

Supporting Information

Alkylarylation of *N*-allylbenzamides and *N*-allylanilines with simple ethers for the direct construction of ether substituted dihydroisoquinolinones and indolines

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1. General experimental details

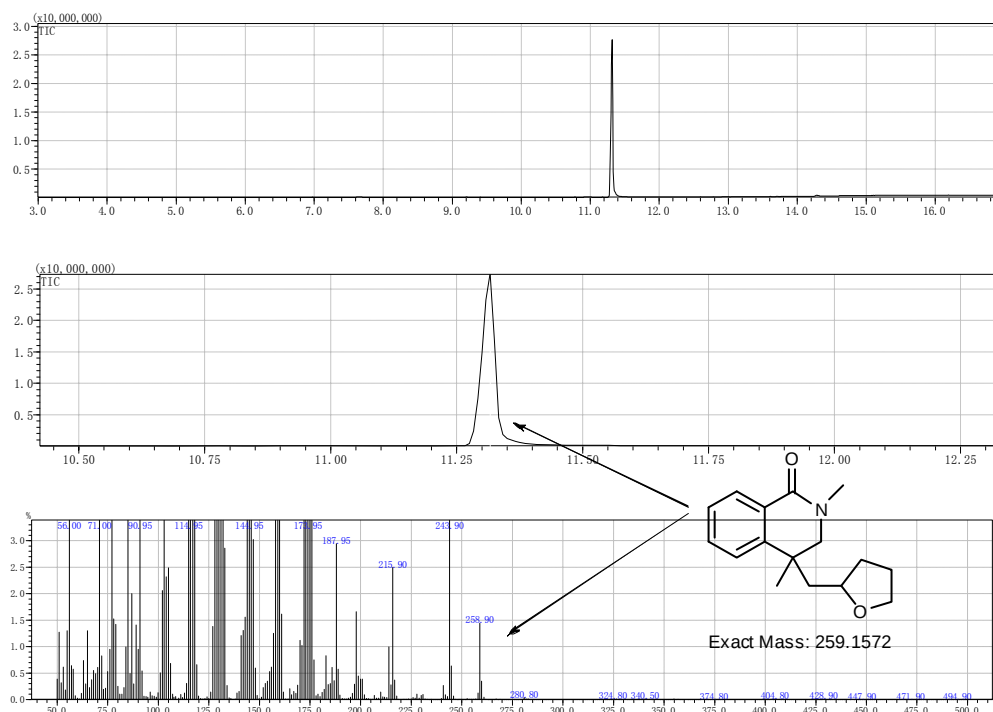
General Information: All chemicals were used as received without further purification unless stated otherwise. NMR spectra were recorded at ambient temperature on a 300 or 400 MHz NMR spectrometer. Chemical shifts (δ) are given in ppm relative to TMS, the coupling constants J are given in Hz. HRMS were recorded on a TOF LC/MS equipped with electrospray ionization (ESI) probe operating in positive or negative ion mode.

The *N*-allylbenzamides (**1a-1p**)¹ and *N*-allylanilines (**4a-4g**)² were prepared according to the literatures.

Experimental general procedure of radical cyanomethylation/arylation of *N*-allylbenzamide or *N*-allylaniline with acetonitrile: Under air, the mixture of **1** or **4** (0.2 mmol), DTBP (3 equiv), CuI (40 mol%) and THF **2a** (2 mL) were added into the tube and sealed. The mixture was stirred at 130 °C for 20 h. Then, the solvent was evaporated under reduced pressure and the residue was purified by flash column chromatography on silica gel to give the product **3** or **5**.

2. Mechanism Studies

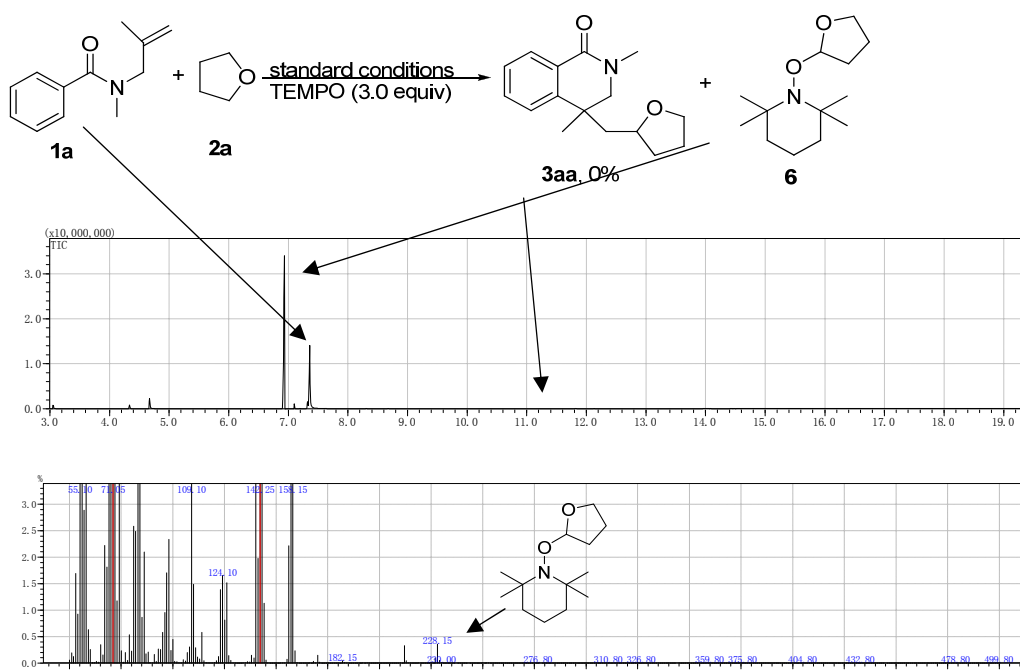
2.1 GC-MS spectra of 3aa



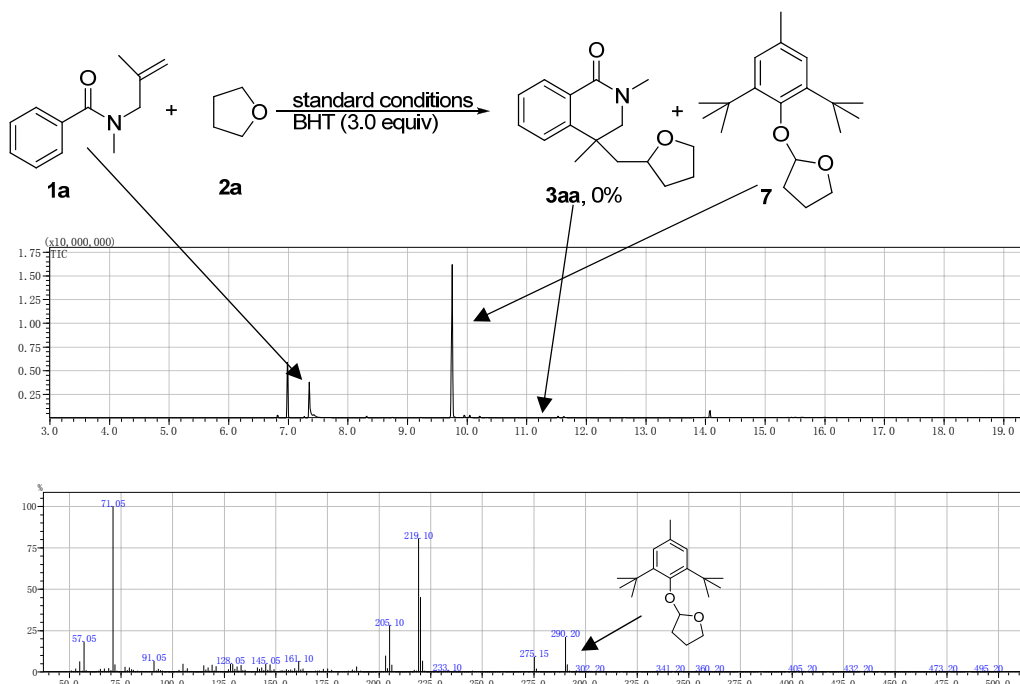
¹ L. Meca, I. Císařová and D. Dvořák, *Organometallics*, 2003, **22**, 3703.

² H. Zhang, P. Chen and G. Liu, *Synlett*, 2012, **23**, 2749.

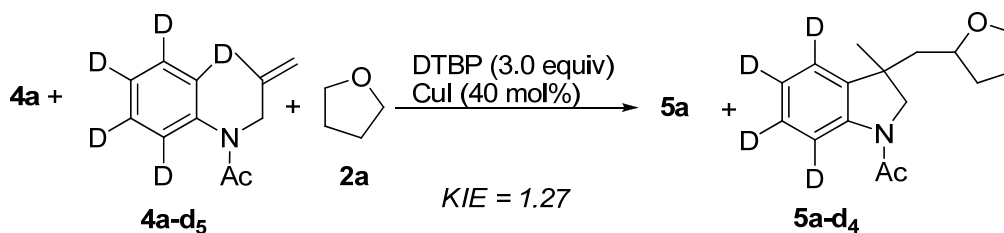
2.2 GC-MS spectra of reaction mixture after adding 3 equivalents of TEMPO



2.3 GC-MS spectra of reaction mixture after adding 3 equivalents of BHT

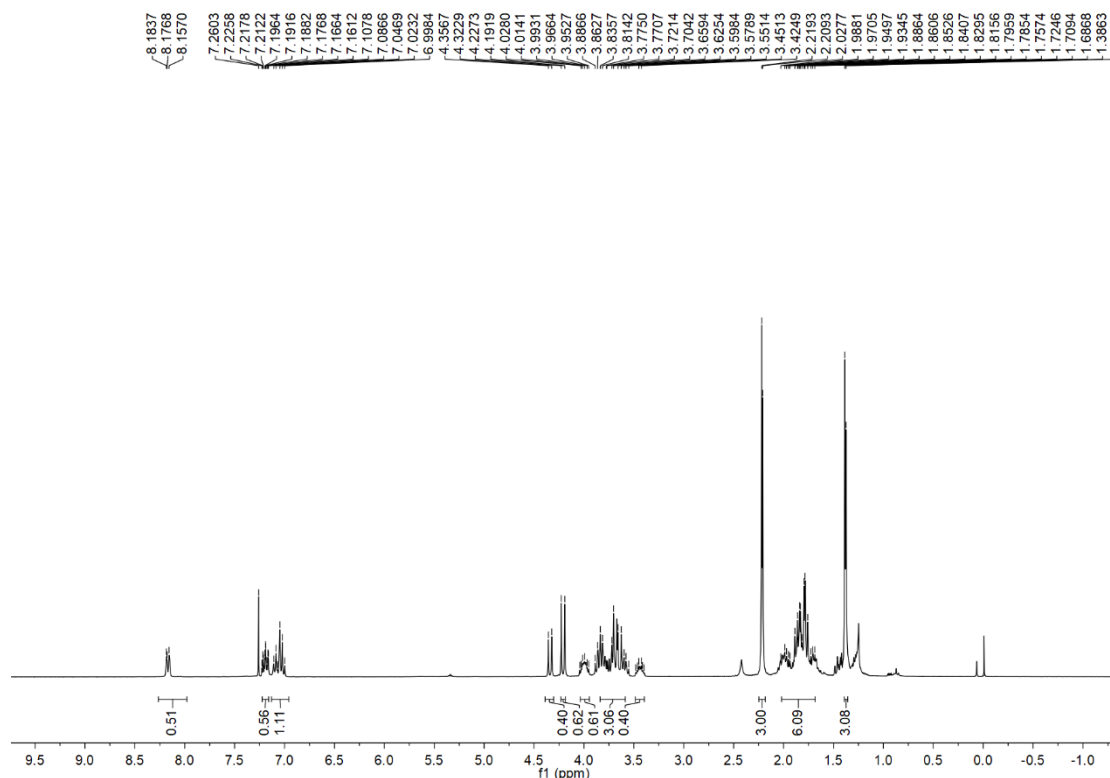


2.4 Intermolecular competition experiment with isotopically labeled 4a-d₅

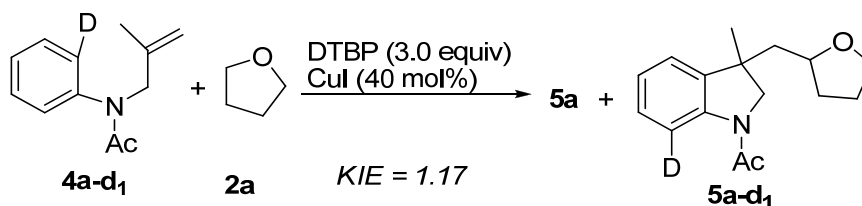


The mixture of **4a** (18.9 mg, 0.1 mmol), **4a-d₅** (19.4 mg, 0.1 mmol), DTBP (0.6 mmol), CuI (0.08 mmol), THF (2 mL) were added into the tube and sealed. The mixture was stirred at 130 °C for 5 h. Then, the solvent was evaporated under reduced pressure and the residue was purified by flash column chromatography on silica gel to give the **5a** and **5a-d₄** in 35% yield.

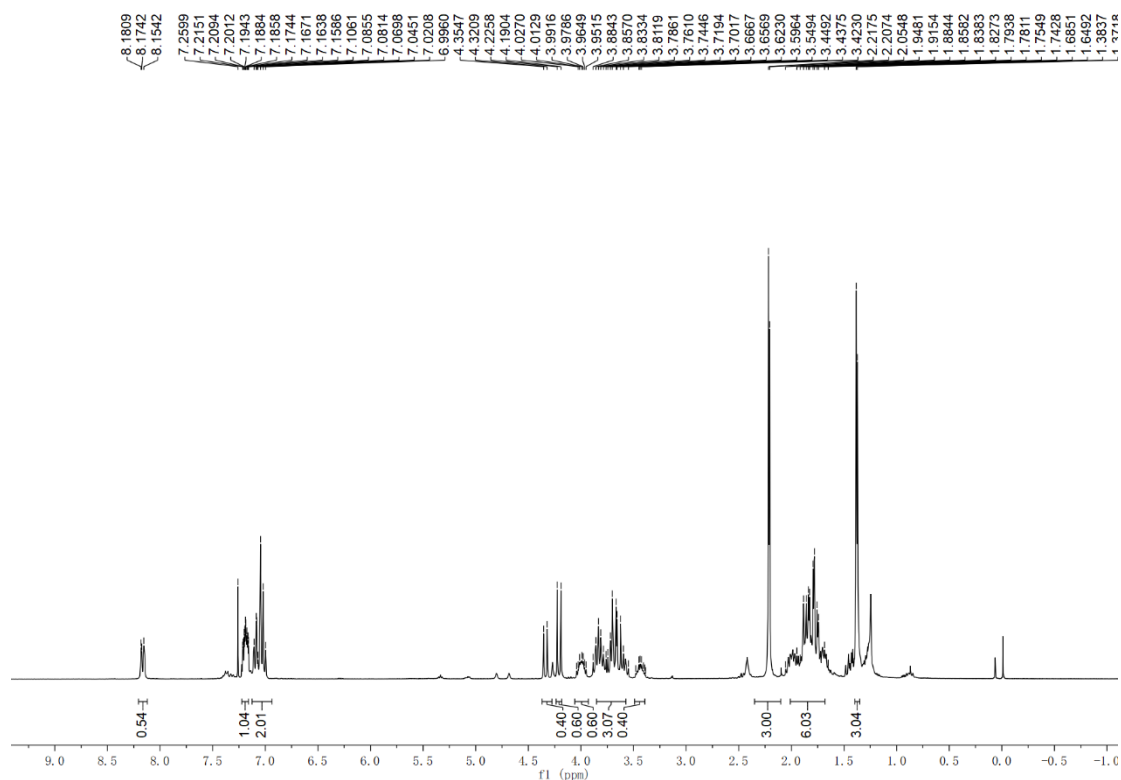
¹H NMR (CDCl₃, 400 MHz): δ 8.18-8.16 (m, 0.51H), 7.23-7.16 (m, 0.56H), 7.11-7.00 (m, 1.11H), 4.36-4.32 (m, 0.4H), 4.23-4.19 (m, 0.6H), 4.04-3.95 (m, 0.6H), 3.89-3.55 (m, 3H), 3.48-3.39 (m, 0.4H), 2.21, 2.20 (s, 3H), 2.02-1.69 (m, 6H), 1.39, 1.37 (s, 3H).



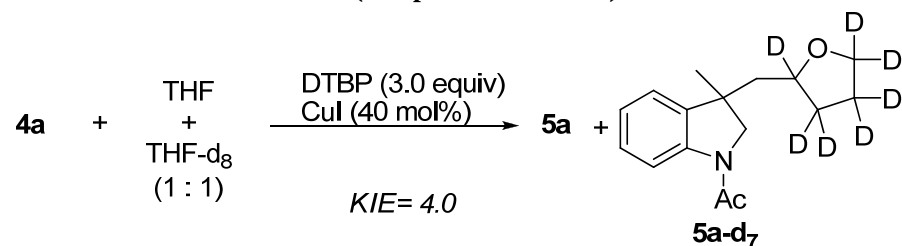
2.4 Intramolecular competition experiment with isotopically labeled **4a-d₁**



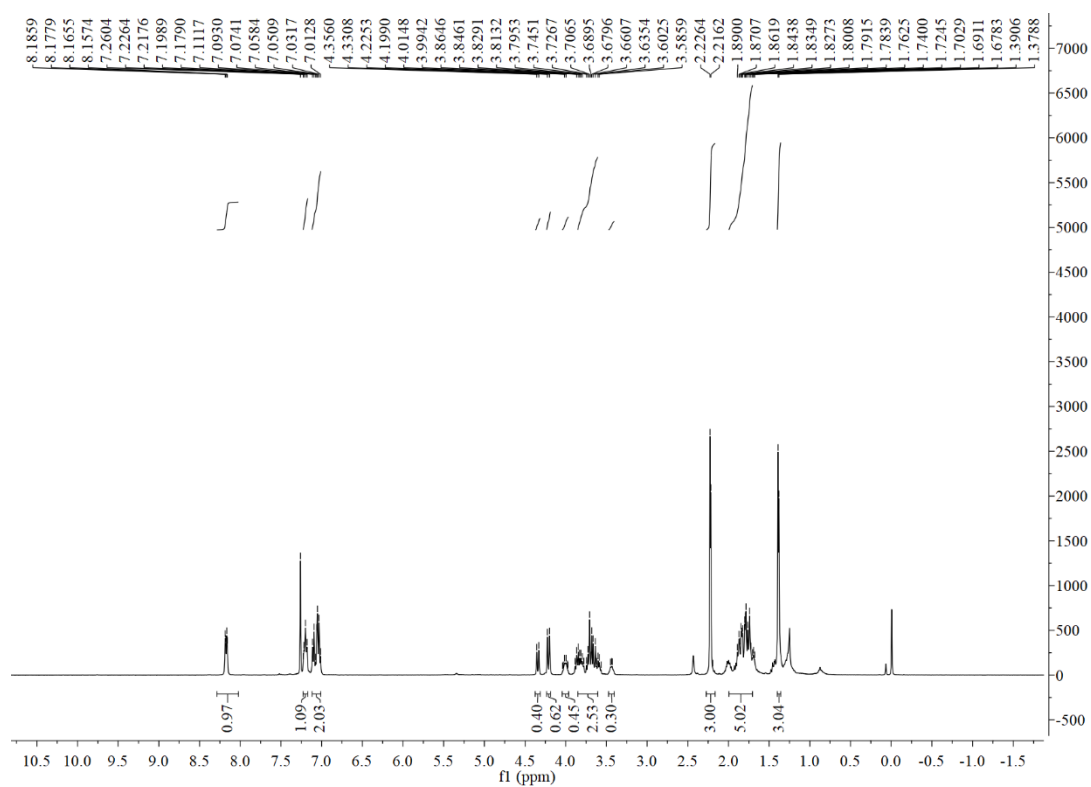
The mixture of **4a-d₁** (19.0 mg, 0.1 mmol), DTBP (0.3 mmol), CuI (0.04 mmol), THF (2 mL) were added into the tube and sealed. The mixture was stirred at 130 °C for 20 h. Then, the solvent was evaporated under reduced pressure and the residue was purified by flash column chromatography on silica gel to give **5a** and the **5a-d₁** in 80% yield. ¹H NMR (CDCl₃, 400 MHz): δ 8.18-8.15 (m, 0.54H), 7.2-7.16 (m, 1H), 7.11-6.99 (m, 2H), 4.35-4.32 (m, 0.4H), 4.23-4.19 (m, 0.6H), 4.04-3.95 (m, 0.6H), 3.88-3.55 (m, 3H), 3.48-3.39 (m, 0.4H), 2.22, 2.21 (s, 3H), 2.01-1.65 (m, 6H), 1.38, 1.37 (s, 3H).



2.5 The KIE studies on THF (competition reaction):

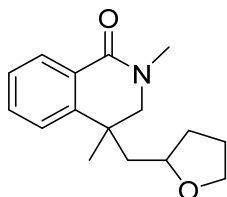


Under N₂, the mixture of **4a** (18.9 mg, 0.1 mmol), DTBP (0.3 mmol), CuI (19.0 mmol), THF (0.5mL), THF-d₈ (0.5 mL) were added into the tube and sealed. The mixture was stirred at 130 °C for 20 h. Then, the solvent was evaporated under reduced pressure and the residue was purified by flash column chromatography on silica gel to give the **5a** and **5a-d₇** in 71% yield. ¹H NMR (CDCl₃, 400 MHz): δ 8.19-8.16 (m, 1H), 7.23-7.18 (m, 1H), 7.11-7.01 (m, 2H), 4.36-4.33 (m, 0.4H), 4.23-4.20 (m, 0.6H), 4.04-3.97 (m, 0.45H), 3.88-3.57 (m, 2.5H), 3.45-3.43 (m, 0.3H), 2.23, 2.22 (s, 3H), 1.89-1.68 (m, 5H), 1.39, 1.38 (s, 3H).



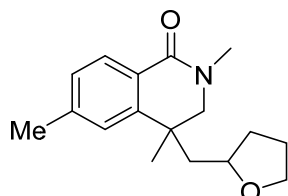
3. Characterization Data for the Products

2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3aa):



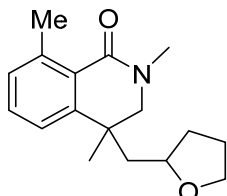
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3aa** as a yellow oil (42.5 mg, 82% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.10-8.06 (m, 1H), 7.45-7.41 (m, 1H), 7.32-7.28 (m, 1H + 0.67H), 7.22 (d, 0.33H, $J = 7.7$ Hz), 3.82-3.67 (m, 3H), 3.59-3.56 (m, 0.33H), 3.44 (m, 1H + 0.39H), 3.35-3.32 (m, 0.3H), 3.14 (s, 1H), 1.84-1.67 (m, 6H), 1.42 (s, 2H), 1.36 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.5, 164.4, 146.0, 145.9, 131.8, 131.6, 128.4, 128.2, 126.7, 126.6, 124.0, 123.6, 76.0, 76.0, 67.7, 67.6, 58.3, 57.6, 45.3, 44.3, 36.8, 35.2, 34.9, 33.1, 32.8, 25.5, 25.3, 25.2, 22.1. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{21}\text{NNaO}_2^+$ 282.1465, Found 282.1468.

2,4,6-trimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ba):



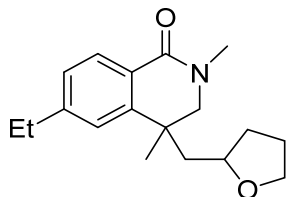
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ba** as a yellow oil (43.7 mg, 80% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.00-7.96 (m, 1H), 7.13-7.11 (m, 1H), 7.06-7.02 (m, 1H), 3.85-3.76 (m, 2H), 3.72-3.63 (m, 1H), 3.56-3.53 (m, 0.4H), 3.43 (s, 1.2H), 3.35-3.32 (m, 0.4H), 3.13 (s, 3H), 2.38 (s, 3H), 1.98-1.64 (m, 6H), 1.41 (s, 1.8H), 1.36 (s, 1.2H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.7, 164.6, 146.2, 146.1, 142.2, 142.0, 128.6, 128.5, 127.5, 125.8, 125.7, 124.6, 124.3, 76.1, 76.1, 67.7, 67.6, 58.4, 57.6, 45.4, 44.4, 36.8, 36.8, 35.2, 34.9, 33.2, 32.9, 25.4, 25.4, 25.3, 22.1, 21.9, 21.8. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{23}\text{NNaO}_2^+$ 296.1621, Found 296.1620.

2,4,8-trimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ca):



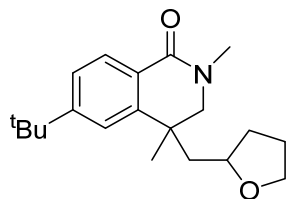
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ca** as a yellow oil (33.9 mg, 62% yield); ^1H NMR (400 MHz, CDCl_3): δ 7.30-7.27 (m, 1H), 7.13-7.07 (m, 2H), 3.86-3.76 (m, 2H), 3.72-3.61 (m, 1H), 3.52-3.49 (m, 0.34H), 3.46-3.34 (m, 1.32H), 3.33-3.30 (m, 0.35H), 3.15 (s, 3H), 2.70 (s, 3H), 1.98-1.65 (m, 6H), 1.40 (s, 2H), 1.35 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 165.2, 165.1, 147.4, 147.3, 141.0, 140.7, 130.8, 130.7, 130.6, 127.1, 122.0, 121.7, 76.2, 76.1, 67.8, 67.7, 58.1, 57.3, 44.8, 43.9, 37.6, 37.5, 35.5, 35.2, 33.2, 33.0, 25.4, 25.3, 25.1, 22.8, 22.7, 22.4. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{23}\text{NNaO}_2^+$ 296.1621, Found 296.1623.

6-ethyl-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3da):



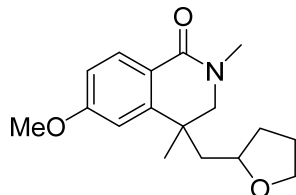
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3da** as a yellow oil (43.1 mg, 75% yield); ^1H NMR (300 MHz, CDCl_3): δ 8.02-7.98 (m, 1H), 7.15-7.12 (m, 1H), 7.08-7.04 (m, 1H), 3.83-3.75 (m, 2H), 3.85-3.62 (m, 3H), 3.56-3.52 (m, 0.34H), 3.47-3.38 (m, 1.35H), 3.35-3.31 (m, 0.34H), 3.13 (s, 3H), 2.66 (q, 2H, $J = 7.6$ Hz), 2.00-1.64 (m, 6 H), 1.41 (s, 2H), 1.37 (s, 1H), 1.23 (t, 3H, $J = 7.6$ Hz). ^{13}C NMR (75 MHz, CDCl_3) δ 164.7, 164.6, 148.4, 148.2, 146.2, 146.1, 128.7, 128.6, 126.2, 126.0, 126.0, 123.5, 123.1, 76.1, 76.1, 67.7, 67.6, 58.4, 57.6, 45.3, 44.3, 36.9, 36.8, 35.2, 34.9, 33.1, 32.9, 29.1, 25.3, 25.2, 22.1, 15.4, 15.3. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{18}\text{H}_{25}\text{NNaO}_2^+$ 310.1778, Found 310.1781.

6-(tert-butyl)-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ea):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ea** as a yellow oil (43.5 mg, 69% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.02-7.99 (m, 1H), 7.34-7.32 (m, 1H), 7.28-7.27 (m, 0.6H), 7.23-7.22 (m, 0.4H), 3.84-3.70 (m, 2H), 3.68-3.63 (m, 1H), 3.56-3.53 (m, 0.37H), 3.47-3.38 (m, 1.27H), 3.34-3.33 (m, 0.37H), 3.13 (s, 3H), 1.84-1.71 (m, 6H), 1.43 (s, 1.8H), 1.38 (s, 1.2H), 1.32 (s, 9H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.7, 164.67, 155.2, 155.0, 145.7, 145.6, 128.4, 128.2, 125.7, 125.7, 123.7, 123.7, 121.0, 120.5, 76.2, 76.2, 67.7, 67.6, 58.6, 57.8, 45.2, 44.3, 37.1, 37.0, 35.2, 35.1, 35.1, 34.9, 33.2, 32.8, 31.2, 25.4, 25.2, 22.2. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{20}\text{H}_{29}\text{NNaO}_2^+$ 338.2091, Found 338.2096.

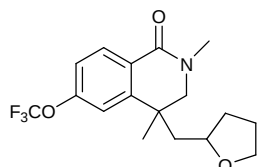
6-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3fa):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **3fa** as a yellow oil (43.4 mg, 76% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.07-8.03 (m, 1H), 6.83-6.80 (m, 1H), 6.77-6.71 (m, 1H), 3.83 (s, 3H), 3.69-3.63 (m, 3H), 3.56-3.53 (m, 0.35H), 3.45-3.38 (m, 1.32H), 3.33-3.30 (m, 0.33H), 3.12 (s, 3H), 1.98-1.66 (m, 6H), 1.39 (s, 2H), 1.35 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.6, 164.5, 162.4, 162.2, 148.3, 148.2, 130.8, 130.6, 121.4, 121.3,

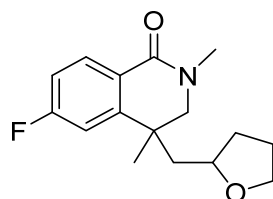
111.3, 111.2, 110.1, 109.8, 76.1, 76.1, 67.7, 67.7, 58.5, 57.6, 55.3, 45.3, 44.2, 37.1, 37.0, 35.1, 34.9, 33.2, 32.9, 25.4, 25.4, 25.3, 22.2. HRMS m/z : $[M+Na]^+$ Calcd for: $C_{17}H_{23}NNaO_3^+$ 312.1570, Found 312.1568.

2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-6-(trifluoromethoxy)-3,4-dihydroisoquinolin-1(2H)-one (3ga):



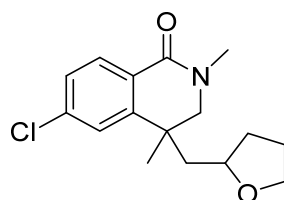
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **3ga** as a yellow oil (39.9 mg, 61% yield); 1H NMR (300 MHz, $CDCl_3$): δ 8.15-8.10 (m, 1H), 7.16-7.05 (m, 2H), 3.86-3.62 (m, 3H), 3.58-3.34 (m, 2H), 3.14 (s, 3H), 1.98-1.64 (m, 6H), 1.42 (s, 2H), 1.37 (s, 1H). ^{13}C NMR (75 MHz, $CDCl_3$) δ 163.2, 163.1, 147.2, 146.9, 133.2 (q, $J_{C-F}=32.25$ Hz), 133.3 (q, $J_{C-F}=32.25$ Hz), 131.4, 131.4, 129.2, 129.1, 123.9 (q, $J_{C-F}=270.75$ Hz), 123.8 (q, $J_{C-F}=270.75$ Hz), 76.6, 75.8, 67.9, 67.8, 57.7, 57.4, 45.2, 44.2, 37.1, 37.1, 35.4, 35.0, 33.1, 32.9, 25.3, 25.2, 21.9. ^{19}F NMR (282 MHz, $CDCl_3$) δ -57.6. HRMS m/z : $[M+Na]^+$ Calcd for: $C_{17}H_{20}F_3NNaO_3^+$ 366.1287, Found 366.1281.

6-fluoro-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ha):



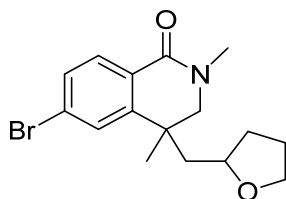
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ha** as a yellow oil (39.3 mg, 71% yield); 1H NMR (300 MHz, $CDCl_3$): δ 8.13-8.01 (m, 1H), 7.01-6.6.88 (m, 2H), 3.86-3.63 (m, 3H), 3.61-3.32 (m, 2H), 3.13 (s, 3H), 1.97-1.63 (m, 6H), 1.40 (s, 2H), 1.36 (s, 1H). ^{13}C NMR (75 MHz, $CDCl_3$) δ 165.0 (d, $J_{C-F} = 250$ Hz), 164.9 (d, $J_{C-F} = 250$ Hz), 163.8, 163.7, 149.3 (d, $J_{C-F}=7.5$ Hz), 149.1 (d, $J_{C-F}=7.5$ Hz), 131.4 (d, $J_{C-F}=9.8$ Hz), 131.2 (d, $J_{C-F}=9.0$ Hz), 124.7 (d, $J_{C-F}=3.0$ Hz), 124.7 (d, $J_{C-F}=3.0$ Hz), 113.8 (d, $J_{C-F}=21.0$ Hz), 111.2 (d, $J_{C-F}=22.5$ Hz), 110.9 (d, $J_{C-F}=22.5$ Hz), 75.9, 75.9, 67.8, 67.7, 58.2, 57.6, 45.2, 44.1, 37.2, 37.1, 37.1, 37.1, 35.2, 34.9, 33.2, 32.9, 25.4, 25.3, 25.2, 22.1. ^{19}F NMR (282 MHz, $CDCl_3$) δ -107.3, -107.5. HRMS m/z : $[M+Na]^+$ Calcd for: $C_{16}H_{20}FNNaO_2^+$ 300.1370, Found 300.1373.

6-chloro-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ia):



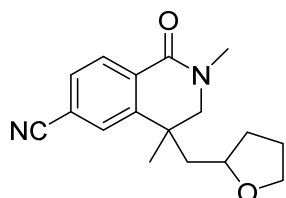
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ia** as a yellow oil (27.0 mg, 46% yield); ^1H NMR (300 MHz, CDCl_3): δ 8.05-8.01 (m, 1H), 7.30-7.26 (m, 1H), 7.25-7.20 (m, 1H), 3.86-3.63 (m, 3 H), 3.61-3.56 (m, 0.34H), 3.51-3.42 (m, 1.35H), 3.37-3.33 (m, 0.34H), 3.14 (s, 3H), 1.97-1.62 (m, 6H), 1.41 (s, 2H), 1.37 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 163.8, 163.6, 148.2, 147.9, 138.2, 137.9, 130.3, 130.1, 127.0, 126.9, 126.8, 124.4, 124.2, 75.9, 67.8, 67.7, 58.0, 57.5, 45.3, 44.2, 37.1, 37.1, 35.3, 34.9, 33.2, 32.9, 25.3, 25.3, 25.2, 21.9. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{20}\text{ClNNaO}_2^+$ 316.1075, Found 316.1078.

6-bromo-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ja):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ja** as a yellow oil (49.9 mg, 74% yield); ^1H NMR (400 MHz, CDCl_3): δ 7.97-7.93 (m, 1H), 7.46-7.43 (m, 1H), 7.40-7.36 (m, 1H), 3.85-3.63 (m, 3H), 3.59-3.56 (m, 0.4H), 3.50-3.42 (m, 1.2H), 3.36-3.33 (m, 0.4H), 3.13 (s, 3H), 1.96-1.75 (m, 6H), 1.40 (s, 1.8H), 1.37 (s, 1.2H). ^{13}C NMR (75 MHz, CDCl_3) δ 163.8, 163.7, 148.4, 148.1, 130.4, 130.3, 130.1, 130.0, 127.3, 127.3, 127.1, 126.7, 126.5, 75.8, 67.8, 67.7, 58.0, 57.5, 45.3, 44.2, 37.1, 37.1, 35.3, 35.0, 33.2, 33.0, 25.4, 25.3, 25.2, 21.9. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{20}\text{BrNNaO}_2^+$ 360.0570, Found 360.0564.

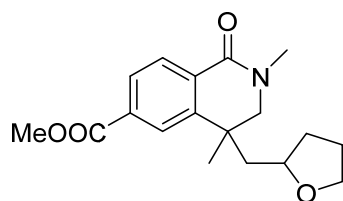
2,4-dimethyl-1-oxo-4-((tetrahydrofuran-2-yl)methyl)-1,2,3,4-tetrahydroisoquinoline-6-carbonitrile (3ka):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **3ka** as a yellow oil (34.1 mg, 60% yield); ^1H NMR (300 MHz, CDCl_3): δ 8.19-8.15 (m, 1H), 7.61-7.52 (m, 2H), 3.85-3.65 (m, 3H), 3.62-3.57 (m, 0.34H), 3.55-3.43 (m, 1.32H), 3.40-3.35 (m, 0.34H), 3.15 (s, 3H), 1.95-1.61 (m, 6H), 1.43 (s, 2H), 1.38 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 162.8, 162.7, 147.3, 147.0, 132.1, 132.1, 130.4, 130.3, 129.3, 129.2, 128.3, 128.2, 118.5, 115.1, 115.0, 75.7, 75.6, 68.0, 67.8, 57.7, 57.5, 45.1, 44.2, 37.1, 35.5, 35.1, 33.2, 33.0, 25.2, 25.2, 21.9. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{20}\text{N}_2\text{NaO}_2^+$ 307.1417, Found 307.1416.

Methyl

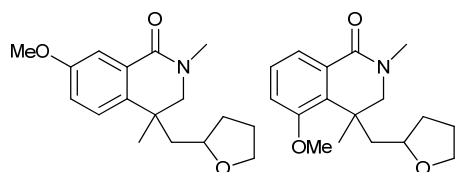
2,4-dimethyl-1-oxo-4-((tetrahydrofuran-2-yl)methyl)-1,2,3,4-tetrahydroisoquinoline-6-carboxylate (3la):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **3la** as a yellow oil (49.5 mg, 78% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.17-8.13 (m, 1H), 7.97-7.91 (m, 2H), 3.92 (s, 3H), 3.84-3.67 (m, 3H), 3.64-3.61 (m, 0.36H), 3.56-3.44 (m, 1.3H), 3.38-3.35 (m, 0.34H), 3.16 (s, 3H), 2.01-1.64 (m, 6H), 1.46 (s, 2H), 1.40 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 166.6, 166.6, 163.6, 163.5, 146.7, 146.1, 132.8, 132.7, 132.1, 132.0, 128.7, 128.6, 127.8, 127.7, 125.4, 125.4, 75.9, 75.8, 67.8, 67.7, 57.8, 57.6, 52.3, 45.3, 44.3, 37.0, 36.9, 35.4, 35.0, 33.2, 33.0, 25.6, 25.3, 25.2, 21.9. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{18}\text{H}_{23}\text{NNaO}_4^+$ 340.1519, Found 340.1523.

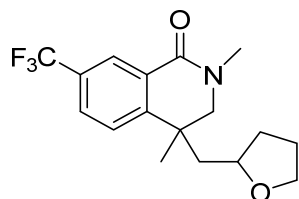
7-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ma) +

5-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one :



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **3ma** and **3ma'** as yellow oil (50.9 mg, 88% yield); ^1H NMR (400 MHz, CDCl_3): δ **3ma**: 7.65-7.63 (m, 1H), 7.22-7.14 (m, 1H), 7.03-6.98 (m, 1H), 3.85 (s, 3H), 3.81-3.59 (m, 3H), 3.59-3.53 (m, 2H), 3.16 (s, 3H), 1.97-1.68 (m, 6H), 1.41 (s, 2H), 1.36 (s, 1H). **3ma'**: 7.82-7.76 (m, 1H), 7.31-7.28 (m, 1H), 7.03-6.98 (m, 1H), 3.83 (s, 3H), 3.79-3.58 (m, 3H), 3.56-3.32 (m, 2H), 3.13 (s, 3H), 1.94-1.67 (m, 6H), 1.5 (s, 1.5H), 1.38 (s, 1.5 H). ^{13}C NMR (75 MHz, CDCl_3) **3ma** + **3ma'** δ 164.7, 164.5, 164.4, 164.3, 158.3, 158.3, 156.7, 156.5, 138.4, 138.1, 134.8, 132.5, 130.6, 130.3, 129.5, 129.4, 127.5, 127.4, 125.5, 125.1, 121.3, 121.1, 119.2, 118.9, 114.7, 114.4, 111.7, 76.1, 76.0, 67.7, 67.6, 67.5, 58.9, 58.7, 58.0, 57.8, 55.5, 55.4, 55.2, 45.6, 44.5, 44.3, 41.7, 37.7, 37.0, 36.3, 36.3, 35.4, 35.2, 35.1, 34.6, 33.1, 33.0, 32.9, 25.7, 25.4, 25.4, 25.3, 22.7, 22.4. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{23}\text{NNaO}_3^+$ 312.1570, Found 312.1572.

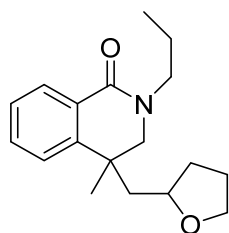
2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-5-(trifluoromethyl)-3,4-dihydroisoquinolin-1(2H)-one (3na):



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3na** as a yellow oil (52.4 mg, 80% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.38-8.36 (m, 1H), 7.69-7.67 (m,

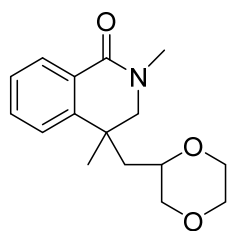
1H), 7.43-7.36 (m, 1H), 3.86-3.62 (m, 3H), 3.62-3.35 (m, 2H), 3.16 (s, 3H), 2.0-1.65 (m, 6H), 1.45 (s, 2H); 1.40 (s, 1H). ¹³C NMR (75 MHz, CDCl₃) δ 163.2, 163.1, 149.7, 149.7 (d, *J*_{C-F} = 7.5 Hz), 129.9 (d, *J*_{C-F} = 3.8 Hz), 129.4 (d, *J*_{C-F} = 7.5 Hz), 129.0 (d, *J*_{C-F} = 1.5 Hz), 129.0 (d, *J*_{C-F} = 1.5 Hz), 128.2 (q, *J*_{C-F} = 3.8 Hz), 128.0 (q, *J*_{C-F} = 3.8 Hz), 125.7 (q, *J*_{C-F} = 3.8 Hz), 125.6 (q, *J*_{C-F} = 3.8 Hz), 124.9, 124.6, 120.2 (q, *J*_{C-F} = 270.0 Hz), 120.2 (q, *J*_{C-F} = 270.0 Hz). 75.8, 75.8, 67.8, 67.7, 57.8, 57.3, 45.1, 44.1, 37.2, 37.2, 35.3, 35.0, 33.1, 32.9, 25.4, 25.2, 25.1, 22.0. ¹⁹F NMR (282 MHz, CDCl₃): δ -62.63, -62.64. HRMS *m/z*: [M+Na]⁺ Calcd for: C₁₇H₂₀F₃NNaO₂⁺ 350.1338, Found 350.1332.

4-methyl-2-propyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (30a):



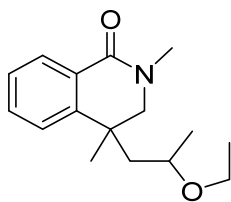
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **30a** as a yellow oil (31.6 mg, 55% yield); ¹H NMR (400 MHz, CDCl₃): δ 8.11-8.08 (m, 1H), 7.46-7.42 (m, 1H), 7.34-7.26 (m, 1H + 0.34H), 7.23-7.22 (m, 0.66H), 3.82-3.70 (m, 3H), 3.68-3.44 (m, 2H), 3.40-3.31 (m, 2H), 2.01-1.75 (m, 6H), 1.64 (q, 1.33H, *J* = 7.4 Hz), 1.43 (s, 2H), 1.37 (s, 1H), 1.24 (m, 0.67H), 0.94 (t, 3H, *J* = 7.2). ¹³C NMR (75 MHz, CDCl₃) δ 164.0, 164.0, 145.9, 145.6, 131.7, 131.5, 128.7, 128.6, 128.5, 126.7, 126.6, 126.3, 124.1, 123.6, 76.1, 76.0, 67.7, 67.6, 56.9, 55.6, 49.1, 49.0, 44.6, 44.0, 36.8, 36.7, 33.1, 32.9, 25.3, 25.3, 25.2, 22.4, 20.7, 20.6, 11.5, 11.4. HRMS *m/z*: [M+Na]⁺ Calcd for: C₁₈H₂₅NNaO₂⁺ 310.1778, Found 310.1776.

4-((1,4-dioxan-2-yl)methyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ab):



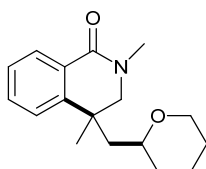
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ab** as a yellow oil (24.2 mg, 44% yield); ¹H NMR (400 MHz, CDCl₃): δ 8.11-8.06 (m, 1H), 7.46-7.42 (m, 1H), 7.34-7.30 (m, 1H), 7.27-7.25 (m, 0.6H), 7.19-7.17 (m, 0.4H), 3.75-3.45 (m, 7H), 3.35-3.15 (m, 2H), 3.13, 3.12 (s, 3H), 1.68-1.63 (m, 1H), 1.43-1.39 (m, 1H+2H), 1.34 (s, 1H). ¹³C NMR (75 MHz, CDCl₃) δ 164.4, 164.3, 145.3, 145.2, 132.0, 131.8, 128.6, 128.6, 128.4, 128.2, 127.0, 126.9, 124.0, 123.6, 73.0, 72.7, 71.2, 66.4, 66.3, 66.2, 58.6, 57.7, 41.2, 39.6, 36.5, 36.3, 35.3, 35.1, 25.8, 22.4. HRMS *m/z*: [M+Na]⁺ Calcd for: C₁₆H₂₁NNaO₃⁺ 298.1414, Found 298.1418.

4-(2-ethoxypropyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ac):



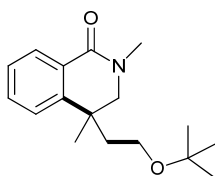
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ac** as a yellow oil (25.1 mg, 48% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.11-8.07 (m, 1H), 7.45-7.41 (m, 1H), 7.32-7.27 (m, 1.3H), 7.25-7.20 (m, 0.7H), 3.60-3.43 (m, 2H), 3.40-3.29 (m, 2H), 3.27-3.18 (m, 1H), 3.14 (s, 3H), 1.42 (s, 2H), 1.35 (s, 1H), 1.21 (t, 2H, $J = 7.0$ Hz), 1.10 (d, 1H, $J = 6.1$ Hz), 1.05 (t, 1H, $J = 7.0$ Hz), 0.97 (d, 2H, $J = 6.0$ Hz). ^{13}C NMR (75 MHz, CDCl_3) δ 164.6, 164.5, 146.1, 146.0, 131.7, 131.5, 128.6, 128.4, 128.4, 128.3, 126.7, 126.6, 124.2, 123.8, 72.7, 72.2, 63.2, 63.2, 58.8, 58.0, 46.5, 45.4, 37.0, 36.8, 35.3, 35.1, 25.4, 22.6, 20.9, 20.3, 15.8, 15.6. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{23}\text{NNaO}_2^+$ 284.1621, Found 284.1620.

2,4-dimethyl-4-((tetrahydro-2H-pyran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ad):



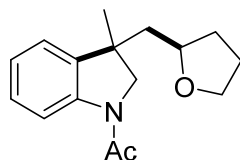
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3ae** as a yellow oil (27.3 mg, 50% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.13-8.07 (m, 1H), 7.46-7.42 (m, 1H), 7.33-7.27 (m, 1.68H), 7.21-7.19 (m, 0.32H), 3.95-3.84 (m, 1.32H), 3.59-3.56 (m, 0.44H), 3.46-3.43 (m, 0.88H), 3.33-3.22 (m, 2.38H), 3.13, 3.13 (s, 3H), 1.84-1.70 (m, 4H), 1.58-1.44 (m, 4H), 1.42 (s, 2H), 1.33 (s, 1H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.5, 164.2, 145.8, 145.7, 131.8, 131.4, 128.5, 128.4, 128.3, 128.2, 126.7, 126.6, 124.3, 123.7, 75.3, 74.9, 68.0, 67.9, 58.9, 57.6, 46.9, 44.6, 36.7, 36.6, 35.2, 35.0, 33.2, 32.8, 26.4, 25.7, 25.6, 23.6, 23.5, 22.7. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{23}\text{NNaO}_2^+$ 296.1621, Found 296.1624.

4-(2-tert-butoxyethyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ae):



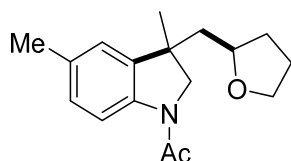
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **3af** as a yellow oil (22.0 mg, 40% yield); ^1H NMR (300 MHz, CDCl_3): δ 8.09-8.05 (m, 1H), 7.44-7.41 (m, 1H), 7.34-7.32 (m, 2H), 3.47-3.43 (m, 1H), 3.24-3.20 (m, 1H), 3.16 (s, 3H), 1.75-1.71 (m, 1H), 1.71-1.69 (m, 2H), 1.60-1.55 (m, 1H), 1.47 (s, 3H), 0.80 (s, 9H). ^{13}C NMR (75 MHz, CDCl_3) δ 164.8, 146.3, 131.5, 128.6, 128.4, 126.7, 124.7, 60.1, 51.3, 38.3, 35.3, 32.3, 31.4, 24.7. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{25}\text{NNaO}_2^+$ 298.1778, Found 298.1776.

1-(3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5a):



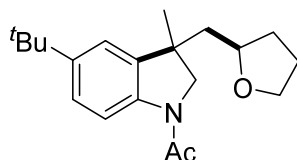
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5a** as a yellow oil (46.2 mg, 89% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.12-8.08 (m, 1H), 7.22-7.15 (m, 1H), 7.10-6.99 (m, 2H), 4.35-4.32 (m, 0.4H), 4.22-4.18 (m, 0.6H), 4.0-3.95 (m, 0.6H), 3.88-3.54 (m, 3H), 3.47-3.38 (m, 0.4H), 2.21, 2.20 (s, 3H), 2.02-1.66 (m, 6H), 1.38, 1.37 (s, 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.9, 142.7, 141.6, 140.5, 138.7, 127.8, 127.7, 123.7, 123.7, 122.1, 117.0, 117.0, 76.4, 76.2, 67.8, 67.7, 62.1, 60.6, 47.2, 46.0, 43.1, 42.9, 33.0, 32.8, 28.7, 25.42, 25.2, 24.3, 24.2. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{21}\text{NNaO}_2^+$ 282.1465, Found 282.1467.

1-(3,5-dimethyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5b):



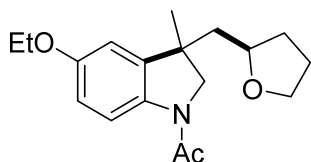
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5b** as a yellow oil (32.8 mg, 60% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.04-8.00 (m, 1H), 7.00-6.97 (m, 1H), 6.89-6.84 (m, 1H), 4.33-4.30 (m, 0.4H), 4.20-4.17 (m, 0.6H), 4.03-3.94 (m, 0.6H), 3.88-3.60 (m, 3H), 3.47-3.39 (m, 0.4H), 2.30 (s, 3H), 2.20, 2.19 (s, 3H), 1.99-1.68 (m, 6H), 1.36, 1.35 (s, 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.6, 140.6, 140.4, 139.4, 138.8, 133.3, 133.2, 128.3, 128.2, 122.7, 122.7, 116.7, 116.7, 76.4, 76.2, 67.8, 67.7, 62.2, 60.7, 47.2, 46.0, 43.1, 42.9, 33.0, 32.8, 28.7, 25.4, 25.2, 24.2, 24.1, 21.2. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{17}\text{H}_{23}\text{NNaO}_2^+$ 296.1621, Found 296.1624.

1-(5-(*tert*-butyl)-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5c):



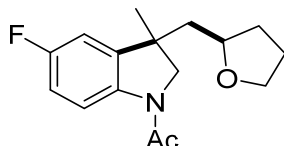
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5c** as a yellow oil (32.2 mg, 51% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.07-8.04 (m, 1H), 7.23-7.20 (m, 1H), 7.10-7.06 (m, 1H), 4.28-4.26 (m, 0.4H), 4.21-4.18 (m, 0.6H), 4.01-3.97 (m, 0.6H), 3.88-3.58 (m, 3H), 3.49-3.44 (m, 0.4H), 2.20, 2.19 (s, 3H), 2.01-1.68 (m, 6H), 1.39, 1.38 (s, 3H), 1.29 (s, 9H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.5, 146.9, 146.8, 140.2, 140.2, 139.3, 138.5, 124.7, 124.6, 118.9, 118.9, 116.4, 116.3, 76.4, 76.3, 67.8, 67.6, 62.3, 60.9, 47.3, 46.0, 43.2, 43.1, 34.6, 33.0, 32.7, 31.6, 25.4, 25.3, 25.1, 24.2, 24.1. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{20}\text{H}_{29}\text{NNaO}_2^+$ 338.2091, Found 338.2088.

1-(5-ethoxy-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5d):



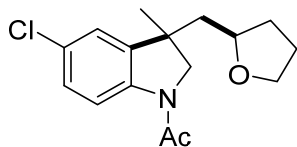
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 2: 1) give **5d** as a yellow oil (55.7 mg, 92% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.08-8.05 (m, 1H), 6.72-6.69 (m, 1H), 6.66-6.61 (m, 1H), 4.33-4.31 (m, 0.4H), 4.20-4.17 (m, 0.6H), 4.01-3.96 (m, 2H + 0.6H), 3.85-3.78 (m, 1.2H), 3.71-3.59 (m, 1.8H), 3.48-3.41 (m, 0.4H), 2.19, 2.18 (s, 3H), 2.03-1.69 (m, 6H), 1.40-1.35 (m, 3H + 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.2, 168.1, 155.7, 155.7, 142.1, 140.4, 136.4, 135.3, 117.6, 117.6, 112.4, 109.4, 109.4, 76.3, 76.1, 67.8, 67.7, 63.8, 62.2, 60.7, 47.1, 45.9, 43.2, 43.1, 33.0, 32.8, 28.6, 25.4, 25.2, 25.0, 24.0, 24.0, 14.9. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{18}\text{H}_{25}\text{NNaO}_3^+$ 326.1727, Found 326.1725.

1-(5-fluoro-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5e) :



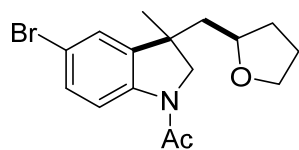
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5e** as a yellow oil (43.3 mg, 78% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.14-8.09 (m, 1H), 6.90-6.82 (m, 1H), 6.80-6.72 (m, 1H), 4.38-4.35 (m, 0.4H), 4.25-4.21 (m, 0.6H), 4.02-3.93 (m, 0.6H), 3.88-3.57 (m, 3H), 3.44-3.41 (m, 0.4H), 2.20, 2.19 (s, 3H), 2.02-1.71 (m, 6H), 1.37, 1.35 (s, 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.6, 168.6, 159.5 (d, $J_{\text{C-F}} = 240.8$ Hz), 159.5 (d, $J_{\text{C-F}} = 240.8$ Hz), 141.8 (d, $J_{\text{C-F}} = 130.5$ Hz), 141.7 (d, $J_{\text{C-F}} = 130.5$ Hz), 138.8 (d, $J_{\text{C-F}} = 1.5$ Hz), 137.7 (d, $J_{\text{C-F}} = 1.5$ Hz), 117.9 (d, $J_{\text{C-F}} = 7.5$ Hz), 114.1 (d, $J_{\text{C-F}} = 22.5$ Hz), 113.9 (d, $J_{\text{C-F}} = 22.5$ Hz), 109.6 (d, $J_{\text{C-F}} = 23.3$ Hz), 109.4 (d, $J_{\text{C-F}} = 23.3$ Hz), 76.2, 76.0, 67.9, 67.8, 62.2, 60.8, 47.0, 45.7, 43.3, 43.2, 43.1, 43.1, 33.0, 32.7, 28.5, 25.4, 25.2, 25.0, 24.0, 24.0. ^{19}F NMR (282 MHz, CDCl_3): δ -118.99, -118.99. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{20}\text{FNNaO}_2^+$ 300.1370, Found 300.1372.

1-(5-chloro-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5f) :



Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5f** as a yellow oil (32.3 mg, 55% yield); ^1H NMR (400 MHz, CDCl_3): δ 8.11-8.09 (m, 1H), 7.16-7.13 (m, 1H), 7.04-7.00 (m, 1H), 4.40-4.37 (m, 0.4H), 4.25-4.23 (m, 0.6H), 4.03-3.97 (m, 0.6H), 3.88-3.77 (m, 1.2H), 3.74-3.68 (m, 1.8H), 3.43-3.38 (m, 0.4H), 2.21, 2.20 (s, 3H), 2.04-1.71 (m, 6H), 1.37, 1.36 (s, 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 168.9, 168.9, 142.5, 141.4, 140.7, 140.3, 128.5, 127.8, 127.7, 122.5, 122.5, 118.0, 118.0, 76.2, 76.0, 67.9, 67.8, 62.1, 60.7, 47.0, 45.8, 43.3, 43.1, 33.0, 32.8, 28.7, 25.4, 25.2, 25.1, 24.2, 24.1. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{20}\text{ClNNaO}_2^+$ 316.1075, Found 316.1072.

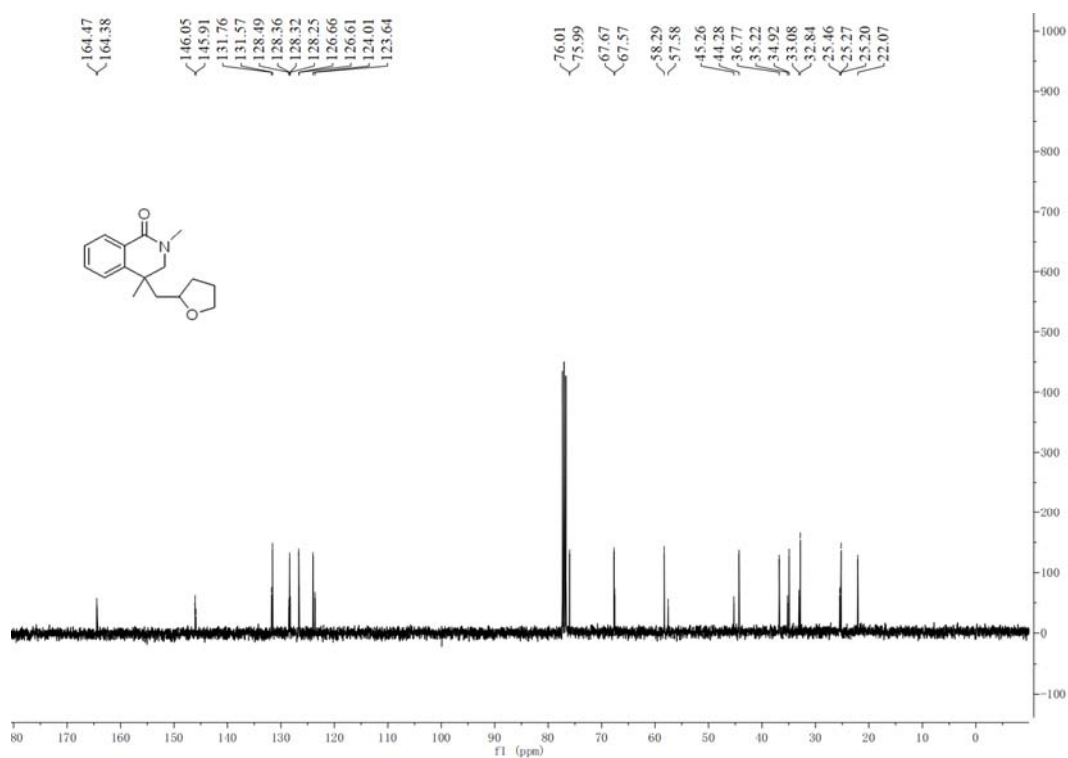
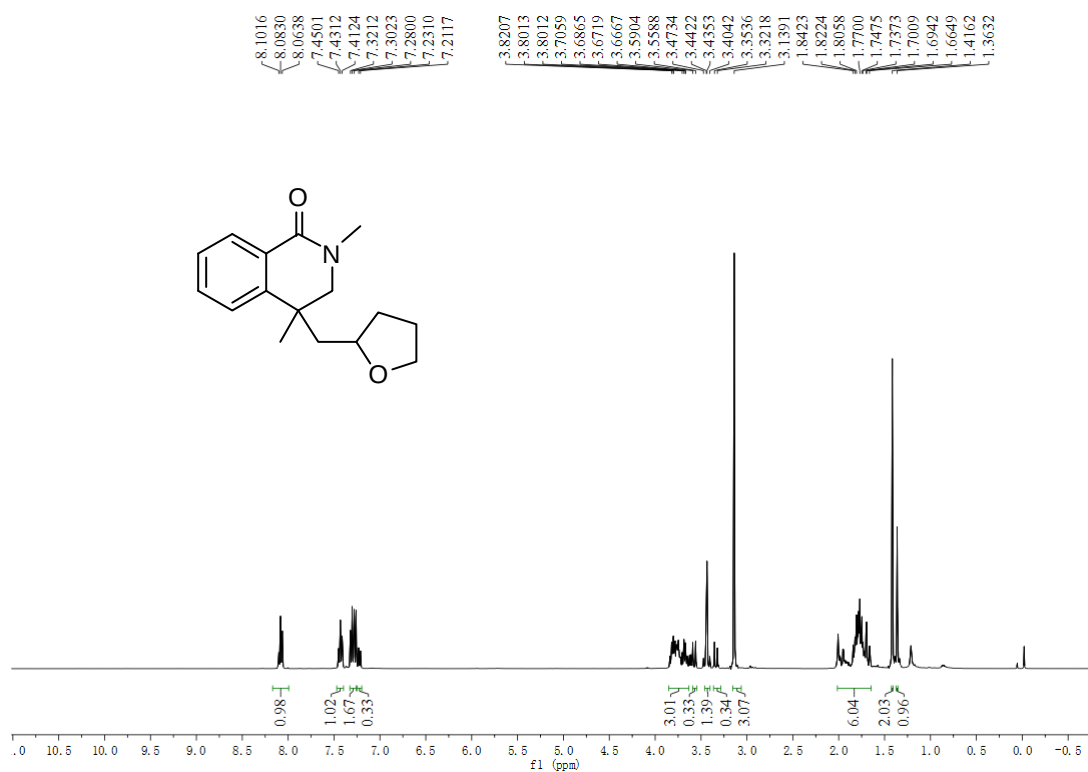
1-(5-bromo-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5g) :



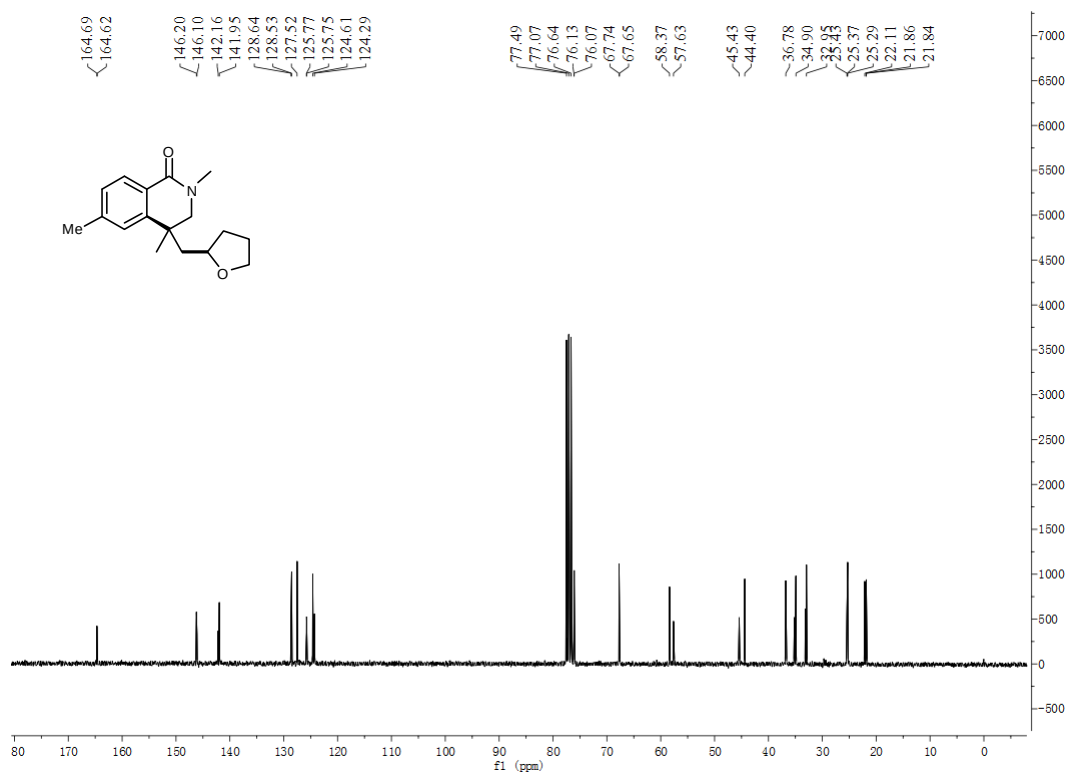
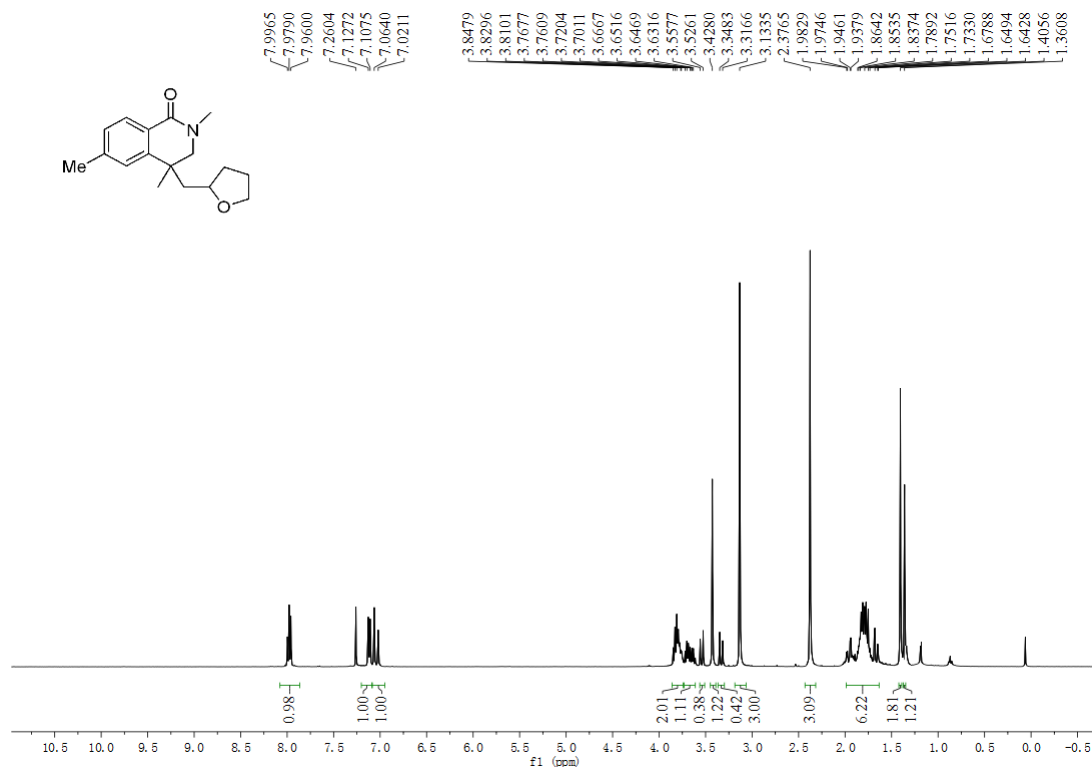
Flash column chromatography on a silica gel (petroleum ether : ethyl acetate, 3: 1) give **5g** as a yellow oil (41.9 mg, 62% yield); ^1H NMR (300 MHz, CDCl_3): δ 8.07-8.03 (m, 1H), 7.32-7.27 (m, 1H), 7.19-7.14 (m, 1H), 4.40-4.36 (m, 0.4H), 4.25-4.22 (m, 0.6H), 4.04-3.95 (m, 0.6H), 3.89-3.75 (m, 1.2H), 3.73-3.56 (m, 1.8H), 3.45-3.37 (m, 0.4H), 2.20, 2.19 (s, 3H), 2.07-1.69 (m, 6H), 1.37, 1.36 (s, 3H). ^{13}C NMR (75 MHz, CDCl_3) δ 169.0, 169.0, 142.9, 141.9, 141.1, 140.8, 130.7, 130.6, 125.4, 125.4, 118.5, 118.4, 116.0, 76.2, 76.0, 67.9, 67.8, 62.1, 60.6, 47.1, 45.8, 43.3, 43.1, 33.0, 32.8, 28.7, 25.4, 25.1, 25.1, 24.2, 24.1. HRMS m/z : $[\text{M}+\text{Na}]^+$ Calcd for: $\text{C}_{16}\text{H}_{20}\text{BrNNaO}_2^+$ 360.0570, Found 360.0578.

4. Copies of the ^1H NMR, ^{13}C NMR and ^{19}F NMR Spectra

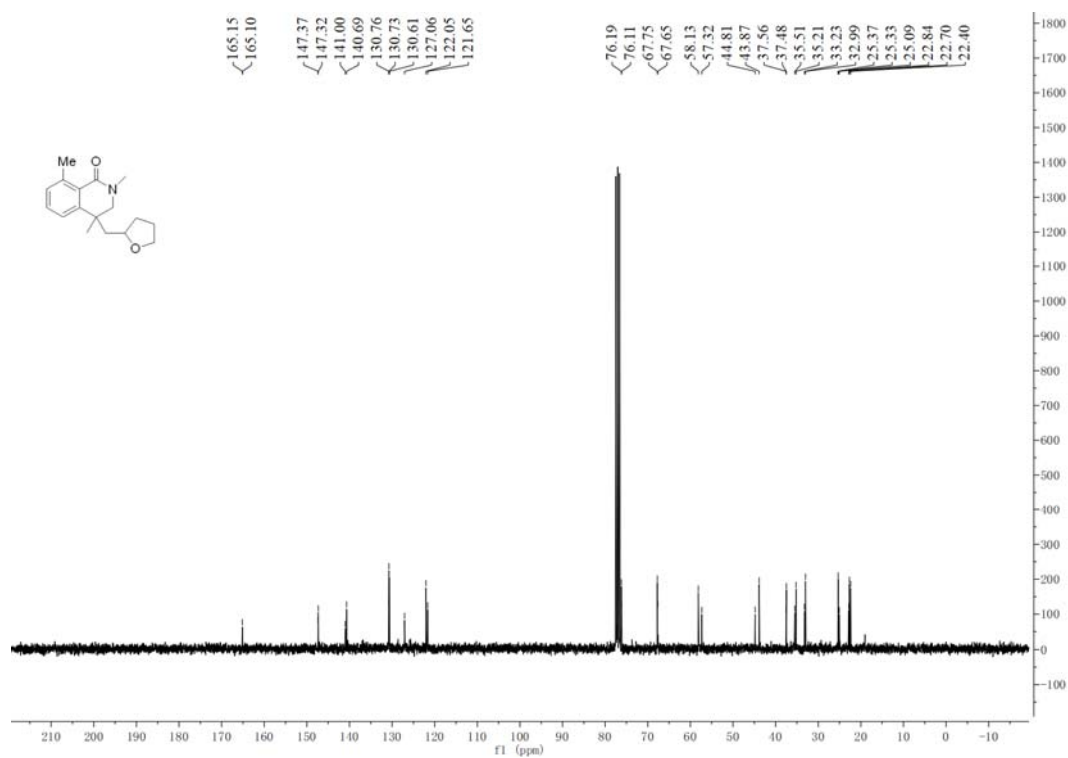
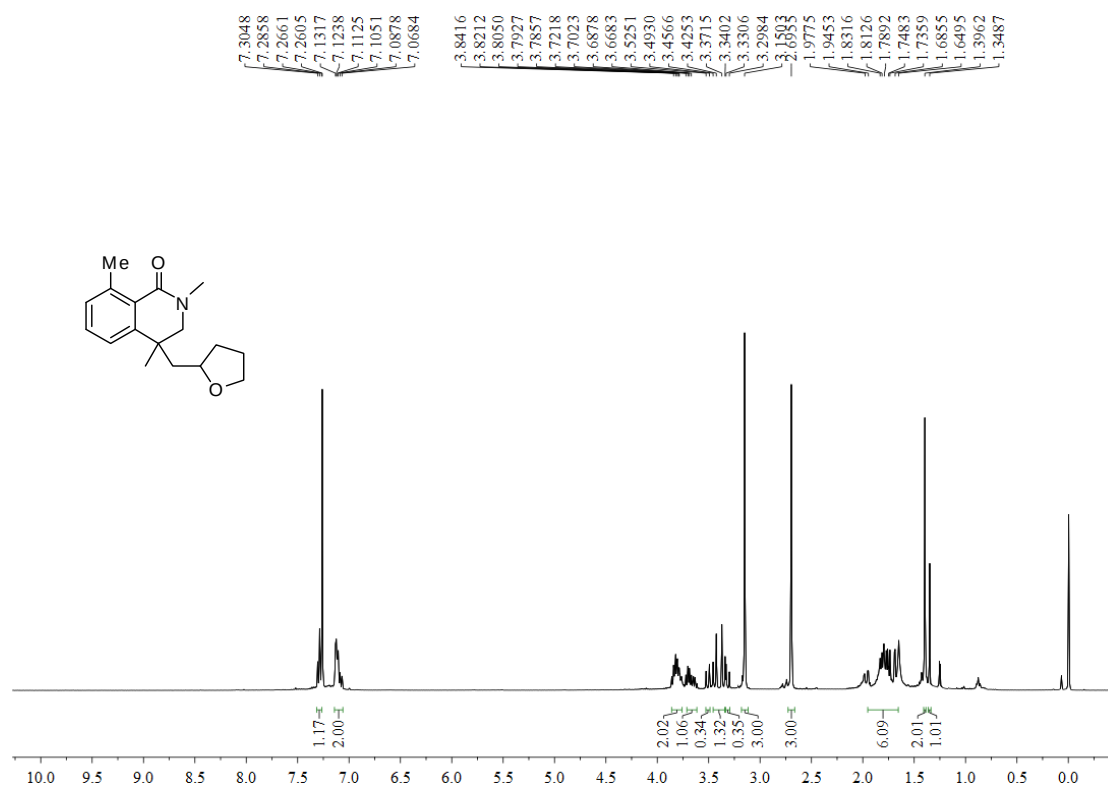
2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3aa):



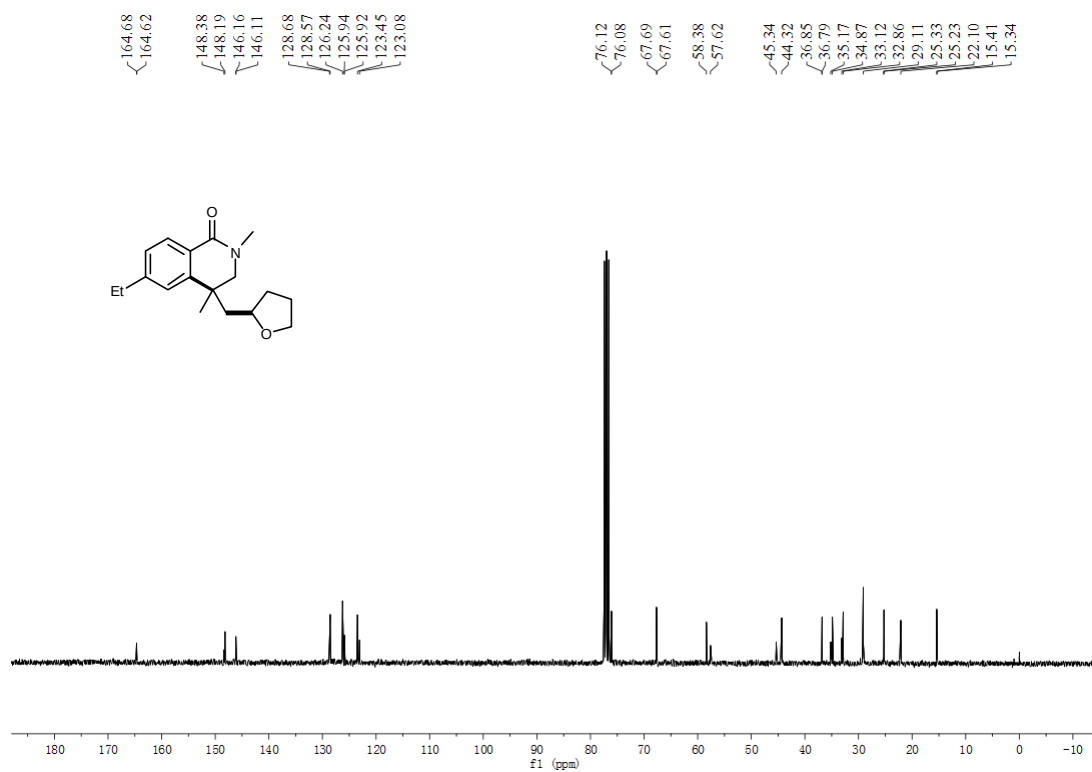
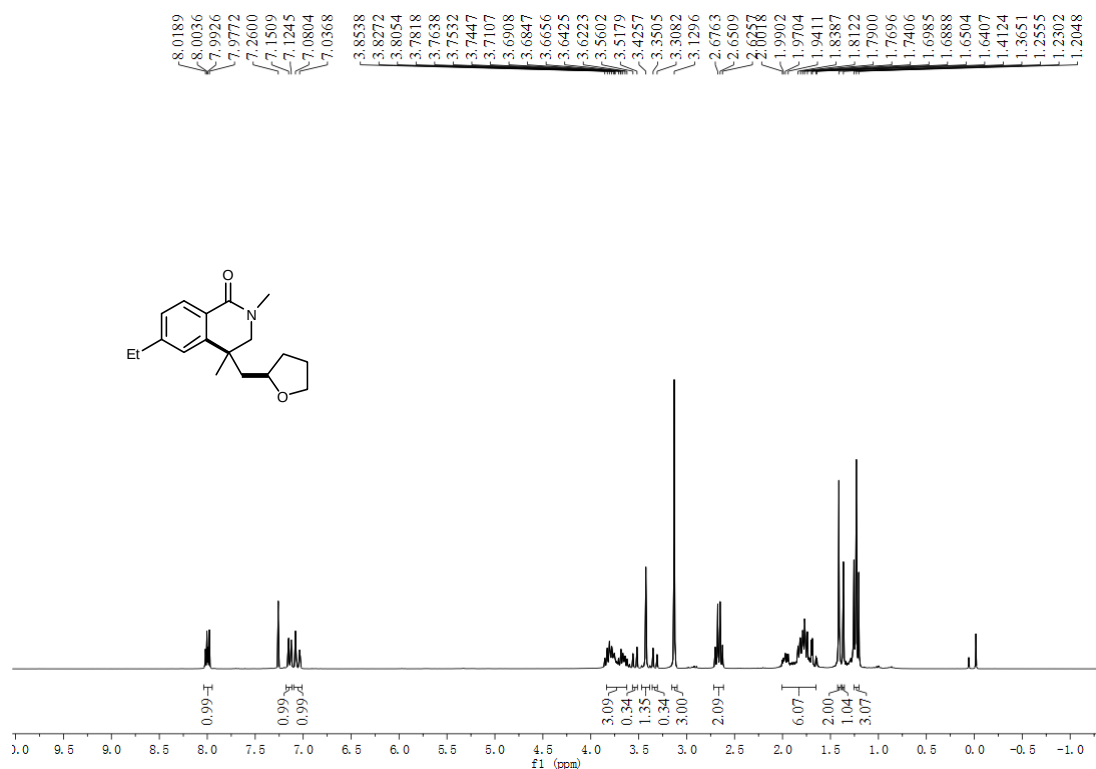
2,4,6-trimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ba):



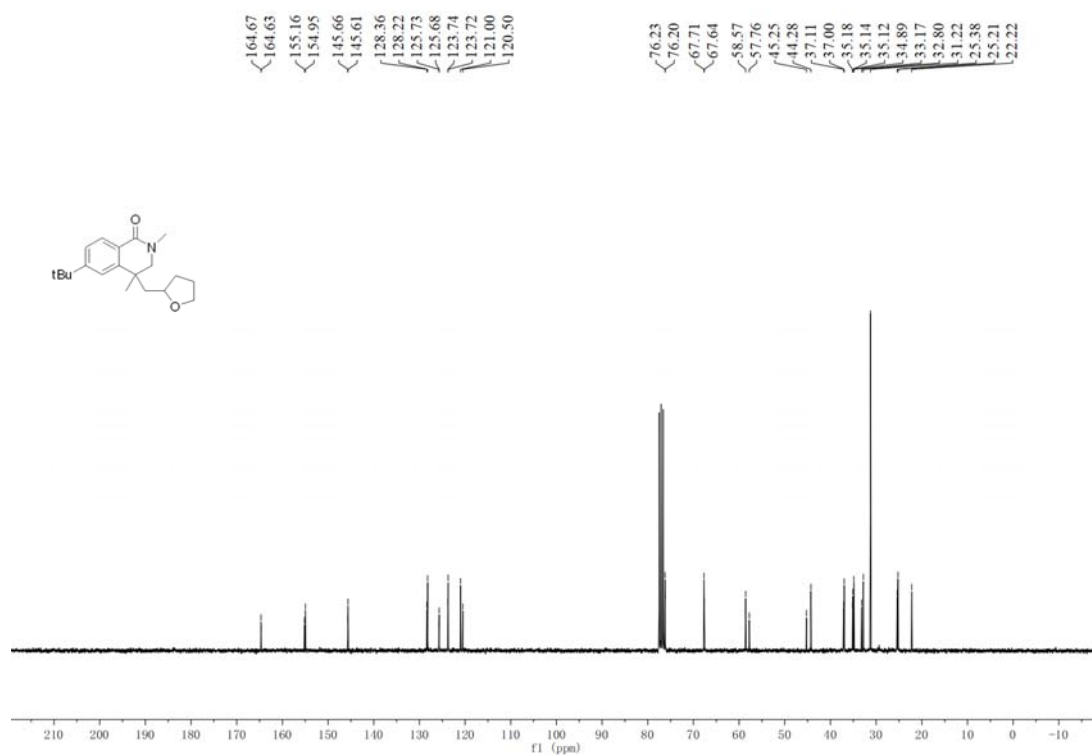
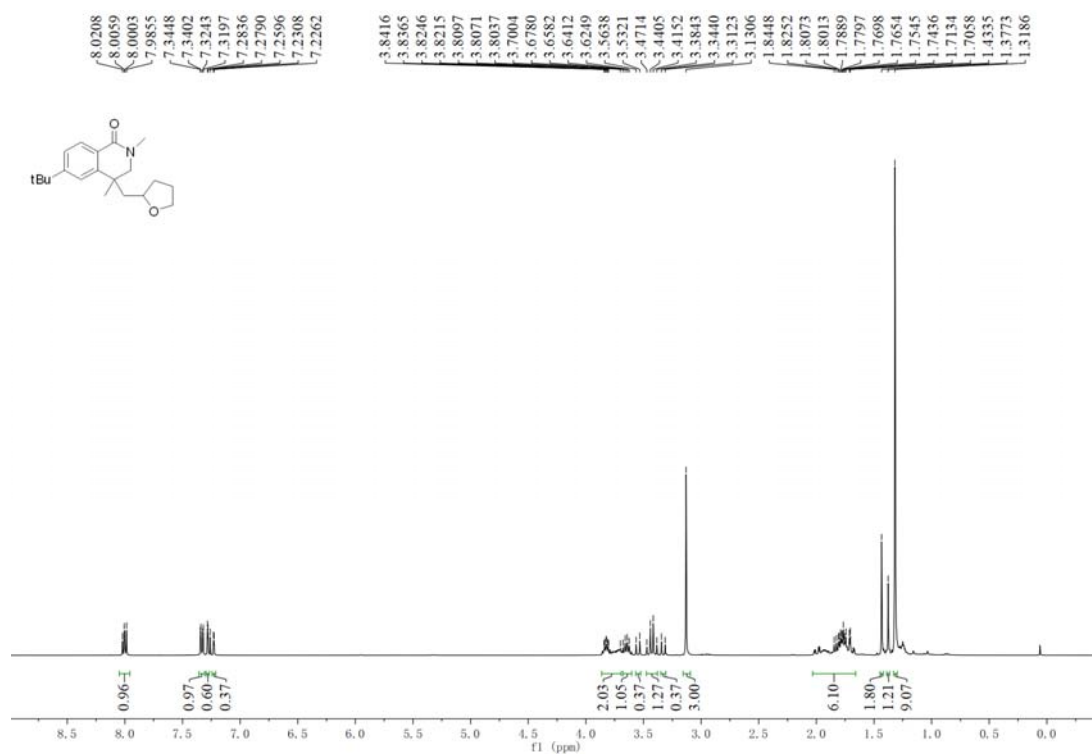
2,4,8-trimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ca):



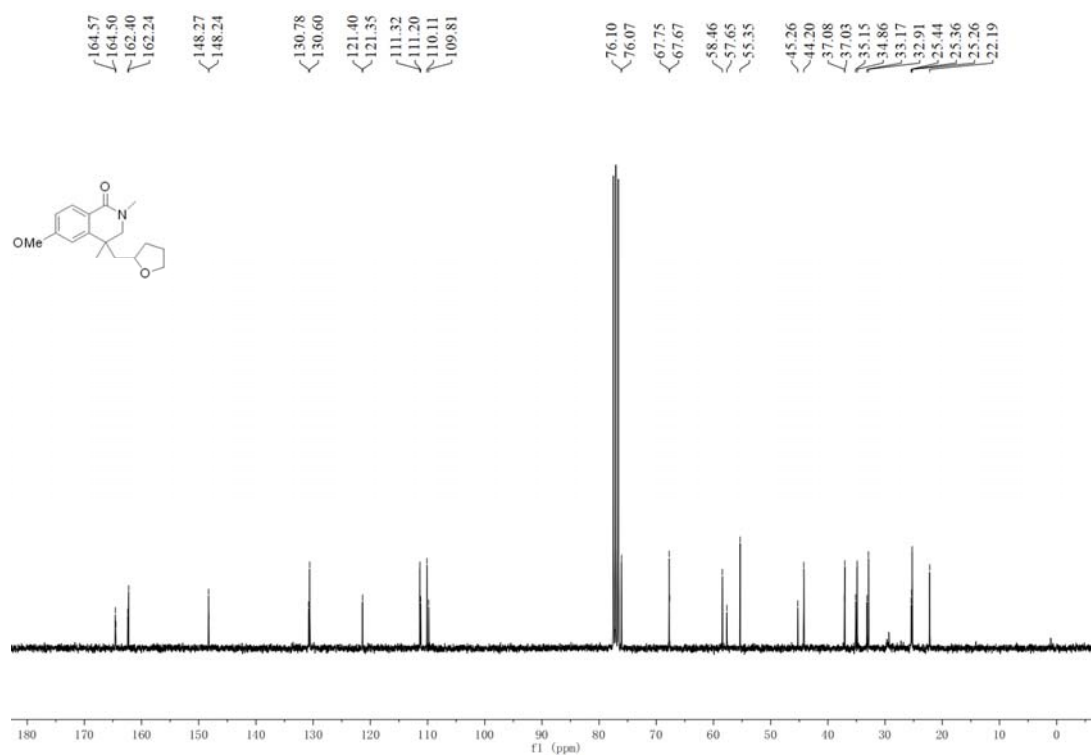
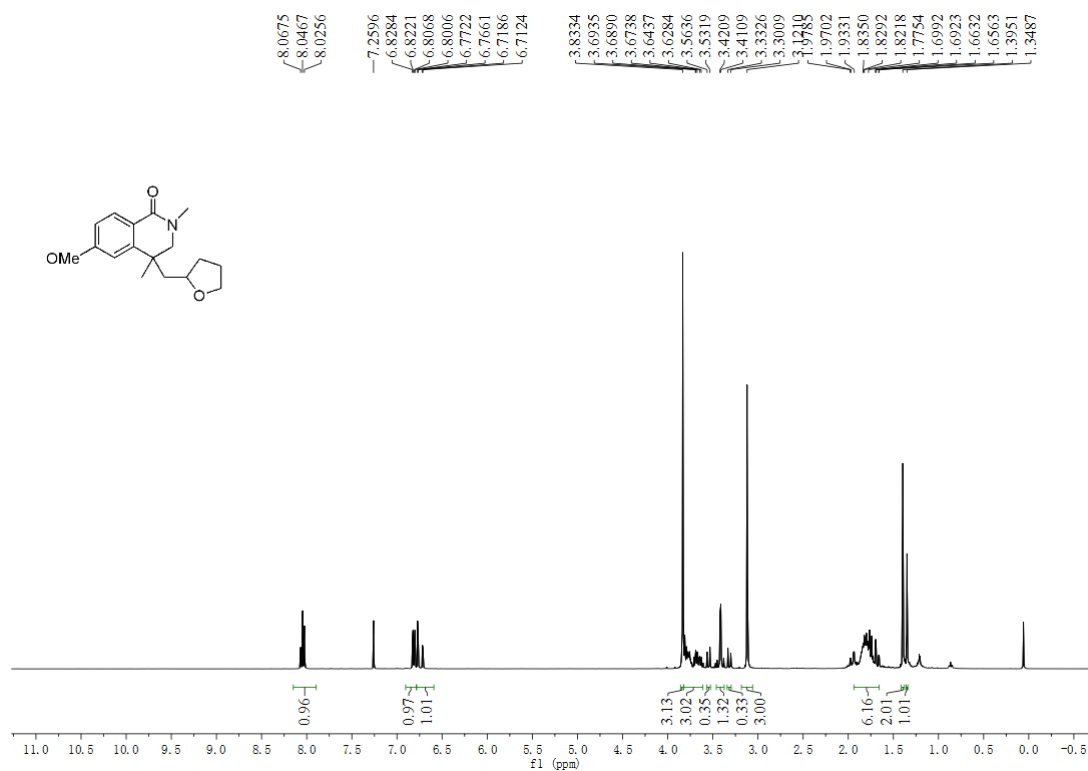
**6-ethyl-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one
(3da):**



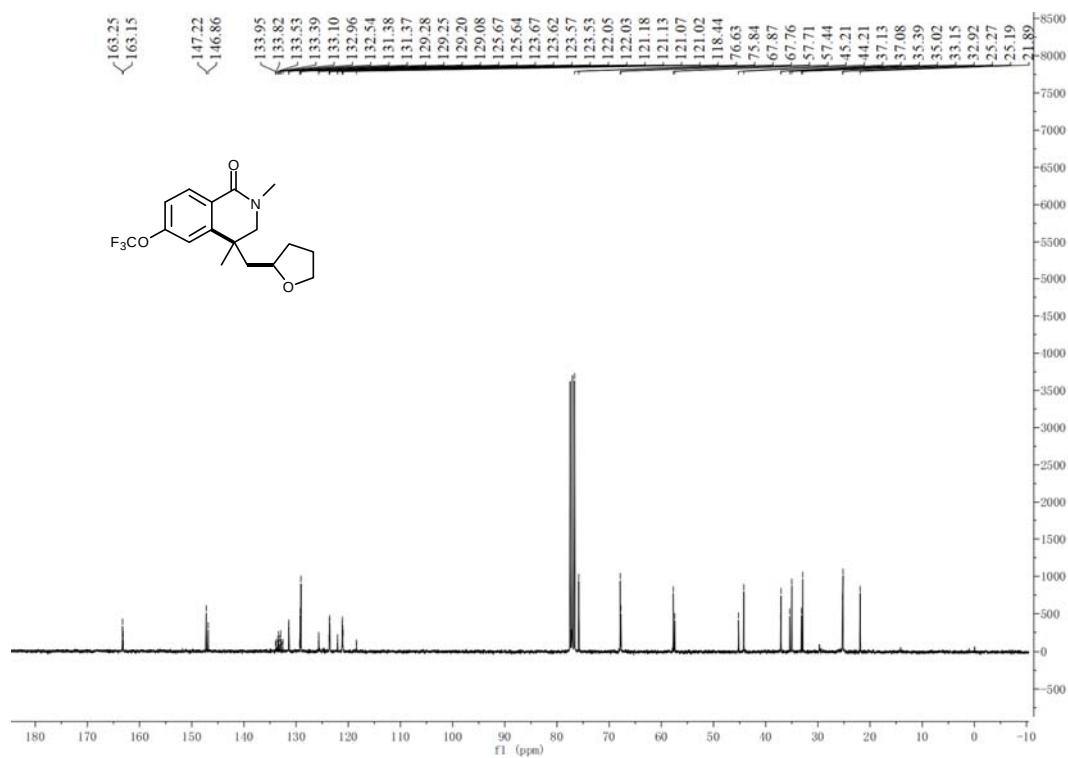
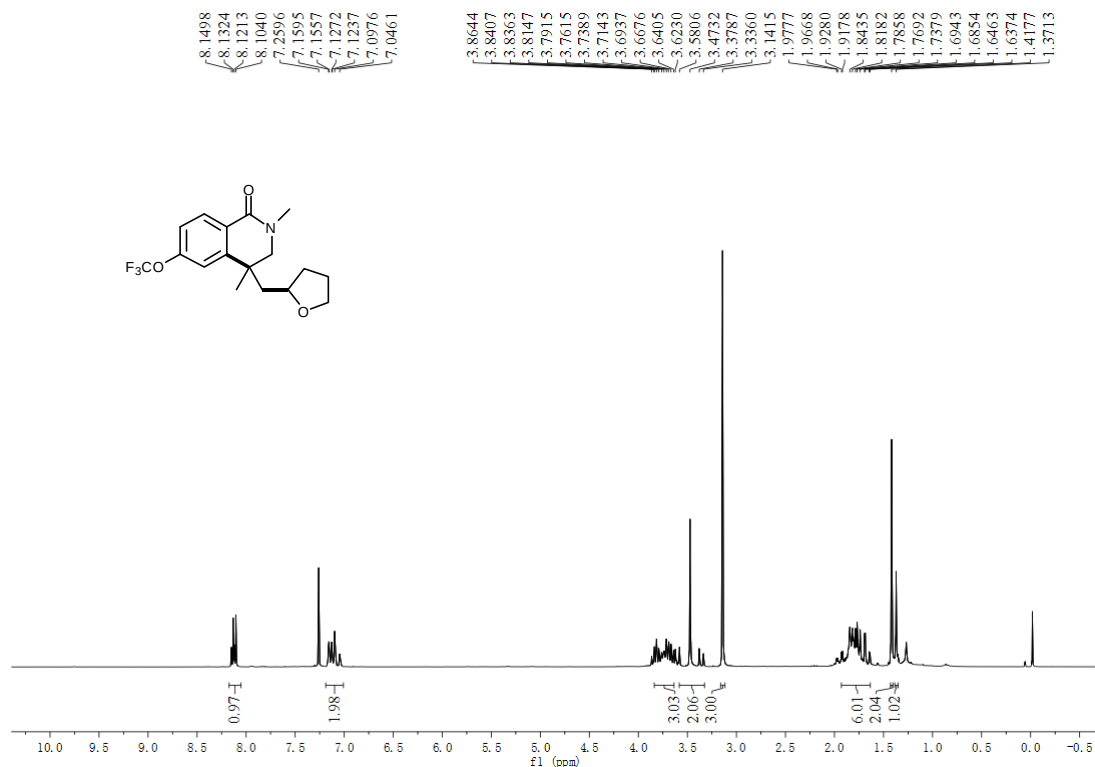
6-(*tert*-butyl)-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2*H*)-one (3ea):

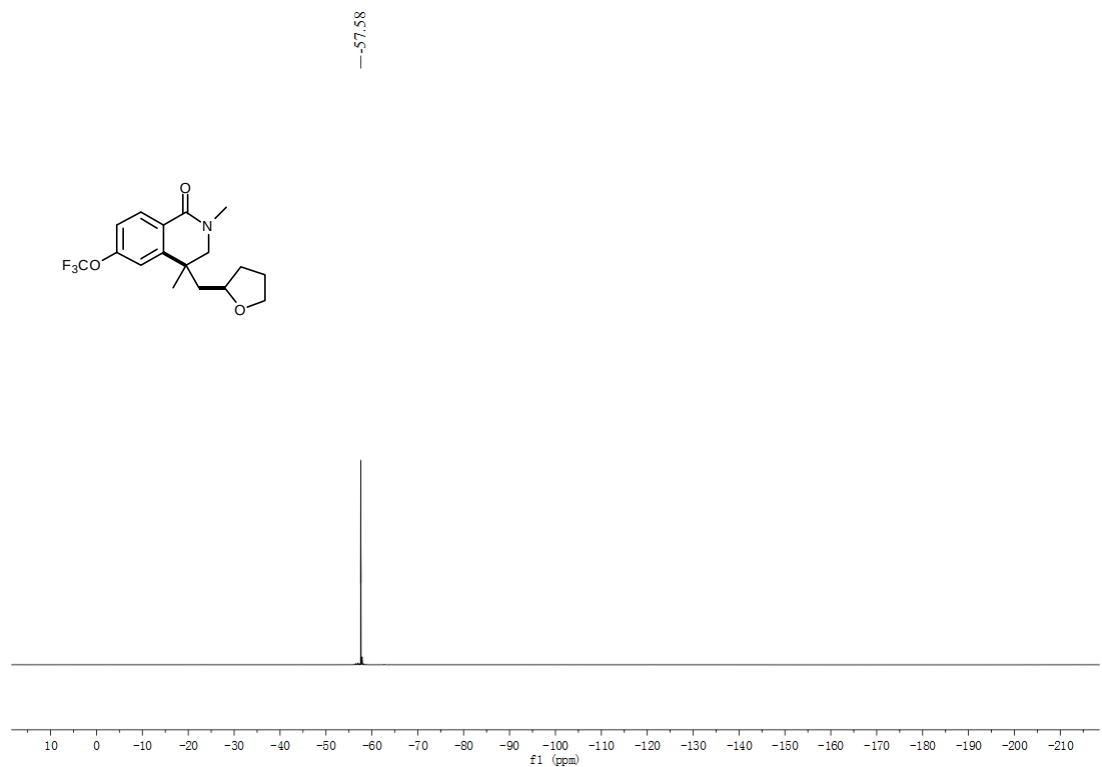


**6-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one
(3fa):**

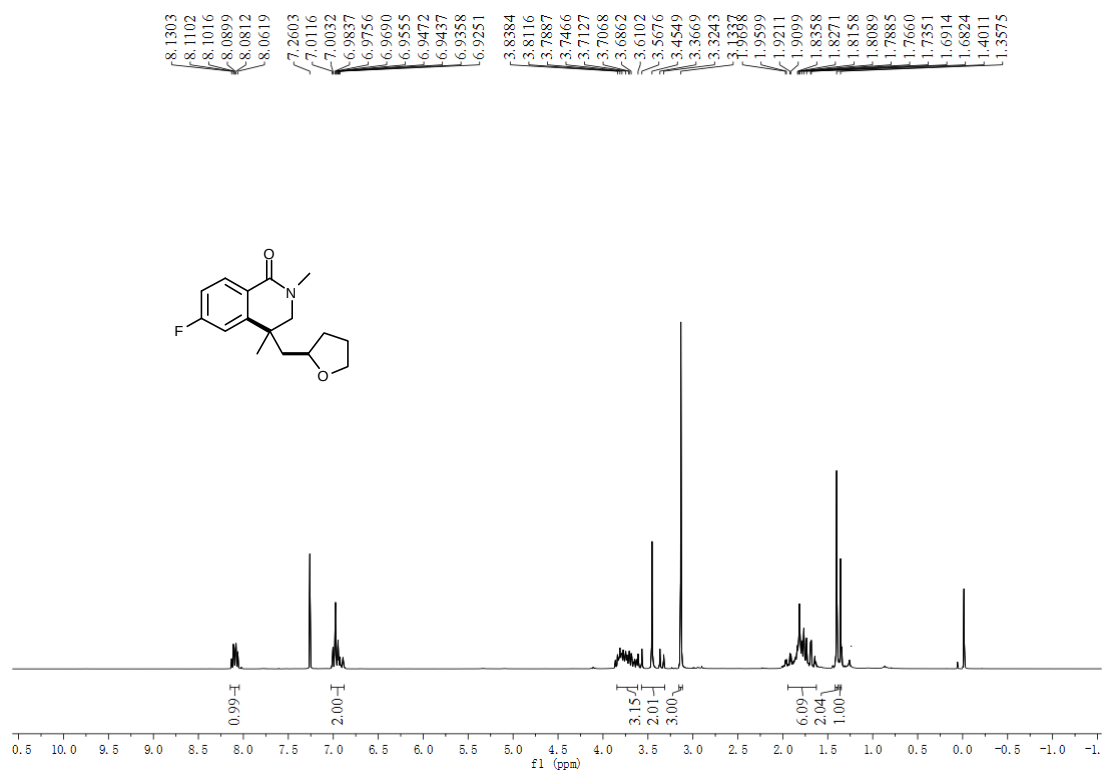


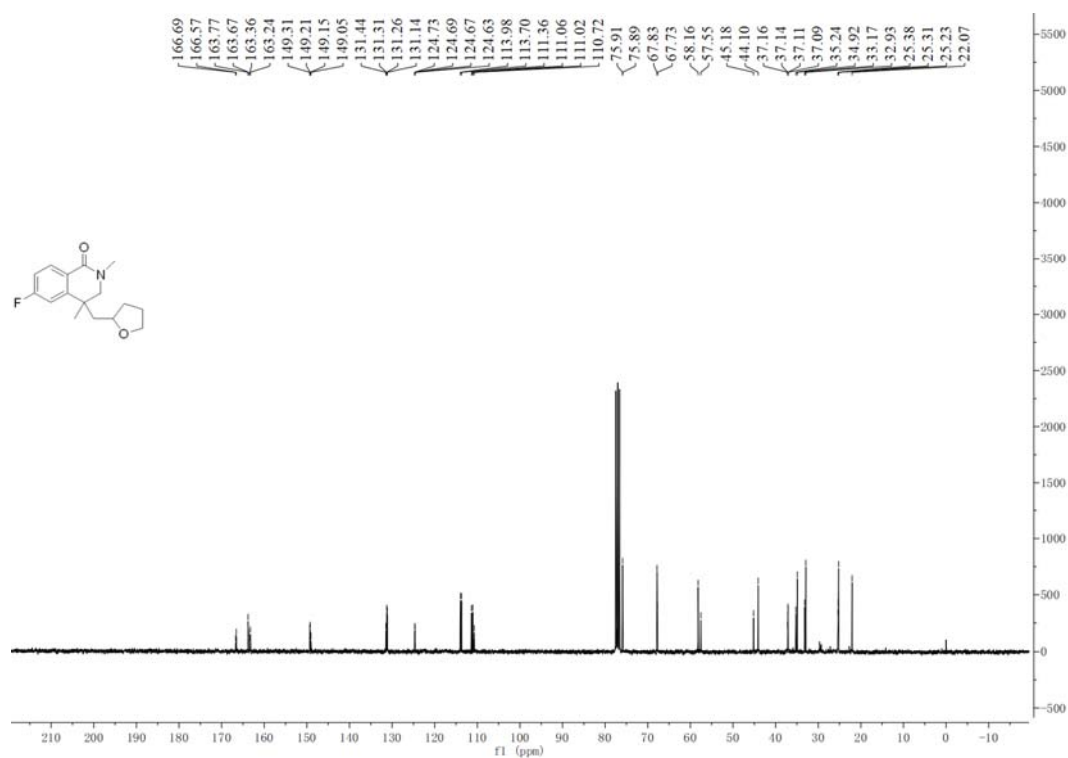
2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-6-(trifluoromethoxy)-3,4-dihydroisoquinolin-1(2H)-one (3ga):



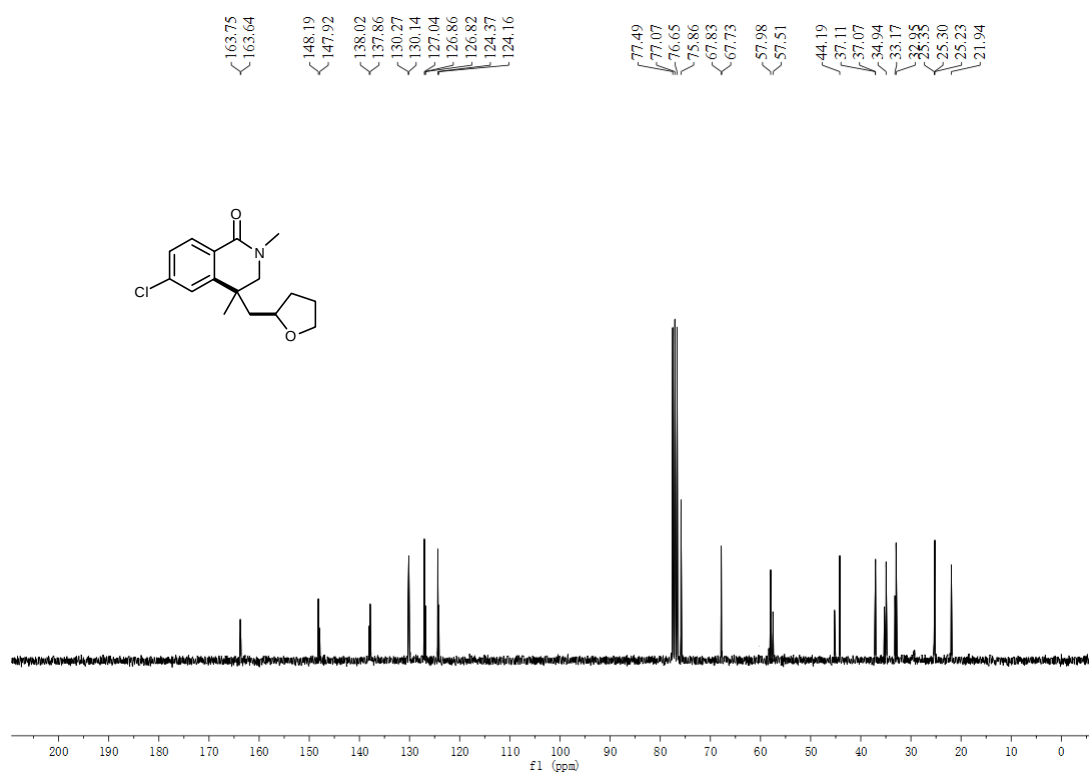
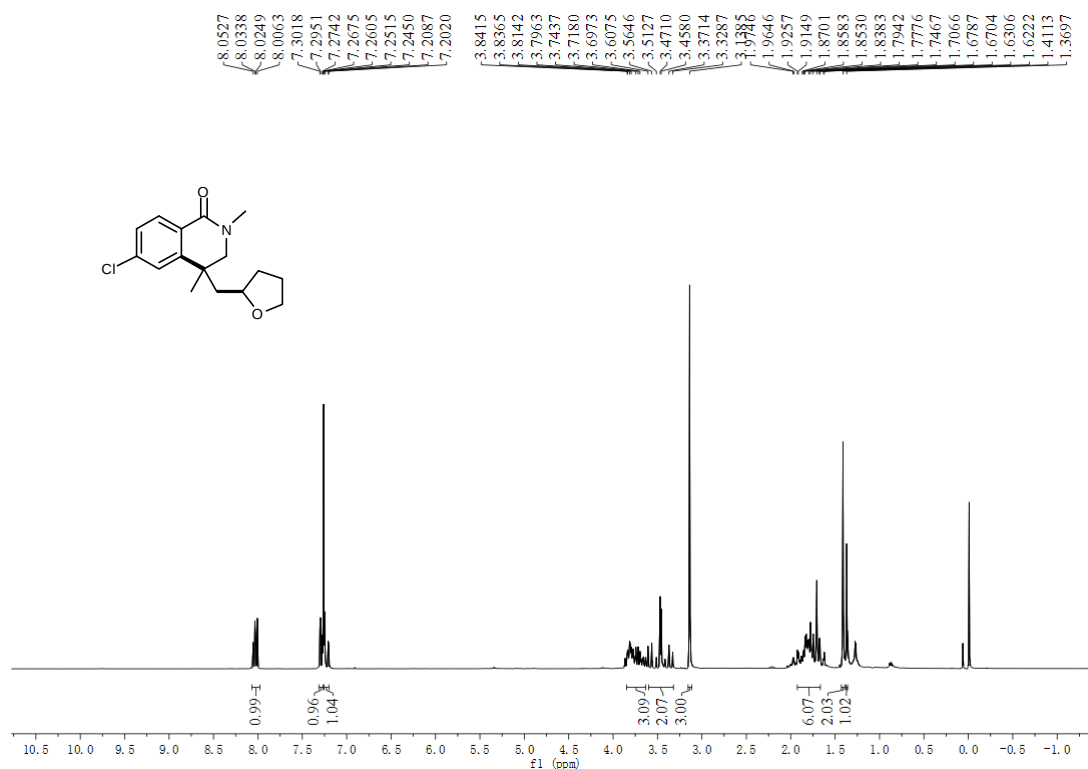


6-fluoro-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ha):

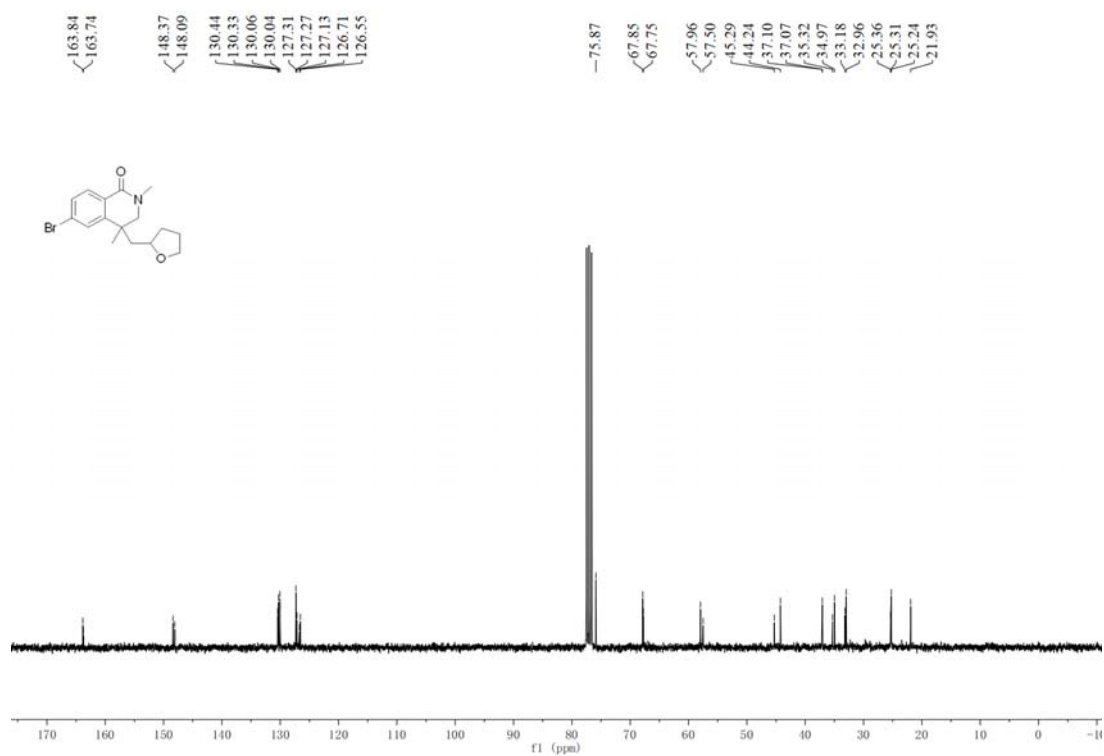
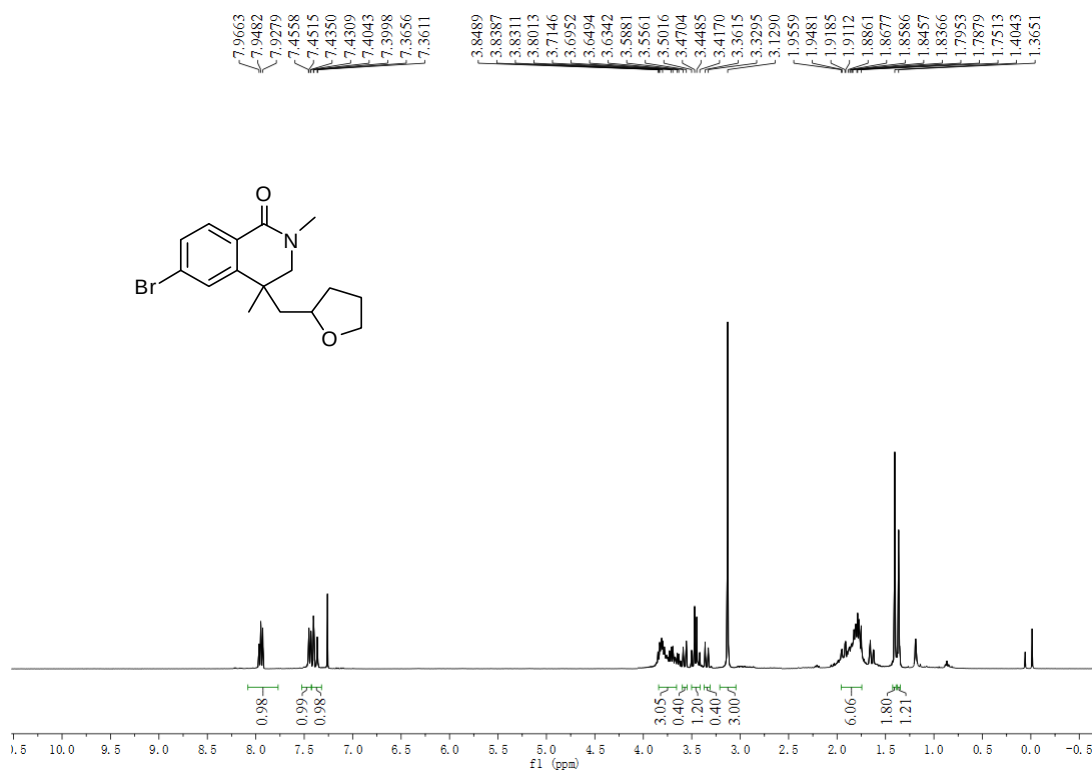




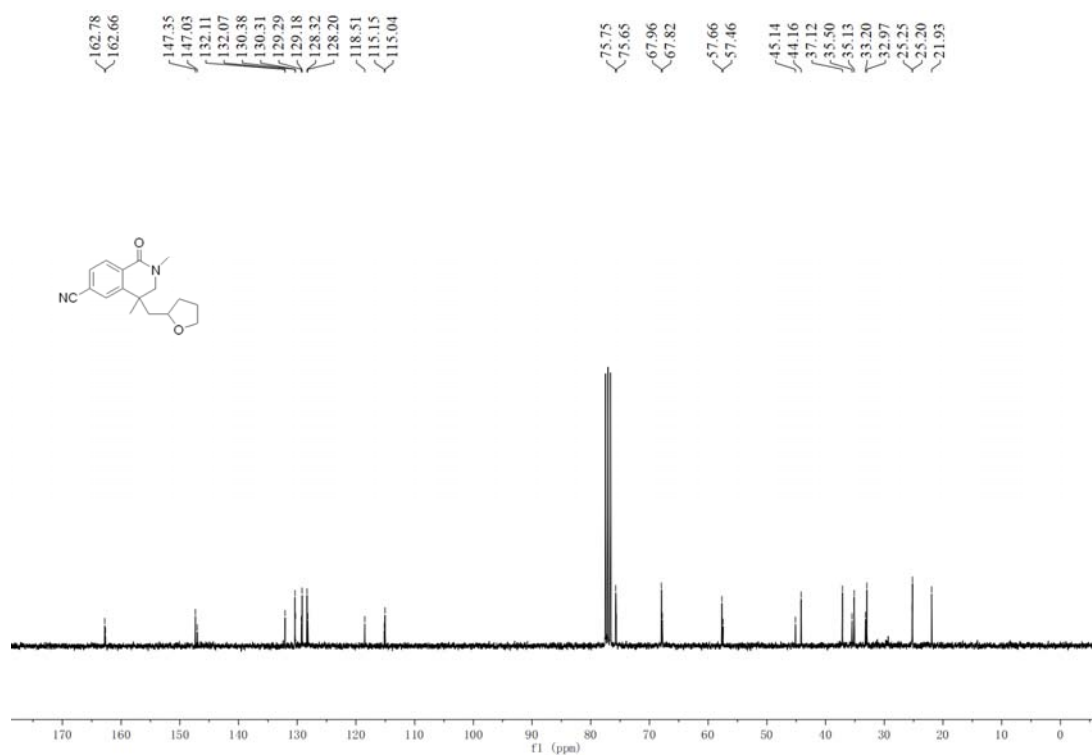
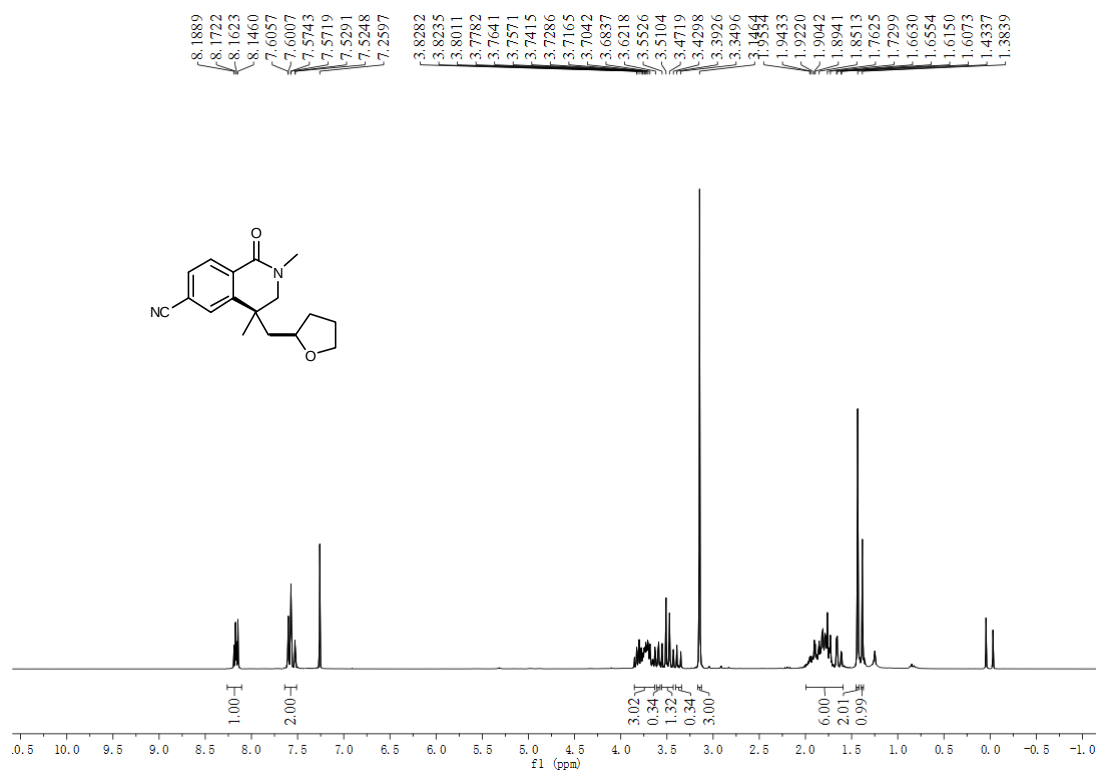
6-chloro-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ia):



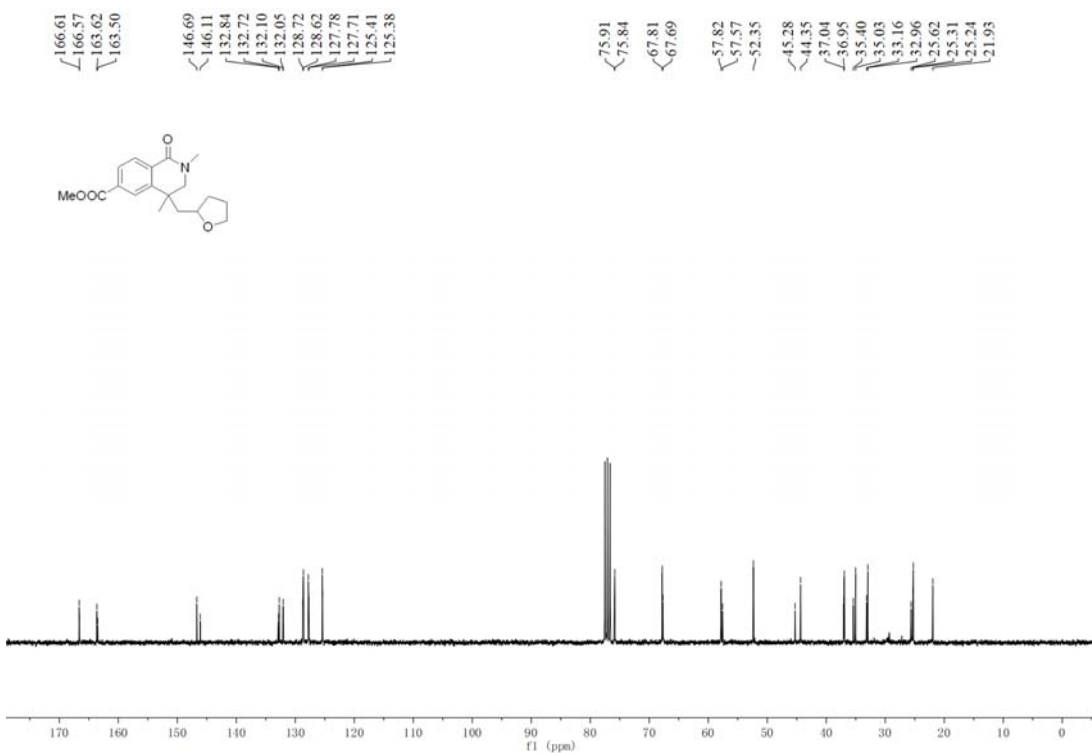
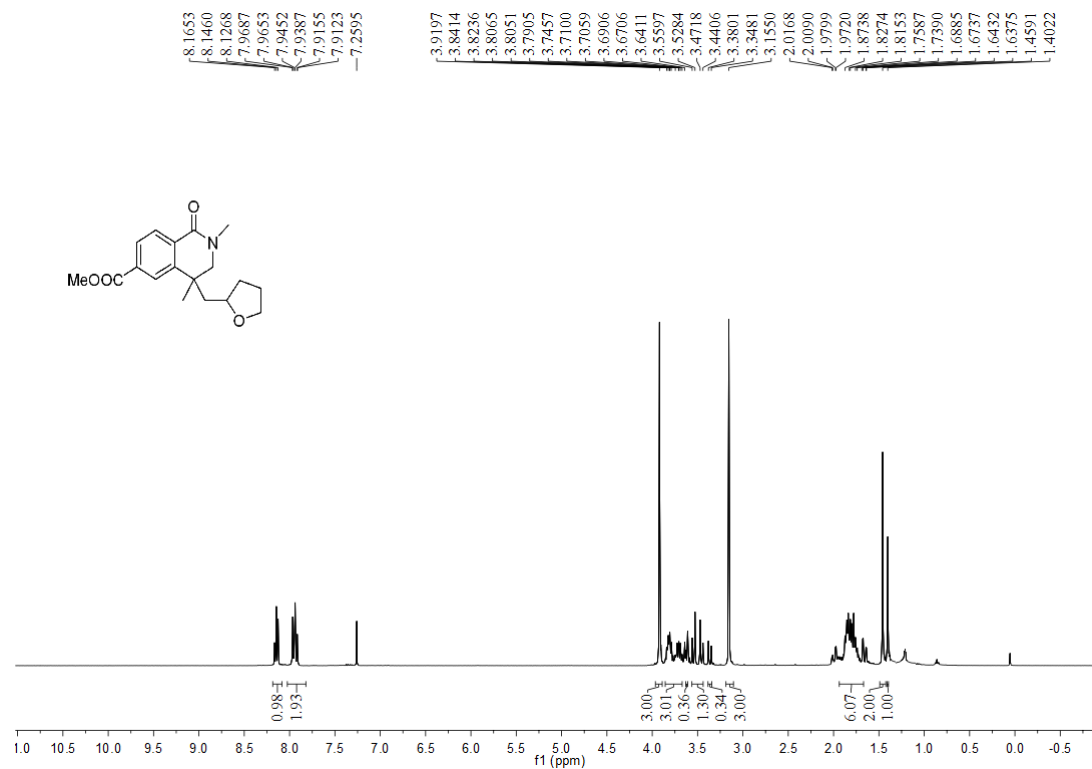
**6-bromo-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one
(3ja):**



2,4-dimethyl-1-oxo-4-((tetrahydrofuran-2-yl)methyl)-1,2,3,4-tetrahydroisoquinoline-6-carbonitrile (3ka):

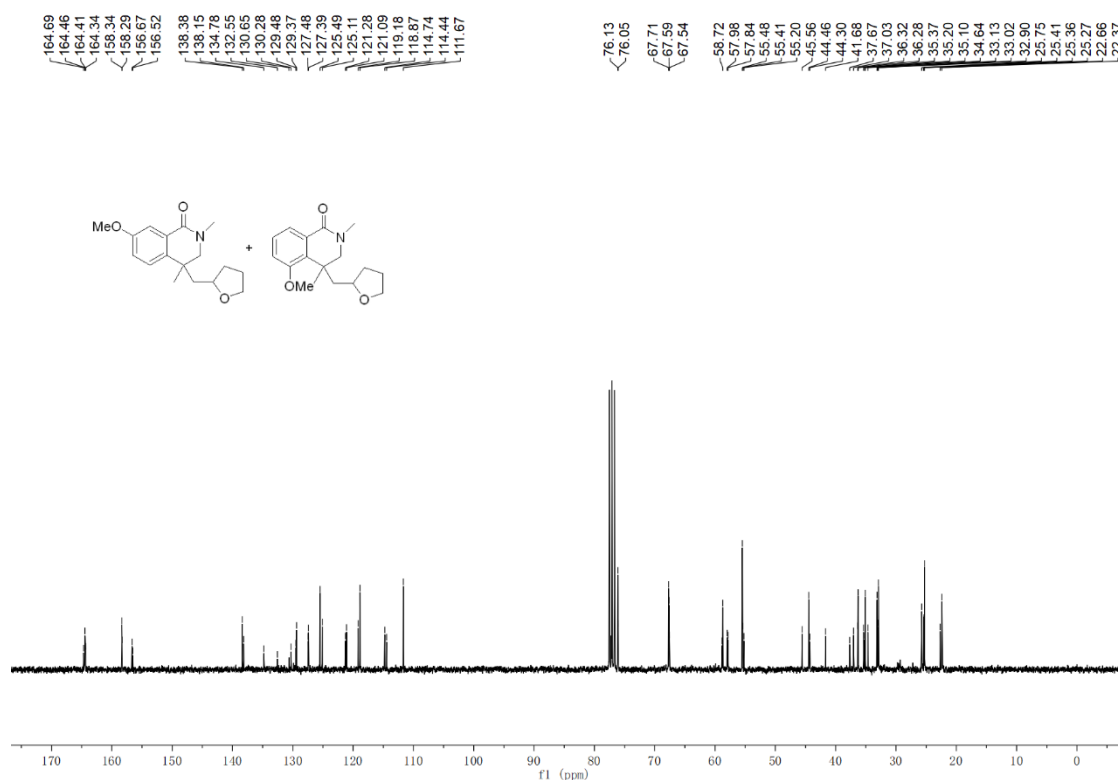
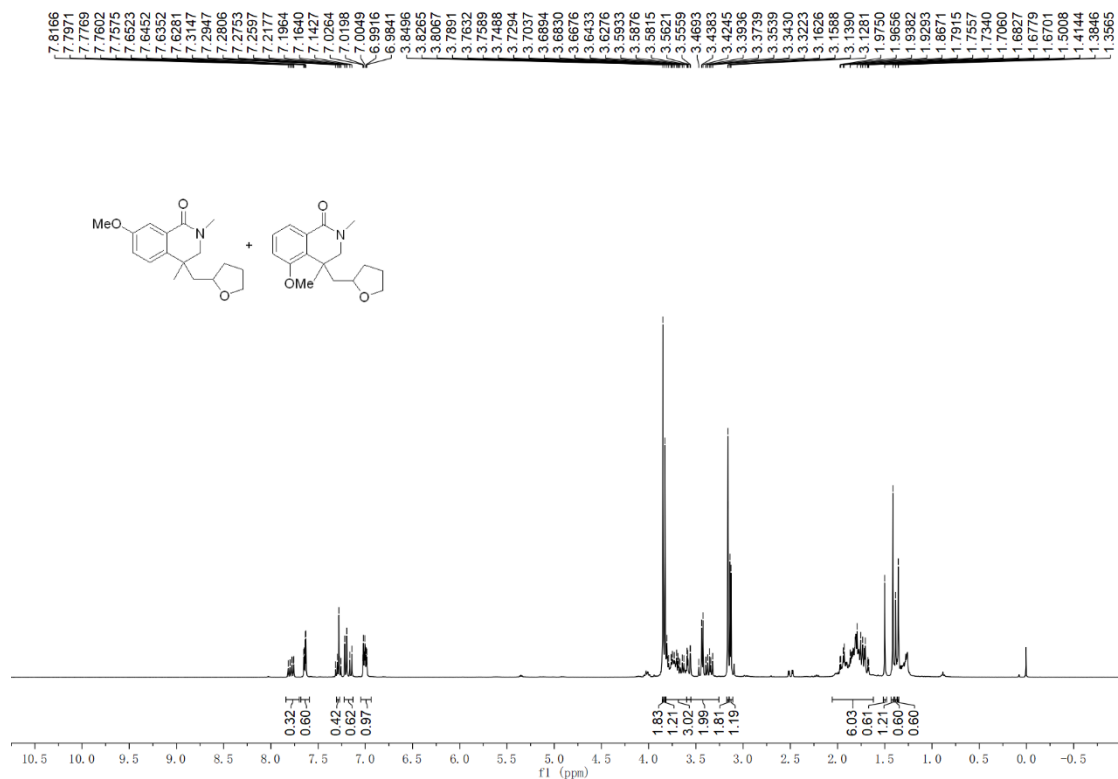


**Methyl
2,4-dimethyl-1-oxo-4-((tetrahydrofuran-2-yl)methyl)-1,2,3,4-tetrahydroisoquinoline-6-carboxylate (3la) :**

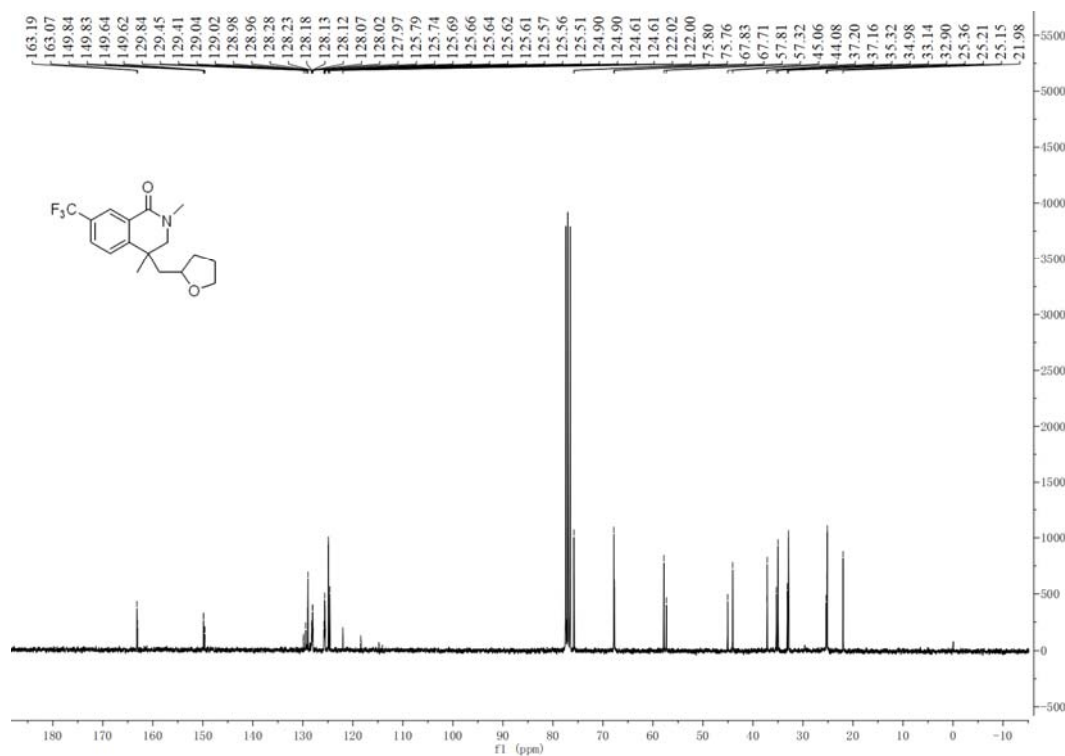
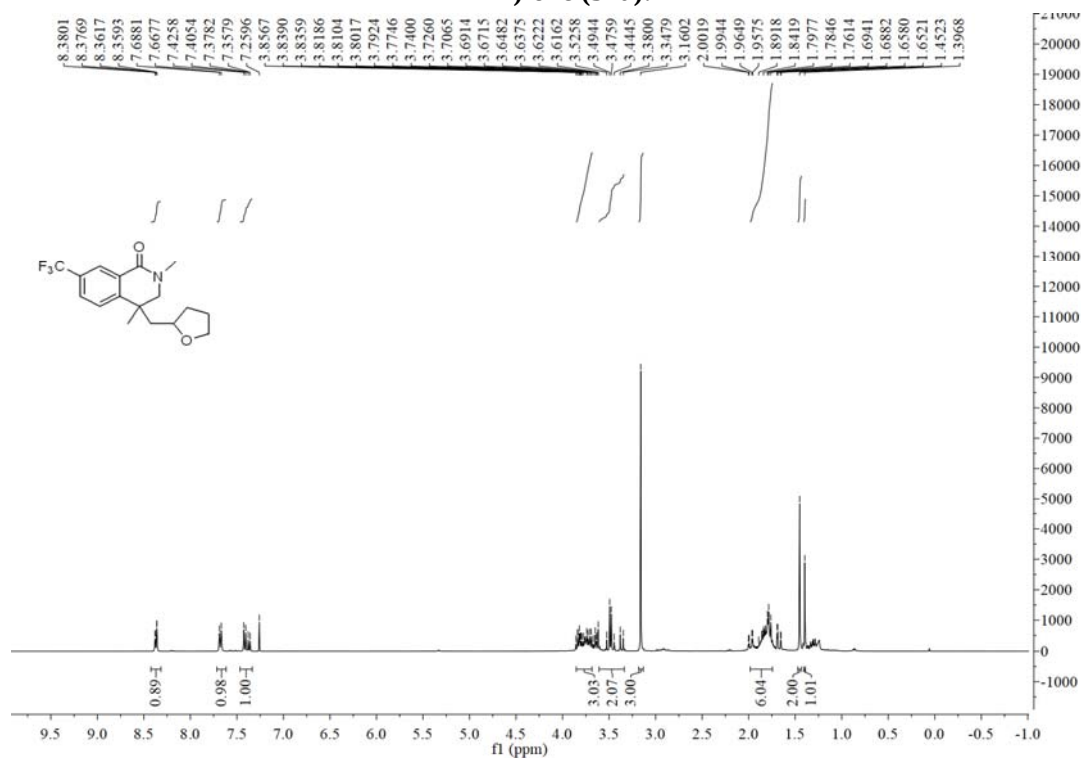


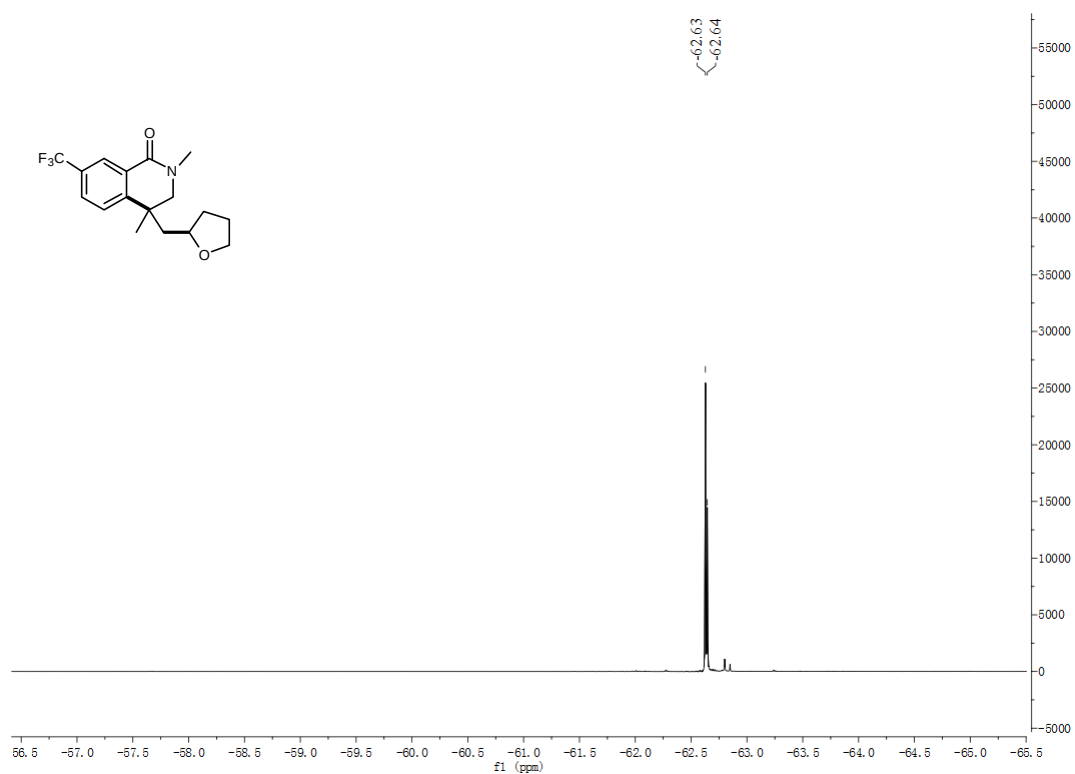
7-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one
(3ma) +

5-methoxy-2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one
(3ma'):

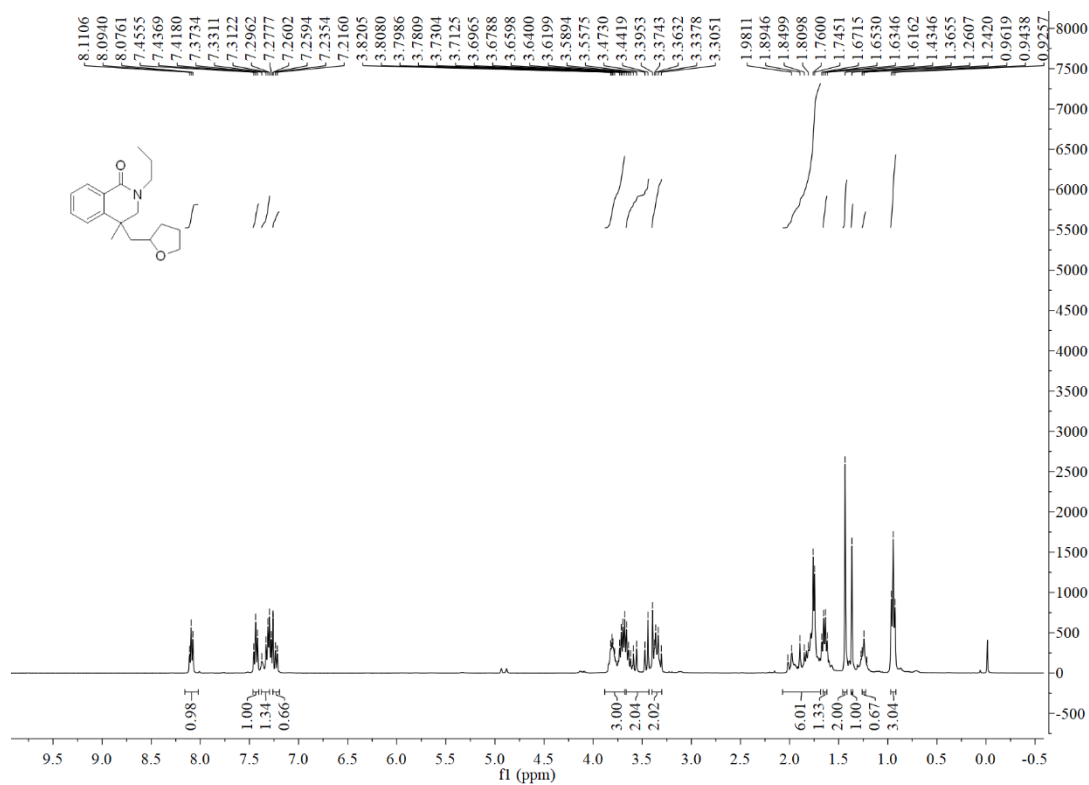


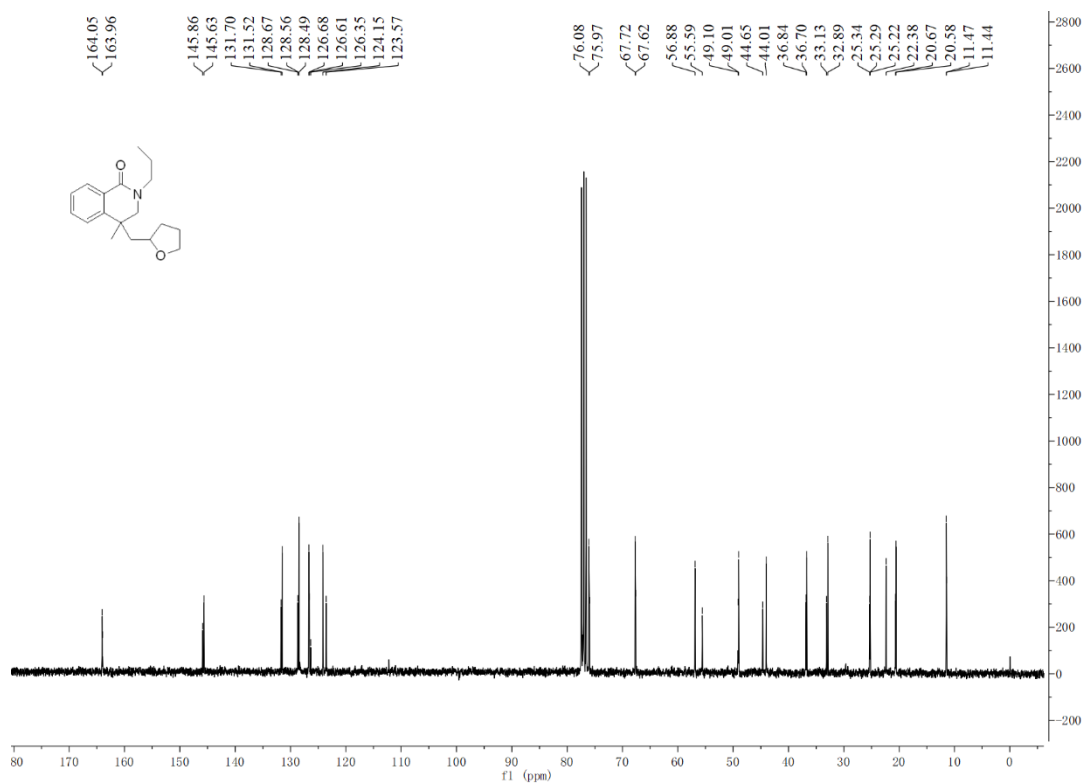
2,4-dimethyl-4-((tetrahydrofuran-2-yl)methyl)-5-(trifluoromethyl)-3,4-dihydroisoquinolin-1(2H)-one (3na):



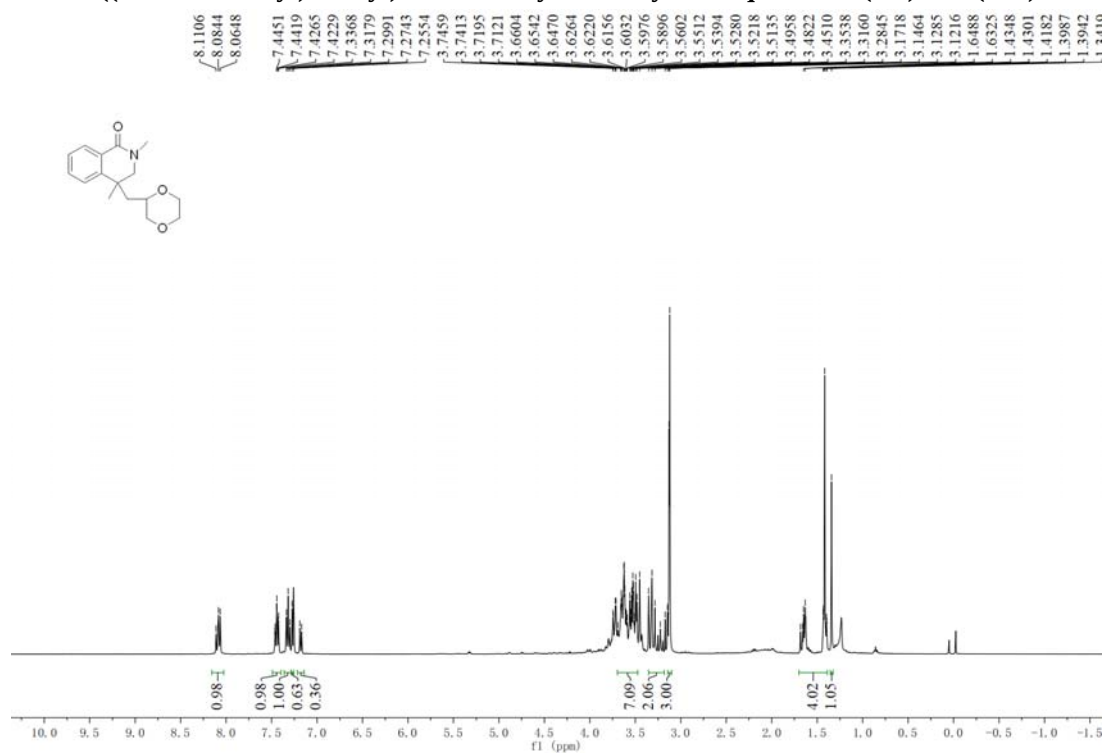


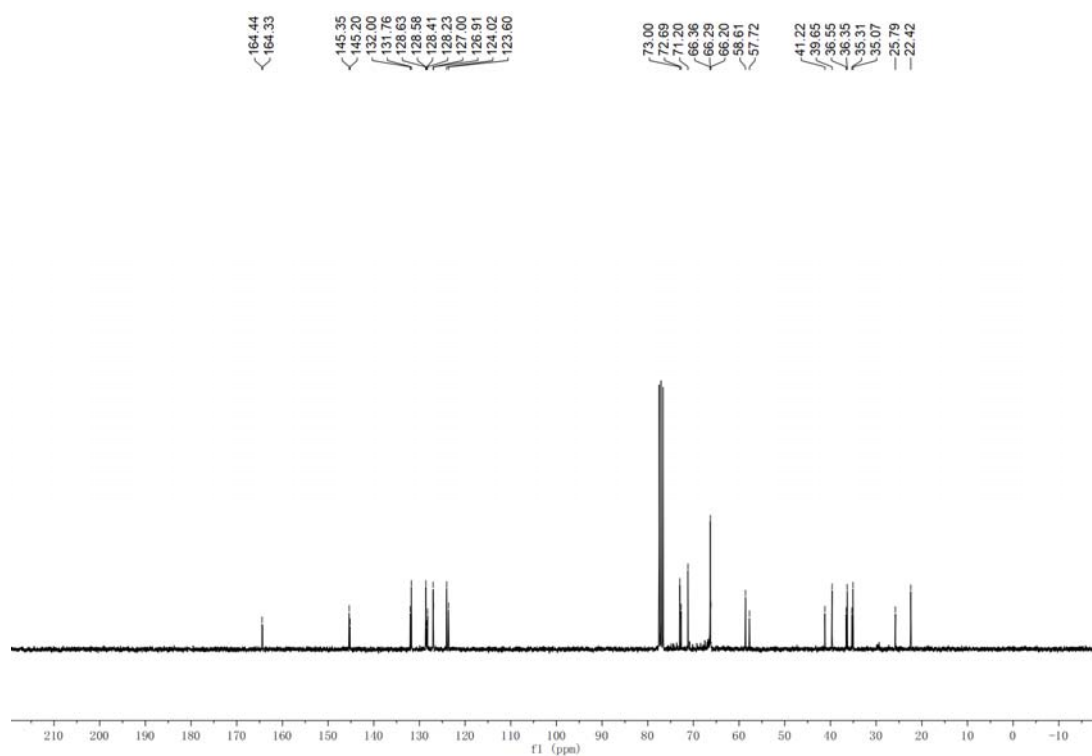
4-methyl-2-propyl-4-((tetrahydrofuran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (30a):



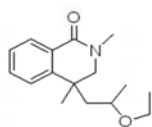
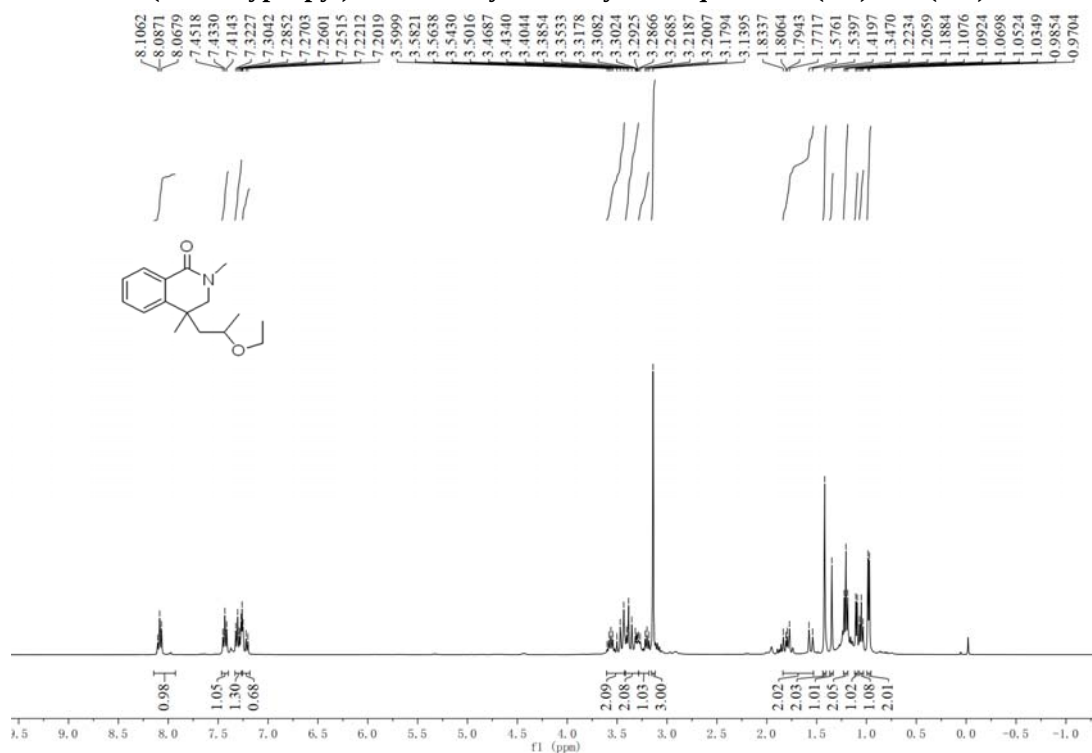


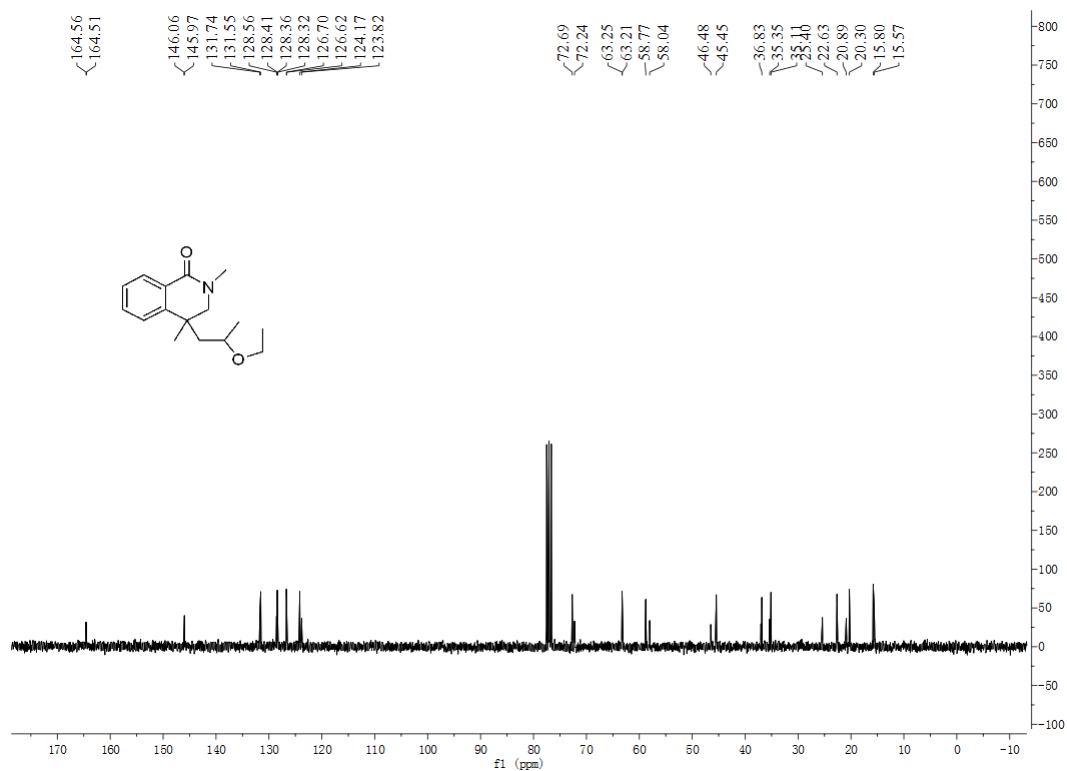
4-((1,4-dioxan-2-yl)methyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ab) :



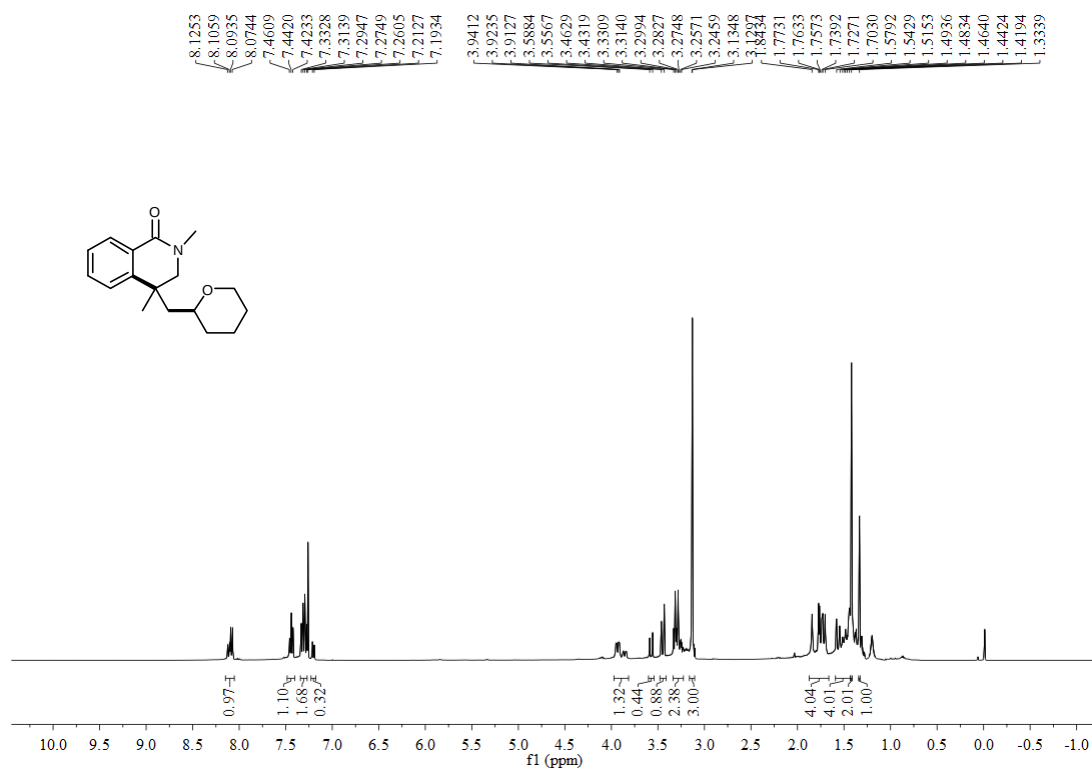


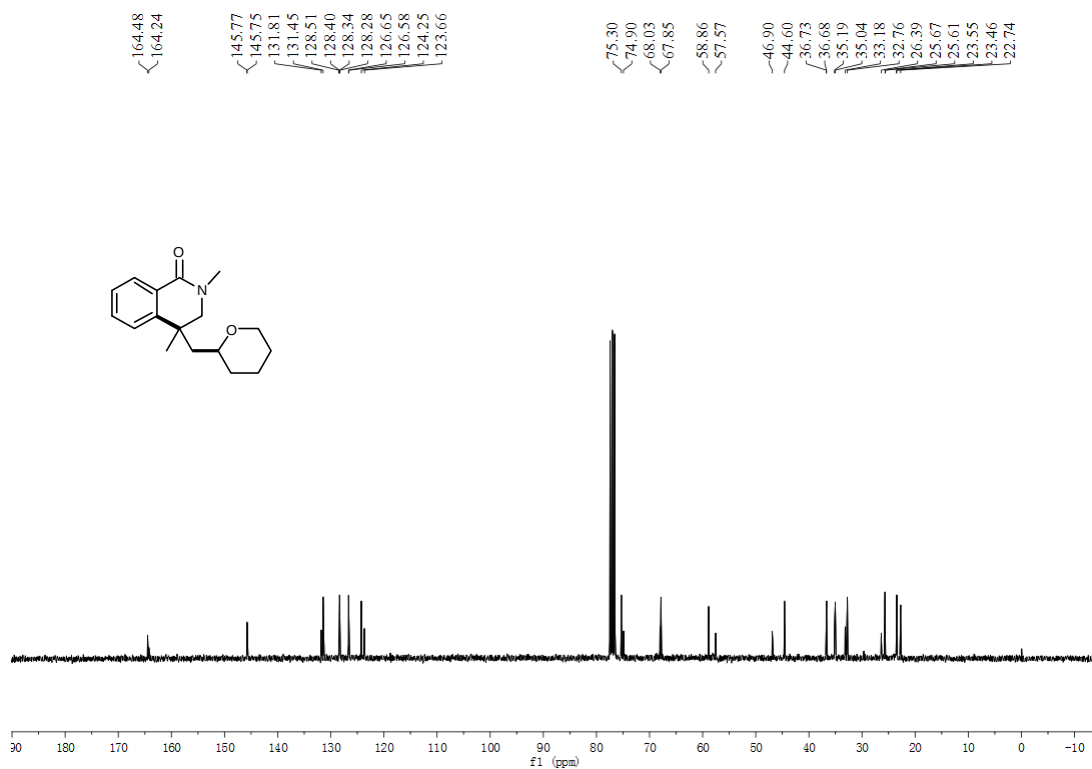
4-(2-ethoxypropyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ac) :



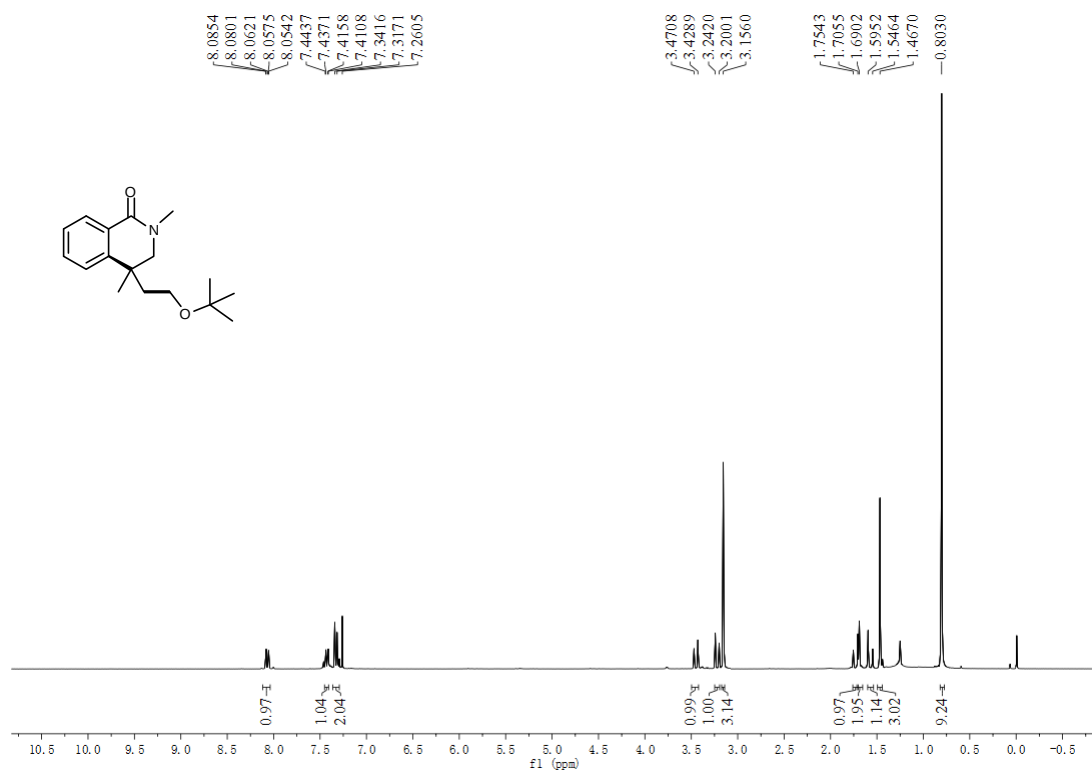


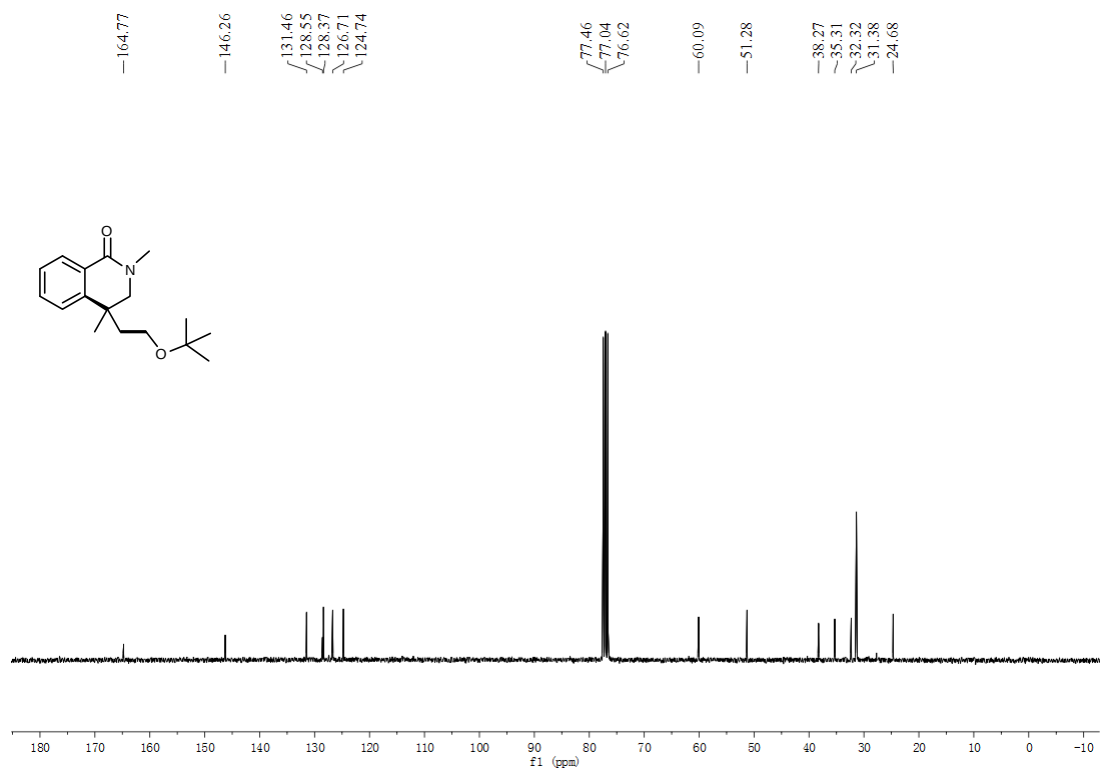
2,4-dimethyl-4-((tetrahydro-2H-pyran-2-yl)methyl)-3,4-dihydroisoquinolin-1(2H)-one (3ad):



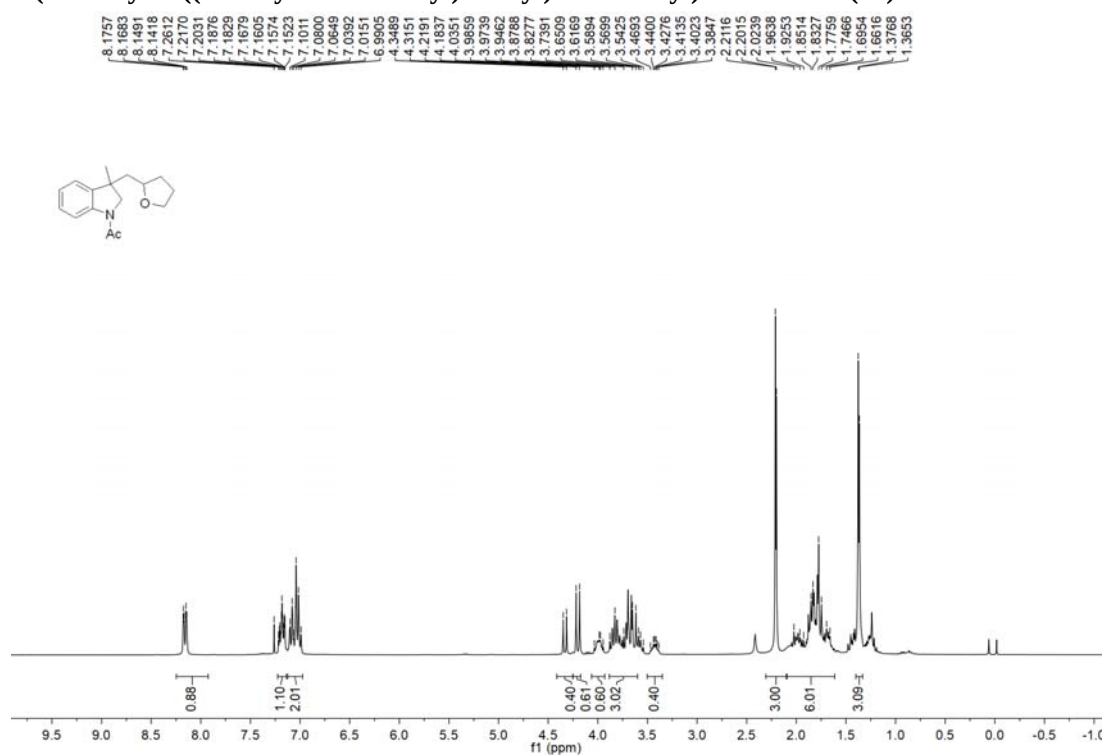


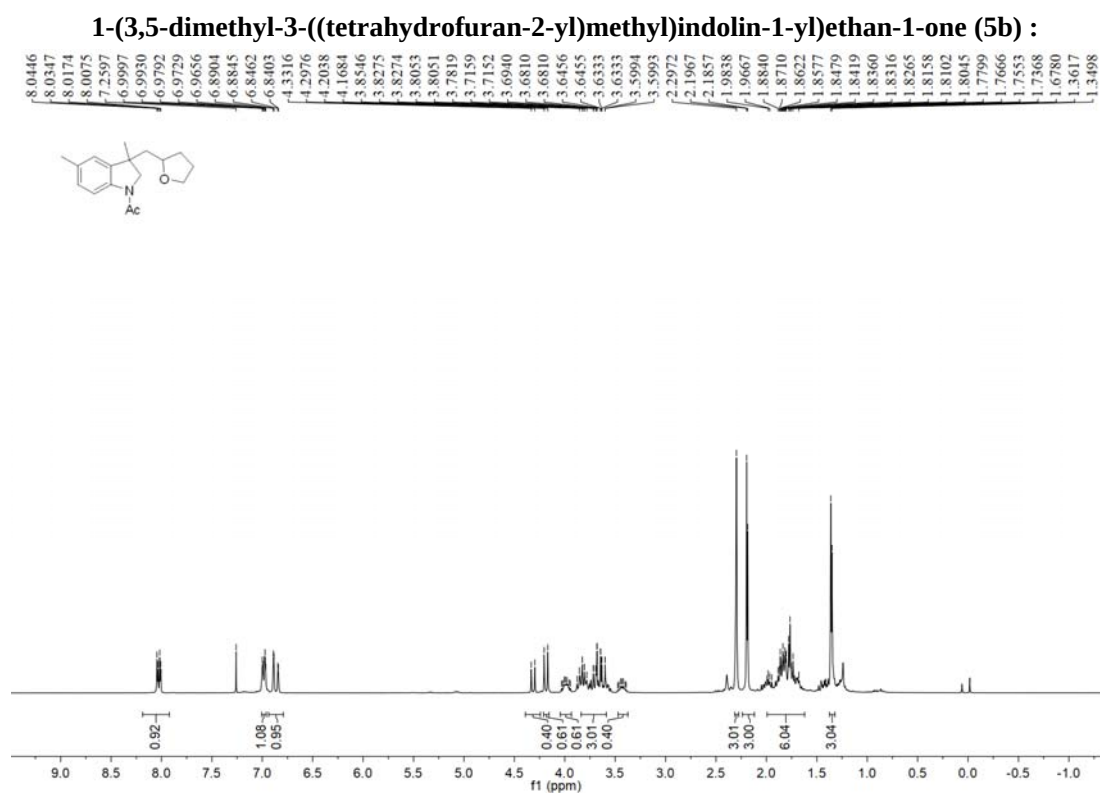
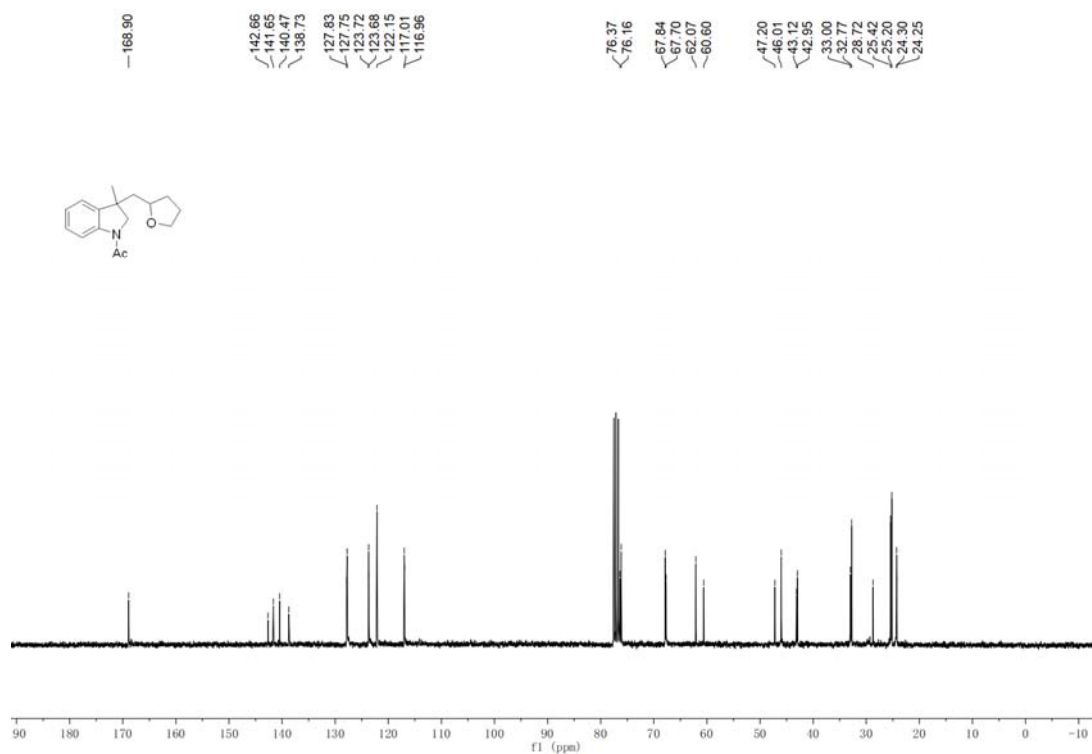
4-(2-*tert*-butoxyethyl)-2,4-dimethyl-3,4-dihydroisoquinolin-1(2H)-one (3ae):

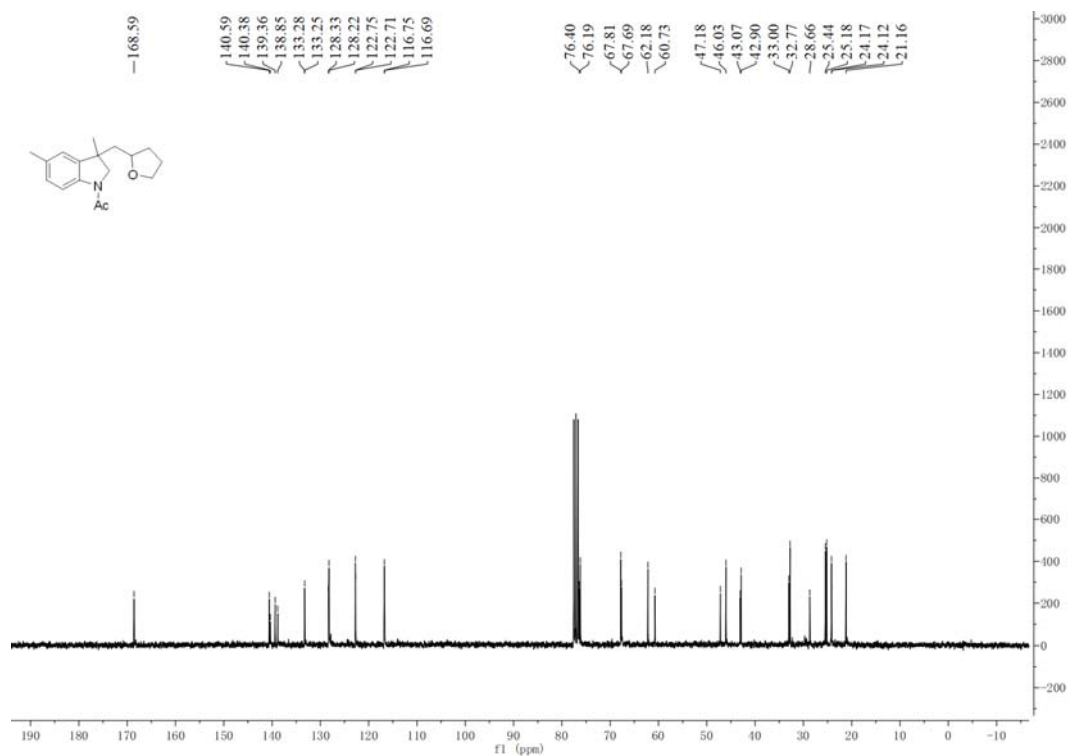




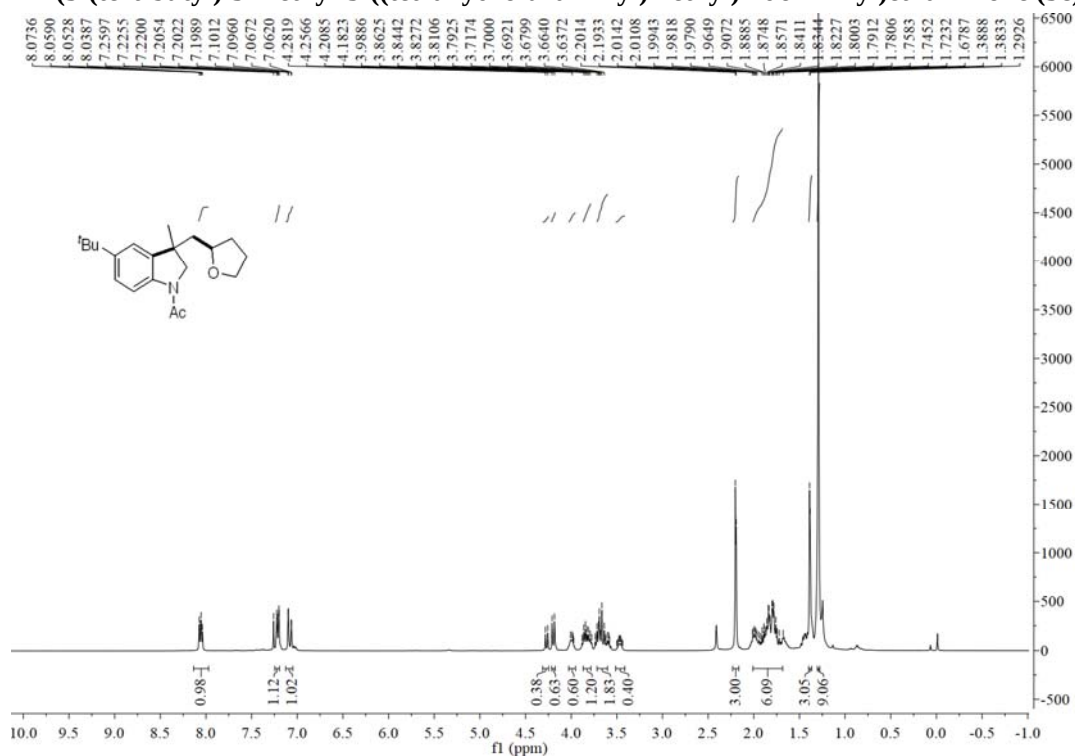
1-(3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5a) :

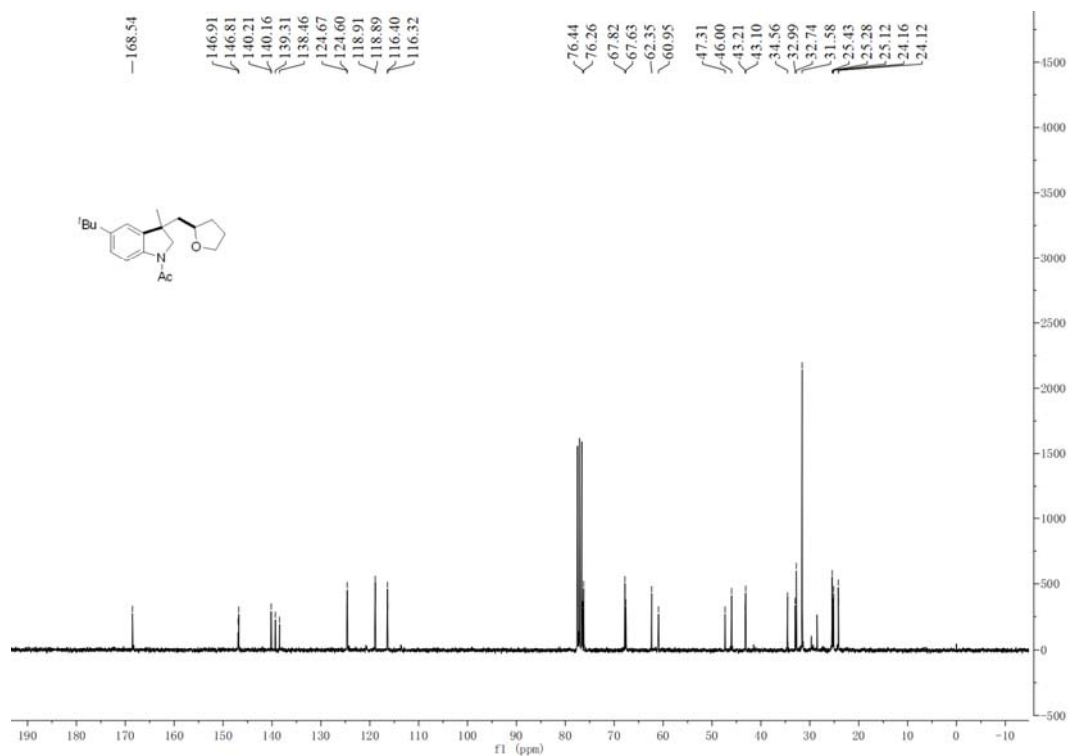




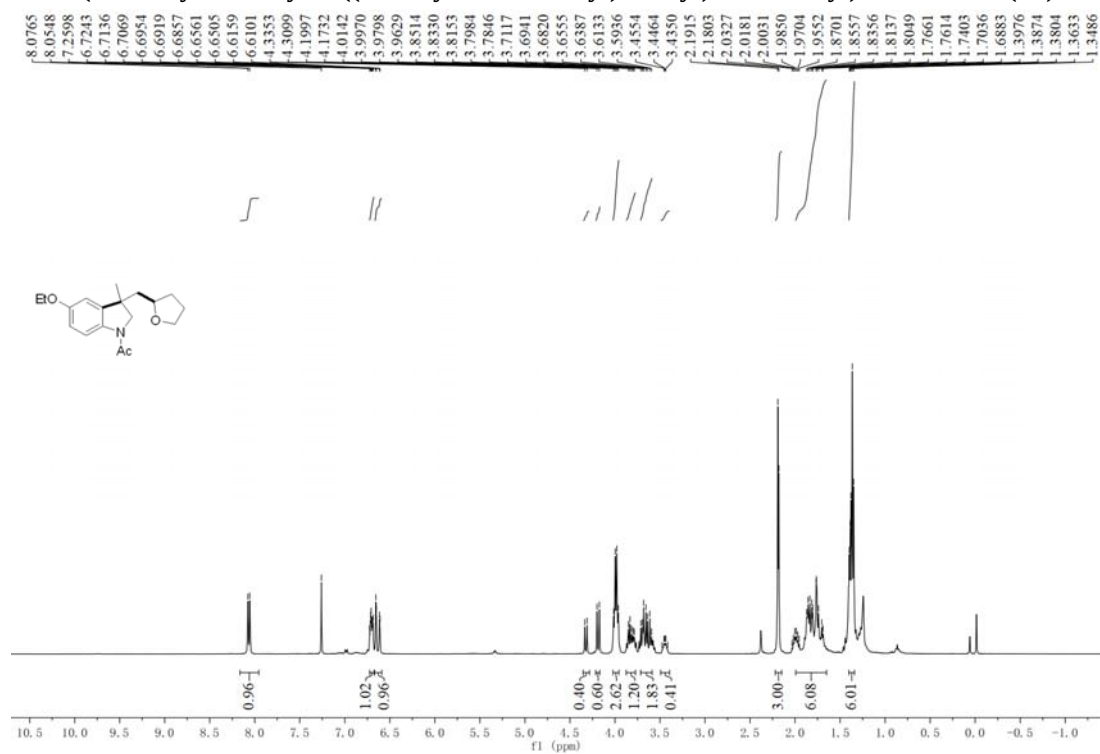


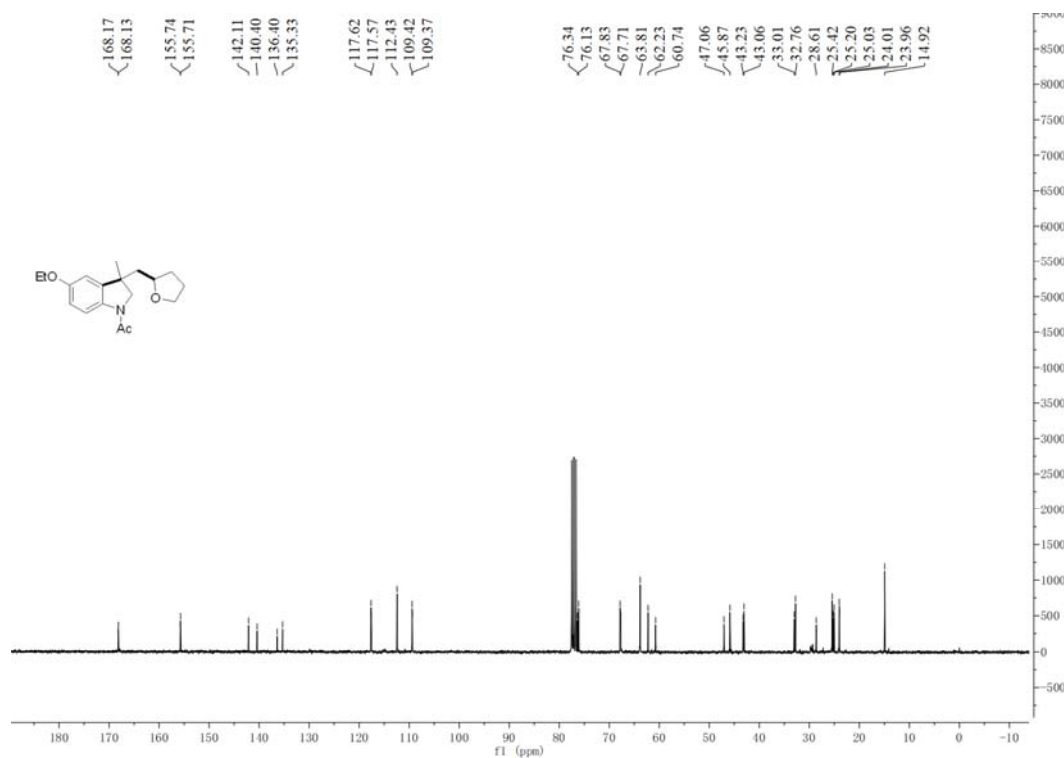
1-(5-(tert-butyl)-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5c) :



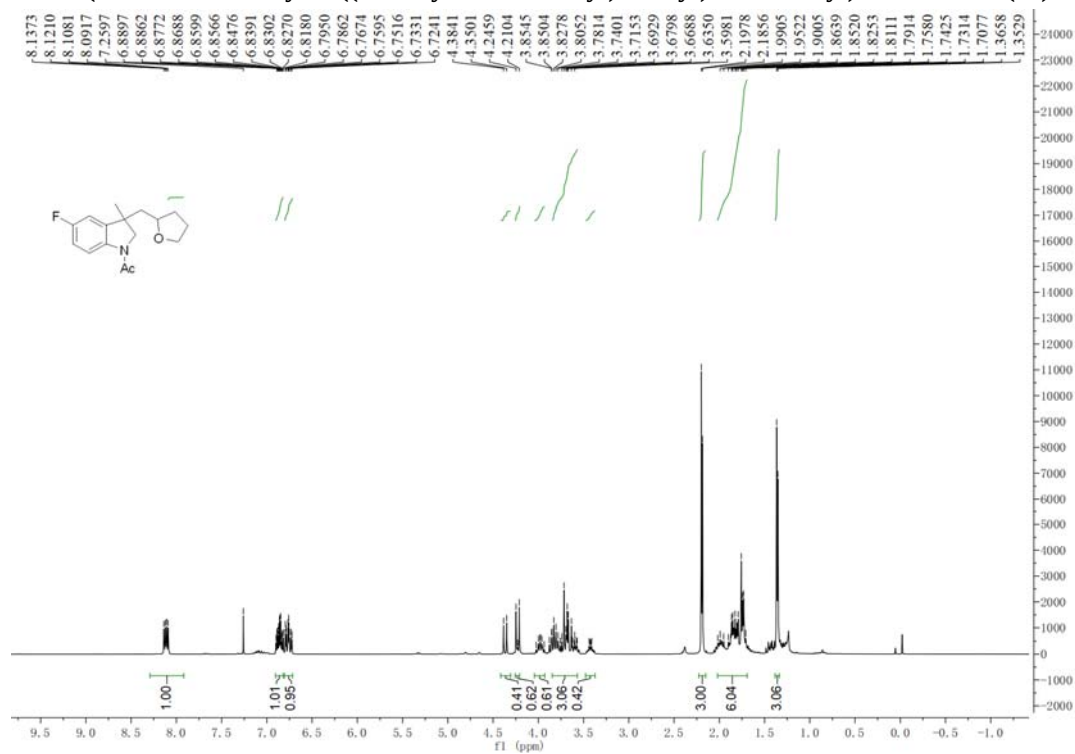


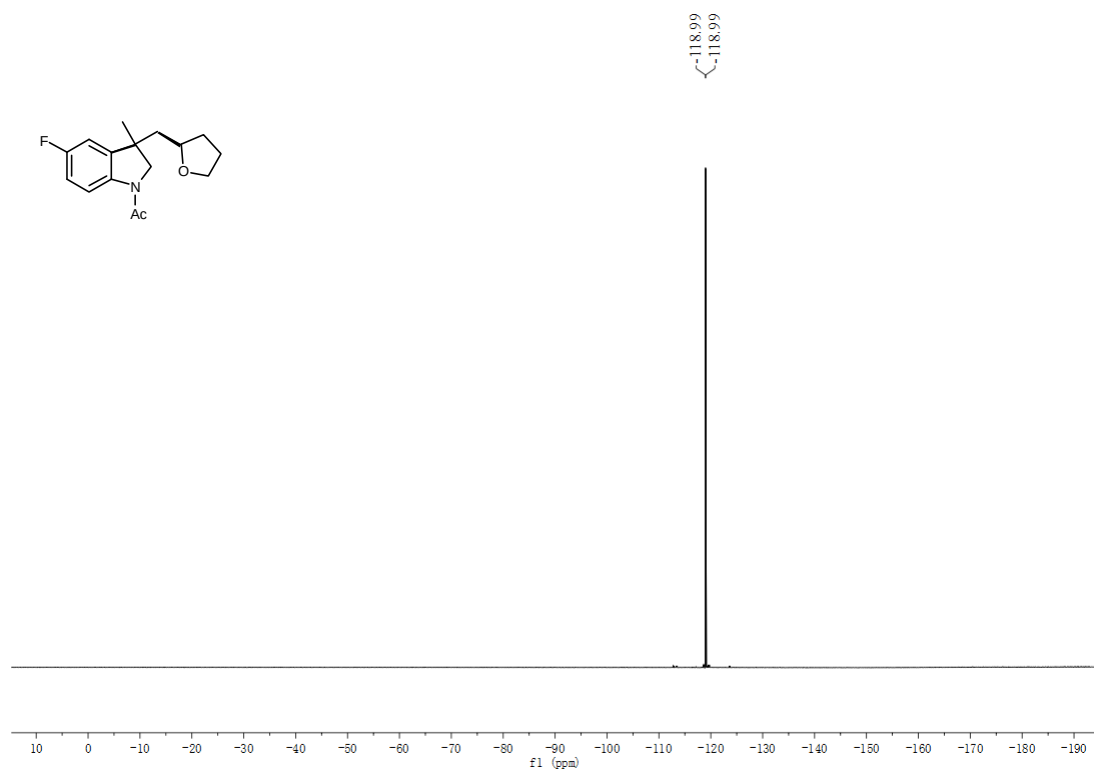
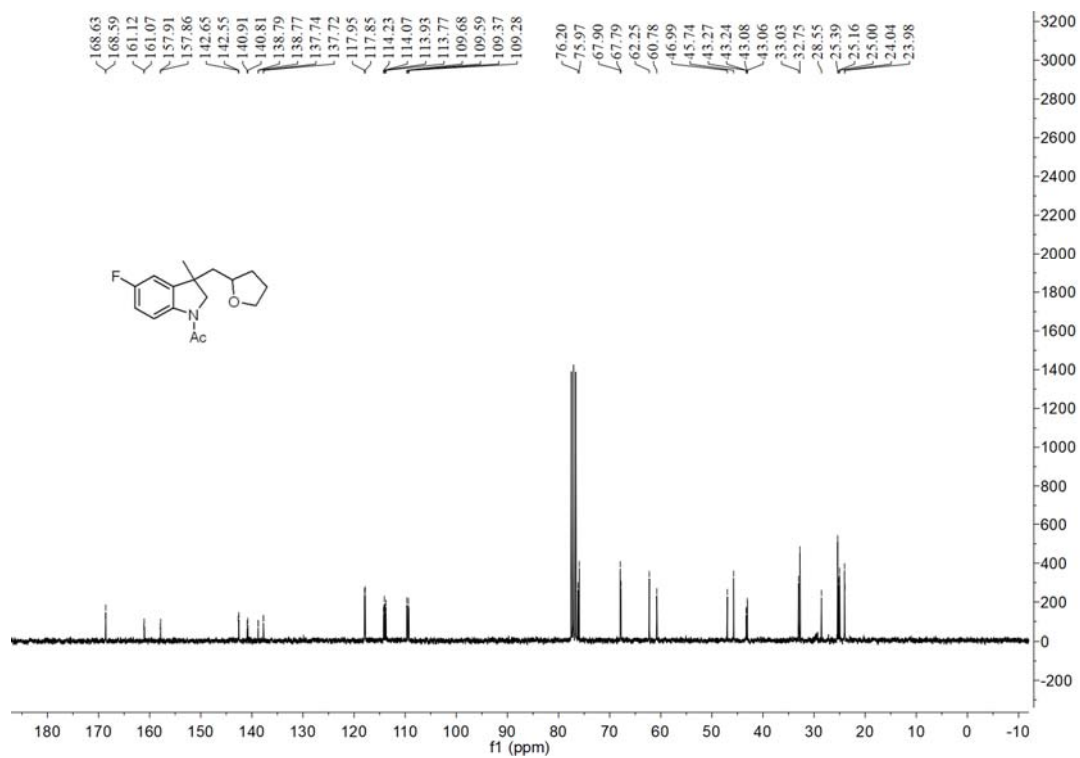
1-(5-ethoxy-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5d) :



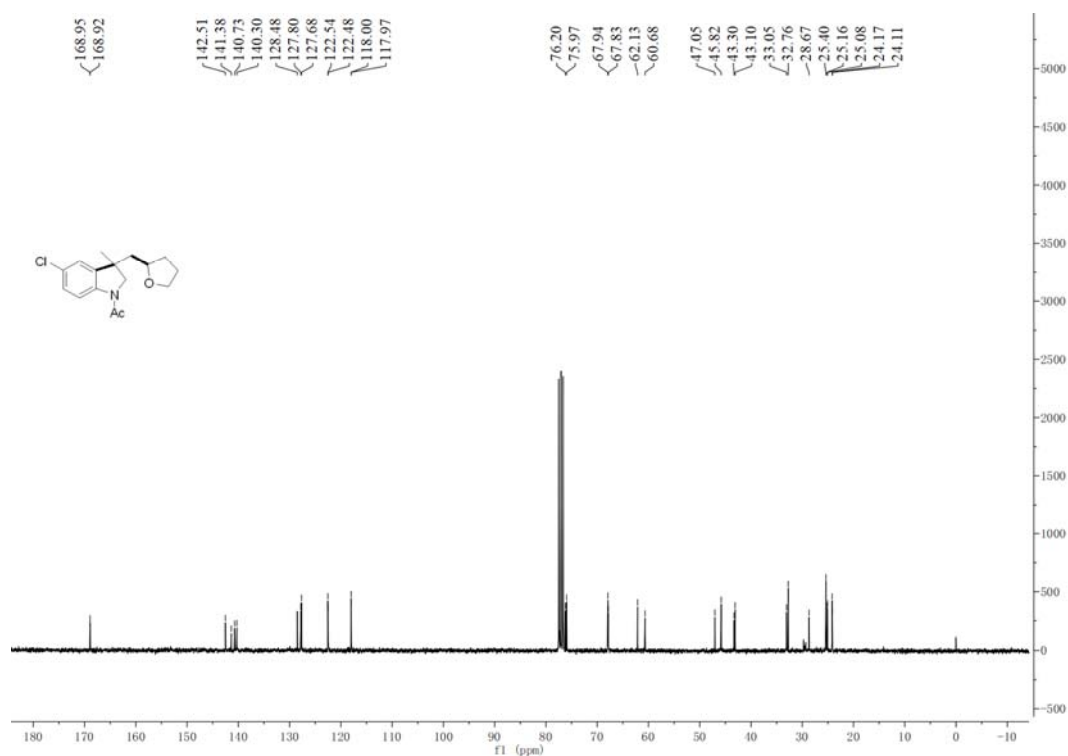
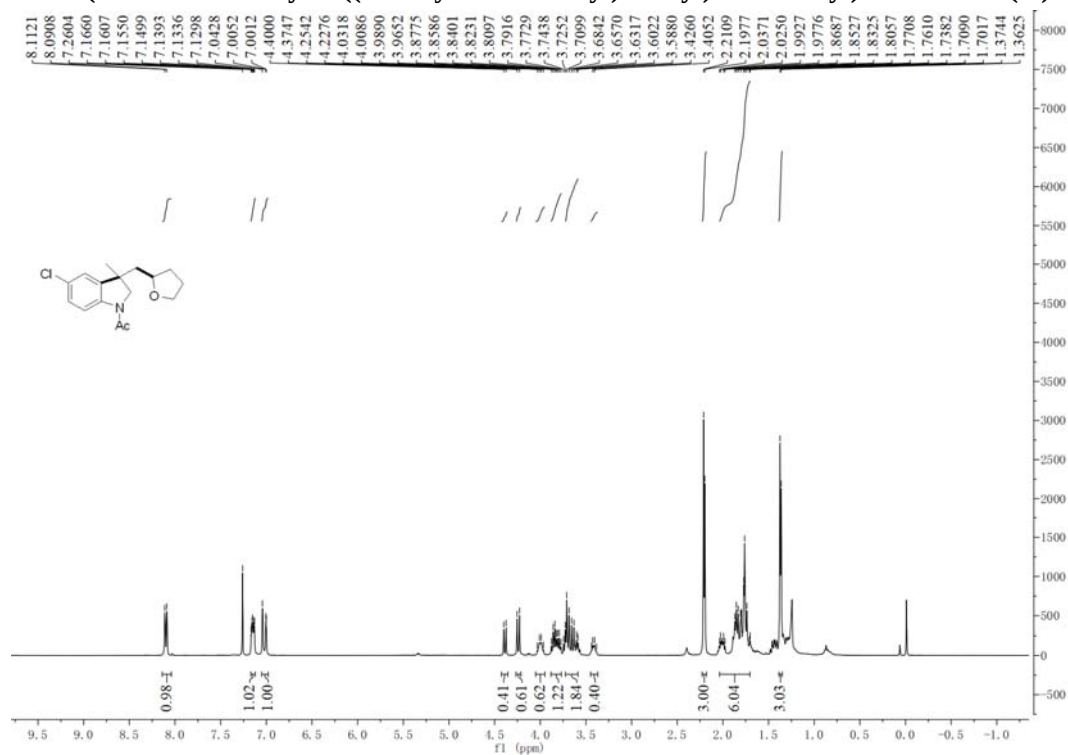


1-(5-fluoro-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5e) :





1-(5-chloro-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5f) :



1-(5-bromo-3-methyl-3-((tetrahydrofuran-2-yl)methyl)indolin-1-yl)ethan-1-one (5g):

