Supporting Information

Tin Powder-Promoted One-Pot Synthesis of 3-Spiro-Fused or 3,3'-Disubstituted 2-Oxindoles

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Experimental Section

1 General

Flash chromatography was performed using silica gel 60 (230-400 mesh). Analytical thin layer chromatography (TLC) was done using Qingdao silica Gel (silica gel GF254). TLC plates were analyzed by an exposure to ultraviolet (UV) light and/or submersion in phosphomolybdic acid solution or in I_2 vapor. IR spectra were obtained using an Alpha Centauri FT-IR spectrophotometer and absorption frequencies were reported in reciprocal centimetres (cm^{-1}). High-resolution mass spectra were recorded on a Bruker APEX II Fourier transform ion cyclotron resonance mass spectrometer. ^1H NMR and ^{13}C NMR spectra were recorded on Varian Mercury 400 plus or Agilent DD2 600 instrument in $CDCl_3$ or $(CD_3)_2SO$ solution using TMS as an internal standard. The following abbreviations are used for the multiplicities: s = singlet, d = doublet, dd = doublet of doublet, t = triplet, q = quadruplet, m = multiplet, br = broad signal for proton spectra; coupling constants (*J*) are reported in Hertz (Hz). Melting points were determined on a Beijing Taike X-4 apparatus and were uncorrected. The solvents were distilled by standard methods. Reagents were obtained from commercial suppliers and used without further purification unless otherwise noted.

2 General Experimental Procedures for the Synthesis of Compounds 4a–4x.

Isatins **1** (0.5 mmol, 1 equiv.), hydrazides **2** (0.5 mmol, 1.0 equiv.) and TfOH (0.05 mmol, 0.1 equiv.) were put into a dried roundbottom flask (50 mL) fitted with a magnetic bar. THF (4 mL) was then added. The mixture was stirred under reflux, and the reaction process was monitored by TLC. After formation of benzoyl hydrazone, tin powder (1.75 mmol, 3.5 equiv.) and ethyl 2-(bromomethyl)acrylate **3** (1.5 mmol, 3 equiv.) in 2 mL of THF were added to the flask. The resulting mixture was stirred under reflux for 3−13 h. The reaction mixture was cooled to room temperature. The saturated NH_4Cl solution (6 mL) was poured into the mixture and stirred for 10 min. The mixture was extracted with EtOAc (3 × 10 mL). The combined organic phases were dried ($MgSO_4$) and concentrated. Purification of the residue by silica gel column chromatography using hexane and EtOAc (1:1) as the eluent furnished the pure products compounds **4**.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4a).** White solid, 143 mg, yield 86%. m.p. 251−253°C; IR (KBr) ν 3406, 2986, 1656, 1404, 1308, 1017 cm^{-1}; ^1H NMR (600 MHz, $(CD_3)_2SO$) δ 10.67 (s, 1H), 10.62 (s, 1H), 7.66 (d, *J* = 7.8 Hz, 2H), 7.51 (t, *J* = 7.8 Hz, 1H), 7.39−7.38 (m, 3H), 7.20 (t, *J* = 7.8 Hz, 1H), 6.94 (t, *J* = 7.8 Hz, 1H), 6.81 (d, *J* = 7.2 Hz, 1H), 6.00 (s, 1H), 5.56 (s, 1H), 3.16 (d, *J* = 17.4 Hz, 1H), 3.07 (d, *J* = 16.8 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.2, 165.6, 165.1, 142.6, 136.0, 132.0, 131.7, 130.1, 128.3, 127.6, 126.2, 125.8, 121.8, 116.9, 109.8, 66.6, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{15}N_3NaO_3$ [M+Na^+] 356.1006, Found: 356.0999.

2-Methyl-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4b). White solid, 101 mg, White solid, yield 58%. m.p. 229−231 °C; IR (KBr) ν 3406, 2236, 1719, 1002, 753 cm^{-1}; ^1H NMR (600 MHz, $(CD_3)_2SO$) δ 10.62 (s, 1H), 10.46 (s, 1H), 7.40 (d, *J* = 7.8 Hz, 1H), 7.28 (t, *J* = 7.8 Hz, 2H), 7.14 (t, *J* = 7.2 Hz, 2H), 7.00−6.98 (m, 2H), 6.85 (d, *J* = 7.8 Hz, 1H), 6.00 (s, 1H), 5.56 (s, 1H), 3.14 (d, *J* = 16.8 Hz, 1H), 3.08 (d, *J* = 17.4 Hz, 1H), 1.92 (s, 3H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.2, 167.7, 164.9, 142.9, 136.1, 135.5, 134.2, 130.3, 130.2, 129.9, 127.2, 126.1, 126.0, 125.3, 121.8, 116.9, 109.8, 66.4, 35.1, 18.5; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{17}N_3NaO_3$ [M+Na^+] 370.1162, Found: 370.1154.

3-Methyl-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4c). White solid, 121 mg, yield 70%. m.p. 256−258 °C; IR (KBr) ν 3406, 2986, 1656, 1404, 1308, 1017 cm^{-1}; ^1H NMR (600 MHz, $(CD_3)_2SO$) δ 10.62 (s, 1H), 10.60 (s, 1H), 7.52 (s, 1H), 7.46 (d, *J* = 7.2 Hz, 1H), 7.39 (d,

J = 7.2 Hz, 1H), 7.31 (d, *J* = 7.8 Hz, 1H), 7.26 (t, *J* = 7.2 Hz, 1H), 7.21 (t, *J* = 7.8 Hz, 1H), 6.94 (t, *J* = 7.2 Hz, 1H), 6.81 (d, *J* = 7.8 Hz, 1H), 6.00 (s, 1H), 5.55 (s, 1H), 3.15 (d, *J* = 16.8 Hz, 1H), 3.06 (d, *J* = 17.4 Hz, 1H), 2.28 (s, 3H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.2, 165.5, 165.0, 142.6, 137.6, 136.0, 132.6, 131.6, 130.1, 128.2, 128.1, 126.2, 125.8, 124.8, 121.8, 116.8, 109.7, 66.6, 35.6, 20.8; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{17}N_3NaO_3$ [M+Na$^+$] 370.1162, Found: 370.1155.

4-Methyl-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4d). White solid, 137 mg, yield 79%. m.p. 248−250 °C; IR (KBr) ν 3412, 2236, 1653, 1020, 753 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.61 (s, 1H), 10.58 (s, 1H), 7.58 (d, *J* = 8.4 Hz, 2H), 7.38 (d, *J* = 7.2 Hz, 1H), 7.21−7.18 (m, 3H), 6.93 (t, *J* = 7.8 Hz, 1H), 6.81 (d, *J* = 7.8 Hz, 1H), 6.00 (s, 1H), 5.55 (s, 1H), 3.15 (d, *J* = 16.8 Hz, 1H), 3.06 (d, *J* = 16.8 Hz, 1H), 2.29 (s, 3H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.2, 165.4, 165.1, 142.6, 142.1, 136.0, 130.1, 128.8, 128.8, 127.7, 126.2, 125.8, 121.8, 116.8, 109.7, 66.6, 35.5, 21.0; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{17}N_3NaO_3$ [M+Na$^+$] 370.1162, Found: 370.1154.

4-Methoxy-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4e). White solid 142 mg, yield 78%. m.p. 258−258 °C; IR (KBr) ν 3412, 2236, 1719, 1470, 1248, 1002, 753 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.61 (s, 1H), 10.49 (s, 1H), 7.68 (s, 1H), 7.66 (s, 1H), 7.38 (d, *J* = 7.2 Hz, 1H), 7.20 (t, *J* = 7.8 Hz, 1H), 6.95−6.91 (m, 3H), 6.80 (d, *J* = 7.8 Hz, 1H), 5.99 (s, 1H), 5.55 (s, 1H), 3.76 (s, 3H), 3.15 (d, *J* = 17.4 Hz, 1H), 3.05 (d, *J* = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.2, 165.2, 164.9, 162.1, 142.6, 136.1, 130.0, 129.6, 126.3, 125.8, 123.8, 121.8, 116.7, 113.5, 109.7, 66.6, 55.4, 35.6; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{17}N_3NaO_4$ [M+Na$^+$] 386.1111, Found: 386.1105.

2-Chloro-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4h). White solid, 152 mg, yield 83%. m.p. 148−150 °C; IR (KBr) ν 3406, 2158, 1656, 999, 753 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.67 (s, 1H), 10.63 (s, 1H), 7.41−7.36 (m, 3H), 7.32 (t, *J* = 7.2 Hz, 1H), 7.27 (t, *J* = 7.8 Hz, 1H), 7.09 (d, *J* = 7.2 Hz, 1H), 6.98 (t, *J* = 7.2 Hz, 1H), 6.84 (d, *J* = 7.8 Hz, 1H), 6.01 (s, 1H), 5.57 (s, 1H), 3.14 (d, *J* = 16.8 Hz, 1H), 3.08 (d, *J* = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.9, 142.4, 135.9, 134.0, 131.4, 130.1, 130.1, 129.5, 129.0, 126.8, 126.0, 125.9, 121.9, 117.0, 109.7, 66.4, 35.1; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{15}ClN_3O_3$ [M+H$^+$] 368.0796, Found: 368.0799.

3-Chloro-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4i). White solid, 156 mg, yield 85%. m.p. 271−273 °C; IR (KBr) ν 3406, 2992, 2122, 1656, 1404, 1308, 1017 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.80 (s, 1H), 10.65 (s, 1H), 7.70 (s, 1H), 7.63 (d, *J* = 7.8, Hz, 1H), 7.60 (d, *J* = 7.2, Hz, 1H), 7.44 (t, *J* = 7.8 Hz, 1H), 7.37 (d, *J* = 7.2 Hz, 1H), 7.22 (t, *J* = 7.8 Hz, 1H), 6.95 (t, *J* = 7.8 Hz, 1H), 6.82 (d, *J* = 7.8 Hz, 1H), 6.01 (s, 1H), 5.57 (s, 1H), 3.16 (d, *J* = 16.8 Hz, 1H), 3.07 (d, *J* = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.2, 142.6, 135.8, 133.5, 133.2, 131.9, 130.4, 130.2, 127.3, 126.4, 126.1, 125.7, 121.8, 117.1, 109.8, 66.5, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{14}ClN_3NaO_3$ [M+Na$^+$] 390.0616, Found: 390.0607.

4-Chloro-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4j). White solid, 167 mg, yield 91%. m.p. 285−287 °C; IR (KBr) ν 3406, 2992, 1656, 1404, 1308, 1017 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.76 (s, 1H), 10.63 (s, 1H), 7.67 (d, *J* = 8.4 Hz, 2H), 7.47 (d, *J* = 8.4 Hz, 2H), 7.37 (d, *J* = 7.8 Hz, 1H), 7.21 (t, *J* = 7.8 Hz, 1H), 6.94 (t, *J* = 7.8 Hz, 1H), 6.81 (d, *J* = 7.2 Hz, 1H), 6.00 (s, 1H), 5.56 (s, 1H), 3.16 (d, *J* = 16.8 Hz, 1H), 3.07 (d, *J* = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.6, 142.6, 136.9, 135.9, 130.3, 130.1, 129.5, 128.5, 126.1, 125.7, 121.8, 117.0, 109.8, 66.6, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{14}ClN_3NaO_3$ [M+Na$^+$] 390.0616, Found: 386.0608.

4-Bromo-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4k). White solid, 146 mg, yield 71%. m.p. 269−271 °C; IR (KBr) ν 3117, 1713, 1407, 1194, 745, 654 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.77 (s, 1H), 10.63 (s, 1H), 7.61 (dd, *J* = 13.2, *J* = 9.0 Hz, 4H), 7.36 (d, *J* = 7.8 Hz, 1H), 7.20 (t, *J* = 7.8 Hz, 1H), 6.94 (t, *J* = 7.8 Hz, 1H), 6.81 (d, *J* = 7.8 Hz, 1H), 6.00 (s, 1H), 5.56 (s,

1H), 3.16 (d, J = 17.4 Hz, 1H), 3.07 (d, J = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.7, 142.6, 135.9, 131.4, 130.7, 130.1, 129.7, 126.1, 125.9, 125.7, 121.8, 117.0, 109.7, 66.6, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{15}BrN_3O_3$ [M+H$^+$] 412.0291, Found: 412.0281.

4-Fluoro-*N*-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4l). White solid, 144 mg, yield 82%. m.p. 268−270 °C; IR (KBr) ν 3406, 2236, 1716, 1275, 1020, 753 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.70 (s, 1H), 10.63 (s, 1H), 7.75 (s, 2H), 7.38 (d, J = 7.2 Hz, 1H), 7.25−7.20 (m, 3H), 6.94 (t, J = 7.2 Hz, 1H), 6.81 (d, J = 7.2 Hz, 1H), 6.00 (s, 1H), 5.57 (s, 1H), 3.16 (d, J = 17.4 Hz, 1H), 3.07 (d, J = 16.8 Hz, 1H); ^{13}C NMR (100 MHz, $(CD_3)_2SO$) δ 176.2, 165.1, 164.5, 164.3 (d, J_{C-F} = 249.0 Hz), 142.6, 135.9, 130.4 (d, J_{C-F} = 10.0 Hz), 130.1, 128.1, 126.2, 125.7, 121.8, 117.0, 115.4 (d, J_{C-F} = 22.0 Hz), 109.8, 66.6, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{14}FN_3NaO_3$ [M+Na$^+$] 374.0911, Found: 374.0901.

Methyl 4-((4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)carbamoyl)benzoate (4n). White solid, 170 mg, yield 87%. m.p. 270−272 °C; IR(KBr) ν 3273, 1724, 1618, 1470, 1281, 1110, 722, 613 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.90 (s, 1H), 10.65 (s, 1H), 7.96 (d, J = 8.4 Hz, 2H), 7.79−7.77 (m, 2H), 7.39 (s, 1H), 7.21 (t, J = 7.3 Hz, 1H), 6.95 (t, J = 7.2 Hz, 1H), 6.82 (d, J = 7.2 Hz, 1H), 6.02 (s, 1H), 5.57 (s, 1H), 3.85 (d, J = 3.0 Hz, 3H), 3.17 (d, J = 17.4 Hz, 1H), 3.08 (d, J = 17.4 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.5, 165.0, 164.9, 142.6, 135.8, 135.6, 132.5, 130.2, 129.1, 128.0, 126.1, 125.7, 121.8, 117.1, 109.8, 66.6, 52.4, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{17}N_3NaO_5$ [M+Na$^+$] 414.1060, Found: 414.1061.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-4-(trifluoromethyl)benzamide (4o).** White solid, 166 mg, yield 83%. m.p. 259−261 °C; IR (KBr) ν 3273, 1724, 1618, 1281, 1110, 722, 613 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.96 (s, 1H), 10.67 (s, 1H), 7.85 (d, J = 8.4 Hz, 2H), 7.80 (d, J = 8.4 Hz, 2H), 7.40 (d, J = 7.2 Hz, 1H), 7.22 (t, J = 7.2 Hz, 1H), 6.96 (t, J = 7.2 Hz, 1H), 6.84 (d, J = 7.8 Hz, 1H), 6.03 (s, 1H), 5.59 (s, 1H), 3.19 (d, J = 16.8 Hz, 1H), 3.10 (d, J = 16.8 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.6, 142.6, 135.8, 135.4, 131.8 (q, J_{C-F} = 31.5 Hz), 130.2, 128.5, 126.0, 125.7, 125.4, 123.7 (q, J_{C-F} = 271.5 Hz), 121.8, 117.1, 109.8, 66.6, 35.5; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{14}F_3N_3NaO_3$ [M+Na$^+$] 424.0879, Found: 424.0869.

4-Chloro-*N*-(5-methyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4q). White solid, 162 mg, yield 85%. m.p. 233−235 °C; IR (KBr) ν 3406, 2986, 2902, 2194, 1653, 1404, 1305, 1017 cm^{-1}; ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 10.74 (s, 1H), 10.53 (s, 1H), 7.68 (d, J = 8.4 Hz, 2H), 7.49 (d, J = 8.4 Hz, 2H), 7.20 (s, 1H), 7.01 (d, J = 7.6 Hz, 1H), 6.70 (d, J = 8.8 Hz, 1H), 6.00 (s, 1H), 5.56 (s, 1H), 3.14 (d, J = 16.4 Hz, 1H), 3.04 (d, J = 17.2 Hz, 1H), 2.19 (s, 3H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.0, 164.6, 140.1, 136.9, 135.9, 130.6, 130.4, 130.3, 129.6, 128.5, 126.3, 126.2, 117.0, 109.5, 66.6, 35.5, 20.7; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{16}ClN_3NaO_3$ [M+Na$^+$] 404.0772, Found: 404.0762.

4-Chloro-*N*-(5-chloro-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4r). White solid, 140 mg, yield 70%. m.p. 240−242 °C; IR (KBr) ν 3436, 2248, 1737, 1656, 1293, 1026, 825, 762, 624 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.83 (s, 1H), 10.78 (s, 1H), 7.70 (d, J = 8.4 Hz, 2H), 7.50 (d, J = 8.4 Hz, 2H), 7.42 (s, 1H), 7.27 (d, J = 8.4 Hz, 1H), 6.83 (d, J = 8.4 Hz, 1H), 6.02 (s, 1H), 5.58 (s, 1H), 3.17 (s, 2H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 175.8, 165.0, 164.8, 141.5, 137.1, 135.5, 130.2, 130.0, 129.5, 128.5, 128.1, 126.0, 125.7, 117.3, 111.2, 66.7, 35.1; HRMS (ESI−TOF) m/z calcd for $C_{19}H_{13}Cl_2N_3NaO_3$ [M+Na$^+$] 424.0226, Found: 424.0217.

***N*-(1-Benzyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-4-chlorobenzamide (4s).** White solid, 153 mg, yield 67%. m.p. 271−273 °C; IR (KBr) ν 3256, 2989, 1690, 1615, 1489, 1364, 1272, 1097, 752 cm^{-1}; ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 10.87 (s, 1H), 7.67 (d, J = 8.4 Hz, 2H), 7.51−7.40 (m, 5H), 7.30−7.28 (m, 3H), 7.20 (t, J = 7.6 Hz, 1H), 6.99 (t, J = 7.6 Hz, 1H), 6.82 (d, J = 7.6 Hz, 1H), 6.06 (s, 1H), 5.63 (s, 1H), 5.08 (d, J = 16.0 Hz, 1H), 4.77 (d, J = 16.0 Hz, 1H), 3.25 (d, J = 17.2 Hz, 1H), 3.17 (d,

J = 17.2 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 174.6, 165.1, 164.6, 142.9, 137.1, 135.8, 135.6, 130.2, 130.1, 129.6, 128.6, 128.4, 127.5, 127.3, 125.7, 122.6, 117.5, 109.3, 66.3, 43.0, 35.2; HRMS (ESI−TOF) m/z calcd for $C_{26}H_{20}ClN_3NaO_3$ [M+Na$^+$] 480.1085, Found: 480.1091.

***N*-(1-Butyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-4-chlorobenzamide (4t).** White solid, 144 mg, yield 68%. 262−264 °C; IR (KBr) ν 3406, 2986, 1656, 1404, 1020 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.76 (s, 1H), 7.66 (d, J = 8.4 Hz, 2H), 7.47 (d, J = 8.4 Hz, 2H), 7.43 (d, J = 7.2 Hz, 1H), 7.30 (t, J = 7.2 Hz, 1H), 7.05 (d, J = 7.8 Hz, 1H), 7.02 (t, J = 7.8 Hz, 1H), 6.03 (s, 1H), 5.59 (s, 1H), 3.75−3.70 (m, 1H) 3.67−3.62 (m, 1H), 3.16−3.09 (m, 2H), 1.62−1.57 (m, 2H), 1.32−1.26 (m, 2H), 0.87 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 174.3, 165.0, 164.5, 143.4, 137.0, 135.7, 130.3, 130.2, 129.5, 128.4, 125.7, 125.6, 122.3, 117.2, 108.9, 66.1, 39.3, 35.3, 28.9, 19.5, 13.7; HRMS (ESI−TOF) m/z calcd for $C_{23}H_{22}ClN_3NaO_3$ [M+Na$^+$] 446.1242, Found: 446.1248.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)furan-2-carboxamide (4u).** White solid, 99 mg, yield 61%. m.p. 282−284 °C; IR (KBr) ν 3430, 2986, 2902, 1656, 1404, 1308, 1020 cm^{-1}; ^{1}H NMR (400 MHz, $(CD_3)_2SO$) δ 10.63 (s, 1H), 10.62 (s, 1H), 7.82 (s, 1H), 7.38 (d, J = 7.2 Hz, 1H), 7.24−7.21 (m, 2H), 6.96 (t, J = 7.2 Hz, 1H), 6.82 (d, J = 7.6 Hz, 1H), 6.57 (t, J = 1.6 Hz, 1H), 6.00 (s, 1H), 5.56 (s, 1H), 3.15 (d, J = 17.2 Hz, 1H), 3.04 (d, J = 17.2 Hz, 1H); ^{13}C NMR (150 MHz, $(CD_3)_2SO$) δ 176.1, 165.2, 156.8, 146.1, 145.1, 142.5, 135.8, 130.2, 126.3, 125.8, 121.9, 117.1, 115.4, 111.8, 109.8, 66.6, 35.6; HRMS (ESI−TOF) m/z calcd for $C_{17}H_{13}N_3NaO_4$ [M+Na$^+$] 346.0798, Found: 346.0789.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-2-naphthamide (4v).** White solid, 142 mg, yield 74%. m.p. 137−139 °C; IR(KBr) ν 3200, 1721, 1657, 1619, 1457, 1286, 1192, 572, 473 cm^{-1}; ^{1}H NMR (600 MHz, $(CD_3)_2SO$) δ 10.85 (s, 1H), 10.68 (s, 1H), 8.34 (s, 1H), 7.97−7.92 (m, 3H), 7.74 (d, J = 9.0 Hz, 1H), 7.61 (t, J = 7.8 Hz, 1H), 7.57 (t, J = 7.2 Hz, 1H), 7.44 (d, J = 7.8 Hz, 1H), 7.21 (t, J = 7.8 Hz, 1H), 6.96 (t, J = 7.8 Hz, 1H), 6.82 (d, J = 7.8 Hz, 1H), 6.03 (s, 1H), 5.59 (s, 1H), 3.19 (d, J = 16.8 Hz, 1H), 3.10 (d, J = 17.4 Hz, 1H); ^{13}C NMR (100 MHz, $(CD_3)_2SO$) δ 176.2, 165.6, 165.1, 142.6, 136.0, 134.4, 131.8, 130.1, 128.9, 128.3, 128.0, 127.9, 127.60, 126.9, 126.2, 125.8, 124.1, 121.8, 116.9, 109.8, 66.7, 35.6; HRMS (ESI−TOF) m/z calcd for $C_{23}H_{17}N_3NaO_3$ [M+Na$^+$] 406.1162, Found: 406.1165.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)dodecanamide (4w).** Colorless oil, 171 mg, yield 83%; IR (KBr) ν 3208, 2914, 1719, 1617, 1464, 1374, 1248 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.35 (s, 1H), 8.95 (s, 1H), 7.51 (d, J = 7.2 Hz, 1H), 7.27−7.24 (m, 1H), 7.06 (t, J = 7.2 Hz, 1H), 6.90 (d, J = 7.8 Hz, 1H), 6.16 (s, 1H), 5.49 (s, 1H), 3.10 (s, 2H), 2.09−2.04 (m, 1H), 2.03−1.98 (m, 1H), 1.36−1.32 (m, 2H), 1.31−1.26 (m, 2H), 1.23−1.17 (m, 8H), 1.14−1.05 (m, 4H), 1.03−0.96 (m, 1H), 0.94−0.91 (m, 1H), 0.87 (t, J = 7.8 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 177.9, 172.4, 167.2, 141.5, 134.6, 130.5, 126.2, 125.7, 123.4, 118.6, 110.6, 67.7, 35.2, 33.8, 31.9, 29.7, 29.6, 29.4, 29.3, 29.2, 28.6, 25.3, 22.6, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{24}H_{33}N_3NaO_3$ [M+Na$^+$] 434.2414, Found: 434.2405.

***N*-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)stearamide (4x).** Colorless oil, 156 mg, yield 63%; IR (KBr) ν 3208, 2914, 2848, 1719, 1617, 1464, 1251, cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.31 (s, 1H), 8.93 (s, 1H), 7.51 (d, J = 7.2 Hz, 1H), 7.27−7.24 (m, 1H), 7.06 (t, J = 7.2 Hz, 1H), 6.90 (d, J = 7.8 Hz, 1H), 6.17 (s, 1H), 5.49 (s, 1H), 3.10 (s, 2H), 2.09−2.04 (m, 1H), 2.02−1.97 (m, 1H), 1.35−0.87 (m, 33H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 177.9, 172.4, 167.2, 141.5, 134.6, 130.5, 126.2, 125.8, 123.4, 118.7, 110.6, 67.7, 35.2, 33.9, 31.9, 29.7, 29.7, 29.6, 29.4, 29.4, 29.3, 28.6, 25.3, 22.7, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{30}H_{45}N_3NaO_3$ [M+Na$^+$] 518 .3353, Found: 518.3340.

3. General experimental procedures for the synthesis of compounds 6a−6s

Isatins **1** (0.5 mmol, 1 equiv.), amines **5** (0.75 mmol, 1.5 equiv.), $CeCl_3{\cdot}7H_2O$ (0.05 mmol, 0.1 equiv.) were put into a dried roundbottom flask (50 mL) fitted with a magnetic bar. THF (4 mL) was then added.

The mixture was stirred under reflux, and the reaction process was monitored by TLC. After reflux for 9 h, tin powder (1.75 mmol, 3.5 equiv.) and ethyl 2-(bromomethyl)acrylate **3** (1.5 mmol, 3 equiv.) in 2 mL of THF were added to the flask. The resulting mixture was stirred under reflux for another 3−19 h. The reaction mixture was cooled to room temperature. The saturated NH_4Cl solution (6 mL) was poured into the mixture and stirred for 10 min. The mixture was extracted with EtOAc (3 × 10 mL). The combined organic phases were dried ($MgSO_4$) and concentrated. Purification of the residue by silica gel column chromatography using hexane and EtOAc (3:1) as the eluent furnished the pure products **6**.

Ethyl 2-((2-oxo-3-(phenylamino)indolin-3-yl)methyl)acrylate (6a). Colorless oil, 139 mg, yield 83%.; IR (KBr) ν 3274, 2152, 1701, 1599, 1467, 1311, 1182, 1014, 735 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.60 (s, 1H), 7.17 (t, *J* = 7.8 Hz, 1H), 7.13 (d, *J* = 7.2 Hz, 1H), 6.95−6.91 (m, 3H), 6.83 (d, *J* = 7.8 Hz, 1H), 6.59 (t, *J* = 7.8 Hz, 1H), 6.30−6.19 (m, 3H), 5.43 (s, 1H), 5.41 (s, 1H), 4.12 (q, *J* = 7.2 Hz, 2H), 3.24 (d, *J* = 13.2 Hz, 1H), 2.69 (d, *J* = 13.2 Hz, 1H), 1.23 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.5, 167.5, 145.2, 139.7, 133.9, 130.4, 129.0, 128.9, 128.8, 124.9, 122.2, 118.4, 114.2, 110.8, 65.2, 61.2, 41.0, 14.0; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{20}N_2NaO_3$ [M+Na^+] 359.1366, Found: 359.1361.

Ethyl 2-((2-oxo-3-(phenylamino)indolin-3-yl)methyl)acrylate (6b). Colorless oil, 130 mg, yield 74%; IR(KBr) ν 3298, 1707, 1605, 1467, 1317, 1185, 744 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.44 (s, 1H), 7.19 (t, *J* = 7.8 Hz, 1H), 7.05 (d, *J* = 7.2 Hz, 1H), 6.98 (d, *J* = 7.2 Hz, 1H), 6.92 (d, *J* = 7.2 Hz, 1H), 6.86 (d, *J* = 7.2 Hz, 1H), 6.66 (t, *J* = 7.2 Hz, 1H), 6.52 (t, *J* = 7.2 Hz, 1H), 6.33 (s, 1H), 5.69 (d, *J* = 8.4 Hz, 1H), 5.40 (s, 1H), 5.17 (s, 1H), 4.20−4.18 (m, 2H), 3.29 (d, *J* = 13.8 Hz, 1H), 2.61 (d, *J* = 13.8 Hz, 1H), 2.26 (s, 3H), 1.28 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.7, 167.9, 143.3, 139.5, 139.4, 134.0, 130.6, 130.1, 129.1, 128.9, 126.69, 124.7, 123.3, 122.1, 117.9, 111.0, 64.9, 61.3, 41.3, 18.0, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{23}N_2O_3$ [M+H^+] 351.1703, Found: 351.1698.

Ethyl 2-((2-oxo-3-(m-tolylamino)indolin-3-yl)methyl)acrylate (6c). White solid, 142 mg, yield 81%. m.p. 136−138 °C; IR (KBr) ν 3298, 1707, 1605, 1467, 1317, 1185, 744 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.32 (s, 1H), 7.20 (t, *J* = 7.8 Hz, 1H), 7.13 (d, *J* = 7.8 Hz, 1H), 6.95 (t, *J* = 7.8 Hz, 1H), 6.86 (d, *J* = 7.8 Hz, 1H), 6.78 (t, *J* = 7.8 Hz, 1H), 6.43 (d, *J* = 7.2 Hz, 1H), 6.26 (s, 1H), 6.19 (s, 1H), 5.91 (d, *J* = 8.4 Hz, 1H), 5.43 (s, 1H), 5.27 (d, *J* = 4.8 Hz, 1H), 4.13 (q, *J* = 7.2 Hz, 2H), 3.24 (d, *J* = 13.2 Hz, 1H), 2.66 (d, *J* = 13.8 Hz, 1H), 2.08 (s, 3H), 1.25 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.4, 167.7, 145.1, 139.7, 138.6, 134.0, 130.4, 129.1, 129.0, 128.8, 125.0, 122.3, 119.5, 115.7, 110.8, 110.7, 65.1, 61.2, 41.1, 21.4, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{23}N_2O_3$ [M+H^+] 351.1703, Found: 351.1697.

Ethyl 2-((2-oxo-3-(p-tolylamino)indolin-3-yl)methyl)acrylate (6d). Colorless oil, 145 mg, yield 83%. IR (KBr) ν 3280, 2974, 1701, 1614, 1509, 1467, 1305, 1182, 1014, 735 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.38 (br, 1H), 7.19−7.14 (m, 2H), 6.95 (t, *J* = 7.8 Hz, 1H), 6.80 (d, *J* = 7.8 Hz, 1H), 6.72 (d, *J* = 7.8 Hz, 2H), 6.24 (s, 1H), 6.17−6.15 (m, 2H), 5.44 (s, 1H), 5.14 (s, 1H), 4.11 (q, *J* = 7.2 Hz, 2H), 3.24 (d, *J* = 7.2 Hz, 1H), 2.68 (dd, *J* = 13.2, 3.6 Hz, 1H), 2.08 (s, 3H), 1.24 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.6, 167.5, 142.8, 139.8, 134.1, 130.1, 129.4, 129.1, 128.9, 127.8, 125.0, 122.2, 114.7, 110.8, 65.4, 61.1, 41.0, 20.3, 14.0; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{23}N_2O_3$ [M+H^+] 351.1703, Found: 359.1698.

Ethyl 2-((3-((4-methoxyphenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6e). White solid, 119 mg, yield 65%. m.p. 126−128 °C; IR (KBr) ν 3274, 2176, 1707, 1617, 1506, 1464, 1299, 1179, 1020, 744 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 8.96 (s, 1H), 7.22−7.19 (m, 2H), 6.98 (t, *J* = 7.8 Hz, 1H), 6.80 (d, *J* = 7.8 Hz, 1H), 6.49 (d, *J* = 9.0 Hz, 2H), 6.26 (d, *J* = 9.0 Hz, 2H), 6.23 (s, 1H), 5.46 (s, 1H), 4.82 (s, 1H), 4.09 (q, *J* = 7.2 Hz, 2H), 3.57 (s, 3H), 3.25 (d, *J* = 13.2 Hz, 1H), 2.68 (d, *J* = 13.2 Hz, 1H), 1.23 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.5, 167.4, 167.4, 153.2, 140.0, 138.9, 134.3, 129.9, 129.2, 129.0, 125.3, 122.3, 117.5, 117.4, 114.3, 110.7, 66.2, 61.1, 55.4, 40.8, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{22}N_2NaO_4$ [M+Na^+] 389.1472, Found: 389.1478.

Ethyl 2-((3-((2,6-dimethylphenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6f). White solid, 138 mg, yield 76%. m.p. 149−151 °C; IR (KBr) ν 3313, 2983, 2255, 1724, 1513, 1238, 1186, 1040, 903, 733 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.40 (br, 1H), 7.08 (t, *J* = 7.8 Hz, 1H), 6.84 (d, *J* = 7.8 Hz, 2H), 6.78 (dd, *J* = 13.8, 7.2 Hz, 2H), 6.73 (t, *J* = 7.8 Hz, 1H), 6.62 (d, *J* = 7.8 Hz, 1H), 6.06 (s, 1H), 5.53 (s, 1H), 3.95−3.87 (m, 2H), 3.84 (d, *J* = 2.4 Hz, 1H), 3.44 (d, *J* = 12.6 Hz, 1H), 3.04 (d, *J* = 12.6 Hz, 1H), 2.11 (s, 6H), 1.11 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.8, 166.9, 142.2, 140.5, 134.5, 133.1, 128.8, 128.7, 128.2, 127.9, 126.3, 123.4, 121.5, 110.0, 67.9, 60.7, 42.1, 19.2, 13.9. HRMS (ESI−TOF) m/z calcd for $C_{22}H_{24}N_2NaO_3$ [M+Na^+] 387.1679, Found: 387.1674.

Ethyl 2-((3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6h). White solid, 175 mg, yield 99%. m.p. 112−114 °C; IR (KBr) ν 3274, 2974, 1701, 1614, 1503, 1467, 1311, 1182, 1014, 744 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.40 (s, 1H), 7.24−7.19 (m, 1H), 7.16 (d, *J* = 7.2 Hz, 1H), 6.98 (t, *J* = 7.2 Hz, 1H), 6.84 (d, *J* = 7.8 Hz, 1H), 6.63 (t, *J* = 8.4 Hz, 2H), 6.26 (s, 1H), 6.21−6.19 (m, 2H), 5.43 (s, 1H), 5.26 (s, 1H), 4.13 (q, *J* = 7.2 Hz, 2H), 3.23 (d, *J* = 13.2 Hz, 1H), 2.67 (dd, *J* = 13.2, 7.8 Hz, 1H), 1.25−1.23 (m, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.3, 167.6, 156.5 (d, J_{C-F} = 234.0 Hz), 141.4, 139.7, 134.0, 130.3, 129.2, 128.8, 125.1, 122.5, 116.0 (d, J_{C-F} = 7.5 Hz), 115.4 (d, J_{C-F} = 22.5 Hz), 110.8, 65.7, 61.3, 41.0, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{19}FN_2NaO_3$ [M+Na^+] 377.1272, Found: 377.1266.

Ethyl 2-((2-oxo-3-((4-(trifluoromethyl)phenyl)amino)indolin-3-yl)methyl)acrylate (6i). Colorless oil, 181 mg, yield 90%. IR (KBr) ν 3423, 3002, 2916, 1709, 1653, 1420, 1323, 1009, 964, 701 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.29 (s, 1H), 7.23 (d, *J* = 7.8 Hz, 1H), 7.17 (d, *J* = 8.4 Hz, 2H), 7.08 (d, *J* = 7.2 Hz, 1H), 6.98 (t, *J* = 7.2 Hz, 1H), 6.91 (d, *J* = 7.8 Hz, 1H), 6.33 (s, 1H), 6.21 (d, *J* = 8.4 Hz, 2H), 6.09 (d, *J* = 10.2 Hz, 1H), 5.40 (s, 1H), 4.20 (q, *J* = 7.2 Hz, 2H), 3.22 (d, *J* = 13.2 Hz, 1H), 2.65 (d, *J* = 13.2 Hz, 1H), 1.29 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 179.7, 168.1, 147.9, 139.4 133.6, 131.3, 129.4, 128.2, 124.9, 124.7 (q, J_{C-F} = 268.0 Hz), 123.3, 122.6, 119.7 (q, J_{C-F} = 32.0 Hz), 113.1, 111.0, 64.8, 61.6, 41.2, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{20}F_3N_2O_3$ [M+H^+] 405.1421, Found: 405.1416.

Ethyl 2-((3-((4-chlorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6j). White solid, 172 mg, yield 93%. m.p. 147−149 °C; IR (KBr) ν 3340, 2164, 1707, 1599, 1488, 1311, 1182, cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.55 (s, 1H), 7.21 (t, *J* = 7.2 Hz, 1H), 7.11 (d, *J* = 7.2 Hz, 1H), 6.97 (t, *J* = 7.2 Hz, 1H), 6.87−6.83 (m, 3H), 6.28 (s, 1H), 6.14 (d, *J* = 9.0 Hz, 2H), 5.60 (s, 1H), 5.42 (s, 1H), 4.15 (q, *J* = 7.2 Hz, 2H), 3.22 (d, *J* = 13.2 Hz, 1H), 2.66 (d, *J* = 13.2 Hz, 1H), 1.26 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.2, 167.8, 143.8, 139.6, 133.8, 130.7, 129.2, 128.8, 128.5, 124.9, 123.1, 122.5, 115.3, 110.9, 65.2, 61.4, 41.1, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{19}ClN_2NaO_3$ [M+Na^+] 393.0976, Found: 393.0968.

Ethyl 2-((3-((4-bromophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6k). White solid, 126 mg, yield 61%. m.p. 143−145 °C; IR (KBr) ν 3334, 1707, 1590, 1467, 1311, 1182, 735 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.32 (s, 1H), 7.23 (t, *J* = 7.8 Hz, 1H), 7.10 (d, *J* = 7.8 Hz, 1H), 7.01 (s, 1H), 6.99 (d, *J* = 3.0 Hz, 1H), 6.97 (d, *J* = 7.2 Hz, 1H), 6.85 (d, *J* = 7.8 Hz, 1H), 6.29 (s, 1H), 6.09 (d, *J* = 8.4 Hz, 2H), 5.59 (d, *J* = 2.4 Hz, 1H), 5.41 (s, 1H), 4.16 (q, *J* = 7.2 Hz, 2H), 3.21 (d, *J* = 13.2 Hz, 1H), 2.65 (d, *J* = 13.8 Hz, 1H), 1.27 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.1, 167.8, 144.3, 139.5, 133.8, 131.7, 130.8, 129.3, 128.5, 124.9, 122.5, 115.7, 110.9, 110.3, 65.1, 61.4, 41.1, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{19}BrN_2NaO_3$ [M+Na^+] 437.0471, Found: 437.0464.

Ethyl 2-((3-((4-fluorophenyl)amino)-5-methyl-2-oxoindolin-3-yl)methyl)acrylate (6m). White solid, 166 mg, yield 90%. m.p. 176−178 °C; IR (KBr) ν 3380, 1716, 1626, 1510, 1305, 1226,1172, 1026, 821 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 9.14 (s, 1H), 7.01 (d, *J* = 7.8 Hz, 1H), 6.98 (s, 1H), 6.73 (d, *J* = 7.8 Hz, 1H), 6.64 (t, *J* = 8.4 Hz, 2H), 6.25 (s, 1H), 6.20 (dd, *J* = 8.4, 4.2 Hz, 2H), 5.45 (s, 1H), 5.21 (s, 1H), 4.15−4.09 (m, 2H), 3.19 (d, *J* = 13.2 Hz, 1H), 2.68 (d, *J* = 13.8 Hz, 1H), 2.26 (s, 3H), 1.25 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 179.1, 166.6, 155.9 (d, J_{C-F} = 235.5 Hz), 140.6, 136.3, 133.1, 131.0,

129.1, 128.6, 128.0, 124.6, 114.8 (d, J_{C-F} = 7.5 Hz), 114.4 (d, J_{C-F} = 22.5 Hz), 109.5, 64.7, 60.2, 40.1, 20.1, 13.1 ; HRMS (ESI−TOF) m/z calcd for $C_{21}H_{21}FN_2NaO_3$ [M+Na$^+$] 391.1428, Found: 391.1432.

Ethyl 2-((5-chloro-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6n). White solid, 169 mg, yield 87%. m.p. 159−161 °C; IR (KBr) ν 3368, 2924, 1714, 1621, 1513, 1184, 818 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.14 (s, 1H), 7.21 (d, J = 6.0 Hz, 1H), 7.15 (s, 1H), 6.79 (d, J = 8.4 Hz, 1H), 6.67 (t, J = 9.0 Hz, 2H), 6.30 (s, 1H), 6.19 (dd, J = 9.0, 4.2 Hz, 2H), 5.46 (s, 1H), 5.22 (s, 1H), 4.21−4.12 (m, 2H), 3.21 (d, J = 13.2 Hz, 1H), 2.65 (d, J = 13.2 Hz, 1H), 1.29 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 179.7, 167.5, 156.6 (d, J_{C-F} = 237.0 Hz), 141.1, 141.0, 138.2, 133.8, 130.7, 129.3, 128.1, 125.4, 116.0 (d, J_{C-F} = 7.5 Hz), 115.6 (d, J_{C-F} = 22.5 Hz), 111.8, 65.8, 61.5, 41.0, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{18}ClFN_2NaO_3$ [M+Na$^+$] 411.0882, Found: 411.0886.

Ethyl 2-((5-bromo-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6o). White solid, 171 mg, yield 79%. m.p. 172−174 °C; IR (KBr) ν 3368, 1718, 1621, 1508, 1466, 1192, 813 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.96 (s, 1H), 7.37 (dd, J = 7.8, 1.8 Hz, 1H), 7.29 (d, J = 1.8 Hz, 1H), 6.75 (d, J = 7.8 Hz, 1H), 6.67 (t, J = 8.4 Hz, 2H), 6.30 (s, 1H), 6.19 (dd, J = 9.0, 4.0 Hz, 2H), 5.47 (s, 1H), 5.18 (s, 1H), 4.21−4.12(m, 2H), 3.20 (d, J = 13.2 Hz, 1H), 2.66 (d, J = 13.2 Hz, 1H), 1.29 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 179.4, 167.5, 156.7 (q, J_{C-F} = 235.5 Hz), 141.0, 138.6, 133.8, 132.2, 131.0, 130.6, 128.2, 116.0 (d, J_{C-F} = 7.5 Hz), 115.6 (d, J_{C-F} = 22.5 Hz), 115.4, 112.2, 65.7, 61.5, 41.0, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{20}H_{18}BrFN_2NaO_3$ [M+Na$^+$] 455.0377, Found: 455.0381.

Ethyl 2-((3-(naphthalen-2-ylamino)-2-oxoindolin-3-yl)methyl)acrylate (6p). White solid, 143 mg, yield 74%. m.p. 166−168 °C; IR (KBr) ν 3304, 1717, 1627, 1536, 1470, 1317, 1189, 745 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.43 (s, 1H), 7.53 (d, J = 7.8 Hz, 1H), 7.43 (d, J = 8.4 Hz, 1H), 7.23−7.21 (m, 1H), 7.23−7.21 (m, 2H), 7.13−7.08 (m, 2H), 6.92 (t, J = 7.8 Hz, 1H), 6.88 (d, J = 7.8 Hz, 1H), 6.75 (d, J = 9.0 Hz, 1H), 6.27 (s, 1H), 6.20 (s, 1H), 5.69 (s, 1H), 5.42 (s, 1H), 4.17−4.12 (m, 2H), 3.28 (d, J = 13.2 Hz, 1H), 2.69 (d, J = 13.2 Hz, 1H), 1.24 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.3, 167.8, 142.8, 139.7, 134.5, 133.9, 130.6, 129.1, 128.7, 128.6, 127.8, 127.3, 126.2, 125.9, 125.0, 122.4, 122.3, 118.5, 110.8, 106.9, 65.3, 61.3, 41.1, 14.0; HRMS (ESI−TOF) m/z calcd for $C_{24}H_{22}N_2NaO_3$ [M+Na$^+$] 409.1523, Found: 409.1526.

Ethyl 2-((1-benzyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6q). Colorless oil, 198 mg, yield 89%. IR (KBr) ν 3384, 1707, 1613, 1509, 1362, 1182, 752 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.27−7.24 (m, 4H), 7.19 (t, J = 7.8 Hz, 1H), 7.14 (d, J = 7.2 Hz, 2H), 6.99 (t, J = 7.2 Hz, 1H), 6.74 (d, J = 7.8 Hz, 1H), 6.60 (t, J = 8.4 Hz, 2H), 6.22 (s, 1H), 6.18 (dd, J = 9.0, 4.2 Hz, 2H), 5.43 (s, 1H), 5.06 (d, J = 15.6 Hz, 1H), 4.94 (s, 1H), 4.68 (d, J = 15.6 Hz, 1H), 4.11 (q, J = 7.2 Hz, 2H), 3.31 (d, J = 13.2 Hz, 1H), 2.67 (d, J = 13.2 Hz, 1H), 1.24 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 177.2, 167.4, 157.1 (d, J_{C-F} = 235.5 Hz), 141.9, 141.3, 135.5, 134.4, 129.9, 129.1, 128.6, 128.2, 127.6, 127.5, 125.1, 122.4, 117.9 (d, J_{C-F} = 7.5 Hz), 115.3 (d, J_{C-F} = 22.5 Hz), 109.6, 65.6, 61.1, 43.9, 40.8, 14.1; HRMS (ESI−TOF) m/z calcd for $C_{27}H_{25}FN_2NaO_3$ [M+Na$^+$] 467.1741, Found: 467.1747.

Ethyl 2-((1-ethyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6r). White solid, 159 mg, yield 83%. m.p. 128−129 °C; IR (KBr) ν 3377, 2924, 1714, 1607, 1505, 1371, 752 cm^{-1}; ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.31 (t, J = 7.8 Hz, 1H), 7.24 (d, J = 7.2 Hz, 1H), 7.02 (t, J = 7.8 Hz, 1H), 6.88 (d, J = 7.8 Hz, 1H), 6.64 (t, J = 9.0 Hz, 2H), 6.21 (s, 1H), 6.15 (dd, J = 9.0, 4.8 Hz, 2H), 5.42 (s, 1H), 4.89 (s, 1H), 4.14−4.07 (m, 2H), 3.77−3.73 (m, 2H), 3.25 (d, J = 13.2 Hz, 1H), 2.61 (d, J = 13.2 Hz, 1H), 1.24 (t, J = 7.2 Hz, 3H), 1.20 (t, J = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 176.8, 167.4, 156.75 (d, J_{C-F} = 237.0 Hz), 141.8, 141.4, 134.3, 129.9, 129.2, 128.4, 125.3, 122.2, 116.8 (d, J_{C-F} = 7.5 Hz), 115.3 (d, J_{C-F} = 22.5 Hz), 108.6, 65.2, 61.1, 40.8, 34.7, 14.1, 12.5.; HRMS (ESI−TOF) m/z calcd for $C_{22}H_{23}FN_2O_3Na$ [M+Na$^+$] 405.1585, Found:. 405.1587.

Ethyl 2-((1-butyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate (6s). White solid, 164 mg, yield 80%. m.p. 104−105 °C; IR (KBr) ν 3358, 2956, 1705, 1615, 1510, 1331, 1186, 826, 752, 518 cm^{-1}; ^1H NMR (600 MHz, $CDCl_3$) δ 7.30 (t, *J* = 7.8 Hz, 1H), 7.24 (d, *J* = 7.8 Hz, 1H), 7.01 (t, *J* = 7.8 Hz, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.63 (t, *J* = 9.0 Hz, 2H), 6.21 (s, 1H), 6.16 (dd, *J* = 9.0, 4.8 Hz, 2H), 5.41 (s, 1H), 4.91 (s, 1H), 4.11 (q, *J* = 7.2 Hz, 2H), 3.73−3.63 (m, 2H), 3.25 (d, *J* = 13.2 Hz, 1H), 2.60 (d, *J* = 13.2 Hz, 1H), 1.63−1.53 (m, 2H), 1.33−1.28 (m, 2H), 1.24 (t, *J* = 7.2 Hz, 3H), 0.92 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 176.9, 167.4, 156.8 (d, J_{C-F} = 237.0 Hz), 142.3, 141.4, 134.3, 129.8, 129.1, 128.3, 125.2, 122.1, 117.1 (d, J_{C-F} = 7.5 Hz), 115.2 (d, J_{C-F} = 22.5 Hz), 108.7, 65.3, 61.1, 40.7, 39.8, 29.4, 20.1, 14.1, 13.7; HRMS (ESI−TOF) m/z calcd for $C_{24}H_{27}FN_2NaO_3$ [M+Na^+] 433.1898, Found:. 433.1900.

IR, NMR and HRMS Spectra of Compounds 4 and 6

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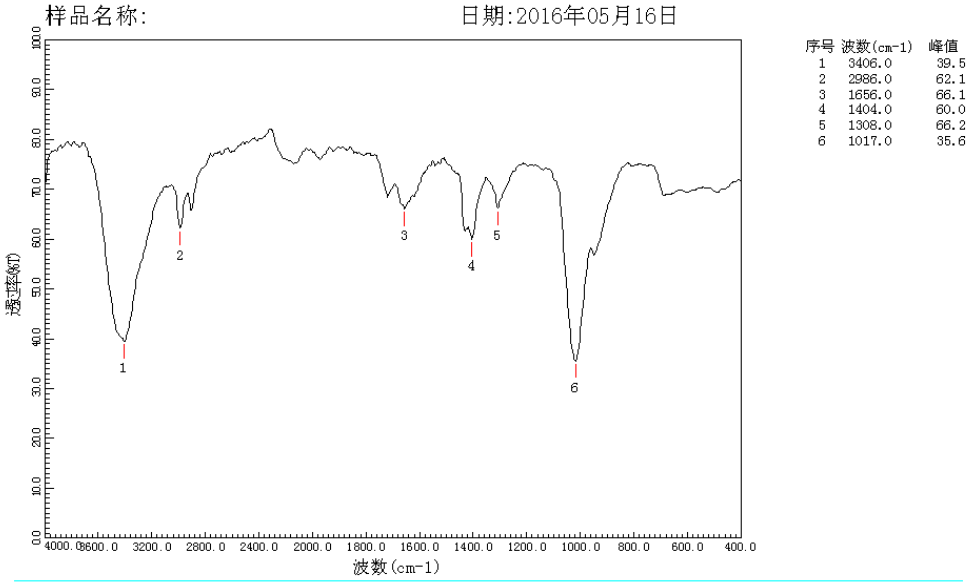

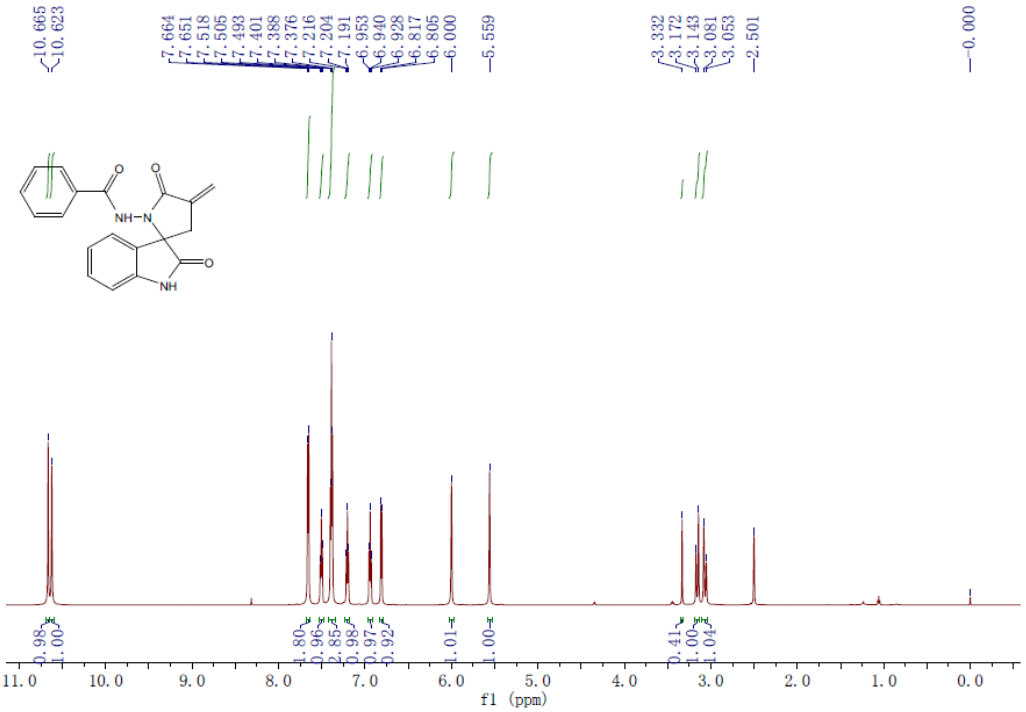

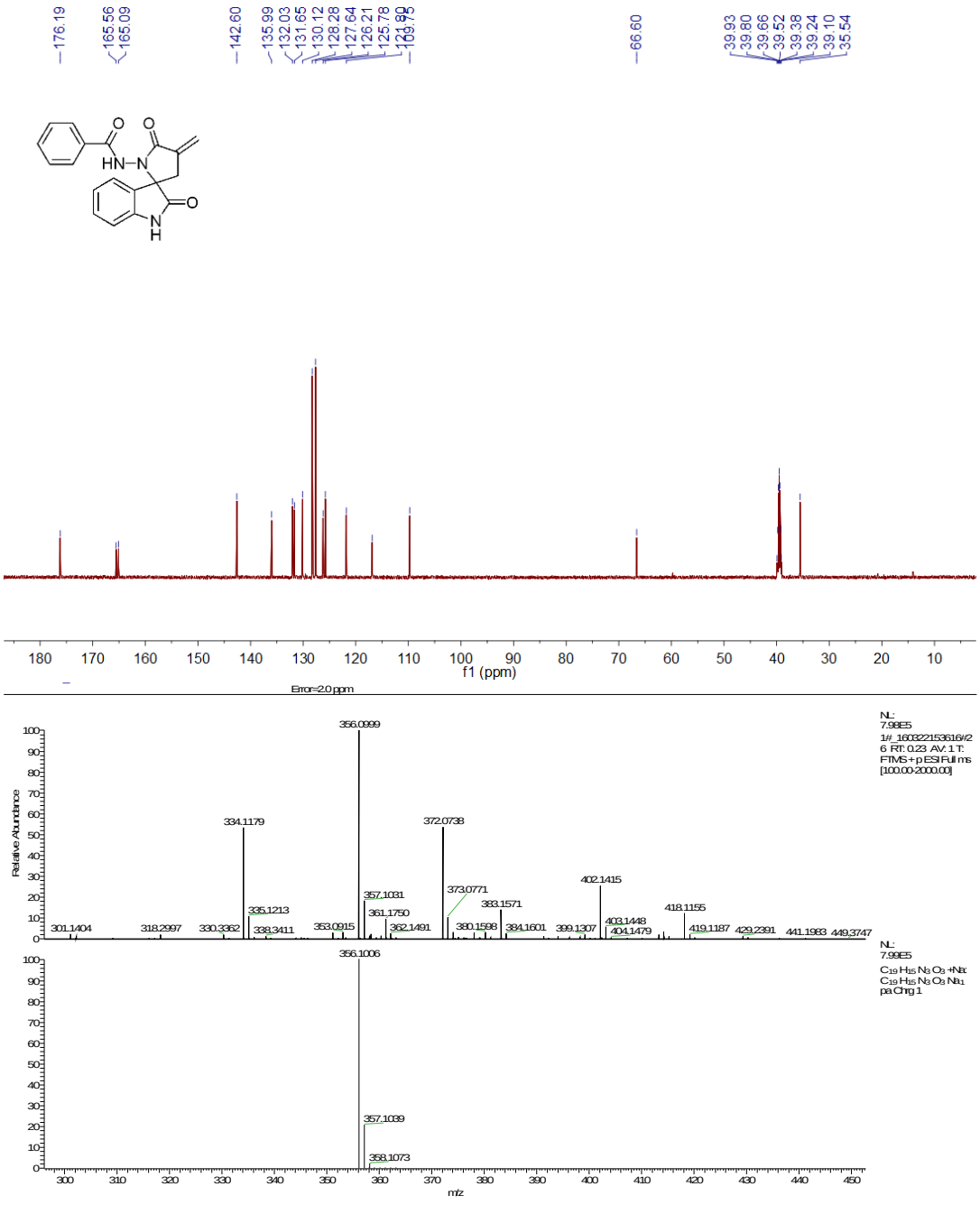
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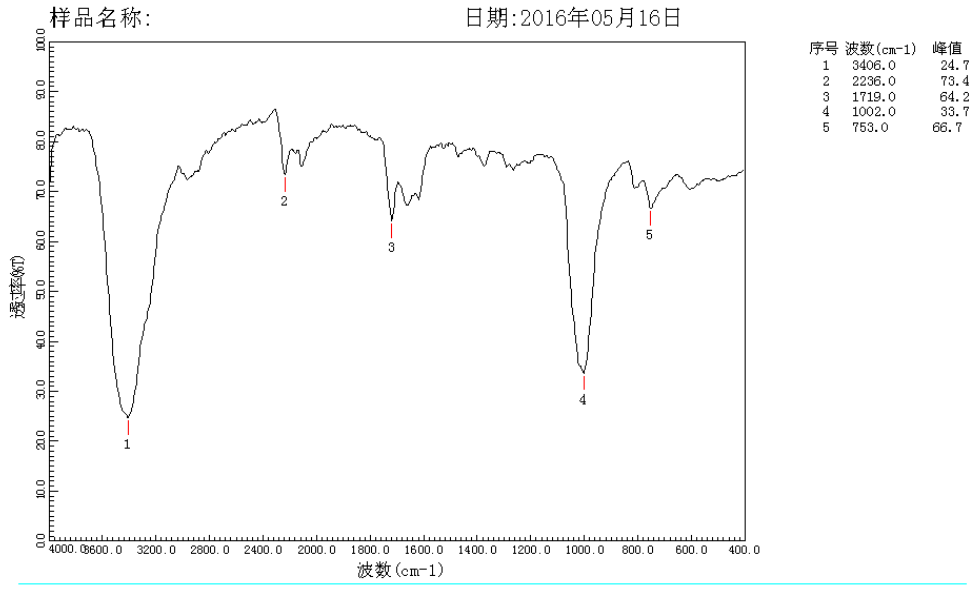
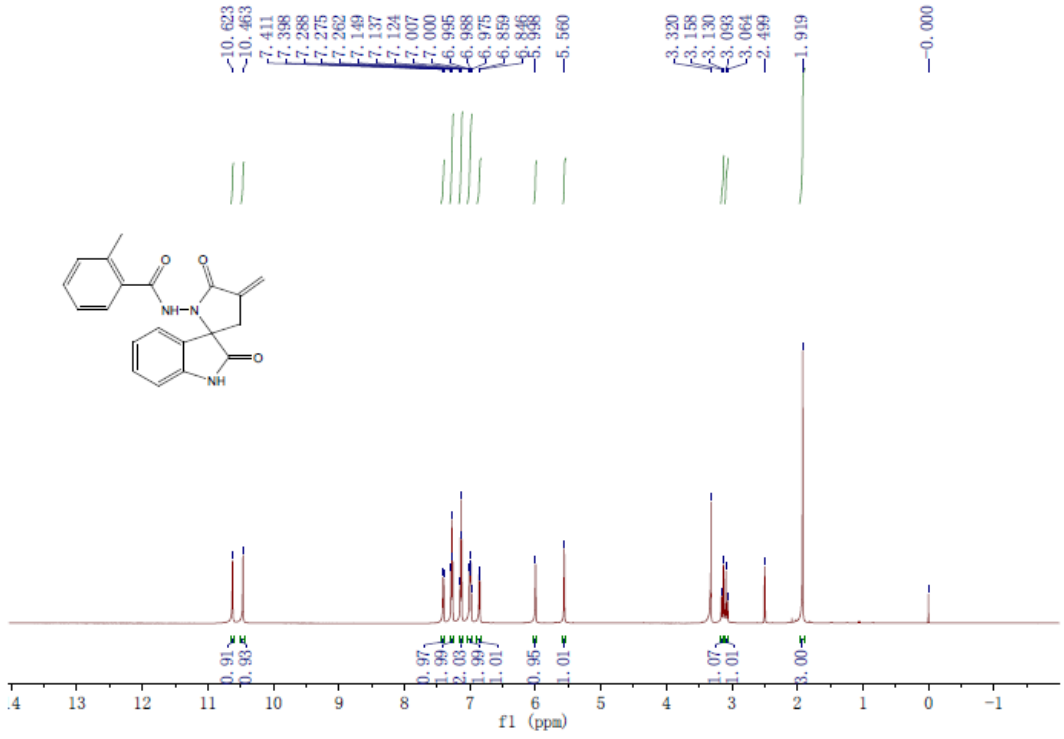
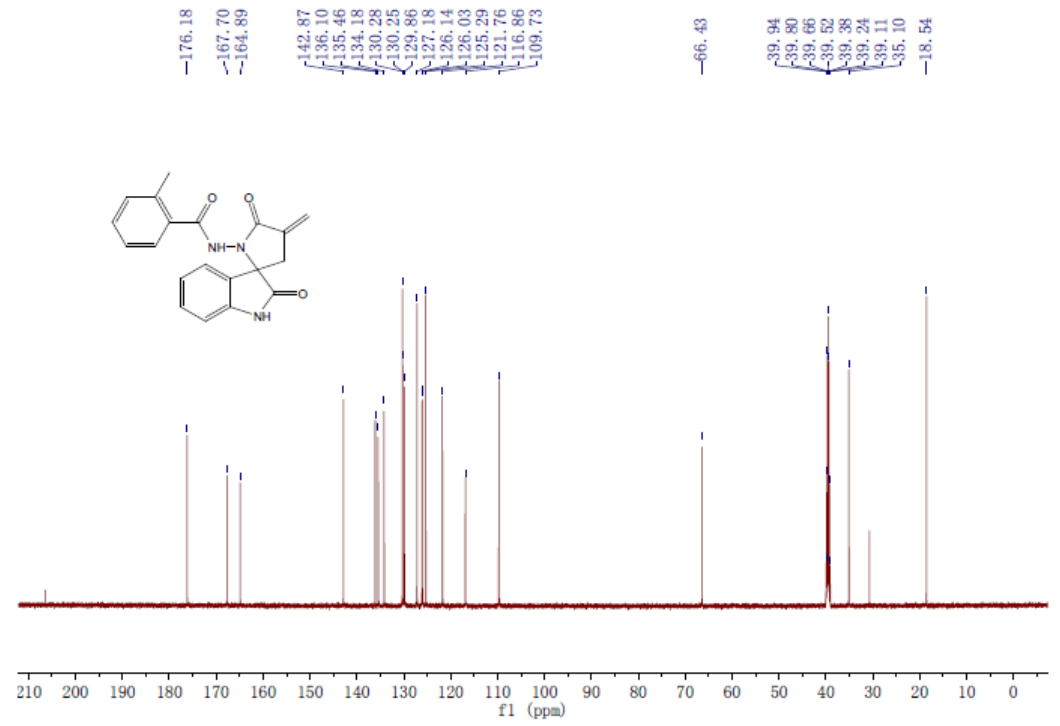
m/z

2-Methyl-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide (4b)



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116.86
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39.66
39.52
39.38
39.24
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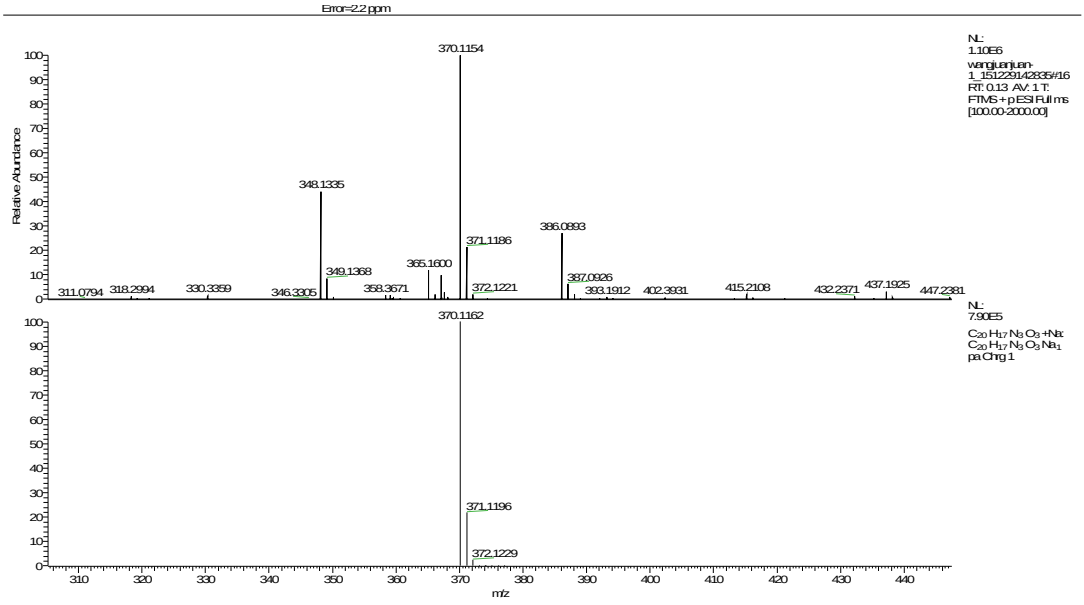
f1 (ppm)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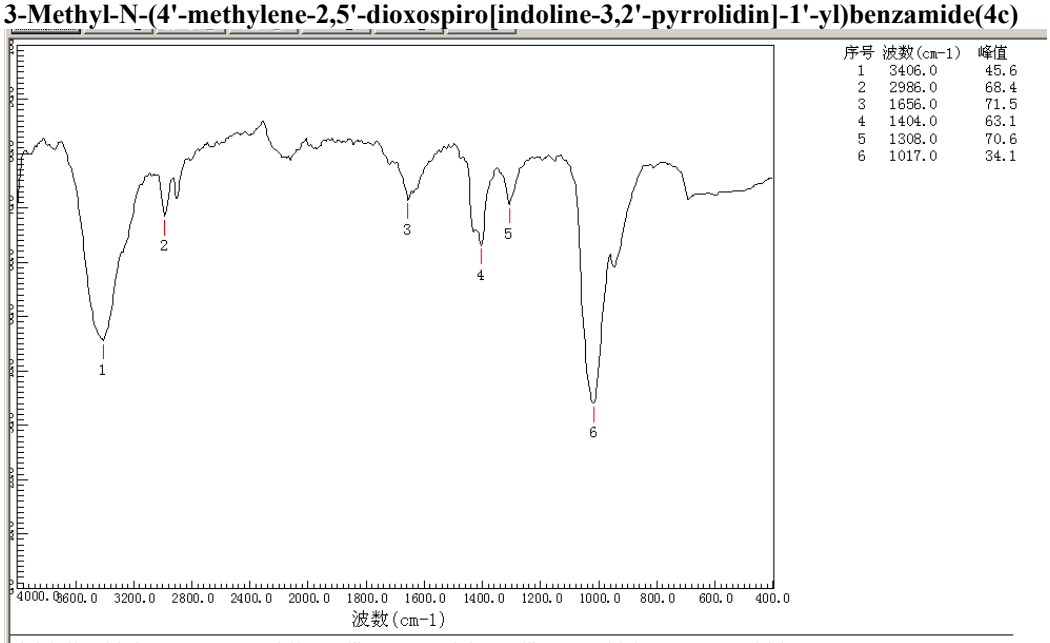
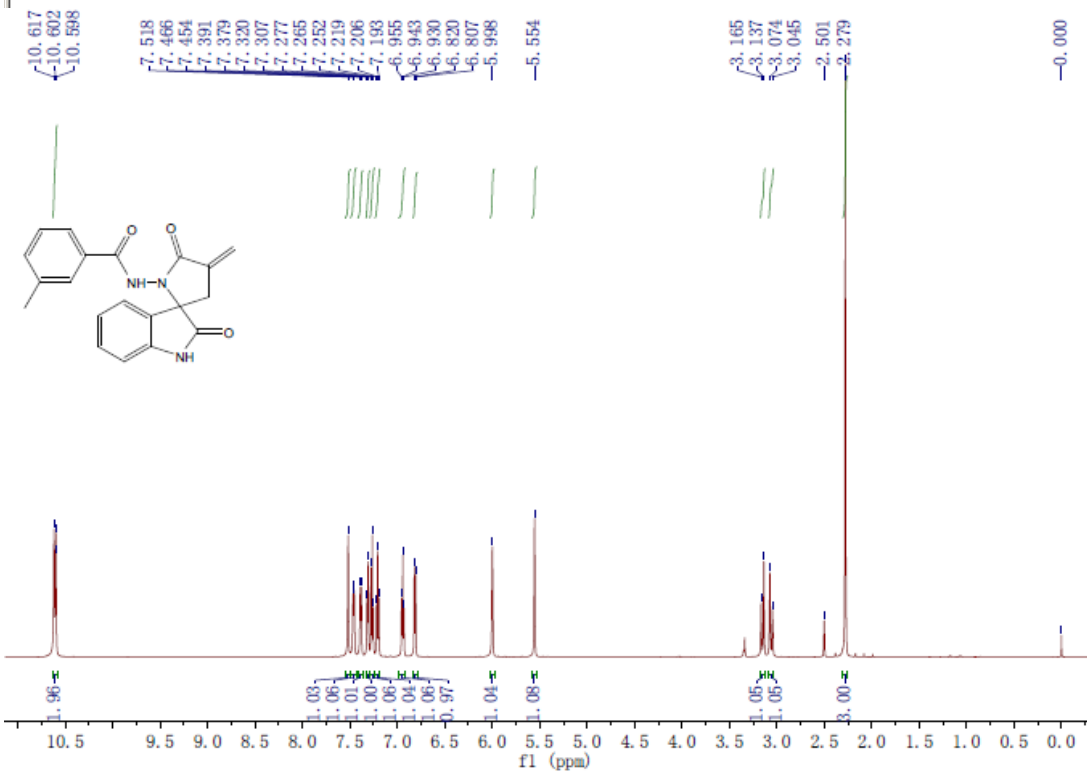
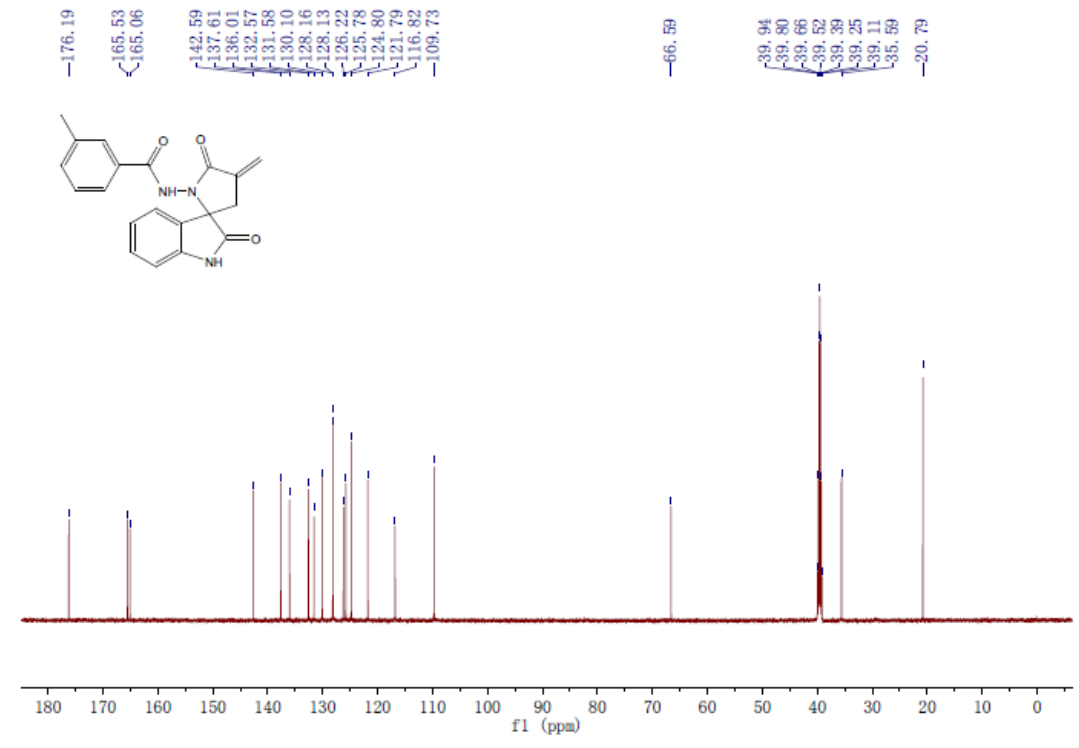
m/z

3-Methyl-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide(4c)



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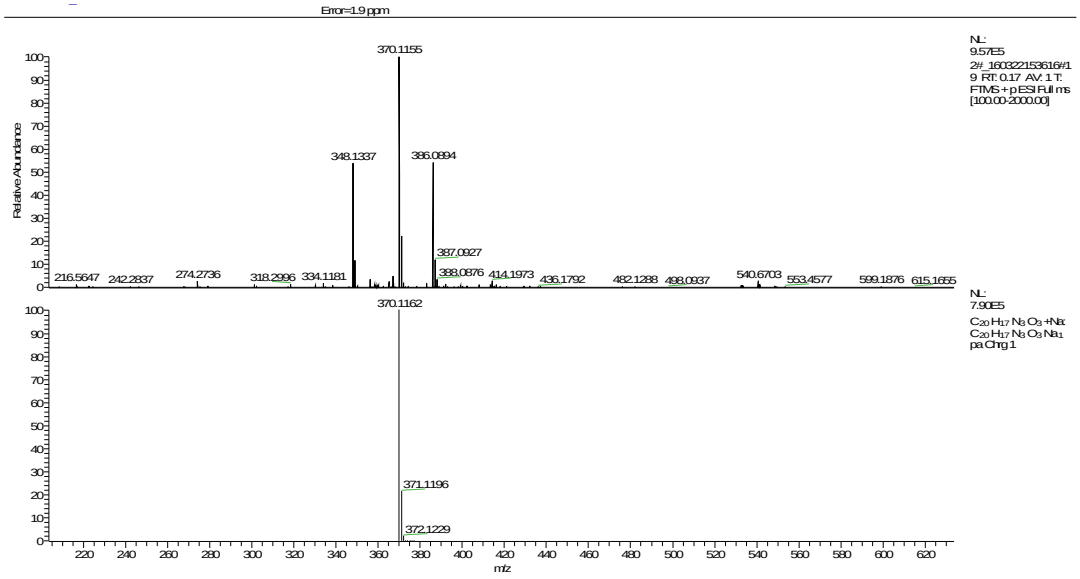
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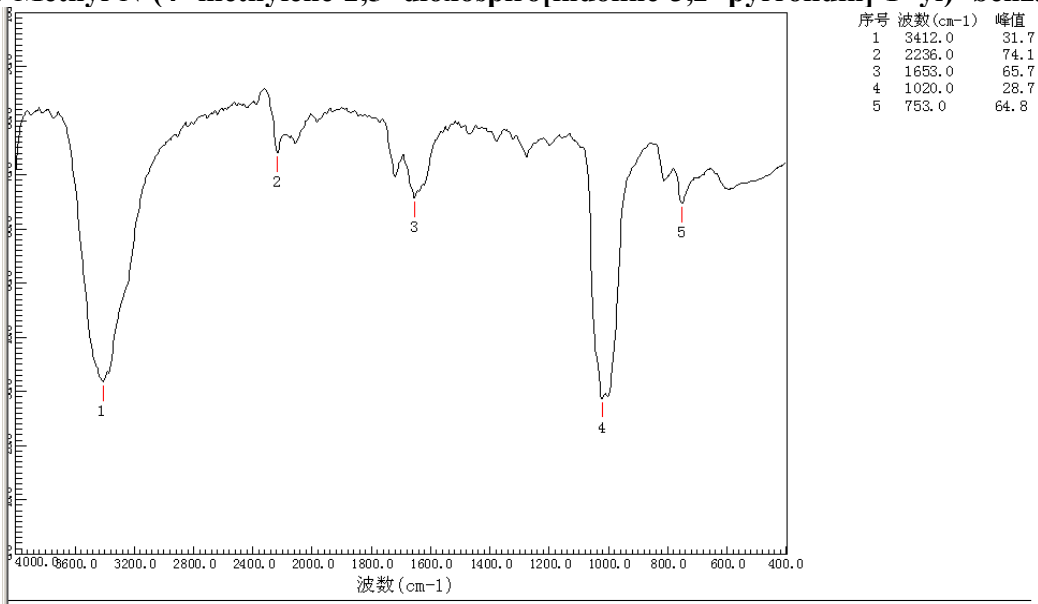
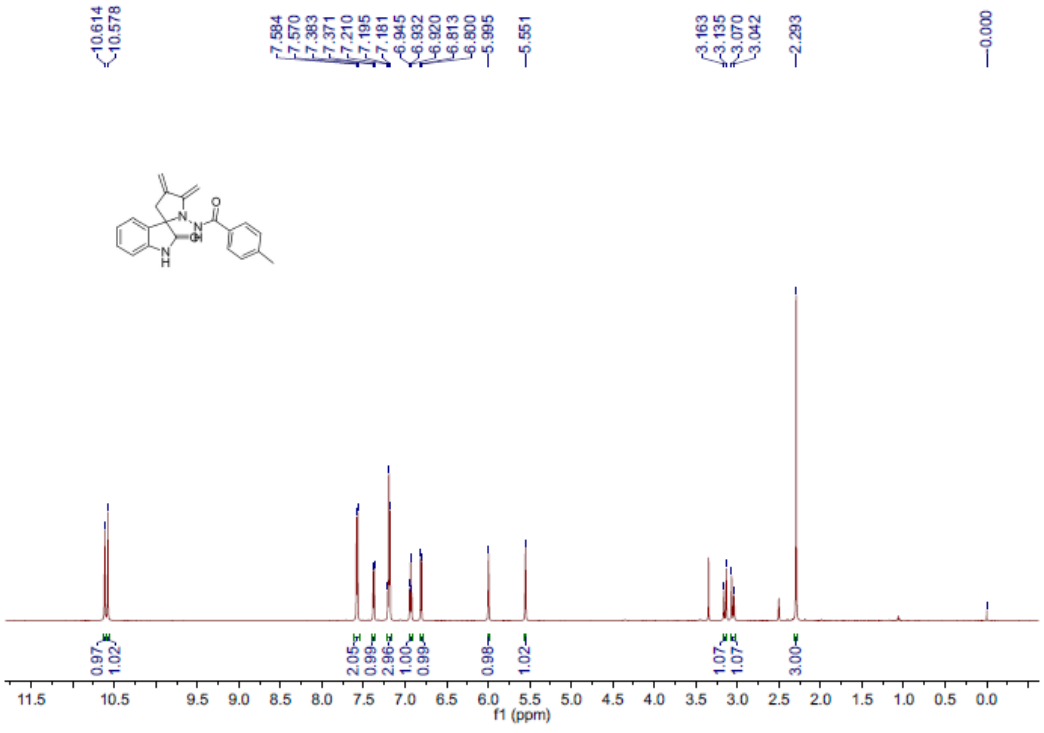
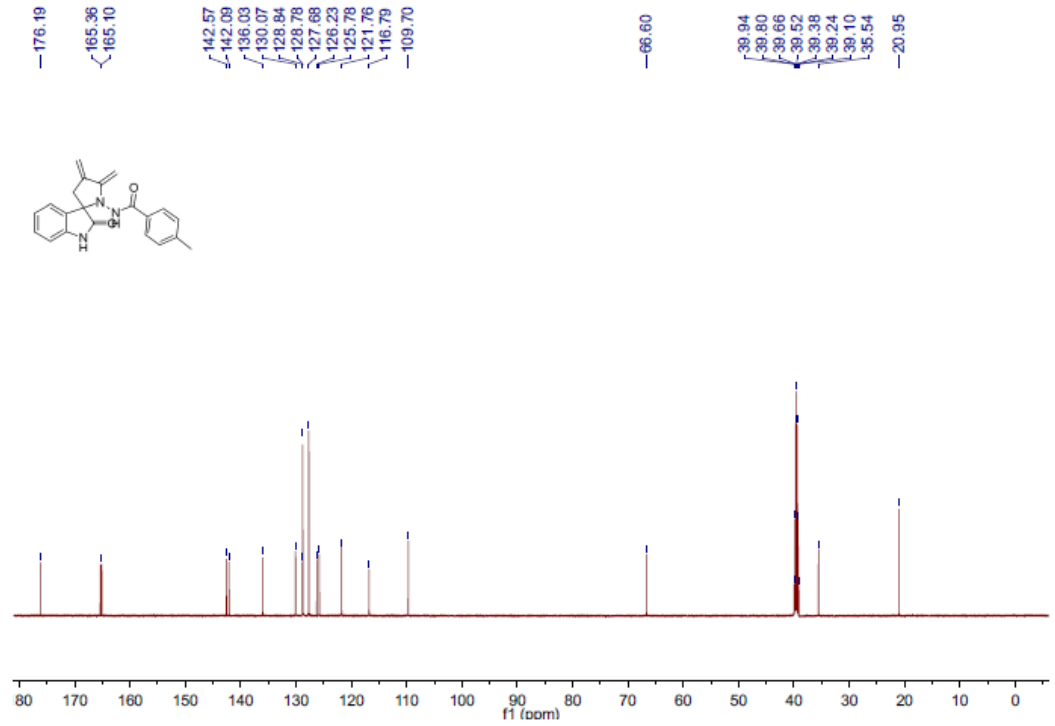
4-Methyl-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4d)



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125.78
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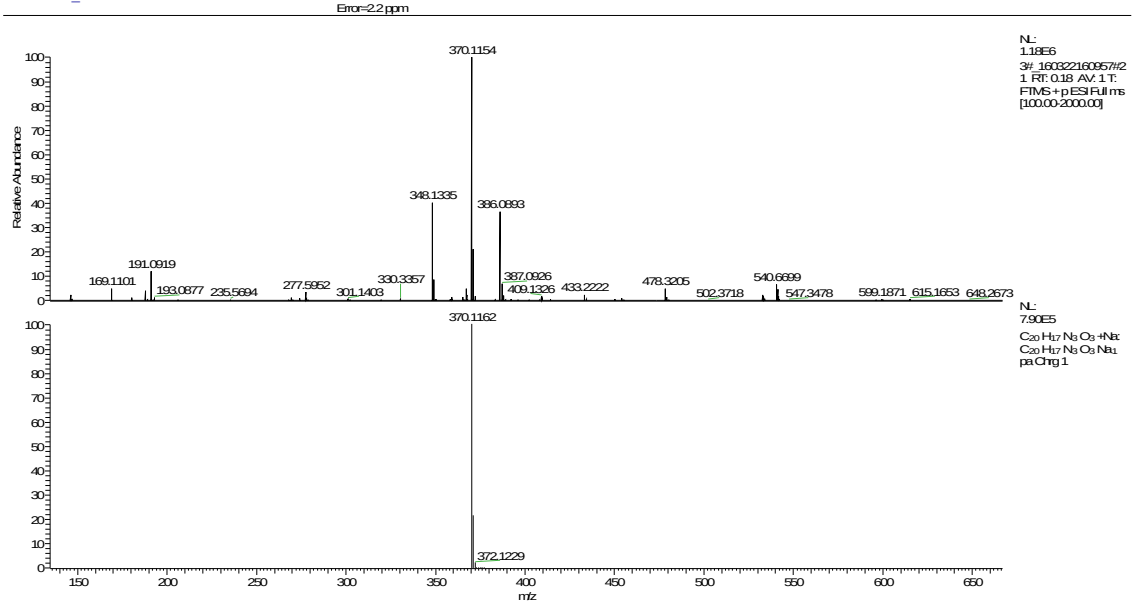
39.10
35.54
20.95
f1 (ppm)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Relative Abundance
m/z
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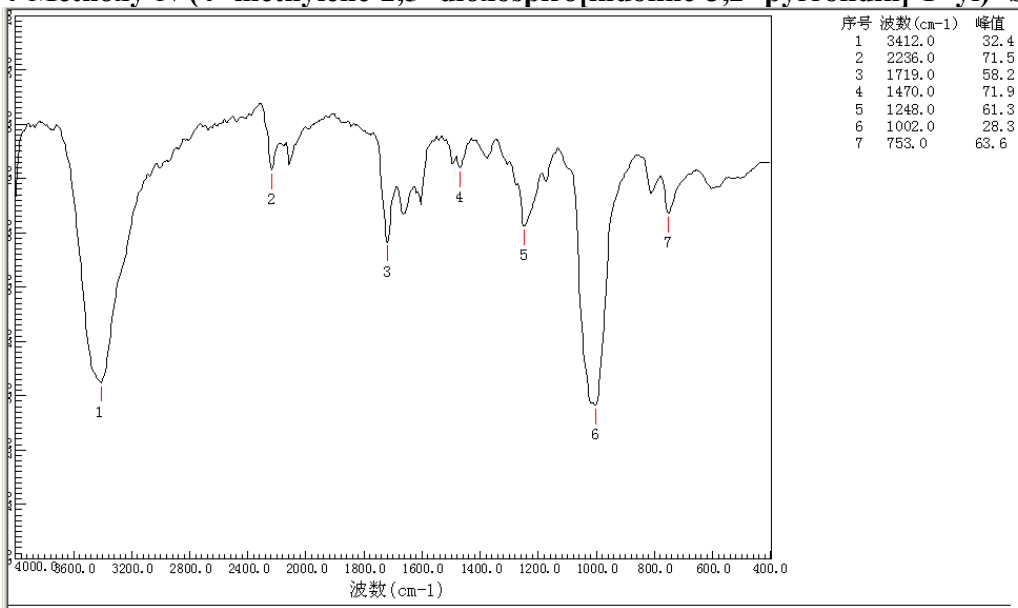
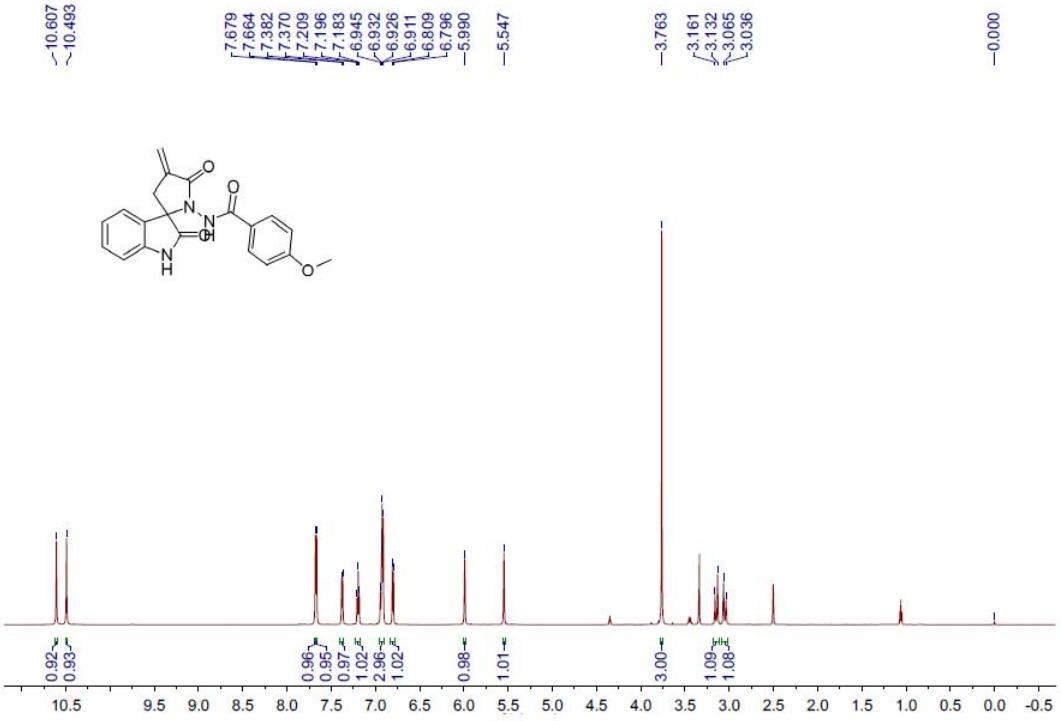
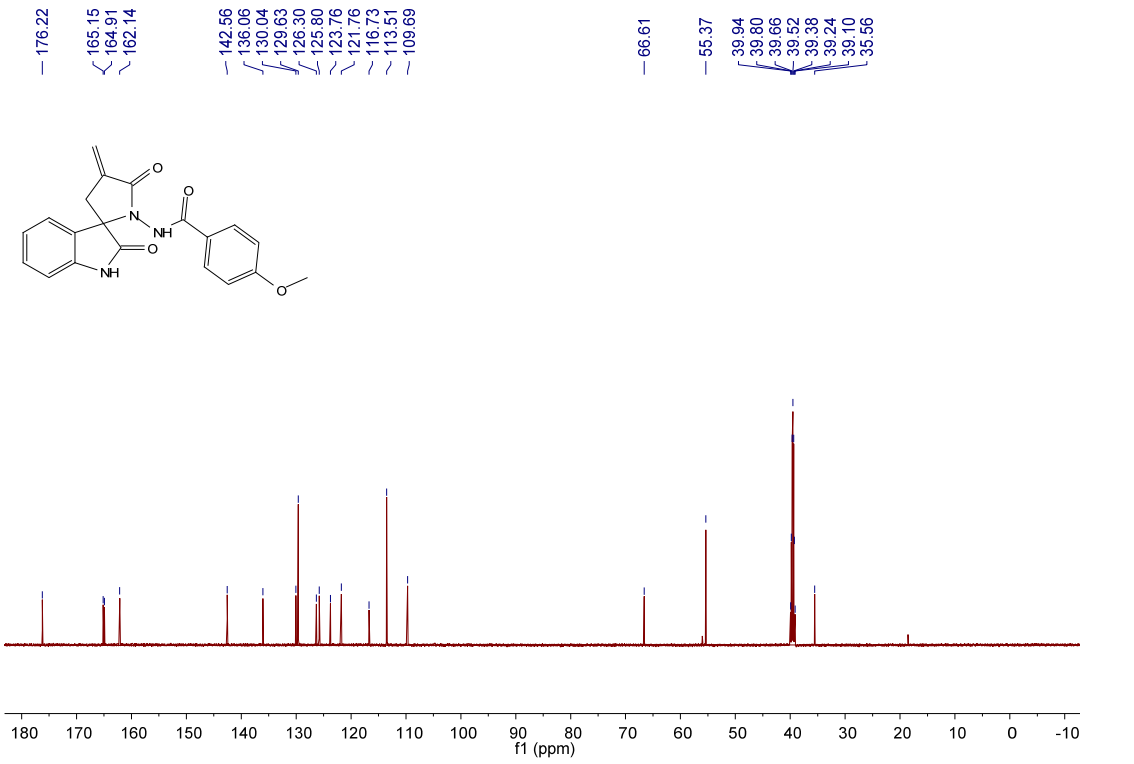
C20 H17 N3 O3 Na1
pa Chrg 1
370.1162
372.1229

4-Methoxy-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4e)



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39.66
39.52
39.38
39.24
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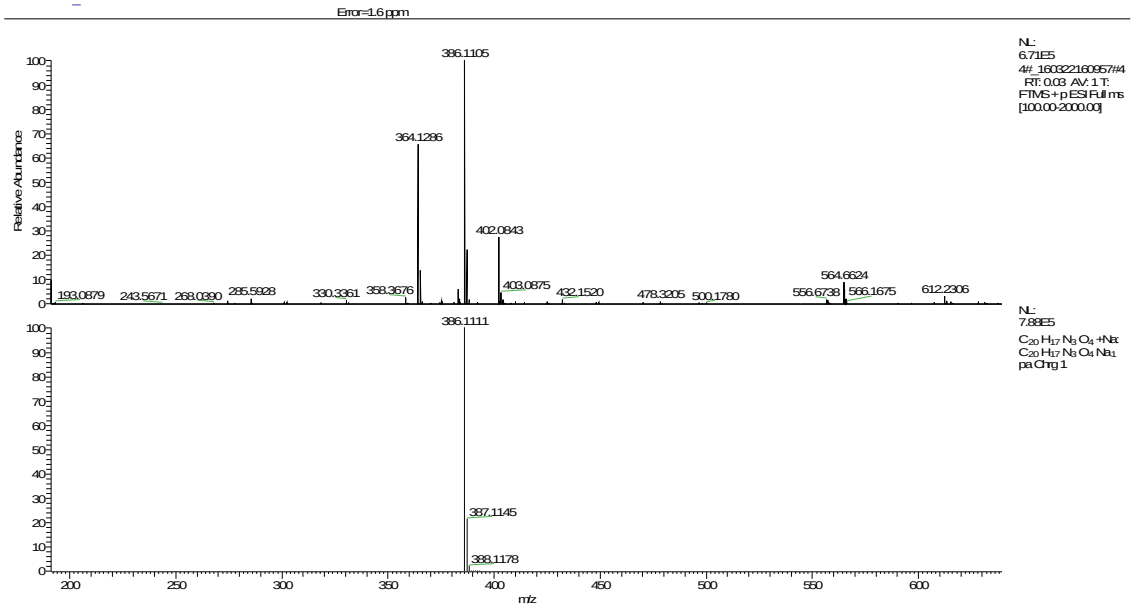
f1 (ppm)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Relative Abundance
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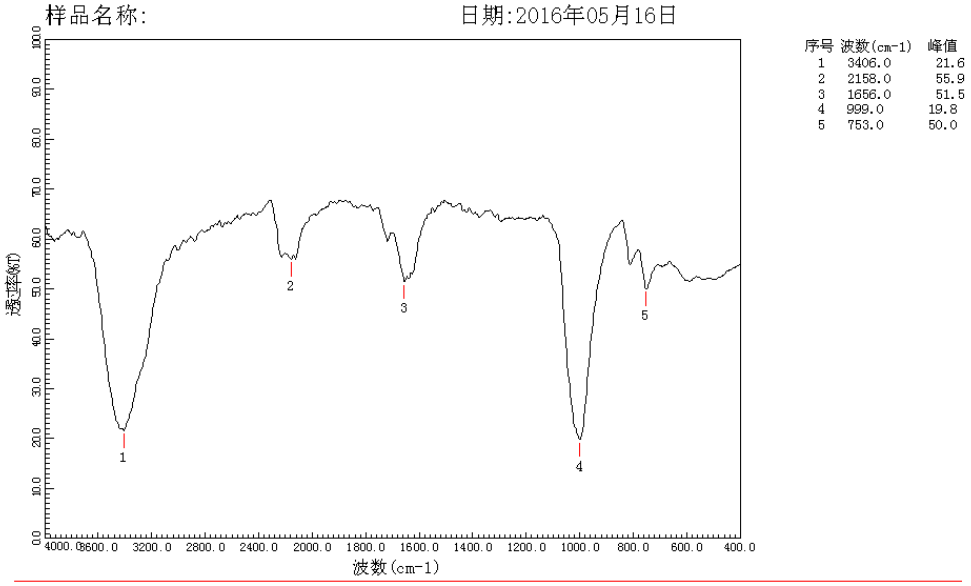
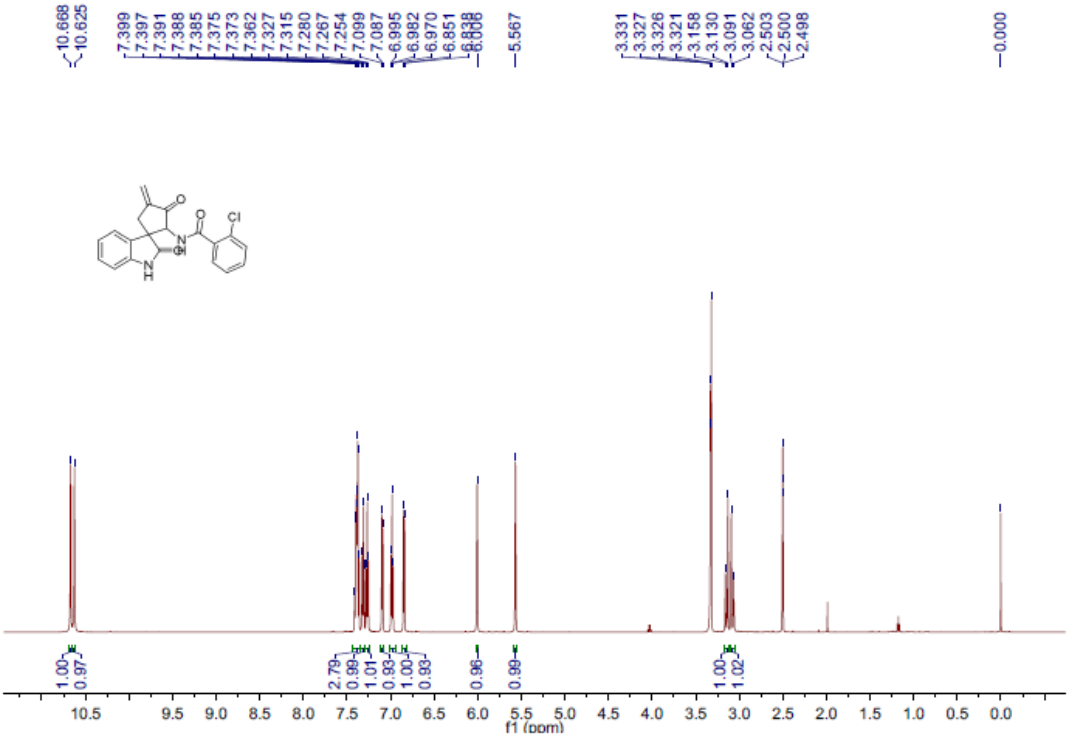
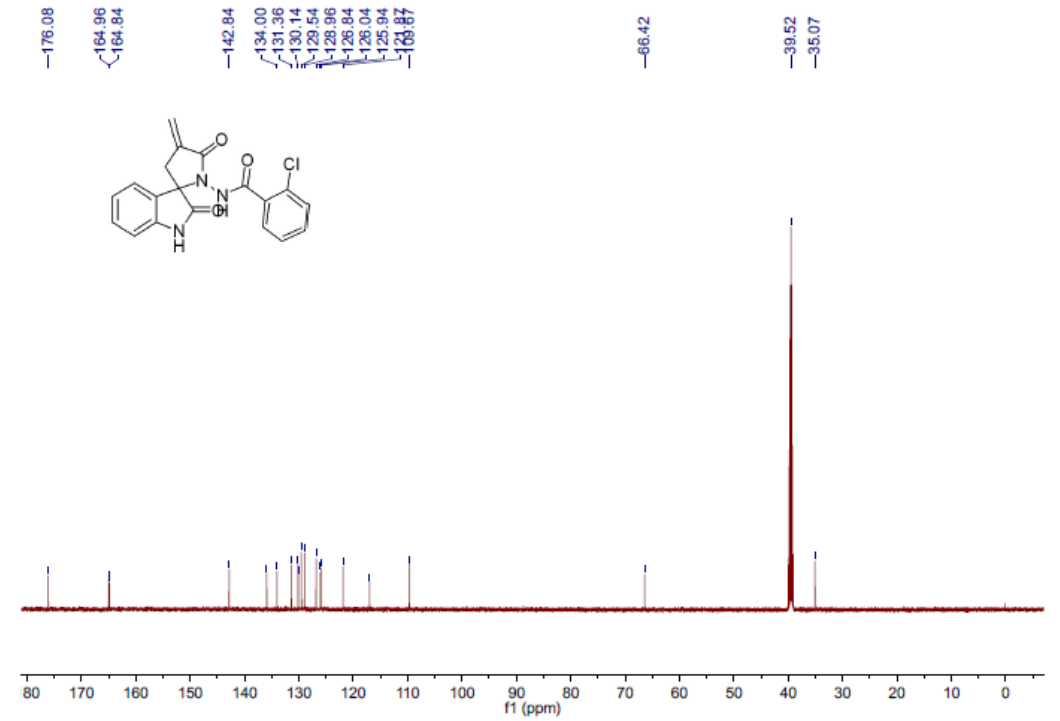
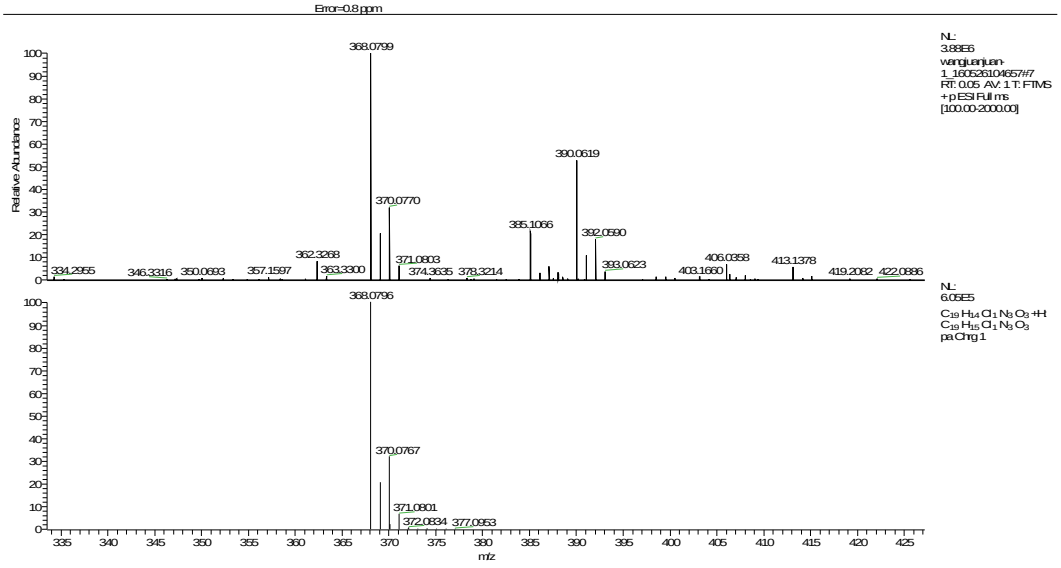
2-Chloro-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4h)

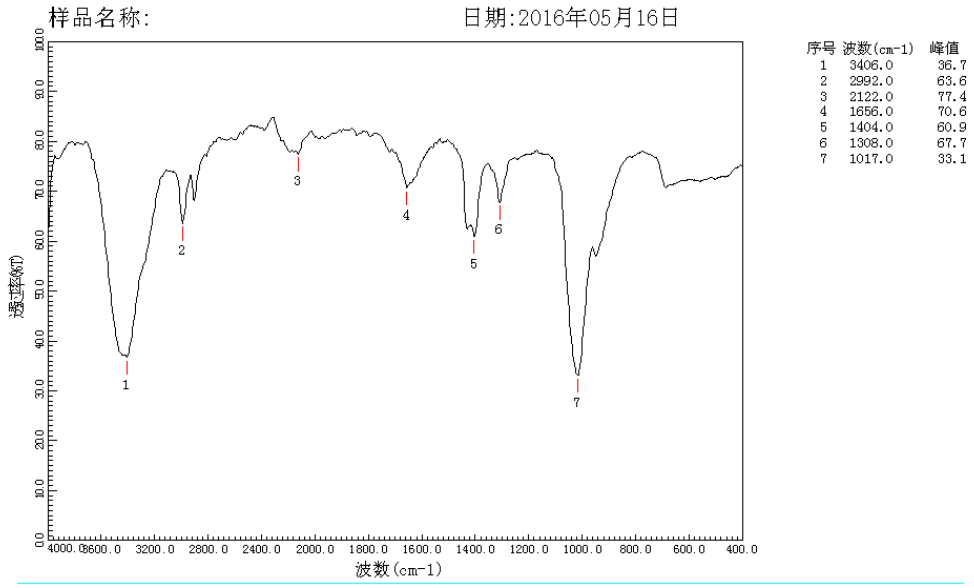


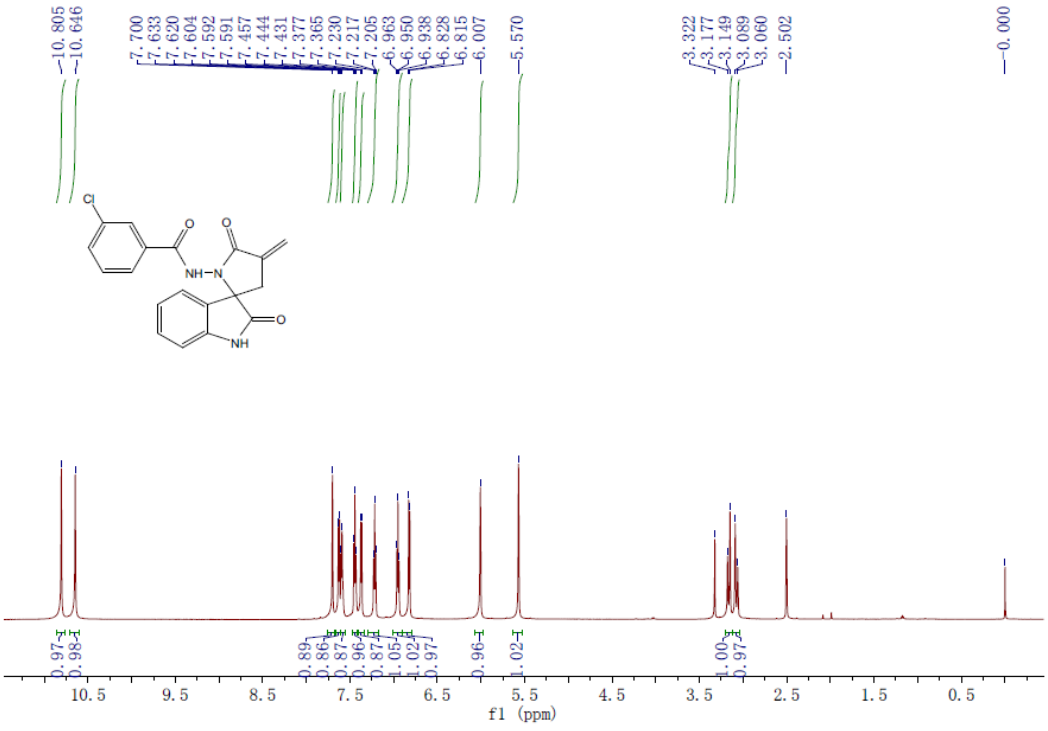


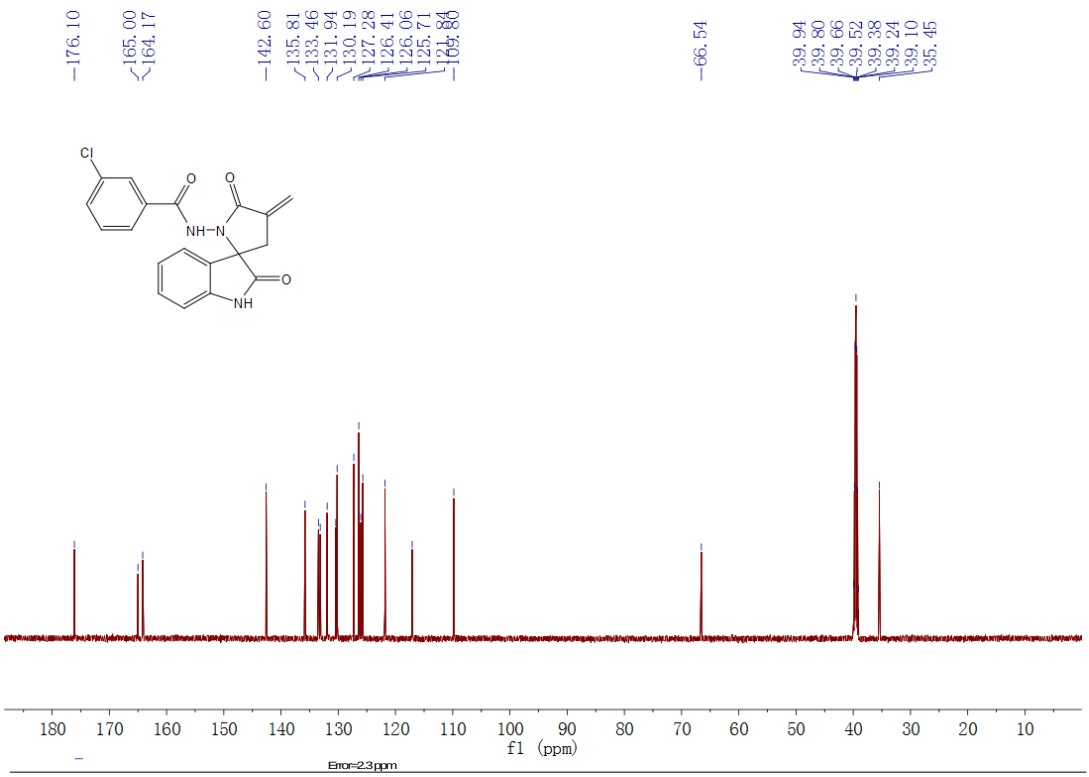

176.08
164.96
164.84
142.84
134.00
131.36
130.14
129.54
128.96
126.84
126.04
125.94
66.42
39.52
35.07
f1 (ppm)

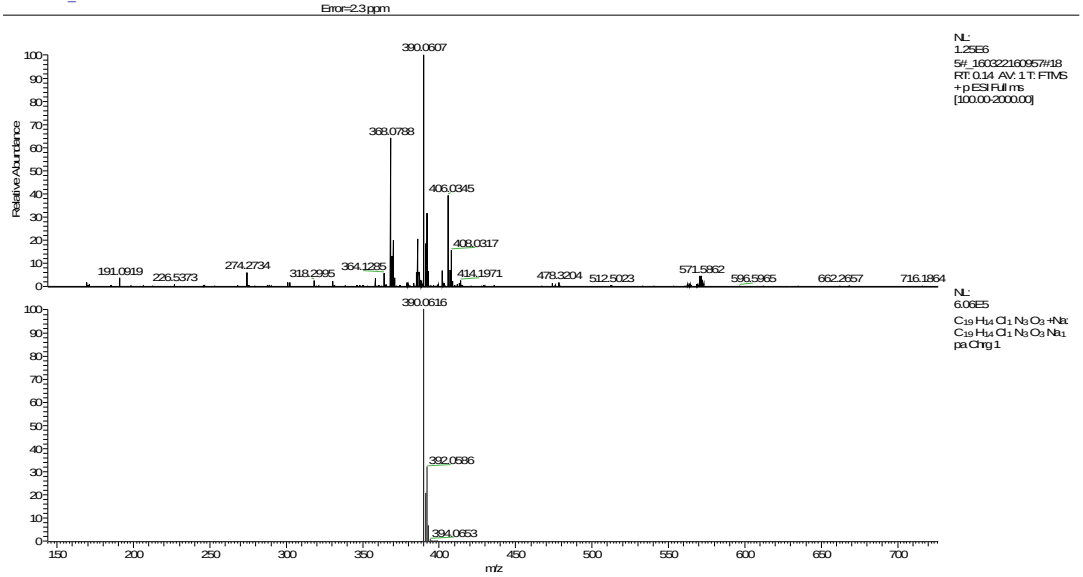

Error=0.8 ppm
Relative Abundance
m/z
368.0799
390.0619
370.0770
385.1066
392.0590
371.0803
362.3268
363.3300
394.2955
346.3316
350.0693
357.1597
374.3635
378.3214
393.0623
403.1660
406.0358
413.1378
419.2082
422.0886
NL:
3.88E6
wangjuanjuan-1_1605261046 57#7
RT: 0.05 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
368.0796
370.0767
371.0801
372.0834
377.0953
NL:
6.05E5
C19 H14 Cl1 N3 O3 +H
C19 H15 Cl1 N3 O3
pa Chrg 1

3-Chloro-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4i)

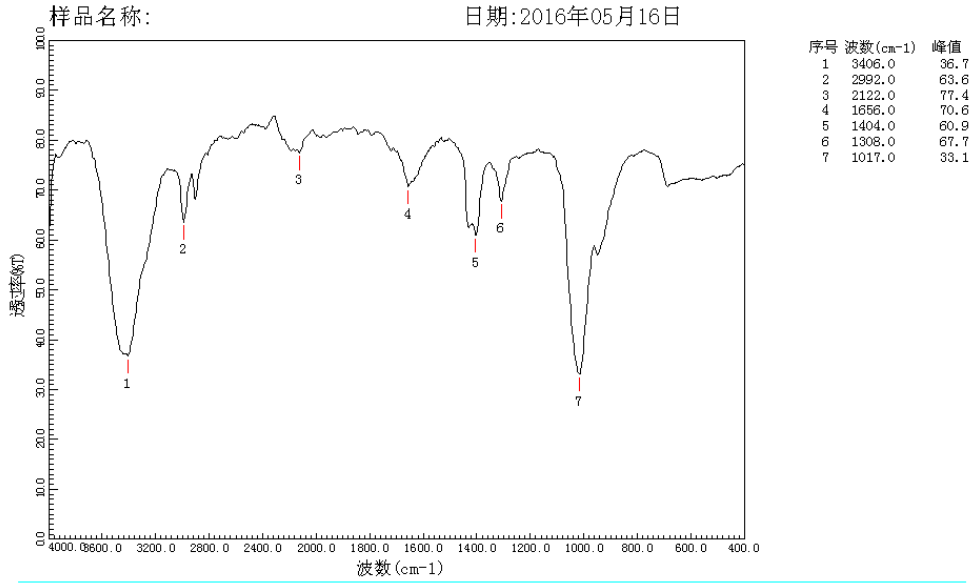


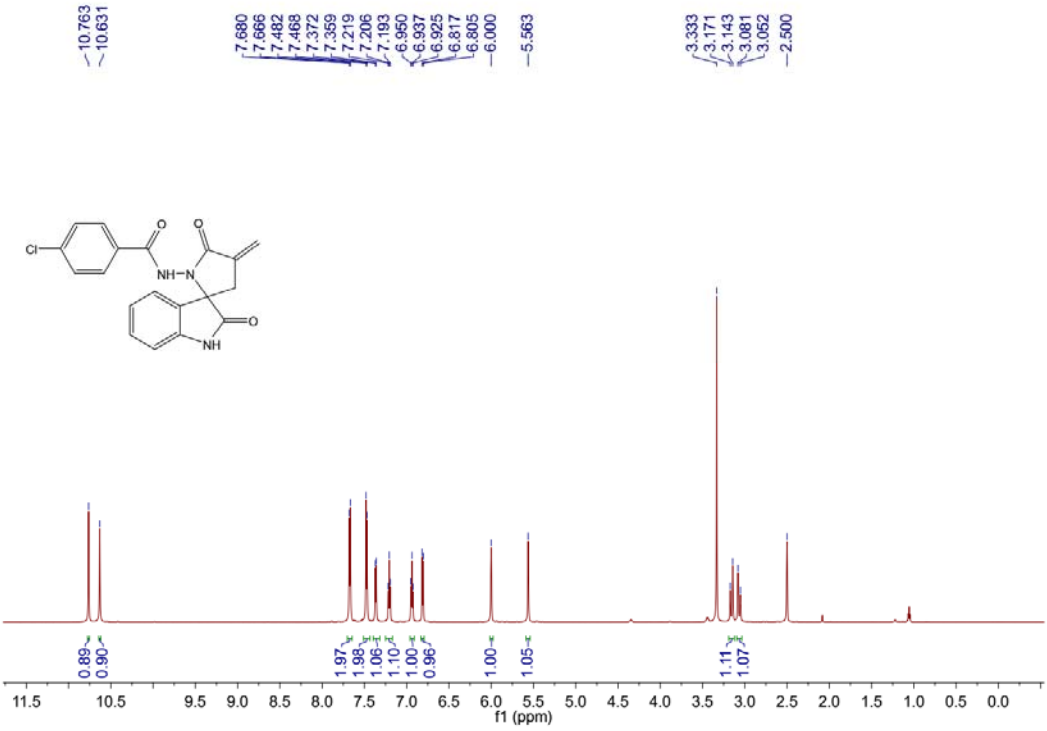


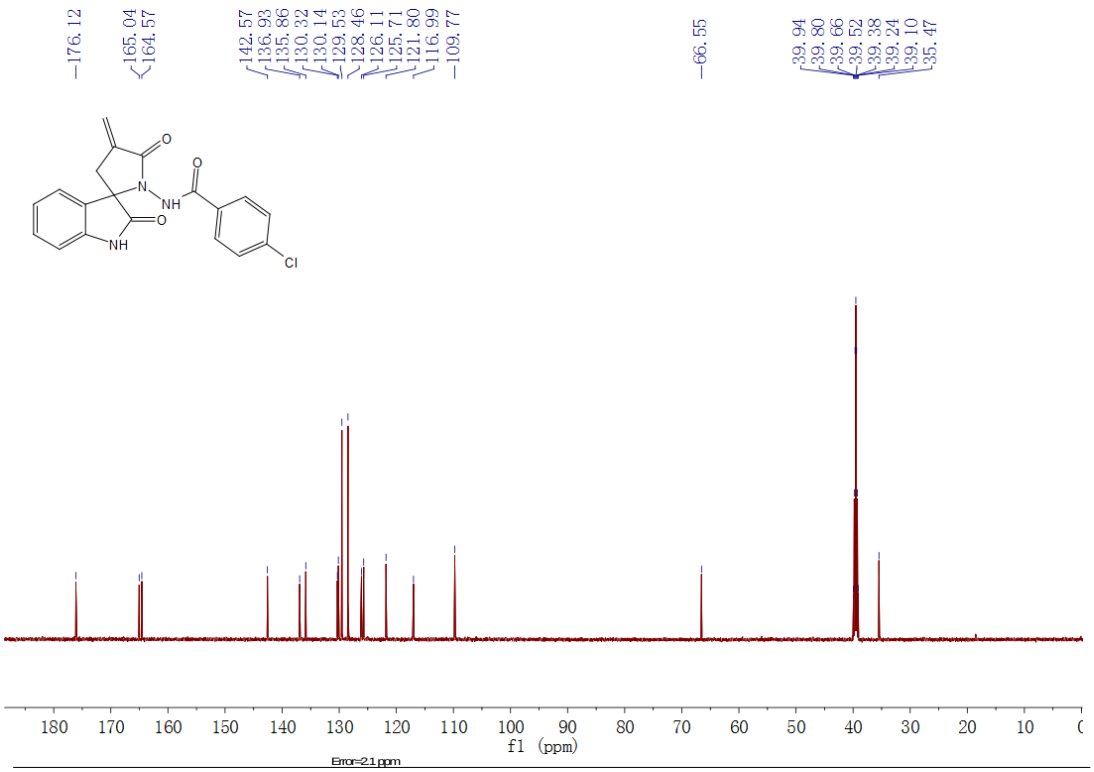

176.10
165.00
164.17
142.60
135.81
133.46
131.94
130.19
127.28
126.41
126.06
125.71
66.54
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.45
Cl
O
O
NH
N
O
NH
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10
f1 (ppm)

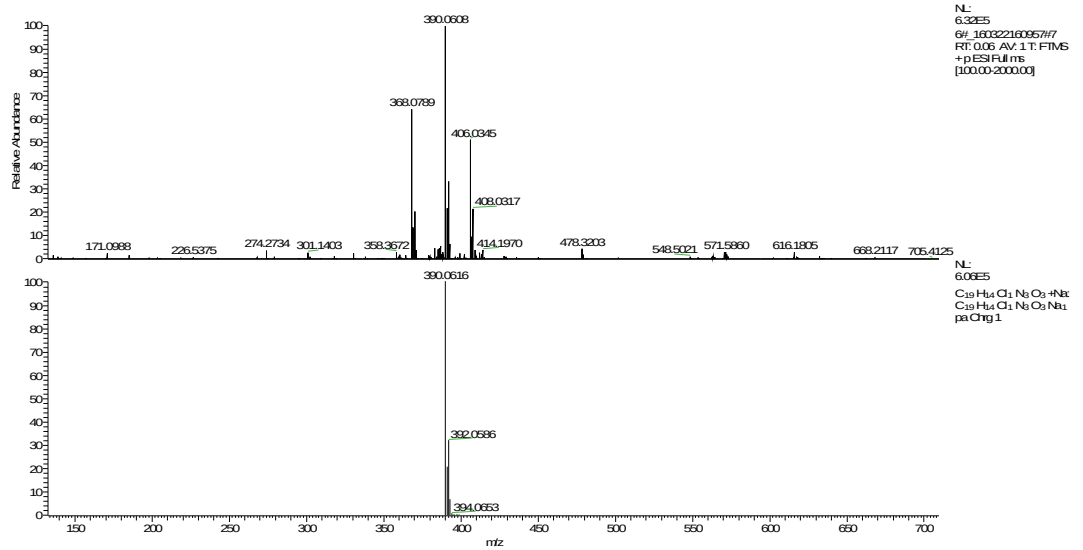

Error=2.3 ppm
Relative Abundance
390.0607
368.0788
406.0345
408.0317
191.0919
226.5373
274.2734
318.2995
364.1285
414.1971
478.3204
512.5023
571.5962
596.5965
662.2657
716.1864
NL:
1.25E6
5#_160322160957#18
RT: 0.14 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
390.0616
392.0586
394.0653
NL:
6.06E5
C19 H14 Cl1 N3 O3 +Na
C19 H14 Cl1 N3 O3 Na1
pa Chrg 1
m/z

4-Chloro-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4j)

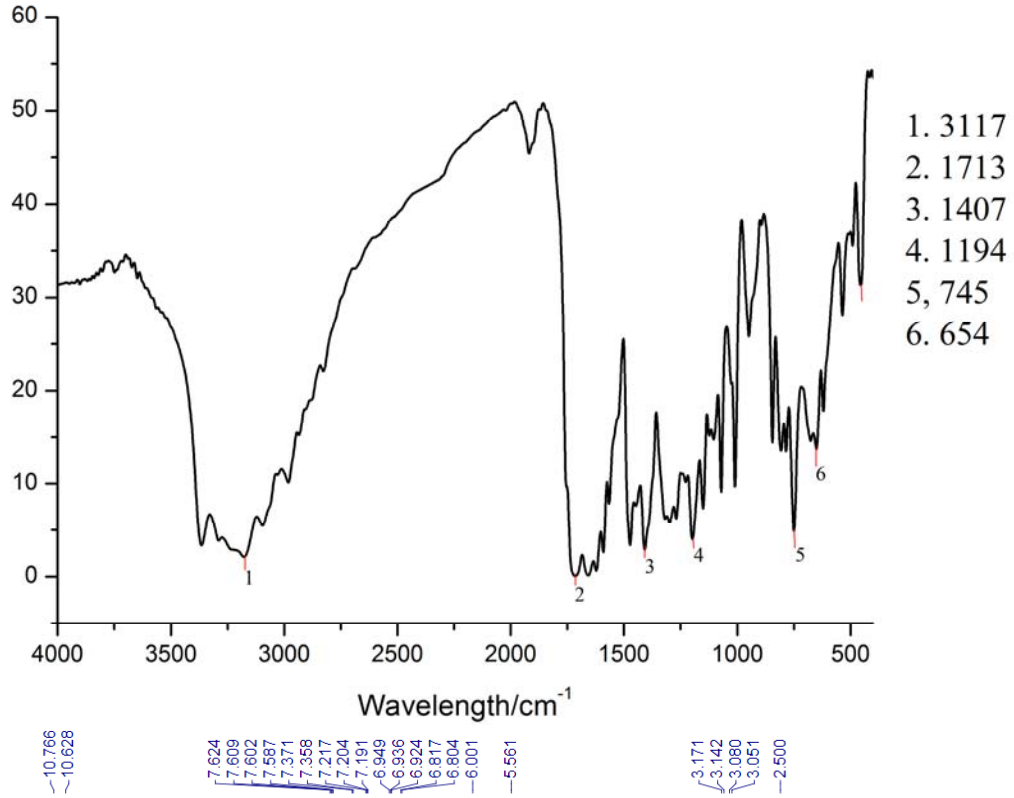


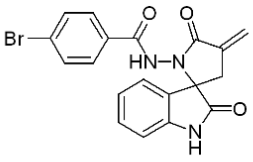


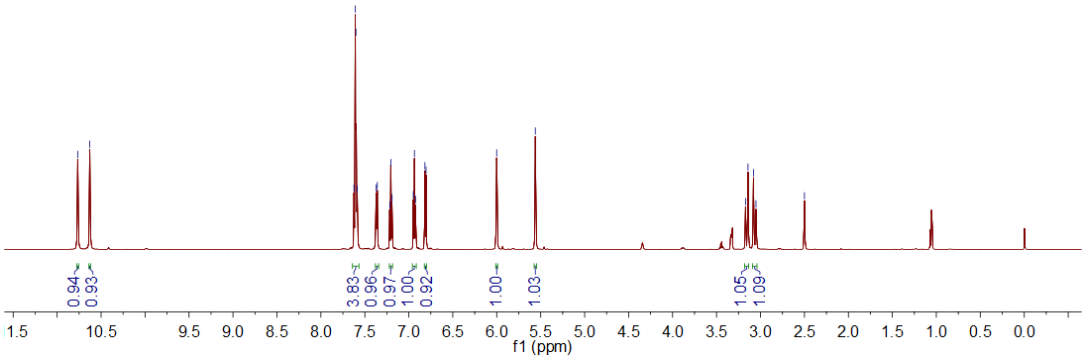

176.12
165.04
164.57
142.57
136.93
135.86
130.32
130.14
129.53
128.46
126.11
125.71
121.80
116.99
109.77
66.55
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.47
O
O
N
NH
O
NH
Cl
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

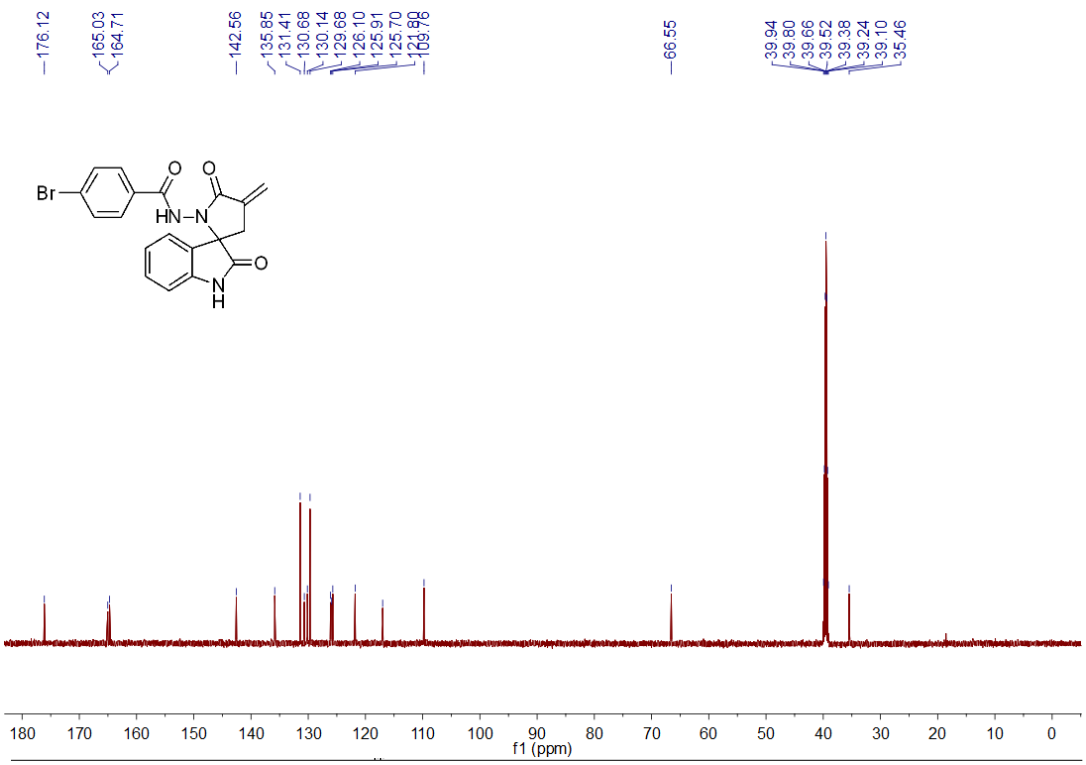

Error=2.1 ppm
Relative Abundance
390.0608
368.0789
406.0345
408.0317
171.0988
226.5375
274.2734
301.1403
358.3672
414.1970
478.3203
548.5021
571.5860
616.1805
668.2117
705.4125
m/z
NL:
6.32E5
6#_1603221609S7#7
RT: 0.06 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
390.0616
392.0586
394.0563
NL:
6.08E5
C19 H14 Cl1 N3 O3 +Na
C19 H14 Cl1 N3 O3 Na1
pa Chrg 1

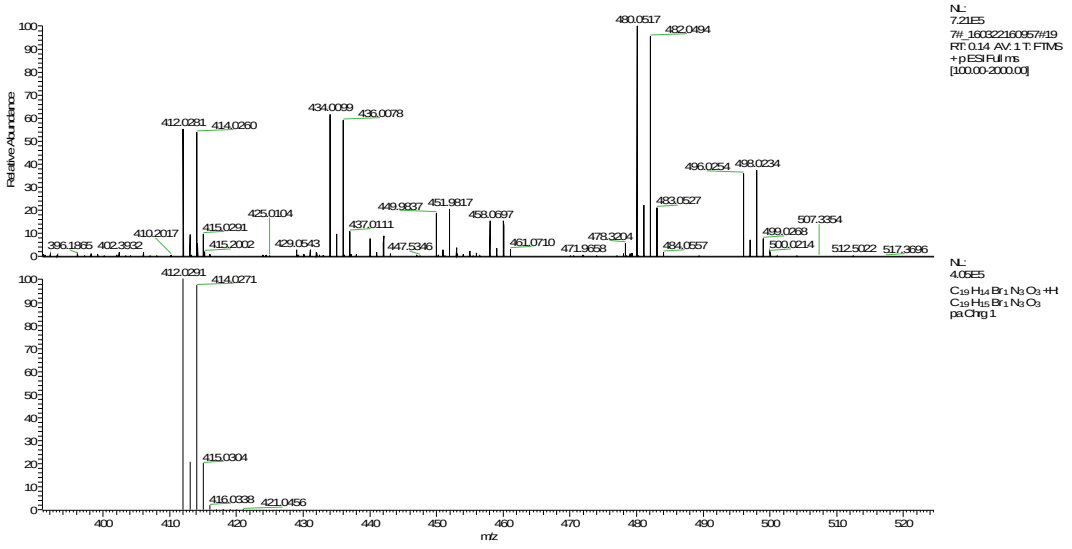
4-Bromo-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4k)



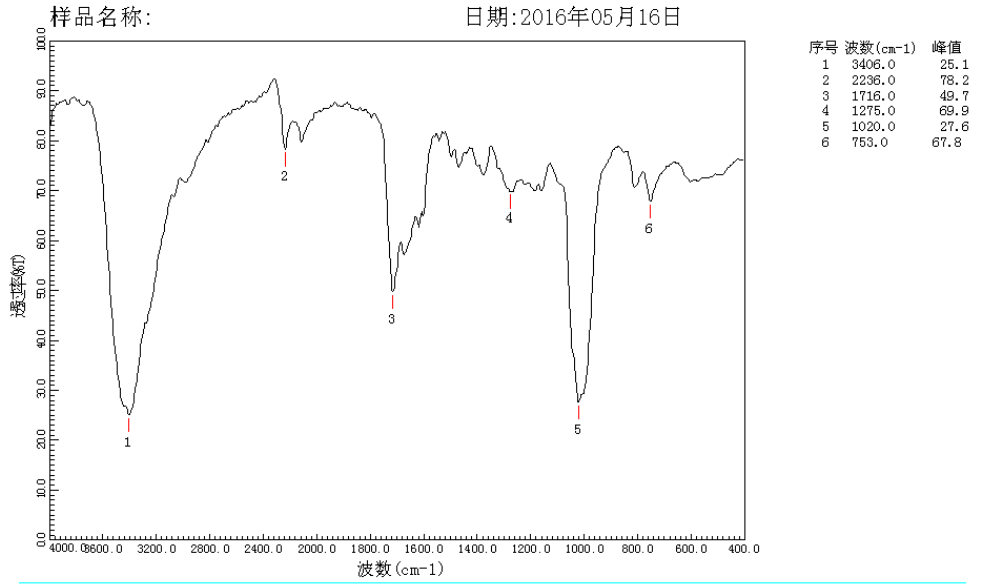


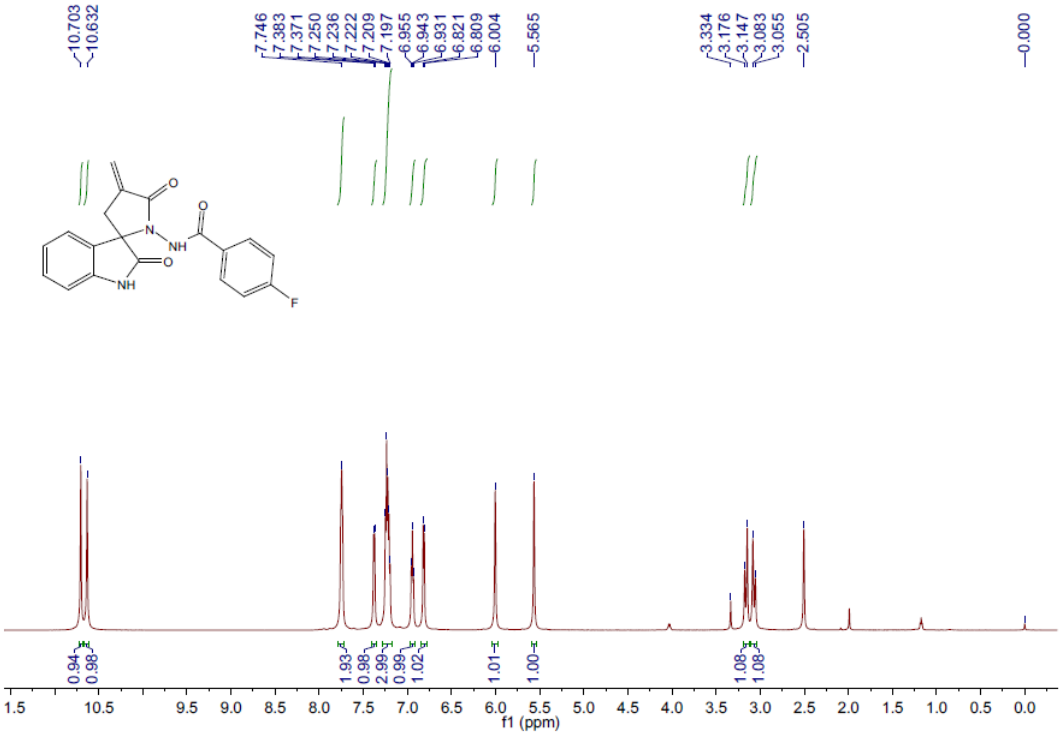


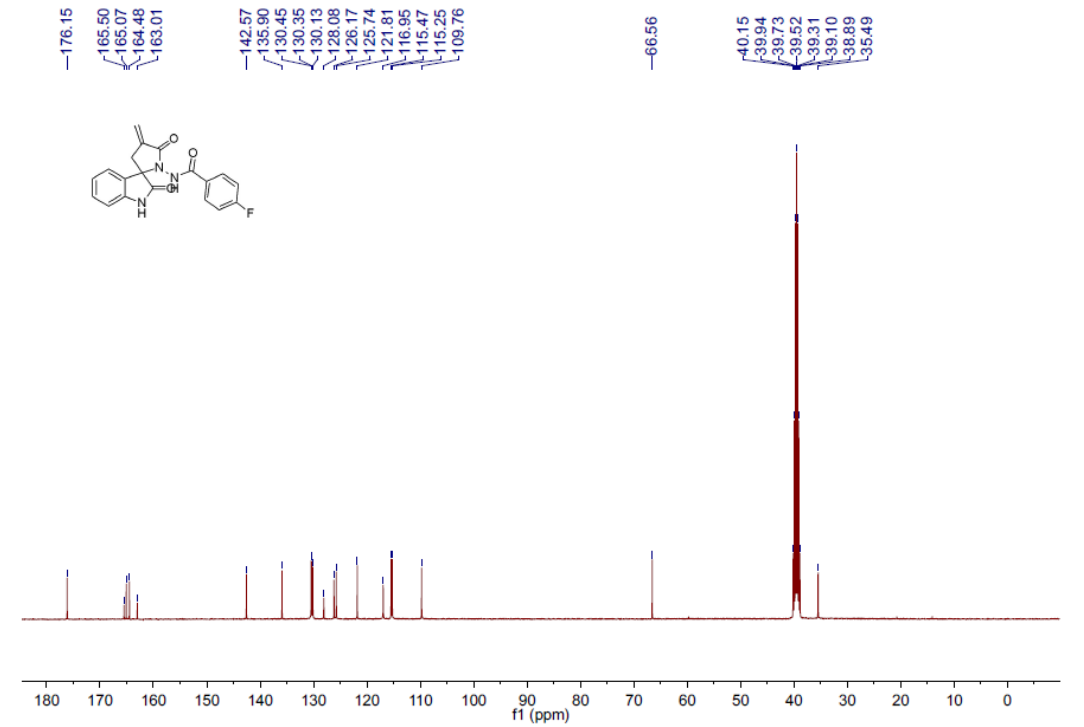

176.12
165.03
164.71
142.56
135.85
131.41
130.68
130.14
129.68
126.10
125.91
125.70
66.55
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.46
Br
O
O
HN–N
O
N
H
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)

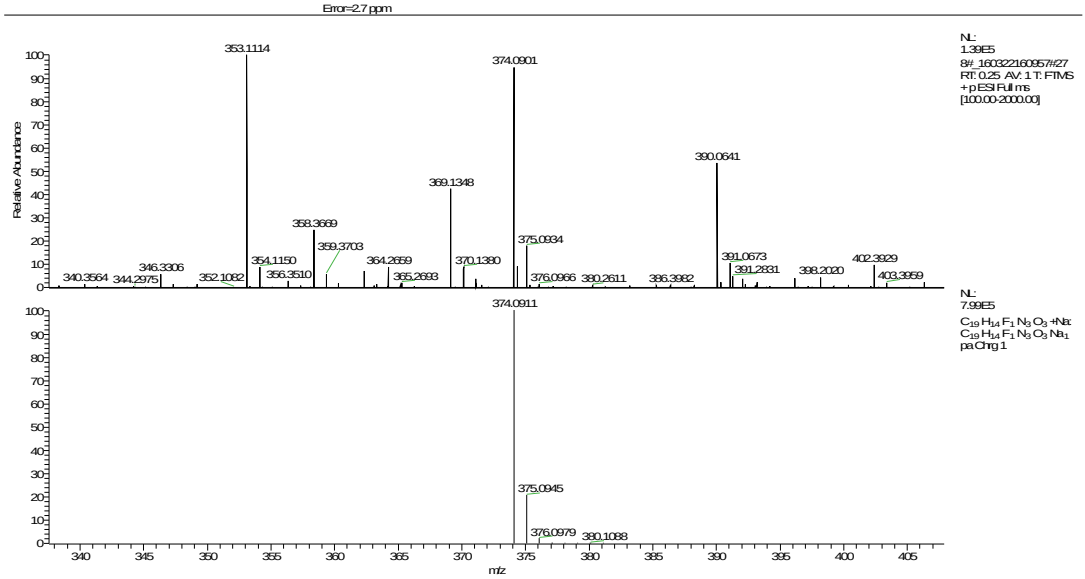

Relative Abundance
m/z
NL:
7.21E5
7#_160322160957#19
RT: 0.14 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
480.0517
482.0494
434.0099
436.0078
412.0281
414.0260
496.0254
498.0234
483.0527
507.3354
499.0268
451.9817
449.9837
458.0697
425.0104
437.0111
415.0291
410.2017
396.1865
402.3932
415.2002
429.0543
447.5346
461.0710
471.9658
478.3204
484.0557
500.0214
512.5022
517.3696
NL:
4.05E5
C19 H14 Br1 N3 O3 +H
C19 H15 Br1 N3 O3
pa Chrg 1
412.0291
414.0271
415.0304
416.0338
421.0456

4-Fluoro-N-(4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)benzamide(4l)

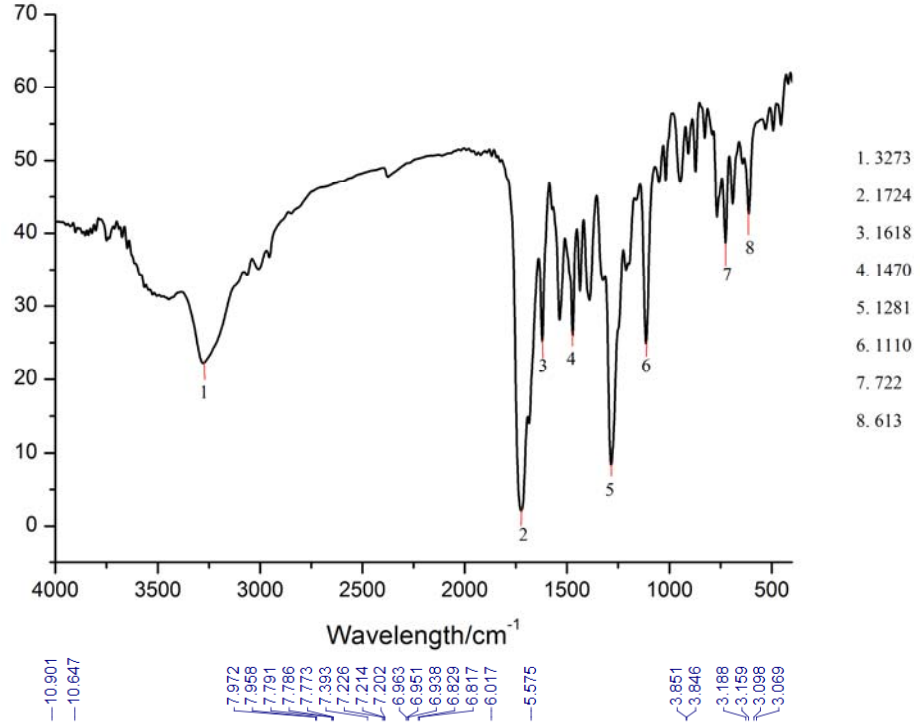


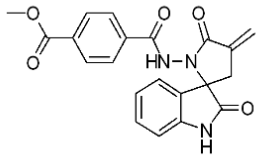


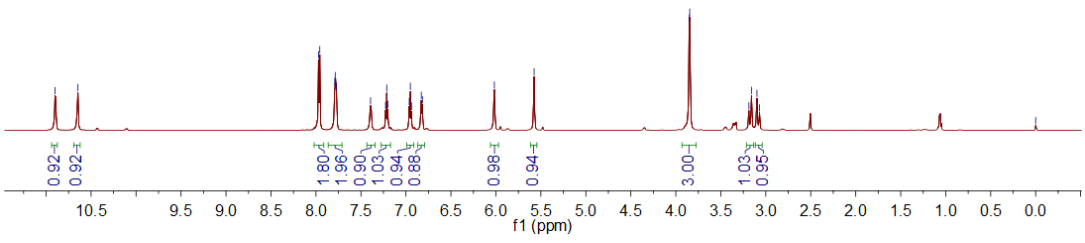

176.15
165.50
165.07
164.48
163.01
142.57
135.90
130.45
130.35
130.13
128.08
126.17
125.74
121.81
116.95
115.47
115.25
109.76
66.56
40.15
39.94
39.73
39.52
39.31
39.10
38.89
35.49
f1 (ppm)

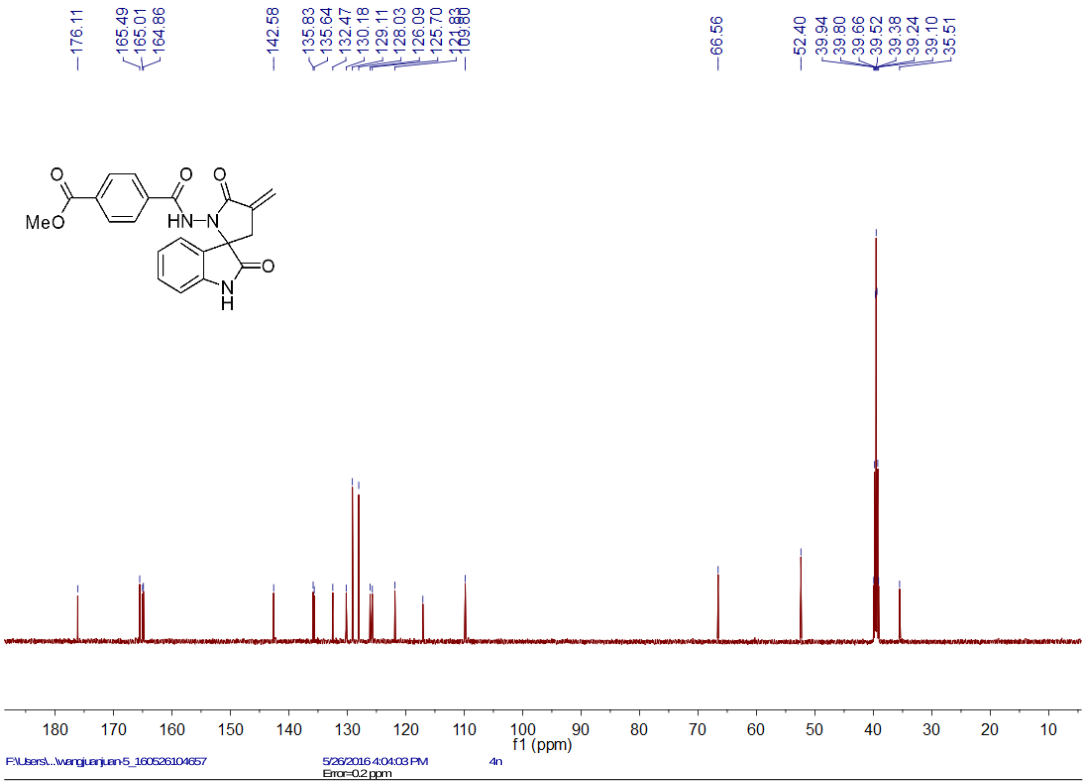

Error=2.7 ppm
Relative Abundance
353.1114
374.0901
390.0641
369.1348
358.3669
359.3703
375.0934
354.1150
356.3510
364.2659
365.2693
370.1380
376.0966
380.2611
386.3982
391.0673
391.2831
398.2020
402.3929
403.3959
340.3564
344.2975
346.3306
352.1082
NL:
1.39E5
8#_160322160957#27
RT: 0.25 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
374.0911
375.0945
376.0979
380.1088
NL:
7.99E5
C19 H14 F1 N3 O3 +Na
C19 H14 F1 N3 O3 Na1
pa Chrg 1
m/z

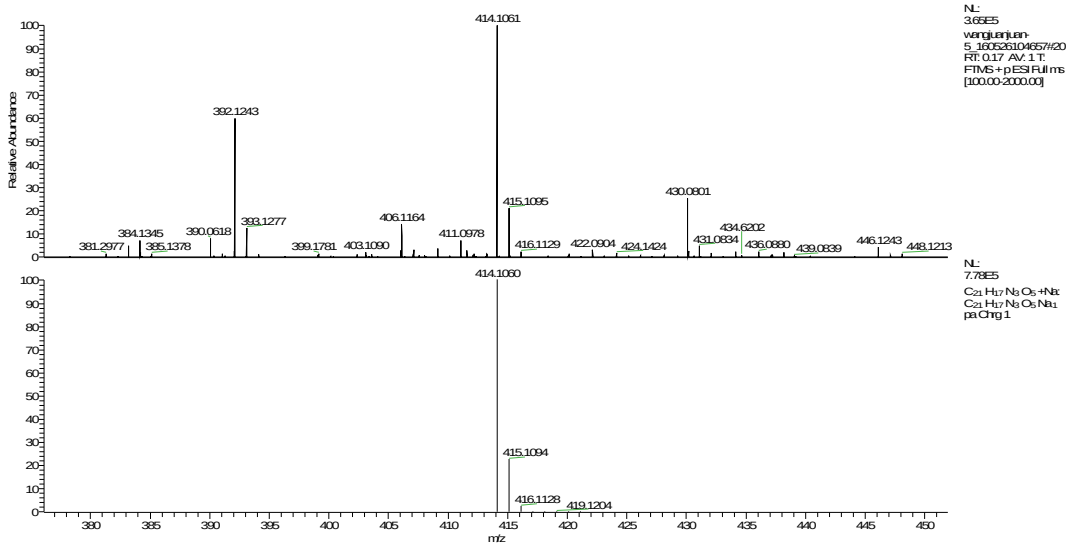
Methyl 4-((4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)carbamoyl)- benzoate(4n)



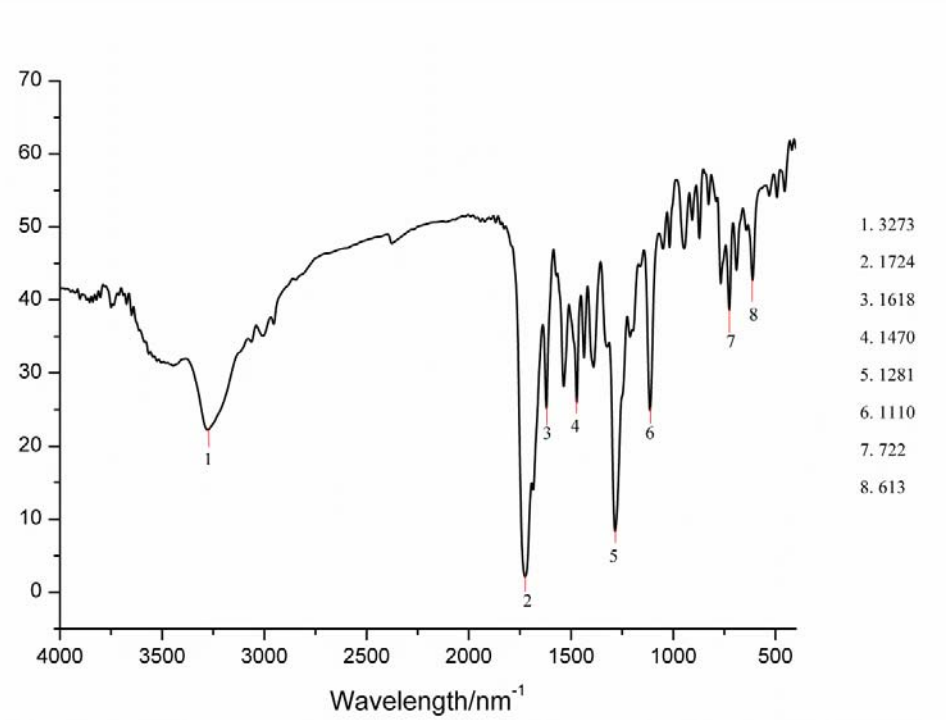


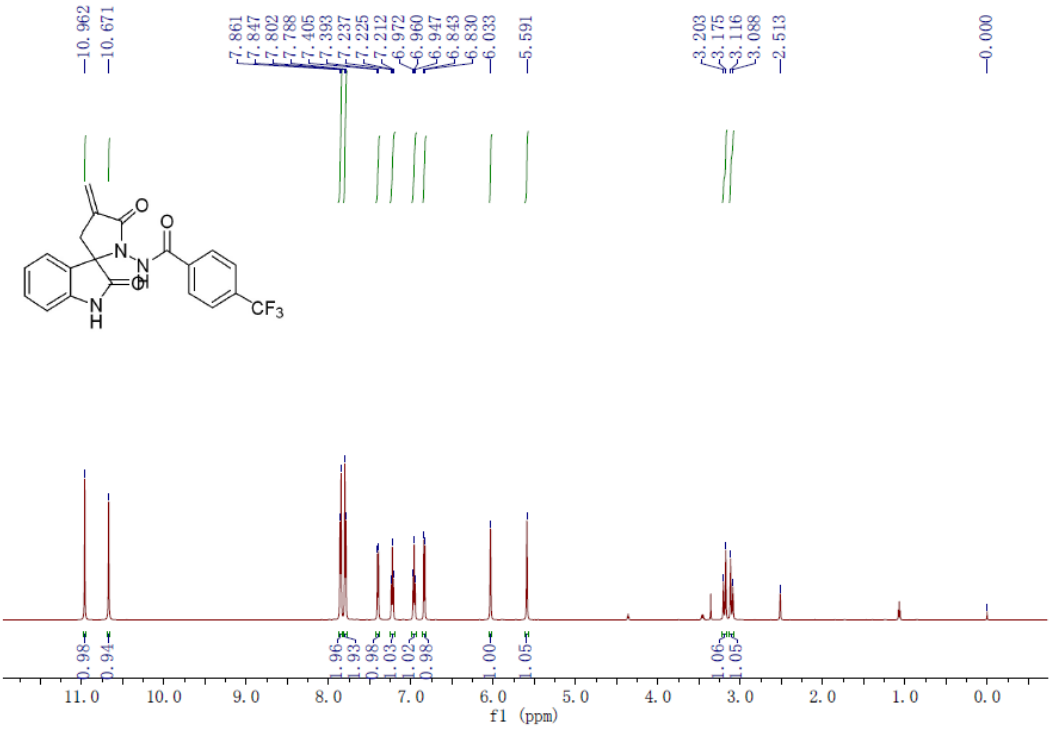


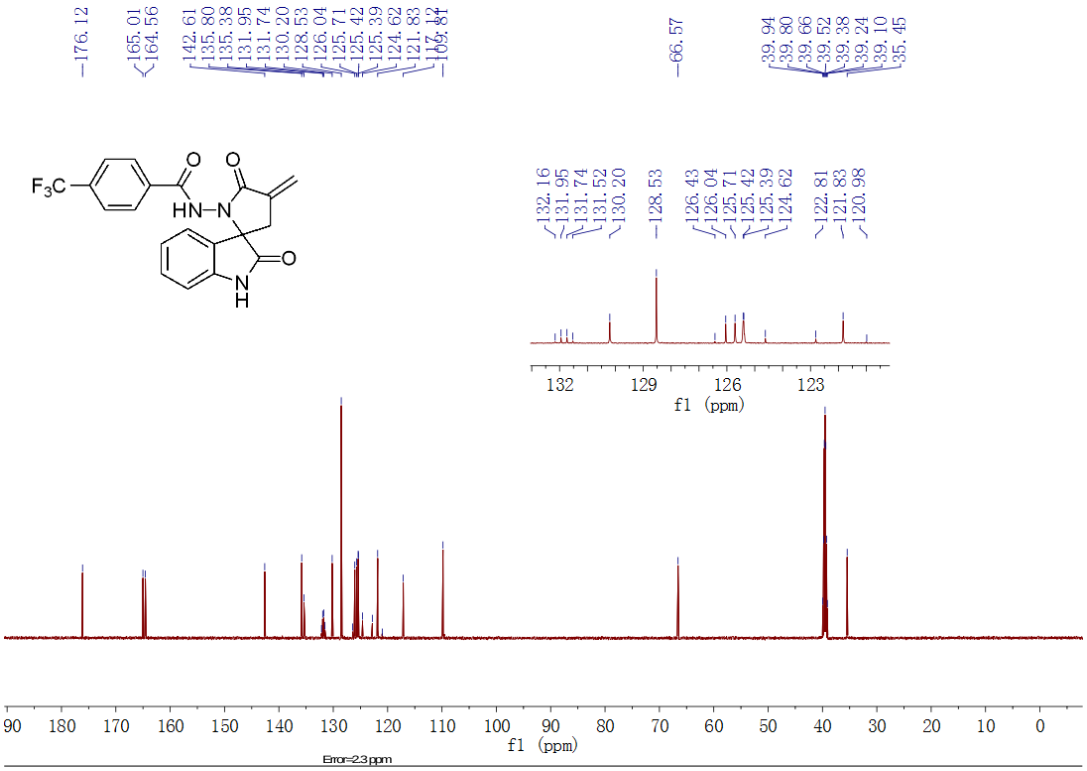

176.11
165.49
165.01
164.86
142.58
135.83
135.64
132.47
130.18
129.11
128.03
126.09
125.70
66.56
52.40
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.51
MeO
HN
N
H
f1 (ppm)
F:\Users\...\wangjuanjuan-5_160526104657
5/26/2016 4:04:03 PM
4n
Error=0.2 ppm

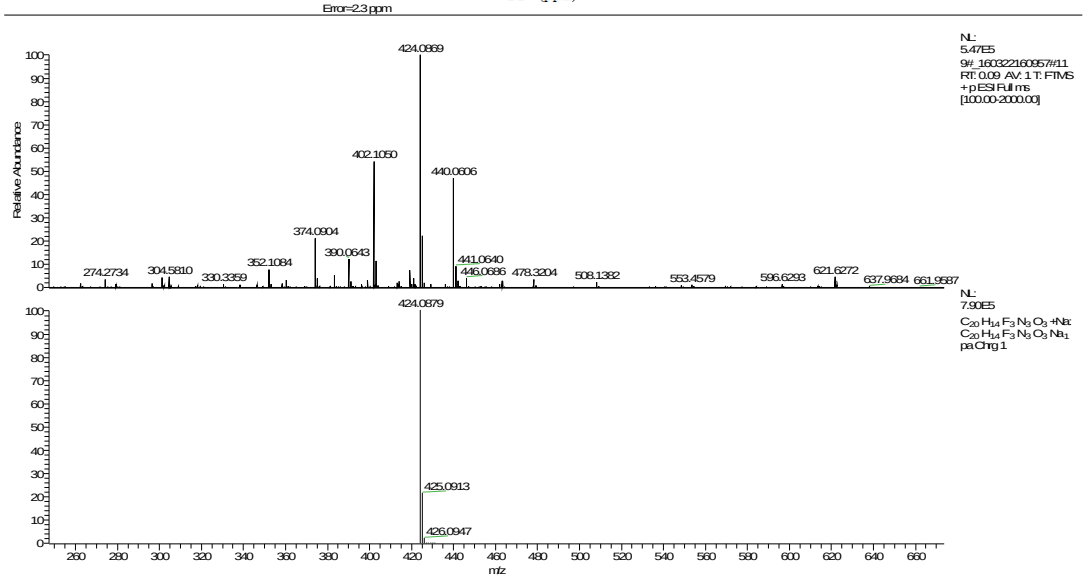

Relative Abundance
m/z
414.1061
392.1243
415.1095
430.0801
393.1277
406.1164
411.0978
434.6202
384.1345
390.0618
381.2977
395.1378
399.1781
403.1090
416.1129
422.0904
424.1424
431.0834
436.0880
439.0839
446.1243
448.1213
NL:
3.65E5
wangjuanjuan-5_160526104657#20 RT: 0.17 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
414.1060
415.1094
416.1128
419.1204
NL:
7.78E5
C21 H17 N3 O5 +Na
C21 H17 N3 O5 Na1
pa Chrg 1

N-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-4-(trifluoromethyl)benzamide(4o)

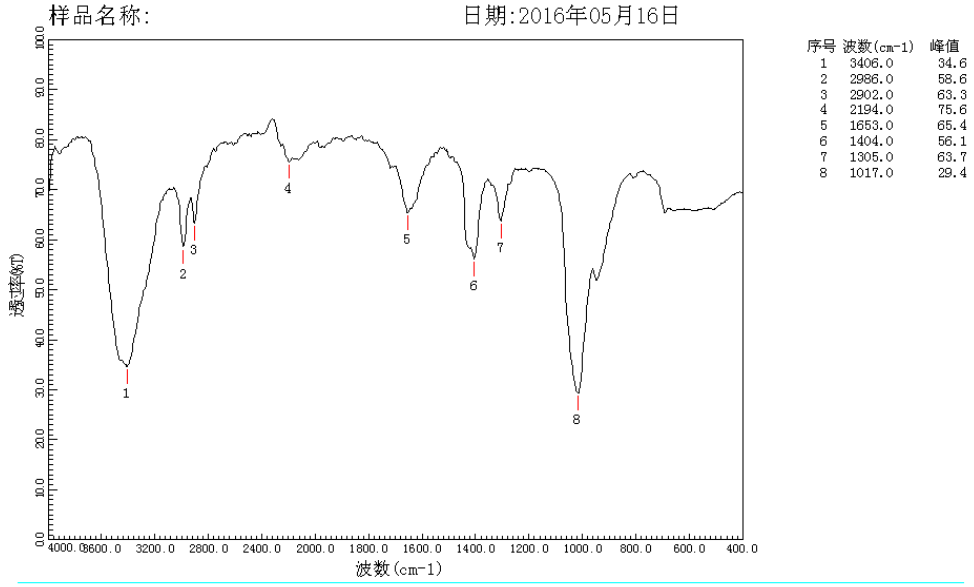


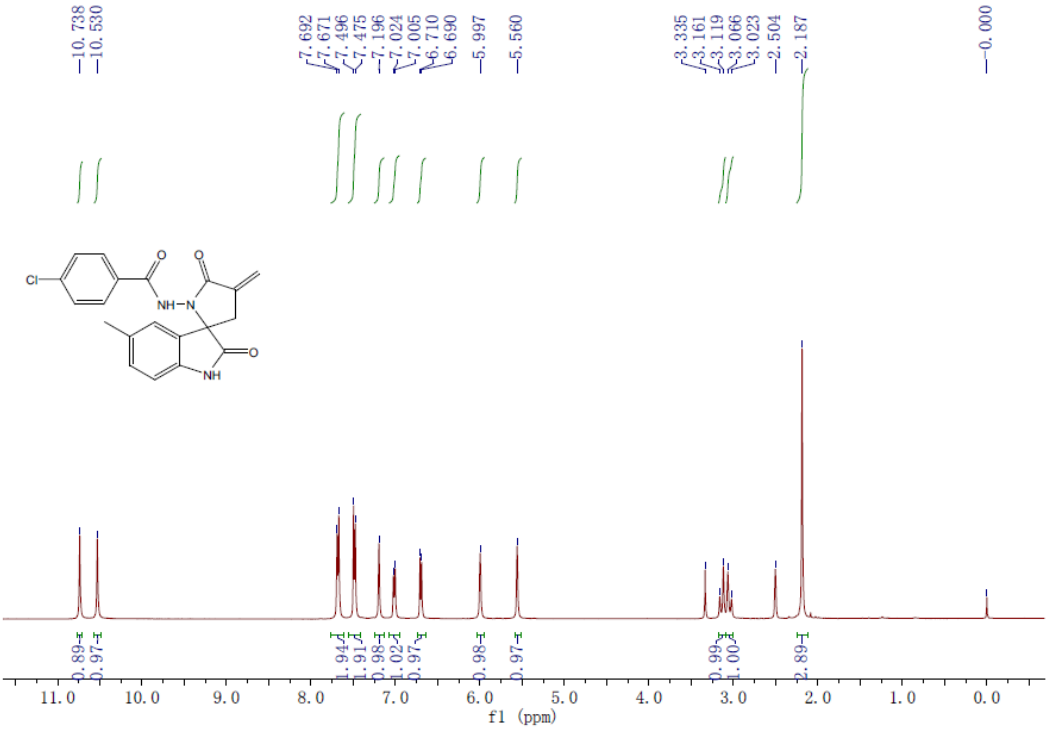


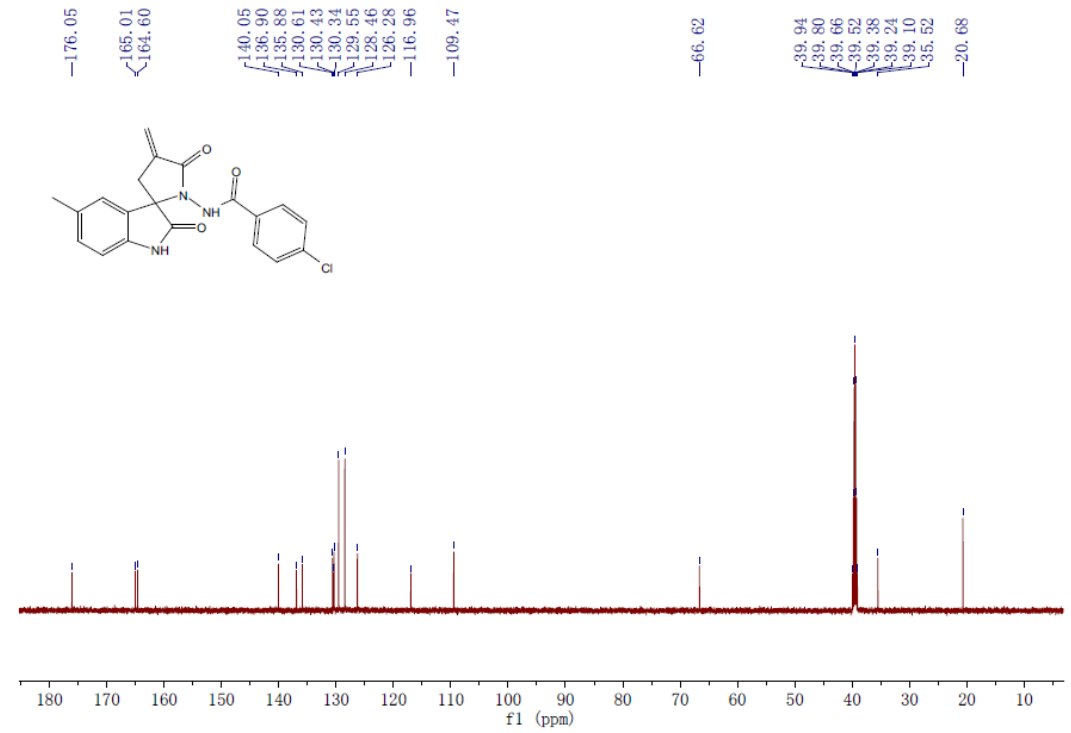

176.12
165.01
164.56
142.61
135.80
135.38
131.95
131.74
130.20
128.53
126.04
125.71
125.42
125.39
124.62
121.83
66.57
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.45
F3C
HN–N
O
O
O
N
H
132.16
131.95
131.74
131.52
130.20
128.53
126.43
126.04
125.71
125.42
125.39
124.62
122.81
121.83
120.98
132
129
126
123
f1 (ppm)
90
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

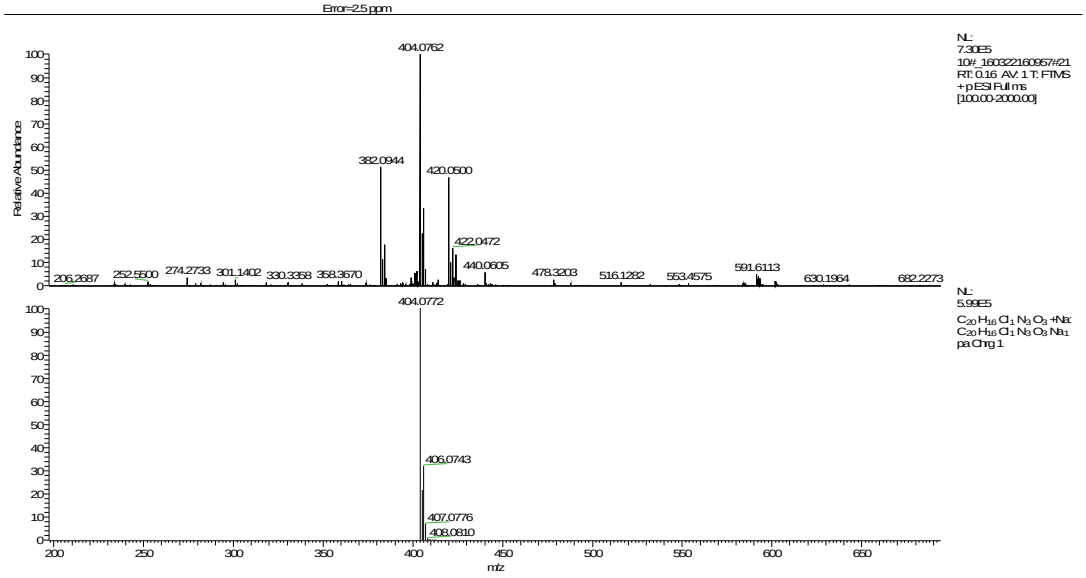

Error=2.3 ppm
424.0869
402.1050
440.0606
374.0904
390.0643
441.0640
446.0686
274.2734
304.5810
330.3359
352.1084
478.3204
508.1382
553.4579
596.6293
621.6272
637.9684
661.9687
Relative Abundance
NL:
5.47E5
9#_160322160957#11
RT: 0.09 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
424.0879
425.0913
426.0947
NL:
7.90E5
C20 H14 F3 N3 O3 +Na
C20 H14 F3 N3 O3 Na1
pa Chrg 1
m/z

4-Chloro-N-(5-methyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin] -1'-yl)-benzamide(4q)

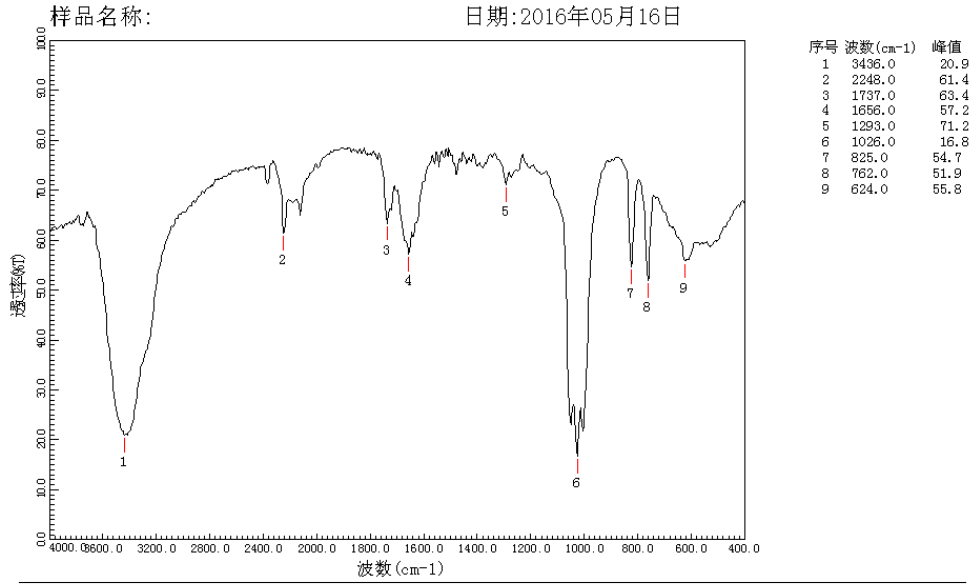


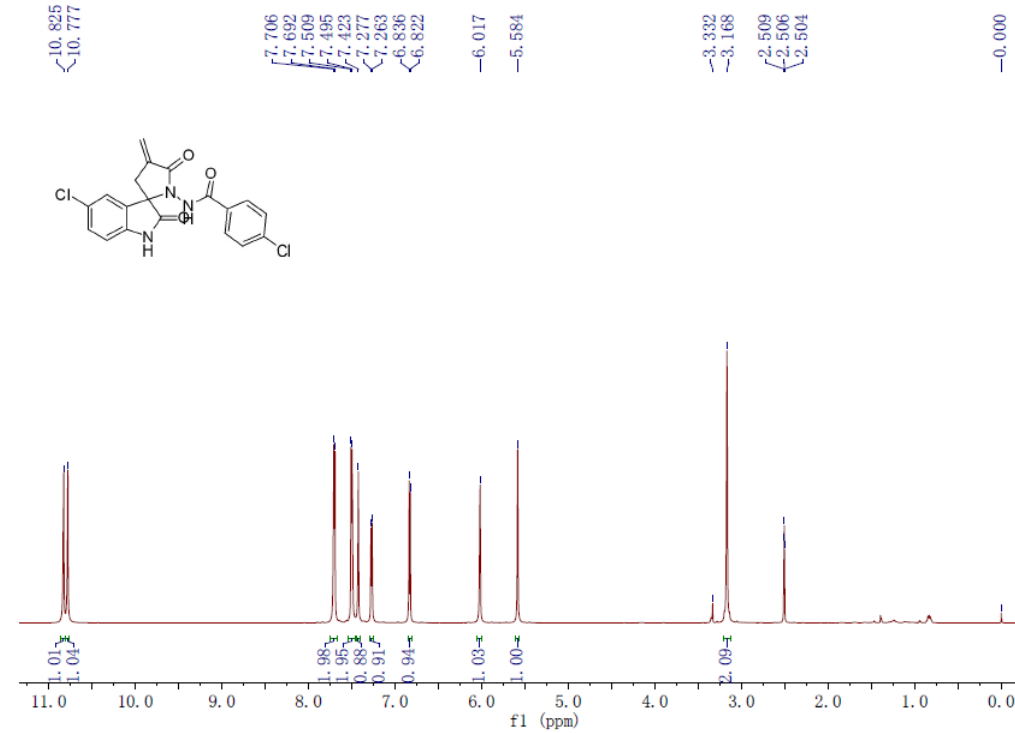


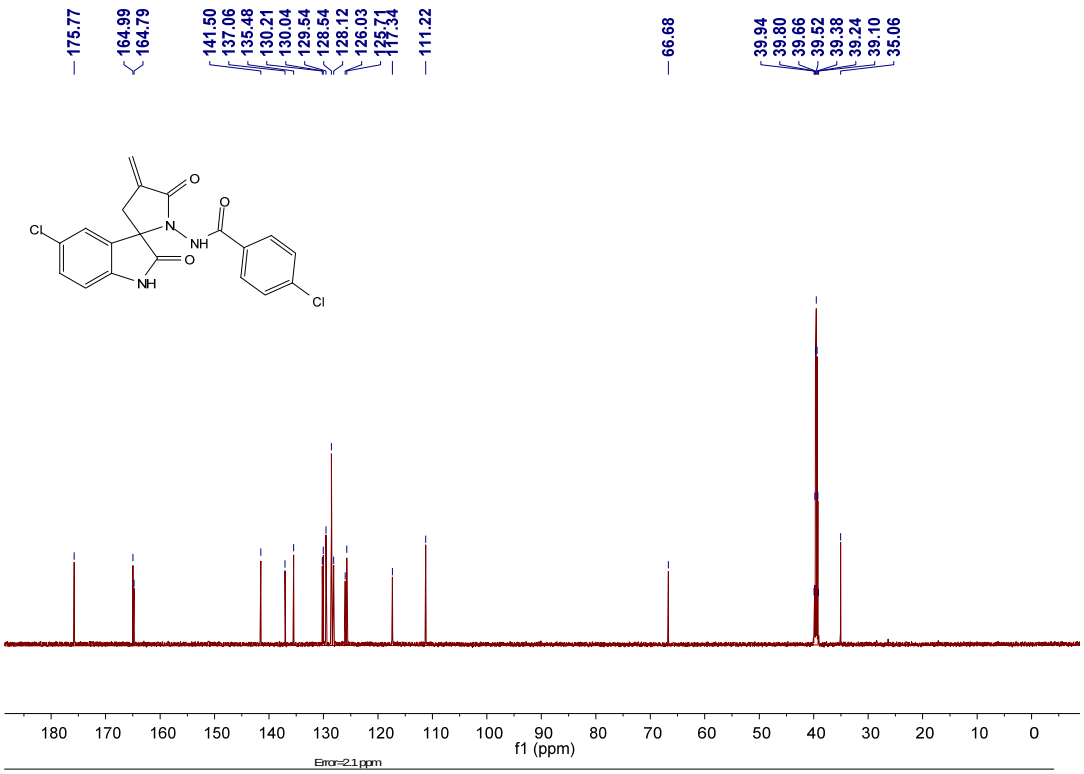

176.05
165.01
164.60
140.05
136.90
135.88
130.61
130.43
130.34
129.55
128.46
126.28
116.96
109.47
66.62
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.52
20.68
O
O
N
NH
O
NH
Cl
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

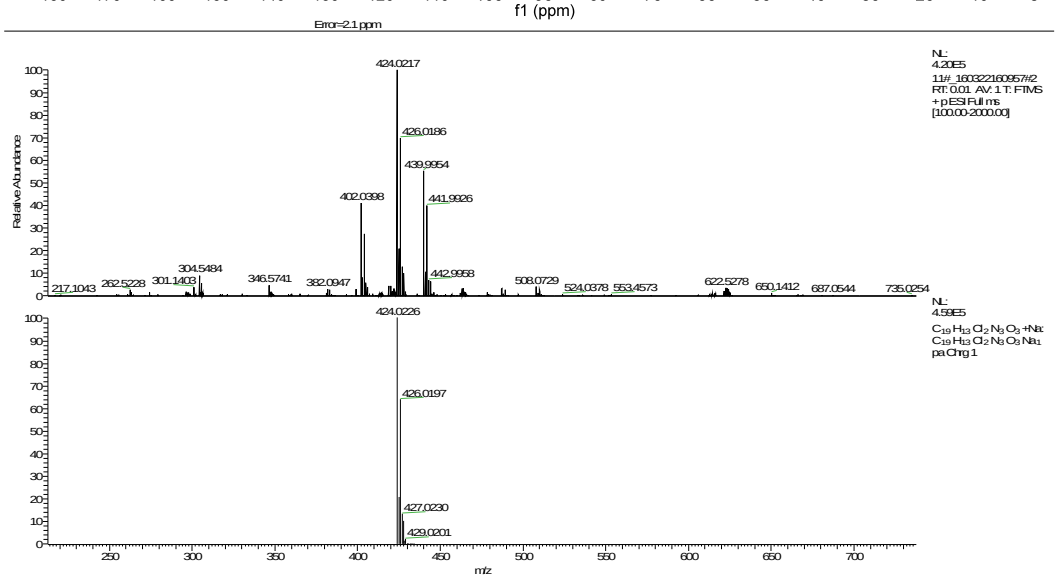

Error=2.5 ppm
Relative Abundance
404.0762
382.0944
420.0500
422.0472
440.0605
206.2687
252.5500
274.2733
301.1402
330.3358
358.3670
478.3203
516.1282
553.4575
591.6113
630.1964
682.2273
NL:
7.30E5
10#_1603221609 57#21
RT: 0.16 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
404.0772
406.0743
407.0776
408.0810
NL:
5.99E5
C20 H16 Cl1 N3 O3 +Na
C20 H16 Cl1 N3 O3 Na1
pa Chrg 1
m/z

4-Chloro-N-(5-chloro-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -benzamide(4r)

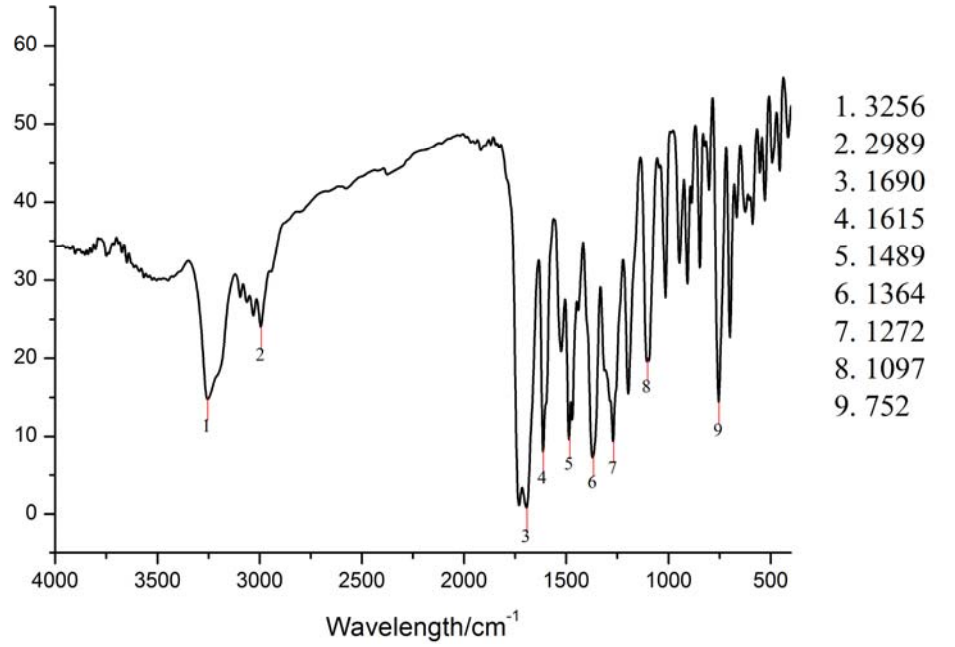


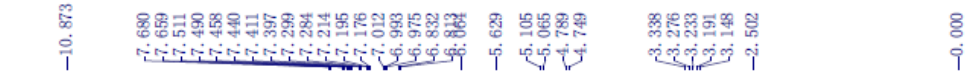


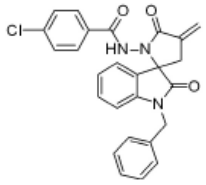

175.77
164.99
164.79
141.50
137.06
135.48
130.21
130.04
129.54
128.54
128.12
126.03
125.71
117.34
111.22
66.68
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.06
Cl
O
N
NH
O
NH
O
Cl
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)

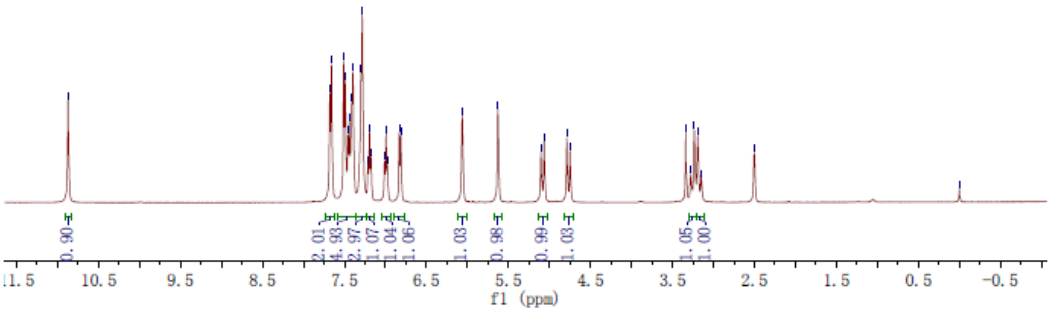

Error=2.1 ppm
Relative Abundance
424.0217
426.0186
439.9954
441.9926
402.0398
442.9958
304.5484
217.1043
262.5228
301.1403
346.5741
382.0947
508.0729
524.0378
553.4573
622.5278
650.1412
687.0544
735.0254
NL:
4.20E5
11#_160222160957#2
RT: 0.01 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
424.0226
426.0197
427.0230
429.0201
NL:
4.59E5
C19 H13 Cl2 N3 O3 +Na
C19 H13 Cl2 N3 O3 Na1
pa Chrg 1
250 300 350 400 450 500 550 600 650 700
m/z

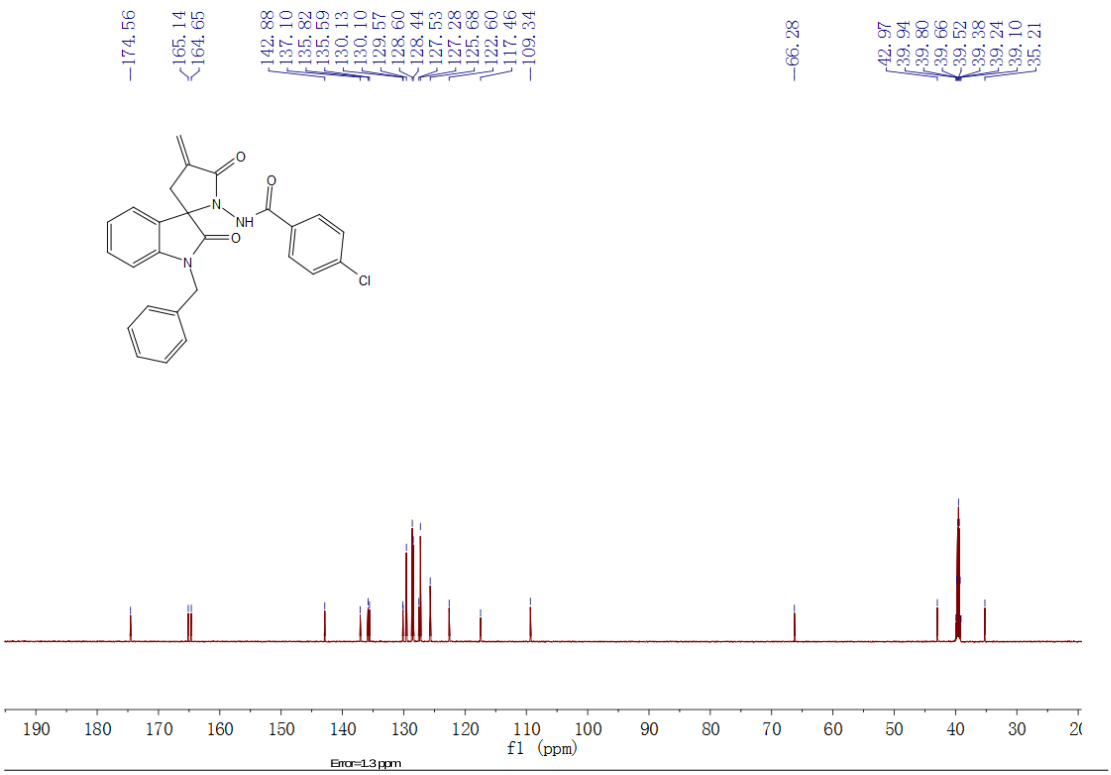
N-(1-Benzyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -4-chlorobenzamide(4s)

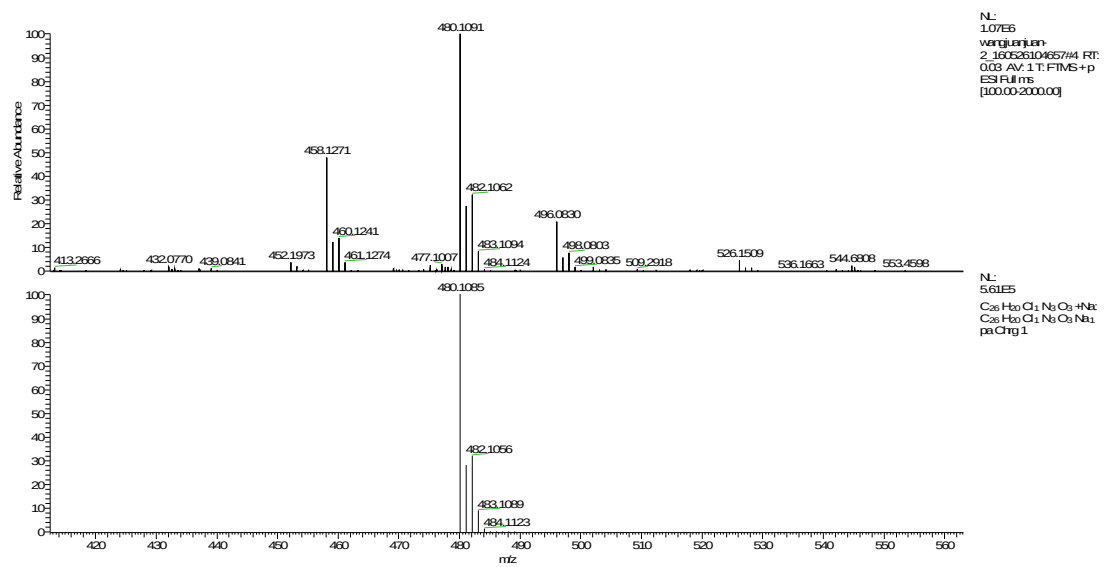




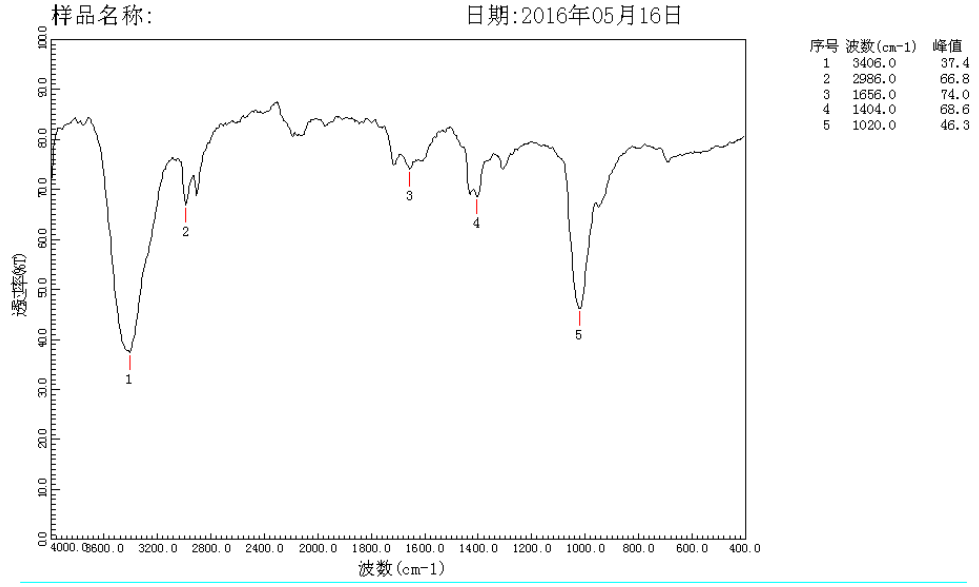


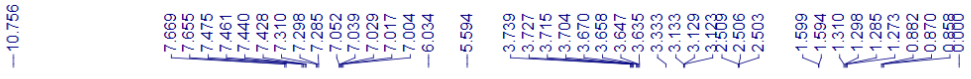


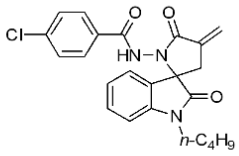

174.56
165.14
164.65
142.88
137.10
135.82
135.59
130.13
130.10
129.57
128.60
128.44
127.53
127.28
125.68
122.60
117.46
109.34
66.28
42.97
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.21
O
O
N
NH
O
N
Cl
f1 (ppm)

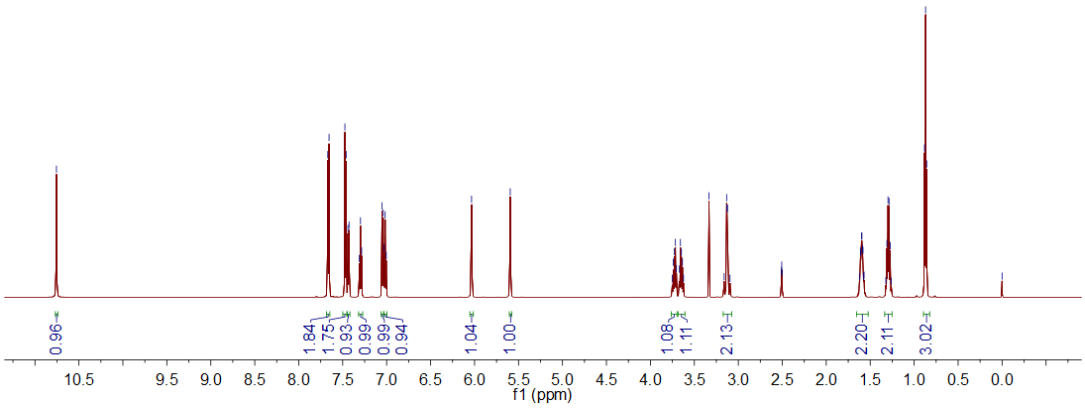

Error=1.3 ppm
480.1091
458.1271
482.1062
496.0830
460.1241
483.1094
498.0803
413.2666
432.0770
439.0841
452.1973
461.1274
477.1007
484.1124
499.0835
509.2918
526.1509
536.1663
544.6808
553.4598
Relative Abundance
m/z
480.1085
482.1056
483.1089
484.1123

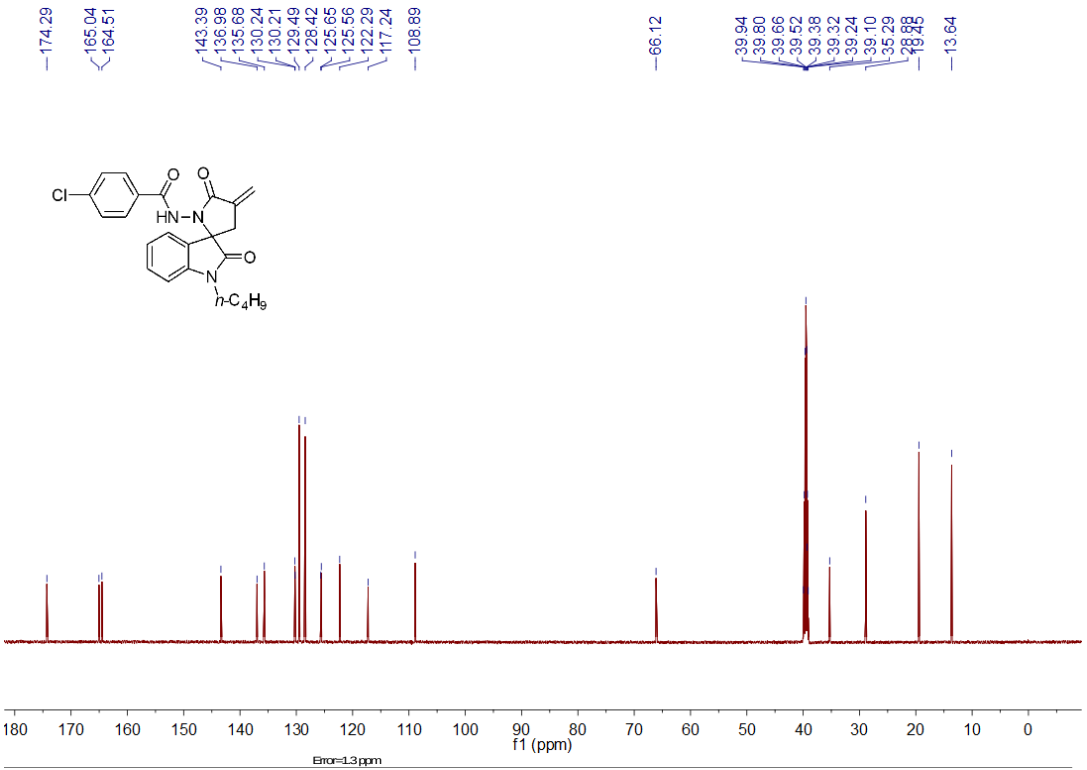
N-(1-Butyl-4'-methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl) -4-chlorobenzamide(4t)

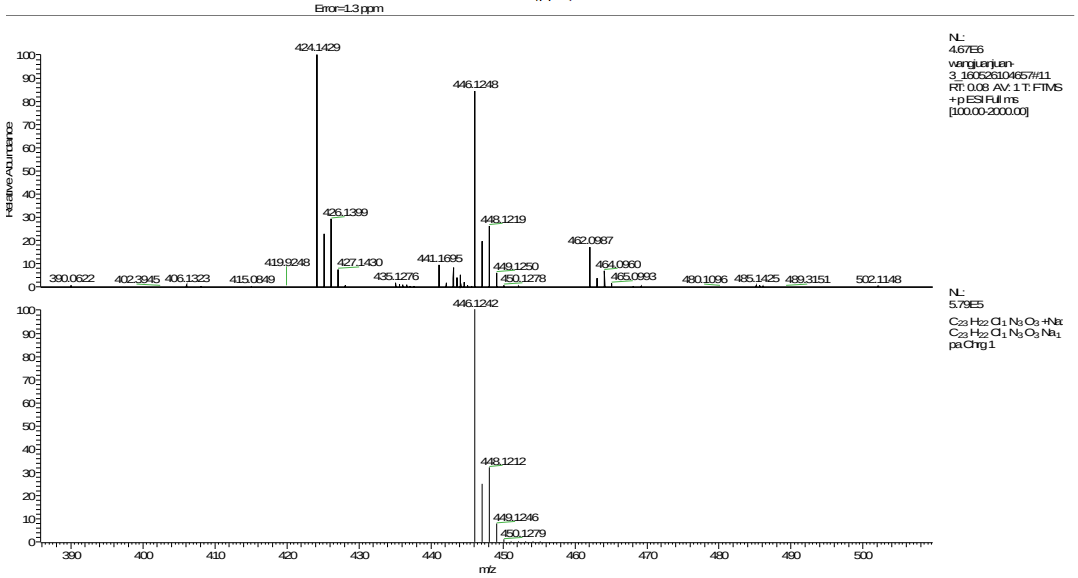




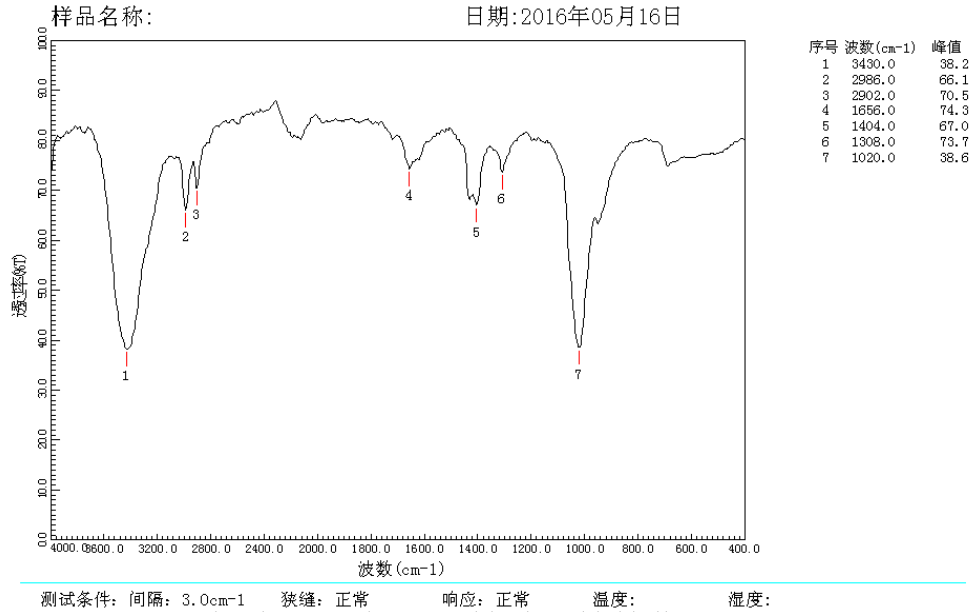


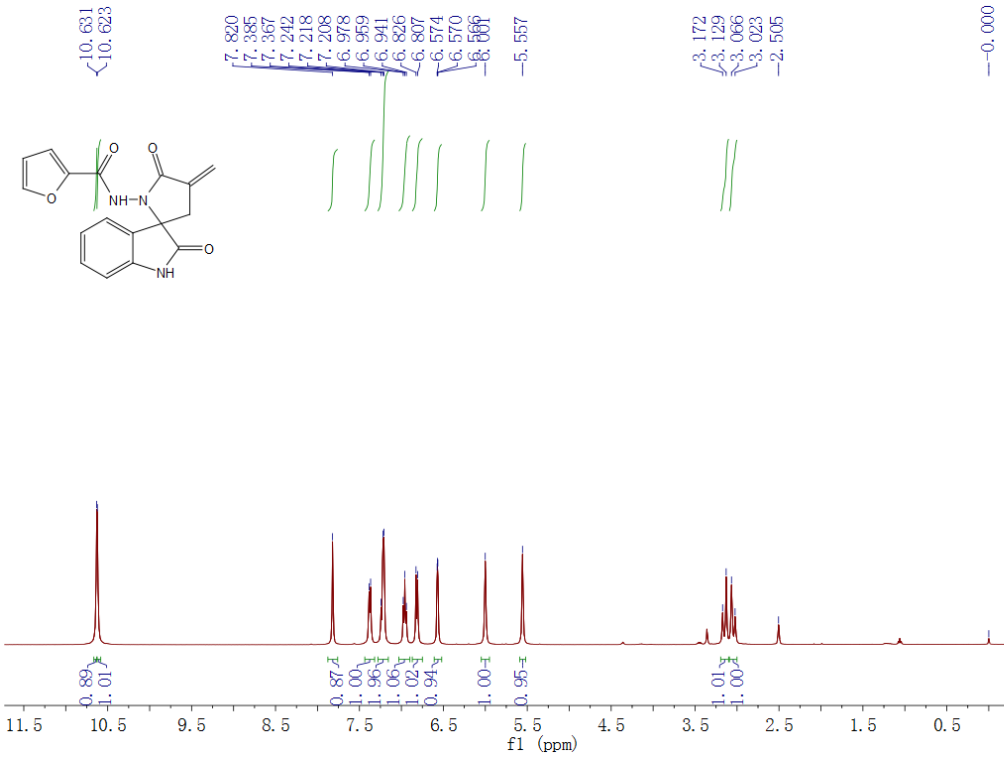


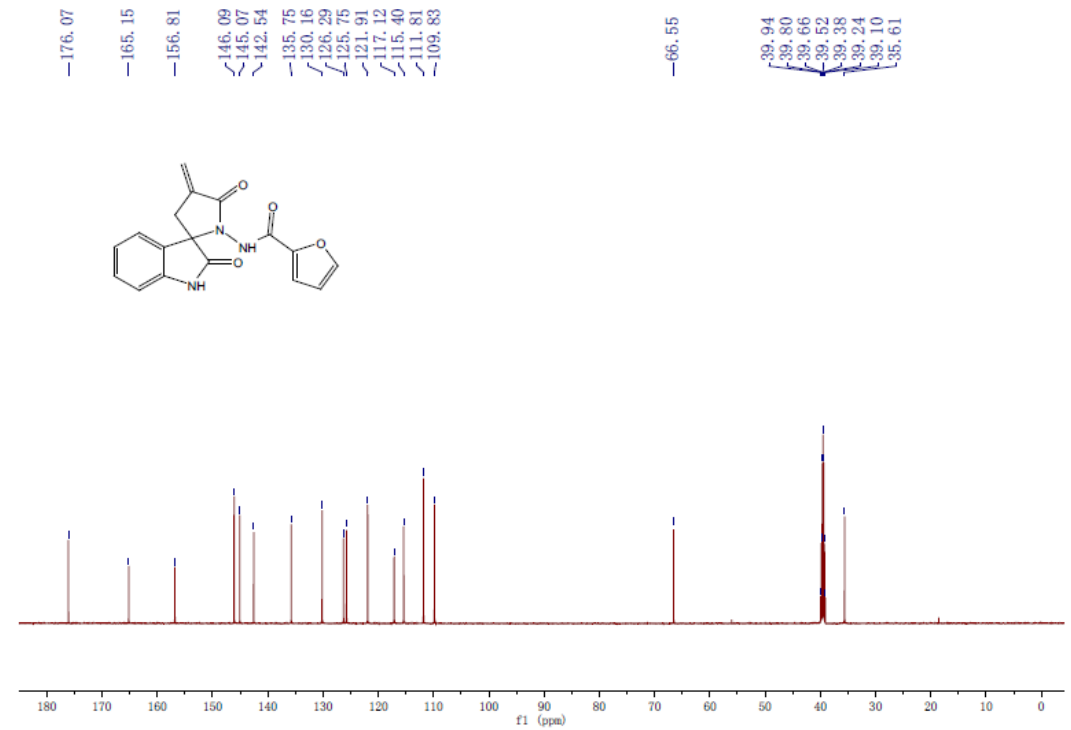

174.29
165.04
164.51
143.39
136.98
135.68
130.24
130.21
129.49
128.42
125.65
125.56
122.29
117.24
108.89
66.12
39.94
39.80
39.66
39.52
39.38
39.32
39.24
39.10
35.29
28.88
19.45
13.64
Cl
HN
N
O
O
O
N
n-C4H9
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

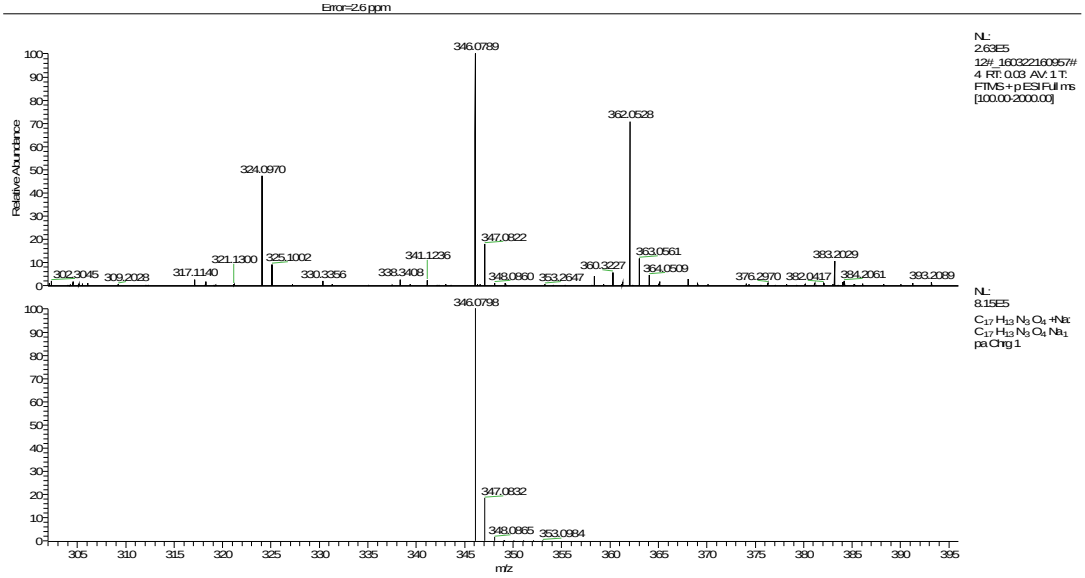

Error=1.3 ppm
424.1429
446.1248
426.1399
448.1219
462.0987
419.9248
427.1430
441.1695
449.1250
464.0960
390.0622
402.3945
406.1323
415.0849
435.1276
450.1278
465.0993
480.1096
485.1425
489.3151
502.1148
Relative Abundance
NL:
4.67E6
wangjuanjuan-3_160526104657#11
RT: 0.08 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
446.1242
448.1212
449.1246
450.1279
NL:
5.79E5
C23 H22 Cl1 N3 O3 +Na
C23 H22 Cl1 N3 O3 Na1
pa Chrg 1
390
400
410
420
430
440
450
460
470
480
490
500
m/z

N-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)furan -2-carboxamide(4u)

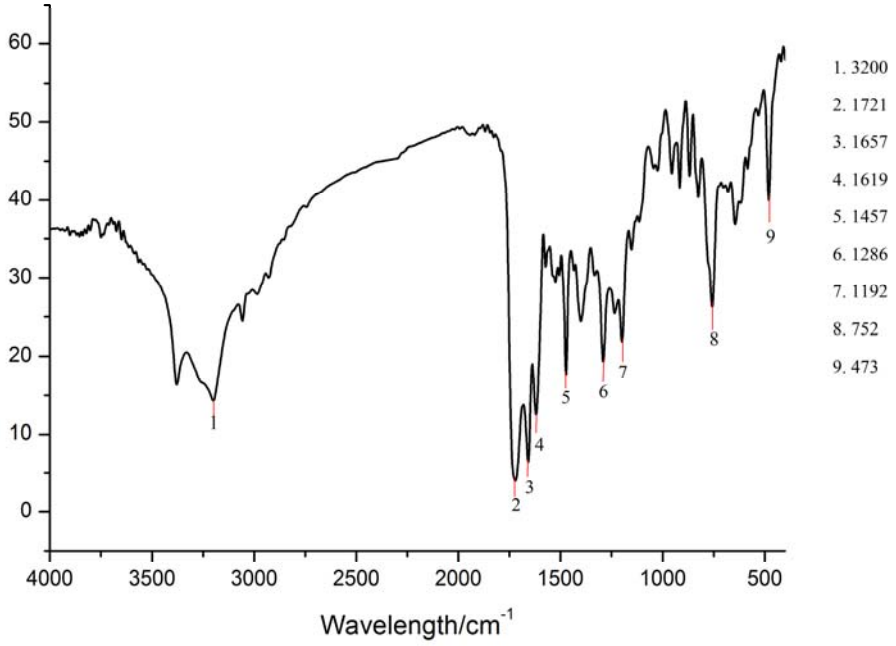


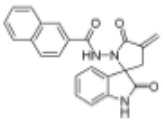


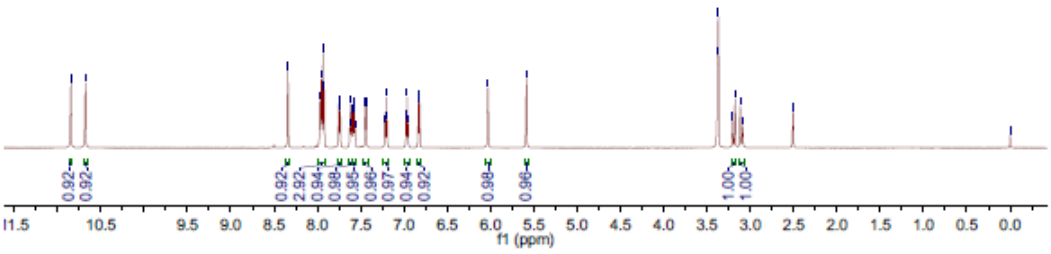

176.07
165.15
156.81
146.09
145.07
142.54
135.75
130.16
126.29
125.75
121.91
117.12
115.40
111.81
109.83
66.55
39.94
39.80
39.66
39.52
39.38
39.24
39.10
35.61
O
N
NH
O
O
NH
O
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)

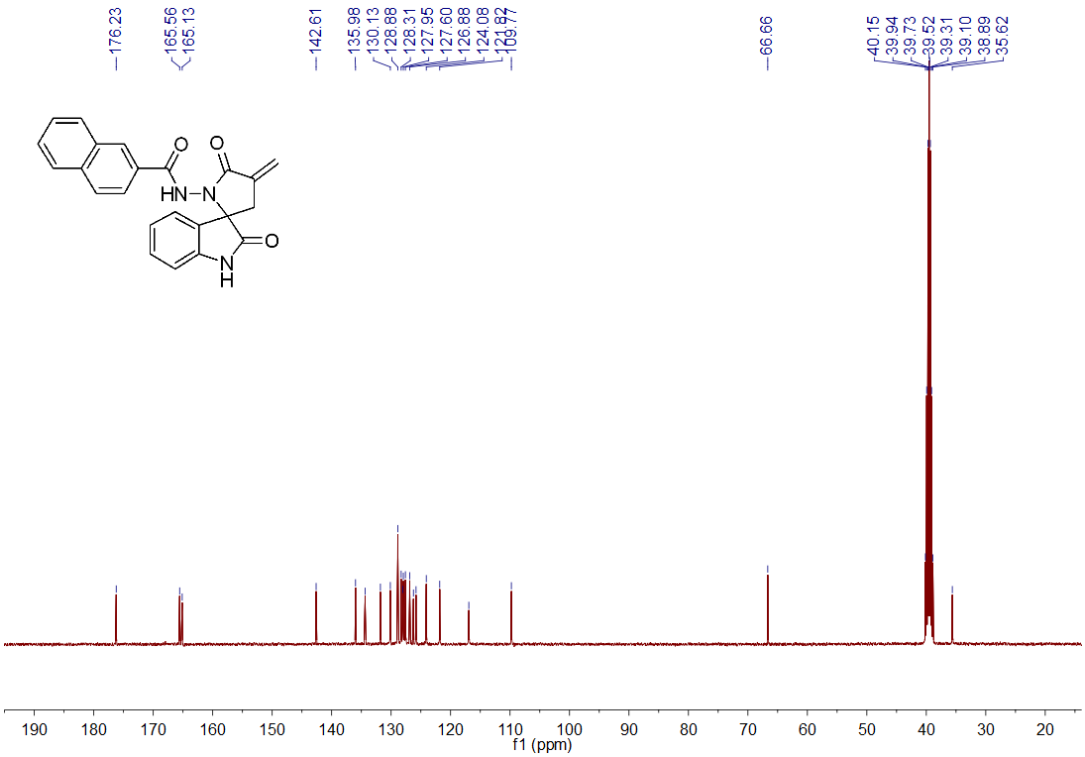

Error=2.6 ppm
Relative Abundance
346.0789
362.0528
324.0970
347.0822
321.1300
325.1002
341.1236
363.0561
360.3227
364.0509
383.2029
302.3045
309.2028
317.1140
330.3356
338.3408
348.0860
353.2647
376.2970
382.0417
384.2061
393.2089
NL:
2.63E5
12#_1603221609574#
4 RT: 0.03 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
346.0798
347.0832
348.0865
353.0984
NL:
8.15E5
C17 H13 N3 O4 +Na
C17 H13 N3 O4 Na1
pa Chrg 1
m/z

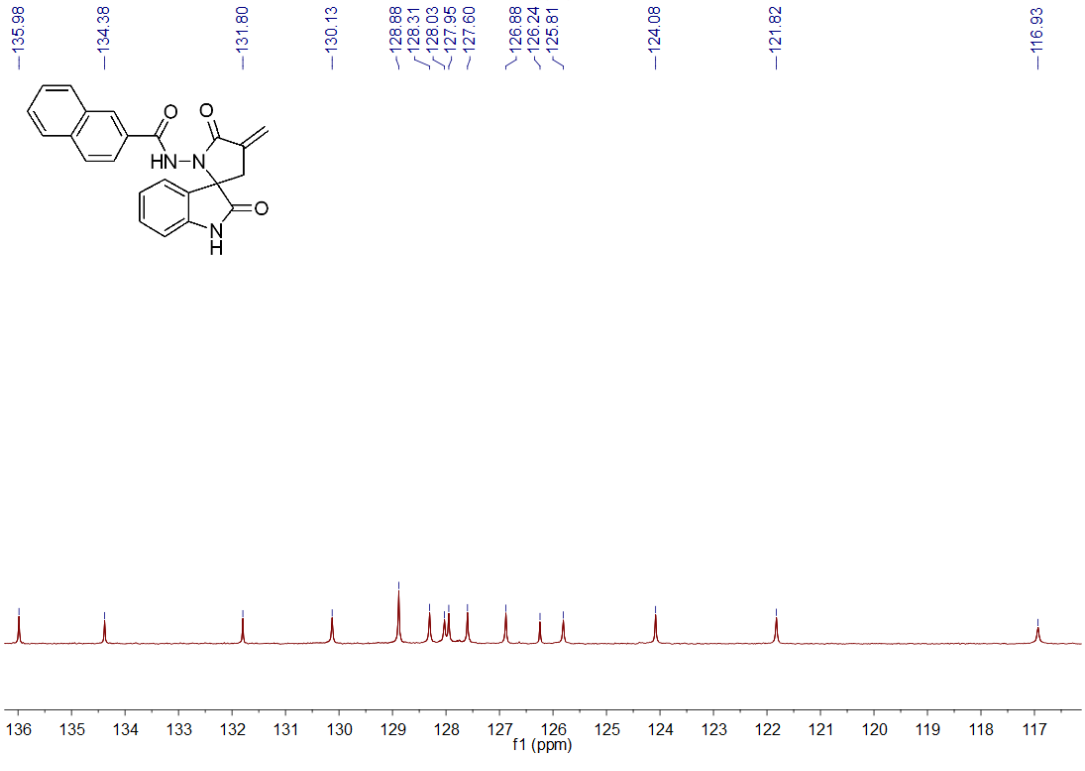
N-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)-2-naphthamide (4v)

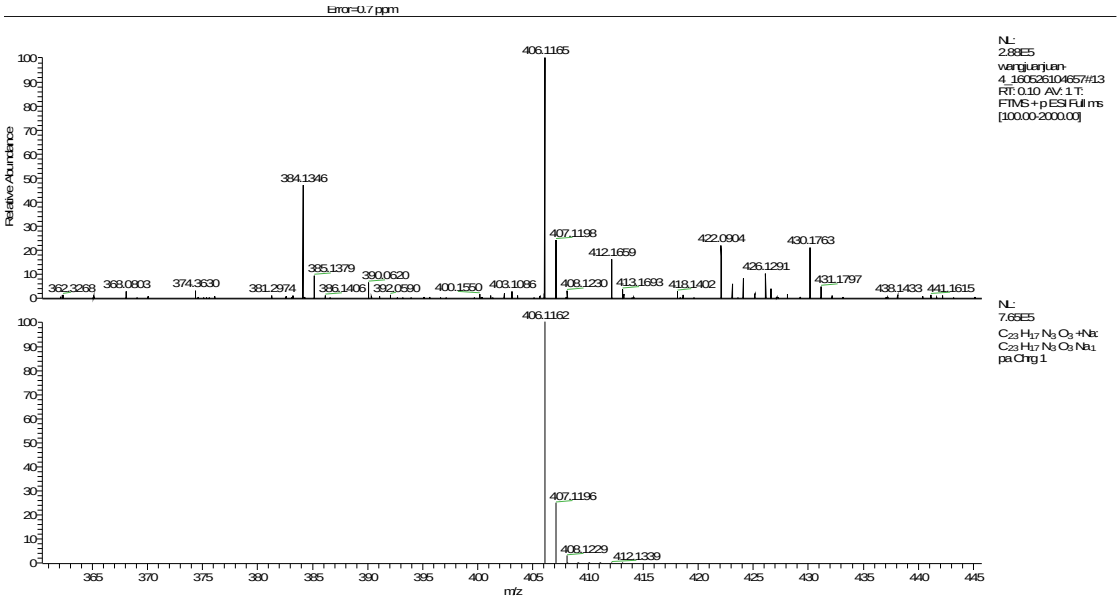




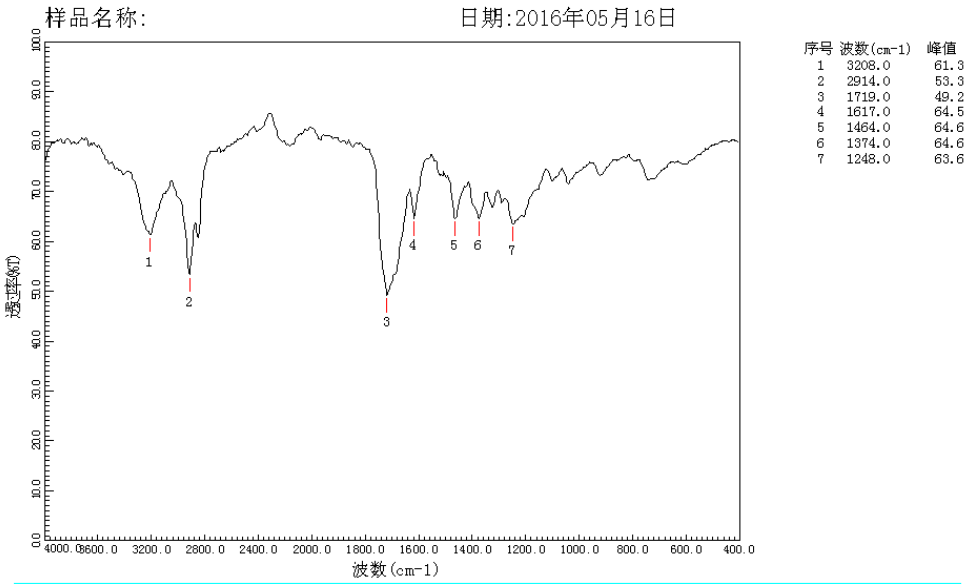


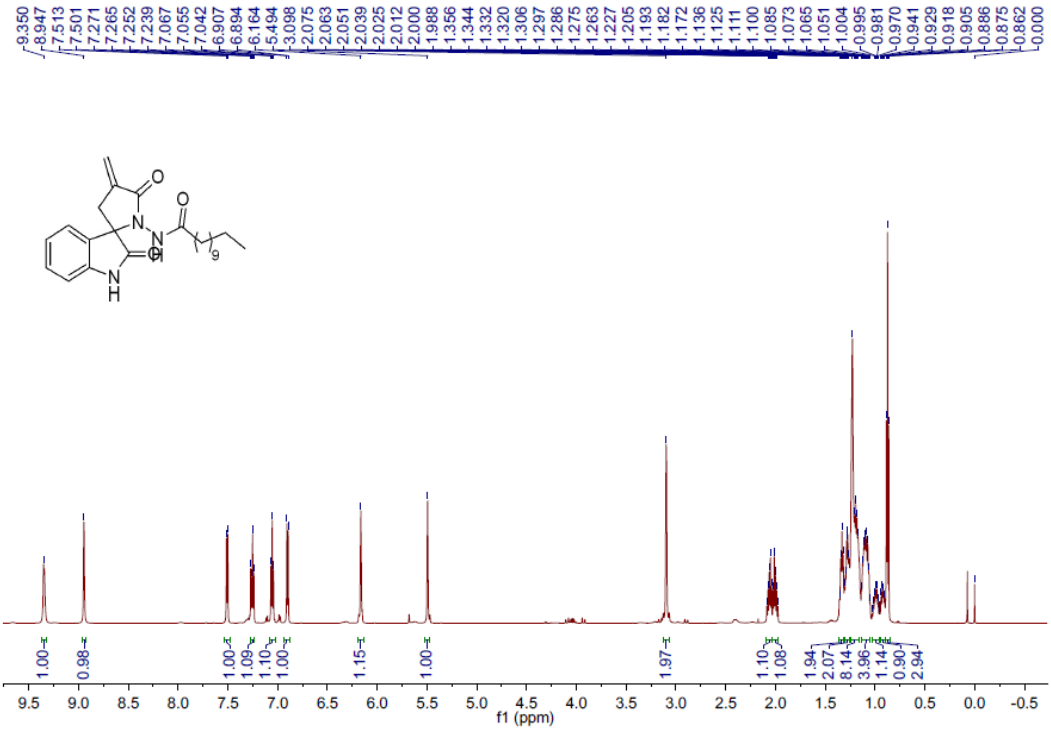

176.23
165.56
165.13
142.61
135.98
130.13
128.88
128.31
127.95
127.60
126.88
124.08
121.82
109.77
66.66
40.15
39.94
39.73
39.52
39.31
39.10
38.89
35.62
HN–N
O
O
O
N
H
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20
f1 (ppm)

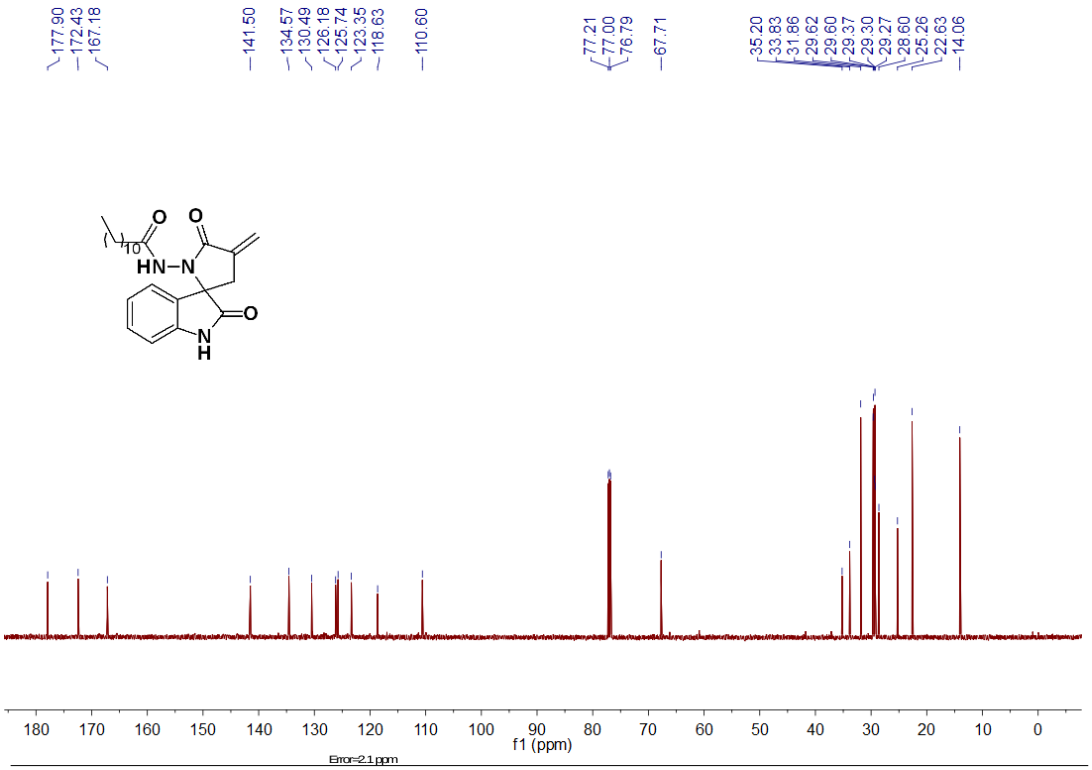

135.98
134.38
131.80
130.13
128.88
128.31
128.03
127.95
127.60
126.88
126.24
125.81
124.08
121.82
116.93
HN–N
O
O
O
N
H
136 135 134 133 132 131 130 129 128 127 126 125 124 123 122 121 120 119 118 117
f1 (ppm)

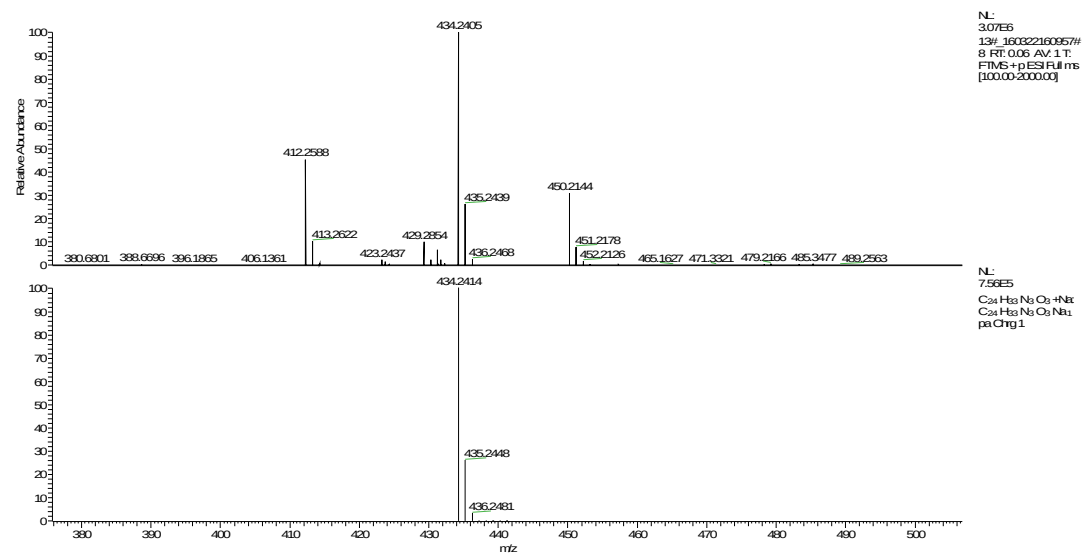

Error=0.7 ppm
Relative Abundance
m/z
406.1165
384.1346
407.1198
412.1659
422.0904
430.1763
426.1291
385.1379
390.0620
431.1797
362.3268
368.0803
374.3630
381.2974
396.1406
392.0590
400.1550
403.1086
408.1230
413.1693
418.1402
438.1433
441.1615
NL:
2.88E5
wangjuanjuan-4_160526104657#13 RT: 0.10 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
406.1162
407.1196
408.1229
412.1339
NL:
7.65E5
C23 H17 N3 O3 +Na
C23 H17 N3 O3 Na1
pa Chrg 1

N-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)dodecanamide (4w)

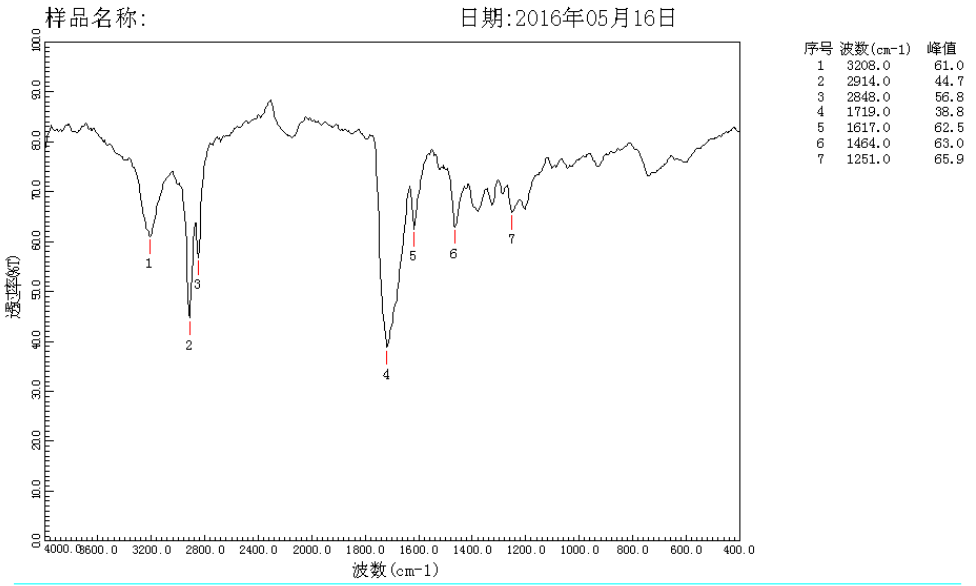


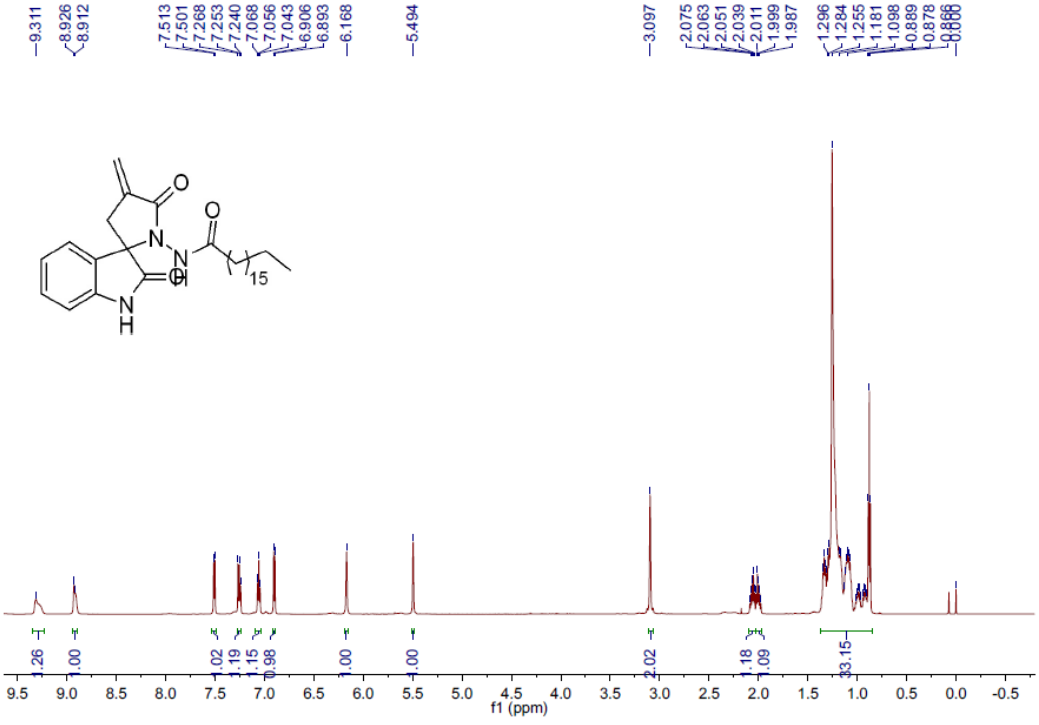


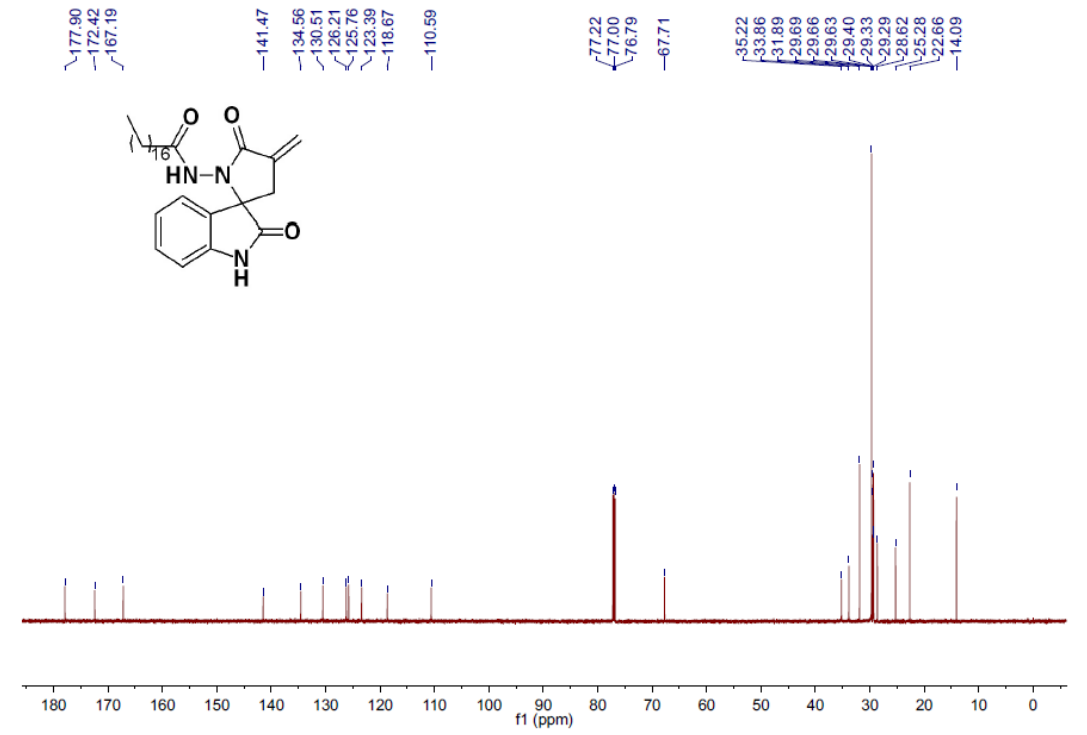

177.90
172.43
167.18
141.50
134.57
130.49
126.18
125.74
123.35
118.63
110.60
77.21
77.00
76.79
67.71
35.20
33.83
31.86
29.62
29.60
29.37
29.30
29.27
28.60
25.26
22.63
14.06
HN–N
O
O
O
N
H
f1 (ppm)

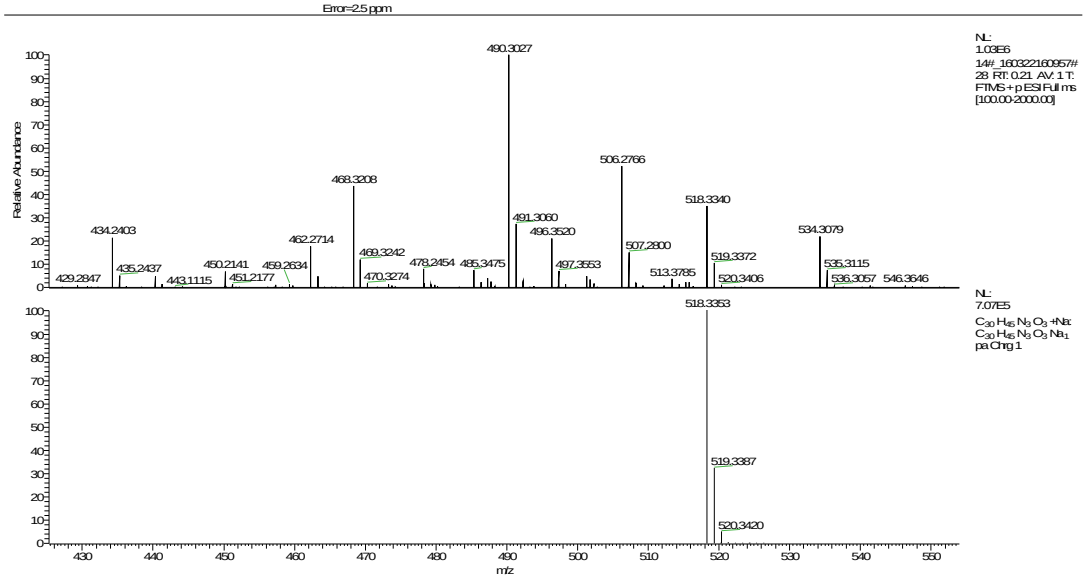

Error=2.1 ppm
Relative Abundance
m/z
434.2405
412.2588
435.2439
450.2144
413.2622
429.2854
451.2178
436.2468
452.2126
434.2414
435.2448
436.2481
NL:
3.07E6
NL:
7.56E5

N-(4'-Methylene-2,5'-dioxospiro[indoline-3,2'-pyrrolidin]-1'-yl)stearamide (4x)

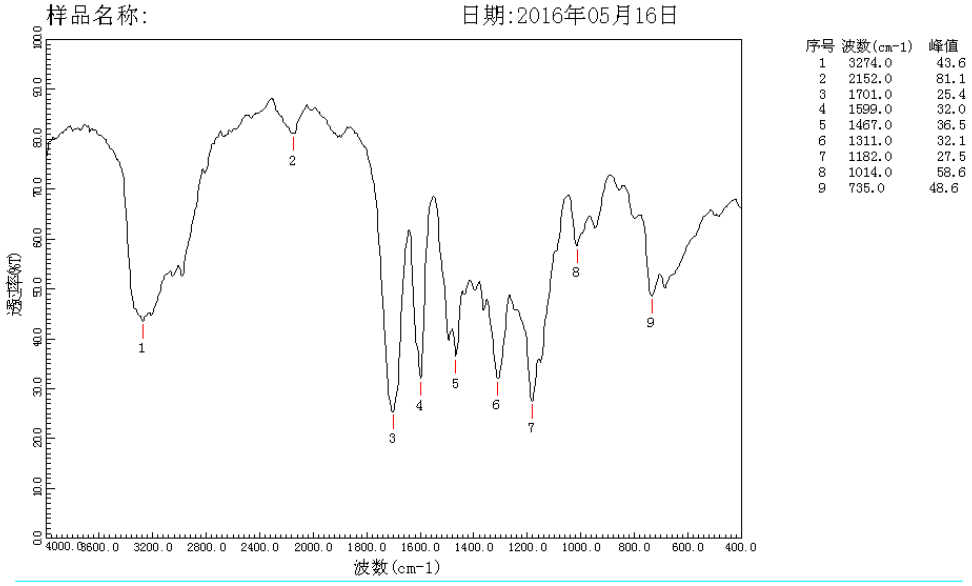


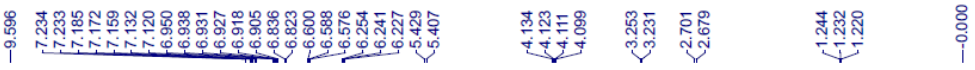


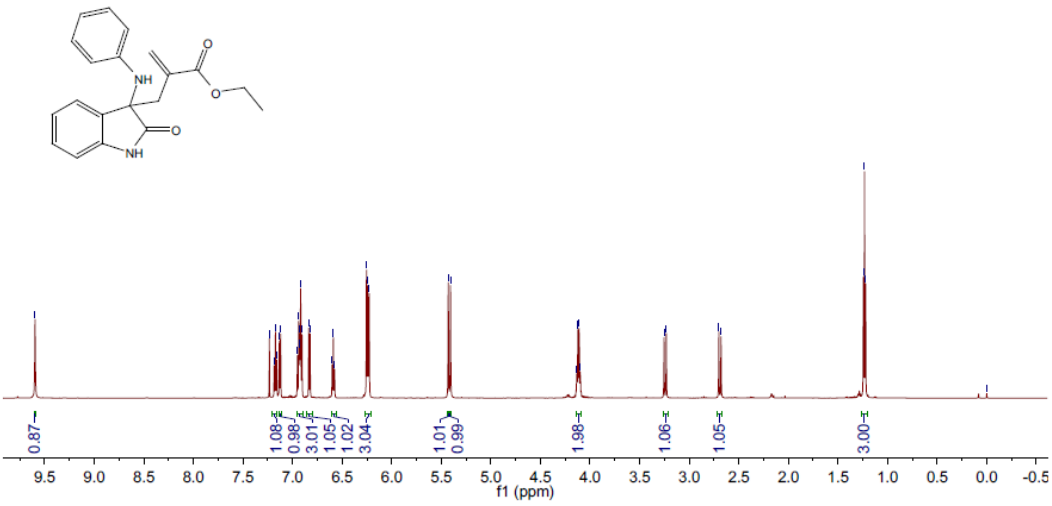

177.90
172.42
167.19
141.47
134.56
130.51
126.21
125.76
123.39
118.67
110.59
77.22
77.00
76.79
67.71
35.22
33.86
31.89
29.69
29.66
29.63
29.40
29.33
29.29
28.62
25.28
22.66
14.09
O
O
HN–N
O
N
H
16
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

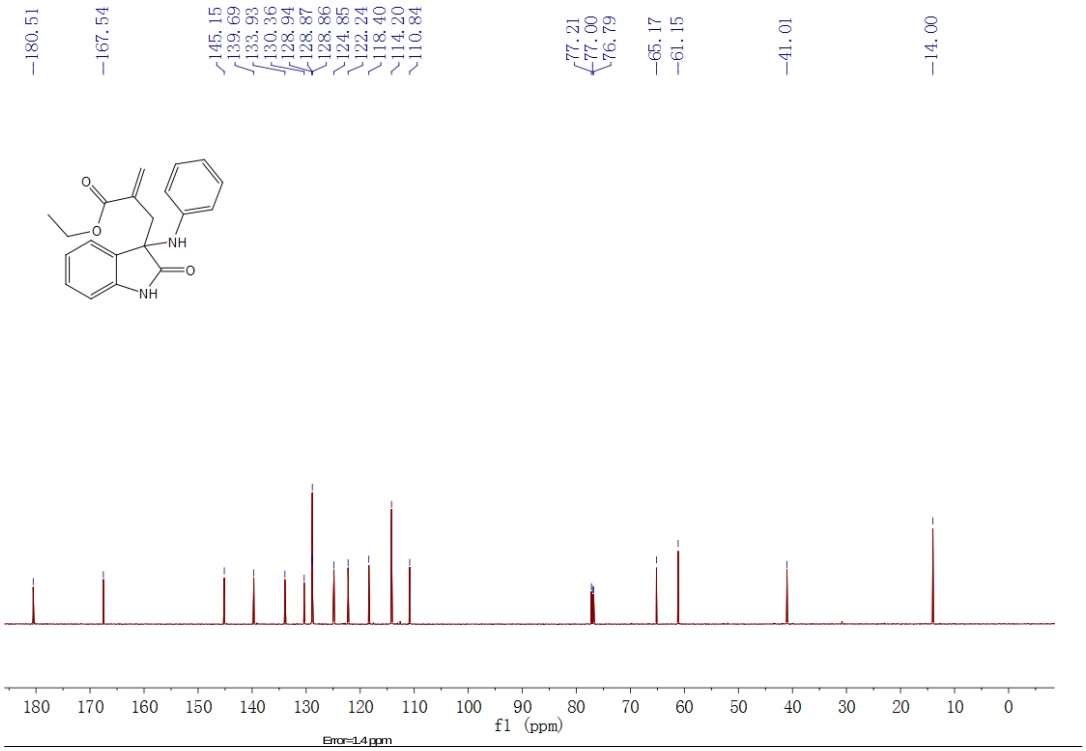

Error=2.5 ppm
Relative Abundance
490.3027
506.2766
468.3208
518.3340
491.3060
496.3520
434.2403
462.2714
469.3242
507.2800
534.3079
519.3372
450.2141
459.2634
478.2454
485.3475
497.3553
513.3785
535.3115
435.2437
429.2847
443.1115
451.2177
470.3274
520.3406
536.3057
546.3646
NL:
1.03E6
14#_160322160957#
28 RT: 0.21 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
518.3353
519.3387
520.3420
NL:
7.07E5
C30 H46 N3 O3 +Na:
C30 H45 N3 O3 Na1
pa Chrg 1
m/z

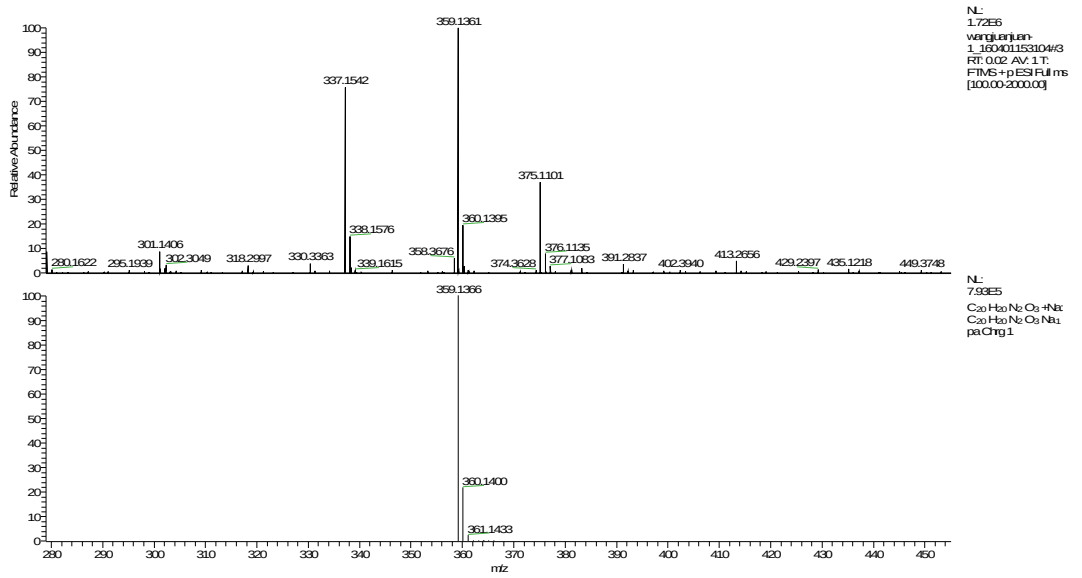
Ethyl 2-((2-oxo-3-(phenylamino)indolin-3-yl)methyl)acrylate(6a)



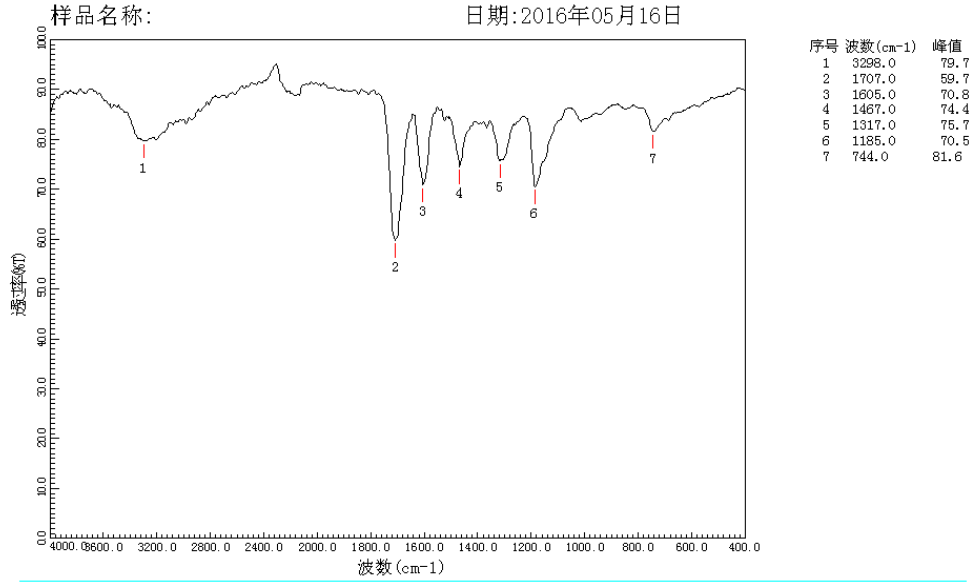


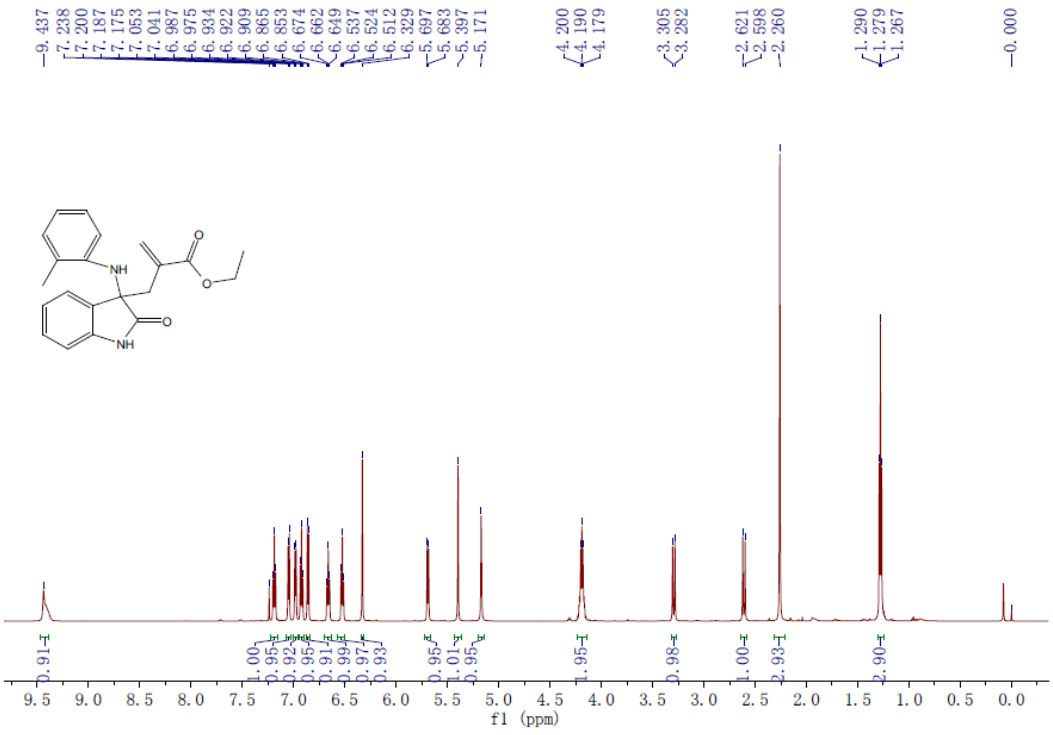


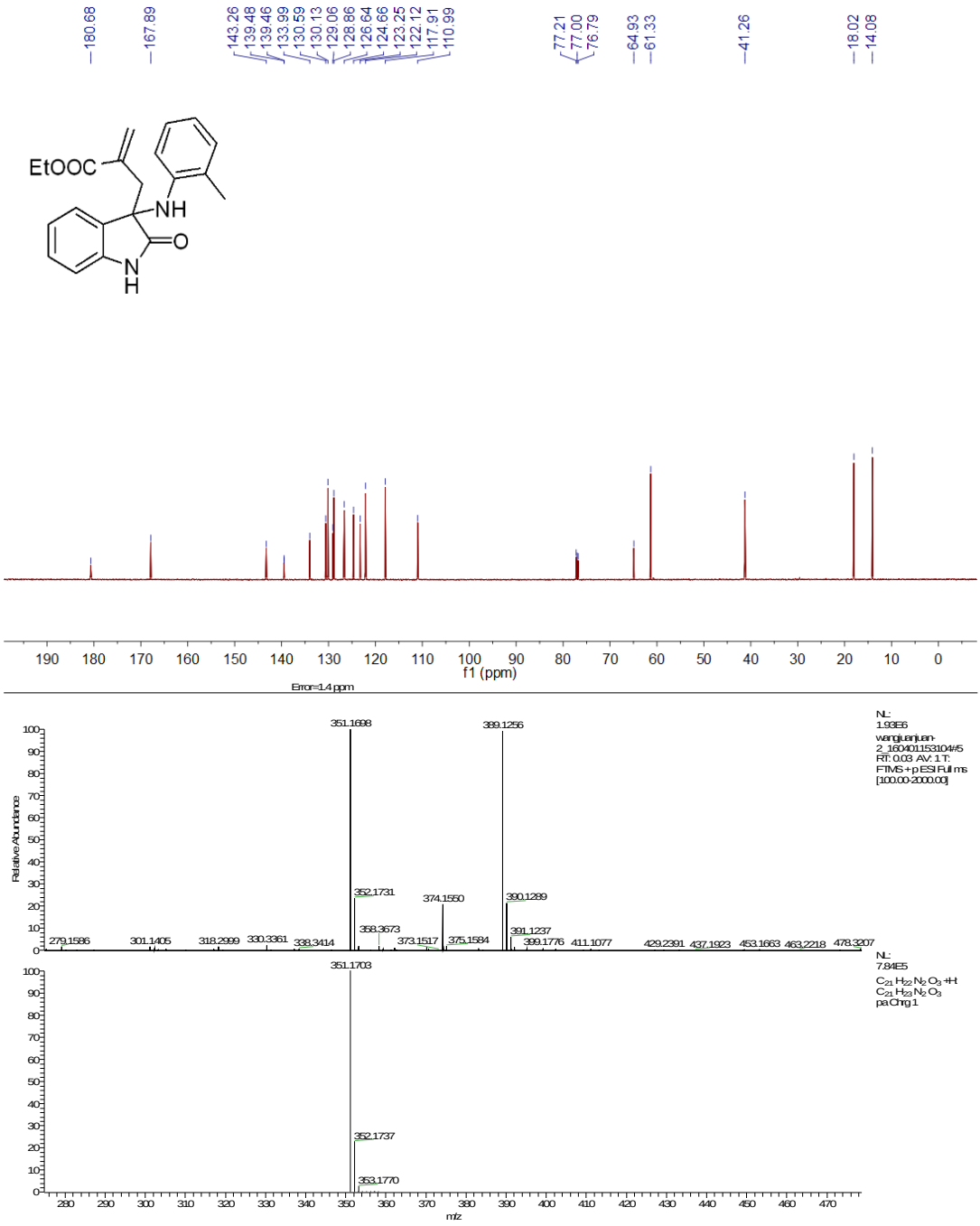

180.51
167.54
145.15
139.69
133.93
130.36
128.94
128.87
128.86
124.85
122.24
118.40
114.20
110.84
77.21
77.00
76.79
65.17
61.15
41.01
14.00
O
O
NH
O
NH
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)


Error=1.4 ppm
Relative Abundance
359.1361
337.1542
375.1101
360.1395
338.1576
301.1406
290.1622
295.1939
302.3049
318.2997
330.3363
358.3676
399.1615
374.3628
376.1135
377.1083
391.2837
402.3940
413.2656
429.2397
435.1218
449.3748
NL:
1.72E6
wangjuanjuan-1_160401153104#3 RT: 0.02 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
359.1366
360.1400
361.1433
m/z
NL:
7.93E5
C20 H20 N2 O3 +Na
C20 H20 N2 O3 Na1
pa Chrg 1

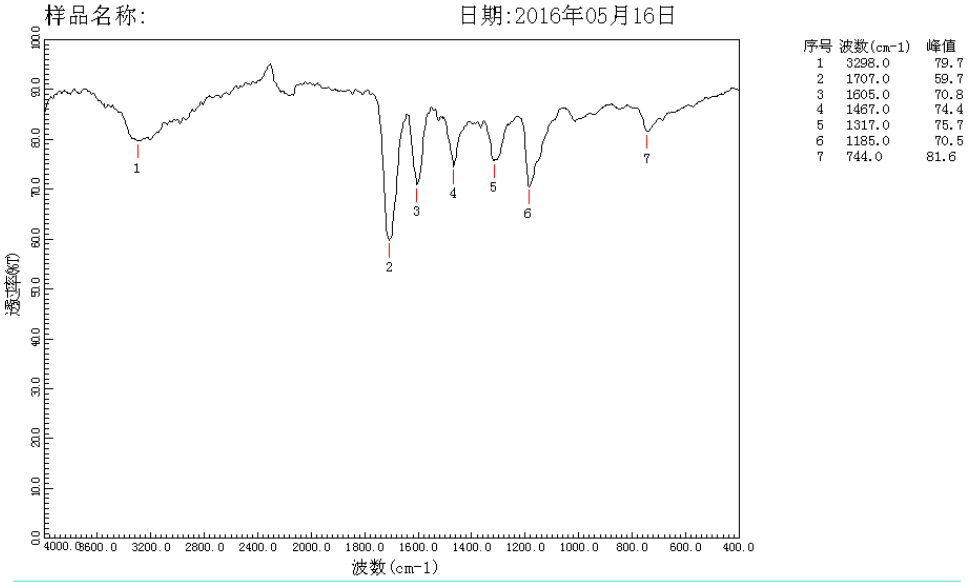
Ethyl 2-((2-oxo-3-(phenylamino)indolin-3-yl)methyl)acrylate(6b)

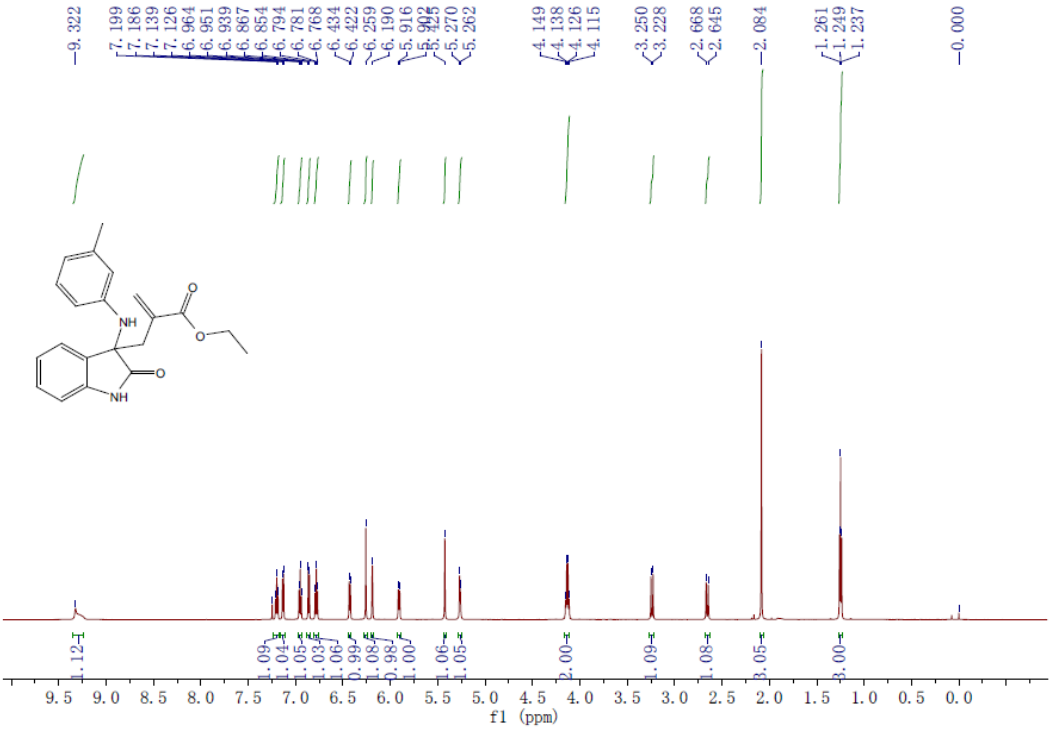


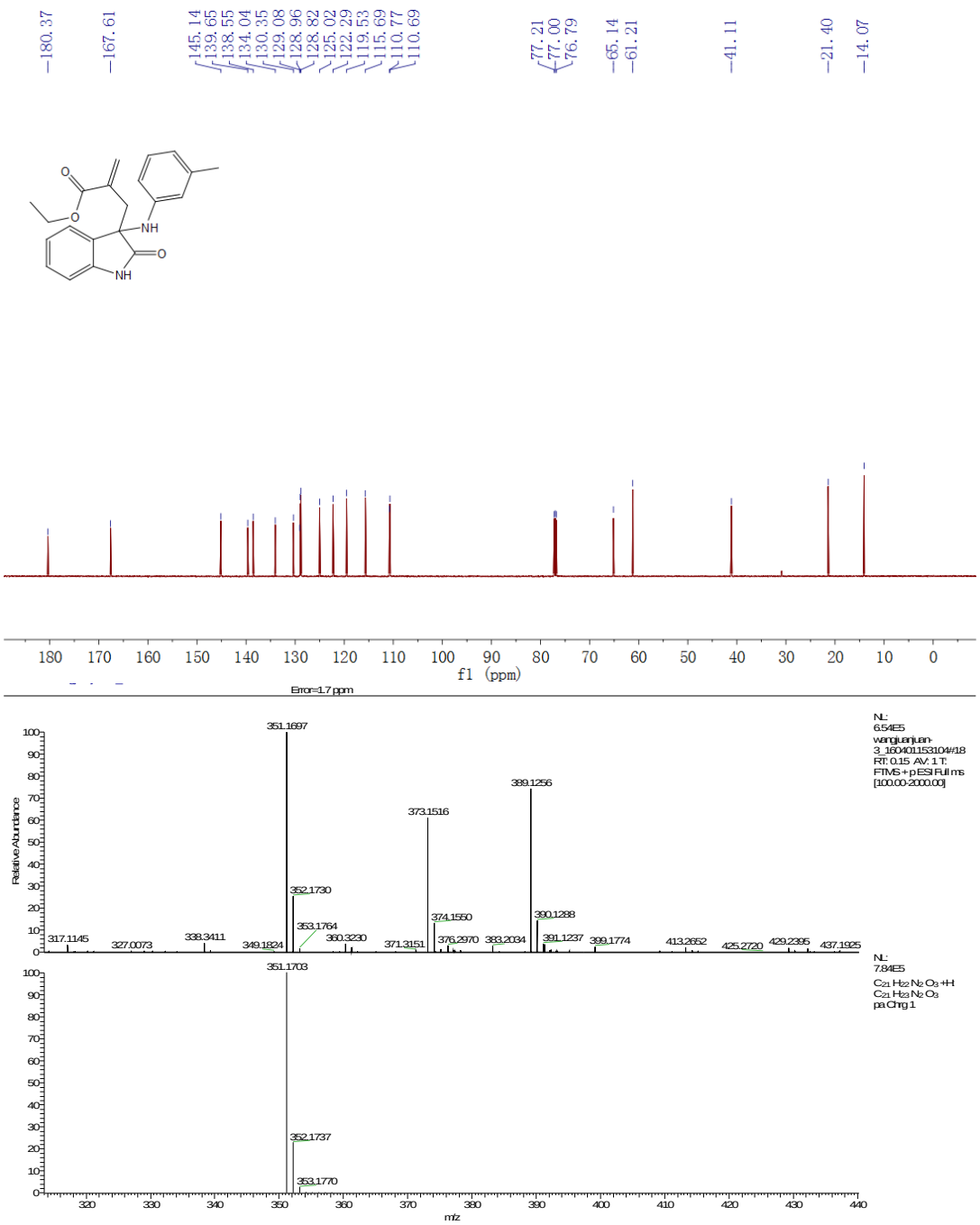



180.68
167.89
143.26
139.48
139.46
133.99
130.59
130.13
129.06
128.86
126.64
124.66
123.25
122.12
117.91
110.99
77.21
77.00
76.79
64.93
61.33
41.26
18.02
14.08
EtOOC
NH
O
N
H
f1 (ppm)
Error=1.4 ppm
351.1698
389.1256
352.1731
374.1550
390.1289
358.3673
391.1237
279.1586
301.1405
318.2999
330.3361
338.3414
373.1517
375.1584
399.1776
411.1077
429.2391
437.1923
453.1663
463.2218
478.3207
Relative Abundance
NL:
1.93E6
wangjuanjuan-2_160401153104#5
RT: 0.03 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
NL:
7.84E5
C21 H22 N2 O3 +H
C21 H23 N2 O3
pa Chrg 1
351.1703
352.1737
353.1770
m/z

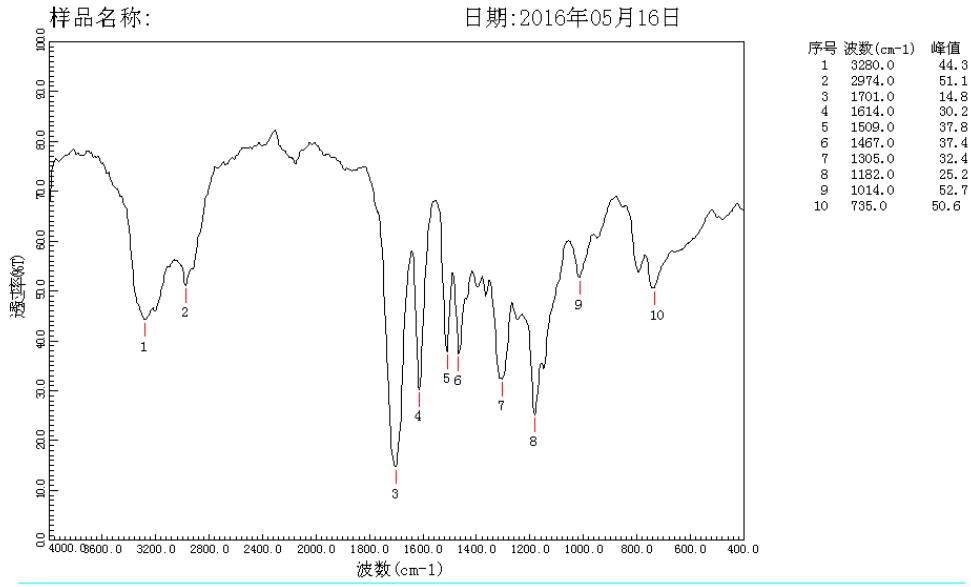
Ethyl 2-((2-oxo-3-(m-tolylamino)indolin-3-yl)methyl)acrylate(6c)

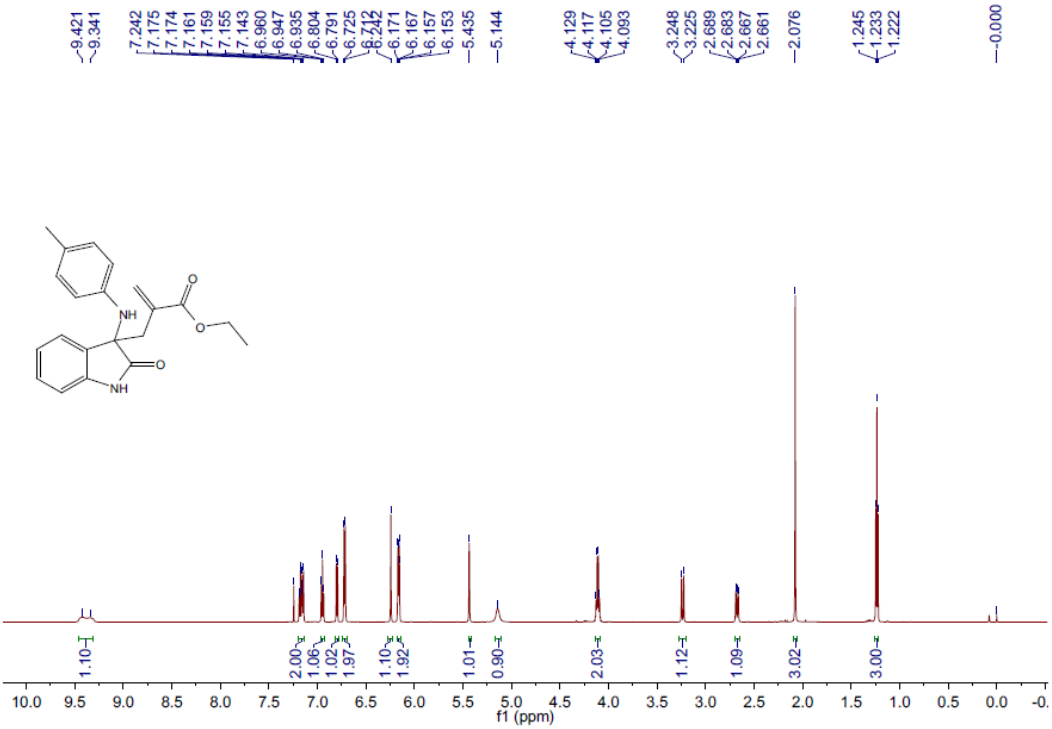


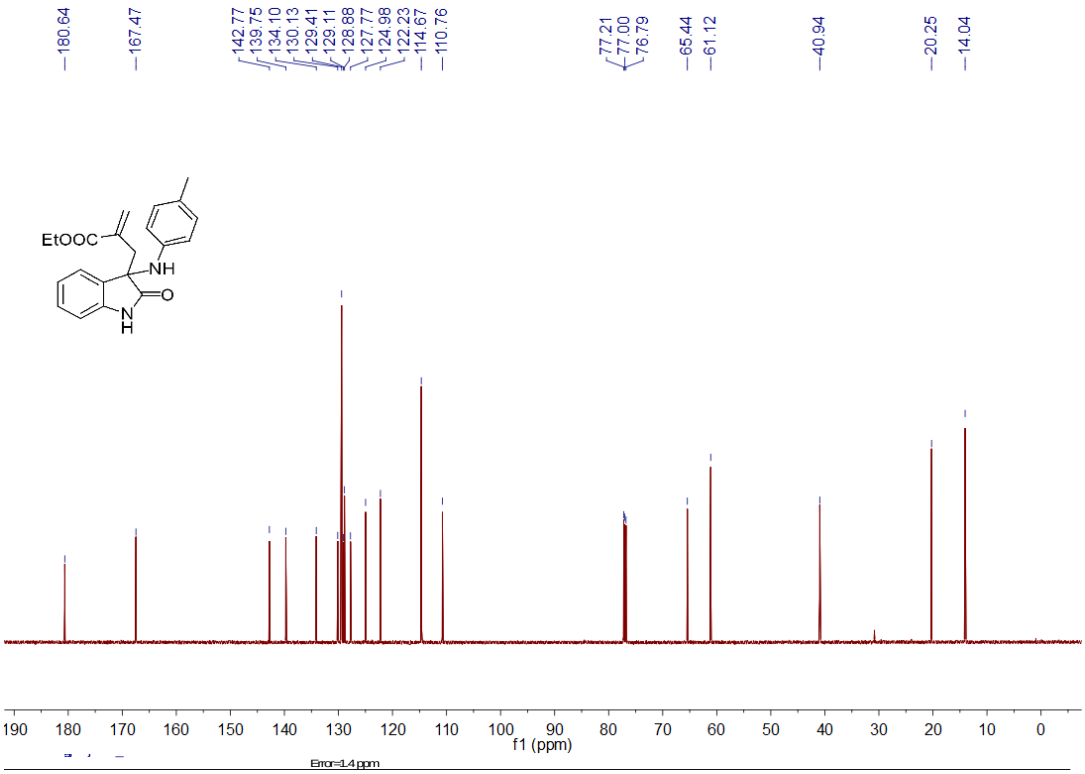


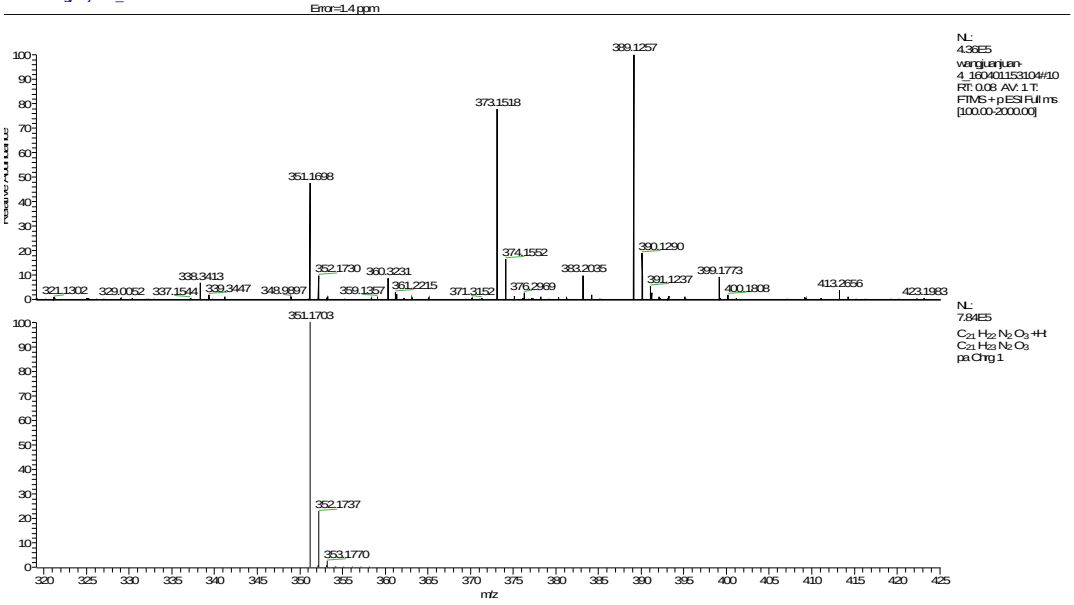

180.37
167.61
145.14
139.65
138.55
134.04
130.35
129.08
128.96
128.82
125.02
122.29
119.53
115.69
110.77
110.69
77.21
77.00
76.79
65.14
61.21
41.11
21.40
14.07
O
O
NH
O
NH
f1 (ppm)
Error=1.7 ppm
351.1697
389.1256
373.1516
352.1730
374.1550
390.1288
353.1764
360.3230
317.1145
327.0073
338.3411
349.1824
371.3151
376.2970
383.2034
391.1237
399.1774
413.2652
425.2720
429.2395
437.1925
Relative Abundance
NL:
6.54E5
wangjuanjuan-
3_160401153104#18
RT: 0.15 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
NL:
7.84E5
C21 H22 N2 O3 +H
C21 H23 N2 O3
pa Chrg 1
351.1703
352.1737
353.1770
m/z

Ethyl 2-((2-oxo-3-(p-tolylamino)indolin-3-yl)methyl)acrylate(6d)

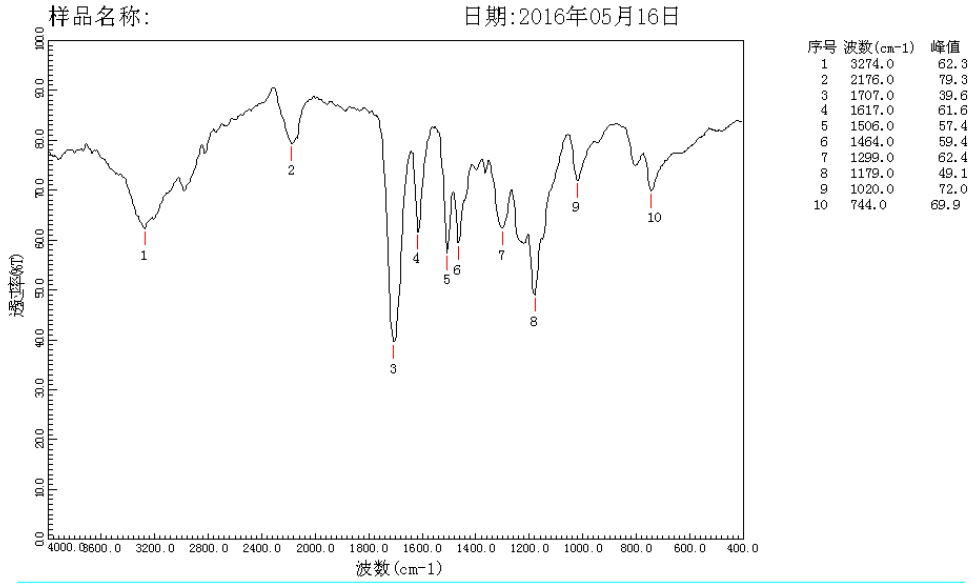


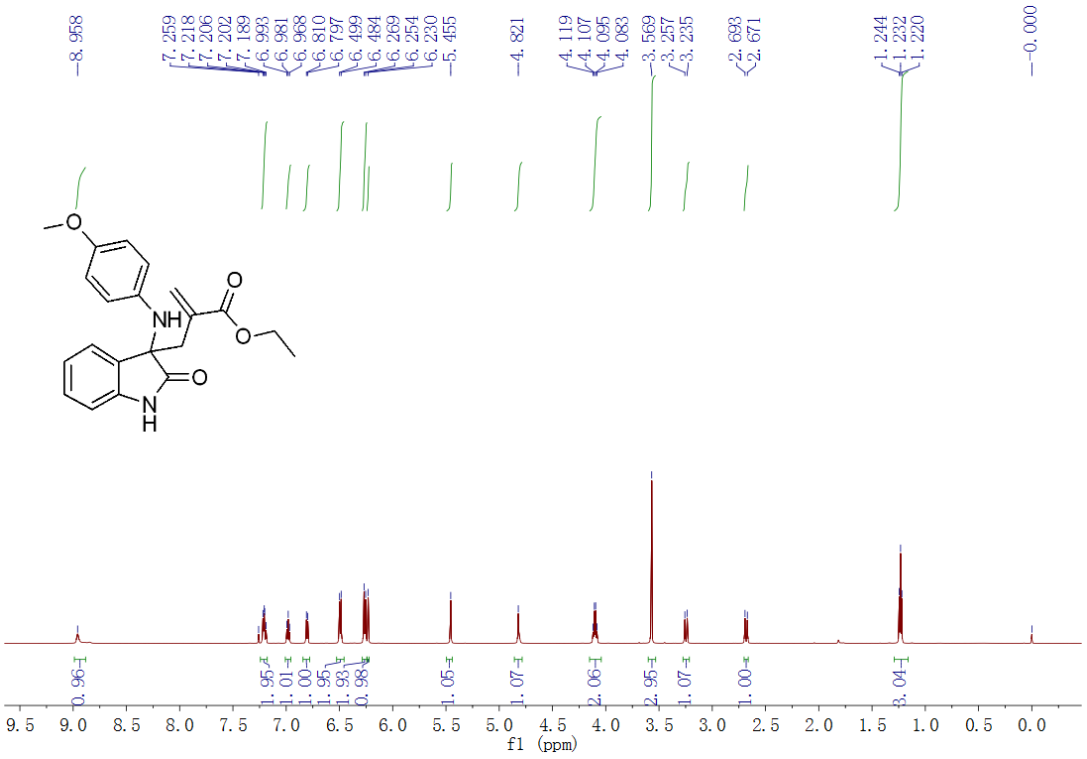


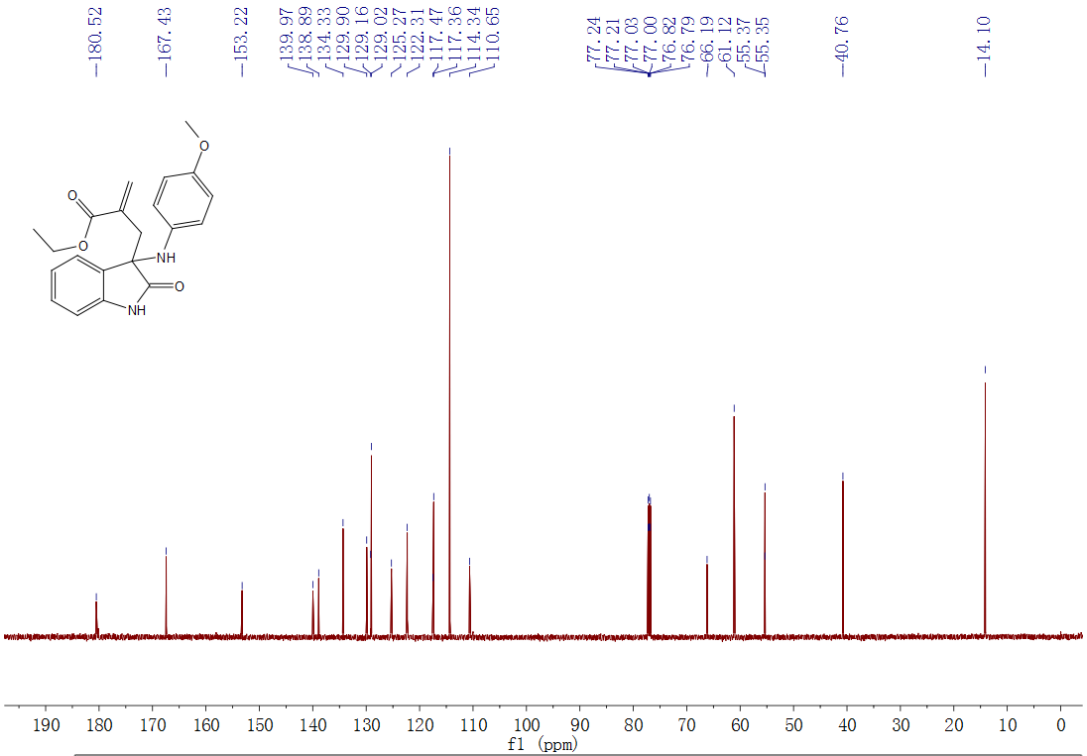

180.64
167.47
142.77
139.75
134.10
130.13
129.41
129.11
128.88
127.77
124.98
122.23
114.67
110.76
77.21
77.00
76.79
65.44
61.12
40.94
20.25
14.04
EtOOC
NH
O
N
H
f1 (ppm)

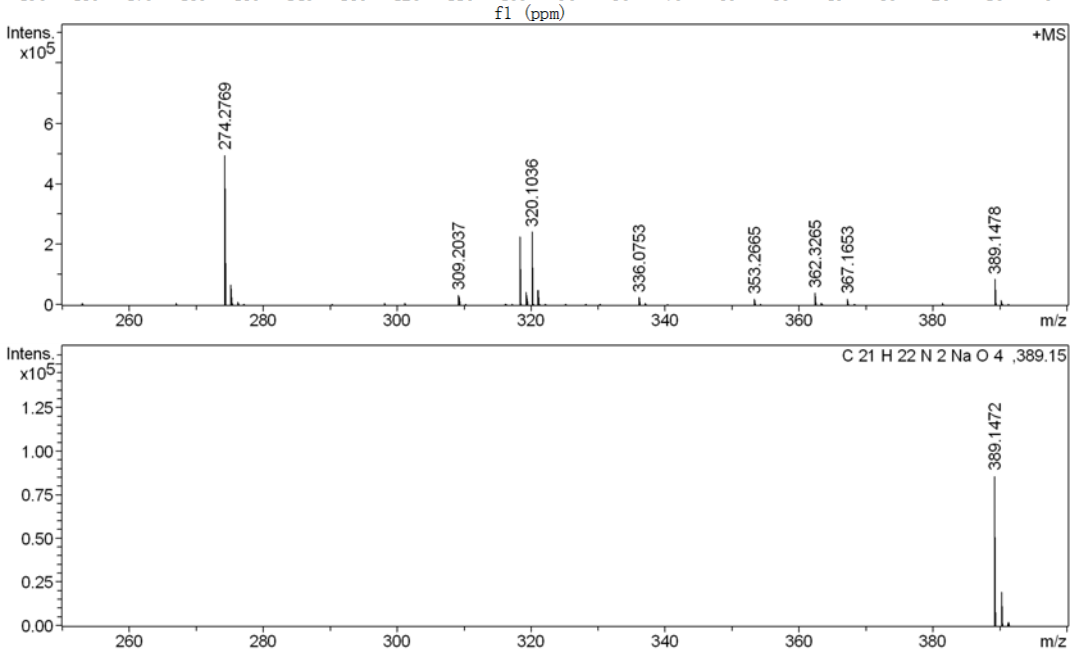

Error=1.4 ppm
NL:
4.36E5
wangjuanjuan-4_160401153104#10
RT: 0.08 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
389.1257
373.1518
351.1698
374.1552
390.1290
352.1730
360.3231
383.2035
399.1773
338.3413
321.1302
329.0052
337.1544
339.3447
348.9897
359.1357
361.2215
371.3152
376.2969
391.1237
400.1808
413.2656
423.1983
NL:
7.84E5
C21 H22 N2 O3 +H
C21 H23 N2 O3
pa Chrg 1
351.1703
352.1737
353.1770
m/z

Ethyl 2-((3-((4-methoxyphenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6e)



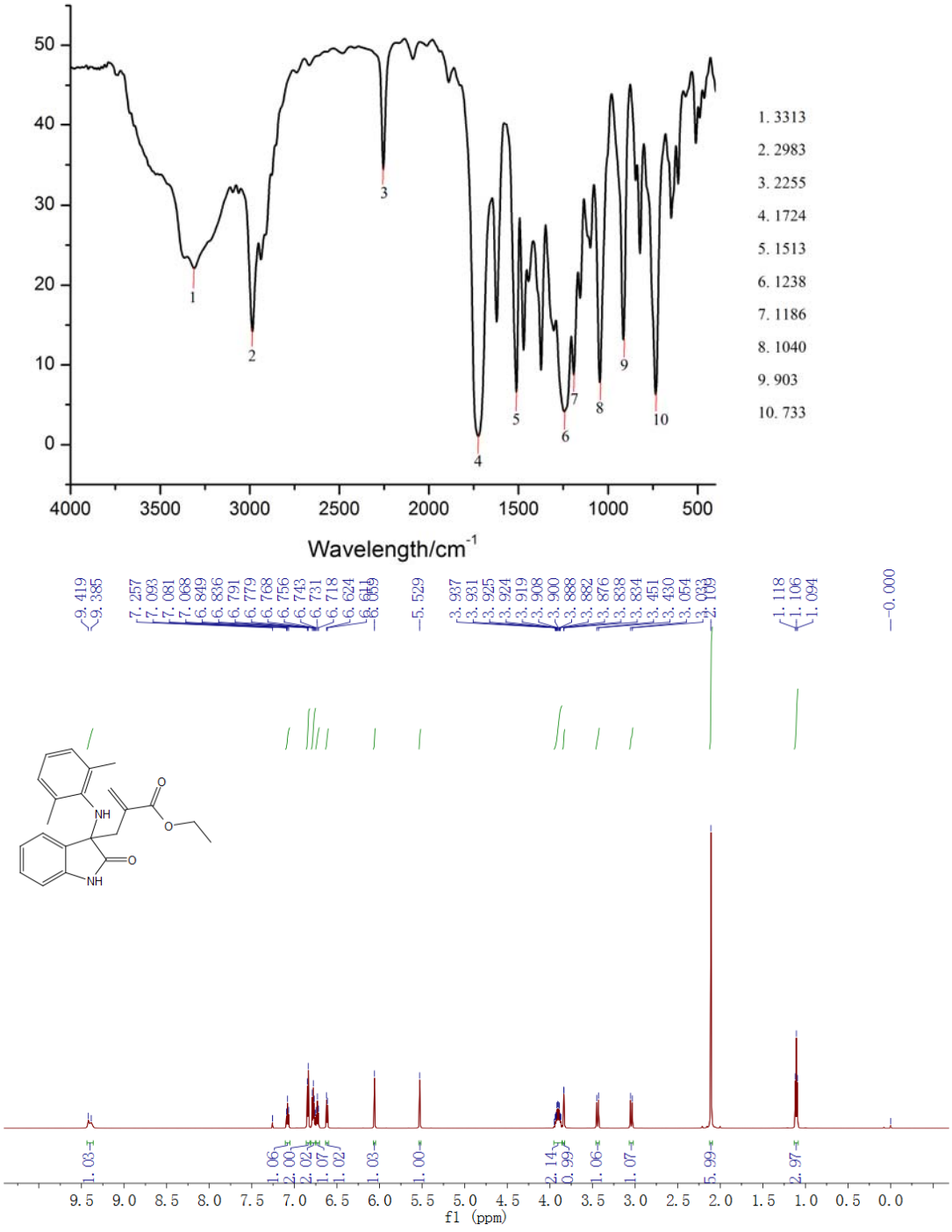


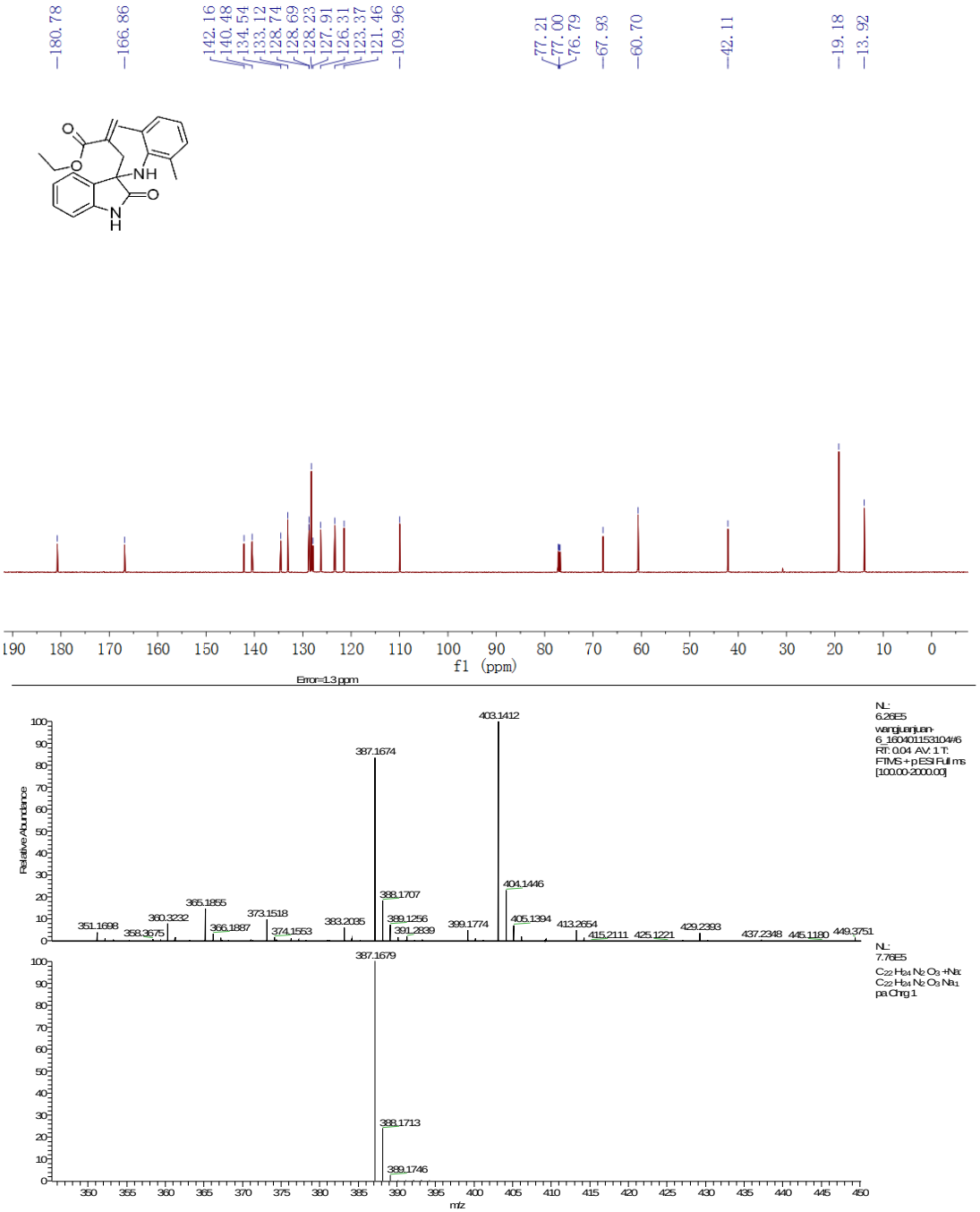

180.52
167.43
153.22
139.97
138.89
134.33
129.90
129.16
129.02
125.27
122.31
117.47
117.36
114.34
110.65
77.24
77.21
77.03
77.00
76.82
76.79
66.19
61.12
55.37
55.35
40.76
14.10
O
O
O
NH
O
NH
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)


Intens.
x10^5
+MS
274.2769
309.2037
320.1036
336.0753
353.2665
362.3265
367.1653
389.1478
260 280 300 320 340 360 380
m/z

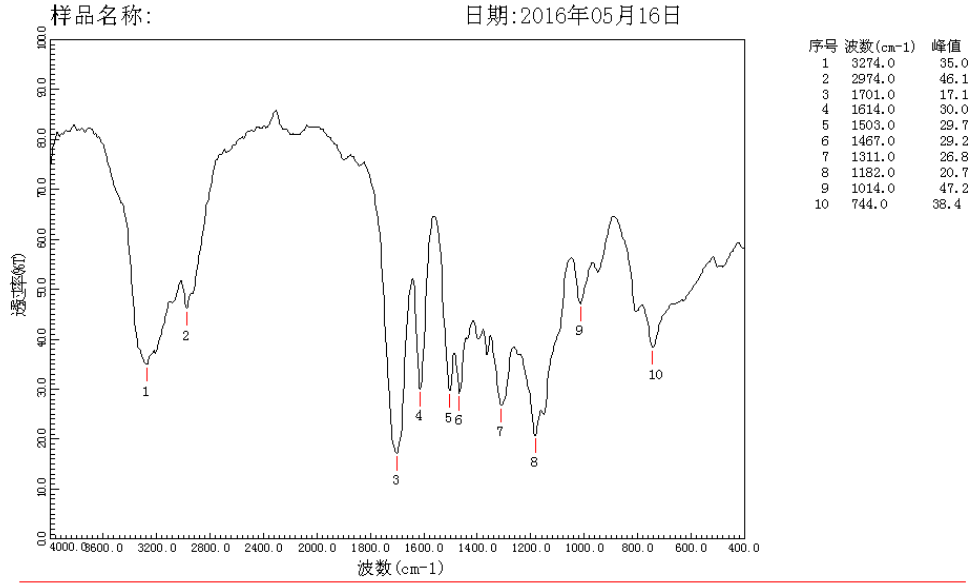
Intens.
x10^5
C 21 H 22 N 2 Na O 4 ,389.15
389.1472
260 280 300 320 340 360 380
m/z

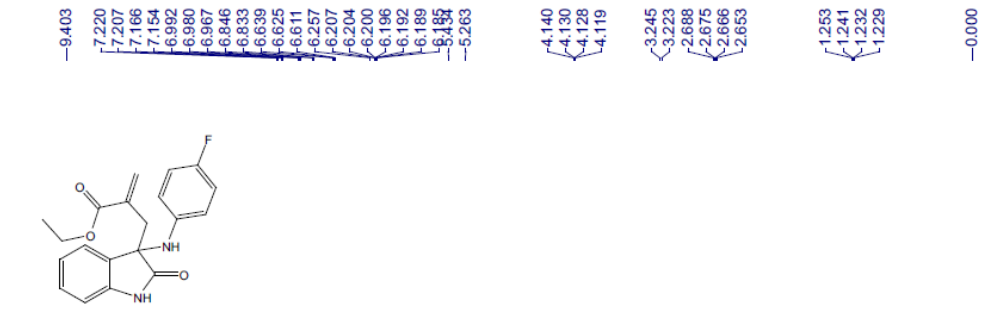
Ethyl 2-((3-((2,6-dimethylphenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6f)

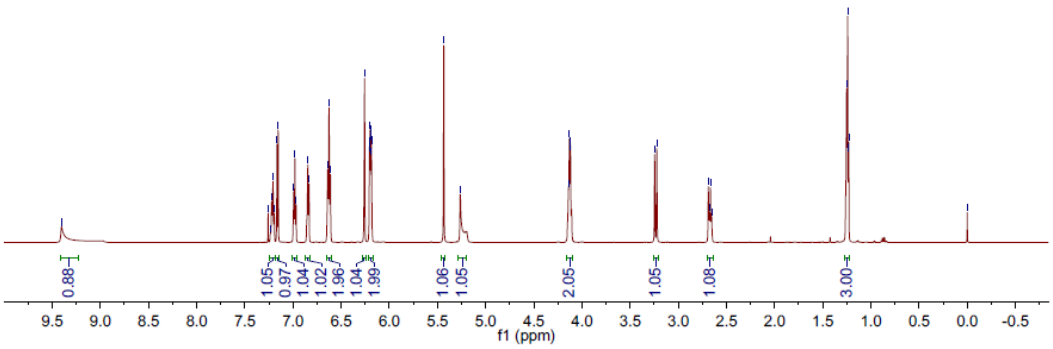


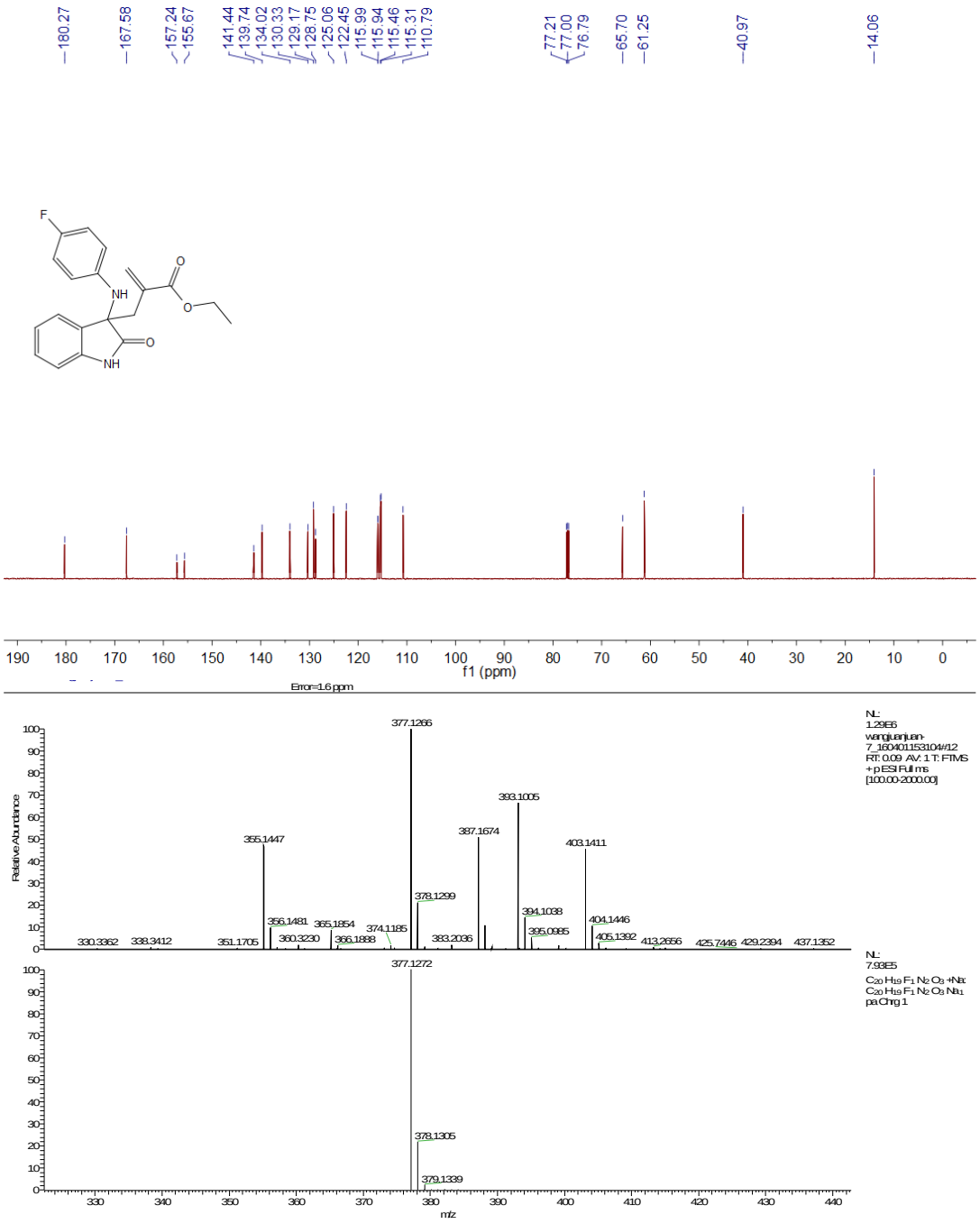

180.78
166.86
142.16
140.48
134.54
133.12
128.74
128.69
128.23
127.91
126.31
123.37
121.46
109.96
77.21
77.00
76.79
67.93
60.70
42.11
19.18
13.92
O
O
NH
O
N
H
f1 (ppm)
Error=1.3 ppm
Relative Abundance
403.1412
387.1674
404.1446
388.1707
365.1855
373.1518
360.3232
351.1698
358.3675
366.1887
374.1553
383.2085
389.1256
391.2839
399.1774
405.1394
413.2654
415.2111
425.1221
429.2393
437.2348
445.1180
449.3751
NL:
6.26E5
wangluanjuan-6_160401153104#6
RT: 0.04 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
387.1679
388.1713
389.1746
NL:
7.76E5
C22 H24 N2 O3 +Na
C22 H24 N2 O3 Na1
pa Chrg 1
m/z

Ethyl 2-((3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6h)

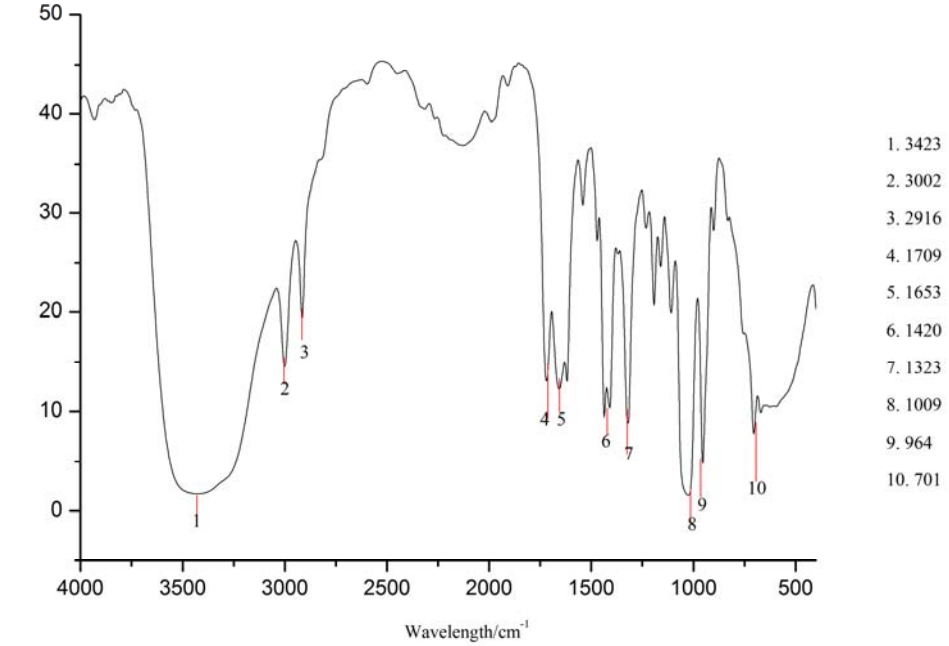


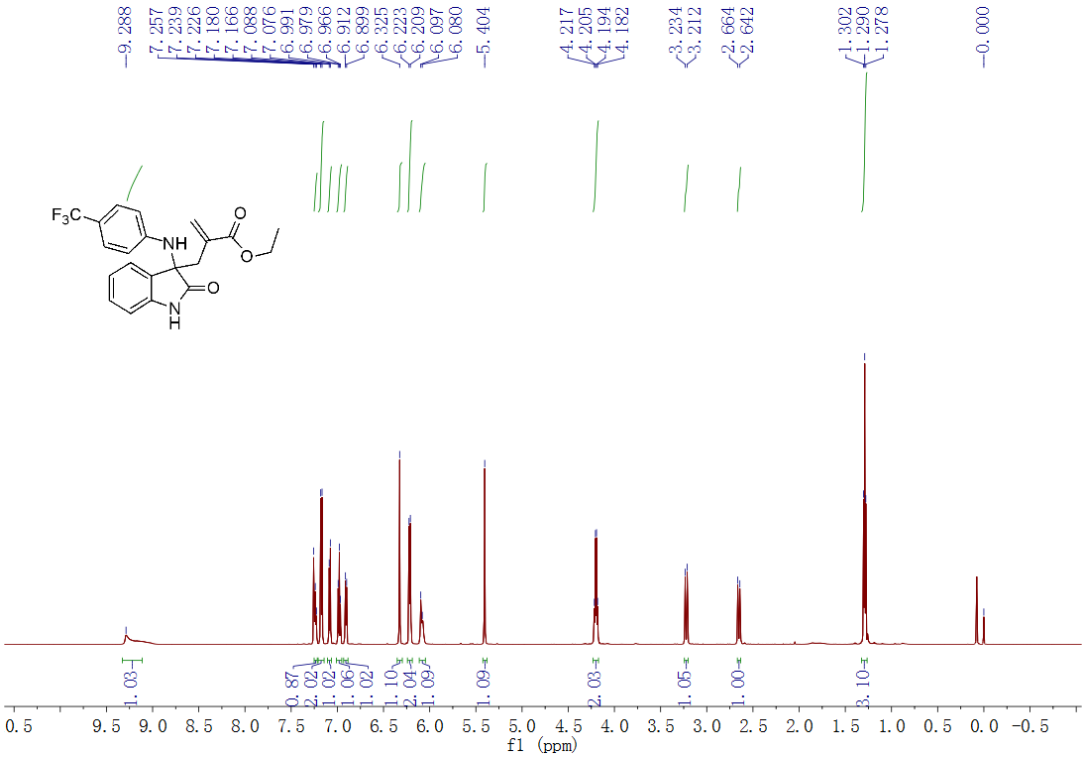


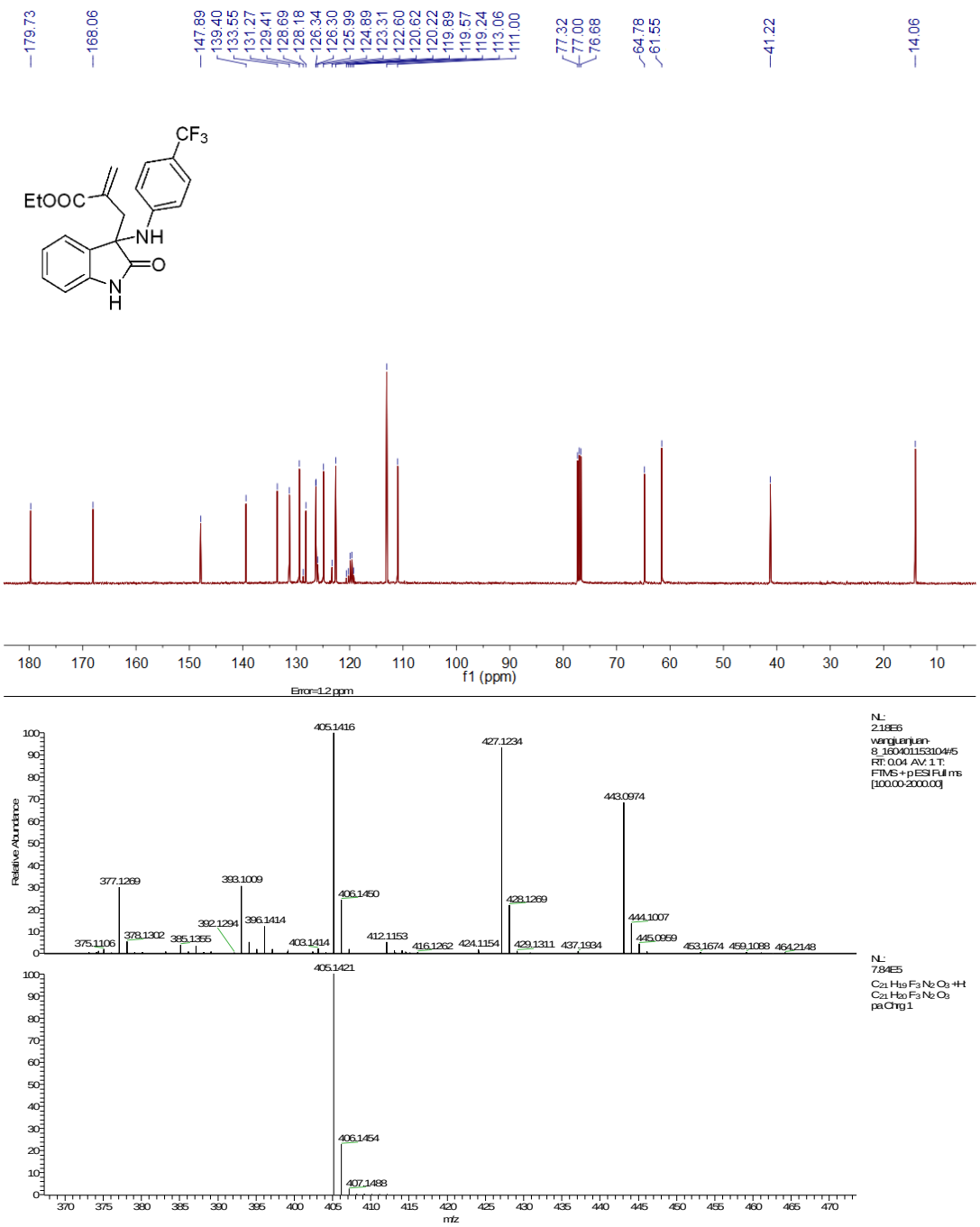



180.27
167.58
157.24
155.67
141.44
139.74
134.02
130.33
129.17
128.75
125.06
122.45
115.99
115.94
115.46
115.31
110.79
77.21
77.00
76.79
65.70
61.25
40.97
14.06
F
NH
O
O
O
NH
f1 (ppm)
Error=1.6 ppm
Relative Abundance
377.1266
393.1005
387.1674
355.1447
403.1411
378.1299
394.1038
395.0985
404.1446
356.1481
365.1854
374.1185
360.3230
366.1888
383.2036
405.1392
330.3362
338.3412
351.1705
413.2656
425.7446
429.2394
437.1352
NL:
1.29E6
wangjuanjuan-7_160401153104#12
RT: 0.09 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
NL:
7.93E5
C20 H19 F1 N2 O3 +Na
C20 H19 F1 N2 O3 Na1
pa Chrg 1
377.1272
378.1305
379.1339
m/z

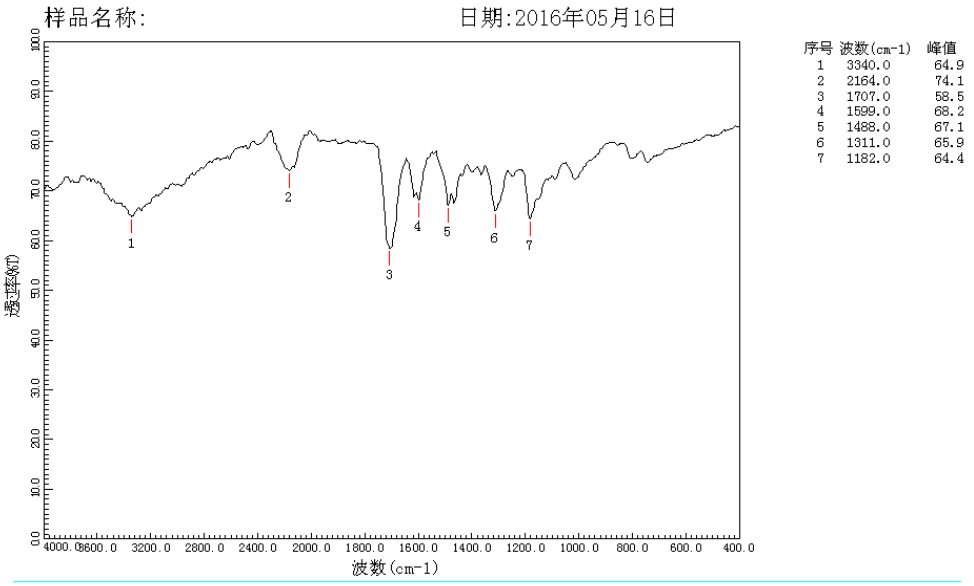
Ethyl 2-((2-oxo-3-((4-(trifluoromethyl)phenyl)amino)indolin-3-yl)methyl) -acrylate(6i)

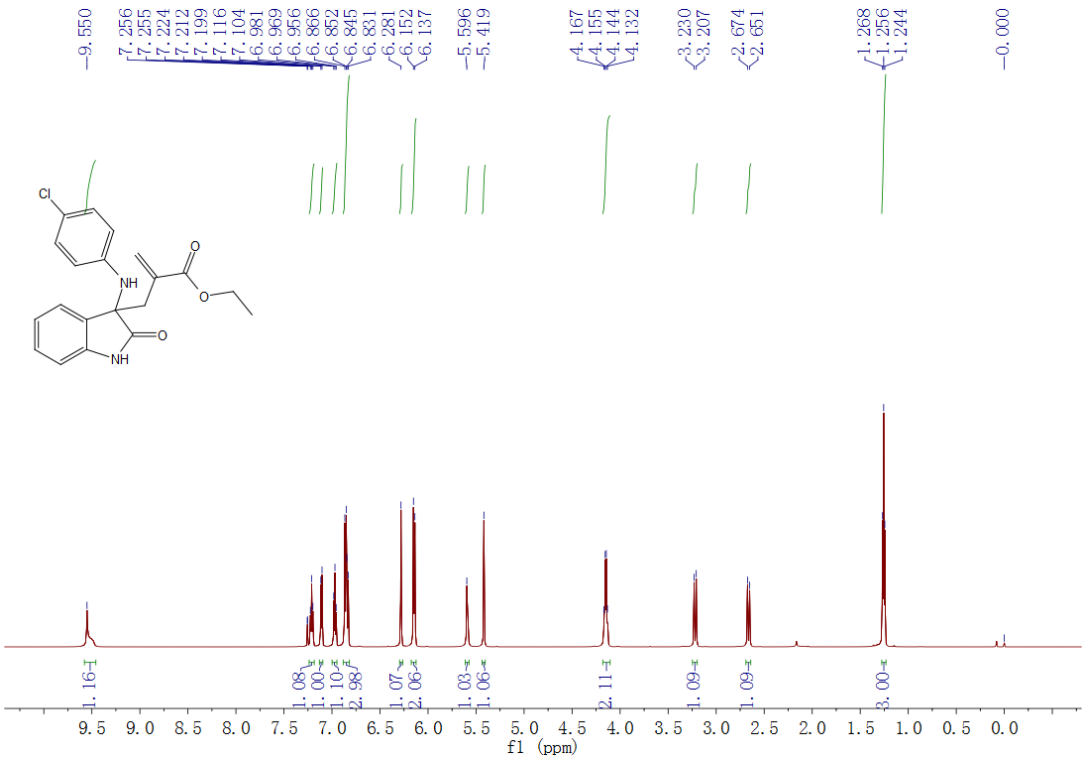


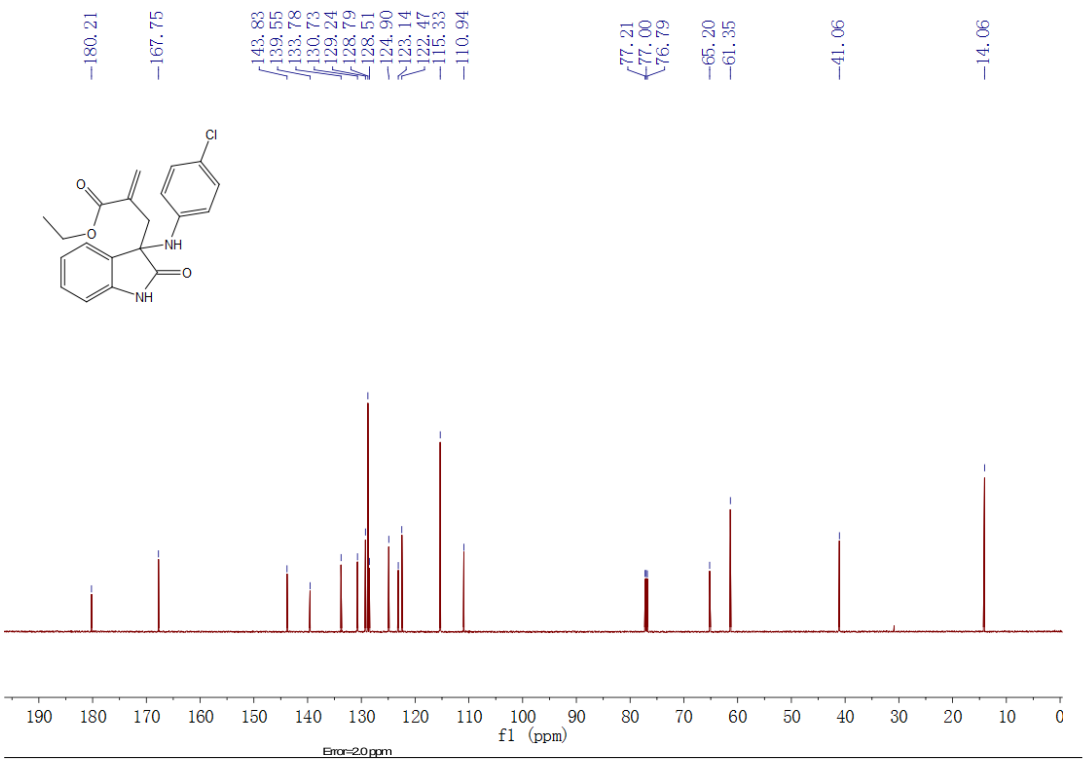


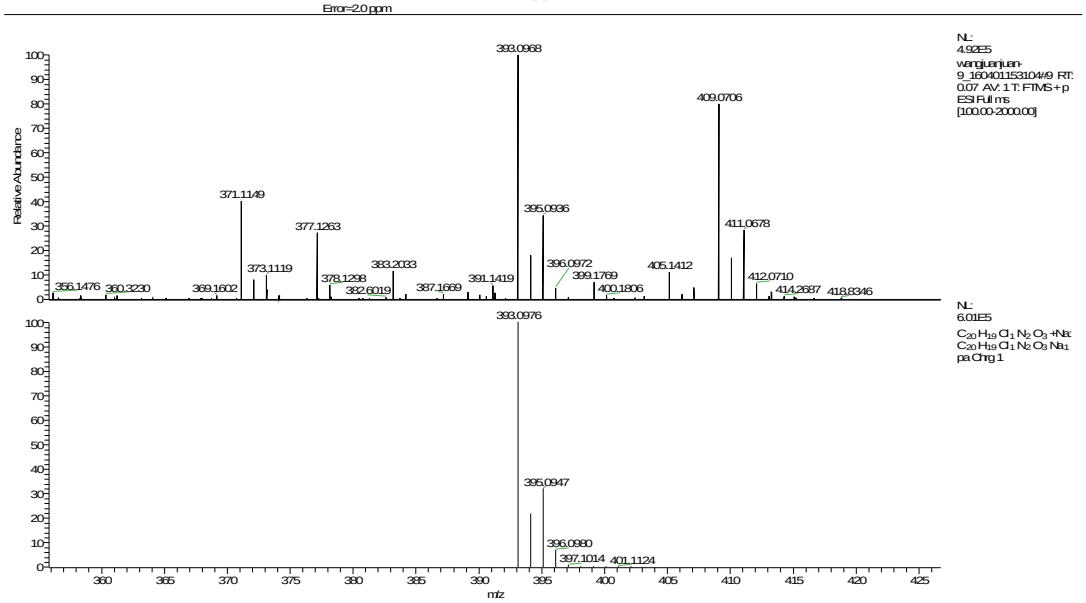

179.73
168.06
147.89
139.40
133.55
131.27
129.41
128.69
128.18
126.34
126.30
125.99
124.89
123.31
122.60
120.62
120.22
119.89
119.57
119.24
113.06
111.00
77.32
77.00
76.68
64.78
61.55
41.22
14.06
CF3
EtOOC
NH
O
N
H
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)
Error=1.2 ppm
Relative Abundance
405.1416
427.1234
443.0974
377.1269
393.1009
406.1450
428.1269
444.1007
396.1414
392.1294
378.1302
375.1106
385.1355
403.1414
412.1153
416.1262
424.1154
429.1311
437.1934
445.0959
453.1674
459.1088
464.2148
N:
2.18E6
wangjuanjuan-8_160401153104#5
RT: 0.04 AV: 1 T:
FTMS + p ESI Full ms
[100.00-2000.00]
405.1421
406.1454
407.1488
N:
7.84E5
C21 H19 F3 N2 O3 +H
C21 H20 F3 N2 O3
pa Chrg 1
m/z

Ethyl 2-((3-((4-chlorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6j)

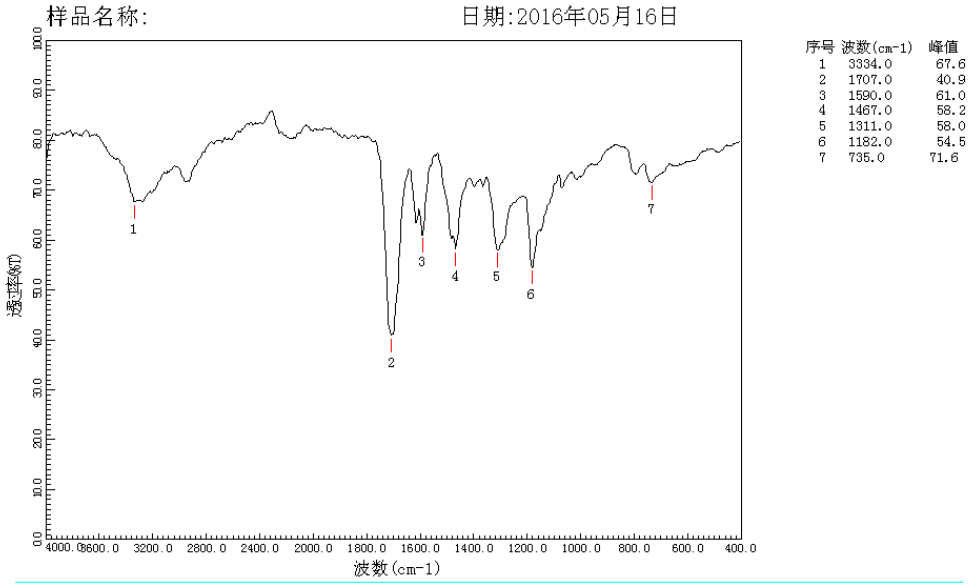


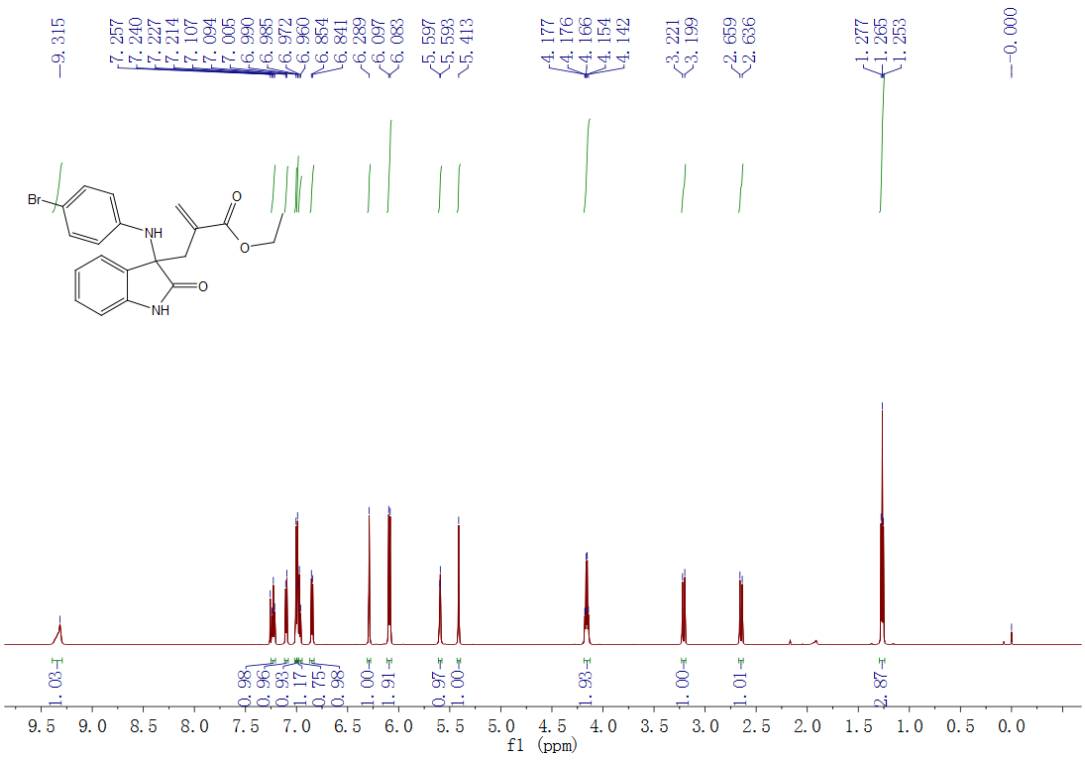


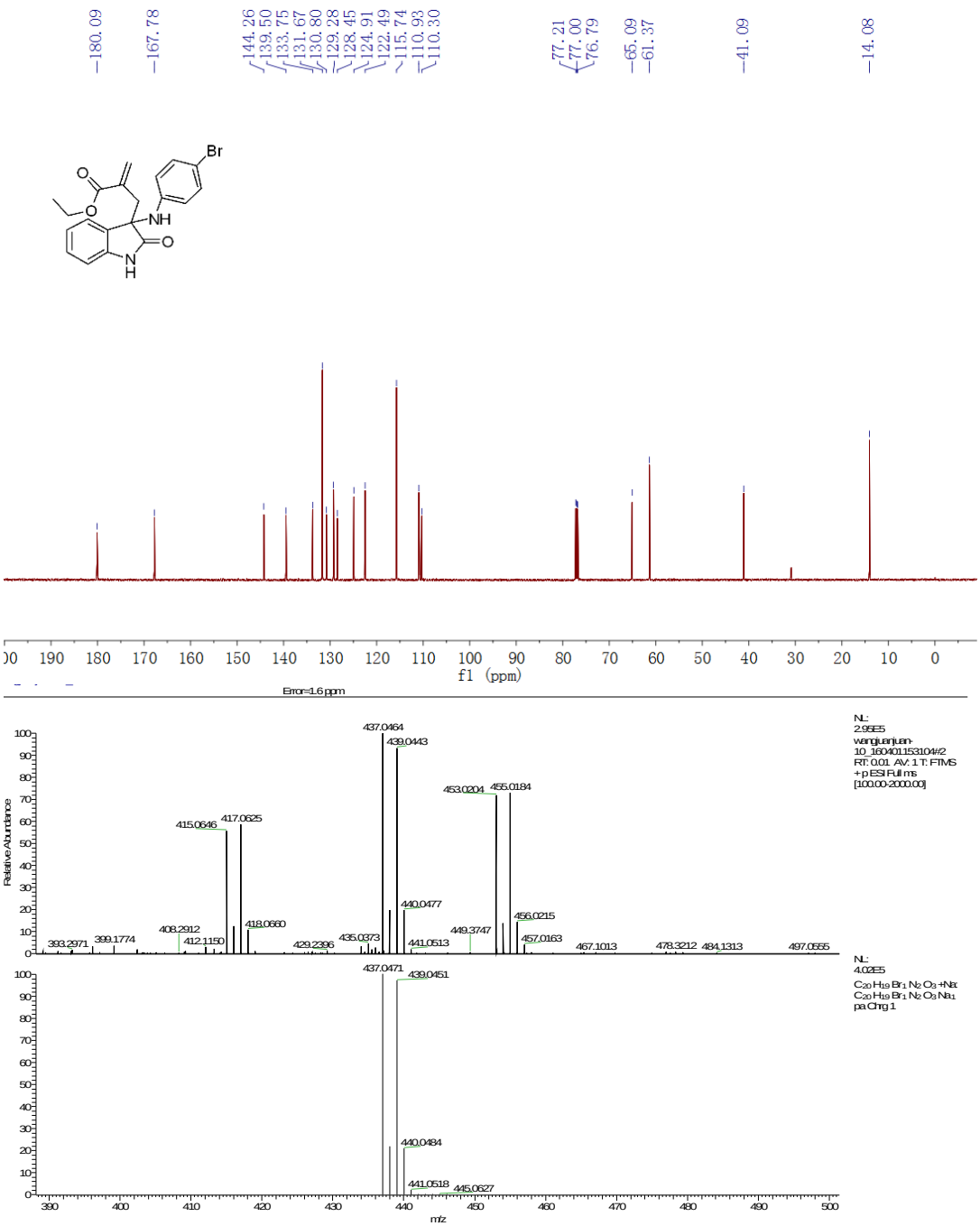

180.21
167.75
143.83
139.55
133.78
130.73
129.24
128.79
128.51
124.90
123.14
122.47
115.33
110.94
77.21
77.00
76.79
65.20
61.35
41.06
14.06
Cl
O
O
NH
O
NH
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)


Error=2.0 ppm
Relative Abundance
393.0968
409.0706
371.1149
395.0936
377.1263
411.0678
396.0972
383.2033
405.1412
373.1119
399.1769
412.0710
356.1476
360.3230
369.1602
378.1298
382.6019
387.1669
391.1419
400.1806
414.2687
418.8346
NL:
4.92E5
wangjuanjuan-9_160401153104#9 RT: 0.07 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
393.0976
395.0947
396.0980
397.1014
401.1124
NL:
6.01E5
C20 H19 Cl1 N2 O3 +Na
C20 H19 Cl1 N2 O3 Na1
pa Chrg 1
m/z

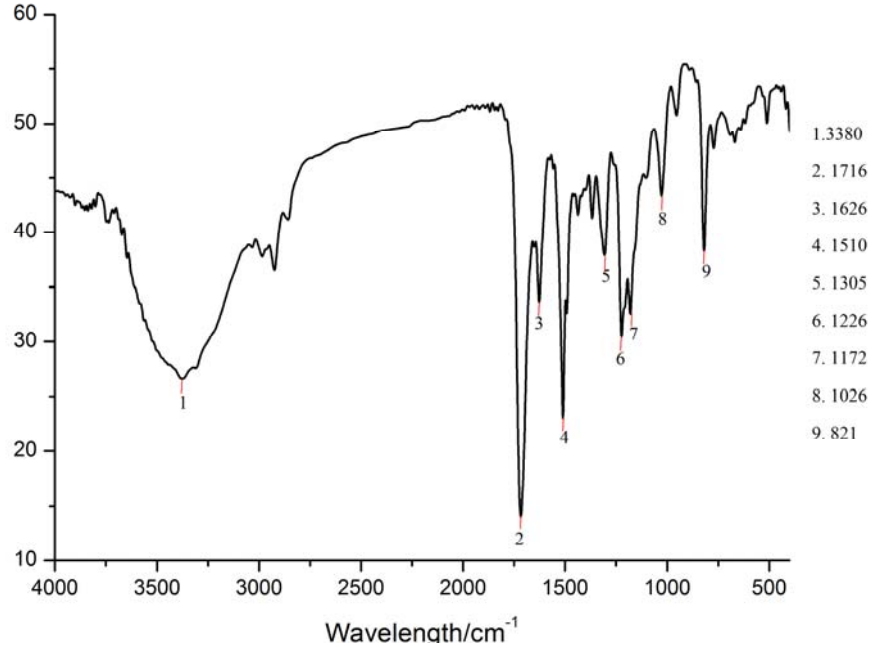
Ethyl 2-((3-((4-bromophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6k)

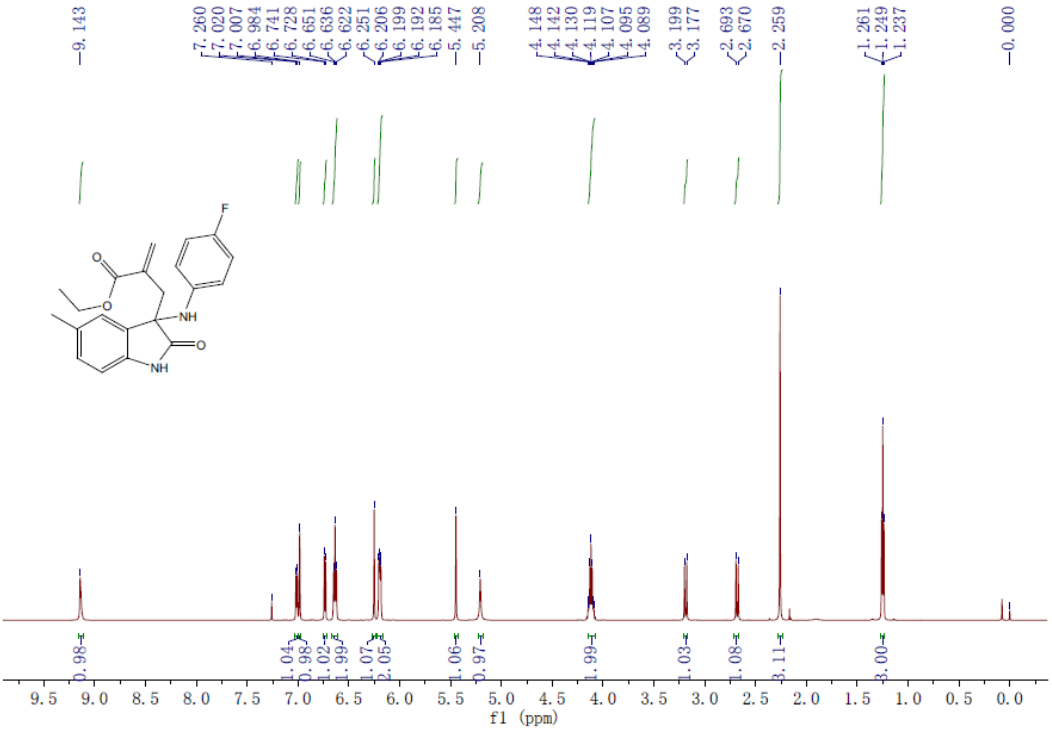


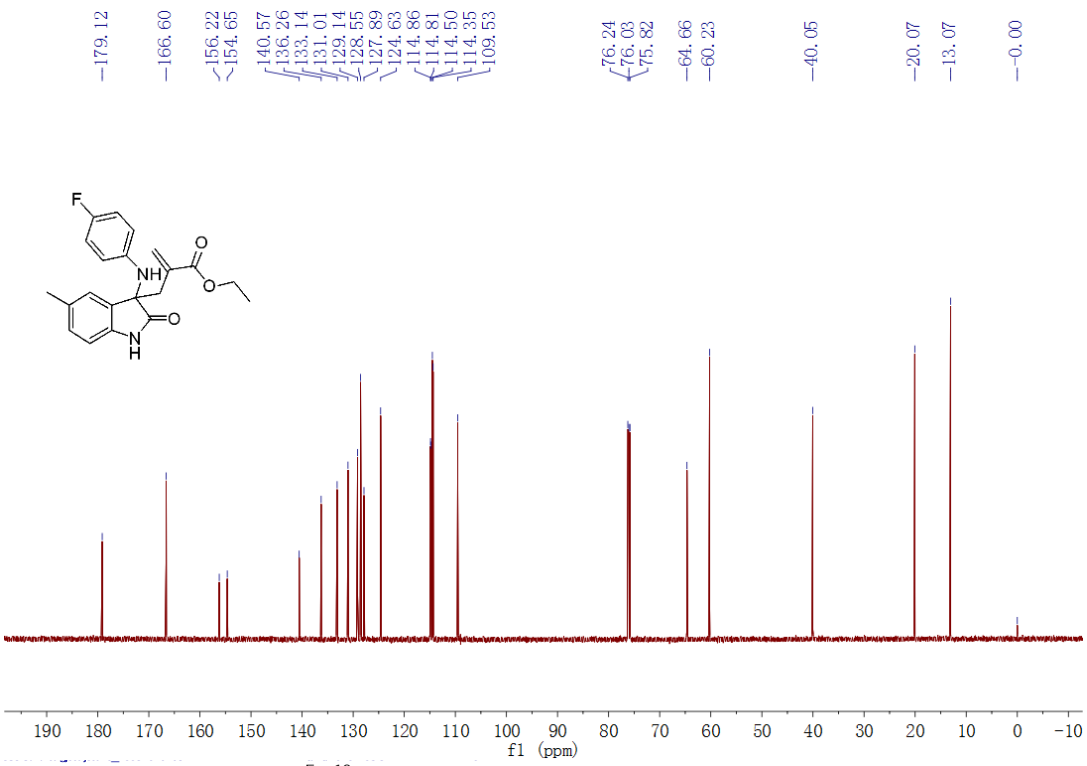


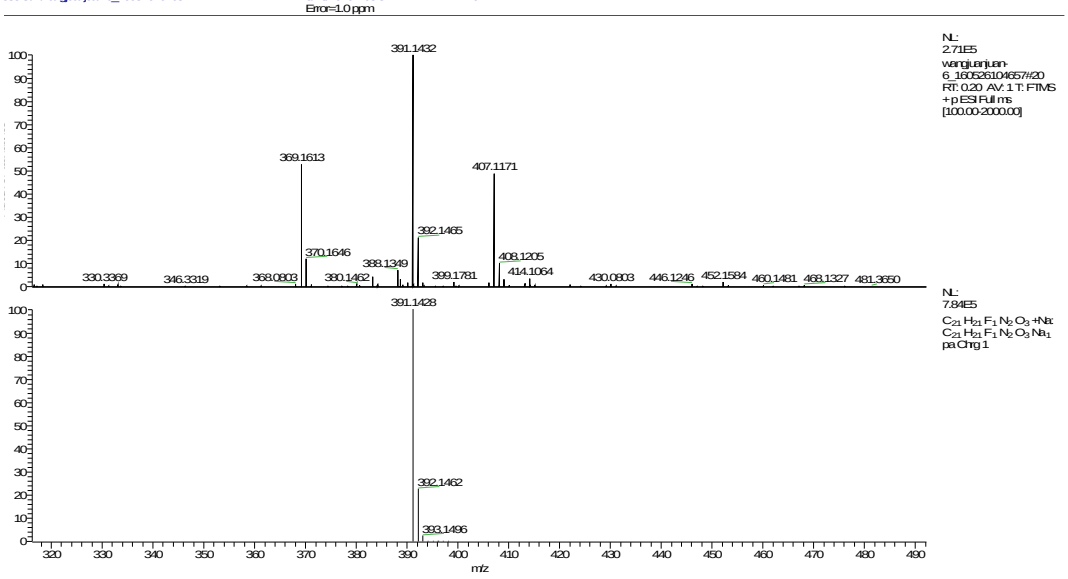

180.09
167.78
144.26
139.50
133.75
131.67
130.80
129.28
128.45
124.91
122.49
115.74
110.93
110.30
77.21
77.00
76.79
65.09
61.37
41.09
14.08
Br
O
O
NH
O
N
H
f1 (ppm)
Error=1.6 ppm
Relative Abundance
437.0464
439.0443
453.0204
455.0184
415.0646
417.0625
440.0477
456.0215
418.0660
408.2912
412.1150
449.3747
457.0163
393.2971
399.1774
429.2396
435.0373
441.0513
467.1013
478.3212
484.1313
497.0555
NL:
2.95E5
wangjuanjuan-10_160401153104#2
RT: 0.01 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
437.0471
439.0451
440.0484
441.0518
445.0627
NL:
4.02E5
C20 H19 Br1 N2 O3 +Na
C20 H19 Br1 N2 O3 Na1
pa Chrg 1
m/z

Ethyl 2-((3-((4-fluorophenyl)amino)-5-methyl-2-oxoindolin-3-yl)methyl)acrylate(6m)

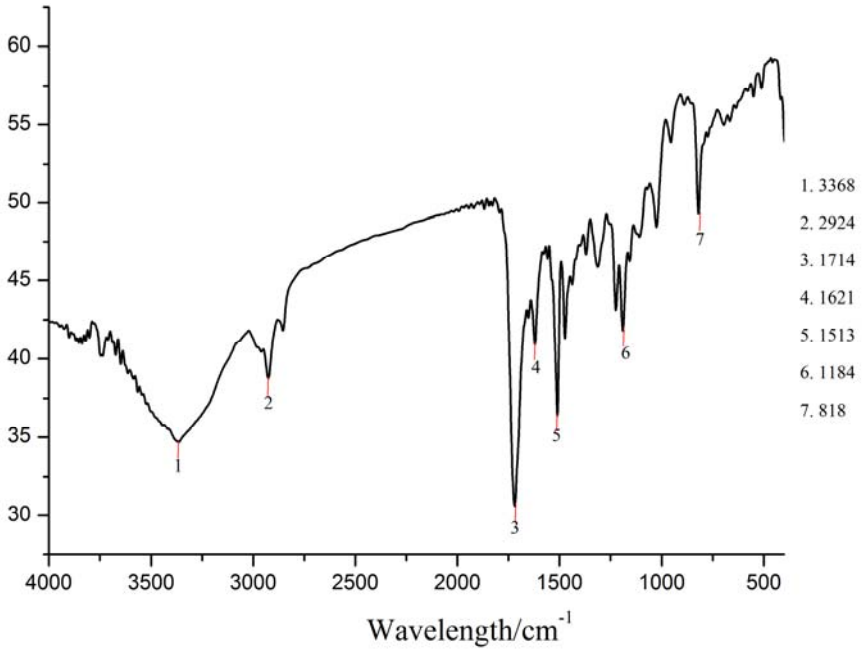


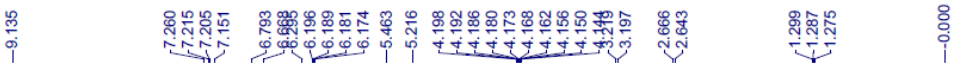


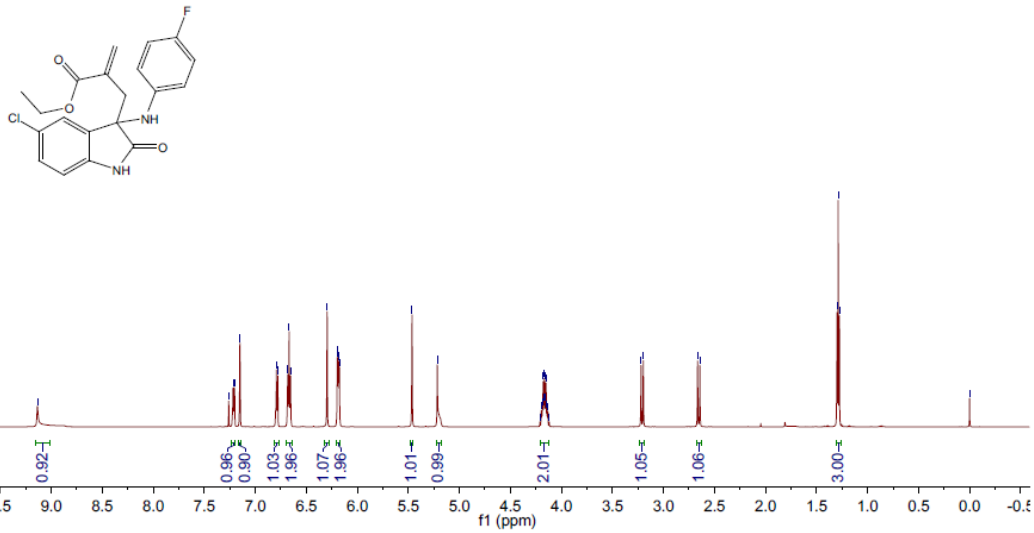

179.12
166.60
156.22
154.65
140.57
136.26
133.14
131.01
129.14
128.55
127.89
124.63
114.86
114.81
114.50
114.35
109.53
76.24
76.03
75.82
64.66
60.23
40.05
20.07
13.07
0.00
F
NH
O
O
N
H
O
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

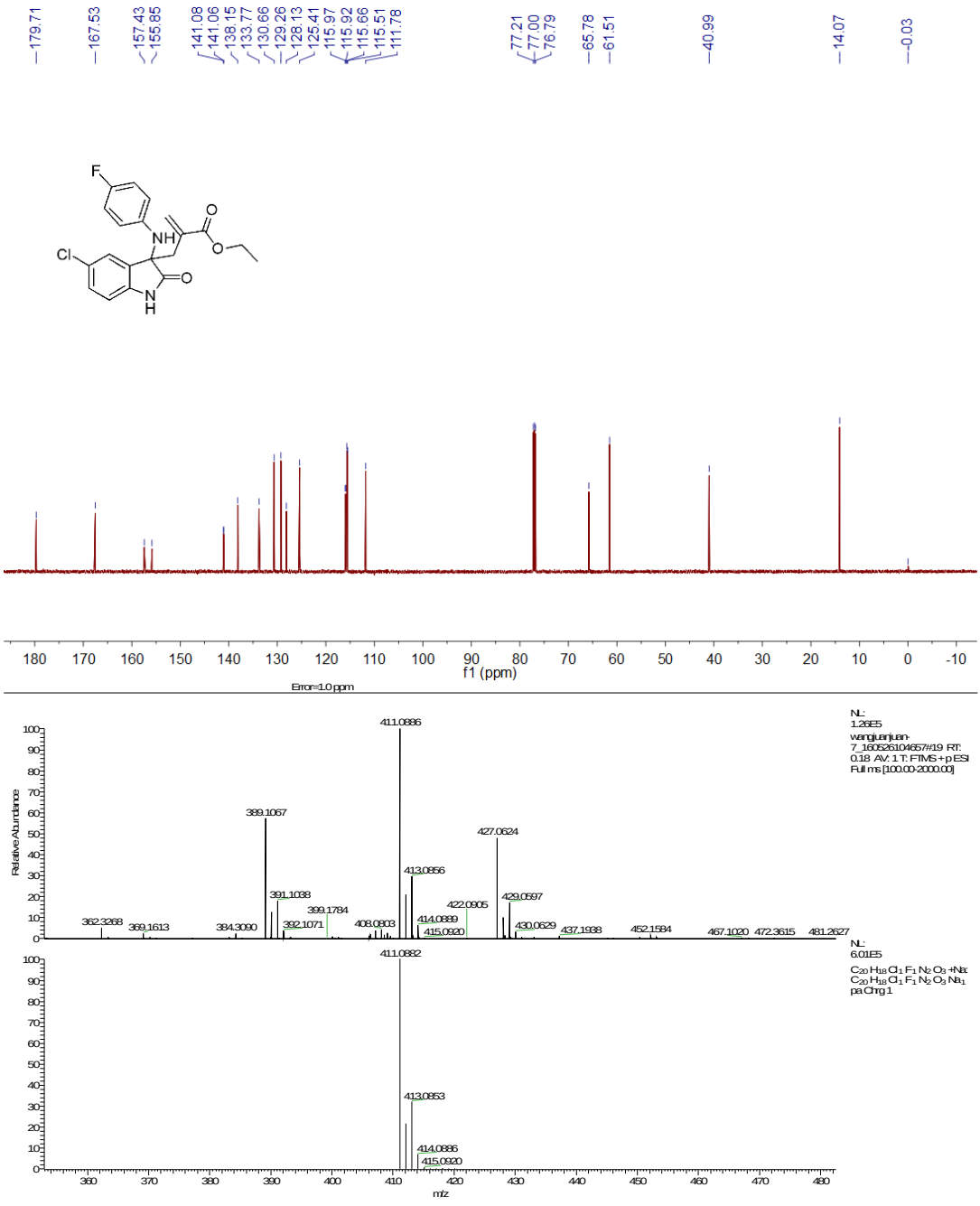

Error=1.0 ppm
391.1432
369.1613
407.1171
392.1465
370.1646
408.1205
414.1064
388.1349
399.1781
330.3369
346.3319
368.0803
380.1462
430.0803
446.1246
452.1584
460.1481
468.1327
481.3650
NL:
2.71E5
wangjuanjuan-6_160526104657#20
RT: 0.20 AV: 1 T: FTMS
+ p ESI Full ms
[100.00-2000.00]
391.1428
392.1462
393.1496
NL:
7.84E5
C21 H21 F1 N2 O3 +Na
C21 H21 F1 N2 O3 Na1
pa Chrg 1
m/z

Ethyl 2-((5-chloro-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6n)

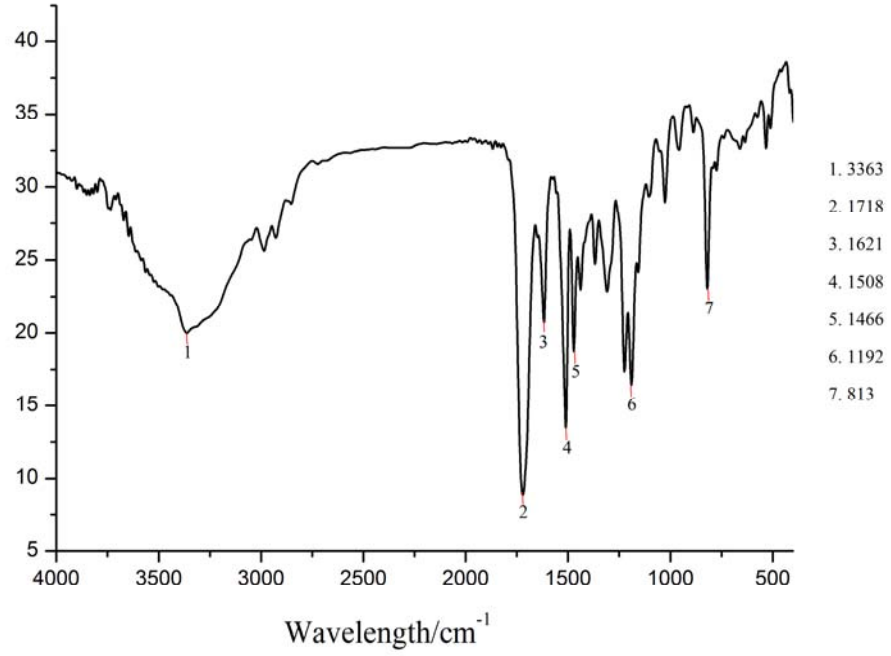


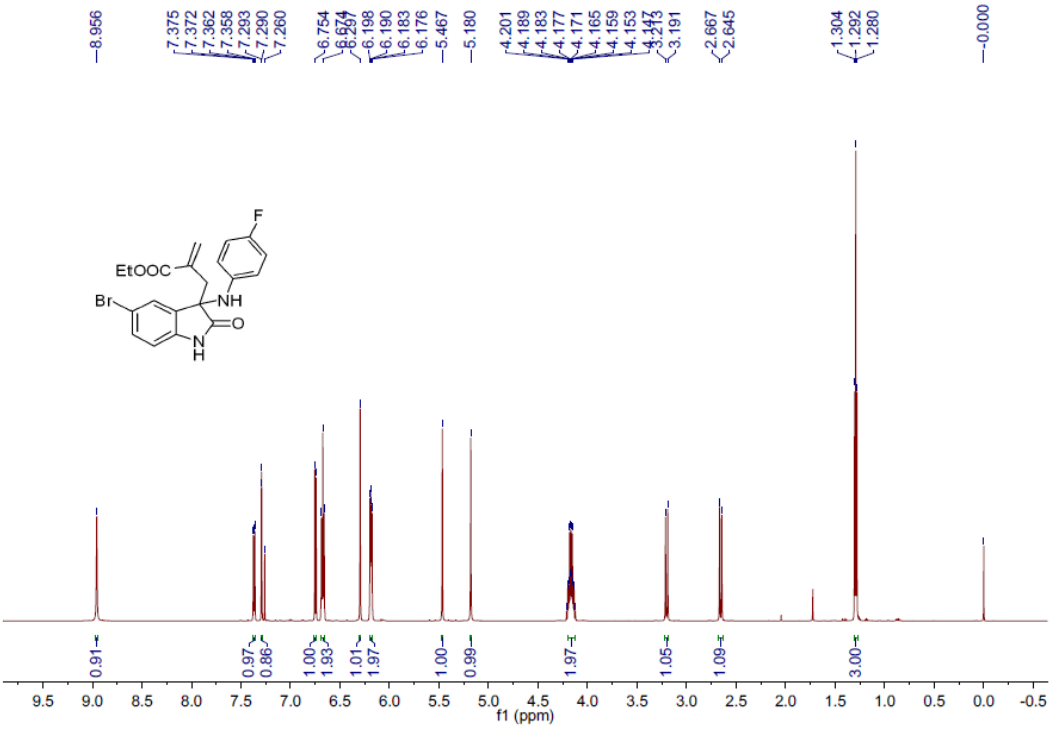


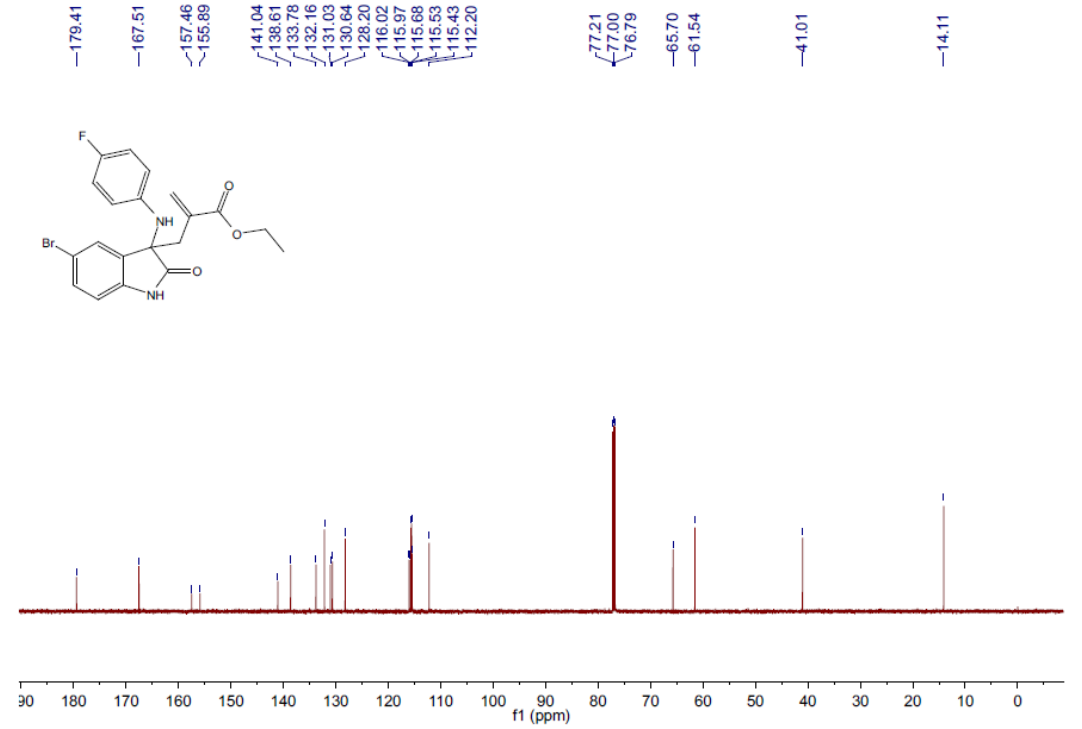


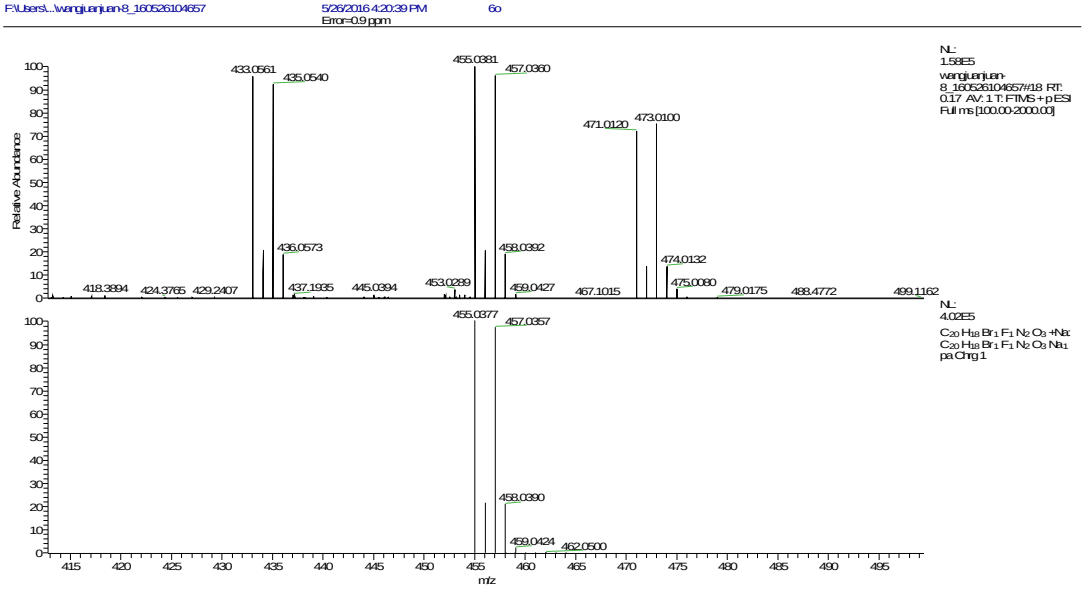

179.71
167.53
157.43
155.85
141.08
141.06
138.15
133.77
130.66
129.26
128.13
125.41
115.97
115.92
115.66
115.51
111.78
77.21
77.00
76.79
65.78
61.51
40.99
14.07
0.03
F
NH
O
O
Cl
O
N
H
f1 (ppm)
Error=1.0 ppm
Relative Abundance
411.0886
389.1067
427.0624
413.0856
391.1038
429.0597
399.1784
422.0905
362.3268
369.1613
384.3090
392.1071
408.0803
414.0889
415.0920
430.0629
437.1938
452.1584
467.1020
472.3615
481.2627
NL:
1.26E5
wangjuanjuan-
7_160526104657#19 RT:
0.18 AV: 1 T: FTMS + p ESI
Full ms [100.00-2000.00]
411.0882
413.0853
414.0886
415.0920
NL:
6.01E5
C20 H18 Cl1 F1 N2 O3 +Na:
C20 H18 Cl1 F1 N2 O3 Na1
pa Chrg 1
m/z

Ethyl 2-((5-bromo-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6o)

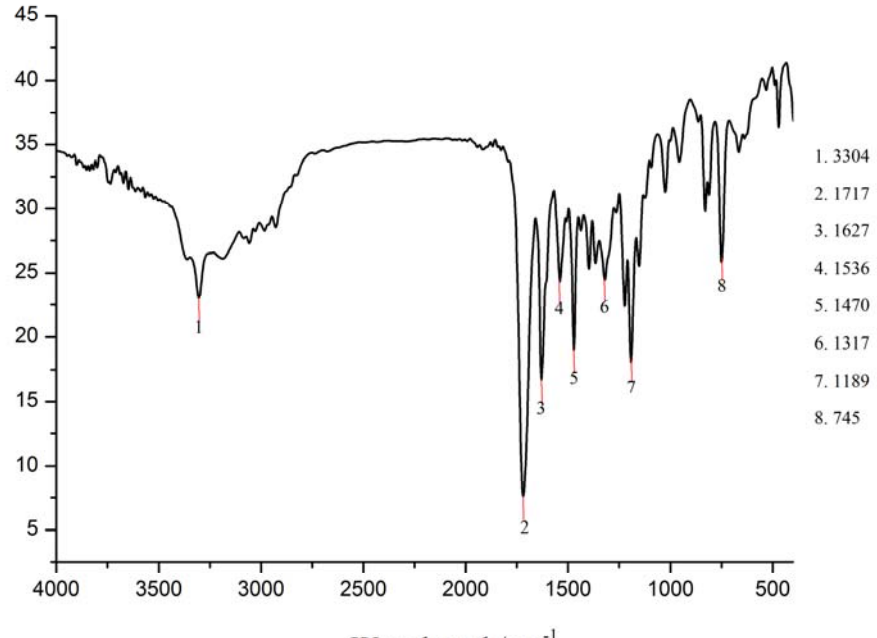


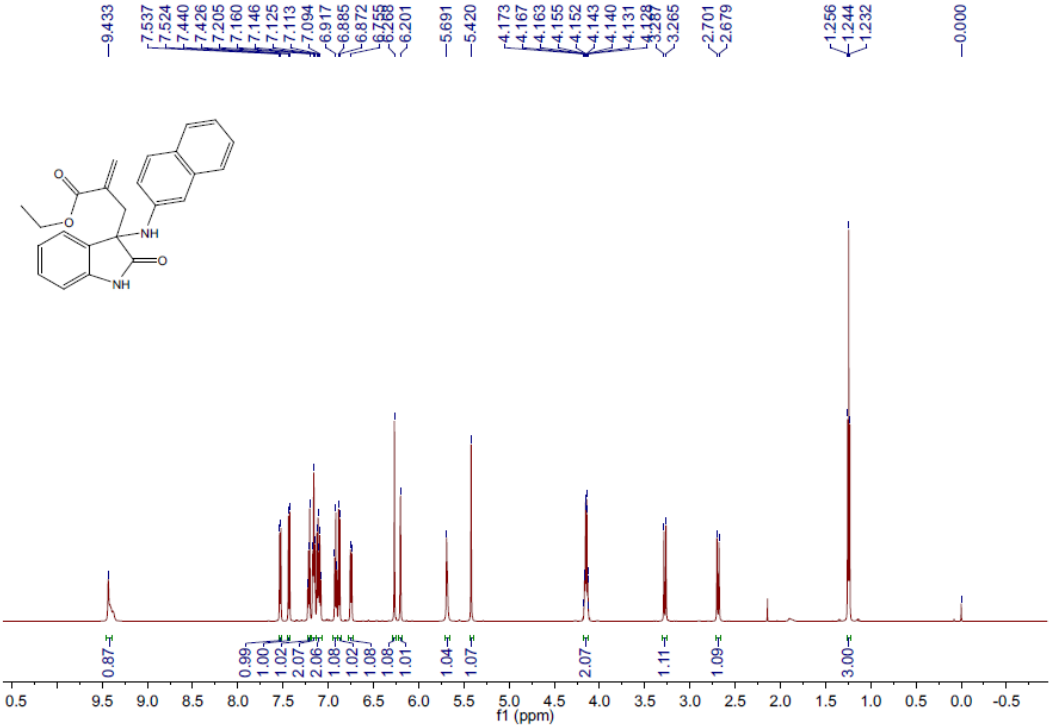


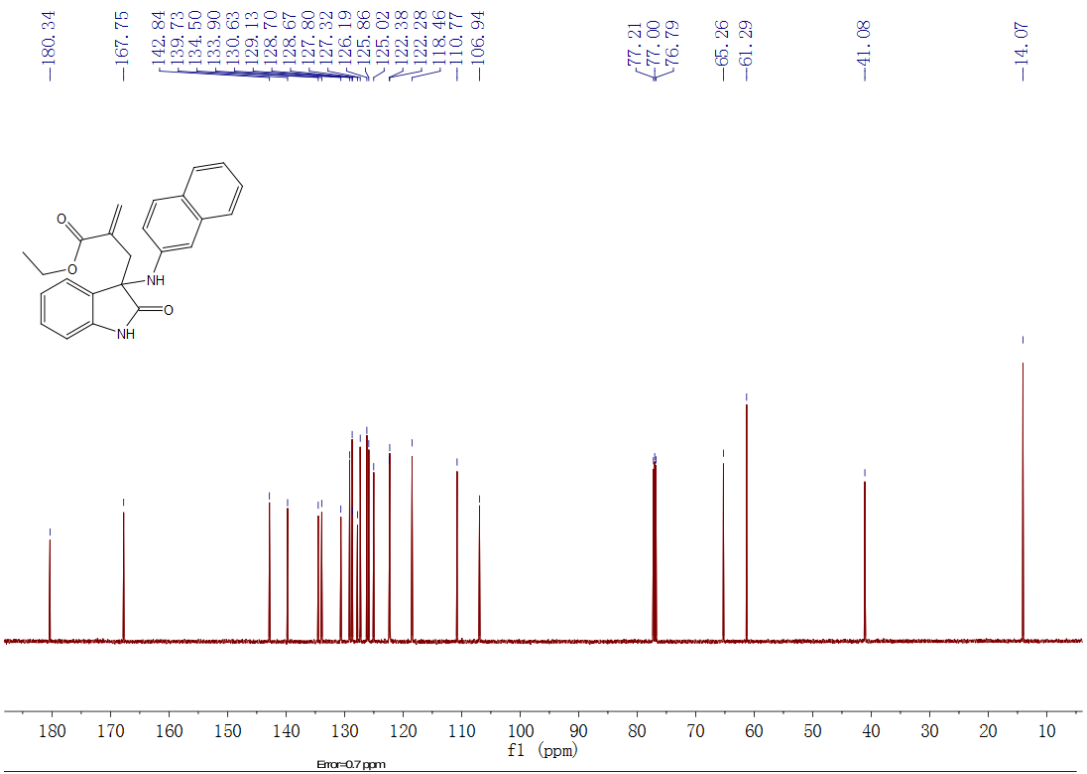

179.41
167.51
157.46
155.89
141.04
138.61
133.78
132.16
131.03
130.64
128.20
116.02
115.97
115.68
115.53
115.43
112.20
77.21
77.00
76.79
65.70
61.54
41.01
14.11
F
NH
O
O
Br
O
NH
f1 (ppm)

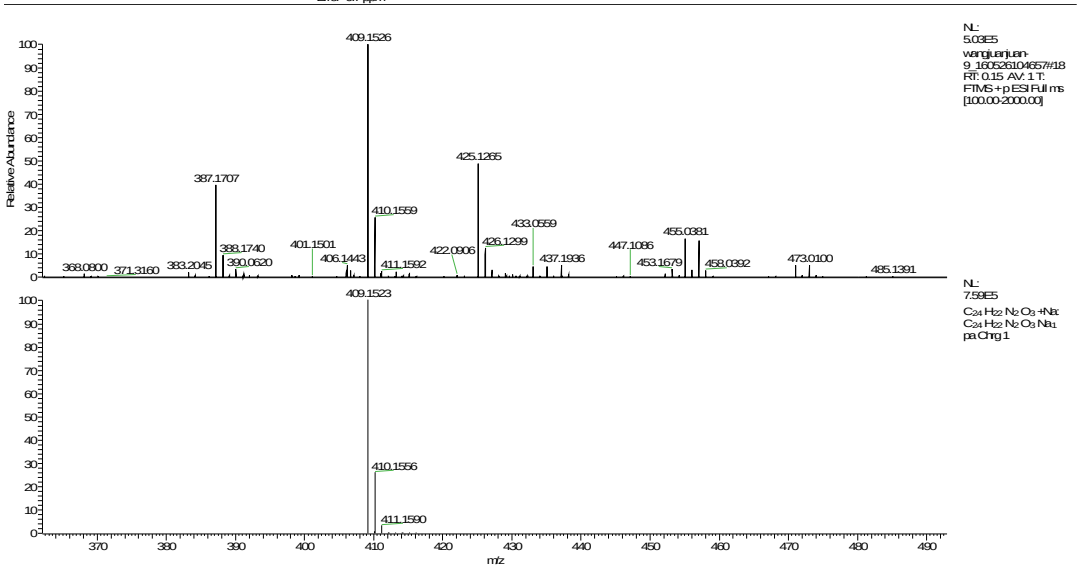

F:\Users\...\wangjuanjuan-8_160526104657
5/26/2016 4:20:39 PM
Error=0.9 ppm
6o
Relative Abundance
433.0561
435.0540
455.0381
457.0360
471.0120
473.0100
436.0573
458.0382
474.0132
418.3894
424.3765
429.2407
437.1935
445.0394
453.0289
459.0427
467.1015
475.0080
479.0175
488.4772
499.1162
NL:
1.58E5
wangjuanjuan-8_160526104657#18 RT: 0.17 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
455.0377
457.0357
458.0390
459.0424
462.0500
NL:
4.02E5
C20 H18 Br1 F1 N2 O3 +Na
C20 H18 Br1 F1 N2 O3 Na1
pa Chrg 1
m/z

Ethyl 2-((3-(naphthalen-2-ylamino)-2-oxoindolin-3-yl)methyl)acrylate(6p)

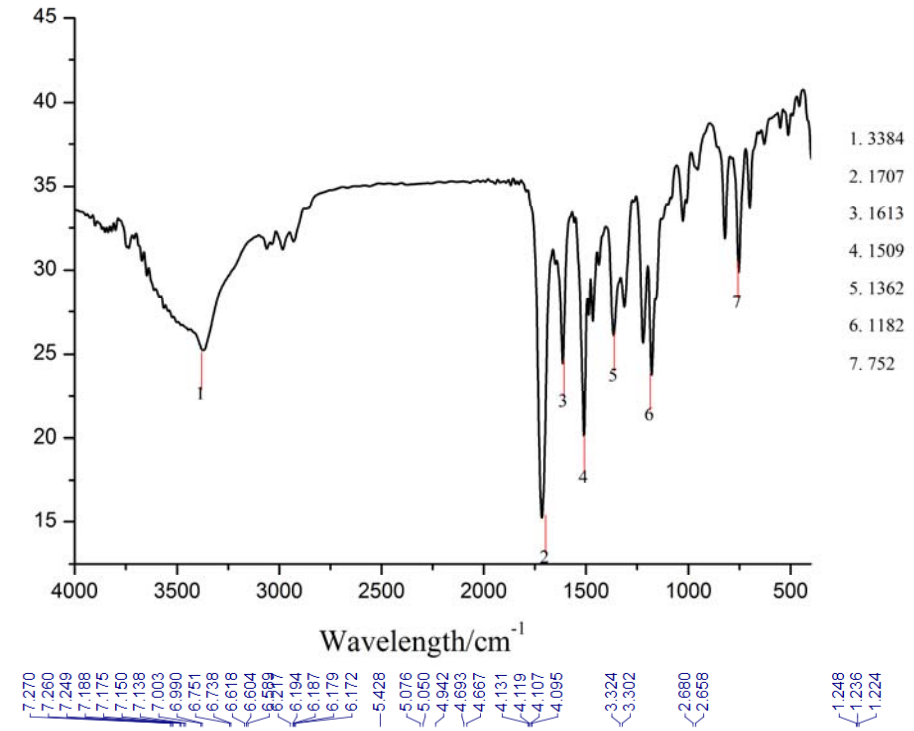


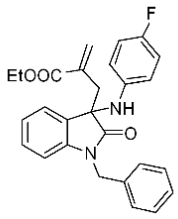


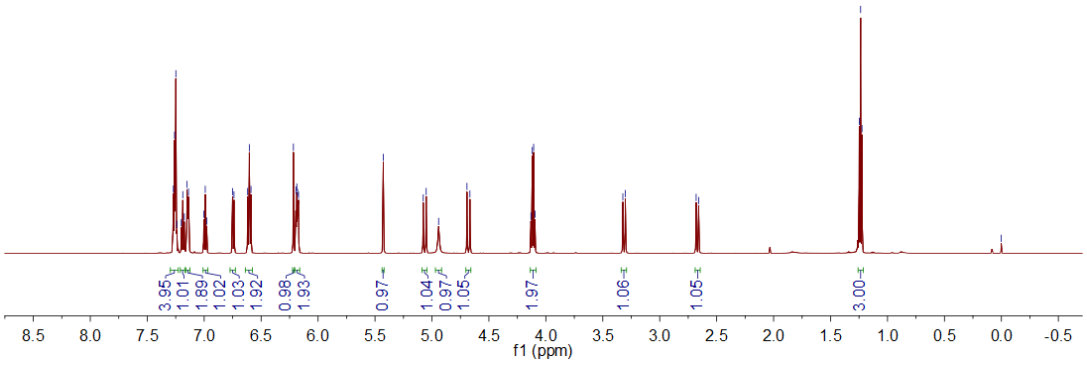

180.34
167.75
142.84
139.73
134.50
133.90
130.63
129.13
128.70
128.67
127.80
127.32
126.19
125.86
125.02
122.38
122.28
118.46
110.77
106.94
77.21
77.00
76.79
65.26
61.29
41.08
14.07
O
O
NH
O
NH
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

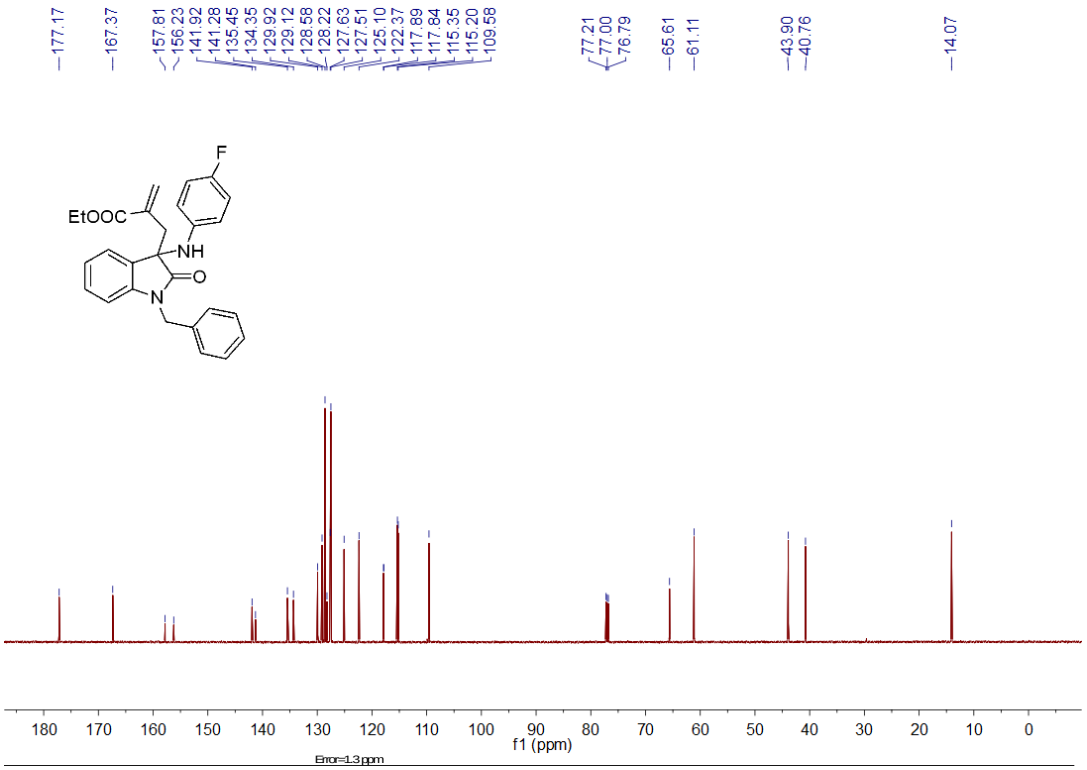

Error=0.7 ppm
Relative Abundance
409.1526
425.1265
387.1707
410.1559
433.0559
426.1299
455.0381
401.1501
406.1443
422.0906
437.1936
447.1086
453.1679
368.0800
371.3160
383.2045
388.1740
390.0620
411.1592
458.0392
473.0100
485.1391
NL:
5.03E5
wangjuanjuan-9_160526104657#18 RT: 0.15 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
409.1523
410.1556
411.1590
NL:
7.59E5
C24 H22 N2 O3 +Na; C24 H22 N2 O3 Na1 pa Chrg 1
mz

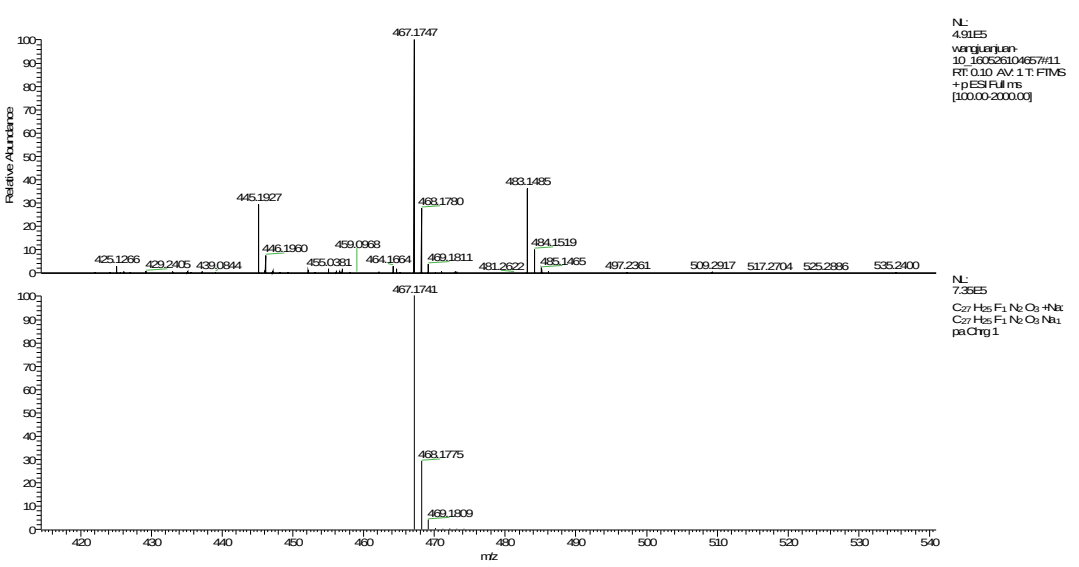
Ethyl 2-((1-benzyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6q)



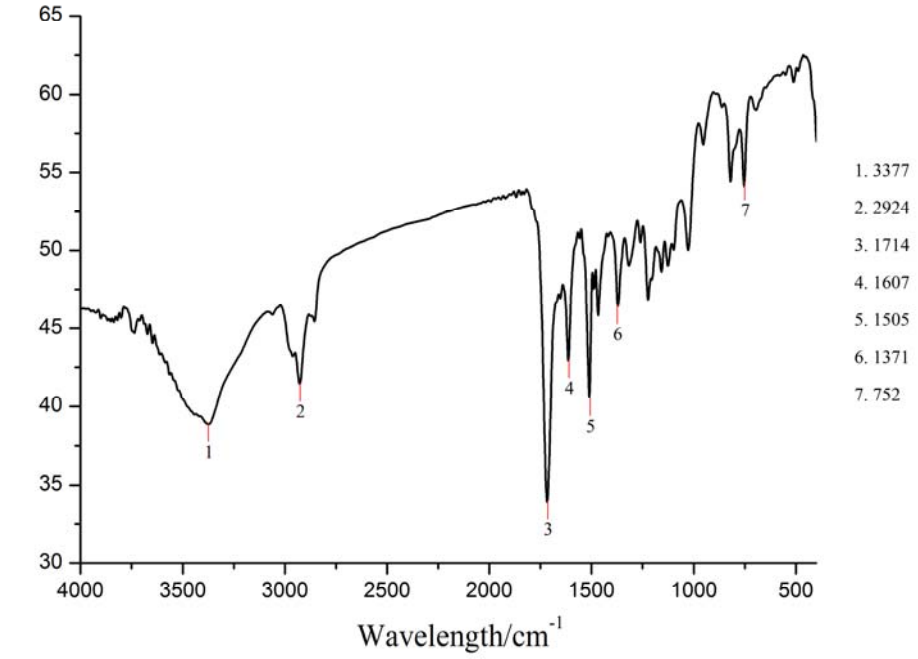


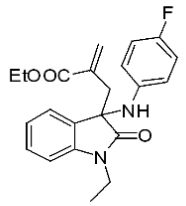


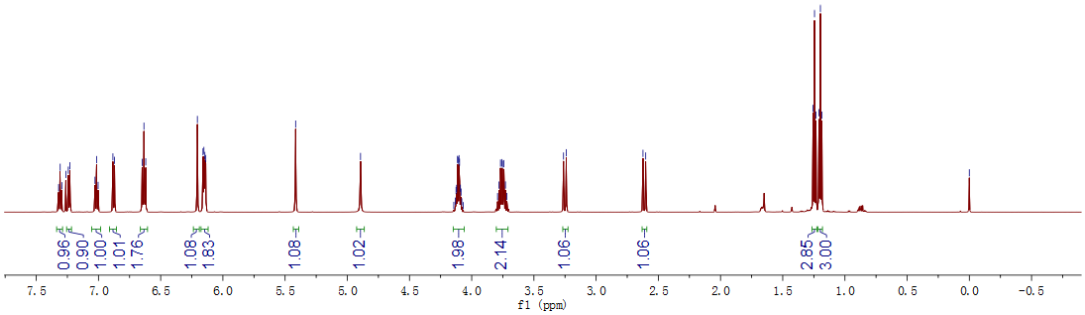

177.17
167.37
157.81
156.23
141.92
141.28
135.45
134.35
129.92
129.12
128.58
128.22
127.63
127.51
125.10
122.37
117.89
117.84
115.35
115.20
109.58
77.21
77.00
76.79
65.61
61.11
43.90
40.76
14.07
F
EtOOC
NH
O
N
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

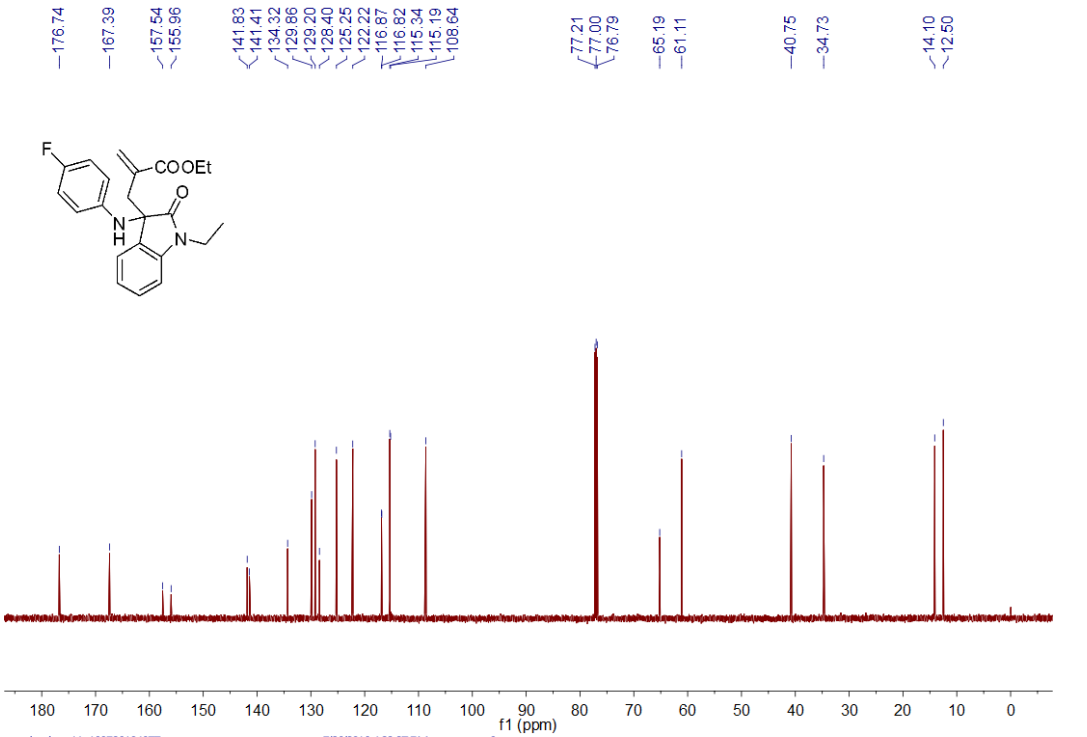

Error=1.3 ppm
Relative Abundance
467.1747
445.1927
483.1485
468.1780
484.1519
425.1266
429.2405
439.0844
446.1960
459.0968
455.0381
464.1664
469.1811
481.2622
485.1465
497.2361
509.2917
517.2704
525.2896
535.2400
NL:
4.91E5
wangjuanjuan-10_160526104657#11
RT: 0.10 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
467.1741
468.1775
469.1809
NL:
7.35E5
C27 H25 F1 N2 O3 +Na
C27 H25 F1 N2 O3 Na1
pa Chrg 1
m/z

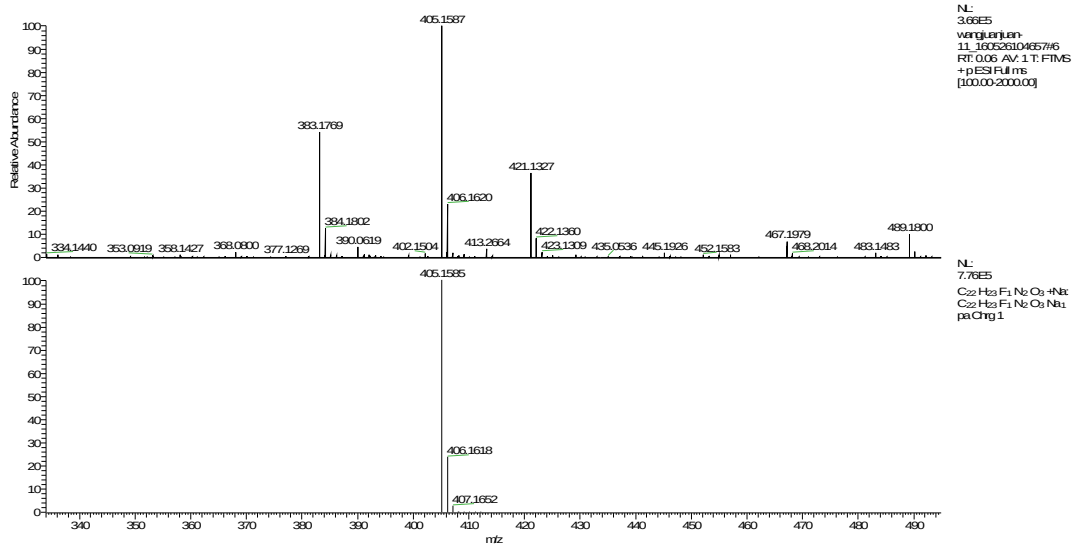
Ethyl 2-((1-ethyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6r)



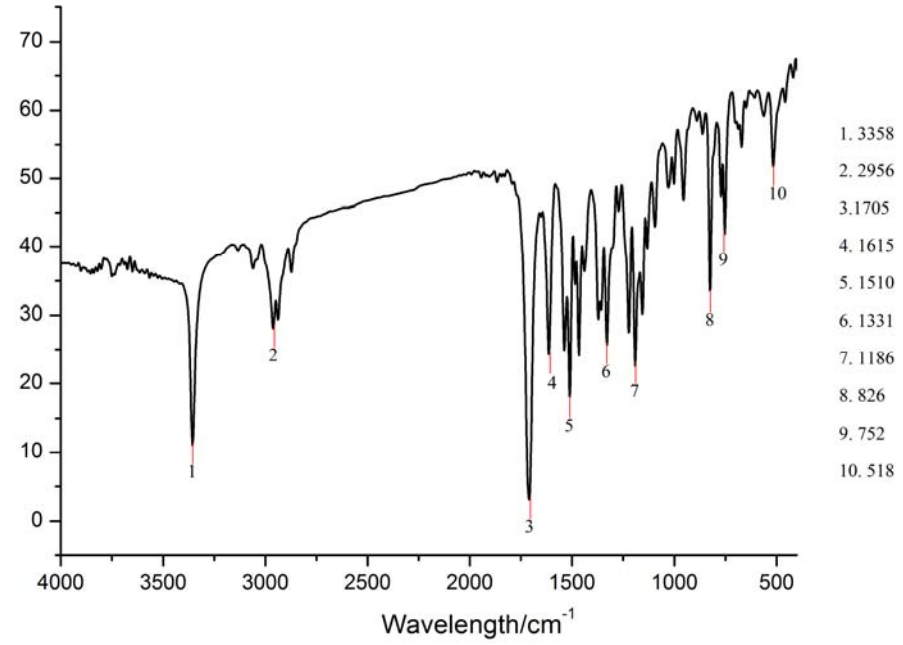


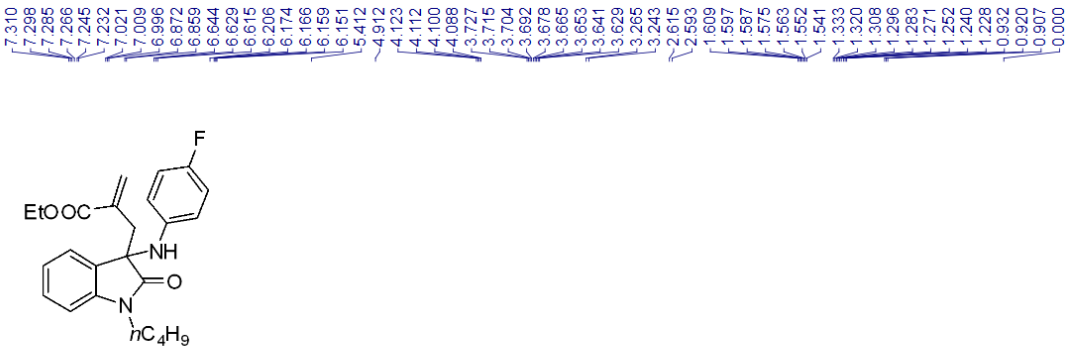


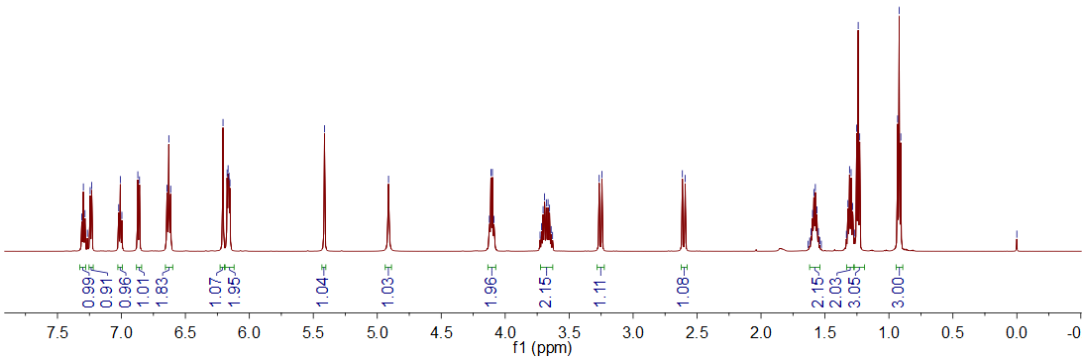

176.74
167.39
157.54
155.96
141.83
141.41
134.32
129.86
129.20
128.40
125.25
122.22
116.87
116.82
115.34
115.19
108.64
77.21
77.00
76.79
65.19
61.11
40.75
34.73
14.10
12.50
F
COOEt
O
N
H
N
180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)
wangjuanjuan-11_160526104657
5/26/2016 4:38:27 PM
6r
Error=0.5 ppm

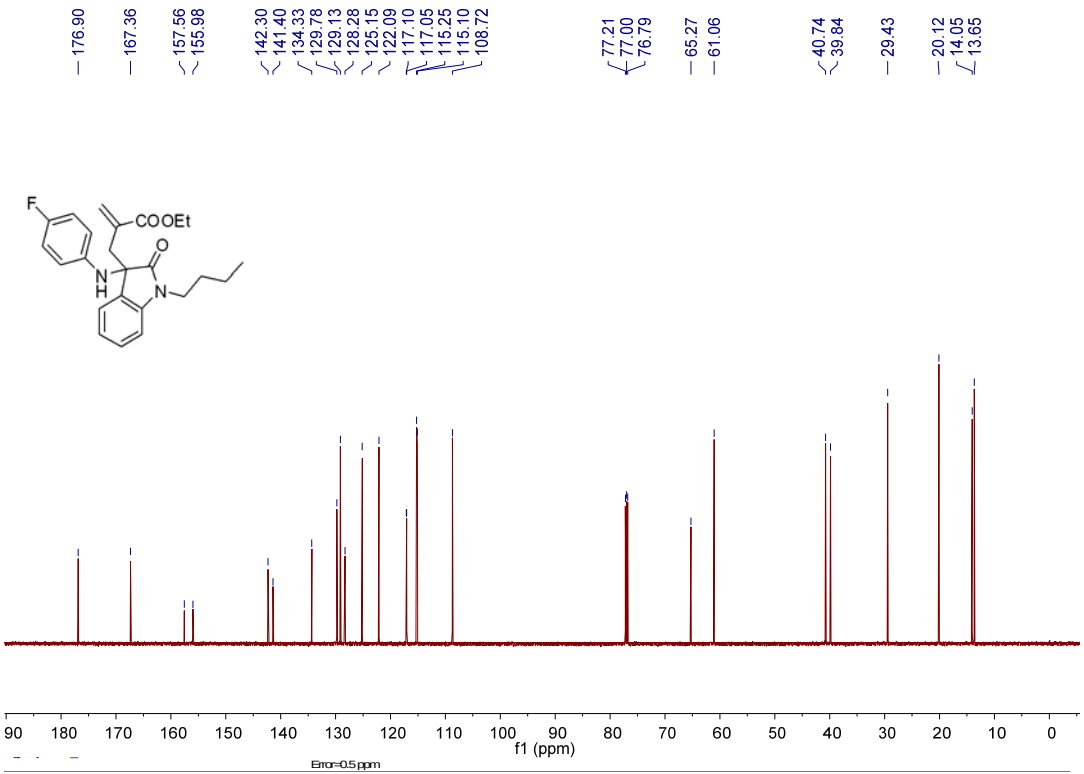

Relative Abundance
405.1587
383.1769
421.1327
406.1620
394.1802
422.1360
390.0619
334.1440
353.0919
358.1427
368.0800
377.1269
402.1504
413.2664
423.1309
435.0536
445.1926
452.1583
467.1979
468.2014
483.1483
489.1800
NL:
3.66E5
wangjuanjuan-11_160526104657#6
RT: 0.06 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
405.1585
406.1618
407.1652
NL:
7.76E5
C22 H23 F1 N2 O3 +Na
C22 H23 F1 N2 O3 Na1
pa Chrg 1
m/z

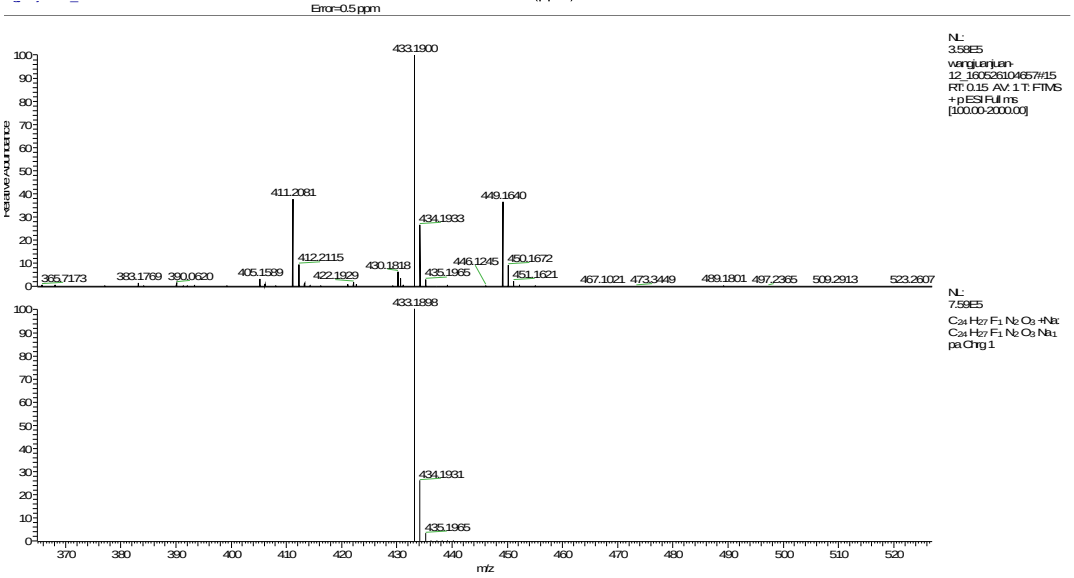
Ethyl 2-((1-butyl-3-((4-fluorophenyl)amino)-2-oxoindolin-3-yl)methyl)acrylate(6s)








176.90
167.36
157.56
155.98
142.30
141.40
134.33
129.78
129.13
128.28
125.15
122.09
117.10
117.05
115.25
115.10
108.72
77.21
77.00
76.79
65.27
61.06
40.74
39.84
29.43
20.12
14.05
13.65
F
COOEt
O
N
H
N
f1 (ppm)


Error=0.5 ppm
433.1900
411.2081
449.1640
434.1933
412.2115
430.1818
446.1245
450.1672
435.1965
451.1621
365.7173
383.1769
390.0620
405.1589
422.1929
467.1021
473.3449
489.1801
497.2365
509.2913
523.2607
Relative Abundance
m/z
NL:
3.58E5
wangjuanjuan-12_160526104657#15 RT: 0.15 AV: 1 T: FTMS + p ESI Full ms [100.00-2000.00]
433.1898
434.1931
435.1965
NL:
7.59E5
C24 H27 F1 N2 O3 +Na
C24 H27 F1 N2 O3 Na1
pa Chrg 1