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Supporting Information

Biomimetic Asymmetric Reduction of Benzoxazinones And Quinoxalinones Using Ureas as Transfer Catalysts

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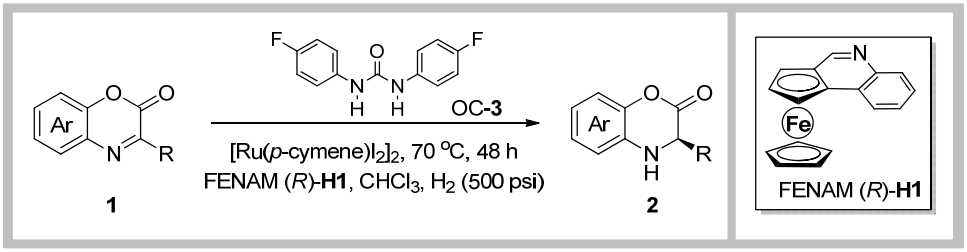
1. General and Materials

All reactions were carried out under an atmosphere of nitrogen using the standard Schlenk techniques, unless otherwise noted. Commercially available reagents were used without further purification. Solvents were treated prior to use according to the standard methods. ^{1}H NMR, ^{13}C NMR spectra were recorded at room temperature in $CDCl_3$ on 400 MHz instrument with TMS as internal standard. Enantiomeric excess was determined by HPLC analysis, using chiral column described below in detail. Optical rotations were measured by polarimeter. Flash column chromatography was performed on silica gel (200-300 mesh). The heat source for all heating reactions is the oil bath. High-resolution mass spectrometry (HRMS) was measured on an electrospray ionization (ESI) apparatus using the time-of-flight (TOF) mass spectrometry. All reactions were monitored by TLC analysis. A variety of organic hydrogen-bonding urea catalysts[1] such as OC-**1** to OC-**7** were synthesized according to the known literature procedures.

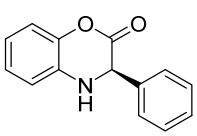
2. Hydrogen Bonding Promoted Biomimetic Asymmetric Reduction

2.1 Biomimetic Asymmetric Reduction of Benzoxazinones



General procedure: A mixture of [Ru(*p*-cymene)I_2]$_2$ (0.001 mmol, 0.5 mol%), organocatalyst urea OC-**3** (0.04 mmol, 20 mol%), NAD(P)H model FENAM ((*R*)-**H1**, 0.02 mmol, 10 mol%) and substrates **1** (0.20 mmol) in chloroform (3.0 mL) was stirred at room temperature for 5 min in glove box and then the reaction mixture was transferred to an autoclave. The hydrogenation was performed at 70 ^{o}C (oil bath temperature) under hydrogen gas (500 psi) for 48 h. After careful release of the hydrogen gas, the autoclave was opened and the reaction mixture was directly purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to give the desirable chiral products **2**. The enantiomeric excesses were determined by chiral HPLC.

(*R*)-3-Phenyl-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2a):

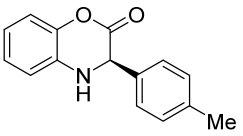


42 mg, 93% yield, white solid, known compound, R_f = 0.50 (hexanes/ethyl acetate 5/1), 94% ee, $[\alpha]^{20}_D$ = -103.19 (*c* 0.72, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +106.5 (c 0.4, $CHCl_3$) for 97% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44-7.33 (m, 5H), 7.08-7.00 (m, 2H), 6.90-6.84 (m, 1H), 6.83-6.79 (m, 1H), 5.07 (s, 1H), 4.24 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.2, 140.9, 136.4, 132.4, 129.0, 127.5, 125.2, 120.4, 117.0, 114.9, 59.3. HPLC: Chiracel OD-H column, 254 nm, 30 ^{o}C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 10.9 min (major) and 15.0 min.

(*R*)-3-(*p*-Tolyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2b):

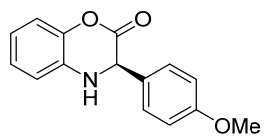
45 mg, 94% yield, yellow solid, known compound, R_f = 0.60 (hexanes/ethyl acetate 5/1), 93% ee, $[\alpha]^{20}_D$ = -91.88 (*c* 0.90, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +85.0 (c 0.4, $CHCl_3$) for 86% ee], ^{1}H NMR (400

MHz, $CDCl_3$) δ 7.27 (d, *J* = 8.1 Hz, 2H), 7.16 (d, *J* = 7.9 Hz, 2H), 7.05-6.98 (m, 2H), 6.88-6.82 (m, 1H), 6.81-6.76 (m, 1H), 4.99 (d, *J* = 1.5 Hz, 1H), 4.22 (brs, 1H), 2.33 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.4, 138.9, 133.4, 132.5, 129.7, 127.4, 125.2, 120.3, 117.0, 114.9, 59.1, 21.2. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 9.6 min (major) and 26.0 min.



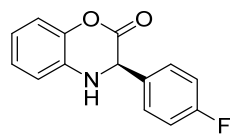
(*R*)-3-(4-Methoxyphenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2c):

47 mg, 92% yield, yellow solid, known compound, R_f = 0.45 (hexanes/ethyl acetate 5/1), 88% ee, $[\alpha]^{20}_D$ = -85.93 (*c* 0.96, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +69.0 (c 0.2, $CHCl_3$) for 80% ee], ^1H NMR (400 MHz, $CDCl_3$) δ 7.36-7.29 (m, 2H), 7.07-6.99 (m, 2H), 6.93-6.84 (m, 3H), 6.82-6.78 (m, 1H), 5.00 (s, 1H), 4.19 (brs, 1H), 3.79 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.6, 160.1, 141.0, 132.6, 128.8, 128.4, 125.2, 120.4, 117.0, 114.9, 114.4, 58.8, 55.4. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 11.8 min (major) and 25.8 min.



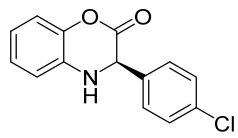
(*R*)-3-(4-Fluorophenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2d):

42 mg, 86% yield, yellow solid, known compound, R_f = 0.65 (hexanes/ethyl acetate 5/1), 93% ee, $[\alpha]^{20}_D$ = -92.70 (*c* 0.74, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +107.0 (c 0.2, $CHCl_3$) for 89% ee], ^1H NMR (400 MHz, $CDCl_3$) δ 7.41-7.35 (m, 2H), 7.09-7.00 (m, 4H), 6.90-6.84 (m, 1H), 6.83-6.79 (m, 1H), 5.01 (d, *J* = 1.8 Hz, 1H), 4.26 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.2, 163.0 (d, $^1J_{F\text{-}C}$ = 246.6 Hz), 140.9, 132.3, 132.1 (d, $^4J_{F\text{-}C}$ = 3.2 Hz), 129.4 (d, $^3J_{F\text{-}C}$ = 8.3 Hz), 125.3, 120.6, 117.0, 116.0 (d, $^2J_{F\text{-}C}$ = 21.6 Hz), 115.0, 58.7. ^{19}F NMR (376 MHz, $CDCl_3$) δ -112.4. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 11.2 min and 13.9 min (major).



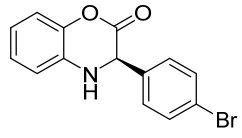
(*R*)-3-(4-Chlorophenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2e):

49 mg, 94% yield, white solid, known compound, R_f = 0.65 (hexanes/ethyl acetate 5/1), 93% ee, $[\alpha]^{20}_D$ = -107.18 (*c* 0.96, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +90.0 (c 0.2, $CHCl_3$) for 87% ee], ^1H NMR (400 MHz, $CDCl_3$) δ 7.40-7.30 (s, 4H), 7.08-7.00 (m, 2H), 6.91-6.85 (m, 1H), 6.84-6.80 (m, 1H), 5.02 (d, *J* = 1.6 Hz, 1H), 4.25 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.8, 140.9, 135.0, 134.7, 132.1, 129.2, 128.9, 125.3, 120.7, 117.1, 115.0, 58.7. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 11.1 min and 12.9 min (major).



(*R*)-3-(4-Bromophenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2f):

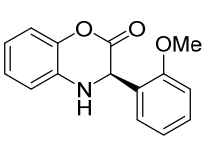
50 mg, 82% yield, white solid, known compound, R_f = 0.70 (hexanes/ethyl acetate 5/1), 90% ee, $[\alpha]^{20}_D$ = -96.05 (*c* 0.66, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +83.0 (c 0.2, $CHCl_3$) for 90% ee], ^1H NMR (400 MHz, $CDCl_3$) δ 7.51 (d, *J* = 8.3 Hz, 2H), 7.30 (d, *J* = 8.3 Hz, 2H), 7.10-6.98 (m, 2H), 6.94-6.86 (m, 1H), 6.85-6.81 (m, 1H), 5.03 (s, 1H), 4.21 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.7, 140.9,



135.2, 132.2, 132.1, 129.2, 125.3, 123.2, 120.8, 117.1, 115.0, 58.8. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 11.8 min and 13.0 min (major).

(*R*)-3-(2-Methoxyphenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2g):

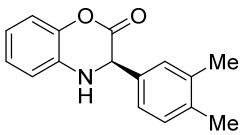
49 mg, 96% yield, yellow solid, known compound, R_f = 0.40 (hexanes/ethyl acetate 5/1), 94% ee,



$[\alpha]^{20}_D$ = 147.23 (*c* 0.98, $CHCl_3$). [lit.[3]: $[\alpha]^{20}_D$ = +150.14 (c 0.68, $CHCl_3$) for 95% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39-7.31 (m, 1H), 7.30-7.25 (m, 1H), 7.15-7.06 (m, 1H), 7.05-6.92 (m, 3H), 6.90-6.81 (m, 1H), 6.77-6.67 (m, 1H), 5.46 (s, 1H), 4.34 (brs, 1H), 3.86 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.6, 157.1, 141.1, 132.6, 130.2, 128.2, 125.0, 124.9, 120.9, 120.0, 116.7, 115.1, 111.2, 55.7, 54.6. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 0.8 mL/min, retention time 11.9 min and 15.8 min (major).

(*R*)-3-(3,4-Dimethylphenyl)-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2h):

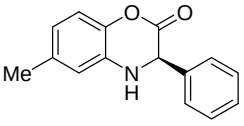
48 mg, 95% yield, white solid, known compound, R_f = 0.70 (hexanes/ethyl acetate 5/1), 91% ee,



$[\alpha]^{20}_D$ = -74.40 (*c* 1.18, $CHCl_3$). [lit.[4]: $[\alpha]^{16}_D$ = -85.1 (c 0.96, $CHCl_3$) for 90% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.15 (s, 1H), 7.12-7.07 (m, 2H), 7.04-6.97 (m, 2H), 6.86-6.81 (m, 1H), 6.79-6.75 (m, 1H), 4.94 (d, *J* = 1.7 Hz, 1H), 4.22 (brs, 1H), 2.23 (s, 6H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.6, 141.0, 137.6, 137.4, 133.8, 132.6, 130.2, 128.8, 125.1, 124.8, 120.3, 116.9, 114.9, 59.1, 19.9, 19.5. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 13.4 min (major) and 29.8 min.

(*R*)-6-Methyl-3-phenyl-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2i):

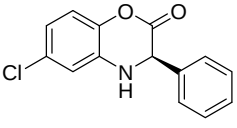
45 mg, 94% yield, yellow solid, known compound, R_f = 0.55 (hexanes/ethyl acetate 5/1), 97% ee,



$[\alpha]^{20}_D$ = -136.88 (*c* 0.90, $CHCl_3$). [lit.[4]: $[\alpha]^{16}_D$ = -104.9 (c 0.74, $CHCl_3$) for 87% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44-7.32 (m, 5H), 6.91 (d, *J* = 8.2 Hz, 1H), 6.68-6.63 (m, 1H), 6.62-6.58 (m, 1H), 5.02 (d, *J* = 1.9 Hz, 1H), 4.19 (brs, 1H), 2.28 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.4, 138.9, 136.6, 135.1, 132.0, 129.0, 128.9, 127.5, 121.0, 116.7, 115.4, 59.3, 21.0. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 9.9 min (major).and 13.0 min.

(*R*)-6-Chloro-3-phenyl-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2j):

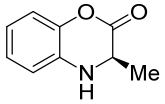
47 mg, 91% yield, white solid, known compound, R_f = 0.65 (hexanes/ethyl acetate 5/1), 98% ee,



$[\alpha]^{20}_D$ = -146.08 (*c* 0.92, $CHCl_3$). [lit.[4]: $[\alpha]^{15}_D$ = -109.9 (c 0.90, $CHCl_3$) for 89% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43-7.36 (m, 5H), 6.96 (d, *J* = 8.2 Hz, 1H), 6.85-6.78 (m, 2H), 5.09 (d, *J* = 1.9 Hz, 1H), 4.32 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 164.3, 139.4, 136.0, 133.1, 130.2, 129.2, 129.1, 127.3, 120.2, 118.0, 114.6, 58.8. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 10.6 min (major) and 15.7 min.

(*R*)-3-Methyl-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2k):

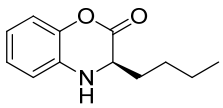
27 mg, 83% yield, white solid, known compound, R_f = 0.45 (hexanes/ethyl acetate 5/1), 90% ee,



$[\alpha]^{20}_D$ = -30.92 (*c* 0.54, $CHCl_3$). [lit.[5]: $[\alpha]^{27}_D$ = -38.4 (c 0.24, $CHCl_3$) for 97% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.05-6.96 (m, 2H), 6.88-6.82 (m, 1H), 6.81-6.74 (m, 1H), 4.02-3.94 (m, 1H), 3.90 (brs, 1H), 1.54 (d, *J* = 6.6 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.3, 141.4, 133.0, 124.9, 120.5, 116.9, 115.1, 50.6, 17.2. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 70/30, flow = 0.7 mL/min, retention time 7.6 min (major) and 8.6 min.

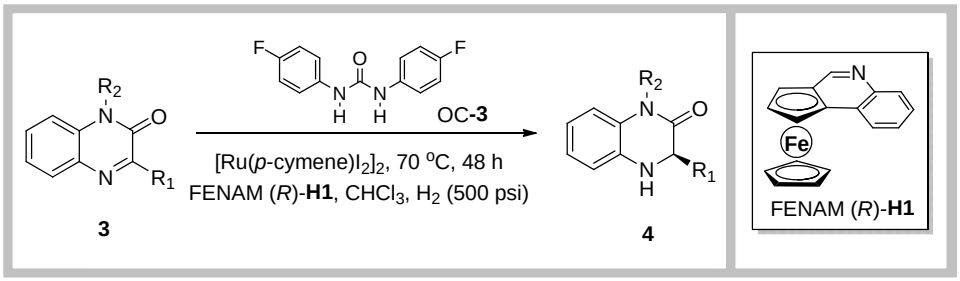
(*R*)-3-Butyl-3,4-dihydro-2H-benzo[*b*][1,4]oxazin-2-one (2l):

39 mg, 95% yield, white solid, known compound,[6] R_f = 0.60 (hexanes/ethyl acetate 5/1), 92% ee,



$[\alpha]^{20}_D$ = -20.90 (*c* 0.78, $CHCl_3$), ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.06-6.93 (m, 2H), 6.87-6.80 (m, 1H), 6.79-6.74 (m, 1H), 4.04-3.85 (m, 2H), 2.02-1.86 (m, 1H), 1.82-1.70 (m, 1H), 1.52-1.30 (m, 4H), 0.92 (t, *J* = 7.0 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.7, 141.1, 132.4, 125.0, 120.2, 116.7, 115.1, 54.9, 31.0, 27.4, 22.4, 13.9. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 95/5, flow = 0.7 mL/min, retention time 18.3 min (major) and 23.5 min.

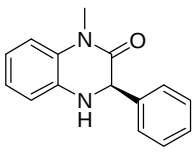
2.2 Biomimetic Asymmetric Reduction of Quinoxalinones



General procedure: A mixture of [Ru(*p*-cymene)I_2]$_2$ (0.001 mmol, 0.5 mol%), organocatalyst urea OC-**3** (0.04 mmol, 20 mol%), NAD(P)H model FENAM (0.02 mmol, 10 mol%, (*R*)-**H1**) and substrates **3** (0.20 mmol) in chloroform (3.0 mL) was stirred at room temperature for 5 min in glove box and then the mixture was transferred to an autoclave. The hydrogenation was performed at 70 °C (oil bath temperature) under hydrogen gas (500 psi) for 48 h. After careful release of the hydrogen gas, the autoclave was opened and the reaction mixture was directly purified by column chromatography on silica gel using hexanes and ethyl acetate as eluent to give the desirable products **4**. The enantiomeric excesses were determined by chiral HPLC.

(*R*)-1-Methyl-3-phenyl-3,4-dihydroquinoxalin-2(1*H*)-one (4a):

44 mg, 92% yield, white solid, known compound, R_f = 0.45 (hexanes/ethyl acetate 5/1), 92% ee,

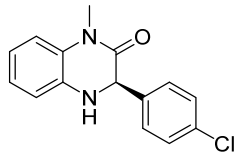


$[\alpha]^{20}_D$ = -140.26 (*c* 0.74, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +153.0 (c 0.4, $CHCl_3$) for 92% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41-7.36 (m, 2H), 7.34-7.28 (m, 3H), 6.99-6.92 (m, 2H), 6.91-6.83 (m, 1H), 6.74 (dd, *J* = 7.6, 1.1 Hz, 1H), 5.06 (s, 1H), 4.32 (brs, 1H), 3.39 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.1, 139.1, 134.5, 128.7, 128.4, 128.3, 127.1, 123.8, 119.5, 114.8, 114.0, 60.9, 29.3. HPLC: Chiracel AD-H

column, 254 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 10.6 min and 13.5 min (major).

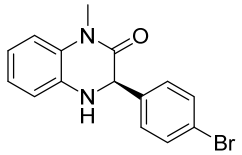
(*R*)-3-(4-Chlorophenyl)-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4b):

50 mg, 92% yield, white solid, known compound, R_f = 0.35 (hexanes/dichloromethane 1/3), 93% ee, $[\alpha]^{20}_D$ = -143.07 (*c* 1.04, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +163.1 (c 0.4, $CHCl_3$) for 88% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.34-7.26 (m, 4H), 6.99-6.92 (m, 2H), 6.91-6.84 (m, 1H), 6.75 (dd, *J* = 7.7, 1.3 Hz, 1H), 5.02 (s, 1H), 4.34 (brs, 1H), 3.38 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.7, 137.4, 134.2, 128.9, 128.6, 128.3, 123.9, 119.8, 114.9, 114.1, 60.2, 29.3. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 10.2 min (major) and 16.4 min.



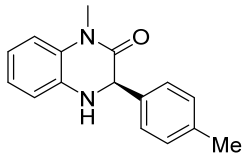
(*R*)-3-(4-Bromophenyl)-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4c):

61 mg, 96% yield, white solid, known compound, R_f = 0.50 (hexanes/dichloromethane 3/1), 92% ee, $[\alpha]^{20}_D$ = -120.24 (*c* 0.40, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +122.1 (c 0.4, $CHCl_3$) for 94% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.50-7.44 (m, 2H), 7.31-7.28 (m, 2H), 7.03 -6.94 (m, 2H), 6.93-6.87 (m, 1H), 6.78 (dd, *J* = 7.7, 1.3 Hz, 1H), 5.04 (s, 1H), 4.33 (brs, 1H), 3.41 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.6, 138.0, 134.2, 131.8, 128.9, 128.3, 123.9, 122.4, 119.9, 114.9, 114.1, 60.3, 29.3. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 10.6 min (major) and 17.2 min.



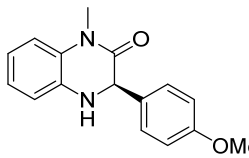
(*R*)-1-Methyl-3-(*p*-tolyl)-3,4-dihydroquinoxalin-2(1*H*)-one (4d):

49 mg, 97% yield, white solid, known compound, R_f = 0.40 (hexanes/ethyl acetate 5/1), 88% ee, $[\alpha]^{20}_D$ = -128.93 (*c* 0.94, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +106.2 (c 0.4, $CHCl_3$) for 89% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.27-7.24 (m, 2H), 7.14-7.08 (m, 2H), 6.98-6.90 (m, 2H), 6.88-6.81 (m, 1H), 6.72 (dd, *J* = 7.6, 1.3 Hz, 1H), 5.00 (s, 1H), 4.32 (brs, 1H), 3.37 (s, 3H), 2.30 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.3, 138.1, 136.1, 134.6, 129.4, 128.4, 127.0, 123.7, 119.5, 114.8, 114.0, 60.6, 29.2, 21.1. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 10.7 min and 14.3 min (major).



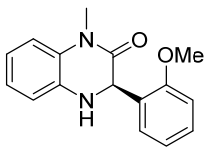
(*R*)-3-(4-Methoxyphenyl)-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4e):

49 mg, 91% yield, white solid, known compound, R_f = 0.75 (hexanes/ethyl acetate 2/1), 83% ee, $[\alpha]^{20}_D$ = -95.36 (*c* 0.54, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +120.9 (c 0.4, $CHCl_3$) for 90% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31-7.26 (m, 2H), 6.97-6.90 (m, 2H), 6.89-6.80 (m, 3H), 6.74-6.69 (m, 1H), 4.97 (s, 1H), 4.32 (brs, 1H), 3.76 (s, 3H), 3.37 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.4, 159.6, 134.6, 131.3, 128.4, 128.4, 123.7, 119.5, 114.8, 114.1, 114.0, 60.3, 55.3, 29.2. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 15.9 min and 18.9 min (major).



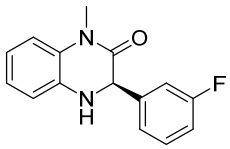
(*R*)-3-(2-Methoxyphenyl)-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4f):

46 mg, 86% yield, yellow solid, known compound, R_f = 0.45 (hexanes/ethyl acetate 3/1), 83% ee, $[\alpha]^{20}_D$ = 174.23 (*c* 0.92, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = -168.4 (c 0.4, $CHCl_3$) for 74% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.25-7.20 (m, 1H), 7.02-6.93 (m, 2H), 6.90-6.87 (m, 1H), 6.86-6.79 (m, 3H), 6.58 (dd, *J* = 7.4, 1.7 Hz, 1H), 5.44 (s, 1H), 4.50 (brs, 1H), 3.86 (s, 3H), 3.48 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.4, 157.2, 134.7, 129.4, 128.8, 127.5, 126.7, 123.6, 120.7, 119.4, 114.6, 114.4, 110.9, 55.8, 55.6, 29.2. HPLC: Chiracel OD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 14.6 min and 17.5 min (major).



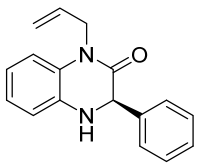
(*R*)-3-(3-Fluorophenyl)-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4g):

49 mg, 96% yield, white solid, the known compound, R_f = 0.50 (hexanes/ethyl acetate 3/1), 94% ee, $[\alpha]^{20}_D$ = -139.28 (*c* 0.98, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +121.8 (c 0.4, $CHCl_3$) for 91% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31-7.26 (m, 1H), 7.20-7.08 (m, 2H), 7.03-6.91 (m, 3H), 6.90-6.85 (m, 1H), 6.76 (dd, *J* = 7.7, 1.3 Hz, 1H), 5.06 (s, 1H), 4.33 (brs, 1H), 3.39 (s, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.5, 162.9 (d, $^1J_{F\text{-}C}$ = 245.2 Hz), 141.5 (d, $^3J_{F\text{-}C}$ = 6.8 Hz), 134.1, 130.2 (d, $^3J_{F\text{-}C}$ = 8.1 Hz), 128.2, 123.9, 122.9 (d, $^4J_{F\text{-}C}$ = 2.9 Hz), 119.8, 115.2 (d, $^2J_{F\text{-}C}$ = 21.0 Hz), 114.9, 114.3, 114.1, 60.4 (d, $^4J_{F\text{-}C}$ = 1.8 Hz), 29.3. ^{19}F NMR (376 MHz, $CDCl_3$) δ -112.2. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane /*i*-PrOH = 85/15, flow = 1.0 mL/min, retention time 13.4 min (minor) and 17.4 min (major).



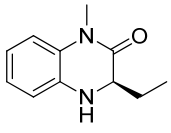
(*R*)-1-Allyl-3-phenyl-3,4-dihydroquinoxalin-2(1*H*)-one (4h):

50 mg, 95% yield, yellow solid, known compound, R_f = 0.40 (hexanes/ethyl acetate 5/1), 93% ee, $[\alpha]^{20}_D$ = -96.32 (*c* 0.98, $CHCl_3$). [lit.[2]: $[\alpha]^{20}_D$ = +93.0 (c 0.2, $CHCl_3$) for 91% ee], ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42-7.36 (m, 2H), 7.35-7.26 (m, 3H), 6.97-6.90 (m, 2H), 6.85-6.79 (m, 1H), 6.75 (dd, *J* = 7.7, 1.2 Hz, 1H), 5.92-5.80 (m, 1H), 5.19-5.03 (m, 3H), 4.71-4.62 (m, 1H), 4.54-4.46 (m, 1H), 4.36 (brs, 1H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 165.7, 138.9, 134.6, 132.0, 128.7, 128.3, 127.5, 127.0, 123.8, 119.6, 116.7, 115.4, 114.3, 60.8, 44.7. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 80/20, flow = 1.0 mL/min, retention time 10.3 min and 15.9 min (major).

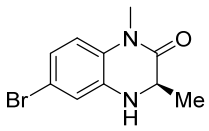


(*R*)-3-Ethyl-1-methyl-3,4-dihydroquinoxalin-2(1*H*)-one (4i):

37 mg, 97% yield, colorless oil, known compound,[7] R_f = 0.35 (hexanes/ethyl acetate 5/1), 90% ee, $[\alpha]^{20}_D$ = -30.81 (*c* 0.74, $CHCl_3$). ^{1}H NMR (400 MHz, $CDCl_3$) δ 6.97-6.91 (m, 2H), 6.89-6.83 (m, 1H), 6.73 (dd, *J* = 7.5, 1.1 Hz, 1H), 4.06 (brs, 1H), 3.85-3.79 (m, 1H), 3.38 (s, 3H), 1.92-1.81 (m, 1H), 1.80-1.67 (m, 1H), 1.02 (t, *J* = 7.5 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.8, 134.6, 128.9, 123.5, 119.4, 114.6, 114.3, 57.9, 29.0, 24.8, 9.8. HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 85/15, flow = 1.0 mL/min, retention time 7.5 min and 8.7 min (major).



(*R*)-6-Bromo-1,3-dimethyl-3,4-dihydroquinoxalin-2(1H)-one (4j):



47 mg, 92% yield, white solid, the known compound,[8] R_f = 0.45 (hexanes/ethyl acetate 5/1), 94% ee, $[\alpha]^{20}_D$ = -70.56 (*c* 0.88, $CHCl_3$). ^{1}H NMR (400 MHz, $CDCl_3$) δ 6.95 (d, *J* = 8.3 Hz, 1H), 6.83 (s, 1H), 6.75 (d, *J* = 8.5 Hz, 1H), 4.02-3.93 (m, 1H), 3.33 (s, 3H), 1.43 (d, *J* = 6.0 Hz, 3H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.9, 136.2, 128.3, 122.2, 116.9, 116.0, 115.9, 52.1, 29.2, 18.1 HPLC: Chiracel AD-H column, 230 nm, 30 °C, *n*-Hexane/*i*-PrOH = 85/15, flow = 1.0 mL/min, retention time 8.4 min and 10.7 min (major).

3. Plausible Mechanism and Transition State Model

Based on experimental results and putative mechanism on biomimetic reduction,[9] a plausible mechanism and transition state model for biomimetic asymmetric reduction are illustrated in **Figure S1**. The reaction proceeds through the following process: chiral NAD(P)H models were regenerated with hydrogen gas, and then the hydride transferred to the unsaturated C=N bond, similar to the coenzyme NAD(P)H mediated reduction. The stereochemistry of this reaction could be explained by the plausible transition state model. The urea catalyst promotes the reaction through hydrogen-bonding activation of C=N bond. The chiral NAD(P)H model selectively transfers the hydrogen atom from the less steric face to the imine, leading to the (*R*)- products with excellent enantioselectivity.

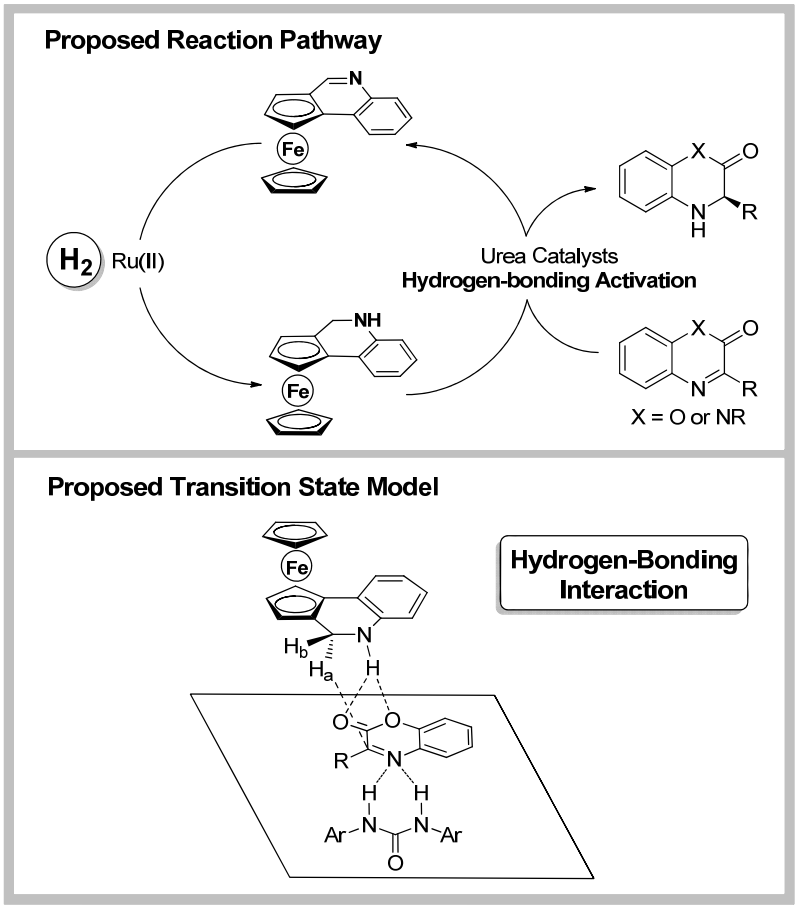


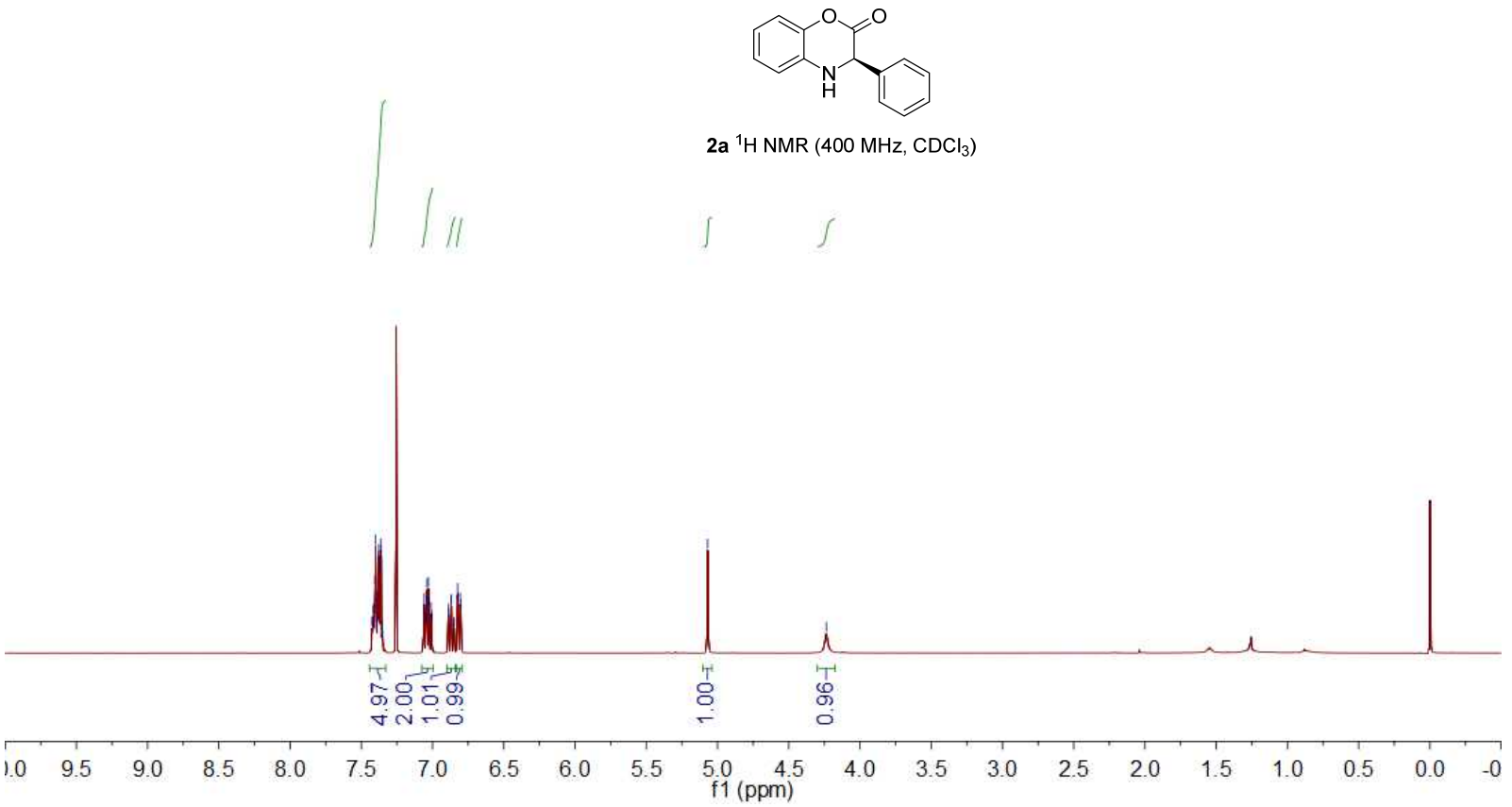
Figure S1. Plausible Mechanism and Transition State Model

4. References

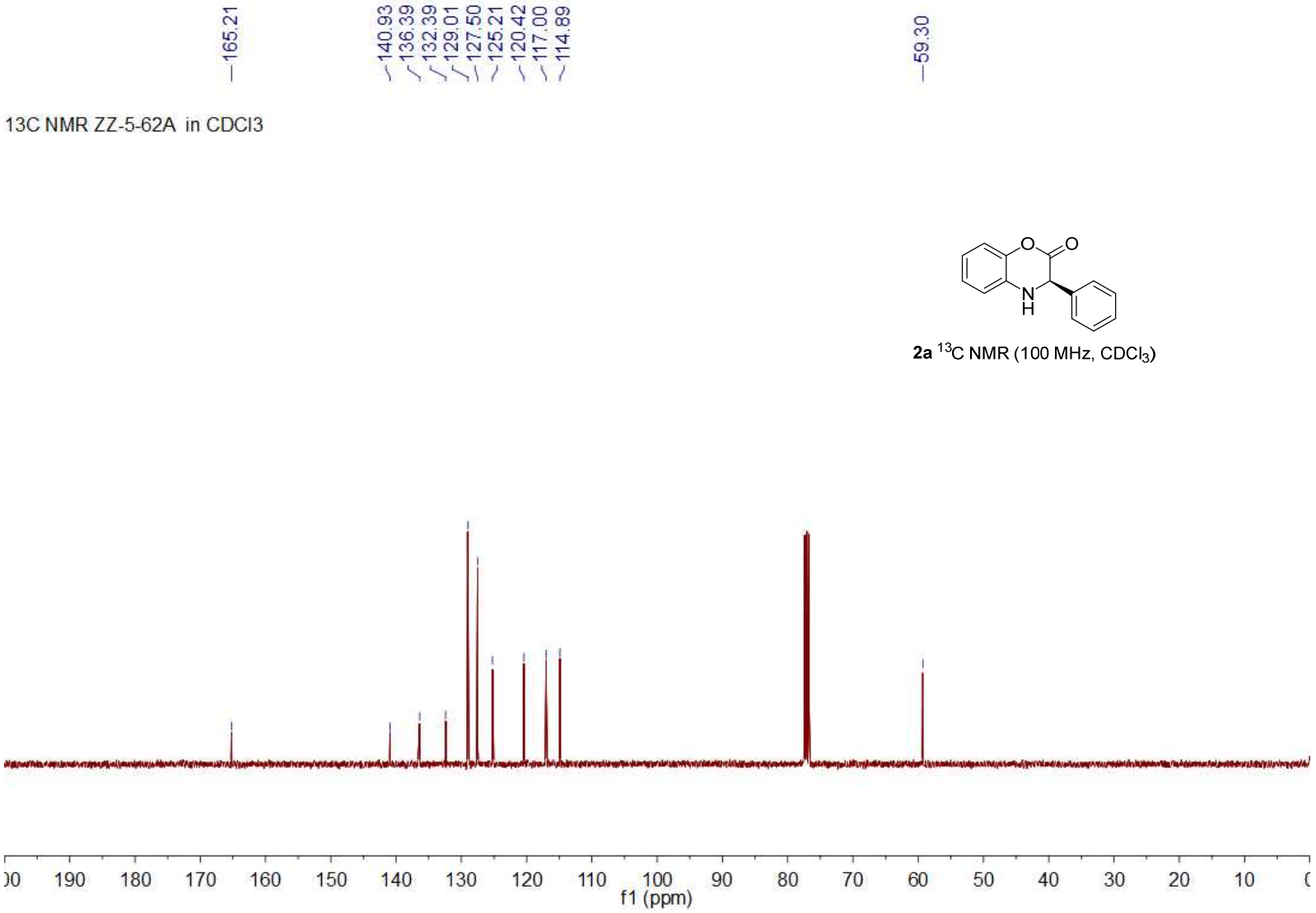
1. (*a*) Liedtke, T.; Spannring, P.; Riccardi, L.; Gansäuer, A. Mechanism-Based Condition Screening for Sustainable Catalysis in Single-Electron Steps by Cyclic Voltammetry. *Angew. Chem. Int. Ed*., **2018**, *57*, 5006. (*b*) Fleming, E. M.; Quigley, C.; Rozas, I.; Connon, S. J. Computational Study-Led Organocatalyst Design: A Novel, Highly Active Urea-Based Catalyst for Addition Reactions to Epoxides. *J. Org. Chem*., **2008**, *73*, 948. (*c*) Yang, W.; Du, D.-M. Highly Enantioselective Michael Addition of Nitroalkanes to Chalcones Using Chiral Squaramides as Hydrogen Bonding Organocatalysts. *Org. Lett*., **2010**, *12*, 5450. (*d*) Rostami, A.; Colin, A.; Li, X. Y.; Chudzinski, M. G.; Lough, A. J.; Taylor, M. S. *N,N*-Diarylsquaramides: General, High-Yielding Synthesis and Applications in Colorimetric Anion Sensing. *J. Org. Chem*., **2010**, *75*, 3983.
2. Xue, Z.-Y.; Jiang, Y.; Peng, X.-Z.; Yuan, W.-C.; Zhang, X.-M. The First General, Highly Enantioselective Lewis Base Organo-catalyzed Hydrosilylation of Benzoxazinones and Quinoxalinones. *Adv. Synth. Catal*., **2010**, *352*, 2132.
3. Wang, J.; Zhu, Z.-H.; Chen, M.-W.; Chen, Q.-A; Zhou, Y.-G. Catalytic Biomimetic Asymmetric Reduction of Alkenes and Imines Enabled by Chiral and Regenerable NAD(P)H Models. *Angew. Chem. Int. Ed*., **2019**, *58*, 1813.
4. Chen, Q.-A.; Gao, K.; Duan, Y.; Ye, Z.-S.; Shi, L.; Yang, Y.; Zhou, Y.-G. Dihydrophenanthridine: A New and Easily Regenerable NAD(P)H Model for Biomimetic Asymmetric Hydrogenation. *J. Am. Chem. Soc*., **2012**, *134*, 2442.
5. Storer, R. I.; Carrera, D. E.; Ni, Y.; MacMillan, D. W. C. Enantioselective Organocatalytic Reductive Amination. *J. Am. Chem. Soc*., **2006**, *128*, 84.
6. Lu, L.-Q.; Li, Y.; Junge, K.; Beller, M. Relay Iron/Chiral Brønsted Acid Catalysis: Enantioselective Hydrogenation of Benzoxazinones. *J. Am. Chem. Soc*., **2015**, *137*, 2763.
7. Zhang, L.; Qiu, R.; Xue, X.; Pan, Y.; Xu, C.; Li, H.; Xu, L. Versatile (Pentamethylcyclopentadienyl)rhodium-2,2'-bipyridine (Cp*Rh-bpy) Catalyst for Transfer Hydrogenation of *N*-Heterocycles in Water. *Adv. Synth. Catal*., **2015**, *357*, 3529.
8. Yang, Y.; Zhao, L.; X, B.; Yang, L.; Zhang, J.; Zhang, H.; Zhou, J. Design, Synthesis and Biological Evaluation of Dihydroquinoxalinone Derivatives as BRD4 Inhibitors. *Bioorg. Chem.,* **2016**, *68*, 236.
9. Wang, J.; Zhao, Z.-B.; Zhao, Y.; Luo, G.; Zhu, Z.-H.; Luo, Y.; Zhou, Y.-G. Chiral and Regenerable NAD(P)H Models Enabled Biomimetic Asymmetric Reduction: Design, Synthesis, Scope, and Mechanistic Studies. *J. Org. Chem*., **2020**, *85*, 2355.

5. Copy of NMR and HPLC

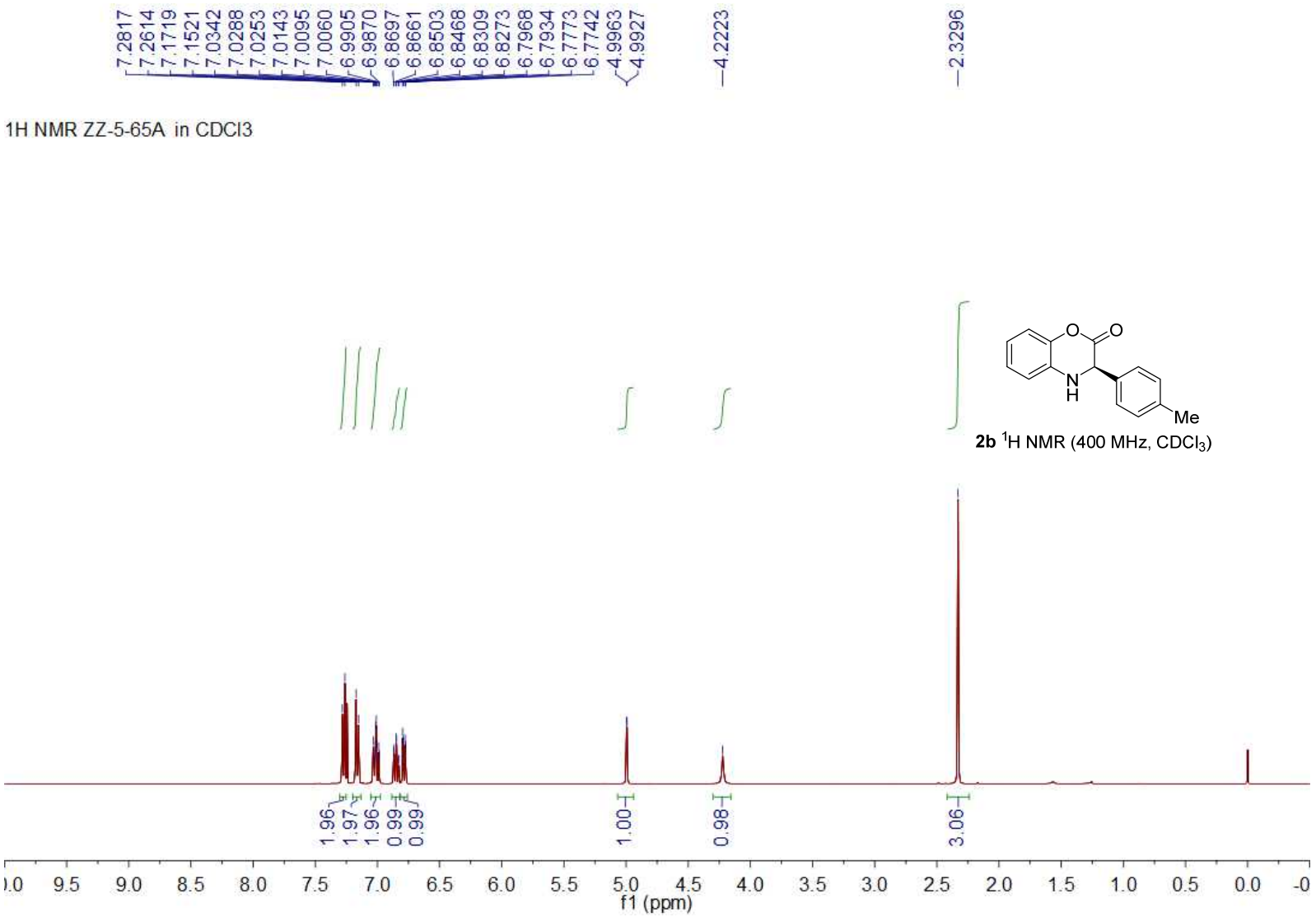
1H NMR ZZ-5-62A in CDCl3



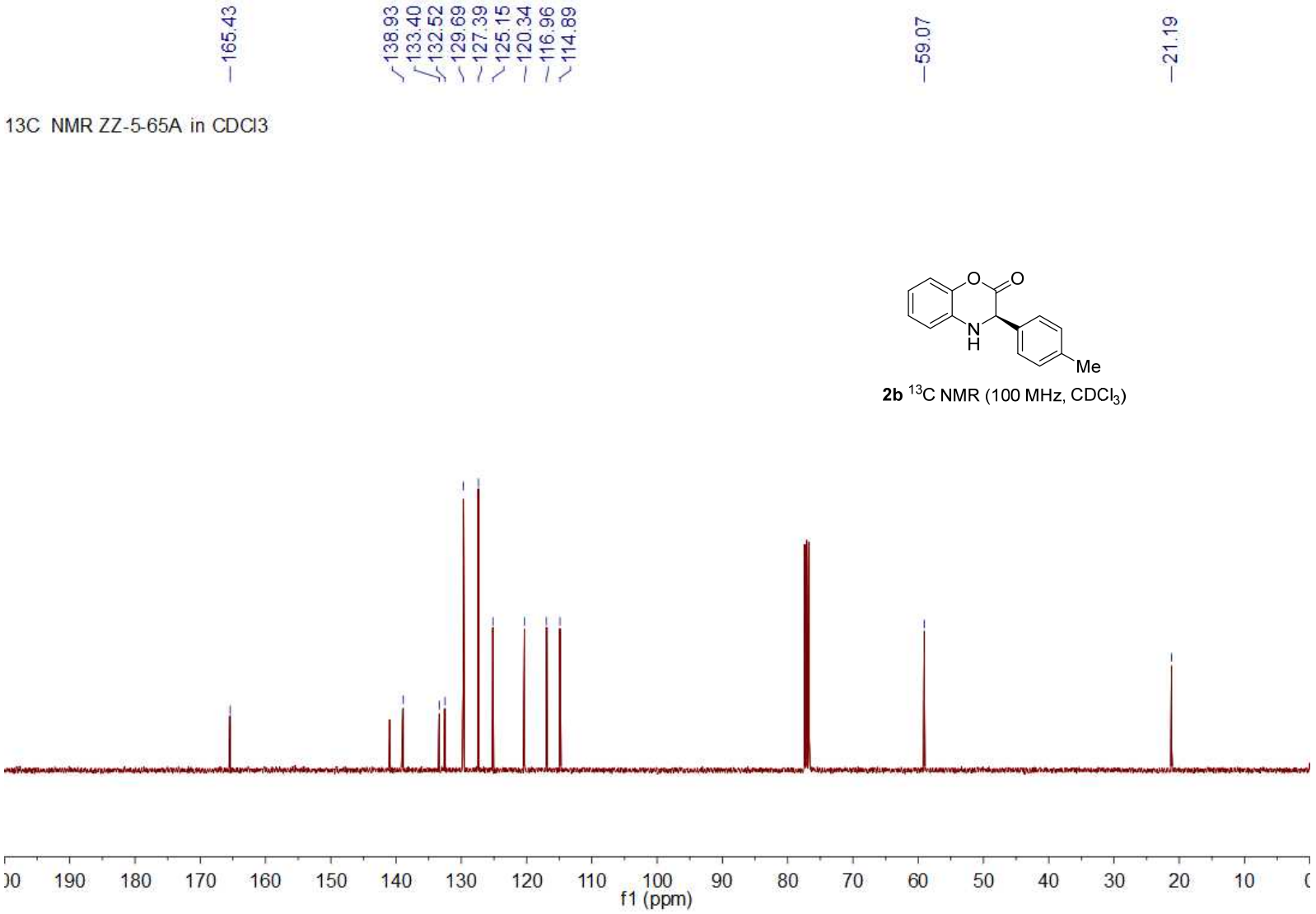
2a ^{1}H NMR (400 MHz, $CDCl_3$)



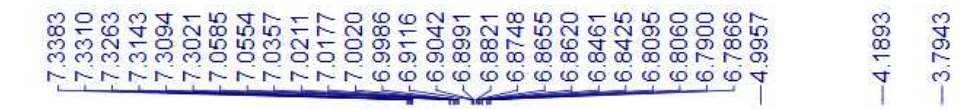
2a ^{13}C NMR (100 MHz, $CDCl_3$)



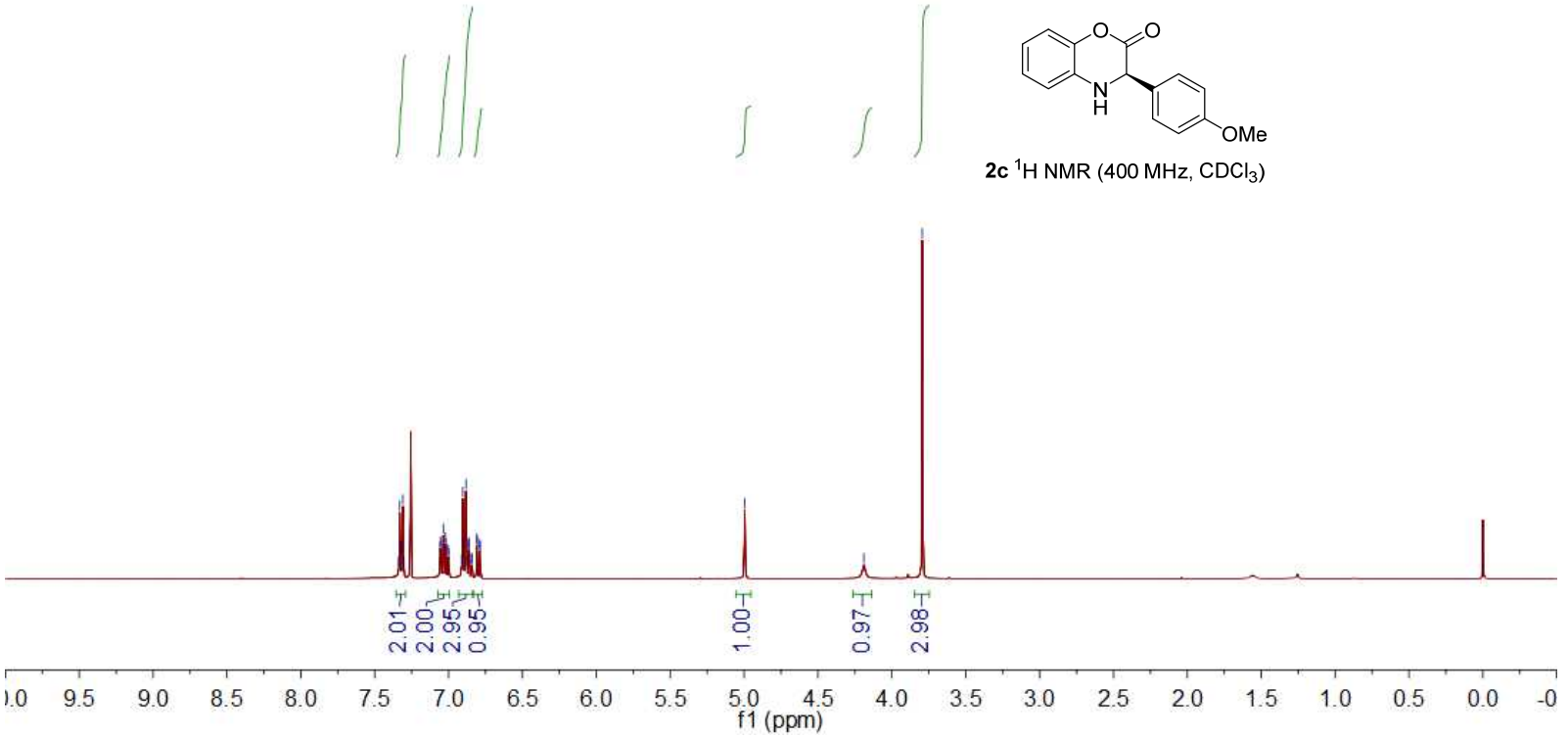
2b ^{1}H NMR (400 MHz, $CDCl_3$)



2b ^{13}C NMR (100 MHz, $CDCl_3$)

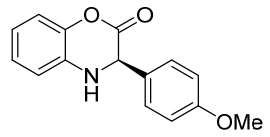


1H NMR ZZ-5-65B in CDCl3

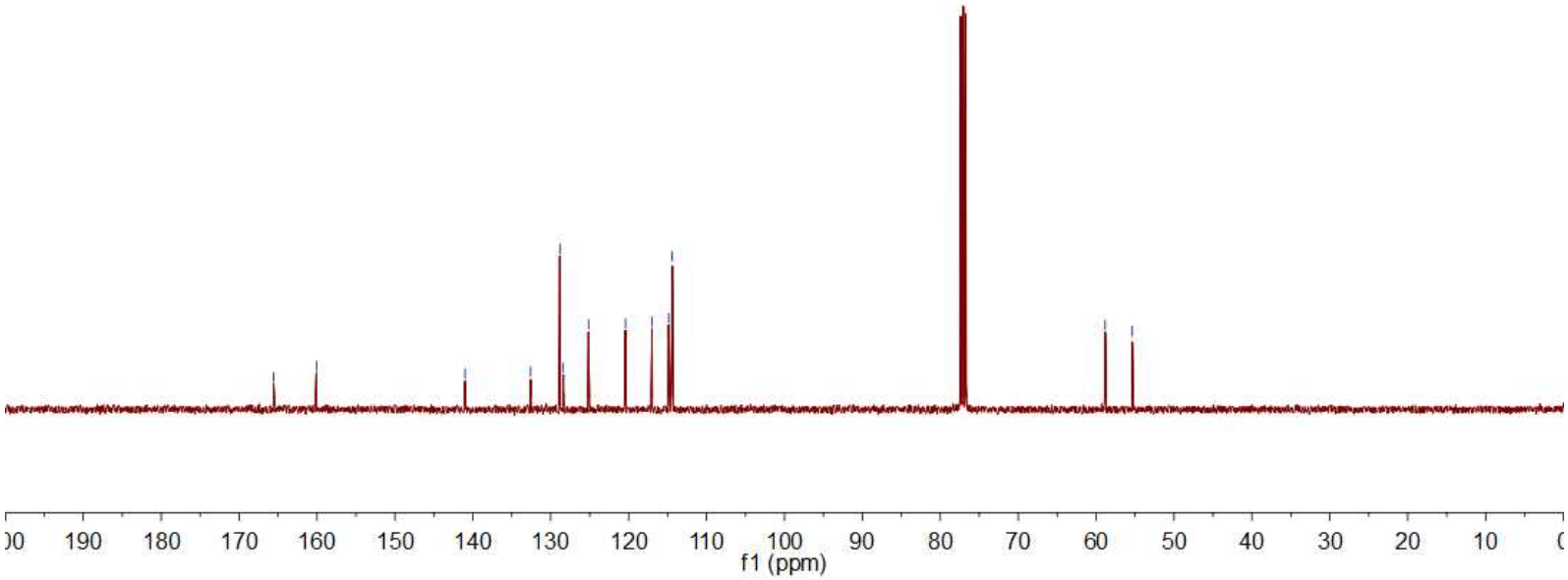


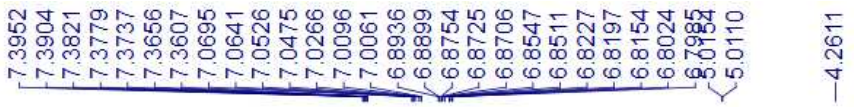
2c ^{1}H NMR (400 MHz, $CDCl_3$)

13C NMR ZZ-5-65B in CDCl3

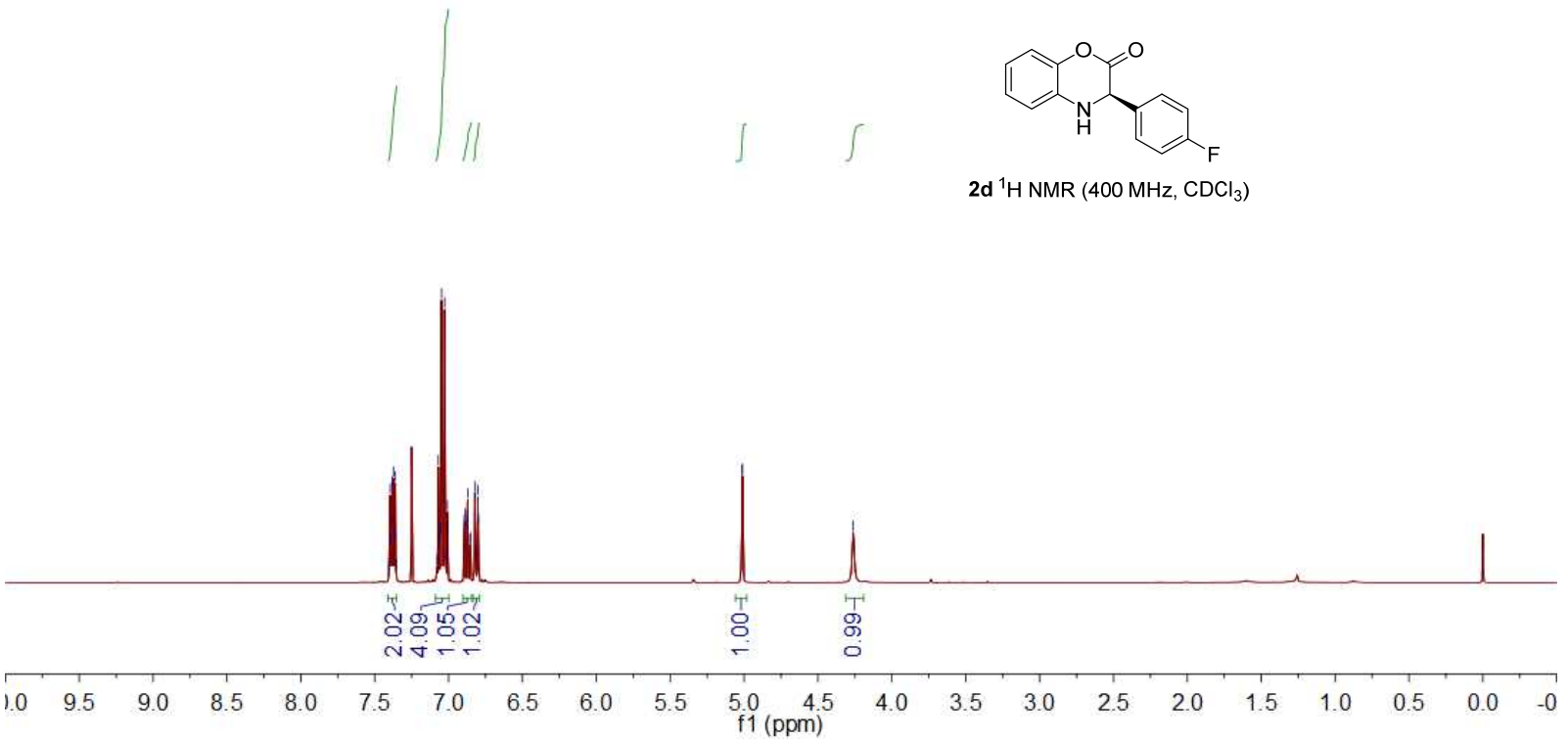


2c ^{13}C NMR (100 MHz, $CDCl_3$)



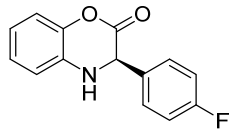


1H NMR ZZ-5-65C in CDCl3

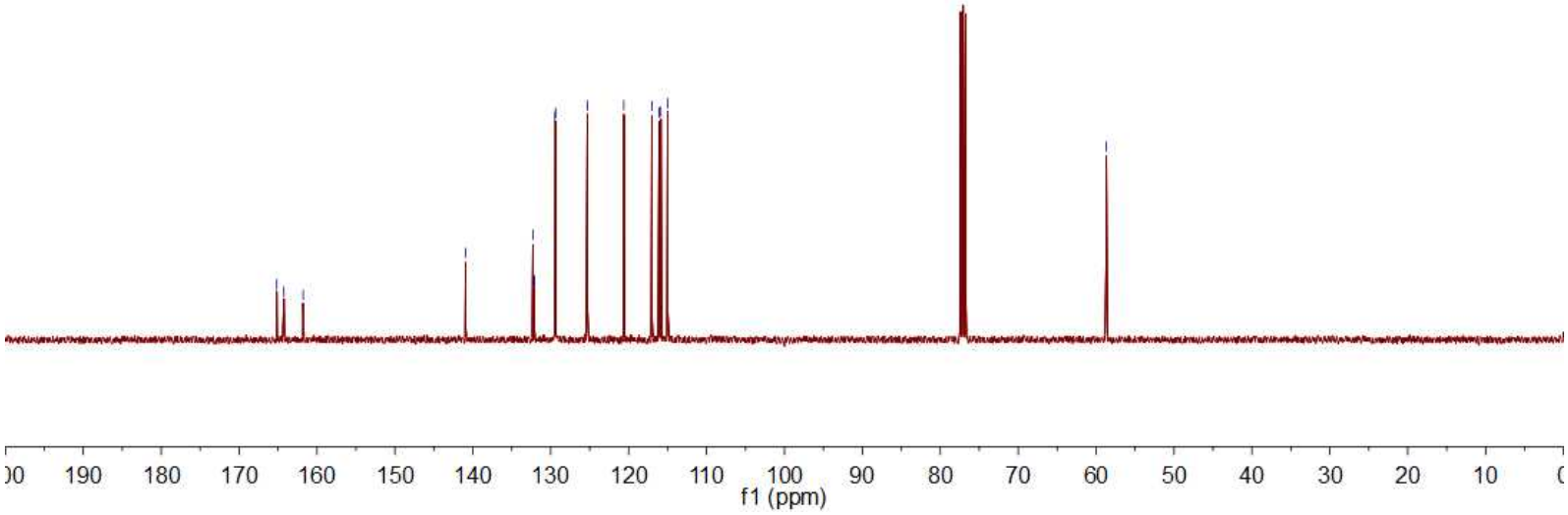


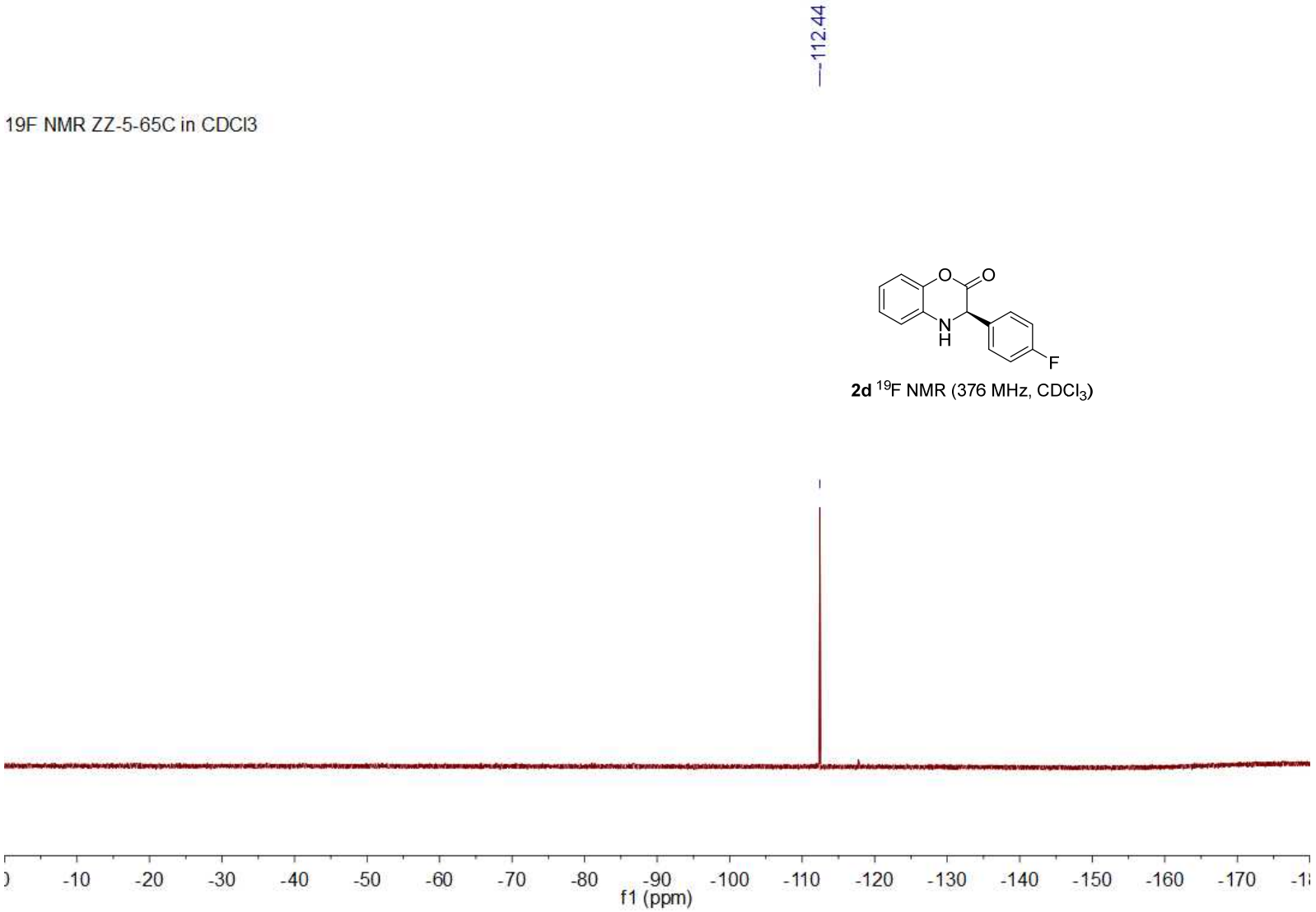
2d ^{1}H NMR (400 MHz, $CDCl_3$)

13C NMR ZZ-5-65C in CDCl3

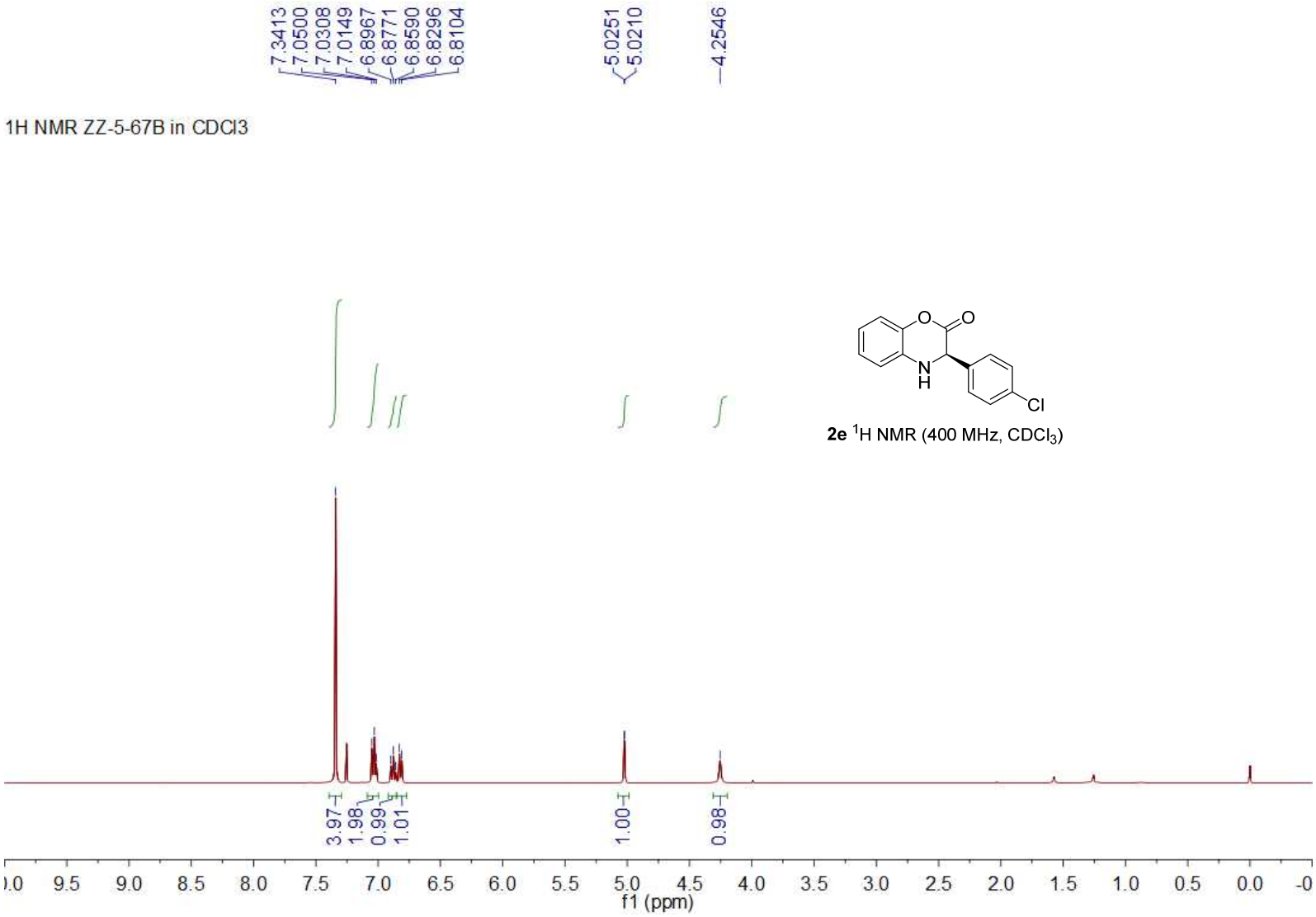


2d ^{13}C NMR (100 MHz, $CDCl_3$)

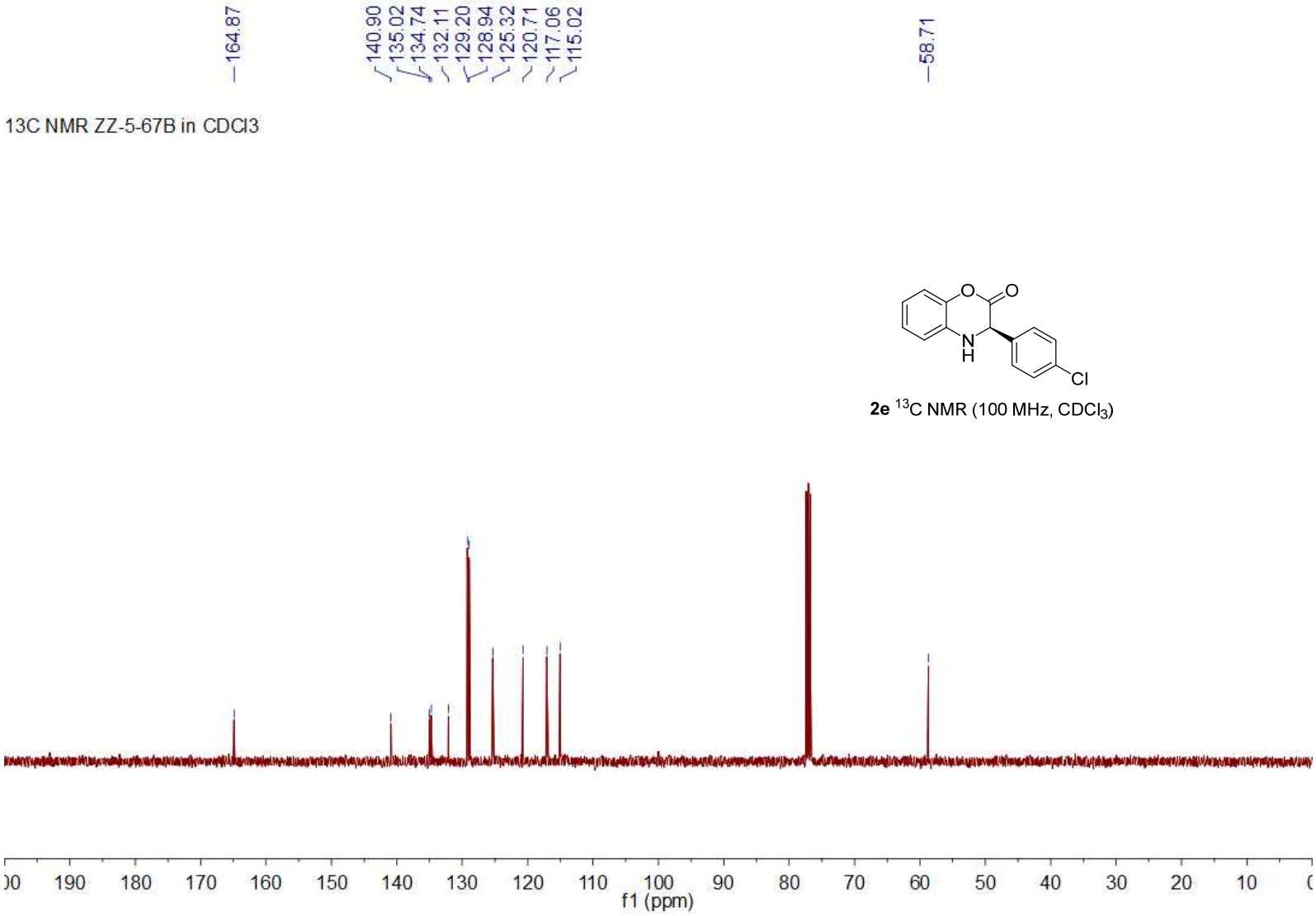




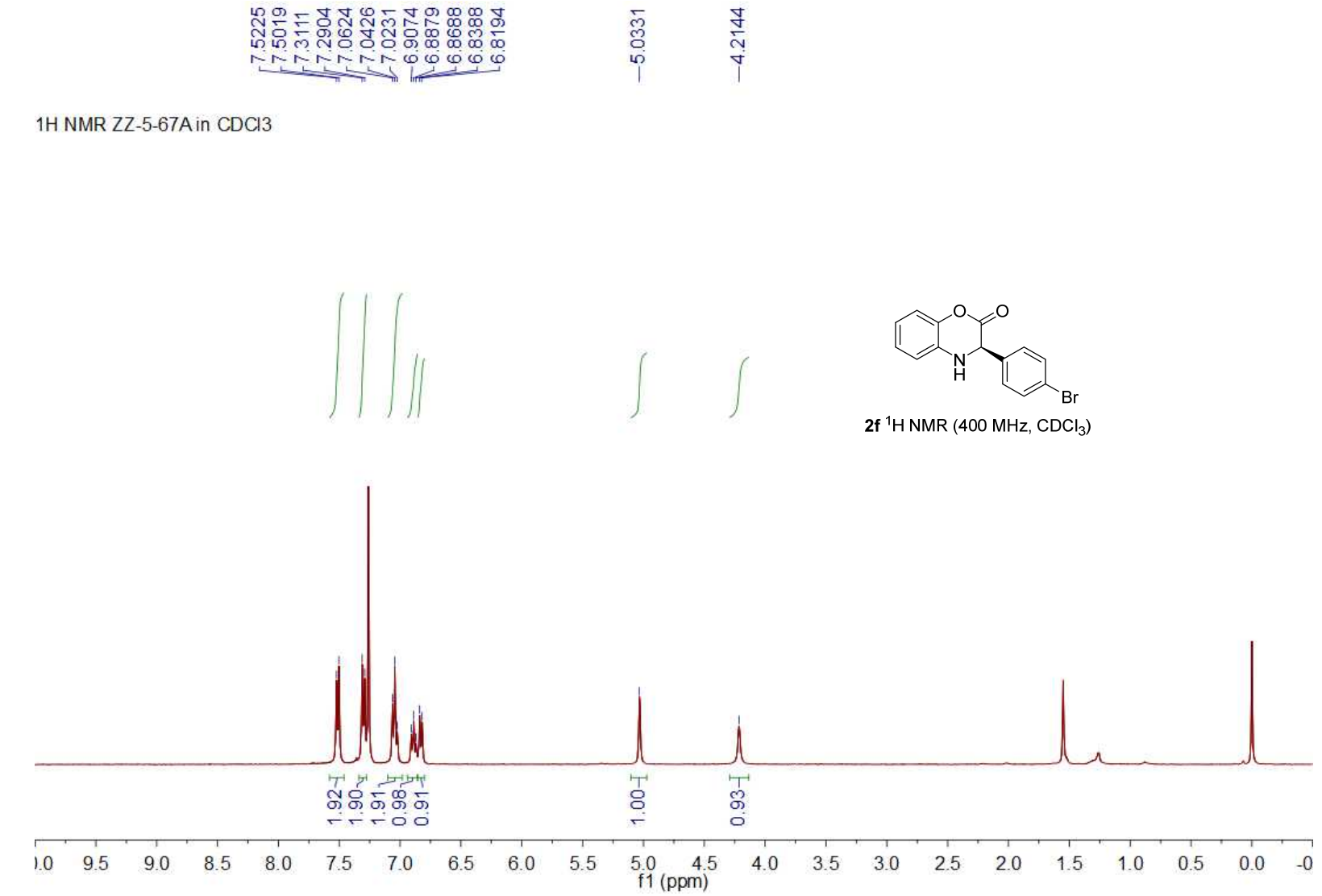
2d ^{19}F NMR (376 MHz, $CDCl_3$)



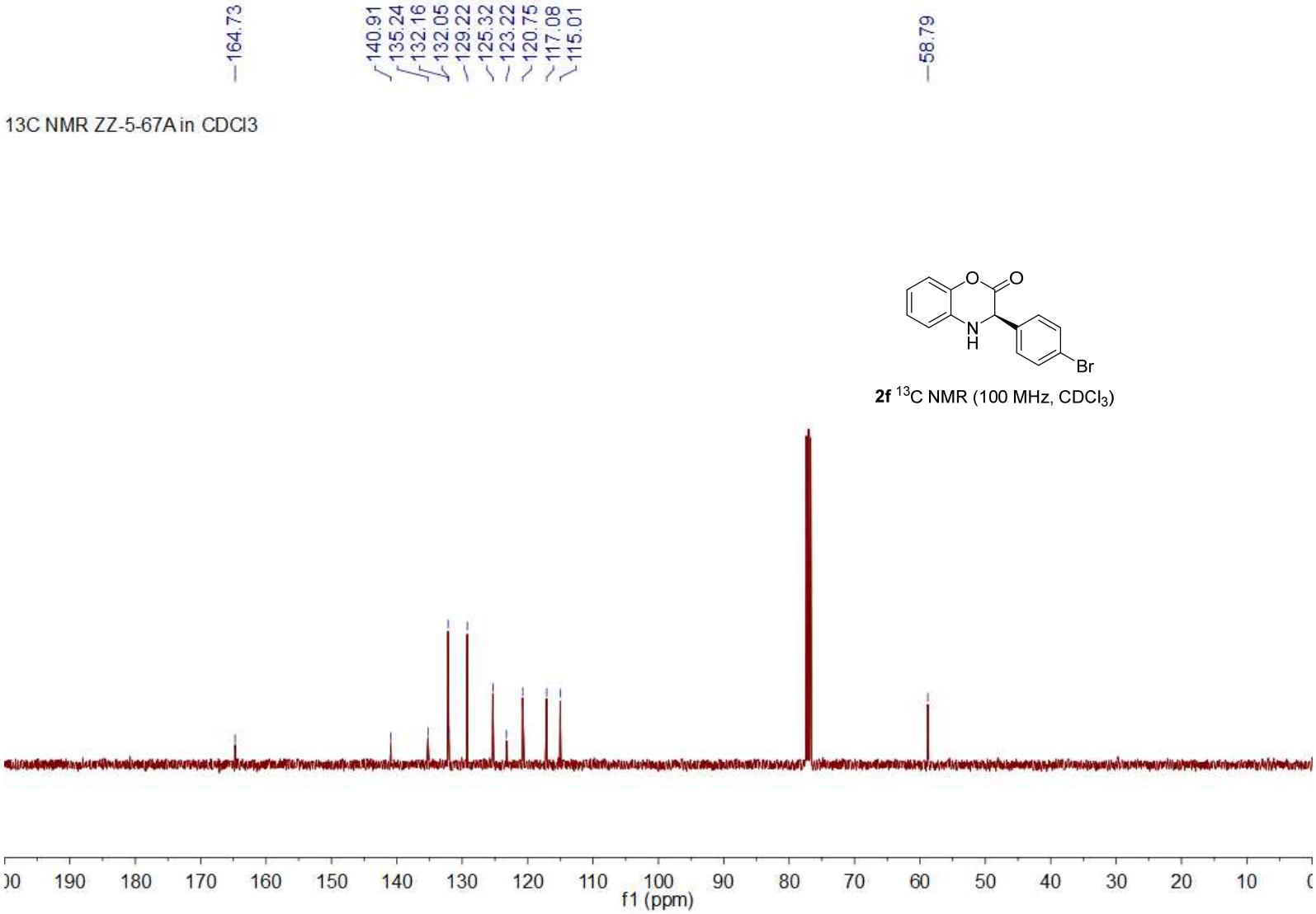
2e ^{1}H NMR (400 MHz, $CDCl_3$)



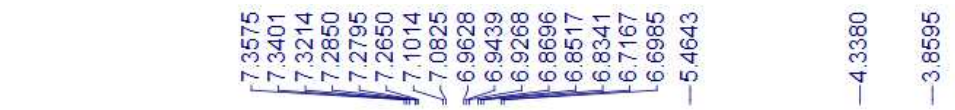
2e ^{13}C NMR (100 MHz, $CDCl_3$)



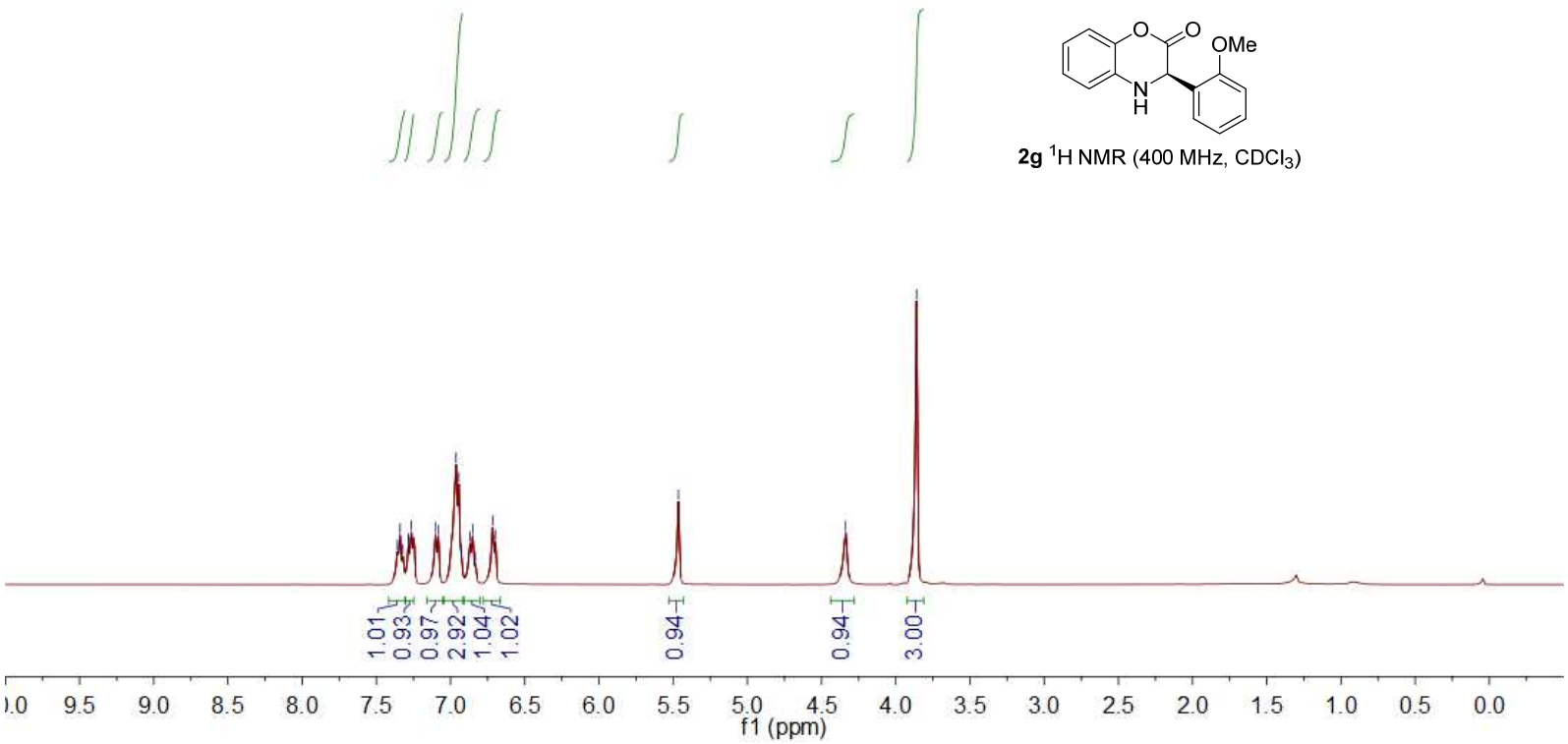
2f ^{1}H NMR (400 MHz, $CDCl_3$)



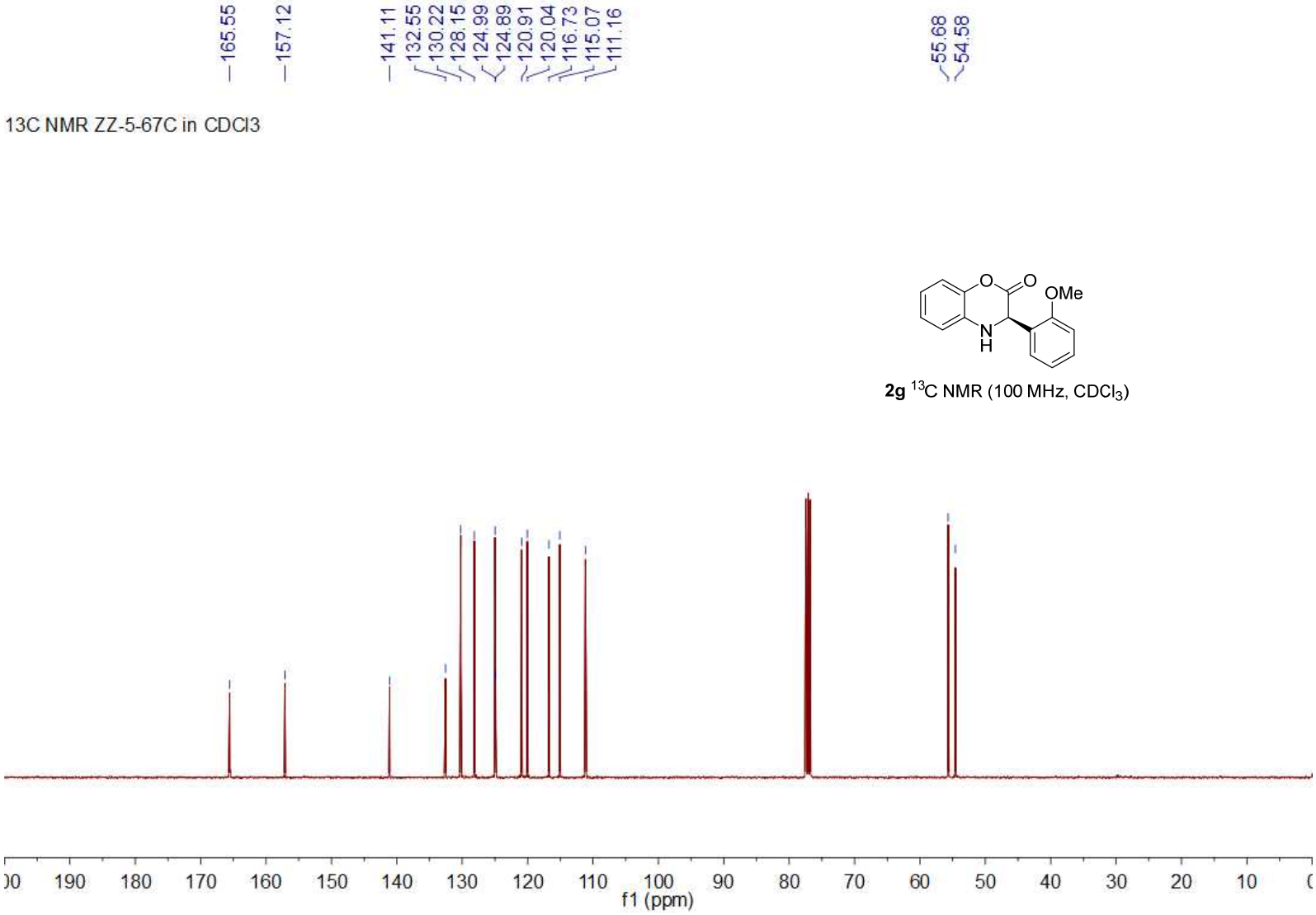
2f ^{13}C NMR (100 MHz, $CDCl_3$)



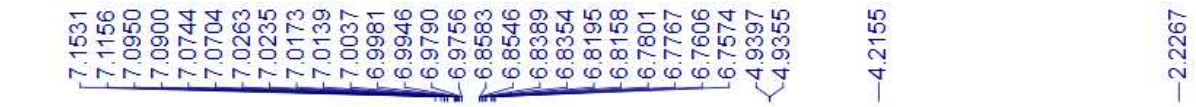
1H NMR ZZ-5-67C in CDCl3



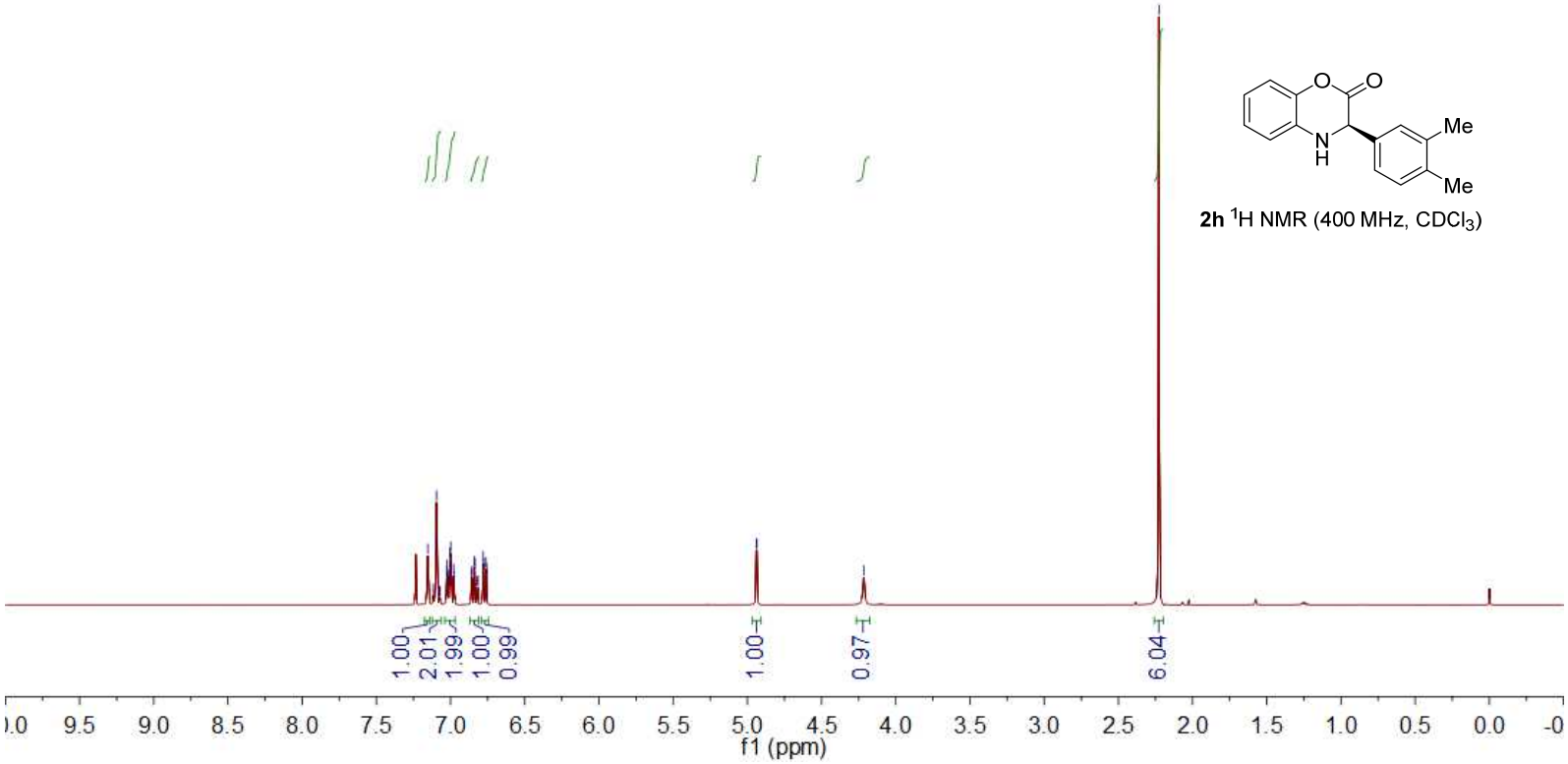
2g ^{1}H NMR (400 MHz, $CDCl_3$)



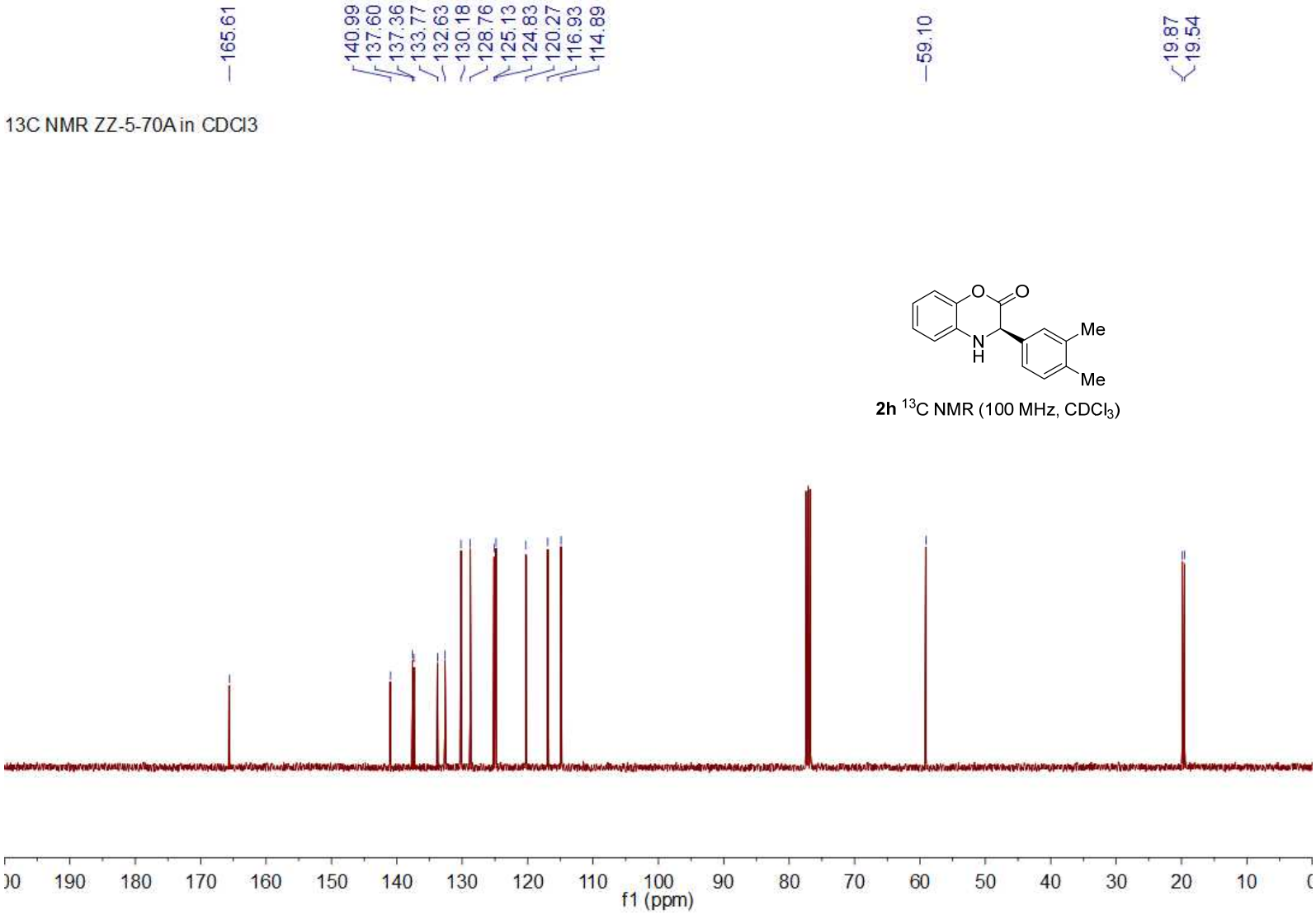
2g ^{13}C NMR (100 MHz, $CDCl_3$)



1H NMR ZZ-5-70A in CDCl3

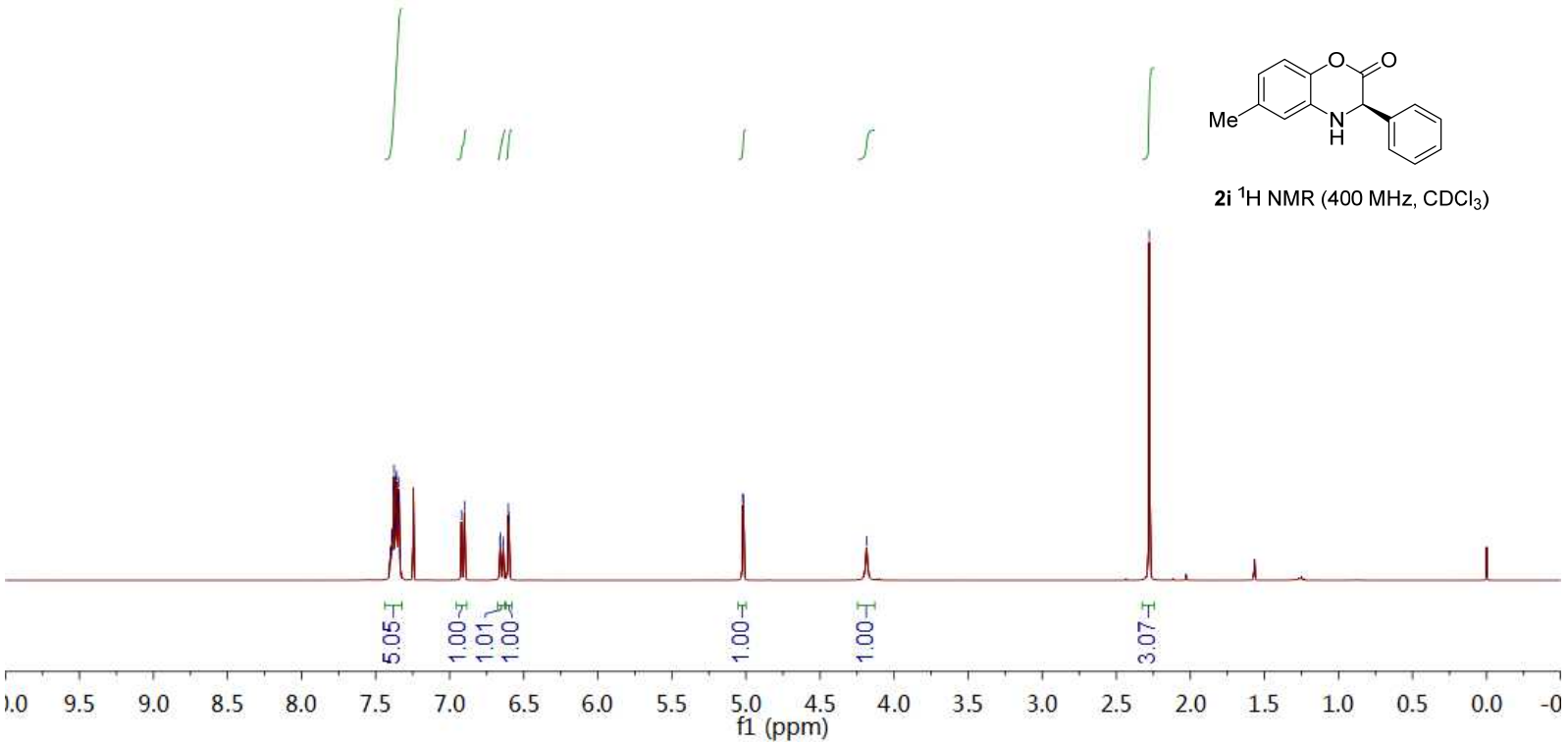


2h ^{1}H NMR (400 MHz, $CDCl_3$)

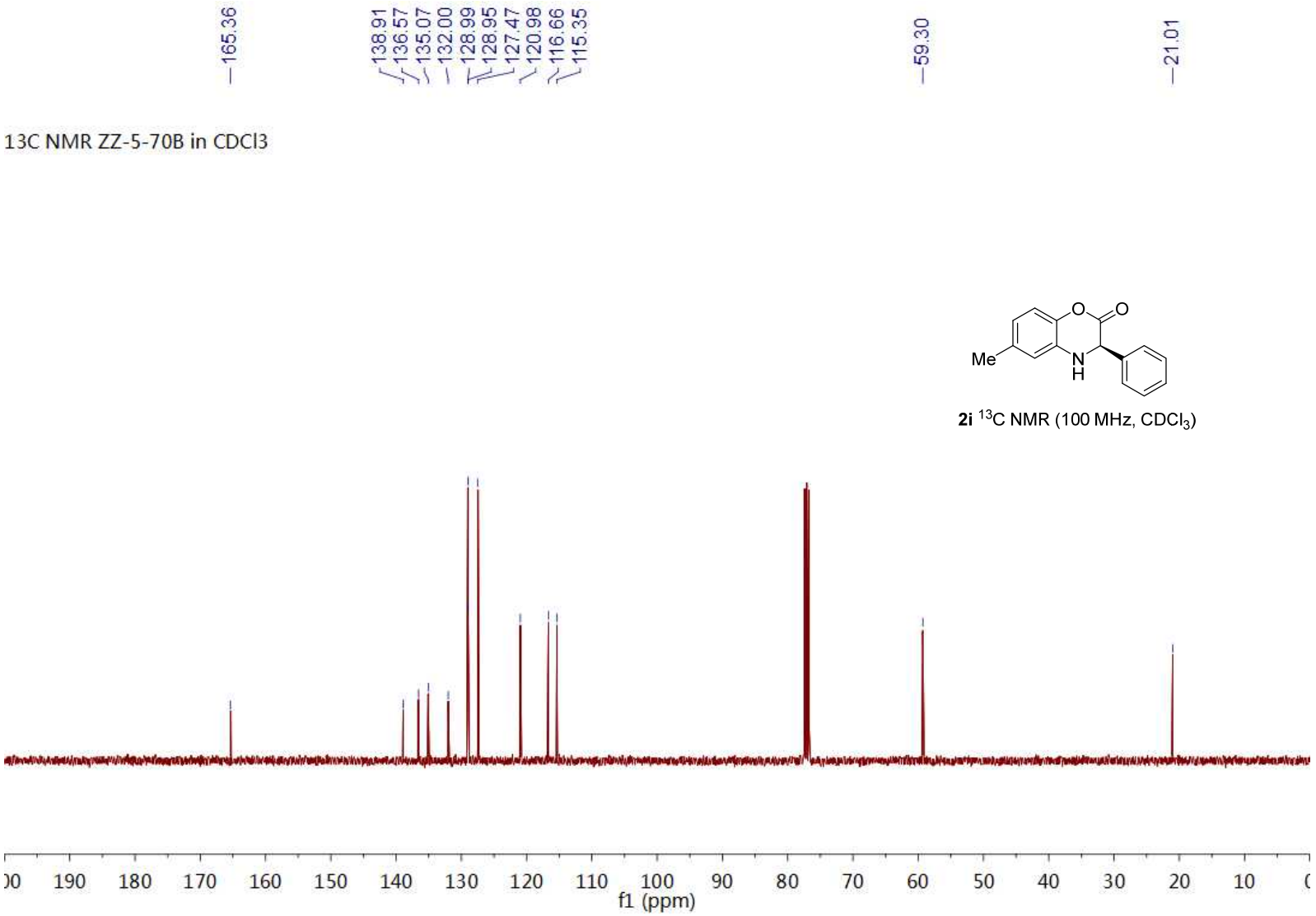


2h ^{13}C NMR (100 MHz, $CDCl_3$)

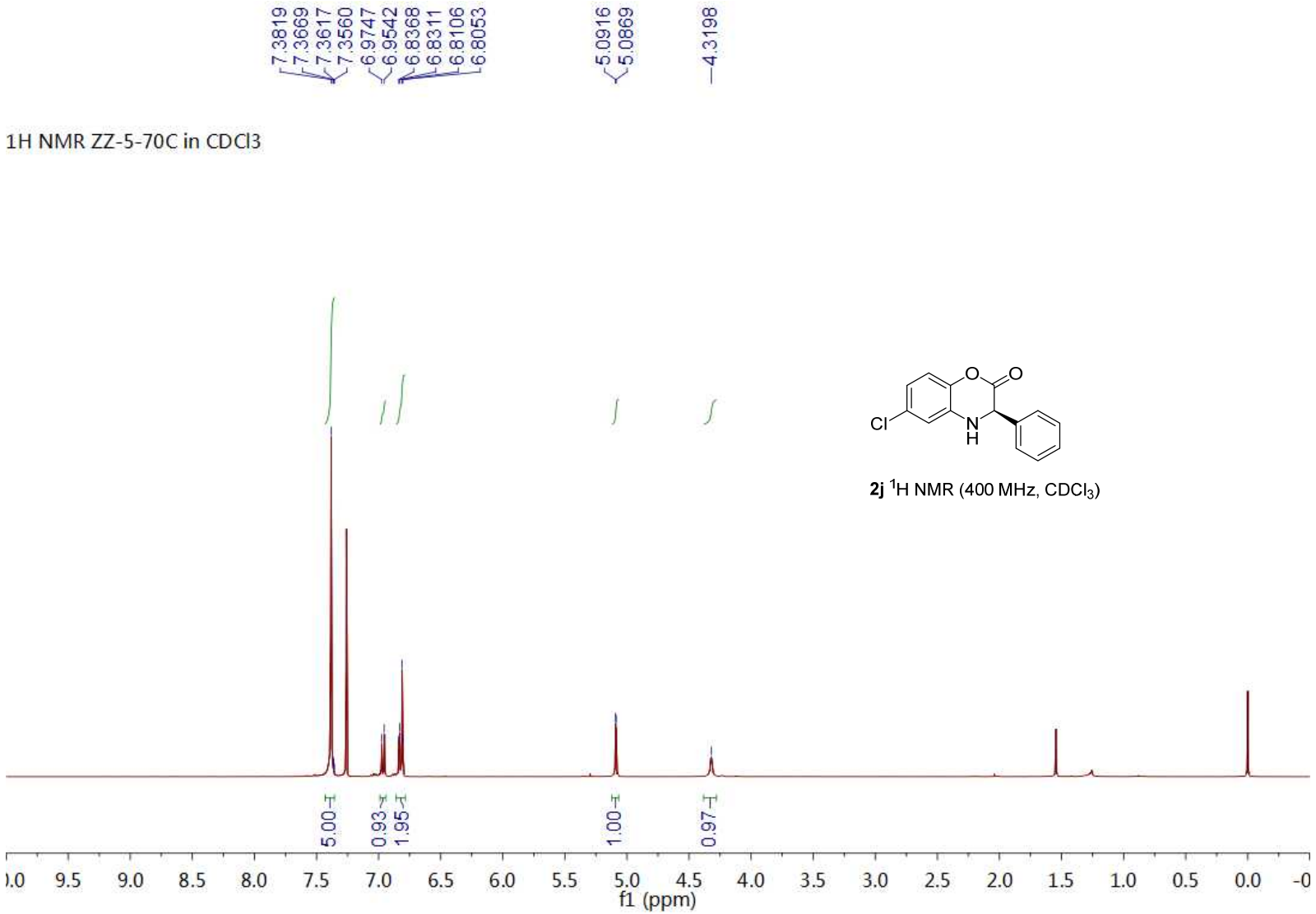
1H NMR ZZ-5-70B in CDCl3



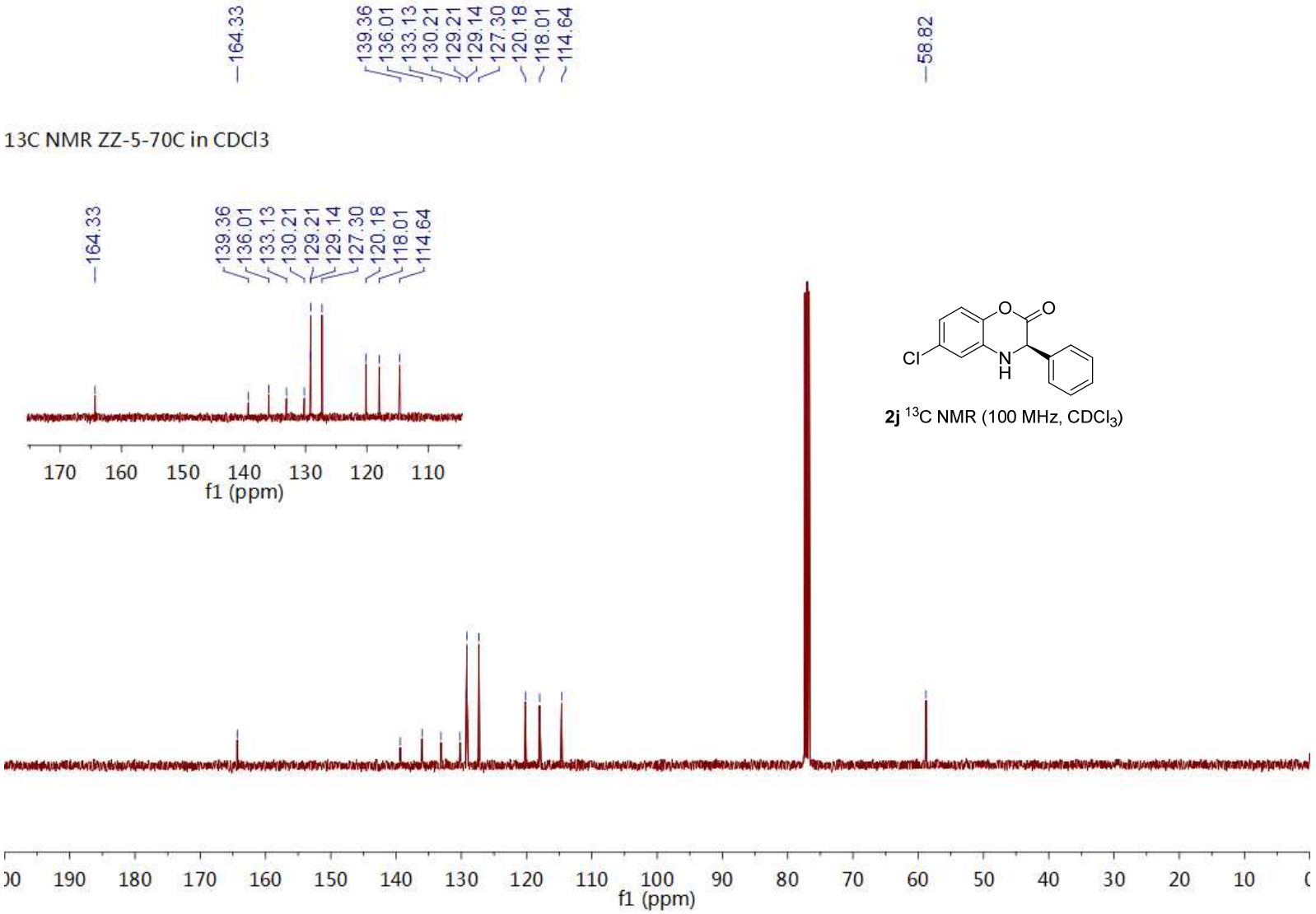
2i ^{1}H NMR (400 MHz, $CDCl_3$)



2i ^{13}C NMR (100 MHz, $CDCl_3$)



2j ^{1}H NMR (400 MHz, $CDCl_3$)



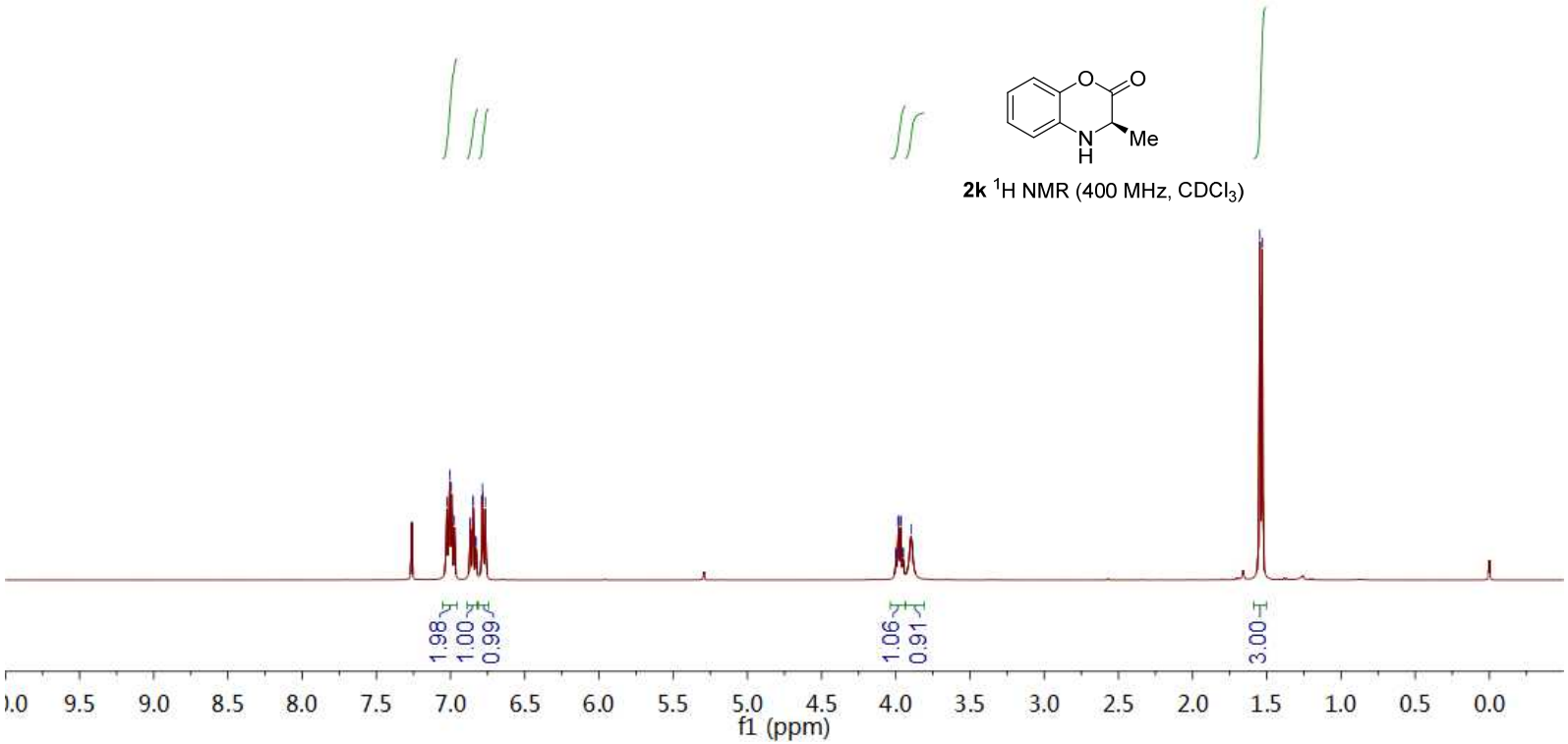
2j ^{13}C NMR (100 MHz, $CDCl_3$)

7.0246
7.0048
6.9930
6.9738
6.8687
6.8661
6.8495
6.8466
6.8300
6.8274
6.7856
6.7828
6.7660

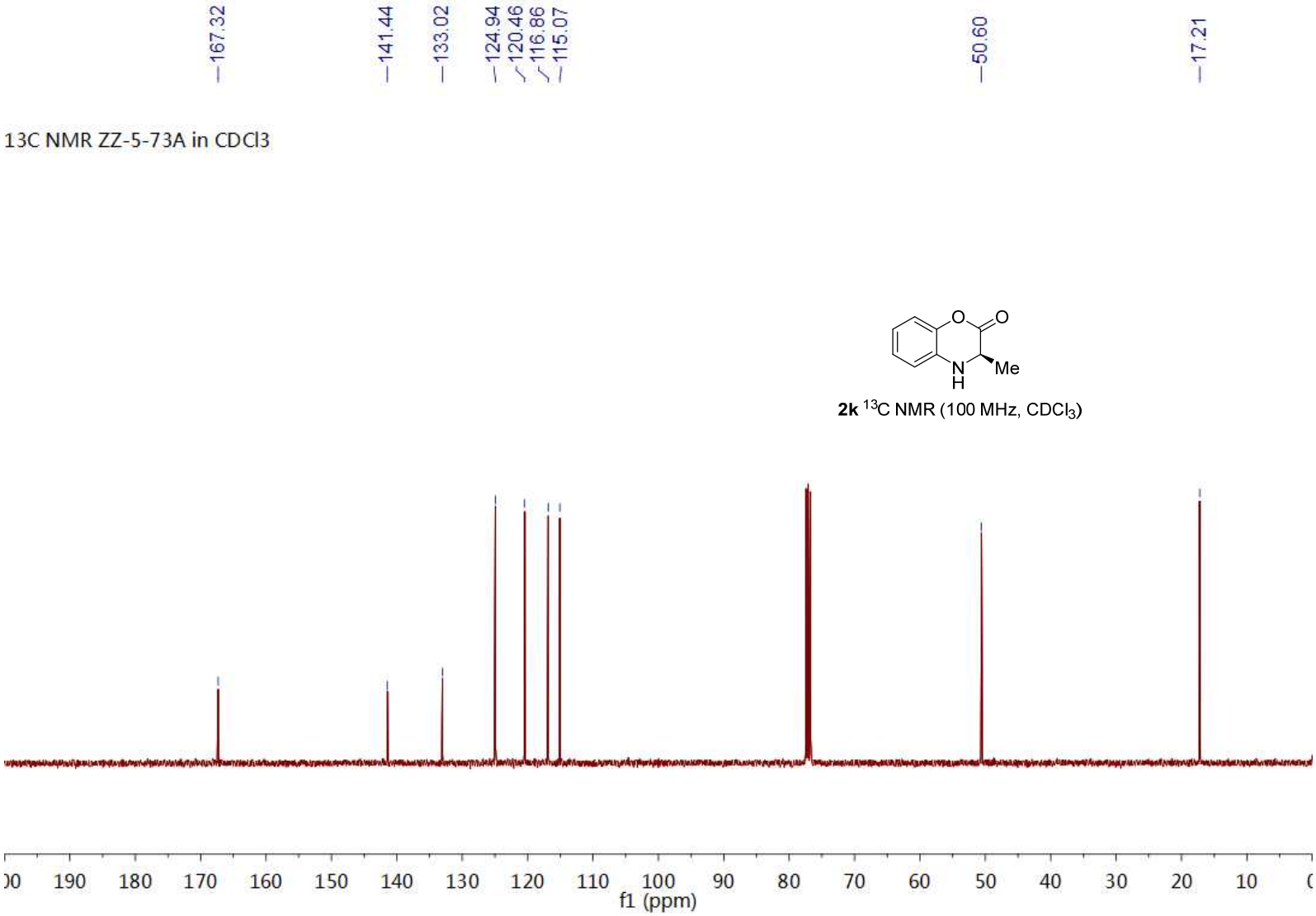
4.0017
3.9979
3.9853
3.9814
3.9688
3.9649
3.9524
3.9485
3.8966

1.5466
1.5300

1H NMR ZZ-5-73A in CDCl3

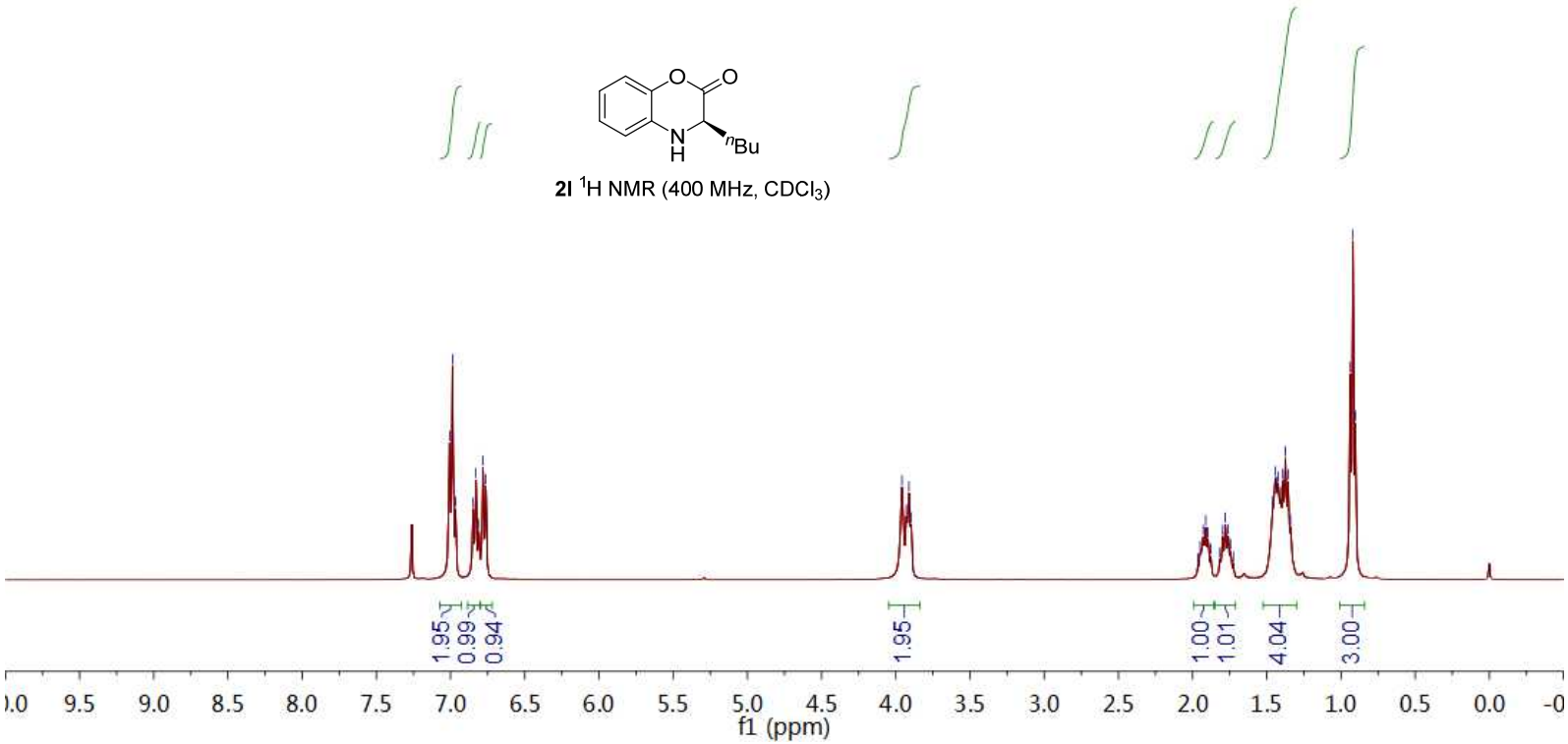


2k ^{1}H NMR (400 MHz, $CDCl_3$)



2k ^{13}C NMR (100 MHz, $CDCl_3$)

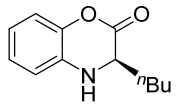
1H NMR ZZ-5-73B in CDCl3



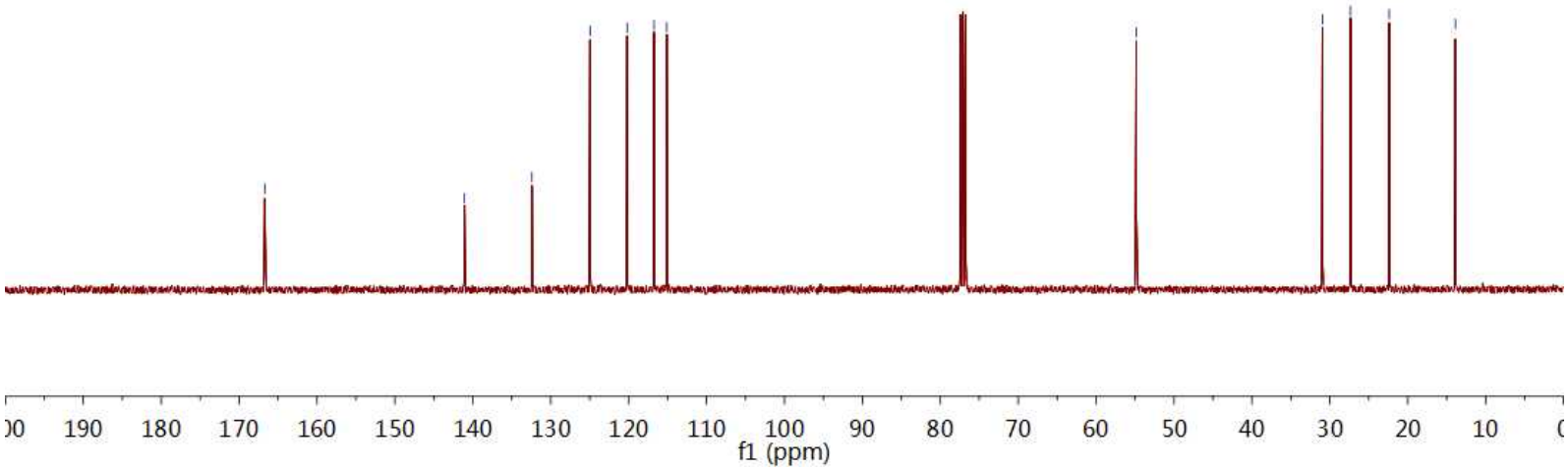
2l ^{1}H NMR (400 MHz, $CDCl_3$)

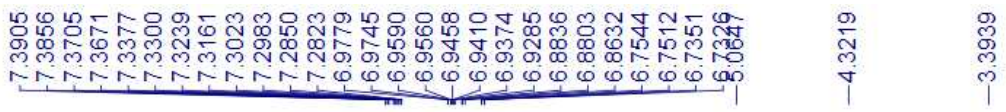
166.71
141.08
132.42
124.96
120.19
116.74
115.11
54.85
30.95
27.36
22.38
13.89

13C NMR ZZ-5-73B in CDCl3

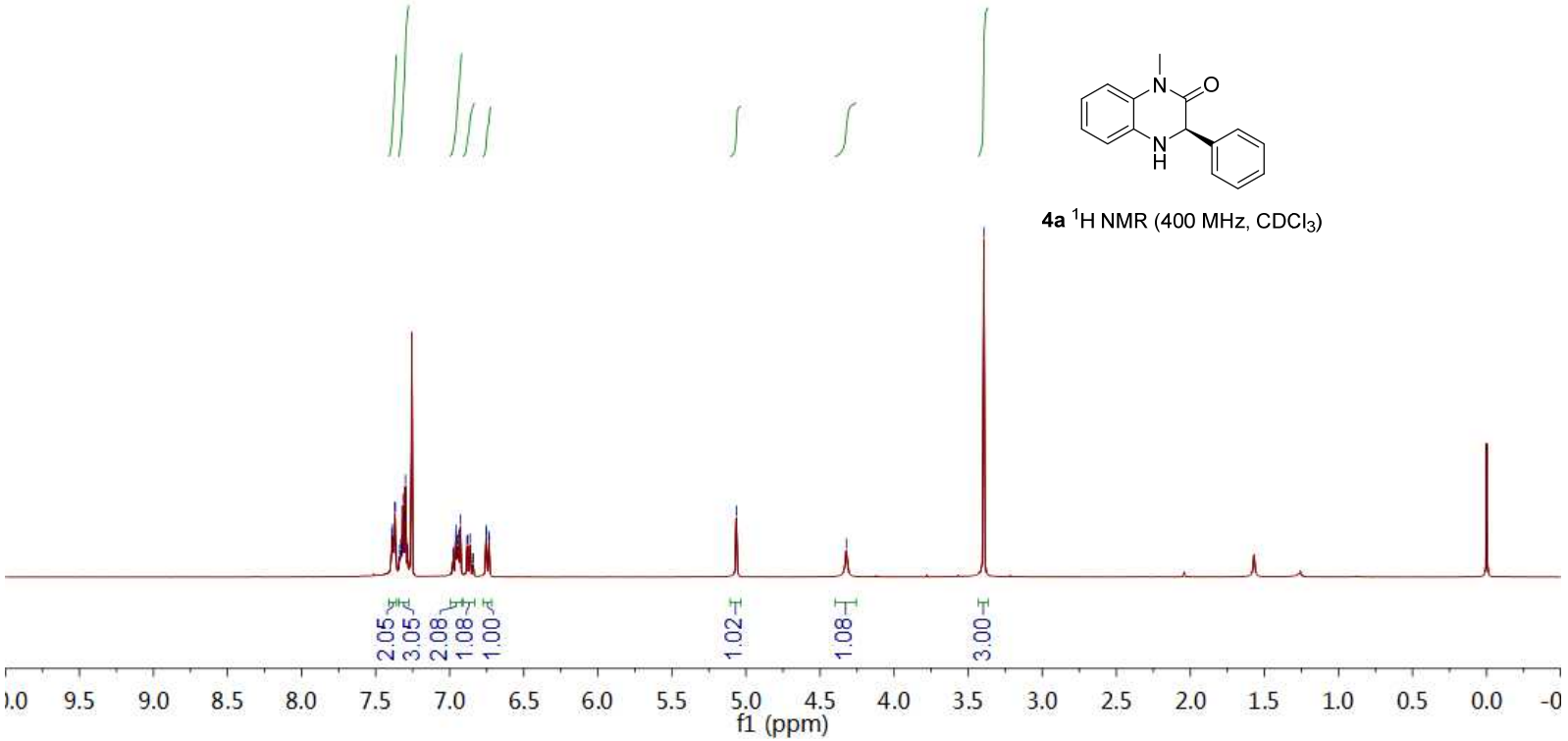


2l ^{13}C NMR (100 MHz, $CDCl_3$)

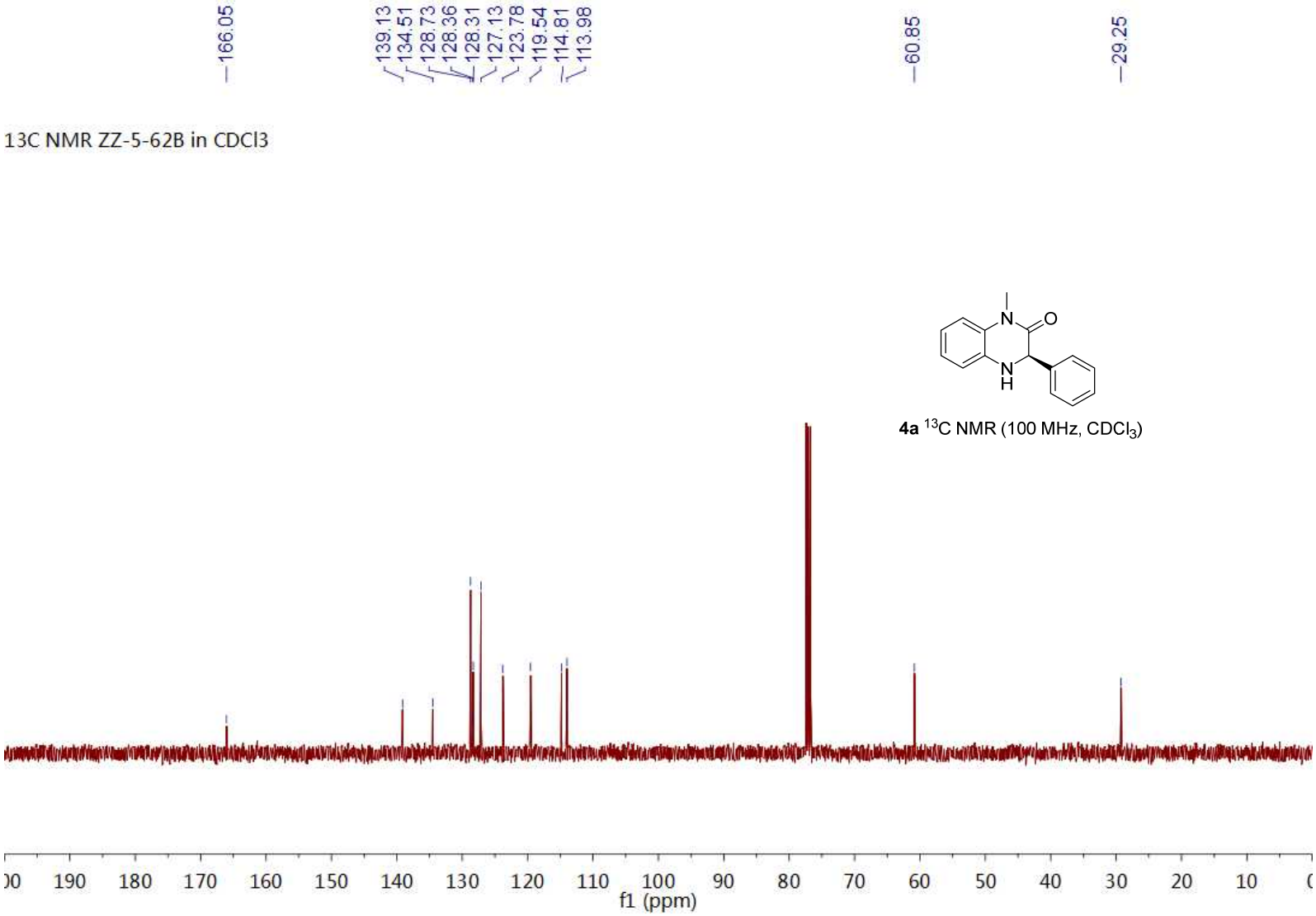




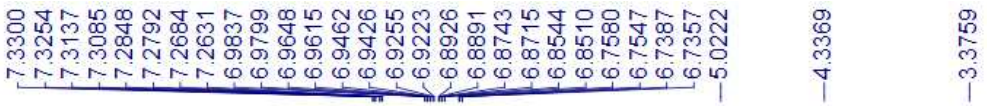
1H NMR ZZ-5-62B in CDCl3



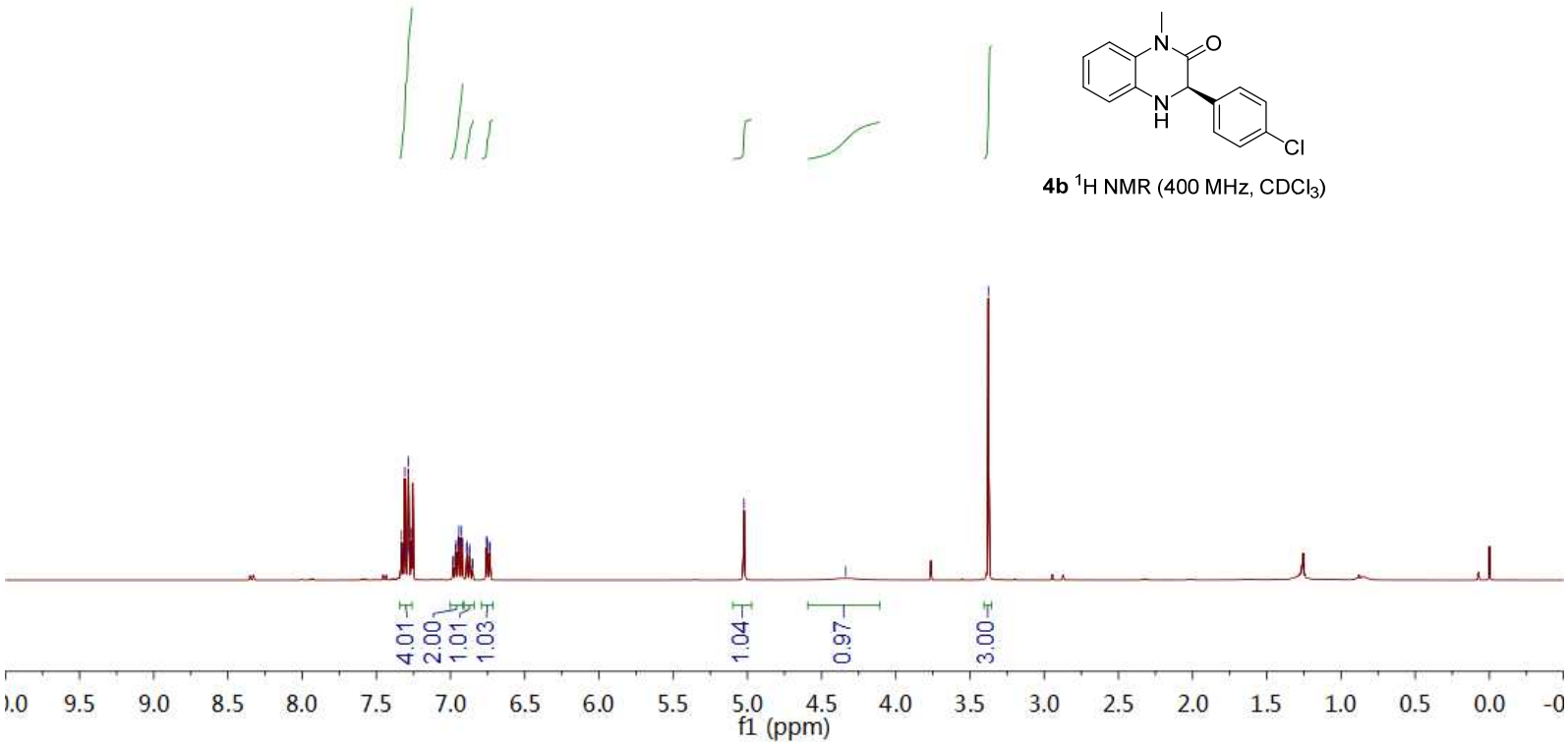
4a ^{1}H NMR (400 MHz, $CDCl_3$)



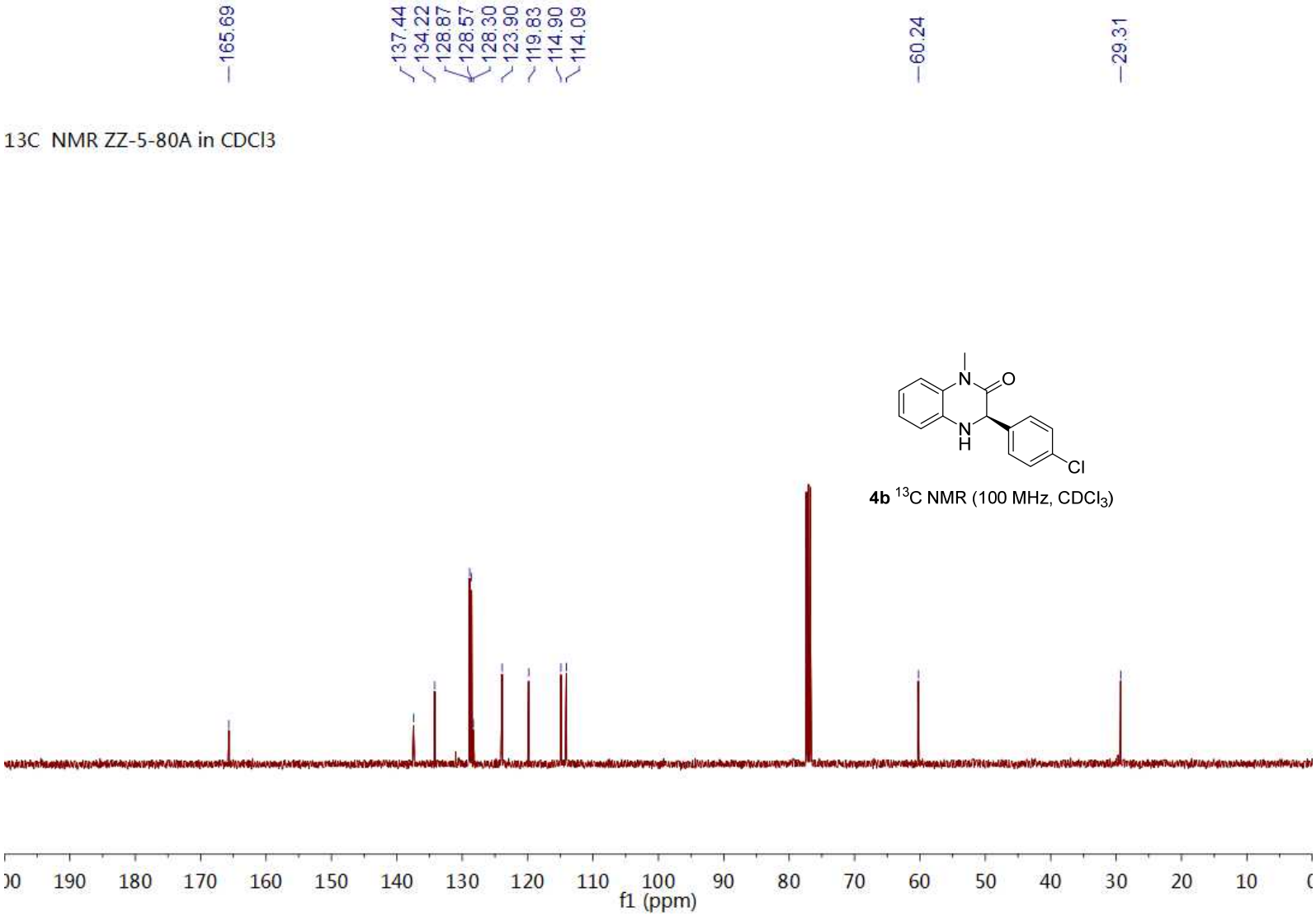
4a ^{13}C NMR (100 MHz, $CDCl_3$)



1H NMR ZZ-5-80A in CDCl3

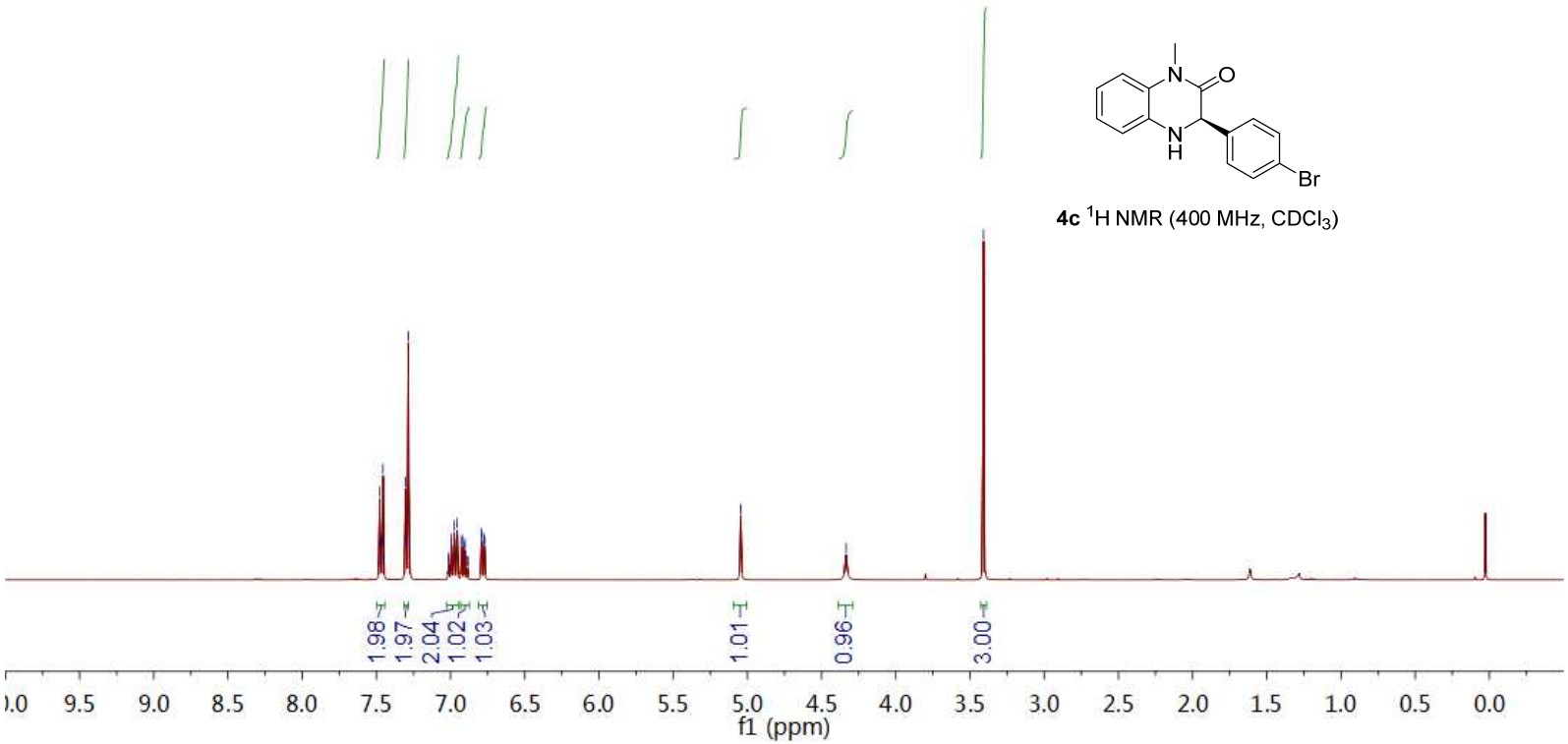


4b ^{1}H NMR (400 MHz, $CDCl_3$)

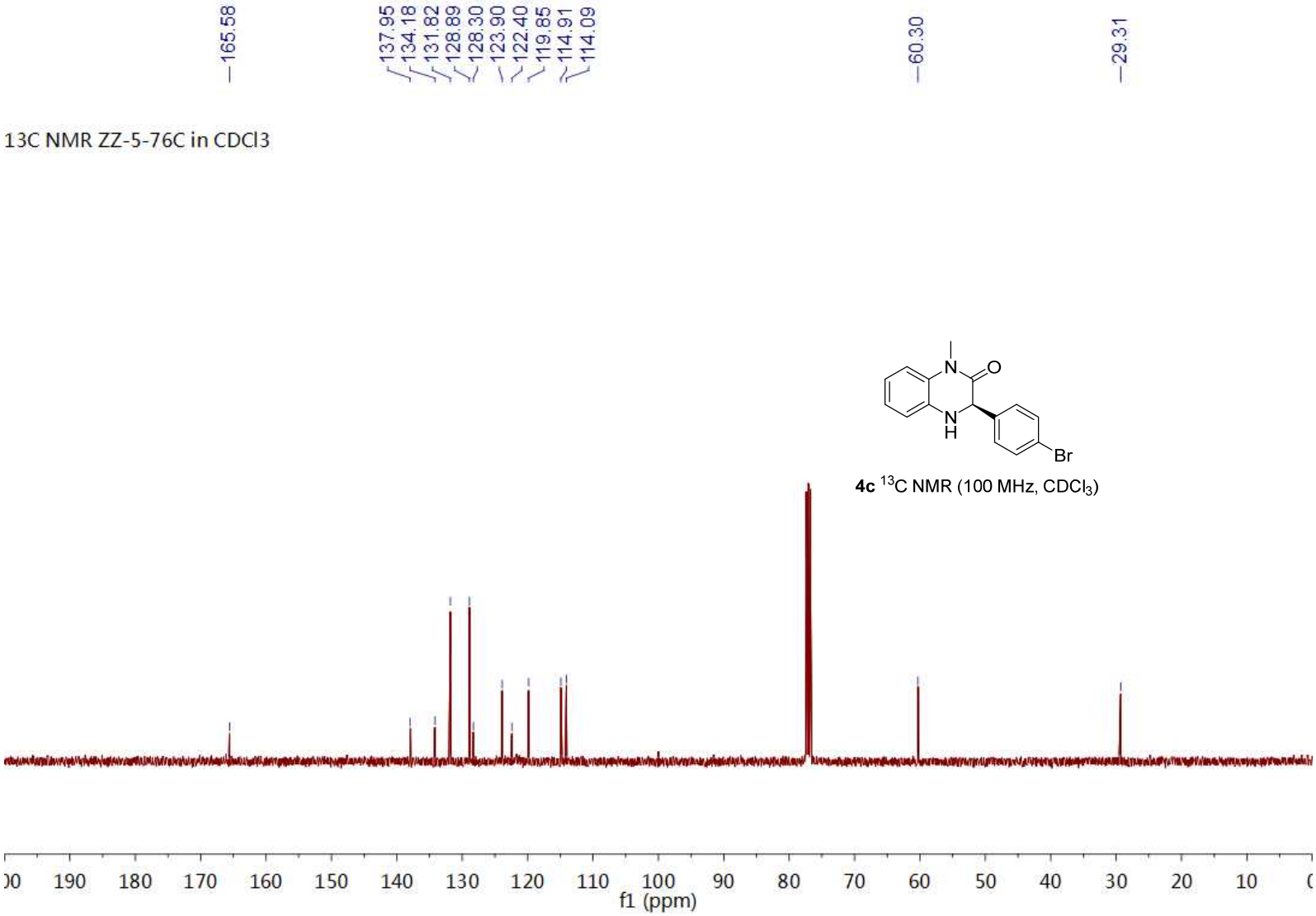


4b ^{13}C NMR (100 MHz, $CDCl_3$)

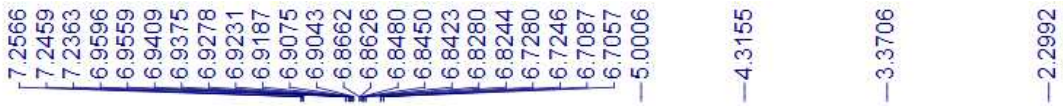
1H NMR ZZ-5-76C in CDCl3



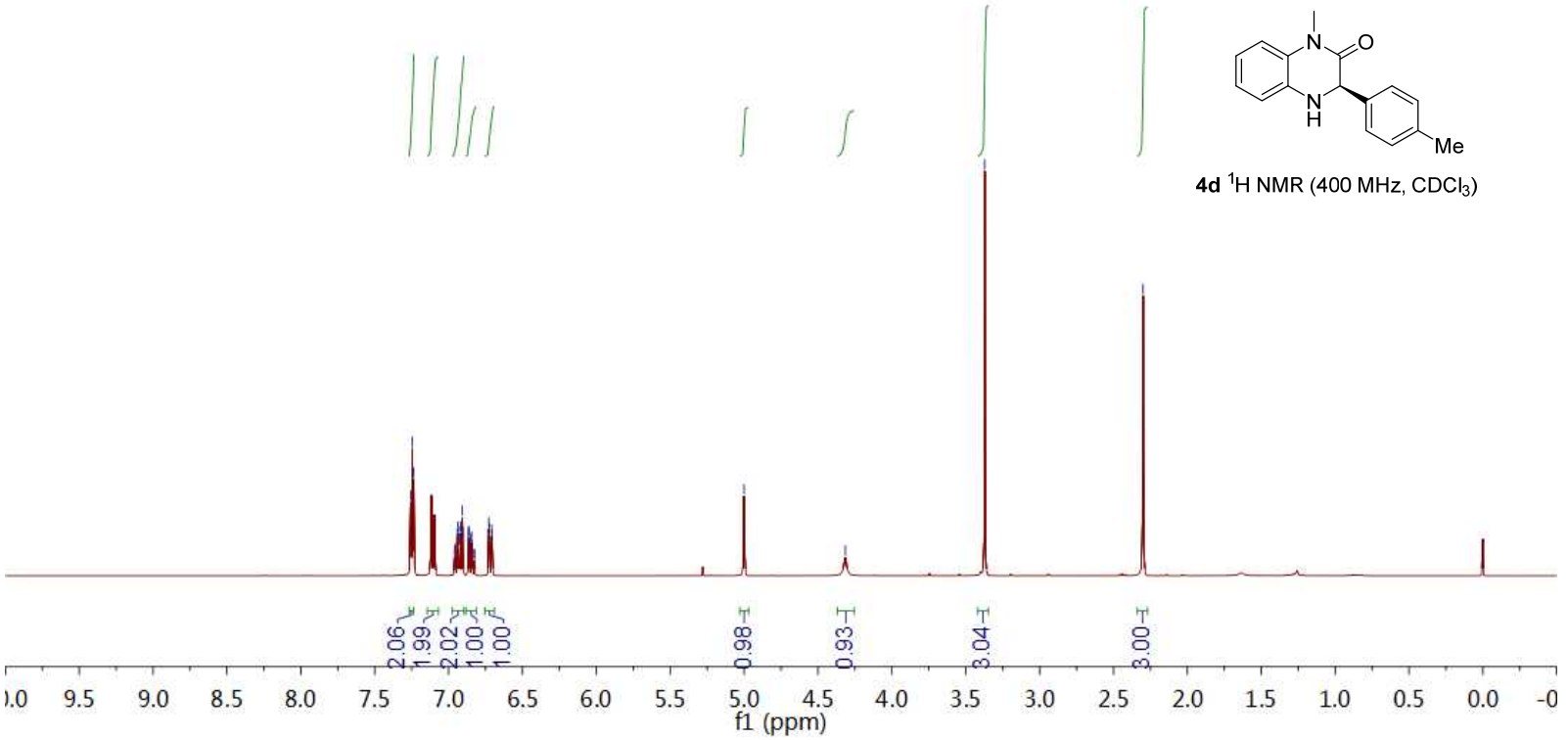
4c ^{1}H NMR (400 MHz, $CDCl_3$)



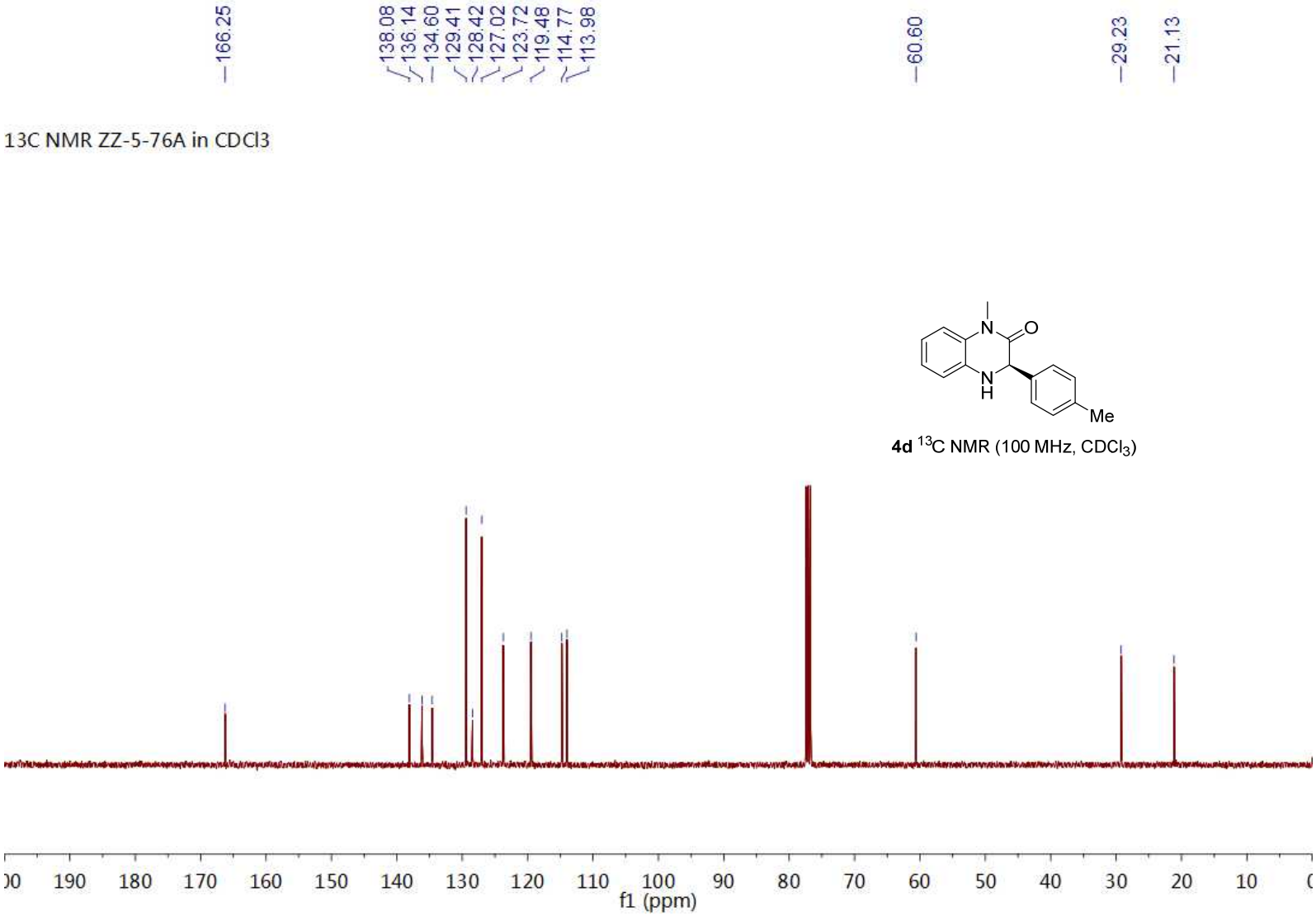
4c ^{13}C NMR (100 MHz, $CDCl_3$)



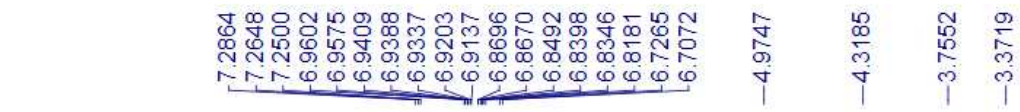
1H NMR ZZ-5-76A in CDCl3



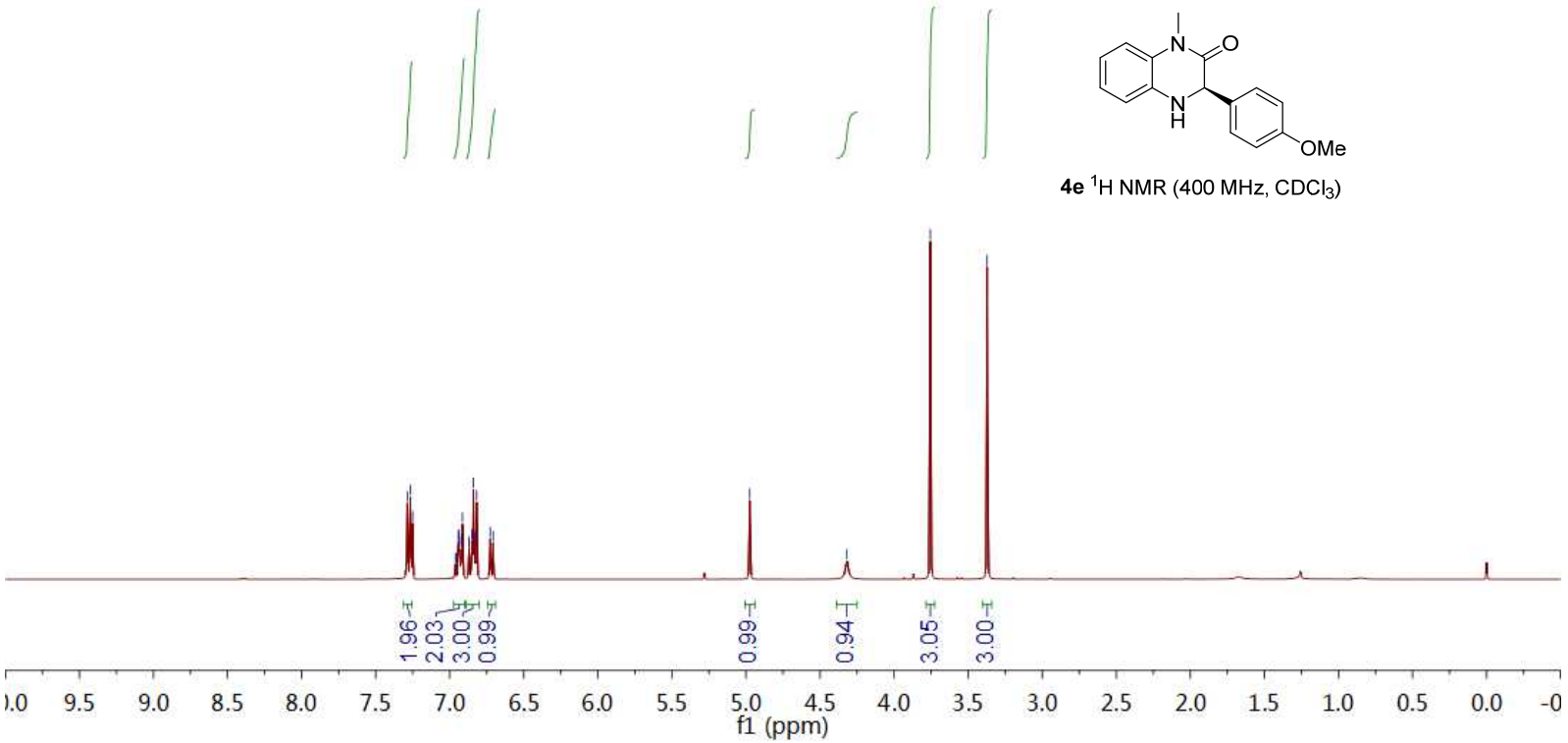
4d ^{1}H NMR (400 MHz, $CDCl_3$)



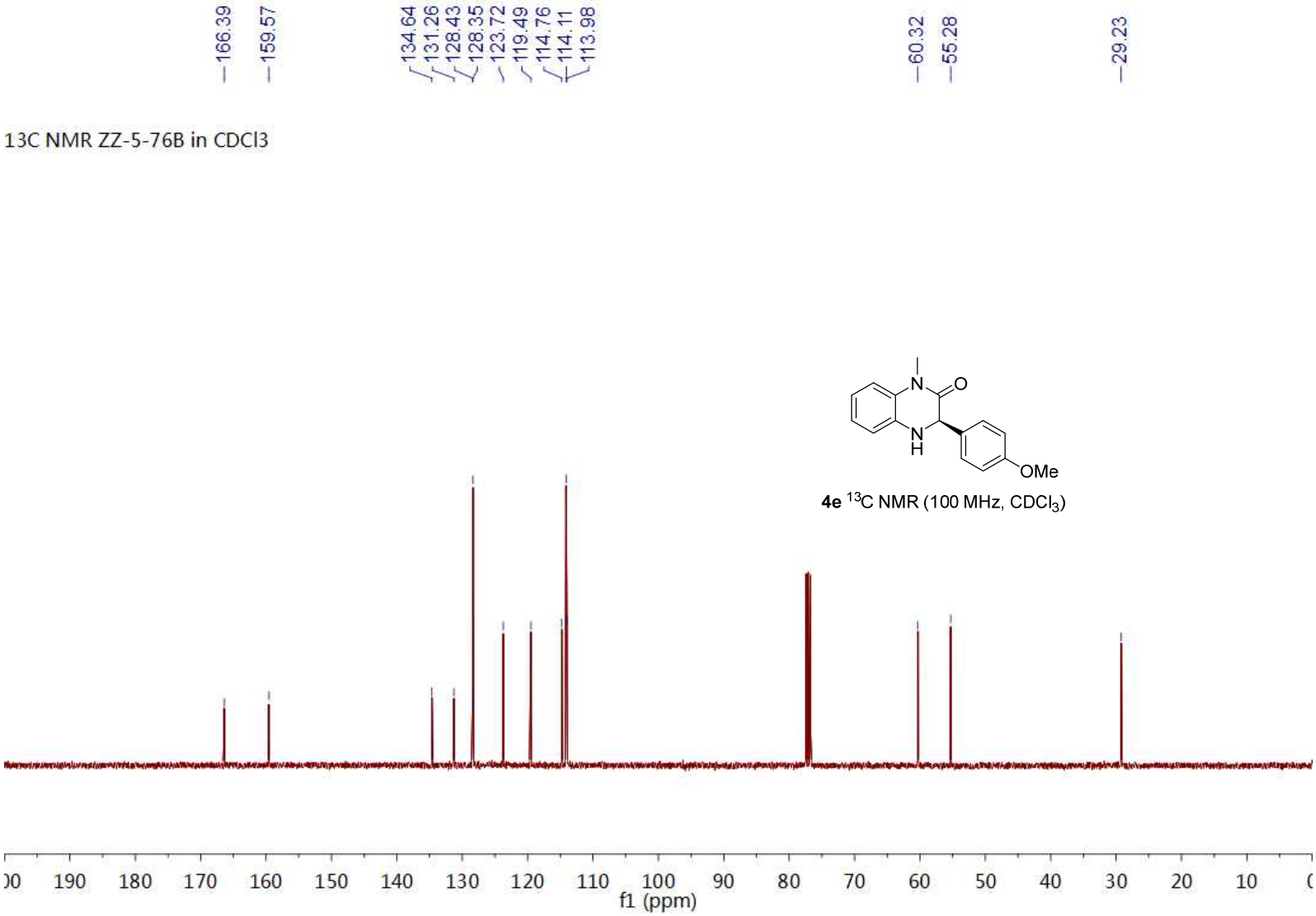
4d ^{13}C NMR (100 MHz, $CDCl_3$)



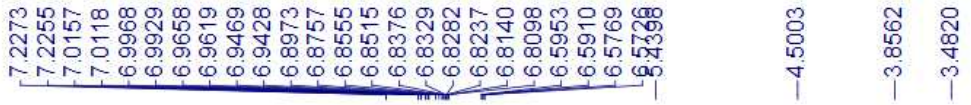
1H NMR ZZ-5-76B in CDCl3



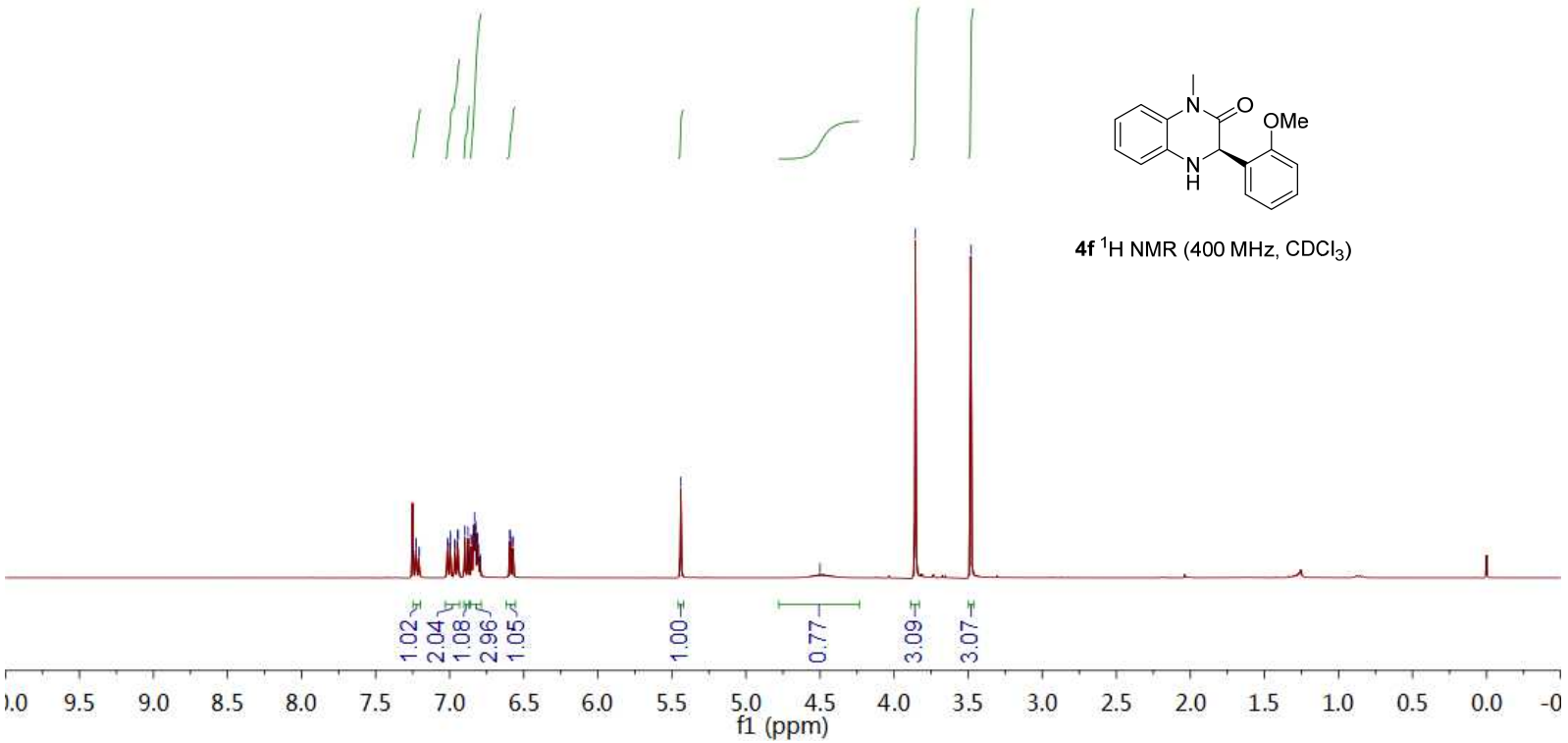
4e ^{1}H NMR (400 MHz, $CDCl_3$)



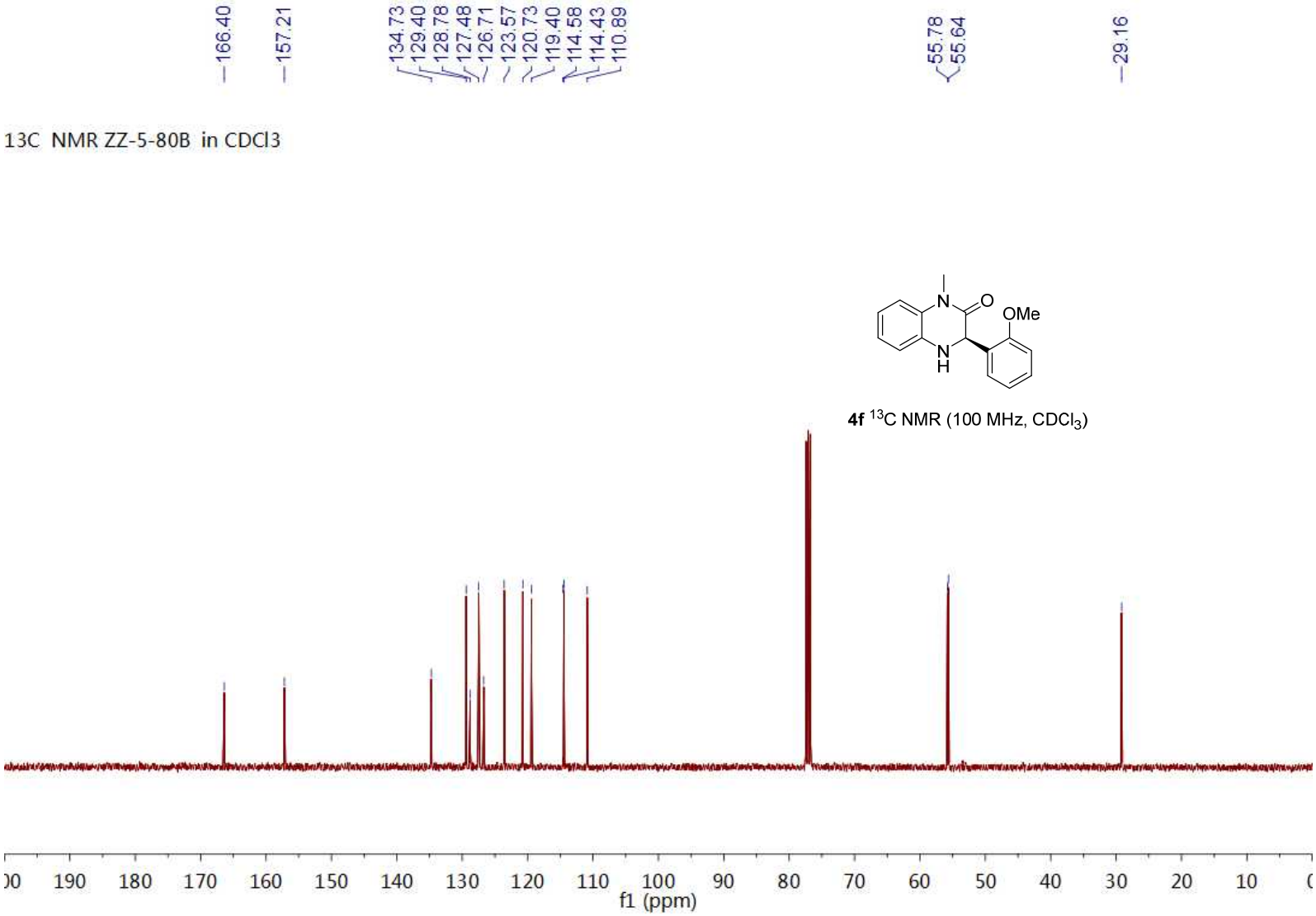
4e ^{13}C NMR (100 MHz, $CDCl_3$)



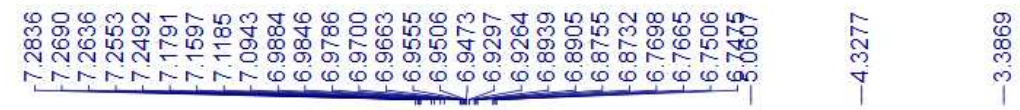
1H NMR ZZ-5-80B in CDCl3



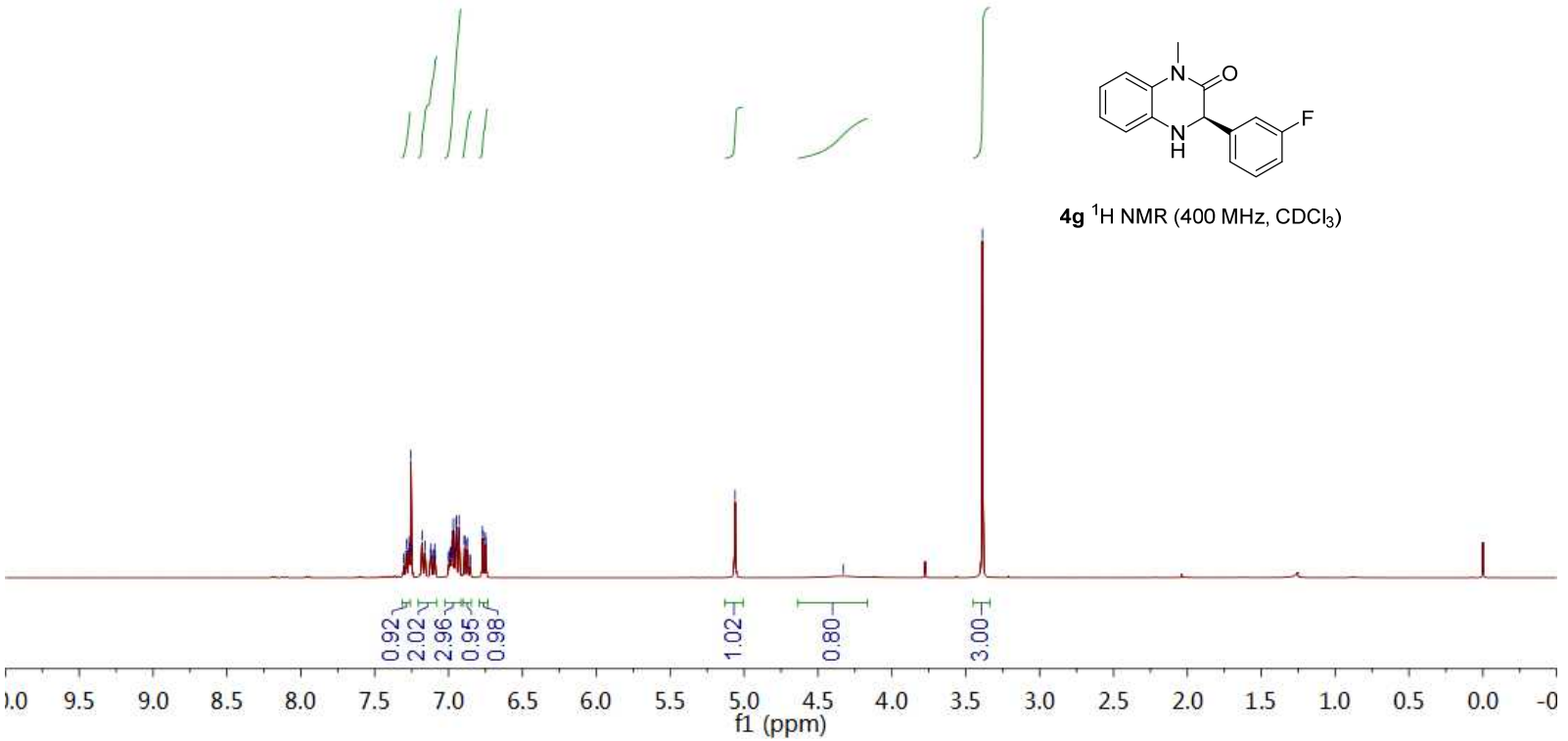
4f ^{1}H NMR (400 MHz, $CDCl_3$)



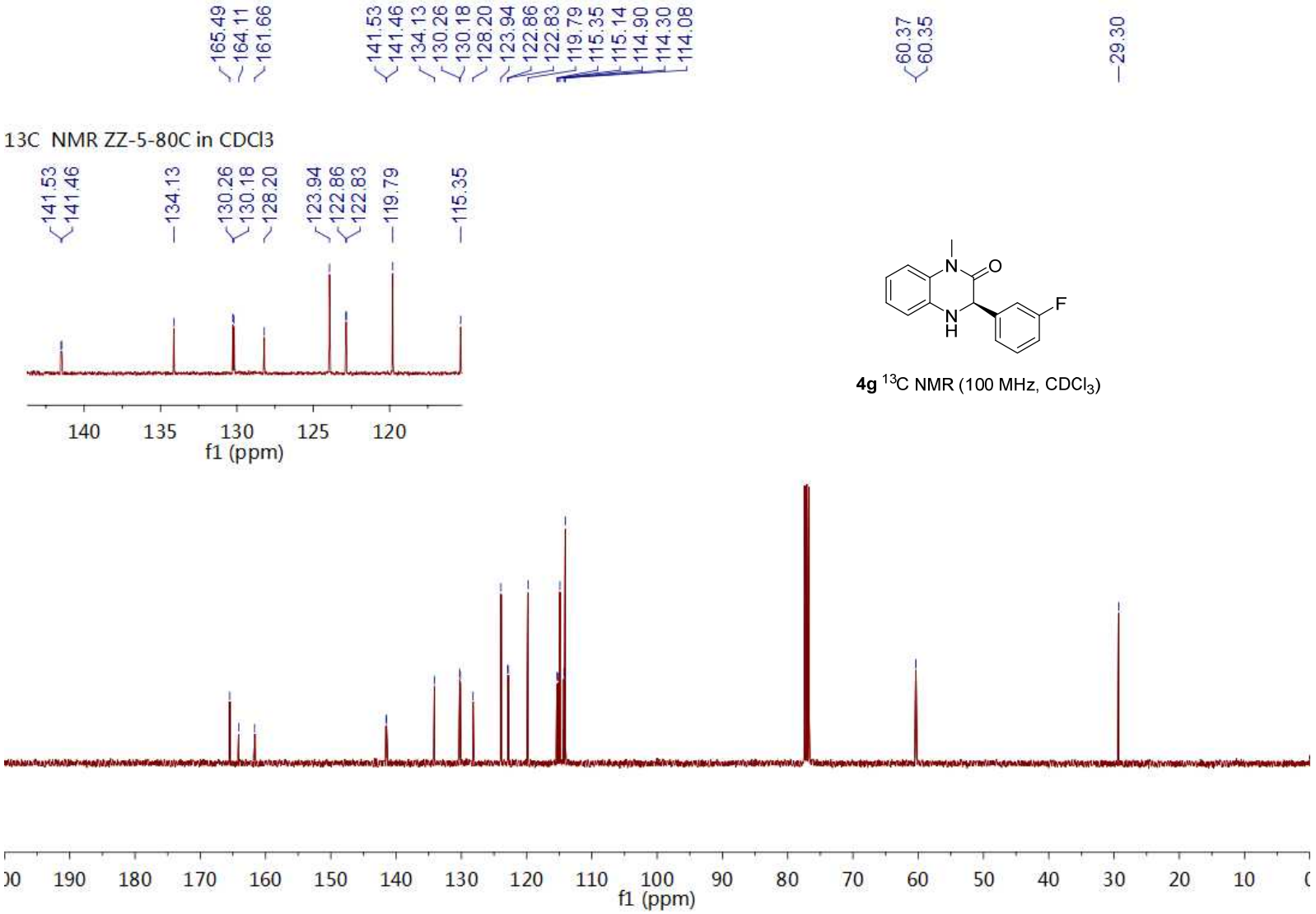
4f ^{13}C NMR (100 MHz, $CDCl_3$)



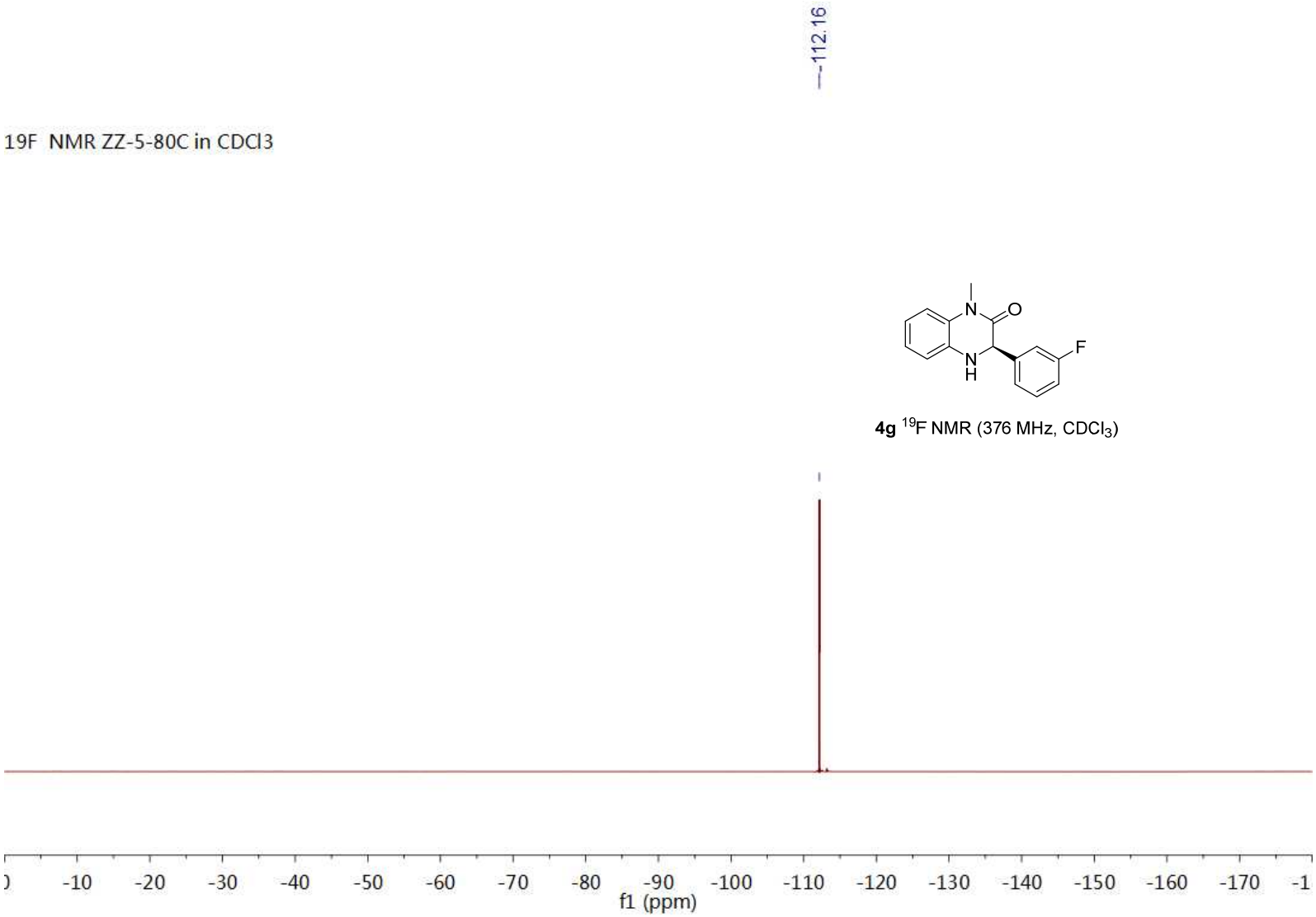
1H NMR ZZ-5-80C in CDCl3



4g ^{1}H NMR (400 MHz, $CDCl_3$)

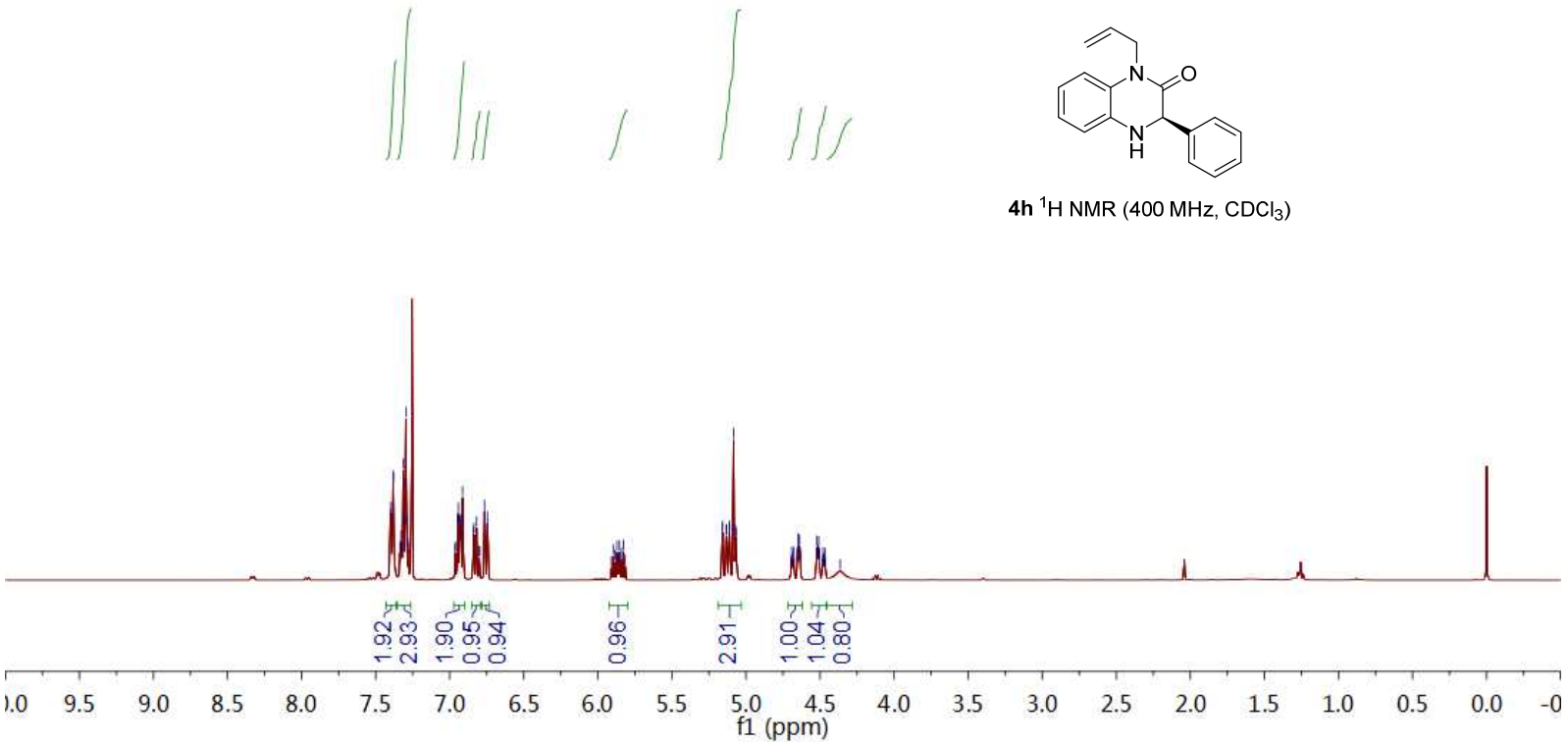


4g ^{13}C NMR (100 MHz, $CDCl_3$)

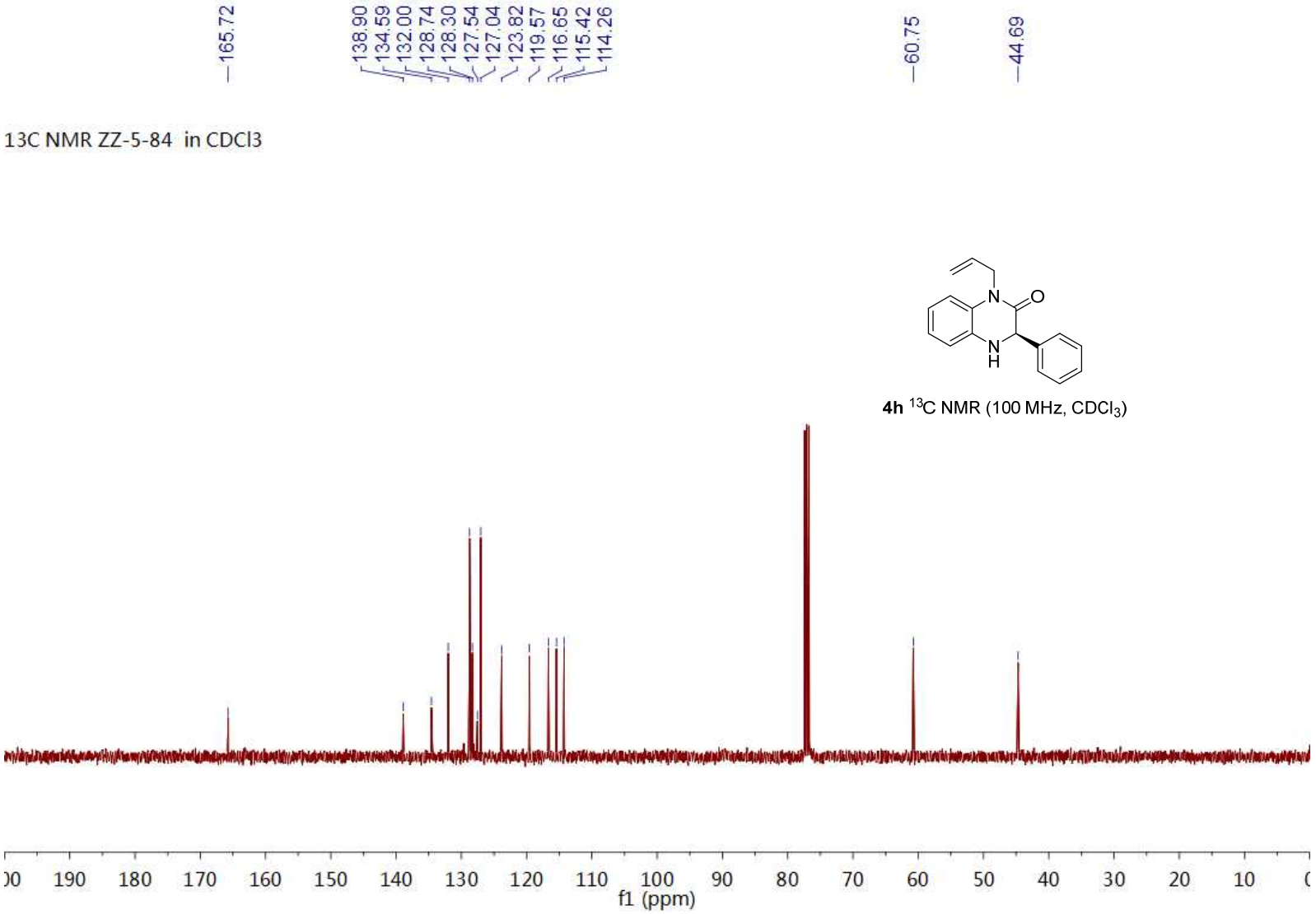


4g ^{19}F NMR (376 MHz, $CDCl_3$)

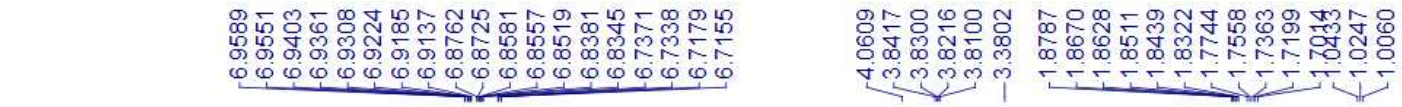
1H NMR ZZ-5-84 in CDCl3



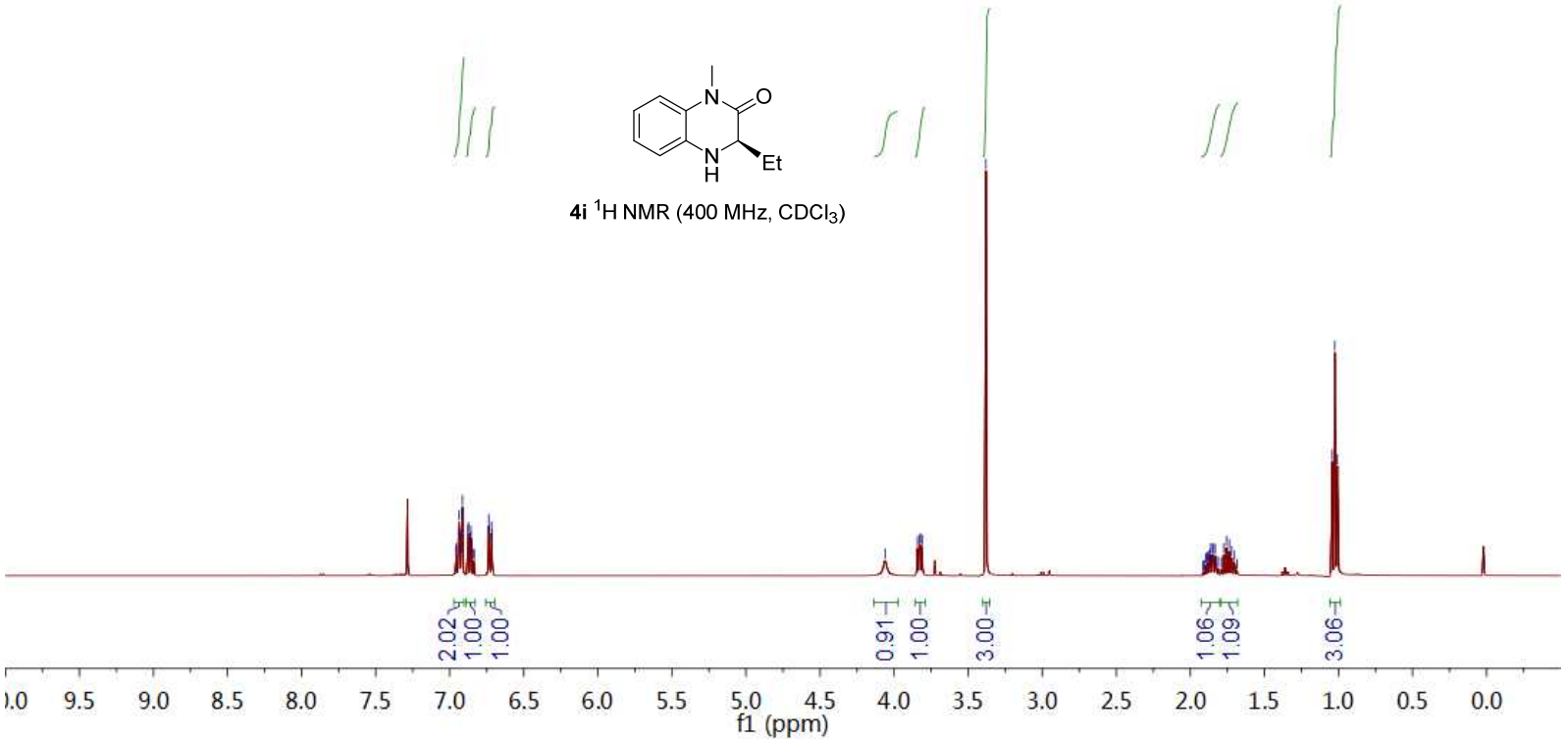
4h ^{1}H NMR (400 MHz, $CDCl_3$)



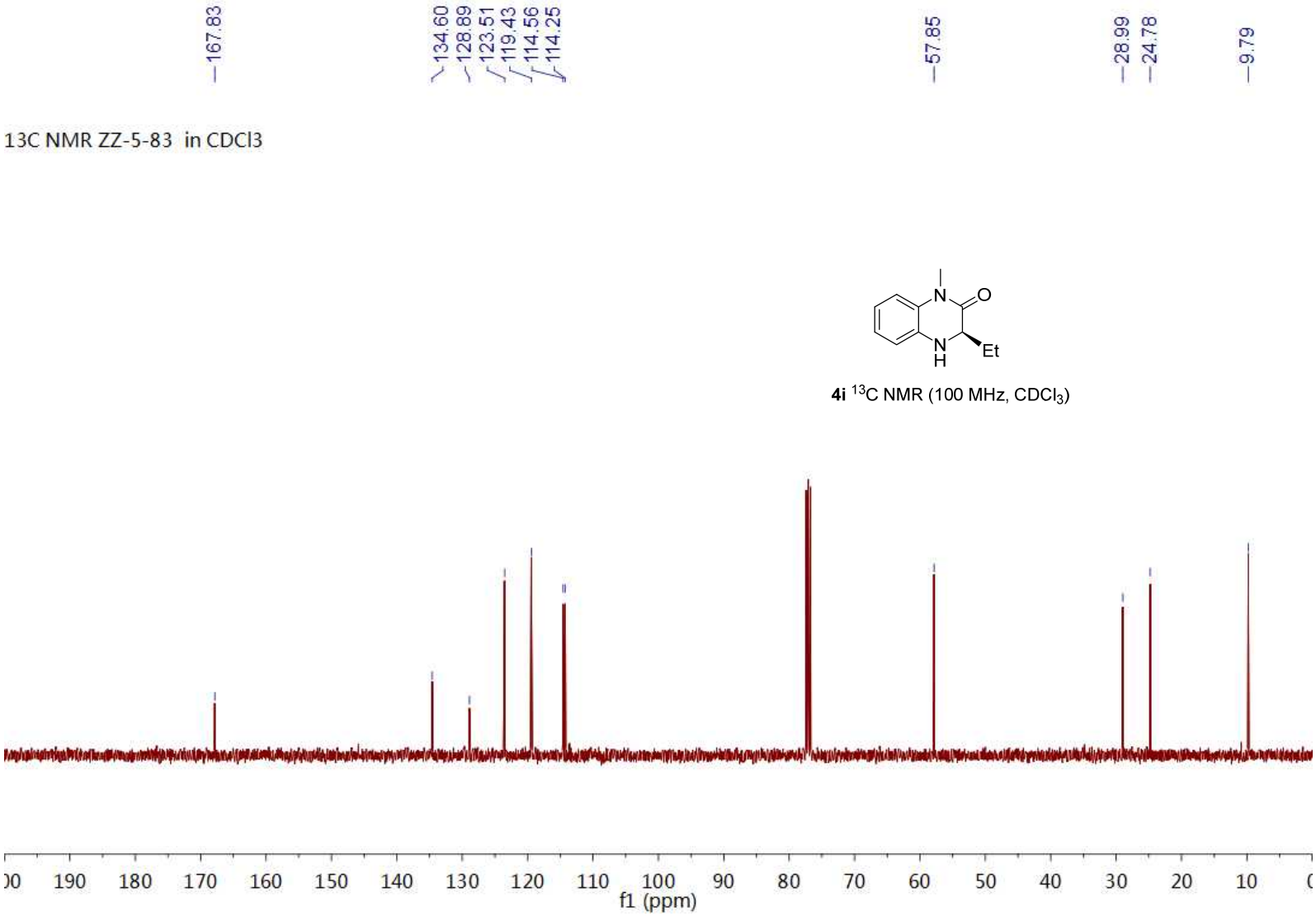
4h ^{13}C NMR (100 MHz, $CDCl_3$)



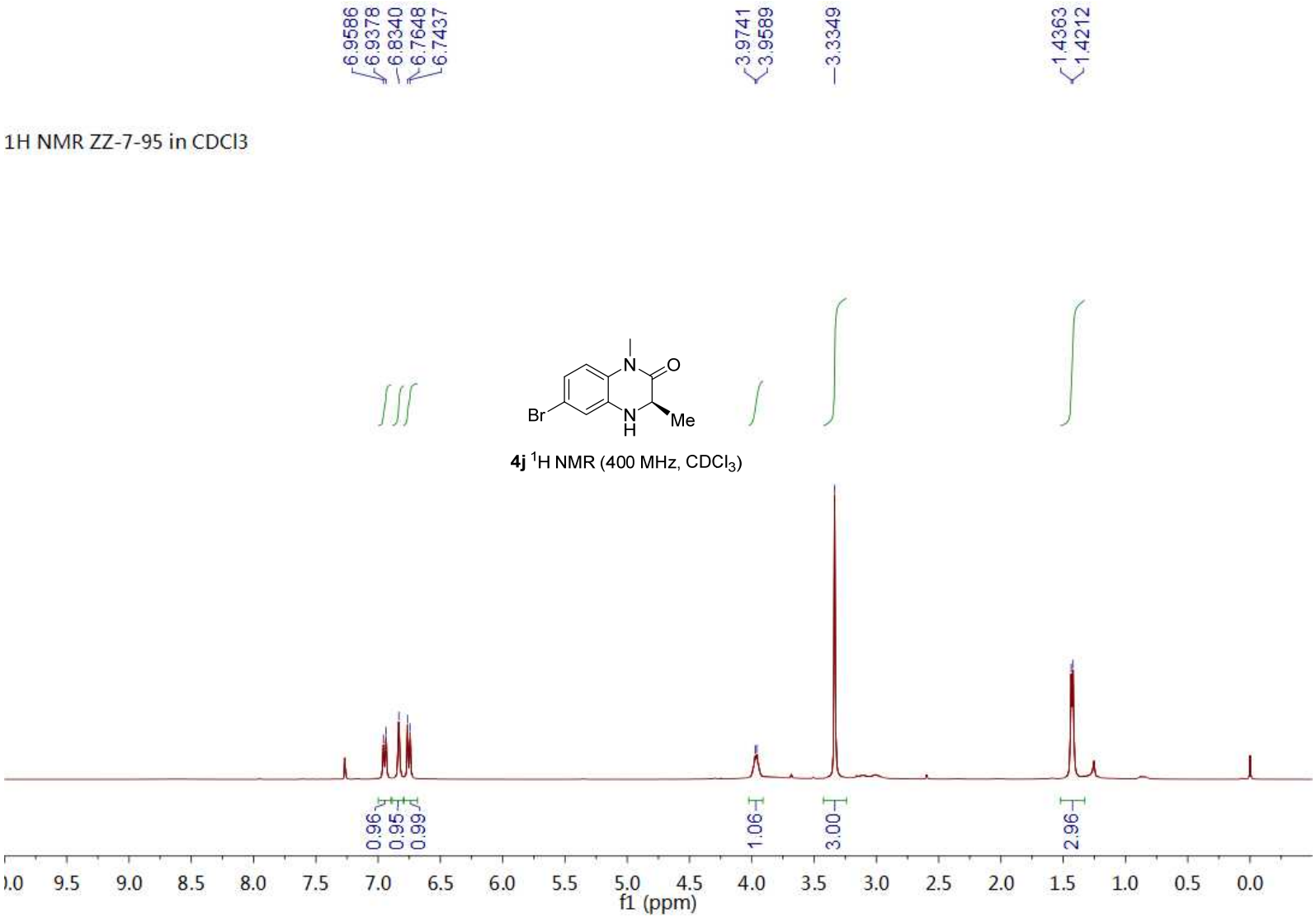
1H NMR ZZ-5-83 in CDCl3



4i ^{1}H NMR (400 MHz, $CDCl_3$)



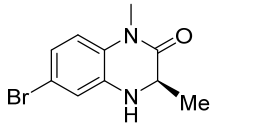
4i ^{13}C NMR (100 MHz, $CDCl_3$)



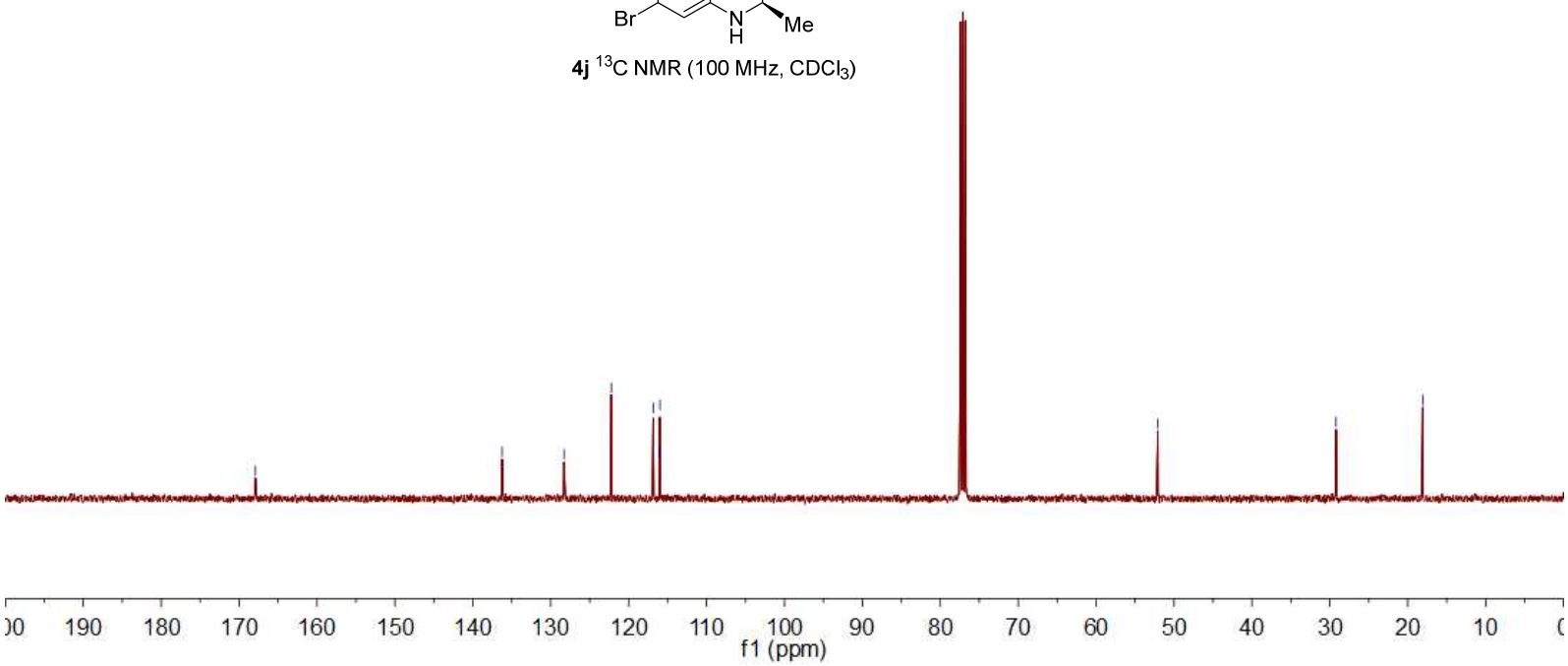
4j ^{1}H NMR (400 MHz, $CDCl_3$)

167.90
136.24
128.29
122.22
116.85
116.03
115.98
52.07
29.21
18.09

13C NMR ZZ-7-95 in CDCl3



4j ^{13}C NMR (100 MHz, $CDCl_3$)



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Acq. Instrument : Instrument 1                    Location :   -
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Last changed    : 3/11/2019 8:52:12 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:19:31 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 254 nm
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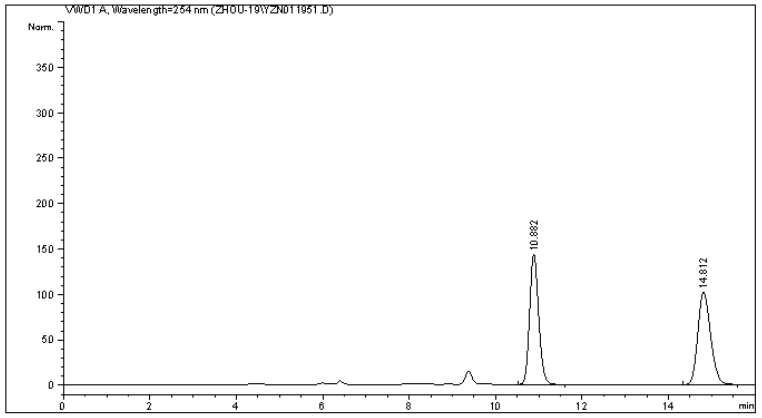


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                          Area Percent Report

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.882 BB    0.2252 2087.35010  143.34428  49.9935
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Totals :                  4175.24438  244.93004

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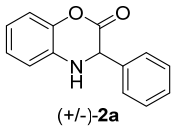

(+/-)-**2a**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011950.D
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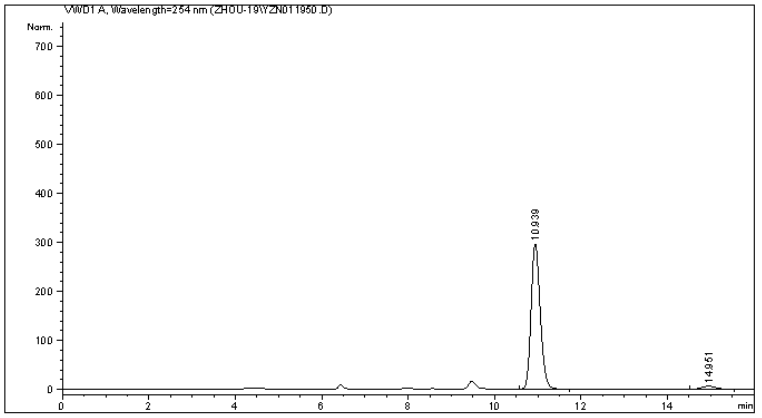
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/11/2019 8:35:56 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/11/2019 8:24:13 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:21:22 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 254 nm
```




```
                          Area Percent Report

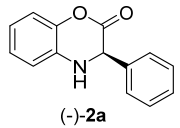
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]       [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.939 BB    0.2284 4359.93018  296.37289  96.9589
   2  14.951 BB    0.3439  136.74971    6.14971   3.0411

Totals :                  4496.67989  302.52260

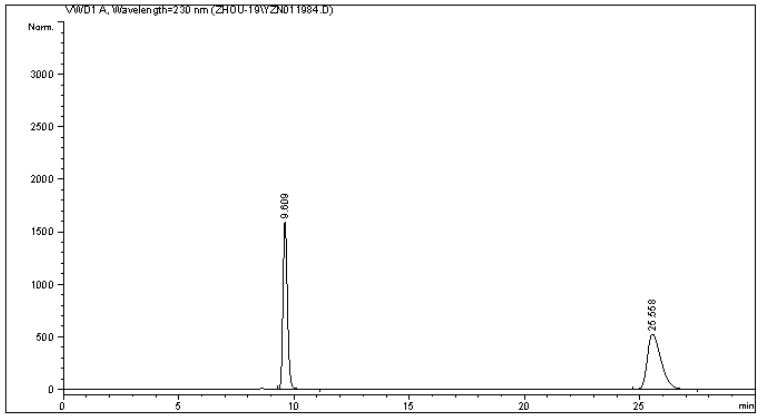
                          *** End of Report ***
```



(-)-**2a**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011984.D
Sample Name: zz-5-65A(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/14/2019 8:53:58 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/14/2019 8:52:48 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:23:54 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

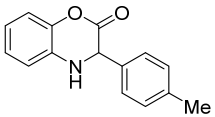
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.609 VB    0.2067 2.12653e4  1593.10547  49.6863
   2  25.558 BB    0.6314 2.15338e4   525.04156  50.3137

Totals :                  4.27992e4  2118.14703

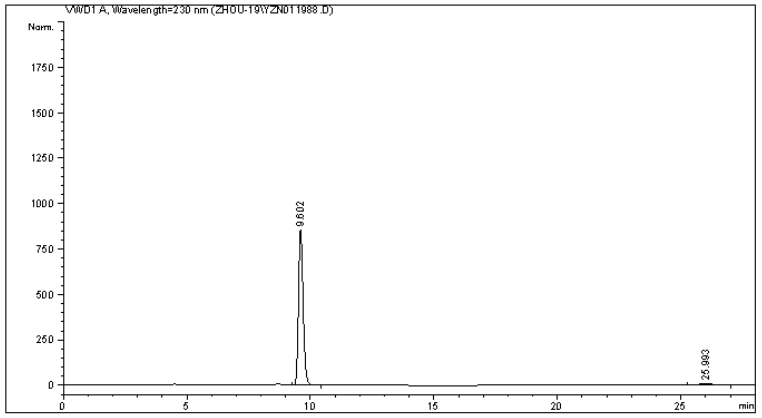
                          *** End of Report ***
```



(+/-)-**2b**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011988.D
Sample Name: zz-5-65A

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/15/2019 9:52:00 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/15/2019 9:31:03 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:25:34 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

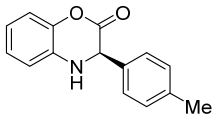
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.602 VB    0.2030 1.12414e4   854.44592  96.7036
   2  25.993 BB    0.6043  383.19458    9.84072   3.2964

Totals :                  1.16246e4   864.28664

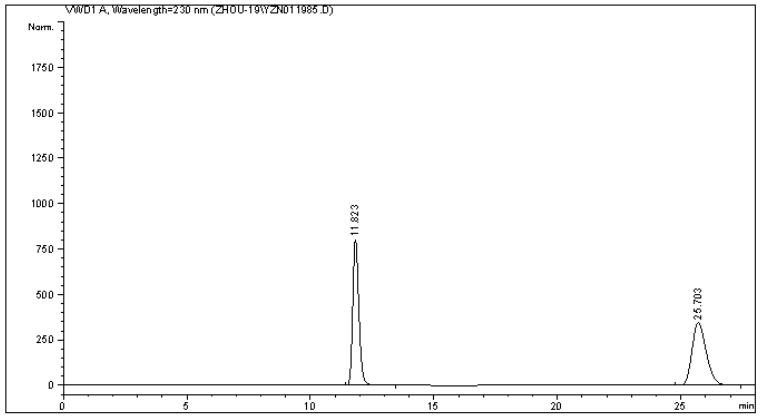
                          *** End of Report ***
```



(-)-**2b**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011985.D
Sample Name: zz-5-65B(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/14/2019 9:26:54 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/14/2019 9:25:39 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:26:55 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

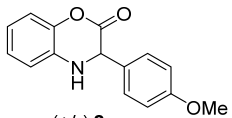
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.823 BB    0.2644 1.37739e4   801.97833  49.9773
   2  25.703 BB    0.6205 1.37864e4   345.03143  50.0227

Totals :                  2.75603e4  1147.00977

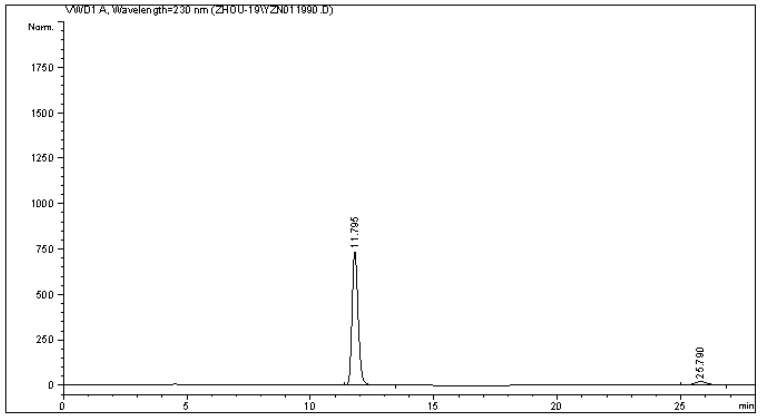
                          *** End of Report ***
```



(+/-)-**2c**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011990.D
Sample Name: zz-5-65B

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/15/2019 11:06:23 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/15/2019 10:53:53 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:26:55 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

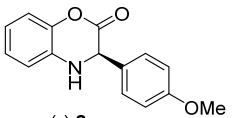
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.795 BB    0.2635 1.25973e4   736.78345  94.0529
   2  25.790 BB    0.6081  796.54932   20.28305   5.9471

Totals :                  1.33939e4   757.06650

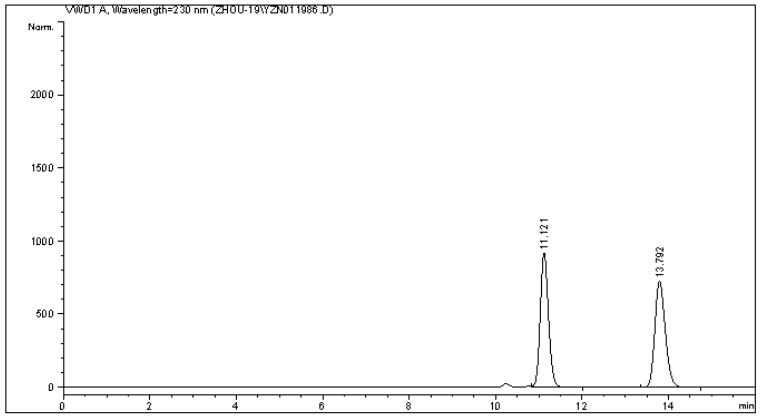
                          *** End of Report ***
```



(-)-**2c**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN011986.D
Sample Name: zz-5-65C(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/14/2019 10:28:17 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/14/2019 10:01:25 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:29:14 PM
                  (modified after loading)
Sample Info     : AD-H,  Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

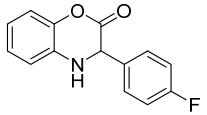
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.121 VB    0.2043 1.22093e4   920.34442  50.0884
   2  13.792 BB    0.2580 1.21662e4   726.45496  49.9116

Totals :                  2.43756e4  1646.79938

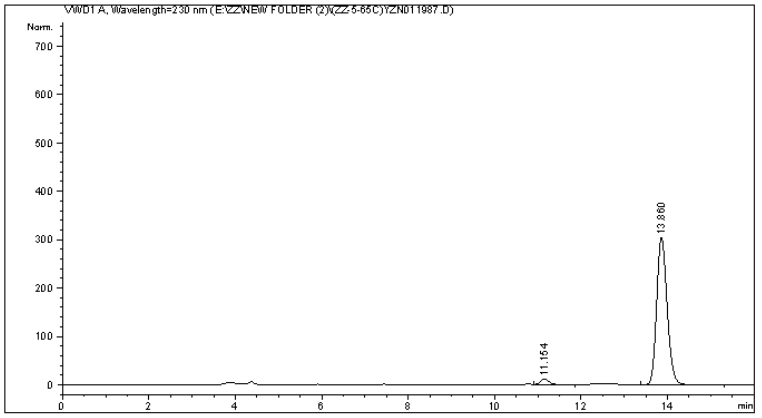
                          *** End of Report ***
```



(+/-)-**2d**

Data File E:\ZZ\NEW FOLDER (2)\(ZZ-5-65C)YZN011987.D
Sample Name: zz-5-65C

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/15/2019 8:37:38 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/15/2019 8:07:22 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/20/2019 8:58:29 PM
                  (modified after loading)
Sample Info     : AD-H,  Hexane/i-PrOH = 80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

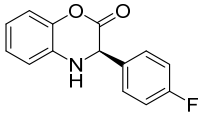
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  11.154 VB    0.2164  176.09573   12.31317   3.3282
   2  13.860 VB    0.2597 5114.91504  305.09503  96.6718

Totals :                  5291.01077  317.40820

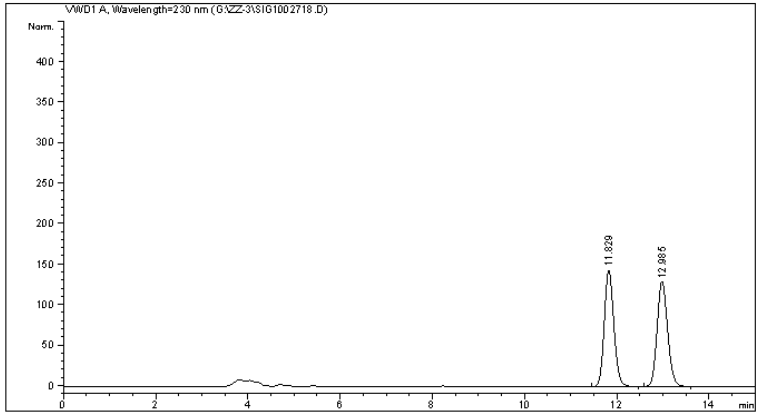
                          *** End of Report ***
```



(-)-**2d**

Data File G:\ZZ-3\SIG1002718.D
Sample Name: zz-5-67B(+-)

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                        Location : Vial 1
    Injection Date  : 3/19/2019 11:02:26 AM
                                                    Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/19/2019 10:58:03 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:33:41 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                            Area Percent Report
    ======================================================================

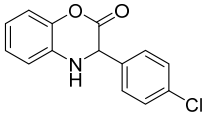
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|----------|----------|-------|
       1  11.829 BB    0.2226 2083.01709  144.17566  50.2605
       2  12.985 BB    0.2451 2061.42822  129.90369  49.7395

    Totals :                  4144.44531  274.07935

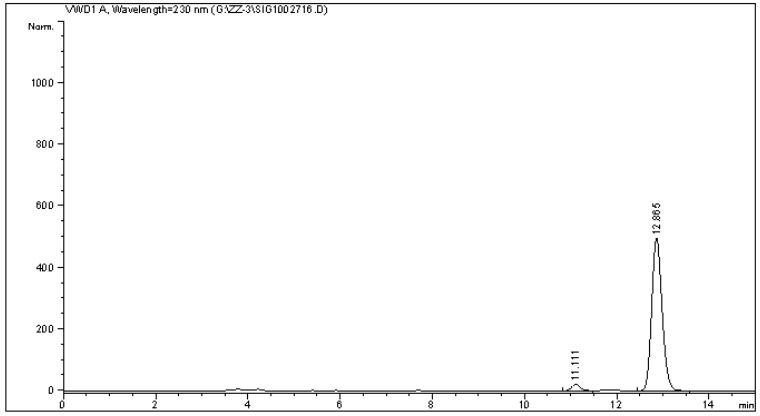
    ======================================================================
                            *** End of Report ***
```



(+/-)-**2e**

Data File G:\ZZ-3\SIG1002716.D
Sample Name: zz-5-67B

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                        Location : Vial 1
    Injection Date  : 3/19/2019 10:24:53 AM
                                                    Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/19/2019 10:23:09 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:35:02 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                            Area Percent Report
    ======================================================================

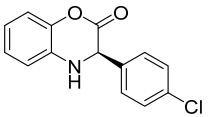
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|----------|----------|-------|
       1  11.111 BV    0.2057  280.62640   20.89816   3.4934
       2  12.865 VB    0.2423 7752.50391  496.09134  96.5066

    Totals :                  8033.13031  516.98950

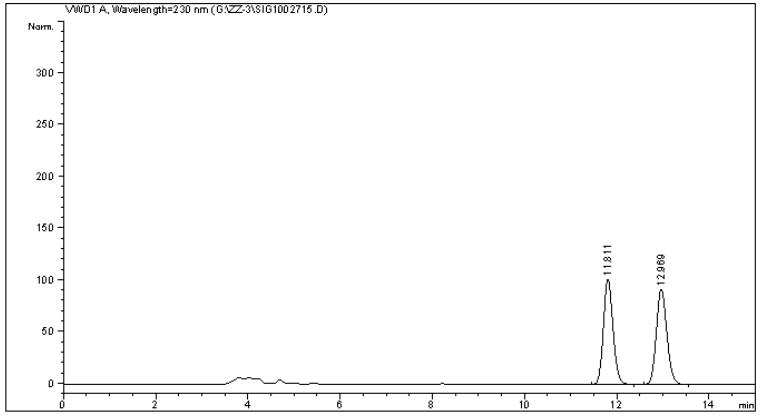
    ======================================================================
                            *** End of Report ***
```



(-)-**2e**

Data File G:\ZZ-3\SIG1002715.D
Sample Name: zz-5-67A(+-)

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                        Location : Vial 1
    Injection Date  : 3/19/2019 10:06:59 AM
                                                  Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/19/2019 10:03:43 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:38:47 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                            Area Percent Report
    ======================================================================

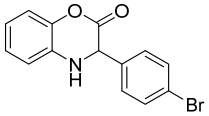
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|---------|---------|-------|
       1  11.811 BB    0.2236 1472.90051  101.90053  50.1816
       2  12.969 BB    0.2448 1462.23779   92.29591  49.8184

    Totals :                  2935.13831  194.19644

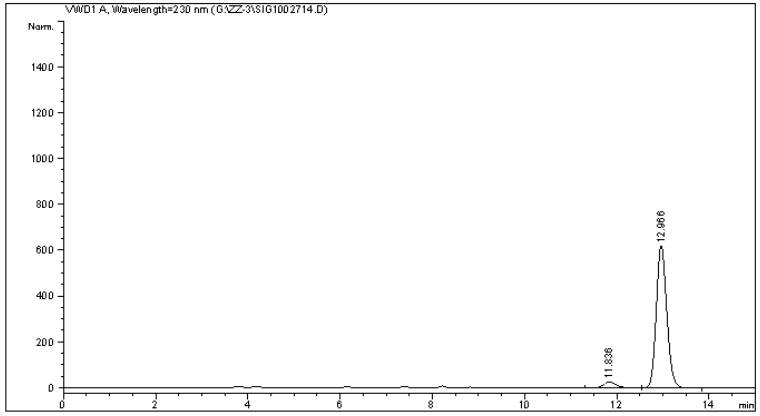
    ======================================================================
                            *** End of Report ***
```



(+/-)-**2f**

Data File G:\ZZ-3\SIG1002714.D
Sample Name: zz-5-67A

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                        Location : Vial 1
    Injection Date  : 3/19/2019 9:48:04 AM
                                                  Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/19/2019 9:44:40 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:41:28 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                            Area Percent Report
    ======================================================================

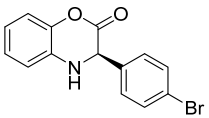
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|---------|---------|-------|
       1  11.836 BV    0.3037  505.53137   25.45727   4.9005
       2  12.966 VB    0.2447 9810.39258  619.70776  95.0995

    Totals :                  1.03159e4   645.16503

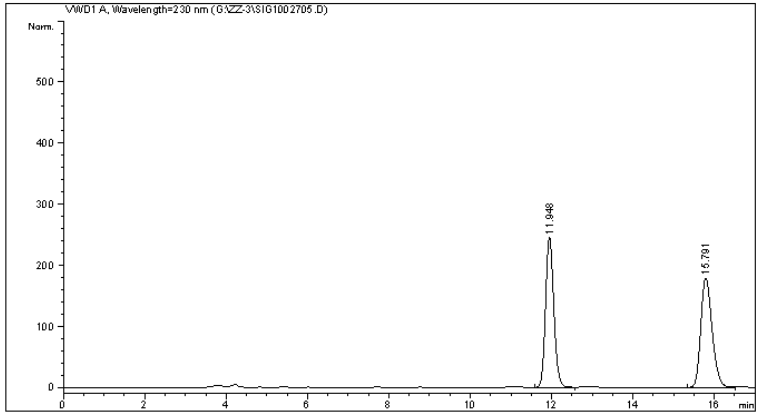
    ======================================================================
                            *** End of Report ***
```



(-)-**2f**

Data File G:\ZZ-3\SIG1002705.D
Sample Name: zz-5-67C(+-)

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/18/2019 9:53:35 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/18/2019 9:47:51 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:43:04 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

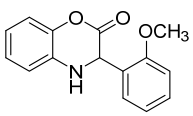
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|----------|----------|-------|
   1  11.948 BB    0.2174 3457.59790  245.36906  49.9383
   2  15.791 BB    0.2969 3466.14258  179.80771  50.0617

Totals :                  6923.74048  425.17677

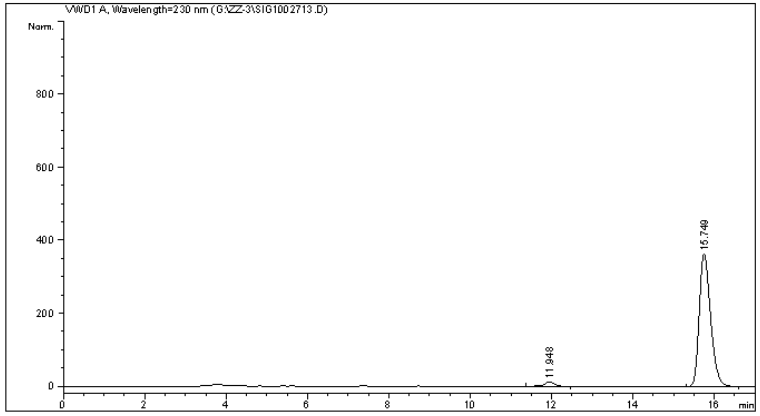
                          *** End of Report ***
```



(+/-)-**2g**

Data File G:\ZZ-3\SIG1002713.D
Sample Name: zz-5-67C

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/19/2019 9:22:45 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/19/2019 8:48:36 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:44:35 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 0.8 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

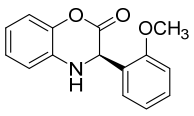
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|----------|----------|-------|
   1  11.948 BB    0.2457  211.74825   12.82010   2.9318
   2  15.749 BB    0.2972 7010.62598  363.15567  97.0682

Totals :                  7222.37422  375.97577

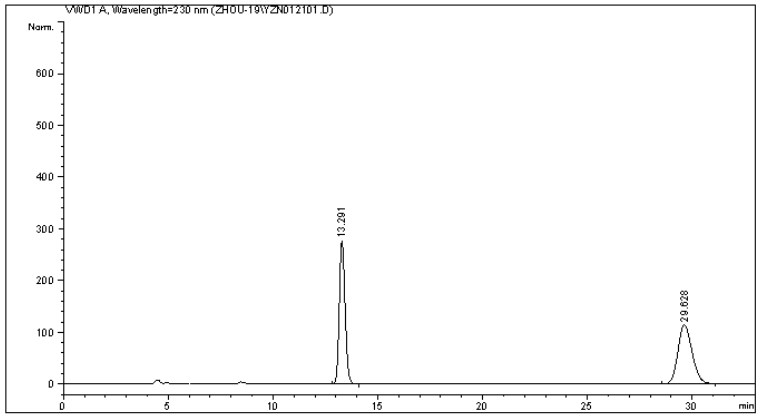
                          *** End of Report ***
```



(+)-**2g**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012101.D
Sample Name: zz-5-70A(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/21/2019 6:49:19 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/21/2019 6:34:43 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:46:26 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

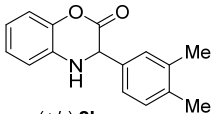
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.291 BB    0.2985 5309.29492  276.22174  49.8926
   2  29.628 BB    0.7250 5332.15137  113.95274  50.1074

Totals :                  1.06414e4   390.17448

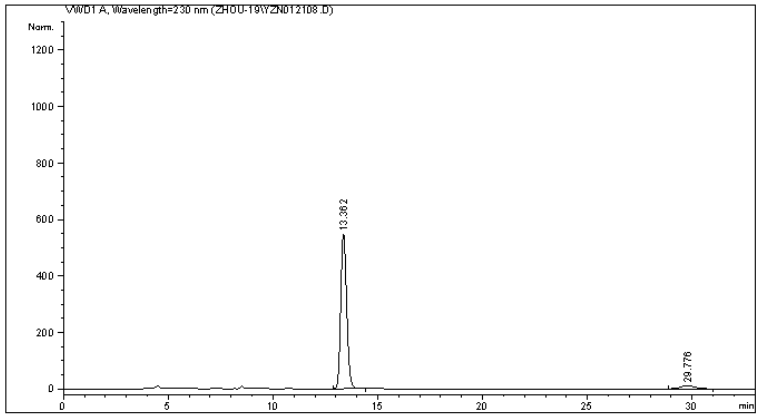
                          *** End of Report ***
```



(+/-)-**2h**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012108.D
Sample Name: zz-5-70A

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/22/2019 4:48:36 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/22/2019 4:21:19 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:47:40 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230nm
```




```
                          Area Percent Report

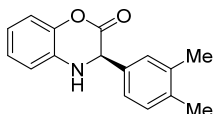
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.362 BB    0.3040 1.07207e4  547.94775  95.4153
   2  29.776 BB    0.7272  515.13049   11.08317   4.5847

Totals :                  1.12358e4   559.03092

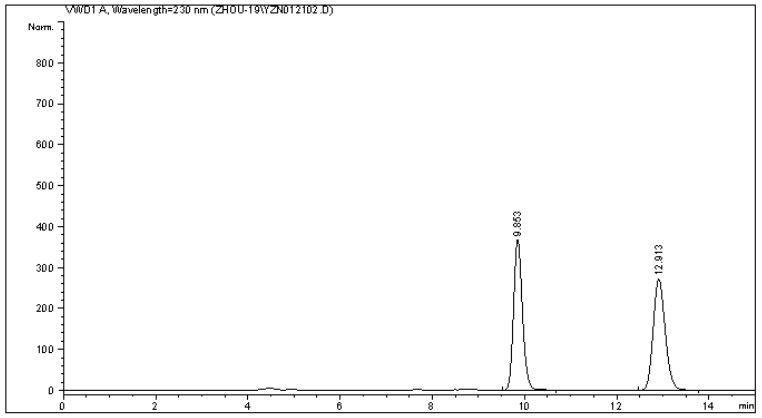
                          *** End of Report ***
```



(-)-**2h**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012102.D
Sample Name: zz-5-70B(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/21/2019 7:26:11 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/21/2019 7:23:32 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:49:08 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

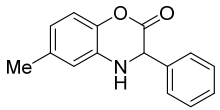
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.853 BB    0.2064 4888.49316  366.89511  49.9919
   2  12.913 BB    0.2788 4890.08203  271.23273  50.0081

Totals :                  9778.57520  638.12784

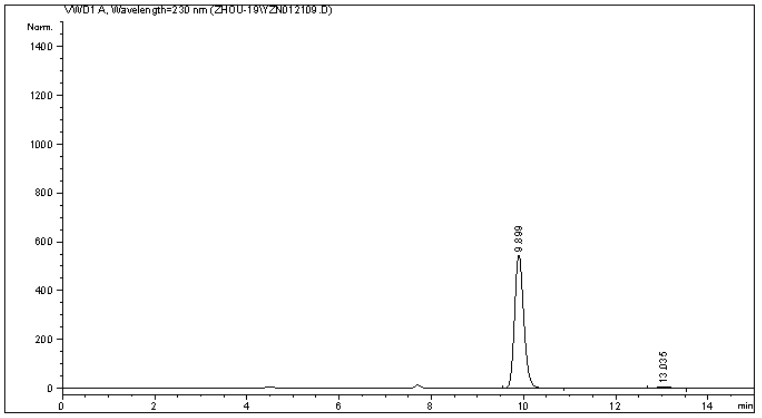
                          *** End of Report ***
```



(+/-)-**2i**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012109.D
Sample Name: zz-5-70B

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/22/2019 5:56:10 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/22/2019 5:50:56 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:50:19 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230nm
```




```
                          Area Percent Report

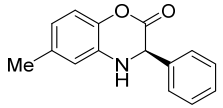
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   9.899 BB    0.2136 7552.41992  546.66711  98.2949
   2  13.035 BB    0.2821  131.00920    7.10378   1.7051

Totals :                  7683.42912  553.77089

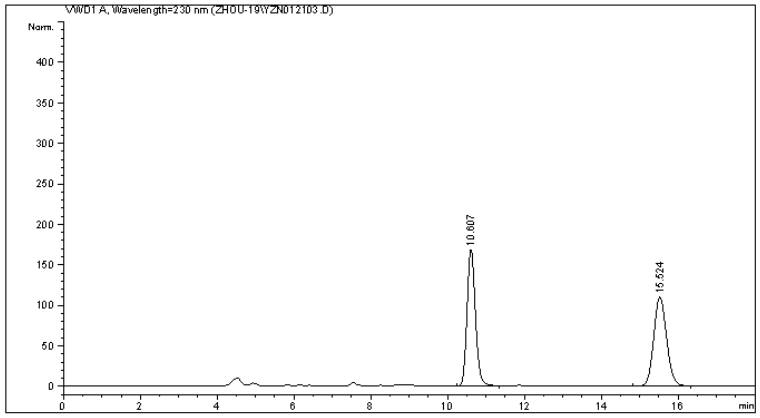
                          *** End of Report ***
```



(-)-**2i**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012103.D
Sample Name: zz-5-70C(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/21/2019 8:05:28 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/21/2019 7:42:34 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:51:41 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

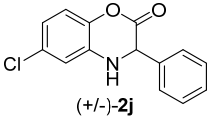
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.607 BB    0.2344 2546.66772  168.67606  49.9143
   2  15.524 BB    0.3594 2555.41138  110.17464  50.0857

Totals :                  5102.07910  278.85069

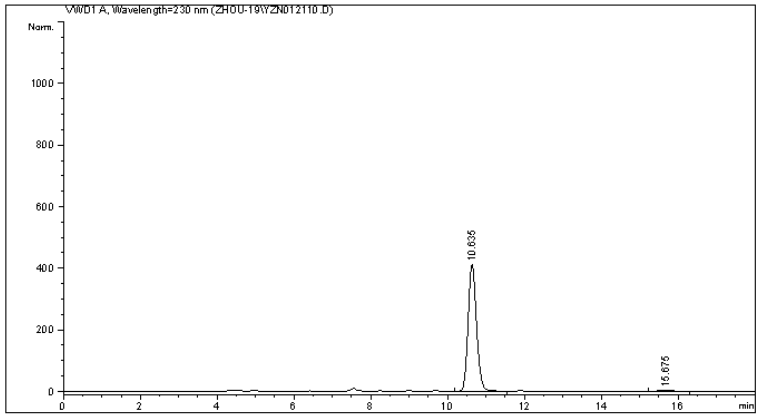
                          *** End of Report ***
```



(+/-)-**2j**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012110.D
Sample Name: zz-5-70C

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/22/2019 6:13:52 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/22/2019 6:12:19 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:53:02 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230nm
```




```
                          Area Percent Report

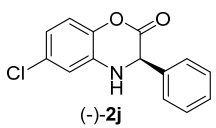
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.635 VB    0.2360 6273.39355  411.68857  98.8052
   2  15.675 BB    0.3646   75.86105    3.26083   1.1948

Totals :                  6349.25461  414.94939

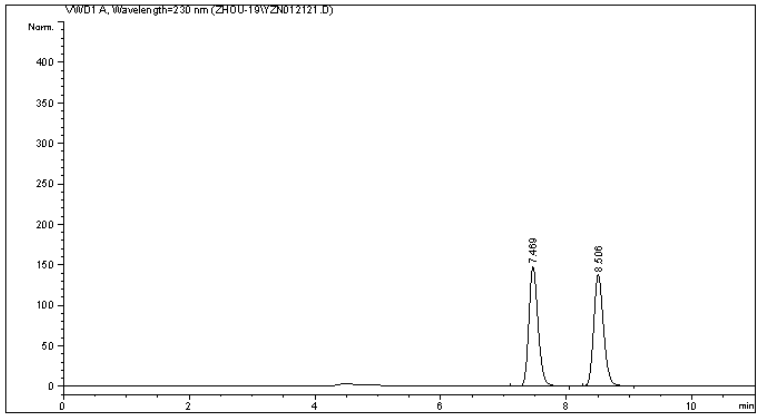
                          *** End of Report ***
```



(-)-**2j**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012121.D
Sample Name: zz-5-73A(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                  Location :   -
Injection Date  : 3/23/2019 10:48:16 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/23/2019 10:19:39 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:54:24 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

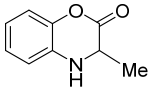
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   7.469 BB    0.1564 1498.10486  147.44156  50.2319
   2   8.506 BB    0.1668 1484.27380  137.40408  49.7681

Totals :                  2982.37866  284.84564

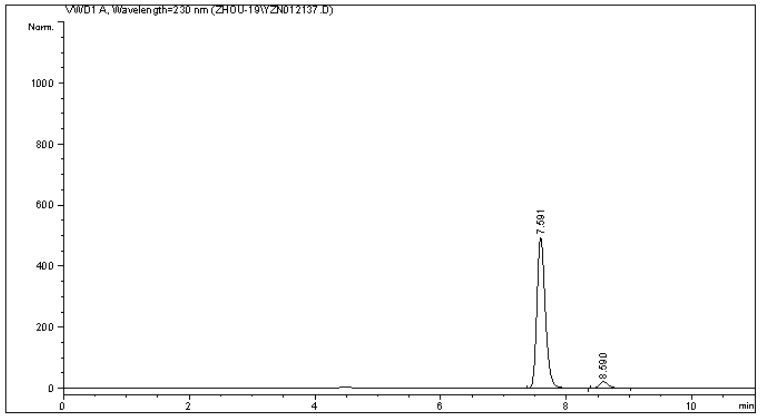
                          *** End of Report ***
```



(+/-)-**2k**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012137.D
Sample Name: zz-5-73A

```
Acq. Operator   :
Acq. Instrument : Instrument 1                  Location :   -
Injection Date  : 3/25/2019 9:39:40 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/25/2019 9:37:04 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 9:55:45 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 70/30, 0.7mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

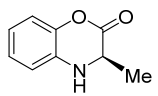
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1   7.591 BB    0.1423 4612.17676  494.38849  95.1528
   2   8.590 BB    0.1669  234.94926   21.48883   4.8472

Totals :                  4847.12602  515.87732

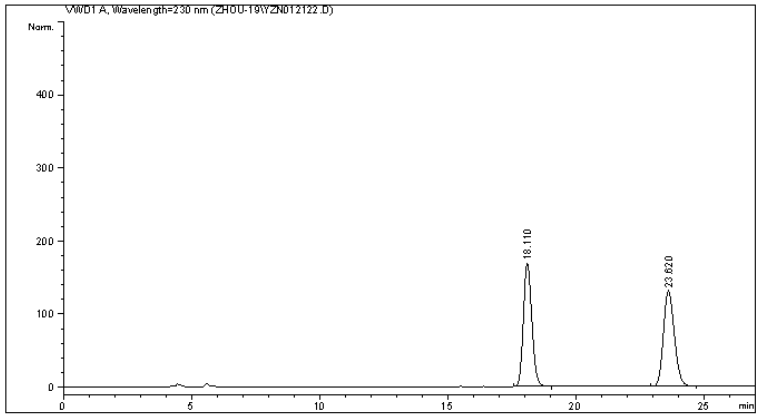
                          *** End of Report ***
```



(-)-**2k**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012122.D
Sample Name: zz-5-73B(+-)

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : Instrument 1                  Location :   -
    Injection Date  : 3/23/2019 11:11:45 AM
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/23/2019 11:00:55 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:57:17 PM
                      (modified after loading)
    Sample Info     : OD-H,  Hexane/i-PrOH = 95/5, 0.7 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                               Area Percent Report
    ======================================================================

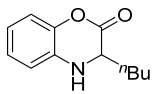
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]  mAU   *s   [mAU   ]      %
    ----|-------|----|-------|----------|----------|--------|
       1  18.110 BB    0.3571 3876.35181  168.58556  49.9973
       2  23.620 BB    0.4604 3876.76831  130.93739  50.0027

    Totals :                  7753.12012  299.52295

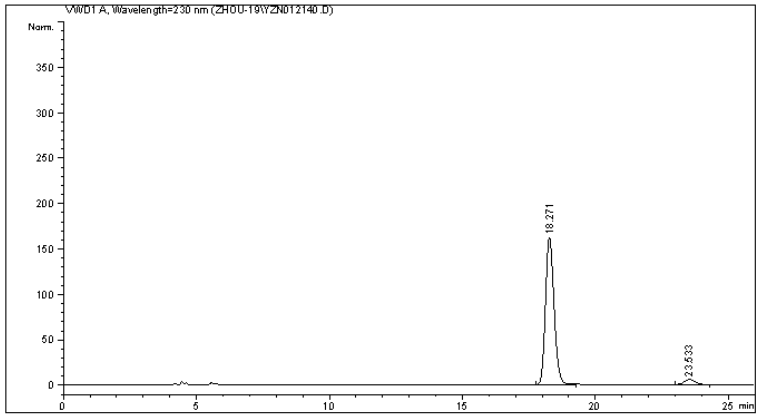
    ======================================================================
                               *** End of Report ***
```



(+/-)-**2l**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012140.D
Sample Name: zz-5-73B

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : Instrument 1                  Location :   -
    Injection Date  : 3/25/2019 10:38:32 AM
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/25/2019 10:26:24 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 9:58:30 PM
                      (modified after loading)
    Sample Info     : OD-H,  Hexane/i-PrOH = 95/5, 0.7mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                               Area Percent Report
    ======================================================================

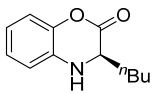
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]  mAU   *s   [mAU   ]      %
    ----|-------|----|-------|----------|----------|--------|
       1  18.271 BB    0.3474 3624.32739  161.68666  95.8838
       2  23.533 BB    0.4412  155.58731    5.51570   4.1162

    Totals :                  3779.91470  167.20236

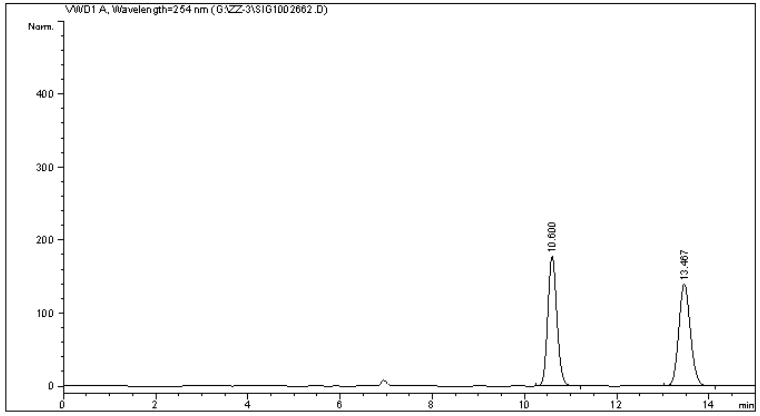
    ======================================================================
                               *** End of Report ***
```



(-)-**2l**

Data File G:\ZZ-3\SIG1002662.D
Sample Name: zz-5-62B(+-)

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/11/2019 11:04:28 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/11/2019 11:03:27 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:00:56 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm
```




```
                          Area Percent Report

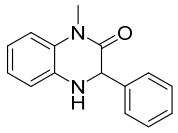
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|---------|---------|-------|
   1  10.600 BB    0.2126 2446.67163  177.70047  49.9430
   2  13.467 BB    0.2719 2452.25244  139.60608  50.0570

Totals :                  4898.92407  317.30655

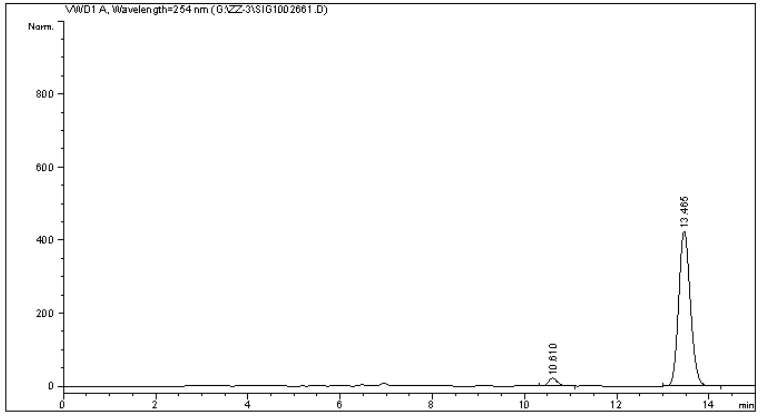

                          *** End of Report ***
```



(+/-)-**4a**

Data File G:\ZZ-3\SIG1002661.D
Sample Name: zz-5-62B

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/11/2019 10:47:21 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/11/2019 10:31:01 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:03:00 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 254 nm
```




```
                          Area Percent Report

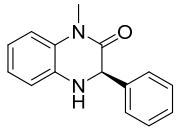
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=254 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|---------|---------|-------|
   1  10.610 BB    0.2123  295.76633   21.53232   3.8100
   2  13.465 BB    0.2734 7467.12256  424.08795  96.1900

Totals :                  7762.88889  445.62027

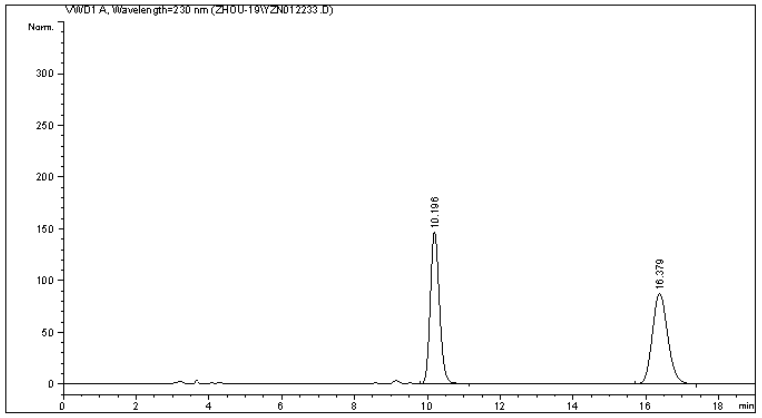

                          *** End of Report ***
```



(-)-**4a**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012233.D
Sample Name: zz-5-80A(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/30/2019 2:52:17 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/30/2019 2:43:02 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:04:40 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

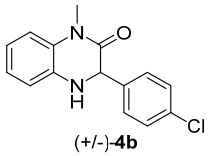
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.196 VB    0.2692 2567.05518  147.00388  50.0734
   2  16.379 BB    0.4527 2559.52930   87.67741  49.9266

Totals :                  5126.58447  234.68129

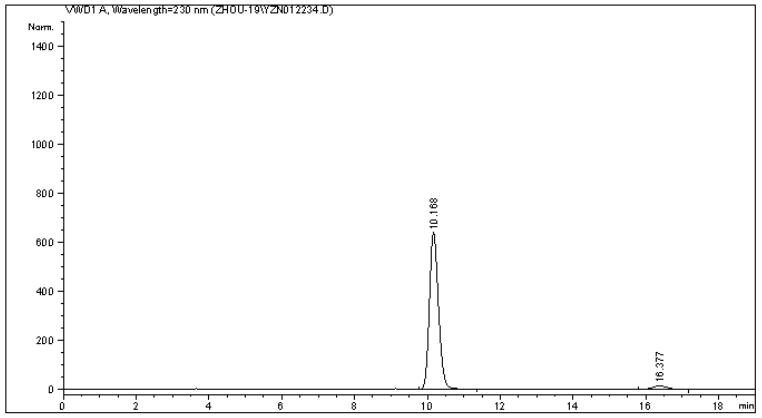
                          *** End of Report ***
```



(+/-)-**4b**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012234.D
Sample Name: zz-5-80A

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/30/2019 3:15:11 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/30/2019 3:12:35 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:06:10 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

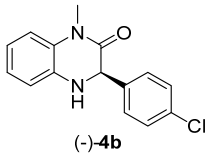
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.168 VB    0.2688 1.11447e4   639.53613  96.3221
   2  16.377 BB    0.4535  425.54388   14.54473   3.6779

Totals :                  1.15702e4   654.08087

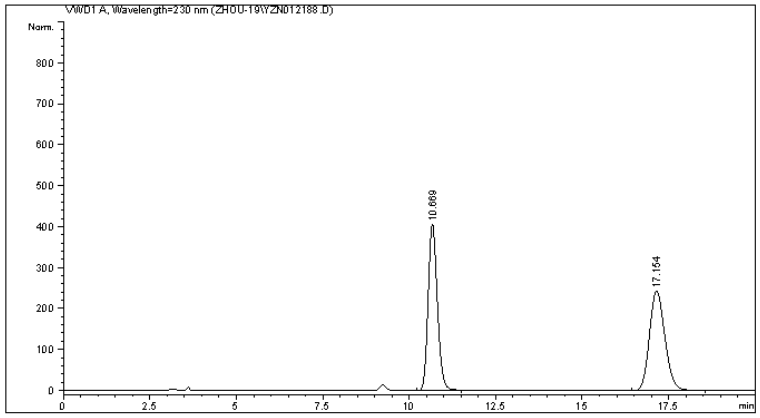
                          *** End of Report ***
```



(-)-**4b**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012188.D
Sample Name: zz-5-76C(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                  Location :   -
Injection Date  : 3/28/2019 11:28:05 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/28/2019 11:22:56 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:07:54 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

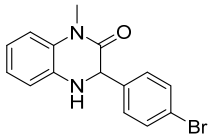
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.669 BB    0.2866 7552.03271  406.50778  50.0241
   2  17.154 BB    0.4819 7544.74121  242.83371  49.9759

Totals :                  1.50968e4   649.34149

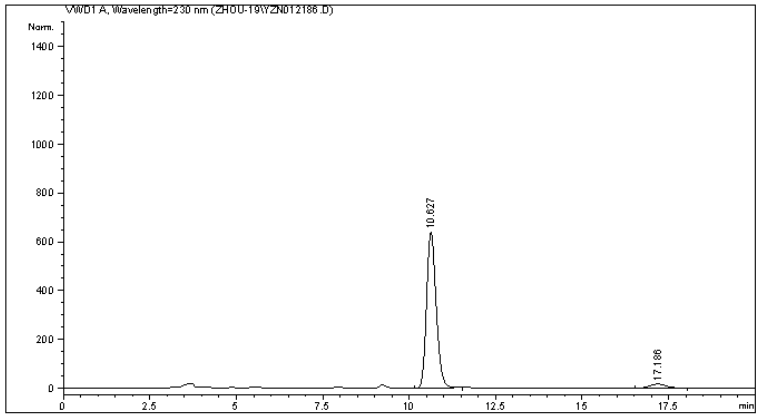
                          *** End of Report ***
```



(+/-)-**4c**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012186.D
Sample Name: zz-5-76C

```
Acq. Operator   :
Acq. Instrument : Instrument 1                  Location :   -
Injection Date  : 3/28/2019 10:37:31 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/28/2019 10:18:02 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:09:05 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

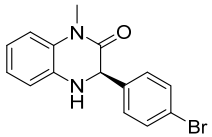
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  10.627 BB    0.2990 1.22899e4   637.97742  95.8961
   2  17.186 BB    0.4939  525.95325   16.64186   4.1039

Totals :                  1.28159e4   654.61928

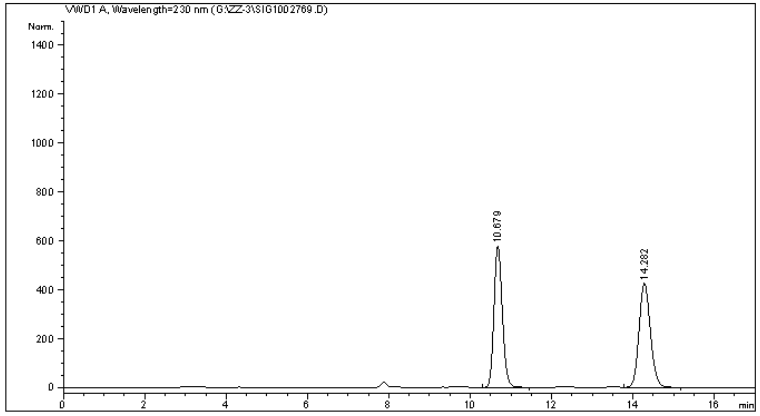
                          *** End of Report ***
```



(-)-**4c**

Data File G:\ZZ-3\SIG1002769.D
Sample Name: zz-5-76A(+-)

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/27/2019 10:47:59 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/27/2019 10:28:38 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:12:40 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```



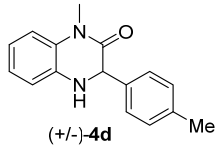
Area Percent Report

```
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|----------|----------|-------|
   1  10.679 BB    0.2207 8274.78516  579.01556  50.0315
   2  14.282 VB    0.3002 8264.36816  426.28293  49.9685

Totals :                  1.65392e4  1005.29849
```

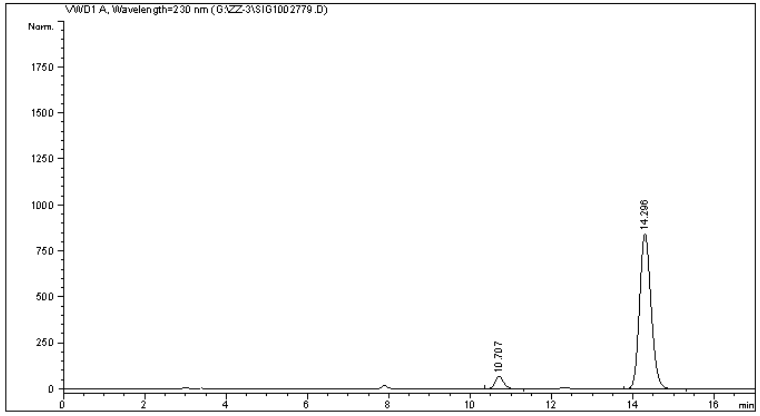


(+/-)-**4d**

*** End of Report ***

Data File G:\ZZ-3\SIG1002779.D
Sample Name: zz-5-76A

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 3/28/2019 9:39:01 AM
                                               Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/28/2019 9:21:12 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:13:54 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```



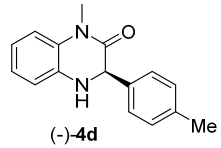
Area Percent Report

```
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|------|----|-------|----------|----------|-------|
   1  10.707 BB    0.2277 1019.57263   68.86074   5.8121
   2  14.296 BB    0.3029 1.65228e4   842.08539  94.1879

Totals :                  1.75423e4   910.94613
```

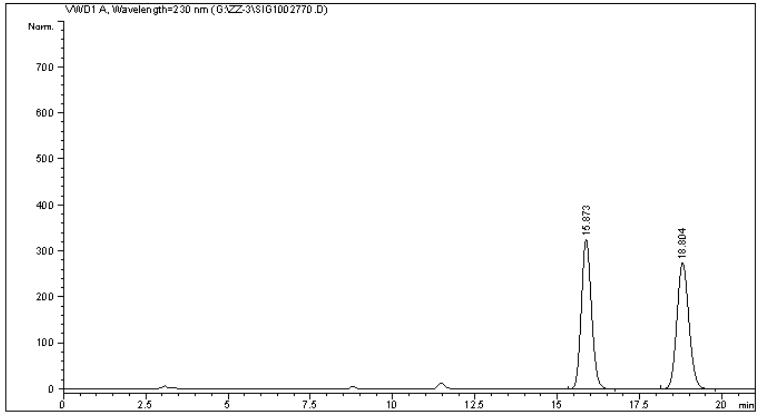


(-)-**4d**

*** End of Report ***

Data File G:\ZZ-3\SIG1002770.D
Sample Name: zz-5-76B(+-)

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                         Location : Vial 1
    Injection Date  : 3/27/2019 11:09:32 AM
                                                   Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/27/2019 11:06:41 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 10:15:11 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                              Area Percent Report
    ======================================================================

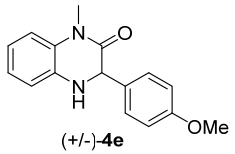
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|----------|----------|-------|
       1  15.873 BB    0.3311 6948.60205  325.41870  49.9334
       2  18.804 BB    0.3936 6967.14355  274.01941  50.0666

    Totals :                  1.39157e4   599.43811

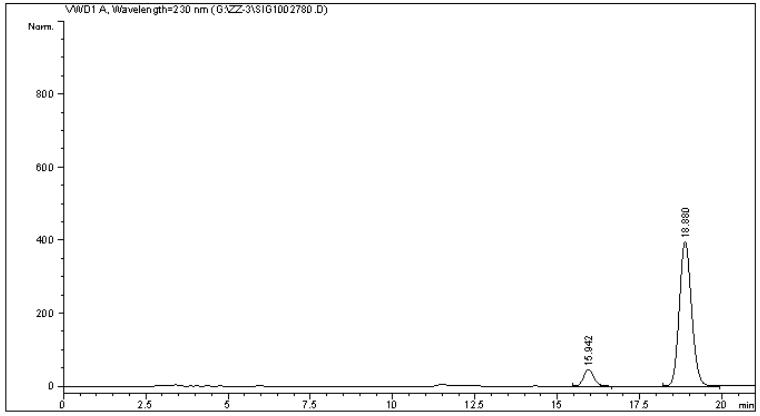
    ======================================================================
                              *** End of Report ***
```



(+/-)-**4e**

Data File G:\ZZ-3\SIG1002780.D
Sample Name: zz-5-76B

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : 仪器 1                         Location : Vial 1
    Injection Date  : 3/28/2019 10:04:38 AM
                                                   Inj Volume : 5.000 µl
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 3/28/2019 10:01:02 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 6/17/2019 10:16:17 PM
                      (modified after loading)
    Sample Info     : AD-H, n-hexane/i-PrOH =80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                              Area Percent Report
    ======================================================================

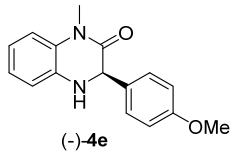
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]   [mAU*s]     [mAU]       %
    ----|------|----|-------|----------|----------|-------|
       1  15.942 BB    0.3333  975.46991   45.28679   8.7558
       2  18.880 BB    0.3990 1.01653e4   395.34314  91.2442

    Totals :                  1.11408e4   440.62993

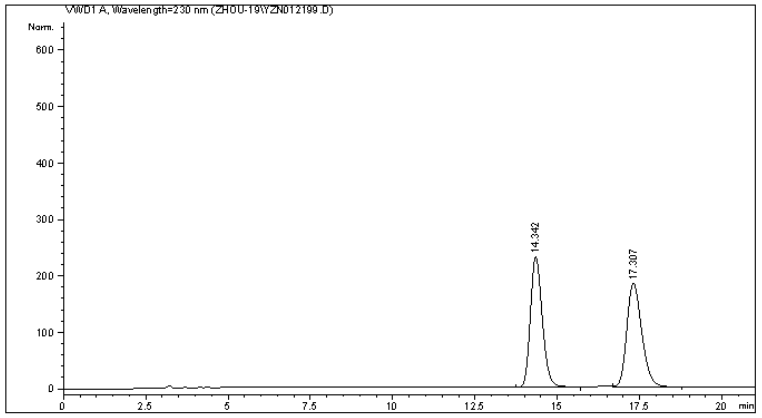
    ======================================================================
                              *** End of Report ***
```



(-)-**4e**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012199.D
Sample Name: zz-5-80B(+-)

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/29/2019 10:03:14 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/29/2019 9:44:13 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:18:01 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

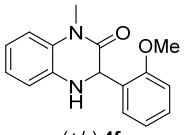
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.342 BB    0.3900 5832.58740  231.50783  49.9788
   2  17.307 VB    0.4893 5837.52588  184.11380  50.0212

Totals :                  1.16701e4   415.62163

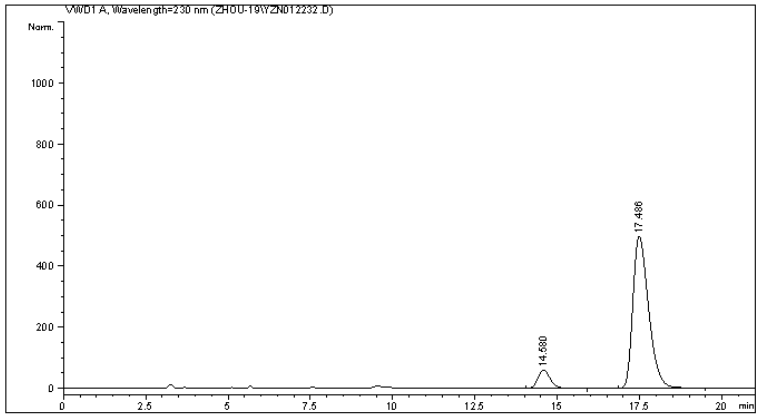
                          *** End of Report ***
```



(+/-)-**4f**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012232.D
Sample Name: zz-5-80B

```
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/30/2019 2:17:11 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/30/2019 1:49:13 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:19:17 PM
                  (modified after loading)
Sample Info     : OD-H,  Hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 nm
```




```
                          Area Percent Report

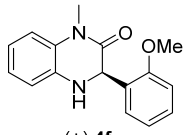
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  14.580 BB    0.4019 1552.64990   59.52419   8.5833
   2  17.486 VB    0.5125 1.65366e4   498.18433  91.4167

Totals :                  1.80893e4   557.70852

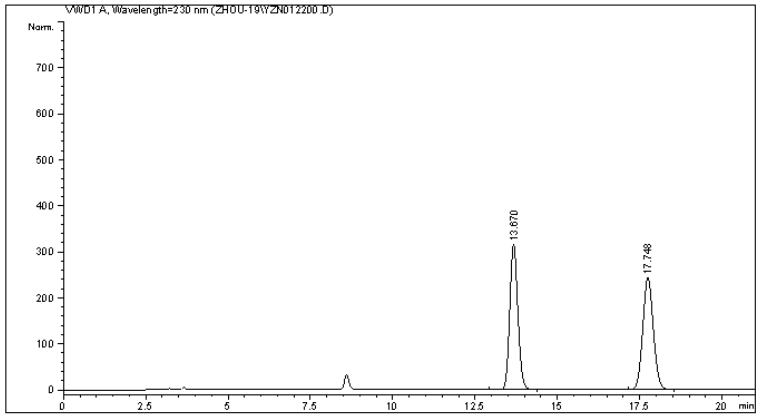
                          *** End of Report ***
```



(+)-**4f**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012200.D
Sample Name: zz-5-80C(+-)

```
=====================================================================
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/29/2019 10:45:36 AM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/29/2019 10:27:29 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:20:32 PM
                  (modified after loading)
Sample Info     : AD-H,  Hexane/i-PrOH = 85/15, 1.0 mL/min, 30 oC, 230 nm
```




```
=====================================================================
                        Area Percent Report
=====================================================================

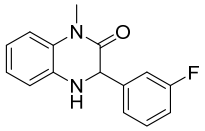
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.670 BB    0.2652 5402.51855  315.68329  50.0205
   2  17.748 BB    0.3458 5398.09277  242.33490  49.9795

Totals :                  1.08006e4   558.01819

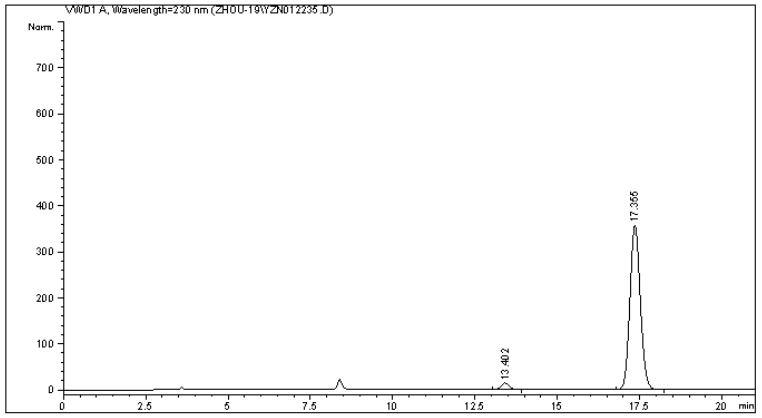
=====================================================================
                        *** End of Report ***
```



(+/-)-**4g**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN012235.D
Sample Name: zz-5-80C

```
=====================================================================
Acq. Operator   :
Acq. Instrument : Instrument 1                    Location :   -
Injection Date  : 3/30/2019 3:53:08 PM
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 3/30/2019 3:36:35 PM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:20:32 PM
                  (modified after loading)
Sample Info     : AD-H,  Hexane/i-PrOH = 85/15, 1.0 mL/min, 30 oC, 230 nm
```




```
=====================================================================
                        Area Percent Report
=====================================================================

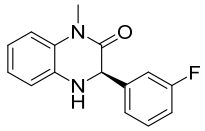
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]  mAU   *s   [mAU   ]      %
----|-------|----|-------|----------|----------|--------|
   1  13.402 BB    0.2600  238.34985   14.18907   2.9443
   2  17.355 BB    0.3413 7857.05762  356.84988  97.0557

Totals :                  8095.40747  371.03896

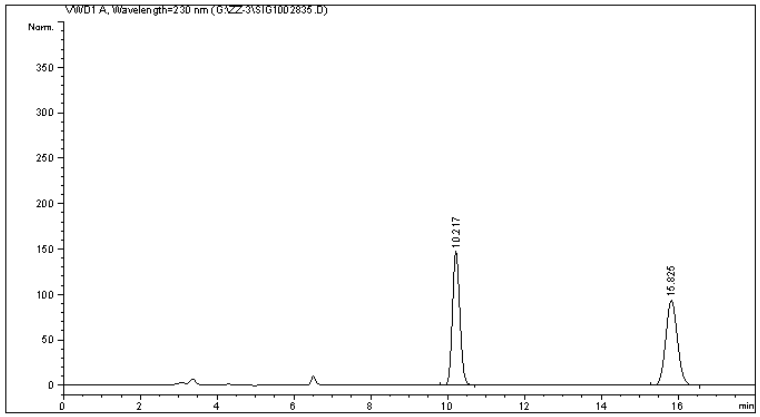
=====================================================================
                        *** End of Report ***
```



(-)-**4g**

Data File G:\ZZ-3\SIG1002835.D
Sample Name: zz-5-84(+-)

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 4/1/2019 10:03:36 AM
                                                Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 4/1/2019 9:39:58 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:25:28 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 n
                  m
```




```
                          Area Percent Report

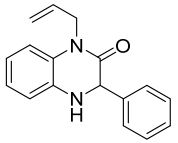
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.217 VB    0.2075 1972.87622  147.11342  50.0079
   2  15.825 BB    0.3276 1972.25647   93.67065  49.9921

Totals :                  3945.13269  240.78407

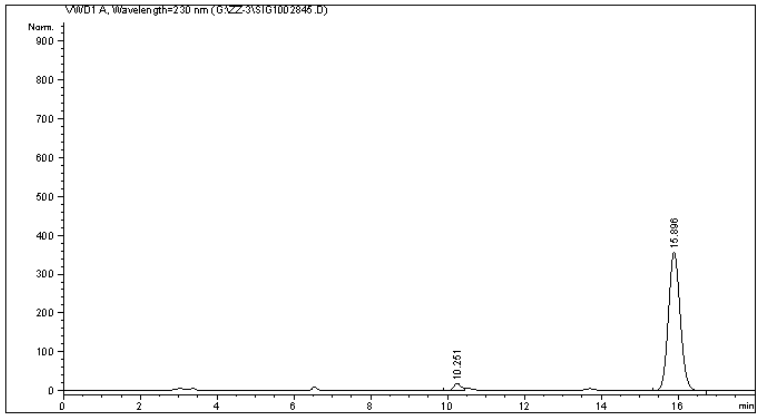
                          *** End of Report ***
```



(+/-)-**4h**

Data File G:\ZZ-3\SIG1002845.D
Sample Name: zz-5-84

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 4/2/2019 10:08:08 AM
                                                Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 4/2/2019 10:06:34 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:24:29 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 80/20, 1.0 mL/min, 30 oC, 230 n
                  m
```




```
                          Area Percent Report

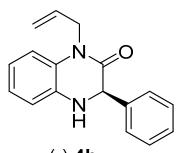
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.251 BV    0.2125  262.32437   18.60990   3.3362
   2  15.896 BB    0.3325 7600.74854  356.82288  96.6638

Totals :                  7863.07291  375.43277

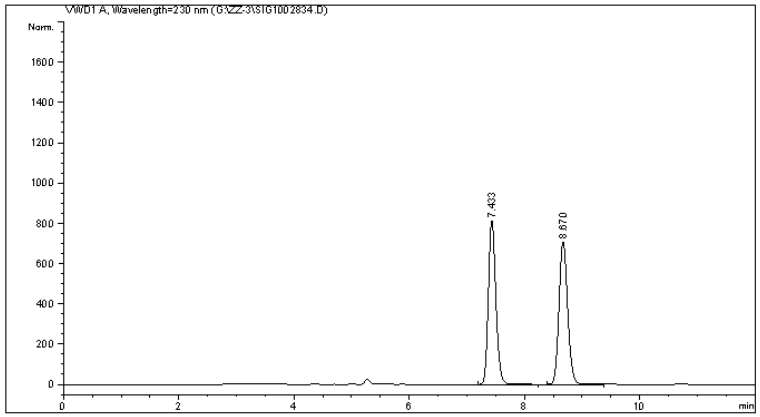
                          *** End of Report ***
```



(-)-**4h**

Data File G:\ZZ-3\SIG1002834.D
Sample Name: zz-5-83(+-)

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 4/1/2019 9:24:04 AM
                                                Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 4/1/2019 8:34:50 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:27:23 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 85/15, 1.0 mL/min, 30 oC, 230 n
                  m
```




```
                          Area Percent Report

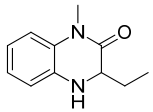
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #  [min]       [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   7.433 BB    0.1408 7369.97363  812.98181  49.9060
   2   8.670 BB    0.1617 7397.72803  709.45715  50.0940

Totals :                  1.47677e4  1522.43896

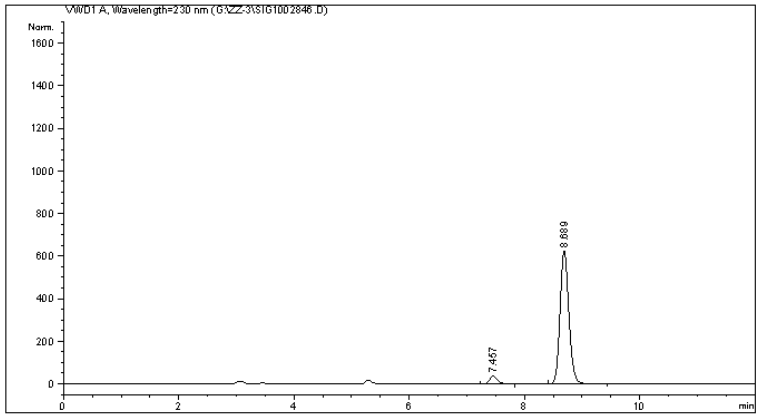
                          *** End of Report ***
```



(+/-)-**4i**

Data File G:\ZZ-3\SIG1002846.D
Sample Name: zz-5-83

```
Acq. Operator   :
Acq. Instrument : 仪器 1                        Location : Vial 1
Injection Date  : 4/2/2019 10:48:58 AM
                                                Inj Volume : 5.000 µl
Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 4/2/2019 10:30:59 AM
                  (modified after loading)
Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
Last changed    : 6/17/2019 10:28:27 PM
                  (modified after loading)
Sample Info     : AD-H, n-hexane/i-PrOH = 85/15, 1.0 mL/min, 30 oC, 230 n
                  m
```




```
                          Area Percent Report

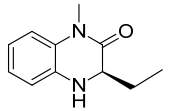
Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: VWD1 A, Wavelength=230 nm

Peak RetTime Type  Width     Area      Height     Area
  #  [min]       [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   7.457 BB    0.1387  330.19495   36.45020   4.7285
   2   8.689 BB    0.1639 6652.92432  626.52374  95.2715

Totals :                  6983.11926  662.97394

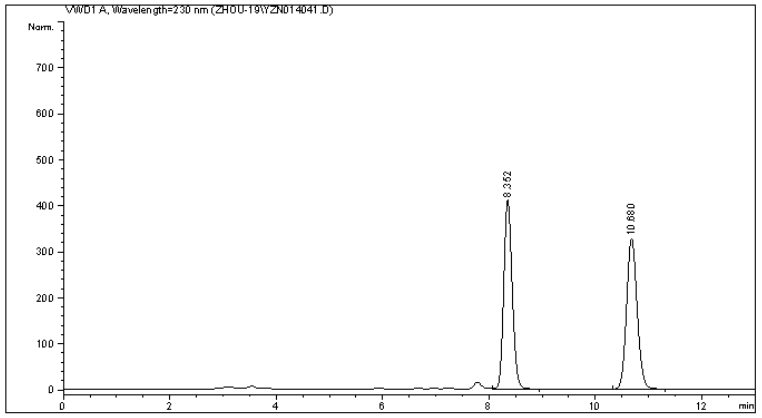
                          *** End of Report ***
```



(-)-**4i**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN014041.D
Sample Name: zz-7-95(+-)

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : Instrument 1                    Location :   -
    Injection Date  : 11/27/2019 7:16:35 AM
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 11/27/2019 6:56:05 AM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 12/11/2019 3:44:16 AM
                      (modified after loading)
    Sample Info     : AD-H, Hexane/i-PrOH =85/15, 1.0 mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                              Area Percent Report
    ======================================================================

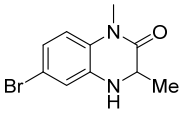
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]  mAU   *s   [mAU   ]      %
    ----|-------|----|-------|----------|----------|--------|
       1   8.352 VB    0.1703 4507.68311  410.56549  50.0406
       2  10.680 BB    0.2130 4500.36475  326.88269  49.9594

    Totals :                  9008.04785  737.44818

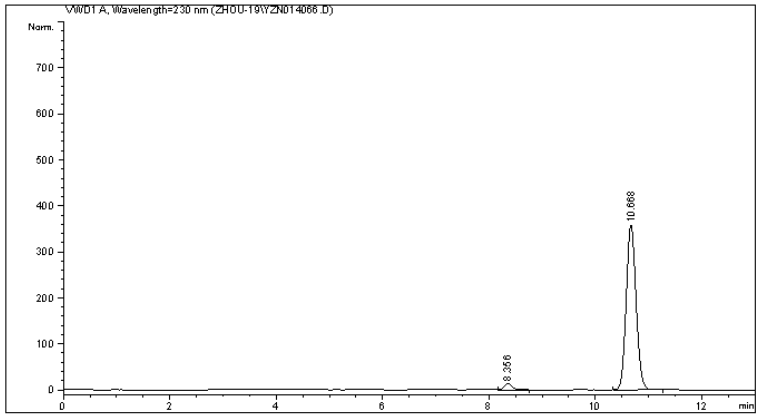
    ======================================================================
                              *** End of Report ***
```



(+/-)-**4j**

Data File C:\CHEM32\1\DATA\ZHOU-19\YZN014066.D
Sample Name: zz-7-95

```
    ======================================================================
    Acq. Operator   :
    Acq. Instrument : Instrument 1                    Location :   -
    Injection Date  : 11/28/2019 9:25:36 PM
    Acq. Method     : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 11/28/2019 9:25:11 PM
                      (modified after loading)
    Analysis Method : C:\CHEM32\1\METHODS\DEF_LC11.M
    Last changed    : 12/11/2019 3:44:16 AM
                      (modified after loading)
    Sample Info     : AD-H, Hexane/i-PrOH =85/15, 1.0mL/min, 30 oC, 230 nm
```




```
    ======================================================================
                              Area Percent Report
    ======================================================================

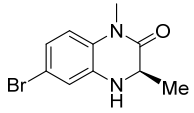
    Sorted By             :      Signal
    Multiplier:                   :      1.0000
    Dilution:                     :      1.0000
    Use Multiplier & Dilution Factor with ISTDs


    Signal 1: VWD1 A, Wavelength=230 nm

    Peak RetTime Type  Width     Area      Height     Area
      #   [min]        [min]  mAU   *s   [mAU   ]      %
    ----|-------|----|-------|----------|----------|--------|
       1   8.356 VB    0.1611  136.72852   12.93931   2.8759
       2  10.668 BB    0.2016 4617.52148  357.62106  97.1241

    Totals :                  4754.25000  370.56038

    ======================================================================
                              *** End of Report ***
```



(-)-**4j**