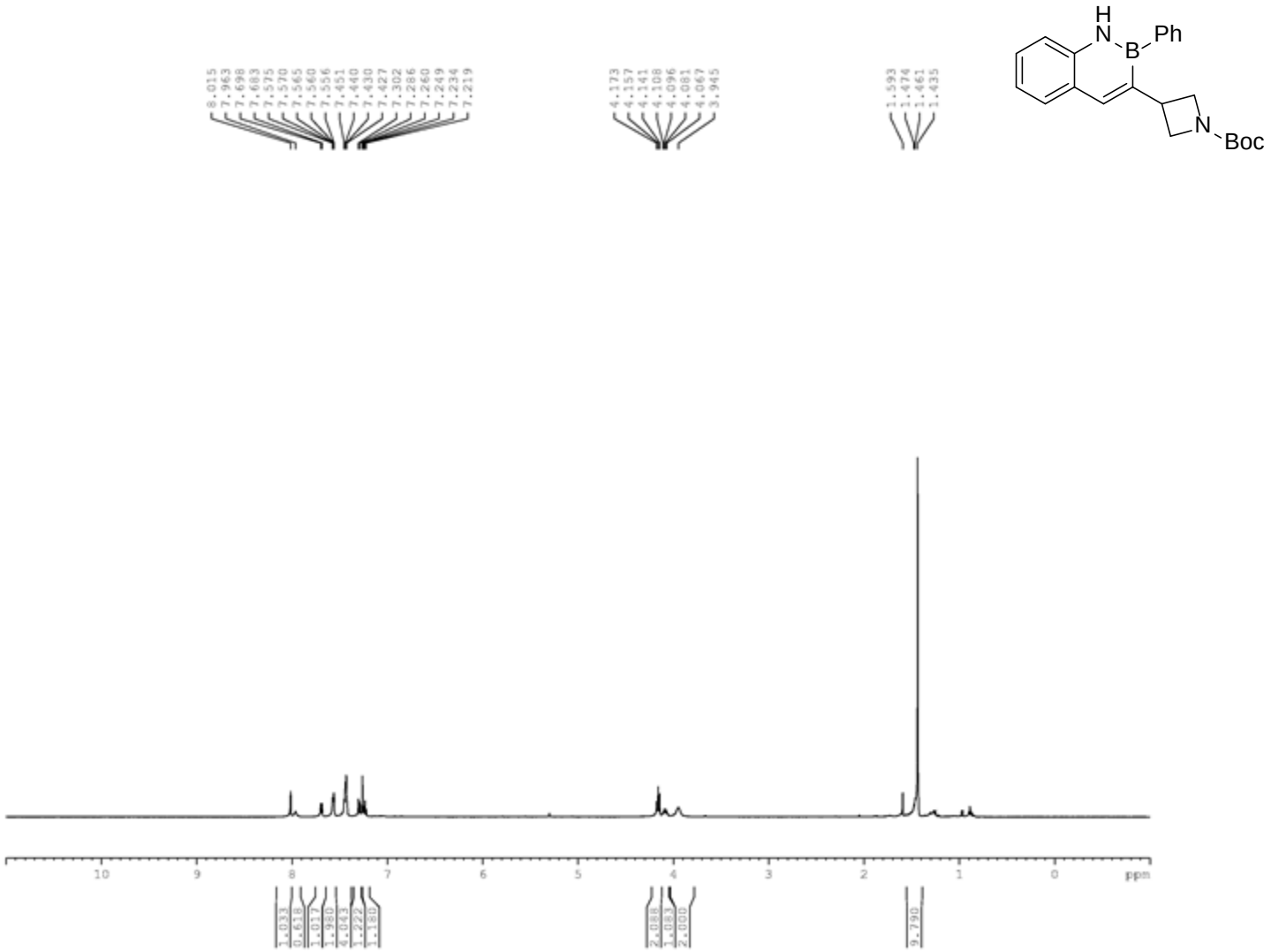


^{11}B NMR (128.38 MHz, $CDCl_3$) of **1-Allyl-3-(4-(*N*-Boc)-piperidenyl)-2-phenyl-2,1-borazaronaphthalene (1m)**

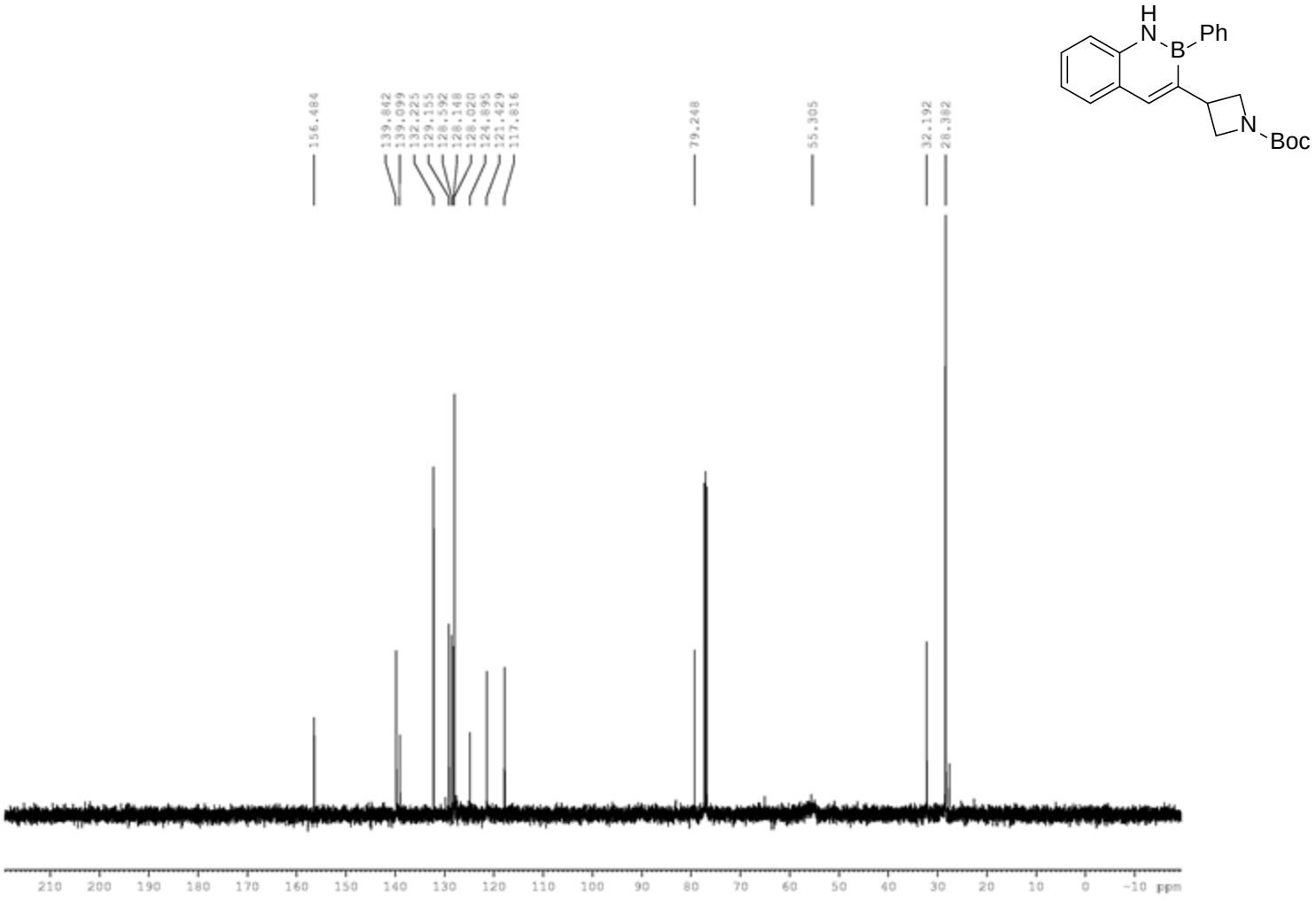




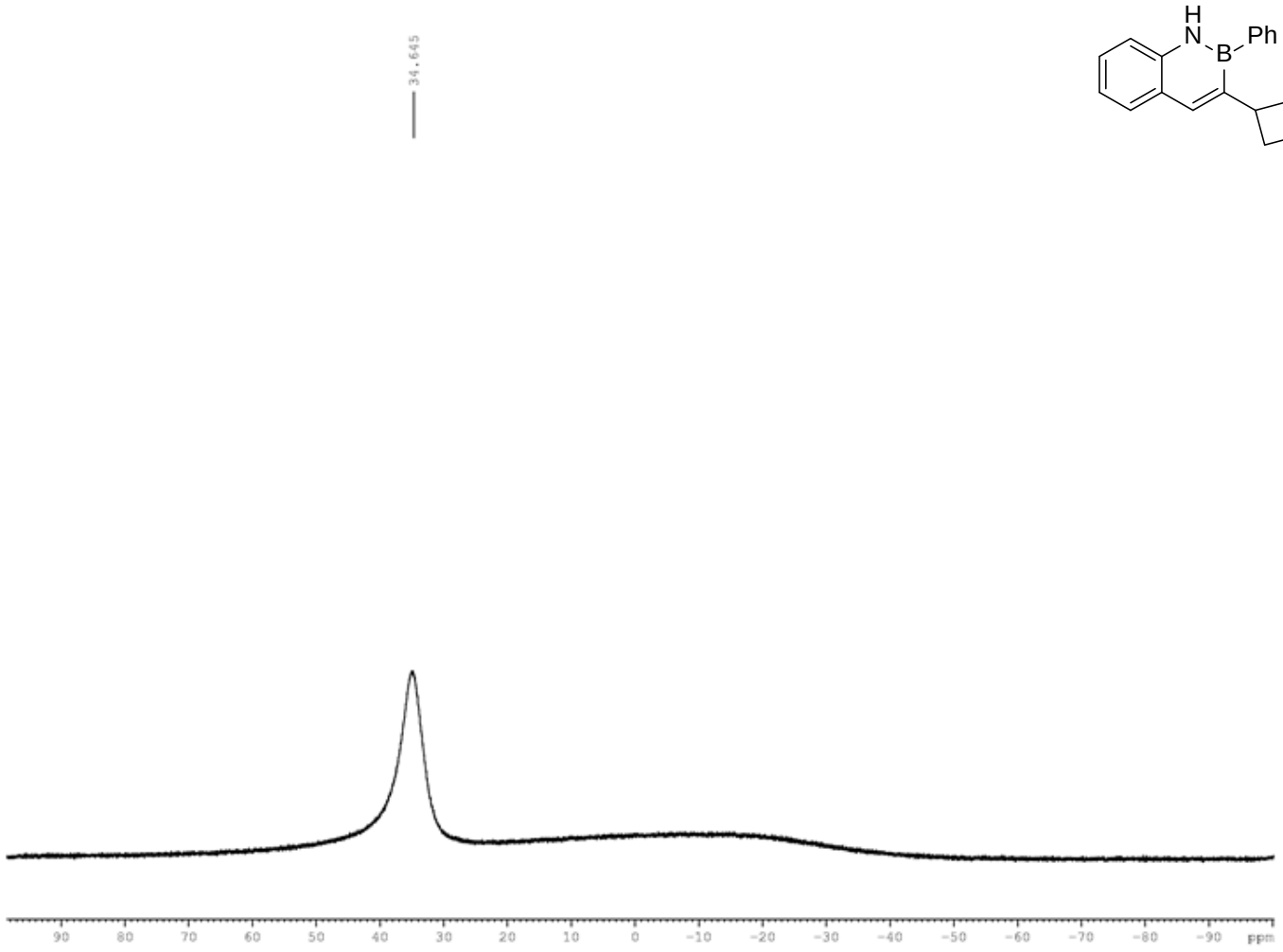
^{1}H NMR (500 MHz, $CDCl_3$) of **3-(3-(*N*-Boc)-azetindyl)-2-phenyl-2,1-borazaronaphthalene (2a)**



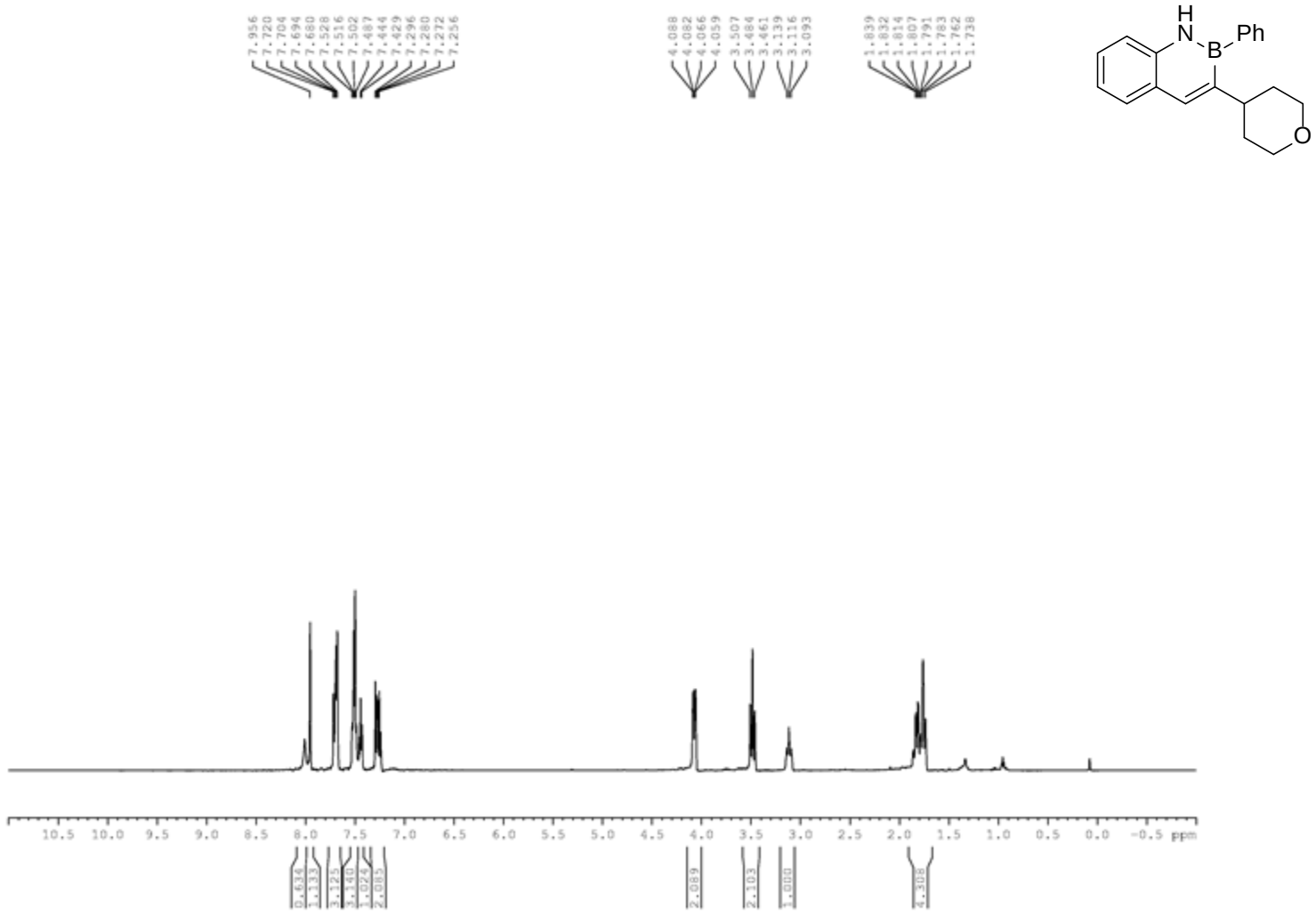
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(3-(*N*-Boc)-azetidinyl)-2-phenyl-2,1-borazaronaphthalene (2a)**



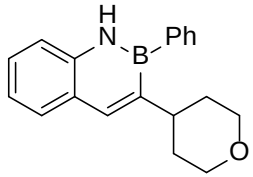
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(3-(*N*-Boc)-azetidinyl)-2-phenyl-2,1-borazaronaphthalene (2a)**

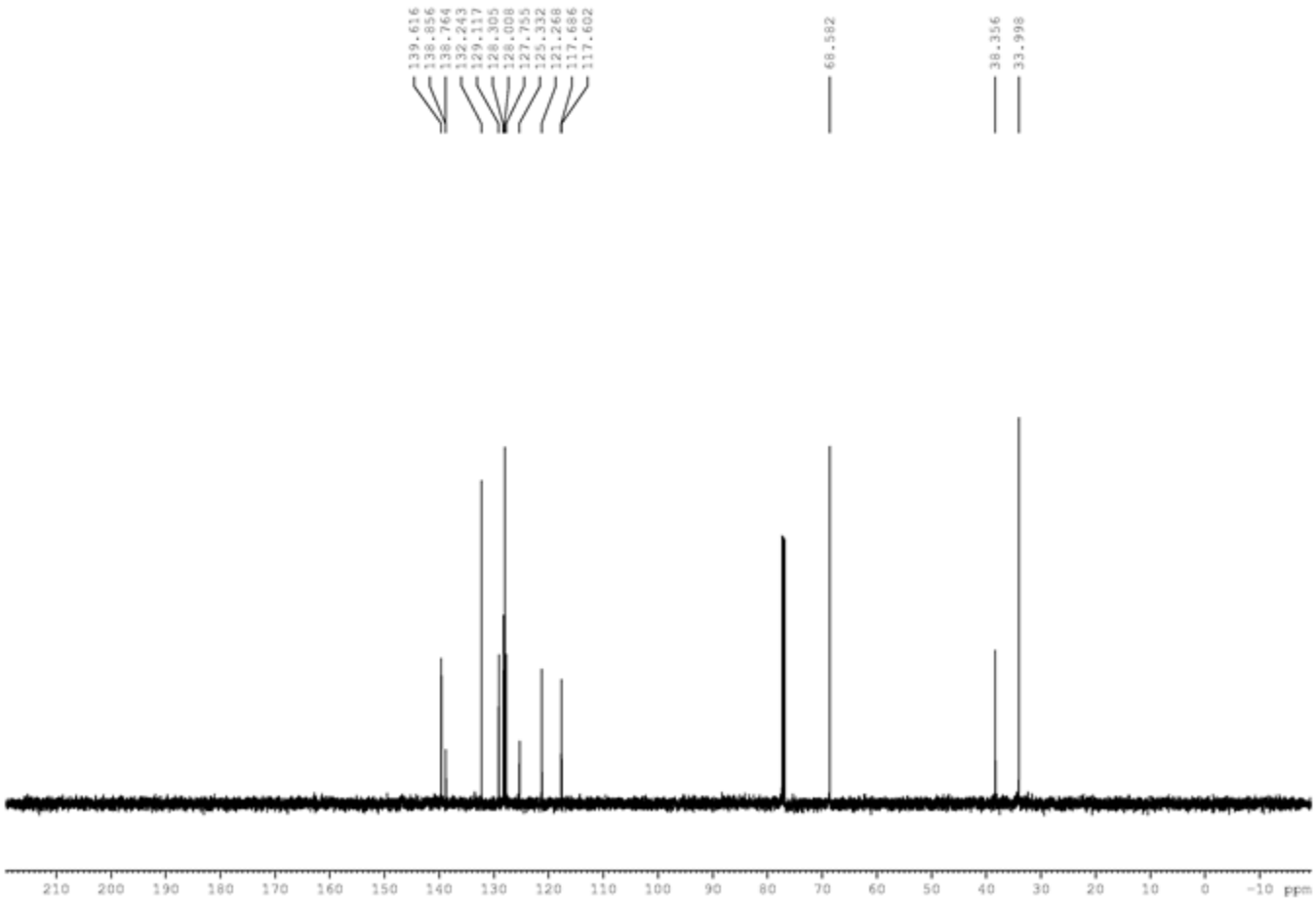


^{1}H NMR (500 MHz, $CDCl_3$) of **2-Phenyl-3-(4-tetrahydro-2*H*-pyranyl)-2,1-borazaronaphthalene (2b)**

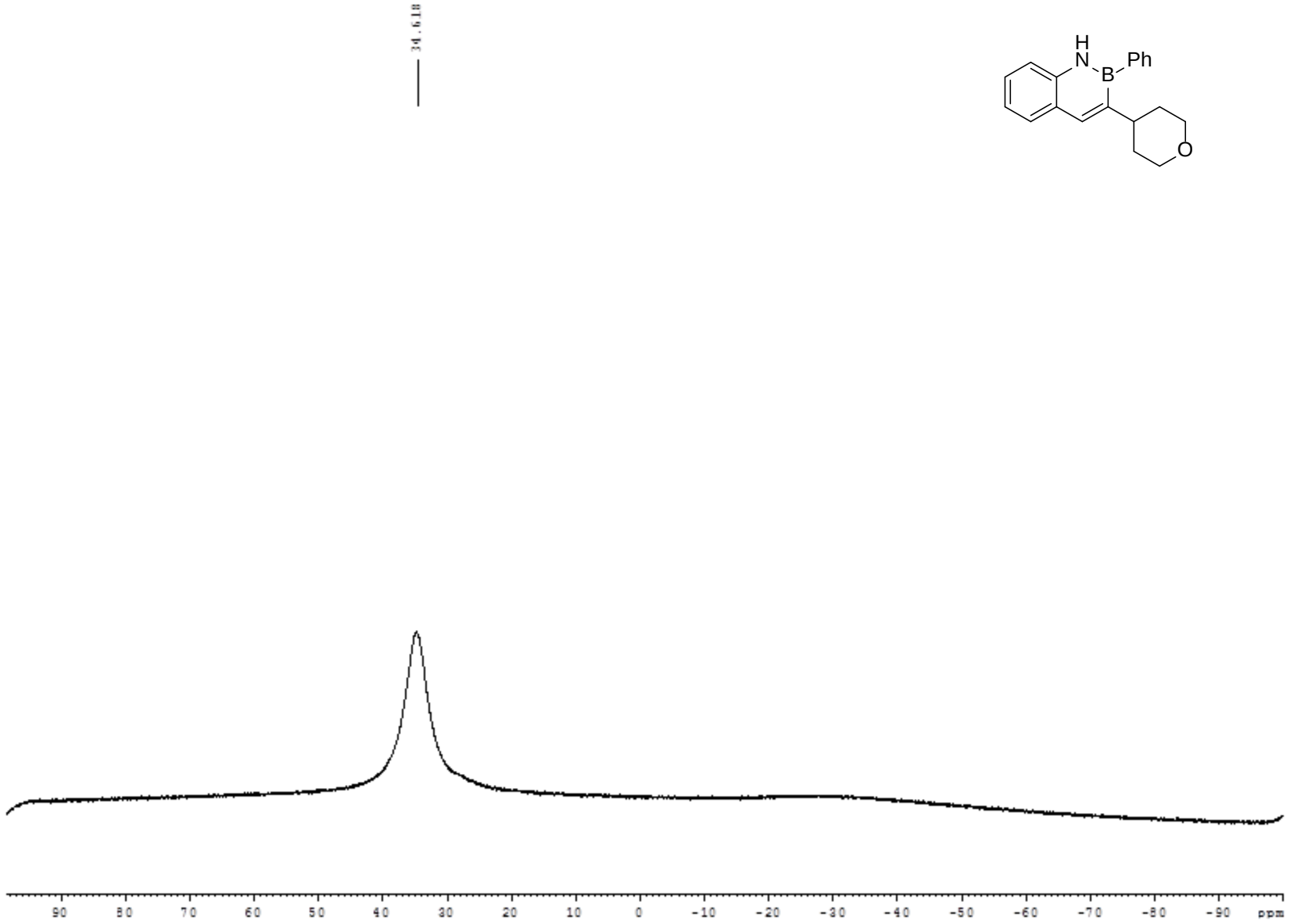


^{13}C NMR (125.8 MHz, $CDCl_3$) of **2-Phenyl-3-(4-tetrahydro-2*H*-pyranyl)-2,1-borazaronaphthalene (2b)**

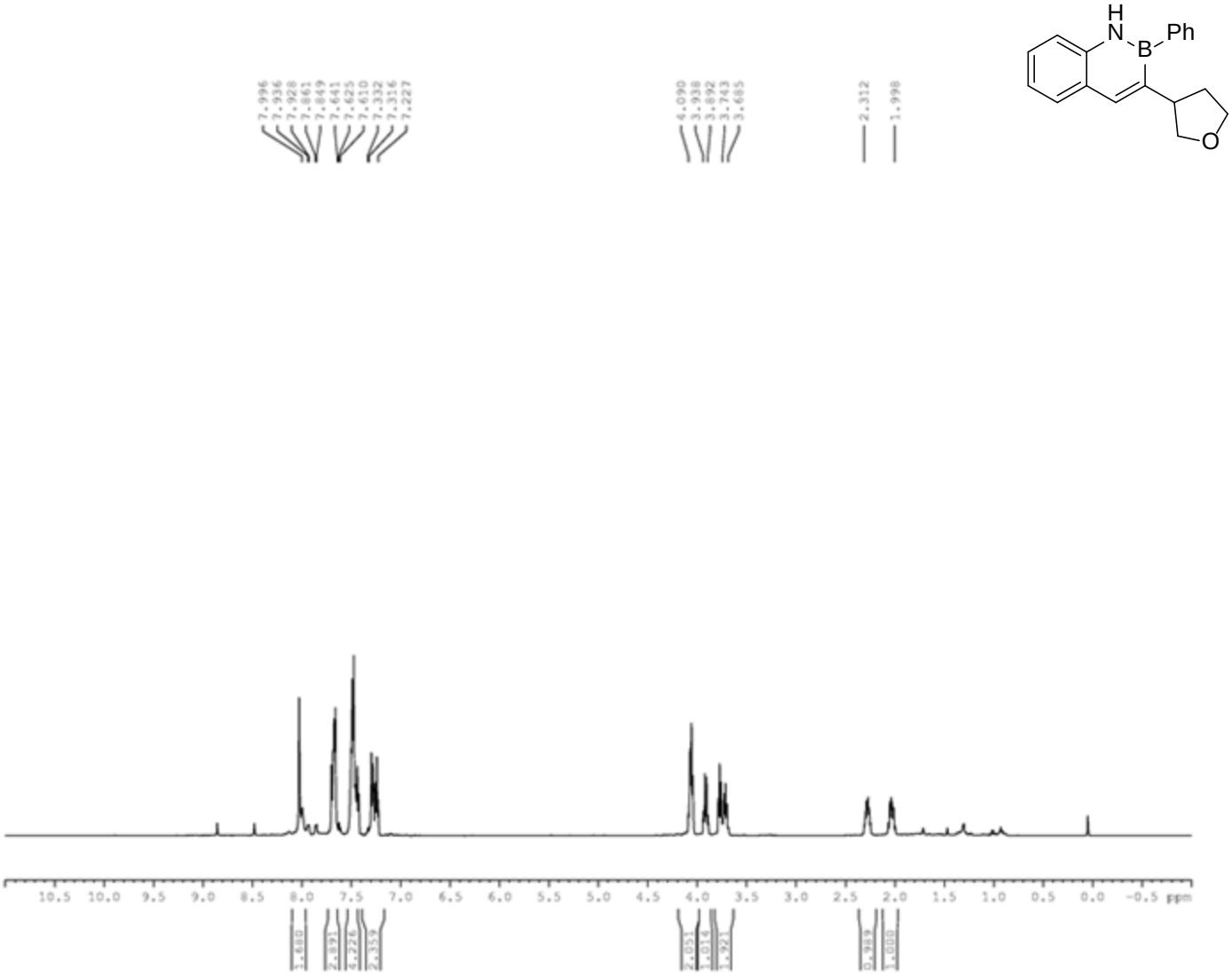




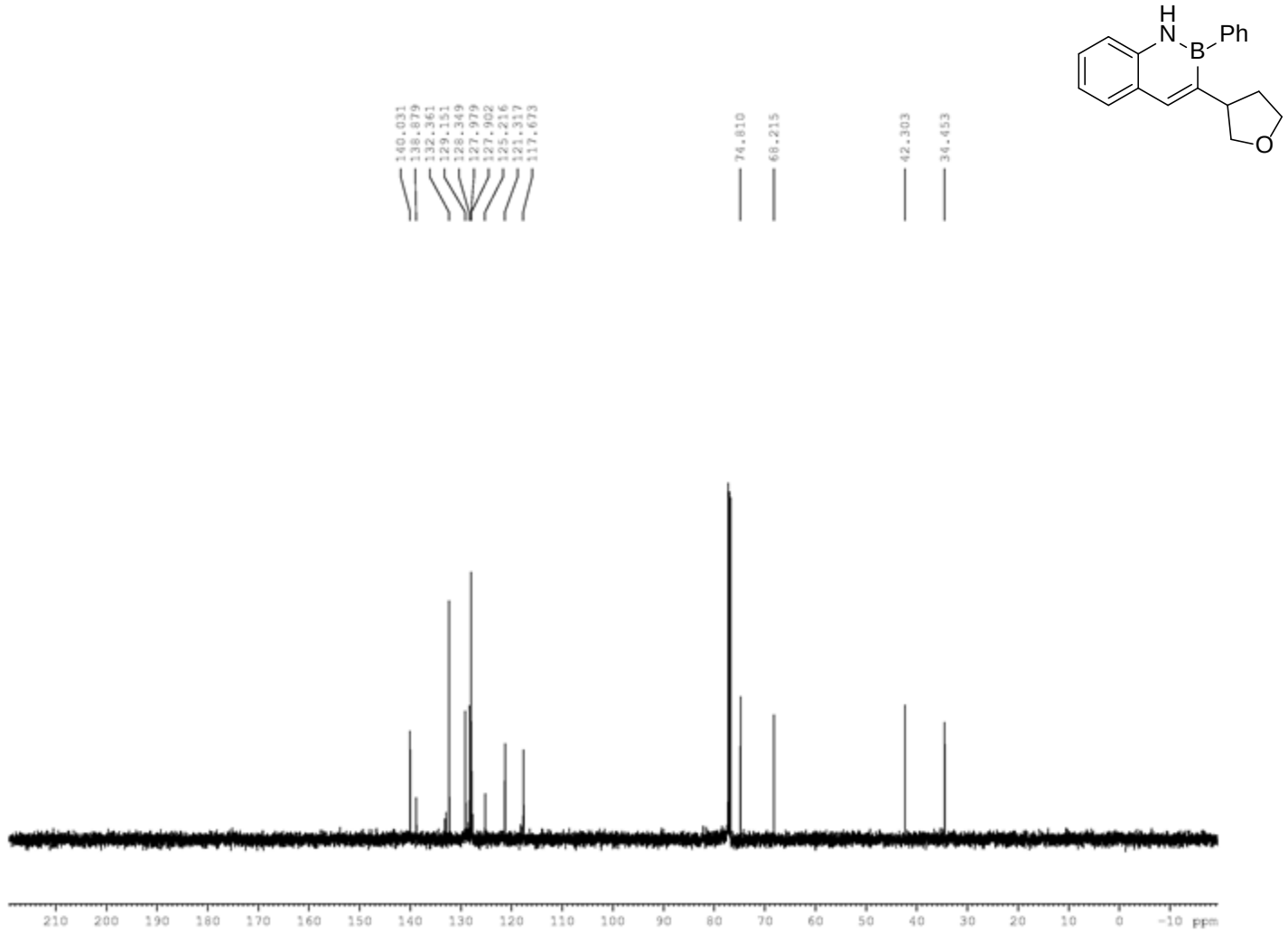
^{11}B NMR (128.38 MHz, $CDCl_3$) of **2-Phenyl-3-(4-tetrahydro-2*H*-pyranyl)-2,1-borazaronaphthalene (2b)**



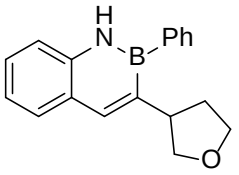
^{1}H NMR (500 MHz, $CDCl_3$) of **2-Phenyl-3-(3-tetrahydrofuranyl)-2,1-borazaronaphthalene (2c)**

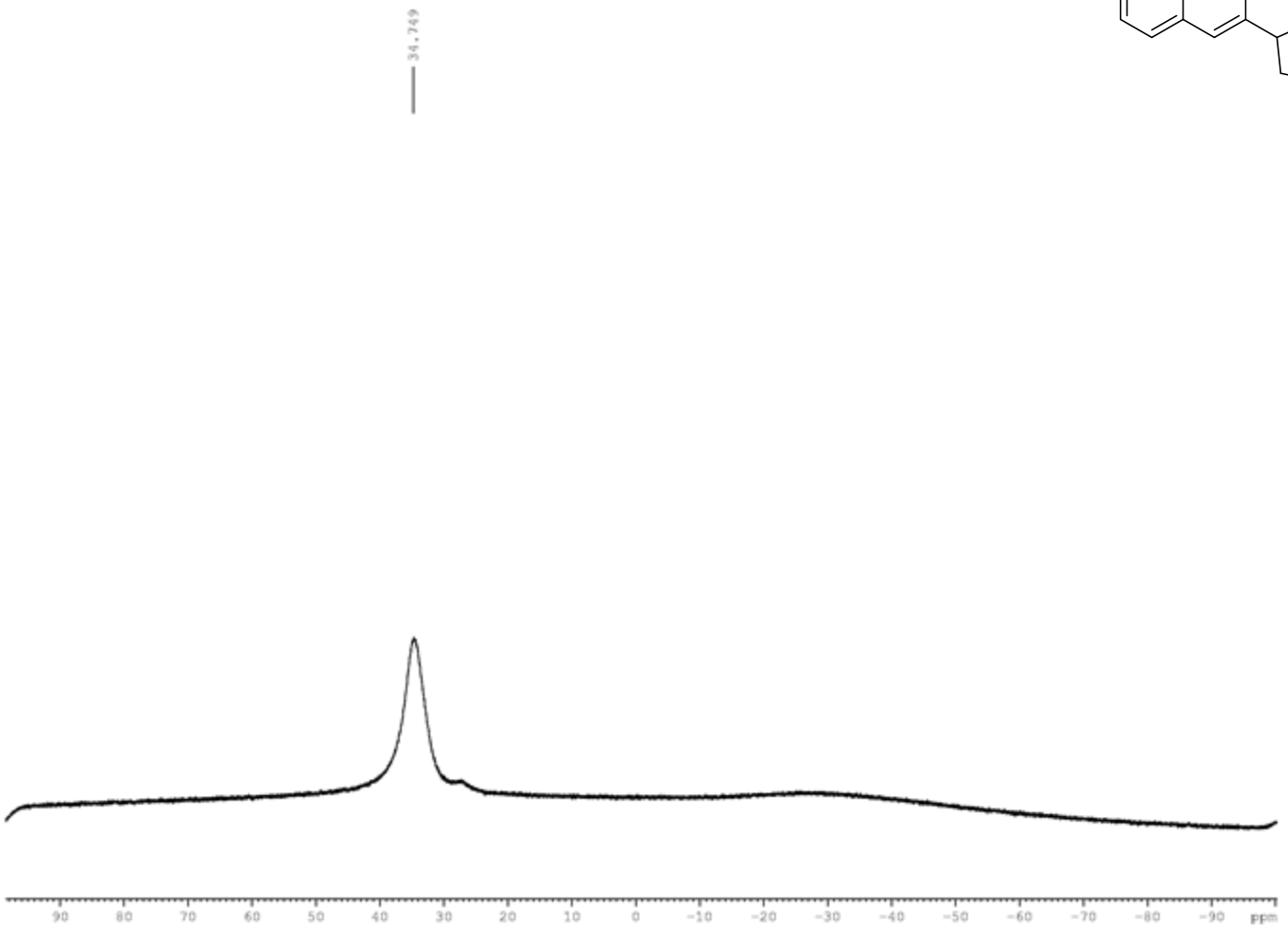


^{13}C NMR (125.8 MHz, $CDCl_3$) of **2-Phenyl-3-(3-tetrahydrofuranyl)-2,1-borazaronaphthalene (2c)**

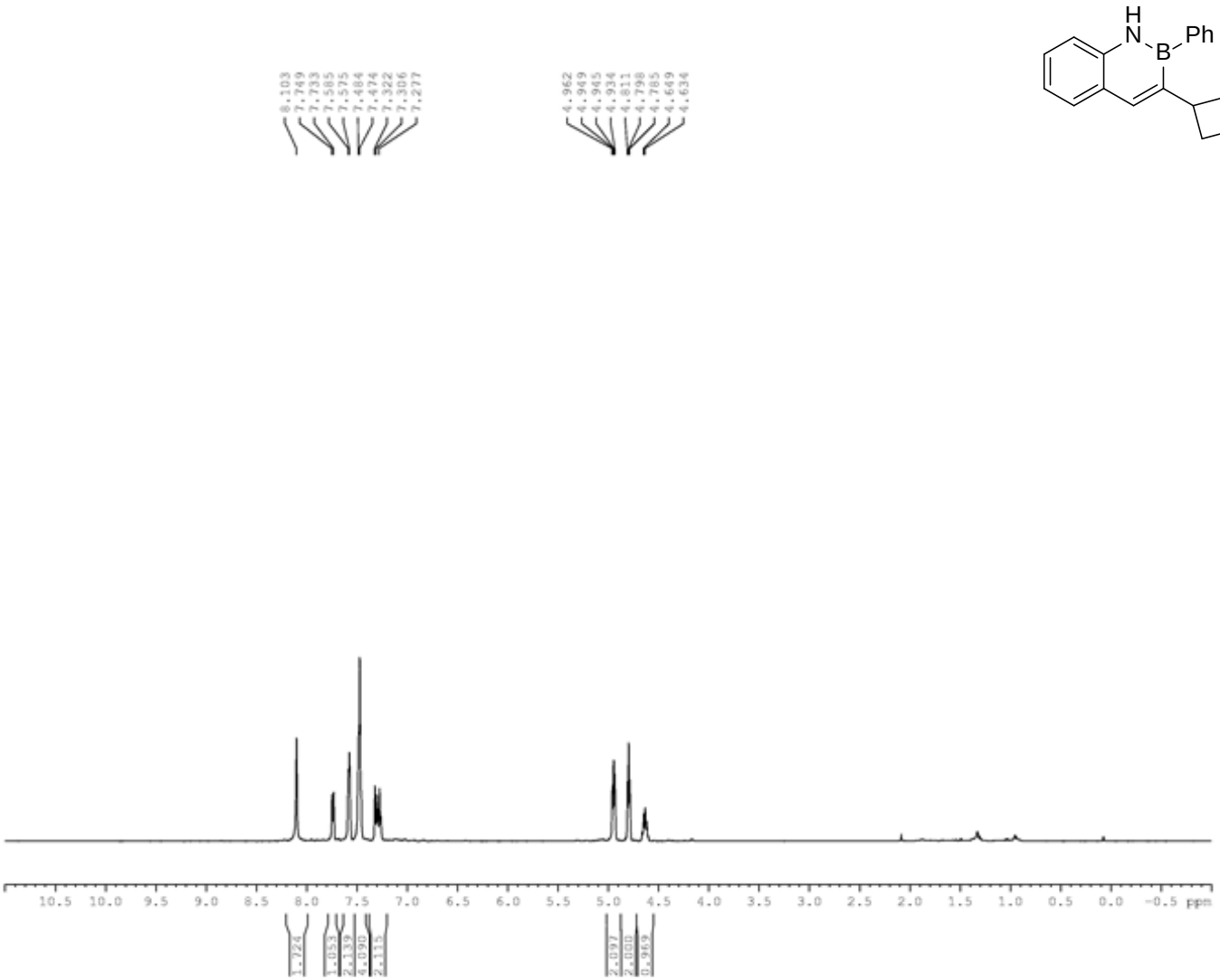


^{11}B NMR (128.38 MHz, $CDCl_3$) of **2-Phenyl-3-(3-tetrahydrofuranyl)-2,1-borazaronaphthalene (2c)**

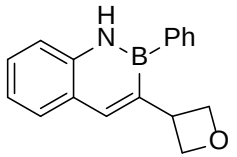


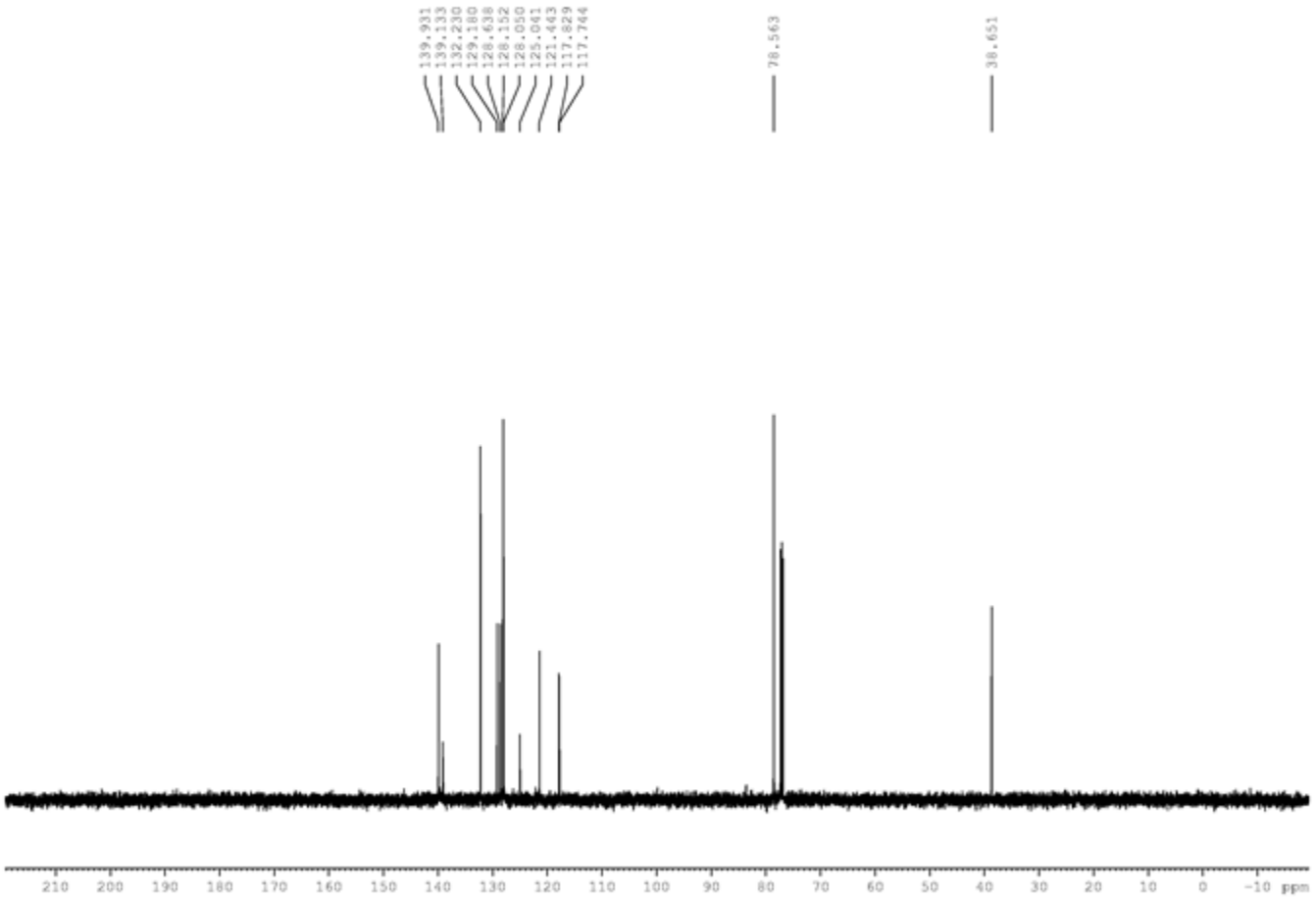


^{1}H NMR (500 MHz, $CDCl_3$) of **3-(3-Oxetanyl)-2-phenyl-2,1-borazaronaphthalene (2d)**

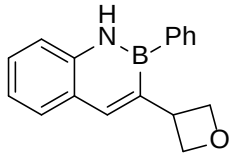


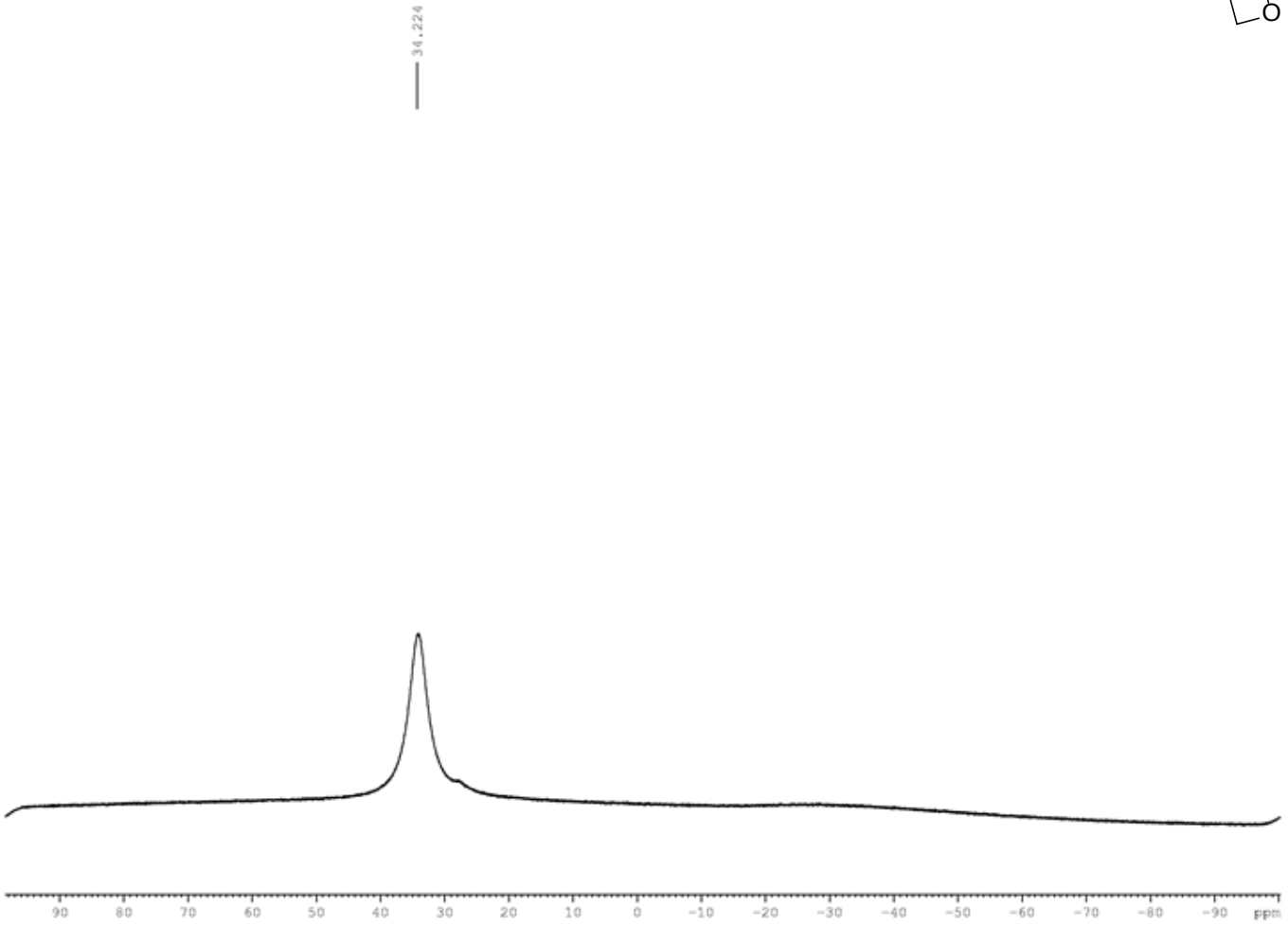
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-(3-Oxetanyl)-2-phenyl-2,1-borazaronaphthalene (2d)**



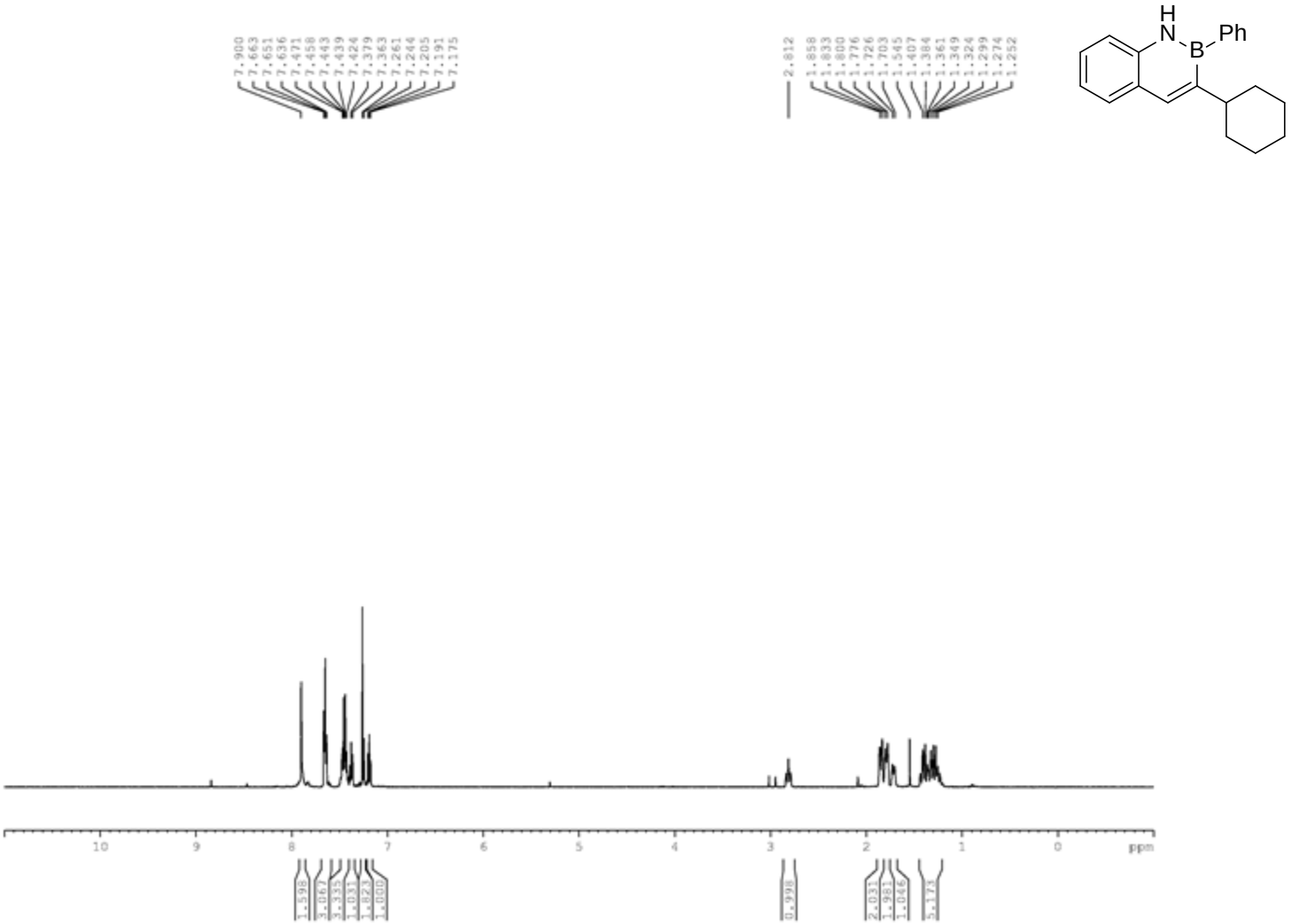


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-(3-Oxetanyl)-2-phenyl-2,1-borazaronaphthalene (2d)**

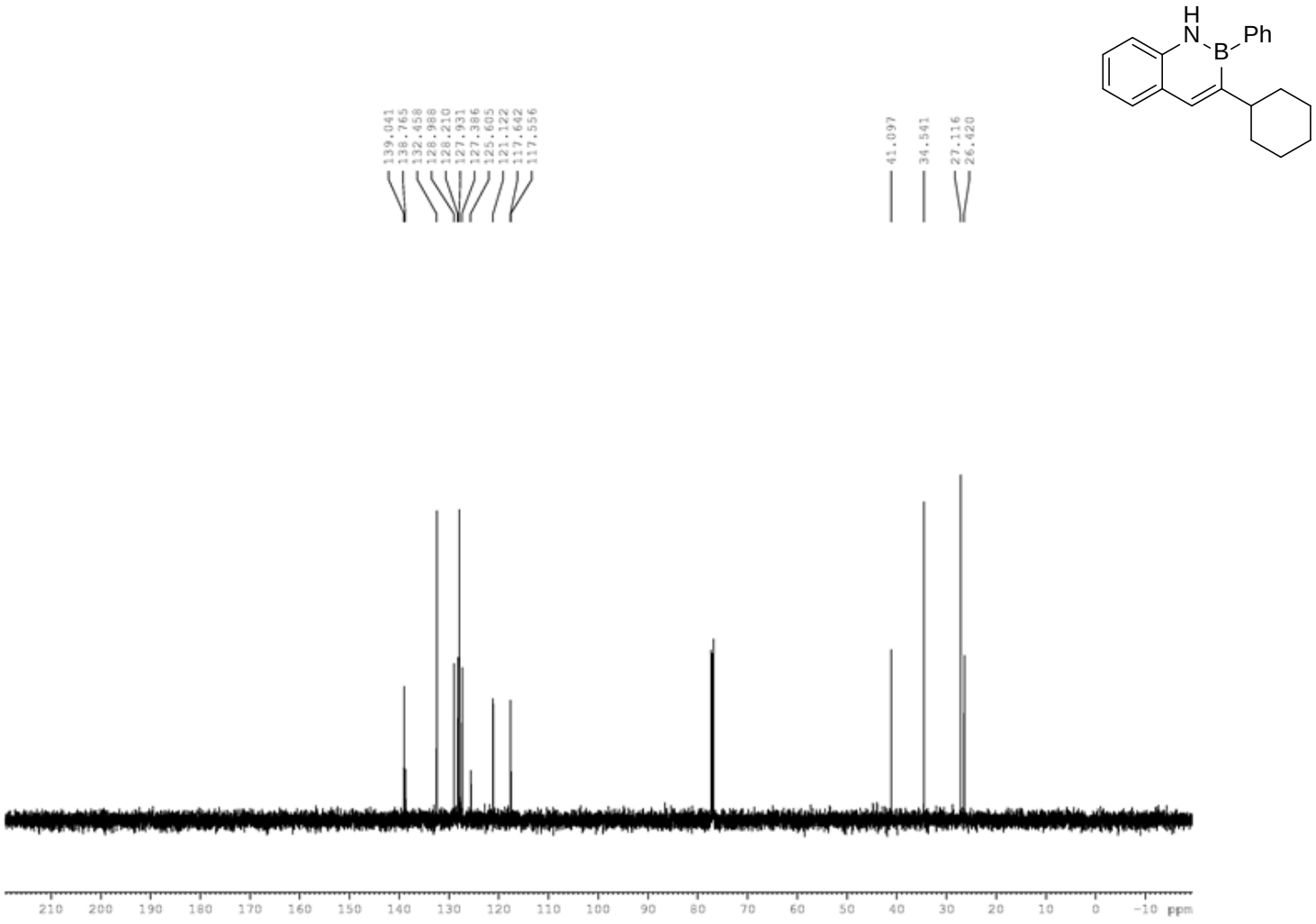




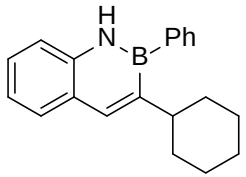
^{1}H NMR (500 MHz, $CDCl_3$) of **3-Cyclohexyl-2-phenyl-2,1-borazaronaphthalene (2e)**

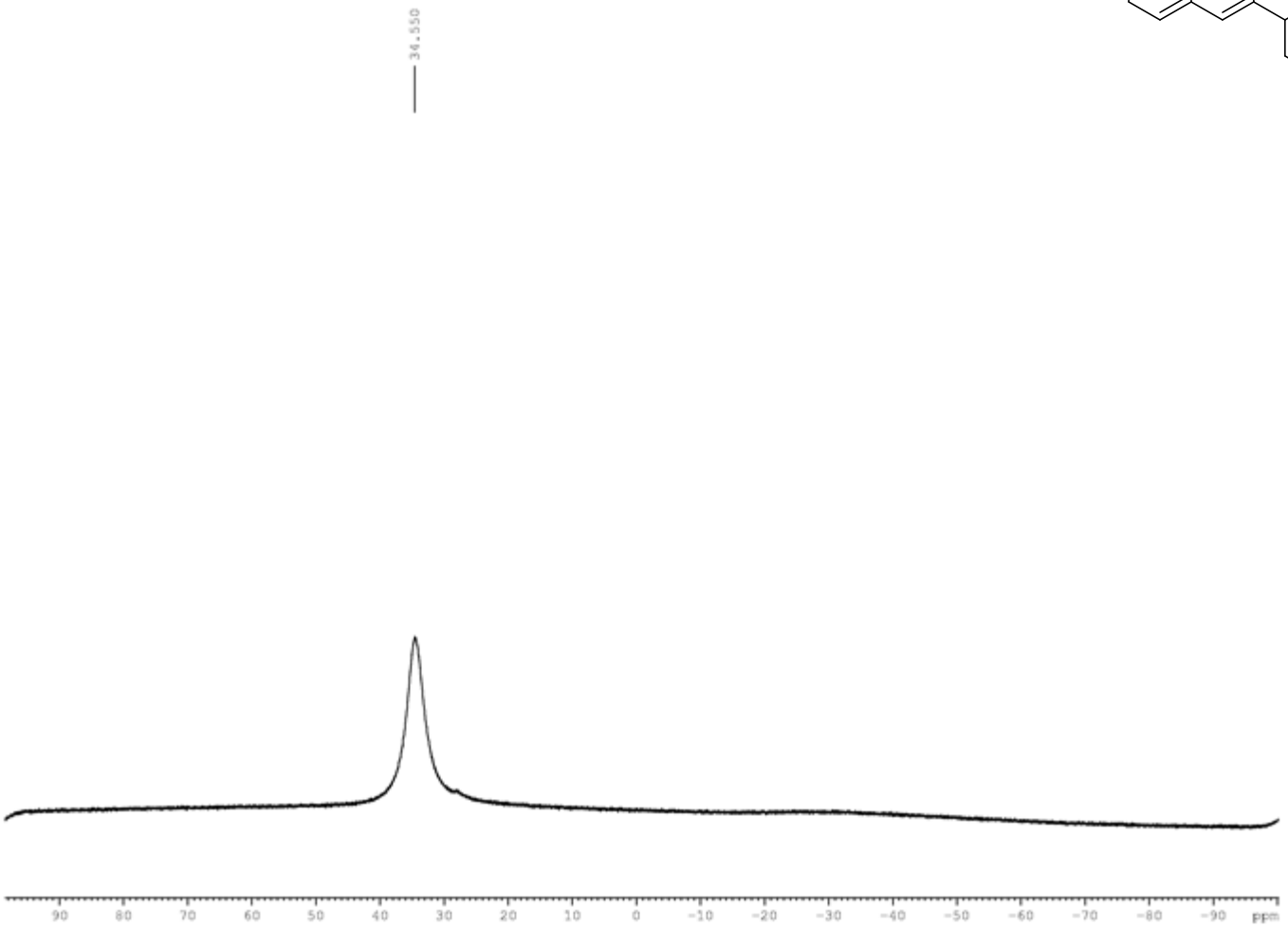


^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-Cyclohexyl-2-phenyl-2,1-borazaronaphthalene (2e)**

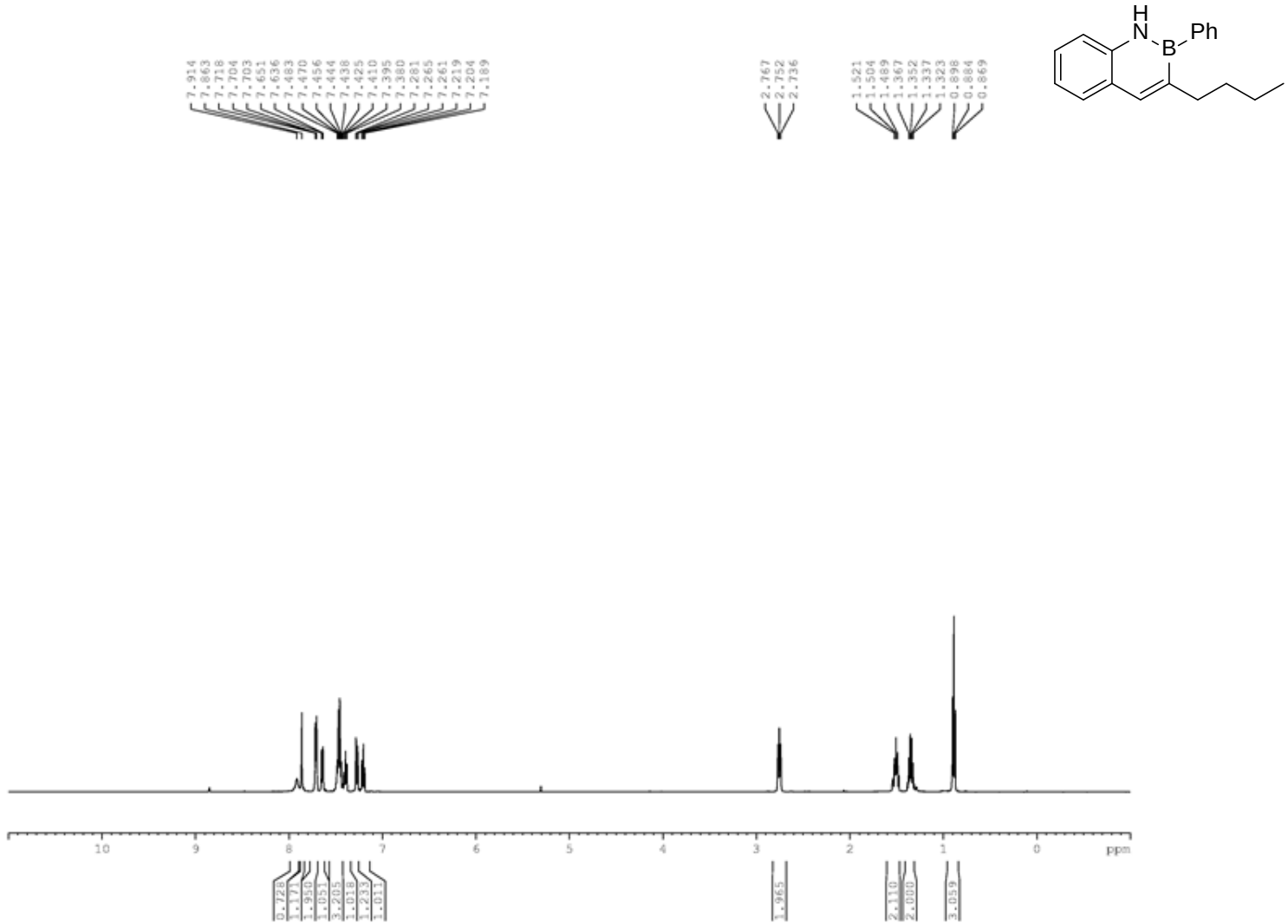


^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-Cyclohexyl-2-phenyl-2,1-borazaronaphthalene (2e)**

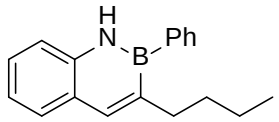


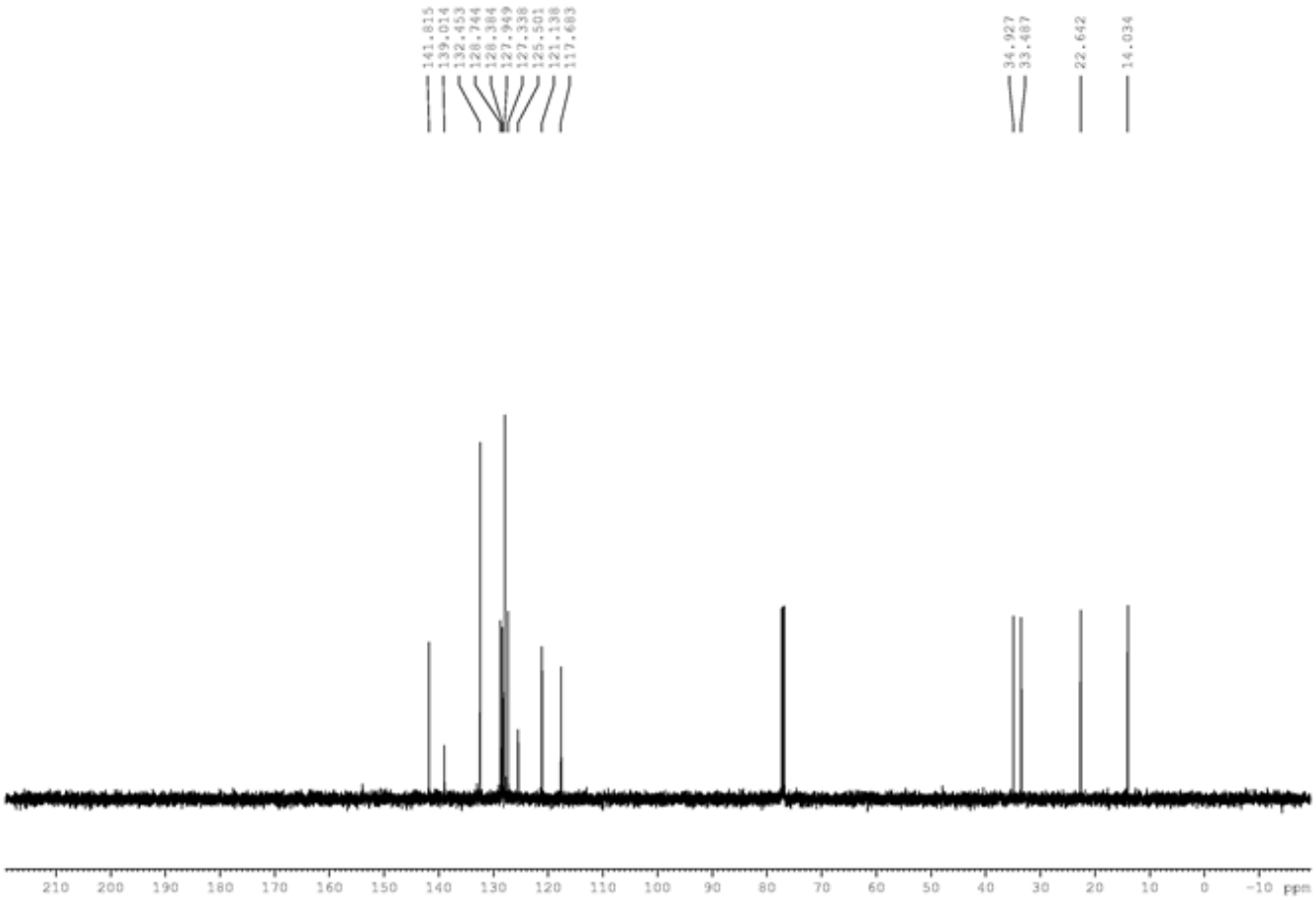


^{1}H NMR (500 MHz, $CDCl_3$) of **3-Butyl-2-phenyl-2,1-borazaronaphthalene (2f)**

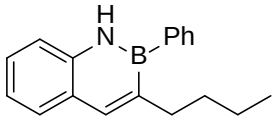


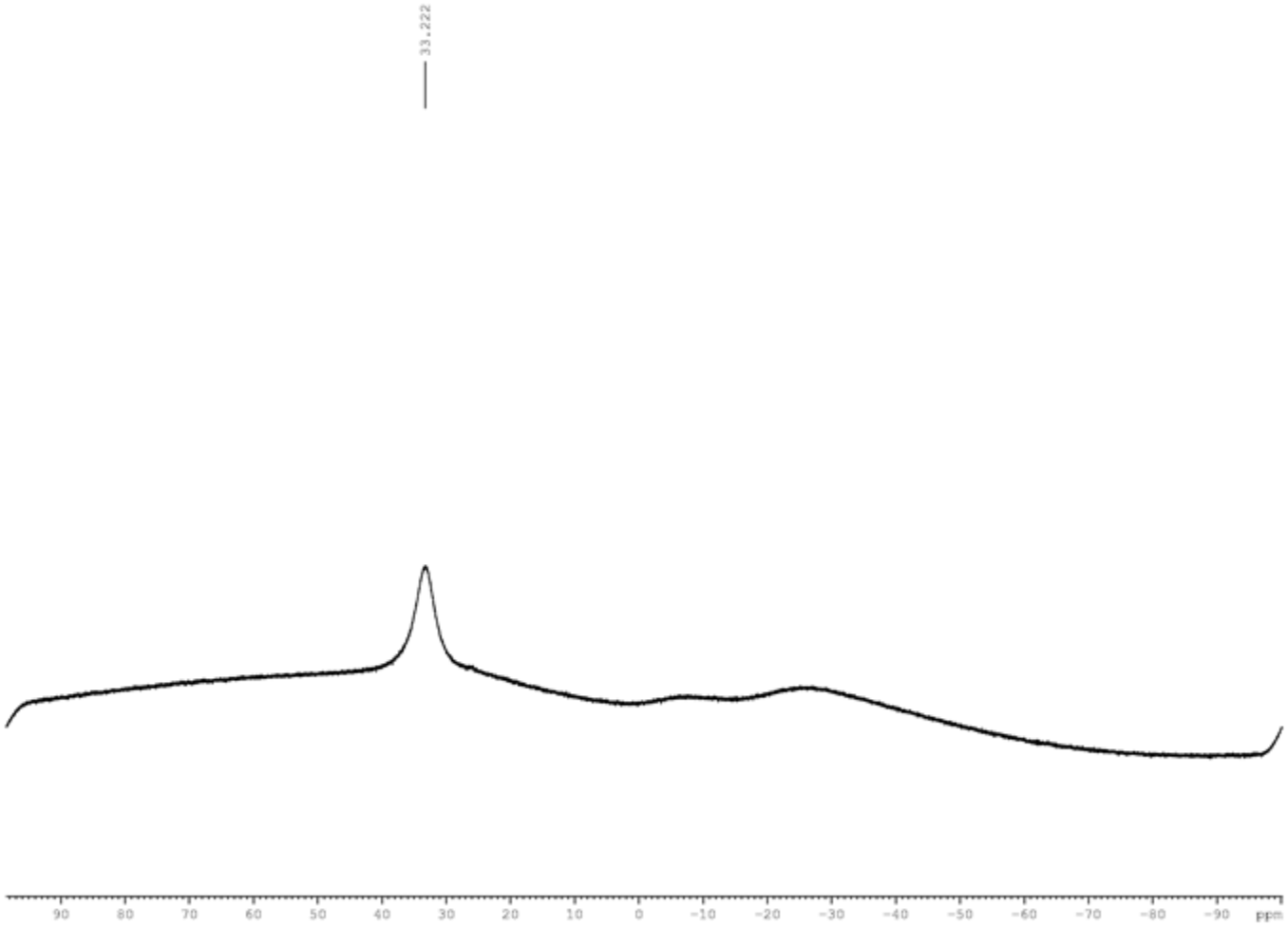
^{13}C NMR (125.8 MHz, $CDCl_3$) of **3-Butyl-2-phenyl-2,1-borazaronaphthalene (2f)**



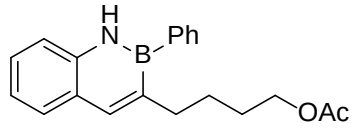


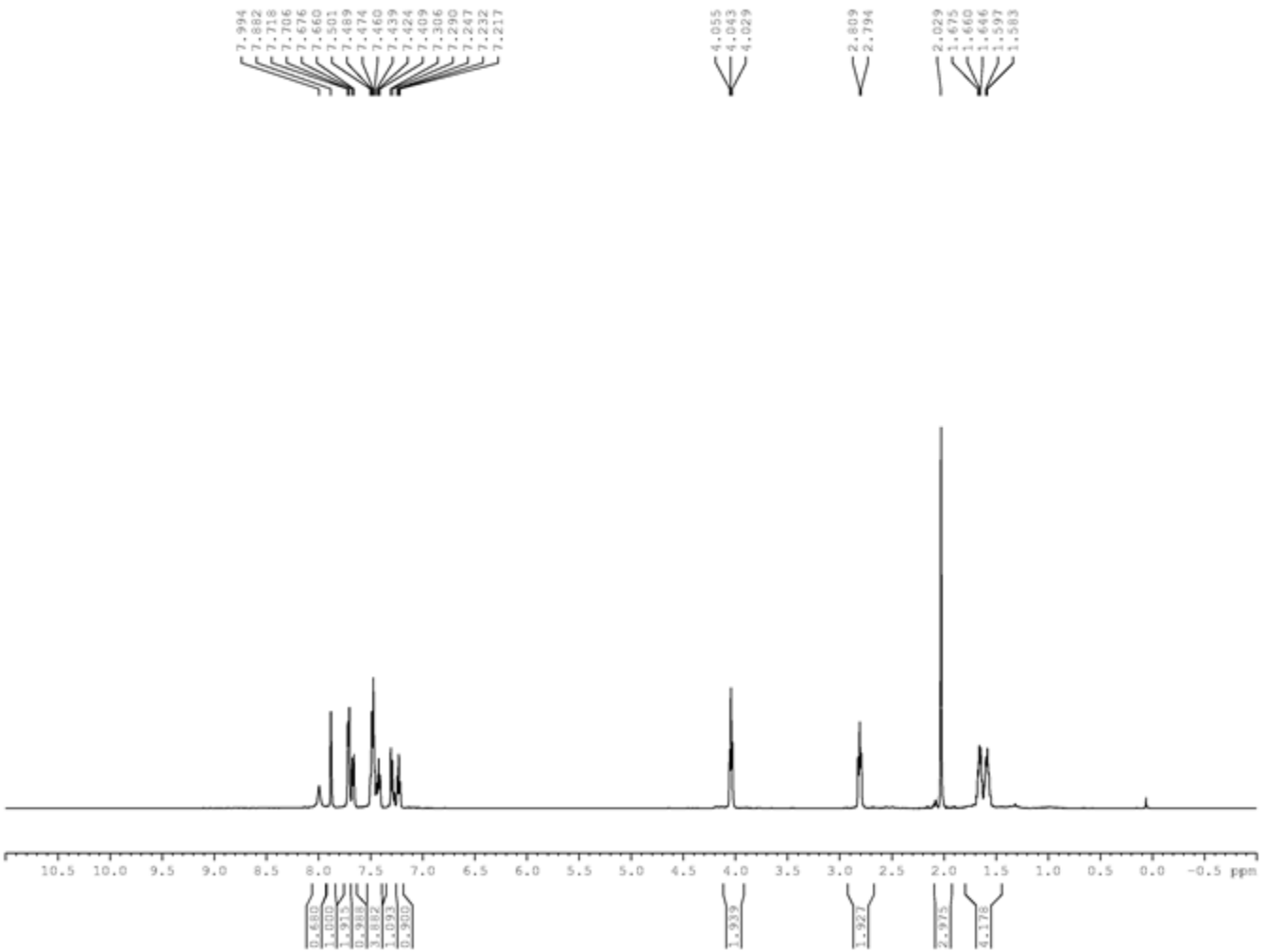
^{11}B NMR (128.38 MHz, $CDCl_3$) of **3-Butyl-2-phenyl-2,1-borazaronaphthalene (2f)**



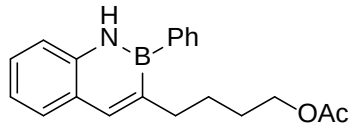


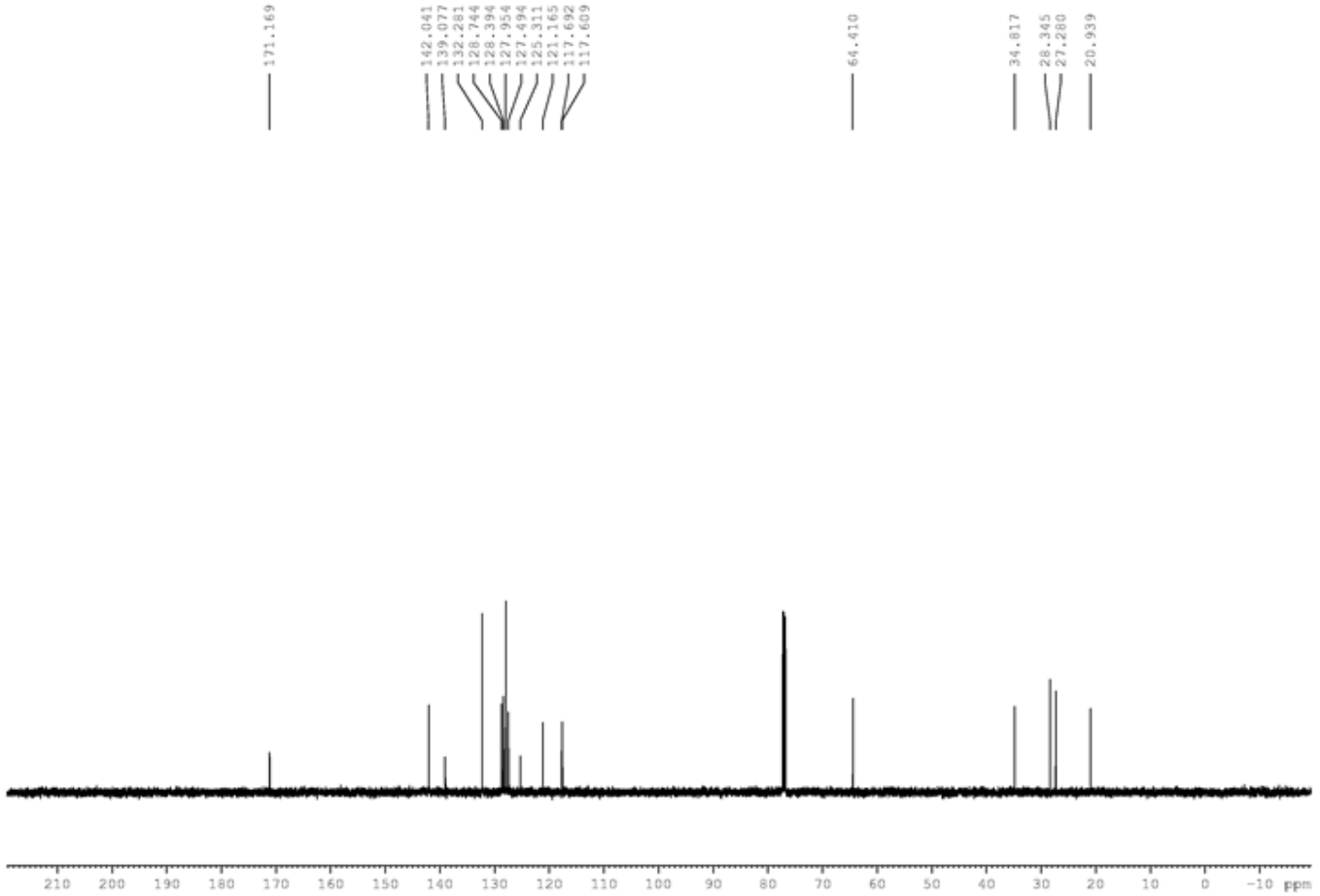
^{1}H NMR (500 MHz, $CDCl_3$) of **4-(2-Phenyl-2,1-borazaronaphthalene)butyl acetate (2g)**



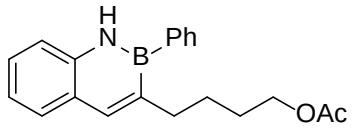


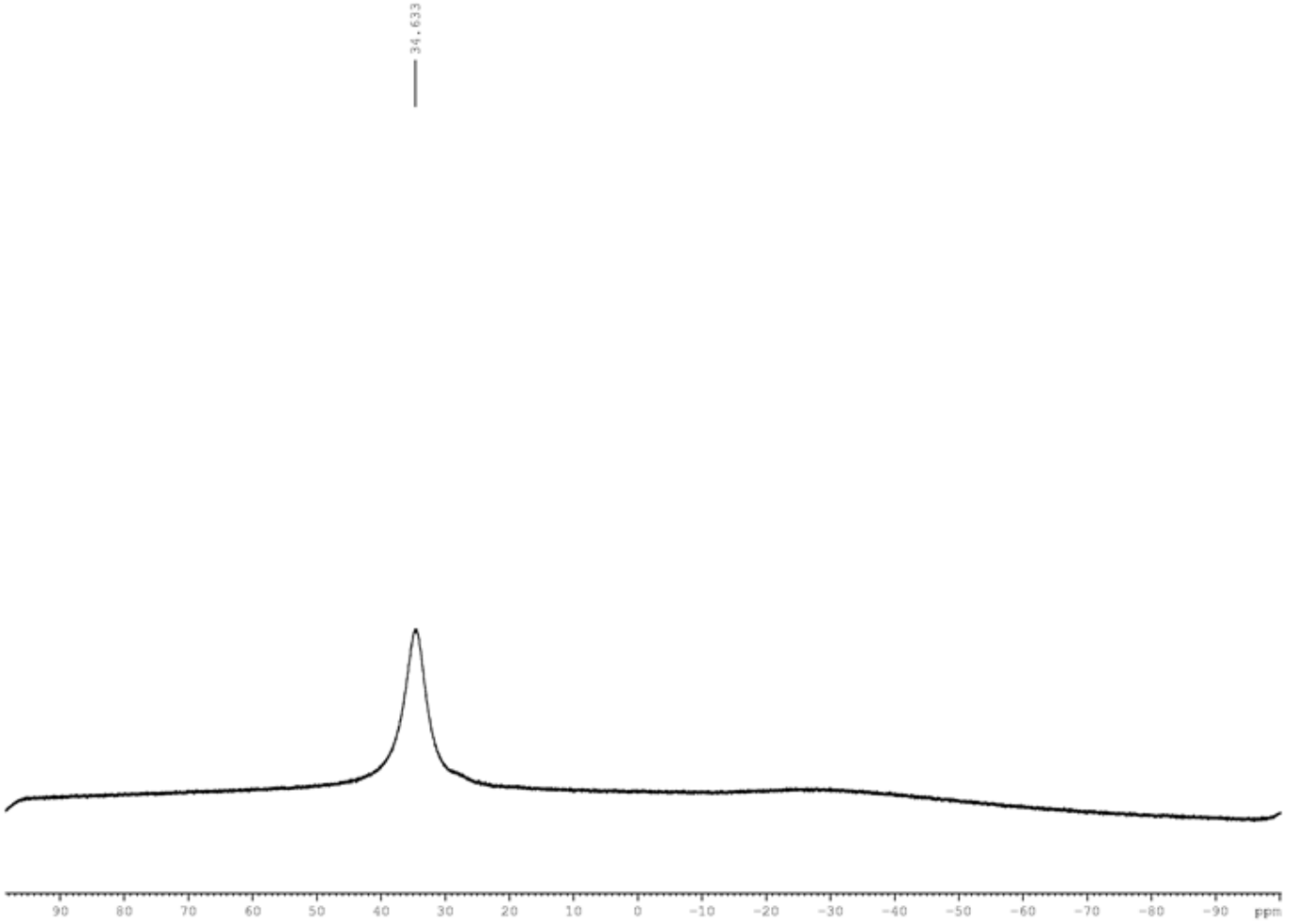
^{13}C NMR (125.8 MHz, $CDCl_3$) of **4-(2-Phenyl-2,1-borazaronaphthalene)butyl acetate (2g)**



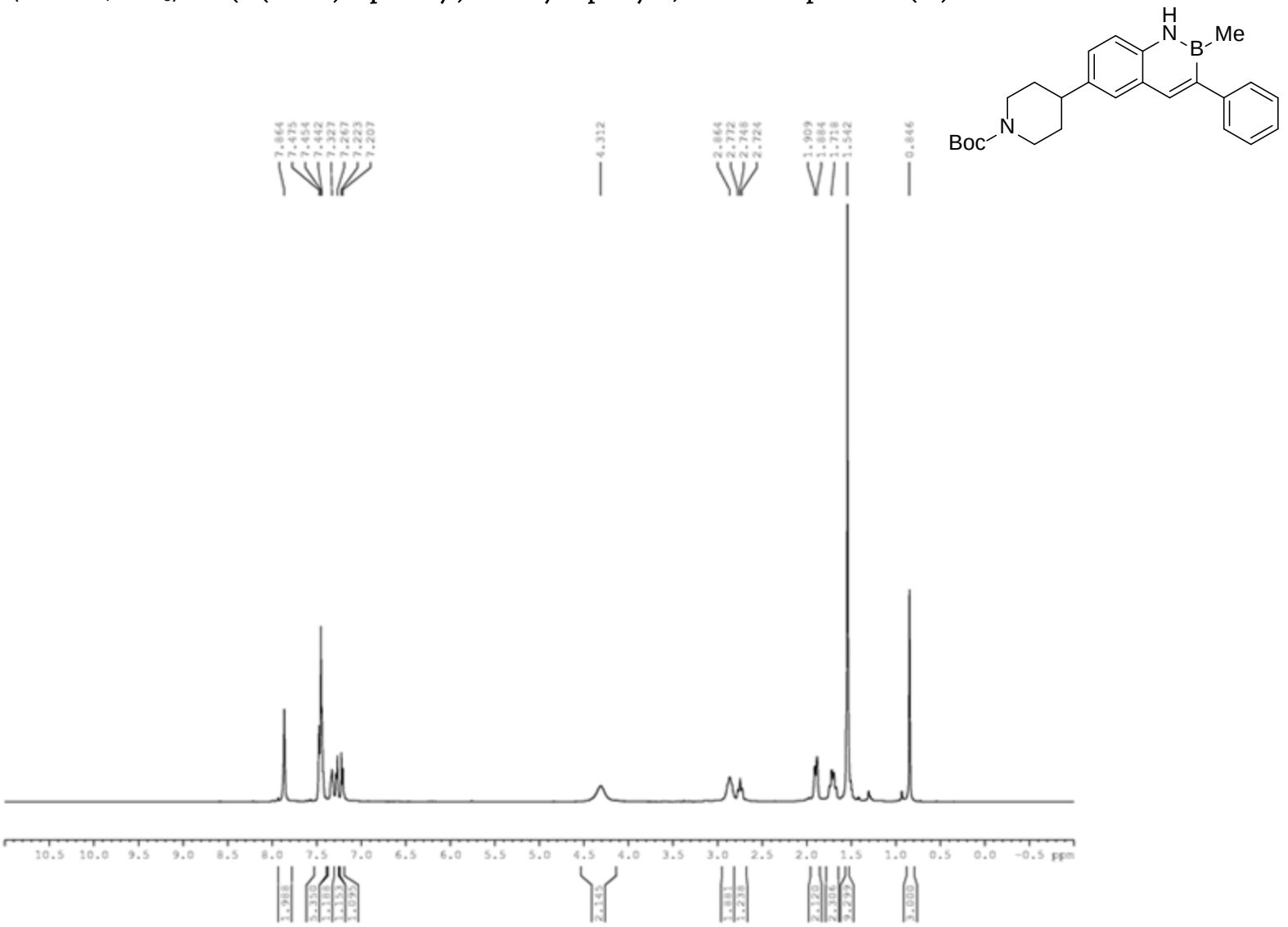


^{11}B NMR (128.38 MHz, $CDCl_3$) of **4-(2-Phenyl-2,1-borazaronaphthalene)butyl acetate (2g)**

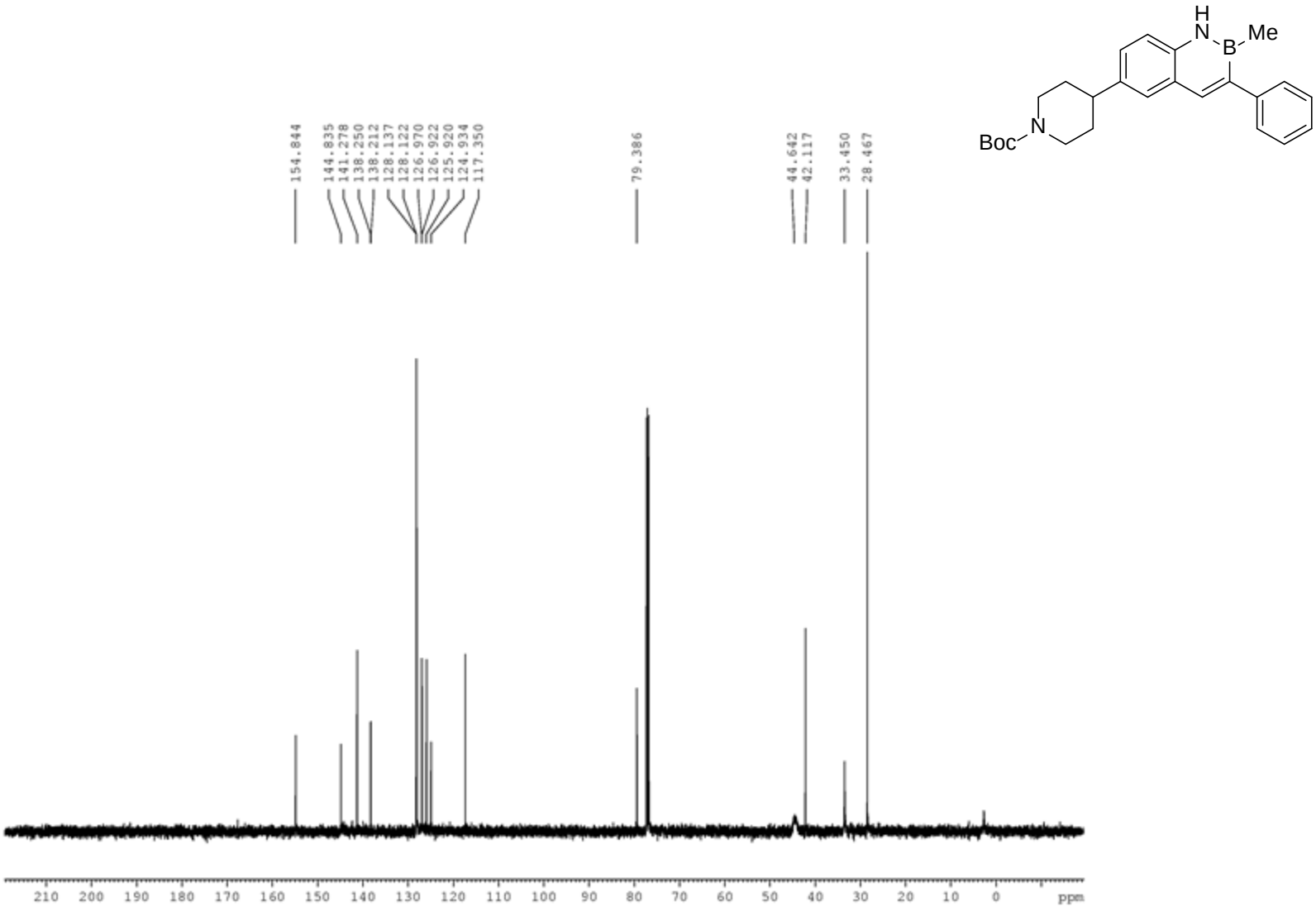




^{1}H NMR (500 MHz, $CDCl_3$) of **6-(4-(*N*-Boc)-Piperidinyl)-2-methyl-3-phenyl-2,1-borazaronaphthalene (3a).**



^{13}C NMR (125.8 MHz, $CDCl_3$) of **6-(4-(*N*-Boc)-Piperidinyl)-2-methyl-3-phenyl-2,1-borazaronaphthalene (3a)**



^{11}B NMR (128.38 MHz, $CDCl_3$) of **6-(4-(*N*-Boc)-Piperidinyl)-2-methyl-3-phenyl-2,1-borazaronaphthalene (3a)**