Electronic Supplementary Material (ESI) for ChemComm.

Supporting Information

General methods

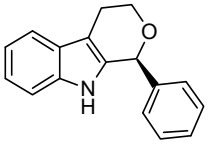
Proton (^{1}H NMR) and carbon (^{13}C NMR) nuclear magnetic resonance spectra were recorded at 500 MHz and 126 MHz, respectively. The chemical shifts are given in parts per million (ppm) on the delta (δ) scale. The solvent peak was used as a reference value, for ^{1}H NMR: $CDCl_3$ = 7.27 ppm; for ^{13}C NMR: $CDCl_3$ = 77.23 ppm. Analytical TLC was performed on precoated silica gel GF254 plates. Column chromatography was carried out on silica gel (200–300 mesh). HRMS were carried out on an Orbitrap analyzer. Optical rotations were measured using a 2.5 mL cell with a 10 cm path length on Hanon P850 Automatic Polarimeter and concentrations (c) were reported in g×(100 mL)$^{-1}$. Enantiomeric excesses were determined by HPLC using a Daicel Chiralpak AD-H, AS-H, OD-H or IB column with hexane/*i*-PrOH as the eluent.

General procedure

Procedure for 1,3,4,9-tetrahydropyrano[3,4-*b*]indole substrates[1]

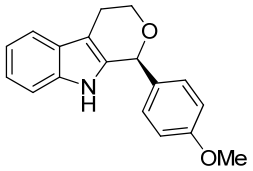
To a solution of rac-**1** (0.05 mmol, 1.0 eq) in CH_2Cl_2 (0.5 mL) was added EtOH (0.15 mmol, 3.0 eq) and DDQ (0.055 mmol, 1.1 eq) at room temperature. Upon starting material consumption, Hantzsch ester **2** (0.07 mmol, 1.4 eq), 4 Å molecular sieves (20 mg), and chiral SPINOL-derived **4b** (0.0025 mmol, 5 mol %) in Et_2O (5.0 mL) was added at 0 °C. The mixture was stirred at that temperature for 24 h. The reaction was quenched by saturated aqueous Et_3N, extracted with EtOAc (10 mL × 3), and the combined organic layer was dried over $MgSO_4$, filtered and evaporated under vacuum. The residue was purified by flash column chromatography to give the desired product.

Analytical data for products



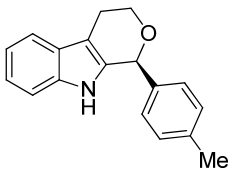
(*S*)-1-Phenyl-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1a)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1a** (11.2 mg, 90%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.57 (d, *J* = 7.2 Hz, 1H), 7.44 (s, 1H), 7.39 (s, 5H), 7.24 (d, *J* = 7.3 Hz, 1H), 7.19–7.10 (m, 2H), 5.81 (s, 1H), 4.34 (ddd, *J* = 11.2, 5.4, 2.9 Hz, 1H), 4.04–3.96 (m, 1H), 3.15–3.07 (m, 1H), 2.87–2.79 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 139.6, 136.18, 133.8, 129.1, 129.0, 128.6, 127.2, 122.1, 119.8, 118.5, 111.1, 108.9, 76.3, 65.1, 22.5. These data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 10/90, 1.0 mL/min, 215 nm), retention time: t_{major} = 12.894 min, t_{minor} = 16.954 min, ee = 95%; $[\alpha]_D^{20}$ = + 15.5 (c = 0.28, $CHCl_3$) $CHCl_3$.



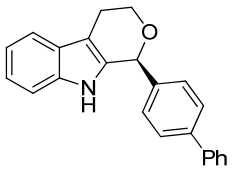
(*S*)-1-(4-Methoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1b)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1b** (11.9 mg, 85%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.5 Hz, 1H), 7.45 (s, 1H), 7.31–7.27 (m, 2H), 7.24 (d, *J* = 7.9 Hz, 1H), 7.19–7.09 (m, 2H), 6.94–6.85 (m, 2H), 5.76 (s, 1H), 4.31 (ddd, *J* = 11.2, 5.4, 2.9 Hz, 1H), 4.02–3.94 (m, 1H), 3.81 (s, 3H), 3.13–3.05 (m, 1H), 2.86–2.78 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 160.2, 136.1, 134.1, 131.8, 130.0, 127.2, 122.1, 119.8, 118.5, 114.3, 111.1, 109.0, 75.8, 65.0, 55.5, 22.5. These data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 215 nm), retention time: t_{major} = 8.320 min, t_{minor} = 12.283 min, ee = 95%; $[\alpha]_D^{20}$ = + 16.1 (c = 0.34, $CHCl_3$).



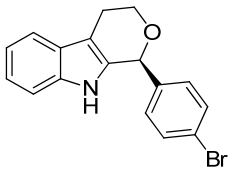
(*S*)-1-(*p*-Tolyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1c)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1c** (12.0 mg, 91%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.2 Hz, 1H), 7.44 (s, 1H), 7.28–7.26 (m, 1H), 7.26–7.25 (m, 1H), 7.25–7.22 (m, 1H), 7.19 (d, *J* = 7.9 Hz, 2H), 7.18–7.11 (m, 2H), 5.77 (s, 1H), 4.33 (ddd, *J* = 11.2, 5.4, 2.9 Hz, 1H), 4.03–3.95 (m, 1H), 3.14–3.05 (m, 1H), 2.86–2.79 (m, 1H), 2.37 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 156.7, 135.9, 134.4, 129.5, 128.8, 128.5, 127.1, 121.8, 121.4, 119.5, 118.3, 111.1, 111.0, 108.3, 69.5, 65.1, 56.1, 22.5. These data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 30/70, 1.0 mL/min, 220 nm), retention time: t_{major} = 5.900 min, t_{minor} = 8.760 min, ee = 92%; $[\alpha]_D^{20}$ = + 3.7 (c = 0.32, $CHCl_3$).



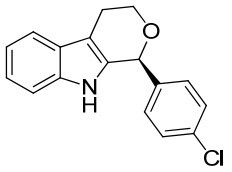
(*S*)-1-([1,1'-Biphenyl]-4-yl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1d)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1d** (14.6 mg, 90%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.66–7.60 (m, 5H), 7.56 (s, 1H), 7.51–7.45 (m, 4H), 7.42–7.38 (m, 1H), 7.26–7.23 (m, 1H), 7.22–7.16 (m, 2H), 5.85 (s, 1H), 4.37 (ddd, *J* = 11.2, 5.3, 3.1 Hz, 1H), 4.07–3.99 (m, 1H), 3.20–3.10 (m, 1H), 2.92–2.83 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 142.0, 140.7, 138.5, 136.2, 133.6, 129.1, 128.9, 127.6, 127.3, 127.1, 122.1, 119.8, 118.5, 111.2, 109.0, 75.9, 64.9, 22.4; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{23}H_{20}NO$: 326.1539, found 326.1526; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 30/70, 1.0 mL/min, 222 nm), retention time: t_{major} = 8.327 min, t_{minor} = 9.231 min, ee = 96%; $[\alpha]_D^{20}$ = + 17.6 (c = 0.84, $CHCl_3$).



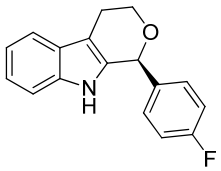
(*S*)-1-(4-Bromophenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1e)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1e** (14.4 mg, 88%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.5 Hz, 1H), 7.54–7.49 (m, 2H), 7.41 (s, 1H), 7.27–7.26 (m, 1H), 7.25 (s, 2H), 7.20–7.11 (m, 2H), 5.77 (s, 1H), 4.31 (ddd, *J* = 11.3, 5.4, 3.0 Hz, 1H), 4.02–3.94 (m, 1H), 3.13–3.04 (m, 1H), 2.87–2.80 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 138.7, 136.2, 133.1, 132.1, 130.2, 127.1, 123.1, 122.3, 120.0, 118.6, 111.2, 109.2, 75.6, 65.0, 22.4; these data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 215 nm), retention time: t_{major} = 9.100 min, t_{minor} = 10.807 min, ee = 91%; $[\alpha]_D^{20}$ = + 8.5 (c = 0.36, $CHCl_3$).



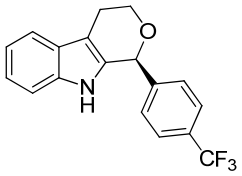
(*S*)-1-(4-Chlorophenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1f)

It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1f** (12.7 mg, 90%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.5 Hz, 1H), 7.42 (s, 1H), 7.38–7.30 (m, 4H), 7.26–7.23 (m, 1H), 7.21–7.11 (m, 2H), 5.78 (s, 1H), 4.31 (ddd, *J* = 11.3, 5.4, 3.0 Hz, 1H), 4.03–3.93 (m, 1H), 3.15–3.04 (m, 1H), 2.88–2.80 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 138.2, 136.2, 135.0, 133.2, 129.9, 129.1, 127.1, 122.3, 119.9, 118.6, 111.2, 109.2, 75.5, 65.0, 22.4; these data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 215 nm), retention time: t_{major} = 13.563 min, t_{minor} = 16.493 min, ee = 95%; $[\alpha]_D^{20}$ = + 10.9 (c = 0.24, $CHCl_3$).



(*S*)-1-(4-Fluorophenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1g)

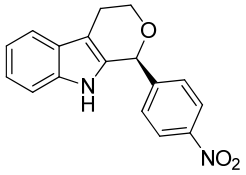
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1g** (12.0 mg, 90%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.58 (d, *J* = 7.4 Hz, 1H), 7.45 (s, 1H), 7.38–7.32 (m, 2H), 7.25 (d, *J* = 1.2 Hz, 1H), 7.21–7.13 (m, 2H), 7.11–7.04 (m, 2H), 5.79 (s, 1H), 4.31 (ddd, *J* = 11.2, 5.4, 3.0 Hz, 1H), 4.03–3.95 (m, 1H), 3.14–3.07 (m, 1H), 2.87–2.81 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 164.2, 162.2, 136.2, 135.5, 135.5, 133.4, 130.5, 130.4, 127.1, 122.3, 119.9, 118.5, 115.9, 115.8, 111.2, 109.1, 75.5, 65.0, 22.4; these data are consistent with reported literature values.[2] HPLC: the ee value was determined by HPLC analysis (Chiralcel AS-H, *i*-PrOH/Hexane = 10/90, 1.0 mL/min, 222 nm), retention time: t_{major} = 12.267 min, t_{minor} = 14.843 min, ee = 96%; $[\alpha]_D^{20}$ = + 10.4 (c = 1.02, $CHCl_3$).



(*S*)-1-(4-(Trifluoromethyl)phenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1h)

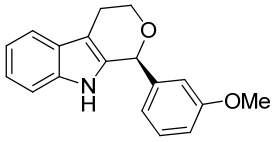
It was prepared following the general procedure A by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1h** (14.4 mg, 91%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.66 (d, *J* = 8.1 Hz, 2H), 7.60 (d, *J* = 7.4 Hz, 1H), 7.51 (d, *J* = 8.1 Hz, 2H), 7.47 (s, 1H), 7.27–7.24 (m, 1H), 7.23–7.14 (m, 2H), 5.85 (s, 1H), 4.33 (ddd, *J* = 11.2, 5.3, 3.1 Hz, 1H), 4.07–3.97 (m, 1H), 3.18–3.07 (m, 1H), 2.93–2.83 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 143.6, 136.3, 132.7,131.2 (q, *J* = 32.5 Hz), 128.8, 127.0,125.9 (q, *J* = 3.7 Hz),124.1 (q, *J* = 272.2 Hz). 122.4, 120.0, 118.6, 111.2, 109.2, 75.5, 64.9, 22.3; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{18}H_{15}F_3NO$: 318.1100, found 318.1109; HPLC: the ee value was determined by HPLC analysis

(Chiralcel OD-H, *i*-PrOH/Hexane = 10/90, 1.0 mL/min, 215 nm), retention time: t_{major} = 15.555 ,min t_{minor} = 18.076 min , ee = 90%; $[\alpha]_D^{20}$ = + 13.9 (c = 0.48, $CHCl_3$).



(*S*)-1-(4-Nitrophenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1i)

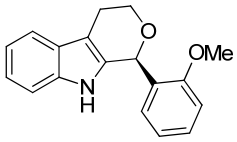
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (20:80) as eluent to afford **1i** (13.5 mg, 92%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.22 (d, *J* = 8.6 Hz, 2H), 7.57 (d, *J* = 8.6 Hz, 3H), 7.42 (s, 1H), 7.27 (d, *J* = 7.8 Hz, 1H), 7.24–7.12 (m, 2H), 5.91 (s, 1H), 4.32 (ddd, *J* = 11.3, 5.3, 3.0 Hz, 1H), 4.07–3.96 (m, 1H), 3.18–3.06 (m, 1H), 2.93–2.82 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 148.3, 146.8, 136.3, 132.1, 129.3, 127.0, 124.1, 122.6, 120.1, 118.7, 111.3, 109.4, 75.1, 65.0, 22.3; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{17}H_{15}N_2O_3$: 295.1077, found 295.1061; HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 40/60, 1.0 mL/min, 275 nm), retention time: t_{major} = 8.600 min, t_{minor} = 11.837 min, ee = 91%; $[\alpha]_D^{20}$ = + 3.2 (c = 0.32, $CHCl_3$).



(*S*)-1-(3-Methoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1j)

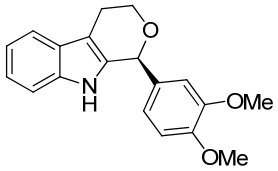
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1j** (11.2 mg, 80%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.57 (d, *J* = 7.1 Hz, 1H), 7.52 (s, 1H), 7.31 (t, *J* = 7.7 Hz, 1H), 7.23 (d, *J* = 7.0 Hz, 1H), 7.20–7.12 (m, 2H), 6.98 (d, *J* = 7.5 Hz, 1H), 6.96–6.89 (m, 2H), 5.77 (s, 1H), 4.36 (ddd, *J* = 11.2, 5.4, 2.8 Hz, 1H), 4.05–3.95 (m, 1H), 3.78 (s, 3H), 3.17–3.07 (m, 1H), 2.88–2.79 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 160.1, 141.2, 136.2, 133.7, 129.9, 127.2, 122.1, 120.7, 119.7, 118.4, 114.8, 113.6, 111.2, 108.7, 76.2, 65.1, 55.4, 22.4; these data are consistent with reported literature values.[2]

HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 30/70, 1.0 mL/min, 222 nm), retention time: t_{major} = 9.900 min, t_{minor} = 13.820 min, ee = 90%; $[\alpha]_D^{20}$ = + 17.0 (c = 0.32, $CHCl_3$).



(*S*)-1-(2-Methoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1k)

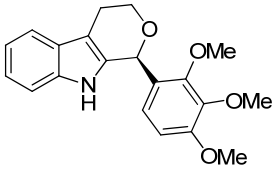
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1k** (10.0 mg, 72%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.88 (s, 1H), 7.56–7.50 (m, 1H), 7.37–7.28 (m, 2H), 7.26–7.24 (m, 1H), 7.18–7.08 (m, 2H), 7.03–6.99 (m, 1H), 6.95 (td, *J* = 7.5, 0.8 Hz, 1H), 6.31 (s, 1H), 4.38 (ddd, *J* = 11.2, 5.2, 3.0 Hz, 1H), 4.06–4.00 (m, 1H), 3.99 (s, 3H), 3.12–3.04 (m, 1H), 2.85–2.79 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 138.9, 136.6, 136.2, 134.0, 129.6, 128.5, 127.2, 122.0, 119.8, 118.5, 111.1, 108.9, 76.1, 65.0, 22.5, 21.4; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{18}H_{18}NO_2$: 280.1332, found 280.1341; HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 30/70, 1.0 mL/min, 215 nm), retention time: t_{major} = 6.903 min, t_{minor} =10.128 min, ee = 90%; $[\alpha]_D^{20}$ = + 60.0 (c = 0.16, $CHCl_3$).



(*S*)-1-(3,4-Dimethoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1l)

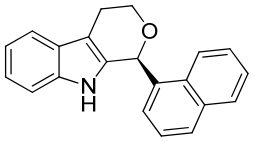
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1l** (14.4 mg, 93%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.63 (s, 1H), 7.56 (d, *J* = 7.7 Hz, 1H), 7.36 (dd, *J* = 5.0, 1.0 Hz, 1H), 7.29 (d, *J* = 7.9 Hz, 1H), 7.21–7.10 (m, 3H), 7.02 (dd, *J* = 5.0, 3.5 Hz, 1H), 6.11 (s, 1H), 4.33–4.25 (m, 1H), 4.05–3.97 (m, 1H), 3.87 (s,3H), 3.80 (s,3H), 3.07–2.98 (m, 1H), 2.90–2.82 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 149.6, 149.5, 136.1, 133.9, 132.1, 127.2, 122.0, 121.1, 119.7, 118.4, 111.3, 111.2, 111.0, 108.8, 76.3,

65.1, 56.0, 56.0, 22.4; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{19}H_{20}NO_3$: 310.1438, found 310.1451; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane =30/70, 1.0 mL/min, 222 nm), retention time: t_{major} = 9.691 min, t_{minor} = 11.534 min,ee = 96%; $[\alpha]_D^{20}$ = + 30.6 (c = 0.23, $CHCl_3$).



(*S*)-1-(2,3,4-Trimethoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1m)

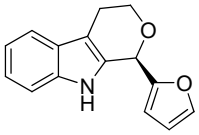
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1m** (14.9 mg, 88%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.03 (s, 1H), 7.54 (d, *J* = 7.5 Hz, 1H), 7.27 (d, *J* = 7.0 Hz, 1H), 7.19–7.08 (m, 2H), 6.99 (d, *J* = 8.7 Hz, 1H), 6.63 (d, *J* = 8.7 Hz, 1H), 6.16 (s, 1H), 4.35 (ddd, *J* = 11.1, 5.1, 3.2 Hz, 1H), 4.03 (s, 3H), 4.02–3.98 (m, 1H), 3.96 (s, 3H), 3.85 (s, 3H), 3.10–3.02 (m, 1H), 2.85–2.79 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 153.9, 151.5, 142.2, 135.9, 134.2, 127.1, 126.2, 123.0, 121.8, 119.5, 118.3, 111.1, 108.5, 107.7, 70.0, 64.9, 61.9, 61.1, 56.1, 22.5; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{20}H_{22}NO_4$: 340.1543, found 340.1536; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 25/75, 1.0 mL/min, 215 nm), retention time: t_{major} = 8.033 min, t_{minor} = 14.083 min, ee = 90%; $[\alpha]_D^{20}$ = + 15.5 (c = 0.60, $CHCl_3$).



(*S*)-1-(Naphthalen-1-yl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1n)

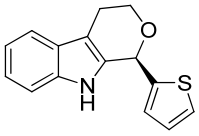
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1n** (13.6 mg, 91%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.33–8.24 (m, 1H), 7.96–7.85 (m, 2H), 7.65–7.57 (m, 1H), 7.57–7.39 (m, 5H), 7.22–7.11 (m, 3H), 6.50 (s, 1H), 4.40–4.31 (m, 1H), 4.09 (ddd, *J* = 11.3, 8.6, 4.3 Hz, 1H), 3.22–3.12 (m, 1H), 2.95 (dtd, *J* = 15.5, 4.1, 1.7 Hz, 1H); ^{13}C

NMR (126 MHz, DMSO) δ 136.1, 135.23, 133.8, 133.7, 131.5, 129.1, 128.4, 127.6, 126.4, 126.2, 125.8, 125.1, 124.6, 120.9, 118.5, 117.8, 111.3, 107.2, 73.0, 62.7, 22.1; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{21}H_{18}NO$: 300.1383, found 300.1378; HPLC: the ee value was determined by HPLC analysis (Chiralcel IB-H, *i*-PrOH/Hexane = 30/70, 1.0 mL/min, 215 nm), retention time: t_{major} = 6.560 min, t_{minor} = 11.640 min, ee = 82%; $[\alpha]_D^{20}$ = + 46.0 (c = 0.40, $CHCl_3$).



(*R*)-1-(Furan-2-yl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1o)

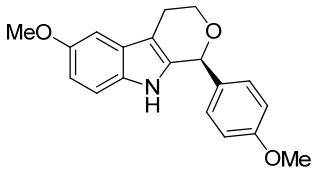
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1o** (10.3 mg, 86%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.79 (s, 1H), 7.56 (d, *J* = 7.8 Hz, 1H), 7.48 (d, *J* = 1.0 Hz, 1H), 7.31 (d, *J* = 8.0 Hz, 1H), 7.23–7.18 (m, 1H), 7.18–7.11 (m, 1H), 6.41–6.36 (m, 1H), 6.31 (d, *J* = 3.2 Hz, 1H), 5.95 (s, 1H), 4.24–4.16 (m, 1H), 4.06–3.98 (m, 1H), 2.99–2.85 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 152.6, 143.5, 136.1, 130.7, 127.0, 122.3, 119.8, 118.6, 111.2, 110.5, 109.8, 109.5, 68.4, 63.5, 22.2; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{15}H_{14}NO_2$: 240.1019, found 240.1010; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 222 nm), retention time: t_{minor} = 8.243 min, t_{major} = 9.061 min, ee = 92%; $[\alpha]_D^{20}$ = -18.1 (c = 0.44, $CHCl_3$).



(*R*)-1-(Thiophen-2-yl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1p)

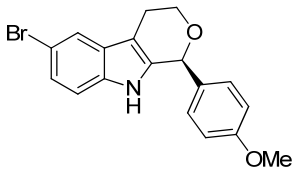
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1p** (10.3 mg, 81%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.63 (s, 1H), 7.56 (d, *J* = 7.7 Hz, 1H), 7.36 (dd, *J* = 5.0, 1.0 Hz, 1H), 7.29 (d, *J* = 7.9 Hz, 1H), 7.21–7.10 (m, 3H), 7.02 (dd, *J* = 5.0, 3.5 Hz, 1H), 6.11 (s, 1H), 4.33–4.25 (m, 1H), 4.05–3.97 (m, 1H), 3.07–2.98 (m, 1H), 2.90–

2.82 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 143.0, 136.1, 132.9, 127.3, 127.1, 126.8, 122.3, 119.9, 118.6, 111.2, 109.0, 70.7, 64.2, 22.3; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{15}H_{14}NOS$: 256.0791, found 256.0776; HPLC: the ee value was determined by HPLC analysis (Chiralcel OD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 215 nm), retention time: t_{major} = 10.070 min, t_{minor} = 13.543 min, ee = 80%; $[\alpha]_D^{20}$ = -5.4 (c = 0.36, $CHCl_3$).



(*S*)-6-Methoxy-1-(4-methoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1q)

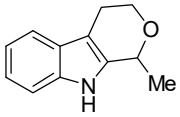
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1q** (14.5 mg, 94%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.28–7.24 (m, 2H), 7.19 (d, *J* = 2.3 Hz, 1H), 7.14 (dd, *J* = 8.7, 2.4 Hz, 1H), 6.92 (d, *J* = 8.7 Hz, 1H), 6.88–6.80 (m, 2H), 6.52 (s, 1H), 5.64 (s, 1H), 4.19–4.13 (m, 1H), 3.86–3.79 (m, 1H), 3.65 (s, 3H), 3.35 (s, 3H), 2.98–2.91 (m, 1H), 2.71–2.64 (m, 1H); ^{13}C NMR (126 MHz, C_6D_6) δ 160.5, 155.0, 134.9, 132.8, 131.6, 130.5, 114.2, 112.2, 112.0, 108.9, 100.8, 75.7, 64.0, 55.5, 54.9, 22; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{19}H_{20}NO_3$: 310.1438, found 310.1453; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 215 nm), retention time: t_{major} = 11.243 min, t_{minor} = 15.150 min, ee = 95%; $[\alpha]_D^{20}$ = + 23.8 (c = 0.48, $CHCl_3$).



(*S*)-6-Bromo-1-(4-methoxyphenyl)-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (1r)

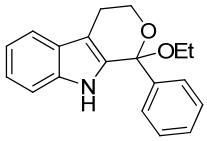
It was prepared following the general procedure by flash chromatography on silica gel using ethyl acetate/petroleum ether (10:90) as eluent to afford **1r** (16.1 mg, 90%). ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.67 (d, *J* = 1.5 Hz, 1H), 7.50 (s, 1H), 7.28 (d, 2H), 7.23

(dd, *J* = 8.6, 1.8 Hz, 1H), 7.10 (d, *J* = 8.5 Hz, 1H), 6.90 (d, *J* = 8.6 Hz, 2H), 5.73 (s, 1H), 4.30 (ddd, *J* = 11.3, 5.4, 2.8 Hz, 1H), 4.00–3.92 (m, 1H), 3.81 (s, 3H), 3.08–2.99 (m, 1H), 2.79–2.71 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 160.4, 135.5, 134.8, 131.4, 129.9, 129.0, 124.8, 121.2, 114.4, 113.0, 112.5, 108.7, 75.7, 64.9, 55.5, 22.3; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{18}H_{17}BrNO_2$: 358.0437, found 358.0423; HPLC: the ee value was determined by HPLC analysis (Chiralcel AD-H, *i*-PrOH/Hexane = 20/80, 1.0 mL/min, 222 nm), retention time: t_{major} = 12.620 min, t_{minor} = 19.572 min, ee = 92%; $[\alpha]_D^{20}$ = + 95.0 (c = 0.26, $CHCl_3$).



1-Methyl-1,3,4,9-tetrahydropyrano[3,4-b]indole (1s)

It was prepared following the general procedure, which did not work.. ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.78 (s, 1H), 7.54 (d, *J* = 7.7 Hz, 1H), 7.34 (d, *J* = 7.9 Hz, 1H), 7.23–13 (m, 2H), 4.97 (q, *J* = 6.5 Hz, 1H), 4.39–4.24 (m, 1H), 3.93–3.84 (m, 1H), 3.09–2.94 (m, 1H), 2.74 (dd, *J* = 15.3, 1.7 Hz, 1H), 1.56 (d, *J* = 6.6 Hz, 3H). ^{13}C NMR (126 MHz, $CDCl_3$) δ 136.0, 135.9, 127.4, 122.0, 120.0, 118.4, 111.1, 107.7, 69.3, 64.9, 22.6, 20.5. HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{12}H_{14}NO$: 188.1070, found 188.1041.



1-Ethoxy-1-phenyl-1,3,4,9-tetrahydropyrano[3,4-*b*]indole (5)

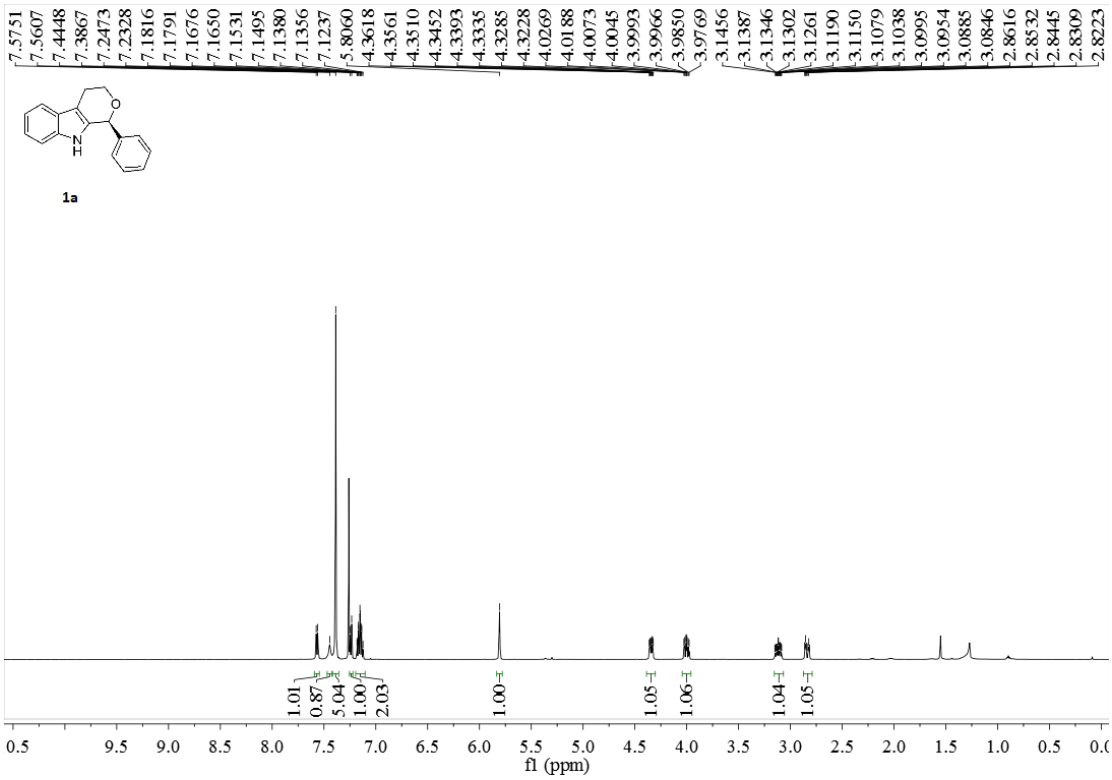
^{1}H NMR (500 MHz, $CDCl_3$) δ 7.73 (s, 1H), 7.68–7.62 (m, 2H), 7.54 (d, *J* = 7.8 Hz, 1H), 7.41 (t, *J* = 7.5 Hz, 2H), 7.35 (t, *J* = 7.3 Hz, 1H), 7.24 (d, 1H), 7.20–7.14 (m, 1H), 7.10 (t, *J* = 7.4 Hz, 1H), 4.41–4.32 (m, 1H), 4.27–4.19 (m, 1H), 3.63–3.54 (m, 2H), 3.12–3.02 (m, 1H), 2.90–2.81 (m, 1H), 1.29 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 141.1, 136.3, 133.8, 128.8, 128.6, 126.5, 122.7, 119.76, 119.1, 111.5, 109.6, 98.5, 61.0, 58.7, 22.2, 15.7; HRMS (EI) *m/z* $[M + H]^+$ calculated for $C_{19}H_{20}NO_2$: 294.1489, found 294.1496.

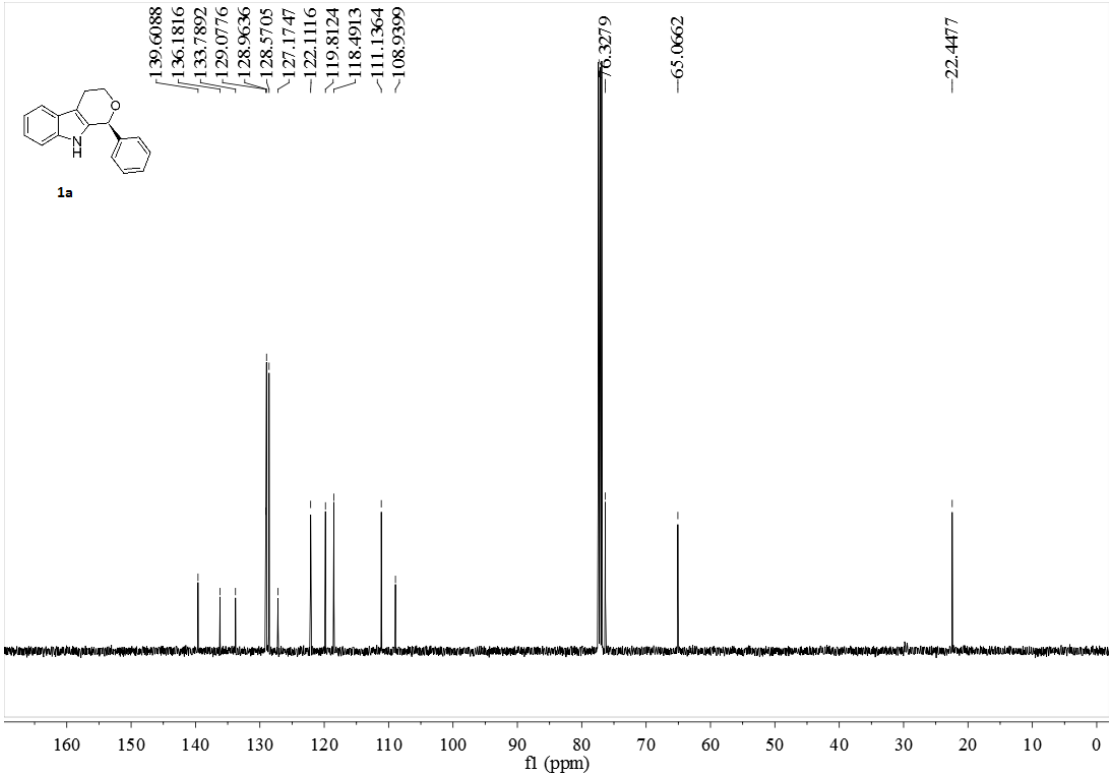
References:

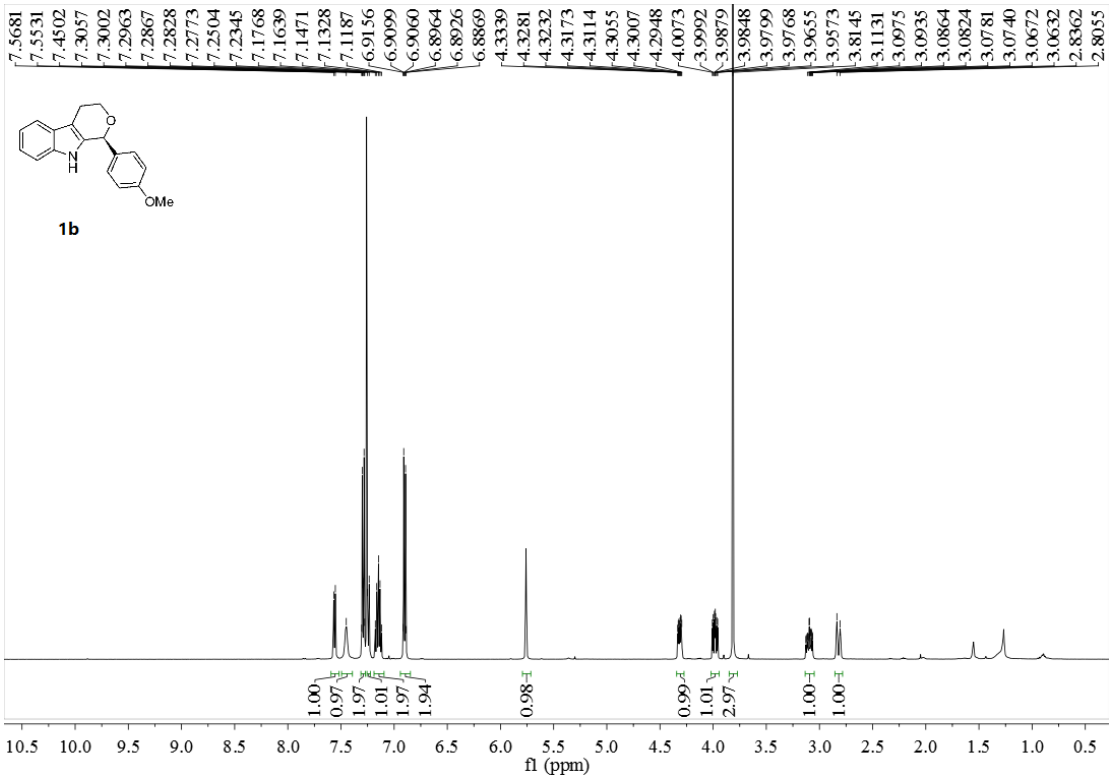
1. B. Bouguerne1, C. Lherbet, M. Baltas. *Letters in Organic Chemistry*, **2010**, *7*, 420.

2. C. Zhao, S. B. Chen, D. Seidel. *J. Am. Chem. Soc*. **2016**, *138*, 9053.

^{1}H and ^{13}C NMR spectra



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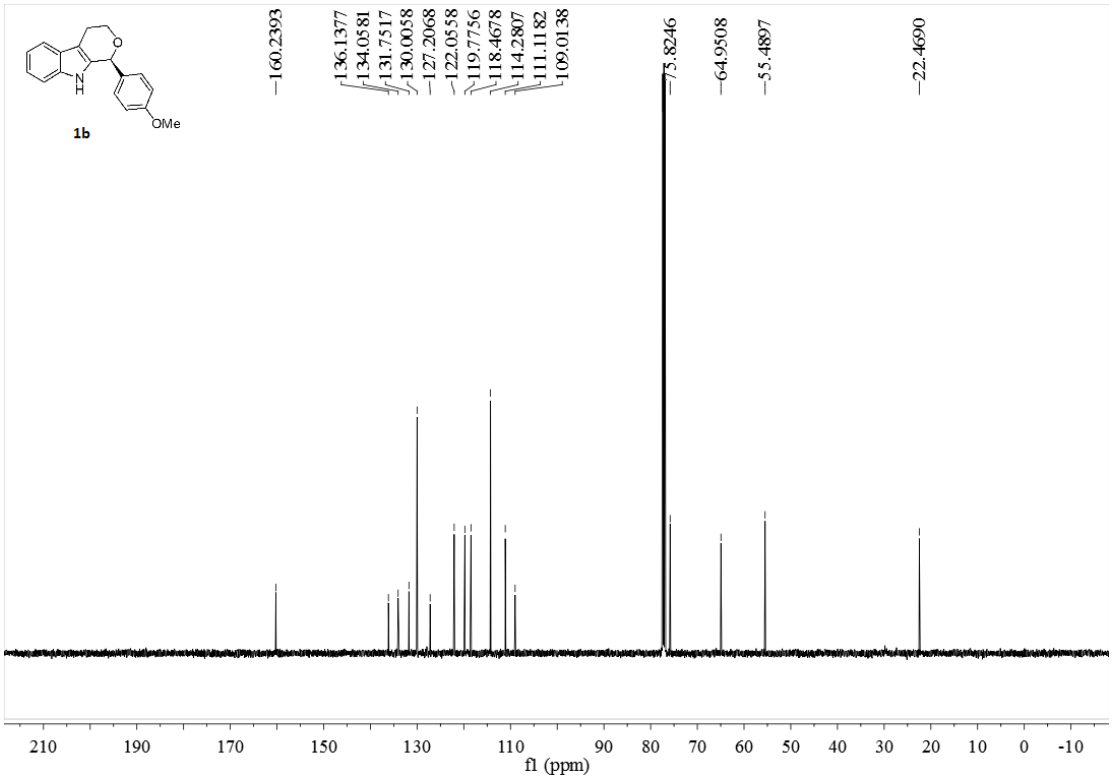
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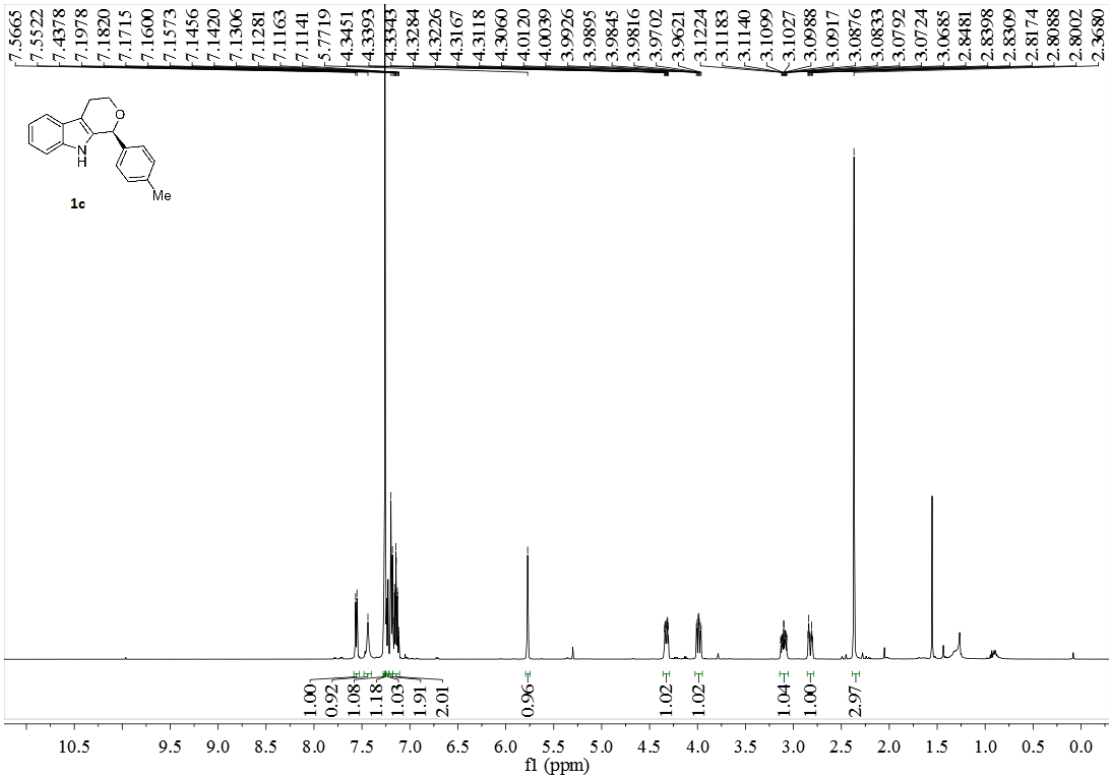
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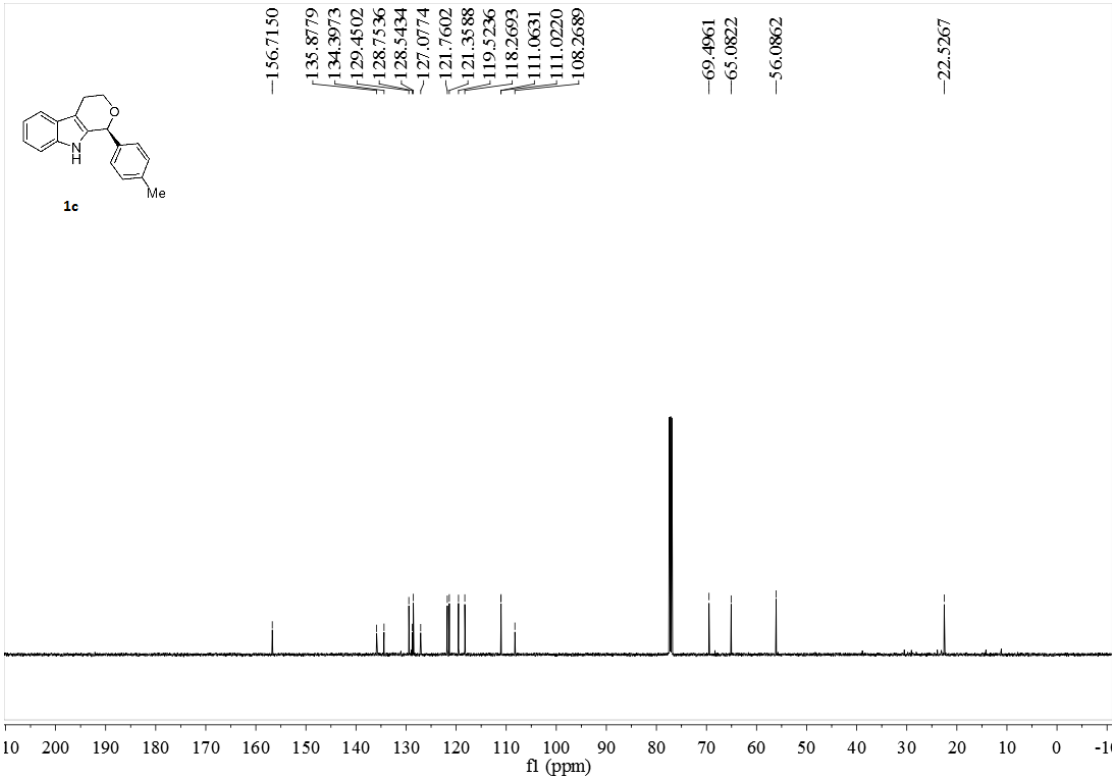
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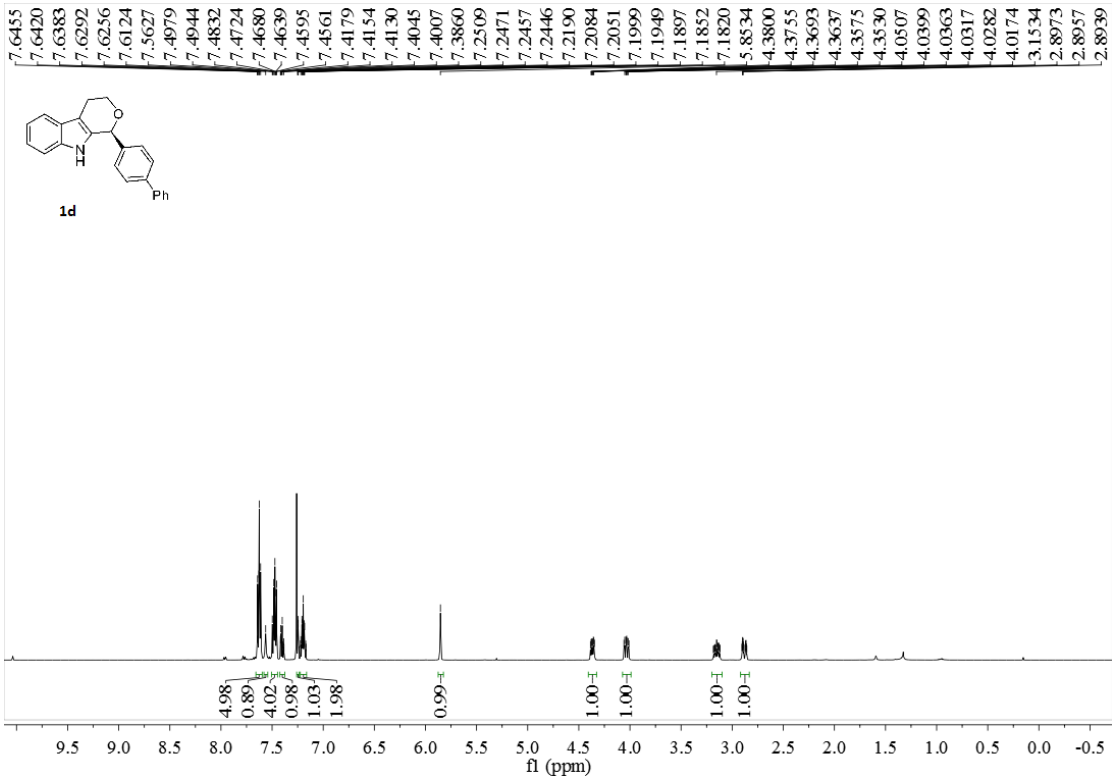
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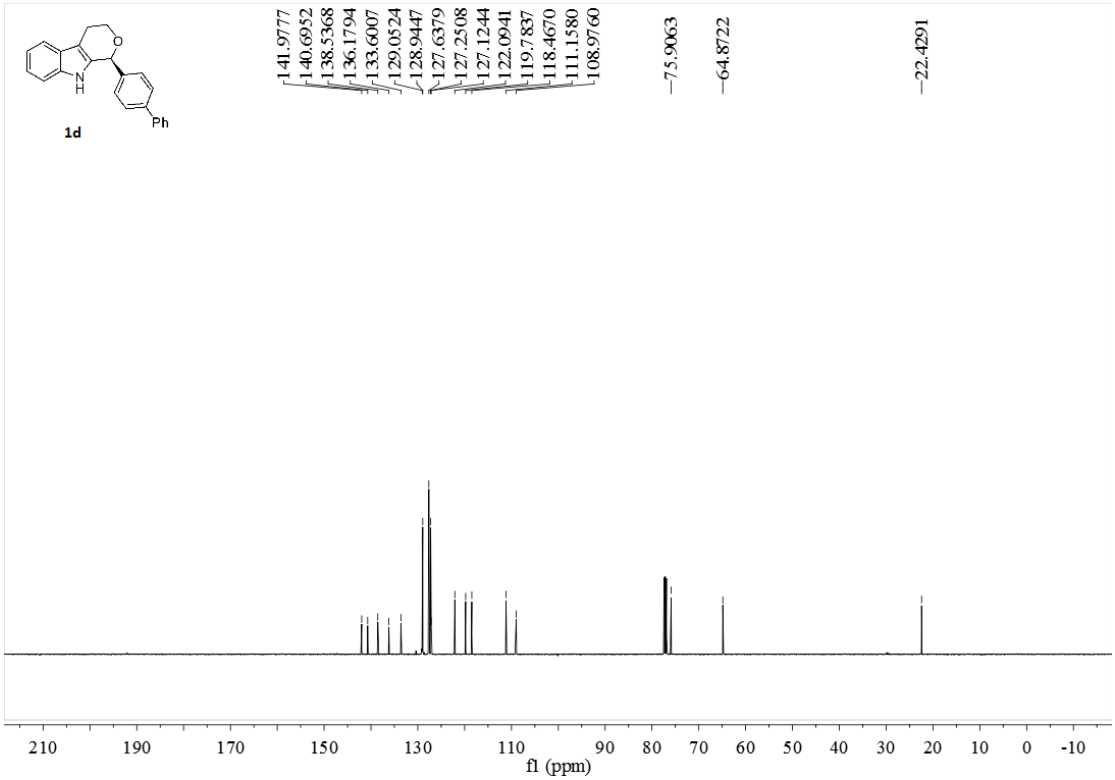
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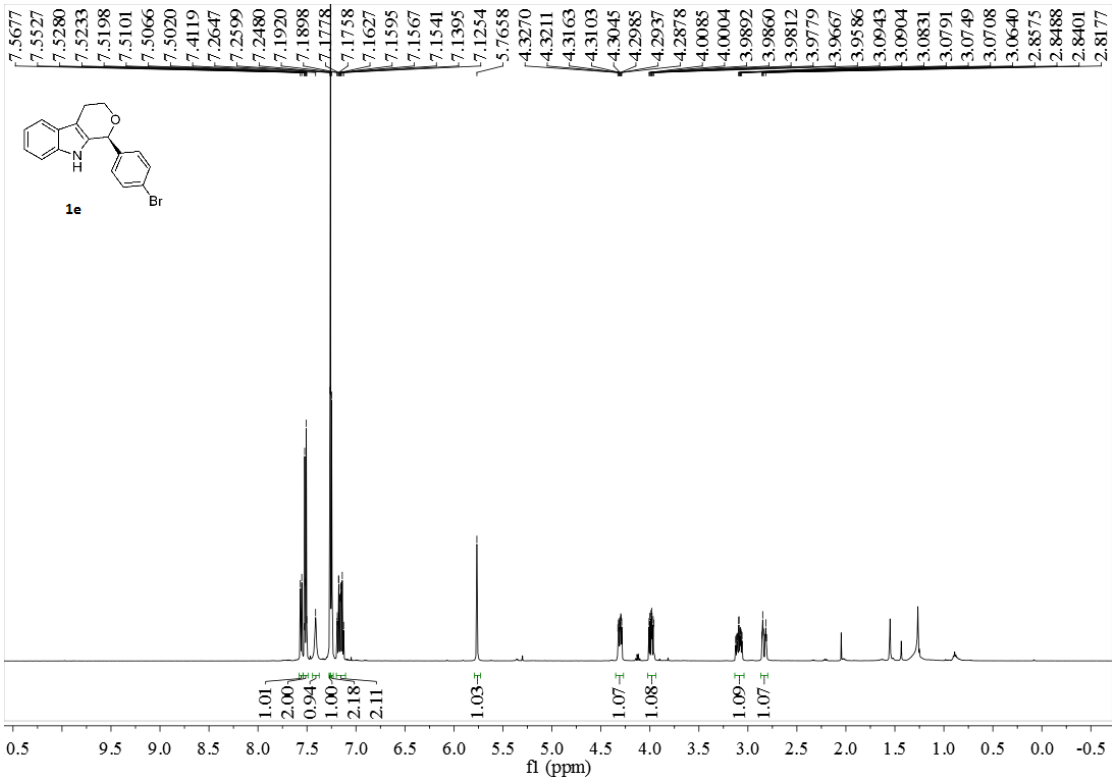
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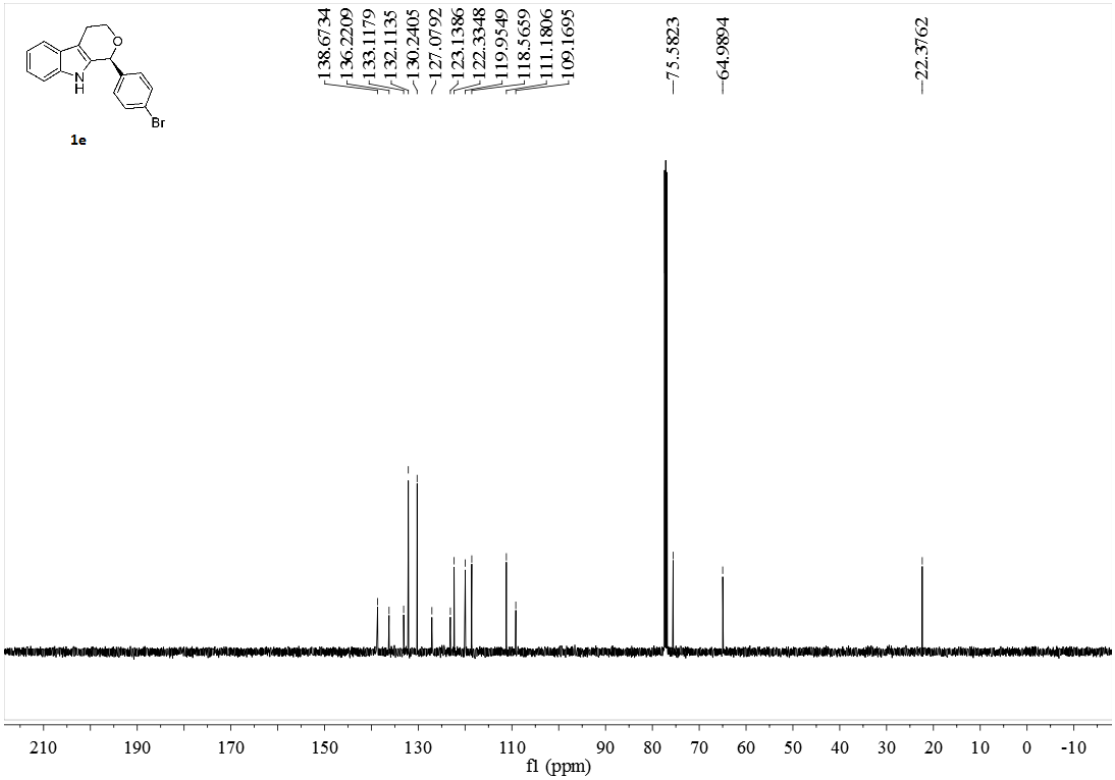
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132.1135
130.2405
127.0792
123.1386
122.3348
119.9549
118.5659
111.1806
109.1695
75.5823
64.9894
22.3762
1e
Br
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190
170
150
130
110
90
80
70
60
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40
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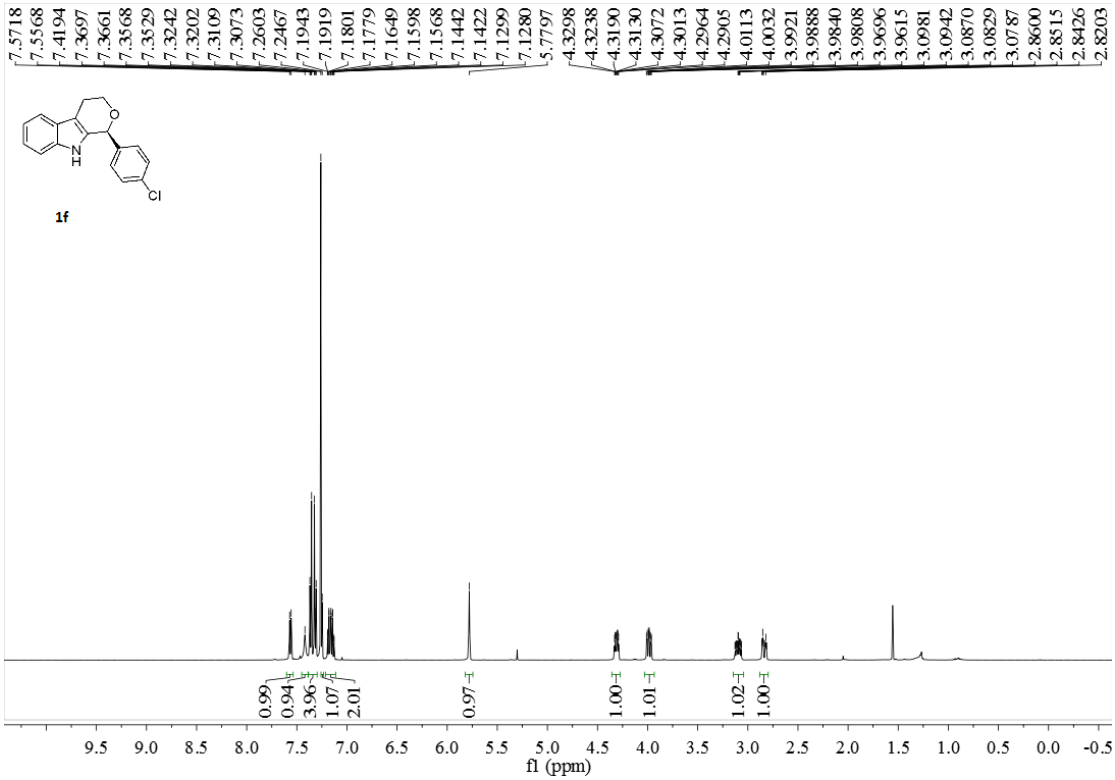
-10
f1 (ppm)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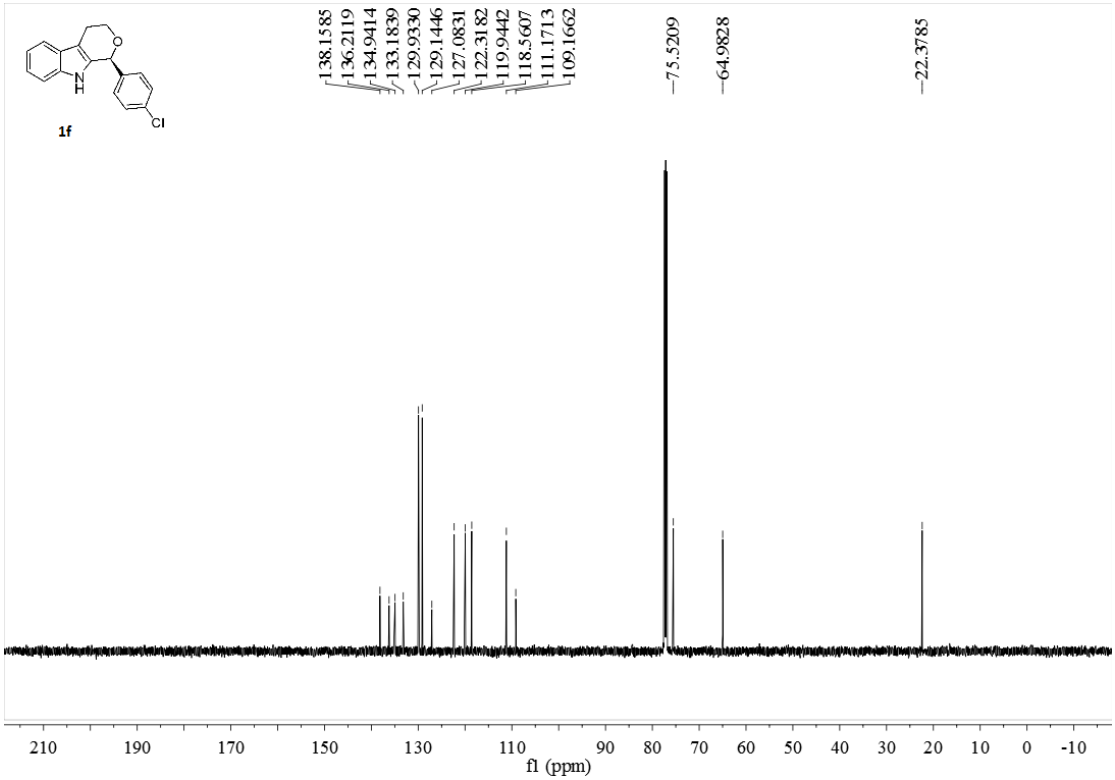
7.2603
7.2467
7.1943
7.1919
7.1801
7.1779
7.1649
7.1598
7.1568
7.1442
7.1422
7.1299
7.1280
5.7797
4.3298
4.3238
4.3190
4.3130
4.3072
4.3013
4.2964
4.2905
4.0113
4.0032
3.9921
3.9888
3.9840
3.9808
3.9696
3.9615
3.0981
3.0942
3.0870
3.0829
3.0787
2.8600
2.8515
2.8426
2.8203
1f
0.99
0.94
3.96
1.07
2.01
0.97
1.00
1.01
1.02
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5
f1 (ppm)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136.2119
134.9414
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129.9330
129.1446
127.0831
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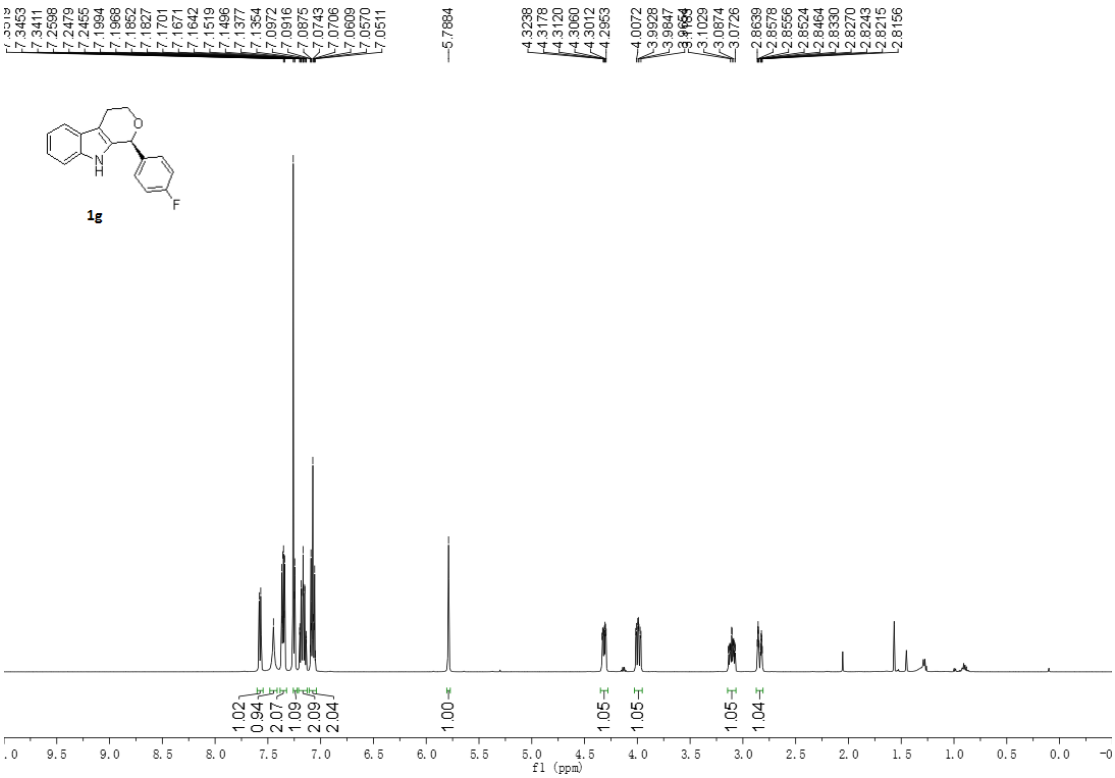
119.9442
118.5607
111.1713
109.1662
75.5209
64.9828
22.3785
1f
210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)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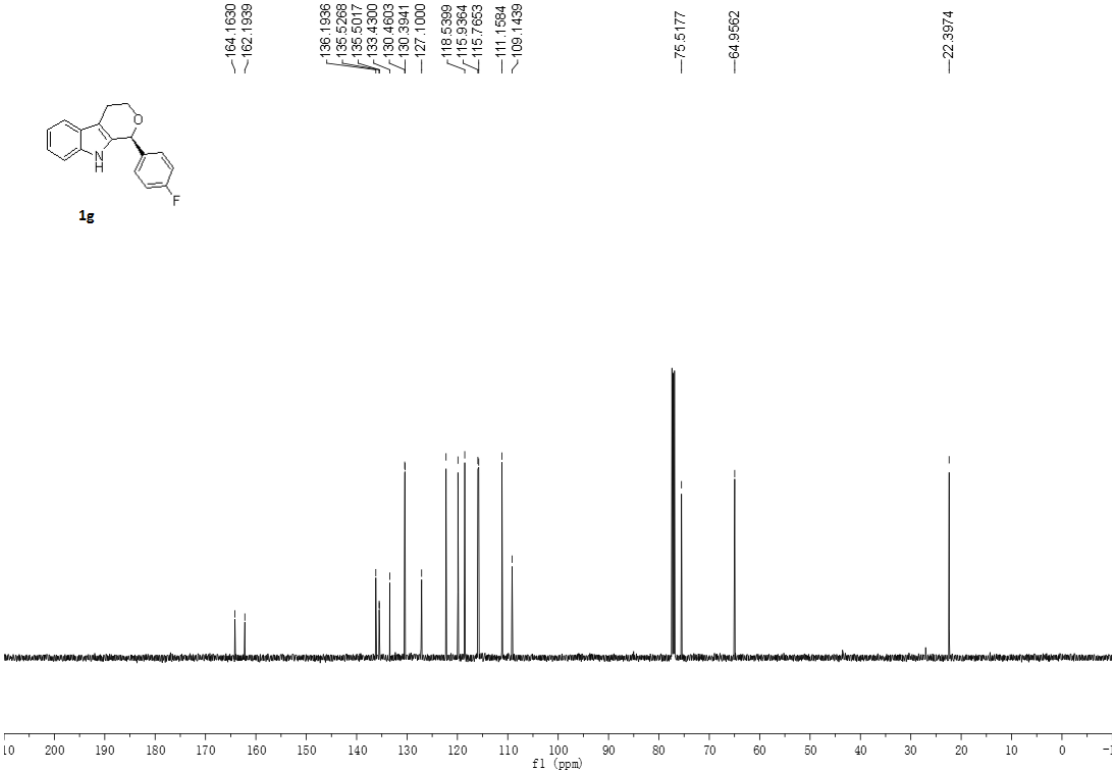
7.1671
7.1642
7.1519
7.1496
7.1377
7.1354
7.0972
7.0916
7.0875
7.0743
7.0706
7.0609
7.0570
7.0511
5.7884
4.3238
4.3178
4.3120
4.3060
4.3012
4.2953
4.0072
3.9928
3.9847
3.1029
3.0874
3.0726
2.8639
2.8578
2.8556
2.8524
2.8464
2.8330
2.8270
2.8243
2.8215
2.8156
1.02
0.94
2.07
1.09
2.09
2.04
1.00
1.05
1.05
1.05
1.04
f1 (ppm)

1g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136.1936
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135.5017
133.4300
130.4603
130.3941
127.1000
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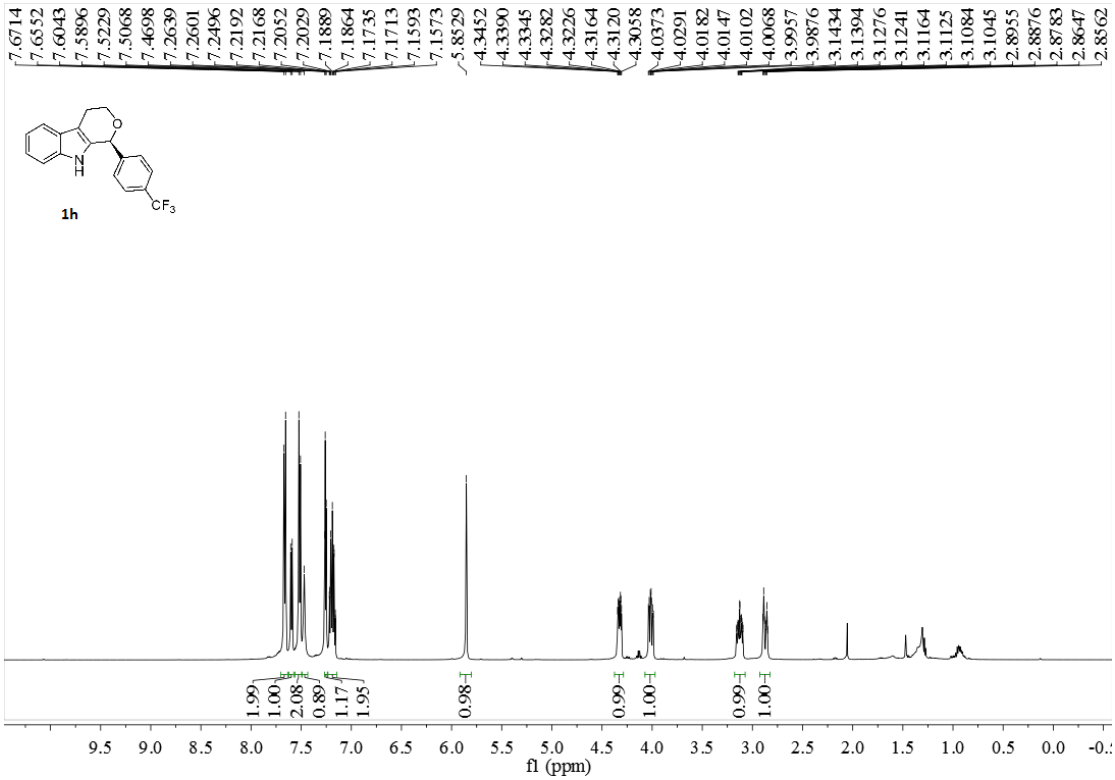
115.7653
111.1584
109.1439
75.5177
64.9562
22.3974
f1 (ppm)

1g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7.5229
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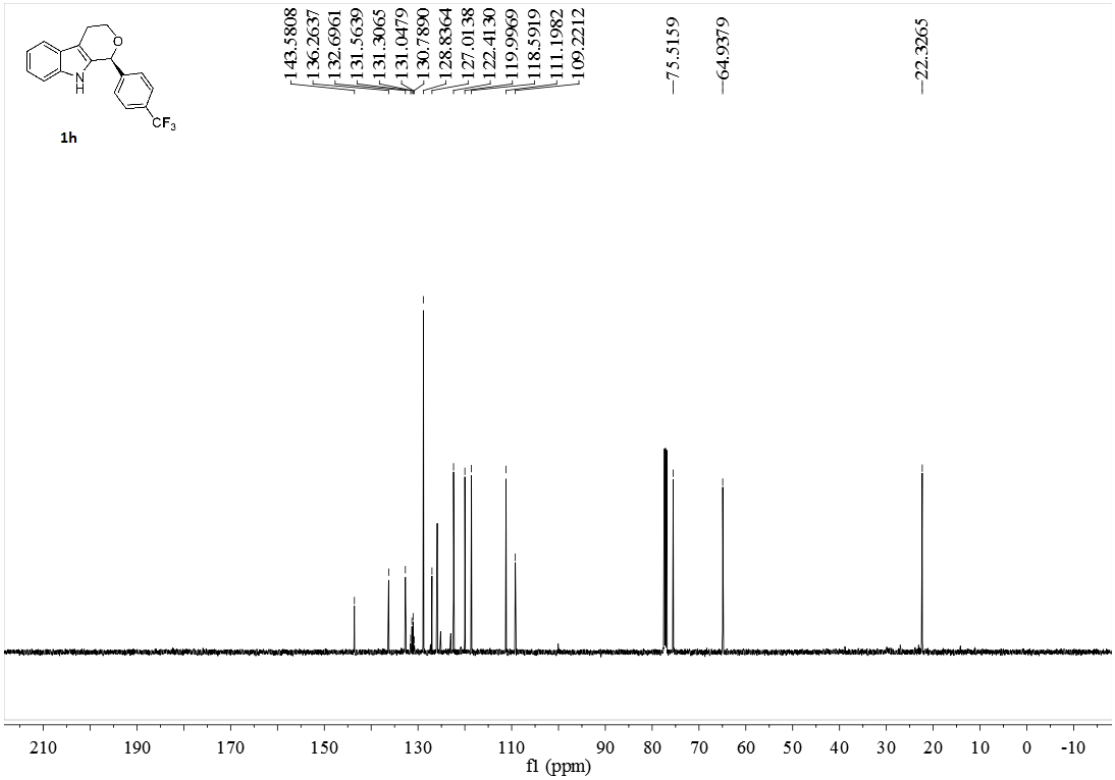
7.2192
7.2168
7.2052
7.2029
7.1889
7.1864
7.1735
7.1713
7.1593
7.1573
5.8529
4.3452
4.3390
4.3345
4.3282
4.3226
4.3164
4.3120
4.3058
4.0373
4.0291
4.0182
4.0147
4.0102
4.0068
3.9957
3.9876
3.1434
3.1394
3.1276
3.1241
3.1164
3.1125
3.1084
3.1045
2.8955
2.8876
2.8783
2.8647
2.8562
1h
1.99
1.00
2.08
0.89
1.17
1.95
0.98
0.99
1.00
0.99
1.00
f1 (ppm)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136.2637
132.6961
131.5639
131.3065
131.0479
130.7890
128.8364
127.0138
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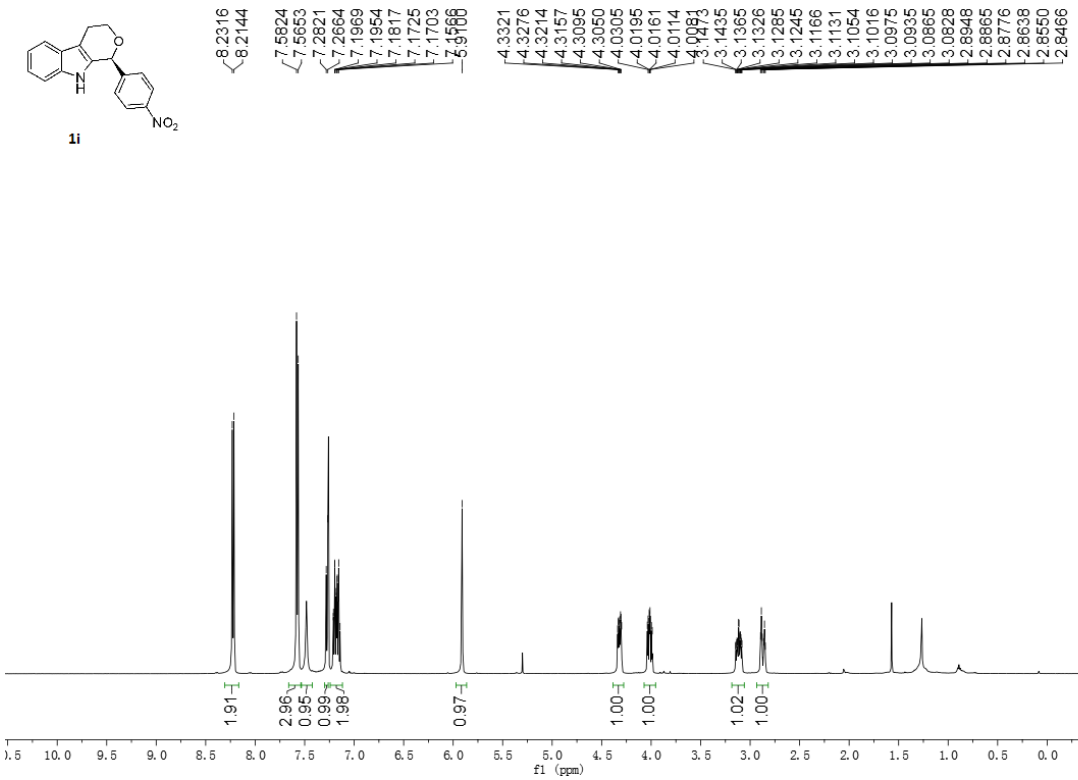
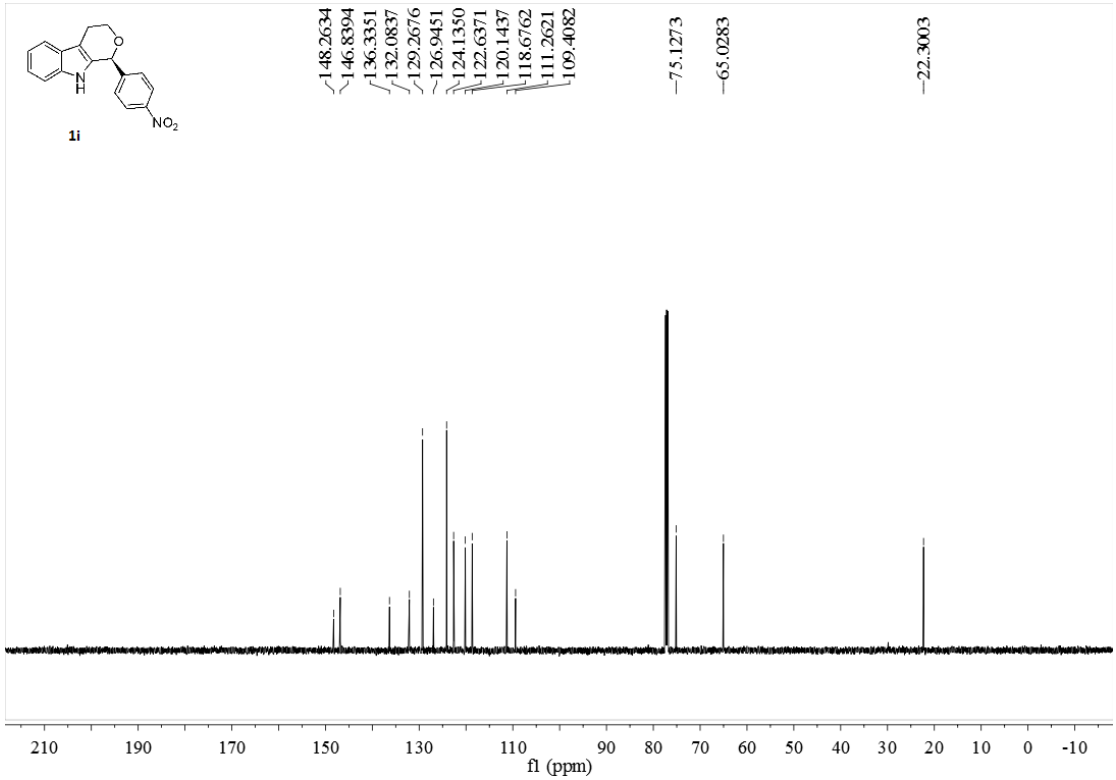
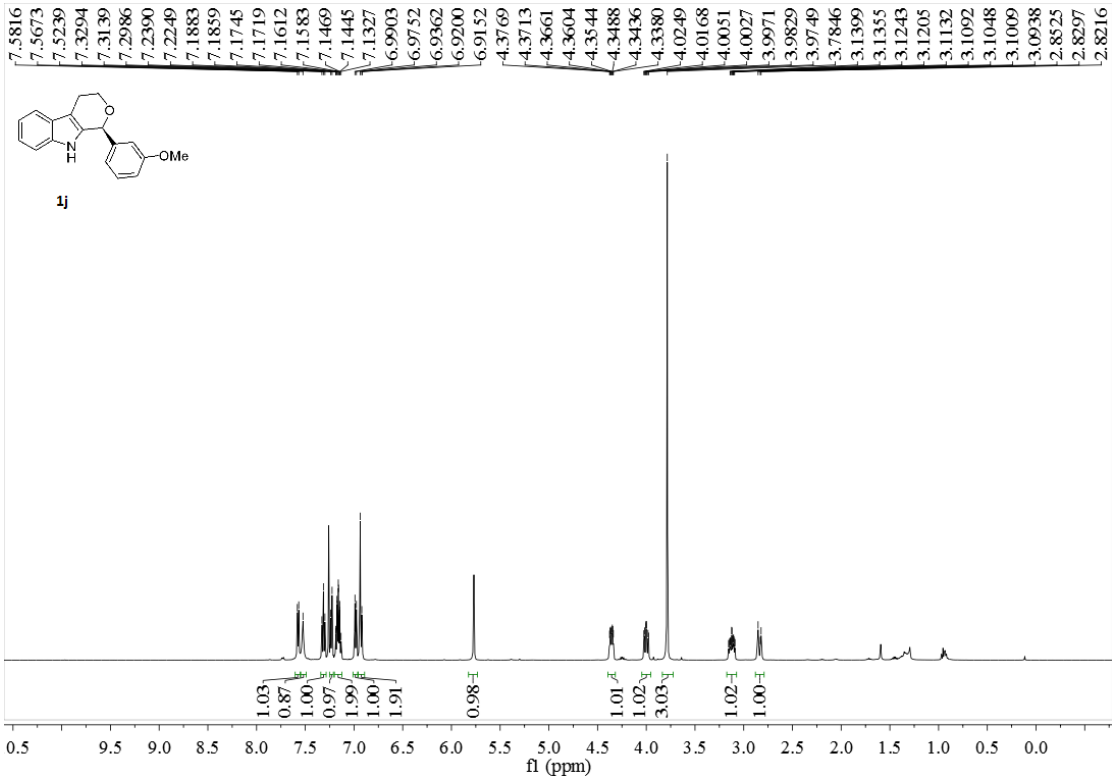
118.5919
111.1982
109.2212
75.5159
64.9379
22.3265
1h
f1 (ppm)


1i
8.2316
8.2144
7.5824
7.5653
7.2821
7.2664
7.1969
7.1954
7.1817
7.1725
7.1703
4.3321
4.3276
4.3214
4.3157
4.3095
4.3050
4.0305
4.0195
4.0161
4.0114
3.1435
3.1365
3.1326
3.1285
3.1245
3.1166
3.1131
3.1054
3.1016
3.0975
3.0935
3.0865
3.0828
2.8948
2.8865
2.8776
2.8638
2.8550
2.8466
1.91
2.96
0.95
0.99
1.98
0.97
1.00
1.00
1.02
1.00
f1 (ppm)


1i
148.2634
146.8394
136.3351
132.0837
129.2676
126.9451
124.1350
122.6371
120.1437
118.6762
111.2621
109.4082
75.1273
65.0283
22.3003
f1 (ppm)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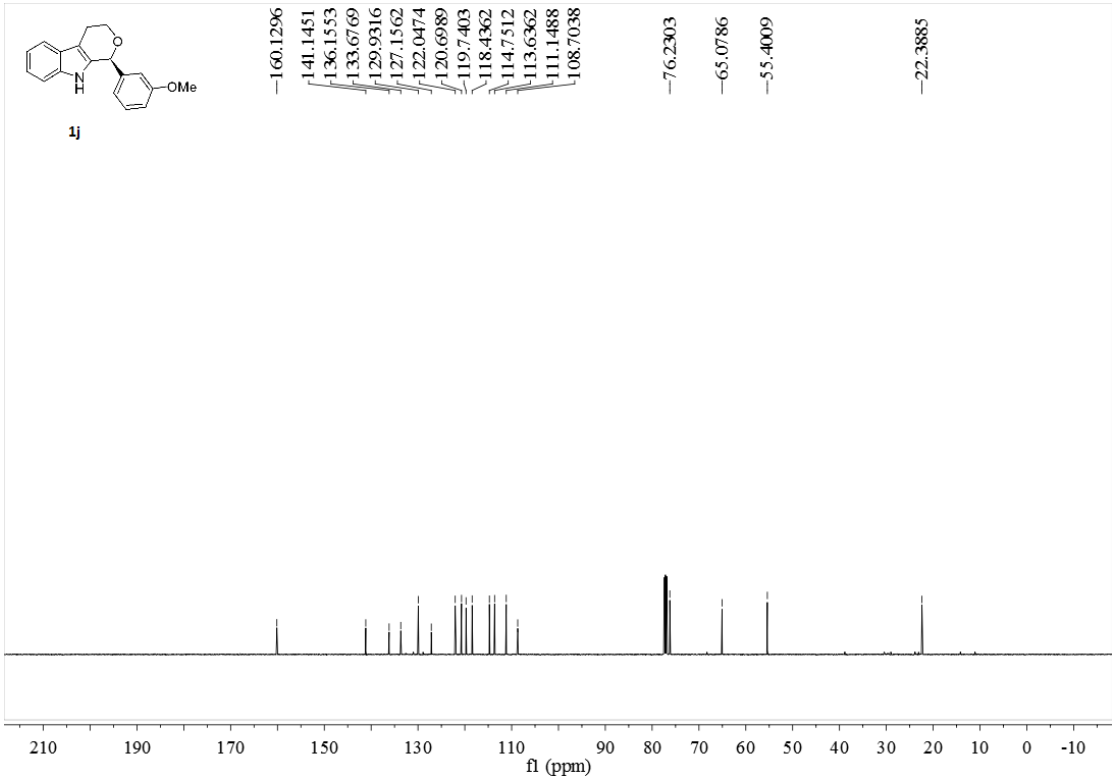
7.5239
7.3294
7.3139
7.2986
7.2390
7.2249
7.1883
7.1859
7.1745
7.1719
7.1612
7.1583
7.1469
7.1445
7.1327
6.9903
6.9752
6.9362
6.9200
6.9152
4.3769
4.3713
4.3661
4.3604
4.3544
4.3488
4.3436
4.3380
4.0249
4.0168
4.0051
4.0027
3.9971
3.9829
3.9749
3.7846
3.1399
3.1355
3.1243
3.1205
3.1132
3.1092
3.1048
3.1009
3.0938
2.8525
2.8297
2.8216
OMe
1j
1.03
0.87
1.00
0.97
1.99
1.00
1.91
0.98
1.01
1.02
3.03
1.02
1.00
f1 (ppm)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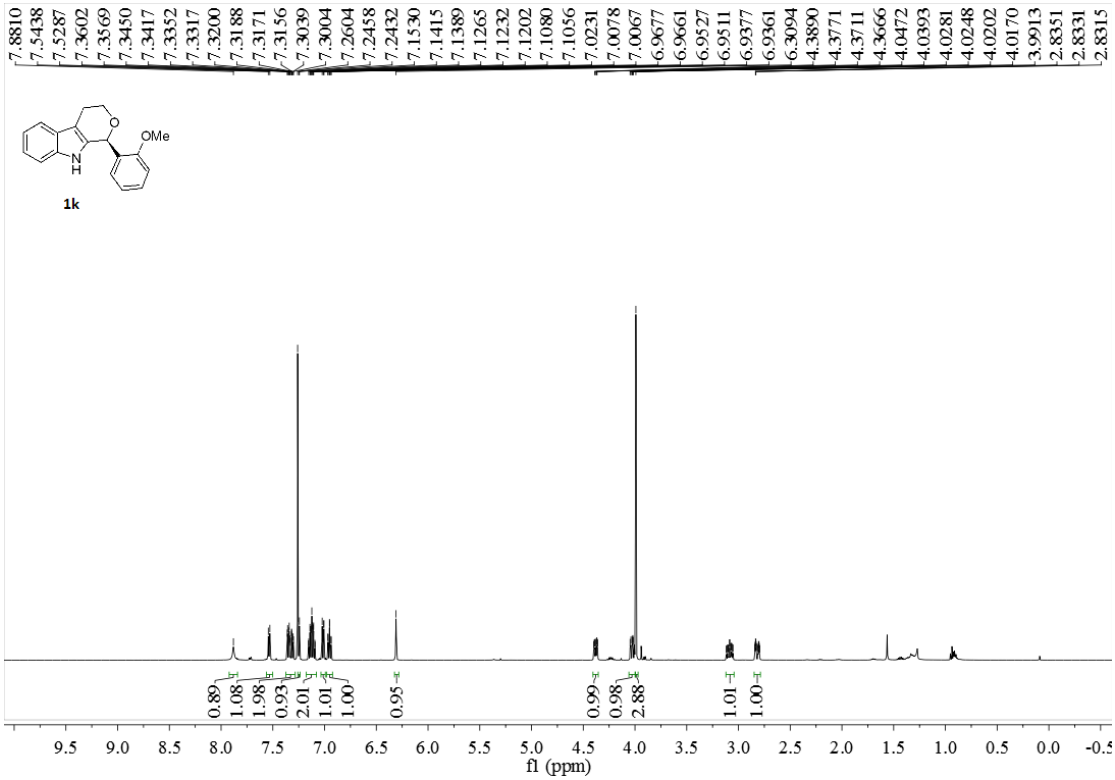
129.9316
127.1562
122.0474
120.6989
119.7403
118.4362
114.7512
113.6362
111.1488
108.7038
76.2303
65.0786
55.4009
22.3885
OMe
1j
f1 (ppm)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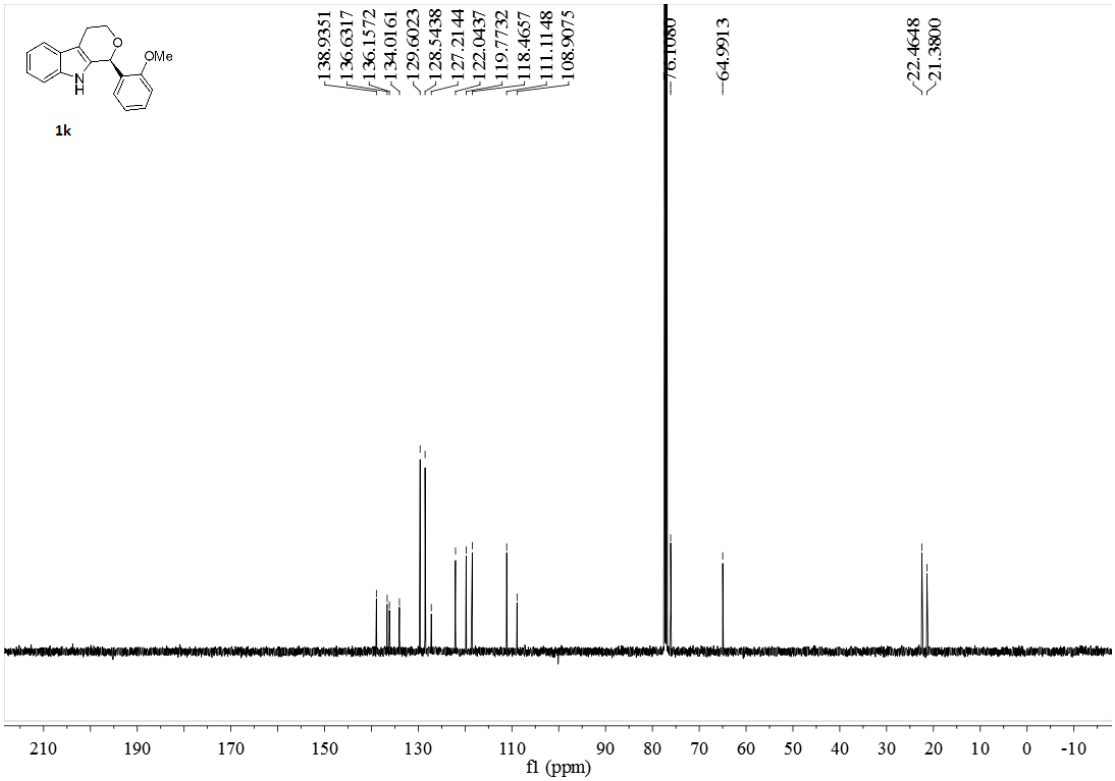
7.5438
7.5287
7.3602
7.3569
7.3450
7.3417
7.3352
7.3317
7.3200
7.3188
7.3171
7.3156
7.3039
7.3004
7.2604
7.2458
7.2432
7.1530
7.1415
7.1389
7.1265
7.1232
7.1202
7.1080
7.1056
7.0231
7.0078
7.0067
6.9677
6.9661
6.9527
6.9511
6.9377
6.9361
6.3094
4.3890
4.3771
4.3711
4.3666
4.0472
4.0393
4.0281
4.0248
4.0202
4.0170
3.9913
2.8351
2.8331
2.8315
OMe
1k
0.89
1.08
1.98
0.93
2.01
1.01
1.00
0.95
0.99
0.98
2.88
1.01
1.00
fl (ppm)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136.6317
136.1572
134.0161
129.6023
128.5438
127.2144
122.0437
119.7732
118.4657
111.1148
108.9075
76.1080
64.9913
22.4648
21.3800
OMe
1k
fl (ppm)


7.6336
7.5789
7.5645
7.1583
7.1263
6.9083
6.8719
6.8682
6.8464
6.8301
5.7373
4.3550
4.3496
4.3434
4.3380
4.3324
4.3272
3.9961
3.9901
3.9758
3.9678
3.8018
3.1296
3.1076
3.0880
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2.8416
2.8382
2.8332
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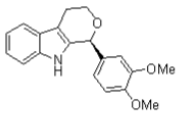
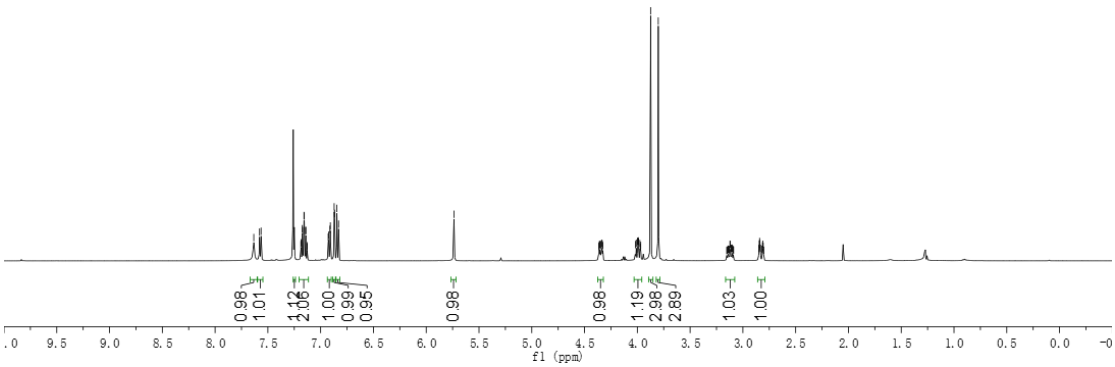
2.8141
2.8107
2.8075
2.8026


O
N
H
OMe
OMe

1l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1.12
2.06
1.00
0.99
0.95
0.98
0.98
1.19
2.98
2.89
1.03
1.00
f1 (ppm)


149.6221
149.4611
136.1372
133.9420
132.0807
127.1826
121.1162
119.4081
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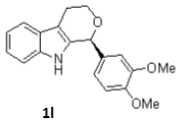
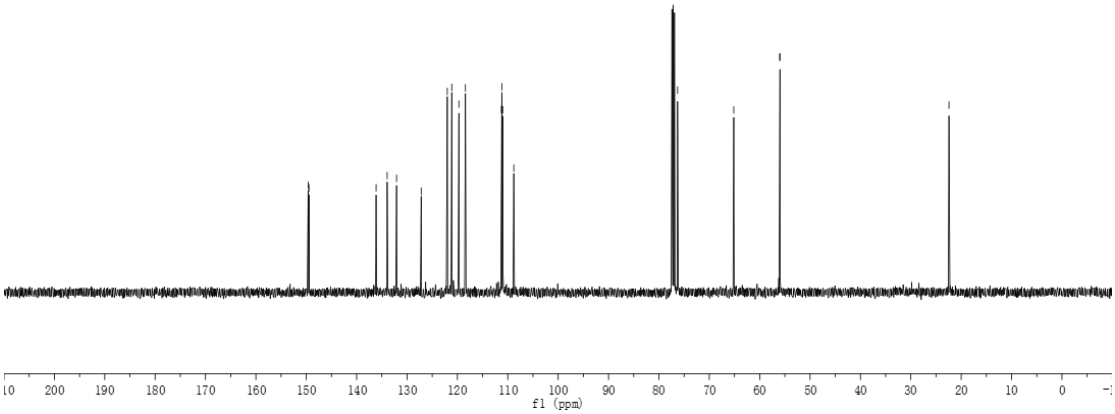
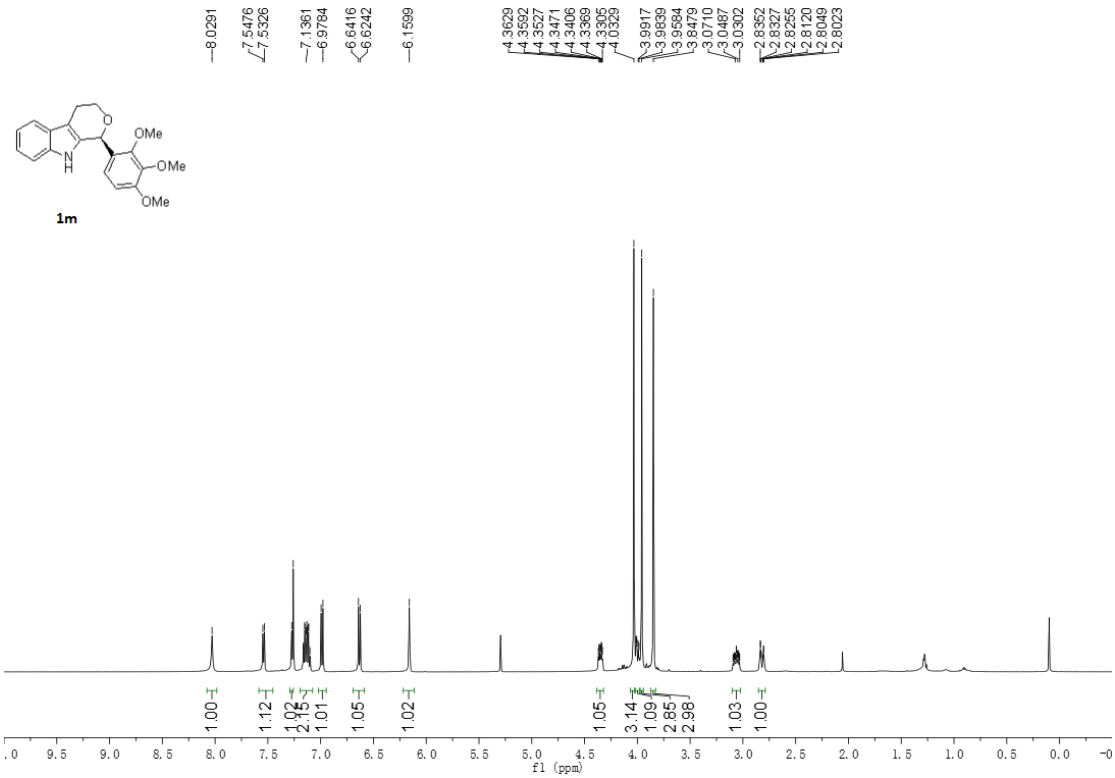
111.1823
111.0040
108.8060
76.2961
65.1408
56.0266
55.9760
22.4251


O
N
H
OMe
OMe

1l


f1 (ppm)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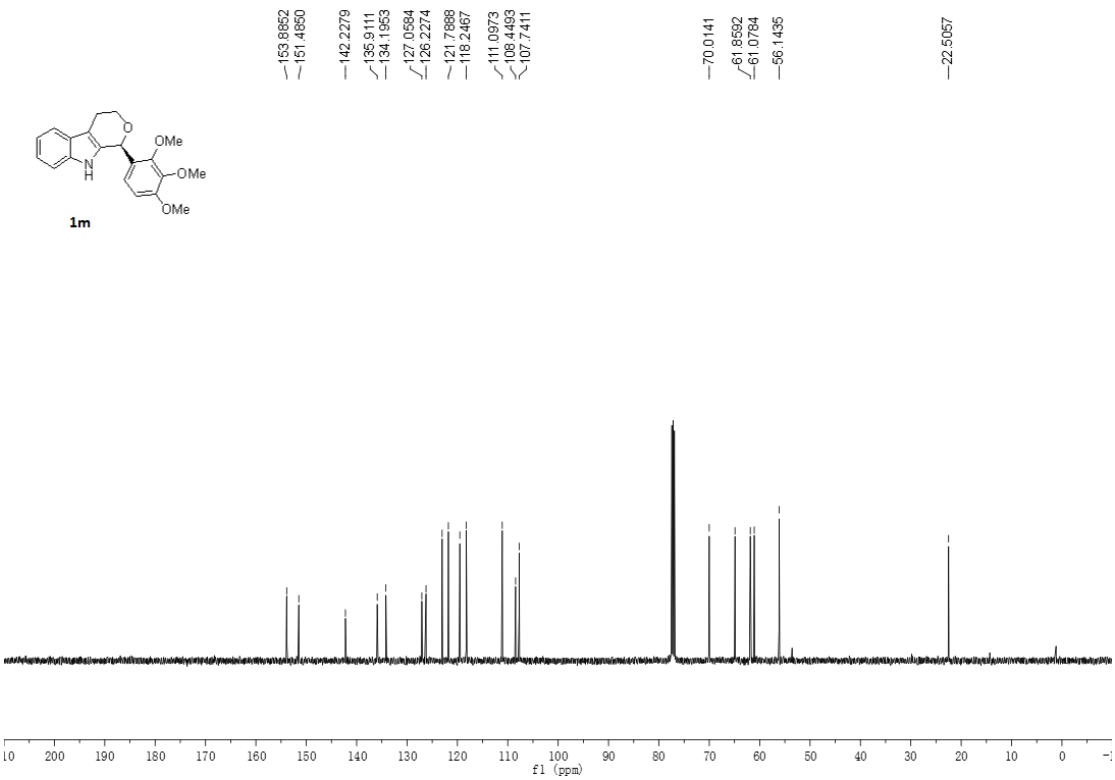
6.6242
6.1599
4.3629
4.3592
4.3527
4.3471
4.3406
4.3369
4.3305
4.0329
3.9917
3.9839
3.9584
3.8479
3.0710
3.0487
3.0302
2.8352
2.8327
2.8255
2.8120
2.8049
2.8023
OMe
OMe
OMe
1m
1.00
1.12
2.15
1.01
1.05
1.02
1.05
3.14
1.09
2.85
2.98
1.03
1.00
f1 (ppm)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151.4850
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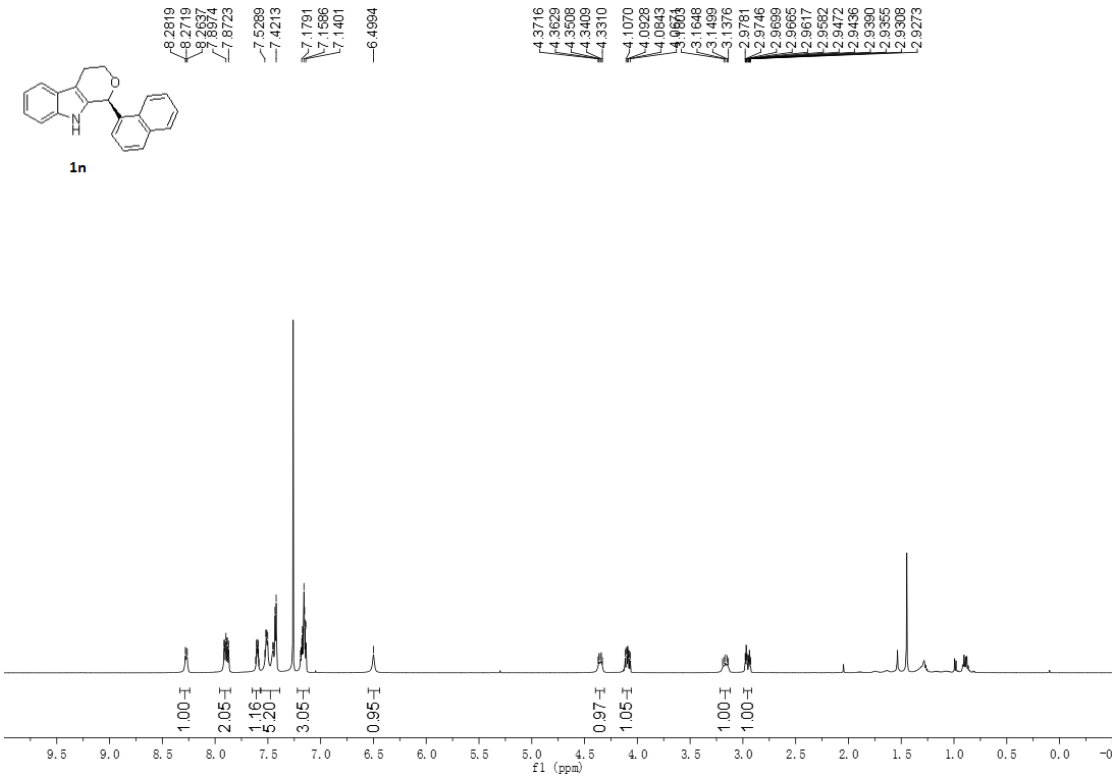
135.9111
134.1953
127.0584
126.2274
121.7888
118.2467
111.0973
108.4493
107.7411
70.0141
61.8592
61.0784
56.1435
22.5057
OMe
OMe
OMe
1m
f1 (ppm)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8.2637
7.8974
7.8723
7.5289
7.4213
7.1791
7.1586
7.1401
6.4994
4.3716
4.3629
4.3508
4.3409
4.3310
4.1070
4.0928
4.0843
3.1648
3.1499
3.1376
2.9781
2.9746
2.9699
2.9665
2.9617
2.9582
2.9472
2.9436
2.9390
2.9355
2.9308
2.9273
1n
1.00
2.05
1.16
5.20
3.05
0.95
0.97
1.05
1.00
1.00
f1 (ppm)
136.1402
135.2304
133.7506
133.7259
131.5150
129.0760
128.4218
127.5798
126.4342
126.1982
125.7679
125.0948
124.6207
120.9061
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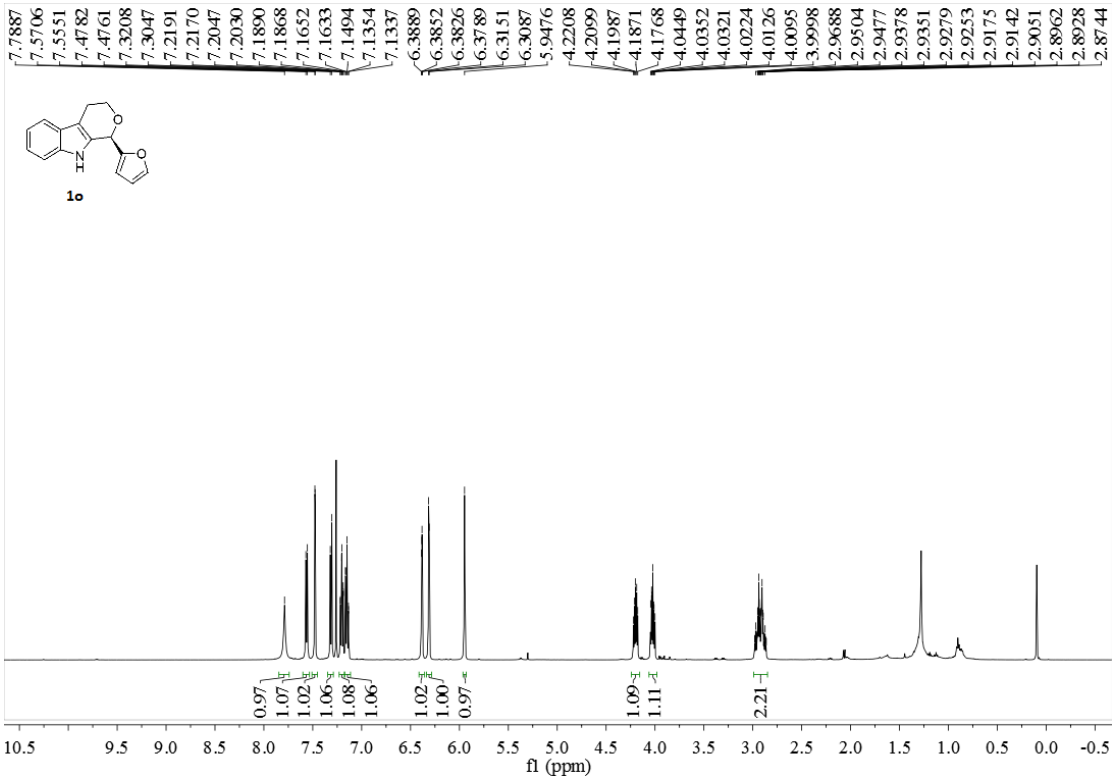
117.8052
111.2949
107.1766
72.9522
62.6569
22.0895
1n
f1 (ppm)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7.2030
7.1890
7.1868
7.1652
7.1633
7.1494
7.1354
7.1337
6.3889
6.3852
6.3826
6.3789
6.3151
6.3087
5.9476
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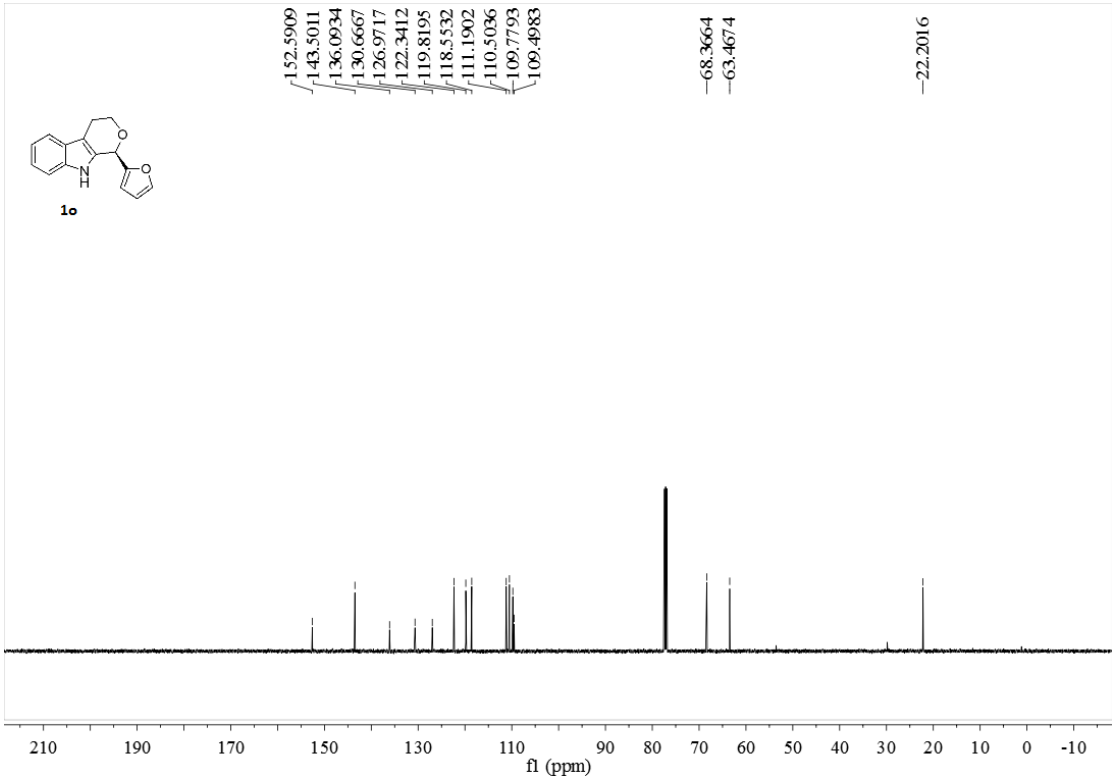
4.2099
4.1987
4.1871
4.1768
4.0449
4.0352
4.0321
4.0224
4.0126
4.0095
3.9998
2.9688
2.9504
2.9477
2.9378
2.9351
2.9279
2.9253
2.9175
2.9142
2.9051
2.8962
2.8928
2.8744
1o
0.97
1.07
1.02
1.06
1.08
1.06
1.02
1.00
0.97
1.09
1.11
2.21
f1 (ppm)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119.8195
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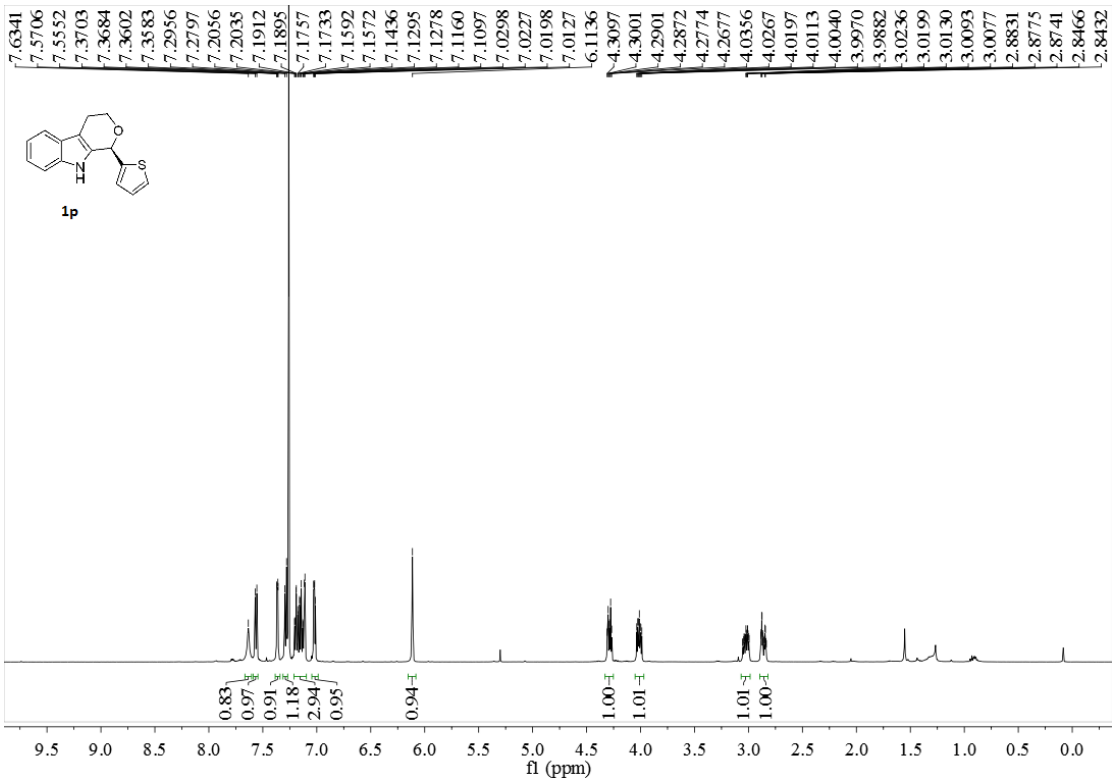
68.3664
63.4674
22.2016
1o
f1 (ppm)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7.2797
7.2056
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7.1912
7.1895
7.1757
7.1733
7.1592
7.1572
7.1436
7.1295
7.1278
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7.1097
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7.0127
6.1136
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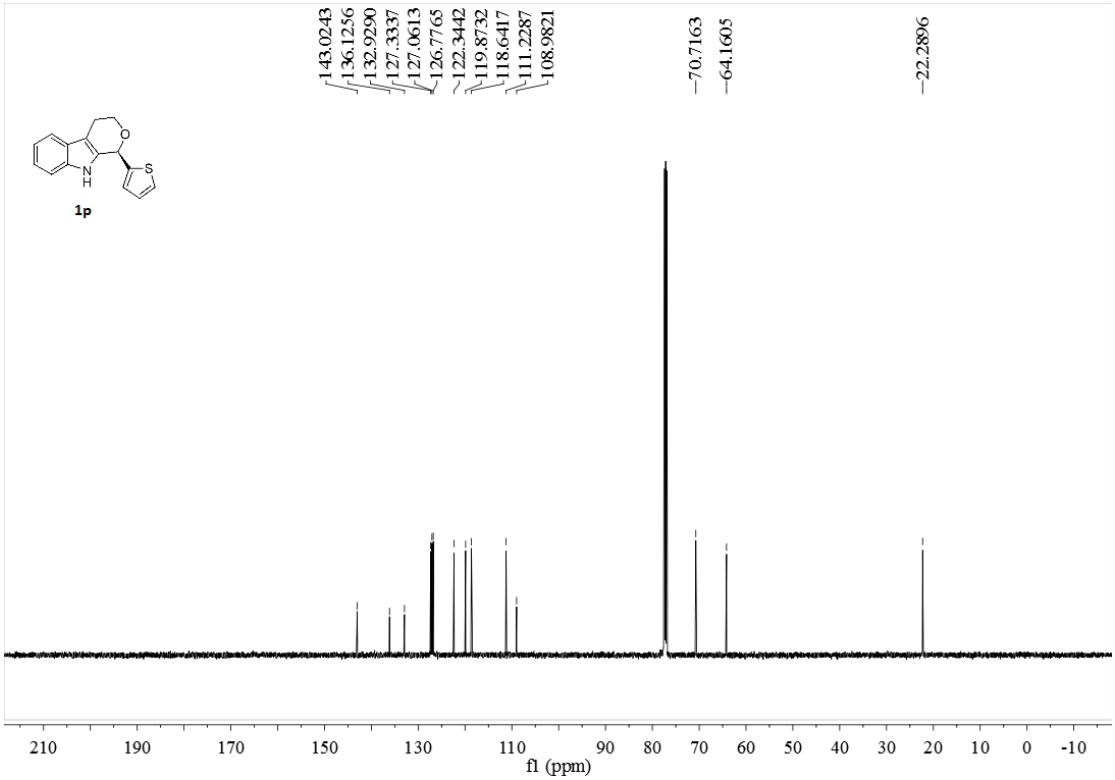
4.3001
4.2901
4.2872
4.2774
4.2677
4.0356
4.0267
4.0197
4.0113
4.0040
3.9970
3.9882
3.0236
3.0199
3.0130
3.0093
3.0077
2.8831
2.8775
2.8741
2.8466
2.8432
1p
0.83
0.97
0.91
1.18
2.94
0.95
0.94
1.00
1.01
1.01
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)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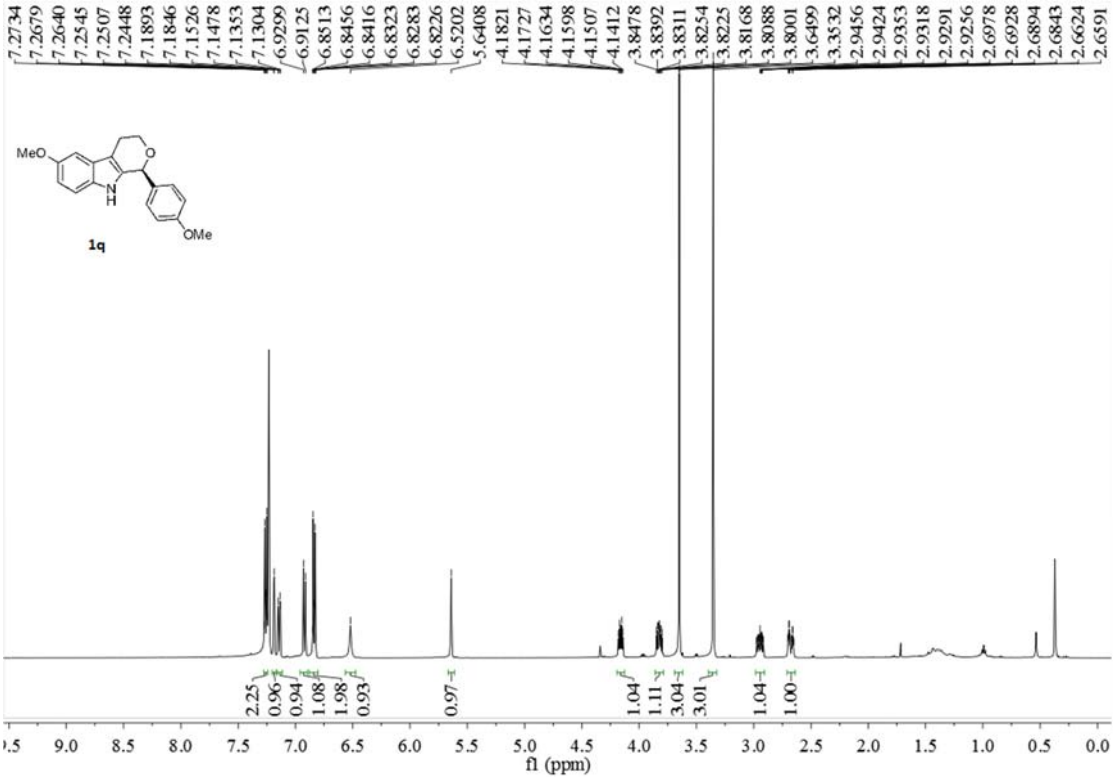
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6.5202
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4.1507
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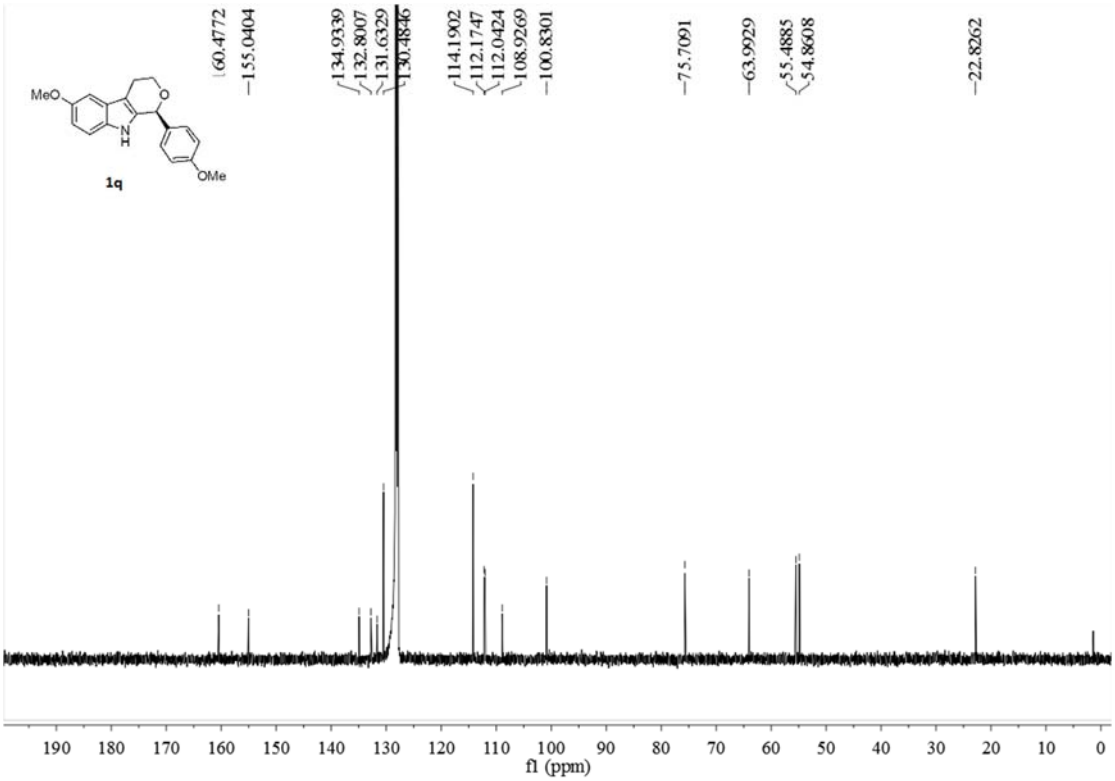
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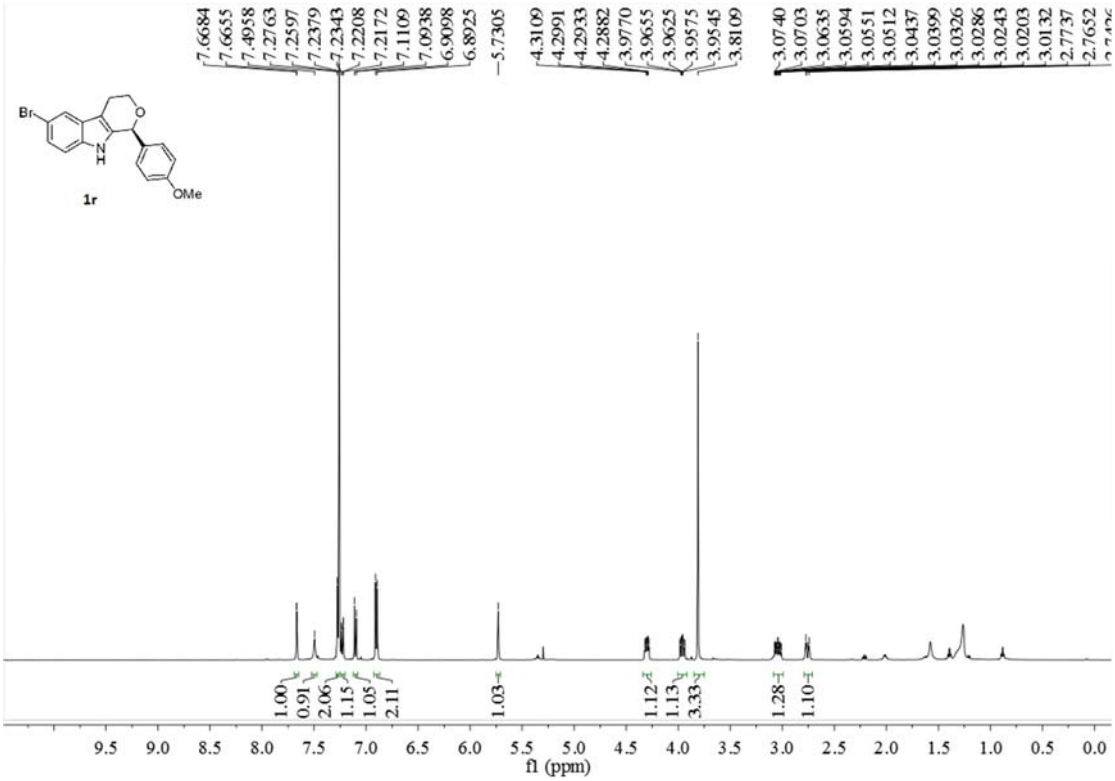
f1 (ppm)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O
H
N
OMe
1r
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0.91
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1.15
1.05
2.11
1.03
1.12
1.13
3.33
1.28
1.10
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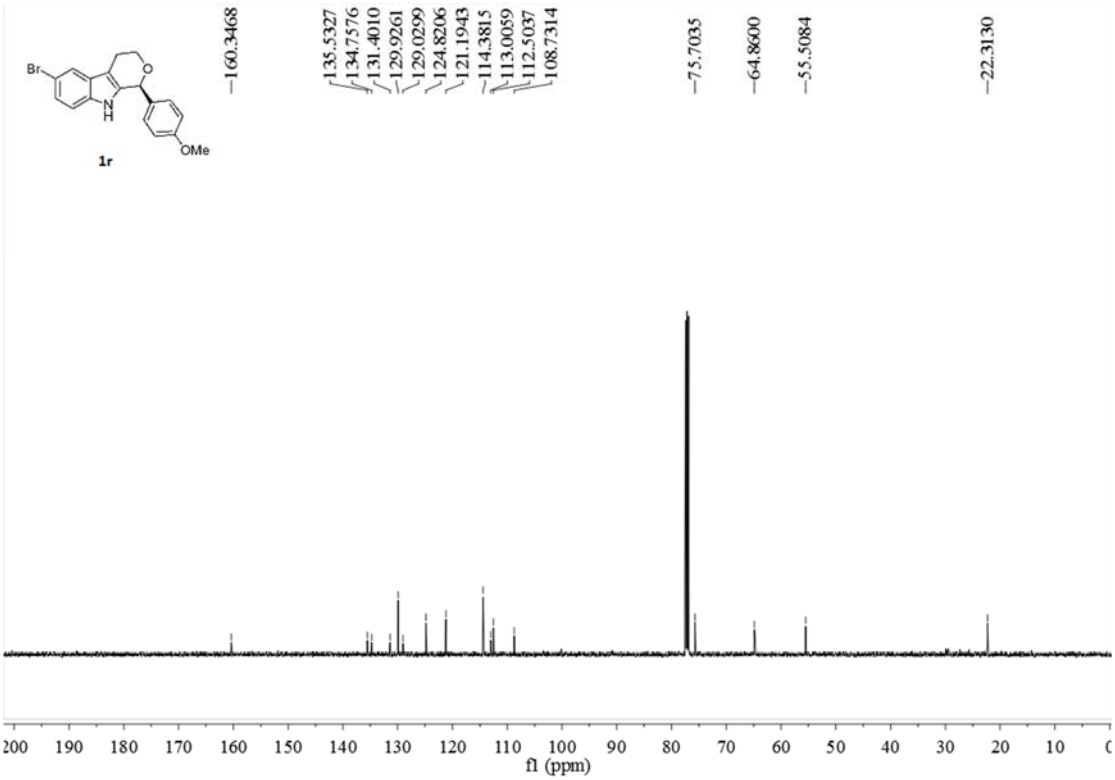
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H
N
OMe
1r
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f1 (ppm)


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NH
Me

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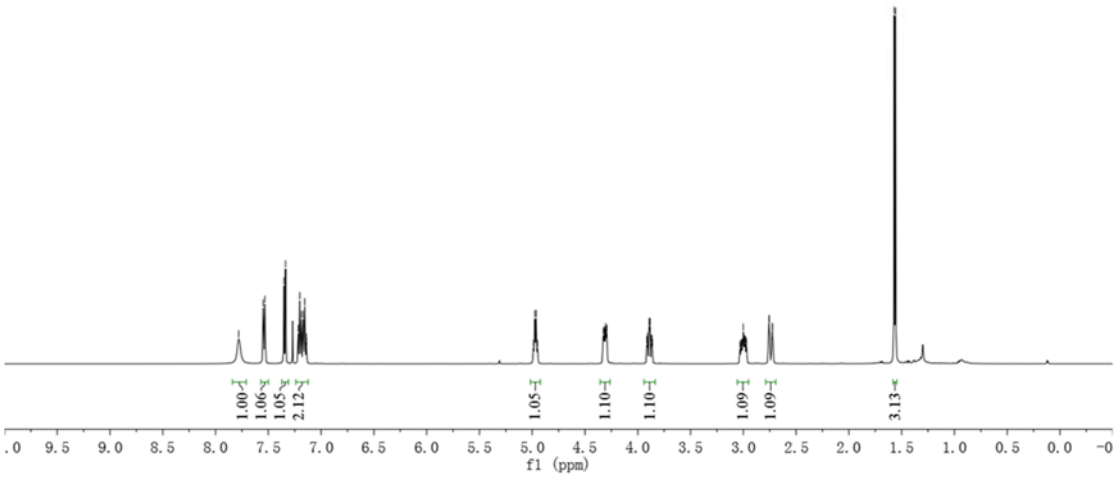
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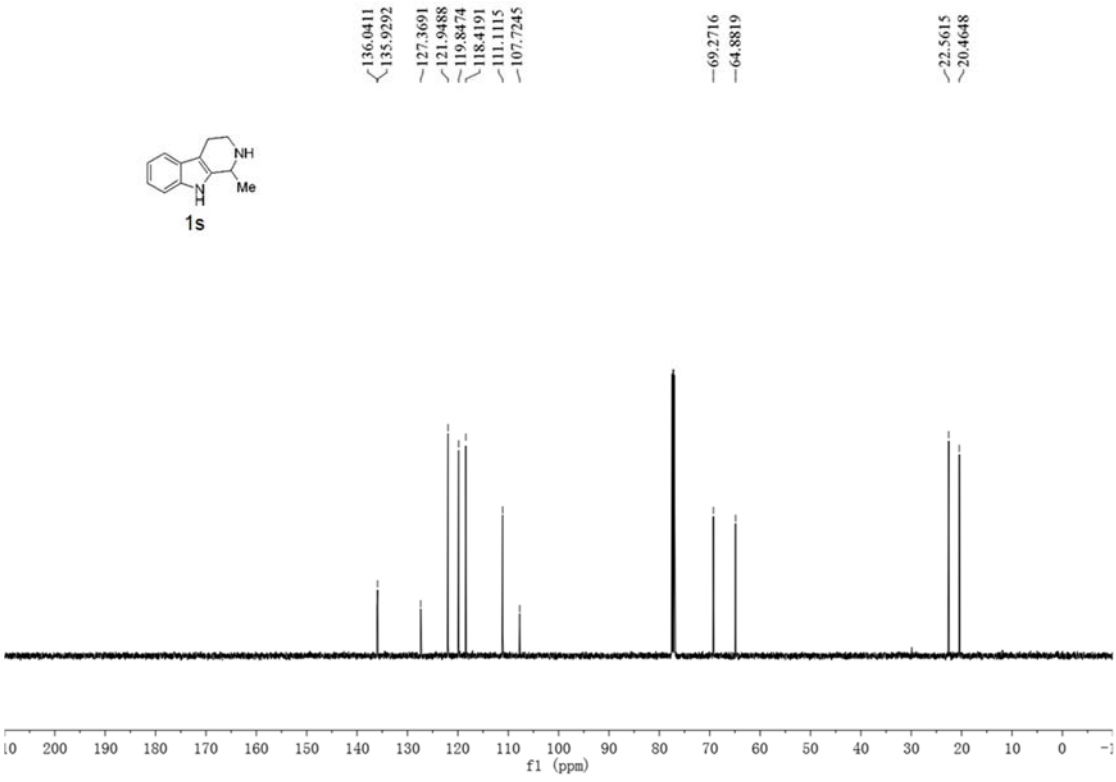
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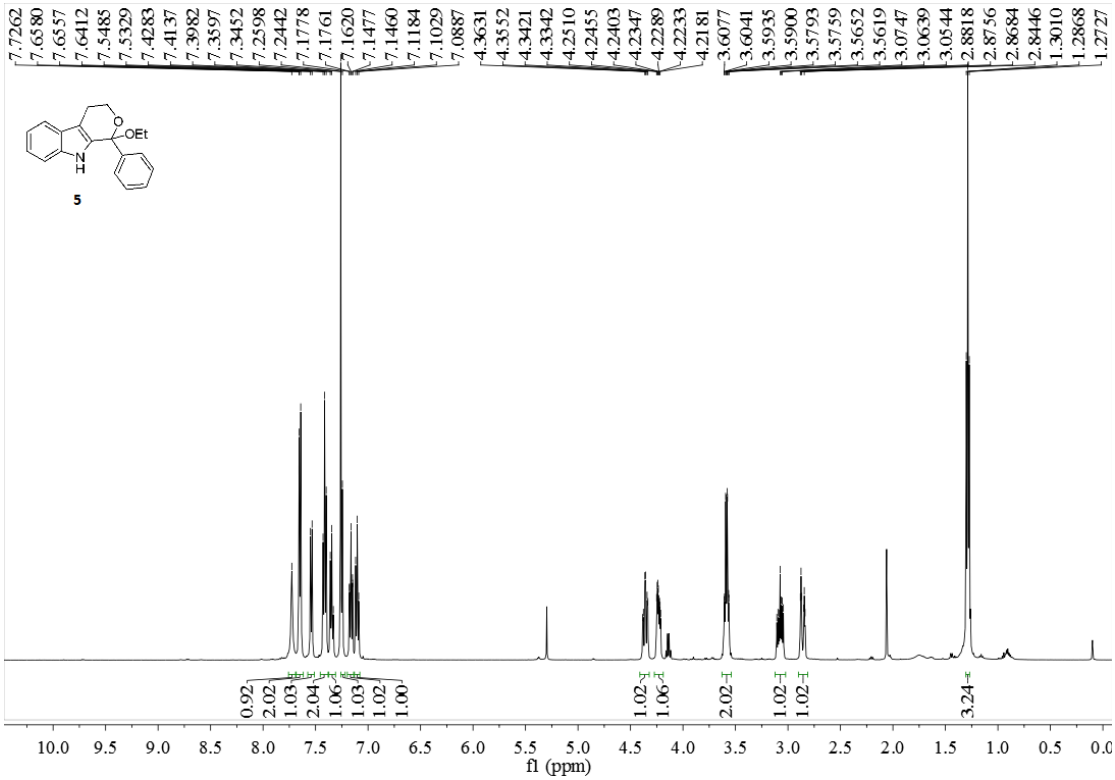
f1 (ppm)

1s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OEt
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1.03
2.04
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1.00
1.02
1.06
2.02
1.02
1.02
3.24
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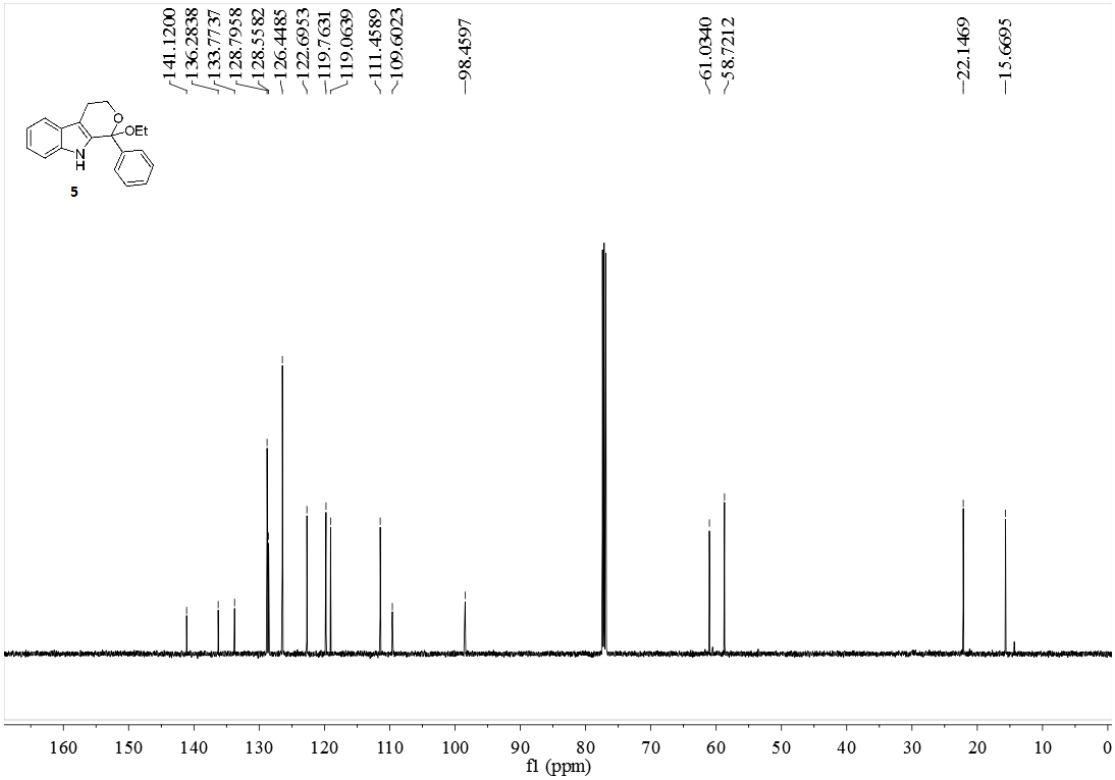
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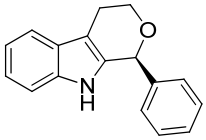
f1 (ppm)

HPLC data



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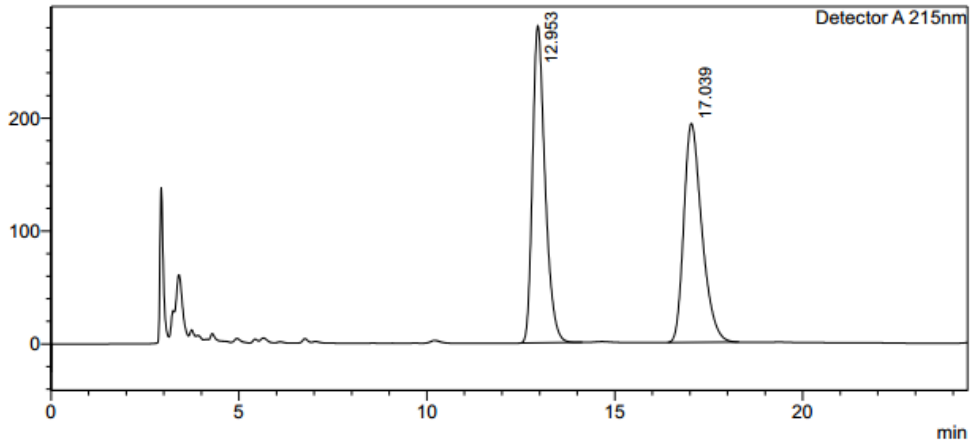


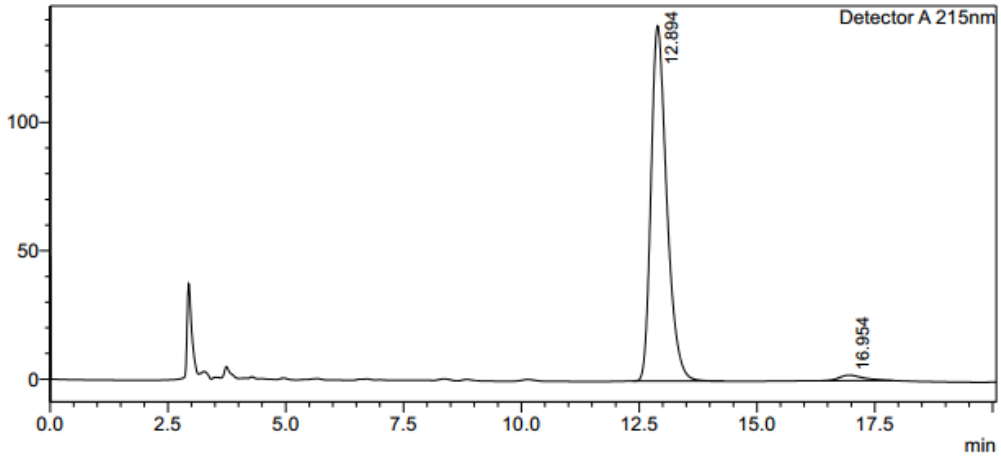
<Peak Table>

Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		12.953	6543307	50.257	280776		M
2		17.039	6476390	49.743	193781		M
Total			13019696	100.000	474557		

<Chromatogram>

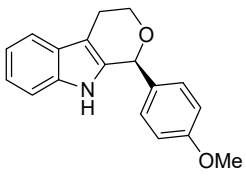
mV

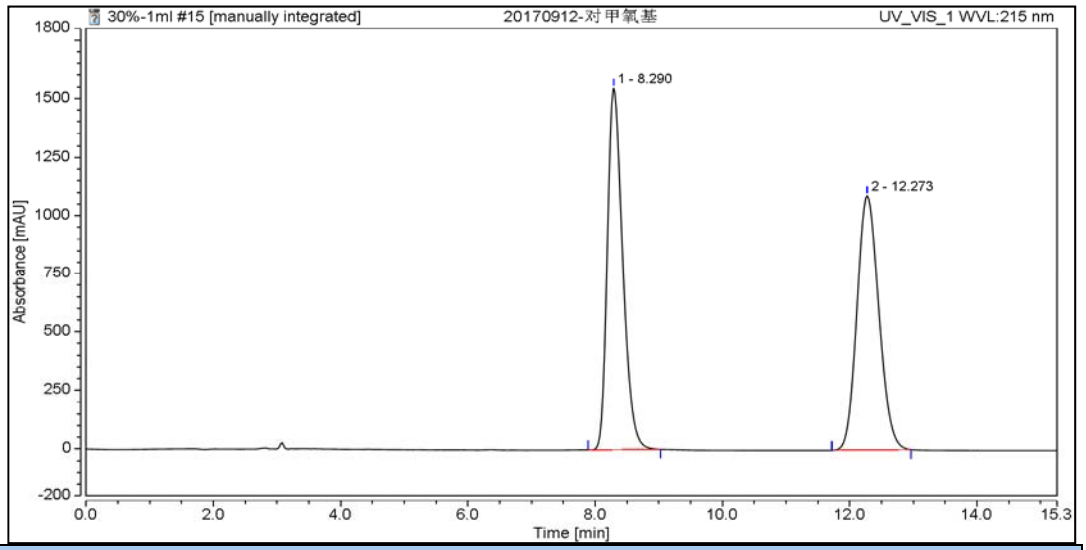


<Peak Table>

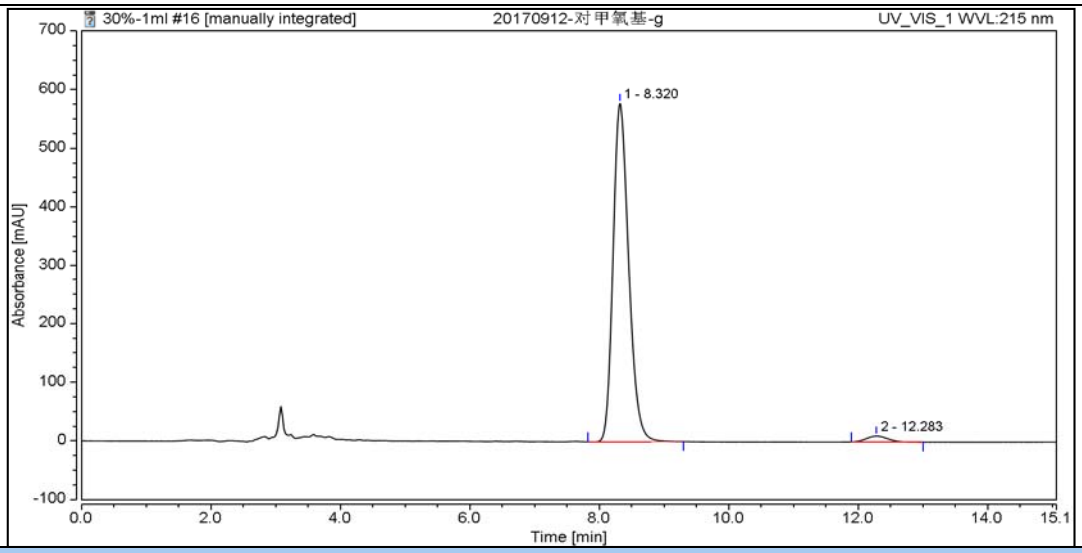
Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		12.894	3216533	97.638	138389		M
2		16.954	77810	2.362	2140		M
Total			3294343	100.000	140529		

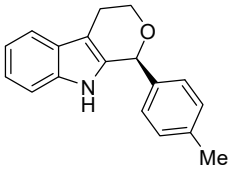


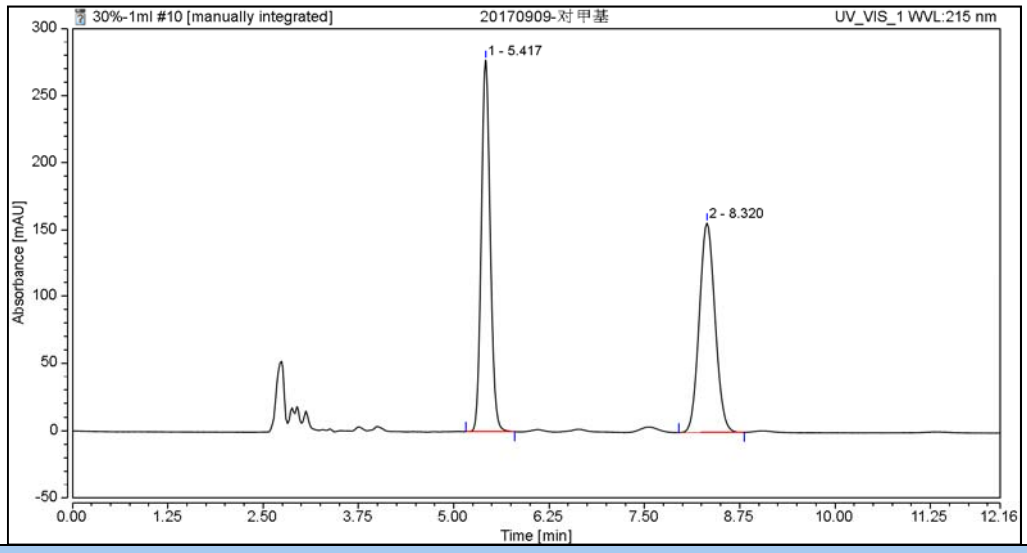


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.290	432.794	49.97	n.a.
2		12.273	433.308	50.03	n.a.
Total:			**866.103**	**100.00**	

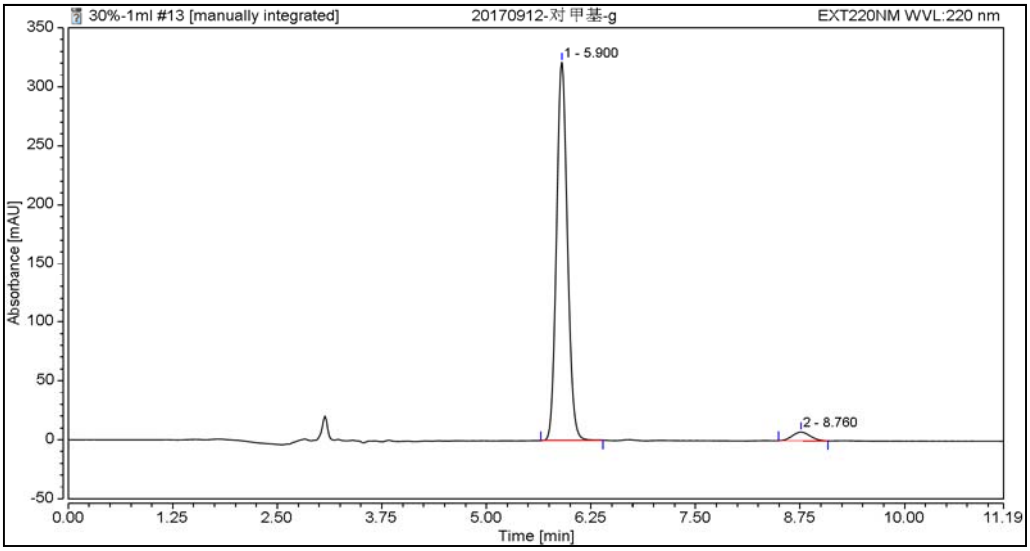


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.320	161.376	97.67	n.a.
2		12.283	3.847	2.33	n.a.
Total:			**165.223**	**100.00**	

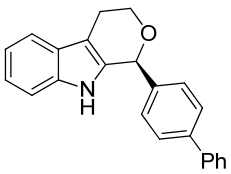




Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		5.417	37.532	50.08	n.a.
2		8.320	37.414	49.92	n.a.
Total:			**74.946**	**100.00**	



Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		5.900	48.491	96.42	n.a.
2		8.760	1.798	3.58	n.a.
Total:			**50.289**	**100.00**	



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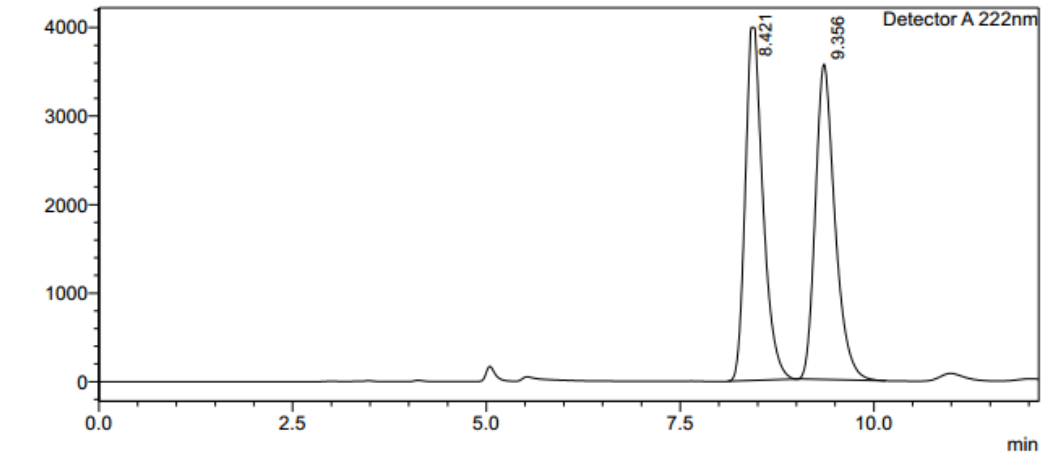
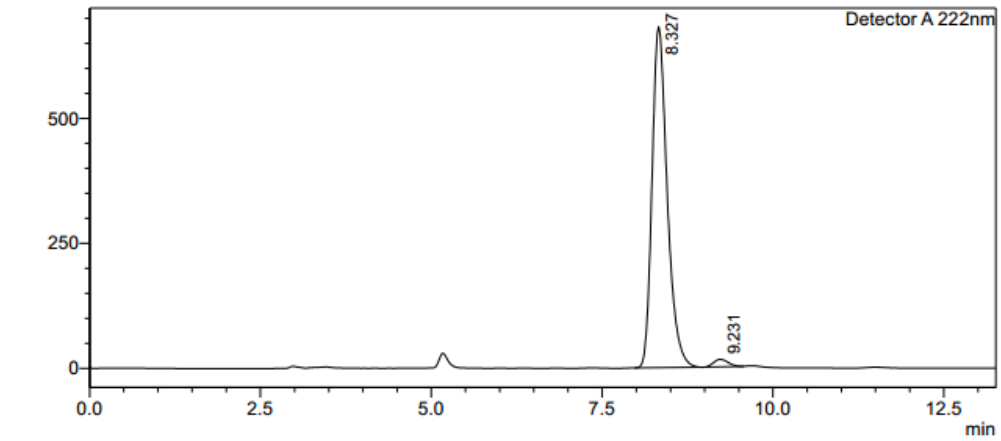


<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		8.421	63362099	50.255	3986372		M
2		9.356	62718785	49.745	3557627		M
Total			126080885	100.000	7543999		

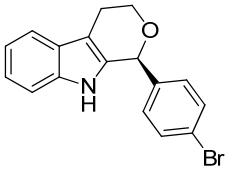
<Chromatogram>



<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		8.327	10540500	97.936	680600		M
2		9.231	222186	2.064	14910		M
Total			10762686	100.000	695510		



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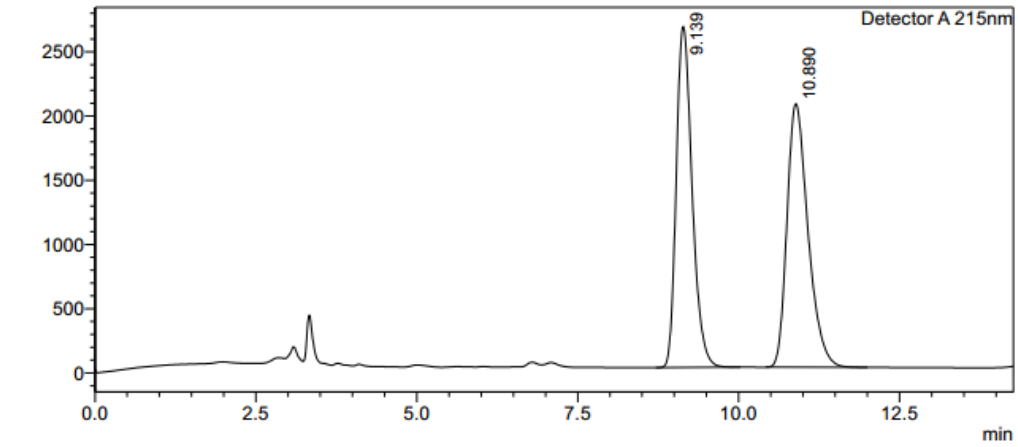
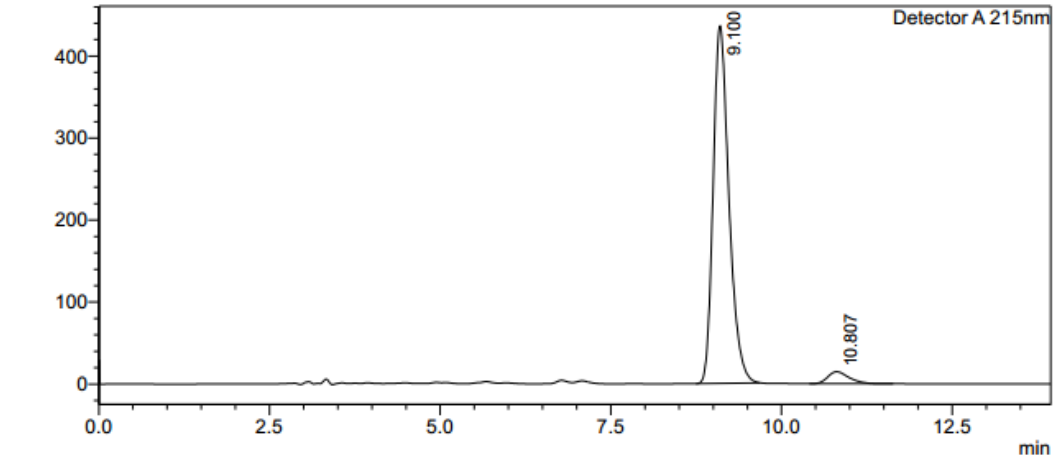


<Peak Table>

Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		9.139	45558130	49.372	2652674		M
2		10.890	46717254	50.628	2051583		M
Total			92275384	100.000	4704258		

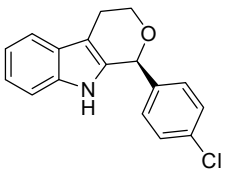
<Chromatogram>

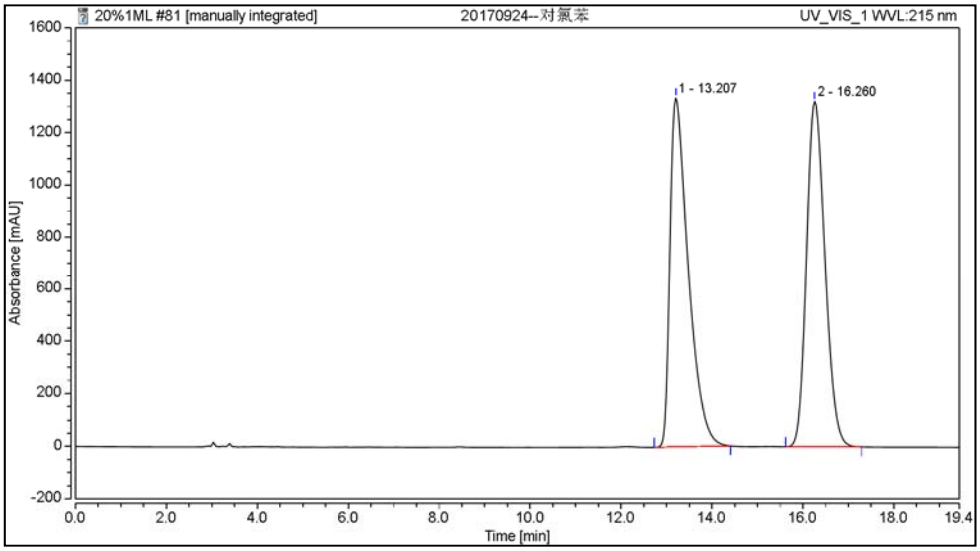


<Peak Table>

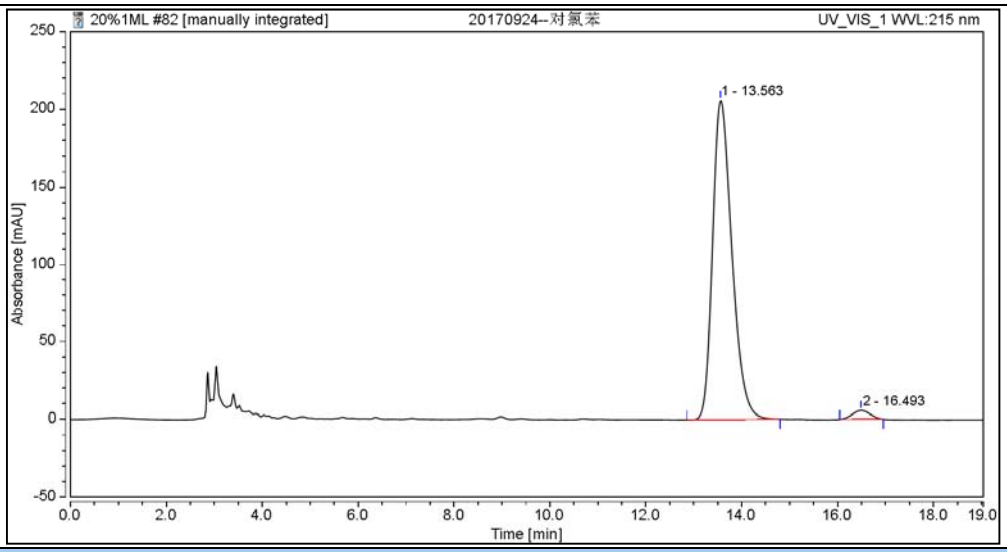
Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		9.100	7036217	95.703	435503		M
2		10.807	315908	4.297	14663		M
Total			7352125	100.000	450166		

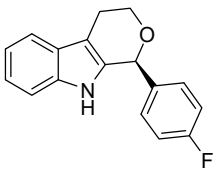


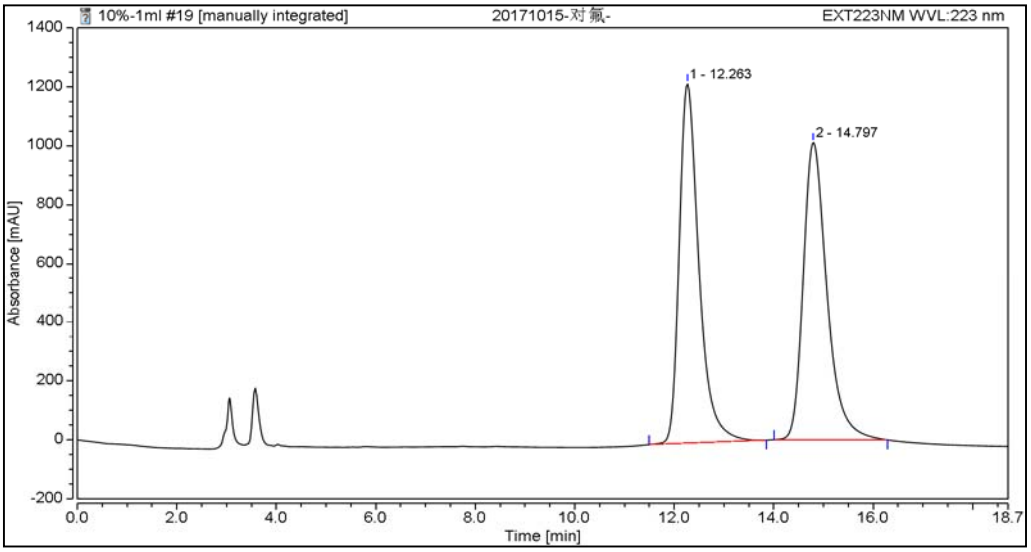


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		13.207	621.354	50.06	n.a.
2		16.260	619.892	49.94	n.a.
Total:			**1241.246**	**100.00**	

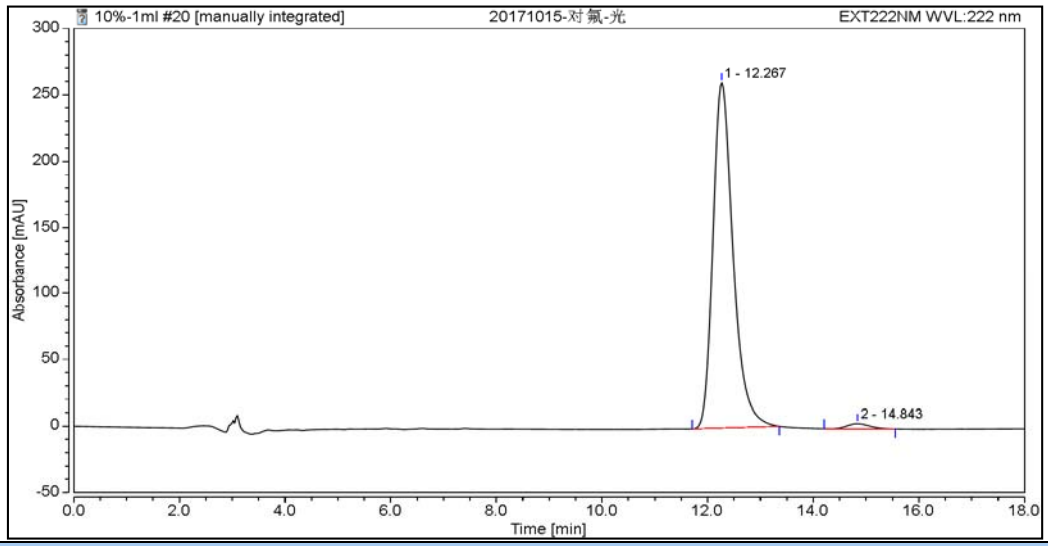


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		13.563	96.108	97.53	n.a.
2		16.493	2.438	2.47	n.a.
Total:			**98.546**	**100.00**	

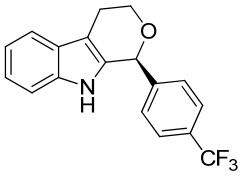




Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		12.263	560.505	50.09	n.a.
2		14.797	558.451	49.91	n.a.
Total:			**1118.956**	**100.00**	

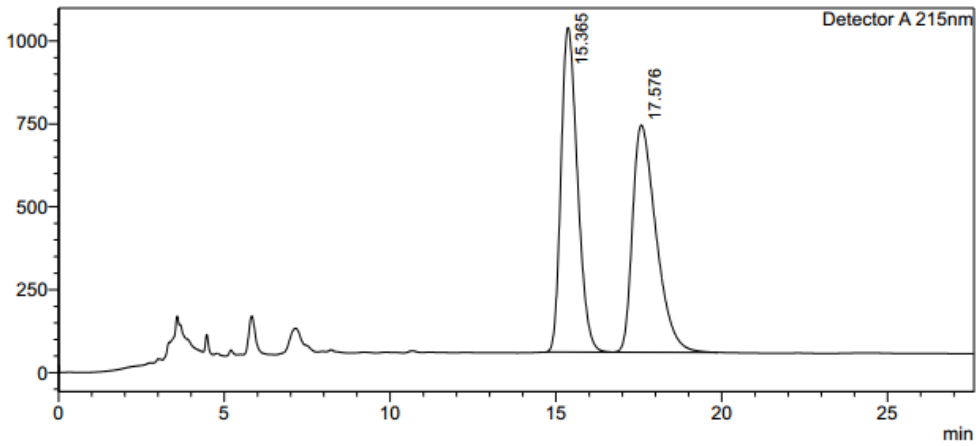


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		12.267	114.959	98.37	n.a.
2		14.843	1.903	1.63	n.a.
Total:			**116.863**	**100.00**	



<Chromatogram>

mV



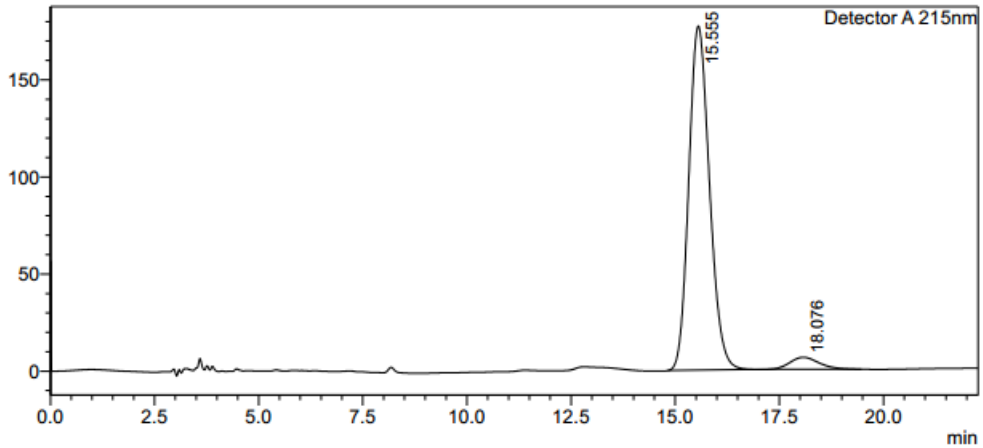
<Peak Table>

Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		15.365	33758532	49.930	978664		M
2		17.576	33853855	50.070	684755		M
Total			67612387	100.000	1663419		

<Chromatogram>

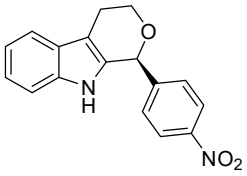
mV

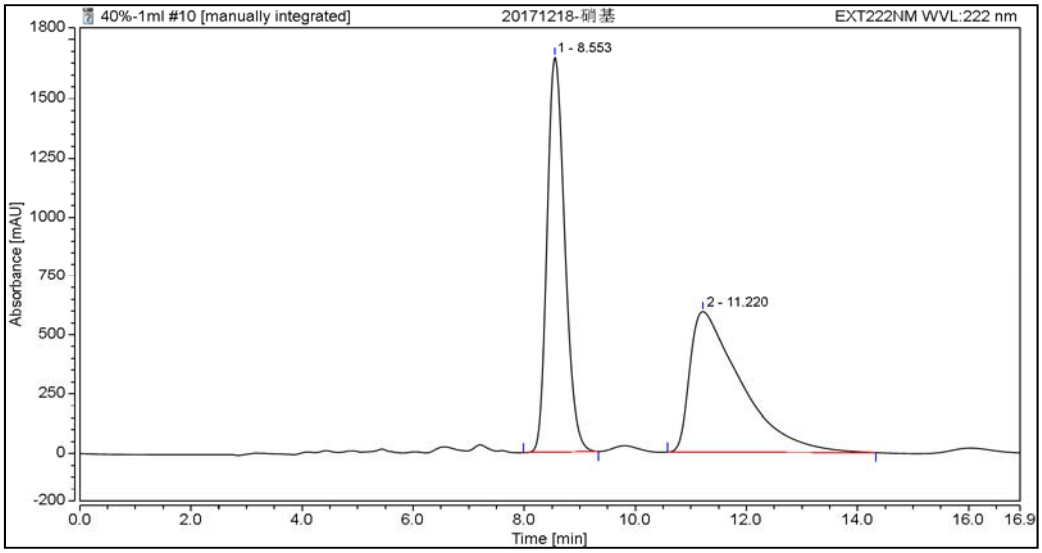


<Peak Table>

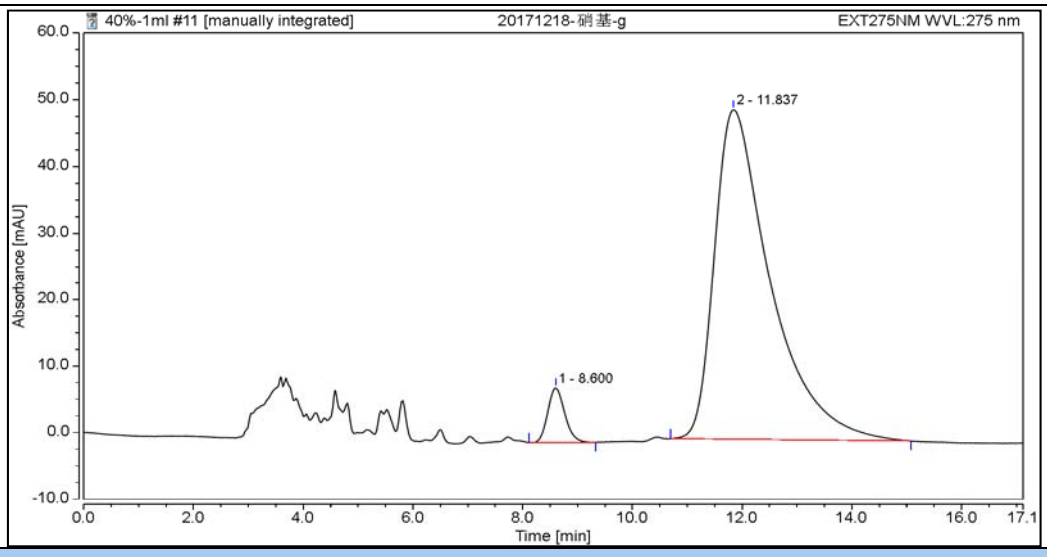
Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		15.555	6129126	95.325	177180		M
2		18.076	300590	4.675	6149		M
Total			6429717	100.000	183328		

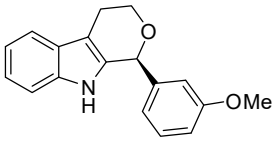


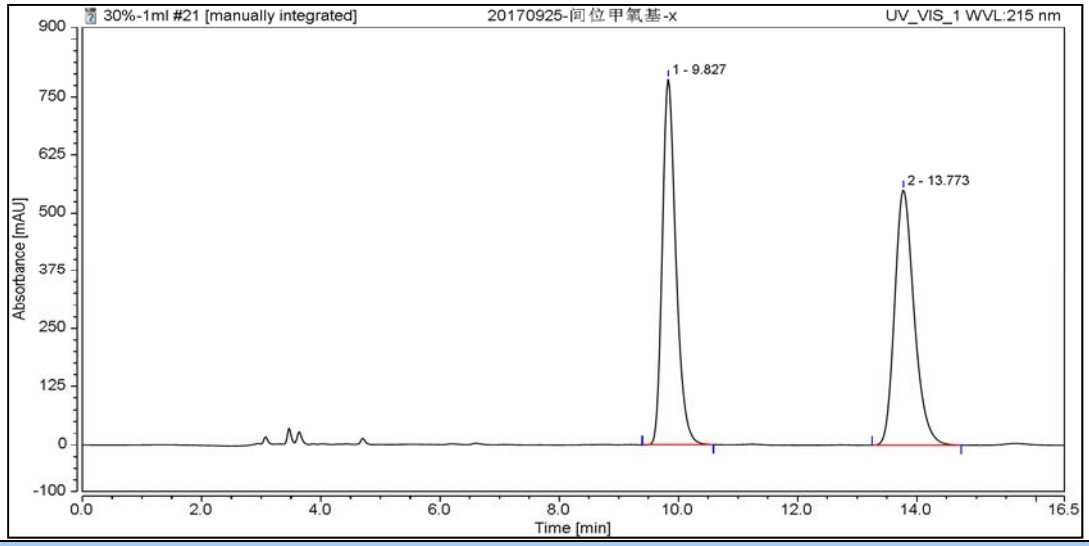


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.553	616.234	49.34	n.a.
2		11.220	632.792	50.66	n.a.
Total:			**1249.026**	**100.00**	

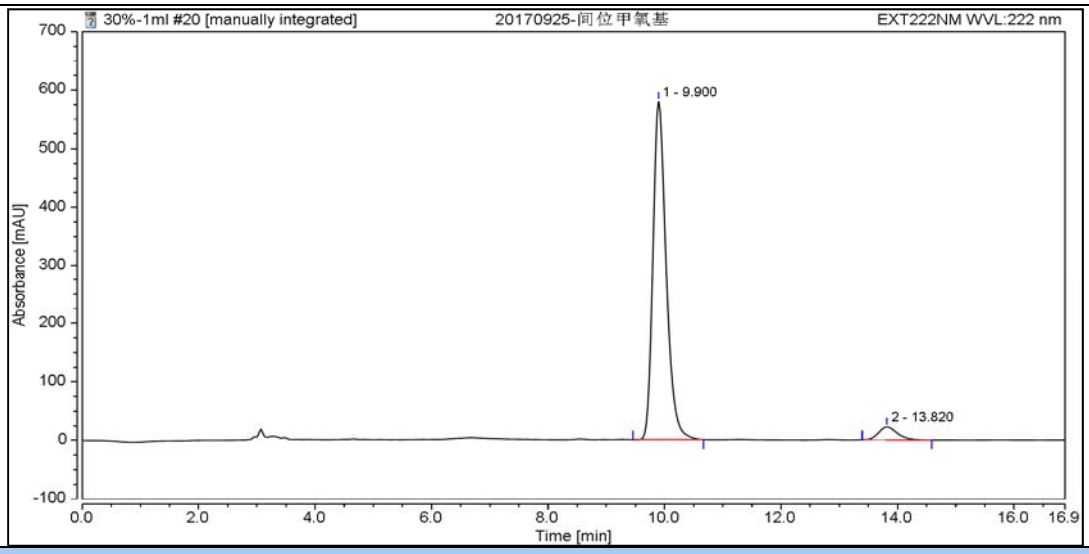


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.600	2.925	4.76	n.a.
2		11.837	58.540	95.24	n.a.
Total:			**61.465**	**100.00**	

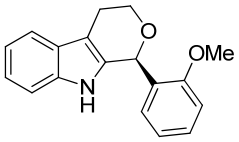




Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		9.827	207.708	49.97	n.a.
2		13.773	207.920	50.03	n.a.
Total:			**415.628**	**100.00**	

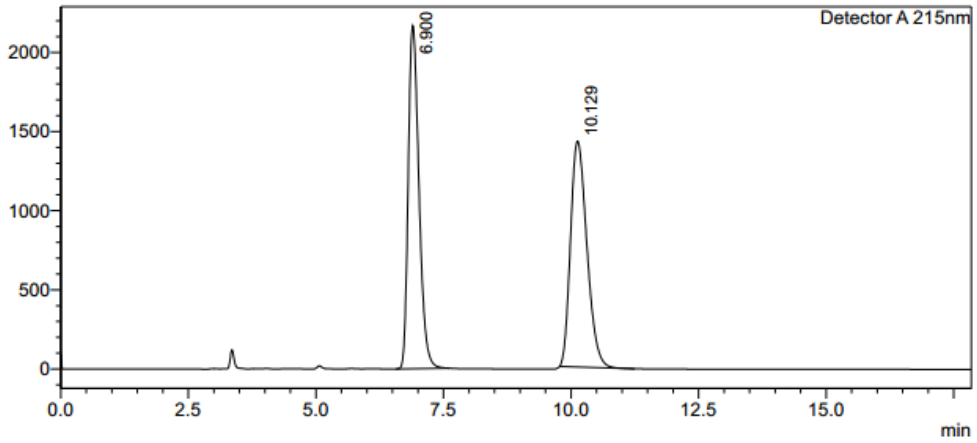


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		9.900	152.269	94.83	n.a.
2		13.820	8.294	5.17	n.a.
Total:			**160.563**	**100.00**	



<Chromatogram>

mV



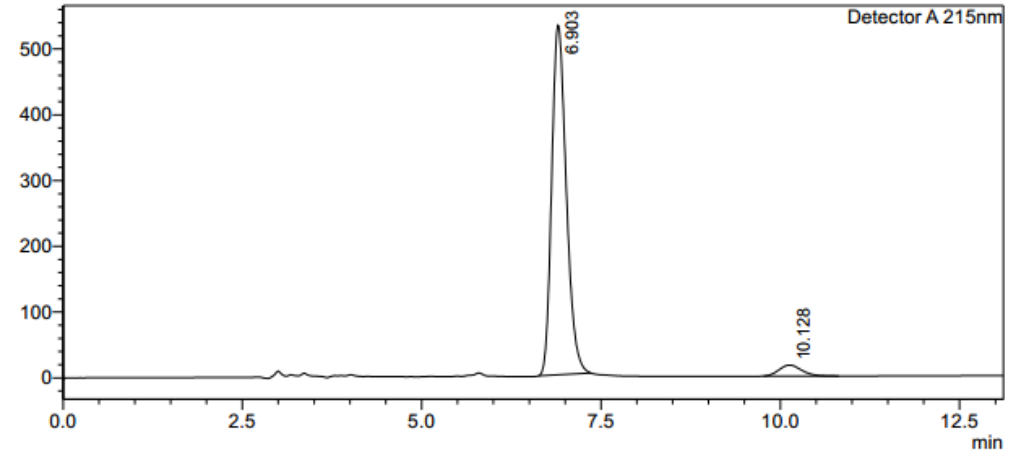
<Peak Table>

Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		6.900	31676338	49.874	2165593		M
2		10.129	31836849	50.126	1426718		M
Total			63513187	100.000	3592311		

<Chromatogram>

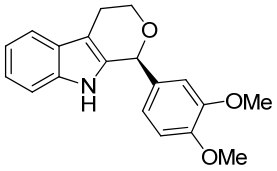
mV



<Peak Table>

Detector A 215nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		6.903	7521699	95.375	531451		M
2		10.128	364782	4.625	16619		M
Total			7886481	100.000	548070		



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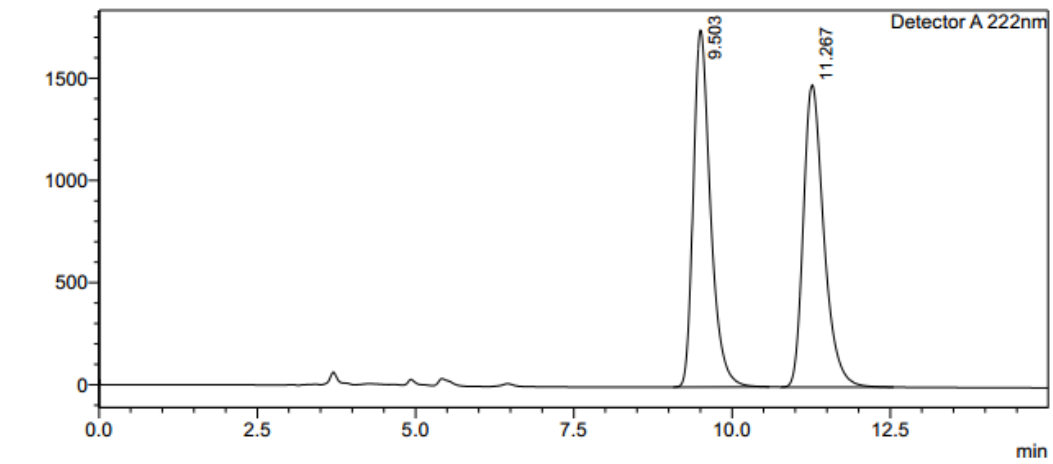
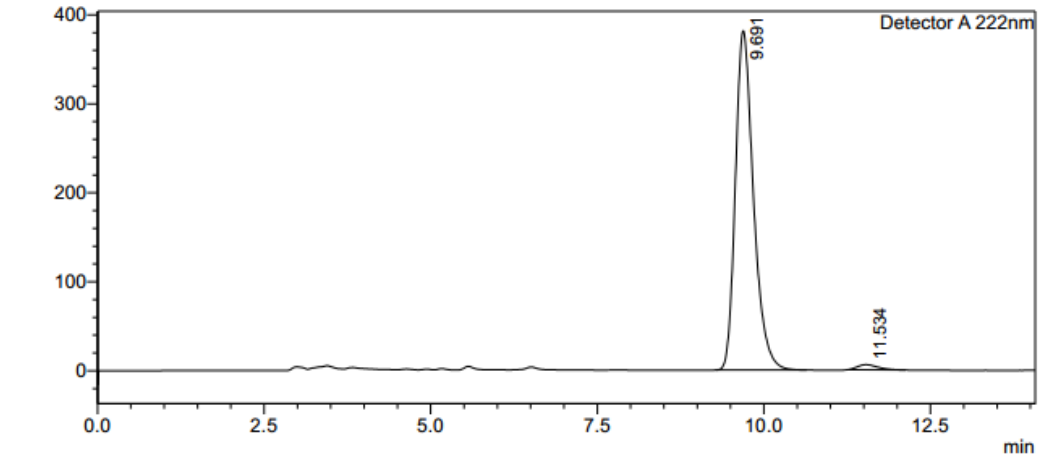


<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		9.503	32983524	49.853	1745112		M
2		11.267	33178644	50.147	1477386		M
Total			66162169	100.000	3222498		

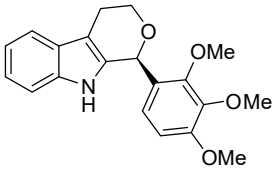
<Chromatogram>

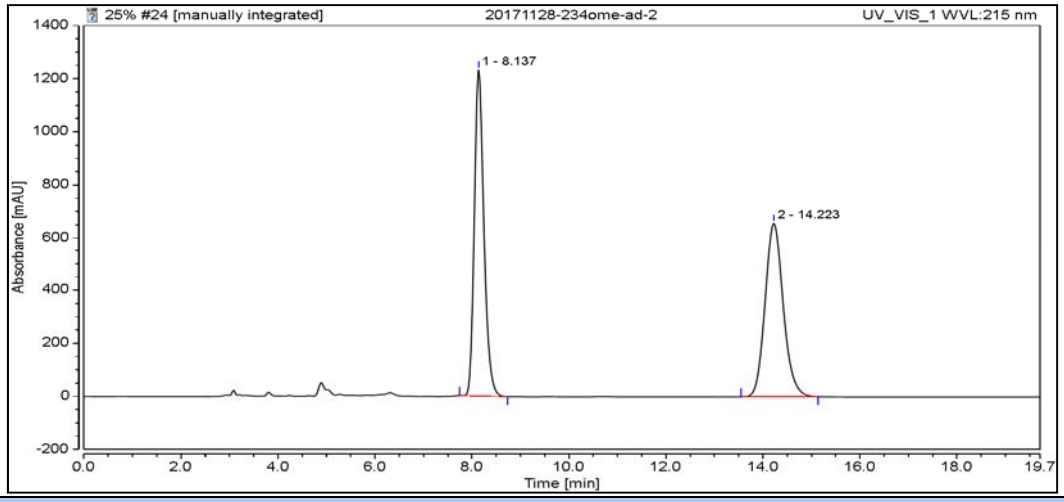


<Peak Table>

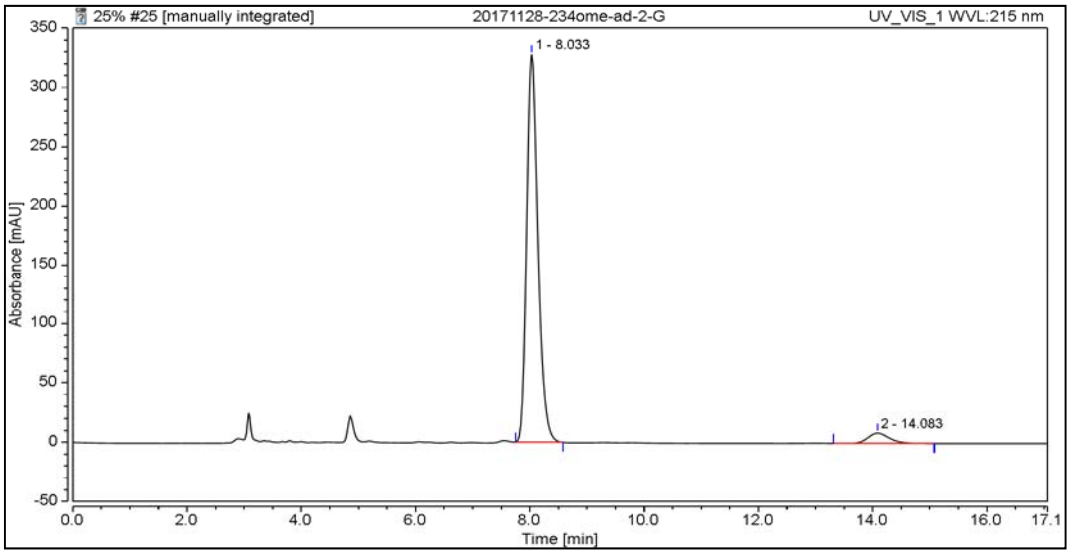
Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		9.691	7205524	98.272	381076		M
2		11.534	126709	1.728	5857		M
Total			7332234	100.000	386933		

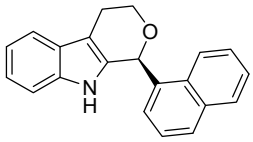


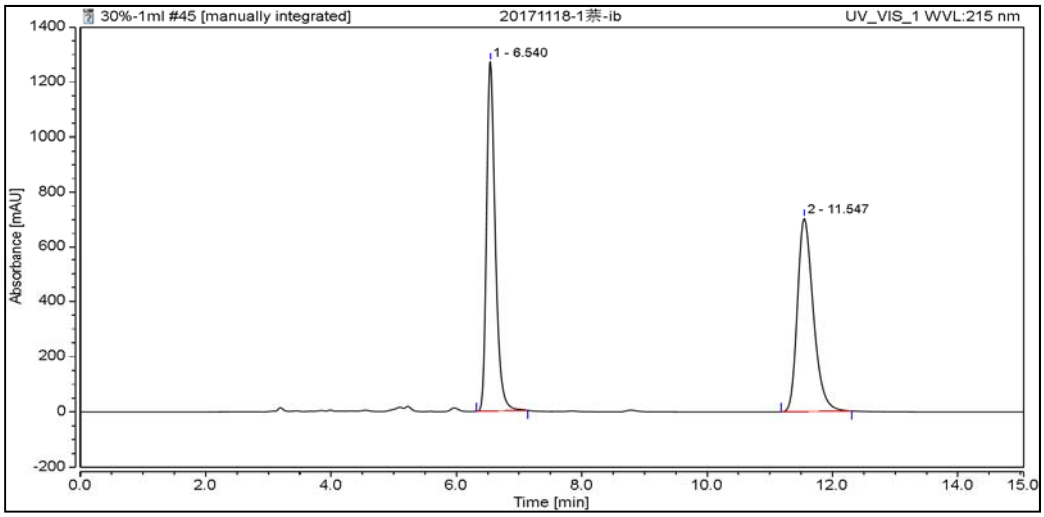


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.137	281.487	49.76	n.a.
2		14.223	284.257	50.24	n.a.
Total:			**565.744**	**100.00**	

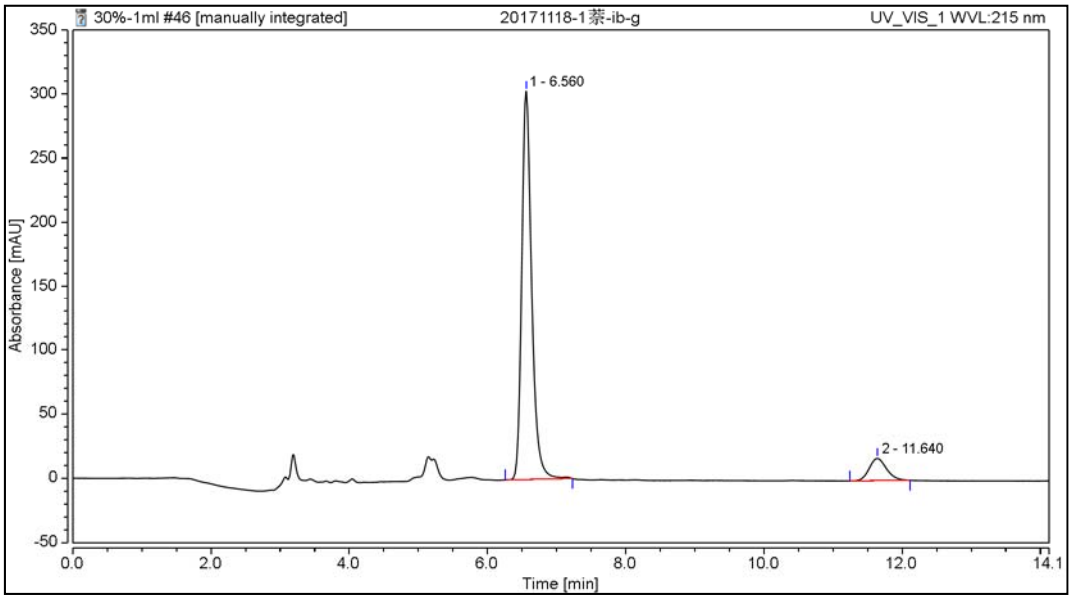


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		8.033	74.576	95.12	n.a.
2		14.083	3.822	4.88	n.a.
Total:			**78.398**	**100.00**	

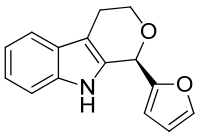




Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		6.540	204.725	49.87	n.a.
2		11.547	205.781	50.13	n.a.
Total:			**410.506**	**100.00**	

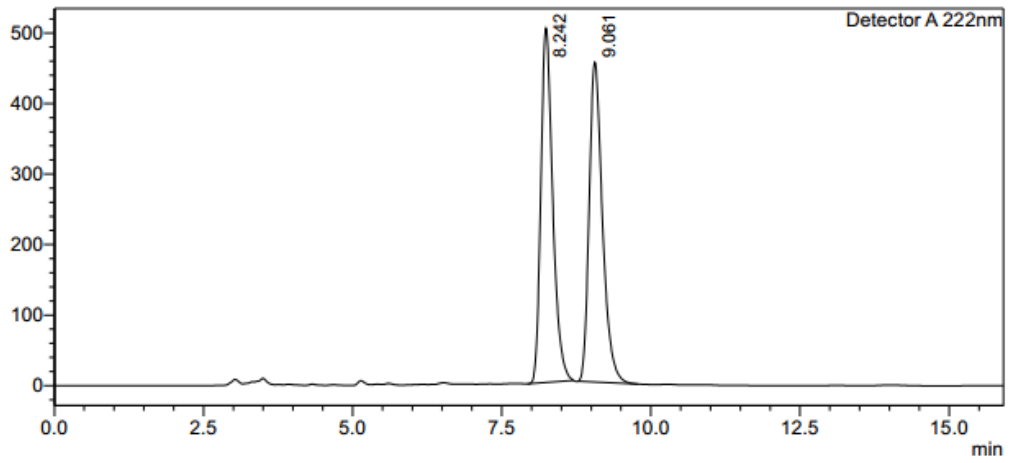


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		6.560	50.344	90.94	n.a.
2		11.640	5.017	9.06	n.a.
Total:			**55.361**	**100.00**	



<Chromatogram>

mV



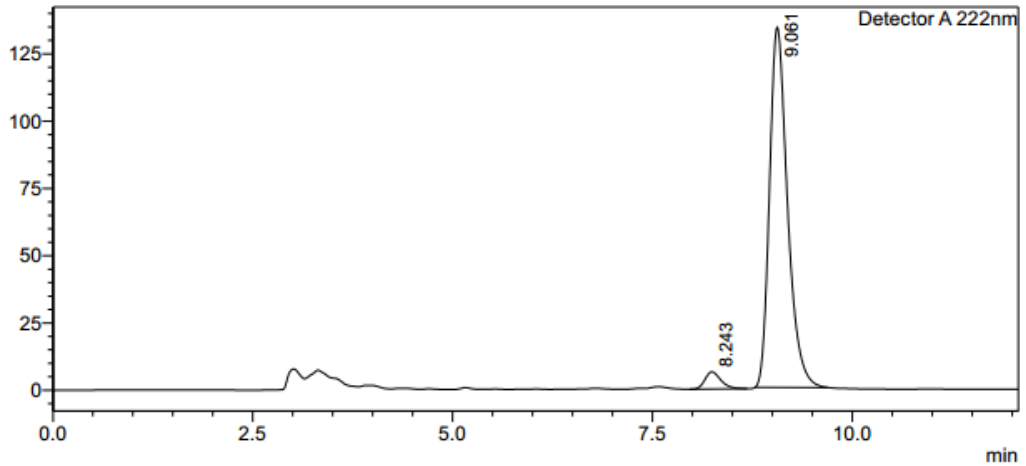
<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		8.242	6944739	49.695	501895		M
2		9.061	7030028	50.305	453404		M
Total			13974767	100.000	955299		

<Chromatogram>

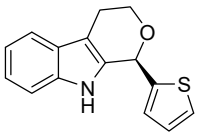
mV

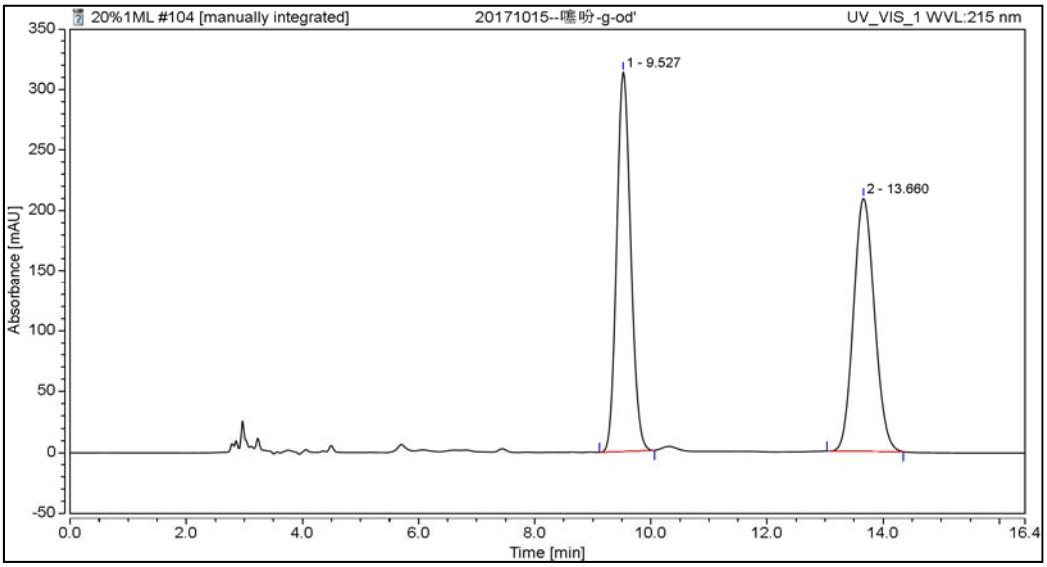


<Peak Table>

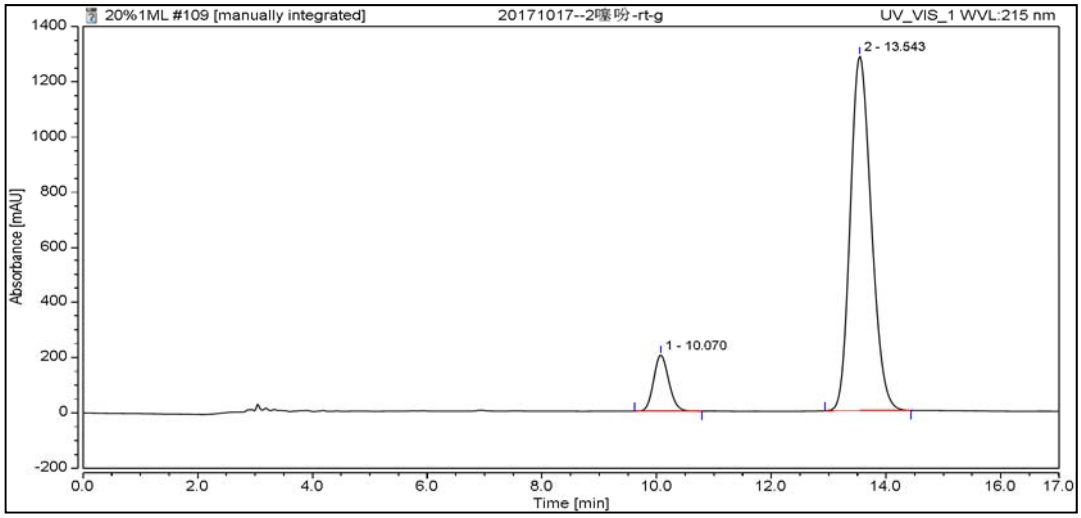
Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		8.243	87249	3.997	6347		M
2		9.061	2095854	96.003	133823		M
Total			2183102	100.000	140169		

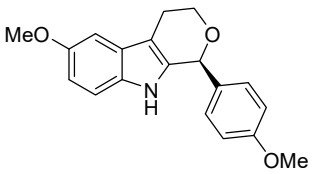


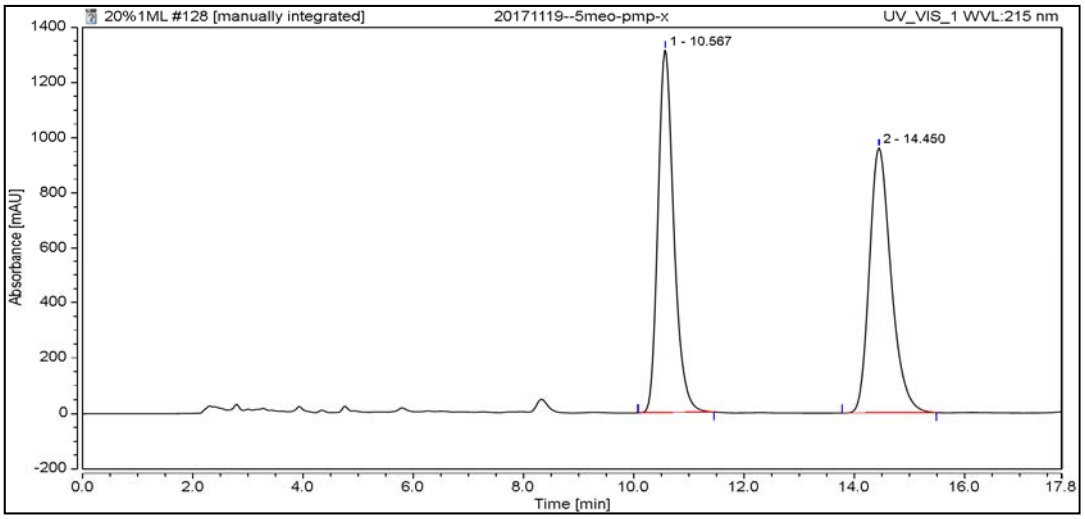


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		9.527	87.617	50.16	n.a.
2		13.660	87.066	49.84	n.a.
Total:			**174.684**	**100.00**	

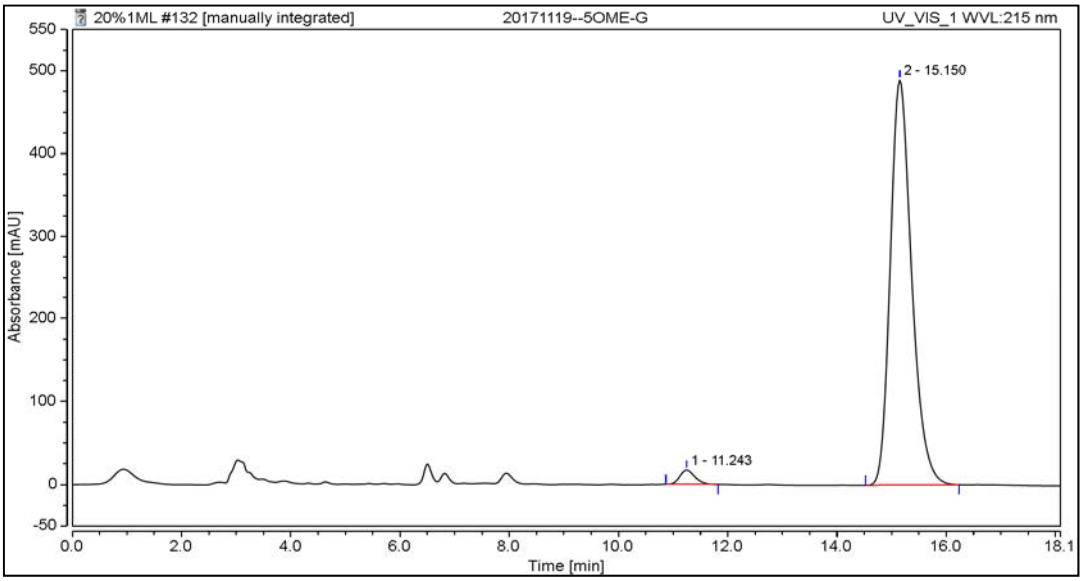


Integration Results					
No.	Peak Name	Retention Time min	Area mAU*min	Relative Area %	Amount n.a.
1		10.070	61.839	10.20	n.a.
2		13.543	544.255	89.80	n.a.
Total:			**606.094**	**100.00**	

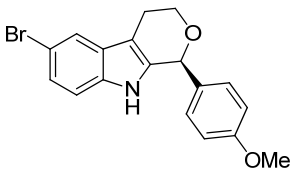




Integration Results					
No.	Peak Name	Retention Time min	Height mAU	Relative Area %	Amount n.a.
1		10.567	1313.452	50.01	n.a.
2		14.450	960.842	49.99	n.a.
Total:			**2274.294**	**100.00**	



Integration Results					
No.	Peak Name	Retention Time min	Height mAU	Relative Area %	Amount n.a.
1		11.243	17.179	2.43	n.a.
2		15.150	489.678	97.57	n.a.
Total:			**506.857**	**100.00**	



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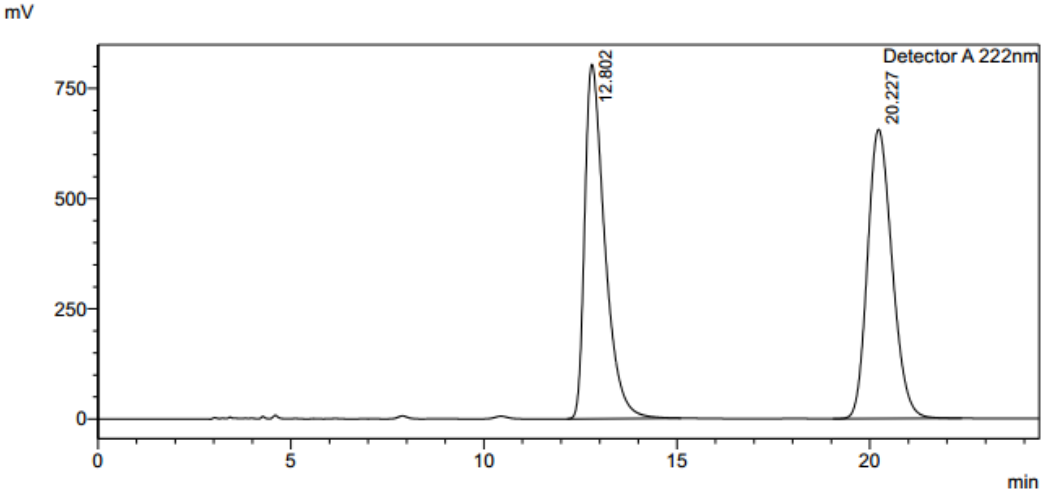
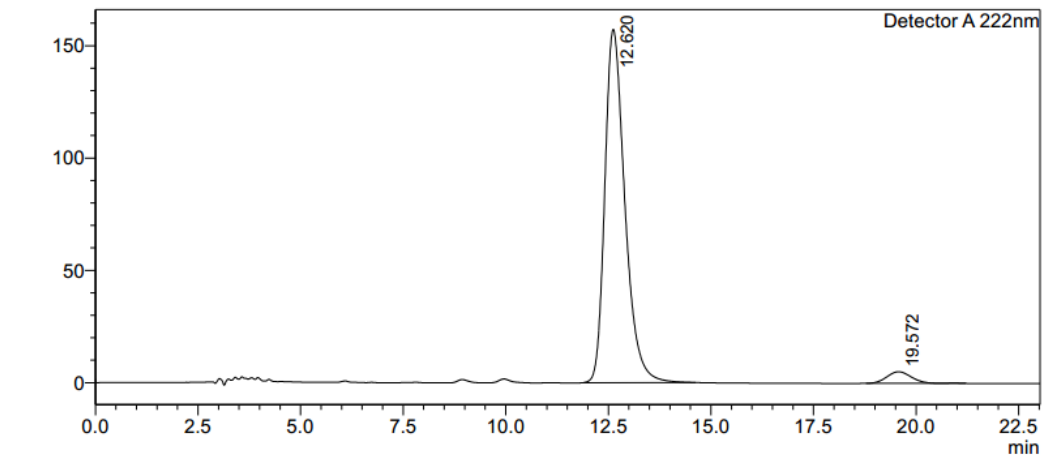


<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		12.802	28954598	49.933	803500		M
2		20.227	29032669	50.067	655860		M
Total			57987267	100.000	1459359		

<Chromatogram>



<Peak Table>

Detector A 222nm

Peak#	Name	Ret. Time	Area	Area%	Height	Unit	Mark
1		12.620	5348559	96.098	157257		M
2		19.572	217153	3.902	5168		M
Total			5565712	100.000	162425		